

# XI3535

## 1W Series



### Introduction

The 3535 package is a lighting grade high power LED. It is a compact package with high lumens and efficiency and is suitable for many lighting applications.

### Features

- ◆ Top view white LED
- ◆ Moisture Sensitivity Level: 1
- ◆ High flux output
- ◆ White package
- ◆ Wide viewing angle
- ◆ Pb-free
- ◆ RoHS compliant
- ◆ Typical viewing angle: 115°
- ◆ ANSI binning
- ◆ Reliability testing conforms to IESNA LM80 Lumen maintenance test method

### Applications

- ◆ Omni-directional Bulbs
- ◆ Linear Lighting
- ◆ Panel Light

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## Product Nomenclature

The product name is designated as below:

### **XI3535 – ABCDEFG – HIJKL – MNOP**

Designation:

AB = color <sup>[1]</sup>

CD = color bin or CCT bin <sup>[1]</sup>

E = Steps Mcadams bin

FG = min. luminous flux (lm) or radiation power (mW) performance

HI = forward voltage bin

J = internal code

KL = power consumption<sup>[2]</sup>

M = internal code

N = Dam

O = internal code

P = packaging type<sup>[3]</sup>

#### Notes

1. Table of color offerings:

Symbol	Color	CCT range	Color Rendering Index
GT	Cool-White	4745~7050K	>65
KT	Cool-White	4745~7050K	>80
PT	Cool-White	4745~7050K	>90
HT	Cool-White	4745~7050K	>93
LM	Warm-White	2580~3710K	>70
	Neutral-White	3710K-4745K	
KM	Warm White	2580~3710K	>80
	Neutral-White	3710K-4745K	
PM	Warm White	2580~3710K	>90
	Neutral-White	3710K-4745K	
HM	Warm White	2580~3710K	>93
	Neutral-White	3710K-4745K	

2. Table of power consumptions:

Symbol	Description
01	1W

3. Table of packaging types:

Symbol	Description
P	Tape

## Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
Max. DC Forward Current (mA)	IF	350	mA
Max. Peak Pulse Current (mA)	IPulse	720	mA
Power Dissipation	Pd	1	W
Thermal Resistance	R <sub>th</sub>	15	°C/W
Operating Temperature	Topr	-40 ~ +85	°C
Storage Temperature	Tstg	-40 ~ +100	°C
Junction temperature	Tj	115	°C
Max. Soldering Temperature	T <sub>Sol</sub>	260	

**Notes:**

1. Maximum forward current for 1W is 350mA (Solder Pad=25°C).
2. Duty cycle = 1/10@1KHZ

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## PN of the XI3535 series: Warm White LEDs



Order Code of XI 3535	Min. Luminous Flux (lm)	Typ. Luminous Flux (lm)	CCT (K) Wavelength (nm)	Forward Voltage (V)	Forward Current (mA)	CRI (Min.)
XI3535-KM277F9-03201-000P	90	100	27K-1,27K-2 27K-3,27K-4	2.95-3.85	350	80
XI3535-KM307F9-03201-000P	90	104	30K-1,30K-2 30K-3,30K-4	2.95-3.85	350	80
XI3535-KM357F9-03201-000P	90	105	35K-1,35K-2 35K-3,35K-4	2.95-3.85	350	80
XI3535-HM307F8-03201-000P	80	84	30K-1,30K-2 30K-3,30K-4	2.95-3.85	350	93

**Notes:**

1. Luminous flux measurement tolerance:  $\pm 10\%$ .
2. The data of luminous flux measured at thermal pad= $25^{\circ}\text{C}$
3. Typical luminous flux or light output performance is operated within the condition guided by this datasheet
4. The CRI value is based on the Everlight testing instrument.
5. CRI measurement tolerance:  $\pm 2$ .

## PN of the XI3535 series: Neutral White LEDs



Order Code of XI 3535	Min. Luminous Flux (lm)	Typ. Luminous Flux (lm)	CCT (K) Wavelength (nm)	Forward Voltage (V)	Forward Current (mA)	CRI (Min.)
XI3535-KM407F9-03201-000P	90	107	40K-1,40K-2 40K-3,40K-4	2.95~3.85	350	80

### Notes:

1. Luminous flux measurement tolerance:  $\pm 10\%$ .
2. The data of luminous flux measured at thermal pad= $25^{\circ}\text{C}$
3. Typical luminous flux or light output performance is operated within the condition guided by this datasheet
4. The CRI value is based on the Everlight testing instrument.
5. CRI measurement tolerance:  $\pm 2$ .

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## PN of the XI3535 series: Cool White LEDs



Order Code of XI 3535	Min. Luminous Flux (lm)	Typ. Luminous Flux (lm)	CCT (K) Wavelength (nm)	Forward Voltage (V)	Forward Current (mA)	CRI (Min.)
XI3535-KT507J1-03201-000P	100	110	50K-1,50K-2 50K-3,50K-4	2.95-3.85	350	80
XI3535-KT577J1-03201-000P	100	111	57K-1,57K-2 57K-3,57K-4	2.95-3.85	350	80
XI3535-KT607J1-03201-000P	100	109	57K-2,57K-3 65K-1,65K-4	2.95-3.85	350	80
XI3535-KT657J1-03201-000P	100	108	65K-1,65K-2 65K-3,65K-4	2.95-3.85	350	80
XI3535-PT577F9-03201-000P	90	97	57K-1,57K-2 57K-3,57K-4	2.95-3.85	350	90

