

GP2S04/GP2S06/GP2S07 /GP2S09/GP2S10

Subminiature Photointerrupter

■ Features

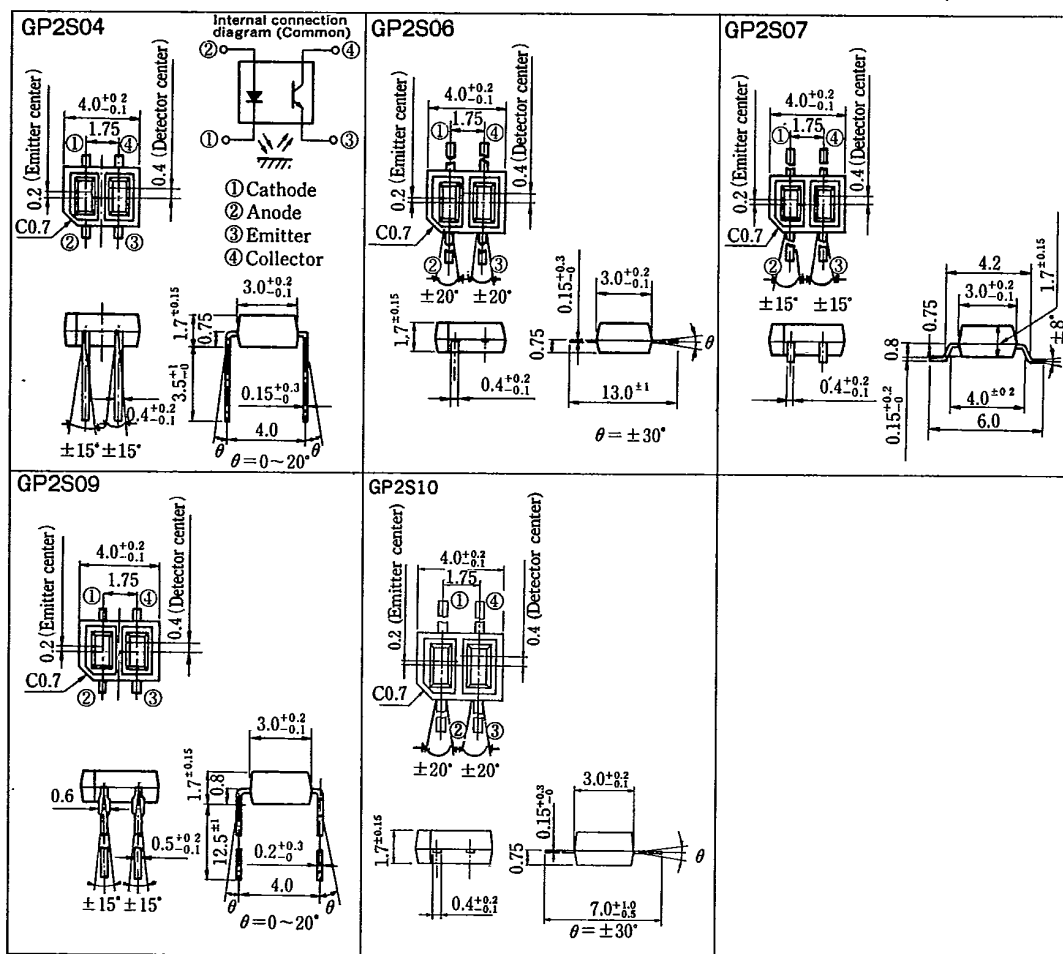
1. Compact and thin
GP2S04 : Compact DIP type
GP2S06 : Flat lead type
GP2S07 : Mini-flat package type
GP2S09 : Compact DIP, long lead type
GP2S10 : Short flat lead type
2. Optical detection distance : 0.8~1mm
3. Visible light cut-off type

■ Applications

1. Cassette tape recorders, VCRs
2. Floppy disk drives
3. Various microcomputerized control equipment

■ Outline Dimensions

(Unit : mm)



Absolute Maximum Ratings

(Ta=25°C)

T-41-73

Parameter	Symbol	Rating	Unit
Input	Forward current	I_F	50 mA
	Reverse voltage	V_R	6 V
	Power dissipation	P_D	75 mW
Output	Collector-emitter voltage	V_{CE0}	35 V
	Emitter-collector voltage	V_{ECO}	6 V
	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 ~ +85 °C
Storage temperature	T_{stg}	-40 ~ +100 °C	
*1 Soldering temperature	T_{sol}	260 °C	

*1 Within 5 seconds (Soldering areas for each model are shown below.)

