

# GP1A67L/GP1A67H

## Subminiature OPIC Photointerrupter

### ■ Features

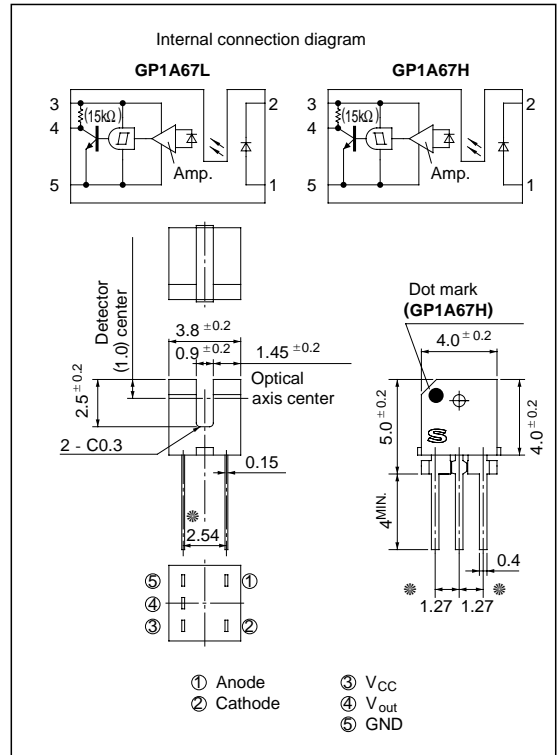
1. Ultra-compact (3.8 x 4.0 x 4.0mm )
2. TTL compatible output
3. Low operating voltage, low dissipation current suitable for battery-driven applications (V<sub>CC</sub>: 2.2 to 7.0V, I<sub>CCL</sub> : TYP. 1.3mA )

### ■ Applications

1. Compact personal OA equipment
2. Floppy disk drives
3. Auto-focus cameras
4. VCRs

### ■ Outline Dimensions

(Unit : mm )



\*"OPIC" (Optical IC) is a trademark of the SHARP Corporation.

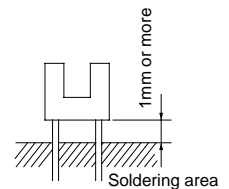
An OPIC consists of a light-detecting element and signal-processing circuit integrated onto a single chip.

\* The dimensions indicated by \* refer to those measured from the lead base.

### ■ Absolute Maximum Ratings

(T<sub>a</sub> = 25°C)

Parameter		Symbol	Rating	Unit
Input	Forward current	I <sub>F</sub>	50	mA
	Reverse voltage	V <sub>R</sub>	6	V
	Power dissipation	P	75	mW
Output	Supply voltage	V <sub>CC</sub>	7	V
	Output current	I <sub>O</sub>	8	mA
	Power dissipation	P <sub>O</sub>	80	mW
	Operating temperature	T <sub>opr</sub>	- 25 to + 85	°C
	Storage temperature	T <sub>stg</sub>	- 40 to + 100	°C
*1 Soldering temperature		T <sub>sol</sub>	260	°C



\*1 For 5 seconds

Electro-optical Charcateristics

(Ta = 25°C)

