GP2W3270XP0F

IrDA Compliant Transceiver Module
9.6 to 115.2 kb/s (SIR LP)
Low Profile
Low Consumption Current

■Description

The **GP2W3270XP0F** is an infrared transceiver module for IrDA ver. 1.4 (SIR LP).
The transceiver consisits of a pin-photo diode, infrared emitter and control IC in a single package.
This device is built in LED constant current circuit.
This device have remote control transmission function (built in drive circuit).

■Features

1. Compliant with the IrDA 1.4 (SIR LP)
   Transmission speed : 9.6 to 115.2 kb/s
   Transmission distance : 20 cm
2. Small package
   L 8.3 × W 2.1 × H 1.7 mm
3. Peak emission wavelength : 890 nm
   (Buit-in shared single LED for RC and IrDA)
4. Top view type
5. Soldering reflow type
6. Shield type
7. Low consumption current due to shutdown function
   (Consumption current at shutdown mode : Max. 0.1 μA)
8. Operates from 2.4 to 3.6 V
9. With built in LED constant circuit
10. With remote control function
    (buit in drive circuit)
11. With V_{IO} terminal

■Agency approvals/Compliance

1. Compliant with IEC60825-1 class 1 eye safety standard
2. Compliant with RoHS directive (2002/95/EC)
3. Content status of six substances specified in
   " Management Methods for Control of Pollution Caused by Electronic Information Products Regulation "
   (popular name : *China RoHS*)
   (Chinese : 电子信息产品污染控制管理办法)
   ; refer to page 13
4. Lead (Pb) free device

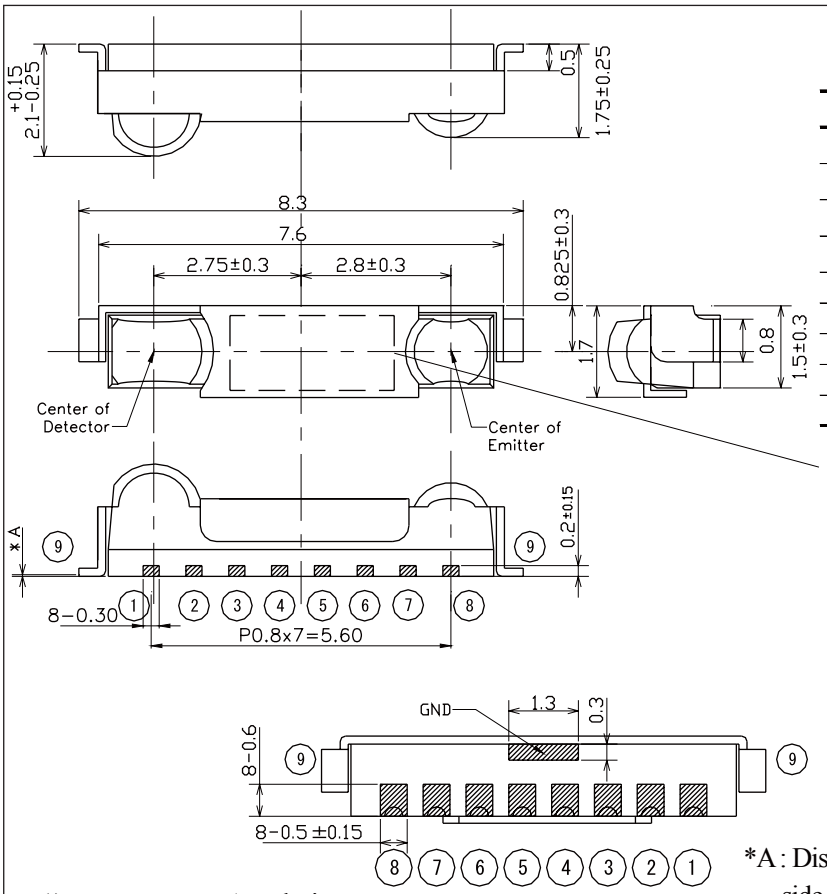
■Applications

1. Mobile equipment
   (Cellular phone, Pager, Smart phone, PDAs, Portable printer, etc.)
2. Digital imaging equipment
   (Digital camera, Photo imaging printer)
3. POS equipment

