

### SMD ■ MID Power LED

67-21S/KK5C-EXXXXXXXXX2834Z15/2T



#### Features

- PLCC-2 package
- Top view white LED
- High luminous intensity output
- Wide viewing angle
- Pb-free
- RoHS compliant
- IEC Binning

#### Description

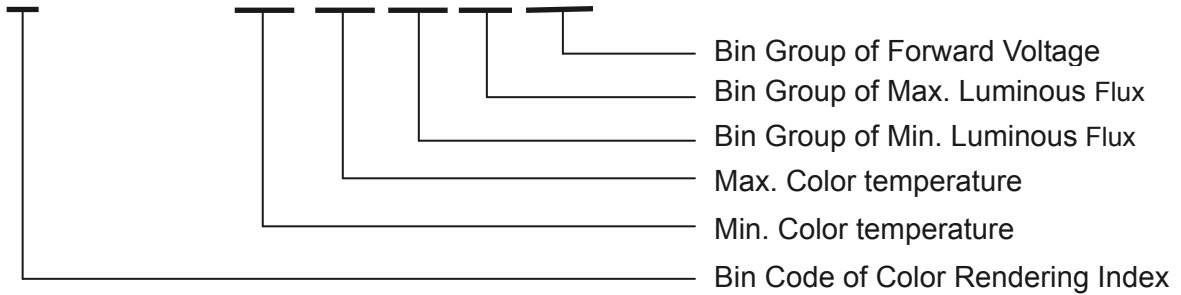
The Everlight 67-21S package has high efficacy, high CRI, low power consumption, wide viewing angle and a compact form factor. These features make this package an ideal LED for all lighting applications.

#### Applications

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

**Product Number Explanation**

**67-21S / K K 5 C – E XX XX XX XX XX Z15 / 2T**



**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: ±3

**Table of Forward Current Index**

Symbol	Description
Z15	I <sub>F</sub> :150mA

Example:  
 67-21S/KK5C-E5050R4R72834Z15/2T

CRI	80(Min.)
CCT	5000K
Flux	65~90lm
V <sub>F</sub>	2.8~3.4V
I <sub>F</sub>	150mA

### Mass Production List

Product	CRI Min. (1)	CCT(K)	Φ(lm) Min. (2)	Φ(lm) Max. (2)
67-21S/KK5C-E2727R2R52834Z15/2T	80	2700K	55	76
67-21S/KK5C-E3030R3R62834Z15/2T	80	3000K	60	83
67-21S/KK5C-E4040R3R62834Z15/2T	80	4000K	60	83
67-21S/KK5C-E5050R4R72834Z15/2T	80	5000K	65	90
67-21S/KK5C-E6262R4R72834Z15/2T	80	6200K	65	90
67-21S/KK5C-E6565R4R72834Z15/2T	80	6500K	65	90

Notes:

1. Tolerance of Color Rendering Index:  $\pm 3$
2. Tolerance of Luminous flux:  $\pm 11\%$ .

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## Device Selection Guide

Chip Materials	Emitted Color	Resin Color
InGaN	Cool White Neutral White Warm White	Water Clear

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

Parameter	Symbol	Rating	Unit
Forward Current	I <sub>F</sub>	180	mA
Peak Forward Current (Duty 1/10 @10ms)	I <sub>FP</sub>	300	mA
Power Dissipation	P <sub>d</sub>	630	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>	21	°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 <sub>(1)</sub>	Φ	55	-----	90	lm	I <sub>F</sub> =150mA
Forward Voltage <sub>(2)</sub>	V <sub>F</sub>	2.8	-----	3.4	V	I <sub>F</sub> =150mA
Color Rendering Index <sub>(3)</sub>	R <sub>a</sub>	80	-----	-----		I <sub>F</sub> =150mA
Viewing Angle	2θ <sub>1/2</sub>	-----	120	-----	deg	I <sub>F</sub> =150mA
Reverse Current	I <sub>R</sub>	-----	-----	50	μA	V <sub>R</sub> =5V

Notes:

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

**Bin Range of Luminous Flux**

Bin Code	Min.	Max.	Unit	Condition
R2	55	60	lm	I <sub>F</sub> =150mA
R3	60	65		
R4	65	70		
R5	70	76		
R6	76	83		
R7	83	90		

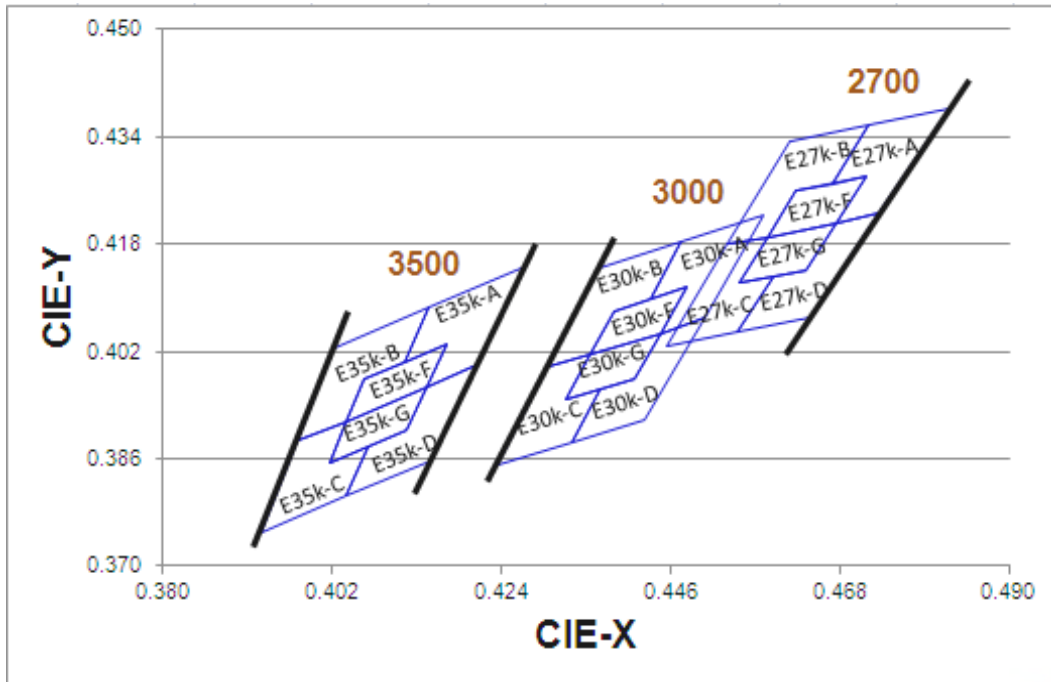
Note:  
 Tolerance of Luminous flux: ±11%.

