

GP1A15

High Sensing Accuracy Type OPIC Photointerrupter

■ Features

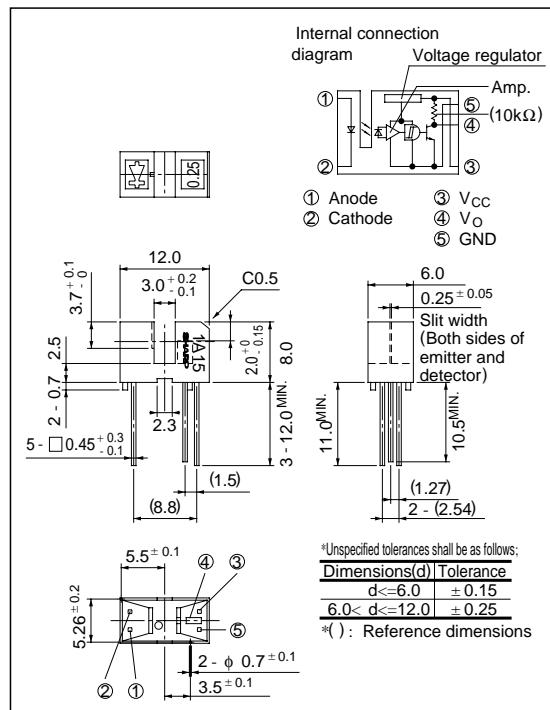
1. High sensing accuracy
(slit width : 0.25mm)
2. Built-in schmidt trigger circuit
3. Low threshold input current
(I_{FLH} : MAX. 10mA)
4. Low level supply current
(I_{CCL} : MAX. 5mA)
5. Operating supply voltage V_{CC} : 4.5 to 17V
6. TTL and CMOS compatible output

■ 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°C)

	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	I _O	50	mA
	Power dissipation	P _O	250	mW
Operating temperature		T _{opr}	- 25 to + 85	°C
Storage temperature		T _{stg}	- 40 to + 100	°C
* ² Soldering temperature		T _{sol}	260	°C

*1 Pulse width <=100 μs, Duty ratio = 0.01

*2 For 5 seconds

■ Electro-optical Characteristics

(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
	* ³ "Low→High" threshold input current	I _{FLH}	V _{CC} = 5V	0.2	2.5	10	mA
Transfer characteristics	* ⁴ Hysteresis	I _{FHL} / I _{FLH}		0.55	0.75	0.95	-
	"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}		-	16.0	mA
Forward current	I _F	Ta = 0 to + 70°C	12.5	20.0	mA

