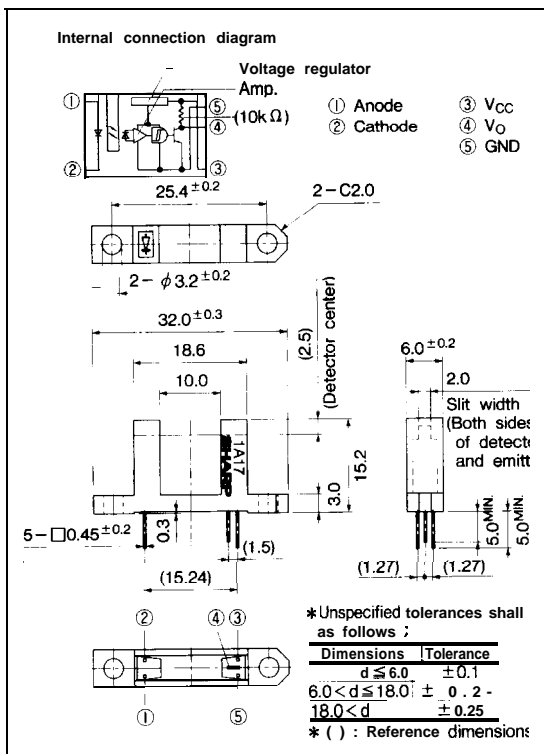# GP1A17

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)

Internal connection diagram

Voltage regulator Amp.

① Anode   ③ V_{CC}
② Cathode   ④ V_O
               ⑤ GND

*Unspecified tolerances shall as follows :

Dimensions	Tolerance
d ≦ 6.0	± 0.1
6.0 < d ≦ 18.0	± 0.2
18.0 < d	± 0.25

*( ) : Reference dimensions

* "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℃)

	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	Po	250	mW
Operating temperature		T_{opr}	−25 to +85	℃
Storage temperature		T_{stg}	−40 to +100	℃
*2 Soldering temperature		T_{sol}	260	℃

*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_{CCI}	$V_{CC} = 5V$, IF=O	—	2.5	5.0	mA
	High level supply current		I_{CCH}	$V_{CC} = 5V$, $I_F = 7mA$	—	1.0	3.0	mA
Transfer charac teristics		*3 "Low→ High" threshold input current	I_{FLH}	$V_{CC} = 5V$	—	3.0	7.0	mA
		*4 Hysteresis	I_{FHL}/I_{FLH}	$Vcc = 5V$	0.55	0.65	0.95	–
	response time	"Low→High" propagation delay time	tPLH	$V_{CC} = 5V$ $I_F = 7mA$ $R_L = 280\Omega$		3	9	μs
		"High →Low" propagation delay time	tPHL		—	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}	$Ta=O$ to $+70°C$		16	mA
Forward current	I_F		10	20	mA

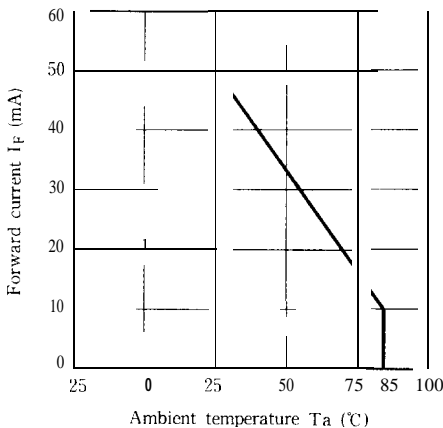### Fig. 1 Forward Current vs. Ambient Temperature

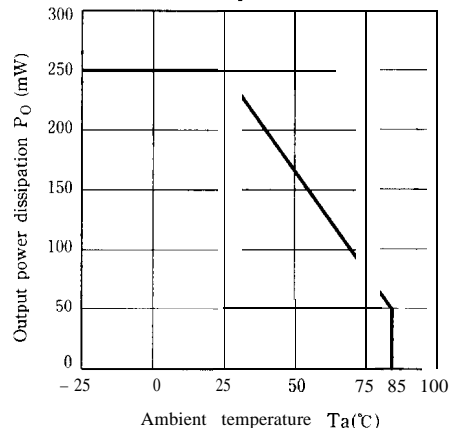### Fig. 2 Output Power Dissipation vs. Ambient Temperature

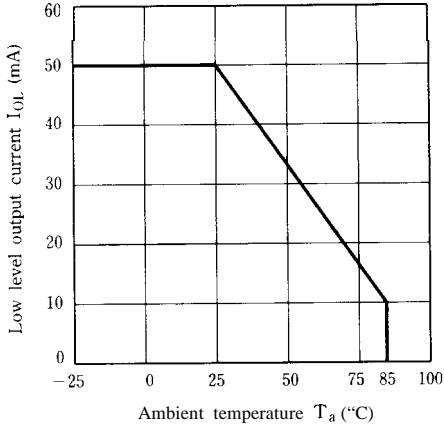## Fig. 3 Low Level Output Current vs. Ambient Temperature

Fig. 4 Forward Current ve. Forward Voltage
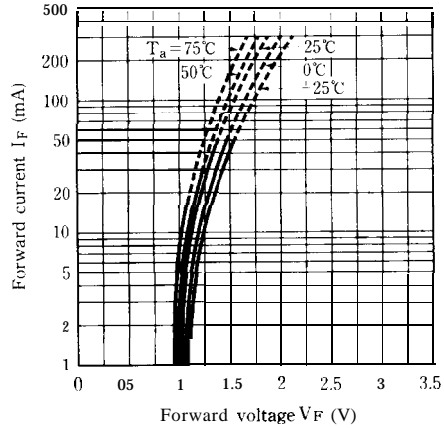