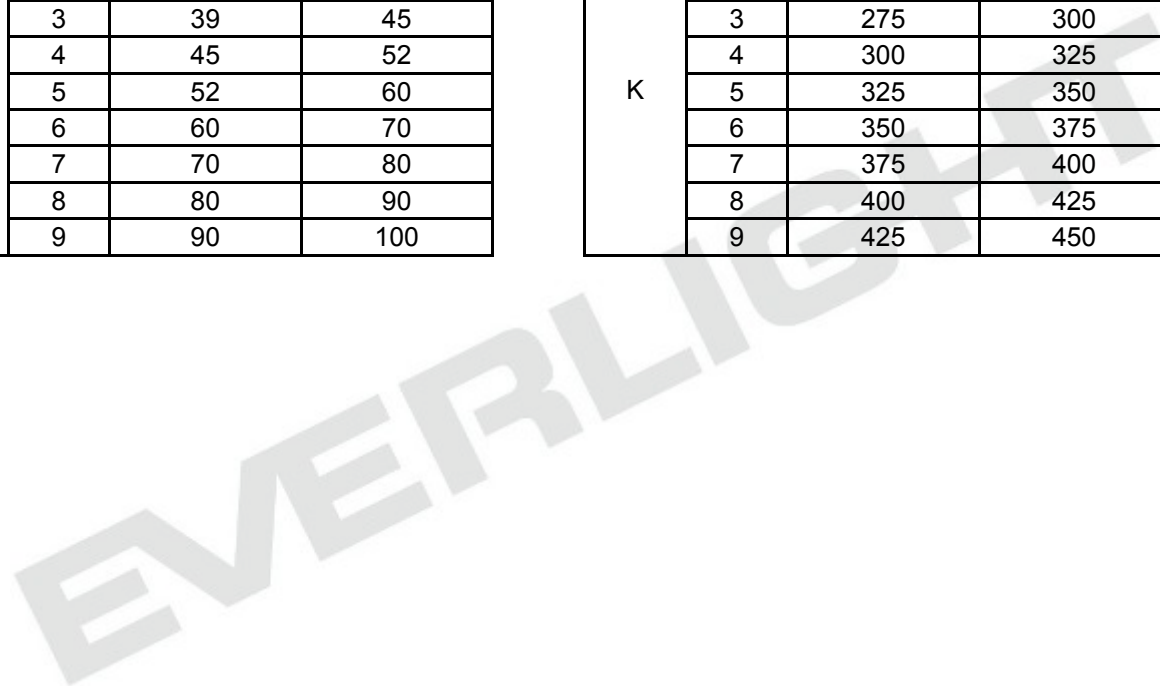
### Notes:

1. Luminous flux measurement tolerance:  $\pm 10\%$ .
2. The data of luminous flux measured at thermal pad=25°C
3. Typical luminous flux or light output performance is operated within the condition guided by this datasheet
4. The CRI value is based on the Everlight testing instrument.
5. CRI measurement tolerance:  $\pm 2$ .

## Product Binning Luminous Flux Bins

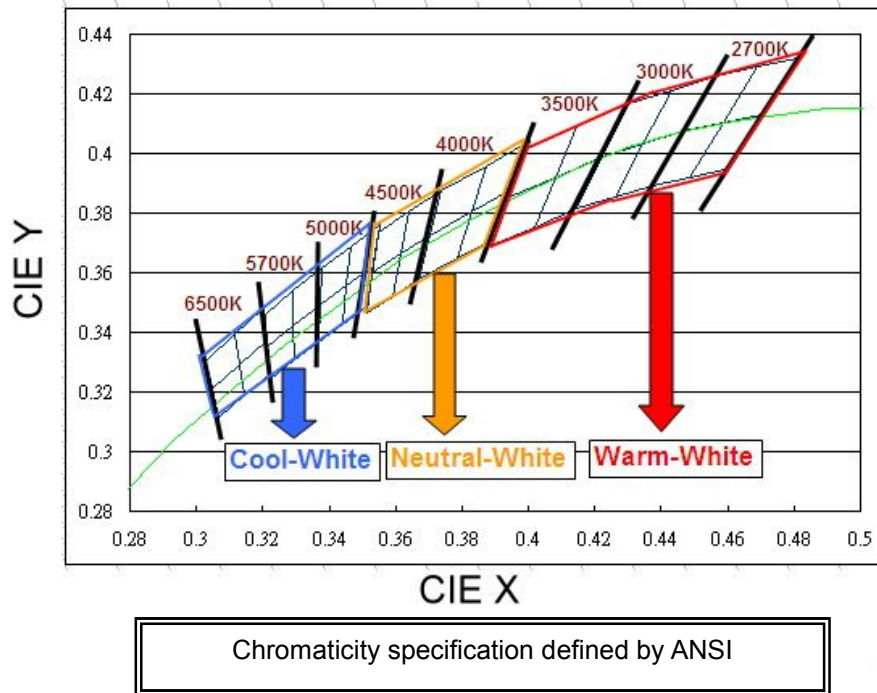
Group	Bin	Minimum Photometric Flux (lm)	Maximum Photometric Flux (lm)
E	1	4	5
	2	5	6
	3	6	8
	4	8	10
	5	10	13
	6	13	17
	7	17	20
	8	20	23
	9	23	27
F	1	27	33
	2	33	39
	3	39	45
	4	45	52
	5	52	60
	6	60	70
	7	70	80
	8	80	90
	9	90	100

Group	Bin	Minimum Photometric Flux (lm)	Maximum Photometric Flux (lm)
J	1	100	110
	2	110	120
	3	120	130
	4	130	140
	5	140	150
	6	150	160
	7	160	180
	8	180	200
	9	200	225
K	1	225	250
	2	250	275
	3	275	300
	4	300	325
	5	325	350
	6	350	375
	7	375	400
	8	400	425
	9	425	450





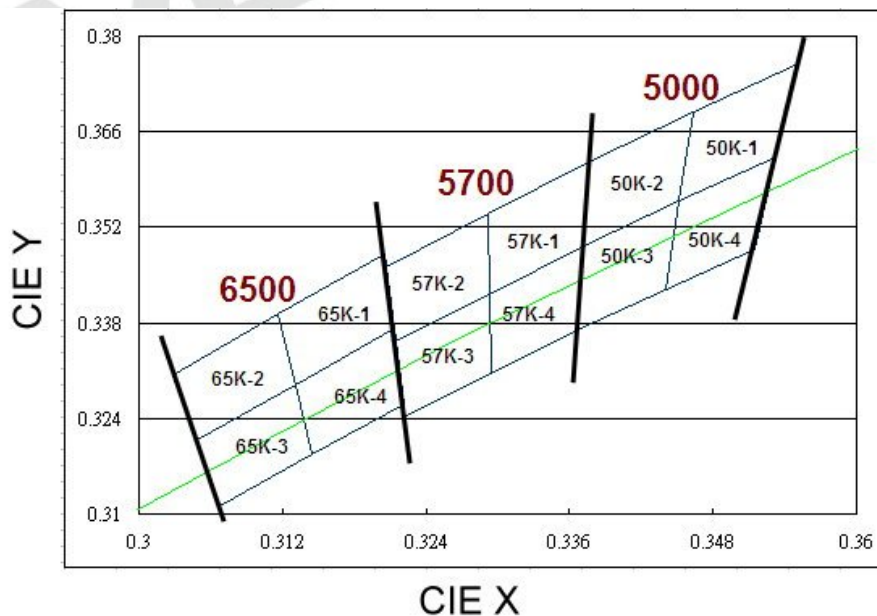
### White Bin Structure



**Notes:**

1. The CCT range of Cool-White varies from 4745K to 7050K.
2. The CCT range of Neutral-White varies from 3710K to 4745K.
3. The CCT range of Warm-White varies from 2580K to 3710K
4. Color coordinates measurement allowance :  $\pm 0.01$
5. Color bins are defined at  $I_F=350\text{mA}$  operation

