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

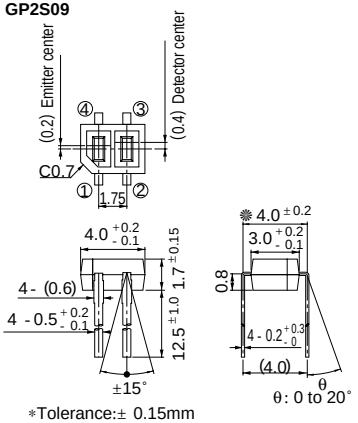
■ Applications

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

■ Outline Dimensions

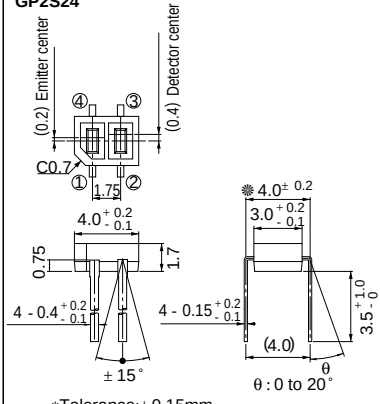
(Unit: mm)

GP2S09



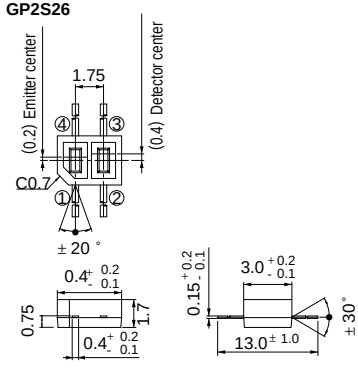
∗Tolerance: ± 0.15mm
∗( ): Reference dimensions
∗The dimensions indicated by ❋ refer to those measured from the lead base.

GP2S24



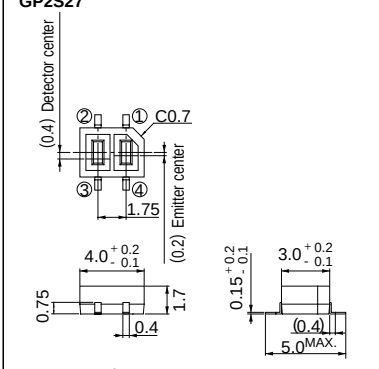
∗Tolerance: ± 0.15mm
∗( ): Reference dimensions
∗The dimensions indicated by ❋ refer to those measured from the lead base.

GP2S26



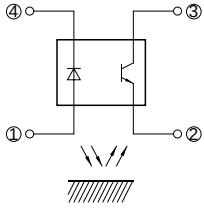
∗Tolerance: ± 0.15mm
∗( ): Reference dimensions

GP2S27



∗Tolerance: ± 0.15mm
∗( ): Reference dimensions

Internal connection diagram
(Common to 4 models)



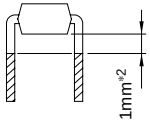
① Anode
② Emitter
③ Collector
④ Cathode

■ 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 dissiipation	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
	*1Soldering temperature	T_{sol}	260	˚C

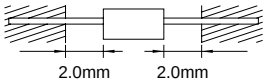
*1 Within 5 seconds (Soldering areas for each model are shown below)

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

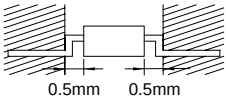


*2 **GP2S09**: 4mm

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	μA
Output	Collector dark current		I_{CEO}	V_{CE} = 20V	-	10^{-9}	10^{-7}	A
Transfer characteristics	*3Collector current		I_C	I_F = 4mA, V_{CE} = 2V	20	45	120	μA
	Response time	Rise time	t_r	V_{CE} = 2V, I_C = 100μA	-	20	100	μs
		Fall time	t_f	R_L = 1kΩ, d = 1mm	-	20	100	μs
	*4Leak current		I_{LEAK}	I_F = 4mA, V_{CE} = 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**, **GP2S24**, **GP2S26**, **GP2S27**)

Rank	Collector-current I_C (μA)
*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

