

# GP2S09/GP2S24/ GP2S26/GP2S27

## Subminiature Photointerrupter

### ■ Features

1. Compact and thin
  - GP2S09: Compact DIP long lead type
  - GP2S24: Compact DIP type
  - GP2S26: Flat lead type
  - GP2S27: Mini-flat package type

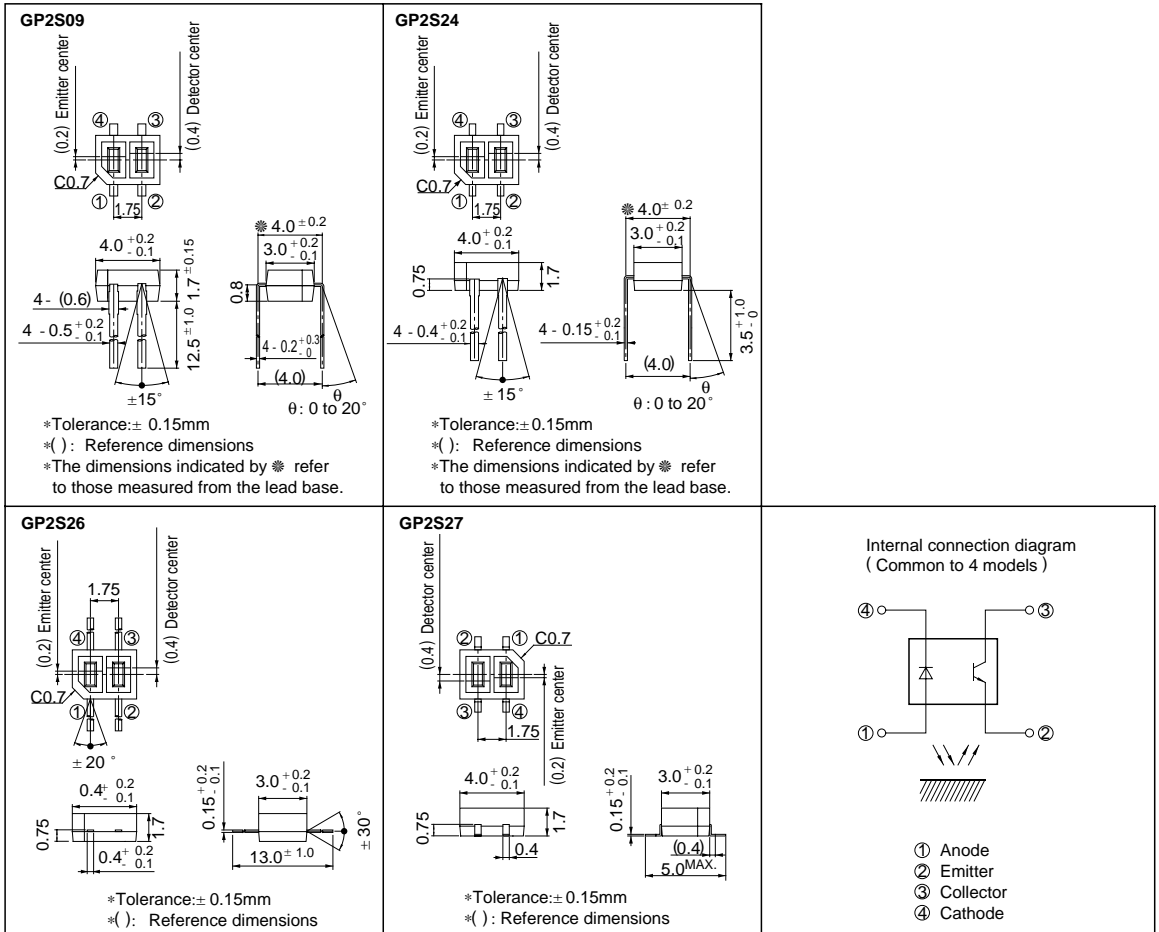
### ■ Applications

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

2. Optimum detection distance: 0.6 to 0.8mm
3. Visible light cut-off type

### ■ Outline Dimensions

(Unit : mm)



