

TOSHIBA LED Lamps

TLRM1100(T11), TLRMM1100(T11), TLSM1100(T11),  
TLOM1100(T11), TLYM1100(T11)

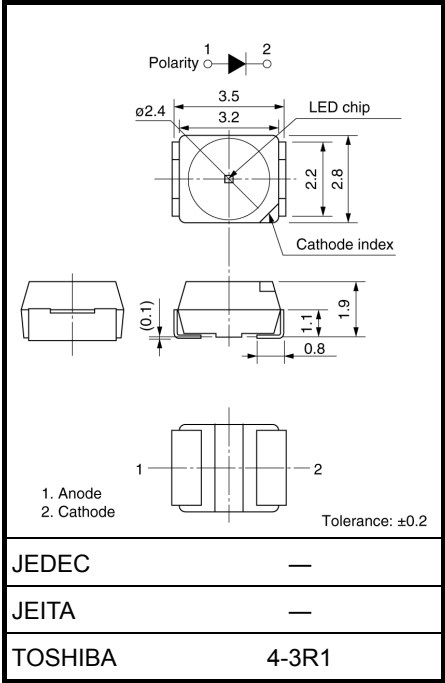
Panel Circuit Indicator

Unit: mm

- Surface-mount device
- 3.2 (L) mm × 2.8 (W) mm × 1.9 (H) mm
- InGaAlP LEDs
- Colors: red, orange, yellow
- High luminous intensity
- Standard embossed tape packing: T11 (2000/reel)  
4-mm pitch tape reel
- High operating temperature  
T<sub>opr</sub> = -40 to 100°C / T<sub>stg</sub> = -40 to 110°C
- Applications: Instrumental panel Backlighting in Automotive equipment, message signboards, backlighting etc.

Color and Material

Part Number	Color	Material
TLRM1100	Red	InGaAlP
TLRMM1100	Red	
TLSM1100	Red	
TLOM1100	Orange	
TLYM1100	Yellow	



Weight: 0.035 g (typ.)

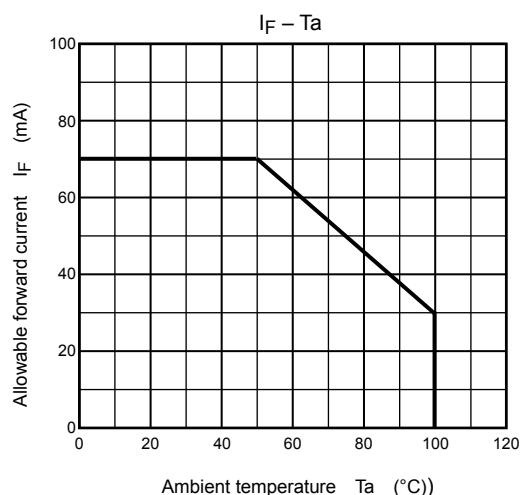
## Absolute Maximum Ratings (Ta = 25°C)

Product Name	Forward Current I <sub>F</sub> (mA) Please see Note 1	Reverse Voltage V <sub>R</sub> (V)	Power Dissipation P <sub>D</sub> (mW)	Operation Temperature T <sub>opr</sub> (°C)	Storage Temperature T <sub>stg</sub> (°C)
TLRM1100	70	4	182	-40 to 100	-40 to 110
TLRMM1100					
TLSM1100					
TLOM1100					
TLYM1100					

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



## Electrical Characteristics (Ta = 25°C)

Product Name	Forward Voltage V <sub>F</sub>				Reverse Current I <sub>R</sub>	
	Min	Typ.	Max	I <sub>F</sub>	Max	V <sub>R</sub>
TLRM1100	1.9	2.25	2.6	30	10	4
TLRMM1100	1.9	2.25	2.6			
TLSM1100	1.9	2.25	2.6			
TLOM1100	1.9	2.30	2.6			
TLYM1100	1.9	2.30	2.6			
Unit	V			mA	μA	V

## Optical Characteristics–1 (Ta = 25°C)

Product Name	Luminous Intensity I <sub>v</sub>				Available I <sub>v</sub> rank Please see Note 2
	Min	Typ.	Max	I <sub>F</sub>	
TLRM1100	250	600	1250	30	TA / UA / VA
TLRMM1100	400	800	2000	30	UA / VA / WA
TLSM1100	630	1100	3200	30	VA / WA / XA
TLOM1100	630	1200	3200	30	VA / WA / XA
TLYM1100	630	1000	3200	30	VA / WA / XA
単 位	mcd	mcd	mcd	mA	

Note 2: The specification on the above table is used for I<sub>v</sub> classification of LEDs in Toshiba facility.  
Each reel includes the same rank LEDs. Let the delivery ratio of each rank be unquestioned.

