GP1A15

High Sensing Accuracy Type OPIC Photointerrupter

■ Features

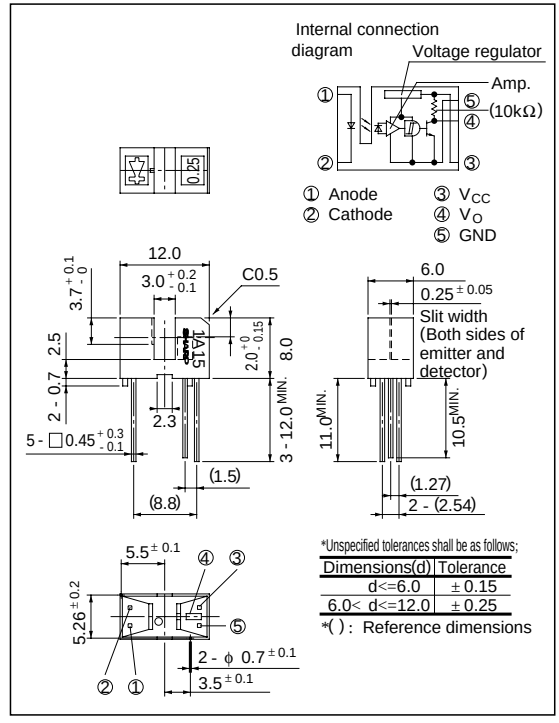
1. High sensing accuracy
   (slit width : 0.25mm)
2. Built-in schmidt trigger circuit
3. Low threshold input current
   (I_{FLH} : MAX. 10mA)
4. Low level supply current
   (I_{CCL}: MAX. 5mA)
5. Operating supply voltage V_{CC} : 4.5 to 17V
6. TTL and CMOS compatible output

■ Applications

1. Floppy disk drives
2. Copiers, printers, facsimiles
3. Opetoelectronic 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°C)

Parameter		Symbol	Rating	Unit
Input	Forward current	I_F	50	mA
	*1Peak 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	I_O	50	mA
	Power dissipation	P_O	250	mW
Operating tamperature		T_{opr}	- 25 to + 85	°C
Storage temperture		T_{stg}	- 40 to + 100	°C
*2Soldering temperature		T_{sol}	260	°C

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

■ Electro-optical Charcateristics

(Ta = 25˚C)

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
	*4Hysteresis		I_{FHL}/I_{FLH}		0.55	0.75	0.95	-
	Response time	“ Low→High” propagation delay time	t_{PLH}	V_{CC}= 5V I_F= 10mA R_L= 280Ω	-	3	9	μs
		“ High→Low” propagation delay time	t_{PHL}		-	5	15	
		Rise time	t_r		-	0.1	0.5	
		Fall time	t_f		-	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	I_{OL}	Ta= 0 to + 70˚C	-	16.0	mA
Forward current	I_F		12.5	20.0	mA

