

## TOSHIBA LED Lamps

### TLRMH1100A (T11), TLSH1100A (T11), TLOH1100A (T11), TLYH1100A (T11)

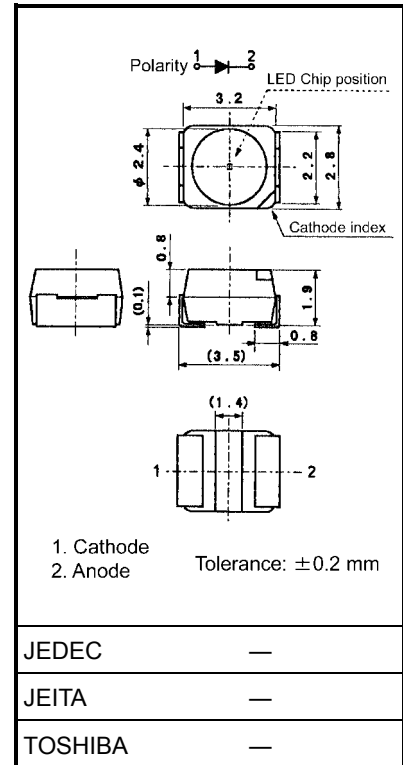
#### Panel Circuit Indicator

- Surface-mount devices
- 3.2 (L) × 2.8 (W) × 1.9 (H) mm
- Flat-top type
- InGaAlP LEDs
- High luminous intensity
- Low drive current, high-intensity light emission
- Colors: red, orange, yellow
- Reflow soldering possible
- Applications: automotive use, message signboards, backlighting etc.
- Standard embossed tape packing: T11 (2000/reel)  
8-mm tape reel

#### Color and Material

Product Name	Color	Material
TLRMH1100A	Red	InGaAlP
TLSH1100A	Red	
TLOH1100A	Orange	
TLYH1100A	Yellow	

Unit: mm



Weight: 0.035 g (typ.)

## Maximum Ratings (Ta = 25°C)

Product Name	Forward Current I <sub>F</sub> (mA)	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)
TLRMH1100A	70	4	161	-40~110	-40~110
TLSH1100A					
TLOH1100A					
TLYH1100A					

## 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>	V <sub>R</sub>	
TLRMH1100A	—	1.9	2.3	20	10	
TLSH1100A	—	1.9	2.3			
TLOH1100A	—	2.0	2.3			
TLYH1100A	—	2.0	2.3			
Unit	V			mA	μA	V