Rank	Luminous Intensity I <sub>v</sub>	
	Min	Max
TA	250	500
UA	400	800
VA	630	1250
WA	1000	2000
XA	1600	3200
Unit	mcd	mcd

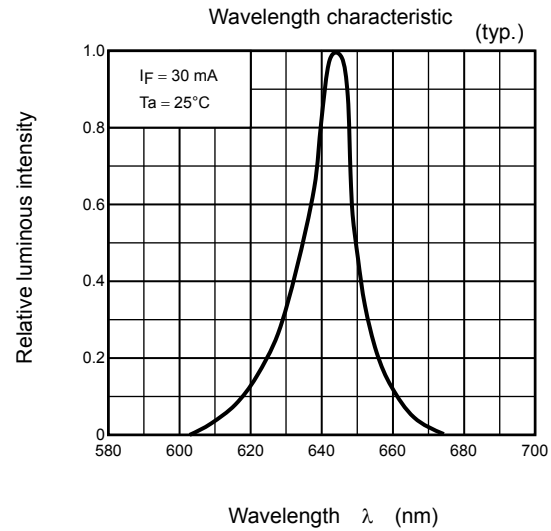
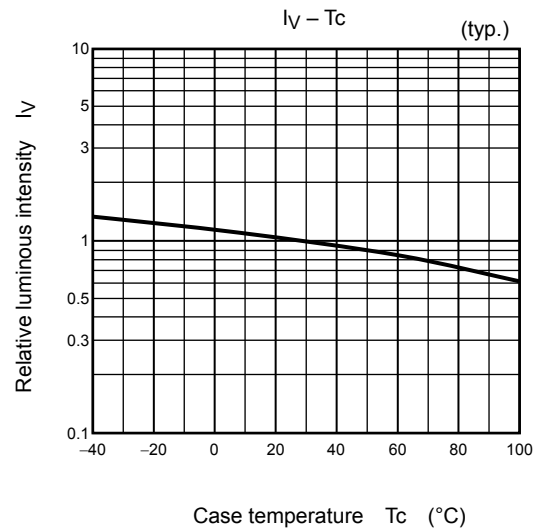
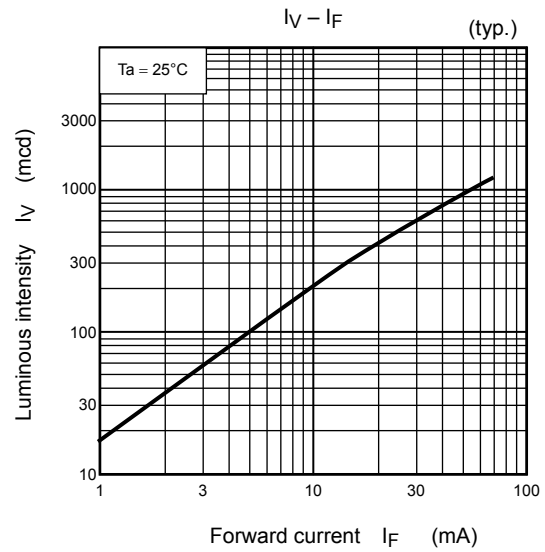
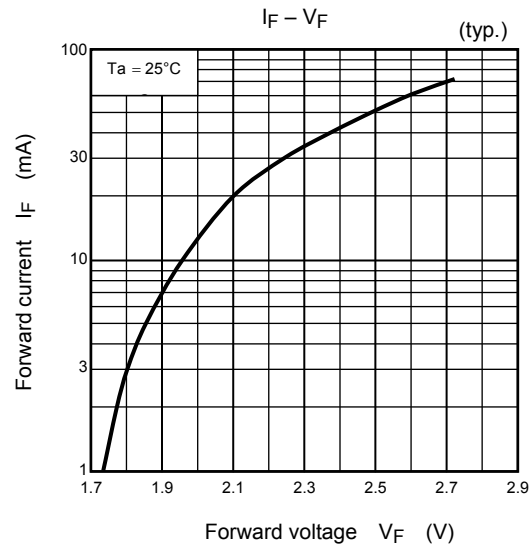
## Optical Characteristics–2 (Ta = 25°C)

Product Name	Emission Spectrum							I <sub>F</sub>
	Peak Emission Wavelength λ <sub>p</sub>			Δλ	Dominant Wavelength λ <sub>d</sub>			
	Min	Typ.	Max	Typ.	Min	Typ.	Max	
TLRM1100	—	644	—	14	624	630	638	30
TLRMM1100	—	636	—	14	620	626	634	
TLSM1100	—	623	—	14	607	613	621	
TLOM1100	—	612	—	14	599	605	613	
TLYM1100	—	592	—	13	583	590	595	
Unit	nm			nm	nm			mA

