## **PC818**

# High Density Mounting Type Photocoupler

\* Lead forming type (I type ) and taping reel type (P type ) are also available. (PC818I/PC818P )

\*\* TÜV (VDE0884) approved type is also available as an option.

### **■** Features

1. High isolation voltage between input and output

 $(V_{iso}: 5000V_{rms})$ 

2. Low collector dark current

( $I_{CEO}: MAX. 6 \times 10^{-9} A \text{ at } V_{CE} = 5V$ )

3. Current transfer ratio

(CTR: MIN. 10% at  $I_F = 1$ mA,  $V_{CE} = 0.4$ V)

4. Compact dual-in-line package

5. Recognized by UL, file No. E64380

## ■ Applications

1. Computer terminals

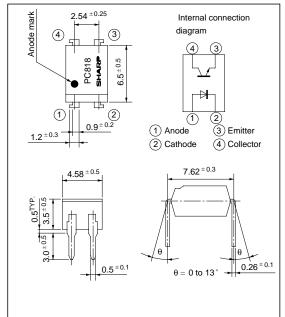
2. System appliances, measuring instruments

3. Copiers, automatic vending machines, medical instruments

 Signal transmission between circuits of different potentials and impedances

### ■ Outline Dimensions





## ■ Absolute Maximum Ratings

| ( - | Γa – | 25 | °C' |
|-----|------|----|-----|
|     |      |    |     |

|                         | Parameter                           | Symbol          | Rating        | Unit             |
|-------------------------|-------------------------------------|-----------------|---------------|------------------|
|                         | Forward current                     | $I_F$           | 50            | mA               |
| Input                   | *1Peak 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 CEO           | 35            | V                |
|                         | Emitter-collector voltage           | V ECO           | 6             | V                |
|                         | Collector current                   | $I_{C}$         | 50            | mA               |
|                         | Collector power dissipation         | Pc              | 150           | mW               |
|                         | Total power dissipation P tot 200 n |                 | mW            |                  |
|                         | *2Isolation voltage                 |                 | 5 000         | V <sub>rms</sub> |
| Operating temperature   |                                     | T opr           | - 30 to + 100 | °C               |
| Storage temperature     |                                     | T stg           | - 55 to + 125 | °C               |
| *3Soldering temperature |                                     | T sol           | 260           | °C               |

<sup>\*1</sup> Pulse width <= 100 \mus, Duty ratio: 0.001

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

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



## **■** Electro-optical Characteristics

| (1a = 23 C) | (Ta= | 25°C) |
|-------------|------|-------|
|-------------|------|-------|

| Parameter                |                                      | Symbol    | Conditions                  | MIN.   | TYP.                 | MAX.      | Unit                 |    |
|--------------------------|--------------------------------------|-----------|-----------------------------|--|----------------------|-----------|----------------------|----|
| Input -                  | Forward voltage                      |           | $V_F$                       | $I_F = 20mA$                                     | -                    | 1.2       | 1.4                  | V  |
|                          | Peak forward voltage                 |           | $V_{\text{FM}}$             | $I_{FM} = 0.5A$                                  | -                    | -         | 3.0                  | V  |
|                          | Reverse current                      |           | $I_R$                       | $V_R = 4V$                                       | -                    | -         | 10                   | μΑ |
|                          | Terminal capacitance                 |           | $C_{t}$                     | V = 0, $f = 1kHz$                                | -                    | 30        | 250                  | pF |
| Output                   | Collector dark cur                   | rent      | $I_{\text{CEO}}$            | $V_{CE} = 5V, I_{F} = 0$                         | -                    | -         | 6 x 10 <sup>-9</sup> | A  |
| Transfer characteristics | Current tranfer ratio                |           | CTR                         | $I_F = 1 \text{mA}$ , $V_{CE} = 0.4 V$           | 10                   | 30        | 100                  | %  |
|                          | Collector-emitter saturation voltage |           | $V_{\text{CE}(\text{sat})}$ | $I_F = 20mA$ , $I_C = 1mA$                       | -                    | 0.2       | 0.4                  | V  |
|                          | Isolation resistance                 |           | R <sub>ISO</sub>            | DC500V, 40 to 60% RH                             | 5 x 10 <sup>10</sup> | $10^{11}$ | -                    | Ω  |
|                          | Floating capacitance                 |           | $C_{\mathrm{f}}$            | V = 0, $f = 1MHz$                                | -                    | 0.6       | 1.0                  | pF |
|                          | Turn-off time                        |           | $t_{ m off}$                | $V_{CC} = 5V$ , $I_F = 1mA$ , $R_L = 110k\Omega$ | -                    | -         | 650                  | μs |
|                          | Response time                        | Rise time | $t_{\rm r}$                 | $V_{CE} = 2V$ , $I_C = 2mA$ , $R_L = 1k\Omega$   | -                    | 7         | 40                   | μs |
|                          |                                      | Fall time | $t_{\mathrm{f}}$            |  | -                    | 6         | 40                   | μs |