**Bin Range of Forward Voltage**

Group	Bin Code	Min.	Max.	Unit	Condition
2834	35	2.8	2.9	V	I <sub>F</sub> =150mA
	36	2.9	3.0		
	37	3.0	3.1		
	38	3.1	3.2		
	39	3.2	3.3		
	40	3.3	3.4		

Note:  
 Tolerance of Forward Voltage: ±0.1V.

The C.I.E. 1931 Chromaticity Diagram

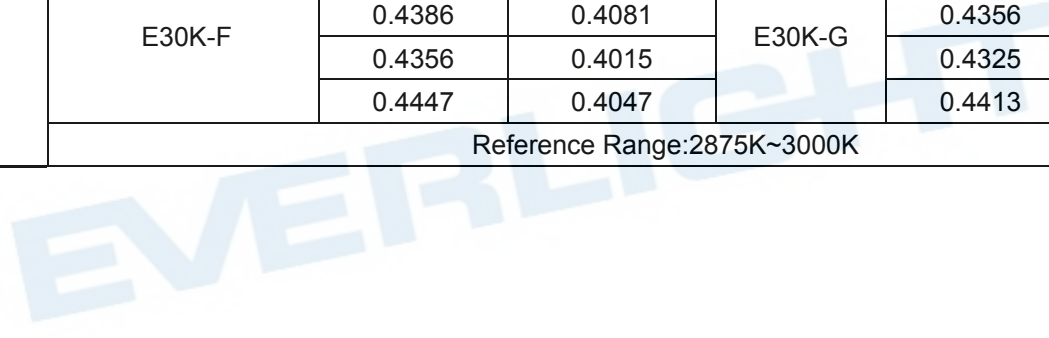


Bin Range of Chromaticity Coordinates

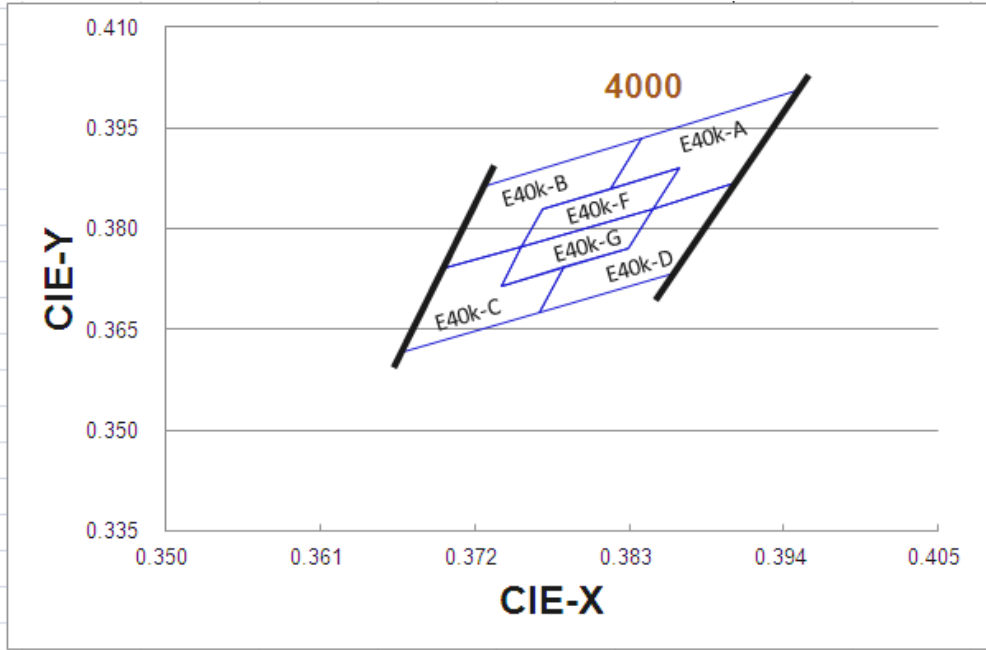
CCT	Bin Code	CIE_x	CIE_y	Bin Code	CIE_x	CIE_y	
2700K	E27K-A	0.4821	0.4383	E27K-D	0.4731	0.4227	
		0.4718	0.4359		0.4676	0.4212	
		0.4670	0.4270		0.4636	0.4142	
		0.4715	0.4281		0.4593	0.4132	
		0.4676	0.4212		0.4548	0.4050	
		0.4731	0.4227		0.4640	0.4071	
	Reference Range: 2620K~2730K						
	E27K-B	0.4718	0.4359	E27K-C	0.4535	0.4181	
		0.4614	0.4334		0.4455	0.4028	
		0.4535	0.4181		0.4548	0.4050	
		0.4587	0.4190		0.4593	0.4132	
		0.4624	0.4259		0.4550	0.4121	
		0.4670	0.4270		0.4587	0.4190	
	Reference Range: 2730K~2850K						
	E27K-F	0.4715	0.4281	E27K-G	0.4676	0.4212	
		0.4624	0.4259		0.4587	0.4190	
		0.4587	0.4190		0.4550	0.4121	
		0.4676	0.4212		0.4636	0.4142	
Reference Range: 2675K~2780K							

