

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)

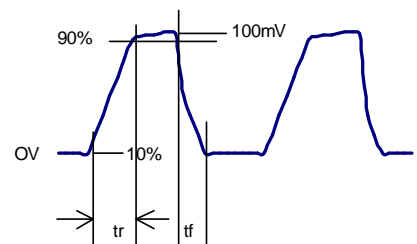
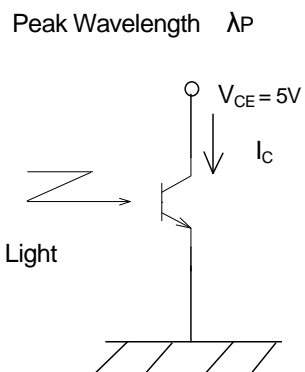
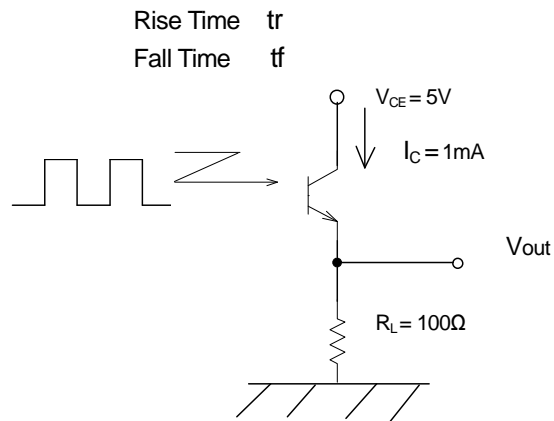
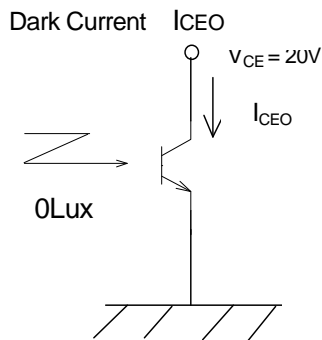
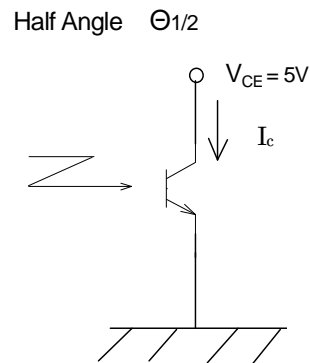
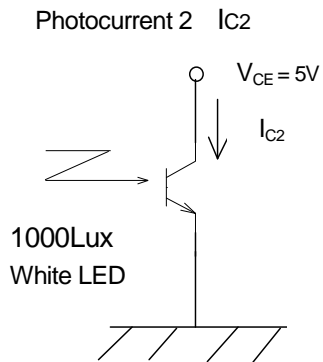
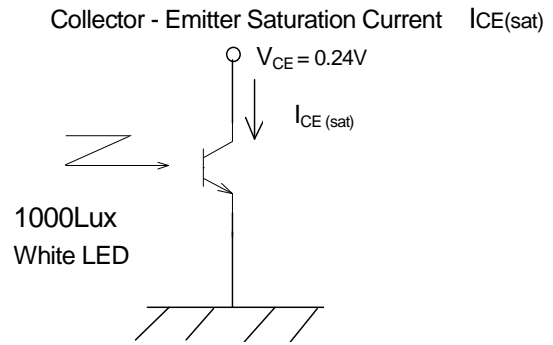
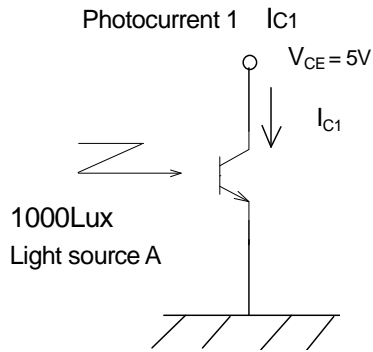
| PARAMETER | SYMBOL | RATINGS | UNIT |
|-----------------------------|-----------|-------------|------|
| Collector - Emitter Voltage | V_{CEO} | 20 | V |
| Emitter - Collector Voltage | V_{ECO} | 5 | V |
| Photocurrent | I_C | 10 | mA |
| Power Dissipation | P_D | 100 | mW |
| Operating Temperature | 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)

