

GP1A15

High Sensing Accuracy Type OPIC Photointerrupter

■ Features

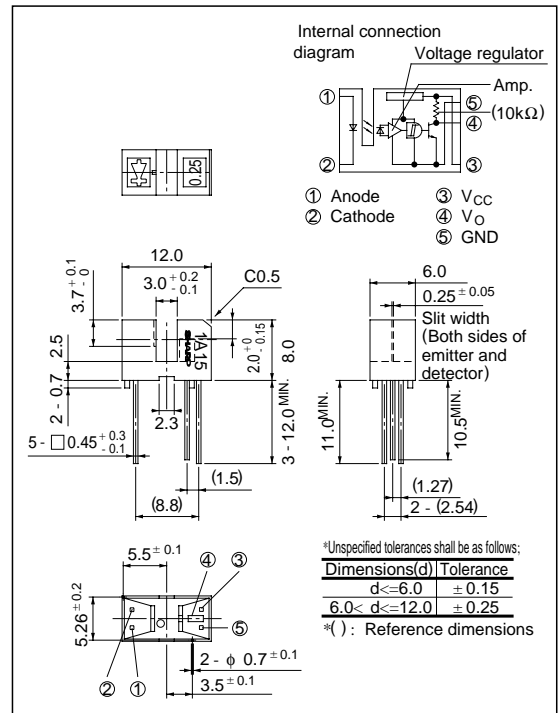
1. High sensing accuracy
(slit width : 0.25mm)
2. Built-in schmidt trigger circuit
3. Low threshold input current
(I_{FLH} : MAX. 10mA)
4. Low level supply current
(I_{CCL} : MAX. 5mA)
5. Operating supply voltage V_{CC} : 4.5 to 17V
6. TTL and CMOS compatible output

■ 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

($T_a = 25^\circ\text{C}$)

	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	$^\circ\text{C}$
Storage temperature		T_{stg}	- 40 to + 100	$^\circ\text{C}$
*2 Soldering temperature		T_{sol}	260	$^\circ\text{C}$

*1 Pules width $\leq 100 \mu\text{s}$, 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	$I_F = 10\text{mA}$	-	1.15	1.4	V	
	Reverse current	I_R	$V_R = 3\text{V}$	-	-	10	μA	
Output	Operating supply voltage	V_{CC}		4.5	-	17	V	
	Low level output voltage	V_{OL}	$I_{OL} = 16\text{mA}, V_{CC} = 5\text{V}, I_F = 0$	-	0.15	0.4	V	
	High level output voltage	V_{OH}	$V_{CC} = 5\text{V}, I_F = 10\text{mA}$	4.9	-	-	V	
	Low level supply current	I_{CCL}	$V_{CC} = 5\text{V}, I_F = 0$	-	2.5	5.0	mA	
	High level supply current	I_{CCH}	$V_{CC} = 5\text{V}, I_F = 10\text{mA}$	-	1.0	3.0	mA	
	Transfer characteristics	*3 "Low→High" threshold input current	I_{FLH}	$V_{CC} = 5\text{V}$	0.2	2.5	10	mA
*4 Hysteresis		I_{FHL} / I_{FLH}	0.55		0.75	0.95	-	
Response time		"Low→High" propagation delay time	t_{PLH}	$V_{CC} = 5\text{V}$ $I_F = 10\text{mA}$ $R_L = 280\Omega$	-	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

