

# PC815 Series

## High Sensitivity, High Density Mounting Type Photocoupler

- \* Lead forming type (I type) and taping reel type (P type) are also available. (PC815I/PC815P)
- \* TÜV (VDE0884) approved type is also available as an option.

### ■ Features

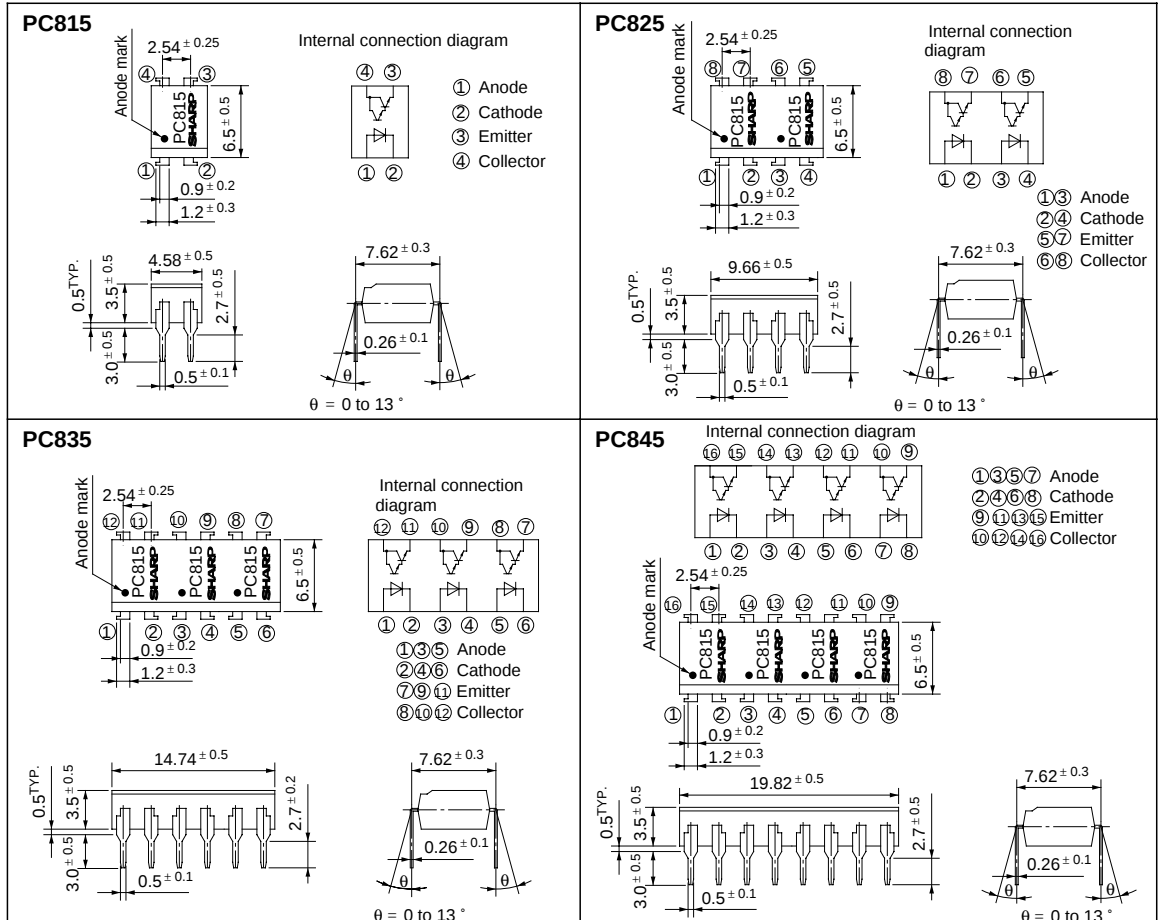
1. High current transfer ratio  
(CTR: MIN. 600% at  $I_F = 1\text{mA}$ ,  $V_{CE} = 2\text{V}$ )
2. High isolation voltage between input and output  
( $V_{iso} : 5000\text{V}_{rms}$ )
3. Compact dual-in-line package  
**PC815** : 1-channel type      **PC825** : 2-channel type  
**PC835** : 3-channel type      **PC845** : 4-channel type
4. Recognized by UL file No. E64380

