

TOSHIBA LED Lamps

TLRV1034(T22, TLRMV1034(T22, TLSV1034(T22, TLOV1034(T22, TLYV1034(T22, TLPYV1034(T22 TLGV1034(T22, TLFGV1034(T22, TLPGV1034(T22

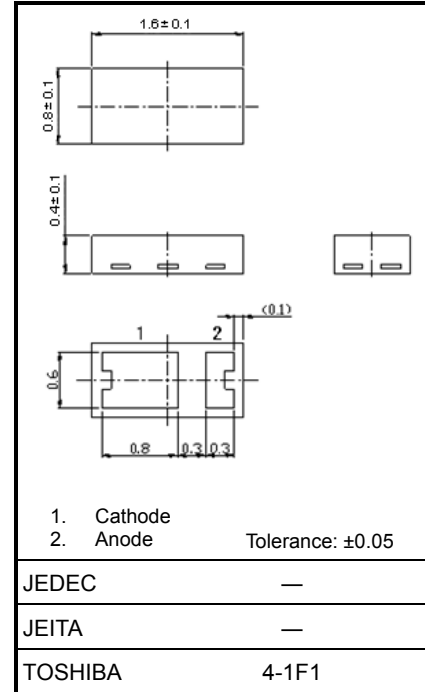
Panel Circuit Indicators

- 1.6 (L) mm × 0.8 (W) mm × 0.4 (H) mm
TL□V1034(T22) series
- InGaAlP LEDs
- Low drive current, high-intensity light emission
- Color : red, orange, yellow, pure yellow, green, pure green
- Transparent resin
- Standard embossed tape packing : T22 (5000 pcs / reel)
- Topr / Tstg = -40 to 100degC
- Applications : backlighting, indicator, instrumental panel backlighting in automotive equipment, etc.

Color and Material

Part Number	Color	Material
TLRV1034	Red	InGaAlP
TLRMV1034	Red	
TLSV1034	Red	
TLOV1034	Orange	
TLYV1034	Yellow	
TLPYV1034	Pure Yellow	
TLGV1034	Green	
TLFGV1034	Green	
TLPGV1034	Pure Green	

Unit: mm



Weight: 0.001 g (typ.)

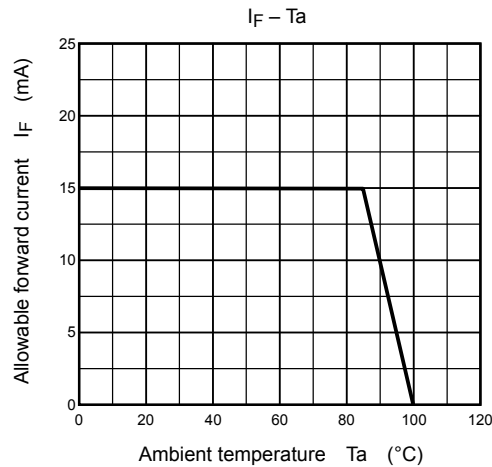
Absolute Maximum Ratings (Ta = 25°C)

Part Number	DC 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)
TLRV1034	15	5	31.5	-40 to 100	-40 to 100
TLRMV1034			34.5		
TLSV1034					
TLOV1034					
TLYV1034					
TLPYV1034					
TLGV1034					
TLFGV1034					
TLPGV1034					

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)

Part Number	Forward Voltage V _F			Reverse Current I _R		
	Min	Typ.	Max	I _F	Max	V _R
TLRV1034	1.5	1.8	2.1	5	10	5
TLRMV1034	1.5	1.8	2.1			
TLSV1034	1.7	2.0	2.3			
TLOV1034	1.7	2.0	2.3			
TLYV1034	1.7	2.0	2.3			
TLPYV1034	1.7	2.0	2.3			
TLGV1034	1.7	2.0	2.3			
TLFGV1034	1.7	2.0	2.3			
TLPGV1034	1.7	2.0	2.3			
Unit	V			mA	μA	V

Optical Characteristics-1 (Ta = 25°C)

Part Number	Luminous Intensity I_v				I_F	Available I_v rank Please see Note 2
	Min	Typ.	Max			
TLRV1034	4	15	50	5	(JA / KA / LA / MA / NA)	
TLRMV1034	4	20	50		(JA / KA / LA / MA / NA)	
TLSV1034	10	30	80		(LA / MA / NA / PA)	
TLOV1034	10	38	80		(LA / MA / NA / PA)	
TLYV1034	10	25	80		(LA / MA / NA / PA)	
TLPYV1034	10	23	80		(LA / MA / NA / PA)	
TLGV1034	4	14	50		(JA / KA / LA / MA / NA)	
TLFGV1034	2.5	8	20		(HA / JA / KA / LA)	
TLPGV1034	1.6	3.5	12.5		(GA / HA / JA / KA)	
Unit	mcd			mA	—	

Note 2 : The specification on the following 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.

Luminous Intensity I_v		
Rank	Min	Max
GA	1.6	3.2
HA	2.5	5.0
JA	4.0	8.0
KA	6.3	12.5
LA	10	20
MA	16	32
NA	25	50
PA	40	80
Unit	mcd	

Optical Characteristics-2 (Ta = 25°C)