**Bin Range of Chromaticity Coordinates**

CCT	Bin Code	CIE_x	CIE_y	Bin Code	CIE_x	CIE_y	
3000K	E30K-A	0.4582	0.4223	E30K-D	0.4505	0.4071	
		0.4474	0.4184		0.4447	0.4047	
		0.4433	0.4098		0.4413	0.3979	
		0.4480	0.4115		0.4369	0.3964	
		0.4447	0.4047		0.4332	0.3885	
		0.4505	0.4071		0.4427	0.3918	
	Reference Range: 2810K~2950K						
	E30K-B	0.4474	0.4184	E30K-C	0.4301	0.3998	
		0.4366	0.4145		0.4236	0.3851	
		0.4301	0.3998		0.4332	0.3885	
		0.4356	0.4015		0.4369	0.3964	
		0.4386	0.4081		0.4325	0.3948	
		0.4433	0.4098		0.4356	0.4015	
	Reference Range: 2950K~3100K						
	E30K-F	0.4480	0.4115	E30K-G	0.4447	0.4047	
		0.4386	0.4081		0.4356	0.4015	
		0.4356	0.4015		0.4325	0.3948	
		0.4447	0.4047		0.4413	0.3979	
	Reference Range: 2875K~3000K						



The C.I.E. 1931 Chromaticity Diagram

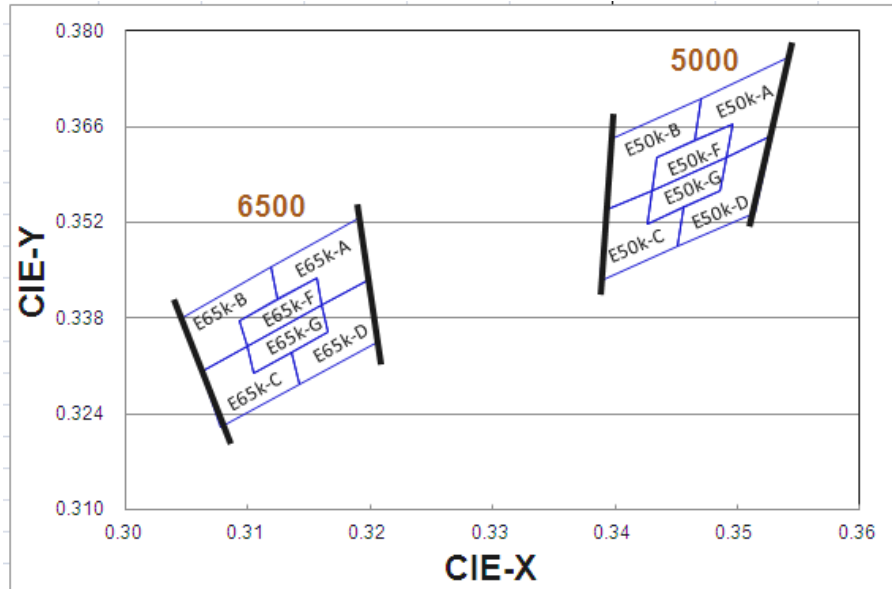


Bin Range of Chromaticity Coordinates

CCT	Bin Code	CIE_x	CIE_y	Bin Code	CIE_x	CIE_y	
4000K	E40K-A	0.3949	0.4004	E40K-D	0.3906	0.3869	
		0.3838	0.3934		0.3847	0.3830	
		0.3817	0.3860		0.3829	0.3770	
		0.3865	0.3889		0.3784	0.3743	
		0.3847	0.3830		0.3766	0.3675	
		0.3906	0.3869		0.3862	0.3733	
	Reference Range:3810K~4050K						
	E40K-B	0.3838	0.3934	E40K-C	0.3698	0.3740	
		0.3727	0.3864		0.3669	0.3616	
		0.3698	0.3740		0.3766	0.3675	
		0.3754	0.3773		0.3784	0.3743	
		0.3768	0.3830		0.3739	0.3715	
		0.3817	0.3860		0.3754	0.3773	
	Reference Range:4050K~4300K						
	E40K-F	0.3865	0.3889	E40K-G	0.3847	0.3830	
		0.3768	0.3830		0.3754	0.3773	
		0.3754	0.3773		0.3739	0.3715	
		0.3847	0.3830		0.3829	0.3770	
	Reference Range:3930K~4150K						



