GP1A17

Wide Gap Type, OPIC Photointerrupter

■ Features

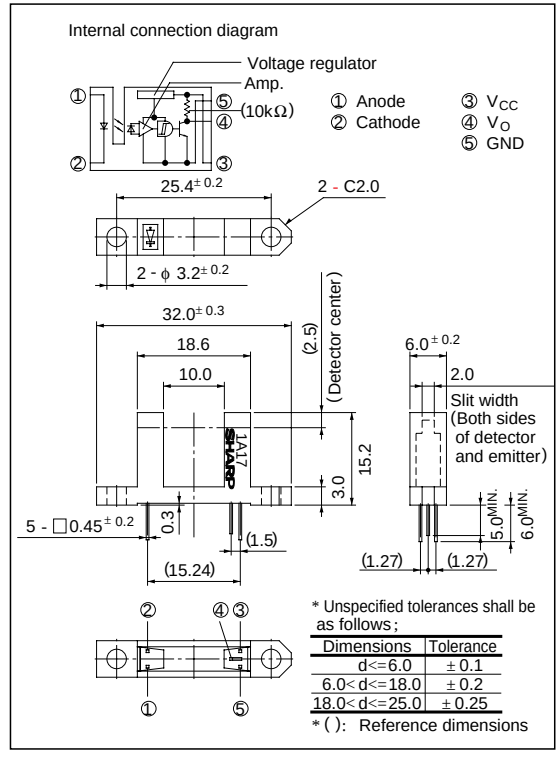
1. Built-in Schmidt trigger circuit
2. Wide gap between light emitter and detector (10mm)
3. Operating supply voltage V_{CC}: 4.5 to 17V
4. TTL and CMOS compatible output

■ Applications

1. Copiers
2. Analyzers, measuring instruments, etc.

■ 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
	*1Peak 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 tamperature		T_{opr}	- 25 to + 85	°C
Storage temperture		T_{stg}	- 40 to + 100	°C
*2 Soldering temperature		T_{sol}	260	°C

*1 Pules width <=100 μs, Duty ratio = 0.01
*2 For 5 seconds

■ Electro-optical Charcateristics

(Ta = 25˚C)

Parameter			Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Input	Forward voltage		V_F	I_F= 7mA	-	1.13	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= 7mA	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= 7mA	-	1.0	3.0	mA
Transfer characteristics	*3" Low→High" threshold input current		I_{FLH}	V_{CC}= 5V	-	3.0	7.0	mA
	*4Hysteresis		I_{FHL}/I_{FLH}	Vcc= 5V	0.55	0.65	0.95	-
	Response time	"Low→High" propagation delay time	t_{PLH}	V_{CC}= 5V I_F= 7mA 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}	Ta = 0 to + 70˚C	-	16	mA
Forward current	I_F		10	20	mA

