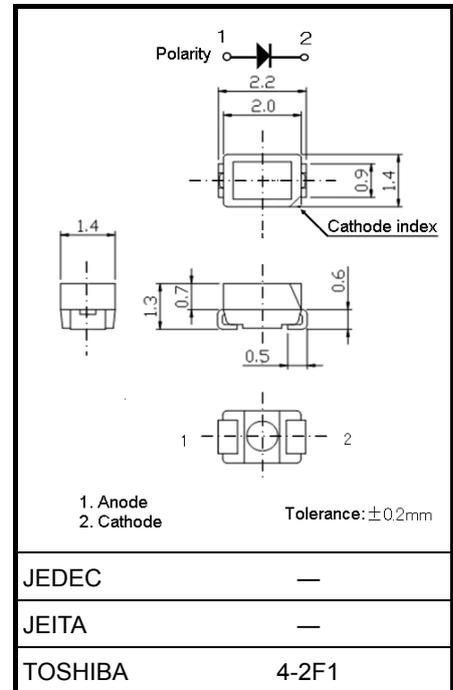


# TLCBD1060(T18)

## Panel Circuit Indicator

Unit: mm

- Surface-mount devices
- 2.2 (L) × 1.4 (W) × 1.3 (H) mm
- LED chip + phosphor
- Color: ICE Blue Cx=0.20(typ), Cy=0.30(typ), 90 mcd(typ.) @10mA
- Low drive current, high-intensity light emission
- Topr / Tstg = -40 to 100°C
- Applications: Instrument panel back light of Equipment for non-driving system (Comfort and convenience) in Automotive equipment
- Standard embossed tape packing: T18 (3000 pcs / reel)  
8-mm tape reel



Weight: 0.01 g (typ.)

## Color and Material

Product Name	Color	Material
TLCBD1060	Ice Blue	InGaN

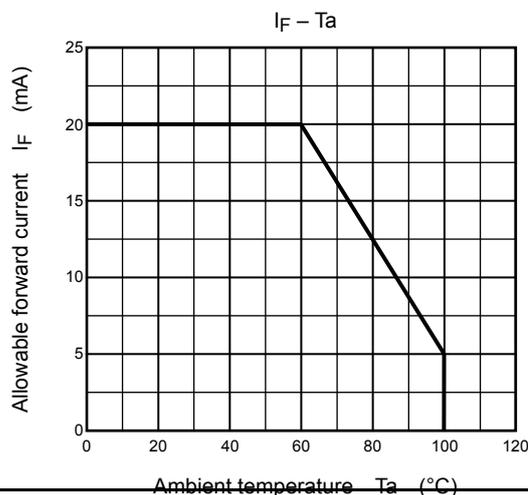
## Absolute Maximum Ratings (Ta = 25°C)

Product Name	Forward Current IF (mA) Please see Note 1	Reverse Voltage VR (V)	Power Dissipation PD (mW)	Operation Temperature Topr (°C)	Storage Temperature Tstg (°C)
TLCBD1060	20	4	76	-40~100	-40~100

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	$V_R$
TLCBD1060	2.5	3.0	3.8	10	10	4
Unit	V			mA	$\mu$ A	V

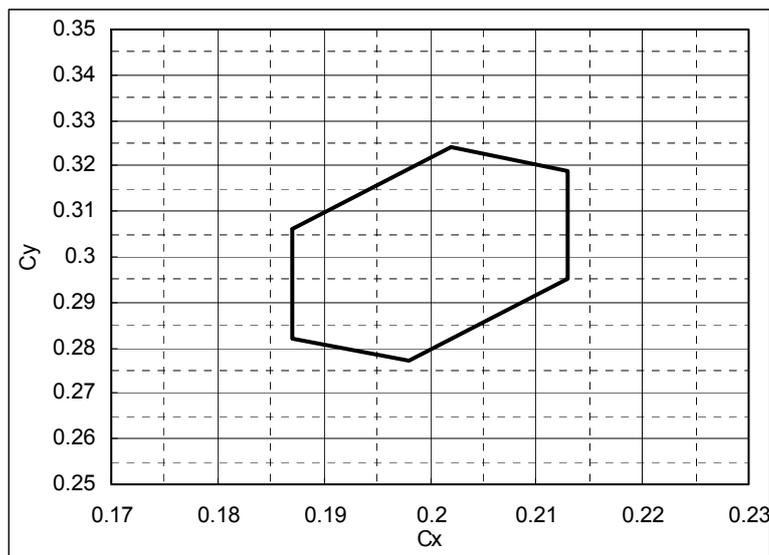
## Optical Characteristics (Ta = 25°C)