### Cool-White Bin Structure



Cool-White Bin Coordinates

5000K

Bin	CIE X	CIE Y
50K-1	0.346	0.369
	0.345	0.356
	0.353	0.362
	0.355	0.376
Reference Range: 4745~5000K		

Bin	CIE X	CIE Y
50K-2	0.338	0.362
	0.337	0.349
	0.345	0.356
	0.346	0.369
Reference Range: 5000~5310K		

Bin	CIE X	CIE Y
50K-4	0.345	0.356
	0.344	0.343
	0.352	0.349
	0.353	0.362
Reference Range: 4745~5000K		

Bin	CIE X	CIE Y
50K-3	0.337	0.349
	0.337	0.337
	0.344	0.343
	0.345	0.356
Reference Range: 5000~5310K		

5700K

Bin	CIE X	CIE Y
57K-1	0.329	0.354
	0.329	0.342
	0.337	0.349
	0.338	0.362
Reference Range: 5310~5700K		

Bin	CIE X	CIE Y
57K-2	0.321	0.346
	0.322	0.335
	0.329	0.342
	0.329	0.354
Reference Range: 5700~6020K		

Bin	CIE X	CIE Y
57K-4	0.329	0.342
	0.329	0.331
	0.337	0.337
	0.337	0.349
Reference Range: 5310~5700K		

Bin	CIE X	CIE Y
57K-3	0.322	0.335
	0.322	0.324
	0.329	0.331
	0.329	0.342
Reference Range: 5700~6020K		

6000K

Bin	CIE X	CIE Y
57K-2	0.321	0.346
	0.322	0.335
	0.329	0.342
	0.329	0.354
Reference Range: 5700~6020K		

Bin	CIE X	CIE Y
65K-1	0.312	0.339
	0.313	0.329
	0.321	0.337
	0.321	0.348
Reference Range: 6020~6500K		

Bin	CIE X	CIE Y
57K-3	0.322	0.335
	0.322	0.324
	0.329	0.331
	0.329	0.342
Reference Range: 5700~6020K		

Bin	CIE X	CIE Y
65K-4	0.313	0.329
	0.315	0.319
	0.322	0.326
	0.321	0.337
Reference Range: 6020~6500K		

6500K

Bin	CIE X	CIE Y
65K-1	0.312	0.339
	0.313	0.329
	0.321	0.337
	0.321	0.348
Reference Range: 6020~6500K		

Bin	CIE X	CIE Y
65K-2	0.303	0.330
	0.305	0.321
	0.313	0.329
	0.312	0.339
Reference Range: 6500~7050K		

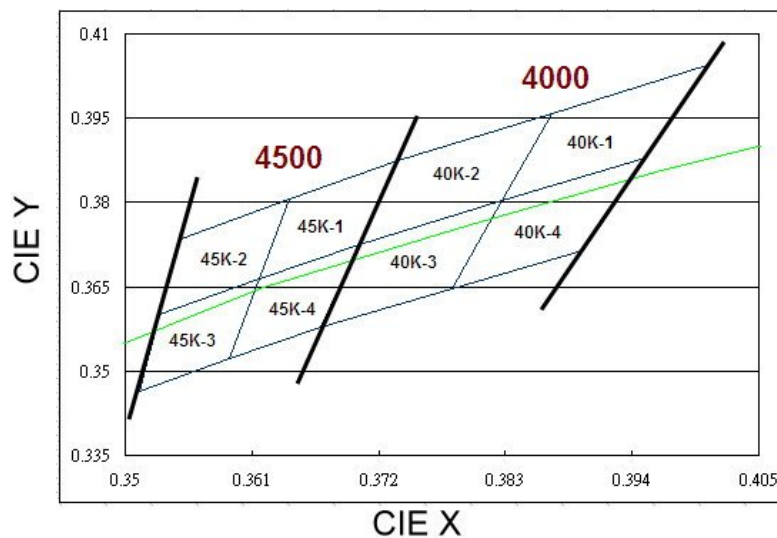
Bin	CIE X	CIE Y
65K-4	0.313	0.329
	0.315	0.319
	0.322	0.326
	0.321	0.337
Reference Range: 6020~6500K		

Bin	CIE X	CIE Y
65K-3	0.305	0.321
	0.307	0.311
	0.315	0.319
	0.313	0.329
Reference Range: 6500~7050K		

**Note:**

1. Color coordinates measurement allowance :  $\pm 0.01$ .

**Neutral-White Bin Structure**



**Neutral-White Bin Coordinates**

**4000K**

Bin	CIE X	CIE Y
40K-1	0.387	0.396
	0.383	0.380
	0.395	0.388
	0.401	0.404
Reference Range: 3710~4000K		

Bin	CIE X	CIE Y
40K-2	0.374	0.387
	0.370	0.373
	0.383	0.380
	0.387	0.396
Reference Range: 4000~4260K		

Bin	CIE X	CIE Y
40K-4	0.383	0.380
	0.378	0.365
	0.390	0.372
	0.395	0.388
Reference Range: 3710~4000K		

Bin	CIE X	CIE Y
40K-3	0.370	0.373
	0.367	0.358
	0.378	0.365
	0.383	0.380
Reference Range: 4000~4260K		

**4500K**

Bin	CIE X	CIE Y
45K-1	0.364	0.381
	0.362	0.366
	0.370	0.373
	0.374	0.387
Reference Range: 4260~4500K		

Bin	CIE X	CIE Y
45K-2	0.355	0.374
	0.353	0.360
	0.362	0.366
	0.364	0.381
Reference Range: 4500~4745K		

Bin	CIE X	CIE Y
45K-4	0.362	0.366
	0.359	0.352
	0.367	0.358
	0.370	0.373
Reference Range: 4260~4500K		

