

IS489

Low Voltage Operating Type High Sensitivity OPIC Light Detector

■ Features

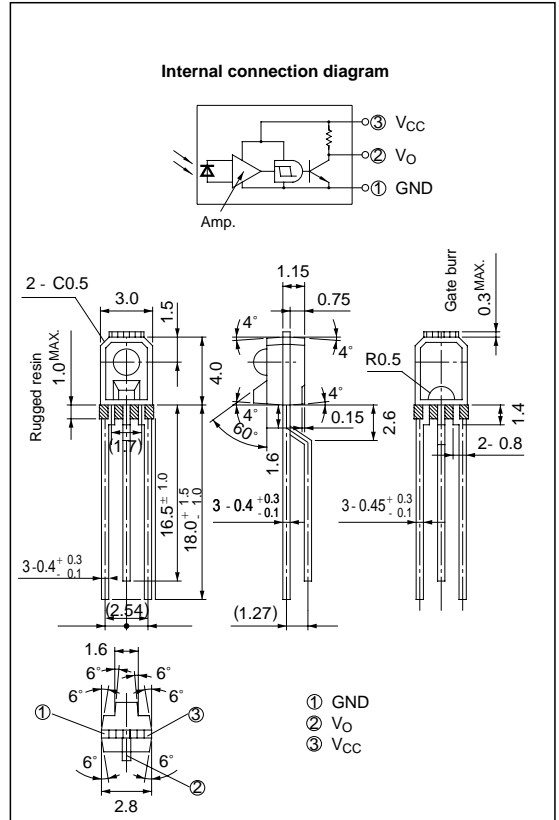
1. Low voltage operating type (V_{CC} : 1.4 to 7.0V)
2. High sensitivity type (E_{VHL} : TYP. 5 lx)
3. Built-in Schmidt trigger circuit
4. Low level output under incident light

■ Applications

1. Amusement equipment
2. Battery-driven portable equipment

■ 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)

| Parameter | Symbol | Rating | Unit |
|----------------------------|-----------|---------------|------|
| Supply voltage | V_{CC} | - 0.5 to + 8 | V |
| *1 Output current | I_o | 2 | mA |
| *2 Total power dissipation | P | 80 | mW |
| Operating temperature | T_{opr} | - 25 to + 85 | °C |
| Storage temperature | T_{stg} | - 40 to + 100 | °C |
| *3 Soldering temperature | T_{sol} | 260 | °C |

*1 Output current vs. ambient temperature : Per Fig. 1

*2 Total power dissipation vs. ambient temperature : Per Fig. 2

*3 For 5 seconds at the position of 1.4 mm from the resin edge

Electro-optical Characteristics

(Ta=0 to 70°C, V_{CC}=3V unless otherwise specified)

| Parameter | | Symbol | Conditions | MIN. | TYP. | MAX. | Unit |
|---|---------------------------------------|-------------------------------------|--|------|------|------|------|
| Low level output voltage | | V _{OL} | I _{OL} = 1mA, E _V = 50 lx | - | 0.1 | 0.4 | V |
| High level output voltage | | V _{OH} | E _V = 0 lx | 2.9 | - | - | V |
| Low level supply current | | I _{CCL} | E _V = 50 lx | - | 0.6 | 1.2 | mA |
| High level supply current | | I _{CCH} | E _V = 0 lx | - | 0.4 | 0.5 | mA |
| *1 "High →Low" threshold illuminance | | E _{VHL} | Ta = 25°C | - | 4.8 | 15 | lx |
| | | | - | - | - | 22 | |
| *2 "Low→High" threshold illuminance | | E _{VLH} | Ta = 25°C | 0.6 | 3.7 | - | lx |
| | | | - | 0.4 | - | - | |
| *3 Hysteresis | | E _{VLH} / E _{VHL} | Ta = 25°C | 0.55 | 0.75 | 0.95 | - |
| Response time | "High→Low" propagation delay time | t _{PHL} | E _V = 125 lx or equivalent R _L = 3kΩ Ta = 25°C | - | 1.3 | 15 | μs |
| | "Low →High" propagation delay time | t _{PLH} | | - | 8.5 | 30 | |
| | Rise time | t _r | | - | 0.1 | 3.0 | |
| | Fall time | t _f | | - | 0.06 | 1.0 | |
| Peak sensitivity wavelength | | λ _P | - | - | 900 | - | nm |

*1 E_{VHL} represents illuminance by CIE standard light source A (tungsten lamp) when output changes from "high" to "low".

*2 E_{VLH} represents illuminance by CIE standard light source A (tungsten lamp) when output changes from "low" to "high".

*3 Hysteresis standards for E_{VLH}/E_{VHL}.

