

**TLRM1108(T11), TLRMM1108(T11), TLSM1108(T11),
TLOM1108(T11), TLYM1108(T11)**

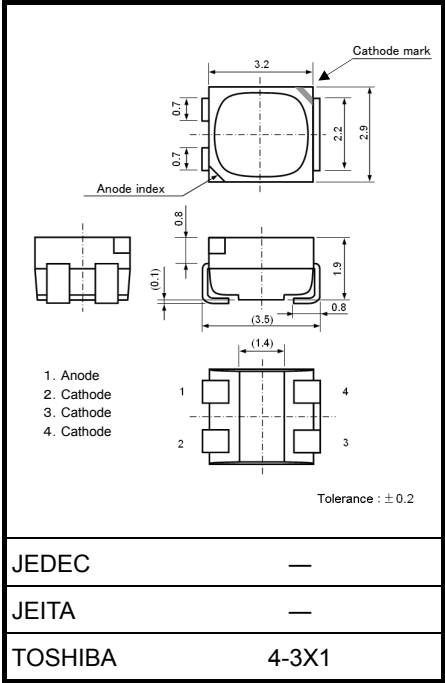
Panel Circuit Indicator

- Surface-mount device
- 3.2 (L) mm × 2.9 (W) mm × 1.9 (H) mm
- InGaAlP LEDs
- Colors: red, orange, yellow
- High luminous intensity
- Standard embossed tape packing: T11 (2000/reel)
4-mm tape reel
- High operating temperature
 $T_{opr} = -40$ to 100°C / $T_{stg} = -40$ to 100°C
- Applications: Instrumental panel Backlighting in Automotive equipment, message signboards, backlighting etc.

Color and Material

Part Number	Color	Material
TLRM1108	Red	InGaAlP
TLRMM1108	Red	
TLSM1108	Red	
TLOM1108	Orange	
TLYM1108	Yellow	

Unit: mm



Weight: 0.035 g (typ.)

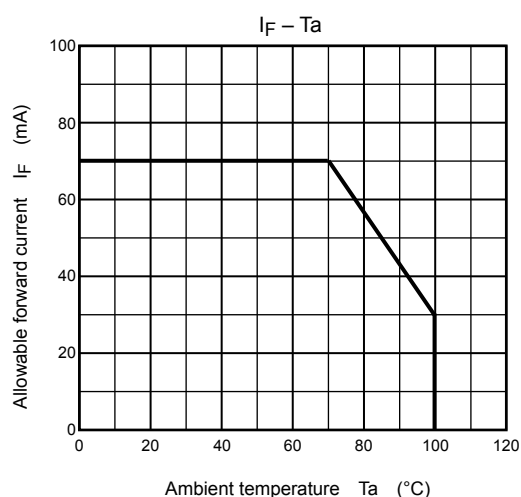
Absolute Maximum Ratings (Ta = 25°C)

Product Name	Forward Current I _F (mA) Please see Note 1	Reverse Voltage V _R (V)	Power Dissipation P _D (mW)	Operation Temperature T _{opr} (°C)	Storage Temperature T _{stg} (°C)
TLRM1108	70	4	203	-40 to 100	-40 to 100
TLRMM1108					
TLSM1108					
TLOM1108					
TLYM1108					

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 _F				Reverse Current I _R	
	Min	Typ.	Max	I _F	Max	V _R
TLRM1108	2.2	2.5	2.9	50	10	4
TLRMM1108	2.2	2.5	2.9			
TLSM1108	2.2	2.5	2.9			
TLOM1108	2.2	2.55	2.9			
TLYM1108	2.2	2.55	2.9			
Unit	V			mA	μA	V

Optical Characteristics–1 (Ta = 25°C)

Product Name	Luminous Intensity I _v				Available I _v rank Please see Note 2
	Min	Typ.	Max	I _F	
TLRM1108	630	1300	3200	50	VA / WA / XA
TLRMM1108	630	1600	3200	50	VA / WA / XA
TLSM1108	1000	2400	5000	50	WA / XA / YA
TLOM1108	1000	2500	5000	50	WA / XA / YA
TLYM1108	1000	2200	5000	50	WA / XA / YA
Unit	mcd	mcd	mcd	mA	

Note 2: The specification on the above table is used for I_v 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 _v	
	Min	Max
VA	630	1250
WA	1000	2000
XA	1600	3200
YA	2500	5000
Unit	mcd	mcd

