GP1A15

High Sensing Accuracy Type OPIC Photointerrupter

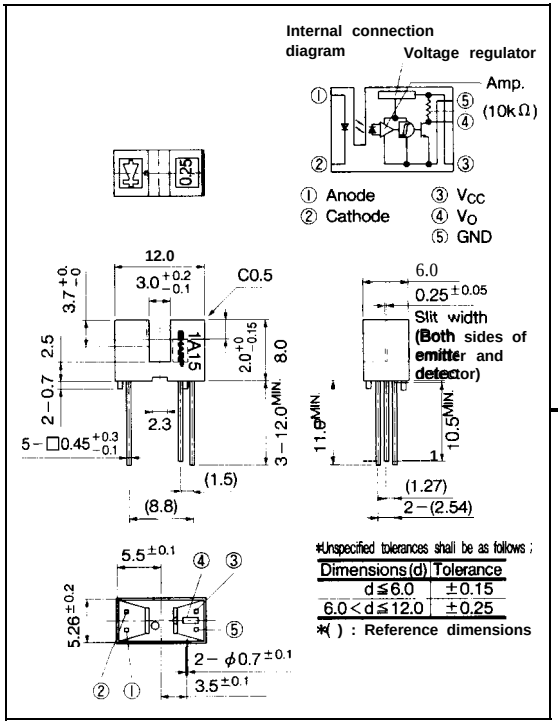
■ Features

1. High sensing accuracy (slit width : 0.25mm)
2. Built-in Schmidt trigger circuit
3. Low threshold input current (I_{FLH} : MAX. 10mA)
4. Low level supply current (I_{CCL} : MAX. 5mA)
5. Operating supply voltage V_{CC} :4.5 to 17V
6. TTL and CMOS compatible output

■ Applications

1. Floppy disk drives
2. Copiers, printers, facsimiles
3. Optoelectronic switches, optoelectronic counters

■ 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.

■ Absolute Maximum Ratings (Ta=25℃)

Parameter		Symbol	Rating	Unit
Input	Forward current	I_F	50	mA
	*1 Peak forward current	I_{FM}	1	A
	Reverse voltage	V_R	6	V
	Power dissipation	P	75	mW
output	Supply voltage	V_{CC}	-0.5 to +17	V
	Output current	10	50	mA
	Power dissipation	P_O	250	mW
Operating temperature		T_{opr}	−25 to +85	℃
Storage temperature		T_{stg}	-40 to +100	℃
*2 Soldering temperature		T_{sol}	260	℃

*1 Pules width ≦ 100 μs, Duty ratio = 0.01
*2 For 5 seconds

"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 Charcateristics (Ta=25℃)

Parameter			Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Input	Forward voltage		V_F	I_F=10mA	—	1.15	1.4	v
	Reverse current		I_R	V_R=3V			10	μA
output	Operating supply voltage		V_{CC}		4.5	—	17	v
	Low level output voltage		V_{OL}	I_{OL}=16mA, V_{CC}=5V, I_F=0	–	0.15	0.4	v
	High level output voltage		V_{OH}	V_{CC}=5V, I_F=10mA	4.9	—	—	v
	Low level supply current		I_{CCL}	V_{CC}=5V, I_F=0	—	2.5	5.0	mA
	High level supply current		I_{CCH}	V_{CC}=5V, I_F=10mA	—	1.0	3.0	mA
Transfer characteristics	*3 "Low→High" threshold input current		I_{FLH}	V_{CC}=5V	0.2	2.5	10	mA
	*4 H ysteresis		I_{FHL}/I_{FLH}		0.55	0.75	0.95	–
	Response time	"Low→High" propagation delay time	tPLH	V_{CC}=5V I_F=10mA R_L=280Ω	—	3	9	μs
		"High→Low" propagation delay time	tPHL		—	5	15	
		Rise time	t_r			0.1	0.5	
		Fall time	tf		—	0.05	0.5	

*3 I_{FLH} represents forward current when output goes from low to high.
*4 I_{FHL} represents forward current when output goes from high to low.
Hysteresis stands for I_{FHL}/I_{FLH}.