Sheet No.: E3-A01201EN
Date Mar.01.2007

■Outline Dimensions

(Unit : mm)



	Terminal	Symbol
①	Ground	GND
②	TXD for Remote Control	TXD-RC
③	V_{CC}	V_{CC}
④	V_{IO}	V_{IO}
⑤	Shutdown	SD
⑥	Receiver Data Output	RXD
⑦	Transmitter Data Input	TXD
⑧	LED Anode	LEDA
⑨	Shield Ground	SGND

Marking area

T 7 0 1

- Lot.No.(01to99)
- Month(1to9,O,N,D)
- Year(It repeats the cycle during 20 years except G,I,O,Q,Y and Z)

Year	Mark
2005	T
2006	U
⋮	⋮
2024	S

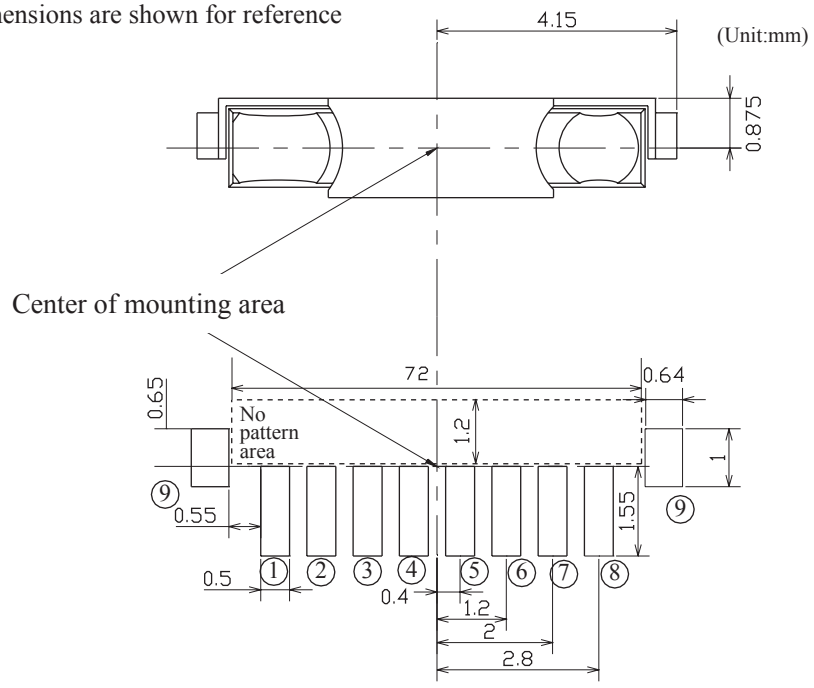
*A : Distance between PCB of the transceiver and bottom side of shield case shall be +/-0.1mm.

1) ▨ area: Au plating
2) Unspecified tolerance shall be ± 0.2 mm
3) Adhesion of resin to the terminal area shall be allowed Max. 0.2 mm.

Product mass : approx. 0.04g

■Recommended PCB Foot Pattern

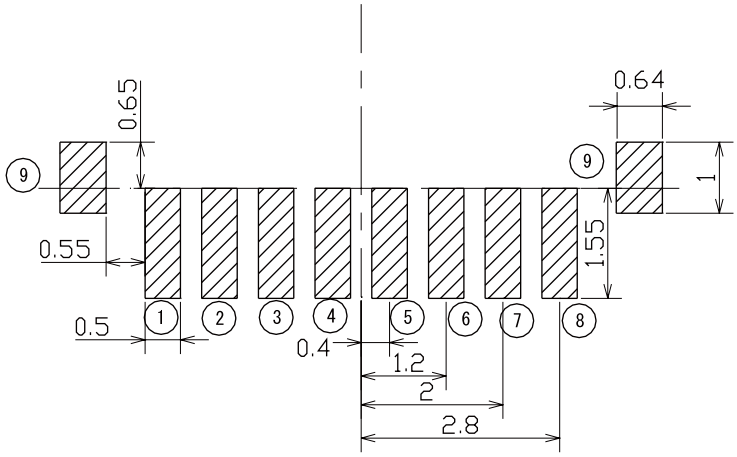
Dimensions are shown for reference



■Recommended Size of Solder Creamed Paste (Reference)

(Unit:mm)

Dimensions are shown for reference. Please open the solder mask as below so that the size of solder creamed paste for this device before reflow soldering must be as large as one of the foot pattern land indicated for reference.



