

GP1A52LR

OPIC Photointerrupter

■ Features

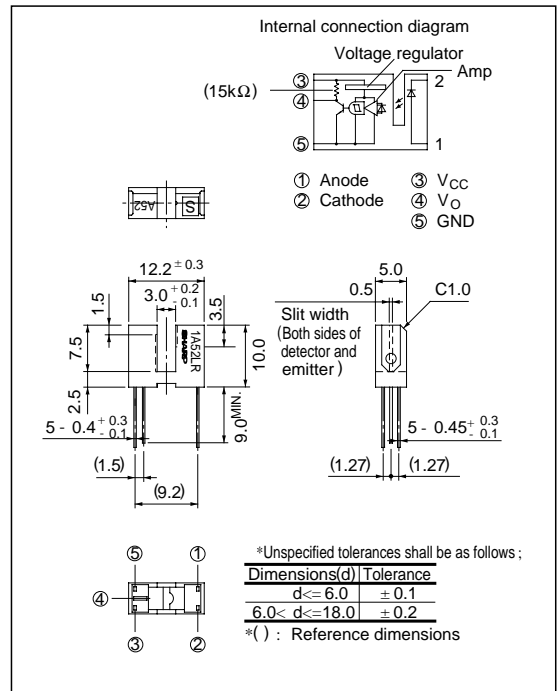
1. Output inverting type of **GP1A52HR**
2. High sensing accuracy (Slit width: 0.5mm)
3. TTL and CMOS compatible output
4. PWB mounting type

■ Applications

1. OA equipment, such as printers, floppy disk drives, etc.
2. VCRs

■ 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 |
| | Low level output current | I _{OL} | 50 | mA |
| | Power dissipation | P _O | 250 | W |
| 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 <= 100μs, Duty ratio = 0.01

*2 For 5 seconds

Electro-optical Characteristics

(Ta = 25°C)

| Parameter | | Symbol | Conditions | MIN. | TYP. | MAX. | Unit | |
|--------------------------|---------------------------|--|--|---|------|------|---------------|---------------|
| Input | Forward voltage | V_F | $I_F = 5\text{mA}$ | - | 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} | $V_{CC} = 5\text{V}, I_F = 5\text{mA}, I_{OL} = 16\text{mA}$ | - | 0.15 | 0.4 | V | |
| | High level output voltage | V_{OH} | $V_{CC} = 5\text{V}, I_F = 0\text{mA}$ | 4.9 | - | - | V | |
| | Low level supply current | I_{CCL} | $V_{CC} = 5\text{V}, I_F = 5\text{mA}$ | - | 1.7 | 3.8 | mA | |
| | High level supply current | I_{CCH} | $V_{CC} = 5\text{V}, I_F = 0\text{mA}$ | - | 0.7 | 2.2 | mA | |
| | Transfer characteristics | ^{*3} “High→Low” threshold input current | I_{FHL} | $V_{CC} = 5\text{V}$ | - | 1.0 | 5.0 | mA |
| ^{*4} Hysteresis | | I_{FLH} / I_{FHL} | $V_{CC} = 5\text{V}$ | 0.55 | 0.75 | 0.95 | | |
| Response time | | “High→Low” propagation delay time | t_{PHL} | $V_{CC} = 5\text{V}, I_F = 5\text{mA}$ $R_L = 280\Omega$ | - | 3.0 | 9.0 | μs |
| | | “Low→High” propagation delay time | t_{PLH} | | - | 5.0 | 15.0 | |
| | | Rise time | t_r | | - | 0.1 | 0.5 | |
| | Fall time | t_f | - | | 0.05 | 0.5 | | |

*3 I_{FHL} represents forward current when output changes from high to low.

*4 I_{FLH} represents forward current when output changes from low to high.

