

# 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                |

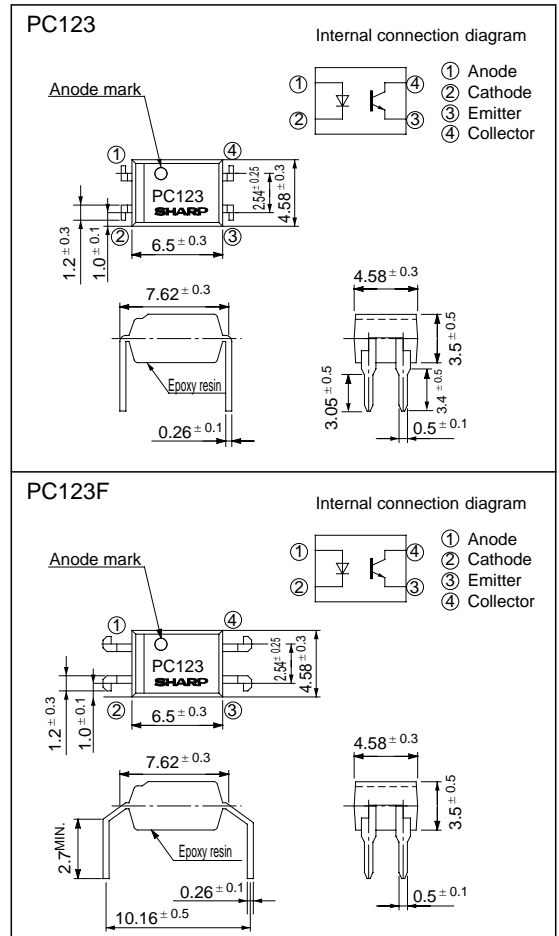
\*1 Pulse width  $\leq 100 \mu s$ , Duty ratio : 0.001

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

\*3 For 10 seconds

### ■ Outline Dimensions

(Unit : mm)

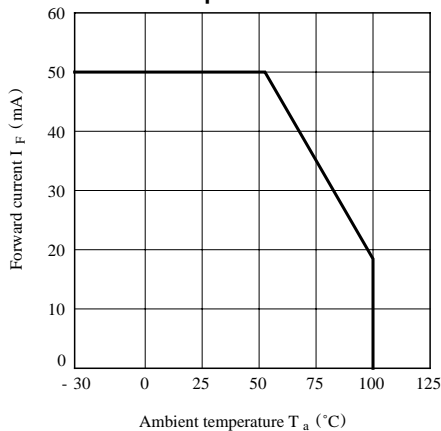


## Electro-optical Characteristics

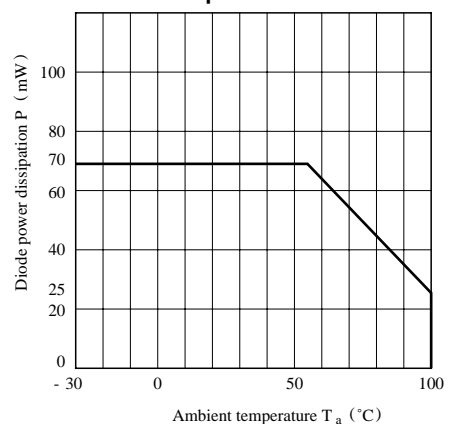
(T<sub>a</sub> = 25°C)

| 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<br>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<br>R <sub>L</sub> = 100Ω        | -                    | 4                | 18   | μs   |
|                          | Fall time                            | t <sub>f</sub>       |  | -                    | 3                | 18   | μs   |

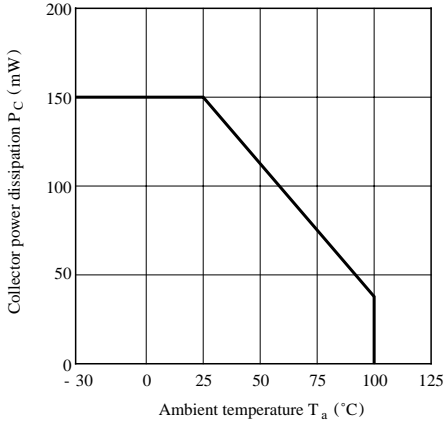
**Fig. 1 Forward Current vs. Ambient Temperature**



