SHARP

OPTO-ANALOG DEVICES DIVISION ELECTRONIC COMPONENTS GROUP SHARP CORPORATION

SPECIFICATION

DEVICE SPECIFICA	TION FOR		
MODEL No.	PHOTOINTERRUP	DE	
Specified for			
Enclosed please find copies of the After confirmation of the content with approving signature on each	s, please be sure to send	consists of 9 pages including collaboration back copies of the Specific	over. cations
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USTOMER'S APPROVAL		PRESENTED	•
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3Y		BY /J. O	
	-	H. Ogura,	al Manager of

H. Ogura,
Department General Manager of
Engineering Dept., III
Opto-Analog Devices Div.
ELECOM Group
SHARP CORPORATION

Product name: PHOTOINTERRUPTER

Model No.: GP2A200LCS0F

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- 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.
- Please contact and consult with a Sharp sales representative for any questions about this product.

1. Application

This specification applies to the outline and characteristics of reflective type photointerrupter with connector, Model No. GP2A200LCS0F.

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 Parts: Refer to the attached sheet, page 8.

6.3 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 : CFCs, Halon, Carbon tetrachloride, 1.1.1-Trichloroethane (Methylchloroform)

6.4 Brominated flame retardants

Specific brominated flame retardants such as the PBBOs and PBBs are not used in this device at all.

- 6.5 Product mass: Approximately 1.95g
- 6.6 RoHS restriction

This product does not contain LEAD(Pb) more than RoHS restriction level.

Object: Lead, hexavalent chromium, cadmium, mercury, and two types of brominated flame retardants (PBB, PBDE).

7. Notes

7.1 The circuit design

Vo terminal: Open collector output

200LCS0F operates the light emitter by pulse drive. Please supply the stable supply voltage in order to prevent error operation by pulse current. 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.

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

7.2 Cleaning

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

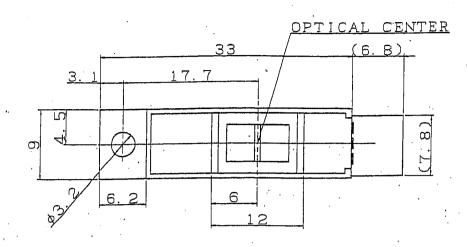
7.3 Plugging in/out

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

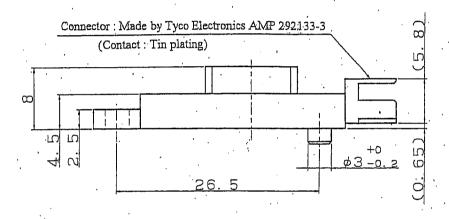
2. Outline (Drawing No. CY12313i02A)

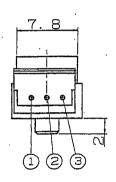
Scale: 2/1

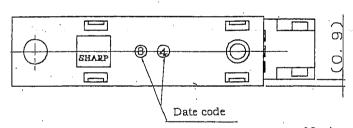
Unit:1/1mm



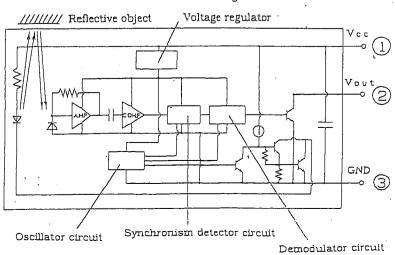
- 3 GND
- ②Vout
- 1 Vcc







Internal connection diagram



Note)

1. Unspecified tolerance shall be shown in the following list

Ono viang and.		
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. Date code: OO

First digit : Last digit of production year

Second digit: Jan. to Sep. 1 to 9

Oct.: X, Nov.: Y, Dec.: Z

3. Ratings and characteristics

3 — 1 Absolute maximun	n 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	$-10 \sim +70$	က	The connector should be plugged in / out
Storage temperature	Tstg	$-20 \sim +80$	°C	at normal temperature.