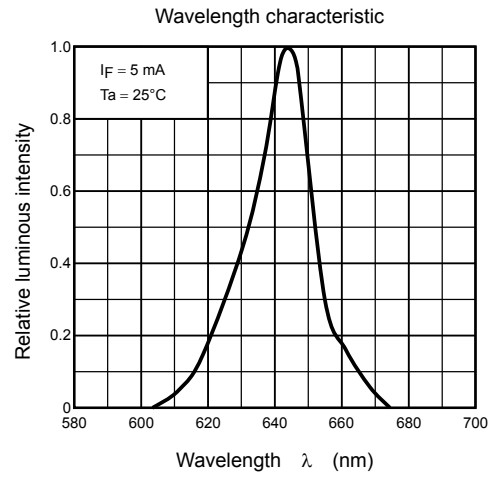
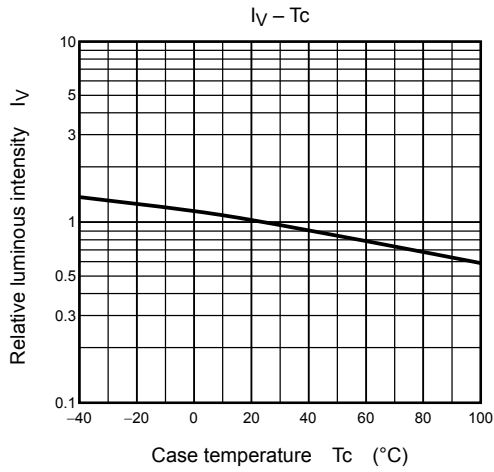
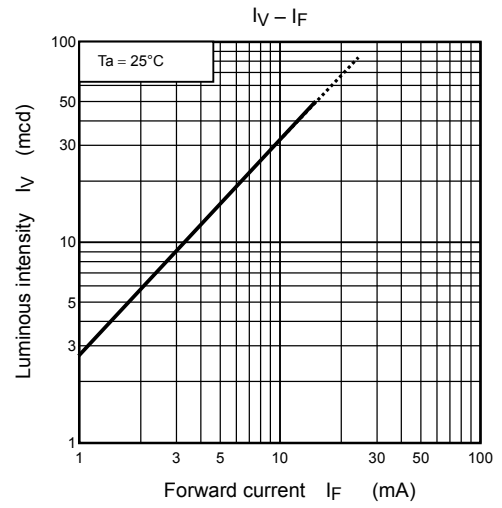
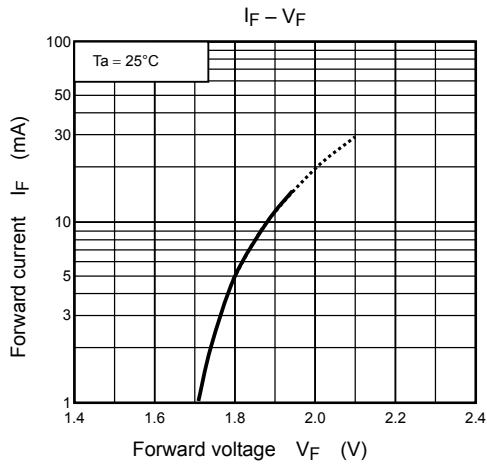
Part Number	Emission Spectrum							I_F
	Peak Emission Wavelength λ_p			$\Delta\lambda$	Dominant Wavelength λ_d			
	Min	Typ.	Max		Min	Typ.	Max	
TLRV1034	—	644	—	18	624	630	638	5
TLRMV1034	—	636	—	17	620	626	634	
TLSV1034	—	623	—	17	607	613	621	
TLOV1034	—	612	—	15	599	605	613	
TLYV1034	—	590	—	13	581	587	595	
TLPYV1034	—	583	—	13	574	580	586	
TLGV1034	—	574	—	11	565	571	576	
TLFGV1034	—	568	—	11	559	565	571	
TLPGV1034	—	562	—	11	555	561	566	
Unit	nm			nm	nm			mA

Cautions

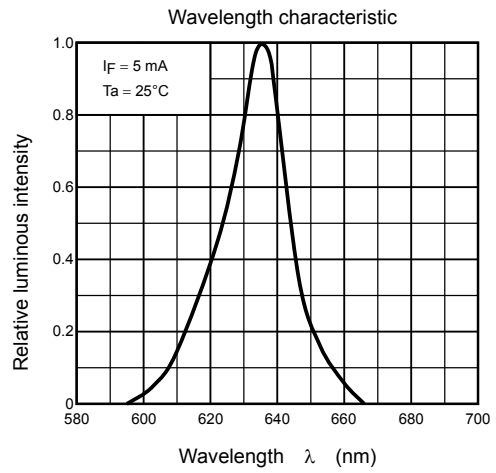
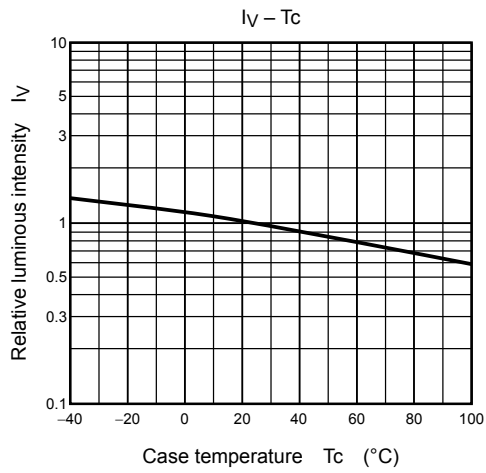
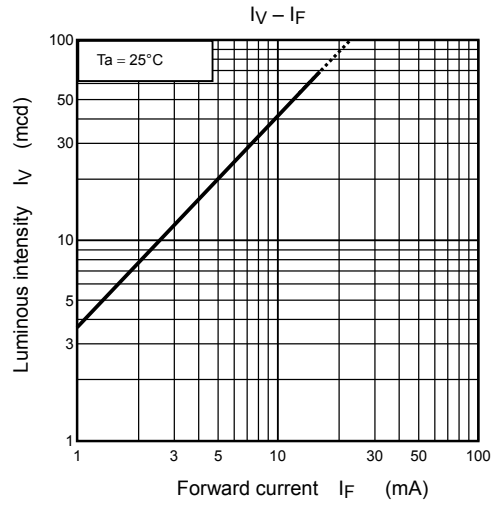
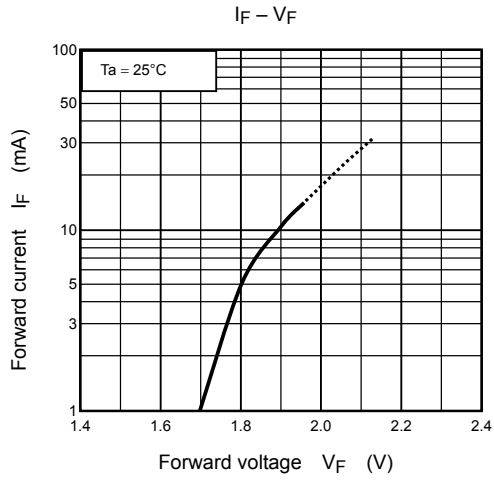
- This visible LED lamp also emits some IR light.
If a photodetector is located near the LED lamp, please ensure that it will not be affected by the IR light.
- This product is designed as a general display light source usage, and it has applied the measurement standard that matched with the sensitivity 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.
- If a voltage is applied in a high humidity environment, migration of electrode metal may occur and, consequently, there may be a short circuit of interelectrode metal.