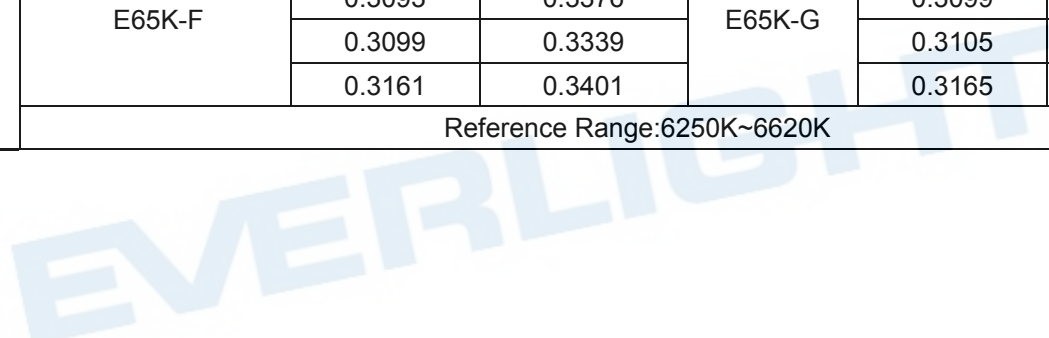
The C.I.E. 1931 Chromaticity Diagram



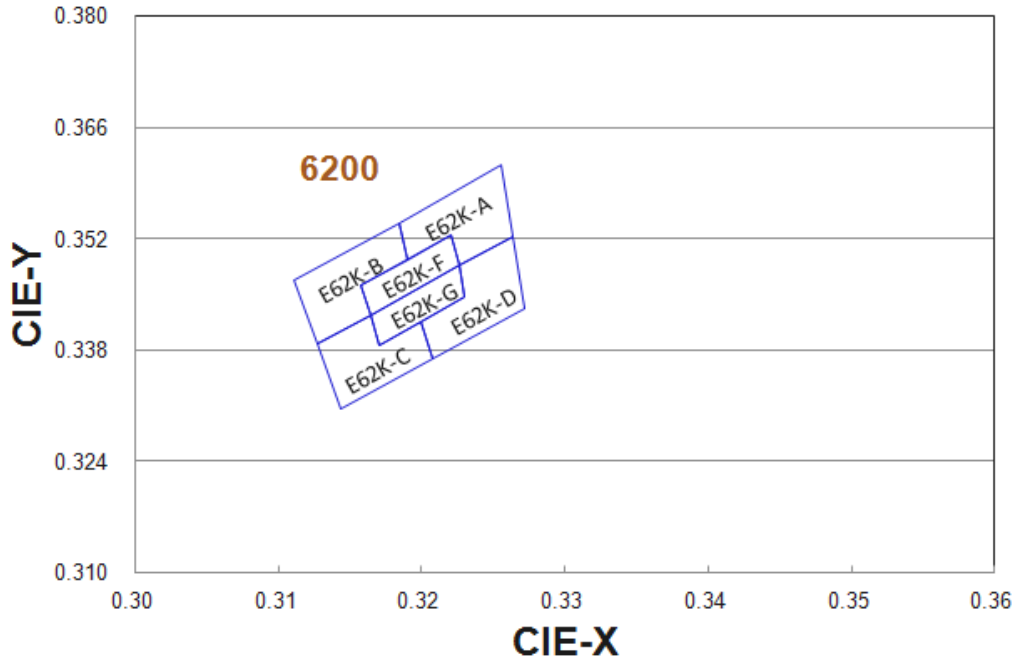
Bin Range of Chromaticity Coordinates

CCT	Bin Code	CIE_x	CIE_y	Bin Code	CIE_x	CIE_y	
5000K	E50K-A	0.3542	0.3761	E50K-D	0.3528	0.3648	
		0.3470	0.3702		0.3491	0.3616	
		0.3465	0.3640		0.3486	0.3566	
		0.3496	0.3665		0.3457	0.3543	
		0.3491	0.3616		0.3451	0.3485	
		0.3528	0.3648		0.3514	0.3535	
	Reference Range:4800K~5000K						
	E50K-B	0.3470	0.3702	E50K-C	0.3393	0.3539	
		0.3398	0.3643		0.3388	0.3435	
		0.3393	0.3539		0.3451	0.3485	
		0.3431	0.3567		0.3457	0.3543	
		0.3434	0.3615		0.3427	0.3519	
		0.3465	0.3640		0.3431	0.3567	
	Reference Range:5000K~5250K						
	E50K-F	0.3496	0.3665	E50K-G	0.3491	0.3616	
		0.3434	0.3615		0.3431	0.3567	
		0.3431	0.3567		0.3427	0.3519	
		0.3491	0.3616		0.3486	0.3566	
	Reference Range:4900K~5100K						

CCT	Bin Code	CIE_x	CIE_y	Bin Code	CIE_x	CIE_y	
6500K	E65K-A	0.3191	0.3528	E65K-D	0.3199	0.3438	
		0.3119	0.3455		0.3161	0.3401	
		0.3125	0.3408		0.3165	0.3361	
		0.3156	0.3440		0.3135	0.3331	
		0.3161	0.3401		0.3143	0.3284	
		0.3199	0.3438		0.3207	0.3347	
	Reference Range:6100K~6450K						
	E65K-B	0.3119	0.3455	E65K-C	0.3062	0.3302	
		0.3046	0.3382		0.3078	0.3221	
		0.3062	0.3302		0.3143	0.3284	
		0.3099	0.3339		0.3135	0.3331	
		0.3093	0.3376		0.3105	0.3301	
		0.3125	0.3408		0.3099	0.3339	
	Reference Range:6450K~6850K						
	E65K-F	0.3156	0.3440	E65K-G	0.3161	0.3401	
		0.3093	0.3376		0.3099	0.3339	
		0.3099	0.3339		0.3105	0.3301	
		0.3161	0.3401		0.3165	0.3361	
	Reference Range:6250K~6620K						



