

Ambient Light Sensor

■ GENERAL DESCRIPTION

The NJL7502R is the photo transistor which spectral response is similar to human eye.

■ FEATURES

1. Peak wavelength 590 nm
2. COBP Package size : 1.6 x 1.3 x 0.65 mm
3. Lead-free package

■ APPLICATIONS

Cellular phone, PDA, Note PC, TV, PDP, Clock, Refrigerator, Camera, Toy, Room light, etc.
to adjust the luminance of display
to control ON/OFF
Replacement of CdS

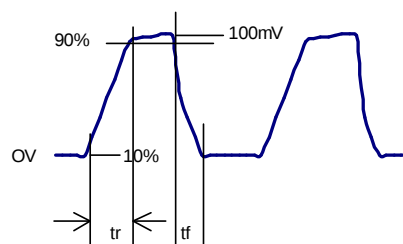
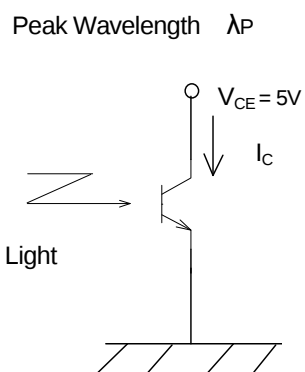
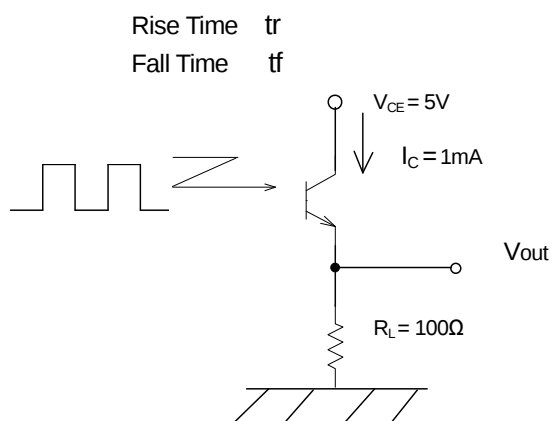
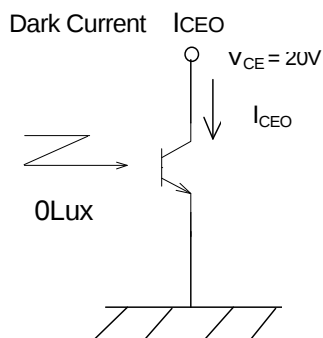
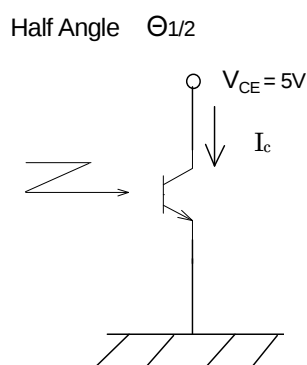
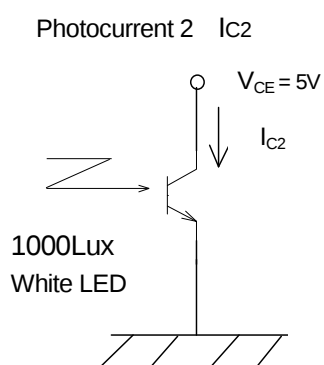
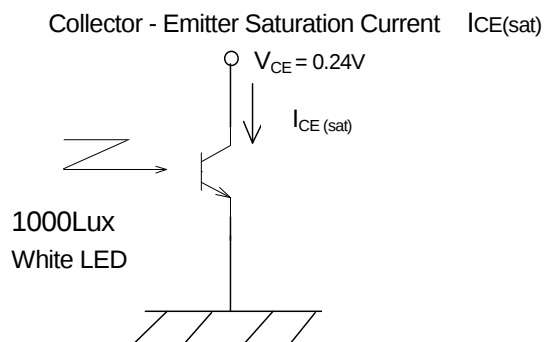
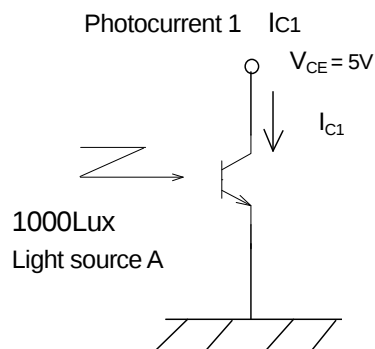
■ ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Collector - Emitter Voltage	V_{CEO}	20	V
Emitter - Collector Voltage	V_{ECO}	5	V
Photocurrent	I_C	10	mA
Power Dissipation	P_D	100	mW
Operating Temperature	T_{opr}	-40 to +85	°C
Storage Temperature	T_{stg}	-40 to +100	°C
Soldering Temperature	T_{sol}	260	°C

