IS456

High Speed Response Type OPIC Light Detector

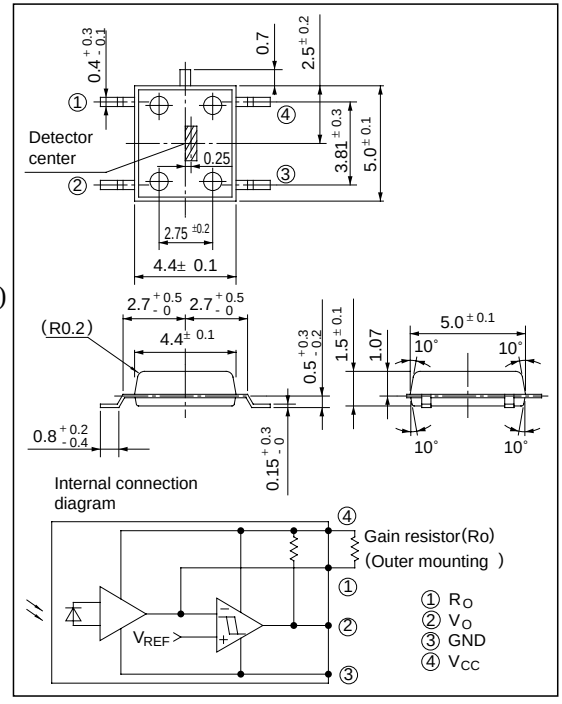
■ Features

1. High speed response (t_{PHL} : TYP.230ns)
2. Uses a pattern to allow for possible positional deviation of the semiconductor laser spot.
3. Compact, mini-flat package

■ Applications

1. Laser beam printers

■ Outline Dimensions (Unit : mm)

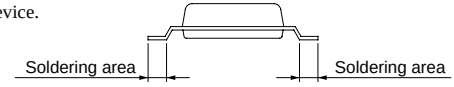


*"OPIC" (Optical IC) is a trademark of the SHARP Corporation. An OPIC consists of a light-detecting element and signal-processing circuit integrated onto a single chip.

■ Absolute Maximum Ratings (Ta= 25°C)

Parameter	Symbol	Rating	Unit
*1Supply voltage	V_{CC}	-0.5 to + 7	V
High level output voltage	V_{OH}	7	V
Low level output current	I_{OL}	20	mA
Operating temperature	T_{opr}	-25 to + 80	°C
Storage temperature	T_{stg}	-40 to + 85	°C
*2Soldering temperature	T_{sol}	260	°C
Power dissipation	P	150	mW
R_O terminal power dissipation	P_{RO}	24	mW
*3Incident light intensity	P_I	5	mW
*3Radiant intensity	E_e	60	WB

*1 For 1 minute
*2 For 3 seconds at the position shown in the following drawing.
*3 Maximum allowable incident light intensity and radiant intensity of laser beam (λ = 780nm) to the device.



■ Electro-optical Characteristics (V_{CC} = 5V, Ta= 25°C)

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
High level output voltage		V_{OH}	R_O=51kΩ, E_V=0	4.9	-	-	V
Low level output voltage		V_{OL}	I_{OL}=10mA, E_V=1 000lx	-	0.4	0.6	V
High level supply current		I_{CCH}	R_O=51kΩ, E_V=0	-	2.6	4.5	mA
Low level supply current		I_{CCL}	R_O=51kΩ, E_V=1 000lx	-	3.8	6.6	mA
*4 "High→Low" threshold illuminance 1		E_{VHL1}	R_O=51kΩ	330	470	600	lx
*4 "High→Low" threshold illuminance 2		E_{VHL2}	R_O=5.1kΩ	-	5 800	-	lx
"High→Low" threshold incident light intensity		P_{IHL}	R_O=5.1kΩ, λ =780nm	-	100	-	μW
Response time	"High→Low" propagation delay time	t_{PHL}	C_L=15pF, Duty=1: 1 P_I=0.2mW, λ =780nm R_O=5.1kΩ, R_L=510Ω	-	230	400	ns
	"Low→High" propagation delay time	t_{PLH}		-	230	400	ns
	Rise time	t_r		-	60	200	ns
	Fall time	t_f		-	20	100	ns

*4 E_{VHL}1, E_{VHL}2 represent illuminance by CIE standard light source A(tungsten lamp) when output goes from high to low.