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

Recommended Operating Conditions

| Parameter | Symbol | Operating temp. | MIN. | MAX. | Unit |
|--------------------------|----------|------------------|------|------|------|
| Low level output current | I_{OL} | Ta = 0 to + 70°C | - | 16.0 | mA |
| Forward current | I_F | | 10.0 | 20.0 | mA |

Fig. 1 Forward Current vs. Ambient Temperature

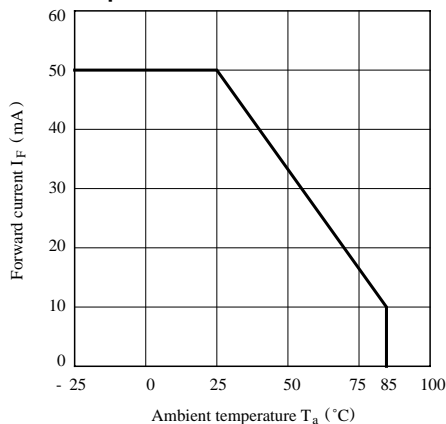


Fig. 2 Output Power Dissipation vs. Ambient Temperature

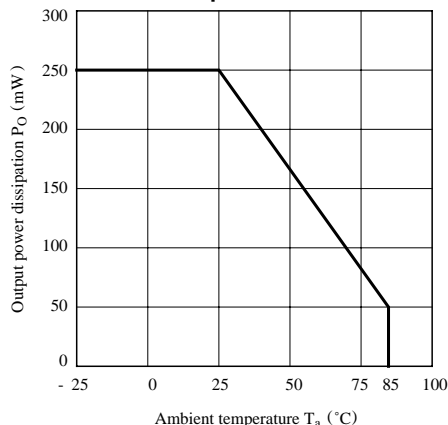


Fig. 3 Low Level Output Current vs. Ambient Temperature

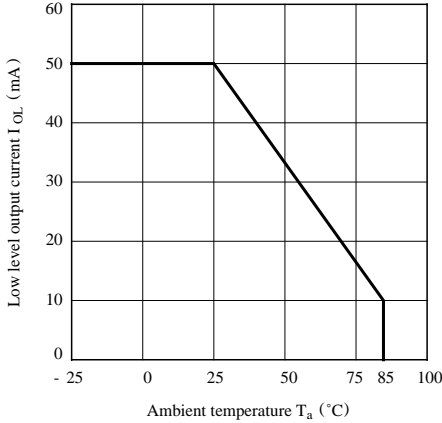


Fig. 4 Forward Current vs. Forward Voltage

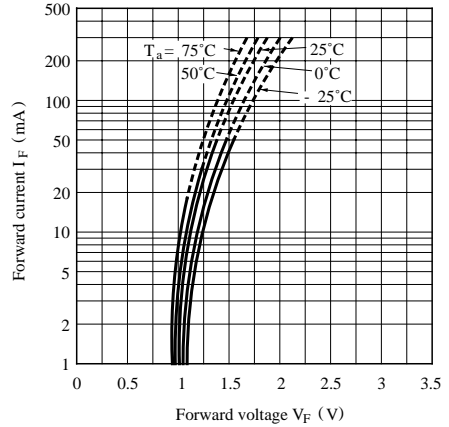