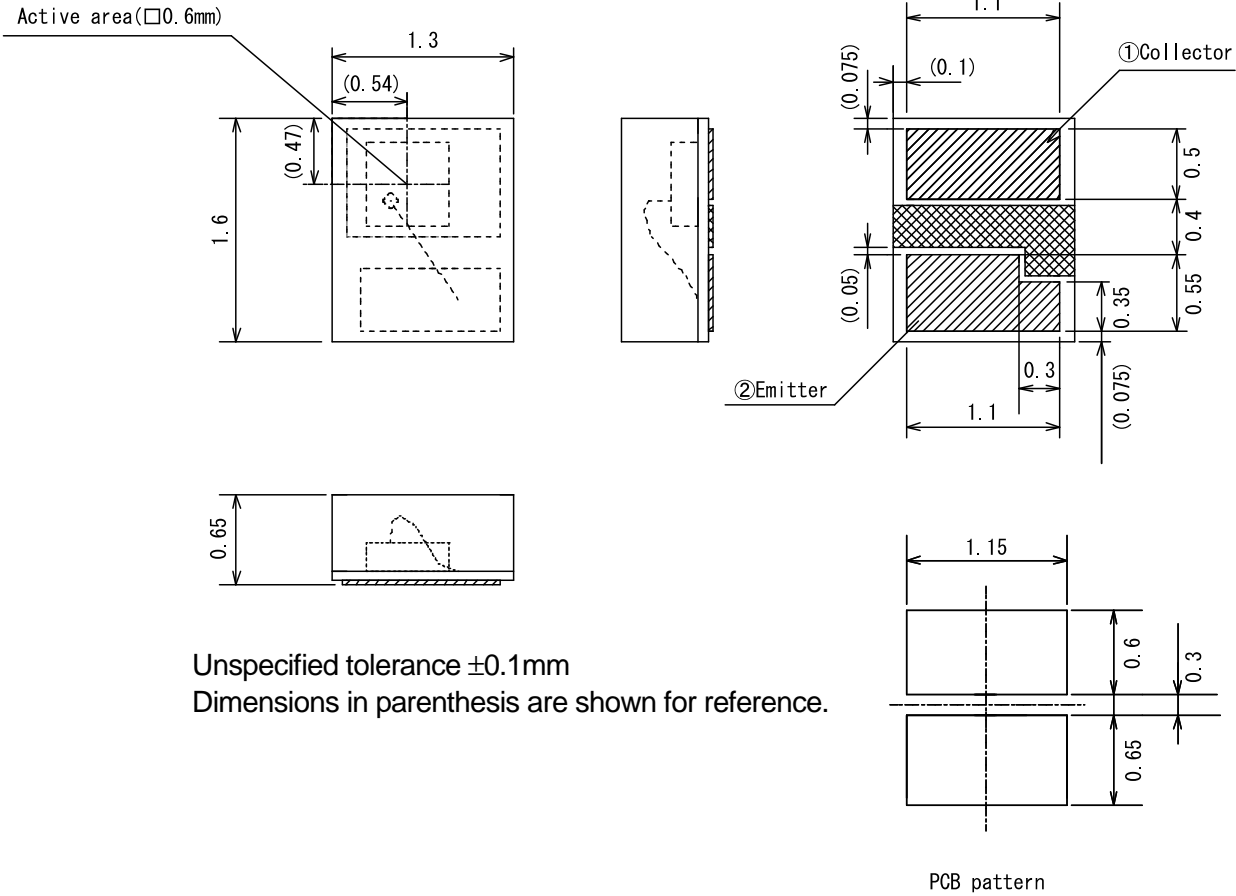
| PARAMETER | SYMBOL | TEST CONDITION | MIN | TYP | MAX | UNIT |
|--|----------------|--|-----|----------|-----|---------------|
| Photocurrent 1 | I_{C1} | $V_{CE}=5V$, $E_v=1,000\text{Lux}$, Light source A | — | 130 | — | μA |
| Photocurrent 2 | I_{C2} | $V_{CE}=5V$, $E_v=1,000\text{Lux}$, White LED | 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 |

