Quality and Environmental Management System

Lelon Electronics Corp.

Standard	Certificate Number	Date of Registration
ISO-9001: 2015	TW06/70649.02	Aug. 8, 2018
ISO-14001: 2015	TW14/10631.00	Sep. 10, 2020
IATF-16949: 2016	IATF 0322025 SGS TW06/0034.01	Aug. 8, 2018
QC 080000: 2017	IECQ-H SGSTW 14.0010	Oct. 15, 2020
ISO 45001: 2018	TW16/00842.00	Aug. 15, 2020

Lelon Electronics (Huizhou) Co., Ltd.

Standard	Certificate Number	Date of Registration
ISO-9001: 2015	TW06/70649.02	Aug. 8, 2018
ISO-14001: 2015	TW14/10631.01	Sep. 10, 2020
IATF -16949: 2016	IATF 0322025 SGS TW06/0034.01	Aug. 8, 2018
QC 080000: 2017	IECQ-H SGSTW 14.0010-03	Oct. 15, 2020
ISO 45001: 2018	TW16/00842.00	Aug. 15, 2020

Lelon Electronics (Suzhou) Co., Ltd.

Standard	Certificate Number	Date of Registration
ISO-9001: 2015	TW06/70649.02	Aug. 8, 2018
ISO-14001: 2015	TW14/10631.02	Sep. 10, 2020
IATF-16949: 2016	IATF 0322022 SGS TW06/0034.02	Aug. 8, 2018
QC 080000: 2017	IECQ-H SGSTW 14.0010-04	Oct. 15, 2020
ISO 45001: 2018	TW16/00842.00	Aug. 15, 2020

Available Product Type

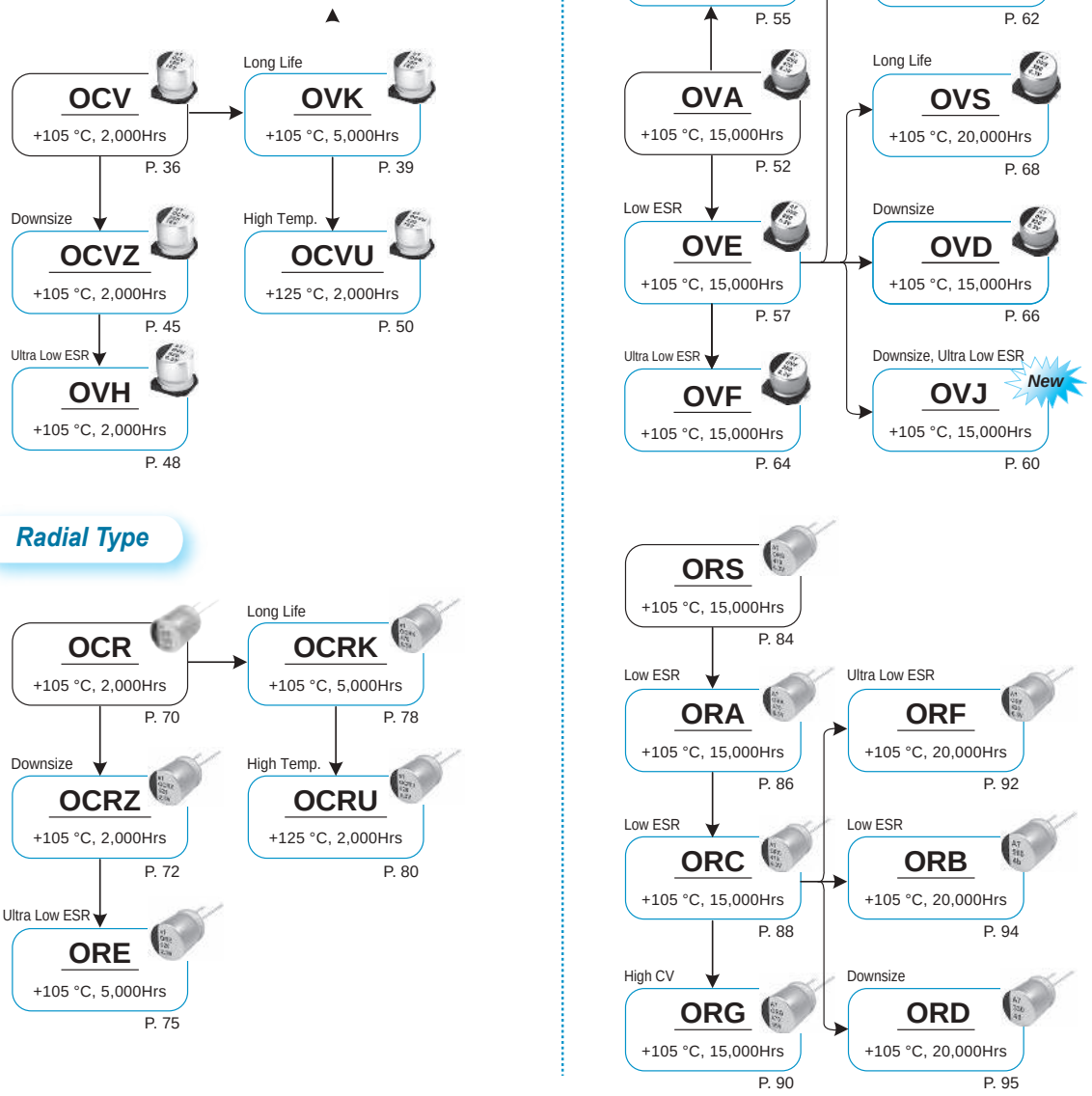
	Radial	SMD	Snap-in & Screw	Polymer	Axial
Huizhou Factory	V	V	V	V	
Suzhou Factory	V	V	V		V

Contents

Product Group Chart

Organic Conductive Polymer Capacitors (OP-CAP)

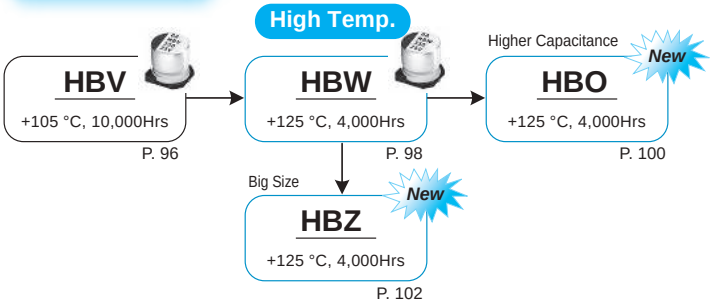
SMD Type



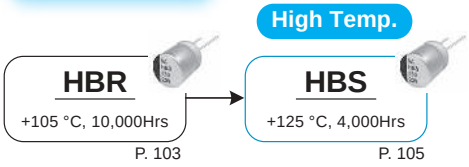
Radial Type

Conductive Polymer Hybrid Capacitors

SMD Type

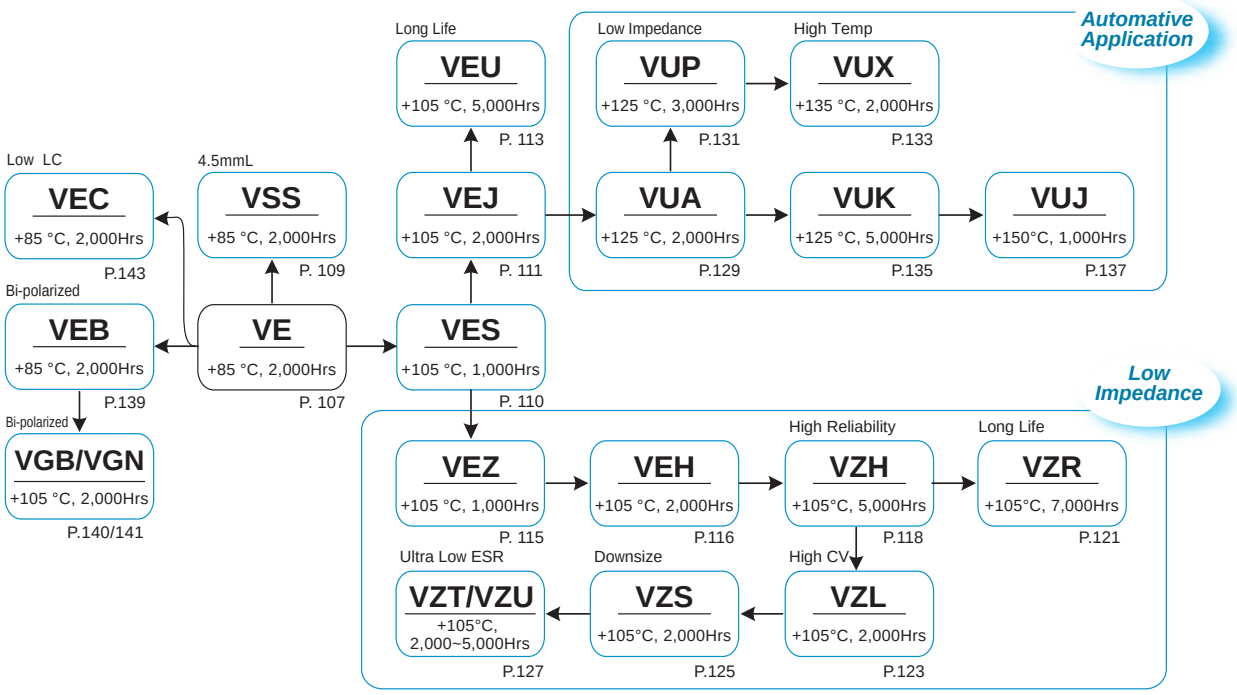


Radial Type

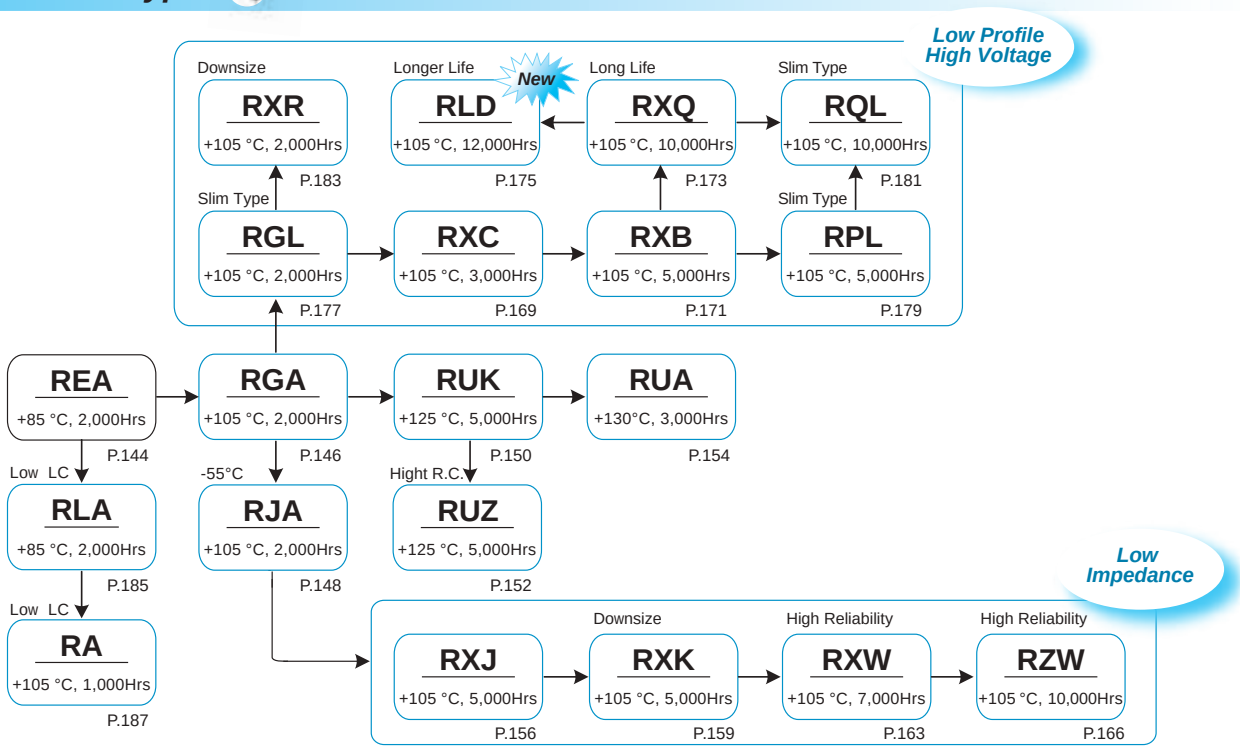


* Special application available upon request.

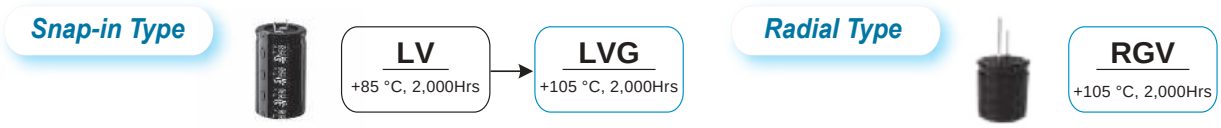
SMD Aluminum Electrolytic Capacitors



Radial Type

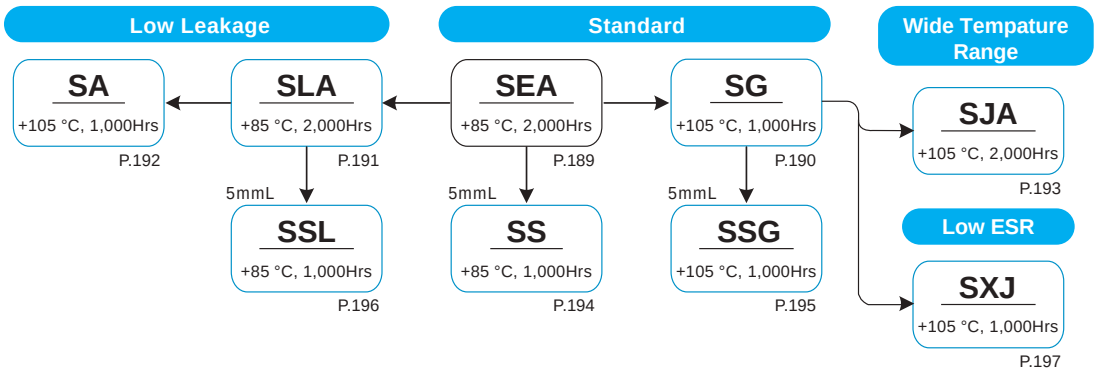


Flame Retardant

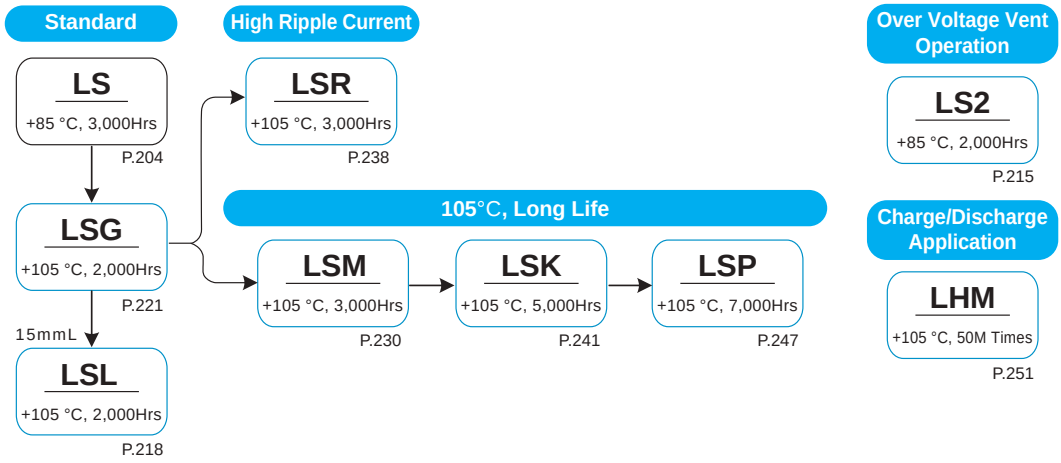


* Special application available upon request.

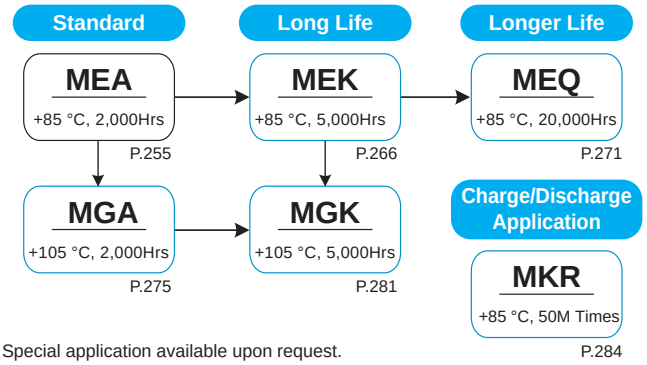
Radial - 7mmL and 5mmL



Snap-in Terminal

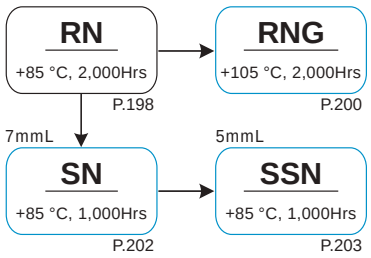


Screw Terminal



* Special application available upon request.

Bi-polarized



Axial

Axial-lead

High RC	Long Life Time	High Temperature
TUR +125 °C, 3,000Hrs	TUK +125°C, 5,000Hrs	TUP +150°C, 2,000Hrs

Soldering Star

High RC	Long Life Time	High Temperature
TSR +125 °C, 3,000Hrs	TSK +125°C, 5,000Hrs	TSP +150°C, 2,000Hrs

Note: Axial type is not included in this catalog.

Capacitor Series Table

Organic Conductive Polymer Capacitors (OP-CAP)

Series		Features	Temperature & Endurance	Rated Voltage Range (V_{DC})	Capacitance Range (μF)	Page
	OCV	Standard	105℃, 2,000 Hrs	2.5 ~ 35	6.8 ~ 1,500	36
	OVK	Long Life	105℃, 5,000 Hrs	2.5 ~ 35	10 ~ 1,500	39
NEW						
	OCVZ	Downsize, Super Low ESR	105℃, 2,000 Hrs	2.5 ~ 35	22 ~ 2,700	45
	OVH	Ultra Low ESR	105℃, 2,000 Hrs	2 ~ 16	150 ~ 2,200	48
	OCVU	High Temperature Usage, 125℃	125℃, 1,000 ~ 2,000 Hrs	2.5 ~ 16	180 ~ 1,500	50
SMD Type	OVA	Standard	105℃, 15,000 Hrs	2.5 ~ 25	10 ~ 1,500	52
NEW	OVB	Low ESR	105℃, 20,000 Hrs	2.5 ~ 25	12 ~ 2,700	55
	OVE	Low ESR	105℃, 15,000 Hrs	2.5 ~ 16	33 ~ 2,700	57
NEW	OVJ	Low ESR, Downsize	105℃, 15,000 Hrs	2.5 ~ 25	82 ~ 1,200	60
	OVG	16 ~ 25V	105℃, 15,000 Hrs	16 ~ 25	10 ~ 1,000	62
	OVF	Ultra Low ESR	105℃, 15,000 Hrs	2 ~ 10	120 ~ 1,000	64
	OVD	Down Size	105℃, 15,000 Hrs	2.5 ~ 16	100 ~ 560	66
	OVS	Long Life	105℃, 20,000 Hrs	4 ~ 16	22 ~ 560	68
	OCR	Standard	105℃, 2,000 Hrs	2.5 ~ 35	6.8 ~ 1,500	70
	OCRZ	Downsize, Super Low ESR	105℃, 2,000 Hrs	2.5 ~ 35	47 ~ 3,900	72
	ORE	Ultra Low ESR, Long Life	105℃, 5,000 Hrs	2.5 ~ 35	22 ~ 2,700	75
	OCRK	Long Life	105℃, 5,000 Hrs	2.5 ~ 35	68 ~ 820	78
	OCRU	High Temperature Usage, 125℃	125℃, 1,000 ~ 2,000 Hrs	2.5 ~ 20	100 ~ 1,200	80
NEW						
Radial Type	ORS	Standard	105℃, 15,000 Hrs	2.5 ~ 35	18 ~ 1,500	84
	ORA	Low ESR	105℃, 15,000 Hrs	2.5 ~ 16	47 ~ 1,500	86
	ORC	Low ESR, High Capacitance	105℃, 15,000 Hrs	2.5 ~ 16	270 ~ 2,700	88
	ORG	16 ~ 35V	105℃, 15,000 Hrs	16 ~ 35	56 ~ 2,200	90
	ORF	Long Life, Low ESR	105℃, 20,000 Hrs	2 ~ 16	100 ~ 1,600	92
	ORB	Long Life	105℃, 20,000 Hrs	2.5 ~ 6.3	470 ~ 820	94
	ORD	Long Life, Down Size	105℃, 20,000 Hrs	2.5 ~ 6.3	220 ~ 560	95

Conductive Polymer Hybrid Capacitors

Series		Features	Temperature & Endurance	Rated Voltage Range (V_{DC})	Capacitance Range (μF)	Page
SMD Type	HBV	Ultra Low ESR, Long Life	105℃, 10,000 Hrs	16 ~ 80	10 ~ 470	96
	HBW	High Temperature Usage, 125℃	125℃, 4,000 Hrs	16 ~ 80	10 ~ 470	98
NEW	HBO	Higher Capacitance	125℃, 4,000 Hrs	25 ~ 35	56 ~ 470	100
	HBZ	Big Size	125℃, 4,000 Hrs	25 ~ 63	100 ~ 560	102
Radial Type	HBR	Ultra Low ESR, Long Life	105℃, 10,000 Hrs	16 ~ 80	10 ~ 470	103
	HBS	High Temperature Usage, 125℃	125℃, 4,000 Hrs	16 ~ 80	10 ~ 470	105

SMD Aluminum Electrolytic Capacitors

Series		Features	Temperature & Endurance	Rated Voltage Range (V_{DC})	Capacitance Range (μF)	Page
	VE	Standard, 85℃	85℃, 2,000 Hrs	4 ~ 450	1 ~ 10,000	107
	VSS	4.5 mmL, Low Profile	85℃, 2,000 Hrs	4 ~ 50	0.47 ~ 100	109
	VES	Downsize, 105℃	105℃, 1,000 Hrs	6.3 ~ 50	1 ~ 100	110
	VEJ	Standard, 105℃	105℃, 2,000 Hrs	6.3 ~ 450	1 ~ 8,200	111
	VEU	Long Life, 105℃	105℃, 3,000 ~ 5,000 Hrs	6.3 ~ 450	1 ~ 1,500	113
	VEZ	Low ESR, Downsize	105℃, 1,000 Hrs	6.3 ~ 50	1 ~ 220	115
	VEH	Low ESR	105℃, 2,000 Hrs	6.3 ~ 50	3.3 ~ 1,000	116
	VZH	Low ESR, High Reliability	105℃, 2,000 ~ 5,000 Hrs	6.3 ~ 100	1 ~ 8,200	118
	VZR	Low ESR, Long Life	105℃, 7,000 Hrs	6.3 ~ 50	10 ~ 470	121
	VZL	Low ESR, High CV	105℃, 2,000 Hrs	6.3 ~ 50	4.7 ~ 1,500	123
	VZS	Low ESR, High CV	105℃, 2,000 Hrs	6.3 ~ 50	22 ~ 2,200	125
	VZT	Ultra Low ESR, High Reliability	105℃, 2,000 Hrs	6.3 ~ 50	10 ~ 2,200	127
	VZU	Ultra Low ESR, High Reliability	105℃, 3,000 ~ 5,000 Hrs	6.3 ~ 50	220 ~ 2,200	127
	VUA	High Temperature Usage, 125℃	125℃, 1,000 ~ 2,000 Hrs	10 ~ 63	10 ~ 4,700	129
	VUP	High Temperature Usage, 125℃, Low ESR	125℃, 2,000 ~ 3,000 Hrs	10 ~ 35	33 ~ 470	131
	VUX	High Temperature Usage, 135℃, Low ESR	135℃, 2,000 Hrs	10 ~ 50	47 ~ 3,300	133

Capacitor Series Table

● Aluminum Electrolytic Capacitors

Series		Features	Temperature & Endurance	Rated Voltage Range (V_{DC})	Capacitance Range (μF)	Page
SMD Type	VUK	High Temperature Usage, 125℃	125℃, 3,000 ~ 5,000 Hrs	10 ~ 63	100 ~ 3,300	135
	VUJ	High Temperature Usage, 150℃	150℃, 1,000 Hrs	10 ~ 50	33 ~ 3,300	137
	VEB	Bi-polarized	85℃, 2,000 Hrs	6.3 ~ 63	0.33 ~ 47	139
	VGB	Bi-polarized, 105℃	105℃, 2,000 Hrs	6.3 ~ 50	1 ~ 47	140
	VGN	Bi-polarized, 105℃	105℃, 2,000 Hrs	6.3 ~ 100	22 ~ 3,300	141
	VEC	Low Leakage Current	85℃, 2,000 Hrs	6.3 ~ 50	1 ~ 150	143
Radial Type	REA	Standard, 85℃	85℃, 2,000 ~ 3,000 Hrs	6.3 ~ 450	2.2 ~ 33,000	144
	RGA	Standard, 105℃	105℃, 2,000 Hrs	6.3 ~ 450	2.2 ~ 33,000	146
	RJA	Wide Temperature Range	105℃, 2,000 Hrs	6.3 ~ 100	2.2 ~ 22,000	148
	RUK	High Temperature Usage, Long Life, 125℃	125℃, 3,000 ~ 5,000 Hrs	10 ~ 63	10 ~ 1,000	150
	RUZ	High Temperature Usage, Low Imp., 125℃	125℃, 3,000 ~ 5,000 Hrs	25 ~ 100	220 ~ 6,800	152
	RUA	High Temperature Usage, 130℃	130℃, 2,000 ~ 3,000 Hrs	10 ~ 450	4.7 ~ 1,000	154
	RXJ	Low ESR, Longer Life	105℃, 2,000 ~ 5,000 Hrs	6.3 ~ 100	2.2 ~ 4,700	156
	RXK	Low ESR, Downsize, Longer Life	105℃, 2,000 ~ 5,000 Hrs	6.3 ~ 63	12 ~ 10,000	159
	RXW	Low ESR, High Reliability	105℃, 4,000 ~ 7,000 Hrs	6.3 ~ 100	2.2 ~ 15,000	163
	RZW	Low ESR, High Reliability	105℃, 4,000 ~ 10,000 Hrs	6.3 ~ 63	3.3 ~ 18,000	166
	RXC	High Voltage, High Ripple Current	105℃, 2,000 ~ 3,000 Hrs	160 ~ 450	1.5 ~ 330	169
	RGL	High Voltage, High Ripple Current, Slim Type	105℃, 2,000 Hrs	400, 420, 450	15 ~ 220	177
	RXB	High Voltage, High Ripple Current, Longer Life	105℃, 5,000 Hrs	160 ~ 450	4.7 ~ 330	171
	RPL	High Voltage, High Ripple Current, Longer Life, Slim Type	105℃, 5,000 Hrs	400, 420, 450	33 ~ 150	179
	RXQ	High Voltage, High Ripple Current, Long Life	105℃, 8,000 ~ 10,000 Hrs	160 ~ 450	6.8 ~ 330	173
NEW	RLD	High Voltage, High Ripple Current, Longer Life	105℃, 12,000 Hrs	160 ~ 450	15 ~ 560	175
	RQL	High Voltage, High Ripple Current, Long Life, Slim Type	105℃, 10,000 Hrs	400, 420, 450	33 ~ 180	181
	RXR	High Voltage, High Ripple Current, Downsize	105℃, 2,000 Hrs	400, 450	22 ~ 220	183
	RLA	Low Leakage Current	85℃, 2,000 Hrs	6.3 ~ 100	2.2 ~ 4,700	185
	RA	Low Leakage Current, 105℃	105℃, 1,000 Hrs	6.3 ~ 100	2.2 ~ 4,700	187
Low - profile	SEA	7 ~ 9mmL, Standard	85℃, 2,000 Hrs	4 ~ 63	1 ~ 1,000	189
	SG	7 mmL, Standard, 105℃	105℃, 1,000 Hrs	4 ~ 63	1 ~ 330	190
	SLA	7 mmL, Low Leakage Current	85℃, 2,000 Hrs	4 ~ 63	1 ~ 100	191
	SA	7 mmL, Low Leakage Current, 105℃	105℃, 1,000 Hrs	4 ~ 63	1 ~ 100	192
	SJA	7 mmL, Wide Temperature Range	105℃, 2,000 Hrs	4 ~ 63	1 ~ 470	193
	SS	5 mmL, Standard	85℃, 1,000 Hrs	4 ~ 50	0.33 ~ 330	194
	SSG	5 mmL, Standard, 105℃	105℃, 1,000 Hrs	4 ~ 50	1 ~ 220	195
	SSL	5 mmL, Low Leakage Current	85℃, 1,000 Hrs	4 ~ 50	1 ~ 100	196
	SXJ	5 ~ 7 mmL, Low ESR	105℃, 1,000 Hrs	6.3 ~ 35	4.7 ~ 220	197
Bi - polarized	RN	Bi-polarized, Standard	85℃, 2,000 Hrs	6.3 ~ 250	0.47 ~ 2,200	198
	RNG	Bi-polarized, 105℃	105℃, 2,000 Hrs	6.3 ~ 250	0.47 ~ 2,200	200
	SN	7 mmL, Bi-polarized	85℃, 1,000 Hrs	4 ~ 63	0.47 ~ 100	202
	SSN	5 mmL, Bi-polarized	85℃, 1,000 Hrs	4 ~ 50	0.33 ~ 47	203
Large Size	LS	Snap-in, Standard	85℃, 3,000 Hrs	16 ~ 500	56 ~ 68,000	204
	LS2	Snap-in, For Over Voltage Vent Operation Test	85℃, 2,000 Hrs	200, 250, 400, 450	120 ~ 1,800	215
	LSL	Snap-in, 15 mmL, 105℃	105℃, 2,000 Hrs	160 ~ 400	39 ~ 390	218
	LSG	Snap-in, Standard, 105℃	105℃, 2,000 Hrs	16 ~ 500	82 ~ 47,000	221
	LSM	Snap-in, Longer Life	105℃, 3,000 Hrs	16 ~ 500	56 ~ 22,000	230
	LSR	Snap-in, Longer Life, High Ripple Current	105℃, 3,000 Hrs	400, 450	82 ~ 680	238
	LSK	Snap-in, Long Life	105℃, 5,000 Hrs	160 ~ 500	39 ~ 1,800	241
	LSP	Snap-in, Long Life	105℃, 7,000 Hrs	350, 400, 450	47 ~ 680	247
	LHM	Snap-in, High Speed Charge / Discharge	105℃, 3,000 Hrs	350, 400, 420, 450	82 ~ 820	251
	MEA	Screw Terminal, Standard, 85℃	85℃, 2,000 Hrs	10 ~ 450	270 ~ 820,000	255
	MEK	Screw Terminal, Long Life, 85℃	85℃, 5,000 Hrs	350 ~ 525	1,000 ~ 18,000	266
	MEQ	Screw Terminal, Long Life, 85℃	85℃, 20,000 Hrs	350, 400, 450	1,000 ~ 18,000	271
	MGA	Screw Terminal, Standard, 105℃	105℃, 2,000 Hrs	16 ~ 400	180 ~ 470,000	275
	MGK	Screw Terminal, Long Life, 105℃	105℃, 5,000 Hrs	350, 400, 450	1,000 ~ 10,000	281
	MKR	Screw Terminal, High Speed Charge / Discharge	85℃, 5,000 Hrs	350, 400, 450	1,000 ~ 18,000	284

Precautions and Guidelines for Using Conductive Polymer Hybrid Capacitors and Aluminum Electrolytic Capacitors

1. Guidelines for Circuit Design (General / Application guidelines for using electrolytic capacitors)

Selecting of a right capacitor is a key to a good circuit design.

(1) Polarity

Most of the aluminum electrolytic capacitors are polarized. Therefore, they must be installed with the correct polarity. Usage in the reverse polarity results into a short-circuit condition that may damage or even explode the capacitor. In addition, it may influence circuit functionality. A bi-polar electrolytic capacitor should be installed when polarity across a capacitor is unstable / reversible. It should be, however, noted that usage of both polar and bi-polar capacitors are limited to DC applications. They must NOT be used for AC application.

(2) Operating Voltage

Applied DC voltage must not exceed rated voltage of the capacitor. Applying higher voltage than its rated voltage across a capacitor terminals cause overheating due to higher leakage currents and capacitor dielectric/insulation deterioration that will ultimately affect a capacitor's performance. The device, however, is capable of working under short-time transient voltages such as DC transients and peak AC ripples. Reverse voltages higher than 1 Volt within a specified temperature limit or AC voltages are not permissible. Overall, using capacitors at recommended operating voltages can prolong its lifespan. Note that the result of DC voltage overlapped with peak ripple voltage should not exceed rated voltage.

(3) Ripple Current

One of the key functions of any capacitor is removal of the ripple current i.e. the RMS value of AC flowing through a capacitor. But, a ripple current higher than rated ripple current will drop resultant capacitance, cause undue internal heating and thus reduces life span of the capacitor. In extreme cases, internal high temperature will cause the pressure relief vent to operate while destroying the device. Overall, it is important to note that an electrolytic capacitor must be used within a permissible range of ripple current. Indicators like temperature coefficient of allowable ripple current are generally used to determine life expectancy of the capacitor, but to avoid related complex calculations and for the sake of simplicity, we haven't provided temperature coefficient in the catalogue. But it offers key indicators like maximum operating temperature for calculation of life expectancy at a given temperature.

(4) Operating Temperature

Capacitors should be used within a permissible range of operating temperatures. Using capacitor at a higher temperature than maximum rated temperature will considerably shorten its life. In the worst-case scenario, high temperature can cause pressure relief vent to operate and the device will get destroyed. Using capacitors at an ambient room temperature assure their longer life.

(5) Leakage Current

Leakage current flows through a capacitor when DC voltage is applied across it. Leakage current varies with changes in ambient temperature and applied DC voltage level and its time of application. Overvoltage situation, presence of moisture, and thermal stresses, especially occurring during the soldering process can enhance leakage current. Initial leakage current is usually higher and does not decrease until voltage is applied for a certain period of time. It is recommended to keep initial leakage current within specified levels.

(6) Charge and Discharge

Regular electrolytic capacitors are not suitable for rapid charging/discharging circuits. Such usage may either cause reduction in overall capacitance or damage due to overheating. Lelon provides special assistance for selecting appropriate capacitors for rapid charging/discharging circuits.

(7) Surge Voltage

The Surge voltage rating is referred as the maximum DC overvoltage that may be applied to an electrolytic capacitor for a short time interval of 30 seconds at infrequent time intervals not exceeding 5.5minutes with a limiting resistance of 1kΩ. Unless otherwise described on the catalogue or product specifications, please do not apply a voltage exceeding the capacitor's voltage rating. The rated surge voltages corresponding to rated voltages of electrolytic capacitors are presented as follows:

Rated Voltage(V)	4	6.3	10	16	25	35	50
Surge Voltage(V)	**4.6**	**7.3**	**11.5**	**18.4**	**28.8**	**40.3**	**57.5**

Rated Voltage(V)	63	80	100	160	180	200	250
Surge Voltage(V)	**72.5**	**92**	**115**	**184**	**207**	**230**	**288**

Rated Voltage(V)	315	350	400	420	450	500	525
Surge Voltage(V)	**347**	**385**	**440**	**462**	**495**	**550**	**578**

(8) Condition of Use

The capacitors shall NOT be exposed to:

(a) Fluids including water, saltwater spray, oil, fumes, highly humid or condensed climates, etc.
(b) Ambient conditions containing hazardous gases/fumes like hydrogen sulfide, sulfurous acid, nitrous acid, chlorine or bromine gas, ammonia, etc.
(c) Exposed to ozone, ultraviolet rays and radiation.
(d) Severe vibrations or physical shocks that exceeds the specifications mentioned in this catalogue.

(9) Circuit Design Consideration

(a) Please ensure whether application, operating and mounting conditions satisfy the conditions specified in the catalog before installation of a capacitor. Please consult Lelon, if any of the conditions are beyond the conditions specified in the catalog.
(b) Heat-generating components or heat sinks should not be placed closer to Aluminum electrolytic capacitors on the PCB to avoid their premature failure. A cooling system is recommended to improve their reliable working.
(c) Electrical characteristics and performance of aluminum electrolytic capacitors are affected by variation of applied voltage, ripple current, ripple frequency and operating temperature. Therefore, these parameters shall not exceed specified values in the catalog.
(d) Aluminum capacitors may be connected in the parallel fashion for increasing total capacitance and/or for achieving higher ripple current capability. But, such design may cause unequal current flow through each of the capacitors due to differences in their impedances.
(e) When two or more capacitors are connected in series, voltage across each capacitor may differ and fall below the applied voltage. A resistor should be placed across each capacitor so as to match applied voltage with voltage across a capacitor.
(f) Please consult Lelon while selecting a capacitor for high-frequency switching circuit or a circuit that undergoes rapid charging/ discharging
(g) Standard outer sleeve of the capacitor is not a perfect electrical insulator therefore is unsuitable for the applications that requires perfect electrical insulation. Please consult Lelon, if your application requires perfect electrical insulation.
(h) Tilting or twisting capacitor body is not recommended once it is soldered to the PCB.

(Continued on next page)

2. Caution for Assembling Capacitors

(1) Mounting

(a) Aluminum electrolytic capacitors are not recommended to re-use in other circuits once they are mounted and powered in a circuit.

(b) Aluminum electrolytic capacitors may hold static charge between its anode and cathode, which is recommended to be discharged through a 1kΩ resistor before re-use.

(c) A long storage of capacitors may result into its insulation deterioration. This can lead to a high leakage current when voltage is applied that may damage the capacitor. Capacitors following a long storage period must undergo voltage treatment/re-forming. Capacitors are charged by applying rated DC voltage through a resistor of 1kΩ in series at least for an hour. It is recommended to increase applied voltage gradually using a voltage regulator unit once capacitors are assembled on the board. The charging should be followed by discharging through a 1KΩ resistor.

(d) Please check capacitor rated voltage before mounting.

(e) Please check capacitor polarity before mounting.

(f) Please don't drop capacitor on the floor / hard object.

(g) Please don't deform the capacitor during installation.

(h) Please confirm whether the lead spacing of the capacitors match with its pad spacing / footprint on PCB prior to installation.

(i) Please avoid excessive mechanical shocks to capacitor during the auto-insertion process, inspection or centering operations.

(j) Please don't place any wiring or circuit over the capacitor's pressure relief vent. The pressure relief vent may fail to open if adequate clearance space is not provided. Following table shows minimum clearance space required for different case diameters.

Case Diameter	φ6.3 ~ φ16	φ18 ~ φ35	φ40 or above
Clearance (min)	2 mm	3 mm	5 mm

(2) Soldering

(a) Please confirm that soldering conditions, especially temperature and contact time are within our specifications. Dip or flow soldering temperature should be limited at 260 ± 5℃ for 10 ± 1 sec while manual soldering using soldering iron should be limited at 350 ± 5℃ for 3 +1/-0 seconds. Please do not dip capacitor body into molten solder. A capacitor's life will be negatively affected if these conditions are violated.

(b) Storage of capacitors in *high humidity* conditions is likely to *affect* the *solder-ability of lead wires and terminals*.

(c) **Reflow soldering should NOLY be used for SMD type capacitors.** The temperature and duration shall not exceed the specified temperature and duration in the specification. If the temperature or duration is higher than the value specified, please consult Lelon before usage.

(d) Standard aluminum electrolytic capacitors are not designed to withstand multiple reflow processes. Please consult Lelon if repeated reflowing is unavoidable.

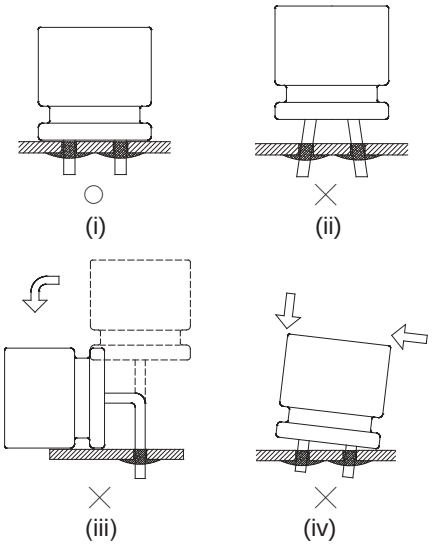
(e) Incorrect mounting on PCB with improper external strength applied on its lead wires or capacitor body after soldering may damage a capacitor's internal structure, cause short circuit, or lead to high leakage current issues. Do not bend or twist the capacitor body after soldering. Referring to the drawings below only case (i) is recommended.

(i) Correct soldering

(ii) Hole-to-hole spacing on PCB differs from the lead space of lead wires.

(iii) Lead wires are bent after soldering.

(iv) Capacitor body doesn't stand vertical on PCB after soldering.



(3) Cleaning Circuit Boards after Soldering

(a) Following chemicals are not recommended for cleaning:
Solvent containing halogen ions, Alkaline solvent, Xylene, Acetone, Terpene, petro-based solvent.

(b) Recommended cleaning conditions:
Fatty-alcohol - Pine Alpha ST-100S, Clean Through-750H and IPA (isopropyl alcohol) are examples of the most acceptable cleaning agents. Temperature of the cleaning agent must not exceed 60℃. Flux content in the cleaning agents should be limited to 2 Wt. %. Overall length of cleaning process (e.g., immersion, ultrasonic or other) shall be within 5 minutes (5 ~ 7mm height within 3 minutes). CFC substitute cleaning agents such as AK225AES can also be used for cleaning. In this case, its temperature shall not exceed 40 C and cleaning process (e.g., immersion, ultrasonic or other) shall be completed within 2 ~ 3 minutes. After cleaning capacitors should be dried with hot air for at least 10 minutes along with the PCB. Temperature of hot air shall not exceed maximum category temperature of the capacitor. Insufficient drying may cause appearance defects, sleeve shrinkage, and bottom-plate bulging. However, usage of this CFC substitute must completely regulated for protection of environment.

3. Maintenance Inspection

Periodical inspection of aluminum capacitors is absolutely necessary, especially when they are used with industrial equipment. The following items should be checked:

(1) Appearance: Bloated, vent operated, leaked, etc.

(2) Electrical characteristic: Capacitance, Tanδ, leakage current, and other specified items listed in specification.

Lelon recommend replacing the capacitors if any of the abovementioned items fail to meet specifications.

4. Storage

(1) The most suitable conditions for aluminum capacitor storage are 5℃ ~ 35℃ and indoor relative humidity less than 75%. High temperature and/or humidity storage is detrimental to the capacitors.

(2) Capacitors shall not be stored in wet or damp atmospheres containing water, brine, fumes or oil.

(3) Capacitors storage area shall neither be exposed to hazardous gases such as hydrogen sulfide, sulfurous acid, nitrous acid, chlorine, ammonium, etc. nor to acidic or alkaline solutions.

(4) Capacitors shall not be exposed to ozone, ultraviolet rays or radiation.

(Continued on next page)

5. Disposal

Please consult with a local industrial waste disposal specialist when disposing of aluminum electrolytic capacitors

6. Environmental Consideration

Lelon already have received IECQ QC 080000 certificate. Cadmium (Cd), Lead (Pb), Mercury (Hg), Hexavalent Chromium (Cr^{+6}), PBB, PBDE, DEHP, BBP, DBP and DIBP have never been using in capacitor. If you need “Halogen-free” products, please consult with us.

7. AEC-Q200 Compliance

Automotive Electronics Counsel (AEC) has established various electronic component qualification/reliability standards in order to serve automotive electronics industry. AEC-Q200 standard is dedicated for passive components like capacitors, inductors, etc. and is widely adopted domestically as well as internationally. Lelon offers compliant product designs and support services to satisfy customers’ product requirements, including the AEC-Q200 required criteria of the reliability tests. Lelon’s capacitors are professionally designed to outperform all requirements of AEC-Q200.

For further details, please refer to the following industrial standards:

IEC 60384-4 - Fixed capacitors for use in electronic equipment –
Part 4: Sectional specification – Fixed aluminum electrolytic capacitors with solid (MnO_2) and non-solid electrolyte (Edition 5.0 2016-08)

JEITA RCR-2367D – Safety application guide for fixed aluminum electrolytic capacitors for use in electronic equipment (Established in March 1995, Revised in October 2017)

Precautions and Guidelines for Using Organic Conductive Polymer Capacitors

Organic conductive polymer capacitor (OP-CAP) is specially structured using with a solid electrolyte of conductive polymers, has several advantages over non-solid aluminum capacitors due to tis compact size, wide operation termperature range, high resistance against ripple current, and especially, low ESR. The only disadvantage, however, is their low working voltage. Over past few years, Lelon has developed a number of series of OP-CAPs. Please refer to following guidelines for obtaining the highest performance and stable quality by using OP-CAP series products.

1. Guidelines for Circuit design

(1) Polarity

OP-CAPs are basically nothing but aluminum electrolytic capacitors with solid electrolyte. Therefore, they must be installed with the correct polarity. Usage in the reverse polarity results into a short-circuit condition that may damage or even explode the capacitor.

In addition, it may affect circuit functionality.

(2) Operating Voltage

Applied DC voltage must not exceed rated voltage of an OP-CAP. Applying higher voltage across a capacitor terminals than its rated voltage will cause overheating due to higher leakage currents, and dielectric/insulation deterioration that will ultimately affect a capacitor's performance. The OPCAP, however, is capable of working under short-time transient voltages such as DC transients and peak AC ripples. Note that the result of DC voltage overlapped with peak ripple voltage should not exceed rated voltage.

(3) Ripple Current

One of the key functions of any capacitor is removal of the ripple current i.e. the RMS value of AC flowing through a capacitor. But, a ripple current higher than rated ripple current will drop resultant capacitance, cause undue internal heating and thus reduces life span of the capacitor. In extreme cases, internal high temperature will cause the pressure relief vent to operate while destroying the device. Overall, it is important to note that an electrolytic capacitor must be used within a permissible range of ripple current.

(4) Operating Temperature

Capacitors should be used within a permissible range of operating temperatures. Use of a capacitor at a higher temperature than maximum rated temperature will considerably shorten its life. Usage of capacitors at an ambient room temperature assure their longer life.

(5) Leakage Current

Leakage current flows through a capacitor when DC voltage is applied across it. Leakage current varies with changes in ambient temperature and applied DC voltage level and its time of application. Overvoltage situation, presence of moisture, and thermal stresses, especially occurring during the soldering process can enhance leakage current. Initial leakage current is usually higher and does not decrease until voltage is applied for a certain period of time. It is recommended to keep initial leakage current within specified levels.

(6) Charge and Discharge

OP-CAPs are unsuitable for rapid charging/discharging circuits. Such usage may either cause reduction in overall capacitance or damage due to overheating. **Note that a protection circuit is required when inrush current in an OP-CAP exceeds 10 A.**

(7) Condition of Use

OP-CAP shall not be used / exposed to:

(a) Fluids including water, saltwater spray, oil, fumes, highly humidity or condensed climates, etc.

(b) Ambient conditions containing hazardous gases/fumes like hydrogen sulfide, sulfurous acid, nitrous acid, chlorine or bromine gas, ammonia, etc.

(c) Ozone, ultraviolet rays and radiation.

(d) Severe vibrations or physical shocks that exceeding the in specifications.

(8) Consideration to Circuit Design

(a) Please ensure whether application, operating and mounting conditions satisfy the conditions specified in the catalog before installation of an OP-CAP. Please consult Lelon, if any of the conditions are beyond the conditions specified in the catalog.

(b) Heat-generating components or heat sinks should not be placed closer to OP-CAPs on the PCB to avoid premature failure. A cooling system is recommended to improve their reliable working.

(c) Electrical characteristics and performance of OP-CAPs are affected by variation of applied voltage, ripple current, ripple frequency and operating temperature. Therefore, these parameters shall not exceed specified values in the catalog.

(d) OP-CAPs may be connected in the parallel fashion for increasing total capacitance and/or for achieving higher ripple current capability. But, such design may cause unequal current flow through each of the capacitors due to differences in their impedances.

(e) When two or more capacitors are connected in series, voltage across each capacitor may differ and fall below the applied voltage. A resistor should be placed across each capacitor so as to match applied voltage with voltage across a capacitor.

(f) Please consult Lelon while selecting a capacitor for high-frequency switching circuit or a circuit that undergoes rapid charging/ discharging.

(g) Standard outer sleeve/ coating material of the capacitor is not a perfect electrical insulator therefore is unsuitable for the applications that requires perfect electrical insulation. Please consult Lelon, if your application requires perfect electrical insulation.

(h) Tilting or twisting capacitor body is not recommended once it is soldered to the PCB.

2. Caution for Assembling Capacitors

(1) Mounting

(a) OP-CAPs are not recommended to re-use in other circuits once they are mounted and powered in a circuit.

(b) OP-CAPs may hold static charge between its anode and cathode, which is recommended to be discharge through a 1kΩ resistor before use.

(c) A long storage of capacitors may result into its insulation deterioration. This can lead to a high leakage current when voltage is applied that may damage the capacitor. Capacitors following a long storage period must undergo voltage treatment/re-forming. Capacitors are charged by applying rated DC voltage through a resistor of 1kΩ in series at least for an hour. It is recommended to increase applied voltage gradually using a voltage regulator unit once capacitors are assembled on the board. The charging should be followed by discharging through a 1kΩ resistor.

(d) Please check capacitor rated voltage before mounting.

(e) Please check capacitor polarity before mounting.

(f) Please don't drop OP-CAPs on the floor/hard object.

(g) Please don't deform the capacitor during installation.

(h) Please confirm whether the lead spacing of the capacitors match with its pad spacing/footprint on PCB prior to installation.

(i) Please avoid excessive mechanical shocks to OP-CAPs during auto-insertion process, inspection or centering operations.

(Continued on next page)

(2) Soldering

(a) Please confirm that soldering conditions, especially temperature and contact time are within our specifications. Dip or flow soldering temperature should be limited at 260 ± 5℃ for 10 ± 1sec. Please do not dip capacitor body into molten solder. An OP-CAP's life will be negatively affected if these conditions are violated.

(b) Storage of capacitors in *high humidity* conditions is likely to *affect* the *solderability of lead wires and terminals*

(c) **Reflow soldering should ONLY be used for SMD type conductive polymer capacitors**. Please check the reflow profile prior to using such type of capacitors. The temperature and duration shall not exceed the specified temperature and duration in the catalogue. If required temperature or duration is higher than the value specified, please consult Lelon before use.

(d) Usually OP-CAPs are not designed to withstand multiple reflow processes. Please consult Lelon if repeated reflowing is unavoidable.

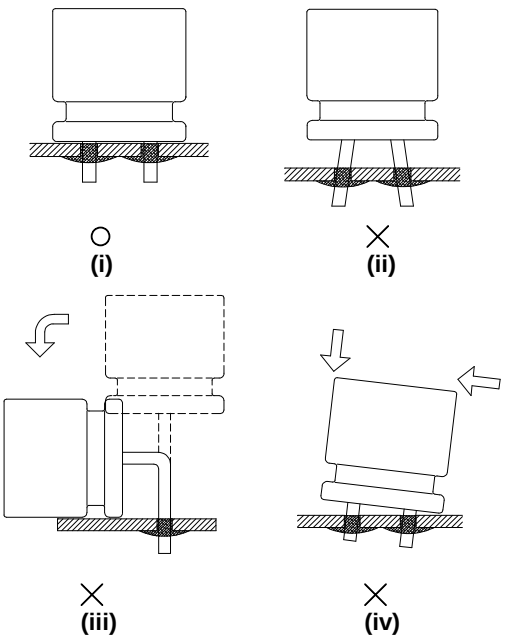
(e) Incorrect mounting on PCB with improper external strength applied on its lead wires or capacitor body after soldering may damage an OP-CAP's internal structure, cause short circuit, or lead to high leakage current. Do not bend or twist the capacitor body after soldering. Referring to the drawings below only case (i) is recommended.

(i) Correct soldering

(ii) Hole-to-hole spacing on PCB differs from the lead spacing of lead wires.

(iii) Lead wires are bent after soldering.

(iv) Capacitor body doesn't stand vertical on PCB after soldering.



(3) Cleaning PCBs After Soldering

(a) Following chemicals are not recommended for cleaning: Solvent containing halogen ions, Alkaline solvent, Xylene, Acetone, Terpene, petro-based solvent.

(b) Recommended cleaning conditions:
Fatty-alcohol - Pine Alpha ST-100S, Clean Through-750H and IPA (isopropyl alcohol) are examples of the most acceptable cleaning agents. Temperature of the cleaning agent must not exceed 60℃. Flux content in the cleaning agents should be limited to 2 Wt. %. Overall length of cleaning process (e.g., immersion, ultrasonic or other) shall be within 5 minutes (5 ~ 7mm height within 3 minutes).

3. Maintenance Inspection

Periodic inspection of OP-CAPs is absolutely necessary, especially when they are used with industrial equipment. The following items should be checked:

(1) Appearance: bloated, vent operated, leaked, etc.

(2) Electrical characteristic: Capacitance, Tan δ, leakage current, and other specified items listed in specifications.

Lelon recommends replacement of the capacitors if any of the abovementioned items fail to meet the specifications.

4. Storage

(1) The most suitable conditions for aluminum capacitor storage are 5℃ ~ 35℃ with indoor relative humidity less than 75%. High temperature and/or humidity storage is detrimental to the capacitors.

(2) OP-CAPs shall not be stored in wet or damp atmospheres containing water, brine, fumes or oil.

(3) Capacitors storage area shall neither be exposed to hazardous gases such as hydrogen sulfide, sulfurous acid, nitrous acid, chlorine, ammonium, etc. nor to acidic/ alkaline solutions.

(4) OP-CAPs shall not be exposed to ozone, ultraviolet rays or radiation.

(5) Storage bags shall be opened just before usage. Please restore unused capacitors as soon as possible. Sealed and secured capacitors are likely to provide better solderability in next usage. Shelf-life of OP-CAPs are as follows:

Series name	Before unseal	After unseal
OCV, OCVZ, OCVU, OVH, OVK,OVA, OVE, OVG, OVS, OVF, OVD, OVB, OVJ	Within 1 year after delivery (Unopened condition)	Within 30 days from opening package
OCR, OCRZ, OCRK, OCRU, ORE ORS, ORA, ORG, ORC, ORF, ORB, ORD	Within 1 year after delivery (Unopened condition)	Within 7 days from opening package

※ It is not applied to the regulation of JEDEC J-STD-020 (Rev. C).

(Continued on next page)

5. Estimation of life time

Formula 1	Formula 2
$L_r = L_0 \times 10^{\frac{T_0 - T_r}{20}}$	$L_r = L_0 \times 2^{\frac{T_{0\,max} - T_{r\,max}}{10}}$
Applicable products: ● OP-CAP OCV, OCVZ, OVH, OVK, OCVU, OCR, OCRZ, ORE, OCRK, OCRU series	Applicable products: ● OP-CAP OVA, OVE, OVG, OVS, OVF, OVD, OVB, OVJ, ORS, ORA, ORG, ORC, ORF, ORB, ORD series ● Conductive Polymer Hybrid Capacitors ● Aluminum Electrolytic Capacitors
Ex. OCV, 105℃, 2,000 Hours	Ex. OVA, 105℃, 15,000 Hours
95℃ ≧ 6,324 Hours	95℃ ≧ 30,000 Hours
85℃ ≧ 20,000 Hours	85℃ ≧ 60,000 Hours
75℃ ≧ 63,245 Hours	75℃ ≧ 120,000 Hours
65℃ ≧ 200,000 Hours (max. 15 years)	65℃ ≧ 240,000 Hours (max. 15 years)

Formula 1:
L_r: Estimated lifetime (hours)
L_0: Base lifetime specified at maximum operating temperature with applied the DC voltage
T_0: Rated maximum operating temperature (℃)
T_r: Actual ambient temperature (℃)

Formula 2:
L_r: Estimated lifetime (hours)
L_0: Base lifetime specified at maximum operating temperature with applied the DC voltage and the ripple current (hours)
* For OP-CAP just applied the DC voltage
$T_{0\,max}$: The core temperature that rated ripple current applied at maximum operating temperature.
$T_{r\,max}$: The core temperature that applied actual ripple current at ambient temperature.

Please note that
(1) Maximum life is 15 years.
(2) Ripple current in application should be less than or equal to ripple current specified in catalogue.

If you need to realize more detail, please consult with us for further discussion.

6. Disposal

Please consult with a local industrial waste disposal specialist when disposing of aluminum electrolytic capacitors.

7. Environmental Consideration

Lelon already have received IECQ QC 080000 certificate. Cadmium (Cd), Lead (Pb), Mercury (Hg), Hexavalent Chromium (Cr^{+6}), PBB, PBDE, DEHP, BBP, DBP and DIBP have never been using in capacitor. If you need “Halogen-free” products, please consult with us.

8. AEC-Q200 Compliance

Automotive Electronics Counsel (AEC) has established various electronic component qualification/reliability standards in order to serve automotive electronics industry. AEC-Q200 standard is dedicated for passive components like capacitors, inductors, etc. and is widely adopted domestically as well as internationally. Lelon offers compliant product designs and support services to satisfy customers' product requirements, including the AEC-Q200 required criteria of the reliability tests. Lelon's capacitors are professionally designed to outperform all requirements of AEC-Q200.

For further details, please refer to the following industrial standards:

**IEC 60384-4 - Fixed capacitors for use in electronic equipment –
Part 4: Sectional specification – Fixed aluminum electrolytic capacitors with solid (MnO_2) and non-solid electrolyte (Edition 5.0 2016-08)**

JEITA RCR-2367D – Safety application guide for fixed aluminum electrolytic capacitors for use in electronic equipment (Established in March 1995, Revised in October 2017)

Part Numbering System (Radial Type)

Product Code Guide

REA series	10μF	±20%	50V	Lead Forming Tape	Gas Type	5φ×11L	Pb-free Wire + PET Sleeve	
REA	**100**	**M**	**1H**	**TA**	**-**	**0511**		
□□□	□□□	□	□□	□□	□	□□□□	□	
①	②	③	④	⑤	⑥	⑦	⑧	⑨
Series	Capacitance	Capacitance Tolerance	Rated Voltage	Lead Configuration and Package	Rubber Type	Case Size	Lead Wire and Sleeve Type	Supplement Code

① Series:

Series is represented by a three-letter code. When the series name only has two letters, use a hyphen, ”-“, to fill the third blank. When the series name has 4 letters, use the following series codes. OCRZ→ORZ; OCRK→ORK; OCRU→ORU

② Capacitance:

Capacitance in μF is represented by a three-digit code. The first two digits are significant and the third digit indicates the number of zeros following the significant figure. “R” represents the decimal point for capacitance under 10μF.
Example:

Capacitance	0.1	0.47	1	4.7	10	47	100	470	1,000	4,700	10,000
Part number	0R1	R47	010	4R7	100	470	101	471	102	472	103

③ Tolerance:

K = -10% ~ +10%	M = -20% ~ +20%	V = -10% ~ +20%

④ Rated voltage:

Rated voltage in volts (V) is represented by a two-digit code.

Rated Voltage (V)	2	2.5	4	6.3	10	16	20	25	35	50	63	80
Code	0D	0E	0G	0J	1A	1C	1D	1E	1V	1H	1J	1K

Rated Voltage (V)	100	160	180	200	250	315	350	400	420	450	500	525
Code	2A	2C	2S	2D	2E	2F	2V	2G	2P	2W	2H	2Y

⑤ Lead configuration and package (Please refer to page 20 ~ 22):

BK = Bulk Package	TA = Formed Lead Taping
FC = Formed & Cut Lead	SA = Straight Lead Taping
CC = Cut Lead	SD = Bent Cathode Lead
SF = Snap-in & Formed Cut Lead	BC = Bent & Cut Lead (Leads in Right Direction)
SC = Snap-in & Cut Lead	BU = Bent & Cut Lead (Leads in Left Direction)

⑥ Rubber type:

– = Gas escape type	F = Flat rubber bung

Note: Meeting one of the below description which used flat rubber bung is the standard design, use a hyphen, “ - “:

1. Aluminum e-caps for case sizes of 3φ×5L, 12.5φ×16L, 16φ×16L, 16φ×20L, 18φ×16L, 18φ×20L, 18φ×25L;
2. OP-CAP for case sizes of 5φ, 6.3φ×5.5 ~ 8L and 8φx8L in OCRZ, ORE, OCRK, ORC, ORG, ORF, ORB, ORD series;
3. Hybrid aluminum e-caps.

Part Numbering System (Radial Type)

⑦ Case size:

The first two digits indicate case diameter and the last two digits indicate case length in mm.

ϕD×L	3×5	4×5	4×7	5×5	5×7	5×8	5×11	6.3×5	6.3×5.5	6.3×6 6.3×6.5	6.3×7
Code	**0305**	**0405**	**0407**	**0505**	**0507**	**0508***	**0511**	**0605**	**0605***	**0606***	**0607**

ϕD×L	6.3×8	6.3×11	6.3×15	8×5	8×6.5	8×7	8×8	8×9	8×10	8×11.5	8×12
Code	**0608***	**0611**	**0615**	**0805**	**0807***	**0807**	**0808***	**0809**	**0810***	**0811**	**0812***

ϕD×L	8×15	8×16*	8×20	10×9	10×10	10×12.5 10×12*	10×16	10×20	10×25	10×30	10×35
Code	**0815**	**0816**	**0820**	**1009**	**1010***	**1012**	**1016**	**1020**	**1025**	**1030**	**1035**

ϕD×L	10×40	10×45	10×50	12.5×16	12.5×20	12.5×25	12.5×30	12.5×35	12.5×40	12.5×45	12.5×50
Code	**1040**	**1045**	**1050**	**1316**	**1320**	**1325**	**1330**	**1335**	**1340**	**1345**	**1350**

ϕD×L	16×16	16×20	16×25	16×31.5	16×35.5	16×40	16×45	16×50	18×16	18×20	18×25
Code	**1616**	**1620**	**1625**	**1632**	**1636**	**1640**	**1645**	**1650**	**1816**	**1820**	**1825**

ϕD×L	18×31.5	18×35.5	18×40	18×45	18×50	22×40	22×45	25×40	25×45
Code	**1832**	**1836**	**1840**	**1845**	**1850**	**2240**	**2245**	**2540**	**2545**

Note: 1. Size or size codes with a mark of " * " are for OP-CAP.
2. When a case size is required and not shown in the table, please contact with us for further discussion.

⑧ Lead wire and sleeve type:

None = Standard design Pb-free wire + PET sleeve (aluminum e-cap) Pb-free wire + Coating case (OP-CAP)	G = Pb-free wire + Black PET sleeve (for RGA & SG series only)
B = Sn-Bi wire + PET sleeve	K / L = Automotive control code

* When a supplement code following a blank digit code of lead wire and sleeve type (standard design), use a hyphen, " - ", to fill the blank digit.
* When the automotive control code is required, please contact with us for further discussion.

⑨ Supplement code (Optional):

For special control purposes

.

Part Numbering System (SMD Type)

Product Code Guide

VE series	10μF	±20%	16V	Carrier Tape		4φ×5.3L	Pb-free and PET coating case	
VE-	**100**	**M**	**1C**	**TR**	**-**	**0405**		
□□□	□□□	□	□□	□□	□	□□□□	□	
①	②	③	④	⑤	⑥	⑦	⑧	⑨
Series	Capacitance	Capacitance Tolerance	Rated Voltage	Package Type	Terminal Type	Case size	Lead Wire and Coating Type	Supplement Code

① Series:

Series is represented by a three-letter code. When the series name only has two letters, use a hyphen, "-", to fill the third blank. When the series name has 4 letters, use the following series codes. OCVZ→OVZ; OCVU→OVU

② ~ ④: Please refer to **Part Numbering System (Radial Type)**

⑤ Package:

TR	Reel package
TT	Reel package of plastic
T-	Tray package for case diameter 12.5 ~ 18 mm

⑥ Terminal:

-	No dummy terminal
A	For automotive application (10G)
K	Anti-vibration structure (30G)
G	Anti-vibration structure (50G)

⑦ Case size:

The first two digits indicate case diameter and the last two digits indicate case length in mm.

φD×L	3×5.3	4×4.5	4×5.3	4×5.7 4×5.8*2	5×4.4*1 5×4.5	5×5.3	5×5.7 5×5.8*2	5×7*3	6.3×4.4*1 6.3×4.5
Code	**0305**	**0404**	**0405**	**0406**	**0504**	**0505**	**0506**	**0507**	**0604**

φD×L	6.3×5.3	6.3×5.7 6.3×5.8*2	6.3×5.9*1	6.3×6.4*1 6.3×7.0*1, 3	6.3×7.7	6.3×8.7*3	6.3×9.5*1	8×6.5	8×6.7*1
Code	**0605**	**0606**	**0606**	**0607**	**0607** **0608***1	**0608**	**0610**	**0806**	**0807**

φD×L	8×7.7*1	8×10	8×12*1	10×7.7	10×10 10× 9.9*1	10×12.5 10×12.6*1	10×16.5*1	12.5×13.5	12.5×16
Code	**0808**	**0810**	**0812**	**1008**	**1010**	**1013**	**1016**	**1313**	**1316**

φD×L	16×16.5	16×21.5	18×16.5	18×21.5
Code	**1616**	**1621**	**1816**	**1821**

Note: *1: Size or code are used for OP-CAP only.
*2: In non-OP-CAP, the case size are for VZL, VZS, VZT series only.
*3: The case size are for VZR series only.
When a case size is required and not shown in the table, please contact with us for further discussion.

⑧ Lead wire and case coating type:

None = Pb free wire + PET coated case (Standard design)	E = Sn-Bi wire + PET coated case
K / L = Automotive control code	

* When a supplement code following a blank digit code of lead wire and case coating type (standard design), use a hyphen, " - ", to fill the blank digit.
* When the automotive control code is required, please contact with us for further discussion.

⑨ Supplement code (Optional):

For special control purposes

Part Numbering System (Snap-in Type)

Product Code Guide

LS Series	100μF	±20%	400V	3-pin Terminal	Terminal Length 4.0mm	22ϕ×30L	Pb-free Terminal + PET Sleeve	
LS-	**101**	**M**	**2G**	**L3**	**A**	**2230**		
□□□	□□□	□	□□	□□	□	□□□□	□	
①	②	③	④	⑤	⑥	⑦	⑧	⑨
Series	Capacitance	Capacitance Tolerance	Rated Voltage	Terminal Type	Terminal Length	Case Size	Terminal and Sleeve Type	Supplement Code

⑤ ~ ④: Please Refer to **Part Numbering System (Radial Type)**

⑤ Terminal type (Refer to page 25):

Terminal type(pins)	2 (Standard)	3	4	5	Vibration-resistant	Horizontal Mounting	
Terminal code	- -	L3	L4	L5	T2	H2	G2

⑥ Terminal length:

Terminal length(mm)	4.0	6.3
Terminal code	A	-

⑦ Case Size:

The first two digits indicate case diameter in mm. The last two digits indicate case length in mm.

ϕD×L	20×15	20×20	20×25	20×30	20×35	20×40	20×45	20×50	22×15	22×20	22×25
Code	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**	**2215**	**2220**	**2225**

ϕD×L	22×30	22×35	22×40	22×45	22×50	22×55	22×60	25×15	25×20	25×25	25×30
Code	**2230**	**2235**	**2240**	**2245**	**2250**	**2255**	**2260**	**2515**	**2520**	**2525**	**2530**

ϕD×L	25×35	25×40	25×45	25×50	25×55	25×60	30×15	30×20	30×25	30×30	30×35
Code	**2535**	**2540**	**2545**	**2550**	**2555**	**2560**	**3015**	**3020**	**3025**	**3030**	**3035**

ϕD×L	30×40	30×45	30×50	30×55	30×60	30×65	35×15	35×20	35×25	35×30	35×35
Code	**3040**	**3045**	**3050**	**3055**	**3060**	**3065**	**3515**	**3520**	**3525**	**3530**	**3535**

ϕD×L	35×40	35×45	35×50	35×60	35×70	35×80	35×90	35×100	40×25	40×30	40×35
Code	**3540**	**3545**	**3550**	**3560**	**3570**	**3580**	**3590**	**35A0**	**4025**	**4030**	**4035**

ϕD×L	40×40	40×45	40×50	40×55	40×60	40×65	40×70	40×80	40×90	40×100	45×70
Code	**4040**	**4045**	**4050**	**4055**	**4060**	**4065**	**4070**	**4080**	**4090**	**40A0**	**4570**

ϕD×L	45×80	45×90
Code	**4580**	**4590**

Note: When a case size is required and not shown in the table, please contact with us for further discussion.

⑧ Terminal and sleeve type

None = Pb free terminal + PET sleeve (Standard design)
R = Pb free terminal + PET sleeve + Rilled
N = Pb free terminal + PET sleeve + No bottom insulation
M = Pb free terminal + PET sleeve + No bottom insulation + Rilled
C = Pb free terminal + Nano carbon coating insulation
K / L = Automotive control code

* When a supplement code following a blank digit code of terminal and sleeve type (standard design), use a hyphen, " - ", to fill the blank digit.
* When the bottom insulation plate is not required or a rilled construction is necessary, please consult Lelon.

⑨ Supplement code (Optional):

For special control purposes

Part Numbering System (Screw Type)

Product Code Guide

MEA series	3300μF	±20%	400V	Rills +Stud Bottom Case	M5 Post	63.5ϕ×115L	Pb-free Terminal + PVC Sleeve	
MEA	**332**	**M**	**2G**	**H**	**-**	**C115**		
□□□	□□□	□	□□	□	□	□□□□	□	
①	②	③	④	⑤	⑥	⑦	⑧	⑨
Series	Capacitance	Capacitance Tolerance	Rated Voltage	Case Type	Terminal Type	Case Size	Terminal and Sleeve Type	Supplement Code

① ~ ④: Please refer to **Part Numbering System (Radial Type)**

⑤ Case type:

- = Plain Case + Mounting clamp	N = Rilled Case + Mounting clamp
X = Plain Case	R = Rilled Case
S = Plain + Stud Bottom Case	H = Rilled + Stud Bottom Case
I = Plain Case + Mounting clamp (2 footed mounting clamp)	

⑥ Terminal type:

Terminal Type	Post Diameter (mm)	Height (±1 mm)	For Case Diameters	Code
M5 Post, Small	8	6.5	35	A
M5 Post	10	6.5	51 ~ 89	-
M5 Post, High Current	17.4	6.5	76.2 ~ 89	C
M6 Post, High Current	17.4	6.5	76.2 ~ 89	D

⑦ Case size:

The first one digit indicates case diameter and the last three digits indicate case length in mm.

ϕD×L	35×53	35×65	35×75	35×83	35×100	35×121	51×75	51×83	51×96	51×100	51×115
Code	**A053**	**A065**	**A075**	**A083**	**A100**	**A121**	**B075**	**B083**	**B096**	**B100**	**B115**

ϕD×L	51×121	51×130	63.5×96	63.5×100	63.5×115	63.5×121	63.5×130	63.5×144	76.2×96	76.2×115	76.2×121
Code	**B121**	**B130**	**C096**	**C100**	**C115**	**C121**	**C130**	**C144**	**D096**	**D115**	**D121**

ϕD×L	76.2×130	76.2×144	76.2×155	89×130	89×157	89×196	89×236
Code	**D130**	**D144**	**D155**	**E130**	**E157**	**E196**	**E236**

Note: When a case size is required and not shown in the table, please contact with us for further discussion.

⑧ Terminal and sleeve type

None = Pb-free terminal + PVC sleeve (Standard design)

* When a supplement code following a blank digit code of terminal and sleeve type (standard design), use a hyphen, " - ", to fill the blank digit.

⑨ Supplement code (Optional):

For special control purposes

Taping Specifications for SMD Type *(Applicable Standard JIS C 0806-3)*

1. Carrier Tape

Fig. 1-1

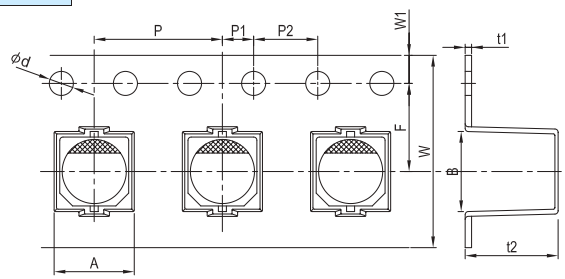


Fig. 1-2

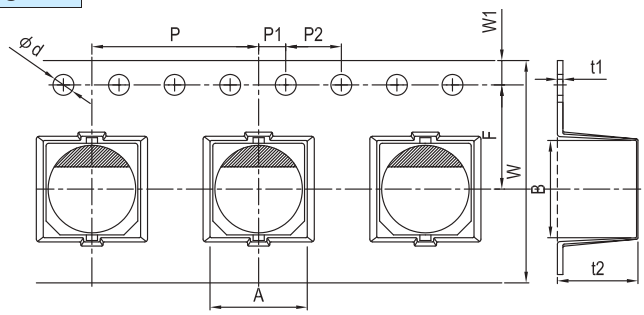
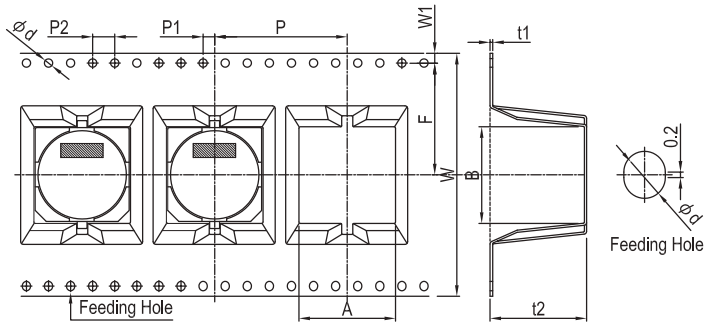


Fig. 1-3



Unit: mm

ϕD × L	A	B	ϕd	F	P	P1	P2	t1	t2	W	W1	Fig. No.
3 ~ 4 × 4.5 ~ 5.3	4.7	4.7	1.5	5.5	8	2.0	4.0	0.4	5.8	12.0	1.75	1-1
4 × 5.7 / 5.8	4.7	4.7			8				6.2			
5 × 4.5 ~ 5.3	5.7	5.7			12				5.8			1-2
5 × 5.7 ~ 6.0									6.2			
5 × 7.0									7.5			
6.3 × 4.4 ~ 5.3	7.0	7.0		7.5	12				5.8	16.0		
6.3 × 5.7 / 5.8* / 5.9*									6.2			
6.3 × 6.4* / 7.0*									6.8			
6.3 × 7.7									8.3			
6.3 × 8.7									9.3			
6.3 × 9.5*				11.5	16			0.5	10.5	24.0		
8 × 6.5	8.7	8.7		7.5	12			0.4	6.8	16.0		
8 × 6.7*									6.8	24.0		
8 × 7.7*, 10				11.5	16				9.2			
8 × 10.5 (G)									11.0			
8 × 12*									12.5			
10 × 7.7	10.7	10.7							10.0			
10 × 10(9.9*)/10.5(G)									11.0			
10 × 12.5 / 12.6*									13.0			
10 × 16.5*									17.5			
12.5 × 13.5	13.4	13.4		14.2	24			0.5	15.0	32.0		1-3
12.5 × 13.5 (G)	13.7	13.7							15.0			
12.5 × 16	13.4	13.4							17.0			
12.5 × 16 (G)	13.7	13.7							18.0			
16 × 16.5	17.5	17.5		20.2	28				17.5	44.0		
16 × 16.5 (G)									20.0			
16 × 21.5 (G)									23.0			
18 × 16.5 (G)	19.5	19.5			32				17.5			
18 × 21.5 (G)									23.0			
Tolerance	± 0.2	± 0.2	+0.1 / -0	± 0.1	± 0.1	± 0.1	± 0.1	± 0.1	± 0.2	± 0.3	± 0.15	

Note: Case size in mark of " * " are for OP-CAP; case size in mark of " (G) " are for "Anti-vibration".

Taping Specifications for SMD Type

2. Reel Package

Fig. 2-1

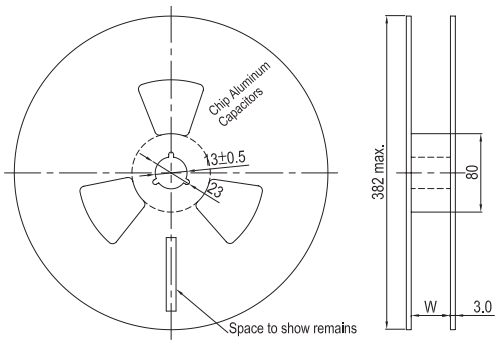
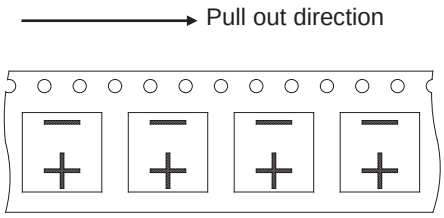


Fig. 2-2

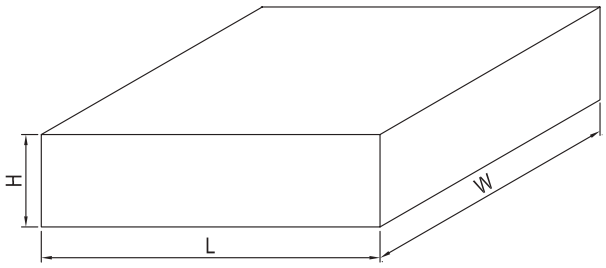


Unit: mm

Case size	3 ~ 4φ	5φ	6.3φ	8φ×6.5 ~ 6.7L	8φ×7.7 ~ 12L	10φ	12.5φ	16 ~ 18φ
W	14	14	18	18	26	26	34	46

3. Packing Specifications

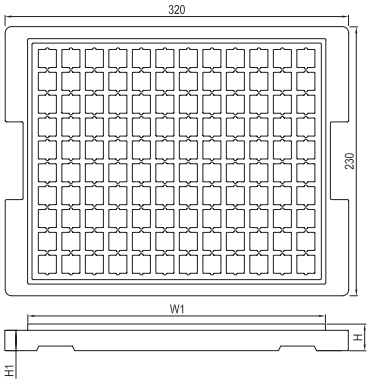
Fig. 3-1 Outer carton box of carrier tape



Unit: mm

Case size	3 ~ 4φ	5φ	6.3φ	8φ×6.5 ~ 6.7L	8φ×7.7 ~ 12L	10φ	12.5φ	16 ~ 18φ
H	210	210	250	250	330	330	330	425
W, L	395							

Fig. 3-2 Chip Tray

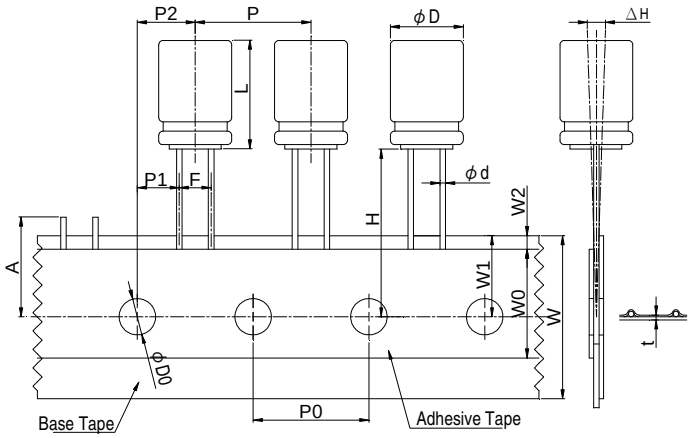


Dimension and package quantity Unit: mm

Case size	W1	H	H1	Q'ty / Tray	Q'ty / Box
12.5φ×13.5L	284	21	18.5	120	600
12.5φ×16L		21	18.5	120	600
16φ×16.5L		28	24.0	80	400
16φ×21.5L				80	400
18φ×16.5L				60	300
18φ×21.5L				60	300

Taping Specifications for Radial Type of OP-CAP (Applicable Standard JIS C 0806-2)

Fig. 1



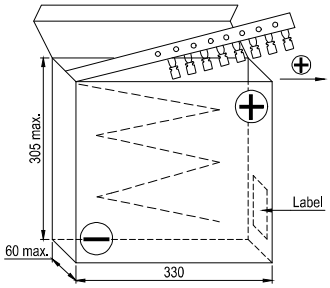
Unit: mm

Packing / ϕD	SA								
	5	6.3			8	8	Tol.	10	Tol.
Symbol L	8	5.5 ~ 6.5	8	11	6.5 ~ 8	≧11.5*1	+1.0 / +1.5*1	≧10*1	+1.0 / +1.5*1
ϕd	0.5	0.45	0.6	0.5	0.6	0.6	±0.05	0.6	± 0.05
F	2.0	2.5			3.5	3.5	+0.8/-0.2	5.0	+0.8/-0.2
H	18.5						±0.75	18.5	± 0.75
P	12.7						±1.0	12.7	± 1.0
P0	12.7						±0.2	12.7	± 0.2
P1	5.35	5.1			4.6	4.6	±0.5	3.85	± 0.7
P2	6.35						±1.0	6.35	± 1.3
W	18.0						±0.5	18.0	±0.5
W0	10.0			12.0	10.0	12.0	min.	12.0	min.
W1	9.0						±0.5	9.0	± 0.5
W2	1.5						max.	1.5	max.
A	11.0						max.	11.0	max.
ϕD0	4.0						±0.2	4.0	± 0.2
ΔH	0						±1.0	0	± 1.0
t	0.7						±0.2	0.7	± 0.2

Note: *1: The tolerance in L for 16 mm is +1.5 mm, for 20 mm is + 2.0 mm.
2. **If you need parts with pitch is 2.5 mm (5ϕ) / 5.0 mm taping (5 ~ 8ϕ), please consult with us before placing order.**
3. Customized taping may be available upon request. Please consult with us.

Package

Fig. 2 Ammo pack box



Package Quantity

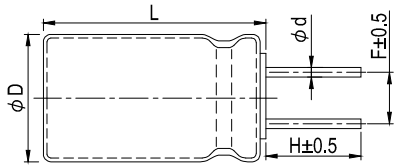
Unit: pcs/box

ϕD (mm)	5 ~ 5.5	6.3	8	10
Quantity	2,000	2,000	1,000	500

Note: The component shall be oriented on the tape as such that the positive lead is leading or the negative lead is leading with customer's request.

Lead Cutting Specifications for Radial Type of OP-CAP

Unit: mm

Forming Method	Code	Shape	Dimensions
Cut (5ϕ ~ 10ϕ)	**CC**		

ϕD × L	ϕd	F	H
5 ~ 5.5	0.5	2.0	5.0
6.3 × 5.5 ~ 6.5	0.45	2.5	
6.3 × 8	0.6		
6.3 × 11	0.5		
8	0.6	3.5	
10	0.6	5.0	4.5

Taping Specifications for Radial Type *(Applicable Standard JIS C 0806-2)*

Fig. 1

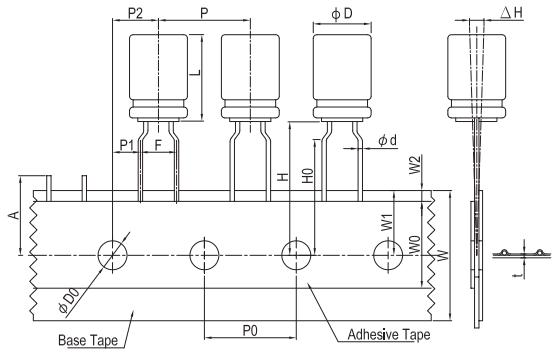


Fig. 2

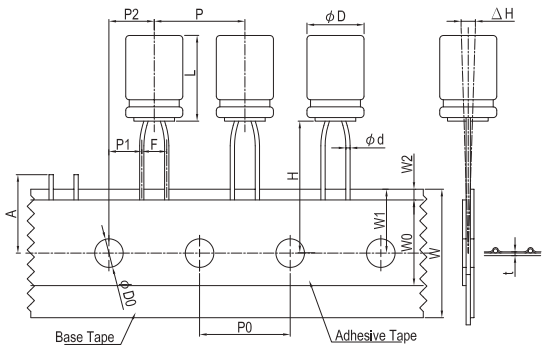


Fig. 3

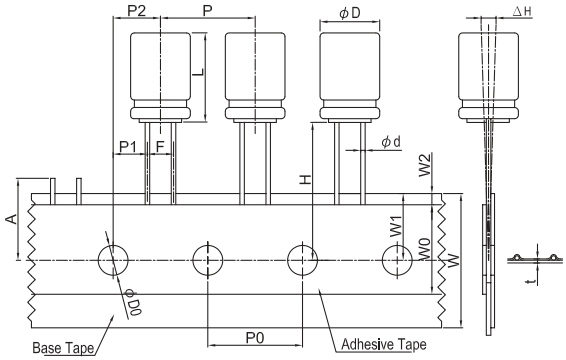
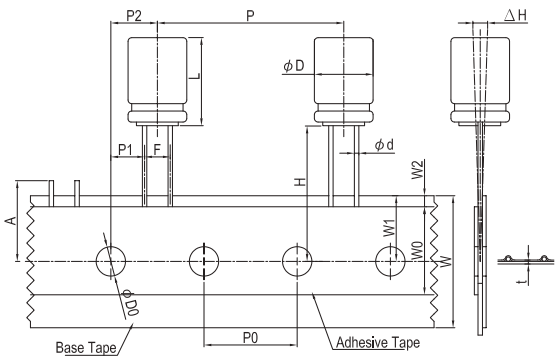


Fig. 4



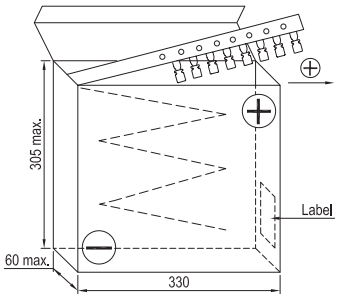
Unit: mm

Packing	TA*1											SA										SP			
L	5*2					7 ~ 9			≧ 11			5*2					≧ 7		7 ~ 9	11.5 ~ 20		9 ~ 25			
Symbol ϕ	3	4*3	5	6.3	8	5	6.3	8	5	6.3	8	3	4*3	5	6.3	8	5*4	6.3*4	8	8	Tol.*1	10	12.5	12.5	Tol.
ϕd	0.4	0.45				0.5			0.6			0.45					0.5			0.6	±0.05	0.6			±0.05
F	5.0											2.5							3.5	3.5	+0.8/-0.2	5.0			+0.8/-0.2
H	17.5								18.5		20.0	17.5	17.5							18.5	±0.75	18.5			±0.75
H0	16.0											---									±0.5	---			---
P	12.7											12.7									±1.0	12.7	25.4	15.0	±1.0
P0	12.7											12.7									±0.2	12.7	12.7	15.0*5	±0.2 / ±0.3(*5)
P1	3.85											5.1							4.6	4.6	±0.5	3.85	3.85	5.0	±0.7
P2	6.35											6.35									±1.0	6.35	6.35	7.5	±1.3
W	18.0											18.0									±0.5	18.0			±0.5
W0	6.0					10.0			12.0			6.0					10.0			12.0	min.	12.0			min.
W1	9.0											9.0									±0.5	9.0			±0.5
W2	1.5											1.5									max.	1.5			max.
A	11.0											11.0									max.	11.0			max.
ϕD0	4.0											4.0									±0.2	4.0			±0.2
ΔH	0											0									±1.0	0			±1.0
t	0.7											0.7									±0.2	0.7			±0.2
Fig. No.	1											2	3	3	2	3						3	4	3	

Note: *1: The “Tol.” of “TA” is the same as “SA”.
*2: For 3 ~ 8ϕ×5L, W0 = 10.0 mm is available.
*3: 4ϕ×7L the spec. is the same as 4ϕ×5L.
*4: H of the 5 ~ 6.3ϕ×11 ~ 15L for “ SA ” packing is 18.5 mm.
*5: The “Tol.” of P0 for “ SP ” packing is 0.3 mm. Customized taping may be available upon request. Please consult with us.

Package

Fig. 5 Ammo pack box



Package Quantity

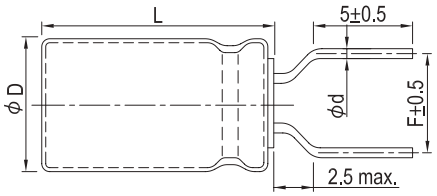
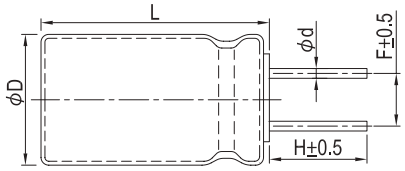
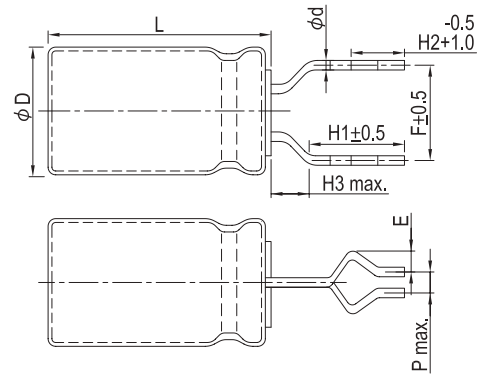
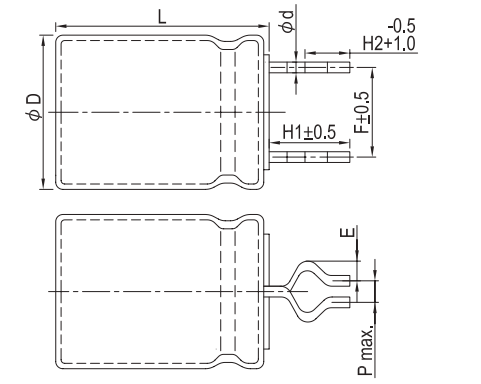
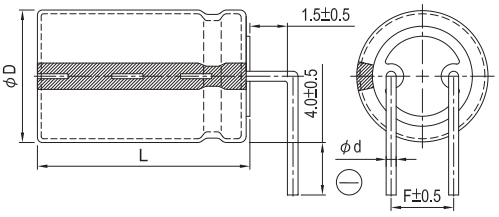
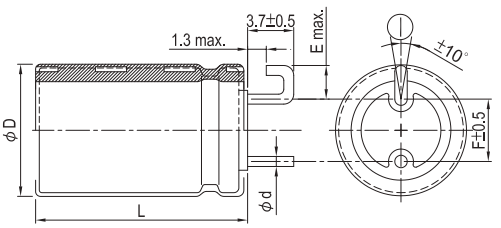
Unit: pcs/box

ϕD(mm)	3	4	5	6.3	8	10	12.5
Quantity	3,000	2,500	2,000	2,000	1,000	500	300

Note: The component shall be oriented on the tape as such that the positive lead is leading or the negative lead is leading with customer’s request.

Lead Forming and Cutting Specifications for Radial Type

Unit: mm

Forming Method	Code	Shape	Dimensions
Forming Cut (4φ ~ 8φ)	FC		
Cut (3φ ~ 25φ)	CC		
Snap-in Forming Cut (4φ ~ 8φ)	SF		
Snap-in Cut (10φ ~ 25φ)	SC		
Bending Cut (5φ ~ 25φ)	BC		
Cathode Lead Bending (10φ ~ 25φ)	SD		

φD × L	φd	F	F'	H
3 × 5	0.4	1.0	5.0	5.0
4 × 5	0.45	1.5		
5 × 5		2.0		
6.3 ~ 8 × 5		2.5		
4 × 7		1.5		
5 × 7~11	0.5	2.0		
6.3 × 7 ~ 15		2.5		
8 × 7 ~ 9		3.5		
8 × 11.5 ~ 50	0.6	3.5		
10		5.0	---	4.5
12.5		5.0		
16	0.8	7.5		
18	0.8	7.5		
22	1.0	10.0		
25	1.0	12.5		

φD × L	φd	H1	H2	H3	F	P	E
4 ~ 8 × 5	0.45	5.0	2.8	2.5	5.0	1.1	1.1
4 × 7	0.45						
5 × 7 ~ 11	0.5						
6.3 × 7 ~ 15							
8 × 7 ~ 9							
8 × 11.5 ~50	0.6						
10		4.5	2.5	---		1.2	
12.5							
16	0.8				7.5		
18	0.8				7.5		
22	1.0				10.0		1.3
25	1.0				12.5		1.3

φD × L	φd	F ± 0.5	*E max.
5 × 11	0.5	2.0	---
6.3 × 11 ~ 15	0.5	2.5	
8 × 11.5 ~ 50	0.6	3.5	
10		5.0	2.3
12.5		5.0	2.3
16	0.8	7.5	2.7
18	0.8	7.5	
22	1.0	10.0	
25	1.0	12.5	

"*E" is only suitable for SD cutting.
"**BU**": Leads bending cut are different direction from **BC.**

Package Quantity

Standard Package Quantity

1. Radial Type of Aluminum Electrolytic Capacitors

Unit: pcs

Case size	Taping		Bulk		Cutting	
	Box	Carton	Bag	Carton	Bag	Carton
3 φ	3,000	30,000	1,000	60,000	1,000	80,000
4 φ	2,500	25,000		50,000		80,000
5 φ× 5 ~ 7L	2,000	20,000		40,000		56,000
5 φ× 11L	2,000	20,000		30,000		40,000
6.3 φ× 5 ~ 7L	2,000	20,000	1,000	30,000	1,000	40,000
6.3 φ× 11L				20,000	1,000	24,000
6.3 φ× 15L				15,000	500	12,000
8 φ× 5 ~ 9L	1,000	10,000	1,000	15,000	1,000	16,000
8 φ× 11.5L				12,000	1,000	16,000
8 φ× 15L				10,000	800	12,800
8 φ× 20L				8,000	500	8,000
8 φ× 25 ~ 30L			500	6,000	500	8,000
8 φ× 35 ~ 50L			250	3,000	250	4,000
10 φ× 9L	500	5,000	1,000	12,000	500	12,000
10 φ× 12.5L			500	8,000		8,000
10 φ× 16L				7,000		8,000
10 φ× 20L				6,000	400	6,400
10 φ× 25L				6,000	300	4,800
10 φ× 30 ~ 40L	500*	5,000*	400	4,000	250	4,000
10 φ× 45 ~ 50L	250	2,500	200	3,000	200	3,200
12.5 φ× 16 ~ 25L	300	3,000	250	3,000	200	3,200
12.5 φ× 30 ~ 35L				2,500	150	2,400
12.5 φ× 40L				2,000	150	2,400
12.5 φ× 45 ~ 50L	150	1,500	100	2,000	100	1,600
16 φ× 16 ~ 25L	---	---	150	1,800	100	1,600
16 φ× 31.5L			100	1,200	100	1,600
16 φ× 35.5L				1,200	75	1,200
16 φ× 40L				1,000	75	1,200
16 φ× 45 ~ 50L				1,000	50	800
18 φ× 16L	---	---	150	1,800	100	1,600
18 φ× 20 ~ 25L			100	1,200	100	1,600
18 φ× 31.5L				1,200	75	1,200
18 φ× 35.5L				800	75	1,200
18 φ× 40L				800	50	800
18 φ× 45 ~ 50L			50	600	50	400
22 φ	---	---	50	500	---	400
25 φ× 40L			25	300		
25 φ× 45 ~ 50L			25	250		

Note: 1. 10φ×35 ~ 40L for taping is 250 pcs / box, 2,500 pcs / carton.
2. Please refer to approval sheets for packing specifications.

2. Radial Type of Organic Conductive Polymer Capacitors

Unit: pcs

Case Size	Taping		Bulk		Cutting	
	Box	Carton	Bag	Carton	Bag	Carton
5φ	2,000	20,000	1,000	20,000	1,000	24,000
6.3φ	2,000	20,000		20,000		20,000
8φ	1,000	10,000		12,000		16,000
10φ×10L	500	5,000	500	10,000	500	8,000
10φ×12L				8,000		

Package Quantity

Standard Package Quantity

3. SMD Type

Unit: pcs

Case size	Q'ty / Reel	Q'ty / Box
3φ	2,000	20,000
4φ	2,000	20,000
5φ	1,000	10,000
6.3φ×4.5L	1,500	15,000
6.3φ×5.3 ~ 7.7L	1,000	10,000
6.3φ×9.5L	750	7,500
8φ×6.5 ~ 6.7L	1,000	10,000
8φ×7.7 ~ 10L	500	5,000
8φ×12L*	400	4,000
10φ×7.7 ~ 10L	500	5,000
10φ×12.5 / 12.6L*	400	4,000
10φ×16.5L	300	3,000
12.5φ×13.5L	200	1,600
12.5φ×16L		
16φ×16.5L		
16φ×21.5L	100	800
18φ×16.5L	150	1,200
18φ×21.5L	100	800

Note: Case sizes with " * " mark are for OP-CAP only.

4. Snap-in Type

Unit: pcs

φD	L	Inner Box	Carton
20φ	15 ~ 25	110	1,320
	30		1,100
	35 ~ 40		880
	45 ~ 50	100	800
22φ	15 ~ 25	90	1,080
	30		900
	35 ~ 40		720
	45 ~ 60	80	640
25φ	15 ~ 25	65	780
	30		650
	35 ~ 40		520
	45 ~ 60		520
30φ	15 ~ 25	50	600
	30		500
	35 ~ 40		400
	45 ~ 60	45	360
	65		270

φD	L	Inner Box	Carton
35φ	15 ~ 25	40	480
	30		400
	35 ~ 60		320
	65 ~ 80		240
	85 ~ 100		160
40φ	25 ~ 30	30	150
	35 ~ 50		120
	55 ~ 70		90
	75 ~ 90		60
	95 ~ 100	20	80
45φ	70	25	75
	75 ~ 90		50

5. Screw Type

Unit: pcs

Case size	Q'ty / Box
35φ	100
51φ	36
63.5φ	25
76.2φ	16
89φ	9

Note: Customized packages for snap-in type and screw type may be available upon request. Please consult with us.

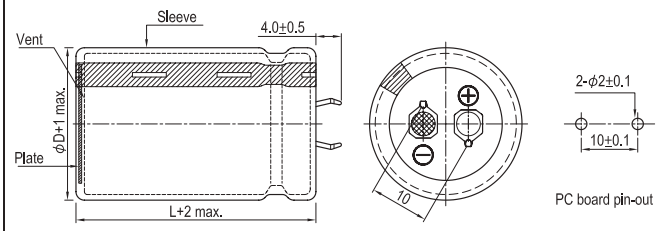
Terminal Codes for Snap-in Type

PC board pin-out positions is viewed from component side.
Each terminal type has a restriction on the applicable case size.
For other terminal types that are not illustrated here, please consult with us.

Unit: mm

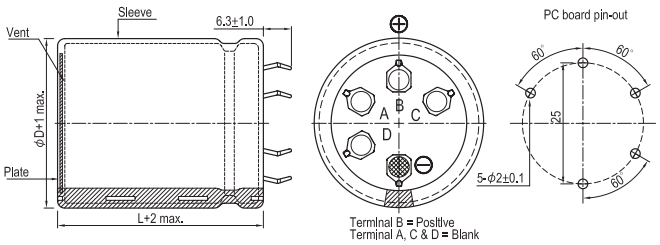
Standard Type

Applicable Size: 20φ ~ 40φ
Terminal Code: **- -**



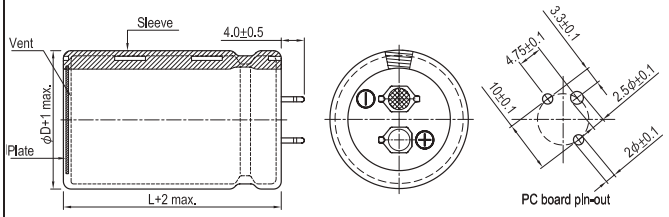
5-pins Terminal Type

Applicable Size: 35φ ~ 40φ
Terminal code: **L5**



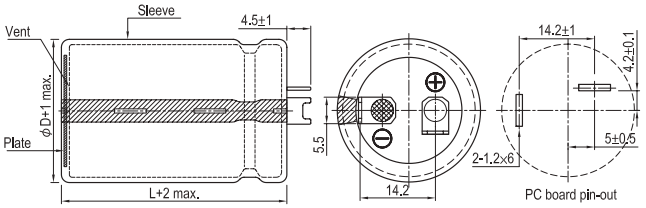
3-pins Terminal Type

Applicable Size: 20φ ~ 40φ
Terminal Code: **L3**



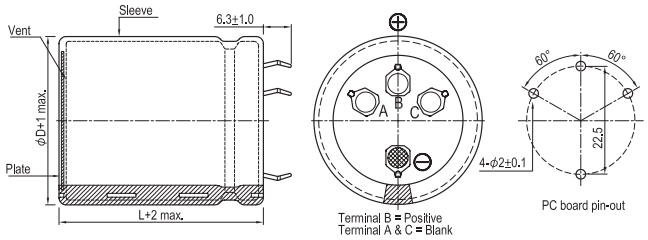
Vibration-resistant Type

Applicable Size: 30φ ~ 40φ
Terminal Code: **T2**



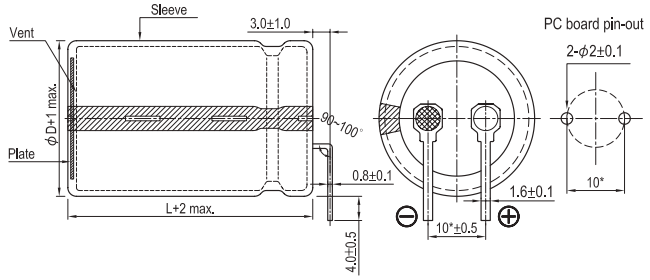
4-pins Terminal Type

Applicable Size: 35φ ~ 40φ
Terminal Code: **L4**



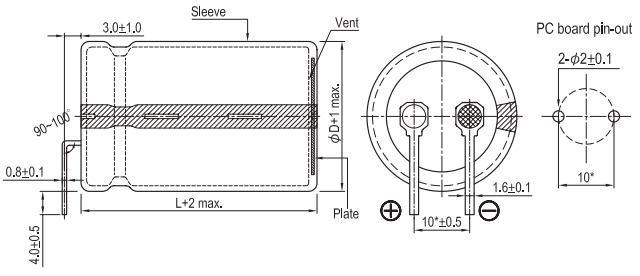
Horizontal Type

Applicable Size: 20φ ~ 35φ
Terminal Code: **H2**



Horizontal Type

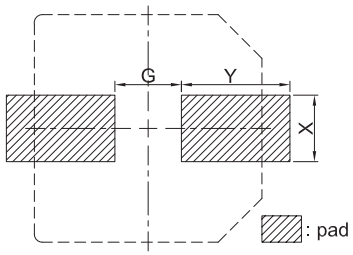
Applicable Size: 20φ ~ 35φ
Terminal Code: **G2**



Note: The pitch of 20 ~ 22φ for horizontal type (marking " 10* ") is 8 mm.

Reflow Conditions for SMD Type

● Recommended Land Pattern and Size



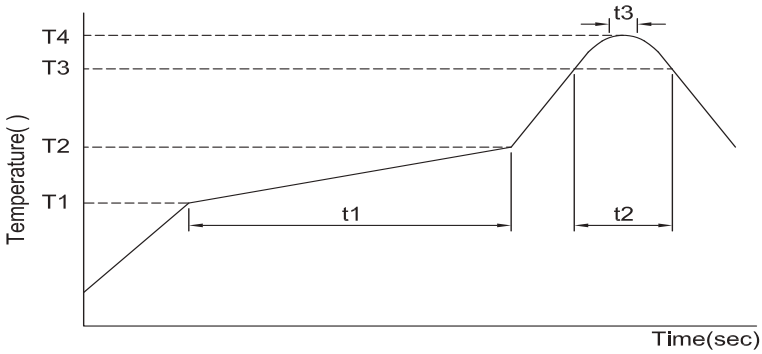
Unit: mm

Case size	Land size			Case size	Land size		
	G	Y	X		G	Y	X
3φ	0.8	2.2	1.6	8φ	3.0	3.5	3.2
4φ	1.0	2.6		10φ	4.0	4.0	
5φ	1.4	3.0		12.5φ	4.0	6.0	
6.3φ	1.9	3.5		16φ	6.0	7.0	
8×6.5	2.1	4.0		18φ	6.0	8.0	

● Recommended Soldering Methods

Method	Reflow soldering	Soldering iron	Flow soldering
Advisability	O Recommended	O Recommended	× Not Recommended

● Reflow Profile for Pb-free Assembly



● Test Conditions

Type		Non-solid capacitor							OP-CAP		Hybrid		
Rated Voltage (V)		4 ~ 50	4 ~ 50		63 up	4 ~ 100		160 up	---		---		
Case Diameter (mm)		4 ~ 6.3 with 4.5 mm	3* ~ 6.3		4 ~ 6.3	8 ~ 18		12.5 up	---		---		
Preheat	Temp. (T1 ~ T2, ℃)	150 ~ 180							150 ~ 200		150 ~ 180		
	Time (t1) (max., secs)	120	100						180		120		
Duration	Temp. (T3, ℃)	230	217	230	217	217	230	217	230		200	217	230
	Time (t2) (max., secs)	30	90	60	60	60	40	40	60		70	50	40
Peak	Temp (T4, ℃)	250	260*		250	250		240	250	260	250	260	
	Time (t3, secs)	5							5		5		
Reflow cycles		1	2 or less						2	1	2	1	

* The peak temperature (T4) in marking with " * " symbol for 3φ is 250℃.
* Please contact our representative if your condition is higher.
* Please ensure that the capacitor became cold enough to the room temperature (5 ~ 35℃) before the second reflow.
* Consult with us when performing reflow profile in IPC / JEDEC (J-STD-020)

(1) Method is as follows.

Reflow soldering condition.
The following temperature profile condition should be observed for soldering. (For higher temperature, pleases contact us after measuring the capacitor's product temperature profile at your side.
Product temperature will rise slower as the product size gets bigger. It is not necessary to adjust the reflow furnace temperature setting according to the product size, for example, φ4 and φ10 products can be mixed on one PCB for reflowing.

(2) Soldering precautions

1. Elements related to the reflow soldering temperature
   * Product size: The temperature rises slower as the size gets bigger.
   * Product location: The center part of the PCB tends to have a lower temperature than the PCB edges.
   * PCB size: The PCB temperature rises slower as the area and/or thickness of the PCB gets greater.
2. Repeated reflowing
   * Avoid reflowing twice if possible.
   * If repeated reflowing is unavoidable, contact us after measuring the first and the second reflow profiles and reflow interval at your side.
   * Do not attempt to reflow three times.
3. Soldering with soldering iron observe the following conditions.
   * The iron tip temperature: 350 ± 5℃
   * Soldering time: 3 +1 / -0 seconds.

● Attention for OP-CAP

Reflow soldering may reduce the capacitance of products before or after soldering even if soldering conditions stipulated in Recommendable Reflow Condition are met.

Though the actual reflow conditions are subject to change depending on the kind of reflow soldering method, please be aware that the peak temperature at the top of Al-case and electrode terminals should not exceed peak temperature.

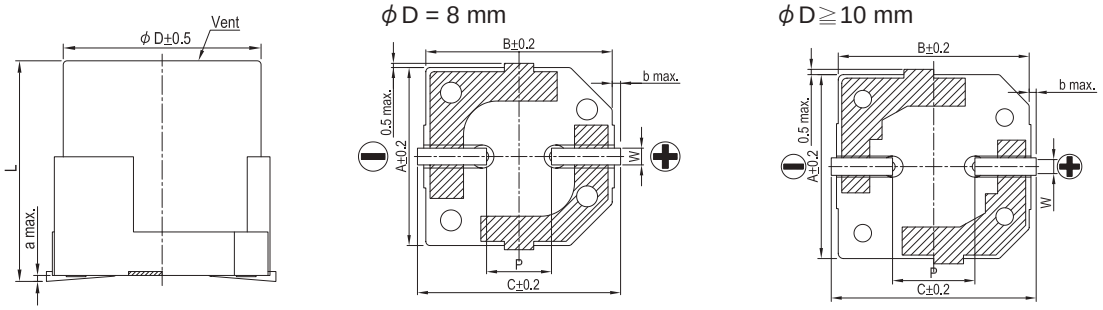
Particular notice should be given to the time that OP-CAP is heated at 200℃ or higher during reflow.
If your reflow conditions (temperature and/or duration) exceed the above, OP-CAP may be damaged exhibiting; 50% decrease in capacitance, an increase of leakage current, (up to several mA) as well as damage to the exterior of the capacitor.

Anti-vibration Structure for SMD Type

Available for SMD φ8 ~ φ18
Suitable for Automotive Application
Peak acceleration: 30 G / 50 G

Specifications	Performance
Peak acceleration: 30 G (for φ8 ~ φ18) / 50 G (for φ8 ~ φ16) Peak to peak amplitude: 1.5mm Frequency: 10 ~ 2,000 Hz reciprocation for 20 minutes Direction and duration of vibration: 3 orthogonal directions mutually each for 4 Hrs (18φx16.5L is for 2 Hrs)	Capacitance Change: Within ± 10% of initial value Tanδ: Within specified value Leakage Current: Within specified value

Diagram of Dimensions



Lead Spacing and Diameter

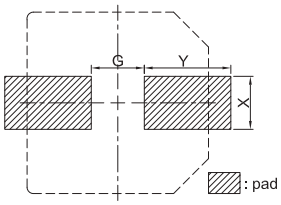
Unit: mm

φD	L ± 0.5	A	B	C	W	a	b	P ± 0.2
8	10.5	8.5	8.9	9.9	0.7 ~ 1.1	0.3	0.4	3.1
10	10.5	10.5	10.9	11.9	0.7 ~ 1.3	0.3	0.4	4.7
12.5	13.5*	13.0	13.5	14.5	1.1 ~ 1.4	0.4	1.0	4.4
12.5	16.5*	13.0	13.5	14.5				4.4
16	16.5	16.5	17.0	18.2				6.4
18	16.5	18.5	19.0	20.2				6.4

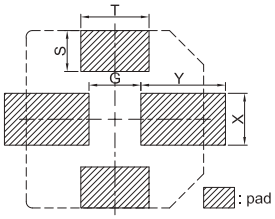
Note: The "L" dimension in marking with " * " symbol is ±1.0.

Land Pattern (Anti-vibration Structure)

30 G



50 G



When using large surface mount capacitor, please design possibly land pattern area than the recommended pattern dimension in order to increase vibration resistance and avoid to falling off a circuit board. If you use higher G value, please consult with us.

Unit: mm

Accelerations	Case Dia. (φ)	Land size				
		G	Y	X	S	T
30 G	8	3.0	4.3	3.5	---	---
	10	4.0	4.7	3.5		
	12.5	3.5	6.0	4.8		
	16	5.0	8.0	6.3		
	18*	5.0	8.5	6.3		
50 G	8	3.0	4.3	3.0	1.1	2.2
	10	4.0	4.7	3.0	1.2	2.4
	12.5	3.8	6.0	6.0	3.0	5.0
	16	5.0	8.0	7.5	3.0	5.0

Note: Case dia. in marking with " * " symbol is only for 18φx16.5L.

Discontinued Series

The following series are discontinued. Please use the recommended in the table.

Type	Original Series	Features	Recommended Substitution
SMD	VE2, VE3,VEA	Higher Capacitance Range	VE
	VGA, VEL	Higher Capacitance Range,105℃	VEJ
	VEK	Long Life, 105℃	VZH
	VLV	Low ESR, High Reliability, Anti-vibartion	VZH
	VLW	High Temperature Usage, 125℃, Anti-vibration	VUA
Radial	RXZ	Super Ultra Low Impedance (Design for M/B)	OCR / OCRZ
	RXH	Ultra Low Impedance, High Reliability (Design for M/B)	
	RZD	Ultra Low Impedance	
	RXF	High Ripple Current, Long Life	RXQ
	RXY	Low Impedance	RZW
	RZY	High Reliability	
	RZF	High Reliability, Long Life	
Axial	TEA	General	

OP-CAP Item List

ESR: mΩ/at 100k ~ 300k Hz, 20℃ max.
Ripple Current: mA/rms at 100k Hz, 105℃

SMD Type (2V ~ 10V)

Rated Voltage	2 V			
Cap. (μF)	Series	Size ϕD×L(mm)	ESR	Ripple Current
680	OVF	6.3 × 5.8	12	3,500
1,200	OVH	6.3 × 9.5	8	5,230

Rated Voltage	2.5 V				4 V				6.3 V				10 V			
Cap. (μF)	Series	Size ϕD× L(mm)	ESR	Ripple Current	Series	Size ϕD×L(mm)	ESR	Ripple Current	Series	Size ϕD×L(mm)	ESR	Ripple Current	Series	Size ϕD×L(mm)	ESR	Ripple Current
33													OVK	5 × 5.7	40	1,300
													OVA	5 × 5.8	40	1,270
													OVS	5 × 5.8	70	1,100
47													OCV	5 × 5.7	40	1,270
									OVK	5 × 5.7	30	1,970	OVA	5 × 5.8	40	1,270
									OVA	5 × 5.8	35	1,380	OVE	5 × 5.8	28	2,310
									OVS	5 × 5.8	30	1,970	OVA	6.3 × 4.4	41	1,560
													OVA	6.3 × 5.8	31	2,250
56													OVE	5 × 5.8	28	2,310
													OVK	6.3 × 4.4	40	1,670
													OVA	6.3 × 5.8	31	2,250
													OCV	6.3 × 5.9	31	2,250
													OVK	6.3 × 5.9	27	2,300
68													OVK	5 × 5.7	30	2,100
													OCVZ	5 × 5.7	23	2,540
					OVK	5 × 5.7	30	1,970	OVA	6.3 × 5.8	27	2,400				
													OVE	5 × 5.8	28	2,310
													OVS	5 × 5.8	30	1,970
													OVK	6.3 × 5.9	27	2,300
82									OVA	6.3 × 4.4	40	1,670				
									OVK	6.3 × 4.4	40	1,670				
									OVA	6.3 × 5.8	27	2,400				
									OCV	6.3 × 5.9	27	2,400				
									OVK	6.3 × 5.9	27	2,400				
100									OCV	5 × 5.7	35	1,380				
									OVK	5 × 5.7	35	1,380				
									OVA	5 × 5.8	35	1,380				
					OVE	5 × 5.8	22	2,610	OVE	5 × 5.8	24	2,500				
					OVK	6.3 × 4.4	40	1,670	OVS	5 × 5.8	20	2,150				
					OVA	6.3 × 5.8	26	2,450	OVA	6.3 × 4.4	40	1,670				
									OVA	6.3 × 5.8	27	2,400				
									OCV	6.3 × 5.9	27	2,400				
									OVK	6.3 × 5.9	22	2,800				
120									OCVZ	5 × 5.7	21	2,660	OVF	5 × 5.8	22	2,600
													OVB	6.3 × 5.8	30	2,700
									OVE	5 × 5.8	24	2,500	OVE	6.3 × 5.8	25	2,530
	OVK	6.3 × 4.4	40	1,670	OVA	6.3 × 4.4	38	1,710	OVA	6.3 × 5.8	27	2,400	OVS	6.3 × 5.8	27	2,320
									OVS	6.3 × 5.8	22	2,570	OCVZ	6.3 × 5.9	22	2,600
									OVK	6.3 × 5.9	22	2,800	OVK	6.3 × 5.9	27	2,300
									OCV	6.3 × 7	30	2,010				
													OVA	8 × 6.7	27	2,800
150					OCV	5 × 5.7	30	1,490					OVK	6.3 × 7.7	21	2,880
					OVK	5 × 5.7	25	2,200	OVF	5 × 4.4	25	2,100	OCVZ	6.3 × 7.7	15	3,400
					OCVZ	5 × 5.7	20	2,730	OVF	5 × 5.8	12	3,500	OVE	6.3 × 7.7	21	2,880
									OVH	5 × 5.8	12	3,520				
					OVA	5 × 5.8	30	1,490	OVD	6.3 × 4.4	19	2,780	OVB	8 × 6.7	21	2,880
					OVE	5 × 5.8	22	2,610	OCV	6.3 × 7	30	2,250	OCV	8 × 6.7	27	2,800
					OVS	5 × 5.8	25	2,150	OCV	8 × 6.7	25	3,020	OVA	8 × 6.7	27	2,800
					OVA	6.3 × 5.8	26	2,450	OVK	8 × 6.7	25	3,020	OVK	8 × 6.7	30	2,760
					OCV	6.3 × 5.9	26	2,450	OVA	8 × 6.7	25	3,020	OVS	8 × 6.7	30	2,760
					OVK	6.3 × 5.9	22	2,570					OVK	10 × 7.7	30	3,020
180	OCVZ	5 × 5.7	19	2,800	OVB	5 × 5.8	25	2,300	OVD	5 × 5.8	17	3,390				
					OVD	6.3 × 4.4	19	2,780	OVH	5 × 5.8	15	3,150				
	OVE	5 × 5.8	21	2,670												
220									OVF	5 × 5.8	12	3,500				
									OVH	5 × 5.8	15	3,150				
									OCVZ	6.3 × 4.4	18	3,000				
									OVD	6.3 × 4.4	18	3,200				
									OVH	6.3 × 4.4	15	3,180				
	OVF	5 × 4.4	25	2,100					OVE	6.3 × 5.8	15	3,160	OVH	6.3 × 5.9	20	2,700
	OVD	6.3 × 4.4	19	2,780	OVD	5 × 5.8	17	3,390	OVF	6.3 × 5.8	10	3,900	OCVZ	8 × 6.7	22	3,220
	OVA	6.3 × 5.8	25	2,500	OCV	8 × 6.7	25	3,020	OVS	6.3 × 5.8	22	2,570	OVE	8 × 6.7	21	3,220
	OCV	6.3 × 5.9	25	2,500	OVA	8 × 6.7	25	3,020	OCVZ	6.3 × 5.9	15	3,160				
	OVK	6.3 × 5.9	25	2,500	OVK	8 × 6.7	25	3,020	OVH	6.3 × 5.9	10	3,900				
									OVK	6.3 × 5.9	20	2,800				
									OCV	6.3 × 7	30	2,250				
									OCV	8 × 6.7	25	3,020				
									OVA	8 × 6.7	25	3,020				
									OVK	8 × 6.7	22	3,220				

OP-CAP Item List

SMD Type (2.5V ~ 10V)

ESR: mΩ/at 100k ~ 300k Hz, 20℃ max.
Ripple Current: mA/rms at 100k Hz, 105℃

Rated Voltage	2.5 V				4 V				6.3 V				10 V			
Cap. (μF)	Series	Size φD×L(mm)	ESR	Ripple Current	Series	Size φD×L(mm)	ESR	Ripple Current	Series	Size φD×L(mm)	ESR	Ripple Current	Series	Size φD×L(mm)	ESR	Ripple Current
270	OVH	5 × 5.8	10	3,860	OVE OCVZ OVK	6.3 × 5.8 6.3 × 5.9 8 × 6.7	15 15 22	3,160 3,160 3,220	OVE OVK OVF	6.3 × 7.7 6.3 × 7.7 6.3 × 7.7	14 14 9	3,470 3,470 4,200	OCVZ OVE OVK OVA OVA	8 × 6.7 8 × 6.7 8 × 6.7 8 × 12 10 × 7.7	22 21 22 14 24	3,220 3,220 3,200 4,420 3,770
330	OCVZ OVH OVD OVF OVH OVD OVF	6.3 × 4.4 6.3 × 4.4 5 × 5.8 5 × 5.8 5 × 5.8 6.3 × 4.4 6.3 × 4.4	16 14 16 10 10 16 12	3,180 3,180 3,500 3,900 3,860 3,500 3,500	OVE OVF OVK OCVZ OVH OCV OVK OVA	6.3 × 5.8 6.3 × 5.8 6.3 × 5.9 6.3 × 5.9 6.3 × 5.9 8 × 6.7 8 × 6.7 8 × 6.7	15 10 20 15 10 25 22 25	3,160 3,900 2,800 3,160 3,900 3,020 3,220 3,020	OVD OVF OCVZ OVB OCVZ OVE OVF OVK OVB OVE OVF OVH OCV OVK OVA	6.3 × 5.8 6.3 × 5.8 6.3 × 5.9 6.3 × 6.4 6.3 × 7.7 6.3 × 7.7 6.3 × 7.7 6.3 × 7.7 8 × 6.7 8 × 6.7 8 × 6.7 8 × 6.7 10 × 7.7 10 × 7.7 10 × 7.7	17 10 17 15 9 14 9 14 14 14 10 9 20 20 20	3,390 3,900 3,390 3,390 4,200 3,470 4,200 3,470 3,900 3,950 4,500 4,500 4,130 4,130 4,130	OCV OVK OCVU OVA OCV OVA OVK	8 × 12 8 × 12 8 × 12 8 × 12 10 × 7.7 10 × 7.7 10 × 7.7	14 14 17 14 24 24 24	4,420 4, 420 3,950 4,420 3,770 3,770 3,770
390	OVF OVH OVE OVF OCVZ OVH	5 × 5.8 5 × 5.8 6.3 × 5.8 6.3 × 5.8 6.3 × 5.9 6.3 × 5.9	10 10 15 10 14 10	3,900 3,860 3,160 3,900 3,160 3,900	OVB OVD OCVZ OVE OVK OVF	6.3 × 5.8 6.3 × 5.8 6.3 × 7.7 6.3 × 7.7 6.3 × 7.7 6.3 × 7.7	24 17 9 14 14 9	2,700 3,390 4,200 3,470 3,470 4,200	OCVZ OVE OVF OVH OVK OVS OVA	8 × 6.7 8 × 6.7 8 × 6.7 8 × 6.7 8 × 6.7 8 × 6.7 8 × 12	22 14 10 9 22 22 12	3,220 3,950 4,500 4,500 3,220 3,220 4,770	OVJ OVJ OCVZ OVE	6.3 × 7.7 6.3 × 9.5 8 × 10 8 × 10	13 13 17 17	4,460 4,000 4,000 4,000
470	OVE OVF	6.3 × 7.7 6.3 × 7.7	13 9	3,600 4,200	OVE OVF OVH OCV OVK OVA	8 × 6.7 8 × 6.7 8 × 6.7 10 × 7.7 10 × 7.7 10 × 7.7	14 10 9 20 20 20	3,950 4,500 4,500 4,130 4,130 4,130	OVE OCV OVK OCVU OVA OVA OVF OVK	8 × 7.7 8 × 12 8 × 12 8 × 12 8 × 12 10 × 7.7 8 × 7.7 10 × 7.7	13 12 12 15 12 20 9 20	3,950 4,770 4,770 4,210 4,770 4,130 4,500 4,130	OVB OCVZ OVE OCV OCVU OVK OVA	8 × 10 10 × 7.7 10 × 7.7 10 × 9.9 10 × 9.9 10 × 9.9 10 × 12.6	17 19 19 18 18 18 12	3,800 3,800 3,800 4,400 4,400 4,400 5,300
560	OVD OVF OCVZ OVH OVB OCVZ OVE OVF OCV OVK OVA OVE OVF OVH	6.3 × 5.8 6.3 × 5.8 6.3 × 5.9 6.3 × 5.9 6.3 × 6.4 6.3 × 7.7 6.3 × 7.7 6.3 × 7.7 8 × 6.7 8 × 6.7 8 × 6.7 8 × 6.7 8 × 6.7 8 × 6.7	16 10 16 10 16 9 13 9 23 23 23 13 10 9	3,500 3,900 3,500 3,900 3,500 4,200 3,600 4,200 3,100 3,100 3,100 4,100 4,500 4,200	OCVZ OVE OVF OVH OVK OVS OCV OCVU OCVZ OVK OVA	8 × 6.7 8 × 6.7 8 × 6.7 8 × 6.7 8 × 6.7 8 × 6.7 8 × 12 8 × 12 8 × 12 8 × 12 8 × 12	22 14 10 9 18 22 12 13 9 12 12	3,220 3,950 4,500 4,500 3,600 3,220 4,770 4,520 5,380 4,770 4,770	OVJ OVJ OVF OCV OVK OCVU	6.3 × 7.7 6.3 × 9.5 8 × 7.7 10 × 9.9 10 × 9.9 10 × 9.9	8 10 9 16 16 16	5,000 4,300 4,500 4,700 4,700 4,700	OCV OCVU OVA OVK	10 × 12.6 10 × 12.6 10 × 12.6 10 × 12.6	12 13 12 12	5,300 5,230 5,300 5,300
680	OCVZ OVE OVF OVH OCV OVK OCVU OVA	8 × 6.7 8 × 6.7 8 × 6.7 8 × 6.7 8 × 12 8 × 12 8 × 12 8 × 12	20 13 10 9 12 12 13 12	3,370 4,100 4,500 4,500 4,770 4,770 4,520 4,770	OVF OCV OVA OVE OVK	8 × 7.7 10 × 7.7 10 × 7.7 8 × 7.7 10 × 7.7	9 20 20 13 20	4,500 4,130 4,130 3,950 4,130	OVB OCV OVA	8 × 10 10 × 12.6 10 × 12.6	12 10 10	4,600 5,500 5,500	OCVZ OVE	10 × 9.9 10 × 10	13 13	4,820 4,820
820	OVJ OVJ OVE OCVZ OVE	6.3 × 7.7 6.3 × 9.5 8 × 7.7 8 × 12 8 × 12	7 10 12 9 9	5,000 4,300 4,260 5,380 5,400	OCV OCVU OVK OVA	10 × 9.9 10 × 9.9 10 × 9.9 10 ×12.6	13 13 13 10	5,200 5,200 5,200 5,500	OVE OCVZ OVE OCVZ OVE OVH OCV OVK OCVU OVA	8 × 10 8 × 12 8 × 12 10 × 7.7 10 × 7.7 10 × 7.7 10 × 12.6 10 × 12.6 10 × 12.6 10 × 12.6	12 13 10 14 14 9 10 10 12 10	4,770 4,700 5,150 4,300 4,300 5,000 5,500 5,500 5,440 5,500	OVB	10 × 10	15	4,300

OP-CAP Item List

ESR: mΩ/at 100k ~ 300k Hz, 20℃ max.
Ripple Current: mA/rms at 100k Hz, 105℃

SMD Type (2.5V ~ 35V)

Rated Voltage	2.5 V				4 V				6.3 V				10 V			
Cap. (μF)	Series	Size φD×L(mm)	ESR	Ripple Current	Series	Size φD×L(mm)	ESR	Ripple Current	Series	Size φD×L(mm)	ESR	Ripple Current	Series	Size φD×L(mm)	ESR	Ripple Current
1,000	OVJ OVF OCV OVK OVA OCVU	6.3 × 9.5 8 × 7.7 10 × 7.7 10 × 7.7 10 × 7.7 10 × 9.9	10 9 19 19 19 13	4,300 4,500 4,240 4,240 4,240 5,200	OVE OCVZ OVE OVH	8 × 10 10 × 7.7 10 × 7.7 10 × 7.7	10 14 14 9	5,220 4,300 4,300 5,000	OVB	8 × 12	11	4,800				
1,200	OVJ OCVZ OVE OVH OCV OVK	6.3 × 9.5 10 × 7.7 10 × 7.7 10 × 7.7 10 × 9.9 10 × 9.9	10 13 13 9 13 13	4,300 4,450 4,450 5,000 5,200 5,200	OVB OCVZ OVE OCVZ OVE OCV OCVU OVK OVA	8 × 10 8 × 12 8 × 12 10 × 9.9 10 × 10 10 × 12.6 10 × 12.6 10 × 12.6 10 × 12.6	15 12 9 10 10 10 12 10 10	5,400 4,700 5,500 5,500 5,500 5,500 5,440 5,500 5,500	 OCVZ OVE	 10 × 9.9 10 × 10	 12 12	 5,025 5,025	OVB	10 × 12.6	13	4,800
1,500	OVE OCVZ OVE OCV OVK OCVU OVA	8 × 10 8 × 12 8 × 12 10 × 12.6 10 × 12.6 10 × 12.6 10 × 12.6	10 12 9 10 10 13 10	5,220 5,150 5,400 5,500 5,500 5,440 5,500	 OCVZ OCVZ OVE	 8 × 12 10 × 9.9 10 × 10	 12 10 10	 4,700 5,500 5,500	OVH OVE OCVZ OCVZ OVE	10 × 9.9 10 × 10 10 × 9.9 10 × 12.6 10 × 12.6	8 12 12 10 10	6,000 5,025 5,025 5,560 5,500				
1,800					OVH OCVZ OCVZ OVE OVE	10 × 9.9 10 × 9.9 10 × 12.6 10 × 10 10 × 12.6	8 10 9 10 9	6,000 5,500 5,600 5,500 5,600	OVB OCVZ	10 × 12.6 10 × 12.6	10 11	5,500 5,200				
2,200	OCVZ OVH OVE	10 × 9.9 10 × 9.9 10 × 10	10 8 10	5,500 6,000 5,500	OCVZ	10 × 12.6	9	5,700								
2,700	OCVZ OVE	10 × 12.6 10 × 12.6	9 9	5,600 5,600	OVB	10 × 12.6	11	5,600								

Rated Voltage	16 V				20 V				25 V				35 V			
Cap. (μF)	Series	Size φD×L(mm)	ESR	Ripple Current	Series	Size φD×L(mm)	ESR	Ripple Current	Series	Size φD×L(mm)	ESR	Ripple Current	Series	Size φD×L(mm)	ESR	Ripple Current
6.8									OCV	6.3 × 5.9	80	1,200				
10									OVG OVA OCV	5 × 4.4 6.3 × 5.8 8 × 6.7	60 65 60	1,700 1,500 1,500				
12									OVB	6.3 × 5.8	70	1,200				
15					OVK OVA	6.3 × 4.4 6.3 × 4.4	45 57	2,000 1,300								
18													OVK	6.3 × 5.9	64	900
22	OCV OVK OVA OVS OVA	5 × 5.7 5 × 5.7 5 × 5.8 5 × 5.8 6.3 × 4.4	45 45 45 90 45	1,210 1,100 1,210 1,060 1,490	OVK OVA OCV OVK	6.3 × 4.4 6.3 × 5.8 6.3 × 5.9 6.3 × 5.9	35 50 50 48	2,000 1,650 1,650 1,300	OVG OVG OVA OCV	5 × 5.8 6.3 × 4.4 8 × 6.7 10 × 7.7	40 45 50 50	2,450 2,350 1,800 2,000	OCVZ	6.3 × 5.9	35	2,600
27					OVG OVB	5 × 4.4 6.3 × 5.8	55 60	1,770 1,400	OVG	5 × 5.8	40	2,450				
33	OVE OVK OVA	5 × 5.8 6.3 × 4.4 6.3 × 5.8	35 40 37	2,070 1, 670 2,050	OVG	5 × 4.4	55	1,770	OVB OCV	8 × 10 8 × 12	50 30	2,000 2,980				
39	OVG OVK OCVZ OVE OVS OVA OVS OCVZ OVK	5 × 4.4 5 × 5.7 5 × 5.7 5 × 5.8 5 × 5.8 6.3 × 5.8 6.3 × 5.8 6.3 × 5.9 6.3 × 5.9	50 35 27 35 35 37 37 24 30	1,840 2,000 2,350 2,070 1,820 2,050 2,050 2,460 2,200	OVA OVB	8 × 6.7 8 × 6.7	45 45	2,000 2,000	OVG OVA	6.3 × 5.8 10 × 7.7	30 45	2,800 2,100	OCV	8 × 12	31	2,100

OP-CAP Item List

ESR: mΩ/at 100k ~ 300k Hz, 20℃ max.
Ripple Current: mA/rms at 100k Hz, 105℃

SMD Type (16V ~ 35V)

Rated Voltage	16 V				20 V				25 V				35 V			
Cap. (μF)	Series	Size ϕD×L(mm)	ESR	Ripple Current	Series	Size ϕD×L(mm)	ESR	Ripple Current	Series	Size ϕD×L(mm)	ESR	Ripple Current	Series	Size ϕD×L(mm)	ESR	Ripple Current
47	OVG	5 × 4.4	50	1,840	OVG	5 × 5.8	30	2,800								
					OVG	6.3 × 4.4	42	2,400	OVG	6.3 × 5.8	30	2,800				
					OCV	8 × 6.7	45	2,000	OVK	6.3 × 5.9	49	1,300				
	OCV	6.3 × 5.9	50	1,650	OVK	8 × 6.7	45	1,890								
					OVA	8 × 6.7	45	2,000								
56									OVG	6.3 × 5.8	30	2,800				
									OCVZ	6.3 × 5.9	30	2,800				
					OVG	5 × 5.8	30	2,800								
					OVK	6.3 × 5.9	48	1,300	OVG	6.3 × 7.7	28	2,800				
									OVB	10 × 10	45	2,200				
									OCV	10 × 12.6	28	3,800				
68	OVG	6.3 × 4.4	40	2,450												
	OVE	6.3 × 5.8	28	2,390												
	OVS	6.3 × 5.8	30	2,200												
	OCVZ	6.3 × 5.9	25	2,440												
	OVK	6.3 × 5.9	30	2,200	OVK	6.3 × 5.9	48	1,300	OVG	8 × 6.7	28	3,000	OCV	10 × 12.6	28	2,700
82	OVK	6.3 × 5.9	30	2,200												
	OVK	6.3 × 7.7	30	2,200					OVJ	6.3 × 7.7	28	3,040				
	OCVZ	6.3 × 7.7	24	2,700	OVK	6.3 × 5.9	48	1,300	OVJ	6.3 × 9.5	28	3,000	OCVZ	8 × 12	20	4,000
	OVE	6.3 × 7.7	24	2,700	OCV	10 × 7.7	40	2,500			28	3,000				
	OCV	8 × 6.7	30	2,700	OVA	10 × 7.7	40	2,500	OVG	8 × 7.7	26	3,100	OVK	8 × 12	29	2,200
	OVA	8 × 6.7	30	2,700					OVB	10 × 12.6	30	3,800				
	OVK	8 × 6.7	28	2,800												
	OVS	8 × 6.7	30	2,760												
100	OVG	5 × 5.8	27	3,000												
	OVD	6.3 × 5.8	24	2,490												
	OVK	6.3 × 5.9	30	2,200												
	OCVZ	6.3 × 5.9	24	2,490												
					OVK	6.3 × 5.9	48	1,300								
	OVB	6.3 × 6.4	24	2,490	OCV	8 × 12	24	3,320								
	OVK	6.3 × 7.7	24	2,700	OVB	8 × 12	22	3,200	OVG	8 × 10	24	3,300				
	OCVZ	6.3 × 7.7	24	2,700	OCV	10 × 9.9	25	3,700								
	OVE	6.3 × 7.7	24	2,700												
	OVE	8 × 6.7	24	3,010												
	OCVZ	8 × 6.7	24	3,010												
	OVK	10 × 7.7	35	2,670												
120	OCVZ	8 × 6.7	24	3,010	OVG	6.3 × 5.8	25	3,200								
	OVE	8 × 6.7	24	3,010	OVK	6.3 × 5.9	48	1,300								
					OCVZ	6.3 × 5.9	25	3,200	OVG	8 × 10	22	3,500	OCVZ	10 × 12.6	18	4,400
	OVK	8 × 6.7	28	2,800		6.3 × 5.9	25	3,200								
	OVS	8 × 6.7	27	2,900												
150	OCVZ	8 × 6.7	22	3,220	OVG	6.3 × 7.7	25	3,200								
					OVJ	6.3 × 7.7	18	3,790								
					OVJ	6.3 × 9.5	18	3,200	OVK	8 × 12	28	2,200				
	OVE	8 × 7.7	22	3,150	OCV	10 × 12.6	20	4,320	OVG	10 × 7.7	25	3,400	OVK	10 × 12.6	28	2,600
	OVA	10 × 7.7	26	3,430	OVA	10 × 12.6	20	4,320								
180	OVG	6.3 × 5.8	22	3,300												
	OVH	6.3 × 9.5	11	4,460												
	OCVZ	8 × 10	18	3,890												
	OVE	8 × 10	18	3,890												
					OVG	8 × 6.7	25	3,200	OCVZ	8 × 12	16	4,650				
	OCV	8 × 12	16	4,360												
	OCVU	8 × 12	20	3,640	OVB	10 × 12.6	20	4,300								
	OVA	8 × 12	16	4,360												
	OCV	10 × 7.7	26	3,430												
	OVA	10 × 7.7	26	3,430												
	OVK	10 × 7.7	29	3,430												
220	OVG	6.3 × 7.7	22	3,300												
	OVE	8 × 10	18	3,890												
	OCVZ	8 × 10	18	3,890												
									OCVZ	10 × 9.9	20	3,800				
	OCVZ	10 × 7.7	22	3,450	OVG	8 × 7.7	23	3,300	OVG	10 × 10	20	3,800				
	OVE	10 × 7.7	22	3,450	OVG	8 × 10	23	3,400								
	OCV	10 × 9.9	20	4,200												
	OCVU	10 × 9.9	20	4,200												
	OVA	10 × 12.6	14	5,050												

