

GP1A14 High Sensitivity Type OPIC Photointerrupter

T-41-73

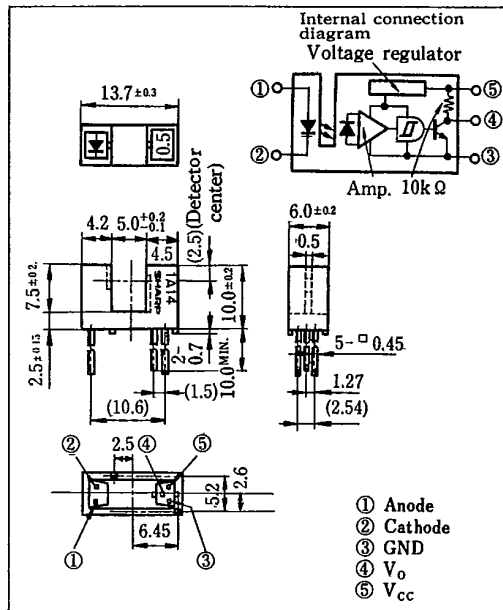
Features

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 V_{CC} : 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.



Absolute Maximum Ratings

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

Parameter	Symbol	Rating	Unit
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
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	$^\circ\text{C}$
Storage temperature	T_{stg}	-40 ~ +100	$^\circ\text{C}$
*2 Soldering temperature	T_{sol}	260	$^\circ\text{C}$

*1 Pulse width $\leq 100\mu\text{s}$, Duty ratio = 0.01

*2 For 5 seconds

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(Ta=25°C)

■ Electro-optical Characteristics

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	
Operating supply voltage		V_{CC}		4.5	—	17	V	
Output	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	
	**Hysteresis	I_{FHL}/I_{FLH}		0.55	0.75	0.95	—	
	Response time	"Low→High" propagation time	t_{PLH}	$V_{CC}=5V$ $I_F=8mA$ $R_L=280\Omega$	—	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 $0.01\mu F$ between V_{CC} and GND near the device.

■ Recommended Operating Conditions

Parameter	Symbol	Operating temperature	MIN.	MAX.	Unit
Low level output current	I_{OL}	$T_a=0\sim+70^\circ C$	—	16.0	mA
Forward current	I_F		10.0	20.0	mA