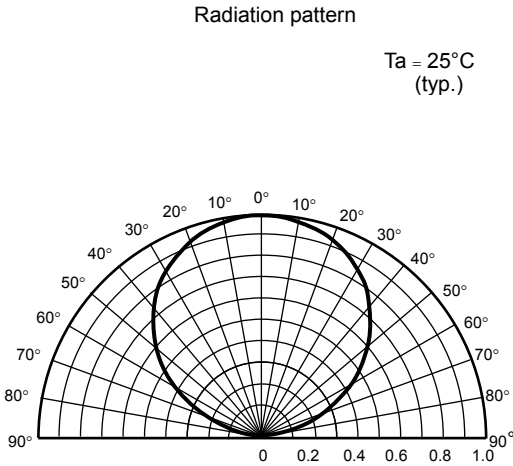
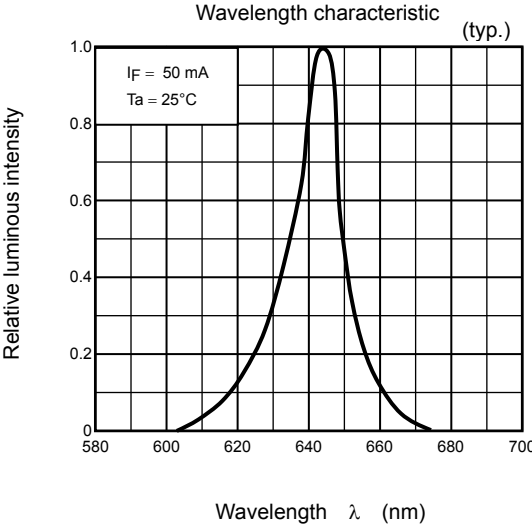
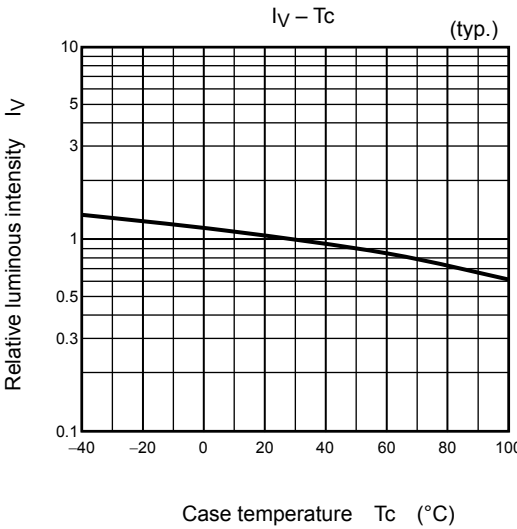
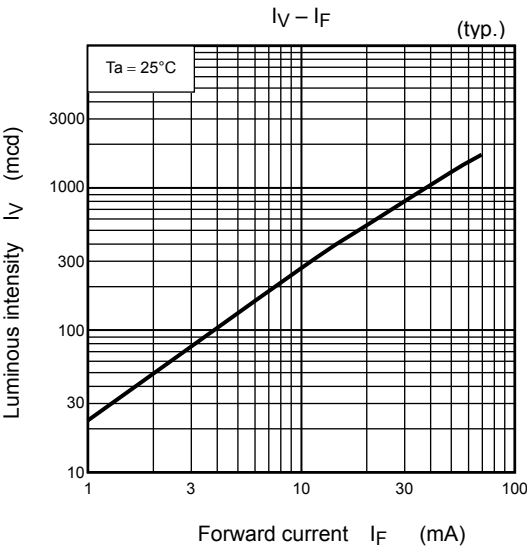
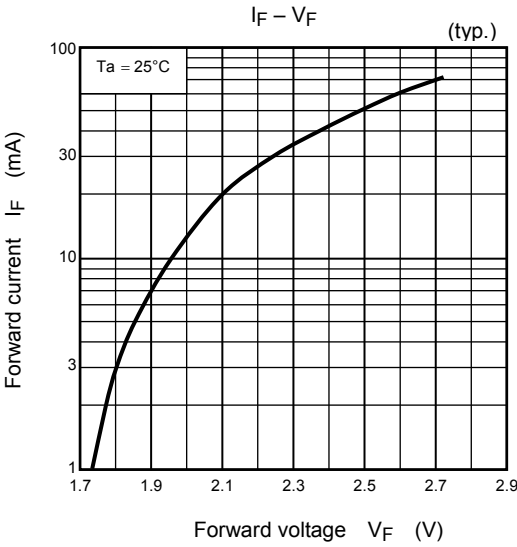
Optical Characteristics–2 (Ta = 25°C)

Product Name	Peak Emission Wavelength λ_p			Emission Spectrum				I _F
				$\Delta\lambda$	Dominant Wavelength λ_d			
	Min	Typ.	Max	Typ.	Min	Typ.	Max	
TLRM1108	—	644	—	14	624	630	638	50
TLRMM1108	—	636	—	14	620	626	634	
TLSM1108	—	623	—	14	607	613	621	
TLOM1108	—	612	—	14	599	605	613	
TLYM1108	—	592	—	13	583	590	595	
Unit	nm			nm	nm			mA