OP-CAP Item List

ESR: mΩ/at 100k ~ 300k Hz, 20℃ max.
Ripple Current: mA/rms at 100k Hz, 105℃

SMD Type (16V ~ 25V)

Rated Voltage	16 V				20 V				25 V			
Cap. (μF)	Series	Size ϕD×L(mm)	ESR	Ripple Current	Series	Size ϕD×L(mm)	ESR	Ripple Current	Series	Size ϕD×L(mm)	ESR	Ripple Current
270	OVJ OVJ OVK OVG OVB OCVZ	6.3 × 7.7 6.3 × 9.5 6.3 × 9.5 8 × 6.7 8 × 10 8 × 12	13 10 11 22 20 12	4,460 5,080 5,000 3,300 3,600 4,850	OVK	8 × 12	21	4,000	OCV OVK	10 × 12.6 10 × 12.6	27 27	2,700 2,700
330	OVG OVG OVE OCV OVK OCVU OCVZ OCVZ OVA	8 × 7.7 8 × 10 10 × 10 10 × 12.6 10 × 12.6 10 × 12.6 10 × 9.9 10 × 12.6 10 × 12.6	21 21 16 14 12 16 16 12 14	3,400 3,400 4,350 5,050 5,300 4,720 4,350 5,300 5,050	OCV	10 × 12.6	26	2,700	OCVZ	10 × 12.6	14	5,000
390	OVB	8 × 12	18	3,900	OVG OCVZ OVK	8 × 10 8 × 12 8 × 12	20 14 14	3,700 4,950 4,950				
470	OVB OVK OCVZ	10 × 10 10 × 12.6 10 × 12.6	16 12 10	4,200 5,300 6,100	OVK	10 × 12.6	20	4,300				
560	OVG	8 × 10	18	3,900 3,900 4,950 4,300	OCVZ OVG OCVZ	10 × 9.9 10 × 10 10 × 12.6	18 18 12	4,100 4,100 5,600				
680	OVB	10 × 12.6	14	4,700								
820	OVG OCV OCVZ OVG OVK	10 × 10 10 × 12.6 10 × 12.6 10 × 12.6 10 x 12.6	16 18 12 12 12	4,200 4,200 5,400 5,400 5,400								
1,000	OVK OCVZ OVG OVG	10 × 12.6 10 × 12.6 10 × 7.7 10 × 12.6	12 12 18 12	5,400 5,400 4,100 5,400								

OP-CAP Item List

ESR: mΩ/at 100k ~ 300k Hz, 20℃ max.
Ripple Current: mA/rms at 100k Hz, 105℃

Radial Type (2V ~ 10V)

Rated Voltage	2 V			
Cap. (μF)	Series	Size φD×L(mm)	ESR	Ripple Current
1,000	ORF	6.3 × 8	5	5,900

Rated Voltage	2.5 V				4 V				6.3 V				10 V			
Cap. (μF)	Series	Size φD×L(mm)	ESR	Ripple Current	Series	Size φD×L(mm)	ESR	Ripple Current	Series	Size φD×L(mm)	ESR	Ripple Current	Series	Size φD×L(mm)	ESR	Ripple Current
47													ORA	6.3 × 11	25	2,820
68													ORA	6.3 × 11	25	2,820
100	ORE	5 × 8	7	4,180					OCR	6.3 × 5.5	40	1,810	OCR ORA	6.3 × 6.5 6.3 × 11	45 25	1,700 2,820
150					OCR	6.3 × 5.5	40	1,810					ORA	6.3 × 11	25	2,820
220	ORD OCR	5 × 8 6.3 × 5.5	7 28	4,350 2,390					OCR ORA	6.3 × 11 6.3 × 11	18 20	3,160 3,160	OCR	10 × 10	17	3,950
270					OCR ORA	6.3 × 11 6.3 × 11	15 20	3,200 3,160	OCRZ ORD	5 × 8 5 × 8	8 10	3,900 3,700	ORE ORA ORS OCRZ	8 × 6.5 8 × 11.5 8 × 11.5 8 × 12	22 9 14 8	3,220 4,710 4,420 5,000
330	ORE ORD OCRK OCRZ ORE ORF	5 × 8 5 × 8 6.3 × 8 6.3 × 8 6.3 × 8 6.3 × 8	7 7 7 7 5 5	4,180 4,350 5,600 5,600 5,900 5,900	ORD	5 × 8	8	4,050	OCRZ ORD OCR ORA	5 × 8 5 × 8 6.3 × 6.5 6.3 × 11	8 8 28 28	3,900 4,050 2,390 3,190	OCR OCRK OCRU ORS	8 × 11.5 8 × 11.5 8 × 11.5 8 × 11.5	14 17 16 14	4,420 3,950 3,950 4,420
390	ORE OCRZ OCR ORA	6.3 × 5.5 6.3 × 6 6.3 × 11 6.3 × 11	10 10 18 20	3,900 3,900 3,160 3,150	ORA	6.3 × 11	24	3,300	OCR OCRK ORA ORS	8 × 11.5 8 × 11.5 8 × 11.5 8 × 11.5	12 15 8 12	4,770 4,210 5,080 4,770	ORC OCRZ	8 × 11.5 8 × 12	9 8	5,650 5,000
470	OCRZ ORD ORE OCRK ORE ORF OCRZ	5 × 8 5 × 8 5 × 8 6.3 × 8 6.3 × 8 6.3 × 8 8 × 8	7 7 7 7 5 5 7	4,200 4,350 4,180 5,600 5,900 5,900 5,000	ORF	6.3 × 8	7	5,600	OCRK OCRZ ORB ORE OCRZ ORC ORE OCR OCRK OCRU ORA ORS OCRZ ORE	6.3 × 8 6.3 × 8 6.3 × 8 6.3 × 8 8 × 8 8 × 8 8 × 8 8 × 11.5 8 × 11.5 8 × 11.5 8 × 11.5 8 × 11.5 8 × 12 8 × 12	8 7 8 7 7 8 8 12 15 15 7 12 7 8	4,700 5,600 4,700 5,600 6,200 5,700 5,700 4,770 4,210 4,210 5,700 4,770 6,200 5,700	OCRZ ORA ORS	10 × 12 10 × 12 10 × 12	8 8 12	6,000 5,650 5,300
560	OCRZ ORD ORE ORE OCRZ OCRK OCRZ ORE ORF OCRZ ORC ORE	5 × 8 5 × 8 5 × 8 6.3 × 5.5 6.3 × 6 6.3 × 8 6.3 × 8 6.3 × 8 6.3 × 8 8 × 8 8 × 8 8 × 8	7 7 7 10 10 7 7 5 5 7 7 8	4,200 4,350 4,180 3,900 4,000 5,600 5,600 5,900 5,900 6,200 6,100 4,700	OCRK OCRZ ORB ORE ORF OCRZ ORC ORE OCR OCRU ORA ORS OCRZ ORE	6.3 × 8 6.3 × 8 6.3 × 8 6.3 × 8 6.3 × 8 8 × 8 8 × 8 8 × 8 8 × 11.5 8 × 11.5 8 × 11.5 8 × 11.5 8 × 12 8 × 12	7 7 7 7 7 7 7 7 10 13 7 10 7 7	5,600 5,000 5,000 5,600 5,600 6,200 6,100 6,100 5,230 4,520 5,580 5,230 6,200 6,100	OCRK OCRZ ORB ORE OCRZ ORC ORE OCRZ	6.3 × 8 6.3 × 8 6.3 × 8 6.3 × 8 8 × 8 8 × 8 8 × 8 8 × 12	8 7 8 7 7 8 7 7	4,700 5,600 4,700 5,600 6,200 5,700 6,100 6,200	OCRZ OCR OCRK OCRU OCRZ ORS	8 × 8 10 × 12 10 × 12 10 × 12 10 × 12 10 × 12	9 12 16 13 8 12	5,600 5,300 4,720 5,230 6,000 5,300
680	OCR OCRU ORA ORS	8 × 11.5 8 × 11.5 8 × 11.5 8 × 11.5	10 13 7 10	5,230 4,520 5,580 5,230	ORC ORE	8 × 11.5 8 × 12	7 7	6,100 6,100	OCRZ ORA ORE ORS	6.3 × 8 10 × 12 10 × 12 10 × 12	7 7 7 10	5,600 5,860 6,640 5,500	ORC	10 × 12	7	6,100
820	OCRK OCRZ ORB ORE ORF OCRZ ORC ORE ORA ORS OCRZ ORE	6.3 × 8 6.3 × 8 6.3 × 8 6.3 × 8 6.3 × 8 8 × 8 8 × 8 8 × 8 8 × 11.5 8 × 11.5 8 × 12 8 × 12	7 7 7 5 5 7 7 7 7 10 7 7	5,600 5,600 5,000 5,900 5,900 6,200 6,100 6,100 5,580 5,230 6,200 6,100	OCRZ ORA ORE ORS	8 × 8 10 × 12 10 × 12 10 × 12	7 6 7 8	6,200 5,860 6,640 5,500	ORF OCRZ OCRZ OCRZ OCR OCRK OCRU OCRZ ORC ORS	6.3 × 8 6.3 × 8 8 × 8 8 × 12 10 × 12 10 × 12 10 × 12 10 × 12 10 × 12 10 × 12	8 7 7 8 12 12 12 7 7 10	4,700 5,600 6,200 5,500 5,500 4,360 5,440 6,200 6,640 5,500	OCRZ OCRZ	8 × 12 10 × 12	8 8	5,000 6,000

OP-CAP Item List

ESR: mΩ/at 100k ~ 300k Hz, 20℃ max.
Ripple Current: mA/rms at 100k Hz, 105℃

Radial Type (2.5V ~ 35V)

Rated Voltage	2.5 V				4 V				6.3 V				10 V			
Cap. (μF)	Series	Size φD×L(mm)	ESR	Ripple Current	Series	Size φD×L(mm)	ESR	Ripple Current	Series	Size φD×L(mm)	ESR	Ripple Current	Series	Size φD×L(mm)	ESR	Ripple Current
1,000	OCRZ	8 × 8	7	6,200	OCRZ	8 × 8	7	6,200	OCRZ	8 × 8	7	6,200				
	ORC	8 × 8	7	6,100	ORC	10 × 12	6	6,640	OCRZ	8 × 12	8	5,500				
	ORE	8 × 8	7	6,100	ORS	10 × 12	8	5,500	ORS	10 × 12	10	5,500				
	ORC	8 × 11.5	7	6,100												
	OCRZ	8 × 12	7	6,200												
	OCR	10 × 10	14	4,700												
	OCRZ	10 × 12	7	6,200												
	ORA	10 × 12	6	5,860												
1,200	ORF	6.3 × 8	5	5,900	OCRZ	8 × 8	7	6,200	OCRZ	8 × 12	8	5,500	OCRZ	10 × 12	8	6,000
	OCRZ	6.3 × 8	7	5,600	OCRZ	8 × 12	7	6,200								
	OCRZ	8 × 8	7	6,200	OCR	10 × 12	12	5,500								
	OCRU	10 × 12	13	5,440	OCRZ	10 × 12	7	6,200								
					OCRU	10 × 12	12	5,440								
					ORS	10 × 12	8	5,500								
1,500	ORC	8 × 11.5	7	6,100	OCRZ	10 × 12	7	6,500	OCRZ	10 × 12	7	6,200				
	OCRZ	8 × 12	7	6,200					ORC	10 × 12	10	5,560				
	OCR	10 × 12	12	5,500					ORE	10 × 12	10	5,560				
	OCRZ	10 × 12	7	6,500												
	ORA	10 × 12	7	5,860												
	ORS	10 × 12	8	5,500												
1,600	ORF	8 × 8	5	6,100												
1,800	OCRZ	8 × 8	7	6,200					OCRZ	10 × 12	7	6,200				
2,200	OCRZ	8 × 12	7	6,200	OCRZ	10 × 12	8	7,200								
2,700	OCRZ	10 × 12	7	7,200	OCRZ	10 × 12	8	7,200								
	ORC	10 × 12	8	5,560												
	ORE	10 × 12	10	5,560												
3,900	OCRZ	10 × 12	7	7,200												

Rated Voltage	16 V				20 V				25 V				35V			
Cap. (μF)	Series	Size φD×L(mm)	ESR	Ripple Current	Series	Size φD×L(mm)	ESR	Ripple Current	Series	Size φD×L(mm)	ESR	Ripple Current	Series	Size φD×L(mm)	ESR	Ripple Current
6.8									OCR	6.3 × 5.5	80	1,200				
18													ORS	8 × 11.5	34	2,830
22					OCR	6.3 × 5.5	60	1,450					ORE	6.3 × 5.5	35	2,600
													OCR	8 × 11.5	31	2,300
33									OCR	8 × 11.5	24	3,320	ORS	10 × 12	30	3,270
39													ORE	8 × 6.5	30	2,800
													OCR	8 × 11.5	31	2,300
47	OCR	6.3 × 5.5	50	1,650									OCRZ	8 × 12	24	3,600
													OCR	10 × 12	30	3,650
56					OCR	6.3 × 11	5	2,650	ORE	6.3 × 5.5	30	2,800				
									ORG	6.3 × 5.5	30	2,600				
									OCR	8 × 11.5	24	3,320				
									OCR	10 × 12.5	20	4,320				
68									OCR	8 × 11.5	24	3,320	OCRK	8 × 11.5	29	2,200
									ORS	8 × 11.5	24	3,320	ORG	8 × 11.5	18	4,380
													OCR	10 × 12	28	2,700
82									ORG	6.3 × 8	28	2,780	ORE	8 × 12	20	4,000
									ORE	8 × 6.5	28	3,000	OCRZ	8 × 12	20	4,000
100	ORF	6.3 × 5.5	24	2,490												
	ORE	6.3 × 5.5	24	2,490												
	ORG	6.3 × 5.5	20	2,490	OCR	8 × 11.5	24	3,320								
	OCRZ	6.3 × 6	24	2,490	OCRK	8 × 11.5	28	2,300	ORG	6.3 × 8	28	2,780				
	OCRZ	6.3 × 8	10	4,680	OCRU	8 × 11.5	24	3,320	OCRK	8 × 11.5	28	2,200				
	ORE	6.3 × 8	10	4,680	ORS	8 × 11.5	24	3,320	OCR	10 × 12	20	4,320				
	OCR	6.3 × 11	22	2,820	OCR	10 × 10	24	3,320	ORS	10 × 12	20	4,320				
	ORA	6.3 × 11	25	2,820												
	ORF	6.3 × 11	25	2,890												
	ORS	8 × 11.5	16	4,360												
120					ORE	6.3 × 5.5	25	3,200	ORG	6.3 × 8	28	2,780	ORE	10 × 12	18	4,400
					ORG	6.3 × 5.5	20	3,200					OCRZ	10 × 12	18	4,000
													ORG	10 × 12	16	4,670
150	ORG	6.3 × 5.5	20	3,200	OCR	10 × 12	20	4,320					OCR	10 × 12	26	2,700
	ORE	6.3 × 5.5	24	2,490	OCRU	10 × 12	20	4,320					OCRK	10 × 12	28	2,600
	ORE	8 × 6.5	22	3,220	ORS	10 × 12	20	4,320					OCRZ	10 × 12	20	3,800
180	OCRZ	6.3 × 8	10	4,680												
	OCRZ	8 × 8	10	5,000												
	ORE	8 × 8	10	5,000					OCRZ	8 × 8	18	3,770				
	OCR	8 × 11.5	16	4,360	ORG	6.3 × 8	18	3,460	ORG	8 × 8	18	3,770				
	OCRK	8 × 11.5	20	3,640	ORE	8 × 6.5	25	3,200	ORG	8 × 11.5	16	4,650				
	OCRU	8 × 11.5	18	3,640					ORE	8 × 12	16	4,650				
	ORS	8 × 11.5	16	4,360												
	ORE	8 × 12	16	4,360												
220	ORE	8 × 6.5	13	4,150					ORG	8 × 11.5	16	4,650	ORE	8 × 12	16	4650
									OCRZ	8 × 12	16	4,650				

OP-CAP Item List

Radial Type (16V ~ 25V)

ESR: mΩ/at 100k ~ 300k Hz, 20℃ max.
Ripple Current: mA/rms at 100k Hz, 105℃

Rated Voltage	16 V				20 V				25 V			
Cap. (μF)	Series	Size ϕD×L(mm)	ESR	Ripple Current	Series	Size ϕD×L(mm)	ESR	Ripple Current	Series	Size ϕD×L(mm)	ESR	Ripple Current
270	OCRK	6.3 × 8	15	3,800								
	OCRZ	6.3 × 8	10	4,680								
	ORE	6.3 × 8	10	5,080								
	ORG	6.3 × 8	10	5,080								
	ORG	8 × 6.5	22	3,300								
	ORE	8 × 6.5	13	4,150								
	OCRZ	8 × 8	10	5,000					OCR	10 × 12	25	2,800
	ORE	8 × 8	10	5,000					OCRK	10 × 12	27	2,700
	ORF	8 × 8	10	5,000								
	ORC	8 × 11.5	11	5,080								
	ORF	8 × 11.5	11	5,080								
	OCRZ	8 × 12	8	5,000								
	ORE	8 × 12	11	5,000								
	ORS	10 × 12	14	5,050								
330	OCRZ	8 × 8	10	5,000								
	ORF	8 × 8	13	4,700								
	OCR	10 × 10	16	4,360								
	OCR	10 × 12	14	5,050	OCRZ	8 × 8	17	3,880				
	OCRK	10 × 12	16	4,720	ORG	8 × 8	17	3,880	ORE	10 × 12	14	5,000
	OCRU	10 × 12	16	4,720	OCR	10 × 12	24	2,800	ORG	10 × 12	14	5,000
	OCRZ	10 × 12	8	6,000	OCRK	10 × 12	26	2,800				
	ORC	10 × 12	10	6,100								
	ORS	10 × 12	14	5,050								
390					ORG	8 × 11.5	14	4,970	OCRZ	10 × 12	14	5,000
					OCRZ	8 × 12	14	4,970	ORG	10 × 12	14	5,000
					ORE	8 × 12	14	4,970	ORE	10 × 12	14	5,000
470	ORE	8 × 8	8	5,400								
	ORG	8 × 8	16	4,000								
	OCRZ	8 × 8	16	4,000								
	ORF	8 × 11.5	11	5,400								
	OCRZ	8 × 12	10	5,400								
	OCRZ	10 × 12	8	6,000								
	ORC	10 × 12	10	6,100								
	ORE	10 × 12	10	6,100								
	ORF	10 × 12	10	6,100								
560	ORG	8 × 11.5	14	4,970	ORE	10 × 12	12	5,600				
	ORE	8 × 12	14	4,950								
680					OCRZ	10 × 12	12	5,400				
					ORG	10 × 12	12	5,400				
820	ORG	8 × 16	8	7,000								
	OCRZ	10 × 12	10	6,100								
	ORG	10 × 12	12	5,400								
1,000	ORG	8 × 16	8	7,000								
	ORG	8 × 20	8	7,500								
	OCRZ	10 × 12	10	6,100								
	ORE	10 × 12	12	5,400								
	ORG	10 × 12	12	5,400								
1,200	ORG	8 × 20	8	7,500								
	ORG	10 × 16	8	7,700								
1,500	ORG	10 × 16	8	7,700								
1,800	ORG	10 × 16	8	7,700								
	ORG	10 × 20	8	8,100								
2,200	ORG	10 × 20	8	8,100								

OCV Series

Features

- 105℃, 2,000 hours assured
- Ultra low ESR, solid capacitors of SMD type
- RoHS compliance

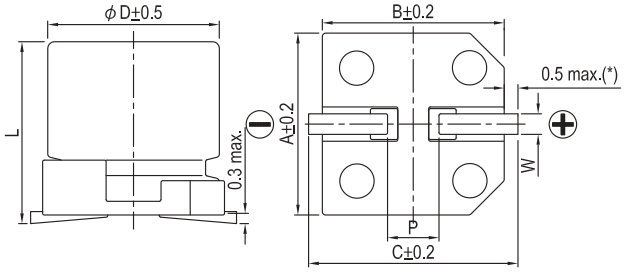
Marking color: Blue

Specifications

Items	Performance
Category Temperature Range	-55℃ ~ +105℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)*	Rated voltage applied, after 2 minutes at 20℃. See Standard Ratings
Tanδ (at 120 Hz, 20℃)	See Standard Ratings
ESR (at 100k ~ 300k Hz, 20℃)	See Standard Ratings
Endurance	Test Time: 2,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 150% of specified value ESR: Less than 150% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied for 2,000 hours at 105℃.
Moisture Resistance	Test Time: 1,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 150% of specified value ESR: Less than 150% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after subjecting them at 60℃, 90 ~ 95% RH for 1,000 hours. Leakage current should be tested after voltage treatment*.
Resistance to Soldering Heat * (Please refer to page 26 for reflowsoldering conditions)	Capacitance Change: Within ±10% of initial value Tanδ: Within specified value ESR: Within specified value Leakage Current: Within specified value
Ripple Current and Frequency Multipliers	Frequency (Hz): 120 ≦ f < 1k | 1k ≦ f < 10k | 10k ≦ f < 100k | 100k≦ f < 500k Multiplier: 0.05 | 0.3 | 0.7 | 1.0

* For any doubt about measured values, measure the leakage current again after the following voltage treatment.
Voltage treatment: DC rated voltage is applied to the capacitors for 2 hours at 105 ℃.

Diagram of Dimensions



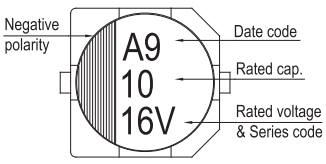
Lead Spacing and Diameter Unit: mm

ϕD	L	A	B	C	W	P ± 0.2
5	5.7 ± 0.3	5.3	5.3	5.9	0.5 ~ 0.8	1.5
6.3	5.9 +0.1/-0.3	6.6	6.6	7.2	0.5 ~ 0.8	2.0
6.3	7.0 ± 0.2	6.6	6.6	7.2	0.5 ~ 0.8	2.0
8	6.7 ± 0.3	8.3	8.3	9.0	0.7 ~ 1.1	3.1
8	12.0 ± 0.5	8.3	8.3	9.0	0.7 ~ 1.1	3.1
10	7.7 ± 0.3	10.3	10.3	11.0	0.7 ~ 1.3	4.7
10	9.9 +0.1/-0.3	10.3	10.3	11.0	0.7 ~ 1.3	4.7
10	12.6 +0.1/-0.4	10.3	10.3	11.0	0.7 ~ 1.3	4.7

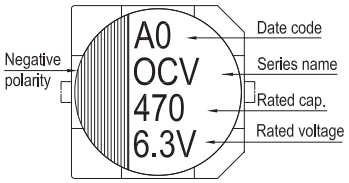
(*): For 5 ~ 6.3ϕ is 0.4 max.

Marking

ϕD = 5 ~ 6.3



ϕD = 8 ~ 10



Dimension: φD×L(mm)

Standard Ratings

Ripple Current: mA/rms at 100k Hz, 105℃

Rated Volt. (V)	Surge Voltage (V)	Capacitance (μF)	Size φD×L(mm)	Tanδ (120 Hz, 20℃)	L C (μA)	E S R (mΩ/at 100k ~ 300k Hz, 20℃ max.)	Rated R. C. (mA/rms at 100k Hz, 105℃)
2.5V (0E)	2.9	220	6.3 × 5.9	0.12	110	25	2,500
		560	8 × 6.7	0.12	280	23	3,100
		680	8 × 12	0.18	340	12	4,770
		1,000	10 × 7.7	0.12	500	19	4,240
		1,200	10 × 9.9	0.18	750	13	5,200
		1,500	10 × 12.6	0.18	750	10	5,500
4V (0G)	4.6	150	5 × 5.7	0.12	120	30	1,490
			6.3 × 5.9		120	26	2,450
		220	8 × 6.7		176	25	3,020
		330	8 × 6.7		264	25	3,020
		470	10 × 7.7		376	20	4,130
		560	8 × 12	0.18	448	12	4,770
		680	10 × 7.7	0.12	544	20	4,130
		820	10 × 9.9	0.18	656	13	5,200
		1,200	10 × 12.6	0.18	960	10	5,500
6.3V (0J)	7.2	82	6.3 × 5.9	0.12	103	27	2,400
		100	5 × 5.7		126	35	1,380
			6.3 × 5.9		126	27	2,400
		120	6.3 × 7		151	30	2,010
		150	6.3 × 7		189	30	2,250
			8 × 6.7		189	25	3,020
		220	6.3 × 7		277	30	2,250
			8 × 6.7		277	25	3,020
		330	10 × 7.7		416	20	4,130
		470	8 × 12	0.15	592	12	4,770
		560	10 × 9.9		706	16	4,700
		820	10 × 12.6		1,033	10	5,500
10V (1A)	12.0	47	5 × 5.7	0.12	94	40	1,270
		56	6.3 × 5.9	0.10	112	31	2,250
		150	8 × 6.7	0.10	300	27	2,800
		330	8 × 12	0.15	660	14	4,420
			10 × 7.7	0.10	660	24	3,770
		470	10 × 9.9	0.15	940	18	4,400
		560	10 × 12.6	0.15	1,120	12	5,300
16V (1C)	18.0	22	5 × 5.7	0.12	70	45	1,210
		47	6.3 × 5.9	0.10	150	50	1,650
		82	8 × 6.7	0.10	262	30	2,700
		180	8 × 12	0.15	576	16	4,360
			10 × 7.7	0.10	576	26	3,430
		220	10 × 9.9	0.15	704	20	4,200
		330	10 × 12.6	0.15	792	14	5,050
		820	10 × 12.6	0.12	2,624	18	4,200

Dimension: φD×L(mm)
Ripple Current: mA/rms at 100k Hz, 105℃

Standard Ratings

Rated Volt. (V)	Surge Voltage (V)	Capacitance (μF)	Size φD×L(mm)	Tanδ (120 Hz, 20℃)	L C (μA)	E S R (mΩ/at 100k ~ 300k Hz, 20℃ max.)	Rated R. C. (mA/rms at 100k Hz, 105℃)
20V (1D)	23.0	22	6.3 × 5.9	0.10	88	50	1,650
		47	8 × 6.7		188	45	2,000
		82	10 × 7.7		328	40	2,500
		100	8 × 12	0.15	400	24	3,320
			10 × 9.9		400	25	3,700
		150	10 × 12.6		600	20	4,320
		330	10 × 12.6	0.12	1,320	26	2,700
25V (1E)	29.0	6.8	6.3 × 5.9	0.10	170	80	1,200
		10	8 × 6.7		125	60	1,500
		22	10 × 7.7		275	50	2,000
		33	8 × 12	0.12	413	30	2,980
		56	10 × 12.6		700	28	3,800
		270	10 × 12.6		1,350	27	2,700
35V (1V)	40.0	39	8 × 12	0.12	273	31	2,100
		68	10 × 12.6	0.12	476	28	2,700

Part Numbering System

OCV Series	470μF	±20%	6.3V	Carrier Tape		8φ×12L	Pb-free and PET coating case
OCV	**471**	**M**	**0J**	**TR**	**-**	**0812**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Package Type	Terminal Type	Case size	Lead Wire and Coating Type

Note: For more details, please refer to “Part Numbering System (SMD Type)” on page 15.

OVK Series

Features

- 105℃, 5,000 hours assured
- Ultra low ESR, solid capacitors of SMD type
- RoHS Compliance

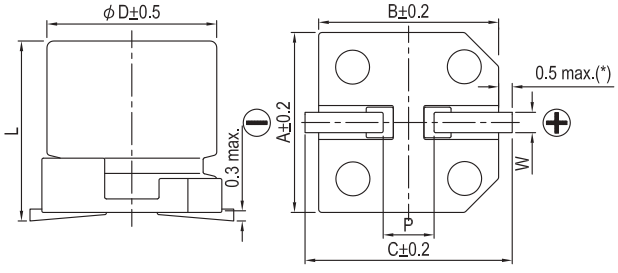
Marking color: Blue

Specifications

Items	Performance
Category Temperature Range	-55℃ ~ +105℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)*	Rated voltage applied, after 2 minutes at 20℃. See Standard Ratings
Tanδ (at 120 Hz, 20℃)	See Standard Ratings
ESR (at 100k ~ 300k Hz, 20℃)	See Standard Ratings
Endurance	Test Time: 5,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 150% of specified value ESR: Less than 150% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied for 5,000 hours at 105℃.
Moisture Resistance	Test Time: 1,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 150% of specified value ESR: Less than 150% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after subjecting them at 60℃, 90 ~ 95% RH for 1,000 hours. Leakage current should be tested after voltage treatment*.
Resistance to Soldering Heat * (Please refer to page 26 for reflow soldering conditions)	Capacitance Change: Within ±10% of initial value Tanδ: Within specified value ESR: Within specified value Leakage Current: Within specified value
Ripple Current and Frequency Multipliers	Frequency (Hz): 120 ≦ f < 1k | 1k ≦ f < 10k | 10k ≦ f < 100k | 100k ≦ f < 500k Multiplier: 0.05 | 0.3 | 0.7 | 1.0

* For any doubt about measured values, measure the leakage current again after the following voltage treatment.
Voltage treatment: DC rated voltage is applied to the capacitors for 2 hours at 105 ℃.

Diagram of Dimensions



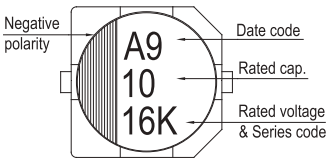
Lead Spacing and Diameter Unit: mm

ϕD	L	A	B	C	W	P ± 0.2
5	5.7 ± 0.3	5.3	5.3	5.9	0.5 ~ 0.8	1.5
6.3	4.4 ± 0.2	6.6	6.6	7.2	0.5 ~ 0.8	2.0
6.3	5.9 +0.1/-0.3	6.6	6.6	7.2	0.5 ~ 0.8	2.0
6.3	7.7 ± 0.3	6.6	6.6	7.2	0.5 ~ 0.8	2.0
6.3	9.5 ± 0.5	6.6	6.6	7.2	0.5 ~ 0.8	2.0
8	6.7 ± 0.3	8.3	8.3	9.0	0.7 ~ 1.1	3.1
8	12.0 ± 0.5	8.3	8.3	9.0	0.7 ~ 1.1	3.1
10	7.7 ± 0.3	10.3	10.3	11.0	0.7 ~ 1.3	4.7
10	9.9 +0.1/-0.3	10.3	10.3	11.0	0.7 ~ 1.3	4.7
10	12.6 +0.1/-0.4	10.3	10.3	11.0	0.7 ~ 1.3	4.7

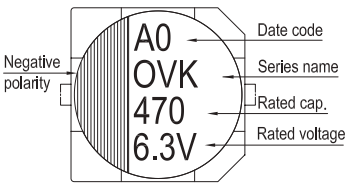
(*): For 5 ~ 6.3ϕ is 0.4 max.

Marking

ϕD = 5 ~ 6.3



ϕD = 8 ~ 10



Standard Ratings

Dimension: φD×L(mm)
Ripple Current: mA/rms at 100k Hz, 105℃

Rated Volt. (V)	Surge Voltage (V)	Capacitance (μF)	Size φD×L(mm)	Tanδ (120 Hz, 20℃)	L C (μA)	E S R (mΩ/at 100k ~ 300k Hz, 20℃ max.)	Rated R. C. (mA/rms at 100k Hz, 105℃)
2.5V (0E)	2.9	120	6.3 × 4.4	0.12	120	40	1,670
		220	6.3 × 5.9		110	25	2,500
		560	8 × 6.7		280	23	3,100
		680	8 × 12	0.18	340	12	4,770
		1,000	10 × 7.7	0.12	500	19	4,240
		1,200	10 × 9.9	0.18	750	13	5,200
		1,500	10 × 12.6	0.18	750	10	5,500
4V (0G)	4.6	68	5 × 5.7	0.12	300	30	1,970
		100	6.3 × 4.4		160	40	1,670
		150	5 × 5.7		120	25	2,200
			6.3 × 5.9		120	22	2,570
		220	8 × 6.7		176	25	3,020
		270	8 × 6.7		216	22	3,220
		330	6.3 × 5.9		264	20	2,800
			8 × 6.7		264	22	3,220
		390	6.3 × 7.7		312	14	3,470
		470	10 × 7.7		375	20	4,130
		560	8 × 6.7		448	18	3,600
			8 × 12	0.18	448	12	4,770
		680	10 × 7.7	0.12	544	20	4,130
		820	10 × 9.9	0.18	656	13	5,200
		1,200	10 × 12.6	0.18	960	10	5,500
6.3V (0J)	7.2	47	5 × 5.7	0.12	300	30	1,970
		82	6.3 × 4.4		207	40	1,670
			6.3 × 5.9		103	27	2,400
		100	5 × 5.7		126	35	1,380
			6.3 × 5.9		126	22	2,800
		120	6.3 × 5.9		151	22	2,800
		150	8 × 6.7		189	25	3,020
		220	6.3 × 5.9		277	20	2,800
			8 × 6.7		277	22	3,220
		270	6.3 × 7.7		340	14	3,470
		330	6.3 × 7.7		416	14	3,470
			10 × 7.7		416	20	4,130
		390	8 × 6.7		491	22	3,220
		470	8 × 12	0.15	592	12	4,770
			10 × 7.7	0.12	592	20	4,130
		560	10 × 9.9	0.15	706	16	4,700
		820	10 × 12.6	0.15	1,033	10	5,500
10V (1A)	12.0	33	5 × 5.7	0.12	100	40	1,300
		56	6.3 × 4.4		224	40	1,670
			6.3 × 5.9		112	27	2,300
		68	5 × 5.7		136	30	2,100
			6.3 × 5.9		136	27	2,300
		120	6.3 × 5.9		240	27	2,300
		150	6.3 × 7.7		300	21	2,880
			8 × 6.7			30	2,760
			10 × 7.7			30	3,020

Dimension: φD×L(mm)
Ripple Current: mA/rms at 100k Hz, 105℃

Standard Ratings

Rated Volt. (V)	Surge Voltage (V)	Capacitance (μF)	Size φD×L(mm)	Tanδ (120 Hz, 20℃)	L C (μA)	E S R (mΩ/at 100k ~ 300k Hz, 20℃ max.)	Rated R. C. (mA/rms at 100k Hz, 105℃)
10V (1A)	12.0	270	8 × 6.7	0.12	540	22	3,200
		330	8 × 12	0.15	660	14	4,420
			10 × 7.7	0.12	660	24	3,770
		470	10 × 9.9		940	18	4,400
		560	10 × 12.6		1,120	12	5,300
16V (1C)	18.0	22	5 × 5.7	0.12	100	45	1,100
		33	6.3 × 4.4		211	40	1,670
		39	5 × 5.7		125	35	2,000
			6.3 × 5.9		125	30	2,200
		68			218		
		82	6.3 × 7.7		262	24	2,700
			8 × 6.7			28	2,800
		100	6.3 × 5.9		320	30	2,200
			6.3 × 7.7			24	2,700
			10 × 7.7			35	2,670
		120	8 × 6.7		384	28	2,800
		180	10 × 7.7		576	29	3,430
		270	6.3 × 9.5		864	11	5,000
		330	10 x 12.6		1,056	12	5,300
		470			1,504		5,300
		820			2,624		5,400
		1,000			3,200		5,400
20V(1D)	23.0	15	6.3 × 4.4	0.12	120	45	2,000
		22	6.3 × 4.4		88	35	2,000
		22	6.3 × 5.9		88	48	1,300
		47	8 × 6.7		188	45	1,.890
		56	6.3 × 5.9		224	48	1,300
		68			272		
		82			328		
		100			400		
		120			480		
		270	8 × 12		1,080	21	4,000
		390	8 x 12		1,560	14	4,950
		470	10 × 12.6		1,880	20	4,300
25V(1E)	29.0	10	8 × 6.7	0.10	125	60	1,500
		47	6.3 × 5.9	0.12	235	49	1,300
		150	8 × 12		750	28	2,200
		270	10 × 12.6		1,350	27	2,700
35V(1V)	40.0	18	6.3 × 5.9	0.12	126	64	900
		82	8 × 12		574	29	2,200
		150	10 × 12.6		1,050	28	2,600

Note: The surface temperature of aluminum case top must not exceed 105℃. A rise in temperature due to self-heating by ripple current should be factored in.

Part Numbering System

OVK Series	470μF	±20%	6.3V	Carrier Tape		10φ×7.7L	Pb-free and PET coating case
OVK	**471**	**M**	**0J**	**TR**	**-**	**1008**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Package Type	Terminal Type	Case size	Lead Wire and Coating Type

Note: For more details, please refer to “Part Numbering System (SMD Type)” on page 15.

OCVZ Series

Features

- 105℃, 2,000 hours assured
- Ultra low ESR with large permissible ripple current
- RoHS Compliance

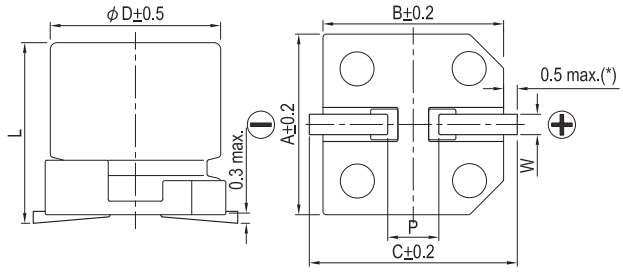
Marking color: Blue

Specifications

Items	Performance
Category Temperature Range	-55℃ ~ +105℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)*	Rated voltage applied, after 2 minutes at 20℃. See Standard Ratings
Tanδ (at 120 Hz, 20℃)	See Standard Ratings
ESR (at 100k ~ 300k Hz, 20℃)	See Standard Ratings
Endurance	Test Time: 2,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 150% of specified value ESR: Less than 150% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied for 2,000 hours at 105℃.
Moisture Resistance	Test Time: 1,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 150% of specified value ESR: Less than 150% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after subjecting them at 60℃, 90 ~ 95% RH for 1,000 hours. Leakage current should be tested voltage treatment*.
Resistance to Soldering Heat * (Please refer to page 26 for reflow soldering conditions)	Capacitance Change: Within ±10% of initial value Tanδ: Within specified value ESR: Within specified value Leakage Current: Within specified value
Ripple Current and Frequency Multipliers	Frequency (Hz): 120 ≦ f < 1k | 1k ≦ f < 10k | 10k ≦ f < 100k | 100k ≦ f < 500k Multiplier: 0.05 | 0.3 | 0.7 | 1.0

* For any doubt about measured values, measure the leakage current again after the following voltage treatment.
Voltage treatment: DC rated voltage is applied to the capacitors for 2 hours at 105 ℃.

Diagram of Dimensions



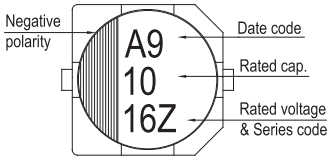
Lead Spacing and Diameter Unit: mm

ϕD	L	A	B	C	W	P ± 0.2
5	5.7 ± 0.3	5.3	5.3	5.9	0.5 ~ 0.8	1.5
6.3	4.4 ± 0.2	6.6	6.6	7.2	0.5 ~ 0.8	2.0
6.3	5.9 +0.1/-0.3	6.6	6.6	7.2	0.5 ~ 0.8	2.0
6.3	7.7 ± 0.3	6.6	6.6	7.2	0.5 ~ 0.8	2.0
8	6.7 ± 0.3	8.3	8.3	9.0	0.7 ~ 1.1	3.1
8	10.0 ± 0.5	8.3	8.3	9.0	0.7 ~ 1.1	3.1
8	12.0 ± 0.5	8.3	8.3	9.0	0.7 ~ 1.1	3.1
10	7.7 ± 0.3	10.3	10.3	11.0	0.7 ~ 1.3	4.7
10	9.9 +0.1/-0.3	10.3	10.3	11.0	0.7 ~ 1.3	4.7
10	12.6 +0.1/-0.4	10.3	10.3	11.0	0.7 ~ 1.3	4.7

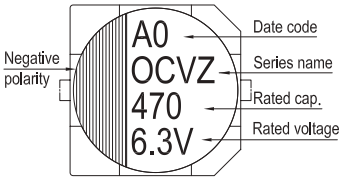
(*): For 5 ~ 6.3ϕ is 0.4 max.

Marking

ϕD = 5 ~ 6.3



ϕD = 8 ~ 10



Dimension: φD×L(mm)

Standard Ratings

Ripple Current: mA/rms at 100k Hz, 105℃

Rated Volt. (V)	Surge Voltage (V)	Capacitance (μF)	Size φD×L(mm)	Tanδ (120 Hz, 20℃)	L C (μA)	E S R (mΩ/at 100k ~ 300k Hz, 20℃ max.)	Rated R. C. (mA/rms at 100k Hz, 105℃)
2.5V (0E)	2.9	180	5 × 5.7	0.12	300	19	2,800
		330	6.3 × 4.4		500	16	3,180
		390	6.3 × 5.9		300	14	3,160
		560	6.3 × 5.9		300	16	3,500
			6.3 × 7.7		420	9	4,200
		680	8 × 6.7		500	20	3,370
		820	8 × 12	0.15	500	9	5,380
		1,200	10 × 7.7	0.12	600	13	4,450
		1,500	8 × 12	0.15	750	12	5,150
		2,200	10 × 9.9	0.12	1,100	10	5,500
		2,700	10 × 12.6	0.15	1,350	9	5,600
4V (0G)	4.6	150	5 × 5.7	0.12	300	20	2,730
		270	6.3 × 5.9			15	3,160
		330	6.3 × 5.9			15	3,160
		390	6.3 × 7.7		468	9	4,200
		560	8 × 6.7		500	22	3,220
			8 × 12	0.15	500	9	5,380
		1,000	10 × 7.7	0.12	800	14	4,300
		1,200	8 × 12	0.15	960	12	4,700
			10 × 9.9	0.12	960	10	5,500
		1,500	8 × 12	0.15	1,200	12	4,700
			10 × 9.9	0.12	1,200	10	5,500
		1,800	10 × 9.9		1,440	10	5,500
			10 × 12.6		1,440	9	5,600
		2,200	10 × 12.6	0.15	1,760	9	5,700
6.3V (0J)	7.2	120	5 × 5.7	0.12	300	21	2,660
		220	6.3 × 4.4		500	18	3,000
			6.3 × 5.9		300	15	3,160
		330	6.3 × 5.9		415	17	3,390
			6.3 × 7.7		623	9	4,200
		390	8 × 6.7		491	22	3,220
		820	8 × 12	0.15	1,033	13	4,700
			10 × 7.7	0.12	1,033	14	4,300
		1,200	10 × 9.9		1,512	12	5,025
		1,500	10 × 9.9		1,890	12	5,025
			10 × 12.6	0.15	1,890	10	5,560
		1,800	10 × 12.6	0.15	2,268	11	5,200
10V (1A)	12.0	68	5 × 5.7	0.12	300	23	2,540
		120	6.3 × 5.9		300	22	2,600
		150	6.3 × 7.7		450	15	3,400
		220	8 × 6.7		440	22	3,220
		270	8 × 6.7		500	22	3,220
		390	8 × 10		780	17	4,000
		470	10 × 7.7		940	19	3,800
		680	10 × 9.9		1,056	13	4,820

Dimension: φD×L(mm)
Ripple Current: mA/rms at 100k Hz, 105℃

Standard Ratings

Rated Volt. (V)	Surge Voltage (V)	Capacitance (μF)	Size φD×L(mm)	Tanδ (120 Hz, 20℃)	L C (μA)	E S R (mΩ/at 100k ~ 300k Hz, 20℃ max.)	Rated R. C. (mA/rms at 100k Hz, 105℃)
16V (1C)	18.0	39	5 × 5.7	0.12	300	27	2,350
			6.3 × 5.9			24	2,460
		68	6.3 × 5.9			25	2,440
		82	6.3 × 7.7		262	24	2,700
		100	6.3 × 5.9		320	24	2,490
			6.3 × 7.7				2,700
			8 × 6.7				3,010
		120			384	24	3,010
		150			500	22	3,220
		180	8 × 10		576	18	3,890
		220	8 × 10		704	18	3,890
			10 × 7.7		704	22	3,450
		270	8 × 12	0.15	864	12	4,850
		330	10 × 9.9	0.12	1,056	16	4,350
			10 × 12.6	0.15	1,056	12	5,300
		470		0.15	1,504	10	6,100
		820		0.12	2,624	12	5,400
		1,000		0.12	3,200	12	5,400
20V(1D)	23.0	120	6.3 × 5.9	0.12	480	25	3,200
		390	8 × 12		1,560	14	4,950
		560	10 × 9.9		2,240	18	4,100
			10 × 12.6		2,240	12	5,600
25V(1E)	29.0	56	6.3 × 5.9	0.12	280	30	2,800
		180	8 × 12		900	16	4,650
		220	10 × 9.9		1,100	20	3,800
		330	10 × 12.6		1,650	14	5,000
35V(1V)	40.0	22	6.3 × 5.9	0.12	154	35	2,600
		82	8 × 12		574	20	4,000
		120	10 × 12.6		840	18	4,400

Part Numbering System

OCVZ Series	820μF	±20%	6.3V	Carrier Tape		10φ×7.7L	Pb-free and PET coating case
OVZ	**821**	**M**	**0J**	**TR**	**-**	**1008**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Package Type	Terminal Type	Case size	Lead Wire and Coating Type

Note: For more details, please refer to “Part Numbering System (SMD Type)” on page 15.

OVH Series

Features
- 105℃, 2,000 hours assured
- Ultra low ESR, solid capacitors of SMD type
- RoHS Compliance

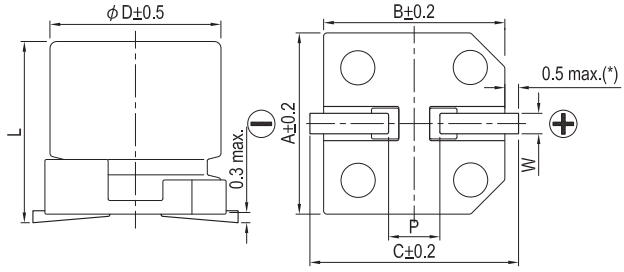
Marking color: Blue

Specifications

Items	Performance
Category Temperature Range	-55℃ ~ +105℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)*	Rated voltage applied, after 2 minutes at 20℃. See Standard Ratings
Tanδ (at 120 Hz, 20℃)	See Standard Ratings
ESR (at 100k ~ 300k Hz, 20℃)	See Standard Ratings
Endurance	Test Time: 2,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 150% of specified value ESR: Less than 150% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied for 2,000 hours at 105℃.
Moisture Resistance	Test Time: 1,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 150% of specified value ESR: Less than 150% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after subjecting them at 60℃, 90 ~ 95% RH for 1,000 hours. Leakage current should be tested after voltage treatment*.
Resistance to Soldering Heat * (Please refer to page 26 for reflow soldering conditions)	Capacitance Change: Within ±10% of initial value Tanδ: Within specified value ESR: Within specified value Leakage Current: Within specified value
Ripple Current and Frequency Multipliers	Frequency (Hz): 120 ≦ f < 1k | 1k ≦ f < 10k | 10k ≦ f < 100k | 100k ≦ f < 500k Multiplier: 0.05 | 0.3 | 0.7 | 1.0

* For any doubt about measured values, measure the leakage current again after the following voltage treatment.
Voltage treatment: DC rated voltage is applied to the capacitors for 2 hours at 105 ℃.

Diagram of Dimensions



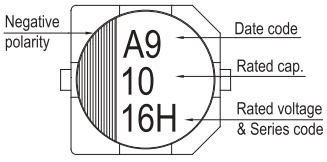
Lead Spacing and Diameter Unit: mm

ϕD	L	A	B	C	W	P ± 0.2
5	5.8 ± 0.3	5.3	5.3	5.9	0.5 ~ 0.8	1.5
6.3	4.4 ± 0.2	6.6	6.6	7.2	0.5 ~ 0.8	2.0
6.3	5.9 + 0.1 / -0.3	6.6	6.6	7.2	0.5 ~ 0.8	2.0
6.3	9.5 ± 0.5	6.6	6.6	7.2	0.5 ~ 0.8	2.0
8	6.7 ± 0.3	8.3	8.3	9.0	0.7 ~ 1.1	3.1
10	7.7 ± 0.3	10.3	10.3	11.0	0.7 ~ 1.3	4.7
10	9.9 + 0.1 / -0.3	10.3	10.3	11.0	0.7 ~ 1.3	4.7

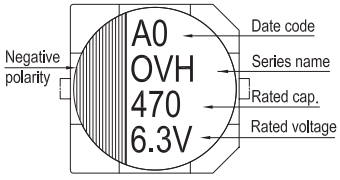
(*): For 5 ~ 6.3ϕ is 0.4 max.

Marking

ϕD = 5 ~ 6.3



ϕD = 8 ~ 10



Dimension: φD×L(mm)

Standard Ratings

Ripple Current: mA/rms at 100k Hz, 105℃

Rated Volt. (V)	Surge Voltage (V)	Capacitance (μF)	Size φD×L(mm)	Tanδ (120 Hz, 20℃)	L C (μA)	E S R (mΩ/at 100k ~ 300k Hz, 20℃ max.)	Rated R. C. (mA/rms at 100k Hz, 105℃)
2V (0D)	2.3	1,200	6.3 × 5.9	0.12	500	8	5,230
2.5V (0E)	2.9	270	5 × 5.8	0.12	500	10	3,860
		330	5 × 5.8			10	3,860
			6.3 × 4.4			14	3,180
		390	5 × 5.8		700	10	3,860
			6.3 × 5.9		293		3,900
		560	6.3 × 5.9		700		3,900
			8 × 6.7		420	9	4,200
		680	8 × 6.7		510		4,500
		1,200	10 × 7.7		900		5,000
		2,200	10 × 9.9		1,650	8	6,000
4V (0G)	4.6	330	6.3 × 5.9	0.12	396	10	3,900
		470	8 × 6.7		564	9	4,500
		560	8 × 6.7		894		4,500
		1,000	10 × 7.7		1,200		5,000
		1,800	10 × 9.9		2,160	8	6,000
6.3V (0J)	7.2	150	5 × 5.8	0.12	500	12	3,520
		180	5 × 5.8			15	3,150
		220	5 × 5.8				3,150
			6.3 × 4.4				3,180
			6.3 × 5.9		416	10	3,900
		330	8 × 6.7		624	9	4,500
		390	8 × 6.7		737		4,500
		820	10 × 7.7		1,550		5,000
		1,500	10 × 9.9		2,835	8	6,000
10V (1A)	12.8	220	6.3 × 5.9	0.12	500	20	2,700
16V (1C)	18.0	180	6.3 × 9.5	0.12	576	11	4,460

Part Numbering System

OVH Series	820μF	±20%	6.3V	Carrier Tape		10φ×7.7L	Pb-free and PET coating case
OVH	**821**	**M**	**0J**	**TR**	**-**	**1008**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Package Type	Terminal Type	Case size	Lead Wire and Coating Type

Note: For more details, please refer to “Part Numbering System (SMD Type)” on page 15.

OCVU Series

Features

- 125℃, 1,000 ~ 2,000 hours assured
- Ultra low ESR, solid capacitors of SMD type
- RoHS Compliance

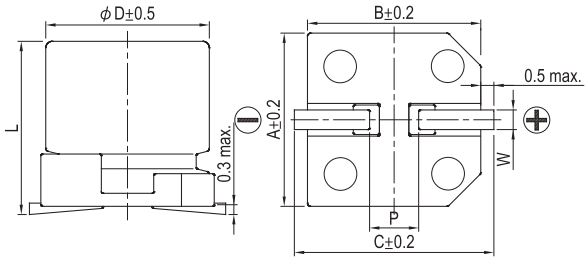
Marking color: Blue

Specifications

Items	Performance
Category Temperature Range	-55℃ ~ +125℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)*	Rated voltage applied, after 2 minutes at 20℃. See Standard Ratings
Tanδ (at120 Hz, 20℃)	See Standard Ratings
ESR (at 100k ~ 300k Hz, 20℃)	See Standard Ratings
Endurance	Test Time: 1,000 Hrs for 2.5 ~ 4V; 2,000 Hrs for 6.3 ~ 16V Capacitance Change: Within ±20% of initial value Tanδ: Less than 200% of specified value ESR: Less than 200% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied for specified hours at 125℃.
Moisture Resistance	Test Time: 1,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 150% of specified value ESR: Less than 150% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after subjecting them at 60℃, 90 ~ 95% RH for 1,000 hours. Leakage current should be tested after voltage treatment*.
Resistance to Soldering Heat * (Please refer to page 26 for reflow soldering conditions)	Capacitance Change: Within ±10% of initial value Tanδ: Within specified value ESR: Within specified value Leakage Current: Within specified value
Ripple Current and Frequency Multipliers	Frequency (Hz): 120 ≦ f < 1k | 1k ≦ f < 10k | 10k ≦ f < 100k | 100k ≦ f < 500k Multiplier: 0.05 | 0.3 | 0.7 | 1.0

* For any doubt about measured values, measure the leakage current again after the following voltage treatment.
Voltage treatment: DC rated voltage is applied to the capacitors for 2 hours at 105℃.

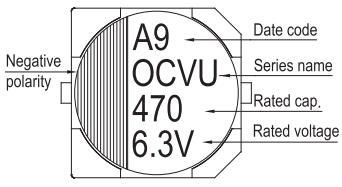
Diagram of Dimensions



Lead Spacing and Diameter Unit: mm

ϕD	L	A	B	C	W	P ± 0.2
8	12.0 ± 0.5	8.3	8.3	9.0	0.7 ~ 1.1	3.1
10	9.9 + 0.1/-0.3	10.3	10.3	11.0	0.7 ~ 1.3	4.7
10	12.6 + 0.1/-0.4	10.3	10.3	11.0	0.7 ~ 1.3	4.7

Marking



Dimension: ϕD×L(mm)
Ripple Current: mA/rms at 100k Hz

Standard Ratings

Rated Volt. (V)	Surge Voltage (V)	Capacitance (μF)	Size ϕD×L(mm)	Tanδ (120 Hz, 20℃)	L C (μA)	ESR (mΩ/at 100k ~ 300k Hz, 20℃ max.)	Rated R. C.(mA/rms at 100k Hz)	
							T ≤ 105℃	105℃ < T ≦ 125℃
2.5V (0E)	2.9	680	8 × 12	0.18	340	13	4,520	1,430
		1,000	10 × 9.9		500		5,200	1,645
		1,500	10 × 12.6		750		5,440	1,721
4V (0G)	4.6	560	8 × 12	0.18	448		4,520	1,430
		820	10 × 9.9		656		5,200	1,645
		1,200	10 × 12.6		960	12	5,440	1,721
6.3V (0J)	7.2	470	8 × 12	0.15	592	15	4,210	1,332
		560	10 × 9.9		706	16	4,700	1,487
		820	10 × 12.6		1,033	12	5,440	1,721
10V (1A)	12.0	330	8 × 12	0.15	660	17	3,950	1,250
		470	10 × 9.9		940	18	4,400	1,392
		560	10 × 12.6		1,120	13	5,230	1,655
16V (1C)	18.0	180	8 × 12	0.15	576	20	3,640	1,151
		220	10 × 9.9		704	20	4,200	1,330
		330	10 × 12.6		1,056	16	4,720	1,493

Part Numbering System

OCVU Series	470μF	±20%	6.3V	Carrier Tape		8ϕ×12L	Pb-free and PET coating case
OVU	**471**	**M**	**0J**	**TR**	**-**	**0812**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Package Type	Terminal Type	Case size	Lead Wire and Coating Type

Note: For more details, please refer to “Part Numbering System (SMD Type)” on page 15.

OVA Series

Features
- 105℃, 15,000 hours assured
- Ultra low ESR, solid capacitors of SMD type
- RoHS Compliance

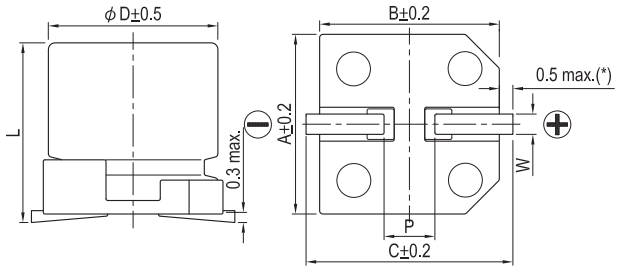
Marking color: Blue

Specifications

Items	Performance
Category Temperature Range	-55℃ ~ +105℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)*	Rated voltage applied, after 2 minutes at 20℃. See Standard Ratings
Tanδ (at120 Hz, 20℃)	See Standard Ratings
ESR (at 100k ~ 300k Hz, 20℃)	See Standard Ratings
Endurance	Test Time: 15,000 Hrs (For 6.3×4.4: 3,000 Hrs) Capacitance Change: Within ±20% of initial value Tanδ: Less than 150% of specified value ESR: Less than 150% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied for 15,000 hours at 105℃.
Moisture Resistance	Test Time: 1,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 150% of specified value ESR: Less than 150% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after subjecting them at 60℃, 90 ~ 95% RH for 1,000 hours. Leakage current should be tested after voltage treatment*.
Resistance to Soldering Heat * (Please refer to page 26 for reflow soldering conditions)	Capacitance Change: Within ±10% of initial value Tanδ: Within specified value ESR: Within specified value Leakage Current: Within specified value
Ripple Current and Frequency Multipliers	Frequency (Hz): 120 ≦ f < 1k | 1k ≦ f < 10k | 10k ≦ f < 100k | 100k ≦ f < 500k Multiplier: 0.05 | 0.3 | 0.7 | 1.0

* For any doubt about measured values, measure the leakage current again after the following voltage treatment.
Voltage treatment: DC rated voltage is applied to the capacitors for 2 hours at 105℃.

Diagram of Dimensions



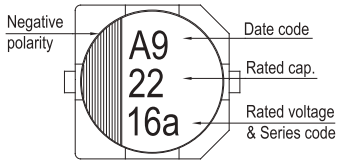
Lead Spacing and Diameter Unit: mm

ϕD	L	A	B	C	W	P ± 0.2
5	5.8 ± 0.3	5.3	5.3	5.9	0.5 ~ 0.8	1.5
6.3	4.4 ± 0.2	6.6	6.6	7.2	0.5 ~ 0.8	2.0
6.3	5.8 ± 0.3	6.6	6.6	7.2	0.5 ~ 0.8	2.0
8	6.7 ± 0.3	8.3	8.3	9.0	0.7 ~ 1.1	3.1
8	12.0 ± 0.5	8.3	8.3	9.0	0.7 ~ 1.1	3.1
10	7.7 ± 0.3	10.3	10.3	11.0	0.7 ~ 1.3	4.7
10	12.6 +0.1/-0.4	10.3	10.3	11.0	0.7 ~ 1.3	4.7

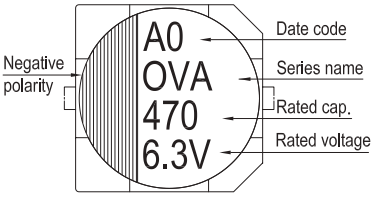
(*): For 5 ~ 6.3ϕ is 0.4 max.

Marking

ϕD = 5 ~ 6.3



ϕD = 8 ~ 10



Standard Ratings

Dimension: ϕD×L(mm)
Ripple Current: mA/rms at 100k Hz

Rated Volt. (V)	Surge Voltage (V)	Capacitance (μF)	Size ϕD×L(mm)	Tanδ (120 Hz, 20℃)	L C (μA)	E S R (mΩ/at 100k ~ 300k Hz, 20℃ max.)	Rated R. C. (mA/rms at 100k Hz, 105℃)
2.5V (0E)	2.9	220	6.3 × 5.8	0.12	110	25	2,500
		560	8 × 6.7		280	23	3,100
		680	8 × 12		340	12	4,770
		1,000	10 × 7.7		500	19	4,240
		1,500	10 ×12.6		750	10	5,500
4V (0G)	4.6	100	6.3 × 5.8	0.12	80	26	2,450
		120	6.3 × 4.4		240	38	1,710
		150	5 × 5.8		120	30	1,490
			6.3 × 5.8		120	26	2,450
		220	8 × 6.7		176	25	3,020
		330	8 × 6.7		264	25	3,020
		470	10 × 7.7		376	20	4,130
		560	8 × 12		448	12	4,770
		680	10 × 7.7		544	20	4,130
		820	10 ×12.6		656	10	5,500
		1,200	10 ×12.6		960	10	5,500
6.3V (0J)	7.2	47	5 × 5.8	0.12	59.2	35	1,380
		68	6.3 × 5.8		85.6	27	2,400
		82	6.3 × 4.4		258	40	1,670
			6.3 × 5.8		103	27	2,400
		100	5 × 5.8		126	35	1,380
			6.3 × 4.4		315	40	1,670
			6.3 × 5.8		126	27	2,400
		120	6.3 × 5.8		151	27	2,400
		150	8 × 6.7		189	25	3,020
		220	8 × 6.7		277	25	3,020
		330	10 × 7.7		416	20	4,130
		390	8 × 12		491	12	4,770
		470	8 × 12		592	12	4,770
			10 × 7.7		592	20	4,130
		680	10 × 12.6		857	10	5,500
		820	10 × 12.6		1,033	10	5,500
10V (1A)	12.0	33	5 × 5.8	0.12	66	40	1,270
		47	5 × 5.8		94	40	1,270
			6.3 × 4.4		235	41	1,560
			6.3 × 5.8		94	31	2,250
		56	6.3 × 5.8		112	31	2,250
		120	8 × 6.7		240	27	2,800
		150	8 × 6.7		300	27	2,800
		270	8 × 12		540	14	4,420
			10 × 7.7		540	24	3,770
		330	8 × 12		660	14	4,420
			10 × 7.7		660	24	3,770
		470	10 × 12.6		940	12	5,300
		560	10 × 12.6		1,120	12	5,300

Dimension: ϕD×L(mm)

Standard Ratings

Ripple Current: mA/rms at 100k Hz, 105℃

Rated Volt. (V)	Surge Voltage (V)	Capacitance (μF)	Size ϕD×L(mm)	Tanδ (120 Hz, 20℃)	L C (μA)	E S R (mΩ/at 100k ~ 300k Hz, 20℃ max.)	Rated R. C. (mA/rms at 100k Hz, 105℃)
		22	5 × 5.8		70	45	1,210
			6.3 × 4.4		176	45	1,490
		33	6.3 × 5.8		106	37	2,050
		39	6.3 × 5.8		125	37	2,050
		82	8 × 6.7		262	30	2,700
16V (1C)	18.0	150	10 × 7.7	0.12	480	26	3,430
		180	8 × 12		576	16	4,360
			10 × 7.7		576	26	3,430
		220	10 × 12.6		704	14	5,050
		330	10 × 12.6		792	14	5,050
		15	6.3 × 4.4		150	57	1,300
		22	6.3 × 5.8		88	50	1,650
		39	8 × 6.7		156	45	2,000
20V (1D)	23.0	47	8 × 6.7	0.12	188	45	2,000
		82	10 × 7.7		328	40	2,500
		150	10 × 12.6		600	20	4,320
		10	6.3 × 5.8		125	65	1,500
25V (1E)	29.0	22	8 × 6.7	0.12	275	50	1,800
		39	10 × 7.7		488	45	2,100

Part Numbering System

OVA Series	470μF	±20%	6.3V	Carrier Tape		8ϕ×12L	Pb-free and PET coating case
OVA	**471**	**M**	**0J**	**TR**	**-**	**0812**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Package Type	Terminal Type	Case size	Lead Wire and Coating Type

Note: For more details, please refer to “Part Numbering System (SMD Type)” on page 15.

OVB Series

Features

- 105℃, 20,000 hours assured
- Ultra low ESR, solid capacitors of SMD type
- RoHS Compliance

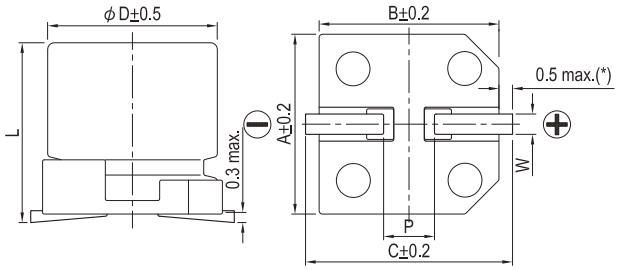
Marking color: Blue

Specifications

Items	Performance
Category Temperature Range	-55℃ ~ +105℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)*	Rated voltage applied, after 2 minutes at 20℃. See Standard Ratings
Tanδ (at120 Hz, 20℃)	See Standard Ratings
ESR (at 100k ~ 300k Hz, 20℃)	See Standard Ratings
Endurance	Test Time: 20,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 150% of specified value ESR: Less than 150% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied for 20,000 hours at 105℃.
Moisture Resistance	Test Time: 1,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 150% of specified value ESR: Less than 150% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after subjecting them at 60℃, 90 ~ 95% RH for 1,000 hours. Leakage current should be tested after voltage treatment*.
Resistance to Soldering Heat * (Please refer to page 26 for reflow soldering conditions)	Capacitance Change: Within ±10% of initial value Tanδ: Within specified value ESR: Within specified value Leakage Current: Within specified value
Ripple Current and Frequency Multipliers	Frequency (Hz): 120 ≦ f < 1k | 1k ≦ f < 10k | 10k ≦ f < 100k | 100k ≦ f < 500k Multiplier: 0.05 | 0.3 | 0.7 | 1.0

* For any doubt about measured values, measure the leakage current again after the following voltage treatment.
Voltage treatment: DC rated voltage is applied to the capacitors for 2 hours at 105℃.

Diagram of Dimensions



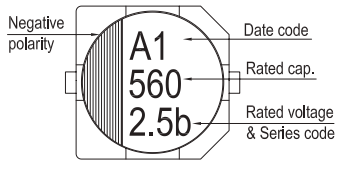
Lead Spacing and Diameter Unit: mm

ϕD	L	A	B	C	W	P ± 0.2
5	5.8 ± 0.3	5.3	5.3	5.9	0.5 ~ 0.8	1.5
6.3	5.8 ± 0.3	6.6	6.6	7.2	0.5 ~ 0.8	2.0
6.3	6.4 +0.1/-0.4	6.6	6.6	7.2	0.5 ~ 0.8	2.0
8	6.7 ± 0.3	8.3	8.3	9.0	0.7 ~ 1.1	3.1
8	10.0 ± 0.5	8.3	8.3	9.0	0.7 ~ 1.1	3.1
8	12.0 ± 0.5	8.3	8.3	9.0	0.7 ~ 1.1	3.1
10	10.0 ± 0.5	10.3	10.3	11.0	0.7 ~ 1.3	4.7
10	12.6 +0.1/-0.4	10.3	10.3	11.0	0.7 ~ 1.3	4.7

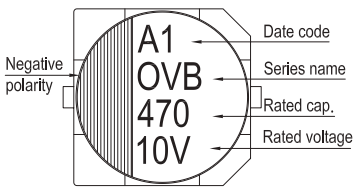
(*): For 5 ~ 6.3ϕ is 0.4 max.

Marking

ϕD = 5 ~ 6.3



ϕD = 8 ~ 10



Dimension: ϕD×L (mm)

Standard Ratings

Ripple Current: mA/rms at 100k Hz, 105℃

Rated Volt. (V)	Surge Voltage (V)	Capacitance (μF)	Size ϕD×L(mm)	Tanδ (120 Hz, 20℃)	L C (μA)	E S R (mΩ/at 100k ~ 300k Hz, 20℃ max.)	Rated R. C. (mA/rms at 100k Hz, 105℃)
2.5V(0E)	2.9	560	6.3 × 6.4	0.12	300	16	3,500
4V (0G)	4.6	180	5 × 5.8	0.12	120	25	2,300
		390	6.3 × 5.8		312	24	2,700
		1,200	8 × 10		960	15	5,400
		2,700	10 × 12.6		2,160	11	5,600
6.3V (0J)	7.2	330	8 × 6.7	0.12	415	14	3,900
			6.3 × 6.4		415	15	3,390
		680	8 × 10		856	12	4,600
		1,000	8 × 12		1,260	11	4,800
		1,800	10 × 12.6		2,268	10	5,500
10V(1A)	12.0	120	6.3 × 5.8	0.12	240	30	2,700
		150	8 × 6.7		300	21	2,880
		470	8 × 10		940	17	3,800
		820	10 × 10		1,640	15	4,300
		1,200	10 × 12.6		2,400	13	4,800
16V(1C)	18.4	100	6.3 × 6.4	0.12	300	24	2,490
		270	8 × 10		864	20	3,600
		390	8 × 12		1,248	18	3,900
		470	10 × 10		1,504	16	4,200
		680	10 × 12.6		2,176	14	4,700
20V(1D)	23.0	27	6.3 × 5.8	0.12	108	60	1,400
		39	8 × 6.7		156	45	2,000
		100	8 × 12		400	22	3,200
		180	10 × 12.6		720	20	4,300
25V(1E)	29.0	12	6.3 × 5.8	0.12	100	70	1,200
		33	8 ×10		165	50	2,000
		56	10 × 10		280	45	2,200
		82	10 × 12.6		410	30	3,800

Part Numbering System

OVB Series	100μF	±20%	16V	Carrier Tape		6.3ϕ×6.4L	Pb-free and PET coating case
OVB	**101**	**M**	**1C**	**TR**	**-**	**0607**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Package Type	Terminal Type	Case size	Lead Wire and Coating Type

Note: For more details, please refer to “Part Numbering System (SMD Type)” on page 15.

OVE Series

Features

- 105℃, 15,000 hours assured
- Ultra low ESR with large permissible ripple current
- RoHS Compliance

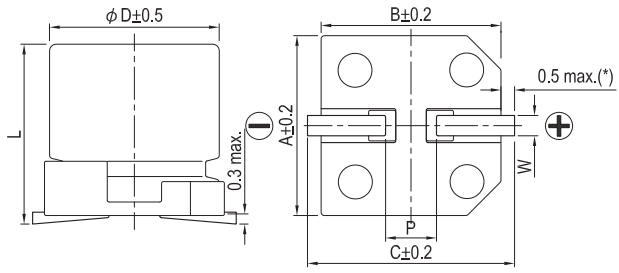
Marking color: Blue

Specifications

Items	Performance
Category Temperature Range	-55℃ ~ +105℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)*	Rated voltage applied, after 2 minutes at 20℃. See Standard Ratings
Tanδ (at120 Hz, 20℃)	See Standard Ratings
ESR (at 100k ~ 300k Hz, 20℃)	See Standard Ratings
Endurance	Test Time: 15,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 150% of specified value ESR: Less than 150% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied for 15,000 hours at 105℃.
Moisture Resistance	Test Time: 1,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 150% of specified value ESR: Less than 150% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after subjecting them at 60℃, 90 ~ 95% RH for 1,000 hours. Leakage current should be tested after voltage treatment*.
Resistance to Soldering Heat * (Please refer to page 26 for reflow soldering conditions)	Capacitance Change: Within ±10% of initial value Tanδ: Within specified value ESR: Within specified value Leakage Current: Within specified value
Ripple Current and Frequency Multipliers	Frequency (Hz): 120 ≦ f < 1k | 1k ≦ f < 10k | 10k ≦ f < 100k | 100k ≦ f < 500k Multiplier: 0.05 | 0.3 | 0.7 | 1.0

* For any doubt about measured values, measure the leakage current again after the following voltage treatment.
Voltage treatment: DC rated voltage is applied to the capacitors for 2 hours at 105℃.

Diagram of Dimensions



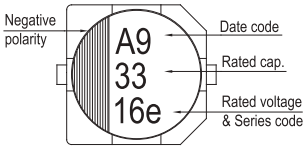
Lead Spacing and Diameter Unit: mm

ϕD	L	A	B	C	W	P ± 0.2
5	5.8 ± 0.3	5.3	5.3	5.9	0.5 ~ 0.8	1.5
6.3	5.8 ± 0.3	6.6	6.6	7.2	0.5 ~ 0.8	2.0
6.3	7.7 ± 0.3	6.6	6.6	7.2	0.5 ~ 0.8	2.0
8	6.7 ± 0.3	8.3	8.3	9.0	0.7 ~ 1.1	3.1
8	7.7 ± 0.3	8.3	8.3	9.0	0.7 ~ 1.1	3.1
8	10.0 ± 0.5	8.3	8.3	9.0	0.7 ~ 1.1	3.1
8	12.0 ± 0.5	8.3	8.3	9.0	0.7 ~ 1.1	3.1
10	7.7 ± 0.3	10.3	10.3	11.0	0.7 ~ 1.3	4.7
10	10.0 ± 0.5	10.3	10.3	11.0	0.7 ~ 1.3	4.7
10	12.6 +0.1/-0.4	10.3	10.3	11.0	0.7 ~ 1.3	4.7

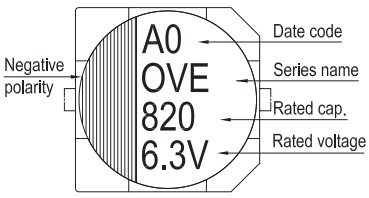
(*): For 5 ~ 6.3ϕ is 0.4 max.

Marking

ϕD = 5 ~ 6.3



ϕD = 8 ~ 10



Dimension: φD×L(mm)

Standard Ratings

Ripple Current: mA/rms at 100k Hz, 105℃

Rated Volt. (V)	Surge Voltage (V)	Capacitance (μF)	Size φD×L(mm)	Tanδ (120 Hz, 20℃)	L C (μA)	E S R (mΩ/at 100k ~ 300k Hz, 20℃ max.)	Rated R. C. (mA/rms at 100k Hz, 105℃)
2.5V (0E)	2.9	180	5 × 5.8	0.12	90	21	2,670
		390	6.3 × 5.8		195	15	3,160
		470	6.3 × 7.7		235	13	3,600
		560	6.3 × 7.7		280		3,600
			8 × 6.7		280		4,100
		680	8 × 6.7		340		4,100
		820	8 × 7.7		410	12	4,260
			8 × 12		410	9	5,400
		1,200	10 × 7.7		600	13	4,450
		1,500	8 × 10		750	10	5,220
			8 × 12		750	9	5,400
		2,200	10 × 10		1,100	10	5,500
		2,700	10 × 12.6		1,350	9	5,600
4V (0G)	4.6	100	5 × 5.8	0.12	80	22	2,610
		150	5 × 5.8		120	22	2,610
		270	6.3 × 5.8		216	15	3,160
		330	6.3 × 5.8		264	15	3,160
		390	6.3 × 7.7		312	14	3,470
		470	8 × 6.7		376		3,950
		560	8 × 6.7		448		
		680	8 × 7.7		544	13	
		1,000	8 × 10		800	10	5,220
			10 × 7.7		800	14	4,300
		1,200	8 × 12		960	9	5,400
			10 × 10		960	10	5,500
		1,500			1,200		
		1,800			1,440		
			10 × 12.6		1,440	9	5,600
6.3V (0J)	7.2	100	5 × 5.8	0.12	126	24	2,500
		120	5 × 5.8		151	24	2,500
		220	6.3 × 5.8		277	15	3,160
		270	6.3 × 7.7		340	14	3,470
		330	6.3 × 7.7		415		3,470
			8 × 6.7		415		3,950
		390	8 × 6.7		491		
		470	8 × 7.7		592	13	
		820	8 × 10		1,033	12	4,770
			8 × 12			10	5,150
			10 × 7.7			14	4,300
		1,200	10 × 10		1,510	12	5,025
		1,500	10 × 10		1,890	12	5,025
			10 × 12.6		1,890	10	5,500

Dimension: φD×L(mm)
Ripple Current: mA/rms at 100k Hz, 105℃

Standard Ratings

Rated Volt. (V)	Surge Voltage (V)	Capacitance (μF)	Size φD×L(mm)	Tanδ (120 Hz, 20℃)	L C (μA)	E S R (mΩ/at 100k ~ 300k Hz, 20℃ max.)	Rated R. C. (mA/rms at 100k Hz, 105℃)
10V (1A)	12.0	47	5 × 5.8	0.12	94	28	2,310
		56			112		
		68			136		
		120	6.3 × 5.8		240	25	2,530
		150	6.3 × 7.7		300	21	2,880
		220	8 × 6.7		440		3,220
		270	8 × 6.7		540		3,220
		390	8 × 10		780	17	4,000
		470	10 × 7.7		940	19	3,800
		680	10 × 10		1,360	13	4,820
16V (1C)	18.0	33	5 × 5.8	0.12	105	35	2,070
		39	5 × 5.8		124	35	2,070
		68	6.3 × 5.8		217	28	2,390
		82	6.3 × 7.7		262	24	2,700
		100	6.3 × 7.7		320		2,700
			8 × 6.7		320		3,010
		120	8 × 6.7		384		3,010
		150	8 × 7.7		480	22	3,150
		180	8 × 10		576	18	3,890
		220	8 × 10		704	18	3,890
			10 × 7.7		704	22	3,450
		330	10 × 10		1,050	16	4,350

Part Numbering System

OVE Series	820μF	±20%	6.3V	Carrier Tape		8φ×12L	Pb-free and PET coating case
OVE	**821**	**M**	**0J**	**TR**	**-**	**0812**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Package Type	Terminal Type	Case size	Lead Wire and Coating Type

Note: For more details, please refer to “Part Numbering System (SMD Type)” on page 15.

OVJ Series

Features

- 105℃, 15,000 hours assured
- Ultra low ESR, solid capacitors of SMD type
- RoHS Compliance

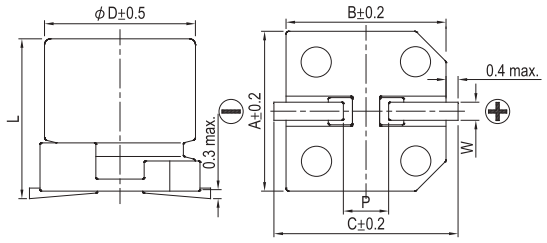
Marking color: Blue

Specifications

Items	Performance
Category Temperature Range	-55℃ ~ +105℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)*	Rated voltage applied, after 2 minutes at 20℃. See Standard Ratings
Tanδ (at120 Hz, 20℃)	See Standard Ratings
ESR (at 100k ~ 300k Hz, 20℃)	See Standard Ratings
Endurance	Test Time: 15,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 150% of specified value ESR: Less than 150% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied for 15,000 hours at 105℃.
Moisture Resistance	Test Time: 1,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 150% of specified value ESR: Less than 150% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after subjecting them at 60℃, 90 ~ 95% RH for 1,000 hours. Leakage current should be tested after voltage treatment*.
Resistance to Soldering Heat * (Please refer to page 26 for reflow soldering conditions)	Capacitance Change: Within ±10% of initial value Tanδ: Within specified value ESR: Within specified value Leakage Current: Within specified value
Ripple Current and Frequency Multipliers	Frequency (Hz): 120 ≦ f < 1k | 1k ≦ f < 10k | 10k ≦ f < 100k | 100k ≦ f < 500k Multiplier: 0.05 | 0.3 | 0.7 | 1.0

* For any doubt about measured values, measure the leakage current again after the following voltage treatment.
Voltage treatment: DC rated voltage is applied to the capacitors for 2 hours at 105℃.

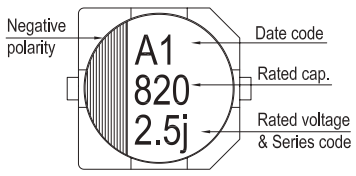
Diagram of Dimensions



Lead Spacing and Diameter Unit: mm

ϕD	L	A	B	C	W	P ± 0.2
6.3	7.7 ± 0.3	6.6	6.6	7.2	0.5 ~ 0.8	2.0
6.3	9.5 ± 0.5	6.6	6.6	7.2	0.5 ~ 0.8	2.0

Marking



Dimension: φD×L(mm)
Ripple Current: mA/rms at 100k Hz, 105℃

Standard Ratings

Rated Volt. (V)	Surge Voltage (V)	Capacitance (μF)	Size φD×L(mm)	Tanδ (120 Hz, 20℃)	L C (μA)	E S R (mΩ/at 100k ~ 300k Hz, 20℃ max.)	Rated R. C. (mA/rms at 100k Hz, 105℃)
2.5V (0E)	2.9	820	6.3 × 7.7	0.12	1,020	7	5,000
			6.3 × 9.5		1,020	10	4,300
		1,000	6.3 × 9.5		1,250		
		1,200	6.3 × 9.5		1,500		
6.3V (0J)	7.2	560	6.3 × 7.7	0.12	1,760	8	5,000
			6.3 × 9.5	0.12	1,760	10	4,300
10V(1A)	12.0	390	6.3 × 7.7	0.12	1,950	13	4,460
			6.3 × 9.5	0.12	1,950	13	4,000
16V(1C)	18.0	270	6.3 × 7.7	0.12	864	13	4,460
			6.3 × 9.5	0.12	864	16	3,500
20V(1D)	23.0	150	6.3 × 7.7	0.12	600	18	3,790
			6.3 × 9.5	0.12	600	18	3,200
25V(1E)	29.0	82	6.3 × 7.7	0.12	410	28	3,040
			6.3 × 9.5	0.12	410	28	3,000

Part Numbering System

OVJ Series	820μF	±20%	2.5V	Carrier Tape		6.3φ×9.5L	Pb-free and PET coating case
OVJ	**821**	**M**	**0E**	**TR**	**-**	**0610**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Package Type	Terminal Type	Case size	Lead Wire and Coating Type

Note: For more details, please refer to “Part Numbering System (SMD Type)” on page 15.

OVG Series

Features
- 105℃, 15,000 hours assured
- Ultra low ESR with large permissible ripple current
- RoHS Compliance

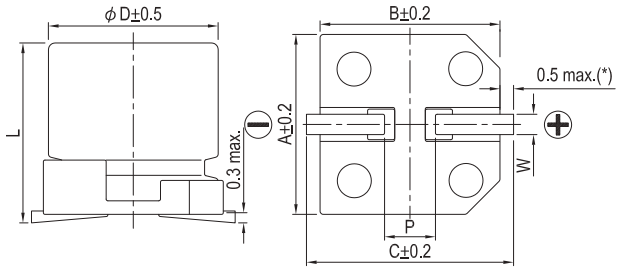
Marking color: Blue

Specifications

Items	Performance
Category Temperature Range	-55℃ ~ +105℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)*	Rated voltage applied, after 2 minutes at 20℃. See Standard Ratings
Tanδ (at120 Hz, 20℃)	See Standard Ratings
ESR (at 100k ~ 300k Hz, 20℃)	See Standard Ratings
Endurance	Test Time: 15,000 Hrs (For 5 ~ 6.3 × 4.4: 3,000 Hrs) Capacitance Change: Within ±20% of initial value Tanδ: Less than 150% of specified value ESR: Less than 150% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied for 15,000 hours at 105℃.
Moisture Resistance	Test Time: 1,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 150% of specified value ESR: Less than 150% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after subjecting them at 60℃, 90 ~ 95% RH for 1,000 hours. Leakage current should be tested after voltage treatment*.
Resistance to Soldering Heat * (Please refer to page 26 for reflow soldering conditions)	Capacitance Change: Within ±10% of initial value Tanδ: Within specified value ESR: Within specified value Leakage Current: Within specified value
Ripple Current and Frequency Multipliers	Frequency (Hz): 120 ≦ f < 1k | 1k ≦ f < 10k | 10k ≦ f < 100k | 100k ≦ f < 500k Multiplier: 0.05 | 0.3 | 0.7 | 1.0

* For any doubt about measured values, measure the leakage current again after the following voltage treatment.
Voltage treatment: DC rated voltage is applied to the capacitors for 2 hours at 105℃.

Diagram of Dimensions



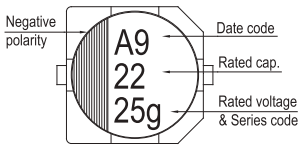
Lead Spacing and Diameter Unit: mm

ϕD	L	A	B	C	W	P ± 0.2
5	4.4 ± 0.2	5.3	5.3	5.9	0.5 ~ 0.8	1.5
5	5.8 ± 0.3	5.3	5.3	5.9	0.5 ~ 0.8	1.5
6.3	4.4 ± 0.2	6.6	6.6	7.2	0.5 ~ 0.8	2.0
6.3	5.8 ± 0.3	6.6	6.6	7.2	0.5 ~ 0.8	2.0
6.3	7.7 ± 0.3	6.6	6.6	7.2	0.5 ~ 0.8	2.0
8	6.7 ± 0.3	8.3	8.3	9.0	0.7 ~ 1.1	3.1
8	7.7 ± 0.3	8.3	8.3	9.0	0.7 ~ 1.1	3.1
8	10.0 ± 0.5	8.3	8.3	9.0	0.7 ~ 1.1	3.1
10	7.7 ± 0.3	10.3	10.3	11.0	0.7 ~ 1.3	4.7
10	10.0 ± 0.5	10.3	10.3	11.0	0.7 ~ 1.3	4.7
10	12.6 +0.1/-0.4	10.3	10.3	11.0	0.7 ~ 1.3	4.7

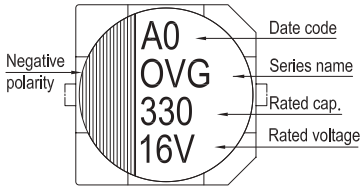
(*): For 5 ~ 6.3ϕ is 0.4 max.

Marking

ϕD = 5 ~ 6.3



ϕD = 8 ~ 10



Dimension: φD×L(mm)

Standard Ratings

Ripple Current: mA/rms at 100k Hz, 105℃

Rated Volt. (V)	Surge Voltage (V)	Capacitance (μF)	Size φD×L(mm)	Tanδ (120 Hz, 20℃)	L C (μA)	E S R (mΩ/at 100k ~ 300k Hz, 20℃ max.)	Rated R. C. (mA/rms at 100k Hz, 105℃)
16V (1C)	18.0	39	5 × 4.4	0.12	312	50	1,840
		47	5 × 4.4		376	50	1,840
		68	6.3 × 4.4		544	40	2,450
		100	5 × 5.8		320	27	3,000
		180	6.3 × 5.8		576	22	3,300
		220	6.3 × 7.7		704		
		270	8 × 6.7		864		
		330	8 × 7.7		1,050	21	3,400
			8 × 10		1,050	21	3,400
		560	8 × 10		1,790	18	3,900
		820	10 × 10		2,620	16	4,200
			10 × 12.6		2,620	12	5,400
		1,000	10 × 10		3,200	18	4,100
			10 × 12.6		3,200	12	5,400
20V(1D)	23.0	27	5 × 4.4	0.12	270	55	1,770
		33	5 × 4.4		330	55	1,770
		47	5 × 5.8		188	30	2,800
			6.3 × 4.4		470	42	2,400
		56	5 × 5.8		224	30	2,800
		120	6.3 × 5.8		480	25	3,200
		150	6.3 × 7.7		600		
		180	8 × 6.7		720		
		220	8 × 7.7		880	23	3,300
			8 × 10		880	23	3,400
		390	8 × 10		1,560	20	3,700
		560	10 × 10		2,240	18	4,100
25V(1E)	29.0	10	5 × 4.4	0.12	125	60	1,700
		22	5 × 5.8		110	40	2,450
			6.3 × 4.4		275	45	2,350
		27	5 × 5.8		135	40	2,450
		39	6.3 × 5.8		195	30	2,800
		47			235		
		56			280		
			6.3 × 7.7		280	28	2,800
		68	8 × 6.7		340	28	3,000
		82	8 × 7.7		410	26	3,100
		100	8 × 10		500	24	3,300
		120	8 × 10		600	22	3,500
		150	10 × 7.7		750	25	3,400
		220	10 × 10		1,100	20	3,800

Part Numbering System

OVG Series	150μF	±20%	25V	Carrier Tape		10φ×7.7L	Pb-free and PET coating case
OVG	**151**	**M**	**1E**	**TR**	**-**	**1008**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Package Type	Terminal Type	Case size	Lead Wire and Coating Type

Note: For more details, please refer to “Part Numbering System (SMD Type)” on page 15.

OVF Series

Features
- 105℃, 15,000 hours assured
- Ultra low ESR, solid capacitors of SMD tyep
- RoHS Compliance

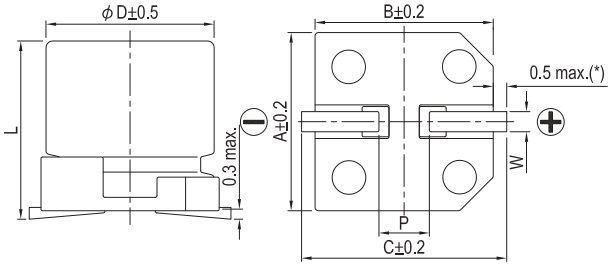
Marking color: Blue

Specifications

Items	Performance
Category Temperature Range	-55℃ ~ +105℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)*	Rated voltage applied, after 2 minutes at 20℃. See Standard Ratings
Tanδ (at120 Hz, 20℃)	See Standard Ratings
ESR (at 100k ~ 300k Hz, 20℃)	See Standard Ratings
Endurance	Test Time: 15,000 Hrs (For 5 ~ 6.3φ×4.4L: 3,000 Hrs) Capacitance Change: Within ±20% of initial value Tanδ: Less than 150% of specified value ESR: Less than 150% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied for 15,000 hours at 105℃.
Moisture Resistance	Test Time: 1,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 150% of specified value ESR: Less than 150% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after subjecting them at 60℃, 90 ~ 95% RH for 1,000 hours. Leakage current should be tested after voltage treatment*.
Resistance to Soldering Heat * (Please refer to page 26 for reflow soldering conditions)	Capacitance Change: Within ±10% of initial value Tanδ: Within specified value ESR: Within specified value Leakage Current: Within specified value
Ripple Current and Frequency Multipliers	Frequency (Hz): 120 ≦ f < 1k | 1k ≦ f < 10k | 10k ≦ f < 100k | 100k ≦ f < 500k Multiplier: 0.05 | 0.3 | 0.7 | 1.0

* For any doubt about measured values, measure the leakage current again after the following voltage treatment.
Voltage treatment: DC rated voltage is applied to the capacitors for 2 hours at 105℃.

Diagram of Dimensions



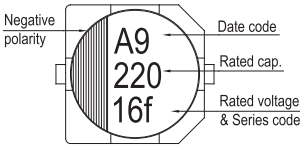
Lead Spacing and Diameter Unit: mm

φD	L	A	B	C	W	P ± 0.2
5	4.4 ± 0.2	5.3	5.3	5.9	0.5 ~ 0.8	1.5
5	5.8 ± 0.3	5.3	5.3	5.9	0.5 ~ 0.8	1.5
6.3	4.4 ± 0.2	6.6	6.6	7.2	0.5 ~ 0.8	2.0
6.3	5.8 ± 0.3	6.6	6.6	7.2	0.5 ~ 0.8	2.0
6.3	7.7 ± 0.3	6.6	6.6	7.2	0.5 ~ 0.8	2.0
8	6.7 ± 0.3	8.3	8.3	9.0	0.7 ~ 1.1	3.1
8	7.7 ± 0.3	8.3	8.3	9.0	0.7 ~ 1.1	3.1

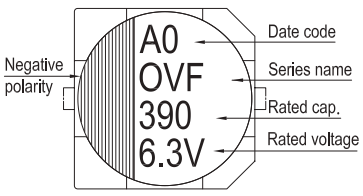
(*): For 5 ~ 6.3φ is 0.4 max.

Marking

φD = 5 ~ 6.3



φD = 8



Dimension: φD×L(mm)

Standard Ratings

Ripple Current: mA/rms at 100k Hz, 105℃

Rated Volt. (V)	Surge Voltage (V)	Capacitance (μF)	Size φD×L(mm)	Tanδ (120 Hz, 20℃)	L C (μA)	E S R (mΩ/at 100k ~ 300k Hz, 20℃ max.)	Rated R. C. (mA/rms at 100k Hz, 105℃)
2.0 (0D)	2.3	680	6.3 × 5.8	0.12	700	12	3,500
2.5V (0E)	2.9	220	5 × 4.4	0.12	700	25	2,100
		330	5 × 5.8			10	3,900
			6.3 × 4.4			12	3,500
		390	5 × 5.8			10	3,900
			6.3 × 5.8		292	10	3,900
		470	6.3 × 7.7		352	9	4,200
		560	6.3 × 5.8		700	10	3,900
			6.3 × 7.7		420	9	4,200
			8 × 6.7		420	10	4,500
		680	8 × 6.7		510	10	
		1,000	8 × 7.7		750	9	
4V (0G)	4.6	330	6.3 × 5.8	0.12	396	10	3,900
		390	6.3 × 7.7		468	9	4,200
		470	8 × 6.7		564	10	4,500
		560	8 × 6.7		672	10	
		680	8 × 7.7		816	9	
6.3V (0J)	7.2	150	5 × 4.4	0.12	700	25	2,100
			5 × 5.8			12	3,500
		220	5 × 5.8			12	3,500
			6.3 × 5.8		416	10	3,900
		270	6.3 × 7.7		510	9	4,200
		330	6.3 × 5.8		700	10	3,900
			6.3 × 7.7		623	9	4,200
			8 × 6.7		624	10	4,500
		390	8 × 6.7		737	10	4,500
		470	8 × 7.7		888	9	4,500
		560	8 × 7.7		1,050	9	4,500
10V (1A)	12.0	120	5 × 5.8	0.12	240	22	2,600

Part Numbering System

OVF Series	560μF	±20%	2.5V	Carrier Tape		6.3φ×7.7L	Pb-free and PET coating case
OVF	**561**	**M**	**0E**	**TR**	**-**	**0608**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Package Type	Terminal Type	Case size	Lead Wire and Coating Type

Note: For more details, please refer to “Part Numbering System (SMD Type)” on page 15.

OVD Series

Features
- 105℃, 15,000 hours assured
- Ultra low ESR, solid capacitors of SMD tyep
- RoHS Compliance

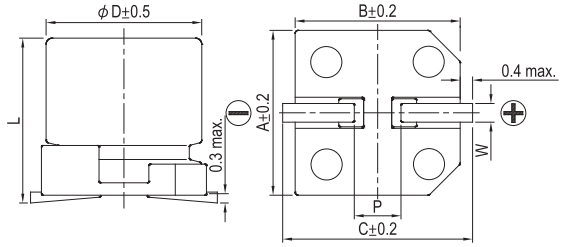
Marking color: Blue

Specifications

Items	Performance
Category Temperature Range	-55℃ ~ +105℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)*	Rated voltage applied, after 2 minutes at 20℃. See Standard Ratings
Tanδ (at120 Hz, 20℃)	See Standard Ratings
ESR (at 100k ~ 300k Hz, 20℃)	See Standard Ratings
Endurance	Test Time: 15,000 Hrs (6.3×4.4: 3,000 Hrs) Capacitance Change: Within ±20% of initial value Tanδ: Less than 150% of specified value ESR: Less than 150% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied for 15,000 / 3,000 hours at 105℃.
Moisture Resistance	Test Time: 1,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 150% of specified value ESR: Less than 150% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after subjecting them at 60℃, 90 ~ 95% RH for 1,000 hours. Leakage current should be tested after voltage treatment*.
Resistance to Soldering Heat * (Please refer to page 26 for reflow soldering conditions)	Capacitance Change: Within ±10% of initial value Tanδ: Within specified value ESR: Within specified value Leakage Current: Within specified value
Ripple Current and Frequency Multipliers	Frequency (Hz): 120 ≦ f < 1k | 1k ≦ f < 10k | 10k ≦ f < 100k | 100k ≦ f < 500k Multiplier: 0.05 | 0.3 | 0.7 | 1.0

* For any doubt about measured values, measure the leakage current again after the following voltage treatment.
Voltage treatment: DC rated voltage is applied to the capacitors for 2 hours at 105℃.

Diagram of Dimensions

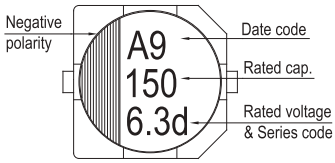


Lead Spacing and Diameter Unit: mm

ϕD	L	A	B	C	W	P ± 0.2
5	5.8 ± 0.3	5.3	5.3	5.9	0.5 ~ 0.8	1.5
6.3	4.4 ± 0.2	6.6	6.6	7.2	0.5 ~ 0.8	2.0
6.3	5.8 ± 0.3	6.6	6.6	7.2	0.5 ~ 0.8	2.0

Marking

ϕD = 5 ~ 6.3



Dimension: φD×L(mm)

Standard Ratings

Ripple Current: mA/rms at 100k Hz, 105℃

Rated Volt. (V)	Surge Voltage (V)	Capacitance (μF)	Size φD×L(mm)	Tanδ (120 Hz, 20℃)	L C (μA)	E S R (mΩ/at 100k ~ 300k Hz, 20℃ max.)	Rated R. C. (mA/rms at 100k Hz, 105℃)
2.5V (0E)	2.9	220	6.3 × 4.4	0.12	300	19	2,780
		330	5 × 5.8		412	16	3,500
			6.3 × 4.4		700		
		560	6.3 × 5.8		700		
4V (0G)	4.6	180	6.3 × 4.4	0.12	360	19	2,780
		220	5 × 5.8		440	17	3,390
		390	6.3 × 5.8		780	17	3,390
6.3V (0J)	7.2	150	6.3 × 4.4	0.12	472	19	2,780
		180	5 × 5.8		567	17	3,390
		220	6.3 × 4.4		700	18	3,200
		330	6.3 × 5.8		1,040	17	3,390
16V(1C)	18.0	100	6.3 × 5.8	0.12	320	24	2,490

Part Numbering System

OVD Series	100μF	±20%	16V	Carrier Tape		6.3φ×5.8L	Pb-free and PET coating case
OVD	**101**	**M**	**1C**	**TR**	**-**	**0606**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Package Type	Terminal Type	Case size	Lead Wire and Coating Type

Note: For more details, please refer to “Part Numbering System (SMD Type)” on page 15.

OVS Series

Features
- 105℃, 20,000 hours assured
- Ultra low ESR, solid capacitors of SMD tyep
- RoHS Compliance

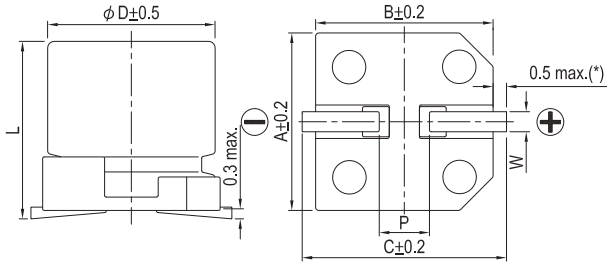
Marking color: Blue

Specifications

Items	Performance
Category Temperature Range	-55℃ ~ +105℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)*	Rated voltage applied, after 2 minutes at 20℃. See Standard Ratings
Tanδ (at120 Hz, 20℃)	See Standard Ratings
ESR (at 100k ~ 300k Hz, 20℃)	See Standard Ratings
Endurance	Test Time: 20,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 150% of specified value ESR: Less than 150% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied for 20,000 hours at 105℃.
Moisture Resistance	Test Time: 1,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 150% of specified value ESR: Less than 150% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after subjecting them at 60℃, 90 ~ 95% RH for 1,000 hours. Leakage current should be tested after voltage treatment*.
Resistance to Soldering Heat * (Please refer to page 26 for reflow soldering conditions)	Capacitance Change: Within ±10% of initial value Tanδ: Within specified value ESR: Within specified value Leakage Current: Within specified value
Ripple Current and Frequency Multipliers	Frequency (Hz): 120 ≦ f < 1k | 1k ≦ f < 10k | 10k ≦ f < 100k | 100k ≦ f < 500k Multiplier: 0.05 | 0.3 | 0.7 | 1.0

* For any doubt about measured values, measure the leakage current again after the following voltage treatment.
Voltage treatment: DC rated voltage is applied to the capacitors for 2 hours at 105℃.

Diagram of Dimensions



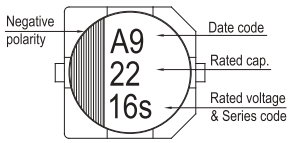
Lead Spacing and Diameter Unit: mm

ϕD	L	A	B	C	W	P ± 0.2
5	5.8 ± 0.3	5.3	5.3	5.9	0.5 ~ 0.8	1.5
6.3	5.8 ± 0.3	6.6	6.6	7.2	0.5 ~ 0.8	2.0
8	6.7 ± 0.3	8.3	8.3	9.0	0.7 ~ 1.1	3.1

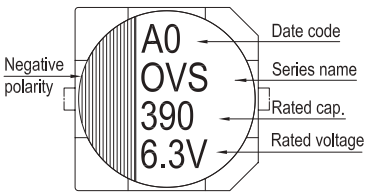
(*): For 5 ~ 6.3ϕ is 0.4 max.

Marking

ϕD = 5 ~ 6.3



ϕD = 8



Dimension: φD×L(mm)
Ripple Current: mA/rms at 100k Hz, 105℃

Standard Ratings

Rated Volt. (V)	Surge Voltage (V)	Capacitance (μF)	Size φD×L(mm)	Tanδ (120 Hz, 20℃)	L C (μA)	E S R (mΩ/at 100k ~ 300k Hz, 20℃ max.)	Rated R. C. (mA/rms at 100k Hz, 105℃)
4V (0G)	4.6	150	5 × 5.8	0.12	120	25	2,150
		560	8 × 6.7	0.12	440	22	3,220
6.3V (0J)	7.2	47	5 × 5.8	0.12	59	30	1,970
		100	5 × 5.8		126	20	2,150
		120	6.3 × 5.8		151	22	2,570
		220	6.3 × 5.8		277		2,570
		390	8 × 6.7		491		3,220
10V(1A)	12.0	33	5 × 5.8	0.12	66	70	1,100
		68	5 × 5.8		136	30	1,970
		120	6.3 × 5.8		240	27	2,320
		150	8 × 6.7		300	30	2,760
16V(1C)	18.0	22	5 × 5.8	0.12	70	90	1,060
		39	5 × 5.8		125	35	1,820
			6.3 × 5.8		125	37	2,050
		68	6.3 × 5.8		218	30	2,200
		82	8 × 6.7		262	30	2,760
		120	8 × 6.7		384	27	2,900

Part Numbering System

OVS Series	120μF	±20%	16V	Carrier Tape		8φ×6.7L	Pb-free and PET coating case
OVS	**121**	**M**	**1C**	**TR**	**-**	**0806**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Package Type	Terminal Type	Case size	Lead Wire and Coating Type

Note: For more details, please refer to “Part Numbering System (SMD Type)” on page 15.

OCR Series

Features

- 105℃, 2,000 hours assured
- Ultra low ESR with large permissible ripple current
- RoHS compliance

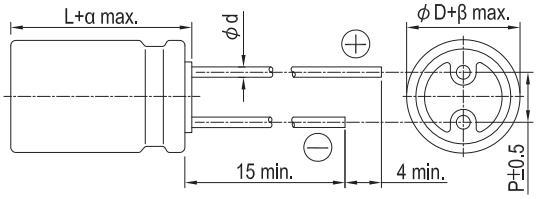
Marking color: Blue

Specifications

Items	Performance
Category Temperature Range	-55℃ ~ +105℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)*	Rated voltage applied, after 2 minutes at 20℃. See Standard Ratings
Tanδ (at 120 Hz, 20℃)	See Standard Ratings
ESR (at 100k ~ 300k Hz, 20℃)	See Standard Ratings
Endurance	Test Time: 2,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 150% of specified value ESR: Less than 150% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied for 2,000 hours at 105℃.
Moisture Resistance	Test Time: 1,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 150% of specified value ESR: Less than 150% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after subjecting them at 60℃, 90 ~ 95% RH for 1,000 hours. Leakage current should be tested after voltage treatment*.
Resistance to Soldering Heat * (Please refer to page 11 for soldering conditions)	Capacitance Change: Within ±10% of initial value Tanδ: Within specified value ESR: Within specified value Leakage Current: Within specified value
Ripple Current and Frequency Multipliers	Frequency (Hz): 120 ≦ f < 1k | 1k ≦ f < 10k | 10k ≦ f < 100k | 100k ≦ f < 500k Multiplier: 0.05 | 0.3 | 0.7 | 1.0

* For any doubt about measured values, measure the leakage current again after the following voltage treatment.
Voltage treatment: DC rated voltage is applied to the capacitors for 2 hours at 105 ℃.

Diagram of Dimensions

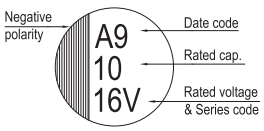


Lead Spacing and Diameter Unit: mm

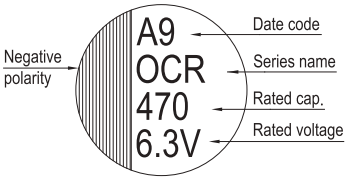
φD	6.3	6.3	6.3	8	10	10
L	5.5	6.5	11	11.5	10	12
P	2.5			3.5	5.0	
φd	0.45		0.5	0.6		
α	1.0					
β	0.5					

Marking

φD = 6.3



φD = 8 ~ 10



Dimension: φD×L(mm)

Standard Ratings

Ripple Current: mA/rms at 100k Hz, 105℃

Rated Volt. (V)	Surge Voltage (V)	Capacitance (μF)	Size φD×L(mm)	Tanδ (120 Hz, 20℃)	L C (μA)	E S R (mΩ/at 100k ~ 300k Hz, 20℃ max.)	Rated R. C. (mA/rms at 100k Hz, 105℃)
2.5V (0E)	2.9	220	6.3 × 5.5	0.12	110	28	2,390
		390	6.3 × 11	0.12	195	18	3,160
		680	8 × 11.5	0.18	340	10	5,230
		1,000	10 × 10		500	14	4,700
		1,500	10 × 12		750	12	5,500
4V (0G)	4.6	150	6.3 × 5.5	0.12	120	40	1,810
		270	6.3 × 11	0.12	216	15	3,200
		560	8 × 11.5	0.18	448	10	5,230
		1,200	10 × 12	0.18	960	12	5,500
6.3V (0J)	7.2	100	6.3 × 5.5	0.12	126	40	1,810
		220	6.3 × 11		277	18	3,160
		330	6.3 × 6.5		416	28	2,390
		390	8 × 11.5	0.15	491	12	4,770
		470	8 × 11.5		592	12	4,770
		820	10 × 12		1,033	12	5,500
10V (1A)	12.0	100	6.3 × 6.5	0.12	200	45	1,700
		220	10 × 10	0.15	440	17	3,950
		330	8 × 11.5	0.12	660	14	4,420
		560	10 × 12		1,360	12	5,300
16V (1C)	18.0	47	6.3 × 5.5	0.10	150	50	1,650
		100	6.3 × 11		320	22	2,820
		180	8 × 11.5	0.12	576	16	4,360
		330	10 × 10		1,056	16	4,360
		330	10 × 12		1,056	14	5,050
20V (1D)	23.0	22	6.3 × 5.5	0.10	88	60	1,450
		56	6.3 × 11		224	25	2,650
		100	8 × 11.5	0.15	400	24	3,320
			10 × 10		400	24	3,320
		150	10 × 12		600	20	4,320
		330	10 × 12	0.12	1,320	24	2,800
25V (1E)	29.0	6.8	6.3 × 5.5	0.10	170	80	1,200
		33	8 × 11.5	0.12	165	24	3,320
		56	8 × 11.5		280	24	3,320
			10 × 12.5		280	20	4,320
		68	8 × 11.5		340	24	3,320
		100	10 × 12		500	20	4,320
		270	10 × 12		1,350	25	2,800
35V (1V)	40.0	22	8 × 11.5	0.12	154	31	2,300
		39	8 × 11.5		273	31	2,300
		47	10 × 12		329	30	3,650
		68	10 × 12		476	28	2,700
		150	10 × 12		1,050	26	2,700

Part Numbering System

OCR Series	470μF	±20%	6.3V	Bulk Package	Gas Type	8φ×11.5L	Pb-free and PET coating case
OCR	**471**	**M**	**0J**	**BK**	**-**	**0811**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Lead Configuration and Package	Rubber Type	Case Size	Lead Wire and Coating Type

Note: For more details, please refer to “Part Numbering System (Radial Type)” on page 13.

OCRZ Series

Features

- 105℃, 2000 hours assured
- Ultra low ESR with large permissible ripple current
- RoHS compliance

Marking color: Blue

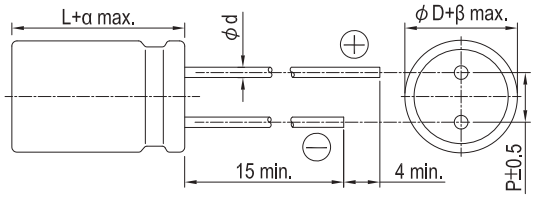
Specifications

Items	Performance
Category Temperature Range	-55℃ ~ +105℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)*	Rated voltage applied, after 2 minutes at 20℃. See Standard Ratings
Tanδ (at 120 Hz, 20℃)	See Standard Ratings
ESR (at 100k ~ 300k Hz, 20℃)	See Standard Ratings
Endurance	Test Time: 2,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 150% of specified value ESR: Less than 150% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied for 2000 hours at 105℃.
Moisture Resistance	Test Time: 1,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 150% of specified value ESR: Less than 150% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after subjecting them at 60℃, 90 ~ 95% RH for 1,000 hours. Leakage current should be tested after voltage treatment*.
Resistance to Soldering Heat * (Please refer to page 11 for soldering conditions)	Capacitance Change: Within ±10% of initial value Tanδ: Within specified value ESR: Within specified value Leakage Current: Within specified value
Ripple Current and Frequency Multipliers	Frequency (Hz): 120 ≦ f < 1k | 1k ≦ f < 10k | 10k ≦ f < 100k | 100k ≦ f < 500k Multiplier: 0.05 | 0.3 | 0.7 | 1.0

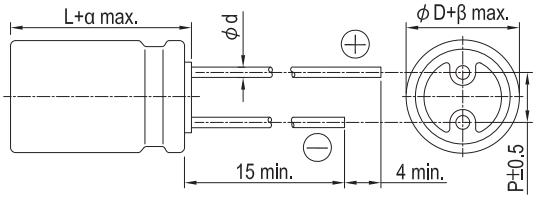
* For any doubt about measured values, measure the leakage current again after the following voltage treatment.
Voltage treatment: DC rated voltage is applied to the capacitors for 2 hours at 105 ℃.

Diagram of Dimensions

5φ, 6.3φ and 8φ×8L



8φ×12L and 10φ×12L

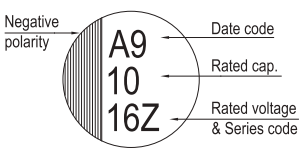


Lead Spacing and Diameter Unit: mm

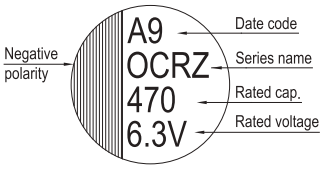
φD	5	6.3	6.3	8	8	10
L	8	6	8	8	12	12
P	2.0	2.5		3.5		5.0
φd	0.5	0.45	0.6			
α	1.0					
β	0.5					

Marking

φD = 5 ~ 6.3



φD = 8 ~ 10



Dimension: φD×L(mm)

Standard Ratings

Ripple Current: mA/rms at 100k Hz, 105℃

Rated Volt. (V)	Surge Voltage (V)	Capacitance (μF)	Size φD×L(mm)	Tanδ (120 Hz, 20℃)	L C (μA)	E S R (mΩ/at 100k ~ 300k Hz, 20℃ max.)	Rated R. C. (mA/rms at 100k Hz, 105℃)
2.5V (0E)	2.9	330	6.3 × 8	0.10	500	7	5,600
		390	6.3 × 6*			10	3,900
		470	5 × 8			7	4,200
			8 × 8		235		5,000
		560	5 × 8		500		4,200
			6.3 × 6*			10	4,000
			6.3 × 8			7	5,600
			8 × 8	0.12	280		6,200
		820	6.3 × 8	0.10	500		5,600
			8 × 8	0.10	410		6,200
			8 × 12	0.12	410		
		1,000	8 × 8		500		
			8 × 12				
			10 × 12				
		1,200	6.3 × 8	0.10	600		5,600
			8 × 8	0.12	600		6,200
		1,500	8 × 12		750		6,200
			10 × 12		750		6,500
		1,800	8 × 8		900		6,200
		2,200	8 × 12		1,100		6,200
		2,700	10 × 12		1,350		7,200
		3,900	10 × 12		1,950		7,200
4V (0G)	4.6	560	6.3 × 8	0.10	500	7	5,600
			8 × 8		448		6,200
			8 × 12	0.12			
		820	8 × 8	0.10	656		
		1,000			800		
		1,200	8 × 12	0.12	960		
			10 × 12				
		1,500			1,200		6,500
		2,200			1,760	8	7,200
		2,700			2,160	8	7,200
6.3V (0J)	7.2	270	5 × 8	0.10	680	8	3,900
		330			832	8	3,900
		470	6.3 × 8		592	7	5,600
			8 × 8	0.12			6,200
			8 × 12	0.12			6,200
		560	6.3 × 8	0.10	706		5,600
			8 × 8	0.10			6,200
			8 × 12	0.12			6,200
		680	6.3 × 8	0.10	857		5,600
		820	6.3 × 8		1,033		5,600
			8 × 8				6,200
			8 × 12			8	5,500
			10 × 12	0.12		7	6,200
		1,000	8 × 8	0.10	1,260	7	6,200
			8 × 12	0.12	1,260	8	5,500

Remark: The case size with " * " of case length is 6.0 mm maximum.

Dimension: φD×L(mm)

Standard Ratings

Ripple Current: mA/rms at 100k Hz, 105℃

Rated Volt. (V)	Surge Voltage (V)	Capacitance (μF)	Size φD×L(mm)	Tanδ (120 Hz, 20℃)	L C (μA)	E S R (mΩ/at 100k ~ 300k Hz, 20℃ max.)	Rated R. C. (mA/rms at 100k Hz, 105℃)
6.3V (0J)	7.2	1,200	10 × 12	0.12	1,512	8	5,500
		1,500			1,890	7	6,200
		1,800			2,268		
		2,200			2,772		
10V (1A)	12.0	270	8 × 12	0.12	540	8	5,000
		390	8 × 12		780		5,000
		470	10 × 12		940		6,000
		560	8 × 8		1,120	9	5,600
			10 × 12		1,120	8	6,000
		820	8 × 12		1,640		5,000
			10 × 12		1,640		6,000
		1,200	10 × 12		2,400		6,000
16V (1C)	18.0	100	6.3 × 6*	0.10	320	24	2,490
			6.3 × 8		500	10	4,680
		180	6.3 × 8		576		4,680
			8 × 8		576		5,000
		270	6.3 × 8		864		4,680
			8 × 8				5,000
			8 × 12	0.12		8	
		330	8 × 8	0.10	1,056	10	
			10 × 12	0.12	1,056	8	6,000
		470	8 × 8	0.12	1,504	16	4,000
			8 × 12			10	5,400
			10 × 12			8	6,000
		820		0.10	2,624	10	6,100
		1,000		0.10	3,200	10	6,100
20V (1D)	23.0	330	8 × 8	0.12	1,320	17	3,880
		390	8 × 12		1,560	14	4,970
		680	10 × 12		2,720	12	5,400
25V (1E)	29.0	180	8 × 8	0.12	900	18	3,770
		220	8 × 12		1,100	16	4,650
		390	10 × 12		1,950	14	5,000
35V (1V)	40.0	47	8 × 12	0.12	329	24	3,600
		82	8 × 12		574	20	4,000
		120	10 × 12		840	18	4,400
		150	10 × 12		1,050	20	3,800

Remark: The case size with " * " of case length is 6.0 mm maximum.

Part Numbering System

OCRZ Series	470μF	±20%	6.3V	Bulk Package	Gas Type	6.3φ×8L	Pb-free and PET coating case
ORZ	**471**	**M**	**0J**	**BK**	**-**	**0608**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Lead Configuration and Package	Rubber Type	Case Size	Lead Wire and Coating Type

Note: For more details, please refer to "Part Numbering System (Radial Type)" on page 13.

ORE Series

Features
- 105℃, 5,000 hours assured
- Ultra low ESR with large permissible ripple current
- RoHS compliance

Marking color: Blue

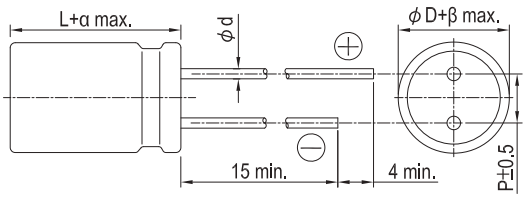
Specifications

Items	Performance
Category Temperature Range	-55℃ ~ +105℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)*	Rated voltage applied, after 2 minutes at 20℃. See Standard Ratings
Tanδ (at 120 Hz, 20℃)	See Standard Ratings
ESR (at 100k ~ 300k Hz, 20℃)	See Standard Ratings
Endurance	Test Time: 5,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 150% of specified value ESR: Less than 150% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied for 5,000 hours at 105℃.
Moisture Resistance	Test Time: 1,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 150% of specified value ESR: Less than 150% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after subjecting them at 60℃, 90 ~ 95% RH for 1,000 hours. Leakage current should be tested after voltage treatment*.
Resistance to Soldering Heat * (Please refer to page 11 for soldering conditions)	Capacitance Change: Within ±10% of initial value Tanδ: Within specified value ESR: Within specified value Leakage Current: Within specified value
Ripple Current and Frequency Multipliers	Frequency (Hz): 120 ≦ f < 1k | 1k ≦ f < 10k | 10k ≦ f < 100k | 100k ≦ f < 500k Multiplier: 0.05 | 0.3 | 0.7 | 1.0

* For any doubt about measured values, measure the leakage current again after the following voltage treatment.
Voltage treatment: DC rated voltage is applied to the capacitors for 2 hours at 105 ℃.

Diagram of Dimensions

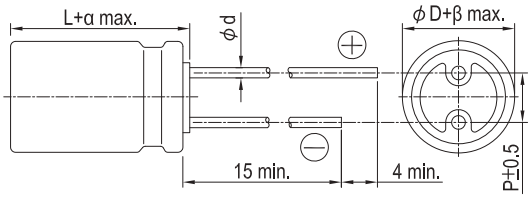
5φ, 6.3φ and 8φ× 6.5 ~ 8L



Lead Spacing and Diameter Unit: mm

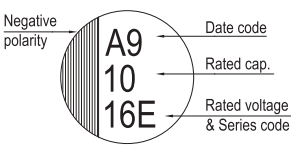
φD	5	6.3	6.3	8	8	8	10
L	8	5.5	8	6.5	8	12	12
P	2.0	2.5		3.5			5.0
φd	0.5	0.45	0.6				
α	1.0	0.5	1.0	0.5	1.0		
β	0.5						

8φ×12L and 10φ×12L

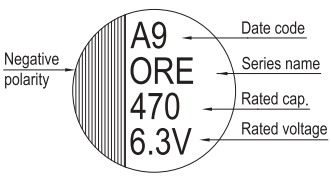


Marking

φD = 5 ~ 6.3



φD = 8 ~ 10



Dimension: φD×L(mm)

Standard Ratings

Ripple Current: mA/rms at 100k Hz, 105℃

Rated Volt. (V)	Surge Voltage (V)	Capacitance (μF)	Size φD×L(mm)	Tanδ (120 Hz, 20℃)	L C (μA)	E S R (mΩ/at 100k ~ 300k Hz, 20℃ max.)	Rated R. C. (mA/rms at 100k Hz, 105℃)
2.5V (0E)	2.9	100	5 × 8	0.10	500	7	4,180
		330	5 × 8			7	4,180
			6.3 × 8			5	5,900
		390	6.3 × 5.5	0.12		10	3,900
		470	5 × 8	0.10		7	4,180
			6.3 × 8			5	5,900
		560	5 × 8			7	4,180
			6.3 × 5.5	0.12		10	3,900
			6.3 × 8	0.10		5	5,900
			8 × 8		280	8	4,700
		820	6.3 × 8		500	5	5,900
			8 × 8			7	6,100
			8 × 12				
		1,000	8 × 8				
		2,700	10 × 12		1,350	10	5,560
4V(0G)	4.6	560	6.3 × 8	0.10	500	7	5,600
			8 × 8				6,100
			8 × 12				
		680	8 × 12		544		
		820	10 × 12		656		6,640
6.3V (0J)	7.2	470	6.3 × 8	0.10	592	7	5,600
			8 × 8			8	5,700
			8 × 12			8	5,700
		560	6.3 × 8		706	7	5,600
			8 × 8		706		6,100
		680	10 × 12		857		6,640
		1,500	10 × 12		1,890	10	5,560
10V(1A)	12.0	270	8 × 6.5	0.12	500	22	3,220
16V (1C)	18.0	100	6.3 × 5.5	0.10	320	24	2,490
			6.3 × 8		480	10	4,680
		150	6.3 × 5.5		500	24	2,490
			8 × 6.5	0.12	500	22	3,220
		180	8 × 8	0.10	576	10	5,000
			8 × 12		576	16	4,360
		220	8 × 6.5		500	13	4,150
		270	6.3 × 8		864	10	5,080
			8 × 6.5			13	4,150
			8 × 8			10	5,000
			8 × 12			11	5,000
		470	8 × 8	0.12	1,504	8	5,400
			10 × 12	0.10	1,504	10	6,100
		560	8 × 12	0.12	1,792	14	4,950
		1000	10 × 12	0.12	3,200	12	5,400

Dimension: φD×L(mm)

Standard Ratings

Ripple Current: mA/rms at 100k Hz, 105℃

Rated Volt. (V)	Surge Voltage (V)	Capacitance (μF)	Size φD×L(mm)	Tanδ (120 Hz, 20℃)	L C (μA)	E S R (mΩ/at 100k ~ 300k Hz, 20℃ max.)	Rated R. C. (mA/rms at 100k Hz, 105℃)
20V(1D)	23.0	120	6.3 × 5.5	0.12	480	25	3,200
		180	8 × 6.5		720	25	3,200
		390	8 × 12		1,560	14	4,970
		560	10 × 12		2,240	12	5,600
25V(1E)	29.0	56	6.3 × 5.5	0.12	280	30	2,800
		82	8 × 6.5		410	28	3,000
		180	8 × 12		900	16	4,650
		220	8 × 12		1,100	16	4,650
		330	10 × 12		1,650	14	5,000
		390	10 × 12		1,950	14	5,000
35V(1V)	40.0	22	6.3 × 5.5	0.12	154	35	2,600
		39	8 × 6.5		273	30	2,800
		82	8 × 12		574	20	4,000
		120	10 × 12		840	18	4,400

Part Numbering System

ORE Series	470μF	±20%	2.5V	Bulk Package	Gas Type	6.3φ×8L	Pb-free and PET coating case
ORE	**471**	**M**	**0E**	**BK**	**-**	**0608**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Lead Configuration and Package	Rubber Type	Case Size	Lead Wire and Coating Type

Note: For more details, please refer to “Part Numbering System (Radial Type)” on page 13.

OCRK Series

Features

- 105℃, 5,000 hours assured
- Ultra low ESR with large permissible ripple current
- RoHS compliance

Marking color: Blue

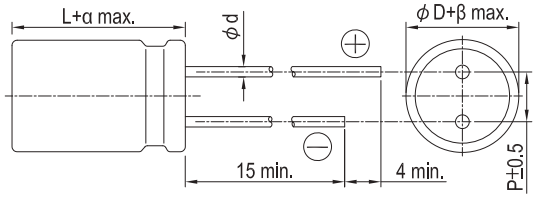
Specifications

Items	Performance
Category Temperature Range	-55℃ ~ +105℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)*	Rated voltage applied, after 2 minutes at 20℃. See Standard Ratings
Tanδ (at 120 Hz, 20℃)	See Standard Ratings
ESR (at 100k~300k Hz, 20℃)	See Standard Ratings
Endurance	Test Time: 5,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 150% of specified value ESR: Less than 150% of specified value Leakage Current: Within specified value *The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied for 5,000 hours at 105℃.
Moisture Resistance	Test Time: 1,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 150% of specified value ESR: Less than 150% of specified value Leakage Current: Within specified value *The above specifications shall be satisfied when the capacitors are restored to 20℃ after subjecting them at 60℃, 90 ~ 95% RH for 1,000 hours. Leakage current should be tested after voltage treatment*.
Resistance to Soldering Heat * (Please refer to page 11 for soldering conditions)	Capacitance Change: Within ±10% of initial value Tanδ: Within specified value ESR: Within specified value Leakage Current: Within specified value
Ripple Current and Frequency Multipliers	Frequency (Hz): 120 ≦ f < 1k | 1k ≦ f < 10k | 10k ≦ f < 100k | 100k ≦ f < 500k Multiplier: 0.05 | 0.3 | 0.7 | 1.0

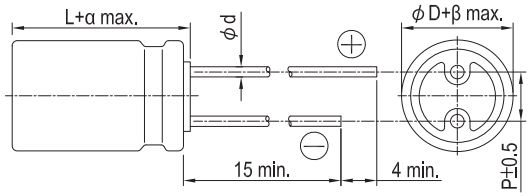
* For any doubt about measured values, measure the leakage current again after the following voltage treatment.
Voltage treatment: DC rated voltage is applied to the capacitors for 2 hours at 105 ℃.

Diagram of Dimensions

6.3φ×8L



8φ×11.5L and 10φ×12L

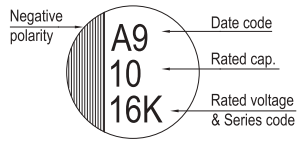


Lead Spacing and Diameter Unit: mm

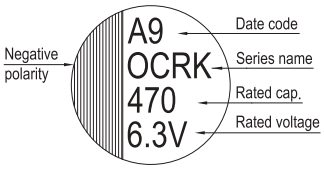
φD	6.3	8	10
L	8	11.5	12
P	2.5	3.5	5.0
φd	0.6		
α	1.0		
β	0.5		

Marking

ϕD = 6.3



ϕD = 8 ~ 10



Standard Ratings

Dimension: ϕD×L(mm)
Ripple Current: mA/rms at 100k Hz, 105℃

Rated Volt. (V)	Surge Voltage (V)	Capacitance (μF)	Size ϕD×L(mm)	Tanδ (120 Hz, 20℃)	L C (μA)	E S R (mΩ/at 100k ~ 300k Hz, 20℃ max.)	Rated R. C. (mA/rms at 100k Hz, 105℃)
2.5V (0E)	2.9	330	6.3 × 8	0.10	500	7	5,600
		470					
		560					
		820					
4V (0G)	4.6	560	6.3 × 8	0.10	500	7	5,000
6.3V (0J)	7.2	390	8 × 11.5	0.15	491	15	4,210
		470	6.3 × 8	0.10	592	8	4,700
			8 × 11.5	0.15	592	15	4,210
		560	6.3 × 8	0.10	706	8	4,700
		820	10 × 12	0.15	1,033	12	4,360
10V (1A)	12.0	330	8 × 11.5	0.12	660	17	3,950
		560	10 × 12	0.12	1,360	16	4,720
16V (1C)	18.0	180	8 × 11.5	0.12	576	20	3,640
		270	6.3 × 8		864	15	3,800
		330	10 × 12		1,056	16	4,720
20V (1D)	23.0	100	8 × 11.5	0.12	400	28	2,300
		330	10 × 12	0.12	1,320	26	2,800
25V (1E)	29.0	100	8 × 11.5	0.12	500	28	2,200
		270	10 × 12	0.12	1,350	27	2,700
35V (1V)	40.0	68	8 × 11.5	0.12	476	29	2,200
		150	10 × 12	0.12	1,050	28	2,600

Part Numbering System

OCRK Series	470μF	±20%	6.3V	Bulk Package	Gas Type	8ϕ×11.5L	Pb-free and PET coating case
ORK	**471**	**M**	**0J**	**BK**	**-**	**0811**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Lead Configuration and Package	Rubber Type	Case Size	Lead Wire and Coating Type

Note: For more details, please refer to “Part Numbering System (Radial Type)” on page 13.

OCRU Series

Features

- 125℃, 1000 ~ 2,000 hours assured
- Ultra low ESR with large permissible ripple current
- RoHS compliance

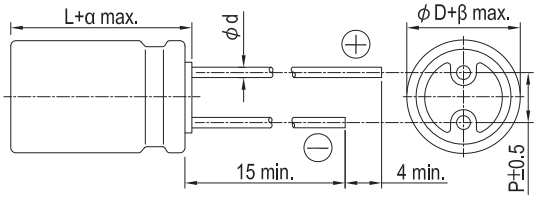
Marking color: Blue

Specifications

Items	Performance
Category Temperature Range	-55℃ ~ +125℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)*	Rated voltage applied, after 2 minutes at 20℃. See Standard Ratings
Tanδ (at 120 Hz, 20℃)	See Standard Ratings
ESR (at 100k ~ 300k Hz, 20℃)	See Standard Ratings
Endurance	Test Time: 1,000 Hrs for 2.5 ~ 4V; 2,000 Hrs for 6.3~ 20V Capacitance Change: Within ±20% of initial value Tanδ: Less than 200% of specified value ESR: Less than 200% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied for specified hours at 125℃.
Moisture Resistance	Test Time: 1,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 150% of specified value ESR: Less than 150% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after subjecting them at 60℃, 90 ~ 95% RH for 1,000 hours. Leakage current should be tested voltage treatment*.
Resistance to Soldering Heat * (Please refer to page 11 for soldering conditions)	Capacitance Change: Within ±10% of initial value Tanδ: Within specified value ESR: Within specified value Leakage Current: Within specified value
Ripple Current and Frequency Multipliers	Frequency (Hz): 120 ≦ f < 1k; 1k ≦ f < 10k; 10k ≦ f < 100k; 100k ≦ f < 500k Multiplier: 0.05; 0.3; 0.7; 1.0

* For any doubt about measured values, measure the leakage current again after the following voltage treatment.
Voltage treatment: DC rated voltage is applied to the capacitors for 2 hours at 105 ℃.

Diagram of Dimensions

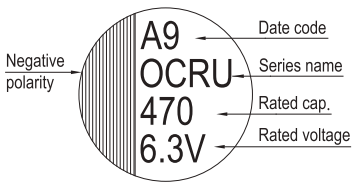


Lead Spacing and Diameter

Unit: mm

ϕD	8	10
L	11.5	12
P	3.5	5.0
ϕd	0.6	
α	1.0	
β	0.5	

Marking



Dimension: ϕD×L(mm)
Ripple Current: mA/rms at 100k Hz

Standard Ratings

Rated Volt. (V)	Surge Voltage (V)	Capacitance (μF)	Size ϕD×L(mm)	Tanδ (120 Hz, 20℃)	L C (μA)	E S R (mΩ/at 100k ~ 300k Hz, 20℃ max.)	Rated R. C.(mA/rms at 100k Hz)	
							T ≤ 105℃	105℃ < T ≦ 125℃
2.5V (0E)	2.9	680	8 × 11.5	0.18	340	13	4,520	1,430
		1,200	10 × 12	0.18	600	13	5,440	1,721
4V (0G)	4.6	560	8 × 11.5	0.18	448	13	4,520	1,430
		1,200	10 × 12	0.18	960	12	5,440	1,721
6.3V (0J)	7.2	470	8 × 11.5	0.15	592	15	4,210	1,332
		820	10 × 12	0.15	1,033	12	5,440	1,721
10V (1A)	12.0	330	8 × 11.5	0.12	660	16	3,950	1,250
		560	10 × 12	0.12	1,120	13	5,230	1,655
16V (1C)	18.0	180	8 × 11.5	0.12	576	18	3,640	1,151
		330	10 × 12	0.12	1,056	16	4,720	1,493
20V (1D)	23.0	100	8 × 11.5	0.15	400	24	3,320	1,050
		150	10 × 12	0.15	600	20	4,320	1,367

Part Numbering System

OCRU Series	470μF	±20%	6.3V	Bulk Package	Gas Type	8ϕ×11.5L	Pb-free and PET coating case
ORU	**471**	**M**	**0J**	**BK**	**-**	**0811**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Lead Configuration and Package	Rubber Type	Case Size	Lead Wire and Coating Type

Note: For more details, please refer to “Part Numbering System (Radial Type)” on page 13.

ORS Series

Features

- 105℃, 15,000 hours assured
- Ultra low ESR with large permissible ripple current
- RoHS Compliance

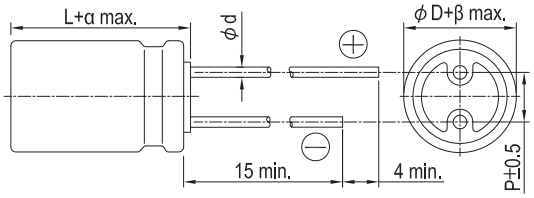
Marking color: Blue

Specifications

Items	Performance
Category Temperature Range	-55℃ ~ +105℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)*	Rated voltage applied, after 2 minutes at 20℃. See Standard Ratings
Tanδ (at120 Hz, 20℃)	See Standard Ratings
ESR (at 100k ~ 300k Hz, 20℃)	See Standard Ratings
Endurance	Test Time: 15,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 150% of specified value ESR: Less than 150% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied for specified hours at 105℃.
Moisture Resistance	Test Time: 1,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 150% of specified value ESR: Less than 150% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after subjecting them at 60℃, 90 ~ 95% RH for 1,000 hours. Leakage current should be tested after voltage treatment*.
Resistance to Soldering Heat * (Please refer to page 11 for soldering conditions)	Capacitance Change: Within ±10% of initial value Tanδ: Within specified value ESR: Within specified value Leakage Current: Within specified value
Ripple Current and Frequency Multipliers	Frequency (Hz): 120 ≦ f < 1k | 1k ≦ f < 10k | 10k ≦ f < 100k | 100k ≦ f < 500k Multiplier: 0.05 | 0.3 | 0.7 | 1.0

* For any doubt about measured values, measure the leakage current again after the following voltage treatment.
Voltage treatment: DC rated voltage is applied to the capacitors for 2 hours at 105℃.

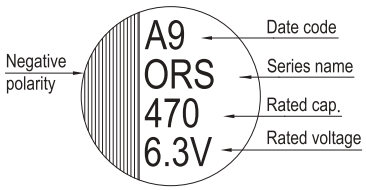
Diagram of Dimensions



Lead Spacing and Diameter Unit: mm

ϕD	8	10
L	11.5	12
P	3.5	5.0
ϕd	0.6	
α	1.0	
β	0.5	

Marking



Dimension: ϕD×L(mm)
Ripple Current: mA/rms at 100k Hz

Standard Ratings

Rated Volt. (V)	Surge Voltage (V)	Capacitance (μF)	Size ϕD×L(mm)	Tanδ (120 Hz, 20℃)	L C (μA)	E S R (mΩ/at 100k ~ 300k Hz, 20℃ max.)	Rated R. C. (mA/rms at 100k Hz, 105℃)
2.5V(0E)	2.9	680	8 × 11.5	0.12	340	10	5,230
		820	8 × 11.5		410	10	5,230
		1,500	10 × 12		750	8	5,500
4V (0G)	4.6	560	8 × 11.5	0.12	448	10	5,230
		820	10 × 12		656	8	5,500
		1,000			800		
		1,200			960		
6.3V (0J)	7.2	390	8 × 11.5	0.12	491	12	4,770
		470	8 × 11.5		592	12	4,770
		680	10 × 12		857	10	5,500
		820			1,033		
		1,000			1,260		
10V (1A)	12.0	270	8 × 11.5	0.12	540	14	4,420
		330	8 × 11.5		660	14	4,420
		470	10 × 12		940	12	5,300
		560	10 × 12		1,360	12	5,300
16V (1C)	18.0	100	8 × 11.5	0.12	320	16	4,360
		180	8 × 11.5		576	16	4,360
		270	10 × 12		864	14	5,050
		330	10 × 12		1,056	14	5,050
20V (1D)	23.0	100	8 × 11.5	0.12	400	24	3,320
		150	10 × 12	0.12	600	20	4,320
25V (1E)	29.0	68	8 × 11.5	0.12	340	24	3,320
		100	10 × 12	0.12	500	20	4,320
35V (1V)	40.0	18	8 × 11.5	0.12	315	34	2,830
		33	10 × 12	0.12	578	30	3,270

Part Numbering System

ORS Series	470μF	±20%	6.3V	Bulk Package	Gas Type	8ϕ×11.5L	Pb-free and PET coating case
ORS	**471**	**M**	**0J**	**BK**	**-**	**0811**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Lead Configuration and Package	Rubber Type	Case size	Lead Wire and Coating Type

Note: For more details, please refer to “Part Numbering System (Radial Type)” on page 13.

