# GP1A58HR

## OPIC Photointerrupter

### ■ Features

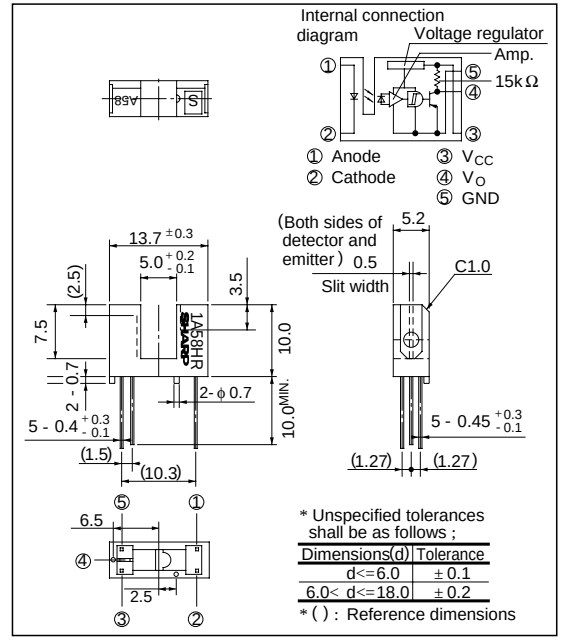
1. High sensing accuracy（Slit width: 0.5mm）
2. PWB mounting type

### ■ Applications

1. OA equipment such as printers, facsimiles, 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

（Ta = 25˚C）

| Paramerter | | Symbol | Rating | Unit |
|---|---|---|---|---|
| Input | Forward currnt | $I_F$ | 50 | mA |
| | *1Peak 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 | mA |
| | 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 |
| *2Soldering temperature | | $T_{sol}$ | 260 | ˚C |

*1 Pulse width<= 100μs, Duty ratio= 0.01
*2 For 5 seconds

" In the absence of confirmation by device specification sheets, SHARP takes no responsibility for any defects that occur in equipment using any of SHARP's devices, shown in catalogs, data books, etc. Contact SHARP in order to obtain the latest version of the device specification sheets before using any SHARP's device."

## ■ Electro-optical Characteristics

(Ta = 25˚C)

| Parameter | | | Symbol | Conditions | MIN. | TYP. | MAX. | Unit |
|---|---|---|---|---|---|---|---|---|
| Input | Forward voltage | | $V_F$ | $I_F$ = 8mA | - | 1.14 | 1.4 | V |
| | Reverse current | | $I_R$ | $V_R$ = 3V | - | - | 10.0 | μA |
| Output | Operating supply voltage | | $V_{CC}$ | - | 4.5 | - | 17.0 | V |
| | Low level output voltage | | $V_{OL}$ | $V_{CC}$ = 5V, $I_F$ = 0mA, $I_{OL}$ = 16mA | - | 0.15 | 0.4 | V |
| | High level output voltage | | $V_{OH}$ | $V_{CC}$ = 5V, $I_F$ = 8mA | 4.9 | - | - | V |
| | Low level supply current | | $I_{CCL}$ | $V_{CC}$ = 5V, $I_F$ = 0mA | - | 1.7 | 3.8 | mA |
| | High level supply current | | $I_{CCH}$ | $V_{CC}$ = 5V, $I_F$ = 8mA | - | 0.7 | 2.2 | mA |
| Transfer characterisitics | *1"Low→High" threshold input current | | $I_{FLH}$ | $V_{CC}$ = 5V | - | 1.5 | 8.0 | mA |
| | *2 Hysteresis | | $I_{FHL}$ /$I_{FLH}$ | $V_{CC}$ = 5V | 0.55 | 0.75 | 0.95 | - |
| | Response time | "Low→High"propagation delay time | $t_{PLH}$ | $V_{CE}$ = 5V, $I_F$ = 8mA, $R_L$ = 280Ω | - | 3.0 | 9.0 | μs |
| | | "High→Low"propagation delay time | $t_{PHL}$ | | - | 5.0 | 15.0 | μs |
| | | Rise time | $t_r$ | | - | 0.1 | 0.5 | μs |
| | | Fall time | $t_f$ | | - | 0.05 | 0.5 | μs |

*1 $I_{FLH}$ represents forward current when output changes from low to high.
*2 $I_{FHL}$ represents forward current when output changes from high to low.

