IS485/IS486

Bulit-in Amp. Type OPIC Light Detector

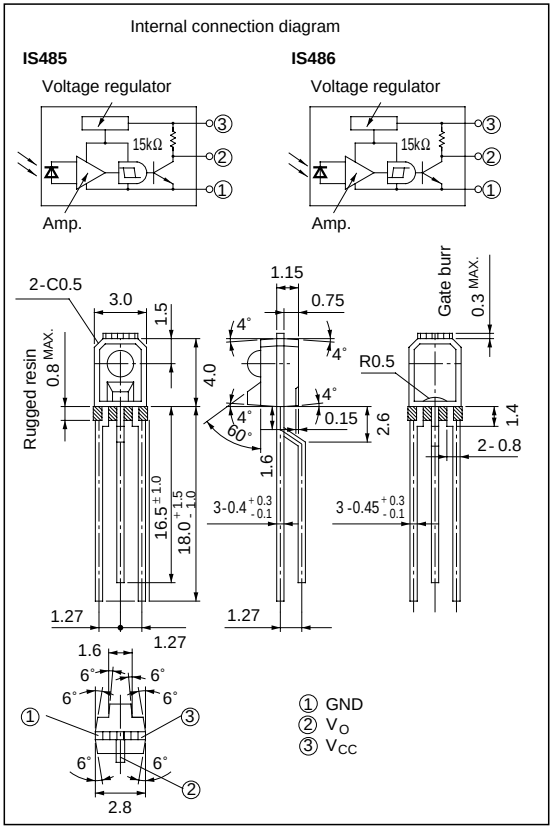
■ Features

1. Built-in schmidt trigger circuit
2. High sensitivity(E_V : MAX. 35 ℓx at Ta= 25˚C)
3. A wide range of operating supply voltage (V_{CC}: 4.5 to 17V)
4. LSTTL and TTL compatible output
5. Low level output under incident light (IS485)
   High level output under incident light (IS486)
6. Compact package

■ Applications

1. Floppy disk drive units
2. Copiers, printers, facsimiles
3. VCRs, cassette decks
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.

* Unspecified tolerance shall be ± 0.2mm.

■ Absolute Maximum Ratings (Ta= 25˚C)

Parameter	Symbol	Rating	Unit
Supply voltage	V_{CC}	-0.5 to + 17	V
Output current	Io	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 package.

" In the absence of confirmation by device specification sheets, SHARP takes no responsibility for any defects that occur in equipment using any of SHARP's devices, shown in catalogs, data books, etc. Contact SHARP in order to obtain the latest version of the device specification sheets before using any SHARP's device. "

■ Electro-optical Characteristics

(Unless otherwise specified Ta= 0 to 70˚C, Vcc= 5V)

Parameter			Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Low level output voltage			V_{OL}	I_{OL}= 16mA, *2	-	0.15	0.4	V
High level output voltage			V_{OH}	*3	3.5	-	-	V
Low level supply current			I_{CCL}	*2	-	1.7	3.8	mA
High level supply current			I_{CCH}	*3	-	0.7	2.2	mA
*4 "High"→ "Low" threshold illuminance		**IS485**	E_{VHL}	Ta = 25˚C	-	15	35	lx
				-	-	-	50	
		IS486		Ta = 25˚C	1.5	10	-	
				-	1	-	-	
*5 "Low"→ "High" threshold illuminance		**IS485**	E_{VLH}	Ta = 25˚C	1.5	10	-	lx
				-	1	-	-	
		IS486		Ta = 25˚C	-	15	35	
				-	-	-	50	
*6 Hysteresis		**IS485**	E_{VLH}/E_{VHL}	Ta = 25˚C	0.50	0.65	0.90	-
		IS486	E_{VHL}/E_{VLH}					
Response time	"High"→ "Low" propagation delay time	**IS485**	t_{PHL}	Ta = 25˚C Ev = 50lx R_L = 280Ω	-	3	9	μs
		IS486			-	5	15	
	"Low"→ "High" propagation delay time	**IS485**	t_{PLH}		-	5	15	
		IS486			-	3	9	
	Rise time		t_r		-	0.1	0.5	
	Fall time		t_f		-	0.05	0.5	

*2 Defines E_V= 50lx (**IS485**) and E_V= 0 (**IS486**).
*3 Defines E_V= 0 (**IS485**) and E_V= 50lx (**IS486**).
*4 E_{VHL} represents illuminance by CIE standard light source A(tungsten lamp) when output changes from high to low.
*5 E_{VLH} represents illuminance by CIE standard light source A(tungsten lamp) when output changes from low to high.
*6 Hysteresis stands for E_{VLH}/E_{VHL} (**IS485**) and E_{VHL}/E_{VLH} (**IS486**).