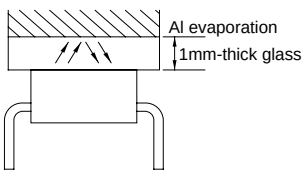


Fig. 1 Forward Current vs. Ambient Temperature

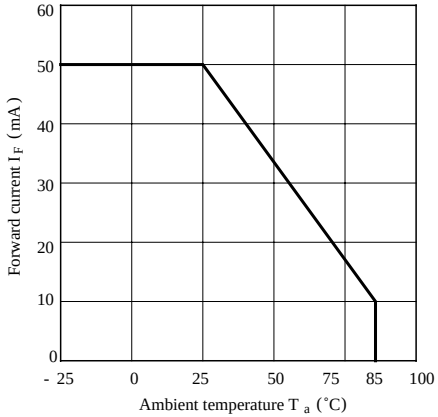


Fig. 2 Power Dissipation vs. Ambient Temperature

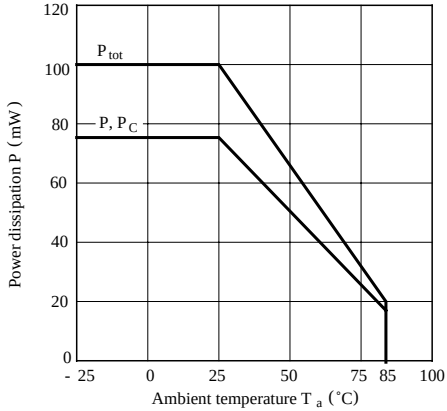


Fig. 3 Forward Current vs. Forward Voltage

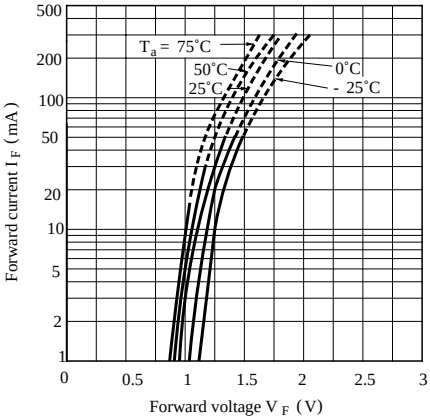


Fig. 4 Collector Current vs. Forward Current

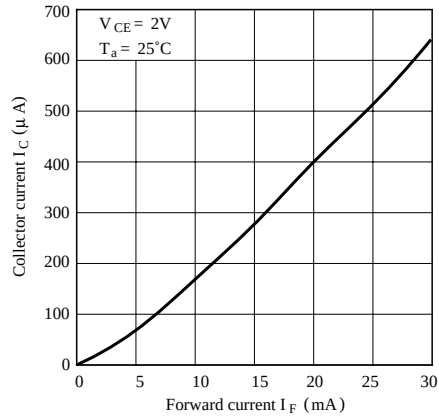


Fig. 5 Collector Current vs. Collector-Emitter Voltage

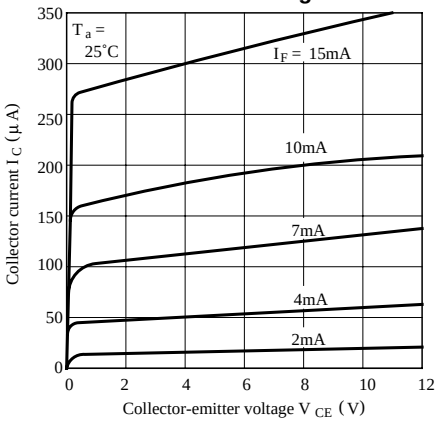


Fig. 6 Relatlve Collector Current vs. Ambient Temperature

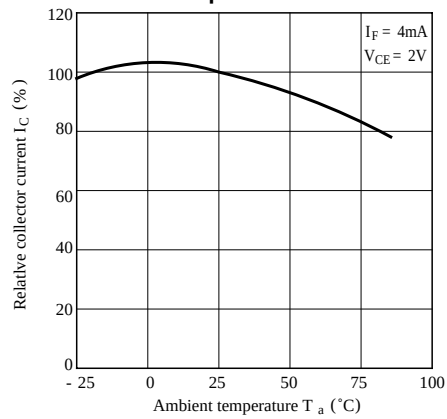


Fig. 7 Collector Dark Current vs. Ambient Temperature

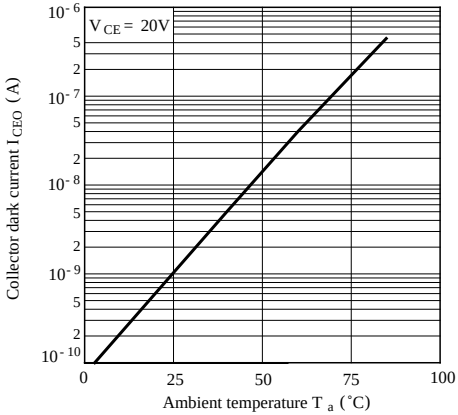


Fig. 8 Response Time vs. Load Resistance (GP2S09)

