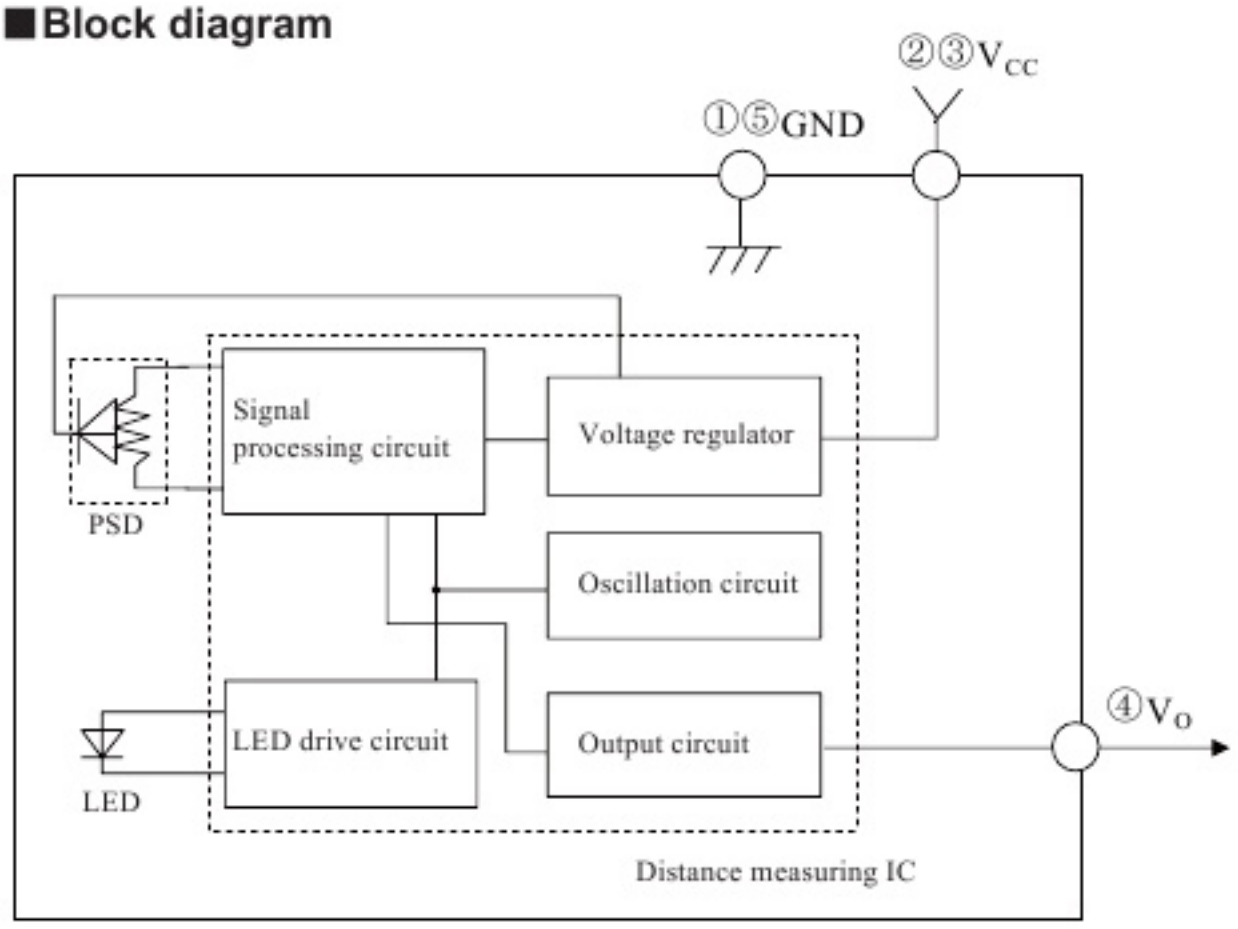
