

# SPECIFICATION

LT P/N

LT3014WH-E-Q

F/8

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: 3.0mmX1.4mmX0.7mm.

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### 1.2 Features

PLCC Package. PLCC

Wide viewing angle.

Suitable for all SMT assembly and solder process.

GAH

Available on tape and reel.

Moisture sensitivity level: Level 3.

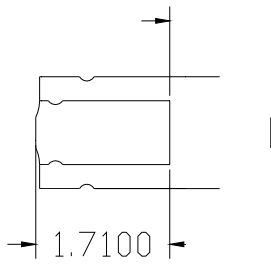
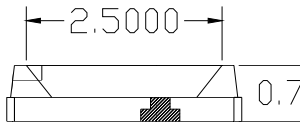
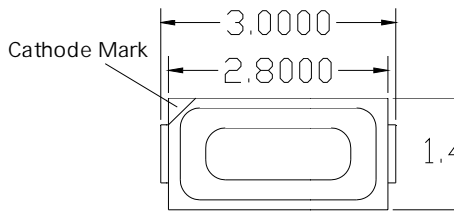
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RoHS compliant. Fc<G

### 1.3 Application

LCD Back Light. LCD

## 1.4 Package Dimension



### Notes

% All dimensions units are

&" All dimensions tolerances

## 1.5 Product Parameters

Table 1-1 Electrical / Optical Characteristics at Ts=25°C

Item	Symbol	Test Condition	Value			Unit
			Min.	Typ.	Max.	
Forward Voltage	$V_F$	IF=80mA	---	3.0	---	V
Reverse Current	$I_R$	$V_R=5V$	---	---	1	uA
Luminous Intensity	$I_v$	IF=80mA	---	24	---	lm
Viewing Angle	2 1/2	IF=80mA	---	120	---	deg

Table 1-2 Absolute Maximum Ratings at Ts=25°C

Parameter	Symbol	Rating	Units
Forward Current	$I_F$	120	mA
Peak Forward Current	$I_{FP}$	150	mA
Reverse Voltage	$V_R$	5	V
Electrostatic Discharge (HBM)	$E_{SD}$	2000	V
LED Junction Temperature (LED )	$T_j$	105	
Operating Temperature	$T_{OPR}$	-30 ~ + 85	
Storage Temperature	$T_{STG}$	-40~+100	

Notes

1. 1/10 Duty cycle, 0.1ms pulse width.
2. The above forward voltage measurement allowance tolera
3. The above color coordinates measurement allowance toler
4. The above luminous intensity measurement allowance tole
5. Care is to be taken that power dissipation does not exceed
6. All measurements were made under the standardized envi
7. When the LEDs are in operation the maximum current shou  
temperature, junction temperature should not exceed the m

## 1.6 Bin Range Of Forward Voltage and Lur BIN (IF=80mA)

Table 1-3 Bin Range Of Luminous Intensity

BIN CODE	Mn(lm)
T20	20.00
T22	22.00
T24	24.00
T26	26.00
T28	28.00
T30	30.00
T32	32.00
T34	34.00
T36	36.00
T38	38.00
T40	40.00

Tabl

BIN CODE	
V0	
V1	
V2	
V	
V	
V	
V	
V	
V	

Notes

VF Tolerance

IV Tolerance:

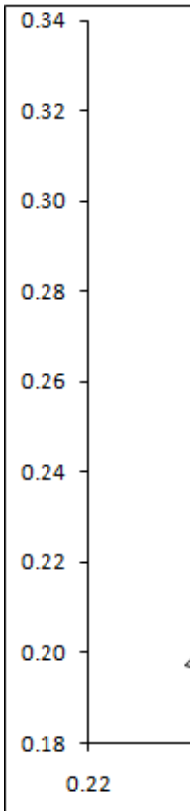


Table 1-4 The C.I.E Chromaticity Diagram CIE

BIN CODE	CIE-X1	CIE-Y1	CIE-X2	CIE-Y2	CIE-X3	CIE-Y3	CIE-X4	CIE-Y4
H23	0.3138	0.3120	0.3071	0.3157	0.3116	0.3247	0.3183	0.3210
H22	0.3093	0.3030	0.3026	0.3067	0.3071	0.3157	0.3138	0.3120
H21	0.3048	0.294	0.2981	0.2977	0.3026	0.3067	0.3093	0.303
H20	0.3003	0.285	0.2936	0.2887	0.2981	0.2977	0.3048	0.294
H00	0.2958	0.276	0.2891	0.2797	0.2936	0.2887	0.3003	0.285
H01	0.2913	0.267	0.2846	0.2707	0.2891	0.2797	0.2958	0.276
H02	0.2868	0.258	0.2801	0.2617	0.2846	0.2707	0.2913	0.267
H03	0.2823	0.249	0.2756	0.2527	0.2801	0.2617	0.2868	0.258
H04	0.2778	0.24	0.2711	0.2437	0.2756	0.2527	0.2823	0.249
H05	0.2733	0.231	0.2666	0.2347	0.2711	0.2437	0.2778	0.24
H06	0.2688	0.222	0.2621	0.2257	0.2666	0.2347	0.2733	0.231
H07	0.2643	0.213	0.2576	0.2167	0.2621	0.2257	0.2688	0.222
H08	0.2598	0.204	0.2531	0.2077	0.2576	0.2167	0.2643	0.213
H09	0.2553	0.195	0.2486	0.1987	0.2531	0.2077	0.2598	0.204
H10	0.2508	0.186	0.2441	0.1897	0.2486	0.1987	0.2553	0.195
K23	0.3071	0.3157	0.3004	0.3194	0.3049	0.3284	0.3116	0.3247
K22	0.3026	0.3067	0.2959	0.3104	0.3004	0.3194	0.3071	0.3157
K21	0.2981	0.2977	0.2914	0.3014	0.2959	0.3104	0.3026	0.3067
K20	0.2936	0.2887	0.2869	0.2924	0.2914	0.3014	0.2981	0.2977
K00	0.2891	0.2797	0.2824	0.2834	0.2869	0.2924	0.2936	0.2887
K01	0.2846	0.2707	0.2779	0.2744	0.2824	0.2834	0.2891	0.2797
K02	0.2801	0.2617	0.2734	0.2654	0.2779	0.2744	0.2846	0.2707
K03	0.2756	0.2527	0.2689	0.2564	0.2734	0.2654	0.2801	0.2617
K04	0.2711	0.2437	0.2644	0.2474	0.2689	0.2564	0.2756	0.2527
K05	0.2666	0.2347	0.2599	0.2384	0.2644	0.2474	0.2711	0.2437
K06	0.2621	0.2257	0.2554	0.2294	0.2599	0.2384	0.2666	0.2347
K07	0.2576	0.2167	0.2509	0.2204	0.2554	0.2294	0.2621	0.2257
K08	0.2531	0.2077	0.2464	0.2114	0.2509	0.2204	0.2576	0.2167
K09	0.2486	0.1987	0.2419	0.2024	0.2464	0.2114	0.2531	0.2077
K10	0.2441	0.1897	0.2374	0.1934	0.2419	0.2024	0.2486	0.1987
T23	0.2937	0.3231	0.2982	0.3321	0.3049	0.3284	0.3004	0.3194
T22	0.2937	0.3231	0.2892	0.3141	0.2959	0.3104	0.3004	0.3194
T21	0.2914	0.3014	0.2847	0.3051	0.2892	0.3141	0.2959	0.3104
T20	0.2869	0.2924	0.2802	0.2961	0.2847	0.3051	0.2914	0.3014
T00	0.2824	0.2834	0.2757	0.2871	0.2802	0.2961	0.2869	0.2924
T01	0.2779	0.2744	0.2712	0.2781	0.2757	0.2871	0.2824	0.2834
T02	0.2734	0.2654	0.2667	0.2691	0.2712	0.2781	0.2779	0.2744
T03	0.2689	0.2564	0.2622	0.2601	0.2667	0.2691	0.2734	0.2654
T04	0.2644	0.2474	0.2577	0.2511	0.2622	0.2601	0.2689	0.2564
T05	0.2599	0.2384	0.2532	0.2421	0.2577	0.2511	0.2644	0.2474
T06	0.2554	0.2294	0.2487	0.2331	0.2532	0.2421	0.2599	0.2384

