

# GP2S09/GP2S10/GP2S24/ GP2S26/GP2S27

## Subminiature Photointerrupter

### ■ Features

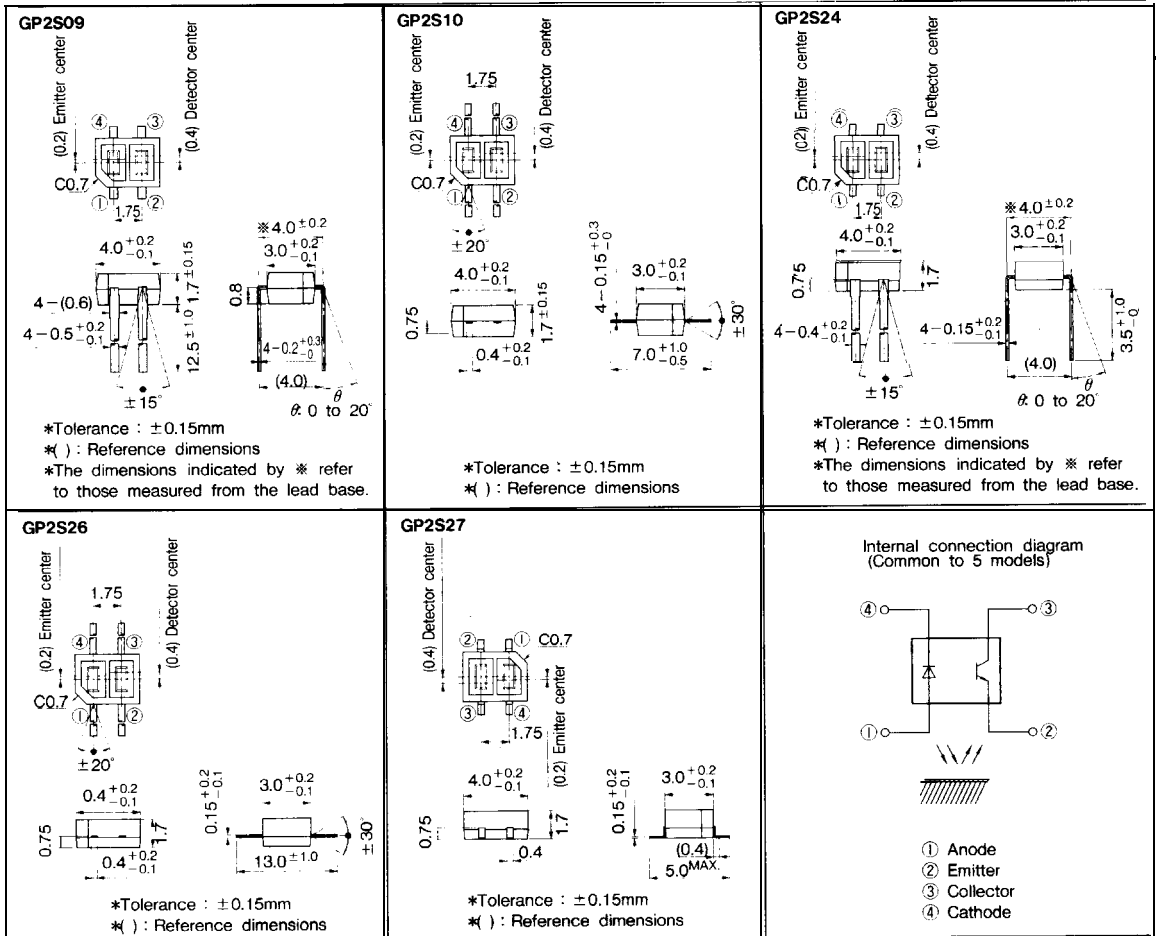
1. Compact and thin  
 GP2S09 : Compact DIP long lead type  
 GP2S10 : Short lead flat type  
 GP2S24 : Compact DIP type  
 GP2S26 : Flat lead type  
 GP2S27 : Mini-flat package type
2. optimum detection distance : 0.6 to 0.8mm
3. Visible light cut-off type

### ■ Applications

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

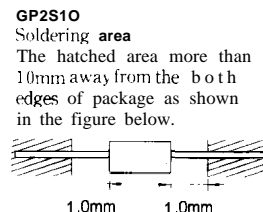
### ■ Outline Dimensions

(Unit : mm)



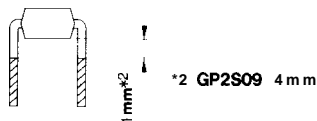
**■ Absolute Maximum Ratings** (Ta = 25°C)