## Handling precautions

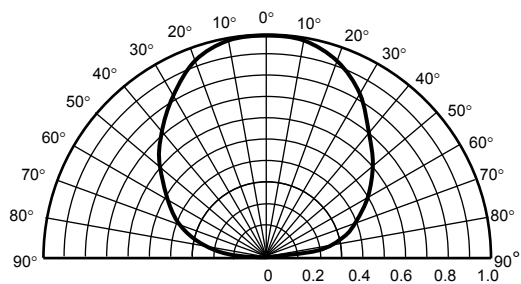
- This product is designed as a general display light source usage, and it has applied the measurement standard that matched with the sensitivity of human's eyes. Therefore, it is not intended for usage of functional application (ex. Light source for sensor, optical communication and etc) except general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

TLRM1100

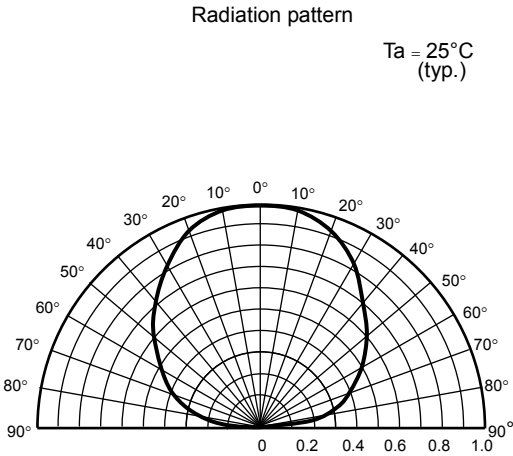
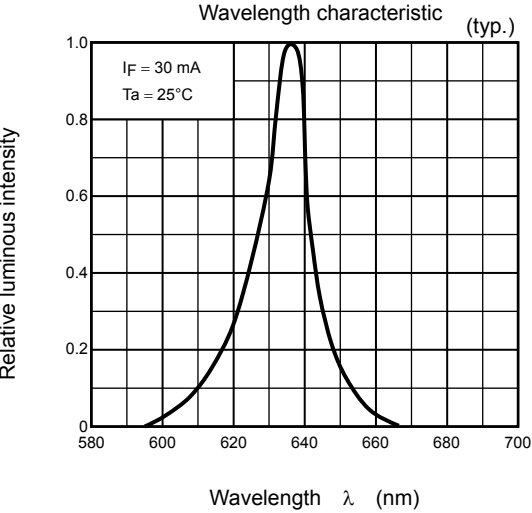
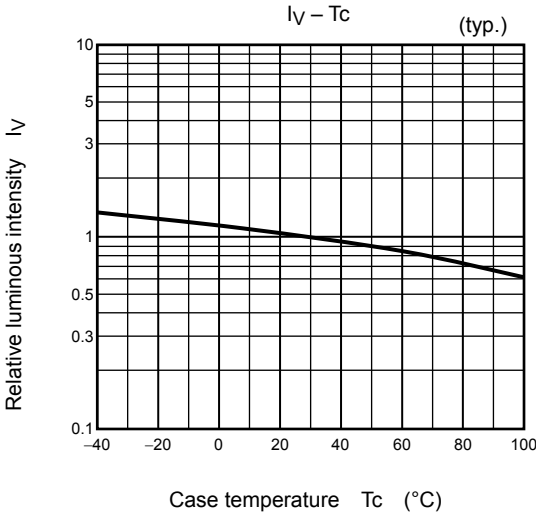
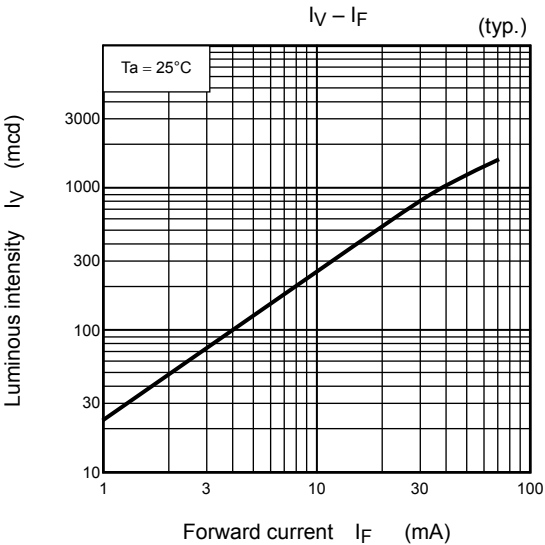
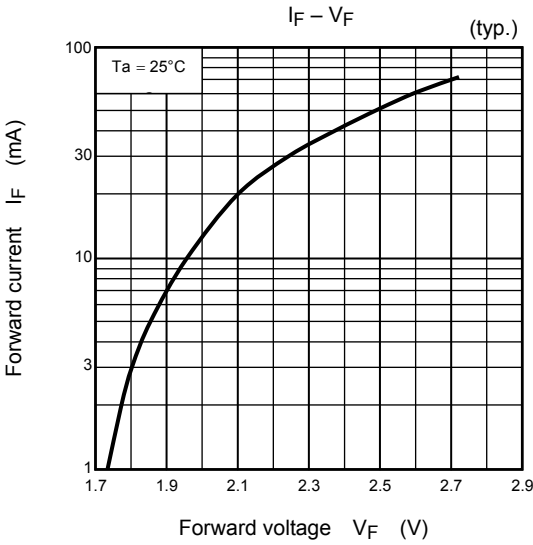


