

GP1A67L/GP1A67H

Subminiature OPIC Photointerrupter

■ Features

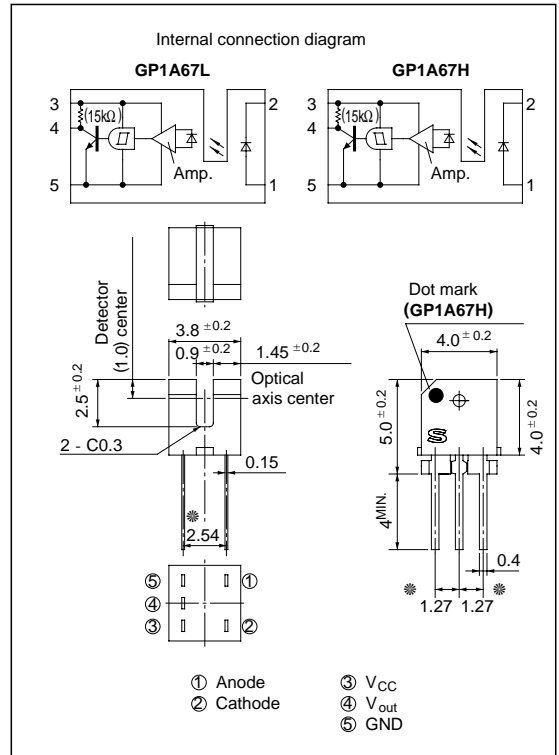
1. Ultra-compact (3.8 x 4.0 x 4.0mm)
2. TTL compatible output
3. Low operating voltage, low dissipation current suitable for battery-driven applications (V_{CC}: 2.2 to 7.0V, I_{CCL} : TYP. 1.3mA)

■ 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.

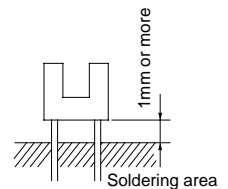
An OPIC consists of a light-detecting element and signal-processing circuit integrated onto a single chip.

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

■ Absolute Maximum Ratings

(T_a = 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	$I_F = 20\text{mA}$	-	1.2	1.4	V		
	Reverse current	I_R	$V_R = 3\text{V}$	-	-	10	μA		
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	μs
			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			

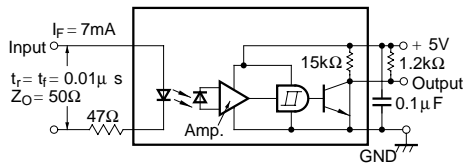
*2 I_{FHL} represents forward current when output changes from "High" to "Low".

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

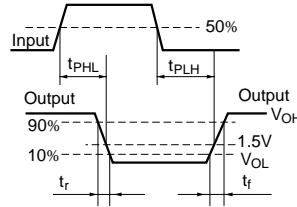
*4 Hysteresis stands for I_{FLH} / I_{FHL} (GP1A67L) or I_{FHL} / I_{FLH} (GP1A67H).

