

# IS481/IS482

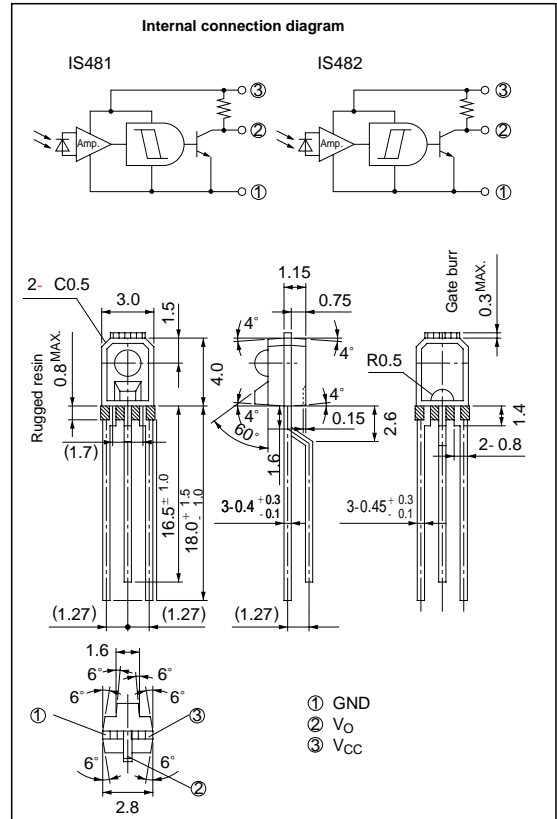
## Low Voltage Operating and High Sensitivity Type OPIC Light Detectors

### ■ Features

1. Built-in Schmidt trigger circuit
2. Low voltage operating type ( $V_{CC}$ : 2.3 to 7.0V)
3. High sensitivity type (**IS481**  $E_{VHL}$  : TYP. 5.4 lx at  $T_a=25^\circ\text{C}$ )  
(**IS482**  $E_{VLH}$  : TYP. 5.4 lx at  $T_a=25^\circ\text{C}$ )
4. LSTTL and TTL compatible
5. Low level output under incident light (**IS481**)  
High level output under incident light (**IS482**)

### ■ Outline Dimensions

(Unit : mm)



### ■ Applications

1. Battery-driven portable equipment

\* 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.

### ■ Absolute Maximum Ratings

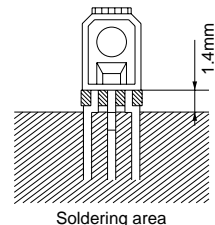
(Ta=25°C)

Parameter	Symbol	Rating	Unit
Supply voltage	$V_{CC}$	-0.5 to +8	V
*1 Output current	$I_o$	8	mA
*2 Total power dissipation	P	80	mW
Operating temperature	$T_{opr}$	-25 to +85	°C
Storage temperature	$T_{stg}$	-40 to +100	°C
*3 Soldering temperature	$T_{sol}$	260	°C

\*1 Output current vs. ambient temperature : Per Fig. 1

\*2 Total power dissipation vs. ambient temperature : Per Fig. 2

\*3 For 5 seconds at the position of 1.4 mm from bottom face of resin package



Soldering area

**Electro-optical Characteristics**

(Ta=0 to 70°C, V<sub>CC</sub>=5V unless otherwise specified)

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit			
Low level output voltage		V <sub>OL</sub>	I <sub>OL</sub> = 4mA,*4	-	0.15	0.4	V			
High level output voltage		V <sub>OH</sub>	*5	4.9	-	-	V			
Low level supply current		I <sub>CCL</sub>	*4	-	1.3	3.8	mA			
High level supply current		I <sub>CCH</sub>	*5	-	1.0	3.0	mA			
*6 "High →Low" threshold illuminance	<b>IS481</b>	E <sub>VHL</sub>	Ta= 25°C	-	5.4	15	lx			
	<b>IS482</b>		Ta= 25°C	0.6	4.3	-				
*7 "Low→High" threshold illuminance	<b>IS481</b>	E <sub>VLH</sub>	Ta= 25°C	0.6	4.3	-	lx			
	<b>IS482</b>		Ta= 25°C	-	5.4	15				
*8 Hysteresis	<b>IS481</b>	E <sub>VLH</sub> / E <sub>VHL</sub>	Ta= 25°C	0.55	0.80	0.95	-			
	<b>IS482</b>	E <sub>VHL</sub> / E <sub>VLH</sub>								
Response time	"High→Low" propagation delay time	<b>IS481</b>	Ta= 25°C E <sub>v</sub> = 50 lx R <sub>L</sub> = 1.2kΩ	-	3.0	15	μ s			
		<b>IS482</b>						-	9.0	30
	"Low →High" propagation delay time	<b>IS481</b>						-	9.0	30
		<b>IS482</b>						-	3.0	15
	Rise time	t <sub>r</sub>						-	0.1	0.5
Fall time	t <sub>f</sub>	-	0.05	0.5						
Peak sensitivity wavelength		λ <sub>P</sub>		-	900	-	nm			