: Solder paste area

■Absolute Maximum Ratings

(T_a=25°C)

Parameter	Symbol	Rating	Unit
Supply voltage	V_{CC}	0 to 6.0	V
VI/O Supply voltage	V_{IO}	0 to V_{CC}	V
LED Supply voltage	V_{LEDA}	0 to 7.0	V
SD,TXD Input voltage	V_{SD},V_{TXD}	0 to V_{IO}+0.3	V
TXD-RC Input voltage	V_{TXDRC}	0 to V_{IO}+0.3	V
*1 Peak forward current 1	I_{FM1}	120	mA
*2 Peak forward current 2	I_{FM2}	300	mA
Operating temperature	T_{opr}	-40 to +85	℃
Storage temperature	T_{stg}	-40 to +85	℃
*3 Soldering temperature	T_{sol}	260	℃

*1 Pulse width: 78.1µs, Duty ratio: 3/16
*2 Pulse width: 17.9µs, Duty ratio: 1/4
*3 Soldering reflow time: 10s

■Electrical Characteristics

(T_a=25°C, V_{CC}=3.3V)

Parameter		Symbol	Rating	MIN.	TYP.	MAX.	Unit
Current consumption at no input signal		I_{CC}	No input signal, output terminal open, V_{IHSD}=0V	—	70	100	µA
Current consumption at Shutdown mode		I_{CC-S}	No input signal, output terminal open, V_{IHSD}=V_{CC}	—	0.001	0.1	µA
High level output voltage		V_{OH}	V_{CC}=2.4 to 3.6V, I_{OH}=200µA *4	V_{IO}-0.4	—	—	V
Low level output voltage		V_{OL}	V_{CC}=2.4 to 3.6V, I_{OL}=200µA *4	—	—	0.4	V
Rise time		t_r	9.6kb/s≦BR≦115.2kb/s, C_L=10pF, ϕ ≦15° *4	—	—	0.06	µs
Fall time		t_f		—	—	0.06	µs
Low level pulse width		t_w		1.35	2.25	3.3	µs
Maximum reception distance		L	9.6kb/s≦BR≦115.2kb/s, C_L=10pF, ϕ ≦15° *4	21	—	—	cm
Input irradiance		E_e	9.6kb/s≦BR≦115.2kb/s, C_L=10pF, ϕ ≦15° *4	—	—	0.081	W/m^2
Receiver wakeup Latency		t_l		—	—	200	µs
Receiver wakeup time		t_{sdw}	No input signal	—	—	200	µs
IrDA	Radiant intensity	I_E	BR=115.2kb/s, ϕ ≦15°, V_{IHTXD}=2.8V *5	5.5	—	28	mW/sr
	LED peak current	I_{LED}		43	60	80	mA
	Rise time	t_r		—	—	0.6	µs
	Fall time	t_f		—	—	0.6	µs
	Peak emission wavelength	λ_p		875	890	900	nm
	Maximum optical pulse width	T_{OPWM}	TXD pin stuck High	30	80	250	µs
RC	Transmit distance	L_{RC}	f=40kHz,duty=25%, ϕ =0°, V_{IHTXD}=2.8V *5	4	—	—	m
	Radiant intensity	I_{ERC}		20	—	100	mW/sr
	LED peak current	I_{LEDRC}		160	200	260	mA
	Peak emission wavelength	λ_p		—	890	—	nm
	Maximum optical pulse width	T_{OPWM}	TXD pin stuck High	30	80	250	µs