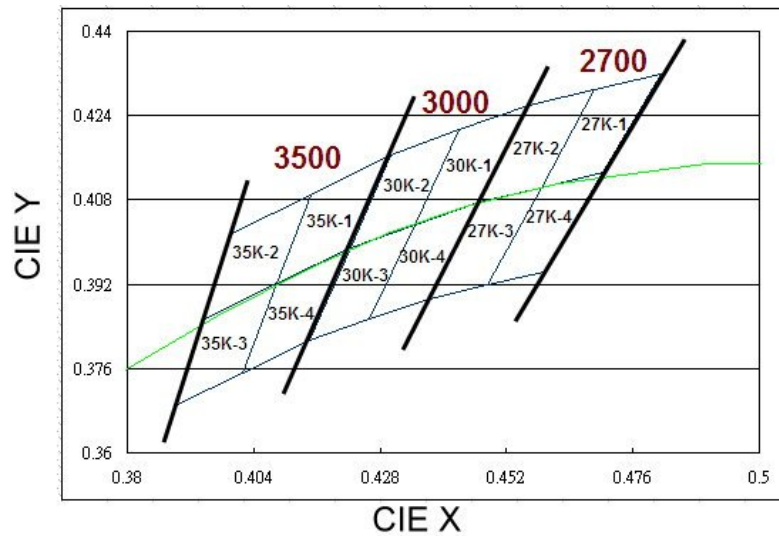
Bin	CIE X	CIE Y
45K-3	0.353	0.360
	0.351	0.347
	0.359	0.352
	0.362	0.366
Reference Range: 4500~4745K		

**Note:**

1. Color coordinates measurement allowance :  $\pm 0.01$ .



### Warm-White Bin Structure



### Warm-White Bin Coordinates

#### 2700K

Bin	CIE X	CIE Y
27K-1	0.469	0.429
	0.459	0.410
	0.470	0.413
	0.481	0.432
Reference Range: 2580~2700K		

Bin	CIE X	CIE Y
27K-2	0.456	0.426
	0.447	0.408
	0.459	0.410
	0.469	0.429
Reference Range: 2700~2870K		

Bin	CIE X	CIE Y
27K-4	0.459	0.410
	0.448	0.392
	0.459	0.394
	0.470	0.413
Reference Range: 2580~2700K		

Bin	CIE X	CIE Y
27K-3	0.447	0.408
	0.437	0.389
	0.448	0.392
	0.459	0.410
Reference Range: 2700~2870K		

#### 3000K

Bin	CIE X	CIE Y
30K-1	0.443	0.421
	0.435	0.403
	0.447	0.408
	0.456	0.426
Reference Range: 2870~3000K		

Bin	CIE X	CIE Y
30K-2	0.430	0.417
	0.422	0.399
	0.435	0.403
	0.443	0.421
Reference Range: 3000~3220K		

Bin	CIE X	CIE Y
30K-4	0.435	0.403
	0.426	0.385
	0.437	0.389
	0.447	0.408
Reference Range: 2870~3000K		

Bin	CIE X	CIE Y
30K-3	0.422	0.399
	0.415	0.381
	0.426	0.385
	0.435	0.403
Reference Range: 3000~3220K		

**3500K**

Bin	CIE X	CIE Y
35K-1	0.415	0.409
	0.408	0.392
	0.422	0.399
	0.430	0.417
Reference Range: 3220~3500K		

Bin	CIE X	CIE Y
35K-2	0.400	0.402
	0.394	0.385
	0.408	0.392
	0.415	0.409
Reference Range: 3500~3710K		

Bin	CIE X	CIE Y
35K-4	0.408	0.392
	0.402	0.375
	0.415	0.381
	0.422	0.399
Reference Range: 3220~3500K		

Bin	CIE X	CIE Y
35K-3	0.394	0.385
	0.389	0.369
	0.402	0.375
	0.408	0.392
Reference Range: 3500~3710K		

**Note:**

1. Color coordinates measurement allowance :  $\pm 0.01$ .



### Forward Voltage Bins

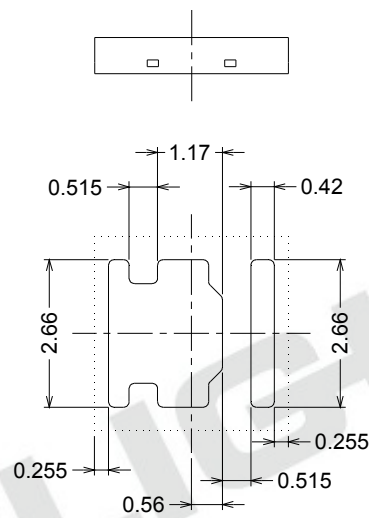
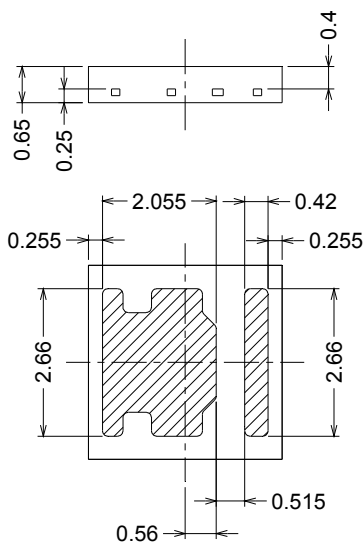
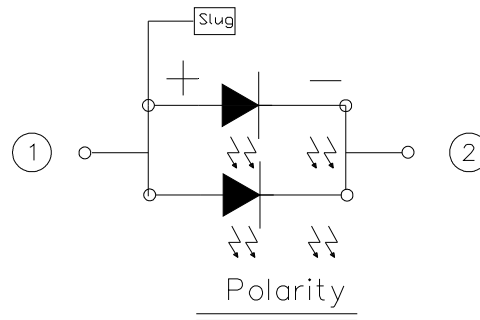
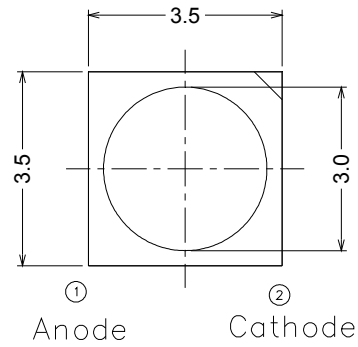
Bin	Minimum Forward Voltage (V)	Maximum Forward Voltage (V)
V1	2.95	3.25
V2	3.25	3.55
V3	3.55	3.85