## ■ Recommended Operating Conditions

| Parameter | Symbol | Operating temperature range | MIN. | MAX. | Unit |
|---|---|---|---|---|---|
| Output current | $I_O$ | Ta = 0 to + 70˚C | - | 16.0 | mA |
| Forward current | $I_F$ | | 10.0 | 20.0 | mA |

**Fig. 1 Forward Current vs. Ambient Temperature**

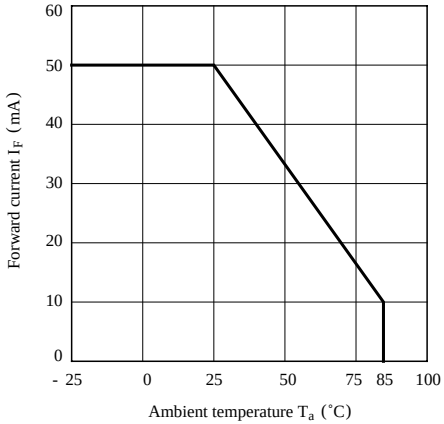



**Fig. 2 Output Power Dissipation vs. Ambient Temperature**

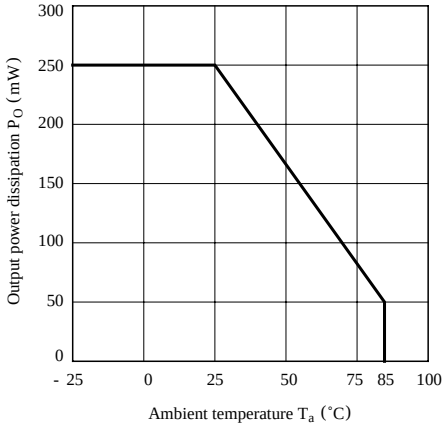


**Fig. 3 Low Level Output Current vs. Ambient Temperature**

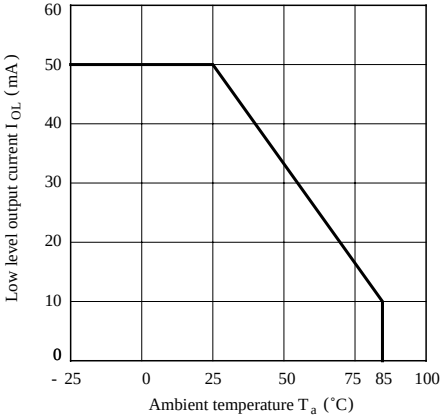



**Fig. 4 Forward Current vs. Forward Voltage**

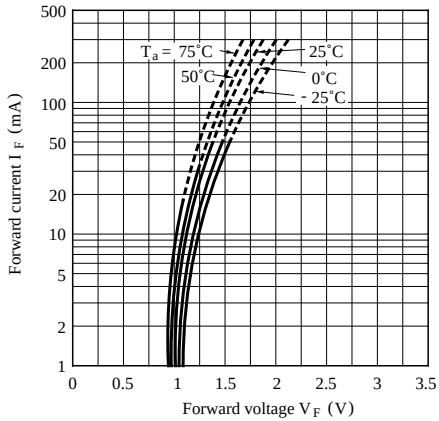



**Fig. 5 Relative Threshold Input Current vs. Supply Voltage**

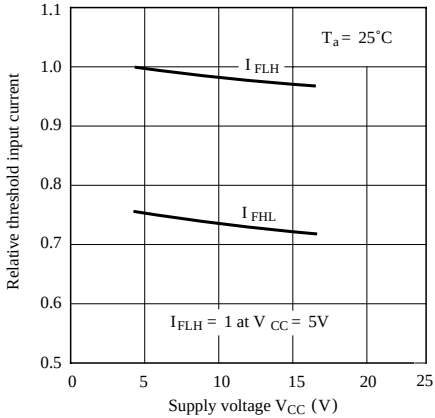



**Fig. 6 Relative Threshold Input Current vs. Ambient Temperature**

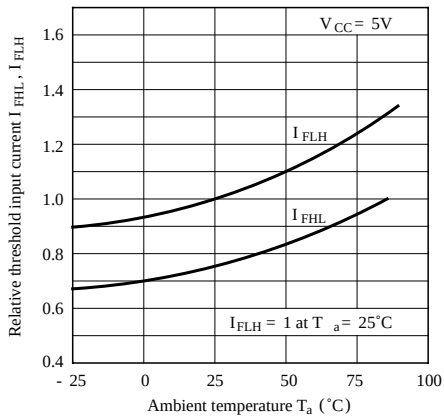



**Fig. 7 Low Level Output Voltage vs. Low Level Output Current**

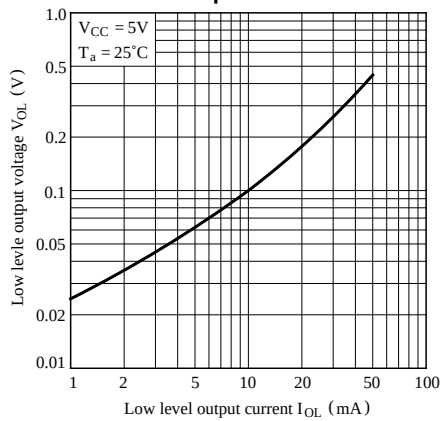



