

# KZN Series

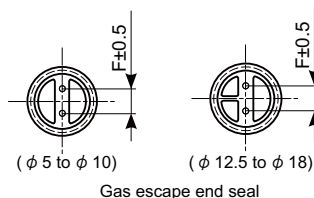
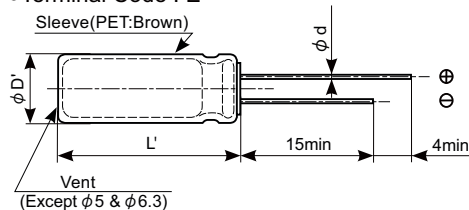
- Adoption of innovative high stability electrolyte
- High ripple current and long endurance
- Rated voltage range : 6.3 to 100V<sub>dc</sub>, Capacitance range : 8.2 to 22,000μF
- Endurance with ripple current : 6,000 to 10,000 hours at 105°C
- Non solvent resistant type
- RoHS Compliant

## ◆ SPECIFICATIONS

Items	Characteristics										
Category	-40 to +105°C										
Temperature Range	-40 to +105°C										
Rated Voltage Range	6.3 to 100V <sub>dc</sub>										
Capacitance Tolerance	±20% (M) (at 20°C, 120Hz)										
Leakage Current	I=0.01CV or 3μA, whichever is greater. Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C after 2 minutes)										
Dissipation Factor (tan δ)	Rated voltage (V <sub>dc</sub> )	6.3V	10V	16V	25V	35V	50V	63V	80V	100V	
	tan δ (Max.)	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.09	0.08	
	When nominal capacitance exceeds 1,000μF, add 0.02 to the value above for each 1,000μF increase. (at 20°C, 120Hz)										
Low Temperature Characteristics	Z(-25°C) / Z(+20°C)	2 max.									
	Z(-40°C) / Z(+20°C)	3 max. (at 120Hz)									
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20°C after subjected to DC voltage with the rated ripple current is applied (the peak voltage shall not exceed the rated voltage) for the specified period of time at 105°C.										
	Time	Case size	φ5, 6.3	φ8×11.5L	φ10×12.5L	φ8×15L, 20L	φ10×16L, 20L, 25L φ12.5 to φ18				
		6.3V <sub>dc</sub>	6,000 hours	8,000 hours	9,000 hours	9,000 hours	10,000 hours				
		10 to 50V <sub>dc</sub>	7,000 hours	9,000 hours	9,000 hours	10,000 hours	10,000 hours				
	63 to 100V <sub>dc</sub>	6,000 hours	8,000 hours	9,000 hours	9,000 hours	9,000 hours	10,000 hours				
	Capacitance change	≤ ±25% of the initial value (6.3, 10V <sub>dc</sub> ≤ ±30%)									
D.F. (tan δ)	≤ 200% of the initial specified value										
Leakage current	≤ The initial specified value										
Shelf Life	The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 500 hours at 105°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4.										
	Capacitance change	≤ ±25% of the initial value (6.3, 10V <sub>dc</sub> ≤ ±30%)									
	D.F. (tan δ)	≤ 200% of the initial specified value									
	Leakage current	≤ The initial specified value									

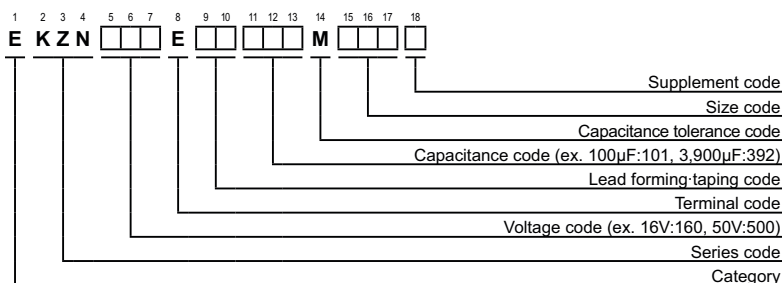
## ◆ DIMENSIONS [mm]

- Terminal Code : E



φ D	5	6.3	8	10	12.5	16	18
φ d	0.5	0.5	0.6	0.6	0.6	0.8	0.8
F	2.0	2.5	3.5	5.0	5.0	7.5	7.5
φ D'	φ D+0.5max.						
L'	L+1.5max.						

