



# LED Specific Lighting Topview Product Data Sheet

## *LTW-3535GSYR-D*

Created Date: 06 / 02 / 2015  
Revision: preliminary 06 / 02 / 2015

## Specific Lighting LTW-3535GSYR-D

### 1. Description

The LTW (LiteOn White PLCC 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..

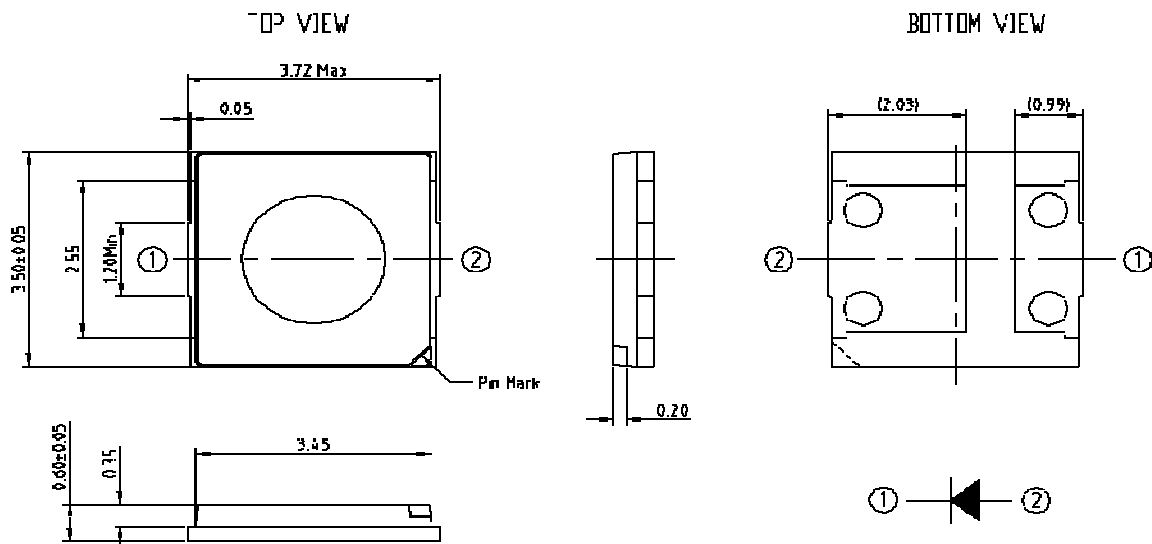
#### 1. Features

- High power LED light source
- Instant light (less than 100 ns)
- Low voltage DC operated
- Low thermal resistance
- RoHS Compliant
- Lead free reflow solder compatible

#### 1.2. Applications

- Reading lights (car, bus, aircraft)
- Portable (flashlight, bicycle)
- Downlighters/Orientation
- Decorative/Entertainment
- Bollards/Security/Garden
- Cove/Undershelf/Task
- Traffic signaling/Beacons/ Rail crossing and Wayside
- Indoor/Outdoor Commercial and Residential Architectural
- Edge\_lit signs (Exit, point of sale)

### 2. Outline Dimensions



#### Notes :

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

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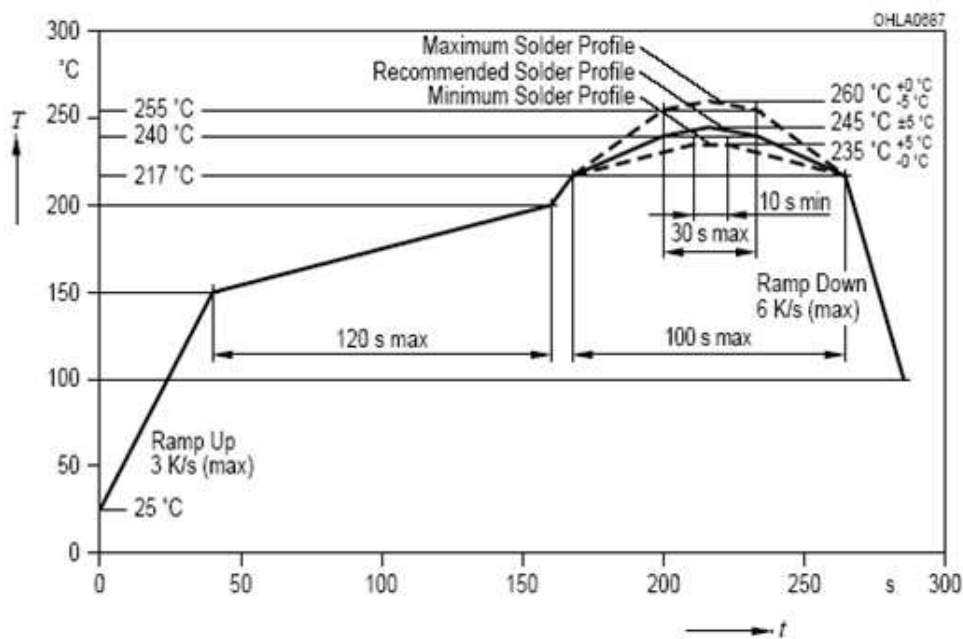
### Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Rating	Unit
Forward Current	I <sub>f</sub>	350	mA
Power Consumption	P <sub>d</sub>	1260	mW
Operating Temp	T <sub>opr</sub>	-40~80	°C
Storage Temp	T <sub>stg</sub>	-40~100	°C
Storage Humidity	H <sub>stg</sub>	10~90	%RH
Reverse Voltage *1	V <sub>r</sub>	5	V
Junction Temperature	T <sub>j</sub>	115	°C
Thermal Resistance	R <sub>thj<sub>s</sub></sub>	18.0	°C/W