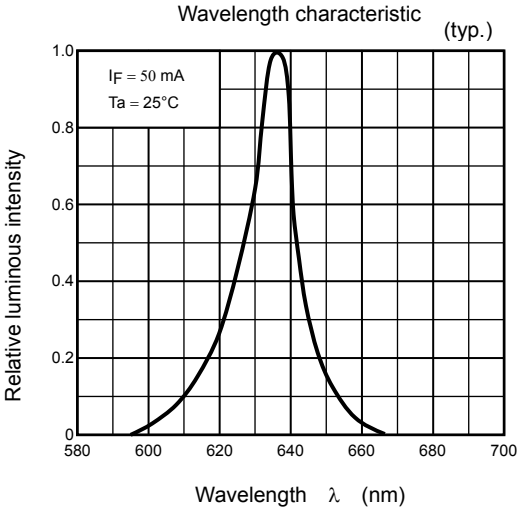
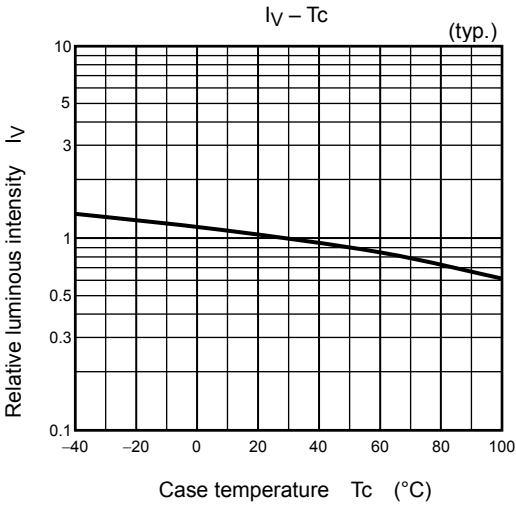
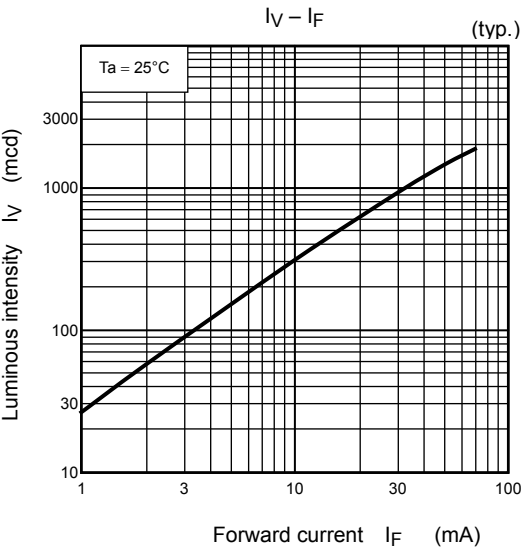
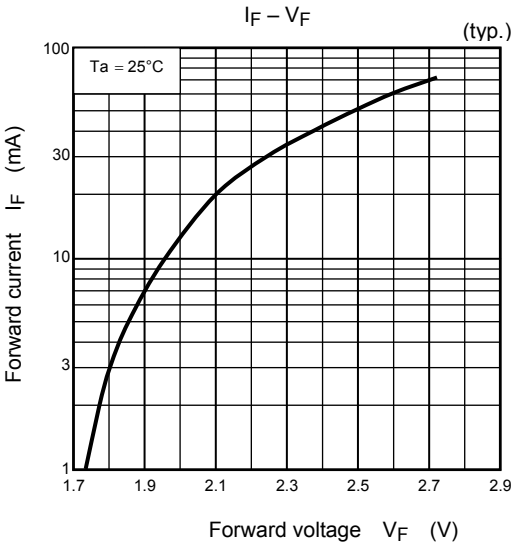
Handling precautions

- 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.

