

IS485/IS486

Built-in Amp. Type OPIC Light Detector

■ Features

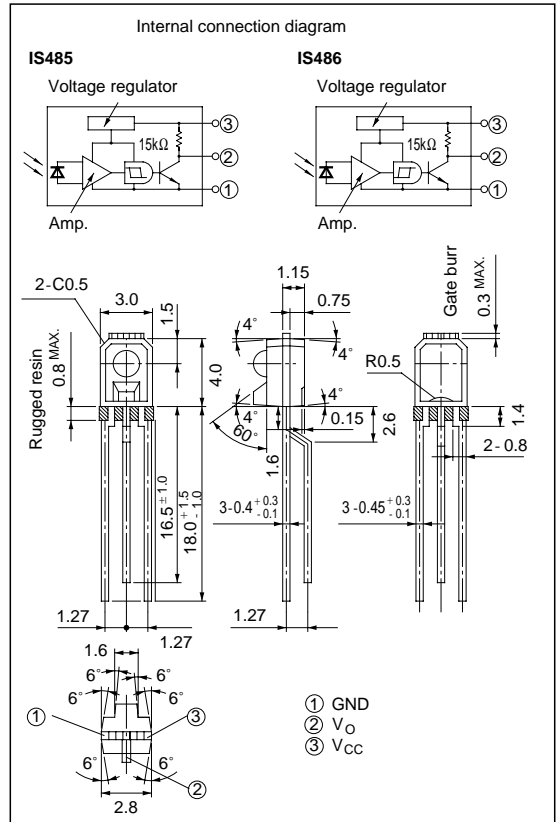
1. Built-in schmidt trigger circuit
2. High sensitivity(E_v : MAX. 35 ℓ x at $T_a=25^\circ\text{C}$)
3. A wide range of operating supply voltage (V_{CC} : 4.5 to 17V)
4. LSTTL and TTL compatible output
5. Low level output under incident light (IS485)
High level output under incident light (IS486)
6. 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 $\pm 0.2\text{mm}$.

■ Absolute Maximum Ratings

($T_a=25^\circ\text{C}$)

Parameter	Symbol	Rating	Unit
Supply voltage	V_{CC}	-0.5 to + 17	V
Output current	I_o	50	mA
Power dissipation	P	175	mW
Operating temperature	T_{opr}	-25 to + 85	$^\circ\text{C}$
Storage temperature	T_{stg}	-40 to + 100	$^\circ\text{C}$
*1 Soldering temperature	T_{sol}	260	$^\circ\text{C}$

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

■ 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}	$I_{OL} = 16\text{mA}$, *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	t_{PHL}	Ta = 25°C Ev = 50lx RL = 280Ω	-	3	9	μs	
				IS485	-	5		15
	“Low”→ “High” propagation delay time	t_{PLH}		IS485	-	5		15
				IS486	-	3		9
	Rise time			t_r	-	0.1		0.5
	Fall time			t_f	-	0.05		0.5

*2 Defines $E_V = 50\text{lx}$ (**IS485**) and $E_V = 0$ (**IS486**).

*3 Defines $E_V = 0$ (**IS485**) and $E_V = 50\text{lx}$ (**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