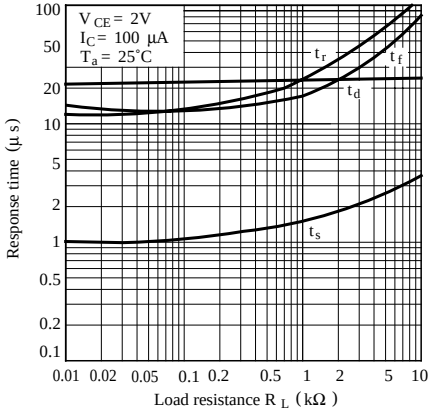
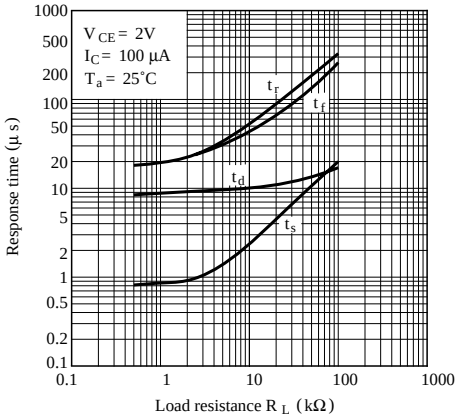


Fig. 9 Response Time vs. Load Resistance (GP2S24/ GP2S26/GP2S27)



Test Circuit for Response Time

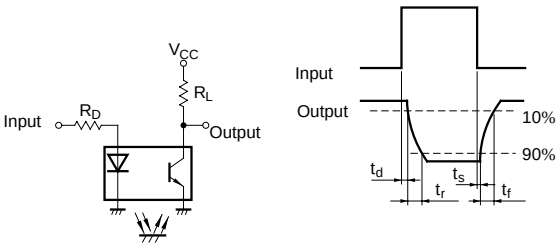


Fig.10 Relative Collector Current vs. Distance between Sensor and Al Evaporation Glass

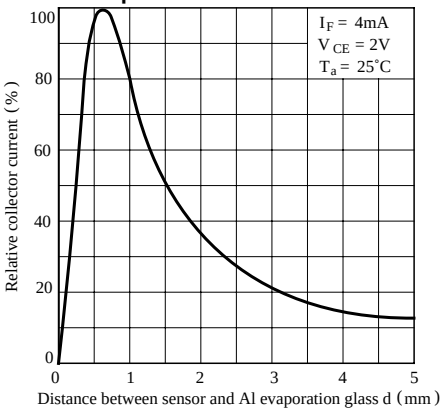


Fig.11 Relative Collector Current vs. Card Moving Distance (1)

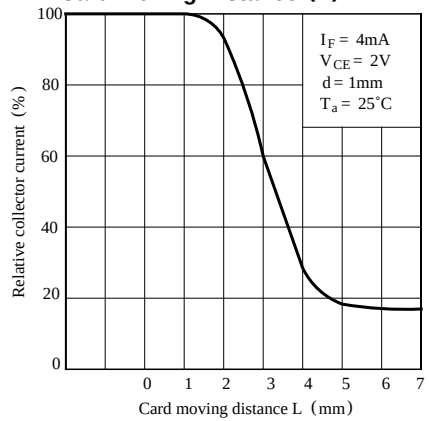
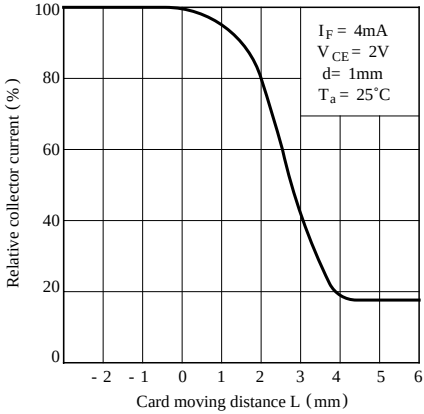


Fig.12 Relative Collector Current vs. Card Moving Distance (2)



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

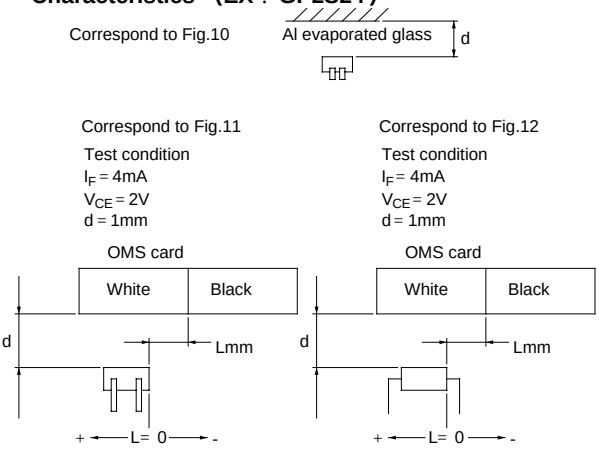


Fig.13-a Frequency Response (GP2S09)

