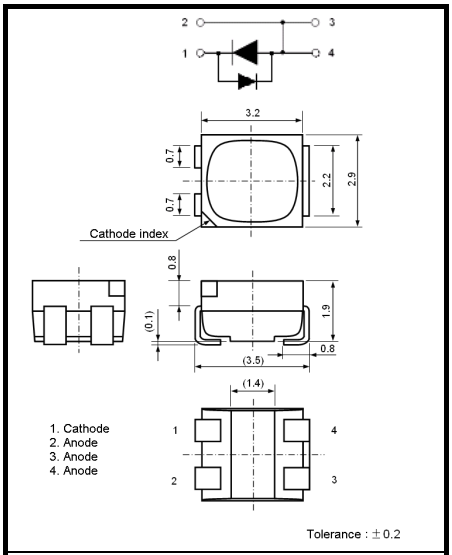
TOSHIBA LED Lamp

# TLWF1109(T11)

Unit: mm

## Panel Circuit Indicators

- 3.5 (L) mm × 2.9 (W) mm × 1.9 (H) mm
- LED chip and phosphor
- Luminous intensity: $I_V$ = 3200 mcd (typ.) @ $I_F$ = 40 mA
- Color: white
- Topr / Tstg = -40 to 100°C
- High current driving : $I_F$ = 50 mA (max)
- Standard embossed tape packing:
  4 mm pitch: T11 type (2000 pcs/reel)
  8-mm tape/ reel
- Applications: automotive use, backlighting etc.




| | |
|---|---|
| JEDEC | — |
| JEITA | — |
| TOSHIBA | 4-3W1 |

Weight: 0.035 g (typ.)

## Color and Material

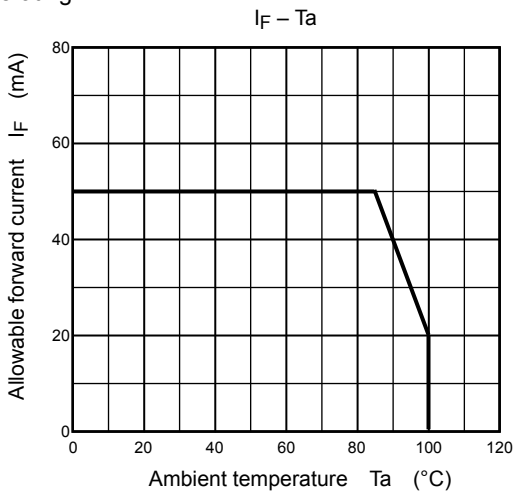
| Part Number | Color | Material |
|---|---|---|
| TLWF1109 | White | InGaN |

## Absolute Maximum Ratings (Ta = 25°C)

| Characteristics | | Symbol | Rating | Unit |
|---|---|---|---|---|
| Forward Current | (Note 1) | $I_F$ | 50 | mA |
| Power Dissipation | | $P_D$ | 200 | mW |
| Operating Temperature | | $T_{opr}$ | −40 to 100 | °C |
| Storage Temperature | | $T_{stg}$ | −40 to 100 | °C |

Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.
Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook (“Handling Precautions”/“Derating Concept and Methods”) and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

Note 1: Forward current derating






Marktech Optoelectronics
For part availability and ordering information please call Toll Free: 800.984.5337
Website: www.marktechopto.com | Email: info@marktechopto.com