### ■ Applications

1. System appliances, measuring instruments
2. Industrial robots
3. Copiers, automatic vending machines
4. Signal transmission between circuits of different potentials and impedances

### ■ Outline Dimensions

(Unit : mm)



■ Absolute Maximum Ratings (Ta= 25°C)

| Parameter                |                             | Symbol           | Rating        | Unit             |
|--------------------------|-----------------------------|------------------|---------------|------------------|
| Input                    | Forward current             | I <sub>F</sub>   | 50            | mA               |
|                          | *1 Peak forward current     | I <sub>FM</sub>  | 1             | A                |
|                          | Reverse voltage             | V <sub>R</sub>   | 6             | V                |
|                          | Power dissipation           | P                | 70            | mW               |
| Output                   | Collector-emitter voltage   | V <sub>CEO</sub> | 35            | V                |
|                          | Emitter-collector voltage   | V <sub>ECO</sub> | 6             | V                |
|                          | Collector current           | I <sub>C</sub>   | 80            | mA               |
|                          | Collector power dissipation | P <sub>C</sub>   | 150           | mW               |
| Total power dissipation  |                             | P <sub>tot</sub> | 200           | mW               |
| *2 Isolation voltage     |                             | V <sub>iso</sub> | 5 000         | V <sub>rms</sub> |
| Operating temperature    |                             | T <sub>opr</sub> | - 30 to + 100 | °C               |
| Storage temperature      |                             | T <sub>stg</sub> | - 55 to + 125 | °C               |
| *3 Soldering temperature |                             | T <sub>sol</sub> | 260           | °C               |

\*1 Pulse width<=100 μ s, Duty ratio : 0.001

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

\*3 For 10 seconds

■ Electro-optical Characteristics (Ta= 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    |
|                                  | Peak forward voltage                 |           | V <sub>FM</sub>      | I <sub>FM</sub> = 0.5A                                             | -                    | -                | 3.0              | V    |
|                                  | Reverse current                      |           | I <sub>R</sub>       | V <sub>R</sub> = 4V                                                | -                    | -                | 10               | μ A  |
|                                  | 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> = 10V, I <sub>F</sub> = 0                          | -                    | -                | 10 <sup>-6</sup> | A    |
| Transfer<br>charac-<br>teristics | Current transfer ratio               |           | CTR                  | I <sub>F</sub> = 1mA, V <sub>CE</sub> = 2V                         | 600                  | -                | 7 500            | %    |
|                                  | Collector-emitter saturation voltage |           | V <sub>CE(sat)</sub> | I <sub>F</sub> = 20mA, I <sub>C</sub> = 5mA                        | -                    | 0.8              | 1.0              | V    |
|                                  | Isolation resistance                 |           | R <sub>ISO</sub>     | DC500V, 40 to 60% RH                                               | 5 x 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> = 2V, I <sub>C</sub> = 2mA, R <sub>L</sub> = 100 Ω | 1                    | 6                | -                | kHz  |
|                                  | Response time                        | Rise time | t <sub>r</sub>       | V <sub>CE</sub> = 2V, I <sub>C</sub> = 10mA, R <sub>L</sub> = 100Ω | -                    | 60               | 300              | μ s  |
|                                  |                                      | Fall time | t <sub>f</sub>       |                                                                    | -                    | 53               | 250              | μ s  |

