

# PC814 Series

## AC Input Photocoupler

✱ Lead forming type (I type) and taping reel type (P type) are also available. (PC814I/PC814P)

### ■ Features

1. AC input
2. High isolation voltage between input and output ( $V : 5\,000V_{rms}$ )
3. Compact dual-in-line package
  - PC814** (1-channel type)
  - PC824** (2-channel type)
  - PC844** (4-channel type)
4. Current transfer ratio
  - CTR : MIN. 20% at  $I_F = \pm 1mA$ ,  $V_{CE} = 5V$
5. Recognized by UL, file No. E64380

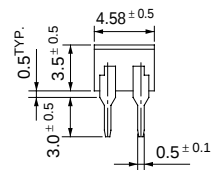
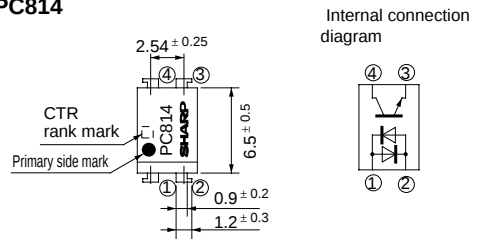
### ■ Applications

1. Programmable controllers
2. Telephone sets, telephone exchangers
3. System appliances
4. Signal transmission between circuits of different potentials and impedances

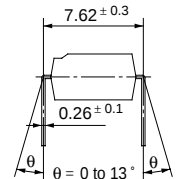
### ■ Outline Dimensions

(Unit : mm)

#### PC814

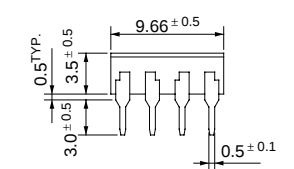
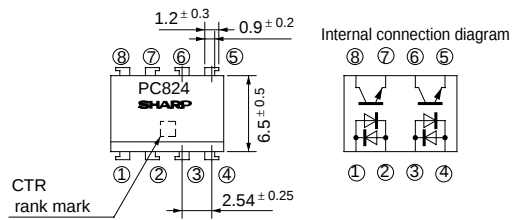


- ① Anode, Cathode
- ② Anode, Cathode

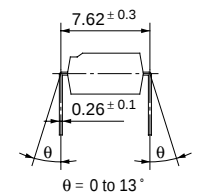


- ③ Emitter
- ④ Collector

#### PC824

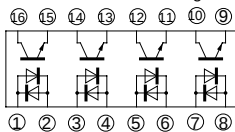


- ①③ Anode, Cathode
- ②④ Anode, Cathode
- ⑤⑦ Emitter
- ⑥⑧ Collector

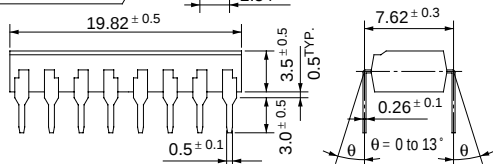
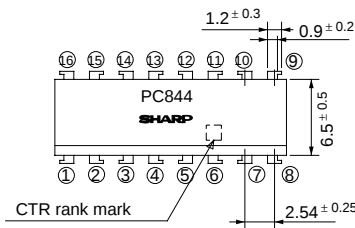


#### PC844

Internal connection diagram



- ①③⑤⑦ Anode, Cathode
- ②④⑥⑧ Anode, Cathode
- ⑨⑪⑬⑮ Emitter
- ⑩⑫⑭⑯ Collector



■ Absolute Maximum Ratings

(Ta= 25°C)

| Parameter               |                             | Symbol           | Rating        | Unit             |
|-------------------------|-----------------------------|------------------|---------------|------------------|
| Input                   | Forward current             | I <sub>F</sub>   | ± 50          | mA               |
|                         | *1Peak forward current      | I <sub>FM</sub>  | ± 1           | A                |
|                         | 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>   | 50            | mA               |
|                         | Collector power dissipation | P <sub>C</sub>   | 150           | mW               |
| Total power dissipation |                             | P <sub>tot</sub> | 200           | mW               |
| *2Isolation 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               |
| *3Soldering temperature |                             | T <sub>sol</sub> | 260           | °C               |

\*1 Pulse width <=100μs, 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> = ± 0.5V                                                 | -                    | -                | 3.0              | V    |
|                                  | Terminal capacitance                 |                | C <sub>t</sub>       | V = 0, f = 1kHz                                                          | -                    | 50               | 250              | pF   |
| Output                           | Collector dark current               |                | I <sub>CEO</sub>     | V <sub>CE</sub> = 20V, I <sub>F</sub> = 0                                | -                    | -                | 10 <sup>-7</sup> | A    |
| Transfer<br>charac-<br>teristics | *4Current transfer ratio             |                | CTR                  | I <sub>F</sub> = ± 1mA, V <sub>CE</sub> = 5V                             | 20                   | -                | 300              | %    |
|                                  | 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 | 15                   | 80               | -                | kHz  |
|                                  | Response time                        | Rise time      | t <sub>r</sub>       | V <sub>CE</sub> = 2V, I <sub>C</sub> = 2mA, R <sub>L</sub> =             | -                    | 4                | 18               | μ s  |
| Fall time                        |                                      | t <sub>f</sub> | 100Ω                 | -                                                                        | 3                    | 18               | μ s              |      |

