IS487/IS488

Built-in Amp.Type OPIC Light Detector

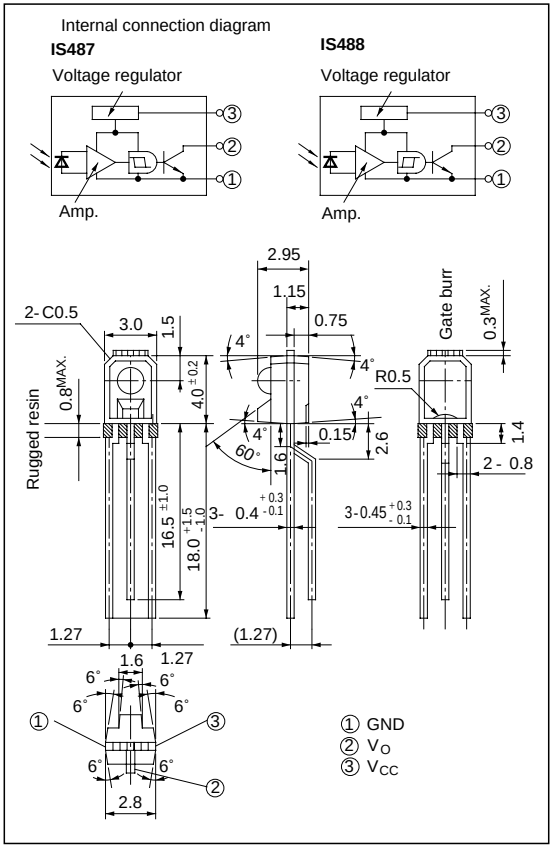
■ Features

1. Compact type
2. Built-in schmidt trigger circuit
3. LSTTL and TTL compatible output
4. Open collector output
5. Low level output under incident light (IS487)
   High level output under incident light (IS488)
6. A wide range of operating supply voltage (V_{CC} : 4.5 to 17v)

■ Applications

1. Floppy disk drive Units
2. Copiers, printers, facsimiles
3. VCRs
4. Automatic vending machines

■ 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 + 35	V
Output voltage	V_O	- 0.5 to + 40	V
Output current	I_O	50	mA
Power dissipation	P	175	mW
Operating temperature	T_{opr}	- 25 to +85	°C
Storage temperature	T_{stg}	- 40 to +100	°C
*1 Soldering temperature	T_{sol}	260	°C

*1 For 5 seconds at the position of 1.4mm from the bottom face of resin package

■ Electro-optical Characteristics

(Unless otherwise specified, Ta= 0 to 70˚C, V_{CC}= 5V)

Parameter			Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Low level output voltage			V_{OL}	*2 I_{OL} = 16mA	-	0.15	0.4	V
High level output current			I_{OH}	*3 V_{CC} = 20V, V_O= 30V	-	-	100	μA
Low level supply current			I_{CCL}	*2	-	1.3	3.4	mA
High level supply current			I_{CCH}	*3	-	0.7	2.2	mA
*4 "High→Low" Threshold illuminance		IS487	E_{VHL}	T_a = 25˚C, R_L= 280Ω	-	15	35	lx
				R_L = 280Ω	-	-	50	
		IS488		T_a = 25˚C, R_L= 280Ω	1.5	10	-	
				R_L = 280Ω	1	-	-	
*5 "Low→High" Threshold illuminance		IS487	E_{VLH}	T_a = 25˚C, R_L= 280Ω	1.5	10	-	lx
				R_L = 280Ω	1	-	-	
		IS488		T_a = 25˚C, R_L= 280Ω	-	15	35	
				R_L = 280Ω	-	-	50	
*6 Hysteresis		IS487	E_{VLH}/E_{VHL}	T_a= 25˚C, R_L= 280Ω	0.50	0.65	0.90	-
		IS488	E_{VHL}/E_{VLH}					
Response time	"Low→High" Propagation time	IS487	t_{PLH}	T_a= 25˚C E_V= 50lx R_L= 280Ω	-	5	15	μs
		IS488			-	3	9	
	"High→Low" Propagation time	IS487	t_{PHL}		-	3	9	
		IS488			-	5	15	
	Rise time		t_r		-	0.1	0.5	
	Fall time		t_f		-	0.05	0.5	

*2 Defines E_V = 50lx (**IS487**) and E_V = 0 (**IS488**).
*3 Defines E_V = 0 (**IS487**) and E_V = 50lx (**IS488**).
*4 E_{VHL} represents illuminance by CIE standerd light source A (tungsten lamp) when output changes from high to low.
*5 E_{VLH} represents illuminance by CIE standerd light source A (tungsten lamp) when output changes from low to high.
*6 Hysteresis stands for E_{VLH}/E_{VHL} (**IS487**) and E_{VHL}/E_{VLH} (**IS488**).

