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GP2Y0D815Z0F

Distance Measuring Sensor Unit
Digital output (150 mm) type



■Description

GP2Y0D815Z0F is distance measuring sensor unit, composed of an integrated combination of PSD (position sensitive detector), IRED (infrared emitting diode) and signal processing circuit.

The variety of the reflectivity of the object, the environmental temperature and the operating duration are not influenced easily to the distance detection because of adopting the triangulation method.

The output voltage of this sensor stays high in case an object exists in the specified distance range. So this sensor can also be used as proximity sensor.

■Features

1. Digital output type
2. Short distance type
Detecting distance : Typ. 150 mm
3. Low profile
Package size : 13.6×7×7.95 mm
4. Consumption current : Typ. 5 mA
5. Battery drive compatible
Supply voltage : 2.7 to 6.2 V
6. Sunlight tolerance
7. Add Vin terminal, and an external transistor of Vcc line is unnecessary at intermittent operating.

■Agency approvals/Compliance

1. Compliant with RoHS directive (2002/95/EC)

■Applications

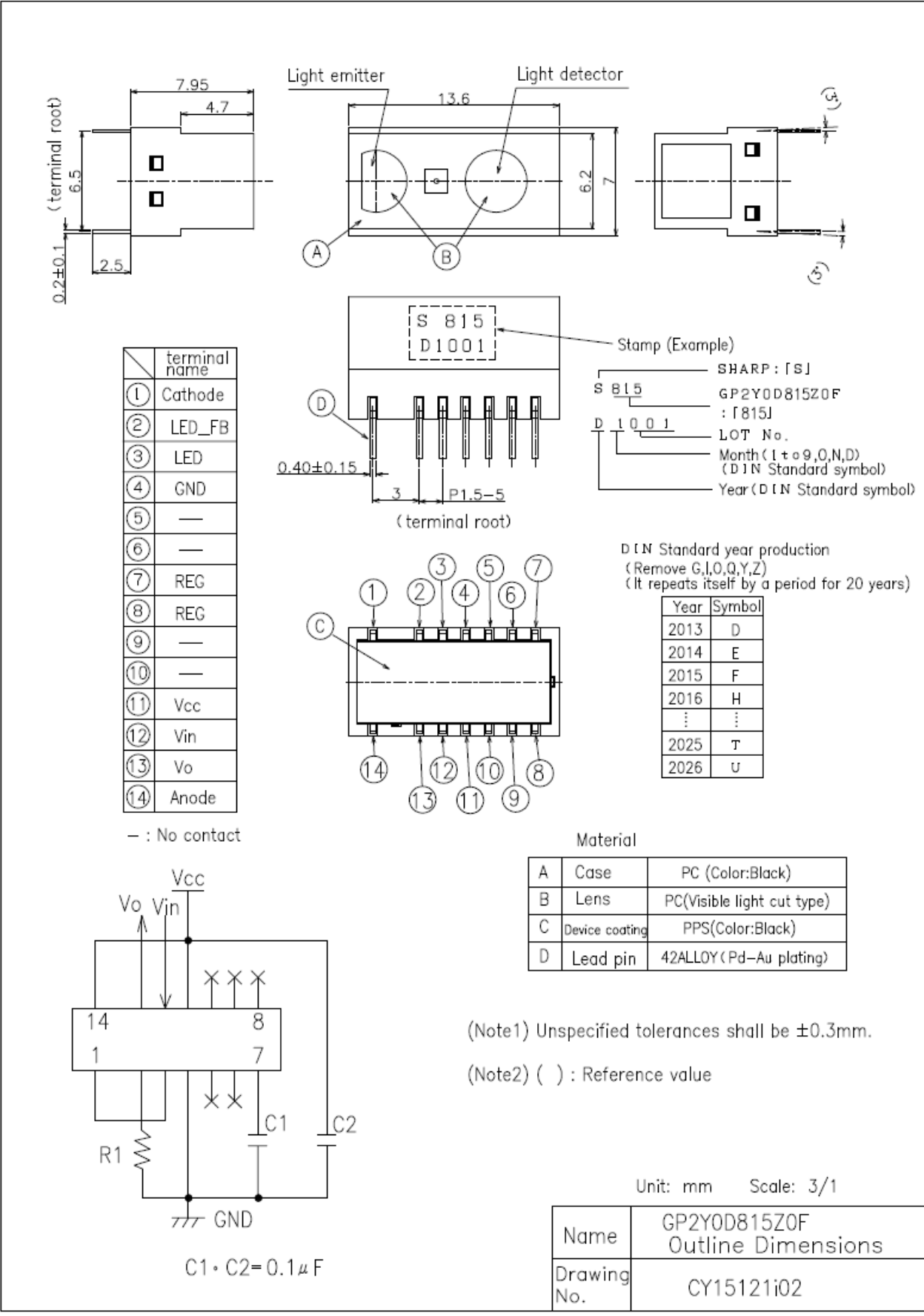
1. Touch-less switch
(Sanitary equipment, Control of illumination, etc.)
2. Robot cleaner