\*4 Classification table of current transfer ratio

| Model No. | Rank mark    | CTR ( % ) |
|-----------|--------------|-----------|
| PC814A    | A            | 50 to 150 |
| PC824A    |              |           |
| PC844A    |              |           |
| PC814     | A or no mark | 20 to 300 |
| PC824     |              |           |
| PC844     |              |           |

Fig. 1 Forward Current vs. Ambient Temperature

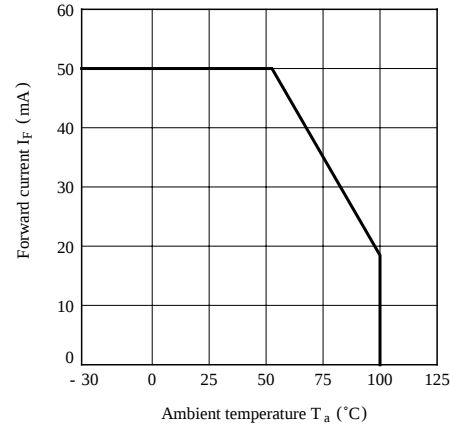


Fig. 2 Collector Power Dissipation vs. Ambient Temperature

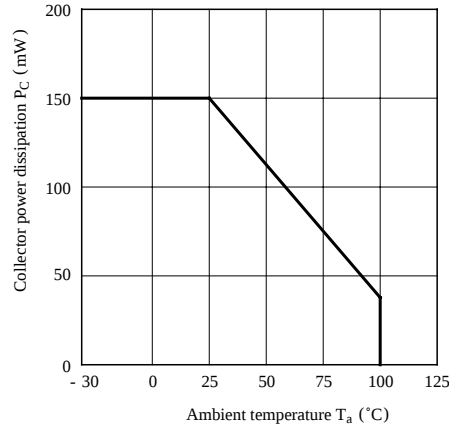


Fig. 3 Peak Forward Current vs. Duty Ratio

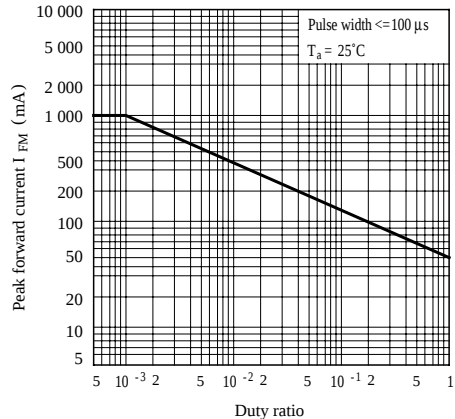


Fig. 4 Forward Current vs. Forward Voltage

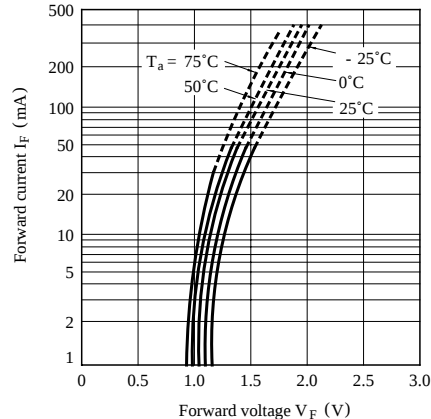


Fig. 5 Current Transfer Ratio vs. Forward Current

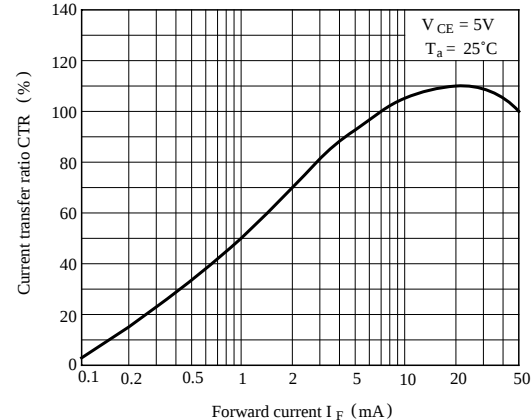


