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T-41-73

# GP2S05/GP2S15

Subminiature Photointerrupter with Lens

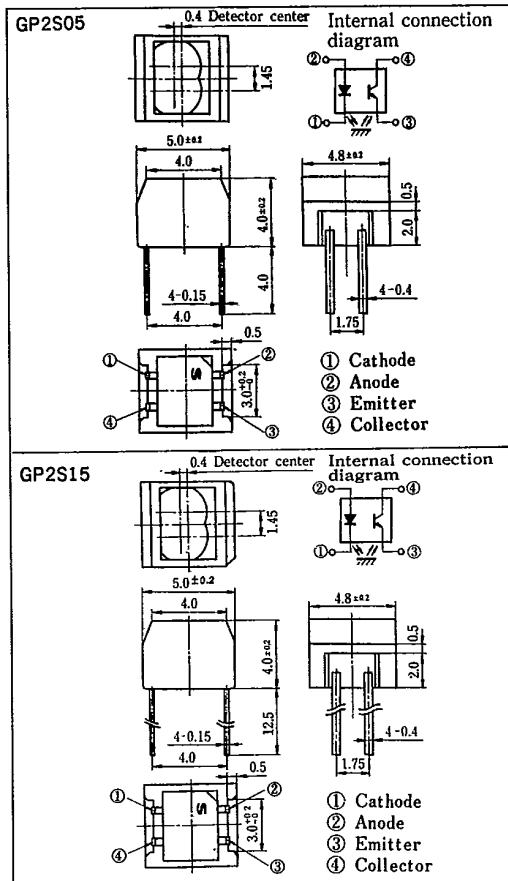
## Features

1. Focal distance : 4mm
2. Easy to install into cartridge due to the snap-intype package
3. Visible light cut-off type
4. Long lead pin : 12.5mm (GP2S15)

## Applications

1. Copiers, printers, facsimiles
2. Cassette decks, video decks
3. Record players

## Outline Dimensions (Unit : mm)



## 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	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 ~ +75	°C
	Storage temperature	$T_{stg}$	-40 ~ +80	°C
	*1 Soldering temperature	$T_{sol}$	260	°C

\*1 For 5 seconds at the position of 1mm from the bottom face of resin package

SHARP

# Electro-optical Characteristics

(Ta=25°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	$\mu\text{A}$
Output	Collector dark current	$I_{CEO}$	$V_{CE}=20\text{V}$		—	$10^{-9}$	$10^{-7}$	A
Transfer charac- teristics	*2Collector current	CTR	$V_{CE}=5\text{V}$ ,	GP 2S05	1.4	—	12	%
			$I_F=20\text{mA}$	GP 2S15	0.5	—	12	%
	Response time (Rise)	$t_r$	$I_C=100\mu\text{A}$ , $V_{CE}=2\text{V}$		—	20	100	$\mu\text{s}$
	Response time (Fall)	$t_f$	$R_L=1\text{k}\Omega$ , $d=4\text{mm}$		—	20	100	$\mu\text{s}$
	*3Leak current	$I_{LEAK}$	$I_F=20\text{mA}$ , $V_{CE}=5\text{V}$		—	8	40	$\mu\text{A}$

\*2 The condition and arrangement of the reflective object are shown below.

\*3 Without reflective object

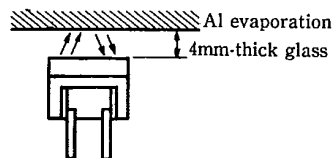
Test Condition and  
Arrangement for  
Collector Current