## ◆ PART NUMBERING SYSTEM



Specifications in this bulletin are subject to change without notice.

KZN Series

◆ STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φ D×L(mm)	Impedance (Ωmax/100kHz)		Rated ripple current (mA rms/105°C 100kHz)	Part No.	WV (Vdc)	Cap (μF)	Case size φ D×L(mm)	Impedance (Ωmax/100kHz)		Rated ripple current (mA rms/105°C 100kHz)	Part No.	
			20°C	-10°C						20°C	-10°C			
6.3	220	5×11	0.38	1.2	345	EKZN6R3E□□221ME11D	16	6,800	16×31.5	0.016	0.048	4,100	EKZN160E□□682MLN3S	
	470	6.3×11	0.17	0.51	540	EKZN6R3E□□471MF11D		6,800	18×25	0.016	0.048	3,880	EKZN160E□□682MM25S	
	820	8×11.5	0.075	0.23	945	EKZN6R3E□□821MHB5D		8,200	16×35.5	0.014	0.042	4,280	EKZN160E□□822MLP1S	
	1,200	8×15	0.059	0.18	1,250	EKZN6R3E□□122MH15D		8,200	18×31.5	0.014	0.042	4,190	EKZN160E□□822MMN3S	
	1,200	10×12.5	0.053	0.16	1,330	EKZN6R3E□□122MJC5S		10,000	16×40	0.013	0.039	4,580	EKZN160E□□103ML40S	
	1,500	8×20	0.041	0.13	1,500	EKZN6R3E□□152MH20D		10,000	18×35.5	0.012	0.036	4,380	EKZN160E□□103MMP1S	
	1,800	10×16	0.038	0.12	1,760	EKZN6R3E□□182MJ16S		12,000	18×40	0.011	0.033	4,960	EKZN160E□□123MM40S	
	2,700	10×20	0.028	0.084	1,960	EKZN6R3E□□272MJ20S		25	68	5×11	0.38	1.2	450	EKZN250E□□680ME11D
	2,700	12.5×16	0.035	0.11	1,900	EKZN6R3E□□272MK16S			150	6.3×11	0.17	0.51	700	EKZN250E□□151MF11D
	3,300	10×25	0.026	0.072	2,250	EKZN6R3E□□332MJ25S			270	8×11.5	0.075	0.23	1,200	EKZN250E□□271MHB5D
	3,900	12.5×20	0.025	0.075	2,480	EKZN6R3E□□392MK20S			470	8×15	0.059	0.18	1,600	EKZN250E□□471MH15D
	5,600	12.5×25	0.019	0.057	2,900	EKZN6R3E□□562MK25S			470	10×12.5	0.053	0.16	1,700	EKZN250E□□471MJC5S
	6,800	12.5×30	0.018	0.054	3,450	EKZN6R3E□□682MK30S			560	8×20	0.041	0.13	1,960	EKZN250E□□561MH20D
	6,800	16×20	0.021	0.063	3,250	EKZN6R3E□□682ML20S			680	10×16	0.038	0.12	2,000	EKZN250E□□681MJ16S
	8,200	12.5×35	0.016	0.048	3,570	EKZN6R3E□□822MK35S			820	10×20	0.028	0.084	2,500	EKZN250E□□821MJ20S
	8,200	18×20	0.020	0.060	3,450	EKZN6R3E□□822MM20S			1,000	12.5×16	0.035	0.11	2,400	EKZN250E□□102MK16S
	10,000	16×25	0.017	0.051	3,630	EKZN6R3E□□103ML25S			1,200	10×25	0.026	0.072	2,900	EKZN250E□□122MJ25S
	12,000	16×31.5	0.016	0.048	4,100	EKZN6R3E□□123MLN3S			1,500	12.5×20	0.025	0.075	2,600	EKZN250E□□123MK20S
	12,000	18×25	0.016	0.048	3,880	EKZN6R3E□□123MM25S			1,800	12.5×25	0.019	0.057	3,200	EKZN250E□□182MK25S