Fig. 5 Relative Threshold Input Current vs. Supply Voltage
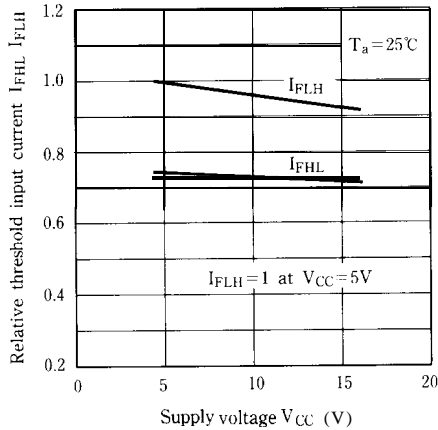

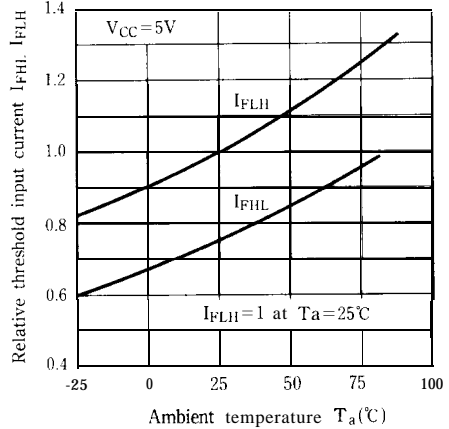## Fig. 6 Relative Threshold Input Current vs. Ambient Temperature

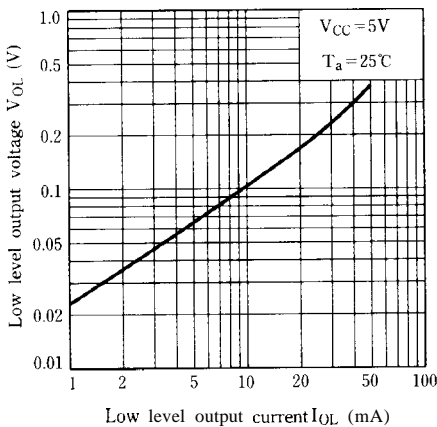## Fig. 7 Low Level Output Voltage vs. Low Level Output Current

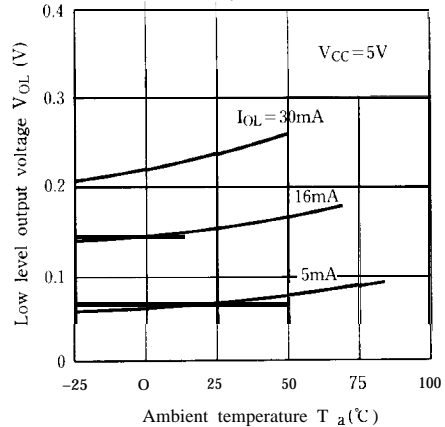## Fig. 8 Low Level Output Voltage vs. Ambient Temperature

Photointerrupters

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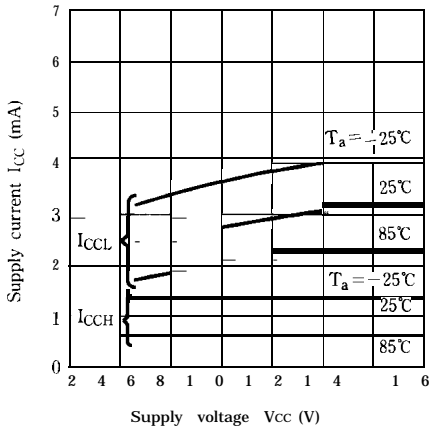**Fig. 9 Supply Current vs. Supply Voltage**

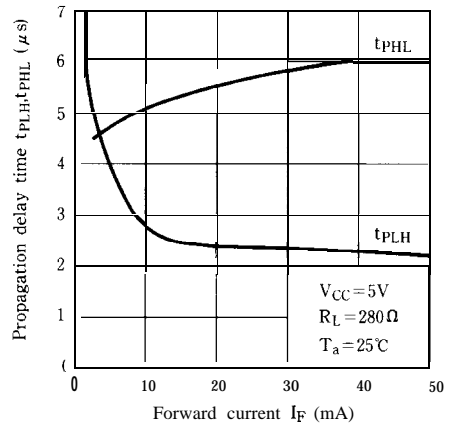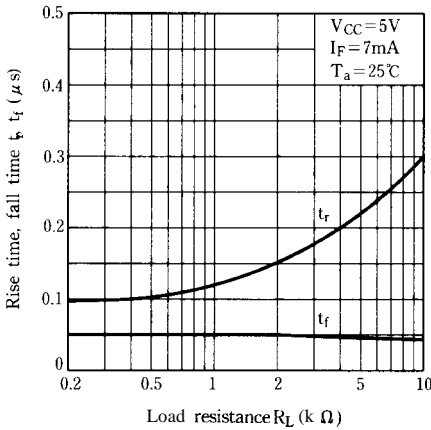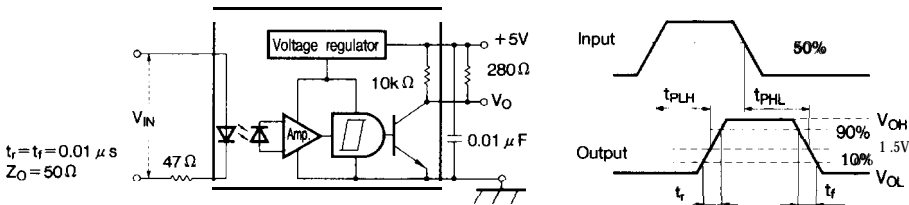**Fig.10 Propagation Delay Time vs. Forward Current**

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" (Page 78 to 93).