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			OPTO-ELECTRONIC DEVICES DIV.

DEVICE SPECIFICATION FOR

PHOTOINTERRUPTER

MODEL No.

GP2A67

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2. When using this product, please observe the absolute maximum ratings and the instructions for use outlined in these specification sheets, as well as the precautions mentioned below. Sharp assumes no responsibility for any damage resulting from use of the product which does not comply with the absolute maximum ratings and the instructions included in these specification sheets, and the precautions mentioned below.

(Precautions)

 - (1) This product is designed for use in the following application areas ;

<ul style="list-style-type: none"> • OA equipment • Telecommunication equipment (Terminal) • Tooling machines 	• Audio visual equipment	• Home appliances	<ul style="list-style-type: none"> • Measuring equipment • Computers
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If the use of the product in the above application areas is for equipment listed in paragraphs (2) or (3), please be sure to observe the precautions given in those respective paragraphs.
 - (2) Appropriate measures, such as fail-safe design and redundant design considering the safety design of the overall system and equipment, should be taken to ensure reliability and safety when this product is used for equipment which demands high reliability and safety in function and precision, such as ;

<ul style="list-style-type: none"> • Transportation control and safety equipment (aircraft, train, automobile etc.) • Other safety equipment 	• Traffic signals	• Gas leakage sensor breakers	<ul style="list-style-type: none"> • Rescue and security equipment
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 - (3) Please do not use this product for equipment which require extremely high reliability and safety in function and precision, such as ;

<ul style="list-style-type: none"> • Space equipment • Nuclear power control equipment 	• Telecommunication equipment (for trunk lines)	<ul style="list-style-type: none"> • Medical equipment
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 - (4) Please contact and consult with a Sharp sales representative if there are any questions regarding interpretation of the above three paragraphs.
3. Please contact and consult with a Sharp sales representative for any questions about this product.

CUSTOMER'S APPROVAL

DATE _____

BY _____

DATE
PRESENTED
BY

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1. Application

This specification applies to the outline and characteristics of reflective type photointerrupter, Model No. GP2A67.

2. Outline

Refer to the attached drawing No. CY8521i02.

3. Ratings and characteristics

Refer to the attached sheet, Page 3 to 4.

Electrical circuit : Refer to the attached drawing No. SOE991629.

4. Supplements

Reflective object

Black paper (black) : Standard reflective object (SHARP Co.)

KODAK Gray Cards (use the white side reflects about 90%)
: Standard reflective object (SHARP Co.)

5. Notes

5.1 Screw fixing torque of reflective type photointerrupter GP2A67 shall be 0.5N · m or less.

5.2 Please don't carry out immersion cleaning or ultrasonic cleaning to avoid keeping solvent inside case of this device.

5.3 Dust and stain shall clean by air blow, or shall clean by soft cloth soaked in washing materials. But, cleaning with washing material to marking portion should be excepted.

And washing material to clean shall be used the below materials only.

