



**Specific Lighting
Product Data Sheet**
LTW-5630SD630

Spec No. :DS23-2017-0003
Effective Date: 10/29/2019
Revision: B

LITE-ON DCC

RELEASE

BNS-OD-FC001/A4

Specific Lighting LTW-5630SD630

1. Description

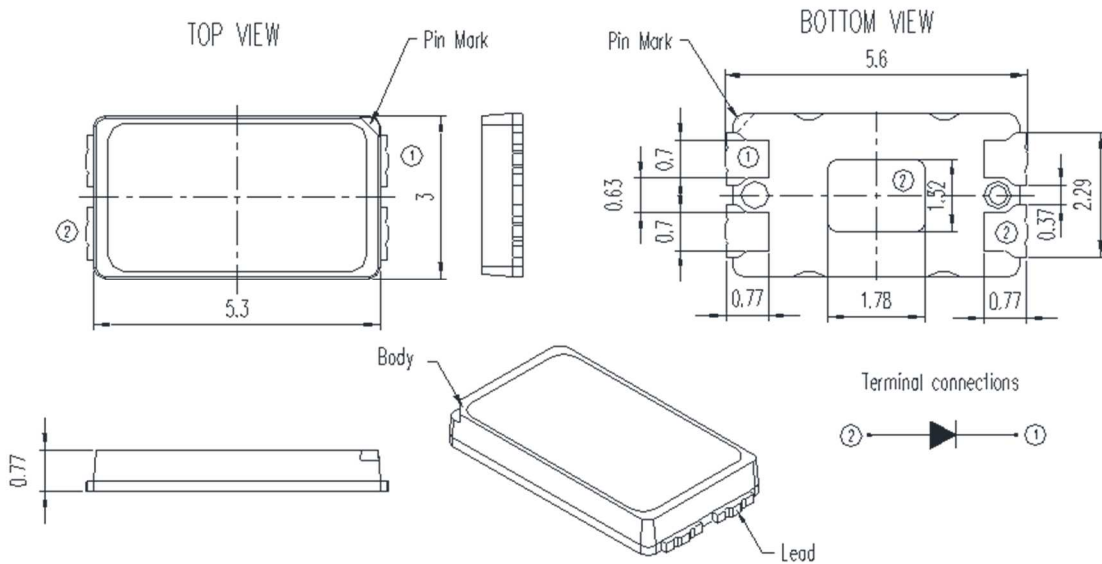
The LiteON 5630 Product series is a wide beam angle standard-dimension package, combining the lifetime and reliability advantages of Light Emitting Diodes with the brightness of conventional lighting. It gives you total design freedom and unmatched brightness, creating a new opportunities for solid state lighting to displace conventional lighting technologies.

1.1 Features

- Package in 12mm tape on 7" diameter reels.
- Compatible with automatic placement equipment.
- Compatible with infrared and vapor phase reflow solder process.
- EIA STD package.
- I.C. compatible.
- Meet green product and Pb-free(According to RoHS)

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2. Outline Dimensions



Part No.	Lens Color	Source Color	Emission color
LTW-5630SD630	Clean	AllnGaP RED	Red

Notes:

1. All dimensions are in millimeters.
2. Tolerance is ± 0.2 mm (.008") unless otherwise noted.

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3. Absolute Maximum Ratings at $T_a=25^{\circ}\text{C}$

Parameter	Symbol	Rating	Unit
DC Forward Current	I_F	150	mA
Pulsed Forward Current ¹	I_{FP}	180	mA
Power Dissipation	P_D	450	mW
Operating Temperature	T_{opr}	-40~+85	$^{\circ}\text{C}$
Storage Temperature	T_{stg}	-40~+100	$^{\circ}\text{C}$
Junction Temperature	T_j	120	$^{\circ}\text{C}$

Notes :

1. 1/10 duty cycle, Pulse width 10msec.
2. Forbid to operating at reverse voltage condition for long.