Recommended Operating Conditions

(Ta=25°C)

| Parameter | Symbol | MIN. | MAX. | Unit |
|----------------|-----------------|------|------|------|
| Supply voltage | V _{CC} | 1.4 | 7.0 | V |
| Output current | I _{OL} | - | 1.0 | mA |

Fig. 1 Output Current vs. Ambient Temperature

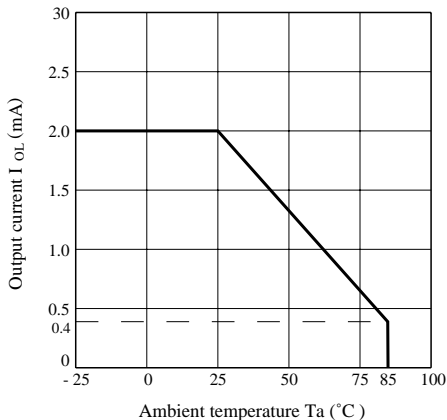


Fig. 2 Output Power Dissipation vs. Ambient Temperature

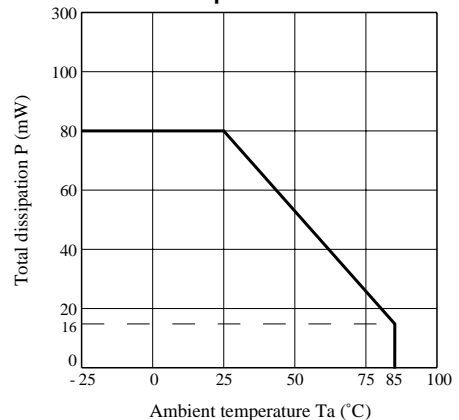


Fig. 3 Low Level Output Voltage vs. Low Level Output Current

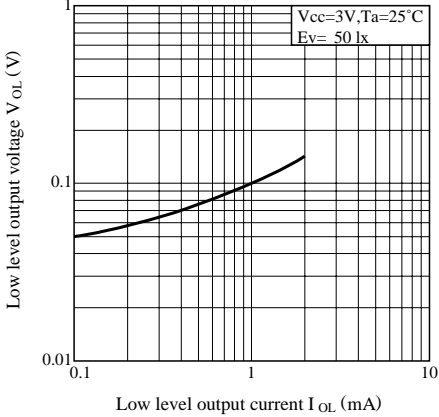


Fig. 4 Supply Current vs. Ambient Temperature

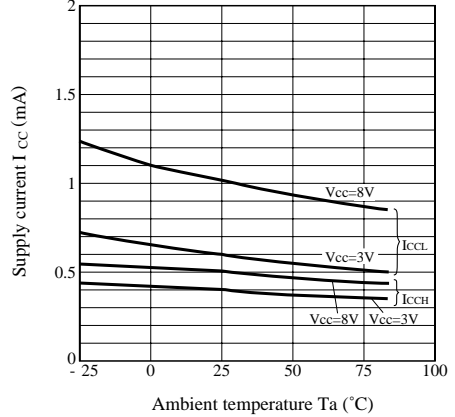
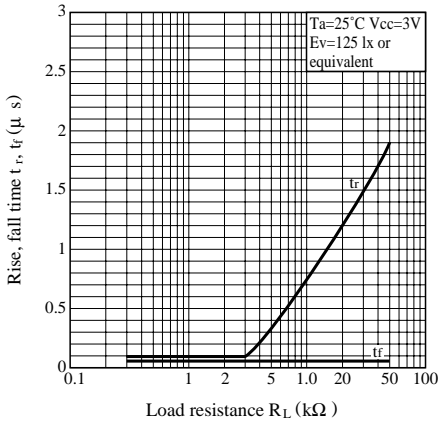


Fig. 5 Rise, Fall Time vs. Load Resistance



Test Circuit for Response Time

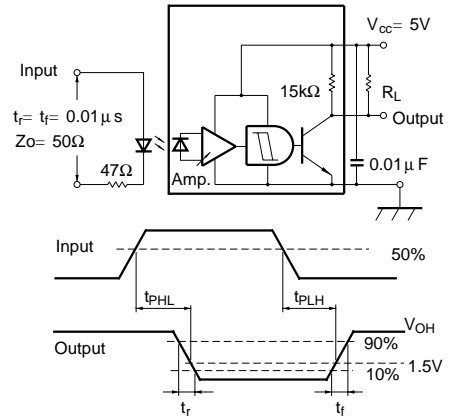


Fig. 6 Radiation Diagram (T_a=25 °C)

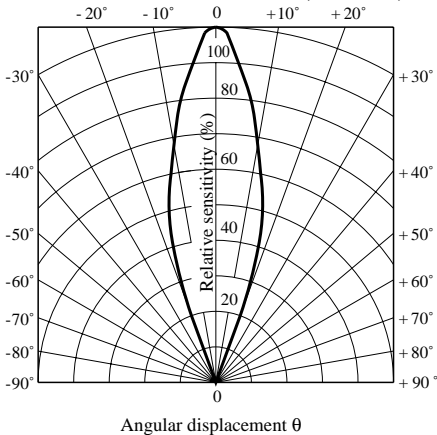
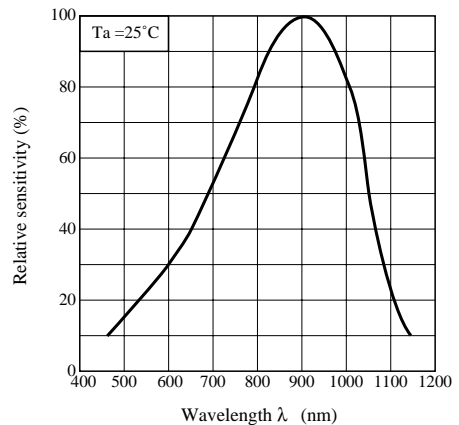


Fig. 7 Spectral Sensitivity



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