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

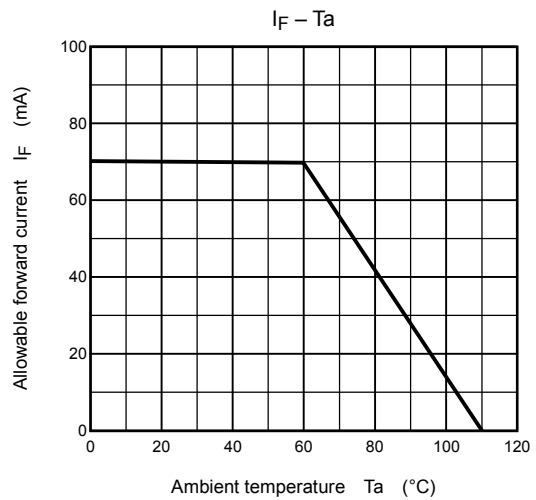
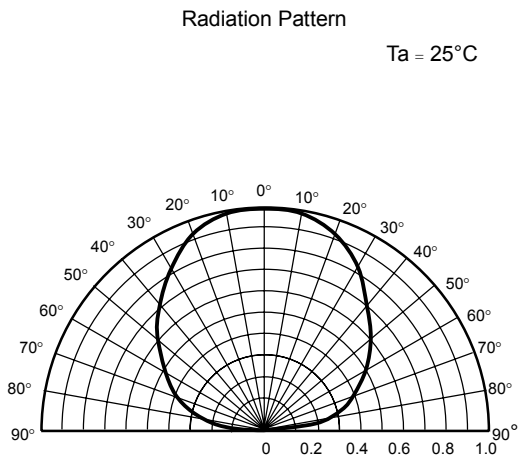
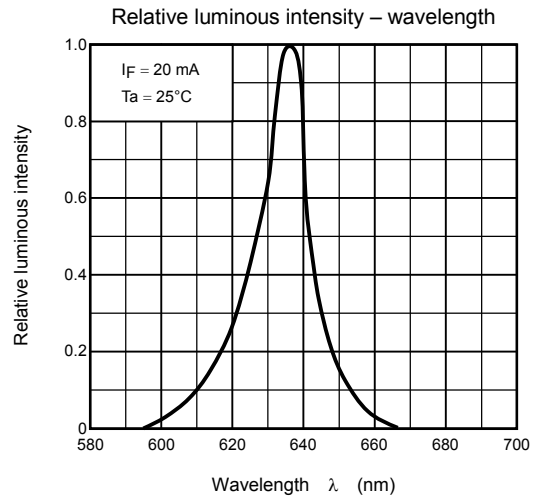
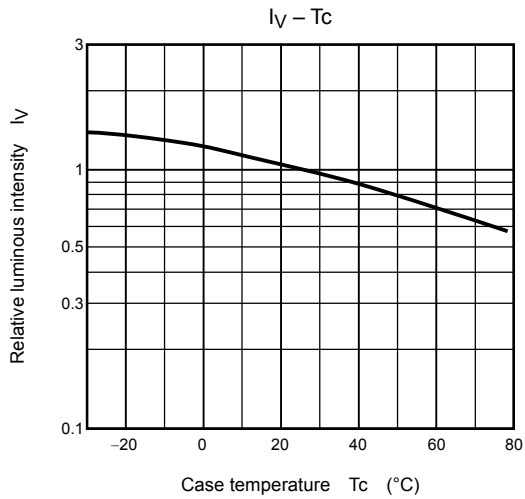
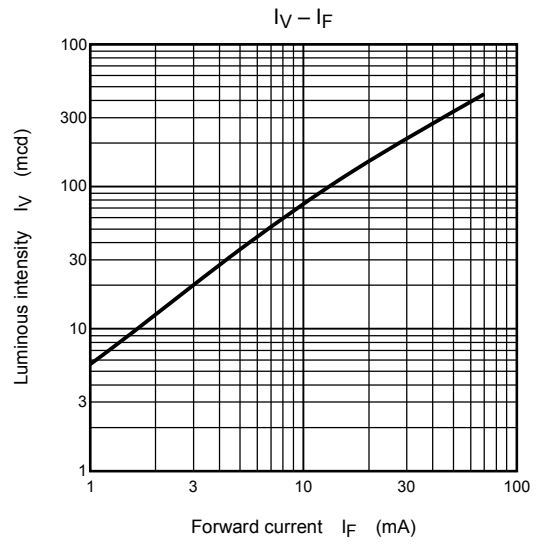
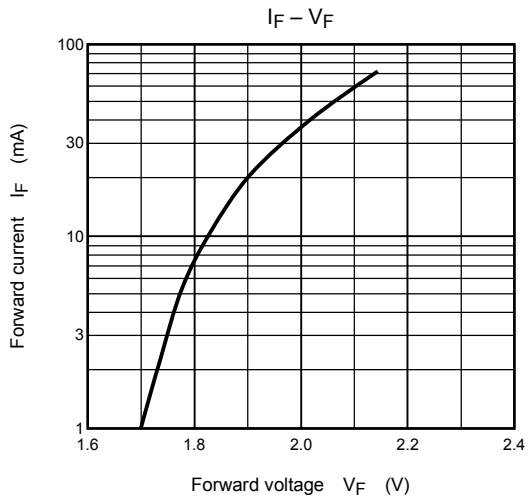
Product Name	Luminous Intensity I <sub>v</sub>			I <sub>F</sub>
	Min	Typ.	Max	
TLRMH1100A	63	150	—	20
TLSH1100A	160	260	—	
TLOH1100A	160	270	—	
TLYH1100A	100	220	—	
Unit	mcd			mA