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4. Electro-Optical Characteristics

4.1 Typical Performance

Parameter	Symbol	Values		Unit	Test Condition
		Min	Max.		
Radiant Flux	Φ_e	Min	83	mW	$I_F = 150\text{mA}$
		Typ.	100		
		Max.	133		
Luminous Flux	Φ_v	Typ.	16	lm	
Dominant Wavelength	Wd	Min	620	nm	
		Typ.	630		
		Max.	640		
Peak Wavelength	W_P	Typ.	645	nm	
Photon Flux	PPF	Typ.	0.53	$\mu\text{mol/s}$	
Spectral Line Half-width	$\Delta\lambda$	Typ.	20	nm	
Viewing angle	$2\theta_{1/2}$	Typ.	120	deg	
Forward Voltage	V_F	Min	1.8	V	
		Typ.	2.2		
		Max.	2.6		
Thermal Resistance	R_{jt}	Typ.	22	$^{\circ}\text{C/W}$	
Reverse Current	I_R	Max.	5	μA	$V_R = -10\text{V}$

Notes

1. Radiant flux are the total flux output as measured with an integrating sphere.
2. Radiant flux classification code is marked on each packing bag.
3. CAS140B is the test standard for radiant flux, dominant wavelength and voltage
4. Caution in ESD:

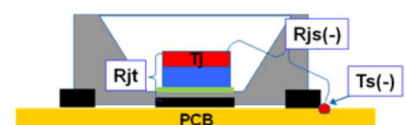
Static Electricity and surge damages the LED. It is recommended using a wrist band or anti-electrostatic glove when handling the LED. All devices, equipment and machinery must be properly grounded.

5. The thermal resistance is defined as the figure, R_{jt} is the R_{th} from T_j to thermal pad solder:

Reference for thermal resistance:

Using 2.5x 2.5x 0.17 cm aluminum MCPCB,

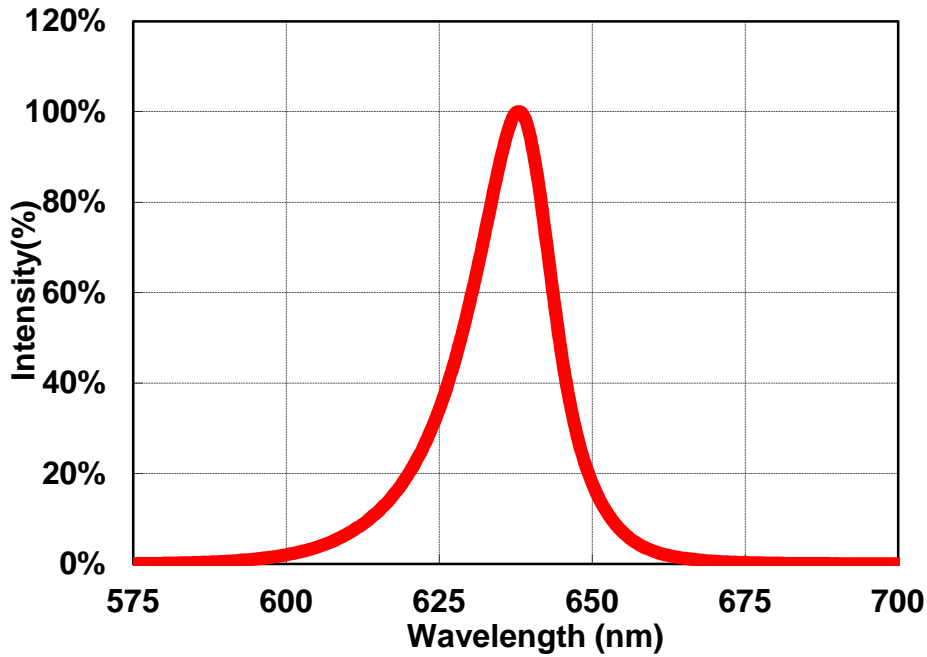
$R_{jt} = 15^{\circ}\text{C/W}$, $R_{js} = 19^{\circ}\text{C/W}$