Fig. 1 Forward Current vs. Ambient Temperature

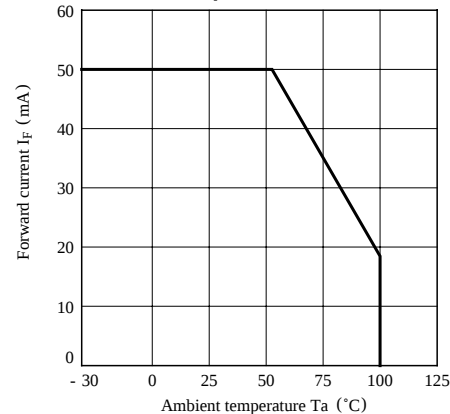


Fig. 2 Collector Power Dissipation vs. Ambient Temperature

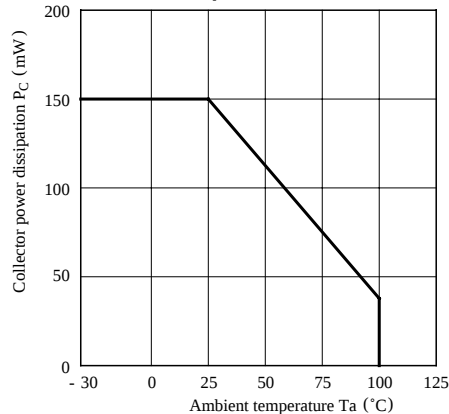


Fig. 3 Peak Forward Current vs. Duty Ratio

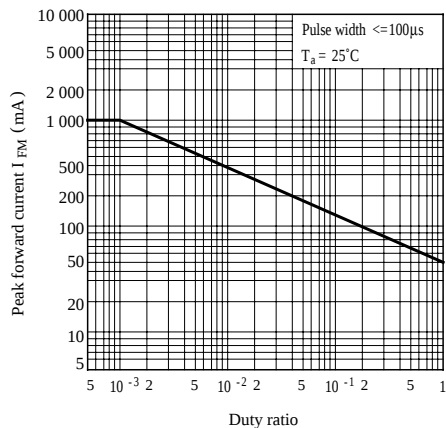


Fig. 4 Forward Current vs. Forward Voltage

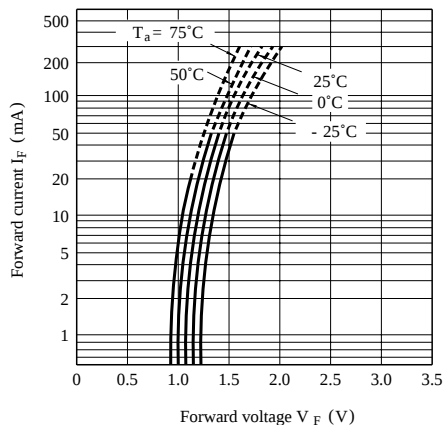


Fig. 5 Current Transfer Ratio vs. Forward Current

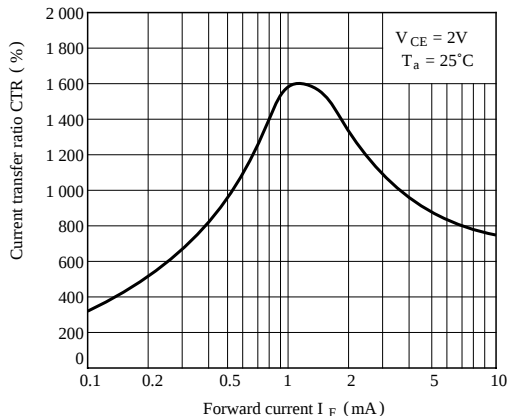


Fig. 6 Collector Current vs. Collector-emitter Voltage

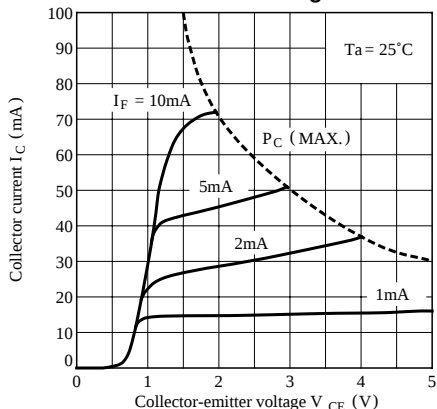


Fig. 7 Relative Current Transfer Ratio vs. Ambient Temperature

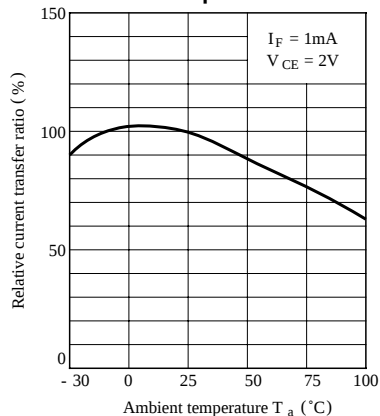
