GP2TD02 Tilt Sensor

T-65-13

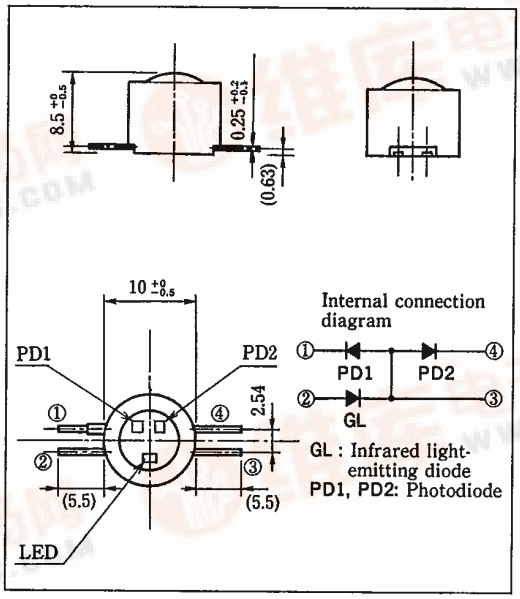
■ Features

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	Pin	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
*1Soldering temperature		T_{sol}	260	°C

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

■ Electro-optical Characteristics

(Ta=25°C)

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

*2 Values for each 1 element

*3 Difference output A is defined as follows :

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

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

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

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

*5 Sum output B is defined as follows :

$B=I_{sc}$ (PD1)$+I_{sc}$ (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

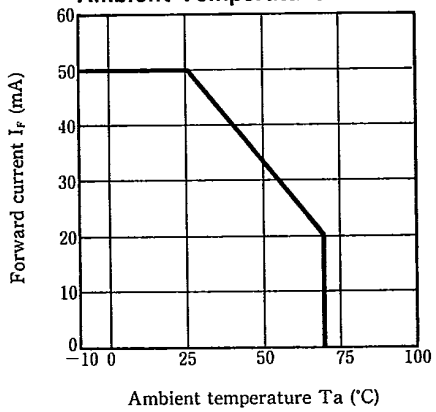


Fig. 2 Output Power Dissipation vs. Ambient Temperature

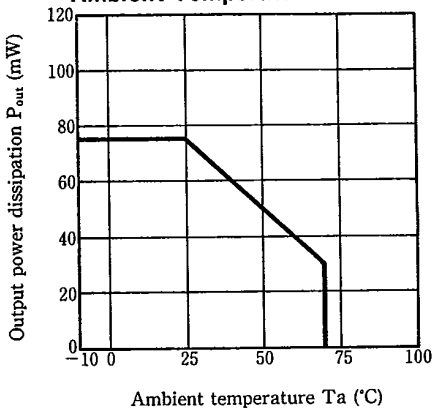


Fig. 3 Difference Output Characteristics

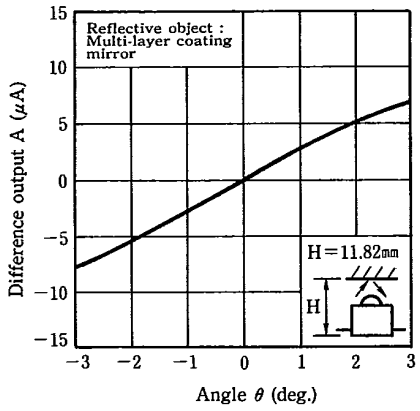


Fig. 4 Sum Output Characteristics

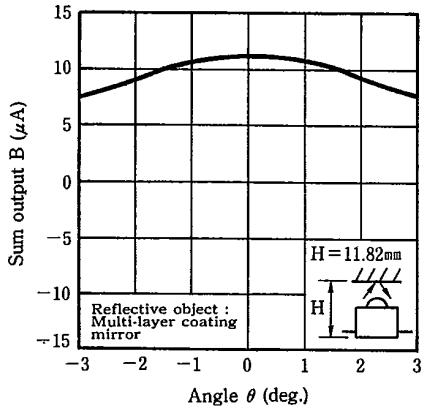
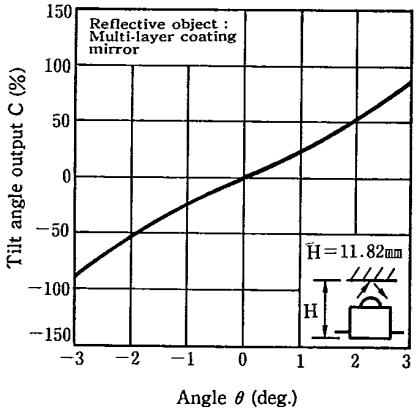
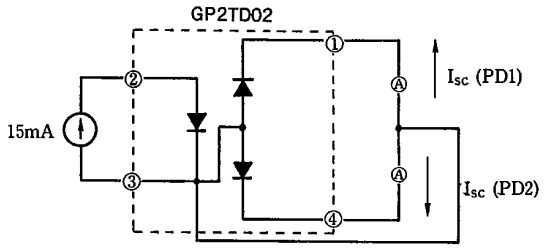


Fig. 5 Tilt Angle Output Characteristics

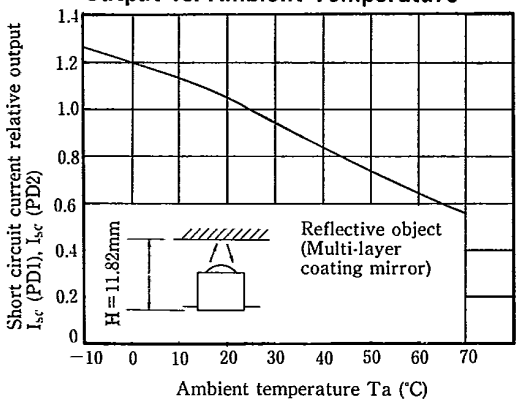


Test Circuit for Sum Output Characteristics, Difference Output Characteristics, Tilt Angle Output Characteristics



PD1, PD2: Photodiode

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



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