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

3 - 2 Electro-optical characteristics

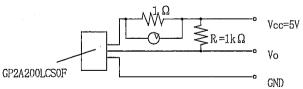
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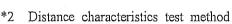
2 Electro-optical charac		Rating			10 25 0	
Parameter	Symbol	MIN.	TYP.	MAX.	Unit	Conditions
Supply voltage	Vcc	4.75		5.25	V	-
Current dissipation (I)	Icc			30	mA	Smoothing value Vcc=5V, R _L =∞
Current dissipation (II)	Icor			150	mA	Pulse peak value Vcc=5V *1
Low level output voltage	Vol	_		0.4	V.	at detection time Vcc=5V , I _{oL} =16mA
High level output voltage	V _{он}	4.5			V	at non detection time $Vcc=5V$, $R_L=1k\Omega$
Non detection distance	L _{LHL}		_	90.0	mm	KODAK Gray Cards (use the white side reflects about 90%), Vcc=5V *2
	L _{HLS}	_	-	2.0	mm	KODAK Gray Cards (use the white side reflects about 90%), Vcc=5V *2
Detection distance		-		5.0		Black paper, Vcc=5V *2
	L _{HLL}	22.0	-	_	mm	KODAK Gray Cards (use the white side reflects about 90%), Vcc=5V *2
		15.0	_			Black paper, Vcc=5V *2
Response time	t _{PLH}			1.0	ms	Vcc=5V *3
	t _{PHL}			1.0	ms	
Acceptable illuminance	Evl	3000			lx	*4
	Ev2	1500		-	lx	

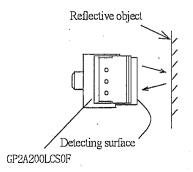
*1 Pulse peak value Iccp test method Vr wave form Iccp= $Vr / 1\Omega$

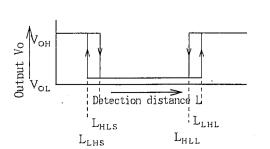
tw(typ)=8us

to(typ)=130us



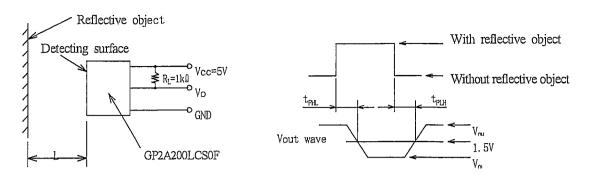




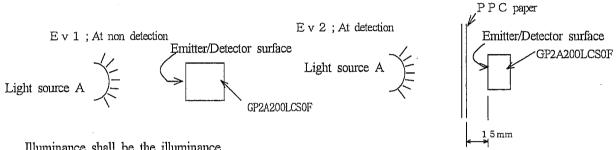


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*3 Response time test method



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

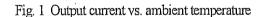


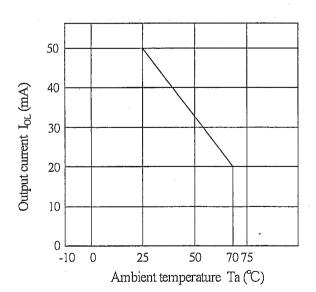
Illuminance shall be the illuminance on the emitter/detector surface.

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

LTPD: 10 or 20

T	Test conditions	Failure Judgement Criteria	Samples (n)
Test item	1est conduons	Pantile Judgement Criteria	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	1,000m/s ² , 3 times/X, Y, Z direction	Icc≧U×1.2 V _{OL} ≧U×1.2 V _{OH} ≦L×0.8 U: Upper specification limit L: Lower specification limit	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		n=11, C=0
Connector strength I	Pull connector housing horizontally to connector terminal pin direction by 20N weight for 5s (1 time)		n=11, C=0
Connector strength II	Push connector housing perpendicular to connector 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

5. Outgoing inspection

	Item	Conditions	Instrument	Judge, Criteria	AQL
1	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 satisfied 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.

* Electro-optical characteristics test items

Current consumption		Icc
Low level output voltage	·	V_{OL}
High level output voltage		V_{OH}
Detection characteristics		L_{LHL}
		L_{HLS}
		L_{HLL}

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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 (μs)
Photodiode	900	700 to 1200	400

6-2-2 Light emitter (Quantity: 1)

Type	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		
Sensor base :	Black PPS resin (UL 94V-0)	
Lens :	Polycarbonate resin (UL 94V-2)	
Bottom cover:	Polycarbonate resin (Gray) (UL 94V-2)	

6-2-4 Others

This product shall not be proof against radiation flux. Laser generator is not used.