High Speed Photo Diode

■FEATURES

- ●Leadless surface mount type: 2.0 X 2.9 X 0.75mm
- ● Active area: 1.16mm X 1.86mm
- ● High Speed
  tr/tf=9ns (VR=2.5V , λ=780nm / 650nm / 405nm)
- ● Pb free solder re-flowing permitted: 260°C, 2times
- ● Pb free, Halogen free
- ● Conformity to RoHS directive

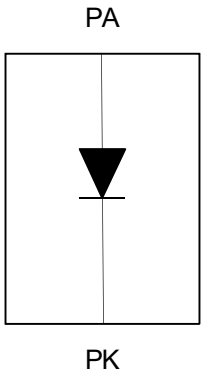
■GENERAL DESCRIPTION

The NJL6407R is the photodiode sensor capable of detecting light in a wide wavelength range of up to infrared light from the blue-violet light.
A thin and small package of COBP is adopted, and providing high efficient space-saving.

■APPLICATION

- ● Laser monitor for Blu-ray, etc.
- ● Monitor for RGB wavelength
- ● Photoelectric switch, Space light transmitting, etc.

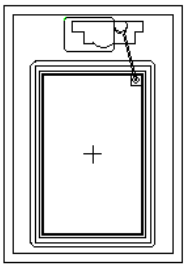
■BLOCK DIAGRAM



■PIN CONFIGURATION

PIN NO.	SYMBOL	DESCRIPTION
1	PA	Anode
2	PK	Cathode

(Top View)
1. PA



2. PK

■ORDERING INFORMATION

PART NUMBER	PACKAGE OUTLINE	RoHS	HALOGEN-FREE	TERMINAL FINISH	MARKING	WEIGHT (mg)	MOQ(pcs)
NJL6407R	COBP	✔	✔	Au	No marking	8.5	3,000

■ABSOLUTE MAXIMUM RATINGS

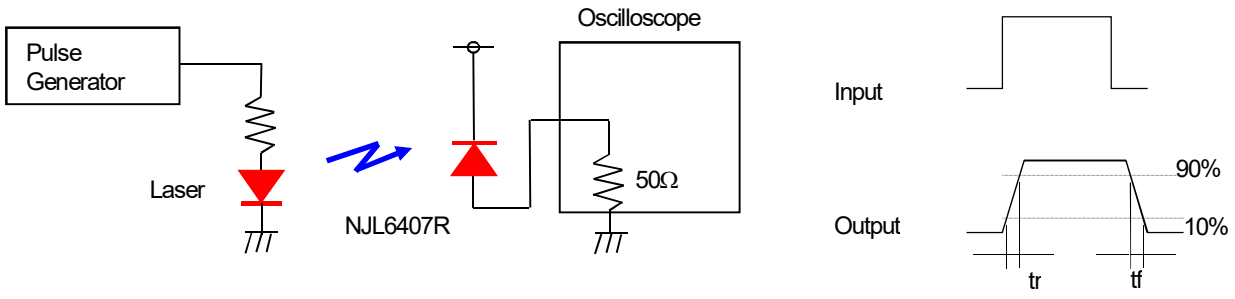
PARAMETER	SYMBOL	RATINGS	UNIT
Reverse Voltage	V_R	35	V
Operating Temperature Range	T_{opr}	-30 to +80	°C
Storage Temperature Range	T_{stg}	-30 to +85	°C
Reflow Soldering Temperature	T_{sol}	260	°C

■ELECTRICAL CHARACTERISTICS (Ta=25 °C)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Dark Current	I_D	V_R=10V	—	0.1	2.0	nA
Forward Voltage	V_F	I_F=1mA	—	—	1.2	V
Capacitance	Ct	V_R=0V, f=1MHz	—	30	—	pF
		V_R=2.5V, f=1MHz	—	13	—	pF
Peak Wavelength	λP	V_R=0V	—	800	—	nm
Sensitivity	S	V_R=2.5V, λ=780nm	0.37	0.47	—	A/W
		V_R=2.5V, λ=650nm	0.34	0.42	—	A/W
		V_R=2.5V, λ=405nm	0.22	0.28	—	A/W
Rise time, Fall time	tr/tf	V_R=2.5V, λ=780nm, RL=50Ω Po=1mW , 10-90%	—	9	—	ns
		V_R=2.5V, λ=650nm, RL=50Ω Po=1mW , 10-90%	—	9	—	ns
		V_R=2.5V, λ=405nm, RL=50Ω Po=1mW , 10-90%	—	9	—	ns

