

IS485/IS486

Built-in Amp. Type OPIC Light Detector

■ Features

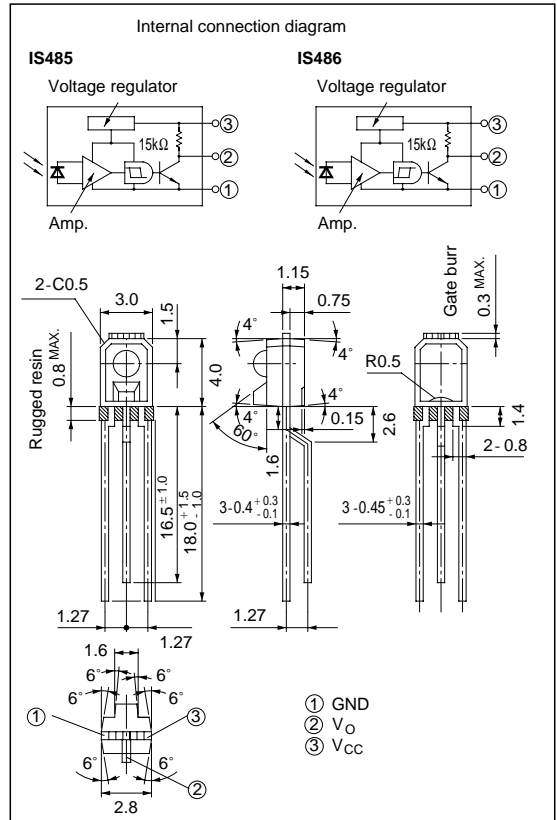
1. Built-in schmidt trigger circuit
2. High sensitivity(E_v : MAX. 35 ℓ x at $T_a=25^\circ\text{C}$)
3. A wide range of operating supply voltage (V_{CC} : 4.5 to 17V)
4. LSTTL and TTL compatible output
5. Low level output under incident light (IS485)
High level output under incident light (IS486)
6.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

