

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

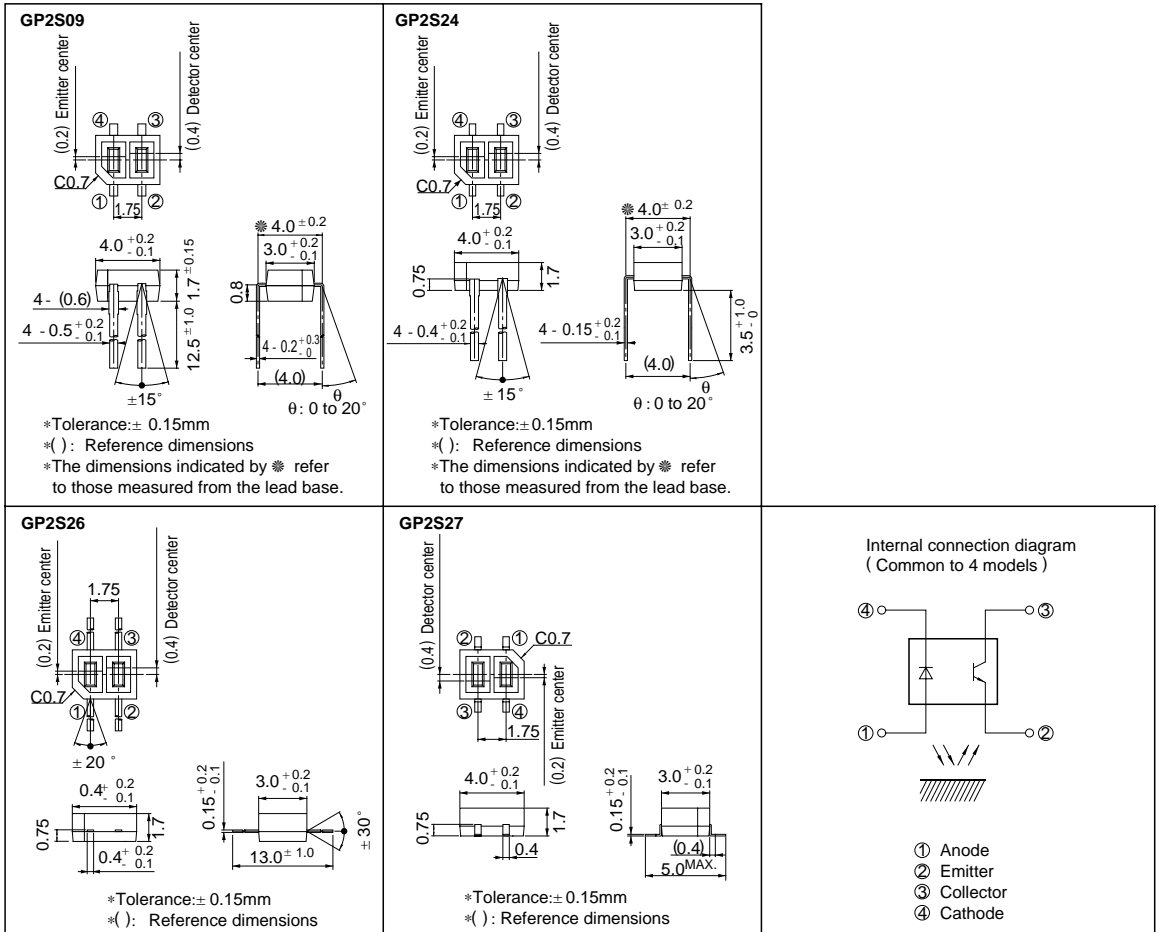
■ Applications

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)

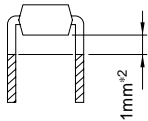
| Parameter | | Symbol | Rating | Unit |
|--------------------------|-----------------------------|------------------|---------------|------|
| Input | Forward current | I _F | 50 | mA |
| | Reverse voltage | V _R | 6 | V |
| | Power dissipation | P | 75 | mW |
| Output | Collector-emitter voltage | V _{CEO} | 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} | - 20 to + 85 | °C |
| Storage temperature | | T _{stg} | - 40 to + 100 | °C |
| *1 Soldering temperature | | T _{sol} | 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.

