

November 17, 2006

OPTO-ANAROG DEVICES DIVISION ELECTRONIC COMPONENTS GROUP SHARP CORPORATION

SPECIFICATION

	DEVICE SPECIFICA	ATION FOR			
	MODEL No.	PHOTOINTERRUI			
` '		GP2A25NJJ0	00F		
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BY				BY /d 0	
				H. Ogura, Department Gen Engineering Dep	ot., III

ELECOM Group SHARP CORPORATION Product name: PHOTOINTERRUPTER

Model No.: GP2A25NJJ00F

- 1. These specification sheets include materials protected under copyright of Sharp Corporation ("Sharp"). Please do not reproduce or cause anyone to reproduce them without Sharp's consent.
- 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;
 - OA equipment Audio visual equipment Home appliances
 - Telecommunication equipment (Terminal) Measuring equipment
 - Tooling machines Computers

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;
 - Transportation control and safety equipment (aircraft, train, automobile etc.)
 - Traffic signals Gas leakage sensor breakers Rescue and security equipment
 - · Other safety equipment
- (3) Please do not use this product for equipment which require extremely high reliability and safety in function and precision, such as;
 - Space equipment Telecommunication equipment (for trunk lines)
 - Nuclear power control equipment Medical equipment
- (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.

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1. Application

This specification applies to the outline and characteristics of reflective type photointerrupter with connector, Model No. GP2A25NJJ00F.

2. Outline

Refer to the attached drawing No. CY12313i02A.

3. Ratings and characteristics

Refer to the attached sheet, page 4, 5.

4. Reliability

Refer to the attached sheet, page 6.

5. Outgoing inspection

Refer to the attached sheet, page 7.

6. Supplements

6.1 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.)

PPC paper

Standard reflective object (SHARP Co.)

- 6.2 The IR90 filter (Made by Fuji Photo Film Co.,Ltd.) shall be placed at detector side.
- 6.3 Parts: Refer to the attached sheet, page 8.
- 6.4 ODS materials

This product shall not contain the following materials.

Also, the following materials shall not be used in the production process for this product.

Materials for ODS : CFC_S, Halon, Carbon tetrachloride, 1.1.1-Trichloroethane (Methylchloroform)

6.5 Specified brominated flame retardants

Specified brominated flame retardants (PBB and PBDE) are not used in this device at all.

- 6.6 Product mass: Approximately 1.95g
- 6.7 RoHS directive

This product complies with RoHS directive.

Object: mercury, lead, cadmium, hexavalent chromium, polybrominated biphenyls and polybrominated diphenyl ethers.

7. Notes

7.1 The circuit design

Vo terminal: Open collector output

GP2A25NJJ00F operates the light emitter by pulse drive. Please supply the stable supply voltage in order to prevent error operation by pulse current.

Please use this device after connecting a capacitor between Vo and GND for prevention of line noise.

7.2 Prevent error operation

Please be careful that you need to keep the direct inverter light away from the photo detecting surface since the device will not operate correctly in such case.

In addition, we recommend to make sure the operation test in the actual application.

Cleaning

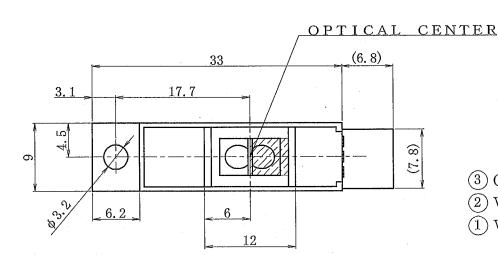
Polycarbonate resin is used as the material of the lens surface. As to cleaning, this reflective type photointerrupter shall not be cleaned by cleasing materials absolutely. Dust and stain shall clean by air blow, or shall clean by soft cloth soaked in washing materials.

7.4 Plugging in/out

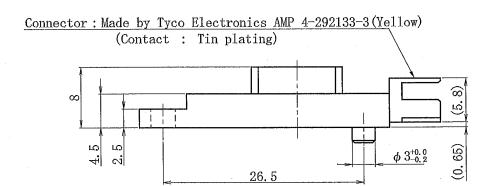
The connector should be plugged in/out at normal temperature.