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

Test Circuit for Response Time



GP1A67L



GP1A67H

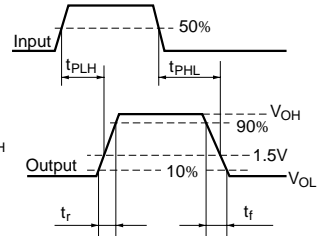


Fig. 1 Forward Current vs. Ambient Temperature

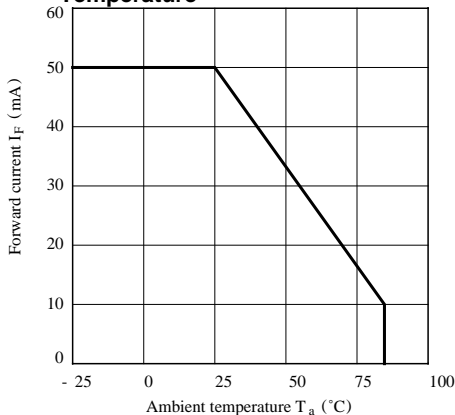


Fig. 2 Power Dissipation vs. Ambient Temperature

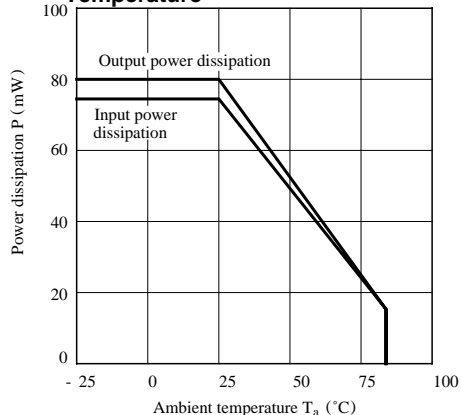


Fig. 3 Low Level Output Current vs. Ambient Temperature

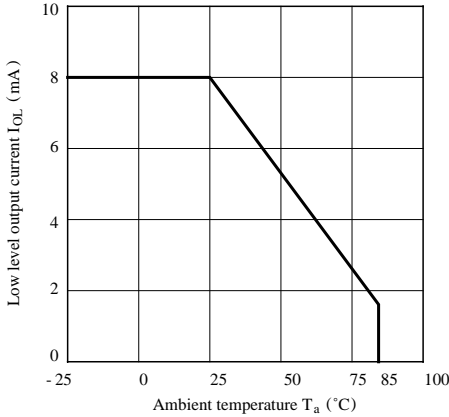


Fig. 4 Forward Current vs. Forward Voltage

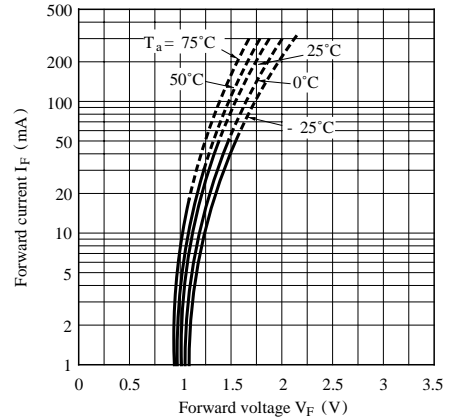


Fig. 5 Relative Threshold Input Current vs. Supply Voltage

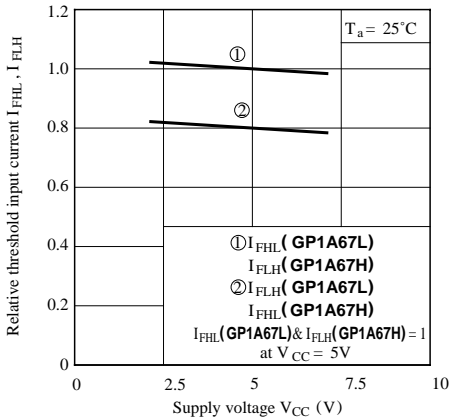


Fig. 6 Relative Threshold Input Current vs. Ambient Temperature

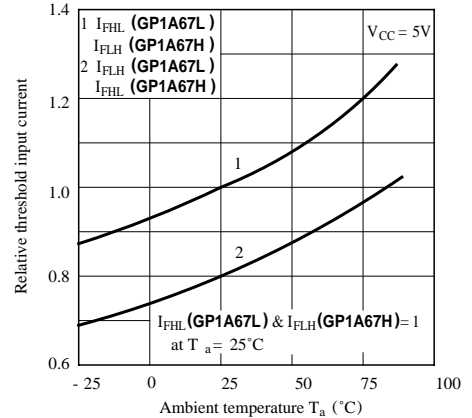


