

# SPECIFICATION

LT P/N

LT3004WH-A-GL

Mass Product



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## 1. Description

### 1.1 General Description



The White LED, which was fabricated by using a blue chip and the phosphor.

Product Package: 3.0mmX0.85mmX0.42mm.

### 1.2 Features

PLCC Package. PLCC

Wide viewing angle.

Suitable for all SMT assembly and solder process.

Available on tape and reel.

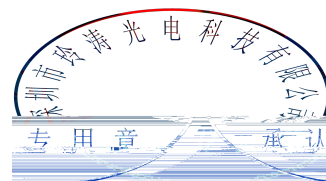
Moisture sensitivity level: Level 3.

RoHS compliant.

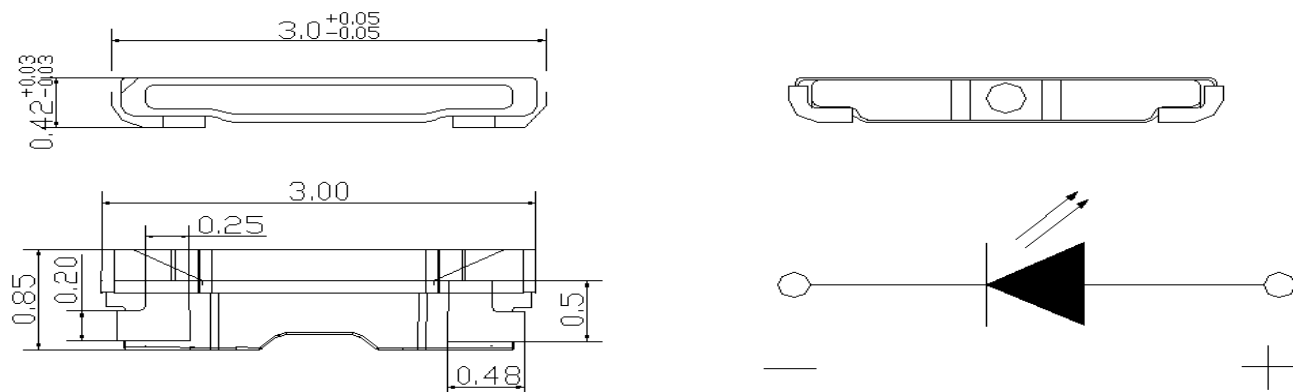
### 1.3 Application

LCD Back Light. LCD

Mobile Phones.



## 1.4 Package Dimension



### Notes

All dimensions units are millimeters

All dimensions tolerances are  $\pm 0.1\text{mm}$  unless otherwise noted.

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## 1.5 Product Parameters

Table 1-1 Electrical / Optical Characteristics at  $T_s=25^\circ\text{C}$



## 1.6 Bin Range Of Forward Voltage and Luminous Intensity (IF=20mA) BIN (IF=20mA)

Table 1-3 Bin Range Of Luminous Intensity

BIN CODE	IF=20mA Test			
	Min(mcd)	Max(mcd)	Min(lm)	Max(lm)
30	2150	2250	6.00	6.25
31	2250	2350	6.25	6.50
32	2350	2450	6.50	6.75
33	2450	2550	6.75	7.00
34	2550	2650	7.00	7.25
35	2650	2750	7.25	7.50
36	2750	2850	7.50	7.75
37	2850	2950	7.75	8.00
38	2950	3050	8.00	8.25
39	3050	3150	8.25	8.50
40	3150	3250	8.50	8.75
41	3250	3350	8.75	9.00
42	3350	3450	9.00	9.25

Table 1-4 Bin Range Of Forward Voltage

BIN CODE	Min.	Max.	Unit	Condition
V0	2.7	2.8	V	IF=20mA
V1	2.8	2.9		
V2	2.9	3.0		
V3	3.0	3.1		
V4	3.1	3.2		
V5	3.2	3.3		

### Notes

VF Tolerance:  $\pm 0.03V$  @ IF= 20mA @ Ta=25

IV Tolerance:  $\pm 3\%$  @ IF= 20mA @ Ta=25

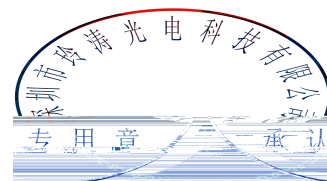


Fig. 1-5 The C.I.E. 1931 Chromaticity Diagram:

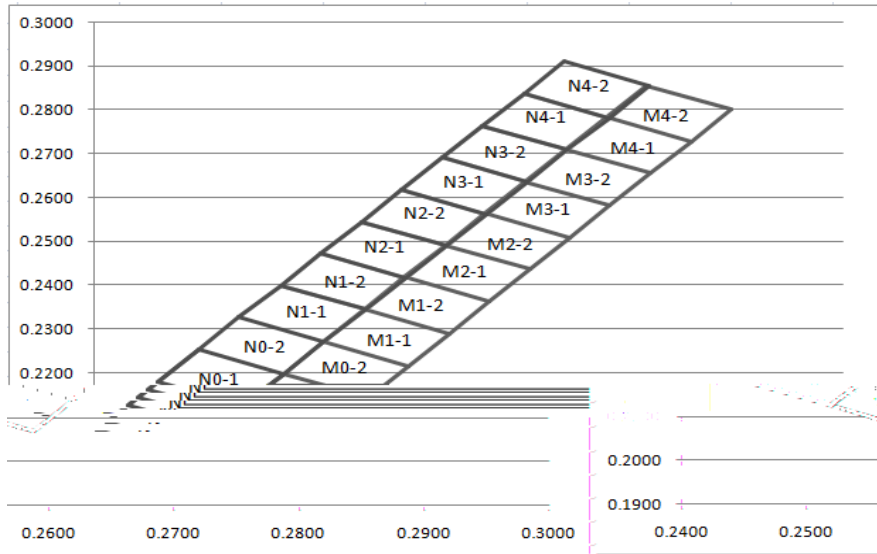
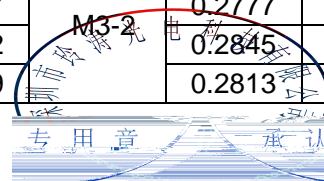


Table 1-6 Bin Range of Chromaticity Coordinates Block

N0-1	0.2451	0.2180	N0-2	0.2484	0.2253	N1-1	0.2516	0.2326
	0.2484	0.2253		0.2516	0.2326		0.2549	0.2399
	0.2552	0.2198		0.2584	0.2271		0.2617	0.2344
	0.2519	0.2125		0.2552	0.2198		0.2584	0.2271
N1-2	0.2549	0.2399	N2-1	0.2581	0.2472	N2-2	0.2614	0.2545
	0.2581	0.2472		0.2614	0.2545		0.2646	0.2618
	0.2649	0.2417		0.2682	0.2490		0.2714	0.2563
	0.2617	0.2344		0.2649	0.2417		0.2682	0.2490
N3-1	0.2646	0.2618	N3-2	0.2679	0.2691	N4-1	0.2711	0.2764
	0.2679	0.2691		0.2711	0.2764		0.2744	0.2837
	0.2747	0.2636		0.2779	0.2709		0.2812	0.2782
	0.2714	0.2563		0.2747	0.2636		0.2779	0.2709
N4-2	0.2744	0.2837	M0-1	0.2519	0.2125	M0-2	0.2552	0.2198
	0.2776	0.2910		0.2552	0.2198		0.2584	0.2271
	0.2844	0.2855		0.2620	0.2143		0.2652	0.2216
	0.2812	0.2782		0.2587	0.2070		0.2620	0.2143
M1-1	0.2584	0.2271	M1-2	0.2616	0.2345	M2-1	0.2648	0.2418
	0.2616	0.2345		0.2648	0.2418		0.2681	0.2491
	0.2684	0.2290		0.2716	0.2363		0.2749	0.2436
	0.2652	0.2216		0.2684	0.2290		0.2716	0.2363
M2-2	0.2681	0.2491	M3-1	0.2713	0.2564	M3-2	0.2745	0.2637
	0.2713	0.2564		0.2745	0.2637		0.2777	0.2710
	0.2781	0.2509		0.2813	0.2582		0.2845	0.2655
	0.2749	0.2436		0.2781	0.2509		0.2813	0.2582



M4-1	0.2777	0.2710	M4-2	0.2810	0.2783
	0.2810	0.2783		0.2842	0.2856
	0.2878	0.2728		0.2910	0.2801
	0.2845	0.2655		0.2878	0.2728

Fig. 1-7 The C.I.E. 1931 Chromaticity Diagram:

MN00-1	0.2355	0.1858	MN00-2	0.2399	0.1956	MN0-1	0.2442	0.2053
	0.2399	0.1956		0.2442	0.2053		0.2485	0.2151
	0.2467	0.1903		0.2510	0.2000		0.2553	0.2098
	0.2423	0.1805		0.2467	0.1903		0.2510	0.2000
	0.2485	0.2151						

MN0-2



## 1.7 Typical Optical Characteristics Curves

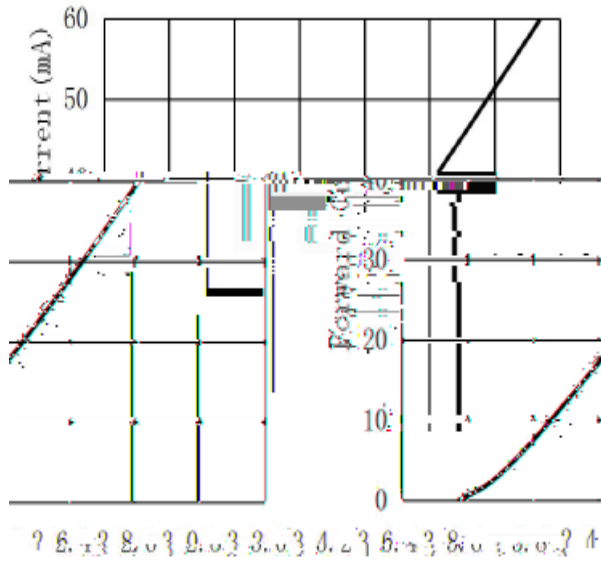


Fig. 1-7 Forward Voltage Vs Forward Current

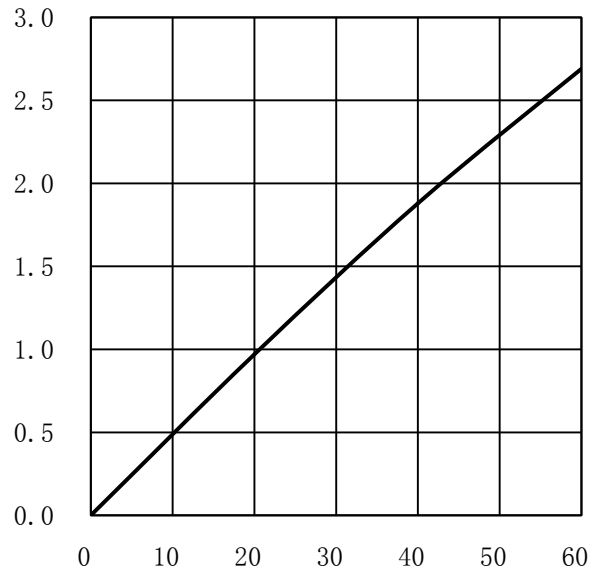


