

TOSHIBA LED Lamps

TLWD1100(T11)

Panel Circuit Indicator

- Surface-mount devices
- 3.2 (L) × 2.8 (W) × 1.9 (H) mm
- LED chip + phosphor
- Luminous intensity : $I_v = 180$ mcd (typ.) @20mA
- Color: White
- Chromaticity (typ.) : $C_x=0.32, C_y=0.31$
- $T_{opr} / T_{stg} = -40$ to 100°C
- Reflow soldering is possible
- Applications: automotive use, backlighting etc.
- Standard embossed tape packing: T11 (2000/reel)
8-mm tape reel

Color and Material

Product Name	Color	Material
TLWD1100	White	InGaN

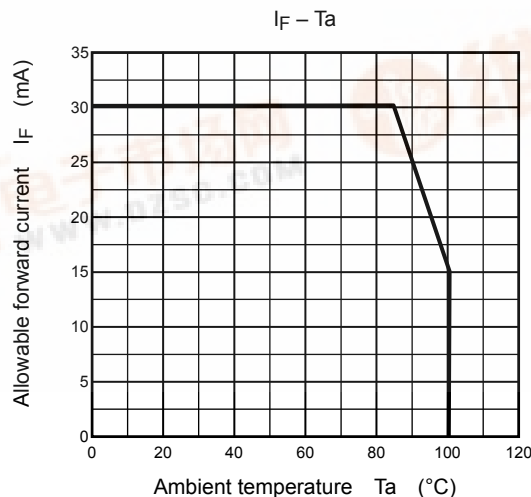
Absolute Maximum Ratings ($T_a = 25^\circ\text{C}$)

Characteristics	Symbol	Rating	Unit
Forward Current (Note 1)	I_F	30	mA
Power Dissipation	P_D	120	mW
Operating Temperature	T_{opr}	$-40 \sim 100$	$^\circ\text{C}$
Storage Temperature	T_{stg}	$-40 \sim 100$	$^\circ\text{C}$

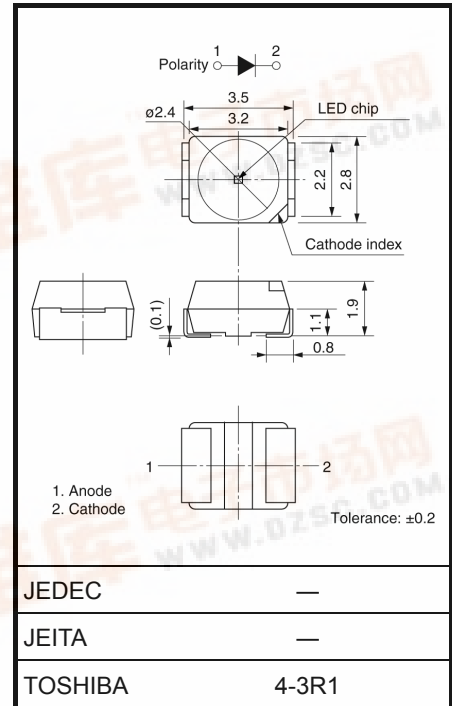
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) 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



Unit: mm



Weight: 0.035 g (typ.)

Electrical Characteristics (Ta = 25°C)

Characteristics	Symbol	Test condition	Min.	Typ.	Max.	Unit
Forward Voltage	V_F	$I_F = 20 \text{ mA}$	2.7	3.3	4.0	V
Reverse Current	I_R	$V_R = 4 \text{ V}$	—	—	10	μA

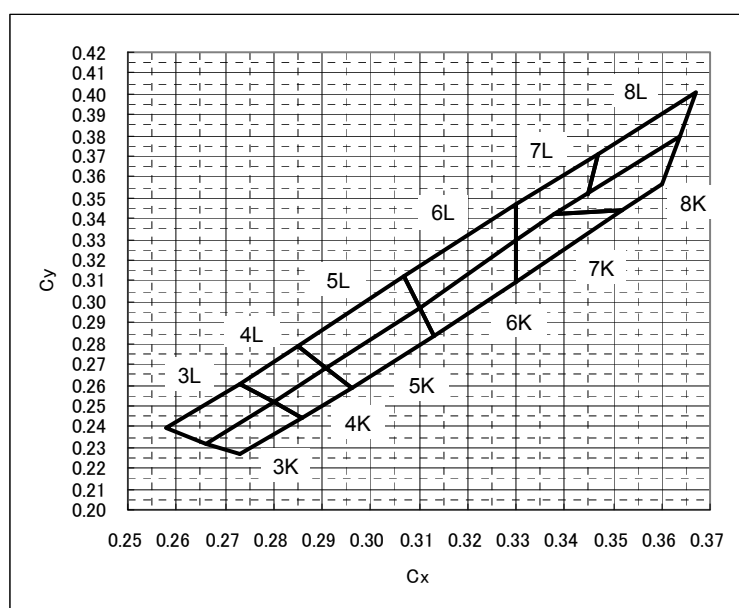
Optical Characteristics (Ta = 25°C)