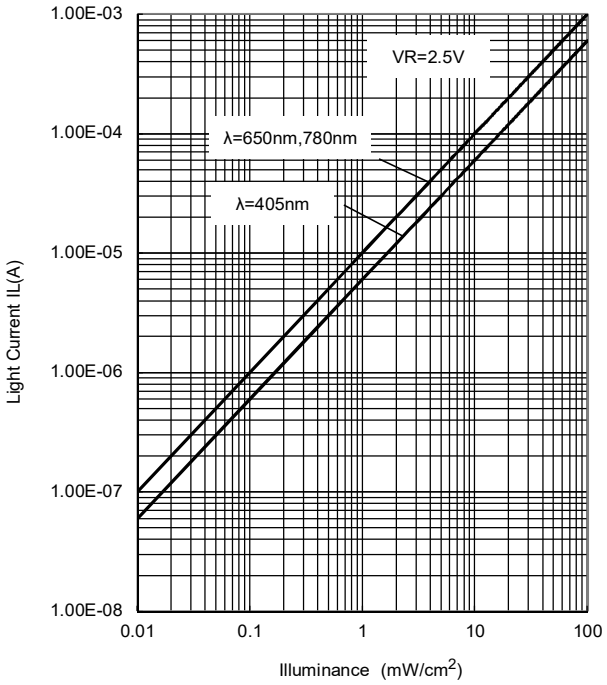
※In the Electro-Optical characteristics table, items that are showed only the typical value are not tested in manufacturing process.

■RESPONSE TEST CONDITION

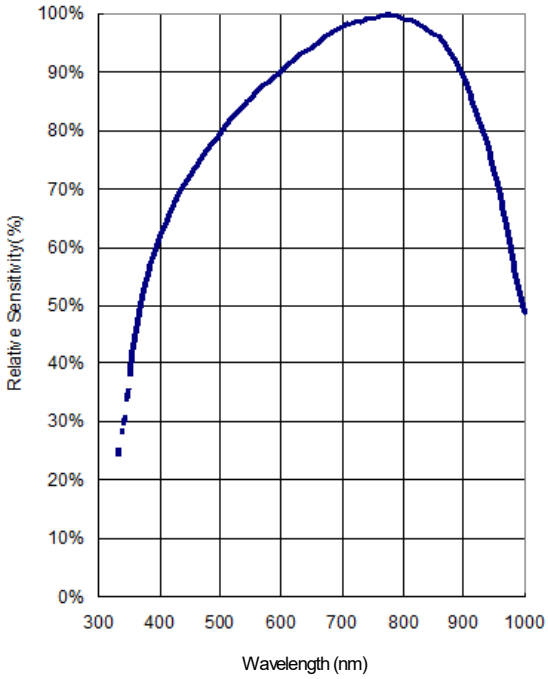


■TYPICAL CHARACTERISTICS

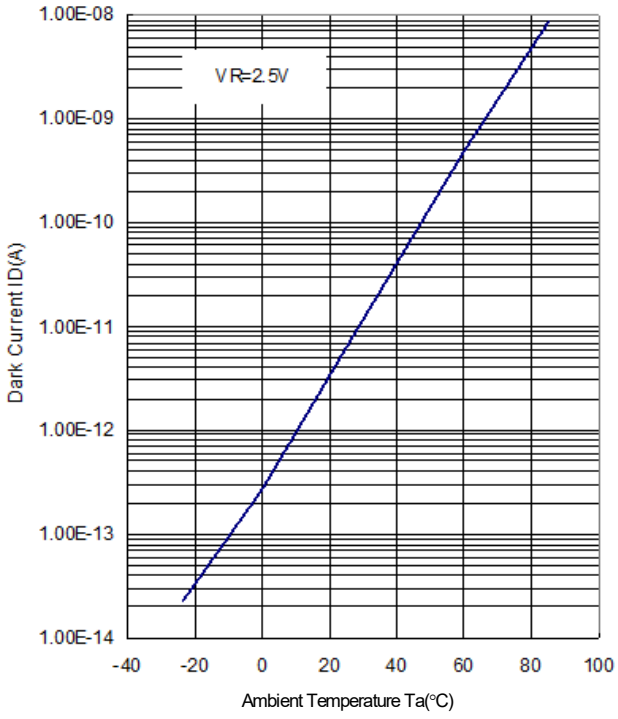
Light Current vs. Illuminance (Ta=25°C)