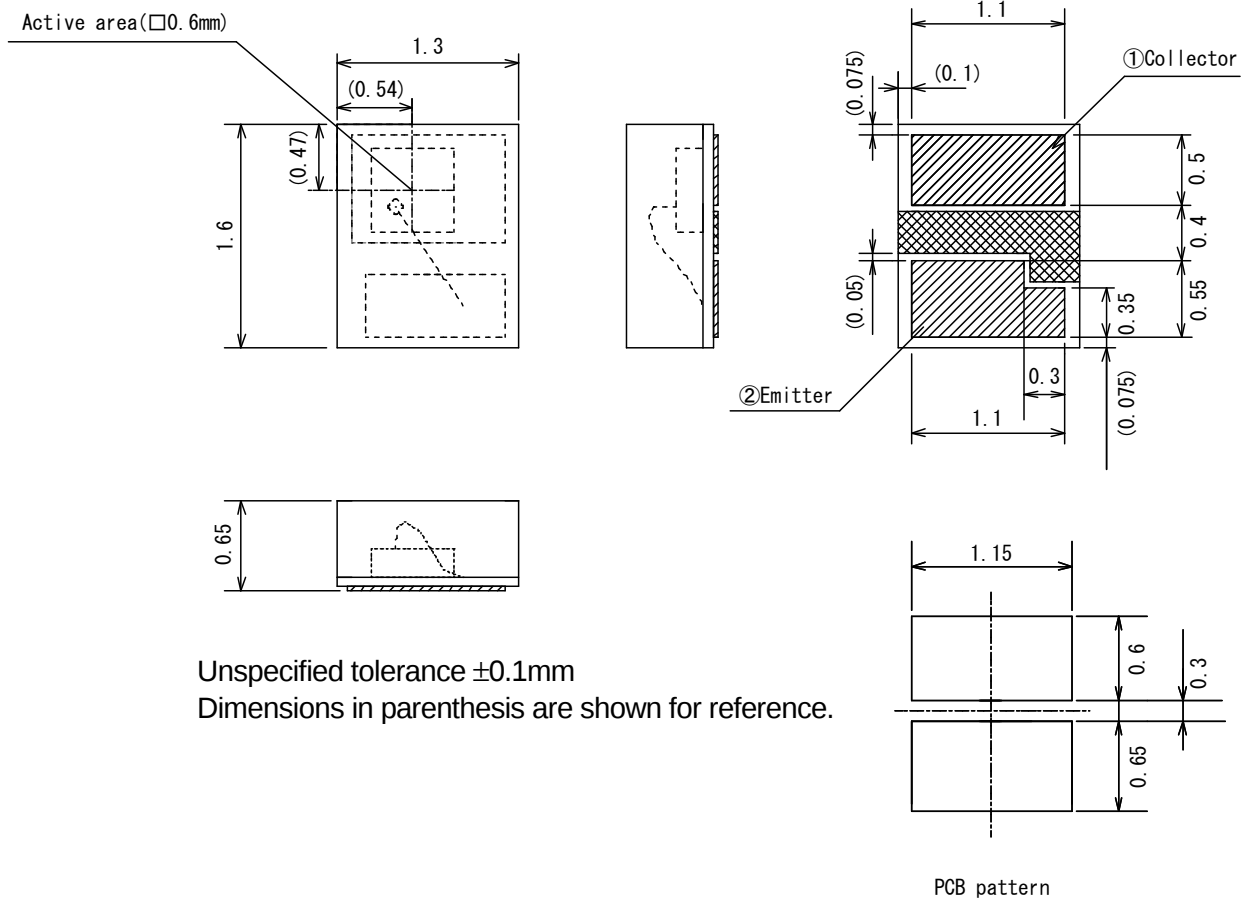
■ ELECTRO-OPTICAL CHARACTERISTICS (Ta=25°C)