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit		
Input	Forward voltage	$V_F$	$I_F = 20\text{mA}$	-	1.2	1.4	V		
	Reverse current	$I_R$	$V_R = 3\text{V}$	-	-	10	$\mu\text{A}$		
Operating supply voltage		$V_{CC}$		2.2	-	7.0	V		
Output	Low level output voltage	GP1A67L	$V_{CC} = 5\text{V}, I_{OL} = 4\text{mA}, I_F = 5\text{mA}$	-	0.15	0.4	V		
		GP1A67H	$V_{CC} = 5\text{V}, I_{OL} = 4\text{mA}, I_F = 0$						
	High level output voltage	GP1A67L	$V_{CC} = 5\text{V}, I_F = 0$	4.9	-	-	V		
		GP1A67H	$V_{CC} = 5\text{V}, I_F = 5\text{mA}$						
	Low level supply current	GP1A67L	$V_{CC} = 5\text{V}, I_F = 5\text{mA}$	-	1.3	3.8	mA		
		GP1A67H	$V_{CC} = 5\text{V}, I_F = 0$						
High level supply current	GP1A67L	$V_{CC} = 5\text{V}, I_F = 0$	-	1.0	3.0	mA			
	GP1A67H	$V_{CC} = 5\text{V}, I_F = 5\text{mA}$							
Transfer characteristics	*2 "High→Low" threshold input current	GP1A67L	$I_{FHL}$	$V_{CC} = 5\text{V}$	-	0.9	2.5	mA	
	*3 "Low→High" threshold input current	GP1A67H	$I_{FLH}$						
	*4 Hysteresis	GP1A67L	$I_{FLH} / I_{FHL}$	$V_{CC} = 5\text{V}$	0.55	0.8	0.95	-	
		GP1A67H	$I_{FHL} / I_{FLH}$						
	*5 Response time	"Low→High" propagation delay time	GP1A67L	$t_{PLH}$	$V_{CC} = 5\text{V}$	-	9.0	30	$\mu\text{s}$
			GP1A67H	$t_{PLH}$		-	3.0	15	
	"High→Low" propagation delay time	GP1A67L	$t_{PHL}$	$I_F = 5\text{mA}$	-	3.0	15		
		GP1A67H	$t_{PHL}$		-	9.0	30		
Rise time		$t_r$	$R_L = 1.2\text{k}\Omega$	-	0.1	0.5			
Fall time		$t_f$		-	0.05	0.5			

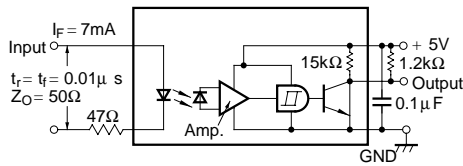
\*2  $I_{FHL}$  represents forward current when output changes from "High" to "Low".

\*3  $I_{FLH}$  represents forward current when output changes from "Low" to "High".

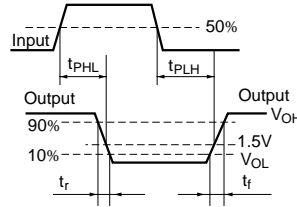
\*4 Hysteresis stands for  $I_{FLH} / I_{FHL}$  (GP1A67L) or  $I_{FHL} / I_{FLH}$  (GP1A67H).

\*5 Test circuit for response time shall be shown below.

Test Circuit for Response Time



GP1A67L



GP1A67H

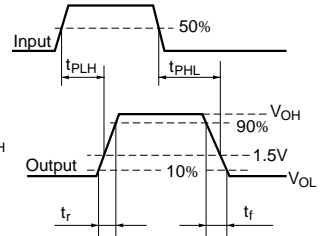


Fig. 1 Forward Current vs. Ambient Temperature

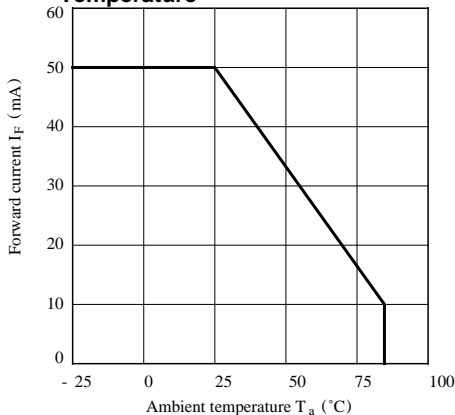
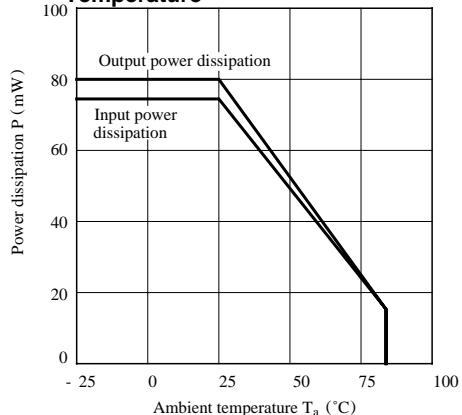
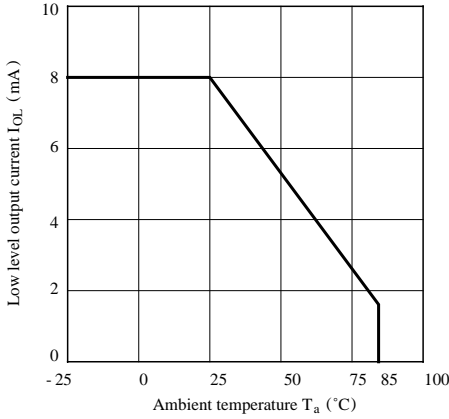