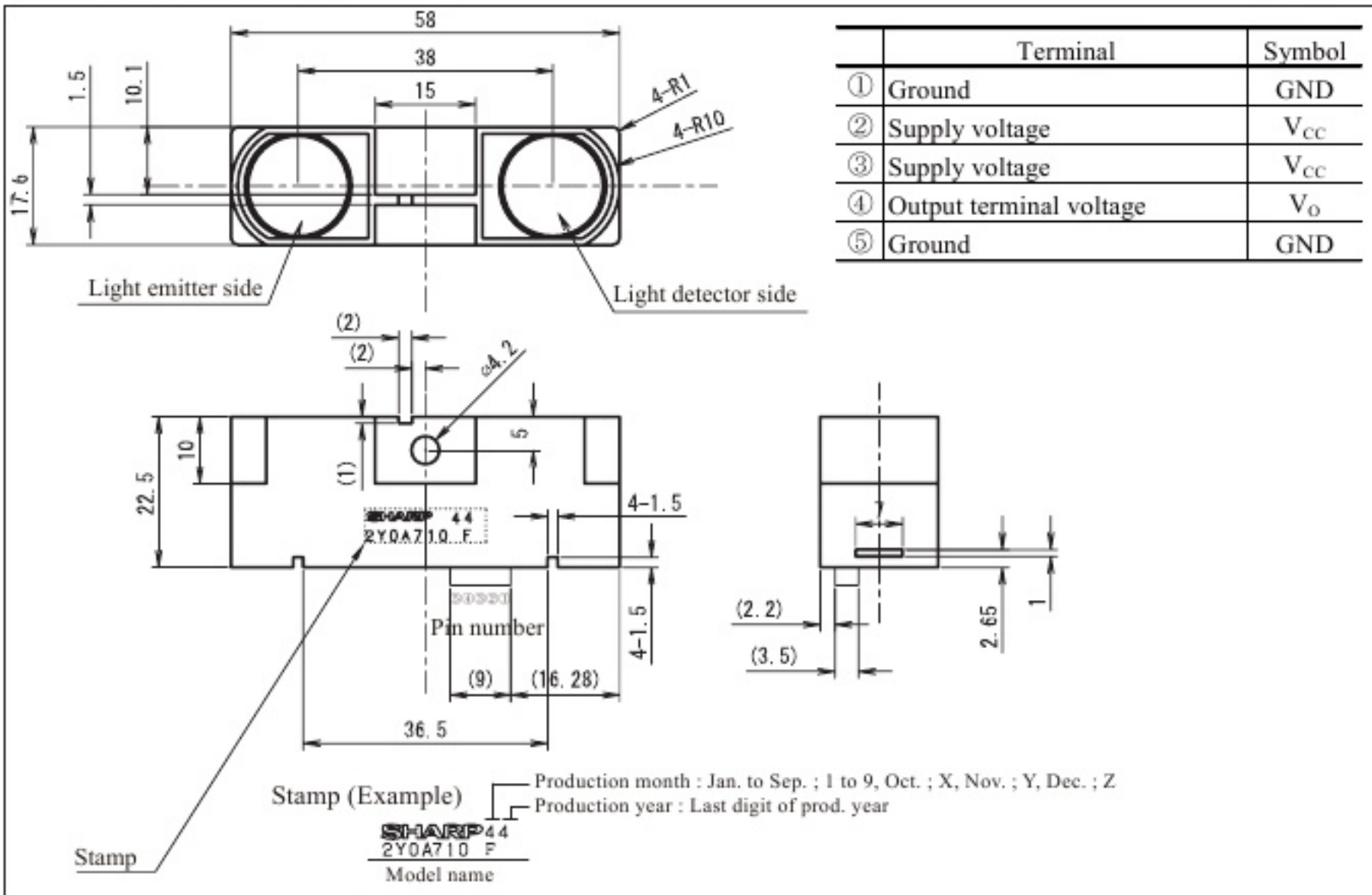
■Block diagram



