GP2L09/GP2L24 GP2L26

Subminiature, High Sensitivity Photointerrupter

■ Features

1. Compact and thin
   GP2L09: Compact DIP, long lead type
   GP2L24: Compact DIP type
   GP2L26: Flat lead type
2. Optimum detection distance: 0.6 to 0.8mm
3. High sensitivity
   (I_C: MIN. 0.5mA at I_F = 4mA)
4. Visible light cut-off type

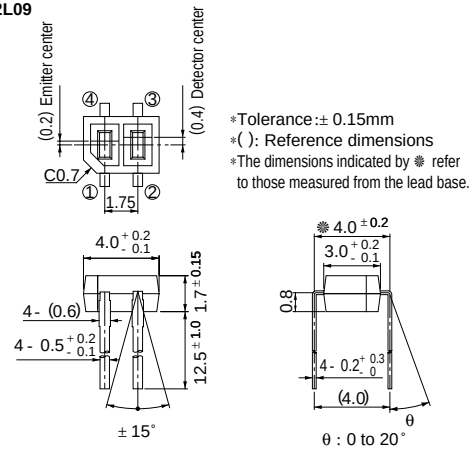
■ Applications

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

■ Outline Dimensions

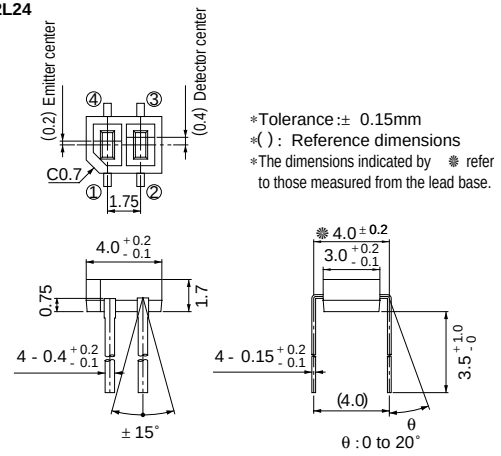
(Unit : mm)

GP2L09



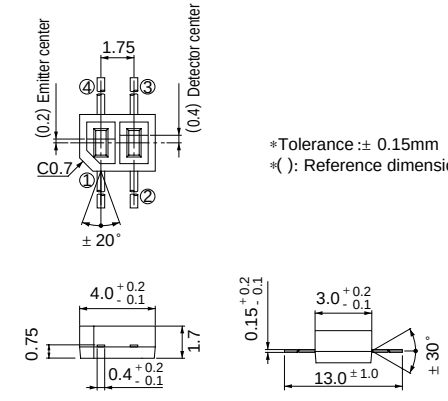
∗Tolerance : ± 0.15mm
∗( ): Reference dimensions
∗The dimensions indicated by ❁ refer to those measured from the lead base.

GP2L24



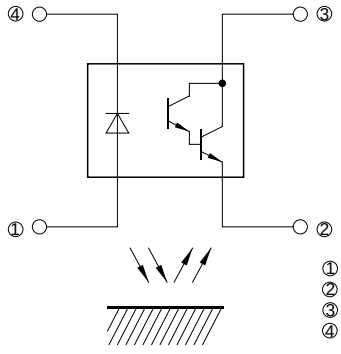
∗Tolerance : ± 0.15mm
∗( ): Reference dimensions
∗The dimensions indicated by ❁ refer to those measured from the lead base.

GP2L26



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

Internal connection diagram
(Common to 3 models)

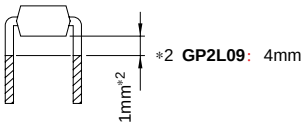


■ Absolute Maximum Ratings (Ta = 25˚C)

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	50	mA
	Collector power dissipation	P_C	75	mW
Total power dissipation		P_{tot}	100	mW
Operating temperature		T_{opr}	- 25 to + 85	˚C
Storage temperature		T_{stg}	- 40 to + 100	˚C
*1Soldering temperature		T_{sol}	260	˚C

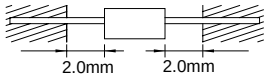
*1 Within 5 seconds (Soldering areas for each model are shown below.)

GP2L09, **GP2L24**
Soldering area
The hatched area more than 1mm*2 away from the lower edge of package as shown in the drawing below.



*2 **GP2L09**: 4mm

GP2L26
Soldering area
The hatched area more than 2.0mm away from the both edge of package as shown in the drawing below.