The C.I.E. 1931 Chromaticity Diagram



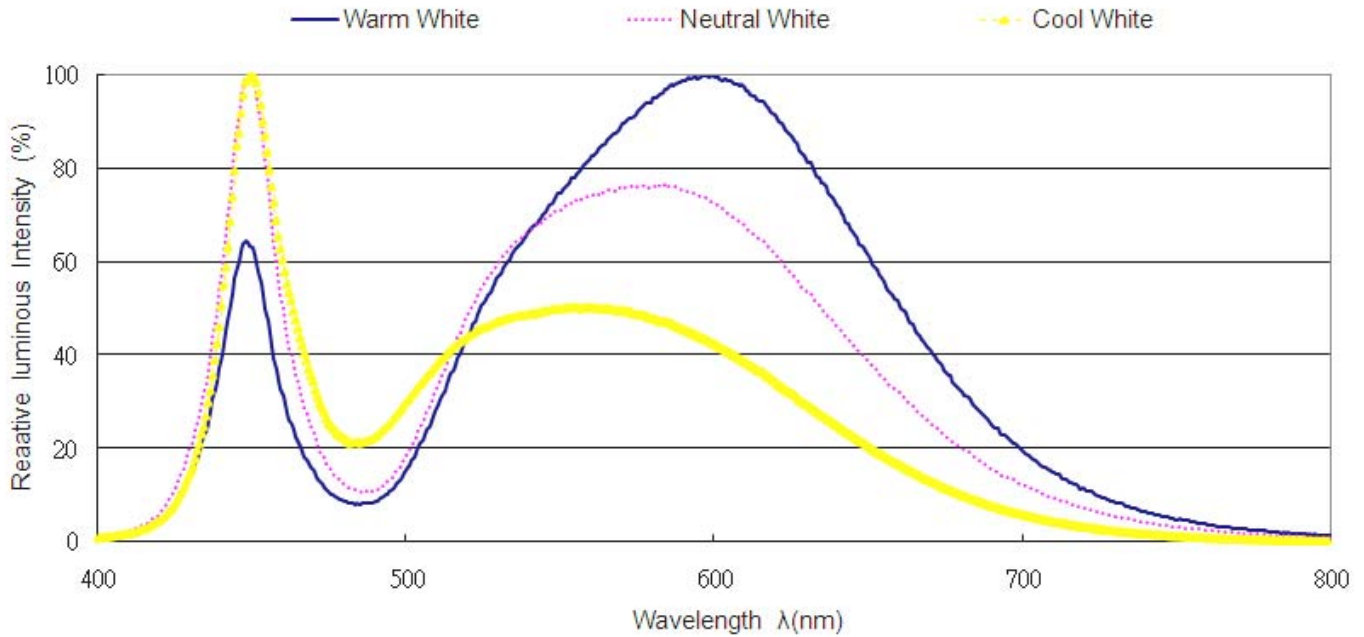
Bin Range of Chromaticity Coordinates

CCT	Bin Code	CIE_x	CIE_y	Bin Code	CIE_x	CIE_y	
6200K	E62K-A	0.3256	0.3613	E62K-D	0.3264	0.3523	
		0.3184	0.3540		0.3226	0.3486	
		0.3190	0.3493		0.3230	0.3446	
		0.3221	0.3525		0.3200	0.3416	
		0.3226	0.3486		0.3208	0.3369	
		0.3264	0.3523		0.3272	0.3432	
	Reference Range:5750K~5940K						
	E62K-B	0.3184	0.3540	E62K-C	0.3127	0.3387	
		0.3111	0.3467		0.3143	0.3306	
		0.3127	0.3387		0.3208	0.3369	
		0.3164	0.3424		0.3200	0.3416	
		0.3158	0.3461		0.3170	0.3386	
		0.3190	0.3493		0.3164	0.3424	
	Reference Range:5940K~6465K						
	E62K-F	0.3221	0.3525	E62K-G	0.3226	0.3486	
		0.3158	0.3461		0.3164	0.3424	
		0.3164	0.3424		0.3170	0.3386	
		0.3226	0.3486		0.3230	0.3446	
	Reference Range:5925K~6240K						

Notes:

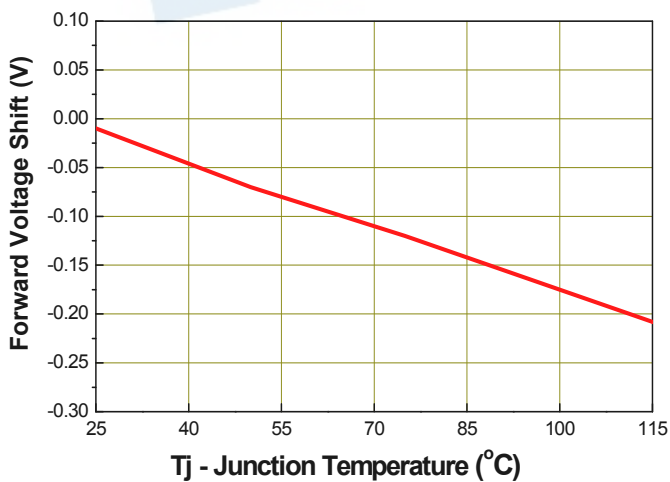
1. The value is based on driving current by 150mA.
2. Tolerance of Chromaticity Coordinates: ±0.01.

