

GP1S36

Photointerrupter for Detecting Tilt Direction

■ Features

1. Subminiature (4.0×4.2×3.8mm)
(with built-in super compact ball for detecting tilt direction)
2. 2-phase output type
3. Able to detect the tilt direction of both side ($\pm 90^\circ$) by the position of rolling ball.
4. High reliability due to non-contact structure

■ Applications

1. Digital cameras
2. Camcoders

■ Absolute Maximum Ratings (Ta=25°C)

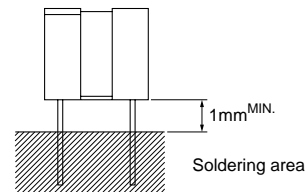
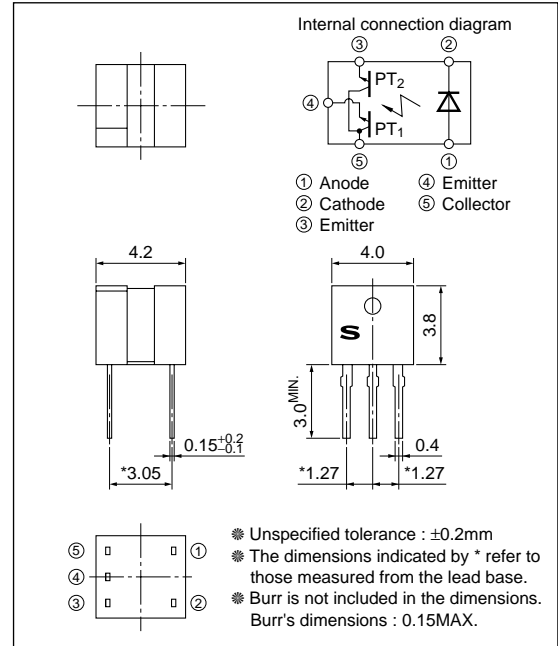
	Parameter	Symbol	Rating	Unit
Input	Forward current	I_F	50	mA
	Reverse voltage	V_R	6	V
	Power dissipation	P	75	mW
Output	Collector-emitter voltage	V_{CE1O}	35	V
		V_{CE2O}		
	Emitter-collector voltage	V_{E1CO}	6	V
		V_{E2CO}		
	Collector current	I_C	20	mA
Collector Power dissipation	P_C	75	mW	
Total power dissipation	P_{tot}	100	mW	
Operating temperature	T_{opr}	-25 to +85	°C	
Storage temperature	T_{stg}	-40 to +100	°C	
*1 Soldering temperature 1	T_{sol}	260	°C	
*2 Soldering temperature 2	T_{sol}	320	°C	

*1 For MAX. 5s

*2 For MAX. 2s at the position of 0.8mm from the bottomface of resin package by hand soldering.

■ Outline Dimensions

(Unit : mm)



■ Electro-optical Characteristics

(Ta=25°C)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit	
Input	Forward voltage	V_F	-	1.2	1.4	V	
	Reverse current	I_R	-	-	10	μA	
*3 Output	Collector dark current	I_{CEO}	-	-	100	nA	
*3 Coupling Characteristics	Collector current	I_C	$V_{CE}=5V, I_f=5mA$	60	-	360	μA
	*4 Leak current	I_{LEAK}	$V_{CE}=5V, I_f=5mA$	-	-	15	μA
	Response time	Rise time	$V_{CE}=5V, I_C=100\mu A$ $R_L=1\ 000\Omega$	-	50	150	μs
		Fall time		-	50	150	μs
	Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_f=10mA, I_C=60\mu A$	-	-	0.4	V

*3 Output and coupling characteristics are common to the both phototransistors.

*4 Characteristics except leak current is measured at $\theta=0^\circ, \phi=0^\circ$.

Leak current is the output current of transistor when $\theta=\pm 90^\circ, \phi=0^\circ$ and $I_C=OFF$.