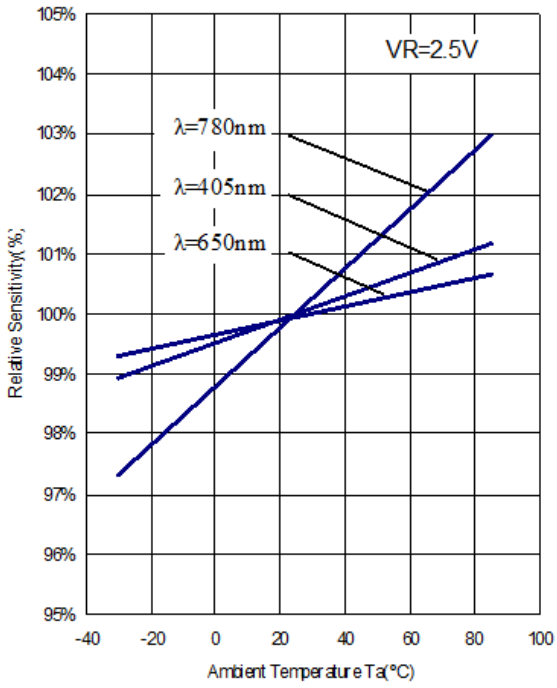
Spectral Response (Ta=25°C)