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>CE(s)</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
*soldering temperature	T <sub>sol</sub>	260	°C	

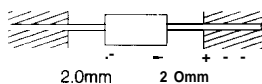


\*1 Within 5 seconds (Soldering areas for each model are shown below)

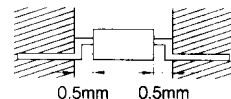
**GP2S09, GP2S24**  
Soldering area  
The hatched area more than 1mm\*2 away from the lower edge of package as shown in the figure below



**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	I <sub>F</sub> = 20mA	-	1.2	1.4	V	
	Reverse current	V <sub>R</sub> = 6V			10	μA	
output	Collector dark current	V <sub>CE</sub> = 20V		10 <sup>-9</sup>	10 <sup>-7</sup>	A	
Transfer characteristics	*3 Collector current	I <sub>F</sub> = 4mA, V <sub>CE</sub> = 2V	20	45	120	μA	
	Response time	Rise time	V <sub>CE</sub> = 2V, I <sub>C</sub> = 100 μA		20	100	μs
		Fall time	R <sub>L</sub> = 1kΩ, d = 1mm		20	100	μs
	*4 Leak current	I <sub>LEAK</sub>	I <sub>F</sub> = 4mA, V <sub>CE</sub> = 2V			0.1	μA

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

\*4 Without reflective object

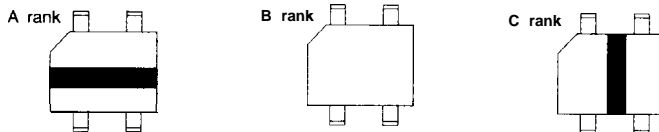
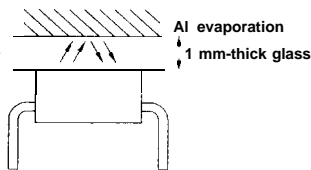
The ranking of collector current shall be classified into the following 6 ranks.

(GP2S09, GP2S10, GP2S24, GP2S26, GP2S27)

Rank	Collector -current I <sub>C</sub> (Y A)
*5 A	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

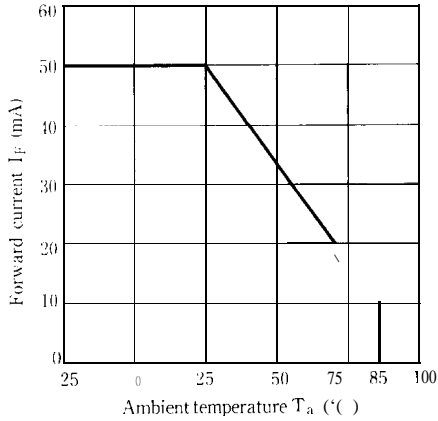
\*5 GP2S24 and GP2S26 don't have A rank

**Test Condition and Arrangement for Collector Current**

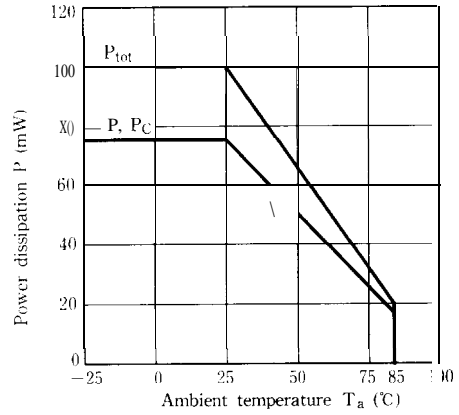


\*\* Marking is shown in the rear face of device

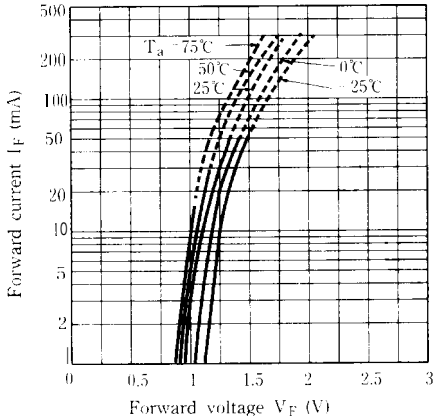
**Fig. 1 Forward Current vs. Ambient Temperature**



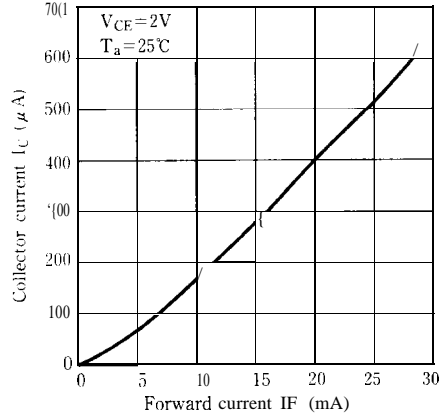
**Fig. 2 Power Dissipation vs. Ambient Temperature**



