

GP1A57HR

Wide Gap Type OPIC Photointerrupter

■ Features

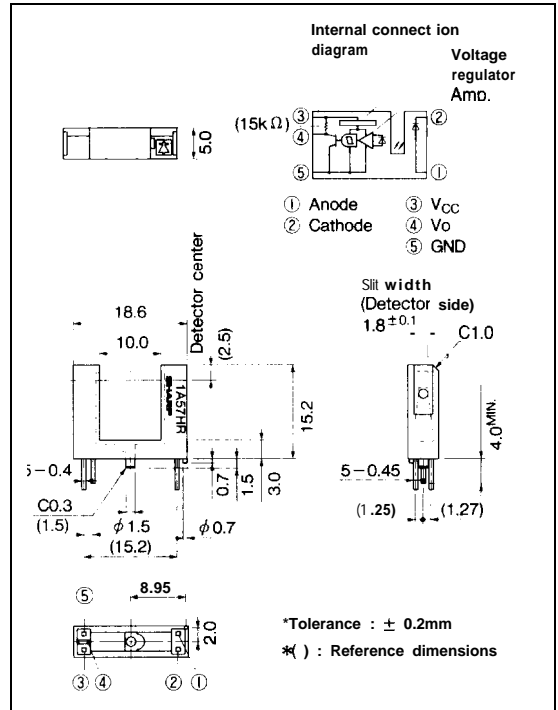
1. Wide gap between LED and detector(10mm)
2. High accuracy mounting type with positioning pin
3. Built-in schmidt-trigger circuit
4. PWB mounting type package

■ Applications

1. Cameras, video cameras
2. OA equipmet, such as copiers etc.
3. Facsimiles

■ 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°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 | 75 | mW |
| output | Supply voltage | V _{CC} | -0.5 to +17 | V |
| | Output current | I _O | 50 | mA |
| | Power dissipation | P _O | 250 | mW |
| Operating temperature | | T _{opr} | -25 to +85 | °C |
| Storage temperature | | T _{stg} | -40 to +100 | °C |
| *2 Soldering temperature | | T _{sol} | 260 | °C |

*1 Pulse width \leq 100 μ s, Duty ratio = 0.01

*2 For 5 seconds

■ Electro-optical Characteristics

(Ta = 25°C)

| Parameter | | Symbol | Conditions | MIN. | 1 YP. | MAX. | Unit | |
|----------------------------|---|-------------------------------------|---|---|-------|------|---------------|---------------|
| Input | Forward voltage | V_F | $I_F = 7\text{mA}$ | | 1.1 | 1.4 | v | |
| | Reverse current | I_R | $V_R = 3\text{V}$ | - | - | 10.0 | μA | |
| output | Operating supply voltage | V_{CC} | | 4.5 | - | 17.0 | v | |
| | Low level output voltage | V_{OL} | $V_{CC} = 5\text{V}, I_F = 0, I_{OL} = 16\text{mA}$ | - | 0.15 | 0.4 | v | |
| | High level output voltage | V_{OH} | $V_{CC} = 5\text{V}, I_F = 7\text{mA}$ | 4.9 | - | - | v | |
| | Low level supply current | I_{CCL} | $V_{CC} = 5\text{V}, I_F = 0$ | - | 1.7 | 3.8 | mA | |
| | High level supply current | I_{CCH} | $V_{CC} = 5\text{V}, I_F = 7\text{mA}$ | - | 0.7 | 2.2 | mA | |
| Transfer charac. teristics | *3 "Low → High" threshold input current | | I_{FLH} | $V_{CC} = 5\text{V}$ | - | 1.0 | 7.0 | mA |
| | *4 Hysteresis | | I_{FHL}/I_{FLH} | $V_{CC} = 5\text{V}$ | 0.55 | 0.75 | 0.95 | - |
| | Response time | "Low → High" propagation delay time | t_{PLH} | $V_{CC} = 5\text{V}, I_F = 7\text{mA}$ $R_L = 280\Omega$ | | 3.0 | 9.0 | μS |
| | | "High → Low" propagation delay time | t_{PHL} | | | 5.0 | 15.0 | |
| | | Rise time | t_r | | - | 0.1 | 0.5 | |
| Fall time | | t_f | - | | 0.05 | 0.5 | | |

*3 I_{FLH} represents forward current when output changes from low to high.
 *4 I_{FHL} represents forward current when output changes from high to low.
 Hysteresis stands for I_{FHL}/I_{FLH} .

