1S487/1S488

Built-in Amp.Type OPIC Light Detector

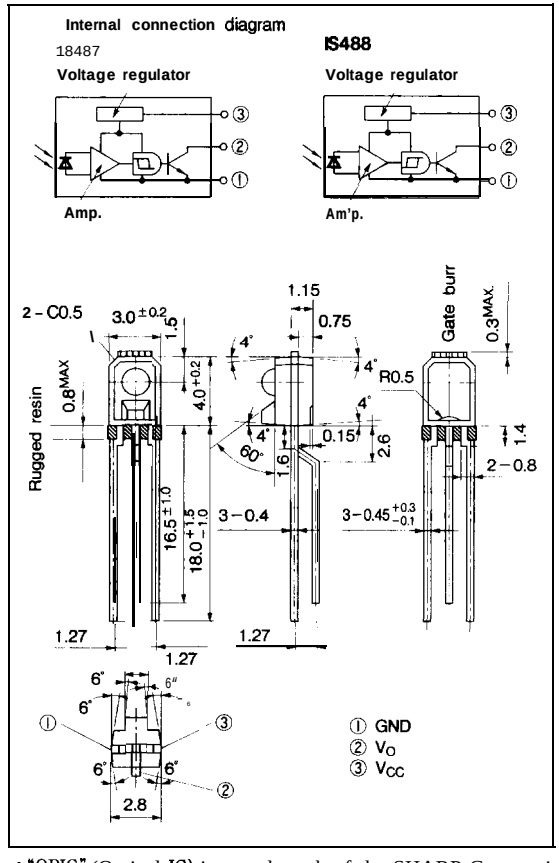
■ Features

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} : -0.5 to +35V)

■ 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 tbe SHARP Corporation
An OPIC consists of a light-detecting element and signal. processing circuit integrated onto a single chip,
Unspecified to tolerance shall be ±0.2mm.

■ Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Rating	Unit
Supply voltage	Vcc	-0.5 to +35	V
Output voltage	Vo	-0.5 to +40	V
Output current	Io	50	mA
Power dissipation	P	175	mW
Operating temperature	T_{opr}	-25 to +85	℃
Storage temperature	T_{stg}	-40 to +100	℃
*1 Soldering temperature	T_{sol}	260	℃

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

■ Electro-optical Characteristics

(Unless otherwise specified, Ta=O 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℃, R_L=280Ω	−	15	35	1x
			R_L = 280 Ω	−	·	50	
	IS488		T_a=25℃, R_L=280Ω	1.5	10	−	
			R_L = 280 Ω	1	−	−	
*5 "Low→ High" Threshold illuminance	IS487	E_{VLH}	T_a=25℃, R_L=280Ω	1.5	10	−	lx
			R_L=280Ω	1	−	−	
	IS488		T_a=25℃, R_L=280Ω	−	15	35	
			R_L=280Ω	−	−	50	
*Hysteresis	IS487	E_{VLH}/E_{VHL}	T_a=25℃, RL= 280 Ω	0.50	0.65	0.90	
	IS488	E_{VHL}/E_{VLH}					
Response time "Low→ High" Propagation time	IS487	tPLH	T_a=25℃ E_V=501x R_L = 280 Ω	−	5	15	μs
	IS488			−	3	9	
"Hight →Low" Propagation time	IS487	tPHL		−	3	9	
	IS488			−	5	15	
Rise time		t_r			0.1	0.5	
Fall time		t_f		−	0.05	0.5	

*2 Defines Ev =501x (S487) and Ev= O (S488),
*3 Defines Ev= 0 (18487) and Ev = 501x (18488).
*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} 6488).

■ 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 0.01 μF or more between V_{CC} and GND near the device.

