

3mm Round Standard T-1 Type White LED Technical Data Sheet

Part No.: LL-304WC4B-W6-3PD

Spec No.: B323 X435 Rev No.: V.2 Date: Jun/16/2006 Page: 1 OF 8

Approved: JoJo Checked: Wu Drawn: Yao



Features:

- ◇ Popular T-1 diameter package.
- ♦ High efficiency.
- ♦ Reliable and robust.
- \diamond Emission color: X=0.43, y=0.40.
- ♦ Industrial standard footprint.
- ♦ The product itself will remain within RoHS compliant Version.

Descriptions:

- ♦ The series is specially designed for applications requiring higher brightness.
- ♦ The LED lamps are available with different colors, intensities.
- ♦ Utilizing advanced InGaN chip technology.

Applications:

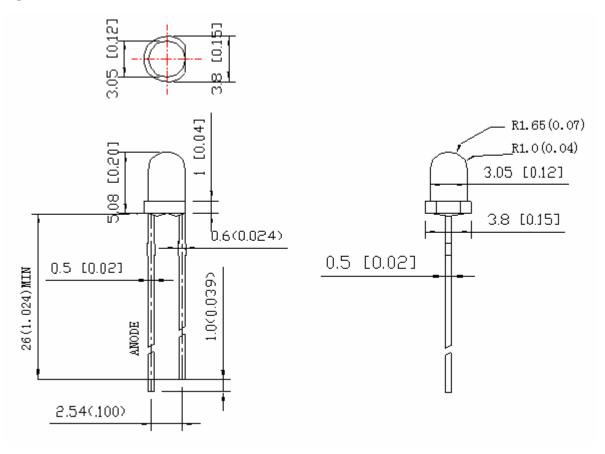
- ♦ QA equipment.
- ♦ Backlighting of LCD.
- Automotive equipment.
- ♦ Replacement of conventional Light bulbs and fluorescent lamps.
- ♦ Indoor and out door displays, etc.

Spec No.: B323 X435 Rev No.: V.2 Date: Jun/16/2006 Page: 2 OF 8

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Package Dimension:



Part No.	Chip Material	Lens Color	Source Color
LL-304WC4B-W6-3PD	InGaN	Water Clear	Warm White

Notes:

1. All dimensions are in millimeters (inches).

2. Tolerance is \pm 0.25 mm (.010") unless otherwise noted.

3. Protruded resin under flange is 1.00 mm (.039") max.

Spec No.: B323 X435 Rev No.: V.2 Date: Jun/16/2006 Page: 3 OF 8

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Absolute Maximum Ratings at Ta=25℃

Parameters	Symbol	Max.	Unit
Power Dissipation	P D	100	mW
Peak Forward Current (1/10 Duty Cycle, 0.1ms Pulse Width)	I FP	100	mA
Forward Current	I F	25	mA
Reverse Voltage	V R	5	V
Operating Temperature Range	T opr	-40°C to +80°C	
Storage Temperature Range	T stg	-40℃ to +85℃	
Lead Soldering Temperature [4mm (.157") From Body]	T sld	260℃ for 5 Seconds	

Notes:

- 1. Proper current derating must be observed to maintain junction temperature below the maximum.
- 2. LEDs are not designed to be driven in reserve bias.

Electrical Optical Characteristics at Ta=25℃

Parameters	Symbol	Min.	Тур.	Max.	Unit	Test Condition	
Viewing Angle	2θ _{1/2}		30		Deg	IF =20mA	
Forward Voltage	V _F	2.8	3.3	3.8	V	IF =20mA	
Reverse Current	\boldsymbol{I}_R			10	μΑ	V _R =5V	
Chromaticity Coordinates	X		0.43			IF =20mA	
	У		0.40			11 –20111A	
Luminous Intensity	Iv	5000	7500		mcd	IF =20mA	

Notes:

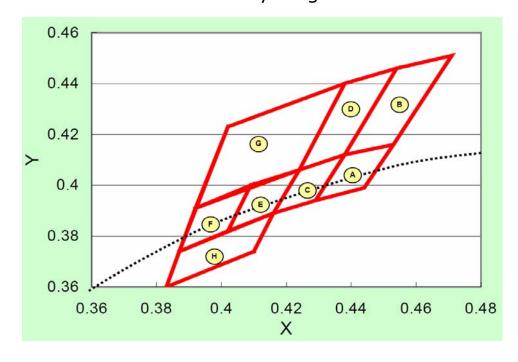
- 1. Luminous Intensity Measurement allowance is \pm 10%.
- 2. $\theta_{1/2}$ is the off-axis angle at which the luminous intensity is half the axial luminous intensity.

Spec No.: B323 X435 Rev No.: V.2 Date: Jun/16/2006 Page: 4 OF 8

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Warm White CIE 1931 Chromaticity Diagram:



Versions: 2.2

Warm White Chromaticity Coordinates Specifications for Bin Ranks:

Ranks	X	Y	CCT (Typ.)	Ranks	X	Y	CCT (Typ.)				
	0.438	0.412							0.409	0.400	
	0.429	0.394	2950		0.402	0.382	3370				
A	0.444	0.399	2930	L	0.416	0.389	3370				
	0.453	0.416			0.424	0.406					
	0.454	0.446			0.392	0.391					
В	0.438	0.412	2950	F	0.387	0.374	3640				
	0.453	0.416		Г	0.402	0.382	3040				
	0.471	0.451				0.409	0.400				
	0.424	0.406	3150		0.402	0.423					
\overline{C}	0.416	0.389			0.392	0.391	3500				
	0.429	0.394		U	0.424	0.406	3300				
	0.438	0.412				0.438	0.440				
	0.438	.438 0.440			0.387	0.374					
D	0.424	0.406	3150	TT	0.383	0.360	3500				
	0.438	0.412		<u>H</u>	0.410	0.374	3500				
	0.454	0.446			0.416	0.389					

Spec No.: B323 X435 Rev No.: V.2 Date: Jun/16/2006 Page: 5 OF 8

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Reliability Test Items And Conditions:

The reliability of products shall be satisfied with items listed below:

Confidence level: 90%.

LTPD: 10%.

1) Test Items and Results:

Test Item	Standard Test Method	Test Conditions	Note	Number of Damaged
Resistance to Soldering Heat	JEITA ED-4701 300 302	Tsld=260±5℃, 10sec 4mm from the base of the epoxy bulb	1 time	0/100
Solder ability	JEITA ED-4701 300 303	Tsld=235 \pm 5°C, 5sec(using flux)	1time over 95%	0/100
Thermal Shock	JEITA ED-4701 300 307	0℃~100℃ 15sec, 15sec	100 cycles	0/100
Temperature Cycle	JEITA ED-4701 100 105	-40℃~25℃~100℃~25℃ 30min,5min,30min,5min	100 cycles	0/100
Moisture Resistance Cycle	JEITA ED-4701 200 203	25℃~65℃~-10℃ 90%RH 24hrs/1cycle	10 cycles	0/100
High Temperature Storage	JEITA ED-4701 200 201	Ta=100℃	1000hrs	0/100
Terminal Strength (Pull test)	JEITA ED-4701 400 401	Load 10N (1kgf) 10±1sec	No noticeable damage	0/100
Terminal Strength (bending test)	JEITA ED-4701 400 401	Load 5N (0.5kgf) 0°~90°~0° bend 2 times	No noticeable damage	0/100
Temperature Humidity Storage	JEITA ED-4701 100 103	Ta=60℃, RH=90%	1000hrs	0/100
Low Temperature Storage	JEITA ED-4701 200 202	Ta=-40℃	1000hrs	0/100
Steady State Operating Life		Ta=25℃, IF=30mA	1000hrs	0/100
Steady State Operating Life of High Humidity Heat		Ta=60℃, RH=90%, IF=30mA	500hrs	0/100
Steady State Operating Life of Low Temperature		Ta=-30℃, IF=20mA	1000hrs	0/100

2) Criteria For Judging The Damage:

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Item	Symbol	Test Conditions	Criteria for Judgment		
		rest Conditions	Min	Max	
Forward Voltage	VF	IF=20mA		F.V.*)×1.1	
Reverse Current	IR	VR=5V		F.V.*)×2.0	
Luminous Intensity	IV	IF=20mA	F.V.*)×0.7		

*) F.V.: First Value.

