GP1A67L/GP1A67H

Subminiature OPIC Photointerrupter

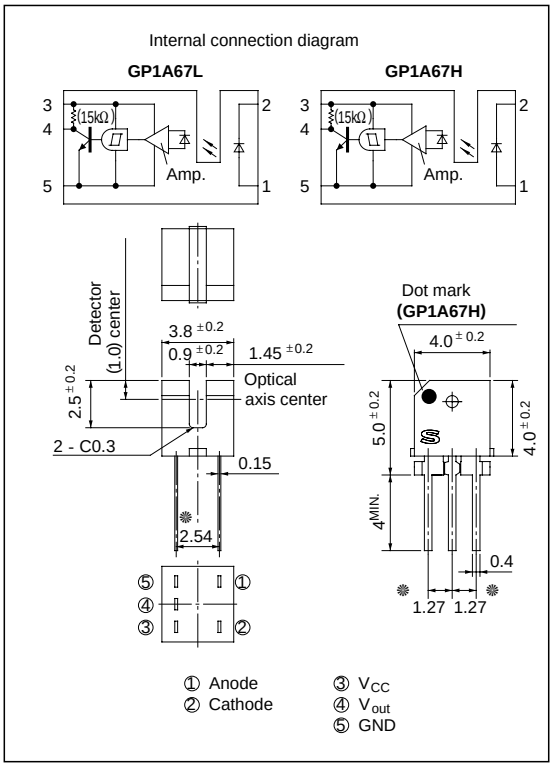
■ Features

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 (Vcc: 2.2 to 7.0V, I_{CCL}: TYP. 1.3mA)

■ Applications

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

■ Outline Dimensions (Unit: mm)

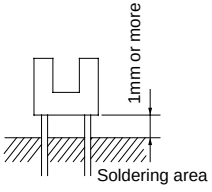


*"OPIC" (Optical IC) is a trademark of the SHARP Corporation.
An OPIC consists of a light-detecting element and signal-processing circuit integrated onto a single chip.

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

■ Absolute Maximum Ratings (Ta= 25°C)

Parameter		Symbol	Rating	Unit
Input	Forward current	I_F	50	mA
	Reverse voltage	V_R	6	V
	Power dissipation	P	75	mW
Output	Supply voltage	V_{CC}	7	V
	Output current	I_O	8	mA
	Power dissipation	P_O	80	mW
Operating temperature		T_{opr}	- 25 to + 85	°C
Storage temperature		T_{stg}	- 40 to + 100	°C
*1 Soldering temperature		T_{sol}	260	°C



*1 For 5 seconds

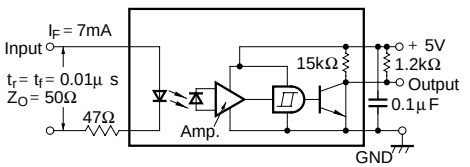
■ Electro-optical Charcateristics

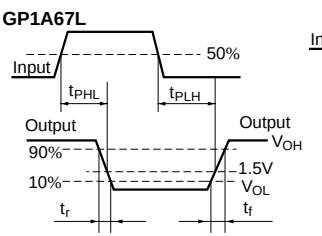
(Ta = 25°C)

