

# PC123/PC123F

\* DIN-VDE0884 approved type (PC123Y/PC123FY) is also available as an option.

## ■ Features

1. Conform to European Safety Standard
2. Internal isolation distance: 0.4mm or more
3. High collector-emitter voltage ( $V_{CEO}$ : 70V)
4. Long creepage distance type
5. Recognized by UL (No. E64380)

Approved by VDE (DIN-VDE83601)

Approved by BSI

(BS415 No. 7087, BS7002 No. 7409)

Approved by SEMCO (No. 9216212)

Approved by DEMCO (No. 108954)

Approved by EI (No. 155030)

Recognized by CSA (No. CA95323)

## ■ Model Line-up

Model No.	*Creepage distance	*Clearance distance
PC123	6.4mm or more	6.4mm or more
PC123F	8mm or more	8mm or more

\* Between input and output

## ■ Applications

1. Power supplies
2. OA equipment

## ■ Absolute Maximum Ratings

( $T_a=25^\circ\text{C}$ )

	Parameter	Symbol	Rating	Unit
Input	Forward current	$I_F$	50	mA
	*1 Peak forward current	$I_{FM}$	1	A
	Reverse voltage	$V_R$	6	V
	Power dissipation	$P$	70	mW
Output	Collector-emitter voltage	$V_{CEO}$	70	V
	Emitter-collector voltage	$V_{ECO}$	6	V
	Collector current	$I_C$	50	mA
	Collector power dissipation	$P_C$	150	mW
	Total power dissipation	$P_{tot}$	200	mW
*2	Isolation voltage	$V_{iso}$ (rms)	5	kV
	Operating temperature	$T_{opr}$	-30 to +100	$^\circ\text{C}$
	Storage temperature	$T_{stg}$	-55 to +125	$^\circ\text{C}$
*3	Soldering temperature	$T_{sol}$	260	$^\circ\text{C}$

\*1 Pulse width  $\leq 100\mu\text{s}$ , Duty ratio: 0.001

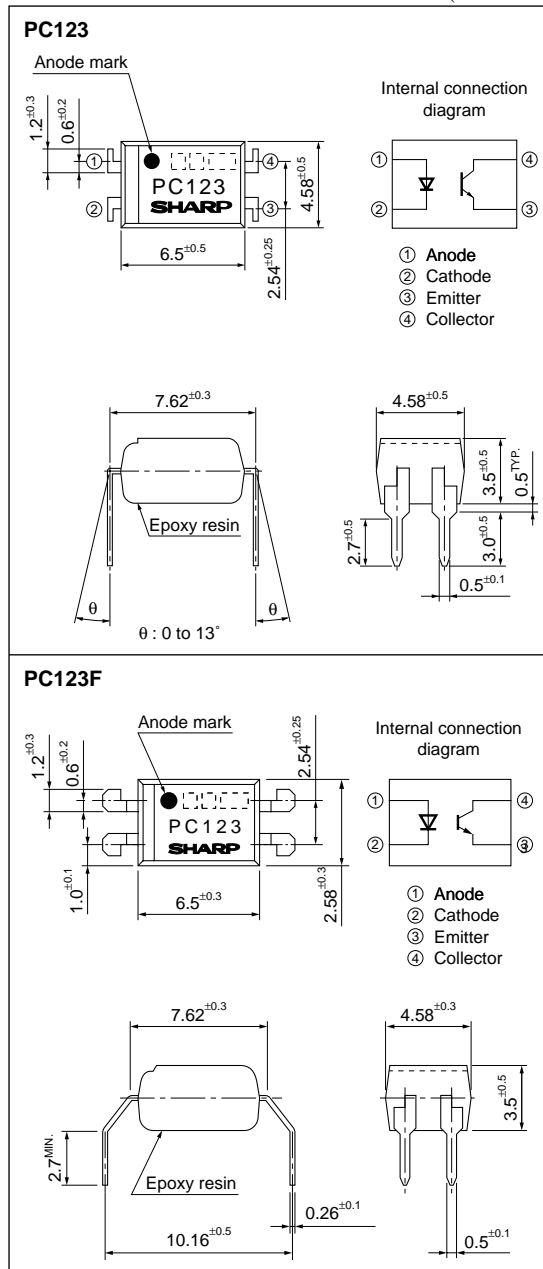
\*2 40 to 60% RH, AC for 1 minute

\*3 For 10s

## European Safety Standard Approved Type Long Creepage Distance Photocoupler

### ■ Outline Dimensions

(Unit : mm)