NJL7502R

■ TEST CIRCUIT



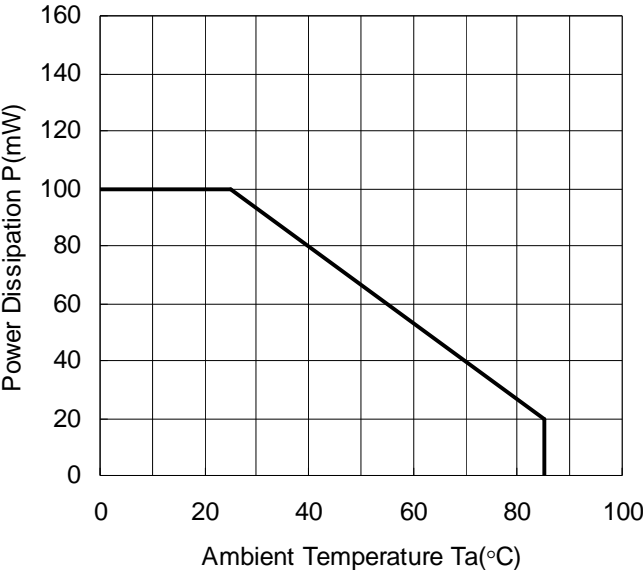
■ **OUTLINE (TYP.)** UNIT : mm



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

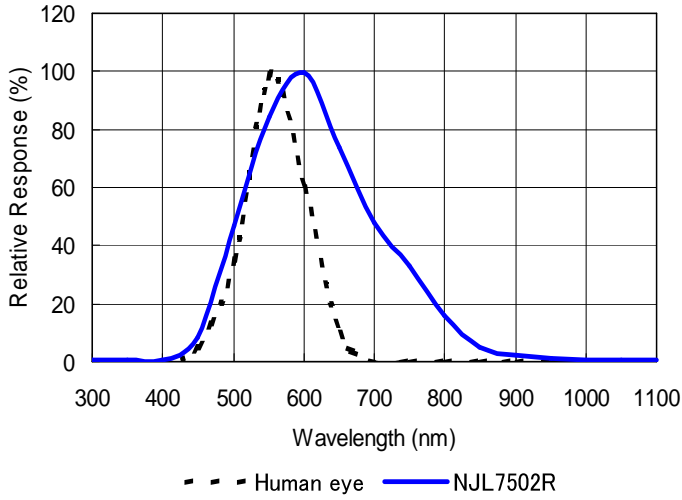
■ **TYPICAL CHARACTERISTICS**

Power Dissipation vs. Temperature

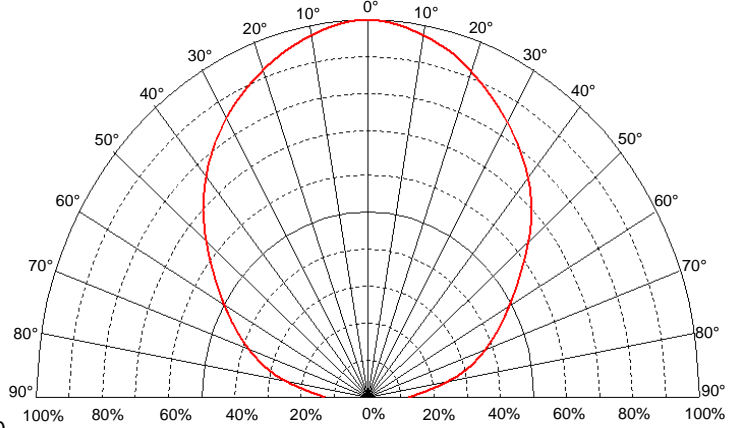


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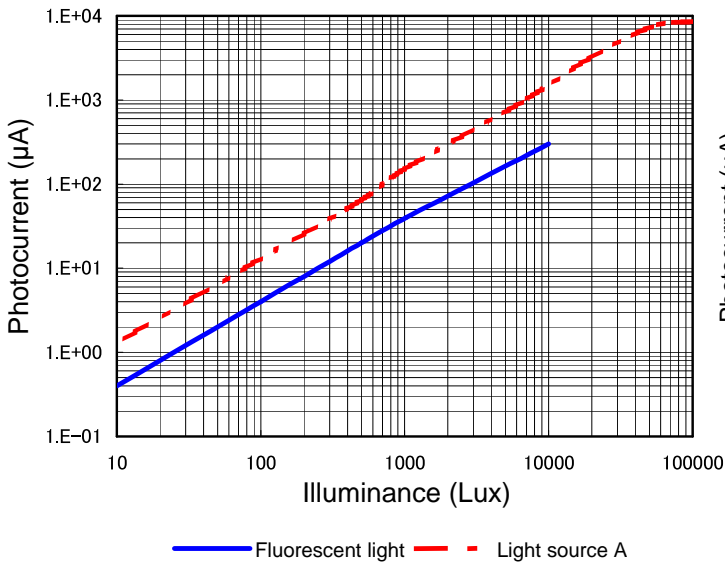
Spectral Response (Ta=25°C)