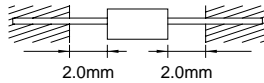


*2 GP2S09: 4mm

GP2S26

Soldering area:

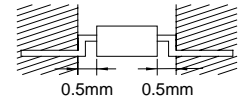
The hatched area more than 2.0mm away from the both edges of package as shown in the figure below.



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 _F | I _F = 20mA | - | 1.2 | 1.4 | V | |
| | Reverse current | I _R | V _R = 6V | - | - | 10 | μ A | |
| Output | Collector dark current | I _{CEO} | V _{CE} = 20V | - | 10 ⁻⁹ | 10 ⁻⁷ | A | |
| Transfer characteristics | *3 Collector current | | I _C | I _F = 4mA, V _{CE} = 2V | 20 | 45 | 120 | μ A |
| | Response time | Rise time | t _r | V _{CE} = 2V, I _C = 100 μ A | - | 20 | 100 | μ s |
| | | Fall time | t _f | R _L = 1kΩ, d = 1mm | - | 20 | 100 | μ s |
| | *4 Leak current | | I _{LEAK} | I _F = 4mA, V _{CE} = 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 _C (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

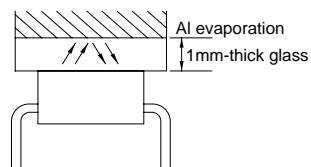


Fig. 1 Forward Current vs. Ambient Temperature

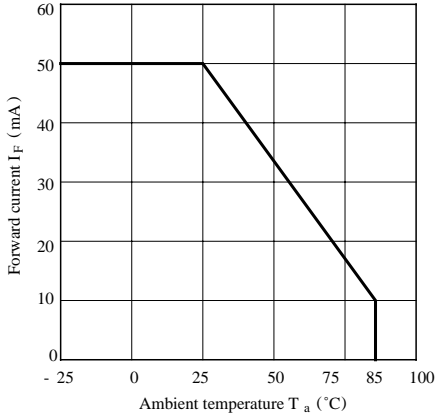