## ■ Electro-optical Characteristics

(T<sub>a</sub>=25°C)

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit	
Input	Forward voltage	V <sub>F</sub>	I <sub>F</sub> =20mA	—	1.2	1.4	V	
	Reverse current	I <sub>R</sub>	V <sub>R</sub> =4V	—	—	10	μA	
	Terminal capacitance	C <sub>t</sub>	V=0, f=1kHz	—	30	250	pF	
Output	Collector dark current	I <sub>CEO</sub>	V <sub>CE</sub> =50V, I <sub>F</sub> =0	—	—	100	nA	
	Collector-emitter breakdown voltage	BV <sub>CEO</sub>	I <sub>C</sub> =0.1mA, I <sub>F</sub> =0	70	—	—	V	
	Emitter-collector breakdown voltage	BV <sub>ECO</sub>	I <sub>E</sub> =10μA, I <sub>F</sub> =0	6	—	—	V	
Transfer characteristics	Collector current	I <sub>C</sub>	I <sub>F</sub> =5mA, V <sub>CE</sub> =5V	2.5	—	20	mA	
	Collector-emitter saturation voltage	V <sub>CE(sat)</sub>	I <sub>F</sub> =20mA, I <sub>C</sub> =1mA	—	0.1	0.2	V	
	Isolation resistance	R <sub>ISO</sub>	DC500V, 40 to 60%RH	5×10 <sup>10</sup>	10 <sup>11</sup>	—	Ω	
	Floating capacitance	C <sub>f</sub>	V=0, f=1MHz	—	0.6	1.0	pF	
	Cut-off frequency	f <sub>c</sub>	V <sub>CE</sub> =5V, I <sub>C</sub> =2mA, R <sub>L</sub> =100Ω, -3dB	—	80	—	kHz	
	Response time	Rise time	t <sub>r</sub>	V <sub>CE</sub> =2V, I <sub>C</sub> =2mA, R <sub>L</sub> =100Ω	—	4	18	μs
		Fall time	t <sub>f</sub>		—	3	18	μs

## ■ Rank Table

(I<sub>F</sub>=5mA, V<sub>CE</sub>=5V, T<sub>a</sub>=25°C)

Model No.	Rank mark	I <sub>C</sub> (mA)
PC123 / PC123Y / PC123F / PC123FY	A, B, S or no mark	2.5 to 20.0
PC123A / PC123Y1 / PC123F1 / PC123FY1	A	2.5 to 7.5
PC123B / PC123Y2 / PC123F2 / PC123FY2	B	5.0 to 12.5
PC123C / PC123Y5 / PC123F5 / PC123FY5	no mark	10.0 to 20.0
PC123S / PC123YS / PC123FS / PC123FY8	S	5.0 to 10.0

Fig.1 Forward Current vs. Ambient Temperature

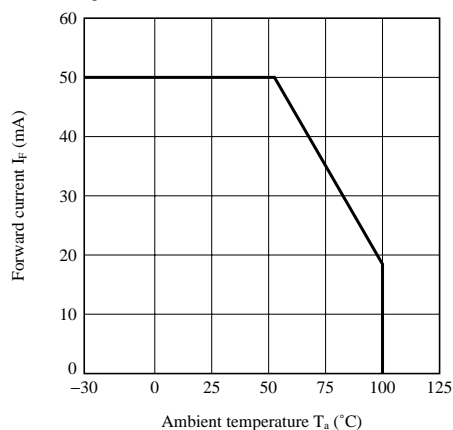
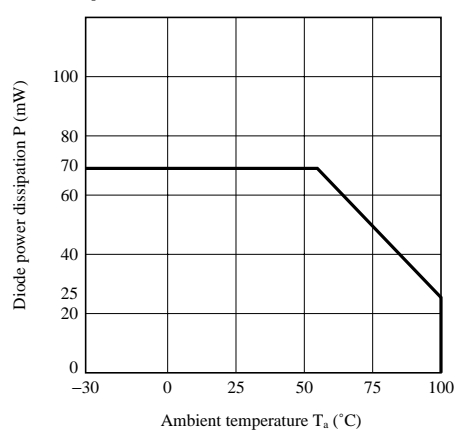
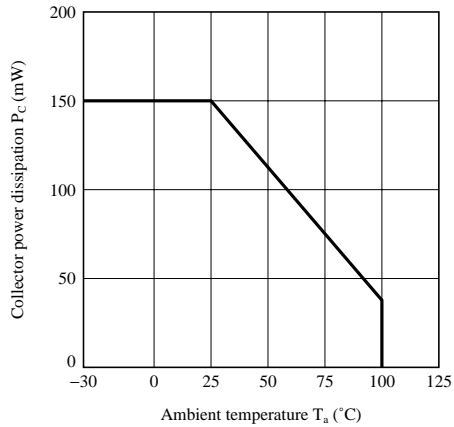