■ Recommended Operating Conditions

(Ta= 0 to 70˚C)

Parameter	Symbol	MIN.	MAX.	Unit
Supply voltage	V_{CC}	4.5	17	V
Low level 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

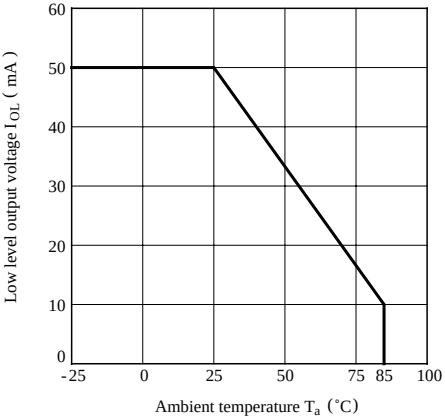


Fig. 2 Power Dissipation vs. Ambient Temperature

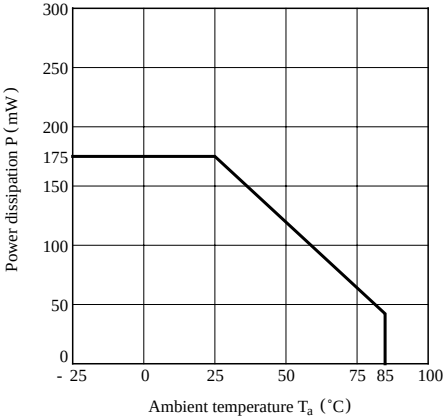


Fig. 3 Relative Threshold Illuminance vs. Supply Voltage

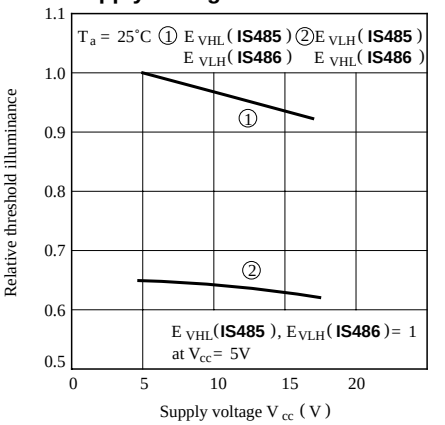


Fig. 4 Low Level Output Voltage vs. Low Level Output Current

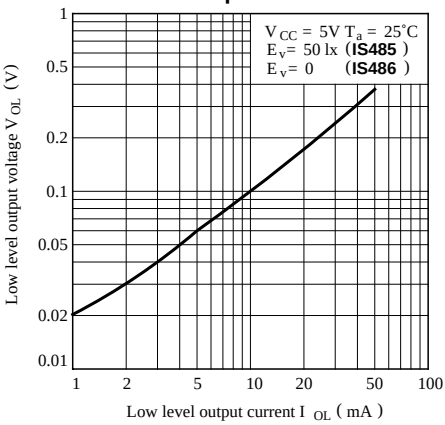


Fig. 5 Low Level Output Voltage vs. Ambient Temperature

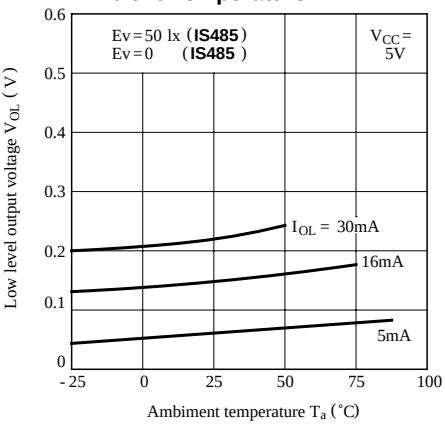


