GP2Y0D810Z0F

Distance Measuring Sensor Unit
Digital output (100 mm) type

■Description

GP2Y0D810Z0F 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. 100 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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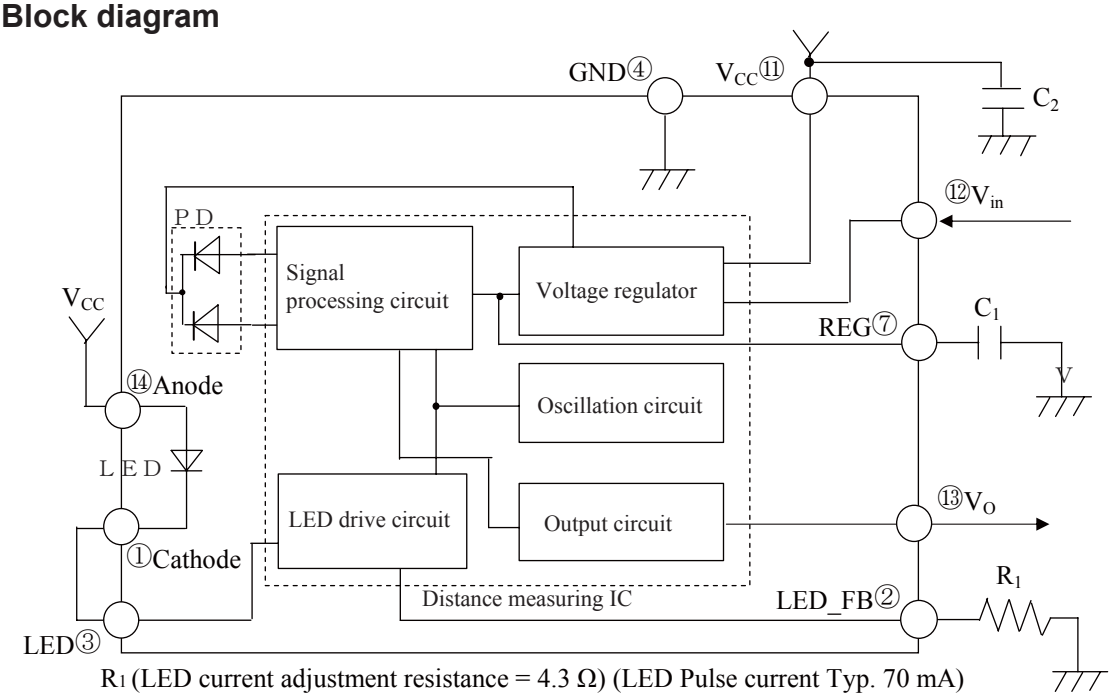
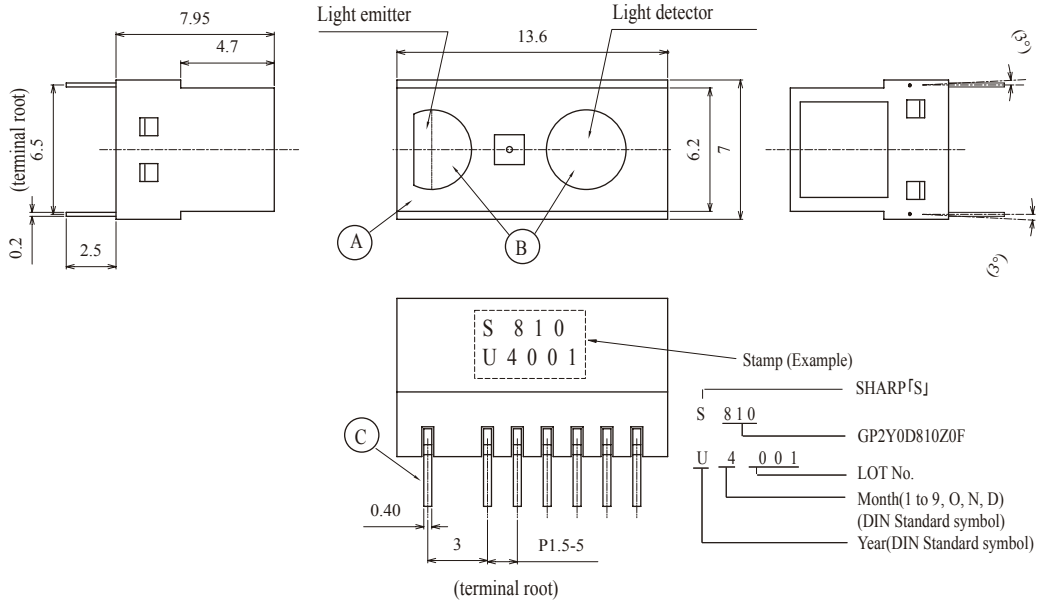
■Block diagram