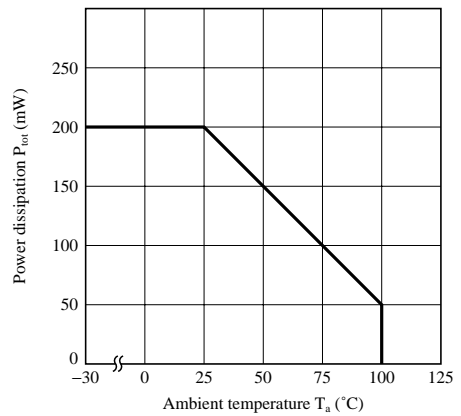
Fig.2 Diode Power Dissipation vs. Ambient Temperature



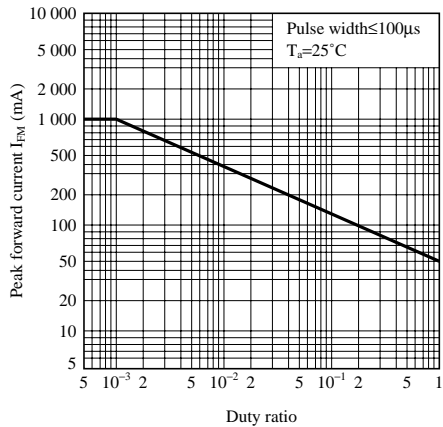
**Fig.3 Collector Power Dissipation vs. Ambient Temperature**



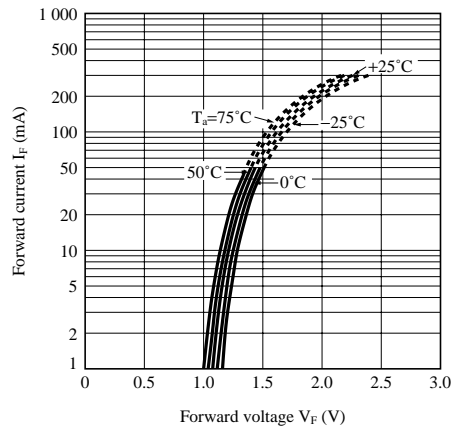
**Fig.4 Power Dissipation vs. Ambient Temperature**



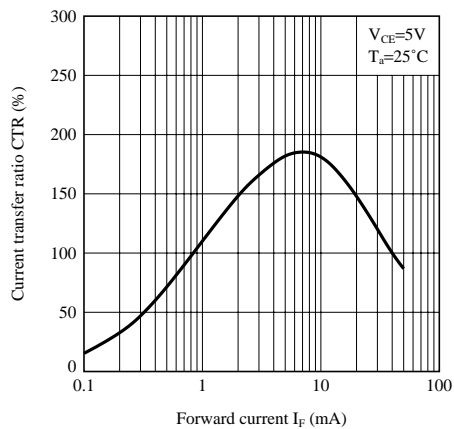
**Fig.5 Peak Forward Current vs. Duty Ratio**



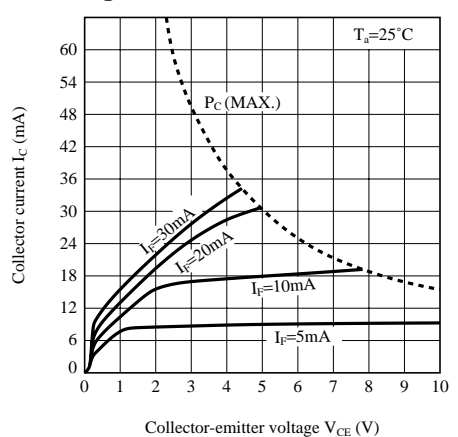
**Fig.6 Forward Current vs. Forward Voltage**