■ Recommended Operating Conditions

Parameter	Symbol	MIN.	MAX.	Unit
Operating supply voltage	V_{cc}	4.5	5.5	V
Operating temperature	T_{opr}	0	60	˚C
Incident light intentity (λ = 780nm)	P_I	-	2.5	mW

In order to stabilize power supply line, connect a by-pass capacitor of 0.1µF between Vcc and GND near the device.

Fig. 1 Total Power Dissipation vs. Ambient Temperature

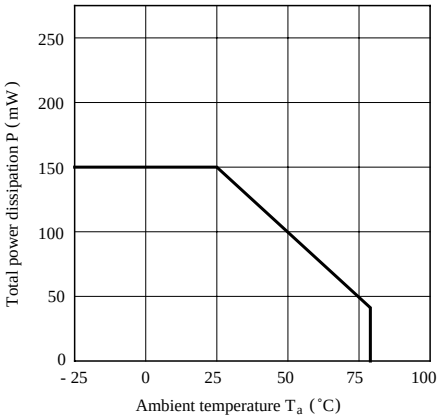


Fig. 2 Low Level Output Voltage vs. Low Level Output Current

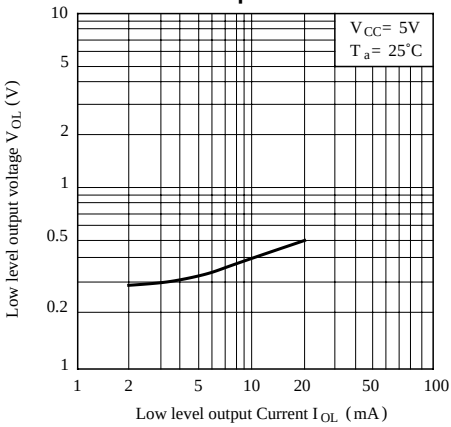


Fig. 3 Low Level Output Voltage vs. Ambient Temperature

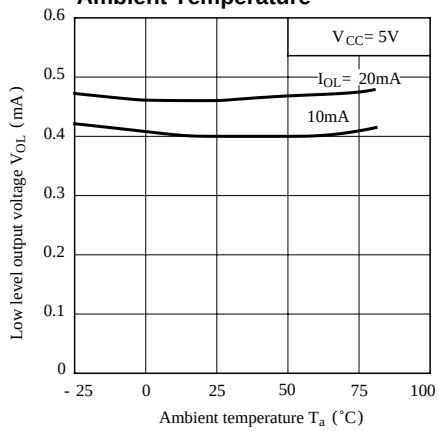


Fig. 4 Supply Current vs. Supply Voltage