## Absolute Maximum Ratings

(Ta = 25°C)

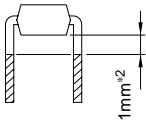
Parameter		Symbol	Rating	Unit
Input	Forward current	I <sub>F</sub>	50	mA
	Reverse voltage	V <sub>R</sub>	6	V
	Power dissipation	P	75	mW
Output	Collector-emitter voltage	V <sub>CEO</sub>	35	V
	Emitter-collector voltage	V <sub>ECO</sub>	6	V
	Collector current	I <sub>C</sub>	20	mA
	Collector power dissipation	P <sub>C</sub>	75	mW
Total power dissipation		P <sub>tot</sub>	100	mW
Operating temperature		T <sub>opr</sub>	- 20 to + 85	°C
Storage temperature		T <sub>stg</sub>	- 40 to + 100	°C
*1 Soldering temperature		T <sub>sol</sub>	260	°C

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

### GP2S09, GP2S24

Soldering area:

The hatched area more than 1mm\*2 away from the lower edge of package as shown in the figure below.

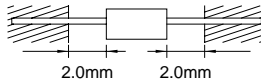


\*2 GP2S09: 4mm

### GP2S26

Soldering area:

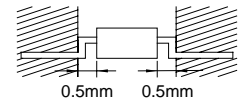
The hatched area more than 2.0mm away from the both edges of package as shown in the figure below.



### GP2S27

Soldering area:

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



## Electro-optical Characteristics

(Ta = 25°C)

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit	
Input	Forward voltage	V <sub>F</sub>	I <sub>F</sub> = 20mA	-	1.2	1.4	V	
	Reverse current	I <sub>R</sub>	V <sub>R</sub> = 6V	-	-	10	μ A	
Output	Collector dark current	I <sub>CEO</sub>	V <sub>CE</sub> = 20V	-	10 <sup>-9</sup>	10 <sup>-7</sup>	A	
Transfer characteristics	*3 Collector current		I <sub>C</sub>	I <sub>F</sub> = 4mA, V <sub>CE</sub> = 2V	20	45	120	μ A
	Response time	Rise time	t <sub>r</sub>	V <sub>CE</sub> = 2V, I <sub>C</sub> = 100 μ A	-	20	100	μ s
		Fall time	t <sub>f</sub>	R <sub>L</sub> = 1kΩ, d = 1mm	-	20	100	μ s
	*4 Leak current		I <sub>LEAK</sub>	I <sub>F</sub> = 4mA, V <sub>CE</sub> = 2V	-	-	0.1	μ A

\*3 The condition and arrangement of the reflective object are shown below.

\*4 Without reflective object

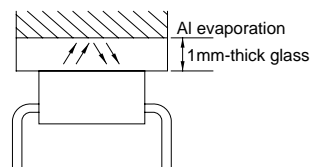
The ranking of collector current shall be classified into the following 6 ranks.

(GP2S09, GP2S24, GP2S26, GP2S27)

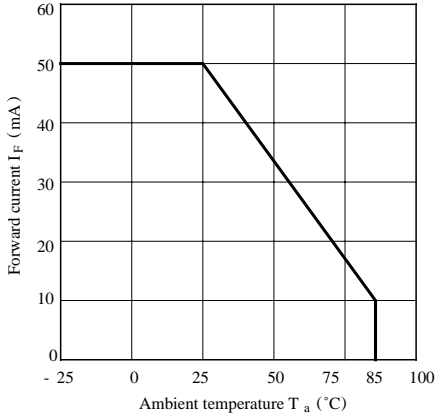
Rank	Collector-current I <sub>C</sub> (μ A)
*5A	20 to 42
B	34 to 71
C	58 to 120
A or B	20 to 71
B or C	34 to 120
A, B or C	20 to 120

\*5 GP2S24 and GP2S26 and GP2S27 don't have A rank.

