GP1A14 High Sensitivity Type OPIC Photointerrupter

T-41-73

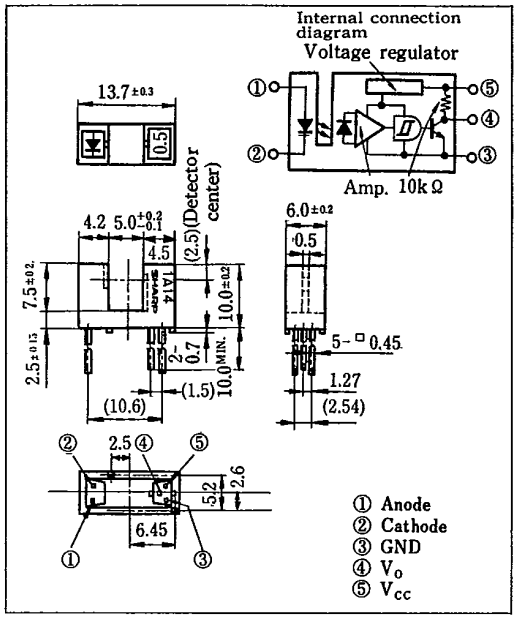
■ Features

1. Built-in Schmidt trigger circuit
2. Low threshold input current (I_{FLH} : MAX. 8mA)
3. Low level supply current (I_{CCL} : MAX. 5mA)
4. Operating supply voltage Vcc : 4.5~17V
5. TTL and CMOS compatible output
6. Wide gap between LED and detector (5mm)

■ Applications

1. Copiers, printers, facsimiles
2. Optoelectronic switches, optoelectronic counters

■ Outline Dimensions (Unit : mm)



※ OPIC is a registered trademark of Sharp and stands for Optical IC. It has a light detecting element and signal processing circuitry integrated onto a single chip.

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■ Absolute Maximum Ratings (T_a=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}	17	V
	Low level output current	I_{OL}	50	mA
	Power dissipation	P_O	250	mW
Operating temperature		T_{opr}	−25~+85	°C
Storage temperature		T_{stg}	−40~+100	°C
*2Soldering temperature		T_{sol}	260	°C

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

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■ Electro-optical Characteristics

(Ta=25°C)

Parameter			Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Input	Forward voltage		V_F	I_F=8mA	—	1.14	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=8mA	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=8mA	—	1.0	3.0	mA
Transfer characteristics	*3"Low→High" threshold input current		I_{FLH}	V_{CC}=5V	—	1.5	8.0	mA
	*4Hysteresis		I_{FHL}/I_{FLH}		0.55	0.75	0.95	—
	Response time	"Low→High" propagation time	t_{PLH}	V_{CC}=5V I_F=8mA R_L=280Ω	—	3	9	μs
		"High→Low" propagation 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}.

In order to stabilize power supply line, connect a by-pass capacitor of more than 0.01μF between V_{CC} and GND near the device.

■ Recommended Operating Conditions

Parameter	Symbol	Operating temperature	MIN.	MAX.	Unit
Low level output current	I_{OL}	Ta=0~+70°C	—	16.0	mA
Forward current	I_F		10.0	20.0	mA

