

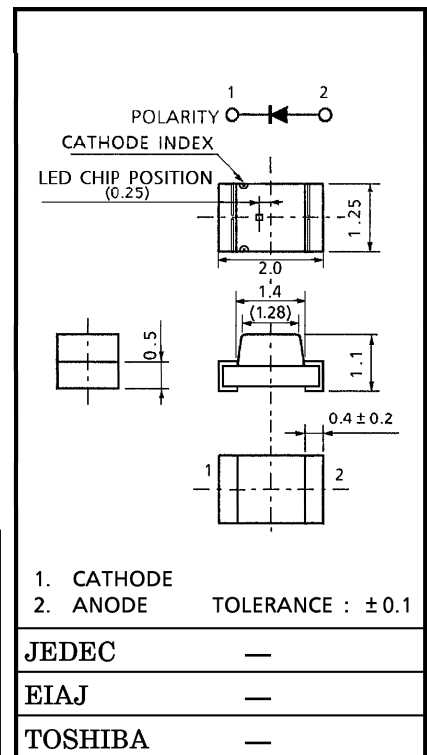
TOSHIBA LED LAMP GaP RED LIGHT EMISSION

TLR1002(ZD)

LED SURFACE MOUNT DEVICE

Unit in mm

- 2.0 (L) × 1.25 (W) × 1.1 (H) mm Size
Small Package-High Density Mounting is Available
- Available of Automounting Machine Use
- Reflow Soldering is possible
- Low Drive Current (10 μ A), Stable Forward Voltage (1.65 V)
Recommended Forward Current : $I_F = 10 \mu A$ (DC)
- Applications : Solar Battery Equipment etc.



MAXIMUM RATINGS (Ta = 25°C)

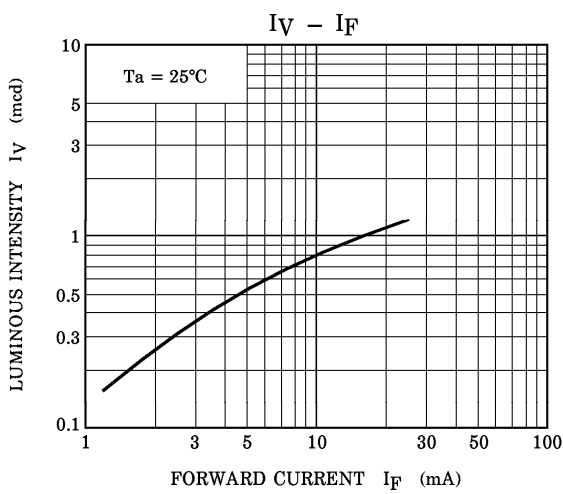
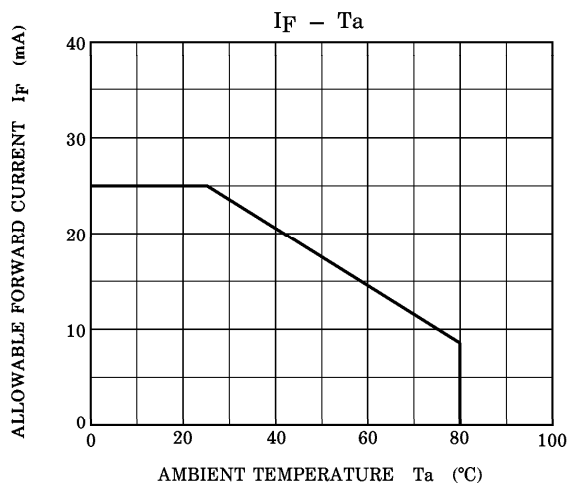
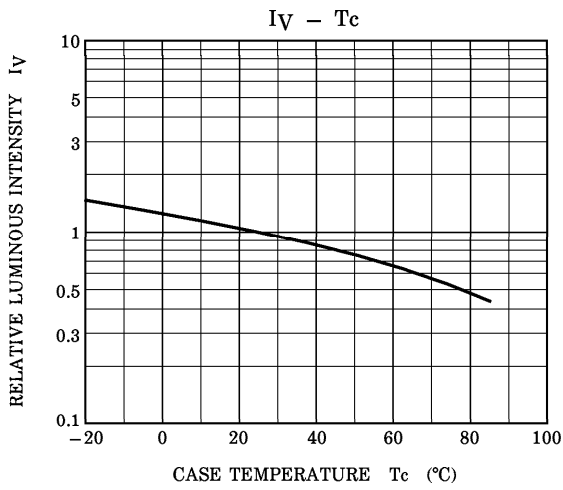
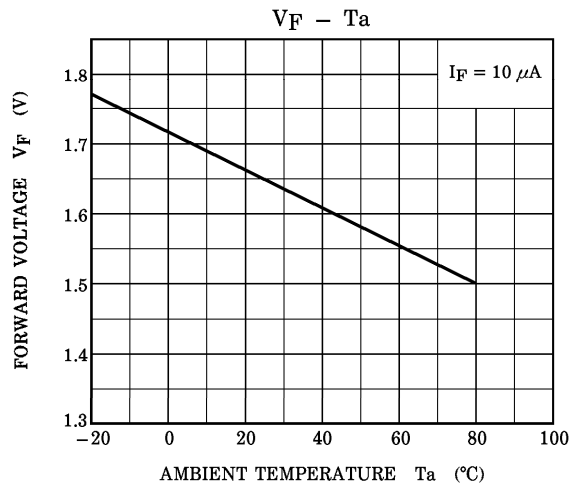
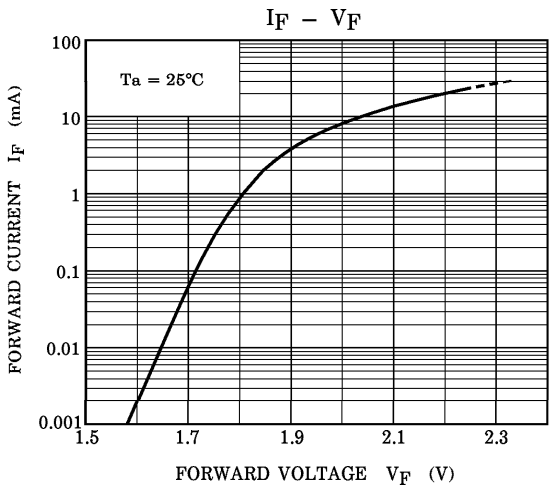
| CHARACTERISTIC | SYMBOL | RATING | UNIT |
|-----------------------------|-----------|--------|------|
| Forward Current (DC) | I_F | 25 | mA |
| Reverse Voltage | V_R | 4 | V |
| Power Dissipation | P_D | 70 | mW |
| Operating Temperature Range | T_{opr} | -25~80 | °C |
| Storage Temperature Range | T_{stg} | -30~85 | °C |