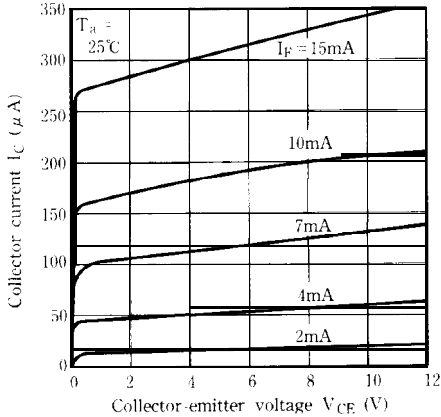
**Fig. 3 Forward Current vs. Forward Voltage**



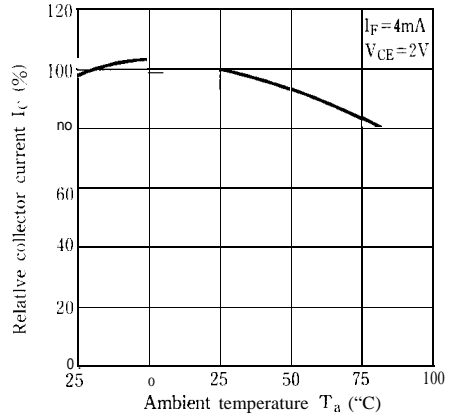
**Fig. 4 Collector Current vs. Forward Current**



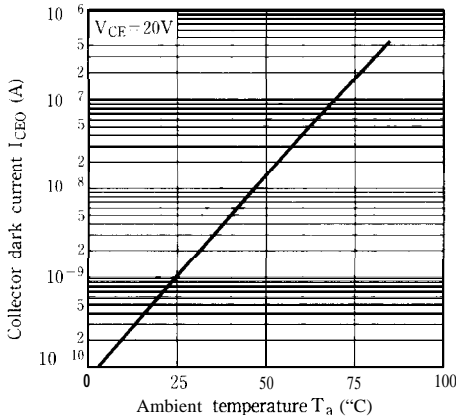
**Fig. 5 Collector Current vs. Collector-Emitter Voltage**



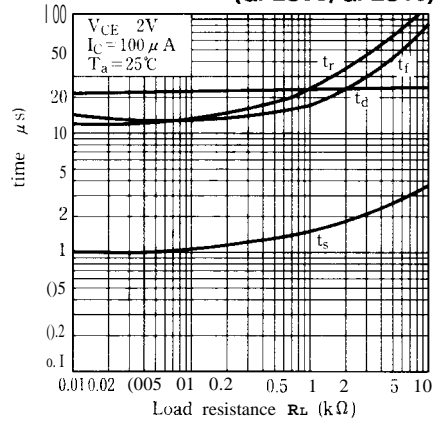
**Fig. 6 Relative Collector current vs. Ambient Temperature**



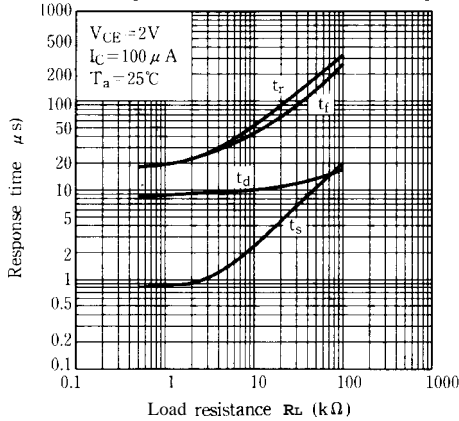
**Fig. 7 Collector Dark Current vs. Ambient Temperature**



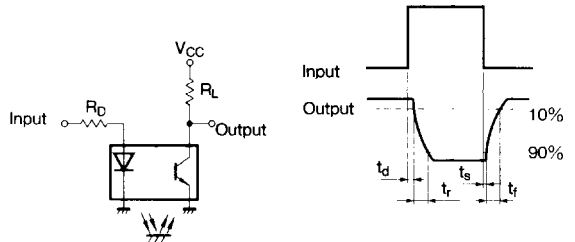
**Fig. 8 Response Time vs. Load Resistance (GP2S09/GP2S10)**