Fig. 1-8 Forward Current Vs Relative Intensity

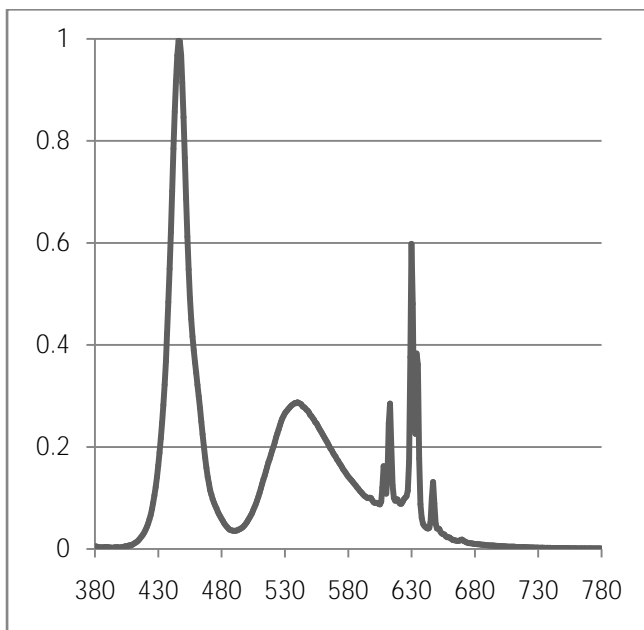


Fig. 1-10 Spectrum Distribution

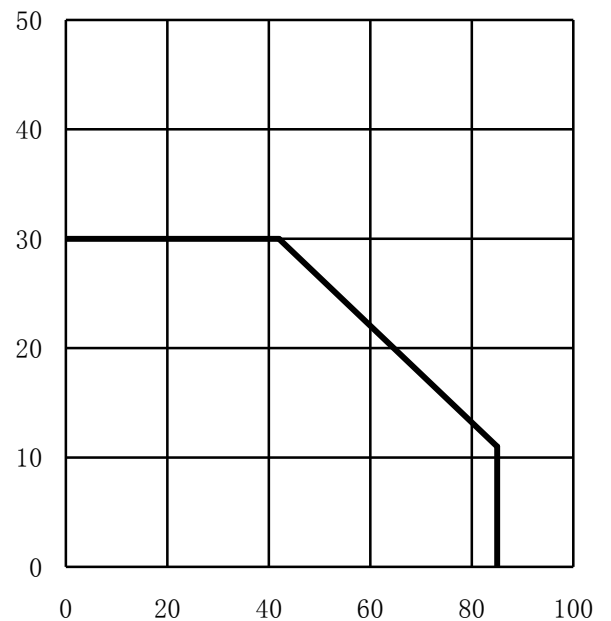
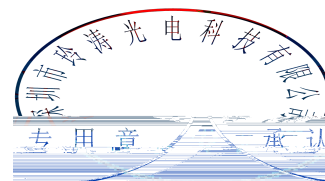


Fig 1-9 Solder Temperature Vs Forward Current

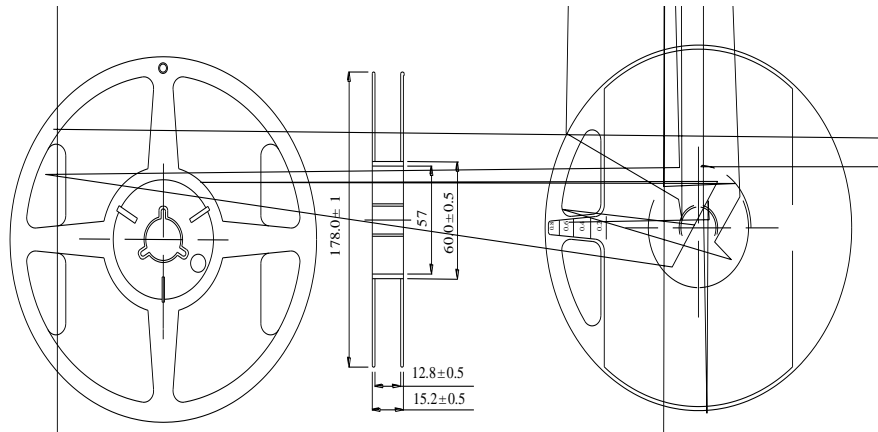


## 2. Packaging

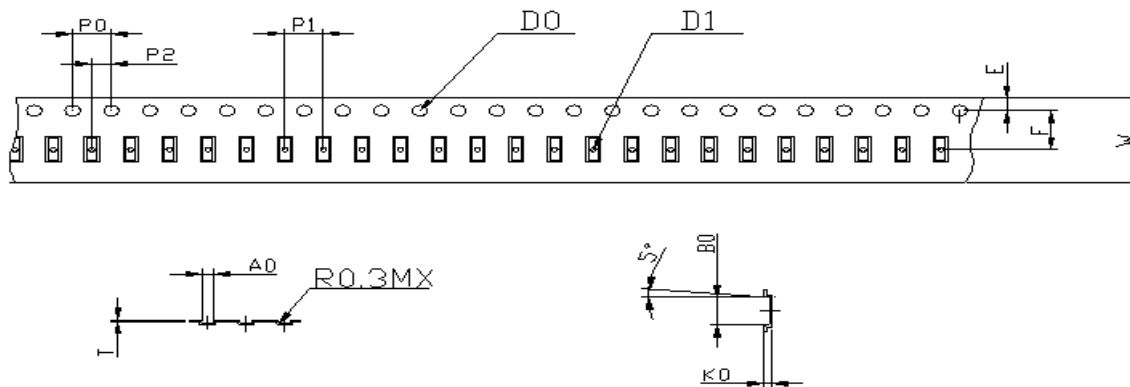
### Packaging Specification

Package:5000pcs/reel.

