

## SMD ▪ MID Power LED

### 67-24ST/MKE-WXXXXXXXXZ3/2T(XNHK)



#### Features

- PLCC-2 package
- Top view white LED
- High luminous intensity output
- Wide viewing angle
- Pb-free
- ANSI Binning
- The product itself will remain within RoHS compliant version.
- Compliance with EU REACH.
- Compliance Halogen Free .(Br<900ppm,Cl<900ppm,Br+Cl<1500ppm)

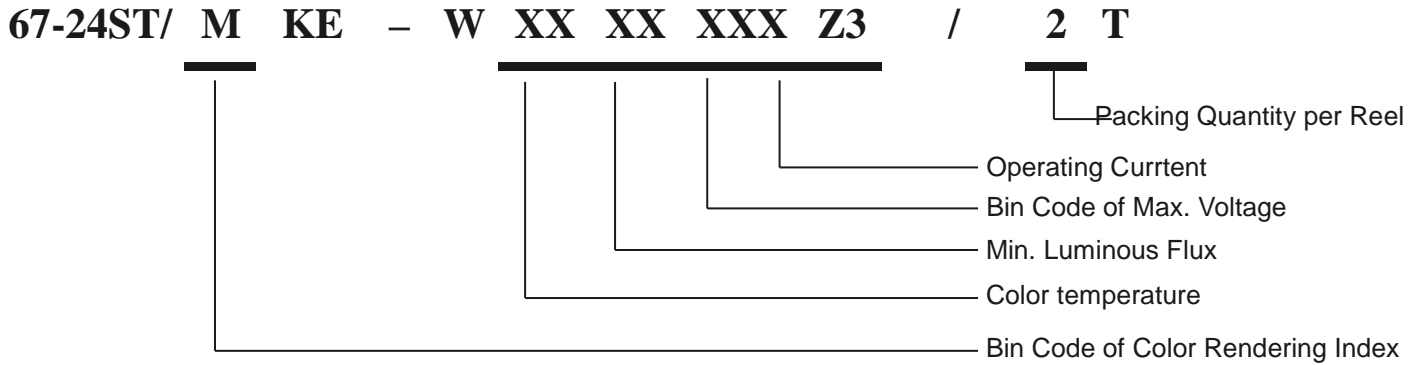
#### Description

The Everlight 67-24ST package has high efficacy, high CRI, low power consumption, wide viewing angle and a compact form factor. These features make this package an ideal LED for all lighting applications.

#### Applications

- General lighting
- Decorative and Entertainment Lighting
- Indicators
- Illumination
- Switch lights

**Product Number Explanation**



**Table of Color Rendering Index**

Symbol	Description
M	CRI(Min.) : 60
N	CRI(Min.) : 65
L	CRI(Min.) : 70
Q	CRI(Min.) : 75
K	CRI(Min.) : 80
P	CRI(Min.) : 85
H	CRI(Min.) : 90

Note:  
 Tolerance of Color Rendering Index: ±2

**Table of Forward Current Index**

Symbol	Description
Z3	I <sub>F</sub> :30mA

**Table of Forward Voltage Index**

Symbol	Description
114	11.4V max

Example:  
 67-24ST/MKE-W7068114Z3/2T(XNHK)

CRI	60(Min.)
CCT	7000K
Flux	68lm min
V <sub>F</sub>	11.4V max
I <sub>F</sub>	30mA

### Mass Production List

Product	CRI Min. <sup>(1)</sup>	CCT(K)	Φ(lm) Min. <sup>(2)</sup>
67-24ST/MKE-W7068114Z3/2T(XNHK)	60	7000K	68
67-24ST/MKE-W9064114Z3/2T(XNHK)	60	9000K	64
67-24ST/MKE-W12062114Z3/2T(XNHK)	60	12000K	62

Notes:

1. Tolerance of Color Rendering Index:  $\pm 2$
2. Tolerance of Luminous flux:  $\pm 11\%$ .

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## Device Selection Guide

Chip Materials	Emitted Color	Resin Color
InGaN	Cool White	Water Clear

## Absolute Maximum Ratings (T<sub>Soldering</sub>=25°C)

Parameter	Symbol	Rating	Unit
Forward Current	I <sub>F</sub>	90	mA
Peak Forward Current (Duty 1/10 @10ms)	I <sub>FP</sub>	180	mA
Power Dissipation	P <sub>d</sub>	1080	mW
Operating Temperature	T <sub>opr</sub>	-40 ~ +85	°C
Storage Temperature	T <sub>stg</sub>	-40 ~ +100	°C
Thermal Resistance (Junction / Soldering point)	R <sub>th J-S</sub>	19	°C/W
Junction Temperature	T <sub>j</sub>	115	°C
Soldering Temperature	T <sub>sol</sub>	Reflow Soldering : 260 °C for 10 sec. Hand Soldering : 350 °C for 3 sec.	