**Note:**

\*1 Operating the LED (in an application) under reverse bias condition might result in damage or failure of the component.

( PCT reflow max temp. should be lower than 240°C )  
**Suggestion IR Reflow Profile For Pb Free Process :**  
 IR-Reflow Soldering Profile for lead free soldering (Acc. to J-STD-020)



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### Electro-Optical Characteristics at Ta=25°C

Parameter	Symbol	Values		Test Condition	Unit
Forward Voltage of dual chips in series	Vf	Min.	2.8	If = 320mA	V
		Typ.	3.3		
		Max.	3.6		
Luminous Flux	IV	Min.	100	If = 320mA	lm
		Typ.	115		
		Max	130		
Viewing Angle	2θ1/2	Typ.	120	If = 320mA	°
Chromaticity Coordinates	x	Typ.	0.284	If = 320mA	
	y	Typ.	0.250		

### Notes

- Luminous flux is the total luminous flux output as measured with an integrating sphere.
- IV classification code is marked on each packing bag.
- The chromaticity coordinates (x, y) is derived from the 1931 CIE chromaticity diagram.
- 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.
- CAS140B is the test standard for the chromaticity coordinates (x, y) & IV
- The chromaticity coordinates (x, y) guarantee should be added +/- 0.01 tolerances

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**Bin Code List**

Vf Spec. Table		
Vf Bin	Forward Voltage (volts) at If = 320mA	
	Min.	Max.
V1	2.8	3.0
V2	3.0	3.2
V3	3.2	3.4
V4	3.4	3.6

Tolerance on each Forward Voltage bin is +/- 0.1 V

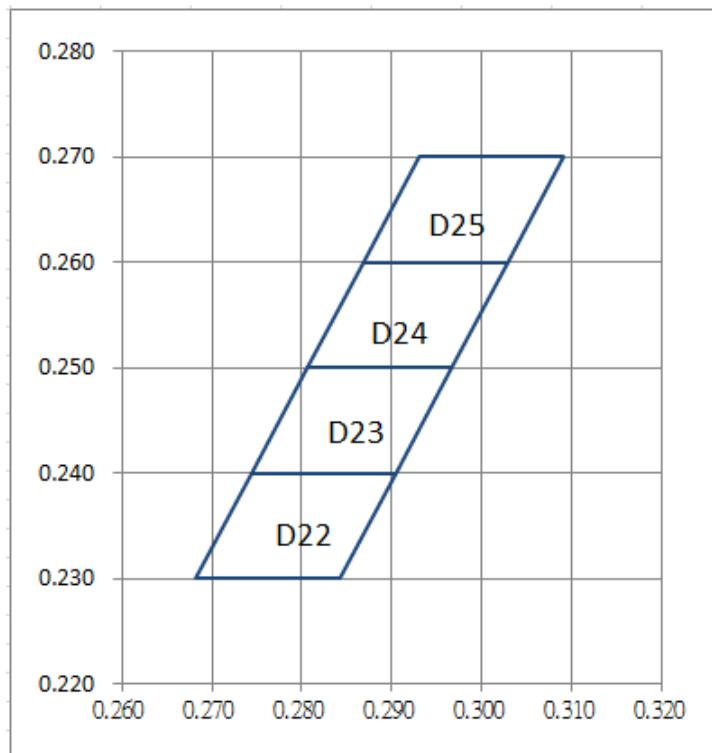
IV Luminous Flux Spec. Table		
IV Bin	IV (lm) at If = 320mA	
	Min.	Max.
X	100	105
Y	105	110
Z	110	115
A	115	120
B	120	125
C	125	130