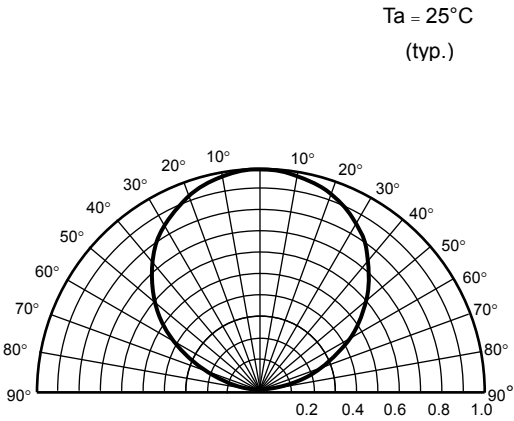
TLRM1108



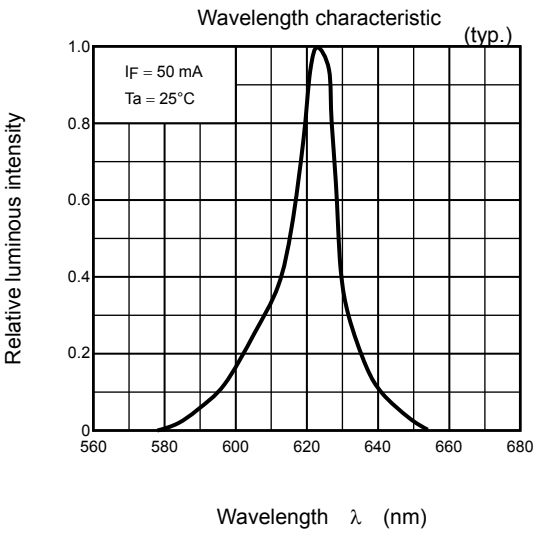
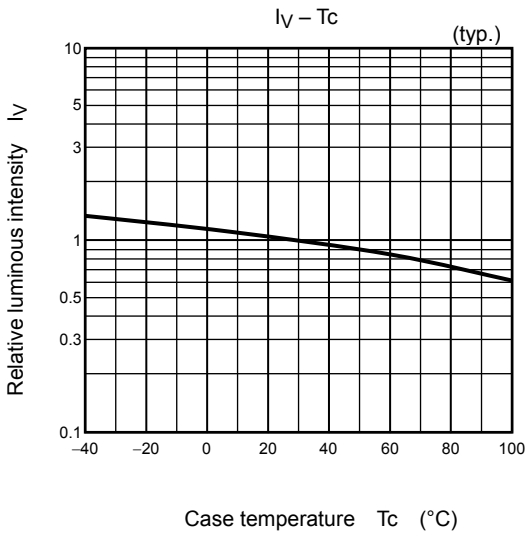
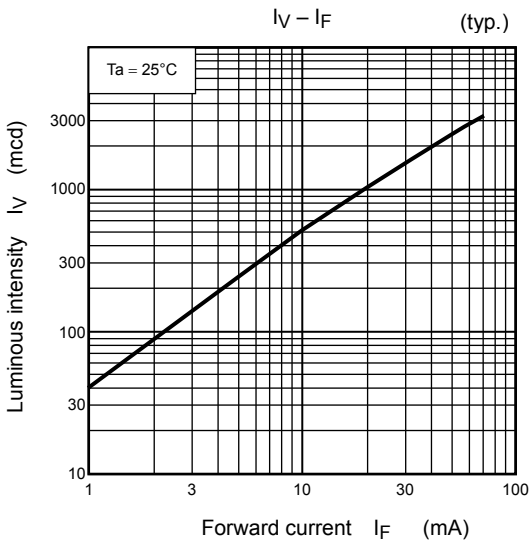
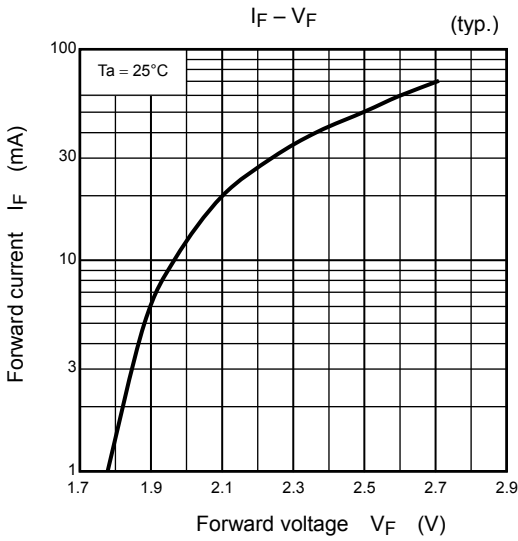
TLRMM1108