*4 Refer to Fig.2, 3, 4
*5 Refer to Fig.5, 6, 7

■Recommended Operating Conditions

Parameter	Symbol	Conditions	Rating	Unit
Supply voltage	V_{CC}		2.4 to 3.6	V
V_{IO} voltage	V_{IO}		1.5 to V_{CC}	V
LED Supply voltage	V_{LEDA}		V_{CC}-0.5 to 6.5	V
Operating temperature	T_{opr}		-25 to +85	℃
Data rate	BR		9.6 to 115.2	kb/s
SD terminal input voltage Logic High	V_{IHSD}	Shutdown mode,2.4V≦V_{IO}	V_{CC}×0.67 to V_{CC}	V
SD terminal input voltage Logic Low	V_{ILSD}	Normal mode,2.4V≦V_{IO}	0.0 to V_{CC}×0.33	V
TDX high level input voltage	V_{IHTXD}	LED ON *6	V_{IO}×0.67 to V_{IO}	V
TDX low level input voltage	V_{ILXTD}	LED OFF *6	0.0 to V_{IO}×0.33	V
TDX-RC high level input voltage	$V_{IHTXDRC}$	LED ON *6	V_{IO}×0.67 to V_{IO}	V
TDX-RC low level input voltage	$V_{ILXTDRC}$	LED OFF *6	0.0 to V_{IO}×0.33	V

*6 Refer to Fig.7

■Truth Table

Mode	SD	TXD	TXD-RC	Input signal	LED	RXD
Normal mode	0	0	0	No	Off	1
	0	0	0	IrDA	Off	0**
IrDA operation	0	0	1	*	On(60mA)	0
	0	1	0	*	On(60mA)	0
Remote control operation	1	0	1	*	On(200mA)	pull-up
Shutdown mode	1	0	0	*	Off	pull-up

* Don't care

** The pulse width is constant without depending on the transmission rate and the light intensity of input signal.

* RXD Equipment circuit

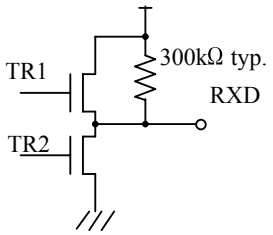
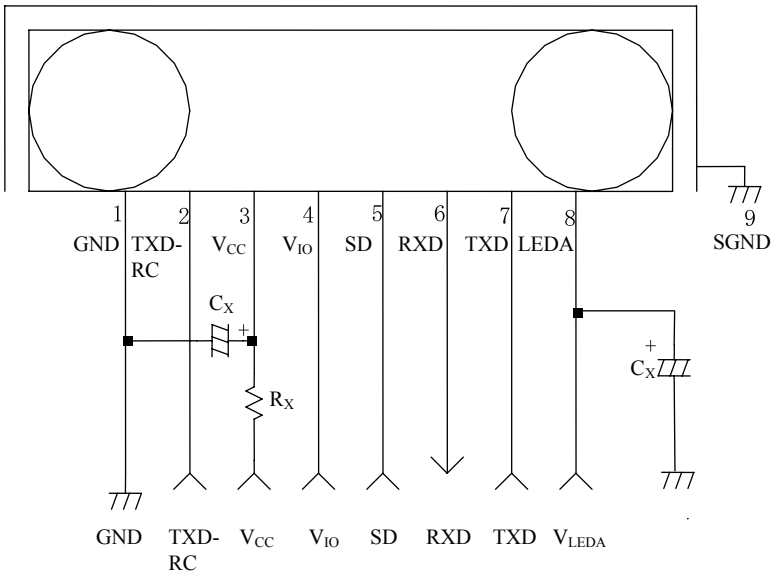


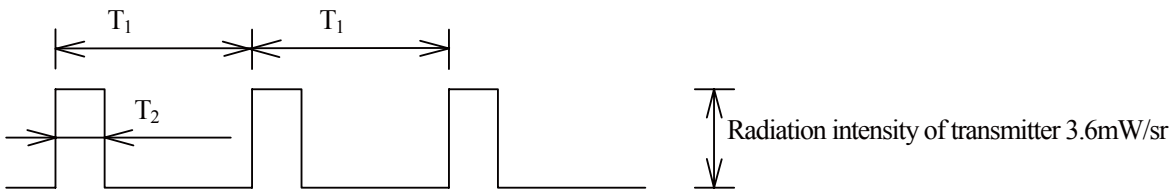
Fig.1 Recommended External Circuit



Components circuit	Recommended values
C_X	1μF/6.3V(Note)
R_X	1 to 15 Ω

(Note) Please choose the most suitable C_X according to the noise level and noise frequency of power supply.
Depending on noise level and noise frequency of power supply, C_X does not work well.
There are cases that some pulse noises from RXD other than signal will occur in certain communication area.
Please check by finish product that there are no problem at all communication area and data rate.
If there are any problem, please check by inserting R_X (1 to 15Ω)in the circuit drawing.
Although there is no problem to distribute the voltage supply of Vcc, V_{IO}, and V_{LED} terminal, please apply the voltage to Vcc terminal first.