Tolerance on each Luminous Flux bin is +/- 10%

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Hue Spec. Table					
Hue Bin	Color bin limits at If = 320mA				
	CIE 1931 Chromaticity coordinates				
D21	x	0.2682	0.2620	0.2780	0.2842
	y	0.2300	0.2200	0.2200	0.2300
D22	x	0.2744	0.2682	0.2842	0.2904
	y	0.2400	0.2300	0.2300	0.2400
D23	x	0.2806	0.2744	0.2904	0.2966
	y	0.2500	0.2400	0.2400	0.2500
D24	x	0.2868	0.2806	0.2966	0.3028
	y	0.2600	0.2500	0.2500	0.2600
D25	x	0.2930	0.2868	0.3028	0.3090
	y	0.2700	0.2600	0.2600	0.2700
D26	x	0.2992	0.2930	0.3090	0.3152
	y	0.2800	0.2700	0.2700	0.2800

Tolerance on each Hue (x, y) bin is +/- 0.01



# Specific Lighting LTW-3535GSYR-D

## Typical Electrical / Optical Characteristics Curves

(25°C Ambient Temperature Unless Otherwise Noted)

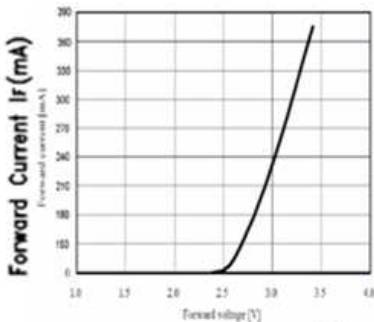
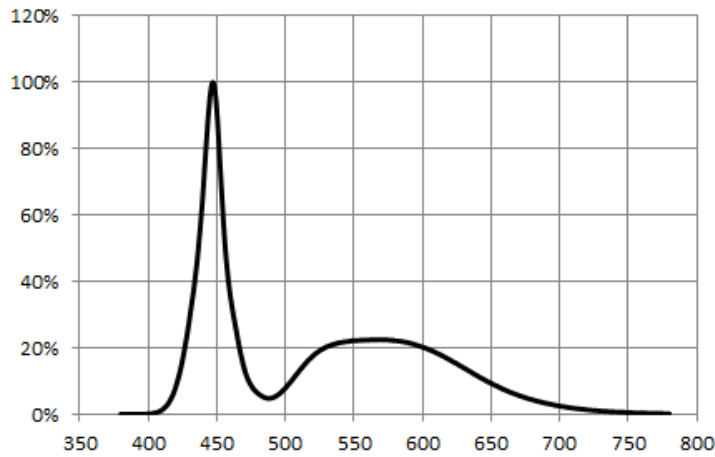