## Electrical Characteristics (Ta = 25°C)

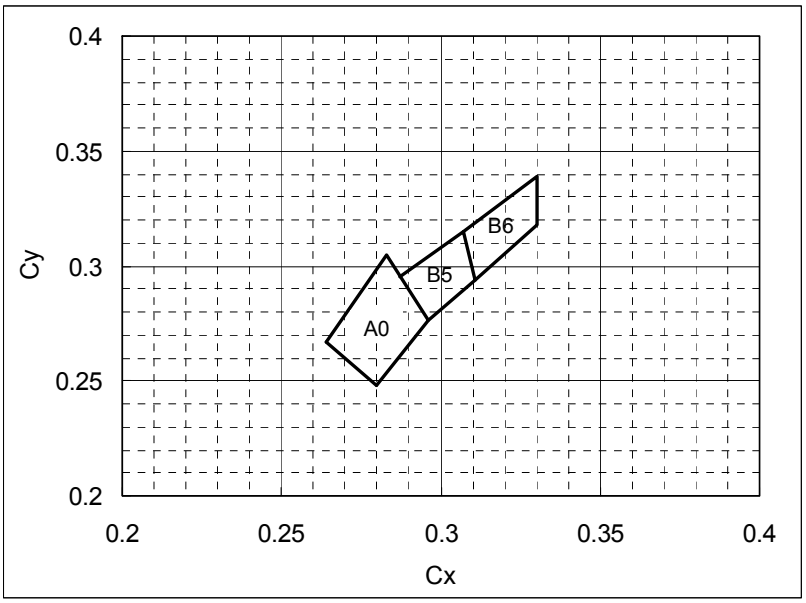
| Characteristics | Symbol | Test condition | Min | Typ. | Max | Unit |
|---|---|---|---|---|---|---|
| Forward Voltage | $V_F$ | $I_F$ = 40 mA | 3.0 | 3.5 | 4.0 | V |
| Reverse Voltage | $V_R$ | $I_R$ = 1 mA | — | 0.75 | — | V |

## Optical Characteristics (Ta = 25°C)

| Characteristics | | Symbol | Test condition | Min | Typ. | Max | Unit |
|---|---|---|---|---|---|---|---|
| Chromaticity | | $C_x$ | $I_F$ = 40 mA | (Note 2) | | | — |
| | | $C_y$ | $I_F$ = 40 mA | (Note 2) | | | — |
| Luminous Intensity | (Note 3) | $I_V$ | $I_F$ = 40 mA | 2000 | 3200 | 5000 | mcd |

Note 2: The product is tested at the following chromaticity coordinate groups.

Accuracy: +/-0.01




| | A0 | | | |
|---|---|---|---|---|
| Cx | 0.280 | 0.296 | 0.283 | 0.264 |
| Cy | 0.248 | 0.276 | 0.305 | 0.267 |

| | B5 | | | |
|---|---|---|---|---|
| Cx | 0.296 | 0.311 | 0.307 | 0.287 |
| Cy | 0.276 | 0.294 | 0.315 | 0.295 |

| | B6 | | | |
|---|---|---|---|---|
| Cx | 0.311 | 0.330 | 0.330 | 0.307 |
| Cy | 0.294 | 0.318 | 0.339 | 0.315 |

Note 3: Iv rank classification

Test conditions: Ta = 25 °C

| Product name | | Luminous intensity $I_V$ | | | |
|---|---|---|---|---|---|
| | | Min | Typ. | Max | $I_F$ |
| TLWF1109(T11) | | 2000 | 3200 | 5000 | 40 |
| | XA2 | 2000 | — | 3200 | |
| | YA1 | 2500 | — | 4000 | |
| | YA2 | 3200 | — | 5000 | |
| Unit | | mcd | | | mA |

The specification on the above table is used for Iv classification of LEDs in Toshiba facility.
Let the delivery ratio of each rank be unquestioned.

## The cautions

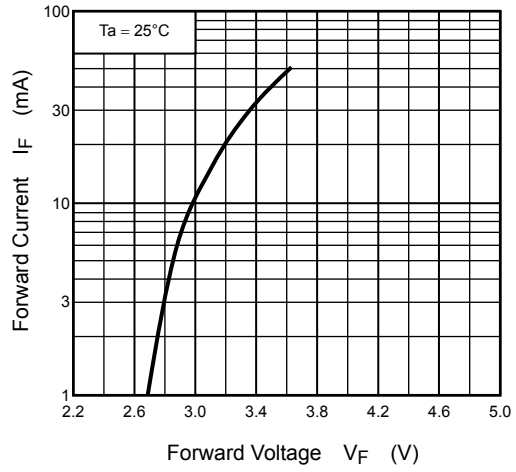
When handling this LED, take the following measures to prevent the LED from being damaged or otherwise adversely affected.