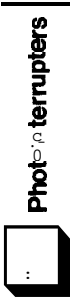


Fig. 1 Forward Current vs. Ambient Temperature

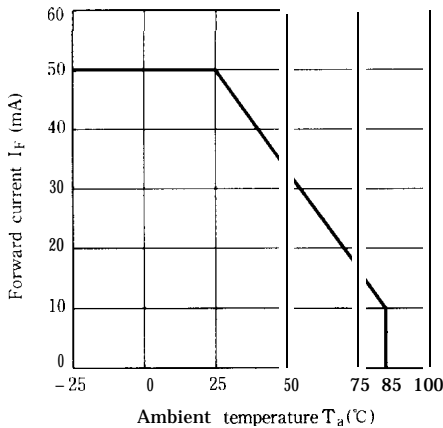


Fig. 2 Output Power Dissipation vs. Ambient Temperature

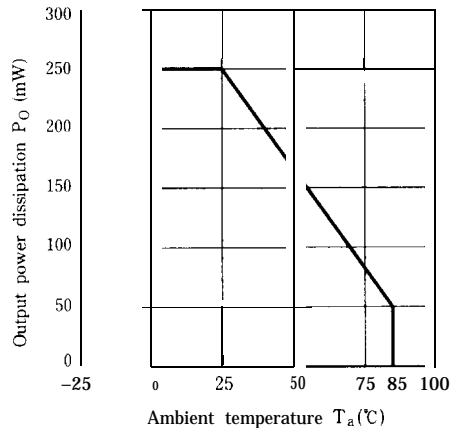


Fig. 3 Low Level Output Current vs. Ambient Temperature

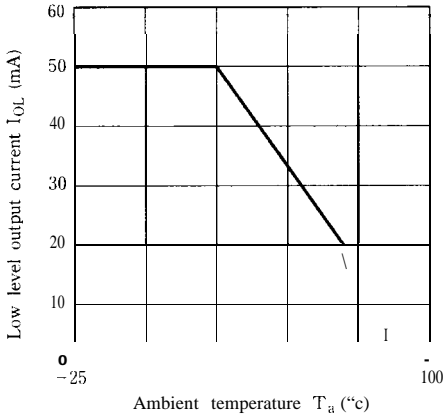


Fig. 4 Forward Current vs. Forward Voltage

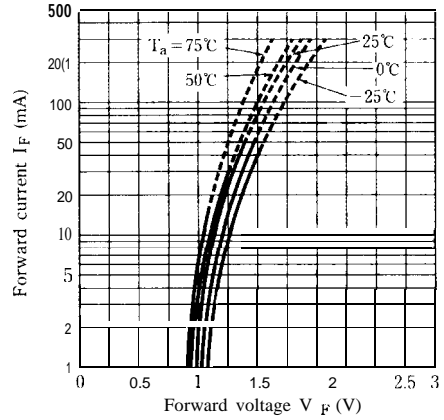


Fig. 5 Relative Threshold Input Current vs. Supply Voltage

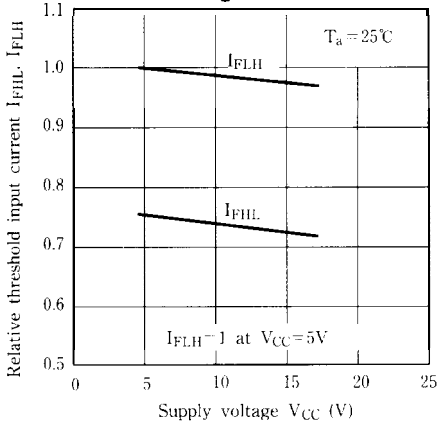


Fig. 6 Relative Threshold Input Current vs. Ambient Temperature

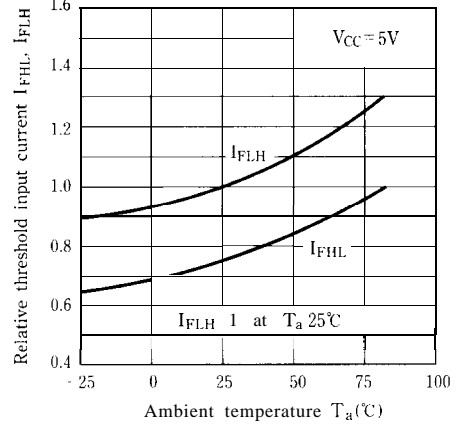


Fig. 7 Low Level Output Voltage vs. Low Level output current

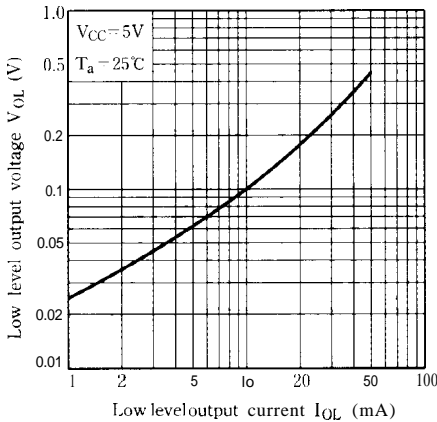


Fig. 8 Low Level Output Voltage vs. Ambient Temperature

