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# GP1S39

## Subminiature, Double-phase Output, Wide Gap Photointerrupter

### ■ Features

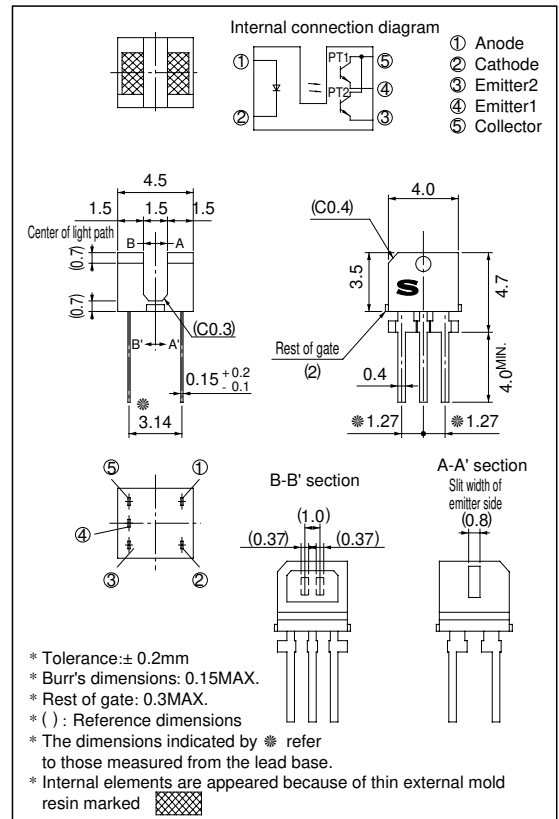
1. Ultra-compact package
2. PWB mounting type
3. Double-phase phototransistor output type for detecting of rotation direction and count
4. Wide gap between light emitter and detector: 1.5mm
5. Slit width: 0.8mm
6. Detecting pitch: 0.6mm

### ■ Applications

1. Mouses
2. Cameras

### ■ Outline Dimensions

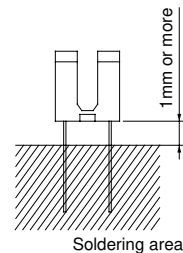
(Unit : mm)



### ■ 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	Collector-emitter voltage	$V_{CE_1O}$	35 V
		$V_{CE_2O}$	
	Emitter-collector voltage	$V_{E_1CO}$	6 V
		$V_{E_2CO}$	
	Collector current	$I_C$	20 mA
	Collector power dissipation	$P_C$	75 mW
Total power dissipation	$P_{tot}$	100 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

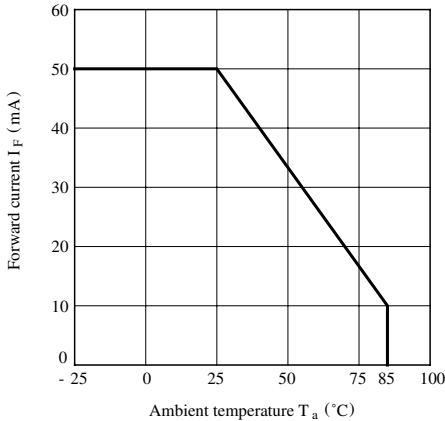


**Electro-optical Characteristics**

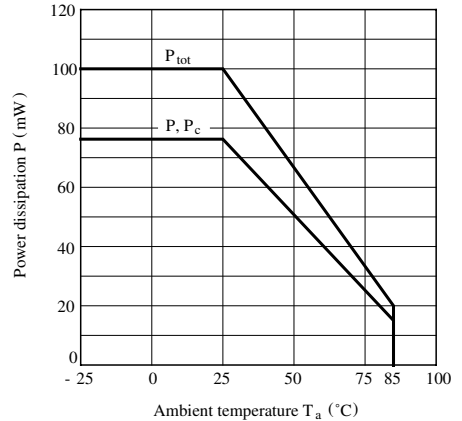
( $T_a = 25^\circ\text{C}$ )