Fig. 1 Forward Current vs. Ambient Temperature

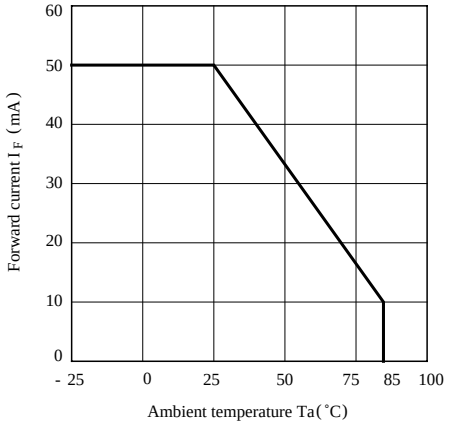


Fig. 2 Output Power Dissipation vs. Ambient Temperature

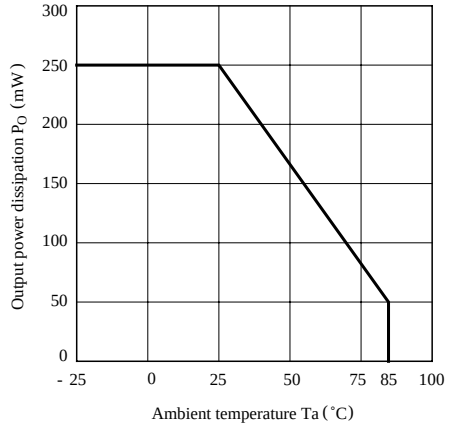


Fig. 3 Low Level Output Current vs. Ambient Temperature

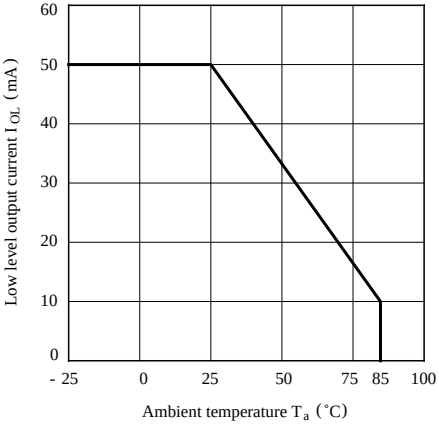


Fig. 4 Forward Current vs. Forward Voltage

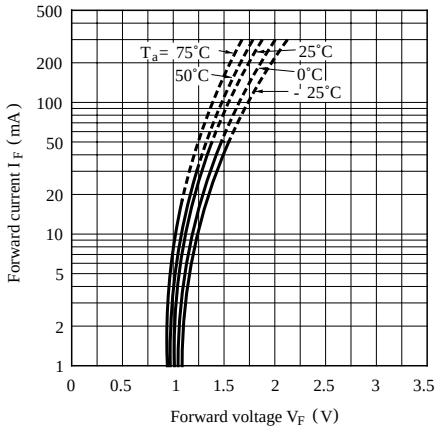


Fig. 5 Relative Threshold Input Current vs. Supply Voltage

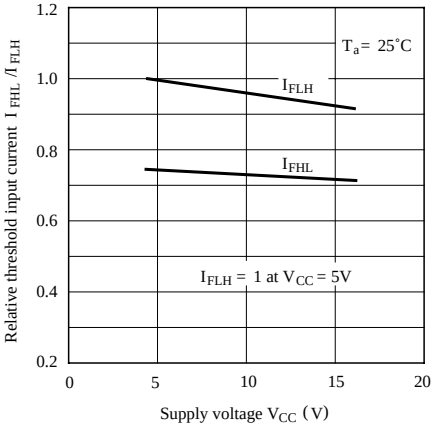


Fig. 6 Relative Threshold Input Current vs. Ambient Temperature

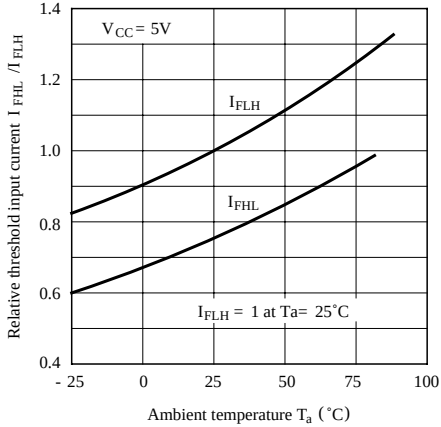


Fig. 7 Low Level Output Voltage vs. Low Level Output Current

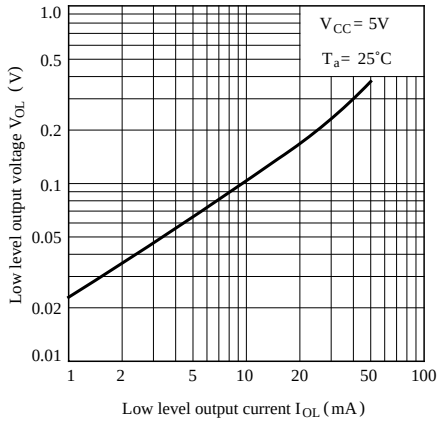


Fig. 8 Low Level Output Voltage vs. Ambient Temperature

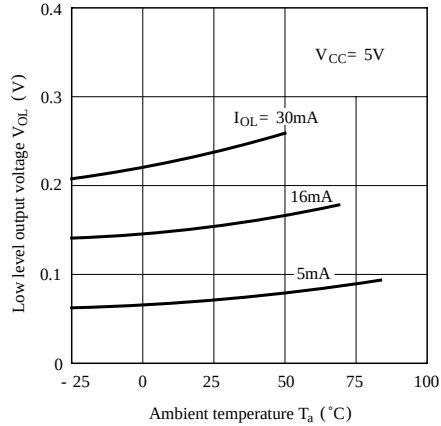


Fig. 9 Supply Current vs. Supply Voltage

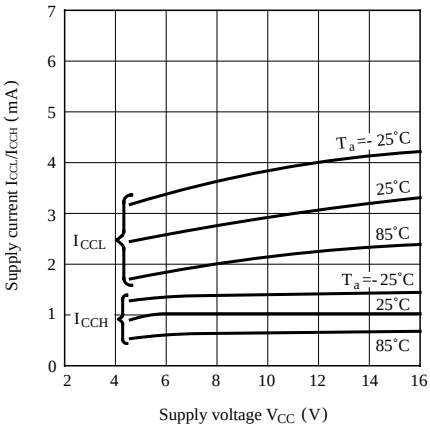


Fig.10 Propagation Delay Time vs. Forward Current

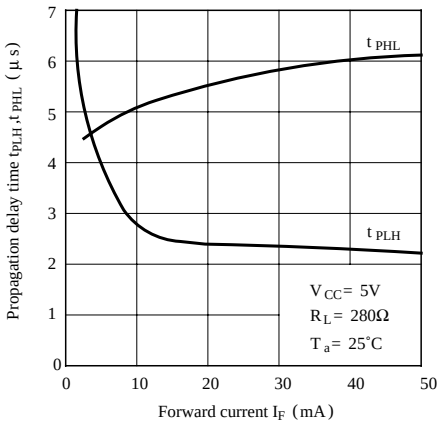
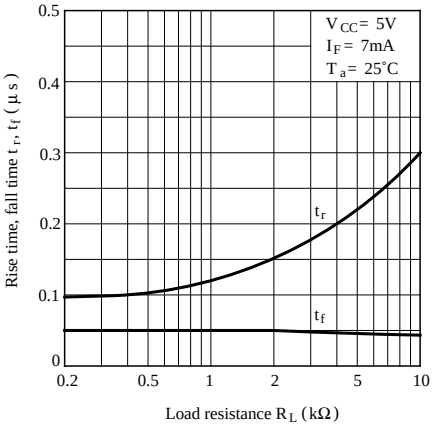
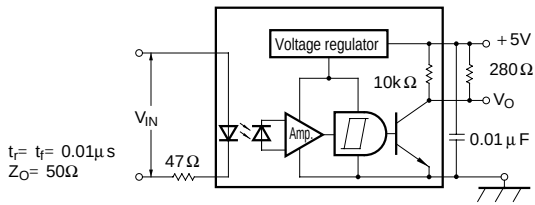
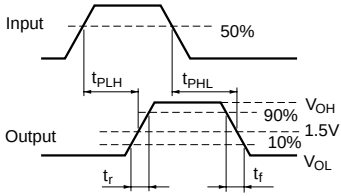


Fig.11 Rise Time, Fall Time vs. Load Resistance



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 Vcc and GND near the device.

(2) As for other general cautions, refer to the chapter "Precautions for Use".

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