1) Use a conductive tablemat and conductive floor mat, and ground the workbench and floor.
2) Operators handling laser diodes must be grounded via a high resistance (about 1 MΩ). A conductive strap is good for this purpose.
3) Ground all tools including soldering irons.

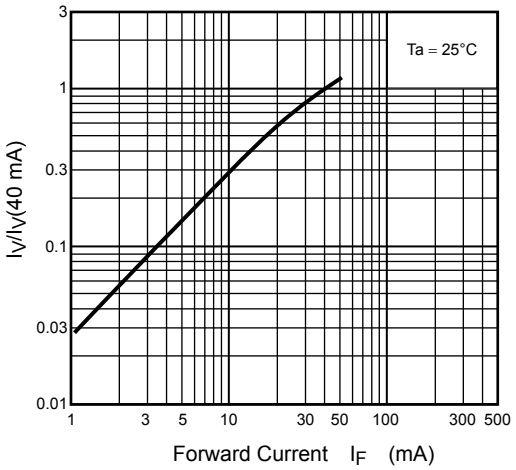
This product is designed as a general display light source usage, and it has applied the measurement standard that matched with the sensitivity of human's eyes. Therefore, it is not intended for usage of functional application (ex. Light source for sensor, optical communication and etc) except general display light source.

## TLWF1109

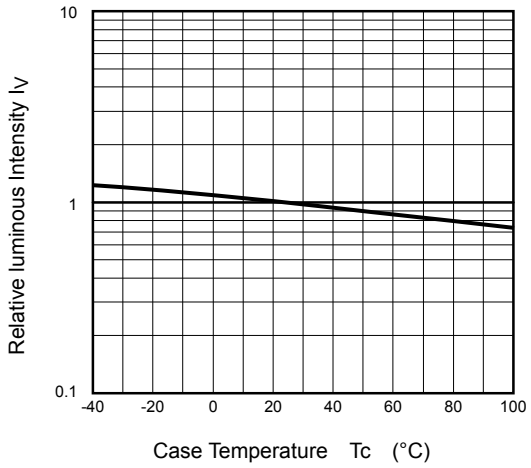
$I_F - V_F$ (typ.)



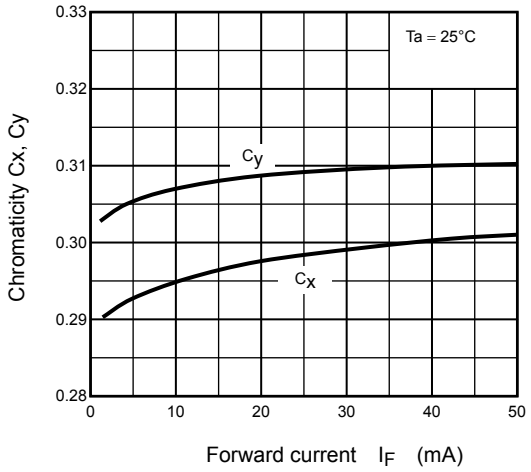

$I_V/I_V(40\ mA) - I_F$ (typ.)



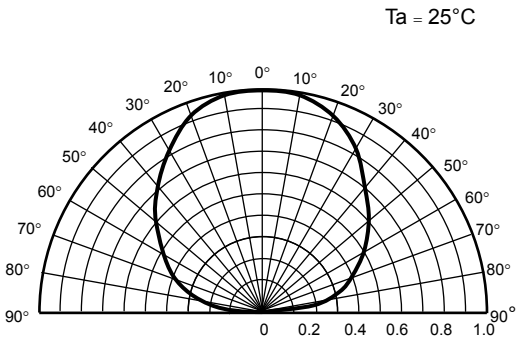

Relative $I_V$ – Tc (typ.)