Radiation pattern

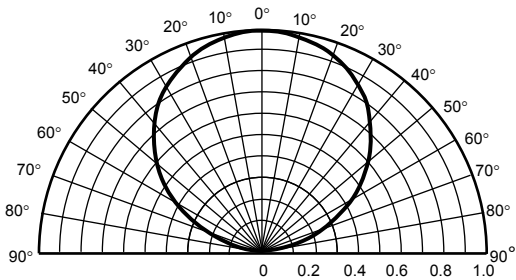


TLSM1108

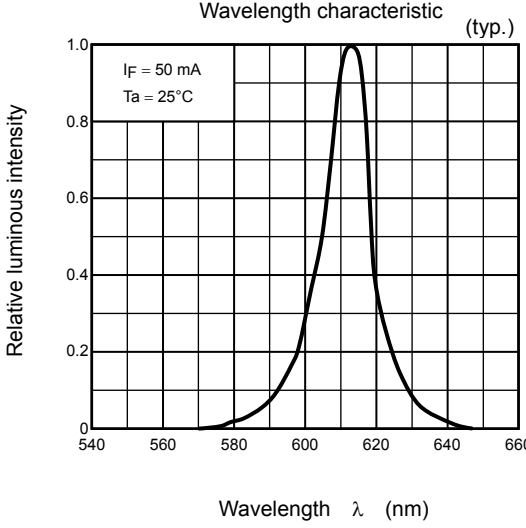
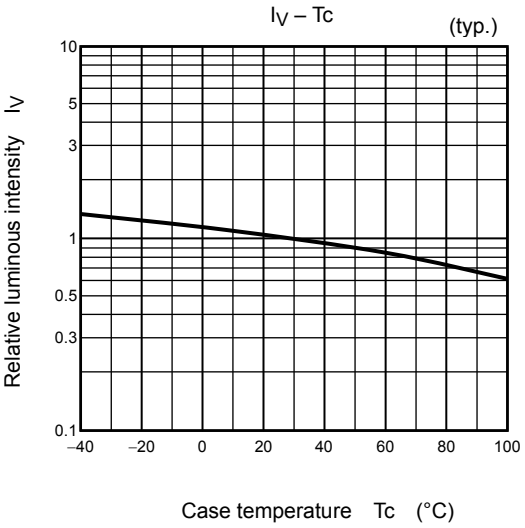
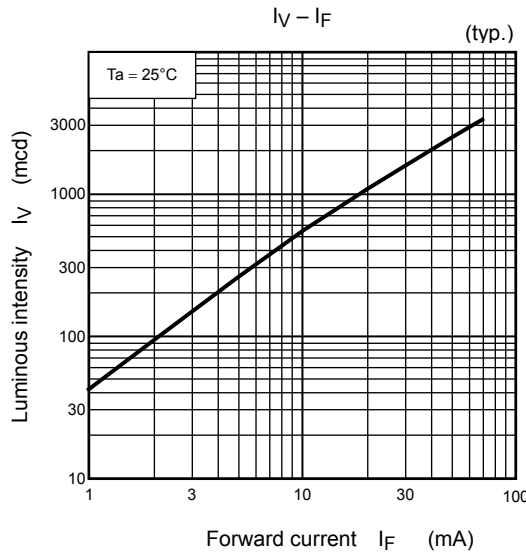
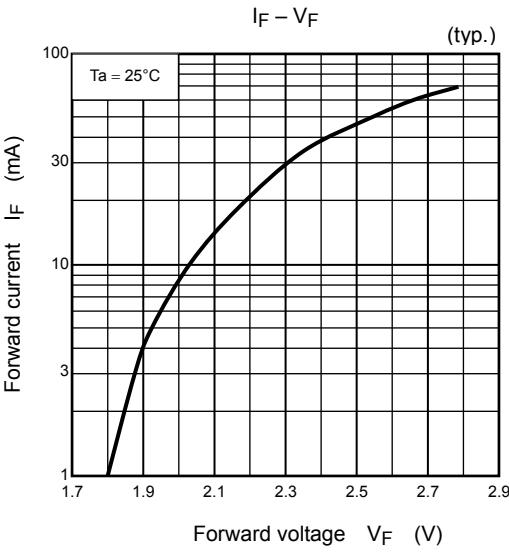


Radiation pattern

Ta = 25°C
(typ.)

