LITEON®
OPTOELECTRONICS

Specific Lighting
Product Data Sheet
LTPA-C3535BWP60-LY

Spec No. :DS23-2018-0001
Effective Date: 06/22/2018
Revision: A

LITE-ON DCC

RELEASE

BNS-OD-FC001/A4

LITE-ON Technology Corp. / Optoelectronics
No.90,Chien 1 Road, Chung Ho, New Taipei City 23585, Taiwan, R.O.C.
Tel: 886-2-2222-6181 Fax: 886-2-2221-1948 / 886-2-2221-0660
http://www.liteon.com/opto

Specific Lighting
LTPA-C3535BWP60-LY

1. Description

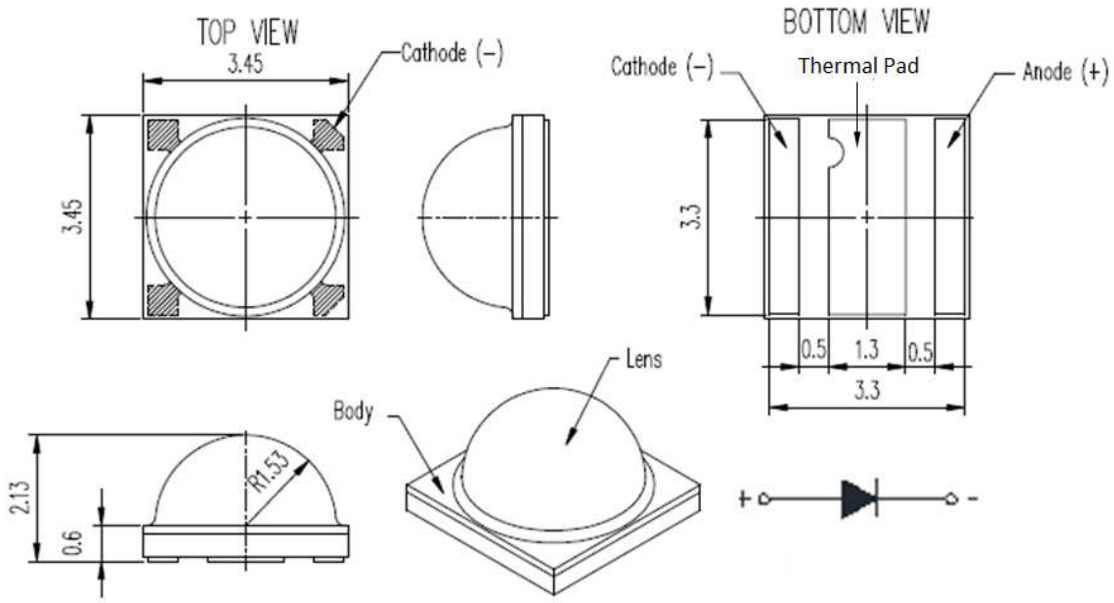
The LiteOn White LED is a revolutionary, energy efficient and ultra-compact new light source, combining the lifetime and reliability advantages of Light Emitting Diodes with the brightness of conventional lighting. It gives you total design freedom and unmatched brightness, creating a new opportunities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

1.1 Features

- Meet RoHS and HF
- Highest brightness SMD LED
- Package in 12mm tape on 7" diameter reels.
- I.C. compatible
- Compatible with automatic placement equipment
- Compatible with infrared reflow solder process

1.2 Applications

- Automotive: accessary applications.



Part No.	Lens Color	Source Color
LTPA-C3535BWP60-LY	Yellow / White	InGaN White

Notes:

1. All dimensions are in millimeters and dimension tolerances are ±0.3mm
2. Dimensions without tolerances are for reference only.

2. Rating and Characteristics

2.1 Absolute Maximum Ratings at Ta=25℃

Parameter	Symbol	Rating	Unit
Power Dissipation	Po	1.7	W
DC Forward Current	I_F	500	mA
ESD Sensitivity(HBM)	V_{HBM}	8	kV
Junction Temperature	Tj	125	℃
Thermal Resistance, Junction-Case	Rth, J-C	40	℃ / W
Operating Temperature Range	Topr	-40~+100	℃
Storage Temperature Range	Tstg	-40~+100	℃

Notes :

1. The pulse mode condition is 1 KHz with 0.1msec pulse width..
2. Forbid to operating at reverse voltage condition
3. ESD spec is reference to AEC-Q101-001 HBM.
4. The unit of Rth is ℃/W electrical and driving c urrent is 350mA.
5. Thermal resistance measurement tolerance is ± 10%,and with 8x 6 cm heat sink.
6. The package LEDs are not designed to be driven in reverse bias