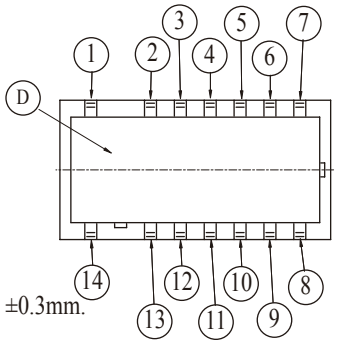


R_1 (LED current adjustment resistance = 4.3 Ω) (LED Pulse current Typ. 70 mA)
$C_1 \cdot C_2$=0.1μF

■Outline Dimensions

(Unit : mm)





Material

A	Case	PC (Color:Black)
B	Lens	PC(Visible light cut type)
C	Device coating	PPS(Color:Black)
D	Lead pin	42ALLOY(Pd-Au plating)

DIN Standard year production
(Remove G, I, O, Q, Y, Z)
(It repeats itself by a period for 20 years)

year	Mark
2006	U
2007	V
2008	W
2009	X
⋮	⋮
2025	T
2026	U

	Symbol
①	Cathode
②	LED_FB
③	LED
④	GND
⑤	—
⑥	—
⑦	REG
⑧	—
⑨	—
⑩	—
⑪	V_{CC}
⑫	V_{in}
⑬	V_O
⑭	Anode

— : No contact

(Note1) Unspecified tolerances shall be ±0.3mm.
(Note2) ( ) : Reference value

Product mass : approx. 0.7g

■Absolute Maximum Ratings

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
Input terminal voltage	V_{in}	-0.3 to V_{CC}+0.3	V
Operating temperature	T_{opr}	-10 to +60	℃
Storage temperature	T_{stg}	-20 to +70	℃
* Soldering temperature	T_{sol}	260	℃

■Electro-optical Characteristics

(T_a=25℃,V_{CC}=5V)

Parameter	Symbol	Rating	MIN.	TYP.	MAX.	Unit
Average supply current	I_{CC1}	V_{CC}=5V, V_{in}=5V, R_1=4.3Ω (*1)	—	5	6.5	mA
Average supply current	I_{CC2}	V_{CC}=5V, V_{in}=5V, R_1=4.3Ω (*1)	—	9	10.5	mA
Stand-by supply current	I_{CC3}	V_{CC}=5V, V_{in}=0V	—	5	8	μA
Output voltage	V_{OH}	Output voltage at high level	V_{CC}-0.6	—	—	V
	V_{OL}	Output voltage at low level	—	—	0.6	V
Detecting distance	L	(*2)(*3)	80	100	130	mm

(*1) I_{CC1} : (LED Emitting time : Typ. 20 μs × 8 times), I_{CC2} : (Emitting time : Typ. 20 μs × 15 times),
LED Pulse Current : Typ. 70 mA

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

(*3) Output voltage switch has a hysteresis width. The distance specified by L should be the distance which the output turns from L to H in case an object moves to the sensor.

■Recommended operating conditions

Parameter	Symbol	Conditions	Rating	Unit
Supply voltage	V_{CC}		2.7 to 6.2	V
High level input voltage	V_{inH}	CMOS level signal. Operating	MIN V_{CC}-0.2	V
Low level input voltage	V_{inL}	CMOS level signal. Standby state	MAX 0.2	V