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

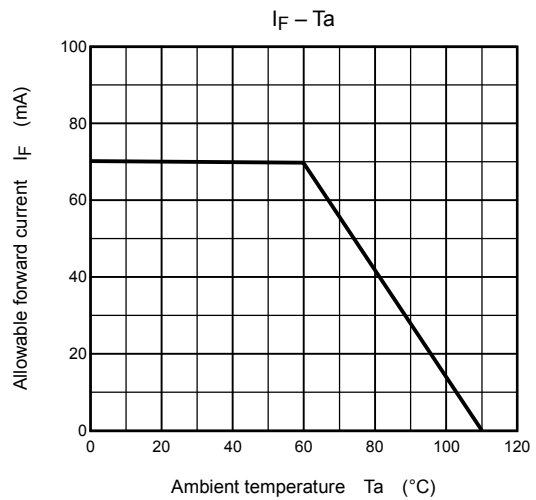
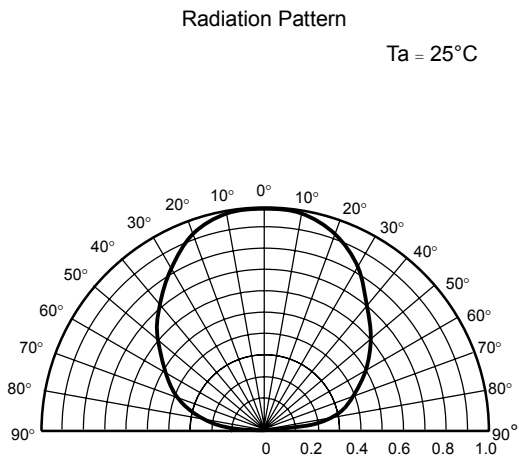
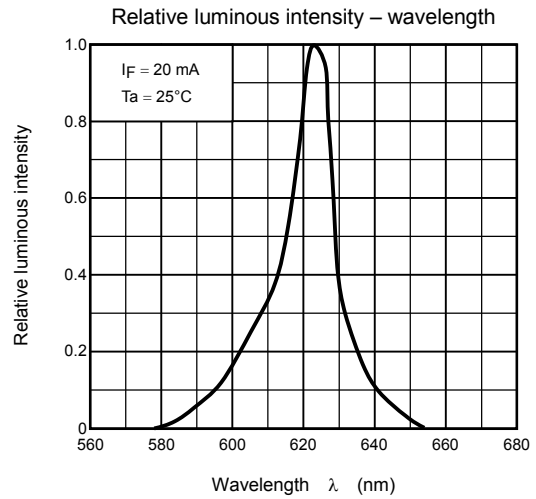
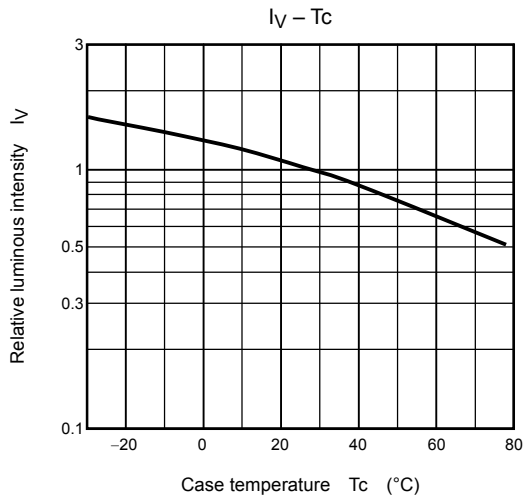
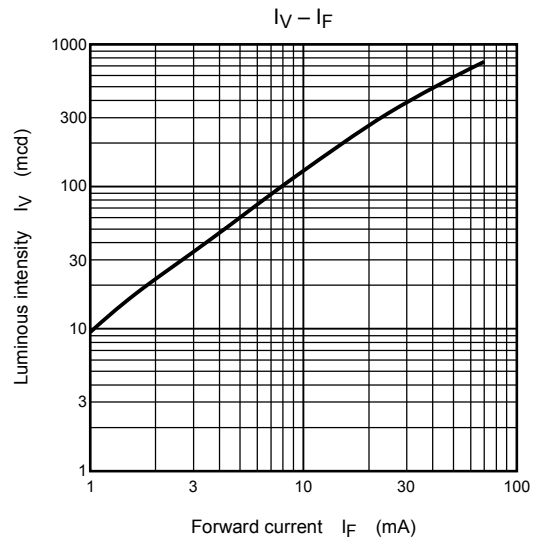
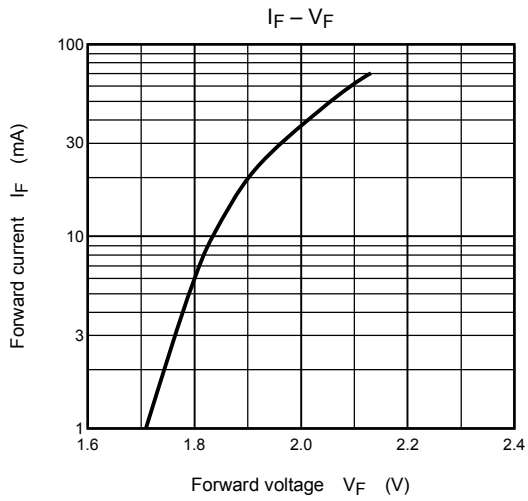
Product Name	Emission Spectrum							I <sub>F</sub>
	Peak Emission Wavelength λ <sub>p</sub>			Δλ Typ.	Dominant Wavelength λ <sub>d</sub>			
	Min	Typ.	Max		Min	Typ.	Max	
TLRMH1100A	—	636	—	17	—	626	—	20
TLSH1100A	—	623	—	17	—	613	—	
TLOH1100A	—	612	—	15	—	605	—	
TLYH1100A	—	590	—	15	—	587	—	
Unit	nm			nm	nm			mA