Since such metal migration is particularly likely to occur if a reverse voltage is applied in conditions in which condensation occurs, please take preventive measures by providing a moisture-proof design, drive circuit design, etc. for customer products into which this product will be integrated.

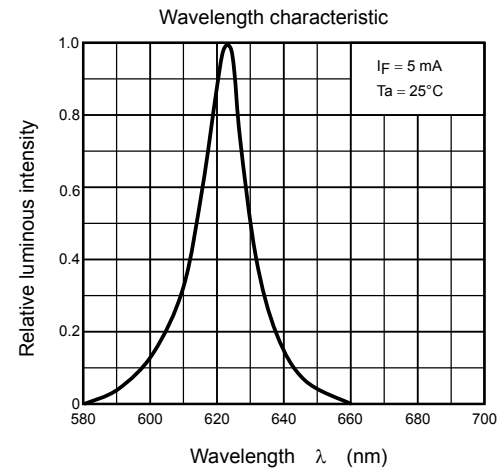
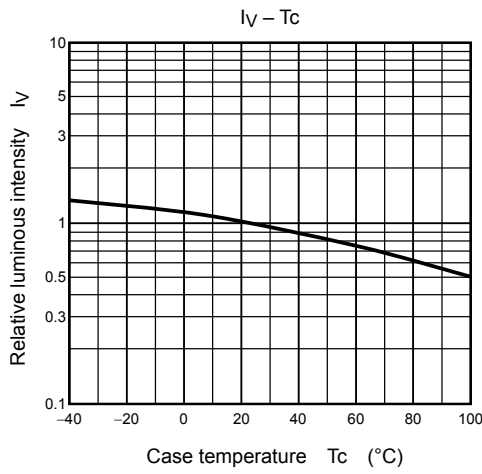
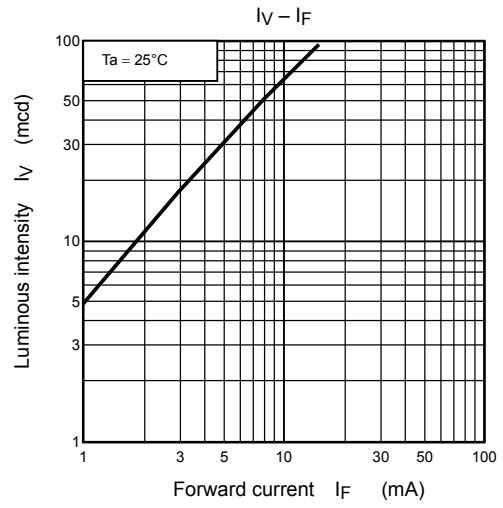
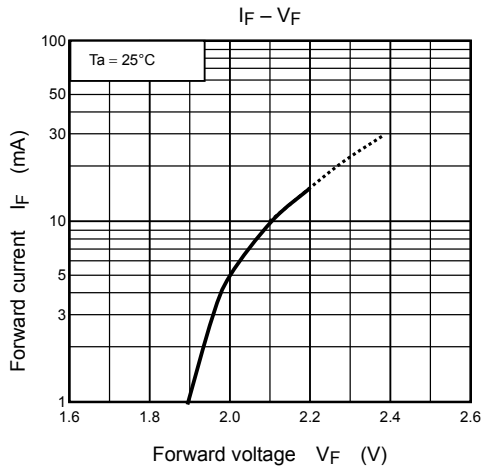
TLRV1034