	15,000	16×35.5	0.014	0.042	4,280	EKZN6R3E□□153MLP1S			2,200	12.5×30	0.018	0.054	3,660	EKZN250E□□222MK30S
	15,000	18×31.5	0.014	0.042	4,190	EKZN6R3E□□153MMN3S			2,200	16×20	0.021	0.063	3,330	EKZN250E□□222ML20S
	18,000	16×40	0.013	0.039	4,580	EKZN6R3E□□183ML40S			2,700	12.5×35	0.016	0.048	4,120	EKZN250E□□272MK35S
18,000	18×35.5	0.012	0.036	4,380	EKZN6R3E□□183MMP1S	3,300	16×25		0.017	0.051	3,810	EKZN250E□□332ML25S		
22,000	18×40	0.011	0.033	4,960	EKZN6R3E□□223MM40S	3,300	18×20		0.020	0.060	3,450	EKZN250E□□332MM20S		
10	150	5×11	0.38	1.2	450	EKZN100E□□151ME11D	4,700		16×31.5	0.016	0.048	4,100	EKZN250E□□472MLN3S	
	330	6.3×11	0.17	0.51	700	EKZN100E□□331MF11D	4,700		18×25	0.016	0.048	3,880	EKZN250E□□472MM25S	
	560	8×11.5	0.075	0.23	1,200	EKZN100E□□561MHB5D	5,600		16×35.5	0.014	0.042	4,280	EKZN250E□□562MLP1S	
	820	8×15	0.059	0.18	1,600	EKZN100E□□821MH15D	5,600		18×31.5	0.014	0.042	4,190	EKZN250E□□562MMN3S	
	1,000	8×20	0.041	0.13	1,960	EKZN100E□□102MH20D	6,800		16×40	0.013	0.039	4,580	EKZN250E□□682ML40S	
	1,000	10×12.5	0.053	0.16	1,700	EKZN100E□□102MJC5S	6,800	18×35.5	0.012	0.036	4,380	EKZN250E□□682MMP1S		
	1,200	10×16	0.038	0.12	2,000	EKZN100E□□122MJ16S	8,200	18×40	0.011	0.033	4,960	EKZN250E□□822MM40S		
	1,800	10×20	0.028	0.084	2,500	EKZN100E□□182MJ20S	35	47	5×11	0.38	1.2	450	EKZN350E□□470ME11D	
	1,800	12.5×16	0.035	0.11	2,400	EKZN100E□□182MK16S		100	6.3×11	0.17	0.51	700	EKZN350E□□101MF11D	
	2,200	10×25	0.026	0.072	2,900	EKZN100E□□222MJ25S		180	8×11.5	0.075	0.23	1,200	EKZN350E□□181MHB5D	
	2,700	12.5×20	0.025	0.075	2,600	EKZN100E□□272MK20S		220	8×15	0.059	0.18	1,600	EKZN350E□□221MH15D	
	3,900	12.5×25	0.019	0.057	3,200	EKZN100E□□392MK25S		270	10×12.5	0.053	0.16	1,700	EKZN350E□□271MJC5S	
	4,700	12.5×30	0.018	0.054	3,660	EKZN100E□□472MK30S		330	8×20	0.041	0.13	1,960	EKZN350E□□331MH20D	
	4,700	16×20	0.021	0.063	3,330	EKZN100E□□472ML20S		390	10×16	0.038	0.12	2,000	EKZN350E□□391MJ16S	
	5,600	12.5×35	0.016	0.048	4,120	EKZN100E□□562MK35S		470	10×20	0.028	0.084	2,500	EKZN350E□□471MJ20S	
	5,600	18×20	0.020	0.060	3,450	EKZN100E□□562MM20S		560	12.5×16	0.035	0.11	2,400	EKZN350E□□561MK16S	
	6,800	16×25	0.017	0.051	3,810	EKZN100E□□682ML25S		680	10×25	0.026	0.072	2,900	EKZN350E□□681MJ25S	
	8,200	16×31.5	0.016	0.048	4,100	EKZN100E□□822MLN3S		820	12.5×20	0.025	0.075	2,600	EKZN350E□□821MK20S	