Fig. 1 Low Level Output Current vs. Ambient Temperature

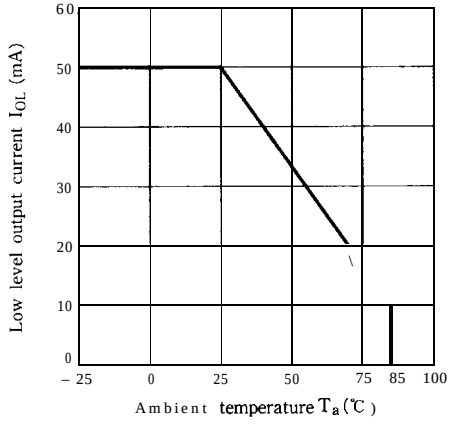


Fig. 2 Power Dissipation vs. Ambient Temperature

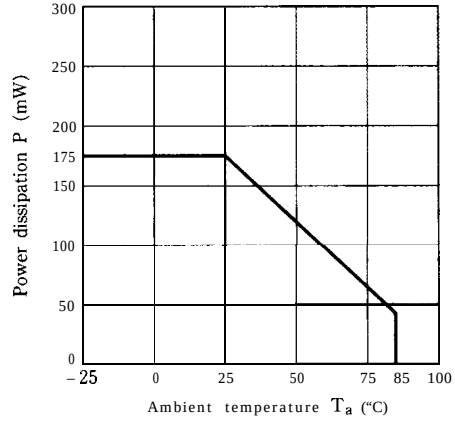


Fig. 3 Relative **Threshold Illuminance vs. Supply** V -

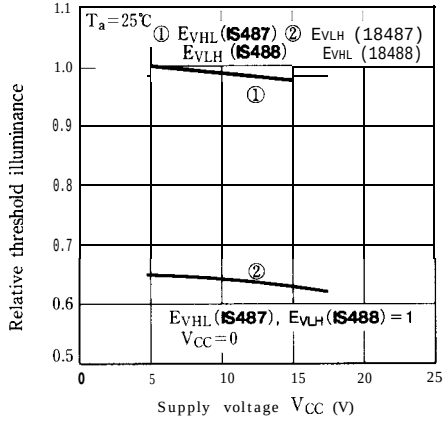


Fig. 4 Low Level Output Voltage vs. Ambient Temperature

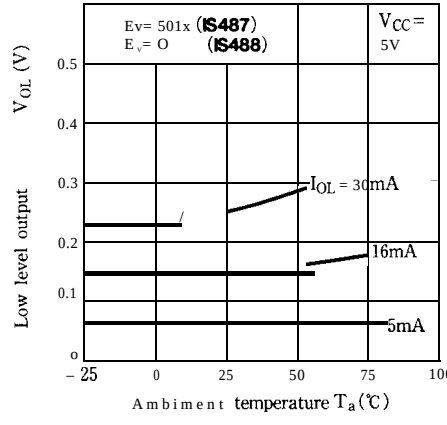


Fig. 5 Supply Current vs. Ambient Temperature

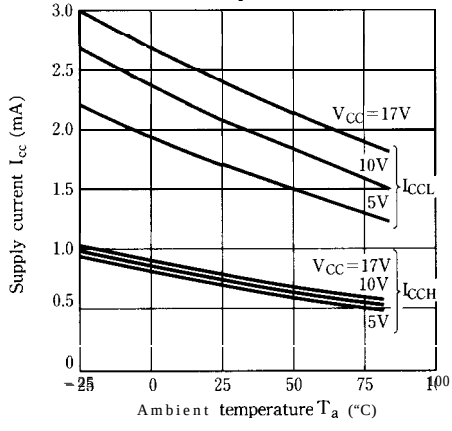


Fig. 6 Propagation Delay Time vs. Illuminance

