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GP2TD02 Tilt Sensor

T-65-13

■ Features

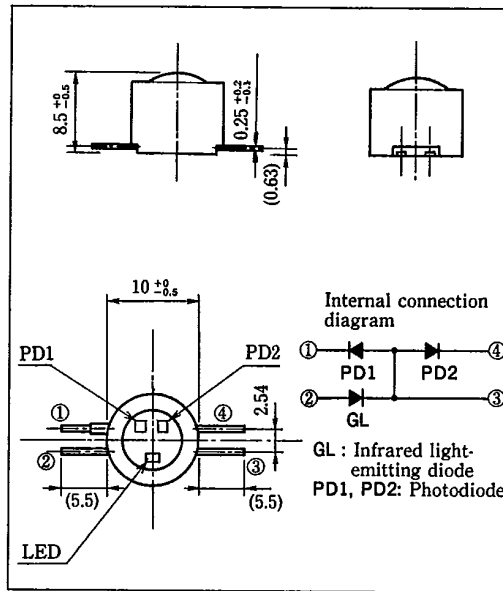
1. With incorporating lens
2. Linear output in accordance with tilt

■ Applications

1. Optical video disk players
2. Magneto-optical disks

■ Outline Dimensions

(Unit : mm)



7

■ 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_{in}	75 mW
Output	Reverse voltage	V_R	20 V
	Power dissipation	P_{out}	75 mW
	Operating temperature	T_{opr}	-10 ~ +70 °C
Storage temperature	T_{stg}	-25 ~ +85 °C	
	*1 Soldering temperature	T_{sol}	260 °C

*1 For 5 seconds at the position of 2.0mm or more from the surface of resin edge.

SHARP

T-65-13

■ Electro-optical Characteristics

(Ta=25°C)

	Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Input	Forward voltage	V_F	$I_F=15\text{mA}$	—	—	1.5	V
	Reverse current	I_R	$V_R=6\text{V}$	—	—	10	μA
Output	*2 Collector dark current	I_d	$V_R=10\text{V}$	—	—	100	nA
**4 Junction charac- teristics	*3 Difference output increment rate	A/deg.	$I_F=15\text{mA}$, $H=11.82\text{mm}$ $\theta=-1\sim 0\sim +1\text{ deg.}$	1.15	2.7	14.3	$\mu\text{A}/\text{deg.}$
	*5 Sum output	B	$I_F=15\text{mA}$, $H=11.82\text{mm}$ $\theta=0\text{ deg.}$	5.5	11.4	40.3	μA
	*6 Angle range of tilt angle output 0	θ_0	$I_F=15\text{mA}$, $H=11.82\text{mm}$	-1	—	+1	deg.
	*7 Monotonous increase range of tilt angle output	$ \theta_i $		2.0	—	—	deg.
	*8 Non-invert range of tilt angle output	$ \theta_i $		5	—	—	deg.

*2 Values for each 1 element

*3 Difference output A is defined as follows :

$$A = I_{sc}(\text{PD1}) - I_{sc}(\text{PD2})$$

Difference output increment rate (A/deg.) is the increment rate of current A at 1 deg.

$$A/\text{deg.} = \frac{\{I_{sc}(\text{PD1}) - I_{sc}(\text{PD2})\} \text{ at } (+1 \text{ deg.}) + \{I_{sc}(\text{PD2}) - I_{sc}(\text{PD1})\} \text{ at } (-1 \text{ deg.})}{2}$$

*4 The reflective object of which junction characteristics are given is a multi-layer coating mirror.

*5 Sum output B is defined as follows :

$$B = I_{sc}(\text{PD1}) + I_{sc}(\text{PD2})$$

*6 Tilt angle output C is defined as follows :

$$C = A/B$$

Angle range of tilt angle output 0 is defined as the range of angles that makes $C=0$.*7 Monotonous increase range of tilt angle output is the range of angles with respect to which C increases monotonously with the coordinate original point at the angle that makes $C=0$.

*8 Non-invert range of tilt angle output is the range of angles that don't make C negative.