	8,200	18×25	0.016	0.048	3,880	EKZN100E□□822MM25S		1,200	12.5×25	0.019	0.057	3,200	EKZN350E□□122MK25S	
	10,000	16×35.5	0.014	0.042	4,280	EKZN100E□□103MLP1S		1,500	12.5×30	0.018	0.054	3,660	EKZN350E□□152MK30S	
	10,000	18×31.5	0.014	0.042	4,190	EKZN100E□□103MMN3S		1,500	16×20	0.021	0.063	3,330	EKZN350E□□152ML20S	
	12,000	16×40	0.013	0.039	4,580	EKZN100E□□123ML40S		1,800	12.5×35	0.016	0.048	4,120	EKZN350E□□182MK35S	
12,000	18×35.5	0.012	0.036	4,380	EKZN100E□□123MMP1S	1,800		16×25	0.017	0.051	3,810	EKZN350E□□182ML25S		
15,000	18×40	0.011	0.033	4,960	EKZN100E□□153MM40S	1,800		18×20	0.020	0.060	3,450	EKZN350E□□182MM20S		
16	120	5×11	0.38	1.2	450	EKZN160E□□121ME11D		2,700	16×31.5	0.016	0.048	4,100	EKZN350E□□272MLN3S	
	270	6.3×11	0.17	0.51	700	EKZN160E□□271MF11D		2,700	18×25	0.016	0.048	3,880	EKZN350E□□272MM25S	
	470	8×11.5	0.075	0.23	1,200	EKZN160E□□471MHB5D		3,300	16×35.5	0.014	0.042	4,280	EKZN350E□□332MLP1S	
	680	8×15	0.059	0.18	1,600	EKZN160E□□681MH15D		3,300	18×31.5	0.014	0.042	4,190	EKZN350E□□332MMN3S	
	680	10×12.5	0.053	0.16	1,700	EKZN160E□□681MJC5S		3,900	16×40	0.013	0.039	4,580	EKZN350E□□392ML40S	
	820	8×20	0.041	0.13	1,960	EKZN160E□□821MH20D	3,900	18×35.5	0.012	0.036	4,380	EKZN350E□□392MMP1S		
	1,000	10×16	0.038	0.12	2,000	EKZN160E□□102MJ16S	4,700	18×40	0.011	0.033	4,960	EKZN350E□□472MM40S		
	1,500	10×20	0.028	0.084	2,500	EKZN160E□□152MJ20S	50	27	5×11	0.4	1.3	450	EKZN500E□□270ME11D	
	1,500	12.5×16	0.035	0.11	2,400	EKZN160E□□152MK16S		56	6.3×11	0.18	0.54	700	EKZN500E□□560MF11D	
	1,800	10×25	0.026	0.072	2,900	EKZN160E□□182MJ25S		100	8×11.5	0.085	0.26	1,200	EKZN500E□□101MHB5D	
	2,200	12.5×20	0.025	0.075	2,600	EKZN160E□□222MK20S		120	8×15	0.065	0.20	1,600	EKZN500E□□121MH15D	
	2,700	12.5×25	0.019	0.057	3,200	EKZN160E□□272MK25S		150	10×12.5	0.073	0.22	1,280	EKZN500E□□151MJC5S	
	3,300	12.5×30	0.018	0.054	3,660	EKZN160E□□332MK30S		180	8×20	0.049	0.16	1,960	EKZN500E□□181MH20D	
	3,900	12.5×35	0.016	0.048	4,120	EKZN160E□□392MK35S		220	10×16	0.053	0.16	1,650	EKZN500E□□221MJ16S	
	3,900	16×20	0.021	0.063	3,330	EKZN160E□□392ML20S		330	10×20	0.038	0.12	2,060	EKZN500E□□331MJ20S	
	4,700	18×20	0.020	0.060	3,450	EKZN160E□□472MM20S		330	12.5×16	0.045	0.14	2,160	EKZN500E□□331MK16S	
	5,600	16×25	0.017	0.051	3,810	EKZN160E□□562ML25S		390	10×25	0.032	0.10	2,420	EKZN500E□□391MJ25S	