■ Recommended Operating Conditions

Parameter	Symbol	Operating temperature	MIN.	MAX.	Unit
Low level output current	101.	Ta=O to +70℃		16.0	mA
Forward current	I_F		12.5	20.0	mA

Fig. 1 Forward Current vs. Ambient Temperature

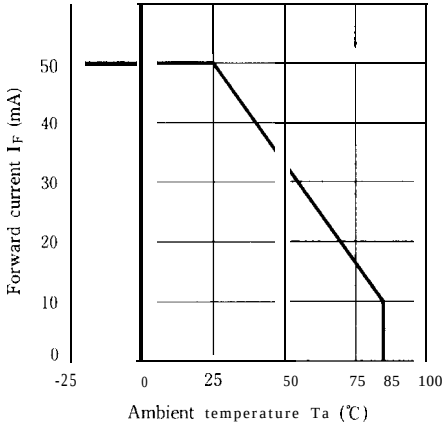


Fig. 2 Output Power Dissipation vs. Ambient Temperature

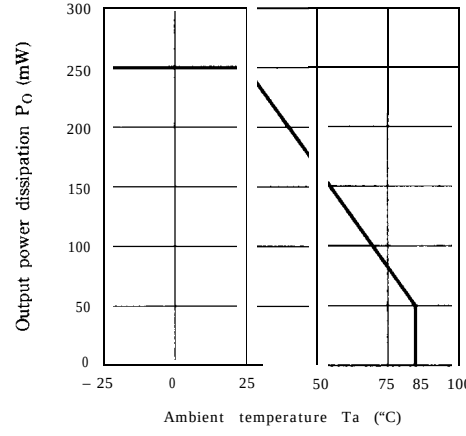


Fig. 3 Low Level Output Current vs. Ambient Temperature

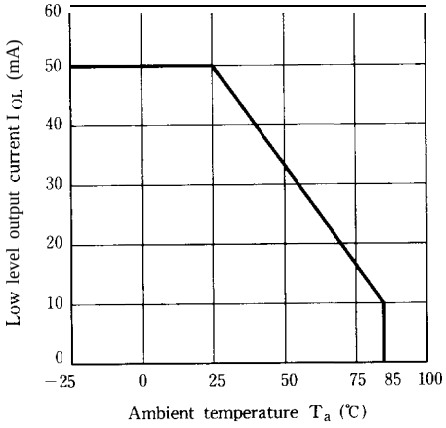


Fig.4 Forward Current vs. Forward Voltage

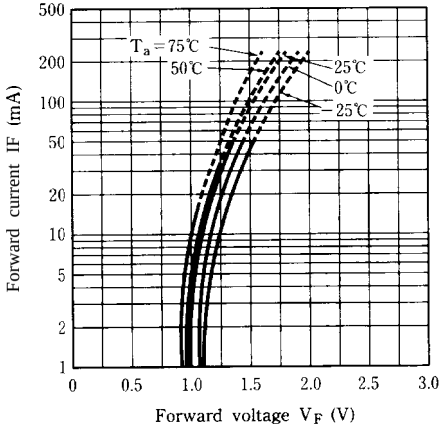


Fig. 5 Relative Threshold Input Current vs. Supply Voltage

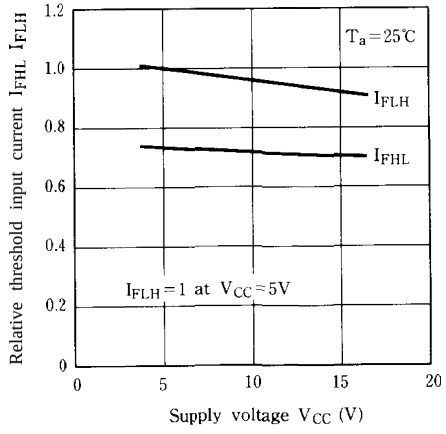


Fig. 6 Relative Threshold Input Current vs. Ambient Temperature

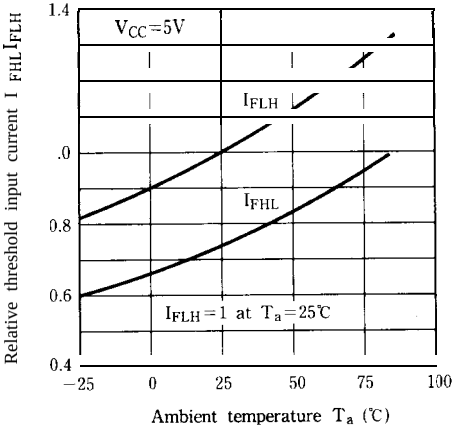


Fig. 7 Low Level Output Voltage vs. Low Level Output Current