GP2S04, GP2S09

Soldering area
The hatched area more than 1mm² away from the lower edge of package as shown in the figure below.

GP2S06

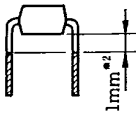
Soldering area
The hatched area more than 2.0mm away from the both edges of package as shown in the figure below.

GP2S07

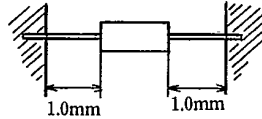
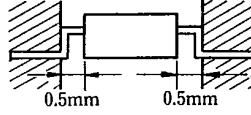
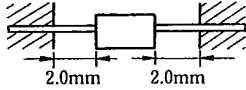
Soldering area
The hatched area more than 0.5mm away from the both edges of package as shown in the figure below.

GP2S10

Soldering area
The hatched area more than 1.0mm away from the both edges of package as shown in the figure below.



*2 GP2S09 : 4mm



Electro-optical Characteristics

(Ta=25°C)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Input	Forward voltage	$I_F=20mA$	—	1.2	1.4	V
	Reverse current	$V_R=6V$	—	—	10	μA
Output	Collector dark current	$V_{CE}=20V$	—	1×10^{-9}	1×10^{-7}	A
	*3 Collector current	$I_F=4mA, V_{CE}=2V$	20	45	120	μA
Transfer characteristics	Response time (Rise)	$V_{CE}=2V, I_C=100\mu A$	—	20	100	μs
	Response time (Fall)	$R_L=1k\Omega, d=1mm$	—	20	100	μs
	*4 Leak current	$I_F=4mA, V_{CE}=2V$	—	—	0.1	μA

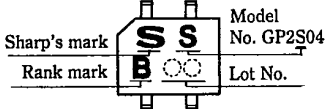
*3 The condition and arrangement of the reflective object are shown in the right drawing.

*4 Without reflective object

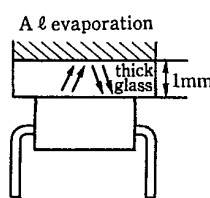
The ranking of collector current shall be classified into the following 6 ranks.
(GP2S04, GP2S06, GP2S07, GP2S09)

Rank	I_C (μA)	Rank mark
A	20~42	A
B	34~71	B
C	58~120	C
A or B	20~71	A or B
B or C	34~120	B or C
A, B or C	20~120	A, B or C