Fig. 1 Forward Current vs. Ambient Temperature

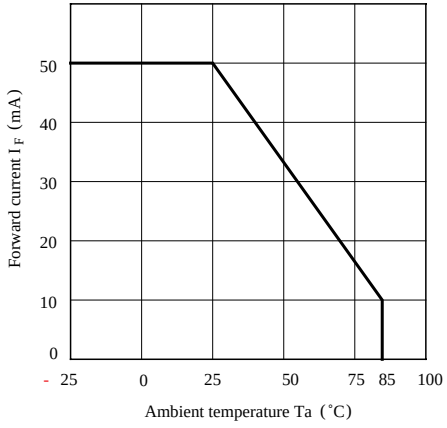


Fig. 2 Output Power Dissipation vs. Ambient Temperature

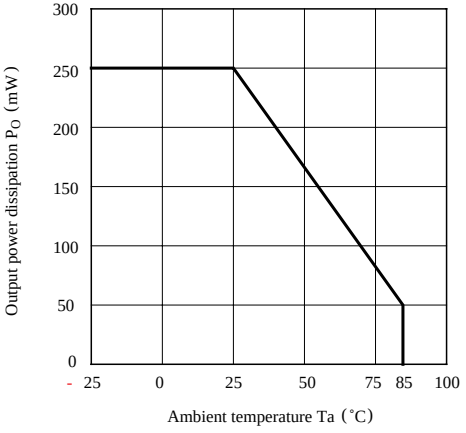


Fig. 3 Low Level Output Current vs. Ambient Temperature

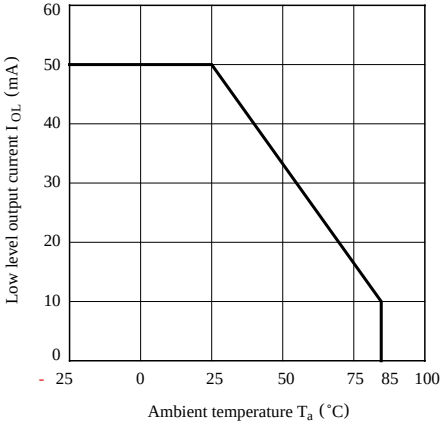


Fig.4 Forward Current vs. Forward Voltage

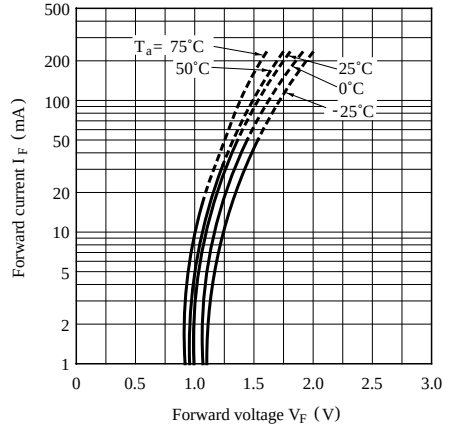


Fig. 5 Relative Threshold Input Current vs. Supply Voltage

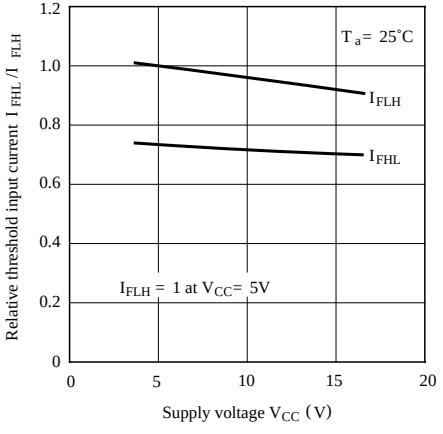


Fig. 6 Relative Threshold Input Current vs. Ambient Temperature

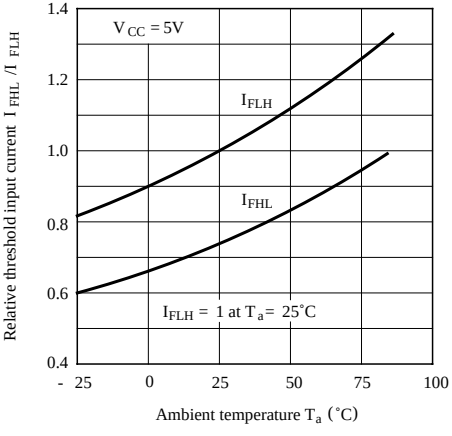


Fig. 7 Low Level Output Voltage vs. Low Level Output Current