Note: This visible LED lamp also emits some IR light.  
If a photodetector is located near the LED lamp, please ensure that it will not be affected by the IR light.

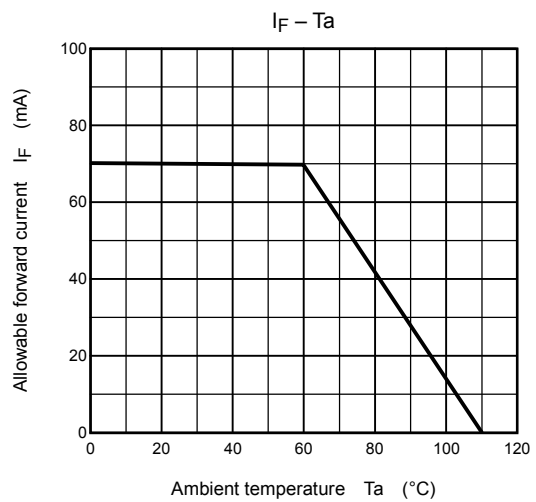
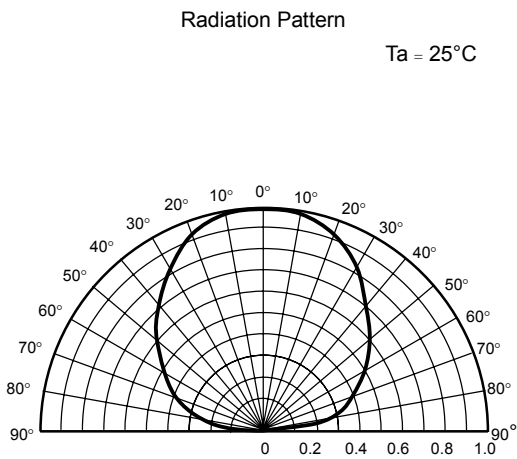
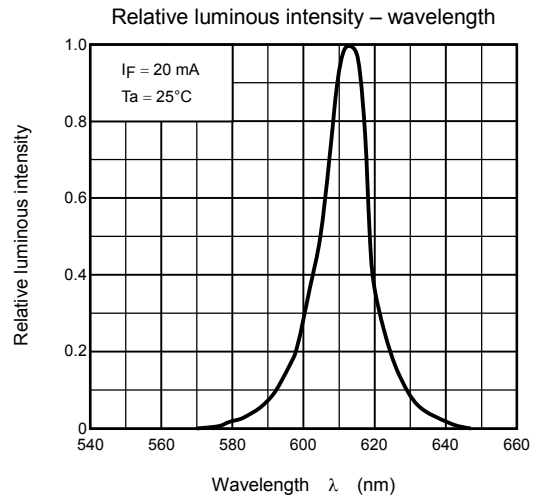
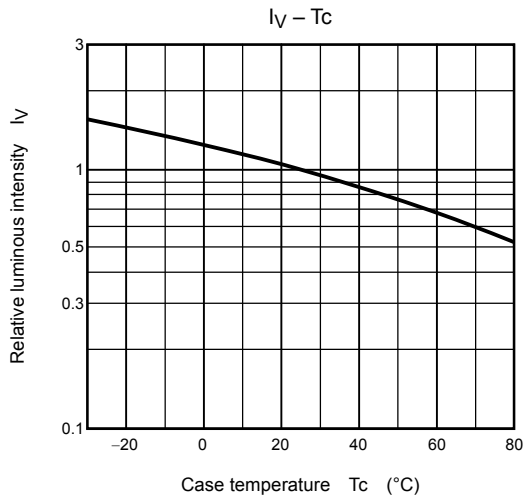
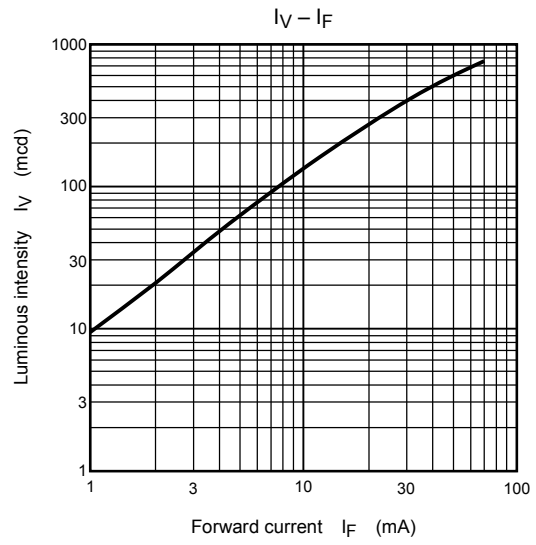
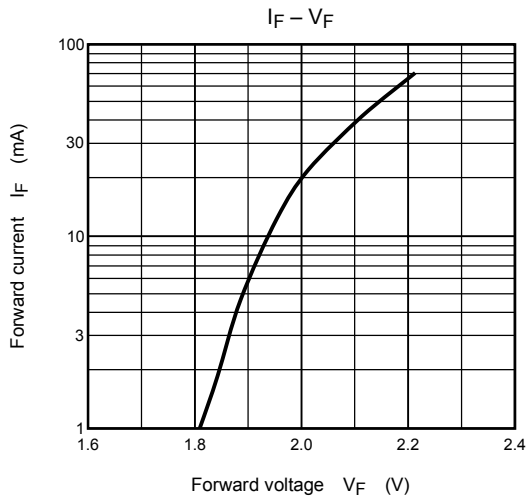
## TLRMH1100A