■Outline Dimensions

(Unit : mm)



	Terminal	Symbol
①	Ground	GND
②	Supply voltage	V_{CC}
③	Supply voltage	V_{CC}
④	Output terminal voltage	V_O
⑤	Ground	GND

Note 1. Unspecified tolerances shall be ± 0.3mm.
Note 2. The connector is made by J.S.T.TRADING COMPANY,LTD. and its part number is B5B-ZR.
Note 3. The dimensions in parenthesis are shown for reference.

Product mass : approx. 9g

GP2Y0A710K0F

Distance Measuring Sensor Unit
Measuring distance: 100 to 550 cm
Analog output type

■Description

GP2Y0A710K0F is a 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.
This device outputs the voltage corresponding to the detection distance. So this sensor can also be used as a proximity sensor.

■Features

1. Long distance type
   Distance measuring range : 100 to 550 cm
2. Analog output type
3. Package size : 58×17.6×22.5 mm
4. Consumption current : Typ. 30 mA
5. Supply voltage : 4.5 to 5.5 V

■Agency approvals/Compliance

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

■Applications

1. Projector (for auto focus)
2. Robot cleaner
3. Auto-switch for illumination, etc.
4. Human body detector
5. Amusement equipment
   (Robot, Arcade game machine)

Notice The content of data sheet is subject to change without prior notice.
In the absence of confirmation by device specification sheets, SHARP takes no responsibility for any defects that may occur in equipment using any SHARP devices shown in catalogs, data books, etc. Contact SHARP in order to obtain the latest device specification sheets before using any SHARP device.

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Date Dec.01.2006
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■Absolute Maximum Ratings

(T_a=25℃,V_{CC}=5V)

Parameter	Symbol	Rating	Unit
Supply voltage	V_{CC}	-0.3 to +7	V
Output terminal voltage	V_O	-0.3 to V_{CC}+0.3	V
Operating temperature	T_{opr}	-10 to +60	℃
Storage temperature	T_{stg}	-40 to +70	℃

■Electro-optical Characteristics

(T_a=25℃,V_{CC}=5V)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Average supply current	I_{CC}	L=150cm (Note 1)	—	30	50	mA
Distance measuring	ΔL	(Note 1)	100	—	550	cm
Output voltage	V_O	L=100cm (Note 1)	2.3	2.5	2.7	V
Output voltage differential	ΔV_{O1}	Output voltage difference between L=100cm and L=200cm (Note 1)	0.5	0.7	0.9	V
	ΔV_{O2}	Output voltage difference (L=100cm→200cm)/ Output voltage differentce (L=200cm→550cm)(Note 1,2)	1.25	1.55	1.85	V

* L : Distance to reflective object

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

Note 2 : The value at 550 cm is the average of 20 times distance measuring.