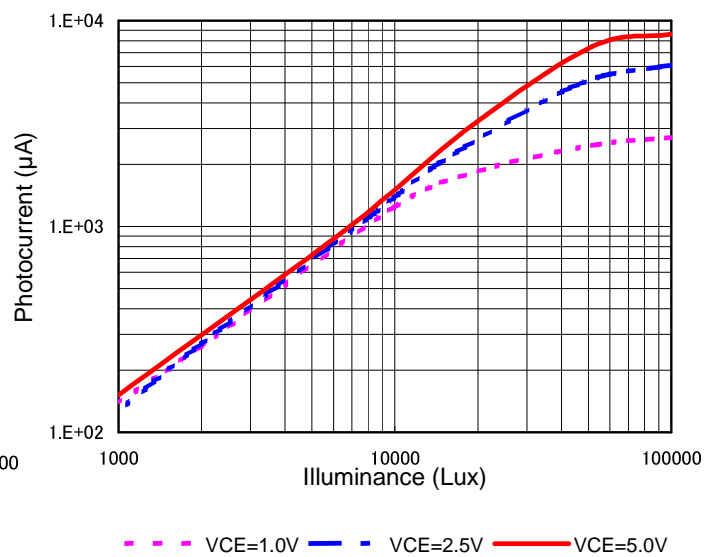
Directivity



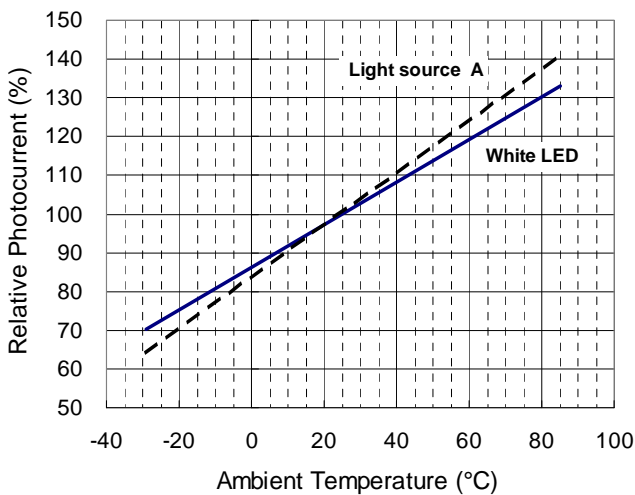
Photocurrent vs. Illuminance (V_{CE}=5.0V, Ta = 25°C)



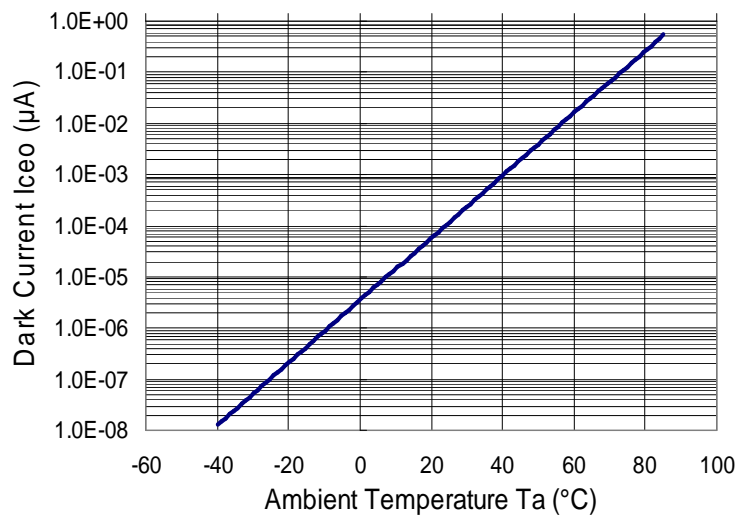
Photocurrent vs. Illuminance (Light source A, Ta = 25°C)