Marking example
GP2S04



Test Condition and Arrangement for Collector Current



SHARP ELEK/ MELEC DIV

T-41-73

Fig. 1 Forward Current vs. Ambient Temperature

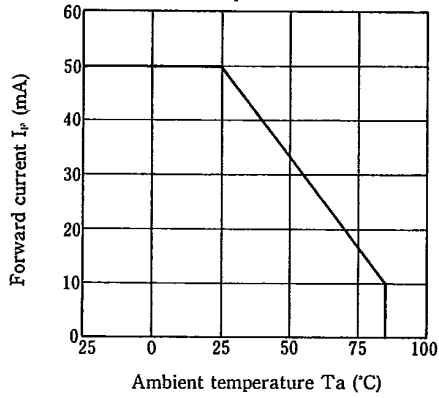


Fig. 2 Power Dissipation vs. Ambient Temperature

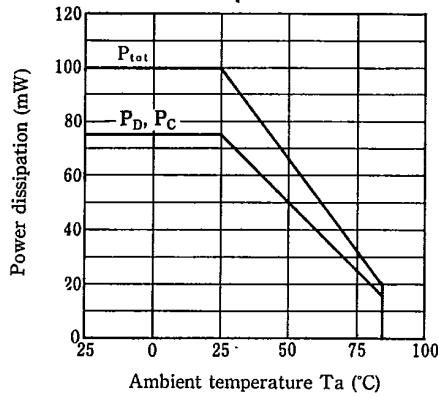


Fig. 3 Forward Current vs. Forward Voltage

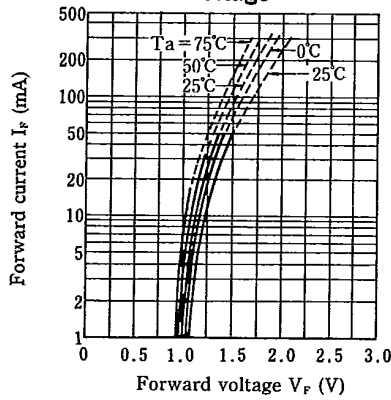


Fig. 4 Collector Current vs. Forward Voltage

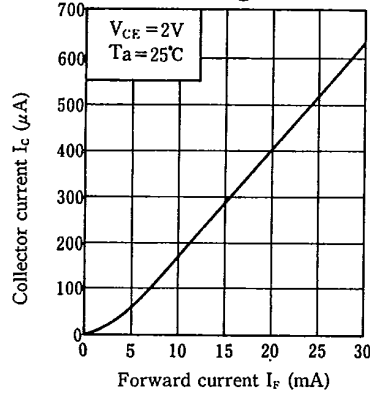
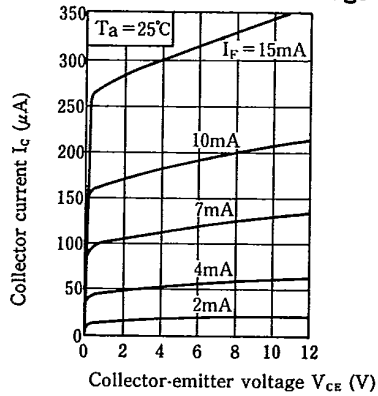


Fig. 5 Collector Current vs. Collector-emitter Voltage



Photointerrupters

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Fig. 6 Relative Collector Current vs. Ambient Temperature

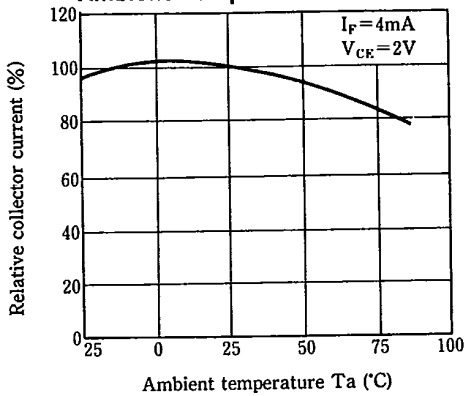


Fig. 7 Collector Dark Current vs. Ambient Temperature

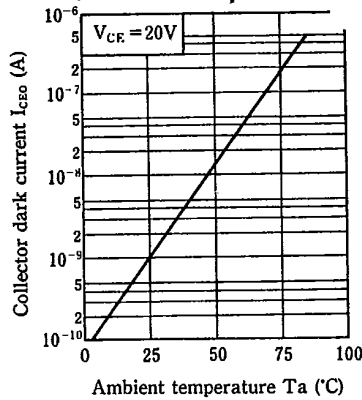
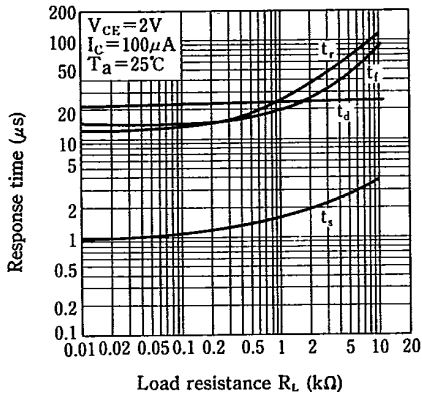