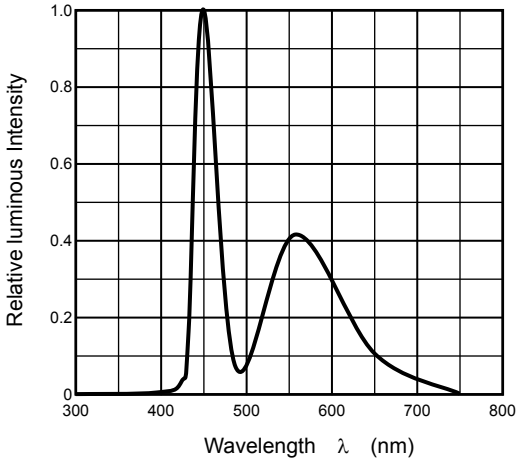

Cx, Cy – $I_F$ (typ.)




Radiation pattern (typ.)




Wavelength characteristic (typ.)



## Packaging

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

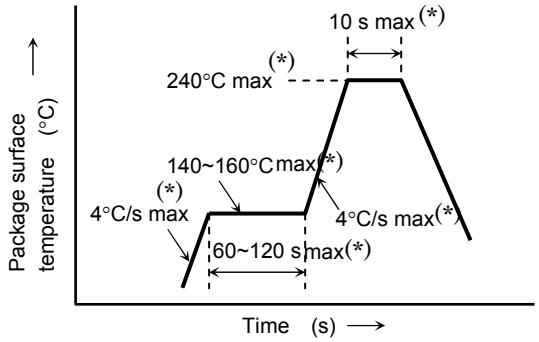
1. This moisture proof bag may be stored unopened within 12 months at the following conditions.
   Temperature: 5°C to 30°C
   Humidity: 90% (max)
2. After opening the moisture proof bag, the device should be assembled within 4weeks in an environment of 5°C to 30°C/60% RH or below.
3. If upon opening, the moisture indicator card shows humidity 30% or above (Color of indication changes to pink) or the expiration date has passed, the device should be baked in taping with reel.
   After baking, use the baked device within 72 hours, but perform baking only once.
   Baking conditions: 60±5°C, for 24 to 48 hours.
   Expiration date: 12 months from sealing date, which is imprinted on the label affixed.
4. Repeated baking can cause the peeling strength of the taping to change, then leads to trouble in mounting.
5. If the packing material of laminate would be broken, the hermeticity would deteriorate. Therefore, do not throw or drop the packed devices.

## Mounting Method

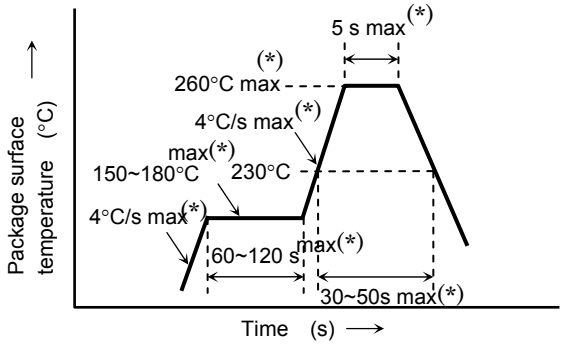
### Soldering

- Reflow soldering (example)

Temperature profile for Pb soldering (example)




Temperature profile for Pb-free soldering (example)