Fig. 1 Forward Current vs. Ambient Temperature

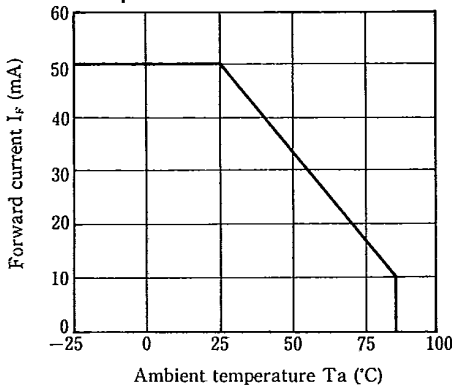


Fig. 2 Output Power Dissipation vs. Ambient Temperature

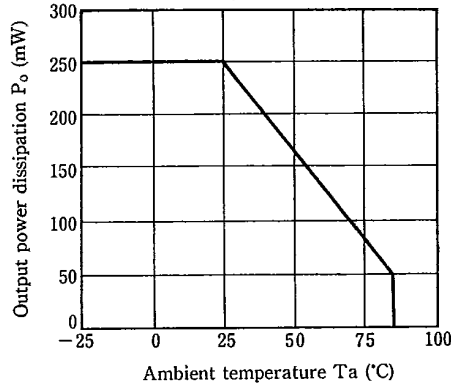


Fig. 3 Low Level Output Current vs. Ambient Temperature

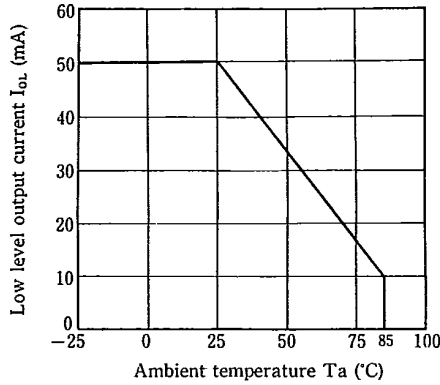


Fig. 4 Forward Current vs. Forward Voltage

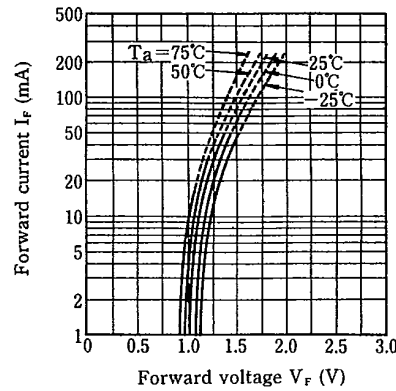


Fig. 5 Relative Threshold Input Current vs. Supply Voltage

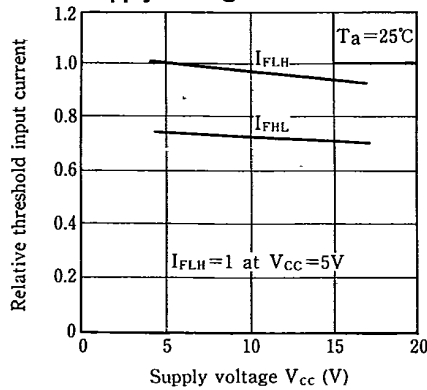


Fig. 6 Relative Threshold Input Current vs. Ambient Temperature

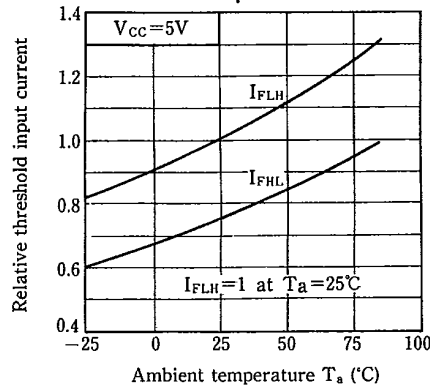


Fig. 7 Low Level Output Voltage vs. Low Level Output Current

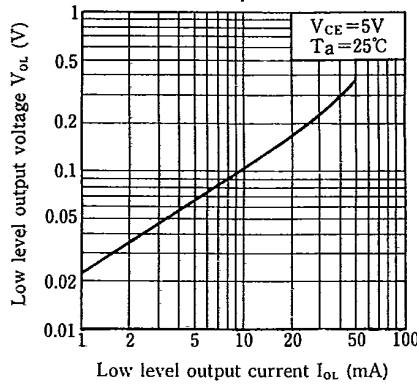
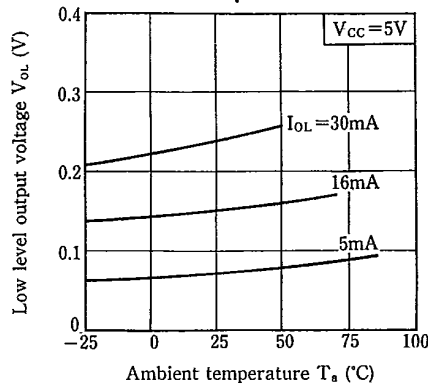


Fig. 8 Low Level Output Voltage vs. Ambient Temperature



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Fig. 9 Supply Current vs. Supply Voltage

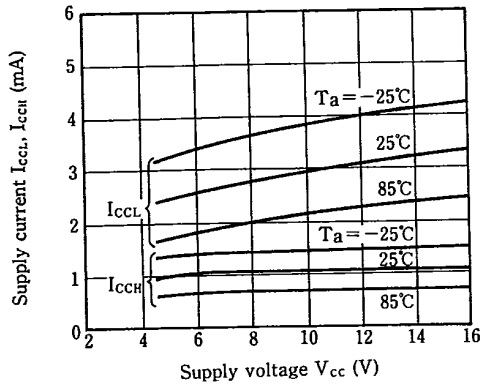


Fig. 10 Propagation Time vs. Forward Current

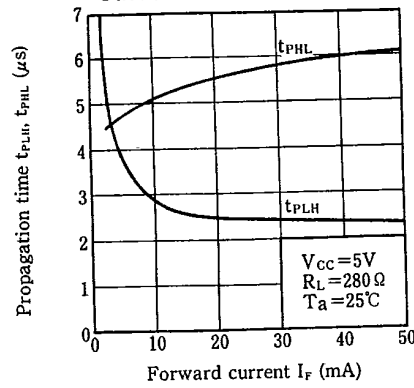
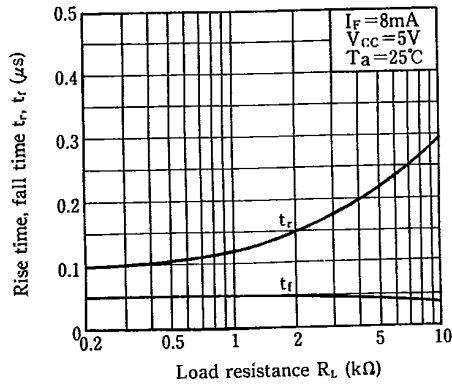


Fig. 11 Rise Time, Fall Time vs. Load Resistance



Test Circuit for Response Time