Note:

The products are sensitive to static electricity and must be carefully taken when handling products

## Electro-Optical Characteristics (T<sub>Soldering</sub>=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Luminous Flux <sup>(1)</sup>	Φ	62	---	---	lm	I <sub>F</sub> =30mA
Forward Voltage <sup>(2)</sup>	V <sub>F</sub>	10.6	----	11.4	V	I <sub>F</sub> =30mA
Color Rendering Index <sup>(3)</sup>	R <sub>a</sub>	60	---	---		I <sub>F</sub> =30mA
Viewing Angle	2θ <sub>1/2</sub>	---	120	----	deg	I <sub>F</sub> =30mA

Notes:

1. Tolerance of Luminous flux: ±11%.
2. Tolerance of Forward Voltage: ±0.1V.
3. Tolerance of Color Rendering Index: ±2

**Bin Range of Luminous Flux  
 7000K**

Bin Code	Min.	Max.	Unit	Condition
68L5	68	73	lm	I <sub>F</sub> =30mA
73L5	73	78		
78L5	78	83		

**9000K**

Bin Code	Min.	Max.	Unit	Condition
64L5	64	69	lm	I <sub>F</sub> =30mA
69L5	69	74		
74L5	74	79		

**12000K**

Bin Code	Min.	Max.	Unit	Condition
62L5	62	67	lm	I <sub>F</sub> =30mA
67L5	67	72		
72L5	72	77		

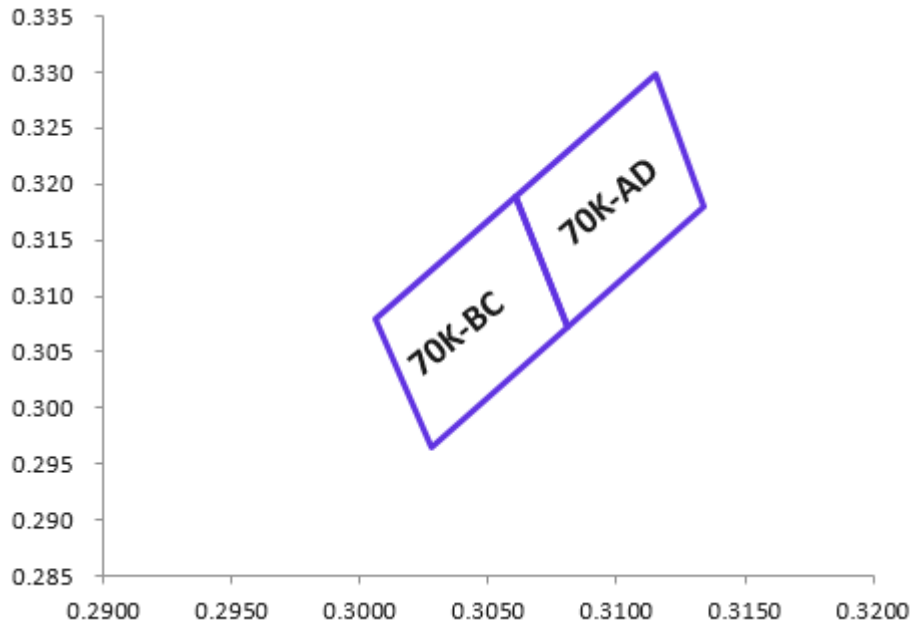
Note:  
 Tolerance of Luminous flux: ±11%.

**Bin Range of Forward Voltage**

Group	Bin Code	Min.	Max.	Unit	Condition
10.6-11.4	106D	10.6	11.0	V	I <sub>F</sub> =30mA
	110D	11.0	11.4		

Note:  
 Tolerance of Forward Voltage : ±0.1V.

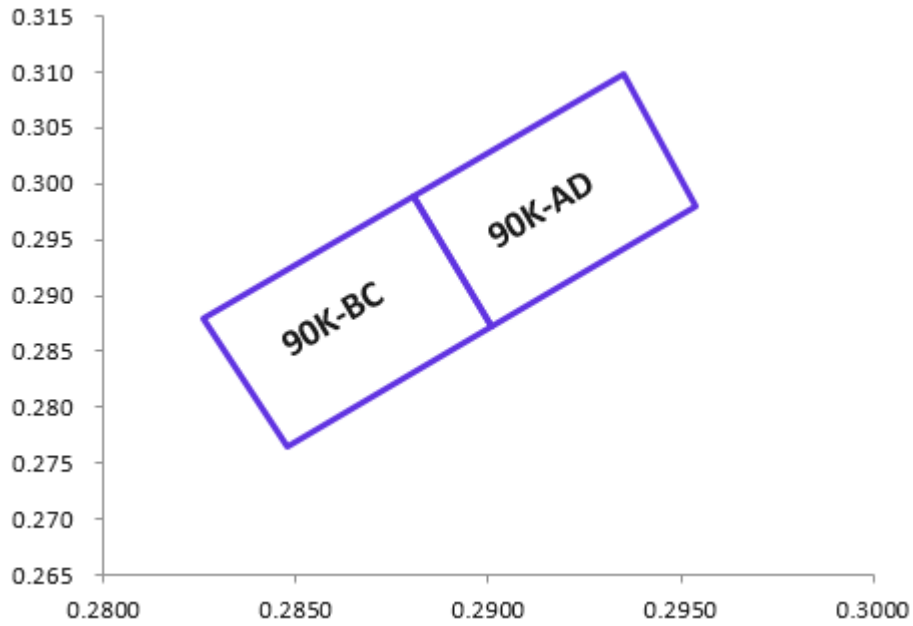
The C.I.E. 1931 Chromaticity Diagram



Bin Range of Chromaticity Coordinates

CCT	Bin Code	CIE_x	CIE_y	Bin Code	CIE_x	CIE_y
7000K	70K-AD	0.3115	0.3299	70K-BC	0.3060	0.3189
		0.3060	0.3189		0.3006	0.3080
		0.3081	0.3072		0.3028	0.2965
		0.3134	0.3180		0.3081	0.3072
Reference Range:6550-7600K						

