LITEON®
OPTOELECTRONICS

Light LED

Product Data Sheet

LTPA-E3030AZL

Spec No.: DS25-2014-0231

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LITE-ON DCC

RELEASE

BNS-OD-FC001/A4

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Light LED
LTPA-E3030AZL

1. Description

The LiteOn White LED is a revolutionary, energy efficient and ultra-compact new light source, combining the lifetime and reliability advantages of Light Emitting Diodes with the brightness of conventional lighting. It gives you total design freedom and unmatched brightness, creating a new opportunities for solid state lighting to displace conventional lighting technologies.

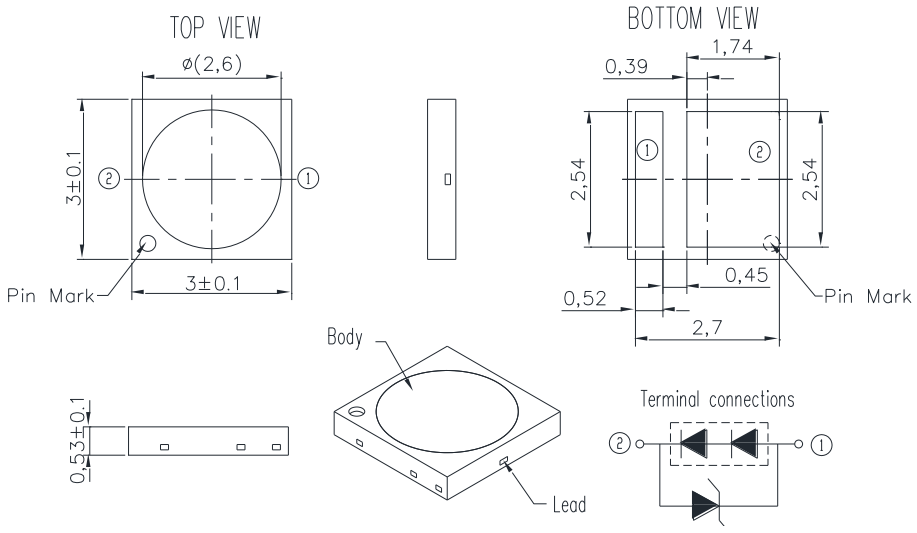
1 .1 Features

- Meet ROHS and HF
- Instant Turn On. Very small emitter size
- Highest brightness SMD LED
- Package In 8mm Tape On 7" Diameter Reels
- EIA STD Package
- I.C. Compatible
- Compatible With Automatic Placement Equipment
- Compatible With Infrared Reflow Solder Process

1.2 Applications

- Automotive aftermarket eg: DRL, Reading light

2. Package Dimensions



Part No.	Lens Color	Emitted Color
LTPA-E3030AZL	Orange	InGaN White

Notes :

1. All dimensions are in millimeters and dimension tolerances are ±0.2mm.
2. Dimensions without tolerances are for reference only.

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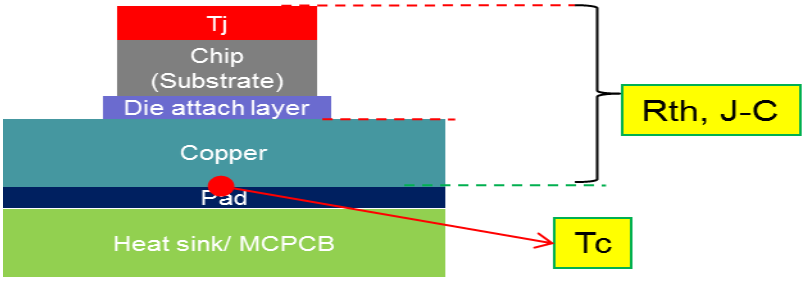
3. Rating and Characteristics

3.1 Absolute Maximum Ratings at Ta=25°C

Parameter	LTPA-E3030AZL	Unit
Power Dissipation	1.32	W
DC Forward Current	200	mA
Junction Temperature (Tc)	125	°C
Electrostatic Discharge Threshold (HBM)	2K	V
Thermal Resistance(Rth, J-C)	18	°C/W
Operating Temperature Range(Tc)	-40 ºC to + 100 ºC	
Storage Temperature Range(Tstg)	-40 ºC to + 100 ºC	

Notes :

1. Forbid to operating at reverse voltage condition for long.
2. It is recommended to follow de-rating curve to use maximum rating to ensure LED can operated normally.
3. All correlation data is mounted on thermal heat sink with 2cmX 2cm Metal Core PCB
4. . All correlation data is mounted on thermal heat sink with 2cmX 2cm Metal Core PCB
5. The Tc point is defined as following figure.