Specific Lighting
LTPA-C3535BWP60-LY

2.2 Electro-Optical Characteristics

■ Typical Performance for white (Ta= 25℃)

Parameter	Symbol	Values			Unit	Test Condition
		Min	Typ.	Max		
Correlated Color Temperature	CCT	--	6000	--	K	I_F = 350mA
Color Rendering Index	CRI	--	70	--	-	
Viewing Angle	$2\theta_{1/2}$	--	118	--	deg	
Forward Voltage	V_F	2.8	3.1	3.6	V	
Luminous Flux	ΦV	90		150	lm	
Reverse Current	IR	--	--	10	uA	VR=5V Note 5

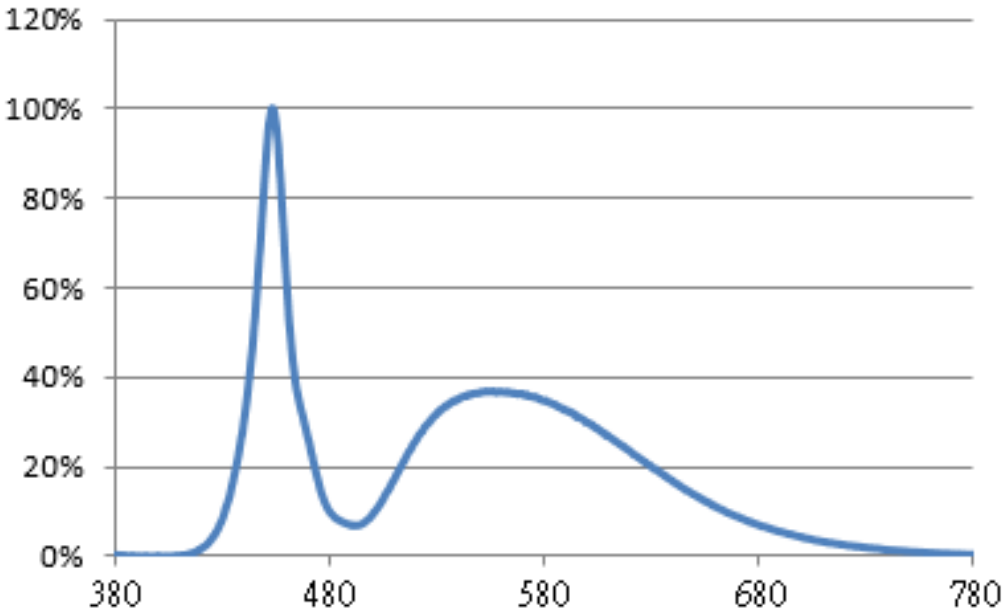
Notes

1. All of the VF value are typical and the real bin range please refer "VF Binning Parameter".
2. All of the Flux value are typical and the real Bin range please refer "Flux Binning Parameter".
3. Tolerance of Flux is ±10%, Tolerance of VF is ±5%, tolerance of CCx/CCy is ±0.01, tolerance of CRI is ±3.,
4. LEDs are lighted up and measured with externally parallel connecting leads of LED.
5. Reverse voltage (VR) condition is applied to IR test only. The device is not designed for reverse operation.