Ethyl alcohol, Methyl alcohol, Isopropyl alcohol

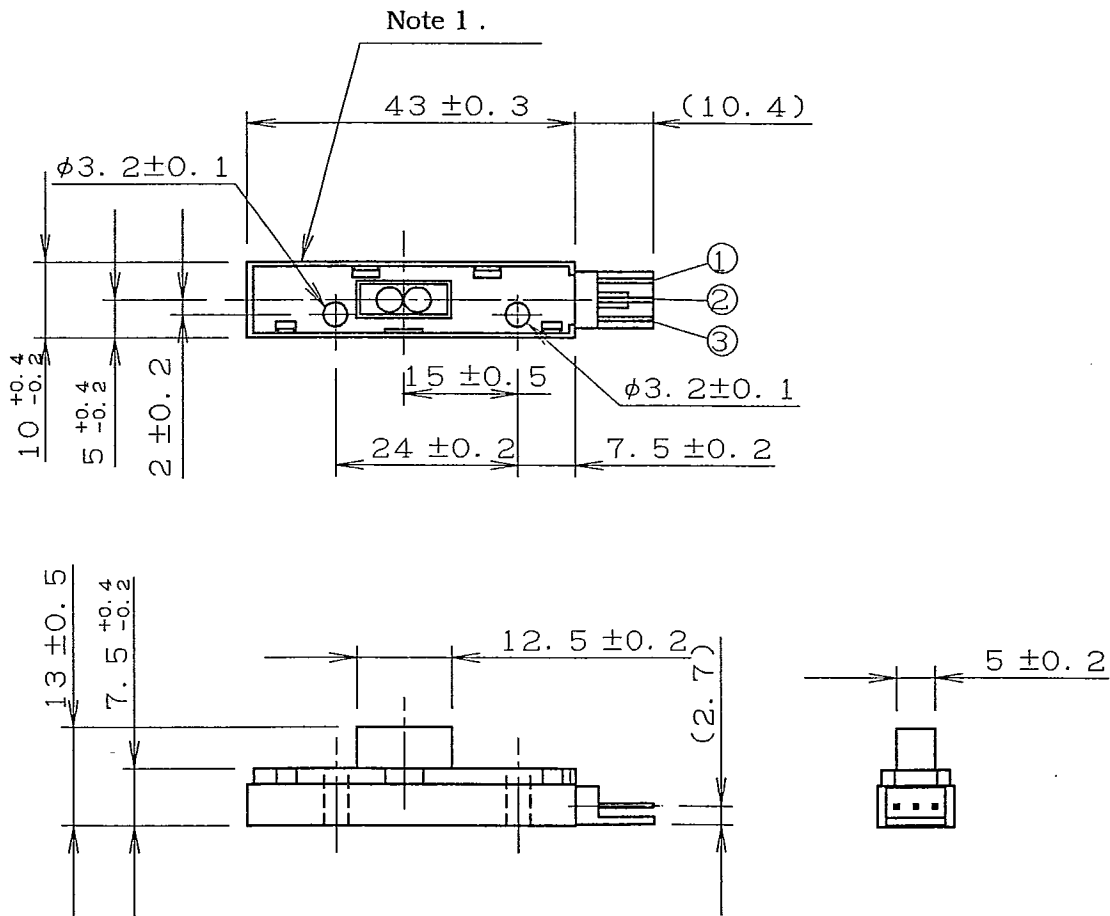
2. Outline (Drawing No. CY8521i02)

Scale : 1/1

Unit : 1/1mm

Pin arrangement

1	V _{cc}
2	V _{out}
3	GND



Note 1 . The below list is printed on the side.

Company : SHARP

Model No. : GP2A67

Lot No. : DIN standard

Note 2 . Connector : EI connector 171825-3 (Japan AMP)

Note 3 . Dimensions in parenthesis are shown for reference.

3. Ratings and characteristics

3.1 Absolute maximum ratings

Ta=25°C

Parameter	Symbol	Rating	Unit	Remark
Supply voltage	Vcc	-0.5 to 7	V	
Output voltage	Vo	30	V	At non detection time
Low level output current	I _{OL}	6	mA	At detection time
Operating temperature	Topr	-10 to +70	°C	The connector should be plugged in/out at normal temperature.
Storage temperature	Tstg	-40 to +80	°C	

3.2 Electrical characteristics

Unless otherwise specified condition shall be Vcc=5V, Ta=25°C

Parameter	Symbol	MIN.	TYP.	MAX.	Unit	Conditions
Supply voltage	Vcc	4.5	5.0	5.5	V	Ta=-10 to +70°C
Current dissipation	Icc	-	27	50	mA	Vcc=5V at non detection time R _L =∞
Low level output voltage	V _{OL}	-	0.2	0.4	V	Vcc=5V at detection time I _{OL} =3mA
High level output voltage	V _{OH}	4.7	-	-	V	Vcc=5V at non detection time R _L =10kΩ
Detection characteristics	Vout	V _{OH}			-	Non detection condition (*2)
		V _{OL}			-	Detection condition (*1)
Response time (*3)	tr	-	-	2.0	ms	R _L =10kΩ
	tf	-	-	2.0	ms	

- (*1) Detection condition : $d=4$ to 5mm using KODAK Gray Cards (use the white side reflects about 90%) as the reflective object with no external disturbing light as shown in Fig. 1.
- (*2) Non detection condition : $d=4$ to 5mm using Black paper (black) as the reflective object with no external disturbing light as shown in Fig. 1.
- (*3) Definition of response time : As shown in Fig. 2.