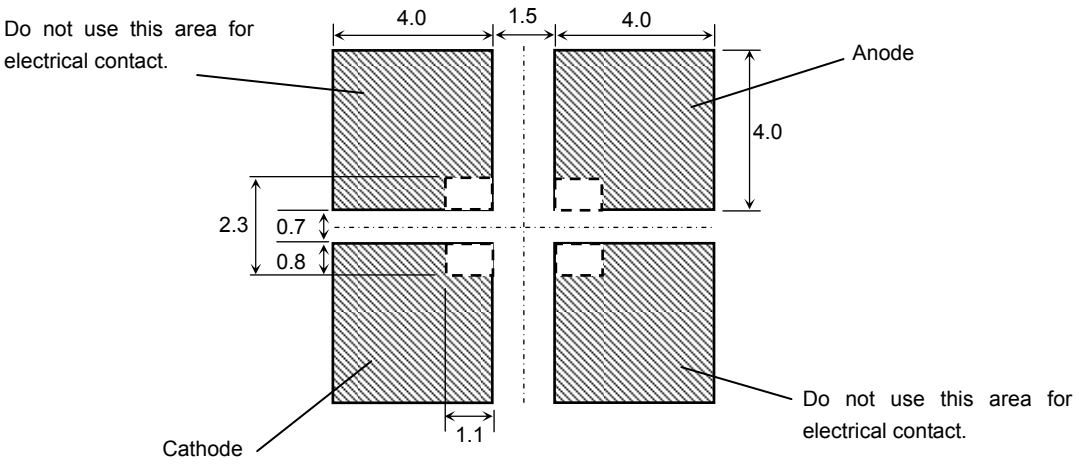



- The product is evaluated using above reflow soldering conditions. No additional test is performed exceed the condition (i.e. the condition more than max(*) values) as a evaluation. Please perform reflow soldering under the above conditions.
- Please perform the first reflow soldering with reference to the above temperature profile and within 4weeks of opening the package.
- Second reflow soldering
  In case of second reflow soldering should be performed within 168 h of the first reflow under the above conditions.
  Storage conditions before the second reflow soldering: 30°C, 60% RH (max)
- Make any necessary soldering corrections manually.
  (only once at each soldering point)
  Soldering iron: 25 W
  Temperature : 300°C or less
  Time : within 3 s
- Do not perform wave soldering.

### Recommended soldering pattern

Cu area > 16 $mm^2$

Unit: mm



### Cleaning

When cleaning is required after soldering, Toshiba recommends the following cleaning solvents.
It is confirmed that these solvents have no effect on semiconductor devices in our dipping test (under the recommended conditions). In selecting the one for your actual usage, please perform sufficient review on washing condition, using condition and etc.

| | |
|---|---|
| ASAHI CLEAN AK-225AES | : (made by ASAHI GLASS) |
| KAO CLEAN THROUGH 750H | : (made by KAO) |
| PINE ALPHA ST-100S | : (made by ARAKAWA CHEMICAL) |

## Precautions when Mounting

Do not apply force to the plastic part of the LED under high-temperature conditions.
To avoid damaging the LED plastic, do not apply friction using a hard material.
When installing the PCB in a product, ensure that the device does not come into contact with other cmponents.
For this product, silicone is used as the encapsulated material. Therefore the top surface of this product is soft. Please do not stress on the encapsulated part of LEDs to avoid affecting the reliability of the product. When using the mounting devices, please use the picking up nozzle that does not affect the silicone resin.

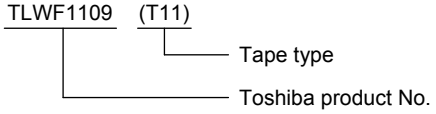
## Tape Specifications

### 1. Product number format

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: T11 (4-mm pitch)