3. Typical Electrical/Optical Characteristics Curve

■ Efficiency Comparison Table

3.1 Relative Spectrum of Emission



3.2 Relative Flux vs. Current

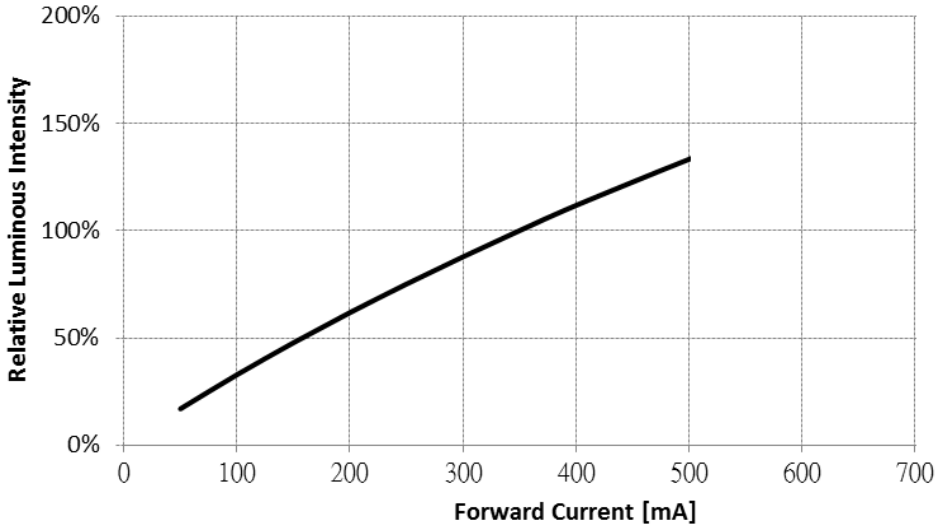


Fig 1. Typical relative luminous flux vs. forward current