Fig. 1 Vo test arrangement

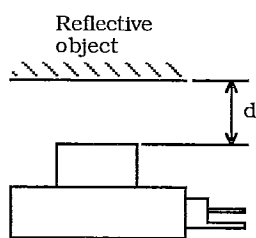
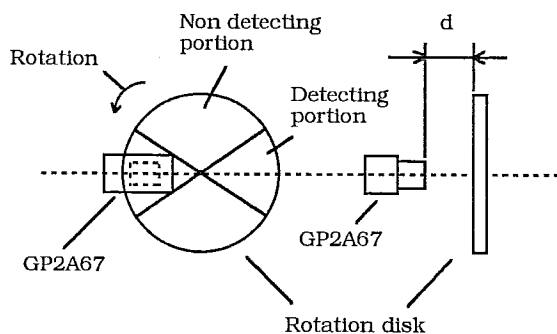
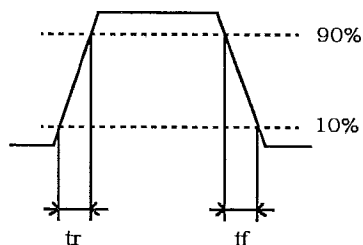


Fig. 2 Test arrangement

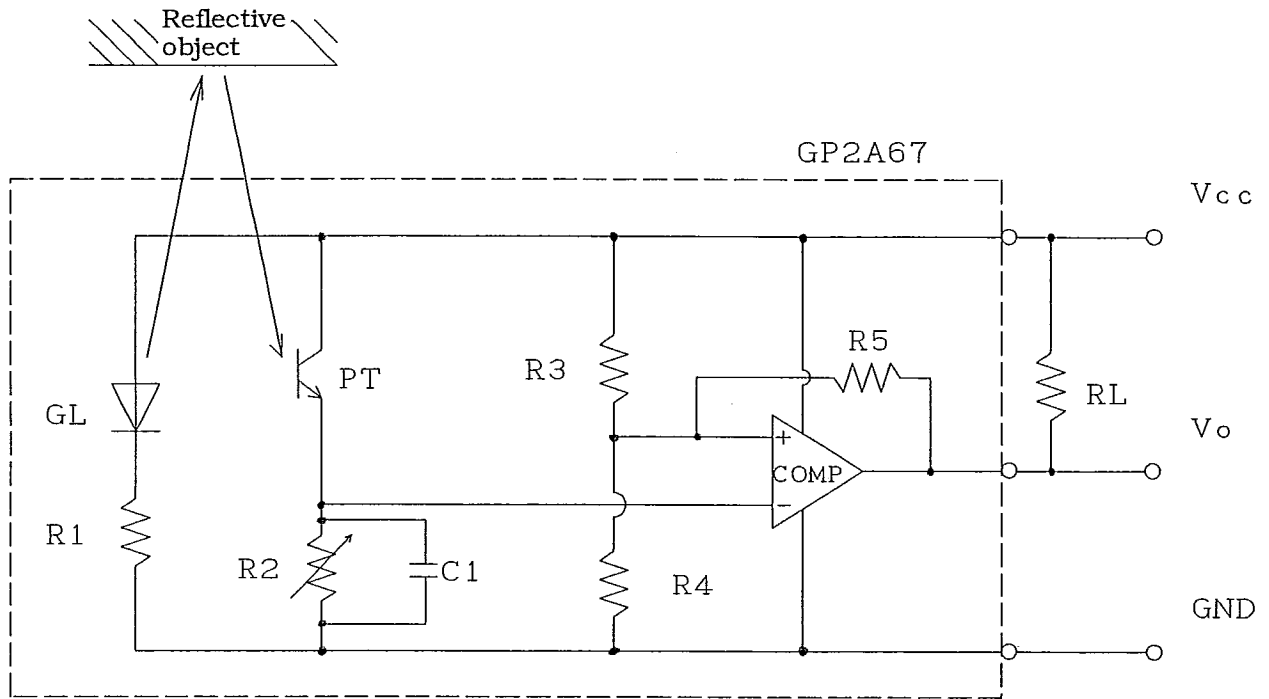


Vout waveform



1. Rotation disk shall be $\phi 40$ or more. And it is in accordance with fig. 2.
2. Rotation frequency shall be 5Hz or less. Output shall not be DC.

3.3 Electrical circuit (Drawing No. SOE991629)



- GL : GL360
- PT : PT360F
- R1 : 150 Ω (1/4W)
- R2 : Trimming resistor or selective resistor
- R3 : 68k Ω (1/16W)
- R3 : 15k Ω (1/16W)
- R3 : 390kΩ (1/16W)
- C1 : 470pF
- COMP : IR9393N or compatible model
- RL : 10k Ω

Note 1) Excluded RL(=10kΩ) in GP2A67.

4. Reliability

The reliability of products shall be satisfied with items listed below.

Confidence level : 90%
LTPD : 10%/20%

Test Items	Test Conditions	Failure Judgement Criteria	Samples (n) Defective (c)	
Temperature cycling	1 cycle -40°C to +80°C (20min) (20min) 20 cycles test	$I_{CC} \geq S \times 1.2$ $V_{OL} \geq U \times 1.2$	n=22, c=0	
High temp. and high humidity storage	+40°C, 90%RH, 240h	$V_{OH} \leq L \times 0.8$	n=22, c=0	
High temp. storage	+80°C, 240h	U : Upper specification limit	n=22, c=0	
Low temp. storage	-40°C, 240h		n=22, c=0	
Operation life	$V_{CC}=5V$, $T_a=25^\circ C$, 1000h		n=22, c=0	
Mechanical shock	1000m/s ² , 3 times/ ±X, ±Y, ±Z direction		n=11, c=0	
Variable vibration frequency	Overall amplitude ; 1.5mm Frequency range 10 to 55 to 10 Hz/1 min 2h/ X, Y, Z direction		L : Lower specification limit	n=11, C=0