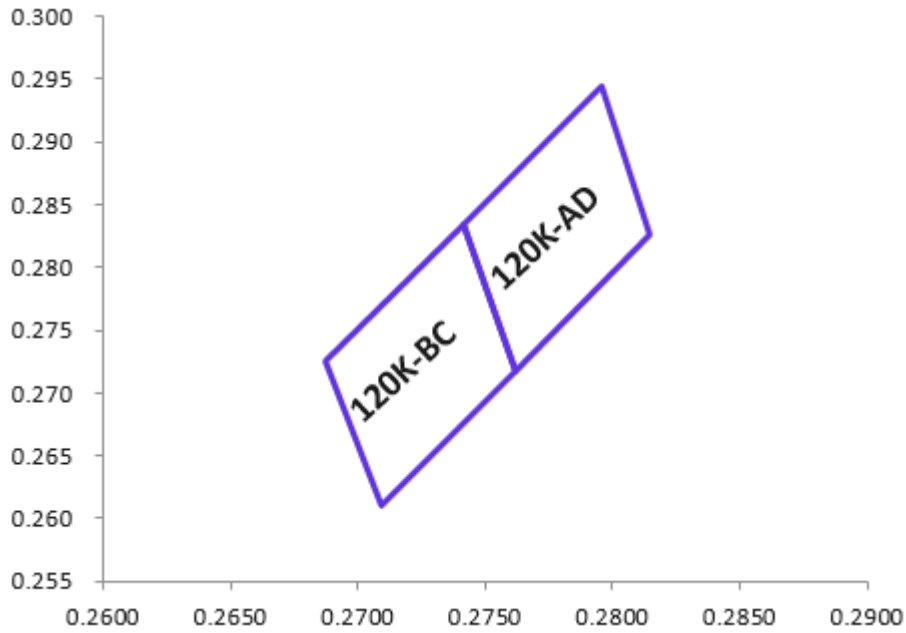
**The C.I.E. 1931 Chromaticity Diagram**



**Bin Range of Chromaticity Coordinates**

CCT	Bin Code	CIE_x	CIE_y	Bin Code	CIE_x	CIE_y
9000K	90K-AD	0.2935	0.3099	90K-BC	0.2880	0.2989
		0.2880	0.2989		0.2826	0.2880
		0.2901	0.2872		0.2848	0.2765
		0.2954	0.2980		0.2901	0.2872
Reference Range:8000-10250K						

**The C.I.E. 1931 Chromaticity Diagram**



**Bin Range of Chromaticity Coordinates**

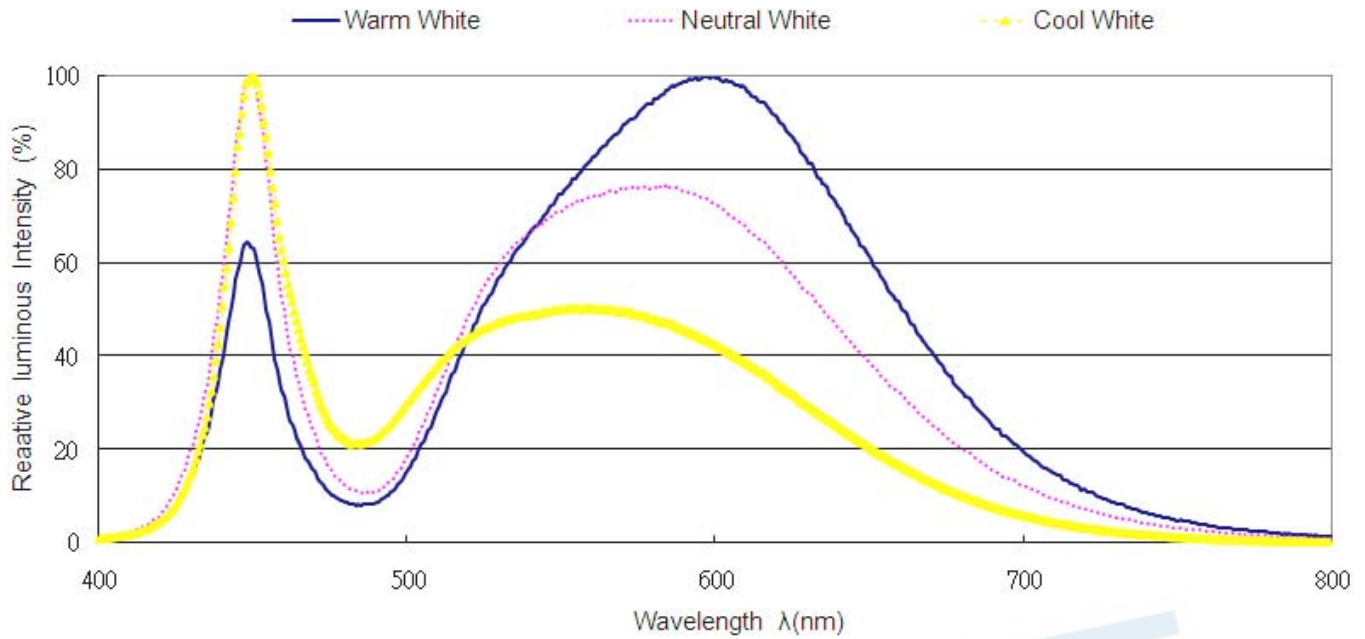
CCT	Bin Code	CIE_x	CIE_y	Bin Code	CIE_x	CIE_y
12000K	120K-AD	0.2796	0.2944	120K-BC	0.2741	0.2835
		0.2815	0.2825		0.2762	0.2718
		0.2762	0.2718		0.2709	0.2610
		0.2741	0.2835		0.2687	0.2725
Reference Range:9770-14500K						

Notes:

1. The value is based on driving current by 30mA.
2. Tolerance of Chromaticity Coordinates:  $\pm 0.01$ .

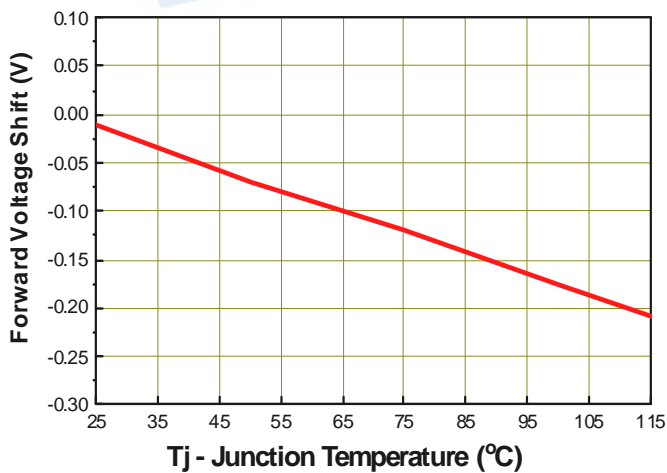


**Spectrum Distribution**

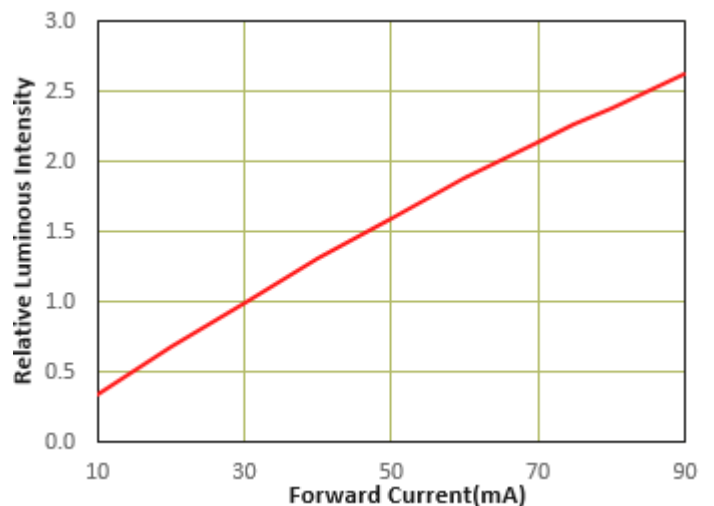


**Typical Electro-Optical Characteristics Curves**

**Fig.1 – Forward Voltage Shift vs. Junction Temperature**

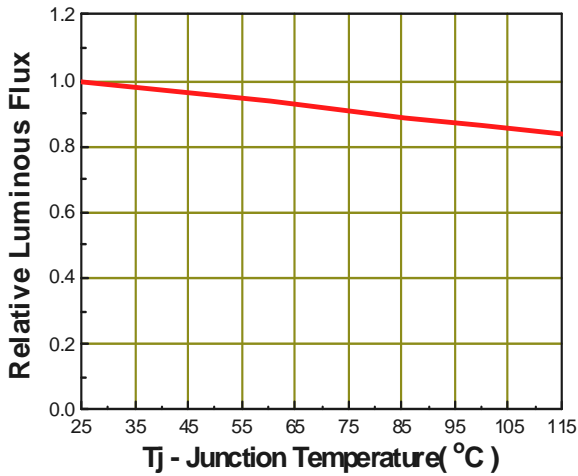


**Fig.2 - Relative Luminous Intensity vs. Forward Current**

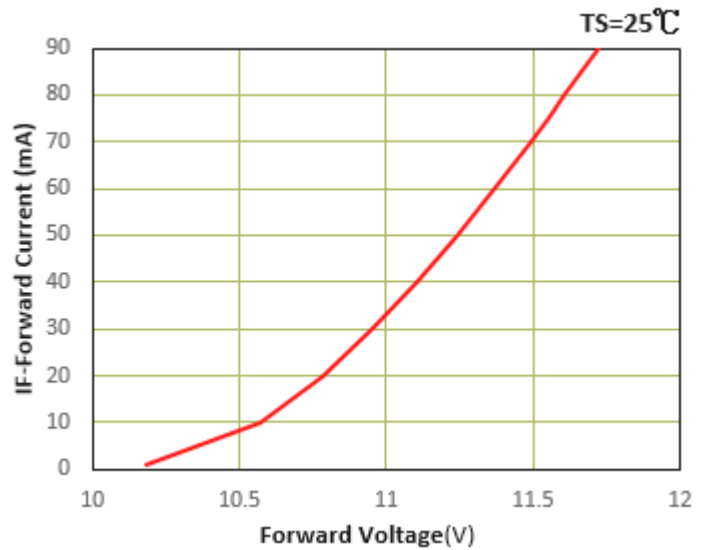