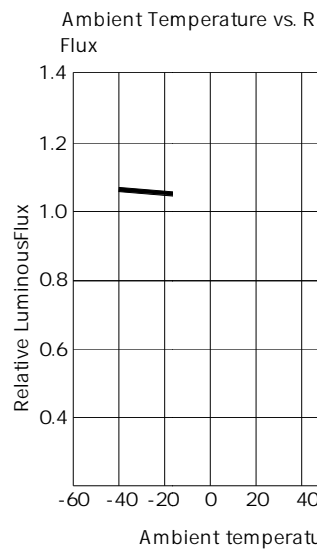
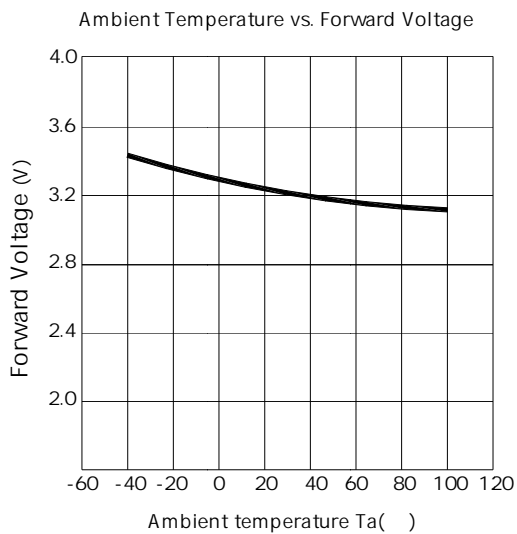
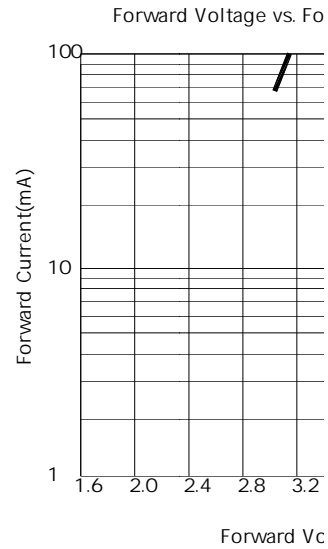
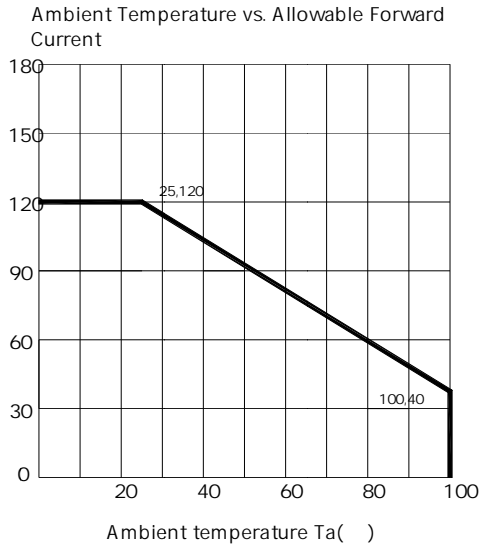
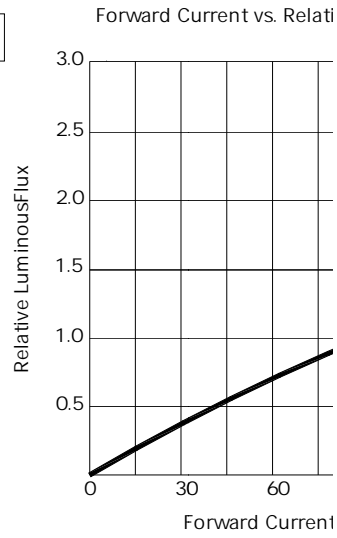
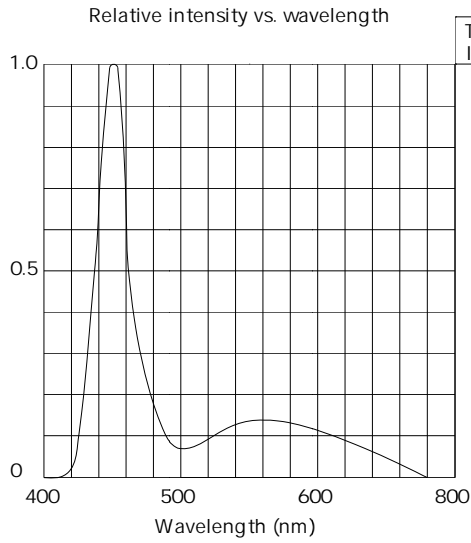