Fig. 7 Low Level Output Voltage vs. Low Level Output Current

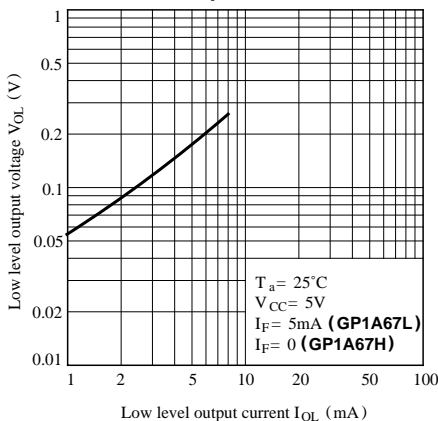


Fig. 8 Low Level Output Voltage vs. Ambient Temperature

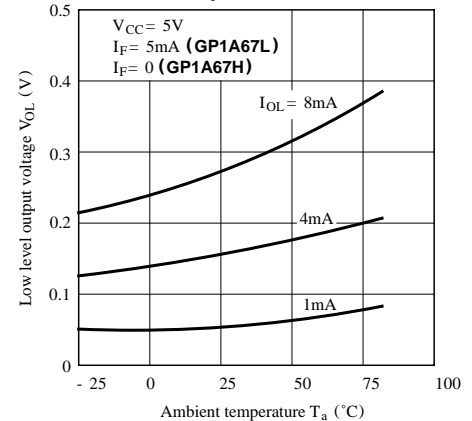


Fig. 9 Low Level Supply Current vs. Supply Voltage

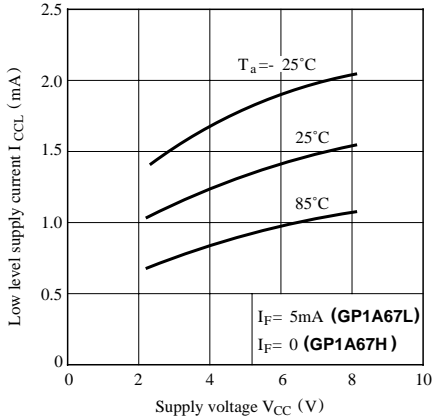


Fig.10 High Level Supply Current vs. Supply Voltage

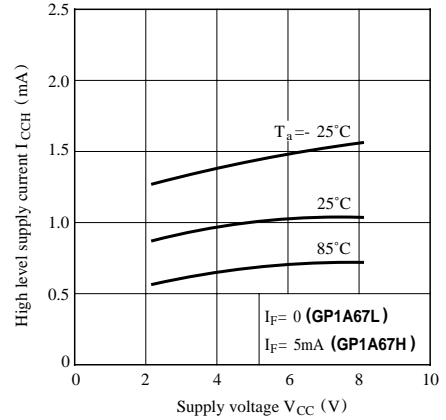


Fig.11 Propagation Delay Time vs. Forward Current

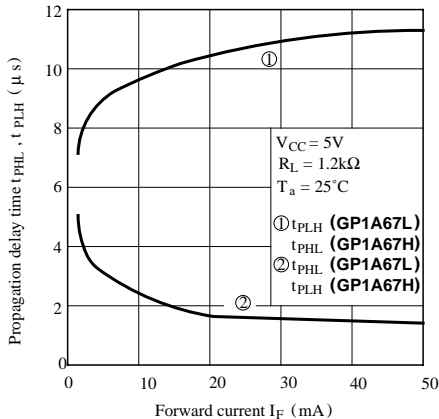
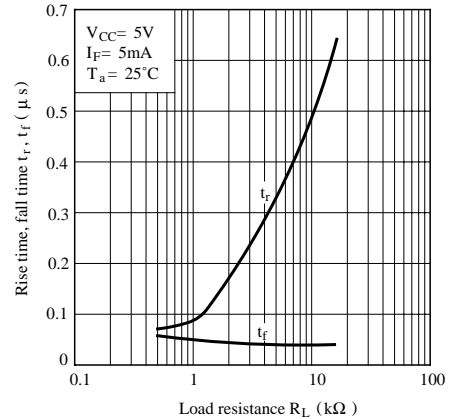


Fig.12 Rise Time, Fall Time vs. Load Resistance



■ 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".

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