

GP1S036HEZ

Photointerrupter for Detecting Tilt Direction

■ Features

1. Subminiature
(with built-in super compact ball for detecting tilt direction)
2. 2-phase output type (4)
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

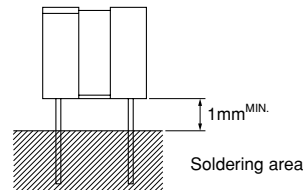
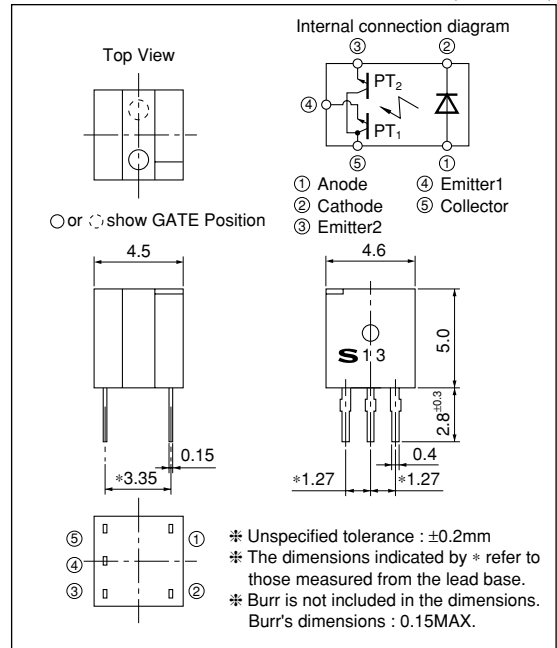
■ Absolute Maximum Ratings ($T_a=25^\circ\text{C}$)

	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	$^\circ\text{C}$
Storage temperature		T_{stg}	-40 to +100	$^\circ\text{C}$
*1 Soldering temperature 1		T_{sol}	260	$^\circ\text{C}$

*1 For MAX. 5s

■ Outline Dimensions

(Unit : mm)



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	μA	
*3 Output	Collector dark current	I_{CEO}	$V_{CE}=20\text{V}$	—	—	100	nA	
*3 Coupling Characteristics	Collector current	I_C	$V_{CE}=5\text{V}, I_F=5\text{mA}$	55	—	300	μA	
	*4 Leak current	I_{LEAK}	$V_{CE}=5\text{V}, I_F=5\text{mA}$	—	—	17	μA	
	Response time	Rise time	t_r	$V_{CE}=5\text{V}, I_C=100\mu\text{A}$ $R_L=1\text{k}\Omega$	—	50	150	μs
		Fall time	t_f		—	50	150	μs
Collector-emitter saturation voltage		$V_{CE(sat)}$	$I_F=10\text{mA}, I_C=55\mu\text{A}$	—	—	0.4	V	

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

*4 Characteristics except leak current is measured at $\theta=180^{\circ}, \phi=0^{\circ}$

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

Detecting Angle Characteristics

θ	0°	\rightarrow	30°	\rightarrow	60°	\rightarrow	120°	\rightarrow	150°	\rightarrow	210°	
I_{C1}	OFF						*5	ON				
I_{C2}	OFF	*5				ON			*5			

θ	\rightarrow	240°	\rightarrow	300°	\rightarrow	330°	\rightarrow	360°
I_{C1}	ON	*5				OFF		
I_{C2}	*5	OFF						

* Conditions : $I_F=5\text{mA}, V_{CE}=5\text{V}, \phi=\pm 5^{\circ}$

*5 Indefinite

I_{C1} : Output current of phototransistors PT₁

I_{C2} : Output current of phototransistors PT₂

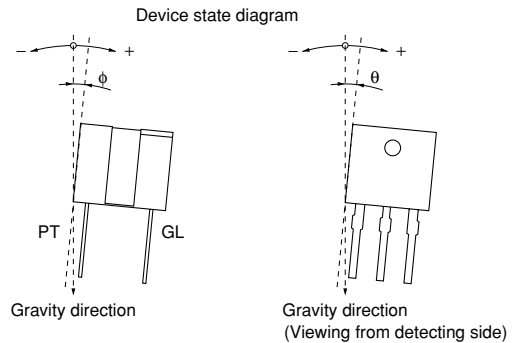
θ : Device condition : Refer to the figure

ϕ : Device condition : Refer to the figure

ON : Output current of phototransistors : 55 μA or more

OFF : Output current of phototransistors : 17 μA or less

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



Supplement

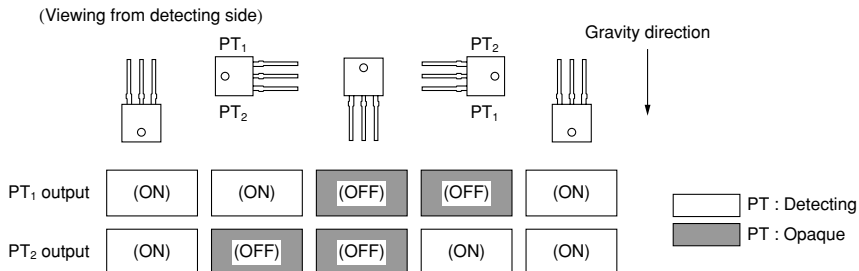


Fig.1 Forward Current vs. Ambient Temperature

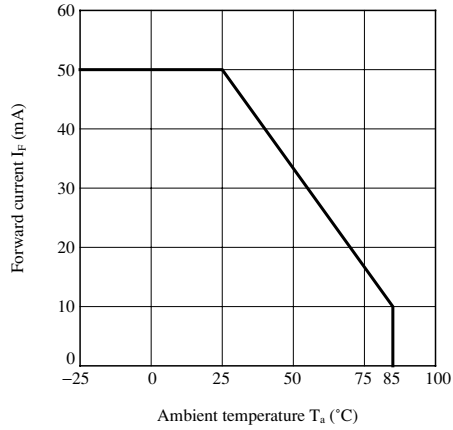
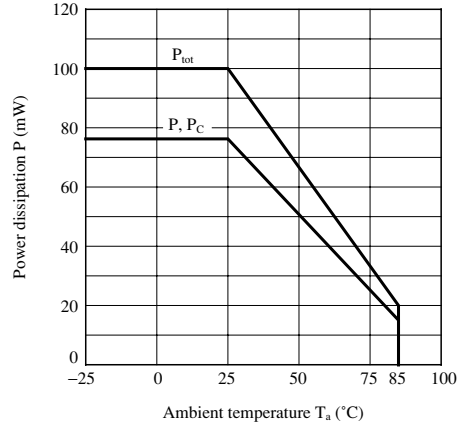


Fig.2 Power Dissipation vs. Ambient Temperature



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