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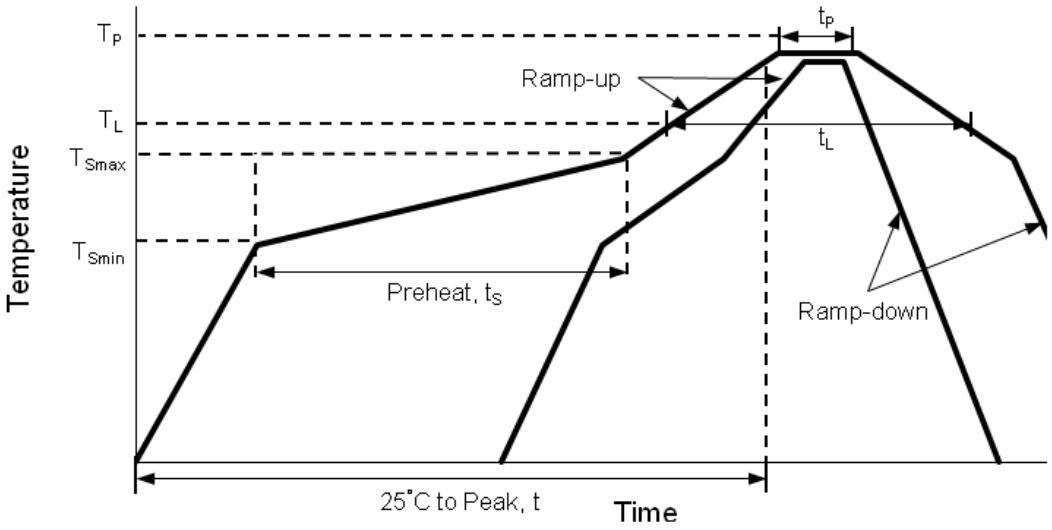
3.2 Suggest IR Reflow Condition For Pb Free Process:



Profile Feature	Lead Free Assembly
Average Ramp-Up Rate (T_{Smax} to T_P)	3°C / second max
Preheat Temperature Min (T_{Smin})	150°C
Preheat Temperature Max (T_{Smax})	200°C
Preheat Time (t_{Smin} to t_{Smax})	60 – 180 seconds
Time Maintained Above Temperature (T_L)	217°C
Time Maintained Above Time (t_L)	60 – 150 seconds
Peak / Classification Temperature (T_P)	260°C
Time Within 5°C of Actual Peak Temperature (t_P)	5 seconds
Ramp – Down Rate	6°C / second max
Time 25°C to Peak Temperature	8 minutes max

Notes:

1. All temperatures refer to topside of the package, measured on the package body surface.
2. The soldering condition referring to J-STD-020D. The storage ambient for the LEDs should not exceed 30 °C temperature or 70% relative humidity. It is recommended that LEDs out of their original packaging are soldered within one week. For extended storage out of their original packaging, it is recommended that the LEDs were stored in a sealed container with appropriate desiccant, or desiccators with nitrogen ambient. If the LEDs were unpacked more than 168hrs, baking the LEDs at 60 ℃ for 24hrs before soldering process.
3. The soldering profile could be further referred to different soldering grease material characteristic. The grease vendor will provide this information.
4. A rapid-rate process is not recommended for the LEDs cooling down from the peak temperature.
5. Although the recommended reflow conditions are specified above, the reflow or hand soldering condition at the lowest possible temperature is desirable for the LEDs.
6. LiteOn cannot make a guarantee on the LEDs which have been already assembled using the dip soldering method.

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3.3 Electrical / Optical Characteristics at Ta=25°C

Parameter	Symbol	LTPA-E3030AZL			Unit	Test Condition
		MIN.	TYP.	MAX.		
Luminous Flux	ΦV	85	--	160	lm	I_F = 150mA
Viewing Angle	$2\theta_{1/2}$	--	120	--	Deg	Fig.2
Forward Voltage	VF	5.8	--	6.6	V	I_F = 150mA

NOTE:

1. Luminous flux measurement tolerance : ±10%
2. Forward voltage measurement tolerance : ±0.1V
3. The chromaticity coordinates (x, y) is derived from the 1931 CIE chromaticity diagram.
4. 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.
5. Tester

   CAS140B is for the chromaticity coordinates(x,y) and Iv.
6. The chromaticity coordinates(x,y) guarantee should be added ±0.01 tolerance.