Fig.2 Input Signal Waveform(Receiver side)



9.6kb/s≦BR(=1/T_1)≦115.2kb/s
1.41μs≦T_2≦22μs

Fig.3 Output Waveform Specification(Receiver side)

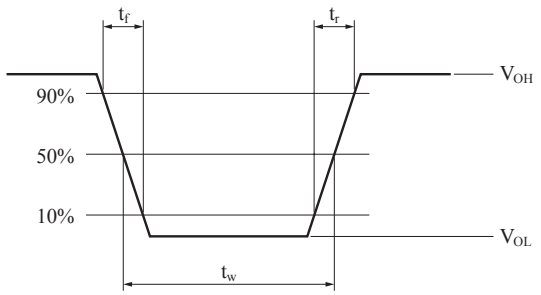
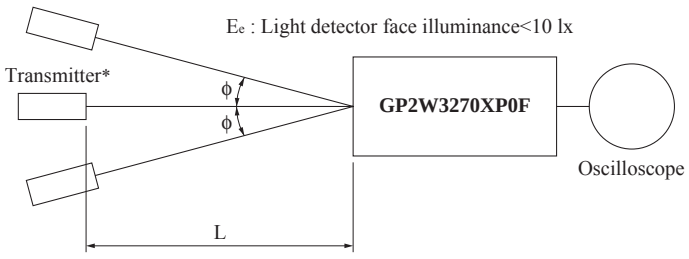


Fig.4 Standard Optical System(Receiver side)



ϕ : Indicates horizontal and vertical directions.

*Transmitter shall use **GP2W3270XP0F** (λp=890nm TYP.) which is adjusted the radiation intensity at 3.6mW/sr.

Fig.5 Output Waveform Specification(Transmitter side)

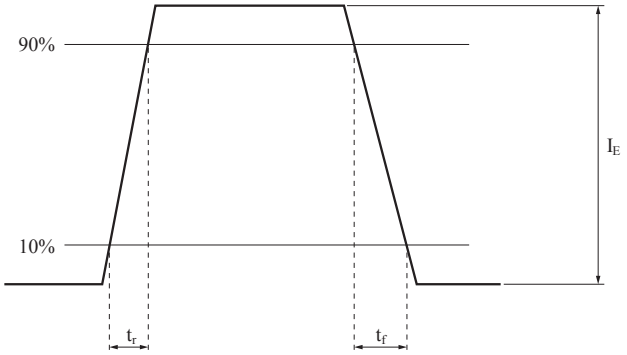


Fig.6 Standard Optical System(Transmitter side)

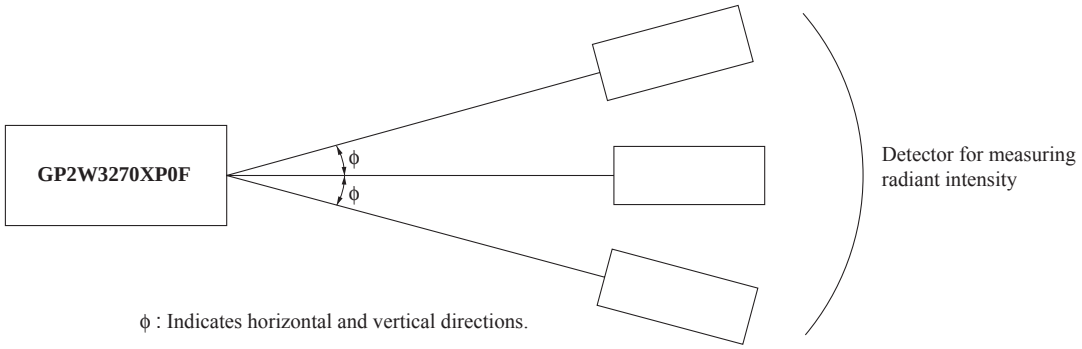
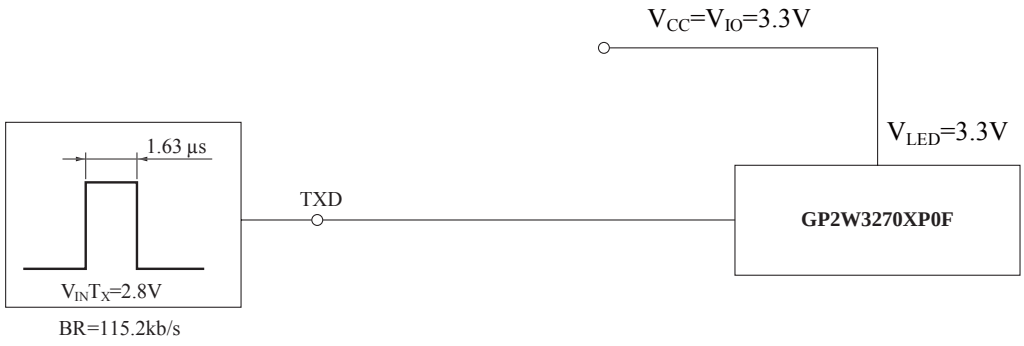