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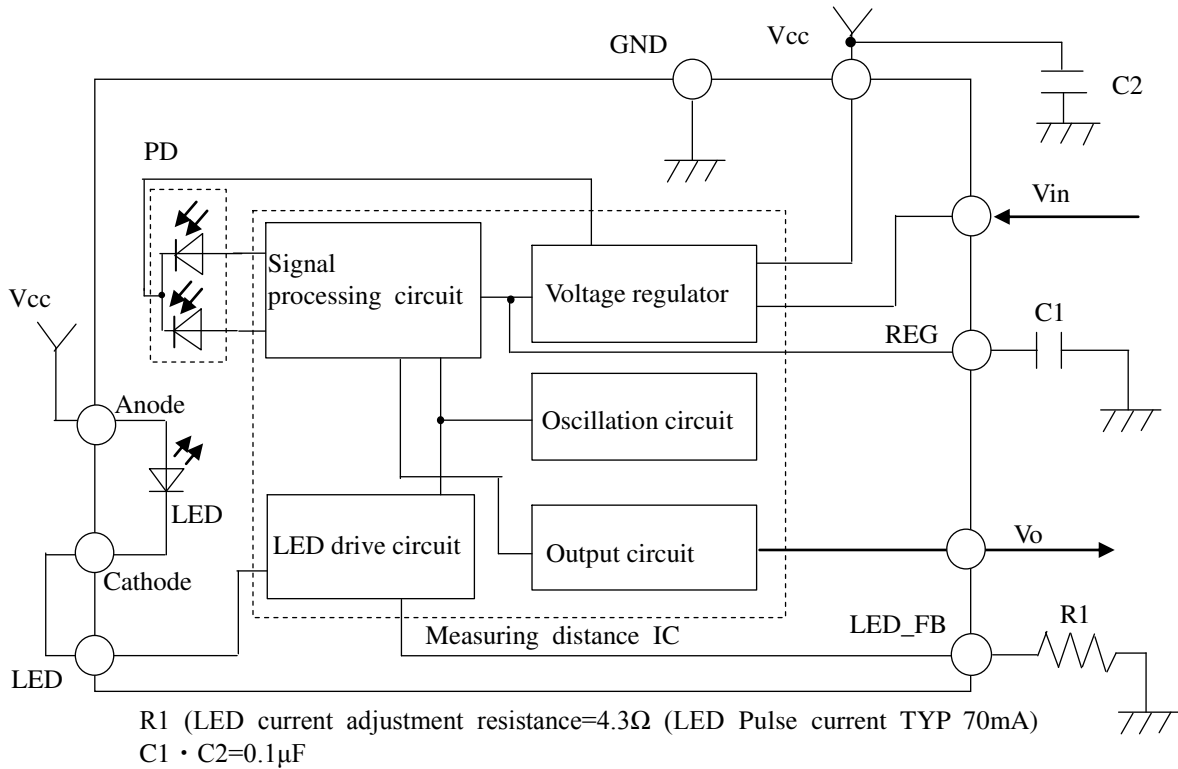
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Sheet No.: OP14005EN