Specific Lighting
LTPA-C3535BWP60-LY

3.3 Beam Pattern

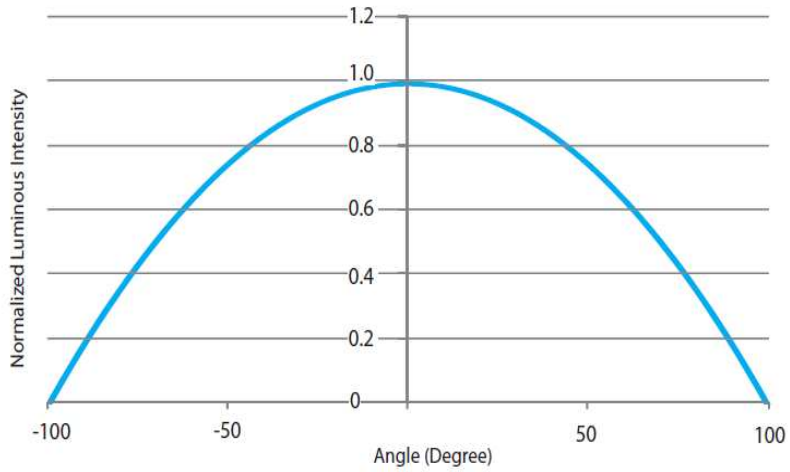


Fig 2. Emission angle

3.4 Forward Current vs. Forward Voltage at 25℃

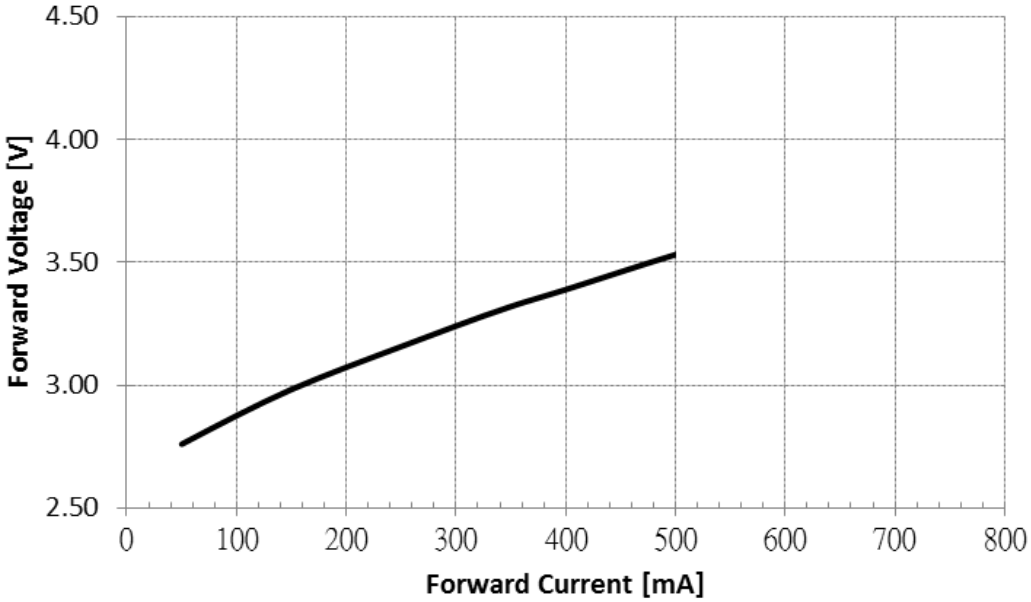
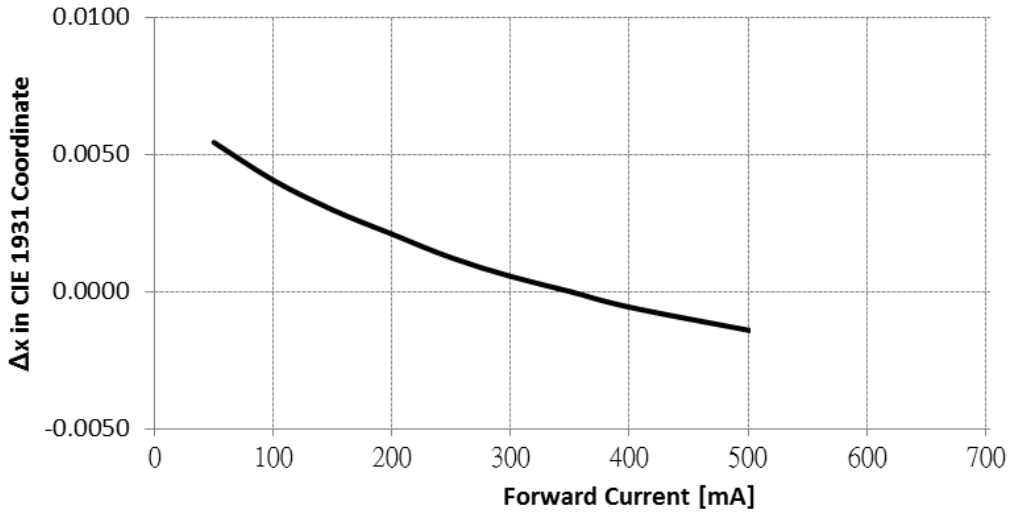