Fig. 8 Response Time vs. Load Resistance



Test Circuit for Response Time

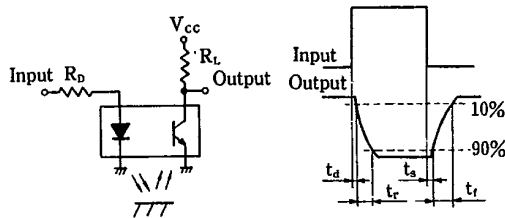


Fig. 9 Relative Collector Current vs. Distance between GP2S04 and Card

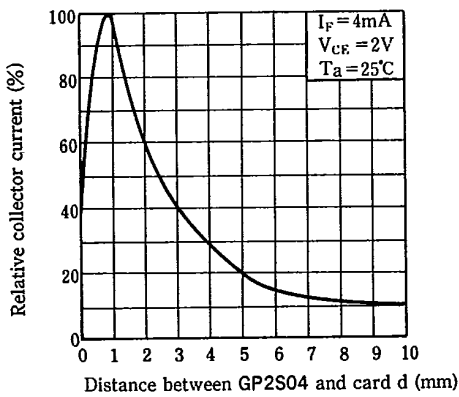
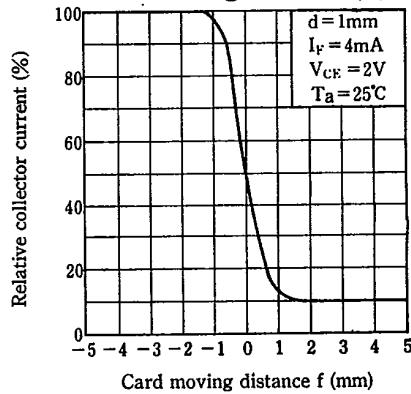
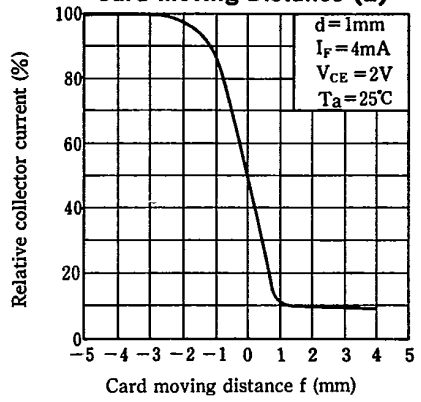


Fig. 10 Relative Collector Current vs. Card Moving Distance (1)



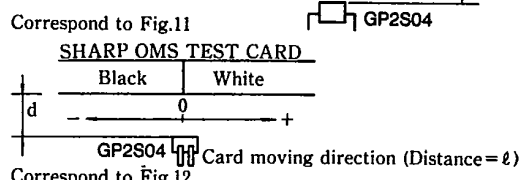
SHARP ELEK/ MELEC DIV

Fig. 11 Relative Collector Current vs. Card Moving Distance (2)



Test Condition for Distance & Detecting Position Characteristics

Correspond to Fig.10
 SHARP OMS TEST CARD (White) *T-41-73*



Correspond to Fig.12
 SHARP OMS TEST CARD

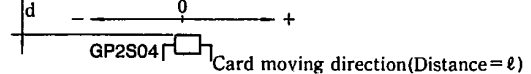


Fig. 12 Frequency Response

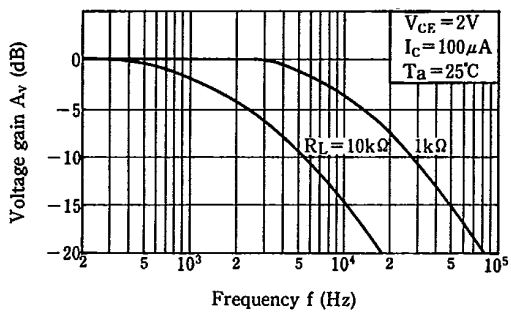


Fig. 13 Spectral Sensitivity (Detecting Side)

