

SHARP

OPTO-ANALOG DEVICES DIVISION
ELECTRONIC COMPONENTS GROUP
SHARP CORPORATION

SPECIFICATION

DEVICE SPECIFICATION FOR

MODEL No.

PHOTOINTERRUPTER

GP2A200LCS0F

Specified for

Enclosed please find copies of the Specifications which consists of 9 pages including cover.
After confirmation of the contents, please be sure to send back copies of the Specifications
with approving signature on each.

CUSTOMER'S APPROVAL

DATE

BY

PRESENTED

DATE

BY

H. O

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

REFERENCE

Product name : PHOTOINTERRUPTER

Model No. : GP2A200LCS0F

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.
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 ;

(• 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)

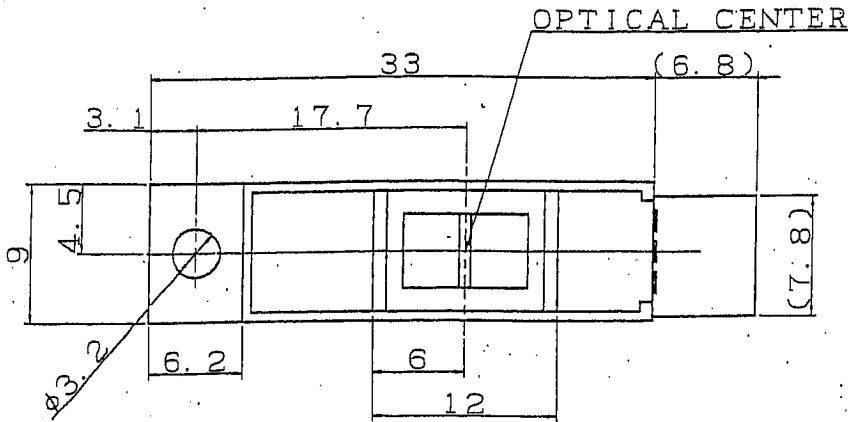
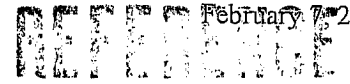
- (4) Please contact and consult with a Sharp sales representative if there are any questions regarding interpretation of the above three paragraphs.

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

2. Outline (Drawing No. CY12313i02A)

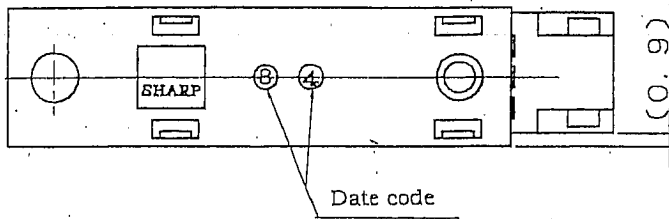
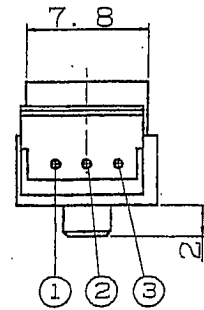
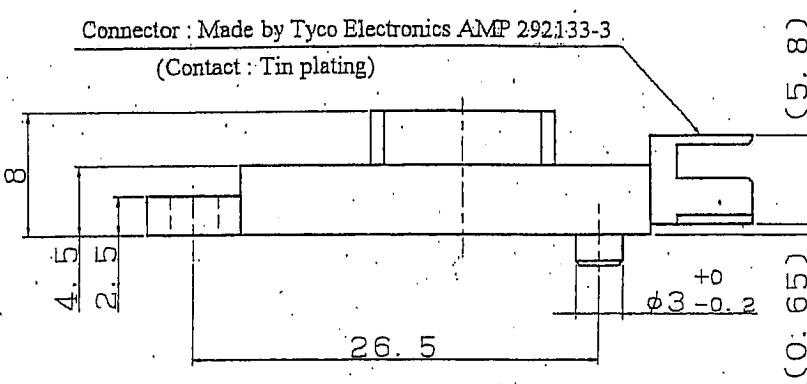
Scale : 2/1

Unit : 1/1mm



- ③ GND
- ② Vout
- ① Vcc

Connector : Made by Tyco Electronics AMP 292133-3
(Contact : Tin plating)



Note)