ORA Series

Features

- 105℃, 15,000 hours assured
- Ultra low ESR with large permissible ripple current
- RoHS compliance

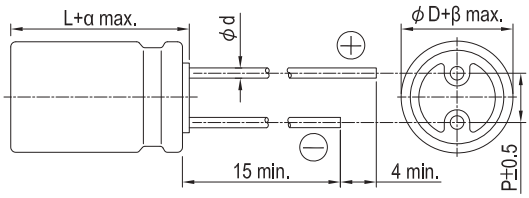
Marking color: Blue

Specifications

Items	Performance
Category Temperature Range	-55℃ ~ +105℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)*	Rated voltage applied, after 2 minutes at 20℃. See Standard Ratings
Tanδ (at120 Hz, 20℃)	See Standard Ratings
ESR (at 100k ~ 300k Hz, 20℃)	See Standard Ratings
Endurance	Test Time: 15,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 150% of specified value ESR: Less than 150% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied for 15,000 hours at 105℃.
Moisture Resistance	Test Time: 1,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 150% of specified value ESR: Less than 150% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after subjecting them at 60℃, 90 ~ 95% RH for 1,000 hours. Leakage current should be tested after voltage treatment*.
Resistance to Soldering Heat * (Please refer to page 11 for soldering conditions)	Capacitance Change: Within ±10% of initial value Tanδ: Within specified value ESR: Within specified value Leakage Current: Within specified value
Ripple Current and Frequency Multipliers	Frequency (Hz): 120 ≦ f < 1k | 1k ≦ f < 10k | 10k ≦ f < 100k | 100k ≦ f < 500k Multiplier: 0.05 | 0.3 | 0.7 | 1.0

* For any doubt about measured values, measure the leakage current again after the following voltage treatment.
Voltage treatment: DC rated voltage is applied to the capacitors for 2 hours at 105℃.

Diagram of Dimensions

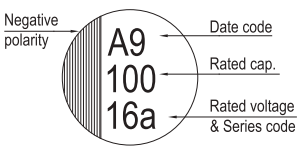


Lead Spacing and Diameter Unit: mm

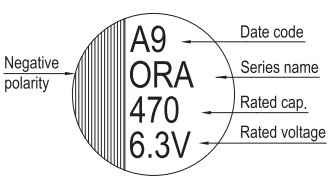
φD	6.3	8	10
L	11	11.5	12
P	2.5	3.5	5.0
φd	0.5	0.6	
α	1.0		
β	0.5		

Marking

φD = 6.3



φD = 8 ~ 10



Dimension: ϕD×L(mm)
Ripple Current: mA/rms at 100k Hz

Standard Ratings

Rated Volt. (V)	Surge Voltage (V)	Capacitance (μF)	Size ϕD×L(mm)	Tanδ (120 Hz, 20℃)	L C (μA)	E S R (mΩ/at 100k ~ 300k Hz, 20℃ max.)	Rated R. C. (mA/rms at 100k Hz, 105℃)
2.5V (0E)	2.9	390	6.3 × 11	0.12	195	20	3,150
		680	8 × 11.5	0.08	340	7	5,580
		820	8 × 11.5		410	7	5,580
		1,000	10 × 12		500	6	5,860
		1,500	10 × 12		750	7	5,860
4V (0G)	4.6	270	6.3 × 11	0.12	216	20	3,160
		390	6.3 × 11	0.12	312	24	3,300
		560	8 × 11.5	0.08	448	7	5,580
		820	10 × 12	0.08	656	6	5,860
6.3V (0J)	7.2	220	6.3 × 11	0.12	277	20	3,160
		330	6.3 × 11	0.12	416	28	3,190
		390	8 × 11.5	0.08	491	8	5,080
		470	8 × 11.5		592	7	5,700
		680	10 × 12		857	7	5,860
10V (1A)	12.0	47	6.3 × 11	0.12	94	25	2,820
		68			136		
		100			200		
		150			300		
		270	8 × 11.5	0.08	540	9	4,710
		470	10 × 12	0.08	940	8	5,650
16V (1C)	18.0	100	6.3 × 11	0.12	320	25	2,820

Part Numbering System

ORA Series	470μF	±20%	6.3V	Bulk Package	Gas Type	8ϕ×11.5L	Pb-free and PET coating case
ORA	**471**	**M**	**0J**	**BK**	**-**	**0811**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Lead Configuration and Package	Rubber Type	Case size	Lead Wire and Coating Type

Note: For more details, please refer to “Part Numbering System (Radial Type)” on page 13.

ORC Series

Features

- 105℃, 15,000 hours assured
- Ultra low ESR with large permissible ripple current
- RoHS compliance

Marking color: Blue

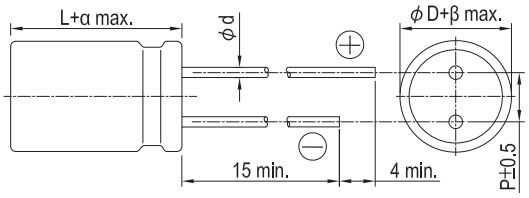
Specifications

Items	Performance
Category Temperature Range	-55℃ ~ +105℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)*	Rated voltage applied, after 2 minutes at 20℃. See Standard Ratings
Tanδ (at120 Hz, 20℃)	See Standard Ratings
ESR (at 100k ~ 300k Hz, 20℃)	See Standard Ratings
Endurance	Test Time: 15,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 150% of specified value ESR: Less than 150% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied for 15,000 hours at 105℃.
Moisture Resistance	Test Time: 1,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 150% of specified value ESR: Less than 150% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after subjecting them at 60℃, 90 ~ 95% RH for 1,000 hours. Leakage current should be tested after voltage treatment*.
Resistance to Soldering Heat * (Please refer to page 11 for soldering conditions)	Capacitance Change: Within ±10% of initial value Tanδ: Within specified value ESR: Within specified value Leakage Current: Within specified value
Ripple Current and Frequency Multipliers	Frequency (Hz): 120 ≦ f < 1k | 1k ≦ f < 10k | 10k ≦ f < 100k | 100k ≦ f < 500k Multiplier: 0.05 | 0.3 | 0.7 | 1.0

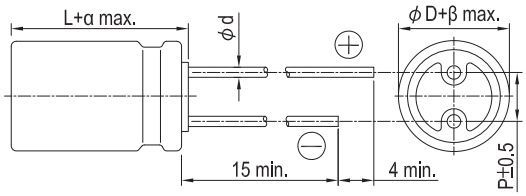
* For any doubt about measured values, measure the leakage current again after the following voltage treatment.
Voltage treatment: DC rated voltage is applied to the capacitors for 2 hours at 105℃.

Diagram of Dimensions

8φ×8L



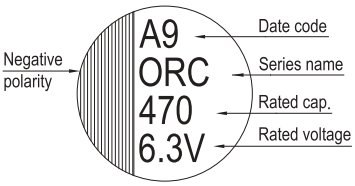
8φ×11.5L and 10φ×12L



Lead Spacing and Diameter Unit: mm

φD	8	8	10
L	8	11.5	12
P	3.5		5.0
φd	0.6		
α	1.0		
β	0.5		

Marking



Dimension: ϕD×L(mm)
Ripple Current: mA/rms at 100k Hz

Standard Ratings

Rated Volt. (V)	Surge Voltage (V)	Capacitance (μF)	Size ϕD×L(mm)	Tanδ (120 Hz, 20℃)	L C (μA)	E S R (mΩ/at 100k ~ 300k Hz, 20℃ max.)	Rated R. C. (mA/rms at 100k Hz, 105℃)
2.5V (0E)	2.9	560	8 × 8	0.10	500	7	6,100
		820	8 × 8		500		
		1,000	8 × 8		500		
			8 × 11.5		500		
		1,500	8 × 11.5		750		
		2,700	10 × 12		1,350	8	5,560
4V (0G)	4.6	560	8 × 8	0.10	448	7	6,100
		680	8 × 11.5		544	7	6,100
		1,000	10 × 12		800	6	6,640
6.3V(0J)	7.2	470	8 × 8	0.10	592	8	5,700
		560	8 × 8		706	8	5,700
		820	10 × 12		1,033	7	6,640
		1,500	10 × 12		1,890	10	5,560
10V (1A)	12.0	390	8 × 11.5	0.10	780	9	5,650
		680	10 × 12		1,360	7	6,100
16V (1C)	18.0	270	8 × 11.5	0.10	864	11	5,080
		330	10 × 12		1,056	10	6,100
		470	10 × 12		1,504	10	6,100

Part Numbering System

ORC Series	470μF	±20%	6.3V	Bulk Package	Gas Type	8ϕ×11.5L	Pb-free and PET coating case
ORC	**471**	**M**	**0J**	**BK**	**-**	**0811**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Lead Configuration and Package	Rubber Type	Case size	Lead Wire and Coating Type

Note: For more details, please refer to “Part Numbering System (Radial Type)” on page 13.

ORG Series

Features

- 105℃, 20,000 hours assured
- Ultra low ESR with large permissible ripple current
- RoHS compliance

Marking color: Blue

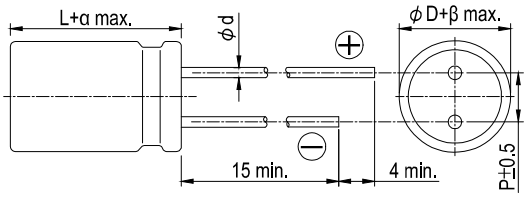
Specifications

Items	Performance
Category Temperature Range	-55℃ ~ +105℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)*	Rated voltage applied, after 2 minutes at 20℃. See Standard Ratings
Tanδ (at120 Hz, 20℃)	See Standard Ratings
ESR (at 100k ~ 300k Hz, 20℃)	See Standard Ratings
Endurance	Test Time: 16V: 20,000 Hrs; 20 ~ 35V: 15,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 150% of specified value ESR: Less than 150% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied for 20,000 / 15,000 hours at 105℃.
Moisture Resistance	Test Time: 1,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 150% of specified value ESR: Less than 150% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after subjecting them at 60℃, 90 ~ 95% RH for 1,000 hours. Leakage current should be tested after voltage treatment*.
Resistance to Soldering Heat * (Please refer to page 11 for soldering conditions)	Capacitance Change: Within ±10% of initial value Tanδ: Within specified value ESR: Within specified value Leakage Current: Within specified value
Ripple Current and Frequency Multipliers	Frequency (Hz): 120 ≦ f < 1k | 1k ≦ f < 10k | 10k ≦ f < 100k | 100k ≦ f < 500k Multiplier: 0.05 | 0.3 | 0.7 | 1.0

* For any doubt about measured values, measure the leakage current again after the following voltage treatment.
Voltage treatment: DC rated voltage is applied to the capacitors for 2 hours at 105℃.

Diagram of Dimensions

Fig. 1



Lead Spacing and Diameter Unit: mm

ϕD	6.3		8					10		
L	5.5	8	8	6.5	11.5	16	20	12	16	20
P	2.5		3.5					5.0		
ϕd	0.45	0.6								
α	0.5	1.0	1.0	0.5	1.0	1.5	2.0	1.0	1.5	2.0
β	0.5									
Fig. No.	1				2	3		2	3	

Fig. 2

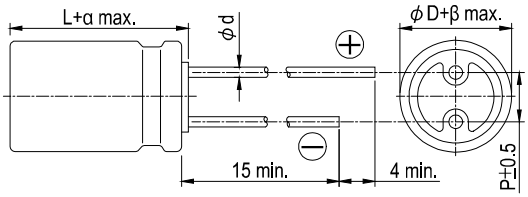
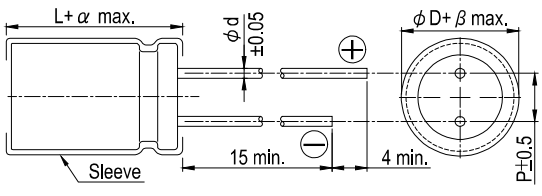


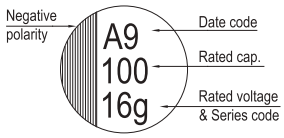
Fig. 3



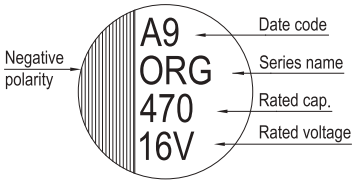
Sleeve & Marking Color: Sapphire Blue & Golden

Marking

ϕD = 6.3



ϕD = 8 ~ 10



Standard Ratings

Dimension: ϕD×L(mm)
Ripple Current: mA/rms at 100k Hz

Rated Volt. (V)	Surge Voltage (V)	Capacitance (μF)	Size ϕD×L(mm)	Tanδ (120 Hz, 20℃)	L C (μA)	E S R (mΩ/at 100k ~ 300k Hz, 20℃ max.)	Rated R. C. (mA/rms at 100k Hz, 105℃)
16V (1C)	18.0	100	6.3 × 5.5	0.12	480	20	2,490
		150	6.3 × 5.5		480	20	3,200
		270	6.3 × 8		864	10	5,080
			8 × 6.5		864	22	3,300
		470	8 × 8		1,504	16	4,000
		560	8 × 11.5		1,792	14	4,970
		820	8 × 16		2,624	8	7,000
			10 × 12		2,624	12	5,400
		1,000	8 × 16		3,200	8	7,000
			8 × 20			8	7,500
			10 × 12			12	5,400
		1,200	8 × 20		3,840	8	7,500
			10 × 16		3,840		7,700
		1,500			4,800		
		1,800			4,800		
			10 × 20		5,760		8,100
		2,200	10 × 20		7,040		8,100
20V (1D)	23.0	120	6.3 × 5.5	0.12	480	20	3,200
		180	6.3 × 8		720	18	3,460
		330	8 × 8		1,320	17	3,880
		390	8 × 11.5		1,560	14	4,970
		680	10 × 12		2,720	12	5,400
25V (1E)	29.0	56	6.3 × 5.5	0.12	280	30	2,600
		82	6.3 × 8		410	28	2,780
		100			500		
		120			600		
		180	8 × 8		900	18	3,770
			8 × 11.5		900	16	4,650
		220	8 × 11.5		1,100	16	4,650
		330	10 × 12		1,650	14	5,000
		390	10 × 12		1,950	14	5,000
35V(1V)	40.0	68	8 × 11.5	0.12	476	18	4,380
		120	10 × 12	0.12	840	16	4,670

Part Numbering System

ORG Series	560μF	±20%	16V	Bulk Package	Gas Type	8ϕ×11.5L	Pb-free and PET coating case
ORG	**561**	**M**	**1C**	**BK**	**-**	**0811**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Lead Configuration and Package	Rubber Type	Case size	Lead Wire and Coating Type

Note: For more details, please refer to “Part Numbering System (Radial Type)” on page 13.

ORF Series

Features

- 105℃, 20,000 hours assured
- Ultra low ESR with large permissible ripple current
- RoHS compliance

Marking color: Blue

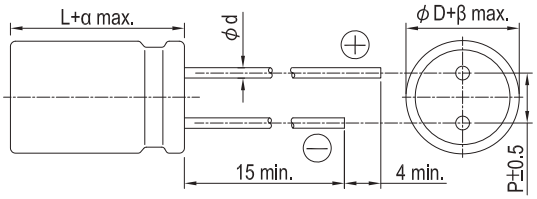
Specifications

Items	Performance
Category Temperature Range	-55℃ ~ +105℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)*	Rated voltage applied, after 2 minutes at 20℃. See Standard Ratings
Tanδ (at120 Hz, 20℃)	See Standard Ratings
ESR (at 100k ~ 300k Hz, 20℃)	See Standard Ratings
Endurance	Test Time: 20,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 150% of specified value ESR: Less than 150% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied for 20,000 hours at 105℃.
Moisture Resistance	Test Time: 1,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 150% of specified value ESR: Less than 150% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after subjecting them at 60℃, 90 ~ 95% RH for 1,000 hours. Leakage current should be tested after voltage treatment*.
Resistance to Soldering Heat * (Please refer to page 11 for soldering conditions)	Capacitance Change: Within ±10% of initial value Tanδ: Within specified value ESR: Within specified value Leakage Current: Within specified value
Ripple Current and Frequency Multipliers	Frequency (Hz): 120 ≦ f < 1k | 1k ≦ f < 10k | 10k ≦ f < 100k | 100k ≦ f < 500k Multiplier: 0.05 | 0.3 | 0.7 | 1.0

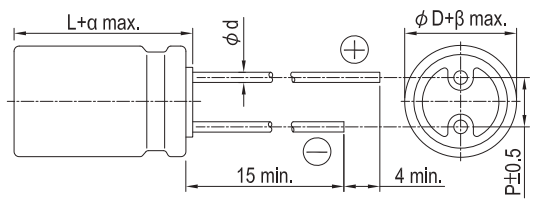
* For any doubt about measured values, measure the leakage current again after the following voltage treatment.
Voltage treatment: DC rated voltage is applied to the capacitors for 2 hours at 105℃.

Diagram of Dimensions

6.3φ and 8φ×8L



8φ×11.5L and 10φ×12L

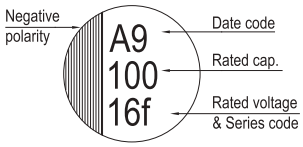


Lead Spacing and Diameter Unit: mm

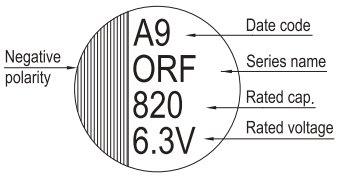
φD	6.3			8		10
L	5.5	8	11	8	11.5	12
P	2.5			3.5		5.0
φd	0.45	0.6	0.5	0.6		
α	0.5	1.0				
β	0.5					

Marking

ϕD = 6.3



ϕD = 8 ~ 10



Standard Ratings

Dimension: ϕD×L(mm)
Ripple Current: mA/rms at 100k Hz

Rated Volt. (V)	Surge Voltage (V)	Capacitance (μF)	Size ϕD×L(mm)	Tanδ (120 Hz, 20℃)	L C (μA)	E S R (mΩ/at 100k ~ 300k Hz, 20℃ max.)	Rated R. C. (mA/rms at 100k Hz, 105℃)
2V (0D)	2.3	1,000	6.3 × 8	0.12	500	5	5,900
2.5V(0E)	2.9	330	6.3 × 8	0.10	500	5	5,900
		470					
		560					
		820					
		1,200		0.12	1,200		
		1,600	8 × 8	0.12	800		6,100
4V(0G)	4.6	470	6.3 × 8	0.10	500	7	5,600
		560	6.3 × 8	0.10	500	7	5,600
6.3V(0J)	7.2	820	6.3 × 8	0.10	1,030	8	4,700
16V (1C)	18.0	100	6.3 × 5.5	0.10	500	24	2,490
			6.3 × 11		500	25	2,890
		270	8 × 8		864	10	5,000
			8 × 11.5		864	11	5,080
		330	8 × 8		1,050	13	4,700
		470	8 × 11.5		1,500	11	5,400
			10 × 12		1,500	10	6,100

Part Numbering System

ORF Series	270μF	±20%	16V	Bulk Package	Gas Type	8ϕ×11.5L	Pb-free and PET coating case
ORF	**271**	**M**	**1C**	**BK**	**-**	**0811**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Lead Configuration and Package	Rubber Type	Case size	Lead Wire and Coating Type

Note: For more details, please refer to “Part Numbering System (Radial Type)” on page 13.

ORB Series

Features

- 105℃, 20,000 hours assured
- Ultra low ESR with large permissible ripple current
- RoHS compliance

Marking color: Blue

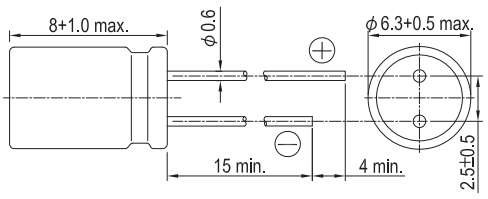
Specifications

Items	Performance
Category Temperature Range	-55℃ ~ +105℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)*	Rated voltage applied, after 2 minutes at 20℃. See Standard Ratings
Tanδ (at120 Hz, 20℃)	See Standard Ratings
ESR (at 100k ~ 300k Hz, 20℃)	See Standard Ratings
Endurance	Test Time: 20,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 150% of specified value ESR: Less than 150% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied for 20,000 hours at 105℃.
Moisture Resistance	Test Time: 1,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 150% of specified value ESR: Less than 150% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after subjecting them at 60℃, 90 ~ 95% RH for 1,000 hours. Leakage current should be tested after voltage treatment*.
Resistance to Soldering Heat * (Please refer to page 11 for soldering conditions)	Capacitance Change: Within ±10% of initial value Tanδ: Within specified value ESR: Within specified value Leakage Current: Within specified value
Ripple Current and Frequency Multipliers	Frequency (Hz): 120 ≦ f < 1k | 1k ≦ f < 10k | 10k ≦ f < 100k | 100k ≦ f < 500k Multiplier: 0.05 | 0.3 | 0.7 | 1.0

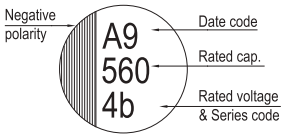
* For any doubt about measured values, measure the leakage current again after the following voltage treatment.
Voltage treatment: DC rated voltage is applied to the capacitors for 2 hours at 105℃.

Diagram of Dimensions

Unit: mm



Marking



Dimension: ϕD×L(mm)

Standard Ratings

Ripple Current: mA/rms at 100k Hz, 105℃

Rated Volt. (V)	Surge Voltage (V)	Capacitance (μF)	Size ϕD×L(mm)	Tanδ (120 Hz, 20℃)	LC (μA)	E S R (mΩ/at 100k ~ 300k Hz, 20℃ max.)	Rated R. C. (mA/rms at 100k Hz, 105℃)
2.5V(0E)	2.9	820	6.3 × 8	0.10	500	7	5,000
4V (0G)	4.6	560			500	7	5,000
6.3V (0J)	7.2	470			592	8	4,700
		560			706	8	4,700

Part Numbering System

ORB Series	470μF	±20%	6.3V	Bulk Package	Gas Type	6.3ϕ×8L	Pb-free and PET coating case
ORB	**471**	**M**	**0J**	**BK**	**-**	**0608**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Lead Configuration and Package	Rubber Type	Case Size	Lead Wire and Coating Type

Note: For more details, please refer to “Part Numbering System (Radial Type)” on page 13.

ORD Series

Features

- 105℃, 20,000 hours assured
- Ultra low ESR with large permissible ripple current
- RoHS compliance

Marking color: Blue

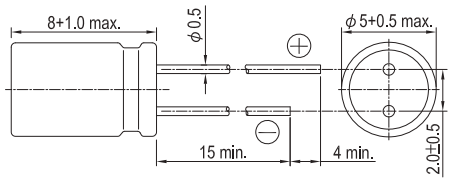
Specifications

Items	Performance
Category Temperature Range	-55℃ ~ +105℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)*	Rated voltage applied, after 2 minutes at 20℃. See Standard Ratings
Tanδ (at120 Hz, 20℃)	See Standard Ratings
ESR (at 100k ~ 300k Hz, 20℃)	See Standard Ratings
Endurance	Test Time: 20,000 Hrs; Capacitance Change: Within ±20% of initial value; Tanδ: Less than 150% of specified value; ESR: Less than 150% of specified value; Leakage Current: Within specified value. * The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied for 20,000 hours at 105℃.
Moisture Resistance	Test Time: 1,000 Hrs; Capacitance Change: Within ±20% of initial value; Tanδ: Less than 150% of specified value; ESR: Less than 150% of specified value; Leakage Current: Within specified value. * The above specifications shall be satisfied when the capacitors are restored to 20℃ after subjecting them at 60℃, 90 ~ 95% RH for 1,000 hours. Leakage current should be tested after voltage treatment*.
Resistance to Soldering Heat * (Please refer to page 11 for soldering conditions)	Capacitance Change: Within ±10% of initial value; Tanδ: Within specified value; ESR: Within specified value; Leakage Current: Within specified value
Ripple Current and Frequency Multipliers	Frequency (Hz): 120 ≦ f < 1k / 1k ≦ f < 10k / 10k ≦ f < 100k / 100k ≦ f < 500k; Multiplier: 0.05 / 0.3 / 0.7 / 1.0

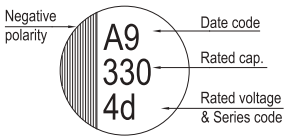
* For any doubt about measured values, measure the leakage current again after the following voltage treatment.
Voltage treatment: DC rated voltage is applied to the capacitors for 2 hours at 105℃.

Diagram of Dimensions

Unit: mm



Marking



Dimension: ϕD×L(mm)
Ripple Current: mA/rms at 100k Hz, 105℃

Standard Ratings

Rated Volt. (V)	Surge Voltage (V)	Capacitance (μF)	Size ϕD×L(mm)	Tanδ (120 Hz, 20℃)	LC (μA)	E S R (mΩ/at 100k ~ 300k Hz, 20℃ max.)	Rated R. C. (mA/rms at 100k Hz, 105℃)
2.5V (0E)	2.9	220	5 × 8	0.10	500	7	4,350
		330					
		470					
		560					
4V (0G)	4.6	330				8	4,050
6.3V (0J)	7.2	270				10	3,700
		330				8	4,050

Part Numbering System

ORD Series	330μF	±20%	6.3V	Bulk Package	Gas Type	5ϕ×8L	Pb-free and PET coating case
ORD	**331**	**M**	**0J**	**BK**	**-**	**0508**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Lead Configuration and Package	Rubber Type	Case Size	Lead Wire and Coating Type

Note: For more details, please refer to “Part Numbering System (Radial Type)” on page 13.

HBV Series

Features

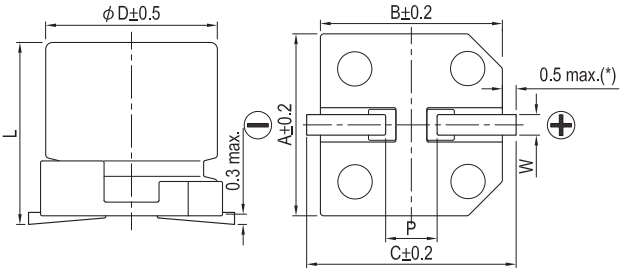
- 105℃, 10,000 hours assured
- Low ESR and High ripple current
- RoHS compliance

Marking color: Dark Green

Specifications

Items	Performance
Category Temperature Range	-55℃ ~ +105℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)	I = 0.01CV or 3 (μA) whichever is greater (after 2 minutes) Where, C = rated capacitance in μF, V = rated DC working voltage in V
Tanδ (at 120 Hz, 20℃)	See Standard Ratings
Endurance	Test Time: 10,000 Hrs Capacitance Change: Within ±30% of initial value Tanδ: Less than 200% of specified value ESR: Less than 200% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied with rated ripple current for 10,000 hours at 105℃.
Shelf Life Test	* After storage for 1,000 hours at 105 ± 2℃ with no voltage applied and then being stabilized at 20℃, capacitors shall meet the limits specified in Endurance. (With voltage treatment)
Resistance to Soldering Heat (Please refer to page 26 for reflowsoldering conditions)	Capacitance Change: Within ±10% of initial value Tanδ: Within specified value ESR: Within specified value Leakage Current: Within specified value
Ripple Current and Frequency Multipliers	Frequency (Hz): 120 ≦ f < 1k | 1k ≦ f < 10k | 10k ≦ f < 100k | 100k ≦ f < 500k Multiplier: 0.1 | 0.3 | 0.6 | 1.0

Diagram of Dimensions



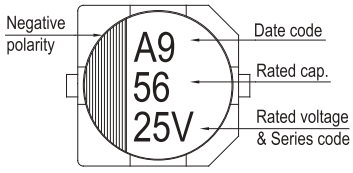
Lead Spacing and Diameter Unit: mm

ϕD	L	A	B	C	W	P ± 0.2
6.3	5.8 ± 0.3	6.6	6.6	7.2	0.5 ~ 0.8	2.0
6.3	7.7 ± 0.3	6.6	6.6	7.2	0.5 ~ 0.8	2.0
8	10.0 ± 0.5	8.3	8.3	9.0	0.7 ~ 1.1	3.1
10	10.0 ± 0.5	10.3	10.3	11.0	0.7 ~ 1.3	4.7
10	12.5 ± 0.5	10.3	10.3	11.0	0.7 ~ 1.3	4.7

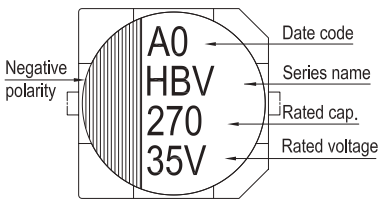
(*): For 6.3ϕ is 0.4 max.

Marking

ϕD = 6.3 mm



ϕD = 8 ~ 10 mm



Dimension: ϕD×L(mm)

Standard Ratings

Ripple Current: mA/rms at 100k Hz, 105℃

Rated Volt. (V)	Surge Voltage (V)	Capacitance (μF)	Size ϕD×L(mm)	Tanδ (120 Hz, 20℃)	L C (μA)	E S R (mΩ/at 100kHz, 20℃ max.)	Rated R. C. (mA/rms at 100k Hz, 105℃)
16V (1C)	18.4	82	6.3 × 5.8	0.16	13.1	50	1,300
		150	6.3 × 7.7		24	30	2,000
		270	8 × 10		43.2	27	2,300
		470	10 × 10		75.2	20	2,500
25V (1E)	28.8	47	6.3 × 5.8	0.14	11.8	50	1,300
		56	6.3 × 5.8		14	50	1,300
		68	6.3 × 7.7		17	30	2,000
		100	6.3 × 7.7		25	30	2,000
		150	8 × 10		37.5	27	2,300
		220	8 × 10		55	27	2,300
		330	10 × 10		82.5	20	2,500
			10 × 12.5		82.5	16	2,900
35V (1V)	40.3	27	6.3 × 5.8	0.12	9.5	60	1,300
		33			11.6		
		47			16.5		
		68	6.3 × 7.7		23.8	35	2,000
		100	8 × 10		35	27	2,300
		150	8 × 10		52.5	27	2,300
		220	10 × 10		77	20	2,500
		270	10 × 10		94.5	20	2,500
50V(1H)	57.5	22	6.3 × 5.8	0.10	11	80	1,100
		33	6.3 × 7.7		16.5	40	1,600
		47	8 × 10		23.5	30	1,800
		68	8 × 10		34	30	1,800
		100	10 × 10		50	28	2,000
63V(1J)	72.5	10	6.3 × 5.8	0.08	6.3	120	1,000
		22	6.3 × 7.7		13.9	80	1,500
		27	8 × 10		17	40	1,700
		33			20.8		
		47			29.6		
		56	10 × 10		35.3	30	1,800
		68			42.8		
		82			51.7		
80V(1K)	92.0	22	8 × 10	0.08	17.6	45	1,550
		33	10 × 10		26.4	36	1,700
		47	10 × 10		37.6	36	1,700

Part Numbering System

HBV Series	220μF	±20%	25V	Carrier Tape		8ϕ×10L	Pb-free and PET coating case
HBV	**221**	**M**	**1E**	**TR**	**-**	**0810**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Package Type	Terminal Type	Case size	Lead Wire and Coating Type

Note: For more details, please refer to “Part Numbering System (SMD Type)” on page 15.

HBW Series

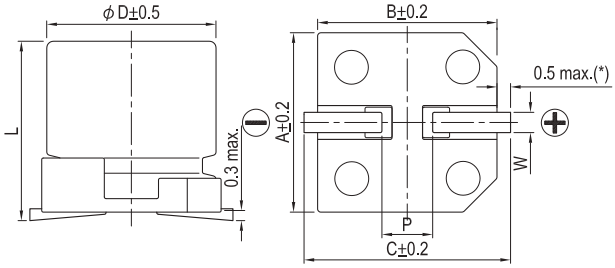
Features
- 125℃, 4,000 hours assured
- Low ESR and High ripple current
- RoHS compliance

Marking color: Dark Green

Specifications

Items	Performance
Category Temperature Range	-55℃ ~ +125℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)	I = 0.01CV or 3 (μA) whichever is greater (after 2 minutes) Where, C = rated capacitance in μF, V = rated DC working voltage in V
Tanδ (at 120 Hz, 20℃)	See Standard Ratings
Endurance	Test Time: 4,000 Hrs Capacitance Change: Within ±30% of initial value Tanδ: Less than 200% of specified value ESR: Less than 200% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied with rated ripple current for 4,000 hours at 125℃.
Shelf Life Test	* After storage for 1,000 hours at 125 ± 2℃ with no voltage applied and then being stabilized at 20℃,capacitors shall meet the limits specified in Endurance. (With voltage treatment)
Resistance to Soldering Heat (Please refer to page 26 for reflowsoldering conditions)	Capacitance Change: Within ±10% of initial value Tanδ: Within specified value ESR: Within specified value Leakage Current: Within specified value
Ripple Current and Frequency Multipliers	Frequency (Hz): 120 ≦ f < 1k | 1k ≦ f < 10k | 10k ≦ f < 100k | 100k ≦ f < 500k Multiplier: 0.10 | 0.3 | 0.6 | 1.0

Diagram of Dimensions



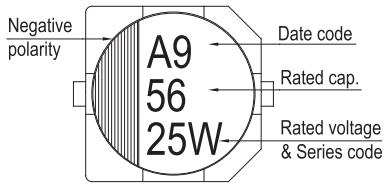
Lead Spacing and Diameter Unit: mm

ϕD	L	A	B	C	W	P ± 0.2
6.3	5.8 ± 0.3	6.6	6.6	7.2	0.5 ~ 0.8	2.0
6.3	7.7 ± 0.3	6.6	6.6	7.2	0.5 ~ 0.8	2.0
8	10.0 ± 0.5	8.3	8.3	9.0	0.7 ~ 1.1	3.1
10	10.0 ± 0.5	10.3	10.3	11.0	0.7 ~ 1.3	4.7
10	12.5 ± 0.5	10.3	10.3	11.0	0.7 ~ 1.3	4.7

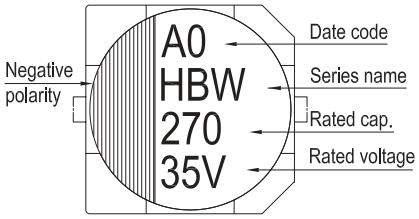
(*): For 6.3ϕ is 0.4 max.

Marking

ϕD = 6.3



ϕD = 8 ~ 10



Dimension: φD×L(mm)

Ripple Current: mA/rms at 100k Hz, 125℃

Standard Ratings

Rated Volt. (V)	Surge Voltage (V)	Capacitance (μF)	Size φD×L(mm)	Tanδ (120 Hz, 20℃)	L C (μA)	E S R (mΩ/at 100kHz, 20℃ max.)	Rated R. C. (mA/rms at 100k Hz, 125℃)
16V (1C)	18.4	82	6.3 × 5.8	0.16	13.1	50	900
		150	6.3 × 7.7		24	30	1,400
		270	8 × 10		43.2	27	1,600
		470	10 × 10		75.2	20	2,000
25V (1E)	28.8	47	6.3 × 5.8	0.14	11.8	50	900
		56	6.3 × 5.8		14	50	900
		68	6.3 × 7.7		17	30	1,400
		100	6.3 × 7.7		25	30	1,400
		150	8 × 10		37.5	27	1,600
		220	8 × 10		55	27	1,600
		330	10 × 10		82.5	20	2,000
35V (1V)	40.3	27	6.3 × 5.8	0.12	9.5	60	900
		33			11.6		
		47			16.5		
		68	6.3 × 7.7		23.8	35	1,400
		100	8 × 10		35	27	1,600
		150	8 × 10		52.5	27	1,600
		220	10 × 10		77	20	2,000
		270	10 × 10		94.5	20	2,000
50V(1H)	57.5	22	6.3 × 5.8	0.10	11	80	750
		33	6.3 × 7.7		16.5	40	1,100
		47	8 × 10		23.5	30	1,250
		68	8 × 10		34	30	1,250
		100	10 × 10		50	28	1,600
		120	10 × 10		60	28	1,600
63V(1J)	72.5	10	6.3 × 5.8	0.08	6.3	120	700
		22	6.3 × 7.7		13.9	80	900
		27	8 × 10		17	40	1,100
		33			20.8		
		47			29.6		
		56	10 × 10		35.3	30	1,400
			10 × 12.5		35.3	26	1,500
		68	10 × 10		42.8	30	1,400
		82	10 × 10		51.7	30	1,400
80V (1K)	92.0	22	8 × 10	0.08	17.6	45	1,050
		33	10 × 10		35.3	36	1,360
		47	10 × 10		37.6	36	1,360

Part Numbering System

HBW Series	220μF	±20%	25V	Carrier Tape		8φ×10L	Pb-free and PET coating case
HBW	**221**	**M**	**1E**	**TR**	**-**	**0810**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Package Type	Terminal Type	Case size	Lead Wire and Coating Type

Note: For more details, please refer to “Part Numbering System (SMD Type)” on page 15.

HBO Series

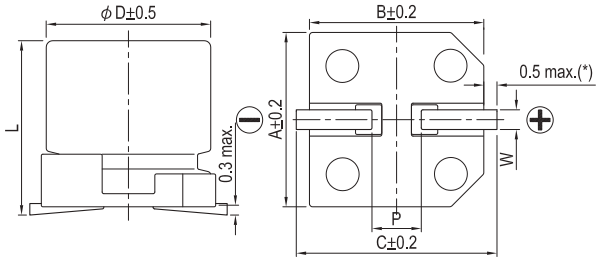
Features
- 125℃, 4,000 hours assured
- Low ESR and High ripple current
- RoHS compliance

Marking color: Dark Green

Specifications

Items	Performance
Category Temperature Range	-55℃ ~ +125℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)	I = 0.01CV or 3 (μA) whichever is greater (after 2 minutes) Where, C = rated capacitance in μF, V = rated DC working voltage in V
Tanδ (at 120 Hz, 20℃)	See Standard Ratings
Endurance	Test Time: 4,000 Hrs Capacitance Change: Within ±30% of initial value Tanδ: Less than 200% of specified value ESR: Less than 200% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied with rated ripple current for 4,000 hours at 125℃.
Shelf Life Test	* After storage for 1,000 hours at 125 ± 2℃ with no voltage applied and then being stabilized at 20℃,capacitors shall meet the limits specified in Endurance. (With voltage treatment)
Resistance to Soldering Heat (Please refer to page 26 for reflowsoldering conditions)	Capacitance Change: Within ±10% of initial value Tanδ: Within specified value ESR: Within specified value Leakage Current: Within specified value
Ripple Current and Frequency Multipliers	Frequency (Hz): 120 ≦ f < 1k | 1k ≦ f < 10k | 10k ≦ f < 100k | 100k ≦ f < 500k Multiplier: 0.10 | 0.3 | 0.6 | 1.0

Diagram of Dimensions



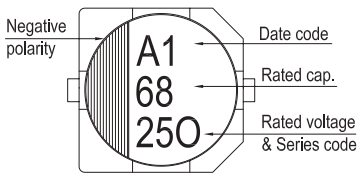
Lead Spacing and Diameter Unit: mm

ϕD	L	A	B	C	W	P ± 0.2
6.3	5.8 ± 0.3	6.6	6.6	7.2	0.5 ~ 0.8	2.0
6.3	7.7 ± 0.3	6.6	6.6	7.2	0.5 ~ 0.8	2.0
8	10.0 ± 0.5	8.3	8.3	9.0	0.7 ~ 1.1	3.1
10	10.0 ± 0.5	10.3	10.3	11.0	0.7 ~ 1.3	4.7

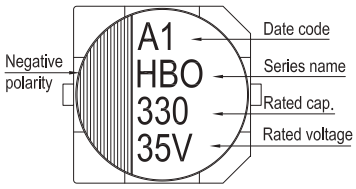
(*): For 6.3ϕ is 0.4 max.

Marking

ϕD = 6.3



ϕD = 8 ~ 10



Dimension: ϕD×L(mm)

Ripple Current: mA/rms at 100k Hz, 125℃

Standard Ratings

Rated Volt. (V)	Surge Voltage (V)	Capacitance (μF)	Size ϕD×L(mm)	Tanδ (120 Hz, 20℃)	L C (μA)	E S R (mΩ/at 100kHz, 20℃ max.)	Rated R. C. (mA/rms at 100k Hz, 125℃)
25V (1E)	28.8	68	6.3 × 5.8	0.14	17	50	1,300
		82	6.3 × 5.8		20.5	50	1,300
		150	6.3 × 7.7		37.5	30	1,800
		270	8 × 10		67.5	27	2,000
		470	10 × 10		117	20	2,800
35V (1V)	40.3	56	6.3 × 5.8	0.12	19.6	60	1,200
		100	6.3 × 7.7		35	35	1,700
		180	8 × 10		63	27	2,000
		330	10 × 10		115	20	2,800

Part Numbering System

HBO Series	270μF	±20%	25V	Carrier Tape		8ϕ×10L	Pb-free and PET coating case
HBO	**271**	**M**	**1E**	**TR**	**-**	**0810**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Package Type	Terminal Type	Case size	Lead Wire and Coating Type

Note: For more details, please refer to “Part Numbering System (SMD Type)” on page 15.

HBZ Series

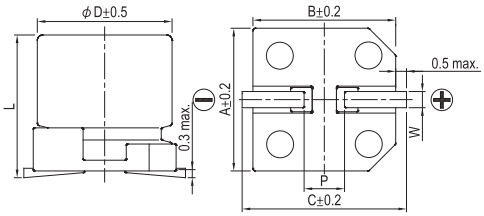
Features
- 125℃, 4,000 hours assured
- Low ESR and High ripple current
- RoHS compliance

Marking color: Dark Green

Specifications

Items	Performance
Category Temperature Range	-55℃ ~ +125℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)	I = 0.01CV or 3 (μA) whichever is greater (after 2 minutes) Where, C = rated capacitance in μF, V = rated DC working voltage in V
Tanδ (at 120 Hz, 20℃)	See Standard Ratings
Endurance	Test Time: 4,000 Hrs Capacitance Change: Within ±30% of initial value Tanδ: Less than 200% of specified value ESR: Less than 200% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied with rated ripple current for 4,000 hours at 125℃.
Shelf Life Test	* After storage for 1,000 hours at 125 ± 2℃ with no voltage applied and then being stabilized at 20℃,capacitors shall meet the limits specified in Endurance. (With voltage treatment)
Resistance to Soldering Heat (Please refer to page 26 for reflowsoldering conditions)	Capacitance Change: Within ±10% of initial value Tanδ: Within specified value ESR: Within specified value Leakage Current: Within specified value
Ripple Current and Frequency Multipliers	Frequency (Hz): 120 ≦ f < 1k; 1k ≦ f < 10k; 10k ≦ f < 100k; 100k ≦ f < 500k Multiplier: 0.10; 0.3; 0.6; 1.0

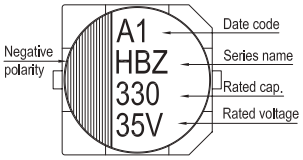
Diagram of Dimensions



Lead Spacing and Diameter Unit: mm

ϕD	L	A	B	C	W	P ± 0.2
10	12.5 ± 0.5	10.3	10.3	11.0	0.7 ~ 1.3	4.7
10	16.5 ± 0.5	10.3	10.3	11.0	0.7 ~ 1.3	4.7

Marking



Dimension: ϕD×L(mm)
Ripple Current: mA/rms at 100k Hz, 125℃

Standard Ratings

Rated Volt. (V)	Surge Voltage (V)	Capacitance (μF)	Size ϕD×L(mm)	Tanδ (120 Hz, 20℃)	L C (μA)	E S R (mΩ/at 100kHz, 20℃ max.)	Rated R. C. (mA/rms at 100k Hz, 125℃)
25V (1E)	28.8	470	10 × 12.5	0.14	117	14	3,500
		560	10 × 16.5	0.14	140	11	4,000
35V (1V)	40.3	330	10 × 12.5	0.12	115	14	3,500
		470	10 × 16.5	0.12	164	11	4,000
50V (1H)	57.5	150	10 × 12.5	0.10	75	17	3,200
		220	10 × 16.5	0.10	110	13	3,700
63V (1J)	72.5	100	10 × 12.5	0.08	63	19	3,000
		150	10 × 16.5	0.08	94.5	15	3,500

Part Numbering System

HBZ Series	470μF	±20%	25V	Carrier Tape		10ϕ×12.5L	Pb-free and PET coating case
HBZ	**471**	**M**	**1E**	**TR**	**-**	**1013**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Package Type	Terminal Type	Case size	Lead Wire and Coating Type

Note: For more details, please refer to “Part Numbering System (SMD Type)” on page 15.

HBR Series

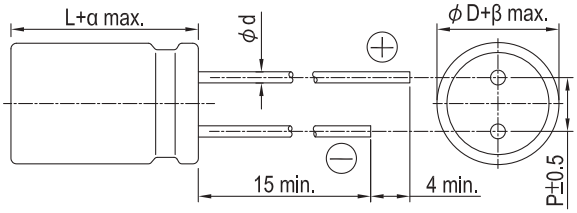
Features
- 105℃, 10,000 hours assured
- Low ESR and High ripple current
- RoHS compliance

Marking color: Dare Green

Specifications

Items	Performance
Category Temperature Range	-55℃ ~ +105℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)	I = 0.01CV or 3 (μA) whichever is greater (after 2 minutes) Where, C = rated capacitance in μF, V = rated DC working voltage in V
Tanδ (at 120 Hz, 20℃)	See Standard Ratings
Endurance	Test Time: 10,000 Hrs Capacitance Change: Within ±30% of initial value Tanδ: Less than 200% of specified value ESR: Less than 200% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied with rated ripple current for 10,000 hours at 105℃.
Shelf Life Test	* After storage for 1,000 hours at 105 ± 2℃ with no voltage applied and then being stabilized at 20℃,capacitors shall meet the limits specified in Endurance. (With voltage treatment)
Resistance to Soldering Heat	Capacitance Change: Within ±10% of initial value Tanδ: Within specified value ESR: Within specified value Leakage Current: Within specified value
Ripple Current and Frequency Multipliers	Frequency (Hz): 120 ≦ f < 1k | 1k ≦ f < 10k | 10k ≦ f < 100k | 100k ≦ f < 500k Multiplier: 0.10 | 0.3 | 0.6 | 1.0

Diagram of Dimensions

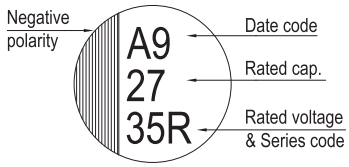


Lead Spacing and Diameter Unit: mm

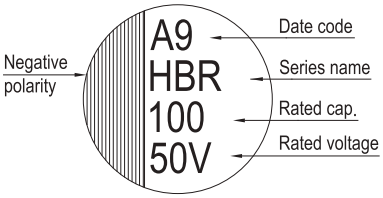
ϕD	6.3	6.3	8	10	10
L	6	8	10	10	12
P	2.5	2.5	3.5	5.0	5.0
ϕd	0.45		0.6		
α	1.0				
β	0.5				

Marking

ϕD = 6.3



ϕD = 8 ~ 10



Dimension: ϕD×L(mm)
Ripple Current: mA/rms at 100k Hz, 105℃

Standard Ratings

Rated Volt. (V)	Surge Voltage (V)	Capacitance (μF)	Size ϕD×L(mm)	Tanδ (120 Hz, 20℃)	L C (μA)	E S R (mΩ/at 100kHz, 20℃ max.)	Rated R. C. (mA/rms at 100k Hz, 105℃)
16V (1C)	18.4	82	6.3 × 6	0.16	13.1	50	1,300
		150	6.3 × 8		24	30	2,000
		270	8 × 10		43.2	27	2,300
		470	10 × 10		75.2	20	2,500
25V (1E)	28.8	47	6.3 × 6	0.14	11.8	50	1,300
		56	6.3 × 6		14	50	1,300
		68	6.3 × 8		17	30	2,000
		100	6.3 × 8		25	30	2,000
		150	8 × 10		37.5	27	2,300
		220	8 × 10		55	27	2,300
		330	10 × 10		82.5	20	2,500
		330	10 × 12		82.5	16	2,900
35V (1V)	40.3	27	6.3 × 6	0.12	9.5	60	1,300
		33			11.6		
		47			16.5		
		68	6.3 × 8		23.8	35	2,000
		100	8 × 10		35	27	2,300
		150	8 × 10		52.5	27	2,300
		220	10 × 10		77	20	2,500
		270	10 × 10		94.5	20	2,500
50V(1H)	57.5	22	6.3 × 6	0.10	11	80	1,100
		33	6.3 × 8		16.5	40	1,600
		47	8 × 10		23.5	30	1,800
		68	8 × 10		34	30	1,800
		100	10 × 10		50	28	2,000
63V(1J)	72.5	10	6.3 × 6	0.08	6.3	120	1,000
		22	6.3 × 8		13.9	80	1,500
		27	8 × 10		17	40	1,700
		33			20.8		
		47			29.6		
		56	10 × 10		35.3	30	1,800
		68			42.8		
		82			51.7		
80V(1K)	92.0	22	8 × 10	0.08	17.6	45	1,550
		33	10 × 10		26.4	36	1,700
		47	10 × 10		37.6	36	1,700

Part Numbering System

HBR Series	220μF	±20%	25V	Bulk Package	Gas Type	8ϕ×10L	Pb-free and PET coating case
HBR	**221**	**M**	**1E**	**BK**	**-**	**0810**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Lead Configuration and Package	Rubber Type	Case size	Lead Wire and Coating Type

Note: For more details, please refer to “Part Numbering System (Radial Type)” on page 13.

HBS Series

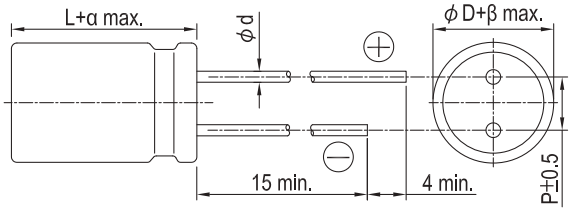
Features
- 125℃, 4,000 hours assured
- Low ESR and High ripple current
- RoHS compliance

Marking color: Dark Green

Specifications

Items	Performance
Category Temperature Range	-55℃ ~ +125℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)	I = 0.01CV or 3 (μA) whichever is greater (after 2 minutes) Where, C = rated capacitance in μF, V = rated DC working voltage in V
Tanδ (at 120 Hz, 20℃)	See Standard Ratings
Endurance	Test Time: 4,000 Hrs Capacitance Change: Within ±30% of initial value Tanδ: Less than 200% of specified value ESR: Less than 200% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied with rated ripple current for 4,000 hours at 125℃.
Shelf Life Test	* After storage for 1,000 hours at 125 ± 2℃ with no voltage applied and then being stabilized at 20℃, capacitors shall meet the limits specified in Endurance. (With voltage treatment)
Resistance to Soldering Heat	Capacitance Change: Within ±10% of initial value Tanδ: Within specified value ESR: Within specified value Leakage Current: Within specified value
Ripple Current and Frequency Multipliers	Frequency (Hz): 120 ≦ f < 1k | 1k ≦ f < 10k | 10k ≦ f < 100k | 100k ≦ f < 500k Multiplier: 0.10 | 0.3 | 0.6 | 1.0

Diagram of Dimensions

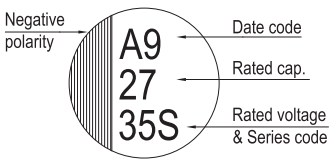


Lead Spacing and Diameter Unit: mm

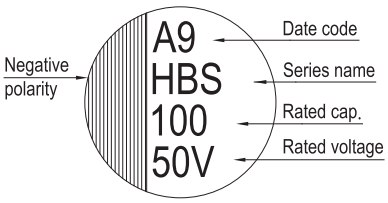
φD	6.3	6.3	8	10	10
L	6	8	10	10	12
P	2.5	2.5	3.5	5.0	5.0
φd	0.45		0.6		
α	1.0				
β	0.5				

Marking

φD = 6.3



φD = 8 ~ 10



Conductive Polymer Hybrid Capacitors

HBS

Dimension: ϕD×L(mm)

Ripple Current: mA/rms at 100k Hz, 125℃

Standard Ratings

Rated Volt. (V)	Surge Voltage (V)	Capacitance (μF)	Size ϕD×L(mm)	Tanδ (120 Hz, 20℃)	L C (μA)	E S R (mΩ/at 100kHz, 20℃ max.)	Rated R. C. (mA/rms at 100k Hz, 125℃)
16V (1C)	18.4	82	6.3 × 6	0.16	13.1	50	900
		150	6.3 × 8		24	30	1,400
		270	8 × 10		43.2	27	1,600
		470	10 × 10		75.2	20	2,000
25V (1E)	28.8	47	6.3 × 6	0.14	11.8	50	900
		56			14		
		68			17		
			6.3 × 8		17	30	1,400
		100	6.3 × 8		25	30	1,400
		150	8 × 10		37.5	27	1,600
		220	8 × 10		55	27	1,600
		330	10 × 10		82.5	20	2,000
35V (1V)	40.3	27	6.3 × 6	0.12	9.5	60	900
		33			11.6		
		47			16.5		
		68	6.3 × 8		23.8	35	1,400
		100	8 × 10		35	27	1,600
		150	8 × 10		52.5	27	1,600
		220	10 × 10		77	20	2,000
		270	10 × 10		94.5	20	2,000
50V(1H)	57.5	22	6.3 × 6	0.10	11	80	750
		33	6.3 × 8		16.5	40	1,100
		47	8 × 10		23.5	30	1,250
		68	8 × 10		34	30	1,250
		100	10 × 10		50	28	1,600
		120	10 × 10		60	28	1,600
63V(1J)	72.5	10	6.3 × 6	0.08	6.3	120	700
		22	6.3 × 8		13.9	80	900
		27	8 × 10		17	40	1,100
		33			20.8		
		47			29.6		
		56	10 × 10		35.3	30	1,400
			10 × 12		35.3	26	1,500
		68	10 × 10		42.8	30	1,400
		82	10 × 10		51.7	30	1,400
80V (1K)	92.0	22	8 × 10	0.08	17.6	45	1,050
		33	10 × 10		35.3	36	1,360
		47	10 × 10		37.6	36	1,360

Part Numbering System

HBS Series	220μF	±20%	25V	Bulk Package	Gas Type	8ϕ×10L	Pb-free and PET coating case
HBS	**221**	**M**	**1E**	**BK**	**-**	**0810**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Lead Configuration and Package	Rubber Type	Case size	Lead Wire and Coating Type

Note: For more details, please refer to “Part Numbering System (Radial Type)” on page 13.

VE Series

Features

- 3φ ~ 18φ, 85℃, 2,000 hours assured
- Chip type large capacitance capacitors
- Designed for surface mounting on high density PC board
- RoHS compliance

Marking color: Black

Specifications

Items	Performance
Category Temperature Range	-40℃ ~ +85℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)	Where, C = rated capacitance in μF, V = rated DC working voltage in V

Rated Voltage	6.3 ~ 100V		160 ~ 450V
Time	after 2 minutes		after 5 minutes
Case size	3 ~ 10φ	12.5 ~ 18φ	12.5 ~ 18φ
Leakage Current	I = 0.01CV or 3μA, whichever is greater	I = 0.03CV or 4μA, whichever is greater	I = 0.04CV +100μA

Tanδ (at 120 Hz, 20℃)

Rated Voltage	4	6.3	10	16	25	35	50	63	100	160 ~ 250	400 ~ 450
3 ~ 10φ	0.42	0.28	0.24	0.20	0.14	0.12	0.10	0.10	0.10	-	-
12.5 ~ 18φ	-	0.38	0.34	0.30	0.26	0.22	0.18	0.14	0.10	0.20	0.25

When the capacitance exceeds 1,000μF, 0.02 shall be added every 1,000μF increase.

Low Temperature Characteristics (at 120 Hz)

Impedance ratio shall not exceed the values given in the table below.

Rated Voltage			4.0	6.3	10	16	25	35	50	63	100	160 ~ 250	400 ~ 450
Impedance Ratio	Z(-25℃)	φD<12.5	7	4	4	3	2	2	2	2	2	-	-
	/Z(+20℃)	φD≧12.5	-	5	5	4	2	2	2	2	2	3	6
	Z(-40℃)	φD<12.5	15	8	5	4	3	3	3	3	3	-	-
	/Z(+20℃)	φD≧12.5	-	14	12	10	5	4	3	3	3	6	10

Endurance

Test Time	2,000 Hrs
Capacitance Change	Within ±20% of initial value (4V: ±30%)
Tanδ	Less than 200% of specified value (4V: ＜300%)
Leakage Current	Within specified value

* The above specifications shall be satisfied when the capacitors are restored to 20℃after the rated voltage applied for 2,000 hours at 85℃.

Shelf Life Test

Test time: 1,000 hours; other items are the same as those for the Endurance.
The rated voltage shall be applied to the capacitors before the measurements for 160 ~ 450V (Refer to JIS C 5101-4 4.1).

Ripple Current and Frequency Multipliers

Cap. (μF) \ Freq. (Hz)	50	120	1k	10k up
≦ 1,000	0.80	1.00	1.25	1.40
1,000 ＜ C ≦ 10,000	0.85	1.00	1.15	1.25

Diagram of Dimensions

Fig. 1

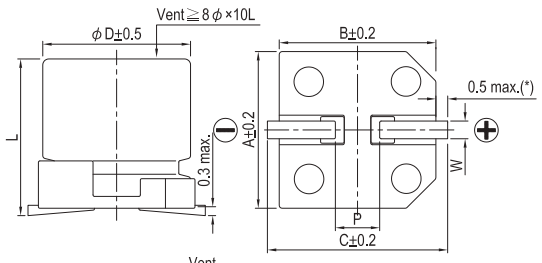
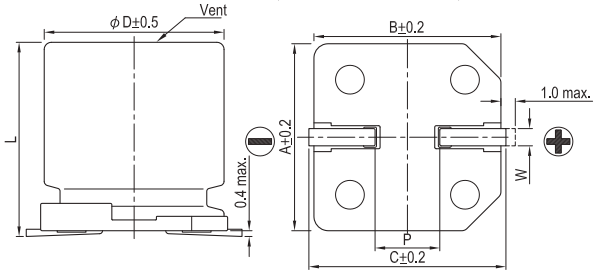


Fig. 2



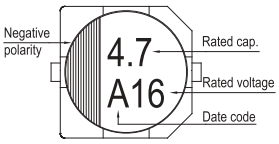
Lead Spacing and Diameter Unit: mm

φD	L	A	B	C	W	P ± 0.2	Fig. No.
3	5.3 ± 0.2	3.3	3.3	4.1	0.45 ~ 0.75	0.8	1
4	5.3 ± 0.2	4.3	4.3	5.1	0.5 ~ 0.8	1.0	1
5	5.3 ± 0.2	5.3	5.3	5.9	0.5 ~ 0.8	1.5	1
6.3	5.3 ± 0.2	6.6	6.6	7.2	0.5 ~ 0.8	2.0	1
6.3	7.7 ± 0.3	6.6	6.6	7.2	0.5 ~ 0.8	2.0	1
8	6.5 ± 0.3	8.3	8.3	9.0	0.5 ~ 0.8	2.3	1
8	10 ± 0.5	8.3	8.3	9.0	0.7 ~ 1.1	3.1	1
10	7.7 ± 0.3	10.3	10.3	11.0	0.7 ~ 1.3	4.7	1
10	10 ± 0.5	10.3	10.3	11.0	0.7 ~ 1.3	4.7	1
12.5	13.5 ± 0.5	13.0	13.0	13.7	1.1 ~ 1.4	4.4	2
12.5	16 ± 0.5	13.0	13.0	13.7	1.1 ~ 1.4	4.4	2
16	16.5 ± 0.5	17.0	17.0	18.0	1.1 ~ 1.4	6.4	2
16	21.5 ± 0.5	17.0	17.0	18.0	1.1 ~ 1.4	6.4	2
18	16.5 ± 0.5	19.0	19.0	20.0	1.1 ~ 1.4	6.4	2
18	21.5 ± 0.5	19.0	19.0	20.0	1.1 ~ 1.4	6.4	2

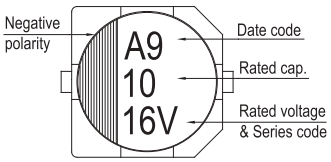
(*): For 3 ~ 6.3φ is 0.4 max.

Marking

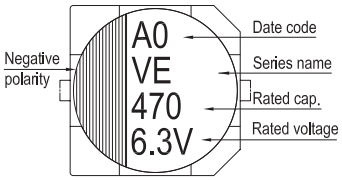
ϕD = 3 mm



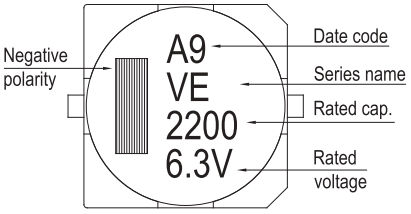
ϕD = 4 ~ 6.3 mm



ϕD = 8 ~ 10 mm



ϕD ≧ 12.5 mm



Dimension and Permissible Ripple Current

Dimension: ϕD × L(mm)
Ripple Current: mA/rms at 120 Hz, 85℃

Rated Volt. (VDC) / Cap. (μF)	Contents	4V (0G)		6.3V (0J)		10V (1A)		16V (1C)		25V (1E)		35V (1V)		50V (1H)		63 (1J)	
		ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA
1	010													4×5.3	10	4×5.3	8
2.2	2R2													4×5.3	14	4×5.3	12
3.3	3R3									3×5.3	14	3×5.3	14	4×5.3	17	5×5.3	22
4.7	4R7					3×5.3	14	3×5.3	14	4×5.3	26	4×5.3	26	4×5.3	20	5×5.3	25
10	100			3×5.3	16	4×5.3	26	4×5.3	26	5×5.3	44	5×5.3	44	5×5.3	35	6.3×5.3 8×6.5	40 46
22	220	3×5.3	16	4×5.3	26	5×5.3	44	4×5.3 5×5.3	30 44	5×5.3 6.3×5.3	47 59	5×5.3 6.3×5.3	47 59	6.3×5.3 6.3×7.7	50 65	8×10	139
33	330	4×5.3	31	4×5.3	31	4×5.3 5×5.3	31 55	5×5.3	55	5×5.3 6.3×5.3	55 67	6.3×5.3 6.3×7.7	67 85	6.3×7.7 8×6.5	75 95	8×10	139
47	470	4×5.3	34	4×5.3 5×5.3	34 55	6.3×5.3	75	5×5.3 6.3×5.3	55 75	6.3×5.3 6.3×7.7	75 98	6.3×7.7 8×6.5	98 105	6.3×7.7 8×10	75 190	10×10	200
68	680	5×5.3	58	5×5.3 6.3×5.3	58 89	5×5.3 6.3×5.3	58 89	6.3×5.3	89	6.3×7.7	109	6.3×7.7	109	8×10	190	10×10	226
100	101	5×5.3 6.3×5.3	58 89	6.3×5.3	89	6.3×5.3 6.3×7.7	89 109	6.3×5.3 6.3×7.7 8×6.5	89 109 125	6.3×7.7 8×6.5	109 125	8×10	252	8×10	190	10×10	226
150	151											10×7.7	252				
220	221	6.3×5.3 6.3×7.7	89 124	6.3×5.3 6.3×7.7	89 124	6.3×7.7 8×6.5 8×10	124 175 270	6.3×7.7 8×10	124 270	8×10 10×7.7	270 270	8×10 10×10	270 370	10×10	320	12.5×13.5	500
330	331	6.3×7.7	124	6.3×7.7 8×6.5	124 190	8×10	290	8×10 10×7.7	290 290	10×10	400	10×10	400	12.5×13.5	600	12.5×16	600
470	471	8×10	290	8×10	290	10×7.7 10×10	290 400	10×10	400	10×10	400	12.5×13.5	680	12.5×16	740	16×16.5	850
680	681			10×7.7	290	10×10	410	10×10	410	12.5×13.5	680	12.5×13.5	680	16×16.5	1,000	18×16.5	1,100
1,000	102			10×10	430	10×10	430	12.5×13.5	750	12.5×13.5	750	16×16.5	1,100	18×16.5 16×21.5	1,350 1,400		
2,200	222			12.5×13.5	890	12.5×13.5	890	16×16.5	1,100	16×16.5	1,100	18×16.5 16×21.5	1,450 1,500				
3,300	332			12.5×16	1,000	16×16.5	1,300	16×16.5	1,300	18×16.5 16×21.5	1,450 1,500	18×21.5	1,750				
4,700	472			16×16.5	1,400	16×16.5	1,400	18×16.5 16×21.5	1,600 1,650	18×21.5	1,750						
6,800	682			18×16.5 16×21.5	1,700 1,750	18×16.5 16×21.5	1,700 1,750	18×21.5	2,000								
10,000	103			18×21.5	2,000	18×21.5	2,000										

Rated Volt. (VDC) / Cap. (μF)	Contents	100V (2A)		160V (2C)		200V (2D)		250V (2E)		400V (2G)		450V (2W)	
		ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA
4.7	4R7									12.5×13.5	120	12.5×13.5	120
10	100	8×10	90					12.5×13.5	150	12.5×13.5	120	12.5×16	130
22	220	8×10	90			12.5×13.5	240	12.5×13.5	150	16×16.5	140	16×16.5	140
33	330	10×10	120	12.5×13.5	290	12.5×16	310	12.5×16	240	16×16.5	140	18×16.5	180
47	470	10×10	120	12.5×16	370	16×16.5	420	16×16.5	340	18×16.5	280	18×21.5	250
68	680	12.5×13.5	380	16×16.5	500	16×16.5	420	18×16.5 16×21.5	440 450	18×21.5	350		
100	101	12.5×13.5	440	18×16.5 16×21.5	650 690	18×16.5 16×21.5	550 590	18×21.5	490				
220	221	16×16.5	600										
330	331	18×16.5 16×21.5	780 850										

Part Numbering System

VE Series	470μF	±20%	6.3V	Carrier Tape		8ϕ×10L	Pb-free and PET coating case
VE-	**471**	**M**	**0J**	**TR**	**-**	**0810**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Package Type	Terminal Type	Case size	Lead Wire and Coating Type

Note: For more details, please refer to “Part Numbering System (SMD Type)” on page 15.

VSS Series

Features

- 4φ ~ 6.3φ, 85℃, 2,000 hours assured
- Vertical chip type miniaturized for 4.5mm height capacitor
- Designed for surface mounting on high density PC board
- RoHS compliance

Marking color: Black

Specifications

Items	Performance
Category Temperature Range	-40℃ ~ +85℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)	I = 0.01CV or 3 (μA) whichever is greater (after 2 minutes) Where, C = rated capacitance in μF, V = rated DC working voltage in V
Tanδ (at 120 Hz, 20℃)	
Low Temperature Characteristics (at 120 Hz)	Impedance ratio shall not exceed the values given in the table below.
Endurance	
Shelf Life Test	Test time: 1,000 hours; other items are the same as those for the Endurance.
Ripple Current and Frequency Multipliers	

Tanδ (at 120 Hz, 20℃)

Rated Voltage	4	6.3	10	16	25	35	50
Tanδ (max)	0.50	0.30	0.24	0.19	0.16	0.14	0.14

Low Temperature Characteristics (at 120 Hz)

Rated Voltage		4	6.3	10	16	25	35	50
Impedance Ratio	Z(-25℃)/Z(+20℃)	7	4	3	2	2	2	2
	Z(-40℃)/Z(+20℃)	15	8	5	4	3	3	3

Endurance

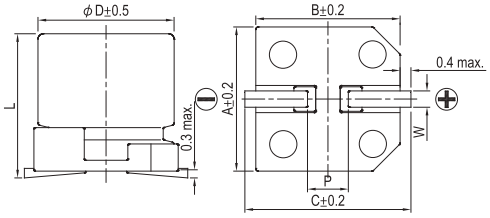
Test Time	2,000 Hrs
Capacitance Change	Within ±30% of initial value for 4 ~ 6.3V Within ±25% of initial value for 10 ~ 50V
Tanδ	Less than 300% of specified value
Leakage Current	Within specified value

* The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied for 2,000 hours at 85℃.

Ripple Current and Frequency Multipliers

Frequency(Hz)	50	120	1k	10k up
Multiplier	0.7	1.0	1.3	1.4

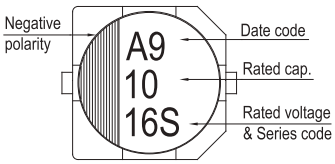
Diagram of Dimensions



Lead Spacing and Diameter Unit: mm

φD	L	A	B	C	W	P ± 0.2
4	4.5 ± 0.2	4.3	4.3	5.1	0.5 ~ 0.8	1.0
5	4.5 ± 0.2	5.3	5.3	5.9	0.5 ~ 0.8	1.5
6.3	4.5 ± 0.2	6.6	6.6	7.2	0.5 ~ 0.8	2.0

Marking



Dimension and Permissible Ripple Current

Dimension: φD × L(mm)
Ripple Current: mA/rms at 120 Hz, 85℃

Rated Volt. (VDC) / Cap. (μF)	Contents	4V (0G)		6.3V (0J)		10V (1A)		16V (1C)		25V (1E)		35V (1V)		50V (1H)	
		φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA
0.47	R47													4×4.5	4.0
1	010													4×4.5	8.4
2.2	2R2													4×4.5	13
3.3	3R3													4×4.5	17
4.7	4R7									4×4.5	16	4×4.5	18	5×4.5	20
10	100							4×4.5	23	5×4.5	27	5×4.5	29	6.3×4.5	33
22	220			4×4.5	23	5×4.5	33	5×4.5	37	6.3×4.5	42	6.3×4.5	46		
33	330	4×4.5	28	5×4.5	37	5×4.5	41	6.3×4.5	49	6.3×4.5	52				
47	470	4×4.5	33	5×4.5	45	6.3×4.5	70	6.3×4.5	58						
100	101	5×4.5	56	6.3×4.5	70										

Part Numbering System

VSS Series	10μF	±20%	16V	Carrier Tape		4φ×4.5L	Pb-free and PET coating case
VSS	**100**	**M**	**1C**	**TR**	**-**	**0404**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Package Type	Terminal Type	Case size	Lead Wire and Coating Type

Note: For more details, please refer to “Part Numbering System (SMD Type)” on page 15.

VES Series

Features

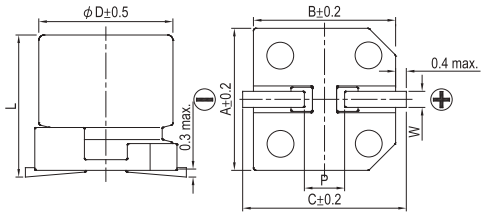
- 4φ ~ 6.3φ, 105℃, 1,000 hours assured
- Vertical chip type miniaturized for 5.5mm high capacitor
- Designed for surface mounting on high density PC board
- RoHS compliance

Marking color: Black

Specifications

Items	Performance
Category Temperature Range	-55℃ ~ +105℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)	I = 0.01CV or 3 (μA) whichever is greater (after 2 minutes) Where, C = rated capacitance in μF, V = rated DC working voltage in V
Tanδ (at 120 Hz, 20℃)	Rated Voltage: 6.3 / 10 / 16 / 25 / 35 / 50 Tanδ (max): 0.30 / 0.26 / 0.22 / 0.16 / 0.13 / 0.12
Low Temperature Characteristics (at 120 Hz)	Impedance ratio shall not exceed the values given in the table below. Rated Voltage: 6.3 / 10 / 16 / 25 / 35 / 50 Impedance Ratio Z(-25℃)/Z(+20℃): 4 / 3 / 2 / 2 / 2 / 2 Impedance Ratio Z(-55℃)/Z(+20℃): 8 / 5 / 4 / 3 / 3 / 3
Endurance	Test Time: 1,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 200% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied for 1,000 hours at 105℃.
Shelf Life Test	Test Time: 1,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 200% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 105℃ without voltage applied.
Ripple Current and Frequency Multipliers	Frequency (Hz): 50 / 120 / 1k / 10k up Multiplier: 0.7 / 1.0 / 1.3 / 1.4

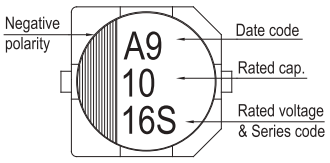
Diagram of Dimensions



Lead Spacing and Diameter Unit: mm

φD	L	A	B	C	W	P ± 0.2
4	5.3 ± 0.2	4.3	4.3	5.1	0.5 ~ 0.8	1.0
5	5.3 ± 0.2	5.3	5.3	5.9	0.5 ~ 0.8	1.5
6.3	5.3 ± 0.2	6.6	6.6	7.2	0.5 ~ 0.8	2.0

Marking



Dimension and Permissible Ripple Current

Dimension: φD × L(mm)
Ripple Current: mA/rms at 120 Hz, 105℃

Rated Volt. (VDC) / Cap. (μF)	Contents	6.3V (0J)		10V (1A)		16V (1C)		25V (1E)		35V (1V)		50V (1H)	
		φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA
1	010											4×5.3	7
2.2	2R2											4×5.3	10
3.3	3R3											4×5.3	12
4.7	4R7							4×5.3	12	4×5.3	14	5×5.3	17
10	100			4×5.3	15	4×5.3	16	5×5.3	21	5×5.3	23	6.3×5.3	26
22	220	4×5.3	21	5×5.3	25	5×5.3	28	6.3×5.3	36	6.3×5.3	50	6.3×5.3	51
33	330	5×5.3	30	5×5.3	31	6.3×5.3	40	6.3×5.3	44				
47	470	5×5.3	36	6.3×5.3	43	6.3×5.3	47	6.3×5.3	60				
100	101	6.3×5.3	61	6.3×5.3	65	6.3×5.3	70						

Part Numbering System

VES Series	10μF	±20%	16V	Carrier Tape		4φ×5.3L	Pb-free and PET coating case
VES	**100**	**M**	**1C**	**TR**	**-**	**0405**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Package Type	Terminal Type	Case size	Lead Wire and Coating Type

Note: For more details, please refer to “Part Numbering System (SMD Type)” on page 15.

VEJ Series

Features

- 4φ ~ 18φ, 105℃, 2,000 hours assured
- Designed for surface mounting on high density PC board
- RoHS compliance

Marking color: Black

Specifications

Items	Performance		
Category Temperature Range	6.3 ~ 100V	160 ~ 400V	450V
	-55℃ ~ +105℃	-40℃ ~ +105℃	-25℃ ~ +105℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)		

Leakage Current (at 20℃)

Rated voltage	6.3 ~ 100V		160 ~ 450V
Time	after 2 minutes		after 5 minutes
Case size	4 ~ 10φ	12.5 ~ 18φ	12.5 ~ 18φ
Leakage Current	I = 0.01CV or 3μA, whichever is greater	I = 0.03CV or 4μA, whichever is greater	I = 0.04CV + 100μA

Where, C = rated capacitance in μF, V = rated DC working voltage in V

Tanδ (at 120 Hz, 20℃)

Rated Voltage	6.3	10	16	25	35	50	63	100	160 ~ 250	400 ~ 450
4 ~ 10φ	0.45	0.35	0.28	0.18	0.16	0.14	0.12	0.12	-	-
12.5 ~ 18φ	0.40	0.38	0.34	0.26	0.22	0.18	0.14	0.10	0.20	0.25

When the capacitance exceeds 1,000μF, 0.02 shall be added every 1,000μF increase.

Low Temperature Characteristics (at 120 Hz)

Impedance ratio shall not exceed the values given in the table below.

Rated Voltage			6.3	10	16	25	35	50	63	100	160	200	250	400	450
Impedance Ratio	Z(-25℃) /Z(+20℃)	φD<12.5	4	4	3	2	2	2	2	3	-	-	-	-	-
		φD≧12.5	5	4	3	2	2	2	2	2	3	3	3	6	6
	Z(-55/-40℃) /Z(+20℃)	φD<12.5	12	8	6	4	3	3	3	4	-	-	-	-	-
		φD≧12.5	10	8	6	4	3	3	3	3	6	6	6	10	-

Note: The ratio value with " * " is only available for 400V.

Endurance

Test Time	2,000 Hrs
Capacitance Change	Within ±25% of initial value for φD ≦ 6.3mm; Within ±20% of initial value for φD ≧ 8mm
Tanδ	Less than 300% of specified value for φD ≦ 6.3mm; Less than 200% of specified value for φD ≧ 8mm
Leakage Current	Within specified value

* The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied for 2,000 hours at 105℃.

Shelf Life Test

Test time: 1,000 hours; other items are the same as those for the Endurance.
The rated voltage shall be applied to the capacitors before the measurements for 160 ~ 450V (Refer to JIS C 5101-4 4.1).

Ripple Current and Frequency Multipliers

Cap. (μF) \ Freq. (Hz)	50	120	1k	10k up
≦ 1,000	0.80	1.00	1.25	1.40
1,000 < C ≦ 8,200	0.85	1.00	1.15	1.25

Diagram of Dimensions

Fig. 1

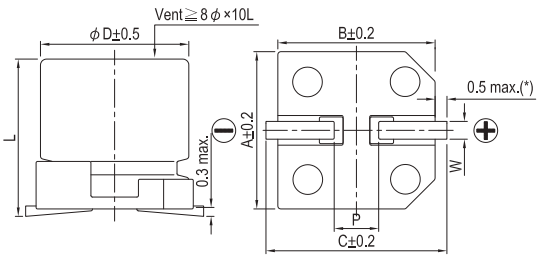
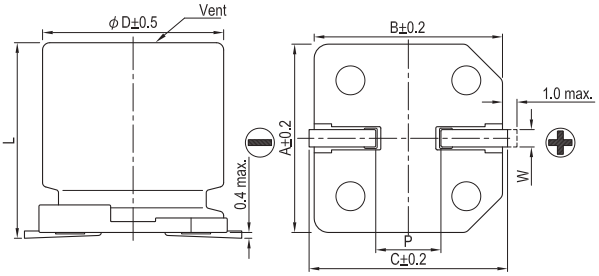


Fig. 2



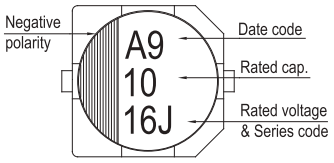
Lead Spacing and Diameter Unit: mm

φD	L	A	B	C	W	P ± 0.2	Fig. No.
4	5.7 ± 0.3	4.3	4.3	5.1	0.5 ~ 0.8	1.0	1
5	5.7 ± 0.3	5.3	5.3	5.9	0.5 ~ 0.8	1.5	1
6.3	5.7 ± 0.3	6.6	6.6	7.2	0.5 ~ 0.8	2.0	1
6.3	7.7 ± 0.3	6.6	6.6	7.2	0.5 ~ 0.8	2.0	1
8	6.5 ± 0.3	8.3	8.3	9.0	0.5 ~ 0.8	2.3	1
8	10 ± 0.5	8.3	8.3	9.0	0.7 ~ 1.1	3.1	1
10	7.7 ± 0.3	10.3	10.3	11.0	0.7 ~ 1.3	4.7	1
10	10 ± 0.5	10.3	10.3	11.0	0.7 ~ 1.3	4.7	1
12.5	13.5 ± 0.5	13.0	13.0	13.7	1.1 ~ 1.4	4.4	2
12.5	16 ± 0.5	13.0	13.0	13.7	1.1 ~ 1.4	4.4	2
16	16.5 ± 0.5	17.0	17.0	18.0	1.1 ~ 1.4	6.4	2
16	21.5 ± 0.5	17.0	17.0	18.0	1.1 ~ 1.4	6.4	2
18	16.5 ± 0.5	19.0	19.0	20.0	1.1 ~ 1.4	6.4	2
18	21.5 ± 0.5	19.0	19.0	20.0	1.1 ~ 1.4	6.4	2

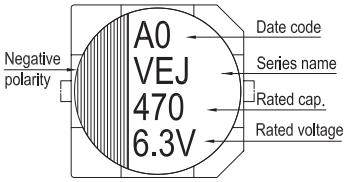
(*): For 4 ~ 6.3φ is 0.4 max.

Marking

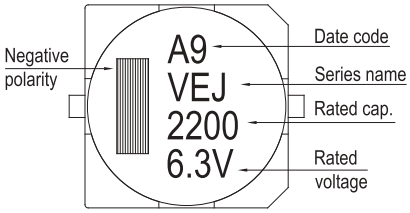
ϕD ≦ 6.3 mm



ϕD = 8 ~ 10 mm



ϕD ≧ 12.5 mm



Dimension and Permissible Ripple Current

Dimension: ϕD × L(mm)

Ripple Current: mA/rms at 120 Hz, 105℃

Rated Volt. (VDC) / Cap. (μF)	Contents	6.3V (0J)		10V (1A)		16V (1C)		25V (1E)		35V (1V)		50V (1H)		63V (1J)		100V (2A)	
		ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA
1	010											4×5.7	8	4×5.7	8		
2.2	2R2											4×5.7	12	4×5.7	12		
3.3	3R3											4×5.7	14	5×5.7	17		
4.7	4R7							4×5.7	17	4×5.7	17	5×5.7	20	6.3×5.7	22		
10	100					4×5.7	20	4×5.7	20	5×5.7	27	6.3×5.7	32	6.3×5.7 8×6.5	32 51		
22	220	4×5.7	22	4×5.7	22	5×5.7	30	5×5.7	30	6.3×5.7	44	6.3×5.7 8×6.5	38 67	6.3×7.7	58	8×10	100
33	330	5×5.7	34	5×5.7	34	5×5.7	34	6.3×5.7	46	6.3×5.7 8×6.5	46 76	6.3×7.7	65	8×10	140	10×10	150
47	470	5×5.7	38	5×5.7	38	6.3×5.7	48	6.3×5.7 8×6.5	48 79	6.3×7.7	80	6.3×7.7	70	8×10	170	12.5×13.5	250
100	101	6.3×5.7	69	6.3×5.7 8×6.5	69 90	6.3×5.7	69	6.3×7.7	100	8×10	240	8×10	210	10×10	310	12.5×13.5	380
220	221	6.3×7.7 8×6.5	120 120	6.3×7.7	120	6.3×7.7	120	8×10 10×7.7	270 270	8×10	270	10×10	330	12.5×13.5	470	16×16.5	450
330	331	8×10	290	8×10	290	8×10 10×7.7	290 290	8×10	290	10×10	370	12.5×13.5	490	16×16.5	650	18×16.5 16×21.5	590 750
470	471	8×10	320	8×10 10×7.7	320 320	10×10	380	10×10	380	12.5×13.5	520	12.5×16	550	16×16.5	700	18×21.5	980
1,000	102	10×10	410	10×10	410	12.5×13.5	500	12.5×16	550	16×16.5	800	18×16.5	990				
2,200	222	12.5×13.5	680	12.5×13.5	680	16×16.5	900	16×16.5	900	18×16.5	1,050						
3,300	332	12.5×16	850	16×16.5	950	16×16.5	950	18×16.5 16×21.5	1,150 1,200								
4,700	472	16×16.5	1,000	16×16.5	1,000	18×16.5 16×21.5	1,225 1,275	18×21.5	1,300								
6,800	682	18×16.5 16×21.5	1,290 1,350	18×16.5 16×21.5	1,290 1,350												
8,200	822	18×21.5	1,450	18×21.5	1,450												

Rated Volt. (VDC) / Cap. (μF)	Contents	160V (2C)		200V (2D)		250V (2E)		400V (2G)		450V (2W)	
		ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA
4.7	4R7					12.5×13.5	65	12.5×13.5	45	12.5×13.5	45
10	100			12.5×13.5	80	12.5×13.5	70	12.5×13.5	50	12.5×16	75
22	220			12.5×16	110	12.5×13.5	105	16×16.5	85	16×16.5	85
33	330	12.5×13.5	95	12.5×16	120	16×16.5	180	18×16.5	100	18×16.5	100
47	470	12.5×16	205	16×16.5	220	16×16.5	220	18×21.5	130		
100	101	16×16.5	250	18×16.5	280	18×21.5	290				

Part Numbering System

VEJ Series	470μF	±20%	6.3V	Carrier Tape		8ϕ×10L	Pb-free and PET coating case
VEJ	**471**	**M**	**0J**	**TR**	**-**	**0810**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Package Type	Terminal Type	Case size	Lead Wire and Coating Type

Note: For more details, please refer to “Part Numbering System (SMD Type)” on page 15.

SMD

VEU Series

Features

- 4φ ~ 18φ, 105℃, 3,000 ~ 5,000 hours assured
- Long life assured
- Designed for surface mounting on high density PC board
- RoHS compliance

Marking color: Black

Specifications

Items	Performance		
Category Temperature Range	6.3 ~ 100V	160 ~ 400V	450V
	-55℃ ~ +105℃	-40℃ ~ +105℃	-25℃ ~ +105℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)		

Leakage Current (at 20℃)

Rated Voltage	6.3 ~ 100V	160 ~ 450V
Time	after 2 minutes	after 5 minutes
Leakage Current	I = 0.01CV or 3 (μA), whichever is greater	I = 0.04CV + 100 (μA)

Where, C = rated capacitance in μF, V = rated DC working voltage in V

Tanδ (at 120 Hz, 20℃)

Rated Voltage	6.3	10	16	25	35	50	63	80	100	160	200	250	400	450
Tanδ (max)	0.30	0.24	0.20	0.16	0.13	0.12	0.09	0.08	0.07	0.15	0.15	0.15	0.20	0.20

Low Temperature Characteristics (at 120 Hz)

Impedance ratio shall not exceed the values given in the table below.

Rated Voltage		6.3	10	16	25	35	50	63	80	100	160	200	250	400	450
Impedance Ratio	Z(-25℃)/Z(+20℃)	4	3	2	2	2	2	2	2	2	3	3	3	6	6
	Z(-55/-40℃)/Z(+20℃)	10	7	5	3	3	3	3	3	3	6	6	6	10	-

Endurance

Test Time	3,000 Hrs for φD ≦ 10 mm; 5,000 Hrs for φD ≧ 12.5 mm
Capacitance Change	Within ±30% of initial value
Tanδ	Less than 300% of specified value
Leakage Current	Within specified value

* The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied for 3,000 ~ 5,000 hours at 105℃.

Shelf Life Test

Test Time	1,000 Hrs
Capacitance Change	Within ±30% of initial value
Tanδ	Less than 300% of specified value
Leakage Current	Within specified value

* The above specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 105℃ without voltage applied.

Ripple Current and Frequency Multipliers

Frequency (Hz) / Cap.(μF)	50	120	1k	10k up
≦ 1,000	0.70	1.00	1.30	1.40
1,000 < C ≦ 1,500	0.85	1.00	1.13	1.15

Diagram of Dimensions

Fig. 1

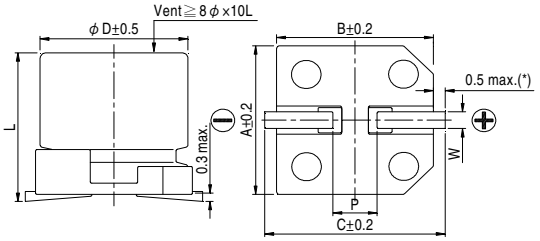
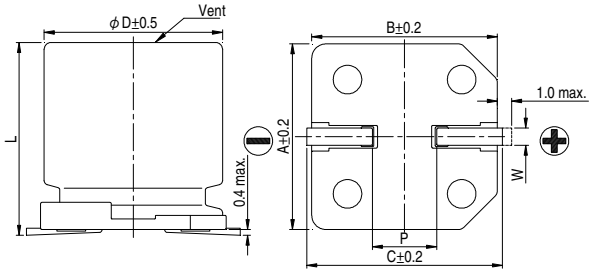


Fig. 2



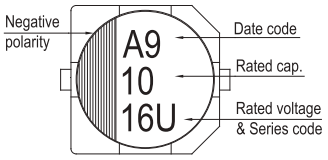
Lead Spacing and Diameter Unit: mm

φD	L	A	B	C	W	P ± 0.2	Fig. No.
4	5.7 ± 0.3	4.3	4.3	5.1	0.5 ~ 0.8	1.0	1
5	5.7 ± 0.3	5.3	5.3	5.9	0.5 ~ 0.8	1.5	1
6.3	5.7 ± 0.3	6.6	6.6	7.2	0.5 ~ 0.8	2.0	1
6.3	7.7 ± 0.3	6.6	6.6	7.2	0.5 ~ 0.8	2.0	1
8	10 ± 0.5	8.3	8.3	9.0	0.7 ~ 1.1	3.1	1
10	10 ± 0.5	10.3	10.3	11.0	0.7 ~ 1.3	4.7	1
12.5	13.5 ± 0.5	13.0	13.0	13.7	1.1 ~ 1.4	4.4	2
12.5	16 ± 0.5	13.0	13.0	13.7	1.1 ~ 1.4	4.4	2
16	16.5 ± 0.5	17.0	17.0	18.0	1.1 ~ 1.4	6.4	2
16	21.5 ± 0.5	17.0	17.0	18.0	1.1 ~ 1.4	6.4	2
18	16.5 ± 0.5	19.0	19.0	20.0	1.1 ~ 1.4	6.4	2
18	21.5 ± 0.5	19.0	19.0	20.0	1.1 ~ 1.4	6.4	2

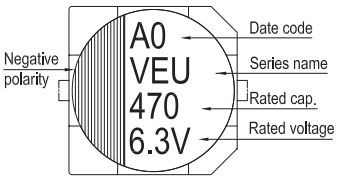
(*): For 4 ~ 6.3φ is 0.4 max.

Marking

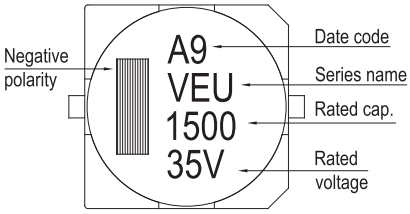
φD ≦ 6.3mm



φD = 8 ~ 10 mm



φD ≧ 12.5mm



Dimension and Permissible Ripple Current

Dimension: φD × L(mm)

Ripple Current: mA/rms at 120 Hz, 105℃

Rated Volt. (V_{DC}) / Cap. (μF)	Contents	6.3V (0J)		10V (1A)		16V (1C)		25V (1E)		35V (1V)		50V (1H)		63V (1J)		80V (1K)	
		φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA
1	010											4×5.7	8				
2.2	2R2											4×5.7	12				
3.3	3R3											4×5.7	17				
4.7	4R7									4×5.7	16	5×5.7	22				
10	100					4×5.7	18	5×5.7	27	5×5.7	27	6.3×5.7	32				
22	220	4×5.7	22	4×5.7	22	5×5.7	30	6.3×5.7	44	6.3×5.7	44	6.3×7.7	58				
33	330	5×5.7	35	5×5.7	35	6.3×5.7	48	6.3×5.7	50	6.3×7.7	57	8×10	130				
47	470	5×5.7	38	6.3×5.7	50	6.3×5.7	50	6.3×7.7	63	8×10	92	8×10	141				
100	101	6.3×5.7	69	6.3×7.7	81	6.3×7.7	81	8×10	116	10×10	151	10×10	160			12.5×13.5	220
150	151													12.5×13.5	240	12.5×16	290
220	221	6.3×7.7	120	8×10	141	8×10	141	10×10	290	10×10	320	12.5×13.5	280	12.5×16	320	16×16.5	410
330	331	8×10	141	10×10	290	10×10	290	10×10	320	12.5×13.5	320	12.5×16	360	16×16.5	450	16×16.5	510
470	471	10×10	320	10×10	320	10×10	320			12.5×16	410	16×16.5	510	16×16.5	540	18×16.5	650
1,000	102	10×10	410							16×16.5	690	18×16.5	780				
1,500	152									18×16.5	900						

Rated Volt. (V_{DC}) / Cap. (μF)	Contents	100V (2A)		160V (2C)		200V (2D)		250V (2E)		400V (2G)		450V (2W)	
		φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA
3.3	3R3											12.5×13.5	40
4.7	4R7							12.5×13.5	65	12.5×16	50	12.5×16	50
10	100					12.5×13.5	80	12.5×16	105	16×16.5	85	16×16.5	85
22	220					12.5×16	105	16×16.5	180	18×21.5	130	18×21.5	130
33	330			12.5×13.5	95	16×16.5	220	18×16.5	230				
47	470			16×16.5	260	18×16.5	270	18×21.5	280				
68	680	12.5×13.5	180	18×16.5	320	18×21.5	330						
100	101	12.5×16	240	16×21.5	380								
150	151	16×16.5	340										
220	221	16×16.5	410										
330	331	18×16.5	540										

Part Numbering System

VEU Series	470μF	±20%	6.3V	Carrier Tape		10φ×10L	Pb-free and PET coating case
VEU	**471**	**M**	**0J**	**TR**	**-**	**1010**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Package Type	Terminal Type	Case size	Lead Wire and Coating Type

Note: For more details, please refer to “Part Numbering System (SMD Type)” on page 15.

VEZ Series

Features

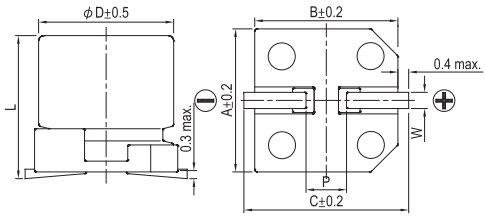
- 4φ ~ 6.3φ, 105℃, 1,000 hours assured
- Low ESR capacitors
- Designed for surface mounting on high density PC board
- RoHS compliance

Marking color: Black

Specifications

Items	Performance
Category Temperature Range	-55℃ ~ +105℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)	I = 0.01CV or 3 (μA) whichever is greater (after 2 minutes) Where, C = rated capacitance in μF, V = rated DC working voltage in V
Tanδ (at 120 Hz, 20℃)	Rated Voltage: 6.3 / 10 / 16 / 25 / 35 / 50 Tanδ (max): 0.28 / 0.24 / 0.20 / 0.16 / 0.14 / 0.12
Low Temperature Characteristics (at 120 Hz)	Impedance ratio shall not exceed the values given in the table below. Rated Voltage: 6.3 / 10 / 16 / 25 / 35 / 50 Impedance Ratio Z(-25℃)/Z(+20℃): 4 / 3 / 2 / 2 / 2 / 2 Impedance Ratio Z(-55℃)/Z(+20℃): 10 / 7 / 5 / 3 / 3 / 3
Endurance	Test Time: 1,000 Hrs Capacitance Change: Within ±25% of initial value Tanδ: Less than 200% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied for 1,000 hours at 105℃.
Shelf Life Test	Test time: 1,000 hours; other items are the same as those for the Endurance.
Ripple Current and Frequency Multipliers	Frequency(Hz): 50, 60 / 120 / 1k / 10k up Multiplier: 0.64 / 0.8 / 0.93 / 1.0

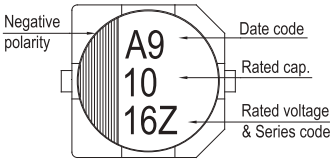
Diagram of Dimensions



Lead Spacing and Diameter Unit: mm

φD	L	A	B	C	W	P ± 0.2
4	5.3 ± 0.2	4.3	4.3	5.1	0.5 ~ 0.8	1.0
5	5.3 ± 0.2	5.3	5.3	5.9	0.5 ~ 0.8	1.5
6.3	5.3 ± 0.2	6.6	6.6	7.2	0.5 ~ 0.8	2.0
6.3	7.7 ± 0.3	6.6	6.6	7.2	0.5 ~ 0.8	2.0

Marking



Dimension: φD × L(mm)
Ripple Current: mA/rms at 100k Hz, 105℃
Impedance: Ω/ at 100k Hz, 20℃

Dimension and Permissible Ripple Current

Rated Volt. (Vdc) / Cap. (μF)	Contents	6.3V (0J)			10V (1A)			16V (1C)			25V (1E)			35V (1V)			50V (1H)		
		φD×L	Imp.	mA	φD×L	Imp.	mA	φD×L	Imp.	mA	φD×L	Imp.	mA	φD×L	Imp.	mA	φD×L	Imp.	mA
1.0	010																4×5.3	5.0	30
2.2	2R2																4×5.3	5.0	30
3.3	3R3																4×5.3	5.0	30
4.7	4R7										4×5.3	3.20	65	4×5.3	3.20	65	5×5.3	3.0	50
10	100				4×5.3	3.20	65	4×5.3	3.20	65	5×5.3	1.50	110	5×5.3	1.50	110	6.3×5.3	2.0	70
22	220	4×5.3	3.20	65	5×5.3	1.50	110	5×5.3	1.50	110	6.3×5.3	0.85	170	6.3×5.3	0.85	170	6.3×5.3	2.0	70
33	330	5×5.3	1.50	110	5×5.3	1.50	110	6.3×5.3	0.85	170	6.3×5.3	0.85	170	6.3×5.3	0.85	170	6.3×7.7	1.0	170
47	470	5×5.3	1.50	110	6.3×5.3	0.85	170	6.3×5.3	0.85	170	6.3×5.3	0.85	170	6.3×7.7	0.50	255			
100	101	6.3×5.3	0.85	170	6.3×5.3	0.85	170	6.3×5.3	0.85	170	6.3×7.7	0.50	255						
150	151	6.3×7.7	0.50	255	6.3×7.7	0.50	255	6.3×7.7	0.50	255									
220	221	6.3×7.7	0.50	255	6.3×7.7	0.50	255	6.3×7.7	0.50	255									

Part Numbering System

VEZ Series	10μF	±20%	16V	Carrier Tape		4φ×5.3L	Pb-free and PET coating case
VEZ	**100**	**M**	**1C**	**TR**	**-**	**0405**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Package Type	Terminal Type	Case size	Lead Wire and Coating Type

Note: For more details, please refer to “Part Numbering System (SMD Type)” on page 15.

VEH Series

Features

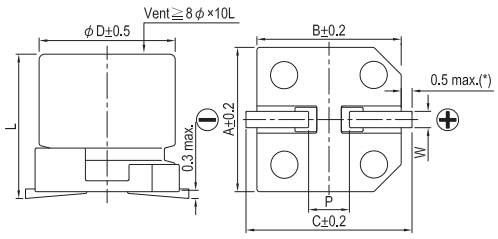
- 4φ ~ 10φ, 105℃, 2,000 hours assured
- Vertical chip type miniaturized
- Low impedance capacitors
- Designed for surface mounting on high density PC board
- RoHS compliance

Marking color: Black

Specifications

Items	Performance
Category Temperature Range	-55℃ ~ +105℃
Capacitance Tolerance	± 20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)	I = 0.01CV or 3 (μA) whichever is greater (after 2 minutes) Where, C = rated capacitance in μF, V = rated DC working voltage in V
Tanδ (at 120 Hz, 20℃)	Rated Voltage: 6.3 / 10 / 16 / 25 / 35 / 50 Tanδ (max): 0.30 / 0.26 / 0.22 / 0.16 / 0.13 / 0.13
Low Temperature Characteristics (at 120 Hz)	Impedance ratio shall not exceed the values given in the table below. Rated Voltage: 6.3 / 10 / 16 / 25 / 35 / 50 Impedance Ratio Z(-25℃)/Z(+20℃): 4 / 3 / 2 / 2 / 2 / 2 Impedance Ratio Z(-55℃)/Z(+20℃): 10 / 7 / 5 / 3 / 3 / 3
Endurance	Test Time: 2,000 Hrs Capacitance Change: Within ±25% of initial value for φD ≦ 6.3 mm; Within ±20% of initial value for φD ≧ 8 mm Tanδ: Less than 200% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied for 2,000 hours at 105℃.
Shelf Life Test	Test Time: 1,000 Hrs Capacitance Change: Within ±25% of initial value for φD ≦ 6.3 mm; Within ±20% of initial value for φD ≧ 8 mm Tanδ: Less than 200% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 105℃ without voltage applied.
Ripple Current and Frequency Multipliers	Frequency (Hz): 50, 60 / 120 / 1k / 10k up Multiplier: 0.64 / 0.8 / 0.93 / 1.0

Diagram of Dimensions



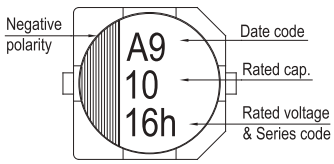
Lead Spacing and Diameter Unit: mm

φD	L	A	B	C	W	P ± 0.2
4	5.7 ± 0.3	4.3	4.3	5.1	0.5 ~ 0.8	1.0
5	5.7 ± 0.3	5.3	5.3	5.9	0.5 ~ 0.8	1.5
6.3	5.7 ± 0.3	6.6	6.6	7.2	0.5 ~ 0.8	2.0
8	10 ± 0.5	8.3	8.3	9.0	0.7 ~ 1.1	3.1
10	10 ± 0.5	10.3	10.3	11.0	0.7 ~ 1.3	4.7

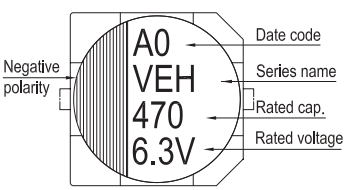
(*): For 4 ~ 6.3φ is 0.4 max.

Marking

φD ≦ 6.3mm



φD = 8 ~ 10 mm



SMD

SMD Aluminum Electrolytic Capacitors

VEH

Dimension: ϕD × L(mm)
Ripple Current: mA/rms at 100k Hz, 105℃
Impedance: Ω/ at 100k Hz, 20℃

Dimension and Permissible Ripple Current

Rated Volt. (V_{DC}) / Cap. (μF)	Contents	6.3V (0J)			10V (1A)			16V (1C)			25V (1E)			35V (1V)			50V (1H)		
		ϕD×L	Imp.	mA	ϕD×L	Imp.	mA	ϕD×L	Imp.	mA	ϕD×L	Imp.	mA	ϕD×L	Imp.	mA	ϕD×L	Imp.	mA
3.3	3R3																4×5.7	5.0	30
4.7	4R7										4×5.7	3.2	65	4×5.7	3.2	65	4×5.7	5.0	30
10	100							4×5.7	3.2	65	5×5.7	1.5	110	5×5.7	1.5	110	5×5.7	3.0	50
22	220				4×5.7	3.2	65	5×5.7	1.5	110	6.3×5.7	0.85	170	6.3×5.7	0.85	170	6.3×5.7	2.0	70
33	330	4×5.7	3.2	65	5×5.7	1.5	110	6.3×5.7	0.85	170	6.3×5.7	0.85	170	6.3×5.7	0.85	170	8×10	0.6	300
47	470	5×5.7	1.5	110	6.3×5.7	0.85	170	6.3×5.7	0.85	170	6.3×5.7	0.85	170	8×10	0.45	450	8×10	0.6	300
100	101	6.3×5.7	0.85	170	6.3×5.7	0.85	170	8×10	0.45	450	8×10	0.45	450	8×10	0.45	450	8×10	0.6	300
150	151	6.3×5.7	0.85	170	6.3×5.7	0.85	170	8×10	0.45	450	8×10	0.45	450	8×10	0.45	450	10×10	0.3	500
220	221	6.3×5.7	0.85	170	8×10	0.45	450	8×10	0.45	450	8×10 10×10	0.45 0.25	450 670	10×10	0.25	670			
330	331	8×10	0.45	450	8×10	0.45	450	8×10	0.45	450	10×10	0.25	670						
470	471	8×10	0.45	450	8×10	0.45	450	10×10	0.25	670									
820	821	10×10	0.25	670	10×10	0.25	670												
1,000	102	10×10	0.25	670															

Part Numbering System

VEH Series	470μF	±20%	6.3V	Carrier Tape		8ϕ×10L	Pb-free and PET coating case
VEH	**471**	**M**	**0J**	**TR**	**-**	**0810**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Package Type	Terminal Type	Case size	Lead Wire and Coating Type

Note: For more details, please refer to “Part Numbering System (SMD Type)” on page 15.

SMD

VZH Series

Features

- 4φ ~ 18φ, 105℃, 2,000 ~ 5,000 hours assured
- Large capacitance with ultra low impedance capacitors
- Designed for surface mounting on high density PC board
- RoHS compliance

Marking color: Black

Specifications

Items	Performance
Category Temperature Range	-55℃ ~ +105℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)	I = 0.01CV or 3 (μA) whichever is greater (after 2 minutes) Where, C = rated capacitance in μF, V = rated DC working voltage in V
Tanδ (at 120 Hz, 20℃)	When the capacitance exceeds 1,000μF, 0.02 shall be added every 1,000μF increase.

Rated Voltage	6.3	10	16	25	35	50	63	80	100
Tanδ (max)	0.30	0.26	0.22	0.16	0.13	0.10	0.08	0.08	0.07

Low Temperature Characteristics (at 120 Hz)

Impedance ratio shall not exceed the values given in the table below.

Rated Voltage		6.3	10	16	25	35	50	63	80	100
Impedance Ratio	Z(-25℃)/Z(+20℃)	4	3	2	2	2	2	2	2	2
	Z(-55℃)/Z(+20℃)	8	5	4	3	3	3	3	3	3

Endurance

Test Time	2,000 Hrs for φD ≦ 6.3mm & 8×6.5L & 10φ×7.7L; 5,000 Hrs for φD ≧ 8mm
Capacitance Change	Within ±30% of initial value
Tanδ	Less than 300% of specified value
Leakage Current	Within specified value

* The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied for 2,000 ~ 5,000 hours at 105℃.

Shelf Life Test

Test Time	1,000 Hrs
Capacitance Change	Within ±30% of initial value
Tanδ	Less than 300% of specified value
Leakage Current	Within specified value

* The above specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 105℃ without voltage applied.

Ripple Current and Frequency Multipliers

Frequency(Hz)	50, 60	120	1k	10k up
Multiplier	0.60	0.70	0.85	1.0

Diagram of Dimensions

Fig. 1

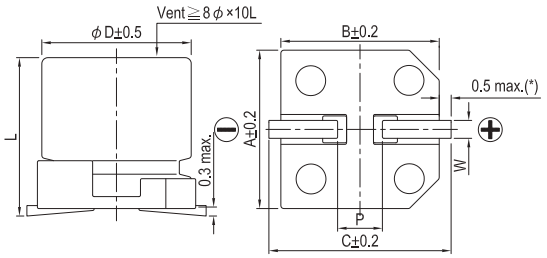
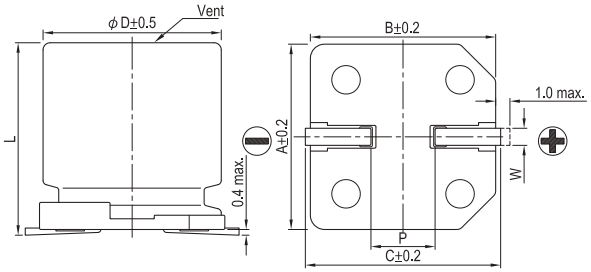


Fig. 2



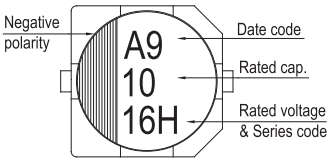
Lead Spacing and Diameter Unit: mm

φD	L	A	B	C	W	P ± 0.2	Fig. No.
4	5.7 ± 0.3	4.3	4.3	5.1	0.5 ~ 0.8	1.0	1
5	5.7 ± 0.3	5.3	5.3	5.9	0.5 ~ 0.8	1.5	1
6.3	5.7 ± 0.3	6.6	6.6	7.2	0.5 ~ 0.8	2.0	1
6.3	7.7 ± 0.3	6.6	6.6	7.2	0.5 ~ 0.8	2.0	1
8	6.5 ± 0.3	8.3	8.3	9.0	0.5 ~ 0.8	2.3	1
8	10 ± 0.5	8.3	8.3	9.0	0.7 ~ 1.1	3.1	1
10	7.7 ± 0.3	10.3	10.3	11.0	0.7 ~ 1.3	4.7	1
10	10 ± 0.5	10.3	10.3	11.0	0.7 ~ 1.3	4.7	1
12.5	13.5 ± 0.5	13.0	13.0	13.7	1.1 ~ 1.4	4.4	2
12.5	16 ± 0.5	13.0	13.0	13.7	1.1 ~ 1.4	4.4	2
16	16.5 ± 0.5	17.0	17.0	18.0	1.1 ~ 1.4	6.4	2
16	21.5 ± 0.5	17.0	17.0	18.0	1.1 ~ 1.4	6.4	2
18	16.5 ± 0.5	19.0	19.0	20.0	1.1 ~ 1.4	6.4	2
18	21.5 ± 0.5	19.0	19.0	20.0	1.1 ~ 1.4	6.4	2

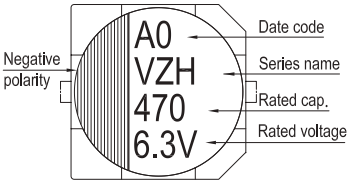
(*): For 4 ~ 6.3φ is 0.4 max.

Marking

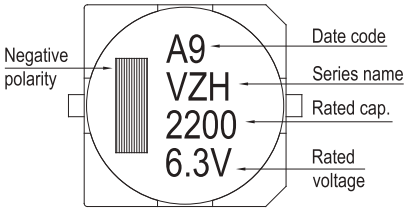
ϕD ≦ 6.3mm



ϕD = 8 ~ 10 mm



ϕD ≧ 12.5mm



Dimension: ϕD × L(mm)
Ripple Current: mA/rms at 100k Hz, 105℃
Impedance: Ω/ at 100k Hz, 20℃

Dimension and Permissible Ripple Current

Rated Volt. (VDC) / Cap. (μF)	Contents	6.3V (0J)			10V (1A)			16V (1C)			25V (1E)			35V (1V)			50V (1H)		
		ϕD×L	Imp.	mA	ϕD×L	Imp.	mA	ϕD×L	Imp.	mA	ϕD×L	Imp.	mA	ϕD×L	Imp.	mA	ϕD×L	Imp.	mA
1	010																4×5.7	2.9	60
2.2	2R2																4×5.7	2.9	60
3.3	3R3																4×5.7	2.9	60
4.7	4R7													4×5.7	1.35	80	5×5.7	1.52	85
10	100							4×5.7	1.35	80	4×5.7	1.35	80	5×5.7	0.80	150	6.3×5.7	0.88	165
22	220	4×5.7	1.35	80	4×5.7	1.35	80	5×5.7	0.80	150	5×5.7	0.80	150	6.3×5.7	0.44	230	6.3×5.7	0.88	165
33	330	4×5.7	1.35	80	5×5.7	0.80	150	6.3×5.7	0.44	230	6.3×5.7	0.44	230	6.3×5.7	0.44	230	6.3×7.7	0.68	185
47	470	5×5.7	0.80	150	6.3×5.7	0.44	230	6.3×5.7	0.44	230	6.3×5.7	0.44	230	6.3×5.7	0.44	230	6.3×7.7 8×6.5	0.68 0.68	185 185
68	680										6.3×5.7	0.44	230	8×6.5	0.36	280	8×10	0.34	369
100	101	6.3×5.7	0.44	230	6.3×5.7	0.44	230	6.3×5.7	0.44	230	6.3×7.7 8×6.5	0.36 0.36	280 280	8×10	0.17	450	8×10 10×10	0.34 0.18	369 553
150	151	6.3×5.7	0.44	230	6.3×5.7	0.44	230	6.3×7.7 8×6.5	0.36 0.36	280 280	8×10	0.17	450	8×10 10×7.7	0.17 0.17	450 450	10×10	0.18	553
220	221	6.3×5.7 6.3×7.7	0.44 0.36	230 280	6.3×7.7 8×6.5	0.36 0.36	280 280	6.3×7.7	0.36	280	8×10 10×7.7	0.17 0.17	450 450	8×10 10×10	0.17 0.09	450 670	12.5×13.5	0.12	650
330	331	8×6.5 8×10	0.36 0.17	280 450	8×10 10×7.7	0.17 0.17	450 450	8×10 10×7.7	0.17 0.17	450 450	8×10	0.17	450	10×10 12.5×13.5	0.090 0.070	670 820	12.5×13.5	0.12	650
470	471	8×10 10×7.7	0.17 0.17	450 450	8×10 10×7.7	0.17 0.17	450 450	8×10 10×10	0.17 0.09	450 670	10×10	0.09	670	12.5×16	0.060	950	16×16.5	0.073	1,000
680	681	8×10 10×7.7	0.17 0.17	450 450	10×10	0.09	670	10×10	0.09	670	12.5×13.5	0.070	820	12.5×16	0.060	950	16×16.5	0.073	1,000
1,000	102	8×10	0.17	450	10×10	0.09	670	12.5×13.5	0.070	820	12.5×16	0.060	950	16×16.5	0.054	1,260	16×16.5 18×16.5	0.073 0.066	1,000 1,500
1,500	152	10×10	0.09	670	12.5×13.5	0.070	820	12.5×16	0.060	950	16×16.5	0.054	1,260	18×16.5 16×21.5	0.048 0.038	1,500 1,630	18×21.5	0.05	1,620
2,200	222	12.5×13.5	0.070	820	12.5×16	0.060	950	16×16.5	0.054	1,260	16×16.5	0.054	1,260	18×21.5	0.038	1,750			
3,300	332	12.5×16	0.060	950	16×16.5	0.054	1,260	16×16.5 16×21.5	0.054 0.038	1,260 1,630	18×16.5 16×21.5 18×21.5	0.048 0.038 0.038	1,500 1,630 1,750						
4,700	472	16×16.5	0.054	1,260	16×16.5	0.054	1,260	18×16.5 16×21.5	0.048 0.038	1,500 1,630									
6,800	682	18×16.5 16×21.5	0.048 0.038	1,500 1,630	18×16.5 16×21.5	0.048 0.038	1,500 1,630												
8,200	822	18×16.5 16×21.5	0.048 0.038	1,500 1,630	18×21.5	0.038	1,750												

SMD

Dimension: ϕD × L(mm)
Ripple Current: mA/rms at 100k Hz, 105℃
Impedance: Ω/ at 100k Hz, 20℃

Dimension and Permissible Ripple Current

Rated Volt. (V_{DC}) / Cap. (μF)	Contents	63V (1J)			80V (1K)			100V (2A)		
		ϕD×L	Imp.	mA	ϕD×L	Imp.	mA	ϕD×L	Imp.	mA
4.7	4R7	5×5.7	1.90	70						
10	100	6.3×5.7	1.20	130						
22	220	6.3×7.7	0.90	150	8×10	1.3	130	8×10	1.3	130
33	330	8×10	0.50	280	8×10	1.3	130	10×10	0.7	200
47	470	8×10	0.50	280	10×10	0.7	200	10×10	0.7	200
100	101	10×10	0.25	450	10×10	0.7	200	12.5×13.5	0.32	450
150	151	12.5×13.5	0.15	700	12.5×13.5	0.32	450	16×16.5	0.17	650
220	221	12.5×13.5	0.15	700	16×16.5	0.17	650	16×16.5 18×21.5	0.17 0.15	650 950
330	331	16×16.5	0.082	900	16×16.5	0.17	650	18×16.5 16×21.5	0.15 0.15	850 900
470	471	16×16.5	0.082	900	16×21.5	0.15	900	18×21.5	0.15	950
680	681	18×16.5 16×21.5	0.080 0.080	1,150 1,150	18×21.5	0.15	950			
1,000	102	18×21.5	0.06	1,250						

Part Numbering System

VZH Series	470μF	±20%	6.3V	Carrier Tape		8ϕ×10L	Pb-free and PET coating case
VZH	**471**	**M**	**0J**	**TR**	**-**	**0810**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Package Type	Terminal Type	Case size	Lead Wire and Coating Type

Note: For more details, please refer to “Part Numbering System (SMD Type)” on page 15.

VZR Series

Features

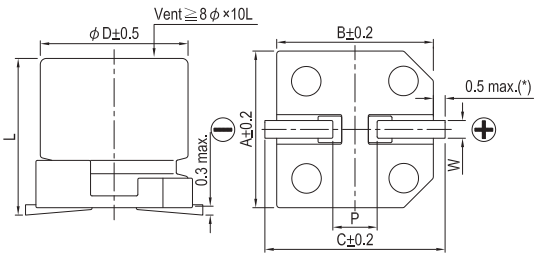
- 5φ ~ 10φ, 105℃, 7,000 hours assured
- Low Impedance temperature range up to +105°C
- For automobile modules and high temperature applications
- RoHS Compliance

Marking color: Black

Specifications

Items	Performance
Category Temperature Range	-25℃ ~ +105℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)	I = 0.01CV or 3 (μA) whichever is greater (after 2 minutes) Where, C = rated capacitance in μF, V = rated DC working voltage in V
Tanδ (at 120 Hz, 20℃)	Rated Voltage: 6.3 / 10 / 16 / 25 / 35 / 50 Tanδ (max): 0.32 / 0.28 / 0.26 / 0.16 / 0.14 / 0.14
Low Temperature Characteristics (at 120 Hz)	Impedance ratio shall not exceed the values given in the table below. Rated Voltage: 6.3 / 10 / 16 / 25 / 35 / 50 Impedance Ratio Z(-25℃)/Z(+20℃): 4 / 3 / 2 / 2 / 2 / 2
Endurance	Test Time: 7,000 Hrs Capacitance Change: Within ±30% of initial value Tanδ: Less than 300% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied for 7,000 hours at 105℃.
Shelf Life Test	Test Time: 1,000 Hrs Capacitance Change: Within ±30% of initial value Tanδ: Less than 300% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 105℃ without voltage applied.
Ripple Current and Frequency Multipliers	Frequency(Hz): 50 / 120 / 1k / 10k up Multiplier: 0.35 / 0.50 / 0.83 / 1.0

Diagram of Dimensions



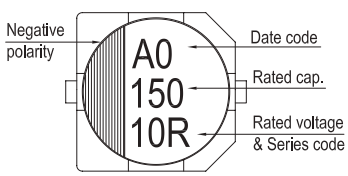
Lead Spacing and Diameter Unit: mm

φD	L	A	B	C	W	P ± 0.2
5	7 ± 0.3	5.3	5.3	5.9	0.5 ~ 0.8	1.5
6.3	7 ± 0.3	6.6	6.6	7.2	0.5 ~ 0.8	2.0
6.3	8.7 ± 0.5	6.6	6.6	7.2	0.5 ~ 0.8	2.0
8	10 ± 0.5	8.3	8.3	9.0	0.7 ~ 1.1	3.1
10	10 ± 0.5	10.3	10.3	11.0	0.7 ~ 1.3	4.7

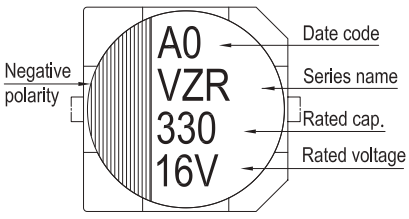
(*): For 5 ~ 6.3φ is 0.4 max.

Marking

φD = 5 ~ 6.3 mm



φD = 8 ~ 10 mm



Dimension: ϕD × L(mm)
Ripple Current: mA/rms at 100k Hz, 105℃
Impedance: Ω/ at 100k Hz, 20℃

Dimension and Permissible Ripple Current

Rated Volt. (V_{DC}) / Cap. (μF)	Contents	6.3V (0J)			10V (1A)			16V (1C)			25V (1E)			35V (1V)			50V (1H)		
		ϕD×L	Imp.	mA	ϕD×L	Imp.	mA	ϕD×L	Imp.	mA	ϕD×L	Imp.	mA	ϕD×L	Imp.	mA	ϕD×L	Imp.	mA
10	100													5×7	2.2	95			
22	220							5×7	2.2	95	5×7	2.2	95	5×7	2.2	95			
33	330				5×7	2.2	95				6.3×7	1.1	140	6.3×8.7	1.0	230			
47	470	5×7	2.2	95				6.3×7	1.1	140	6.3×7	1.1	140	6.3×8.7	1.0	230	8×10	0.53	350
100	101	6.3×7	1.1	140				6.3×7	1.1	140	6.3×8.7	1.0	230				8×10	0.53	350
150	151				6.3×7	1.1	140	6.3×8.7	1.0	230									
220	221	6.3×8.7	1.0	230				6.3×8.7	1.0	230	8×10	0.22	600	8×10	0.22	600	10×10	0.35	670
330	331	6.3×8.7	1.0	230				8×10	0.22	600	8×10	0.22	600	10×10	0.16	850			
470	471	8×10	0.22	600				8×10	0.22	600	10×10	0.16	850						

Part Numbering System

VZR Series	470μF	±20%	6.3V	Carrier Tape		8ϕ×10L	Pb-free and PET coating case
VZR	**471**	**M**	**0J**	**TR**	**-**	**0810**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Package Type	Terminal Type	Case size	Lead Wire and Coating Type

Note: For more details, please refer to “Part Numbering System (SMD Type)” on page 15.

VZL Series

Features

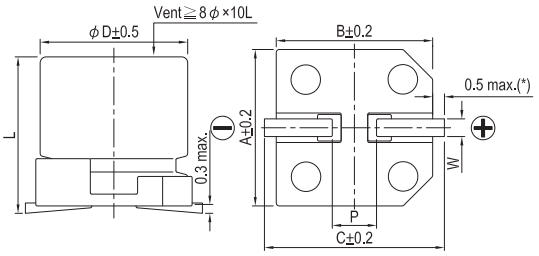
- 4φ ~ 10φ, 105℃, 2,000 hours assured
- Large capacitance with ultra low impedance capacitors
- Designed for surface mounting on high density PC board
- RoHS compliance

Marking color: Black

Specifications

Items	Performance
Category Temperature Range	-55℃ ~ +105℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)	I = 0.01CV or 3 (μA) whichever is greater (after 2 minutes) Where, C = rated capacitance in μF, V = rated DC working voltage in V
Tanδ (at 120 Hz, 20℃)	Rated Voltage: 6.3 / 10 / 16 / 25 / 35 / 50 Tanδ (max): 0.26 / 0.19 / 0.16 / 0.14 / 0.12 / 0.10
Low Temperature Characteristics (at 120 Hz)	Impedance ratio shall not exceed the values given in the table below. Rated Voltage: 6.3 / 10 / 16 / 25 / 35 / 50 Impedance Ratio Z(-25℃)/Z(+20℃): 4 / 3 / 2 / 2 / 2 / 2 Impedance Ratio Z(-55℃)/Z(+20℃): 8 / 5 / 4 / 3 / 3 / 3
Endurance	Test Time: 2,000 Hrs Capacitance Change: Within ±30% of initial value Tanδ: Less than 300% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied for 2,000 hours at 105℃.
Shelf Life Test	Test time: 1,000 hours; other items are the same as those for the Endurance.
Ripple Current and Frequency Multipliers	Frequency(Hz): 50, 60 / 120 / 1k / 10k up Multiplier: 0.60 / 0.70 / 0.85 / 1.0

Diagram of Dimensions



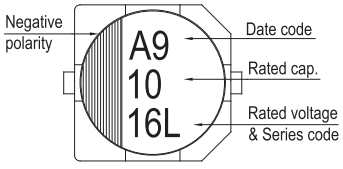
Lead Spacing and Diameter Unit: mm

φD	L	A	B	C	W	P ± 0.2
4	5.8 ± 0.3	4.3	4.3	5.1	0.5 ~ 0.8	1.0
5	5.8 ± 0.3	5.3	5.3	5.9	0.5 ~ 0.8	1.5
6.3	5.8 ± 0.3	6.6	6.6	7.2	0.5 ~ 0.8	2.0
6.3	7.7 ± 0.3	6.6	6.6	7.2	0.5 ~ 0.8	2.0
8	6.5 ± 0.3	8.3	8.3	9.0	0.5 ~ 0.8	2.3
8	10 ± 0.5	8.3	8.3	9.0	0.7 ~ 1.1	3.1
10	10 ± 0.5	10.3	10.3	11.0	0.7 ~ 1.3	4.7

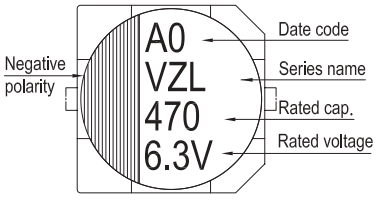
(*): For 4 ~ 6.3φ is 0.4 max.

Marking

φD ≦ 6.3 mm



φD = 8 ~ 10 mm



SMD

Dimension: ϕD × L(mm)
Ripple Current: mA/rms at 100k Hz, 105℃
Impedance: Ω/ at 100k Hz, 20℃

Dimension and Permissible Ripple Current

Rated Volt. (V_{DC}) / Cap. (μF)	Contents	6.3V (0J)			10V (1A)			16V (1C)			25V (1E)			35V (1V)			50V (1H)		
		ϕD×L	Imp.	mA	ϕD×L	Imp.	mA	ϕD×L	Imp.	mA	ϕD×L	Imp.	mA	ϕD×L	Imp.	mA	ϕD×L	Imp.	mA
4.7	4R7													4×5.8	1.35	90			
10	100							4×5.8	1.35	90	4×5.8	1.35	90	5×5.8	0.70	160			
22	220	4×5.8	1.35	90	4×5.8	1.35	90	5×5.8	0.70	160	5×5.8	0.70	160	6.3×5.8	0.36	240			
33	330	4×5.8	1.35	90	5×5.8	0.70	160	6.3×5.8	0.36	240	6.3×5.8	0.36	240	6.3×5.8	0.36	240			
47	470	5×5.8	0.70	160	6.3×5.8	0.36	240	6.3×5.8	0.36	240	6.3×5.8	0.36	240	6.3×5.8	0.36	240			
68	680	6.3×5.8	0.36	240	6.3×5.8	0.36	240	6.3×5.8	0.36	240	6.3×5.8	0.36	240	6.3×7.7 8×6.5	0.32 0.26	290 300			
100	101	6.3×5.8	0.36	240	6.3×5.8	0.36	240	6.3×5.8	0.36	240	6.3×7.7 8×6.5	0.32 0.26	290 300	6.3×7.7 8×10	0.32 0.16	290 600	8×10	0.34	350
150	151	6.3×5.8	0.36	240	6.3×5.8	0.36	240	6.3×7.7	0.32	290	8×10	0.16	600	8×10	0.16	600			
220	221	6.3×5.8	0.36	240	6.3×7.7 8×6.5	0.32 0.26	290 300	6.3×7.7 8×6.5	0.32 0.26	290 300	8×10	0.16	600	10×10	0.08	850	10×10	0.18	670
330	331	6.3×7.7 8×6.5 8×10	0.32 0.26 0.16	290 300 600	8×10	0.16	600	8×10	0.16	600	8×10	0.16	600	10×10	0.08	850			
470	471	8×10	0.16	600	8×10	0.16	600	8×10 10×10	0.16 0.08	600 850	10×10	0.08	850						
680	681	8×10	0.16	600	10×10	0.08	850	10×10	0.08	850									
1,000	102	8×10	0.16	600	10×10	0.08	850												
1,500	152	10×10	0.08	850															

Part Numbering System

VZL Series	470μF	±20%	6.3V	Carrier Tape		8ϕ×10L	Pb-free and PET coating case
VZL	**471**	**M**	**0J**	**TR**	**-**	**0810**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Package Type	Terminal Type	Case size	Lead Wire and Coating Type

Note: For more details, please refer to “Part Numbering System (SMD Type)” on page 15.

VZS Series

Features

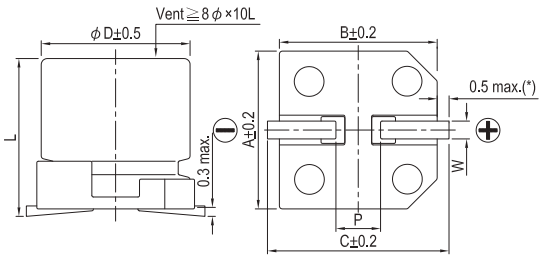
- 5φ ~ 10φ, 105℃, 2,000 hours assured
- Low impedance 30 ~ 50% less than VZH series
- Large capacitance with ultra low impedance capacitors
- Designed for surface mounting on high density PC board
- RoHS compliance

Marking color: Black

Specifications

Items	Performance
Category Temperature Range	-55℃ ~ +105℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)	I = 0.01CV or 3 (μA) whichever is greater (after 2 minutes) Where, C = rated capacitance in μF, V = rated DC working voltage in V
Tanδ (at 120 Hz, 20℃)	Rated Voltage: 6.3 / 10 / 16 / 25 / 35 / 50 Tanδ (max): 0.30 / 0.26 / 0.22 / 0.16 / 0.13 / 0.10 When the capacitance exceeds 1,000μF, 0.02 shall be added every 1,000μF increase.
Low Temperature Characteristics (at 120 Hz)	Impedance ratio shall not exceed the values given in the table below. Rated Voltage: 6.3 / 10 / 16 / 25 / 35 / 50 Impedance Ratio Z(-25℃)/Z(+20℃): 4 / 3 / 2 / 2 / 2 / 2 Impedance Ratio Z(-55℃)/Z(+20℃): 8 / 5 / 4 / 3 / 3 / 3
Endurance	Test Time: 2,000 Hrs Capacitance Change: Within ±30% of initial value Tanδ: Less than 300% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied for 2,000 hours at 105℃.
Shelf Life Test	Test time: 1,000 hours; other items are the same as those for the Endurance.
Ripple Current and Frequency Multipliers	Frequency(Hz): 50, 60 / 120 / 1k / 10k up Multiplier: 0.60 / 0.70 / 0.85 / 1.0

Diagram of Dimensions



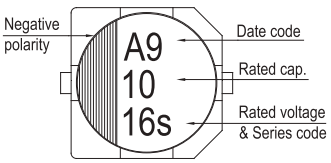
Lead Spacing and Diameter Unit: mm

φD	L	A	B	C	W	P ± 0.2
5	5.8 ± 0.3	5.3	5.3	5.9	0.5 ~ 0.8	1.5
6.3	5.8 ± 0.3	6.6	6.6	7.2	0.5 ~ 0.8	2.0
8	10 ± 0.5	8.3	8.3	9.0	0.7 ~ 1.1	3.1
10	10 ± 0.5	10.3	10.3	11	0.7 ~ 1.3	4.7
10	12.5 ± 0.5	10.3	10.3	11	0.7 ~ 1.3	4.7

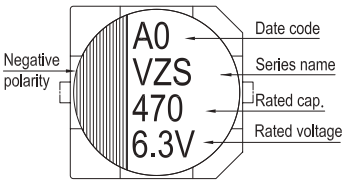
(*): For 5 ~ 6.3φ is 0.4 max.

Marking

φD ≦ 6.3mm



φD = 8 ~ 10 mm



Dimension: ϕD × L(mm)
Ripple Current: mA/rms at 100k Hz, 105℃
Impedance: Ω/ at 100k Hz, 20℃

Dimension and Permissible Ripple Current

Rated Volt. (V_{DC}) / Cap. (μF)	Contents	6.3V (0J)			10V (1A)			16V (1C)			25V (1E)			35V (1V)			50V (1H)		
		ϕD×L	Imp.	mA	ϕD×L	Imp.	mA	ϕD×L	Imp.	mA	ϕD×L	Imp.	mA	ϕD×L	Imp.	mA	ϕD×L	Imp.	mA
22	220							5×5.8	0.36	240	5×5.8	0.36	240	5×5.8	0.36	240			
33	330				5×5.8	0.36	240				5×5.8 6.3×5.8	0.36 0.26	240 300	5×5.8 6.3×5.8	0.36 0.26	240 300			
47	470	5×5.8	0.36	240				5×5.8 6.3×5.8	0.36 0.26	240 300	6.3×5.8	0.26	300	6.3×5.8	0.26	300			
68	680							6.3×5.8	0.26	300	6.3×5.8	0.26	300	6.3×5.8	0.26	300			
100	101	5×5.8 6.3×5.8	0.36 0.26	240 300	5×5.8	0.36	240	6.3×5.8	0.26	300	6.3×5.8	0.26	300	8×10	0.08	850	8×10	0.18	670
150	151				6.3×5.8	0.26	300				8×10	0.08	850	8×10	0.08	850			
220	221	6.3×5.8	0.26	300	6.3×5.8	0.26	300	8×10	0.08	850	8×10	0.08	850				10×10	0.15	900
330	331				8×10	0.08	850	8×10	0.08	850				10×10	0.06	1,190			
470	471	8×10	0.08	850	8×10	0.08	850	8×10	0.08	850	10×10	0.06	1,190	10×12.5	0.06	1,190			
680	681	8×10	0.08	850	8×10	0.08	850	10×10	0.06	1,190	10×12.5	0.06	1,190						
1,000	102				10×10	0.06	1,190	10×10	0.06	1,190									
1,500	152	10×10	0.06	1,190	10×12.5	0.06	1,190												
2,200	222	10×12.5	0.06	1,190															

Part Numbering System

VZS Series	470μF	±20%	6.3V	Carrier Tape		8ϕ×10L	Pb-free and PET coating case
VZS	**471**	**M**	**0J**	**TR**	**-**	**0810**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Package Type	Terminal Type	Case size	Lead Wire and Coating Type

Note: For more details, please refer to “Part Numbering System (SMD Type)” on page 15.

VZT/VZU Series

FeaturesU

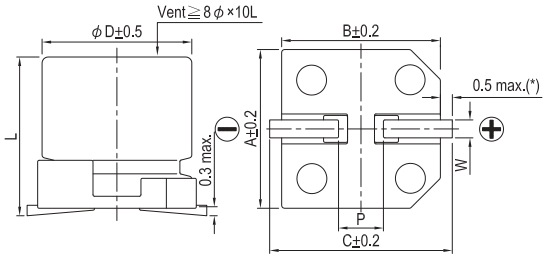
- 4φ ~ 10φ, 105℃, 2,000 ~ 5,000 hours assured
- Capacitance more than VZS series
- Designed for surface mounting on high density PC board
- RoHS compliance

Marking color: Black

Specifications

Items	Performance
Category Temperature Range	-55℃ ~ +105℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)	I = 0.01CV or 3 (μA) whichever is greater (after 2 minutes) Where, C = rated capacitance in μF, V = rated DC working voltage in V
Tanδ (at 120 Hz, 20℃)	Rated Voltage: 6.3 / 10 / 16 / 25 / 35 / 50 Tanδ (max): 0.26 / 0.19 / 0.16 / 0.14 / 0.12 / 0.10 When the capacitance exceeds 1,000μF, 0.02 shall be added every 1,000μF increase.
Low Temperature Characteristics (at 120 Hz)	Impedance ratio shall not exceed the values given in the table below. Rated Voltage: 6.3 / 10 / 16 / 25 / 35 / 50 Impedance Ratio Z(-25℃)/Z(+20℃): 4 / 3 / 2 / 2 / 2 / 2 Impedance Ratio Z(-55℃)/Z(+20℃): 8 / 5 / 4 / 3 / 3 / 3
Endurance of VZT Series	Test Time: 2,000 Hrs Capacitance Change: Within ±30% of initial value Tanδ: Less than 200% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied for 2,000 hours at 105℃.
Endurance of VZU Series	Test Time: 3,000 Hrs for voltage = 6.3 V; 5,000 Hrs for voltage ≧ 10 V Capacitance Change: Within ±35% of initial value Tanδ: Less than 300% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied for 3,000 ~ 5,000 hours at 105℃.
Shelf Life Test	Test time: 1,000 hours; other items are the same as those for the Endurance.
Ripple Current and Frequency Multipliers	Frequency (Hz) / Cap. (μF): 50, 60 / 120 / 1k / 10k up ≦ 470: 0.50 / 0.65 / 0.85 / 1.00 470 < C ≦ 2,200: 0.55 / 0.70 / 0.90 / 1.00

Diagram of Dimensions



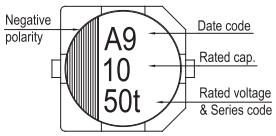
Lead Spacing and Diameter Unit: mm

φD	L	A	B	C	W	P ± 0.2
4	5.8 ± 0.3	4.3	4.3	5.1	0.5 ~ 0.8	1.0
5	5.8 ± 0.3	5.3	5.3	5.9	0.5 ~ 0.8	1.5
6.3	5.8 ± 0.3	6.6	6.6	7.2	0.5 ~ 0.8	2.0
6.3	7.7 ± 0.3	6.6	6.6	7.2	0.5 ~ 0.8	2.0
8	10 ± 0.5	8.3	8.3	9.0	0.7 ~ 1.1	3.1
10	10 ± 0.5	10.3	10.3	11	0.7 ~ 1.3	4.7

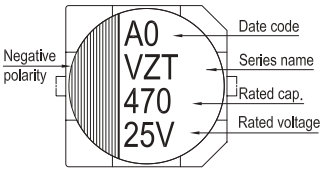
(*): For 4 ~ 6.3φ is 0.4 max.