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Photocurrent 1	I_{C1}	$V_{CE}=5V$, $E_v=1,000\text{Lux}$, Light source A	—	130	—	μA
Photocurrent 2	I_{C2}	$V_{CE}=5V$, $E_v=1,000\text{Lux}$, White LED	11	45	79	μA
Dark Current	I_{CEO}	$V_{CE}=20V$	—	—	0.1	μA
Peak Wavelength	λ_P	—	—	590	—	nm
Collector - Emitter Saturation Current	$I_{CE(sat)}$	$V_{CE}=0.24V$, $E_v=1,000\text{Lux}$ White LED	3	—	—	μA
Half Angle	$\Theta_{1/2}$	—	—	± 60	—	deg.
Rise Time	t_r	$V_{CE}=5V$, $I_C=1\text{mA}$, $R_L=100\Omega$	—	10	—	μs
Fall Time	t_f	$V_{CE}=5V$, $I_C=1\text{mA}$, $R_L=100\Omega$	—	10	—	μs

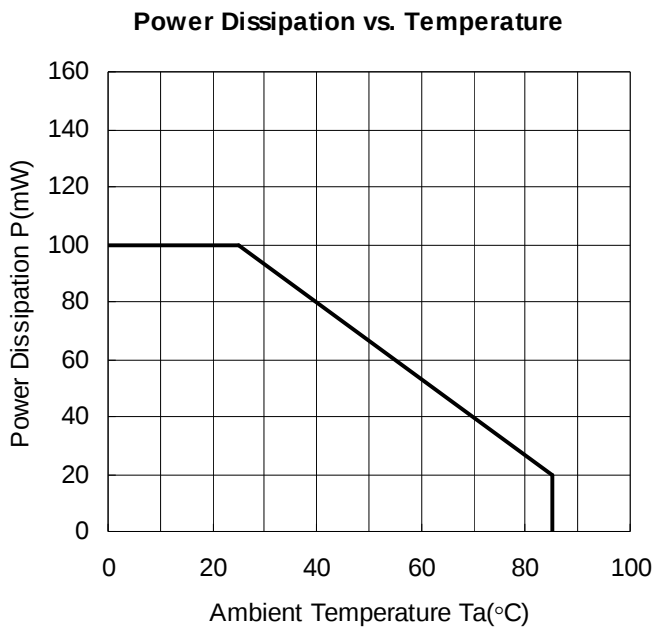
■ TEST CIRCUIT



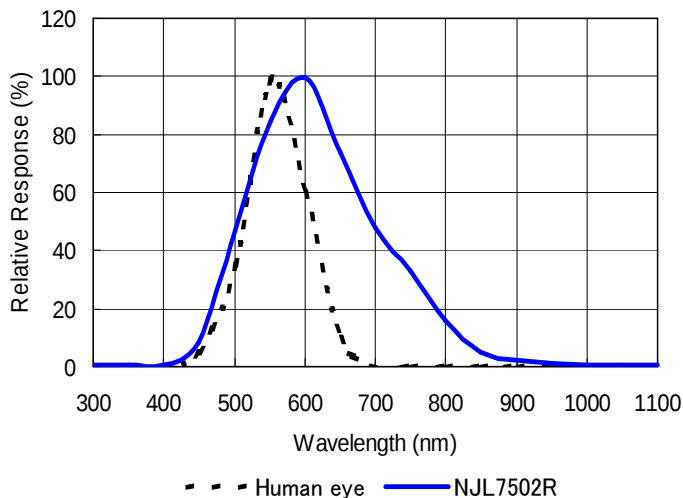
■ OUTLINE (TYP.) UNIT : mm



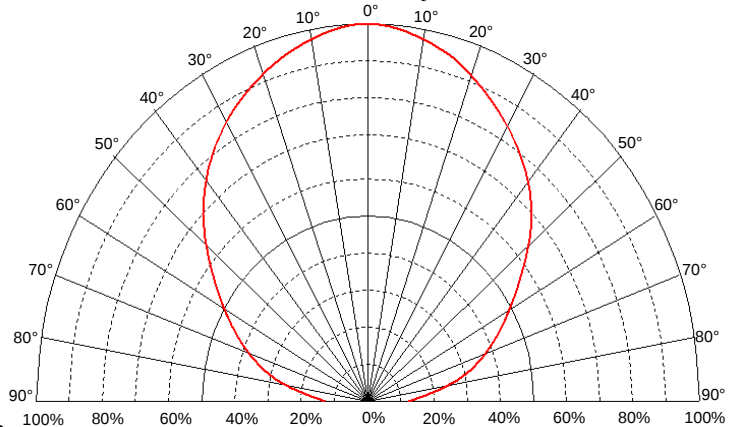
■ TYPICAL CHARACTERISTICS



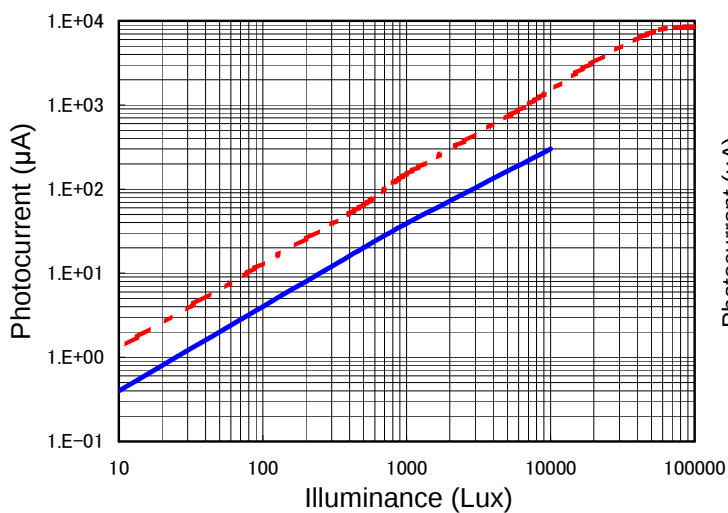
Spectral Response ($T_a=25^\circ\text{C}$)



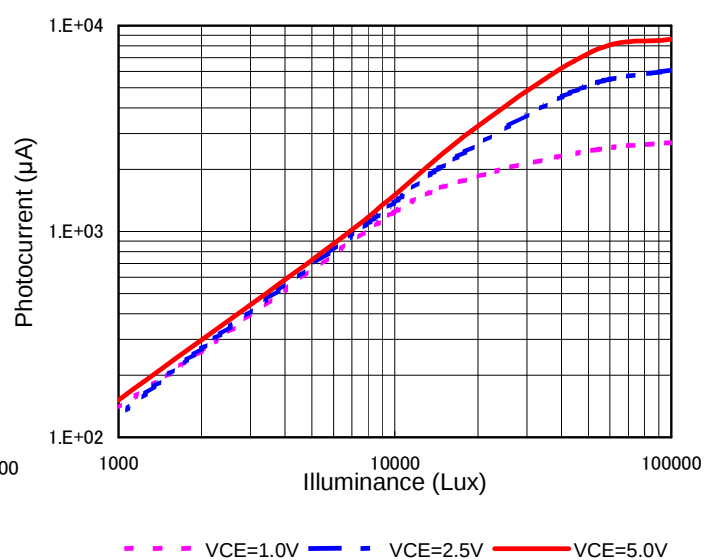
Directivity



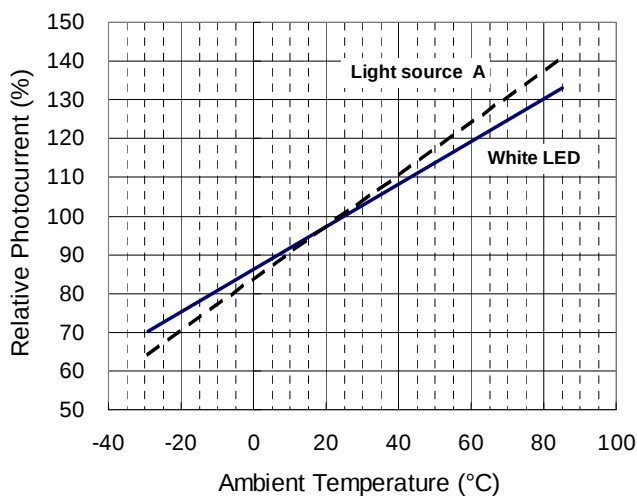
Photocurrent vs. Illuminance
($V_{CE}=5.0\text{V}$, $T_a = 25^\circ\text{C}$)



