

# PC123/PC123F

## European Safety Standard Approved Type Long Creepage Distance Photocoupler

\* 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 NEMKO (No. 199438181)

Approved by EI (No. 155030)

Recognized by CSA (No. CA95323)

	Creepage distance	Space distance
<b>PC123</b>	6.4mm or more	6.4mm or more
<b>PC123F</b>	8mm or more	8mm or more

### ■ Applications

1. Power supplies
2. OA equipment

### ■ Absolute Maximum Ratings (Ta = 25°C)

	Parameter	Symbol	Ratings	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	$V_{iso}$	5	kV <sub>rms</sub>
	Operating temperature	$T_{opr}$	- 30 to + 100	°C
	Storage temperature	$T_{stg}$	- 55 to + 125	°C
	*3 Soldering temperature	$T_{sol}$	260	°C

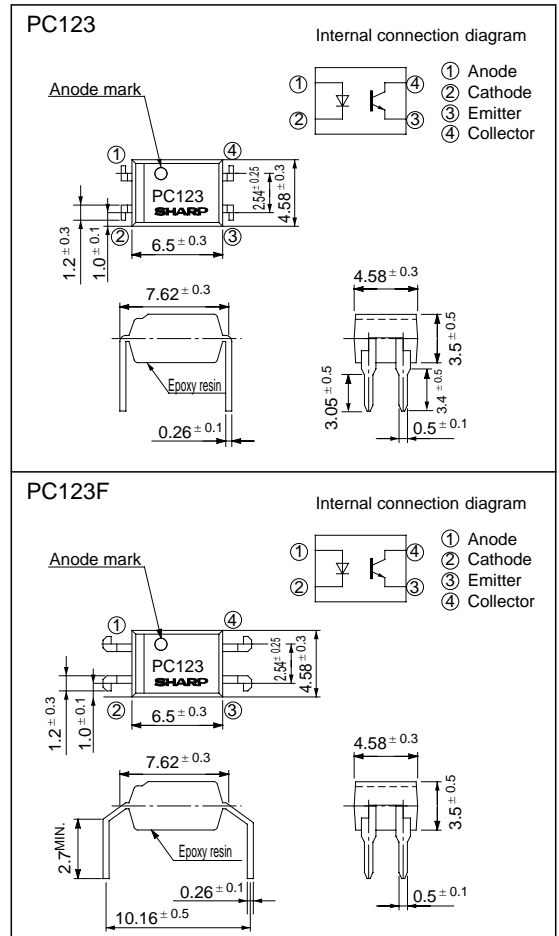
\*1 Pulse width  $\leq 100 \mu s$ , Duty ratio : 0.001

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

\*3 For 10 seconds

### ■ Outline Dimensions

(Unit : mm)

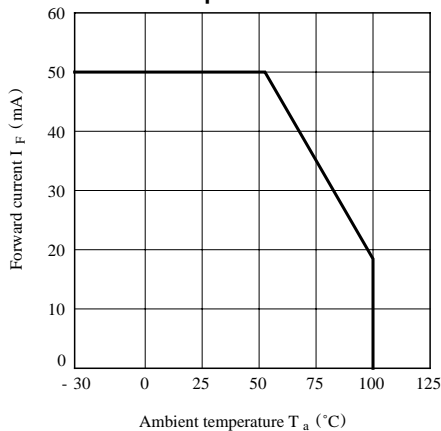


## Electro-optical Characteristics

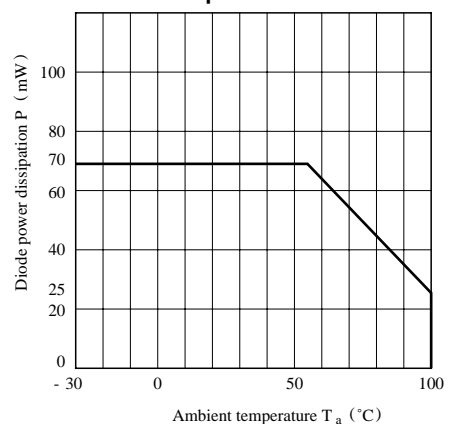
(T<sub>a</sub> = 25°C)