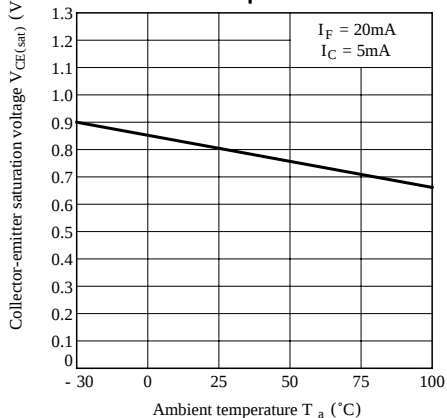
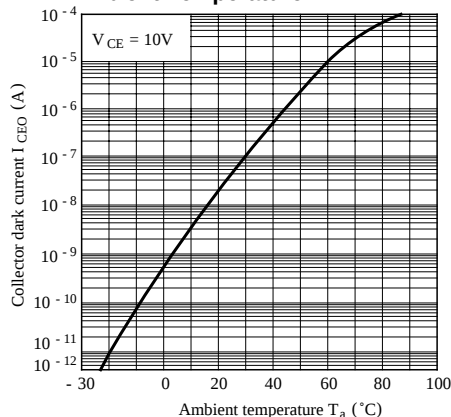


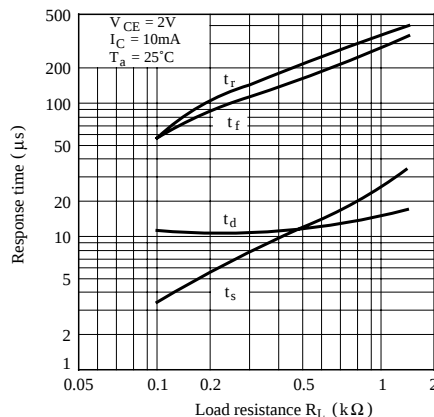
Fig. 8 Collector-emitter Saturation Voltage vs. Ambient Temperature



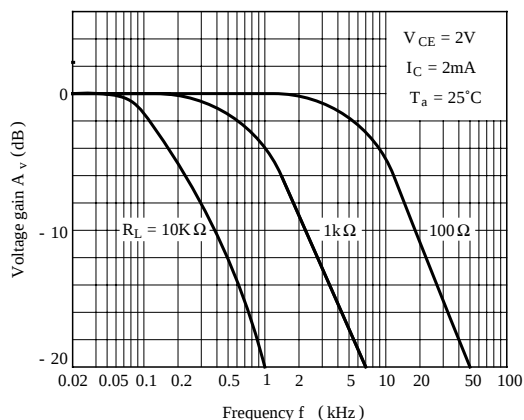
**Fig. 9 Collector Dark Current vs. Ambient Temperature**



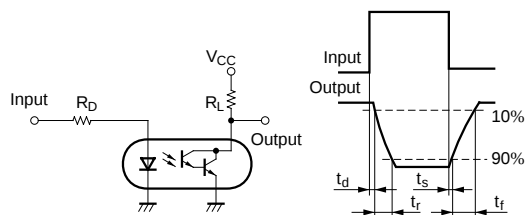
**Fig.10 Response Time vs. Load Resistance**



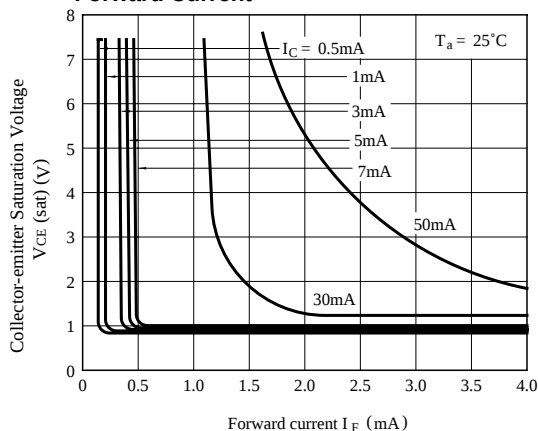
**Fig.11 Frequency Response**



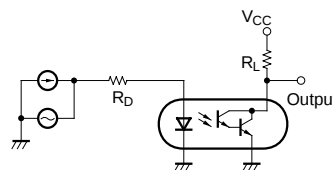
**Test Circuit for Response Time**



**Fig.12 Collector-emitter Saturation Voltage vs. Forward Current**



**Test Circuit for Frequency Response**



● Please refer to the chapter  
“Precautions for Use”