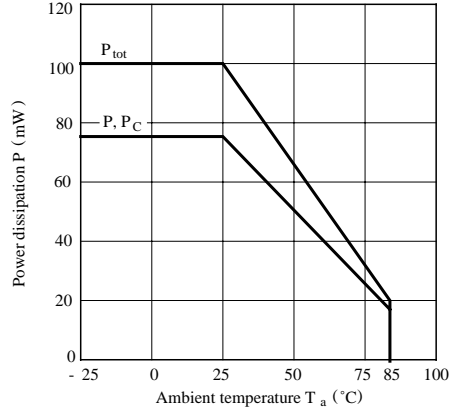
Test Condition and Arrangement for Collector Current



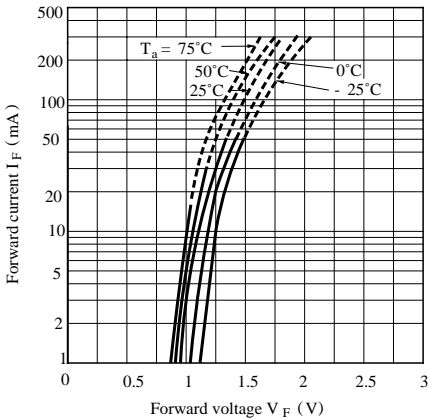
**Fig. 1 Forward Current vs. Ambient Temperature**



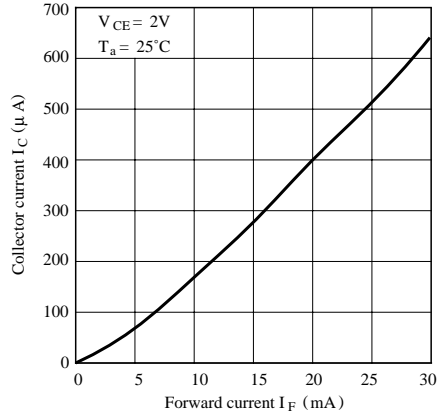
**Fig. 2 Power Dissipation vs. Ambient Temperature**



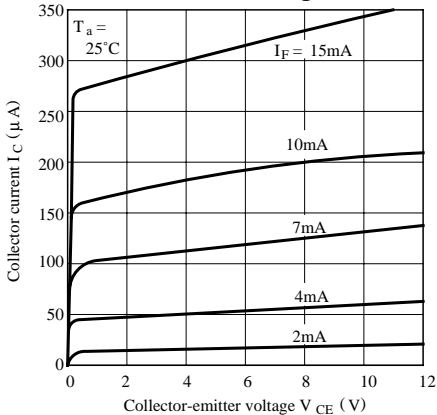
**Fig. 3 Forward Current vs. Forward Voltage**



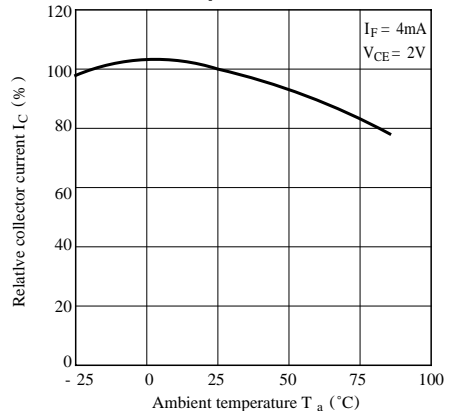
**Fig. 4 Collector Current vs. Forward Current**