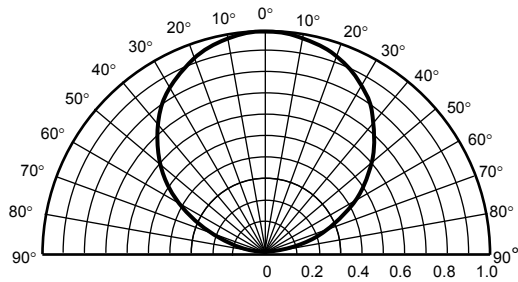


TLOM1108

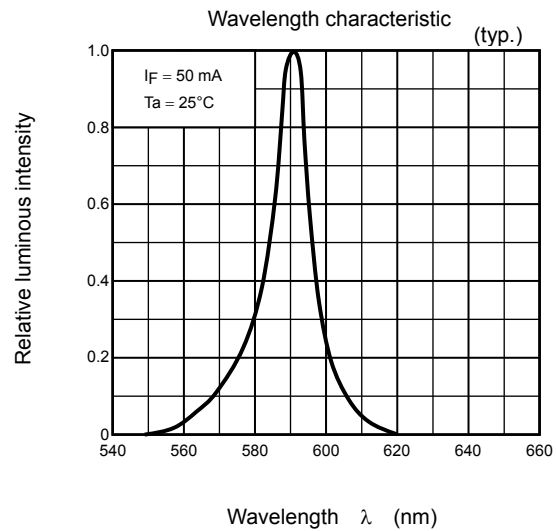
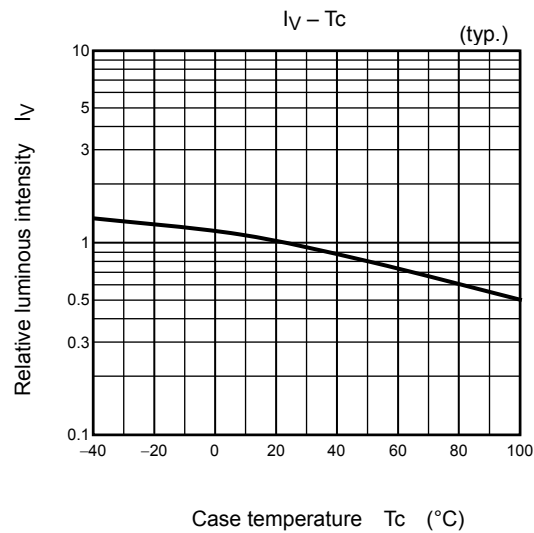
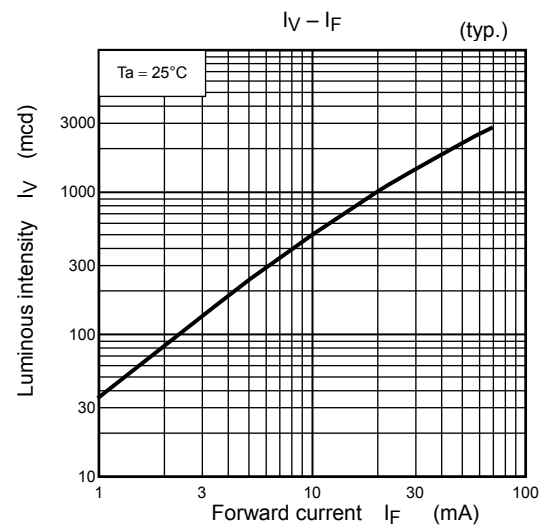
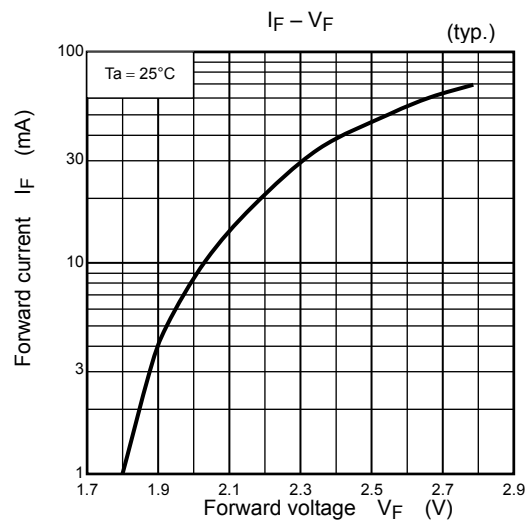


Radiation pattern

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

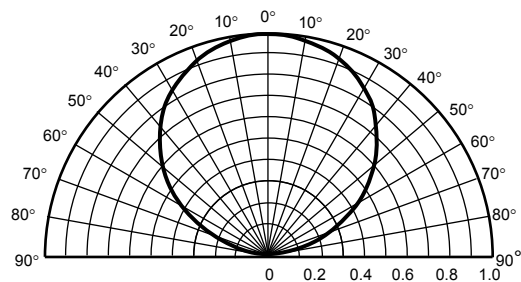


TLYM1108



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:

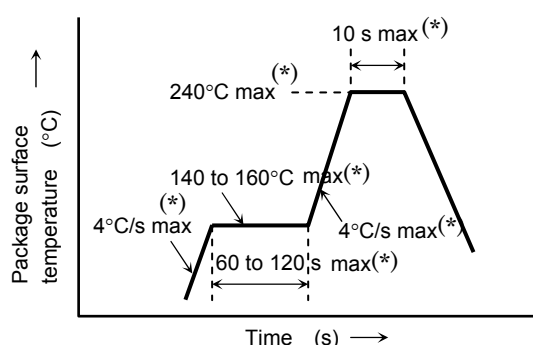
1. This moisture proof bag may be stored unopened within 12 months at the following conditions.
Temperature: 5°C to 30°C
Humidity: 90% (max)
2. After opening the moisture proof bag, the devices should be assembled within 4 weeks in an environment of 5°C to 30°C/60% RH or below.
3. If upon opening, the 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

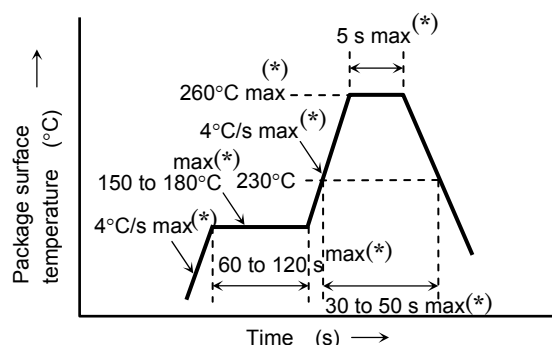
Soldering

- Reflow soldering (example)