- ◆ $R_{js} = R_{th}$ of T_j to T_s
- ◆ $R_{jt} = R_{th}$ of T_j to Thermal pad solder
- ◆ R_{th} definition in Datasheet = R_{jt}
- ◆ $R_{jt} < R_{jc}$
- ◆ $T_j = R_{js} \cdot I_F + T_s$

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4.2 Typical Electrical / Optical Characteristics Curves



5 Fig1. Relative Spectrum of Emission

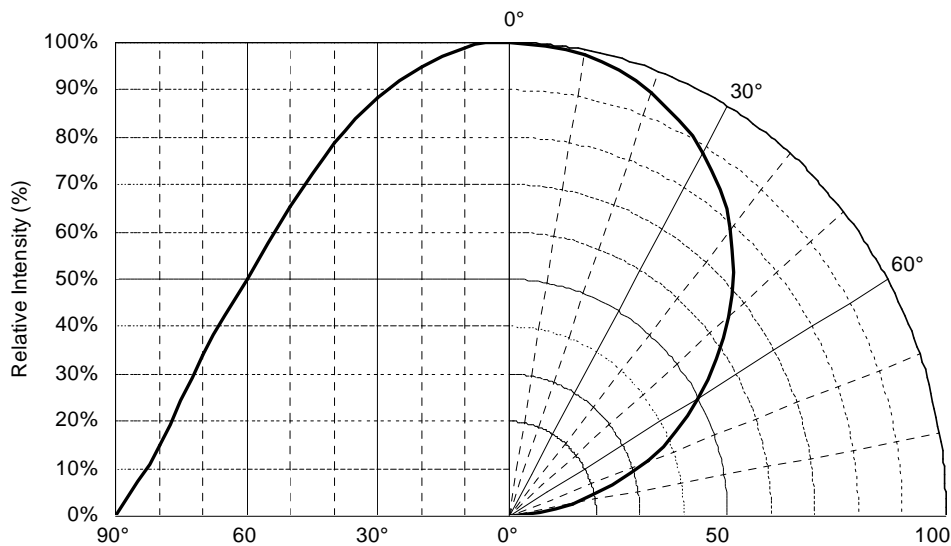


Fig2. Radiation Characteristics

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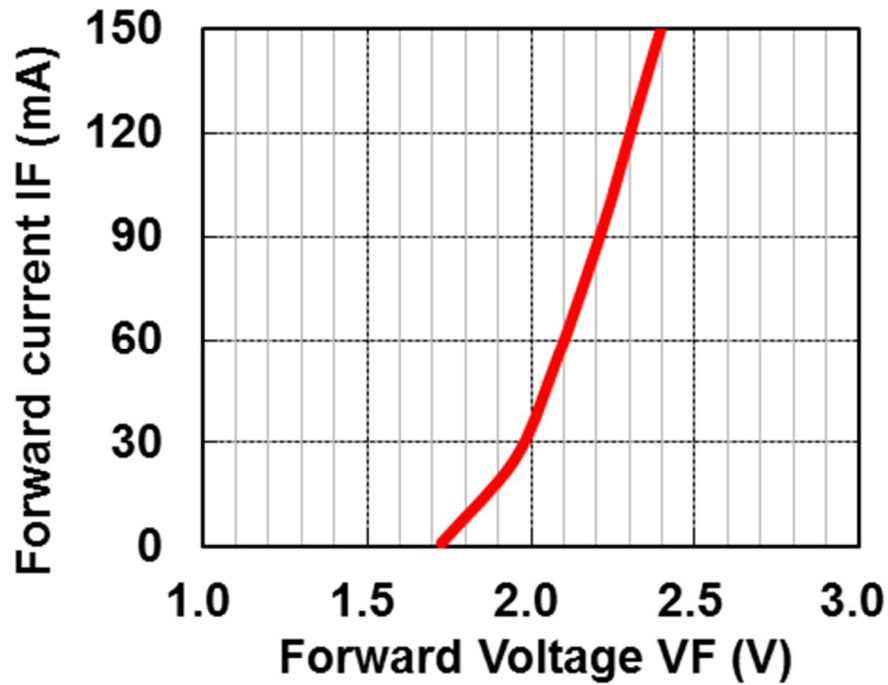