(2) Example

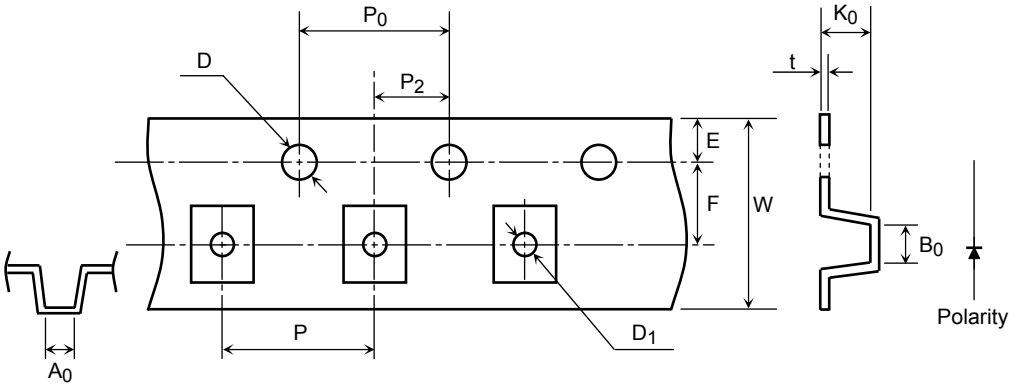



### 2. Tape dimensions

Unit: mm

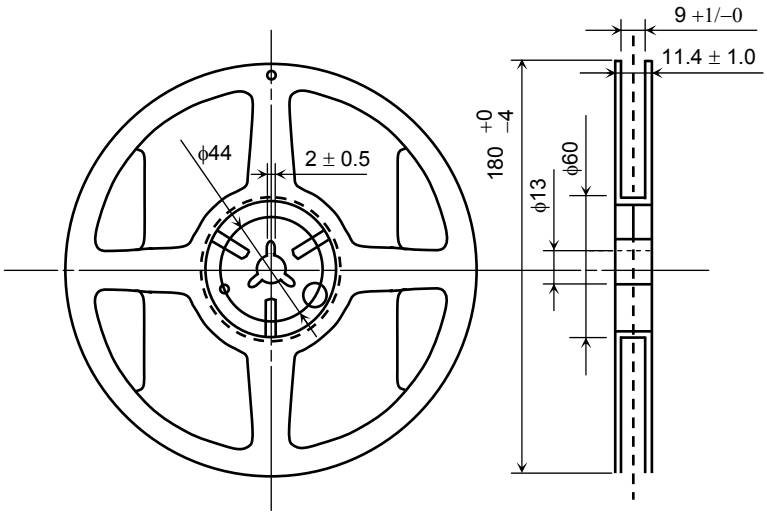
| Symbol | Dimension | Tolerance |
|---|---|---|
| D | 1.5 | +0.1/−0 |
| E | 1.75 | ±0.1 |
| $P_0$ | 4.0 | ±0.1 |
| t | 0.3 | ±0.05 |
| F | 3.5 | ±0.05 |
| $D_1$ | 1.5 | ±0.1 |

| Symbol | Dimension | Tolerance |
|---|---|---|
| $P_2$ | 2.0 | ±0.05 |
| W | 8.0 | ±0.3 |
| P | 4.0 | ±0.1 |
| $A_0$ | 2.9 | ±0.1 |
| $B_0$ | 3.7 | ±0.1 |
| $K_0$ | 2.3 | ±0.1 |