Fig. 1 Forward Current vs. Ambient Temperature

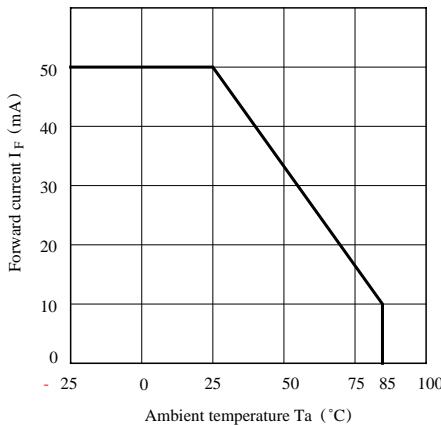


Fig. 2 Output Power Dissipation vs. Ambient Temperature

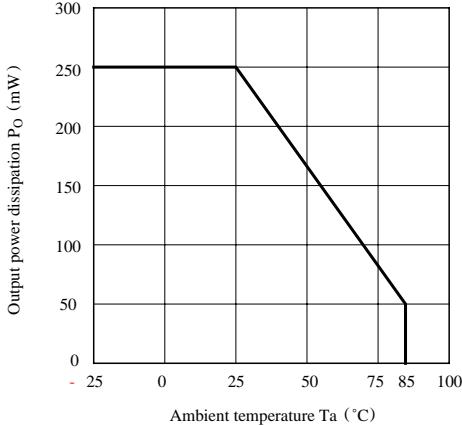


Fig. 3 Low Level Output Current vs. Ambient Temperature

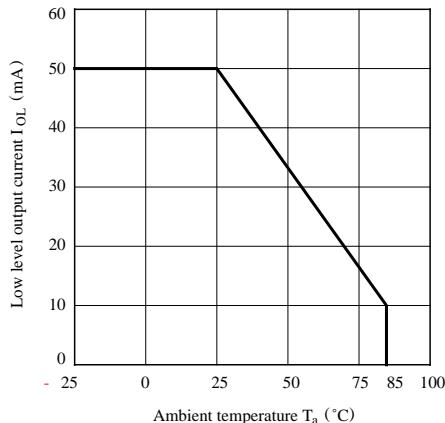


Fig. 5 Relative Threshold Input Current vs. Supply Voltage

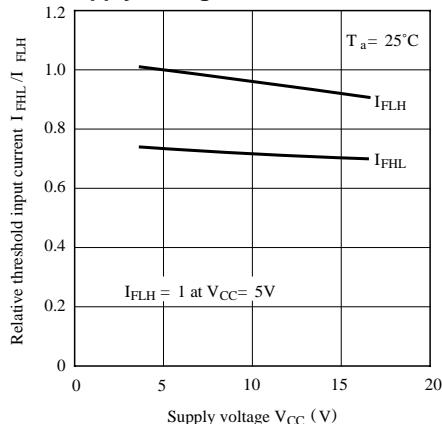


Fig. 7 Low Level Output Voltage vs. Low Level Output Current

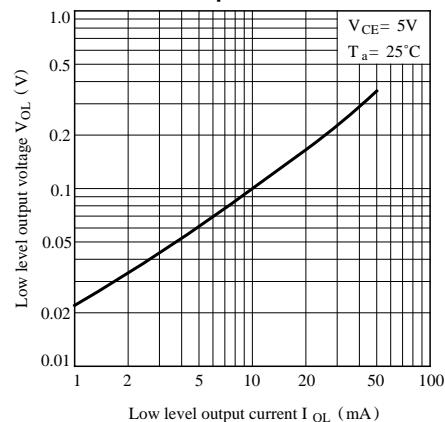


Fig.4 Forward Current vs. Forward Voltage

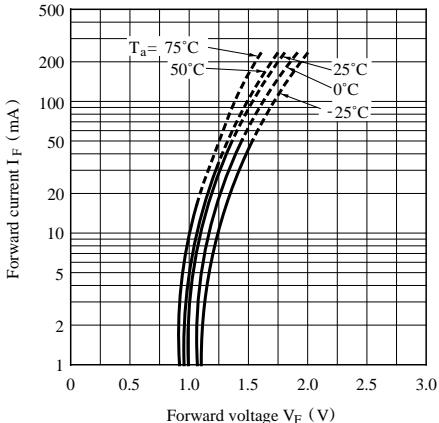


Fig. 6 Relative Threshold Input Current vs. Ambient Temperature

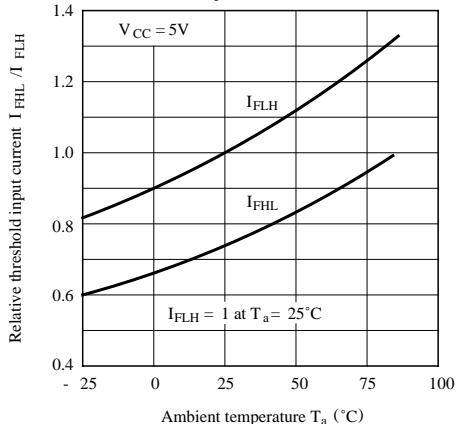


Fig. 8 Low Level Output Voltage vs. Ambient Temperature

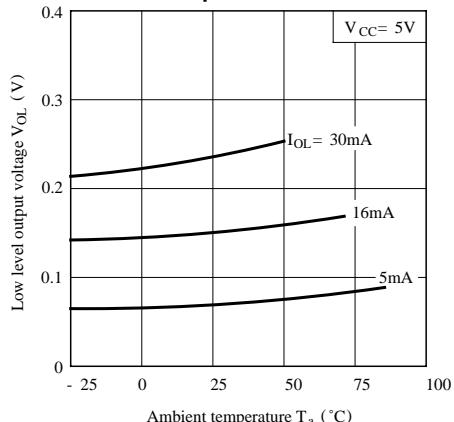
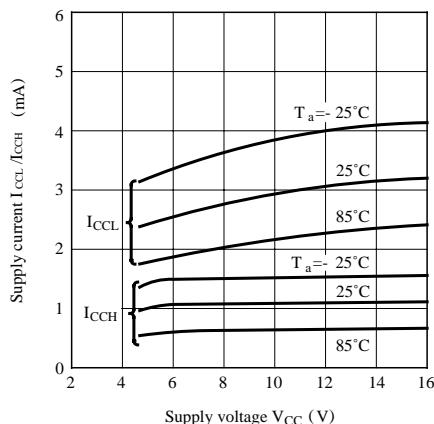
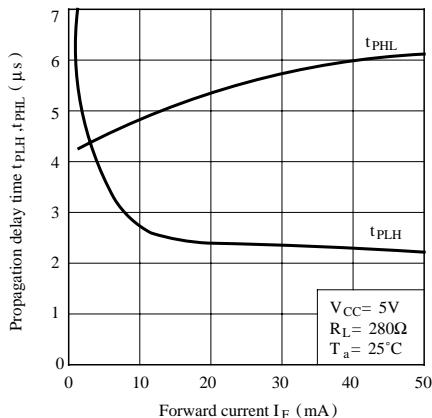
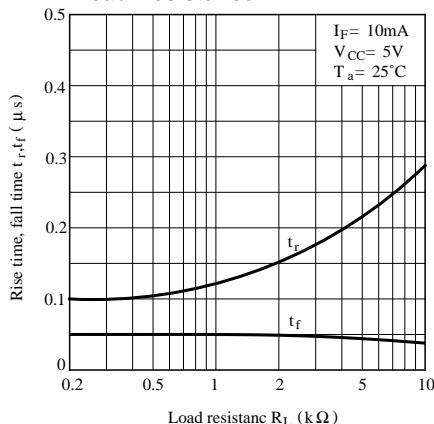
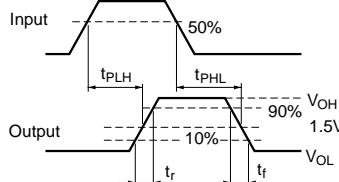
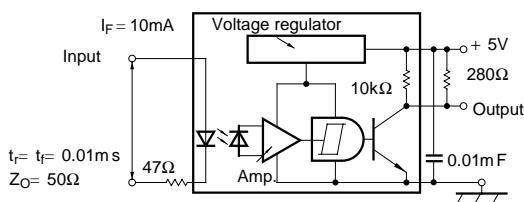


Fig. 9 Supply Current vs. Supply Voltage**Fig.10 Propagation Delay Time vs. Forward Current****Fig.11 Rise Time, Fall Time vs. Load Resistance****Test Circuit for Response Time****■ Precautions for Use**

- (1) In order to stabilize power supply line, connect a by-pass capacitor of more than $0.01\mu F$ between Vcc and GND near the device.
- (2) As for other general cautions, refer to the chapter "Precautions for Use".