Fig3. Forward Current vs. Voltage

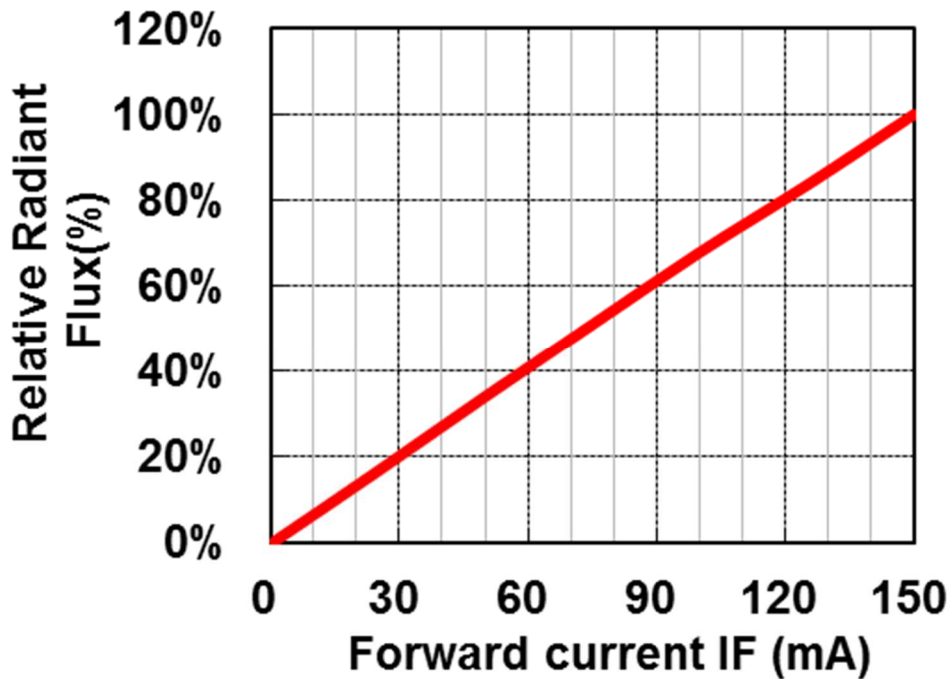


Fig.4. Forward Current vs. Relative Radiant Flux

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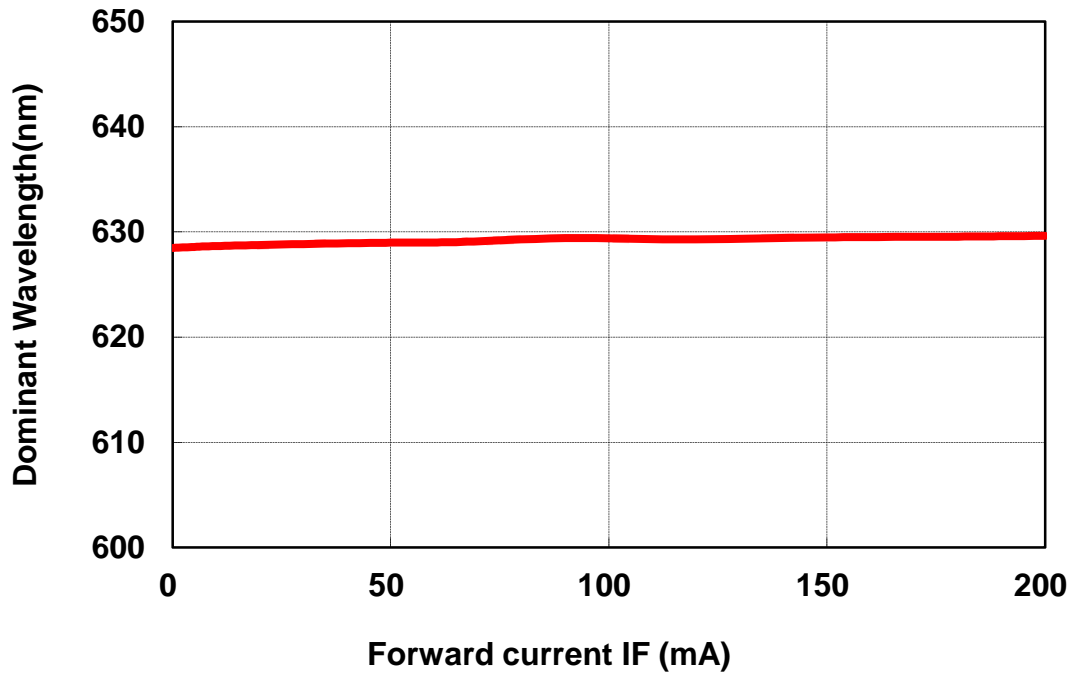


Fig.5. Forward Current vs. Dominant Wavelength