**Notes:**

1. Forward voltage measurement tolerance:  $\pm 0.1V$ .
2. Forward voltage bins are defined at  $I_f=350mA$  operation.

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## Mechanical Dimension



Bot. view

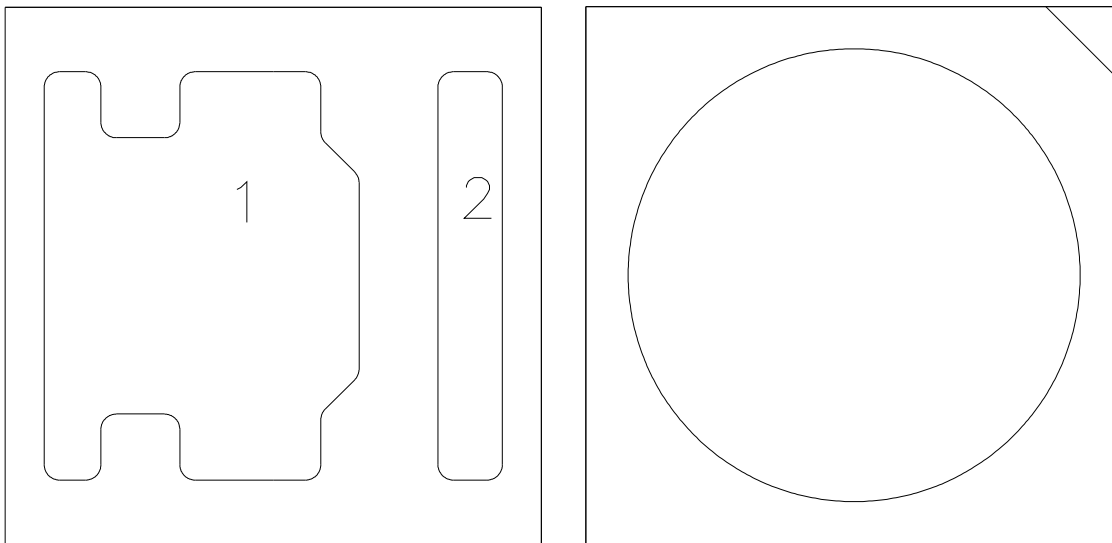
Soldering patterns

### Notes:

1. Dimensions are in millimeters.
2. Tolerances unless mentioned are  $\pm 0.15\text{mm}$ .
3. The thermal pad is electrically unity from the Anode and contact pads.
4. Do not handle the device by the lens. Incorrect force applied to the lens may lead to the failure of devices.



## Pad Configuration



BOTTOM VIEW

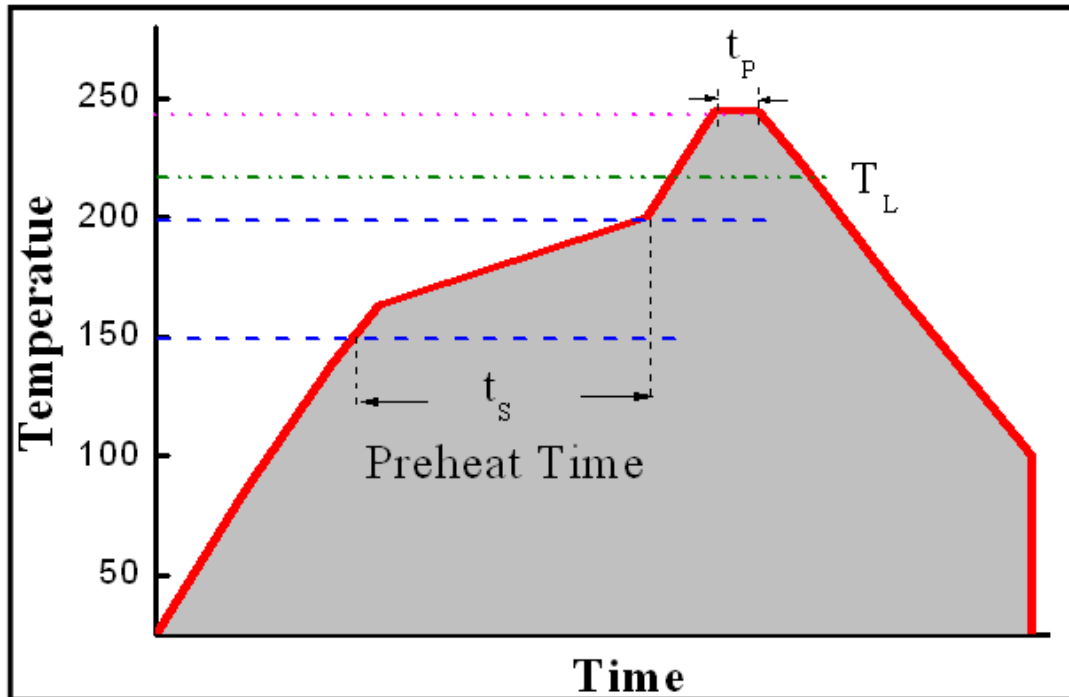
TOP VIEW

PAD	FUNCTION
1	ANODE
2	CATHODE

## Reflow Soldering Characteristics

### For Reflow Process

- 3535 series are suitable for SMT processes.
- Curing of glue in oven must be according to standard operation flow processes.

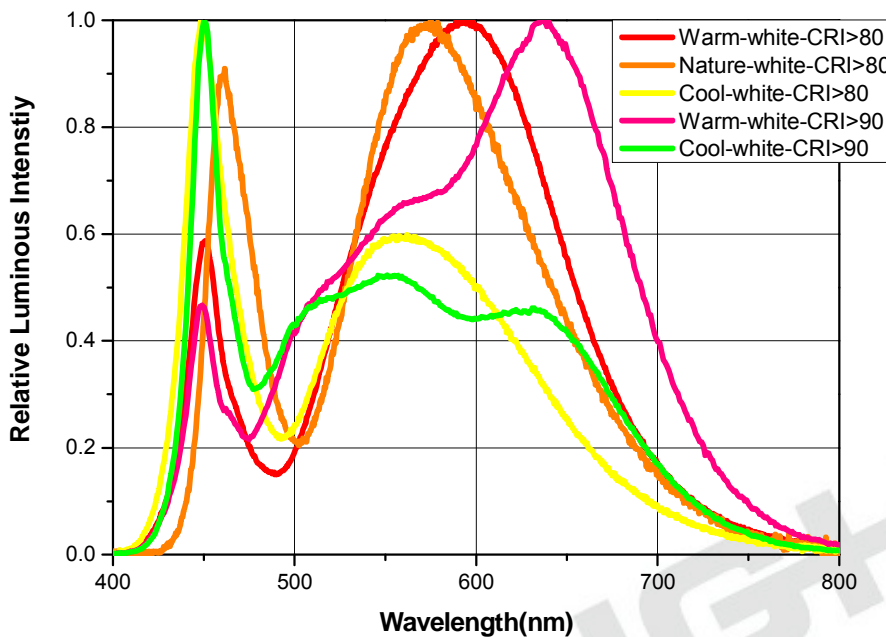


Profile Feature	Lead Free Assembly
Ramp-Up Rate	2-3 °C/S
Preheat Temperature	150-200 °C
Preheat Time ( $t_s$ )	60-120 S
Liquid Temperature ( $T_L$ )	217 °C
Time maintained above $T_L$	60-90 S
Peak Temperature ( $T_p$ )	240±5 °C
Peak Time ( $t_p$ )	Max 20 S
Ramp-Down Rate	3-5 °C/S

- Reflow soldering should not be done more than twice.
- In soldering process, stress on the LEDs during heating should be avoided.
- After soldering, do not bend the circuit board.