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

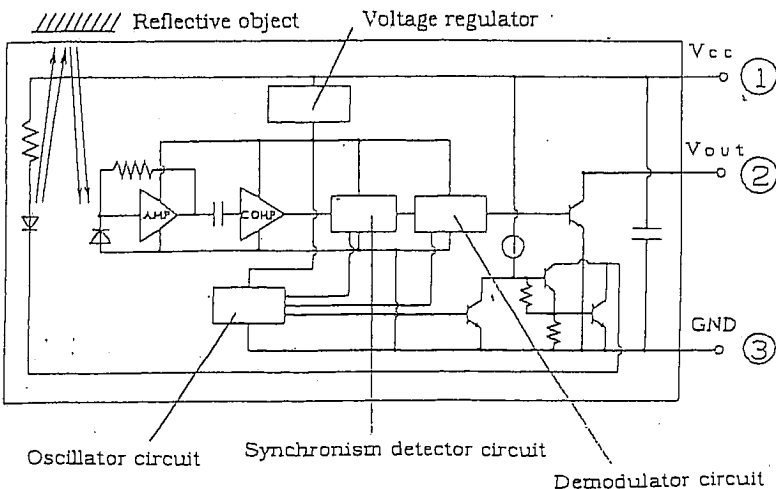
Dimension	Tolerance
less than 6.0	± 0.2
6.0 or more less than 14.0	± 0.3
14.0 or more	± 0.4

2. Dimensions in parenthesis are shown for reference.

3. Date code : ○○

□ First digit : Last digit of production year
 □ Second digit : Jan. to Sep. 1 to 9
 Oct.: X, Nov.: Y, Dec.: Z

Internal connection diagram



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Ta=25°C

3. Ratings and characteristics

3-1 Absolute maximum ratings

Parameter	Symbol	Rating	Unit	Remark
Supply voltage	V _{CC}	-0.5 ~ +7	V	
Output voltage	V _O	30	V	
Output current	I _{OL}	50	mA	Sink current ※1
Operating temperature	T _{opr}	-10 ~ +70	°C	The connector should be plugged in / out at normal temperature.
Storage temperature	T _{stg}	-20 ~ +80	°C	

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

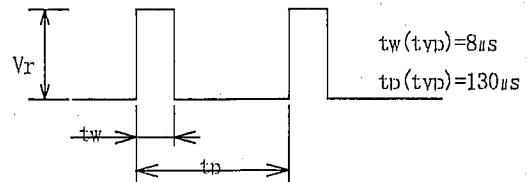
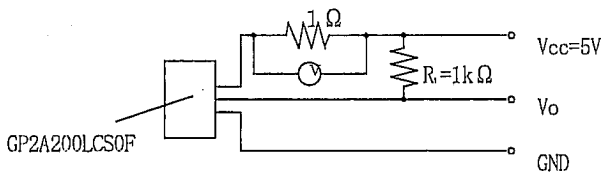
3-2 Electro-optical characteristics

Ta=25°C

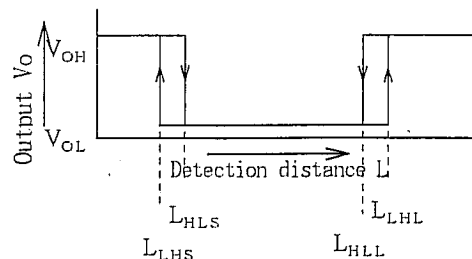
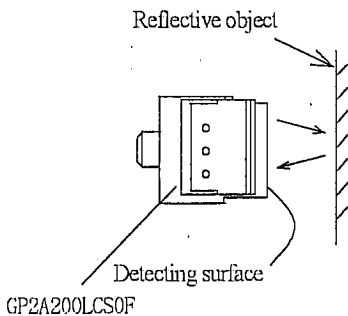
Parameter	Symbol	Rating			Unit	Conditions
		MIN.	TYP.	MAX.		
Supply voltage	V _{CC}	4.75	—	5.25	V	-
Current dissipation (I)	I _{CC}	—	—	30	mA	Smoothing value V _{CC} =5V, R _L =∞
Current dissipation (II)	I _{CCP}	—	—	150	mA	Pulse peak value V _{CC} =5V *1
Low level output voltage	V _{OL}	—	—	0.4	V	at detection time V _{CC} =5V, I _{OL} =16mA
High level output voltage	V _{OH}	4.5	—	—	V	at non detection time V _{CC} =5V, R _L =1kΩ
Non detection distance	L _{LHL}	—	—	90.0	mm	KODAK Gray Cards (use the white side reflects about 90%), V _{CC} =5V *2
Detection distance	L _{HLS}	—	—	2.0	mm	KODAK Gray Cards (use the white side reflects about 90%), V _{CC} =5V *2 Black paper, V _{CC} =5V *2
		—	—	5.0		
	L _{HLL}	22.0	—	—	mm	KODAK Gray Cards (use the white side reflects about 90%), V _{CC} =5V *2 Black paper, V _{CC} =5V *2
		15.0	—	—		
Response time	t _{PLH}	—	—	1.0	ms	V _{CC} =5V *3
	t _{PHL}	—	—	1.0	ms	
Acceptable illuminance	E _{v1}	3000	—	—	lx	*4
	E _{v2}	1500	—	—	lx	