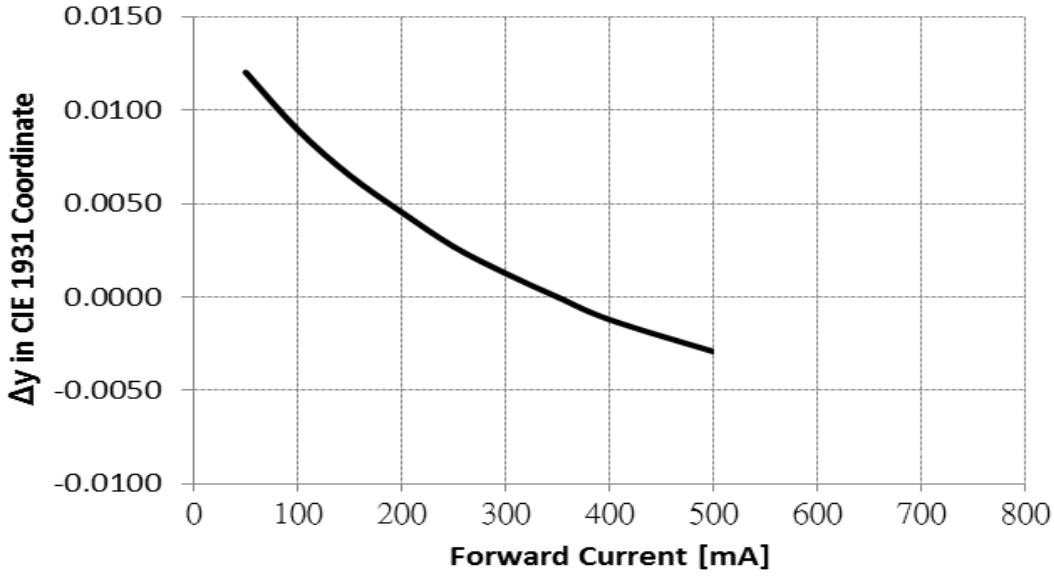
Fig 3. Forward Current vs. Forward Voltage