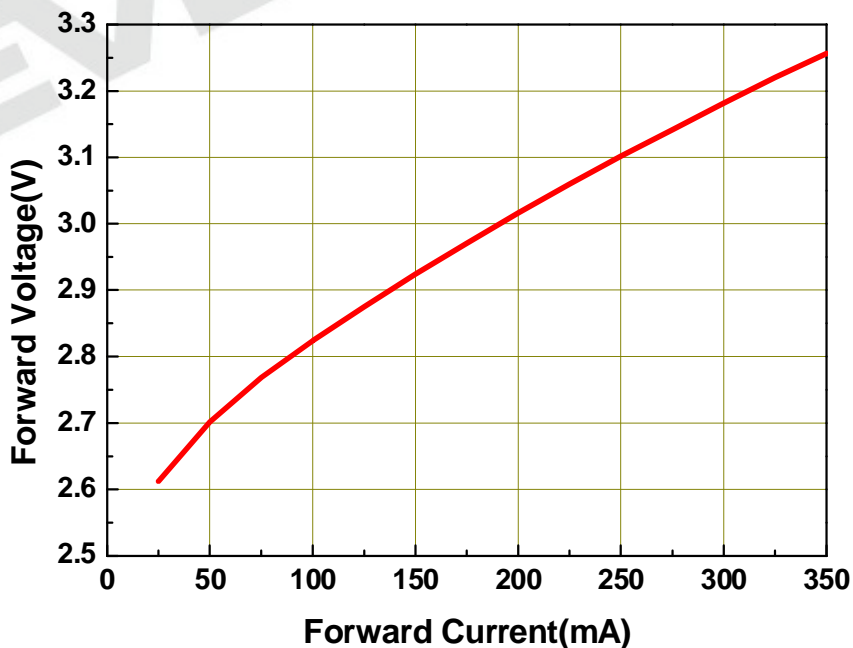
## Wavelength Characteristics

For Cool-White, Warm-White  
Relative Spectral Distribution  
@ Solder Pad Temperature = 25



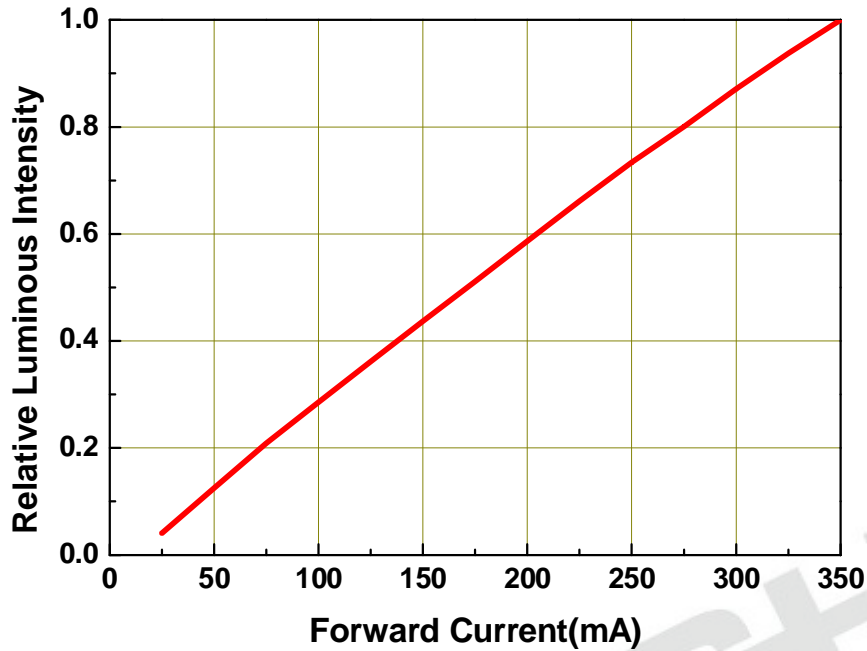
## Typical Electrical Characteristics

For Cool-White, Warm-White  
@ Solder Pad Temperature = 25



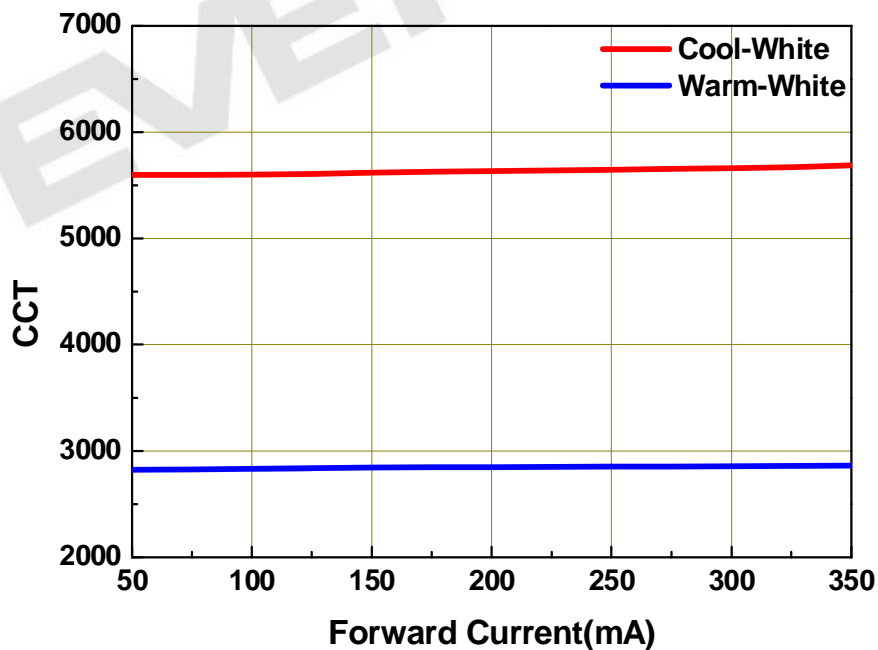
## Typical Relative Luminous Flux V.S. Forward Current