■ Detecting Angle Characteristics

θ	-90°	↔	-75°	↔	-15°	↔	+15°	↔	+75°	↔	+90°
I_{C1}	ON				*5	OFF					
I_{C2}	OFF	*5	ON								

* Conditions : $I_f=5mA, V_{CC}=5V, \phi<=\pm 5^\circ$

*5 Indefinite

I_{C1} : Output current of phototransistors PT1

I_{C2} : Output current of phototransistors PT2

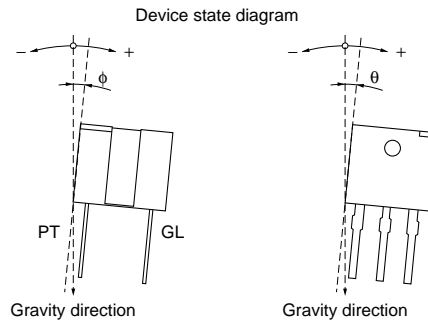
θ : Device condition : Refer to the figure

ϕ : Device condition : Refer to the figure

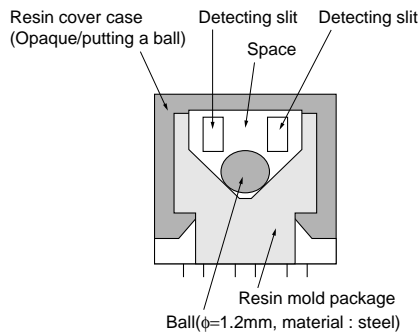
ON : Output current of phototransistors : 60 μA or more

OFF : Output current of phototransistors : 15 μA or less

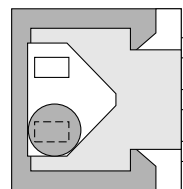
* Output current of ON/OFF is output when device is at a standstill