Specific Lighting
LTPA-C3535BWP60-LY

3.5 Relative CCx v.s. Forward Current at 25°C

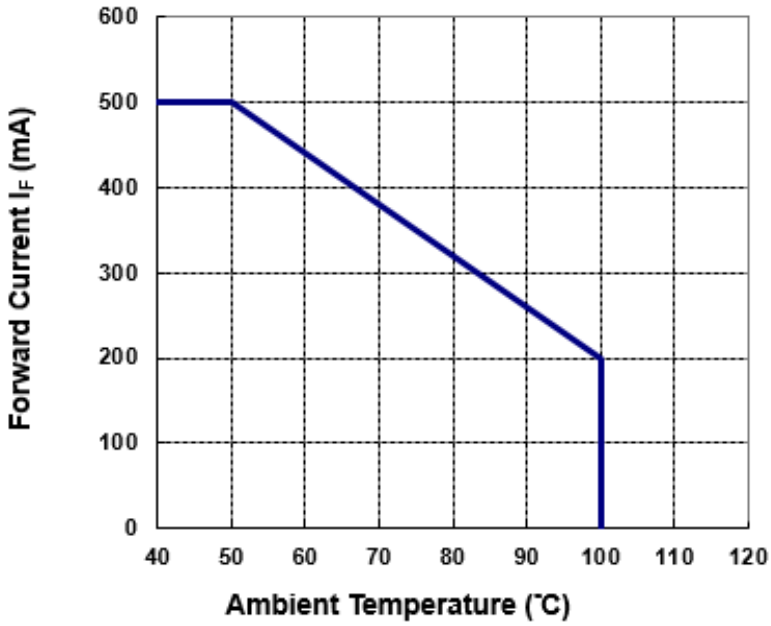


3.6 Relative CCy v.s. Forward Current at 25°C



Specific Lighting
LTPA-C3535BWP60-LY

3.7 Forward Current vs. Ambient Temperature



4. VF Bin Definition

4.1 Forward Voltage Binning Parameter at Ta = 25℃

Parameter	Bin	Symbol	Min	Max	Unit	Condition
Forward Voltage	C	VF	2.8	3.1	V	I_F = 350mA
	D		3.1	3.4		
	E		3.4	3.7		

Tolerance on each Forward Voltage bin is ±5%

5. Flux Bin Definition

5.1 Luminous Flux Binning Parameter at Ta = 25℃

Parameter	Bin	Symbol	Min	Max	Unit	condition
Luminous Flux	R9	ΦV	100	110	lm	I_F = 350mA
	S0		110	120		
	S1		120	130		
	S2		130	140		

Tolerance on each Luminous Flux bin is ±10%

Specific Lighting
LTPA-C3535BWP60-LY

6. Hue Bin Definition

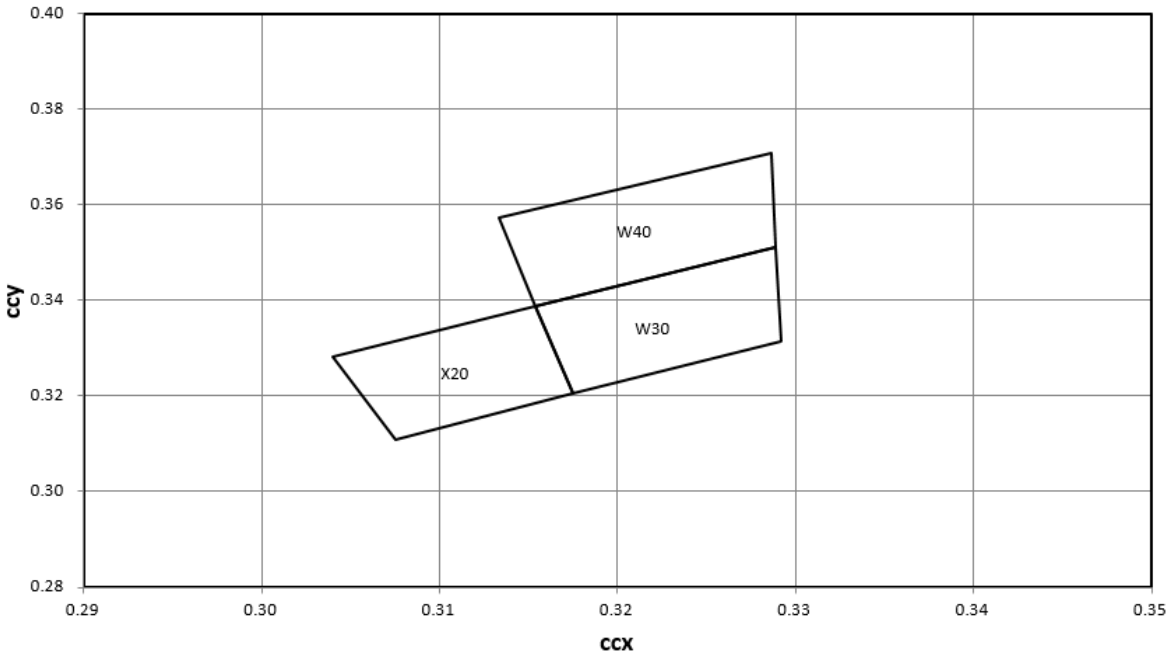
6.1 Chromaticity Coordinate Groups at Ta=25℃