Photocurrent vs Temperature V_{ce}=5.0V



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



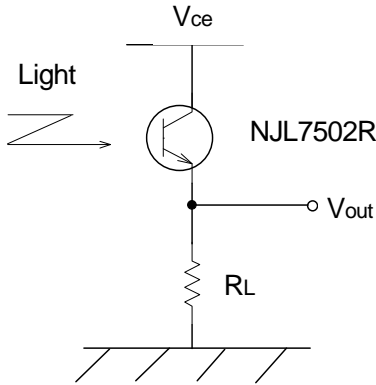
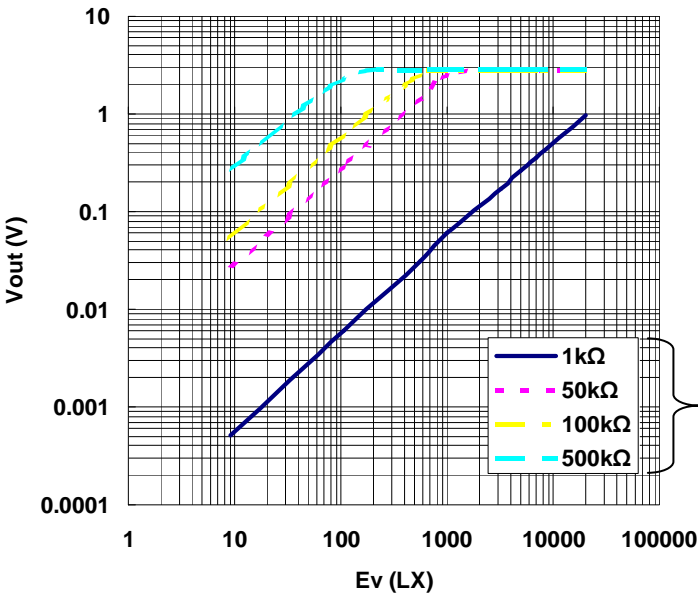
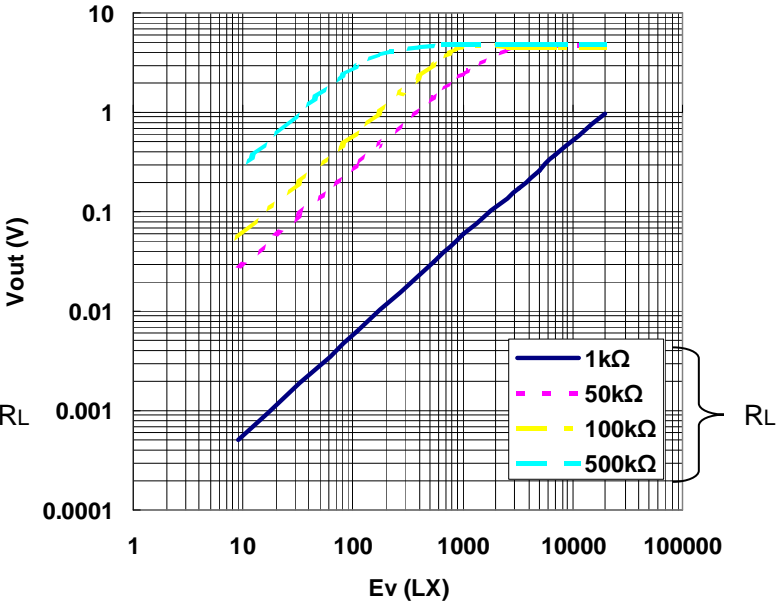