Fig. 6 Supply Current vs. Ambient Temperature

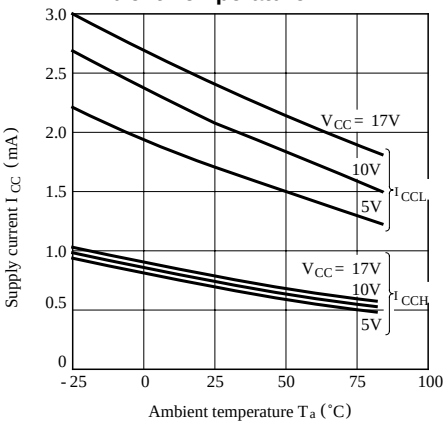


Fig. 7 Propagation Delay Time vs. Illuminance

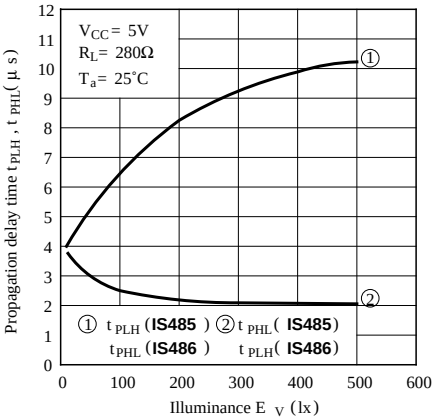
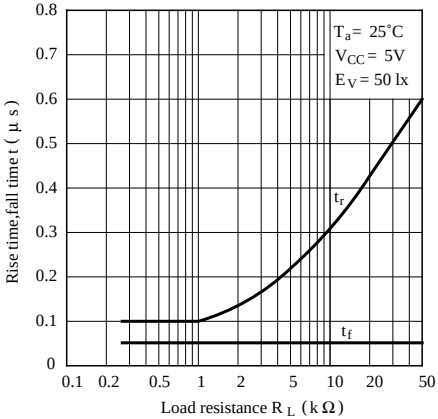
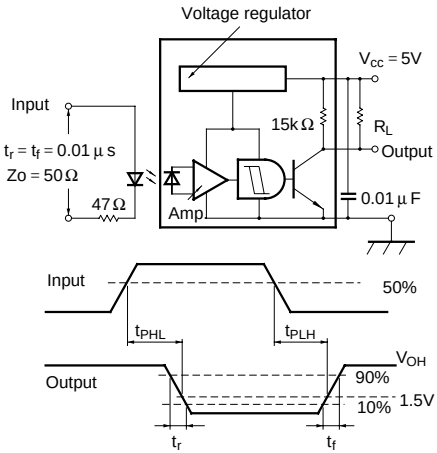


Fig. 8 Rise Time, Fall Time vs. Load Resistance



Test Circuit for Response Time (IS485)



Test Circuit for Response Time (IS486)

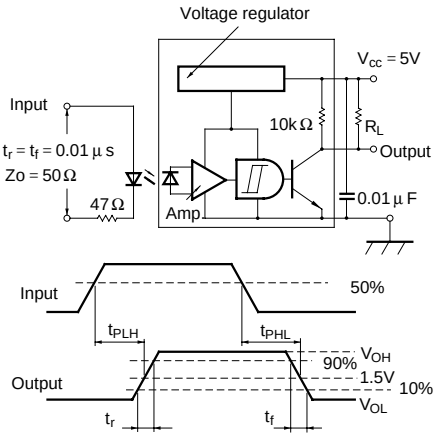


Fig. 9 Sensitivity Diagram (T_a = 25°C)

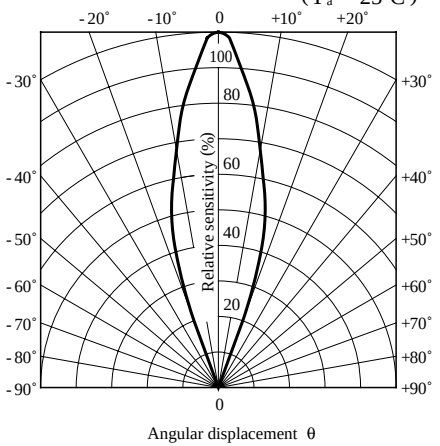
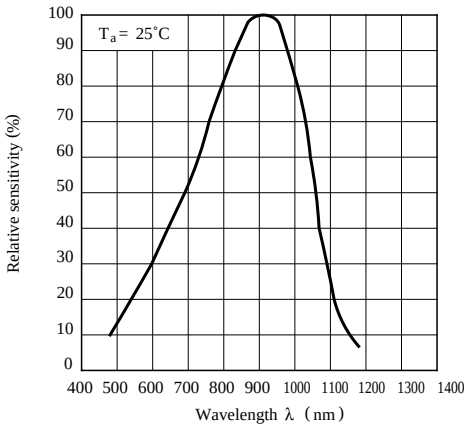


Fig.10 Spectral Sensitivity



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