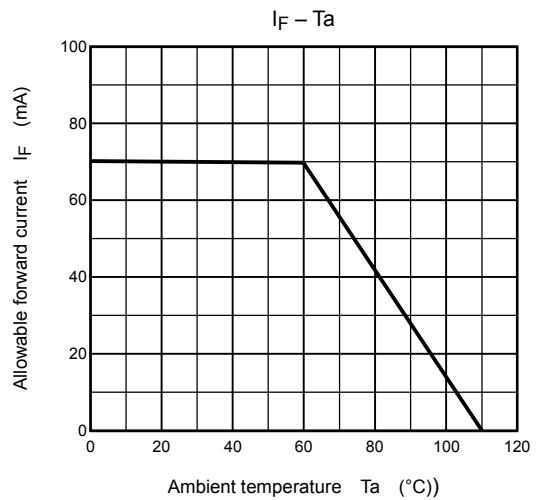
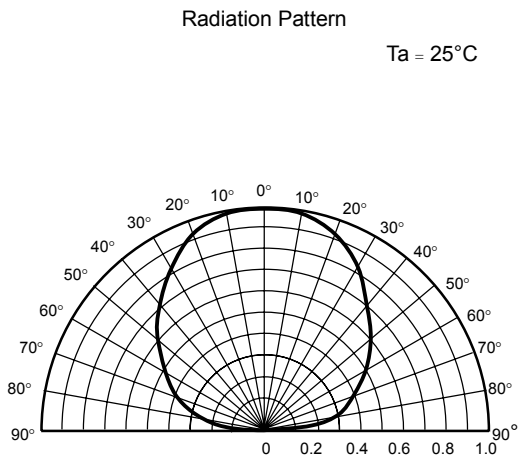
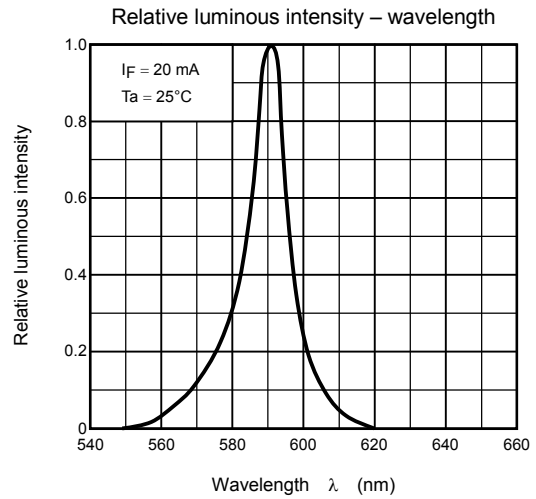
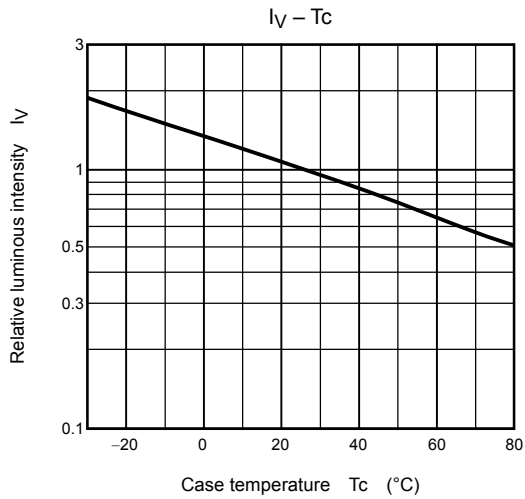
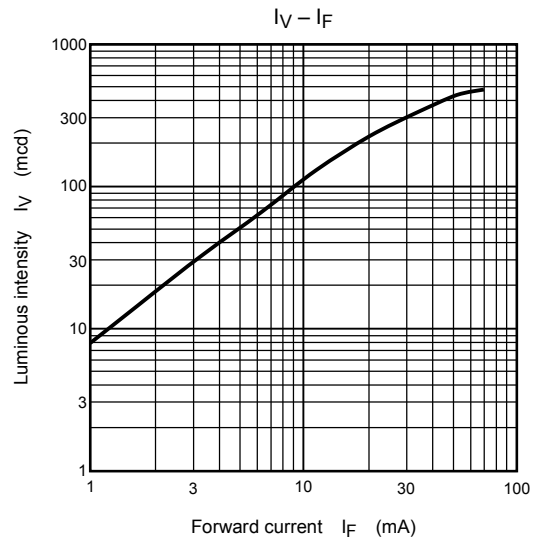
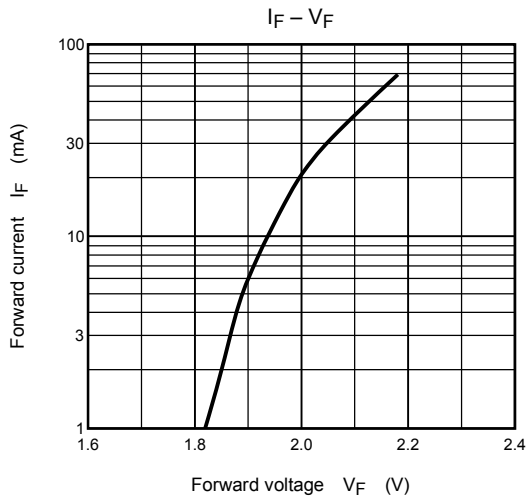
## TLSH1100A