Characteristics	Symbol	Test condition	Min.	Typ.	Max.	Unit
Chromaticity	C_x	$I_F = 20 \text{ mA}$	(Note 2)			—
	C_y	$I_F = 20 \text{ mA}$	(Note 2)			—
Luminous Intensity (Note 3)	I_V	$I_F = 20 \text{ mA}$	63	180	320	mcd

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

Test conditions: $I_F = 20 \text{ mA}$, $T_a = 25^\circ\text{C}$

Tolerance: ± 0.01



	C_x	C_y		C_x	C_y		C_x	C_y
3K	0.273	0.227	5K	0.296	0.259	7K	0.330	0.310
	0.266	0.232		0.291	0.268		0.330	0.330
	0.280	0.252		0.310	0.297		0.338	0.342
	0.286	0.244		0.313	0.284		0.352	0.344
3L	0.266	0.232	5L	0.291	0.268	7L	0.330	0.330
	0.258	0.239		0.285	0.279		0.330	0.347
	0.273	0.261		0.307	0.312		0.347	0.371
	0.280	0.252		0.310	0.297		0.345	0.352
4K	0.286	0.244	6K	0.313	0.284	8K	0.352	0.344
	0.280	0.252		0.310	0.297		0.338	0.342
	0.291	0.268		0.330	0.330		0.364	0.380
	0.296	0.259		0.330	0.310		0.360	0.357
4L	0.280	0.252	6L	0.310	0.297	8L	0.345	0.352
	0.273	0.261		0.307	0.312		0.347	0.371
	0.285	0.279		0.330	0.347		0.367	0.401
	0.291	0.268		0.330	0.330		0.364	0.380

Note 3: Iv rank classification

Test conditions: IF=20mA, Ta=25°C

Product name	Luminous intensity Iv			
	min	typ	max	If
TLWD1100(T11)	63	180	320	20
	QA	—	125	
	RA	—	200	
	SA	—	320	
Unit		mcd		mA

The specification on the above table is used for Iv classification of LEDs in Toshiba facility.
Each reel includes the same rank LEDs. Let the delivery ratio of each rank be unquestioned.