Item	Symbol	Test condition	Min.	Typ.	Max.	Unit
Chromaticity coordinate	$C_x$	$I_F = 10$ mA	(Note 2)			—
	$C_y$	$I_F = 10$ mA	(Note 2)			—
Luminous intensity	$I_V$	$I_F = 10$ mA (Note 3)	40	90	200	mcd

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

Test conditions:  $I_F=10$ mA,  $T_a=25^\circ$ C

Accuracy: +/-0.01



$C_x$	$C_y$
0.202	0.324
0.213	0.319
0.213	0.295
0.198	0.277
0.187	0.282
0.187	0.306

Note 3: Luminous Intensity classification

@ $T_a=25^\circ$ C

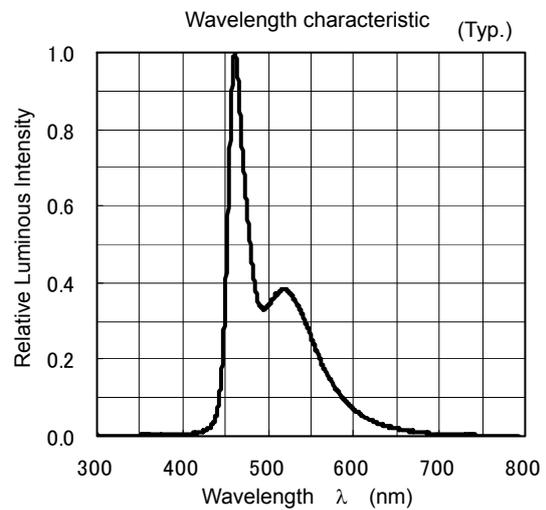
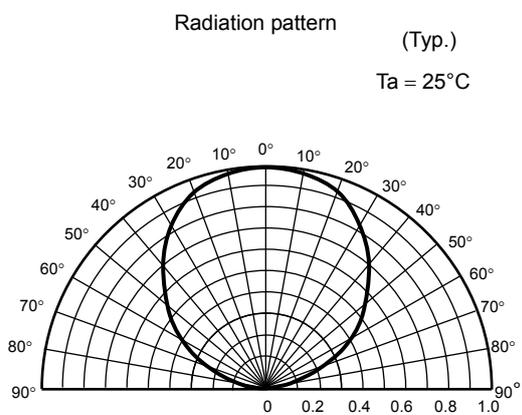
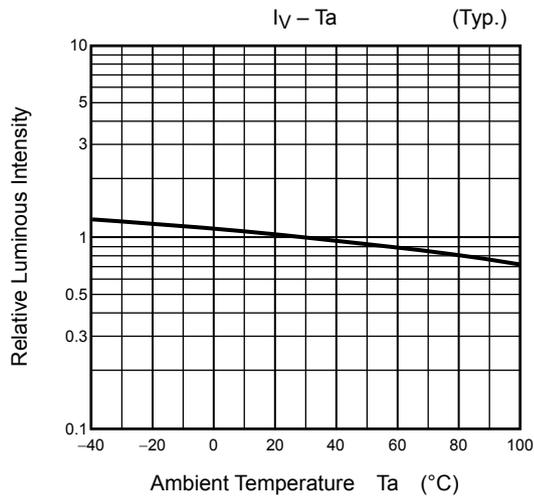
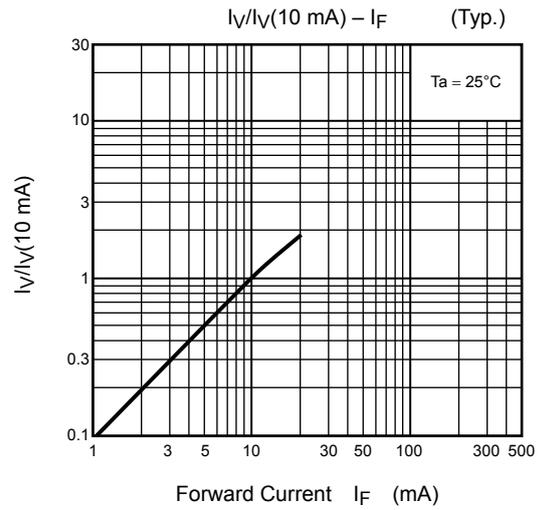
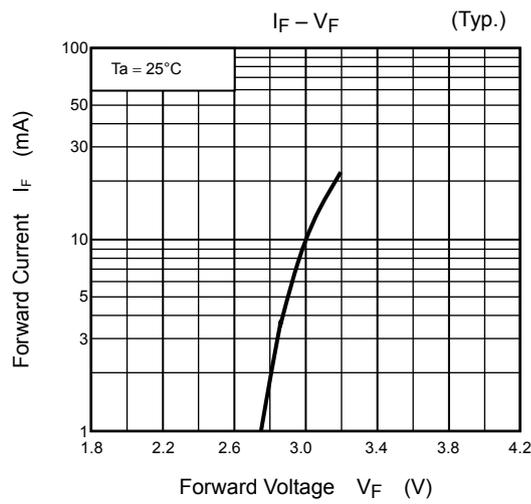
Product name	Luminous Intensity $I_V$			
	Min.	Typ.	Max.	$I_F$
TLCBD1060(T18)	40	—	200	10
PA	40	—	80	
QA	63	—	125	
RA	100	—	200	
Unit	mcd			mA