■Recommended operating conditions

Parameter	Symbol	Conditions	Rating	Unit
Supply voltage	V_{CC}		4.5 to 5.5	V

Fig. 1 Timing chart

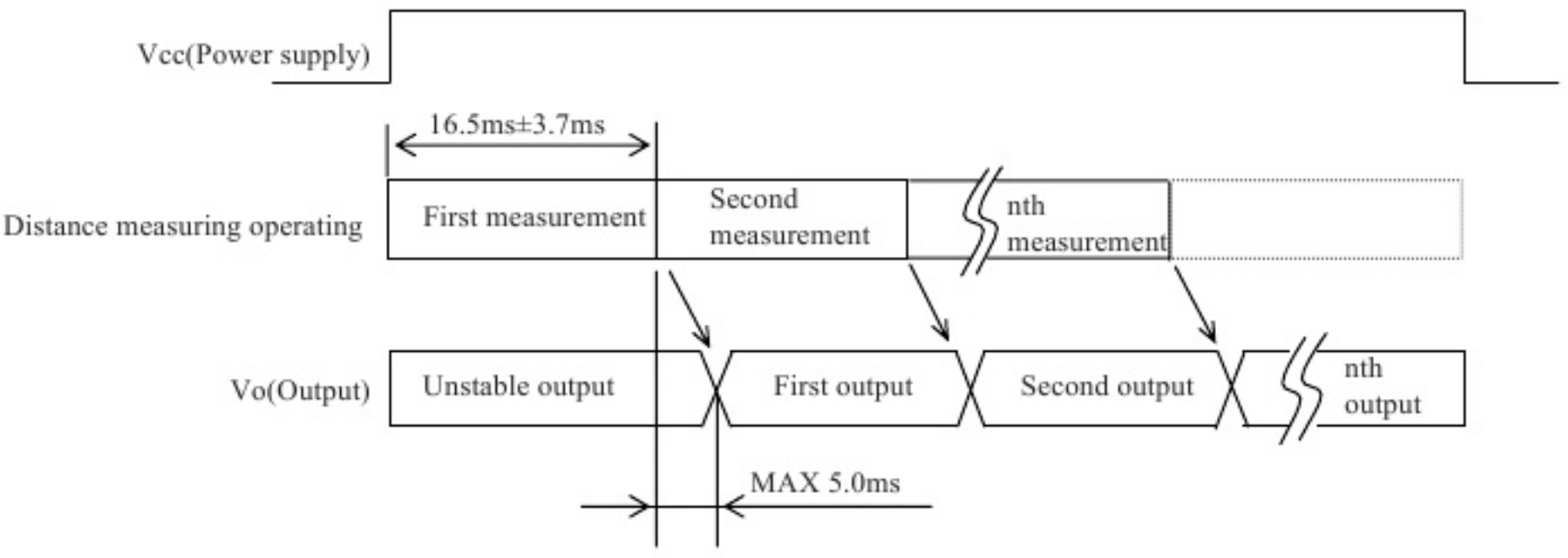
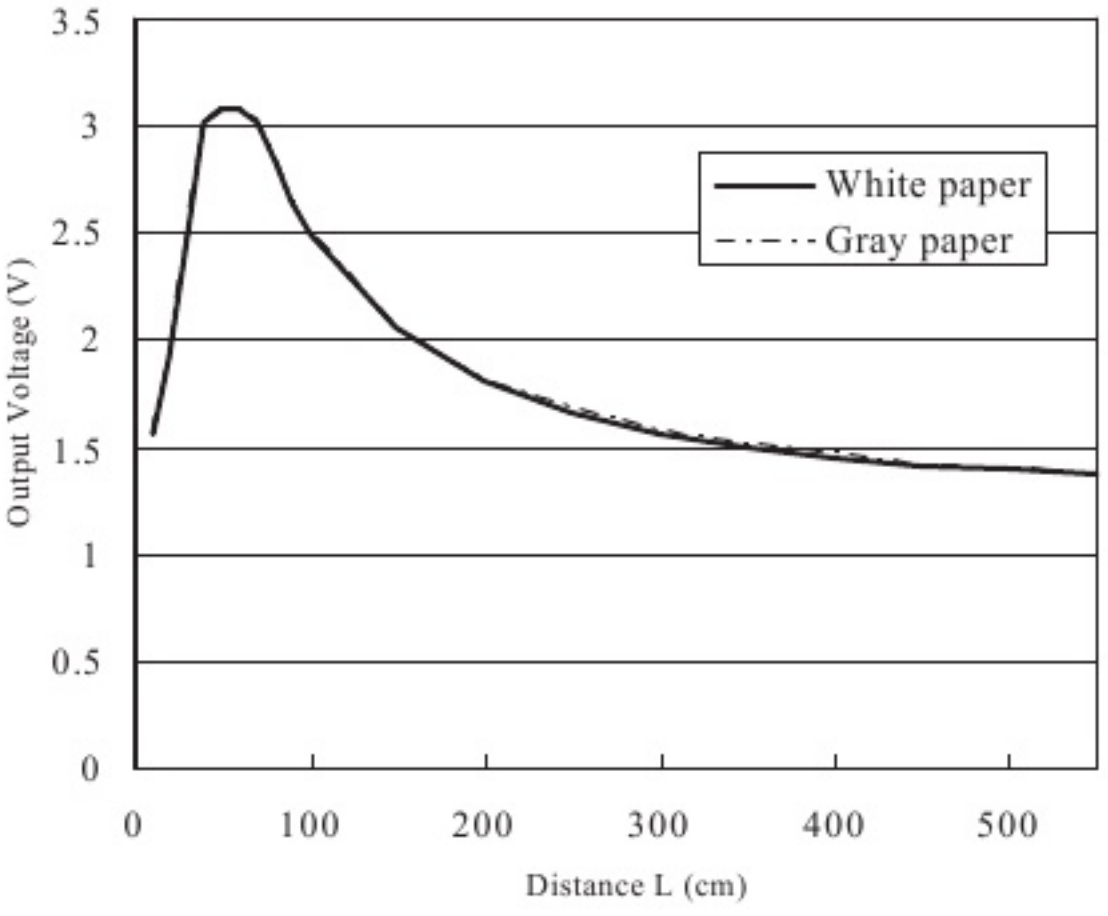
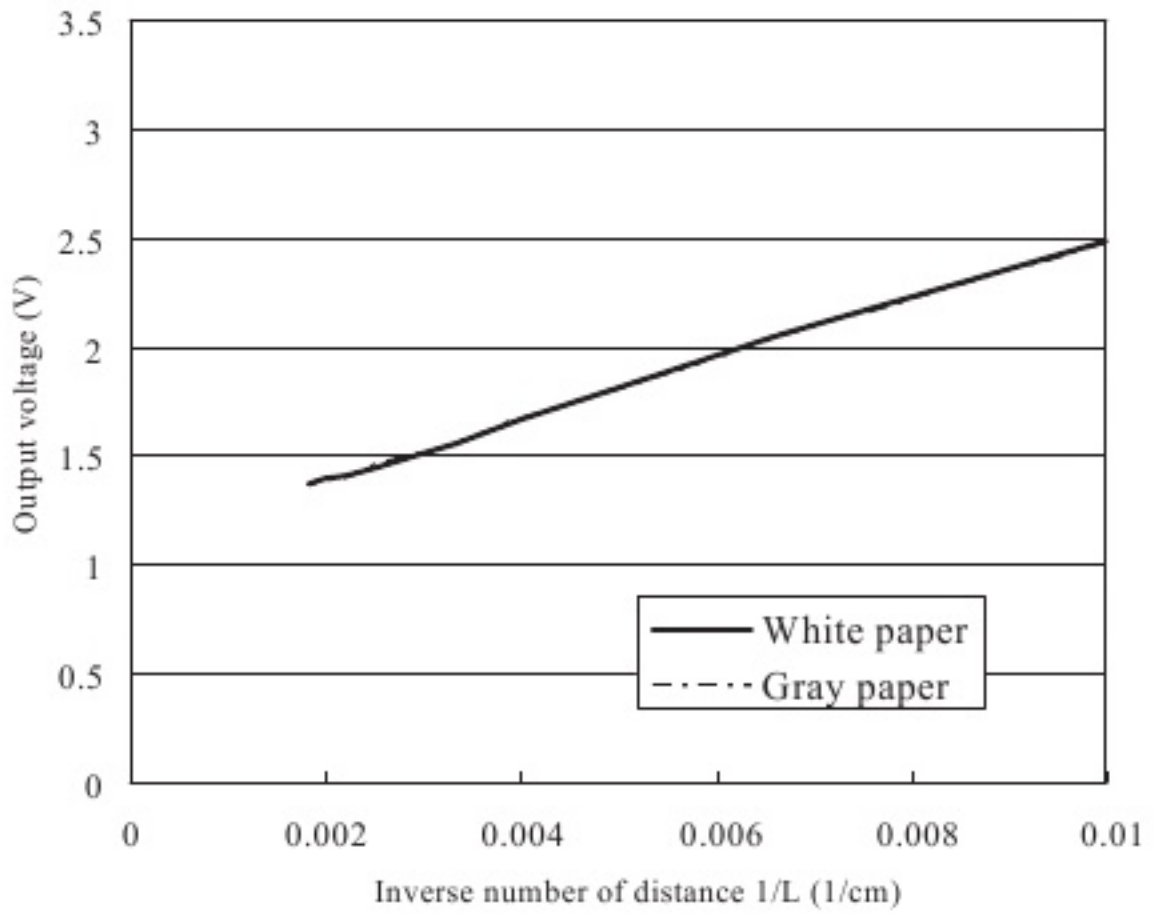