Fig. 6 Collector Current vs. Collector-emitter Voltage

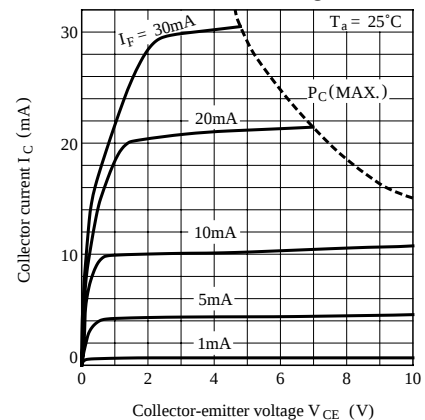


Fig. 7 Relative Current Transfer Ratio vs. Ambient Temperature

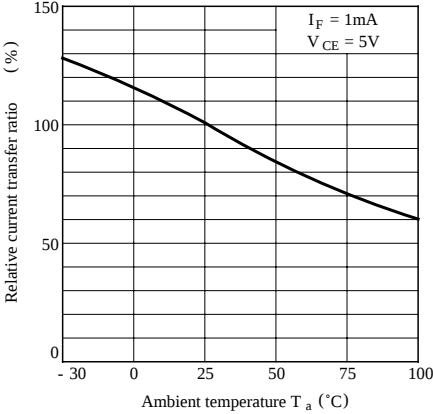


Fig. 8 Collector-emitter Saturation Voltage vs. Ambient Temperature

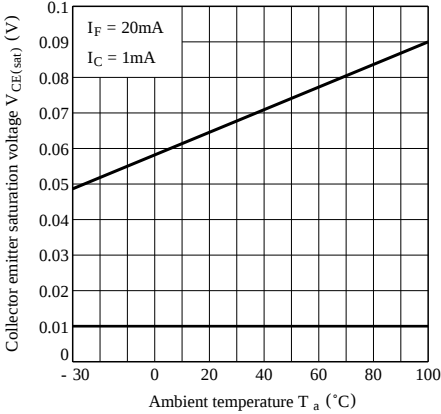


Fig. 9 Collector Dark Current vs. Ambient Temperature

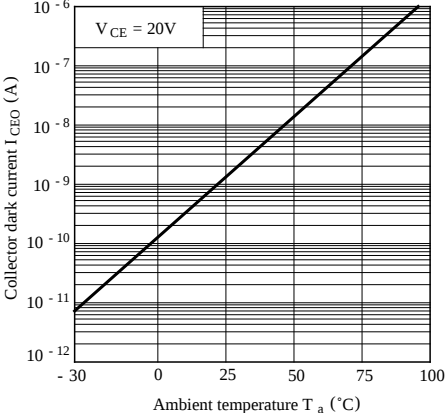


Fig.10 Response Time vs. Load Resistance

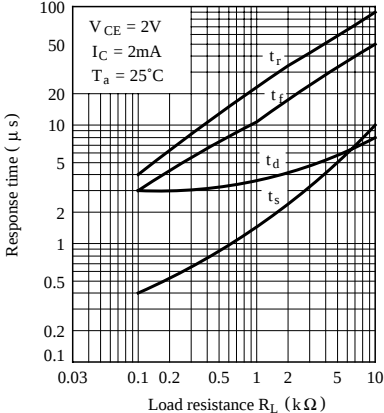
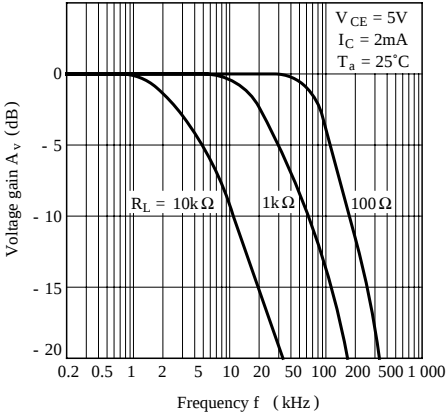
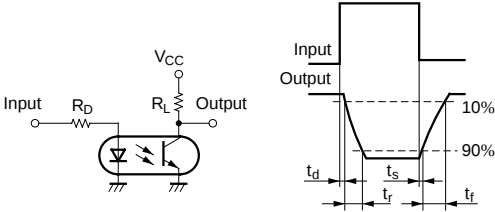


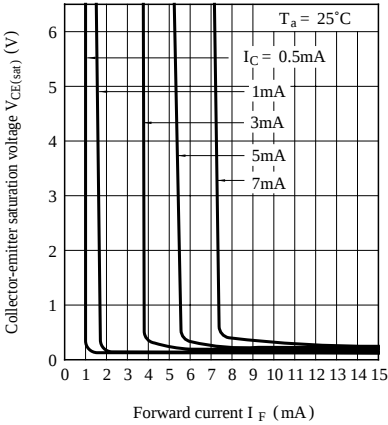
Fig.11 Frequency Response



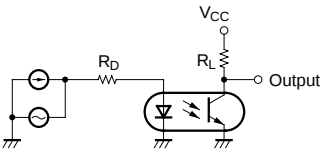
Test Circuit for Response Time



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



**Test Circuit for Frequency Response**



● Please refer to the chapter “Precautions for Use ”