4. Bin Rank

4.1 Bin code list

■ **VF Rank**

Forward Voltage Color : White, Unit : V @150mA		
Bin Code	Min.	Max.
V1	5.8	6.0
V2	6.0	6.2
V3	6.2	6.4
V4	6.4	6.6

Tolerance on each Forward Voltage bin is ±0.1V

■ **Luminous Flux Rank**

Luminous Flux Color : White, Unit : lm @150mA		
Bin Code	Min.	Max.
F	85	105
G	105	130
H	130	160

Tolerance on each Luminous Flux bin is ±10%

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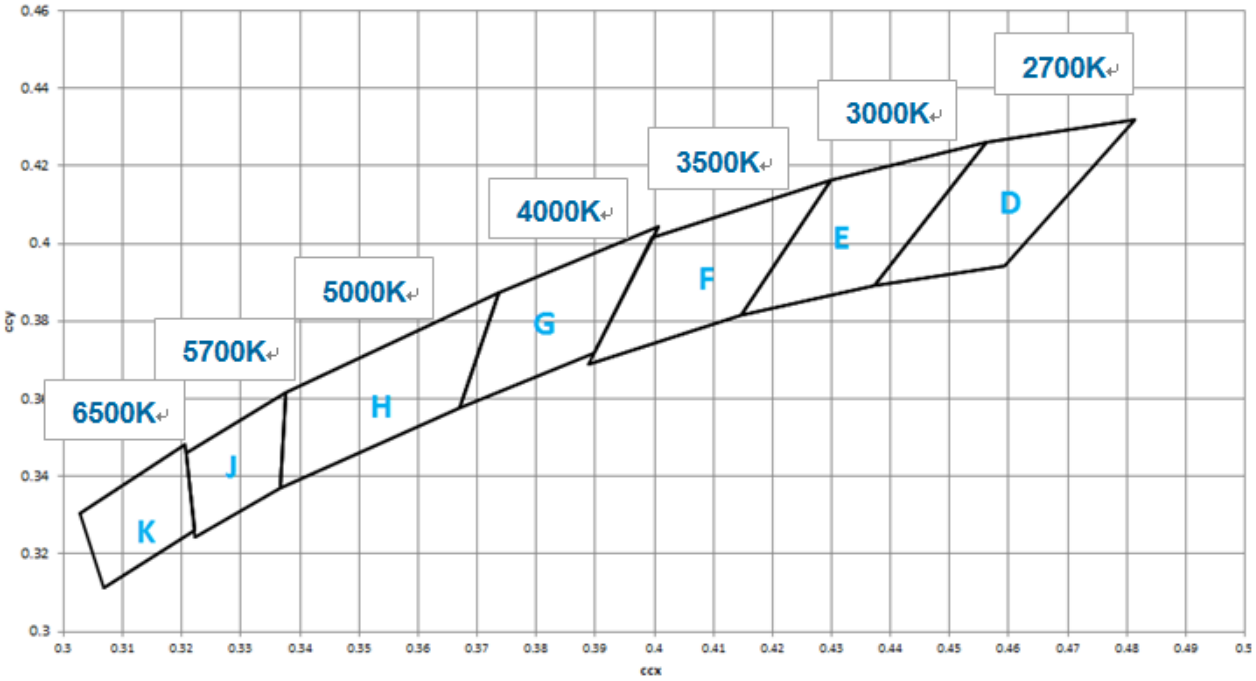
■ Hue Rank



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■ Color rank

I_F = 150mA											
Rank	-	x	y	Rank	-	x	y	Rank	-	x	y
K	1	0.3028	0.3304	J	1	0.3207	0.3462	H	1	0.3376	0.3616
	2	0.3068	0.3113		2	0.3222	0.3243		2	0.3366	0.3369
	3	0.3221	0.3261		3	0.3366	0.3369		3	0.367	0.3578
	4	0.3205	0.3481		4	0.3376	0.3616		4	0.3736	0.3874
	5	0.3028	0.3304		5	0.3207	0.3462			0.3376	0.3616
G	1	0.3736	0.3874	F	1	0.3996	0.4015	E	1	0.4299	0.4165
	2	0.367	0.3578		2	0.3889	0.369		2	0.4147	0.3814
	3	0.3898	0.3716		3	0.4147	0.3814		3	0.4373	0.3893
	4	0.4006	0.4044		4	0.4299	0.4165		4	0.4562	0.426
	5	0.3736	0.3874		5	0.3996	0.4015			0.4299	0.4165
D	1	0.4562	0.426								
	2	0.4373	0.3893								
	3	0.4593	0.3944								
	4	0.4813	0.4319								
	5	0.4562	0.426								

Tolerance on each Hue (x, y) bin is ± 0.01

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5. Typical Electrical / Optical Characteristics Curves.