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





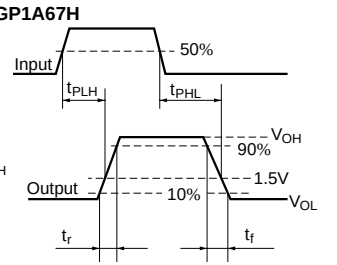


Fig. 1 Forward Current vs. Ambient Temperature

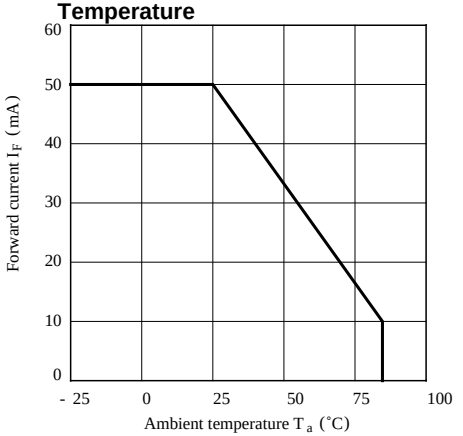


Fig. 2 Power Dissipation vs. Ambient Temperature

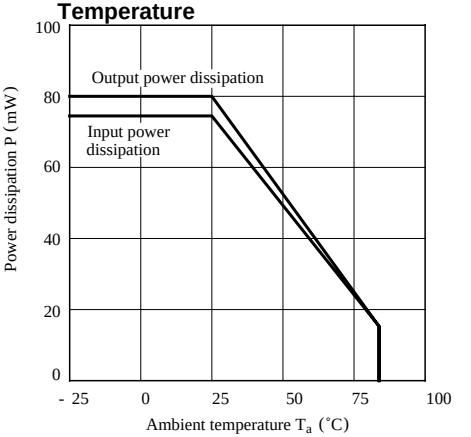


Fig. 3 Low Level Output Current vs. Ambient Temperature

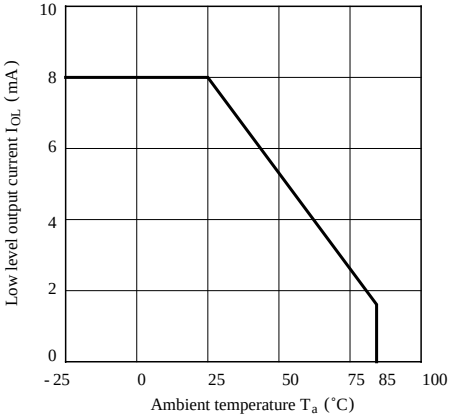


Fig. 4 Forward Current vs. Forward Voltage

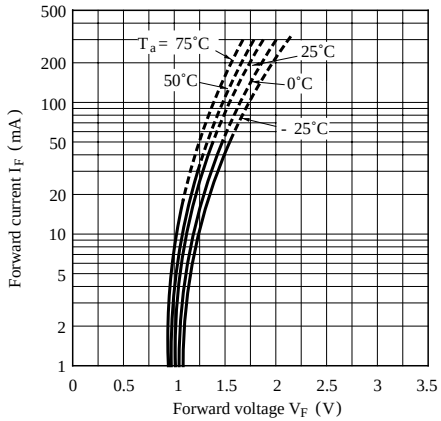


Fig. 5 Relative Threshold Input Current vs. Supply Voltage

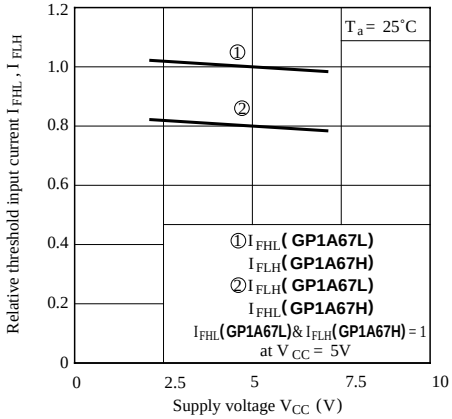


Fig. 6 Relative Threshold Input Current vs. Ambient Temperature

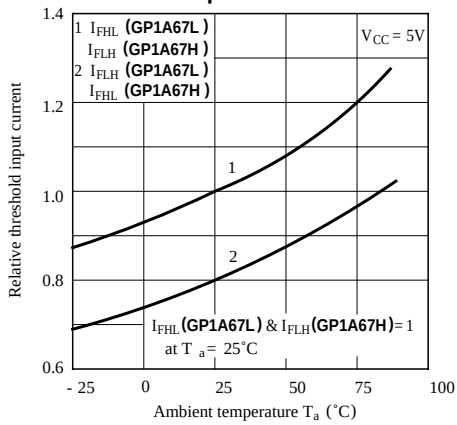


Fig. 7 Low Level Output Voltage vs. Low Level Output Current

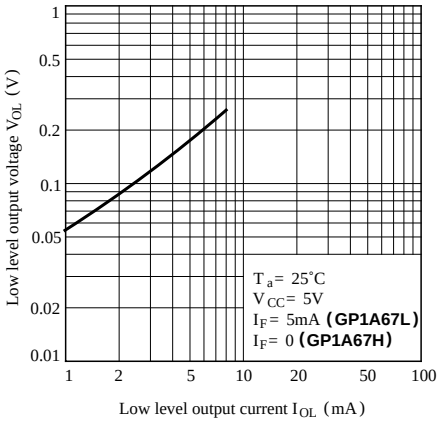