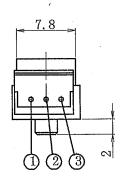
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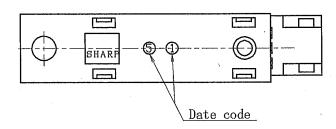
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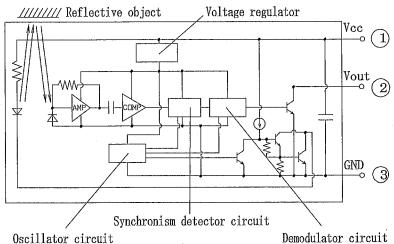
- (3) GND
- (2) V o u t
- (1) V c c







Internal connection diagram



Note)

1. Unspecified tolerance shall be shown in the following list.

Dimension	Tolerance	
less than 6.0	±0.2	
6.0 or more less than 14.0	±0.3	
14.0 or more	±0.4	

- 2. Dimensions in parenthesis are shown for reference.
- 3. The IR90 filter is arranged between the lens and sensor base.
- 4. Date code: OO
 - First digit : Last digit of production year
 - -- Last digit : Jan. to Sep. 1 to 9 Oct.:X, Nov.:Y, Dec.:Z

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3. Ratings and characteristics

3-1 Absolute maximum ratings

Ta=25℃

Parameter	Symbol	Rating	Unit	Remark
Supply voltage	Vcc	$-0.5 \sim +7$	V	
Output voltage	Vo	3 0	V	
Output current	I_{oL}	5 0	mA	Sink current ※1
Operating temperature	Topr	$-10 \sim +70$	$^{\circ}\mathbb{C}$	The connector should be plugged in / out
Storage temperature	Tstg	$-20 \sim +80$	လူ	at normal temperature.

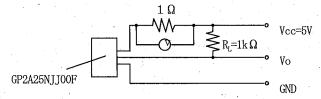
¾ 1 Fig.1 shows output current vs. ambient temperature.

3-2 Electro-optical characteristics

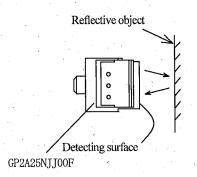
Ta=25°C

2 Dicero opticar charac						
Parameter	Symbol	MIN.	TYP.	MAX.	Unit	Conditions
Supply voltage	V _{cc}	4.75	. '	5.25	V	-
Current dissipation (I)	I_{cc}			30	mA	Smoothing value Vcc=5V, R _L =∞
Current dissipation (II)	I_{ccp}	·	. —	150	mA	Pulse peak value Vcc=5V *1
Low level output voltage	V_{ol}	<u> </u>	-	0.4	V	at detection time $Vcc=5V$, $I_{oL}=16mA$
High level output voltage	V _{OH}	4.5			V	at non detection time $Vcc=5V$, $R_L=1k\Omega$
Non detection distance	$L_{\scriptscriptstyle m LHL}$			27.0	mm	KODAK Gray Cards
						(use the white side to reflect about 90%), Vcc=5V *2
	L _{HLS}	· · · - ·		1.0	mm	KODAK Gray Cards
						(use the white side to reflect about 90%), Vcc=5V *2
Detection distance		_		3.0		Black paper, Vcc=5V *2
	$L_{\scriptscriptstyle \mathrm{HLL}}$	9.0		_ :	mm	KODAK Gray Cards
						(use the white side to reflect about 90%), Vcc=5V *2
		7.0		_		Black paper, Vcc=5V *2
Response time	t _{PLH}	-	_	1.0	ms	Vcc=5V *3
	$t_{\scriptscriptstyle \mathrm{PHL}}$		_	1.0	ms	
Acceptable illuminance	Ev1	3000	-	-	lx	*4
	Ev2	1500	- ;		lx	