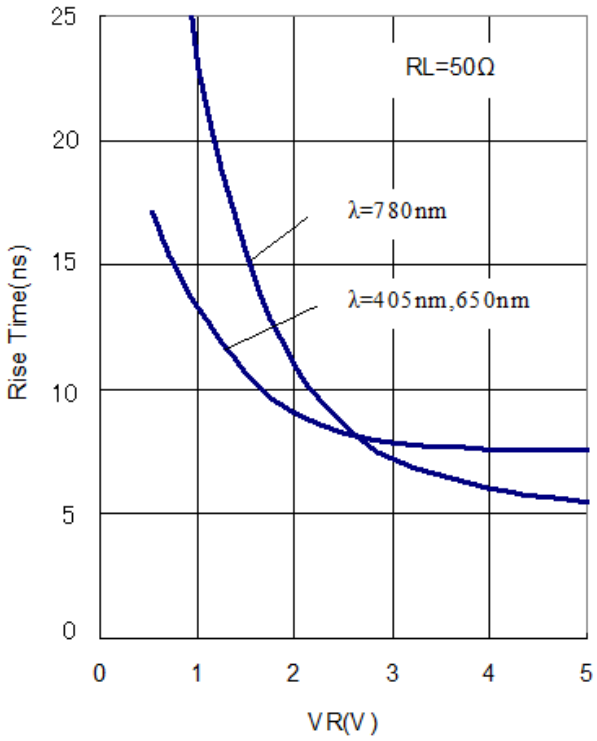
Dark Current vs. Temperature



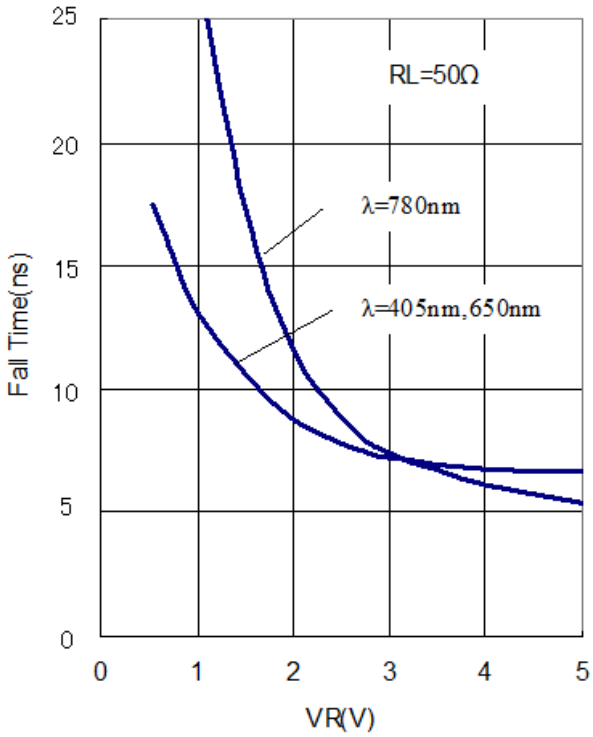
Relative Sensitivity vs. Temperature



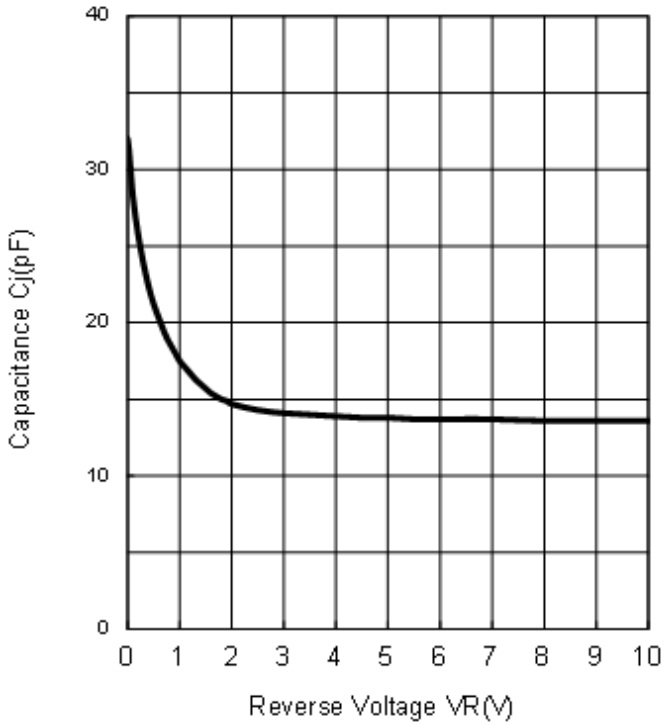
Rise time vs. Reverse Voltage (Ta=25°C)



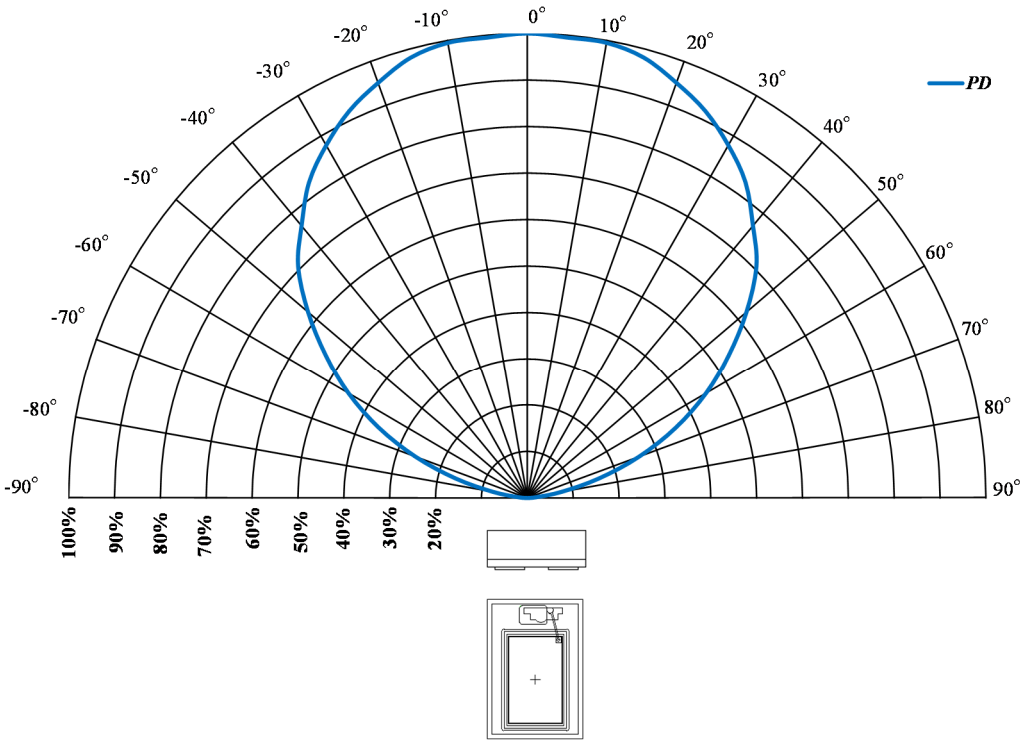
Fall time vs. Reverse Voltage (Ta=25°C)