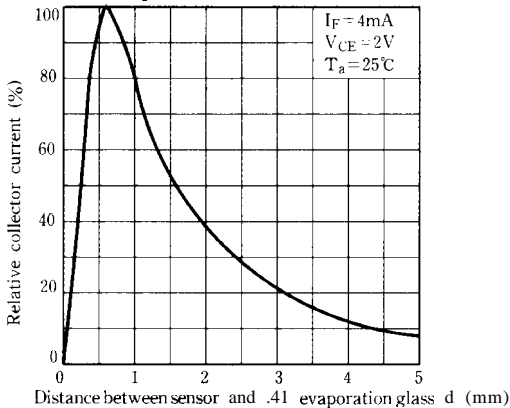
**Fig. 9 Response Time vs. Load Resistance (GP2S24/GP2S26/GP2S27)**



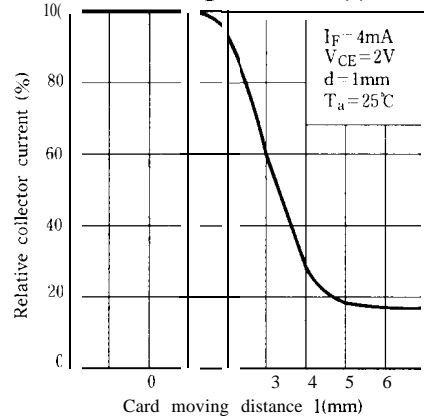
**Test Circuit for Response Time**



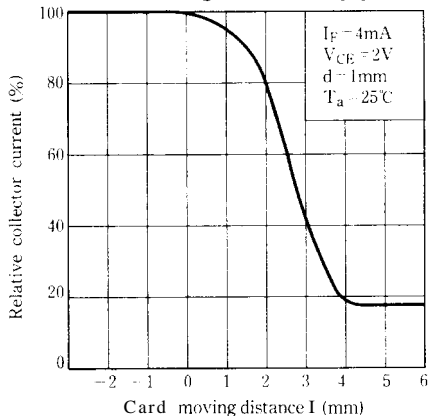
**Fig.10 Relative Collector Current vs. Distance between Sensor and Al Evaporation Glass**



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

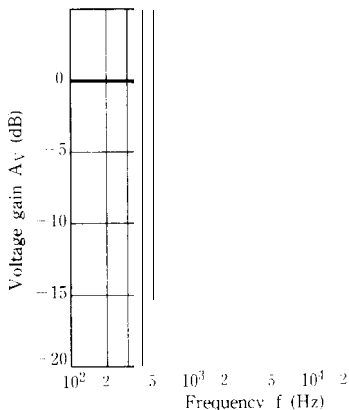


**Fig.12 Relative Collector Current vs. Card Moving Distance (2)**

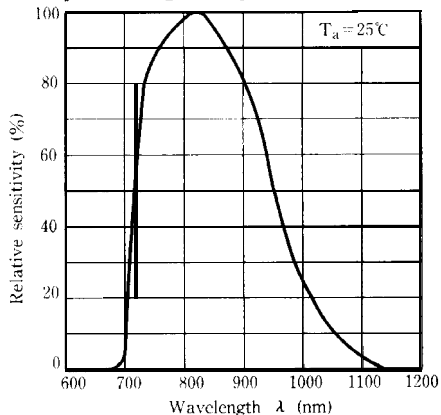


**Fig.13-a Frequency Response**

(GP2S09/GP2S10)

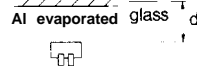


**Fig.14 Spectral Sensitivity (Detecting Side)**



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

Correspond to Fig.10

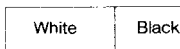


Correspond to Fig.11

Test condition

$I_F = 4\text{mA}$   
 $V_{CE} = 2\text{V}$   
 $d = 1\text{mm}$

OMS card



1mm



$I = 0$

Correspond to Fig.12

Test condition

$I_F = 4\text{mA}$   
 $V_{CE} = 2\text{V}$   
 $d = 1\text{mm}$

OMS card



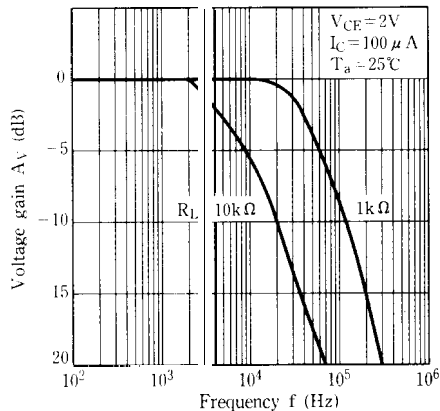
1mm



$I = 0$

**Fig.13-b Frequency Response**

(GP2S24/GP2S26/GP2S27)



● Please refer to the chapter "Precautions for Use" (Page 78 to 93).