**Typical Electro-Optical Characteristics Curves**

**Fig.3 - Relative Luminous Intensity vs. Junction Temperature**

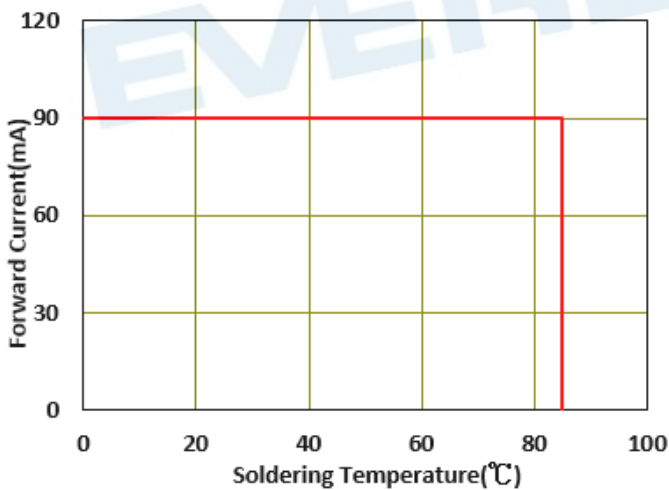


**Fig.4 - Forward Current vs. Forward Voltage**

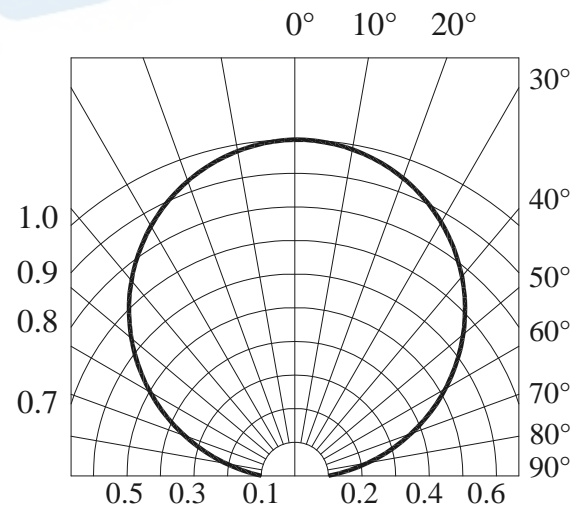


**Fig.5 – Max. Driving Forward Current vs. Soldering Temperature**

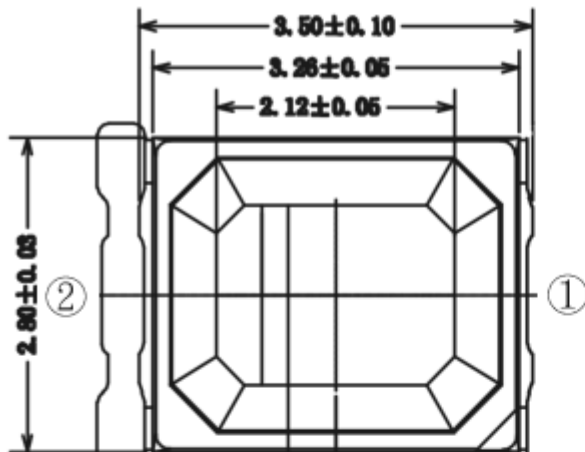
$R_{th\ j-s}=19\ ^\circ\text{C/W}$



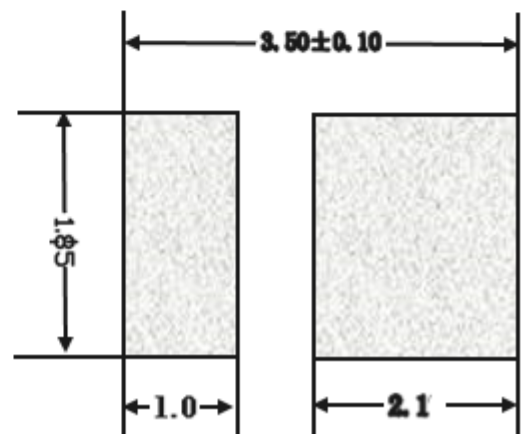
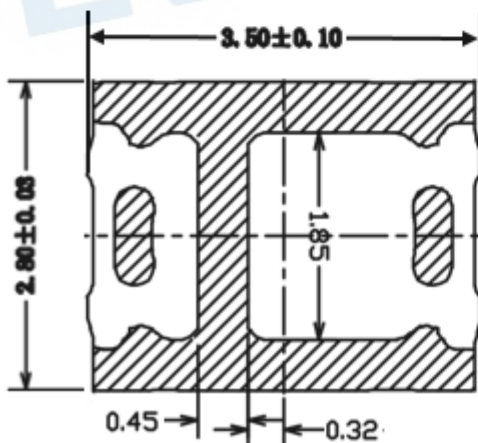
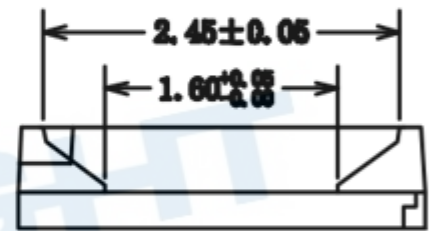
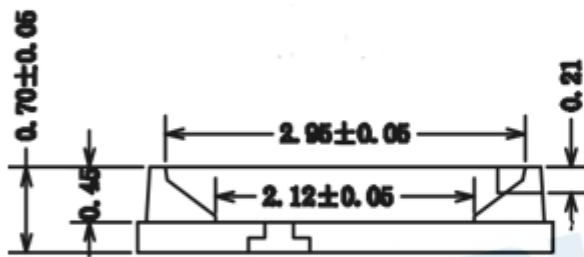
**Fig.6 – Radiation Diagram**