Fig. 2 Example of distance measuring characteristics(output)





Note. Reflection : White paper (reflectance : 90%)
: Gray paper (reflectance: 18%)

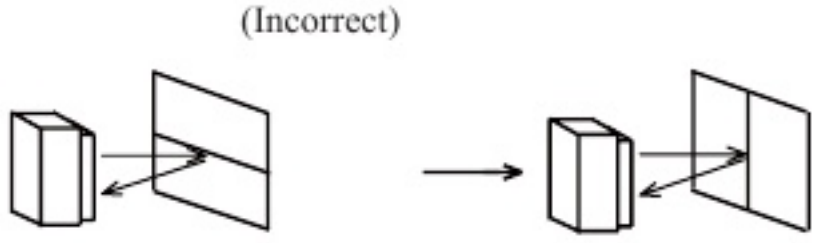
■Notes

●Advice for the optics

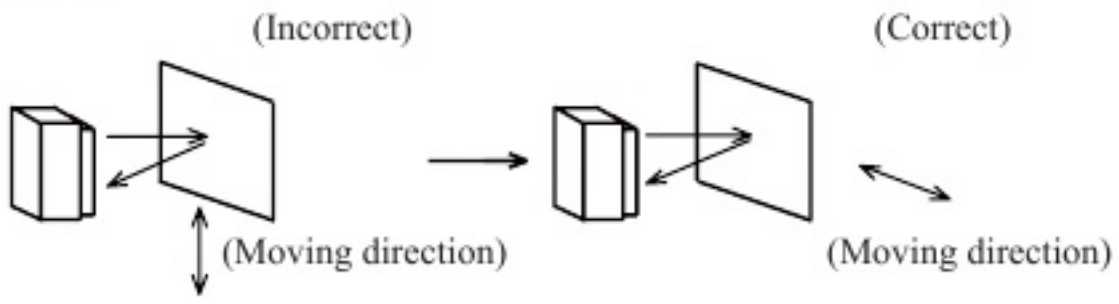
- The lens of this device needs to be kept clean. There are cases that dust, water or oil and so on deteriorate the characteristics of this device. Please consider in actual application.
- Please don't do washing. Washing may deteriorate the characteristics of optical system and so on. Please confirm resistance to chemicals under the actual usage since this product has not been designed against washing.

●Advice for the characteristics

- In case that an optical filter is set in front of the emitter and detector portion, the optical filter which has the most efficient transmittance at the emitting wavelength range of LED for this product ($\lambda = 870 \pm 70$nm), shall be recommended to use. Both faces of the filter should be mirror polishing. Also, as there are cases that the characteristics may not be satisfied 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.
- In case that there is an object near to emitter side of the sensor between sensor and a detecting object, please use this device after confirming sufficiently that the characteristics of this sensor do not change by the object.
- When the detector is exposed to the direct light from the sun, tungsten lamp and so on, there are cases that it can not measure the distance exactly. Please consider the design that the detector is not exposed to the direct light from such light source.
- Distance to a mirror reflector can not be sometimes measured exactly. In case of changing the mounting angle of this product, it may measure the distance exactly.
- In case that reflective object has boundary line which material or color etc. are excessively different, in order to decrease deviation of measuring distance, it shall be recommended to set the sensor that the direction of boundary line and the line between emitter center and detector center are in parallel.



- In order to decrease deviation of measuring distance by moving direction of the reflective object, it shall be recommended to set the sensor that the moving direction of the object and the line between emitter center and detector center are vertical.