Fig. 2 Power Dissipation vs. Ambient Temperature

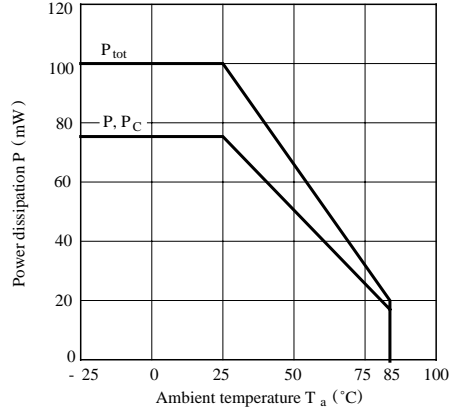


Fig. 3 Forward Current vs. Forward Voltage

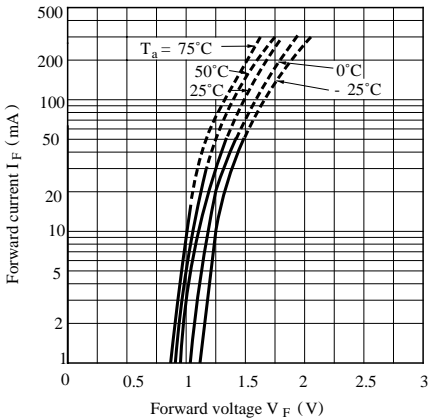


Fig. 4 Collector Current vs. Forward Current

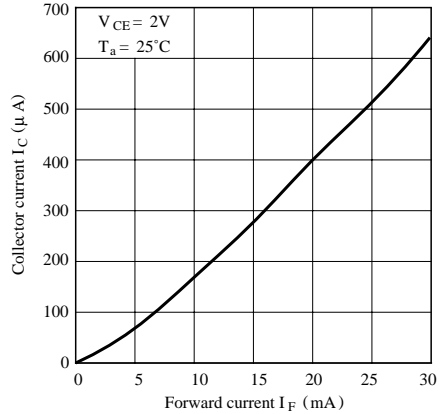


Fig. 5 Collector Current vs. Collector-Emitter Voltage

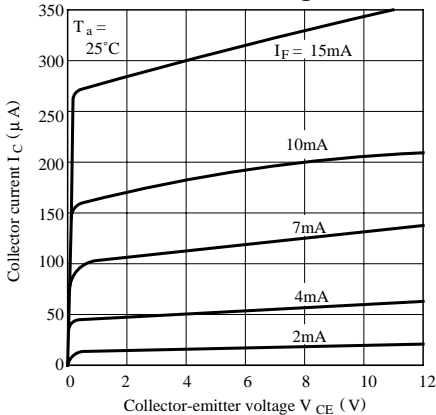


Fig. 6 Relative Collector Current vs. Ambient Temperature

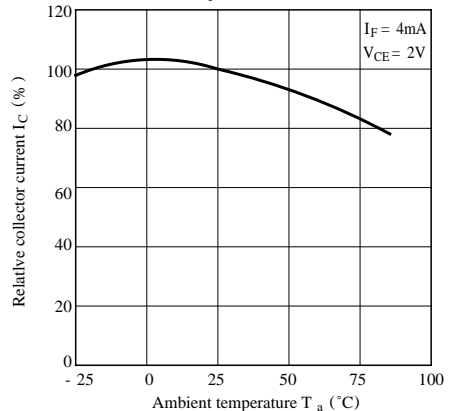


Fig. 7 Collector Dark Current vs. Ambient Temperature

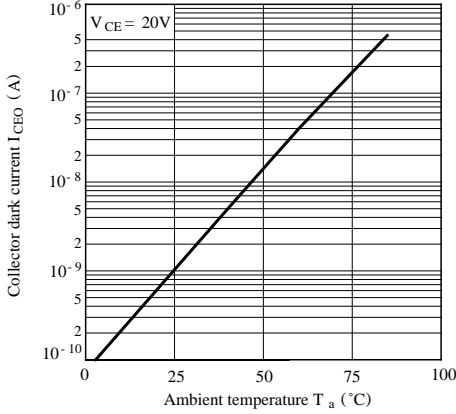


Fig. 8 Response Time vs. Load Resistance (GP2S09)

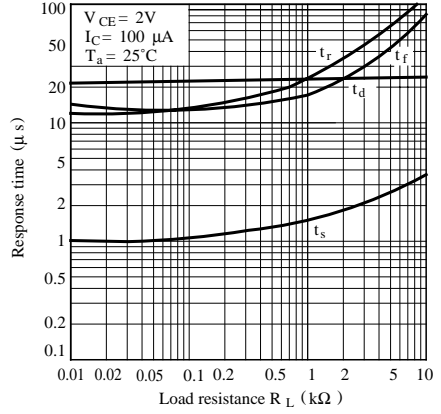
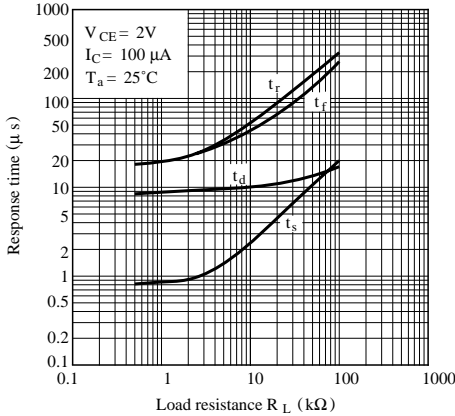


Fig. 9 Response Time vs. Load Resistance (GP2S24/ GP2S26/GP2S27)



Test Circuit for Response Time

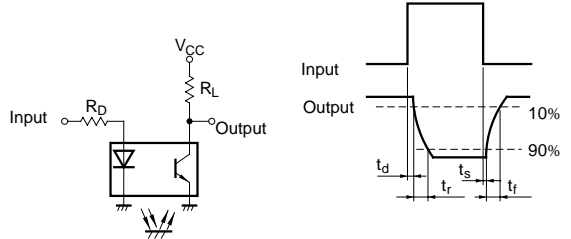


Fig.10 Relative Collector Current vs. Distance between Sensor and Al Evaporation Glass

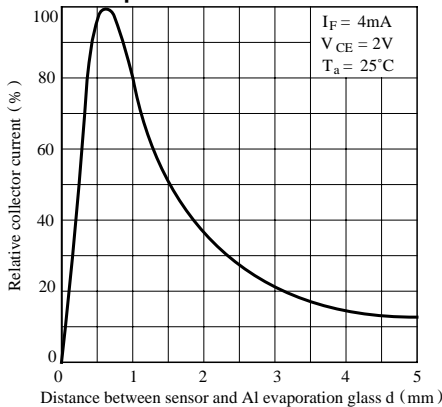


Fig.11 Relative Collector Current vs. Card Moving Distance (1)