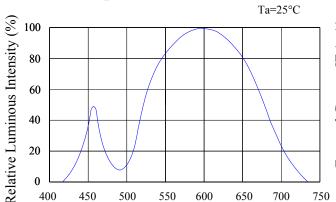
Spec No.: B323 X435 Rev No.: V.2 Date: Jun/16/2006 Page: 6 OF 8

Approved: JoJo Checked: Wu Drawn: Yao



Typical Electrical / Optical Characteristics Curves (25°C Ambient Temperature Unless Otherwise Noted)

Spectrum Distribution



550

Wavelength λp (nm)

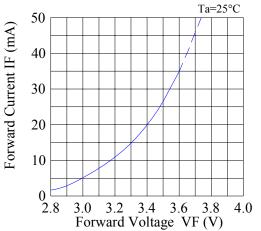
600

650

700

750

Forward Current & Forward Voltage

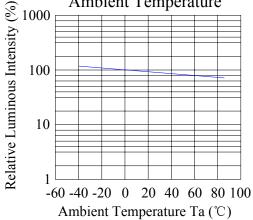


Luminous Intensity & Ambient Temperature

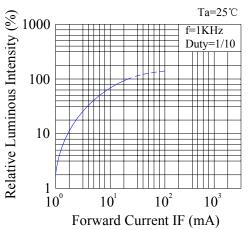
450

400

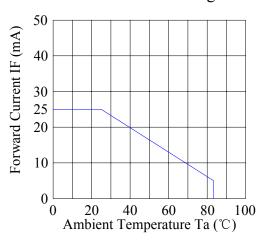
500



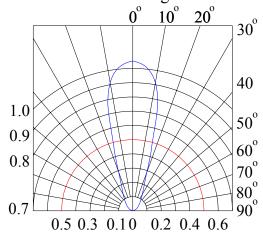
Luminous Intensity & Forward Current



Forward Current Derating Curve



Radiation Diagram



Spec No.: B323 X435 Date: Jun/16/2006 Rev No.: V.2 Page: 7 OF 8

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Lucky Light Electronics Co., Ltd.

http://www.luckylight.cn



Please read the following notes before using the datasheets:

1. Over-current-proof

Customer must apply resistors for protection, otherwise slight voltage shift will cause big current change (Burn out will happen).

2. Storage

- 2.1 Do not open moisture proof bag before the products are ready to use.
- 2.2 Before opening the package, the LEDs should be kept at 30℃ or less and 90%RH or less.
- 2.3 The LEDs should be used within a year.
- 2.4 After opening the package, the LEDs should be kept at 30℃ or less and 70%RH or less.
- 2.5 The LEDs should be used within 168 hours (7 days) after opening the package.

3. Soldering Condition

- 3.1 Pb-free solder temperature profile.
- 3.2 Reflow soldering should not be done more than two times.
- 3.3 When soldering, do not put stress on the LEDs during heating.
- 3.4 After soldering, do not warp the circuit board.

4. Soldering Iron

Each terminal is to go to the tip of soldering iron temperature less than 260°C for 5 seconds within once in less than the soldering iron capacity 25W. Leave two seconds and more intervals, and do soldering of each terminal. Be careful because the damage of the product is often started at the time of the hand solder.

5. Repairing

Repair 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 beforehand whether the characteristics of the LEDs will or will not be damaged by repairing.

6. Caution in ESD

Static Electricity and surge damages the LED. It is recommend to use a wrist band or anti-electrostatic glove when handling the LED. All devices equipment and machinery must be properly grounded.

Spec No.: B323 X435 Rev No.: V.2 Date: Jun/16/2006 Page: 8 OF 8

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