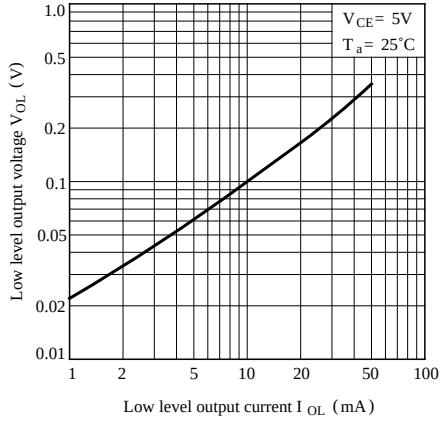


Fig. 8 Low Level Output Voltage vs. Ambient Temperature

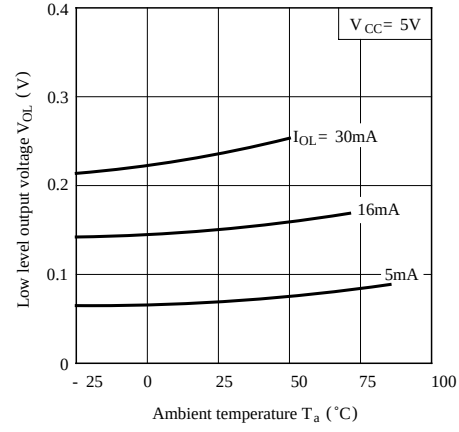


Fig. 9 Supply Current vs. Supply Voltage

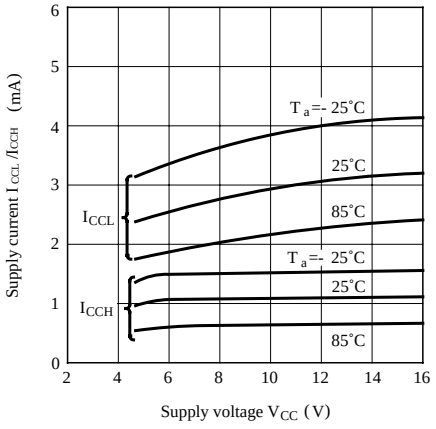


Fig.10 Propagation Delay Time vs. Forward Current

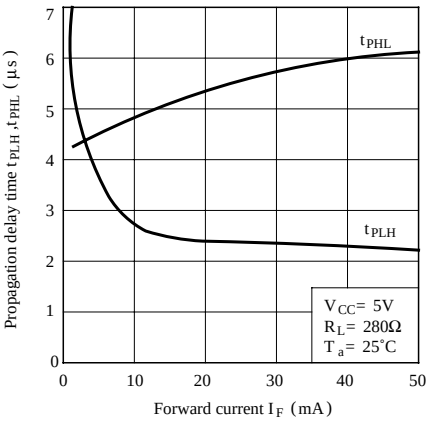
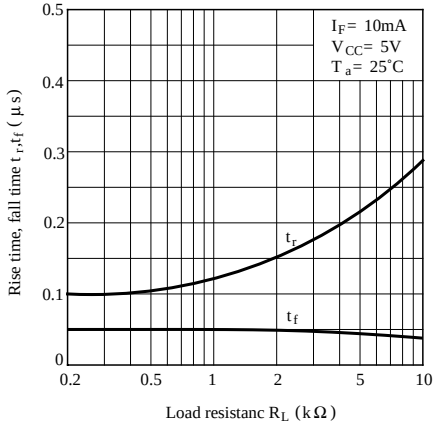
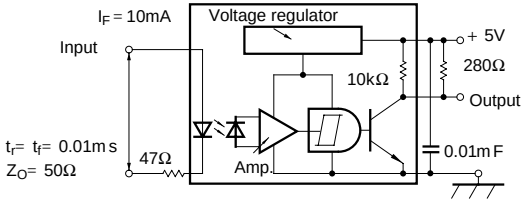
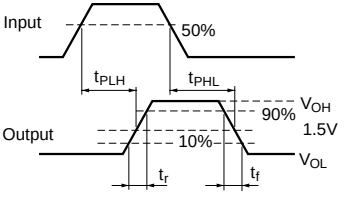


Fig.11 Rise Time, Fall Time vs. Load Resistance



Test Circuit for Response Time





■ Precautions for Use

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

(2) As for other general cautions, refer to the chapter "Precautions for Use".