6.1.1 Cool White hue point (CW series)

C3535 Cool White hue family											
Code	-	x	y	Code	-	x	y	Code	-	x	y
X20	1	0.3076	0.3108	W30	1	0.3289	0.3510	W40	1	0.3289	0.3510
	2	0.3040	0.3282		2	0.3292	0.3313		2	0.3154	0.3388
	3	0.3154	0.3388		3	0.3175	0.3204		3	0.3133	0.3572
	4	0.3175	0.3204		4	0.3154	0.3388		4	0.3286	0.3707

Tolerance of each hue bin is ±0.01

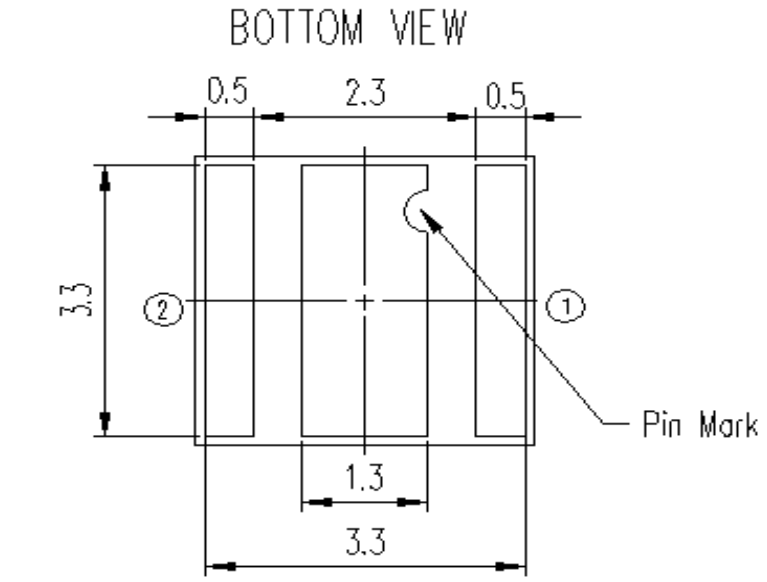
6.1.2 Cool white hue range

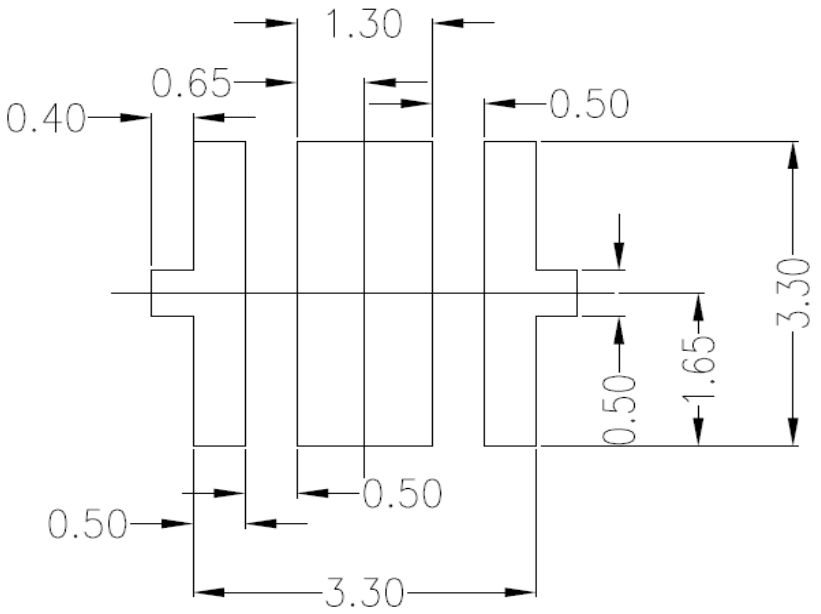


Notes

1. The (CCx, CCy) center follow ANSI Quadrangle

7. Recommend Soldering Pad Layout



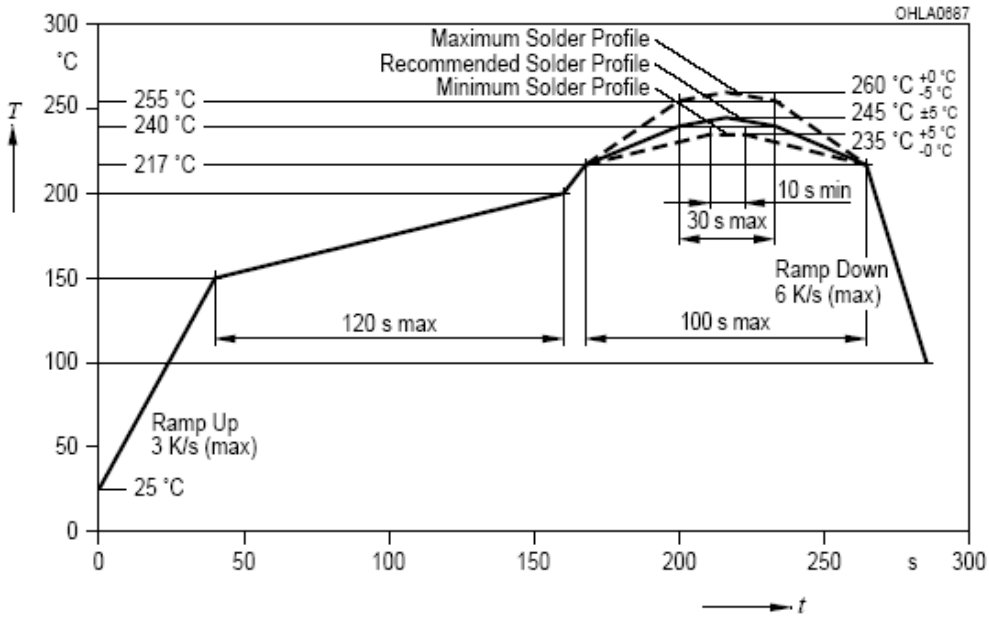


Notes:

1. Suggest stencil thickness is maximum 0.10mm

Specific Lighting
LTPA-C3535BWP60-LY

8. Reflow Soldering Characteristics



Notes

1. All temperatures refer to topside of the package, measured on the package body surface.
2. The soldering profile could be further referred to different soldering grease material characteristic. The grease vendor will provide this information.
3. A rapid-rate process is not recommended for the LEDs cooling down from the peak temperature.
4. Although the recommended reflow conditions are specified above, the reflow condition at the lowest possible temperature is desirable for the LEDs.
5. LiteOn cannot make a guarantee on the LEDs which have been already assembled using the dip soldering Method