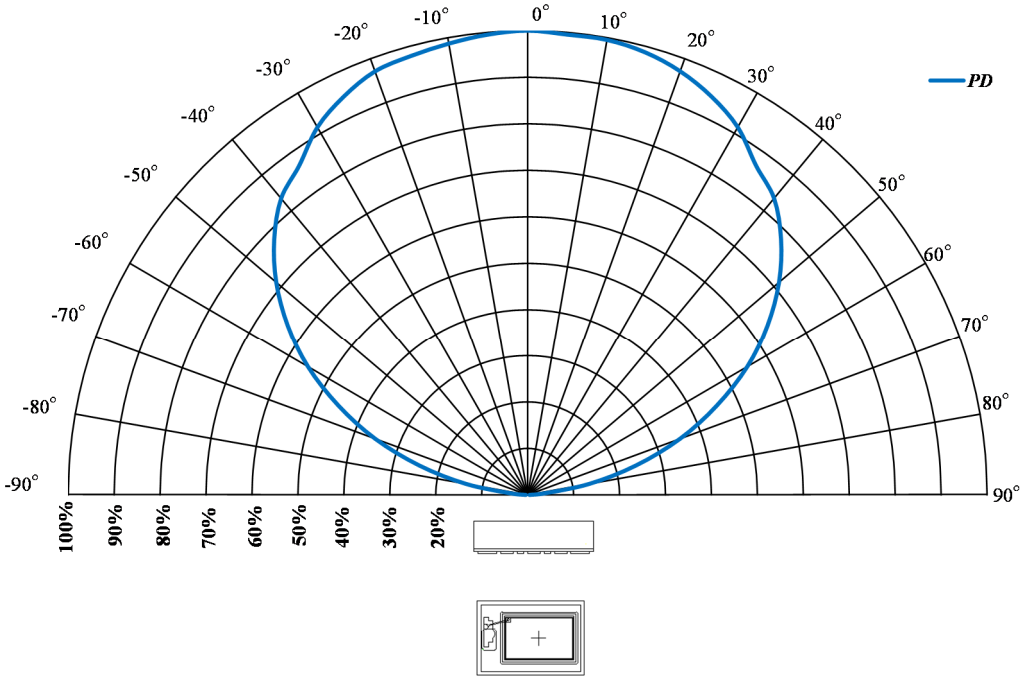
Capacitance vs. Reverse Voltage (Ta=25°C)