**Spectrum Distribution**

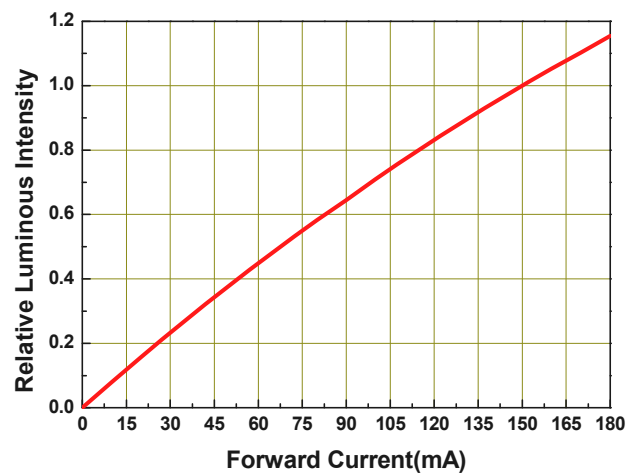


**Typical Electro-Optical Characteristics Curves**

**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

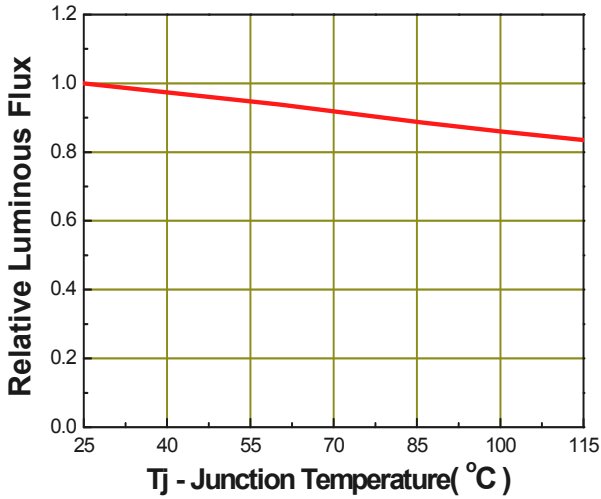


Fig.4 - Forward Current vs. Forward Voltage

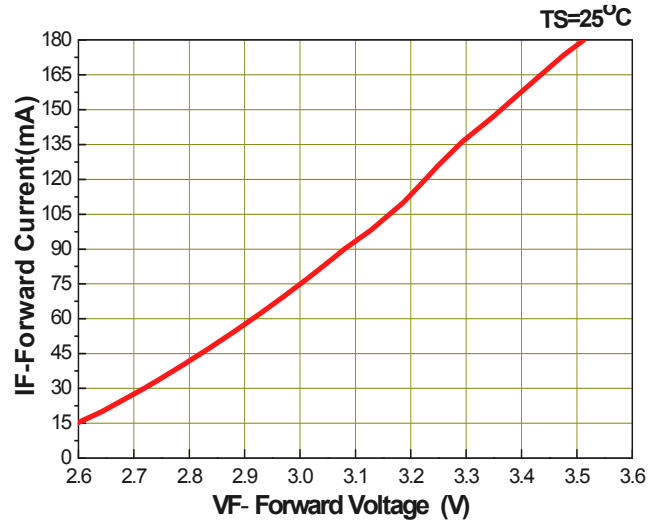


Fig.5 - Max. Driving Forward Current vs. Soldering Temperature

R<sub>th j-s</sub>=21 °C/W

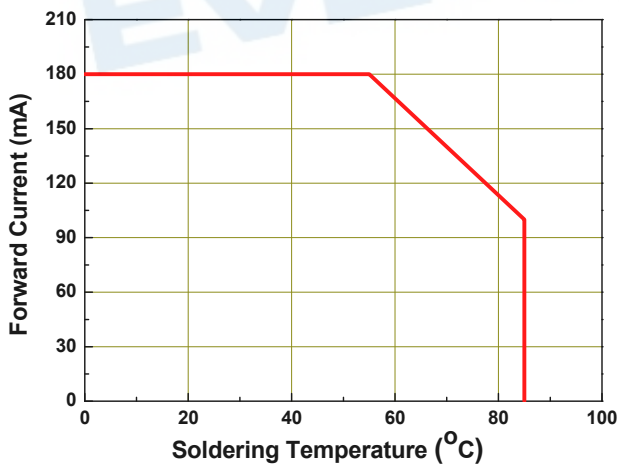
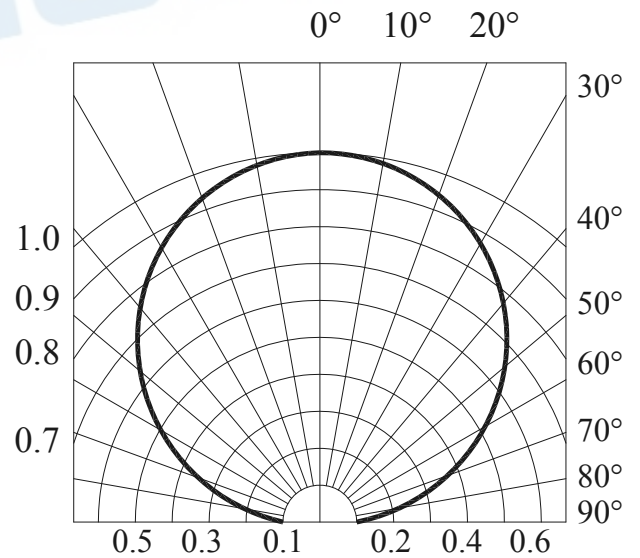
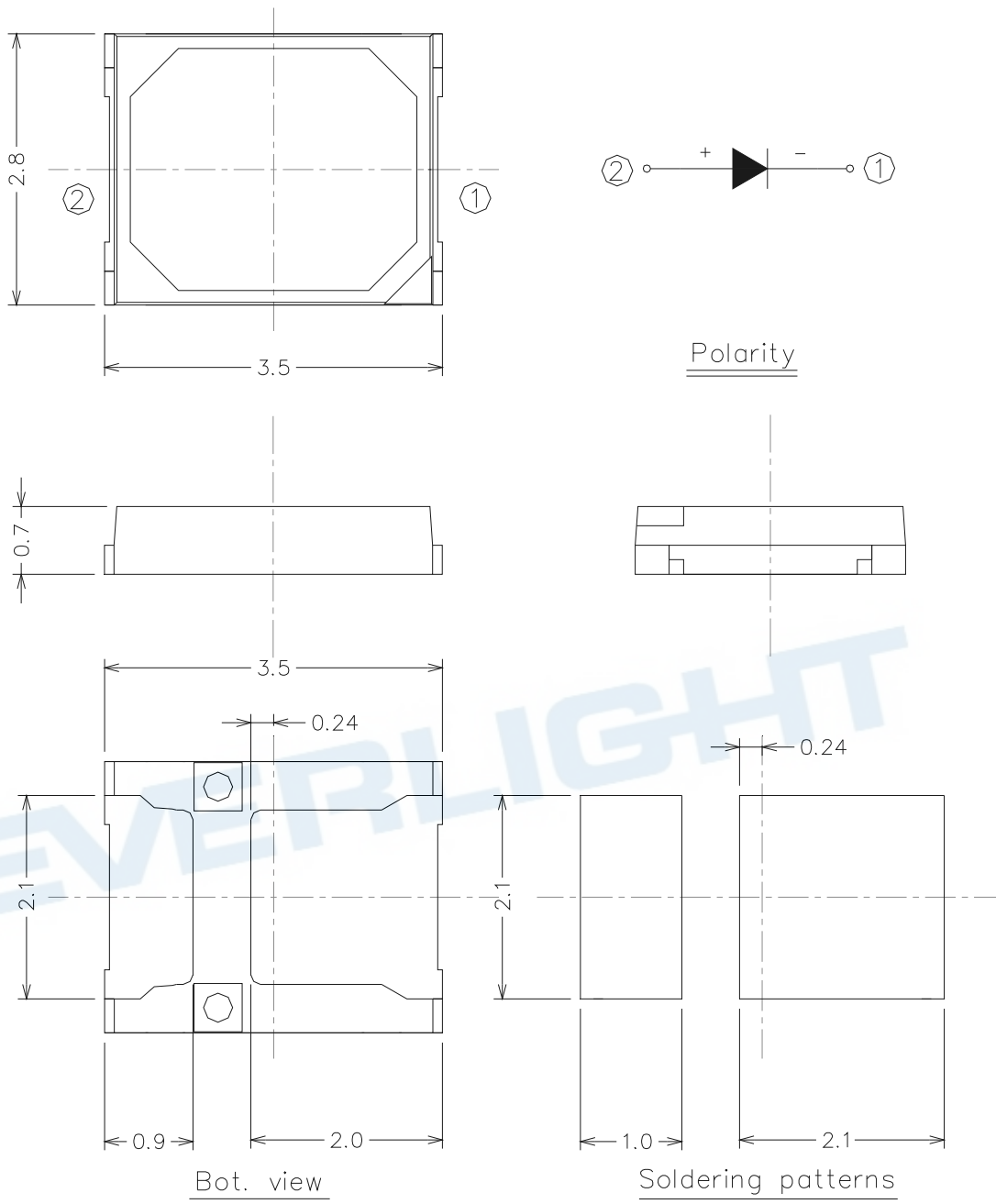