Radiation pattern

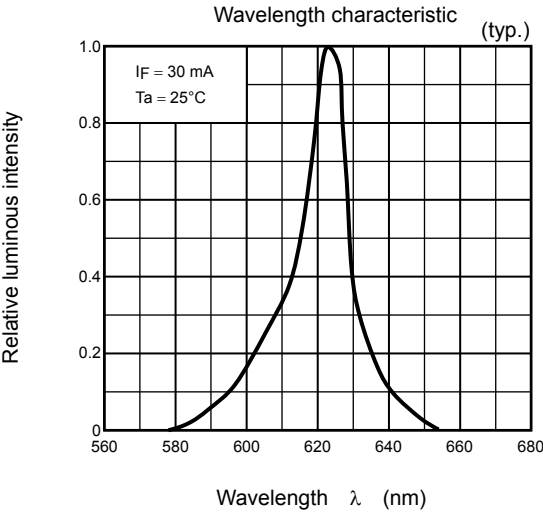
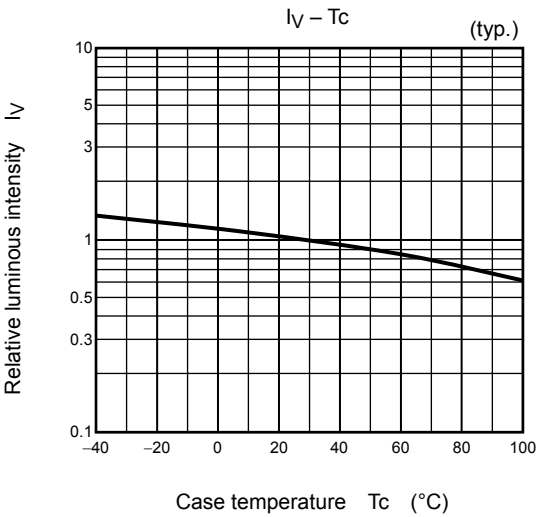
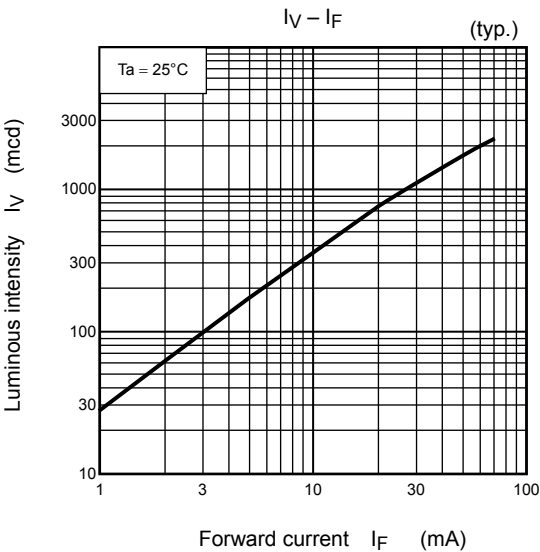
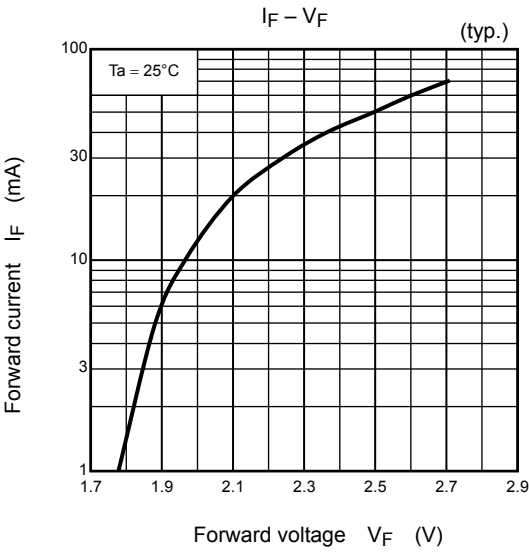
$T_a = 25^\circ\text{C}$   
(typ.)