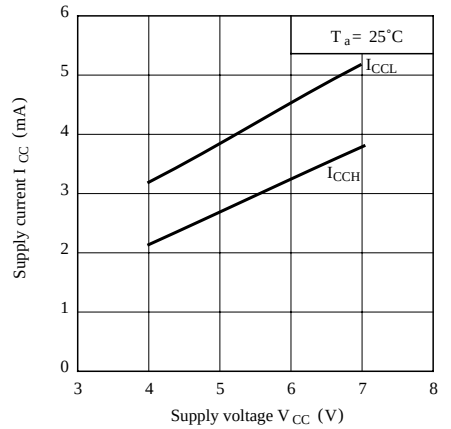


Fig. 5 Supply Current vs. Ambient Temperature

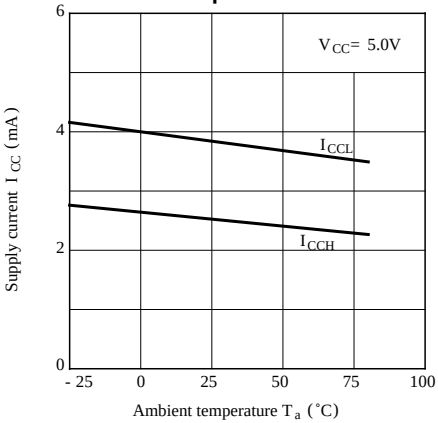


Fig. 6 "High→Low" Threshold Incident Light Intensity vs. Gain Resistanse

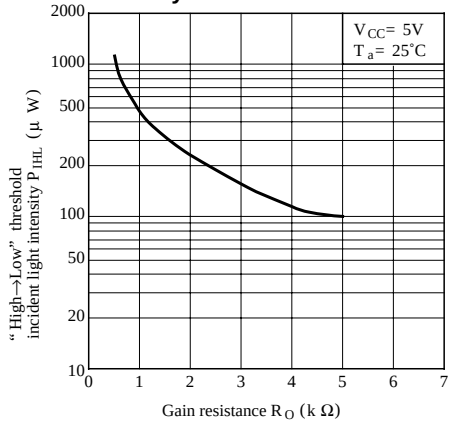


Fig. 7 "High→Low" Threshold Incident Light Intensity vs. Ambient Temperature

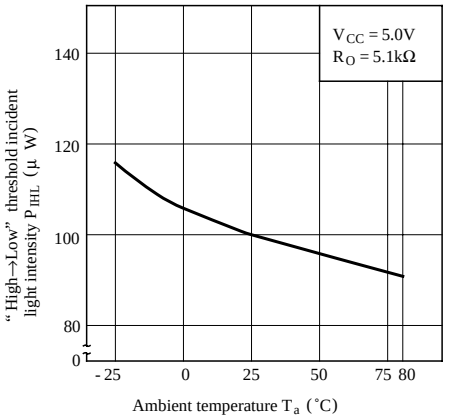


Fig. 8 "High→Low" Threshold Incident Light Intensity vs. Supply Voltage

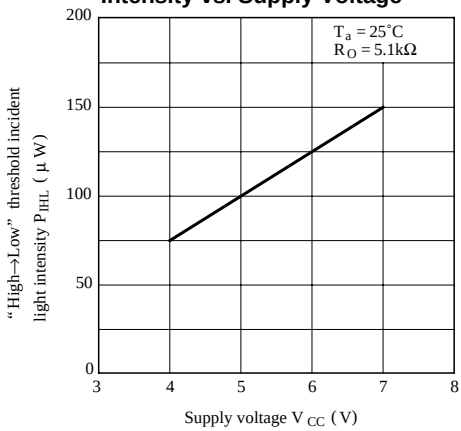


Fig. 9 Propagation Delay Time vs. Incident Light Intensity

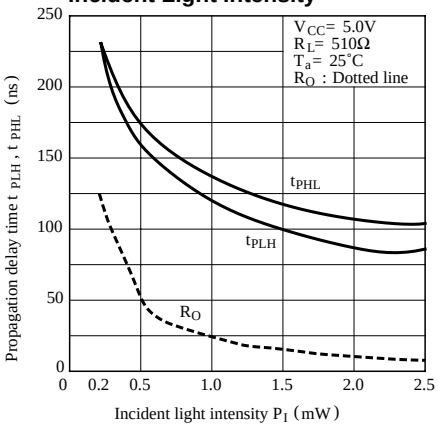


Fig.10 Propagation Delay Time vs. Gain Resistance