Fig. 1 Timing chart

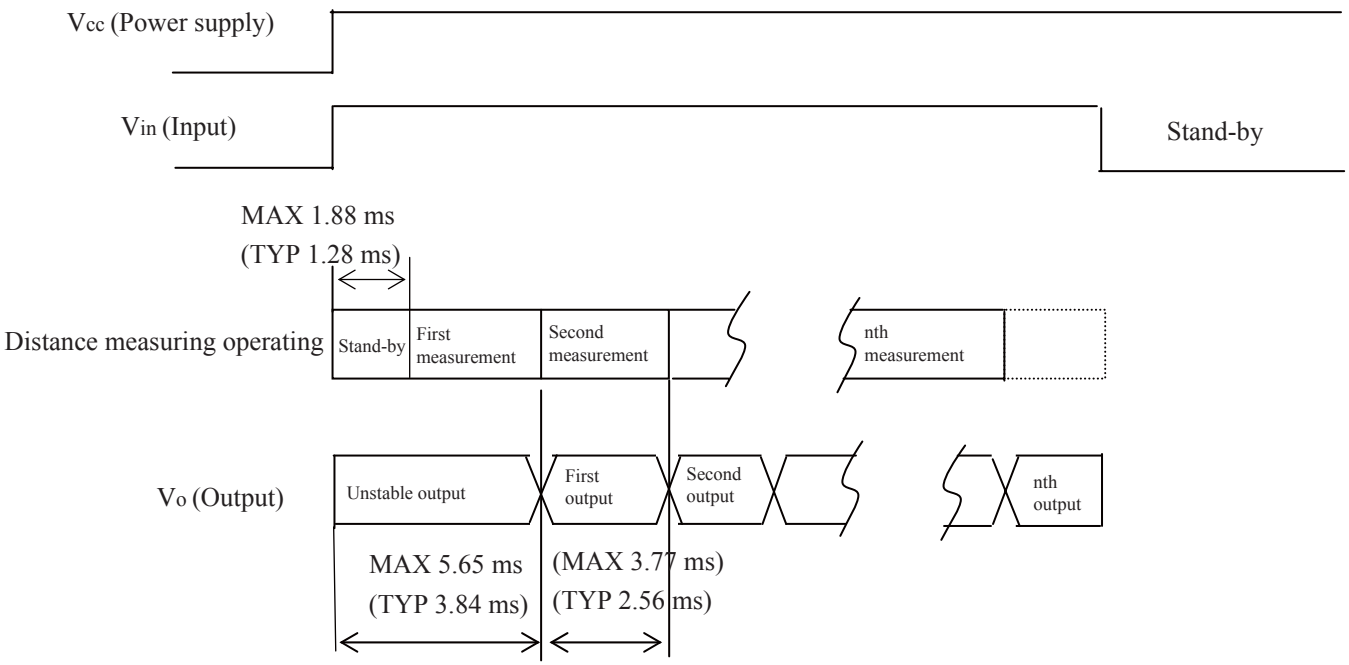
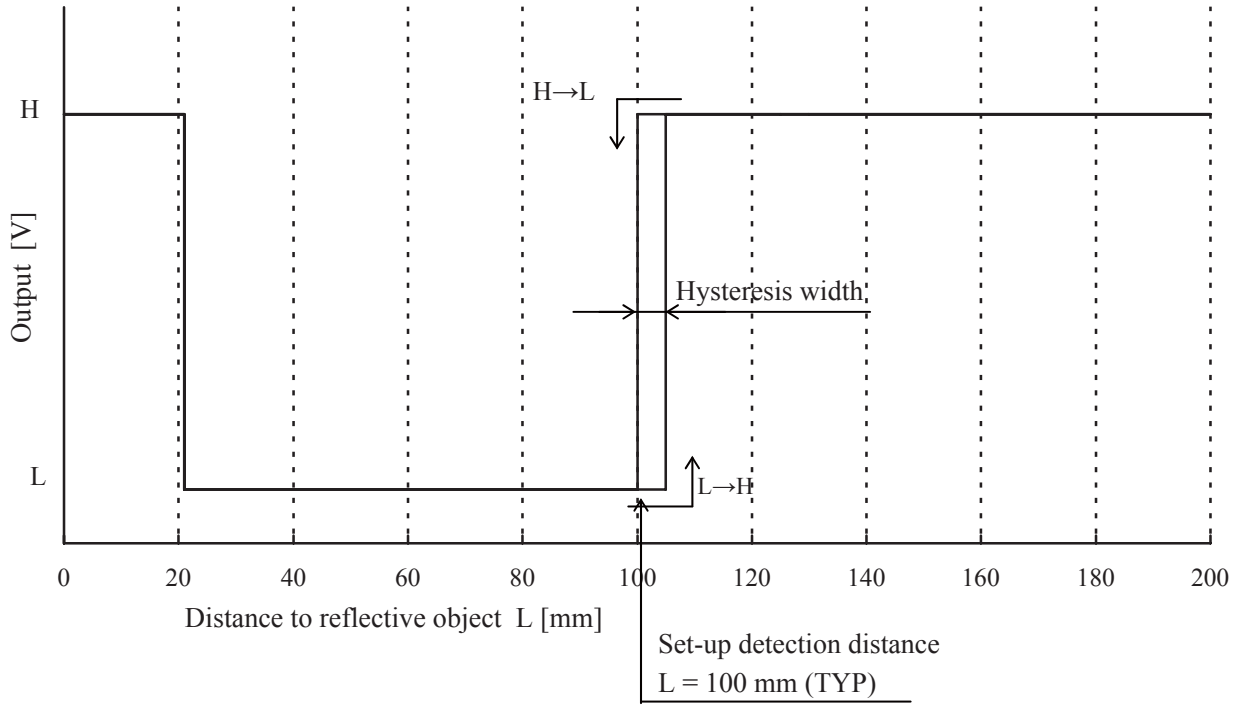