**Package Dimension**



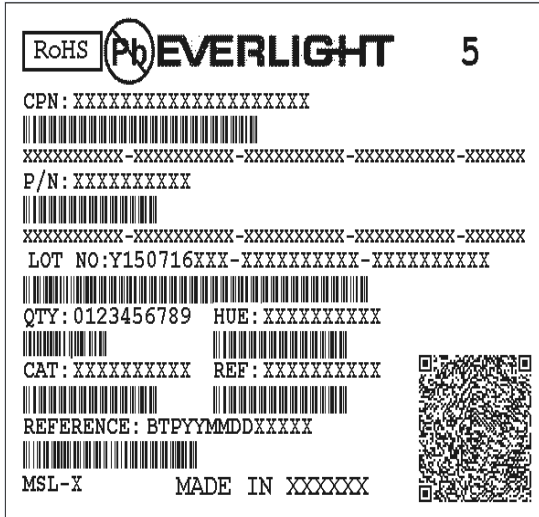
Polarity



Note:  
 Tolerance unless mentioned is  $\pm 0.15$  mm; Unit = mm

**Moisture Resistant Packing Materials**

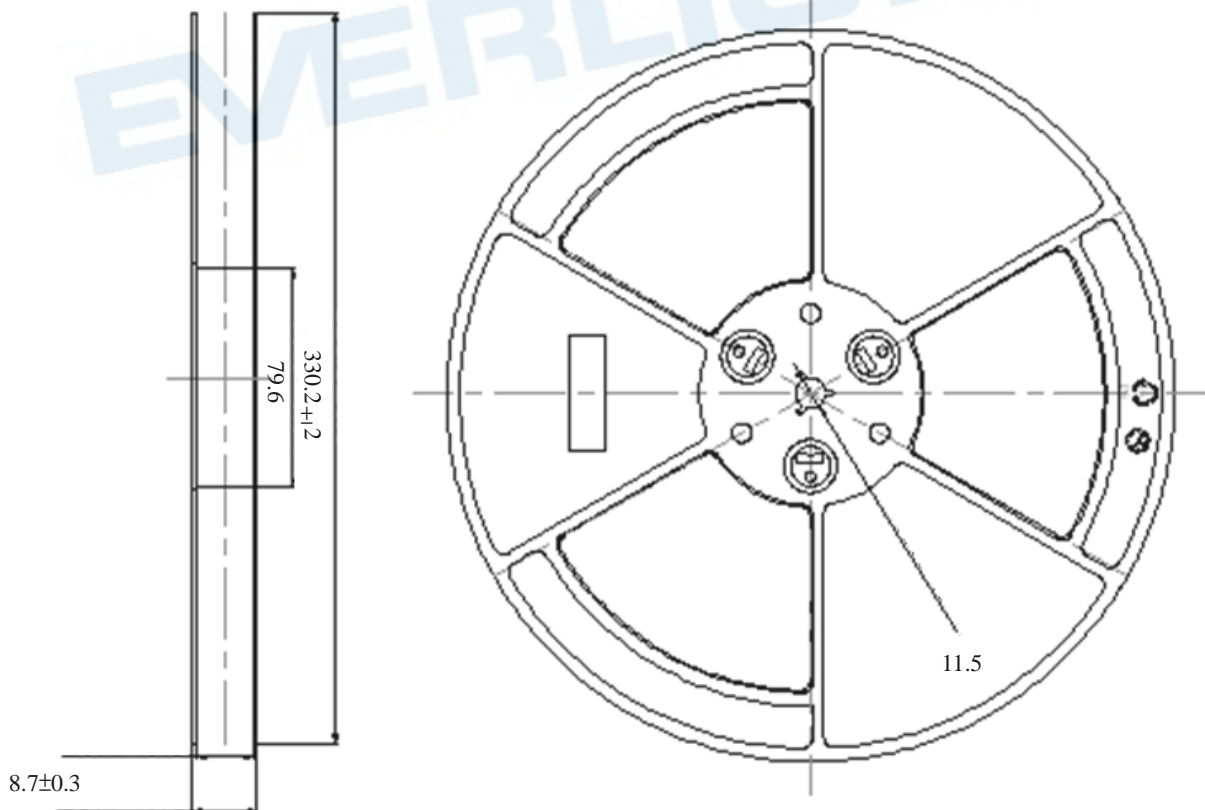
**Label Explanation**



- CPN: Customer's Product Number
- P/N: Product Number
- QTY: Packing Quantity
- CAT: Luminous Intensity Rank
- HUE: Dom. Wavelength Rank
- REF: Forward Voltage Rank
- LOT No: Lot Number