Fig. 1 Forward Current vs. Ambient Temperature

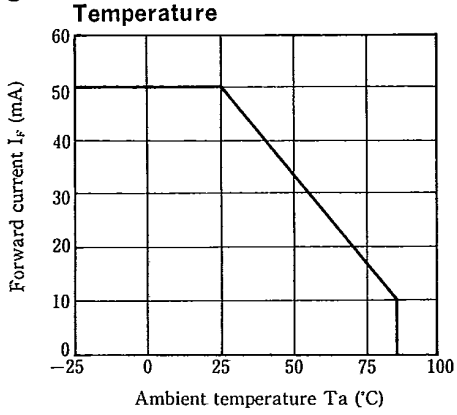

Fig. 2 Output Power Dissipation vs. Ambient Temperature

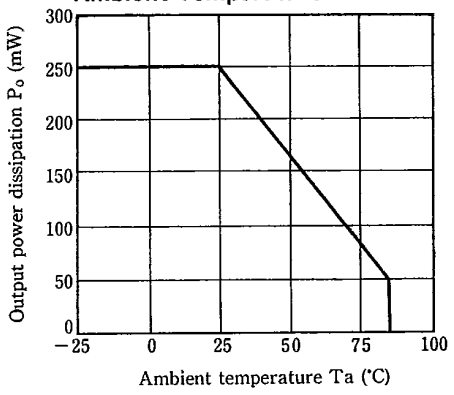

Fig. 3 Low Level Output Current vs. Ambient Temperature

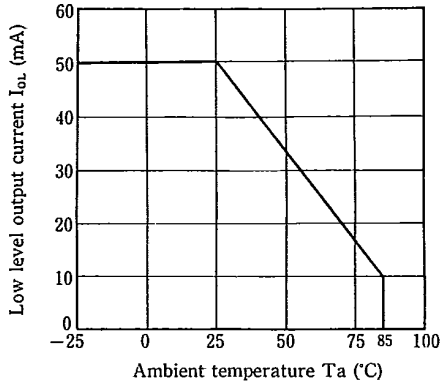

Fig. 4 Forward Current vs. Forward Voltage

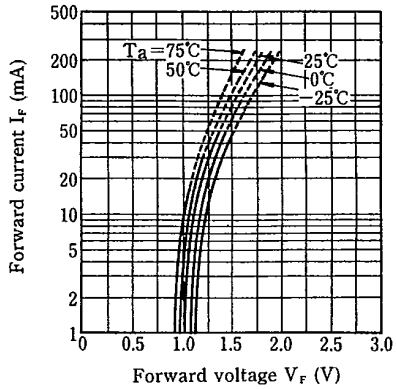

Fig. 5 Relative Threshold Input Current vs. Supply Voltage

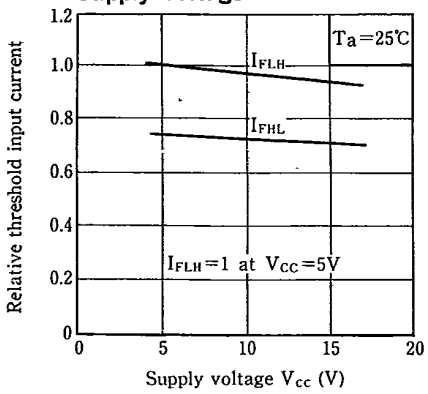

Fig. 6 Relative Threshold Input Current vs. Ambient Temperature

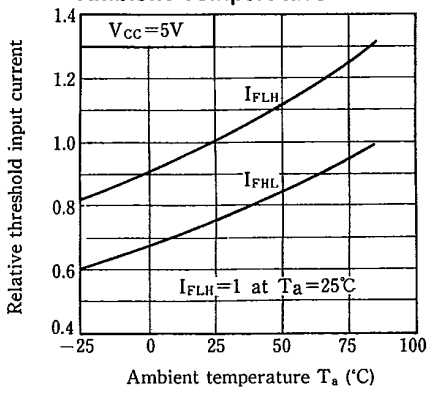

Fig. 7 Low Level Output Voltage vs. Low Level Output Current

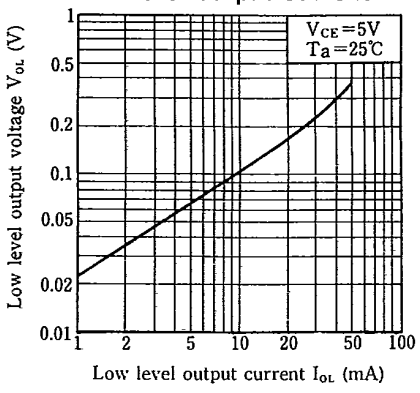

Fig. 8 Low Level Output Voltage vs. Ambient Temperature

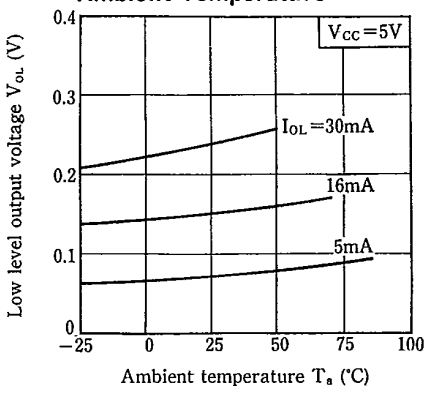

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Fig. 9 Supply Current vs. Supply Voltage

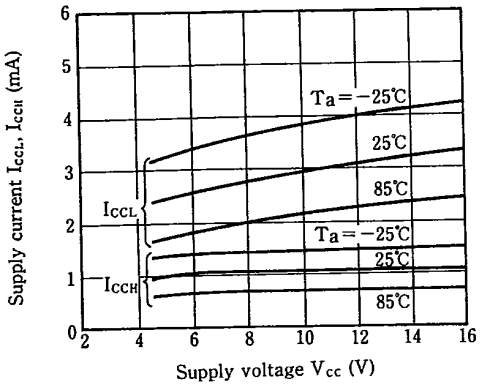


Fig. 10 Propagation Time vs. Forward Current

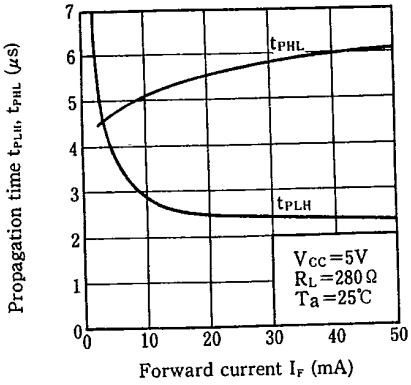
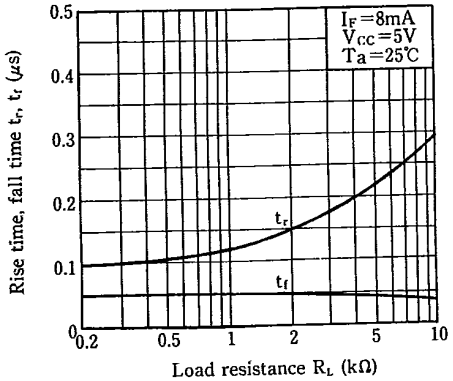


Fig. 11 Rise Time, Fall Time vs. Load Resistance



Test Circuit for Response Time