Fig. 2 Example of distance measuring characteristics (output)



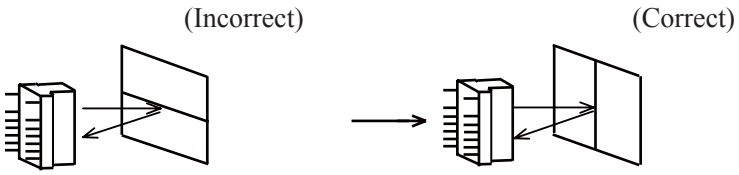
■Notes

●Advice for the optics

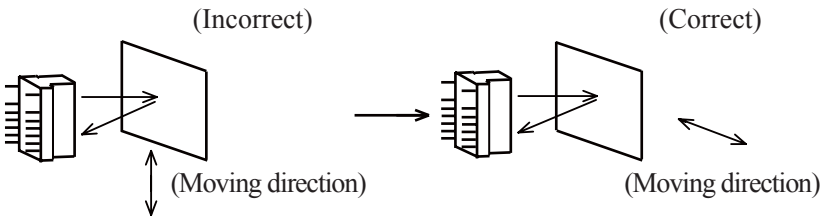
- The lens of this device needs to be kept clean. There are cases that dust, water or oil and so on deteriorate the characteristics of this device. Please consider in actual application.
- Please don't do washing. Washing may deteriorate the characteristics of optical system and so on. Please confirm 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.



●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.
- Soldering shall be done with a soldering iron and below 260℃, 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.

● Presence of ODC etc.

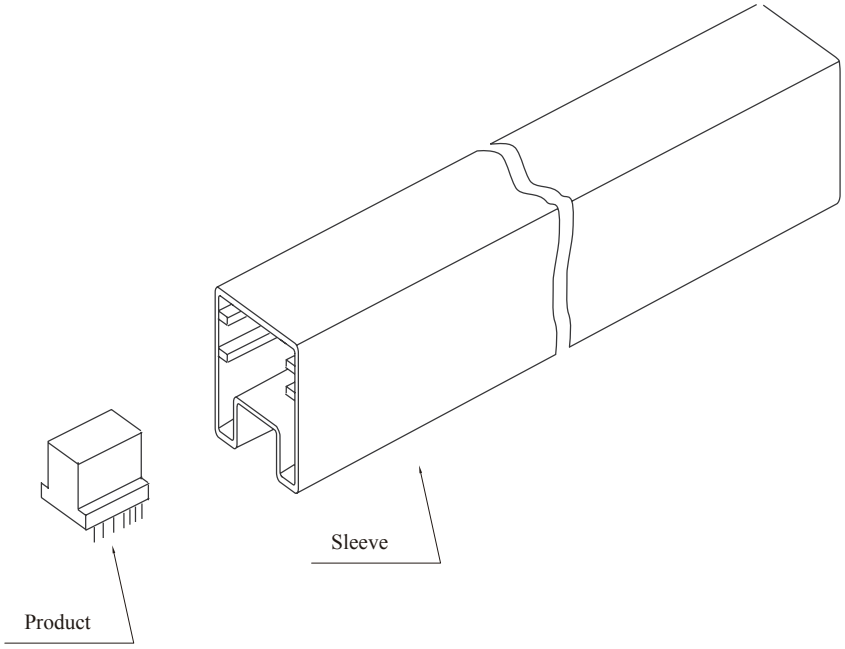
This product shall not contain the following materials.
And they are not used in the production process for this product.
Regulation substances : CFCs, Halon, Carbon tetrachloride, 1.1.1-Trichloroethane (Methylchloroform)

Specific brominated flame retardants such as the PBB and PBDE are not used in this product at all.

This product shall not contain the following materials banned in the RoHS Directive (2002/95/EC).

- Lead, Mercury, Cadmium, Hexavalent chromium, Polybrominated biphenyls (PBB), Polybrominated diphenyl ethers (PBDE).

■Package specification



Put products of 40 pieces in sleeve.

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