For Cool-White , Warm-White  
@ Solder Pad Temperature = 25

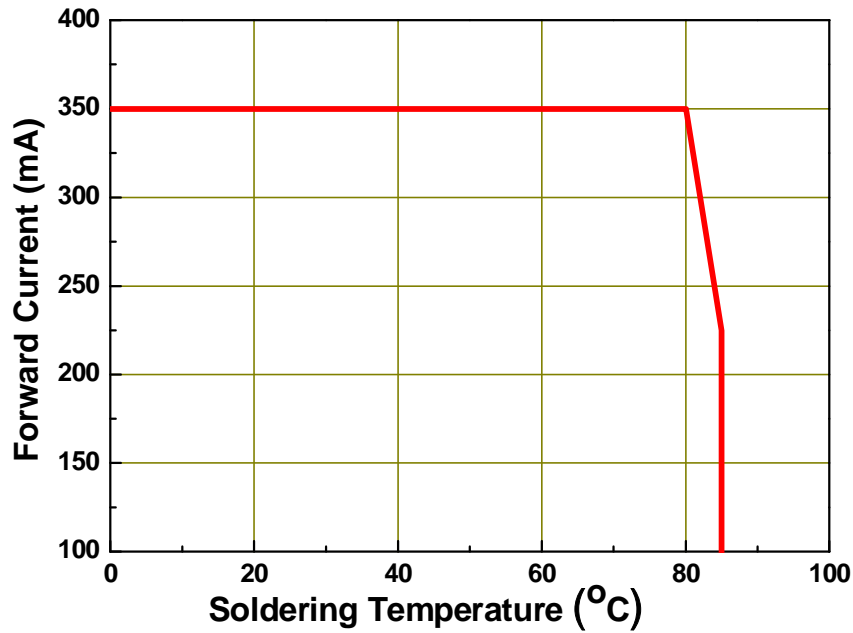


## Typical Wavelength & Color Shift Characteristics V.S. Forward Current

For Cool-White , Warm-White  
@ Solder Pad Temperature = 25

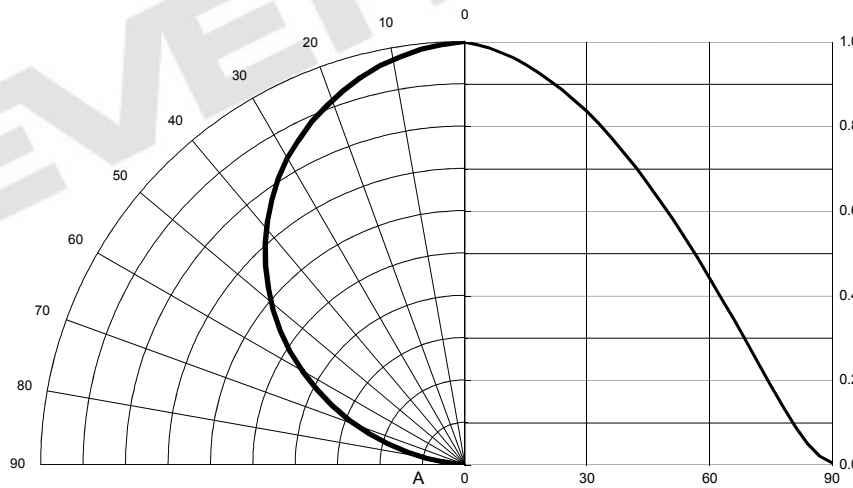


### Forward Current Derating Curve @ Junction Temperature <115



### Typical Radiation Patterns

3535 series: Typical Diagram Characteristics of Radiation for Warm-White and Cool-White



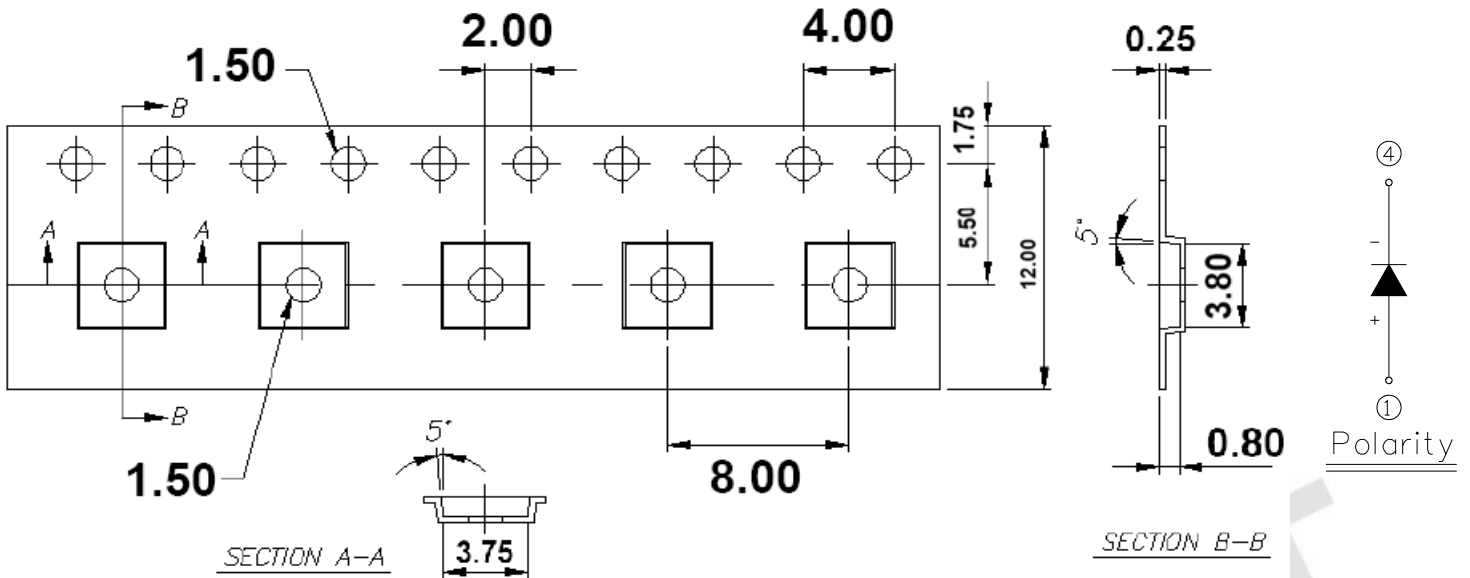
**Notes:**

1.  $2\theta_{1/2}$  is the off axis angle from lamp centerline where the luminous intensity is 1/2 of the peak value.
2. View angle tolerance is  $\pm 5^\circ$ .