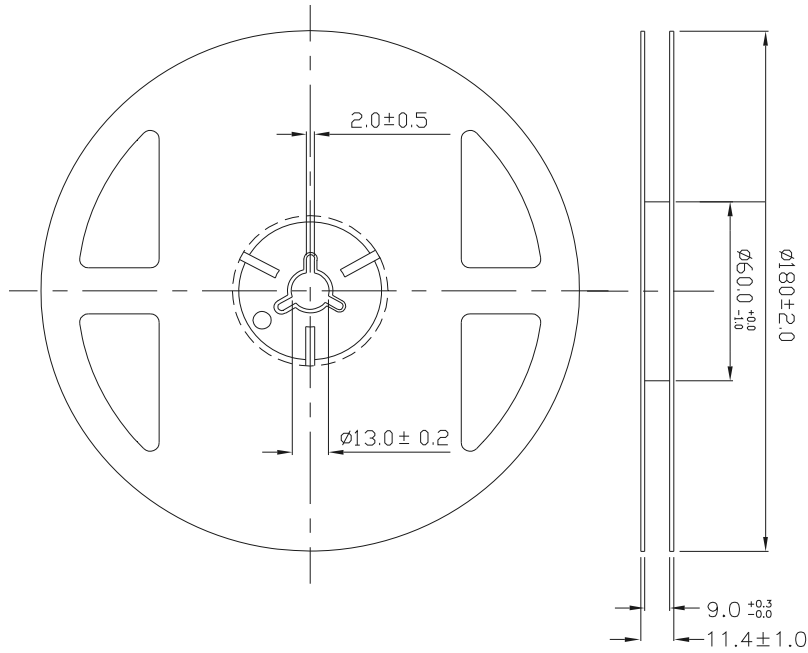
**Reel Dimensions**

**1.Carrier Tape Dimensions:**



**1-1. Loaded Quantity 16000 pcs Per Reel**

## 2. Carrier Tape Dimensions:

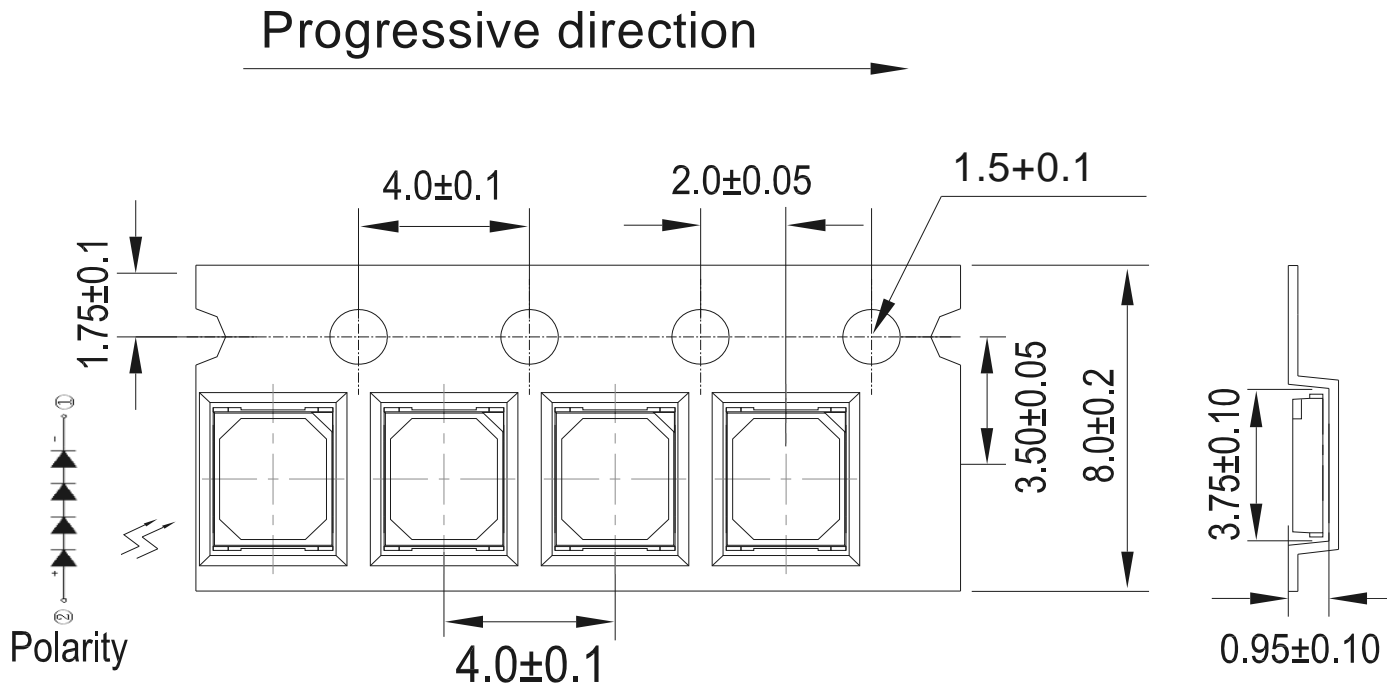


### 2-1. Loaded Quantity 4000 pcs Per Reel

Note:

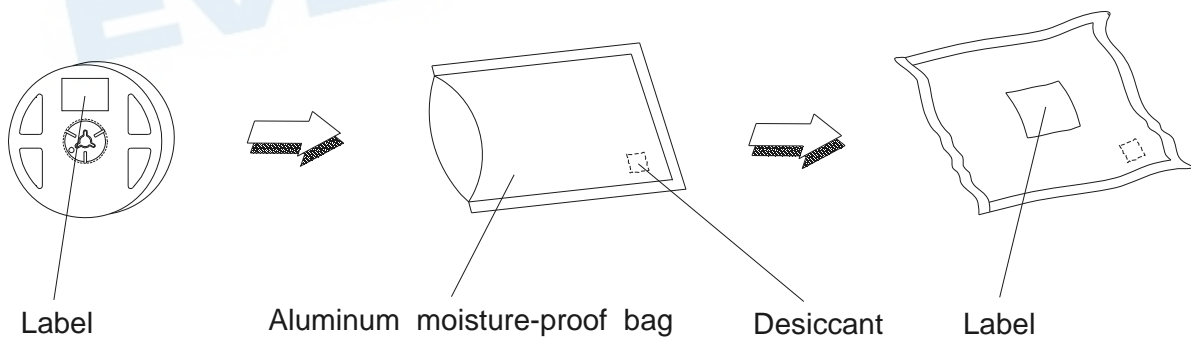
Tolerances unless mentioned  $\pm 0.1$ mm. Unit = mm

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Note:  
 1. Tolerance unless mentioned is  $\pm 0.1$  mm; Unit = mm

### Moisture Resistant Packing Process



## Reliability Test Items and Conditions

The reliability of products shall be satisfied with items listed below.  
 Confidence level : 90%  
 LTPD : 10%

No.	Items	Test Condition	Test Hours/Cycles	Sample Size	Ac/Re
1	Resistance to Solder Heat	Temp. : 260°C/10sec.	3 Times.	8 PCS.	0/1
2	Temperature Cycle	-40°C~100°C / Dwell time 30min	200 Cycles	8 PCS.	0/1
3	High Temperature/Humidity Life	Ta=85°C,85%RH, I <sub>F</sub> =90mA	1000 Hrs.	8 PCS.	0/1
4	Low Temperature Life	Ta=-40°C, I <sub>F</sub> = 90 mA	1000 Hrs.	8 PCS.	0/1
5	High Temperature Life	Ta=60°C, I <sub>F</sub> =90 mA	3000 Hrs.	8 PCS.	0/1
6	High Temperature Life	Ta=85°C, I <sub>F</sub> =90 mA	3000 Hrs.	8 PCS.	0/1
7	Pulse	ON 30ms / OFF 2500ms	30000 CYCLES	8 PCS.	0/1
8	Thermal Shock	H : +100°C 20min ∫ 10 sec L : -40°C 20min	200 Cycles	8 PCS.	0/1
9	Power Temperature Cycle	H : +100°C 15min ∫ 5 min L : -40°C 15min I <sub>F</sub> = 30 mA	200 Cycles	8 PCS.	0/1

## Precautions for Use

### 1. Over-current-proof

Customer must apply resistors for protection; otherwise slight voltage shift will cause big current change (Burn out will happen).