Fig. 1 Forward Current vs. Ambient Temperature

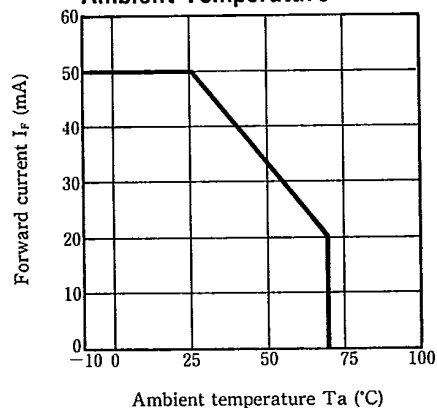
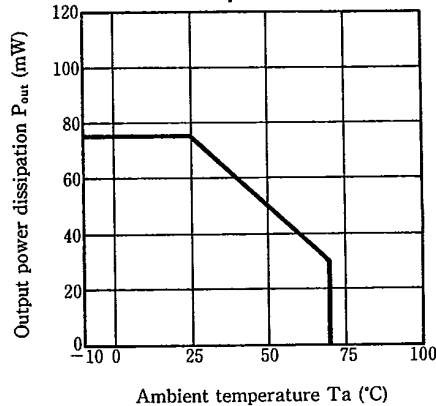


Fig. 2 Output Power Dissipation vs. Ambient Temperature



T-65-13

Fig. 3 Difference Output Characteristics

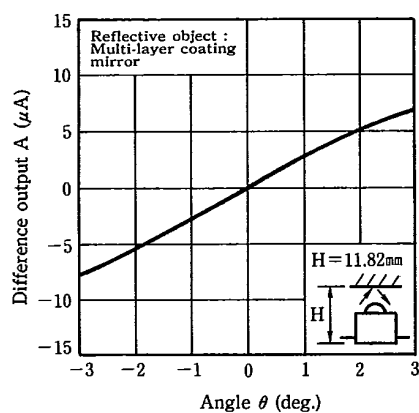


Fig. 4 Sum Output Characteristics

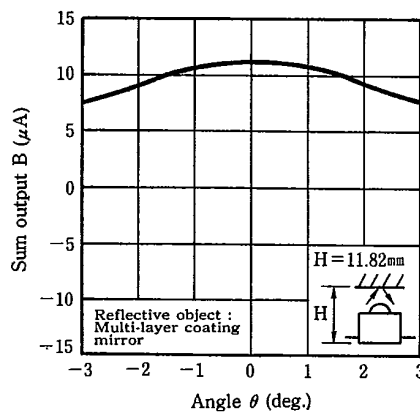
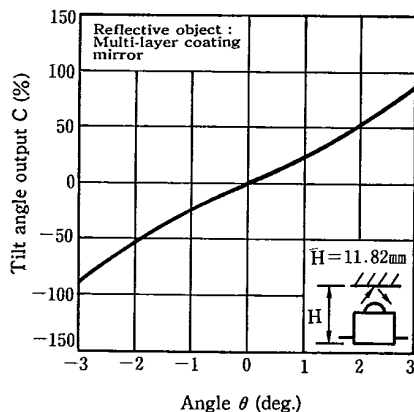
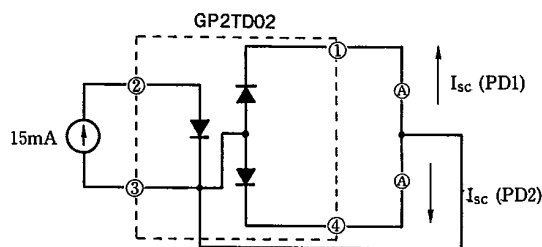


Fig. 5 Tilt Angle Output Characteristics



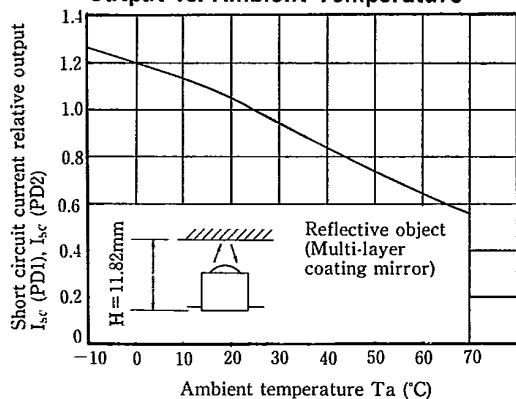
Test Circuit for Sum Output Characteristics, Difference Output Characteristics, Tilt Angle Output Characteristics



PD1, PD2: Photodiode



Fig. 6 Short Circuit Current Relative Output vs. Ambient Temperature



Test Circuit for Short Circuit Current Relative Output vs. Ambient Temperature