(25℃ Ambient Temperature Unless Otherwise Noted)

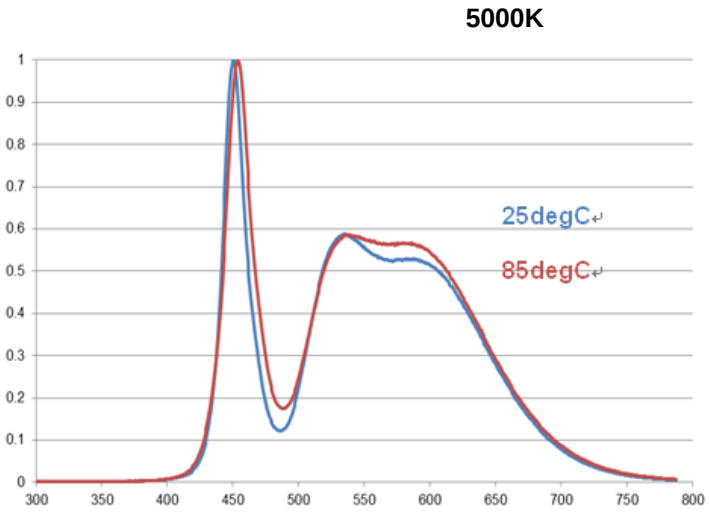

Fig 1. Relative Spectrum of Emission

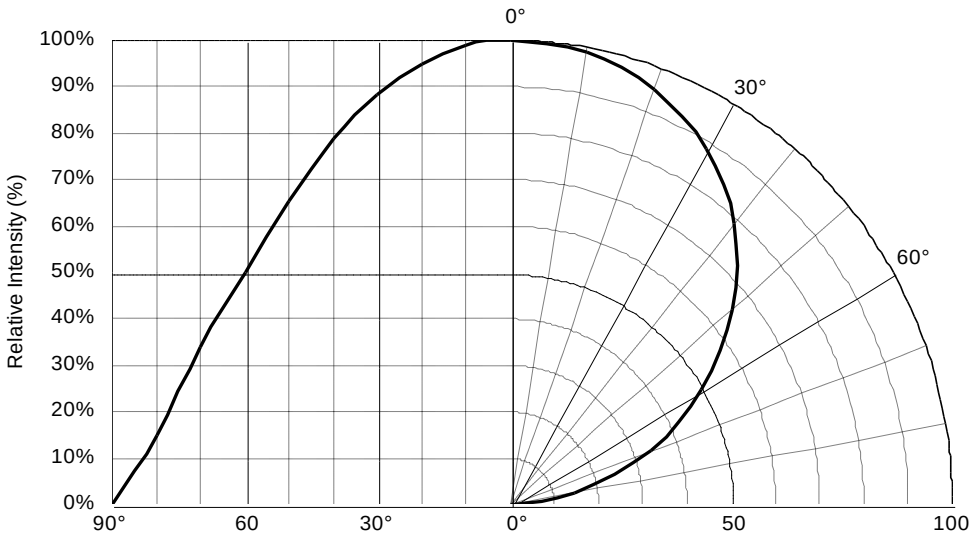

Fig 2. Radiation Characteristics

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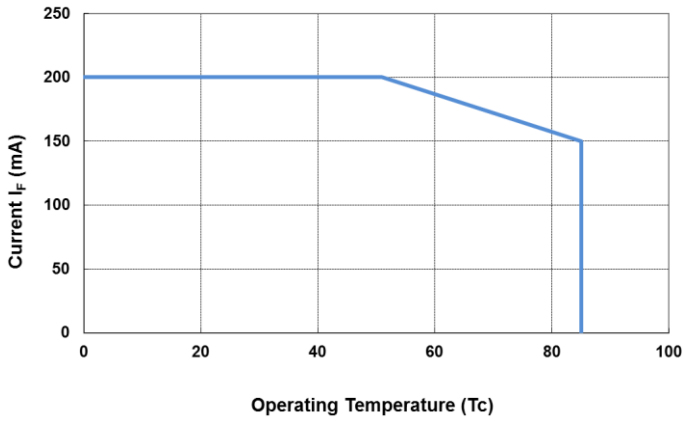