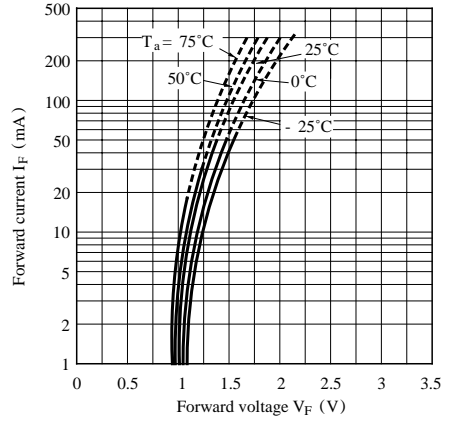
Fig. 2 Power Dissipation vs. Ambient Temperature



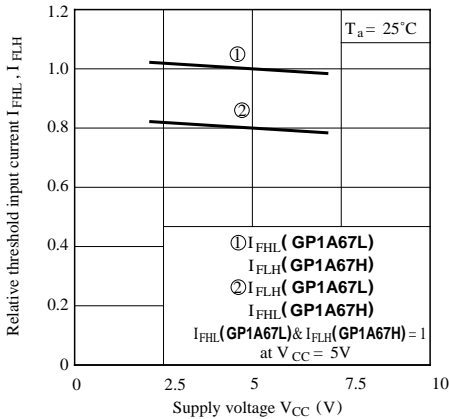
**Fig. 3 Low Level Output Current vs. Ambient Temperature**



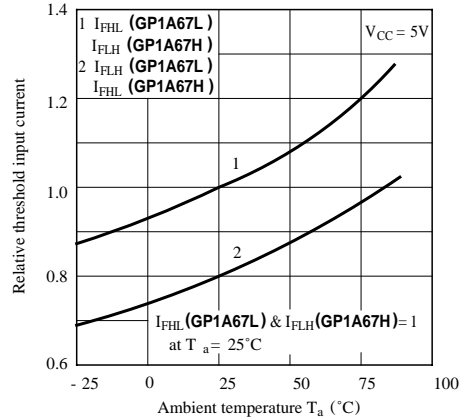
**Fig. 4 Forward Current vs. Forward Voltage**



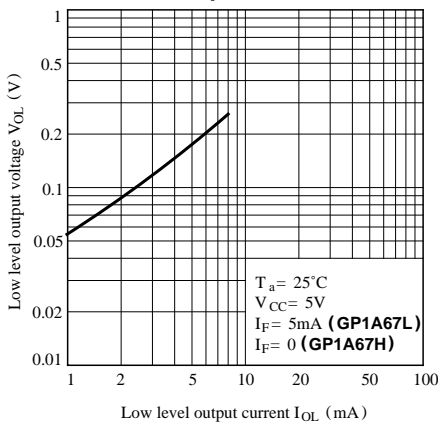
**Fig. 5 Relative Threshold Input Current vs. Supply Voltage**