The specification on the above table is used for  $I_V$  classification of LEDs in Toshiba facility. Measurement tolerance for each limit is +/-11%. Each reel includes the same rank LEDs. Let the delivery ratio of each rank be unquestioned.

**The cautions**

- ESD withstand voltage according to MIL STD 883D, Method 3015.7 :  $\geq 1000V$
- 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  $1M\Omega$ ). 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.

## TLCBD1060



## 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:

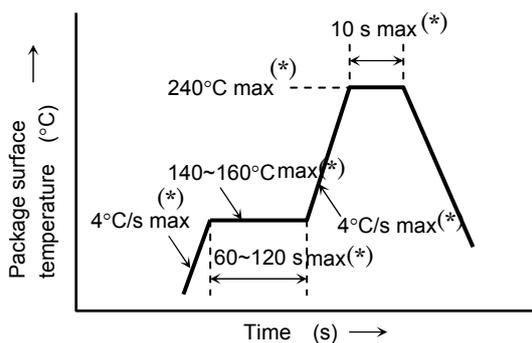
1. This moisture proof bag may be stored unopened within 12 months at the following conditions.  
Temperature: 5°C~30°C  
Humidity: 90% (max)
2. After opening the moisture proof bag, the devices should be assembled within 168 hours in an environment of 5°C to 30°C/60% RH or below.
3. If upon opening,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

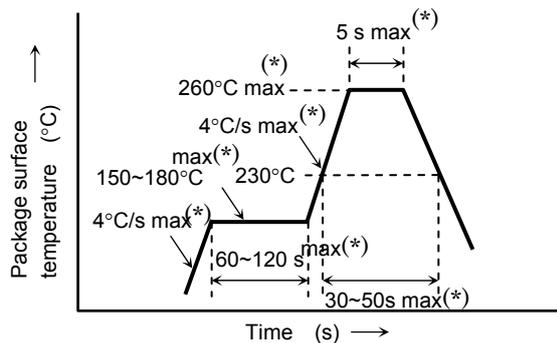
### Soldering

- Reflow soldering

Temperature profile for Pb soldering (example)



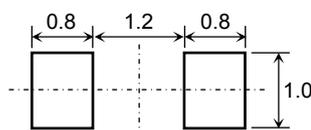
Temperature profile for Pb-free soldering (example)



- 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 : 300°C or less  
Time : within 3 s
- Do not perform wave soldering.