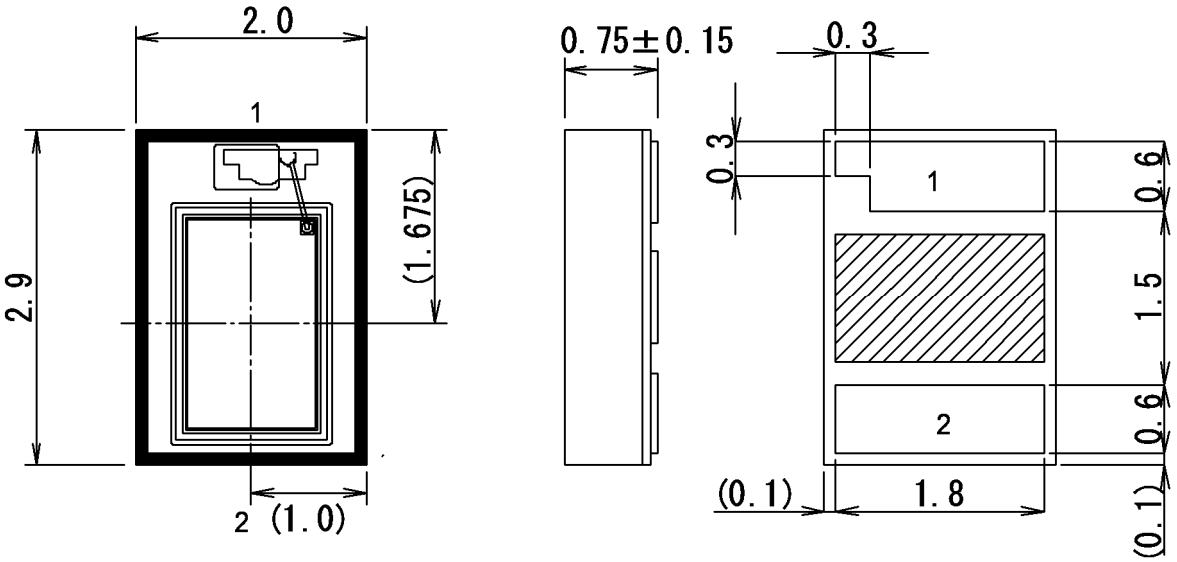
Directivity at Package direction X



Directivity at Package direction Y

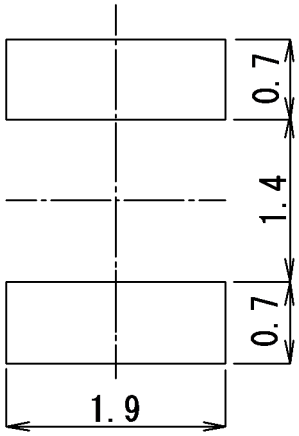


■PACKAGE OUTLINE Unit : mm



1.PA
2.PK

Unspecified tolerance : ±0.1mm
Dimensions in parenthesis are shown for reference.

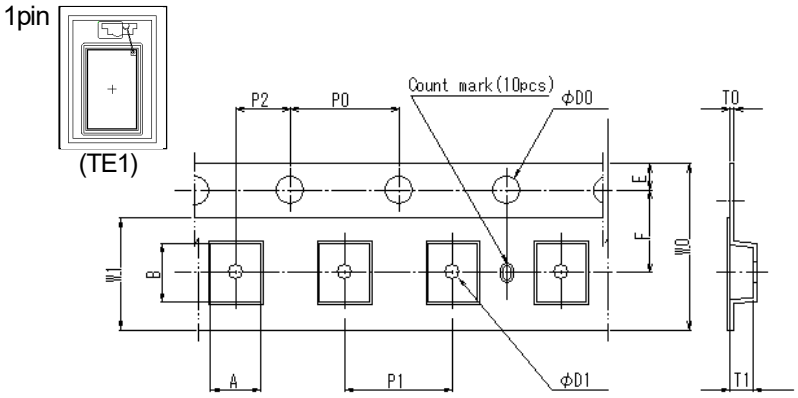


Foot Pattern

■PACKING SPECIFICATION

PACKING DIMENTIONS UNIT : mm

Insert direction Drawing direction →



SYMBOL	DIMENSION	REMARKS
A	2.35 ±0.05	BOTTOM DIMENSION
B	3.25 ±0.05	BOTTOM DIMENSION
D0	φ1.50 +0.1/-0	
D1	φ1.05 ±0.05	
E	1.75 ±0.10	
F	5.50 ±0.05	
P0	4.00 ±0.10	
P1	4.00 ±0.10	
P2	2.00 ±0.05	
T0	0.20 ±0.05	
T1	1.13 ±0.10	
W0	12.0 +0.3/-0.1	
W1	9.3 ±0.10	THICKNESS 0.1MAX