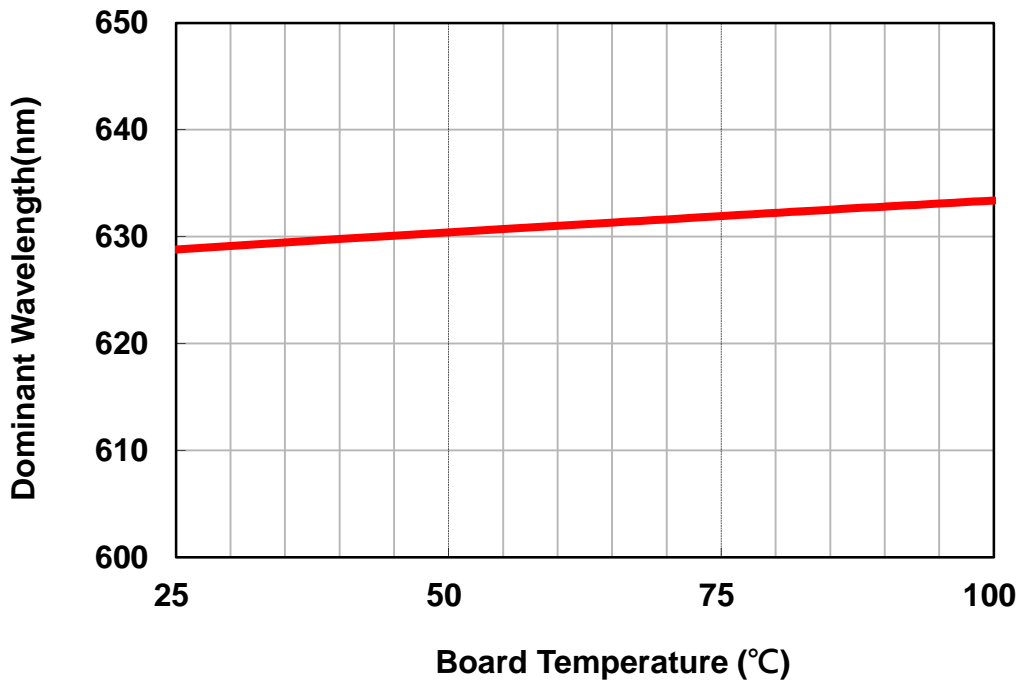


Fig.6. Board Temperature vs. Dominant Wavelength

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5. Bin Code List

Forward Voltage Spec. Table		
V _F Bin	IF =150mA, Ta=25°C	
	Min	Max
2	1.8	2.0
3	2.0	2.2
4	2.2	2.4
5	2.4	2.6