■ Outline



■ Schematic



■ Absolute maximum ratings

Parameter	Symbol	Ratings	Unit	Remark
Supply voltage	Vcc	-0.3 to +7	V	-
Output terminal voltage	Vo	-0.3 to Vcc+0.3	V	-
Input terminal voltage	Vin	-0.3 to Vcc+0.3	V	-
Operating temperature	Topr	-10 to +60	°C	-
Storage temperature	Tstg	-20 to +70	°C	-
Soldering temperature	Tsol	260	°C	5s or less/time up 2 times t=1.0mm One side board mounting

■ Recommended operating conditions

Parameter	Symbol	Rating	Unit	Remark
Supply voltage	Vcc	2.7 to 6.2	V	-
High level input voltage	VinH	MIN Vcc-0.2	V	CMOS level signal. Operating
Low level input voltage	VinL	MAX 0.2	V	CMOS level signal. Standby state

■ Electro-optical Characteristics

(Ta=25°C, Vcc=5V)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Output terminal voltage	VoH	Output voltage at high level	Vcc-0.6	-	-	V
	VoL	Output voltage at low level	-	-	0.6	V
Output distance characteristics	Vo	(*1) (*2)	120	150	220	mm
Average supply current	Icc 1	Vcc=5V Vin=5V R1=4.3Ω (*3)	-	5	6.5	mA
Average supply current	Icc 2	Vcc=5V Vin=5V R1=4.3Ω (*3)	-	9	10.5	mA
Stand-by supply current	Icc 3	Vcc=5V Vin=0V	-	5	8	μA

※ L : Distance to reflective object

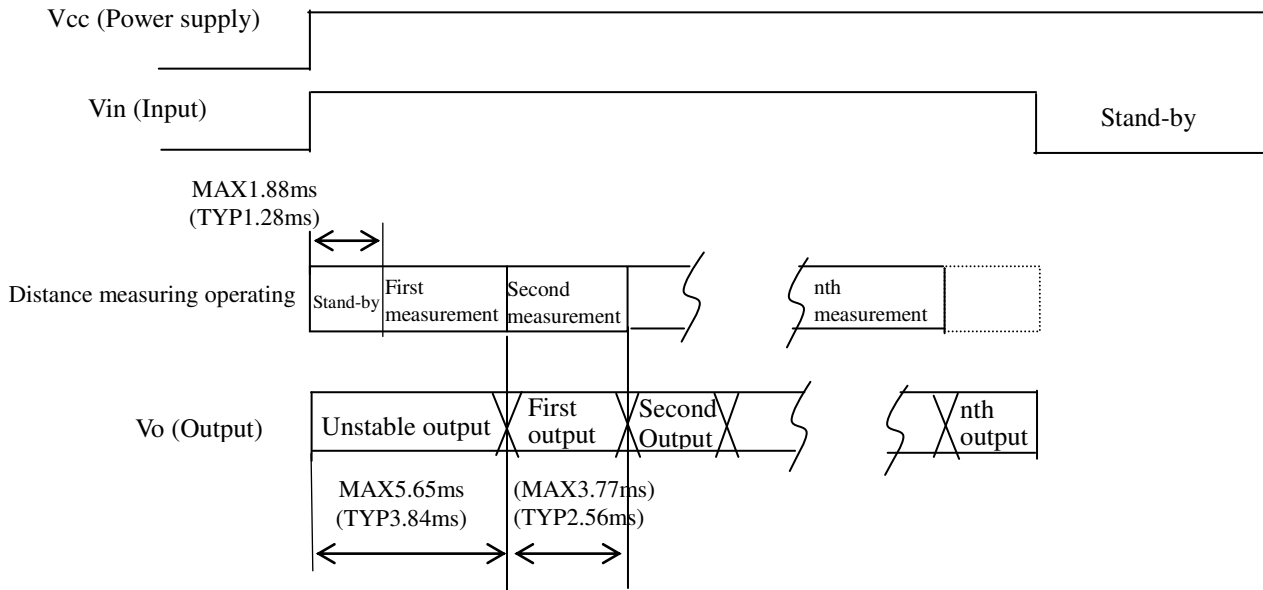
(*1) Using reflective object : White paper (Made by Kodak Co., Ltd. gray cards R-27•white face, reflectance ; 90%)

(*2) Output switching has a hysteresis width.