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Input	Forward voltage	$V_F$	$I_F = 20\text{mA}$	-	1.2	1.4	V
	Reverse current	$I_R$	$V_R = 3\text{V}$	-	-	10	$\mu\text{A}$
Output	Collector dark current	$I_{CEO}$	$V_{CE} = 20\text{V}$	-	-	100	nA
Transfer characteristics	Collector current	$I_C$	$V_{CE} = 5\text{V}, I_F = 4\text{mA}$	130	-	520	$\mu\text{A}$
	Collector current ratio	$I_{C1}/I_{C2}$	$V_{CE} = 5\text{V}, I_F = 4\text{mA}$	0.67	-	1.5	-
	Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_F = 8\text{mA}, I_C = 50\mu\text{A}$	-	-	0.4	V
	Response time	Rise time	$t_r$	$V_{CE} = 5\text{V}, I_C = 100\mu\text{A}$ $R_L = 1\,000\Omega$	-	50	150
Fall time		$t_f$	-		50	150	$\mu\text{s}$

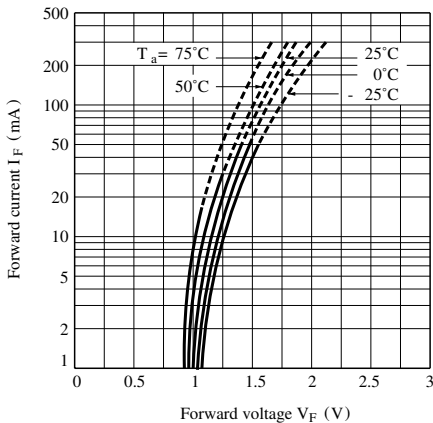
**Fig. 1 Forward Current vs. Ambient Temperature**



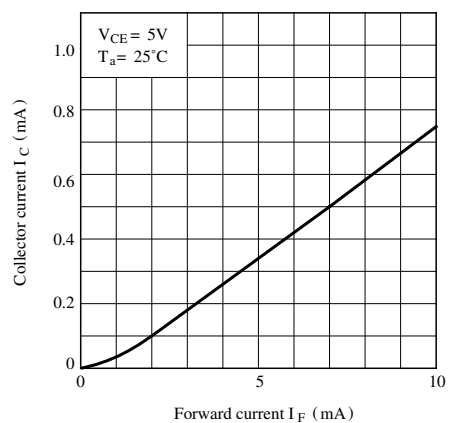
**Fig. 2 Power Dissipation vs. Ambient Temperature**



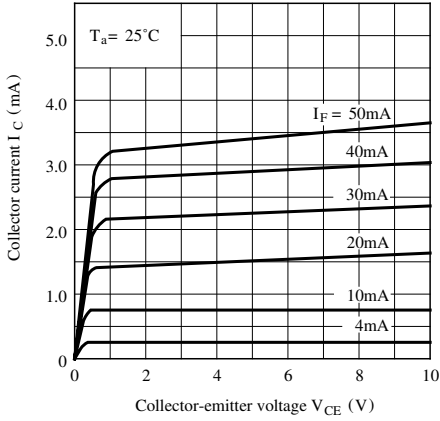
**Fig. 3 Forward Current vs. Forward Voltage**



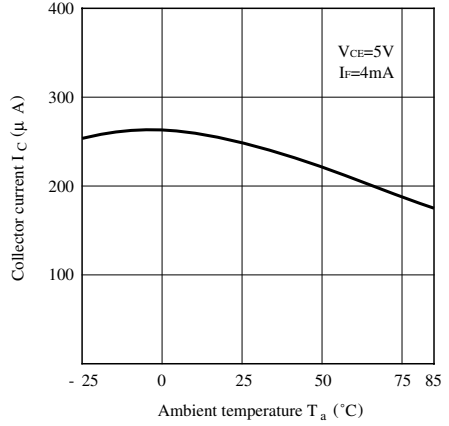
**Fig. 4 Collector Current vs. Forward Current**