**Fig. 8 Low Level Output Voltage vs. Ambient Temperature**

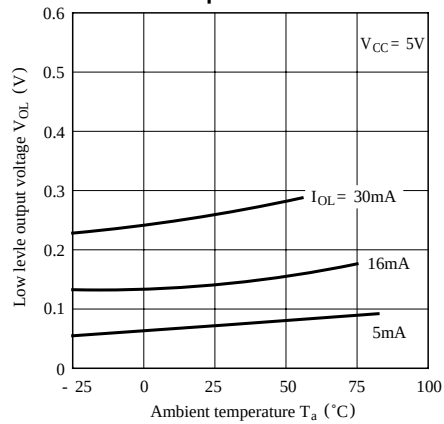


**Fig. 9 Supply Current vs. Ambient Temperature**

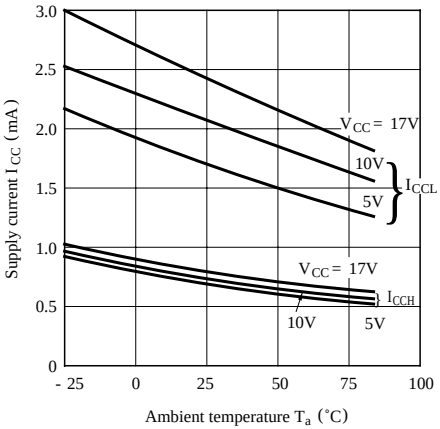



**Fig.10 Propagation Delay Time vs. Forward Current**

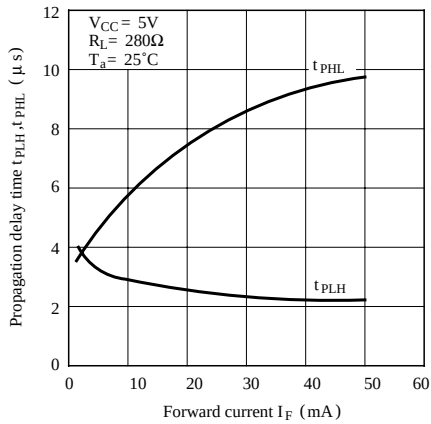
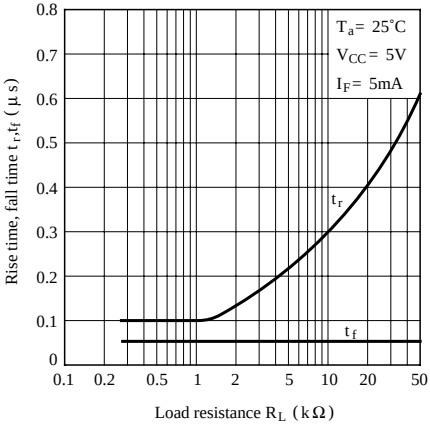
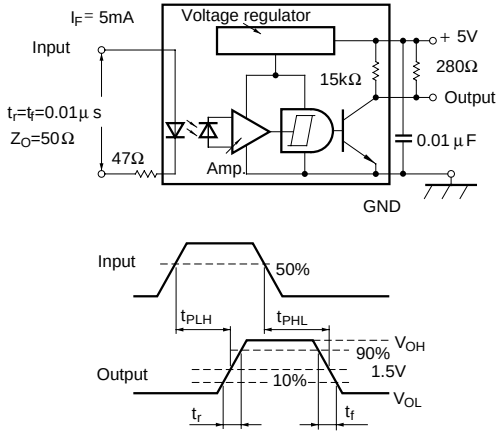



**Fig.11 Rise Time, Fall Time vs. Load Resistance**




**Test Circuit for Response Time**




## ■ Precautions for Use

(1) In order to stabilize power supply line, connect a by-pass capacitor of more than 0.01μF between Vcc and GND near the device.

(2) In case of cleaning, use only the following type of cleaning solvent.
Ethyl alcohol, Methyl alcohol, Isopropyl alcohol

(3) As for other general cautions, refer to the chapter "Precautions for Use".

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