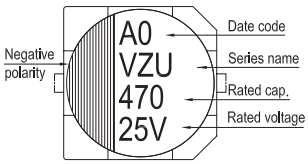
Marking

φD ≦ 6.3mm



φD = 8 ~ 10 mm





Dimension: ϕD × L(mm)
Ripple Current: mA/rms at 100k Hz, 105℃
Impedance: Ω/ at 100k Hz, 20℃

Dimension and Permissible Ripple Current

Rated Volt. (V_{DC}) / Cap. (μF)	Contents	6.3V (0J)			10V (1A)			16V (1C)			25V (1E)			35V (1V)			50V (1H)		
		ϕD×L	Imp.	mA	ϕD×L	Imp.	mA	ϕD×L	Imp.	mA	ϕD×L	Imp.	mA	ϕD×L	Imp.	mA	ϕD×L	Imp.	mA
10	100																4×5.8 5×5.8	2.30 0.88	85 165
22	220										4×5.8	0.85	160	4×5.8	0.85	160	5×5.8	0.88	165
33	330										4×5.8	0.85	160	5×5.8	0.36	240			
47	470							4×5.8	0.85	160	5×5.8	0.36	240	5×5.8	0.36	240	6.3×5.8	0.68	195
68	680				4×5.8	0.85	160	5×5.8	0.36	240	5×5.8	0.36	240	6.3×5.8	0.26	300			
100	101	4×5.8	0.85	160				5×5.8	0.36	240	6.3×5.8	0.26	300	6.3×5.8	0.26	300	6.3×7.7	0.34	350
150	151				5×5.8	0.36	240	6.3×5.8	0.26	300	6.3×7.7	0.16	600	6.3×7.7	0.16	600			
220	221	5×5.8	0.36	240	6.3×5.8	0.26	300	6.3×5.8	0.26	300	6.3×7.7	0.16	600				8×10*	0.18	670
330	331	6.3×5.8	0.26	300	6.3×7.7	0.16	600	6.3×7.7	0.16	600				8×10*	0.08	850	10×10*	0.12	900
470	471	6.3×7.7	0.16	600	6.3×7.7	0.16	600				8×10*	0.08	850						
560	561													10×10*	0.06	1,190			
680	681	6.3×7.7	0.16	600				8×10*	0.08	850									
820	821										10×10*	0.06	1,190						
1,000	102				8×10*	0.08	850	10×10*	0.06	1,190									
1,500	152	8×10*	0.08	850	10×10*	0.06	1,190												
2,200	222	10×10*	0.06	1,190															

Note: For the case sizes with the mark of " * ", the endurance requirements of VZU series are available.

Part Numbering System

VZT Series	1500 μF	±20%	6.3V	Carrier Tape		8ϕ×10L	Pb-free and PET coating case
VZT	**152**	**M**	**0J**	**TR**	**-**	**0810**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Package Type	Terminal Type	Case size	Lead Wire and Coating Type

Note: 1. If the life time of product was required 5,000 hours, the series name is VZU.
2. For more details, please refer to “Part Numbering System (SMD Type)” on page 15.

SMD

VUA Series

Features

- 6.3φ ~ 18φ, 125℃, 1,000 ~ 2,000 hours assured
- Chip type high temperature range, for +125℃ use
- For automobile modules and other high temperature applications
- RoHS compliance

Marking color: Black

Specifications

Items	Performance
Category Temperature Range	-40℃ ~ +125℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)	I = 0.03CV or 4 (μA) whichever is greater (after 1 minutes) Where, C = rated capacitance in μF, V = rated DC working voltage in V
Tanδ (at 120 Hz, 20℃)	Rated Voltage: 10 / 16 / 25 / 35 / 50 / 63 Tanδ (max): 0.32 / 0.24 / 0.21 / 0.18 / 0.15 / 0.15 When the capacitance exceeds 1,000μF, 0.02 shall be added every 1,000μF increase.
Low Temperature Characteristics (at 120 Hz)	Impedance ratio shall not exceed the values given in the table below. Rated Voltage: 10 / 16 / 25 / 35 / 50 / 63 Impedance Ratio Z(-25℃)/Z(+20℃): 6 / 5 / 4 / 3 / 3 / 3 Impedance Ratio Z(-40℃)/Z(+20℃): 12 / 8 / 6 / 4 / 4 / 4
Endurance	Test Time: 1,000 Hrs for φD ≦ 8 × 6.5mm; 2,000 Hrs for φD ≧ 8 × 10mm Capacitance Change: Within ±30% of initial value Tanδ: Less than 300% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied for 1,000 / 2,000 hours at 125℃.
Shelf Life Test	Test Time: 1,000 Hrs Capacitance Change: Within ±30% of initial value Tanδ: Less than 300% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 125℃ without voltage applied.
Ripple Current and Frequency Multipliers	Cap.(μF) \ Freq.(Hz): 50 / 120 / 1k / 10k up ≦ 330: 0.80 / 1.0 / 1.25 / 1.40 330 < C ≦ 4,700: 0.85 / 1.0 / 1.20 / 1.30

Diagram of Dimensions

Fig. 1

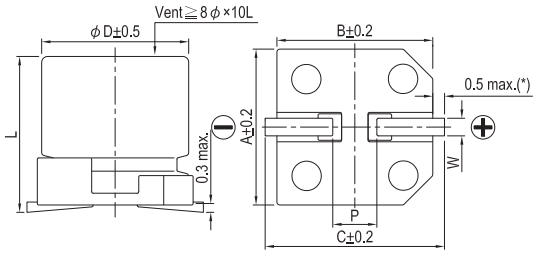
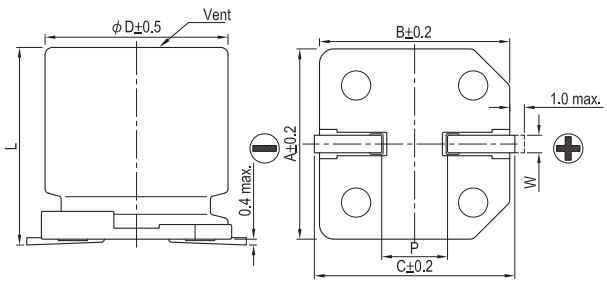


Fig. 2



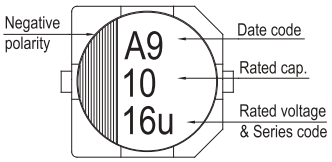
Lead Spacing and Diameter Unit: mm

φD	L	A	B	C	W	P ± 0.2	Fig. No.
6.3	5.7 ± 0.3	6.6	6.6	7.2	0.5 ~ 0.8	2.0	1
6.3	7.7 ± 0.3	6.6	6.6	7.2	0.5 ~ 0.8	2.0	1
8	6.5 ± 0.3	8.3	8.3	9.0	0.5 ~ 0.8	2.3	1
8	10 ± 0.5	8.3	8.3	9.0	0.7 ~ 1.1	3.1	1
10	10 ± 0.5	10.3	10.3	11.0	0.7 ~ 1.3	4.7	1
12.5	13.5 ± 0.5	13.0	13.0	13.7	1.1 ~ 1.4	4.4	2
12.5	16 ± 0.5	13.0	13.0	13.7	1.1 ~ 1.4	4.4	2
16	16.5 ± 0.5	17.0	17.0	18.0	1.1 ~ 1.4	6.4	2
18	16.5 ± 0.5	19.0	19.0	20.0	1.1 ~ 1.4	6.4	2

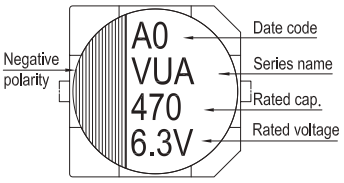
(*): For 6.3φ is 0.4 max.

Marking

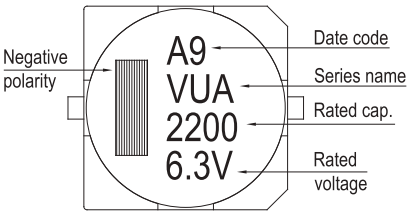
ϕD = 6.3 mm



ϕD = 8 ~ 10 mm



ϕD ≧ 12.5mm



Dimension and Permissible Ripple Current

Dimension: ϕD × L(mm)

Ripple Current: mA/rms at 120 Hz, 125℃

Rated Volt. (V_{DC}) / Cap. (μF)	Contents	10V (1A)		16V (1C)		25V (1E)		35V (1V)		50V (1H)		63V (1J)	
		ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA
10	100											8×6.5	60
22	220							6.3×5.7	50	8×6.5	75	8×10	100
33	330			6.3×5.7	50	6.3×5.7	50	6.3×7.7	70	8×10	130	10×10	150
47	470			6.3×7.7	70	6.3×7.7	70	8×6.5	75	8×10	130	10×10	150
68	680	6.3×5.7	50	8×6.5	75	8×6.5	75	8×10	130	10×10	180	10×10	150
100	101	8×6.5	75	8×6.5	75	8×10	130	10×10	180	12.5×13.5	357	12.5×13.5	300
220	221	8×10	130	10×10	180	10×10	180	12.5×13.5	357	12.5×16	400	16×16.5	600
330	331	8×10	130	12.5×13.5	480	12.5×13.5	480	16×16.5	650	16×16.5	650	16×16.5	600
470	471	12.5×13.5	480	12.5×13.5	480	12.5×13.5	480	16×16.5	650	16×16.5	650	18×16.5	800
680	681	12.5×13.5	480	12.5×13.5	480	12.5×16	585	16×16.5	650	18×16.5	855		
1,000	102	12.5×16	585	12.5×16	585	16×16.5	650	18×16.5	855				
1,500	152	12.5×16	585	16×16.5	650	18×16.5	855						
2,200	222	16×16.5	650	18×16.5	855								
3,300	332	18×16.5	855										
4,700	472	18×16.5	855										

Part Numbering System

VUA Series	33μF	±20%	16V	Carrier Tape		6.3ϕ×5.7L	Pb-free and PET coating case
VUA	**330**	**M**	**1C**	**TR**	**-**	**0606**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Package Type	Terminal Type	Case size	Lead Wire and Coating Type

Note: For more details, please refer to “Part Numbering System (SMD Type)” on page 15.

VUP Series

Features

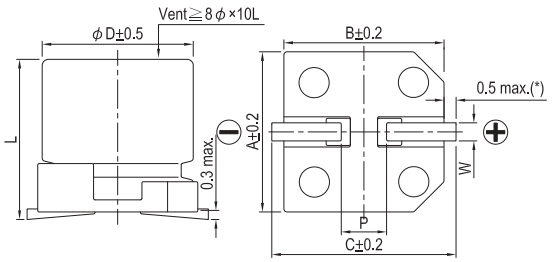
- 6.3φ ~ 10φ, 125℃, 2,000 ~ 3,000 hours assured
- Low impedance capacitors
- Chip type high temperature range, for +125℃ use
- For automobile modules and other high temperature applications
- RoHS compliance

Marking color: Black

Specifications

Items	Performance
Category Temperature Range	-40℃ ~ +125℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)	I = 0.01CV or 3(μA) whichever is greater (after 2 minutes) Where, C = rated capacitance in μF, V = rated DC working voltage in V
Tanδ (at 120 Hz, 20℃)	Rated Voltage: 10 / 16 / 25 / 35 Tanδ (max): 0.30 / 0.23 / 0.18 / 0.16
Low Temperature Characteristics (at 120 Hz)	Impedance ratio shall not exceed the values given in the table below. Rated Voltage: 10 / 16 / 25 / 35 Impedance Ratio Z(-40℃)/Z(+20℃): 12 / 8 / 6 / 4
Endurance	Test Time: 2,000 Hrs for φD = 6.3 mm; 3,000 Hrs for φD ≧ 8 mm Capacitance Change: Within ±30% of initial value Tanδ: Less than 300% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied for 2,000 ~ 3,000 hours at 125℃.
Shelf Life Test	Test Time: 1,000 Hrs Capacitance Change: Within ±30% of initial value Tanδ: Less than 300% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 125℃ without voltage applied.
Ripple Current and Frequency Multipliers	Frequency (Hz): 50 / 120 / 300 / 1k / 10k up Multiplier: 0.35 / 0.50 / 0.64 / 0.83 / 1.0

Diagram of Dimensions



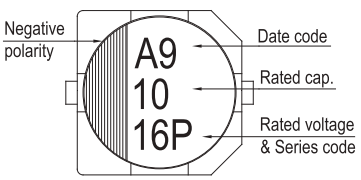
Lead Spacing and Diameter Unit: mm

φD	L	A	B	C	W	P ± 0.2
6.3	7.7 ± 0.3	6.6	6.6	7.2	0.5 ~ 0.8	2.0
8	10 ± 0.5	8.3	8.3	9.0	0.7 ~ 1.1	3.1
10	10 ± 0.5	10.3	10.3	11.0	0.7 ~ 1.3	4.7

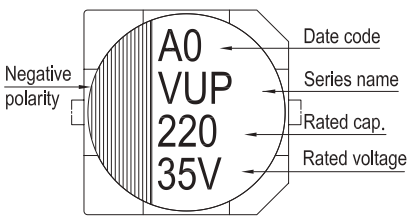
(*): For 6.3φ is 0.4 max.

Marking

φD = 6.3 mm



φD = 8 ~ 10 mm



Dimension: ϕD × L(mm)
Ripple Current: mA/rms at 100k Hz, 125℃
Impedance: Ω/ at 100k Hz, 20℃

Dimension and Permissible Ripple Current

Rated Volt. (V_{DC}) / Cap. (μF)	Contents	10V (1A)			16V (1C)			25V (1E)			35V (1V)		
		ϕD×L	Imp.	mA	ϕD×L	Imp.	mA	ϕD×L	Imp.	mA	ϕD×L	Imp.	mA
33	330										6.3×7.7	0.5	197
47	470										6.3×7.7 8×10	0.5 0.2	197 270
100	101				6.3×7.7 8×10	0.5 0.2	197 270	6.3×7.7 8×10	0.5 0.2	197 270	8×10	0.2	270
220	221	8×10	0.2	270	8×10	0.2	270	8×10 10×10	0.2 0.15	270 500	10×10	0.15	500
330	331	8×10 10×10	0.2 0.15	270 500	10×10	0.15	500	10×10	0.15	500			
470	471	10×10	0.15	500	10×10	0.15	500						

Part Numbering System

VUP series	100μF	±20%	16V	Carrier Tape		6.3ϕ×7.7L	Pb-free and PET coating case
VUP	**101**	**M**	**1C**	**TR**	**-**	**0607**	
Series name	Capacitance	Capacitance Tolerance	Rated Voltage	Package Type	Terminal Type	Case size	Lead Wire and Coating Type

Note: For more details, please refer to “Part Numbering System (SMD Type)” on page 15.

VUX Series

Features

- 8φ ~ 18φ, 135℃, 2,000 hours assured
- Chip type, high temperature range, for +135°C use
- For automobile modules and high temperature applications
- RoHS Compliance

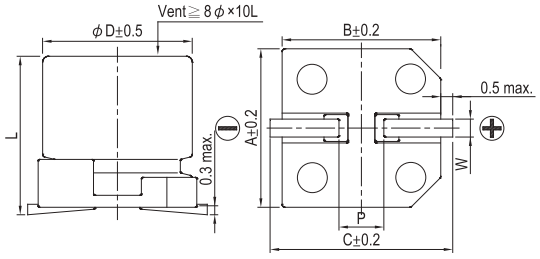
Marking color: Black

Specifications

Items	Performance
Category Temperature Range	-40℃ ~ +135℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)	I = 0.01CV or 3 (μA) whichever is greater (after 2 minutes) Where, C = rated capacitance in μF, V = rated DC working voltage in V
Tanδ (at 120 Hz, 20℃)	Rated Voltage: 10 / 16 / 25 / 35 / 50 Tanδ (max): 0.30 / 0.23 / 0.18 / 0.16 / 0.16 When the capacitance exceeds 1,000μF, 0.02 shall be added every 1,000μF increase.
Low Temperature Characteristics (at 120 Hz)	Impedance ratio shall not exceed the values given in the table below. Rated Voltage: 10 / 16 / 25 / 35 / 50 Impedance Ratio Z(-40℃)/Z(+20℃): 12 / 8 / 6 / 4 / 4
Endurance	Test Time: 2,000 Hrs Capacitance Change: Within ±30% of initial value Tanδ: Less than 300% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied for 2,000 hours at 135℃.
Shelf Life Test	Test Time: 1,000 Hrs Capacitance Change: Within ±30% of initial value Tanδ: Less than 300% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 135℃ without voltage applied.
Ripple Current and Frequency Multipliers	Frequency(Hz): 50 / 120 / 1k / 10k up Multiplier: 0.35 / 0.50 / 0.83 / 1.0

Diagram of Dimensions

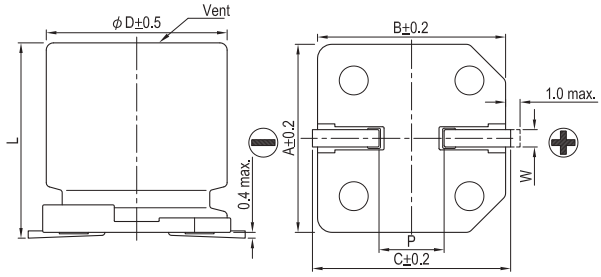
Fig. 1



Lead Spacing and Diameter Unit: mm

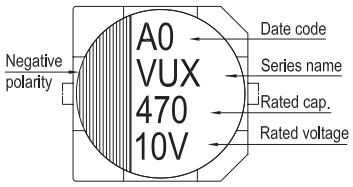
φD	L	A	B	C	W	P ± 0.2	Fig. No.
8	10 ± 0.5	8.3	8.3	9.0	0.7 ~ 1.1	3.1	1
10	10 ± 0.5	10.3	10.3	11.0	0.7 ~ 1.3	4.7	1
12.5	13.5 ± 0.5	13.0	13.0	13.7	1.1 ~ 1.4	4.4	2
16	16.5 ± 0.5	17.0	17.0	18.0	1.1 ~ 1.4	6.4	2
16	21.5 ± 0.5	17.0	17.0	18.0	1.1 ~ 1.4	6.4	2
18	16.5 ± 0.5	19.0	19.0	20.0	1.1 ~ 1.4	6.4	2
18	21.5 ± 0.5	19.0	19.0	20.0	1.1 ~ 1.4	6.4	2

Fig. 2

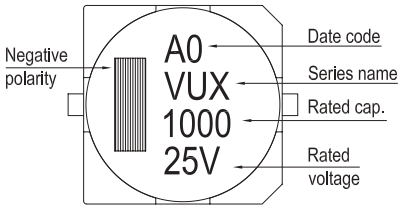


Marking

ϕD = 8 ~ 10 mm



ϕD ≧ 12.5mm



Dimension: ϕD × L(mm)
Ripple Current: mA/rms at 100k Hz, 135℃
Impedance: Ω/ at 100k Hz, 20℃

Dimension and Permissible Ripple Current

Rated Volt. (V_{DC}) / Cap. (μF)	Contents	10V (1A)			16V (1C)			25V (1E)			35V (1V)			50V (1H)		
		ϕD×L	Imp.	mA	ϕD×L	Imp.	mA	ϕD×L	Imp.	mA	ϕD×L	Imp.	mA	ϕD×L	Imp.	mA
47	470										8×10	0.20	270	8×10	0.30	270
68	680										8×10	0.20	270			
100	101				8×10	0.20	270	8×10	0.20	270	8×10	0.20	270	10×10	0.25	500
220	221	8×10	0.20	270	8×10	0.20	270	10×10	0.15	500	10×10	0.15	500			
330	331	8×10 10×10	0.20 0.15	270 500	10×10	0.15	500	10×10	0.15	500						
470	471	10×10	0.15	500	10×10	0.15	500				12.5×13.5	0.08	750	16×16.5	0.075	1,000
560	561										12.5×13.5	0.08	750	16×16.5	0.075	1,000
680	681										16×16.5	0.06	1,200	18×16.5	0.075	1,200
820	821							12.5×13.5	0.08	750	16×16.5	0.06	1,200	18×16.5	0.075	1,200
1,000	102							12.5×13.5	0.08	750	16×16.5	0.06	1,200	16×21.5	0.06	1,600
1,200	122							16×16.5	0.06	1,200	18×16.5	0.05	1,400	18×21.5	0.04	1,900
1,500	152							16×16.5	0.06	1,200	16×21.5 18×16.5	0.04 0.05	1,900 1,400			
1,800	182							16×16.5	0.06	1,200	18×21.5	0.035	2,200			
2,200	222							18×16.5	0.05	1,400	18×21.5	0.035	2,200			
2,700	272							16×21.5	0.04	1,900						
3,300	332							18×21.5	0.035	2,200						

Part Numbering System

VUX Series	470μF	±20%	10V	Carrier Tape		10ϕ×10L	Pb-free and PET coating case
VUX	**471**	**M**	**1A**	**TR**	**-**	**1010**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Package Type	Terminal Type	Case size	Lead Wire and Coating Type

Note: For more details, please refer to “Part Numbering System (SMD Type)” on page 15.

VUK Series

Features

- 8φ ~ 18φ, 125℃, 3,000 ~ 5,000 hours assured
- Chip type high temperature range, for +125℃ use
- For automobile modules and other high temperature applications
- RoHS compliance

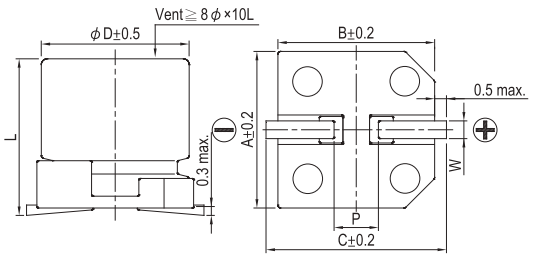
Marking color: Black

Specifications

Items	Performance
Category Temperature Range	-40℃ ~ +125℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)	I = 0.03CV or 4 (μA) whichever is greater (after 1 minutes) Where, C = rated capacitance in μF, V = rated DC working voltage in V
Tanδ (at 120 Hz, 20℃)	Rated Voltage: 10 / 16 / 25 / 35 / 50 / 63 Tanδ (max): 0.22 / 0.18 / 0.16 / 0.14 / 0.12 / 0.12 When the capacitance exceeds 1,000μF, 0.02 shall be added every 1,000μF increase.
Low Temperature Characteristics (at 120 Hz)	Impedance ratio shall not exceed the values given in the table below. Rated Voltage: 10 / 16 / 25 / 35 / 50 / 63 Impedance Ratio Z(-25℃)/Z(+20℃): 6 / 5 / 4 / 3 / 3 / 3 Impedance Ratio Z(-40℃)/Z(+20℃): 12 / 8 / 6 / 4 / 4 / 4
Endurance	Test Time: 3,000 Hrs for φD ≦ 10 mm; 5,000 Hrs for φD ≧ 12.5 mm Capacitance Change: Within ±30% of initial value Tanδ: Less than 300% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied for 3,000 / 5,000 hours at 125℃.
Shelf Life Test	Test Time: 1,000 Hrs Capacitance Change: Within ±30% of initial value Tanδ: Less than 300% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 125℃ without voltage applied.
Ripple Current and Frequency Multipliers	Cap.(μF) \ Freq.(Hz): 50 / 120 / 1k / 10k up ≦ 330: 0.80 / 1.0 / 1.25 / 1.40 330 < C ≦ 3,300: 0.85 / 1.0 / 1.20 / 1.30

Diagram of Dimensions

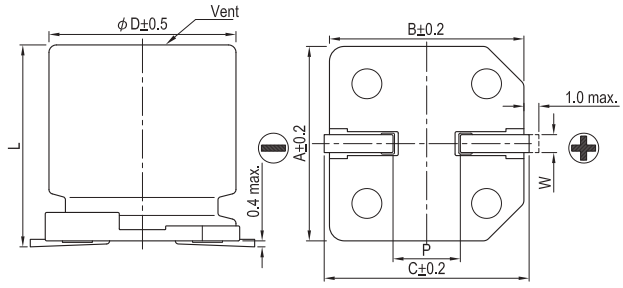
Fig. 1



Lead Spacing and Diameter Unit: mm

φD	L	A	B	C	W	P ± 0.2	Fig. No.
8	10 ± 0.5	8.3	8.3	9.0	0.7 ~ 1.1	3.1	1
10	10 ± 0.5	10.3	10.3	11.0	0.7 ~ 1.3	4.7	1
12.5	13.5 ± 0.5	13.0	13.0	13.7	1.1 ~ 1.4	4.4	2
12.5	16 ± 0.5	13.0	13.0	13.7	1.1 ~ 1.4	4.4	2
16	16.5 ± 0.5	17.0	17.0	18.0	1.1 ~ 1.4	6.4	2
18	16.5 ± 0.5	19.0	19.0	20.0	1.1 ~ 1.4	6.4	2
18	21.5 ± 0.5	19.0	19.0	20.0	1.1 ~ 1.4	6.4	2

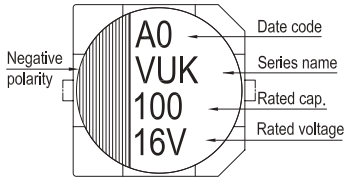
Fig. 2



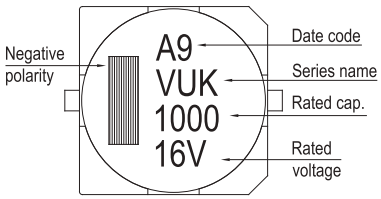
SMD

Marking

ϕD = 8 ~ 10 mm



ϕD ≧ 12.5mm



Dimension and Permissible Ripple Current

Dimension: ϕD × L(mm)

Ripple Current: mA/rms at 120 Hz, 125℃

Rated Volt. (V_{DC}) / Cap. (μF)	Contents	10V (1A)		16V (1C)		25V (1E)		35V (1V)		50V (1H)		63V (1J)	
		ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA
100	101			8×10	85	8×10	85	10×10	110	12.5×13.5	170	12.5×13.5	150
220	221	8×10	85	10×10	150	10×10	150	12.5×13.5	200	16×16.5	250	16×16.5	230
330	331	10×10	150	12.5×13.5	230	12.5×13.5	230	16×16.5	280	18×16.5	340	18×16.5	320
470	471	12.5×13.5	230	12.5×13.5	250	16×16.5	310	18×16.5	380	18×21.5	430	18×21.5	410
680	681	12.5×13.5	250	12.5×13.5	280	16×16.5	350	18×16.5	450				
1,000	102	12.5×16	350	16×16.5	440	18×21.5	540						
1,500	152	12.5×16	350	16×16.5	460								
2,200	222	18×16.5	620	18×21.5	710								
3,300	332	18×21.5	770										

Part Numbering System

VUK Series	330μF	±20%	16V	Carrier Tape		12.5ϕ×13.5L	Pb-free and PET coating case
VUK	**331**	**M**	**1C**	**TR**	**-**	**1313**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Package Type	Terminal Type	Case size	Lead Wire and Coating Type

Note: For more details, please refer to “Part Numbering System (SMD Type)” on page 15.

VUJ Series

Features

- 8φ ~ 18φ, 150℃, 1,000 hours assured
- Chip type high temperature range, for +150℃ use
- For automobile modules and other high temperature applications
- RoHS compliance

Marking color: Black

Specifications

Items	Performance
Category Temperature Range	-55℃ ~ +150℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)	I = 0.03CV or 4 (μ A) whichever is greater (after 1 minutes) Where, C = rated capacitance in μF, V = rated DC working voltage in V
Tanδ (at 120 Hz, 20℃)	Rated Voltage: 10 / 16 / 25 / 35 / 50 Tanδ (max) Dφ≦10: 0.26 / 0.20 / 0.16 / 0.14 / 0.14 Tanδ (max) Dφ≧12.5: 0.22 / 0.18 / 0.16 / 0.14 / 0.12 When the capacitance exceeds 1,000μF, 0.02 shall be added every 1,000μF increase.
Low Temperature Characteristics (at 120 Hz)	Impedance ratio shall not exceed the values given in the table below. Rated Voltage: 10 / 16 / 25 / 35 / 50 Impedance Ratio Z(-40℃)/Z(+20℃) Dφ≦10: 10 / 8 / 6 / 4 / 4 Impedance Ratio Z(-40℃)/Z(+20℃) Dφ≧12.5: 8 / 6 / 4 / 4 / 4
Endurance	Test Time: 1,000 Hrs Capacitance Change: Within ±30% of initial value Tanδ: Less than 300% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied for 1,000 hours at 150℃.
Shelf Life Test	Test Time: 1,000 Hrs Capacitance Change: Within ±30% of initial value Tanδ: Less than 300% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 150℃ without voltage applied.
Ripple Current and Frequency Multipliers	Frequency (Hz): 120 / 300 / 1k / 10k up Multiplier: 0.67 / 0.79 / 0.91 / 1.00

Diagram of Dimensions

Fig. 1

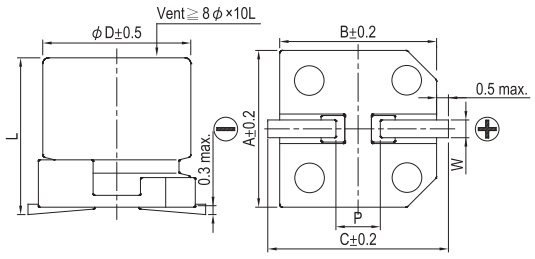
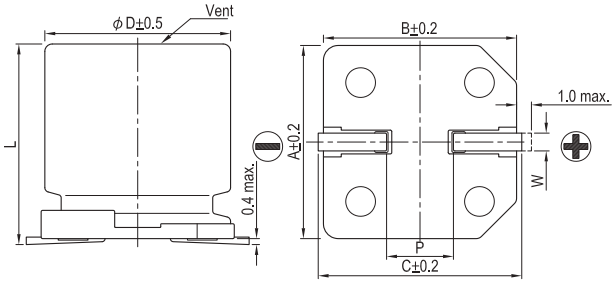


Fig. 2

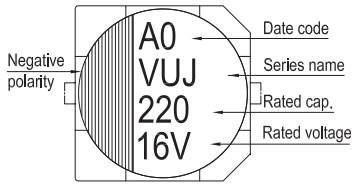


Lead Spacing and Diameter Unit: mm

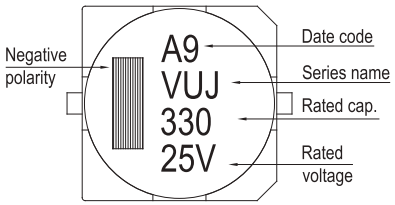
φD	L	A	B	C	W	P ± 0.2	Fig. No.
8	10 ± 0.5	8.3	8.3	9.0	0.7 ~ 1.1	3.1	1
10	10 ± 0.5	10.3	10.3	11.0	0.7 ~ 1.3	4.7	1
12.5	13.5 ± 0.5	13.0	13.0	13.7	1.1 ~ 1.4	4.4	2
16	16.5 ± 0.5	17.0	17.0	18.0	1.1 ~ 1.4	6.4	2
18	16.5 ± 0.5	19.0	19.0	20.0	1.1 ~ 1.4	6.4	2
18	21.5 ± 0.5	19.0	19.0	20.0	1.1 ~ 1.4	6.4	2

Marking

ϕD = 8 ~ 10 mm



ϕD ≧ 12.5mm



Dimension and Permissible Ripple Current

Dimension: ϕD × L(mm)

Ripple Current: mA/rms at 100k Hz, 150℃

Rated Volt. (V_{DC}) / Cap. (μF)	Contents	10V (1A)		16V (1C)		25V (1E)		35V (1V)		50V (1H)	
		ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA
33	330									8×10	70
47	470							8×10	80	10×10	100
100	101			8×10	110	8×10	110	10×10	120	12.5×13.5	420
220	221	8×10	110	10×10	150	10×10	150	12.5×13.5	550	16×16.5	550
330	331	10×10	150			12.5×13.5	650	12.5×13.5	650	16×21.5	650
470	471			12.5×13.5	750	12.5×13.5	700	16×16.5	750	16×21.5	850
680	681	12.5×13.5	800	12.5×13.5	800	16×16.5	800	16×21.5	950	18×21.5	1,100
1,000	102	12.5×13.5	900	16×16.5	850	16×21.5	1,000	18×21.5	1,150		
2,200	222	18×21.5	1,350	18×21.5	1,350						
3,300	332	18×21.5	1,400								

Part Numbering System

VUJ series	220μF	±20%	10V	Carrier Tape		8ϕ×10L	Pb-free and PET coating case
VUJ	**221**	**M**	**1A**	**TR**	**-**	**0810**	
Series name	Capacitance	Capacitance Tolerance	Rated Voltage	Package Type	Terminal Type	Case size	Lead Wire and Coating Type

Note: For more details, please refer to “Part Numbering System (SMD Type)” on page 15.

SMD

VEB Series

Features

- 4φ ~ 6.3φ, 85℃, 2,000 hours assured
- Vertical chip type miniaturized
- Bi-polarized capacitors for 5.5 mm high capacitors
- Designed for surface mounting on high density PC board
- RoHS compliance

Marking color: Black

Specifications

Items	Performance
Category Temperature Range	-40℃ ~ +85℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)	I = 0.01CV or 3 (μA) whichever is greater (after 2 minutes) Where, C = rated capacitance in μF, V = rated DC working voltage in V

Tanδ (at 120 Hz, 20℃)

Rated Voltage		6.3	10	16	25	35	50	63
Tanδ (max)	4φ	0.35	0.30	0.25	0.25	0.25	0.25	--
	5 ~ 6.3φ	0.30	0.25	0.20	0.15	0.15	0.15	0.15

Low Temperature Characteristics (at 120 Hz)

Impedance ratio shall not exceed the values given in the table below.

Rated Voltage		6.3	10	16	25	35	50	63
Impedance Ratio	Z(-25℃)/Z(+20℃)	3	3	2	2	2	2	2
	Z(-40℃)/Z(+20℃)	8	5	4	3	3	3	3

Endurance (with the polarity inverted every 250 hours)

Test Time	2,000 Hrs
Capacitance Change	Within ±20% of initial value
Tanδ	Less than 200% of specified value
Leakage Current	Within specified value

* The above specifications shall be satisfied when the capacitors are restored to 20℃after the rated voltage applied for 2,000 hours at 85℃.

Shelf Life Test

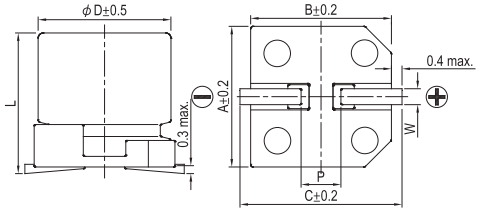
Test Time	1,000 Hrs
Capacitance Change	Within ±20% of initial value
Tanδ	Less than 200% of specified value
Leakage Current	Within specified value

* The above specifications shall be satisfied when the capacitors are restored to 20℃after exposing them for 1,000 hours at 85 ℃ without voltage applied.

Ripple Current and Frequency Multipliers

Frequency (Hz)	50	120	1k	10k up
Multiplier	0.7	1.0	1.3	1.4

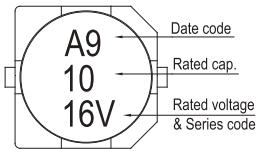
Diagram of dimensions



Lead Spacing and Diameter Unit: mm

φD	L	A	B	C	W	P ± 0.2
4	5.3 ± 0.2	4.3	4.3	5.1	0.5 ~ 0.8	1.0
5	5.3 ± 0.2	5.3	5.3	5.9	0.5 ~ 0.8	1.5
6.3	5.3 ± 0.2	6.6	6.6	7.2	0.5 ~ 0.8	2.0

Marking



Dimension and Permissible Ripple Current

Dimension: φD × L(mm)
Ripple Current: mA/rms at 120 Hz, 85℃

Rated Volt. (V_{DC}) / Cap. (μF)	Contents	6.3V (0J)		10V (1A)		16V (1C)		25V (1E)		35V (1V)		50V (1H)		63V (1J)	
		φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA
0.33	R33											4×5.3	4.1		
0.47	R47											4×5.3	4.9		
1	010											4×5.3	7.2	5×5.3	9.4
2.2	2R2									4×5.3	10	5×5.3	14		
3.3	3R3							4×5.3	13	5×5.3	17	5×5.3	17		
4.7	4R7					4×5.3	14	5×5.3	20	5×5.3	21	6.3×5.3	24	6.3×5.3	24
10	100			4×5.3	18	5×5.3	26	6.3×5.3	35	6.3×5.3	35	6.3×5.3	35		
22	220	5×5.3	27	6.3×5.3	40	6.3×5.3	45								
33	330	6.3×5.3	45	6.3×5.3	50	6.3×5.3	55								
47	470	6.3×5.3	54												

Part Numbering System

VEB Series	10μF	±20%	16V	Carrier Tape		5φ×5.3L	Pb-free and PET coating case
VEB	**100**	**M**	**1C**	**TR**	**-**	**0505**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Package Type	Terminal Type	Case size	Lead Wire and Coating Type

Note: For more details, please refer to “Part Numbering System (SMD Type)” on page 15.

VGB Series

Features

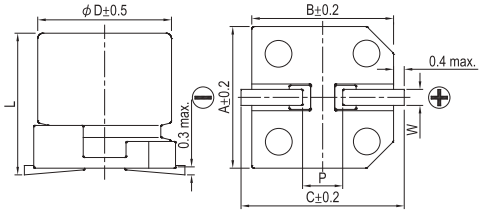
- 4φ ~ 6.3φ, 105℃, 2,000 hours assured
- Vertical chip type miniaturized
- Bi-polarized capacitors for 6 mm high capacitors
- Designed for surface mounting on high density PC board
- RoHS compliance

Marking color: Black

Specifications

Items	Performance
Category Temperature Range	-55℃ ~ +105℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)	I = 0.05CV or 10 (μA) whichever is greater (after 2 minutes) Where, C = rated capacitance in μF, V = rated DC working voltage in V
Tanδ (at 120 Hz, 20℃)	Rated Voltage: 6.3 / 10 / 16 / 25 / 35 / 50 Tanδ (max): 0.24 / 0.20 / 0.17 / 0.17 / 0.15 / 0.15
Low Temperature Characteristics (at 120 Hz)	Impedance ratio shall not exceed the values given in the table below. Rated Voltage: 6.3 / 10 / 16 / 25 / 35 / 50 Impedance Ratio Z(-25℃)/Z(+20℃): 4 / 3 / 2 / 2 / 2 / 2 Impedance Ratio Z(-40℃)/Z(+20℃): 8 / 6 / 4 / 4 / 3 / 3
Endurance (with the polarity inverted every 250 hours)	Test Time: 2,000 Hrs Capacitance Change: Within ±30% of initial value Tanδ: Less than 300% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied for 2,000 hours at 105℃.
Shelf Life Test	Test Time: 1,000 Hrs Capacitance Change: Within ±30% of initial value Tanδ: Less than 300% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 105℃ without voltage applied.
Ripple Current and Frequency Multipliers	Frequency (Hz): 50 / 120 / 1k / 10k up Multiplier: 0.7 / 1.0 / 1.36 / 1.5

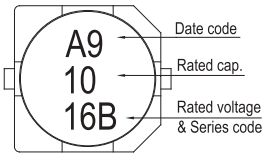
Diagram of dimensions



Lead Spacing and Diameter Unit: mm

φD	L	A	B	C	W	P ± 0.2
4	5.7 ± 0.3	4.3	4.3	5.1	0.5 ~ 0.8	1.0
5	5.7 ± 0.3	5.3	5.3	5.9	0.5 ~ 0.8	1.5
6.3	5.7 ± 0.3	6.6	6.6	7.2	0.5 ~ 0.8	2.0

Marking



Dimension and Permissible Ripple Current

Dimension: φD × L(mm)
Ripple Current: mA/rms at 120 Hz, 105℃

Rated Volt. (VDC) / Cap. (μF)	Contents	6.3V (0J)		10V (1A)		16V (1C)		25V (1E)		35V (1V)		50V (1H)	
		φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA
1	010											4×5.7	8.4
2.2	2R2									4×5.7	8.4	5×5.7	13
3.3	3R3							5×5.7	12	5×5.7	16	5×5.7	17
4.7	4R7					4×5.7	12	5×5.7	16	5×5.7	18	6.3×5.7	20
10	100			4×5.7	17	5×5.7	23	6.3×5.7	27	6.3×5.7	29		
22	220	5×5.7	28	6.3×5.7	33	6.3×5.7	37						
33	330	6.3×5.7	37	6.3×5.7	41	6.3×5.7	49						
47	470	6.3×5.7	45										

Part Numbering System

VGB Series	10μF	±20%	16V	Carrier Tape		5φ×5.7L	Pb-free and PET coating case
VGB	**100**	**M**	**1C**	**TR**	**-**	**0506**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Package Type	Terminal Type	Case size	Lead Wire and Coating Type

Note: For more details, please refer to “Part Numbering System (SMD Type)” on page 15.

VGN Series

Features

- 12.5φ ~ 18φ, 105℃, 2,000 hours assured
- Bi-polarized series for operations wide temperature range
- Designed for surface mounting on high density PC board
- RoHS Compliance

Marking color: Black

Specifications

Items	Performance
Category Temperature Range	-55℃ ~ +105℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)	I = 0.03CV or 4 (μA) whichever is greater (after 1 minutes) Where, C = rated capacitance in μF, V = rated DC working voltage in V
Tanδ (at 120 Hz, 20℃)	When the capacitance exceeds 1,000μF, 0.02 shall be added every 1,000μF increase.

Rated Voltage	6.3	10	16	25	35	50	63	100
Tanδ (max)	0.26	0.22	0.18	0.16	0.14	0.12	0.10	0.09

Low Temperature Characteristics (at 120 Hz)

Impedance ratio shall not exceed the values given in the table below.

Rated Voltage		6.3	10	16	25	35	50	63	100
Impedance Ratio	Z(-25℃)/Z(+20℃)	5	4	3	2	2	2	2	2
	Z(-40℃)/Z(+20℃)	10	8	6	4	3	3	3	3

Endurance (with the polarity inverted every 250 hours)

Test Time	2,000 Hrs
Capacitance Change	Within ±20% of initial value
Tanδ	Less than 200% of specified value
Leakage Current	Within specified value

* The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied for 2,000 hours at 105℃.

Shelf Life Test

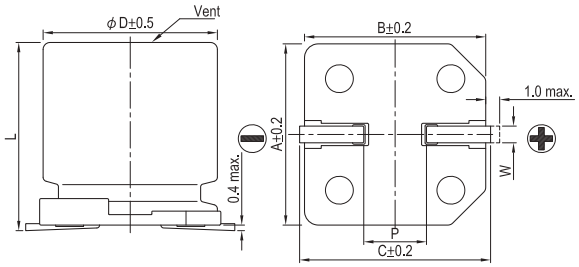
Test Time	1,000 Hrs
Capacitance Change	Within ±20% of initial value
Tanδ	Less than 200% of specified value
Leakage Current	Within specified value

* The above specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 105℃ without voltage applied.

Ripple Current and Frequency Multipliers

Frequency (Hz) / Cap. (μF)	50	120	1k	10k up
22 ~ 47	0.75	1.00	1.57	2.00
100 ~ 470	0.80	1.00	1.34	1.50
1,000 ~ 3,300	0.85	1.00	1.13	1.15

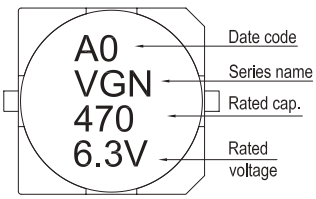
Diagram of Dimensions



Lead Spacing and Diameter Unit: mm

φD	L	A	B	C	W	P ± 0.2
12.5	13.5 ± 0.5	13.0	13.0	13.7	1.1 ~ 1.4	4.4
12.5	16 ± 0.5	13.0	13.0	13.7	1.1 ~ 1.4	4.4
16	16.5 ± 0.5	17.0	17.0	18.0	1.1 ~ 1.4	6.4
16	21.5 ± 0.5	17.0	17.0	18.0	1.1 ~ 1.4	6.4
18	16.5 ± 0.5	19.0	19.0	20.0	1.1 ~ 1.4	6.4
18	21.5 ± 0.5	19.0	19.0	20.0	1.1 ~ 1.4	6.4

Marking



Dimension and Permissible Ripple Current

Dimension: ϕD × L(mm)
Ripple Current: mA/rms at 120 Hz, 105℃

Rated Volt. (V_{DC}) / Cap. (μF)	Contents	6.3V (0J)		10V (1A)		16V (1C)		25V (1E)		35V (1V)		50V (1H)		63V (1J)		100V (2A)	
		ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA
22	220															12.5×13.5	100
33	330															12.5×16	150
47	470											12.5×13.5	130	12.5×13.5	140	16×16.5	180
100	101									12.5×13.5	180	12.5×16	230	16×16.5	270	18×21.5	310
220	221							12.5×13.5	270	16×16.5	330	18×16.5 16×21.5	400 400	18×21.5	440		
330	331					12.5×13.5	310	16×16.5	370	18×16.5 16×21.5	450 450	18×21.5	540	18×21.5	590		
470	471	12.5×13.5	270	12.5×13.5	340	16×16.5	420	16×16.5	490	18×21.5	590	18×21.5	640				
1,000	102	12.5×16	500	16×16.5	600	18×16.5 16×21.5	670 670	18×21.5	780								
2,200	222	18×16.5 16×21.5	740 740	18×21.5	830												
3,300	332	18×21.5	920														

Part Numbering System

VGN Series	470μF	±20%	6.3V	Carrier Tape		12.5ϕ×13.5L	Pb-free and PET coating case
VGN	**471**	**M**	**0J**	**TR**	**-**	**1313**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Package Type	Terminal Type	Case size	Lead Wire and Coating Type

Note: For more details, please refer to “Part Numbering System (SMD Type)” on page 15.

SMD

VEC Series

Features

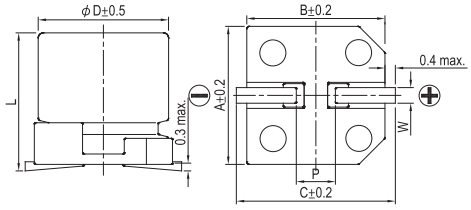
- 4ϕ ~ 6.3ϕ, 85℃, 2,000 hours assured
- Low Leakage Current Lead free reflow soldering is available
- Designed for surface mounting on high density PC board
- RoHS compliance

Marking color: Black

Specifications

Items	Performance
Category Temperature Range	-40℃ ~ +85℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)	I = 0.002CV or 0.5 (μA) whichever is greater (after 2 minutes) Where, C = rated capacitance in μF, V = rated DC working voltage in V
Tanδ (at 120 Hz, 20℃)	Rated Voltage: 6.3 / 10 / 16 / 25 / 35 / 50 Tanδ (max): 0.28 / 0.24 / 0.20 / 0.14 / 0.12 / 0.10
Low Temperature Characteristics (at 120 Hz)	Impedance ratio shall not exceed the values given in the table below. Rated Voltage: 6.3 / 10 / 16 / 25 / 35 / 50 Impedance Ratio Z(-25℃)/Z(+20℃): 3 / 3 / 2 / 2 / 2 / 2 Impedance Ratio Z(-40℃)/Z(+20℃): 8 / 5 / 4 / 3 / 3 / 3
Endurance	Test Time: 2,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 200% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied for 2,000 hours at 85℃.
Shelf Life Test	Test Time: 1,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 200% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 85℃ without voltage applied.
Ripple Current and Frequency Multipliers	Frequency (Hz): 50 / 120 / 1k / 10k up Multiplier: 0.7 / 1.0 / 1.3 / 1.4

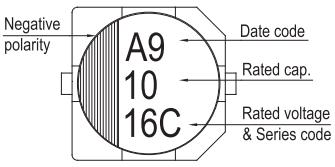
Diagram of Dimensions



Lead Spacing and Diameter Unit: mm

ϕD	L	A	B	C	W	P ± 0.2
4	5.3 ± 0.2	4.3	4.3	5.1	0.5 ~ 0.8	1.0
5	5.3 ± 0.2	5.3	5.3	5.9	0.5 ~ 0.8	1.5
6.3	5.3 ± 0.2	6.6	6.6	7.2	0.5 ~ 0.8	2.0
6.3	7.7 ± 0.3	6.6	6.6	7.2	0.5 ~ 0.8	2.0

Marking



Dimension and Permissible Ripple Current

Dimension: ϕD × L(mm)
Ripple Current: mA/rms at 120 Hz, 85℃

Rated Volt. (V_{DC}) / Cap. (μF)	Contents	6.3V (0J)		10V (1A)		16V (1C)		25V (1E)		35V (1V)		50V (1H)	
		ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA
1	010											4×5.3	10
2.2	2R2											4×5.3	15
3.3	3R3											4×5.3	19
4.7	4R7							4×5.3	19	4×5.3	20	5×5.3	26
10	100			4×5.3	23	4×5.3	26	5×5.3	32	5×5.3	34	6.3×5.3	44
22	220	4×5.3	31	5×5.3	39	5×5.3	44	6.3×5.3	55	6.3×5.3	59	6.3×5.3	56
33	330	5×5.3	44	5×5.3	48	6.3×5.3	63	6.3×5.3	67	6.3×5.3	71		
47	470	5×5.3	52	6.3×5.3	67	6.3×5.3	75	6.3×5.3	79				
100	101	6.3×5.3	89	6.3×5.3	98	6.3×7.7	103	6.3×7.7	105				
150	151	6.3×7.7	125	6.3×7.7	135								

Part Numbering System

VEC Series	10μF	±20%	16V	Carrier Tape		4ϕ×5.3L	Pb-free and PET coating case
VEC	**100**	**M**	**1C**	**TR**	**-**	**0405**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Package Type	Terminal Type	Case size	Lead Wire and Coating Type

Note: For more details, please refer to “Part Numbering System (SMD Type)” on page 15.

REA Series

Features

- 85℃, 2,000 ~ 3,000 hours assured
- Standard series for general purposes
- RoHS compliance

Specifications

Items	Performance
Category Temperature Range	-40℃ ~ +85℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)

Leakage Current (at 20℃)

Rated voltage	≦100V	>100V	
Time	after 2 minutes	after 5 minutes	
Leakage Current	I = 0.01CV or 3 (μA) whichever is greater	CV ≦ 1,000 I = 0.03CV + 15(μA)	CV > 1,000 I = 0.02CV + 25(μA)

Where, C = rated capacitance in μF, V = rated DC working voltage in V

Tanδ (at 120 Hz, 20℃)

Rated Voltage	6.3	10	16	25	35	50	63	100	160	200	250	350	400	450
Tanδ (max)	0.23	0.20	0.16	0.14	0.12	0.10	0.09	0.08	0.12	0.14	0.17	0.20	0.25	0.25

When the capacitance exceeds 1,000μF, 0.02 shall be added every 1,000μF increase.

Low Temperature Characteristics (at 120 Hz)

Impedance ratio shall not exceed the values given in the table below.

Rated Voltage			6.3	10	16	25	35	50	63	100	160	200	250	350	400	450
Impedance Ratio	Z(-25℃) /Z(+20℃)	φD<16	6	4	3	3	2	2	2	2	3	6	8	12	14	16
		φD≧16	8	6	4	4	3	3	3	3						
	Z(-40℃) /Z(+20℃)	φD<16	10	8	6	6	4	3	3	3	4	8	10	16	18	20
		φD≧16	18	16	12	10	8	8	6	6						

Endurance

Test Time	2,000 Hrs for φD ≦ 8mm 3,000 Hrs for φD ≧ 10mm
Capacitance Change	Within ±20% of initial value
Tanδ	Less than 200% of specified value
Leakage Current	Within specified value

* The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied with rated ripple current for 2,000 / 3,000 hours at 85℃.

Shelf Life Test

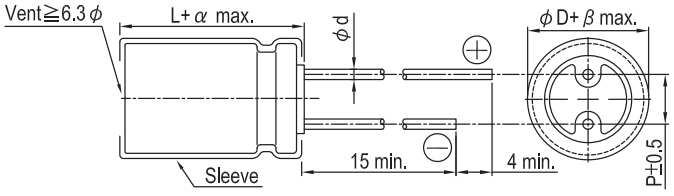
Test Time	1,000 Hrs
Capacitance Change	Within ±20% of initial value
Tanδ	Less than 200% of specified value
Leakage Current	Within specified value

* The above specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 85℃ without voltage applied. The rated voltage shall be applied to the capacitors before the measurements for 160 ~ 450V (Refer to JIS C 5101-4 4.1).

Ripple Current and Frequency Multipliers

Cap. (μF) \ Freq. (Hz)	60 (50)	120	500	1k	10k up
≦ 100	0.70	1.00	1.30	1.40	1.50
100 < C ≦ 1,000	0.75	1.00	1.20	1.30	1.35
1,000 <	0.80	1.00	1.10	1.12	1.15

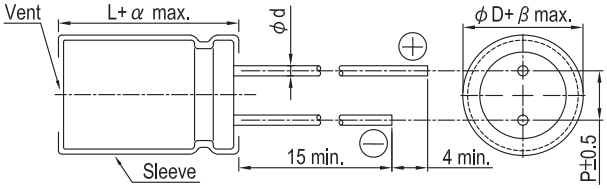
Diagram of Dimensions



Lead Spacing and Diameter Unit: mm

φD	5	6.3	8	10	12.5	16	18	22	25
P	2.0	2.5	3.5	5.0	5.0	7.5	7.5	10	12.5
φd	0.5		0.6			0.8		1.0	
α	L<20: 1.5, L≧20: 2.0							2.0	
β	0.5								

The case size of 12.5×16, 16×16, 16×20, 18×16, 18×20 and 18×25 are suitable for below diagram:



Dimension: ϕD × L(mm)

Dimension and Permissible Ripple Current

Ripple Current: mA/rms at 120 Hz, 85℃

Cap.(μF) / Rated Volt. (VDC) / Contents		6.3V (0J)		10V (1A)		16V (1C)		25V (1E)		35V (1V)		50V (1H)		63V (1J)		100V (2A)	
		ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA
2.2	2R2											5×11	29			5×11	33
3.3	3R3											5×11	35			5×11	40
4.7	4R7											5×11	42			5×11	48
10	100											5×11	65	5×11	70	5×11	59
22	220											5×11	95	6.3×11	115	6.3×11 8×11.5	115 135
33	330									5×11	108	6.3×11 5×11	136 125	6.3×11	140	8×11.5	145
47	470							5×11	115	5×11	130	6.3×11	165	6.3×11	170	10×12.5	235
100	101					5×11	160	6.3×11	190	6.3×11	210	8×11.5	260	8×11.5 10×12.5	245 320	10×16	325
220	221			5×11	220	6.3×11	260	8×11.5	320	8×11.5	385	10×12.5	455	10×16	490	12.5×20 16×16	640 625
330	331			6.3×11	290	6.3×11	290	8×11.5	440	10×12.5	490	10×16	585	10×20 12.5×16	710 675	16×20 18×16	695 685
470	471			6.3×11	350	8×11.5	440	10×12.5	545	10×16	740	10×20 12.5×16	755 610	16×16 12.5×20	910 900	16×25	910
1,000	102	8×11.5	540	10×12.5 8×11.5	650 550	10×12.5	635	10×20 12.5×16	955 830	12.5×20 16×16	1,145 1,010	12.5×25 16×20	1,340 1,160	16×20	1,260	18×40	1,820
2,200	222	10×16	845	10×20 12.5×16	1,070 970	12.5×16 16×16	930 1,160	12.5×25 16×16	1,540 1,150	16×20	1,390	16×35.5	1,960	18×31.5	2,040		
3,300	332	10×20 12.5×16	1,185 960	12.5×20	1,420	12.5×20 16×16	1,450 1,240	16×20	1,490	16×31.5 18×25	2,070 1,970	18×35.5	2,500	18×40	2,575		
4,700	472	12.5×20	1,545	12.5×25 16×16	1,780 1,420	16×20 18×16	1,600 1,820	16×25 18×25	2,100 2,170	18×35.5	2,700	22×40	3,040				
6,800	682	12.5×25	1,880	16×20 18×20	1,700 1,870	16×25 18×20	2,280 1,890	16×35.5 18×31.5	2,475 2,550	22×40	2,900	22×45	3,185				
10,000	103	16×20 18×20	2,000 2,020	16×25 18×25	2,150 2,370	18×31.5 16×35.5	2,590 2,450	18×40	3,080	22×45	3,400						
15,000	153	16×31.5 18×25	2,460 2,375	16×40 18×31.5	2,730 2,620	18×40	3,100	22×45 25×40	3,780 3,850								
22,000	223	18×31.5	2,780	18×40	3,370	22×40	3,900	25×45	4,290								
33,000	333	22×40	3,700														

Cap.(μF) / Rated Volt. (VDC) / Contents		160V (2C)		200V (2D)		250V (2E)		350V (2V)		400V (2G)		450V (2W)	
		ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA
1	010					5×11	18	5×11	18	5×11	22	6.3×11	25
2.2	2R2			5×11	29	6.3×11	33	6.3×11	33	6.3×11	33	8×11.5	45
3.3	3R3			6.3×11	46	6.3×11	46	8×11.5	50	8×11.5	50	10×12.5	65
4.7	4R7			6.3×11	50	8×11.5	55	8×11.5	60	8×11.5 10×12.5	55 80	8×11.5 10×12.5	55 80
10	100	8×11.5	75	8×11.5	81	10×12.5	100	10×16	110	10×16	110	10×20	140
22	220	10×12.5	130	10×12.5	135	10×16	150	12.5×16	185	12.5×20	200	12.5×20	200
33	330	10×16	175	10×16	180	10×20 12.5×16	215 220	12.5×20 16×16	245 260	16×16	260	16×20	270
47	470	10×20 12.5×16	230 250	10×20 12.5×16	240 250	12.5×20	290	16×20 18×16	340 310	16×20	340	16×31.5	390
68	680	12.5×20	330	12.5×20 16×16	330 370	12.5×25	370	16×25 18×20	420 410	16×31.5	435	16×35.5	460
100	101	12.5×25	440	16×20 18×16	460 450	16×25	510	16×31.5 18×25	540 520	16×40 18×35.5	560 570	18×35.5	570
150	151	16×25	620	16×25 18×20	620 605	16×31.5 18×25	625 630	18×35.5	640	18×40	670	22×45	800
220	221	16×31.5 18×25	790 760	16×35.5	830	16×40 18×35.5	840 890	22×40	920	22×45 25×40	960 980	25×45	1,030
330	331	18×35.5	985	18×40	1,150	22×40	1,200	25×45	1,270				
470	471	18×40	1,150	22×40	1,400	22×45	1,470						

Part Numbering System

REA Series	470μF	±20%	16V	Bulk Package	Gas Type	8ϕ×11.5L	Pb-free and PET sleeve
REA	**471**	**M**	**1C**	**BK**	**-**	**0811**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Lead Configuration and Package	Rubber Type	Case Size	Lead Wire and Sleeve type

Note: For more details, please refer to “Part Numbering System (Radial Type)” on page 13.

RGA Series

Features

- 105℃, 2,000 hours assured
- 105℃ standard series for general purposes
- RoHS compliance
- If there is any requirement on ESR, it's suggested to use low ESR series instead of RGA. Please consult us for any inquiry.

Specifications

Items	Performance
Category Temperature Range	6.3~400V: -40℃ ~ +105℃ / 450V: -25℃ ~ +105℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)	Rated voltage: ≦100V / >100V; Time: after 2 minutes / after 5 minutes; Leakage Current: I = 0.01CV or 3 (μA) whichever is greater / CV ≦ 1,000 I = 0.03CV + 15(μA) / CV > 1,000 I = 0.02CV + 25(μA). Where, C = rated capacitance in μF, V = rated DC working voltage in V
Tanδ (at 120 Hz, 20℃)	Rated Voltage: 6.3 10 16 25 35 50 63 100 160 200 250 350 400 450; Tanδ (max): 0.23 0.20 0.16 0.14 0.12 0.10 0.09 0.08 0.12 0.14 0.17 0.20 0.25 0.25. When the capacitance exceeds 1,000μF, 0.02 shall be added every 1,000μF increase.
Low Temperature Characteristics (at 120 Hz)	Impedance ratio shall not exceed the values given in the table below.

Low Temperature Characteristics (at 120 Hz)

Rated Voltage			6.3	10	16	25	35	50	63	100	160	200	250	350	400	450
Impedance Ratio	Z(-25℃) /Z(+20℃)	φD<16	4	3	3	2	2	2	2	2	3	6	8	12	14	16
		φD≧16	6	4	4	3	3	3	3	3						
	Z(-40℃) /Z(+20℃)	φD<16	8	6	6	4	4	3	3	3	4	8	10	16	18	-
		φD≧16	12	10	8	8	8	8	6	6						

Endurance

Test Time	2,000 Hrs
Capacitance Change	Within ±20% of initial value
Tanδ	Less than 200% of specified value
Leakage Current	Within specified value

* The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied with rated ripple current for 2,000 hours at 105℃.

Shelf Life Test

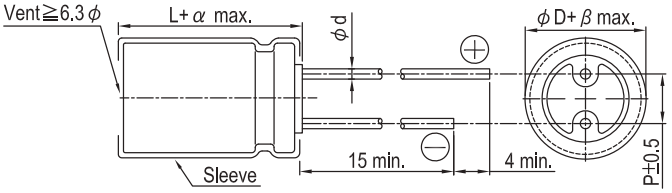
Test Time	1,000 Hrs
Capacitance Change	Within ±20% of initial value
Tanδ	Less than 200% of specified value
Leakage Current	Within specified value

* The above specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 105℃ without voltage applied. The rated voltage shall be applied to the capacitors before the measurements for 160 ~ 450V (Refer to JIS C 5101-4 4.1).

Ripple Current and Frequency Multipliers

Cap. (μF) \ Freq. (Hz)	60 (50)	120	500	1k	10k up
≦ 100	0.70	1.00	1.30	1.40	1.50
100 < C ≦ 1,000	0.75	1.00	1.20	1.30	1.35
1,000 <	0.80	1.00	1.10	1.12	1.15

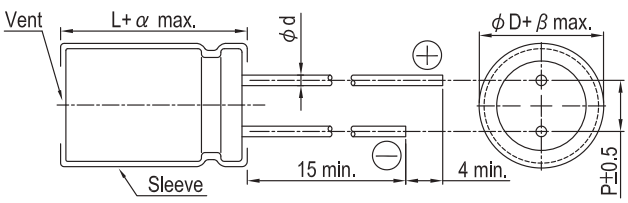
Diagram of Dimensions



Lead Spacing and Diameter Unit: mm

φD	5	6.3	8	10	12.5	16	18	22	25
P	2.0	2.5	3.5	5.0	5.0	7.5	7.5	10	12.5
φd	0.5		0.6			0.8		1.0	
α	L<20: 1.5, L≧20: 2.0							2.0	
β	0.5								

The case size of 12.5×16, 16×16, 16×20, 18×16, 18×20 and 18×25 are suitable for below diagram:



Dimension and Permissible Ripple Current

Dimension: φD × L(mm)

Ripple Current: mA/rms at 120 Hz, 105℃

Cap.(μF) \ Rated Volt. (VDC) / Contents		6.3V (0J)		10V (1A)		16V (1C)		25V (1E)		35V (1V)		50V (1H)		63V (1J)		100V (2A)	
		φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA
2.2	2R2											5×11	20			5×11	30
3.3	3R3											5×11	30			5×11	31
4.7	4R7											5×11	33			5×11	36
10	100											5×11	50			6.3×11	54
22	220											5×11	78	6.3×11	86	6.3×11 8×11.5	93 99
33	330									5×11	75	5×11	90	6.3×11	100	8×11.5	130
47	470							5×11	97	5×11	90	6.3×11	120	6.3×11 8×11.5	130 141	10×12.5	165
100	101					5×11	110	6.3×11	142	6.3×11	150	8×11.5	188	10×12.5	235	10×20 12.5×16	265 290
220	221	5×11	140	6.3×11	175	6.3×11	190	8×11.5	236	8×11.5	270	10×12.5	300	10×16	335	12.5×25 16×16	440 420
330	331			6.3×11	200	8×11.5	270	8×11.5 10×12.5	310 335	10×12.5	350	10×16	410	10×20 12.5×16	510 460	16×25	620
470	471	6.3×11	230	8×11.5	290	8×11.5	310	10×12.5	380	10×16	460	10×20 12.5×16	530 425	12.5×20 16×16	640 665	16×31.5 18×25	715 745
1,000	102	8×11.5	380	10×12.5	460	10×16	560	10×20 12.5×16	680 590	12.5×20 16×16	810 720	12.5×25 16×20	950 830	16×25	930	18×40	1,275
2,200	222	10×16	690	10×20	760	12.5×16	780	12.5×25	1,110	16×25 18×20	1,260 1,110	16×35.5 18×31.5	1,470 1,520	18×40	2,280	25×45	2,400
3,300	332	10×20 12.5×16	840 850	12.5×20 16×16	1,100 940	12.5×25 16×16	1,170 950	16×25 18×20	1,440 1,220	16×31.5 18×25	1,420 1,570	18×35.5	1,770	22×40	2,510		
4,700	472	12.5×20 16×16	1,090 1,010	12.5×25 16×16	1,260 1,060	16×20 18×16	1,185 1,290	16×31.5 18×25	1,650 1,550	18×35.5	1,900	22×40	2,340	25×40	3,000		
6,800	682	12.5×25 16×20	1,460 1,190	16×20	1,270	16×31.5 18×20	1,930 1,585	16×40 18×35.5	2,000 2,160	18×40	2,250	25×40	2,530				
10,000	103	16×20	1,340	16×31.5 18×25	2,220 1,800	16×35.5 18×31.5	2,210 2,330	22×40 18×45	2,720 2,410								
15,000	153	16×31.5 18×25	2,365 2,290	18×31.5 16×35.5	2,620 2,590	18×40	2,950	25×40	3,200								
22,000	223	16×40 18×35.5	2,800 2,930	18×40	3,230	22×40	3,460										
33,000	333	18×45	3,080	22×40	4,090	25×45	4,500										

Cap.(μF) \ Rated Volt. (VDC) / Contents		160V (2C)		200V (2D)		250V (2E)		350V (2V)		400V (2G)		450V (2W)	
		φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA
1	010									6.3×11	21	8×11.5	27
2.2	2R2			6.3×11	30	6.3×11	35	6.3×11	35	8×11.5	39	8×11.5	39
3.3	3R3			6.3×11	39	6.3×11	40	8×11.5	43	8×11.5	45	8×11.5	45
4.7	4R7			6.3×11	43	8×11.5	45	8×11.5 10×12.5	45 55	8×11.5 10×12.5	50 55	8×11.5 10×12.5	50 55
10	100	8×11.5	65	8×11.5	65	10×12.5	92	10×16	95	10×16	95	10×20	105
22	220	10×12.5	110	10×16	140	10×16	140	12.5×20	220	12.5×20	160	12.5×20	160
33	330	10×16	150	10×20	170	12.5×16	175	12.5×25 16×16	215 205	16×20	225	16×20 18×16	225 220
47	470	10×20	195	12.5×16	215	12.5×20 16×16	230 245	16×20	255	16×25	295	16×25 18×20	280 285
68	680	12.5×20	275	12.5×20 16×16	265 290	16×20	320	18×25 16×31.5	360 370	18×25 16×31.5	360 375	16×35.5 18×31.5	400 420
100	101	12.5×25	355	16×20 18×16	365 360	16×25 18×20	425 415	18×31.5 16×35.5	460 430	18×35.5	540	18×40	560
150	151	16×25	470	18×20	510	16×31.5 18×25	550 535	18×40	600	22×40	730	22×40	770
220	221	16×31.5	660	18×31.5	750	18×35.5	760	25×40 22×45	865 850	22×45	930		
330	331	18×35.5	820	18×40	965	22×40	1,140	25×45	1,070				
470	471	22×40	1,130	22×40	1,130	25×40	1,325						

Part Numbering System

RGA Series	470μF	±20%	6.3V	Bulk Package	Gas Type	6.3φ×11L	Pb-free and PET sleeve
RGA	**471**	**M**	**0J**	**BK**	**-**	**0611**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Lead Configuration and Package	Rubber Type	Case Size	Lead Wire and Sleeve type

Note: For more details, please refer to “Part Numbering System (Radial Type)” on page 13.

RJA Series

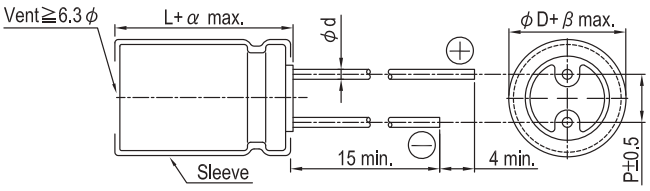
Features

- 105℃, wide temperature range
- Suitable for high reliability products
- RoHS compliance

Specifications

Items	Performance								
Category Temperature Range	6.3 ~ 63V							100V	
	-55℃ ~ +105℃							-40℃ ~ +105℃	
Capacitance Tolerance	±20% (at 120 Hz, 20℃)								
Leakage Current (at 20℃)	I = 0.01CV or 3 (μA) whichever is greater (after 2 minutes) Where, C = rated capacitance in μF, V = rated DC working voltage in V								
Tanδ (at 120 Hz, 20℃)	Rated Voltage: 6.3 / 10 / 16 / 25 / 35 / 50 / 63 / 100 Tanδ (max): 0.23 / 0.20 / 0.16 / 0.14 / 0.12 / 0.10 / 0.09 / 0.08 When the capacitance exceeds 1,000μF, 0.02 shall be added every 1,000μF increase.								
Low Temperature Characteristics (at 120 Hz)	Impedance ratio shall not exceed the values given in the table below.								
	Rated Voltage			6.3	10	16	25	35	50 / 63 / 100
	Impedance Ratio	Z(-25℃)/Z(+20℃)	φD＜16	4	3	3	2	2	2 / 2 / 2
			φD≧16	5	4	3	2	2	2 / 2 / 3
		Z(-40/-55℃)/Z(+20℃)	φD＜16	8	6	4	4	4	3 / 3 / 3
			φD≧16	12	8	6	4	3	3 / 3 / 6
Endurance	Test Time: 2,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 200% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied with rated ripple current for 2,000 hours at 105℃.								
Shelf Life Test	Test Time: 1,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 200% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 105℃ without voltage applied.								
Ripple Current and Frequency Multipliers	Freq.(Hz) / Cap.(μF)	60 (50)	120	500	1k	10k up			
	≦ 100	0.70	1.00	1.30	1.40	1.50			
	100 ＜ C ≦ 1,000	0.75	1.00	1.20	1.30	1.35			
	1,000 ＜	0.80	1.00	1.10	1.12	1.15			

Diagram of Dimensions



Lead Spacing and Diameter Unit: mm

φD	5	6.3	8	10	12.5	16	18
P	2.0	2.5	3.5	5.0	5.0	7.5	7.5
φd	0.5		0.6			0.8	
α	L<20: 1.5, L≧20: 2.0						
β	0.5						

Dimension: ϕD × L(mm)

Dimension and Permissible Ripple Current

Ripple Current: mA/rms at 120 Hz, 105℃

Cap.(μF) \ Rated Volt. (VDC) / Contents		6.3V (0J)		10V (1A)		16V (1C)		25V (1E)		35V (1V)		50V (1H)		63V (1J)		100V (2A)	
		ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA
2.2	2R2											5×11	20			5×11	26
3.3	3R3											5×11	30			5×11	31
4.7	4R7											5×11	33	5×11	36	5×11 6.3×11	36 40
10	100											5×11	50	5×11	54	6.3×11	54
22	220											5×11	78	5×11 6.3×11	64 86	6.3×11 8×11.5	93 111
33	330									5×11	85	5×11	90	6.3×11	100	8×11.5 10×12.5	144 183
47	470							5×11	97	5×11	90	6.3×11	117	6.3×11	129	10×12.5	204
100	101					5×11	110	5×11 6.3×11	120 142	6.3×11	150	8×11.5	188	10×12.5	235	10×20	285
220	221			5×11	150	6.3×11	180	8×11.5	236	8×11.5	270	10×16	335	10×20	400	12.5×25	440
330	331			6.3×11	200	8×11.5	260	8×11.5	330	10×12.5	350	10×16 10×20	410 460	10×20 12.5×20	490 520	16×25	478
470	471	6.3×11	230	6.3×11 8×11.5	250 290	8×11.5	310	10×12.5	380	10×16	460	12.5×20	590	12.5×20 12.5×25	665 720	16×31.5	688
1,000	102	8×11.5	380	10×12.5	460	10×16	560	10×20	680	12.5×20	830	16×25	1,080	16×25	1,190		
2,200	222	10×16	690	10×20	760	12.5×20	920	12.5×25	1,090	16×25	1,260	16×35.5	1,470				
3,300	332	10×20	840	12.5×20	1,100	12.5×25	1,170	16×25	1,400	16×35.5	1,610	18×35.5	1,650				
4,700	472	12.5×20	1,090	12.5×25	1,260	16×25	1,480	16×31.5	1,710	18×35.5	1,900						
6,800	682	12.5×25	1,460	16×25	1,690	16×31.5	1,930	18×35.5	2,160								
10,000	103	16×25	1,990	16×31.5	2,220	18×31.5	2,330										
22,000	223	18×35.5	2,930	18×40	3,230												

Part Numbering System

RJA Series	470μF	±20%	6.3V	Bulk Package	Gas Type	6.3ϕ×11L	Pb-free and PET sleeve
RJA	**471**	**M**	**0J**	**BK**	**-**	**0611**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Lead Configuration and Package	Rubber Type	Case Size	Lead Wire and Sleeve type

Note: For more details, please refer to “Part Numbering System (Radial Type)” on page 13.

Radial

RUK Series

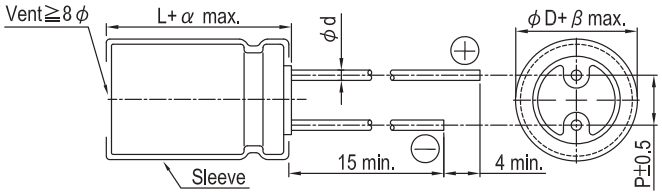
Features

- 125℃, 3,000 ~ 5,000 hours assured
- For automobile modules and other high temperature applications
- RoHS compliance

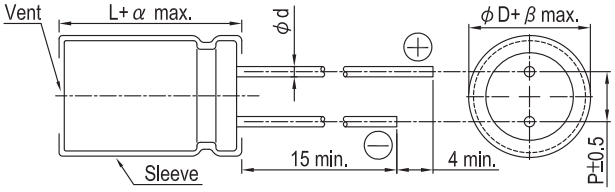
Specifications

Items	Performance
Category Temperature Range	-40℃ ~ +125℃
Capacitance Tolerance	± 20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)	I = 0.01CV or 3 (μA) whichever is greater (after 2 minutes) Where, C = rated capacitance in μF, V = rated DC working voltage in V
Tanδ (at 120 Hz, 20℃)	Rated Voltage: 10 / 16 / 25 / 35 / 50 / 63 Tanδ (max): 0.15 / 0.12 / 0.10 / 0.10 / 0.08 / 0.08
Low Temperature Characteristics (at 120 Hz)	Impedance ratio shall not exceed the values given in the table below. Rated Voltage: 10 / 16 / 25 / 35 / 50 / 63 Impedance Ratio Z(-25℃) / Z(+20℃): 3 / 2 / 2 / 2 / 2 / 2 Impedance Ratio Z(-40℃) / Z(+20℃): 6 / 4 / 4 / 4 / 4 / 4
Endurance	Test Time: 3,000 Hrs for φD = 8mm; 5,000 Hrs for φD≧10mm Capacitance Change: Within ±20% of initial value Tanδ: Less than 200% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after applied with rated subjected to DC voltage with the rated ripple current is applied for 3,000 / 5,000 hours at 125℃.
Shelf Life Test	Test Time: 1,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 200% of specified value Leakage Current: Less than 500% of specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 125℃ without voltage applied.
Ripple Current and Frequency Multipliers	Freq.(Hz) / Cap.(μF): 120 / 1k / 10k / 100k up 0.47 ~ 100: 1.00 / 1.70 / 1.88 / 2.00 150 ~ 470: 1.00 / 1.45 / 1.58 / 1.65 1,000: 1.00 / 1.20 / 1.25 / 1.33

Diagram of Dimensions



The case size of 16×20 is suitable for below diagram:



Lead Spacing and Diameter Unit: mm

φD	8	10	12.5	16
P	3.5	5.0	5.0	7.5
φd	0.6			0.8
α	L<20: 1.5, L≧20: 2.0			
β	0.5			

Dimension: ϕD × L(mm)
Ripple Current: mA/rms at 120 Hz, 125°C

Dimension and Permissible Ripple Current

Cap.(μF)	Rated Volt. (V_{DC}) / Contents	10V (1A)		16V (1C)		25V (1E)		35V (1V)		50V (1H)		63V (1J)	
		ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA
10	100									8×11.5	56	8×11.5	56
22	220							8×11.5	75	10×12.5	99	10×12.5	99
33	330					8×11.5	92	10×12.5	108	10×16	133	10×16	133
47	470			8×11.5	100	10×12.5	129	10×16	142	10×16	159	10×20	173
100	101	10×12.5	154	10×16	190	10×16	208	10×20	225				
220	221	10×16	252	10×20	305	12.5×20	371	12.5×25	403	12.5×20	279	12.5×20	279
330	331	10×16	308	12.5×20	414	12.5×25	493	16×20	503				
470	471	10×20	399	12.5×25	537	16×20	601			16×20	459		
1,000	102	16×20	715										

Part Numbering System

RUK Series	470μF	±20%	16V	Bulk Package	Gas Type	12.5ϕ×25L	Pb-free and PET sleeve
RUK	**471**	**M**	**1C**	**BK**	**-**	**1325**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Lead Configuration and Package	Rubber Type	Case Size	Lead Wire and Sleeve type

Note: For more details, please refer to “Part Numbering System (Radial Type)” on page 13.

RUZ Series

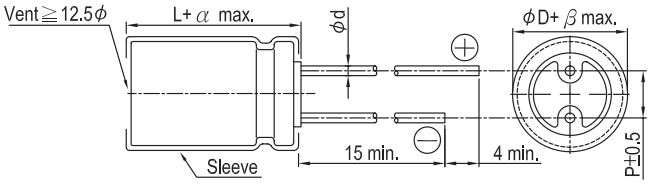
Features

- 125℃, 3,000 ~ 5,000 hours assured
- Low impedance and high-ripple current
- For automobile modules and other high temperature applications
- RoHS Compliance

Specifications

Items	Performance
Category Temperature Range	-40℃ ~ +125℃
Capacitance Tolerance	± 20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)	I = 0.03CV or 4 (μA) whichever is greater (after 1 minutes) Where, C = rated capacitance in μF, V = rated DC working voltage in V.
Tanδ (at 120 Hz, 20℃)	Rated Voltage: 25 / 35 / 50 / 63 / 80 / 100 Tanδ (max): 0.14 / 0.12 / 0.10 / 0.10 / 0.08 / 0.08 When the capacitance exceeds 1,000μF, 0.02 shall be added every 1,000μF increase.
Low Temperature Characteristics (at 120 Hz)	Impedance ratio shall not exceed the values given in the table below. Rated Voltage: 25 / 35 / 50 / 63 / 80 / 100 Impedance Ratio Z(-25℃) / Z(+20℃): 2 / 2 / 2 / 2 / 2 / 2 Impedance Ratio Z(-40℃) / Z(+20℃): 4 / 4 / 4 / 4 / 4 / 4 When the capacitance exceeds 1000μF, 0.02 shall be added every 1000μF increase
Endurance	Test Time: 3,000 Hrs for L ≦ 25mm; 5,000 Hrs for L > 25mm Capacitance Change: Within ±30% of initial value Tanδ: Less than 300% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied with rated ripple current for 3,000 / 5,000 hours at 125℃.
Shelf Life Test	Test Time: 1,000 Hrs Capacitance Change: Within ±30% of initial value Tanδ: Less than 300% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 125℃ without voltage applied.
Ripple Current and Frequency Multipliers	Freq. (Hz) / Cap. (μF): 120 / 1k / 10k / 100k 200: 0.40 / 0.82 / 0.93 / 1.00 330 ~ 560: 0.50 / 0.85 / 0.94 / 1.00 680 ~ 1,800: 0.60 / 0.87 / 0.95 / 1.00 2,200 ~ 3,900: 0.75 / 0.90 / 0.95 / 1.00 4,700 ~ 6,800: 0.85 / 0.95 / 0.98 / 1.00

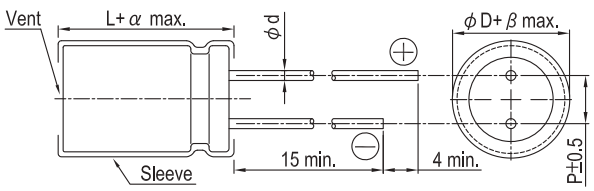
Diagram of Dimensions



Lead Spacing and Diameter Unit: mm

φD	12.5	16	18
P	5.0	7.5	7.5
φd	0.6	0.8	
α	2.0		
β	0.5		

The case size of 16×20 and 18×25 are suitable for below diagram:



Dimension: ϕD × L(mm)
Impedance: Ω/ at 100k Hz, 20°C
Ripple Current: mA/rms at 100 kHz, 125°C

Dimension and Permissible Ripple Current

Rated Volt. (V_{DC}) / Cap. (μF)	Contents	25V (1E)			35V (1V)			50V (1H)			63V (1J)			80V (1K)		
		ϕD×L	Imp.	mA	ϕD×L	Imp.	mA	ϕD×L	Imp.	mA	ϕD×L	Imp.	mA	ϕD×L	Imp.	mA
330	331													16×20	0.085	1,790
470	471							12.5×20	0.065	1,500	16×20	0.085	1,790	16×25	0.061	2,030
560	561													18×25	0.049	2,280
680	681				12.5×20	0.044	1820	12.5×25 16×20	0.048 0.043	1,900 2,040	16×25	0.061	2,030	16×35.5	0.044	2,580
820	821							12.5×30	0.041	2,150				16×40 18×35.5	0.036 0.035	2,900 2,890
1,000	102				12.5×25	0.033	2,400	12.5×35 16×25	0.034 0.031	2,510 2,620	16×35.5 18×25	0.044 0.049	2,580 2,280			
1,200	122	12.5×20	0.044	1,820	12.5×30 16×20	0.029 0.034	2,560 2,280	12.5×40 18×25	0.028 0.029	2,870 2,750	16×40	0.036	2,900	18×40	0.030	3,210
1,500	152				12.5×35	0.024	2,970	16×35.5	0.023	3,300	18×35.5	0.035	2,890			
1,800	182	12.5×25 16×20	0.033 0.034	2,400 2,280	12.5×40 16×25	0.021 0.026	3,600 3,100				18×40	0.030	3,210			
2,200	222	12.5×30	0.029	2,560	18×25	0.024	3,200	16×40 18×35.5	0.020 0.022	3,720 3,510						
2,700	272	12.5×35 16×25	0.024 0.026	2,970 3,100	16×35.5	0.020	3,590	18×40	0.018	3,940						
3,300	332	12.5×40	0.021	3,600	16×40 18×35.5	0.017 0.019	4,300 4,200									
3,900	392	16×35.5 18×25	0.020 0.024	3,590 3,200												
4,700	472				18×40	0.016	4,600									
5,600	562	16×40 18×35.5	0.017 0.019	4,300 4,200												
6,800	682	18×40	0.016	4,600												

Rated Volt. (V_{DC}) / Cap. (μF)	Contents	100V (2A)		
		ϕD×L	Imp.	mA
200	201	16×20	0.11	1,580
330	331	16×25 18×25	0.079 0.064	1,990 2,110
470	471	16×35.5	0.056	2,500
560	561	16×40 18×35.5	0.046 0.044	2,700 2,690
680	681	18×40	0.039	2,880

Part Numbering System

RUZ series	1200μF	±20%	25V	Bulk Package	Gas Type	12.5φ×20L	Pb-free and PET sleeve
RUZ	**122**	**M**	**1E**	**BK**	**-**	**1320**	
Series	Capacitance	Capacitance Tolerance	Rated Voltage	Lead Configuration and Package	Rubber Type	Case Size	Lead Wire and Sleeve type

Note: For more details, please refer to “Part Numbering System (Radial Type)” on page 13.

RUA Series

Features

- 130℃, 2,000 ~ 3,000 hours assured
- For automobile modules and other high temperature applications
- RoHS compliance

Specifications

Items	Performance	
Category Temperature Range	10 ~ 250V	350 ~ 450V
	-40℃ ~ +130℃	-25℃ ~ +130℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)	

Leakage Current (at 20℃)

Rated voltage	≦100V	>100V	
Time	after 2 minutes	after 1 minutes	
Leakage Current	I = 0.01CV or 3 (μA) whichever is greater	CV ≦ 1,000 I = 0.1CV + 40(μA)	CV > 1,000 I = 0.04CV + 100(μA)

Where, C = rated capacitance in μF, V = rated DC working voltage in V

Tanδ (at 120 Hz, 20℃)

Rated Voltage	10	16	25	35	50	63	160	200	250	350	400	450
Tanδ (max)	0.15	0.12	0.10	0.10	0.08	0.08	0.20	0.20	0.20	0.24	0.24	0.24

Low Temperature Characteristics (at 120 Hz)

Impedance ratio shall not exceed the values given in the table below.

Rated Voltage		10	16	25	35	50	63	160	200	250	350	400	450
Impedance Ratio	Z(-25℃) / Z(+20℃)	3	2	2	2	2	2	3	3	3	6	6	6
	Z(-40℃) / Z(+20℃)	6	4	4	4	4	4	6	6	6	-	-	-

Endurance

Test Time	2,000 Hrs for φD ≦ 8 mm; 3,000 Hrs for φD ≧10 mm
Capacitance Change	Within ±20% of initial value
Tanδ	Less than 200% of specified value
Leakage Current	Within specified value

* The above specifications shall be satisfied when the capacitors are restored to 20℃ after applied with ratedsubjected to DC voltage with the rated ripple current is applied for 2,000 / 3,000 hours at 130℃.

Shelf Life Test

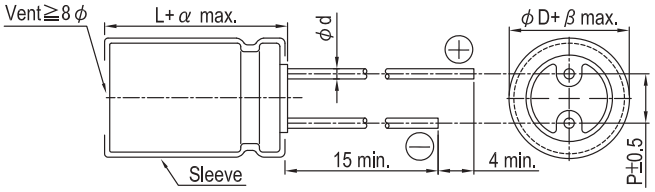
Test Time	1,000 hrs
Capacitance Change	Within ±20% of initial value
Tanδ	Less than 200% of specified value
Leakage Current	Less than 500% of specified value

* The above specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 130℃ without voltage applied. The rated voltage shall be applied to the capacitors before the measurements for 160 ~ 450V (Refer to JIS C 5101-4 4.1).

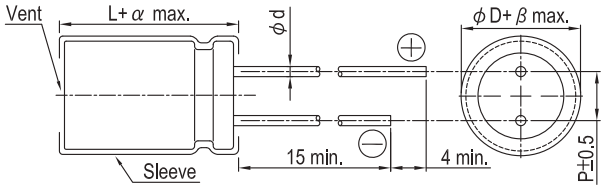
Ripple Current and Frequency Multipliers

Rated Voltage (V)	Freq.(Hz) / Cap.(μF)	120	1k	10k	100k up
10 ~ 63	0.47 ~ 100	1.00	1.85	2.25	2.50
	150 ~ 470	1.00	1.70	1.88	2.00
	1,000	1.00	1.45	1.58	1.65
160 ~ 450	≦ 33	1.00	1.50	1.75	1.80
	47 ≦	1.00	1.30	1.40	1.50

Diagram of Dimensions



The case size of 16×20 is suitable for below diagram:



Lead Spacing and Diameter Unit: mm

φD	8	10	12.5	16
P	3.5	5.0	5.0	7.5
φd	0.6			0.8
α	L<20: 1.5, L≧20: 2.0			
β	0.5			

Dimension: ϕD × L(mm)

Ripple Current: mA/rms at 120 Hz, 130°C

Dimension and Permissible Ripple Current

Cap.(μF) \ Rated Volt. (VDC) / Contents		10V (1A)		16V (1C)		25V (1E)		35V (1V)		50V (1H)		63V (1J)	
		ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA
10	100									8×11.5	84	8×11.5	84
22	220							8×11.5	113	10×12.5	149	10×12.5	149
33	330					8×11.5	138	10×12.5	162	10×16	200	10×16	200
47	470			8×11.5	150	10×12.5	194	10×16	213	10×16	239	10×20	260
100	101	10×12.5	231	10×16	285	10×16	312	10×20	338				
220	221	10×16	378	10×20	458	12.5×20	557	12.5×25	605	12.5×20	419	12.5×20	419
330	331	10×16	462	12.5×20	621	12.5×25	740	16×20	755				
470	471	10×20	599	12.5×25	806	16×20	902			16×20	689		
1,000	102	16×20	1073										

Cap.(μF) \ Rated Volt. (VDC) / Contents		160V (2C)		200V (2D)		250V (2E)		350V (2V)		400V (2G)		450V (2W)	
		ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA
4.7	4R7							10×20	53	10×20	53	10×25	58
10	100			10×20	78	10×20	78	10×25	85	10×25	86	12.5×20	86
22	220	10×20	115	10×25	126	12.5×20	128	12.5×25	139	12.5×25	142	16×25	154
33	330	10×25	154	12.5×20	157	12.5×25	171	16×25	189	16×25	189	16×31.5	203
47	470	12.5×20	187	12.5×25	204	16×25	225	16×31.5	243	16×31.5	243		
68	680	12.5×25	245	16×20	250	16×31.5	292						
100	101	16×25	329	16×25	329								
150	151	16×31.5	434										

Part Numbering System

RUA Series	470μF	±20%	16V	Bulk Package	Gas Type	12.5ϕ×25L	Pb-free and PET sleeve
RUA	**471**	**M**	**1C**	**BK**	**-**	**1325**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Lead Configuration and Package	Rubber Type	Case Size	Lead Wire and Sleeve type

Note: For more details, please refer to “Part Numbering System (Radial Type)” on page 13.

RXJ Series

Features

- 105℃, 2,000 ~ 5,000 hours assured
- Low ESR, suitable for switching power supplies
- Smaller size with large permissible ripple current
- RoHS compliance

Specifications

Items	Performance	
Category Temperature Range	6.3 ~ 63V	100V
	-55℃ ~ +105℃	-40℃ ~ +105℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)	
Leakage Current (at 20℃)	I = 0.01CV or 3 (μA) whichever is greater (after 2 minutes) Where, C = rated capacitance in μF, V = rated DC working voltage in V	

Tanδ (at 120 Hz, 20℃)

Rated Voltage	6.3	10	16	25	35	50	63	100
Tanδ (max)	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.08

When the capacitance exceeds 1,000μF, 0.02 shall be added every 1,000μF increase.

Low Temperature Characteristics (at 120 Hz)

Impedance ratio shall not exceed the values given in the table below.

Rated Voltage		6.3	10	16	25	35	50	63	100
Impedance Ratio	Z(-55℃)/Z(+20℃)	4	4	3	3	3	3	3	3

Endurance

Test Time	2,000 Hrs for φD ≦ 8 mm; 5,000 Hrs for φD ≧ 10 mm
Capacitance Change	Within ±20% of initial value
Tanδ	Less than 200% of specified value
Leakage Current	Within specified value

* The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied with rated ripple current for 2,000/5,000 hours at 105℃.

Shelf Life Test

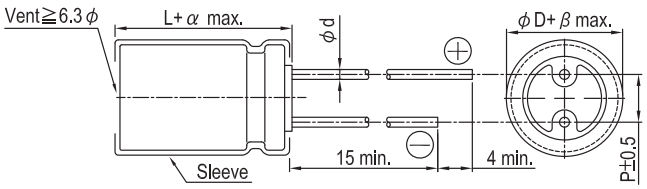
Test Time	1,000 Hrs
Capacitance Change	Within ±20% of initial value
Tanδ	Less than 200% of specified value
Leakage Current	Within specified value

* The above specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 105℃ without voltage applied.

Ripple Current and Frequency Multipliers

Cap.(μF) \ Freq.(Hz)	60 (50)	120	500	1k	10k	100k
≦ 33	0.40	0.55	0.65	0.80	0.90	1.00
39 ~ 330	0.60	0.70	0.80	0.90	0.95	1.00
390 ~ 1,000	0.65	0.80	0.85	0.98	1.00	1.00
1,200 ≦	0.80	0.90	0.95	0.98	1.00	1.00

Diagram of Dimensions



Lead Spacing and Diameter Unit: mm

φD	5	6.3	8	10	12.5	16	18
P	2.0	2.5	3.5	5.0	5.0	7.5	7.5
φd	0.5		0.6			0.8	
α	L<20: 1.5, L≧20: 2.0						
β	0.5						

Dimension: ϕD × L(mm)
Impedance: Ω/ at 100k Hz
Ripple Current: mA/rms at 105°C

Dimension and Permissible Ripple Current

Rated Volt. (Vdc) / Contents / Cap. (μF)	6.3V (0J)					10V (1A)					16V (1C)				
	ϕD×L	Impedance (Ω, max./100k Hz)		Ripple Current (mA/rms, 105℃)		ϕD×L	Impedance (Ω, max./100k Hz)		Ripple Current (mA/rms, 105℃)		ϕD×L	Impedance (Ω, max./100k Hz)		Ripple Current (mA/rms, 105℃)	
		20℃	-10℃	120 Hz	100k Hz		20℃	-10℃	120 Hz	100k Hz		20℃	-10℃	120 Hz	100k Hz
33											5×11	1.30	3.90	108	154
39											5×11	1.30	3.90	108	154
47						5×11	2.10	5.50	78	111	6.3×11	0.60	1.80	182	260
56						5×11	1.90	4.80	85	121	6.3×11	0.60	1.80	182	260
68						5×11	1.30	3.90	108	154	6.3×11	0.60	1.80	182	260
100	5×11	1.30	3.90	108	154	6.3×11	0.60	1.80	182	260	6.3×11	0.60	1.80	182	260
220	6.3×11	0.60	1.80	182	260	8×11.5	0.33	0.99	280	400	8×11.5	0.33	0.99	320	400
330	8×11.5	0.33	0.88	280	400	8×11.5	0.33	0.99	280	400	10×12.5	0.25	0.75	360	510
390	8×11.5	0.33	0.88	320	400	10×12.5	0.27	0.75	410	510	10×16	0.19	0.57	510	635
470	10×12.5	0.25	0.75	410	510	10×12.5	0.25	0.75	410	510	10×16	0.19	0.57	510	635
560	10×12.5	0.25	0.75	410	510	10×16	0.19	0.57	510	635	10×20	0.14	0.42	775	860
680	10×16	0.19	0.57	510	635	10×16	0.19	0.57	510	635	10×20	0.14	0.42	775	860
1,000	10×20	0.14	0.42	690	860	10×20	0.14	0.37	690	860	12.5×20	0.085	0.26	1,000	1,250
1,200	10×20	0.14	0.42	775	860	10×25	0.12	0.30	930	1,030	12.5×20	0.085	0.26	1,125	1,250
2,200	12.5×20	0.085	0.26	1,125	1,250	12.5×25	0.070	0.21	1,200	1,355	12.5×25	0.070	0.21	1,200	1,355
3,300	12.5×25	0.070	0.21	1,200	1,355	12.5×25	0.070	0.21	1,200	1,355	16×31.5	0.048	0.14	1,830	2,030
4,700	16×25	0.060	0.18	1,595	1,770	16×31.5	0.048	0.14	1,830	2,030	16×35.5	0.044	0.13	2,065	2,295

Rated Volt. (Vdc) / Contents / Cap. (μF)	25V (1E)					35V (1V)					50V (1H)				
	ϕD×L	Impedance (Ω, max./100k Hz)		Ripple Current (mA/rms, 105℃)		ϕD×L	Impedance (Ω, max./100k Hz)		Ripple Current (mA/rms, 105℃)		ϕD×L	Impedance (Ω, max./100k Hz)		Ripple Current (mA/rms, 105℃)	
		20℃	-10℃	120 Hz	100KHz		20℃	-10℃	120 Hz	100KHz		20℃	-10℃	120 Hz	100KHz
2.2											5×11	4.0	12.0	48	88
3.3											5×11	3.50	11.0	52	94
4.7											5×11	3.00	9.00	55	100
6.8											5×11	3.00	9.00	55	100
10											5×11	2.00	6.00	68	124
22						5×11	1.30	3.90	108	154	6.3×11	0.60	1.80	143	260
33	5×11	1.30	3.90	108	154	6.3×11	0.60	1.80	182	260	6.3×11	0.60	1.80	143	260
39	6.3×11	0.60	1.80	182	260	6.3×11	0.60	1.80	182	260	6.3×11	0.60	1.80	182	260
47	6.3×11	0.60	1.80	182	260	6.3×11	0.60	1.80	182	260	8×11.5	0.33	0.99	320	400
56	6.3×11	0.60	1.80	182	260	6.3×11	0.60	1.80	182	260	8×11.5	0.33	0.99	320	400
68	6.3×11	0.60	1.80	182	260	6.3×11	0.60	1.80	182	260	8×11.5	0.33	0.99	320	400
100	8×11.5	0.33	0.99	320	400	8×11.5	0.33	0.99	320	400	10×16	0.19	0.57	445	635
220	10×12.5	0.25	0.75	360	510	10×16	0.19	0.57	445	635	10×25	0.12	0.30	825	1,030
330	10×16	0.19	0.57	445	635	10×20	0.12	0.42	600	860	12.5×20	0.085	0.26	875	1,250
390	10×20	0.14	0.42	775	965	10×25	0.12	0.30	930	1,030	12.5×25	0.070	0.21	1,085	1,355
470	10×20	0.14	0.42	775	965	12.5×20	0.085	0.26	1,000	1,250	12.5×25	0.070	0.21	1,085	1,355
560	10×25	0.12	0.30	930	1,030	12.5×20	0.085	0.26	1,000	1,250	12.5×25	0.070	0.21	1,085	1,355
680	12.5×20	0.085	0.26	1,000	1,250	12.5×25	0.070	0.21	1,085	1,355	16×25	0.060	0.18	1,415	1,770
1,000	12.5×25	0.070	0.23	1,080	1,355	12.5×25	0.070	0.21	1,085	1,355	16×25	0.060	0.18	1,595	1,770
1,200	12.5×25	0.070	0.21	1,200	1,355	12.5×25	0.070	0.21	1,200	1,355	16×31.5	0.048	0.14	1,830	2,030
2,200	16×25	0.060	0.18	1,595	1,770	16×35.5	0.044	0.13	2,065	2,295	18×40	0.037	0.10	2,465	2,740
3,300	16×35.5	0.044	0.13	2,065	2,295	18×40	0.037	0.10	2,465	2,740					
4,700	18×40	0.037	0.10	2,465	2,740										

Dimension: ϕD×L(mm)
Impedance: Ω/ at 100k Hz
Ripple Current: mA/rms at 105℃

Dimension and Permissible Ripple Current

Rated Volt. (VDC) / Contents / Cap. (μF)	63V (1J)					100V (2A)				
	ϕD×L	Impedance (Ω, max./100k Hz)		Ripple Current (mA/rms, 105℃)		ϕD×L	Impedance (Ω, max./100k Hz)		Ripple Current (mA/rms, 105℃)	
		20℃	-10℃	120 Hz	100k Hz		20℃	-10℃	120 Hz	100k Hz
2.2						5×11	6.00	21.0	40	72
3.3						5×11	5.00	18.0	43	78
4.7						6.3×11	1.20	4.20	100	180
6.8						6.3×11	1.20	4.20	100	180
10	6.3×11	1.20	4.20	100	180	8×11.5	0.56	2.00	168	305
22	6.3×11	1.20	4.20	100	180	8×11.5	0.56	2.00	168	308
33	8×11.5	0.56	2.00	170	305	10×12.5	0.50	1.80	210	380
39	8×11.5	0.56	2.00	170	305	10×16	0.32	1.10	350	500
47	8×11.5	0.56	2.00	170	305	10×20	0.27	0.95	435	620
56	10×12.5	0.50	1.80	265	380	10×20	0.27	0.95	435	620
68	10×12.5	0.50	1.80	265	380	10×25	0.21	0.63	530	760
100	10×20	0.27	0.95	435	620	12.5×20	0.16	0.56	625	890
220	12.5×20	0.094	0.24	570	820	16×25	0.090	0.32	1,010	1,440
330	12.5×25	0.073	0.21	770	1,100	16×31.5	0.060	0.17	1,255	1,790
390	12.5×25	0.073	0.21	770	1,100	16×35.5	0.056	0.14	1,650	2,065
470	16×25	0.060	0.18	1,420	1,770					
560	16×31.5	0.048	0.14	1,625	2,030					
680	16×31.5	0.048	0.14	1,625	2,030					
1,000	18×35.5	0.041	0.11	1,790	2,240					

Part Numbering System

RXJ Series	470μF	±20%	6.3V	Bulk Package	Gas Type	10ϕ×12.5L	Pb-free and PET sleeve
RXJ	**471**	**M**	**0J**	**BK**	**-**	**1012**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Lead Configuration and Package	Rubber Type	Case Size	Lead Wire and Sleeve type

Note: For more details, please refer to “Part Numbering System (Radial Type)” on page 13.

RXK Series

Features

- 105℃, 2,000 ~ 5,000 hours assured
- Low ESR, suitable for switching power supplies
- Smaller size with large permissible ripple current
- RoHS compliance

Specifications

Items	Performance
Category Temperature Range	-55℃ ~ +105℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)	I = 0.01CV or 3 (μA) whichever is greater (after 2 minutes) Where, C = rated capacitance in μF, V = rated DC working voltage in V
Tanδ (at 120 Hz, 20℃)	When the capacitance exceeds 1,000μF, 0.02 shall be added every 1,000μF increase.
Low Temperature Characteristics (at 120 Hz)	Impedance ratio shall not exceed the values given in the table below.
Endurance	* The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied with rated ripple current for 2,000 ~ 5,000 hours at 105℃.
Shelf Life Test	* The above specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 105℃ without voltage applied.
Ripple Current and Frequency Multipliers	

Tanδ (at 120 Hz, 20℃)

Rated Voltage	6.3	10	16	25	35	50	63
Tanδ (max)	0.22	0.19	0.16	0.14	0.12	0.10	0.09

Low Temperature Characteristics (at 120 Hz)

Rated Voltage		6.3	10	16	25	35	50	63
Impedance Ratio	Z(-55℃)/Z(+20℃)	4	4	3	3	3	3	3

Endurance

Test Time	2,000 Hrs for φD ≦ 6.3 mm; 3,000 Hrs for φD = 8 mm; 4,000 Hrs for φD = 10 mm; 5,000 Hrs for φD ≧ 12.5 mm
Capacitance Change	Within ±20% of initial value
Tanδ	Less than 200% of specified value
Leakage Current	Within specified value

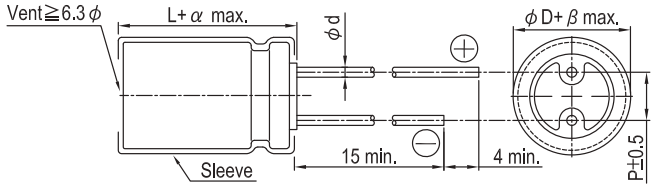
Shelf Life Test

Test Time	1,000 Hrs
Capacitance Change	Within ±20% of initial value
Tanδ	Less than 200% of specified value
Leakage Current	Within specified value

Ripple Current and Frequency Multipliers

Cap.(μF) \ Freq.(Hz)	60 (50)	120	500	1k	10k	100k
≦ 33	0.40	0.55	0.65	0.80	0.90	1.00
39 ~ 330	0.60	0.70	0.80	0.90	0.95	1.00
390 ~ 1,000	0.65	0.80	0.85	0.98	1.00	1.00
1,200 ≦	0.80	0.90	0.95	0.98	1.00	1.00

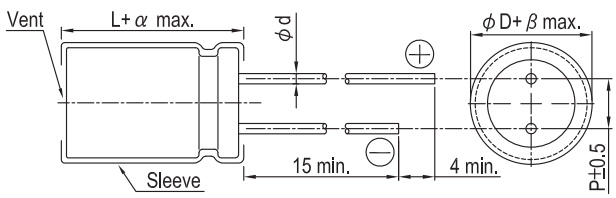
Diagram of Dimensions



Lead Spacing and Diameter Unit: mm

φD	5	6.3	8	10	12.5	16	18
P	2.0	2.5	3.5	5.0	5.0	7.5	7.5
φd	0.5		0.6			0.8	
α	L<20: 1.5, L≧20: 2.0						
β	0.5						

The case size of 16×20 is suitable for below diagram:



Radial

Dimension: ϕD × L(mm)
Impedance: Ω/ at 100k Hz
Ripple Current: mA/rms at 105°C

Dimension and Permissible Ripple Current

Rated Volt. (VDC) / Contents / Cap. (μF)	6.3V (0J)					10V (1A)					16V (1C)				
	ϕD×L	Impedance (Ω, max./100k Hz)		Ripple Current (mA/rms, 105℃)		ϕD×L	Impedance (Ω, max./100k Hz)		Ripple Current (mA/rms, 105℃)		ϕD×L	Impedance (Ω, max./100k Hz)		Ripple Current (mA/rms, 105℃)	
		20℃	-10℃	120 Hz	100k Hz		20℃	-10℃	120 Hz	100k Hz		20℃	-10℃	120 Hz	100k Hz
56											5×11	0.72	1.8	116	165
68											5×11	0.72	1.8	126	180
82						5×11	0.72	1.8	116	165					
100						5×11	0.72	1.8	126	180					
120	5×11	0.72	1.8	116	165						6.3×11	0.38	0.95	179	255
180						6.3×11	0.38	0.95	179	255	6.3×15	0.27	0.68	231	330
220	6.3×11	0.38	0.95	179	255	6.3×11	0.38	0.95	196	280					
270	6.3×11	0.38	0.95	196	280	6.3×15	0.27	0.68	231	330	8×11.5 10×12.5	0.20 0.12	0.50 0.30	291 438	415 625
330	6.3×15	0.27	0.68	231	330	8×11.5	0.20	0.50	291	415	8×11.5 8×15 10×12.5	0.20 0.16 0.12	0.50 0.40 0.30	315 347 540	450 495 675
390	8×11.5	0.20	0.50	332	415	8×11.5 10×12.5	0.20 0.12	0.50 0.30	360 500	450 625					
470	8×11.5 10×12.5	0.20 0.12	0.50 0.30	360 500	450 625	8×15 10×12.5	0.16 0.12	0.40 0.30	396 540	495 675	8×15 8×20 10×16	0.16 0.11 0.084	0.40 0.28 0.21	472 512 660	590 640 825
560	8×15 10×12.5	0.16 0.12	0.40 0.30	396 540	495 675	8×15	0.16	0.40	472	590	8×20 10×16	0.11 0.084	0.28 0.21	560 728	700 910
680	10×16	0.084	0.21	660	825	8×20 10×16	0.11 0.084	0.28 0.21	512 660	640 825	10×20	0.062	0.16	832	1,040
820	8×15 8×20 10×16	0.16 0.11 0.084	0.40 0.28 0.21	472 512 728	590 640 910	8×20 10×16	0.11 0.084	0.28 0.21	560 728	700 910	10×20 10×25	0.062 0.052	0.16 0.13	904 1,008	1,130 1,260
1,000	8×20	0.11	0.28	560	700	10×20	0.062	0.16	832	1,040	10×25	0.052	0.13	1,112	1,390
1,200	10×20	0.062	0.16	936	1,040	10×20 10×25	0.062 0.052	0.16 0.13	1,017 1,134	1,130 1,260	10×30 12.5×20	0.044 0.046	0.11 0.12	1,296 1,206	1,440 1,340
1,500	10×20 10×25	0.062 0.052	0.16 0.13	1,017 1,134	1,130 1,260	10×25 10×30	0.052 0.044	0.13 0.11	1,251 1,296	1,390 1,440	10×30 12.5×20 12.5×25	0.044 0.046 0.034	0.11 0.12 0.085	1,413 1,305 1,521	1,570 1,450 1,690
1,800	10×25	0.052	0.13	1,251	1,390	10×30 12.5×20	0.044 0.046	0.11 0.12	1,413 1,206	1,570 1,340	12.5×25	0.034	0.085	1,629	1,810
2,200	10×30 12.5×20	0.044 0.046	0.11 0.12	1,296 1,206	1,440 1,340	12.5×20 12.5×25	0.046 0.034	0.12 0.085	1,305 1,521	1,450 1,690	12.5×30 16×20	0.030 0.035	0.075 0.087	1,755 1,485	1,950 1,650
2,700	10×30 12.5×20 12.5×25	0.044 0.046 0.034	0.11 0.12 0.085	1,413 1,305 1,521	1,570 1,450 1,690	12.5×25 12.5×30	0.034 0.030	0.085 0.075	1,629 1,755	1,810 1,950	12.5×30 12.5×35 16×25	0.030 0.027 0.028	0.075 0.068 0.070	1,917 1,980 1,863	2,130 2,200 2,070
3,300	12.5×25	0.034	0.085	1,629	1,810	12.5×30 12.5×35	0.030 0.027	0.075 0.068	1,917 1,980	2,130 2,200	12.5×35 12.5×40 16×25	0.027 0.024 0.028	0.068 0.060 0.070	2,151 2,196 2,025	2,390 2,440 2,250
3,900	12.5×30	0.030	0.075	1,755	1,950	12.5×35 12.5×40 16×20 16×25	0.027 0.024 0.035 0.028	0.068 0.060 0.087 0.070	2,196 2,151 1,692 1,863	2,390 2,440 1,880 2,070	16×31.5	0.025	0.063	2,115	2,350
4,700	12.5×30 12.5×35 16×20	0.030 0.027 0.035	0.075 0.068 0.087	1,917 1,980 1,440	2,130 2,200 1,600	12.5×40 16×25	0.024 0.028	0.060 0.070	2,358 2,025	2,620 2,250	16×31.5 16×35.5	0.025 0.022	0.055 0.055	2,295 2,295	2,550 2,550
5,600	12.5×35 12.5×40 16×25	0.027 0.024 0.028	0.068 0.060 0.070	2,151 2,196 1,863	2,390 2,440 2,070	16×31.5	0.025	0.063	2,115	2,350	16×35.5 16×40	0.022 0.018	0.055 0.045	2,394 2,610	2,660 2,900
6,800	12.5×40 16×25 16×31.5	0.024 0.028 0.025	0.060 0.070 0.063	2,358 2,025 2,115	2,620 2,250 2,350	16×31.5 16×35.5	0.025 0.022	0.063 0.055	2,295 2,295	2,550 2,550	16×40 18×35.5	0.018 0.021	0.045 0.053	2,844 2,448	3,160 2,720
8,200	16×31.5	0.025	0.063	2,295	2,550	16×35.5	0.022	0.055	2,448	2,720	18×35.5	0.021	0.053	2,601	2,890
10,000	16×35.5	0.022	0.055	2,691	2,990										

Dimension: ϕD × L(mm)
Impedance: Ω/ at 100k Hz
Ripple Current: mA/rms at 105℃

Dimension and Permissible Ripple Current

Rated Volt. (VDC) / Contents / Cap. (μF)	25V (1E)					35V (1V)					50V (1H)				
	ϕD×L	Impedance (Ω, max./100k Hz)		Ripple Current (mA/rms, 105℃)		ϕD×L	Impedance (Ω, max./100k Hz)		Ripple Current (mA/rms, 105℃)		ϕD×L	Impedance (Ω, max./100k Hz)		Ripple Current (mA/rms, 105℃)	
		20℃	-10℃	120 Hz	100k Hz		20℃	-10℃	120 Hz	100k Hz		20℃	-10℃	120 Hz	100k Hz
18											5×11	1.1	3.3	72	130
22											5×11	1.1	3.3	83	150
27						5×11	0.72	1.8	91	165					
33						5×11	0.72	1.8	99	180					
39	5×11	0.72	1.8	116	165						6.3×11	0.56	1.6	154	220
47	5×11	0.72	1.8	126	180						6.3×11	0.56	1.6	161	230
56						6.3×11	0.38	0.95	179	255	6.3×15	0.41	1.2	217	310
68						6.3×11	0.38	0.95	196	280	8×11.5	0.29	0.84	238	340
82	6.3×11	0.38	0.95	179	255	6.3×15	0.27	0.68	231	330	8×11.5 8×15 10×12.5	0.29 0.25 0.16	0.84 0.75 0.40	249 329 336	355 470 480
100	6.3×11	0.38	0.95	196	280						10×12.5	0.16	0.40	371	530
120	6.3×15	0.27	0.68	231	330	8×11.5 10×12.5	0.20 0.12	0.50 0.30	291 438	415 625	8×15 8×20 10×16	0.25 0.18 0.12	0.75 0.52 0.30	392 427 529	560 610 755
150	8×11.5	0.20	0.50	291	415	8×11.5 10×12.5	0.20 0.12	0.50 0.30	315 473	450 675	10×16	0.12	0.30	588	840
180	8×11.5 10×12.5	0.20 0.12	0.50 0.30	315 438	450 625	8×15	0.16	0.40	347	495	8×20 10×20	0.18 0.088	0.52 0.22	525 662	750 945
220	8×15 10×12.5	0.16 0.12	0.40 0.30	347 473	495 675	8×15 8×20 10×16	0.16 0.11 0.084	0.40 0.28 0.21	413 448 578	590 640 825	10×20 10×25	0.088 0.068	0.22 0.17	728 805	1,040 1,150
270						8×20 10×16	0.11 0.084	0.28 0.21	490 637	700 910	10×25	0.068	0.17	896	1,280
330	8×15 8×20 10×16	0.16 0.11 0.084	0.40 0.28 0.21	413 448 578	590 640 825	10×20	0.062	0.16	728	1,040	10×30 12.5×20	0.059 0.059	0.15 0.15	882 833	1,260 1,190
390	8×20 10×16	0.11 0.084	0.28 0.21	560 728	700 910	10×20 10×25	0.062 0.052	0.16 0.13	904 1,008	1,130 1,260	12.5×20	0.059	0.15	952	1,190
470	10×20	0.062	0.16	832	1,040	10×25	0.052	0.13	1,112	1,390	10×30 12.5×25	0.059 0.045	0.15 0.11	1,176 1,192	1,470 1,490
560	10×20 10×25	0.062 0.052	0.16 0.13	904 1,008	1,130 1,260	10×30 12.5×20	0.044 0.046	0.11 0.12	1,152 1,072	1,440 1,340	12.5×25 12.5×30	0.045 0.039	0.11 0.098	1,304 1,376	1,630 1,720
680	10×25	0.052	0.13	1,112	1,390	10×30 12.5×20 12.5×25	0.044 0.046 0.034	0.11 0.12 0.085	1,256 1,160 1,352	1,570 1,450 1,690	12.5×30 12.5×35 16×20	0.039 0.033 0.048	0.098 0.083 0.120	1,520 1,512 1,248	1,800 1,900 1,560
820	10×30 12.5×20	0.044 0.046	0.11 0.12	1,152 1,072	1,440 1,340	12.5×25	0.034	0.085	1,448	1,810	12.5×35 12.5×40 16×25	0.033 0.029 0.033	0.083 0.073 0.083	1,624 1,656 1,504	2,030 2,070 1,880
1,000	10×30 12.5×20 12.5×25	0.044 0.046 0.034	0.11 0.12 0.085	1,256 1,160 1,352	1,570 1,450 1,690	12.5×30 16×20	0.030 0.035	0.075 0.087	1,560 1,376	1,950 1,720	12.5×40 16×25 16×31.5	0.029 0.033 0.029	0.073 0.083 0.073	1,800 1,664 1,720	2,250 2,080 2,150
1,200	12.5×25	0.034	0.085	1,629	1,810	12.5×30 12.5×35 16×25	0.030 0.027 0.028	0.075 0.068 0.070	1,917 1,980 1,863	2,130 2,200 2,070	16×31.5 16×35.5	0.029 0.025	0.073 0.063	2,088 2,115	2,320 2,350
1,500	12.5×30 16×20	0.030 0.035	0.075 0.087	1,755 1,539	1,950 1,710	12.5×35 12.5×40 16×25	0.027 0.024 0.028	0.068 0.060 0.070	2,151 2,196 2,025	2,390 2,440 2,250	16×35.5 16×40	0.025 0.021	0.063 0.063	2,160 2,336	2,400 2,595
1,800	12.5×30 12.5×35 16×25	0.030 0.027 0.028	0.075 0.068 0.070	1,917 1,980 1,863	2,130 2,200 2,070	12.5×40 16×31.5	0.024 0.025	0.060 0.063	2,358 2,115	2,620 2,350	16×40 18×35.5	0.021 0.023	0.063 0.058	2,466 2,286	2,740 2,540
2,200	12.5×35 12.5×40 16×25	0.027 0.024 0.028	0.068 0.060 0.070	2,151 2,196 2,025	2,390 2,440 2,250	16×31.5 16×35.5	0.025 0.022	0.063 0.055	2,295 2,295	2,550 2,550	18×35.5 18×40	0.023 0.020	0.058 0.050	2,349 2,385	2,610 2,650
2,700	16×31.5	0.025	0.063	2,115	2,350	16×35.5 16×40 18×35.5	0.022 0.018 0.021	0.055 0.045 0.053	2,394 2,610 2,448	2,660 2,900 2,720					
3,300	16×31.5 16×35.5	0.025 0.022	0.063 0.055	2,295 2,295	2,550 2,550	18×35.5 18×40	0.021 0.017	0.053 0.043	2,601 2,709	2,890 3,010					
3,900	16×35.5 16×40 18×35.5	0.022 0.018 0.021	0.055 0.045 0.053	2,394 2,610 2,448	2,660 2,900 2,720	18×40	0.017	0.043	2,934	3,260					
4,700	18×35.5 18×40	0.021 0.017	0.053 0.043	2,601 2,709	2,890 3,010										
5,600	18×40	0.017	0.043	2,934	3,260										

Dimension: ϕD × L(mm)
Impedance: Ω/ at 100k Hz
Ripple Current: mA/rms at 105°C

Dimension and Permissible Ripple Current

Rated Volt. (VDC) / Contents Cap. (μF)	63V(1J)				
	ϕD×L	Impedance (Ω, max./100k Hz)		Ripple Current (mA/rms, 105℃)	
		20℃	-10℃	120 Hz	100k Hz
12	5×11	1.90	4.78	55	100
27	6.3×11	1.10	2.78	88	160
33	6.3×11	1.10	2.75	96	175
39	6.3×15	0.62	1.55	161	230
47	8×11.5	0.49	1.23	193	275
56	8×11.5 10×12.5	0.49 0.27	1.23 0.675	203 294	290 420
68	8×15 10×12.5 10×16	0.34 0.27 0.21	0.850 0.675 0.525	252 354 366	360 505 523
82	8×20	0.21	0.525	350	500
100	8×15	0.34	0.850	308	440
120	10×16 10×20	0.210 0.160	0.525 0.400	455 490	650 700
150	8×20 10×25	0.210 0.130	0.525 0.325	476 546	680 780
180	10×20 10×30	0.160 0.100	0.400 0.250	553 672	790 960
220	10×25 12.5×20	0.130 0.110	0.325 0.275	648 609	925 870
270	10×30 12.5×25	0.100 0.074	0.250 0.185	812 805	1,160 1,150
330	12.5×20	0.110	0.275	746	1,065
390	12.5×25 12.5×30	0.074 0.068	0.185 0.170	1,088 1,024	1,280 1,360
470	12.5×30 12.5×35 16×20 16×25	0.068 0.063 0.059 0.055	0.170 0.158 0.148 0.138	1,120 1,112 1,080 1,184	1,360 1,400 1,350 1,480
560	12.5×40 16×25	0.051 0.055	0.128 0.138	1,224 1,296	1,530 1,620
680	12.5×40 16×31.5	0.051 0.046	0.128 0.115	1,336 1,376	1,670 1,720
820	12.5×40 16×31.5 16×35.5	0.051 0.046 0.040	0.128 0.115 0.100	1,480 1,512 1,528	1,850 1,890 1,910
1,000	16×35.5 18×35.5	0.040 0.040	0.100 0.100	1,576 1,688	1,970 2,110
1,500	18×35.5	0.040	0.100	2,169	2,410

Part Numbering System

RXK Series	470μF	±20%	6.3V	Bulk Package	Gas Type	8ϕ×11.5L	Pb-free and PET sleeve
RXK	**471**	**M**	**0J**	**BK**	**-**	**0811**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Lead Configuration and Package	Rubber Type	Case Size	Lead Wire and Sleeve type

Note: For more details, please refer to “Part Numbering System (Radial Type)” on page 13.

RXW Series

Features

- 105℃, 4,000 ~ 7,000 hours assured
- Low ESR, suitable for switching power supplies
- Smaller size with large permissible ripple current
- RoHS compliance

Specifications

Items	Performance	
Category Temperature Range	6.3 ~ 63V	100V
	-55℃ ~ +105℃	-40℃ ~ +105℃
Capacitance Tolerance	± 20 % (at 120 Hz, 20℃)	
Leakage Current (at 20℃)	I = 0.01CV or 3 (μA) whichever is greater (after 2 minutes) Where, C = rated capacitance in μF, V = rated DC working voltage in V	

Tanδ (at 120 Hz, 20℃)

Rated Voltage	6.3	10	16	25	35	50	63	100
Tanδ (max)	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.08

When the capacitance exceeds 1000μF, 0.02 shall be added every 1000μF increase.

Low Temperature Characteristics (at 120 Hz)

Impedance ratio shall not exceed the values given in the table below.

Rated Voltage		6.3	10	16	25	35	50	63	100
Impedance Ratio	Z(-55℃/-40℃) / Z(+20℃)	3	3	3	3	3	3	3	3

Endurance

Test Time	4,000 Hrs for φD ≦ 6.3 mm; 5,000 Hrs for φD = 8 mm; 6,000 Hrs for φD = 10 mm; 7,000 Hrs for φD ≧ 12.5 mm
Capacitance Change	Within ±25% of initial value
Tanδ	Less than 200% of specified value
Leakage Current	Within specified value

* The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied with rated ripple current for 4,000 ~ 7,000 hours at 105℃.

Shelf Life Test

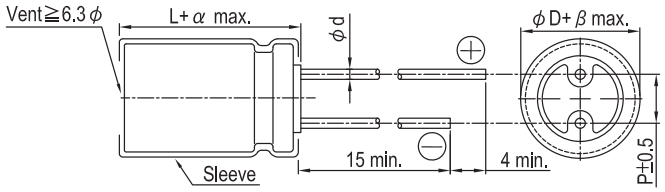
Test Time	1,000 Hrs
Capacitance Change	Within ±25% of initial value
Tanδ	Less than 200% of specified value
Leakage Current	Within specified value

* The above specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 105℃ without voltage applied.

Ripple Current and Frequency Multipliers

Cap.(μF) \ Freq.(Hz)	120	1k	10k	100k up
≦ ~ 33	0.42	0.70	0.90	1.0
39 ~ 270	0.5	0.73	0.92	1.0
330 ~ 680	0.55	0.77	0.94	1.0
820 ~ 1,800	0.6	0.80	0.96	1.0
2,200 ~ 15,000	0.7	0.85	0.98	1.0

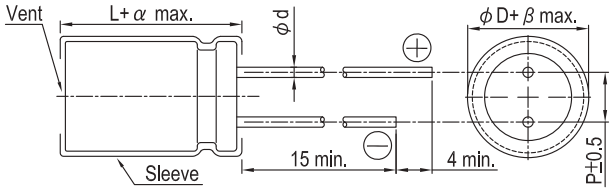
Diagram of Dimensions



Lead Spacing and Diameter Unit: mm

φD	5	6.3	8	10	12.5	16	18
P	2.0	2.5	3.5	5.0	5.0	7.5	7.5
φd	0.5		0.6			0.8	
α	L<20: 1.5, L≧20: 2.0						
β	0.5						

The case size of 16×20, 18×20 and 18×25 are suitable for below diagram:



Dimension: ϕD×L(mm)
Impedance: Ω/ at 100k Hz
Ripple Current: mA/rms at 105℃

Dimension and Permissible Ripple Current

Rated Volt. (VDC) / Contents / Cap. (μF)	6.3V (0J)				10V (1A)				16V (1C)				25V (1E)			
	ϕD×L	Impedance (Ω, max./100kHz)		Ripple Current (mA/rms,105℃)	ϕD×L	Impedance (Ω, max./100kHz)		Ripple Current (mA/rms, 105℃)	ϕD×L	Impedance (Ω, max./100kHz)		Ripple Current (mA/rms, 105℃)	ϕD×L	Impedance (Ω, max./100kHz)		Ripple Current (mA/rms, 105℃)
		20℃	-10℃	100k Hz		20℃	-10℃	100k Hz		20℃	-10℃	100k Hz		20℃	-10℃	100k Hz
4.7													5×11	0.6	1.2	180
10									5×11	0.6	1.2	180	5×11	0.6	1.2	180
22	5×11	0.6	1.2	180	5×11	0.6	1.2	180	5×11	0.6	1.2	180	5×11	0.6	1.2	180
33	5×11	0.6	1.2	180	5×11	0.6	1.2	180	5×11	0.6	1.2	180	5×11	0.6	1.2	180
39													5×11	0.6	1.2	180
47	5×11	0.6	1.2	180	5×11	0.6	1.2	180	5×11	0.6	1.2	180	5×11	0.6	1.2	180
56									5×11	0.6	1.2	180				
82					5×11	0.6	1.2	180					6.3×11	0.25	0.50	290
100	5×11	0.6	1.2	180	5×11	0.6	1.2	180	6.3×11	0.25	0.5	290	6.3×11	0.25	0.50	290
120									6.3×11	0.25	0.5	290	6.3×15	0.23	0.46	430
150	6.3×11	0.25	0.5	290	6.3×11	0.25	0.5	290	6.3×11	0.25	0.5	290	8×11.5	0.117	0.234	555
180					6.3×11	0.25	0.5	290	6.3×15	0.23	0.46	430				
220	6.3×11	0.25	0.5	290	6.3×11 6.3×15	0.25 0.23	0.5 0.46	290 430	8×11.5	0.117	0.234	555	8×11.5	0.117	0.234	555
330	6.3×11 6.3×15	0.25 0.23	0.50 0.46	290 430	8×11.5	0.117	0.234	555	8×11.5	0.117	0.234	555	8×15 10×12.5	0.085 0.090	0.17 0.18	730 755
470	8×11.5	0.117	0.234	555	8×11.5	0.117	0.234	555	8×15 10×12.5	0.085 0.090	0.17 0.18	730 755	8×20 10×16	0.065 0.068	0.130 0.136	995 1,050
560	8×11.5	0.117	0.234	555									10×20	0.052	0.104	1,220
680	10×12.5	0.090	0.180	755	8×15 10×12.5	0.085 0.090	0.170 0.180	730 755	8×20 10×16	0.065 0.068	0.130 0.136	995 1,050	10×20	0.052	0.104	1,220
820	8×15 10×12.5	0.085 0.090	0.170 0.180	730 755					10×20	0.052	0.104	1,220	10×25	0.045	0.090	1,440
1,000	10×12.5	0.090	0.180	755	8×20 10×16	0.065 0.068	0.130 0.136	995 1,050	10×20	0.052	0.104	1,220	10×30 12.5×20	0.035 0.038	0.070 0.076	1,815 1,655
1,200	8×20 10×16	0.065 0.068	0.130 0.136	955 1,050	10×20	0.052	0.104	1,220	10×25	0.045	0.090	1,440				
1,500	10×20	0.052	0.104	1,220	10×20 10×25	0.052 0.045	0.104 0.090	1,220 1,440	12.5×20 10×30	0.038 0.035	0.076 0.070	1,655 1,815	12.5×25 16×25	0.030 0.022	0.060 0.044	1,945 2,555
1,800													12.5×30 16×20	0.025 0.029	0.050 0.058	2,310 2,205
2,200	10×25 12.5×20	0.045 0.038	0.090 0.076	1,440 1,615	10×30 12.5×20	0.035 0.038	0.070 0.076	1,815 1,655	12.5×25	0.030	0.06	1,945	12.5×35 16×25 18×20	0.022 0.022 0.028	0.044 0.044 0.056	2,510 2,555 2,490
2,700	10×30	0.035	0.070	1,815	12.5×25	0.030	0.060	1,945	12.5×30 16×20	0.025 0.029	0.05 0.058	2,310 2,205	16×25	0.022	0.044	2,555
3,300	12.5×20	0.038	0.076	1,655	12.5×25 12.5×30	0.030 0.025	0.060 0.050	1,945 2,310	16×25 12.5×35	0.022 0.022	0.044 0.044	2,555 2,510	16×31.5 18×25	0.018 0.020	0.036 0.040	3,010 2,740
3,900	12.5×25	0.030	0.060	1,945	12.5×35 16×20	0.022 0.029	0.044 0.058	2,510 2,205	16×25 18×20	0.022 0.028	0.044 0.056	2,555 2,490	16×35.5 18×31.5	0.016 0.016	0.032 0.032	3,150 3,635
4,700	12.5×30 16×25	0.025 0.022	0.050 0.044	2,310 2,555	16×25	0.022	0.044	2,555	16×31.5 18×25	0.018 0.020	0.036 0.040	3,010 2,740	18×35.5	0.015	0.030	3,680
5,600	12.5×35 16×20	0.022 0.029	0.044 0.058	2,510 2,205	16×25 18×20	0.022 0.028	0.044 0.056	2,555 2,490	16×35.5 18×31.5	0.016 0.016	0.032 0.032	3,150 3,635				
6,800	16×25 18×20	0.022 0.028	0.044 0.056	2,555 2,490	16×31.5 18×25	0.018 0.020	0.036 0.040	3,010 2,740	18×35.5	0.015	0.030	3,680	18×40	0.014	0.028	3,800
8,200	16×31.5	0.018	0.036	3,010	16×35.5 18×31.5	0.016 0.016	0.032 0.032	3,150 3,635	18×35.5	0.015	0.030	3,680				
10,000	16×31.5 18×25	0.016 0.020	0.032 0.040	3,150 2,740	18×35.5	0.015	0.030	3,680	18×40	0.014	0.028	3,800				
12,000	18×31.5	0.016	0.032	3,635												
15,000	18×35.5	0.015	0.030	3,680	18×40	0.014	0.028	3,800								

Dimension: ϕD×L(mm)
Impedance: Ω/ at 100k Hz
Ripple Current: mA/rms at 105℃

Dimension and Permissible Ripple Current

Rated Volt. (V_{DC}) / Contents / Cap. (μF)	35V (1V)				50V (1H)				63V (1J)				100V (2A)			
	ϕD×L	Impedance (Ω, max./100kHz)		Ripple Current (mA/rms, 105℃)	ϕD×L	Impedance (Ω, max./100kHz)		Ripple Current (mA/rms, 105℃)	ϕD×L	Impedance (Ω, max./100kHz)		Ripple Current (mA/rms, 105℃)	ϕD×L	Impedance (Ω, max./100kHz)		Ripple Current (mA/rms, 105℃)
		20℃	-10℃	100k Hz		20℃	-10℃	100k Hz		20℃	-10℃	100k Hz		20℃	-10℃	100k Hz
2.2													5×11	9.8	19.6	44
3.3													5×11	6.6	13.2	58
4.7	5×11	0.6	1.2	180	5×11	2.3	4.6	90	5×11	4.7	9.4	68	5×11	4.6	9.2	74
6.8									5×11	2.5	5.0	95	5×11	3.5	7.0	95
10	5×11	0.6	1.2	180	5×11	1.4	2.8	120	5×11	2.1	4.2	110	6.3×11	1.8	3.6	130
12									5×11	2.0	4.0	145				
15									6.3×11	1.2	2.4	160	8×11.5	0.83	1.66	180
18					5×11	1.3	2.6	155					6.3×15	0.80	1.60	200
22	5×11	0.6	1.2	180	5×11	1.2	2.4	170	6.3×11	0.71	1.42	250	8×11.5	0.68	1.36	230
27	5×11	0.6	1.2	180												
33	5×11	0.6	1.2	180	6.3×11	0.43	0.86	300	6.3×11	0.71	1.42	250	8×15 10×12.5	0.45 0.46	0.90 0.92	360 320
39									6.3×15	0.70	1.40	330				
47	6.3×11	0.25	0.5	290	6.3×11	0.43	0.86	300	8×11.5	0.342	0.684	405	10×16 8×20	0.37 0.37	0.74 0.74	420 420
56	6.3×11	0.25	0.5	290	6.3×15	0.40	0.80	360								
68									8×11.5	0.342	0.684	405	10×20	0.30	0.60	490
82	6.3×15	0.23	0.46	430	8×11.5	0.234	0.468	485					10×25	0.25	0.50	540
100	8×11.5	0.117	0.234	555	8×11.5	0.234	0.468	485	10×12.5 8×15	0.256 0.230	0.512 0.460	535 535	12.5×20	0.18	0.36	580
120					8×15 10×12.5	0.155 0.162	0.310 0.324	635 615	10×16	0.194	0.388	600				
150	8×11.5	0.117	0.234	555	10×12.5	0.162	0.324	615	10×16	0.194	0.388	660	12.5×25	0.13	0.26	710
180					8×20 10×16	0.120 0.119	0.240 0.238	860 850	10×20 12.5×16	0.147 0.150	0.294 0.300	885 1,020	12.5×30 16×20	0.12 0.13	0.24 0.26	790 750
220	8×15 10×12.5	0.085 0.090	0.17 0.18	730 755	10×16 10×20	0.119 0.090	0.238 0.180	850 1,030	10×20 10×25	0.147 0.130	0.294 0.260	885 1,050	16×25 18×20	0.10 0.11	0.20 0.22	890 850
270					10×25	0.082	0.164	1,200	16×16	0.090	0.180	1,410				
330	8×20 10×16	0.065 0.068	0.130 0.136	995 1,050	10×20 10×30	0.090 0.060	0.180 0.120	1,030 1,610	12.5×20	0.085	0.170	1,285	16×25	0.090	0.180	1,080
390	10×20	0.052	0.104	1,220	12.5×20	0.063	0.126	1,480	12.5×25 18×16	0.070 0.086	0.140 0.172	1,720 1,690	18×25	0.083	0.166	1,260
470	10×20	0.052	0.104	1,220	12.5×20	0.060	0.120	1,500	12.5×25 12.5×30 16×20	0.070 0.055 0.059	0.140 0.110 0.118	1,720 2,090 1,765	16×31.5	0.076	0.152	1,310
560	10×25	0.045	0.090	1,440	12.5×25	0.050	0.100	1,832	16×25	0.050	0.100	2,160	18×31.5 18×35.5	0.068 0.064	0.136 0.128	1,370 1,410
680	10×30 12.5×20	0.035 0.038	0.070 0.076	1,815 1,655	12.5×25 16×20	0.050 0.048	0.100 0.096	1,832 1,835	12.5×35 18×20	0.047 0.055	0.094 0.110	2,265 2,290				
820					12.5×35 18×20	0.034 0.042	0.068 0.084	2,285 2,200	16×31.5 18×25	0.043 0.043	0.086 0.086	2,670 2,585	18×40	0.047	0.094	1,520
1,000	12.5×25	0.030	0.060	1,945	16×25	0.034	0.068	2,235	16×31.5 16×35.5	0.043 0.036	0.086 0.072	2,670 2,770				
1,200	12.5×30 16×20	0.025 0.029	0.050 0.058	2,310 2,205	16×31.5 18×25	0.028 0.029	0.056 0.058	2,700 2,610	18×31.5	0.032	0.064	2,950				
1,500	12.5×35 16×25	0.022 0.022	0.044 0.044	2,510 2,555	16×31.5 16×35.5	0.028 0.025	0.056 0.050	2,700 2,790	18×35.5	0.030	0.060	3,095				
1,800	16×25 18×20	0.022 0.028	0.044 0.056	2,555 2,490	18×31.5	0.025	0.05	3,000								
2,200	16×31.5 18×25	0.018 0.020	0.036 0.040	3,010 2,740	18×35.5	0.023	0.046	3,100	18×40	0.028	0.056	3,200				
2,700	16×35.5 18×31.5	0.016 0.016	0.032 0.032	3,150 3,635												
3,300	18×35.5	0.015	0.030	3,680												
4,700	18×40	0.014	0.028	3,800												

Part Numbering System

RXW Series	470μF	±20%	6.3V	Bulk Package	Gas Type	8ϕ×11.5L	Pb-free and PET sleeve
RXW	**471**	**M**	**0J**	**BK**	**-**	**0811**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Lead Configuration and Package	Rubber Type	Case Size	Lead Wire and Sleeve type

Note: For more details, please refer to “Part Numbering System (Radial Type)” on page 13.