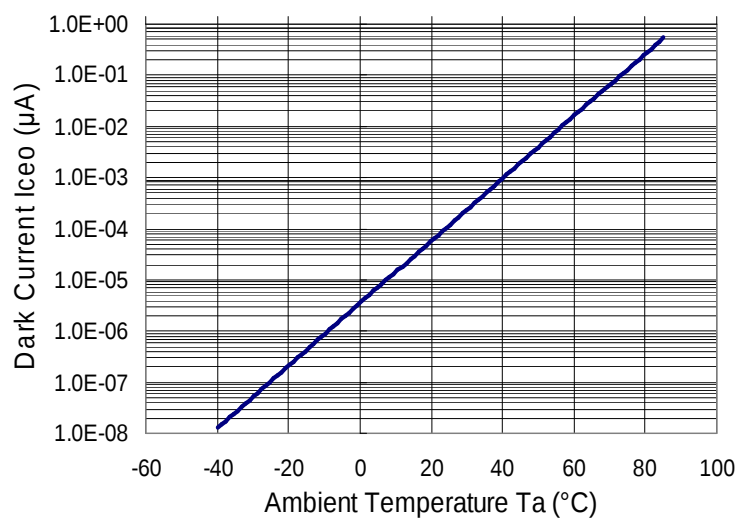
Photocurrent vs. Illuminance
(Light source A, $T_a = 25^\circ\text{C}$)



Photocurrent vs Temperature
 $V_{ce}=5.0\text{V}$



Dark Current vs. Temperature
 $V_{ce}=5.0\text{V}$



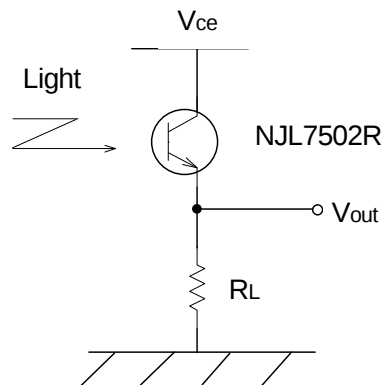
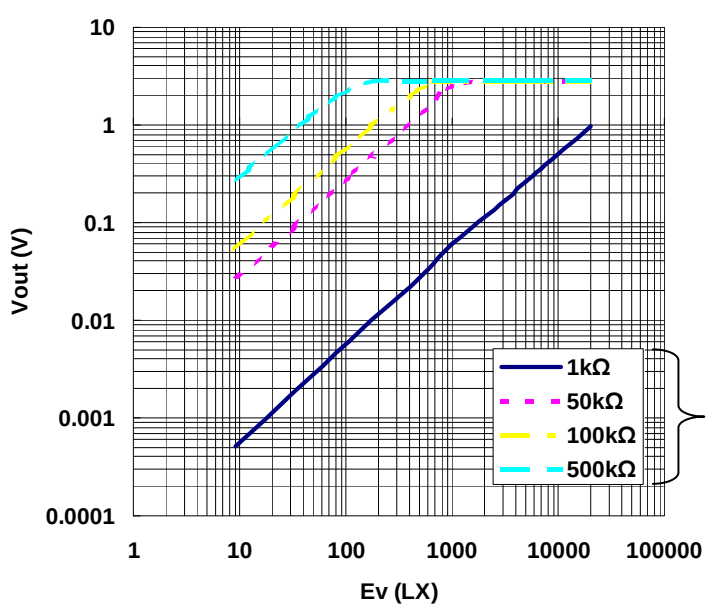
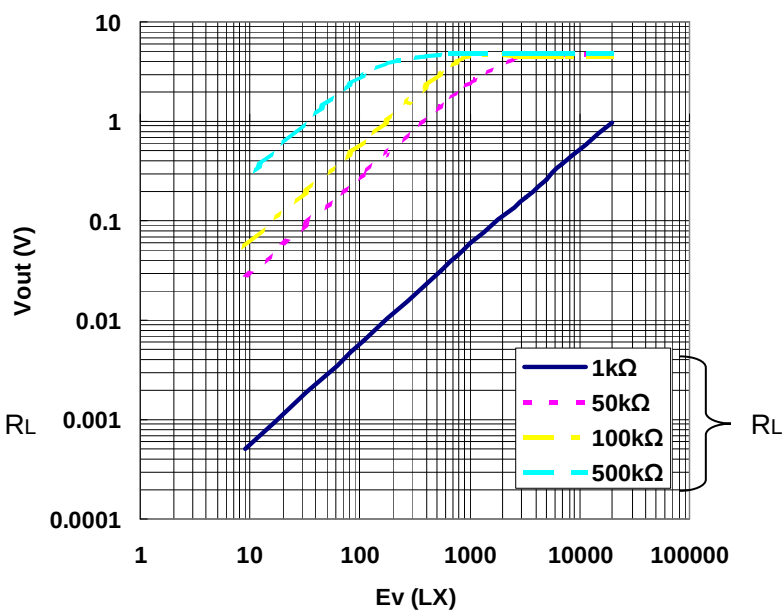


