

### SMD ■ MID Power LED 67-24ST/KKE-EXXXXX190Z5/SZM/2T



#### 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

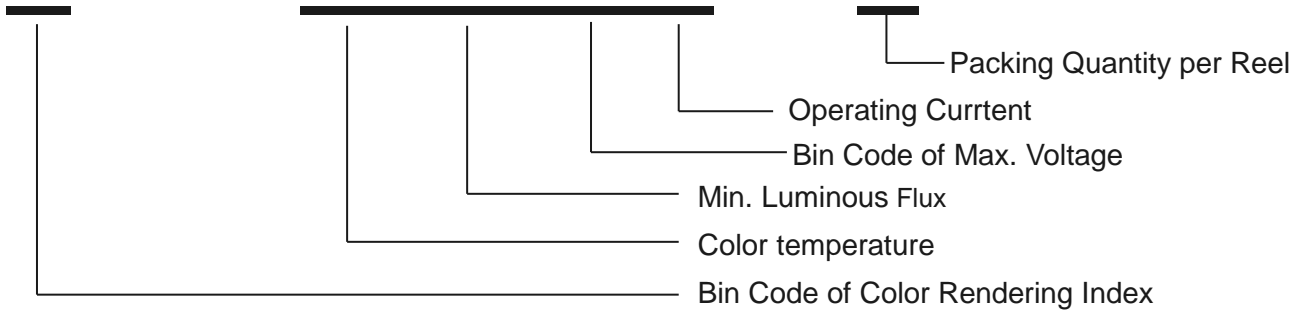
The Everlight 67-24ST package has high efficacy, high CRI, low power consumption, wide viewing angle and a compact form factor. These features make this package an ideal LED for all lighting applications.

#### Applications

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

**Product Number Explanation**

**67-24ST/ K KE - E XX XXX XXX Z5 /SZM/ 2 T**



**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
Z5	I <sub>F</sub> :50mA

**Table of Forward Voltage Index**

Symbol	Description
190	19.0V max

Example:  
 67-24ST/KKE-E27125190Z5/SZM/2T

CRI	80(Min.)
CCT	2700K
Flux	125lm min
V <sub>F</sub>	19.0V max
I <sub>F</sub>	50mA

Mass Production List

CCT(K)	Product <sup>(4)</sup>	CRI Min. <sup>(1)</sup>	Φ(lm) Min. <sup>(2)</sup>	(V <sub>F</sub> ) Max. <sup>(3)</sup>
2700K	67-24ST/KKE-E27125190Z5/SZM/2T	80	125	19.0
3000K	67-24ST/KKE-E30130190Z5/SZM/2T	80	130	19.0
3500K	67-24ST/KKE-E35130190Z5/SZM/2T	80	130	19.0
4000K	67-24ST/KKE-E40135190Z5/SZM/2T	80	135	19.0
5000K	67-24ST/KKE-E50135190Z5/SZM/2T	80	135	19.0
6500K	67-24ST/KKE-E65135190Z5/SZM/2T	80	135	19.0

Notes:

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

EVERLIGHT

## 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>	60	mA
Peak Forward Current (Duty 1/10 @10ms)	I <sub>FP</sub>	120	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>	17	°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	125	-----	-----	lm	I <sub>F</sub> =50mA
Forward Voltage <sub>(2)</sub>	V <sub>F</sub>	-----	-----	19.0	V	I <sub>F</sub> =50mA
Color Rendering Index <sub>(3)</sub>	R <sub>a</sub>	80	-----	87		I <sub>F</sub> =50mA
	R <sub>9</sub>	0	----	----		I <sub>F</sub> =50mA
Viewing Angle	2θ <sub>1/2</sub>	----	120	----	deg	I <sub>F</sub> =50mA

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

Bin Code	Min.	Max.	Unit	Condition
125L5	125	130	lm	I <sub>F</sub> =50mA
130L5	130	135		
135L5	135	140		
140L5	140	145		
145L5	145	150		
150L5	150	155		