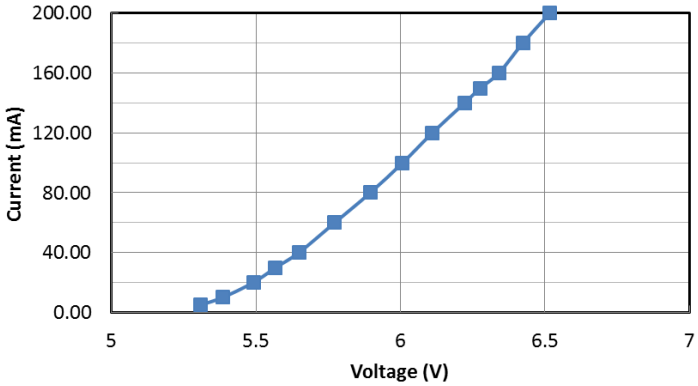

Fig 4. Forward Current

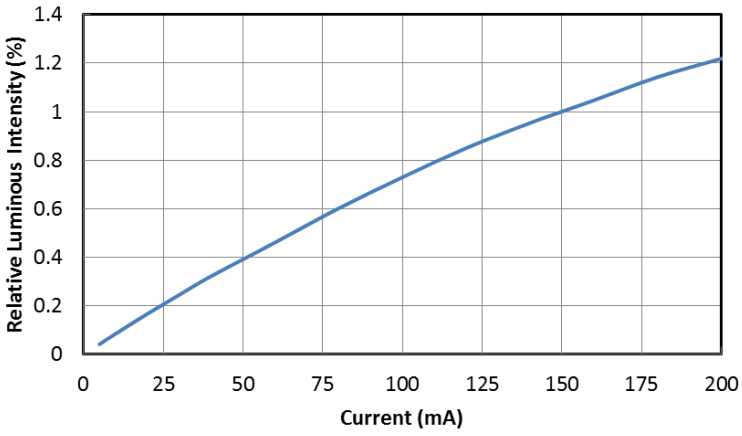

Fig 5. Relative Luminous Flux

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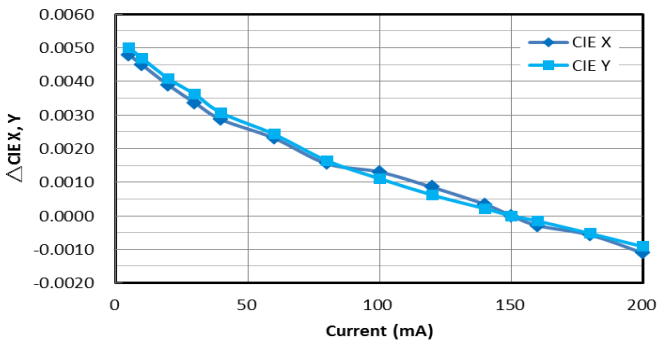
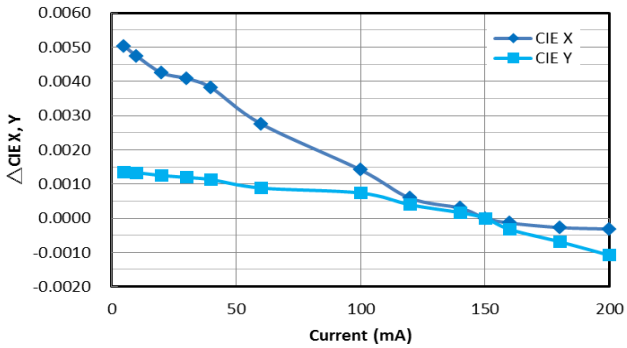