RZW Series

Features

- 105℃, 4,000 ~ 10,000 hours assured
- Low ESR, suitable for switching power supplies
- Smaller size with large permissible ripple current
- RoHs compliance

Specifications

Items	Performance
Category Temperature Range	-55℃ ~ +105℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)	I = 0.01CV or 3 (μA) whichever is greater (after 2 minutes) Where, C = rated capacitance in μF, V = rated DC working voltage in V
Tanδ (at 120 Hz, 20℃)	When the capacitance exceeds 1000μF, 0.02 shall be added every 1000μF increase.
Low Temperature Characteristics (at 120 Hz)	Impedance ratio shall not exceed the values given in the table below.
Endurance	* The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied with rated ripple current for 4,000 ~ 10,000 hours at 105℃.
Shelf Life Test	* The above specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 105℃ without voltage applied.
Ripple Current and Frequency Multipliers	

Tanδ (at 120 Hz, 20℃)

Rated Voltage	6.3	10	16	25	35	50	63
Tanδ (max)	0.22	0.19	0.16	0.14	0.12	0.10	0.09

Low Temperature Characteristics (at 120 Hz)

Rated Voltage		6.3	10	16	25	35	50	63
Impedance Ratio	Z(-55℃)/Z(+20℃)	3	3	3	3	3	3	3

Endurance

Time	6.3 ~ 10V	4,000 Hrs for φD = 5 ~ 6.3 mm; 6,000 Hrs for φD = 8 ~ 10 mm; 8,000 Hrs for φD ≧ 12.5 mm
	16 ~ 63V	5,000 Hrs for φD = 5 ~ 6.3 mm; 7,000 Hrs for φD = 8 ~ 10 mm; 10,000 Hrs for φD ≧ 12.5 mm
Capacitance Change		Within ±25% of initial value
Tanδ		Less than 200% of specified value
Leakage Current		Within specified value

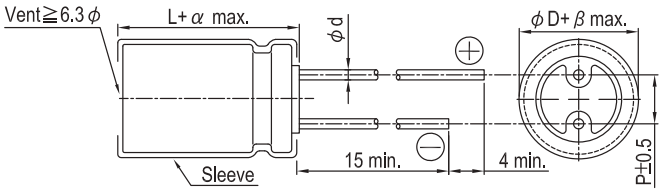
Shelf Life Test

Test Time	1,000 Hrs
Capacitance Change	Within ±25% of initial value
Tanδ	Less than 200% of specified value
Leakage Current	Within specified value

Ripple Current and Frequency Multipliers

Freq.(Hz) / Cap.(μF)	120	1k	10k	100k up
≦ ~ 33	0.42	0.70	0.90	1.0
39 ~ 270	0.50	0.73	0.92	1.0
330 ~ 680	0.55	0.77	0.94	1.0
820 ~ 1,800	0.6	0.80	0.96	1.0
2,200 ~ 18,000	0.7	0.85	0.98	1.0

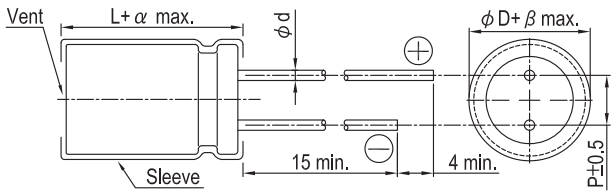
Diagram of Dimensions



Lead Spacing and Diameter Unit: mm

φD	5	6.3	8	10	12.5	16	18
P	2.0	2.5	3.5	5.0	5.0	7.5	7.5
φd	0.5		0.6			0.8	
α	L<20: 1.5, L≧20: 2.0						
β	0.5						

The case size of 12.5×16, 16×16, 16×20, 18×16, 18×20 and 18×25 are suitable for below diagram:



Dimension: ϕD × L(mm)
Impedance: Ω/ at 100k Hz
Ripple Current: mA/rms at 105°C

Dimension and Permissible Ripple Current

Rated Volt. (VDC) / Contents / Cap. (μF)	6.3V (0J)				10V (1A)				16V (1C)				25V (1E)			
	ϕD×L	Impedance (Ω, max./100kHz)		Ripple Current (mA/rms, 105℃)	ϕD×L	Impedance (Ω, max./100kHz)		Ripple Current (mA/rms, 105℃)	ϕD×L	Impedance (Ω, max./100kHz)		Ripple Current (mA/rms, 105℃)	ϕD×L	Impedance (Ω, max./100kHz)		Ripple Current (mA/rms, 105℃)
		20℃	-10℃	100k Hz		20℃	-10℃	100k Hz		20℃	-10℃	100k Hz		20℃	-10℃	100k Hz
47													5×11	0.58	1.16	210
56									5×11	0.58	1.16	210				
100					5×11	0.58	1.16	210					6.3×11	0.22	0.44	340
120									6.3×11	0.22	0.44	340				
150	5×11	0.58	1.16	210												
220					6.3×11	0.22	0.44	340	8×11.5	0.11	0.22	640	8×11.5	0.11	0.22	640
330	6.3×11	0.22	0.44	340					8×11.5	0.11	0.22	640	8×15 10×12.5	0.083 0.080	0.166 0.160	840 865
470					8×11.5	0.11	0.22	640	8×15 10×12.5	0.083 0.080	0.166 0.160	840 865	8×20 10×16	0.064 0.060	0.128 0.120	1,050 1,210
680	8×11.5	0.11	0.22	640	8×15 10×12.5	0.083 0.080	0.166 0.160	840 865	8×20 10×16	0.064 0.060	0.128 0.120	1,050 1,210	10×20 12.5×16	0.046 0.049	0.092 0.098	1,400 1,450
820	10×12.5	0.080	0.16	865									10×25	0.042	0.084	1,650
1,000	8×15	0.087	0.174	840	8×20 10×16	0.064 0.060	0.128 0.120	1,050 1,210	10×20 12.5×16	0.046 0.049	0.092 0.098	1,400 1,450	10×30 12.5×20 16×16	0.031 0.035 0.042	0.062 0.070 0.084	1,910 1,900 1,940
1,200	8×20 10×16	0.069 0.060	0.128 0.120	1,050 1,210	10×20	0.046	0.092	1,400	10×25	0.042	0.084	1,650	18×16	0.043	0.086	2,210
1,500	10×20	0.046	0.092	1,400	10×25 12.5×16	0.042 0.049	0.084 0.090	1,650 1,450	10×30 12.5×20 16×16	0.031 0.035 0.042	0.062 0.070 0.084	1,910 1,900 1,940	12.5×25	0.027	0.054	2,230
1,800	12.5×16	0.045	0.090	1,450									12.5×30 16×20	0.024 0.027	0.048 0.054	2,650 2,530
2,200	10×25	0.042	0.084	1,650	10×30 12.5×20 16×16	0.031 0.035 0.042	0.062 0.070 0.084	1,910 1,900 1,940	12.5×25 18×16	0.027 0.043	0.054 0.086	2,230 2,210	12.5×35 18×20	0.020 0.026	0.040 0.052	2,880 2,860
2,700	10×30 16×16	0.031 0.042	0.062 0.084	1,910 1,940	18×16	0.043	0.086	2,210	12.5×30 16×20	0.024 0.027	0.048 0.054	2,650 2,530	12.5×40 16×25	0.017 0.021	0.034 0.042	3,350 2,930
3,300	12.5×20	0.035	0.070	1,900	12.5×25	0.027	0.054	2,230	12.5×35	0.020	0.040	2,880	16×31.5 18×25	0.017 0.019	0.034 0.038	3,450 3,140
3,900	12.5×25 18×16	0.027 0.043	0.054 0.086	2,230 2,210	12.5×30 16×20	0.024 0.027	0.048 0.054	2,650 2,530	12.5×40 16×25 18×20	0.017 0.021 0.026	0.034 0.042 0.052	3,350 2,930 2,860	16×35.5 18×31.5	0.015 0.015	0.030 0.030	3,610 4,170
4,700	12.5×30	0.024	0.048	2,650	12.5×35	0.020	0.040	2,880	16×31.5 18×25	0.017 0.019	0.034 0.038	3,450 3,140	16×40 18×35.5	0.013 0.014	0.026 0.028	4,080 4,220
5,600	12.5×35 16×20	0.020 0.027	0.040 0.054	2,880 2,530	12.5×40 16×25 18×20	0.017 0.021 0.026	0.034 0.042 0.052	3,350 2,930 2,860	16×35.5 18×31.5	0.015 0.015	0.030 0.03	3,610 4,170	18×40	0.012	0.024	4,280
6,800	12.5×40 16×25 18×20	0.017 0.021 0.026	0.034 0.042 0.052	3,350 2,930 2,860	16×31.5 18×25	0.017 0.019	0.034 0.038	3,450 3,140	16×40	0.013	0.026	4,080				
8,200	16×31.5	0.017	0.034	3,450	16×35.5 18×31.5	0.015 0.015	0.030 0.030	3,610 4,170	18×35.5	0.014	0.02	4,220				
10,000	16×35.5 18×25	0.015 0.019	0.030 0.038	3,610 3,140	16×40 18×35.5	0.013 0.014	0.026 0.028	4,080 4,220	18×40	0.012	0.024	4,280				
12,000	16×40 18×31.5	0.013 0.015	0.026 0.030	4,080 4,170	18×40	0.012	0.024	4,280								
15,000	18×35.5	0.014	0.028	4,220												
18,000	18×40	0.012	0.024	4,280												

Dimension: ϕD × L(mm)
Impedance: Ω/ at 100k Hz
Ripple Current: mA/rms at 105°C

Dimension and Permissible Ripple Current

Rated Volt. (VDC) / Contents / Cap. (μF)	35V (1V)				50V (1H)				63V (1J)			
	ϕD×L	Impedance (Ω, max./100kHz)		Ripple Current (mA/rms, 105℃)	ϕD×L	Impedance (Ω, max./100kHz)		Ripple Current (mA/rms, 105℃)	ϕD×L	Impedance (Ω, max./100kHz)		Ripple Current (mA/rms, 105℃)
		20℃	-10℃	100k Hz		20℃	-10℃	100k Hz		20℃	-10℃	100k Hz
3.3					5×11	2.9	5.8	53				
4.7					5×11	2.5	5.0	95				
10					5×11	2.0	4.0	130				
15									5×11	1.2	2.4	165
22					5×11	0.91	1.82	180				
33	5×11	0.58	1.16	210					6.3×11	0.49	0.98	265
56	6.3×11	0.22	0.44	340	6.3×11	0.39	0.78	295	8×11.5	0.31	0.62	500
82									8×15 10×12.5	0.22 0.15	0.44 0.30	665 690
100					8×11.5	0.22	0.44	555				
120					8×15	0.190	0.38	730	8×20 10×16	0.17 0.11	0.34 0.22	820 950
150	8×11.5	0.11	0.22	640	10×12.5	0.160	0.32	760				
180					8×20	0.17	0.34	880	10×20 12.5×16	0.078 0.101	0.156 0.202	1,150 1,150
220	8×15 10×12.5	0.083 0.080	0.166 0.160	840 865	10×16	0.110	0.22	1,050	10×25	0.064	0.128	1,350
270	8×20	0.064	0.128	1,050	10×20 12.5×16	0.078 0.079	0.156 0.158	1,220 1,260	12.5×20	0.057	0.114	1,500
330	10×16	0.060	0.120	1,210	10×25	0.072	0.144	1,440				
390									12.5×25	0.043	0.086	1,900
470	10×20 12.5×16	0.046 0.049	0.092 0.098	1,400 1,450	10×30 12.5×20 16×16	0.056 0.059 0.072	0.112 0.118 0.114	1,690 1,660 1,690	12.5×30 16×20	0.039 0.045	0.078 0.090	2,300 2,000
560	10×25	0.042	0.084	1,650	12.5×25 18×16	0.044 0.070	0.088 0.140	1,950 1,930	12.5×35	0.034	0.068	2,500
680	10×30 12.5×20 16×16	0.031 0.035 0.042	0.062 0.070 0.084	1,910 1,900 1,940	12.5×30	0.039	0.078	2,310	12.5×40 16×25 18×20	0.029 0.035 0.042	0.058 0.070 0.084	2,800 2,600 2,500
820					12.5×35 16×20	0.033 0.044	0.066 0.088	2,510 2,210	16×31.5 18×25	0.029 0.034	0.058 0.068	2,850 2,800
1,000	12.5×25 18×16	0.027 0.043	0.054 0.086	2,230 2,210	12.5×40 16×25 18×20	0.027 0.033 0.047	0.054 0.066 0.094	2,920 2,555 2,490	16×35.5	0.027	0.054	2,900
1,200	12.5×30 16×20	0.024 0.027	0.048 0.054	2,650 2,530	16×31.5 18×25	0.027 0.028	0.054 0.056	3,010 2,740	16×40 18×31.5	0.025 0.028	0.050 0.056	3,400 3,300
1,500	12.5×35	0.020	0.040	2,880	16×35.5	0.024	0.048	3,150	18×35.5	0.025	0.050	3,400
1,800	12.5×40 16×25 18×20	0.017 0.021 0.026	0.034 0.042 0.052	3,350 2,930 2,860	16×40 18×31.5	0.021 0.024	0.042 0.048	3,710 3,635	18×40	0.024	0.048	3,500
2,200	16×31.5 18×25	0.017 0.019	0.034 0.038	3,450 3,140	18×35.5	0.022	0.044	3,680				
2,700	16×35.5 18×31.5	0.015 0.015	0.030 0.030	3,610 4,170	18×40	0.018	0.036	3,800				
3,300	16×40 18×35.5	0.013 0.014	0.026 0.028	4,080 4,220								
3,900	18×40	0.012	0.024	4,280								

Part Numbering System

RZW Series	470μF	±20%	16V	Bulk Package	Gas Type	8ϕ×15L	Pb-free and PET sleeve
RZW	**471**	**M**	**1C**	**BK**	**-**	**0815**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Lead Configuration and Package	Rubber Type	Case Size	Lead Wire and Sleeve type

Note: For more details, please refer to “Part Numbering System (Radial Type)” on page 13.

RXC Series

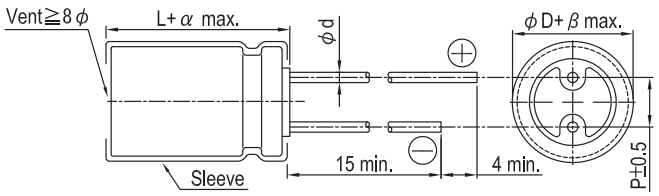
Features

- 105℃, 2,000 ~ 3,000 hours assured
- Suitable for switching power supplies, UPS
- Smaller size with large permissible ripple current
- RoHS compliance

Specifications

Items	Performance						
Category Temperature Range	160 ~ 400V					450V	
	-40℃ ~ +105℃					-25℃ ~ +105℃	
Capacitance Tolerance	±20% (at 120 Hz, 20℃)						
Leakage Current (at 20℃)	Time	After 5 minutes					
	Leakage Current	CV ≤ 1,000 I = 0.03CV(μA)			CV > 1,000 I = 0.02CV(μA)		
	Where, C = rated capacitance in μF, V = rated DC working voltage in V						
Tanδ (at 120 Hz, 20℃)	Rated Voltage	160	200	250	350	400	450
	Tanδ (max)	0.20	0.20	0.20	0.24	0.24	0.24
Low Temperature Characteristics (at 120 Hz)	Impedance ratio shall not exceed the values given in the table below.						
	Rated Voltage		160	200	250	350	400	450
	Impedance Ratio	Z(-25℃)/Z(+20℃)	3	3	3	3	5	6
		Z(-40℃)/Z(+20℃)	4	4	4	4	6	-
Endurance	Test Time	2,000 Hrs for φD ≦ 10 mm; 3,000 Hrs for φD ≧ 12.5 mm						
	Capacitance Change	Within ±20% of initial value						
	Tanδ	Less than 200% of specified value						
	Leakage Current	Within specified value						
	* The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied with rated ripple current for 2,000 ~ 3,000 hours at 105℃.							
Shelf Life Test	Test Time	1,000 Hrs						
	Capacitance Change	Within ±20% of initial value						
	Tanδ	Less than 200% of specified value						
	Leakage Current	Within specified value						
	* The above specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 105℃ without voltage applied. The rated voltage shall be applied to the capacitors before the measurements (Refer to JIS C 5101-4 4.1).							
Ripple Current and Frequency Multipliers	Freq.(Hz) / Cap. (μF)	120	1k	10k	100k		
	≦ 82	1.00	1.20	1.40	1.50		
	100 ≦	1.00	1.18	1.35	1.45		

Diagram of Dimensions



Lead Spacing and Diameter Unit: mm

φD	8	10	12.5	16	18
P	3.5	5.0	5.0	7.5	7.5
φd	0.6			0.8	
α	L<20: 1.5, L≧20: 2.0				
β	0.5				

Dimension: ϕD × L(mm)
Ripple Current: mA/rms, 105°C

Dimension and Permissible Ripple Current

Rated Volt. (VDC) / Contents / Cap.(μF)	160V (2C)			200V (2D)			250V (2E)			350V (2V)			400V (2G)		
	ϕD×L	Ripple Current 120 Hz	Ripple Current 100k Hz	ϕD×L	Ripple Current 120 Hz	Ripple Current 100k Hz	ϕD×L	Ripple Current 120 Hz	Ripple Current 100k Hz	ϕD×L	Ripple Current 120 Hz	Ripple Current 100k Hz	ϕD×L	Ripple Current 120 Hz	Ripple Current 100k Hz
2.2										10×12.5	55	83	10×12.5	55	83
3.3	8×11.5	48	72	8×11.5	52	78	8×11.5	65	98	10×16	75	113	10×16	75	113
4.7	8×11.5	58	87	10×12.5	88	132	10×12.5	90	135	10×20	120	180	10×20	100	150
10	10×12.5 10×16	88 100	132 150	10×16	125	188	10×16	150	225	10×20	150	225	10×20	145	218
22	10×16	155	233	10×20	170	255	12.5×20	240	360	12.5×20	240	360	12.5×25	260	390
33	10×20	220	330	12.5×20	275	415	12.5×25	365	550	12.5×25	300	450	12.5×25	285	430
47	12.5×25	340	510	12.5×20	295	445	12.5×25	390	585	16×25	410	615	16×25	400	600
68	12.5×25	385	580	12.5×25	395	595	16×25	485	730	16×31.5	485	730	16×31.5	490	735
100	12.5×25	450	655	16×25	550	800	16×31.5	630	915	16×31.5	520	755	18×31.5	610	885
150	16×25	610	885	16×31.5	720	1,045	18×31.5	780	1,130						
220	16×31.5	755	1,095	18×35.5	900	1,305	18×40	970	1,405						
330	18×35.5	940	1,360												

Rated Volt. (VDC) / Contents / Cap.(μF)	450V (2W)		
	ϕD×L	Ripple Current 120 Hz	Ripple Current 100k Hz
1.5	10×12.5	50	75
2.2	10×16	68	102
3.3	10×20	88	132
4.7	12.5×20	140	210
10	12.5×25	200	300
22	16×25	305	460
33	16×31.5	410	615
47	18×31.5	495	745
68	18×35.5	540	810

Part Numbering System

RXC Series	22μF	±20%	450V	Bulk Package	Gas Type	16ϕ×25L	Pb-free and PET sleeve
RXC	**220**	**M**	**2W**	**BK**	**-**	**1625**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Lead Configuration and Package	Rubber Type	Case Size	Lead Wire and Sleeve type

Note: For more details, please refer to “Part Numbering System (Radial Type)” on page 13.

RXB Series

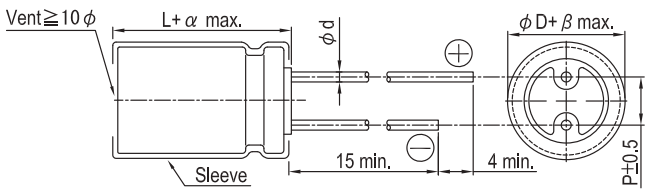
Features

- 105℃, 5,000 hours assured
- Suitable for switching power supplies, UPS, Ballast
- Smaller size with large permissible ripple current
- RoHS compliance

Specifications

Items	Performance						
Category Temperature Range	160 ~ 400V						450V
	-40℃ ~ +105℃						-25℃ ~ +105℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)						
Leakage Current (at 20℃)	Time: after 5 minutes Leakage Current: CV ≦ 1,000 I = 0.03CV(μA); CV > 1,000 I = 0.02CV(μA) Where, C = rated capacitance in μF, V = rated DC working voltage in V						
Tanδ (at 120 Hz, 20℃)	Rated Voltage: 160 / 200 / 250 / 350 / 400 / 450 Tanδ (max): 0.20 / 0.20 / 0.20 / 0.24 / 0.24 / 0.24						
Low Temperature Characteristics (at 120 Hz)	Impedance ratio shall not exceed the values given in the table below.						
	Rated Voltage		160	200	250	350	400	450
	Impedance Ratio	Z(-25℃) /Z(+20℃)	3	3	3	3	5	6
		Z(-40℃) /Z(+20℃)	4	4	4	4	6	-
Endurance	Test Time: 5,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 200% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied with rated ripple current for 5,000 hours at 105℃.						
Shelf Life Test	Test Time: 1,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 200% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 105℃ without voltage applied. The rated voltage shall be applied to the capacitors before the measurements (Refer to JIS C 5101-4 4.1).						
Ripple Current and Frequency Multipliers	Freq.(Hz) / Cap. (μF)		120	1k	10k	100k up	
	4.7 ~ 82		1.00	1.20	1.40	1.50	
	100 ≦		1.00	1.18	1.35	1.45	

Diagram of Dimensions



Lead Spacing and Diameter Unit: mm

ϕD	10	12.5	16	18
P	5.0	5.0	7.5	7.5
ϕd	0.6		0.8	
α	L<20: 1.5, L≧20: 2.0			
β	0.5			

Dimension: ϕD × L(mm)
Ripple Current: mA/rms at 105°C

Dimension and Permissible Ripple Current

Rated Volt. (VDC) / Contents / Cap.(μF)	160V (2C)			200V (2D)			250V (2E)			350V (2V)			400V (2G)		
	ϕD×L	Ripple Current 120 Hz	100k Hz	ϕD×L	Ripple Current 120 Hz	100k Hz	ϕD×L	Ripple Current 120 Hz	100k Hz	ϕD×L	Ripple Current 120 Hz	100k Hz	ϕD×L	Ripple Current 120 Hz	100k Hz
4.7													10×16	98	147
6.8										10×16	100	150	10×16	120	180
10							10×16	155	233	10×20	160	240	10×20	170	255
22	10×16	190	285	10×16	205	305	12.5×20	210	315	12.5×25	305	460	12.5×25	320	480
33	10×20	255	380	10×20	280	420	12.5×20	335	505	16×25	410	615	16×25	425	635
47	10×20	265	395	12.5×20	330	495	16×25	560	840	16×31.5	510	765	16×31.5	530	795
68	12.5×20	430	645	12.5×25	480	720	16×25	600	900	18×31.5	580	870	18×31.5	600	900
100	12.5×25	540	780	16×20	570	825	16×31.5	700	1,015	18×35.5	665	965	18×40	700	1,015
120	16×20	555	805	16×25	700	1,015	18×31.5	790	1,145	18×40	715	1,035	18×45	780	1,130
150	16×25	645	935	16×31.5	750	1,090	18×35.5	875	1,270						
180	16×31.5	745	1,080	18×31.5	830	1,205	18×40	980	1,420						
220	18×31.5	825	1,196	18×35.5	900	1,305	18×45	1,100	1,595						
270	18×35.5	930	1,350	18×40	1,100	1,595									
330	18×40	995	1,440	18×45	1,250	1,815									

Rated Volt. (VDC) / Contents / Cap.(μF)	450V (2W)		
	ϕD×L	Ripple Current 120 Hz	100k Hz
4.7	10×16	105	158
6.8	10×20	170	255
10	12.5×20	280	420
22	16×25	405	610
33	16×31.5	490	735
47	18×31.5	575	865
68	18×40	665	1,000

Part Numbering System

RXB Series	22μF	±20%	450V	Bulk Package	Gas Type	16ϕ×25L	Pb-free and PET sleeve
RXB	**220**	**M**	**2W**	**BK**	**-**	**1625**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Lead Configuration and Package	Rubber Type	Case Size	Lead Wire and Sleeve type

Note: For more details, please refer to “Part Numbering System (Radial Type)” on page 13.

RXQ Series

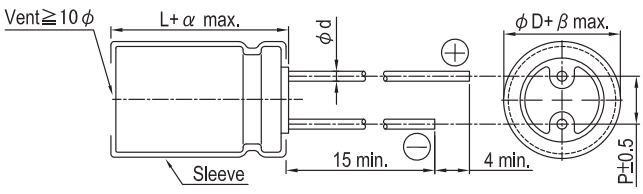
Features

- 105℃, 8,000 ~ 10,000 hours assured
- Suitable for switching power supplies, UPS, Ballast
- Smaller case size current
- RoHS compliance

Specifications

Items	Performance						
Category Temperature Range	160 ~ 400V					450V	
	-40℃ ~ +105℃					-25℃ ~ +105℃	
Capacitance Tolerance	±20% (at 120 Hz, 20℃)						
Leakage Current (at 20℃)	Time: after 5 minutes Leakage Current: CV ≦ 1,000: I = 0.03CV+15(μA); CV > 1,000: I = 0.02CV+25(μA) Where, C = rated capacitance in μF, V = rated DC working voltage in V						
Tanδ (at 120 Hz, 20℃)	Rated Voltage: 160 / 200 / 250 / 350 / 400 / 450 Tanδ (max): 0.20 / 0.20 / 0.20 / 0.24 / 0.24 / 0.24						
Low Temperature Characteristics (at 120 Hz)	Impedance ratio shall not exceed the values given in the table below.						
	Rated Voltage		160	200	250	350	400	450
	Impedance Ratio	Z(-25℃)/Z(+20℃)	3	3	3	5	5	6
		Z(-40℃)/Z(+20℃)	6	6	6	6	6	-
Endurance	Test Time: 8,000 Hrs for φD = 10mm; 10,000 Hrs for φD ≥ 12.5mm Capacitance Change: Within ±20% of initial value Tanδ: Less than 200% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage applied with rated ripple current for 8,000 / 10,000 hours at 105°C.						
Shelf Life Test	Test Time: 1,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 200% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 105°C without voltage applied. The rated voltage shall be applied to the capacitors before the measurements (Refer to JIS C 5101-4 4.1).						
Ripple Current and Frequency Multipliers	Frequency (Hz) / Cap. (μF)		120	1k	10k	100k up	
	6.8 ~ 82		1.00	1.75	2.25	2.50	
	100 ≦		1.00	1.67	2.05	2.25	

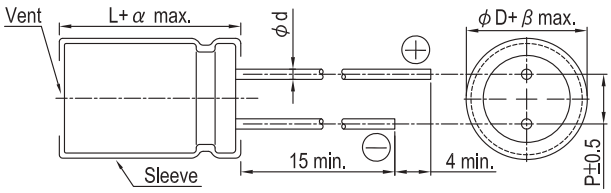
Diagram of Dimensions



Lead Spacing and Diameter Unit: mm

φD	10	12.5	16	18
P	5.0	5.0	7.5	7.5
φd	0.6		0.8	
α	L<20: 1.5, L≧20: 2.0			
β	0.5			

The case size of 16×20, 18×20 and 18×25 are suitable for below diagram:



Dimension: ϕD × L(mm)
Ripple Current: mA/rms at 105°C

Dimension and Permissible Ripple Current

Rated Volt. (VDC) / Contents / Cap.(μF)	160V (2C)			200V (2D)			250V (2E)			350V (2V)			400V (2G)		
	ϕD×L	Ripple Current 120 Hz	Ripple Current 100k Hz	ϕD×L	Ripple Current 120 Hz	Ripple Current 100k Hz	ϕD×L	Ripple Current 120 Hz	Ripple Current 100k Hz	ϕD×L	Ripple Current 120 Hz	Ripple Current 100k Hz	ϕD×L	Ripple Current 120 Hz	Ripple Current 100k Hz
6.8										10×16	110	275	10×16	110	275
10	10×12.5	100	250	10×16	125	313	10×20	140	350	10×20	140	350	10×20	140	350
22	10×16 10×20	170 200	425 500	10×20	200	500	10×20	200	500	12.5×20	260	650	12.5×20	260	650
33	10×20	250	625	10×20	260	650	12.5×20	320	800	16×20	360	900	16×20	360	900
47	10×20	300	750	12.5×20	390	975	12.5×20	390	975	16×20	430	1,075	16×25 18×20	470 450	1,175 1,125
68	12.5×20	470	1,175	12.5×20	470	1,175	16×20	520	1,300	16×25 18×20	560 550	1,400 1,375	18×25	585	1,463
82	12.5×20	510	1,275	16×20	550	1,375	16×20	550	1,375	18×25	610	1,525	18×25	610	1,525
100	12.5×25 16×20	620 630	1,395 1,418	16×20	630	1,418	16×25	680	1,530	18×25	700	1,575	18×31.5	765	1,721
120										18×31.5	830	1,868	18×35.5	865	1,946
150	16×25	770	1,733	16×25	840	1,890	18×25	860	1,935	18×35.5	960	2,160	18×40	985	2,216
220	16×31.5	1,020	2,295	18×25	1,050	2,363	18×31.5	1,130	2,543						
330	18×35.5	1,390	3,128	18×35.5	1,430	3,218									

Rated Volt. (VDC) / Contents / Cap.(μF)	450V (2W)		
	ϕD×L	Ripple Current 120 Hz	Ripple Current 100k Hz
6.8	10×20	110	275
10	12.5×20	180	450
22	16×20	290	725
33	16×25 18×20	390 380	975 950
47	18×25	480	1,200
68	18×31.5	630	1,575
82	18×35.5	715	1,788
100	18×40	800	1,800

Part Numbering System

RXQ Series	10μF	±20%	450V	Bulk Package	Gas Type	12.5ϕ×20L	Pb-free and PET sleeve
RXQ	**100**	**M**	**2W**	**BK**	**-**	**1320**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Lead Configuration and Package	Rubber Type	Case Size	Lead Wire and Sleeve type

Note: For more details, please refer to “Part Numbering System (Radial Type)” on page 13.

RLD Series

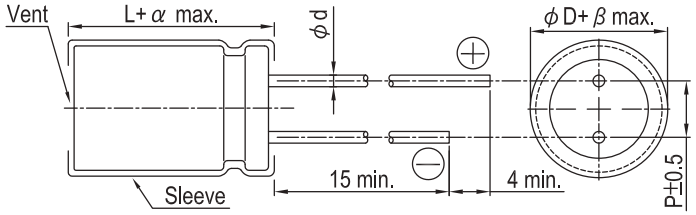
Features

- 105℃, 12,000 hours assured
- 10φ ~ 18φ with large permissible ripple current
- Suitable for switching power supplies, UPS, Ballast
- Smaller case size current
- RoHS compliance

Specifications

Items	Performance						
Category Temperature Range	160 ~ 400V					450V	
	-40℃ ~ +105℃					-25℃ ~ +105℃	
Capacitance Tolerance	±20% (at 120 Hz, 20℃)						
Leakage Current (at 20℃)	Time: after 5 minutes Leakage Current: CV ≦ 1,000 → I = 0.03CV+15(μA); CV > 1,000 → I = 0.02CV+25(μA) Where, C = rated capacitance in μF, V = rated DC working voltage in V						
Tanδ (at 120 Hz, 20℃)	Rated Voltage: 160 / 200 / 250 / 350 / 400 / 450 Tanδ (max): 0.20 / 0.20 / 0.20 / 0.24 / 0.24 / 0.24						
Low Temperature Characteristics (at 120 Hz)	Impedance ratio shall not exceed the values given in the table below.						
	Rated Voltage		160	200	250	350	400	450
	Impedance Ratio	Z(-25℃)/Z(+20℃)	3	3	3	5	5	6
		Z(-40℃)/Z(+20℃)	6	6	6	6	6	-
Endurance	Test Time: 12,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 200% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage applied with rated ripple current for 12,000 hours at 105°C.						
Shelf Life Test	Test Time: 1,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 200% of specified value Leakage Current: Less than 500% of specified value * The above specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 105°C without voltage applied. The rated voltage shall be applied to the capacitors before the measurements (Refer to JIS C 5101-4 4.1).						
Ripple Current and Frequency Multipliers	Frequency (Hz) / Cap. (μF)	120	1k	10k	100k up		
	15 ~ 82	1.00	1.75	2.25	2.50		
	100 ≦	1.00	1.67	2.05	2.25		

Diagram of Dimensions



Lead Spacing and Diameter Unit: mm

φD	10	12.5	16	18
P	5.0	5.0	7.5	7.5
φd	0.6		0.8	
α	2.0			
β	0.5			

Dimension and Permissible Ripple Current

Dimension: φD × L(mm)
Ripple Current: mA/rms at 105°C

Rated Volt. (VDC) / Contents / Cap.(μF)	160V (2C)			200V (2D)			250V (2E)			350V (2V)			400V (2G)		
	φD×L	Ripple Current 120 Hz	Ripple Current 100k Hz	φD×L	Ripple Current 120 Hz	Ripple Current 100k Hz	φD×L	Ripple Current 120 Hz	Ripple Current 100k Hz	φD×L	Ripple Current 120 Hz	Ripple Current 100k Hz	φD×L	Ripple Current 120 Hz	Ripple Current 100k Hz
22													10×25	215	538
27										10×25	240	600	10×35	270	675
33										10×35	300	750	10×40 12.5×25	310 355	775 888
47							10×25	315	788	12.5×30 10×45	450 385	1,125 963	10×50 12.5×35	400 480	1,000 1,200
56				10×25	345	863	12.5×25	460	1,150	10×50 12.5×35	440 525	1,100 1,313	12.5×40 16×25	540 515	1350 1,288
68	10×25	375	938	10×35	425	1,063	10×35 12.5×25	430 510	1,075 1,275	12.5×40 16×25	595 565	1,488 1,413	18×25 12.5×45	580 620	1,450 1,550
82	10×30	445	1,113	12.5×25	565	1,413	10×45 12.5×30	515 590	1,288 1,475	12.5×45 16×31.5	675 670	1,688 1,675	16×35.5	685	1,713
100	10×35	520	1,170	10×45 12.5×30	565 660	1,271 1,485	10×50 12.5×35	585 700	1,316 1,575	16×35.5	755	1,699	16×40 18×35.5	785 790	1,766 1,778
120	10×40 12.5×25	595 680	1,339 1,700	10×50 12.5×35	640 765	1,440 1,721	12.5×40 16×25	795 755	1,789 1,699	16×45 18×31.5	870 840	1,958 1,890	16×50 18×40	890 880	2,003 1,980
150	10×50 12.5×35	715 850	1,609 1,913	12.5×40 16×25	880 840	1,980 1,890	12.5×45 18×25	920 865	2,070 1,946	18×40	985	2,216	18×45	1,000	2,250
180	16×25	920	2,070	16×31.5 18×25	995 950	2,239 2,138	16×35.5	1,015	2,284	18×45	1,090	2,453			
220	16×31.5 18×25	1,100 1,050	2,475 2,363	16×35.5 18×31.5	1,125 1,135	2,531 2,554	16×40 18×31.5	1,160 1,135	2,610 2,554	18×50	1,220	2,745			
270	16×35.5 18×31.5	1,240 1,255	2,790 2,824	16×40 18×35.5	1,280 1,300	2,880 2,925	16×50 18×40	1,330 1,320	2,993 2,970						
330	16×40 18×35.5	1,420 1,435	3,195 3,229	16×50 18×40	1,470 1,510	3,308 3,398	18×45	1,485	3,341						
390	16×45 18×40	1,575 1,590	3,544 3,578	18×45	1,610	3,623	18×50	1,625	3,656						
470	16×50 18×45	1,760 1,770	3,960 3,983												
560	18×50	1,945	4,376												

Rated Volt. (VDC) / Contents / Cap.(μF)	450V (2W)		
	φD×L	Ripple Current 120 Hz	Ripple Current 100k Hz
15	10×25	185	463
22	10×35	250	625
27	10×40 12.5×25	290 340	725 850
33	12.5×30	400	1,000
47	12.5×40 16×25	525 500	1,313 1,250
56	12.5×50 16×31.5	605 585	1,513 1,463
68	16×35.5 18×31.5	660 660	1,650 1,650
82	16×45 18×35.5	760 755	1,900 1,888
100	16×50 18×40	855 845	1,924 1,901
120	18×45	945	2,126

Part Numbering System

RLD Series	15 μF	±20%	450V	Bulk Package	Flat Type	10φ×25L	Pb-free and PET sleeve
RLD	**150**	**M**	**2W**	**BK**	**F**	**1025**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Lead Configuration and Package	Rubber Type	Case Size	Lead Wire and Sleeve type

Note: For more details, please refer to “Part Numbering System (Radial Type)” on page 13.

RGL Series

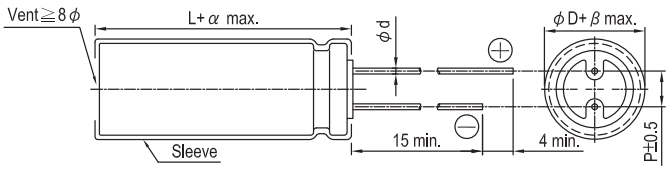
Features

- 105℃, for general purposes
- 8φ ~ 18φ with large permissible ripple current
- Slim type included
- RoHS compliance

Specifications

Items	Performance		
Category Temperature Range	400V	420 ~ 450V	
	-40℃ ~ +105℃	-25℃ ~ +105℃	
Capacitance Tolerance	±20% (at 120 Hz, 20℃)		
Leakage Current (at 20℃)	Time: after 5 minutes Leakage Current: CV ≦ 1,000 I = 0.03CV + 15(μA); CV > 1,000 I = 0.02CV + 25(μA) Where, C = rated capacitance in μF, V = rated DC working voltage in V		
Tanδ (at 120 Hz, 20℃)	Rated Voltage: 400 / 420 / 450 Tanδ (max): 0.24 / 0.24 / 0.24		
Low Temperature Characteristics (at 120 Hz)	Impedance ratio shall not exceed the values given in the table below. Rated Voltage: 400 / 420 / 450 Impedance Ratio Z(-25℃)/Z(+20℃): 5 / 6 / 6 Impedance Ratio Z(-40℃)/Z(+20℃): 6 / - / -		
Endurance	Test Time: 2,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 200% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage applied with rated ripple current for 2,000 hours at 105°C.		
Shelf Life Test	Test Time: 1,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 200% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 105°C without voltage applied. The rated voltage shall be applied to the capacitors before the measurements (Refer to JIS C 5101-4 4.1).		
Ripple Current and Frequency Multipliers	Frequency (Hz): 60 / 120 / 500 / 1k / 10k up Multipliers: 0.8 / 1.00 / 1.25 / 1.45 / 1.50		

Diagram of Dimensions



Lead Spacing and Diameter Unit: mm

φD	8	10	12.5	16	18
P	3.5	5.0	5.0	7.5	7.5
φd	0.6			0.8	
α	2.0				
β	0.5				

Dimension and Permissible Ripple Current

Dimension: φD × L(mm)
Ripple Current: mA/rms at 105°C

Rated Voltage (V_{DC})	Cap. (μF)	8φ			10φ			12.5φ			16φ			18φ		
		φD×L	Ripple Current		φD×L	Ripple Current		φD×L	Ripple Current		φD×L	Ripple Current		φD×L	Ripple Current	
			120 Hz	100k Hz		120 Hz	100k Hz		120 Hz	100k Hz		120 Hz	100k Hz		120 Hz	100k Hz
400V (2G)	15	8×30	190	285												
	22	8×35	250	375												
	27	8×40	300	450	10×30	245	370									
	33	8×45	350	525	10×35	295	445									
	39	8×50	390	585	10×40	345	515									
	47				10×45	400	600									
	56				10×50	450	675	12.5×30	470	705						
	68							12.5×35	540	810						
	82							12.5×40	620	930						
	100															
	120										16×35.5 16×40	800 840	1,200 1,260			
	150										16×45	940	1,410	18×35.5	920	1,380
	180										16×50	1,050	1,575	18×40	1,060	1,590
	220													18×45	1,200	1,800
420V (2P)	15	8×30	195	293												
	22	8×35	255	383												
	27	8×45	320	480	10×30	245	370									
	33	8×50	370	555	10×35	295	445									
	39				10×40	345	515									
	47				10×45	400	600									
	56				10×50	450	675	12.5×30	470	705						
	68							12.5×35	540	810						
	82							12.5×45	630	945						
	100							12.5×50	730	1,095	16×35.5	730	1,095			
	120										16×40 16×45	840 885	1,260 1,330	18×35.5	850	1,275
	150										16×50	1030	1,545	18×35.5 18×40	920 960	1,380 1,440
	180													18×45	1,100	1,650
	220													18×50	1,220	1,830
450V (2W)	15	8×30	195	293												
	22	8×40	270	405	10×30	225	330									
	27	8×45	320	480	10×35	265	400									
	33	8×50	370	555	10×40	315	475									
	39				10×45	360	545	12.5×30	400	600						
	47				10×50	420	625	12.5×35	460	690						
	56							12.5×40	520	780						
	68							12.5×45	580	870						
	82							12.5×50	660	990	16×35.5	660	990			
	100										16×40	750	1,125			
	120										16×45	840	1,260	18×35.5	820	1,230
	150										16×50	980	1,470	18×45	995	1,490
	180													18×50	1,140	1,710

Remark: Other sizes and specification are available, please contact us for detail.

Part Numbering System

RGL Series	22μF	±20%	450V	Bulk Package	Gas Type	10φ×30L	Pb-free and PET sleeve
RGL	**220**	**M**	**2W**	**BK**	**-**	**1030**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Lead Configuration and Package	Rubber Type	Case Size	Lead Wire and Sleeve type

Note: For more details, please refer to “Part Numbering System (Radial Type)” on page 13.

RPL Series

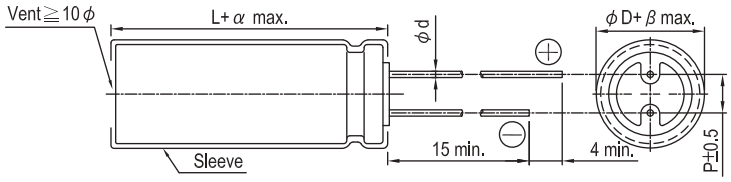
Features

- 105℃, 5,000 hours assured
- 10ϕ ~ 18ϕ with large permissible ripple current
- Slim type included
- RoHS compliance

Specifications

Items	Performance		
Category Temperature Range	400V	420 ~ 450V	
	-40℃ ~ +105℃	-25℃ ~ +105℃	
Capacitance Tolerance	±20% (at 120 Hz, 20℃)		
Leakage Current (at 20℃)	Time: after 5 minutes Leakage Current: CV ≦ 1,000 I = 0.03CV + 15(μA); CV > 1,000 I = 0.02CV + 25(μA) Where, C = rated capacitance in μF, V = rated DC working voltage in V		
Tanδ (at 120 Hz, 20℃)	Rated Voltage: 400 / 420 / 450 Tanδ (max): 0.24 / 0.24 / 0.24		
Low Temperature Characteristics (at 120 Hz)	Impedance ratio shall not exceed the values given in the table below. Rated Voltage: 400 / 420 / 450 Impedance Ratio Z(-25℃)/Z(+20℃): 5 / 6 / 6 Impedance Ratio Z(-40℃)/Z(+20℃): 6 / - / -		
Endurance	Test Time: 5,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 200% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage applied with rated ripple current for 5,000 hours at 105°C.		
Shelf Life Test	Test Time: 1,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 200% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 105°C without voltage applied. The rated voltage shall be applied to the capacitors before the measurements (Refer to JIS C 5101-4 4.1).		
Ripple Current and Frequency Multipliers	Frequency (Hz): 60 / 120 / 500 / 1k / 10k up Multipliers: 0.80 / 1.00 / 1.25 / 1.40 / 1.50		

Diagram of Dimensions



Lead Spacing and Diameter Unit: mm

ϕD	10	12.5	16	18
P	5.0	5.0	7.5	7.5
ϕd	0.6		0.8	
α	2.0			
β	0.5			

Dimension and Permissible Ripple Current

Dimension: ϕD × L(mm)
Ripple Current: mA/rms at 105°C

Rated Voltage (V_{DC})	Cap. (μF)	10ϕ			12.5ϕ			16ϕ			18ϕ		
		ϕD×L	Ripple Current		ϕD×L	Ripple Current		ϕD×L	Ripple Current		ϕD×L	Ripple Current	
			120 Hz	100k Hz		120 Hz	100k Hz		120 Hz	100k Hz		120 Hz	100k Hz
400V (2G)	33	10×35	320	480									
	39	10×40	380	570	12.5×30	380	570						
	47	10×45	425	638									
	56	10×50	490	735	12.5×35	475	713						
	68				12.5×40	550	825	16×31.5	530	795			
	82				12.5×45	615	923	16×35.5	605	908			
	100							16×40	740	1,110			
	120							16×45	795	1,193	18×35.5	730	1,095
	150							16×50	865	1,300	18×45	910	1,365
420V (2P)	33	10×40	350	525									
	39	10×45	390	585	12.5×30	380	570						
	47	10×50	445	668	12.5×35	410	615						
	56				12.5×40	490	735	16×31.5	475	713			
	68				12.5×45	560	840	16×35.5	550	825			
	82				12.5×50	625	938	16×40	630	945			
	100							16×45	750	1,125	18×35.5	675	1,013
	120							16×50	865	1,298	18×40 18×45	810 825	1,238 1,215
	150										18×45 18×50	950 950	1,425 1,425
450V (2W)	33	10×45	315	475	12.5×30	350	525						
	39	10×50	360	545	12.5×35	400	600						
	47				12.5×40	425	683	16×31.5	455	683			
	56				12.5×45	500	750	16×35.5	560	750			
	68				12.5×50	540	810	16×40 16×35.5	590 530	885 795			
	82							16×45	675	1,013	18×35.5	645	968
	100							16×50	785	1,178	18×40 18×35.5	740 685	1,110 1,025
	120										18×45 18×40	825 790	1,238 1,185
	150										18×50	950	1,425

Remark: Other sizes and specification are available, please contact us for detail.

Part Numbering System

RPL Series	33μF	±20%	450V	Bulk Package	Gas Type	10ϕ×45L	Pb-free and PET sleeve
RPL	**330**	**M**	**2W**	**BK**	**-**	**1045**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Lead Configuration and Package	Rubber Type	Case Size	Lead Wire and Sleeve type

Note: For more details, please refer to “Part Numbering System (Radial Type)” on page 13.

RQL Series

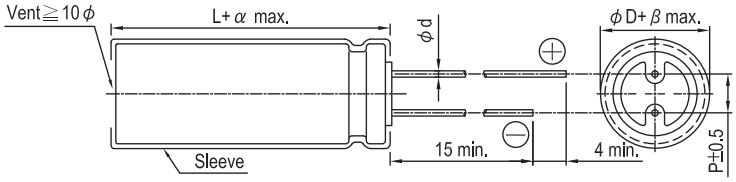
Features

- 105℃, 10,000 hours assured
- 10ϕ ~ 18ϕ with large permissible ripple current
- Slim type included
- RoHS compliance

Specifications

Items	Performance		
Category Temperature Range	400V	420 ~ 450V	
	-40℃ ~ +105℃	-25℃ ~ +105℃	
Capacitance Tolerance	±20% (at 120 Hz, 20℃)		
Leakage Current (at 20℃)	Time: after 5 minutes Leakage Current: CV ≦ 1,000 I = 0.03CV + 15(μA); CV > 1,000 I = 0.02CV + 25(μA) Where, C = rated capacitance in μF, V = rated DC working voltage in V		
Tanδ (at 120 Hz, 20℃)	Rated Voltage: 400 / 420 / 450 Tanδ (max): 0.24 / 0.24 / 0.24		
Low Temperature Characteristics (at 120 Hz)	Impedance ratio shall not exceed the values given in the table below. Rated Voltage: 400 / 420 / 450 Impedance Ratio Z(-25℃)/Z(+20℃): 5 / 6 / 6 Impedance Ratio Z(-40℃)/Z(+20℃): 6 / - / -		
Endurance	Test Time: 10,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 200% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage applied with rated ripple current for 10,000 hours at 105°C.		
Shelf Life Test	Test Time: 1,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 200% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20° ℃ after exposing them for 1,000 hours at 105°C without voltage applied. The rated voltage shall be applied to the capacitors before the measurements (Refer to JIS C 5101-4 4.1).		
Ripple Current and Frequency Multipliers	Frequency (Hz): 60 / 120 / 500 / 1k / 10k up Multipliers: 0.80 / 1.00 / 1.25 / 1.40 / 1.50		

Diagram of Dimensions



Lead Spacing and Diameter Unit: mm

ϕD	10	12.5	16	18
P	5.0	5.0	7.5	7.5
ϕd	0.6		0.8	
α	2.0			
β	0.5			

Dimension and Permissible Ripple Current

Dimension: φD × L(mm)
Ripple Current: mA/rms at 105℃

Rated Voltage (V_{DC})	Cap. (μF)	10φ			12.5φ			16φ			18φ		
		φD×L	Ripple Current		φD×L	Ripple Current		φD×L	Ripple Current		φD×L	Ripple Current	
			120 Hz	100k Hz		120 Hz	100k Hz		120 Hz	100k Hz		120 Hz	100k Hz
400V (2G)	33	10×40	315	475									
	39	10×45	360	545									
	47	10×50	420	630	12.5×30	440	660						
	56				12.5×35	500	750						
	68				12.5×40	580	870	16×31.5	530	795			
	82				12.5×50	625	935	16×35.5	615	920			
	100							16×40	715	1,070			
	120							16×40 16×45	800 840	1,200 1,260	18×35.5 18×40	790 870	1,185 1,305
	150							16×50	990	1,485	18×45	985	1,475
	180										18×50	1,120	1,685
420V (2P)	33	10×40	370	555									
	39	10×45	410	615	12.5×30	390	585						
	47	10×50	465	700	12.5×35	450	675						
	56				12.5×40	520	780	16×31.5	500	750			
	68				12.5×45	580	870	16×35.5	580	870			
	82				12.5×50	660	990	16×35.5 16×40	730 675	1,095 1,010			
	100							16×40 16×45	750 755	1,125 1,130	18×35.5	725	1,085
	120							16×50	865	1,300	18×40 18×45	835 880	1,250 1,320
	150										18×50	1,030	1,550
450V (2W)	33	10×45	330	495	12.5×30	370	555						
	39	10×50	380	570	12.5×35	420	630						
	47				12.5×40	480	720						
	53				12.5×45	500	750						
	56				12.5×45	530	795	16×31.5	510	765			
	68				12.5×50	620	930	16×35.5	590	885			
	82							16×40	615	920	18×35.5	645	965
	100							16×45	715	1,070	18×40	750	1,125
	120							16×50	820	1,230	18×45	835	1,250
	150										18×50	975	1,465

Remark: Other sizes and specification are available, please contact us for detail.

Part Numbering System

RQL Series	39μF	±20%	450V	Bulk Package	Gas Type	10φ×50L	Pb-free and PET sleeve
RQL	**390**	**M**	**2W**	**BK**	**-**	**1050**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Lead Configuration and Package	Rubber Type	Case Size	Lead Wire and Sleeve type

Note: For more details, please refer to “Part Numbering System (Radial Type)” on page 13.

RXR Series

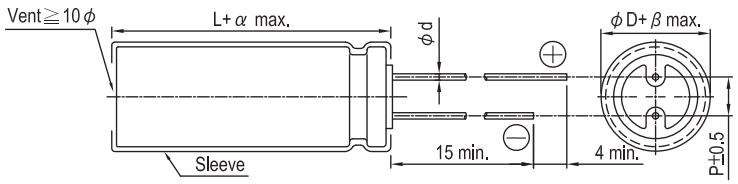
Features

- 105℃, 2,000 hours assured
- Downsize, high allowable ripple current design
- Slim type included
- RoHS compliance

Specifications

Items	Performance			
Category Temperature Range	400V		450V	
	-40℃ ~ +105℃		-25℃ ~ +105℃	
Capacitance Tolerance	±20% (at 120 Hz, 20℃)			
Leakage Current (at 20℃)	I = 0.02CV+25(μA, after 5 minutes) Where, C = rated capacitance in μF, V = rated DC working voltage in V			
Tanδ (at 120 Hz, 20℃)	Rated Voltage: 400 / 450 Tanδ (max): 0.15 / 0.20			
Low Temperature Characteristics (at 120 Hz)	Impedance ratio shall not exceed the values given in the table below. Rated Voltage: 400 / 450 Impedance Ratio Z(-25℃)/Z(+20℃): 5 / 6 Impedance Ratio Z(-40℃)/Z(+20℃): 6 / -			
Endurance	Test Time: 2,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 200% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage applied with rated ripple current for 2,000 hours at 105°C.			
Shelf Life Test	Test Time: 1,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 200% of specified value Leakage Current: Less than 500% of specified value * The above specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 105°C without voltage applied. The rated voltage shall be applied to the capacitors before the measurements (Refer to JIS C 5101-4 4.1).			
Ripple Current and Frequency Multipliers	Frequency (Hz): 60 / 120 / 500 / 1k / 10k up Multipliers: 0.8 / 1.00 / 1.25 / 1.45 / 1.50			

Diagram of Dimensions



Lead Spacing and Diameter Unit: mm

φD	10	12.5	16	18
P	5.0	5.0	7.5	7.5
φd	0.6		0.8	
α	2.0			
β	0.5			

Dimension: ϕD × L(mm)

Ripple Current: mA/rms at 105℃

Dimension and Permissible Ripple Current

Rated Voltage (V_{DC})	Cap. (μF)	10ϕ			12.5ϕ			16ϕ			18ϕ		
		ϕD×L	Ripple Current		ϕD×L	Ripple Current		ϕD×L	Ripple Current		ϕD×L	Ripple Current	
			120 Hz	100k Hz		120 Hz	100k Hz		120 Hz	100k Hz		120 Hz	100k Hz
400V (2G)	27	10×30	315	475									
	33	10×35	355	535									
	39	10×40	425	640									
	47	10×45	485	730									
	56	10×50	535	805	12.5×35	530	795						
	68				12.5×40	610	915						
	82				12.5×45	690	1,035	16×31.5	680	1,020			
	100				12.5×50	765	1,150	16×35.5	775	1,165			
	120							16×40	865	1,300	18×31.5	825	1,240
	150							16×45	960	1,440	18×40	1,015	1,525
	180							16×50	1,090	1,635	18×45	1,140	1,710
	220										18×50	1,240	1,860
450V (2W)	22	10×30	290	435									
	27	10×35	340	510									
	33	10×40	395	595									
	39	10×45	440	660	12.5×30	420	630						
	47				12.5×35	485	730						
	56				12.5×40	550	825						
	68				12.5×45	630	945	16×31.5	625	940			
	82				12.5×50	680	1,020	16×35.5	700	1,050			
	100							16×40	785	1,180	18×31.5	780	1,170
	120							16×50	915	1,375	18×35.5	840	1,260
	150										18×45	1,045	1,570
	180										18×50	1,160	1,740

Remark: Other sizes and specification are available, please contact us for detail.

Part Numbering System

RXR Series	82μF	±20%	450V	Bulk Package	Gas Type	12.5ϕ×50L	Pb-free and PET sleeve
RXR	**820**	**M**	**2W**	**BK**	**-**	**1350**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Lead Configuration and Package	Rubber Type	Case Size	Lead Wire and Sleeve type

Note: For more details, please refer to “Part Numbering System (Radial Type)” on page 13.

RLA Series

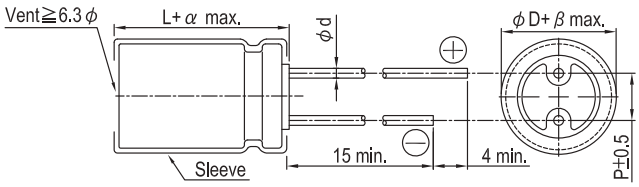
Features

- 85℃, standard low leakage current series
- 2,000 hours assured
- RoHS compliance

Specifications

Items	Performance
Category Temperature Range	-40℃ ~ +85℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)	I = 0.002CV or 0.4 (μA) whichever is greater (after 2 minutes) Where, C = rated capacitance in μF, V = rated DC working voltage in V
Tanδ (at 120 Hz, 20℃)	Rated Voltage: 6.3 / 10 / 16 / 25 / 35 / 50 / 63 / 100 Tanδ (max): 0.24 / 0.21 / 0.16 / 0.14 / 0.12 / 0.10 / 0.09 / 0.08 When the capacitance exceeds 1,000μF, 0.02 shall be added every 1,000μF increase.
Low Temperature Characteristics (at 120 Hz)	Impedance ratio shall not exceed the values given in the table below. Rated Voltage: 6.3 / 10 / 16 / 25 / 35 / 50 / 63 / 100 Impedance Ratio Z(-25℃)/Z(+20℃): 5 / 4 / 2 / 2 / 2 / 2 / 2 / 2 Impedance Ratio Z(-40℃)/Z(+20℃): 10 / 8 / 6 / 4 / 4 / 3 / 3 / 3
Endurance	Test Time: 2,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 200% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied with rated ripple current for 2,000 hours at 85℃.
Shelf Life Test	Test Time: 1,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 200% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 85℃ without voltage applied.
Ripple Current and Frequency Multipliers	Freq.(Hz) / Cap.(μF): 60 (50) / 120 / 500 / 1k / 10k up ≦ 100: 0.70 / 1.00 / 1.35 / 1.55 / 2.00 100 ＜ C ≦ 1,000: 0.83 / 1.00 / 1.23 / 1.32 / 1.50 1,000 ＜: 0.90 / 1.00 / 1.10 / 1.12 / 1.15

Diagram of Dimensions



Lead Spacing and Diameter Unit: mm

ϕD	5	6.3	8	10	12.5	16	18
P	2.0	2.5	3.5	5.0	5.0	7.5	7.5
ϕd	0.5		0.6			0.8	
α	L<20: 1.5, L≧20: 2.0						
β	0.5						

Dimension: ϕD × L(mm)

Ripple Current: mA/rms at 120 Hz, 85℃

Dimension and Permissible Ripple Current

Rated Volt. (V_{DC}) / Cap.(μF)	Contents	6.3V (0J)		10V (1A)		16V (1C)		25V (1E)		35V (1V)		50V (1H)		63V (1J)		100V (2A)	
		ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA
2.2	2R2											5×11	29			5×11	33
3.3	3R3											5×11	35			5×11	40
4.7	4R7							5×11	31	5×11	40	5×11	42	5×11	45	5×11	48
10	100					5×11	44	5×11	54	5×11	58	5×11	65	5×11	70	6.3×11	80
22	220			5×11	59	5×11	75	5×11	80	5×11	87	5×11	95	6.3×11	115	8×11.5	135
33	330	5×11	55	5×11	84	5×11	90	5×11	97	5×11	105	6.3×11	125	6.3×11	140	10×12.5	195
47	470	5×11	79	5×11	100	5×11	110	5×11	115	6.3×11	145	6.3×11	150	8×11.5	190	10×16	255
100	101	5×11	130	5×11	145	6.3×11	180	6.3×11	190	8×11.5	240	8×11.5	255	10×12.5	320	12.5×20	450
220	221	6.3×11	230	6.3×11	250	8×11.5	300	8×11.5	320	10×12.5	420	10×16	490	10×20	565	16×25	810
330	331	6.3×11	280	8×11.5	350	8×11.5	370	10×12.5	470	10×16	570	10×20	650	12.5×20	765	16×25	990
470	471	8×11.5	380	8×11.5	415	10×12.5	520	10×16	620	10×20	740	12.5×20	860	12.5×25	990	16×31.5	1,250
1,000	102	10×12.5	650	10×16	790	10×20	910	12.5×20	1,090	12.5×25	1,300	16×25	1,530	16×31.5	1,700		
2,200	222	12.5×20	1,150	12.5×20	1,240	12.5×25	1,420	16×25	1,660	16×31.5	1,890	18×35.5	2,160				
3,300	332	12.5×20	1,380	12.5×25	1,590	16×25	1,840	16×31.5	2,070	18×35.5	2,340						
4,700	472	16×25	1,880	16×25	1,980	16×31.5	2,260	18×35.5	2,520	18×40	2,690						

Part Numbering System

RLA Series	470μF	±20%	6.3V	Bulk Package	Gas Type	8ϕ×11.5L	Pb-free and PET sleeve
RLA	**471**	**M**	**0J**	**BK**	**-**	**0811**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Lead Configuration and Package	Rubber Type	Case Size	Lead Wire and Sleeve type

Note: For more details, please refer to “Part Numbering System (Radial Type)” on page 13.

Radial

RA Series

Features

- 105℃, 1,000 hours assured
- Very low leakage current
- Use in high temperature industrial equipment
- RoHS compliance

Specifications

Items	Performance
Category Temperature Range	-40℃ ~ +105℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)	I = 0.002CV or 0.4 (μA) whichever is greater (after 2 minutes) Where, C = rated capacitance in μF, V = rated DC working voltage in V
Tanδ (at 120 Hz, 20℃)	When the capacitance exceeds 1,000 μF, 0.02 shall be added every 1,000 μF increase.

Rated Voltage	6.3	10	16	25	35	50	63	100
Tanδ (max)	0.24	0.21	0.16	0.14	0.12	0.10	0.09	0.08

Low Temperature Characteristics (at 120 Hz): Impedance ratio shall not exceed the values given in the table below.

Rated Voltage		6.3	10	16	25	35	50	63	100
Impedance Ratio	Z(-25℃)/Z(+20℃)	4	3	3	2	2	2	2	2
	Z(-40℃)/Z(+20℃)	8	6	6	4	4	3	3	3

Endurance

Test Time	1,000 Hrs
Capacitance Change	Within ±20% of initial value
Tanδ	Less than 200% of specified value
Leakage Current	Within specified value

* The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied with rated ripple current for 1,000 hours at 105℃.

Shelf Life Test

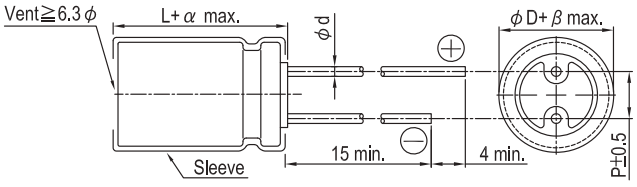
Test Time	1,000 Hrs
Capacitance Change	Within ±20% of initial value
Tanδ	Less than 200% of specified value
Leakage Current	Within specified value

* The above specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 105℃ without voltage applied.

Ripple Current and Frequency Multipliers

Cap.(μF) \ Freq.(Hz)	60 (50)	120	500	1k	10k up
≦ 100	0.75	1.00	1.35	1.55	1.90
100 ＜ C ≦ 1,000	0.83	1.00	1.23	1.32	1.45
1,000 ＜	0.90	1.00	1.10	1.12	1.12

Diagram of Dimensions



Lead Spacing and Diameter Unit: mm

ϕD	5	6.3	8	10	12.5	16	18
P	2.0	2.5	3.5	5.0	5.0	7.5	7.5
ϕd	0.5		0.6			0.8	
α	L<20: 1.5, L≧20: 2.0						
β	0.5						

Dimension: ϕD × L(mm)

Ripple Current: mA/rms at 120 Hz, 105℃

Dimension and Permissible Ripple Current

Rated Volt. (V_{DC}) / Cap. (μF)	Contents	6.3V (0J)		10V (1A)		16V (1C)		25V (1E)		35V (1V)		50V (1H)		63V (1J)		100V (2A)	
		ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA
2.2	2R2											5×11	20			5×11	23
3.3	3R3											5×11	25			5×11	29
4.7	4R7							5×11	26	5×11	28	5×11	30	5×11	32	5×11	34
10	100					5×11	35	5×11	38	5×11	41	5×11	46	5×11	50	6.3×11	56
22	220			5×11	49	5×11	54	5×11	57	5×11	61	5×11	68	6.3×11	82	8×11.5	96
33	330	5×11	54	5×11	60	5×11	64	5×11	69	5×11	75	6.3×11	90	6.3×11	100	10×12.5	140
47	470	5×11	65	5×11	70	5×11	99	5×11	82	6.3×11	100	6.3×11	110	8×11.5	135	10×16	180
100	101	5×11	95	5×11	105	6.3×11	125	6.3×11	135	8×11.5	170	8×11.5	180	10×12.5	225	12.5×20	320
220	221	6.3×11	160	6.3×11	175	8×11.5	215	8×11.5	230	10×12.5	300	10×16	345	10×20	400	16×25	570
330	331	6.3×11	195	8×11.5	245	8×11.5	260	10×12.5	335	10×16	400	10×20	460	12.5×20	540	16×25	700
470	471	8×11.5	270	8×11.5	290	10×12.5	370	10×16	440	10×20	520	12.5×20	610	12.5×25	700	16×31.5	880
1,000	102	10×12.5	460	10×16	550	10×20	640	12.5×20	770	12.5×25	920	16×25	1,080	16×31.5	1,210		
2,200	222	12.5×20	810	12.5×20	860	12.5×25	1,000	16×25	1,170	16×31.5	1,340	18×35.5	1,530				
3,300	332	12.5×20	960	12.5×25	1,100	16×25	1,300	16×31.5	1,460	18×35.5	1,650						
4,700	472	16×25	1,330	16×25	1,400	16×31.5	1,600	18×35.5	1,780	18×40	1,900						

Part Numbering System

RA Series	470μF	±20%	6.3V	Bulk Package	Gas Type	8ϕ×11.5L	Pb-free and PET sleeve
RA-	**471**	**M**	**0J**	**BK**	**-**	**0811**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Lead Configuration and Package	Rubber Type	Case Size	Lead Wire and Sleeve type

Note: For more details, please refer to “Part Numbering System (Radial Type)” on page 13.

SEA Series

Features

- 85℃, 2,000 hours assured, standard miniature type with 7 ~ 9mm height for compact circuits
- RoHS compliance

Specifications

Items	Performance
Category Temperature Range	-40℃ ~ +85℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)	I = 0.01CV or 3 (μA) whichever is greater (after 2 minutes) Where, C = rated capacitance in μF, V = rated DC working voltage in V
Tanδ (at 120 Hz, 20℃)	
Low Temperature Characteristics (at 120 Hz)	
Endurance	
Shelf Life Test	Test time: 500 hours; other items are the same as those for the Endurance.
Ripple Current and Frequency Multipliers	

Tanδ (at 120 Hz, 20℃)

Rated Voltage	4	6.3	10	16	25	35	50	63
Tanδ (max)	0.35	0.23	0.20	0.16	0.14	0.12	0.10	0.10

Low Temperature Characteristics (at 120 Hz)

Impedance ratio shall not exceed the values given in the table below.

Rated Voltage		4	6.3	10	16	25	35	50	63
Impedance Ratio	Z(-25℃) / Z(+20℃)	7	4	3	3	2	2	2	2
	Z(-40℃) / Z(+20℃)	14	10	8	6	4	4	4	4

Endurance

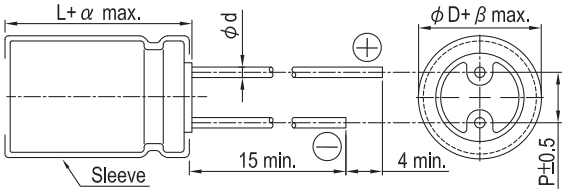
Test Time	2,000 Hrs
Capacitance Change	Within ±20% of initial value
Tanδ	Less than 200% of specified value
Leakage Current	Within specified value

* The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied with rated ripple current for 2,000 hours at 85℃.

Ripple Current and Frequency Multipliers

Freq.(Hz) / Cap.(μF)	60 (50)	120	500	1k	10k up
≦ 47	0.70	1.00	1.20	1.30	1.45
100 ~ 1,000	0.80	1.00	1.10	1.15	1.20

Diagram of Dimensions



Lead Spacing and Diameter Unit: mm

ϕD	4	5	6.3	8	10
P	1.5	2.0	2.5	3.5	5.0
ϕd	0.45	0.5			0.6
α	1.0				1.5
β	0.5				

Dimension: ϕD × L(mm)
Ripple Current: mA/rms at 120 Hz, 85℃

Dimension and Permissible Ripple Current

Rated Volt. (Vdc) / μF	Contents	4V (0G)		6.3V (0J)		10V (1A)		16V (1C)		25V (1E)		35V (1V)		50V (1H)		63V (1J)	
		ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA
1	010													4×7	10	4×7	11
2.2	2R2													4×7	15	4×7	17
3.3	3R3													4×7	18	4×7	21
4.7	4R7											4×7	22	5×7*	23	5×7*	26
10	100							4×7	25	4×7	26	5×7*	30	6.3×7*	34	6.3×7*	40
22	220			4×7	31	4×7	32	5×7*	39	5×7*	41	6.3×7*	47	6.3×7	53	8×7*	70
33	330	4×7	32	4×7	32	4×7	35	5×7	43	6.3×7	53	8×7*	71	8×7*	76	8×7	80
47	470	4×7	38	4×7	38	5×7*	47	6.3×7*	59	6.3×7	65	8×7*	83	8×7	85	8×7	95
100	101	5×7	61	6.3×7*	75	6.3×7	80	6.3×7	90	8×7	125	8×7	115	8×9	130	10×9	170
220	221	6.3×7	90	6.3×7	99	8×7	140	8×7	146	8×9	190	10×9	215				
330	331	8×7	129	8×7	156	8×7	165	8×9	185	10×9	265						
470	471	8×7	154	8×7	175	8×9	215	10×9	255								
1,000	102	8×9	200	10×9	205												

Note: Case size in mark of " * " is available to product down size.

Part Numbering System

SEA Series	470μF	±20%	6.3V	Bulk Package	Gas Type	8ϕ×7L	Pb-free and PET sleeve
SEA	**471**	**M**	**0J**	**BK**	**-**	**0807**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Lead Configuration and Package	Rubber Type	Case Size	Lead Wire and Sleeve type

Note: For more details, please refer to "Part Numbering System (Radial Type)" on page 13.

SG Series

Features

- 105℃, 1,000 hours assured
- High temperature Category range, with 7mm height
- RoHS compliance

Specifications

Items	Performance
Category Temperature Range	-40℃ ~ +105℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)	I = 0.01CV or 3 (μA) whichever is greater (after 2 minutes) Where, C = rated capacitance in μF, V = rated DC working voltage in V
Tanδ (at 120 Hz, 20℃)	

Rated Voltage	4	6.3	10	16	25	35	50	63
Tanδ (max)	0.35	0.23	0.20	0.17	0.15	0.12	0.10	0.10

Low Temperature Characteristics (at 120 Hz)

Impedance ratio shall not exceed the values given in the table below.

Rated Voltage		4	6.3	10	16	25	35	50	63
Impedance Ratio	Z(-25℃)/Z(+20℃)	6	4	3	3	2	2	2	2
	Z(-40℃)/Z(+20℃)	12	10	8	6	4	4	4	4

Endurance

Test Time	1,000 Hrs
Capacitance Change	Within ±20% of initial value
Tanδ	Less than 200% of specified value
Leakage Current	Within specified value

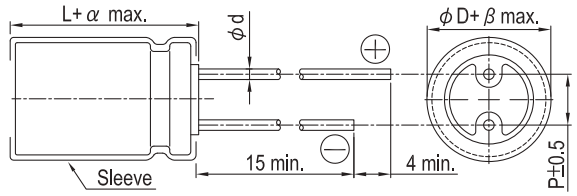
* The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied with rated ripple current for 1,000 hours at 105℃.

Shelf Life Test: Test time: 500 hours; other items are the same as those for the Endurance.

Ripple Current and Frequency Multipliers

Cap.(μF) \ Freq.(Hz)	60 (50)	120	500	1k	10k up
≦ 47	0.75	1.00	1.20	1.30	1.45
100 ~ 330	0.88	1.00	1.10	1.15	1.20

Diagram of Dimensions



Lead Spacing and Diameter Unit: mm

φD	4	5	6.3	8
P	1.5	2.0	2.5	3.5
φd	0.45	0.5		
α	1.0			
β	0.5			

Dimension and Permissible Ripple Current

Dimension: φD × L(mm)
Ripple Current: mA/rms at 120 Hz, 105℃

Rated Volt. (V_{DC}) / μF / Contents	4V (0G)		6.3V (0J)		10V (1A)		16V (1C)		25V (1E)		35V (1V)		50V (1H)		63V (1J)	
	φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA
1 / 010													4×7	10	4×7	11
2.2 / 2R2													4×7	15	4×7	17
3.3 / 3R3													4×7	18	4×7	21
4.7 / 4R7											4×7	22	5×7*	23	5×7	26
10 / 100							4×7	25	4×7	26	5×7*	30	6.3×7*	34	6.3×7	40
22 / 220			4×7	31	4×7	32	5×7*	39	5×7*	41	6.3×7	47	6.3×7	53	8×7	70
33 / 330	4×7	32	4×7	32	4×7	35	5×7	43	6.3×7	53	8×7*	71	8×7	76		
47 / 470	4×7	38	4×7	38	5×7*	47	6.3×7*	59	6.3×7	65	8×7	83	8×7	85		
100 / 101	5×7	61	6.3×7*	75	6.3×7	80	6.3×7	90	8×7	125						
220 / 221	6.3×7	90	6.3×7	99	8×7	140	8×7	146								
330 / 331	8×7	156	8×7	156												

Note: Case size in mark of "*" is available to product down size.

Part Numbering System

SG Series	330μF	±20%	6.3V	Bulk Package	Gas Type	8φ×7L	Pb-free and PET sleeve
SG-	**331**	**M**	**0J**	**BK**	**-**	**0807**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Lead Configuration and Package	Rubber Type	Case Size	Lead Wire and Sleeve type

Note: For more details, please refer to "Part Numbering System (Radial Type)" on page 13.

SLA Series

Features

- 85℃, 7mm height, low leakage current
- RoHS compliance

Specifications

Items	Performance
Category Temperature Range	-40℃ ~ +85℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)	I = 0.002CV or 0.4 (μA) whichever is greater (after 2 minutes) Where, C = rated capacitance in μF, V = rated DC working voltage in V

Tanδ (at 120 Hz, 20℃)

Rated Voltage	4	6.3	10	16	25	35	50	63
Tanδ (max)	0.35	0.23	0.21	0.16	0.14	0.12	0.10	0.10

Low Temperature Characteristics (at 120 Hz)

Impedance ratio shall not exceed the values given in the table below.

Rated Voltage		4	6.3	10	16	25	35	50	63
Impedance Ratio	Z(-25℃)/Z(+20℃)	6	4	3	3	2	2	2	2
	Z(-40℃)/Z(+20℃)	12	10	8	6	5	4	4	4

Endurance

Test Time	2,000 Hrs
Capacitance Change	Within ±20% of initial value
Tanδ	Less than 200% of specified value
Leakage Current	Within specified value

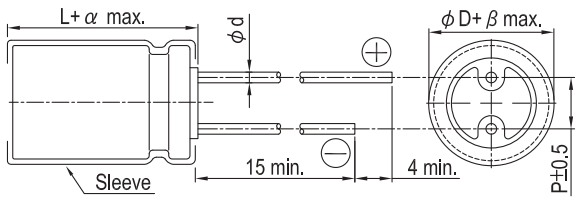
* The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied with rated ripple current for 2,000 hours at 85℃.

Shelf Life Test: Test time: 500 hours; other items are the same as those for the Endurance.

Ripple Current and Frequency Multipliers

Cap.(μF) \ Freq.(Hz)	60 (50)	120	500	1k	10k up
≦ 47	0.70	1.00	1.20	1.30	1.45
100	0.80	1.00	1.10	1.15	1.20

Diagram of Dimensions



Lead Spacing and Diameter Unit: mm

φD	4	5	6.3	8
P	1.5	2.0	2.5	3.5
φd	0.45	0.5		
α	1.0			
β	0.5			

Dimension: φD × L(mm)
Ripple Current: mA/rms at 120 Hz, 85℃

Dimension and Permissible Ripple Current

Rated Volt. (VDC) / μF	Contents	4V (0G)		6.3V (0J)		10V (1A)		16V (1C)		25V (1E)		35V (1V)		50V (1H)		63V (1J)	
		φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA
1	010													4×7	10	4×7	10
2.2	2R2													4×7	16	5×7	19
3.3	3R3											4×7	18	4×7	20	6.3×7	29
4.7	4R7									4×7	19	5×7	21	5×7	24	6.3×7	36
10	100							4×7	27	5×7	29	6.3×7	36	6.3×7	40		
22	220					4×7	36	4×7	40	6.3×7	47	6.3×7	53				
33	330	4×7	33	4×7	41	5×7	44	5×7	55	6.3×7	63	8×7	71				
47	470	4×7	39	5×7	49	6.3×7	54	6.3×7	62	8×7	74						
100	101	6.3×7	59	6.3×7	75	8×7	90	8×7	110								

Part Numbering System

SLA Series	100μF	±20%	6.3V	Bulk Package	Gas Type	6.3φ×7L	Pb-free and PET sleeve
SLA	**101**	**M**	**0J**	**BK**	**-**	**0607**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Lead Configuration and Package	Rubber Type	Case Size	Lead Wire and Sleeve type

Note: For more details, please refer to “Part Numbering System (Radial Type)” on page 13.

SA Series

Features

- 105℃, 1,000 hours assured, 7mm height with low leakage current
- Use in very compact high temperature industrial equipment
- RoHS compliance

Specifications

Items	Performance
Category Temperature Range	-40℃ ~ +105℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)	I = 0.002CV or 0.4 (μA) whichever is greater (after 2 minutes) Where, C = rated capacitance in μF, V = rated DC working voltage in V
Tanδ (at 120 Hz, 20℃)	
Low Temperature Characteristics (at 120 Hz)	Impedance ratio shall not exceed the values given in the table below.
Endurance	
Shelf Life Test	Test time: 500 hours; other items are the same as those for the Endurance.
Ripple Current and Frequency Multipliers	

Rated Voltage	4	6.3	10	16	25	35	50	63
Tanδ (max)	0.35	0.24	0.21	0.16	0.14	0.12	0.10	0.10

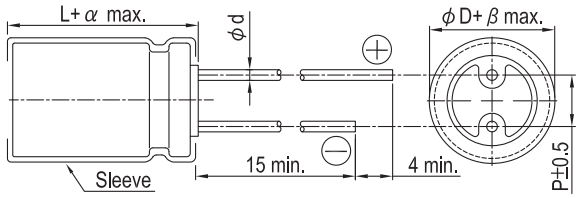
Rated Voltage		4	6.3	10	16	25	35	50	63
Impedance Ratio	Z(-25℃)/Z(+20℃)	6	4	3	3	2	2	2	2
	Z(-40℃)/Z(+20℃)	12	10	8	6	5	4	4	3

Test Time	1,000 Hrs
Capacitance Change	Within ±20% of initial value
Tanδ	Less than 200% of specified value
Leakage Current	Within specified value

* The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied with rated ripple current for 1,000 hours at 105℃.

Freq.(Hz) / Cap.(μF)	60 (50)	120	500	1k	10k up
≦ 47	0.70	1.00	1.20	1.30	1.45
100	0.80	1.00	1.10	1.15	1.20

Diagram of Dimensions



Lead Spacing and Diameter Unit: mm

φD	4	5	6.3	8
P	1.5	2.0	2.5	3.5
φd	0.45	0.5		
α	1.0			
β	0.5			

Dimension and Permissible Ripple Current

Dimension: φD × L(mm)
Ripple Current: mA/rms at 120 Hz, 105℃

Rated Volt. (VDC) / μF / Contents	4V (0G)		6.3V (0J)		10V (1A)		16V (1C)		25V (1E)		35V (1V)		50V (1H)		63V (1J)	
	φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA
1 / 010													4×7	10	4×7	10
2.2 / 2R2													4×7	16	5×7	19
3.3 / 3R3											4×7	18	4×7	20	6.3×7	29
4.7 / 4R7									4×7	19	5×7	21	6.3×7	24	6.3×7	36
10 / 100							4×7	27	5×7	29	6.3×7	32	8×7	40		
22 / 220					4×7	36	4×7	40	6.3×7	44	6.3×7	49				
33 / 330	4×7	33	4×7	41	5×7	44	5×7	50	6.3×7	55	8×7	67				
47 / 470	4×7	39	5×7	49	6.3×7	54	6.3×7	62	8×7	74						
100 / 101	6.3×7	59	6.3×7	75	8×7	90										

Part Numbering System

SA Series	100μF	±20%	6.3V	Bulk Package	Gas Type	6.3φ×7L	Pb-free and PET sleeve
SA-	**101**	**M**	**0J**	**BK**	**-**	**0607**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Lead Configuration and Package	Rubber Type	Case Size	Lead Wire and Sleeve type

Note: For more details, please refer to “Part Numbering System (Radial Type)” on page 13.

SJA Series

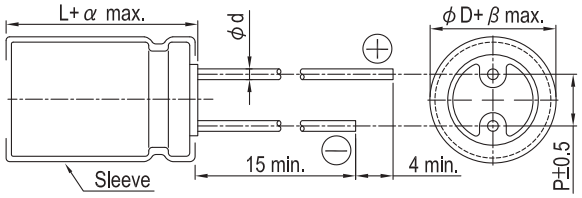
Features

- 105℃, 2,000 hours assured
- High temperature category range, with 7mm height
- RoHS compliance

Specifications

Items	Performance
Category Temperature Range	-55℃ ~ +105℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)	I = 0.01CV or 3 (μA) whichever is greater (after 2 minutes) Where, C = rated capacitance in μF, V = rated DC working voltage in V
Tanδ (at 120 Hz, 20℃)	Rated Voltage: 4 / 6.3 / 10 / 16 / 25 / 35 / 50 / 63 Tanδ (max): 0.35 / 0.23 / 0.20 / 0.17 / 0.15 / 0.12 / 0.10 / 0.10
Low Temperature Characteristics (at 120 Hz)	Impedance ratio shall not exceed the values given in the table below. Rated Voltage: 4 / 6.3 / 10 / 16 / 25 / 35 / 50 / 63 Impedance Ratio Z(-25℃)/Z(+20℃): 6 / 4 / 3 / 3 / 2 / 2 / 2 / 2 Impedance Ratio Z(-55℃)/Z(+20℃): 12 / 10 / 8 / 6 / 4 / 4 / 4 / 3
Endurance	Test Time: 2,000 Hrs Capacitance Change: Within ±25% of initial value Tanδ: Less than 200% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied with rated ripple current for 2,000 hours at 105℃.
Shelf Life Test	Test time: 1,000 hours; other items are the same as those for the Endurance.
Ripple Current and Frequency Multipliers	Cap.(μF) \ Freq.(Hz): 60 (50) / 120 / 500 / 1k / 10k up ≦ 47: 0.75 / 1.00 / 1.20 / 1.30 / 1.45 100 ~ 470: 0.88 / 1.00 / 1.10 / 1.15 / 1.20

Diagram of Dimensions



Lead Spacing and Diameter Unit: mm

φD	4	5	6.3	8
P	1.5	2.0	2.5	3.5
φd	0.45	0.5		
α	1.0			
β	0.5			

Dimension and Permissible Ripple Current

Dimension: φD×L(mm)
Ripple Current: mA/rms at 120 Hz, 105℃

Rated Volt. (VDC) / μF / Contents	4V (0G)		6.3V (0J)		10V (1A)		16V (1C)		25V (1E)		35V (1V)		50V (1H)		63V (1J)	
	φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA
1 / 010													4×7	10	4×7	11
2.2 / 2R2													4×7	15	4×7	17
3.3 / 3R3													4×7	18	4×7	21
4.7 / 4R7											4×7	22	5×7	23	5×7	26
10 / 100							4×7	25	4×7	26	5×7	30	6.3×7	34	6.3×7	40
22 / 220			4×7	31	4×7	32	5×7	39	5×7	41	6.3×7	47	6.3×7	53	8×7	70
33 / 330	4×7	32	4×7	32	4×7	35	5×7	43	6.3×7	53	8×7	71	8×7	76		
47 / 470	4×7	38	4×7	38	5×7	47	6.3×7	59	6.3×7	65	8×7	83	8×7	85		
100 / 101	5×7	61	6.3×7	75	6.3×7	80	6.3×7	90	8×7	125	8×7	145				
220 / 221	6.3×7	90	6.3×7	99	8×7	140	8×7	146								
330 / 331	8×7	156	8×7	156	8×7	160										
470 / 471	8×7	180	8×7	180												

Part Numbering System

SJA Series	470μF	±20%	6.3V	Bulk Package	Gas Type	8φ×7L	Pb-free and PET sleeve
SJA	**471**	**M**	**0J**	**BK**	**-**	**0807**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Lead Configuration and Package	Rubber Type	Case Size	Lead Wire and Sleeve type

Note: For more details, please refer to “Part Numbering System (Radial Type)” on page 13.

SS Series

Features

- 85℃, 1,000 hours assured
- Standard micro miniature size with 5mm height
- RoHS compliance

Specifications

Items	Performance
Category Temperature Range	-40℃ ~ +85℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)	I = 0.01CV or 3 (μA) whichever is greater (after 2 minutes) Where, C = rated capacitance in μF, V = rated DC working voltage in V
Tanδ (at 120 Hz, 20℃)	

Rated Voltage	4	6.3	10	16	25	35	50
Tanδ (max)	0.35	0.25	0.20	0.17	0.15	0.13	0.10

Low Temperature Characteristics (at 120 Hz)

Impedance ratio shall not exceed the values given in the table below.

Rated Voltage		4	6.3	10	16	25	35	50
Impedance Ratio	Z(-25℃)/Z(+20℃)	7	6	4	3	2	2	2
	Z(-40℃)/Z(+20℃)	15	12	8	6	4	4	4

Endurance

Test Time	1,000 Hrs
Capacitance Change	Within ±30% of initial value for 4 ~ 6.3V; Within ±25% of initial value for 10 ~ 50V
Tanδ	Less than 200% of specified value
Leakage Current	Within specified value

* The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied with rated ripple current for 1,000 hours at 85℃.

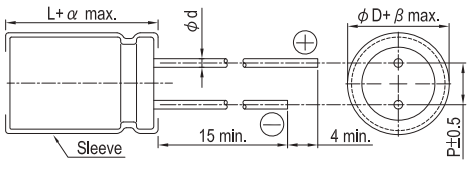
Shelf Life Test: Test time: 500 hours; other items are the same as those for the Endurance.

Ripple Current and Frequency Multipliers

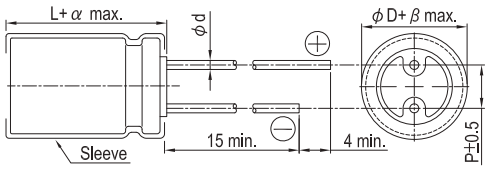
Cap.(μF) \ Freq.(Hz)	60 (50)	120	500	1k	10k up
≦ 47	0.75	1.00	1.15	1.34	1.50
100 ~ 330	0.80	1.00	1.08	1.20	1.30

Diagram of Dimensions

1. ϕD = 3mm



2. ϕD ≧ 4mm



Unit: mm

Lead Spacing and Diameter

ϕD	3	4	5	6.3	8
P	1.0	1.5	2.0	2.5	2.5
ϕd	0.4	0.45			
α	1.0				
β	0.5				

Dimension: ϕD × L(mm)
Ripple Current: mA/rms at 120 Hz, 85℃

Dimension and Permissible Ripple Current

Rated Volt. (VDC) / μF \ Contents		4V (0G)		6.3V (0J)		10V (1A)		16V (1C)		25V (1E)		35V (1V)		50V (1H)	
μF	Contents	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA
0.33	R33													3×5	2.8
0.47	R47													3×5	4
1	010													4×5(3×5)	8.7(7)
2.2	2R2											4×5(3×5)	8.7(7)	4×5(3×5)	10(9)
3.3	3R3									4×5(3×5)	11(10)	4×5	12	4×5	13
4.7	4R7							4×5(3×5)	14(11)	4×5	14	4×5	17	5×5	20
10	100					4×5(3×5)	17(13)	4×5	23	5×5	27	5×5	27	6.3×5	31
22	220			4×5(3×5)	22(18)	5×5	30	5×5	35	6.3×5	42	6.3×5	46	6.3×5	46
33	330	4×5	27	4×5	34	5×5	41	5×5	49	6.3×5	52	6.3×5	52	8×5	66
47	470	4×5	34	5×5	37	6.3×5	50	6.3×5	58	6.3×5	58	8×5	72	8×5	80
100	101	5×5	55	6.3×5	62	6.3×5	70	8×5	99	8×5	99				
220	221	6.3×5	74	8×5	104	8×5	120								
330	331	8×5	105	8×5	120										

Part Numbering System

SS Series	330μF	±20%	6.3V	Bulk Package	Gas Type	8ϕ×5L	Pb-free and PET sleeve
SS-	**331**	**M**	**0J**	**BK**	**-**	**0805**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Lead Configuration and Package	Rubber Type	Case Size	Lead Wire and Sleeve type

Note: For more details, please refer to “Part Numbering System (Radial Type)” on page 13.

SSG Series

Features

- 105℃, 1,000 hours assured
- Standard micro miniature size with 5mm height
- RoHS compliance

Specifications

Items	Performance
Category Temperature Range	-40℃ ~ +105℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)	I = 0.01CV or 3 (μA) whichever is greater (after 2 minutes) Where, C = rated capacitance in μF, V = rated DC working voltage in V
Tanδ (at 120 Hz, 20℃)	

Rated Voltage	4	6.3	10	16	25	35	50
Tanδ (max)	0.35	0.25	0.20	0.17	0.15	0.13	0.10

Low Temperature Characteristics (at 120 Hz)

Impedance ratio shall not exceed the values given in the table below.

Rated Voltage		4	6.3	10	16	25	35	50
Impedance Ratio	Z(-25℃)/Z(+20℃)	7	6	4	3	2	2	2
	Z(-40℃)/Z(+20℃)	15	12	8	6	4	4	4

Endurance

Test Time	1,000 Hrs
Capacitance Change	Within ±30% of initial value for 4 ~ 6.3V; Within ±25% of initial value for 10 ~ 50V
Tanδ	Less than 200% of specified value
Leakage Current	Within specified value

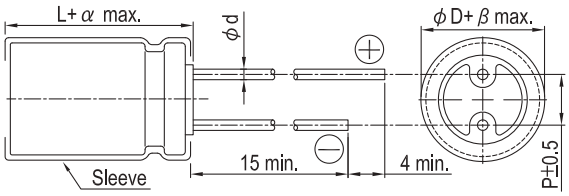
* The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied with rated ripple current for 1,000 hours at 105℃.

Shelf Life Test: Test time: 500 hours; other items are the same as those for the Endurance.

Ripple Current and Frequency Multipliers

Freq.(Hz) / Cap.(μF)	60 (50)	120	500	1k	10k up
≦ 47	0.75	1.00	1.15	1.34	1.50
100 ~ 220	0.80	1.00	1.08	1.20	1.30

Diagram of Dimensions



Lead Spacing and Diameter Unit: mm

φD	4	5	6.3
P	1.5	2.0	2.5
φd	0.45		
α	1.0		
β	0.5		

Dimension and Permissible Ripple Current

Dimension: φD × L(mm)
Ripple Current: mA/rms at 120 Hz, 105℃

Rated Volt. (VDC) / Cap. (μF)	Contents	4V (0G)		6.3V (0J)		10V (1A)		16V (1C)		25V (1E)		35V (1V)		50V (1H)	
		φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA
1	010													4×5	7
2.2	2R2											4×5	8.7	4×5	10
3.3	3R3									4×5	11	4×5	12	4×5	13
4.7	4R7							4×5	14	4×5	15	4×5	17	5×5	20
10	100					4×5	14	4×5	23	5×5	27	5×5	27	6.3×5	31
22	220			4×5	21	5×5	27	5×5	30	6.3×5	42	6.3×5	46	6.3×5	46
33	330	4×5	27	5×5	30	5×5	34	6.3×5	40	6.3×5	52	6.3×5	52		
47	470	4×5	34	5×5	36	6.3×5	43	6.3×5	48	6.3×5	58				
100	101	5×5	50	6.3×5	56	6.3×5	70								
220	221	6.3×5	74												

Part Numbering System

SSG Series	100μF	±20%	6.3V	Bulk Package	Gas Type	6.3φ×5L	Pb-free and PET sleeve
SSG	**101**	**M**	**0J**	**BK**	**-**	**0605**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Lead Configuration and Package	Rubber Type	Case Size	Lead Wire and Sleeve type

Note: For more details, please refer to “Part Numbering System (Radial Type)” on page 13.

SSL Series

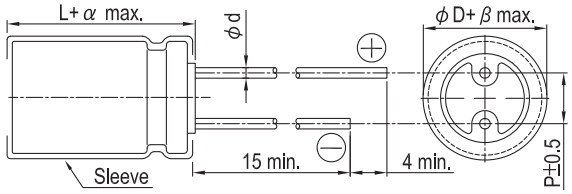
Features

- 85℃, 1,000 hours assured, 5mm height with low leakage current
- Use in very compact high temperature industrial equipment
- RoHS compliance

Specifications

Items	Performance
Category Temperature Range	-40℃ ~ +85℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)	I = 0.002CV or 0.4 (μA) whichever is greater (after 2 minutes) Where, C= rated capacitance in μF, V = rated DC working voltage in V
Tanδ (at 120 Hz, 20℃)	Rated Voltage: 4 / 6.3 / 10 / 16 / 25 / 35 / 50 Tanδ (max): 0.35 / 0.27 / 0.23 / 0.19 / 0.15 / 0.13 / 0.11
Low Temperature Characteristics (at 120 Hz)	Impedance ratio shall not exceed the values given in the table below. Rated Voltage: 4 / 6.3 / 10 / 16 / 25 / 35 / 50 Impedance Ratio Z(-25℃)/Z(+20℃): 6 / 3 / 2 / 2 / 2 / 2 / 2 Impedance Ratio Z(-40℃)/Z(+20℃): 12 / 9 / 7 / 5 / 3 / 3 / 3
Endurance	Test Time: 1,000 Hrs Capacitance Change: Within ±30% of initial value for 4 ~ 6.3V; Within ±25% of initial value for 10 ~ 50V Tanδ: Less than 200% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied with rated ripple current for 1,000 hours at 85℃.
Shelf Life Test	Test time: 500 hours; other items are the same as those for the Endurance.

Diagram of Dimensions



Lead Spacing and Diameter Unit: mm

φD	4	5	6.3
P	1.5	2.0	2.5
φd	0.45		
α	1.0		
β	0.5		

Dimension and Permissible Ripple Current

Dimension: φD × L(mm)
Ripple Current: mA/rms at 120 Hz, 85℃

Rated Volt. (VDC) / Cap. (μF)	Contents	4V (0G)		6.3V (0J)		10V (1A)		16V (1C)		25V (1E)		35V (1V)		50V (1H)	
		φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA
1	010													4×5	6.9
2.2	2R2													4×5	10
3.3	3R3													4×5	13
4.7	4R7									4×5	14	4×5	16	5×5	19
10	100							4×5	19	5×5	23	5×5	24	6.3×5	32
22	220			4×5	22	5×5	24	5×5	28	6.3×5	38	6.3×5	42		
33	330	5×5	27	5×5	28	5×5	30	6.3×5	41	6.3×5	46				
47	470	5×5	32	5×5	34	6.3×5	43	6.3×5	50						
100	101	6.3×5	54	6.3×5	60										

Part Numbering System

SSL Series	100μF	±20%	6.3V	Bulk Package	Gas Type	6.3φ×5L	Pb-free and PET sleeve
SSL	**101**	**M**	**0J**	**BK**	**-**	**0605**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Lead Configuration and Package	Rubber Type	Case Size	Lead Wire and Sleeve type

Note: For more details, please refer to “Part Numbering System (Radial Type)” on page 13.

SXJ Series

Features

- 105℃, 1,000 hours assured
- Low impedance with 5 ~ 7mm height
- RoHS compliance

Specifications

Items	Performance
Category Temperature Range	-55℃ ~ +105℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)	I = 0.01CV or 3 (μA) whichever is greater (after 2 minutes) Where, C = rated capacitance in μF, V = rated DC working voltage in V
Tanδ (at 120 Hz, 20℃)	
Low Temperature Characteristics (at 120 Hz)	
Endurance	
Shelf Life Test	Test time: 500 hours; other items are the same as those for the Endurance.
Ripple Current and Frequency Multipliers	

Tanδ (at 120 Hz, 20℃)

Rated Voltage	6.3	10	16	25	35
Tanδ (max)	0.25	0.20	0.17	0.15	0.13

Low Temperature Characteristics (at 120 Hz)

Impedance ratio shall not exceed the values given in the table below.

Rated Voltage		6.3	10	16	25	35
Impedance Ratio	Z(-25℃)/Z(+20℃)	2	2	2	2	2
	Z(-55℃)/Z(+20℃)	4	4	4	4	4

Endurance

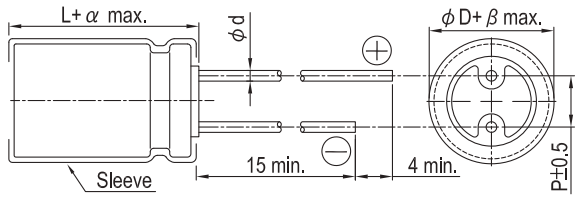
Test Time	1,000 Hrs
Capacitance Change	Within ±20% of initial value
Tanδ	Less than 200% of specified value
Leakage Current	Within specified value

* The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied with rated ripple current for 1,000 hours at 105℃.

Ripple Current and Frequency Multipliers

Frequency (Hz)	60 (50)	120	300	1k	10k up
Multiplier	0.35	0.5	0.64	0.83	1.0

Diagram of Dimensions



Lead Spacing and Diameter Unit: mm

φD	4		5		6.3		8
L	5	7	5	7	5	7	7
P	1.5		2.0		2.5		3.5
φd	0.45		0.5	0.45		0.5	
α	1.0						
β	0.5						

Dimension: φD × L(mm)
Ripple Current: mA/rms at 100k Hz, 105℃
Impedance: Ω/100k Hz, 20℃

Dimension and Permissible Ripple Current

Rated Volt. (V_DC) / Cap.(μF)	Contents	6.3V (0J)			10V (1A)			16V (1C)			25V (1E)			35V (1V)		
		φD×L	mA	Imp.	φD×L	mA	Imp.	φD×L	mA	Imp.	φD×L	mA	Imp.	φD×L	mA	Imp.
4.7	4R7													4×7 4×5	70 50	3.3 5.0
10	100							4×5	50	5.0	4×7 5×5	70 80	3.3 2.6	5×7 5×5	110 80	1.7 2.6
22	220	4×5	50	5.0	4×7 5×5	70 80	3.3 2.6	5×7 5×5	110 80	1.7 2.6	5×7 6.3×5	110 115	1.7 1.3	6.3×7 6.3×5	160 115	0.8 1.3
33	330	5×7 5×5	110 80	1.7 2.6	5×7 5×5	110 80	1.7 2.6	6.3×7 6.3×5	160 115	0.8 1.3	6.3×7 6.3×5	160 115	0.8 1.3	8×7 6.3×7	200 160	0.5 0.8
47	470	5×7 5×5	110 80	1.7 2.6	6.3×7 6.3×5	160 115	0.8 1.3	6.3×7 6.3×5	160 115	0.8 1.3	8×7 6.3×7	200 160	0.5 0.8			
100	101	6.3×7 6.3×5	160 115	0.8 1.3	8×7 6.3×7	200 160	0.5 0.8	8×7 6.3×7	200 160	0.5 0.8						
150	151	8×7 6.3×7	200 160	0.5 0.8	8×7	200	0.5									
220	221	8×7	200	0.5												

Part Numbering System

SXJ Series	220μF	±20%	6.3V	Bulk Package	Gas Type	8φ×7L	Pb-free and PET sleeve
SXJ	**221**	**M**	**0J**	**BK**	**-**	**0807**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Lead Configuration and Package	Rubber Type	Case Size	Lead Wire and Sleeve type

Note: For more details, please refer to “Part Numbering System (Radial Type)” on page 13.

RN Series

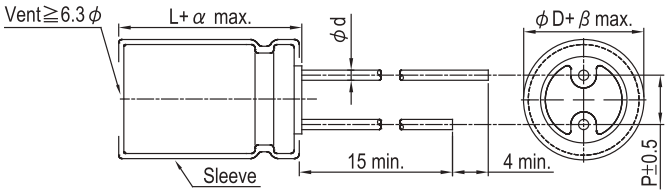
Features

- 85℃, 2,000 hours assured, standard bi-polarized series
- Suitable for use in circuits which has a reversed or unknown polarity
- RoHS compliance

Specifications

Items	Performance
Category Temperature Range	-40℃ ~ +85℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)	Rated voltage: ≦ 100V / > 100V Time: after 2 minutes / after 5 minutes Leakage Current: I = 0.03CV or 4 (μA) whichever is greater / CV ≦ 1,000 I = 0.03CV+15(μA) / CV > 1,000 I = 0.02CV+25(μA) Where, C = rated capacitance in μF, V = rated DC working voltage in V
Tanδ (at 120 Hz, 20℃)	Rated Voltage: 6.3 10 16 25 35 50 63 100 160 200 250 Tanδ (max): 0.23 0.20 0.16 0.14 0.12 0.10 0.09 0.08 0.12 0.14 0.17 When the capacitance exceeds 1,000μF, 0.02 shall be added every 1,000μF increase.
Low Temperature Characteristics (at 120 Hz)	Impedance ratio shall not exceed the values given in the table below. Rated Voltage: 6.3 10 16 25 35 50 63 100 160 200 250 Impedance Ratio Z(-25℃)/Z(+20℃): 4 3 3 2 2 2 2 2 2 2 2 Impedance Ratio Z(-40℃)/Z(+20℃): 8 6 6 4 4 3 3 3 4 4 4
Endurance (After application of the rated voltage at 85℃, the polarity inverted every 250 Hrs.)	Test Time: 2,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 200% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied with rated ripple current for 2,000 hours at 85℃.
Shelf Life Test	Test Time: 1,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 200% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 85 ℃ without voltage applied. The rated voltage shall be applied to the capacitors before the measurements for 160 ~ 250V (Refer to JIS C 5101-4 4.1).

Diagram of Dimensions



Lead Spacing and Diameter Unit: mm

ϕD	5	6.3	8	10	12.5	16	18
P	2.0	2.5	3.5	5.0	5.0	7.5	7.5
ϕd	0.5		0.6			0.8	
α	L<20: 1.5, L≧20: 2.0						
β	0.5						

Dimension: ϕD × L(mm)

Dimension and Permissible Ripple Current

Ripple Current: mA/rms at 120 Hz, 85℃

Cap. (μF) \ Rated Volt. (VDC)	Contents	6.3V (0J)		10V (1A)		16V (1C)		25V (1E)		35V (1V)		50V (1H)		63V (1J)		100V (2A)	
		ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA
1	010											5×11	15	5×11	18	5×11	23
2.2	2R2											5×11	23	5×11	25	6.3×11	26
3.3	3R3											5×11	28	5×11	31	6.3×11	32
4.7	4R7									5×11	32	5×11	34	6.3×11	37	6.3×11	40
10	100					5×11	40	5×11	42	5×11	46	6.3×11	55	6.3×11	60	8×11.5	66
22	220	5×11	50	5×11	56	5×11	59	6.3×11	63	6.3×11	76	8×11.5	82	8×11.5	90	10×16	120
33	330	5×11	62	5×11	69	5×11	73	6.3×11	78	8×11.5	94	8×11.5	104	10×12.5	135	10×20	175
47	470	5×11	74	5×11	82	6.3×11	88	6.3×11	95	8×11.5	115	10×12.5	135	10×16	175	12.5×20	200
100	101	6.3×11	115	6.3×11	120	8×11.5	149	8×11.5	155	10×16	202	10×20	235	12.5×20	270	16×25	350
220	221	8×11.5	181	8×11.5	200	10×12.5	240	10×16	294	12.5×20	335	12.5×25	378	16×25	443	16×35.5	590
330	331	8×11.5	250	10×16	308	10×16	330	12.5×20	384	12.5×20	429	16×25	496	16×31.5	653		
470	471	10×12.5	329	10×16	365	10×20	435	12.5×25	479	16×25	548	16×25	590	18×35.5	815		
1,000	102	10×20	505	12.5×20	598	12.5×25	659	16×25	700	16×31.5	880	16×31.5	920				
2,200	222	12.5×25	840	16×25	992	16×31.5	1,150	18×35.5	1,347								

Cap. (μF) \ Rated Volt. (VDC)	Contents	160V (2C)		200V (2D)		250V (2E)	
		ϕD×L	mA	ϕD×L	mA	ϕD×L	mA
0.47	R47	5×11	10	5×11	10	6.3×11	12
1	010	6.3×11	14	8×11.5	16	8×11.5	16
2.2	2R2	8×11.5	23	8×11.5	28	10×12.5	32
3.3	3R3	8×11.5	33	10×12.5	33	10×16	46
4.7	4R7	10×12.5	39	10×16	46	10×20	62
10	100	10×16	75	10×20	83	10×20	99
22	220	12.5×20	146	12.5×20	146	12.5×25	172
33	330	12.5×20	179	12.5×25	197	16×25	211
47	470	12.5×25	235				

Part Numbering System

RN Series	470μF	±20%	6.3V	Bulk Package	Gas Type	10ϕ×12.5L	Pb-free and PET sleeve
RN-	**471**	**M**	**0J**	**BK**	**-**	**1012**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Lead Configuration and Package	Rubber Type	Case Size	Lead Wire and Sleeve type

Note: For more details, please refer to “Part Numbering System (Radial Type)” on page 13.

RNG Series

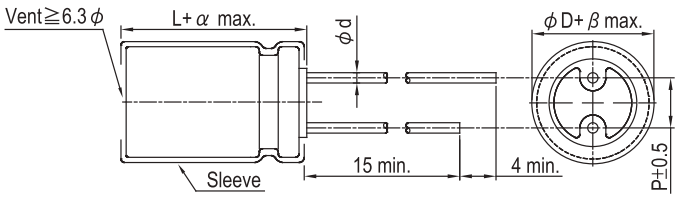
Features

- 105℃, 2,000 hours assured, standard bi-polarized series
- Suitable for use in circuits which has a reversed or unknown polarity
- RoHS compliance

Specifications

Items	Performance
Category Temperature Range	-40℃ ~ +105℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)	Rated voltage: ≦ 100V / >100V Time: after 2 minutes / after 5 minutes Leakage Current: I = 0.03CV or 4 (μA) whichever is greater / CV ≦ 1,000 I = 0.03CV+15(μA) / CV > 1,000 I = 0.02CV+25(μA) Where, C = rated capacitance in μF, V = rated DC working voltage in V
Tanδ (at 120 Hz, 20℃)	Rated Voltage: 6.3 10 16 25 35 50 63 100 160 200 250 Tanδ (max): 0.25 0.22 0.18 0.16 0.14 0.12 0.10 0.09 0.15 0.15 0.20 When the capacitance exceeds 1,000μF, 0.02 shall be added every 1,000μF increase.
Low Temperature Characteristics (at 120 Hz)	Impedance ratio shall not exceed the values given in the table below. Rated Voltage: 6.3 10 16 25 35 50 63 100 160 200 250 Impedance Ratio Z(-25℃)/Z(+20℃): 4 3 3 2 2 2 2 2 2 2 2 Impedance Ratio Z(-40℃)/Z(+20℃): 8 6 6 4 4 3 3 3 4 4 4
Endurance (After application of the rated voltage at 105℃, the polarity inverted every 250 hours.)	Test Time: 2,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 200% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied with rated ripple current for 2,000 hours at 105℃.
Shelf Life Test	Test Time: 1,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 200% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 105℃ without voltage applied. The rated voltage shall be applied to the capacitors before the measurements for 160 ~ 250V (Refer to JIS C 5101-4 4.1).

Diagram of Dimensions



Lead Spacing and Diameter Unit: mm

ϕD	5	6.3	8	10	12.5	16	18
P	2.0	2.5	3.5	5.0	5.0	7.5	7.5
ϕd	0.5		0.6			0.8	
α	L<20: 1.5, L≧20: 2.0						
β	0.5						

Dimension: ϕD × L(mm)

Ripple Current: mA/rms at 120 Hz, 105℃

Dimension and Permissible Ripple Current

Rated Volt. (V_{DC}) / Cap. (μF)	Contents	6.3V (0J)		10V (1A)		16V (1C)		25V (1E)		35V (1V)		50V (1H)		63V (1J)		100V (2A)	
		ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA
1	010											5×11	10	5×11	11	5×11	12
2.2	2R2											5×11	15	5×11	16	6.3×11	20
3.3	3R3											5×11	18	5×11	20	6.3×11	25
4.7	4R7									5×11	21	5×11	22	6.3×11	24	6.3×11	30
10	100					5×11	27	5×11	27	5×11	30	6.3×11	37	6.3×11	40	8×11.5	50
22	220	5×11	34	5×11	34	5×11	40	6.3×11	46	6.3×11	51	8×11.5	63	8×11.5	68	10×16	97
33	330	5×11	45	5×11	45	5×11	49	6.3×11	56	8×11.5	72	8×11.5	77	10×12.5	98	10×20	140
47	470	5×11	54	5×11	54	6.3×11	67	6.3×11	67	8×11.5	86	10×12.5	105	10×16	130	12.5×20	170
100	101	6.3×11	90	6.3×11	90	8×11.5	110	8×11.5	110	10×16	160	10×20	190	12.5×20	225	16×25	300
220	221	8×11.5	150	8×11.5	150	10×12.5	195	10×16	215	12.5×20	290	12.5×25	340	16×25	405	16×35.5	510
330	331	8×11.5	185	10×16	240	10×16	265	12.5×20	320	12.5×20	350	16×25	460	16×31.5	535		
470	471	10×12.5	260	10×20	290	10×20	345	12.5×25	380	12.5×25	465	16×31.5	590	18×35.5	680		
1,000	102	10×20	460	12.5×20	510	12.5×25	605	16×25	670	16×31.5	805						
2,200	222	12.5×25	820	16×25	940	16×31.5	1,070	18×35.5	1,140								

Rated Volt. (V_{DC}) / Cap. (μF)	Contents	160V (2C)		200V (2D)		250V (2E)	
		ϕD×L	mA	ϕD×L	mA	ϕD×L	mA
0.47	R47	5×11	8	5×11	9	6.3×11	10
1	010	6.3×11	11	8×11.5	12	8×11.5	13
2.2	2R2	8×11.5	18	8×11.5	22	10×12.5	26
3.3	3R3	8×11.5	26	10×12.5	30	10×16	37
4.7	4R7	10×12.5	31	10×16	37	10×20	50
10	100	10×16	60	10×20	66	10×20	79
22	220	12.5×20	117	12.5×20	117	12.5×25	138
33	330	12.5×20	143	12.5×25	158	16×25	169
47	470	16×25	188				

Part Numbering System

RNG Series	470μF	±20%	6.3V	Bulk Package	Gas Type	10ϕ×12.5L	Pb-free and PET sleeve
RNG	**471**	**M**	**0J**	**BK**	**-**	**1012**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Lead Configuration and Package	Rubber Type	Case Size	Lead Wire and Sleeve type

Note: For more details, please refer to “Part Numbering System (Radial Type)” on page 13.

SN Series

Features

- 85℃, 1,000 hours assured, bi-polarized series with 7mm height
- Suitable for use in circuits wihich has a reversed or unknown polarity
- RoHS compliance

Specifications

Items	Performance
Category Temperature Range	-40℃ ~ +85℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)	I = 0.05CV or 10 (μA) whichever is greater (after 2 minutes) Where, C = rated capacitance in μF, V = rated DC working voltage in V
Tanδ (at 120 Hz, 20℃)	

Rated Voltage	4	6.3	10	16	25	35	50	63
Tanδ (max)	0.35	0.24	0.20	0.16	0.16	0.14	0.12	0.10

Low Temperature Characteristics (at 120 Hz)

Impedance ratio shall not exceed the values given in the table below.

Rated Voltage		4	6.3	10	16	25	35	50	63
Impedance Ratio	Z(-25℃)/Z(+20℃)	4	4	3	2	2	2	2	2
	Z(-40℃)/Z(+20℃)	10	10	8	6	4	3	3	3

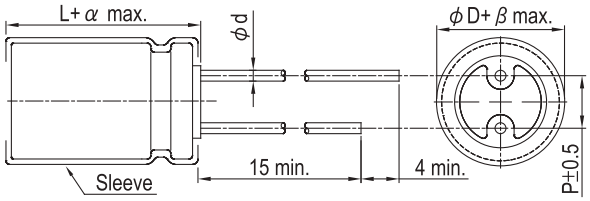
Endurance (After application of the rated voltage at 85℃, the polarity inverted every 250 Hrs.)

Test Time	1,000 Hrs
Capacitance Change	Within ±20% of initial value
Tanδ	Less than 200% of specified value
Leakage Current	Within specified value

* The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied for 1,000 hours at 85℃.

Shelf Life Test	Test time: 500 hours; other items are the same as those for the Endurance.

Diagram of Dimensions



Lead Spacing and Diameter Unit: mm

φD	4	5	6.3	8
P	1.5	2.0	2.5	3.5
φd	0.45	0.5		
α	1.0			
β	0.5			

Dimension and Permissible Ripple Current

Dimension: φD×L(mm)
Ripple Current: mA/rms at 120 Hz, 85℃

Rated Volt. (V_{DC}) / Cap. (μF) / Contents		4V (0G)		6.3V (0J)		10V (1A)		16V (1C)		25V (1E)		35V (1V)		50V (1H)		63V (1J)	
		φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA
0.47	R47													4×7	6.6	4×7	7.3
1	010													4×7	9.7	4×7	10
2.2	2R2											4×7	13	4×7	14	5×7	16
3.3	3R3									4×7	15	5×7	16	5×7	18	6.3×7	20
4.7	4R7							4×7	18	5×7	18	6.3×7	20	6.3×7	22	8×7	24
10	100					4×7	23	5×7	27	6.3×7	28	8×7	30				
22	220			5×7	40	5×7	40	6.3×7	45	8×7	52						
33	330	5×7	40	5×7	40	6.3×7	45	8×7	52								
47	470	6.3×7	45	6.3×7	49	8×7	55										
100	101	8×7	66														

Part Numbering System

SN Series	47μF	±20%	6.3V	Bulk Package	Gas Type	6.3φ×7L	Pb-free and PET sleeve
SN-	**470**	**M**	**0J**	**BK**	**-**	**0607**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Lead Configuration and Package	Rubber Type	Case Size	Lead Wire and Sleeve type

Note: For more details, please refer to “Part Numbering System (Radial Type)” on page 13.

SSN Series

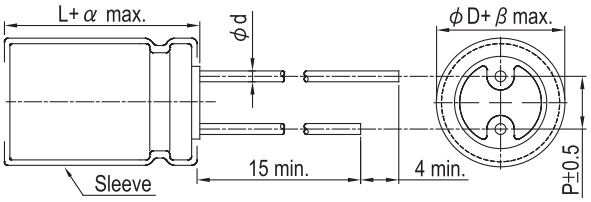
Features

- 85℃, 1,000 hours assured, bi-polarized series with 5mm height
- Suitable for use in circuits wihich has a reversed or unknown polarity
- RoHS compliance

Specifications

Items	Performance
Category Temperature Range	-40℃ ~ +85℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)	I = 0.05CV or 10 (μA) whichever is greater (after 2 minutes) Where, C = rated capacitance in μF, V = rated DC working voltage in V
Tanδ (at 120 Hz, 20℃)	Rated Voltage: 4 / 6.3 / 10 / 16 / 25 / 35 / 50 Tanδ (max): 0.35 / 0.24 / 0.20 / 0.17 / 0.17 / 0.15 / 0.15
Low Temperature Characteristics (at 120 Hz)	Impedance ratio shall not exceed the values given in the table below. Rated Voltage: 4 / 6.3 / 10 / 16 / 25 / 35 / 50 Impedance Ratio Z(-25℃)/Z(+20℃): 7 / 4 / 3 / 2 / 2 / 2 / 2 Impedance Ratio Z(-40℃)/Z(+20℃): 15 / 10 / 8 / 6 / 4 / 3 / 3
Endurance (After application of the rated voltage at 85℃, the polarity inverted every 250 Hrs.)	Test Time: 1,000 Hrs Capacitance Change: Within ±30% of initial value for 4 ~ 6.3 V; Within ±25% of initial value for 10 ~ 50V Tanδ: Less than 200% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied for 1,000 hours at 85℃.
Shelf Life Test	Test time: 500 hours; LC: Less than 200% of specified value; other items are the same as those for the Endurance.

Diagram of Dimensions



Lead Spacing and Diameter Unit: mm

φD	4	5	6.3
P	1.5	2.0	2.5
φd	0.45		
α	1.0		
β	0.5		

Dimension and Permissible Ripple Current

Dimension: φD×L(mm)
Ripple Current: mA/rms at 120 Hz, 85℃

Rated Volt. (V_{DC}) / Cap. (μF)	Contents	4V (0G)		6.3V (0J)		10V (1A)		16V (1C)		25V (1E)		35V (1V)		50V (1H)	
		φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA
0.33	R33													4×5	3.5
0.47	R47													4×5	4.2
1	010											4×5	5.5	4×5	6.1
2.2	2R2									4×5	8	4×5	9.1	5×5	10
3.3	3R3							4×5	9	4×5	10	5×5	12	5×5	13
4.7	4R7					4×5	11	5×5	12	5×5	14	5×5	15	6.3×5	16
10	100	4×5	19	4×5	15	5×5	19	6.3×5	21	6.3×5	22	6.3×5	24		
22	220	5×5	23	5×5	26	6.3×5	31	6.3×5	33						
33	330	6.3×5	30	6.3×5	36	6.3×5	38								
47	470	6.3×5	36	6.3×5	41										

Part Numbering System

SSN Series	47μF	±20%	6.3V	Bulk Package	Gas Type	6.3φ×5L	Pb-free and PET sleeve
SSN	**470**	**M**	**0J**	**BK**	**-**	**0605**	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Lead Configuration and Package	Rubber Type	Case Size	Lead Wire and Sleeve type

Note: For more details, please refer to “Part Numbering System (Radial Type)” on page 13.

LS Series

Features
- Snap-in terminal type
- 85℃, 3,000 hours assured
- RoHS compliance

Specifications

Items	Performance	
Category Temperature Range	16 ~ 400V	420 ~ 500V
	-40℃ ~ +85℃	-25℃ ~ +85℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)	
Leakage Current (at 20℃)	$I = 3\sqrt{CV}$ or 1.5 mA whichever is smaller (after 5 minutes) Where, C = rated capacitance in μF, V = rated DC working voltage in V	

Tanδ (at 120 Hz, 20℃)

Rated Voltage	16	25	35	50	63	80	100	160	200	250	350	400	420	450	500
Tanδ (max)	0.50	0.45	0.40	0.35	0.30	0.25	0.20	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15

Low Temperature Characteristics (at 120 Hz)

Impedance ratio shall not exceed the values given in the table below.

Rated Voltage		16	25	35	50	63	80	100	160	200	250	350	400	420	450	500
Impedance Ratio	Z(-25℃)/Z(+20℃)	4	3	3	2	2	2	4	4	4	4	8	8	8	8	8
	Z(-40℃)/Z(+20℃)	15	10	8	6	5	5	4	8	10	10	16	18	-	-	-

Endurance

Test Time	3,000 Hrs
Capacitance Change	Within ±20% of initial value
Tanδ	Less than 200% of specified value
Leakage Current	Within specified value

* The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied with rated ripple current for 3,000 hours at 85℃.

Shelf Life Test

Test Time	1,000 Hrs
Capacitance Change	Within ±20% of initial value
Tanδ	Less than 150% of specified value
Leakage Current	Within specified value

* The above specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 85℃ without voltage applied. The rated voltage shall be applied to the capacitors before the measurements (Refer to JIS C 5101-4 4.1).

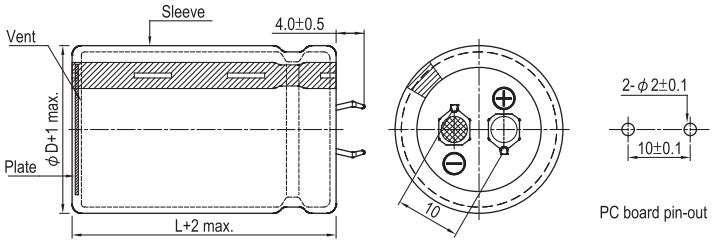
Ripple Current and Frequency Multipliers

Case size	Freq.(Hz) / Rated Volt.(V)	50 / 60	100 / 120	500	1k	10k up
Length ≦ 55L	≦ 100	0.92	1.00	1.13	1.19	1.20
	160 ~ 250	0.81	1.00	1.32	1.45	1.50
	350 ≦	0.77	1.00	1.30	1.41	1.43
Length ≧ 60L	160 ~ 450	0.88	1.00	1.20	1.25	1.40

Failure percentage Failure rate: When the failure percentage / failure rate is required, please contact with us for further discussion.