□□ :Enter the appropriate lead forming or taping code.

Specifications in this bulletin are subject to change without notice.

KZN Series

◆ STANDARD RATINGS

VV (Vdc)	Cap (μF)	Case size φ D×L(mm)	Impedance (Ωmax/100kHz)		Rated ripple current (mA <sub>rms</sub> /105°C/100kHz)	Part No.	VV (Vdc)	Cap (μF)	Case size φ D×L(mm)	Impedance (Ωmax/100kHz)		Rated ripple current (mA <sub>rms</sub> /105°C/100kHz)	Part No.	
			20°C	-10°C						20°C	-10°C			
50	470	12.5×20	0.032	0.10	2,300	EKZN500E□□471MK20S	80	82	10×12.5	0.14	0.56	780	EKZN800E□□820MJC5S	
	680	12.5×25	0.025	0.080	2,800	EKZN500E□□681MK25S		120	10×16	0.090	0.36	1,040	EKZN800E□□121MJ16S	
	820	12.5×30	0.023	0.074	3,370	EKZN500E□□821MK30S		180	10×20	0.068	0.28	1,430	EKZN800E□□181MJ20S	
	820	16×20	0.026	0.084	3,070	EKZN500E□□821ML20S		180	12.5×16	0.090	0.27	1,430	EKZN800E□□181MK16S	
	1,000	12.5×35	0.021	0.067	3,810	EKZN500E□□102MK35S		220	10×25	0.055	0.22	1,620	EKZN800E□□221MJ25S	
	1,200	16×25	0.022	0.070	3,510	EKZN500E□□122MLP1S		270	12.5×20	0.048	0.15	1,750	EKZN800E□□271MK20S	
	1,200	18×20	0.025	0.075	3,120	EKZN500E□□122MM20S		390	12.5×25	0.038	0.12	2,210	EKZN800E□□391MK25S	
	1,500	16×31.5	0.019	0.057	4,030	EKZN500E□□152MLN3S		470	12.5×30	0.033	0.11	2,400	EKZN800E□□471MK30S	
	1,500	18×25	0.021	0.063	3,530	EKZN500E□□152MM25S		470	16×20	0.036	0.12	1,950	EKZN800E□□471ML20S	
	1,800	16×35.5	0.016	0.048	4,220	EKZN500E□□182MLP1S		560	12.5×35	0.026	0.078	2,600	EKZN800E□□561MK35S	
	2,200	16×40	0.014	0.042	4,500	EKZN500E□□222ML40S		680	16×25	0.028	0.084	2,430	EKZN800E□□681ML25S	
	2,200	18×31.5	0.016	0.048	4,080	EKZN500E□□222MMN3S		680	18×20	0.032	0.096	2,270	EKZN800E□□681MM20S	
	2,700	18×35.5	0.013	0.039	4,270	EKZN500E□□272MMP1S		820	16×31.5	0.022	0.066	2,640	EKZN800E□□821MLN3S	
	3,300	18×40	0.012	0.036	4,850	EKZN500E□□332MM40S		820	18×25	0.027	0.081	2,500	EKZN800E□□821MM25S	
	63	18	5×11	0.52	2.3	240		EKZN630E□□180ME11D	1,000	16×35.5	0.020	0.060	2,860	EKZN800E□□102MLP1S
		39	6.3×11	0.24	1.1	420		EKZN630E□□390MF11D	1,200	16×40	0.018	0.054	3,510	EKZN800E□□122ML40S
68		8×11.5	0.15	0.68	720	EKZN630E□□680MHB5D	1,200	18×31.5	0.020	0.060	2,860	EKZN800E□□122MMN3S		
100		8×15	0.1	0.45	990	EKZN630E□□101MH15D	1,500	18×35.5	0.018	0.054	3,510	EKZN800E□□152MMP1S		
120		8×20	0.077	0.35	1,200	EKZN630E□□121MH20D	1,800	18×40	0.017	0.051	3,860	EKZN800E□□182MM40S		
120		10×12.5	0.090	0.36	990	EKZN630E□□121MJC5S	100	8.2	5×11	0.72	3.2	220	EKZN101E□□8R2ME11D	
180		10×16	0.061	0.25	1,200	EKZN630E□□181MJ16S		18	6.3×11	0.34	1.5	370	EKZN101E□□180MF11D	
270		10×20	0.045	0.18	1,570	EKZN630E□□271MJ20S		33	8×11.5	0.2	0.9	620	EKZN101E□□330MHB5D	