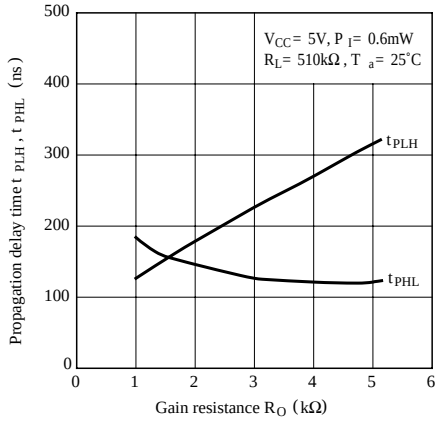


Fig.11 Propagation Delay Time vs. Ambient Temperature

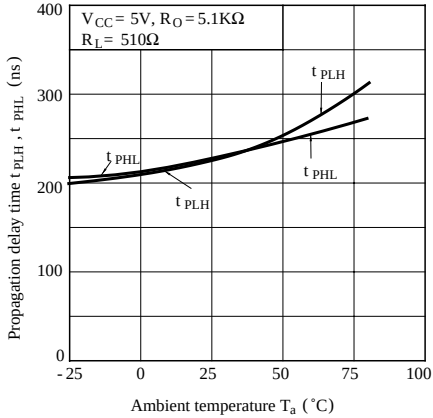


Fig.12 Rise Time, Fall Time vs. Load Resistance

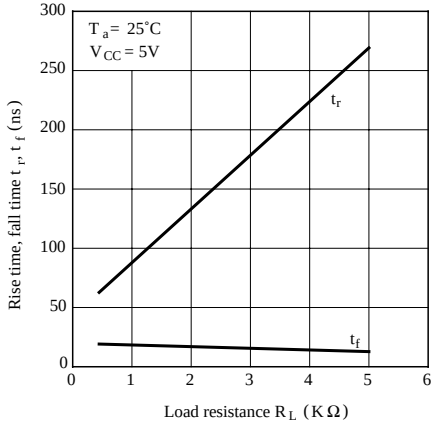


Fig.13 Rise Time, Fall Time vs. Ambient Temperature

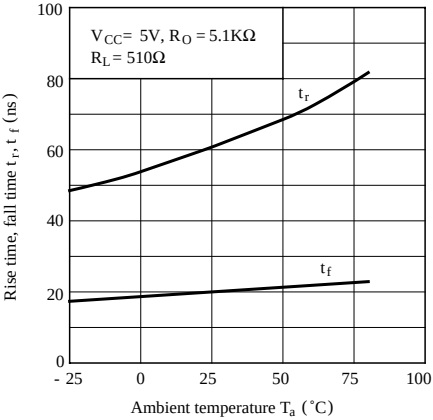
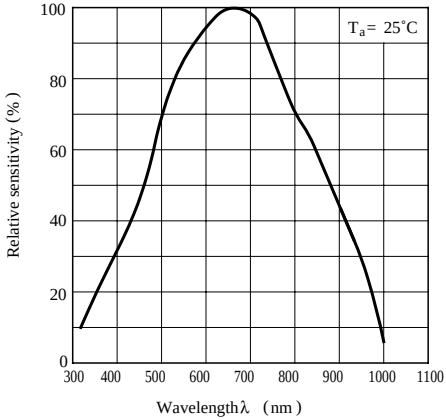
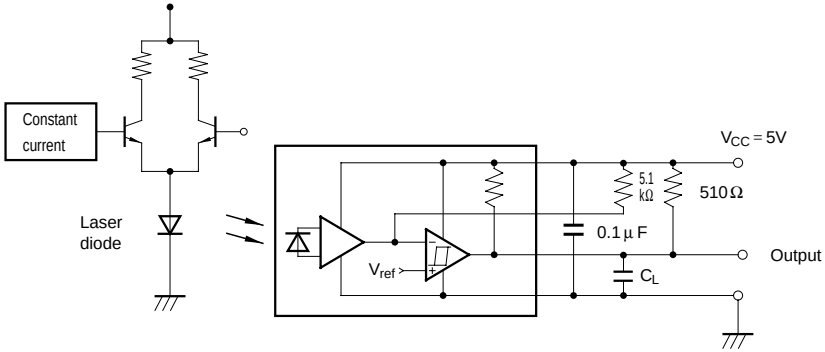
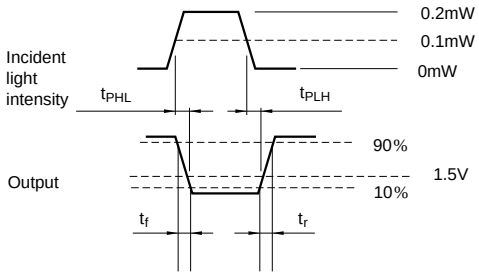


Fig.14 Spectral Sensitivity



Test Circuit for Response Time





● Please refer to the chapter "Precautions for Use."

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