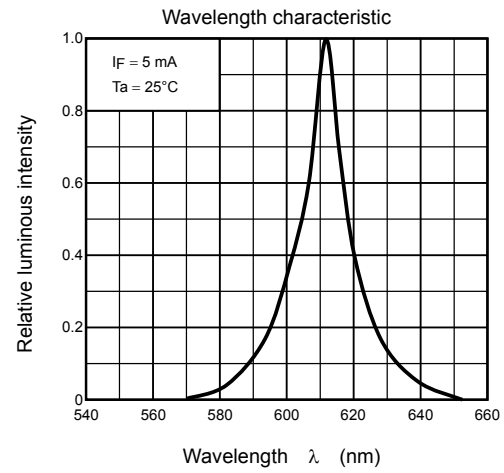
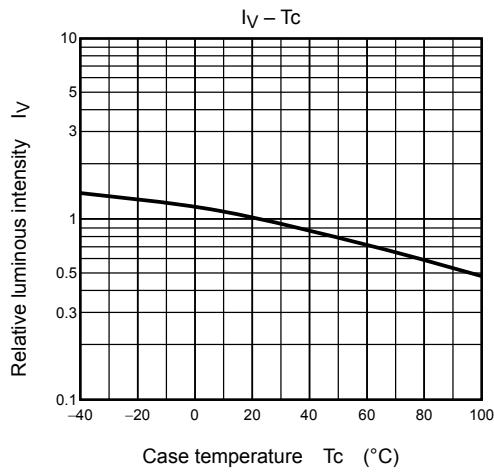
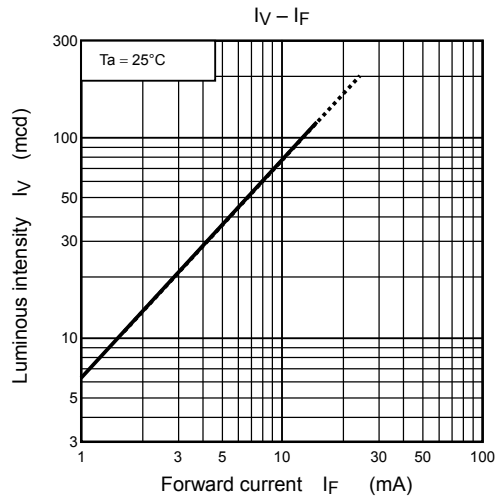
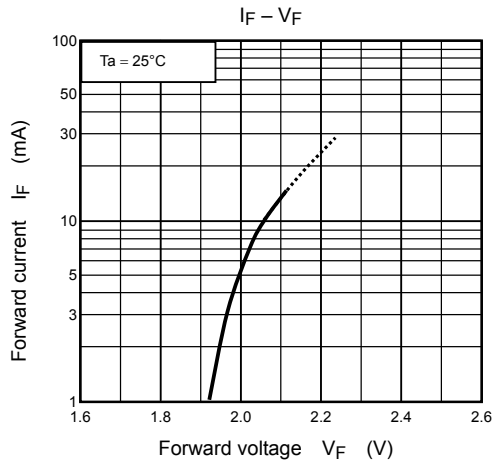
TLRMV1034



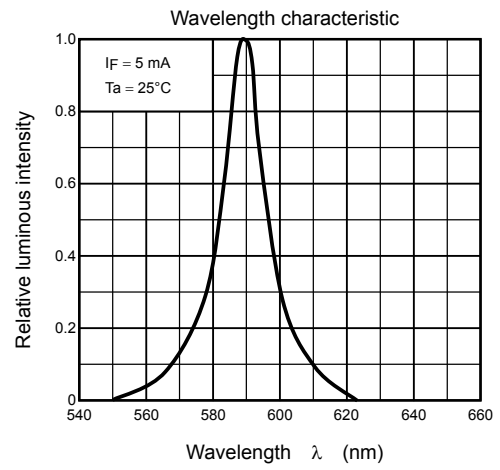
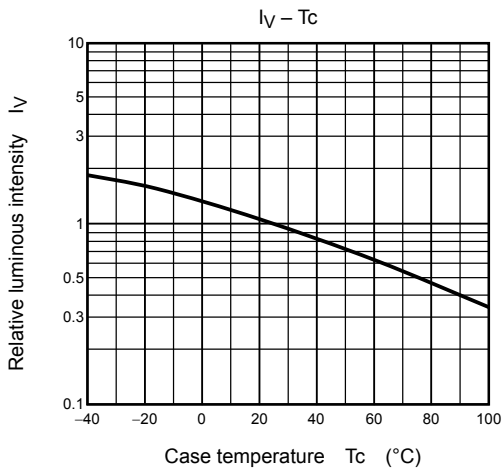
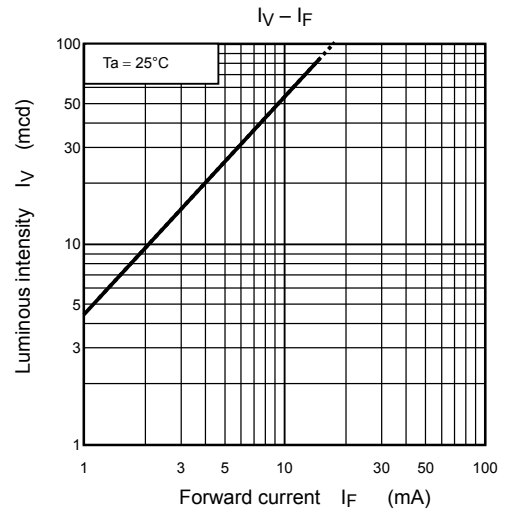
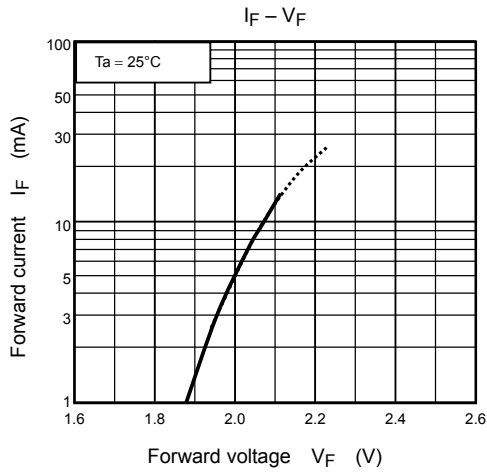
TLSV1034