Diagram of Dimensions

Unit: mm



Snap-in

Dimension and Permissible Ripple Current

Rated Voltage V_{DC}	Capacitance 120 Hz, 20℃ μF	φD×L mm	Ripple Current 120 Hz, 85℃ A/rms	Tan δ at 120 Hz, 20℃	ESR 120 Hz, 20℃ Ω	LC 5 minutes mA	Part Number
16	8,200	20 × 25	2.41	0.50	0.081	1.09	LS-822M1C--A2025
	8,200	22 × 25	2.56	0.50	0.081	1.09	LS-822M1C--A2225
	10,000	20 × 25	2.46	0.50	0.066	1.20	LS-103M1C--A2025
	10,000	22 × 25	2.60	0.50	0.066	1.20	LS-103M1C--A2225
	10,000	25 × 25	2.81	0.50	0.066	1.20	LS-103M1C--A2525
	12,000	20 × 30	2.92	0.50	0.055	1.31	LS-123M1C--A2030
	12,000	22 × 25	2.88	0.50	0.055	1.31	LS-123M1C--A2225
	12,000	25 × 25	2.96	0.50	0.055	1.31	LS-123M1C--A2525
	15,000	20 × 35	3.49	0.50	0.044	1.47	LS-153M1C--A2035
	15,000	22 × 30	3.45	0.50	0.044	1.47	LS-153M1C--A2230
	15,000	25 × 25	3.38	0.50	0.044	1.47	LS-153M1C--A2525
	15,000	30 × 25	3.73	0.50	0.044	1.47	LS-153M1C--A3025
	18,000	20 × 40	3.72	0.50	0.037	1.50	LS-183M1C--A2040
	18,000	22 × 30	3.47	0.50	0.037	1.50	LS-183M1C--A2230
	18,000	25 × 25	3.47	0.50	0.037	1.50	LS-183M1C--A2525
	22,000	20 × 45	4.07	0.50	0.030	1.50	LS-223M1C--A2045
	22,000	22 × 35	3.84	0.50	0.030	1.50	LS-223M1C--A2235
	22,000	25 × 30	3.93	0.50	0.030	1.50	LS-223M1C--A2530
	22,000	30 × 25	4.08	0.50	0.030	1.50	LS-223M1C--A3025
	22,000	35 × 25	4.15	0.50	0.030	1.50	LS-223M1C--A3525
	27,000	22 × 45	4.63	0.50	0.025	1.50	LS-273M1C--A2245
	27,000	25 × 40	4.72	0.50	0.025	1.50	LS-273M1C--A2540
	33,000	22 × 50	5.20	0.50	0.020	1.50	LS-333M1C--A2250
	33,000	25 × 45	5.41	0.50	0.020	1.50	LS-333M1C--A2545
	33,000	30 × 35	5.40	0.50	0.020	1.50	LS-333M1C--A3035
	33,000	35 × 25	5.19	0.50	0.020	1.50	LS-333M1C--A3525
	39,000	30 × 40	6.02	0.50	0.017	1.50	LS-393M1C--A3040
	39,000	35 × 30	5.88	0.50	0.017	1.50	LS-393M1C--A3530
	47,000	30 × 45	6.95	0.50	0.014	1.50	LS-473M1C--A3045
	47,000	35 × 35	6.85	0.50	0.014	1.50	LS-473M1C--A3535
	56,000	35 × 40	7.39	0.50	0.012	1.50	LS-563M1C--A3540
	68,000	35 × 45	8.06	0.50	0.010	1.50	LS-683M1C--A3545
25	5,600	20 × 25	2.18	0.45	0.107	1.12	LS-562M1E--A2025
	5,600	22 × 25	2.31	0.45	0.107	1.12	LS-562M1E--A2225
	6,800	20 × 25	2.25	0.45	0.088	1.24	LS-682M1E--A2025
	6,800	22 × 25	2.38	0.45	0.088	1.24	LS-682M1E--A2225
	6,800	25 × 25	2.78	0.45	0.088	1.24	LS-682M1E--A2525
	8,200	20 × 30	2.30	0.45	0.073	1.36	LS-822M1E--A2030
	8,200	22 × 25	2.43	0.45	0.073	1.36	LS-822M1E--A2225
	8,200	25 × 25	2.85	0.45	0.073	1.36	LS-822M1E--A2525
	10,000	20 × 35	2.97	0.45	0.060	1.50	LS-103M1E--A2035
	10,000	22 × 30	2.97	0.45	0.060	1.50	LS-103M1E--A2230
	10,000	25 × 25	2.93	0.45	0.060	1.50	LS-103M1E--A2525
	10,000	30 × 25	3.21	0.45	0.060	1.50	LS-103M1E--A3025
	12,000	22 × 35	3.33	0.45	0.050	1.50	LS-123M1E--A2235
	12,000	25 × 30	3.26	0.45	0.050	1.50	LS-123M1E--A2530
	12,000	30 × 25	3.59	0.45	0.050	1.50	LS-123M1E--A3025
	12,000	35 × 25	3.58	0.45	0.050	1.50	LS-123M1E--A3525
	15,000	22 × 40	3.68	0.45	0.040	1.50	LS-153M1E--A2240
	15,000	25 × 35	3.77	0.45	0.040	1.50	LS-153M1E--A2535
	15,000	30 × 25	3.60	0.45	0.040	1.50	LS-153M1E--A3025
	15,000	35 × 25	3.96	0.45	0.040	1.50	LS-153M1E--A3525
	18,000	22 × 45	4.36	0.45	0.033	1.50	LS-183M1E--A2245
	18,000	25 × 35	4.20	0.45	0.033	1.50	LS-183M1E--A2535
	18,000	30 × 30	4.40	0.45	0.033	1.50	LS-183M1E--A3030
	18,000	35 × 25	4.34	0.45	0.033	1.50	LS-183M1E--A3525
	22,000	25 × 45	4.71	0.45	0.027	1.50	LS-223M1E--A2545
	22,000	30 × 35	4.70	0.45	0.027	1.50	LS-223M1E--A3035
	22,000	35 × 25	4.60	0.45	0.027	1.50	LS-223M1E--A3525
	27,000	30 × 45	5.79	0.45	0.022	1.50	LS-273M1E--A3045
	27,000	35 × 35	5.71	0.45	0.022	1.50	LS-273M1E--A3535
	33,000	35 × 40	6.31	0.45	0.018	1.50	LS-333M1E--A3540
	39,000	35 × 45	6.92	0.45	0.015	1.50	LS-393M1E--A3545
35	4,700	22 × 25	2.21	0.40	0.113	1.22	LS-472M1V--A2225
	4,700	25 × 25	2.42	0.40	0.113	1.22	LS-472M1V--A2525

Dimension and Permissible Ripple Current

Rated Voltage V_{DC}	Capacitance 120 Hz, 20℃ μF	ϕD×L mm	Ripple Current 120 Hz, 85℃ A/rms	Tan δ at 120 Hz, 20℃	ESR 120 Hz, 20℃ Ω	LC 5 minutes mA	Part Number
35	5,600	20 × 30	2.54	0.40	0.095	1.33	LS-562M1V--A2030
	5,600	22 × 30	2.69	0.40	0.095	1.33	LS-562M1V--A2230
	5,600	25 × 25	2.69	0.40	0.095	1.33	LS-562M1V--A2525
	6,800	20 × 35	2.60	0.40	0.078	1.46	LS-682M1V--A2035
	6,800	22 × 35	2.70	0.40	0.078	1.46	LS-682M1V--A2235
	6,800	25 × 25	2.67	0.40	0.078	1.46	LS-682M1V--A2525
	6,800	30 × 25	2.99	0.40	0.078	1.46	LS-682M1V--A3025
	8,200	20 × 40	3.02	0.40	0.065	1.50	LS-822M1V--A2040
	8,200	22 × 35	3.09	0.40	0.065	1.50	LS-822M1V--A2235
	8,200	25 × 30	3.12	0.40	0.065	1.50	LS-822M1V--A2530
	8,200	30 × 25	3.04	0.40	0.065	1.50	LS-822M1V--A3025
	10,000	22 × 40	3.22	0.40	0.053	1.50	LS-103M1V--A2240
	10,000	25 × 35	3.37	0.40	0.053	1.50	LS-103M1V--A2535
	10,000	30 × 25	3.28	0.40	0.053	1.50	LS-103M1V--A3025
	10,000	35 × 25	3.60	0.40	0.053	1.50	LS-103M1V--A3525
	12,000	22 × 45	3.71	0.40	0.044	1.50	LS-123M1V--A2245
	12,000	25 × 40	3.79	0.40	0.044	1.50	LS-123M1V--A2540
	12,000	30 × 30	3.74	0.40	0.044	1.50	LS-123M1V--A3030
	12,000	35 × 25	3.75	0.40	0.044	1.50	LS-123M1V--A3525
	15,000	25 × 45	4.55	0.40	0.035	1.50	LS-153M1V--A2545
	15,000	30 × 35	4.54	0.40	0.035	1.50	LS-153M1V--A3035
	15,000	35 × 25	4.37	0.40	0.035	1.50	LS-153M1V--A3525
	18,000	25 × 50	4.84	0.40	0.029	1.50	LS-183M1V--A2550
	18,000	30 × 40	4.87	0.40	0.029	1.50	LS-183M1V--A3040
	18,000	35 × 30	5.03	0.40	0.029	1.50	LS-183M1V--A3530
	22,000	30 × 45	5.79	0.40	0.024	1.50	LS-223M1V--A3045
	22,000	35 × 35	5.71	0.40	0.024	1.50	LS-223M1V--A3535
	27,000	35 × 45	6.81	0.40	0.020	1.50	LS-273M1V--A3545
50	2,200	22 × 25	1.93	0.35	0.211	0.99	LS-222M1H--A2225
	2,700	22 × 25	2.05	0.35	0.172	1.10	LS-272M1H--A2225
	3,300	22 × 30	2.41	0.35	0.141	1.22	LS-332M1H--A2230
	3,300	25 × 25	2.38	0.35	0.141	1.22	LS-332M1H--A2525
	3,900	22 × 30	2.51	0.35	0.119	1.32	LS-392M1H--A2230
	3,900	25 × 25	2.46	0.35	0.119	1.32	LS-392M1H--A2525
	4,700	22 × 35	2.83	0.35	0.099	1.45	LS-472M1H--A2235
	4,700	25 × 30	3.03	0.35	0.099	1.45	LS-472M1H--A2530
	4,700	30 × 25	3.01	0.35	0.099	1.45	LS-472M1H--A3025
	5,600	22 × 40	3.21	0.35	0.083	1.50	LS-562M1H--A2240
	5,600	25 × 35	3.37	0.35	0.083	1.50	LS-562M1H--A2535
	5,600	30 × 25	3.17	0.35	0.083	1.50	LS-562M1H--A3025
	5,600	35 × 25	3.47	0.35	0.083	1.50	LS-562M1H--A3525
	6,800	22 × 45	3.73	0.35	0.068	1.50	LS-682M1H--A2245
	6,800	25 × 35	3.59	0.35	0.068	1.50	LS-682M1H--A2535
	6,800	30 × 30	3.56	0.35	0.068	1.50	LS-682M1H--A3030
	6,800	35 × 25	3.64	0.35	0.068	1.50	LS-682M1H--A3525
	8,200	25 × 40	4.10	0.35	0.057	1.50	LS-822M1H--A2540
	8,200	30 × 30	4.12	0.35	0.057	1.50	LS-822M1H--A3030
	8,200	35 × 25	4.07	0.35	0.057	1.50	LS-822M1H--A3525
	10,000	25 × 50	4.91	0.35	0.046	1.50	LS-103M1H--A2550
	10,000	30 × 35	4.68	0.35	0.046	1.50	LS-103M1H--A3035
	10,000	35 × 30	4.59	0.35	0.046	1.50	LS-103M1H--A3530
	12,000	30 × 40	5.10	0.35	0.039	1.50	LS-123M1H--A3040
	12,000	35 × 35	5.30	0.35	0.039	1.50	LS-123M1H--A3535
	15,000	30 × 50	6.28	0.35	0.031	1.50	LS-153M1H--A3050
	15,000	35 × 40	6.24	0.35	0.031	1.50	LS-153M1H--A3540
	18,000	35 × 45	7.18	0.35	0.026	1.50	LS-183M1H--A3545
63	1,800	22 × 25	1.90	0.30	0.221	1.01	LS-182M1J--A2225
	2,200	22 × 30	2.35	0.30	0.181	1.12	LS-222M1J--A2230
	2,200	25 × 25	2.30	0.30	0.181	1.12	LS-222M1J--A2525
	2,700	22 × 35	2.50	0.30	0.147	1.24	LS-272M1J--A2235
	2,700	25 × 25	2.34	0.30	0.147	1.24	LS-272M1J--A2525
	3,300	22 × 35	2.62	0.30	0.121	1.37	LS-332M1J--A2235
	3,300	25 × 30	2.69	0.30	0.121	1.37	LS-332M1J--A2530
	3,300	30 × 25	2.78	0.30	0.121	1.37	LS-332M1J--A3025
	3,900	22 × 40	2.90	0.30	0.102	1.49	LS-392M1J--A2240

Dimension and Permissible Ripple Current

Rated Voltage V_{DC}	Capacitance 120 Hz, 20℃ μF	ϕD×L mm	Ripple Current 120 Hz, 85℃ A/rms	Tan δ at 120 Hz, 20℃	ESR 120 Hz, 20℃ Ω	LC 5 minutes mA	Part Number
63	3,900	25 × 35	3.09	0.30	0.102	1.49	LS-392M1J--A2535
	3,900	30 × 30	3.09	0.30	0.102	1.49	LS-392M1J--A3030
	4,700	22 × 50	3.49	0.30	0.085	1.50	LS-472M1J--A2250
	4,700	25 × 40	3.37	0.30	0.085	1.50	LS-472M1J--A2540
	4,700	30 × 30	3.37	0.30	0.085	1.50	LS-472M1J--A3030
	4,700	35 × 25	3.36	0.30	0.085	1.50	LS-472M1J--A3525
	5,600	25 × 45	3.77	0.30	0.071	1.50	LS-562M1J--A2545
	5,600	30 × 35	3.75	0.30	0.071	1.50	LS-562M1J--A3035
	5,600	35 × 30	3.88	0.30	0.071	1.50	LS-562M1J--A3530
	6,800	25 × 50	4.41	0.30	0.059	1.50	LS-682M1J--A2550
	6,800	30 × 40	4.41	0.30	0.059	1.50	LS-682M1J--A3040
	6,800	35 × 30	4.04	0.30	0.059	1.50	LS-682M1J--A3530
	10,000	30 × 50	5.49	0.30	0.040	1.50	LS-103M1J--A3050
	10,000	35 × 40	5.47	0.30	0.040	1.50	LS-103M1J--A3540
	12,000	35 × 45	5.97	0.30	0.033	1.50	LS-123M1J--A3545
80	1,200	22 × 25	1.62	0.25	0.276	0.93	LS-122M1K--A2225
	1,500	22 × 25	1.81	0.25	0.221	1.04	LS-152M1K--A2225
	1,800	22 × 30	2.14	0.25	0.184	1.14	LS-182M1K--A2230
	1,800	25 × 25	2.14	0.25	0.184	1.14	LS-182M1K--A2525
	2,200	22 × 35	2.37	0.25	0.151	1.26	LS-222M1K--A2235
	2,200	25 × 30	2.39	0.25	0.151	1.26	LS-222M1K--A2530
	2,200	30 × 25	2.48	0.25	0.151	1.26	LS-222M1K--A3025
	2,700	22 × 40	2.78	0.25	0.123	1.39	LS-272M1K--A2240
	2,700	25 × 35	2.82	0.25	0.123	1.39	LS-272M1K--A2535
	2,700	30 × 25	2.74	0.25	0.123	1.39	LS-272M1K--A3025
	3,300	22 × 45	3.14	0.25	0.101	1.50	LS-332M1K--A2245
	3,300	25 × 40	3.20	0.25	0.101	1.50	LS-332M1K--A2540
	3,300	30 × 30	3.16	0.25	0.101	1.50	LS-332M1K--A3030
	3,300	35 × 25	3.24	0.25	0.101	1.50	LS-332M1K--A3525
	3,900	22 × 50	3.58	0.25	0.085	1.50	LS-392M1K--A2250
	3,900	25 × 45	3.67	0.25	0.085	1.50	LS-392M1K--A2545
	3,900	30 × 35	3.66	0.25	0.085	1.50	LS-392M1K--A3035
	3,900	35 × 25	3.52	0.25	0.085	1.50	LS-392M1K--A3525
	4,700	25 × 50	4.10	0.25	0.071	1.50	LS-472M1K--A2550
	4,700	30 × 40	4.13	0.25	0.071	1.50	LS-472M1K--A3040
	4,700	35 × 30	4.03	0.25	0.071	1.50	LS-472M1K--A3530
	5,600	30 × 45	4.61	0.25	0.059	1.50	LS-562M1K--A3045
	5,600	35 × 35	4.54	0.25	0.059	1.50	LS-562M1K--A3535
	6,800	30 × 50	5.18	0.25	0.049	1.50	LS-682M1K--A3050
	6,800	35 × 40	5.15	0.25	0.049	1.50	LS-682M1K--A3540
	8,200	35 × 45	5.80	0.25	0.040	1.50	LS-822M1K--A3545
	10,000	35 × 50	6.69	0.25	0.033	1.50	LS-103M1K--A3550
100	1,200	22 × 30	2.12	0.20	0.221	1.04	LS-122M2A--A2230
	1,200	25 × 25	2.10	0.20	0.221	1.04	LS-122M2A--A2525
	1,500	22 × 35	2.45	0.20	0.177	1.16	LS-152M2A--A2235
	1,500	25 × 30	2.43	0.20	0.177	1.16	LS-152M2A--A2530
	1,500	30 × 25	2.46	0.20	0.177	1.16	LS-152M2A--A3025
	1,800	22 × 40	2.77	0.20	0.147	1.27	LS-182M2A--A2240
	1,800	25 × 35	2.77	0.20	0.147	1.27	LS-182M2A--A2535
	1,800	30 × 25	2.65	0.20	0.147	1.27	LS-182M2A--A3025
	2,200	22 × 45	3.12	0.20	0.121	1.41	LS-222M2A--A2245
	2,200	25 × 40	3.20	0.20	0.121	1.41	LS-222M2A--A2540
	2,200	30 × 30	3.10	0.20	0.121	1.41	LS-222M2A--A3030
	2,200	35 × 25	3.14	0.20	0.121	1.41	LS-222M2A--A3525
	2,700	25 × 45	3.61	0.20	0.098	1.50	LS-272M2A--A2545
	2,700	30 × 35	3.60	0.20	0.098	1.50	LS-272M2A--A3035
	2,700	35 × 30	3.71	0.20	0.098	1.50	LS-272M2A--A3530
	3,300	25 × 50	4.06	0.20	0.080	1.50	LS-332M2A--A2550
	3,300	30 × 40	4.05	0.20	0.080	1.50	LS-332M2A--A3040
	3,300	35 × 35	4.07	0.20	0.080	1.50	LS-332M2A--A3535
	3,900	30 × 45	4.60	0.20	0.068	1.50	LS-392M2A--A3045
	3,900	35 × 35	4.50	0.20	0.068	1.50	LS-392M2A--A3535
	4,700	30 × 50	5.13	0.20	0.056	1.50	LS-472M2A--A3050
	4,700	35 × 40	5.12	0.20	0.056	1.50	LS-472M2A--A3540
	5,600	35 × 45	5.75	0.20	0.047	1.50	LS-562M2A--A3545

Dimension and Permissible Ripple Current

Rated Voltage V_{DC}	Capacitance 120 Hz, 20℃ μF	ϕD×L mm	Ripple Current 120 Hz, 85℃ A/rms	Tan δ at 120 Hz, 20℃	ESR 120 Hz, 20℃ Ω	LC 5 minutes mA	Part Number
100	6,800	35 × 50	6.01	0.20	0.039	1.50	LS-682M2A--A3550
160	270	20 × 25	1.12	0.15	0.737	0.62	LS-271M2C--A2025
	270	22 × 25	1.27	0.15	0.737	0.62	LS-271M2C--A2225
	330	20 × 30	1.28	0.15	0.603	0.69	LS-331M2C--A2030
	330	22 × 25	1.40	0.15	0.603	0.69	LS-331M2C--A2225
	390	22 × 30	1.62	0.15	0.510	0.75	LS-391M2C--A2230
	470	22 × 30	1.77	0.15	0.423	0.82	LS-471M2C--A2230
	470	25 × 25	1.77	0.15	0.423	0.82	LS-471M2C--A2525
	560	22 × 30	1.92	0.15	0.355	0.90	LS-561M2C--A2230
	560	22 × 35	2.05	0.15	0.355	0.90	LS-561M2C--A2235
	560	25 × 25	1.92	0.15	0.355	0.90	LS-561M2C--A2525
	560	30 × 25	2.02	0.15	0.355	0.90	LS-561M2C--A3025
	680	22 × 35	2.12	0.15	0.293	0.99	LS-681M2C--A2235
	680	25 × 30	2.22	0.15	0.293	0.99	LS-681M2C--A2530
	680	30 × 25	2.22	0.15	0.293	0.99	LS-681M2C--A3025
	820	22 × 40	2.32	0.15	0.243	1.09	LS-821M2C--A2240
	820	25 × 30	2.32	0.15	0.243	1.09	LS-821M2C--A2530
	820	30 × 25	2.31	0.15	0.243	1.09	LS-821M2C--A3025
	820	35 × 25	2.50	0.15	0.243	1.09	LS-821M2C--A3525
	1,000	22 × 50	2.88	0.15	0.199	1.20	LS-102M2C--A2250
	1,000	25 × 40	2.86	0.15	0.199	1.20	LS-102M2C--A2540
	1,000	30 × 30	2.82	0.15	0.199	1.20	LS-102M2C--A3030
	1,000	35 × 25	2.79	0.15	0.199	1.20	LS-102M2C--A3525
	1,200	25 × 45	3.27	0.15	0.166	1.31	LS-122M2C--A2545
	1,200	30 × 35	3.25	0.15	0.166	1.31	LS-122M2C--A3035
	1,200	35 × 30	3.24	0.15	0.166	1.31	LS-122M2C--A3530
	1,500	30 × 40	3.77	0.15	0.133	1.47	LS-152M2C--A3040
	1,500	35 × 35	3.75	0.15	0.133	1.47	LS-152M2C--A3535
	1,800	30 × 45	4.10	0.15	0.111	1.50	LS-182M2C--A3045
	1,800	35 × 35	4.08	0.15	0.111	1.50	LS-182M2C--A3535
	2,200	35 × 45	4.72	0.15	0.090	1.50	LS-222M2C--A3545
	2,700	35 × 55	5.53	0.15	0.074	1.50	LS-272M2C--A3555
	3,300	35 × 70	6.80	0.15	0.060	1.50	LS-332M2C--A3570
	3,300	40 × 50	6.34	0.15	0.060	1.50	LS-332M2C--A4050
	3,900	35 × 80	7.84	0.15	0.051	1.50	LS-392M2C--A3580
	3,900	40 × 60	7.45	0.15	0.051	1.50	LS-392M2C--A4060
	4,700	35 × 90	8.62	0.15	0.042	1.50	LS-472M2C--A3590
	4,700	40 × 80	8.79	0.15	0.042	1.50	LS-472M2C--A4080
200	220	22 × 25	1.15	0.15	0.905	0.63	LS-221M2D--A2225
	270	22 × 25	1.30	0.15	0.737	0.70	LS-271M2D--A2225
	330	22 × 25	1.40	0.15	0.603	0.77	LS-331M2D--A2225
	330	25 × 25	1.43	0.15	0.603	0.77	LS-331M2D--A2525
	390	22 × 25	1.42	0.15	0.510	0.84	LS-391M2D--A2225
	390	25 × 25	1.63	0.15	0.510	0.84	LS-391M2D--A2525
	470	22 × 30	1.68	0.15	0.423	0.92	LS-471M2D--A2230
	470	25 × 25	1.68	0.15	0.423	0.92	LS-471M2D--A2525
	470	30 × 25	1.85	0.15	0.423	0.92	LS-471M2D--A3025
	560	22 × 35	1.97	0.15	0.355	1.00	LS-561M2D--A2235
	560	25 × 30	2.05	0.15	0.355	1.00	LS-561M2D--A2530
	560	30 × 25	2.05	0.15	0.355	1.00	LS-561M2D--A3025
	680	22 × 40	2.24	0.15	0.293	1.11	LS-681M2D--A2240
	680	25 × 30	2.13	0.15	0.293	1.11	LS-681M2D--A2530
	680	30 × 25	2.21	0.15	0.293	1.11	LS-681M2D--A3025
	680	35 × 25	2.43	0.15	0.293	1.11	LS-681M2D--A3525
	820	22 × 45	2.32	0.15	0.243	1.21	LS-821M2D--A2245
	820	25 × 35	2.23	0.15	0.243	1.21	LS-821M2D--A2535
	820	30 × 30	2.62	0.15	0.243	1.21	LS-821M2D--A3030
	820	35 × 25	2.68	0.15	0.243	1.21	LS-821M2D--A3525
	1,000	22 × 50	2.57	0.15	0.199	1.34	LS-102M2D--A2250
	1,000	25 × 40	2.50	0.15	0.199	1.34	LS-102M2D--A2540
	1,000	30 × 30	2.47	0.15	0.199	1.34	LS-102M2D--A3030
	1,000	35 × 25	2.53	0.15	0.199	1.34	LS-102M2D--A3525
	1,200	25 × 45	2.89	0.15	0.166	1.47	LS-122M2D--A2545
	1,200	30 × 35	2.88	0.15	0.166	1.47	LS-122M2D--A3035
	1,200	35 × 30	2.97	0.15	0.166	1.47	LS-122M2D--A3530

Dimension and Permissible Ripple Current

Rated Voltage V_{DC}	Capacitance 120 Hz, 20℃ μF	ϕD×L mm	Ripple Current 120 Hz, 85℃ A/rms	Tan δ at 120 Hz, 20℃	ESR 120 Hz, 20℃ Ω	LC 5 minutes mA	Part Number
200	1,500	25 × 55	3.41	0.15	0.133	1.50	LS-152M2D--A2555
	1,500	30 × 45	3.46	0.15	0.133	1.50	LS-152M2D--A3045
	1,500	35 × 35	3.42	0.15	0.133	1.50	LS-152M2D--A3535
	1,800	30 × 50	3.97	0.15	0.111	1.50	LS-182M2D--A3050
	1,800	35 × 40	3.95	0.15	0.111	1.50	LS-182M2D--A3540
	2,200	30 × 60	4.51	0.15	0.090	1.50	LS-222M2D--A3060
	2,200	35 × 45	4.35	0.15	0.090	1.50	LS-222M2D--A3545
	2,200	40 × 40	4.48	0.15	0.090	1.50	LS-222M2D--A4040
	2,700	35 × 55	4.79	0.15	0.074	1.50	LS-272M2D--A3555
	2,700	40 × 50	5.00	0.15	0.074	1.50	LS-272M2D--A4050
	3,300	35 × 65	5.69	0.15	0.060	1.50	LS-332M2D--A3565
	3,300	40 × 60	5.90	0.15	0.060	1.50	LS-332M2D--A4060
	3,900	35 × 80	6.30	0.15	0.051	1.50	LS-392M2D--A3580
	3,900	40 × 60	5.97	0.15	0.051	1.50	LS-392M2D--A4060
	4,700	35 × 90	7.10	0.15	0.042	1.50	LS-472M2D--A3590
	4,700	40 × 70	6.77	0.15	0.042	1.50	LS-472M2D--A4070
	5,600	35 × 100	7.36	0.15	0.036	1.50	LS-562M2D--A35A0
	6,800	40 × 100	8.65	0.15	0.029	1.50	LS-682M2D--A40A0
250	180	22 × 25	1.01	0.15	1.106	0.64	LS-181M2E--A2225
	220	22 × 25	1.18	0.15	0.905	0.70	LS-221M2E--A2225
	220	25 × 25	1.24	0.15	0.905	0.70	LS-221M2E--A2525
	270	22 × 25	1.21	0.15	0.737	0.78	LS-271M2E--A2225
	270	25 × 25	1.49	0.15	0.737	0.78	LS-271M2E--A2525
	330	22 × 30	1.58	0.15	0.603	0.86	LS-331M2E--A2230
	330	25 × 25	1.53	0.15	0.603	0.86	LS-331M2E--A2525
	330	30 × 25	1.59	0.15	0.603	0.86	LS-331M2E--A3025
	390	22 × 30	1.57	0.15	0.510	0.94	LS-391M2E--A2230
	390	25 × 25	1.57	0.15	0.510	0.94	LS-391M2E--A2525
	390	30 × 25	1.77	0.15	0.510	0.94	LS-391M2E--A3025
	470	22 × 35	1.72	0.15	0.423	1.03	LS-471M2E--A2235
	470	25 × 30	1.73	0.15	0.423	1.03	LS-471M2E--A2530
	470	30 × 25	1.80	0.15	0.423	1.03	LS-471M2E--A3025
	560	22 × 45	2.12	0.15	0.355	1.12	LS-561M2E--A2245
	560	25 × 35	2.04	0.15	0.355	1.12	LS-561M2E--A2535
	560	30 × 25	2.01	0.15	0.355	1.12	LS-561M2E--A3025
	560	35 × 25	2.21	0.15	0.355	1.12	LS-561M2E--A3525
	680	22 × 50	2.48	0.15	0.293	1.24	LS-681M2E--A2250
	680	25 × 45	2.54	0.15	0.293	1.24	LS-681M2E--A2545
	680	30 × 30	2.38	0.15	0.293	1.24	LS-681M2E--A3030
	680	35 × 30	2.54	0.15	0.293	1.24	LS-681M2E--A3530
	820	25 × 50	2.92	0.15	0.243	1.36	LS-821M2E--A2550
	820	30 × 35	2.78	0.15	0.243	1.36	LS-821M2E--A3035
	820	35 × 30	2.87	0.15	0.243	1.36	LS-821M2E--A3530
	1,000	25 × 55	3.06	0.15	0.199	1.50	LS-102M2E--A2555
	1,000	30 × 45	3.11	0.15	0.199	1.50	LS-102M2E--A3045
	1,000	35 × 35	3.06	0.15	0.199	1.50	LS-102M2E--A3535
	1,200	25 × 60	3.33	0.15	0.166	1.50	LS-122M2E--A2560
	1,200	30 × 50	3.39	0.15	0.166	1.50	LS-122M2E--A3050
	1,200	35 × 35	3.20	0.15	0.166	1.50	LS-122M2E--A3535
	1,500	30 × 60	4.06	0.15	0.133	1.50	LS-152M2E--A3060
	1,500	35 × 45	3.92	0.15	0.133	1.50	LS-152M2E--A3545
	1,500	40 × 40	4.04	0.15	0.133	1.50	LS-152M2E--A4040
	1,800	30 × 65	4.27	0.15	0.111	1.50	LS-182M2E--A3065
	1,800	35 × 50	4.15	0.15	0.111	1.50	LS-182M2E--A3550
	1,800	40 × 50	4.50	0.15	0.111	1.50	LS-182M2E--A4050
	2,200	35 × 60	4.92	0.15	0.090	1.50	LS-222M2E--A3560
	2,200	40 × 60	5.30	0.15	0.090	1.50	LS-222M2E--A4060
	2,700	35 × 90	5.40	0.15	0.074	1.50	LS-272M2E--A3590
	2,700	40 × 80	6.30	0.15	0.074	1.50	LS-272M2E--A4080
	3,300	35 × 90	6.10	0.15	0.060	1.50	LS-332M2E--A3590
	3,300	40 × 80	7.00	0.15	0.060	1.50	LS-332M2E--A4080
	3,900	35 × 100	7.47	0.15	0.051	1.50	LS-392M2E--A35A0
	4,700	40 × 100	8.88	0.15	0.042	1.50	LS-472M2E--A40A0

Dimension and Permissible Ripple Current

Rated Voltage V_{DC}	Capacitance 120 Hz, 20℃ μF	ϕD×L mm	Ripple Current 120 Hz, 85℃ A/rms	Tan δ at 120 Hz, 20℃	ESR 120 Hz, 20℃ Ω	LC 5 minutes mA	Part Number
350	82	20 × 20	0.58	0.15	2.427	0.51	LS-820M2V--A2020
	82	22 × 25	0.70	0.15	2.427	0.51	LS-820M2V--A2225
	100	20 × 25	0.70	0.15	1.990	0.56	LS-101M2V--A2025
	100	22 × 25	0.77	0.15	1.990	0.56	LS-101M2V--A2225
	100	25 × 20	0.73	0.15	1.990	0.56	LS-101M2V--A2520
	120	20 × 30	0.95	0.15	1.659	0.61	LS-121M2V--A2030
	120	22 × 25	0.99	0.15	1.659	0.61	LS-121M2V--A2225
	120	25 × 20	0.80	0.15	1.659	0.61	LS-121M2V--A2520
	150	20 × 35	1.05	0.15	1.327	0.69	LS-151M2V--A2035
	150	25 × 25	1.16	0.15	1.327	0.69	LS-151M2V--A2525
	150	30 × 25	1.24	0.15	1.327	0.69	LS-151M2V--A3025
	180	20 × 35	1.08	0.15	1.106	0.75	LS-181M2V--A2035
	180	22 × 35	1.28	0.15	1.106	0.75	LS-181M2V--A2235
	180	25 × 30	1.30	0.15	1.106	0.75	LS-181M2V--A2530
	180	30 × 25	1.37	0.15	1.106	0.75	LS-181M2V--A3025
	220	20 × 45	1.36	0.15	0.905	0.83	LS-221M2V--A2045
	220	22 × 40	1.40	0.15	0.905	0.83	LS-221M2V--A2240
	220	25 × 30	1.28	0.15	0.905	0.83	LS-221M2V--A2530
	220	30 × 25	1.47	0.15	0.905	0.83	LS-221M2V--A3025
	270	22 × 45	1.62	0.15	0.737	0.92	LS-271M2V--A2245
	270	25 × 35	1.65	0.15	0.737	0.92	LS-271M2V--A2535
	270	30 × 30	1.71	0.15	0.737	0.92	LS-271M2V--A3030
	270	35 × 25	1.72	0.15	0.737	0.92	LS-271M2V--A3525
	330	22 × 50	1.89	0.15	0.603	1.02	LS-331M2V--A2250
	330	25 × 40	1.84	0.15	0.603	1.02	LS-331M2V--A2540
	330	30 × 30	1.74	0.15	0.603	1.02	LS-331M2V--A3030
	330	35 × 25	1.77	0.15	0.603	1.02	LS-331M2V--A3525
	390	25 × 45	2.04	0.15	0.510	1.11	LS-391M2V--A2545
	390	30 × 35	2.12	0.15	0.510	1.11	LS-391M2V--A3035
	390	35 × 30	2.19	0.15	0.510	1.11	LS-391M2V--A3530
	470	30 × 40	2.41	0.15	0.423	1.22	LS-471M2V--A3040
	470	35 × 30	2.25	0.15	0.423	1.22	LS-471M2V--A3530
	560	30 × 45	2.60	0.15	0.355	1.33	LS-561M2V--A3045
	560	35 × 35	2.62	0.15	0.355	1.33	LS-561M2V--A3535
	680	35 × 40	2.80	0.15	0.293	1.46	LS-681M2V--A3540
	820	35 × 45	3.35	0.15	0.243	1.50	LS-821M2V--A3545
400	68	20 × 25	0.66	0.15	2.927	0.49	LS-680M2G--A2025
	68	22 × 25	0.72	0.15	2.927	0.49	LS-680M2G--A2225
	82	20 × 25	0.72	0.15	2.427	0.54	LS-820M2G--A2025
	82	22 × 25	0.80	0.15	2.427	0.54	LS-820M2G--A2225
	100	20 × 25	0.75	0.15	1.990	0.60	LS-101M2G--A2025
	100	22 × 25	0.81	0.15	1.990	0.60	LS-101M2G--A2225
	100	25 × 20	0.79	0.15	1.990	0.60	LS-101M2G--A2520
	120	22 × 30	1.04	0.15	1.659	0.66	LS-121M2G--A2230
	120	25 × 25	1.06	0.15	1.659	0.66	LS-121M2G--A2525
	150	20 × 35	1.00	0.15	1.327	0.66	LS-151M2G--A2035
	150	22 × 30	1.06	0.15	1.327	0.73	LS-151M2G--A2230
	150	25 × 25	1.06	0.15	1.327	0.73	LS-151M2G--A2525
	150	30 × 25	1.24	0.15	1.327	0.73	LS-151M2G--A3025
	180	20 × 40	1.17	0.15	1.106	0.80	LS-181M2G--A2040
	180	22 × 35	1.16	0.15	1.106	0.80	LS-181M2G--A2235
	180	25 × 30	1.23	0.15	1.106	0.80	LS-181M2G--A2530
	180	30 × 25	1.45	0.15	1.106	0.80	LS-181M2G--A3025
	180	35 × 25	1.54	0.15	1.106	0.80	LS-181M2G--A3525
	220	20 × 45	1.39	0.15	0.905	0.89	LS-221M2G--A2045
	220	22 × 40	1.39	0.15	0.905	0.89	LS-221M2G--A2240
	220	25 × 30	1.33	0.15	0.905	0.89	LS-221M2G--A2530
	220	30 × 25	1.38	0.15	0.905	0.89	LS-221M2G--A3025
	220	35 × 25	1.44	0.15	0.905	0.89	LS-221M2G--A3525
	270	22 × 45	1.54	0.15	0.737	0.99	LS-271M2G--A2245
	270	25 × 35	1.48	0.15	0.737	0.99	LS-271M2G--A2535
	270	30 × 30	1.56	0.15	0.737	0.99	LS-271M2G--A3030
	270	35 × 25	1.53	0.15	0.737	0.99	LS-271M2G--A3525
	330	22 × 50	1.70	0.15	0.603	1.09	LS-331M2G--A2250
	330	25 × 45	1.76	0.15	0.603	1.09	LS-331M2G--A2545
	330	30 × 35	1.76	0.15	0.603	1.09	LS-331M2G--A3035

Dimension and Permissible Ripple Current

Rated Voltage V_{DC}	Capacitance 120 Hz, 20℃ μF	ϕD×L mm	Ripple Current 120 Hz, 85℃ A/rms	Tan δ at 120 Hz, 20℃	ESR 120 Hz, 20℃ Ω	LC 5 minutes mA	Part Number
400	330	35 × 25	1.68	0.15	0.603	1.09	LS-331M2G--A3525
	390	25 × 45	1.86	0.15	0.510	1.18	LS-391M2G--A2545
	390	30 × 35	1.89	0.15	0.510	1.18	LS-391M2G--A3035
	390	35 × 30	1.97	0.15	0.510	1.18	LS-391M2G--A3530
	470	25 × 55	2.26	0.15	0.423	1.30	LS-471M2G--A2555
	470	30 × 40	2.18	0.15	0.423	1.30	LS-471M2G--A3040
	470	35 × 30	2.12	0.15	0.423	1.30	LS-471M2G--A3530
	470	40 × 25	2.16	0.15	0.423	1.30	LS-471M2G--A4025
	560	30 × 45	2.37	0.15	0.355	1.42	LS-561M2G--A3045
	560	35 × 35	2.34	0.15	0.355	1.42	LS-561M2G--A3535
	680	30 × 55	2.85	0.15	0.293	1.50	LS-681M2G--A3055
	680	35 × 40	2.72	0.15	0.293	1.50	LS-681M2G--A3540
	680	40 × 35	2.79	0.15	0.293	1.50	LS-681M2G--A4035
	820	30 × 60	3.25	0.15	0.243	1.50	LS-821M2G--A3060
	820	35 × 50	3.28	0.15	0.243	1.50	LS-821M2G--A3550
	820	40 × 40	3.23	0.15	0.243	1.50	LS-821M2G--A4040
	1,000	35 × 55	3.77	0.15	0.199	1.50	LS-102M2G--A3555
	1,000	40 × 45	3.75	0.15	0.199	1.50	LS-102M2G--A4045
	1,200	35 × 65	4.50	0.15	0.166	1.50	LS-122M2G--A3565
	1,200	40 × 60	4.68	0.15	0.166	1.50	LS-122M2G--A4060
	1,500	35 × 80	5.51	0.15	0.133	1.50	LS-152M2G--A3580
	1,500	40 × 70	5.60	0.15	0.133	1.50	LS-152M2G--A4070
	1,800	40 × 80	6.50	0.15	0.111	1.50	LS-182M2G--A4080
420	220	22 × 45	1.38	0.15	0.905	0.91	LS-221M2P--A2245
	220	25 × 35	1.33	0.15	0.905	0.91	LS-221M2P--A2535
	330	25 × 50	1.90	0.15	0.603	1.12	LS-331M2P--A2550
	330	30 × 40	1.99	0.15	0.603	1.12	LS-331M2P--A3040
	470	35 × 35	2.37	0.15	0.423	1.33	LS-471M2P--A3535
	560	30 × 50	2.73	0.15	0.355	1.45	LS-561M2P--A3050
	560	35 × 40	2.73	0.15	0.355	1.45	LS-561M2P--A3540
	680	35 × 45	3.16	0.15	0.293	1.50	LS-681M2P--A3545
	680	40 × 50	3.70	0.15	0.293	1.50	LS-681M2P--A4050
	820	35 × 55	3.69	0.15	0.243	1.50	LS-821M2P--A3555
	820	40 × 45	3.66	0.15	0.243	1.50	LS-821M2P--A4045
	1,000	35 × 65	4.48	0.15	0.199	1.50	LS-102M2P--A3565
	1,000	40 × 50	4.27	0.15	0.199	1.50	LS-102M2P--A4050
	1,200	35 × 70	4.90	0.15	0.166	1.50	LS-122M2P--A3570
	1,200	40 × 55	4.76	0.15	0.166	1.50	LS-122M2P--A4055
	1,500	40 × 70	5.90	0.15	0.133	1.50	LS-152M2P--A4070
	1,800	40 × 80	6.86	0.15	0.111	1.50	LS-182M2P--A4080
450	56	20 × 25	0.57	0.15	3.554	0.48	LS-560M2W--A2025
	56	22 × 25	0.68	0.15	3.554	0.48	LS-560M2W--A2225
	68	20 × 25	0.62	0.15	2.927	0.52	LS-680M2W--A2025
	68	22 × 20	0.58	0.15	2.927	0.52	LS-680M2W--A2220
	82	20 × 30	0.74	0.15	2.427	0.58	LS-820M2W--A2030
	82	22 × 25	0.69	0.15	2.427	0.58	LS-820M2W--A2225
	82	25 × 25	0.75	0.15	2.427	0.58	LS-820M2W--A2525
	100	20 × 30	0.78	0.15	1.990	0.64	LS-101M2W--A2030
	100	22 × 25	0.77	0.15	1.990	0.64	LS-101M2W--A2225
	100	25 × 25	0.83	0.15	1.990	0.64	LS-101M2W--A2525
	120	20 × 35	0.92	0.15	1.659	0.70	LS-121M2W--A2035
	120	22 × 35	0.97	0.15	1.659	0.70	LS-121M2W--A2235
	120	25 × 25	0.91	0.15	1.659	0.70	LS-121M2W--A2525
	120	30 × 25	1.10	0.15	1.659	0.70	LS-121M2W--A3025
	150	20 × 40	1.06	0.15	1.327	0.78	LS-151M2W--A2040
	150	22 × 35	1.20	0.15	1.327	0.78	LS-151M2W--A2235
	150	25 × 30	1.16	0.15	1.327	0.78	LS-151M2W--A2530
	150	30 × 25	1.16	0.15	1.327	0.78	LS-151M2W--A3025
	180	20 × 45	1.21	0.15	1.106	0.85	LS-181M2W--A2045
	180	22 × 40	1.21	0.15	1.106	0.85	LS-181M2W--A2240
	180	25 × 35	1.31	0.15	1.106	0.85	LS-181M2W--A2535
	180	30 × 25	1.19	0.15	1.106	0.85	LS-181M2W--A3025
	180	35 × 25	1.35	0.15	1.106	0.85	LS-181M2W--A3525
	220	22 × 50	1.48	0.15	0.905	0.94	LS-221M2W--A2250
	220	25 × 40	1.47	0.15	0.905	0.94	LS-221M2W--A2540

Dimension and Permissible Ripple Current

Rated Voltage V_{DC}	Capacitance 120 Hz, 20℃ μF	φD×L mm	Ripple Current 120 Hz, 85℃ A/rms	Tan δ at 120 Hz, 20℃	ESR 120 Hz, 20℃ Ω	LC 5 minutes mA	Part Number
450	220	30 × 30	1.42	0.15	0.905	0.94	LS-221M2W--A3030
	220	35 × 25	1.45	0.15	0.905	0.94	LS-221M2W--A3525
	270	22 × 55	1.71	0.15	0.737	1.05	LS-271M2W--A2255
	270	25 × 45	1.59	0.15	0.737	1.05	LS-271M2W--A2545
	270	30 × 35	1.65	0.15	0.737	1.05	LS-271M2W--A3035
	270	35 × 25	1.61	0.15	0.737	1.05	LS-271M2W--A3525
	330	25 × 50	1.76	0.15	0.603	1.16	LS-331M2W--A2550
	330	30 × 40	1.93	0.15	0.603	1.16	LS-331M2W--A3040
	330	35 × 30	1.88	0.15	0.603	1.16	LS-331M2W--A3530
	390	25 × 55	2.08	0.15	0.510	1.26	LS-391M2W--A2555
	390	30 × 40	2.00	0.15	0.510	1.26	LS-391M2W--A3040
	390	35 × 30	1.95	0.15	0.510	1.26	LS-391M2W--A3530
	470	30 × 45	2.35	0.15	0.423	1.38	LS-471M2W--A3045
	470	35 × 40	2.45	0.15	0.423	1.38	LS-471M2W--A3540
	560	30 × 55	2.76	0.15	0.355	1.50	LS-561M2W--A3055
	560	35 × 40	2.63	0.15	0.355	1.50	LS-561M2W--A3540
	680	35 × 50	2.91	0.15	0.293	1.50	LS-681M2W--A3550
	680	40 × 40	2.98	0.15	0.293	1.50	LS-681M2W--A4040
	820	35 × 55	3.86	0.15	0.243	1.50	LS-821M2W--A3555
	820	40 × 50	4.00	0.15	0.243	1.50	LS-821M2W--A4050
	1,000	35 × 70	4.74	0.15	0.199	1.50	LS-102M2W--A3570
	1,000	40 × 55	4.60	0.15	0.199	1.50	LS-102M2W--A4055
	1,200	35 × 80	5.51	0.15	0.166	1.50	LS-122M2W--A3580
	1,200	40 × 65	5.42	0.15	0.166	1.50	LS-122M2W--A4065
	1,500	35 × 100	5.99	0.15	0.133	1.50	LS-152M2W--A35A0
	2,200	45 × 90	8.48	0.15	0.090	1.50	LS-222M2W--A4590
500	56	20 × 25	0.54	0.15	3.554	0.50	LS-560M2H--A2025
	56	22 × 25	0.57	0.15	3.554	0.50	LS-560M2H--A2225
	68	20 × 30	0.65	0.15	2.927	0.55	LS-680M2H--A2030
	68	22 × 25	0.63	0.15	2.927	0.55	LS-680M2H--A2225
	68	25 × 20	0.62	0.15	2.927	0.55	LS-680M2H--A2520
	82	20 × 30	0.71	0.15	2.427	0.61	LS-820M2H--A2030
	82	22 × 30	0.75	0.15	2.427	0.61	LS-820M2H--A2230
	82	25 × 25	0.75	0.15	2.427	0.61	LS-820M2H--A2525
	100	22 × 35	0.85	0.15	1.990	0.67	LS-101M2H--A2235
	100	25 × 30	0.86	0.15	1.990	0.67	LS-101M2H--A2530
	100	30 × 20	0.82	0.15	1.990	0.67	LS-101M2H--A3020
	120	22 × 40	0.98	0.15	1.659	0.73	LS-121M2H--A2240
	120	25 × 30	0.94	0.15	1.659	0.73	LS-121M2H--A2530
	120	30 × 30	1.04	0.15	1.659	0.73	LS-121M2H--A3030
	120	35 × 25	1.07	0.15	1.659	0.73	LS-121M2H--A3525
	150	22 × 45	1.16	0.15	1.327	0.73	LS-151M2H--A2245
	150	25 × 35	1.12	0.15	1.327	0.82	LS-151M2H--A2535
	150	30 × 30	1.17	0.15	1.327	0.82	LS-151M2H--A3030
	150	35 × 25	1.20	0.15	1.327	0.82	LS-151M2H--A3525
	180	22 × 50	1.33	0.15	1.106	0.90	LS-181M2H--A2250
	180	25 × 40	1.30	0.15	1.106	0.90	LS-181M2H--A2540
	180	30 × 30	1.28	0.15	1.106	0.90	LS-181M2H--A3030
	180	35 × 20	1.21	0.15	1.106	0.90	LS-181M2H--A3520
	220	30 × 35	1.51	0.15	0.905	0.99	LS-221M2H--A3035
	220	35 × 30	1.55	0.15	0.905	0.99	LS-221M2H--A3530
	270	30 × 40	1.77	0.15	0.737	1.10	LS-271M2H--A3040
	270	35 × 35	1.83	0.15	0.737	1.10	LS-271M2H--A3530
	330	30 × 50	2.15	0.15	0.603	1.22	LS-331M2H--A3050
	330	35 × 35	2.03	0.15	0.603	1.22	LS-331M2H--A3535
	390	35 × 45	2.44	0.15	0.510	1.32	LS-391M2H--A3545
	470	35 × 50	2.80	0.15	0.423	1.45	LS-471M2H--A3550
	560	35 × 60	3.37	0.15	0.355	1.50	LS-561M2H--A3560
	560	40 × 50	3.31	0.15	0.355	1.50	LS-561M2H--A4050
	680	35 × 70	3.91	0.15	0.293	1.50	LS-681M2H--A3570
	680	40 × 55	3.79	0.15	0.293	1.50	LS-681M2H--A4055
	820	35 × 80	4.56	0.15	0.243	1.50	LS-821M2H--A3580
	820	40 × 60	4.33	0.15	0.243	1.50	LS-821M2H--A4060
	1,000	35 × 90	5.31	0.15	0.199	1.50	LS-102M2H--A3590
	1,000	40 × 80	5.42	0.15	0.199	1.50	LS-102M2H--A4080
	1,500	40 × 100	6.56	0.15	0.133	1.50	LS-152M2H--A40A0

Part Numbering System

LS Series	100μF	±20%	400V		4.0±0.5mm	22ϕ×30L	Pb-free Terminal + PET Sleeve
LS-	**101**	**M**	**2G**	**- -**	**A**	**2230**	
Series Name	Capacitance	Capacitance tolerance	Rated voltage	Terminal type	Terminal length	Case size	Terminal and Sleeve Type

Example:

Cap.	Symbol
56	560
220	221
470	471

M = ±20%
K = ±10%

Example:

Voltage	Symbol
400	2G
450	2W

Example:

Type	Symbol
2 pins	- -
5 pins	L5

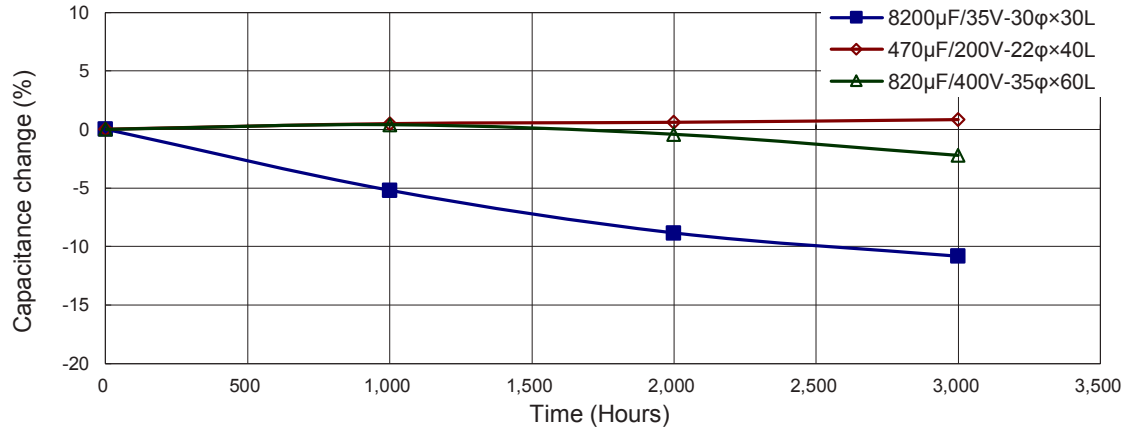
"-":
6.3±1.0 mm

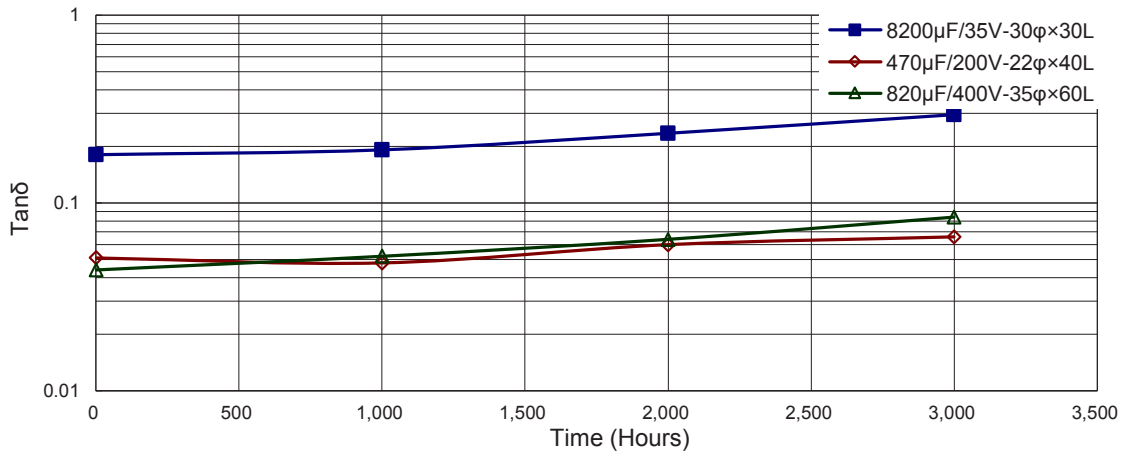
Example:

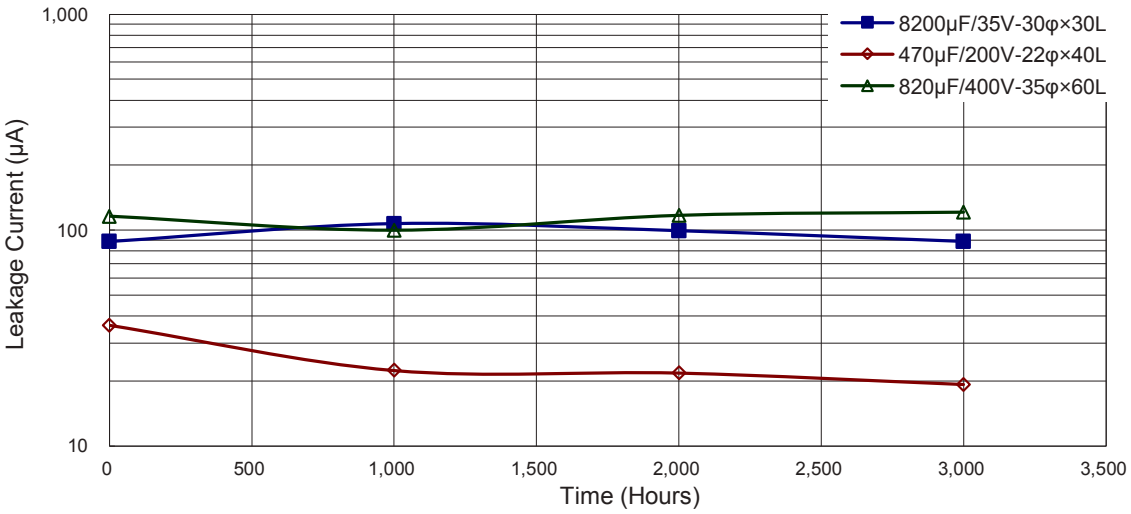
ϕD×L	Code
22×30	2230
25×25	2525
30×40	3040

Note: For more details, please refer to "Part Numbering System (Snap-in Type)" on page 16.

Typical Endurance Curves

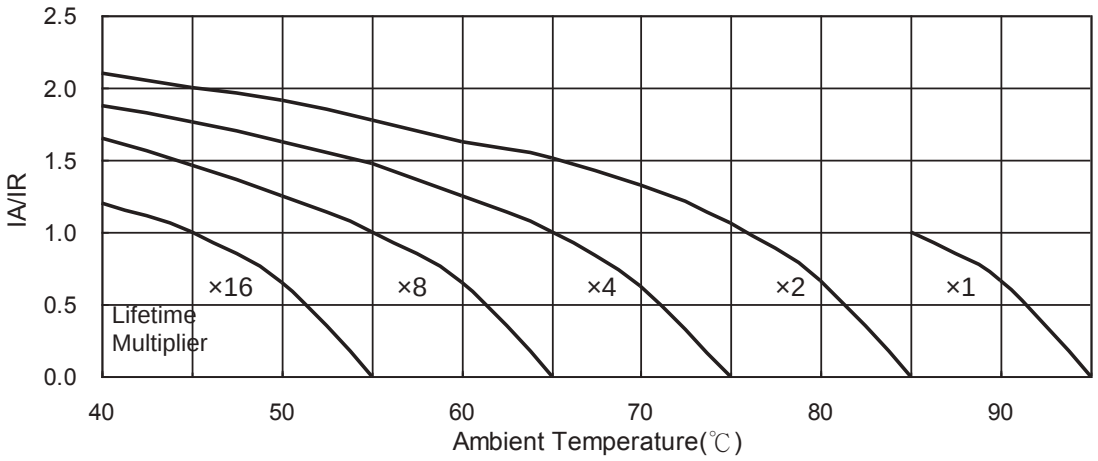




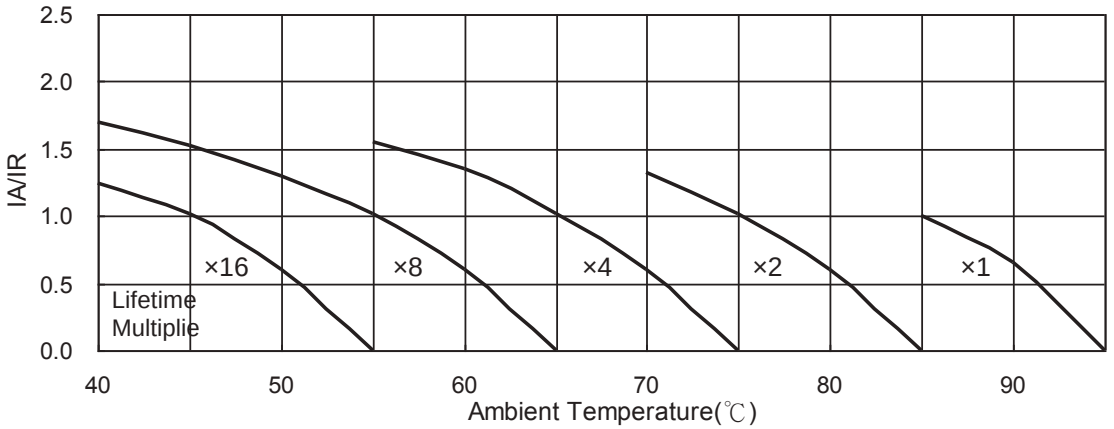


Useful Life Chart

Rated Voltage ≦ 100V



Rated Voltage ≧ 160V



LS2 Series

Features

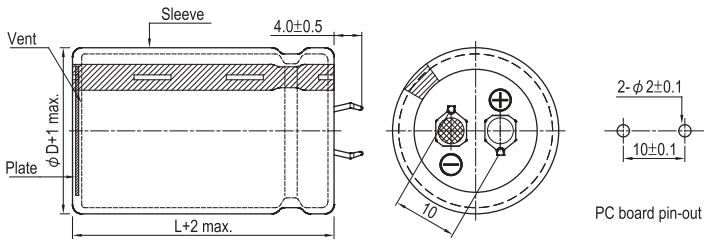
- Snap-in terminal type
- 85℃, 2,000 hours assured
- Good safe characteristics which shall be failed with open mode without sparking and catching fire, when it is applied excess voltage
- RoHS compliance

Specifications

Items	Performance				
Category Temperature Range	200 ~ 400V			450V	
	-40℃ ~ +85℃			-25℃ ~ +85℃	
Capacitance Tolerance	±20% (at 120 Hz, 20℃)				
Leakage Current (at 20℃)	$I = 3\sqrt{CV}$ or 1.5 mA whichever is smaller (after 5 minutes) Where, C = rated capacitance in μF, V = rated DC Rated Voltage in V				
Tanδ (at 120 Hz, 20℃)	Rated Voltage: 200 / 250 / 400 / 450 Tanδ (max): 0.15 / 0.15 / 0.20 / 0.20				
Low Temperature Characteristics (at 120 Hz)	Impedance ratio shall not exceed the values given in the table below.				
	Rated Voltage		200	250	400 / 450
	Impedance Ratio	Z(-25℃)/Z(+20℃)	4	4	8 / 8
		Z(-40℃)/Z(+20℃)	8	10	18 / -
Endurance	Test Time: 2,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 200% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied with rated ripple current for 2,000 hours at 85℃.				
Shelf Life Test	Test Time: 1,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 150% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 85 ℃ without voltage applied. The rated voltage shall be applied to the capacitors before the measurements (Refer to JIS C 5101-4 4.1).				
Ripple Current and Frequency Multipliers	Frequency (Hz): 50 / 60 / 100 / 120 / 300 / 1k / 10k up Multiplier: 0.8 / 1.0 / 1.1 / 1.3 / 1.4				
Safety Function Test Conditions	1. DC reverse voltage test: The capacitor is shall be connected in reverse polarity, and applied under specified Rated Voltage. 2. DC over voltage test: The voltage of 1.2 times shall be applied to the capacitor.				
Failure percentage Failure rate	When the failure percentage / failure rate is required, please contact with us for further discussion.				

Diagram of Dimensions

Unit: mm



Dimension and Permissible Ripple Current

Rated Voltage V_{DC}	Capacitance 120 Hz, 20℃ μF	ϕD×L mm	Ripple Current 120 Hz, 85℃ A/rms	Tan δ at 120 Hz, 20℃	ESR 120 Hz, 20℃ Ω	LC 5 minutes mA	Part Number
200	560	35 × 20	2.08	0.15	0.355	1.00	LS2561M2D--A3520
	680	35 × 20	2.23	0.15	0.293	1.11	LS2681M2D--A3520
	680	35 × 25	2.30	0.15	0.293	1.11	LS2681M2D--A3525
	820	35 × 25	2.53	0.15	0.243	1.21	LS2821M2D--A3525
	1,000	35 × 30	2.96	0.15	0.199	1.34	LS2102M2D--A3530
	1,200	35 × 35	3.40	0.15	0.166	1.47	LS2122M2D--A3535
	1,500	35 × 40	3.87	0.15	0.133	1.50	LS2152M2D--A3540
	1,800	35 × 45	4.37	0.15	0.111	1.50	LS2182M2D--A3545
250	390	35 × 20	1.68	0.15	0.510	0.94	LS2391M2E--A3520
	470	35 × 20	1.85	0.15	0.423	1.03	LS2471M2E--A3520
	470	35 × 25	2.01	0.15	0.423	1.03	LS2471M2E--A3525
	560	35 × 25	2.21	0.15	0.355	1.12	LS2561M2E--A3525
	680	35 × 30	2.54	0.15	0.293	1.24	LS2681M2E--A3530
	820	35 × 35	2.90	0.15	0.243	1.36	LS2821M2E--A3535
	1,000	35 × 35	3.21	0.15	0.199	1.50	LS2102M2E--A3535
	1,200	35 × 40	3.56	0.15	0.166	1.50	LS2122M2E--A3540
	1,500	35 × 50	4.26	0.15	0.133	1.50	LS2152M2E--A3550
400	220	35 × 25	1.60	0.20	1.206	0.89	LS2221M2G--A3525
	270	35 × 30	1.75	0.20	0.983	0.99	LS2271M2G--A3530
	330	35 × 30	1.95	0.20	0.804	1.09	LS2331M2G--A3530
	390	35 × 35	2.17	0.20	0.680	1.18	LS2391M2G--A3535
	470	35 × 40	2.42	0.20	0.565	1.30	LS2471M2G--A3540
	560	35 × 45	2.71	0.20	0.474	1.42	LS2561M2G--A3545
450	120	35 × 20	1.11	0.20	2.212	0.70	LS2121M2W--A3520
	150	35 × 20	1.24	0.20	1.769	0.78	LS2151M2W--A3520
	150	35 × 25	1.35	0.20	1.769	0.78	LS2151M2W--A3525
	180	35 × 25	1.39	0.20	1.474	0.85	LS2181M2W--A3525
	220	35 × 30	1.61	0.20	1.206	0.94	LS2221M2W--A3530
	270	35 × 35	1.86	0.20	0.983	1.05	LS2271M2W--A3535
	330	35 × 35	2.06	0.20	0.804	1.16	LS2331M2W--A3535
	390	35 × 45	2.34	0.20	0.680	1.26	LS2391M2W--A3545
	470	35 × 50	2.63	0.20	0.565	1.38	LS2471M2W--A3550

Part Numbering System

LS2 Series	220μF	±20%	400V		4.0±0.5mm	35ϕ×25L	Pb-free Terminal + PET Sleeve
LS2	**221**	**M**	**2G**	**- -**	**A**	**3525**	
Series Name	Capacitance	Capacitance tolerance	Rated voltage	Terminal type	Terminal length	Case size	Terminal and Sleeve Type

Example:

Cap.	Symbol
56	560
220	221
470	471

M = ±20%
K = ±10%

Example:

Voltage	Symbol
400	2G
450	2W

Example:

Type	Symbol
2 pins	- -
5 pins	L5

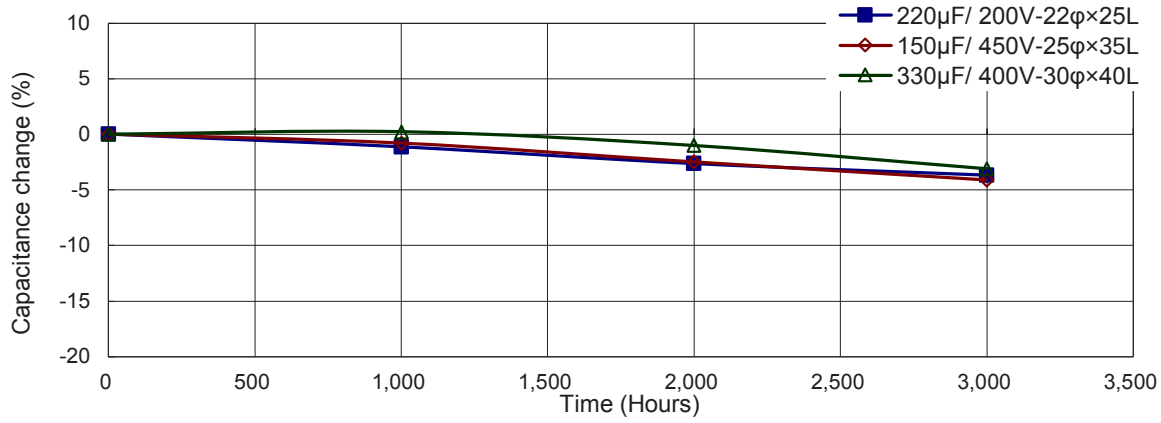
"-":
6.3±1.0 mm

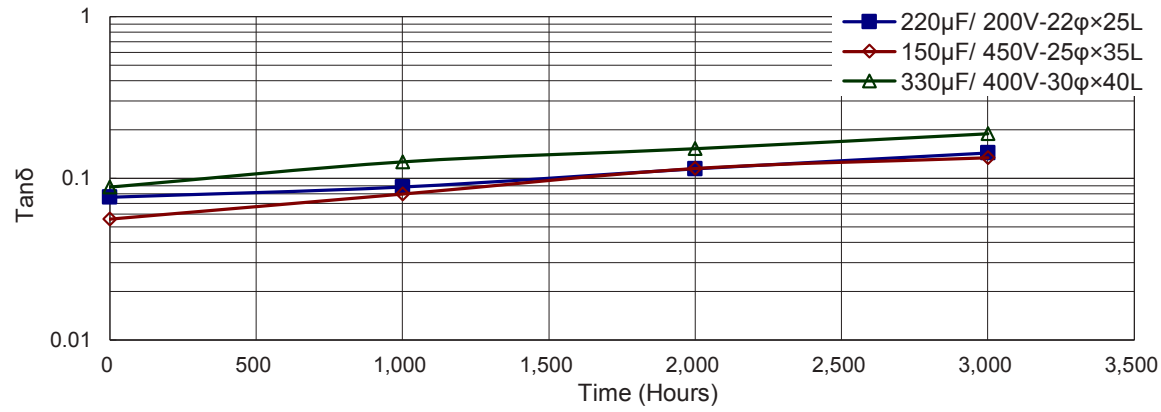
Example:

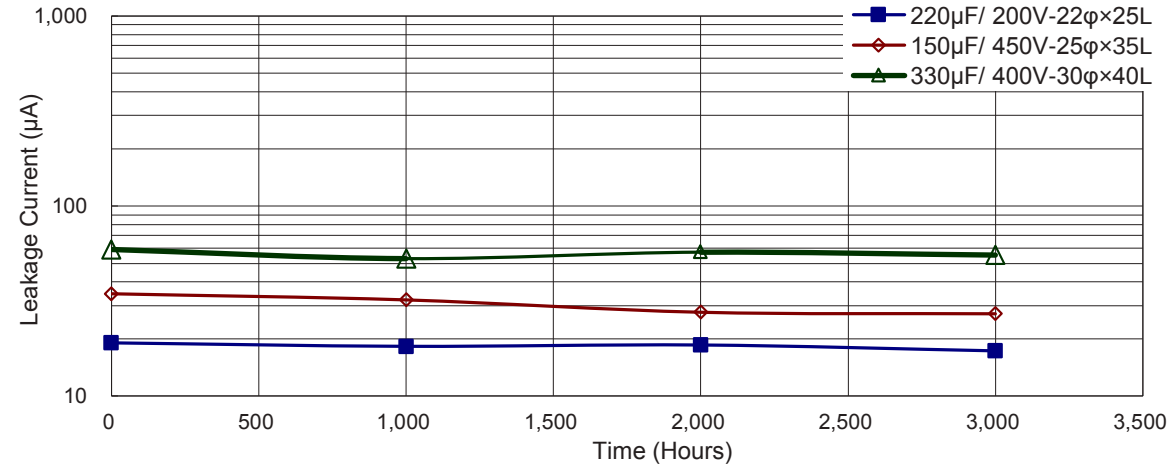
ϕD×L	Code
22×30	2230
25×25	2525
30×40	3040

Note: For more details, please refer to "Part Numbering System (Snap-in Type)" on page 16.

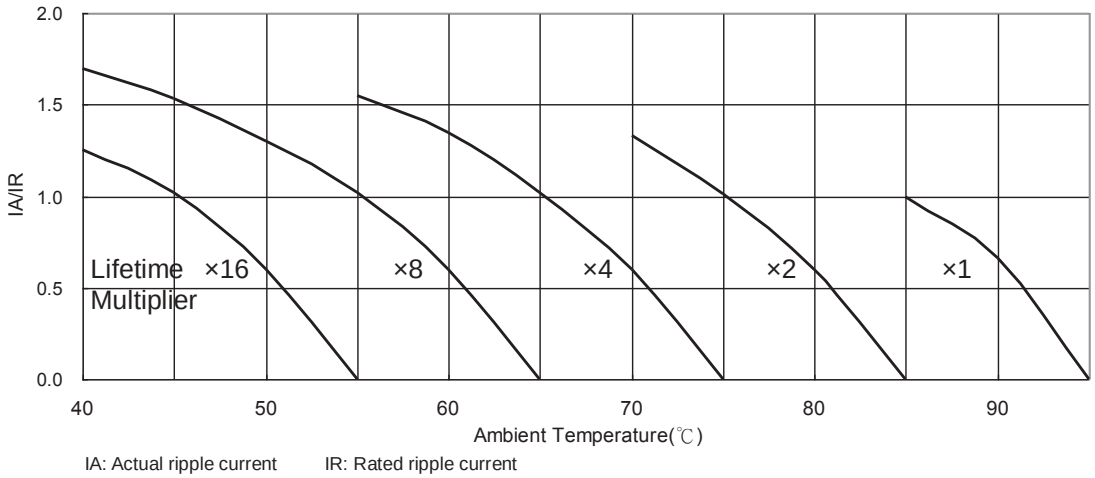
Typical Endurance Curves







Useful Life Chart



IA: Actual ripple current IR: Rated ripple current

LSL Series

Features

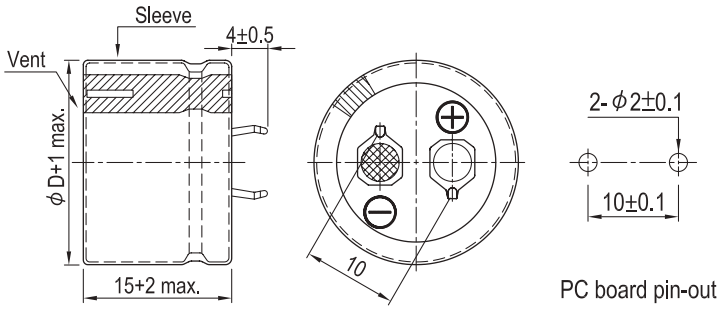
- Snap-in terminal type
- 105℃, 2,000 hours assured
- Low profile size
- RoHS compliance

Specifications

Items	Performance
Category Temperature Range	160 ~ 400V -25℃ ~ +105℃
Capacitance Tolerance	± 20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)	$I = 3\sqrt{CV}$ or 1.5 mA whichever is smaller (after 5 minutes) Where, C = rated capacitance in μF, V = rated DC Rated Voltage in V
Tanδ (at 120 Hz, 20℃)	Rated Voltage: 160 / 180 / 200 / 250 / 315 / 400 Tanδ(max): 0.15 / 0.15 / 0.15 / 0.15 / 0.15 / 0.15
Low Temperature Characteristics (at 120 Hz)	Impedance ratio shall not exceed the values given in the table below. Rated Voltage: 160 / 180 / 200 / 250 / 315 / 400 Impedance Ratio Z(-25℃)/ Z(+20℃): 4 / 4 / 4 / 4 / 8 / 8
Endurance	Test Time: 2,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 200% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied with rated ripple current for 2,000 hours at 105℃.
Shelf Life Test	Test Time: 1,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 150% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 105 ℃ without voltage applied. The rated voltage shall be applied to the capacitors before the measurements (Refer to JIS C 5101-4 4.1).
Ripple Current and Frequency Multipliers	Frequency (Hz): 50 / 60 / 100 / 120 / 300 / 1k / 10k up Multiplier: 0.8 / 1.0 / 1.1 / 1.3 / 1.4
Failure percentage Failure rate	When the failure percentage / failure rate is required, please contact with us for further discussion.

Diagram of Dimensions

Unit: mm



Snap-in

Dimension and Permissible Ripple Current

Rated Voltage V_{DC}	Capacitance 120 Hz, 20℃ μF	ϕD×L mm	Ripple Current 120 Hz, 105℃ A/rms	Tan δ at 120 Hz, 20℃	ESR 120 Hz, 20℃ Ω	LC 5 minutes mA	Part Number
160	150	20 × 15	0.55	0.15	1.327	0.46	LSL151M2C--A2015N
	180	22 × 15	0.65	0.15	1.106	0.50	LSL181M2C--A2215N
	220	25 × 15	0.80	0.15	0.905	0.56	LSL221M2C--A2515N
	270	30 × 15	0.95	0.15	0.737	0.62	LSL271M2C--A3015N
	330	30 × 15	1.00	0.15	0.603	0.68	LSL331M2C--A3015N
	390	35 × 15	1.20	0.15	0.510	0.74	LSL391M2C--A3515N
180	120	20 × 15	0.50	0.15	1.659	0.44	LSL121M2S--A2015N
	150	22 × 15	0.60	0.15	1.327	0.49	LSL151M2S--A2215N
	180	25 × 15	0.75	0.15	1.106	0.54	LSL181M2S--A2515N
	220	30 × 15	0.85	0.15	0.905	0.59	LSL221M2S--A3015N
	270	30 × 15	1.00	0.15	0.737	0.66	LSL271M2S--A3015N
	330	35 × 15	1.10	0.15	0.603	0.73	LSL331M2S--A3515N
	390	35 × 15	1.20	0.15	0.510	0.79	LSL391M2S--A3515N
200	100	20 × 15	0.45	0.15	1.990	0.42	LSL101M2D--A2015N
	120	22 × 15	0.55	0.15	1.659	0.46	LSL121M2D--A2215N
	150	25 × 15	0.65	0.15	1.327	0.51	LSL151M2D--A2515N
	180	25 × 15	0.75	0.15	1.106	0.56	LSL181M2D--A2515N
	220	30 × 15	0.90	0.15	0.905	0.62	LSL221M2D--A3015N
	270	30 × 15	1.00	0.15	0.737	0.69	LSL271M2D--A3015N
	330	35 × 15	1.10	0.15	0.603	0.77	LSL331M2D--A3515N
250	100	22 × 15	0.50	0.15	1.990	0.47	LSL101M2E--A2215N
	120	25 × 15	0.60	0.15	1.659	0.51	LSL121M2E--A2515N
	150	30 × 15	0.70	0.15	1.327	0.58	LSL151M2E--A3015N
	180	30 × 15	0.75	0.15	1.106	0.63	LSL181M2E--A3015N
	220	35 × 15	0.90	0.15	0.905	0.70	LSL221M2E--A3515N
	270	35 × 15	1.00	0.15	0.737	0.77	LSL271M2E--A3515N
315	56	22 × 15	0.35	0.15	3.554	0.39	LSL560M2F--A2215N
	68	25 × 15	0.40	0.15	2.927	0.43	LSL680M2F--A2515N
	82	30 × 15	0.45	0.15	2.427	0.48	LSL820M2F--A3015N
	100	30 × 15	0.50	0.15	1.990	0.53	LSL101M2F--A3015N
	120	35 × 15	0.55	0.15	1.659	0.58	LSL121M2F--A3515N
	150	35 × 15	0.60	0.15	1.327	0.65	LSL151M2F--A3515N
400	39	22 × 15	0.30	0.15	5.104	0.37	LSL390M2G--A2215N
	47	25 × 15	0.35	0.15	4.235	0.41	LSL470M2G--A2515N
	56	30 × 15	0.40	0.15	3.554	0.44	LSL560M2G--A3015N
	68	30 × 15	0.45	0.15	2.927	0.49	LSL680M2G--A3015N
	82	35 × 15	0.50	0.15	2.427	0.54	LSL820M2G--A3515N
	100	35 × 15	0.55	0.15	1.990	0.60	LSL101M2G--A3515N

Part Numbering System

LSL Series	100μF	±20%	400V		4.0±0.5mm	35ϕ×15L	Pb-free Terminal + PET Sleeve
LSL	**101**	**M**	**2G**	**- -**	**A**	**3515**	
Series Name	Capacitance	Capacitance tolerance	Rated voltage	Terminal type	Terminal length	Case size	Terminal and Sleeve Type

Example:

Cap.	Symbol
56	560
220	221
390	391

M = ±20%
K = ±10%

Example:

Voltage	Symbol
315	2F
400	2G

Example:

Type	Symbol
2 pins	- -
5 pins	L5

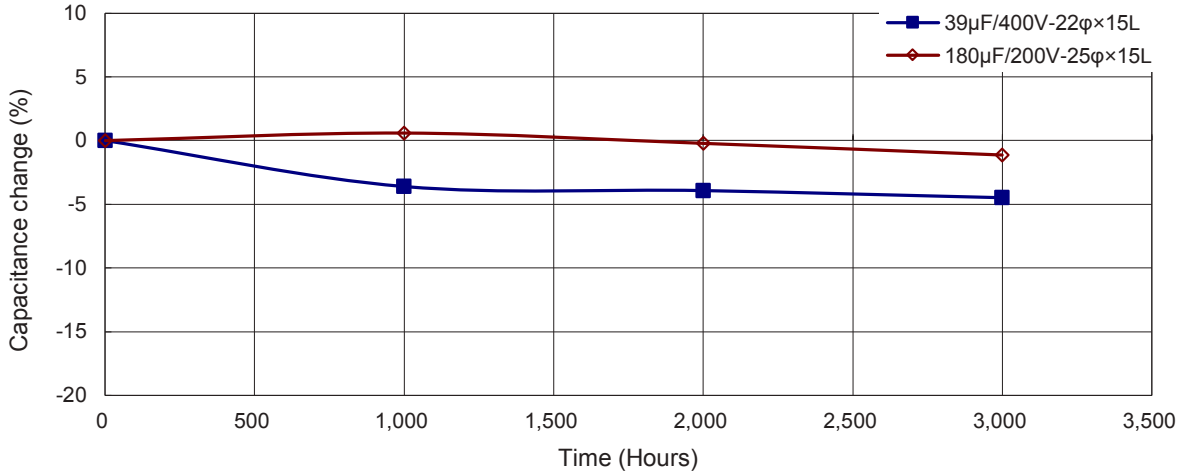
"-":
6.3±1.0 mm

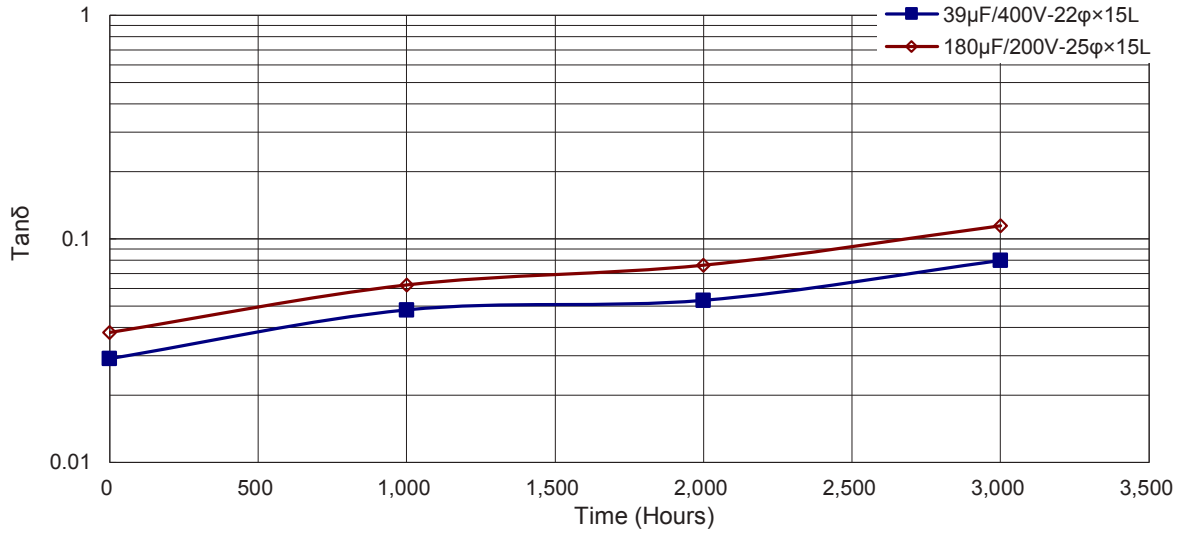
Example:

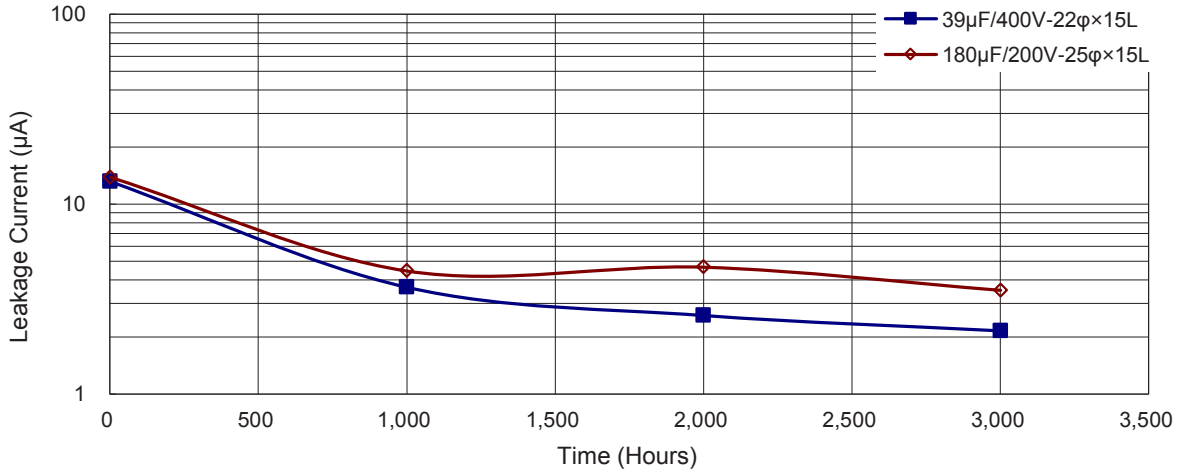
ϕD×L	Code
20×15	2015
25×15	2515
35×15	3515

Note: For more details, please refer to "Part Numbering System (Snap-in Type)" on page 16.

Typical Endurance Curves







LSG Series

Features

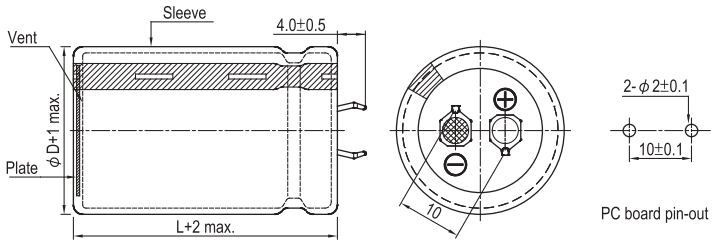
- Snap-in terminal type
- 105℃, 2,000 hours assured
- RoHS compliance

Specifications

Items	Performance															
Category Temperature Range	16 ~ 100V							160 ~ 500V								
	-40℃ ~ +105℃							-25℃ ~ +105℃								
Capacitance Tolerance	±20% (at 120 Hz, 20℃)															
Leakage Current (at 20℃)	$I = 3\sqrt{CV}$ or 1.5 mA whichever is smaller (after 5 minutes) Where, C = rated capacitance in μF, V = rated DC Rated Voltage in V															
Tanδ (at 120 Hz, 20℃)	Rated Voltage	16	25	35	50	63	80	100	160	200	250	350	400	420	450	500
	Tanδ (max)	0.50	0.45	0.40	0.35	0.30	0.25	0.20	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
Low Temperature Characteristics (at 120 Hz)	Impedance ratio shall not exceed the values given in the table below.															
	Rated Voltage		16	25	35	50	63	80	100	160	200	250	350	400	420	450	500
	Impedance Ratio	Z(-25℃)/Z(+20℃)	4	3	3	2	2	2	4	4	4	4	8	8	8	8	8
		Z(-40℃)/Z(+20℃)	15	10	8	6	5	5	4	-	-	-	-	-	-	-	-
Endurance	Test Time: 2,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 200% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied with rated ripple current for 2,000 hours at 105℃.															
Shelf Life Test	Test Time: 1,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 150% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 105℃ without voltage applied. The rated voltage shall be applied to the capacitors before the measurements (Refer to JIS C 5101-4 4.1).															
Ripple Current and Frequency Multipliers	Case size	Freq.(Hz) / Rated Volt. (V)	50 / 60	100 / 120	500	1k	10k up									
	Length ≦ 55L	≦ 100	0.92	1.00	1.13	1.19	1.20									
		160 ~ 250	0.81	1.00	1.32	1.45	1.50									
		350 ≦	0.77	1.00	1.30	1.41	1.43									
	Length ≧ 60L	160 ~ 450	0.88	1.00	1.20	1.25	1.40									
Failure percentage Failure rate	When the failure percentage / failure rate is required, please contact with us for further discussion.															

Diagram of Dimensions

Unit: mm



Snap-in

Dimension and Permissible Ripple Current

Rated Voltage V_{DC}	Capacitance 120 Hz, 20℃ μF	φD×L mm	Ripple Current 120 Hz, 105℃ A/rms	Tan δ at 120 Hz, 20℃	ESR 120 Hz, 20℃ Ω	LC 5 minutes mA	Part Number
16	10,000	20 × 25	1.61	0.50	0.066	1.20	LSG103M1C--A2025
	10,000	22 × 25	1.78	0.50	0.066	1.20	LSG103M1C--A2225
	12,000	22 × 25	1.92	0.50	0.055	1.31	LSG123M1C--A2225
	15,000	22 × 30	2.20	0.50	0.044	1.47	LSG153M1C--A2230
	15,000	25 × 25	2.25	0.50	0.044	1.47	LSG153M1C--A2525
	18,000	22 × 35	2.49	0.50	0.037	1.50	LSG183M1C--A2235
	18,000	25 × 30	2.52	0.50	0.037	1.50	LSG183M1C--A2530
	18,000	30 × 25	2.61	0.50	0.037	1.50	LSG183M1C--A3025
	22,000	22 × 40	2.90	0.50	0.030	1.50	LSG223M1C--A2240
	22,000	25 × 30	2.77	0.50	0.030	1.50	LSG223M1C--A2530
	22,000	30 × 25	2.88	0.50	0.030	1.50	LSG223M1C--A3025
	27,000	25 × 35	3.02	0.50	0.025	1.50	LSG273M1C--A2535
	27,000	30 × 30	3.15	0.50	0.025	1.50	LSG273M1C--A3030
	33,000	30 × 30	3.48	0.50	0.020	1.50	LSG333M1C--A3030
	33,000	35 × 25	3.57	0.50	0.020	1.50	LSG333M1C--A3525
	39,000	30 × 35	4.03	0.50	0.017	1.50	LSG393M1C--A3035
	39,000	35 × 30	4.16	0.50	0.017	1.50	LSG393M1C--A3530
	47,000	35 × 35	4.85	0.50	0.014	1.50	LSG473M1C--A3535
25	8,200	22 × 25	1.73	0.45	0.073	1.36	LSG822M1E--A2225
	10,000	22 × 30	2.05	0.45	0.060	1.50	LSG103M1E--A2230
	10,000	25 × 25	2.05	0.45	0.060	1.50	LSG103M1E--A2525
	12,000	22 × 35	2.23	0.45	0.050	1.50	LSG123M1E--A2235
	12,000	25 × 25	2.09	0.45	0.050	1.50	LSG123M1E--A2525
	12,000	30 × 25	2.45	0.45	0.050	1.50	LSG123M1E--A3025
	12,000	35 × 25	2.74	0.45	0.050	1.50	LSG123M1E--A3525
	15,000	22 × 40	2.65	0.45	0.040	1.50	LSG153M1E--A2240
	15,000	25 × 35	2.80	0.45	0.040	1.50	LSG153M1E--A2535
	15,000	30 × 25	2.72	0.45	0.040	1.50	LSG153M1E--A3025
	15,000	35 × 25	3.00	0.45	0.040	1.50	LSG153M1E--A3525
	18,000	22 × 45	2.93	0.45	0.033	1.50	LSG183M1E--A2245
	18,000	25 × 35	2.83	0.45	0.033	1.50	LSG183M1E--A2535
	18,000	30 × 30	3.07	0.45	0.033	1.50	LSG183M1E--A3030
	18,000	35 × 25	3.02	0.45	0.033	1.50	LSG183M1E--A3525
	22,000	22 × 50	3.31	0.45	0.027	1.50	LSG223M1E--A2250
	22,000	25 × 40	3.22	0.45	0.027	1.50	LSG223M1E--A2540
	22,000	30 × 30	3.18	0.45	0.027	1.50	LSG223M1E--A3030
	22,000	35 × 25	3.07	0.45	0.027	1.50	LSG223M1E--A3525
	27,000	30 × 35	3.35	0.45	0.022	1.50	LSG273M1E--A3035
	27,000	35 × 30	3.46	0.45	0.022	1.50	LSG273M1E--A3530
35	3,300	22 × 25	1.31	0.40	0.161	1.02	LSG332M1V--A2225
	3,900	22 × 30	1.54	0.40	0.136	1.11	LSG392M1V--A2230
	4,700	22 × 25	1.63	0.40	0.113	1.22	LSG472M1V--A2225
	4,700	25 × 25	1.70	0.40	0.113	1.22	LSG472M1V--A2525
	5,600	22 × 25	1.63	0.40	0.095	1.33	LSG562M1V--A2225
	5,600	25 × 25	1.77	0.40	0.095	1.33	LSG562M1V--A2525
	5,600	30 × 25	1.99	0.40	0.095	1.33	LSG562M1V--A3025
	6,800	22 × 30	1.86	0.40	0.078	1.46	LSG682M1V--A2230
	6,800	25 × 30	2.04	0.40	0.078	1.46	LSG682M1V--A2530
	6,800	30 × 30	2.24	0.40	0.078	1.46	LSG682M1V--A3030
	8,200	22 × 35	2.10	0.40	0.065	1.50	LSG822M1V--A2235
	8,200	25 × 35	2.60	0.40	0.065	1.50	LSG822M1V--A2535
	8,200	30 × 25	2.49	0.40	0.065	1.50	LSG822M1V--A3025
	8,200	35 × 25	2.69	0.40	0.065	1.50	LSG822M1V--A3525
	10,000	22 × 40	2.42	0.40	0.053	1.50	LSG103M1V--A2240
	10,000	25 × 40	2.83	0.40	0.053	1.50	LSG103M1V--A2540
	10,000	30 × 30	2.75	0.40	0.053	1.50	LSG103M1V--A3030
	12,000	22 × 45	2.79	0.40	0.044	1.50	LSG123M1V--A2245
	12,000	25 × 45	3.00	0.40	0.044	1.50	LSG123M1V--A2545
	12,000	30 × 35	2.96	0.40	0.044	1.50	LSG123M1V--A3035
	12,000	35 × 25	2.75	0.40	0.044	1.50	LSG123M1V--A3525

Dimension and Permissible Ripple Current

Rated Voltage V_{DC}	Capacitance 120 Hz, 20℃ μF	ϕD×L mm	Ripple Current 120 Hz, 105℃ A/rms	Tan δ at 120 Hz, 20℃	ESR 120 Hz, 20℃ Ω	LC 5 minutes mA	Part Number
35	15,000	25 × 45	3.24	0.40	0.035	1.50	LSG153M1V--A2545
	15,000	30 × 35	3.24	0.40	0.035	1.50	LSG153M1V--A3035
	15,000	35 × 25	3.12	0.40	0.035	1.50	LSG153M1V--A3525
	18,000	25 × 50	3.71	0.40	0.029	1.50	LSG183M1V--A2550
	18,000	30 × 45	4.07	0.40	0.029	1.50	LSG183M1V--A3045
	18,000	35 × 35	4.02	0.40	0.029	1.50	LSG183M1V--A3535
	22,000	30 × 45	4.34	0.40	0.024	1.50	LSG223M1V--A3045
	22,000	35 × 40	4.69	0.40	0.024	1.50	LSG223M1V--A3540
50	1,800	22 × 25	1.33	0.35	0.258	0.90	LSG182M1H--A2225
	2,200	22 × 25	1.48	0.35	0.211	0.99	LSG222M1H--A2225
	2,700	22 × 25	1.53	0.35	0.172	1.10	LSG272M1H--A2225
	2,700	25 × 25	1.57	0.35	0.172	1.10	LSG272M1H--A2525
	3,300	22 × 30	1.76	0.35	0.141	1.22	LSG332M1H--A2230
	3,300	25 × 25	1.70	0.35	0.141	1.22	LSG332M1H--A2525
	3,900	22 × 35	1.97	0.35	0.119	1.32	LSG392M1H--A2235
	3,900	25 × 25	1.82	0.35	0.119	1.32	LSG392M1H--A2525
	3,900	30 × 25	1.95	0.35	0.119	1.32	LSG392M1H--A3025
	4,700	22 × 35	2.01	0.35	0.099	1.45	LSG472M1H--A2235
	4,700	25 × 30	2.18	0.35	0.099	1.45	LSG472M1H--A2530
	4,700	30 × 25	2.04	0.35	0.099	1.45	LSG472M1H--A3025
	4,700	35 × 25	2.48	0.35	0.099	1.45	LSG472M1H--A3525
	5,600	22 × 40	2.32	0.35	0.083	1.50	LSG562M1H--A2240
	5,600	25 × 35	2.47	0.35	0.083	1.50	LSG562M1H--A2535
	5,600	30 × 25	2.33	0.35	0.083	1.50	LSG562M1H--A3025
	6,800	22 × 45	2.70	0.35	0.068	1.50	LSG682M1H--A2245
	6,800	25 × 40	2.92	0.35	0.068	1.50	LSG682M1H--A2540
	6,800	30 × 30	2.84	0.35	0.068	1.50	LSG682M1H--A3030
	6,800	35 × 25	2.91	0.35	0.068	1.50	LSG682M1H--A3525
	8,200	25 × 45	3.13	0.35	0.057	1.50	LSG822M1H--A2545
	8,200	30 × 35	3.13	0.35	0.057	1.50	LSG822M1H--A3035
	8,200	35 × 30	3.23	0.35	0.057	1.50	LSG822M1H--A3530
	10,000	25 × 50	3.39	0.35	0.046	1.50	LSG103M1H--A2550
	10,000	30 × 40	3.55	0.35	0.046	1.50	LSG103M1H--A3040
	10,000	35 × 30	3.47	0.35	0.046	1.50	LSG103M1H--A3530
	12,000	30 × 45	4.04	0.35	0.039	1.50	LSG123M1H--A3045
	12,000	35 × 35	3.98	0.35	0.039	1.50	LSG123M1H--A3535
	15,000	30 × 50	4.60	0.35	0.031	1.50	LSG153M1H--A3050
	15,000	35 × 45	4.80	0.35	0.031	1.50	LSG153M1H--A3545
63	1,200	22 × 25	1.19	0.30	0.332	0.82	LSG122M1J--A2225
	1,500	22 × 25	1.30	0.30	0.265	0.92	LSG152M1J--A2225
	1,500	25 × 25	1.38	0.30	0.265	0.92	LSG152M1J--A2525
	1,800	22 × 25	1.36	0.30	0.221	1.01	LSG182M1J--A2225
	1,800	25 × 25	1.52	0.30	0.221	1.01	LSG182M1J--A2525
	2,200	22 × 30	1.55	0.30	0.181	1.12	LSG222M1J--A2230
	2,200	25 × 25	1.60	0.30	0.181	1.12	LSG222M1J--A2525
	2,700	22 × 35	1.89	0.30	0.147	1.24	LSG272M1J--A2235
	2,700	25 × 30	1.90	0.30	0.147	1.24	LSG272M1J--A2530
	2,700	30 × 25	1.97	0.30	0.147	1.24	LSG272M1J--A3025
	3,300	22 × 40	1.99	0.30	0.121	1.37	LSG332M1J--A2240
	3,300	25 × 35	2.06	0.30	0.121	1.37	LSG332M1J--A2535
	3,300	30 × 25	2.00	0.30	0.121	1.37	LSG332M1J--A3025
	3,300	35 × 25	2.22	0.30	0.121	1.37	LSG332M1J--A3525
	3,900	22 × 45	2.34	0.30	0.102	1.49	LSG392M1J--A2245
	3,900	25 × 35	2.20	0.30	0.102	1.49	LSG392M1J--A2535
	3,900	30 × 25	2.18	0.30	0.102	1.49	LSG392M1J--A3025
	3,900	35 × 25	2.40	0.30	0.102	1.49	LSG392M1J--A3525
	4,700	22 × 50	2.58	0.30	0.085	1.50	LSG472M1J--A2250
	4,700	25 × 40	2.51	0.30	0.085	1.50	LSG472M1J--A2540
	4,700	30 × 30	2.48	0.30	0.085	1.50	LSG472M1J--A3030
	4,700	35 × 25	2.54	0.30	0.085	1.50	LSG472M1J--A3525
	5,600	25 × 45	2.92	0.30	0.071	1.50	LSG562M1J--A2545
	5,600	30 × 35	2.91	0.30	0.071	1.50	LSG562M1J--A3035
	5,600	35 × 30	3.00	0.30	0.071	1.50	LSG562M1J--A3530
	6,800	30 × 50	3.65	0.30	0.059	1.50	LSG682M1J--A3050
	6,800	35 × 30	3.30	0.30	0.059	1.50	LSG682M1J--A3530

Dimension and Permissible Ripple Current

Rated Voltage V_{DC}	Capacitance 120 Hz, 20℃ μF	ϕD×L mm	Ripple Current 120 Hz, 105℃ A/rms	Tan δ at 120 Hz, 20℃	ESR 120 Hz, 20℃ Ω	LC 5 minutes mA	Part Number
63	8,200	30 × 45	3.57	0.30	0.049	1.50	LSG822M1J--A3045
	8,200	35 × 35	3.52	0.30	0.049	1.50	LSG822M1J--A3535
	10,000	35 × 40	3.90	0.30	0.040	1.50	LSG103M1J--A3540
	12,000	35 × 45	4.50	0.30	0.033	1.50	LSG123M1J--A3545
80	1,000	22 × 25	1.05	0.25	0.332	0.85	LSG102M1K--A2225
	1,200	22 × 30	1.24	0.25	0.276	0.93	LSG122M1K--A2230
	1,500	22 × 35	1.48	0.25	0.221	1.04	LSG152M1K--A2235
	1,500	25 × 25	1.38	0.25	0.221	1.04	LSG152M1K--A2525
	1,800	22 × 40	1.72	0.25	0.184	1.14	LSG182M1K--A2240
	1,800	25 × 30	1.63	0.25	0.184	1.14	LSG182M1K--A2530
	2,200	22 × 45	1.82	0.25	0.151	1.26	LSG222M1K--A2245
	2,200	25 × 30	1.65	0.25	0.151	1.26	LSG222M1K--A2530
	2,700	25 × 45	2.17	0.25	0.123	1.39	LSG272M1K--A2545
	2,700	30 × 30	2.03	0.25	0.123	1.39	LSG272M1K--A3030
	3,300	25 × 50	2.51	0.25	0.101	1.50	LSG332M1K--A2550
	3,300	35 × 25	2.30	0.25	0.101	1.50	LSG332M1K--A3525
	3,900	30 × 45	2.89	0.25	0.085	1.50	LSG392M1K--A3045
	3,900	35 × 30	2.68	0.25	0.085	1.50	LSG392M1K--A3530
	4,700	30 × 50	2.97	0.25	0.071	1.50	LSG472M1K--A3050
	4,700	35 × 30	2.64	0.25	0.071	1.50	LSG472M1K--A3530
	5,600	30 × 45	3.10	0.25	0.059	1.50	LSG562M1K--A3045
	5,600	35 × 45	3.39	0.25	0.059	1.50	LSG562M1K--A3545
	6,800	35 × 40	3.56	0.25	0.049	1.50	LSG682M1K--A3540
	6,800	35 × 50	3.90	0.25	0.049	1.50	LSG682M1K--A3550
100	820	22 × 30	1.14	0.20	0.324	0.86	LSG821M2A--A2230
	1,000	22 × 30	1.26	0.20	0.265	0.95	LSG102M2A--A2230
	1,200	22 × 35	1.55	0.20	0.221	1.04	LSG122M2A--A2235
	1,200	25 × 30	1.56	0.20	0.221	1.04	LSG122M2A--A2530
	1,200	30 × 25	1.68	0.20	0.221	1.04	LSG122M2A--A3025
	1,500	22 × 40	1.78	0.20	0.177	1.16	LSG152M2A--A2240
	1,500	25 × 35	1.80	0.20	0.177	1.16	LSG152M2A--A2535
	1,500	30 × 25	1.76	0.20	0.177	1.16	LSG152M2A--A3025
	1,500	35 × 25	1.98	0.20	0.177	1.16	LSG152M2A--A3525
	1,800	22 × 45	1.99	0.20	0.147	1.27	LSG182M2A--A2245
	1,800	25 × 35	1.95	0.20	0.147	1.27	LSG182M2A--A2535
	1,800	30 × 30	2.29	0.20	0.147	1.27	LSG182M2A--A3030
	1,800	35 × 25	2.34	0.20	0.147	1.27	LSG182M2A--A3525
	2,200	22 × 50	2.21	0.20	0.121	1.41	LSG222M2A--A2250
	2,200	25 × 40	2.15	0.20	0.121	1.41	LSG222M2A--A2540
	2,200	30 × 30	2.12	0.20	0.121	1.41	LSG222M2A--A3030
	2,200	35 × 25	2.27	0.20	0.121	1.41	LSG222M2A--A3525
	2,700	25 × 50	2.59	0.20	0.098	1.50	LSG272M2A--A2550
	2,700	30 × 35	2.37	0.20	0.098	1.50	LSG272M2A--A3035
	2,700	35 × 30	2.62	0.20	0.098	1.50	LSG272M2A--A3530
	3,300	30 × 40	2.77	0.20	0.080	1.50	LSG332M2A--A3040
	3,300	35 × 35	2.99	0.20	0.080	1.50	LSG332M2A--A3535
	3,900	30 × 45	3.02	0.20	0.068	1.50	LSG392M2A--A3045
	3,900	35 × 40	3.35	0.20	0.068	1.50	LSG392M2A--A3540
	4,700	35 × 40	3.30	0.20	0.056	1.50	LSG472M2A--A3540
	5,600	35 × 45	3.51	0.20	0.047	1.50	LSG562M2A--A3545
160	270	22 × 25	0.86	0.15	0.737	0.62	LSG271M2C--A2225
	330	22 × 25	1.10	0.15	0.603	0.69	LSG331M2C--A2225
	390	22 × 30	1.22	0.15	0.510	0.75	LSG391M2C--A2230
	390	25 × 25	1.15	0.15	0.510	0.75	LSG391M2C--A2525
	470	22 × 35	1.35	0.15	0.423	0.82	LSG471M2C--A2235
	470	25 × 25	1.33	0.15	0.423	0.82	LSG471M2C--A2525
	560	22 × 40	1.50	0.15	0.355	0.90	LSG561M2C--A2240
	560	25 × 30	1.45	0.15	0.355	0.90	LSG561M2C--A2530
	560	30 × 25	1.40	0.15	0.355	0.90	LSG561M2C--A3025
	680	22 × 45	1.65	0.15	0.293	0.99	LSG681M2C--A2245
	680	25 × 35	1.65	0.15	0.293	0.99	LSG681M2C--A2535
	680	30 × 25	1.65	0.15	0.293	0.99	LSG681M2C--A3025
	820	22 × 50	1.93	0.15	0.243	1.09	LSG821M2C--A2250
	820	25 × 40	1.85	0.15	0.243	1.09	LSG821M2C--A2540

Dimension and Permissible Ripple Current

Rated Voltage V_{DC}	Capacitance 120 Hz, 20℃ μF	ϕD×L mm	Ripple Current 120 Hz, 105℃ A/rms	Tan δ at 120 Hz, 20℃	ESR 120 Hz, 20℃ Ω	LC 5 minutes mA	Part Number
160	820	30 × 30	1.76	0.15	0.243	1.09	LSG821M2C--A3030
	820	35 × 25	1.91	0.15	0.243	1.09	LSG821M2C--A3525
	1,000	25 × 45	2.20	0.15	0.199	1.20	LSG102M2C--A2545
	1,000	30 × 35	2.02	0.15	0.199	1.20	LSG102M2C--A3035
	1,000	35 × 30	2.44	0.15	0.199	1.20	LSG102M2C--A3530
	1,200	25 × 50	2.45	0.15	0.166	1.31	LSG122M2C--A2550
	1,200	30 × 40	2.35	0.15	0.166	1.31	LSG122M2C--A3040
	1,200	35 × 35	2.50	0.15	0.166	1.31	LSG122M2C--A3535
	1,500	30 × 45	2.82	0.15	0.133	1.47	LSG152M2C--A3045
	1,500	35 × 40	2.70	0.15	0.133	1.47	LSG152M2C--A3540
	1,800	30 × 50	3.31	0.15	0.111	1.50	LSG182M2C--A3050
	1,800	35 × 45	2.85	0.15	0.111	1.50	LSG182M2C--A3545
200	270	22 × 25	0.95	0.15	0.737	0.70	LSG271M2D--A2225
	330	22 × 30	1.13	0.15	0.603	0.77	LSG331M2D--A2230
	330	25 × 25	1.13	0.15	0.603	0.77	LSG331M2D--A2525
	390	22 × 35	1.25	0.15	0.510	0.84	LSG391M2D--A2235
	390	25 × 30	1.21	0.15	0.510	0.84	LSG391M2D--A2530
	390	30 × 25	1.20	0.15	0.510	0.84	LSG391M2D--A3025
	470	22 × 35	1.23	0.15	0.423	0.92	LSG471M2D--A2235
	470	25 × 30	1.32	0.15	0.423	0.92	LSG471M2D--A2530
	470	30 × 25	1.50	0.15	0.423	0.92	LSG471M2D--A3025
	560	22 × 40	1.43	0.15	0.355	1.00	LSG561M2D--A2240
	560	25 × 35	1.50	0.15	0.355	1.00	LSG561M2D--A2535
	560	30 × 30	1.52	0.15	0.355	1.00	LSG561M2D--A3030
	560	35 × 25	1.49	0.15	0.355	1.00	LSG561M2D--A3525
	680	22 × 50	1.74	0.15	0.293	1.11	LSG681M2D--A2250
	680	25 × 40	1.70	0.15	0.293	1.11	LSG681M2D--A2540
	680	30 × 30	1.58	0.15	0.293	1.11	LSG681M2D--A3030
	680	35 × 25	1.72	0.15	0.293	1.11	LSG681M2D--A3525
	820	25 × 45	1.85	0.15	0.243	1.21	LSG821M2D--A2545
	820	30 × 35	1.85	0.15	0.243	1.21	LSG821M2D--A3035
	820	35 × 30	1.90	0.15	0.243	1.21	LSG821M2D--A3530
	1,000	25 × 55	2.13	0.15	0.199	1.34	LSG102M2D--A2555
	1,000	30 × 40	2.06	0.15	0.199	1.34	LSG102M2D--A3040
	1,000	35 × 30	2.01	0.15	0.199	1.34	LSG102M2D--A3530
	1,200	30 × 45	2.37	0.15	0.166	1.47	LSG122M2D--A3045
	1,200	35 × 35	2.34	0.15	0.166	1.47	LSG122M2D--A3535
	1,500	30 × 50	2.77	0.15	0.133	1.50	LSG152M2D--A3050
	1,500	35 × 40	2.76	0.15	0.133	1.50	LSG152M2D--A3540
	1,800	35 × 45	3.17	0.15	0.111	1.50	LSG182M2D--A3545
	2,200	35 × 55	3.82	0.15	0.090	1.50	LSG222M2D--A3555
	2,700	40 × 50	4.39	0.15	0.074	1.50	LSG272M2D--A4050
250	180	22 × 25	0.78	0.15	1.106	0.64	LSG181M2E--A2225
	220	22 × 30	0.85	0.15	0.905	0.70	LSG221M2E--A2230
	220	25 × 25	0.90	0.15	0.905	0.70	LSG221M2E--A2525
	270	22 × 30	0.91	0.15	0.737	0.78	LSG271M2E--A2230
	270	25 × 25	0.91	0.15	0.737	0.78	LSG271M2E--A2525
	270	30 × 25	1.01	0.15	0.737	0.78	LSG271M2E--A3025
	330	22 × 35	1.03	0.15	0.603	0.86	LSG331M2E--A2235
	330	25 × 30	1.13	0.15	0.603	0.86	LSG331M2E--A2530
	330	30 × 25	1.05	0.15	0.603	0.86	LSG331M2E--A3025
	390	22 × 40	1.13	0.15	0.510	0.94	LSG391M2E--A2240
	390	25 × 35	1.27	0.15	0.510	0.94	LSG391M2E--A2535
	390	30 × 25	1.11	0.15	0.510	0.94	LSG391M2E--A3025
	470	22 × 45	1.31	0.15	0.423	1.03	LSG471M2E--A2245
	470	25 × 40	1.49	0.15	0.423	1.03	LSG471M2E--A2540
	470	30 × 30	1.37	0.15	0.423	1.03	LSG471M2E--A3030
	470	35 × 25	1.17	0.15	0.423	1.03	LSG471M2E--A3525
	560	25 × 45	1.79	0.15	0.355	1.12	LSG561M2E--A2545
	560	30 × 35	1.58	0.15	0.355	1.12	LSG561M2E--A3035
	560	35 × 25	1.61	0.15	0.355	1.12	LSG561M2E--A3525
	680	25 × 50	1.77	0.15	0.293	1.24	LSG681M2E--A2550
	680	30 × 40	2.00	0.15	0.293	1.24	LSG681M2E--A3040
	680	35 × 30	1.95	0.15	0.293	1.24	LSG681M2E--A3530

Dimension and Permissible Ripple Current

Rated Voltage V_{DC}	Capacitance 120 Hz, 20℃ μF	ϕD×L mm	Ripple Current 120 Hz, 105℃ A/rms	Tan δ at 120 Hz, 20℃	ESR 120 Hz, 20℃ Ω	LC 5 minutes mA	Part Number
250	820	30 × 45	2.30	0.15	0.243	1.36	LSG821M2E--A3045
	820	35 × 35	2.27	0.15	0.243	1.36	LSG821M2E--A3535
	1,000	30 × 50	2.37	0.15	0.199	1.50	LSG102M2E--A3050
	1,000	35 × 40	2.65	0.15	0.199	1.50	LSG102M2E--A3540
	1,200	30 × 55	2.71	0.15	0.166	1.50	LSG122M2E--A3055
	1,200	35 × 45	3.05	0.15	0.166	1.50	LSG122M2E--A3545
	1,500	35 × 50	3.18	0.15	0.133	1.50	LSG152M2E--A3550
	1,800	35 × 60	3.76	0.15	0.111	1.50	LSG182M2E--A3560
	2,200	35 × 70	4.45	0.15	0.090	1.50	LSG222M2E--A3570
350	100	22 × 25	0.58	0.15	1.990	0.46	LSG101M2V--A2225
	120	22 × 30	0.69	0.15	1.659	0.56	LSG121M2V--A2230
	120	25 × 25	0.69	0.15	1.659	0.56	LSG121M2V--A2525
	150	22 × 35	0.80	0.15	1.327	0.69	LSG151M2V--A2235
	180	25 × 30	0.82	0.15	1.106	0.75	LSG181M2V--A2530
	180	30 × 25	0.85	0.15	1.106	0.75	LSG181M2V--A3025
	220	22 × 40	0.95	0.15	0.905	0.83	LSG221M2V--A2240
	220	25 × 40	1.04	0.15	0.905	0.83	LSG221M2V--A2540
	220	30 × 30	1.02	0.15	0.905	0.83	LSG221M2V--A3030
	220	35 × 25	1.04	0.15	0.905	0.83	LSG221M2V--A3525
	270	25 × 45	1.17	0.15	0.737	0.92	LSG271M2V--A2545
	270	30 × 35	1.17	0.15	0.737	0.92	LSG271M2V--A3035
	270	35 × 25	1.12	0.15	0.737	0.92	LSG271M2V--A3525
	330	25 × 50	1.20	0.15	0.603	1.02	LSG331M2V--A2550
	330	30 × 35	1.12	0.15	0.603	1.02	LSG331M2V--A3035
	330	35 × 30	1.21	0.15	0.603	1.02	LSG331M2V--A3530
	390	30 × 40	1.29	0.15	0.510	1.11	LSG391M2V--A3040
	470	30 × 45	1.48	0.15	0.423	1.22	LSG471M2V--A3045
	470	35 × 40	1.63	0.15	0.423	1.22	LSG471M2V--A3540
	560	35 × 40	1.69	0.15	0.355	1.33	LSG561M2V--A3540
	560	40 × 30	1.63	0.15	0.355	1.33	LSG561M2V--A4030
	680	35 × 35	1.52	0.15	0.293	1.46	LSG681M2V--A3535
	680	40 × 35	1.58	0.15	0.293	1.46	LSG681M2V--A4035
	820	35 × 50	1.86	0.15	0.243	1.50	LSG821M2V--A3550
	820	40 × 50	2.01	0.15	0.243	1.50	LSG821M2V--A4050
	1,000	35 × 60	2.22	0.15	0.199	1.50	LSG102M2V--A3560
	1,000	40 × 50	2.21	0.15	0.199	1.50	LSG102M2V--A4050
	1,200	40 × 55	2.52	0.15	0.166	1.50	LSG122M2V--A4055
	1,500	40 × 65	3.03	0.15	0.133	1.50	LSG152M2V--A4065
400	100	22 × 25	0.52	0.15	1.990	0.60	LSG101M2G--A2225
	120	22 × 30	0.62	0.15	1.659	0.66	LSG121M2G--A2230
	120	25 × 25	0.61	0.15	1.659	0.66	LSG121M2G--A2525
	150	22 × 35	0.70	0.15	1.327	0.73	LSG151M2G--A2235
	150	25 × 30	0.73	0.15	1.327	0.73	LSG151M2G--A2530
	180	22 × 40	0.81	0.15	1.106	0.80	LSG181M2G--A2240
	180	25 × 35	0.85	0.15	1.106	0.80	LSG181M2G--A2535
	180	30 × 25	0.83	0.15	1.106	0.80	LSG181M2G--A3025
	220	22 × 45	0.94	0.15	0.905	0.89	LSG221M2G--A2245
	220	25 × 40	1.00	0.15	0.905	0.89	LSG221M2G--A2540
	220	30 × 30	0.99	0.15	0.905	0.89	LSG221M2G--A3030
	270	22 × 55	1.14	0.15	0.737	0.99	LSG271M2G--A2255
	270	25 × 45	1.17	0.15	0.737	0.99	LSG271M2G--A2545
	270	30 × 35	1.16	0.15	0.737	0.99	LSG271M2G--A3035
	270	35 × 25	1.08	0.15	0.737	0.99	LSG271M2G--A3525
	330	25 × 50	1.30	0.15	0.603	1.09	LSG331M2G--A2550
	330	30 × 40	1.36	0.15	0.603	1.09	LSG331M2G--A3040
	390	30 × 45	1.56	0.15	0.510	1.18	LSG391M2G--A3045
	390	35 × 30	1.44	0.15	0.510	1.18	LSG391M2G--A3530
	470	30 × 50	1.72	0.15	0.423	1.30	LSG471M2G--A3050
	470	35 × 40	1.78	0.15	0.423	1.30	LSG471M2G--A3540
	560	30 × 55	1.95	0.15	0.355	1.42	LSG561M2G--A3055
	560	35 × 40	1.86	0.15	0.355	1.42	LSG561M2G--A3540
	560	40 × 35	1.91	0.15	0.355	1.42	LSG561M2G--A4035

Dimension and Permissible Ripple Current

Rated Voltage V_{DC}	Capacitance 120 Hz, 20℃ μF	ϕD×L mm	Ripple Current 120 Hz, 105℃ A/rms	Tan δ at 120 Hz, 20℃	ESR 120 Hz, 20℃ Ω	LC 5 minutes mA	Part Number
400	680	35 × 50	2.25	0.15	0.293	1.50	LSG681M2G--A3550
	680	40 × 40	2.22	0.15	0.293	1.50	LSG681M2G--A4040
	820	35 × 55	2.58	0.15	0.243	1.50	LSG821M2G--A3555
	820	40 × 50	2.67	0.15	0.243	1.50	LSG821M2G--A4050
	1,000	35 × 65	2.90	0.15	0.243	1.50	LSG102M2G--A3565
	1,000	40 × 55	2.92	0.15	0.199	1.50	LSG102M2G--A4055
	1,200	35 × 75	3.39	0.15	0.199	1.50	LSG122M2G--A3575
	1,200	40 × 60	3.31	0.15	0.166	1.50	LSG122M2G--A4060
	1,500	45 × 70	4.23	0.15	0.133	1.50	LSG152M2G--A4570
	1,800	45 × 80	4.92	0.15	0.111	1.50	LSG182M2G--A4580
420	82	22 × 25	0.45	0.15	2.427	0.56	LSG820M2P--A2225
	100	22 × 30	0.53	0.15	1.990	0.61	LSG101M2P--A2230
	120	22 × 35	0.62	0.15	1.659	0.67	LSG121M2P--A2235
	120	25 × 25	0.58	0.15	1.659	0.67	LSG121M2P--A2525
	150	22 × 40	0.74	0.15	1.327	0.75	LSG151M2P--A2240
	180	22 × 45	0.85	0.15	1.106	0.82	LSG181M2P--A2245
	180	25 × 30	0.77	0.15	1.106	0.82	LSG181M2P--A2530
	220	22 × 50	1.00	0.15	0.905	0.91	LSG221M2P--A2250
	220	25 × 40	0.96	0.15	0.905	0.91	LSG221M2P--A2540
	220	30 × 30	0.95	0.15	0.905	0.91	LSG221M2P--A3030
	270	22 × 60	1.20	0.15	0.737	1.01	LSG271M2P--A2260
	270	25 × 50	1.10	0.15	0.737	1.01	LSG271M2P--A2550
	270	30 × 35	1.06	0.15	0.737	1.01	LSG271M2P--A3035
	270	35 × 30	1.09	0.15	0.737	1.01	LSG271M2P--A3530
	330	25 × 55	1.36	0.15	0.603	1.12	LSG331M2P--A2555
	330	30 × 40	1.24	0.15	0.603	1.12	LSG331M2P--A3040
	330	35 × 30	1.21	0.15	0.603	1.12	LSG331M2P--A3530
	390	30 × 45	1.42	0.15	0.510	1.21	LSG391M2P--A3045
	390	35 × 35	1.40	0.15	0.510	1.21	LSG391M2P--A3535
	390	40 × 40	1.60	0.15	0.510	1.21	LSG391M2P--A4040
	470	35 × 40	1.62	0.15	0.423	1.33	LSG471M2P--A3540
	470	40 × 35	1.66	0.15	0.423	1.33	LSG471M2P--A4035
	560	35 × 45	1.77	0.15	0.355	1.45	LSG561M2P--A3545
	560	40 × 40	1.82	0.15	0.355	1.45	LSG561M2P--A4040
	680	35 × 50	2.12	0.15	0.293	1.50	LSG681M2P--A3550
	680	40 × 45	2.11	0.15	0.293	1.50	LSG681M2P--A4045
	820	35 × 60	2.42	0.15	0.243	1.50	LSG821M2P--A3560
	820	40 × 55	2.52	0.15	0.243	1.50	LSG821M2P--A4055
	1,000	35 × 70	3.08	0.15	0.199	1.50	LSG102M2P--A3570
	1,000	40 × 60	2.88	0.15	0.199	1.50	LSG102M2P--A4060
	1,200	35 × 90	3.51	0.15	0.166	1.50	LSG122M2P--A3590
	1,200	40 × 70	3.38	0.15	0.166	1.50	LSG122M2P--A4070
450	82	22 × 25	0.45	0.15	2.427	0.58	LSG820M2W--A2225
	100	22 × 30	0.53	0.15	1.990	0.64	LSG101M2W--A2230
	100	25 × 25	0.51	0.15	1.990	0.64	LSG101M2W--A2525
	120	22 × 35	0.62	0.15	1.659	0.70	LSG121M2W--A2235
	150	22 × 40	0.74	0.15	1.327	0.78	LSG151M2W--A2240
	150	25 × 30	0.70	0.15	1.327	0.78	LSG151M2W--A2530
	150	35 × 25	0.83	0.15	1.327	0.78	LSG151M2W--A3525
	180	22 × 45	0.88	0.15	1.106	0.85	LSG181M2W--A2245
	180	25 × 35	0.82	0.15	1.106	0.85	LSG181M2W--A2535
	180	30 × 25	0.80	0.15	1.106	0.85	LSG181M2W--A3025
	220	25 × 40	0.96	0.15	0.905	0.94	LSG221M2W--A2540
	220	30 × 30	0.95	0.15	0.905	0.94	LSG221M2W--A3030
	270	25 × 50	1.21	0.15	0.737	1.05	LSG271M2W--A2550
	270	30 × 35	1.12	0.15	0.737	1.05	LSG271M2W--A3035
	330	25 × 55	1.35	0.15	0.603	1.16	LSG331M2W--A2555
	330	30 × 40	1.31	0.15	0.603	1.16	LSG331M2W--A3040
	330	35 × 30	1.27	0.15	0.603	1.16	LSG331M2W--A3530
	390	30 × 45	1.49	0.15	0.510	1.26	LSG391M2W--A3045
	390	35 × 35	1.47	0.15	0.510	1.26	LSG391M2W--A3535
	390	40 × 30	1.51	0.15	0.510	1.26	LSG391M2W--A4030

Dimension and Permissible Ripple Current

Rated Voltage V_{DC}	Capacitance 120 Hz, 20℃ μF	ϕD×L mm	Ripple Current 120 Hz, 105℃ A/rms	Tan δ at 120 Hz, 20℃	ESR 120 Hz, 20℃ Ω	LC 5 minutes mA	Part Number
450	470	30 × 55	1.79	0.15	0.423	1.38	LSG471M2W--A3055
	470	35 × 40	1.71	0.15	0.423	1.38	LSG471M2W--A3540
	470	40 × 35	1.75	0.15	0.423	1.38	LSG471M2W--A4035
	560	35 × 45	1.96	0.15	0.355	1.50	LSG561M2W--A3545
	560	40 × 40	2.02	0.15	0.355	1.50	LSG561M2W--A4040
	680	35 × 55	2.35	0.15	0.293	1.50	LSG681M2W--A3555
	680	40 × 45	2.33	0.15	0.293	1.50	LSG681M2W--A4045
	820	40 × 50	2.68	0.15	0.243	1.50	LSG821M2W--A4050
	1,000	40 × 60	3.03	0.15	0.199	1.50	LSG102M2W--A4060
	1,200	35 × 90	3.68	0.15	0.166	1.50	LSG122M2W--A3590
	1,200	40 × 70	3.54	0.15	0.166	1.50	LSG122M2W--A4070
	1,500	45 × 80	4.49	0.15	0.133	1.50	LSG152M2W--A4580
500	82	22 × 30	0.75	0.15	2.427	0.61	LSG820M2H--A2230
	82	25 × 30	0.81	0.15	2.427	0.61	LSG820M2H--A2530
	100	22 × 40	0.94	0.15	1.990	0.67	LSG101M2H--A2240
	100	25 × 40	1.00	0.15	1.990	0.67	LSG101M2H--A2540
	120	22 × 50	1.14	0.15	1.659	0.73	LSG121M2H--A2250
	120	25 × 50	1.22	0.15	1.659	0.73	LSG121M2H--A2550
	150	22 × 50	1.27	0.15	1.327	0.82	LSG151M2H--A2250
	150	25 × 55	1.42	0.15	1.327	0.82	LSG151M2H--A2555
	180	30 × 35	1.42	0.15	1.106	0.90	LSG181M2H--A3035
	220	30 × 35	1.57	0.15	0.905	0.99	LSG221M2H--A3035
	220	35 × 40	1.74	0.15	0.905	0.99	LSG221M2H--A3540
	270	35 × 45	2.02	0.15	0.737	1.10	LSG271M2H--A3545
	330	35 × 50	2.45	0.15	0.603	1.22	LSG331M2H--A3550
	470	35 × 60	2.62	0.15	0.423	1.45	LSG471M2H--A3560
	680	35 × 70	3.38	0.15	0.293	1.50	LSG681M2H--A3570
	820	40 × 70	4.00	0.15	0.243	1.50	LSG821M2H--A4070
	1,000	40 × 80	4.68	0.15	0.199	1.50	LSG102M2H--A4080

Part Numbering System

LSG Series	100μF	±20%	400V		4.0±0.5mm	22ϕ×30L	Pb-free Terminal + PET Sleeve
LSG	**101**	**M**	**2G**	**- -**	**A**	**2230**	
Series Name	Capacitance	Capacitance tolerance	Rated voltage	Terminal type	Terminal length	Case size	Terminal and Sleeve Type

Example:

Cap.	Symbol
56	560
220	221
470	471

M = ±20%
K = ±10%

Example:

Voltage	Symbol
400	2G
450	2W

Example:

Type	Symbol
2 pins	- -
5 pins	L5

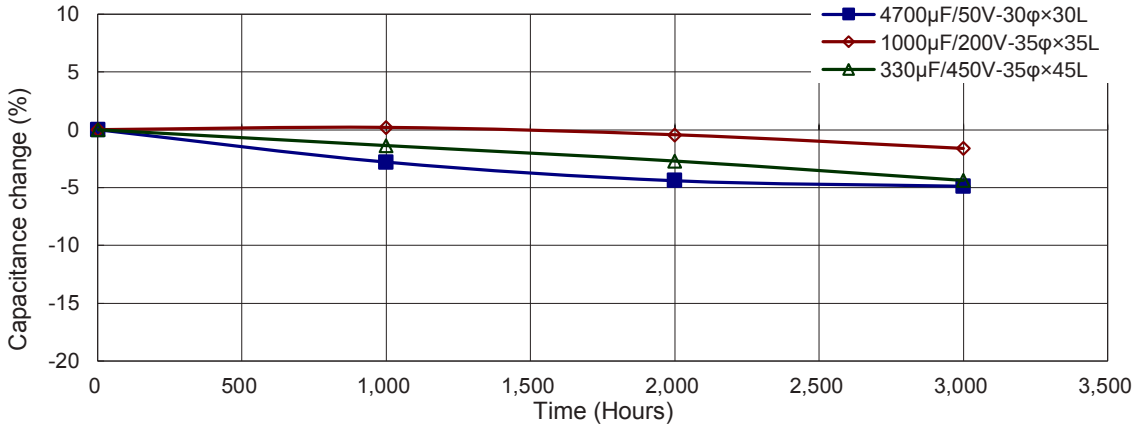
"-": 6.3±1.0 mm

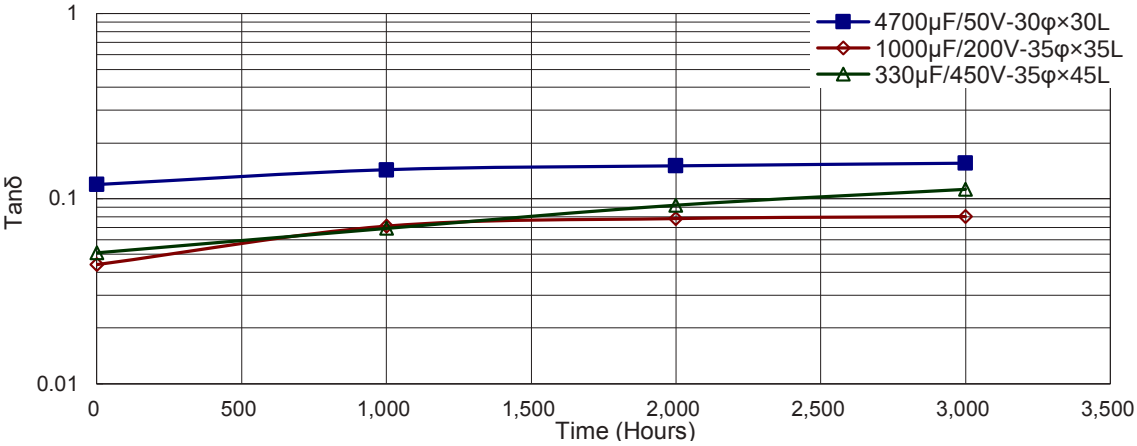
Example:

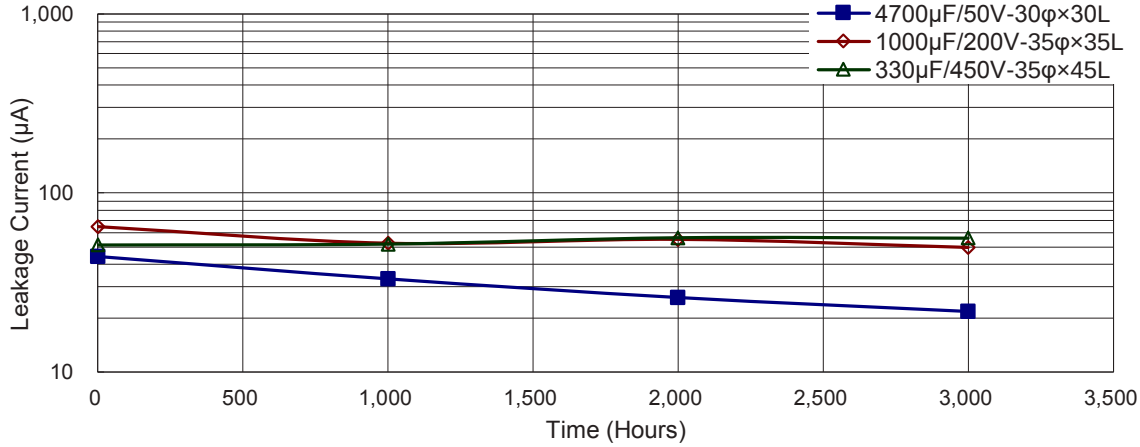
ϕD×L	Code
22×30	2230
25×25	2525
30×40	3040

Note: For more details, please refer to "Part Numbering System (Snap-in Type)" on page 16.

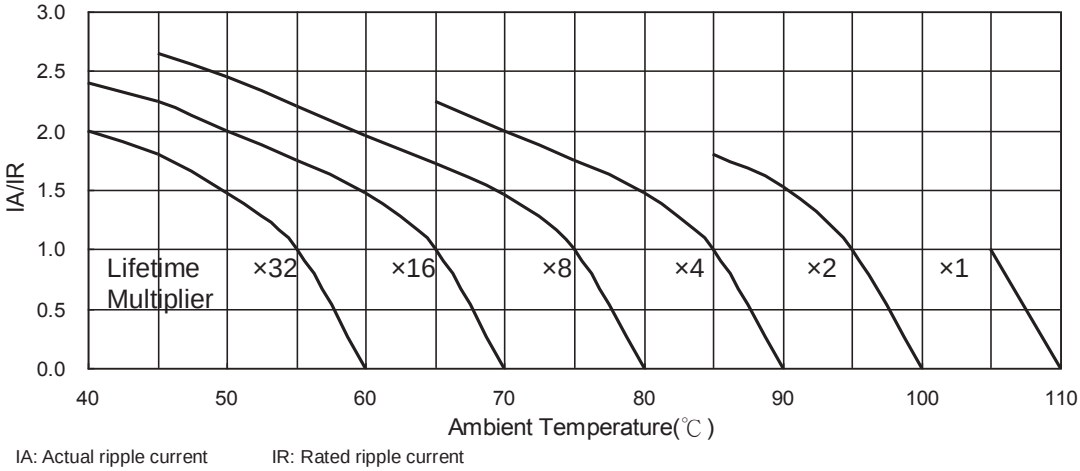
Typical Endurance Curves







Useful Life Chart



IA: Actual ripple current IR: Rated ripple current

Snap-in

LSM Series

Features
- Snap-in terminal type
- 105℃, 3,000 hours assured
- RoHS compliance

Specifications

Items	Performance	
Category Temperature Range	16 ~ 100V	160 ~ 500V
	-40℃ ~ +105℃	-25℃ ~ +105℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)	
Leakage Current (at 20℃)	$I = 3\sqrt{CV}$ or 1.5 mA whichever is smaller (after 5 minutes) Where, C = rated capacitance in μF, V = rated DC Rated Voltage in V	

Tanδ (at 120 Hz, 20℃)

Rated Voltage	16	25	35	50	63	80	100	160	200	250	350	400	420	450	500
Tanδ (max)	0.50	0.45	0.40	0.35	0.30	0.25	0.20	0.10*	0.10*	0.10*	0.15	0.15	0.15	0.15	0.15

*: 0.15 for φD = 35mm

Low Temperature Characteristics (at 120 Hz)

Impedance ratio shall not exceed the values given in the table below.

Rated Voltage		16	25	35	50	63	80	100	160	200	250	350	400	420	450	500
Impedance Ratio	Z(-25℃)/ Z(+20℃)	4	3	3	2	2	2	2	4	4	4	4	8	8	8	8
	Z(-40℃)/ Z(+20℃)	15	10	8	6	6	6	5	-	-	-	-	-	-	-	-

Endurance

Test Time	3,000 Hrs
Capacitance Change	Within ±20% of initial value
Tanδ	Less than 200% of specified value
Leakage Current	Within specified value

* The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied with rated ripple current for 3,000 hours at 105℃.

Shelf Life Test

Test Time	1,000 Hrs
Capacitance Change	Within ±20% of initial value
Tanδ	Less than 150% of specified value
Leakage Current	Within specified value

* The above specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 105 ℃ without voltage applied. The rated voltage shall be applied to the capacitors before the measurements (Refer to JIS C 5101-4 4.1).

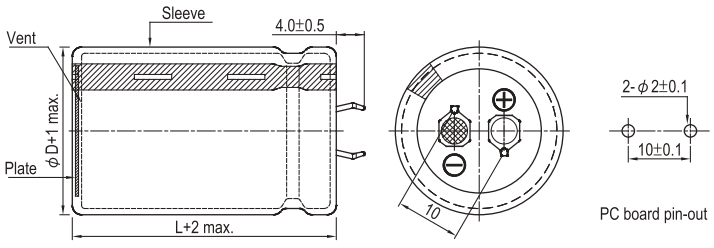
Ripple Current and Frequency Multipliers

Frequency (Hz)	50 / 60	100 / 120	300	1k	10k up
Multiplier	0.8	1.0	1.1	1.3	1.4

Failure percentage Failure rate: When the failure percentage / failure rate is required, please contact with us for further discussion.