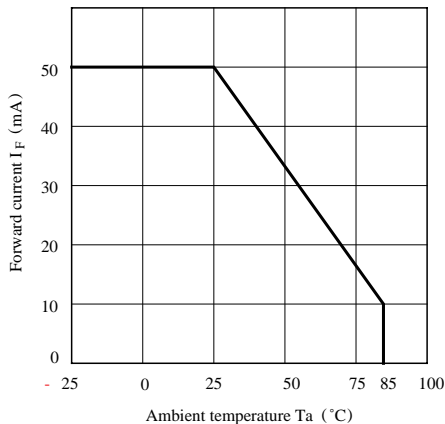


Fig. 2 Output Power Dissipation vs. Ambient Temperature

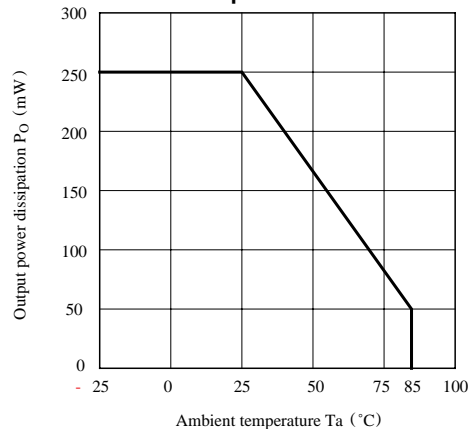


Fig. 3 Low Level Output Current vs. Ambient Temperature

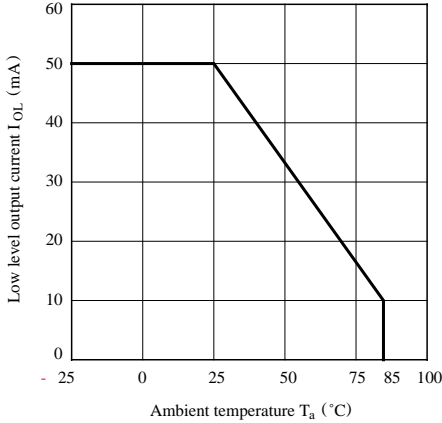


Fig. 4 Forward Current vs. Forward Voltage

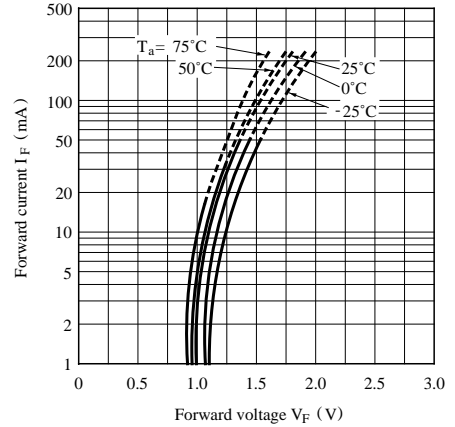


Fig. 5 Relative Threshold Input Current vs. Supply Voltage

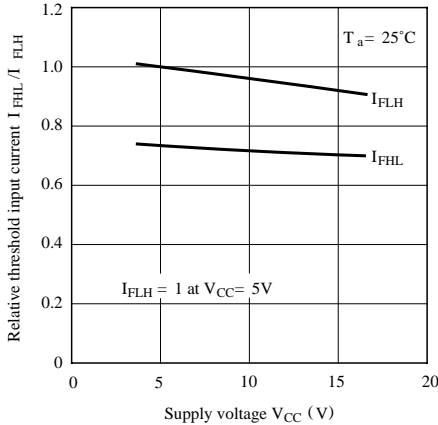


Fig. 6 Relative Threshold Input Current vs. Ambient Temperature

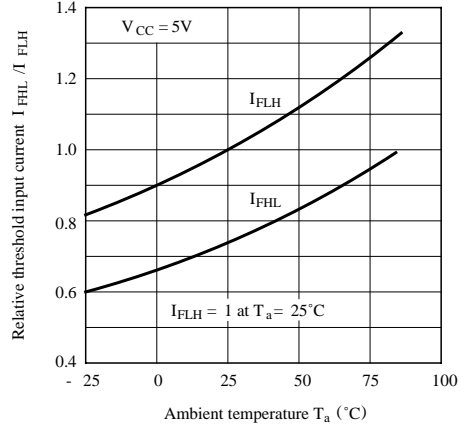


Fig. 7 Low Level Output Voltage vs. Low Level Output Current

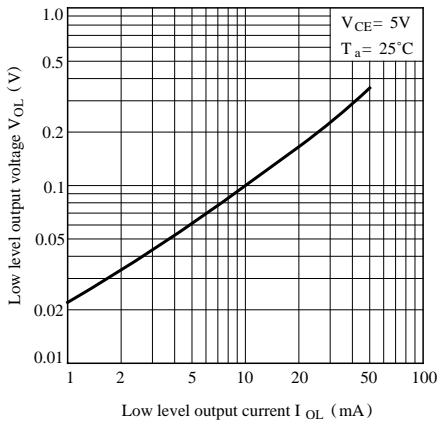