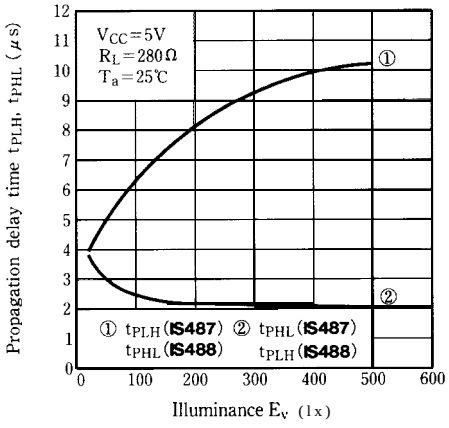
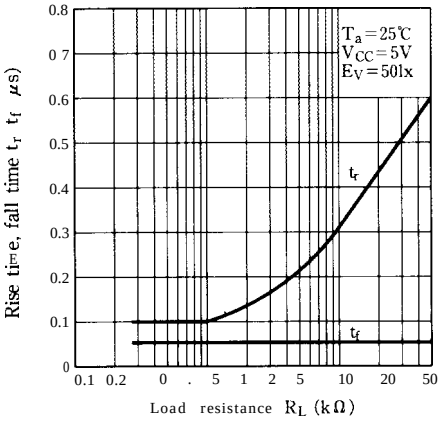
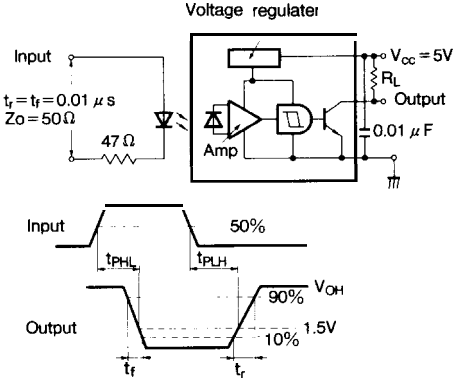


Fig. 7 Rise Time, Fall Time vs. Load Resistance



Test Circuit for Response Time (IS487)



Test Circuit for Response Time (18466)

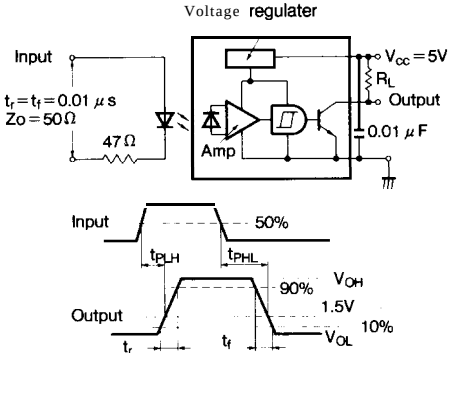


Fig. 8 Sensitivity Diagram

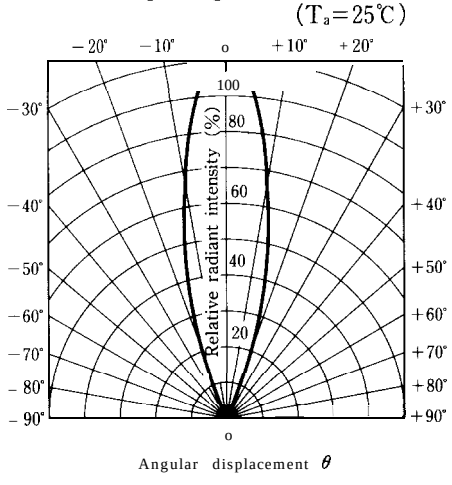
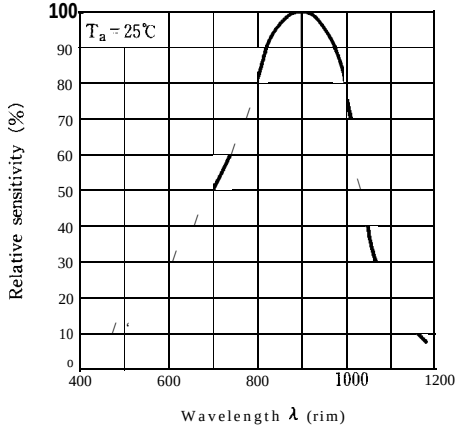


Fig. 9 Spectral Sensitivity



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