The distance specified by Vo should be the one with which the output H switches to the output L.

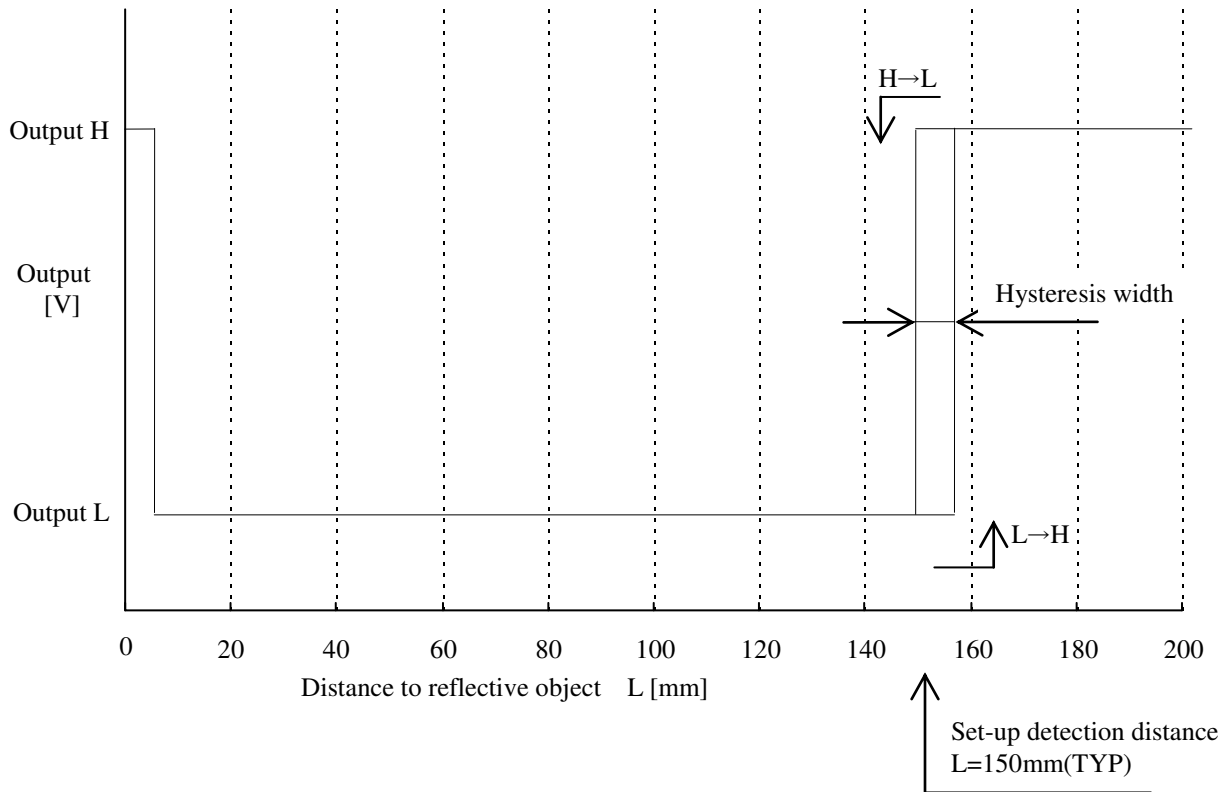
(*3) Icc1 : (LED Emitting time:TYP20μs*8times) Icc2 : (Emitting time:TYP20μs*15times)
LED Pulse Current : TYP 70mA

■ Timing chart



■Supplements

- GP2Y0D815Z0F Example of Output distance characteristics



- 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 (Methyl chloroform)
- This manufacture does not contain the chemical materials regurated by RoHS directive.
(except for the parts NOT regurated by RoHS)
- Product mass : Approx. 0.7g
- Compliance with each regulation

1) The RoHS directive(2002/95/EC)

This product complies with the RoHS directive(2002/95/EC).