T07	0.2509	0.2204	0.2442	0.2241	0.2487	0.2331	0.2554
T08	0.2464	0.2114	0.2397	0.2151	0.2442	0.2241	0.2509
T09	0.2419	0.2024	0.2352	0.2061	0.2397	0.2151	0.2464
T10	0.2374	0.1934	0.2307	0.1971	0.2352	0.2061	0.2419
D23	0.3205	0.3083	0.3138	0.312	0.3183	0.321	0.325
D22	0.316	0.2993	0.3093	0.303	0.3138	0.312	0.3205
D21	0.3115	0.2903	0.3048	0.294	0.3093	0.303	0.316
D20	0.307	0.2813	0.3003	0.285	0.3048	0.294	0.3115
D00	0.3025	0.2723	0.2958	0.276	0.3003	0.285	0.307
D01	0.298	0.2633	0.2913	0.267	0.2958	0.276	0.3025
D02	0.2935	0.2543	0.2868	0.258	0.2913	0.267	0.298
D03	0.289	0.2453	0.2823	0.249	0.2868	0.258	0.2935
D04	0.2845	0.2363	0.2778	0.24	0.2823	0.249	0.289
D05	0.28	0.2273	0.2733	0.231	0.2778	0.24	0.2845
D06	0.2755	0.2183	0.2688	0.222	0.2733	0.231	0.28
D07	0.271	0.2093	0.2643	0.213	0.2688	0.222	
D08	0.2665	0.2003	0.2598	0.204	0.2643	0.213	
D09	0.262	0.1913	0.2553	0.195	0.2598	0.204	
D10	0.2575	0.1823	0.2508	0.186	0.2553	0.195	

## Notes

- 1 Measurement uncertainty of the color coordinates:  $\pm 0.003$ .
- 2 The new white dustbin refers to the application of small backlight standard.

## 1.7 Typical Optical Characteristics Curves

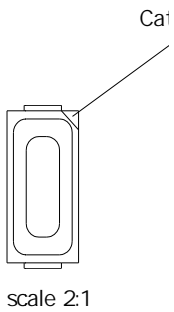




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Package:400

### 2.1.1 Carrier



### Notes

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## 2.1.2 Label Fc

Table 2-



## 2.2 Moistur

## 2.3

## 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 10s 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=80mA	1000hrs.	20pcs.	0/1
High Temperature and Humidity storage	60 / 90%RH	1000hrs.	20pcs.	0/1
Temperature Humidity Operation Life	IF=80mA 60 / 90%RH	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	$V_F$	IF=80mA	-	>U.S.L*)x1.1
Reverse Current	$I_R$	$V_R = 5V$	-	>U.S.L*)x2.0
Luminous Flux		IF=80mA	<L.S.L*)x0.7	-

Notes

- 1.U.S.L: Upper standard level
- 2.The above reliability tests is based on the test platform,the reliability experiment was carried out on the LED to the series and parallel circuit, voltage distribution, heat dissipation and so on.
- 3.The technical information shown in this document is for reference only, it does not constitute a license.