### 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 750H	: (made by KAO)
PINE ALPHA ST-100S	: (made by ARAKAWA CHEMICAL)

## Precautions when Mounting

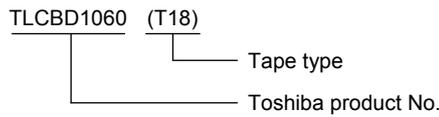
Do not apply force to the plastic part of the LED under high-temperature conditions. To avoid damaging the LED plastic, do not apply friction using a hard material. When installing the PCB in a product, ensure that the device does not come into contact with other components.

## 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: T18 (4-mm pitch)
- (2) Example

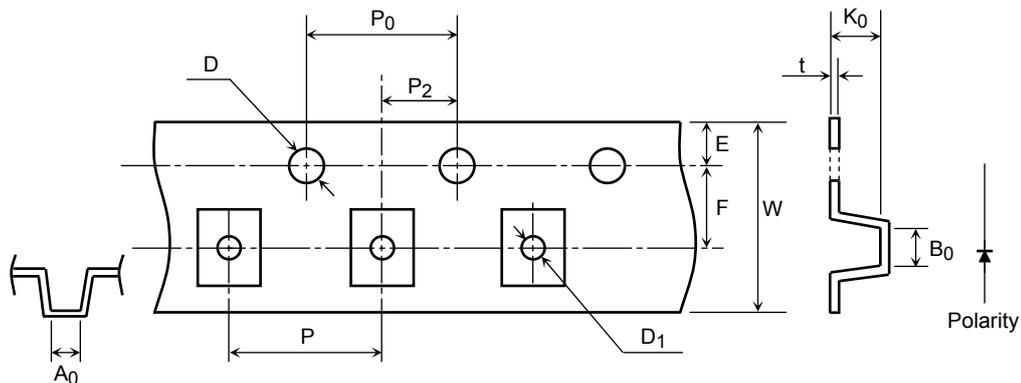


### 2. Tape dimensions

Unit: mm

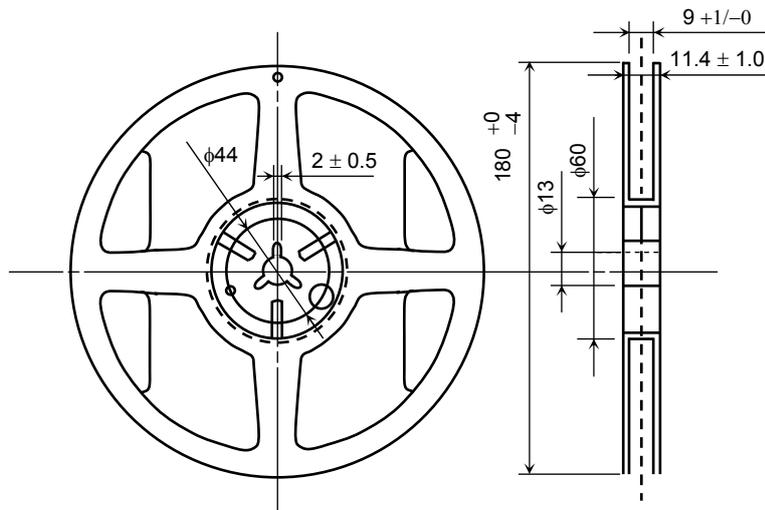
Symbol	Dimension	Tolerance
D	1.5	+0.1/-0
E	1.75	±0.1
P <sub>0</sub>	4.0	±0.1
t	0.2	±0.05
F	3.5	±0.05
D <sub>1</sub>	1.1	±0.1

Symbol	Dimension	Tolerance
P <sub>2</sub>	2.0	±0.05
W	8.0	±0.2
P	4.0	±0.1
A <sub>0</sub>	1.5	±0.1
B <sub>0</sub>	2.5	±0.1
K <sub>0</sub>	1.5	±0.1

