IS485/IS486

Bulit-in Amp. Type OPIC Light Detector

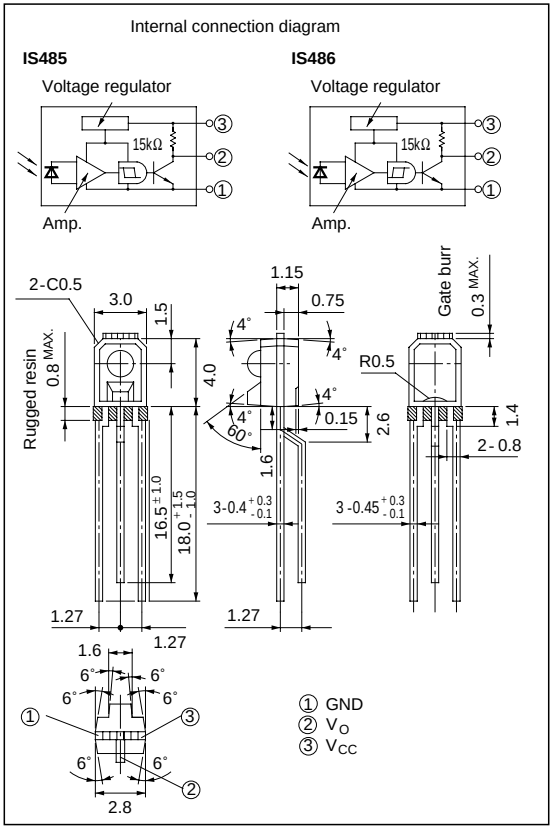
■ Features

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.