Note 4: Caution

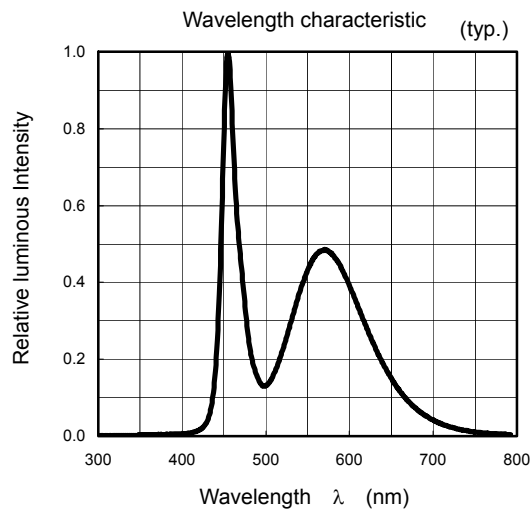
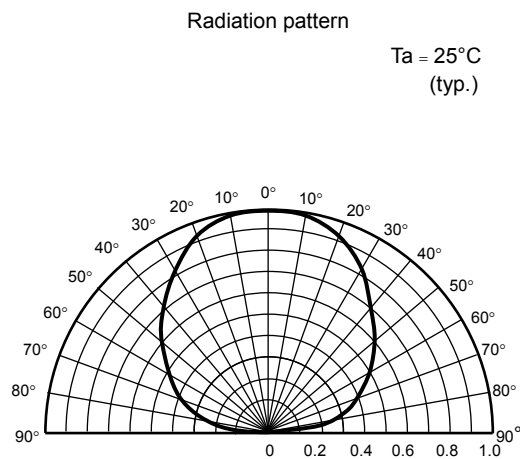
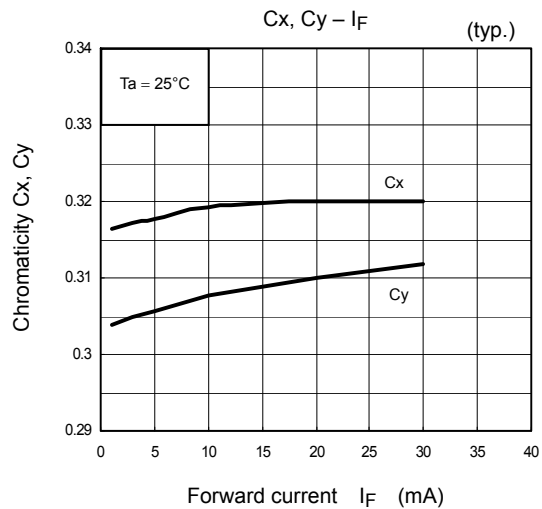
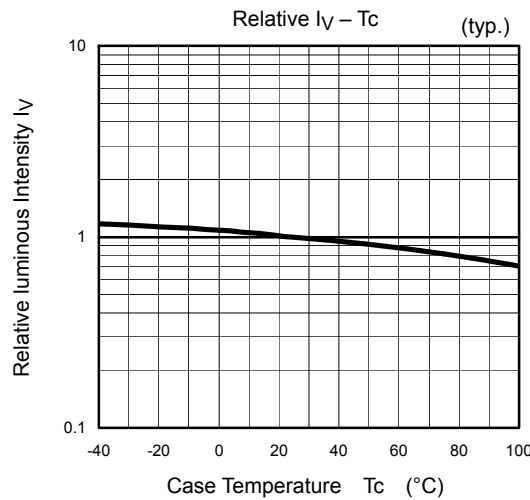
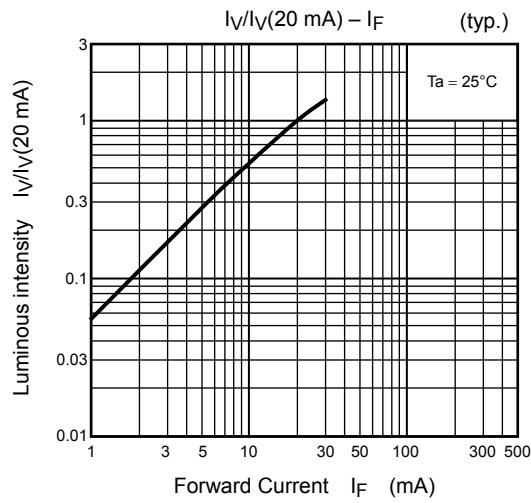
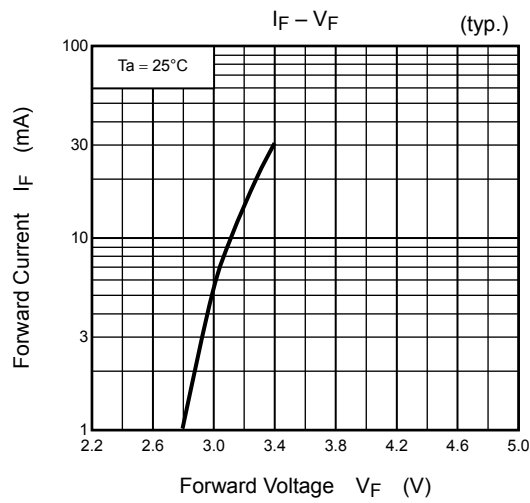
ESD withstand voltage according to MIL STD 883D, Method 3015.7 : $\geq 1000V$

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.