270		12.5×16	0.058	0.18	1,570	EKZN630E□□271MK16S		47	8×15	0.14	0.63	780	EKZN101E□□470MH15D	
330		10×25	0.037	0.12	1,990	EKZN630E□□331MJ25S		56	8×20	0.12	0.54	1,040	EKZN101E□□560MH20D	
390		12.5×20	0.033	0.10	1,990	EKZN630E□□391MK20S		56	10×12.5	0.14	0.56	780	EKZN101E□□560MJC5S	
560		12.5×25	0.026	0.080	2,460	EKZN630E□□561MK25S		82	10×16	0.090	0.36	1,040	EKZN101E□□820MJ16S	
680		12.5×30	0.024	0.075	2,760	EKZN630E□□681MK30S		100	10×20	0.068	0.28	1,430	EKZN101E□□101MJ20S	
680		16×20	0.027	0.085	2,380	EKZN630E□□681ML20S		120	12.5×16	0.090	0.27	1,430	EKZN101E□□121MK16S	
820		12.5×35	0.022	0.068	3,040	EKZN630E□□821MK35S		150	10×25	0.055	0.22	1,620	EKZN101E□□151MJ25S	
820		18×20	0.026	0.078	2,530	EKZN630E□□821MM20S		180	12.5×20	0.048	0.15	1,750	EKZN101E□□181MK20S	
1,000	16×25	0.024	0.072	2,890	EKZN630E□□102ML25S	220		12.5×25	0.038	0.12	2,210	EKZN101E□□221MK25S		
1,200	16×31.5	0.020	0.060	3,280	EKZN630E□□122MLN3S	270		12.5×30	0.033	0.11	2,400	EKZN101E□□271MK30S		
1,200	18×25	0.022	0.066	2,930	EKZN630E□□122MM25S	270		16×20	0.036	0.12	1,950	EKZN101E□□271ML20S		
1,500	16×35.5	0.018	0.054	3,440	EKZN630E□□152MLP1S	390		12.5×35	0.026	0.078	2,600	EKZN101E□□391MK35S		
1,500	18×31.5	0.018	0.054	3,380	EKZN630E□□152MMN3S	390		16×25	0.028	0.084	2,430	EKZN101E□□391ML25S		
1,800	16×40	0.016	0.048	3,690	EKZN630E□□182ML40S	390	18×20	0.032	0.096	2,270	EKZN101E□□391MM20S			
1,800	18×35.5	0.017	0.051	3,550	EKZN630E□□182MMP1S	470	16×31.5	0.022	0.066	2,640	EKZN101E□□471MLN3S			
2,200	18×40	0.015	0.045	3,930	EKZN630E□□222MM40S	560	16×35.5	0.020	0.060	2,860	EKZN101E□□561MLP1S			
80	12	5×11	0.72	3.2	220	EKZN800E□□120ME11D	560	18×25	0.027	0.081	2,500	EKZN101E□□561MM25S		
	27	6.3×11	0.34	1.5	370	EKZN800E□□270MF11D	680	16×40	0.018	0.054	3,510	EKZN101E□□681ML40S		
	47	8×11.5	0.2	0.9	620	EKZN800E□□470MHB5D	680	18×31.5	0.020	0.060	2,860	EKZN101E□□681MMN3S		
	68	8×15	0.14	0.63	780	EKZN800E□□680MH15D	820	18×35.5	0.018	0.054	3,510	EKZN101E□□821MMP1S		
	82	8×20	0.12	0.54	1,040	EKZN800E□□820MH20D	1,000	18×40	0.017	0.051	3,860	EKZN101E□□102MM40S		

□□ : Enter the appropriate lead forming or taping code.

◆ RATED RIPPLE CURRENT MULTIPLIERS

• Frequency Multipliers

Capacitance (μF)	Frequency (Hz)			
	120	1k	10k	100k
8.2 to 180	0.40	0.75	0.90	1.00
220 to 560	0.50	0.85	0.94	1.00
680 to 1,800	0.60	0.87	0.95	1.00
2,200 to 3,900	0.75	0.90	0.95	1.00
4,700 to 22,000	0.85	0.95	0.98	1.00

The endurance of capacitors is reduced with internal heating produced by ripple current at the rate of halving the lifetime with every 5°C rise. When long life performance is required in actual use, the rms ripple current has to be reduced.

Specifications in this bulletin are subject to change without notice.