5000pcs



#### 2.1.1 Carrier Tape Dimension

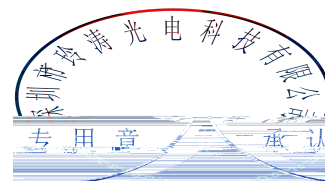


P0	4.00±0.10	P2	2±0.05	P1	4.00±0.10	D0	1.60±0.10	D1	0.60±0.10
E	1.75±0.10	F	5.50±0.10	W	12.00±0.20	A0	0.95±0.10	T	0.20±0.10
B0	3.15±0.10	K0	0.55±0.10						

Fig.2-1 Carrier Tape Dimension

#### Notes

The tolerances unless mentioned ±0.2mm. Unit : mm



## 2.1.2 Label Form Specification

Table 2-2 Label Map



Table 2-3 Label Form Specification

PART NO.	Part Number
BIN CODE	Bin Code
IV	Luminous intensity
V <sub>F</sub>	Forward Voltage
WL	Wavelength
QTY	Packing Quantity
DATE	Made Date
LOT NO	Lot Number

## 2.2 Moisture Resistant Packing

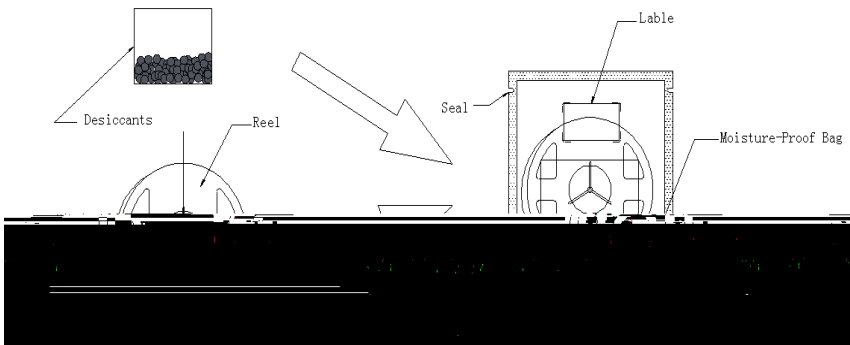


Fig.2-4 Moisture Resistant Packing

## 2.3 Cardboard Box

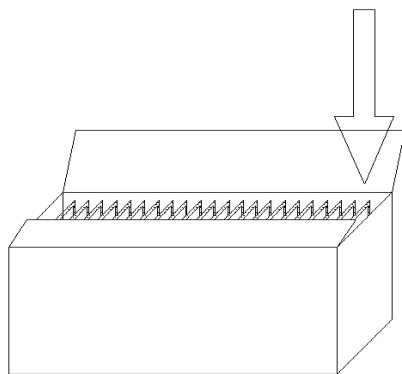
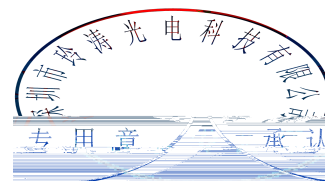


Fig.2-5 Cardboard Box



## 2.4 Reliability Test Items And Conditions

Table 2-6 Reliability Test Items And Conditions

Test Items	Test Condition	Time	Quantity	Ac/Re /
Reflow	Temp:260 max T=10 sec	---	20pcs.	0/1
Thermal Shock	-40 20min 10min 100 20min	100 cycle	20pcs.	0/1
High Temperature Storage	Temp:100	1000hrs.	20pcs.	0/1
Low Temperature Storage	Temp:-40	1000hrs.	20pcs.	0/1
Life Test	Ta=25 If=20mA	1000hrs.	20pcs.	0/1
High Temperature and Humidity storage	60 / 90%RH	1000hrs.	20pcs.	0/1
Temperature Humidity Operation Life	60 / 90%RH If=15mA	500hrs	20pcs.	0/1

## 2.5 Criteria For Judging Damage

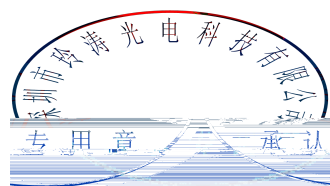
Table 2-7 Criteria For Judging Damage

Test Items	Symbol	Test Condition	Criteria For Judgement	
			Min.	Max.
Forward Voltage	V <sub>F</sub>	I <sub>F</sub> =20mA		>U.S.L*)x1.1
Reverse Current	I <sub>R</sub>	V <sub>R</sub> = 5V		>U.S.L*)x2.0

Luminous Flux		$I_F=20\text{mA}$	$<L.S.L^*)\times 0.7$	-
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Notes

- 1.U.S.L: Upper standard level                      L.S.L: Lower standard level
- 2.The above reliability tests is based on the verification of a single/strip LED of LT existing experimental platform,the reliability experiment was taken under good heat dissipation conditions. when customers applies the LED to the series and parallel circuit, should take consideration of all the factors such as the current, voltage distribution, heat dissipation and others.