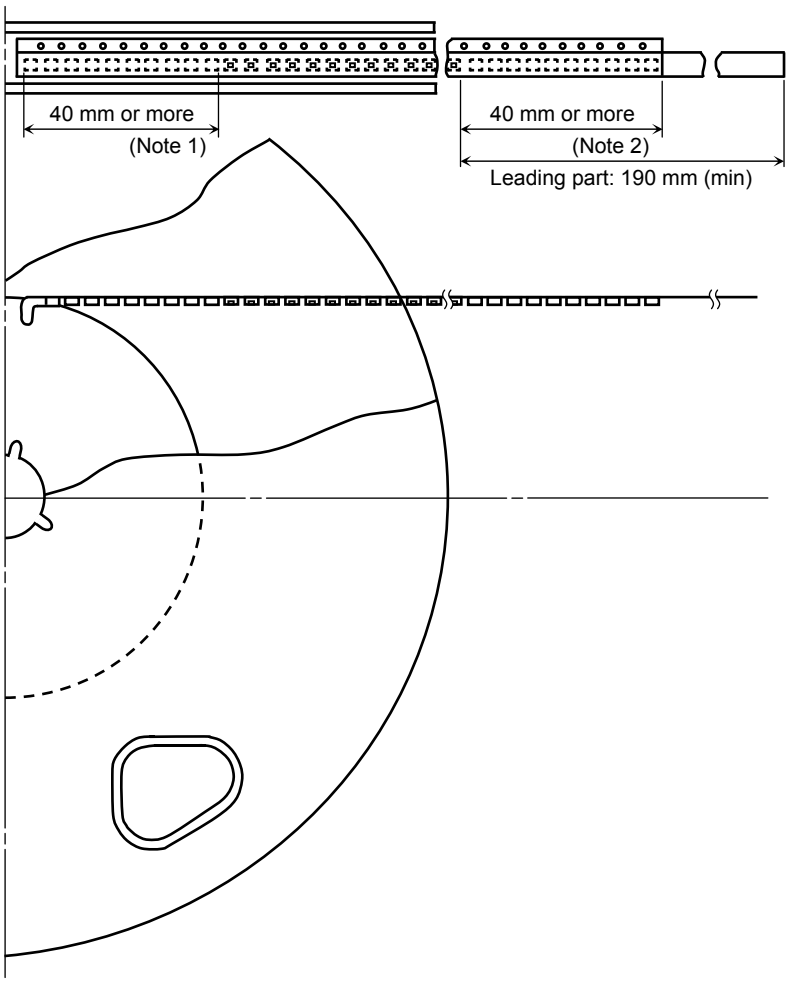


### 3. Reel dimensions

Unit: mm




### 4. Leader and trailer sections of tape




Note1: Empty trailer section

Note2: Empty leader section

## 5. Packing form

(1) Packing quantity

| | |
|---|---|
| Reel | 2,000 pcs |
| Carton | 10,000 pcs |

(2) Packing form: Each reel is sealed in an aluminum pack with silica gel.

## 6. Label format

(1) Label contents
Shipped products are mentioned the following contents.

P/N:

| | | | |
|---|---|---|---|
| TYPE | **TLWF1109** | | |
| ADDC | (T11) | Q'TY | 2,000 pcs |

Lot Number (RANK SYMBOL) Key code for TSB 32C 2000

TOSHIBA

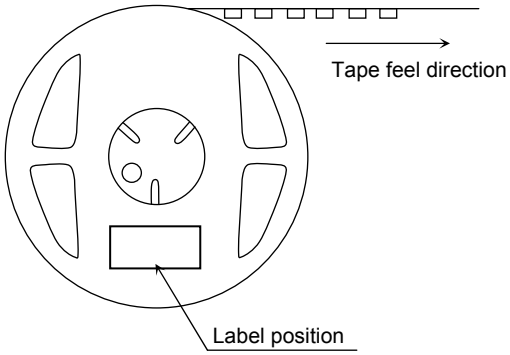
Use under 5-30degC/60%RH within 4weeks

[[G]]/RoHS COMPATIBLE
*Y380xxxxxxxxxxxxxxxxx*

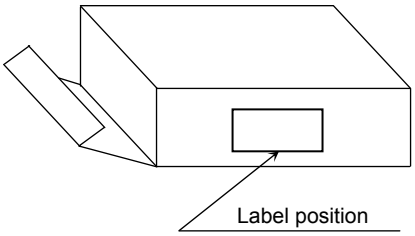
SEALED:
DIFFUSED IN *****
ASSEMBLED IN *****

(2) Label location

- Reel




- Carton




- The aluminum package in which the reel is supplied also has the label attached to center of one side.

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