

PC900V/PC900VQ

Digital Output Type OPIC Photocoupler

- * Lead forming type (I type) and taping reel type (P type) are also available. (**PC900VI/PC900VP**)
- ** TÜV (DIN-VDE0884) approved type is also available as an option.

■ Features

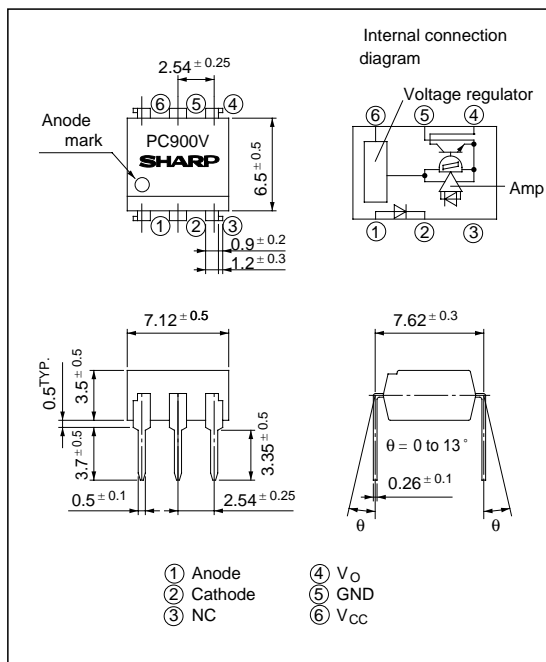
1. High reliability type (**PC900VQ**)
2. Normal OFF operation, open collector output
3. TTL and LSTTL compatible output
4. Operating supply voltage V_{CC} : 3 to 15V
5. High isolation voltage between input and output (V_{iso} : 5 000V_{rms})
6. Recognized by UL, file No. E64380

■ Applications

1. Isolation between logic circuits
2. Logic level shifters
3. Line receivers
4. Replacements for relays and pulse transformers
5. Noise reduction

■ Outline Dimensions

(Unit : mm)



* "OPIC" (Optical IC) is a trademark of the SHARP Corporation.
An OPIC consists of a light-detecting element and signal-processing circuit integrated onto a single chip.

■ Absolute Maximum Ratings

($T_a = 25^\circ\text{C}$)

| | Parameter | Symbol | Rating | 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 | Supply voltage | V_{CC} | 16 | V |
| | High level output voltage | V_{OH} | 16 | V |
| | Low level output current | I_{OL} | 50 | mA |
| | Power dissipation | P_O | 150 | mW |
| | Total power dissipation | P_{tot} | 170 | mW |
| | *2 Isolation voltage | V_{iso} | 5 000 | V _{rms} |
| | Operating temperature | T_{opr} | - 25 to + 85 | $^\circ\text{C}$ |
| | Storage temperature | T_{stg} | - 40 to + 125 | $^\circ\text{C}$ |
| | *3 Soldering temperature | T_{sol} | 260 | $^\circ\text{C}$ |

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

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

*3 For 10 seconds

■ Electro-optical Characteristics

(Ta= 0 to + 70°C unless specified)

| Parameter | | | Symbol | Conditions | MIN. | TYP. | MAX. | Unit | |
|--------------------------|---------------------------|---|-------------------------------------|--|--|------------------|------|------|-----|
| Input | Forward voltage | | V _F | I _F = 4mA | - | 1.1 | 1.4 | V | |
| | | | | I _F = 0.3mA | 0.7 | 1.0 | - | | |
| | Reverse current | | I _R | Ta = 25°C, V _R = 3V | - | - | 10 | μ A | |
| | Terminal capacitance | | C _t | Ta = 25°C, V = 0, f = 1kHz | - | 30 | 250 | pF | |
| Output | Operating supply voltage | | V _{CC} | | 3 | - | 15 | V | |
| | Low level output voltage | | V _{OL} | I _{OL} = 16mA, V _{CC} = 5V, I _F = 4mA | - | 0.2 | 0.4 | V | |
| | High level output current | | I _{OH} | V _O = V _{CC} = 15V, I _F = 0 | - | - | 100 | μ A | |
| | Low level supply current | | I _{CCL} | V _{CC} = 5V, I _F = 4mA | - | 2.5 | 5.0 | mA | |
| | High level supply current | | I _{CCH} | V _{CC} = 5V, I _F = 0 | - | 1.0 | 5.0 | mA | |
| | | *4“High→Low” threshold input current | | I _{FHL} | Ta = 25°C, V _{CC} = 5V, R _L = 280Ω | - | 1.1 | 2.0 | mA |
| | | V _{CC} = 5V, R _L = 280Ω | - | | - | 4.0 | | | |
| Transfer characteristics | | *5“Low→High” threshold input current | | I _{FLH} | Ta = 25°C, V _{CC} = 5V, R _L = 280Ω | 0.4 | 0.8 | - | mA |
| | | | | | V _{CC} = 5V, R _L = 280Ω | 0.3 | - | - | |
| | *6Hysteresis | | I _{FLH} / I _{FHL} | V _{CC} = 5V, R _L = 280Ω | 0.5 | 0.7 | 0.9 | - | |
| | Isolation resistance | | R _{ISO} | Ta = 25°C, DC500V, 40 to 60% RH | 5 x 10 ¹⁰ | 10 ¹¹ | - | Ω | |
| | *7 Response time | “High→Low” propagation delay time | | t _{PHL} | Ta = 25°C V _{CC} = 5V, I _F = 4mA R _L = 280Ω | - | 1 | 3 | μ s |
| | | “Low→High” propagation delay time | | t _{PLH} | | - | 2 | 6 | |
| | | Fall time | | t _f | | - | 0.05 | 0.5 | |
| | | Rise time | | t _r | | - | 0.1 | 0.5 | |