Fig1 Application Circuit

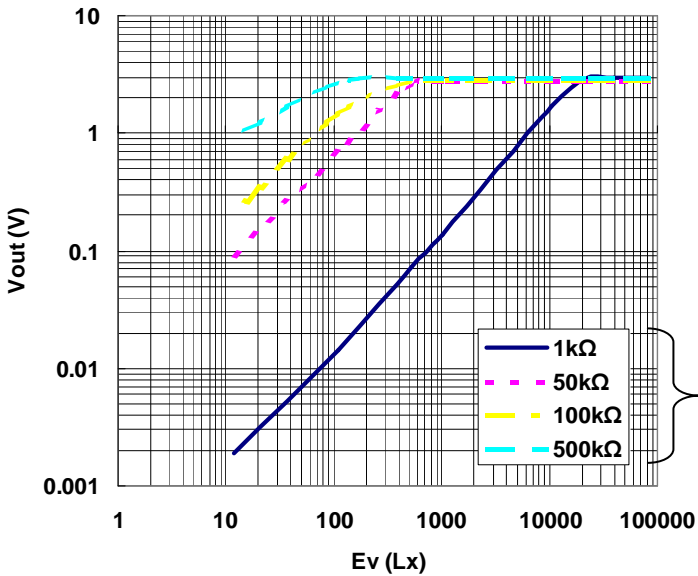
NJL7502R White LED Vce=3.0V



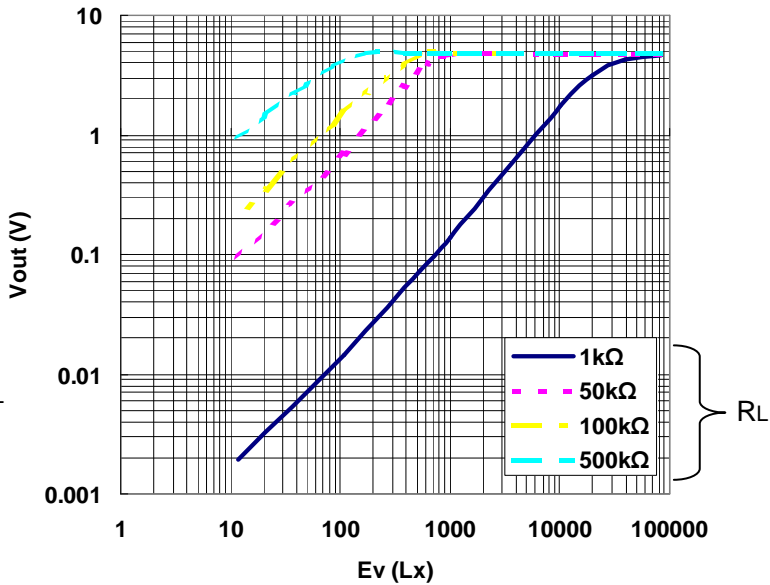
NJL7502R White LED Vce=5.0V



NJL7502R Light source A Vce=3.0V



NJL7502R Light source A Vce=5.0V



NJL7502R

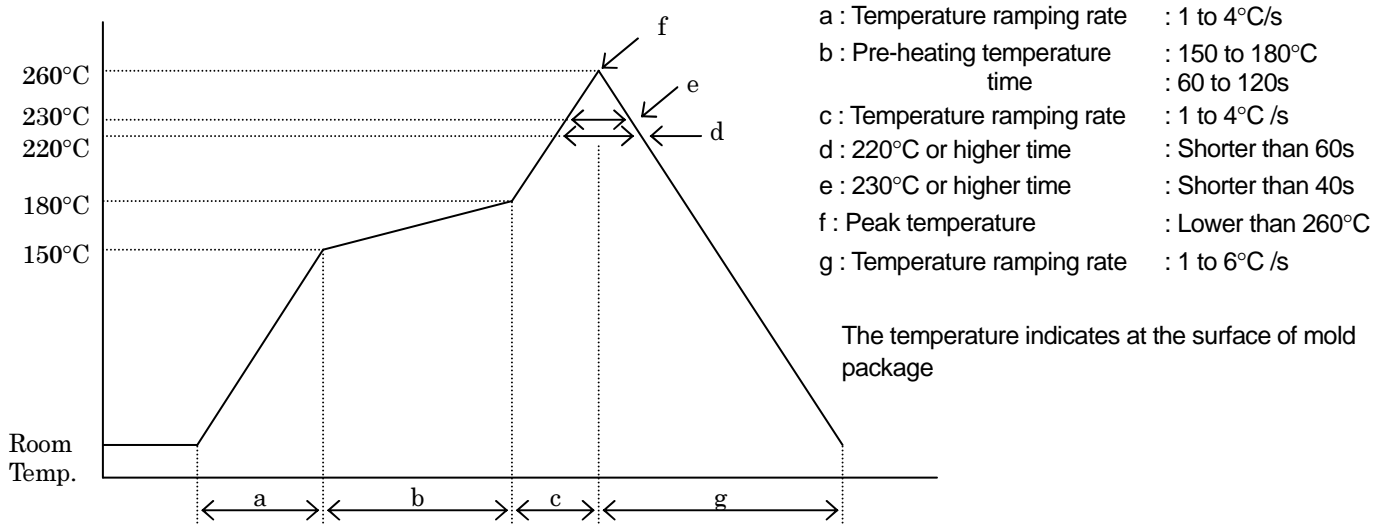
■ MOUNTING METHOD

(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.