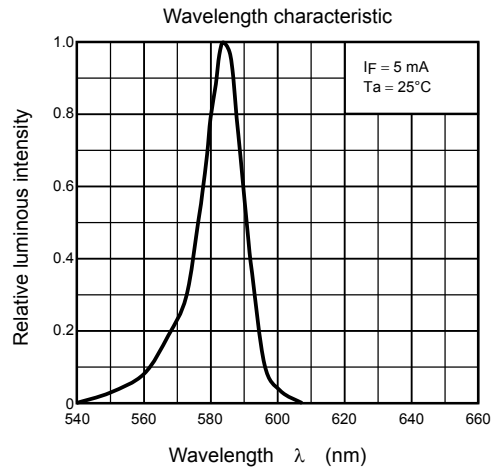
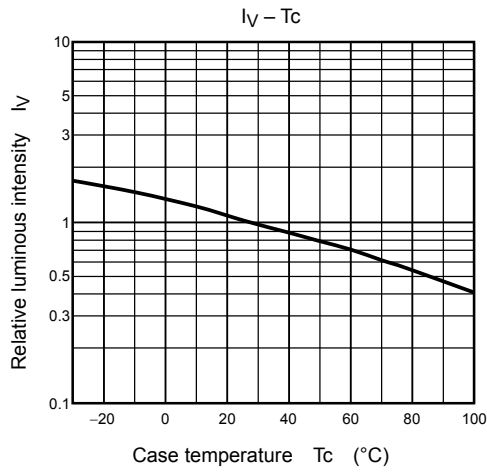
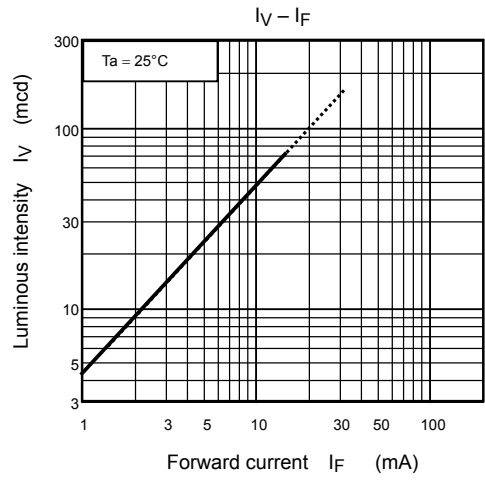
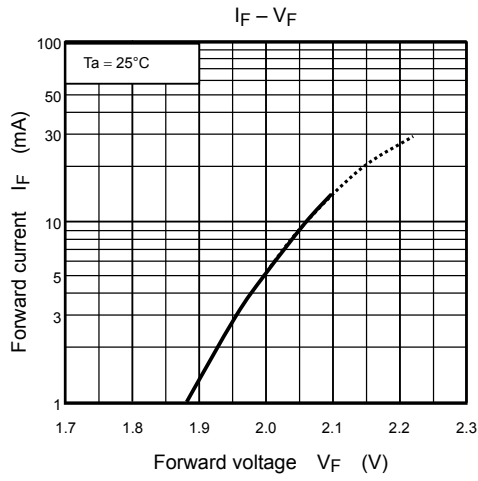
TLOV1034



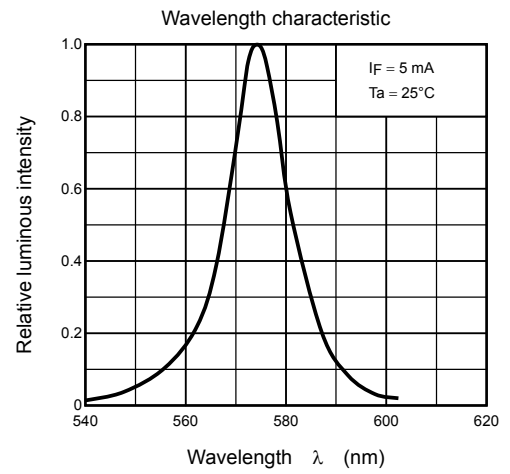
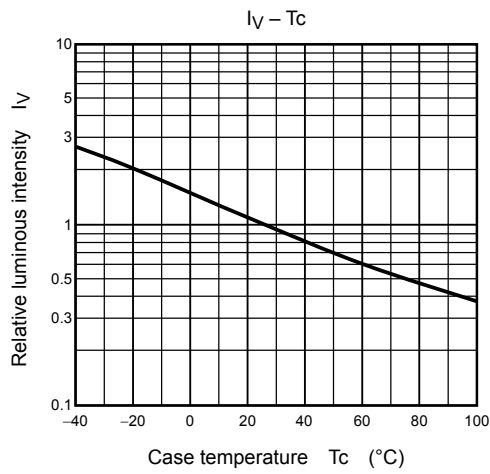
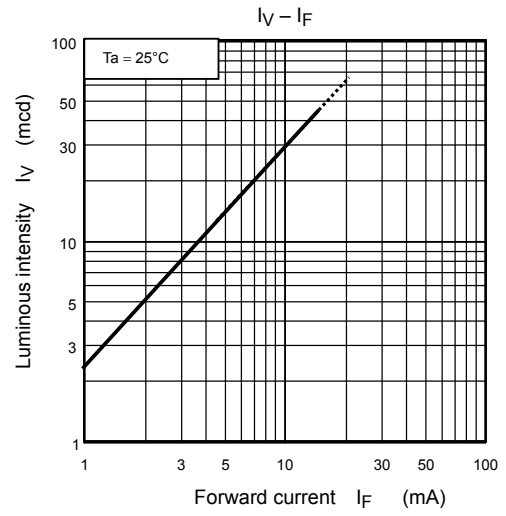
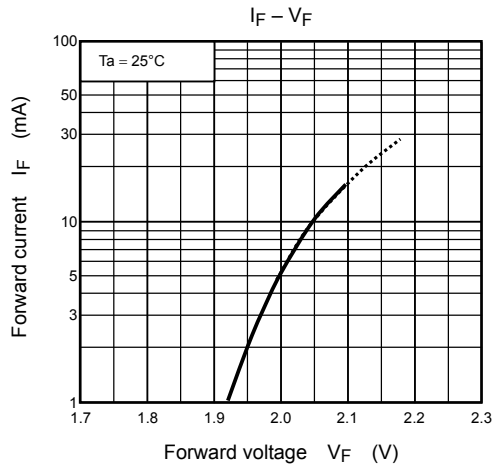
TLYV1034