■ Recommended Operating Conditions

Parameter	Symbol	MIN.	MAX.	Unit
Supply voltage	V_{CC}	4.5	17	V
Output current	I_{OL}	-	16	mA

In order to stabilize power supply line, connect a by-pass capacitor of 0.01μF or more between V_{CC} and GND near the device.

Fig. 1 Low Level Output Current vs. Ambient Temperature

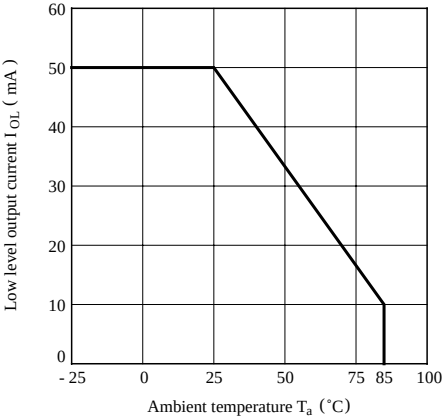


Fig. 2 Power Dissipation vs. Ambient Temperature

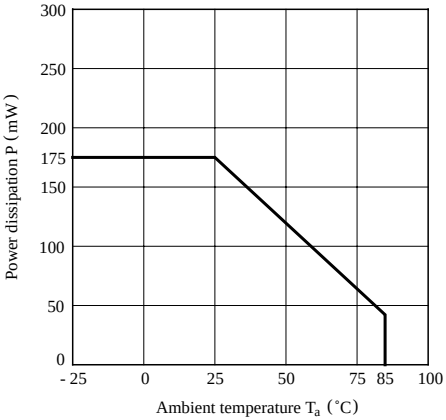


Fig. 3 Relative Threshold Illuminance vs. Supply Voltage

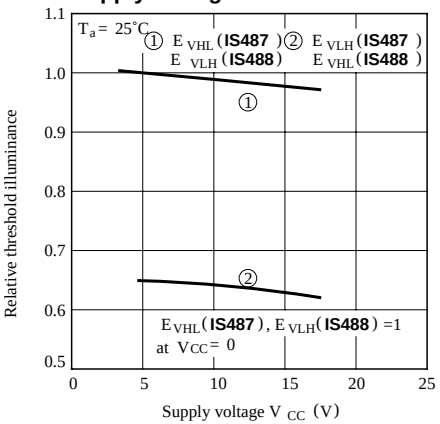


Fig. 4 Low Level Output Voltage vs. Ambient Temperature

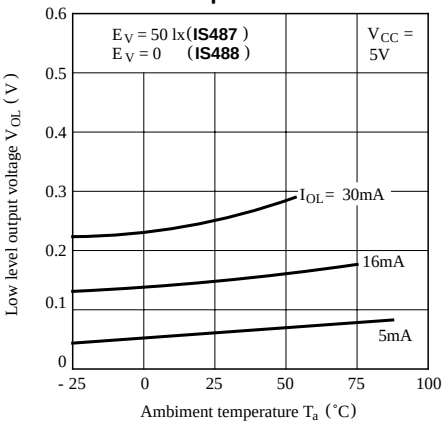