## TLOH1100A



## TLYH1100A



## 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:

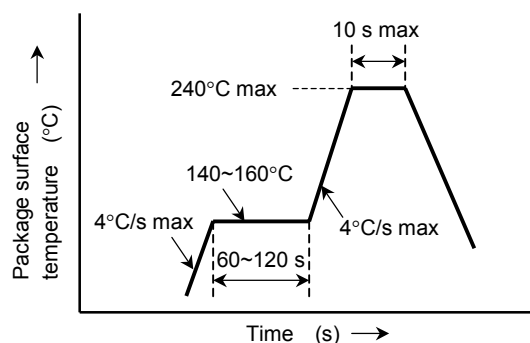
1. This moisture proof bag may be stored unopened within 12 months at the following conditions.  
 Temperature: 5°C~30°C  
 Humidity: 90% (max)
2. After opening the moisture proof bag, the devices should be assembled within 168 hours in an environment of 5°C to 30°C/60% RH or below.
3. If upon opening, 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

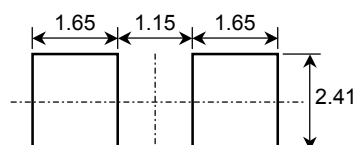
Temperature profile



- 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 : 300°C or less  
 Time : within 3 s

### Recommended soldering pattern

Unit: mm



## Cleaning

When cleaning is required after soldering, Toshiba recommends the following conditions:

Cleaning solvents: AK225 or alcohol

Temperature : 50°C (max) for 30 s (max) or 30°C (max) for 3 min (max)

Ultrasonic : 300 W max

## 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.

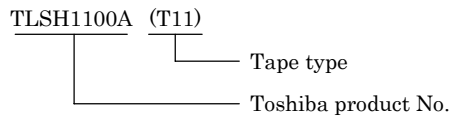
## Tape Specifications

### 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: T14 (4-mm pitch)

(2) Example

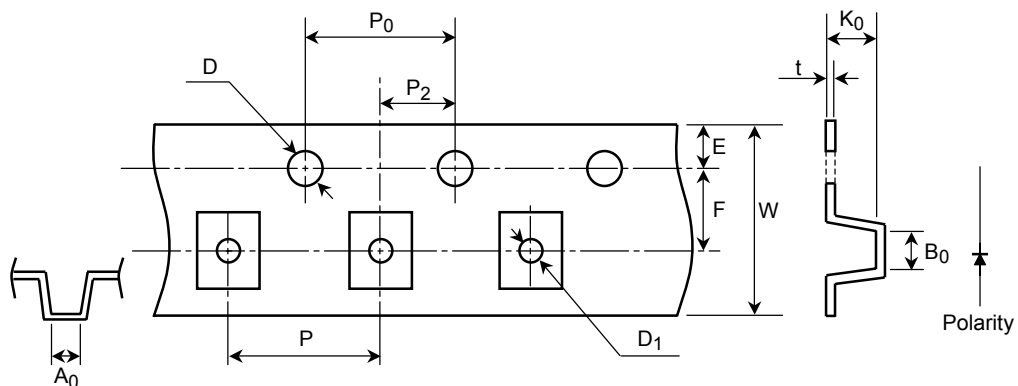


### 2. Tape dimensions

Unit: mm

Symbol	Dimension	Tolerance
D	1.5	+0.1/-0
E	1.75	±0.1
P <sub>0</sub>	4.0	±0.1
t	0.3	±0.05
F	3.5	±0.05
D <sub>1</sub>	1.5	±0.1

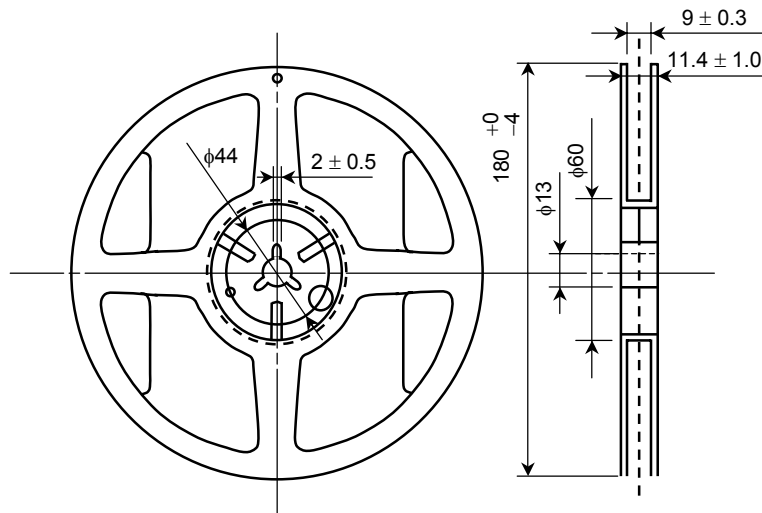
Symbol	Dimension	Tolerance
P <sub>2</sub>	2.0	±0.05
W	8.0	±0.3
P	4.0	±0.1
A <sub>0</sub>	2.9	±0.1
B <sub>0</sub>	3.7	±0.1
K <sub>0</sub>	2.3	±0.1