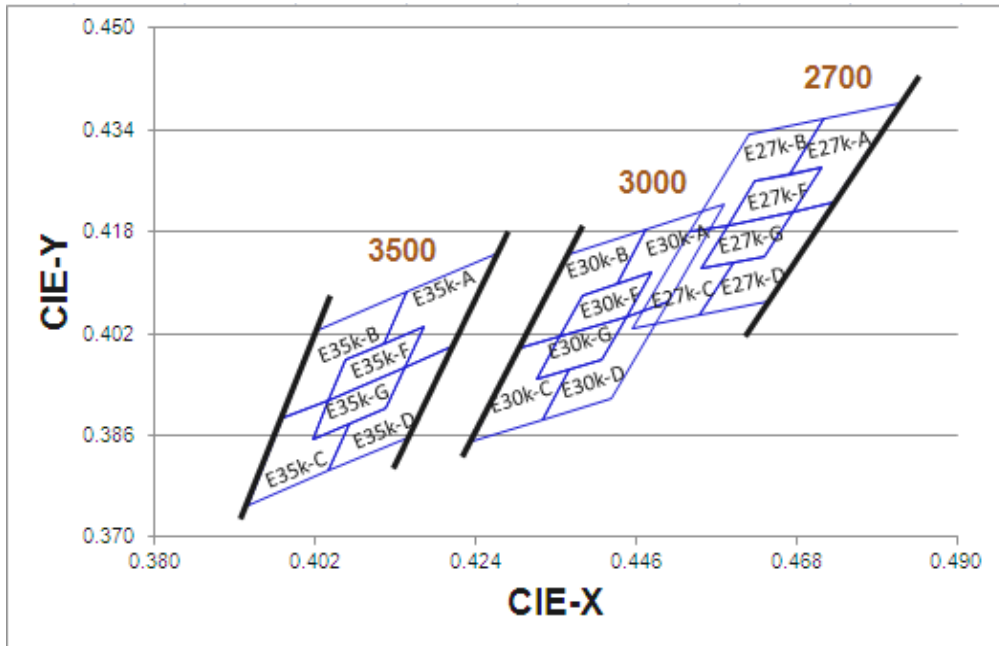
Note:  
Tolerance of Luminous flux: ±11%.

### Bin Range of Forward Voltage

Bin Code	Min.	Max.	Unit	Condition
170E	17.0	17.5	V	I <sub>F</sub> =50mA
175E	17.5	18.0		
180E	18.0	18.5		
185E	18.5	19.0		

Note:  
Tolerance of Forward Voltage: ±0.1V.

The C.I.E. 1931 Chromaticity Diagram

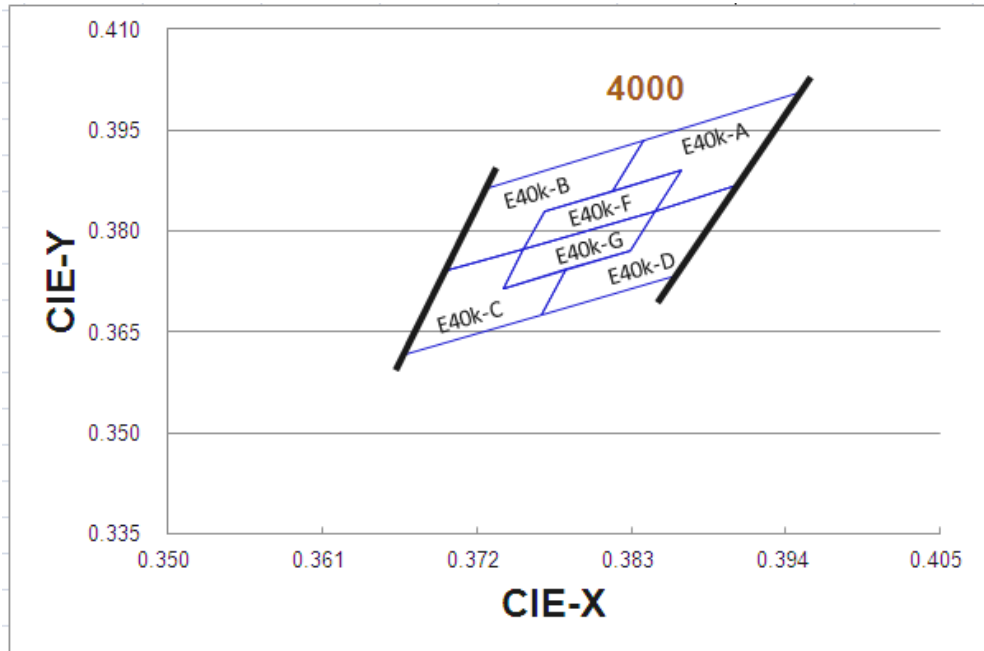


Bin Range of Chromaticity Coordinates

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						

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						
	CCT	Bin Code	CIE_x	CIE_y	Bin Code	CIE_x	CIE_y
	3500K	E35K-A	0.4271	0.4146	E35K-D	0.4209	0.4001
			0.4147	0.4085		0.4144	0.3967
			0.4115	0.4005		0.4118	0.3902
			0.4169	0.4031		0.4067	0.3878
0.4144			0.3967	0.4038		0.3804	
0.4209			0.4001	0.4147		0.3856	
Reference Range: 2810K~2950K							
E35K-B		0.4147	0.4085	E35K-C	0.3976	0.3888	
		0.4022	0.4024		0.3929	0.3751	
		0.3976	0.3888		0.4038	0.3804	
		0.4039	0.3916		0.4067	0.3878	
		0.4061	0.3978		0.4016	0.3853	
		0.4115	0.4005		0.4356	0.4015	
Reference Range: 2950K~3100K							
E35K-F		0.4169	0.4031	E35K-G	0.4144	0.3967	
		0.4061	0.3978		0.4039	0.3916	
		0.4039	0.3916		0.4016	0.3853	
		0.4144	0.3967		0.4118	0.3902	
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

