1s457

High Speed Response OPIC Light Detector

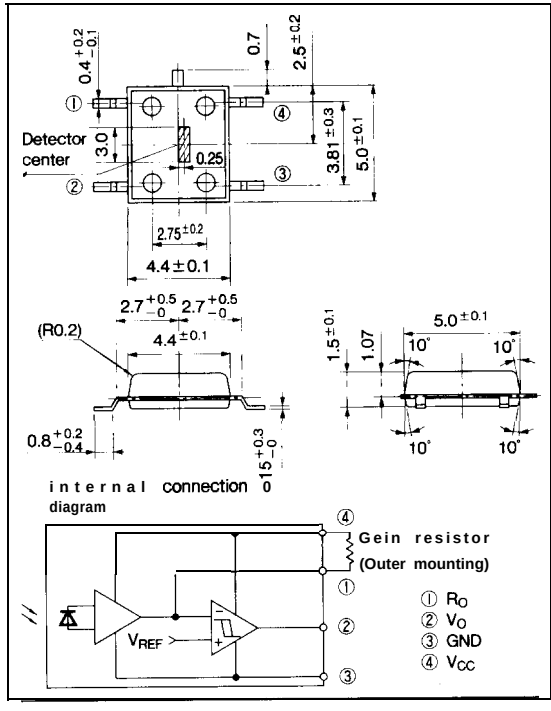
■ Features

1. High speed response
   (t_{PHL} : TYP. 300ns)
2. Uses a pattern to allow positional deviation of the semiconductor laser spot (Chip size: 0.5mm X3.0mm)
3. Open collector output
4. Capable of sensitivity adjustment due to external resistor

■ Applications

1. Laser beam printers

■ Outline Dimensions (Unit : mm)

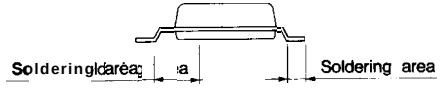


*"OPIC" (Optical IC) is a trademark of the SHARP Corporation. An OPIC consists of a light-detecting element and signal processing circuit integrated onto a single chip.

■ Absolute Maximum Ratings (T_a=25℃)

Parameter	Symbol	Rating	Unit
*1Supply voltage	Vcc	−0.5to +7	V
High level output voltage	V_{OH}	7	V
Low level output current	I_{OL}	40	mA
Operating temperature	T_{opr}	−25 to +80	℃
Storage temperature	T_{stg}	−40to +85	℃
*2Soldering temperature	T_{sol}	260	℃
Power dissipation	P	150	mW
RO terminal power dissipation	pRO	24	mW
*3Incident light intensity	PI	5	mW
*3Radiant intensity	E_e	60	W/cm²

*1 For 1 minute
*2 For 3 seconds at the position ahown in the 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℃)

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
High level output current		I_{OH}	R_O=51k Ω, E_V=0lx	−	−	100	μA
Low level output voltage		V_{OL}	I_{OL}=40mA, E_V=1 000lx	−	0.35	0.52	v
High level supply current		I_{CCH}	R_O=51kΩ, Ev=OIX	−	3.0	6.5	mA
Low level supply current		ICCL	R_O=51k Q, E_V=1000lx	−	5.8	8.6	mA
Ro terminal OFF set current		I_{OSRO}	R_O=5.1kΩ	−	8	15	μA
*4 "High→Low" threshold illuminance 1		E_{VHL1}	R_O=51k Q	250	360	470	lx
*4 "High→Low" threshold illuminance 2		E_{VHL2}	R_O=5.1kΩ	−	4500	–	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	−	300	500	ns
	"Low-High" propagation delay time	tPLH		−	300	500	ns
	Rise time	t_r		−	100	500	ns
	Fall time	t_f		−	50	200	ns

*4 Ev, E_{VHL} represent illuminance by CIE standard light source A (tungsten lamp).

■ 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 intensity (λ = 780nm)	P_I	−	2.5	mW
Gain resistance	Ro	0,39	5.1	kΩ

In order to stabilize power supply line, connect a by-pass capacitor of 0.1 μF between Vcc and GND at the position of 1cm or less from lead pins.

Fig. 1 Total Power Dissipation vs. Ambient Temperature

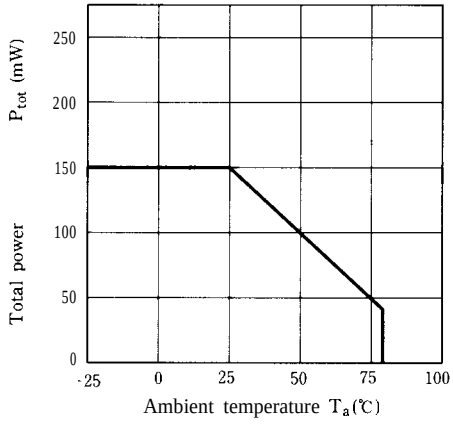
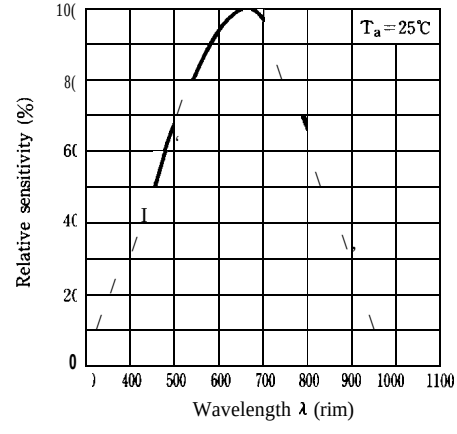
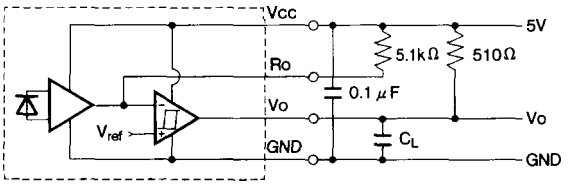


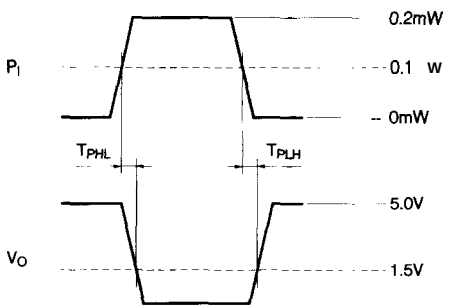
Fig. 2 Spectral Sensitivity Ambient Temperature (TYP.)



Test Circuit for Response Time



Notes 1) CL includes probe and wiring capacity.
2) Connect a by-pass ceramic capacitor of 0.1 μF between Vcc and GND at tbe position within 1cm from lead pins.



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