Fig1 Application Circuit

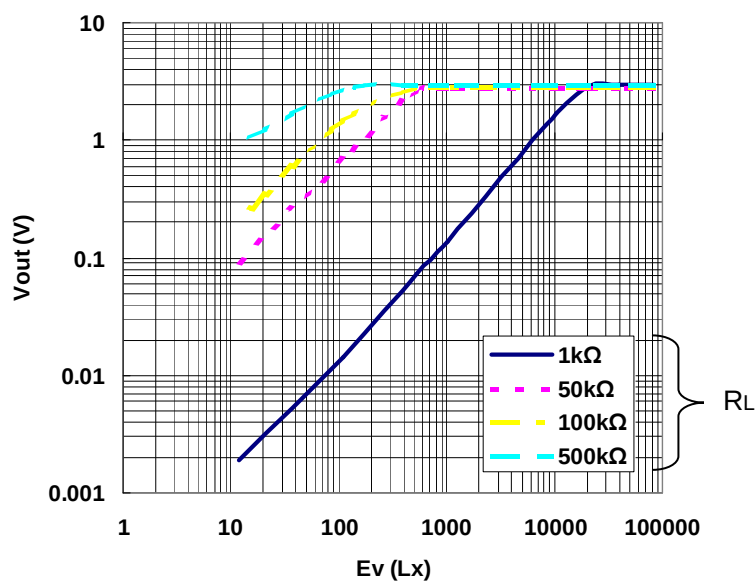
NJL7502R White LED $V_{ce}=3.0V$



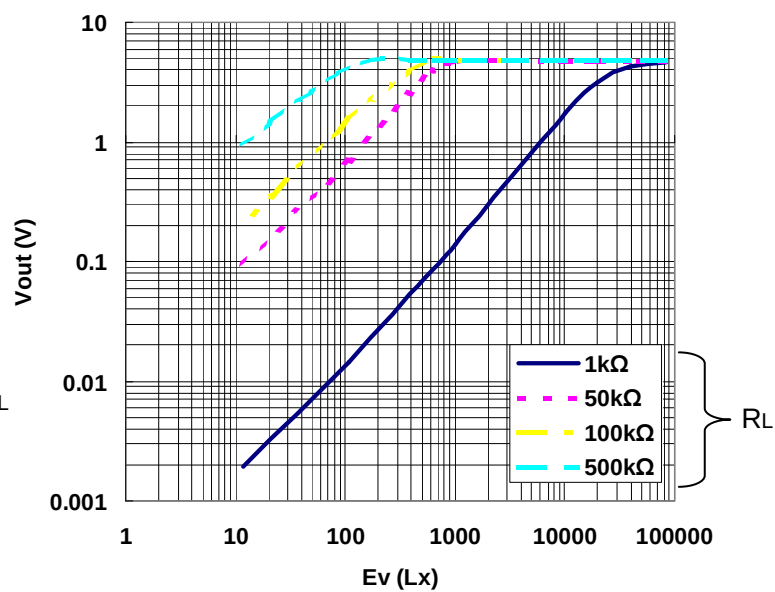
NJL7502R White LED $V_{ce}=5.0V$



NJL7502R Light source A $V_{ce}=3.0V$



NJL7502R Light source A $V_{ce}=5.0V$



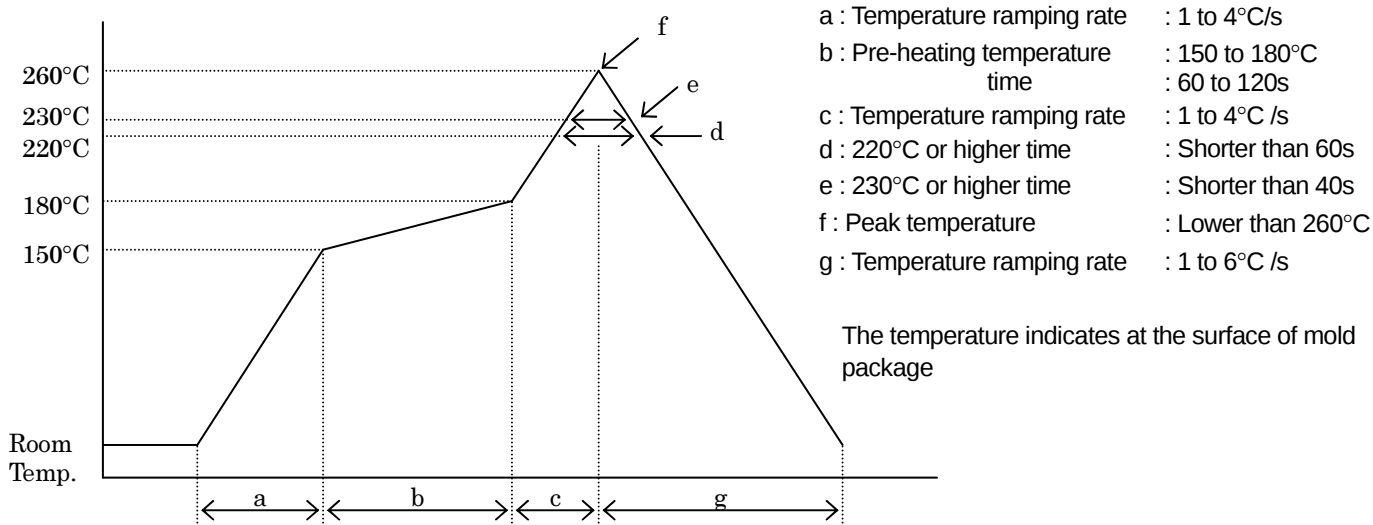
■ MOUNTING METHOD

(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 may affect to the reliability of the products, it is recommended to complete soldering in the shortest time possible.
- Mounting : twice soldering is allowed.

INFRARED REFLOW SOLDERING METHOD

* Recommended reflow soldering procedure



- (1) Using reflow furnace with short wave infrared radiation heater such 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 form direct exposure to mold resin.
- (2) 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.
- (3) The resin gets softened right after soldered, 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 CONDITIONS

Please refrain from cleaning immediately after reflow of this device.

■ 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. (Heat-resistant tape)

Baking method: Ta=60°C, 48 to 72h, Three times baking is allowed

Ta=100°C, 2 to 6h, Three times 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.