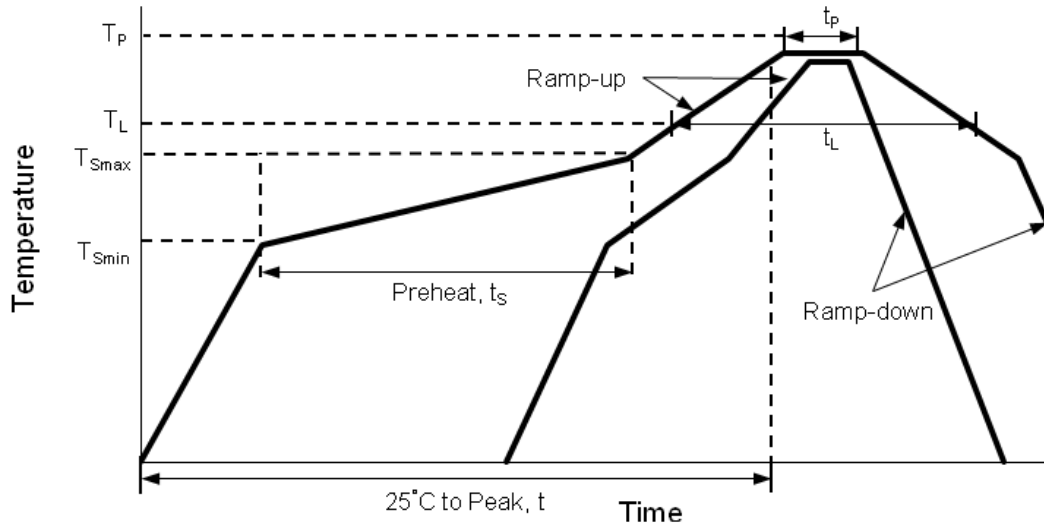
Luminous Flux Table		
lm code	IF =150mA, Ta=25°C	
	Min	Max
R2	83	91
R3	91	100
R4	100	110
R5	110	121
R6	121	133

Dominant Wavelength Spec. Table		
W _d Bin	IF =150mA, Ta=25°C	
	Min	Max
D35	620	625
D36	625	630
D37	630	635
D38	635	640

Notes

1. The flux is operated performance with forward current 150mA per die.
2. Flux is the total luminous flux output as initial measured with an integrated sphere.
3. Forward Voltage (V_F) measurement allowance is ±0.1V.
4. Flux measurement allowance is ±10%.
5. Wavelength allowance is ±5nm

6. Reflow Soldering Characteristics



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

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Notes:

1. The LEDs can be soldered using the reflow soldering or hand soldering method. The recommended hand soldering condition is 350 °C max. and 2 secs max. for one time only, and the recommended reflow soldering condition is 260 °C max. and 5 secs max. for three times max.
2. All temperatures refer to topside of the package, measured on the package body surface.
3. The soldering condition referring to J-STD-020B. 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 °C for 24hrs before soldering process.
4. The soldering profile could be further referred to different soldering grease material characteristic. The grease vendor will provide this information.
5. A rapid-rate process is not recommended for the LEDs cooling down from the peak temperature.
6. Although the recommended reflow conditions are specified above, the reflow or hand soldering condition at the lowest possible temperature is desirable for the LEDs.
7. LiteOn cannot make a guarantee on the LEDs which have been already assembled using the dip soldering method.