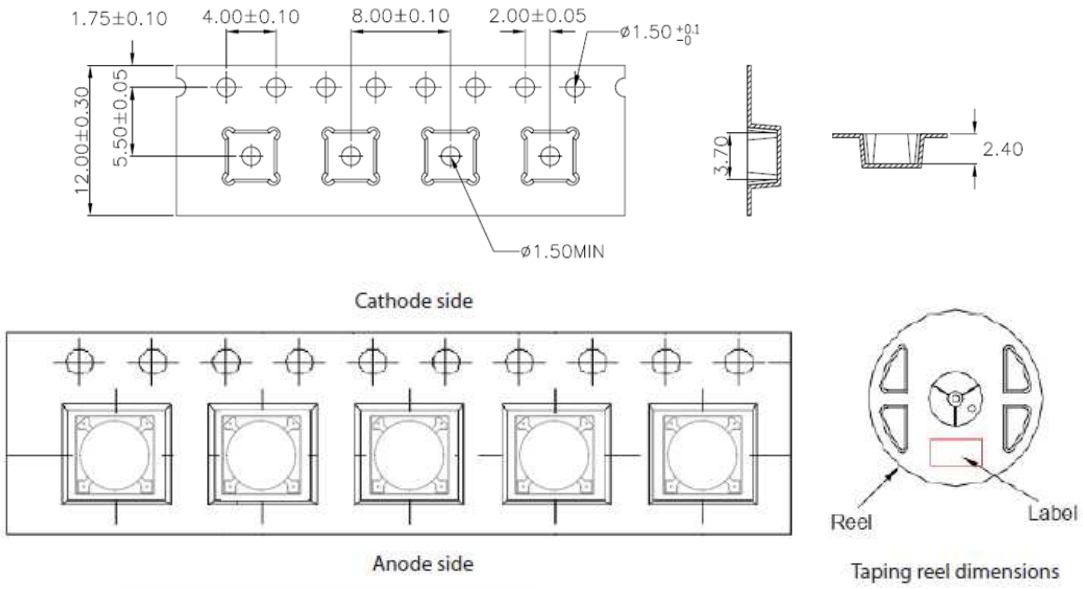
9. Reliability Test

No	Test item	Test Condition	Duration	Number of Damaged
1	Pre-conditional	MSL 2 125℃, 24hrs baking Moisture Soak 85℃/60% 168hrs Interval: 15mins~4hours to do IR-Reflow	Before and after	Qualification parts before Test # 2, 3, 4, 5, 6
2	High Temperature Operating Life I	IF=500mA, Ta=50℃, 1000 hrs	1000 hrs	0/30
3	High Temperature Operating Life II	Ta=100℃., IF=200mA, 1000 hrs	1000 hrs	0/30
4	High Temperature High Humidity Bias (HTHHB)	Ta=60℃, Rh=90%, IF=400mA, 1000 hrs	1000 hrs	0/30
5	Temperature Cycle I	-40℃ ± 5℃ ~ 100 ± 5℃ 30min 30min Transfer time <= 1min, 500cycles	500 cycle	0/30
6	Temperature Cycle II	-40℃~ 25℃~ 100℃~ 25℃ 30min 5min 30min 5min 500cycles	500 cycle	0/30
7	Resistance to Soldering Heat	(1) Bake 125℃ / 24 hours (2) Acceleration moisture soak condition (if urgent): 60℃ / 60% / 52 hours (Interval: 15mins ~ 4 hours to do IR-Reflow) (3) IR Reflow 2 times (260℃: 10 secs, Interval: 5 mins ~ 60 mins for each reflow)	Before and after	0/30
8	Solderability	Tsld=245± 5℃	Before and after	0/11

Specific Lighting
LTPA-C3535BWP60-LY

10. Package Dimensions of Tape and Reel

Reel Packaging



Note:

1. All dimensions are in millimeters.
2. Empty component pockets sealed with top cover tape.
3. 7 inch reel-maximum 500 pieces per reel.
4. The maximum number of consecutive missing is two.
5. In accordance with ANSI/EIA 481 specifications.

11. Cautions

11.1 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 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.

11.2 Do not put any pressure on the light emitting surface either by finger or any hand tool and do not stack the COB products. Stress or pressure may cause damage to the wires of the LED array.

11.3 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.

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.

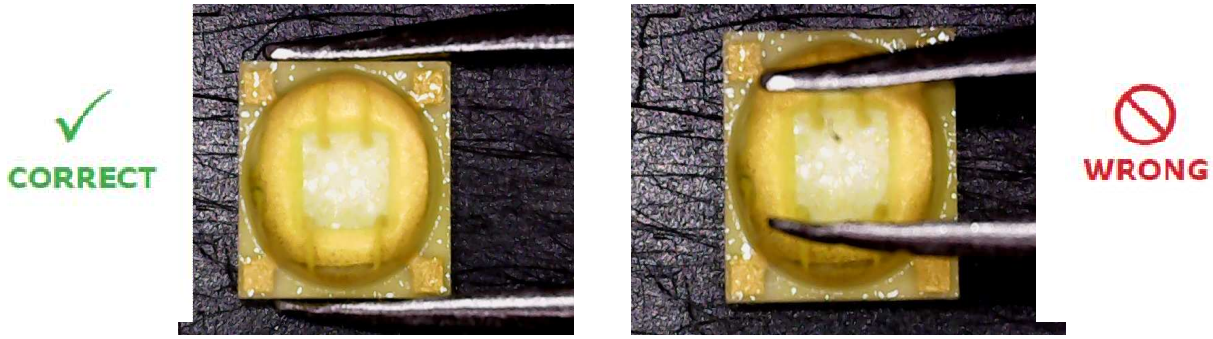
ESD-damaged LEDs will exhibit abnormal characteristics such as high reverse leakage current, low forward voltage, or "no light up" at low currents.

To verify for ESD damage, check for "light up" and VF of the suspect LEDs at low currents.

Specific Lighting
LTPA-C3535BWP60-LY

Lens Handling Remark

The LED should only be picked up by making contact with the sides of the LED body. It should not put any pressure on the lens either by finger or any hand tool. Do not puncture or push the lens. Below figure illustrate correct and incorrect handling.



The scrape on lens is acceptable but no effect about the RA test result.

Storage

- This product is qualified as Moisture sensitive Level 2 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℃ 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 storage ambient for the LEDs should not exceed 30℃ temperature or 60% relative humidity. It is recommended that LEDs out of their original packaging are IR-reflowed within one year. For extended storage out of their original packaging, it is recommended that the LEDs be stored in a sealed container with appropriate desiccant, or in a desiccators with nitrogen ambient. LEDs stored out of their original packaging for more than one year should be baked at about 60 deg C for at least 20 hours before solder assembly.