Object substances: mercury, lead (except for lead in glass of electronic components), cadmium, hexavalent chromium, polybrominated biphenyls (PBB) and polybrominated diphenyl ethers (PBDE)

2) Content of six substances specified in Management Methods for Control of Pollution Caused by Electronic Information Products Regulation (Chinese : 电子信息产品污染控制管理办法).

Category	Toxic and hazardous substances					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent chromium (Cr ⁶⁺)	Polybrominated biphenyls (PBB)	Polybrominated diphenyl ethers (PBDE)
Distance measuring sensor	✓	✓	✓	✓	✓	✓

✓ : indicates that the content of the toxic and hazardous substance in all the homogeneous materials of the part is below the concentration limit requirement as described in SJ/T 11363-2006 standard.

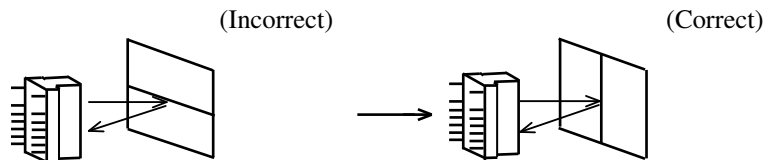
■Notes

●Advice for the optics

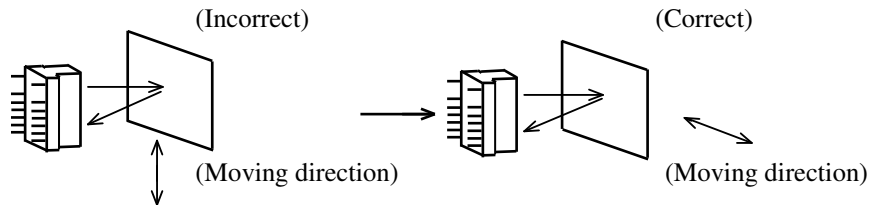
- Lens of this device shall be kept cleanly. There are cases that dust, water or oil and so on deteriorate the characteristics of this device. Please consider it at actual application.
- In case that protection is set in front of the emitter and detector portion, the protection cover which has the most efficient transmittance at the emitting wavelength range of LED for this product ($\lambda=870\text{nm}\pm 50\text{nm}$), shall be recommended to use. The face and back of protection cover should be mirror polishing. Also, as there are cases that the characteristics may not be satisfied with according to the distance between the protection cover and this product or the thickness of the protection cover, please use this product after confirming the operation sufficiently in actual application.

●Advice for the characteristics

- In case that there is an object near to light exits of the sensor between the sensor and the detected object, please use this device after confirming sufficiently whether the characteristics of this sensor do not change by the object.
- When the detector surface receive direct light from the sun, tungsten lamp and so on, there are cases that the distance can not be measured exactly. Please consider the design that the detector does not receive direct light from such light source.
- Distance between sensor and mirror reflector can not sometimes measure exactly. By changing the mounting angle of this product, it may measure the distance exactly.
- In case that reflective object has boundary line clearly, there is cases that distance can not measure exactly. At that time, if direction of boundary line and the line between emitter center and detector center are parallels, it is possible to decrease deviation of measuring distance.