■ Supplement



<90°rotation>



<Viewing from detecting side>

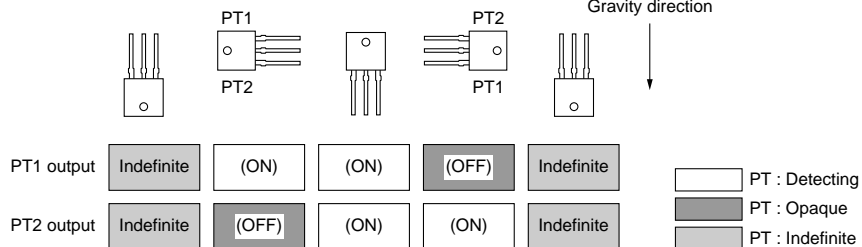


Fig.1 Forward Current vs. Ambient Temperature

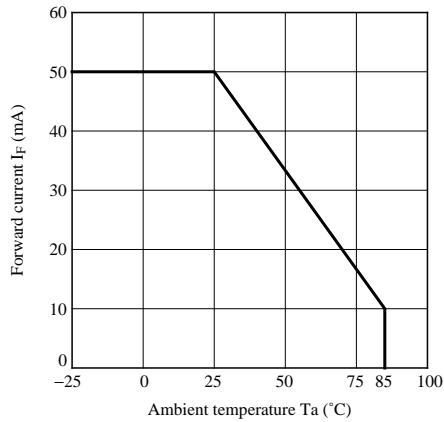


Fig.2 Power Dissipation vs. Ambient Temperature

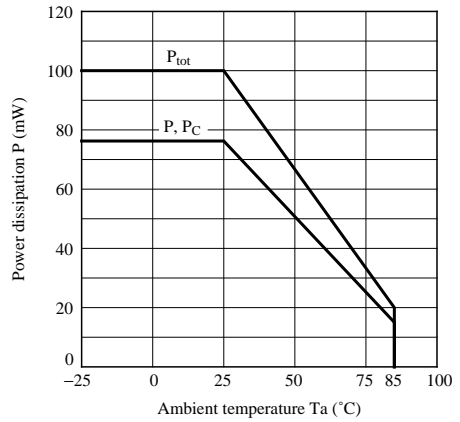


Fig.3 Forward Current vs. Forward Voltage

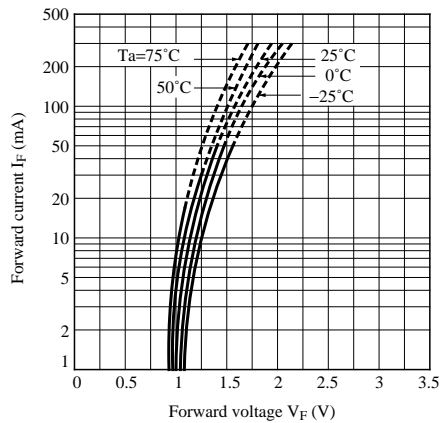


Fig.4 Collector Current vs. Forward Current

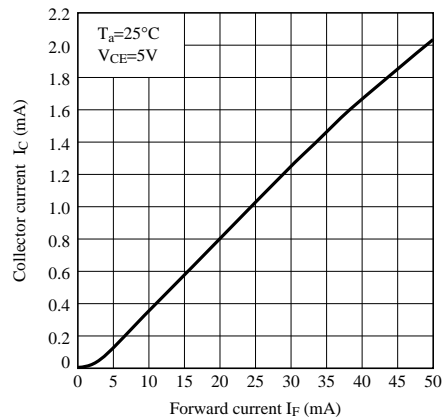


Fig.5 Collector Current vs. Collector-emitter Voltage

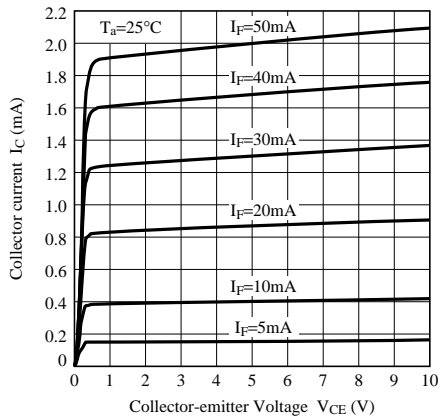


Fig.6 Relative Collector Current vs. Ambient Temperature

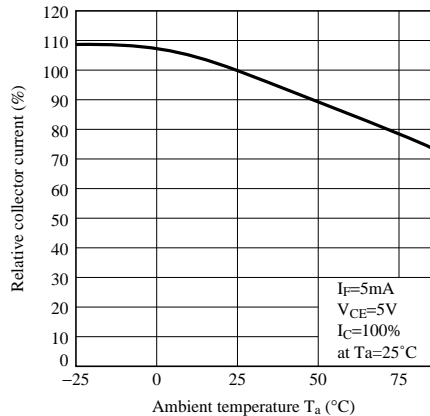


Fig.7 Collector-emitter Saturation Voltage vs. Ambient Temperature

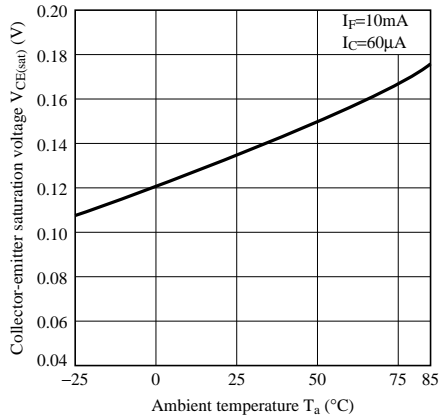


Fig.8 Response Time vs. Load Resistance

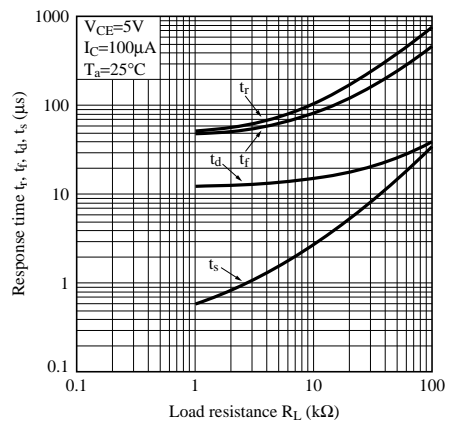


Fig.9 Collector Dark Current vs. Ambient Temperature

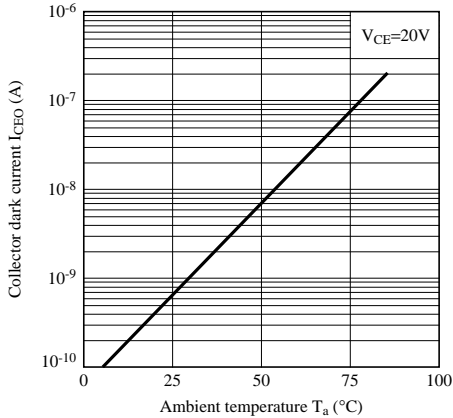
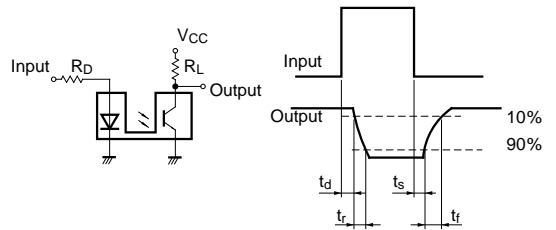


Fig.10 Test Circuit for Response Time



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