TLRMM1100

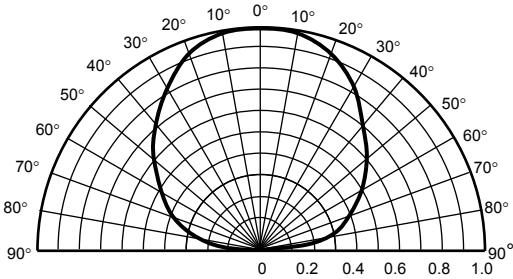


TLSM1100

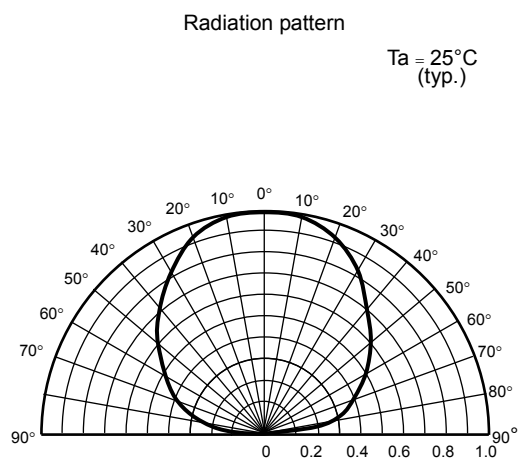
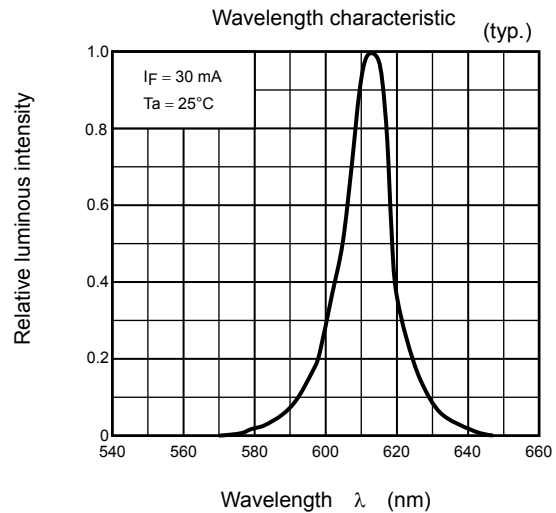
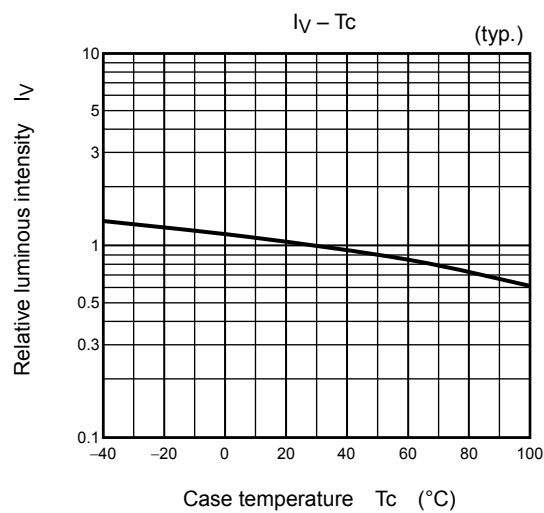
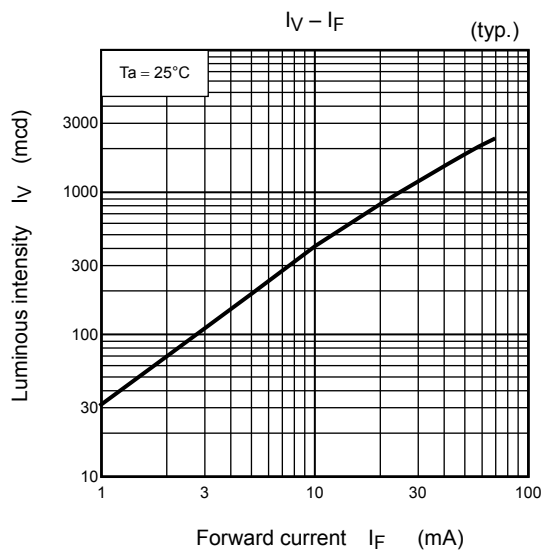
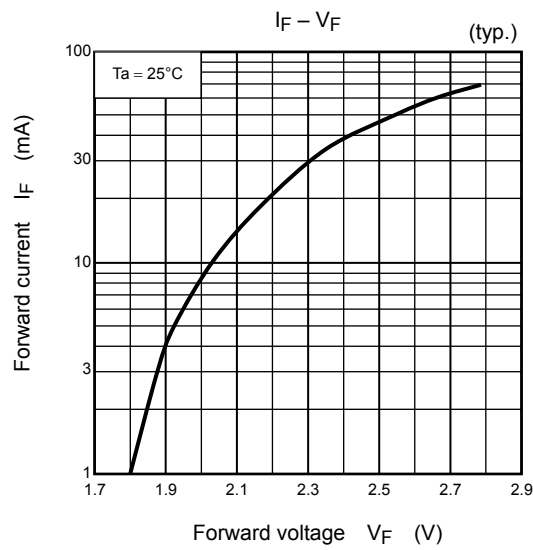