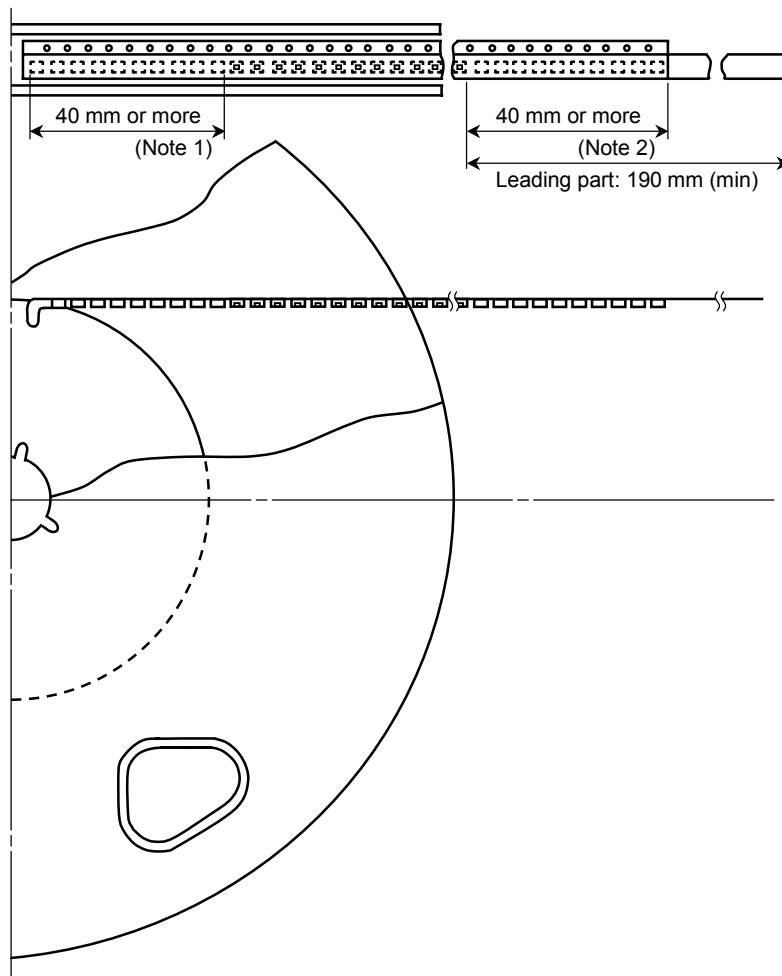


**3. Reel dimensions**

Unit: mm



**4. Leader and trailer sections of tape**



Note1: Empty trailer section

Note2: Empty leader section

## 5. Packing display

(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

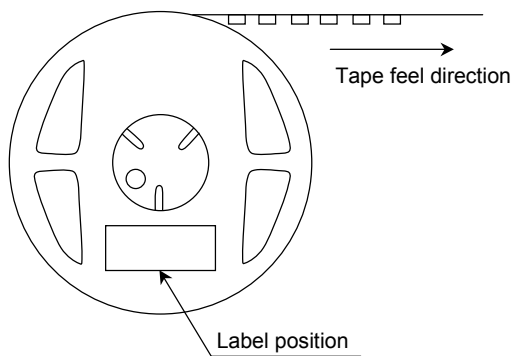
(1) Example: TL1SH1100A (T11)

P/N:

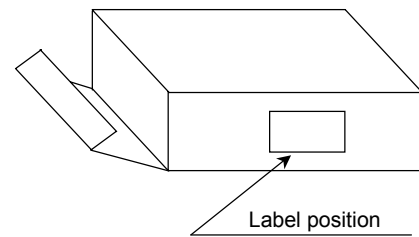
TYPE	TL1SH1100A		
ADD.C	(T11)	Q'TY	2,000 pcs
NOTE (RANK SYMBOL)	Lot Number		

(2) Label location

• Reel



• Carton



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

**RESTRICTIONS ON PRODUCT USE**

000707EAC

- TOSHIBA is continually working to improve the quality and reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to comply with the standards of safety in making a safe design for the entire system, and to avoid situations in which a malfunction or failure of such TOSHIBA products could cause loss of human life, bodily injury or damage to property.  
In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent TOSHIBA products specifications. Also, please keep in mind the precautions and conditions set forth in the "Handling Guide for Semiconductor Devices," or "TOSHIBA Semiconductor Reliability Handbook" etc..
- The TOSHIBA products listed in this document are intended for usage in general electronics applications (computer, personal equipment, office equipment, measuring equipment, industrial robotics, domestic appliances, etc.). These TOSHIBA products are neither intended nor warranted for usage in equipment that requires extraordinarily high quality and/or reliability or a malfunction or failure of which may cause loss of human life or bodily injury ("Unintended Usage"). Unintended Usage include atomic energy control instruments, airplane or spaceship instruments, transportation instruments, traffic signal instruments, combustion control instruments, medical instruments, all types of safety devices, etc.. Unintended Usage of TOSHIBA products listed in this document shall be made at the customer's own risk.
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