■ 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

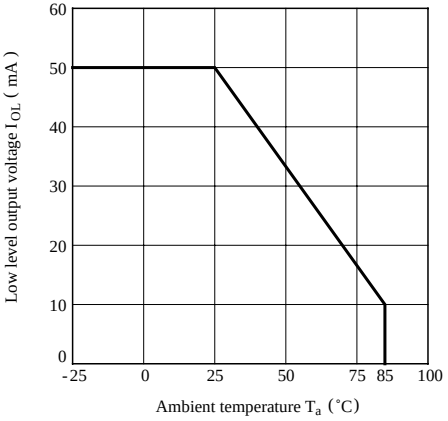


Fig. 2 Power Dissipation vs. Ambient Temperature

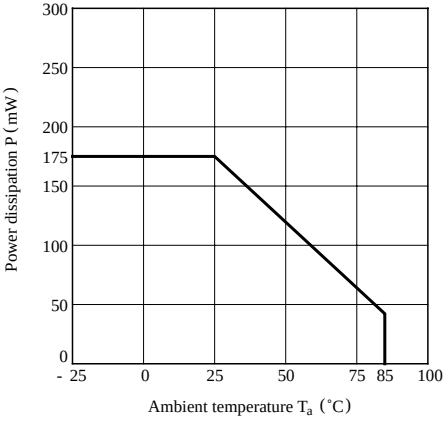


Fig. 3 Relative Threshold Illuminance vs. Supply Voltage

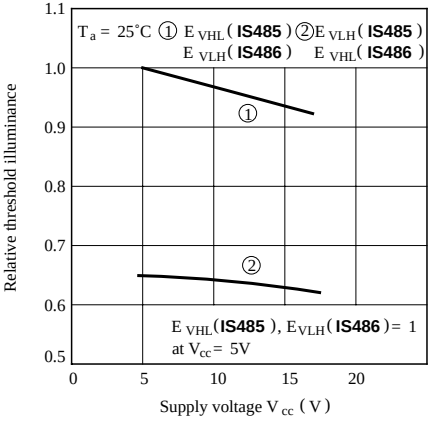


Fig. 4 Low Level Output Voltage vs. Low Level Output Current

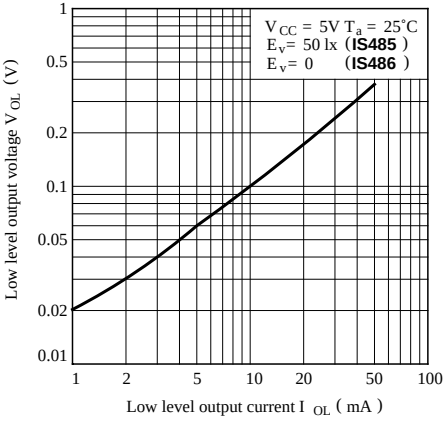


Fig. 5 Low Level Output Voltage vs. Ambient Temperature

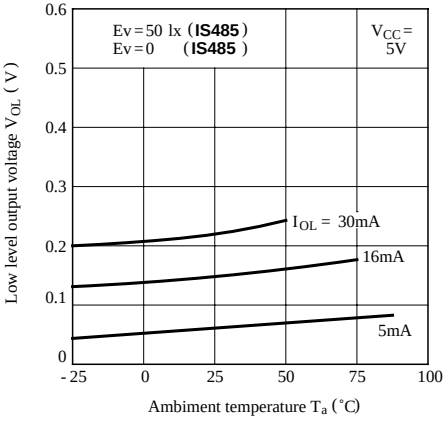


Fig. 6 Supply Current vs. Ambient Temperature

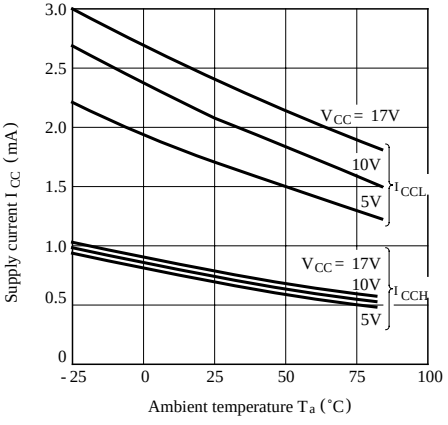


Fig. 7 Propagation Delay Time vs. Illuminance

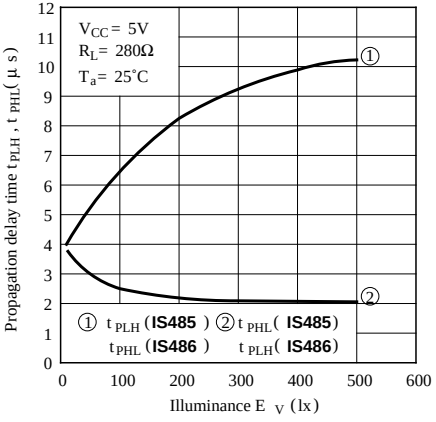
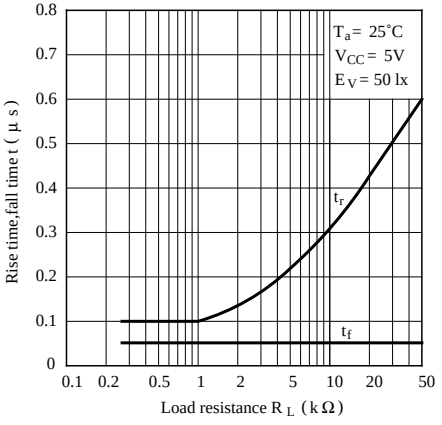
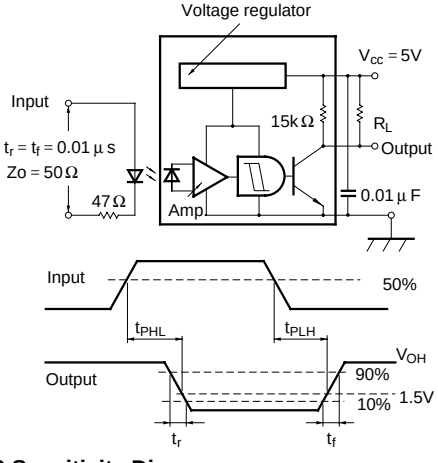


Fig. 8 Rise Time, Fall Time vs. Load Resistance



Test Circuit for Response Time (IS485)



Test Circuit for Response Time (IS486)