Fig.7 Recommended Circuit of Transmitter side



■Notes

(1) When the system (program) is designed, the Turn Around Time shall be secured by considering 500 µs or more that is specified to IrDA.
Then, this Turn Around Time means the time when this device does not temporarily detect the signal light, since the transmitted light form the transceiver reaches the detector side of the transceiver.

(2) As it is necessary 200 µs or more (at Ta =25 °C, no input signal) to return from shut-down mode to ready-operation mode, please consider this point at the system (program) designing.
Also, please confirm thoroughly the operation in actual application.

(3) When there is much external disturbing light source is located near this transceiver and the detector face resceiver much external disturbing light, there is case that the pulse other than signal output is generated as noise on output terminal of this transceiver. Please consider the lay-out and structure to reduce disturbing light on the detector face.

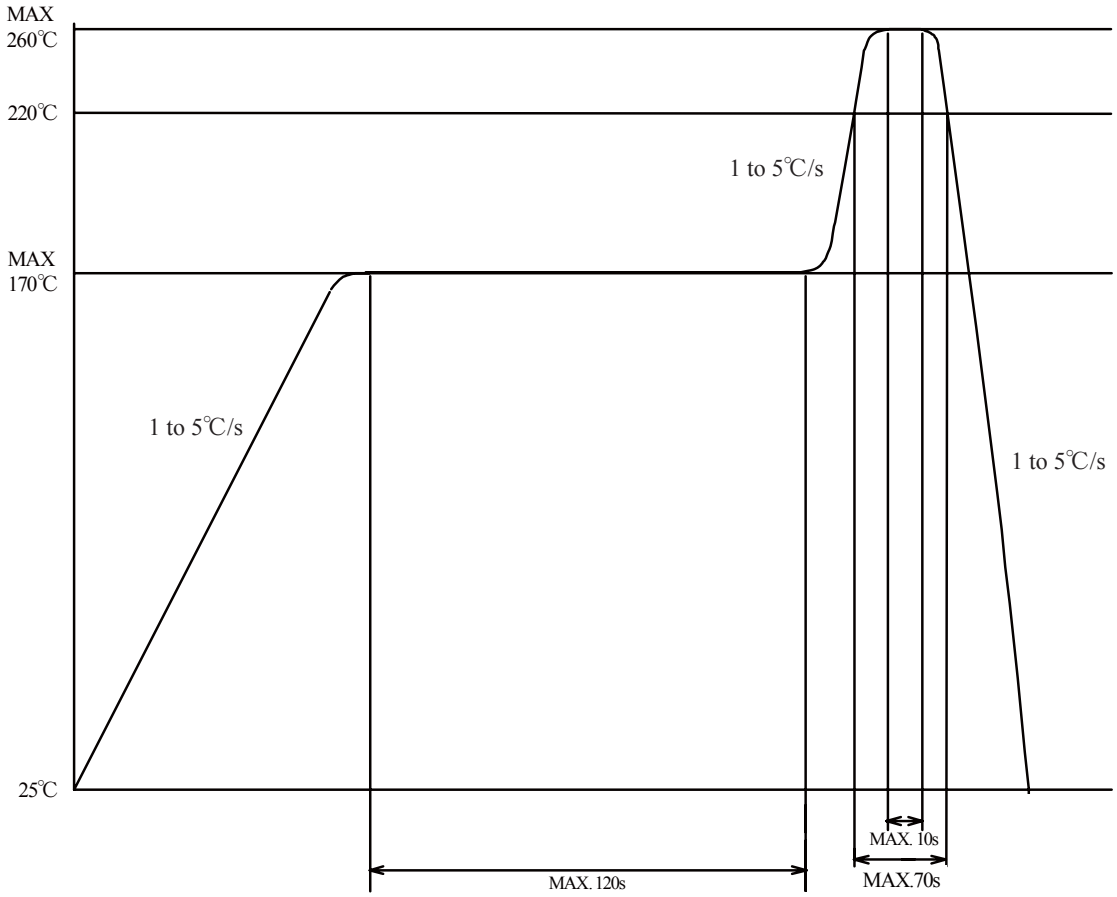
(4) In case that this sensor is adopted in IR communication system, please use it according to the signal method which is specified by [Serial Infrared Physical Layer Link Specification Version 1.4] published by Infrared Data Association. False operation may happen if the different signal method is used.