ELECTRICAL AND OPTICAL CHARACTERISTICS (Ta = 25°C)

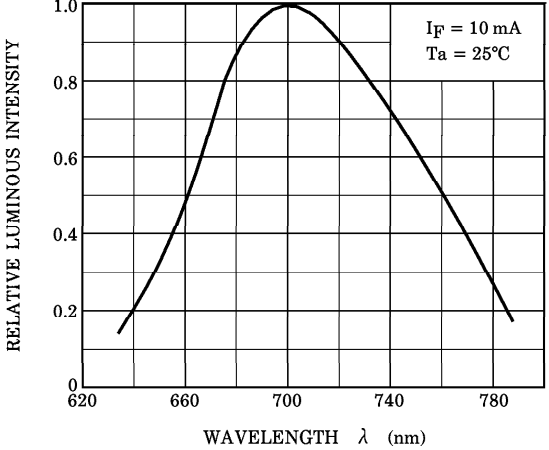
| CHARACTERISTIC | SYMBOL | TEST CONDITION | MIN | TYP. | MAX | UNIT |
|---------------------------|-----------------|------------------|------|------|------|---------|
| Forward Voltage | V_F | $I_F = 10 \mu A$ | 1.53 | 1.65 | 1.73 | V |
| | V_F | $I_F = 1 mA$ | 1.7 | 1.8 | 1.9 | V |
| Reverse Current | I_R | $V_R = 4 V$ | — | — | 5 | μA |
| Luminous Intensity | I_V | $I_F = 10 mA$ | — | 0.8 | — | mcd |
| Peak Emission Wave Length | λ_P | $I_F = 10 mA$ | — | 700 | — | nm |
| Spectral Line Half Width | $\Delta\lambda$ | $I_F = 10 mA$ | — | 100 | — | nm |