Cool White



Warm White

Fig 6. Correlated Color Temperature (CCT) Shift

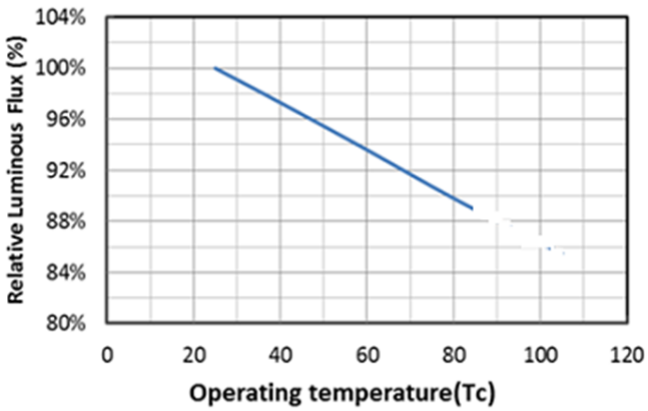


Fig 7.Relative Intensity vs. Operating Temperature

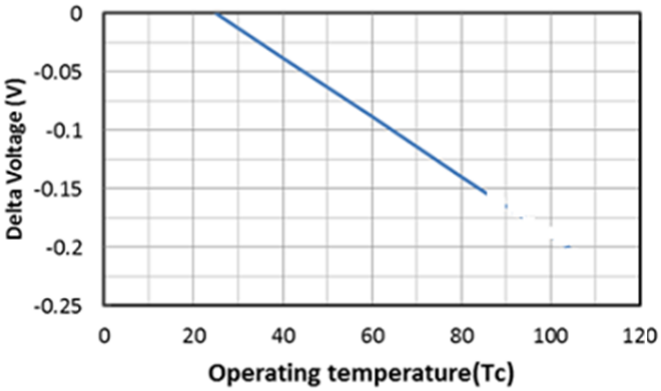


Fig 8. Voltage vs. Operating Temperature

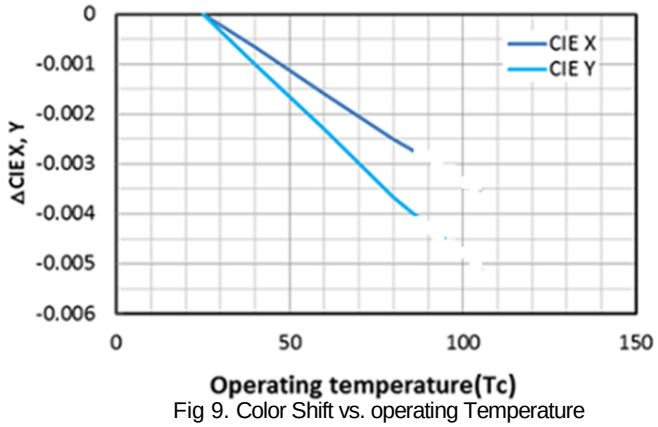


Fig 9. Color Shift vs. operating Temperature

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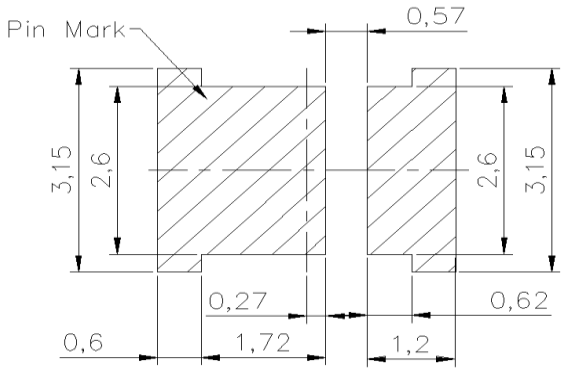
6.1 Cleaning

Do not use unspecified chemical liquid to clean LED they could harm the package.
If clean is necessary, immerse the LED in ethyl alcohol or in isopropyl alcohol at normal temperature for less one minute.

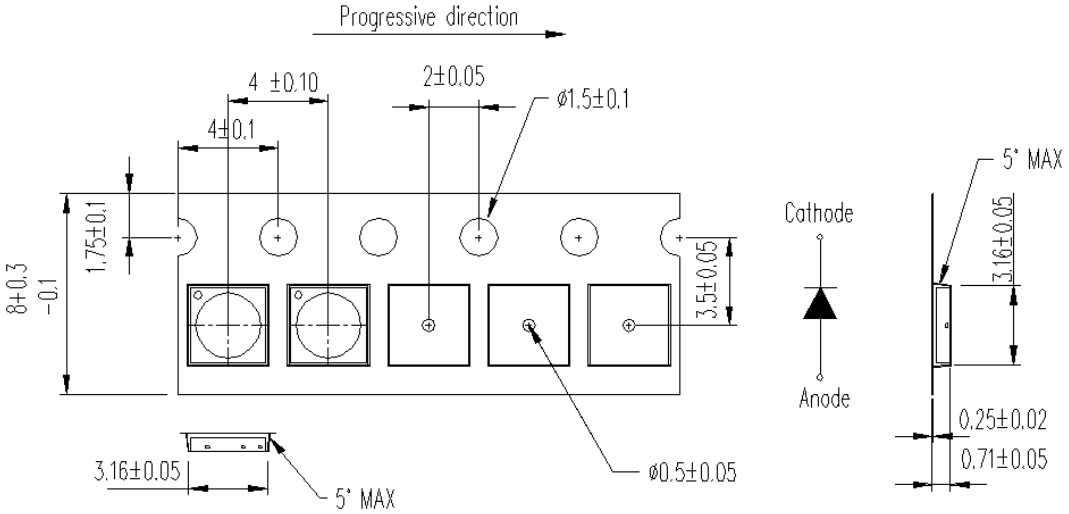
6.2 Recommend Printed Circuit Board Attachment Pad

Infrared / vapor phase

Reflow Soldering



6.3 Package Dimensions Of Tape And Reel



Note:

1. All dimensions are in millimeters (inches).

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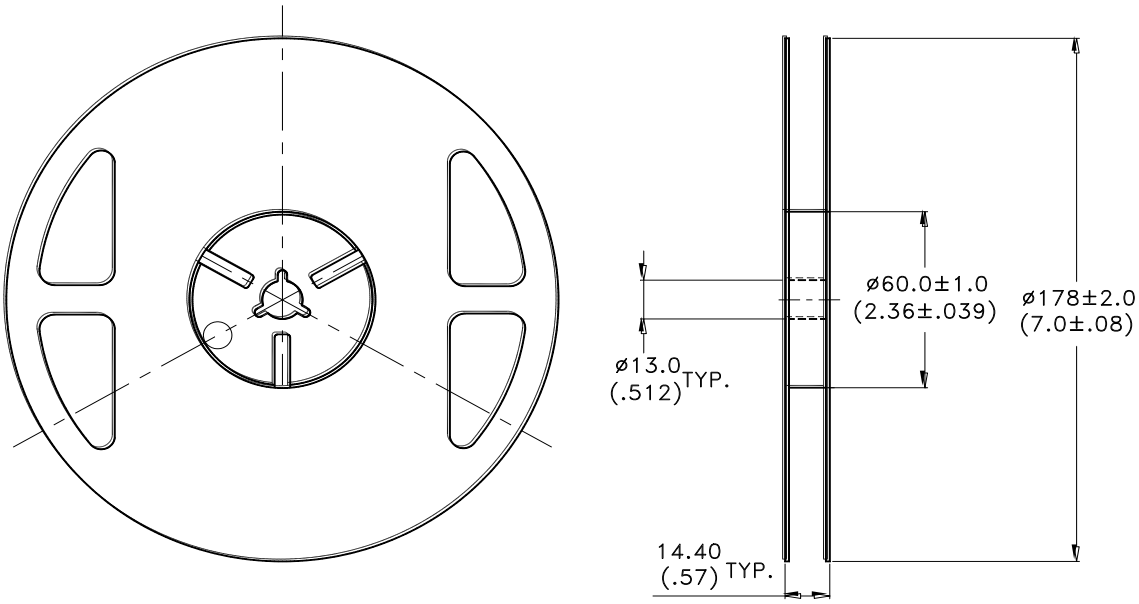
6.4 Package Dimensions of Reel



Notes:

1. Empty component pockets sealed with top cover tape.
2. 7 inch reel-1000 pieces per reel.
3. Minimum packing quantity is 500 pieces for remainders.
4. The maximum number of consecutive missing lamps is two.
5. In accordance with EIA-481 specifications.

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7. Cautions

7.1 Application

The LEDs described here are intended to be used for ordinary electronic equipment (such as office equipment, communication equipment and household applications).Consult Liteon's Sales in advance for information on applications in which exceptional reliability is required, particularly when the failure or malfunction of the LEDs may directly jeopardize life or health (such as in aviation, transportation, traffic control equipment, medical and life support systems and safety devices).

7.2 Storage

This product is qualified as Moisture sensitive Level 3 per JEDEC J-STD-020 Precaution when handing this moisture sensitive product is important to ensure the reliability of the product.

The package is sealed:

The LEDs should be stored at 30°C or less and 90%RH or less. And the LEDs are limited to use within one year, while the LEDs is packed in moisture-proof package with the desiccants inside.

The package is opened:

The LEDs should be stored at 30°C or less and 60%RH or less. Moreover, the LEDs are limited to solder process within 168hrs. If exceeding the storage limiting time since opened, that we recommended to baking LEDs at 60°C at least 48hrs. To seal the remainder LEDs return to package, it's recommended to be with workable desiccants in original package.

7.3 Cleaning

Use alcohol-based cleaning solvents such as isopropyl alcohol to clean the LED if necessary.

7.4 Soldering

Recommended soldering conditions:

Reflow soldering		Soldering iron	
Pre-heat	150~200°C	Temperature	300°C Max.
Pre-heat time	120 sec. Max.	Soldering time	3 sec. Max.
Peak temperature	260°C Max.		(one time only)
Soldering time	10 sec. Max.(Max. two times)		

Notes:

Because different board designs use different number and types of devices, solder pastes, reflow ovens, and circuit boards, no single temperature profile works for all possible combinations. However, you can successfully mount your packages to the PCB by following the proper guidelines and PCB-specific characterization.