Fig. 8 Low Level Output Voltage vs. Ambient Temperature

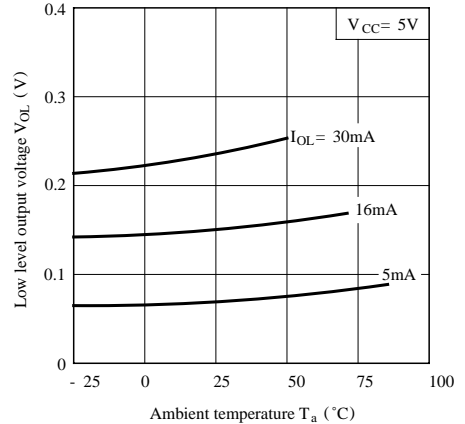


Fig. 9 Supply Current vs. Supply Voltage

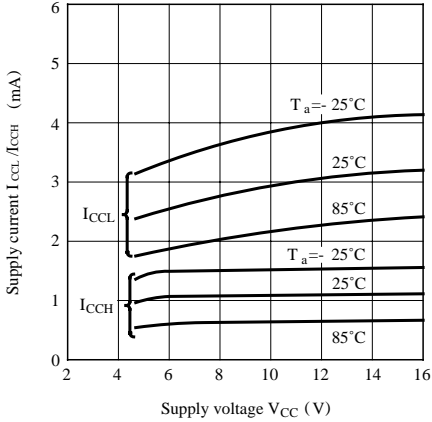


Fig.10 Propagation Delay Time vs. Forward Current

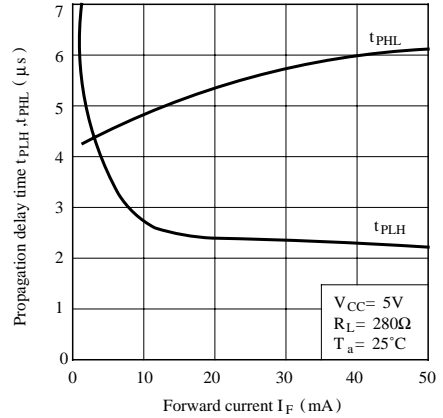
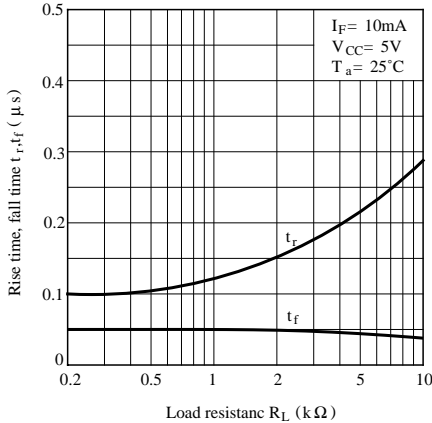
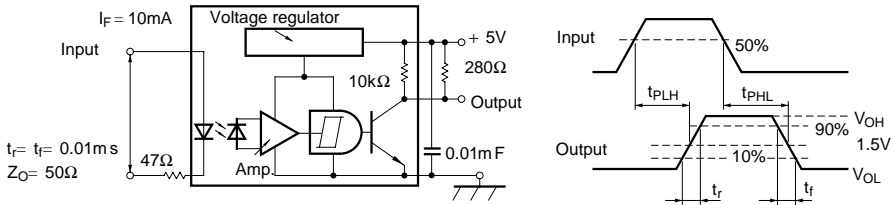


Fig.11 Rise Time, Fall Time vs. Load Resistance



Test Circuit for Response Time



■ Precautions for Use

- (1) In order to stabilize power supply line, connect a by-pass capacitor of more than 0.01 μF between V_{CC} and GND near the device.
- (2) As for other general cautions, refer to the chapter “Precautions for Use”.