

# GP1S09

## Photointerrupter with Connector

### ■ Features

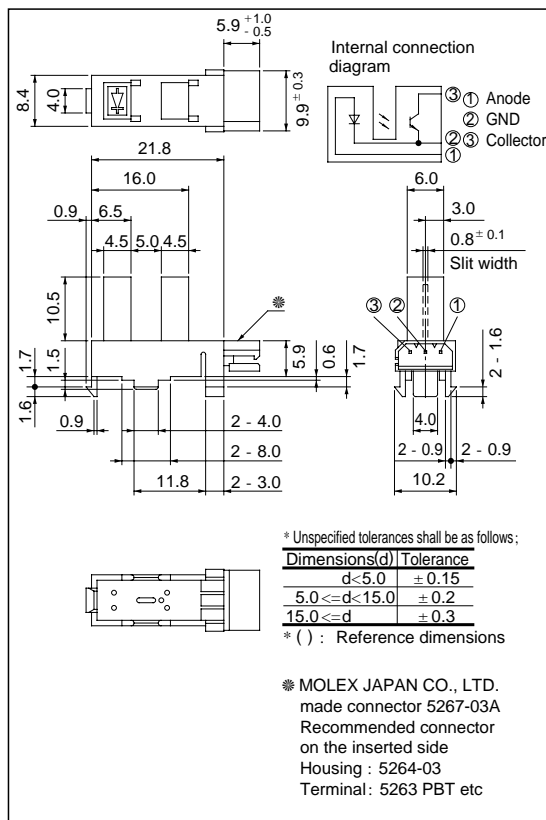
1. Snap-in mounting type
2. Can be mounted on 2 different thickness boards (1.0mm, 1.6mm)
3. 3-pin connector terminal
4. Wide gap between light emitter and detector (5mm)

### ■ Applications

1. Copiers
2. Printers
3. Facsimiles

### ■ Outline Dimensions

(Unit : mm)



### ■ Absolute Maximum Ratings

(Ta= 25°C)

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	Collector-emitter voltage	$V_{CEO}$	35	V
	Emitter-collector voltage	$V_{ECO}$	6	V
	Collector current	$I_C$	20	mA
	Collector power dissipation	$P_C$	75	mW
*2 Operating temperature		$T_{opr}$	- 25 to + 75	°C
*2 Storage temperature		$T_{stg}$	- 40 to + 85	°C

\*1 Pulse width  $\leq 100 \mu s$ , Duty ratio = 0.01

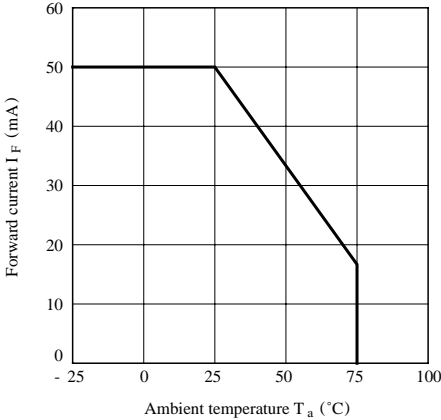
\*2 The connector should be plugged in/out and the unit's hook should be used at normal temperature

**■ Electro-optical Characteristics**

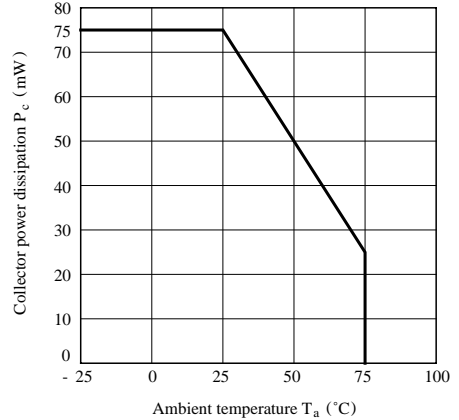
( $T_a = 25^\circ\text{C}$ )

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit	
Input	Forward voltage	$V_F$	$I_F = 20\text{mA}$	-	1.2	1.4	V	
	Peak forward voltage	$V_{FM}$	$I_{FM} = 0.5\text{A}$	-	3	4	V	
	Reverse current	$I_R$	$V_R = 3\text{V}$	-	-	10	$\mu\text{A}$	
Output	Collector dark current	$I_{CEO}$	$V_{CE} = 20\text{V}$	-	$1 \times 10^{-9}$	$1 \times 10^{-7}$	A	
Transfer characteristics	Collector Current		$I_C$	$I_F = 20\text{mA}, V_{CE} = 5\text{V}$	0.5	-	1.5	mA
	Collector-emitter saturation voltage		$V_{CE(sat)}$	$I_F = 40\text{mA}, I_C = 1\text{mA}$	-	-	0.4	V
	Response time	Rise time	$t_r$	$V_{CE} = 2\text{V}, I_C = 2\text{mA}, R_L = 100\Omega$	-	3	15	$\mu\text{s}$
		Fall time	$t_f$		-	4	20	$\mu\text{s}$