●Advice for the power supply

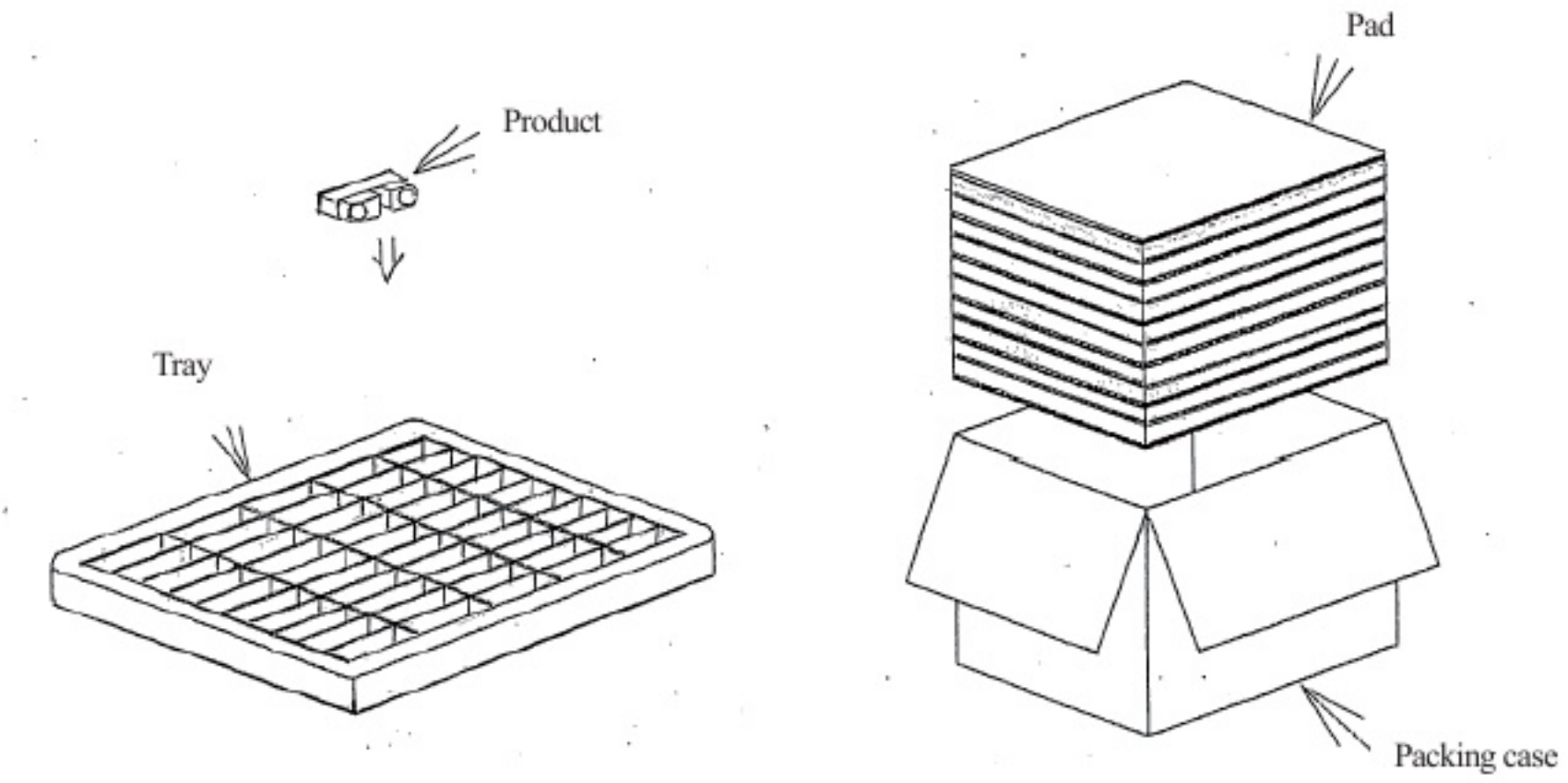
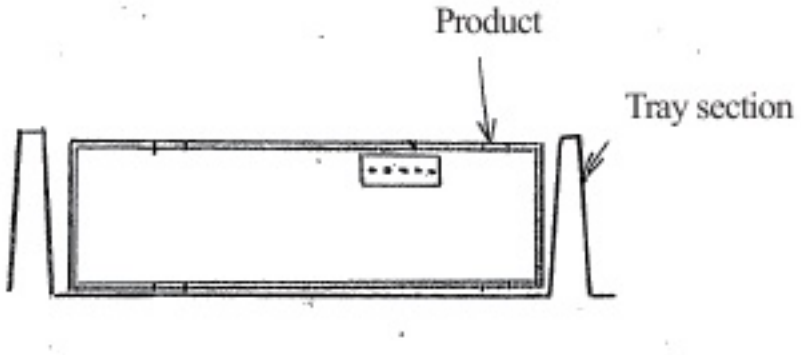
- In order to stabilize power supply line, we recommend to insert a by-pass capacitor of 10μF or more between Vcc and GND near this product.
- Please use power supply which can output 350mA or more to operate this product properly since this product requires about 330mA as the sensing peak current to LED.

●Notes on handling

- There are some possibilities that the internal components in the sensor may be exposed to the excessive mechanical stress. Please be careful not to cause any excessive pressure on the sensor package and also on the PCB while assembling this product.

■Package specification

Package method

MAX.50 pieces per tray
MAX 500 pieces per case
Arranges in 10 stages of trays containing products into the outer case.
Put pads between trays.
Closes the lid of case and seals with kraft tape.

Package composition