Repairing should not be done after the LEDs have been soldered. When repairing is unavoidable, a double-head soldering iron should be used (as below figure). It should be confirmed in advance whether the characteristics of LEDs will or not be damaged by repairing.

## LED

### 3.1.3 Cautions

(1) The encapsulated material of the LEDs is silicone. Therefore the LEDs have a soft surface on the top of package. The pressure to the top surface will be impacted on the reliability of the LEDs. Precautions should be taken to avoid the strong pressure on the encapsulated part. So when use the picking up nozzle, the pressure on the silicone resin should be proper. LED

(2) Components should not be mounted on warped (non coplanar) portion of PCB. After soldering, do not warp the circuit board. LED

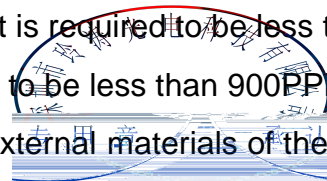
(3) Do not apply mechanical force or excess vibration during the cooling process to normal temperature after soldering. Do not rapidly cool device after soldering.

## 4. Handling Precautions

### 4.1 Handling Precautions

(1) LED operating environment and sulfur element composition cannot be over 100PPM in the LED mating usage material. This is provided for informational purposes only and is not a warranty or endorsement. LED

(2) In order to prevent external material from getting into the inside of LED, which may cause the malfunction of LED, the single content of Bromine element is required to be less than 900PPM, the single content of Chlorine element is required to be less than 900PPM, the total content of Bromine element and Chlorine element in the external materials of the application



products is required to be less than 1500PPM. This is provided for informational purposes only and is not a warranty or endorsement.

(3) VOCs (Volatile organic compounds) emitted from materials used in the construction of fixtures can penetrate silicone encapsulants of LEDs and discolor when exposed to heat and photonic energy. The result can be a significant loss of light output from the fixture. Knowledge of the properties of the materials selected to be used in the construction of fixtures can help prevent these issues. LT advises against the use of any chemicals or materials that have been found or are suspected to have an adverse effect on device performance or reliability. To verify compatibility, LT recommends that all chemicals and materials be tested in the specific application and environment for which they are intended to be used. Attaching LEDs, do not use adhesives that outgas organic vapor.

(4) Handle the component along the side surface by using forceps or appropriate tools; do not directly touch or handle the silicone lens surface, it may damage the internal circuitry.

(5) In designing a circuit, the current through each LED must



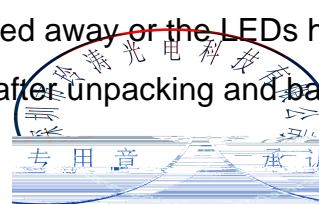
the heat generation of the LEDs when making the system design.LED

(7) Compared to standard encapsulants, silicone is generally softer, and the surface is more likely to attract dust , requiring special care during processing. In cases where a minimal level of dirt and dust particles cannot be guaranteed, a suitable cleaning solution must be applied to the surface after the soldering of components. LT suggests using isopropyl alcohol for cleaning. In case other solvents are used, it must be assured that these solvents do not dissolve the package or resin. Ultrasonic cleaning is not recommended. Ultrasonic cleaning may cause damage to the LED.

Table 4-1Storage

Conditions		Temperature	Humidity	Time
Storage	Before Opening Aluminum Bag	30	75%	Within 1 Year From Date
	After Opening Aluminum Bag	30	60%	24hours 24
Baking		60± 5	-	24hours 24

(8) If the moisture absorbent material ( silica gel ) has faded away or the LEDs have exceeded the storage time , baking treatment should be performed after unpacking and based on the following condition ( 65±5 ) °C for above 24 hours.



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If the package is flatulence or damaged, please notify the sales staff to assist.

(9) Similar to most Solid state devices; LEDs are sensitive to Electro-Static Discharge (ESD) and Electrical Over Stress (EOS).