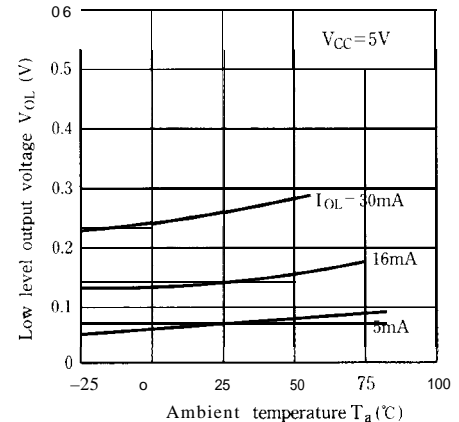


Fig. 9 Supply Current vs. Ambient Temperature

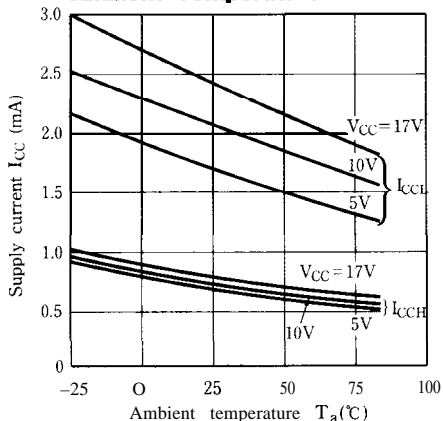


Fig.10 Propagation Delay Time vs. Forward Current

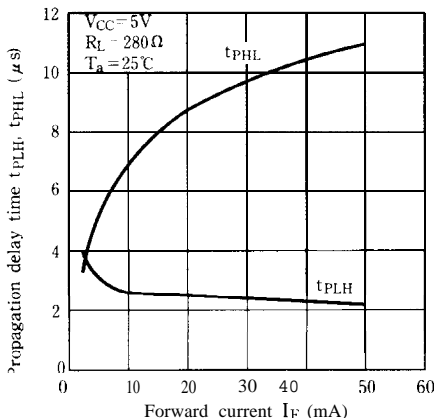
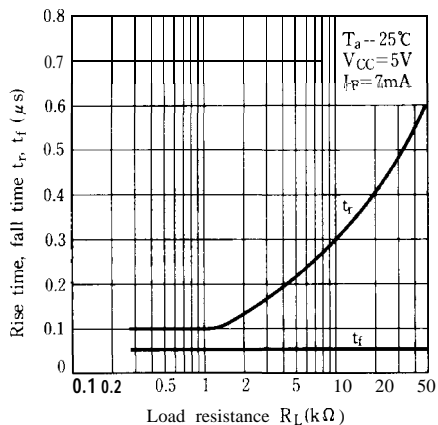
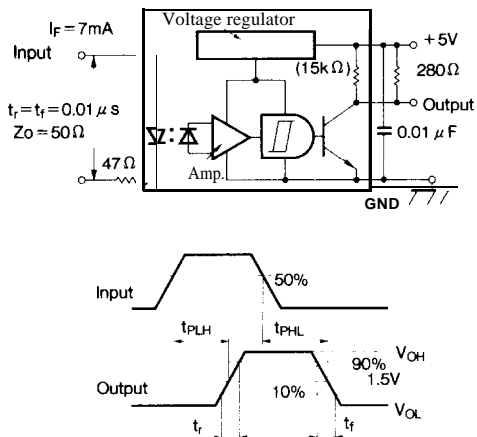


Fig.11 Rise Time, Fall Time vs. Load Resistance



Test Circuit for Response Time



Precautions for Use

- (1) In case of cleaning, use only the following type of cleaning solvent.
Ethyl alcohol, Methyl alcohol, Isopropyl alcohol
- (2) In order to stabilize power supply line, connect a by-pass capacitor of more than 0.01 µF between Vcc and GND near the device.
- (3) As for other general cautions, refer to the chapter "Precautions for Use." (Page 78 to 93)