*4 I_{FHL} represents forward current when output goes from high to low.

*5 I_{FLH} represents forward current when output goes from low to high.

*6 Hysteresis stands for I_{FLH} / I_{FHL} .

*7 Test circuit for response time is shown below.

<Precautions for Use>

Connect a capacitor of more than 0.1 μ F between V_{CC} and GND.

Test Circuit for Response Time

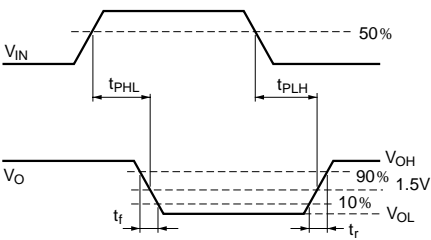
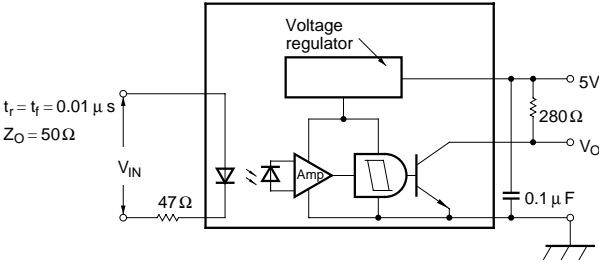