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7. Reliability Test

7.1 Typical Performance

No	Test item	Test Condition	Duration	Number of Damaged
1	Operating Test	Ta=25°C, IF=180mA	1,000hrs	0/20
2	High Temp. Operating Test	Ta=85°C, IF=180mA	1,000 hrs	0/20
3	High Humidity Operating Test	Ta=85°C, RH=85%, IF= 180mA	1,000hrs	0/20
4	Low Temp. Operating Test	Ta=-40°C, IF=180mA	1,000 hrs	0/20
5	High Temp. Storage Test	Ta=100°C	1,000hrs	0/20
6	Low Temp. Storage Test	Ta=-40°C	1,000hrs	0/20
7	Temperature Cycle Test	Ta= -40°C, 30min . ~25°C, 5min . ~100°C, 30min .	100 cycle	0/20
8	Resistance to Soldering Heat (Reflow Soldering)	Tsld=260°C , 10sec	2 times	0/20

7.2 Criteria for Judging the Damage

Item	Symbol	Test Condition	Criteria for Judgment	
			Min.	Max.
Forward Voltage	VF	IF=150 mA	—	Initial Value x1.1
flux	Φ_v	IF=150 mA	Initial Value x0.7	—
Reverse Current	IR	VR=-5V	—	10 μ A

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8. User Guide

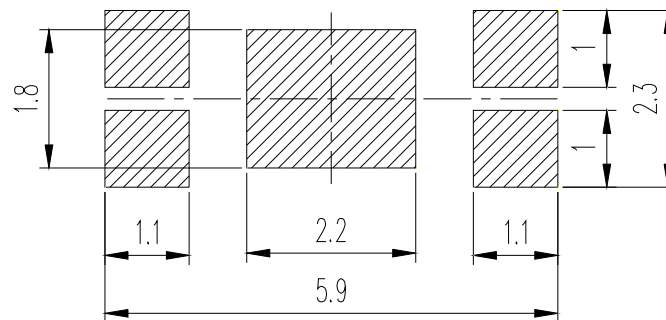
■ Cleaning

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

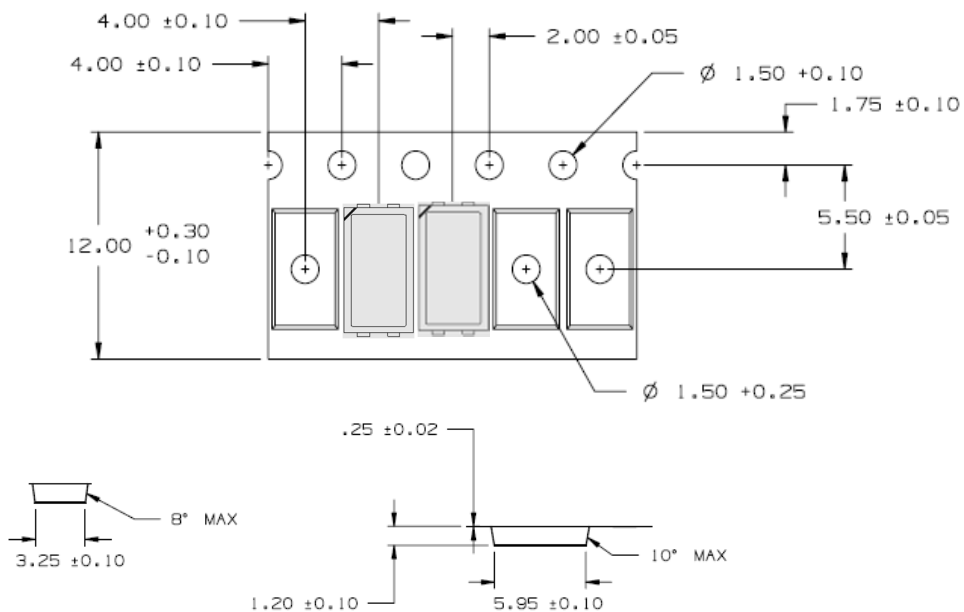
■ Recommend Printed Circuit Board Attachment Pad