Fig. 5 Relative Threshold Input Current vs. Supply Voltage

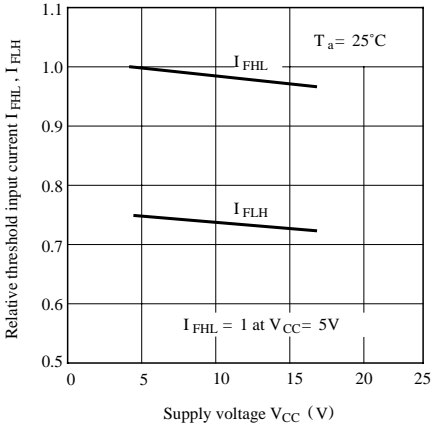


Fig. 6 Relative Threshold Input Current vs. Ambient Temperature

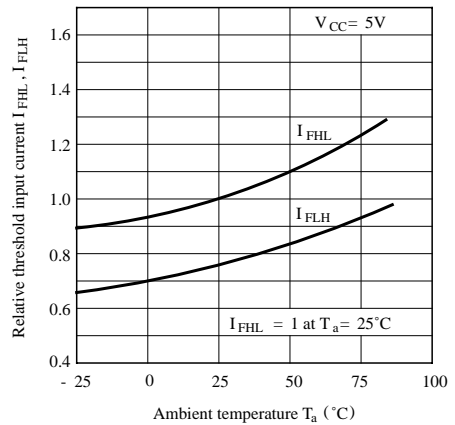


Fig. 7 Low Level Output Voltage vs. Low Level Output Current

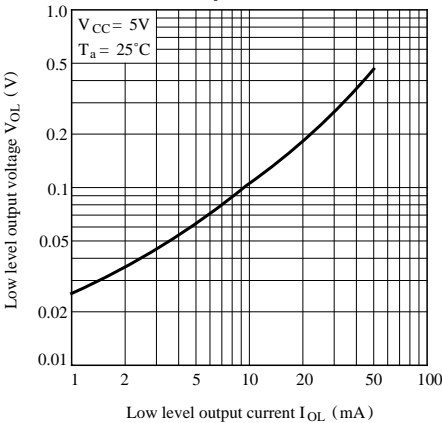


Fig. 8 Low Level Output Voltage vs. Ambient Temperature

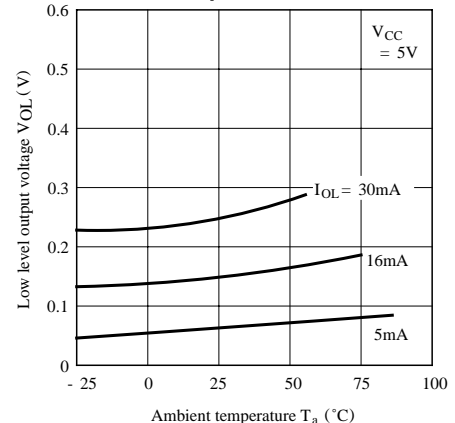


Fig. 9 Supply Current vs. Ambient Temperature

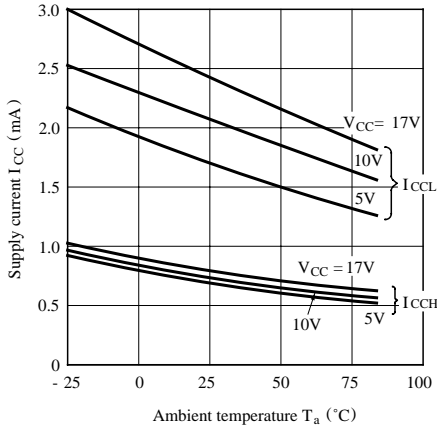


Fig.10 Propagation Delay Time vs. Forward Current

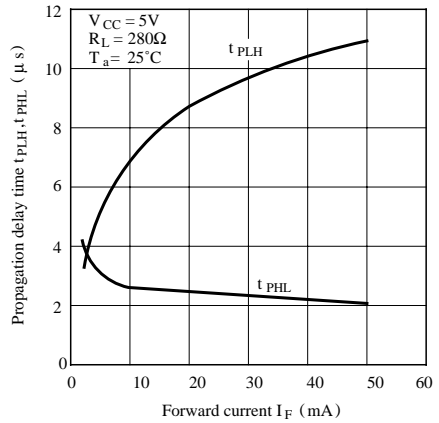
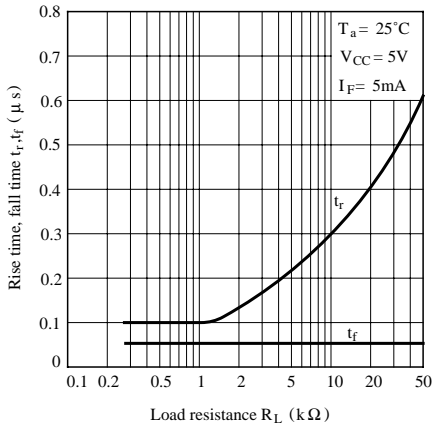
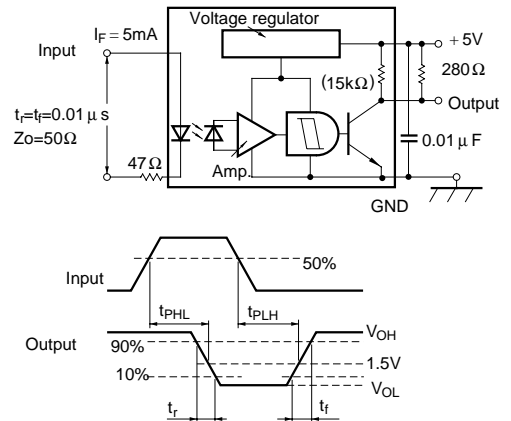


Fig.11 Rise Time, Fall Time vs. Load Resistance



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”.