Radiation pattern

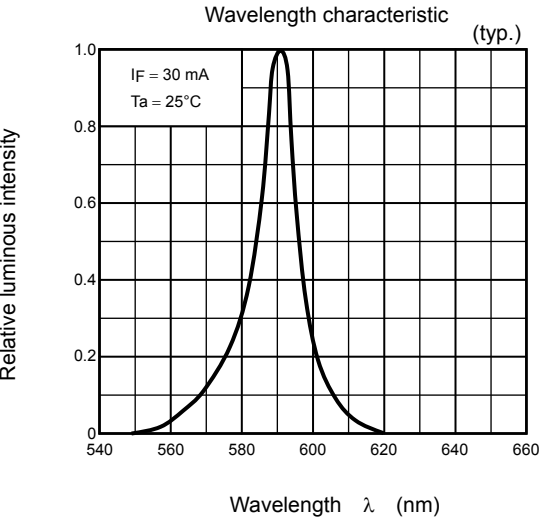
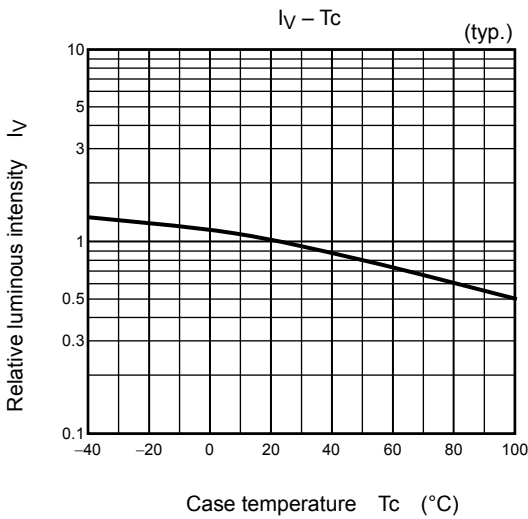
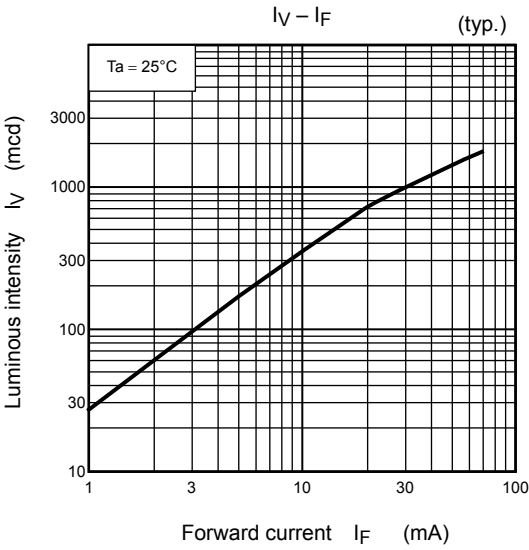
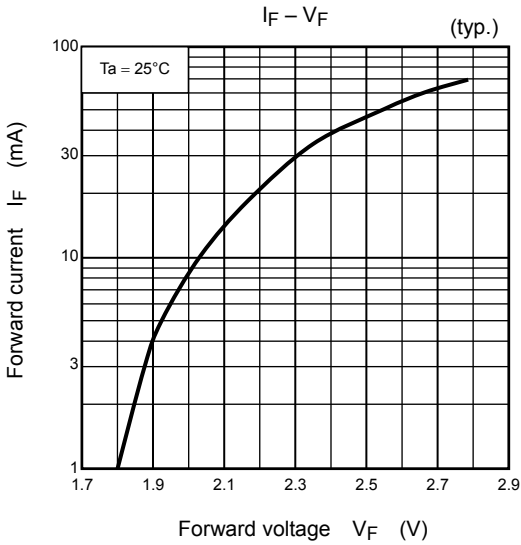
$T_a = 25^\circ\text{C}$   
(typ.)



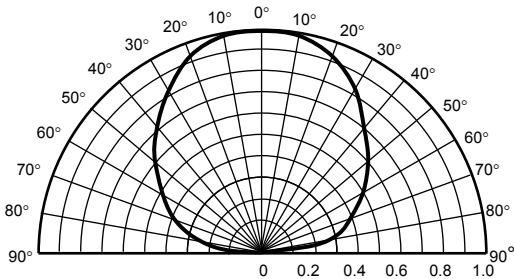
TL0M1100



TLYM1100



Radiation pattern  
Ta = 25°C  
(typ.)





## Packaging

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

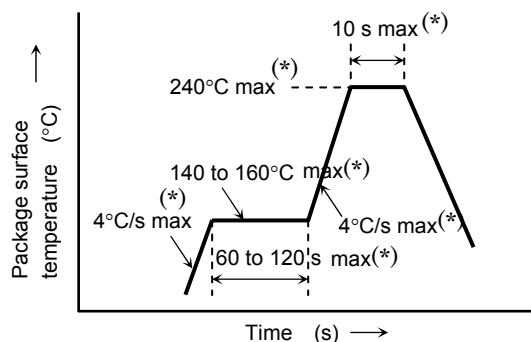
1. This moisture proof bag may be stored unopened within 12 months at the following conditions.  
Temperature: 5°C to 30°C  
Humidity: 90% (max)
2. After opening the moisture proof bag, the devices should be assembled within 168 hours in an environment of 5°C to 30°C/60% RH or below.
3. If upon opening, the moisture indicator card shows humidity 30% or above (Color of indication changes to pink) or the expiration date has passed, the devices should be baked in taping with reel.  
After baking, use the baked devices within 72 hours, but perform baking only once.  
Baking conditions: 60±5°C, for 12 to 24 hours.  
Expiration date: 12 months from sealing date, which is imprinted on the same side as this label affixed.
4. Repeated baking can cause the peeling strength of the taping to change, then leads to trouble in mounting.  
Furthermore, prevent the devices from being destructed against static electricity for baking of it.
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