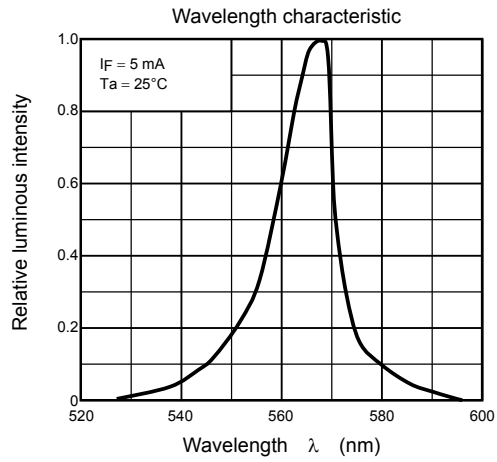
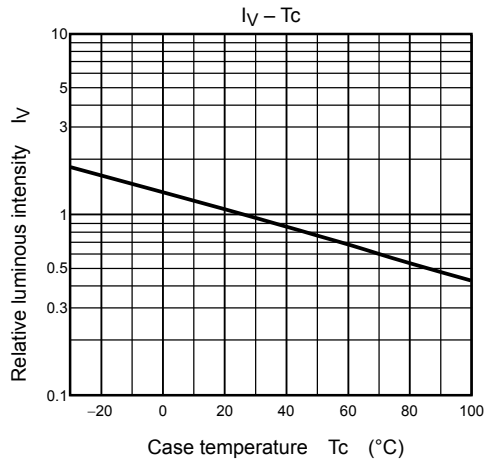
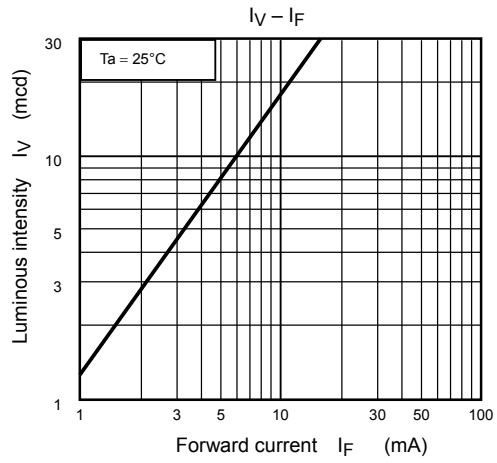
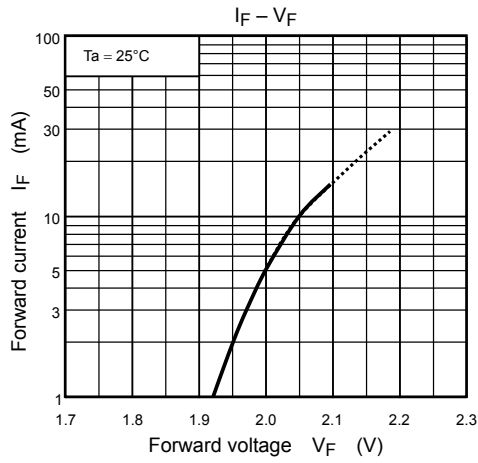
TLPYV1034



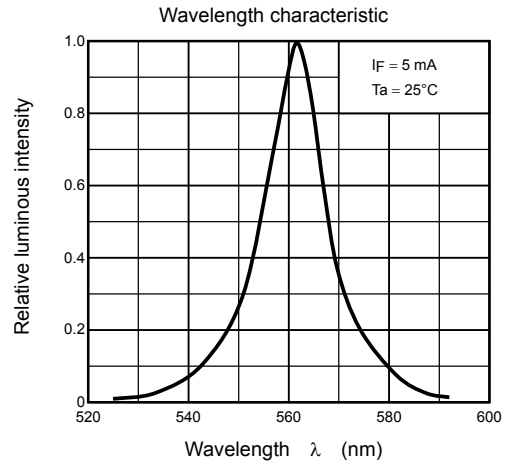
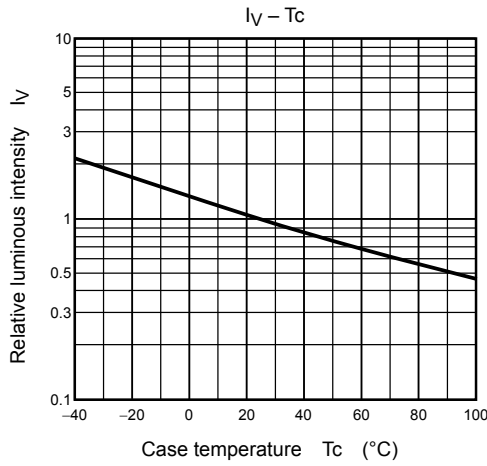
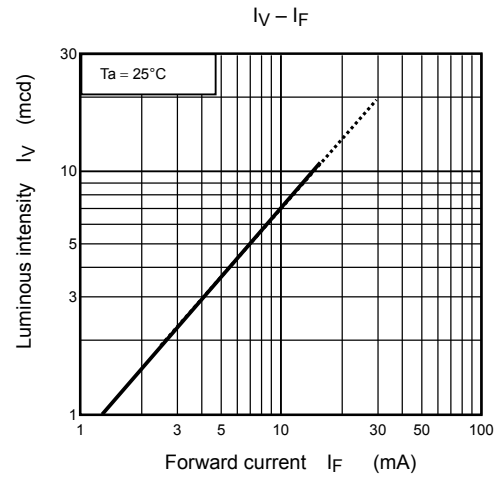
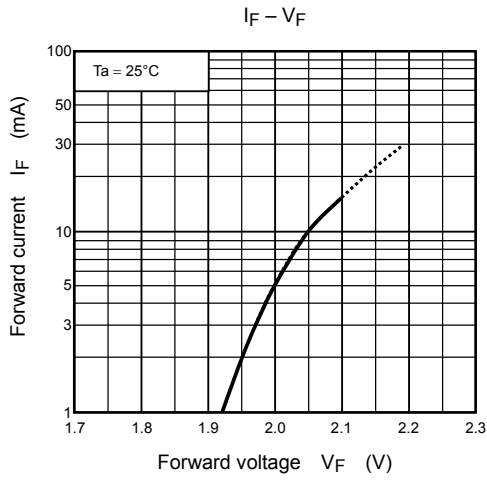
TLGV1034