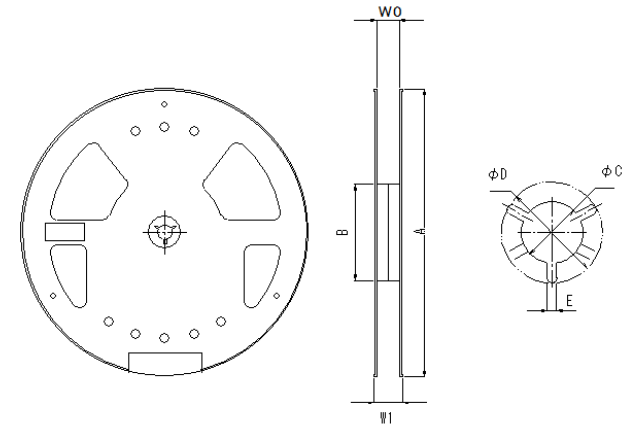
* Carrier tape material : Polycarbonate(antistatic)
Cover tape material : PETP(antistatic)

■Taping Strength

There is a peel strength in the range of 0.2 to 0.7N when was peeled at a rate of 300mm per minute in opening angle 165 to 180° between the carrier tape and the cover tape.

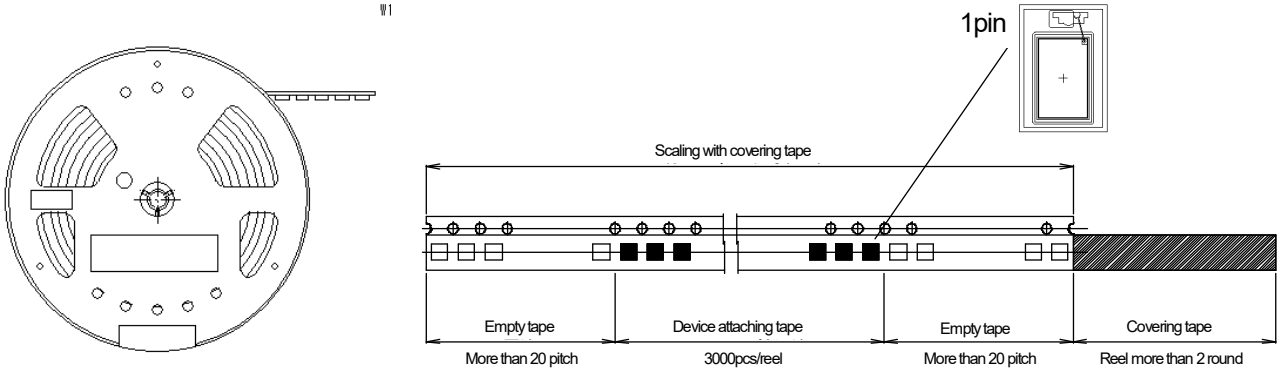
■Packaging

1) The taped products are to be rolled up on the taping reel as on the drawing.
2) Rolling up specification
   2-1) Start rolling : Carrier tape open space more than 20 Pieces.
   2-2) End of rolling : Carrier tape open space more than 2 round of reel space at the cover tape only.
3) Taping quantity : 3,000 Pieces
4) Seal off after putting each reel in a damp proof bag with silica gel.



SYMBOL	DIMENSION	REMARKS
A	φ254.0 ±2.0	
B	φ100.0 ±1.0	
C	φ13.0 ±0.2	
D	φ21.0 ±0.8	
E	2.0 ±0.5	
W0	13.4 ±1.0	INNER DIMENSION
W1	17.4 ±1.0	OUTER DIMENSION

* Reel material : PS(antistatic)