Fig.2 Forward Current vs. Forward Voltage

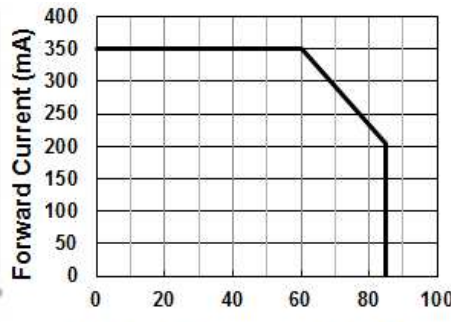


Fig.3 Forward Current Derating Curve

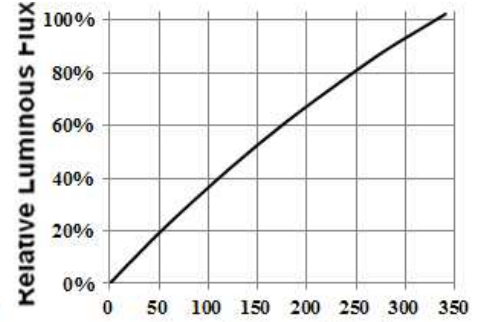


Fig.4 Relative Luminous Intensity vs. Forward Current

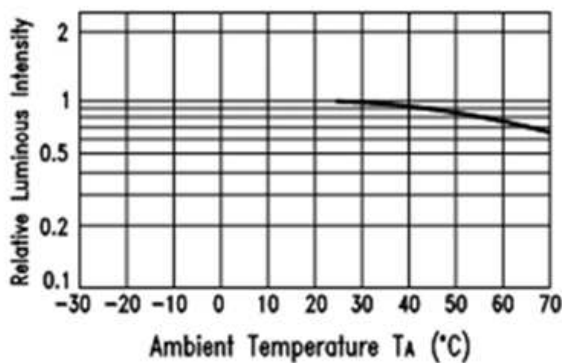


Fig.5 Luminous Intensity vs. Ambient Temperature

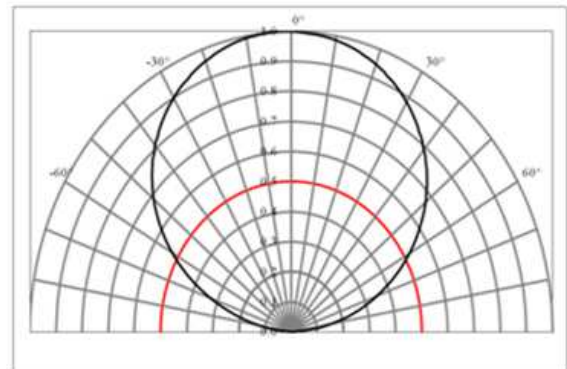


Fig.6 Spatial Distribution

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**User Guide**

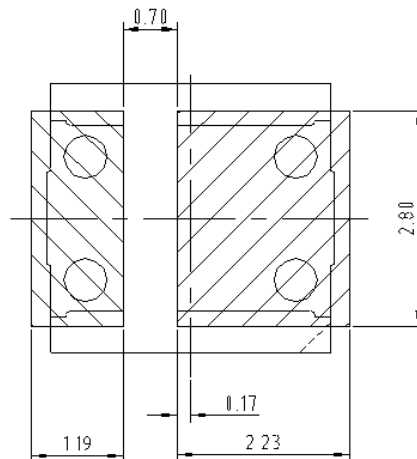
**Cleaning**

Do not use unspecified chemical liquid to clean LED they could harm the package.

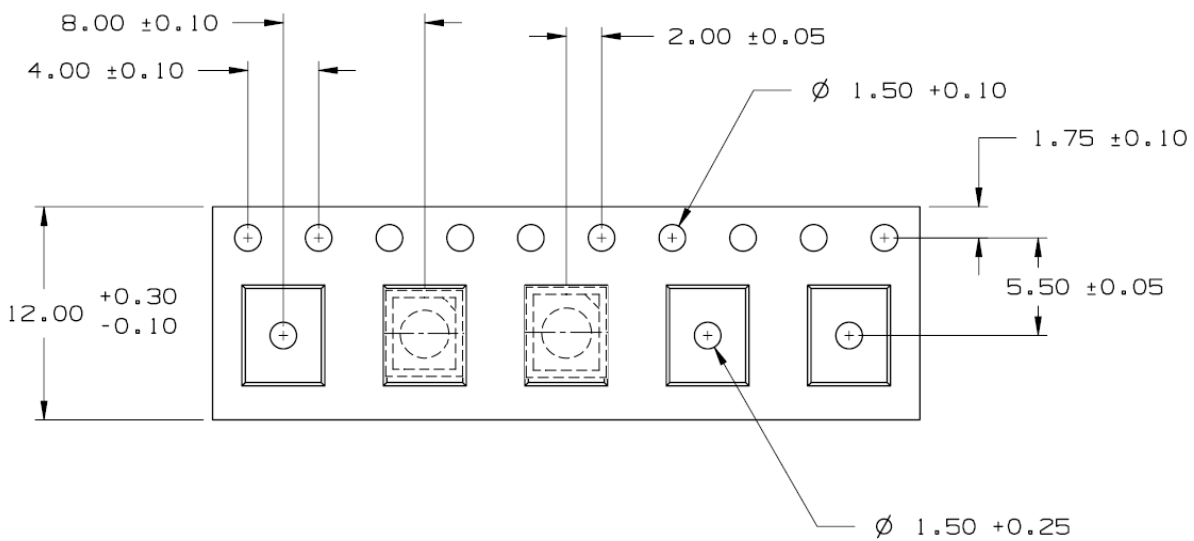
If cleaning is necessary, immerse the LED in ethyl alcohol or isopropyl alcohol at normal temperature for less than one minute.