\*4 Defines E<sub>v</sub>=50 lx (**IS481**) and E<sub>v</sub>=0 lx (**IS482**).

\*5 Defines E<sub>v</sub>=0 lx (**IS481**) and E<sub>v</sub>=50 lx (**IS482**).

\*6 E<sub>VHL</sub> represents illuminance by CIE standard light source A (tungsten lamp) when output changes from "high" to "low".

\*7 E<sub>VLH</sub> represents illuminance by CIE standard light source A (tungsten lamp) when output changes from "low" to "high".

\*8 Hysteresis standards for E<sub>VLH</sub>/E<sub>VHL</sub> (**IS481**) and E<sub>VHL</sub>/E<sub>VLH</sub> (**IS482**).

**Recommended Operating Conditions**

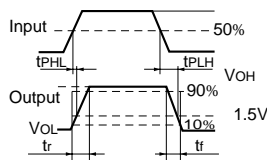
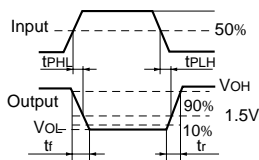
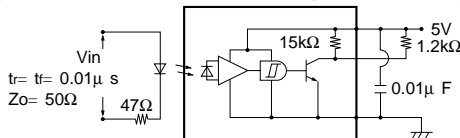
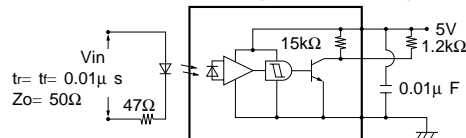
(Ta=0 to +70°C)

Parameter	Symbol	MIN.	MAX.	Unit
Supply voltage	V <sub>CC</sub>	2.3	7.0	V
Output current	I <sub>OL</sub>	-	4.0	mA

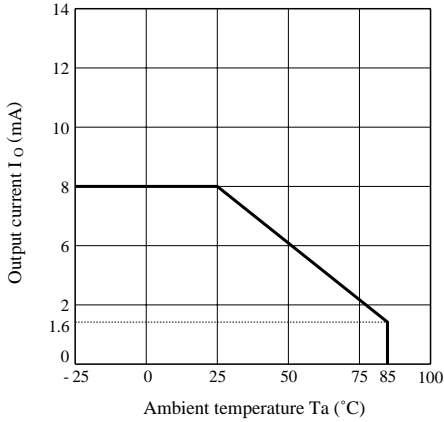
In order to stabilize power supply line, connect a by-pass capacitor of 0.01μ F or more between V<sub>cc</sub> and GND near the device.

**Test Circuit for Response Time (IS481)**

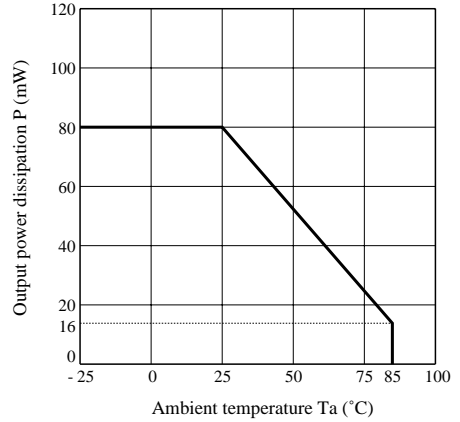
**Test Circuit for Response Time (IS482)**



