

GP1A18 High Sensitivity Type OPIC Photointerrupter

Features

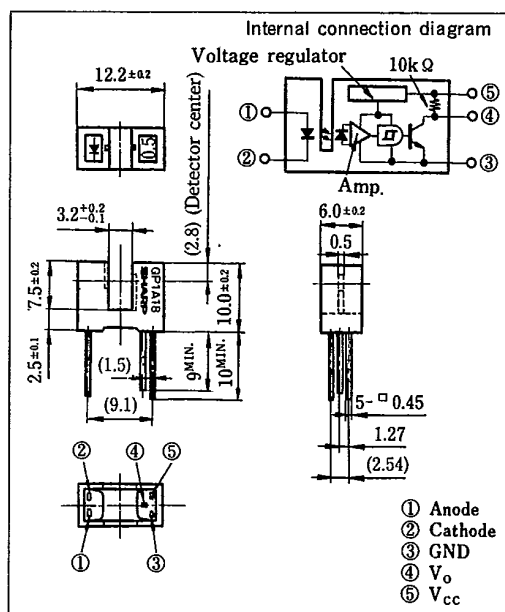
1. Built-in Schmidt trigger circuit
2. Low threshold input current (I_{FLH} : MAX. 5mA)
3. Operating supply voltage V_{CC} : 4.5~17V
4. High sensing accuracy (Slit width : 0.5mm)
5. TTL and CMOS compatible output
6. Easy to mount on PWB due to compact and lightweight

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

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

	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}	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

T-41-73

(Ta=25°C)

■ Electro-optical Characteristics

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Input	Forward voltage	V_F	$I_F=5\text{mA}$	—	1.1	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}	$V_{CC}=5\text{V}$, $I_F=5\text{mA}$	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}	$V_{CC}=5\text{V}$, $I_F=5\text{mA}$	—	1.0	3.0	mA
	*3 "Low→High" threshold input current	I_{FLH}	$V_{CC}=5\text{V}$	—	1.0	5.0	mA
Transfer characteristics	*4 Hysteresis	I_{FHL}/I_{FLH}	$V_{CC}=5\text{V}$	0.55	0.75	0.95	
	Response time	"Low→High" propagation time	$V_{CC}=5\text{V}$ $I_F=5\text{mA}$ $R_L=280\Omega$	—	3	9	μs
		"High→Low" propagation time		—	5	15	
		Rise time		—	0.1	0.5	
		Fall time		—	0.05	0.5	

*3 I_{FLH} represents forward current when output changes from low to high.*4 I_{FHL} represents forward current when output changes from high to low.Hysteresis stands for I_{FHL}/I_{FLH} .

(Precautions for Use)

In order to stabilize power supply line, we recommend to connect a by-pass capacitor of more than $0.01\mu\text{F}$ between V_{CC} and GND near the device.