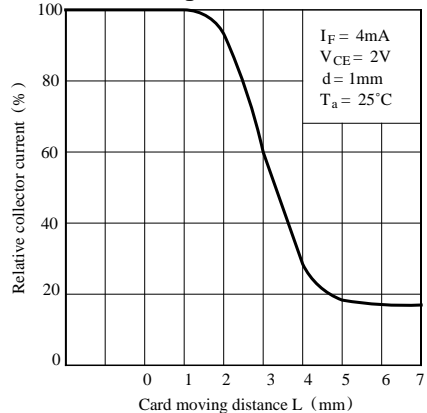
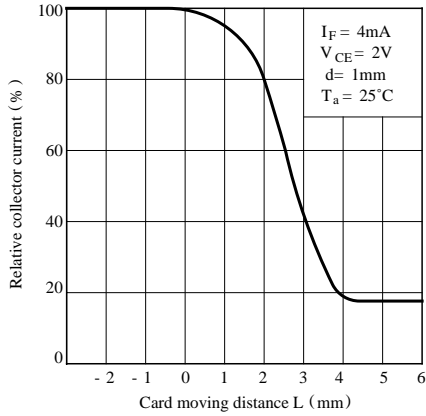


Fig.12 Relative Collector Current vs. Card Moving Distance (2)



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

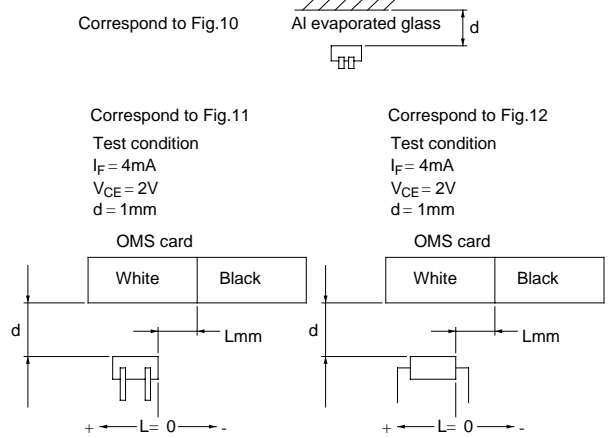


Fig.13-a Frequency Response (GP2S09)

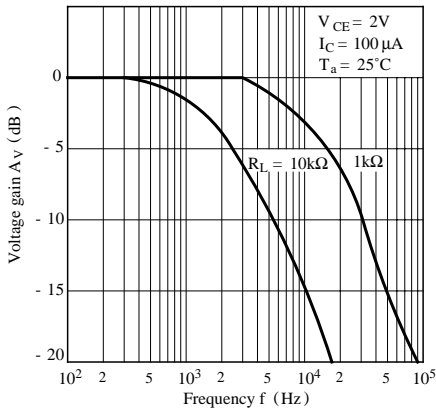


Fig.13-b Frequency Response (GP2S24/ GP2S26/ GP2S27)

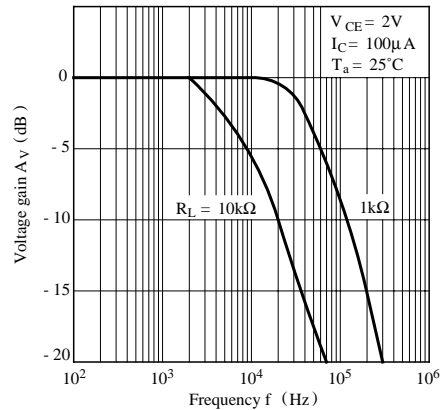
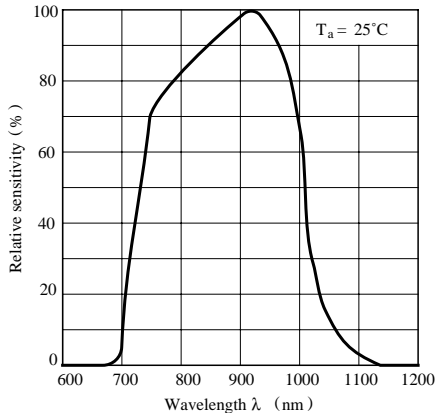


Fig.14 Spectral Sensitivity (Detecting Side)



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

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