Connector strength I	Pull connector housing horizontally to connector terminal pin direction by 20N weight for 5 s (1 time)		S : Initial value	n=11, C=0
Connector strength II	Push connector housing perpendicular to connector terminal pin direction by 10N weight for 5 s (1 time)		Detection characteristics : Satisfied 3.2	n=11, C=0
Screw tightening torque	Tighten the screw with the torque of 0.5N · m		n=11, C=0	

5. Incoming inspection

5.1 Inspection items

(1) Electrical characteristics

I_{CC} , V_{OL} , V_{OH}

(2) Appearance

5.2 Sampling method and Inspection level

A single sampling plan, normal inspection level II based on ISO 2859 is applied. The AQL according to the inspection items are shown below.

Defect	Inspection item	AQL (%)
Major defect	Characteristics defect Unreadable marking	0.4
Minor defect	Appearance defect except the above mentioned.	1.0

6. Supplements

6.1 Parts

This product uses the below parts.

6.1.1 Light detector (PT360F, Q'ty : 1)

Type	Material	Maximum sensitivity wavelength (nm)	Sensitivity wavelength (nm)	Response time (μ s)
Phototransistor	Silicon	860	700 to 1200	10

6.1.2 Light emitter (GL360, Q'ty : 1)

Type	Material	Maximum light emitting wavelength (nm)	I/O Frequency (MHz)
Infrared light emitting diode (Non-coherent)	GaAs	950	0.3

6.1.3 Material

Case	PWB
Black polycarbonate resin (UL 94V-0)	Glass epoxy resin (UL 94V-0)

6.1.4 Others

This product shall not be proof against radiation flux.

Laser generator is not used.