Fig. 1 Forward Current vs. Ambient Temperature

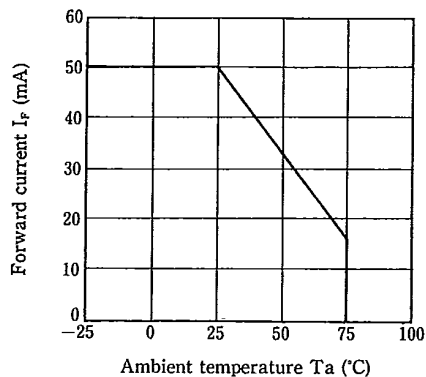


Fig. 2 Power Dissipation vs. Ambient Temperature

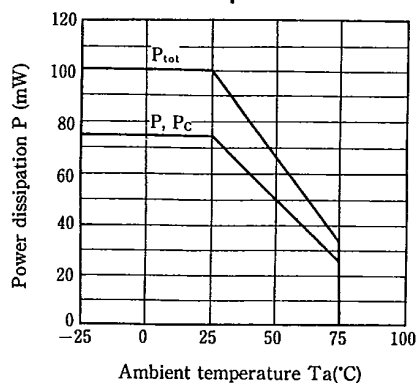


Fig. 3 Peak Forward Current vs. Duty Ratio

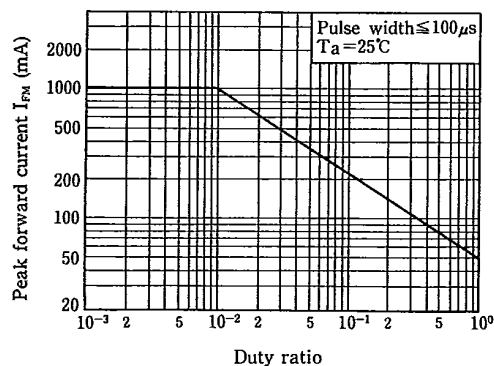
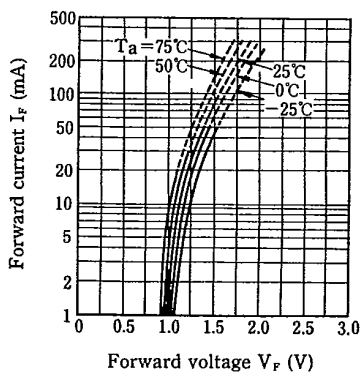
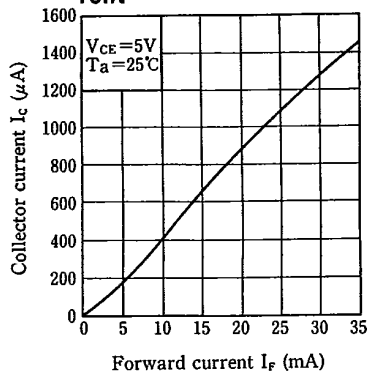
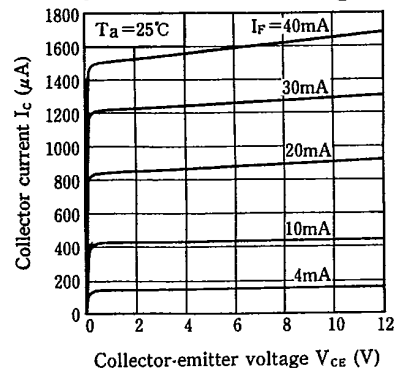
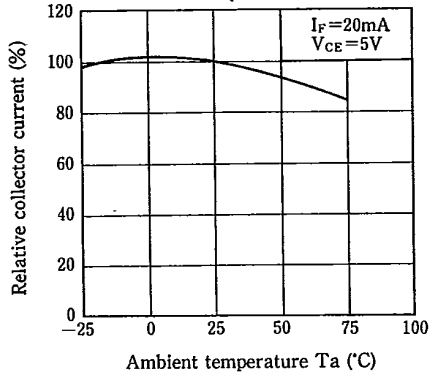
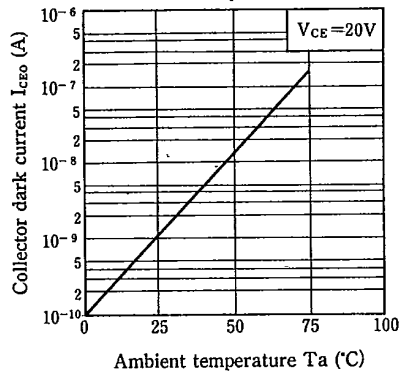
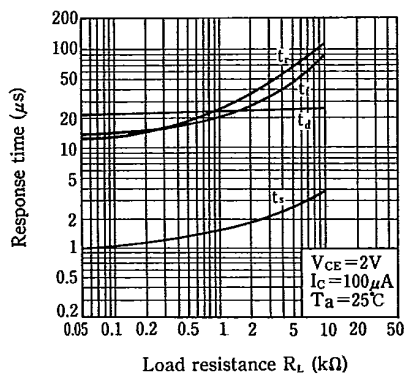
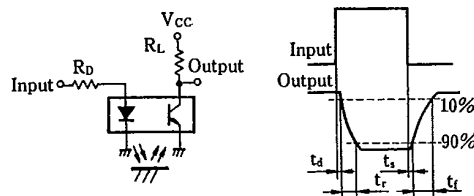