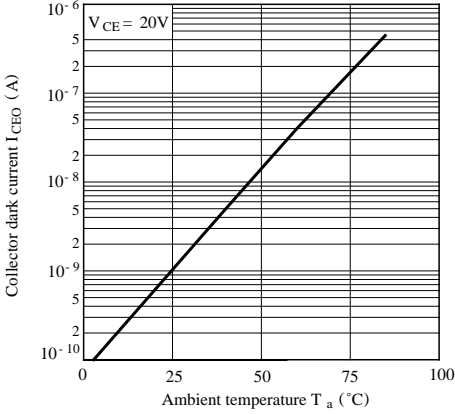
**Fig. 5 Collector Current vs. Collector-Emitter Voltage**



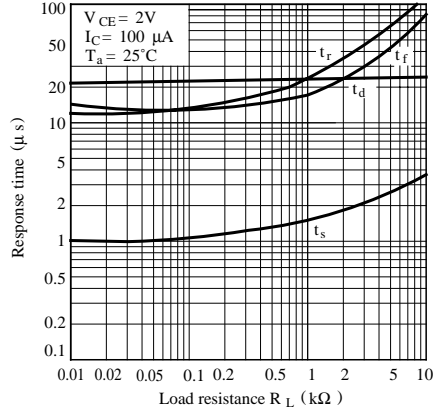
**Fig. 6 Relative Collector Current vs. Ambient Temperature**



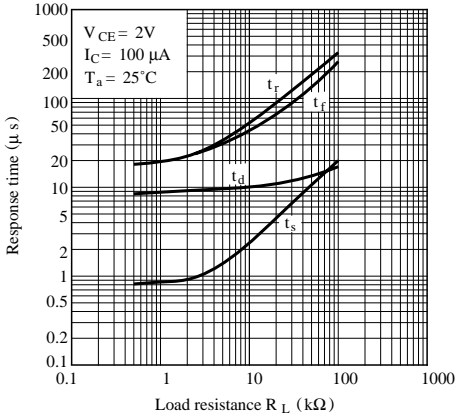
**Fig. 7 Collector Dark Current vs. Ambient Temperature**



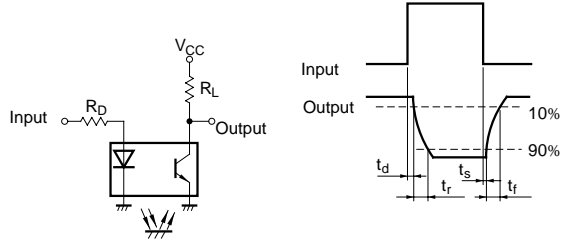
**Fig. 8 Response Time vs. Load Resistance (GP2S09)**



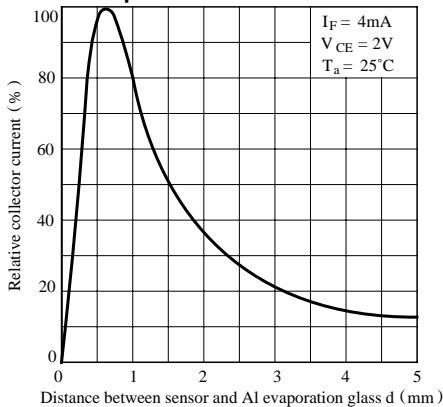
**Fig. 9 Response Time vs. Load Resistance (GP2S24/ GP2S26/GP2S27)**