*1 Pulse peak value I_{CCP} test method

V_r wave form I_{CCP}=V_r / 1Ω

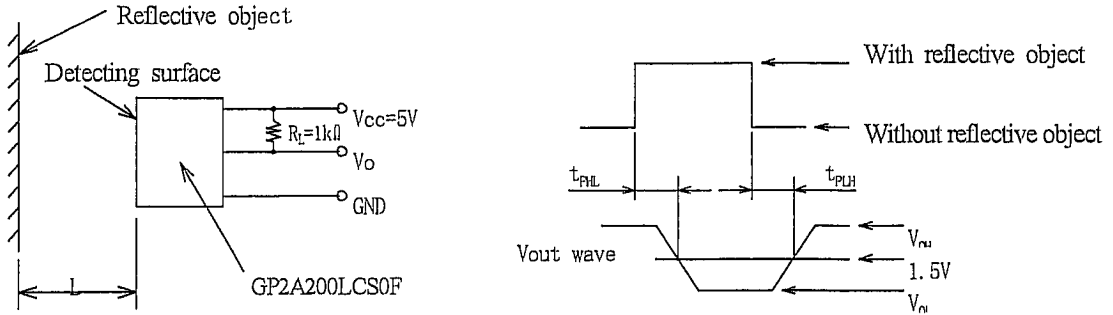


*2 Distance characteristics test method

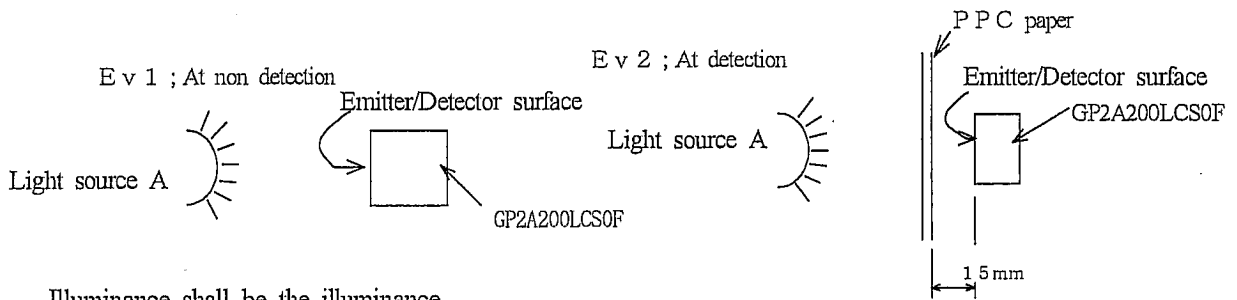


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*3 Response time test method



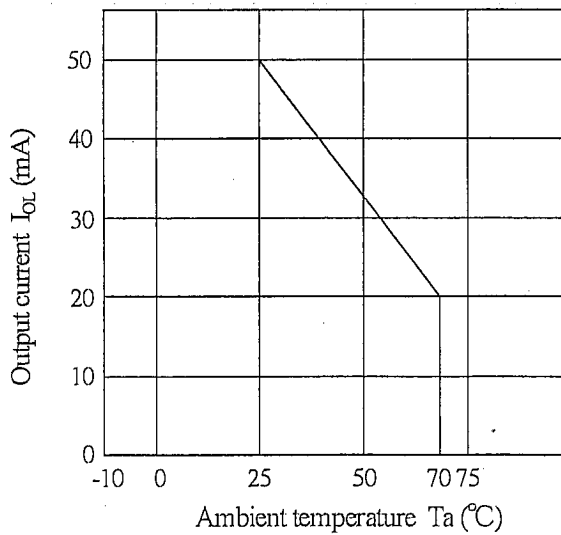
*4 Test measurement method for acceptable illuminate of external disturbing light



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".

Fig. 1 Output current vs. ambient temperature



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Confidence level : 90%

LTPD : 10 or 20

4. Reliability

The reliability of products shall satisfy items listed below

Test item	Test conditions	Failure Judgement Criteria	Samples (n)
			Defective(C)
Temperature cycling	1 cycle -20°C to +80°C (20min) (20min) 20 cycles test	$I_{CC} \geq U \times 1.2$ $V_{OL} \geq U \times 1.2$ $V_{OH} \leq L \times 0.8$ U : Upper specification limit L : Lower specification limit	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	V _{CC} =5V, T _a =25±3°C, 1000h		n=22, C=0
Mechanical shock	1,000m/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 / 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 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
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	_____	I _{cc}
Low level output voltage	_____	V _{OL}
High level output voltage	_____	V _{OH}
Detection characteristics	┌───┐ │───┘	L _{LHL}
		L _{HLS}
		L _{HLL}

REF ID: A66666

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.)

Type	Maximum sensitivity wavelength (nm)	Sensitivity wavelength (nm)	Response time (μ s)
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.