Diagram of Dimensions

Unit: mm



Snap-in

Dimension and Permissible Ripple Current

Rated Voltage V_{DC}	Capacitance 120 Hz, 20℃ μF	ϕD×L mm	Ripple Current 120 Hz, 105℃ A/rms	Tan δ at 120 Hz, 20℃	ESR 120 Hz, 20℃ Ω	LC 5 minutes mA	Part Number
16	4,700	22 × 25	1.30	0.50	0.141	0.82	LSM472M1C--A2225
	6,800	22 × 35	1.80	0.50	0.098	0.99	LSM682M1C--A2235
	6,800	25 × 30	1.80	0.50	0.098	0.99	LSM682M1C--A2530
	10,000	22 × 45	2.34	0.50	0.066	1.20	LSM103M1C--A2245
	10,000	25 × 35	2.25	0.50	0.066	1.20	LSM103M1C--A2535
	10,000	30 × 25	2.19	0.50	0.066	1.20	LSM103M1C--A3025
	15,000	25 × 45	2.83	0.50	0.044	1.47	LSM153M1C--A2545
	15,000	30 × 35	2.82	0.50	0.044	1.47	LSM153M1C--A3035
	15,000	35 × 30	2.82	0.50	0.044	1.47	LSM153M1C--A3530
	22,000	30 × 45	3.13	0.50	0.030	1.50	LSM223M1C--A3045
	22,000	35 × 35	3.09	0.50	0.030	1.50	LSM223M1C--A3535
25	3,300	22 × 25	1.25	0.45	0.181	0.86	LSM332M1E--A2225
	4,700	22 × 30	1.61	0.45	0.127	1.03	LSM472M1E--A2230
	4,700	25 × 25	1.61	0.45	0.127	1.03	LSM472M1E--A2525
	6,800	22 × 35	1.91	0.45	0.088	1.24	LSM682M1E--A2235
	6,800	25 × 30	1.91	0.45	0.088	1.24	LSM682M1E--A2530
	6,800	30 × 25	1.91	0.45	0.088	1.24	LSM682M1E--A3025
	10,000	22 × 45	2.51	0.45	0.060	1.50	LSM103M1E--A2245
	10,000	25 × 40	2.42	0.45	0.060	1.50	LSM103M1E--A2540
	10,000	30 × 30	2.42	0.45	0.060	1.50	LSM103M1E--A3030
	10,000	35 × 25	2.42	0.45	0.060	1.50	LSM103M1E--A3525
	15,000	25 × 45	3.12	0.45	0.040	1.50	LSM153M1E--A2545
	15,000	30 × 35	3.11	0.45	0.040	1.50	LSM153M1E--A3035
	15,000	35 × 30	3.11	0.45	0.040	1.50	LSM153M1E--A3530
	22,000	30 × 45	3.85	0.45	0.027	1.50	LSM223M1E--A3045
	22,000	35 × 40	3.85	0.45	0.027	1.50	LSM223M1E--A3540
35	2,200	22 × 25	1.14	0.40	0.241	0.83	LSM222M1V--A2225
	2,200	25 × 25	1.51	0.40	0.241	0.83	LSM222M1V--A2525
	3,300	22 × 30	1.51	0.40	0.161	1.02	LSM332M1V--A2230
	3,300	25 × 30	1.92	0.40	0.161	1.02	LSM332M1V--A2530
	4,700	22 × 35	1.92	0.40	0.113	1.22	LSM472M1V--A2235
	4,700	25 × 40	2.31	0.40	0.113	1.22	LSM472M1V--A2540
	4,700	30 × 25	1.92	0.40	0.113	1.22	LSM472M1V--A3025
	6,800	22 × 45	2.31	0.40	0.078	1.46	LSM682M1V--A2245
	6,800	25 × 45	2.87	0.40	0.078	1.46	LSM682M1V--A2545
	6,800	30 × 30	2.33	0.40	0.078	1.46	LSM682M1V--A3030
	6,800	35 × 25	2.33	0.40	0.078	1.46	LSM682M1V--A3525
	10,000	30 × 35	2.87	0.40	0.053	1.50	LSM103M1V--A3035
	10,000	35 × 30	2.87	0.40	0.053	1.50	LSM103M1V--A3530
	15,000	30 × 45	3.66	0.40	0.035	1.50	LSM153M1V--A3045
	15,000	35 × 40	3.66	0.40	0.035	1.50	LSM153M1V--A3540
	22,000	35 × 45	4.53	0.40	0.024	1.50	LSM223M1V--A3545
50	1,500	22 × 25	1.22	0.35	0.310	0.82	LSM152M1H--A2225
	2,200	22 × 30	1.59	0.35	0.211	0.99	LSM222M1H--A2230
	2,200	25 × 25	1.59	0.35	0.211	0.99	LSM222M1H--A2525
	3,300	22 × 35	1.93	0.35	0.141	1.22	LSM332M1H--A2235
	3,300	25 × 30	1.88	0.35	0.141	1.22	LSM332M1H--A2530
	3,300	30 × 25	1.88	0.35	0.141	1.22	LSM332M1H--A3025
	4,700	22 × 45	2.43	0.35	0.099	1.45	LSM472M1H--A2245
	4,700	25 × 35	2.34	0.35	0.099	1.45	LSM472M1H--A2535
	4,700	30 × 30	2.42	0.35	0.099	1.45	LSM472M1H--A3030
	4,700	35 × 25	2.42	0.35	0.099	1.45	LSM472M1H--A3525
	6,800	25 × 45	3.10	0.35	0.068	1.50	LSM682M1H--A2545
	6,800	30 × 35	3.10	0.35	0.068	1.50	LSM682M1H--A3035
	6,800	35 × 30	3.10	0.35	0.068	1.50	LSM682M1H--A3530
	10,000	30 × 45	4.18	0.35	0.046	1.50	LSM103M1H--A3045
	10,000	35 × 40	4.20	0.35	0.046	1.50	LSM103M1H--A3540
63	1,000	20 × 20	0.90	0.30	0.398	0.75	LSM102M1J--A2020
	1,000	22 × 20	0.90	0.30	0.398	0.75	LSM102M1J--A2220
	1,200	20 × 25	1.08	0.30	0.332	0.82	LSM122M1J--A2025
	1,200	22 × 20	1.05	0.30	0.332	0.82	LSM122M1J--A2220
	1,500	20 × 30	1.31	0.30	0.265	0.92	LSM152M1J--A2030
	1,500	22 × 25	1.28	0.30	0.265	0.92	LSM152M1J--A2225

Dimension and Permissible Ripple Current

Rated Voltage V_{DC}	Capacitance 120 Hz, 20℃ μF	ϕD×L mm	Ripple Current 120 Hz, 105℃ A/rms	Tan δ at 120 Hz, 20℃	ESR 120 Hz, 20℃ Ω	LC 5 minutes mA	Part Number
63	1,500	25 × 20	1.27	0.30	0.265	0.92	LSM152M1J--A2520
	2,200	20 × 35	1.70	0.30	0.181	1.12	LSM222M1J--A2035
	2,200	22 × 35	1.78	0.30	0.181	1.12	LSM222M1J--A2235
	2,200	25 × 25	1.60	0.30	0.181	1.12	LSM222M1J--A2525
	2,200	30 × 25	1.78	0.30	0.181	1.12	LSM222M1J--A3025
	2,700	20 × 40	1.82	0.30	0.147	1.24	LSM272M1J--A2040
	2,700	22 × 35	1.81	0.30	0.147	1.24	LSM272M1J--A2235
	2,700	25 × 30	1.83	0.30	0.147	1.24	LSM272M1J--A2530
	2,700	30 × 25	1.89	0.30	0.147	1.24	LSM272M1J--A3025
	3,300	20 × 45	2.00	0.30	0.121	1.37	LSM332M1J--A2045
	3,300	22 × 40	2.00	0.30	0.121	1.37	LSM332M1J--A2240
	3,300	25 × 35	2.03	0.30	0.121	1.37	LSM332M1J--A2535
	3,300	30 × 25	1.81	0.30	0.121	1.37	LSM332M1J--A3025
	3,300	35 × 25	2.03	0.30	0.121	1.37	LSM332M1J--A3525
	3,900	20 × 50	2.16	0.30	0.102	1.49	LSM392M1J--A2050
	3,900	22 × 50	2.37	0.30	0.102	1.49	LSM392M1J--A2250
	3,900	25 × 40	2.22	0.30	0.102	1.49	LSM392M1J--A2540
	3,900	30 × 30	2.19	0.30	0.102	1.49	LSM392M1J--A3030
	3,900	35 × 25	2.24	0.30	0.102	1.49	LSM392M1J--A3525
	4,700	25 × 45	2.56	0.30	0.085	1.50	LSM472M1J--A2545
	4,700	30 × 35	2.66	0.30	0.085	1.50	LSM472M1J--A3035
	4,700	35 × 25	2.46	0.30	0.085	1.50	LSM472M1J--A3525
	5,600	25 × 50	2.93	0.30	0.071	1.50	LSM562M1J--A2550
	5,600	30 × 35	2.79	0.30	0.071	1.50	LSM562M1J--A3035
	5,600	35 × 30	2.88	0.30	0.071	1.50	LSM562M1J--A3530
	6,800	30 × 40	3.25	0.30	0.059	1.50	LSM682M1J--A3040
	6,800	35 × 35	3.26	0.30	0.059	1.50	LSM682M1J--A3535
	6,800	35 × 40	3.49	0.30	0.059	1.50	LSM682M1J--A3540
	8,200	35 × 40	3.52	0.30	0.049	1.50	LSM822M1J--A3540
80	1,000	22 × 25	1.05	0.25	0.332	0.85	LSM102M1K--A2225
	1,000	25 × 20	1.04	0.25	0.332	0.85	LSM102M1K--A2520
	1,200	20 × 30	1.17	0.25	0.276	0.93	LSM122M1K--A2030
	1,200	22 × 30	1.24	0.25	0.276	0.93	LSM122M1K--A2230
	1,200	25 × 25	1.24	0.25	0.276	0.93	LSM122M1K--A2525
	1,500	20 × 40	1.49	0.25	0.221	1.04	LSM152M1K--A2040
	1,500	22 × 35	1.54	0.25	0.221	1.04	LSM152M1K--A2235
	1,500	25 × 30	1.54	0.25	0.221	1.04	LSM152M1K--A2530
	1,500	30 × 25	1.61	0.25	0.221	1.04	LSM152M1K--A3025
	2,200	20 × 50	1.94	0.25	0.151	1.26	LSM222M1K--A2050
	2,200	22 × 45	1.95	0.25	0.151	1.26	LSM222M1K--A2245
	2,200	25 × 35	1.94	0.25	0.151	1.26	LSM222M1K--A2535
	2,200	30 × 30	2.05	0.25	0.151	1.26	LSM222M1K--A3030
	2,200	35 × 25	2.10	0.25	0.151	1.26	LSM222M1K--A3525
	3,300	25 × 50	2.25	0.25	0.101	1.50	LSM332M1K--A2550
	3,300	30 × 35	2.24	0.25	0.101	1.50	LSM332M1K--A3035
	3,300	35 × 30	2.30	0.25	0.101	1.50	LSM332M1K--A3530
	4,700	30 × 45	2.84	0.25	0.071	1.50	LSM472M1K--A3045
	4,700	35 × 35	2.80	0.25	0.071	1.50	LSM472M1K--A3535
100	1,000	20 × 35	1.28	0.20	0.265	0.95	LSM102M2A--A2035
	1,000	22 × 30	1.36	0.20	0.265	0.95	LSM102M2A--A2230
	1,000	25 × 25	1.36	0.20	0.265	0.95	LSM102M2A--A2525
	1,200	20 × 40	1.49	0.20	0.221	1.04	LSM122M2A--A2040
	1,200	22 × 35	1.48	0.20	0.221	1.04	LSM122M2A--A2235
	1,200	25 × 30	1.49	0.20	0.221	1.04	LSM122M2A--A2530
	1,500	20 × 45	1.75	0.20	0.177	1.16	LSM152M2A--A2045
	1,500	22 × 40	1.82	0.20	0.177	1.16	LSM152M2A--A2240
	1,500	25 × 35	1.85	0.20	0.177	1.16	LSM152M2A--A2535
	1,500	30 × 25	1.80	0.20	0.177	1.16	LSM152M2A--A3025
	2,200	25 × 45	2.50	0.20	0.121	1.41	LSM222M2A--A2545
	2,200	30 × 35	2.50	0.20	0.121	1.41	LSM222M2A--A3035
	2,200	35 × 30	2.50	0.20	0.121	1.41	LSM222M2A--A3530
	2,700	25 × 50	2.70	0.20	0.098	1.50	LSM272M2A--A2550
	2,700	30 × 40	2.72	0.20	0.098	1.50	LSM272M2A--A3040
	2,700	35 × 35	2.82	0.20	0.098	1.50	LSM272M2A--A3535
	3,300	30 × 45	3.11	0.20	0.080	1.50	LSM332M2A--A3045

Dimension and Permissible Ripple Current

Rated Voltage V_{DC}	Capacitance 120 Hz, 20℃ μF	φD×L mm	Ripple Current 120 Hz, 105℃ A/rms	Tan δ at 120 Hz, 20℃	ESR 120 Hz, 20℃ Ω	LC 5 minutes mA	Part Number
100	3,300	35 × 35	3.07	0.20	0.080	1.50	LSM332M2A--A3535
	3,900	30 × 50	3.40	0.20	0.068	1.50	LSM392M2A--A3050
	3,900	35 × 40	3.38	0.20	0.068	1.50	LSM392M2A--A3540
	4,700	35 × 45	3.90	0.20	0.056	1.50	LSM472M2A--A3545
160	180	20 × 20	0.61	0.10	0.737	0.51	LSM181M2C--A2020
	220	20 × 25	0.73	0.10	0.603	0.56	LSM221M2C--A2025
	220	22 × 20	0.71	0.10	0.603	0.56	LSM221M2C--A2220
	270	20 × 25	0.81	0.10	0.491	0.62	LSM271M2C--A2025
	270	25 × 20	0.85	0.10	0.491	0.62	LSM271M2C--A2520
	330	20 × 30	0.97	0.10	0.402	0.69	LSM331M2C--A2030
	330	22 × 25	0.98	0.10	0.402	0.69	LSM331M2C--A2225
	330	25 × 20	0.94	0.10	0.402	0.69	LSM331M2C--A2520
	390	20 × 30	1.06	0.10	0.340	0.75	LSM391M2C--A2030
	390	22 × 25	1.03	0.10	0.340	0.75	LSM391M2C--A2225
	390	25 × 25	1.09	0.10	0.340	0.75	LSM391M2C--A2525
	470	20 × 35	1.17	0.10	0.282	0.82	LSM471M2C--A2035
	470	22 × 30	1.21	0.10	0.282	0.82	LSM471M2C--A2230
	470	25 × 25	1.19	0.10	0.282	0.82	LSM471M2C--A2525
	560	20 × 40	1.35	0.10	0.237	0.90	LSM561M2C--A2040
	560	22 × 35	1.40	0.10	0.237	0.90	LSM561M2C--A2235
	560	25 × 30	1.40	0.10	0.237	0.90	LSM561M2C--A2530
	560	30 × 25	1.40	0.10	0.237	0.90	LSM561M2C--A3025
	680	20 × 45	1.57	0.10	0.195	0.99	LSM681M2C--A2045
	680	22 × 40	1.62	0.10	0.195	0.99	LSM681M2C--A2240
	680	25 × 35	1.61	0.10	0.195	0.99	LSM681M2C--A2535
	680	30 × 25	1.54	0.10	0.195	0.99	LSM681M2C--A3025
	820	22 × 45	1.86	0.10	0.162	1.09	LSM821M2C--A2245
	820	25 × 40	1.86	0.10	0.162	1.09	LSM821M2C--A2540
	820	30 × 30	1.79	0.10	0.162	1.09	LSM821M2C--A3030
	820	35 × 25	1.79	0.15	0.243	1.09	LSM821M2C--A3525
	1,000	22 × 50	2.18	0.10	0.133	1.20	LSM102M2C--A2250
	1,000	25 × 45	2.15	0.10	0.133	1.20	LSM102M2C--A2545
	1,000	30 × 35	2.09	0.10	0.133	1.20	LSM102M2C--A3035
	1,000	35 × 25	1.98	0.15	0.199	1.20	LSM102M2C--A3525
	1,200	25 × 50	2.35	0.10	0.111	1.31	LSM122M2C--A2550
	1,200	30 × 40	2.35	0.10	0.111	1.31	LSM122M2C--A3040
	1,200	35 × 30	2.29	0.15	0.166	1.31	LSM122M2C--A3530
	1,500	30 × 35	2.56	0.10	0.088	1.47	LSM152M2C--A3035
	1,500	35 × 35	2.72	0.15	0.133	1.47	LSM152M2C--A3535
	1,800	30 × 45	2.97	0.10	0.074	1.50	LSM182M2C--A3045
	1,800	35 × 40	3.09	0.15	0.111	1.50	LSM182M2C--A3540
	2,200	30 × 60	3.48	0.10	0.060	1.50	LSM222M2C--A3060
	2,200	35 × 50	3.51	0.15	0.090	1.50	LSM222M2C--A3550
	2,700	35 × 55	4.05	0.15	0.074	1.50	LSM272M2C--A3555
200	180	22 × 20	0.70	0.10	0.737	0.57	LSM181M2D--A2220
	220	20 × 25	0.80	0.10	0.603	0.63	LSM221M2D--A2025
	220	25 × 20	0.84	0.10	0.603	0.63	LSM221M2D--A2520
	270	20 × 30	0.96	0.10	0.491	0.70	LSM271M2D--A2030
	270	22 × 25	1.03	0.10	0.491	0.70	LSM271M2D--A2225
	330	22 × 30	1.21	0.10	0.402	0.77	LSM331M2D--A2230
	390	20 × 35	1.24	0.10	0.340	0.84	LSM391M2D--A2035
	390	22 × 35	1.39	0.10	0.340	0.84	LSM391M2D--A2235
	390	25 × 25	1.31	0.10	0.340	0.84	LSM391M2D--A2525
	470	20 × 40	1.44	0.10	0.282	0.92	LSM471M2D--A2040
	470	22 × 35	1.52	0.10	0.282	0.92	LSM471M2D--A2235
	470	25 × 30	1.52	0.10	0.282	0.92	LSM471M2D--A2530
	560	20 × 50	1.74	0.10	0.237	1.00	LSM561M2D--A2050
	560	22 × 40	1.66	0.10	0.237	1.00	LSM561M2D--A2240
	560	25 × 35	1.75	0.10	0.237	1.00	LSM561M2D--A2535
	560	30 × 25	1.64	0.10	0.237	1.00	LSM561M2D--A3025
	680	22 × 45	2.04	0.10	0.195	1.11	LSM681M2D--A2245
	680	25 × 40	2.04	0.10	0.195	1.11	LSM681M2D--A2540
	680	30 × 30	1.96	0.10	0.195	1.11	LSM681M2D--A3030
	820	25 × 45	2.34	0.10	0.162	1.21	LSM821M2D--A2545
	820	30 × 35	2.27	0.10	0.162	1.21	LSM821M2D--A3035

Dimension and Permissible Ripple Current

Rated Voltage V_{DC}	Capacitance 120 Hz, 20℃ μF	ϕD×L mm	Ripple Current 120 Hz, 105℃ A/rms	Tan δ at 120 Hz, 20℃	ESR 120 Hz, 20℃ Ω	LC 5 minutes mA	Part Number
200	820	35 × 25	1.99	0.15	0.243	1.21	LSM821M2D--A3525
	1,000	25 × 50	2.26	0.10	0.133	1.34	LSM102M2D--A2550
	1,000	30 × 40	2.63	0.10	0.133	1.34	LSM102M2D--A3040
	1,000	35 × 30	2.51	0.15	0.199	1.34	LSM102M2D--A3530
	1,200	30 × 45	3.00	0.10	0.111	1.47	LSM122M2D--A3045
	1,200	35 × 35	2.92	0.15	0.166	1.47	LSM122M2D--A3535
	1,500	30 × 50	3.36	0.10	0.088	1.50	LSM152M2D--A3050
	1,500	35 × 40	3.34	0.15	0.133	1.50	LSM152M2D--A3540
	1,800	30 × 60	3.64	0.10	0.074	1.50	LSM182M2D--A3060
	1,800	35 × 45	3.51	0.15	0.111	1.50	LSM182M2D--A3545
	2,200	35 × 55	4.01	0.15	0.090	1.50	LSM222M2D--A3555
250	180	22 × 25	0.77	0.10	0.737	0.64	LSM181M2E--A2225
	220	20 × 30	0.87	0.10	0.603	0.70	LSM221M2E--A2030
	270	20 × 35	1.03	0.10	0.491	0.78	LSM271M2E--A2035
	270	22 × 30	1.02	0.10	0.491	0.78	LSM271M2E--A2230
	270	25 × 25	1.08	0.10	0.491	0.78	LSM271M2E--A2525
	330	20 × 40	1.21	0.10	0.402	0.86	LSM331M2E--A2040
	330	22 × 35	1.20	0.10	0.402	0.86	LSM331M2E--A2235
	330	25 × 30	1.27	0.10	0.402	0.86	LSM331M2E--A2530
	390	20 × 50	1.45	0.10	0.340	0.94	LSM391M2E--A2050
	390	22 × 40	1.38	0.10	0.340	0.94	LSM391M2E--A2240
	390	25 × 35	1.46	0.10	0.340	0.94	LSM391M2E--A2535
	390	30 × 25	1.39	0.10	0.340	0.94	LSM391M2E--A3025
	470	22 × 45	1.46	0.10	0.282	1.03	LSM471M2E--A2245
	470	25 × 40	1.69	0.10	0.282	1.03	LSM471M2E--A2540
	470	30 × 30	1.63	0.10	0.282	1.03	LSM471M2E--A3030
	560	25 × 45	1.93	0.10	0.237	1.12	LSM561M2E--A2545
	560	35 × 25	1.78	0.15	0.355	1.12	LSM561M2E--A3525
	680	25 × 50	2.04	0.10	0.195	1.24	LSM681M2E--A2550
	680	30 × 35	2.06	0.10	0.195	1.24	LSM681M2E--A3035
	680	35 × 30	2.06	0.15	0.293	1.24	LSM681M2E--A3530
	820	30 × 45	2.48	0.10	0.162	1.36	LSM821M2E--A3045
	820	35 × 35	2.41	0.15	0.243	1.36	LSM821M2E--A3535
	1,000	30 × 50	2.65	0.10	0.133	1.50	LSM102M2E--A3050
	1,000	35 × 40	2.76	0.15	0.199	1.50	LSM102M2E--A3540
	1,200	30 × 60	3.15	0.10	0.111	1.50	LSM122M2E--A3060
	1,200	35 × 45	3.14	0.15	0.166	1.50	LSM122M2E--A3545
	1,800	35 × 60	3.97	0.15	0.111	1.50	LSM182M2E--A3560
350	100	20 × 30	0.53	0.15	1.990	0.56	LSM101M2V--A2030
	100	22 × 25	0.52	0.15	1.990	0.56	LSM101M2V--A2225
	100	25 × 20	0.52	0.15	1.990	0.56	LSM101M2V--A2520
	120	20 × 35	0.63	0.15	1.659	0.61	LSM121M2V--A2035
	120	22 × 30	0.62	0.15	1.659	0.61	LSM121M2V--A2230
	120	25 × 25	0.65	0.15	1.659	0.61	LSM121M2V--A2525
	150	20 × 40	0.74	0.15	1.327	0.69	LSM151M2V--A2040
	150	22 × 35	0.74	0.15	1.327	0.69	LSM151M2V--A2235
	180	20 × 45	0.81	0.15	1.106	0.75	LSM181M2V--A2045
	180	22 × 40	0.81	0.15	1.106	0.75	LSM181M2V--A2240
	180	25 × 30	0.77	0.15	1.106	0.75	LSM181M2V--A2530
	180	30 × 25	0.80	0.15	1.106	0.75	LSM181M2V--A3025
	220	20 × 50	0.94	0.15	0.905	0.83	LSM221M2V--A2050
	220	22 × 45	0.94	0.15	0.905	0.83	LSM221M2V--A2245
	220	25 × 35	0.91	0.15	0.905	0.83	LSM221M2V--A2535
	270	22 × 50	1.09	0.15	0.737	0.92	LSM271M2V--A2250
	270	25 × 40	1.06	0.15	0.737	0.92	LSM271M2V--A2540
	270	30 × 30	1.05	0.15	0.737	0.92	LSM271M2V--A3030
	270	35 × 25	1.08	0.15	0.737	0.92	LSM271M2V--A3525
	330	25 × 45	1.24	0.15	0.603	1.02	LSM331M2V--A2545
	330	30 × 35	1.24	0.15	0.603	1.02	LSM331M2V--A3035
	330	35 × 30	1.33	0.15	0.603	1.02	LSM331M2V--A3530
	390	30 × 40	1.42	0.15	0.510	1.11	LSM391M2V--A3040
	390	35 × 30	1.39	0.15	0.510	1.11	LSM391M2V--A3530
	470	30 × 45	1.56	0.15	0.423	1.22	LSM471M2V--A3045
	470	35 × 35	1.53	0.15	0.423	1.22	LSM471M2V--A3535
	560	30 × 50	1.78	0.15	0.355	1.33	LSM561M2V--A3050

Dimension and Permissible Ripple Current

Rated Voltage V_{DC}	Capacitance 120 Hz, 20℃ μF	ϕD×L mm	Ripple Current 120 Hz, 105℃ A/rms	Tan δ at 120 Hz, 20℃	ESR 120 Hz, 20℃ Ω	LC 5 minutes mA	Part Number
350	560	35 × 40	1.77	0.15	0.355	1.33	LSM561M2V--A3540
	680	30 × 60	1.94	0.15	0.293	1.46	LSM681M2V--A3060
	680	35 × 50	1.95	0.15	0.293	1.46	LSM681M2V--A3550
	820	35 × 55	2.23	0.15	0.243	1.50	LSM821M2V--A3555
400	56	22 × 20	0.41	0.15	3.554	0.45	LSM560M2G--A2220
	68	22 × 25	0.52	0.15	2.927	0.49	LSM680M2G--A2225
	68	25 × 20	0.49	0.15	2.927	0.49	LSM680M2G--A2520
	82	20 × 30	0.54	0.15	2.427	0.54	LSM820M2G--A2030
	100	20 × 35	0.64	0.15	1.990	0.60	LSM101M2G--A2035
	100	22 × 30	0.67	0.15	1.990	0.60	LSM101M2G--A2230
	120	20 × 40	0.74	0.15	1.659	0.66	LSM121M2G--A2040
	120	22 × 35	0.78	0.15	1.659	0.66	LSM121M2G--A2235
	120	25 × 25	0.69	0.15	1.659	0.66	LSM121M2G--A2525
	150	20 × 45	0.87	0.15	1.327	0.73	LSM151M2G--A2045
	150	22 × 40	0.91	0.15	1.327	0.73	LSM151M2G--A2240
	150	25 × 30	0.83	0.15	1.327	0.73	LSM151M2G--A2530
	150	30 × 25	0.86	0.15	1.327	0.73	LSM151M2G--A3025
	180	22 × 45	1.04	0.15	1.106	0.80	LSM181M2G--A2245
	180	25 × 35	0.97	0.15	1.106	0.80	LSM181M2G--A2535
	220	22 × 50	1.17	0.15	0.905	0.89	LSM221M2G--A2250
	220	25 × 40	1.14	0.15	0.905	0.89	LSM221M2G--A2540
	220	30 × 30	1.12	0.15	0.905	0.89	LSM221M2G--A3030
	220	35 × 25	1.15	0.15	0.905	0.89	LSM221M2G--A3525
	270	25 × 50	1.40	0.15	0.737	0.99	LSM271M2G--A2550
	270	30 × 35	1.31	0.15	0.737	0.99	LSM271M2G--A3035
	270	35 × 30	1.31	0.15	0.737	0.99	LSM271M2G--A3530
	330	30 × 40	1.39	0.15	0.603	1.09	LSM331M2G--A3040
	330	35 × 30	1.34	0.15	0.603	1.09	LSM331M2G--A3530
	390	30 × 45	1.49	0.15	0.510	1.18	LSM391M2G--A3045
	390	35 × 35	1.47	0.15	0.510	1.18	LSM391M2G--A3535
	470	30 × 50	1.72	0.15	0.423	1.30	LSM471M2G--A3050
	470	35 × 40	1.71	0.15	0.423	1.30	LSM471M2G--A3540
	560	30 × 60	2.03	0.15	0.355	1.42	LSM561M2G--A3060
	560	35 × 45	2.23	0.15	0.355	1.42	LSM561M2G--A3545
	680	35 × 55	2.31	0.15	0.293	1.50	LSM681M2G--A3555
	820	35 × 60	2.54	0.15	0.243	1.50	LSM821M2G--A3560
420	56	20 × 25	0.41	0.15	3.554	0.46	LSM560M2P--A2025
	56	22 × 20	0.40	0.15	3.554	0.46	LSM560M2P--A2220
	68	20 × 30	0.49	0.15	2.927	0.51	LSM680M2P--A2030
	68	22 × 25	0.48	0.15	2.927	0.51	LSM680M2P--A2225
	82	20 × 30	0.54	0.15	2.427	0.56	LSM820M2P--A2030
	82	22 × 25	0.53	0.15	2.427	0.56	LSM820M2P--A2225
	100	20 × 35	0.64	0.15	1.990	0.61	LSM101M2P--A2035
	100	22 × 30	0.63	0.15	1.990	0.61	LSM101M2P--A2230
	100	25 × 25	0.63	0.15	1.990	0.61	LSM101M2P--A2525
	120	20 × 40	0.74	0.15	1.659	0.67	LSM121M2P--A2040
	120	22 × 35	0.74	0.15	1.659	0.67	LSM121M2P--A2235
	120	25 × 30	0.78	0.15	1.659	0.67	LSM121M2P--A2530
	150	20 × 50	0.92	0.15	1.327	0.75	LSM151M2P--A2050
	150	22 × 40	0.87	0.15	1.327	0.75	LSM151M2P--A2240
	150	30 × 25	0.80	0.15	1.327	0.75	LSM151M2P--A3025
	180	22 × 45	0.93	0.15	1.106	0.82	LSM181M2P--A2245
	180	25 × 35	0.90	0.15	1.106	0.82	LSM181M2P--A2535
	180	30 × 30	0.98	0.15	1.106	0.82	LSM181M2P--A3030
	220	25 × 45	1.01	0.15	0.905	0.91	LSM221M2P--A2545
	220	30 × 35	1.05	0.15	0.905	0.91	LSM221M2P--A3035
	220	35 × 25	0.97	0.15	0.905	0.91	LSM221M2P--A3525
	270	25 × 50	1.17	0.15	0.737	1.01	LSM271M2P--A2550
	270	30 × 40	1.22	0.15	0.737	1.01	LSM271M2P--A3040
	270	35 × 30	1.15	0.15	0.737	1.01	LSM271M2P--A3530
	330	30 × 45	1.37	0.15	0.603	1.12	LSM331M2P--A3045
	330	35 × 35	1.35	0.15	0.603	1.12	LSM331M2P--A3535
	390	30 × 50	1.56	0.15	0.510	1.21	LSM391M2P--A3050
	390	35 × 40	1.55	0.15	0.510	1.21	LSM391M2P--A3540
	470	30 × 60	1.76	0.15	0.423	1.33	LSM471M2P--A3060

Dimension and Permissible Ripple Current

Rated Voltage V_{DC}	Capacitance 120 Hz, 20℃ μF	ϕD×L mm	Ripple Current 120 Hz, 105℃ A/rms	Tan δ at 120 Hz, 20℃	ESR 120 Hz, 20℃ Ω	LC 5 minutes mA	Part Number
420	470	35 × 45	1.70	0.15	0.423	1.33	LSM471M2P--A3545
	560	35 × 50	1.94	0.15	0.355	1.45	LSM561M2P--A3550
	680	35 × 60	2.31	0.15	0.293	1.50	LSM681M2P--A3560
450	56	20 × 25	0.41	0.15	3.554	0.48	LSM560M2W--A2025
	82	20 × 30	0.54	0.15	2.427	0.58	LSM820M2W--A2030
	82	25 × 25	0.57	0.15	2.427	0.58	LSM820M2W--A2525
	100	20 × 45	0.71	0.15	1.990	0.64	LSM101M2W--A2045
	100	22 × 35	0.67	0.15	1.990	0.64	LSM101M2W--A2235
	120	20 × 50	0.82	0.15	1.659	0.70	LSM121M2W--A2050
	120	22 × 40	0.78	0.15	1.659	0.70	LSM121M2W--A2240
	120	25 × 30	0.74	0.15	1.659	0.70	LSM121M2W--A2530
	120	30 × 25	0.77	0.15	1.659	0.70	LSM121M2W--A3025
	150	22 × 45	0.92	0.15	1.327	0.78	LSM151M2W--A2245
	150	25 × 35	0.89	0.15	1.327	0.78	LSM151M2W--A2535
	150	30 × 30	0.93	0.15	1.327	0.78	LSM151M2W--A3030
	150	35 × 25	0.95	0.15	1.327	0.78	LSM151M2W--A3525
	180	22 × 50	1.06	0.15	1.106	0.85	LSM181M2W--A2250
	180	25 × 40	1.03	0.15	1.106	0.85	LSM181M2W--A2540
	180	30 × 30	1.01	0.15	1.106	0.85	LSM181M2W--A3030
	180	35 × 25	1.04	0.15	1.106	0.85	LSM181M2W--A3525
	220	25 × 45	1.18	0.15	0.905	0.94	LSM221M2W--A2545
	220	30 × 35	1.18	0.15	0.905	0.94	LSM221M2W--A3035
	220	35 × 30	1.22	0.15	0.905	0.94	LSM221M2W--A3530
	270	30 × 40	1.17	0.15	0.737	1.05	LSM271M2W--A3040
	330	30 × 50	1.42	0.15	0.603	1.16	LSM331M2W--A3050
	330	35 × 35	1.64	0.15	0.603	1.16	LSM331M2W--A3535
	390	35 × 40	1.74	0.15	0.510	1.26	LSM391M2W--A3540
	470	35 × 50	1.85	0.15	0.423	1.38	LSM471M2W--A3550
	560	35 × 50	2.02	0.15	0.355	1.50	LSM561M2W--A3550
500	82	22 × 35	0.68	0.15	2.427	0.61	LSM820M2H--A2235
	82	25 × 35	0.73	0.15	2.427	0.61	LSM820M2H--A2535
	100	22 × 40	0.79	0.15	1.990	0.67	LSM101M2H--A2240
	100	25 × 40	0.85	0.15	1.990	0.67	LSM101M2H--A2540
	100	30 × 35	1.20	0.15	1.990	0.67	LSM101M2H--A3035
	120	22 × 45	0.91	0.15	1.659	0.73	LSM121M2H--A2245
	120	25 × 45	0.98	0.15	1.659	0.73	LSM121M2H--A2545
	150	22 × 50	1.07	0.15	1.327	0.82	LSM151M2H--A2250
	150	25 × 55	1.20	0.15	1.327	0.82	LSM151M2H--A2555
	220	30 × 40	1.40	0.15	0.905	0.99	LSM221M2H--A3040
	270	35 × 35	1.61	0.15	0.737	1.10	LSM271M2H--A3535
	330	35 × 40	1.88	0.15	0.603	1.22	LSM331M2H--A3540
	390	35 × 45	2.15	0.15	0.510	1.32	LSM391M2H--A3545

Part Numbering System

LSM Series	100μF	±20%	400V		4.0±0.5mm	22ϕ×30L	Pb-free Terminal + PET Sleeve
LSM	**101**	**M**	**2G**	**- -**	**A**	**2230**	
Series Name	Capacitance	Capacitance tolerance	Rated voltage	Terminal type	Terminal length	Case size	Terminal and Sleeve Type

Example:

Cap.	Symbol
56	560
220	221
470	471

M = ±20%
K = ±10%

Example:

Voltage	Symbol
400	2G
450	2W

Example:

Type	Symbol
2 pins	- -
5 pins	L5

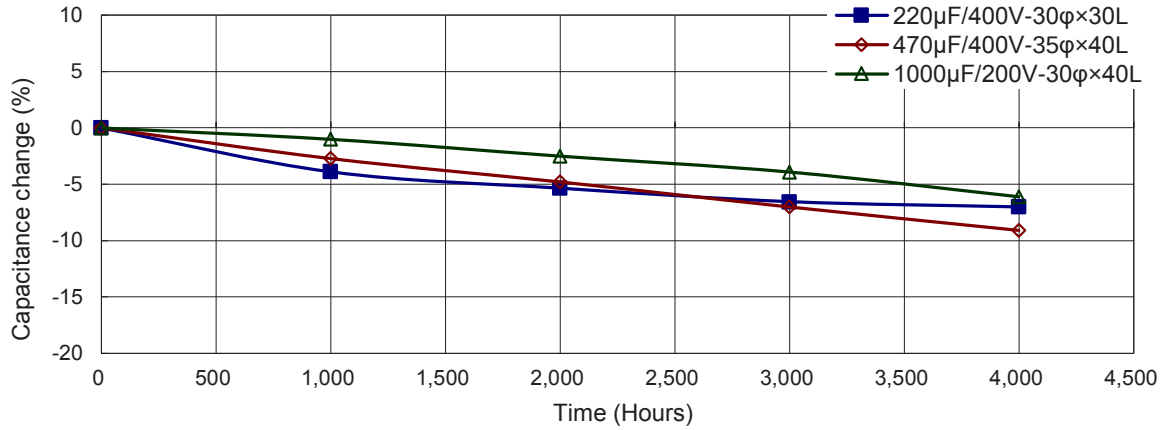
"-": 6.3±1.0 mm

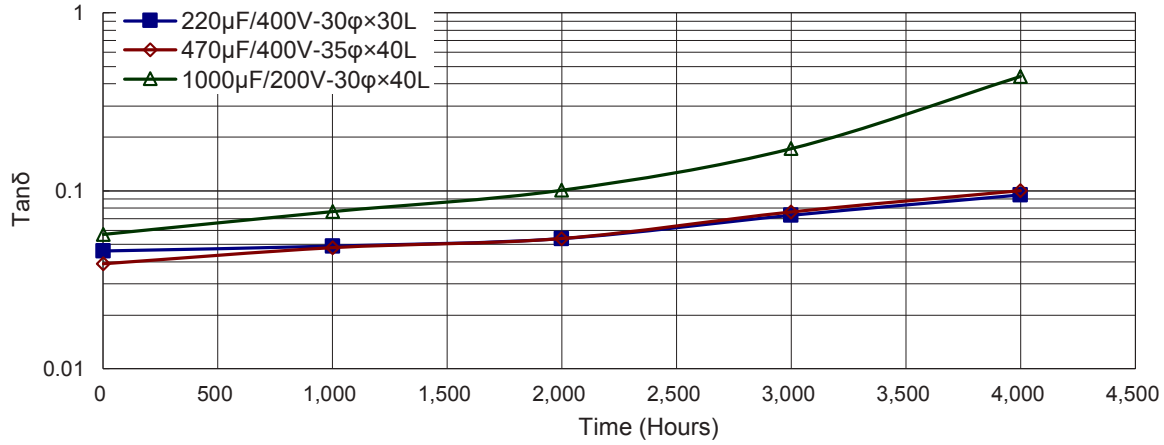
Example:

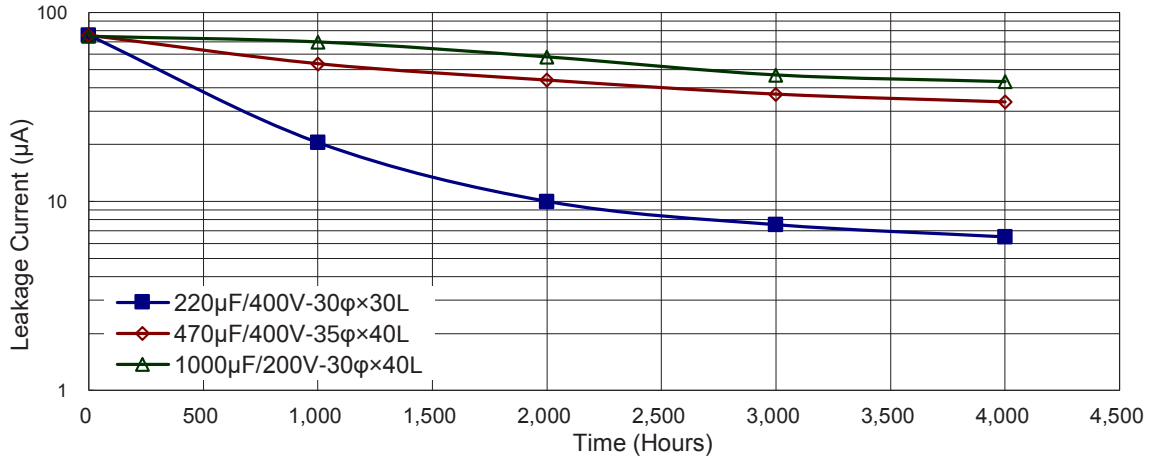
ϕD×L	Code
22×30	2230
25×25	2525
30×40	3040

Note: For more details, please refer to "Part Numbering System (Snap-in Type)" on page 16.

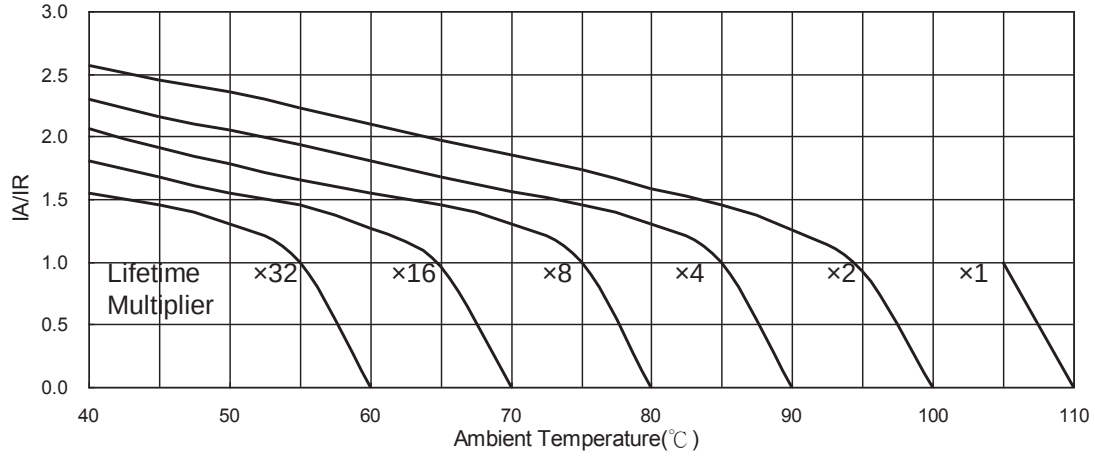
Typical Endurance Curves







Useful Life Chart



IA: Actual ripple current IR: Rated ripple current

LSR Series

Features

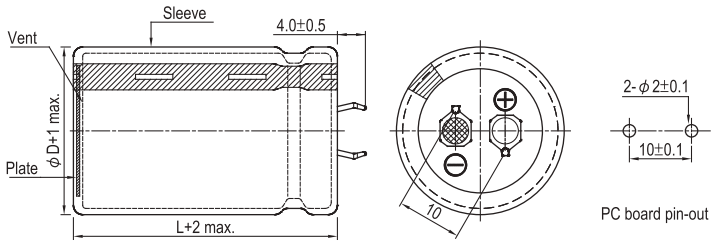
- Snap-in terminal type
- 105℃, 3,000 hours assured
- High Ripple current.
- RoHS compliance

Specifications

Items	Performance
Category Temperature Range	400 ~ 450V -25℃ ~ +105℃
Capacitance Tolerance	± 20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)	$I = 3\sqrt{CV}$ or 1.5 mA whichever is smaller (after 5 minutes) Where, C = rated capacitance in μF, V = rated DC Rated Voltage in V
Tanδ (at 120 Hz, 20℃)	Rated Voltage: 400 / 450 Tanδ(max): 0.15 / 0.15
Low Temperature Characteristics (at 120 Hz)	Impedance ratio shall not exceed the values given in the table below. Rated Voltage: 400 / 450 Impedance Ratio Z(-25℃)/ Z(+20℃): 8 / 8
Endurance	Test Time: 3,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 200% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied with rated ripple current for 3,000 hours at 105℃.
Shelf Life Test	Test Time: 1,000 Hrs Capacitance Change: Within ±15% of initial value Tanδ: Less than 150% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 105 ℃ without voltage applied. The rated voltage shall be applied to the capacitors before the measurements (Refer to JIS C 5101-4 4.1).
Ripple Current and Frequency Multipliers	Frequency (Hz): 50 / 60 / 100 / 120 / 300 / 1k / 10k up Multiplier: 0.8 / 1.0 / 1.1 / 1.3 / 1.4
Failure percentage Failure rate	When the failure percentage / failure rate is required, please contact with us for further discussion.

Diagram of Dimensions

Unit: mm



Snap-in

Dimension and Permissible Ripple Current

Rated Voltage V_{DC}	Capacitance 120 Hz, 20℃ μF	ϕD×L mm	Ripple Current 120 Hz, 105℃ A/rms	Tan δ at 120 Hz, 20℃	ESR 120 Hz, 20℃ Ω	LC 5 minutes mA	Part Number
400	100	22 × 25	1.02	0.15	1.194	0.60	LSR101M2G--A2225
	120	22 × 30	1.22	0.15	0.995	0.66	LSR121M2G--A2230
	120	25 × 25	1.22	0.15	0.995	0.66	LSR121M2G--A2525
	150	22 × 35	1.33	0.15	0.796	0.73	LSR151M2G--A2235
	180	22 × 40	1.43	0.15	0.664	0.80	LSR181M2G--A2240
	180	25 × 30	1.43	0.15	0.664	0.80	LSR181M2G--A2530
	180	30 × 25	1.68	0.15	0.664	0.80	LSR181M2G--A3025
	220	22 × 45	1.55	0.15	0.543	0.89	LSR221M2G--A2245
	220	25 × 35	1.65	0.15	0.543	0.89	LSR221M2G--A2535
	220	30 × 30	1.79	0.15	0.543	0.89	LSR221M2G--A3030
	270	22 × 50	1.68	0.15	0.442	0.99	LSR271M2G--A2250
	270	25 × 40	1.83	0.15	0.442	0.99	LSR271M2G--A2540
	270	30 × 35	2.12	0.15	0.442	0.99	LSR271M2G--A3035
	270	35 × 25	2.12	0.15	0.442	0.99	LSR271M2G--A3525
	330	25 × 50	2.12	0.15	0.362	1.09	LSR331M2G--A2550
	330	30 × 40	2.33	0.15	0.362	1.09	LSR331M2G--A3040
	330	35 × 30	2.33	0.15	0.362	1.09	LSR331M2G--A3530
	390	30 × 45	2.52	0.15	0.306	1.18	LSR391M2G--A3045
	390	35 × 35	2.52	0.15	0.306	1.18	LSR391M2G--A3535
	470	30 × 50	2.85	0.15	0.254	1.30	LSR471M2G--A3050
	470	35 × 40	2.85	0.15	0.254	1.30	LSR471M2G--A3540
	560	35 × 45	3.18	0.15	0.213	1.42	LSR561M2G--A3545
	680	35 × 50	3.21	0.15	0.176	1.50	LSR681M2G--A3550
450	82	22 × 25	0.96	0.15	1.456	0.58	LSR820M2W--A2225
	100	22 × 30	1.04	0.15	1.194	0.64	LSR101M2W--A2230
	100	25 × 25	1.04	0.15	1.194	0.64	LSR101M2W--A2525
	120	22 × 35	1.15	0.15	0.995	0.70	LSR121M2W--A2235
	120	25 × 30	1.22	0.15	0.995	0.70	LSR121M2W--A2530
	150	22 × 40	1.22	0.15	0.796	0.78	LSR151M2W--A2240
	150	25 × 35	1.31	0.15	0.796	0.78	LSR151M2W--A2535
	150	30 × 25	1.31	0.15	0.796	0.78	LSR151M2W--A3025
	180	22 × 45	1.35	0.15	0.664	0.85	LSR181M2W--A2245
	180	25 × 40	1.35	0.15	0.664	0.85	LSR181M2W--A2540
	180	30 × 30	1.60	0.15	0.664	0.85	LSR181M2W--A3030
	180	35 × 25	1.60	0.15	0.664	0.85	LSR181M2W--A3525
	220	25 × 45	1.55	0.15	0.543	0.94	LSR221M2W--A2545
	220	30 × 35	1.71	0.15	0.543	0.94	LSR221M2W--A3035
	270	25 × 50	1.74	0.15	0.442	1.05	LSR271M2W--A2550
	270	30 × 40	1.90	0.15	0.442	1.05	LSR271M2W--A3040
	270	35 × 30	1.90	0.15	0.442	1.05	LSR271M2W--A3530
	330	30 × 45	2.20	0.15	0.362	1.16	LSR331M2W--A3045
	330	35 × 35	2.20	0.15	0.362	1.16	LSR331M2W--A3535
	390	30 × 50	2.40	0.15	0.306	1.26	LSR391M2W--A3050
	390	35 × 40	2.42	0.15	0.306	1.26	LSR391M2W--A3540
	470	35 × 45	2.67	0.15	0.254	1.38	LSR471M2W--A3545
	560	35 × 50	2.85	0.15	0.213	1.50	LSR561M2W--A3550

Part Numbering System

LSR Series	220μF	±20%	400V		4.0±0.5mm	30ϕ×30L	Pb-free Terminal + PET Sleeve
LSR	**221**	**M**	**2G**	**- -**	**A**	**3030**	
Series Name	Capacitance	Capacitance tolerance	Rated voltage	Terminal type	Terminal length	Case size	Terminal and Sleeve Type

Example:

Cap.	Symbol
56	560
220	221
470	471

M = ±20%
K = ±10%

Example:

Voltage	Symbol
400	2G
450	2W

Example:

Type	Symbol
2 pins	- -
5 pins	L5

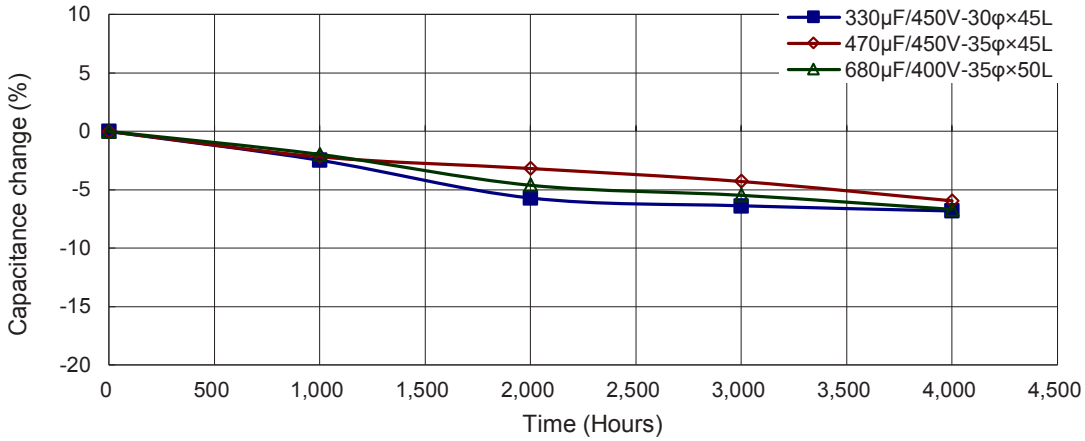
"-":
6.3±1.0 mm

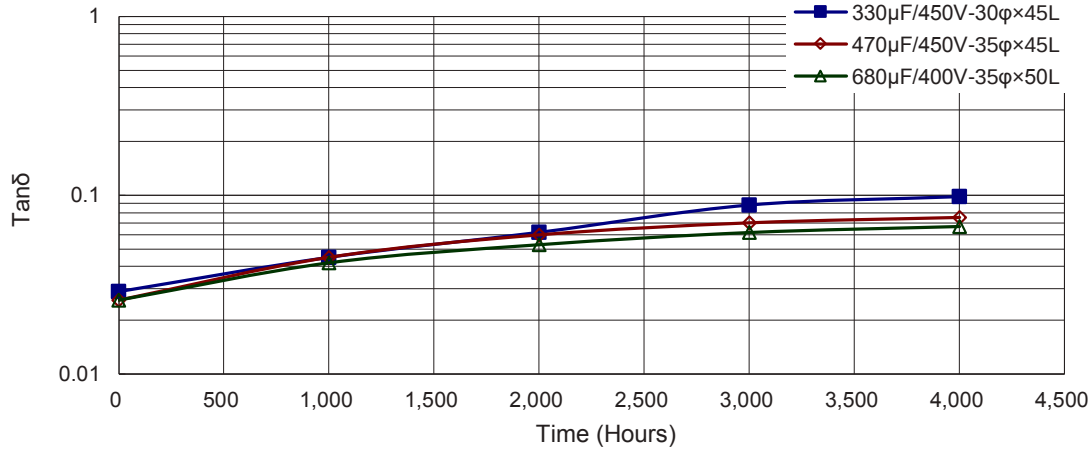
Example:

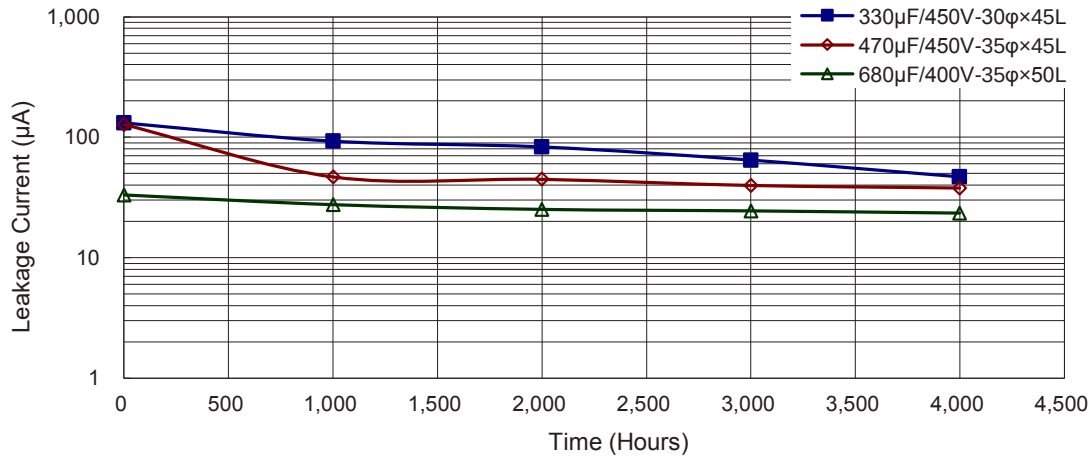
ϕD×L	Code
22×30	2230
25×25	2525
30×40	3040

Note: For more details, please refer to "Part Numbering System (Snap-in Type)" on page 16.

Typical Endurance Curves







Aluminum Electrolytic Capacitors

LSK Series

Features

- Snap-in terminal type
- 105℃, 5,000 hours assured
- Suitable for medium to high voltage circuits
- RoHS compliance

Specifications

Items	Performance
Category Temperature Range	-25℃ ~ +105℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)	$I = 3\sqrt{CV}$ or 1.5 mA whichever is smaller (after 5 minutes) Where, C = rated capacitance in μF, V = rated DC Rated Voltage in V
Tanδ (at 120 Hz, 20℃)	

Rated Voltage	160	200	250	315	350	400	420	450	500
Tanδ (max)	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15

Low Temperature Characteristics (at 120 Hz)

Impedance ratio shall not exceed the values given in the table below.

Rated Voltage		160	200	250	315	350	400	420	450	500
Impedance Ratio	Z(-25℃)/Z(+20℃)	4	4	4	4	4	8	8	8	8

Endurance

Test Time	5,000 Hrs
Capacitance Change	Within ±25% of initial value
Tanδ	Less than 250% of specified value
Leakage Current	Within specified value

* The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied with rated ripple current for 5,000 hours at 105℃.

Shelf Life Test

Test Time	1,000 Hrs
Capacitance Change	Within ±20% of initial value
Tanδ	Less than 150% of specified value
Leakage Current	Within specified value

* The above specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 105℃ without voltage applied. The rated voltage shall be applied to the capacitors before the measurements (Refer to JIS C 5101-4 4.1).

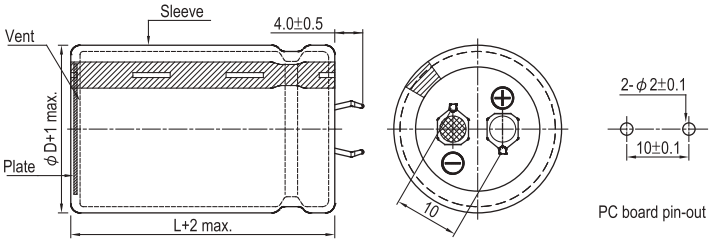
Ripple Current and Frequency Multipliers

Frequency (Hz)	50 / 60	100 / 120	300	1k	10k up
Multiplier	0.8	1.0	1.1	1.3	1.4

Failure percentage Failure rate: When the failure percentage / failure rate is required, please contact with us for further discussion.

Diagram of Dimensions

Unit: mm



Dimension and Permissible Ripple Current

Rated Voltage V_{DC}	Capacitance 120 Hz, 20℃ μF	ϕD×L mm	Ripple Current 120 Hz, 105℃ A/rms	Tan δ at 120 Hz, 20℃	ESR 120 Hz, 20℃ Ω	LC 5 minutes mA	Part Number
160	390	22 × 35	1.05	0.15	0.510	0.75	LSK391M2C--A2235
	470	20 × 40	1.16	0.15	0.423	0.82	LSK471M2C--A2040
	470	22 × 40	1.23	0.15	0.423	0.82	LSK471M2C--A2240
	470	25 × 30	1.17	0.15	0.423	0.82	LSK471M2C--A2530
	560	22 × 45	1.41	0.15	0.355	0.90	LSK561M2C--A2245
	560	25 × 35	1.36	0.15	0.355	0.90	LSK561M2C--A2535
	560	30 × 25	1.32	0.15	0.355	0.90	LSK561M2C--A3025
	680	22 × 50	1.63	0.15	0.293	0.99	LSK681M2C--A2250
	680	25 × 40	1.59	0.15	0.293	0.99	LSK681M2C--A2540
	680	30 × 30	1.56	0.15	0.293	0.99	LSK681M2C--A3030
	820	25 × 45	1.83	0.15	0.243	1.09	LSK821M2C--A2545
	820	30 × 35	1.83	0.15	0.243	1.09	LSK821M2C--A3035
	820	35 × 30	1.89	0.15	0.243	1.09	LSK821M2C--A3530
	1,000	25 × 50	2.12	0.15	0.199	1.20	LSK102M2C--A2550
	1,000	30 × 40	2.13	0.15	0.199	1.20	LSK102M2C--A3040
	1,000	35 × 30	2.08	0.15	0.199	1.20	LSK102M2C--A3530
	1,200	30 × 45	2.46	0.15	0.166	1.31	LSK122M2C--A3045
	1,200	35 × 35	2.42	0.15	0.166	1.31	LSK122M2C--A3535
	1,500	30 × 50	2.88	0.15	0.133	1.47	LSK152M2C--A3050
	1,500	35 × 40	2.86	0.15	0.133	1.47	LSK152M2C--A3540
	1,800	35 × 45	3.29	0.15	0.111	1.50	LSK182M2C--A3545
200	180	22 × 20	0.59	0.15	1.106	0.57	LSK181M2D--A2220
	220	22 × 25	0.72	0.15	0.905	0.63	LSK221M2D--A2225
	220	25 × 20	0.71	0.15	0.905	0.63	LSK221M2D--A2520
	270	22 × 30	0.81	0.15	0.737	0.70	LSK271M2D--A2230
	270	25 × 25	0.81	0.15	0.737	0.70	LSK271M2D--A2525
	330	22 × 35	0.92	0.15	0.603	0.77	LSK331M2D--A2235
	330	30 × 20	0.87	0.15	0.603	0.77	LSK331M2D--A3020
	390	22 × 40	1.02	0.15	0.510	0.84	LSK391M2D--A2240
	390	25 × 30	1.01	0.15	0.510	0.84	LSK391M2D--A2530
	390	30 × 25	1.01	0.15	0.510	0.84	LSK391M2D--A3025
	390	35 × 20	1.02	0.15	0.510	0.84	LSK391M2D--A3520
	470	22 × 45	1.10	0.15	0.423	0.92	LSK471M2D--A2245
	470	25 × 35	1.15	0.15	0.423	0.92	LSK471M2D--A2535
	470	35 × 20	1.12	0.15	0.423	0.92	LSK471M2D--A3520
	560	22 × 50	1.22	0.15	0.355	1.00	LSK561M2D--A2250
	560	25 × 40	1.19	0.15	0.355	1.00	LSK561M2D--A2540
	560	30 × 30	1.17	0.15	0.355	1.00	LSK561M2D--A3030
	560	35 × 25	1.31	0.15	0.355	1.00	LSK561M2D--A3525
	680	25 × 45	1.38	0.15	0.293	1.11	LSK681M2D--A2545
	680	30 × 35	1.37	0.15	0.293	1.11	LSK681M2D--A3035
	820	30 × 40	1.50	0.15	0.243	1.21	LSK821M2D--A3040
	820	35 × 30	1.46	0.15	0.243	1.21	LSK821M2D--A3530
	1,000	30 × 50	1.91	0.15	0.199	1.34	LSK102M2D--A3050
	1,000	35 × 35	1.72	0.15	0.199	1.34	LSK102M2D--A3535
	1,200	35 × 40	1.93	0.15	0.166	1.47	LSK122M2D--A3540
	1,500	35 × 50	2.37	0.15	0.133	1.50	LSK152M2D--A3550
	1,800	35 × 55	2.70	0.15	0.111	1.50	LSK182M2D--A3555
250	150	22 × 25	0.57	0.15	1.327	0.58	LSK151M2E--A2225
	180	25 × 20	0.61	0.15	1.106	0.64	LSK181M2E--A2520
	220	22 × 30	0.68	0.15	0.905	0.70	LSK221M2E--A2230
	220	25 × 25	0.75	0.15	0.905	0.70	LSK221M2E--A2525
	220	30 × 20	0.77	0.15	0.905	0.70	LSK221M2E--A3020
	270	22 × 35	0.78	0.15	0.737	0.78	LSK271M2E--A2235
	270	25 × 30	0.83	0.15	0.737	0.78	LSK271M2E--A2530
	270	30 × 20	0.79	0.15	0.737	0.78	LSK271M2E--A3020
	270	35 × 20	0.86	0.15	0.737	0.78	LSK271M2E--A3520
	330	22 × 40	0.91	0.15	0.603	0.86	LSK331M2E--A2240
	330	25 × 35	0.96	0.15	0.603	0.86	LSK331M2E--A2535
	390	22 × 50	1.08	0.15	0.510	0.94	LSK391M2E--A2250
	390	25 × 40	1.07	0.15	0.510	0.94	LSK391M2E--A2540
	390	30 × 30	1.07	0.15	0.510	0.94	LSK391M2E--A3030
	470	22 × 50	1.12	0.15	0.423	1.03	LSK471M2E--A2250
	470	25 × 45	1.15	0.15	0.423	1.03	LSK471M2E--A2545
	470	30 × 35	1.19	0.15	0.423	1.03	LSK471M2E--A3035

Dimension and Permissible Ripple Current

Rated Voltage V_{DC}	Capacitance 120 Hz, 20℃ μF	ϕD×L mm	Ripple Current 120 Hz, 105℃ A/rms	Tan δ at 120 Hz, 20℃	ESR 120 Hz, 20℃ Ω	LC 5 minutes mA	Part Number
250	470	35 × 25	1.10	0.15	0.423	1.03	LSK471M2E--A3525
	560	25 × 50	1.31	0.15	0.355	1.12	LSK561M2E--A2550
	560	30 × 35	1.25	0.15	0.355	1.12	LSK561M2E--A3035
	560	35 × 30	1.29	0.15	0.355	1.12	LSK561M2E--A3530
	680	30 × 40	1.36	0.15	0.293	1.24	LSK681M2E--A3040
	680	35 × 40	1.57	0.15	0.293	1.24	LSK681M2E--A3540
	820	30 × 50	1.65	0.15	0.243	1.36	LSK821M2E--A3050
	1,000	35 × 40	1.76	0.15	0.199	1.50	LSK102M2E--A3540
315	120	22 × 25	0.51	0.15	1.659	0.58	LSK121M2F--A2225
	150	22 × 30	0.62	0.15	1.327	0.65	LSK151M2F--A2230
	180	22 × 35	0.72	0.15	1.106	0.71	LSK181M2F--A2235
	180	25 × 30	0.73	0.15	1.106	0.71	LSK181M2F--A2530
	220	22 × 40	0.85	0.15	0.905	0.79	LSK221M2F--A2240
	220	25 × 35	0.86	0.15	0.905	0.79	LSK221M2F--A2535
	220	30 × 25	0.84	0.15	0.905	0.79	LSK221M2F--A3025
	270	22 × 45	0.99	0.15	0.737	0.87	LSK271M2F--A2245
	270	25 × 40	1.01	0.15	0.737	0.87	LSK271M2F--A2540
	270	30 × 30	1.00	0.15	0.737	0.87	LSK271M2F--A3030
	330	22 × 55	1.20	0.15	0.603	0.97	LSK331M2F--A2255
	330	25 × 45	1.18	0.15	0.603	0.97	LSK331M2F--A2545
	330	30 × 35	1.17	0.15	0.603	0.97	LSK331M2F--A3035
	330	35 × 25	1.13	0.15	0.603	0.97	LSK331M2F--A3525
	390	25 × 50	1.34	0.15	0.510	1.05	LSK391M2F--A2550
	390	30 × 40	1.35	0.15	0.510	1.05	LSK391M2F--A3040
	390	35 × 30	1.31	0.15	0.510	1.05	LSK391M2F--A3530
	470	30 × 45	1.56	0.15	0.423	1.15	LSK471M2F--A3045
	470	35 × 35	1.53	0.15	0.423	1.15	LSK471M2F--A3535
	560	30 × 50	1.78	0.15	0.355	1.26	LSK561M2F--A3050
	560	35 × 40	1.77	0.15	0.355	1.26	LSK561M2F--A3540
	680	35 × 45	2.04	0.15	0.293	1.39	LSK681M2F--A3545
	820	35 × 50	2.35	0.15	0.243	1.50	LSK821M2F--A3550
350	56	22 × 20	0.32	0.15	3.554	0.42	LSK560M2V--A2220
	68	22 × 25	0.39	0.15	2.927	0.46	LSK680M2V--A2225
	82	22 × 30	0.49	0.15	2.427	0.51	LSK820M2V--A2230
	82	25 × 20	0.44	0.15	2.427	0.51	LSK820M2V--A2520
	100	22 × 25	0.45	0.15	1.990	0.56	LSK101M2V--A2225
	100	25 × 25	0.49	0.15	1.990	0.56	LSK101M2V--A2525
	120	22 × 30	0.53	0.15	1.659	0.61	LSK121M2V--A2230
	120	25 × 30	0.55	0.15	1.659	0.61	LSK121M2V--A2530
	120	30 × 20	0.52	0.15	1.659	0.61	LSK121M2V--A3020
	150	22 × 35	0.58	0.15	1.327	0.69	LSK151M2V--A2235
	150	25 × 25	0.54	0.15	1.327	0.69	LSK151M2V--A2525
	150	30 × 25	0.63	0.15	1.327	0.69	LSK151M2V--A3025
	150	35 × 20	0.64	0.15	1.327	0.69	LSK151M2V--A3520
	180	22 × 40	0.67	0.15	1.106	0.75	LSK181M2V--A2240
	180	25 × 30	0.64	0.15	1.106	0.75	LSK181M2V--A2530
	220	22 × 45	0.78	0.15	0.905	0.83	LSK221M2V--A2245
	220	25 × 35	0.76	0.15	0.905	0.83	LSK221M2V--A2535
	220	30 × 25	0.73	0.15	0.905	0.83	LSK221M2V--A3025
	220	35 × 30	0.87	0.15	0.905	0.83	LSK221M2V--A3530
	270	22 × 50	0.88	0.15	0.737	0.92	LSK271M2V--A2250
	270	25 × 40	0.85	0.15	0.737	0.92	LSK271M2V--A2540
	270	30 × 30	0.84	0.15	0.737	0.92	LSK271M2V--A3030
	270	35 × 25	0.86	0.15	0.737	0.92	LSK271M2V--A3525
	330	25 × 45	0.99	0.15	0.603	1.02	LSK331M2V--A2545
	330	30 × 35	0.99	0.15	0.603	1.02	LSK331M2V--A3035
	390	30 × 40	1.14	0.15	0.510	1.11	LSK391M2V--A3040
	390	35 × 30	1.11	0.15	0.510	1.11	LSK391M2V--A3530
	470	30 × 45	1.19	0.15	0.423	1.22	LSK471M2V--A3045
	470	35 × 35	1.18	0.15	0.423	1.22	LSK471M2V--A3535
	560	30 × 50	1.32	0.15	0.355	1.33	LSK561M2V--A3050
	560	35 × 40	1.32	0.15	0.355	1.33	LSK561M2V--A3540
	680	35 × 45	1.52	0.15	0.293	1.46	LSK681M2V--A3545
	820	35 × 50	1.75	0.15	0.243	1.50	LSK821M2V--A3550

Dimension and Permissible Ripple Current

Rated Voltage V_{DC}	Capacitance 120 Hz, 20℃ μF	ϕD×L mm	Ripple Current 120 Hz, 105℃ A/rms	Tan δ at 120 Hz, 20℃	ESR 120 Hz, 20℃ Ω	LC 5 minutes mA	Part Number
400	56	22 × 25	0.34	0.15	3.554	0.45	LSK560M2G--A2225
	68	25 × 20	0.37	0.15	2.927	0.49	LSK680M2G--A2520
	82	22 × 35	0.50	0.15	2.427	0.54	LSK820M2G--A2235
	82	30 × 20	0.50	0.15	2.427	0.54	LSK820M2G--A3020
	100	22 × 30	0.51	0.15	1.990	0.60	LSK101M2G--A2230
	100	25 × 25	0.51	0.15	1.990	0.60	LSK101M2G--A2525
	100	30 × 25	0.58	0.15	1.990	0.60	LSK101M2G--A3025
	120	22 × 35	0.59	0.15	1.659	0.66	LSK121M2G--A2235
	120	25 × 25	0.55	0.15	1.659	0.66	LSK121M2G--A2525
	120	35 × 20	0.65	0.15	1.659	0.66	LSK121M2G--A3520
	150	22 × 40	0.70	0.15	1.327	0.73	LSK151M2G--A2240
	150	25 × 30	0.67	0.15	1.327	0.73	LSK151M2G--A2530
	180	22 × 45	0.81	0.15	1.106	0.80	LSK181M2G--A2245
	180	25 × 35	0.78	0.15	1.106	0.80	LSK181M2G--A2535
	180	30 × 25	0.76	0.15	1.106	0.80	LSK181M2G--A3025
	220	22 × 50	0.94	0.15	0.905	0.89	LSK221M2G--A2250
	220	25 × 40	0.91	0.15	0.905	0.89	LSK221M2G--A2540
	220	30 × 30	0.90	0.15	0.905	0.89	LSK221M2G--A3030
	270	25 × 45	1.06	0.15	0.737	0.99	LSK271M2G--A2545
	270	30 × 35	1.06	0.15	0.737	0.99	LSK271M2G--A3035
	270	35 × 25	1.02	0.15	0.737	0.99	LSK271M2G--A3525
	330	25 × 50	1.23	0.15	0.603	1.09	LSK331M2G--A2550
	330	30 × 40	1.24	0.15	0.603	1.09	LSK331M2G--A3040
	330	35 × 30	1.21	0.15	0.603	1.09	LSK331M2G--A3530
	390	30 × 45	1.42	0.15	0.510	1.18	LSK391M2G--A3045
	390	35 × 35	1.40	0.15	0.510	1.18	LSK391M2G--A3535
	470	30 × 50	1.63	0.15	0.423	1.30	LSK471M2G--A3050
	470	35 × 40	1.62	0.15	0.423	1.30	LSK471M2G--A3540
	560	35 × 45	1.86	0.15	0.355	1.42	LSK561M2G--A3545
420	39	22 × 25	0.25	0.15	5.104	0.38	LSK390M2P--A2225
	68	25 × 25	0.36	0.15	2.927	0.51	LSK680M2P--A2525
	100	22 × 30	0.43	0.15	1.990	0.61	LSK101M2P--A2230
	100	25 × 25	0.43	0.15	1.990	0.61	LSK101M2P--A2525
	120	22 × 35	0.50	0.15	1.659	0.67	LSK121M2P--A2235
	120	35 × 25	0.59	0.15	1.659	0.67	LSK121M2P--A3525
	150	22 × 40	0.61	0.15	1.327	0.75	LSK151M2P--A2240
	150	25 × 30	0.58	0.15	1.327	0.75	LSK151M2P--A2530
	150	30 × 25	0.58	0.15	1.327	0.75	LSK151M2P--A3025
	180	22 × 45	0.70	0.15	1.106	0.82	LSK181M2P--A2245
	180	25 × 35	0.68	0.15	1.106	0.82	LSK181M2P--A2535
	180	30 × 30	0.71	0.15	1.106	0.82	LSK181M2P--A3030
	220	22 × 50	0.82	0.15	0.905	0.91	LSK221M2P--A2250
	220	25 × 40	0.80	0.15	0.905	0.91	LSK221M2P--A2540
	220	30 × 35	0.84	0.15	0.905	0.91	LSK221M2P--A3035
	220	35 × 25	0.78	0.15	0.905	0.91	LSK221M2P--A3525
	270	25 × 45	0.93	0.15	0.737	1.01	LSK271M2P--A2545
	270	30 × 40	0.98	0.15	0.737	1.01	LSK271M2P--A3040
	270	35 × 30	0.92	0.15	0.737	1.01	LSK271M2P--A3530
	330	25 × 55	1.12	0.15	0.603	1.12	LSK331M2P--A2555
	330	30 × 45	1.14	0.15	0.603	1.12	LSK331M2P--A3045
	330	35 × 35	1.09	0.15	0.603	1.12	LSK331M2P--A3535
	390	30 × 50	1.25	0.15	0.510	1.21	LSK391M2P--A3050
	390	35 × 40	1.25	0.15	0.510	1.21	LSK391M2P--A3540
	470	35 × 45	1.44	0.15	0.423	1.33	LSK471M2P--A3545
	560	35 × 50	1.64	0.15	0.355	1.45	LSK561M2P--A3550
450	39	22 × 25	0.37	0.15	5.104	0.40	LSK390M2W--A2225
	68	25 × 25	0.47	0.15	2.927	0.52	LSK680M2W--A2525
	82	22 × 30	0.61	0.15	2.427	0.58	LSK820M2W--A2230
	100	22 × 45	0.64	0.15	1.990	0.64	LSK101M2W--A2245
	100	25 × 25	0.67	0.15	1.990	0.64	LSK101M2W--A2525
	100	30 × 25	0.57	0.15	1.990	0.64	LSK101M2W--A3025
	120	22 × 35	0.72	0.15	1.659	0.70	LSK121M2W--A2235
	120	25 × 30	0.73	0.15	1.659	0.70	LSK121M2W--A2530
	150	25 × 35	0.87	0.15	1.327	0.78	LSK151M2W--A2535
	150	30 × 30	0.71	0.15	1.327	0.78	LSK151M2W--A3030

Dimension and Permissible Ripple Current

Rated Voltage V_{DC}	Capacitance 120 Hz, 20℃ μF	ϕD×L mm	Ripple Current 120 Hz, 105℃ A/rms	Tan δ at 120 Hz, 20℃	ESR 120 Hz, 20℃ Ω	LC 5 minutes mA	Part Number
450	180	22 × 50	0.98	0.15	1.106	0.85	LSK181M2W--A2250
	180	25 × 40	1.01	0.15	1.106	0.85	LSK181M2W--A2540
	180	30 × 30	1.00	0.15	1.106	0.85	LSK181M2W--A3030
	220	25 × 45	1.07	0.15	0.905	0.94	LSK221M2W--A2545
	220	30 × 35	1.07	0.15	0.905	0.94	LSK221M2W--A3035
	220	35 × 25	1.03	0.15	0.905	0.94	LSK221M2W--A3525
	270	30 × 40	1.25	0.15	0.737	1.05	LSK271M2W--A3040
	270	35 × 30	1.30	0.15	0.737	1.05	LSK271M2W--A3530
	330	30 × 45	1.46	0.15	0.603	1.16	LSK331M2W--A3045
	330	35 × 35	1.44	0.15	0.603	1.16	LSK331M2W--A3535
	390	35 × 45	1.69	0.15	0.510	1.26	LSK391M2W--A3545
	470	35 × 50	1.87	0.15	0.423	1.38	LSK471M2W--A3550
500	47	22 × 25	0.30	0.15	4.235	0.46	LSK470M2H--A2225
	56	22 × 30	0.35	0.15	3.554	0.50	LSK560M2H--A2230
	56	25 × 25	0.35	0.15	3.554	0.50	LSK560M2H--A2525
	68	22 × 30	0.39	0.15	2.927	0.55	LSK680M2H--A2230
	68	25 × 30	0.42	0.15	2.927	0.55	LSK680M2H--A2530
	82	22 × 35	0.46	0.15	2.427	0.61	LSK820M2H--A2235
	82	25 × 30	0.46	0.15	2.427	0.61	LSK820M2H--A2530
	100	22 × 40	0.54	0.15	1.990	0.67	LSK101M2H--A2240
	100	25 × 35	0.54	0.15	1.990	0.67	LSK101M2H--A2535
	120	22 × 45	0.62	0.15	1.659	0.73	LSK121M2H--A2245
	120	25 × 40	0.63	0.15	1.659	0.73	LSK121M2H--A2540
	150	22 × 50	0.73	0.15	1.327	0.82	LSK151M2H--A2250
	150	25 × 45	0.75	0.15	1.327	0.82	LSK151M2H--A2545
	150	30 × 30	0.70	0.15	1.327	0.82	LSK151M2H--A3030
	180	25 × 50	0.86	0.15	1.106	0.90	LSK181M2H--A2550
	180	30 × 35	0.81	0.15	1.106	0.90	LSK181M2H--A3035
	220	25 × 50	0.95	0.15	0.905	0.99	LSK221M2H--A2550
	220	30 × 45	1.00	0.15	0.905	0.99	LSK221M2H--A3045
	220	35 × 30	0.93	0.15	0.905	0.99	LSK221M2H--A3530
	270	35 × 35	1.09	0.15	0.737	1.10	LSK271M2H--A3535
	330	35 × 40	1.28	0.15	0.603	1.22	LSK331M2H--A3540

Part Numbering System

LSK Series	100μF	±20%	400V		4.0±0.5mm	22ϕ×30L	Pb-free Terminal + PET Sleeve
LSK	**101**	**M**	**2G**	**- -**	**A**	**2230**	
Series Name	Capacitance	Capacitance tolerance	Rated voltage	Terminal type	Terminal length	Case size	Terminal and Sleeve Type

Example:

Cap.	Symbol
56	560
220	221
470	471

M = ±20%
K = ±10%

Example:

Voltage	Symbol
400	2G
450	2W

Example:

Type	Symbol
2 pins	- -
5 pins	L5

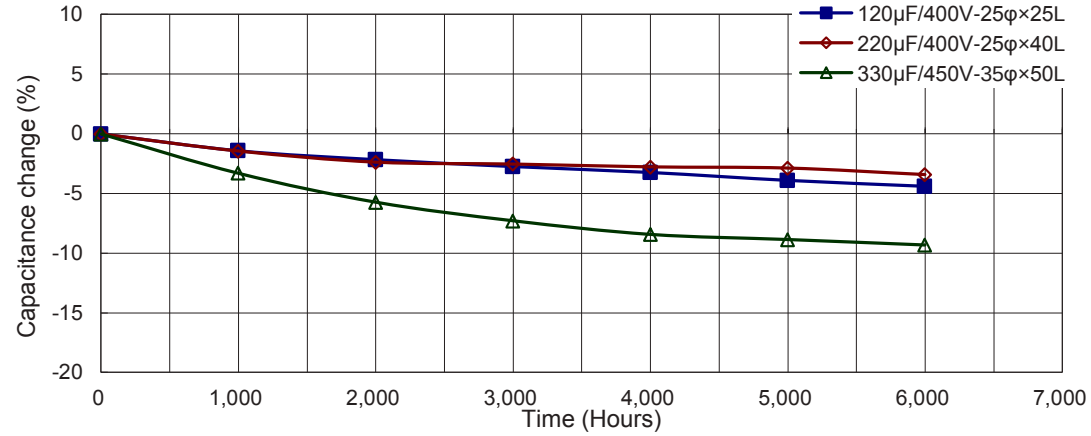
"-":
6.3±1.0 mm

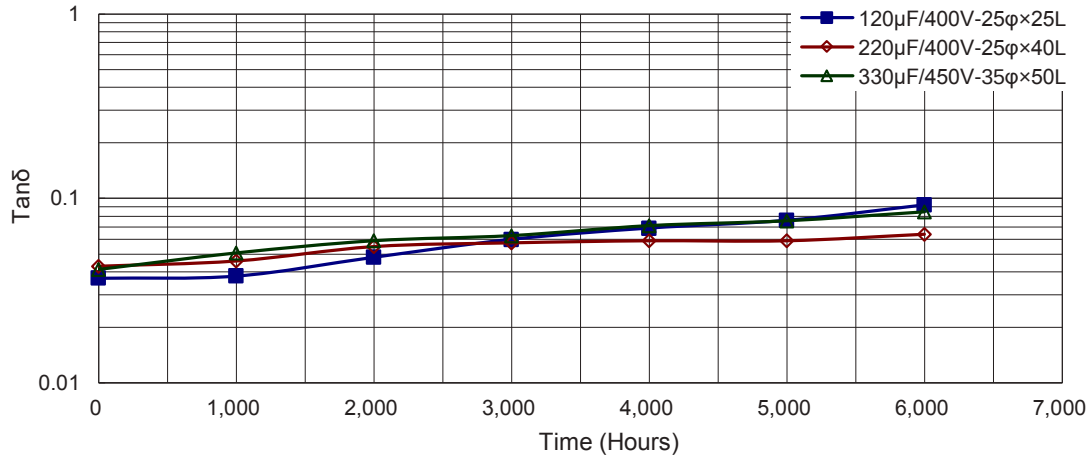
Example:

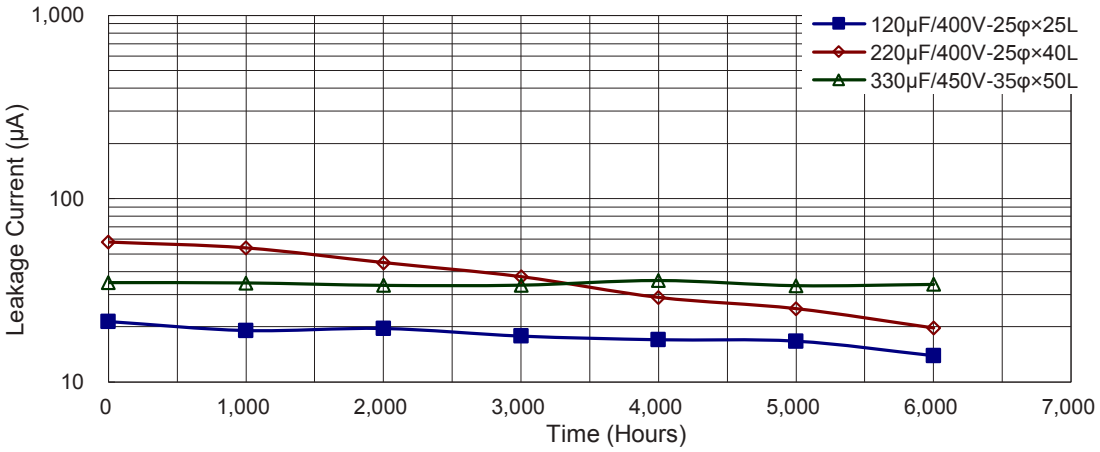
ϕD×L	Code
22×30	2230
25×25	2525
30×40	3040

Note: For more details, please refer to "Part Numbering System (Snap-in Type)" on page 16.

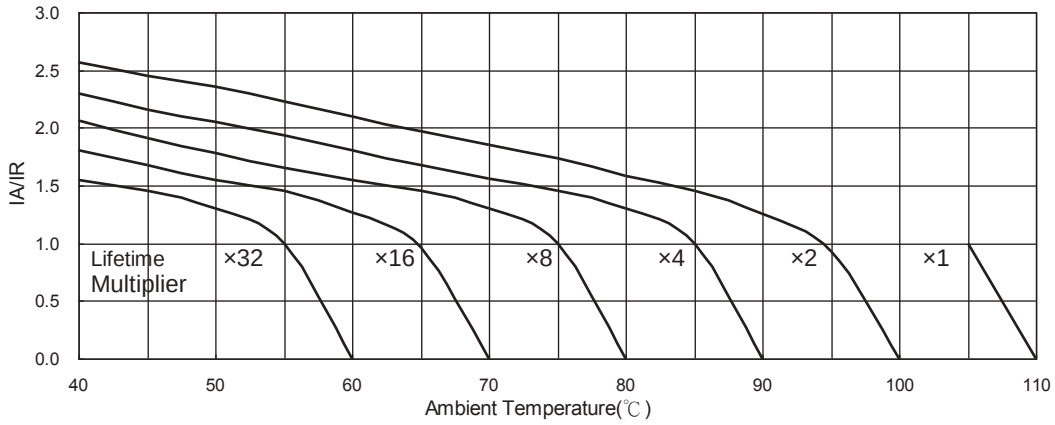
Typical Endurance Curves







Useful Life Chart



IA: Actual Ripple Current IR: Rated Ripple Current

LSP Series

Features

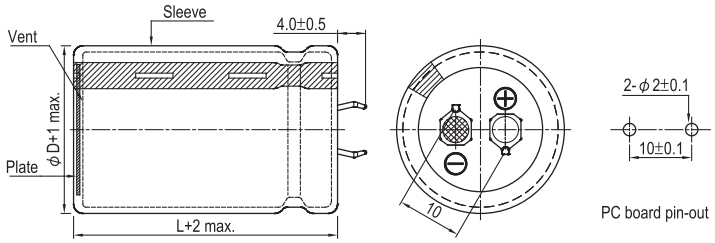
- Snap-in terminal type
- 105℃, 7,000 hours assured
- Suitable for high voltage circuits
- RoHS compliance

Specifications

Items	Performance
Category Temperature Range	-25℃ ~ +105℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)	$I = 3\sqrt{CV}$ or 1.5 mA whichever is smaller (after 5 minutes) Where, C = rated capacitance in μF, V = rated DC Rated Voltage in V
Tanδ (at 120 Hz, 20℃)	Rated Voltage: 350 / 400 / 450 Tanδ(max): 0.105 / 0.105 / 0.105
Low Temperature Characteristics (at 120 Hz)	Impedance ratio shall not exceed the values given in the table below. Rated Voltage: 350 / 400 / 450 Impedance Ratio Z(-25℃)/Z(+20℃): 4 / 8 / 8
Endurance	Test Time: 7,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 250% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied with rated ripple current for 7,000 hours at 105℃.
Shelf Life Test	Test Time: 1,000 Hrs Capacitance Change: Within ±15% of initial value Tanδ: Less than 150% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 105℃ without voltage applied. The rated voltage shall be applied to the capacitors before the measurements (Refer to JIS C 5101-4 4.1).
Ripple Current and Frequency Multipliers	Frequency (Hz): 50 / 60 / 100 / 120 / 300 / 1k / 10k up Multiplier: 0.8 / 1.0 / 1.1 / 1.3 / 1.4
Failure percentage Failure rate	When the failure percentage / failure rate is required, please contact with us for further discussion.

Diagram of Dimensions

Unit: mm



Snap-in

Dimension and Permissible Ripple Current

Rated Voltage V_{DC}	Capacitance 120 Hz, 20℃ μF	ϕD×L mm	Ripple Current 120 Hz, 105℃ A/rms	Tan δ at 120 Hz, 20℃	ESR 120 Hz, 20℃ Ω	LC 5 minutes mA	Part Number
350V	100	22 × 25	0.67	0.105	1.474	0.56	LSP101M2V--A2225
	120	22 × 30	0.77	0.105	1.228	0.61	LSP121M2V--A2230
	120	25 × 25	0.76	0.105	1.228	0.61	LSP121M2V--A2525
	150	22 × 35	0.88	0.105	0.982	0.69	LSP151M2V--A2235
	150	25 × 30	0.88	0.105	0.982	0.69	LSP151M2V--A2530
	180	22 × 40	0.99	0.105	0.819	0.75	LSP181M2V--A2240
	180	25 × 30	0.96	0.105	0.819	0.75	LSP181M2V--A2530
	180	30 × 25	0.98	0.105	0.819	0.75	LSP181M2V--A3025
	220	22 × 45	1.12	0.105	0.737	0.83	LSP221M2V--A2245
	220	25 × 35	1.11	0.105	0.737	0.83	LSP221M2V--A2535
	220	30 × 30	1.11	0.105	0.737	0.83	LSP221M2V--A3030
	270	25 × 40	1.26	0.105	0.600	0.92	LSP271M2V--A2540
	270	30 × 35	1.28	0.105	0.600	0.92	LSP271M2V--A3035
	330	25 × 45	1.40	0.105	0.491	1.02	LSP331M2V--A2545
	330	30 × 35	1.42	0.105	0.491	1.02	LSP331M2V--A3035
	330	35 × 30	1.45	0.105	0.491	1.02	LSP331M2V--A3530
	390	30 × 40	1.60	0.105	0.453	1.11	LSP391M2V--A3040
	390	35 × 35	1.61	0.105	0.453	1.11	LSP391M2V--A3535
	470	30 × 50	1.86	0.105	0.376	1.22	LSP471M2V--A3050
	470	35 × 40	1.85	0.105	0.376	1.22	LSP471M2V--A3540
	560	35 × 40	2.02	0.105	0.316	1.33	LSP561M2V--A3540
	680	35 × 50	2.36	0.105	0.260	1.39	LSP681M2V--A3550
400V	68	22 × 25	0.55	0.105	2.167	0.49	LSP680M2G--A2225
	82	22 × 30	0.63	0.105	1.797	0.54	LSP820M2G--A2230
	100	22 × 30	0.70	0.105	1.474	0.60	LSP101M2G--A2230
	100	25 × 25	0.70	0.105	1.474	0.60	LSP101M2G--A2525
	120	22 × 35	0.79	0.105	1.228	0.66	LSP121M2G--A2235
	120	25 × 30	0.79	0.105	1.228	0.66	LSP121M2G--A2530
	150	22 × 40	0.90	0.105	0.982	0.73	LSP151M2G--A2240
	150	25 × 30	0.88	0.105	0.982	0.73	LSP151M2G--A2530
	150	30 × 25	0.90	0.105	0.982	0.73	LSP151M2G--A3025
	180	22 × 45	0.99	0.105	0.819	0.80	LSP181M2G--A2245
	180	25 × 35	1.01	0.105	0.819	0.80	LSP181M2G--A2535
	180	30 × 30	1.01	0.105	0.819	0.80	LSP181M2G--A3030
	220	25 × 40	1.14	0.105	0.670	0.89	LSP221M2G--A2540
	220	30 × 35	1.16	0.105	0.670	0.89	LSP221M2G--A3035
	270	25 × 50	1.32	0.105	0.546	0.99	LSP271M2G--A2550
	270	30 × 40	1.33	0.105	0.546	0.99	LSP271M2G--A3040
	270	35 × 30	1.31	0.105	0.546	0.99	LSP271M2G--A3530
	330	30 × 45	1.52	0.105	0.447	1.09	LSP331M2G--A3045
	330	35 × 35	1.48	0.105	0.447	1.09	LSP331M2G--A3535
	390	30 × 50	1.69	0.105	0.378	1.18	LSP391M2G--A3050
	390	35 × 40	1.68	0.105	0.378	1.18	LSP391M2G--A3540
	470	35 × 45	1.91	0.105	0.314	1.30	LSP471M2G--A3545
	560	35 × 50	2.14	0.105	0.263	1.42	LSP561M2G--A3550
450V	47	22 × 25	0.46	0.105	3.135	0.44	LSP470M2W--A2225
	56	22 × 30	0.52	0.105	2.843	0.48	LSP560M2W--A2230
	68	22 × 30	0.58	0.105	2.631	0.52	LSP680M2W--A2230
	68	25 × 25	0.58	0.105	2.631	0.52	LSP680M2W--A2525
	82	22 × 35	0.65	0.105	1.797	0.58	LSP820M2W--A2235
	82	25 × 30	0.65	0.105	1.797	0.58	LSP820M2W--A2530
	100	22 × 40	0.74	0.105	1.474	0.64	LSP101M2W--A2240
	100	25 × 30	0.72	0.105	1.474	0.64	LSP101M2W--A2530
	100	30 × 25	0.73	0.105	1.474	0.64	LSP101M2W--A3025
	120	22 × 45	0.83	0.105	1.228	0.70	LSP121M2W--A2245
	120	25 × 35	0.82	0.105	1.228	0.70	LSP121M2W--A2535
	120	30 × 30	0.82	0.105	1.228	0.70	LSP121M2W--A3030
	150	25 × 40	0.94	0.105	0.982	0.78	LSP151M2W--A2540
	150	30 × 35	0.96	0.105	0.982	0.78	LSP151M2W--A3035
	180	30 × 35	1.05	0.105	0.819	0.85	LSP181M2W--A3035
	180	35 × 30	1.07	0.105	0.819	0.85	LSP181M2W--A3530
	220	30 × 40	1.20	0.105	0.670	0.94	LSP221M2W--A3040
	220	35 × 35	1.21	0.105	0.670	0.94	LSP221M2W--A3535

Dimension and Permissible Ripple Current

Rated Voltage V_{DC}	Capacitance 120 Hz, 20℃ μF	ϕD×L mm	Ripple Current 120 Hz, 105℃ A/rms	Tan δ at 120 Hz, 20℃	ESR 120 Hz, 20℃ Ω	LC 5 minutes mA	Part Number
450V	270	30 × 50	1.41	0.105	0.546	1.05	LSP271M2W--A3050
	270	35 × 40	1.40	0.105	0.546	1.05	LSP271M2W--A3540
	330	35 × 45	1.60	0.105	0.447	1.16	LSP331M2W--A3545
	390	35 × 50	1.79	0.105	0.378	1.26	LSP391M2W--A3550

Part Numbering System

LSP Series	100μF	±20%	400V		4.0±0.5mm	30ϕ×35L	Pb-free Terminal + PET Sleeve
LSP	**221**	**M**	**2G**	**- -**	**A**	**3035**	
Series Name	Capacitance	Capacitance tolerance	Rated voltage	Terminal type	Terminal length	Case size	Terminal and Sleeve Type

Example:

Cap.	Symbol
56	560
220	221
470	471

M = ±20%
K = ±10%

Example:

V	Symbol
400	2G
450	2W

Example:

Type	Symbol
2 pins	- -
5 pins	L5

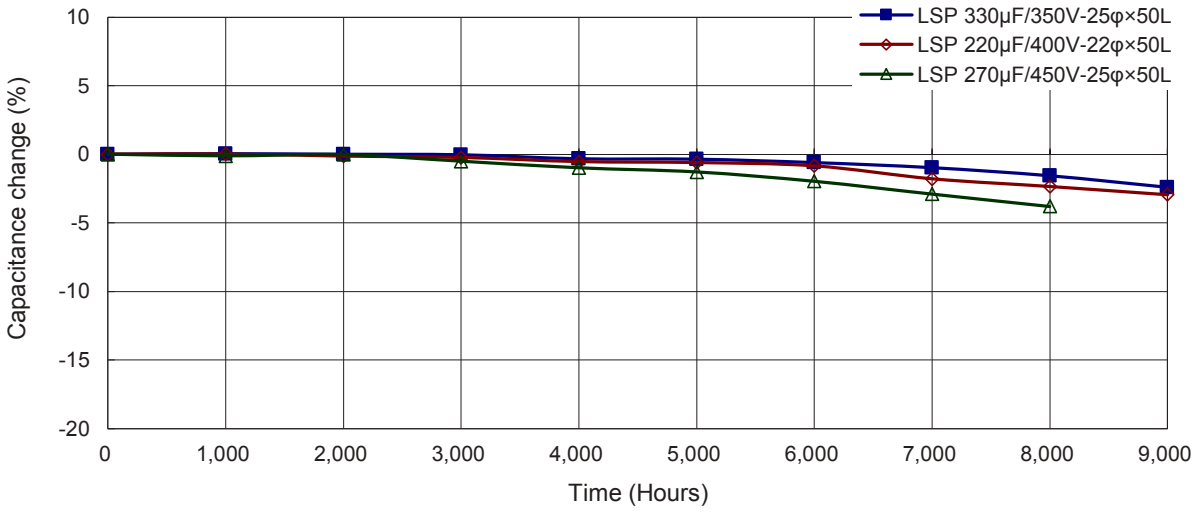
"-":
6.3±1.0 mm

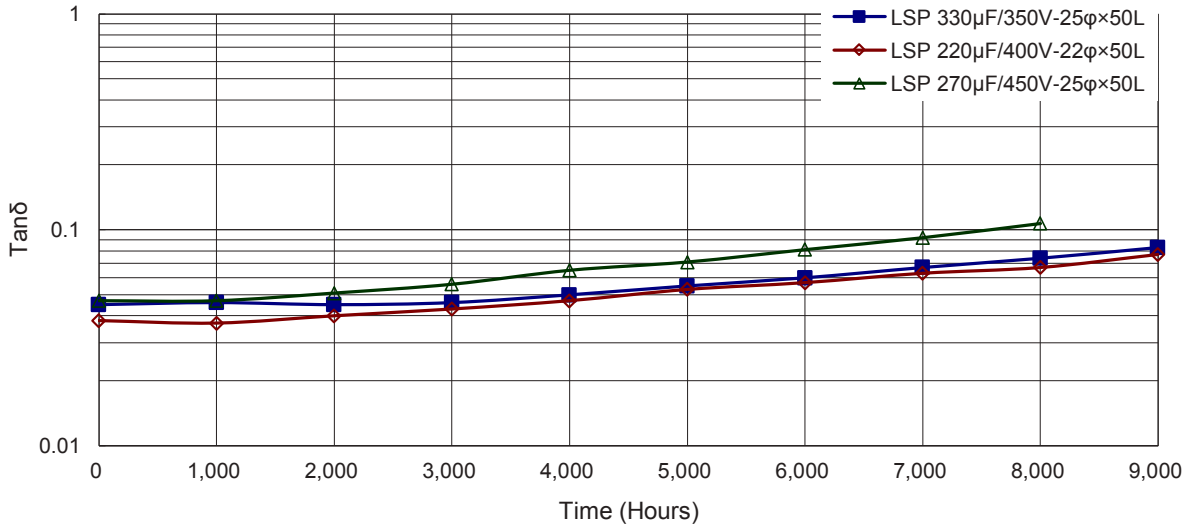
Example:

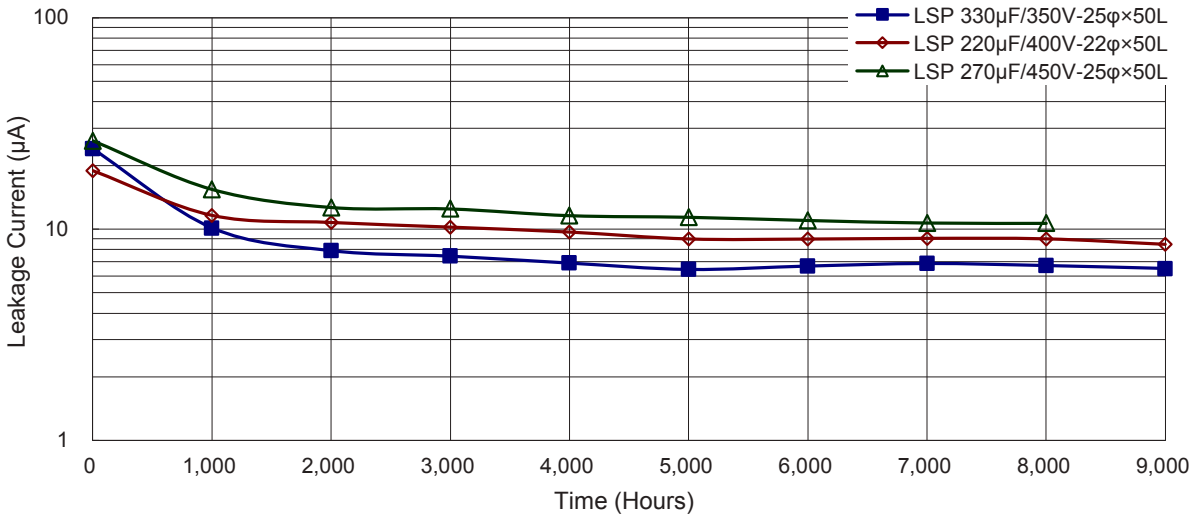
ϕD×L	Code
22×30	2230
25×25	2525
30×40	3040

Note: For more details, please refer to "Part Numbering System (Snap-in Type)" on page 16.

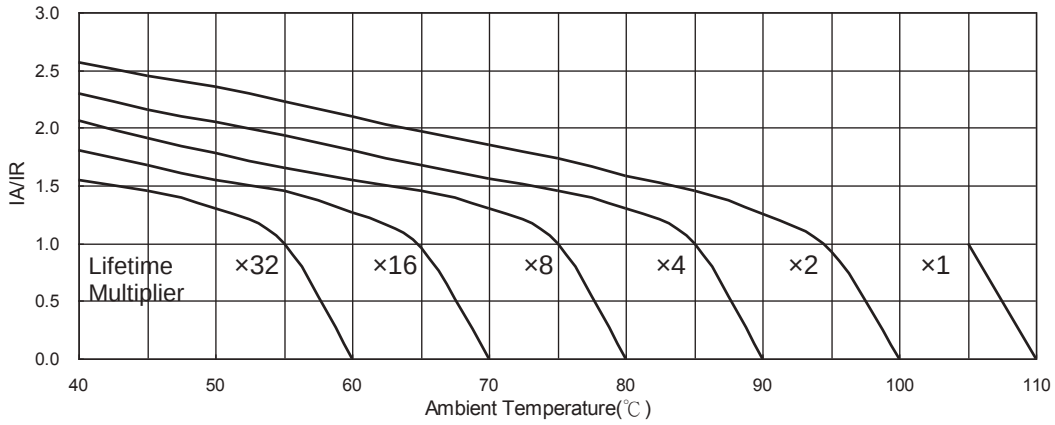
Typical Endurance Curves







Useful Life Chart



IA: Actual ripple current IR: Rated ripple current

LHM Series

Features

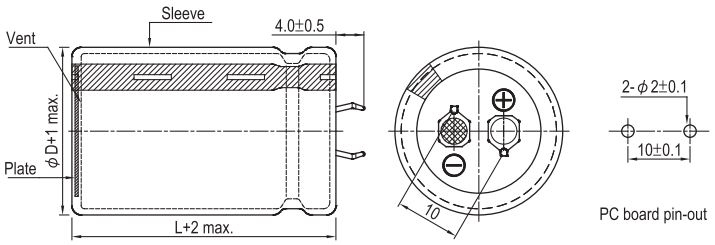
- Snap-in terminal type
- Suitable for high freq. regenerative volt. for AC servomotor, general inverter
- Suitable for equipment used at volt. Fluctuating area & rectifier circuit of volt. doubler
- Application of charge-discharge DC volt. for 50 million times
- RoHS compliance

Specifications

Items	Performance
Category Temperature Range	-25℃ ~ +105℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)	$I = 3\sqrt{CV}$ or 3.0 mA whichever is smaller (after 5 minutes) Where, C = rated capacitance in μF, V = rated DC Rated Voltage in V
Tanδ (at 120 Hz, 20℃)	Rated Voltage: 350 / 400 / 420 / 450 Tanδ (max): 0.15 / 0.15 / 0.15 / 0.15
Low Temperature Characteristics (at 120 Hz)	Impedance ratio shall not exceed the values given in the table below. Rated Voltage: 350 / 400 / 420 / 450 Impedance Ratio Z(-25℃)/Z(+20℃): 8 / 8 / 8 / 8
Endurance of Charge/ Discharge Behavior	After an application of charge-discharge voltage for 50 million times, capacitor shall meet the characteristics requirement listed below: Charge discharge voltage(ΔV) = Rated voltage × 0.35 Frequency: 6 Hz Temperature: 15 ~ 35℃ Capacitance Change: Within ±20% of initial value Tanδ: Less than 300% of specified value Leakage Current: Within specified value Appearance: There shall be not found to remarkable abnormality on the capacitor
Endurance	Test Time: 3,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 200% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied with rated ripple current for 3,000 hours at 105℃.
Shelf Life Test	Test Time: 1,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 200% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 105℃ without voltage applied. The rated voltage shall be applied to the capacitors before the measurements (Refer to JIS C 5101-4 4.1).
Ripple Current and Frequency Multipliers	Frequency (Hz): 50 / 60 / 100 / 120 / 500 / 1k / 10k up Multiplier: 0.8 / 1.0 / 1.1 / 1.3 / 1.4
Failure percentage Failure rate	When the failure percentage / failure rate is required, please contact with us for further discussion.

Diagram of Dimensions

Unit: mm



Dimension and Permissible Ripple Current

Rated Voltage V_{DC}	Capacitance 120 Hz, 20℃ μF	φD×L mm	Ripple Current 120 Hz, 105℃ A/rms	Tan δ at 120 Hz, 20℃	ESR 120 Hz, 20℃ Ω	LC 5 minutes mA	Part Number
350	120	22 × 25	0.75	0.15	1.659	0.61	LHM121M2V--A2225
	150	22 × 30	0.82	0.15	1.327	0.69	LHM151M2V--A2230
	180	22 × 30	0.90	0.15	1.106	0.75	LHM181M2V--A2230
	180	25 × 25	0.90	0.15	1.106	0.75	LHM181M2V--A2525
	220	22 × 35	1.00	0.15	0.905	0.83	LHM221M2V--A2235
	220	25 × 30	1.00	0.15	0.905	0.83	LHM221M2V--A2530
	270	22 × 40	1.10	0.15	0.737	0.92	LHM271M2V--A2240
	270	25 × 35	1.10	0.15	0.737	0.92	LHM271M2V--A2535
	270	30 × 25	1.10	0.15	0.737	0.92	LHM271M2V--A3025
	330	22 × 45	1.20	0.15	0.603	1.02	LHM331M2V--A2245
	330	25 × 40	1.20	0.15	0.603	1.02	LHM331M2V--A2540
	330	30 × 30	1.20	0.15	0.603	1.02	LHM331M2V--A3030
	390	25 × 45	1.30	0.15	0.510	1.11	LHM391M2V--A2545
	390	30 × 35	1.30	0.15	0.510	1.11	LHM391M2V--A3035
	470	25 × 50	1.40	0.15	0.423	1.22	LHM471M2V--A2550
	470	30 × 40	1.40	0.15	0.423	1.22	LHM471M2V--A3040
	470	35 × 30	1.40	0.15	0.423	1.22	LHM471M2V--A3530
	560	30 × 45	1.50	0.15	0.355	1.33	LHM561M2V--A3045
	560	35 × 35	1.50	0.15	0.355	1.33	LHM561M2V--A3535
	680	30 × 50	1.70	0.15	0.293	1.46	LHM681M2V--A3050
	680	35 × 40	1.70	0.15	0.293	1.46	LHM681M2V--A3540
	820	35 × 45	1.90	0.15	0.243	1.50	LHM821M2V--A3545
400	100	22 × 25	0.68	0.15	1.990	0.60	LHM101M2G--A2225
	120	22 × 30	0.73	0.15	1.659	0.66	LHM121M2G--A2230
	150	22 × 35	0.85	0.15	1.327	0.73	LHM151M2G--A2235
	180	22 × 35	0.95	0.15	1.106	0.80	LHM181M2G--A2235
	180	25 × 30	0.95	0.15	1.106	0.80	LHM181M2G--A2530
	180	30 × 25	0.95	0.15	1.106	0.80	LHM181M2G--A3025
	220	22 × 45	1.10	0.15	0.905	0.89	LHM221M2G--A2245
	220	25 × 35	1.10	0.15	0.905	0.89	LHM221M2G--A2535
	220	30 × 25	1.10	0.15	0.905	0.89	LHM221M2G--A3025
	270	22 × 50	1.22	0.15	0.737	0.99	LHM271M2G--A2250
	270	25 × 40	1.22	0.15	0.737	0.99	LHM271M2G--A2540
	270	30 × 30	1.22	0.15	0.737	0.99	LHM271M2G--A3030
	270	35 × 25	1.22	0.15	0.737	0.99	LHM271M2G--A3525
	330	25 × 45	1.44	0.15	0.603	1.09	LHM331M2G--A2545
	330	30 × 35	1.44	0.15	0.603	1.09	LHM331M2G--A3035
	390	25 × 50	1.55	0.15	0.510	1.18	LHM391M2G--A2550
	390	30 × 40	1.55	0.15	0.510	1.18	LHM391M2G--A3040
	390	35 × 30	1.55	0.15	0.510	1.18	LHM391M2G--A3530
	470	30 × 45	1.68	0.15	0.423	1.30	LHM471M2G--A3045
	470	35 × 35	1.68	0.15	0.423	1.30	LHM471M2G--A3535
	560	30 × 50	1.90	0.15	0.355	1.42	LHM561M2G--A3050
	560	35 × 40	1.90	0.15	0.355	1.42	LHM561M2G--A3540
	680	35 × 50	2.12	0.15	0.293	1.50	LHM681M2G--A3550
420	100	22 × 25	0.66	0.15	1.990	0.61	LHM101M2P--A2225
	120	22 × 30	0.81	0.15	1.659	0.67	LHM121M2P--A2230
	120	25 × 25	0.81	0.15	1.659	0.67	LHM121M2P--A2525
	150	22 × 35	0.84	0.15	1.327	0.75	LHM151M2P--A2235
	150	25 × 30	0.84	0.15	1.327	0.75	LHM151M2P--A2530
	180	22 × 40	0.91	0.15	1.106	0.82	LHM181M2P--A2240
	180	25 × 30	0.91	0.15	1.106	0.82	LHM181M2P--A2530
	180	30 × 25	0.91	0.15	1.106	0.82	LHM181M2P--A3025
	220	22 × 45	1.05	0.15	0.905	0.91	LHM221M2P--A2245
	220	25 × 35	1.05	0.15	0.905	0.91	LHM221M2P--A2535
	220	30 × 30	1.05	0.15	0.905	0.91	LHM221M2P--A3030
	270	25 × 40	1.25	0.15	0.737	1.01	LHM271M2P--A2540
	270	30 × 30	1.25	0.15	0.737	1.01	LHM271M2P--A3030
	270	35 × 25	1.25	0.15	0.737	1.01	LHM271M2P--A3525
	330	25 × 50	1.42	0.15	0.603	1.12	LHM331M2P--A2550
	330	30 × 35	1.42	0.15	0.603	1.12	LHM331M2P--A3035
	330	35 × 30	1.42	0.15	0.603	1.12	LHM331M2P--A3530
	390	30 × 40	1.61	0.15	0.510	1.21	LHM391M2P--A3040
	390	35 × 35	1.61	0.15	0.510	1.21	LHM391M2P--A3535
	470	30 × 50	1.86	0.15	0.423	1.33	LHM471M2P--A3050

Dimension and Permissible Ripple Current

Rated Voltage V_{DC}	Capacitance 120 Hz, 20℃ μF	ϕD×L mm	Ripple Current 120 Hz, 105℃ A/rms	Tan δ at 120 Hz, 20℃	ESR 120 Hz, 20℃ Ω	LC 5 minutes mA	Part Number
420	470	35 × 40	1.86	0.15	0.423	1.33	LHM471M2P--A3540
	560	35 × 45	2.10	0.15	0.355	1.45	LHM561M2P--A3545
	680	35 × 50	2.20	0.15	0.293	1.50	LHM681M2P--A3550
450	82	22 × 25	0.64	0.15	2.427	0.58	LHM820M2W--A2225
	100	22 × 30	0.69	0.15	1.990	0.64	LHM101M2W--A2230
	100	25 × 25	0.69	0.15	1.990	0.64	LHM101M2W--A2525
	120	22 × 35	0.72	0.15	1.659	0.70	LHM121M2W--A2235
	120	25 × 30	0.72	0.15	1.659	0.70	LHM121M2W--A2530
	150	22 × 40	0.79	0.15	1.327	0.78	LHM151M2W--A2240
	150	25 × 30	0.79	0.15	1.327	0.78	LHM151M2W--A2530
	150	30 × 25	0.79	0.15	1.327	0.78	LHM151M2W--A3025
	180	22 × 45	0.87	0.15	1.106	0.85	LHM181M2W--A2245
	180	25 × 35	0.87	0.15	1.106	0.85	LHM181M2W--A2535
	180	30 × 30	0.87	0.15	1.106	0.85	LHM181M2W--A3030
	220	25 × 40	1.05	0.15	0.905	0.94	LHM221M2W--A2540
	220	30 × 30	1.05	0.15	0.905	0.94	LHM221M2W--A3030
	220	35 × 25	1.05	0.15	0.905	0.94	LHM221M2W--A3525
	270	25 × 50	1.23	0.15	0.737	1.05	LHM271M2W--A2550
	270	30 × 35	1.23	0.15	0.737	1.05	LHM271M2W--A3035
	270	35 × 30	1.23	0.15	0.737	1.05	LHM271M2W--A3530
	330	30 × 40	1.38	0.15	0.603	1.16	LHM331M2W--A3040
	330	35 × 35	1.38	0.15	0.603	1.16	LHM331M2W--A3535
	390	30 × 50	1.61	0.15	0.510	1.26	LHM391M2W--A3050
	390	35 × 40	1.61	0.15	0.510	1.26	LHM391M2W--A3540
	470	35 × 45	1.78	0.15	0.423	1.38	LHM471M2W--A3545
	560	35 × 50	1.99	0.15	0.355	1.50	LHM561M2W--A3550

Part Numbering System

LHM Series	100μF	±20%	400V		4.0±0.5mm	22ϕ×30L	Pb-free Terminal + PET Sleeve
LHM	**101**	**M**	**2G**	**- -**	**A**	**2230**	
Series Name	Capacitance	Capacitance tolerance	Rated voltage	Terminal type	Terminal length	Case size	Terminal and Sleeve Type

Example:

Cap.	Symbol
56	560
220	221
470	471

M = ±20%
K = ±10%

Example:

Voltage	Symbol
400	2G
450	2W

Example:

Type	Symbol
2 pins	- -
5 pins	L5

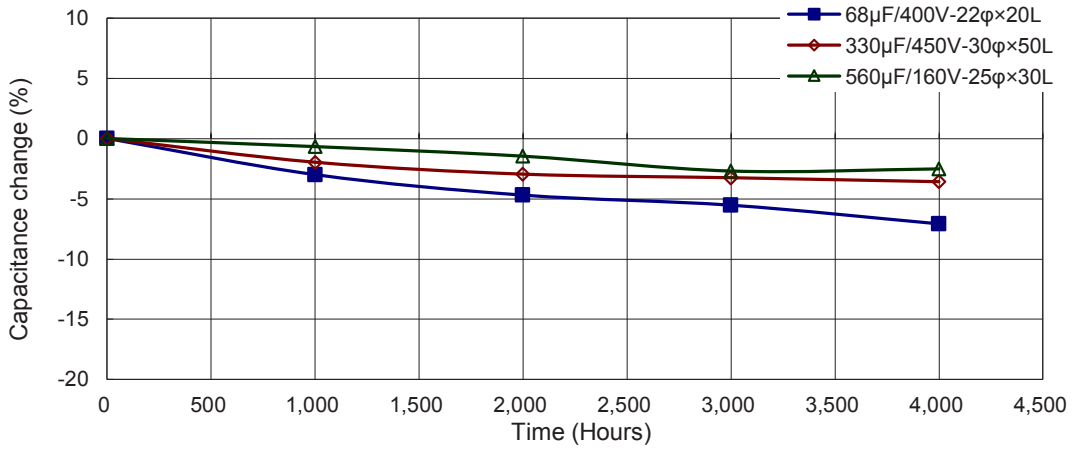
"-": 6.3±1.0 mm

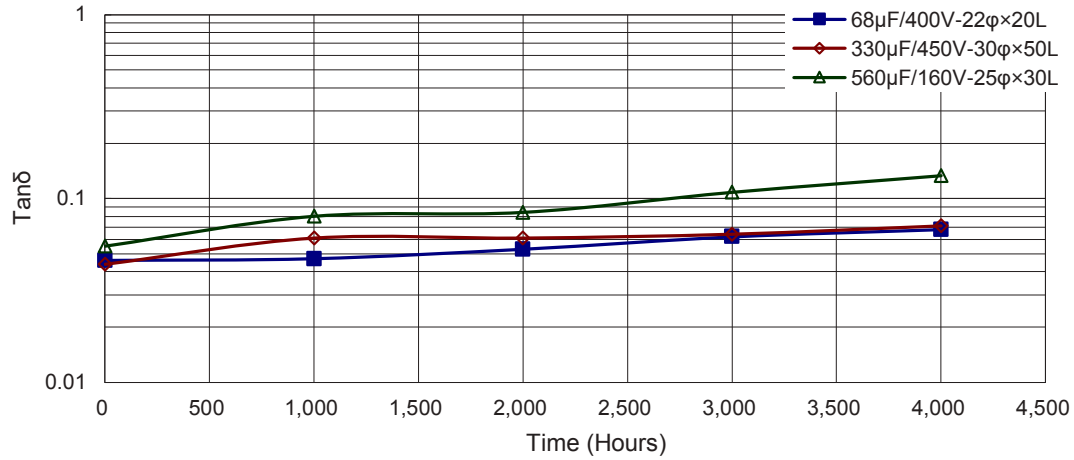
Example:

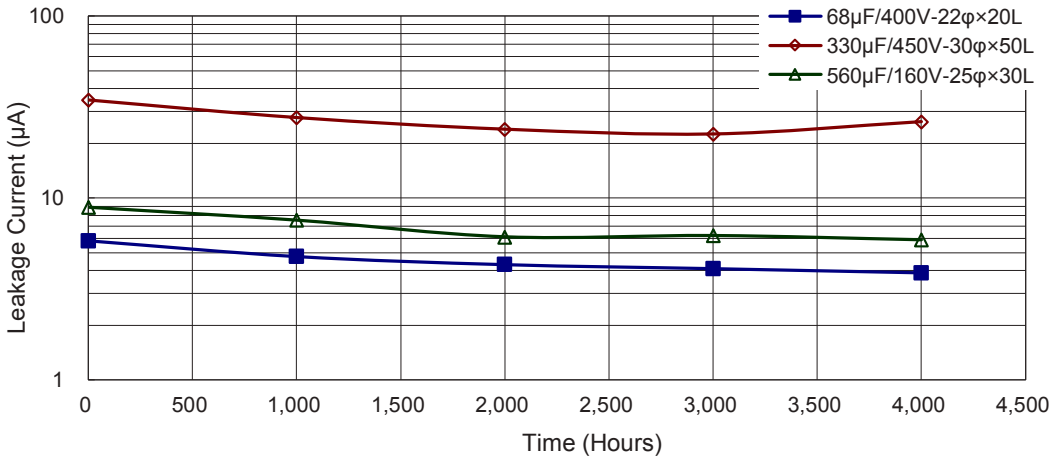
ϕD×L	Code
22×30	2230
25×25	2525
30×40	3040

Note: For more details, please refer to "Part Numbering System (Snap-in Type)" on page 16.

Typical Endurance Curves







MEA Series

Features

- Endurance with ripple current: 85℃, 2,000 hours
- RoHS compliance

Specifications

Items	Performance	
Category Temperature Range	-40℃ ~ +85℃	-25℃ ~ +85℃
	10 ~ 100V	160 ~ 450V
Capacitance Tolerance	±20%	(at 120 Hz, 20℃)
Leakage Current (at 20℃)	$I = 3\sqrt{CV}$ or 5 (mA) whichever is smaller (after 5 minutes) Where, C = rated capacitance in μF, V = rated DC Rated Voltage in V	
Tanδ (at 120 Hz, 20℃)	See the Dimensions & Permissible Ripple Current	
Low Temperature Characteristics (at 120 Hz)	Capacitance change : C(-25℃) / C(+20℃) ≧ 0.7	
Endurance	Test Time: 2,000 Hrs Capacitance Change: Within ±15% of initial value Tanδ: Less than 175% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after subjected to DC voltage with rated ripple current applied for 2,000 hours at 85℃.	
Shelf Life Test	Test Time: 500 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 200% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 500 hours at 85℃ without voltage applied. The rated voltage shall be applied to the capacitors before the measurements (Refer to JIS C 5101-4 4.1).	

Ripple Current and Frequency Multipliers					
Frequency (Hz)	50 / 60	100 / 120	300	1k	10k up
Multiplier	0.7	1.0	1.1	1.3	1.4

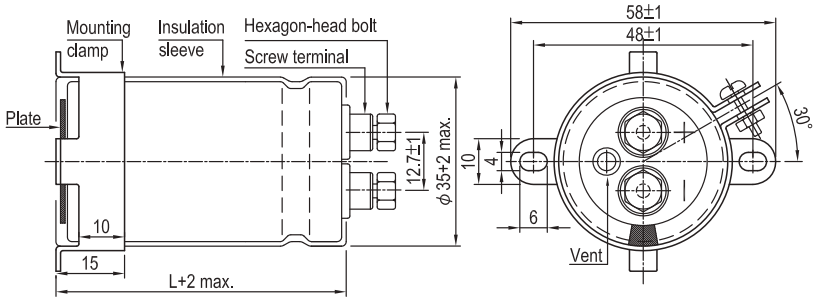
Ripple Current and Temperature Multipliers				
Temperature (℃)	40	60	70	85
Multiplier	2.7	2.0	1.7	1.0

Failure percentage Failure rate	When the failure percentage / failure rate is required, please contact with us for further discussion.

Diagram of Dimensions

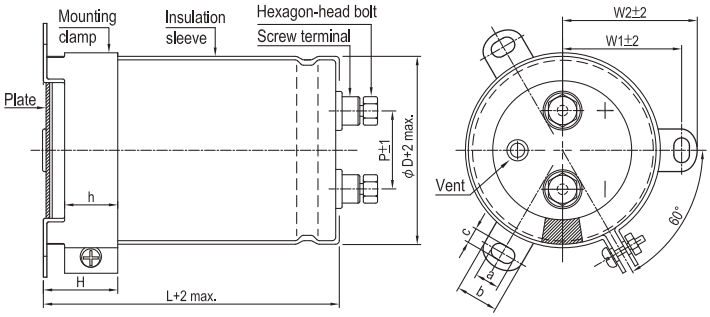
1. 35ϕ

Unit: mm



Screw Specifications:
Plug hexagon-head screw: M5×0.8×10
Max. screw tightening torque: 3.23Nm

2. 51 ~ 89 ϕ



Unit: mm

φD	P	W1	W2	H	h	a	b	c
51	22.0	31.8	36.5	30	24	7	14.0	4.5
63.5	28.6	38.1	42.6	30	24	7	14.0	4.5
76.2	32.0	44.5	49.2	30	24	7	14.0	5.0
89	32.0	50.8	55.6	30	24	7	14.0	5.0

Screw Specifications:
Plug hexagon-head screw: M5×0.8×10
Max. screw tightening torque: 3.23Nm

Dimension and Permissible Ripple Current

Rated Voltage V_{DC}	Capacitance 120 Hz, 20℃ μF	φD×L mm	Ripple Current 120 Hz, 85℃ A/rms	Tan δ at 120 Hz, 20℃	ESR 120 Hz, 20℃ mΩ	LC 5 minutes mA	Part Number
10	33,000	35 × 53	4.4	0.60	24.1	1.72	MEA333M1A-AA053
	39,000	35 × 50	4.6	0.60	20.4	1.87	MEA393M1A-AA050
	39,000	35 × 53	4.7	0.60	20.4	1.87	MEA393M1A-AA053
	47,000	35 × 65	5.6	0.60	16.9	2.06	MEA473M1A-AA065
	56,000	35 × 65	5.9	0.60	14.2	2.24	MEA563M1A-AA065
	68,000	35 × 83	7.5	0.60	11.7	2.47	MEA683M1A-AA083
	82,000	35 × 80	7.6	0.60	9.7	2.72	MEA823M1A-AA080
	82,000	35 × 83	7.7	0.60	9.7	2.72	MEA823M1A-AA083
	82,000	35 × 100	8.3	0.60	9.7	2.72	MEA823M1A-AA100
	100,000	35 × 100	8.4	0.70	9.3	3.00	MEA104M1A-AA100
	100,000	35 × 121	9.2	0.70	9.3	3.00	MEA104M1A-AA121
	120,000	35 × 121	9.4	0.70	7.7	3.29	MEA124M1A-AA121
	150,000	35 × 121	10.5	0.90	8.0	3.67	MEA154M1A-AA121
	150,000	51 × 80	10.0	0.90	8.0	3.67	MEA154M1A--B080
	150,000	51 × 83	10.2	0.90	8.0	3.67	MEA154M1A--B083
	180,000	51 × 83	10.7	0.90	6.6	4.02	MEA184M1A--B083
	220,000	51 × 100	12.8	1.00	6.0	4.45	MEA224M1A--B100
	220,000	51 × 121	13.9	1.00	6.0	4.45	MEA224M1A--B121
	270,000	51 × 121	15.2	1.20	5.9	4.93	MEA274M1A--B121
	330,000	63.5 × 96	15.5	1.40	5.6	5.00	MEA334M1A--C096
	330,000	63.5 × 121	17.2	1.40	5.6	5.00	MEA334M1A--C121
	390,000	63.5 × 100	16.7	1.50	5.1	5.00	MEA394M1A--C100
	390,000	63.5 × 115	17.7	1.50	5.1	5.00	MEA394M1A--C115
	390,000	63.5 × 121	18.1	1.50	5.1	5.00	MEA394M1A--C121
	470,000	63.5 × 121	18.3	2.00	5.6	5.00	MEA474M1A--C121
	470,000	63.5 × 130	18.5	2.00	5.6	5.00	MEA474M1A--C130
	470,000	76.2 × 121	19.2	2.00	5.6	5.00	MEA474M1A--D121
	560,000	76.2 × 100	18.3	2.50	5.9	5.00	MEA564M1A--D100
	560,000	76.2 × 115	19.4	2.50	5.9	5.00	MEA564M1A--D115
	560,000	76.2 × 121	19.8	2.50	5.9	5.00	MEA564M1A--D121
	680,000	76.2 × 121	21.0	3.00	5.9	5.00	MEA684M1A--D121
	820,000	76.2 × 155	23.8	3.50	5.7	5.00	MEA824M1A--D155
16	22,000	35 × 53	3.7	0.40	24.1	1.78	MEA223M1C-AA053
	27,000	35 × 50	4.1	0.45	22.1	1.97	MEA273M1C-AA050
	27,000	35 × 53	4.2	0.45	22.1	1.97	MEA273M1C-AA053
	33,000	35 × 53	5.0	0.50	20.1	2.18	MEA333M1C-AA053
	33,000	35 × 55	5.1	0.50	20.1	2.18	MEA333M1C-AA055
	33,000	35 × 65	5.5	0.50	20.1	2.18	MEA333M1C-AA065
	39,000	35 × 65	5.8	0.50	17.0	2.37	MEA393M1C-AA065
	47,000	35 × 80	7.1	0.55	15.5	2.60	MEA473M1C-AA080
	47,000	35 × 83	7.2	0.55	15.5	2.60	MEA473M1C-AA083
	56,000	35 × 80	7.4	0.60	14.2	2.84	MEA563M1C-AA080
	56,000	35 × 83	7.5	0.60	14.2	2.84	MEA563M1C-AA083
	68,000	35 × 100	9.3	0.60	11.7	3.13	MEA683M1C-AA100
	68,000	35 × 105	9.6	0.60	11.7	3.13	MEA683M1C-AA105
	68,000	35 × 121	10.2	0.60	11.7	3.13	MEA683M1C-AA121
	82,000	35 × 100	9.5	0.70	11.3	3.44	MEA823M1C-AA100
	82,000	35 × 121	10.4	0.70	11.3	3.44	MEA823M1C-AA121
	100,000	35 × 121	11.5	0.70	9.3	3.79	MEA104M1C-AA121

Dimension and Permissible Ripple Current

Rated Voltage V_{DC}	Capacitance 120 Hz, 20℃ μF	ϕD×L mm	Ripple Current 120 Hz, 85℃ A/rms	Tan δ at 120 Hz, 20℃	ESR 120 Hz, 20℃ mΩ	LC 5 minutes mA	Part Number
16	100,000	51 × 80	10.7	0.70	9.3	3.79	MEA104M1C--B080
	100,000	51 × 83	10.9	0.70	9.3	3.79	MEA104M1C--B083
	120,000	35 × 121	11.5	0.80	8.8	4.16	MEA124M1C-AA121
	120,000	51 × 80	11.1	0.80	8.8	4.16	MEA124M1C--B080
	120,000	51 × 83	11.3	0.80	8.8	4.16	MEA124M1C--B083
	150,000	51 × 80	11.4	0.90	8.0	4.65	MEA154M1C--B080
	150,000	51 × 96	11.6	0.90	8.0	4.65	MEA154M1C--B096
	150,000	51 × 100	11.7	0.90	8.0	4.65	MEA154M1C--B100
	150,000	51 × 121	12.6	0.90	8.0	4.65	MEA154M1C--B121
	180,000	51 × 115	12.7	0.90	6.6	5.00	MEA184M1C--B115
	180,000	51 × 121	13.0	0.90	6.6	5.00	MEA184M1C--B121
	220,000	51 × 121	14.4	1.00	6.0	5.00	MEA224M1C--B121
	220,000	51 × 130	14.8	1.00	6.0	5.00	MEA224M1C--B130
	220,000	63.5 × 100	14.7	1.00	6.0	5.00	MEA224M1C--C100
	270,000	63.5 × 96	15.0	1.20	5.9	5.00	MEA274M1C--C096
	270,000	63.5 × 100	15.3	1.20	5.9	5.00	MEA274M1C--C100
	330,000	63.5 × 105	15.8	1.30	5.2	5.00	MEA334M1C--C105
	330,000	63.5 × 115	16.4	1.30	5.2	5.00	MEA334M1C--C115
	330,000	63.5 × 121	16.7	1.30	5.2	5.00	MEA334M1C--C121
	330,000	76.2 × 121	18.2	1.30	5.2	5.00	MEA334M1C--D121
	390,000	63.5 × 130	17.3	1.60	5.4	5.00	MEA394M1C--C130
	390,000	76.2 × 100	17.2	1.60	5.4	5.00	MEA394M1C--D100
	390,000	76.2 × 121	18.6	1.60	5.4	5.00	MEA394M1C--D121
	470,000	76.2 × 115	18.9	1.80	5.1	5.00	MEA474M1C--D115
	470,000	76.2 × 121	19.3	1.80	5.1	5.00	MEA474M1C--D121
	560,000	76.2 × 130	19.9	2.00	4.7	5.00	MEA564M1C--D130
	560,000	76.2 × 140	20.5	2.00	4.7	5.00	MEA564M1C--D140
	560,000	76.2 × 144	20.7	2.00	4.7	5.00	MEA564M1C--D144
	680,000	76.2 × 144	21.8	2.40	4.7	5.00	MEA684M1C--D144
	680,000	76.2 × 155	22.3	2.40	4.7	5.00	MEA684M1C--D155
	820,000	89 × 157	24.1	2.80	4.5	5.00	MEA824M1C--E157
25	15,000	35 × 53	3.7	0.30	26.5	1.84	MEA153M1E-AA053
	18,000	35 × 50	3.9	0.30	22.1	2.01	MEA183M1E-AA050
	18,000	35 × 53	4.0	0.30	22.1	2.01	MEA183M1E-AA053
	22,000	35 × 53	4.1	0.35	21.1	2.22	MEA223M1E-AA053
	22,000	35 × 55	4.2	0.35	21.1	2.22	MEA223M1E-AA055
	22,000	35 × 65	4.5	0.35	21.1	2.22	MEA223M1E-AA065
	27,000	35 × 65	5.0	0.35	17.2	2.46	MEA273M1E-AA065
	33,000	35 × 80	5.4	0.40	16.1	2.72	MEA333M1E-AA080
	33,000	35 × 83	5.5	0.40	16.1	2.72	MEA333M1E-AA083
	39,000	35 × 80	6.1	0.40	13.6	2.96	MEA393M1E-AA080
	39,000	35 × 83	6.2	0.40	13.6	2.96	MEA393M1E-AA083
	47,000	35 × 100	6.8	0.40	11.3	3.25	MEA473M1E-AA100
	47,000	35 × 105	6.9	0.40	11.3	3.25	MEA473M1E-AA105
	47,000	35 × 121	7.4	0.40	11.3	3.25	MEA473M1E-AA121
	56,000	35 × 100	7.6	0.40	9.5	3.55	MEA563M1E-AA100
	56,000	35 × 121	8.3	0.40	9.5	3.55	MEA563M1E-AA121
	68,000	35 × 121	9.0	0.45	8.8	3.91	MEA683M1E-AA121
	68,000	51 × 80	8.4	0.45	8.8	3.91	MEA683M1E--B080
	68,000	51 × 100	9.3	0.45	8.8	3.91	MEA683M1E--B100
	82,000	35 × 121	7.9	0.50	8.1	4.30	MEA823M1E-AA121
	82,000	51 × 80	9.2	0.50	8.1	4.30	MEA823M1E--B080
	82,000	51 × 121	9.7	0.50	8.1	4.30	MEA823M1E--B121
	100,000	51 × 96	9.5	0.50	6.6	4.74	MEA104M1E--B096
	100,000	51 × 100	9.6	0.50	6.6	4.74	MEA104M1E--B100
	100,000	51 × 105	9.8	0.50	6.6	4.74	MEA104M1E--B105
	100,000	51 × 121	10.5	0.50	6.6	4.74	MEA104M1E--B121
	120,000	51 × 115	11.2	0.60	6.6	5.00	MEA124M1E--B115
	120,000	51 × 121	11.5	0.60	6.6	5.00	MEA124M1E--B121
	150,000	51 × 130	12.8	0.60	5.3	5.00	MEA154M1E--B130
	150,000	63.5 × 100	12.9	0.60	5.3	5.00	MEA154M1E--C100
	150,000	63.5 × 105	13.2	0.60	5.3	5.00	MEA154M1E--C105
	180,000	63.5 × 96	13.3	0.70	5.2	5.00	MEA184M1E--C096
	180,000	63.5 × 100	13.5	0.70	5.2	5.00	MEA184M1E--C100
	180,000	63.5 × 121	14.7	0.70	5.2	5.00	MEA184M1E--C121
	220,000	63.5 × 105	15.7	0.75	4.5	5.00	MEA224M1E--C105

Dimension and Permissible Ripple Current

Rated Voltage V_{DC}	Capacitance 120 Hz, 20℃ μF	ϕD×L mm	Ripple Current 120 Hz, 85℃ A/rms	Tan δ at 120 Hz, 20℃	ESR 120 Hz, 20℃ mΩ	LC 5 minutes mA	Part Number
25	220,000	63.5 × 115	16.3	0.75	4.5	5.00	MEA224M1E--C115
	220,000	63.5 × 121	16.7	0.75	4.5	5.00	MEA224M1E--C121
	220,000	63.5 × 144	18.0	0.75	4.5	5.00	MEA224M1E--C144
	270,000	63.5 × 130	17.5	0.80	3.9	5.00	MEA274M1E--C130
	270,000	63.5 × 144	18.3	0.80	3.9	5.00	MEA274M1E--C144
	270,000	76.2 × 100	16.8	0.80	3.9	5.00	MEA274M1E--D100
	330,000	63.5 × 155	20.3	0.90	3.6	5.00	MEA334M1E--C155
	330,000	76.2 × 121	18.1	0.90	3.6	5.00	MEA334M1E--D121
	330,000	76.2 × 144	19.5	0.90	3.6	5.00	MEA334M1E--D144
	390,000	76.2 × 115	18.9	1.00	3.4	5.00	MEA394M1E--D115
	390,000	76.2 × 140	20.5	1.00	3.4	5.00	MEA394M1E--D140
	390,000	76.2 × 144	20.8	1.00	3.4	5.00	MEA394M1E--D144
	470,000	76.2 × 155	21.5	1.20	3.4	5.00	MEA474M1E--D155
	470,000	76.2 × 220	25.2	1.20	3.4	5.00	MEA474M1E--D220
	560,000	89 × 130	22.4	1.40	3.3	5.00	MEA564M1E--E130
	560,000	89 × 140	23.0	1.40	3.3	5.00	MEA564M1E--E140
	680,000	89 × 157	25.0	1.60	3.1	5.00	MEA684M1E--E157
35	10,000	35 × 53	3.5	0.30	39.8	1.77	MEA103M1V-AA053
	12,000	35 × 53	3.7	0.30	33.2	1.94	MEA123M1V-AA053
	15,000	35 × 50	3.7	0.30	26.5	2.17	MEA153M1V-AA050
	15,000	35 × 65	3.9	0.30	26.5	2.17	MEA153M1V-AA065
	18,000	35 × 65	4.2	0.35	25.8	2.38	MEA183M1V-AA065
	18,000	35 × 83	4.7	0.35	25.8	2.38	MEA183M1V-AA083
	22,000	35 × 83	4.9	0.35	21.1	2.63	MEA223M1V-AA083
	27,000	35 × 100	5.7	0.40	19.7	2.92	MEA273M1V-AA100
	27,000	35 × 83	5.2	0.40	19.7	2.92	MEA273M1V-AA083
	33,000	35 × 80	5.9	0.40	16.1	3.22	MEA333M1V-AA080
	33,000	35 × 100	6.5	0.40	16.1	3.22	MEA333M1V-AA100
	33,000	35 × 121	7.1	0.40	16.1	3.22	MEA333M1V-AA121
	39,000	35 × 100	6.7	0.40	13.6	3.50	MEA393M1V-AA100
	39,000	35 × 121	7.3	0.40	13.6	3.50	MEA393M1V-AA121
	47,000	35 × 121	8.0	0.45	12.7	3.85	MEA473M1V-AA121
	47,000	51 × 83	8.3	0.45	12.7	3.85	MEA473M1V--B083
	47,000	51 × 96	8.8	0.45	12.7	3.85	MEA473M1V--B096
	56,000	51 × 83	8.7	0.50	11.8	4.20	MEA563M1V--B083
	56,000	51 × 96	9.3	0.50	11.8	4.20	MEA563M1V--B096
	68,000	51 × 80	9.3	0.50	9.8	4.63	MEA683M1V--B080
	68,000	51 × 100	10.2	0.50	9.8	4.63	MEA683M1V--B100
	68,000	51 × 115	10.9	0.50	9.8	4.63	MEA683M1V--B115
	82,000	51 × 100	10.5	0.55	8.9	5.00	MEA823M1V--B100
	82,000	63.5 × 96	10.7	0.55	8.9	5.00	MEA823M1V--C096
	100,000	63.5 × 100	10.9	0.60	8.0	5.00	MEA104M1V--C100
	100,000	63.5 × 115	11.6	0.60	8.0	5.00	MEA104M1V--C115
	120,000	51 × 121	12.4	0.60	6.6	5.00	MEA124M1V--B121
	120,000	63.5 × 121	12.8	0.60	6.6	5.00	MEA124M1V--C121
	150,000	63.5 × 100	13.0	0.70	6.2	5.00	MEA154M1V--C100
	150,000	63.5 × 130	14.6	0.70	6.2	5.00	MEA154M1V--C130
	150,000	63.5 × 144	15.3	0.70	6.2	5.00	MEA154M1V--C144
	180,000	63.5 × 121	14.6	0.70	5.2	5.00	MEA184M1V--C121
	180,000	63.5 × 144	15.8	0.70	5.2	5.00	MEA184M1V--C144
	180,000	76.2 × 115	14.2	0.70	5.2	5.00	MEA184M1V--D115
	220,000	76.2 × 100	14.8	0.75	4.5	5.00	MEA224M1V--D100
	220,000	76.2 × 130	16.5	0.75	4.5	5.00	MEA224M1V--D130
	220,000	76.2 × 144	17.3	0.75	4.5	5.00	MEA224M1V--D144
	270,000	76.2 × 121	17.1	0.80	3.9	5.00	MEA274M1V--D121
	270,000	76.2 × 155	19.2	0.80	3.9	5.00	MEA274M1V--D155
	330,000	76.2 × 140	19.6	0.85	3.4	5.00	MEA334M1V--D140
	330,000	89 × 130	20.9	0.85	3.4	5.00	MEA334M1V--E130
	390,000	89 × 157	23.8	0.90	3.1	5.00	MEA394M1V--E157
	470,000	89 × 140	24.3	0.95	2.7	5.00	MEA474M1V--E140
	470,000	89 × 157	25.5	0.95	2.7	5.00	MEA474M1V--E157

Dimension and Permissible Ripple Current

Rated Voltage V_{DC}	Capacitance 120 Hz, 20℃ μF	ϕD×L mm	Ripple Current 120 Hz, 85℃ A/rms	Tan δ at 120 Hz, 20℃	ESR 120 Hz, 20℃ mΩ	LC 5 minutes mA	Part Number
50	5,600	35 × 53	2.9	0.25	59.2	1.59	MEA562M1H-AA053
	6,800	35 × 53	3.2	0.25	48.8	1.75	MEA682M1H-AA053
	8,200	35 × 53	3.4	0.25	40.4	1.92	MEA822M1H-AA053
	10,000	35 × 50	3.8	0.25	33.2	2.12	MEA103M1H-AA050
	10,000	35 × 65	4.3	0.25	33.2	2.12	MEA103M1H-AA065
	12,000	35 × 65	4.5	0.25	27.6	2.32	MEA123M1H-AA065
	12,000	35 × 83	4.6	0.25	27.6	2.32	MEA123M1H-AA083
	15,000	35 × 83	4.7	0.25	22.1	2.60	MEA153M1H-AA083
	18,000	35 × 80	4.8	0.25	18.4	2.85	MEA183M1H-AA080
	18,000	35 × 83	4.9	0.25	18.4	2.85	MEA183M1H-AA083
	18,000	35 × 100	5.3	0.25	18.4	2.85	MEA183M1H-AA100
	22,000	35 × 100	5.8	0.30	18.1	3.15	MEA223M1H-AA100
	22,000	35 × 121	6.3	0.30	18.1	3.15	MEA223M1H-AA121
	27,000	35 × 121	6.6	0.35	17.2	3.49	MEA273M1H-AA121
	33,000	51 × 83	7.5	0.40	16.1	3.85	MEA333M1H--B083
	33,000	51 × 96	8.0	0.40	16.1	3.85	MEA333M1H--B096
	39,000	51 × 80	7.6	0.40	13.6	4.19	MEA393M1H--B080
	39,000	51 × 83	7.7	0.40	13.6	4.19	MEA393M1H--B083
	39,000	51 × 96	8.2	0.40	13.6	4.19	MEA393M1H--B096
	47,000	51 × 100	9.6	0.40	11.3	4.60	MEA473M1H--B100
	47,000	51 × 115	10.2	0.40	11.3	4.60	MEA473M1H--B115
	56,000	51 × 100	9.8	0.40	9.5	5.00	MEA563M1H--B100
	56,000	63.5 × 96	10.9	0.40	9.5	5.00	MEA563M1H--C096
	68,000	51 × 121	11.4	0.45	8.8	5.00	MEA683M1H--B121
	68,000	63.5 × 96	11.7	0.45	8.8	5.00	MEA683M1H--C096
	68,000	63.5 × 100	11.9	0.45	8.8	5.00	MEA683M1H--C100
	82,000	63.5 × 100	12.2	0.50	8.1	5.00	MEA823M1H--C100
	82,000	63.5 × 115	13.0	0.50	8.1	5.00	MEA823M1H--C115
	100,000	63.5 × 144	14.2	0.50	6.6	5.00	MEA104M1H--C144
	100,000	76.2 × 115	14.3	0.50	6.6	5.00	MEA104M1H--D115
	120,000	63.5 × 121	13.4	0.50	5.5	5.00	MEA124M1H--C121
	120,000	63.5 × 144	14.5	0.50	5.5	5.00	MEA124M1H--C144
	120,000	76.2 × 115	14.6	0.50	5.5	5.00	MEA124M1H--D115
	150,000	76.2 × 121	15.3	0.60	5.3	5.00	MEA154M1H--D121
	150,000	76.2 × 130	15.8	0.60	5.3	5.00	MEA154M1H--D130
	150,000	76.2 × 144	16.5	0.60	5.3	5.00	MEA154M1H--D144
	180,000	76.2 × 140	16.6	0.70	5.2	5.00	MEA184M1H--D140
	180,000	76.2 × 144	16.8	0.70	5.2	5.00	MEA184M1H--D144
	180,000	76.2 × 155	17.4	0.70	5.2	5.00	MEA184M1H--D155
	220,000	89 × 130	18.2	0.80	4.8	5.00	MEA224M1H--E130
	270,000	89 × 140	18.7	1.00	4.9	5.00	MEA274M1H--E140
	270,000	89 × 157	19.7	1.00	4.9	5.00	MEA274M1H--E157
63	3,900	35 × 53	2.5	0.20	68.0	1.49	MEA392M1J-AA053
	4,700	35 × 53	2.7	0.20	56.4	1.63	MEA472M1J-AA053
	4,700	35 × 55	2.8	0.20	56.4	1.63	MEA472M1J-AA055
	5,600	35 × 50	2.9	0.20	47.4	1.78	MEA562M1J-AA050
	5,600	35 × 53	3.0	0.20	47.4	1.78	MEA562M1J-AA053
	6,800	35 × 53	3.7	0.20	39.0	1.96	MEA682M1J-AA053
	6,800	35 × 55	3.8	0.20	39.0	1.96	MEA682M1J-AA055
	6,800	35 × 65	4.1	0.20	39.0	1.96	MEA682M1J-AA065
	8,200	35 × 65	4.4	0.25	40.4	2.16	MEA822M1J-AA065
	8,200	35 × 83	4.6	0.25	40.4	2.16	MEA822M1J-AA083
	10,000	35 × 80	4.6	0.25	33.2	2.38	MEA103M1J-AA080
	10,000	35 × 83	4.7	0.25	33.2	2.38	MEA103M1J-AA083
	12,000	35 × 83	4.8	0.25	27.6	2.61	MEA123M1J-AA083
	12,000	35 × 100	5.1	0.25	27.6	2.61	MEA123M1J-AA100
	15,000	35 × 100	5.6	0.25	22.1	2.92	MEA153M1J-AA100
	15,000	35 × 105	5.7	0.25	22.1	2.92	MEA153M1J-AA105
	18,000	35 × 100	6.2	0.25	18.4	3.19	MEA183M1J-AA100
	18,000	35 × 121	6.8	0.25	18.4	3.19	MEA183M1J-AA121
	22,000	35 × 121	7.4	0.30	18.1	3.53	MEA223M1J-AA121
	22,000	51 × 80	7.6	0.30	18.1	3.53	MEA223M1J--B080
	22,000	51 × 83	7.7	0.30	18.1	3.53	MEA223M1J--B083
	27,000	51 × 83	8.2	0.30	14.7	3.91	MEA273M1J--B083
	27,000	51 × 96	8.5	0.30	14.7	3.91	MEA273M1J--B096
	33,000	51 × 96	8.6	0.35	14.1	4.33	MEA333M1J--B096