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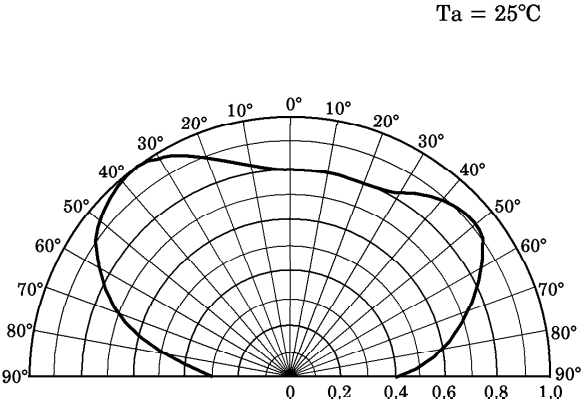
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RELATIVE LUMINOUS INTENSITY – WAVELENGTH



RADIATION PATTERN



PACKAGING

This LED device is packed in an aluminum envelope with silica gel to avoid moisture absorption. The optical characteristics may be affected by exposure to moisture in the air before soldering and it should be stored under the following conditions.

- Temperature : 5~30°C
- Relative Humidity : 60% or lower

Baking is required if the device have been stored with unopened for more than 6 months or if the aluminum envelope has been opened for more than 168 h.

Recommended baking condition is 60°C for 12 h minimum in the dry atmosphere.

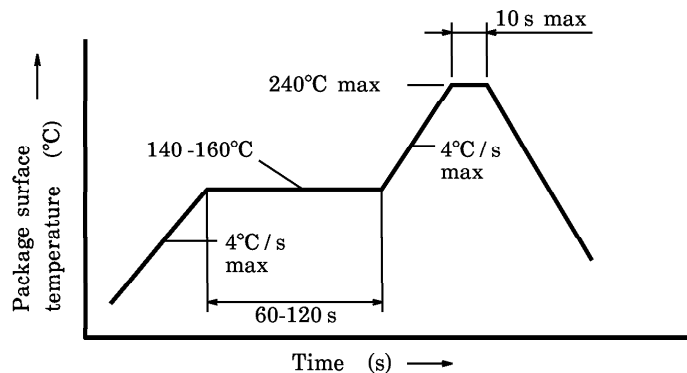
PRECAUTION FOR MOUNTING

- Do not apply force to the plastic part of the LED in high temperature conditions.
- Do not apply friction using a hard materials for avoid injuring the plastic part of the LED.
- Keep the LED away from any other parts when assembling boards into the set.

SOLDERING

- Reflow soldering

Temperature profile



- Second time reflow

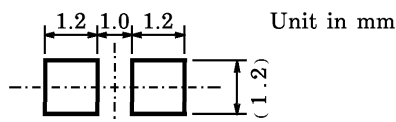
In case of second reflow soldering, it should be performed within 168 h after first reflow under the above conditions.

Storage conditions before second reflow soldering : 30°C, 60% RH or lower

- Do not perform flow soldering.
- Make any necessary soldering corrections manually.
(Do not do this more than once for any given pin.)

- Soldering iron : Less than 25 W
- Temperature : Lower than 300°C
- Time : Within 3 s

- Recommended soldering pattern



POST SOLDER CLEANING

When cleaning after soldering is needed, the following condition must be adhered to.

| | |
|-------------------|---------------------------------------------------------------|
| Cleaning solvents | : AK225 or Alcohol |
| Temperature | : 50°C (max) for 30 s (max) or 30°C (max) for 3 minutes (max) |
| Ultrasonic | : 300 W max |

TAPING SPECIFICATIONS

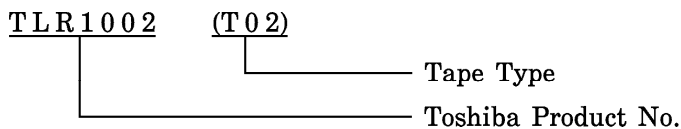
This specification lays out the 4 mm pitch embossed-tape packing requirements for 2.0 mm (L) × 1.25 mm (W) × 1.1 mm (H) size surface-mount LED lamp.