Fig.6 - Radiation Diagram



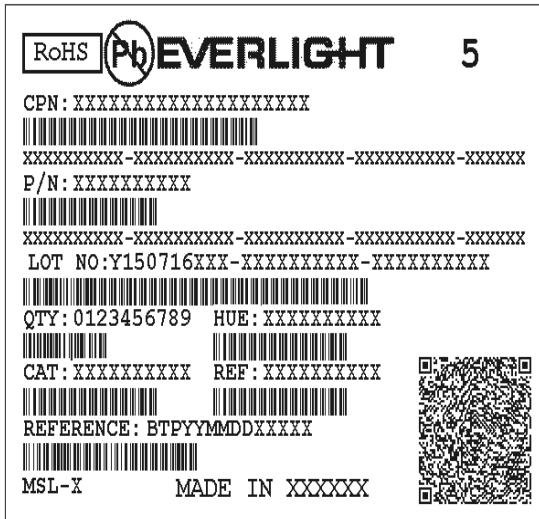
Package Dimension



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

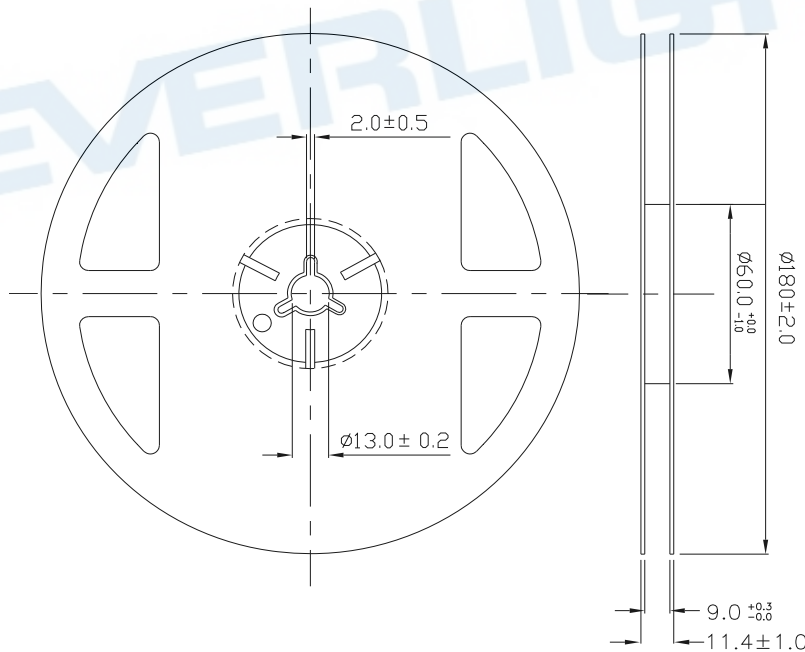
Moisture Resistant Packing Materials

Label Explanation



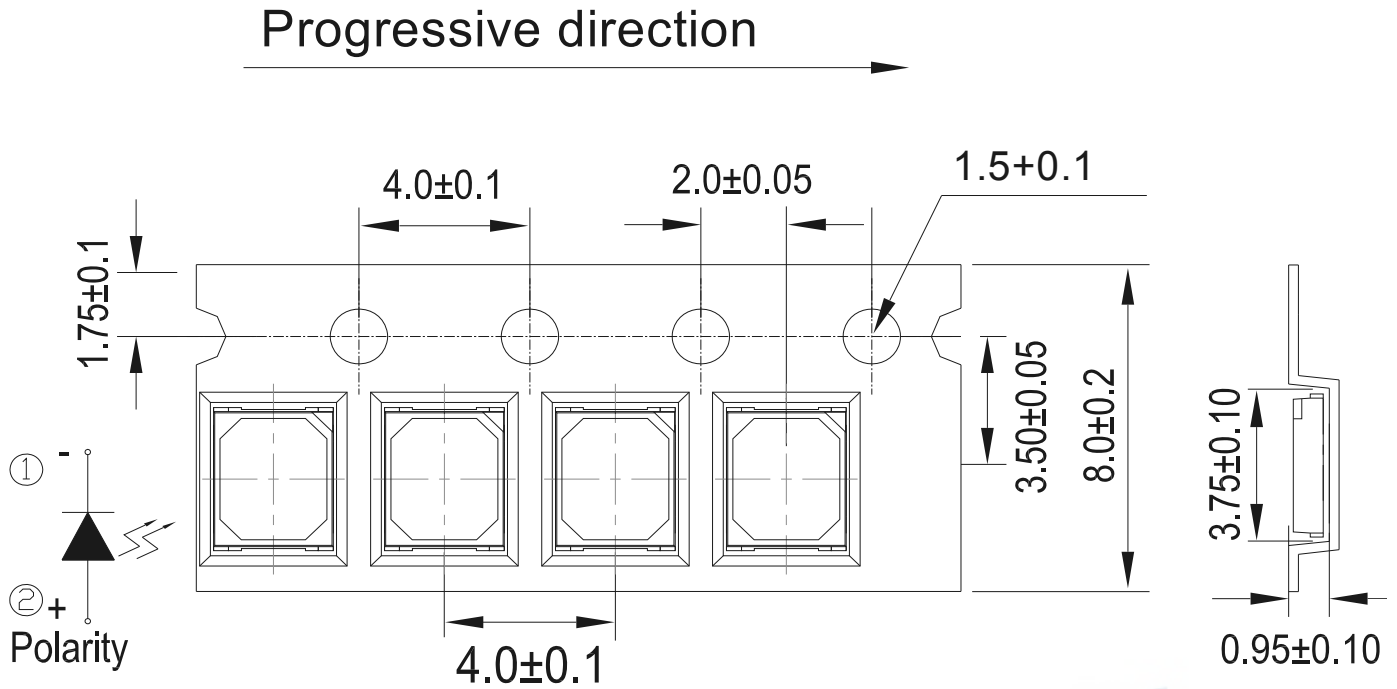
- CPN: Customer's Product Number
- P/N: Product Number
- QTY: Packing Quantity
- CAT: Luminous Intensity Rank
- HUE: Dom. Wavelength Rank
- REF: Forward Voltage Rank
- LOT No: Lot Number