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> = 10 μA, 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
				-	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

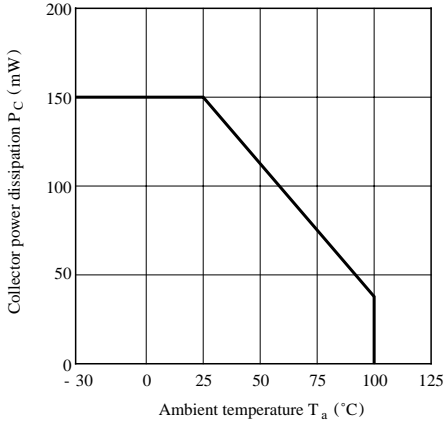
**Fig. 1 Forward Current vs. Ambient Temperature**



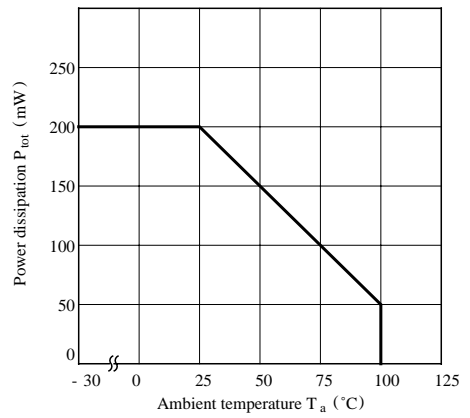
**Fig. 2 Diode Power Dissipation vs. Ambient Temperature**



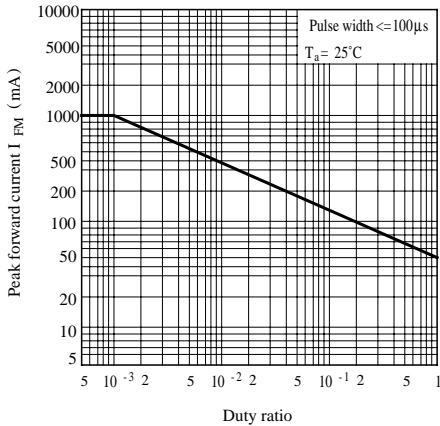
**Fig. 3 Collector Power Dissipation vs. Ambient Temperature**



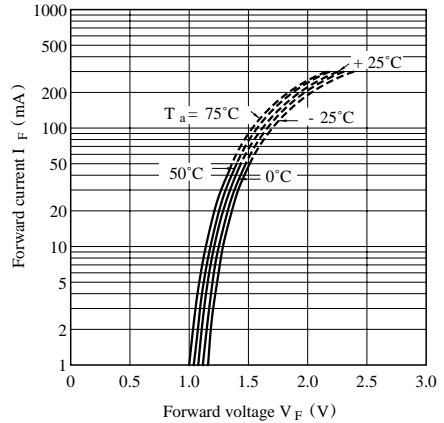
**Fig. 4 Power Dissipation vs. Ambient Temperature**



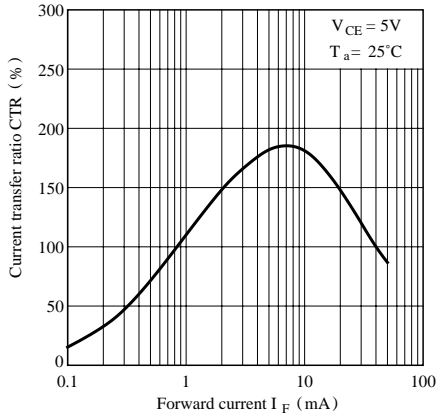
**Fig. 5 Peak Forward Current vs. Duty Ratio**