■ Electro-optical Characteristics (Ta = 25˚C)

Parameter			Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Input	Forward voltage		I_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} = 10V, I_F = 0	-	-	$1x\ 10^{-6}$	A
Transfer-characteristics	*3Collector current		I_C	V_{CE} = 2V, I_F = 4mA	0.5	3.0	15.0	mA
	Response time	Rise time	t_r	V_{CE} = 2V, I_C = 10mA R_L = 100Ω, d = 1mm	-	80	400	μs
		Fall time	t_f		-	70	400	μs
	*4Leak current		I_{LEAK}	I_F = 4mA, V_{CE} = 5V	-	-	5.0	μA

*3 The condition and arrangement of the reflective object are shown in the right drawing.
*4 Without reflective object

The ranking of collector current shall be classified into the following 6 ranks.
(**GP2L09**, **GP2L24**, **GP2L26**)

Rank	Collector current I_C (mA)
*5A	0.5 to 1.9
B	1.45 to 5.4
C	4.0 to 15.0
A or B	0.5 to 5.4
B or C	1.45 to 15.0
A, B or C	0.5 to 15.0

*5 **GP2L24** and **GP2L26** don't have A rank.

Test Condition for Collector Current

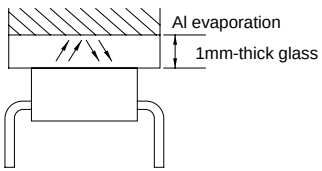


Fig. 1 Forward Current vs. Ambient Temperature

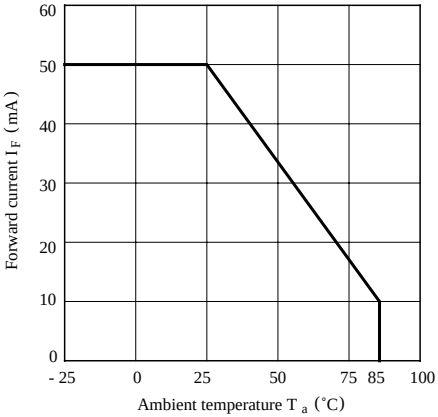