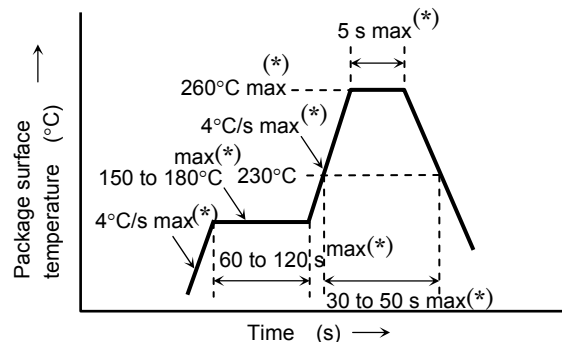
### Soldering

- Reflow soldering (example)

Temperature profile for Pb soldering (example)



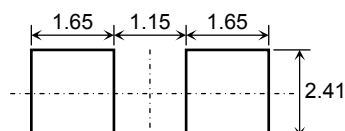
Temperature profile for Pb-free soldering (example)



- The products are 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 168 h 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: 350°C or less  
Time: within 3 s
- If the products need to be performed by other soldering method (ex. wave soldering), please contact Toshiba sales representative.

### Recommended soldering pattern

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 750HS:	(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.

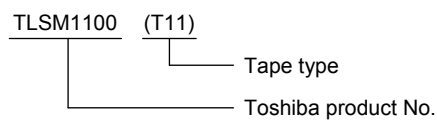
When installing the PCB in a product, ensure that the device does not come into contact with other components.

## 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. Handling precautions

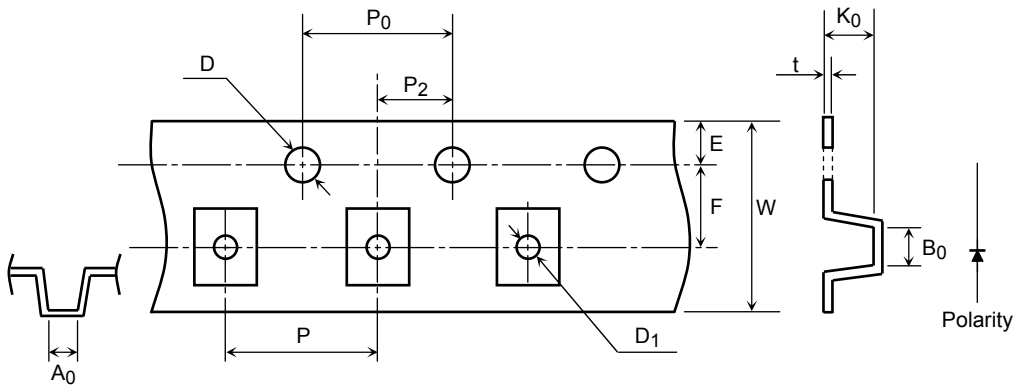
Tape material protected against static electricity. However, static electricity may occur depending on quantity of charged static electricity and a device may attach to a tape, or a device may be unstable when peeling a tape cover.

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

3. Tape dimensions

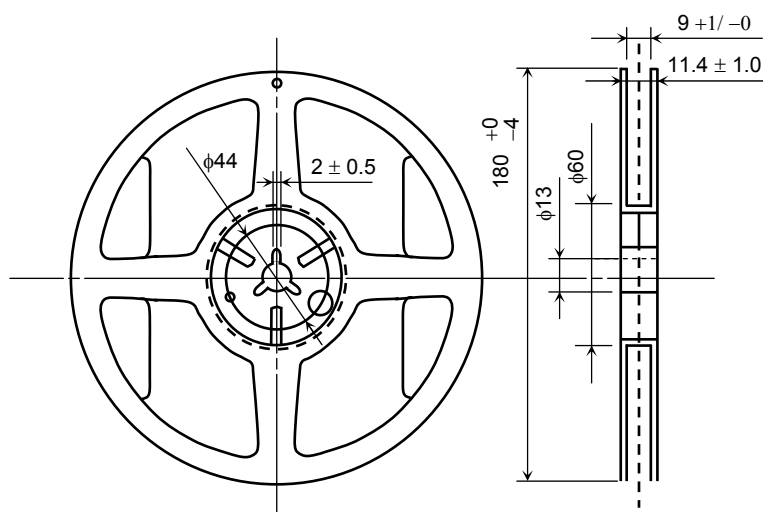
Unit: mm

Symbol	Dimension	Tolerance	Symbol	Dimension	Tolerance
D	1.5	+0.1/-0	P <sub>2</sub>	2.0	±0.05
E	1.75	±0.1	W	8.0	±0.3
P <sub>0</sub>	4.0	±0.1	P	4.0	±0.1
t	0.3	±0.05	A <sub>0</sub>	2.9	±0.1
F	3.5	±0.05	B <sub>0</sub>	3.7	±0.1
D <sub>1</sub>	1.5	±0.1	K <sub>0</sub>	2.3	±0.1