Fig. 1 Forward Current vs.

Ambient Temperature

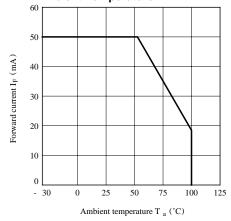


Fig. 3 Peak Forward Current vs. Duty Ratio

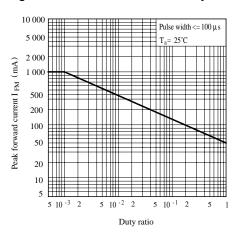


Fig. 2 Collector Power Dissipation vs.
Ambient Temperature

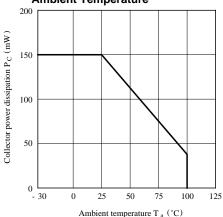


Fig. 4 Forward Current vs. Forward Voltage

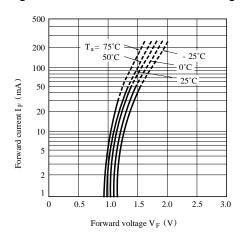


Fig. 5 Current Transfer Ratio vs. Forward Current

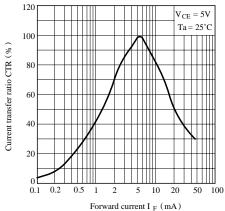


Fig. 7 Relative Current Transfer Ratio vs.
Ambient Temperature

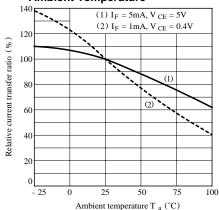


Fig. 9 Collector Dark Current vs.

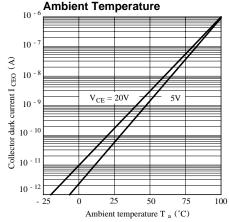


Fig. 6 Collector Current vs.
Collector-emitter Voltage

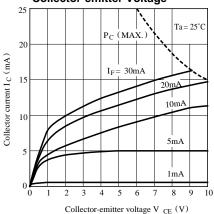


Fig. 8 Collector-emitter Saturation Voltage vs. Ambient Temperature

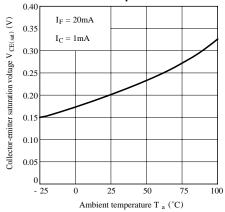
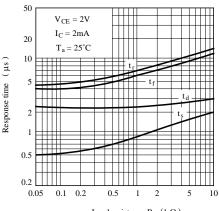


Fig.10 Response Time vs. Load Resistance



Load resistance  $R_L$  (k $\Omega$ )

Fig.11 Frequency Response

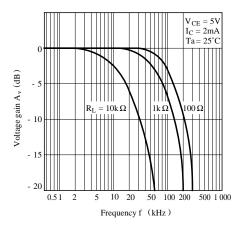
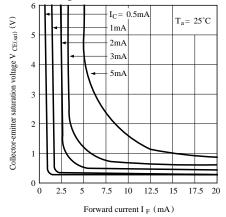
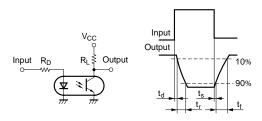


Fig.12 Collector-emitter Saturation Voltage vs. Forward Current

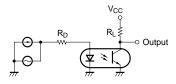


• Please refer to the chapter "Precautions for Use"

## **Test Circuit for Response Time**



#### **Test Circuit for Frepuency Response**



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