Fig. 5 Supply Current vs. Ambient Temperature

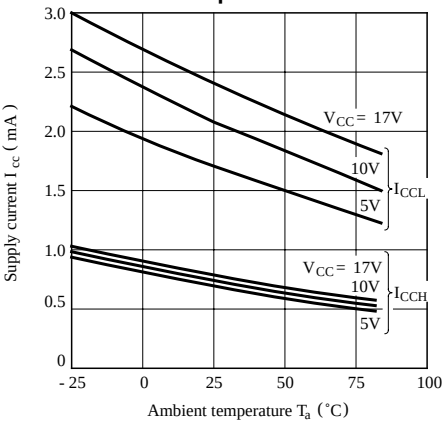


Fig. 6 Propagation Delay Time vs. Illuminance

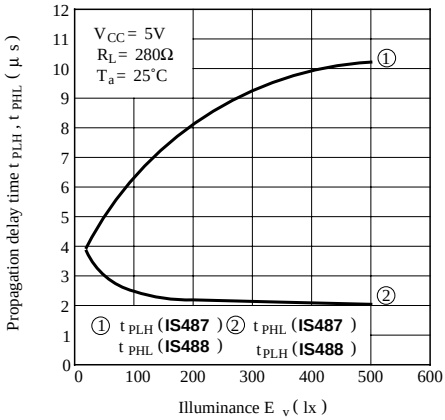
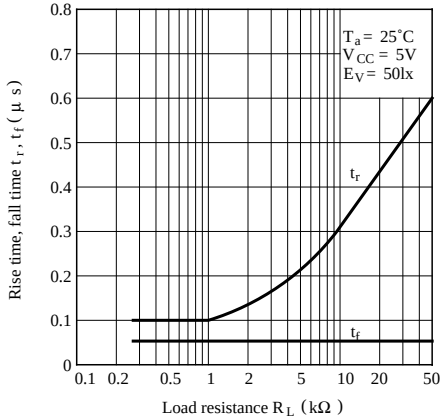
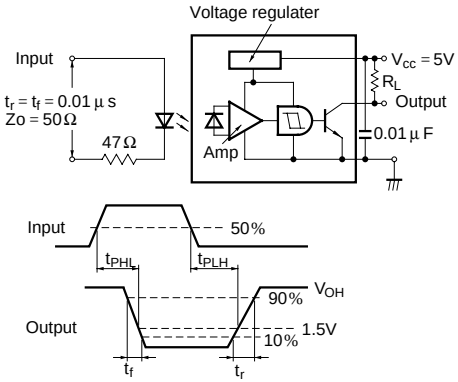


Fig. 7 Rise Time, Fall Time vs. Load Resistance



Test Circuit for Response Time (IS487)



Test Circuit for Response Time (IS488)

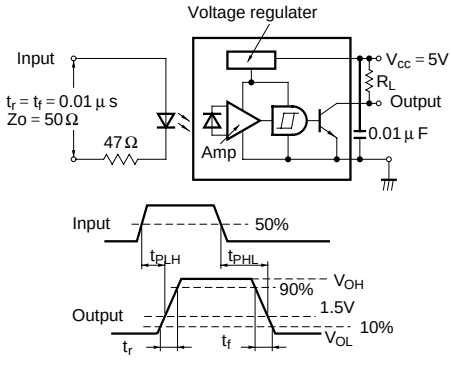


Fig. 8 Sensitivity Diagram

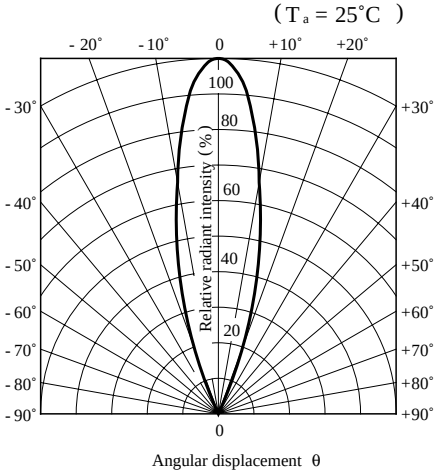
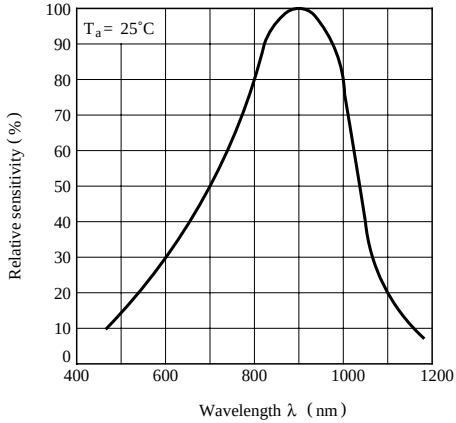


Fig. 9 Spectral Sensitivity



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