Reel Dimensions



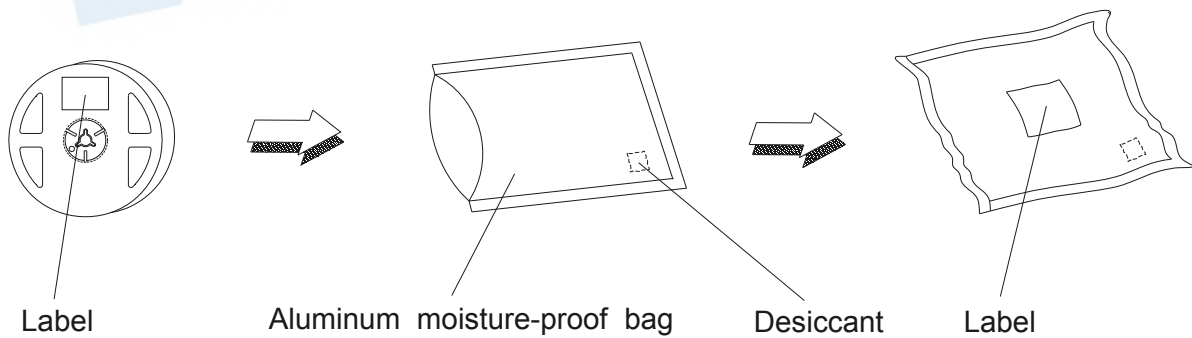
Note:  
 Tolerances unless mentioned ±0.1mm. Unit = mm

Carrier Tape Dimensions: Loaded Quantity 4000 pcs Per Reel



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	Reflow Soldering	Temp. : 260°C/10sec.	6 Min.	22 PCS.	0/1
2	Thermal Shock	H : +100°C 20min ∩ 10 sec L : -10°C 20min	200 Cycles	22 PCS.	0/1
3	Temperature Cycle	H : +100°C 30min ∩ 5 min L : -40°C 30min	200 Cycles	22 PCS.	0/1
4	High Temperature/Humidity Reverse Bias	Ta=85°C,85%RH	1000 Hrs.	22 PCS.	0/1
5	High Temperature/Humidity Operation	Ta=85°C,85%RH, I <sub>F</sub> = 100 mA	1000 Hrs.	22 PCS.	0/1
6	Low Temperature Storage	Ta=-40°C	1000 Hrs.	22 PCS.	0/1
7	High Temperature Storage	Ta=85°C	1000 Hrs.	22 PCS.	0/1
8	Low Temperature Operation Life	Ta=-40°C, I <sub>F</sub> = 180 mA	1000 Hrs.	22 PCS.	0/1
9	High Temperature Operation/ Life#1	Ta=25°C, I <sub>F</sub> = 180 mA	1000 Hrs.	22 PCS.	0/1
10	High Temperature Operation/ Life#2	Ta=55°C, I <sub>F</sub> =180 mA	1000 Hrs.	22 PCS.	0/1
11	High Temperature Operation/ Life#3	Ta=85°C, I <sub>F</sub> = 100 mA	1000 Hrs.	22 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.

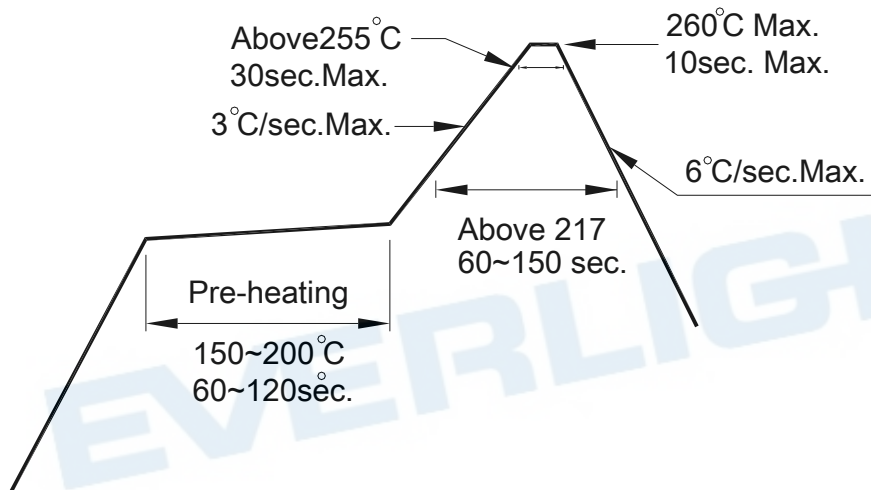
2.3 After opening the package: The LED's floor life is 168 Hrs under 30°C or less and 60% RH or less. If unused LEDs remain, it should be stored in moisture proof packages.

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.

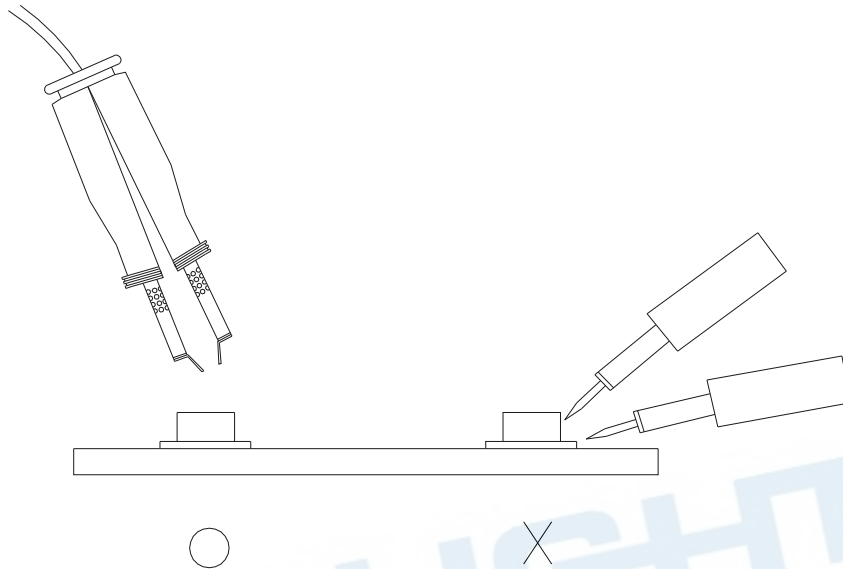
3.4 After soldering, do not warp the circuit board.

#### 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.



## 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.
5. These specification sheets include materials protected under copyright of EVERLIGHT. Reproduction in any form is prohibited without obtaining EVERLIGHT's prior consent.
6. This product is not intended to be used for military, aircraft, automotive, medical,

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