Fig. 1 Forward Current vs. Ambient Temperature

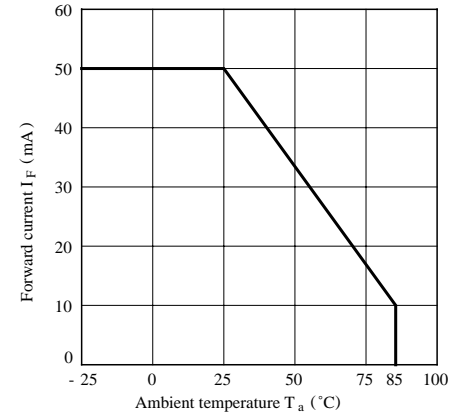


Fig. 2 Power Dissipation vs. Ambient Temperature

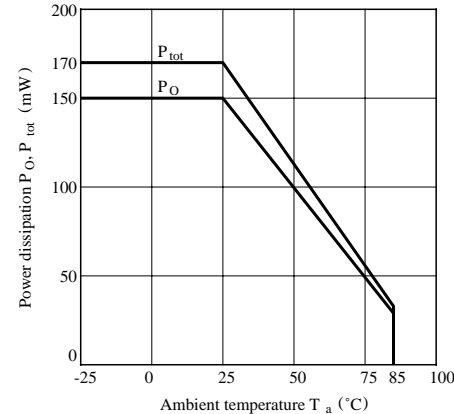


Fig. 3 Forward Current vs. Forward Voltage

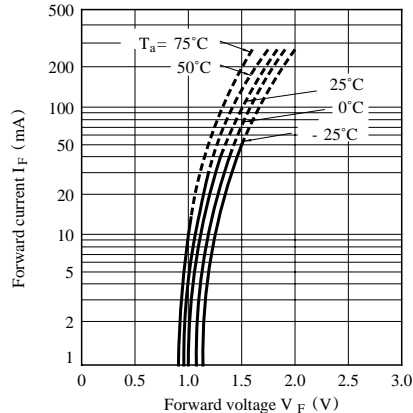


Fig. 4 Relative Threshold Input Current vs. Supply Voltage

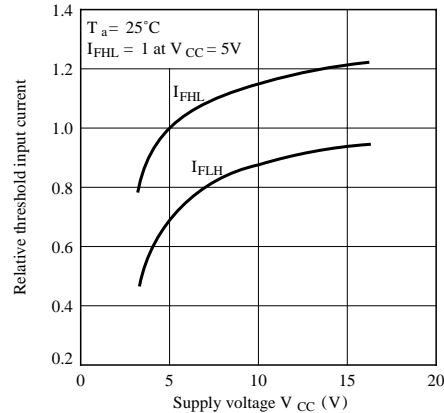


Fig. 5 Relative Threshold Input Current vs. Ambient Temperature

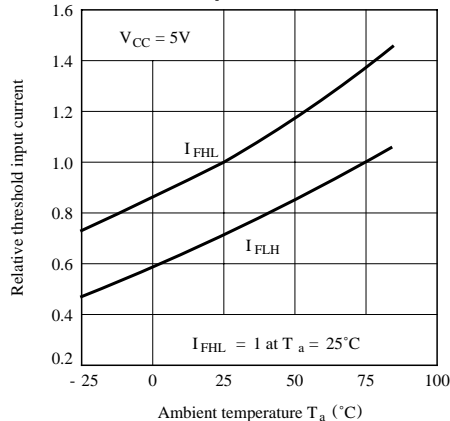


Fig. 6 Low Level Output Voltage vs. Low Level Output Current

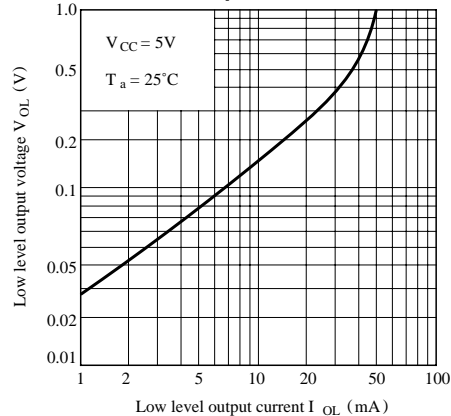


Fig. 7 Low Level Output Voltage vs. Ambient Temperature

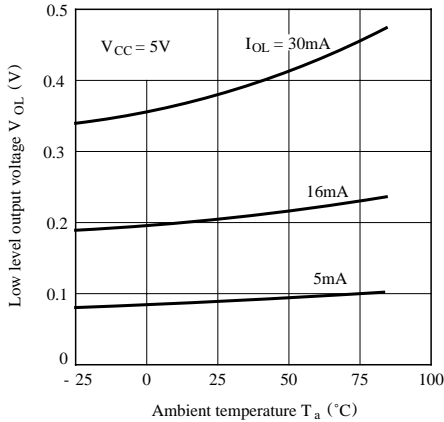


Fig. 8 Supply Current vs. Supply Voltage

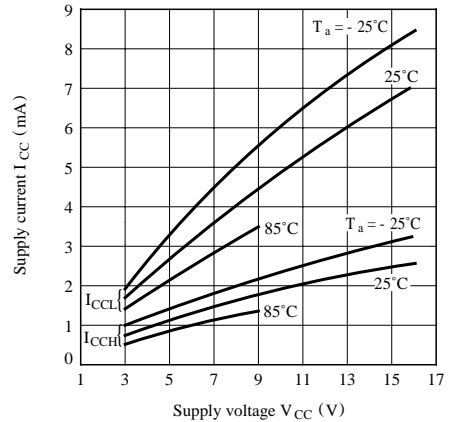


Fig. 9 Propagation Delay Time vs. Forward Current

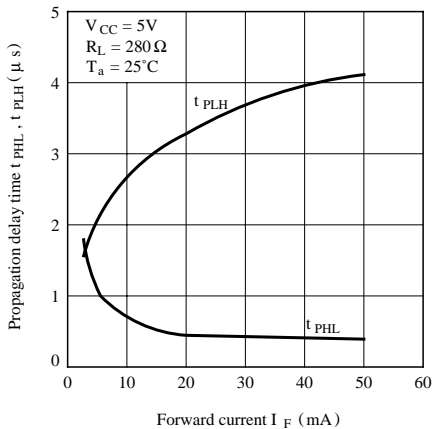
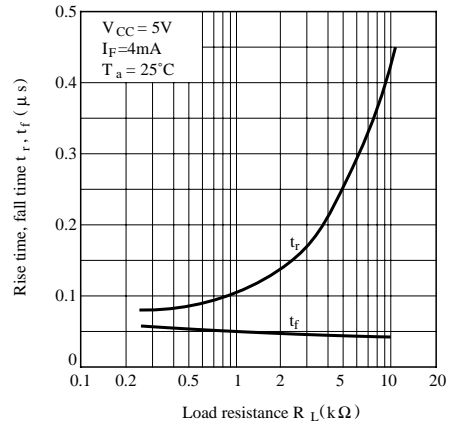


Fig.10 Rise Time, Fall Time vs. Load Resistance



■ Precautions for Use

- (1) It is recommended that a by-pass capacitor of more than $0.01\mu F$ is added between V_{CC} and GND near the device in order to stabilize power supply line.
- (2) Handle this product the same as with other integrated circuits against static electricity.
 - Please refrain from soldering under preheating and refrain from soldering by reflow.
 - Please refer to the chapter "Precautions for Use."

This datasheet has been download from:

www.datasheetcatalog.com

Datasheets for electronics components.