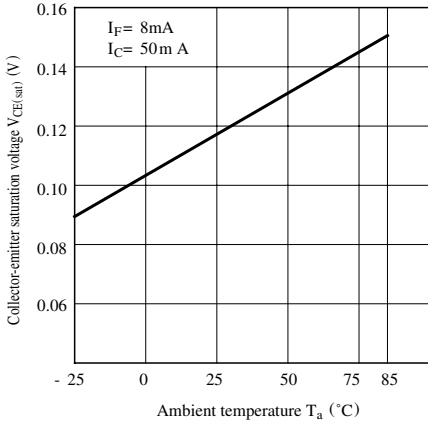
**Fig. 5 Collector Current vs. Collector-emitter Voltage**



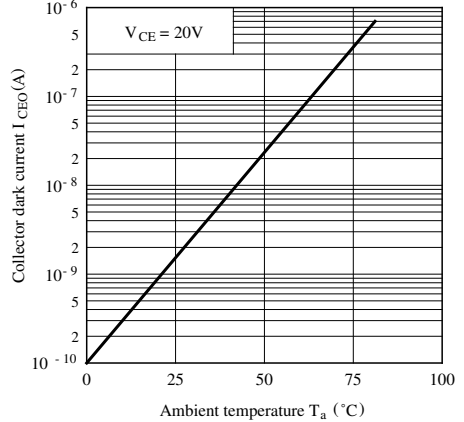
**Fig. 6 Collector Current vs. Ambient Temperature**



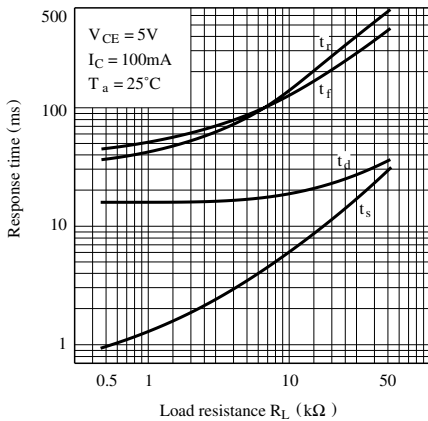
**Fig. 7 Collector-emitter Saturation Voltage vs. Ambient Temperature**



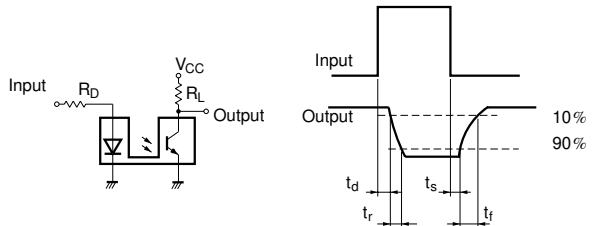
**Fig. 8 Collector Dark Current vs. Ambient Temperature**



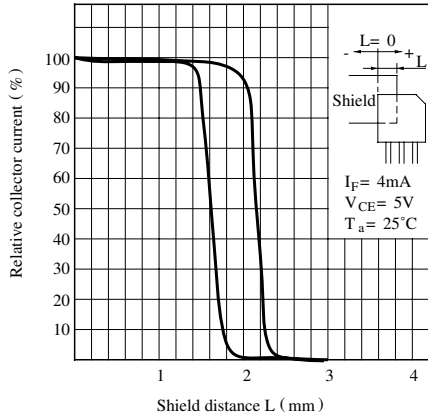
**Fig. 9 Response Time vs. Load Resistance**



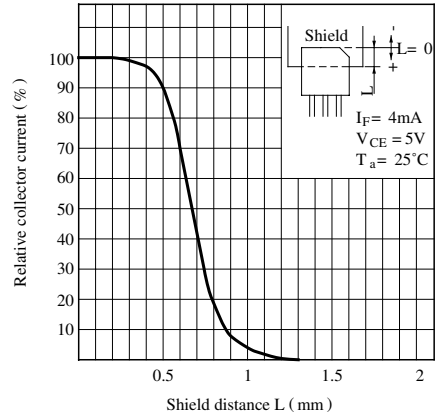
**Test Circuit for Response Time**



**Fig.10 Relative Collector Current vs. Shield Distance (1)**



**Fig.11 Relative Collector Current vs. Shield Distance (2)**



- Please refer to the chapter “Precautions for Use”.

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