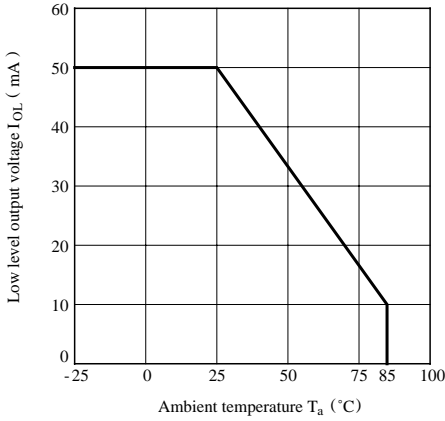


Fig. 2 Power Dissipation vs. Ambient Temperature

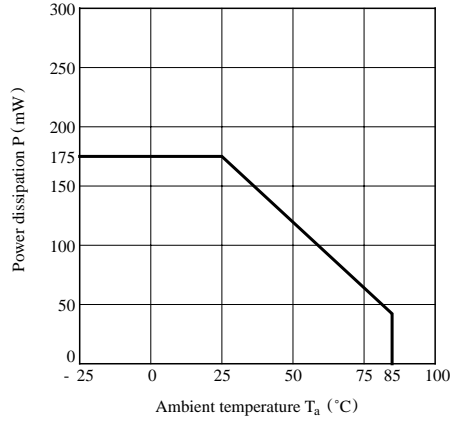


Fig. 3 Relative Threshold Illuminance vs. Supply Voltage

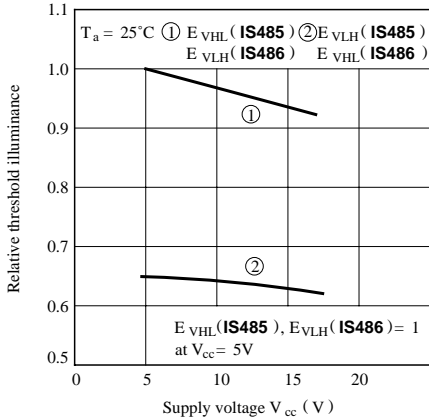


Fig. 4 Low Level Output Voltage vs. Low Level Output Current

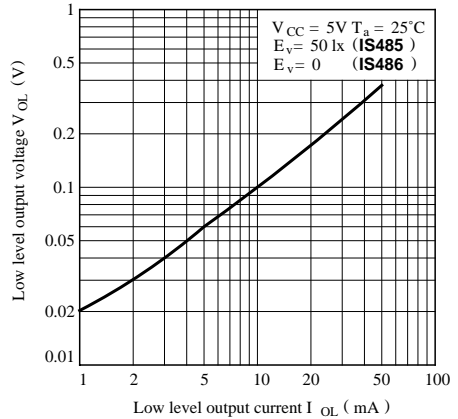


Fig. 5 Low Level Output Voltage vs. Ambient Temperature

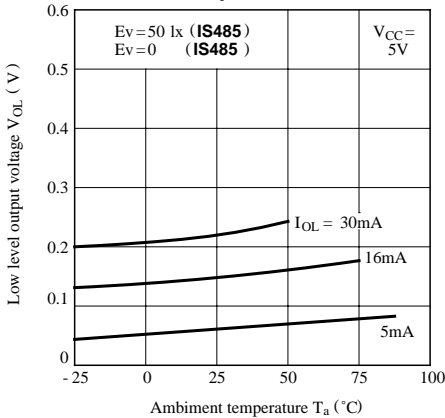


Fig. 6 Supply Current vs. Ambient Temperature

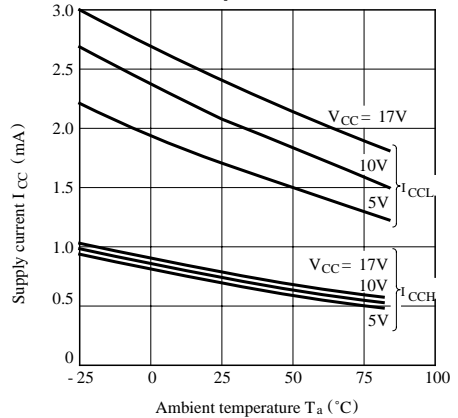


Fig. 7 Propagation Delay Time vs. Illuminance

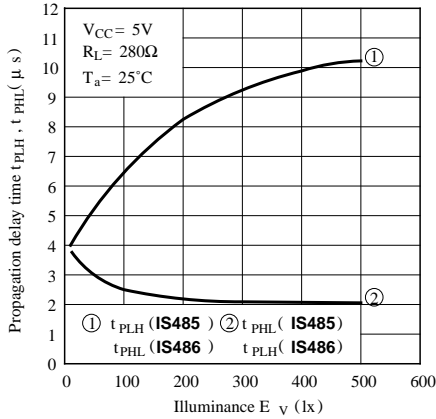
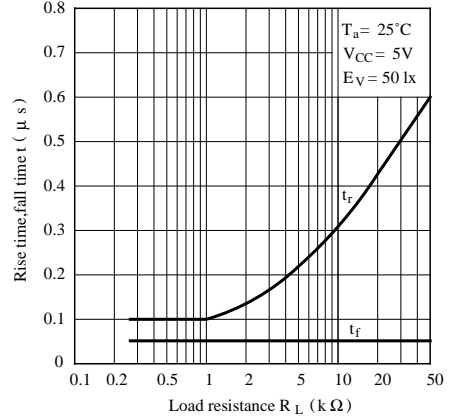
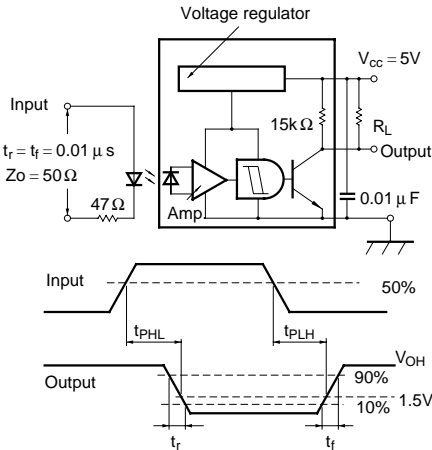


Fig. 8 Rise Time, Fall Time vs. Load Resistance



Test Circuit for Response Time (IS485)



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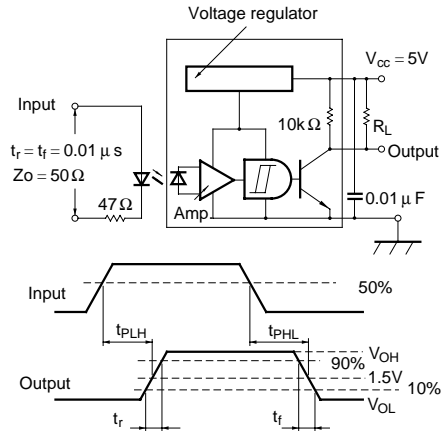


Fig. 9 Sensitivity Diagram ($T_a = 25^\circ C$)

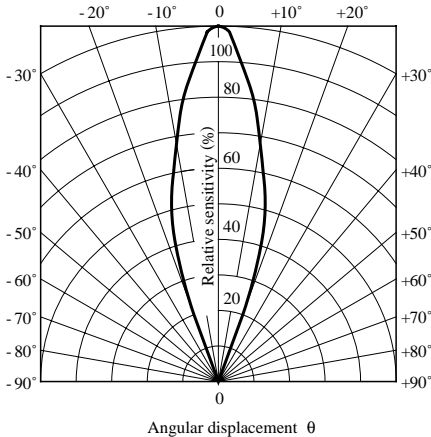


Fig.10 Spectral Sensitivity