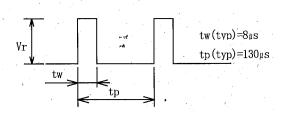
*1 Pulse peak value Iccp test method

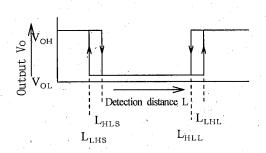


Distance characteristics test method



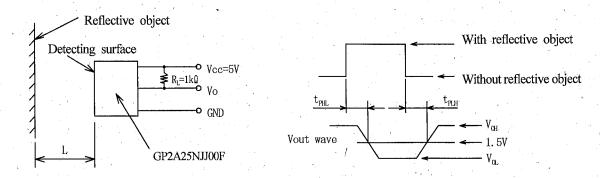
Vr wave form Iccp=Vr / 1Ω



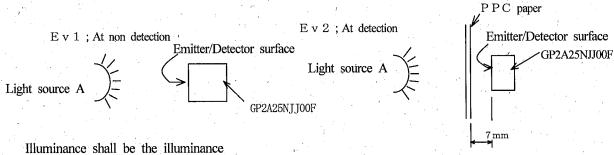


REFERENCE

*3 Response time test method



*4 Test measurement method for acceptable illuminate of external disturbing light

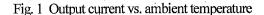


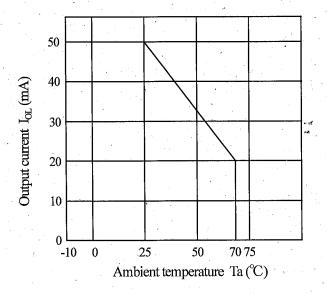
Illuminance shall be the illuminance on the emitter/detector surface.

Output should not change "H" to "L".

Illuminance shall be the illuminance on the emitter/detector surface.

Output should not change "L" to "H".





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4. Reliability

The reliability of products shall satisfy items listed below

Confidence level: 90%

LTPD: 10 or 20

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Test item	Test conditions	Failure Judgement Criteria	Samples (n)
Test nom	Tost conditions	Tundre suagement Ontona	Defective(C)
Temperature cycling	1 cycle -20°C to +80°C (20min) (20min) 20 cycles test		n=22, C=0
High temp, and high humidity storage	+40°C, 95%R.H. Note 1, 240h		n=22, C=0
High temp. storage	+80°C, 240h		n=22, C=0
Low temp. storage	-20°C, 240h		n=22, C=0
Operation life	Vcc=5V, Ta=25±3°C, 1000h		n=22, C=0
Mechanical shock	1000m/s ² , 3 times/ X, Y, Z direction	Icc≧U×1.2	n=11, C=0
Variable vibration frequency	Overall amplitude; 1.5mm Frequency range 10 to 55 to 10 Hz/1min 2h/X, Y, Z direction	$V_{OL} \ge U \times 1.2$ $V_{OH} \le L \times 0.8$	n=11, C=0
Connector strength I	Pull connector housing horizontally to connector terminal pin direction by 20N weight for 5s (1 time)	U: Upper specification limit L: Lower specification limit	n=11, C=0
Connector strength II	Push connector housing perpendicular to connect-or terminal pin direction by 10N weight for 5s (1 time)		n=11, C=0
Screw tightening torque	Tighten the screw with the torque of 0.5N • m		n=11, C=0

**Note 1 R.H.: Relative humidity

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5. Outgoing inspection

-	Item	Conditions	Instrument	Judge, Criteria	AQL
ì	Appearance	No defects that may conflict with product specifications, including crack, split, chip scratch, burr and blur, No bent connector pin and loosened pin	Visual inspection	Any of the specified defects at left is not acceptable	1.0%
2	Electrical characteristics *	The same as specified in paragraph 3.2	Dedicated tester	Specimen that does not satisfy the requirements specified on the left-hand side is not acceptable.	0.4%

A single sampling plan, normal inspection level II based on ISO 2859 shall be adopted.

Current consumption		Icc
Low level output voltage		V_{OL}
High level output voltage		V _{OH}
Detection characteristics	'	LLHL
		L _{HLS}
		L _{HI I}

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6.2 Supplements

Parts: This product uses the below parts.

6.2.1 Light detector(Quantity: 1)

(Using a silicon photodiode as light detecting portion, and a bipolar IC as signal processing circuit.)

Туре	Maximum sensitivity wavelength (nm)	Sensitivity wavelength (nm)	Response time (μ s)
Photodiode	900	700 to 1200	400

6.2.2 Light emitter(Quantity: 1)

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

6.2.3 Material

Case

Black PPS resin Sensor base

(UL 94V-0)

Lens Polycarbonate resin

(UL 94V-2)

Bottom cover: Polycarbonate resin (Gray)

(UL 94V-2)

6.2.4

This product shall not be radiation flux proof.

Laser generator is not used.