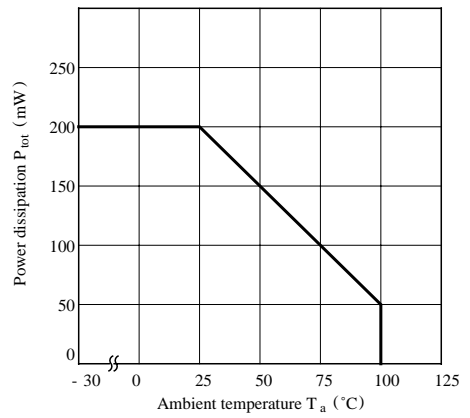
**Fig. 2 Diode Power Dissipation vs. Ambient Temperature**



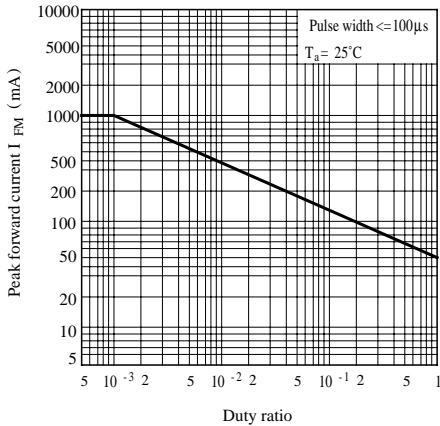
**Fig. 3 Collector Power Dissipation vs. Ambient Temperature**



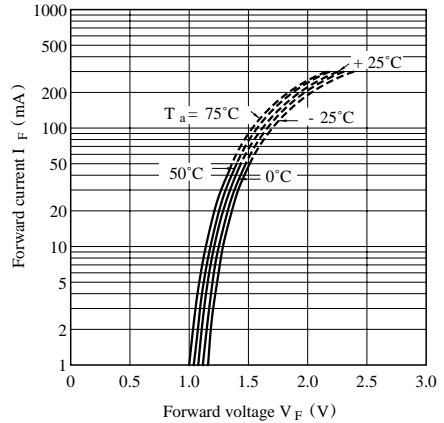
**Fig. 4 Power Dissipation vs. Ambient Temperature**



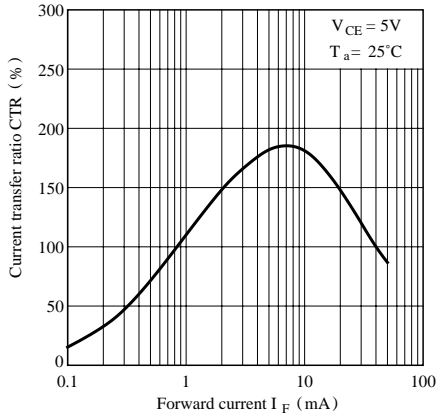
**Fig. 5 Peak Forward Current vs. Duty Ratio**



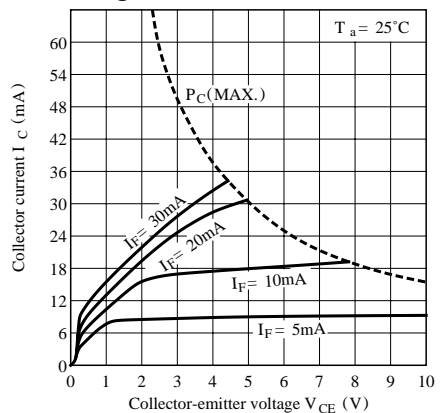
**Fig. 6 Forward Current vs. Forward Voltage**