### 3. SMT Reflow

#### 3.1 SMT Reflow Soldering

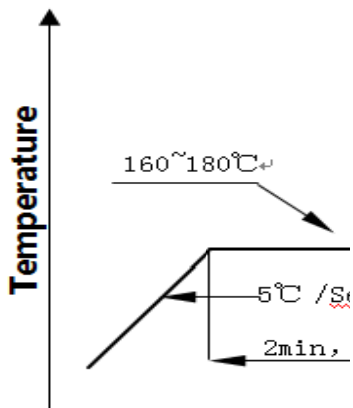


Fig.3-1

Fig.3-2 SMT Reflow Soldering Instructions SMT

Average temperature rise speed	$T_{smax}$ $T_P$	5 °C/	Max 5 °C/ s
Preheating: minimum temperature	( $T_{smin}$ )	160 °C	
Preheating: Max temperature	( $T_{smax}$ )	260 °C	
Preheating: Time	$T_{smin}$ $T_{smax}$	60 - 120	60s-120s
Time limited to maintain high temperature: the temperature	( $T_L$ )	217 °C	
Time limited to maintain high temperature: The Time	( $t_L$ )	60	Max 60s
Peak /Classification of temperature:	/ ( $T_P$ )	260 °C	
Time limit classification of peak temperature time	$t_p$	10	Max 10s
( $T_P$ ) 5 °C	Hold time within 5 °C with the actual peak temperature (TP)	30	Max 30s
Cooling speed		6 °C/	Max 6 °C/ s
25 °C	Needed time from 25 °C to $T_p$	8	Max 8 minutes

Notes

(1)Reflow soldering should not be done more than twice. If more than 24 hours between the two solderings , LED will be damaged.

24 LED

(2)Whensoldering , do not put stress on the LEDs during heating.

3.1.1 Soldering Iron

(1) When do soldering by hand, keep the temperature of iron below less 300 less than 3 seconds.

300 3

(2) Soldering by hand should be done only one time.



### 3.1.2 Repairing

Repairing should not be done after the LEDs have been soldered. When repairing is unavoidable, a double-iron should be used (as below figure). It should be confirmed in advance whether the characteristic is 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 surface which will be impacted on the reliability of the LEDs. Precautions should be taken to the encapsulated part. So when using the picking up nozzle, the pressure on the silicone resin should be

LED

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

PCB

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

## 4. Handling Precautions

### 4.1 Handling Precautions

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

100PPM.

(2) In order to prevent external material from getting into the inside of LED, which may cause the 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 LED is required to be less than 1500PPM. This is provided for informational purposes only and is not a warranty or endorsement.

LED

LED

900PPM

1500PPM.

(3) VOCs (Volatile organic compounds) emitted from materials used in the construction of fixtures and encapsulants of LEDs and discolor when exposed to heat and photonic energy. The result can be

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.

LED

LED

LED

LED

(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 exceed the absolute maximum rating specified for each LED. In the meanwhile, resistors for protection should be applied, otherwise slight voltage shift will cause big current change, burn out may happen. The driving circuit must be designed to allow forward voltage only when it is ON or OFF. If the reverse voltage is applied to LED, migration can be generated resulting in LED damage.

LED

LED

(6) Thermal Design is paramount importance because heat generation may result in the Characteristics decline, such as brightness decreased, Color change and so on. Please consider 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.

LED

Conditions	
Storage	Before Opening Alum
	After Opening Alum
Baking	

(8) If the moisture absorbent material silica treatment should be performed

If the package is flatulence or d

(9) Similar to most Solid state d

LT