1. Product Naming System

The type of package used for shipment is denoted by a symbol suffix after the product number. The method of classification is as below. (this method, however does not apply to products whose electrical characteristics differ from standard Toshiba specifications)

(1) Tape Type : T02 (4 mm pitch)

(2) Example



2. Related Matter

(1) Electro-optical Characteristics

Please refer to the each technical datasheet for electro-optical characteristics of tape packed products

(2) Handling Precautions

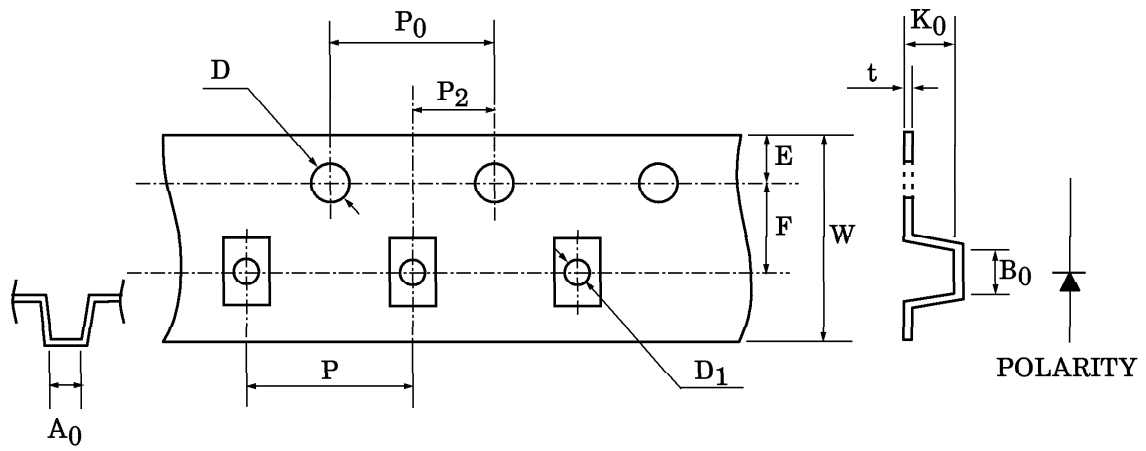
Tape material protected against static electricity. However, static electricity may occur depending on quantity of charged static electricity and a device may attach to a tape, or a device may be unstable when peeling a tape cover.

- In process, taping materials may sustain an electrostatic charge, use an ionizer to neutralize the ions.
- For transport and temporary storage of devices, use containers (boxes, jigs, bags) that are made of anti-static materials or of materials that dissipate electrostatic electricity.

3. Dimensions of tape

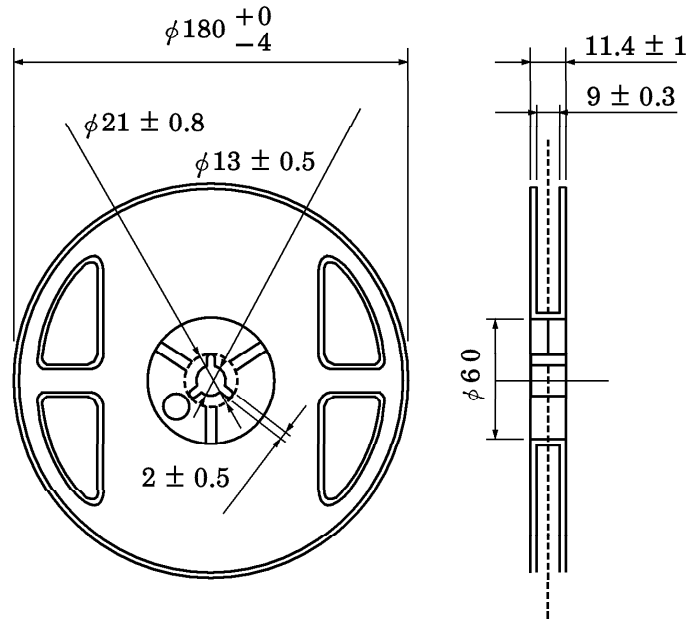
(Unit in mm)

| SYMBOL | DIMENSION | TOLERANCE | SYMBOL | DIMENSION | TOLERANCE |
|----------------|-----------|-----------|----------------|-----------|-----------|
| D | 1.50 | +0.1 / -0 | P ₂ | 2.00 | ±0.05 |
| E | 1.75 | ±0.1 | W | 8.00 | ±0.3 |
| P ₀ | 4.00 | ±0.1 | P | 4.00 | ±0.1 |
| t | 0.25 | ±0.05 | A ₀ | 1.45 | ±0.1 |
| F | 3.50 | ±0.05 | B ₀ | 2.25 | ±0.1 |
| D ₁ | 1.10 | ±0.1 | K ₀ | 1.30 | ±0.05 |