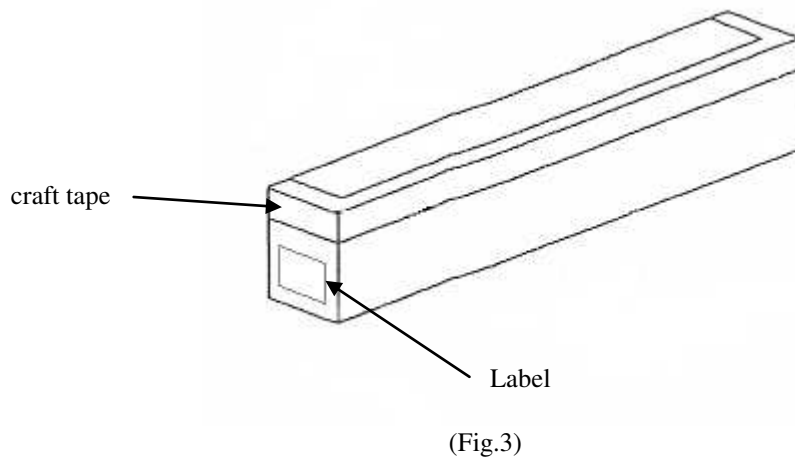
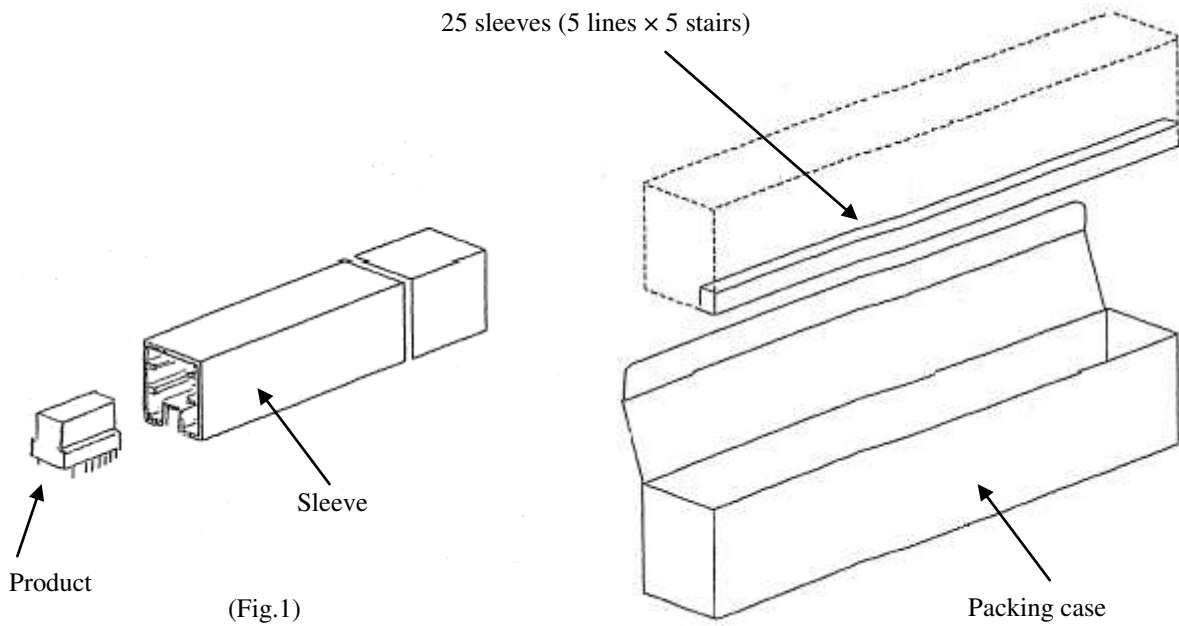
- In order to decrease measuring error due to moving direction of object, we recommend that the sensor be mounted like the drawing below.



●Notes on handling

- Please don't do washing. Washing may deteriorate the characteristics of optical system and so on. Please confirm resistance to chemicals under the actual usage since this product has not been designed against washing.
- Soldering shall be done with a soldering iron and below 260°C, less than 5s and maximum 2 times. Also, please pay attention not to put outer force on lead terminals while soldering. Please do not apply flow soldering because it may damage optical lens of the device.

■ Packing specification



● Packing method

1. Products of appointed quantity shall be packaged in a sleeve and both of sleeve edge shall be fixed by stopper. MAX. 40 pieces per sleeve. (Fig.1)

The above figure shows the method of storing the product.

2. 25 sleeves shall be packaged in a packing case. (Fig.2)

3. Fix the packing case by craft tape (Fig. 3)

(Quantity per a packing case : 1000pcs.) Outside : 607×64×77 (mm)

4. Indication items

The contents of the carton indication conforms to EIAJ C-3 and the following items are indicated.

Model No., Internal production control name, Quantity, Packing date, Corporate name, Country of origin

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- 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.

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- Telecommunication equipment [trunk lines]
- Nuclear power control equipment
- Medical and other life support equipment (e.g., scuba).

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