(5) In circuit designing, make allowance for the degradation of light emitting diode output that results from long continuous operation. (50 % degradation/5 years)

■Soldering Method

1. In case of solder reflow

   Please carry out only two times soldering at the temperature and the time within the temperature profile as shown in the figure below. Reflow interval shall be within 3 days under conditions, 10 to 30℃, 70%RH or less.



2. Other precautions

   An infrared lamp used to heat up for soldering may cause a localized temperature rise in the resin.
   So keep the package temperature within that specified in Item 1. Also avoid immersing the resin part in the solder.
   Even if within the temperature profile above, there is the possibility that the gold wire in package is broken in case that the deformation of PCB gives the affection to lead pins. Please use after confirming the conditions fully by actual solder reflow machine.

3. Soldering

   - Soldering iron shall be less than 25W, and temperature of point of soldering iron shall use at 350℃ or less.
   - Soldering time shall be within 5s.
   - Soldered product shall treat at normal temperature.

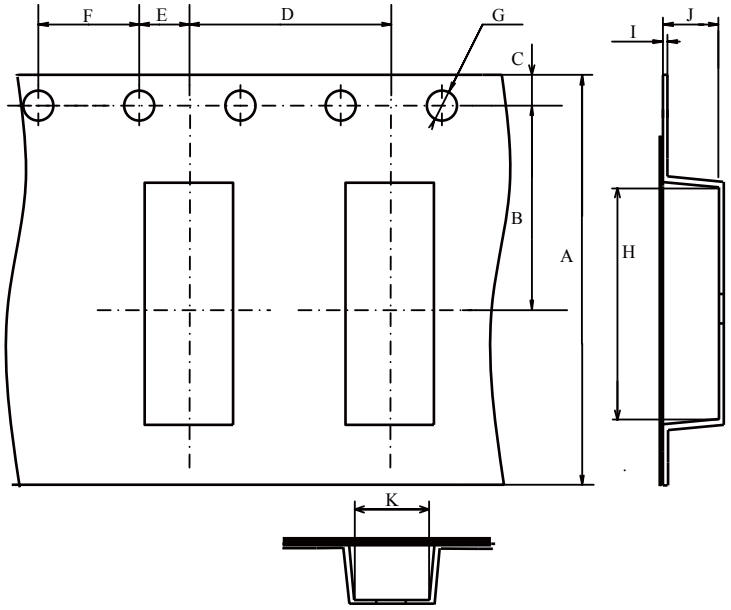
■Package specification

●Tape and Reel package
2000pcs/reel

Taping materials

Name	Material	Countermeasure for ESD
Reel	PPE	Coped(conductivity)
Carrier tape	PC	Coped(conductivity)
Cover tape	PET	Coped(conductivity)