Temperature profile for Pb soldering (example)



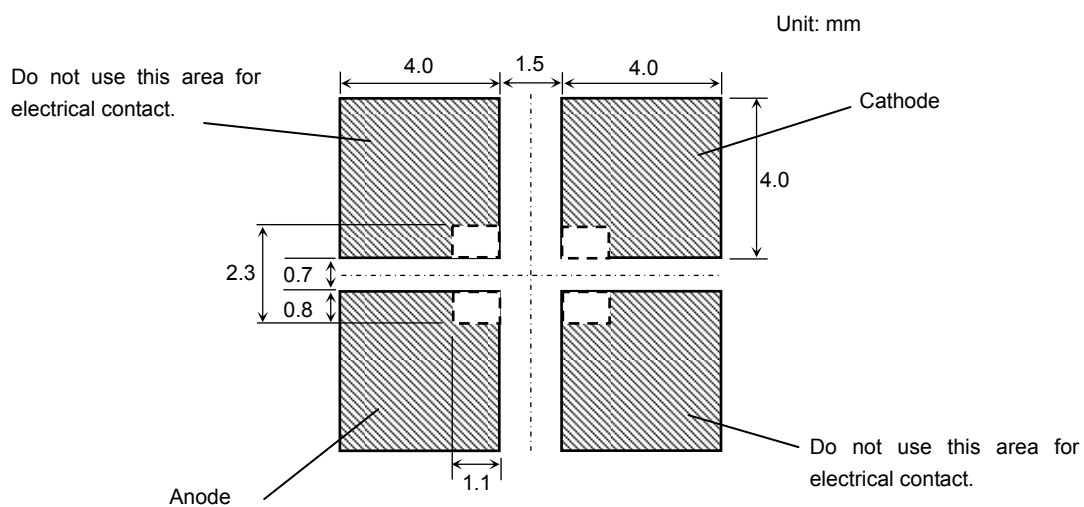
Temperature profile for Pb-free soldering (example)



- 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 4 weeks 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

Cu area > 16 mm²



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

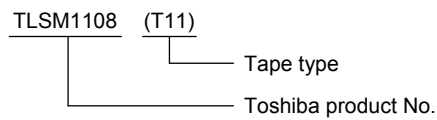
Do not apply force to the plastic part of the LED under high-temperature conditions.
To avoid damaging the LED plastic, do not apply friction using a hard material.
When installing the PCB in a product, ensure that the device does not come into contact with other components.

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

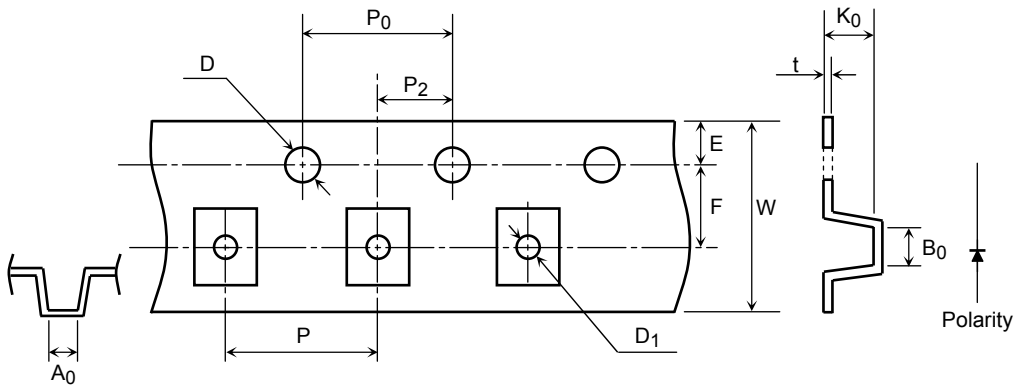
Tape material protected against static electricity. However, static electricity may occur depending on quantity of charged static electricity and a device may attach to a tape, or a device may be unstable when peeling a tape cover.