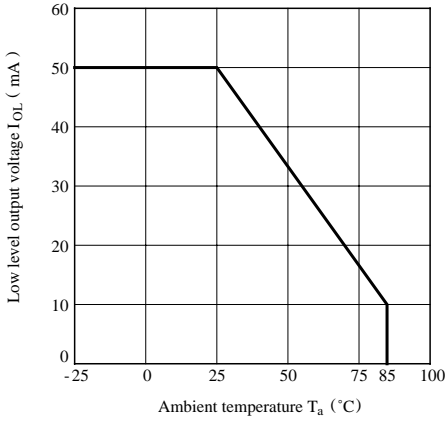


Fig. 2 Power Dissipation vs. Ambient Temperature

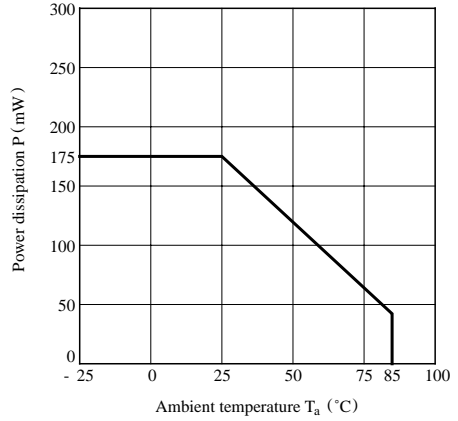


Fig. 3 Relative Threshold Illuminance vs. Supply Voltage

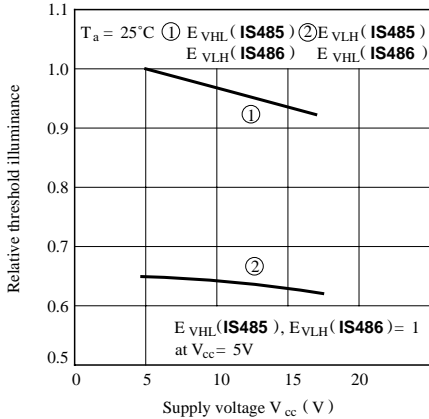


Fig. 4 Low Level Output Voltage vs. Low Level Output Current

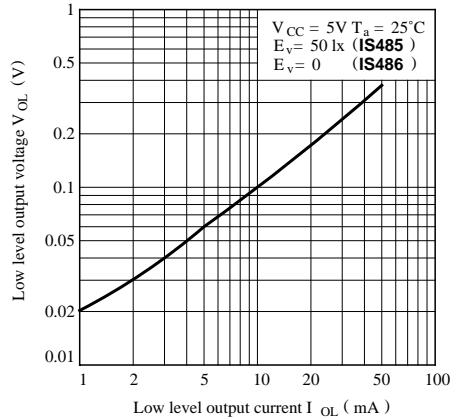


Fig. 5 Low Level Output Voltage vs. Ambient Temperature

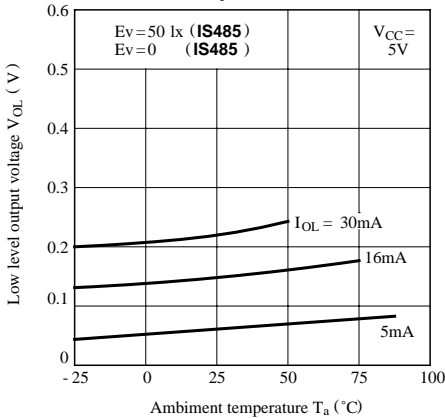


Fig. 6 Supply Current vs. Ambient Temperature

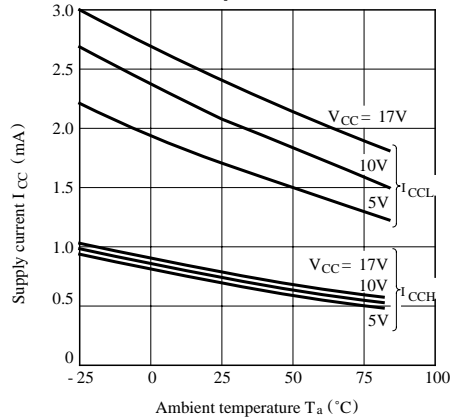


Fig. 7 Propagation Delay Time vs. Illuminance

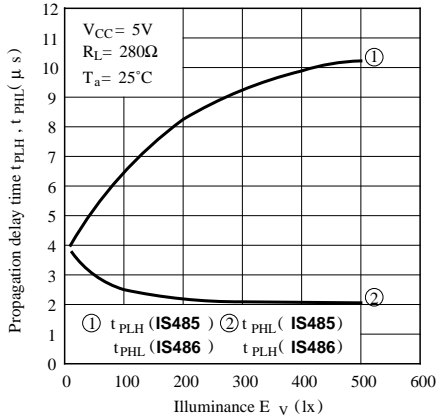
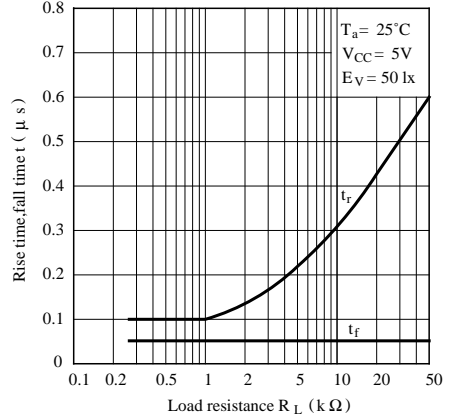
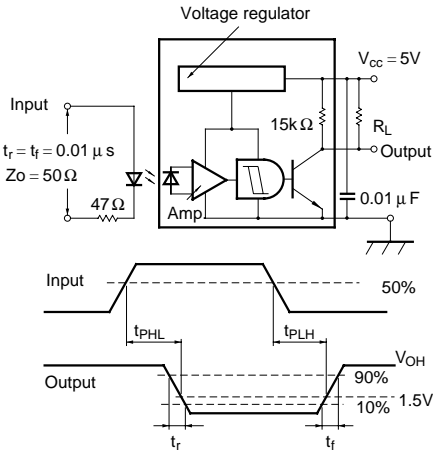


Fig. 8 Rise Time, Fall Time vs. Load Resistance



Test Circuit for Response Time (IS485)



Test Circuit for Response Time (IS486)

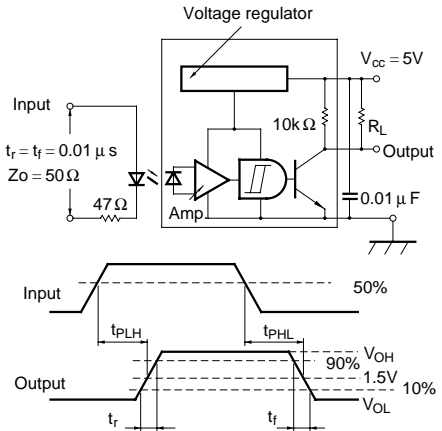


Fig. 9 Sensitivity Diagram ($T_a = 25^\circ C$)

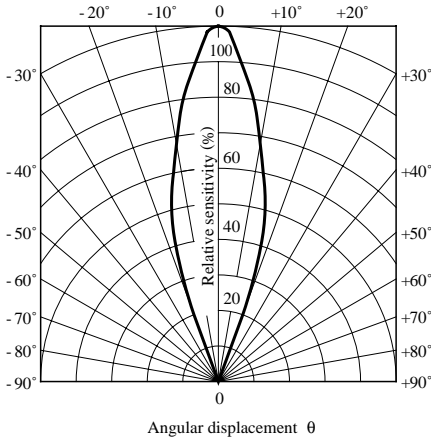


Fig.10 Spectral Sensitivity