**Recommend Printed Circuit Board Attachment Pad**

Infrared / vapor phase  
Reflow Soldering



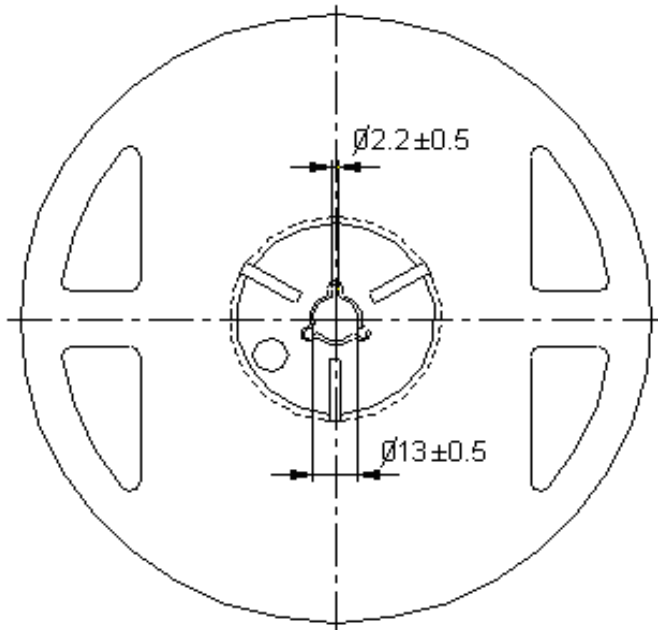
**Package Dimensions of Tape**



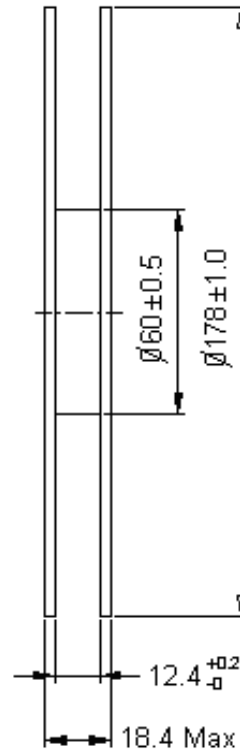


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### Package Dimensions of Reel



Note: 01. The tolerance unless mentioned is  $\pm 0.1 \text{ mm}$   
02. The measured unit is "mm"



### Notes:

1. Empty component pockets sealed with top cover tape.
2. 7 inch reel-maximum 2000 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.

Package Method

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## Specific Lighting LTW-3535GSYR-D

### CAUTIONS

#### 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).

#### 2. Storage

This product is qualified as Moisture sensitive Level 4 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 72hrs. If the Humidity Indicator shows the pink color in 10% even higher or exceed 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.

#### 3. Cleaning

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

#### 4. Soldering

Recommended soldering conditions:

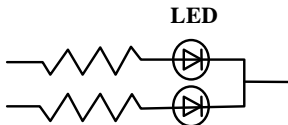
Reflow soldering		Wave Soldering		Soldering iron	
Pre-heat	120~150°C	Pre-heat	100°C Max.	Temperature	300°C Max.
Pre-heat time	120 sec. Max.	Pre-heat time	60 sec. Max.	Soldering time	3 sec. Max.
Soldering Temp.	260°C Max.	Solder wave	260°C Max.		(one time only)

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### 5. Drive Method

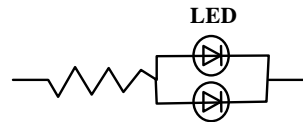
An LED is a current-operated device. In order to ensure intensity uniformity on multiple LEDs connected in parallel in an application, it is recommended that a current limiting resistor be incorporated in the drive circuit, in series with each LED as shown in Circuit A below.

**Circuit model A**



(A) Recommended circuit.

**Circuit model B**



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

### 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.

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.

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### 7. Reliability Test

No	Items[1]	Temp. (°C)	Humidity (%)	Other condition	Test period	Spec	Number Damaged
1	Room temp driving	25	----	If = 320mA	1000hrs	IV decay < 70% $\Delta Vf < 0.3V$ $\Delta Cx, \Delta Cy < \pm 0.03$	0/30
2	Operating driving	60	----	If = 320mA	1000hrs		0/30
3	Low temp driving	-30	----	If = 320mA	1000hrs		0/30
4	Thermal shock	----	----	H: +100°C 20min L: -40°C 20min (Trans Time : 20sec)	100 cycles	No lighting problem (Abnormal phenomenon)	0/30

### 8. Others

The appearance and specifications of the product may be modified for improvement without prior notice.

### 9. 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.

### **Specific Lighting LTW-3535GSYR-D**

#### 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 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?

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