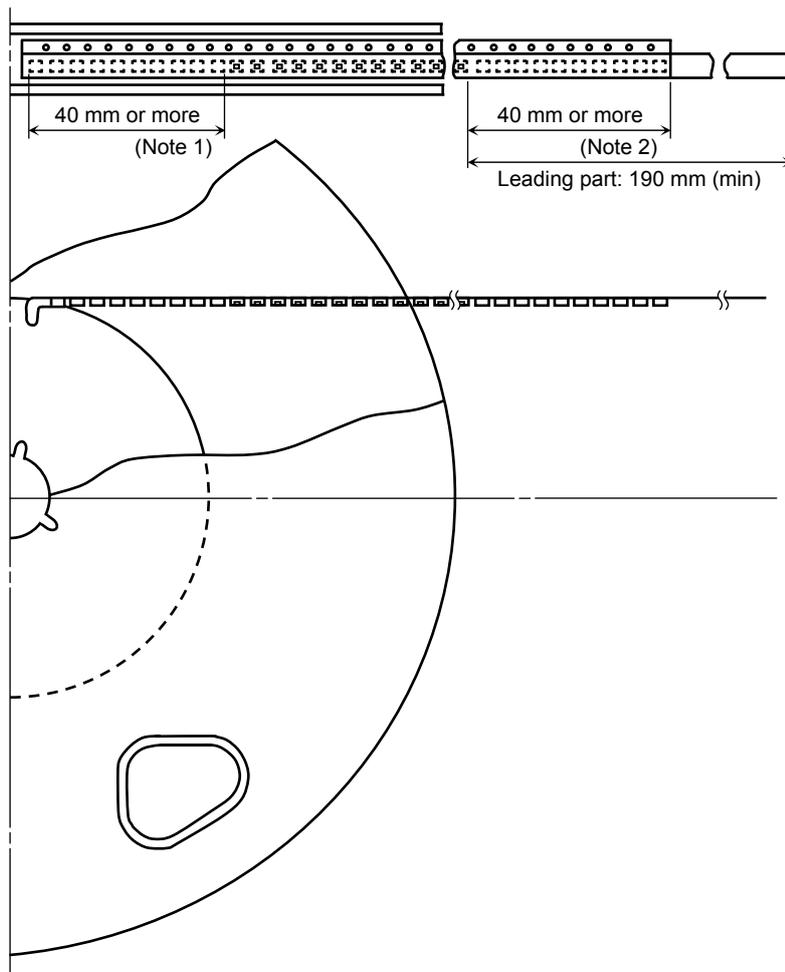


**3. Reel dimensions**

Unit: mm



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



Note1: Empty trailer section

Note2: Empty leader section

## 5. Packing display

(1) Packing quantity

Reel	3,000 pcs
Carton	15,000 pcs

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

## 6. Label format

(1) Example: TLCBD1060 (T18)

P/N:				 
TYPE	TLCBD1060			
ADDC	(T18)	Q'TY	3,000 pcs	

Lot Number    Key code for TSB                      32C    3000  
(RANK SYMBOL)

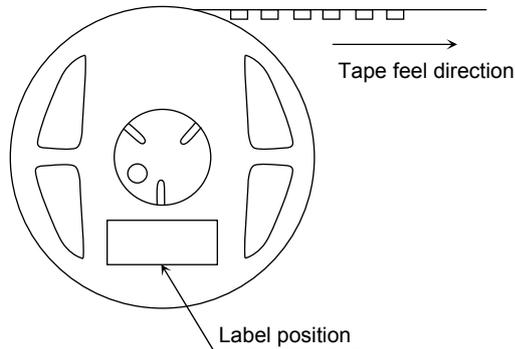
Use under 5-30degC/60%RH within 168h

[[G]]/RoHS COMPATIBLE	SEALED
*Y380xxxxxxxxxxxxxxxxxxxx*	DIFFUSED IN *****
	ASSEMBLED IN *****

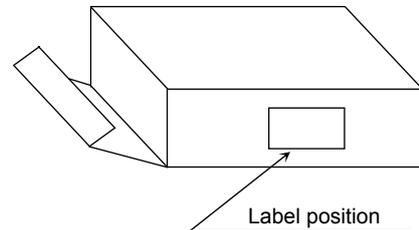


(2) Label location

- 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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