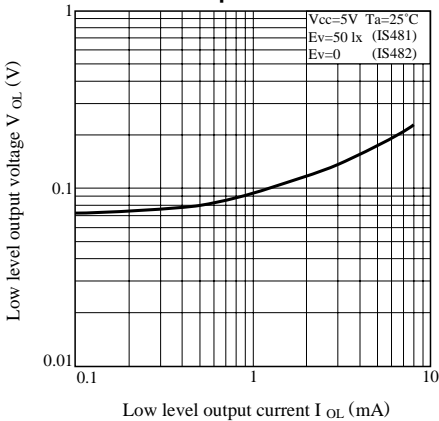
**Fig. 1 Output Current vs. Ambient Temperature**



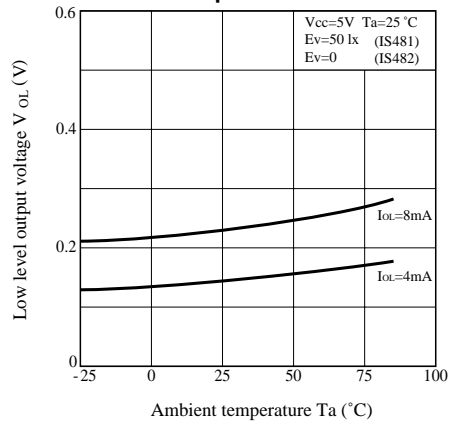
**Fig. 2 Output Power Dissipation vs. Ambient Temperature**



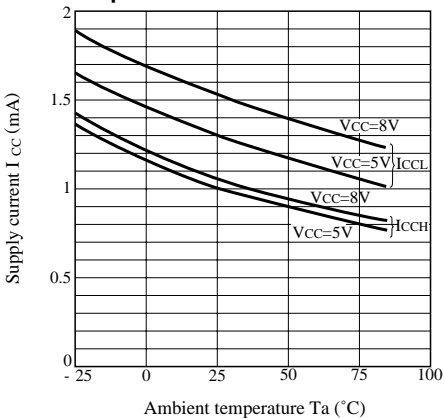
**Fig. 3 Low Level Output Voltage vs. Low Level Output Current**



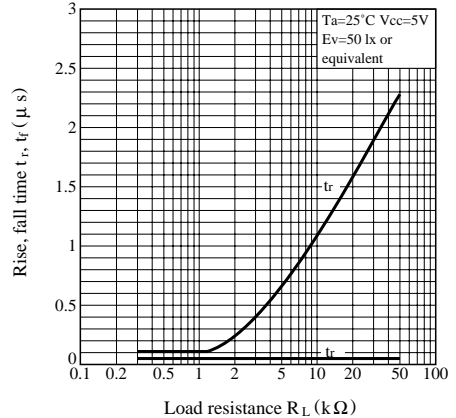
**Fig. 4 Low Level Output Voltage vs. Ambient Temperature**



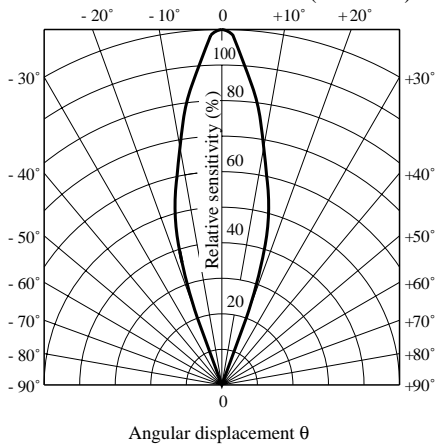
**Fig. 5 Supply Current vs. Ambient Temperature**



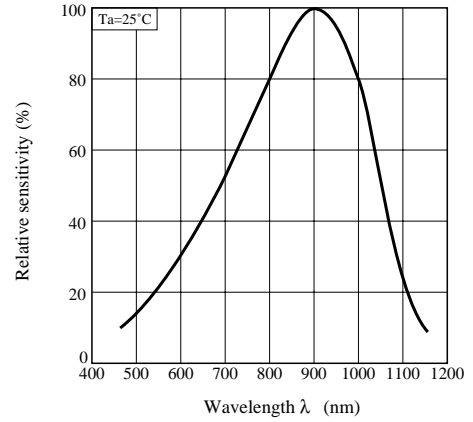
**Fig. 6 Rise, Fall Time vs. Load Resistance**



**Fig. 7 Radiation Diagram** (Ta=25 °C)



**Fig. 8 Spectral Sensitivity (TYP.)**



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