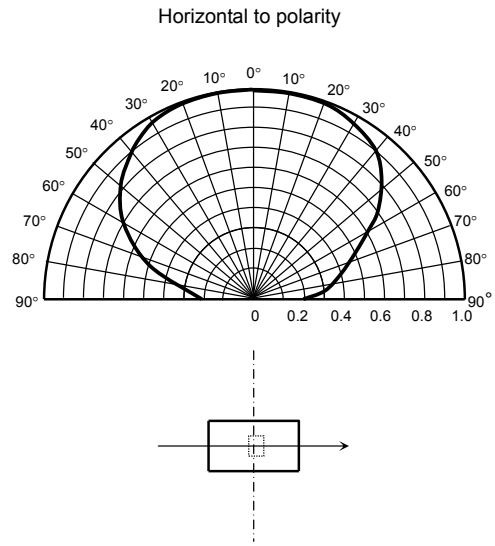
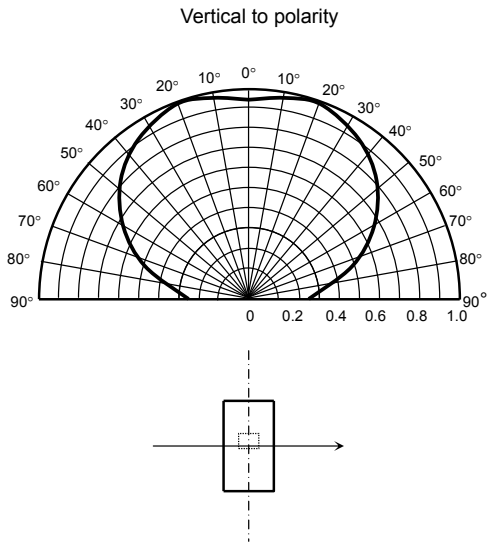
TLFGV1034



TLPGV1034



Radiation Pattern



Packaging

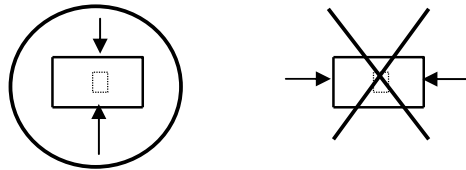
These LED devices are packed in an aluminum envelope with a silica gel and a moisture indicator to avoid moisture absorption. The optical characteristics of the devices may be affected by exposure to moisture in the air before soldering and they should therefore be stored under the following conditions:

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.

Attention of mounting method

Please note the handling of products during evaluation.

1. Please do not apply pressure to the upper surface of the product with fingers, tweezers, and others. Failure of product to light up may occur due to package deformation, wire deformation and/or disconnection.
2. Please handle the product lengthwise.



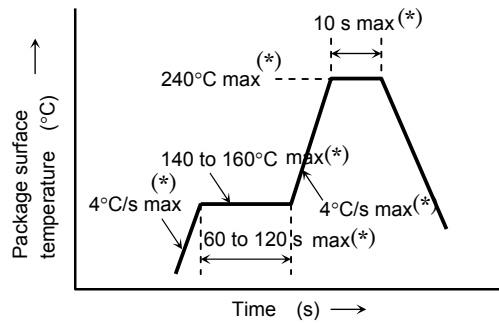
3. Should tweezers be used in product handling, one with flat surfaces is recommended.
4. Please do not drop the product. There is a possibility for package transformation etc. to occur when the product is dropped.
5. Please do not stack the Printed Circuit Boards on which the product is mounted to prevent damages to product surface. Also, please note not to damage the surface of the product with cushioning material etc. Surface damage to the product may influence their optical characteristics.

Mounting Method

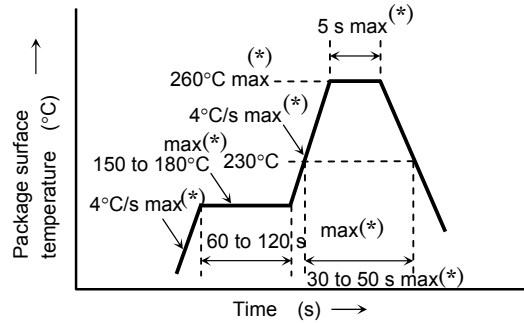
Soldering

- Reflow soldering

Temperature profile for Pb soldering (example)

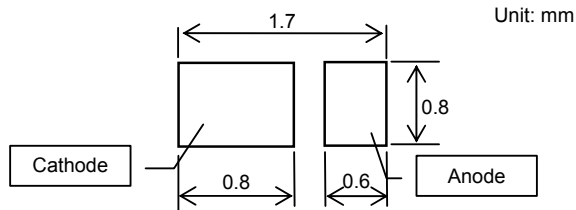


Temperature profile for Pb-free soldering (example)



- 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)
- Do not perform wave soldering.

Land Pattern dimensions for reference only



Please be sure to check solderability.

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

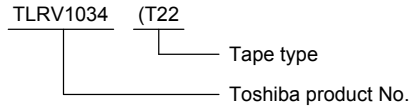
Do not apply force to the plastic part of the LED under high-temperature conditions.
To avoid damaging the LED plastic, do not apply friction using a hard material.
When installing the PCB in a product, ensure that the device does not come into contact with other components.