TLWD1100



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:

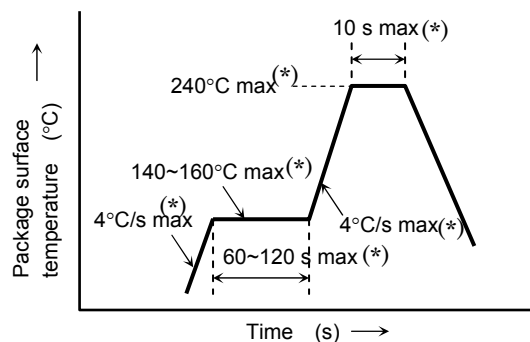
1. This moisture proof bag may be stored unopened within 12 months at the following conditions.
Temperature: 5°C~30°C
Humidity: 90% (max)
2. After opening the moisture proof bag, the devices should be assembled within 168 hours in an environment of 5°C to 30°C/60% RH or below.
3. If upon opening, the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

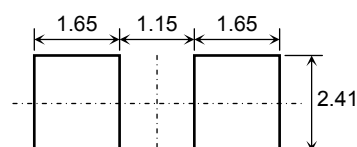
Temperature profile (example)



- The product is 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
- If the product needs 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 TROUGH 750H	: (made by KAO)
PINE ALPHA ST-100S	: (made by ARAKAWA CHEMICAL)
TOSHIBA TECHNOCARE (FRW-17, FRW-1, FRV-100)	: (made by GE TOSHIBA SILICONES)

Precautions when Mounting

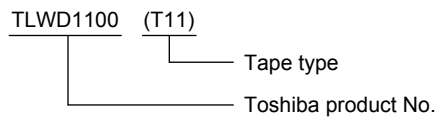
Do not apply force to the plastic part of the LED under high-temperature conditions.
To avoid damaging the LED plastic, do not apply friction using a hard material.
When installing the PCB in a product, ensure that the device does not come into contact with other components.

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)

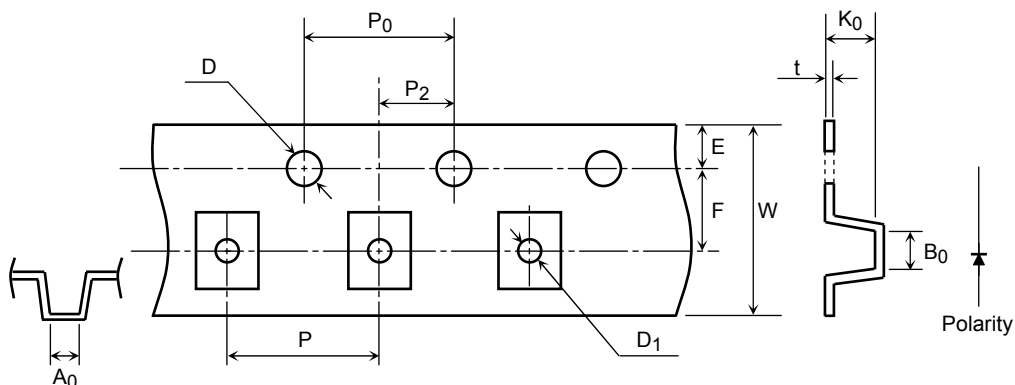
- (1) Tape Type: T11 (4-mm pitch)
- (2) Example