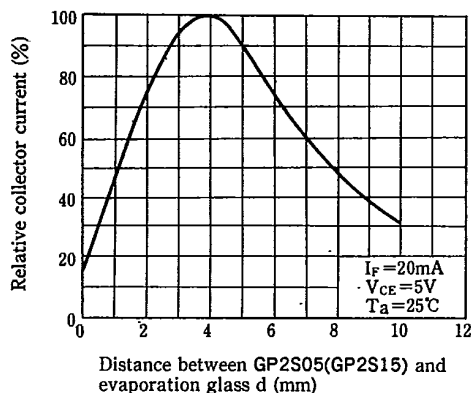
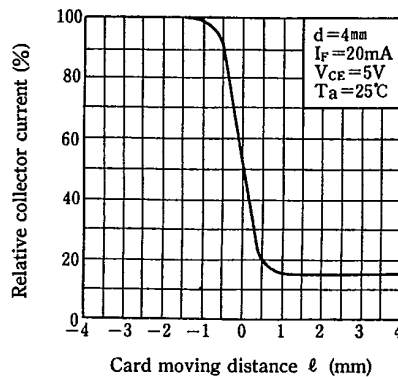
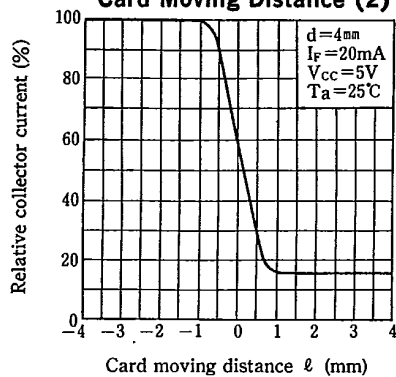
Fig. 4 Forward Current vs. Forward Voltage



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**Fig. 5 Collector Current vs. Forward Current****Fig. 6 Collector Current vs. Collector-emitter Voltage****Fig. 7 Relative Collector Current vs. Ambient Temperature****Fig. 8 Collector Dark Current vs. Ambient Temperature****Fig. 9 Response Time vs. Load Resistance****Test Circuit for Response Time**

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**Fig.10 Relative Collector Current vs. Distance between GP2S05 (GP2S15) and Evaporation Glass****Fig. 11 Relative Collector Current vs. Card Moving Distance (1)****Fig. 12 Relative Collector Current vs. Card Moving Distance (2)****Distance Characteristic Test Condition**

Correspond to Fig. 10

Al evaporation glass

Correspond to Fig. 11

SHARP OMS TEST

Black White

 $d$  0  $+$ GP2S05 (GP2S15) Card moving direction (Distance =  $l$ )

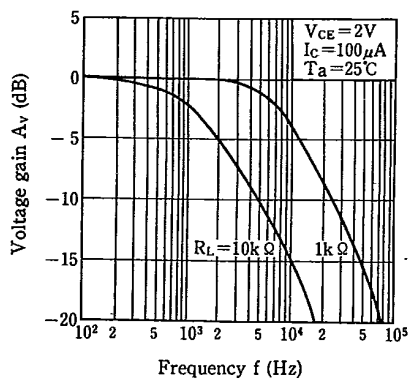
Correspond to Fig. 12

SHARP OMS TEST CARD

Black White

 $d$  0  $+$ GP2S05 (GP2S15) Card moving direction (Distance =  $l$ )

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**Fig. 13 Frequency Response****Fig. 14 Spectral Sensitivity (Detecting Side)**