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 (±90°) by the position of rolling ball.
4. High reliability due to non-contact structure

■ Applications

1. Digital cameras
2. Camcoders

■ Absolute Maximum Ratings

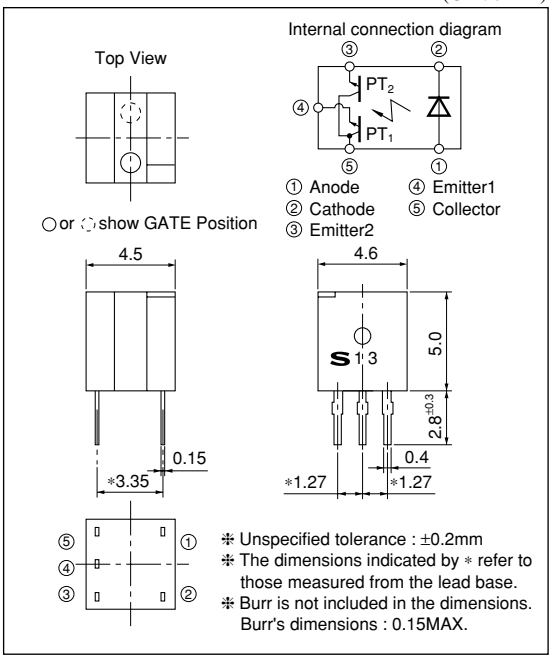
(T_a=25°C)

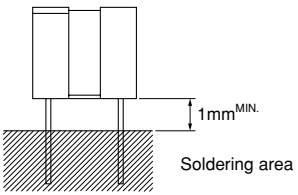
Parameter		Symbol	Rating	Unit
Input	Forward current	I_F	50	mA
	Reverse voltage	V_R	6	V
	Power dissipation	P	75	mW
Output	Collector-emitter voltage	V_{CE1O}	35	V
		V_{CE2O}		
	Emitter-collector voltage	V_{E1CO}	6	V
		V_{E2CO}		
	Collector current	I_C	20	mA
	Collector Power dissipation	P_C	75	mW
Total 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

*1 For MAX. 5s

■ Outline Dimensions

(Unit : mm)





■ Electro-optical Characteristics

(T_a=25°C)

Parameter			Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Input	Forward voltage		V_F	I_F=20mA	–	1.2	1.4	V
	Reverse current		I_R	V_R=3V	–	–	10	μA
*3 Output	Collector dark current		I_{CEO}	V_{CE}=20V	–	–	100	nA
*3 Coupling Characteristics	Collector current		I_C	V_{CE}=5V, I_F=5mA	55	–	300	μA
	*4 Leak current		I_{LEAK}	V_{CE}=5V, I_F=5mA			17	μA
	Response time	Rise time	t_r	V_{CE}=5V, I_C=100μA	–	50	150	μs
		Fall time	t_f	R_L=1kΩ	–	50	150	μs
	Collector-emitter saturation voltage		$V_{CE(sat)}$	I_F=10mA, I_C=55μA	–	–	0.4	V

*3 Output and coupling characteristics are common to the both phototransistors
*4 Characteristics except leak current is measured at θ=180°, ϕ=0°
Leak current is the output current of transistor when θ=±90°, ϕ=0° and I_C=OFF