### 2. Storage

2.1 Do not open moisture proof bag before the products are ready to use.

2.2 Before opening the package: The LEDs should be kept at 30°C or less and 90%RH or less.

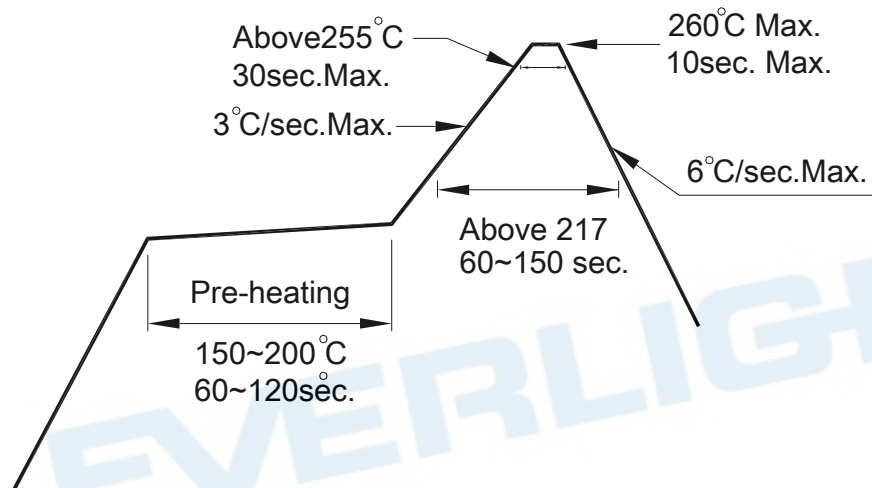
2.3 After opening the package: The LED's floor life is 168 Hrs under 30°C or less and 60% RH or less. If unused LEDs remain, it should be stored in moisture proof packages.

2.4 If the moisture absorbent material (silica gel) has faded away or the LEDs have exceeded the storage time, baking treatment should be performed using the following conditions.

Baking treatment: 60±5°C for 24 hours.

### 3. Soldering Condition

#### 3.1 Pb-free solder temperature profile



3.2 Reflow soldering should not be done more than two times.

3.3 When soldering, do not put stress on the LEDs during heating.

3.4 After soldering, do not warp the circuit board.

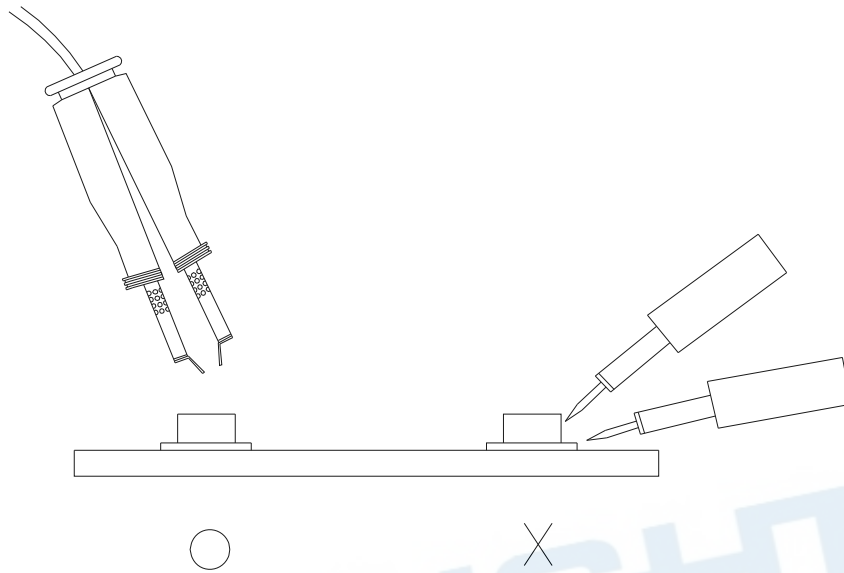


#### 4. Soldering Iron

Each terminal is to go to the tip of soldering iron temperature less than 350°C for 3 seconds within once in less than the soldering iron capacity 25W. Leave two seconds and more intervals, and do soldering of each terminal. Be careful because the damage of the product is often started at the time of the hand solder.

#### 5. Repairing

Repair should not be done after the LEDs have been soldered. When repairing is unavoidable, a double-head soldering iron should be used (as below figure). It should be confirmed beforehand whether the characteristics of the LEDs will or will not be damaged by repairing.



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## DISCLAIMER

1. EVERLIGHT reserves the right(s) on the adjustment of product material mix for the specification.
2. The product meets EVERLIGHT published specification for a period of twelve (12) months from date of shipment.
3. The graphs shown in this datasheet are representing typical data only and do not show guaranteed values.
4. When using this product, please observe the absolute maximum ratings and the instructions for using outlined in these specification sheets. EVERLIGHT assumes no responsibility for any damage resulting from the use of the product which does not comply with the absolute maximum ratings and the instructions included in these specification sheets.
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6. This product is not intended to be used for military, aircraft, automotive, medical,

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