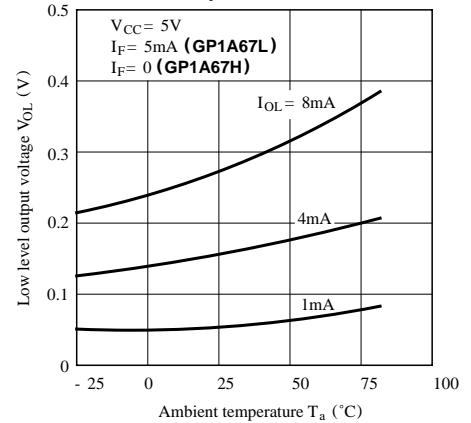
**Fig. 6 Relative Threshold Input Current vs. Ambient Temperature**



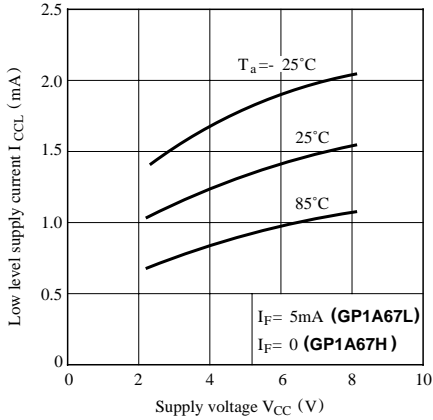
**Fig. 7 Low Level Output Voltage vs. Low Level Output Current**



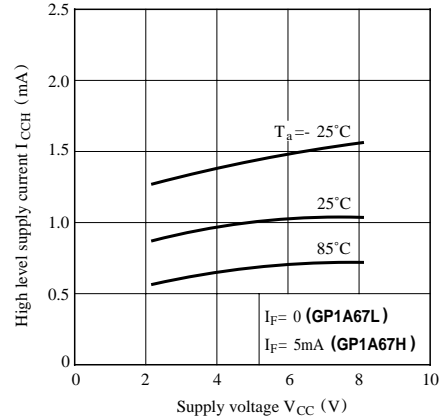
**Fig. 8 Low Level Output Voltage vs. Ambient Temperature**



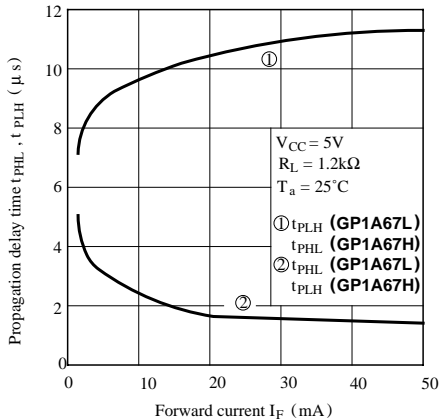
**Fig. 9 Low Level Supply Current vs. Supply Voltage**



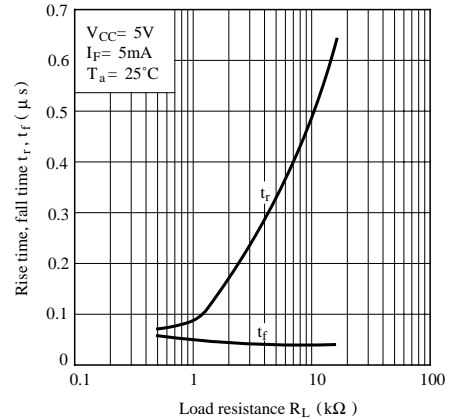
**Fig.10 High Level Supply Current vs. Supply Voltage**



**Fig.11 Propagation Delay Time vs. Forward Current**



**Fig.12 Rise Time, Fall Time vs. Load Resistance**



## ■ Precautions for Use

- (1) In order to stabilize power supply line, connect a by-pass capacitor of more than  $0.1\mu\text{F}$  between  $V_{CC}$  and GND near the device.
- (2) Ultrasonic cleaning is prohibited.
- (3) As for other general cautions, refer to the chapter "Precautions for Use".