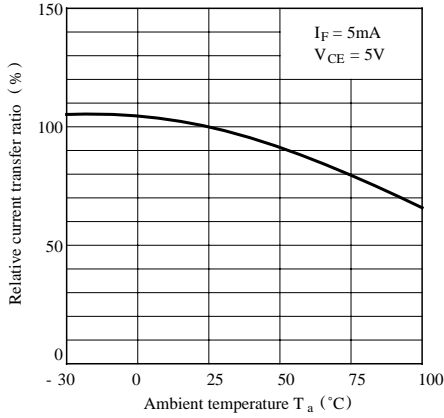
**Fig. 7 Current Transfer Ratio vs. Forward Current**



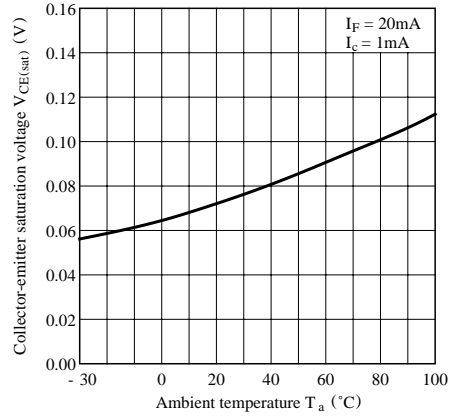
**Fig. 8 Collector Current vs. Collector-emitter Voltage**



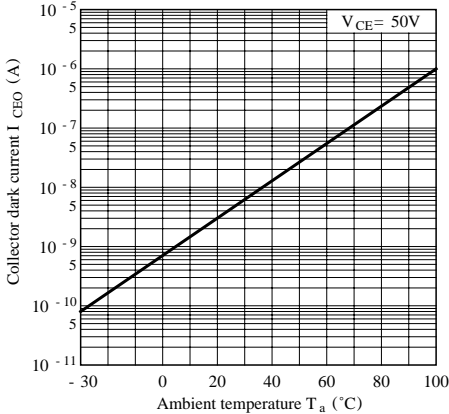
**Fig. 9 Relative Current Transfer Ratio vs. Ambient Temperature**



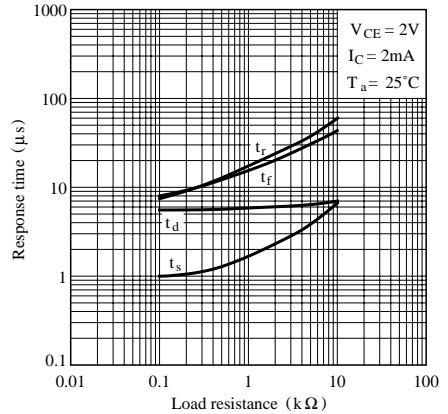
**Fig.10 Collector-emitter Saturation Voltage vs. Ambient temperature**



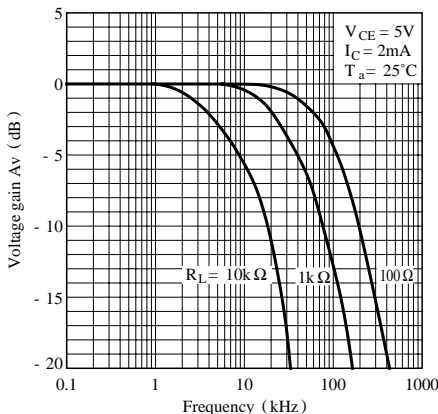
**Fig.11 Collector Dark Current vs. Ambient Temperature**



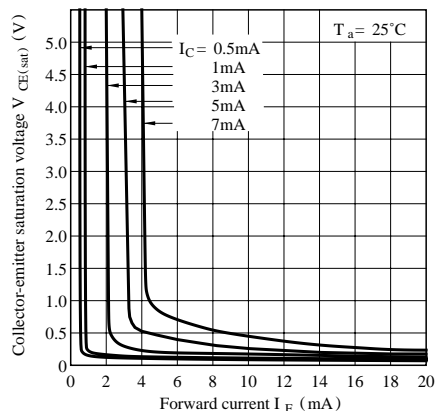
**Fig.12 Response Time vs. Load Resistance**



**Fig.13 Frequency Response**



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



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[www.datasheetcatalog.com](http://www.datasheetcatalog.com)

Datasheets for electronics components.