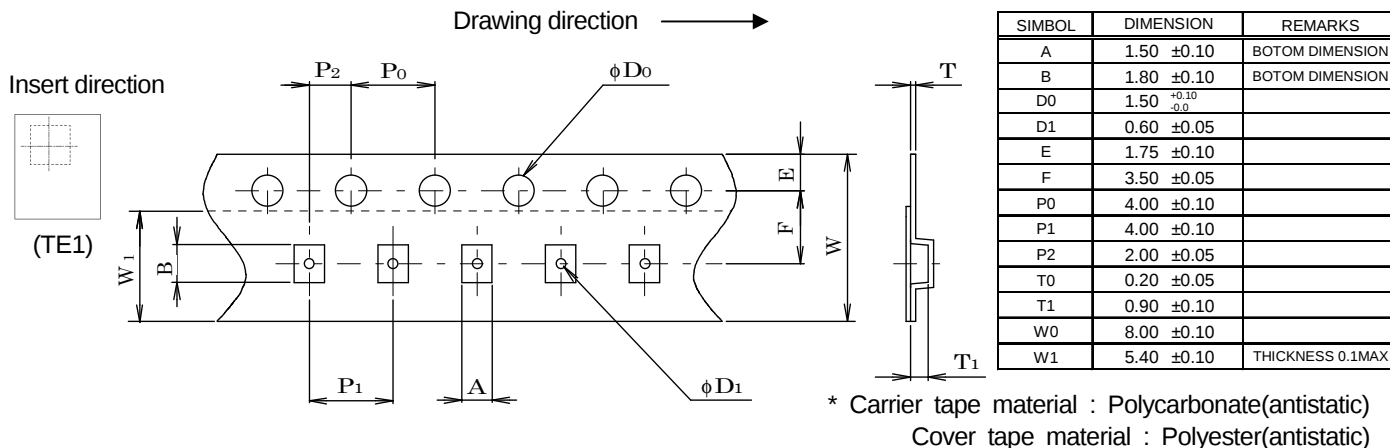
■ MOISTURE SENSITIVITY LEVELS

JEDEC : Level 5

NJL7502R

PACKING SPECIFICATION

PACKING DIMENTIONS UNIT : mm

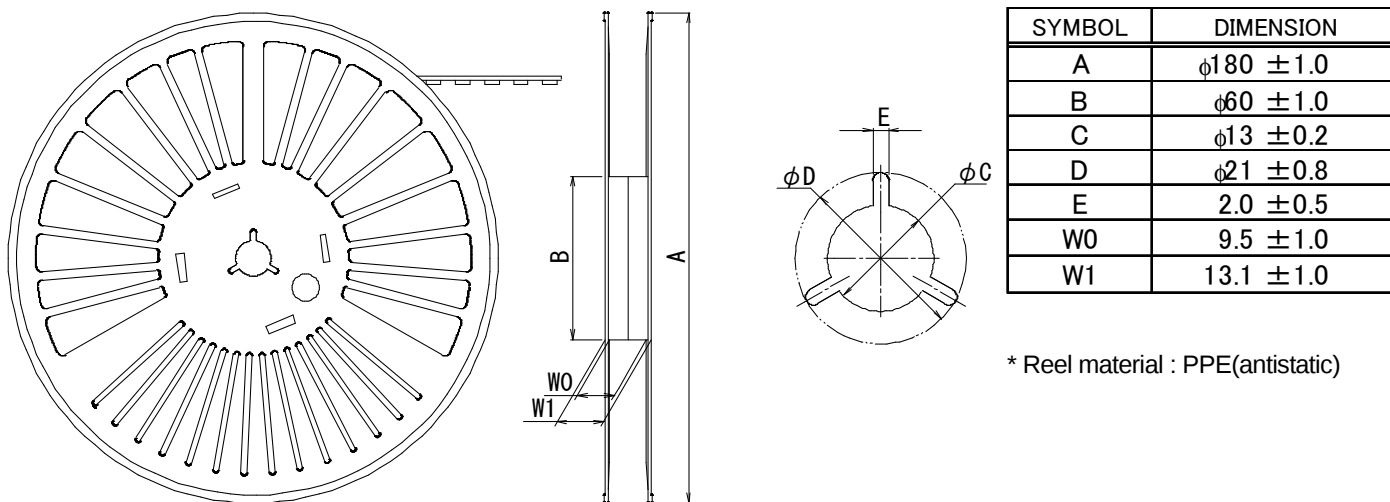


Taping Strength

Pull up the cover tape from the carrier tape, and when the opening angle comes around 10 to 15 , and the peeling-off strength is to be within the power of 20 to 40g.

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 20 Pieces, and 2 round of reel space at the cover tape only.
- 3) Taping quantity : 2,000 Pieces
- 4) Seal off after putting each reels in a damp proof bag with silica gel.



[CAUTION]

The specifications on this databook are only given for information , without any guarantee as regards either mistakes or omissions. The application circuits in this databook are described only to show representative usages of the product and not intended for the guarantee or permission of any right including the industrial rights.