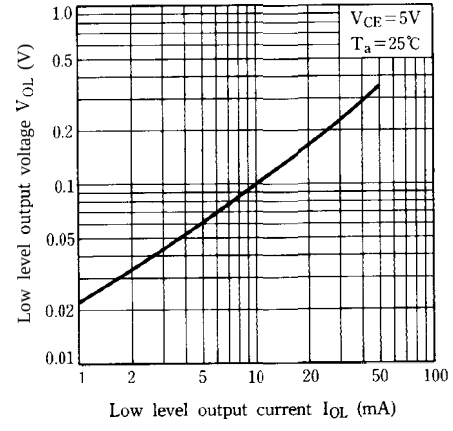


Fig 8 Low Level Output Voltage vs. Ambient Temperature

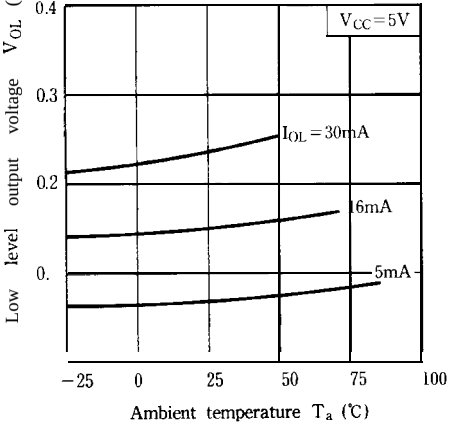


Fig. 9 Supply Current vs. Supply Voltage

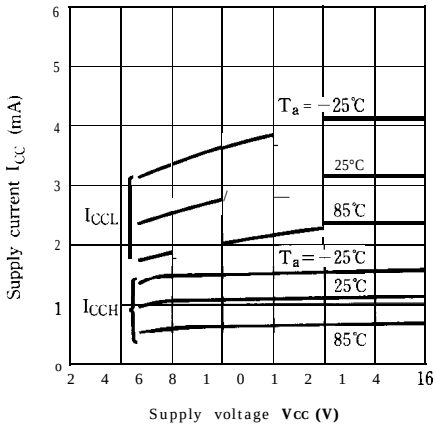


Fig.10 Propagation Delay Time vs. Forward Current

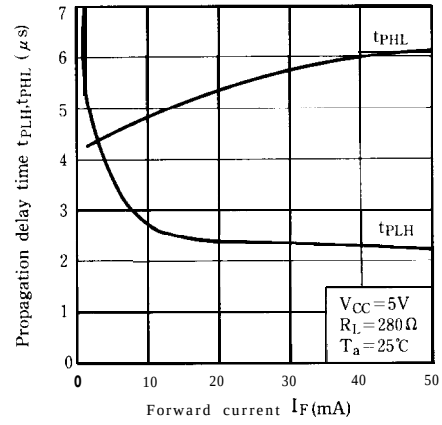
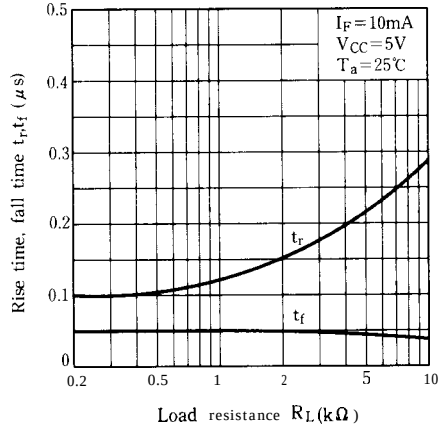
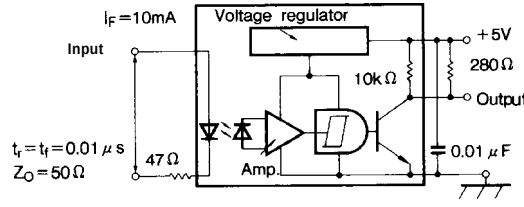
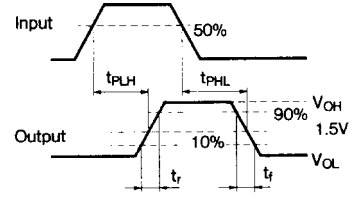


Fig.11 Rise Time, Fall Time vs. Load Resistance



Test Circuit for Response Time





■ Precautions for Use

(1) In order to stabilize power supply line, connect a by-pass capacitor of more than 0.01 μF between Vcc and GND near the device.

(2) As for other general cautions, refer to the chapter “Precautions for Use” (Page 78 to 93).