■RECOMMENDED MOUNTING METHOD

NOTE

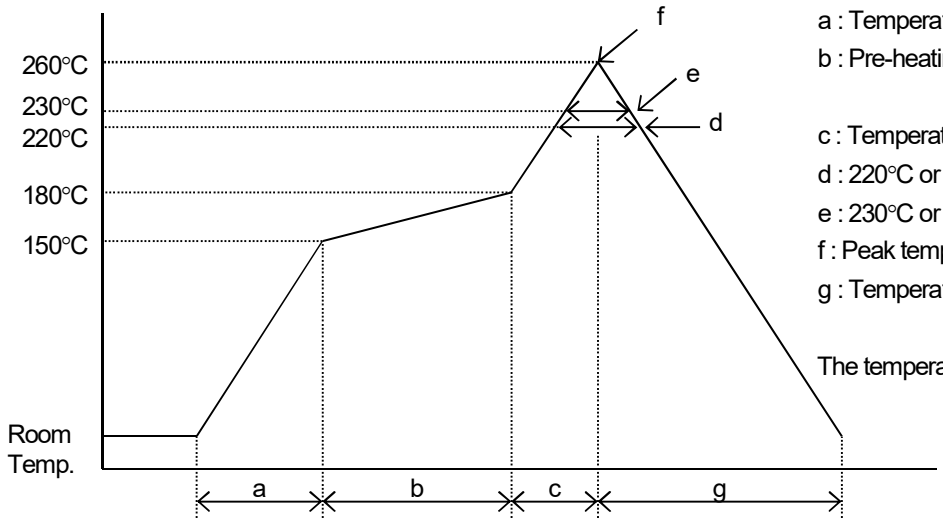
Mounting was evaluated with the following profiles in our company, so there was no problem.
However, confirm mounting by the condition of your company beforehand.

The exposure of device under higher temperature many affect to the reliability of the products, it is recommended to complete soldering in the shortest time possible.

Mounting: Two Times soldering is allowed.

■ INFRARED REFLOW SOLDERING METHOD

Recommended reflow soldering procedure



a : Temperature ramping rate	: 1 to 4°C/s
b : Pre-heating temperature	: 150 to 180°C
time	: 60 to 120s
c : Temperature ramping rate	: 1 to 4°C /s
d : 220°C or higher time	: Shorter than 60s
e : 230°C or higher time	: Shorter than 40s
f : Peak temperature	: Lower than 260°C
g : Temperature ramping rate	: 1 to 6°C /s

The temperature of the surface of mold package

(NOTE1) Using reflow furnace with short wave infrared radiation heater such as halogen lamp
Regarding temperature profile, please refer to those of reflow furnace.
In this case the resin surface temperature may become higher than lead terminals due to endothermic ally of black colored mold resin. Therefore, please avoid from direct exposure to mold resin.

(NOTE2) Other method
Such other methods of soldering as dipping the device into melted solder and vapor phase method (VPS) are not appropriate because the body of device will be heated rapidly. Therefore, these are not recommended to apply.

(NOTE3) The resin gets softened right after soldering, so, the following care has to be taken
Not to contact the lens surface to anything.
Not to dip the device into water or any solvents.

■ FLOW SOLDERING METHOD

Flow soldering is not possible.

■ IRON SOLDERING METHOD

Iron soldering is not possible.

■ CLEANING

Avid washing the device after soldering by reflow method.

■ IC STORAGE CONDITIONS AND ITS DURATION

(1) Temperature and humidity ranges

Pack Sealing	Temperature:	5 to 40 [°C]
	Humidity:	40 to 80 [%]
Pack Opening	Temperature:	5 to 30 [°C]
	Humidity:	40 to 70 [%]

After opening the bag, solder products within 48h.
Avoid a dry environment below 40% because the products are easily damageable by the electrical discharge.
Store the products in the place where it does not create dew with the products due to a sudden change in temperature.

(2) When baking, place the reel vertically to avoid load to the side.
(3) Do not store the devices in corrosive-gas atmosphere.
(4) Do not store the devices in a dusty place.
(5) Do not expose the devices to direct rays of the sun.
(6) Do not allow external forces or loads to be applied to IC's.
(7) Be careful because affixed label on the reel might be peeled off when baking.
(8) The product is recommended to do the baking before using for the stability of the quality.

■ BAKING

In case of keeping expect above condition be sure to apply baking.
Baking method: Ta=60°C, 48 to 72h, one time baking is allowed

■ STORAGE DURATION

Within a year after delivering this device.
For the products stored longer than a year, confirm their terminals and solderability before they are used.

■ APPLICATION NOTES

When using the laser diode in the vicinity of λ=405nm, there is the restriction in terms of use.
Please be careful in the case of the use.

■ MOISTURE SENSITIVITY LEVELS

JEDEC : Level 5

[CAUTION]

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