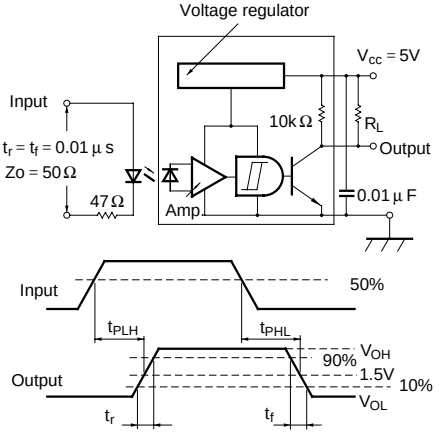


Fig. 9 Sensitivity Diagram (T_a = 25°C)

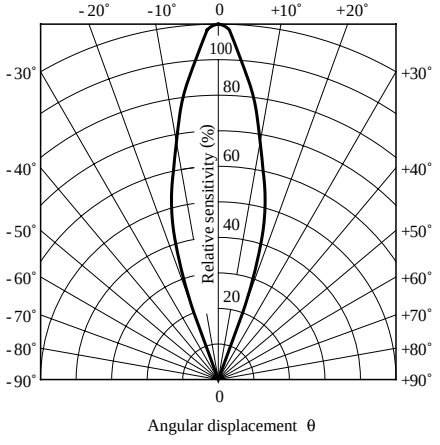
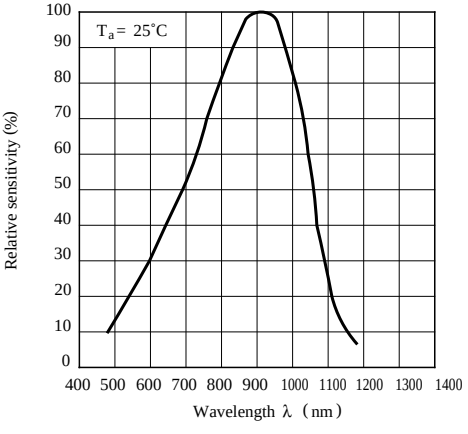


Fig.10 Spectral Sensitivity



● ter "Precautions for Use."

NOTICE

- The circuit application examples in this publication are provided to explain representative applications of SHARP devices and are not intended to guarantee any circuit design or license any intellectual property rights. SHARP takes no responsibility for any problems related to any intellectual property right of a third party resulting from the use of SHARP's devices.
- Contact SHARP in order to obtain the latest device specification sheets before using any SHARP device. SHARP reserves the right to make changes in the specifications, characteristics, data, materials, structure, and other contents described herein at any time without notice in order to improve design or reliability. Manufacturing locations are also subject to change without notice.
- Observe the following points when using any devices in this publication. SHARP takes no responsibility for damage caused by improper use of the devices which does not meet the conditions and absolute maximum ratings to be used specified in the relevant specification sheet nor meet the following conditions:
  (i) The devices in this publication are designed for use in general electronic equipment designs such as:
  — Personal computers
  — Office automation equipment
  — Telecommunication equipment [terminal]
  — Test and measurement equipment
  — Industrial control
  — Audio visual equipment
  — Consumer electronics
  (ii) Measures such as fail-safe function and redundant design should be taken to ensure reliability and safety when SHARP devices are used for or in connection with equipment that requires higher reliability such as:
  — Transportation control and safety equipment (i.e., aircraft, trains, automobiles, etc.)
  — Traffic signals
  — Gas leakage sensor breakers
  — Alarm equipment
  — Various safety devices, etc.
  (iii) SHARP devices shall not be used for or in connection with equipment that requires an extremely high level of reliability and safety such as:
  — Space applications
  — Telecommunication equipment [trunk lines]
  — Nuclear power control equipment
  — Medical and other life support equipment (e.g., scuba).
- Contact a SHARP representative in advance when intending to use SHARP devices for any "specific" applications other than those recommended by SHARP or when it is unclear which category mentioned above controls the intended use.
- If the SHARP devices listed in this publication fall within the scope of strategic products described in the Foreign Exchange and Foreign Trade Control Law of Japan, it is necessary to obtain approval to export such SHARP devices.
-
- Contact and consult with a SHARP representative if there are any questions about the contents of this publication.