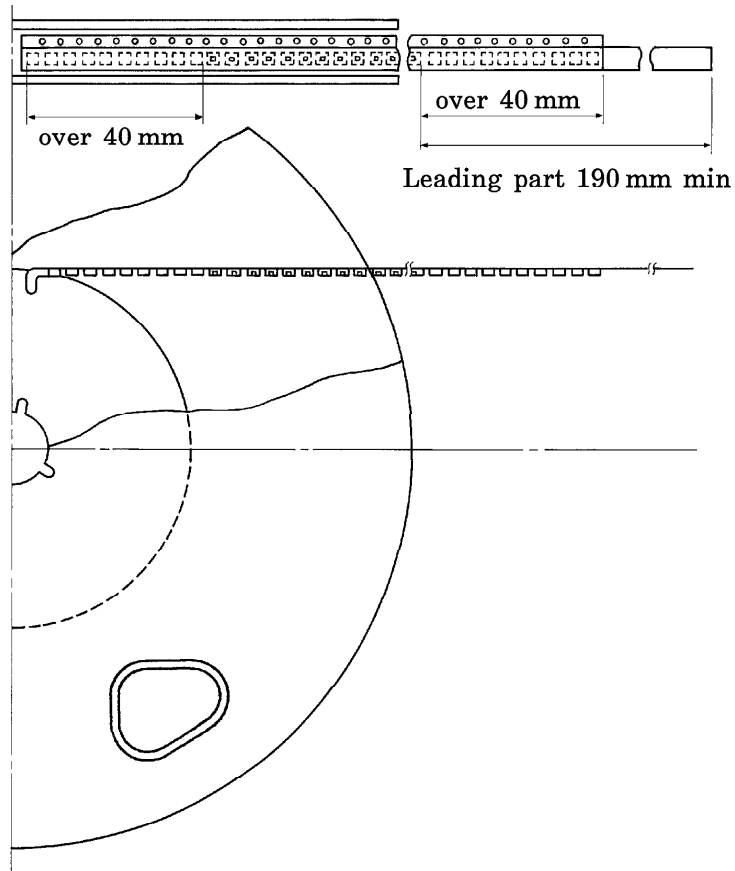


4. Dimensions of reel

Unit in mm



5. Leading part



6. Packing Form

(1) Number of Devices per Reel and Carton

| | |
|--------|---------------|
| Reel | 3000 devices |
| Carton | 15000 devices |

(2) Packing : Silica gel and reel are packed into sealed aluminum pack.

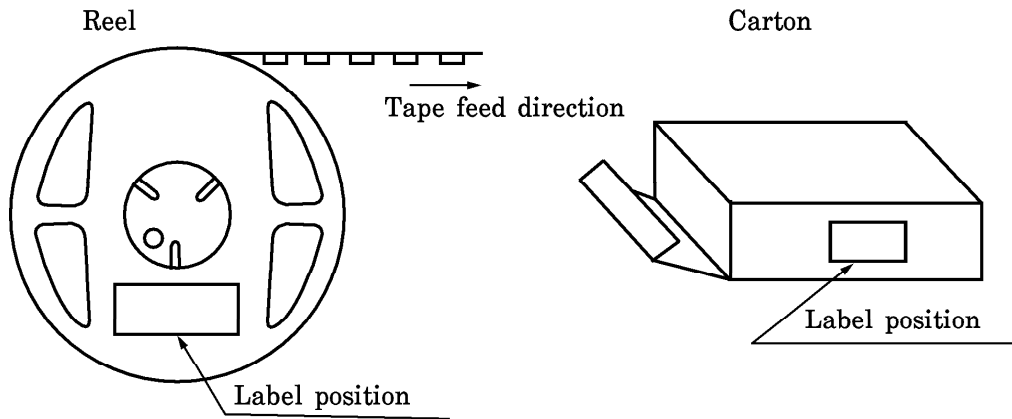
7. Notation Method

(1) Example : TLR1002 (ZD)

P/N :

| | | | |
|--------|---------------|------|------------|
| TYPE | TLR1002 | | |
| ADD. C | (ZD) | Q'TY | 3000 pcs |
| NOTE | (rank symbol) | | Lot Number |

(2) Label location :



Aluminum pack : Attached to center of one side