Fig. 2 Power Dissipation vs. Ambient Temperature

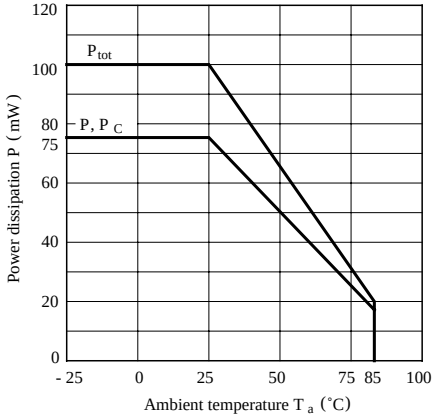


Fig. 3 Peak Forward Current vs. Duty Ratio

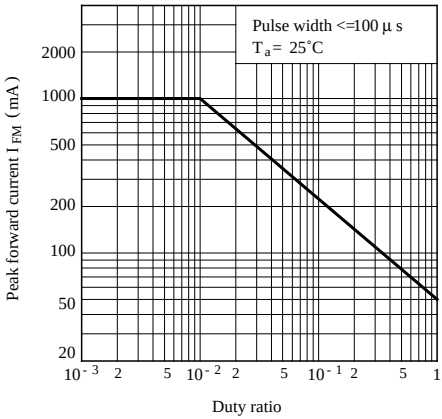


Fig. 4 Forward Current vs. Forward Voltage

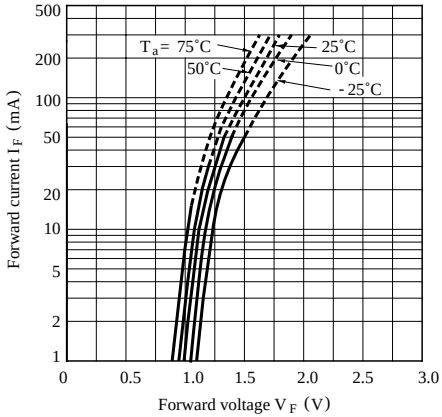


Fig. 5 Collector Current vs. Forward Current

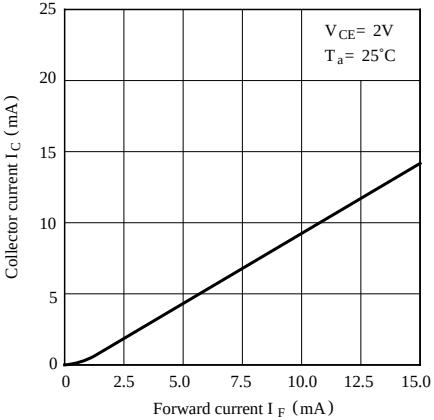


Fig. 6 Collector Current vs. Collector-emitter Voltage

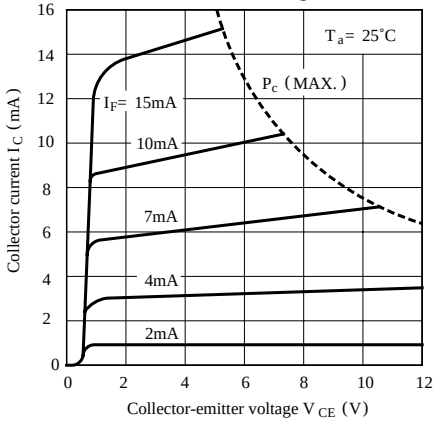


Fig. 7 Relative Collector Current vs. Ambient Temperature

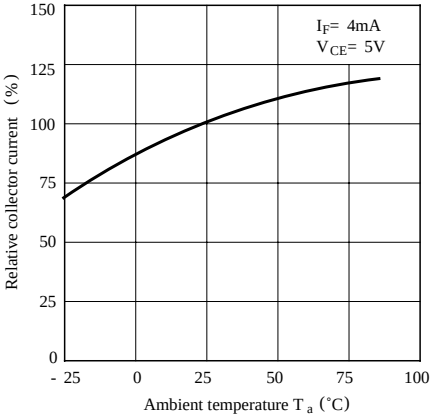


Fig. 8 Collector Dark Current vs. Ambient Temperature

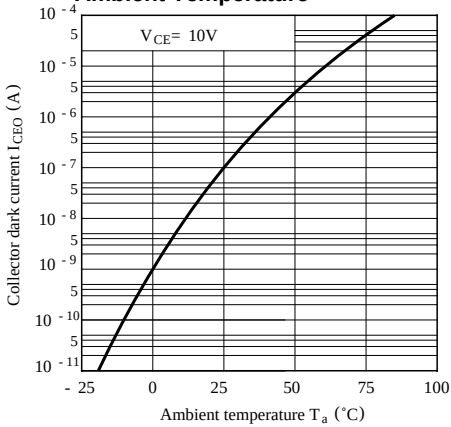


Fig. 9-a Response Time vs. Load Resistance (GP2L09)

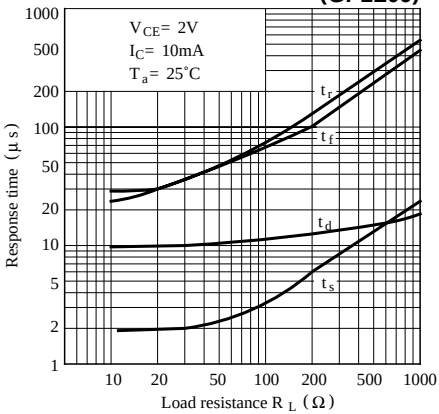
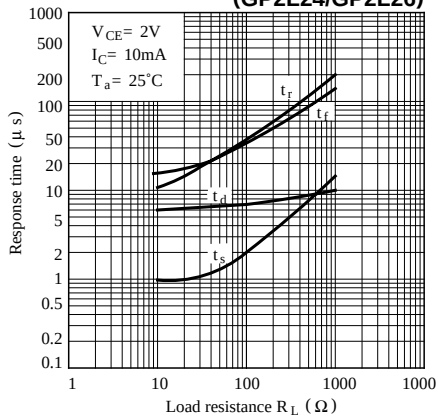


Fig. 9-b Response Time vs. Load Resistance (GP2L24/GP2L26)



Test Circuit for Response Time

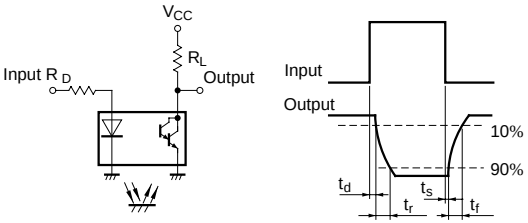


Fig.10 Relative Collector Current vs. Distance between Sensor and Al Evaporation Glass

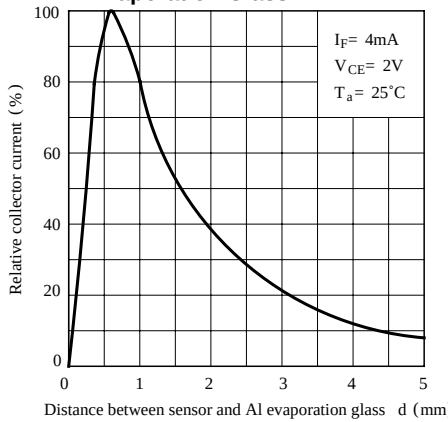


Fig.11 Relative Collector Current vs. Card Moving Distance (1)

