# 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			
PC123	6.4mm or more	6.4mm or more			
PC123F	8mm or more	8mm or more			

### Applications

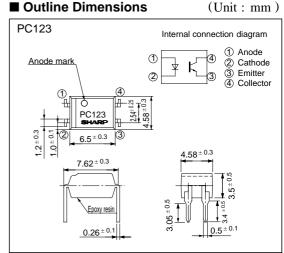
- 1. Power supplies
- 2. OA equipment

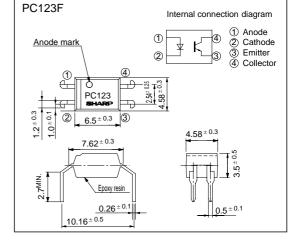
#### ■ Absolute Maximum Ratings $(Ta = 25^{\circ}C)$

Parameter		Symbol	Ratings	Unit	
Input	Forward current	$I_F$	50	mA	
	*1Peak forward current	$I_{\text{FM}}$	1	A	
	Reverse voltage	$V_R$	6	V	
	Power dissipation	P	70	mW	
Output	Collector-emitter voltage	V <sub>CEO</sub>	70	V	
	Emitter-collector voltage	V <sub>ECO</sub>	6	V	
	Collector current	$I_{\rm C}$	50	mA	
	Collector power dissipation	Pc	150	mW	
Total power dissipation		P tot	200	mW	
*2 Isolation voltage		V iso	5	kV rms	
Operating temperature		T opr	- 30 to + 100	°C	
Storage temperature		T stg	- 55 to + 125	°C	
*3 Soldering temperature		T sol	260	°C	

<sup>\*1</sup> Pulse width  $\leq$ = 100  $\mu$  s, Duty ratio : 0.001

#### ■ Outline Dimensions





<sup>\*2</sup> AC for 1 minute, 40 to 60% RH

<sup>\*3</sup> For 10 seconds

<sup>&</sup>quot; In the absence of confirmation by device specification sheets, SHARP takes no responsibility for any defects that occur in equipment using any of SHARP's devices, shown in catalogs, data books, etc. Contact SHARP in order to obtain the latest version of the device specification sheets before using any SHARP's device.

## **■** Electro-optical Characteristics

 $(Ta=25^{\circ}C)$ 

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit	
Input	Forward voltage		$V_F$	$I_F = 20mA$	-	1.2	1.4	V
	Reverse current		$I_R$	$V_R = 4V$	-	-	10	μΑ
	Terminal capacitance		$C_t$	V = 0, $f = 1kHz$	-	30	250	pF
Output	Collector dark current		$I_{CEO}$	$V_{CE} = 50V, I_{F} = 0$	-	-	100	nA
	Collector-emitter breakdown voltage		BV CEO	$I_C = 0.1 \text{mA}, I_F = 0$	70	-	-	V
	Emitter-collector breakdown voltage		BV <sub>ECO</sub>	$I_E = 10 \mu A, I_F = 0$	6	-	-	V
Transfer characte- risitics	Collector current		$I_{\rm C}$	$I_F = 5mA$ , $V_{CE} = 5V$	2.5	-	20	mA
	Collector-emitter saturation voltage		V <sub>CE(sat)</sub>	$I_F = 20mA$ , $I_C = 1mA$	-	0.1	0.2	V
	Isolation resistance		R <sub>ISO</sub>	DC500V, 40 to 60%RH	5 x 10 <sup>10</sup>	1011	-	Ω
	Floating capacitance		$C_{\rm f}$	V = 0, $f = 1MHz$	-	0.6	1.0	pF
	Cut-off frequency		fc	$V_{CE} = 5V$ , $I_{C} = 2mA$ $R_{L} = 100\Omega$ , - 3dB	-	80	-	kHz
	Response time	Rise time	t <sub>r</sub>	$V_{CE} = 2V$ , $I_{C} = 2mA$	-	4	18	μs
		Fall time	$t_{\mathrm{f}}$	$R_L = 100 \Omega$	-	3	18	μs

Fig. 1 Forward Current vs.
Ambient Temperature

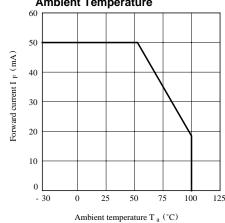


Fig. 2 Diode Power Dissipation vs.
Ambient Temperature

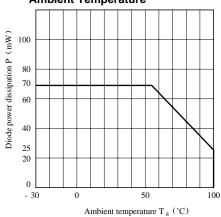


Fig. 3 Collector Power Dissipation vs.
Ambient Temperature

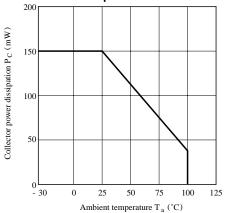


Fig. 5 Peak Forward Current vs. Duty Ratio

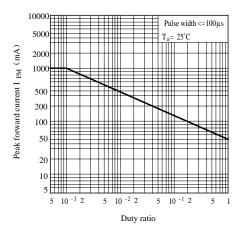


Fig. 7 Current Transfer Ratio vs. Forward Current

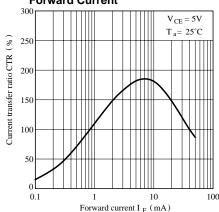


Fig. 4 Power Dissipation vs. Ambient Temperature

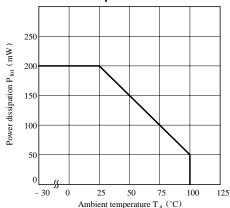


Fig. 6 Forward Current vs. Forward Voltage

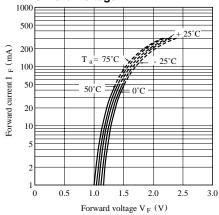
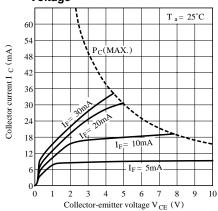


Fig. 8 Collector Current vs. Collector-emitter Voltage



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Fig. 9 Relative Current Transfer Ratio vs. Ambient Temperature

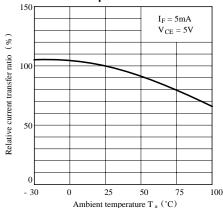


Fig.11 Collector Dark Current vs.

Ambient Temperature

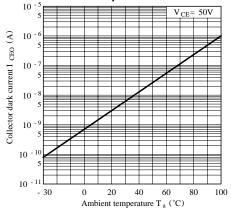


Fig.13 Frequency Response

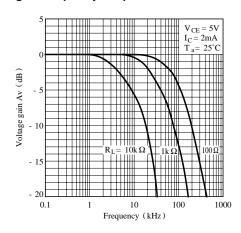


Fig.10 Collector-emitter Saturation Voltage vs. Ambient temperature

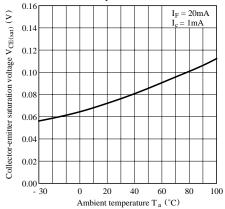


Fig.12 Response Time vs. Load Resistance

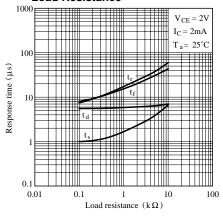
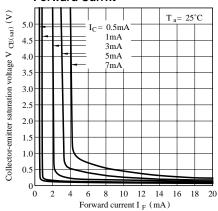


Fig.14 Collector-emitter Saturation Voltage vs. Forward Currnt



Please refer to the chapter "Precautions for Use"