■ Recommended Operating Conditions

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

Fig. 1 Forward Current vs. Ambient Temperature

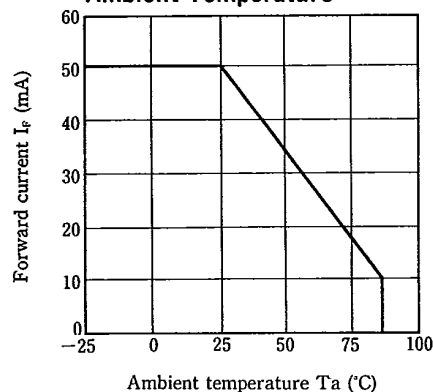


Fig. 2 Output Power Dissipation vs. Ambient Temperature

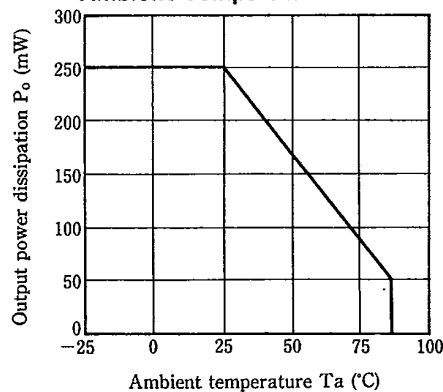


Fig. 3 Low Level Output Current vs. Ambient Temperature

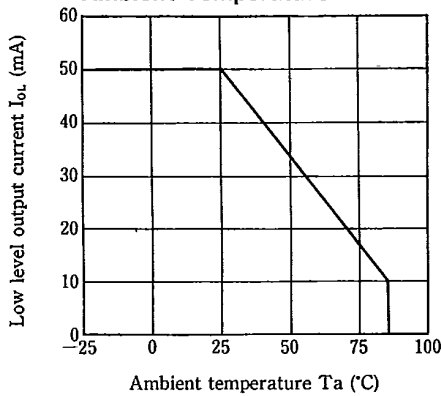


Fig. 4 Forward Current vs. Forward Voltage

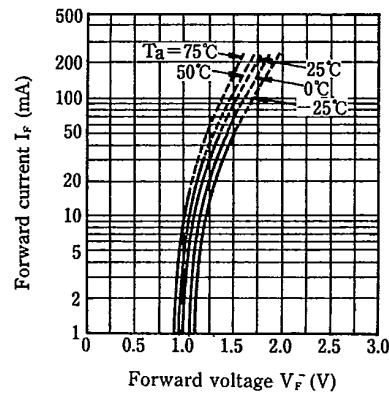


Fig. 5 Relative Threshold Input Current vs. Supply Voltage

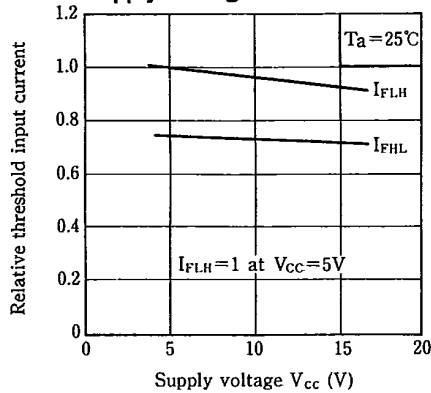


Fig. 6 Relative Threshold Input Current vs. Ambient Temperature

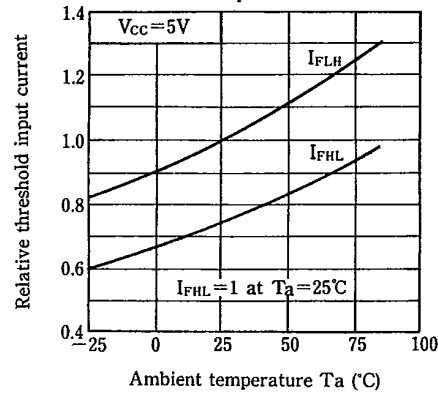


Fig. 7 Low Level Output Voltage vs. Low Level Output Current

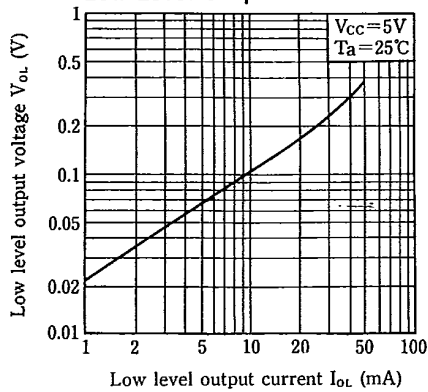
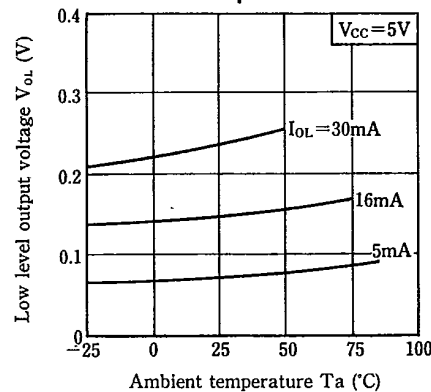


Fig. 8 Low Level Output Voltage vs. Ambient Temperature



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Fig. 9 Supply Current vs. Supply Voltage

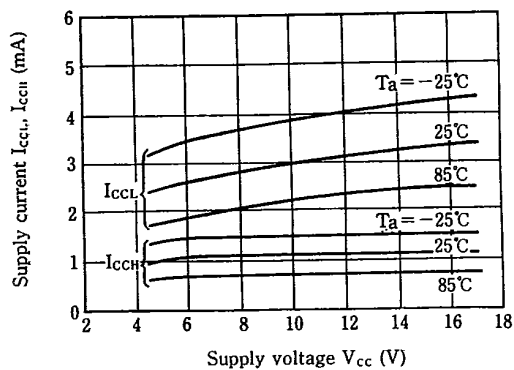


Fig. 10 Propagation Time vs. Forward Current

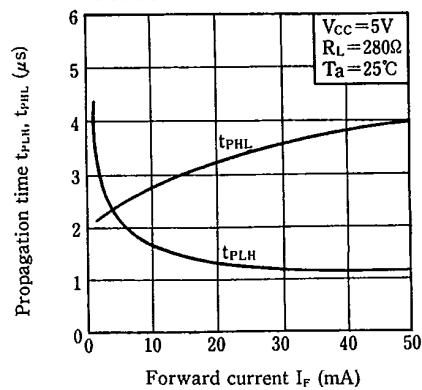
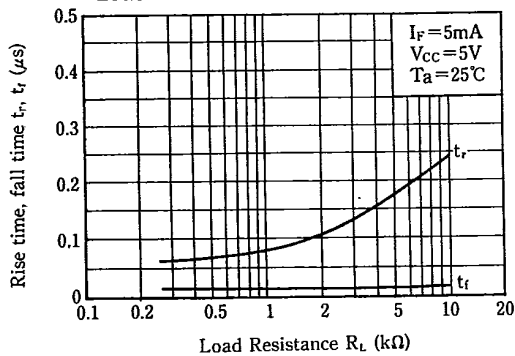


Fig. 11 Rise Time, Fall Time vs. Load Resistance



Test Circuit for Response Time