Fig. 8 Low Level Output Voltage vs. Ambient Temperature

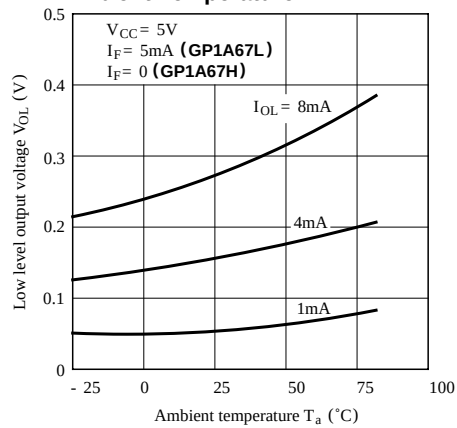


Fig. 9 Low Level Supply Current vs. Supply Voltage

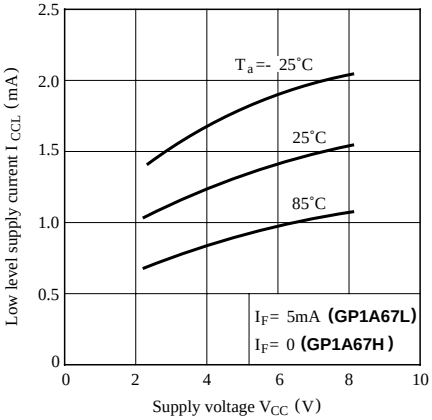


Fig.10 High Level Supply Current vs. Supply Voltage

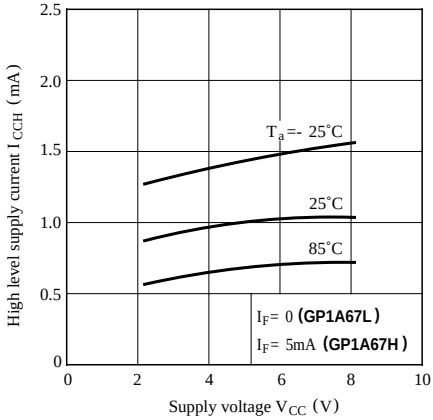


Fig.11 Propagation Delay Time vs. Forward Current

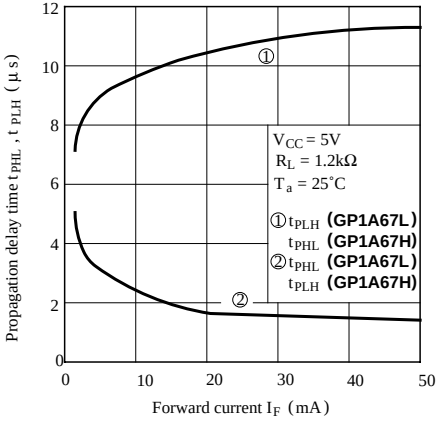
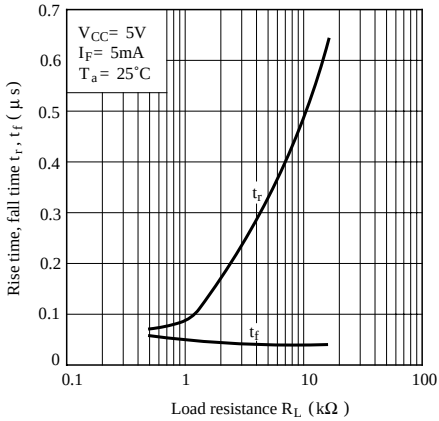


Fig.12 Rise Time, Fall Time vs. Load Resistance



■ Precautions for Use

(1) In order to stabilize power supply line, connect a by-pass capacitor of more than 0.1μF between Vcc and GND near the device.

(2) Ultrasonic cleaning is prohibited.

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

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