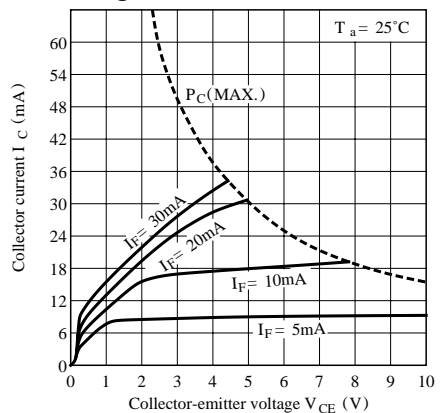
**Fig. 6 Forward Current vs. Forward Voltage**



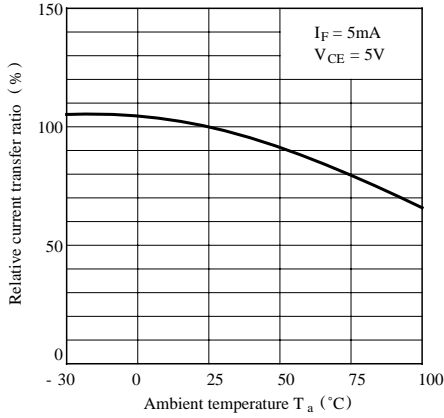
**Fig. 7 Current Transfer Ratio vs. Forward Current**



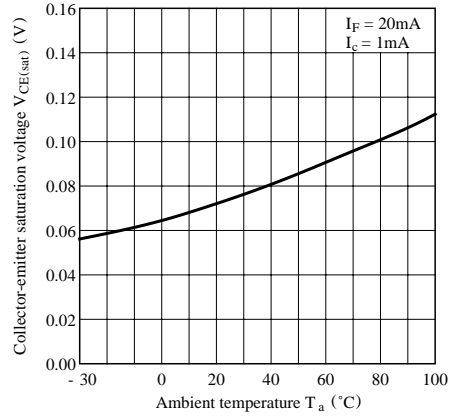
**Fig. 8 Collector Current vs. Collector-emitter Voltage**



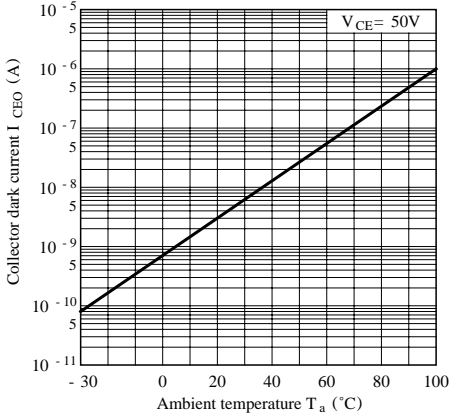
**Fig. 9 Relative Current Transfer Ratio vs. Ambient Temperature**



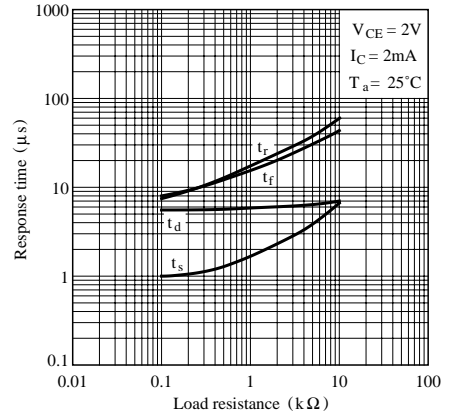
**Fig.10 Collector-emitter Saturation Voltage vs. Ambient temperature**



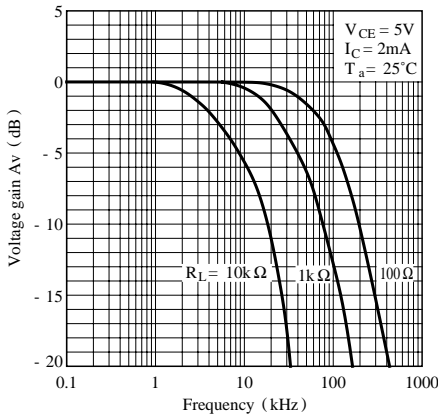
**Fig.11 Collector Dark Current vs. Ambient Temperature**



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



**Fig.13 Frequency Response**



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