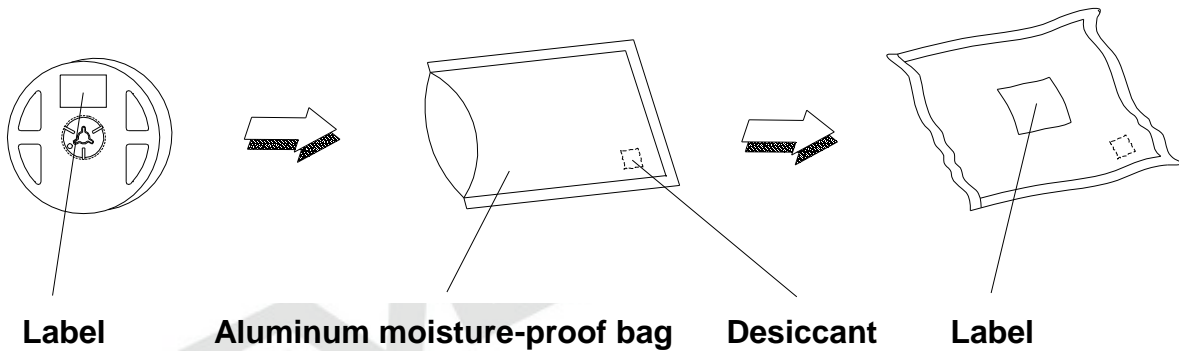
### Emitter Tape Packaging

MOQ  $\geq 2K$ pcs, multiple of 400pcs per reel, max 1600pcs

MOQ  $< 2K$ pcs, multiple of 100pcs per reel, max 1600pcs

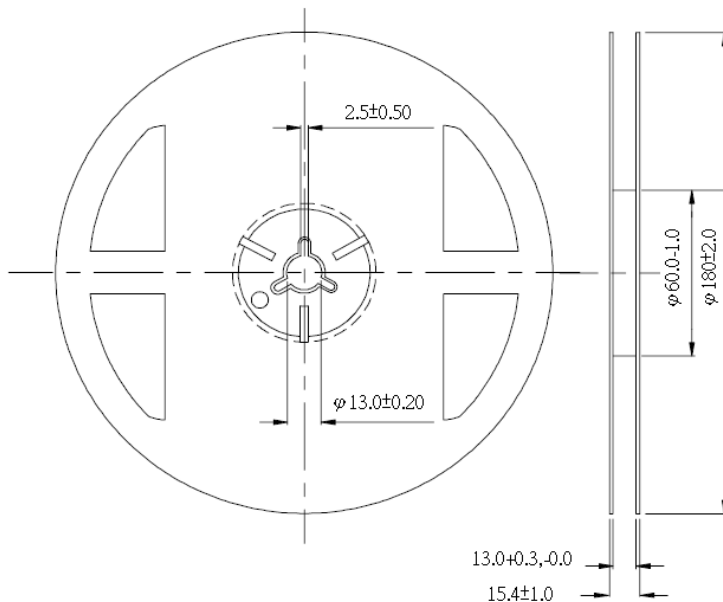


### Moisture Resistant Packaging



## Emitter Reel Packaging

### Reel Dimensions



#### Notes:

1. Dimensions are in millimeters.
2. Tolerances unless mentioned are  $\pm 0.1$ mm.

## Product Labeling

### Label Explanation

CPN: Customer Specification (when required)

P/N : Everlight Production Number

QTY: Packing Quantity

CAT: Luminous Flux (Brightness) Bin

HUE: Color Bin

REF: Forward Voltage Bin

LOT No: Lot Number

MADE IN TAIWAN: Production Place



## Reliability Data

Stress Test	Stress Condition	Stress Duration
Reflow	Tsol=260 , 10sec	3 times
Thermal Shock	H : + 100 20min. ↓ 10sec. L : - 10 20min.	500,1000 Cycles
Power Temperature Cycle	H : + 85 15min. ↓ 5min. L : - 40 15min. IF=350mA	500,1000 Cycles
High Temperature/Humidity Operation	Ta=85 , RH=85%, IF=225mA	1000hours
Room Temperature Operation Life	Ta=25 , IF=350mA	1000hours
High Temperature Operation Life #1	Ta=55 , IF=350mA	1000hours
High Temperature Operation Life #2	Ta=85 , IF=225mA	1000hours
Low Temperature Operation Life	Ta=-40 , IF=350mA	1000hours
Pulse	30ms ON/2500ms OFF / 30000 Cycles IF=720mA	30ms ON/2500ms OFF / 30000 Cycles

### Failure Criteria:

1. LEDs are open or shorted
2. Im: luminous flux attenuate difference(1000hrs)>50%
3. VF: forward voltage difference(1000hrs)>20%



## Storage Conditions

- Before the package is opened: The LEDs should be stored at 30°C or less and 50%RH or less after being shipped from Everlight. The storage life is 6 months. If the LEDs are to be stored for more than 6 months, they should be stored in a sealed container with a nitrogen atmosphere and moisture absorbent material.
- After opening the package: The LED's should be stored under 30 °C or less and 30%RH or less. The LED should be used within 168hrs (7days) after opening the package. If unused LEDs remain, they should be stored in moisture proof packages.
- Before using LEDs: The LEDs should be baked under the following conditions: pre-curing at 60±5 °C for 24 hours.
- Do not stack assemblies containing Everlight XI3535 LEDs to prevent damage to the optical surface of LEDs. Forces applied to the optical surface may result in the surface being damaged.

EVERLIGHT

## Revision History

Current version: 06.19.2013  
Issue No: DHE-0002027  
Version: 10  
Created by: Betty Hong

Page	Subjects (major change in previous version)	Date of change
P5,P6,P7	New 3000K、 4000K、 5000K Series.	2012-12-07
P7	New XI3535-KT657J1-03201-000P	2013-02-07
P4	Change the Max. Peak Pulse Current	2013-03-13
P5,P7	Create New CRI>90 spec	2013-03-26
P21	MOQ >2Kpcs, multiple of 400pcs per reel MOQ <2Kpcs, multiple of 100pcs per reel	2013-04-09
P23	Create Reliability Data	2013-04-18
P21	Create Package Quantity max 1600pcs	2013-05-28
P5,P7	Added the 4000K and 6000K Color	06-19-2013