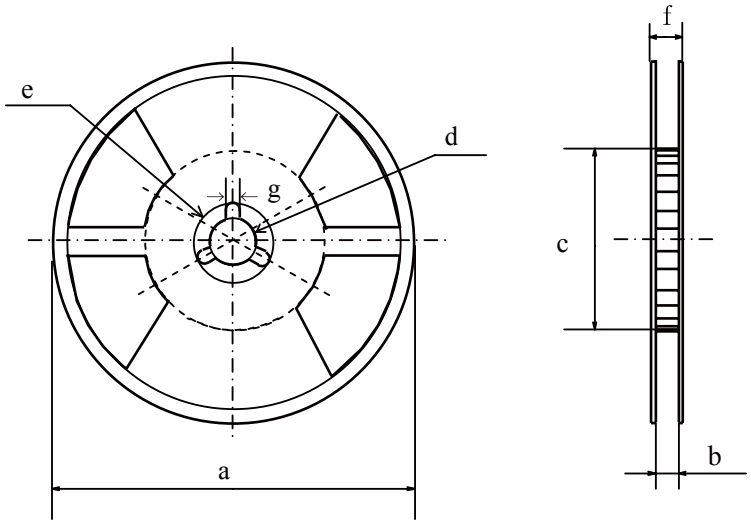
Carrier tape structure and Dimensions



Dimension List (Unit : mm)

A	B	C	D	E	F
16.0±0.3	7.5±0.1	1.75±0.10	8.0±0.1	2.0±0.1	4.0±0.1
G	H	I	J	K	
ϕ $1.5^{+0.1}_{-0.0}$	8.5±0.1	0.33±0.05	2.5±0.1	1.8±0.1	

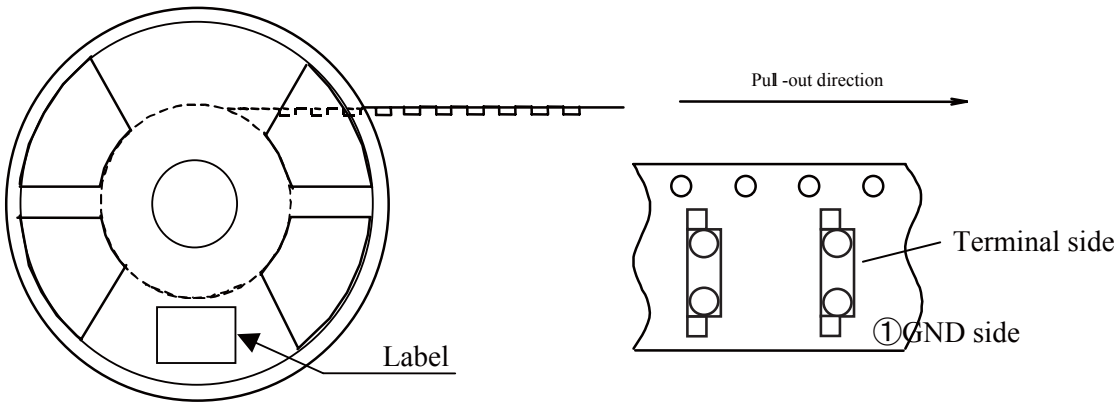
Reel structure and Dimensions



Dimension List (Unit : mm)

a	b	c	d
330±2	17.5±1.0	100±1	13±0.2
e	f	g	
21±0.8	22.4±1.0	2±0.5	

Direction of product insertion



●Cleaning Instructions

Solvent cleaning :

Solvent temperature 45℃ or less, Immersion for 3 min or less

Ultrasonic cleaning :

The effect to device by ultrasonic cleaning differs by cleaning bath size, ultrasonic power output, cleaning time, PCB size or device mounting condition etc.
Please test it in actual using condition and confirm that doesn't occur any defect before starting the ultrasonic cleaning. The cleaning shall be carried out with solvent below.

Recommended Solvent materials :

Ethyl alcohol, Methyl alcohol, Isopropyl alcohol

●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.

• The RoHS directive (2002/95/EC)
This product complies with the RoHS directive (2002/95/EC).
Object substances: lead, cadmium, hexavalent chromium, polybrominated biphenyls (PBB) and polybrominated diphenyl ethers (PBDE)

• 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)
Infrared data communication device	✓	✓	✓	✓	✓	✓

✓: 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.

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