2. Tape dimensions

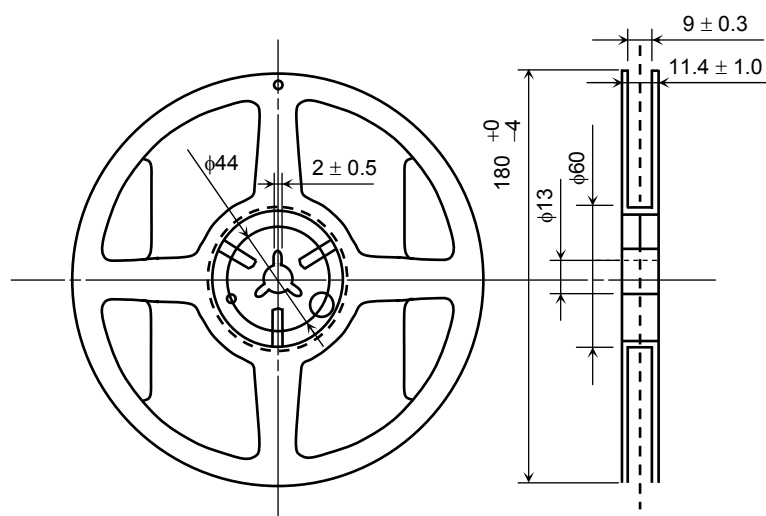
Unit: mm

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

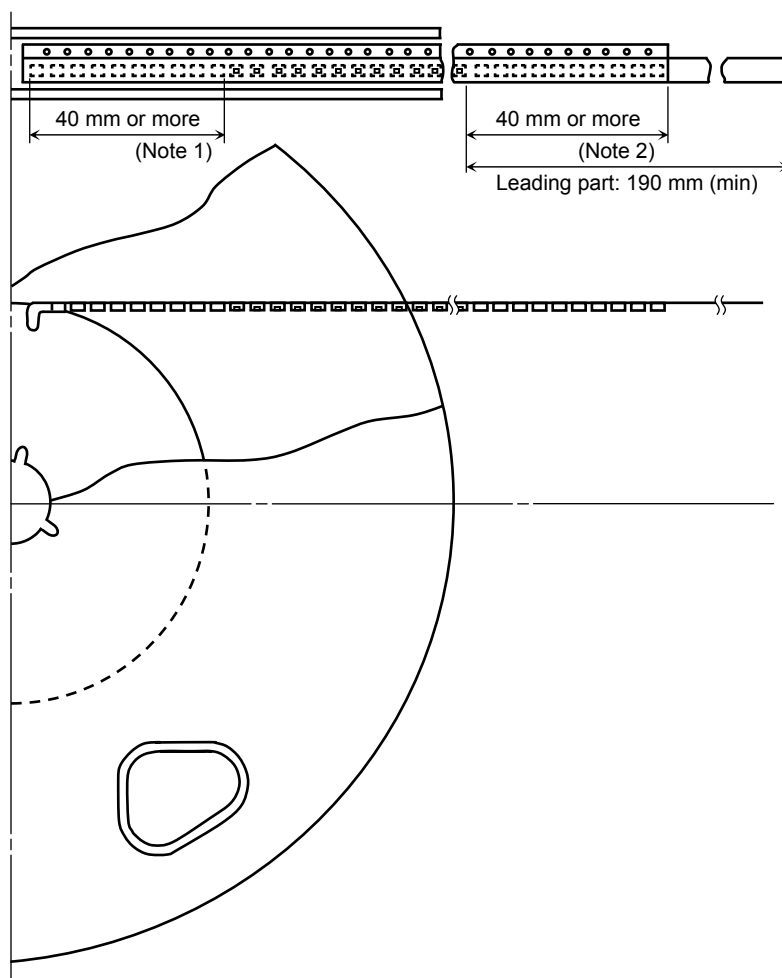


3. Reel dimensions

Unit: mm



4. Leader and trailer sections of tape



Note1: Empty trailer section

Note2: Empty leader section

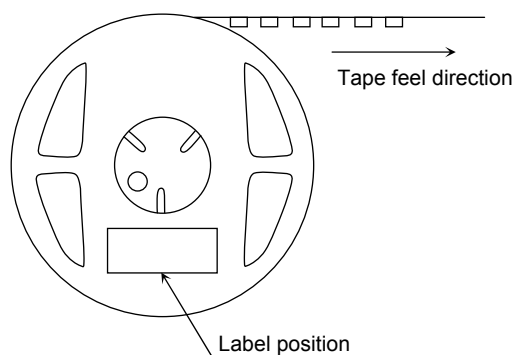
(1) Packing quantity

Reel	2,000 pcs
Carton	10,000 pcs

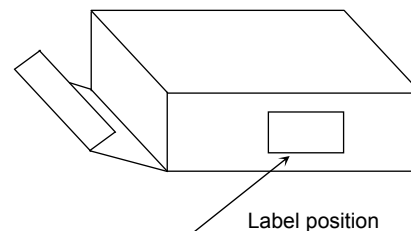
6. Label format

P/N:		TOSHIBA	
TYPE	TLWD1100		
ADDC	(T11)	Q'TY	2,000 pcs
Lot Number Key code for TSB		32C	2000
(RANK SYMBOL)			
Use under 5-30degC/6-%RH within 168h			
[[G]]/RoHS COMPATIBLE		SEAL DATE:	
Y3804xxxxxxxxxxxxxxxxx		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.

RESTRICTIONS ON PRODUCT USE

20070701-EN GENERAL

- The information contained herein is subject to change without notice.
- 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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