Dimension and Permissible Ripple Current

Rated Voltage V_{DC}	Capacitance 120 Hz, 20℃ μF	ϕD×L mm	Ripple Current 120 Hz, 85℃ A/rms	Tan δ at 120 Hz, 20℃	ESR 120 Hz, 20℃ mΩ	LC 5 minutes mA	Part Number
63	33,000	51 × 100	8.7	0.35	14.1	4.33	MEA333M1J--B100
	33,000	51 × 105	8.9	0.35	14.1	4.33	MEA333M1J--B105
	39,000	51 × 100	9.6	0.35	11.9	4.70	MEA393M1J--B100
	39,000	51 × 115	10.2	0.35	11.9	4.70	MEA393M1J--B115
	39,000	51 × 121	10.5	0.35	11.9	4.70	MEA393M1J--B121
	47,000	51 × 130	11.4	0.40	11.3	5.00	MEA473M1J--B130
	47,000	63.5 × 100	11.5	0.40	11.3	5.00	MEA473M1J--C100
	47,000	63.5 × 105	11.8	0.40	11.3	5.00	MEA473M1J--C105
	56,000	63.5 × 100	11.8	0.40	9.5	5.00	MEA563M1J--C100
	56,000	63.5 × 115	12.5	0.40	9.5	5.00	MEA563M1J--C115
	68,000	63.5 × 121	12.7	0.40	7.8	5.00	MEA683M1J--C121
	68,000	63.5 × 144	13.7	0.40	7.8	5.00	MEA683M1J--C144
	68,000	76.2 × 105	13.3	0.40	7.8	5.00	MEA683M1J--D105
	82,000	63.5 × 130	13.6	0.45	7.3	5.00	MEA823M1J--C130
	82,000	63.5 × 144	14.2	0.45	7.3	5.00	MEA823M1J--C144
	100,000	76.2 × 115	13.8	0.45	6.0	5.00	MEA104M1J--D115
	100,000	76.2 × 121	14.1	0.45	6.0	5.00	MEA104M1J--D121
	100,000	76.2 × 144	15.2	0.45	6.0	5.00	MEA104M1J--D144
	120,000	76.2 × 130	15.1	0.50	5.5	5.00	MEA124M1J--D130
	120,000	76.2 × 140	15.6	0.50	5.5	5.00	MEA124M1J--D140
	120,000	76.2 × 144	15.8	0.50	5.5	5.00	MEA124M1J--D144
	150,000	76.2 × 155	17.4	0.55	4.9	5.00	MEA154M1J--D155
	150,000	76.2 × 220	20.4	0.55	4.9	5.00	MEA154M1J--D220
	150,000	89 × 140	18.2	0.55	4.9	5.00	MEA154M1J--E140
	180,000	89 × 130	18.6	0.60	4.4	5.00	MEA184M1J--E130
	220,000	89 × 157	21.4	0.65	3.9	5.00	MEA224M1J--E157
80	3,300	35 × 50	2.4	0.15	60.3	1.54	MEA332M1K-AA050
	3,300	35 × 53	2.5	0.15	60.3	1.54	MEA332M1K-AA053
	3,900	35 × 53	2.7	0.15	51.0	1.68	MEA392M1K-AA053
	4,700	35 × 65	2.9	0.15	42.3	1.84	MEA472M1K-AA065
	5,600	35 × 65	3.7	0.20	47.4	2.01	MEA562M1K-AA065
	5,600	35 × 83	4.1	0.20	47.4	2.01	MEA562M1K-AA083
	6,800	35 × 80	4.2	0.20	39.0	2.21	MEA682M1K-AA080
	6,800	35 × 83	4.3	0.20	39.0	2.21	MEA682M1K-AA083
	8,200	35 × 83	4.5	0.20	32.3	2.43	MEA822M1K-AA083
	10,000	35 × 100	5.4	0.20	26.5	2.68	MEA103M1K-AA100
	12,000	35 × 100	5.6	0.20	22.1	2.94	MEA123M1K-AA100
	12,000	35 × 121	6.1	0.20	22.1	2.94	MEA123M1K-AA121
	15,000	35 × 121	7.1	0.25	22.1	3.29	MEA153M1K-AA121
	15,000	51 × 80	7.2	0.25	22.1	3.29	MEA153M1K--B080
	15,000	51 × 83	7.3	0.25	22.1	3.29	MEA153M1K--B083
	18,000	35 × 121	7.4	0.25	18.4	3.60	MEA183M1K-AA121
	18,000	51 × 83	7.7	0.25	18.4	3.60	MEA183M1K--B083
	22,000	51 × 96	8.2	0.30	18.1	3.98	MEA223M1K--B096
	22,000	51 × 100	8.5	0.30	18.1	3.98	MEA223M1K--B100
	27,000	51 × 96	8.4	0.30	14.7	4.41	MEA273M1K--B096
	27,000	51 × 121	8.6	0.30	14.7	4.41	MEA273M1K--B121
	27,000	63.5 × 100	8.6	0.30	14.7	4.41	MEA273M1K--C100
	33,000	51 × 115	9.8	0.35	14.1	4.87	MEA333M1K--B115
	33,000	63.5 × 100	10.5	0.35	14.1	4.87	MEA333M1K--C100
	39,000	51 × 130	10.8	0.35	11.9	5.00	MEA393M1K--B130
	39,000	63.5 × 121	11.8	0.35	11.9	5.00	MEA393M1K--C121
	47,000	63.5 × 115	12.7	0.35	9.9	5.00	MEA473M1K--C115
	47,000	63.5 × 121	13.0	0.35	9.9	5.00	MEA473M1K--C121
	47,000	63.5 × 144	14.0	0.35	9.9	5.00	MEA473M1K--C144
	56,000	63.5 × 130	13.6	0.35	8.3	5.00	MEA563M1K--C130
	56,000	63.5 × 144	14.2	0.35	8.3	5.00	MEA563M1K--C144
	68,000	76.2 × 115	15.2	0.35	6.8	5.00	MEA683M1K--D115
	68,000	76.2 × 121	15.5	0.35	6.8	5.00	MEA683M1K--D121
	68,000	76.2 × 144	16.7	0.35	6.8	5.00	MEA683M1K--D144
	82,000	76.2 × 130	16.4	0.35	5.7	5.00	MEA823M1K--D130
	82,000	76.2 × 140	16.9	0.35	5.7	5.00	MEA823M1K--D140
	82,000	76.2 × 144	17.1	0.35	5.7	5.00	MEA823M1K--D144
	100,000	76.2 × 155	18.3	0.40	5.3	5.00	MEA104M1K--D155
	100,000	89 × 140	19.1	0.40	5.3	5.00	MEA104M1K--E140
	120,000	89 × 130	20.3	0.40	4.4	5.00	MEA124M1K--E130
	150,000	89 × 157	24.6	0.40	3.5	5.00	MEA154M1K--E157

Dimension and Permissible Ripple Current

Rated Voltage V_{DC}	Capacitance 120 Hz, 20℃ μF	φD×L mm	Ripple Current 120 Hz, 85℃ A/rms	Tan δ at 120 Hz, 20℃	ESR 120 Hz, 20℃ mΩ	LC 5 minutes mA	Part Number
100	1,800	35 × 53	2.3	0.15	111	1.27	MEA182M2A-AA053
	2,200	35 × 50	2.4	0.15	90.4	1.41	MEA222M2A-AA050
	2,200	35 × 53	2.5	0.15	90.4	1.41	MEA222M2A-AA053
	2,700	35 × 53	2.7	0.15	73.7	1.56	MEA272M2A-AA053
	3,300	35 × 65	2.9	0.15	60.3	1.72	MEA332M2A-AA065
	3,300	35 × 80	3.2	0.15	60.3	1.72	MEA332M2A-AA080
	3,900	35 × 83	3.5	0.15	51.0	1.87	MEA392M2A-AA083
	4,700	35 × 80	3.6	0.15	42.3	2.06	MEA472M2A-AA080
	4,700	35 × 83	3.7	0.15	42.3	2.06	MEA472M2A-AA083
	5,600	35 × 100	4.6	0.15	35.5	2.24	MEA562M2A-AA100
	6,800	35 × 100	4.9	0.20	39.0	2.47	MEA682M2A-AA100
	6,800	35 × 105	5.0	0.20	39.0	2.47	MEA682M2A-AA105
	8,200	35 × 121	5.6	0.20	32.3	2.72	MEA822M2A-AA121
	8,200	51 × 83	5.8	0.20	32.3	2.72	MEA822M2A--B083
	10,000	35 × 121	6.0	0.20	26.5	3.00	MEA103M2A-AA121
	10,000	51 × 80	6.1	0.20	26.5	3.00	MEA103M2A--B080
	10,000	51 × 83	6.2	0.20	26.5	3.00	MEA103M2A--B083
	12,000	51 × 75	6.6	0.20	22.1	3.29	MEA123M2A--B075
	12,000	51 × 100	7.5	0.20	22.1	3.29	MEA123M2A--B100
	15,000	51 × 96	7.7	0.20	17.7	3.67	MEA153M2A--B096
	15,000	51 × 105	8.0	0.20	17.7	3.67	MEA153M2A--B105
	15,000	51 × 121	8.5	0.20	17.7	3.67	MEA153M2A--B121
	18,000	51 × 115	8.2	0.20	14.7	4.02	MEA183M2A--B115
	18,000	51 × 121	8.6	0.20	14.7	4.02	MEA183M2A--B121
	18,000	63.5 × 100	8.8	0.20	14.7	4.02	MEA183M2A--C100
	22,000	51 × 130	9.5	0.25	15.1	4.45	MEA223M2A--B130
	22,000	63.5 × 100	9.6	0.25	15.1	4.45	MEA223M2A--C100
	22,000	63.5 × 105	9.8	0.25	15.1	4.45	MEA223M2A--C105
	27,000	63.5 × 115	10.1	0.25	12.3	4.93	MEA273M2A--C115
	27,000	63.5 × 121	10.3	0.25	12.3	4.93	MEA273M2A--C121
	33,000	63.5 × 130	11.6	0.25	10.0	5.00	MEA333M2A--C130
	33,000	63.5 × 144	12.1	0.25	10.0	5.00	MEA333M2A--C144
	33,000	76.2 × 100	11.5	0.25	10.0	5.00	MEA333M2A--D100
	33,000	76.2 × 105	11.7	0.25	10.0	5.00	MEA333M2A--D105
	39,000	76.2 × 115	13.8	0.25	8.5	5.00	MEA393M2A--D115
	39,000	76.2 × 121	14.1	0.25	8.5	5.00	MEA393M2A--D121
	39,000	76.2 × 144	12.4	0.25	8.5	5.00	MEA393M2A--D144
	47,000	76.2 × 130	13.3	0.25	7.1	5.00	MEA473M2A--D130
	47,000	76.2 × 140	13.7	0.25	7.1	5.00	MEA473M2A--D140
	47,000	76.2 × 144	13.9	0.25	7.1	5.00	MEA473M2A--D144
	56,000	76.2 × 144	15.3	0.30	7.1	5.00	MEA563M2A--D144
	56,000	76.2 × 155	15.8	0.30	7.1	5.00	MEA563M2A--D155
	68,000	89 × 130	16.4	0.35	6.8	5.00	MEA683M2A--E130
	68,000	89 × 140	16.9	0.35	6.8	5.00	MEA683M2A--E140
	82,000	89 × 157	19.5	0.35	5.7	5.00	MEA823M2A--E157
	100,000	89 × 170	22.3	0.35	4.6	5.00	MEA104M2A--E170
160	3,300	35 × 121	5.2	0.15	60.3	2.18	MEA332M2C-AA121
	3,900	51 × 75	5.3	0.15	51.0	2.37	MEA392M2C--B075
	4,700	51 × 75	5.8	0.15	42.3	2.60	MEA472M2C--B075
	5,600	51 × 96	7.0	0.15	35.5	2.84	MEA562M2C--B096
	6,800	51 × 96	7.7	0.15	29.3	3.13	MEA682M2C--B096
	8,200	51 × 115	9.1	0.15	24.3	3.44	MEA822M2C--B115
	10,000	63.5 × 96	10.3	0.15	19.9	3.79	MEA103M2C--C096
	12,000	63.5 × 96	11.3	0.15	16.6	4.16	MEA123M2C--C096
	15,000	63.5 × 130	14.3	0.15	13.3	4.65	MEA153M2C--C130
	18,000	63.5 × 130	15.6	0.15	11.1	5.00	MEA183M2C--C130
	22,000	76.2 × 130	18.2	0.15	9.0	5.00	MEA223M2C--D130
	27,000	76.2 × 130	20.2	0.15	7.4	5.00	MEA273M2C--D130
	33,000	89 × 130	23.7	0.15	6.0	5.00	MEA333M2C--E130
	39,000	89 × 157	27.8	0.15	5.1	5.00	MEA393M2C--E157
200	2,200	35 × 100	3.9	0.15	90.4	1.99	MEA222M2D-AA100
	2,700	35 × 121	4.7	0.15	73.7	2.20	MEA272M2D-AA121
	3,300	51 × 75	4.9	0.15	60.3	2.44	MEA332M2D--B075
	3,900	51 × 75	5.3	0.15	51.0	2.65	MEA392M2D--B075
	4,700	51 × 96	6.4	0.15	42.3	2.91	MEA472M2D--B096
	5,600	51 × 115	7.5	0.15	35.5	3.17	MEA562M2D--B115

Screw

Dimension and Permissible Ripple Current

Rated Voltage V_{DC}	Capacitance 120 Hz, 20℃ μF	ϕD×L mm	Ripple Current 120 Hz, 85℃ A/rms	Tan δ at 120 Hz, 20℃	ESR 120 Hz, 20℃ mΩ	LC 5 minutes mA	Part Number
200	6,800	51 × 130	8.7	0.15	29.3	3.50	MEA682M2D--B130
	8,200	63.5 × 96	9.4	0.15	24.3	3.84	MEA822M2D--C096
	10,000	63.5 × 96	10.3	0.15	19.9	4.24	MEA103M2D--C096
	12,000	76.2 × 96	12.0	0.15	16.6	4.65	MEA123M2D--D096
	15,000	76.2 × 96	14.4	0.15	13.3	5.00	MEA153M2D--D096
	18,000	76.2 × 130	16.5	0.15	11.1	5.00	MEA183M2D--D130
	22,000	76.2 × 155	19.6	0.15	9.0	5.00	MEA223M2D--D155
	27,000	89 × 130	21.5	0.15	7.4	5.00	MEA273M2D--E130
	33,000	89 × 157	25.5	0.15	6.0	5.00	MEA333M2D--E157
250	1,500	35 × 100	3.2	0.15	132.6	1.84	MEA152M2E-AA100
	1,800	35 × 100	3.5	0.15	110.5	2.01	MEA182M2E-AA100
	2,200	51 × 75	4.0	0.15	90.4	2.22	MEA222M2E--B075
	2,700	51 × 75	4.4	0.15	73.7	2.46	MEA272M2E--B075
	3,300	51 × 96	5.4	0.15	60.3	2.72	MEA332M2E--B096
	3,900	51 × 115	6.3	0.15	51.0	2.96	MEA392M2E--B115
	4,700	63.5 × 96	7.1	0.15	42.3	3.25	MEA472M2E--C096
	5,600	63.5 × 96	7.7	0.15	35.5	3.55	MEA562M2E--C096
	6,800	63.5 × 115	9.1	0.15	29.3	3.91	MEA682M2E--C115
	8,200	63.5 × 115	10.0	0.15	24.3	4.30	MEA822M2E--C115
	10,000	63.5 × 130	11.6	0.15	19.9	4.74	MEA103M2E--C130
	12,000	76.2 × 115	12.8	0.15	16.6	5.00	MEA123M2E--D115
	15,000	76.2 × 130	15.1	0.15	13.3	5.00	MEA153M2E--D130
	18,000	76.2 × 155	17.7	0.15	11.1	5.00	MEA183M2E--D155
	22,000	89 × 157	20.9	0.15	9.0	5.00	MEA223M2E--E157
350	390	35 × 50	1.5	0.15	510	1.11	MEA391M2V-AA050
	390	35 × 53	1.6	0.15	510	1.11	MEA391M2V-AA053
	470	35 × 60	2.0	0.15	423	1.22	MEA471M2V-AA060
	470	35 × 65	2.1	0.15	423	1.22	MEA471M2V-AA065
	470	35 × 83	2.3	0.15	423	1.22	MEA471M2V-AA083
	560	35 × 70	2.2	0.15	355	1.33	MEA561M2V-AA070
	560	35 × 83	2.3	0.15	355	1.33	MEA561M2V-AA083
	680	35 × 80	2.5	0.15	293	1.46	MEA681M2V-AA080
	680	35 × 83	2.6	0.15	293	1.46	MEA681M2V-AA083
	820	35 × 90	2.9	0.15	243	1.61	MEA821M2V-AA090
	820	35 × 100	3.0	0.15	243	1.61	MEA821M2V-AA100
	1,000	35 × 100	3.4	0.15	199	1.77	MEA102M2V-AA100
	1,200	35 × 121	4.1	0.15	166	1.94	MEA122M2V-AA121
	1,200	51 × 75	3.8	0.15	166	1.94	MEA122M2V--B075
	1,500	51 × 75	4.2	0.15	133	2.17	MEA152M2V--B075
	1,800	51 × 85	4.8	0.15	111	2.38	MEA182M2V--B085
	1,800	51 × 96	5.1	0.15	111	2.38	MEA182M2V--B096
	2,200	51 × 96	5.7	0.15	90.4	2.63	MEA222M2V--B096
	2,700	51 × 115	6.8	0.15	73.7	2.92	MEA272M2V--B115
	2,700	51 × 130	7.1	0.15	73.7	2.92	MEA272M2V--B130
	3,300	51 × 130	8.1	0.15	60.3	3.22	MEA332M2V--B130
	3,300	63.5 × 96	7.3	0.15	60.3	3.22	MEA332M2V--C096
	3,300	63.5 × 115	7.9	0.15	60.3	3.22	MEA332M2V--C115
	3,900	63.5 × 115	8.9	0.15	51.0	3.50	MEA392M2V--C115
	4,700	63.5 × 130	10.3	0.15	42.3	3.85	MEA472M2V--C130
	4,700	76.2 × 96	10.1	0.15	42.3	3.85	MEA472M2V--D096
	5,600	76.2 × 115	11.3	0.15	35.5	4.20	MEA562M2V--D115
	6,800	76.2 × 130	13.1	0.15	29.3	4.63	MEA682M2V--D130
	8,200	76.2 × 155	15.4	0.15	24.3	5.00	MEA822M2V--D155
	10,000	76.2 × 170	17.3	0.15	19.9	5.00	MEA103M2V--D170
	10,000	89 × 130	16.7	0.15	19.9	5.00	MEA103M2V--E130
	10,000	89 × 157	18.1	0.15	19.9	5.00	MEA103M2V--E157
	12,000	89 × 155	19.9	0.15	16.6	5.00	MEA123M2V--E155
	12,000	89 × 157	20.0	0.15	16.6	5.00	MEA123M2V--E157
	15,000	89 × 196	24.4	0.15	13.3	5.00	MEA153M2V--E196
	18,000	89 × 236	28.8	0.15	11.1	5.00	MEA183M2V--E236
400	330	35 × 50	1.5	0.15	603	1.09	MEA331M2G-AA050
	330	35 × 53	1.5	0.15	603	1.09	MEA331M2G-AA053
	390	35 × 60	1.9	0.15	510	1.18	MEA391M2G-AA060
	390	35 × 65	2.0	0.15	510	1.18	MEA391M2G-AA065

Dimension and Permissible Ripple Current

Rated Voltage V_{DC}	Capacitance 120 Hz, 20℃ μF	ϕD×L mm	Ripple Current 120 Hz, 85℃ A/rms	Tan δ at 120 Hz, 20℃	ESR 120 Hz, 20℃ mΩ	LC 5 minutes mA	Part Number
400	390	35 × 83	2.1	0.15	510	1.18	MEA391M2G-AA083
	470	35 × 70	2.0	0.15	423	1.30	MEA471M2G-AA070
	470	35 × 83	2.1	0.15	423	1.30	MEA471M2G-AA083
	560	35 × 80	2.2	0.15	355	1.42	MEA561M2G-AA080
	560	35 × 83	2.3	0.15	355	1.42	MEA561M2G-AA083
	680	35 × 90	2.7	0.15	293	1.56	MEA681M2G-AA090
	680	35 × 100	2.8	0.15	293	1.56	MEA681M2G-AA100
	820	35 × 100	3.1	0.15	243	1.72	MEA821M2G-AA100
	1,000	35 × 121	3.5	0.15	199	1.90	MEA102M2G-AA121
	1,000	51 × 75	3.5	0.15	199	1.90	MEA102M2G--B075
	1,200	51 × 75	3.8	0.15	166	2.08	MEA122M2G--B075
	1,500	51 × 85	4.4	0.15	133	2.32	MEA152M2G--B085
	1,500	51 × 96	4.7	0.15	133	2.32	MEA152M2G--B096
	1,800	51 × 96	5.1	0.15	111	2.55	MEA182M2G--B096
	2,200	51 × 121	6.2	0.15	90.4	2.81	MEA222M2G--B121
	2,200	51 × 130	6.4	0.15	90.4	2.81	MEA222M2G--B130
	2,200	63.5 × 96	6.3	0.15	90.4	2.81	MEA222M2G--C096
	2,700	63.5 × 96	6.9	0.15	73.7	3.12	MEA272M2G--C096
	3,300	63.5 × 115	8.2	0.15	60.3	3.45	MEA332M2G--C115
	3,900	63.5 × 130	9.4	0.15	51.0	3.75	MEA392M2G--C130
	3,900	76.2 × 96	9.1	0.15	51.0	3.75	MEA392M2G--D096
	4,700	76.2 × 115	10.4	0.15	42.3	4.11	MEA472M2G--D115
	5,600	76.2 × 130	11.9	0.15	35.5	4.49	MEA562M2G--D130
	6,800	76.2 × 155	14.0	0.15	29.3	4.95	MEA682M2G--D155
	6,800	89 × 157	14.9	0.15	29.3	4.95	MEA682M2G--E157
	8,200	76.2 × 170	15.6	0.15	24.3	5.00	MEA822M2G--D170
	8,200	89 × 130	15.1	0.15	24.3	5.00	MEA822M2G--E130
	8,200	89 × 157	16.4	0.15	24.3	5.00	MEA822M2G--E157
	10,000	89 × 155	18.1	0.15	19.9	5.00	MEA103M2G--E155
	10,000	89 × 157	18.2	0.15	19.9	5.00	MEA103M2G--E157
	12,000	89 × 196	21.8	0.15	16.6	5.00	MEA123M2G--E196
	15,000	89 × 220	25.4	0.15	13.3	5.00	MEA153M2G--E220
	15,000	89 × 236	26.3	0.15	13.3	5.00	MEA153M2G--E236
450	270	35 × 50	1.2	0.15	736	1.05	MEA271M2W-AA050
	270	35 × 53	1.3	0.15	736	1.05	MEA271M2W-AA053
	330	35 × 60	1.7	0.15	602	1.16	MEA331M2W-AA060
	330	35 × 65	1.8	0.15	602	1.16	MEA331M2W-AA065
	390	35 × 70	1.9	0.15	510	1.26	MEA391M2W-AA070
	390	35 × 83	2.0	0.15	510	1.26	MEA391M2W-AA083
	470	35 × 80	2.1	0.15	423	1.38	MEA471M2W-AA080
	470	35 × 83	2.1	0.15	423	1.38	MEA471M2W-AA083
	560	35 × 90	2.4	0.15	355	1.51	MEA561M2W-AA090
	560	35 × 100	2.5	0.15	355	1.51	MEA561M2W-AA100
	680	35 × 100	2.8	0.15	293	1.66	MEA681M2W-AA100
	820	35 × 121	3.2	0.15	243	1.82	MEA821M2W-AA121
	820	51 × 75	3.2	0.15	243	1.82	MEA821M2W--B075
	1,000	51 × 75	3.5	0.15	199	2.01	MEA102M2W--B075
	1,200	51 × 96	4.2	0.15	166	2.20	MEA122M2W--B096
	1,500	51 × 115	5.0	0.15	133	2.46	MEA152M2W--B115
	1,800	51 × 130	5.8	0.15	111	2.70	MEA182M2W--B130
	2,200	63.5 × 96	6.3	0.15	90.4	2.98	MEA222M2W--C096
	2,700	63.5 × 115	7.5	0.15	73.7	3.31	MEA272M2W--C115
	3,300	63.5 × 130	8.6	0.15	60.3	3.66	MEA332M2W--C130
	3,300	76.2 × 96	8.4	0.15	60.3	3.66	MEA332M2W--D096
	3,900	76.2 × 115	9.5	0.15	51.0	3.97	MEA392M2W--D115
	4,700	76.2 × 130	10.8	0.15	42.3	4.36	MEA472M2W--D130
	5,600	76.2 × 155	12.8	0.15	35.5	4.76	MEA562M2W--D155
	6,800	76.2 × 170	14.3	0.15	29.3	5.00	MEA682M2W--D170
	6,800	89 × 130	13.8	0.15	29.3	5.00	MEA682M2W--E130
	6,800	89 × 157	15.0	0.15	29.3	5.00	MEA682M2W--E157
	8,200	89 × 155	16.3	0.15	24.3	5.00	MEA822M2W--E155
	8,200	89 × 157	16.4	0.15	24.3	5.00	MEA822M2W--E157
	10,000	89 × 196	19.9	0.15	19.9	5.00	MEA103M2W--E196
	12,000	89 × 220	22.8	0.15	16.6	5.00	MEA123M2W--E220
	12,000	89 × 236	23.6	0.15	16.6	5.00	MEA123M2W--E236

Part Numbering System

MEA Series	3300μF	±20%	400V	Plain case + Mounting clamp	M5 Post	63.5ϕ×115L	Pb-free Terminal + PVC Sleeve
MEA	**332**	**M**	**2G**	**-**	**-**	**C115**	
Series Name	Capacitance	Capacitance tolerance	Rated voltage	Case Type	Terminal type	Case size	Terminal and Sleeve Type

Example:

Cap.	Symbol
470	471
1,800	182
10,000	103

M = ±20%
K = ±10%

Example:

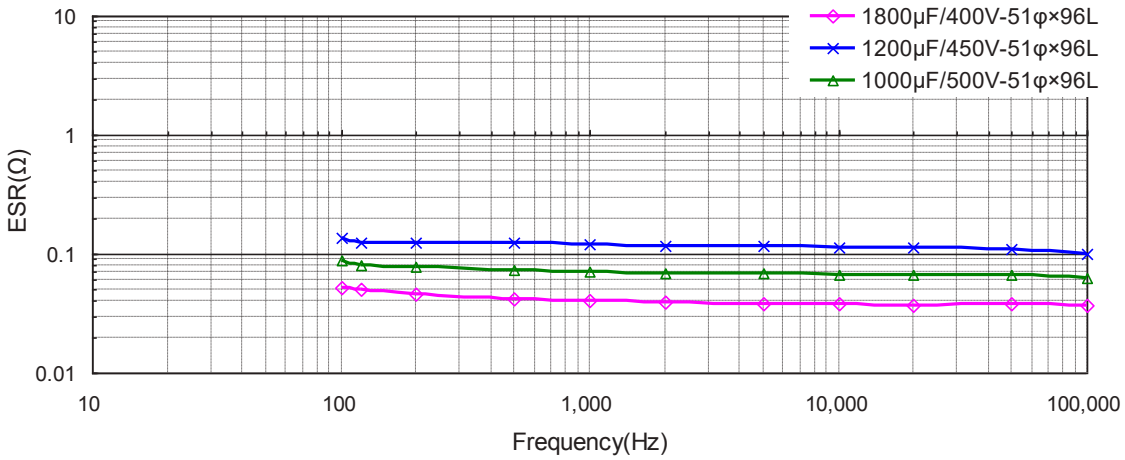
Voltage	Symbol
350	2V
400	2G
450	2W

Example:

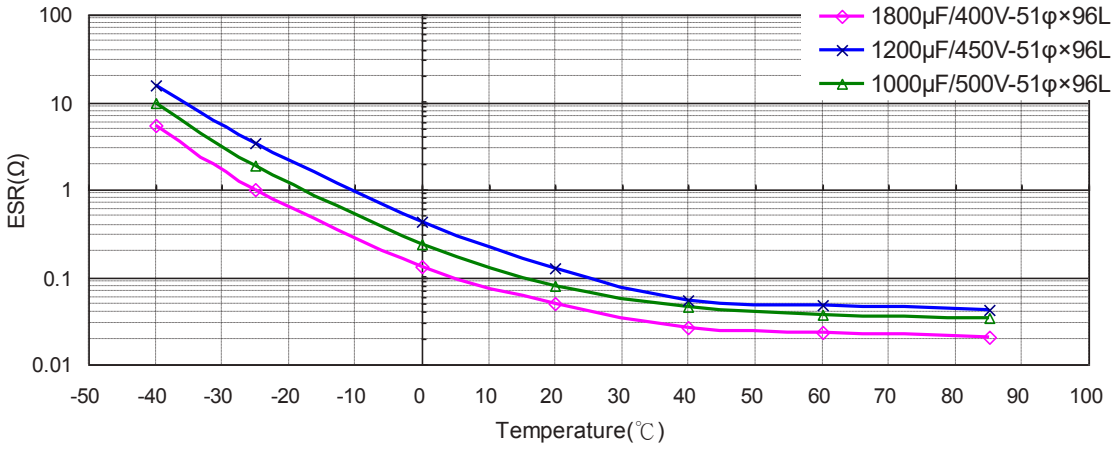
ϕD×L	Code
35× 83	A083
51× 96	B096
89×157	E157

Note: For more details, please refer to “Part Numbering System (Screw Type)” on page 17.

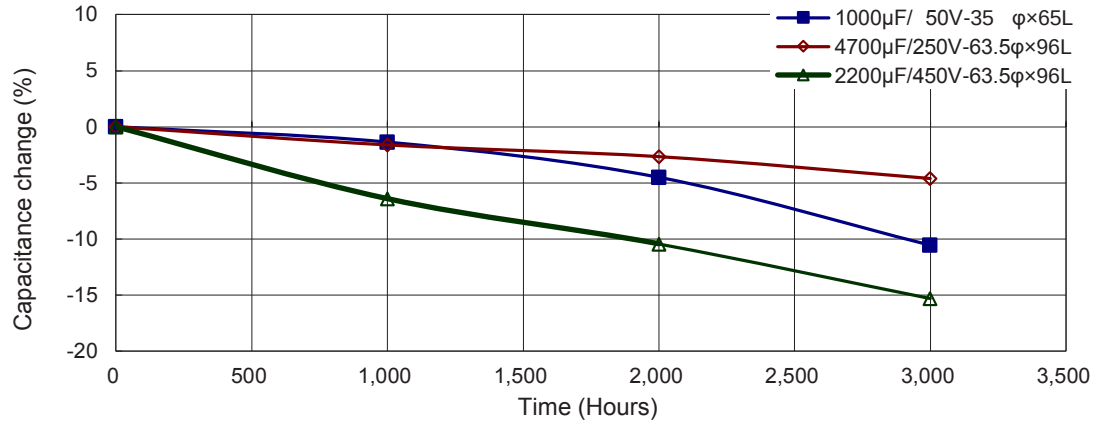
ESR-Frequency Characteristics

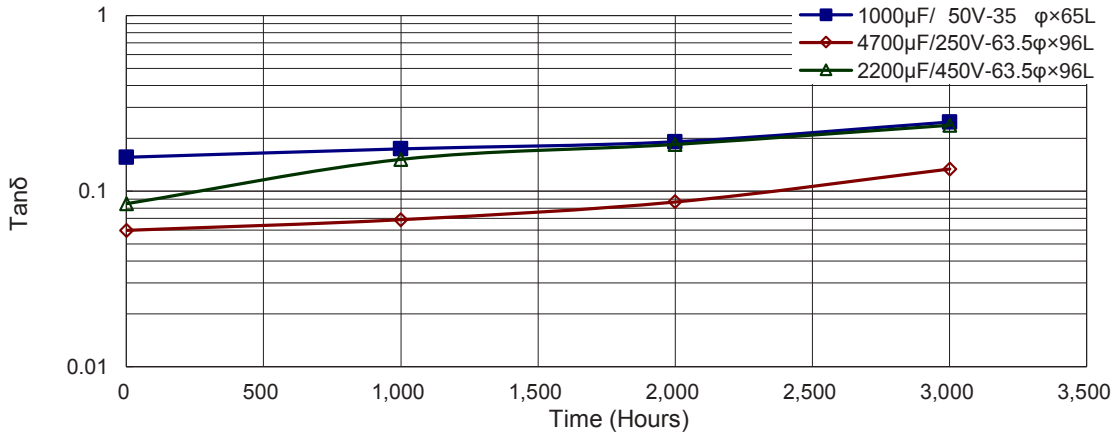


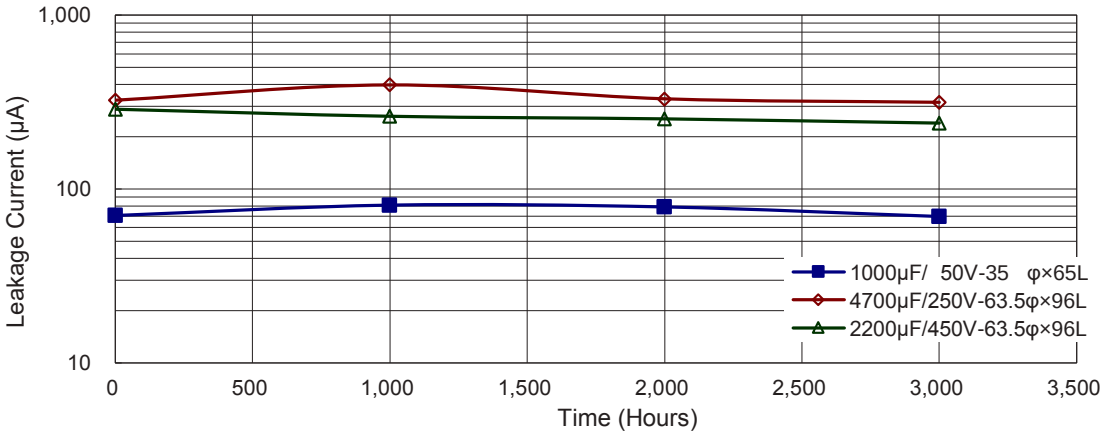
ESR-Temperature Characteristics



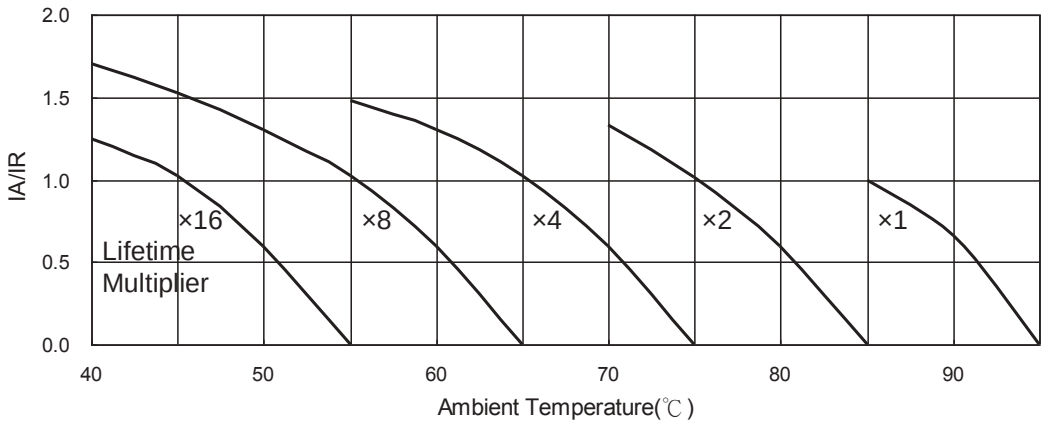
Typical Endurance Curves







Useful Life Chart



IA: Actual ripple current IR: Rated ripple current

Screw

MEK Series

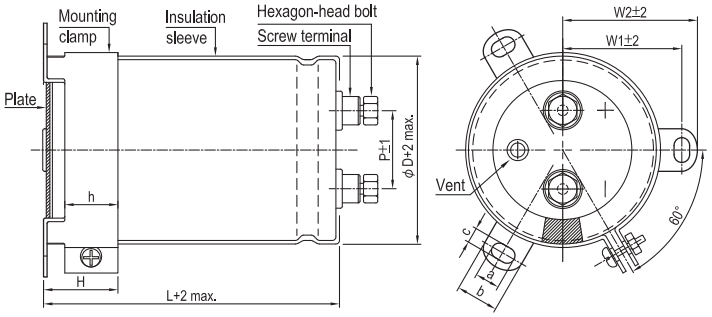
Features

- Endurance with ripple current: 85℃, 5,000 hours
- RoHS compliance

Specifications

Items	Performance
Category Temperature Range	-25℃ ~ +85℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)	I = $3\sqrt{CV}$ or 5 (mA) whichever is smaller (after 5 minutes) Where, C= rated capacitance in μF, V = rated DC Rated Voltage in V.
Tanδ (at 120 Hz, 20℃)	See the Dimensions & Permissible Ripple Current
Low Temperature Characteristics (at 120 Hz)	Capacitance change : C(-25℃) / C(+20℃) ≧ 0.7
Endurance	Test Time: 5,000 Hrs Capacitance Change: Within ±15% of initial value Tanδ: Less than 175% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after subjected to DC voltage with rated ripple current applied for 5,000 hours at 85℃.
Shelf Life Test	Test Time: 1,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 200% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 85℃ without voltage applied. The rated voltage shall be applied to the capacitors before the measurements (Refer to JIS C 5101-4 4.1).
Ripple Current and Frequency Multipliers	Frequency (Hz): 50 / 60 | 100 / 120 | 300 | 1k | 10k up Multiplier: 0.7 | 1.0 | 1.1 | 1.3 | 1.4
Ripple Current and Temperature Multipliers	Temperature (℃): 40 | 60 | 85 Multiplier: 1.89 | 1.67 | 1.0
Failure percentage Failure rate	When the failure percentage / failure rate is required, please contact with us for further discussion.

Diagram of Dimensions



Unit: mm

ϕD	P	W1	W2	H	h	a	b	c
51	22.0	31.8	36.5	30	24	7	14.0	4.5
63.5	28.6	38.1	42.6	30	24	7	14.0	4.5
76.2	32.0	44.5	49.2	30	24	7	14.0	5.0
89	32.0	50.8	55.6	30	24	7	14.0	5.0

Screw Specifications:
Plug hexagon-head screw: M5×0.8×10
Max. screw tightening torque: 3.23Nm

Dimension and Permissible Ripple Current

Rated Voltage V_{DC}	Capacitance 120 Hz, 20℃ μF	ϕD×L mm	Ripple Current 120 Hz, 85℃ A/rms	Tan δ at 120 Hz, 20℃	ESR 120 Hz, 20℃ mΩ	LC 5 minutes mA	Part Number
350	1,000	51 × 60	4.5	0.15	199	1.77	MEK102M2V--B060
	1,200	51 × 70	5.3	0.15	166	1.94	MEK122M2V--B070
	1,200	51 × 75	5.5	0.15	166	1.94	MEK122M2V--B075
	1,200	51 × 83	5.7	0.15	166	1.94	MEK122M2V--B083
	1,500	51 × 75	6.1	0.15	133	2.17	MEK152M2V--B075
	1,500	51 × 83	6.3	0.15	133	2.17	MEK152M2V--B083
	1,800	51 × 96	7.4	0.15	111	2.38	MEK182M2V--B096
	2,200	51 × 96	8.2	0.15	90.4	2.63	MEK222M2V--B096
	2,700	51 × 115	9.8	0.15	73.7	2.92	MEK272M2V--B115
	2,700	51 × 130	10.2	0.15	73.7	2.92	MEK272M2V--B130
	2,700	63.5 × 85	9.3	0.15	73.7	2.92	MEK272M2V--C085
	3,300	51 × 130	11.3	0.15	60.3	3.22	MEK332M2V--B130
	3,300	63.5 × 96	10.8	0.15	60.3	3.22	MEK332M2V--C096
	3,900	63.5 × 115	12.8	0.15	51.0	3.50	MEK392M2V--C115
	3,900	76.2 × 85	12.0	0.15	51.0	3.50	MEK392M2V--D085
	4,700	63.5 × 115	14.0	0.15	42.3	3.85	MEK472M2V--C115
	4,700	63.5 × 130	14.8	0.15	42.3	3.85	MEK472M2V--C130
	4,700	76.2 × 90	13.5	0.15	42.3	3.85	MEK472M2V--D090
	5,600	63.5 × 155	17.3	0.15	35.5	4.20	MEK562M2V--C155
	5,600	76.2 × 100	15.4	0.15	35.5	4.20	MEK562M2V--D100
	5,600	76.2 × 115	16.3	0.15	35.5	4.20	MEK562M2V--D115
	6,800	76.2 × 130	18.8	0.15	29.3	4.63	MEK682M2V--D130
	8,200	63.5 × 190	22.1	0.15	24.3	5.00	MEK822M2V--C190
	8,200	76.2 × 155	22.1	0.15	24.3	5.00	MEK822M2V--D155
	8,200	89 × 121	20.2	0.15	24.3	5.00	MEK822M2V--E121
	10,000	76.2 × 170	25.7	0.15	19.9	5.00	MEK103M2V--D170
	10,000	89 × 140	24.7	0.15	19.9	5.00	MEK103M2V--E140
	10,000	89 × 157	25.9	0.15	19.9	5.00	MEK103M2V--E157
	12,000	89 × 150	27.6	0.15	16.6	5.00	MEK123M2V--E150
	12,000	89 × 155	28.0	0.15	16.6	5.00	MEK123M2V--E155
	12,000	89 × 157	28.4	0.15	16.6	5.00	MEK123M2V--E157
	15,000	89 × 190	34.2	0.15	13.3	5.00	MEK153M2V--E190
	15,000	89 × 196	34.6	0.15	13.3	5.00	MEK153M2V--E196
	18,000	89 × 236	41.4	0.15	11.1	5.00	MEK183M2V--E236
400	1,000	51 × 65	4.7	0.15	199	1.90	MEK102M2G--B065
	1,000	51 × 75	5.0	0.15	199	1.90	MEK102M2G--B075
	1,000	51 × 83	5.2	0.15	199	1.90	MEK102M2G--B083
	1,200	51 × 75	5.5	0.15	166	2.08	MEK122M2G--B075
	1,200	51 × 83	5.7	0.15	166	2.08	MEK122M2G--B083
	1,500	51 × 96	6.7	0.15	133	2.32	MEK152M2G--B096
	1,800	51 × 96	7.4	0.15	111	2.55	MEK182M2G--B096
	2,200	51 × 115	8.9	0.15	90.4	2.81	MEK222M2G--B115
	2,200	51 × 130	9.2	0.15	90.4	2.81	MEK222M2G--B130
	2,200	63.5 × 85	8.5	0.15	90.4	2.81	MEK222M2G--C085
	2,700	51 × 130	10.4	0.15	73.7	3.12	MEK272M2G--B130
	2,700	63.5 × 96	9.9	0.15	73.7	3.12	MEK272M2G--C096
	2,700	76.2 × 75	9.4	0.15	73.7	3.12	MEK272M2G--D075
	3,300	63.5 × 96	11.0	0.15	60.3	3.45	MEK332M2G--C096
	3,300	63.5 × 115	11.8	0.15	60.3	3.45	MEK332M2G--C115
	3,300	76.2 × 90	11.2	0.15	60.3	3.45	MEK332M2G--D090
	3,900	63.5 × 115	12.8	0.15	51.0	3.75	MEK392M2G--C115
	3,900	63.5 × 130	13.5	0.15	51.0	3.75	MEK392M2G--C130
	3,900	76.2 × 96	12.5	0.15	51.0	3.75	MEK392M2G--D096
	4,700	63.5 × 130	14.8	0.15	42.3	4.11	MEK472M2G--C130
	4,700	63.5 × 155	15.9	0.15	42.3	4.11	MEK472M2G--C155
	4,700	76.2 × 110	14.5	0.15	42.3	4.11	MEK472M2G--D110
	4,700	76.2 × 115	14.9	0.15	42.3	4.11	MEK472M2G--D115
	5,600	63.5 × 155	16.6	0.15	35.5	4.49	MEK562M2G--C155
	5,600	63.5 × 190	18.3	0.15	35.5	4.49	MEK562M2G--C190
	5,600	63.5 × 195	19.1	0.15	35.5	4.49	MEK562M2G--C195
	5,600	76.2 × 115	16.2	0.15	35.5	4.49	MEK562M2G--D115
	5,600	76.2 × 130	17.0	0.15	35.5	4.49	MEK562M2G--D130
	6,800	63.5 × 190	20.1	0.15	29.3	4.95	MEK682M2G--C190
	6,800	76.2 × 130	18.8	0.15	29.3	4.95	MEK682M2G--D130
	6,800	76.2 × 155	20.2	0.15	29.3	4.95	MEK682M2G--D155
	6,800	89 × 121	19.3	0.15	29.3	4.95	MEK682M2G--E121

Dimension and Permissible Ripple Current

Rated Voltage V_{DC}	Capacitance 120 Hz, 20℃ μF	ϕD×L mm	Ripple Current 120 Hz, 85℃ A/rms	Tan δ at 120 Hz, 20℃	ESR 120 Hz, 20℃ mΩ	LC 5 minutes mA	Part Number
400	8,200	76.2 × 155	22.3	0.15	24.3	5.00	MEK822M2G--D155
	8,200	76.2 × 170	23.2	0.15	24.3	5.00	MEK822M2G--D170
	8,200	89 × 157	23.5	0.15	24.3	5.00	MEK822M2G--E157
	10,000	76.2 × 195	27.3	0.15	19.9	5.00	MEK103M2G--D195
	10,000	89 × 155	25.8	0.15	19.9	5.00	MEK103M2G--E155
	10,000	89 × 157	25.9	0.15	19.9	5.00	MEK103M2G--E157
	12,000	89 × 155	28.0	0.15	16.6	5.00	MEK123M2G--E155
	12,000	89 × 157	28.2	0.15	16.6	5.00	MEK123M2G--E157
	12,000	89 × 170	29.2	0.15	16.6	5.00	MEK123M2G--E170
	12,000	89 × 196	31.0	0.15	16.6	5.00	MEK123M2G--E196
	15,000	89 × 190	34.0	0.15	13.3	5.00	MEK153M2G--E190
	15,000	89 × 196	34.4	0.15	13.3	5.00	MEK153M2G--E196
	15,000	89 × 236	37.5	0.15	13.3	5.00	MEK153M2G--E236
	18,000	89 × 236	41.0	0.15	11.1	5.00	MEK183M2G--E236
450	1,000	51 × 75	5.0	0.15	199	2.01	MEK102M2W--B075
	1,000	51 × 83	5.2	0.15	199	2.01	MEK102M2W--B083
	1,200	51 × 96	6.0	0.15	166	2.20	MEK122M2W--B096
	1,500	51 × 96	6.7	0.15	133	2.46	MEK152M2W--B096
	1,500	51 × 115	7.2	0.15	133	2.46	MEK152M2W--B115
	1,800	51 × 130	8.3	0.15	111	2.70	MEK182M2W--B130
	2,200	63.5 × 96	9.0	0.15	90.4	2.98	MEK222M2W--C096
	2,700	63.5 × 115	10.7	0.15	73.7	3.31	MEK272M2W--C115
	3,300	63.5 × 130	12.4	0.15	60.3	3.66	MEK332M2W--C130
	3,300	76.2 × 100	11.8	0.15	60.3	3.66	MEK332M2W--D100
	3,900	63.5 × 155	14.4	0.15	51.0	3.97	MEK392M2W--C155
	3,900	76.2 × 110	13.4	0.15	51.0	3.97	MEK392M2W--D110
	3,900	76.2 × 115	13.6	0.15	51.0	3.97	MEK392M2W--D115
	4,700	63.5 × 190	17.4	0.15	42.3	4.36	MEK472M2W--C190
	4,700	63.5 × 195	17.5	0.15	42.3	4.36	MEK472M2W--C195
	4,700	76.2 × 130	15.6	0.15	42.3	4.36	MEK472M2W--D130
	5,600	63.5 × 190	19.0	0.15	35.5	4.76	MEK562M2W--C190
	5,600	76.2 × 155	18.3	0.15	35.5	4.76	MEK562M2W--D155
	5,600	89 × 121	17.3	0.15	35.5	4.76	MEK562M2W--E121
	6,800	76.2 × 170	21.2	0.15	29.3	5.00	MEK682M2W--D170
	6,800	89 × 130	19.7	0.15	29.3	5.00	MEK682M2W--E130
	6,800	89 × 157	21.4	0.15	29.3	5.00	MEK682M2W--E157
	8,200	76.2 × 190	24.2	0.15	24.3	5.00	MEK822M2W--D190
	8,200	89 × 155	23.4	0.15	24.3	5.00	MEK822M2W--E155
	8,200	89 × 157	23.5	0.15	24.3	5.00	MEK822M2W--E157
	10,000	89 × 170	26.7	0.15	19.9	5.00	MEK103M2W--E170
	10,000	89 × 196	28.3	0.15	19.9	5.00	MEK103M2W--E196
	12,000	89 × 236	33.6	0.15	16.6	5.00	MEK123M2W--E236
500	1,000	51 × 96	5.5	0.20	265	2.12	MEK102M2H--B096
	1,000	51 × 100	5.6	0.20	265	2.12	MEK102M2H--B100
	1,000	63.5 × 80	5.8	0.20	265	2.12	MEK102M2H--C080
	1,200	51 × 115	6.6	0.20	221	2.32	MEK122M2H--B115
	1,200	63.5 × 85	6.5	0.20	221	2.32	MEK122M2H--C085
	1,200	63.5 × 96	6.9	0.20	221	2.32	MEK122M2H--C096
	1,500	51 × 130	7.8	0.20	177	2.60	MEK152M2H--B130
	1,500	63.5 × 90	7.5	0.20	177	2.60	MEK152M2H--C090
	1,500	63.5 × 96	7.7	0.20	177	2.60	MEK152M2H--C096
	1,800	63.5 × 105	8.3	0.20	147	2.85	MEK182M2H--C105
	1,800	63.5 × 115	8.6	0.20	147	2.85	MEK182M2H--C115
	2,200	63.5 × 115	8.9	0.20	121	3.15	MEK222M2H--C115
	2,200	63.5 × 121	9.1	0.20	121	3.15	MEK222M2H--C121
	2,200	63.5 × 130	9.4	0.20	121	3.15	MEK222M2H--C130
	2,700	76.2 × 110	9.8	0.20	98.2	3.49	MEK272M2H--D110
	2,700	76.2 × 115	9.9	0.20	98.2	3.49	MEK272M2H--D115
	3,300	76.2 × 115	10.1	0.20	80.4	3.85	MEK332M2H--D115
	3,300	76.2 × 130	10.4	0.20	80.4	3.85	MEK332M2H--D130
	3,900	76.2 × 150	10.9	0.20	68.0	4.19	MEK392M2H--D150
	3,900	76.2 × 155	11.0	0.20	68.0	4.19	MEK392M2H--D155
	3,900	89 × 121	11.9	0.20	68.0	4.19	MEK392M2H--E121
	4,700	76.2 × 170	12.7	0.20	56.4	4.60	MEK472M2H--D170
	4,700	89 × 130	13.5	0.20	56.4	4.60	MEK472M2H--E130

Screw

Dimension and Permissible Ripple Current

Rated Voltage V_{DC}	Capacitance 120 Hz, 20℃ μF	ϕD×L mm	Ripple Current 120 Hz, 85℃ A/rms	Tan δ at 120 Hz, 20℃	ESR 120 Hz, 20℃ mΩ	LC 5 minutes mA	Part Number
500	5,600	76.2 × 190	14.6	0.20	47.4	5.00	MEK562M2H--D190
	5,600	76.2 × 195	14.8	0.20	47.4	5.00	MEK562M2H--D195
	5,600	89 × 150	15.0	0.20	47.4	5.00	MEK562M2H--E150
	5,600	89 × 157	15.5	0.20	47.4	5.00	MEK562M2H--E157
	6,800	89 × 170	16.7	0.20	39.0	5.00	MEK682M2H--E170
	8,200	89 × 190	19.3	0.20	32.3	5.00	MEK822M2H--E190
	8,200	89 × 196	19.5	0.20	32.3	5.00	MEK822M2H--E196
525	1,000	51 × 115	6.7	0.20	265	2.17	MEK102M2Y--B115
	1,200	51 × 130	7.6	0.20	221	2.38	MEK122M2Y--B130
	1,200	63.5 × 96	7.5	0.20	221	2.38	MEK122M2Y--C096
	1,500	63.5 × 115	8.4	0.20	177	2.66	MEK152M2Y--C115
	1,800	63.5 × 130	9.1	0.20	147	2.92	MEK182M2Y--C130
	2,200	76.2 × 115	9.9	0.20	121	3.22	MEK222M2Y--D115
	2,700	76.2 × 130	10.5	0.20	98.2	3.57	MEK272M2Y--D130
	3,300	76.2 × 155	11.2	0.20	80.4	3.95	MEK332M2Y--D155
	3,900	89 × 157	12.1	0.20	68.0	4.29	MEK392M2Y--E157

Part Numbering System

MEK Series	3300μF	±20%	350V	Plain case + Mounting clamp	M5 Post	51ϕ×130L	Pb-free Terminal + PVC Sleeve
MEK	**332**	**M**	**2V**	**-**	**-**	**B130**	
Series Name	Capacitance	Capacitance tolerance	Rated voltage	Case Type	Terminal type	Case size	Terminal and Sleeve Type

Example:

Cap.	Symbol
1,000	102
4,700	472
10,000	103

M = ±20%
K = ±10%

Example:

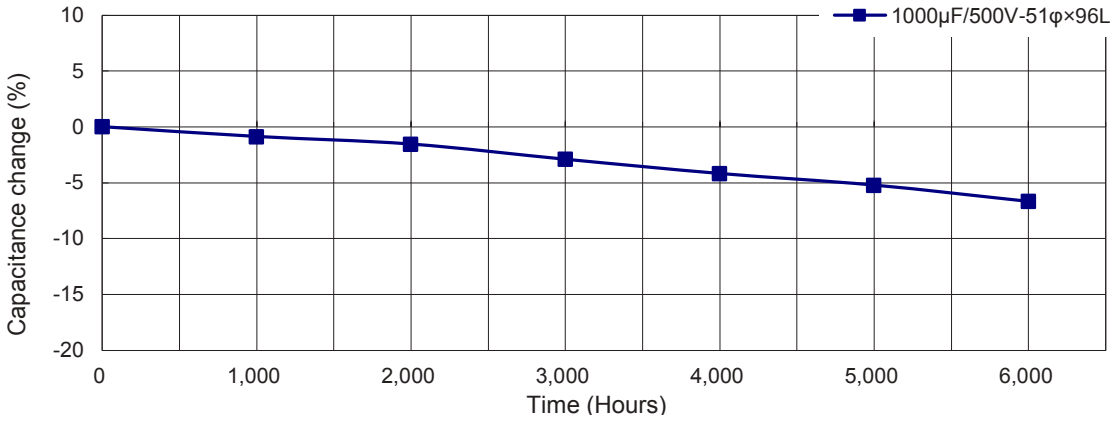
Voltage	Symbol
350	2V
400	2G
450	2W

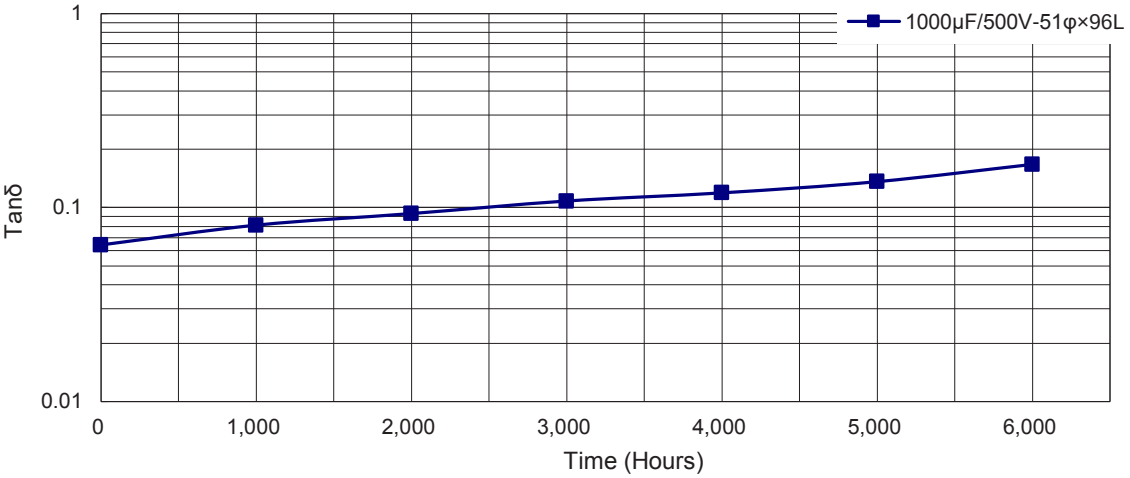
Example:

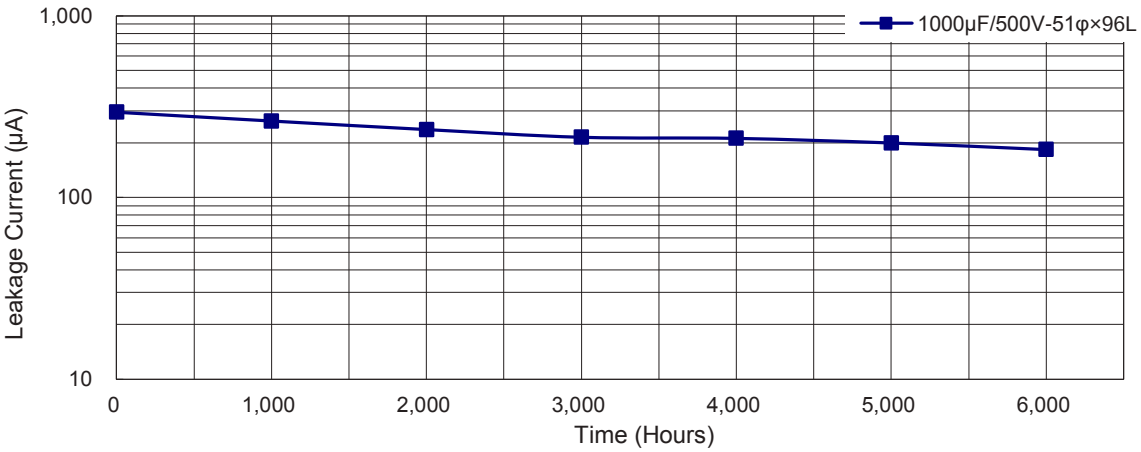
ϕD×L	Code
63.5×130	C130
76.2×115	D115
89 ×157	E157

Note: For more details, please refer to “Part Numbering System (Screw Type)” on page 17.

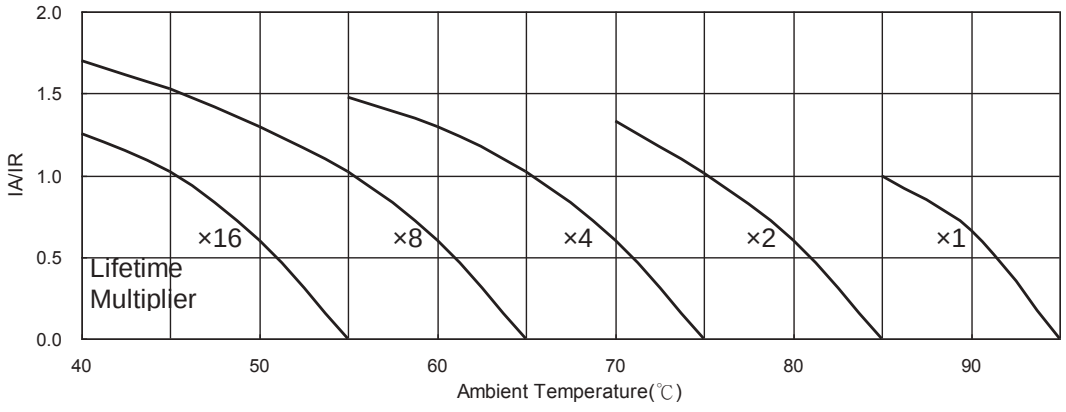
Typical Endurance Curves







Useful Life Chart



IA: Actual ripple current IR: Rated ripple current

Screw

MEQ Series

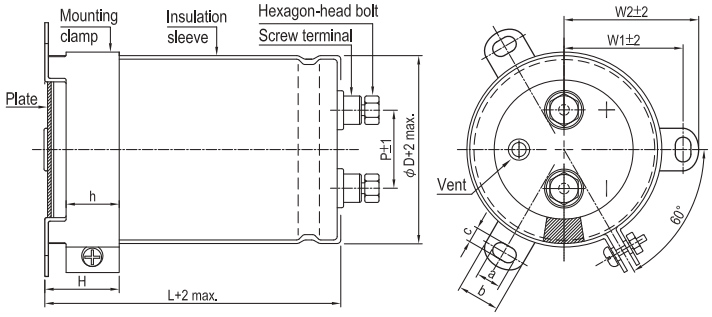
Features

- Endurance with ripple current: 85℃, 20,000 hours
- RoHS compliance

Specifications

Items	Performance
Category Temperature Range	-25℃ ~ +85℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)	$I = 3\sqrt{CV}$ or 5 (mA) whichever is smaller (after 5 minutes) Where, C = rated capacitance in μF, V = rated DC Rated Voltage in V
Tanδ (at 120 Hz, 20℃)	See the Dimensions & Permissible Ripple Current
Low Temperature Characteristics (at 120 Hz)	Capacitance change : C(-25℃) / C(+20℃) ≧ 0.7
Endurance	Test Time: 20,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 200% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after subjected to DC voltage with rated ripple current applied for 20,000 hours at 85℃.
Shelf Life Test	Test Time: 1,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 200% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 85℃ without voltage applied. The rated voltage shall be applied to the capacitors before the measurements (Refer to JIS C 5101-4 4.1).
Ripple Current and Frequency Multipliers	Frequency (Hz): 50 / 60 | 100 / 120 | 300 | 1k | 10k up Multiplier: 0.7 | 1.0 | 1.1 | 1.3 | 1.4
Ripple Current and Temperature Multipliers	Temperature (℃): 40 | 60 | 85 Multiplier: 2.44 | 2.16 | 1.00
Failure percentage Failure rate	When the failure percentage / failure rate is required, please contact with us for further discussion.

Diagram of Dimensions



Unit: mm

ϕD	P	W1	W2	H	h	a	b	c
51	22.0	31.8	36.5	30	24	7	14.0	4.5
63.5	28.6	38.1	42.6	30	24	7	14.0	4.5
76.2	32.0	44.5	49.2	30	24	7	14.0	5.0
89	32.0	50.8	55.6	30	24	7	14.0	5.0

Screw Specifications:
Plug hexagon-head screw: M5×0.8×10
Max. screw tightening torque: 3.23Nm

Dimension and Permissible Ripple Current

Rated Voltage V_{DC}	Capacitance 120 Hz, 20℃ μF	φD×L mm	Ripple Current 120 Hz, 85℃ A/rms	Tan δ at 120 Hz, 20℃	ESR 120 Hz, 20℃ mΩ	LC 5 minutes mA	Part Number
350	1,000	51 × 75	3.8	0.15	199	1.77	MEQ102M2V--B075
	1,200	51 × 75	4.2	0.15	166	1.94	MEQ122M2V--B075
	1,500	51 × 96	5.2	0.15	133	2.17	MEQ152M2V--B096
	1,800	51 × 96	5.6	0.15	111	2.38	MEQ182M2V--B096
	2,200	51 × 110	6.6	0.15	90.4	2.63	MEQ222M2V--B110
	2,200	51 × 130	7.1	0.15	90.4	2.63	MEQ222M2V--B130
	2,700	51 × 130	7.9	0.15	73.7	2.92	MEQ272M2V--B130
	2,700	63.5 × 90	7.3	0.15	73.7	2.92	MEQ272M2V--C090
	2,700	63.5 × 96	7.6	0.15	73.7	2.92	MEQ272M2V--C096
	3,300	51 × 150	9.4	0.15	60.3	3.22	MEQ332M2V--B150
	3,300	63.5 × 100	8.5	0.15	60.3	3.22	MEQ332M2V--C100
	3,300	63.5 × 115	9.0	0.15	60.3	3.22	MEQ332M2V--C115
	3,900	63.5 × 110	9.6	0.15	51.0	3.50	MEQ392M2V--C110
	3,900	63.5 × 130	10.3	0.15	51.0	3.50	MEQ392M2V--C130
	3,900	76.2 × 90	9.4	0.15	51.0	3.50	MEQ392M2V--D090
	4,700	63.5 × 130	11.4	0.15	42.3	3.85	MEQ472M2V--C130
	4,700	63.5 × 155	12.2	0.15	42.3	3.85	MEQ472M2V--C155
	4,700	76.2 × 100	10.8	0.15	42.3	3.85	MEQ472M2V--D100
	4,700	76.2 × 115	11.5	0.15	42.3	3.85	MEQ472M2V--D115
	5,600	63.5 × 150	13.3	0.15	35.5	4.20	MEQ562M2V--C150
	5,600	63.5 × 170	14.0	0.15	35.5	4.20	MEQ562M2V--C170
	5,600	63.5 × 195	15.0	0.15	35.5	4.20	MEQ562M2V--C195
	5,600	76.2 × 110	12.2	0.15	35.5	4.20	MEQ562M2V--D110
	5,600	76.2 × 130	13.1	0.15	35.5	4.20	MEQ562M2V--D130
	6,800	63.5 × 190	16.3	0.15	29.3	4.63	MEQ682M2V--C190
	6,800	76.2 × 130	14.3	0.15	29.3	4.63	MEQ682M2V--D130
	6,800	76.2 × 155	15.5	0.15	29.3	4.63	MEQ682M2V--D155
	8,200	76.2 × 150	16.7	0.15	24.3	5.00	MEQ822M2V--D150
	8,200	76.2 × 170	17.7	0.15	24.3	5.00	MEQ822M2V--D170
	8,200	89 × 130	16.6	0.15	24.3	5.00	MEQ822M2V--E130
	8,200	89 × 157	18.1	0.15	24.3	5.00	MEQ822M2V--E157
	10,000	89 × 150	19.5	0.15	19.9	5.00	MEQ103M2V--E150
	10,000	89 × 155	19.8	0.15	19.9	5.00	MEQ103M2V--E155
	10,000	89 × 157	19.9	0.15	19.9	5.00	MEQ103M2V--E157
	12,000	89 × 150	21.4	0.15	16.6	5.00	MEQ123M2V--E150
	12,000	89 × 190	23.7	0.15	16.6	5.00	MEQ123M2V--E190
	12,000	89 × 196	24.0	0.15	16.6	5.00	MEQ123M2V--E196
	15,000	89 × 190	26.5	0.15	13.3	5.00	MEQ153M2V--E190
	15,000	89 × 236	29.2	0.15	13.3	5.00	MEQ153M2V--E236
	18,000	89 × 220	31.0	0.15	11.1	5.00	MEQ183M2V--E220
400	1,000	51 × 75	3.8	0.15	199	1.90	MEQ102M2G--B075
	1,200	51 × 96	4.6	0.15	166	2.08	MEQ122M2G--B096
	1,500	51 × 100	5.2	0.15	133	2.32	MEQ152M2G--B100
	1,500	51 × 115	5.5	0.15	133	2.32	MEQ152M2G--B115
	1,800	51 × 110	6.0	0.15	111	2.55	MEQ182M2G--B110
	1,800	51 × 130	6.4	0.15	111	2.55	MEQ182M2G--B130
	2,200	63.5 × 90	6.6	0.15	90.4	2.81	MEQ222M2G--C090
	2,200	51 × 130	7.1	0.15	90.4	2.81	MEQ222M2G--B130
	2,200	63.5 × 96	6.9	0.15	90.4	2.81	MEQ222M2G--C096
	2,700	63.5 × 110	8.0	0.15	73.7	3.12	MEQ272M2G--C110
	2,700	63.5 × 115	8.2	0.15	73.7	3.12	MEQ272M2G--C115
	2,700	76.2 × 90	7.7	0.15	73.7	3.12	MEQ272M2G--D090
	3,300	63.5 × 130	9.5	0.15	60.3	3.45	MEQ332M2G--C130
	3,300	76.2 × 100	9.0	0.15	60.3	3.45	MEQ332M2G--D100
	3,900	63.5 × 150	11.0	0.15	51.0	3.75	MEQ392M2G--C150
	3,900	63.5 × 155	11.1	0.15	51.0	3.75	MEQ392M2G--C155
	3,900	76.2 × 100	9.7	0.15	51.0	3.75	MEQ392M2G--D100
	3,900	76.2 × 115	10.4	0.15	51.0	3.75	MEQ392M2G--D115
	4,700	63.5 × 170	12.8	0.15	42.3	4.11	MEQ472M2G--C170
	4,700	63.5 × 195	13.6	0.15	42.3	4.11	MEQ472M2G--C195
	4,700	76.2 × 130	12.0	0.15	42.3	4.11	MEQ472M2G--D130
	5,600	63.5 × 190	14.7	0.15	35.5	4.49	MEQ562M2G--C190
	5,600	63.5 × 195	14.8	0.15	35.5	4.49	MEQ562M2G--C195
	5,600	76.2 × 150	14.2	0.15	35.5	4.49	MEQ562M2G--D150
	5,600	76.2 × 155	14.4	0.15	35.5	4.49	MEQ562M2G--D155
	6,800	76.2 × 170	16.5	0.15	29.3	4.95	MEQ682M2G--D170

Dimension and Permissible Ripple Current

Rated Voltage V_{DC}	Capacitance 120 Hz, 20℃ μF	ϕD×L mm	Ripple Current 120 Hz, 85℃ A/rms	Tan δ at 120 Hz, 20℃	ESR 120 Hz, 20℃ mΩ	LC 5 minutes mA	Part Number
400	6,800	89 × 130	15.3	0.15	29.3	4.95	MEQ682M2G--E130
	6,800	89 × 157	16.5	0.15	29.3	4.95	MEQ682M2G--E157
	8,200	76.2 × 190	19.1	0.15	24.3	5.00	MEQ822M2G--D190
	8,200	89 × 150	17.8	0.15	24.3	5.00	MEQ822M2G--E150
	8,200	89 × 155	18.1	0.15	24.3	5.00	MEQ822M2G--E155
	8,200	89 × 157	18.1	0.15	24.3	5.00	MEQ822M2G--E157
	10,000	76.2 × 220	22.5	0.15	19.9	5.00	MEQ103M2G--D220
	10,000	89 × 170	20.8	0.15	19.9	5.00	MEQ103M2G--E170
	10,000	89 × 190	21.8	0.15	19.9	5.00	MEQ103M2G--E190
	10,000	89 × 196	22.1	0.15	19.9	5.00	MEQ103M2G--E196
	12,000	89 × 190	23.9	0.15	16.6	5.00	MEQ123M2G--E190
	12,000	89 × 236	26.4	0.15	16.6	5.00	MEQ123M2G--E236
450	1,000	51 × 96	4.2	0.15	199	2.01	MEQ102M2W--B096
	1,200	51 × 100	4.7	0.15	166	2.20	MEQ122M2W--B100
	1,200	51 × 115	5.0	0.15	166	2.20	MEQ122M2W--B115
	1,500	51 × 130	5.8	0.15	133	2.46	MEQ152M2W--B130
	1,800	63.5 × 96	6.2	0.15	111	2.70	MEQ182M2W--C096
	2,200	63.5 × 110	7.2	0.15	90.4	2.98	MEQ222M2W--C110
	2,200	63.5 × 115	7.4	0.15	90.4	2.98	MEQ222M2W--C115
	2,200	76.2 × 90	7.0	0.15	90.4	2.98	MEQ222M2W--D090
	2,700	63.5 × 130	8.6	0.15	73.7	3.31	MEQ272M2W--C130
	2,700	76.2 × 100	8.2	0.15	73.7	3.31	MEQ272M2W--D100
	2,700	76.2 × 115	8.7	0.15	73.7	3.31	MEQ272M2W--D115
	3,300	63.5 × 150	10.1	0.15	60.3	3.66	MEQ332M2W--C150
	3,300	63.5 × 155	10.2	0.15	60.3	3.66	MEQ332M2W--C155
	3,300	76.2 × 100	9.0	0.15	60.3	3.66	MEQ332M2W--D100
	3,300	76.2 × 130	10.0	0.15	60.3	3.66	MEQ332M2W--D130
	3,900	63.5 × 170	11.6	0.15	51.0	3.97	MEQ392M2W--C170
	3,900	63.5 × 195	12.4	0.15	51.0	3.97	MEQ392M2W--C195
	3,900	76.2 × 130	10.8	0.15	51.0	3.97	MEQ392M2W--D130
	3,900	76.2 × 155	11.7	0.15	51.0	3.97	MEQ392M2W--D155
	4,700	63.5 × 190	13.4	0.15	42.3	4.36	MEQ472M2W--C190
	4,700	76.2 × 150	12.7	0.15	42.3	4.36	MEQ472M2W--D150
	4,700	76.2 × 155	12.9	0.15	42.3	4.36	MEQ472M2W--D155
	5,600	76.2 × 170	14.6	0.15	35.5	4.76	MEQ562M2W--D170
	5,600	76.2 × 190	15.4	0.15	35.5	4.76	MEQ562M2W--D190
	5,600	76.2 × 195	15.6	0.15	35.5	4.76	MEQ562M2W--D195
	5,600	89 × 150	14.6	0.15	35.5	4.76	MEQ562M2W--E150
	5,600	89 × 155	14.8	0.15	35.5	4.76	MEQ562M2W--E155
	5,600	89 × 157	14.9	0.15	35.5	4.76	MEQ562M2W--E157
	6,800	76.2 × 190	16.9	0.15	29.3	5.00	MEQ682M2W--D190
	6,800	89 × 150	16.1	0.15	29.3	5.00	MEQ682M2W--E150
	6,800	89 × 170	17.0	0.15	29.3	5.00	MEQ682M2W--E170
	6,800	89 × 196	18.1	0.15	29.3	5.00	MEQ682M2W--E196
	8,200	76.2 × 220	19.9	0.15	24.3	5.00	MEQ822M2W--D220
	8,200	89 × 170	18.7	0.15	24.3	5.00	MEQ822M2W--E170
	8,200	89 × 190	19.6	0.15	24.3	5.00	MEQ822M2W--E190
	8,200	89 × 196	19.9	0.15	24.3	5.00	MEQ822M2W--E196
	10,000	89 × 190	21.6	0.15	19.9	5.00	MEQ103M2W--E190
	10,000	89 × 236	23.9	0.15	19.9	5.00	MEQ103M2W--E236

Part Numbering System

MEQ Series	1000μF	±20%	350V	Plain case + Mounting clamp	M5 Post	51ϕ×75L	Pb-free Terminal + PVC Sleeve
MEQ	**102**	**M**	**2V**	**-**	**-**	**B075**	
Series Name	Capacitance	Capacitance tolerance	Rated voltage	Case Type	Terminal type	Case size	Terminal and Sleeve Type

Example:

Cap.	Symbol
1,000	102
6,800	682
10,000	103

M = ±20%
K = ±10%

Example:

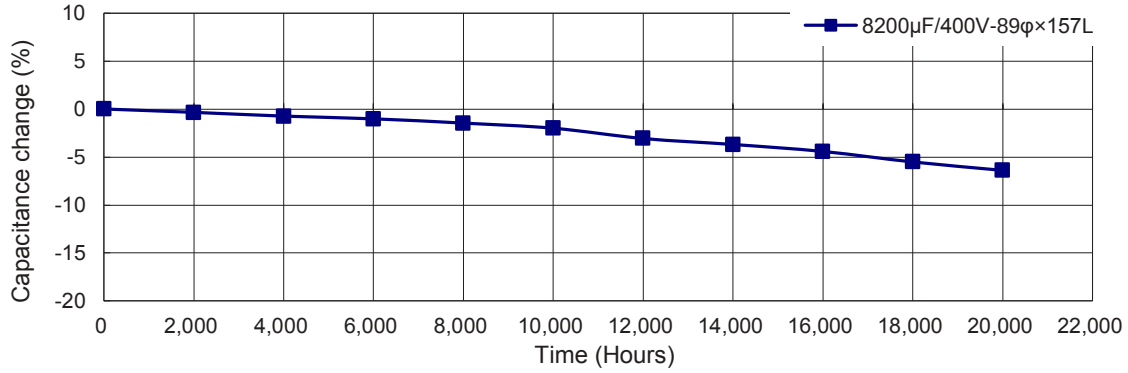
Voltage	Symbol
350	2V
400	2G
450	2W

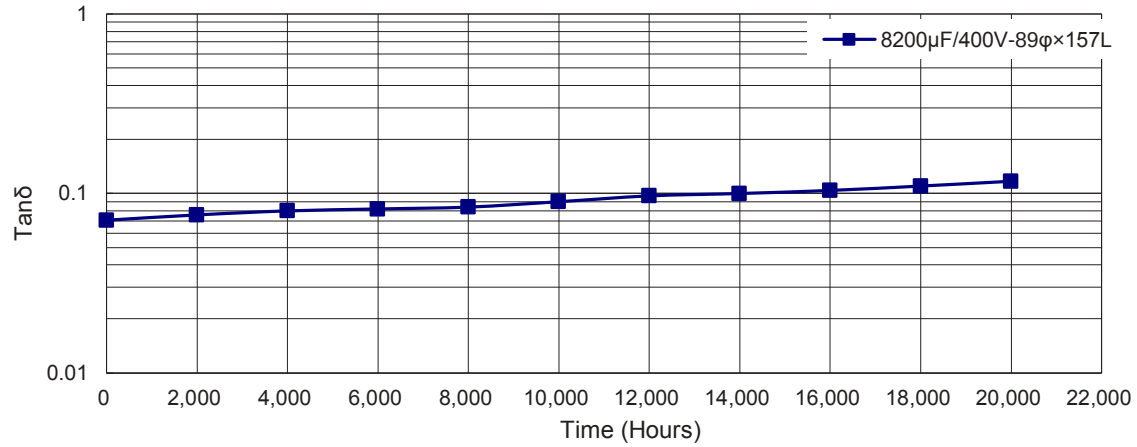
Example:

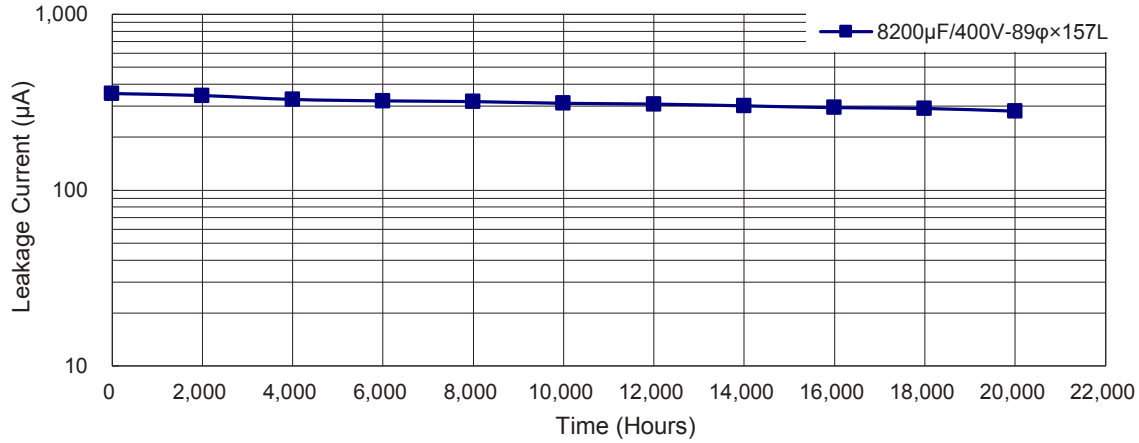
ϕD×L	Code
63.5×115	C115
76.2×130	D130
89 ×157	E157

Note: For more details, please refer to “Part Numbering System (Screw Type)” on page 17.

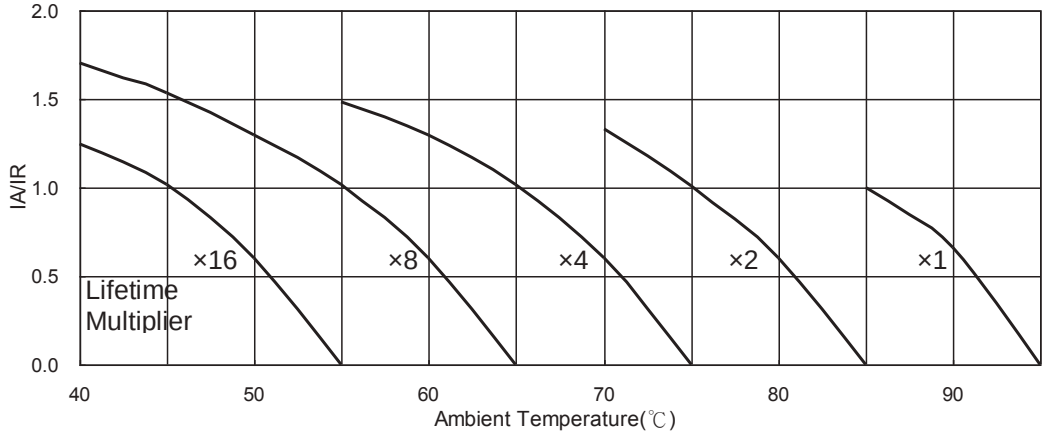
Typical Endurance Curves







Useful Life Chart



IA: Actual ripple current IR: Rated ripple current

MGA Series

Features

- Endurance with ripple current: 105℃, 2,000 hours
- RoHS compliance

Specifications

Items	Performance	
Category Temperature Range	16 ~ 100V	160 ~ 400V
	-40℃ ~ +105℃	-25℃ ~ +105℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)	
Leakage Current (at 20℃)	$I = 3\sqrt{CV}$ or 5 (mA) whichever is smaller (after 5 minutes) Where, C = rated capacitance in μF, V = rated DC Rated Voltage in V	
Tanδ (at 120 Hz, 20℃)	See the Dimensions & Permissible Ripple Current	
Low Temperature Characteristics (at 120 Hz)	Capacitance change : C(-25℃) / C(+20℃) ≧ 0.7	
Endurance	Test Time: 2,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 200% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after subjected to DC voltage with rated ripple current applied for 2,000 hours at 105℃.	
Shelf Life Test	Test Time: 1,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 200% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 105℃ without voltage applied. The rated voltage shall be applied to the capacitors before the measurements (Refer to JIS C 5101-4 4.1).	

Ripple Current and Frequency Multipliers	Frequency (Hz)	50 / 60	100 / 120	300	1k	10k up
	Multiplier	0.8	1.0	1.1	1.3	1.4

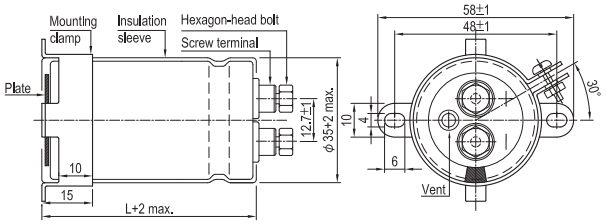
Ripple Current and Temperature Multipliers	Temperature (℃)	40	55	70	85	105
	Multiplier ≦250V	4.9	3.9	3.0	1.8	1.0
	Multiplier ≧350V	3.8	3.3	2.5	2.0	1.0

Failure percentage Failure rate	When the failure percentage / failure rate is required, please contact with us for further discussion.

Diagram of Dimensions

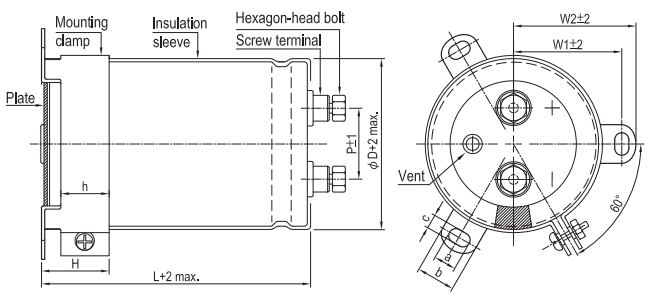
1. 35ϕ

Unit: mm



Screw Specifications:
Plug hexagon-head screw: M5×0.8×10
Max. screw tightening torque: 3.23Nm

2. 51 ~ 90ϕ



ϕD	P	W1	W2	H	h	a	b	c
51	22.0	31.8	36.5	30	24	7	14.0	4.5
63.5	28.6	38.1	42.6	30	24	7	14.0	4.5
76.2	32.0	44.5	49.2	30	24	7	14.0	5.0
89	32.0	50.8	55.6	30	24	7	14.0	5.0

Dimension and Permissible Ripple Current

Rated Voltage V_{DC}	Capacitance 120 Hz, 20℃ μF	φD×L mm	Ripple Current 120 Hz, 105℃ A/rms	Tan δ at 120 Hz, 20℃	ESR 120 Hz, 20℃ mΩ	LC 5 minutes mA	Part Number
16	18,000	35 × 53	4.2	0.40	29.5	1.61	MGA183M1C-AA053
	22,000	35 × 53	4.7	0.40	24.1	1.78	MGA223M1C-AA053
	27,000	35 × 53	5.5	0.40	19.7	1.97	MGA273M1C-AA053
	33,000	35 × 65	5.7	0.45	18.1	2.18	MGA333M1C-AA065
	39,000	35 × 65	6.8	0.45	15.3	2.37	MGA393M1C-AA065
	47,000	35 × 83	7.1	0.50	14.1	2.60	MGA473M1C-AA083
	56,000	35 × 100	8.4	0.50	11.8	2.84	MGA563M1C-AA100
	68,000	35 × 121	8.8	0.55	10.7	3.13	MGA683M1C-AA121
	82,000	51 × 83	10.7	0.55	8.9	3.44	MGA823M1C--B083
	100,000	51 × 83	10.8	0.65	8.6	3.79	MGA104M1C--B083
	120,000	51 × 100	13.1	0.65	7.2	4.16	MGA124M1C--B100
	150,000	51 × 121	15.3	0.70	6.2	4.65	MGA154M1C--B121
	180,000	51 × 121	15.7	0.80	5.9	5.00	MGA184M1C--B121
	220,000	63.5 × 121	19.2	0.85	5.1	5.00	MGA224M1C--C121
	270,000	63.5 × 121	19.6	1.00	4.9	5.00	MGA274M1C--C121
	330,000	76.2 × 121	21.1	1.30	5.2	5.00	MGA334M1C--D121
	390,000	76.2 × 121	21.3	1.50	5.1	5.00	MGA394M1C--D121
	470,000	76.2 × 144	24.2	1.60	4.5	5.00	MGA474M1C--D144
25	12,000	35 × 53	3.7	0.35	38.7	1.64	MGA123M1E-AA053
	15,000	35 × 53	4.1	0.35	31.0	1.84	MGA153M1E-AA053
	18,000	35 × 65	4.8	0.35	25.8	2.01	MGA183M1E-AA065
	22,000	35 × 65	5.3	0.35	21.1	2.22	MGA223M1E-AA065
	27,000	35 × 83	6.4	0.40	19.7	2.46	MGA273M1E-AA083
	33,000	35 × 83	6.7	0.40	16.1	2.72	MGA333M1E-AA083
	39,000	35 × 100	7.8	0.40	13.6	2.96	MGA393M1E-AA100
	47,000	35 × 121	9.3	0.40	11.3	3.25	MGA473M1E-AA121
	56,000	51 × 75	9.7	0.50	11.8	3.55	MGA563M1E--B075
	68,000	51 × 100	11.2	0.50	9.8	3.91	MGA683M1E--B100
	82,000	51 × 100	11.2	0.60	9.7	4.30	MGA823M1E--B100
	100,000	51 × 121	14.8	0.60	8.0	4.74	MGA104M1E--B121
	120,000	63.5 × 100	14.9	0.80	8.8	5.00	MGA124M1E--C100
	150,000	63.5 × 121	17.9	0.80	7.1	5.00	MGA154M1E--C121
	180,000	64 × 121	17.9	1.00	7.4	5.00	MGA184M1E--C121
	220,000	76.2 × 121	21.3	1.00	6.0	5.00	MGA224M1E--D121
	270,000	76.2 × 121	21.7	1.00	4.9	5.00	MGA274M1E--D121
	330,000	76.2 × 144	23.4	1.00	4.0	5.00	MGA334M1E--D144
	390,000	89 × 130	24.9	1.00	3.4	5.00	MGA394M1E--E130
35	8,200	35 × 53	3.3	0.30	48.5	1.61	MGA822M1V-AA053
	10,000	35 × 53	3.6	0.30	39.8	1.77	MGA103M1V-AA053
	12,000	35 × 65	4.2	0.30	33.2	1.94	MGA123M1V-AA065
	15,000	35 × 65	4.7	0.30	26.5	2.17	MGA153M1V-AA065
	18,000	35 × 83	5.7	0.35	25.8	2.38	MGA183M1V-AA083
	22,000	35 × 83	6.3	0.35	21.1	2.63	MGA223M1V-AA083
	27,000	35 × 100	7.5	0.40	19.7	2.92	MGA273M1V-AA100
	33,000	35 × 121	9.0	0.40	16.1	3.22	MGA333M1V-AA121
	39,000	51 × 75	9.2	0.45	15.3	3.50	MGA393M1V--B075
	47,000	51 × 100	11.2	0.45	12.7	3.85	MGA473M1V--B100
	56,000	51 × 100	11.4	0.50	11.8	4.20	MGA563M1V--B100
	68,000	51 × 121	13.6	0.50	9.8	4.63	MGA683M1V--B121
	82,000	63.5 × 100	14.8	0.60	9.7	5.00	MGA823M1V--C100
	100,000	63.5 × 121	17.6	0.60	8.0	5.00	MGA104M1V--C121
	120,000	63.5 × 121	17.6	0.70	7.7	5.00	MGA124M1V--C121
	150,000	76.2 × 121	19.8	0.70	6.2	5.00	MGA154M1V--D121
	180,000	76.2 × 121	19.8	0.70	5.2	5.00	MGA184M1V--D121
	220,000	76.2 × 144	23.4	0.70	4.2	5.00	MGA224M1V--D144
	270,000	89 × 157	25.5	0.70	3.4	5.00	MGA274M1V--E157
50	3,900	35 × 53	2.8	0.25	85.1	1.32	MGA392M1H-AA053
	4,700	35 × 53	3.1	0.25	70.6	1.45	MGA472M1H-AA053
	5,600	35 × 53	3.3	0.25	59.2	1.59	MGA562M1H-AA053
	6,800	35 × 53	3.3	0.25	48.8	1.75	MGA682M1H-AA053
	8,200	35 × 65	3.8	0.25	40.5	1.92	MGA822M1H-AA065
	10,000	35 × 83	4.6	0.25	33.2	2.12	MGA103M1H-AA083
	12,000	35 × 83	5.1	0.30	33.2	2.32	MGA123M1H-AA083
	15,000	35 × 83	5.7	0.30	26.5	2.60	MGA153M1H-AA083

Dimension and Permissible Ripple Current

Rated Voltage V_{DC}	Capacitance 120 Hz, 20℃ μF	φD×L mm	Ripple Current 120 Hz, 105℃ A/rms	Tan δ at 120 Hz, 20℃	ESR 120 Hz, 20℃ mΩ	LC 5 minutes mA	Part Number
50	18,000	35 × 100	6.7	0.35	25.8	2.85	MGA183M1H-AA100
	22,000	35 × 121	8.1	0.35	21.1	3.15	MGA223M1H-AA121
	27,000	51 × 75	9.1	0.40	19.7	3.49	MGA273M1H--B075
	33,000	51 × 100	11.1	0.40	16.1	3.85	MGA333M1H--B100
	39,000	51 × 121	13.1	0.40	13.6	4.19	MGA393M1H--B121
	47,000	51 × 121	13.9	0.40	11.3	4.60	MGA473M1H--B121
	56,000	63.5 × 100	13.9	0.45	10.7	5.00	MGA563M1H--C100
	68,000	63.5 × 121	16.6	0.45	8.8	5.00	MGA683M1H--C121
	82,000	76.2 × 121	18.9	0.50	8.1	5.00	MGA823M1H--D121
	100,000	76.2 × 121	19.5	0.50	6.6	5.00	MGA104M1H--D121
	120,000	76.2 × 121	19.5	0.50	5.5	5.00	MGA124M1H--D121
	150,000	89 × 130	22.5	0.50	4.4	5.00	MGA154M1H--E130
	180,000	89 × 157	23.9	0.50	3.7	5.00	MGA184M1H--E157
63	2,700	35 × 53	2.3	0.20	98.3	1.24	MGA272M1J-AA053
	3,300	35 × 53	2.5	0.20	80.4	1.37	MGA332M1J-AA053
	3,900	35 × 53	2.8	0.20	68.0	1.49	MGA392M1J-AA053
	4,700	35 × 53	3.1	0.20	56.5	1.63	MGA472M1J-AA053
	5,600	35 × 65	3.5	0.20	47.4	1.78	MGA562M1J-AA065
	6,800	35 × 65	3.9	0.20	39.0	1.96	MGA682M1J-AA065
	8,200	35 × 83	4.4	0.25	40.5	2.16	MGA822M1J-AA083
	10,000	35 × 83	4.7	0.25	33.2	2.38	MGA103M1J-AA083
	12,000	35 × 100	5.5	0.25	27.6	2.61	MGA123M1J-AA100
	15,000	35 × 121	6.6	0.25	22.1	2.92	MGA153M1J-AA121
	18,000	51 × 75	7.4	0.30	22.1	3.19	MGA183M1J--B075
	22,000	51 × 100	9.0	0.30	18.1	3.53	MGA223M1J--B100
	27,000	51 × 121	10.9	0.30	14.7	3.91	MGA273M1J--B121
	33,000	51 × 121	12.0	0.30	12.1	4.33	MGA333M1J--B121
	39,000	63.5 × 100	12.5	0.35	11.9	4.70	MGA393M1J--C100
	47,000	63.5 × 121	14.9	0.35	9.9	5.00	MGA473M1J--C121
	56,000	63.5 × 121	16.3	0.40	9.5	5.00	MGA563M1J--C121
	68,000	76.2 × 121	18.4	0.40	7.8	5.00	MGA683M1J--D121
	82,000	76.2 × 144	20.0	0.40	6.5	5.00	MGA823M1J--D144
	100,000	76.2 × 144	20.0	0.40	5.3	5.00	MGA104M1J--D144
	120,000	89 × 157	21.8	0.40	4.4	5.00	MGA124M1J--E157
80	2,200	35 × 53	2.4	0.15	90.5	1.26	MGA222M1K-AA053
	2,700	35 × 53	2.7	0.15	73.7	1.39	MGA272M1K-AA053
	3,300	35 × 53	3.0	0.15	60.3	1.54	MGA332M1K-AA053
	3,900	35 × 65	3.4	0.15	51.0	1.68	MGA392M1K-AA065
	4,700	35 × 65	3.7	0.15	42.3	1.84	MGA472M1K-AA065
	5,600	35 × 83	4.5	0.20	47.4	2.01	MGA562M1K-AA083
	6,800	35 × 83	4.9	0.20	39.0	2.21	MGA682M1K-AA083
	8,200	35 × 100	5.1	0.20	32.4	2.43	MGA822M1K-AA100
	10,000	35 × 121	6.1	0.20	26.5	2.68	MGA103M1K-AA121
	12,000	51 × 75	6.7	0.25	27.6	2.94	MGA123M1K--B075
	15,000	51 × 100	8.3	0.25	22.1	3.29	MGA153M1K--B100
	18,000	51 × 121	9.9	0.25	18.4	3.60	MGA183M1K--B121
	22,000	51 × 121	11.0	0.25	15.1	3.98	MGA223M1K--B121
	27,000	63.5 × 100	11.4	0.30	14.7	4.41	MGA273M1K--C100
	33,000	76.2 × 100	13.9	0.30	12.1	4.87	MGA333M1K--D100
	39,000	76.2 × 100	13.9	0.30	10.2	5.00	MGA393M1K--D100
	47,000	76.2 × 121	16.5	0.30	8.5	5.00	MGA473M1K--D121
	56,000	76.2 × 121	18.1	0.30	7.1	5.00	MGA563M1K--D121
	68,000	76.2 × 144	19.7	0.30	5.9	5.00	MGA683M1K--D144
	82,000	89 × 130	22.1	0.30	4.9	5.00	MGA823M1K--E130
100	1,800	35 × 53	2.7	0.15	111	1.27	MGA182M2A-AA053
	2,200	35 × 53	3.0	0.15	90.5	1.41	MGA222M2A-AA053
	2,700	35 × 65	3.5	0.15	73.7	1.56	MGA272M2A-AA065
	3,300	35 × 83	4.2	0.15	60.3	1.72	MGA332M2A-AA083
	3,900	35 × 83	4.2	0.15	51.0	1.87	MGA392M2A-AA083
	4,700	35 × 100	5.0	0.15	42.3	2.06	MGA472M2A-AA100
	5,600	35 × 100	5.4	0.15	35.5	2.24	MGA562M2A-AA100
	6,800	35 × 121	5.8	0.15	29.3	2.47	MGA682M2A-AA121
	8,200	51 × 75	6.4	0.15	24.3	2.72	MGA822M2A--B075
	10,000	51 × 100	7.8	0.15	19.9	3.00	MGA103M2A--B100

Dimension and Permissible Ripple Current

Rated Voltage V_{DC}	Capacitance 120 Hz, 20℃ μF	ϕD×L mm	Ripple Current 120 Hz, 105℃ A/rms	Tan δ at 120 Hz, 20℃	ESR 120 Hz, 20℃ mΩ	LC 5 minutes mA	Part Number
100	12,000	51 × 121	9.3	0.20	22.1	3.29	MGA123M2A--B121
	15,000	51 × 121	10.4	0.20	17.7	3.67	MGA153M2A--B121
	18,000	63.5 × 100	10.4	0.20	14.7	4.02	MGA183M2A--C100
	22,000	63.5 × 121	12.5	0.20	12.1	4.45	MGA223M2A--C121
	27,000	76.2 × 121	13.7	0.25	12.3	4.93	MGA273M2A--D121
	33,000	76.2 × 121	15.2	0.25	10.1	5.00	MGA333M2A--D121
	39,000	76.2 × 144	16.1	0.25	8.5	5.00	MGA393M2A--D144
	47,000	89 × 130	19.3	0.25	7.1	5.00	MGA473M2A--E130
	56,000	89 × 157	21.1	0.25	5.9	5.00	MGA563M2A--E157
160	560	35 × 53	1.2	0.15	355	0.90	MGA561M2C-AA053
	680	35 × 53	1.3	0.15	293	0.99	MGA681M2C-AA053
	820	35 × 65	1.4	0.15	243	1.09	MGA821M2C-AA065
	1,000	35 × 83	1.8	0.15	199	1.20	MGA102M2C-AA083
	1,200	35 × 83	1.9	0.15	166	1.31	MGA122M2C-AA083
	1,500	35 × 83	2.1	0.15	133	1.47	MGA152M2C-AA083
	1,800	35 × 83	2.5	0.15	111	1.61	MGA182M2C-AA083
	2,200	35 × 100	2.8	0.15	90.5	1.78	MGA222M2C-AA100
	2,700	35 × 100	3.3	0.15	73.7	1.97	MGA272M2C-AA100
	3,300	51 × 75	3.8	0.15	60.3	2.18	MGA332M2C--B075
	3,900	51 × 75	3.8	0.15	51.0	2.37	MGA392M2C--B075
	4,700	51 × 96	4.6	0.15	42.3	2.60	MGA472M2C--B096
	5,600	51 × 96	5.1	0.15	35.5	2.84	MGA562M2C--B096
	6,800	63.5 × 96	6.1	0.15	29.3	3.13	MGA682M2C--C096
	8,200	63.5 × 96	7.0	0.15	24.3	3.44	MGA822M2C--C096
	10,000	76.2 × 96	8.4	0.15	19.9	3.79	MGA103M2C--D096
	12,000	76.2 × 115	9.4	0.15	16.6	4.16	MGA123M2C--D115
	15,000	76.2 × 130	11.4	0.15	13.3	4.65	MGA153M2C--D130
	18,000	76.2 × 144	13.4	0.15	11.1	5.00	MGA183M2C--D144
	22,000	89 × 130	14.5	0.15	9.0	5.00	MGA223M2C--E130
	27,000	89 × 157	16.0	0.15	7.4	5.00	MGA273M2C--E157
200	330	35 × 53	0.9	0.15	603	0.77	MGA331M2D-AA053
	390	35 × 53	1.0	0.15	510	0.84	MGA391M2D-AA053
	470	35 × 53	1.1	0.15	423	0.92	MGA471M2D-AA053
	560	35 × 53	1.2	0.15	355	1.00	MGA561M2D-AA053
	680	35 × 53	1.3	0.15	293	1.11	MGA681M2D-AA053
	820	35 × 65	1.5	0.15	243	1.21	MGA821M2D-AA065
	1,000	35 × 83	1.7	0.15	199	1.34	MGA102M2D-AA083
	1,200	35 × 83	1.9	0.15	166	1.47	MGA122M2D-AA083
	1,500	35 × 100	2.3	0.15	133	1.64	MGA152M2D-AA100
	1,800	35 × 100	2.5	0.15	111	1.80	MGA182M2D-AA100
	2,200	51 × 75	3.0	0.15	90.5	1.99	MGA222M2D--B075
	2,700	51 × 96	3.6	0.15	73.7	2.20	MGA272M2D--B096
	3,300	51 × 96	4.1	0.15	60.3	2.44	MGA332M2D--B096
	3,900	51 × 115	4.9	0.15	51.0	2.65	MGA392M2D--B115
	4,700	63.5 × 96	5.3	0.15	42.3	2.91	MGA472M2D--C096
	5,600	63.5 × 96	5.8	0.15	35.5	3.17	MGA562M2D--C096
	6,800	63.5 × 115	6.9	0.15	29.3	3.50	MGA682M2D--C115
	8,200	63.5 × 130	7.6	0.15	24.3	3.84	MGA822M2D--C130
	10,000	76.2 × 115	9.6	0.15	19.9	4.24	MGA103M2D--D115
	12,000	76.2 × 130	10.2	0.15	16.6	4.65	MGA123M2D--D130
	15,000	89 × 130	12.2	0.15	13.3	5.00	MGA153M2D--E130
	18,000	89 × 157	13.1	0.15	11.1	5.00	MGA183M2D--E157
250	270	35 × 53	0.8	0.15	737	0.78	MGA271M2E-AA053
	330	35 × 53	0.9	0.15	603	0.86	MGA331M2E-AA053
	390	35 × 53	1.0	0.15	510	0.94	MGA391M2E-AA053
	470	35 × 53	1.1	0.15	423	1.03	MGA471M2E-AA053
	560	35 × 65	1.4	0.15	355	1.12	MGA561M2E-AA065
	680	35 × 83	1.5	0.15	293	1.24	MGA681M2E-AA083
	820	35 × 83	1.6	0.15	243	1.36	MGA821M2E-AA083
	1,000	35 × 100	1.8	0.15	199	1.50	MGA102M2E-AA100
	1,200	35 × 100	1.9	0.15	166	1.64	MGA122M2E-AA100
	1,500	51 × 75	2.3	0.15	133	1.84	MGA152M2E--B075
	1,800	51 × 75	2.5	0.15	111	2.01	MGA182M2E--B075
	2,200	51 × 96	3.0	0.15	90.5	2.22	MGA222M2E--B096

Dimension and Permissible Ripple Current

Rated Voltage V_{DC}	Capacitance 120 Hz, 20℃ μF	ϕD×L mm	Ripple Current 120 Hz, 105℃ A/rms	Tan δ at 120 Hz, 20℃	ESR 120 Hz, 20℃ mΩ	LC 5 minutes mA	Part Number
250	2,700	51 × 115	3.5	0.15	73.7	2.46	MGA272M2E--B115
	3,300	63.5 × 96	4.2	0.15	60.3	2.72	MGA332M2E--C096
	3,900	63.5 × 96	4.6	0.15	51.0	2.96	MGA392M2E--C096
	4,700	63.5 × 115	5.7	0.15	42.3	3.25	MGA472M2E--C115
	5,600	63.5 × 130	6.3	0.15	35.5	3.55	MGA562M2E--C130
	6,800	76.2 × 115	7.7	0.15	29.3	3.91	MGA682M2E--D115
	8,200	76.2 × 130	8.4	0.15	24.3	4.30	MGA822M2E--D130
	10,000	76.2 × 155	10.0	0.15	19.9	4.74	MGA103M2E--D155
	12,000	89 × 140	11.9	0.15	16.6	5.00	MGA123M2E--E140
	15,000	89 × 157	12.5	0.15	13.3	5.00	MGA153M2E--E157
350	180	35 × 53	0.8	0.15	1106	0.75	MGA181M2V-AA053
	220	35 × 53	0.9	0.15	905	0.83	MGA221M2V-AA053
	270	35 × 53	1.0	0.15	737	0.92	MGA271M2V-AA053
	330	35 × 65	1.2	0.15	603	1.02	MGA331M2V-AA065
	390	35 × 65	1.3	0.15	510	1.11	MGA391M2V-AA065
	470	35 × 83	1.5	0.15	423	1.22	MGA471M2V-AA083
	560	35 × 83	1.6	0.15	355	1.33	MGA561M2V-AA083
	680	35 × 100	1.7	0.15	293	1.46	MGA681M2V-AA100
	820	35 × 100	1.8	0.15	243	1.61	MGA821M2V-AA100
	1,000	51 × 75	2.2	0.15	199	1.77	MGA102M2V--B075
	1,200	51 × 75	2.3	0.15	166	1.94	MGA122M2V--B075
	1,500	51 × 96	3.0	0.15	133	2.17	MGA152M2V--B096
	1,800	51 × 115	3.6	0.15	111	2.38	MGA182M2V--B115
	2,200	51 × 130	4.0	0.15	90.5	2.63	MGA222M2V--B130
	2,700	63.5 × 96	4.6	0.15	73.7	2.92	MGA272M2V--C096
	3,300	63.5 × 115	5.6	0.15	60.3	3.22	MGA332M2V--C115
	3,900	63.5 × 130	6.7	0.15	51.0	3.50	MGA392M2V--C130
	4,700	76.2 × 121	7.5	0.15	42.3	3.85	MGA472M2V--D121
	5,600	76.2 × 130	8.3	0.15	35.5	4.20	MGA562M2V--D130
	6,800	76.2 × 155	9.4	0.15	29.3	4.63	MGA682M2V--D155
	8,200	89 × 157	11.4	0.15	24.3	5.00	MGA822M2V--E157
400	180	35 × 53	0.8	0.15	1106	0.80	MGA181M2G-AA053
	220	35 × 53	0.9	0.15	905	0.89	MGA221M2G-AA053
	270	35 × 65	1.1	0.15	737	0.99	MGA271M2G-AA065
	330	35 × 65	1.2	0.15	603	1.09	MGA331M2G-AA065
	390	35 × 83	1.3	0.15	510	1.18	MGA391M2G-AA083
	470	35 × 83	1.4	0.15	423	1.30	MGA471M2G-AA083
	560	35 × 100	1.6	0.15	355	1.42	MGA561M2G-AA100
	680	35 × 100	1.7	0.15	293	1.56	MGA681M2G-AA100
	820	35 × 121	2.0	0.15	243	1.72	MGA821M2G-AA121
	1,000	51 × 75	2.2	0.15	199	1.90	MGA102M2G--B075
	1,200	51 × 96	2.7	0.15	166	2.08	MGA122M2G--B096
	1,500	51 × 115	3.3	0.15	133	2.32	MGA152M2G--B115
	1,800	51 × 130	3.7	0.15	111	2.55	MGA182M2G--B130
	2,200	63.5 × 96	4.2	0.15	90.5	2.81	MGA222M2G--C096
	2,700	63.5 × 115	4.8	0.15	73.7	3.12	MGA272M2G--C115
	3,300	63.5 × 130	5.5	0.15	60.3	3.45	MGA332M2G--C130
	3,900	76.2 × 115	6.5	0.15	51.0	3.75	MGA392M2G--D115
	4,700	76.2 × 130	7.6	0.15	42.3	4.11	MGA472M2G--D130
	5,600	76.2 × 155	9.4	0.15	35.5	4.49	MGA562M2G--D155
	6,800	89 × 157	10.4	0.15	29.3	4.95	MGA682M2G--E157
	8,200	89 × 157	11.8	0.15	24.3	5.00	MGA822M2G--E157

Part Numbering System

MGA Series	1000μF	±20%	350V	Plain case + Mounting clamp	M5 Post	51ϕ×75L	Pb-free Terminal + PVC Sleeve
MGA	**102**	**M**	**2V**	**-**	**-**	**B075**	
Series Name	Capacitance	Capacitance tolerance	Rated voltage	Case Type	Terminal type	Case size	Terminal and Sleeve Type

Example:

Cap.	Symbol
3,300	332
10,000	103

M = ±20%
K = ±10%

Example:

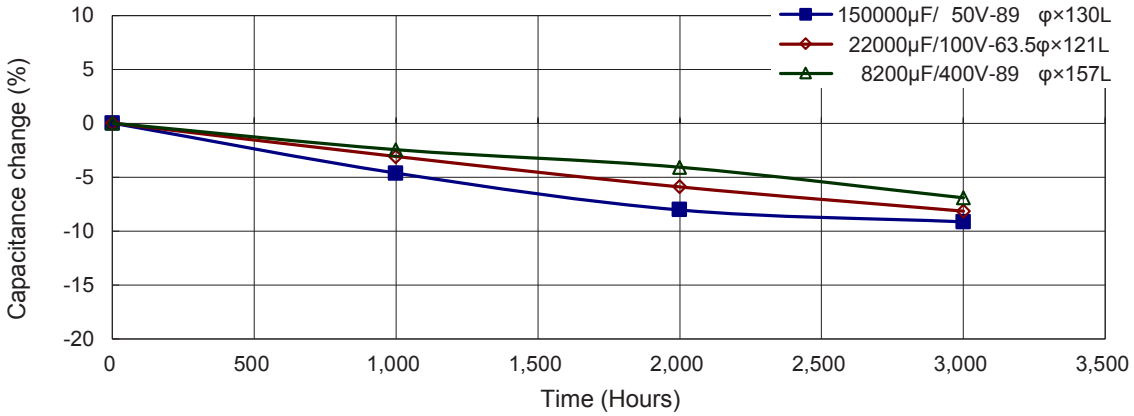
Voltage	Symbol
400	2G
450	2W

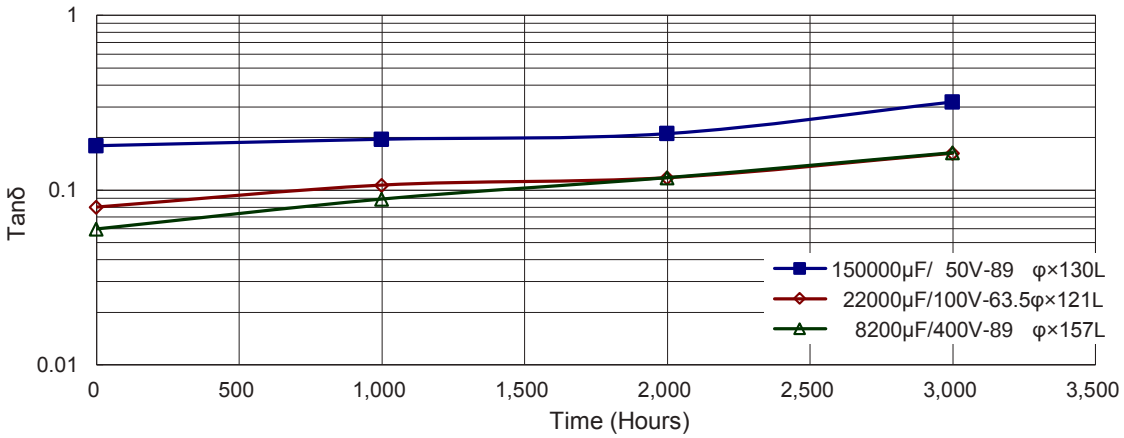
Example:

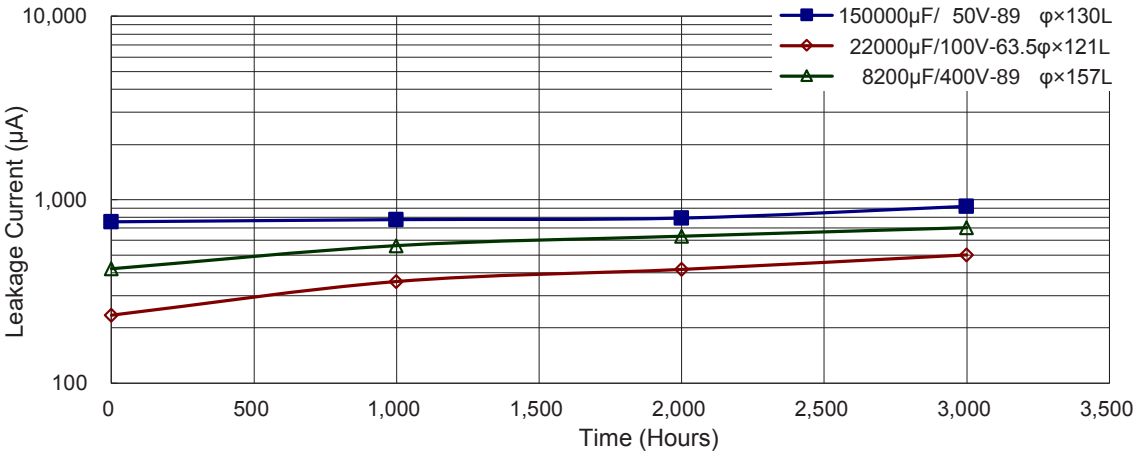
ϕD×L	Code
63.5×130	C130
89 ×157	E157

Note: For more details, please refer to “Part Numbering System (Screw Type)” on page 17.

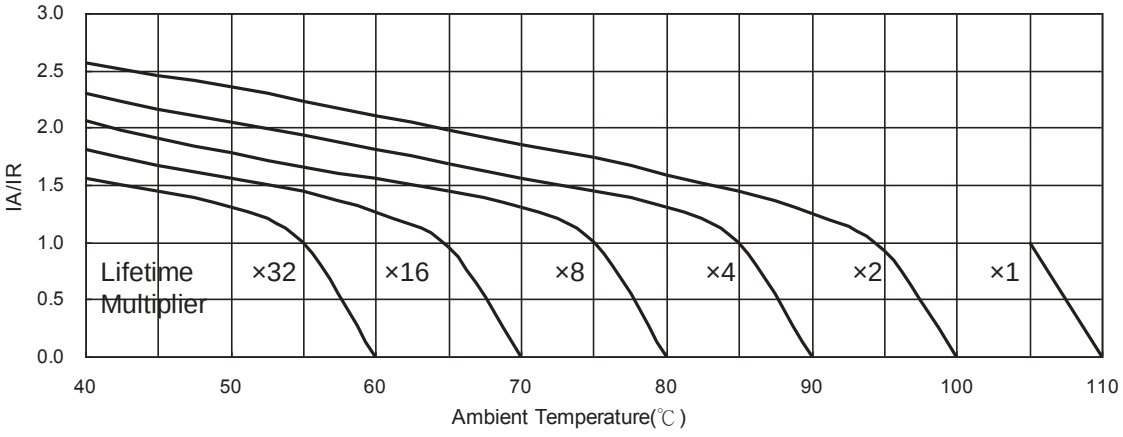
Typical Endurance Curves







Useful Life Chart



IA: Actual ripple current IR: Rated ripple current

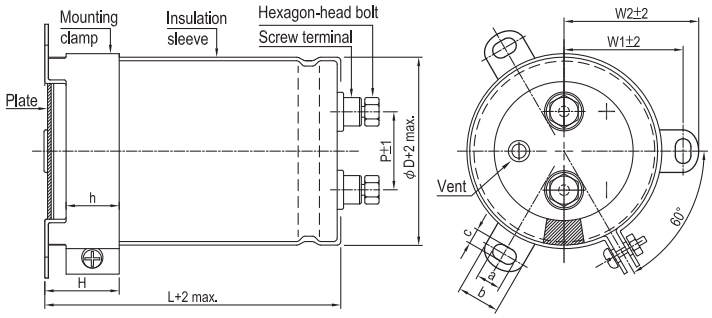
MGK Series

Features
- Endurance with ripple current: 105℃, 5,000 hours
- RoHS compliance

Specifications

Items	Performance
Category Temperature Range	-25℃ ~ +105℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)	$I = 3\sqrt{CV}$ or 5 (mA) whichever is smaller (after 5 minutes) Where, C = rated capacitance in μF, V = rated DC Rated Voltage in V
Tanδ (at 120 Hz, 20℃)	See the Dimensions & Permissible Ripple Current
Low Temperature Characteristics (at 120 Hz)	Capacitance change : C(-25℃) / C(+20℃) ≧ 0.7
Endurance	Test Time: 5,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 200% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after subjected to DC voltage with rated ripple current applied for 5,000 hours at 105℃.
Shelf Life Test	Test Time: 1,000 Hrs Capacitance Change: Within ±20% of initial value Tanδ: Less than 200% of specified value Leakage Current: Within specified value * The above specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 105℃ without voltage applied. The rated voltage shall be applied to the capacitors before the measurements (Refer to JIS C 5101-4 4.1).
Ripple Current and Frequency Multipliers	Frequency (Hz): 50 / 60 | 100 / 120 | 300 | 1k | 10k up Multiplier: 0.7 | 1.0 | 1.1 | 1.3 | 1.4
Ripple Current and Temperature Multipliers	Temperature (℃): 40 | 60 | 85 | 105 Multiplier: 2.44 | 2.16 | 2.00 | 1.00
Failure percentage Failure rate	When the failure percentage / failure rate is required, please contact with us for further discussion.

Diagram of Dimensions



Unit: mm

ϕD	P	W1	W2	H	h	a	b	c
51	22.0	31.8	36.5	30	24	7	14.0	4.5
63.5	28.6	38.1	42.6	30	24	7	14.0	4.5
76.2	32.0	44.5	49.2	30	24	7	14.0	5.0
89	32.0	50.8	55.6	30	24	7	14.0	5.0

Screw Specifications:
Plug hexagon-head screw: M5×0.8×10
Max. screw tightening torque: 3.23Nm

Dimension and Permissible Ripple Current

Rated Voltage V_{DC}	Capacitance 120 Hz, 20℃ μF	ϕD×L mm	Ripple Current 120 Hz, 105℃ A/rms	Tan δ at 120 Hz, 20℃	ESR 120 Hz, 20℃ mΩ	LC 5 minutes mA	Part Number
350	1,000	51 × 75	3.9	0.15	199	1.77	MGK102M2V--B075
	1,200	51 × 75	4.2	0.15	166	1.94	MGK122M2V--B075
	1,500	51 × 96	5.2	0.15	133	2.17	MGK152M2V--B096
	1,800	51 × 96	5.7	0.15	111	2.38	MGK182M2V--B096
	2,200	51 × 130	7.1	0.15	90.5	2.63	MGK222M2V--B130
	2,700	63.5 × 96	7.7	0.15	73.7	2.92	MGK272M2V--C096
	3,300	63.5 × 115	9.1	0.15	60.3	3.22	MGK332M2V--C115
	3,900	63.5 × 130	10.4	0.15	51.0	3.50	MGK392M2V--C130
	4,700	63.5 × 155	12.2	0.15	42.3	3.85	MGK472M2V--C155
	4,700	76.2 × 115	11.5	0.15	42.3	3.85	MGK472M2V--D115
	5,600	76.2 × 130	13.1	0.15	35.5	4.20	MGK562M2V--D130
	6,800	76.2 × 155	15.5	0.15	29.3	4.63	MGK682M2V--D155
	8,200	89 × 157	18.1	0.15	24.3	5.00	MGK822M2V--E157
	10,000	89 × 157	19.9	0.15	19.9	5.00	MGK103M2V--E157
400	1,000	51 × 75	3.9	0.15	199	1.90	MGK102M2G--B075
	1,200	51 × 96	4.6	0.15	166	2.08	MGK122M2G--B096
	1,500	51 × 115	5.6	0.15	133	2.32	MGK152M2G--B115
	1,800	51 × 130	6.4	0.15	111	2.55	MGK182M2G--B130
	2,200	63.5 × 96	6.9	0.15	90.5	2.81	MGK222M2G--C096
	2,700	63.5 × 115	8.2	0.15	73.7	3.12	MGK272M2G--C115
	3,300	63.5 × 130	9.5	0.15	60.3	3.45	MGK332M2G--C130
	3,900	63.5 × 155	11.1	0.15	51.0	3.75	MGK392M2G--C155
	3,900	76.2 × 115	10.4	0.15	51.0	3.75	MGK392M2G--D115
	4,700	76.2 × 130	12.0	0.15	42.3	4.11	MGK472M2G--D130
	5,600	76.2 × 155	14.0	0.15	35.5	4.49	MGK562M2G--D155
	6,800	89 × 157	16.5	0.15	29.3	4.95	MGK682M2G--E157
	8,200	89 × 157	18.1	0.15	24.3	5.00	MGK822M2G--E157
450	1,000	51 × 96	4.2	0.15	199	2.01	MGK102M2W--B096
	1,200	51 × 115	5.0	0.15	166	2.20	MGK122M2W--B115
	1,500	51 × 130	5.9	0.15	133	2.46	MGK152M2W--B130
	1,800	63.5 × 96	6.3	0.15	111	2.70	MGK182M2W--C096
	2,200	63.5 × 115	7.4	0.15	90.5	2.98	MGK222M2W--C115
	2,700	63.5 × 130	8.6	0.15	73.7	3.31	MGK272M2W--C130
	2,700	76.2 × 115	8.7	0.15	73.7	3.31	MGK272M2W--D115
	3,300	63.5 × 155	10.2	0.15	60.3	3.66	MGK332M2W--C155
	3,300	76.2 × 130	10.1	0.15	60.3	3.66	MGK332M2W--D130
	3,900	76.2 × 155	11.7	0.15	51.0	3.97	MGK392M2W--D155
	4,700	76.2 × 155	12.9	0.15	42.3	4.36	MGK472M2W--D155
	5,600	89 × 157	14.9	0.15	35.5	4.76	MGK562M2W--E157

Part Numbering System

MGK Series	1000μF	±20%	350V	Plain case + Mounting clamp	M5 Post	51ϕ×75L	Pb-free Terminal + PVC Sleeve
MGK	**102**	**M**	**2V**	**-**	**-**	**B075**	
Series Name	Capacitance	Capacitance tolerance	Rated voltage	Case Type	Terminal type	Case size	Terminal and Sleeve Type

Example:

Cap.	Symbol
1,000	102
3,300	332
10,000	103

M = ±20%
K = ±10%

Example:

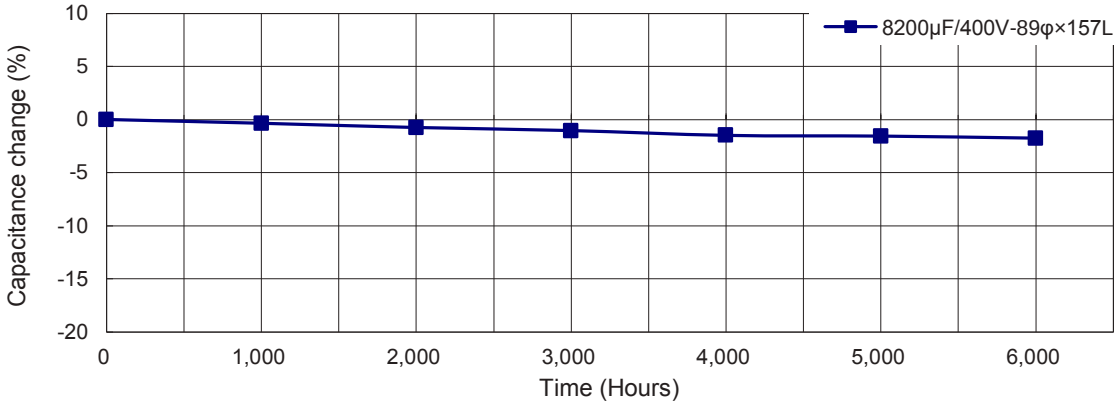
Voltage	Symbol
350	2V
400	2G
450	2W

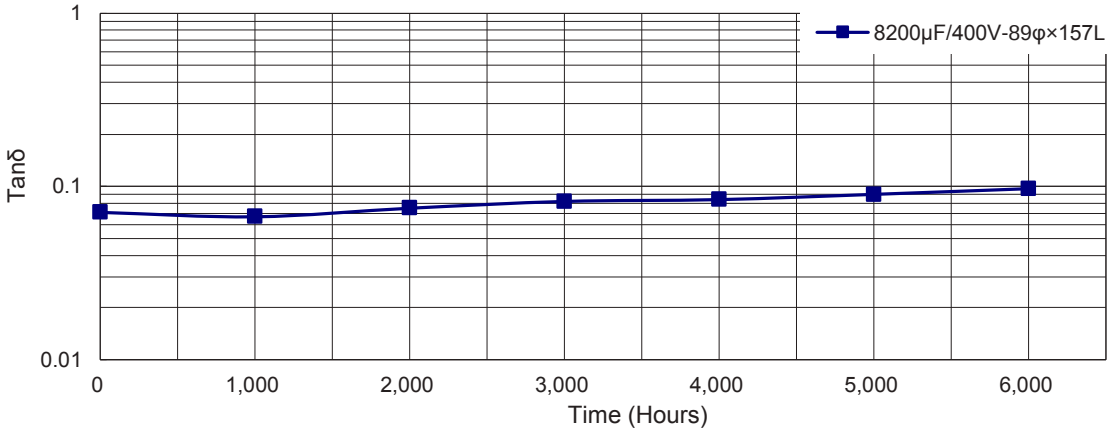
Example:

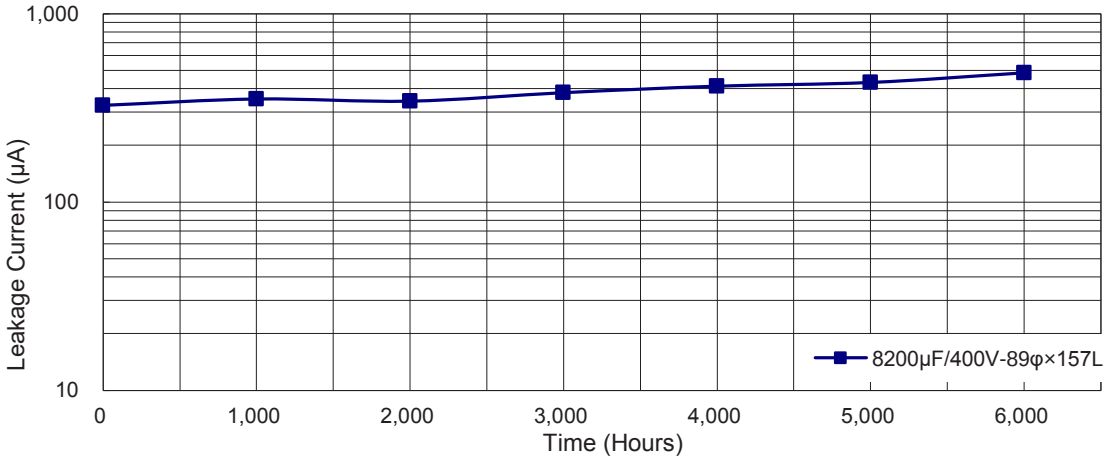
ϕD×L	Code
63.5×115	C115
76.2×130	D130
89 ×157	E157

Note: For more details, please refer to “Part Numbering System (Screw Type)” on page 17.

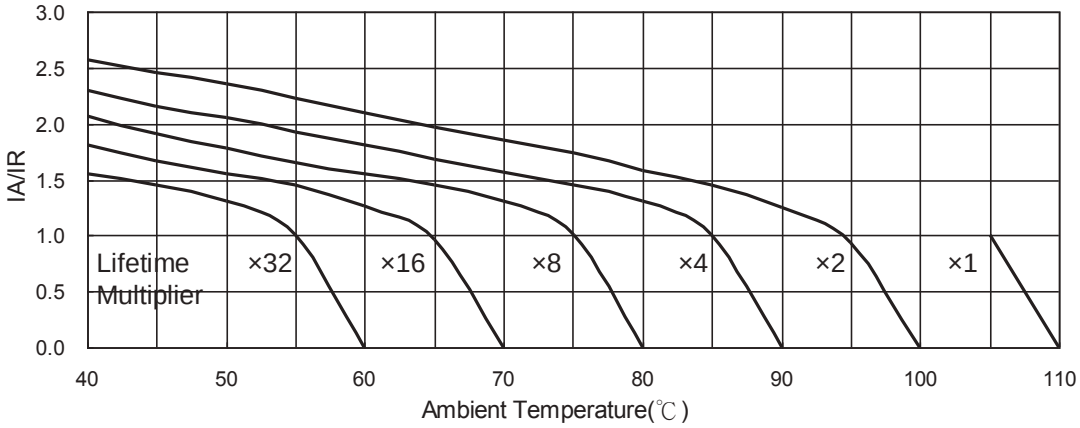
Typical Endurance Curves







Useful Life Chart



IA: Actual ripple current IR: Rated ripple current

MKR Series

Features

- Endurance with ripple current at: 85℃, 5,000 hours
- High speed charge-discharge
- Suitable for high frequency regenerative voltage for AC servomotor, general inverter
- Suitable for equipment used at voltage fluctuating area and rectifier circuit of voltage doubler
- Application of charge-discharge DC voltage for 50 million times
- RoHS compliance

Specifications

Items	Performance
Category Temperature Range	-25℃ ~ +85℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)
Leakage Current (at 20℃)	$I = 3\sqrt{CV}$ or 5 (mA) whichever is smaller (after 5 minutes) Where, C= rated capacitance in μF, V = rated DC Rated Voltage in V.
Tanδ (at 120 Hz, 20℃)	See the Dimensions & Permissible Ripple Current
Low Temperature Characteristics (at 120 Hz)	Capacitance change : C(-25℃) / C(+20℃) ≧ 0.7
Endurance of Charge / Discharge behavior	After an application of charge-discharge voltage for 50 million times, capacitors shall meet the characteristics requirement listed below. Charge discharge voltage (ΔV) = rated voltage × 0.3 Frequency: 3 Hz Temperature: 15 ~ 35℃

Capacitance Change	Within ±20% of initial value
Tanδ	Less than 200% of specified value
Leakage Current	Within specified value
Appearance	There shall be not found to remarkable abnormality on the capacitor

Endurance

Test Time	5,000 hrs
Capacitance Change	Within ±20% of initial value
Tanδ	Less than 200% of specified value
Leakage Current	Within specified value

* The above specifications shall be satisfied when the capacitors are restored to 20℃ after subjected to DC voltage with rated ripple current applied for 5,000 hrs at 85℃.

Shelf Life Test

Test Time	1,000 hrs
Capacitance Change	Within ±20% of initial value
Tanδ	Less than 200% of specified value
Leakage Current	Within specified value

* The above specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hrs at 85 ℃ without voltage applied. The rated voltage shall be applied to the capacitors before the measurements (Refer to JIS C 5101-4 4.1).

Ripple Current and Frequency Multipliers

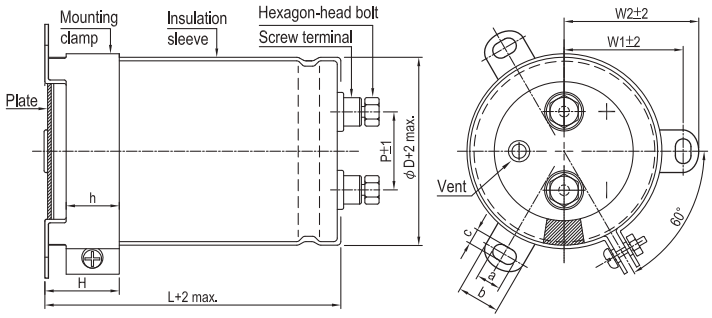
Frequency (Hz)	50 / 60	100 / 120	300	1k	10k up
Multiplier	0.7	1.0	1.1	1.3	1.4

Ripple Current and Temperature Multipliers

Temperature (℃)	40	60	85
Multiplier	1.89	1.67	1.0

Failure percentage Failure rate: When the failure percentage / failure rate is required, please contact with us for further discussion.

Diagram of Dimensions



Unit: mm

ϕD	P	W1	W2	H	h	a	b	c
51	22.0	31.8	36.5	30	24	7	14.0	4.5
63.5	28.6	38.1	42.6	30	24	7	14.0	4.5
76.2	32.0	44.5	49.2	30	24	7	14.0	5.0
89	32.0	50.8	55.6	30	24	7	14.0	5.0

Screw Specifications:
Plug hexagon-head screw: M5×0.8×10
Max. screw tightening torque: 3.23Nm

Dimension and Permissible Ripple Current

Rated Voltage V_{DC}	Capacitance 120 Hz, 20℃ μF	ϕD×L mm	Ripple Current 120 Hz, 85℃ A/rms	Tan δ at 120 Hz, 20℃	ESR 120 Hz, 20℃ mΩ	LC 5 minutes mA	Part Number
350	1,200	51 × 75	5.6	0.15	166	1.94	MKR122M2V--B075
	1,500	51 × 75	6.3	0.15	133	2.17	MKR152M2V--B075
	1,800	51 × 96	7.7	0.15	111	2.38	MKR182M2V--B096
	2,200	51 × 96	8.5	0.15	90.5	2.63	MKR222M2V--B096
	2,700	51 × 130	10.7	0.15	73.7	2.92	MKR272M2V--B130
	3,300	51 × 130	11.9	0.15	60.3	3.22	MKR332M2V--B130
	3,900	63.5 × 115	13.8	0.15	51.0	3.50	MKR392M2V--C115
	4,700	63.5 × 130	15.9	0.15	42.3	3.85	MKR472M2V--C130
	5,600	63.5 × 155	18.6	0.15	35.5	4.20	MKR562M2V--C155
	5,600	76.2 × 115	18.6	0.15	35.5	4.20	MKR562M2V--D115
	6,800	76.2 × 130	21.6	0.15	29.3	4.63	MKR682M2V--D130
	8,200	76.2 × 155	25.7	0.15	24.3	5.00	MKR822M2V--D155
	10,000	89 × 157	28.8	0.15	19.9	5.00	MKR103M2V--E157
	12,000	89 × 157	31.5	0.15	16.6	5.00	MKR123M2V--E157
	15,000	89 × 196	38.9	0.15	13.3	5.00	MKR153M2V--E196
	18,000	89 × 236	45.2	0.15	11.1	5.00	MKR183M2V--E236
400	1,000	51 × 75	5.2	0.15	199	1.90	MKR102M2G--B075
	1,200	51 × 75	5.7	0.15	166	2.08	MKR122M2G--B075
	1,500	51 × 96	7.1	0.15	133	2.32	MKR152M2G--B096
	1,800	51 × 96	7.7	0.15	111	2.55	MKR182M2G--B096
	2,200	51 × 130	9.9	0.15	90.5	2.81	MKR222M2G--B130
	2,700	63.5 × 96	10.7	0.15	73.7	3.12	MKR272M2G--C096
	3,300	63.5 × 115	12.7	0.15	60.3	3.45	MKR332M2G--C115
	3,900	63.5 × 130	14.7	0.15	51.0	3.75	MKR392M2G--C130
	3,900	76.2 × 100	15.3	0.15	51.0	3.75	MKR392M2G--D100
	4,700	63.5 × 155	17.5	0.15	42.3	4.11	MKR472M2G--C155
	4,700	76.2 × 110	18.3	0.15	42.3	4.11	MKR472M2G--D110
	5,600	63.5 × 195	21.1	0.15	35.5	4.49	MKR562M2G--C195
	5,600	76.2 × 130	19.9	0.15	35.5	4.49	MKR562M2G--D130
	6,800	76.2 × 155	23.0	0.15	29.3	4.95	MKR682M2G--D155
	8,200	89 × 157	26.3	0.15	24.3	5.00	MKR822M2G--E157
	10,000	89 × 157	28.8	0.15	19.9	5.00	MKR103M2G--E157
	12,000	89 × 196	34.6	0.15	16.6	5.00	MKR123M2G--E196
	15,000	89 × 236	41.9	0.15	13.3	5.00	MKR153M2G--E236
450	1,000	51 × 75	4.5	0.15	199	2.01	MKR102M2W--B075
	1,200	51 × 96	5.3	0.15	166	2.20	MKR122M2W--B096
	1,500	51 × 115	6.8	0.15	133	2.46	MKR152M2W--B115
	1,800	51 × 130	7.9	0.15	111	2.70	MKR182M2W--B130
	2,200	63.5 × 96	8.4	0.15	90.5	2.98	MKR222M2W--C096
	2,700	63.5 × 115	10.5	0.15	73.7	3.31	MKR272M2W--C115
	3,300	63.5 × 130	12.5	0.15	60.3	3.66	MKR332M2W--C130
	3,900	76.2 × 115	14.3	0.15	51.0	3.97	MKR392M2W--D115
	4,700	63.5 × 195	17.5	0.15	42.3	4.36	MKR472M2W--C195
	4,700	76.2 × 130	16.1	0.15	42.3	4.36	MKR472M2W--D130
	5,600	76.2 × 155	19.2	0.15	35.5	4.76	MKR562M2W--D155
	6,800	89 × 157	23.6	0.15	29.3	5.00	MKR682M2W--E157
	8,200	89 × 157	25.3	0.15	24.3	5.00	MKR822M2W--E157
	10,000	89 × 196	30.2	0.15	19.9	5.00	MKR103M2W--E196
	12,000	89 × 236	35.0	0.15	16.6	5.00	MKR123M2W--E236

Part Numbering System

MKR Series	3300μF	±20%	350V	Plain case + Mounting clamp	M5 Post	51ϕ×130L	Pb-free Terminal + PVC Sleeve
MKR	**332**	**M**	**2V**	**-**	**-**	**B130**	
Series Name	Capacitance	Capacitance tolerance	Rated voltage	Case Type	Terminal type	Case size	Terminal and Sleeve Type

Example:

Cap.	Symbol
1,000	102
3,300	332
10,000	103

M = ±20%
K = ±10%

Example:

Voltage	Symbol
350	2V
400	2G
450	2W

Example:

ϕD×L	Code
63.5×130	C130
76.2×115	D115
89 ×157	E157

Note: For more details, please refer to “Part Numbering System (Screw Type)” on page 17.