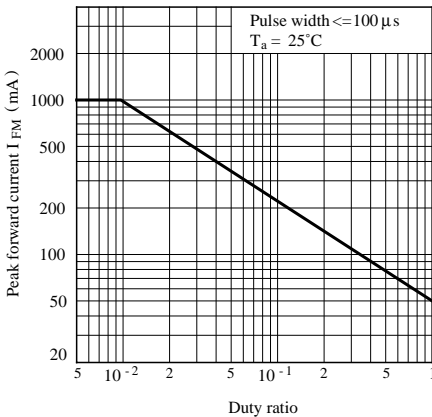
**Fig. 1 Forward Current vs. Ambient Temperature**



**Fig. 2 Collector Power Dissipation vs. Ambient Temperature**



**Fig. 3 Peak Forward Current vs. Duty Ratio**



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

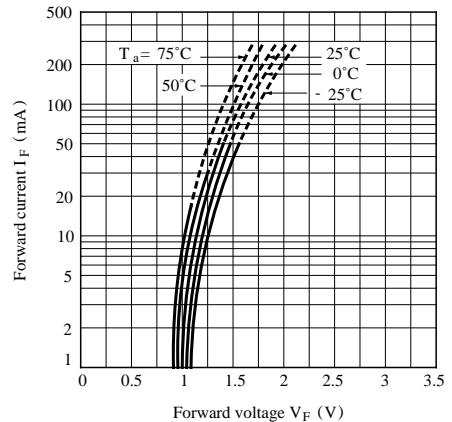


Fig. 5 Collector Current vs. Forward Current

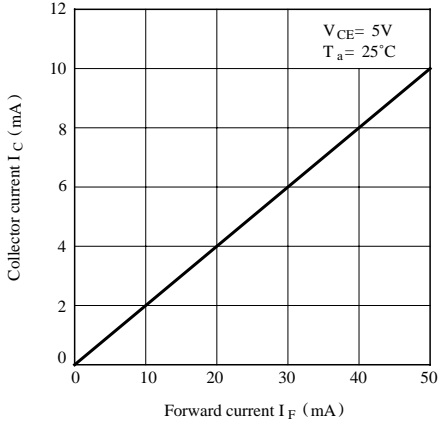


Fig. 6 Collector Current vs. Collector-emitter Voltage

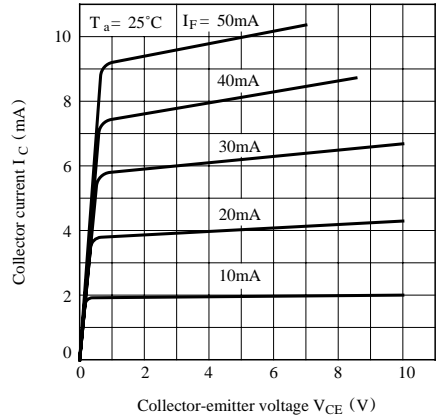


Fig. 7 Collector Current vs. Ambient Temperature

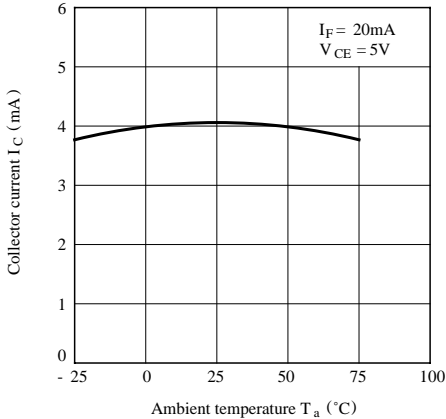


Fig. 8 Collector-emitter Saturation Voltage vs. Ambient Temperature

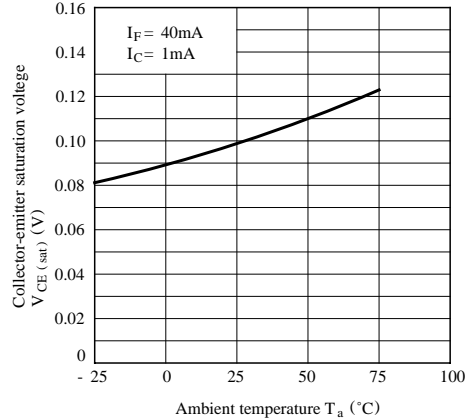
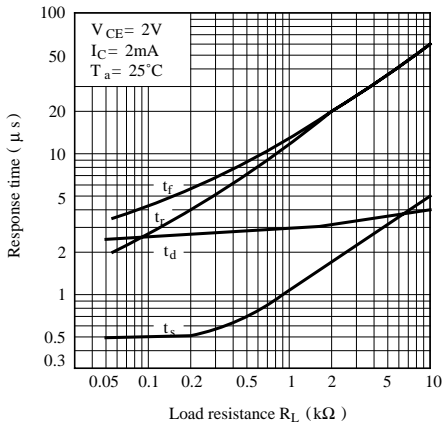
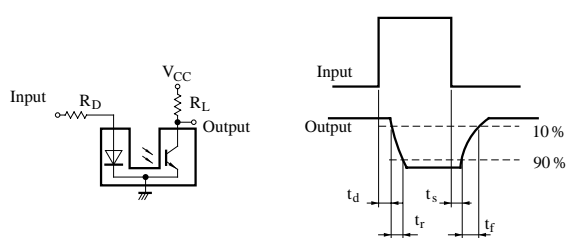