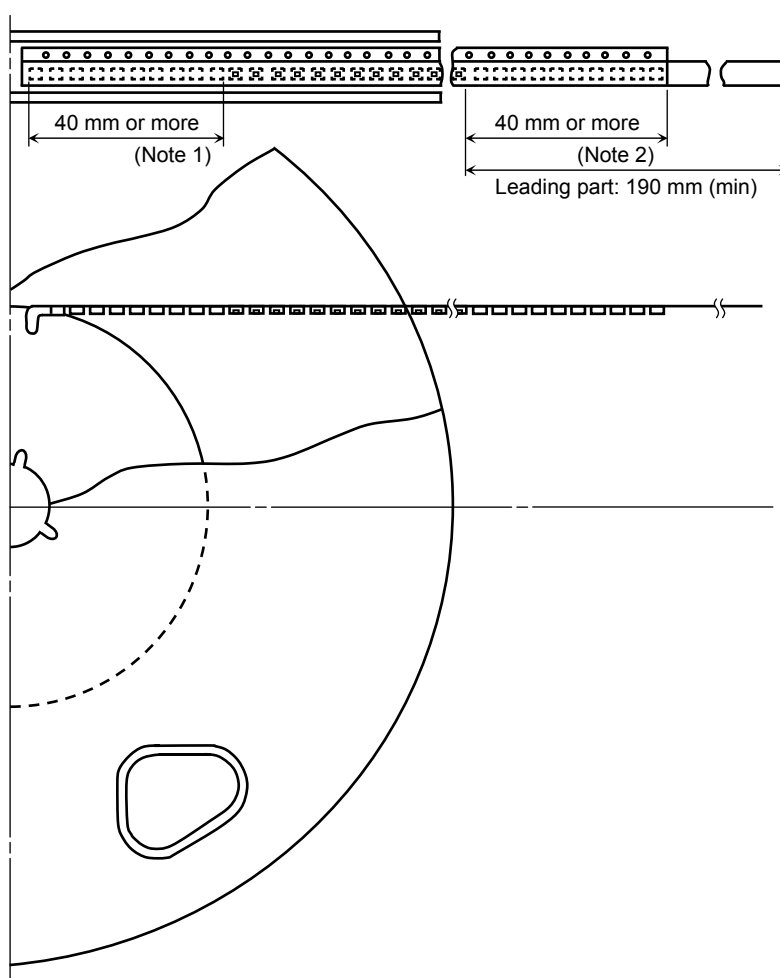


## 4. Reel dimensions

Unit: mm



## 5. Leader and trailer sections of tape



Note 1: Empty trailer section

Note 2: Empty leader section

6. 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.

7. Label format

(1) Example: TLSM1100 (T11)

P/N:

TYPE	TLSM1100		
ADDC	(T11)	Q'TY	2,000 pcs

Lot Number

Key code for TSB

(RANK SYMBOL)

32C

2000

Use under 5-30degC/60%RH within 168h


SEALING: DIFFUSED IN \*\*\*\*\*


ASSEMBLED IN \*\*\*\*\*

[[G]]/RoHS COMPATIBLE

\*Y380xxxxxxxxxxxxxxxxx\*

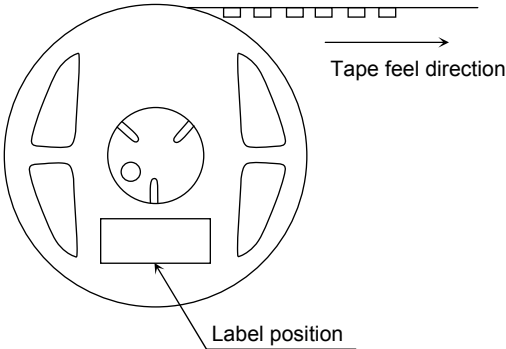
TOSHIBA



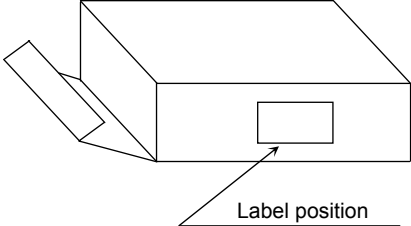


(2) Label location

- Reel



Tape feed direction
- Carton



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

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