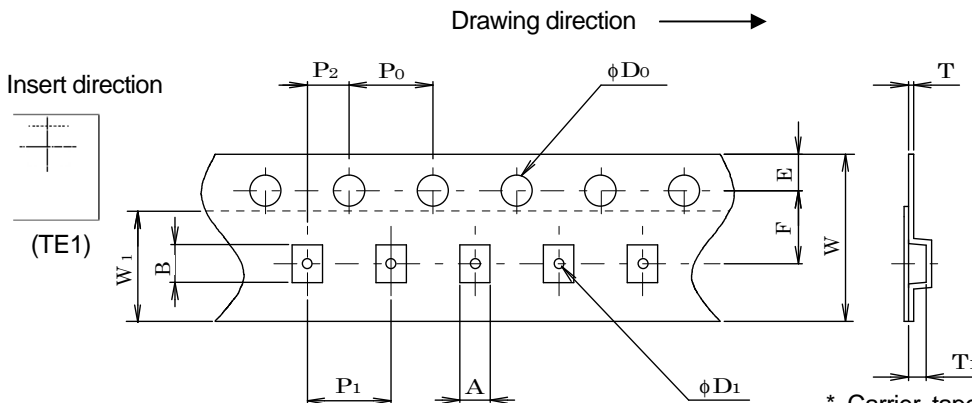
■ MOISTURE SENSITIVITY LEVELS

JEDEC : Level 5

NJL7502R

PACKING SPECIFICATION

PACKING DIMENTIONS UNIT : mm



| SIMBOL | DIMENSION | REMARKS |
|--------|---------------------------------------|------------------|
| A | 1.50 ±0.10 | BOTOM DIMENSION |
| B | 1.80 ±0.10 | BOTOM DIMENSION |
| D0 | 1.50 ^{+0.10} _{-0.0} | |
| D1 | 0.60 ±0.05 | |
| E | 1.75 ±0.10 | |
| F | 3.50 ±0.05 | |
| P0 | 4.00 ±0.10 | |
| P1 | 4.00 ±0.10 | |
| P2 | 2.00 ±0.05 | |
| T0 | 0.20 ±0.05 | |
| T1 | 0.90 ±0.10 | |
| W0 | 8.00 ±0.10 | |
| W1 | 5.40 ±0.10 | THICKNESS 0.1MAX |

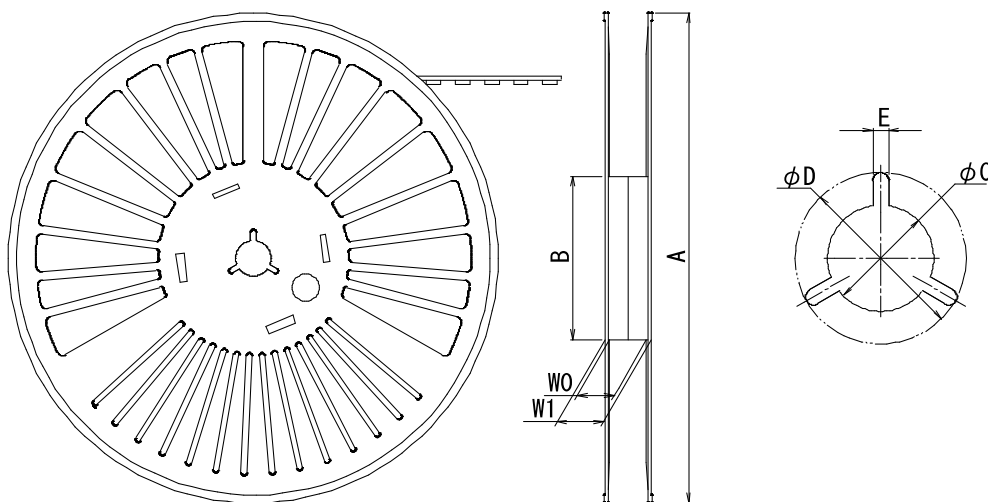
* Carrier tape material : Polycarbonate(antistatic)
Cover tape material : Polyester(antistatic)

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.



| SYMBOL | DIMENSION |
|--------|-----------|
| A | φ180 ±1.0 |
| B | φ60 ±1.0 |
| C | φ13 ±0.2 |
| D | φ21 ±0.8 |
| E | 2.0 ±0.5 |
| W0 | 9.5 ±1.0 |
| W1 | 13.1 ±1.0 |

* Reel material : PPE(antistatic)

[CAUTION]
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