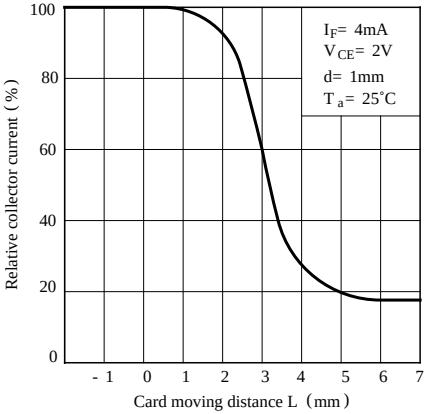
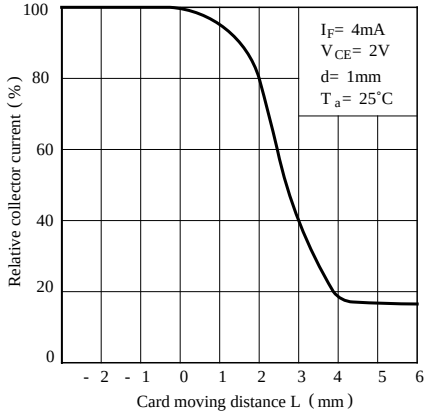


Fig.12 Relative Collector Current vs. Card Moving Distance (2)



Test Condition for Distance & Detecting Position Characteristics

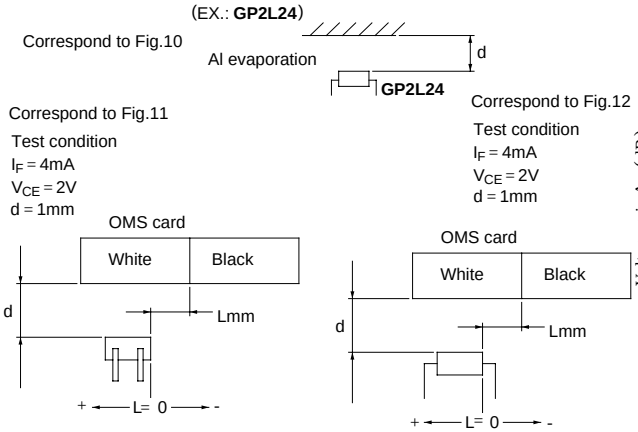


Fig.13 Frequency Response (GP2L09)

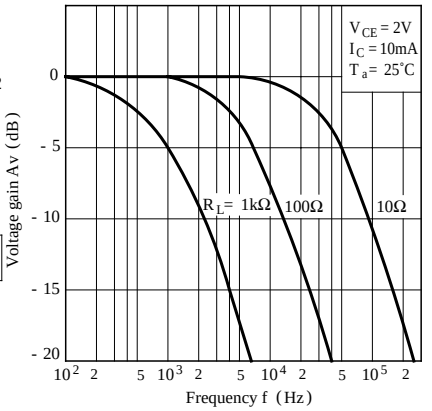


Fig.14 Frequency Response (GP2L24/ GP2L26)

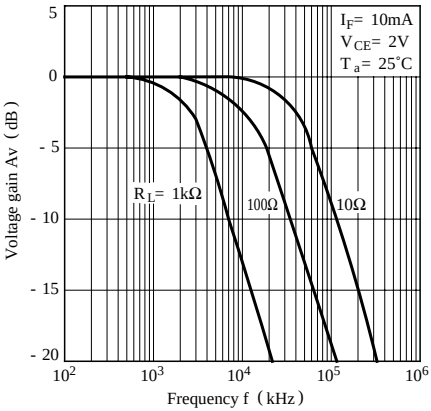
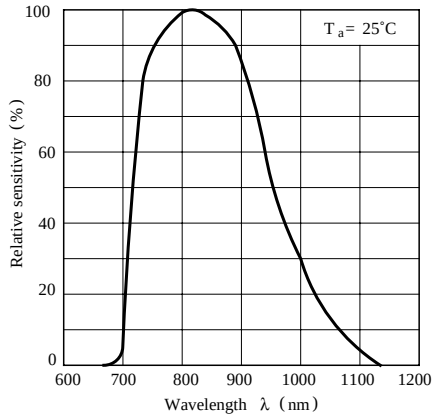


Fig.15 Spectral Sensitivity (Detecting Side)



■ Precautions for Use

(1) In order to stabilize power supply line, connect a by-pass capacitor of more than 0.01 μF between Vcc and GND near the device.

(2) In this product, the PWB is fixed with a resin cover, and cleaning solvent may remain inside the case; therefore, dip cleaning or ultrasonic cleaning are prohibited.

(3) Remove dust or stains, using an air blower or a soft cloth moistened in cleaning solvent. However, do not perform the above cleaning using a soft cloth with cleaning solvent in the marking portion.
In this case, use only the following type of cleaning solvent used for wiping off:
Ethyl alcohol, Methyl alcohol, Isopropyl alcohol, Freon TE, Freon TF, Diflon solvent S3-E
When the cleaning solvents except for specified materials are used, please consult us.

(4) As for other general cautions, 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.