LITE-ON Runs both component-level verification using in-house **KYRAMX98** reflow chambers and board-level assembly. The results of this testing are verified through post-reflow reliability testing. Profiles used at LITE-ON are based on JEDEC standards to ensure that all packages can be successfully and reliably surface mounted. Figure on page2 shows a sample temperature profile compliant to JEDEC standards. You can use this example as a generic target to set up your reflow process. You should adhere to the JEDEC profile limits as well as specifications and recommendations from the solder paste manufacturer to avoid damaging the device and create a reliable solder joint.

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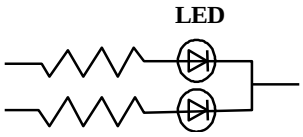
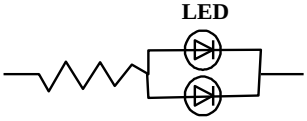
7.5 Drive Method

A LED is a current-operated device. In order to ensure intensity uniformity on multiple LEDs connected in parallel in an application, it is recommended that a current limiting resistor be incorporated in the drive circuit, in series with each LED as shown in Circuit A below.

Circuit model A



Circuit model B



(A) Recommended circuit.
(B) The brightness of each LED might appear different due to the differences in the I-V characteristics of those LEDs.

7.6 ESD (Electrostatic Discharge)

Static Electricity or power surge will damage the LED.
Suggestions to prevent ESD damage:

- Use of a conductive wrist band or anti-electrostatic glove when handling these LEDs.
- All devices, equipment, and machinery must be properly grounded.
- Work tables, storage racks, etc. should be properly grounded.
- Use ion blower to neutralize the static charge which might have built up on surface of the LED's plastic lens as a result of friction between LEDs during storage and handling.

Plastic lens as a result of friction between LEDs during storage and handling.
ESD-damaged LEDs will exhibit abnormal characteristics such as high reverse leakage current, low forward Voltage, or "no light-up" at low currents.
To verify for ESD damage, check for "light up" and Vf of the suspect LEDs at low currents.
The Vf of "good" LEDs should be>2.0V@0.1mA for InGaN product.forward voltage, or "no lightup" at low currents.
To verify for ESD damage, check for "lightup" and VF of the suspect LEDs at low currents.

8. Reliability Test

Stress Test	Stress Condition	Stress Duration	Number of Damaged
High Temperature Storage (HTS)	100℃	1000 hrs	0/20
Low Temperature Storage (LTS)	-40℃	1000 hrs	0/20
Thermal Cycle (TC)	-40℃~100℃ 30min dwell 5min transfe	200 cycles	0/20
Thermal Shock (TS)	-40℃~100℃ 20min dwell 20sec transfer	200 cycle	0/20

9. Others

- Do not put any pressure on the light emitting surface either by finger or any hand tool and do not stack the products. Stress or pressure may cause damage to the wires of the LED array.
- This product is not designed for the use under any of the following conditions, please confirm the performance and reliability are well enough if you use it under any of the following conditions
- Do not use sulfur-containing materials in commercial products including the materials such as seals and adhesives that may contain sulfur.
- Do not put this product in a place with a lot of moisture (over 85% relative humidity), dew condensation, briny air, and corrosive gas (Cl, H2S, NH3, SO2, NOX, etc.), exposure to a corrosive environment may affect silver plating.
- The appearance and specifications of the product may be modified for improvement without prior notice.

10. Suggested Checking List

Training and Certification

1. Everyone working in a static-safe area is ESD-certified?
2. Training records kept and re-certification dates monitored?

Static-Safe Workstation & Work Areas

1. Static-safe workstation or work-areas have ESD signs?
2. All surfaces and objects at all static-safe workstation and within 1 ft measure less than 100V?
3. All ionizer activated, positioned towards the units?
4. Each work surface mats grounding is good?

Personnel Grounding

1. Every person (including visitors) handling ESD sensitive (ESDS) items wears wrist strap, heel strap or conductive shoes with conductive flooring?
2. If conductive footwear used, conductive flooring also present where operator stand or walk?
3. Garments, hairs or anything closer than 1 ft to ESD items measure less than 100V*?
4. Every wrist strap or heel strap/conductive shoes checked daily and result recorded for all DLs?
5. All wrist strap or heel strap checkers calibration up to date?

Note: *50V for InGaN LED.

Device Handling

1. Every ESDS items identified by EIA-471 labels on item or packaging?
2. All ESDS items completely inside properly closed static-shielding containers when not at static-safe workstation?
3. No static charge generators (e.g. plastics) inside shielding containers with ESDS items?
4. All flexible conductive and dissipative package materials inspected before reuse or recycles?

Others

1. Audit result reported to entity ESD control coordinator?
2. Corrective action from previous audits completed?
3. Are audit records complete and on file?