IS489

Low Voltage Operating Type High Sensitivity OPIC Light Detector

■ Features

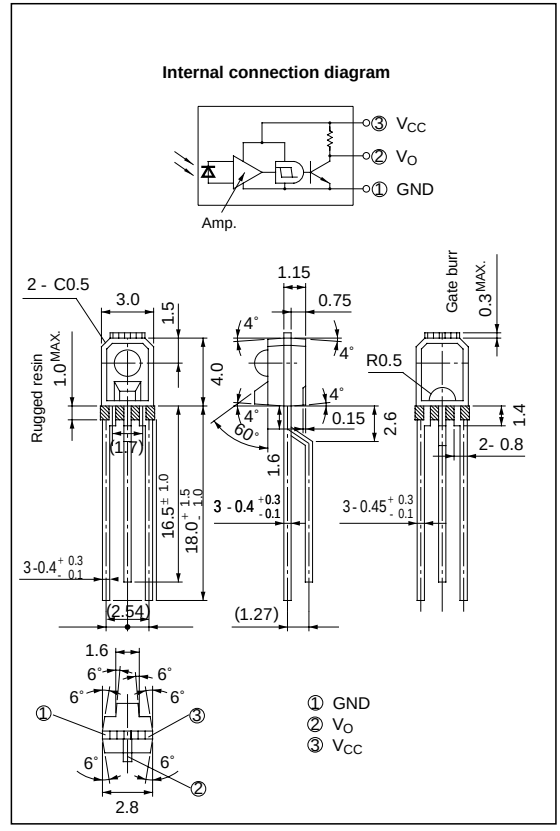
1. Low voltage operating type (Vcc : 1.4 to 7.0V)
2. High sensitivity type (E_{VHL} : TYP. 5 lx)
3. Built-in Schmidt trigger circuit
4. Low level output under incident light

■ 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	Io	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}	Ev = 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

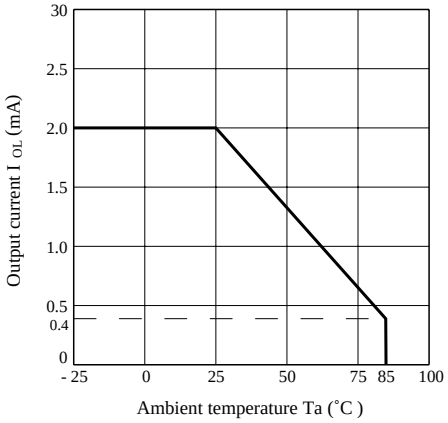


Fig. 2 Output Power Dissipation vs. Ambient Temperature

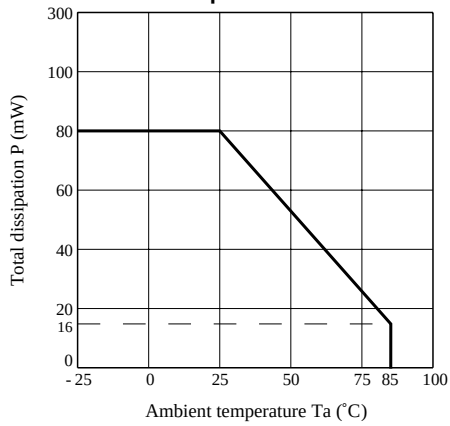


Fig. 3 Low Level Output Voltage vs. Low Level Output Current

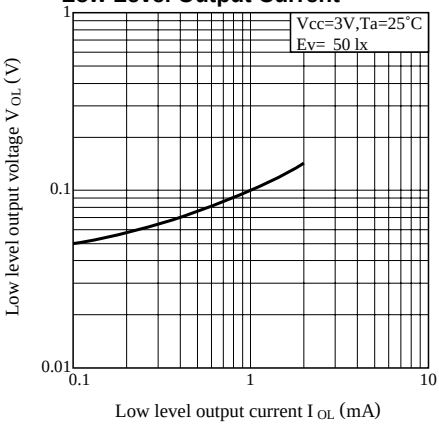


Fig. 4 Supply Current vs. Ambient Temperature

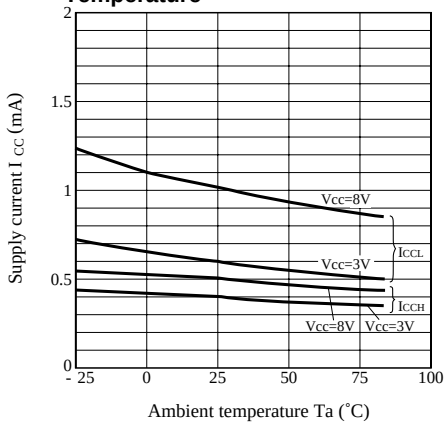
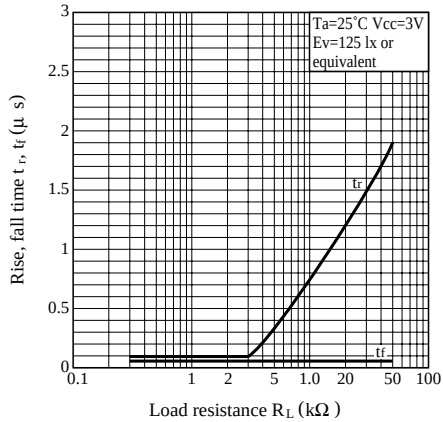


Fig. 5 Rise, Fall Time vs. Load Resistance



Test Circuit for Response Time

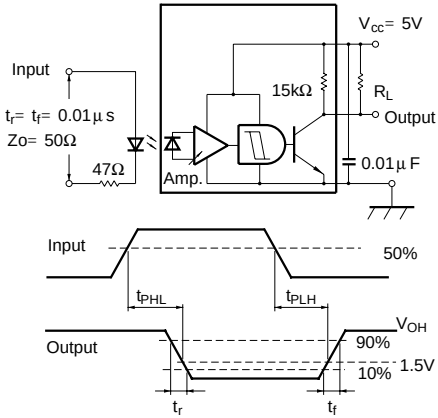


Fig. 6 Radiation Diagram

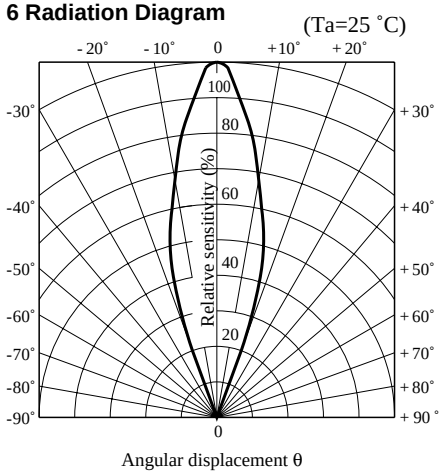
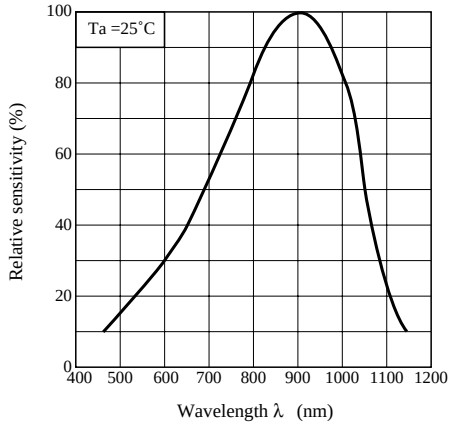


Fig. 7 Spectral Sensitivity



● Please refer to the chapter "Precautions for Use". (Page 78 to 93)