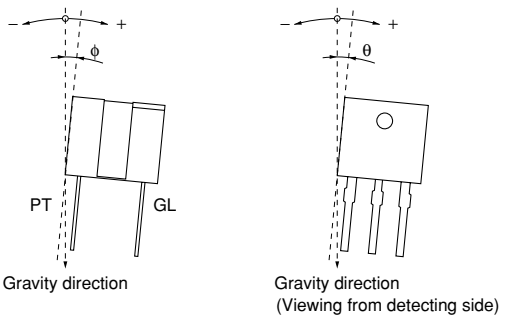
■ Detecting Angle Characteristics

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

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

✻ Conditions : I_F=5mA, V_{CE}=5V, ϕ=±5°
*5 Indefinite

Device state diagram



I_{C1} : Output current of phototransistors PT_1

I_{C2} : Output current of phototransistors PT_2

θ : Device condition : Refer to the figure

ϕ : Device condition : Refer to the figure

ON :Output current of phototransistors : 55μA or more

OFF : Output current of phototransistors : 17μA or less

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

■ Supplement

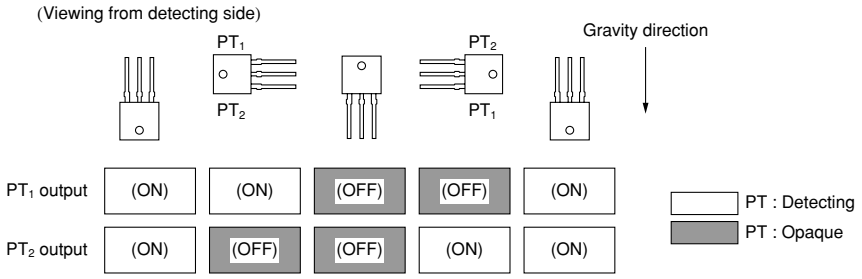


Fig.1 Forward Current vs. Ambient Temperature

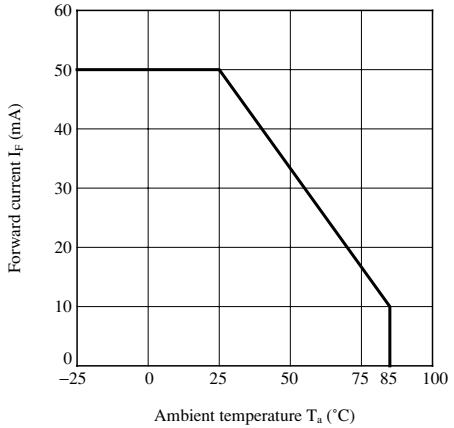
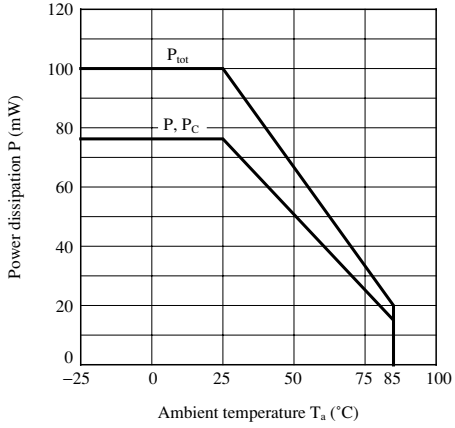


Fig.2 Power Dissipation vs. Ambient Temperature



NOTICE

- The circuit application examples in this publication are provided to explain representative applications of SHARP devices and are not intended to guarantee any circuit design or license any intellectual property rights. SHARP takes no responsibility for any problems related to any intellectual property right of a third party resulting from the use of SHARP's devices.
- Contact SHARP in order to obtain the latest device specification sheets before using any SHARP device. SHARP reserves the right to make changes in the specifications, characteristics, data, materials, structure, and other contents described herein at any time without notice in order to improve design or reliability. Manufacturing locations are also subject to change without notice.
- Observe the following points when using any devices in this publication. SHARP takes no responsibility for damage caused by improper use of the devices which does not meet the conditions and absolute maximum ratings to be used specified in the relevant specification sheet nor meet the following conditions:

  (i) The devices in this publication are designed for use in general electronic equipment designs such as:
  --- Personal computers
  --- Office automation equipment
  --- Telecommunication equipment [terminal]
  --- Test and measurement equipment
  --- Industrial control
  --- Audio visual equipment
  --- Consumer electronics

  (ii) Measures such as fail-safe function and redundant design should be taken to ensure reliability and safety when SHARP devices are used for or in connection with equipment that requires higher reliability such as:
  --- Transportation control and safety equipment (i.e., aircraft, trains, automobiles, etc.)
  --- Traffic signals
  --- Gas leakage sensor breakers
  --- Alarm equipment
  --- Various safety devices, etc.

  (iii) SHARP devices shall not be used for or in connection with equipment that requires an extremely high level of reliability and safety such as:
  --- Space applications
  --- Telecommunication equipment [trunk lines]
  --- Nuclear power control equipment
  --- Medical and other life support equipment (e.g., scuba).

- Contact a SHARP representative in advance when intending to use SHARP devices for any "specific" applications other than those recommended by SHARP or when it is unclear which category mentioned above controls the intended use.
- If the SHARP devices listed in this publication fall within the scope of strategic products described in the Foreign Exchange and Foreign Trade Control Law of Japan, it is necessary to obtain approval to export such SHARP devices.
-
- Contact and consult with a SHARP representative if there are any questions about the contents of this publication.