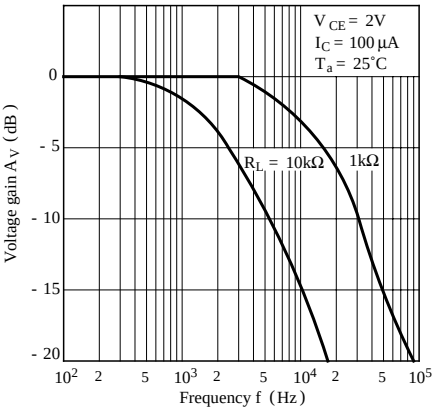


Fig.13-b Frequency Response (GP2S24/ GP2S26/ GP2S27)

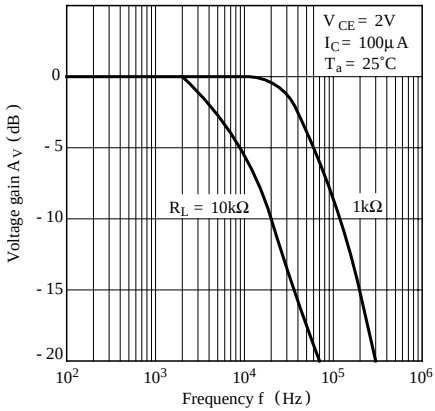
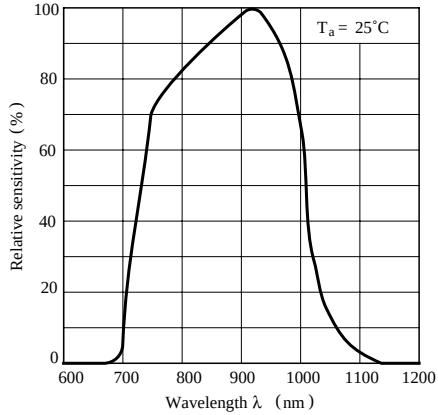


Fig.14 Spectral Sensitivity (Detecting Side)



- Please refer to the chapter "Precautions for Use".

NOTICE

- The circuit application examples in this publication are provided to explain representative applications of SHARP devices and are not intended to guarantee any circuit design or license any intellectual property rights. SHARP takes no responsibility for any problems related to any intellectual property right of a third party resulting from the use of SHARP's devices.
- Contact SHARP in order to obtain the latest device specification sheets before using any SHARP device. SHARP reserves the right to make changes in the specifications, characteristics, data, materials, structure, and other contents described herein at any time without notice in order to improve design or reliability. Manufacturing locations are also subject to change without notice.
- Observe the following points when using any devices in this publication. SHARP takes no responsibility for damage caused by improper use of the devices which does not meet the conditions and absolute maximum ratings to be used specified in the relevant specification sheet nor meet the following conditions:

(i) The devices in this publication are designed for use in general electronic equipment designs such as:
— Personal computers
— Office automation equipment
— Telecommunication equipment [terminal]
— Test and measurement equipment
— Industrial control
— Audio visual equipment
— Consumer electronics

(ii) Measures such as fail-safe function and redundant design should be taken to ensure reliability and safety when SHARP devices are used for or in connection with equipment that requires higher reliability such as:
— Transportation control and safety equipment (i.e., aircraft, trains, automobiles, etc.)
— Traffic signals
— Gas leakage sensor breakers
— Alarm equipment
— Various safety devices, etc.

(iii) SHARP devices shall not be used for or in connection with equipment that requires an extremely high level of reliability and safety such as:
— Space applications
— Telecommunication equipment [trunk lines]
— Nuclear power control equipment
— Medical and other life support equipment (e.g., scuba).

- Contact a SHARP representative in advance when intending to use SHARP devices for any "specific" applications other than those recommended by SHARP or when it is unclear which category mentioned above controls the intended use.
- If the SHARP devices listed in this publication fall within the scope of strategic products described in the Foreign Exchange and Foreign Trade Control Law of Japan, it is necessary to obtain approval to export such SHARP devices.
-
- Contact and consult with a SHARP representative if there are any questions about the contents of this publication.