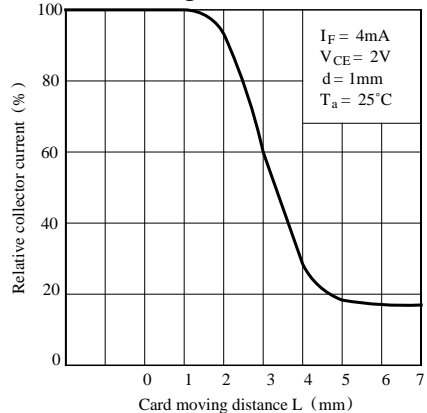
**Test Circuit for Response Time**



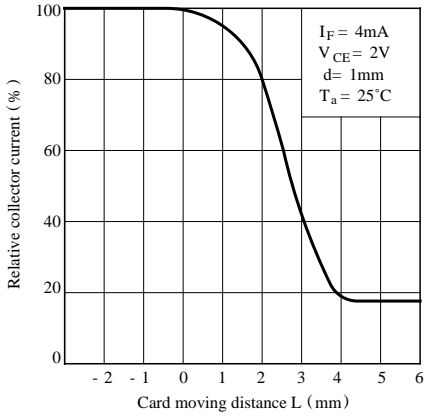
**Fig.10 Relative Collector Current vs. Distance between Sensor and Al Evaporation Glass**



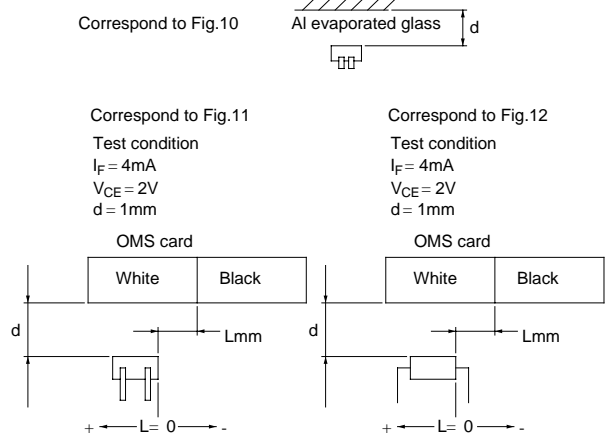
**Fig.11 Relative Collector Current vs. Card Moving Distance (1)**



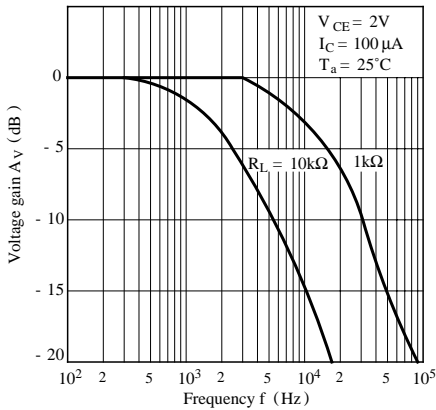
**Fig.12 Relative Collector Current vs. Card Moving Distance (2)**



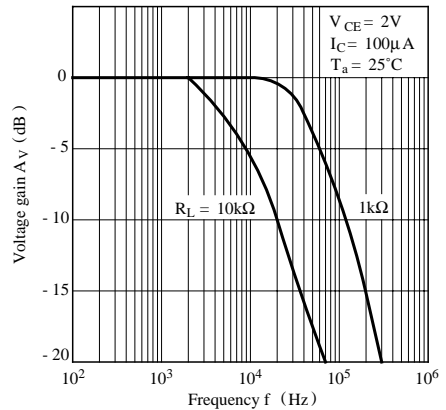
**Test Condition for Distance & Detecting Position Characteristics (EX : GP2S24)**



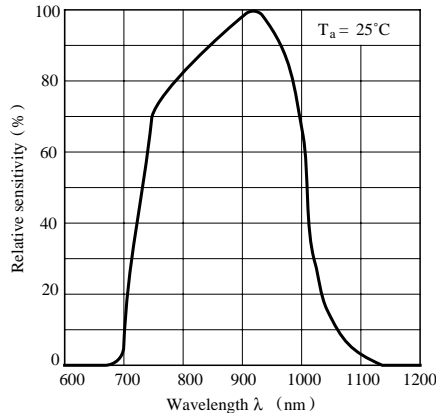
**Fig.13-a Frequency Response (GP2S09)**



**Fig.13-b Frequency Response (GP2S24/ GP2S26/ GP2S27)**



**Fig.14 Spectral Sensitivity (Detecting Side)**



- Please refer to the chapter “Precautions for Use”.

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