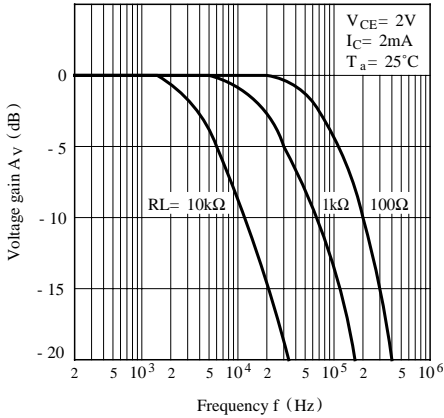
Fig. 9 Response Time vs. Load Resistance



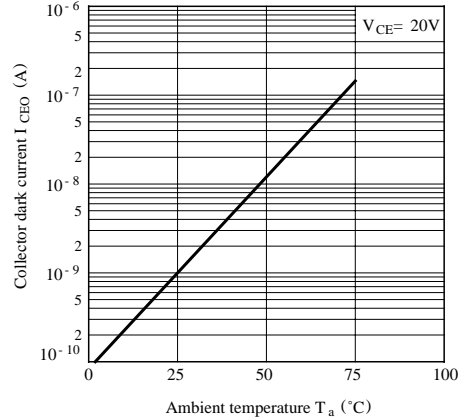
Test Circuit for Response Time



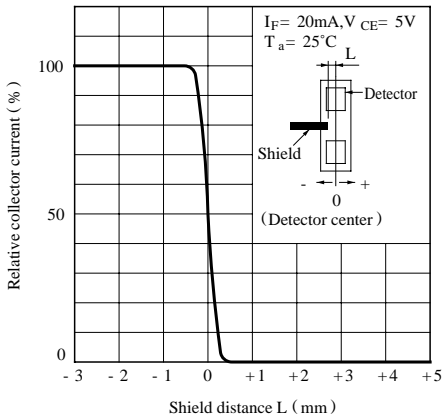
**Fig.10 Frequency Response**



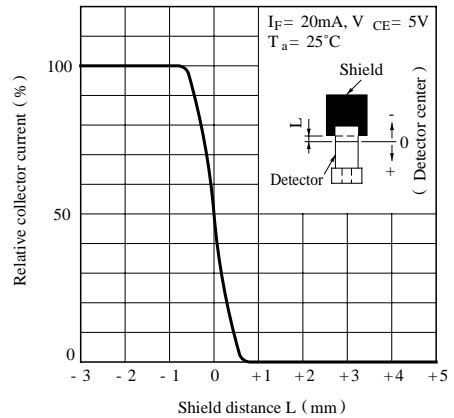
**Fig.11 Collector Dark Current vs. Ambient Temperature**



**Fig.12 Relative Collector Current vs. Shield Distance (1)**

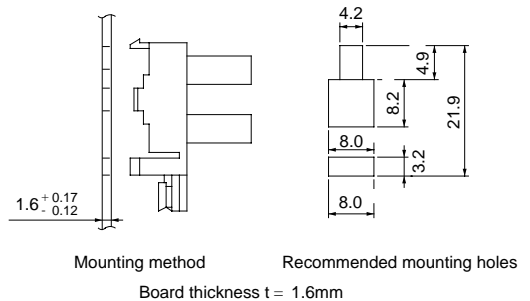
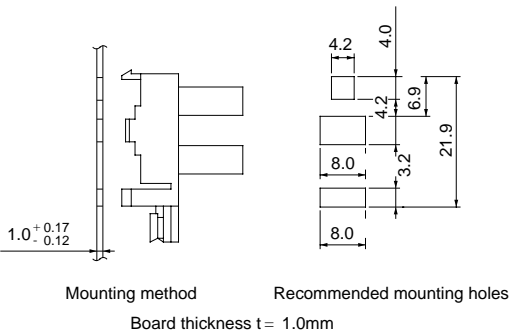


**Fig.13 Relative Collector Current vs. Shield Distance (2)**



**Recommended Mounting Holes**

(Following dimensions are recommended values, so confirm the intensity by using actual equipment before mounting.)



**■ Precautions for Use**

- (1) In this product, the PWB is fixed with a hook, and cleaning solvent may remain inside the case; therefore, dip cleaning or ultrasonic cleaning are prohibited.
- (2) Remove dust or stains, using an air blower or a soft cloth moistened in cleaning solvent. However, do not perform the above cleaning using a soft cloth with cleaning solvent in the marking portion.  
In this case, use only the following type of cleaning solvent for wiping off  
Ethyl alcohol, Methyl alcohol, Isopropyl alcohol  
When the cleaning solvents except for specified materials are used, please consult us.
- (3) As for other general cautions, refer to the chapter“Precautions for Use”.

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