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: T22 (4-mm pitch)
- (2) Example

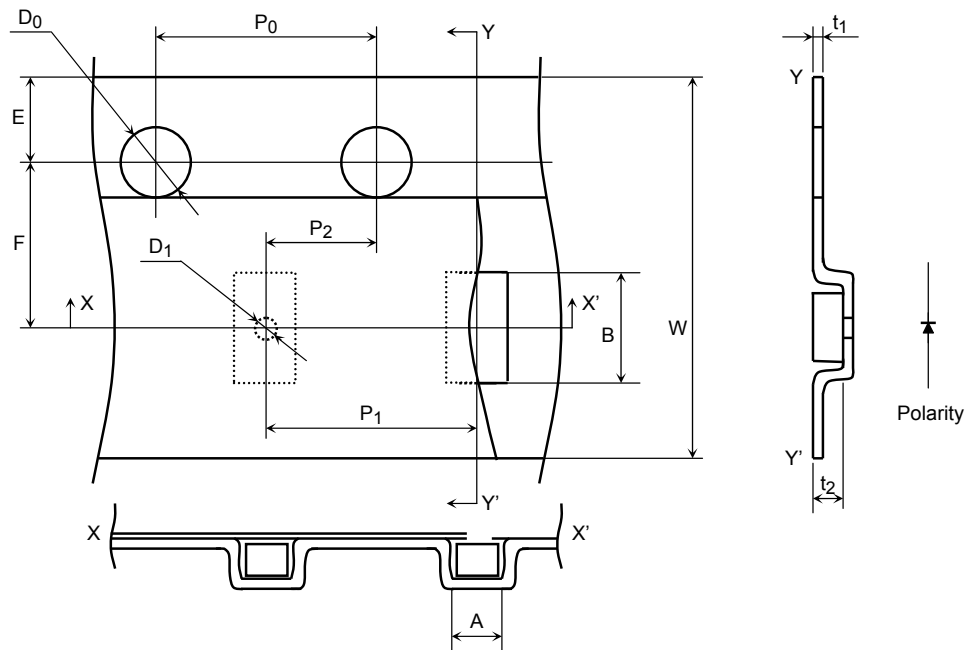


2. Tape Dimensions

Unit: mm

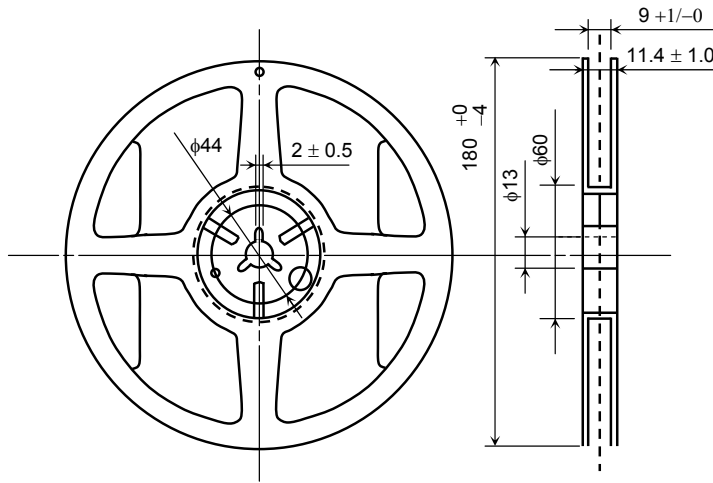
Item	Symbol	Value	Tolerance
Carrier tape	Width	W	±0.2
	Thickness	t ₁	±0.05
Feed hole	Diameter	D ₀	+0.1/-0
	Pitch	P ₀	±0.1
	Position	E	±0.1
Distance from center Line	Vertical Direction(1)	P ₁	±0.1
	Vertical Direction(2)	P ₂	±0.05
	Horizontal Direction(1)	F	±0.05

Item	Symbol	Value	Tolerance
Cavity	Length	B	±0.05
	Width	A	±0.05
	Depth	t ₂	±0.05
	Diameter of mark hole	D ₁	±0.1

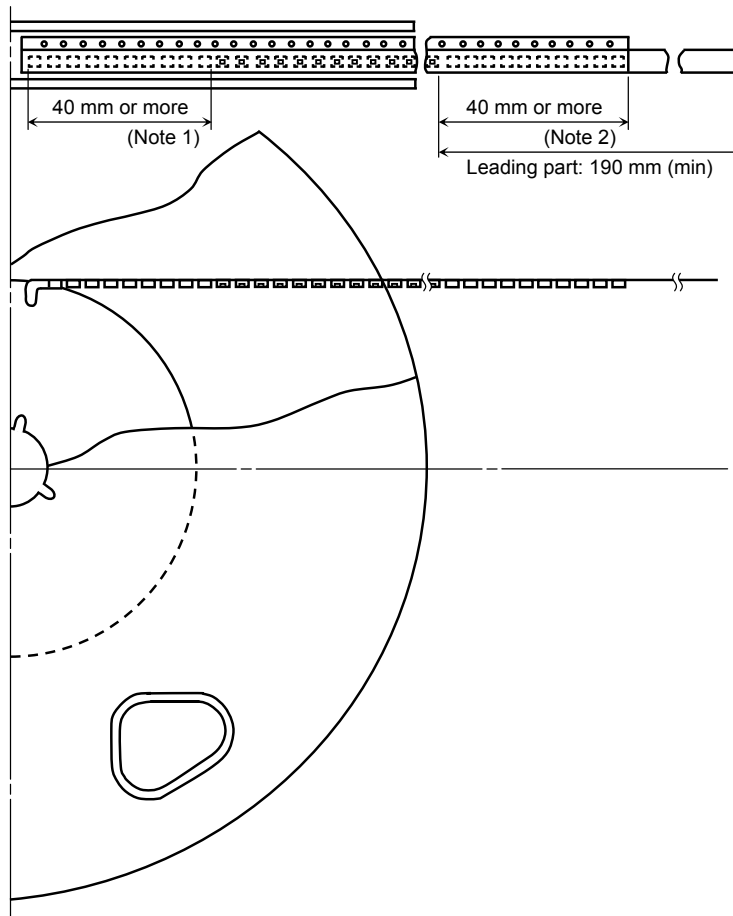


3. Reel Dimensions

Unit: mm



4. Leader and Trailer Sections of Tape



Note 1: Empty trailer section

Note 2: Empty leader section

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