- (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

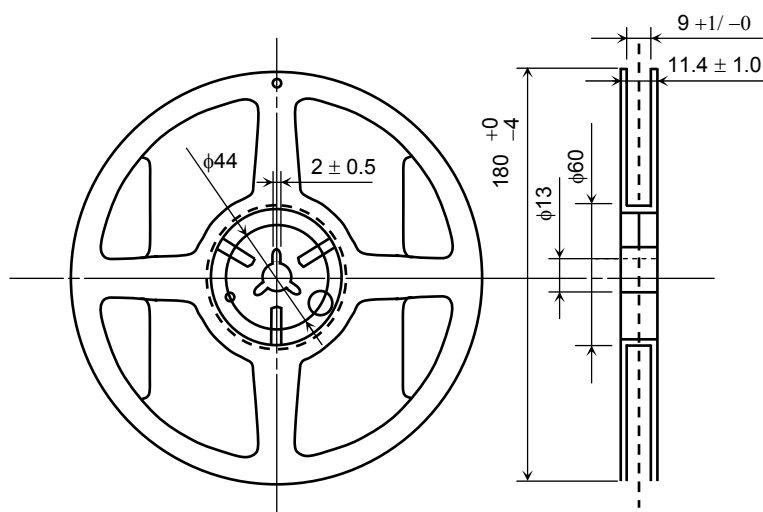
Unit: mm

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

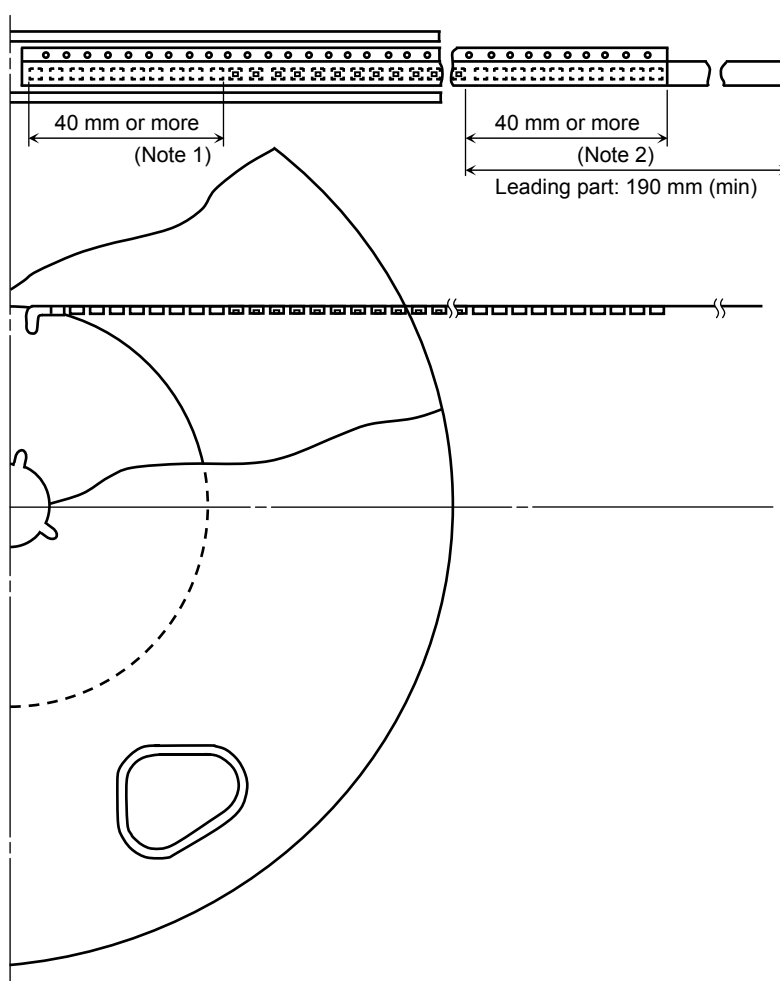


4. Reel dimensions

Unit: mm



5. Leader and trailer sections of tape



Note 1: Empty trailer section

Note 2: Empty leader section

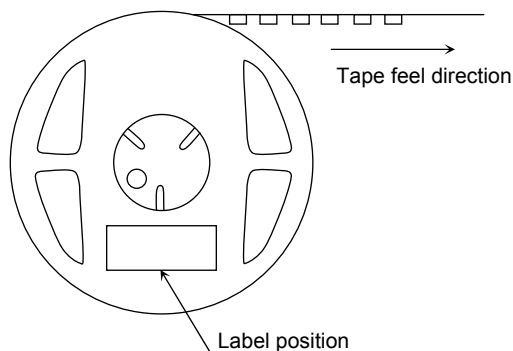
(1) Packing quantity

Reel	2,000 pcs
Carton	10,000 pcs

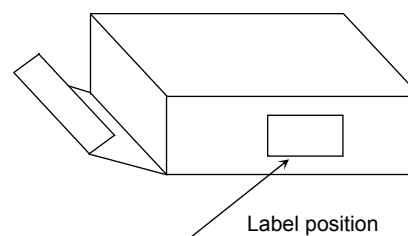
7. Label format

P/N:		TOSHIBA	
TYPE	TLSM1108		
ADDC	(T11)	Q'TY	2,000 pcs
Lot Number Key code for TSB		32C	2000
(RANK SYMBOL)			
Use under 5-30degC/60%RH in 4weeks			
[[G]]/RoHS COMPATIBLE		SEALED:	
Y380xxxxxxxxxxxxxxxxxxx		DIFFUSED IN *****	
		ASSEMBLED IN *****	

- 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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