Infrared / vapor phase

Reflow Soldering



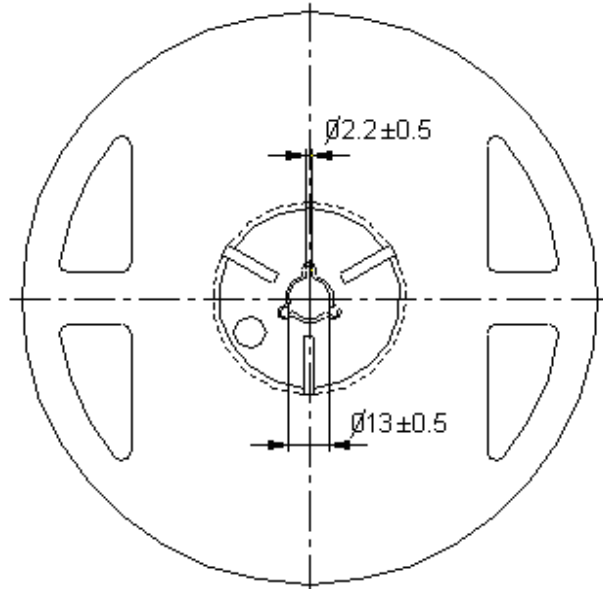
■ Package Dimensions of Tape



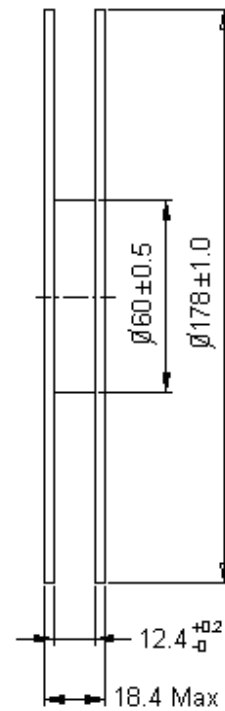
Note: All dimensions are in millimeters (inches).

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■ Package Dimensions of Reel



Note: 01. The tolerance unless mentioned is ± 0.1 mm
02. The measured unit is "mm"



Notes:

1. Empty component pockets sealed with top cover tape.
2. 7 inch reel-3000 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-481-1-B specifications.

9. Cautions

9.1 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).

9.2 Storage

This product is qualified as Moisture sensitive Level 3 per JEDEC J-STD-020 Precaution when handling 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:

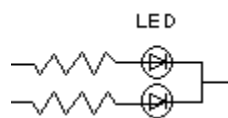
The LEDs should be stored at 30°C or less and 60%RH or less. Moreover, the LEDs are limited to solder process within 168hrs. If exceeding the storage limiting time since opened, that we recommended to baking LEDs at 60°C at least 24hrs. To seal the remainder LEDs return to package, it's recommended to be with workable desiccants in original package.

9.3 Cleaning

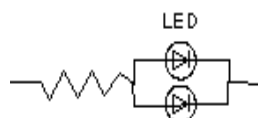
Use alcohol-based cleaning solvents such as isopropyl alcohol to clean the LED if necessary.

9.4 Drive Mode

An 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.

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9.5 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.

ESD-damaged LEDs will exhibit abnormal characteristics such as high reverse leakage current, low forward voltage, or "no lightup" at low currents. To verify for ESD damage, check for "light up" and V_F of the suspect LEDs at low currents. The V_F of "good" LEDs should be $>2.0V@0.1mA$ for InGaN product and $>1.4V@0.1mA$ for AlInGaP product.

9.6 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 wear 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 Blue LED.
- Device Handling
 1. Every ESDS items identified by EIA-471 labels on item or packaging?

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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 recycle?
- 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?

9.7 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, NO_x, 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.

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10. Revision History:

Revision Date: 10/01/2019

Last Version: 1.3

Version	Page	Content of Change	Date Record
1.0	-	New spec	01/25/2017
1.1	4	Add thermal resistance R_{jt} description	01/29/2018
1.2	3	Revise junction temperature spec	02/01/2018
1.3	4, 8	Revise forward voltage VF spec	10/01/2019