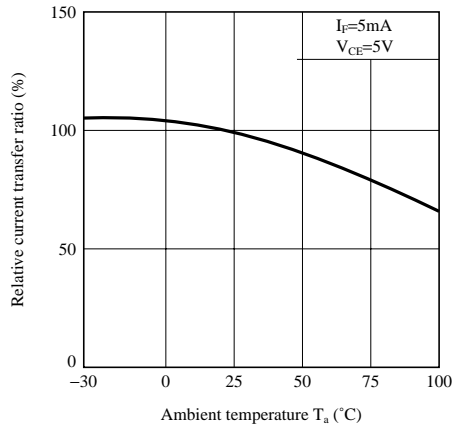
**Fig.7 Current Transfer Ratio vs. Forward Current**



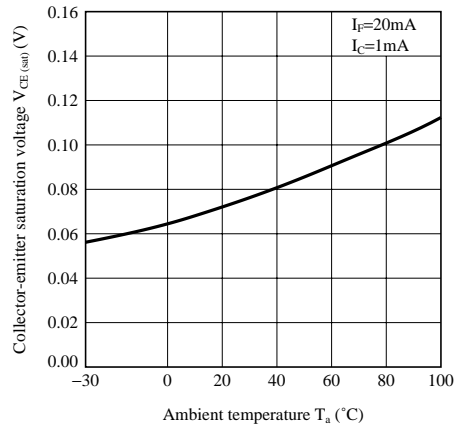
**Fig.8 Collector Current vs. Collector-emitter Voltage**



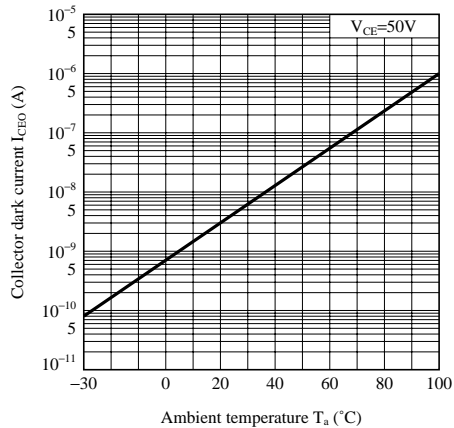
**Fig.9 Relative Current Transfer Ratio vs. Ambient Temperature**



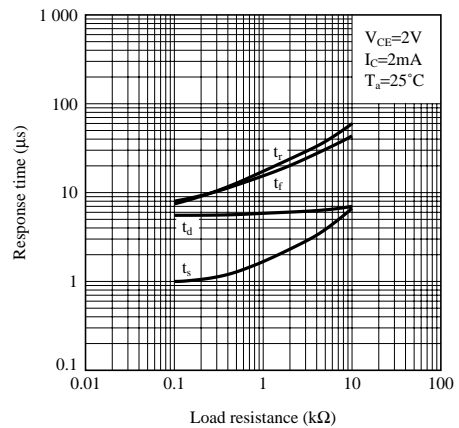
**Fig.10 Collector-emitter Saturation Voltage vs. Ambient Temperature**



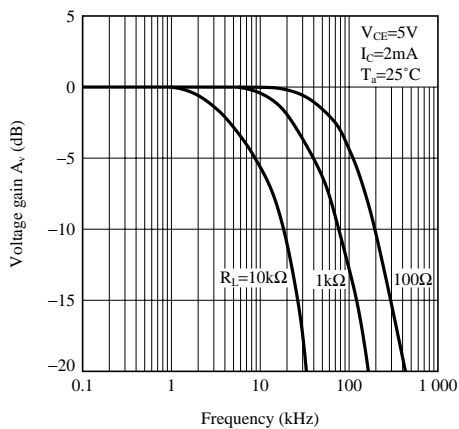
**Fig.11 Collector Dark Current vs. Ambient Temperature**



**Fig.12 Response Time vs. Load Resistance**



**Fig.13 Frequency Response**



**Fig.14 Collector-emitter Saturation Voltage vs. Forward Current**