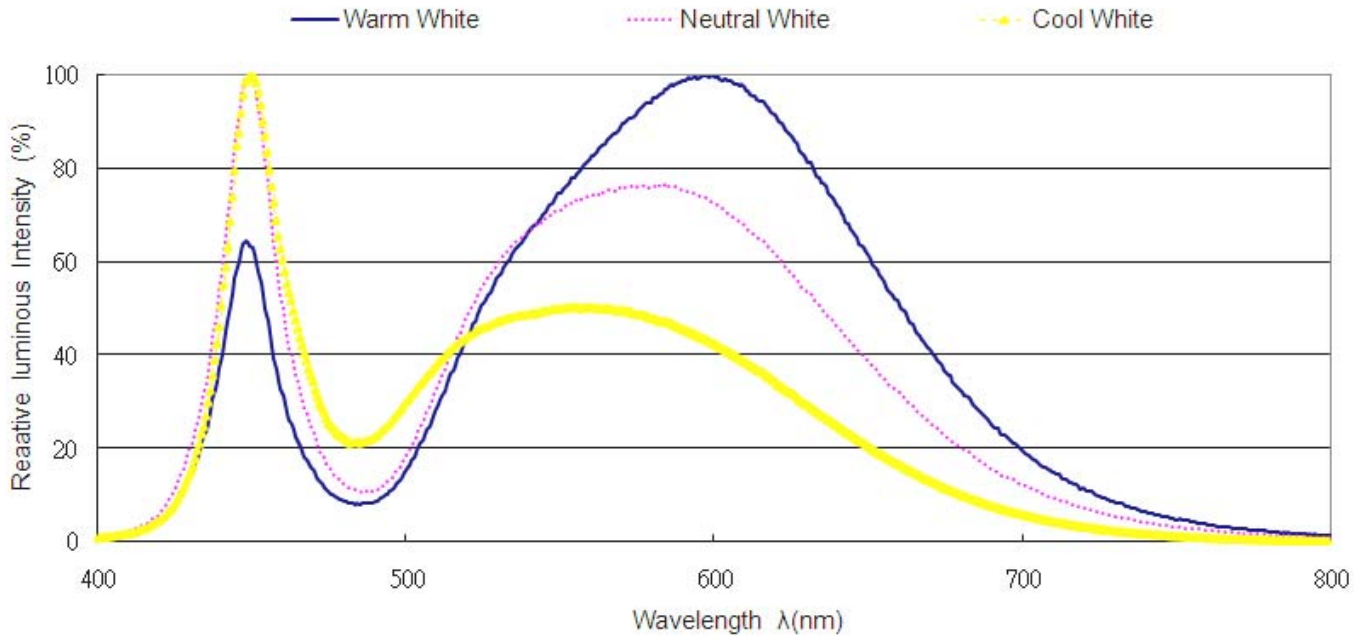
CCT	Bin Code	CIE_x	CIE_y	Bin Code	CIE_x	CIE_y	
5000K	E50K-A	0.3542	0.3761	E50K-D	0.3528	0.3648	
		0.3470	0.3702		0.3491	0.3616	
		0.3465	0.3640		0.3486	0.3566	
		0.3496	0.3665		0.3457	0.3543	
		0.3491	0.3616		0.3451	0.3485	
		0.3528	0.3648		0.3514	0.3535	
	Reference Range:4800K~5000K						
	E50K-B	0.3470	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						

Notes:

1. The value is based on driving current by 50mA.
2. Tolerance of Chromaticity Coordinates:  $\pm 0.01$ .

Spectrum Distribution



Typical Electro-Optical Characteristics Curves

Fig.1 – Forward Voltage Shift vs. Junction Temperature

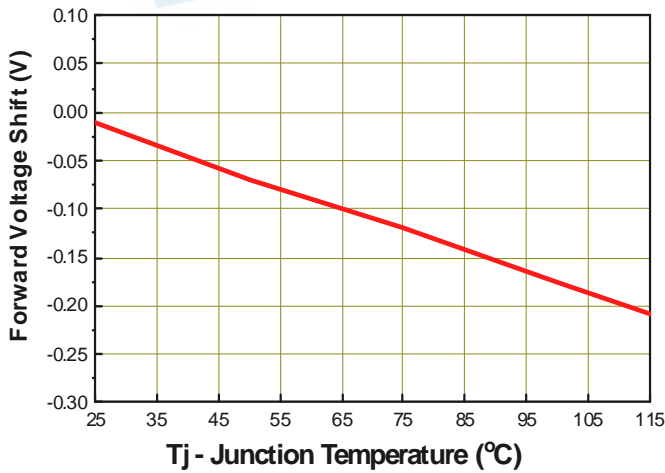
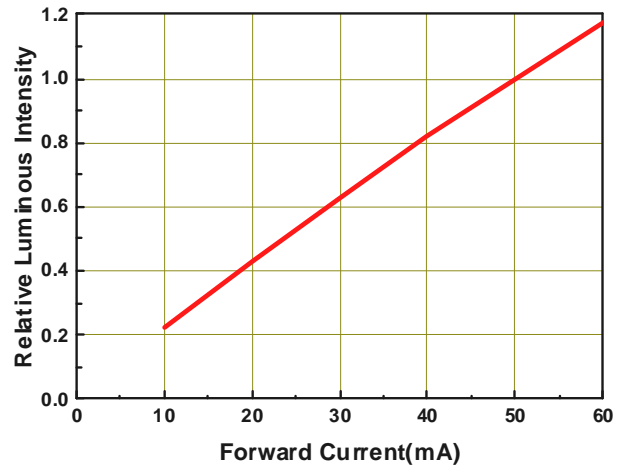


Fig.2 - Relative Luminous Intensity vs. Forward Current



Typical Electro-Optical Characteristics Curves

Fig.3 - Relative Luminous Intensity vs. Junction Temperature

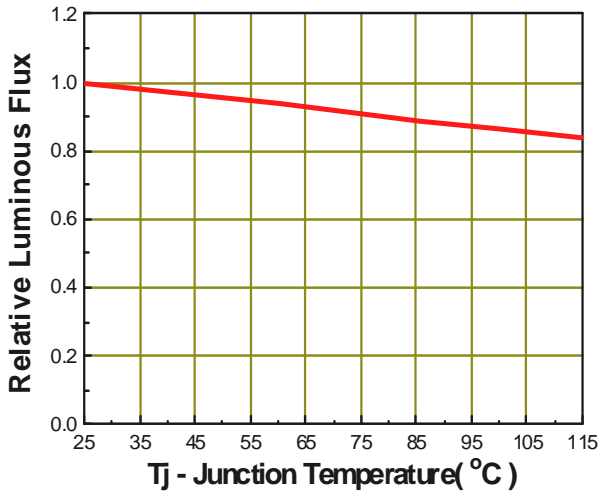


Fig.4 - Forward Current vs. Forward Voltage

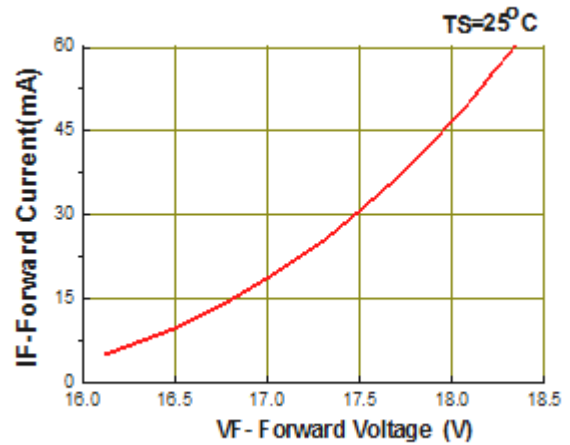


Fig.5 - Max. Driving Forward Current vs. Soldering Temperature

Rth j-s=17 °C/W

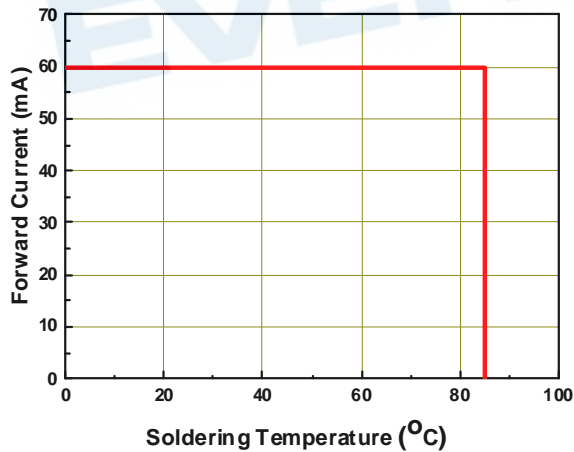
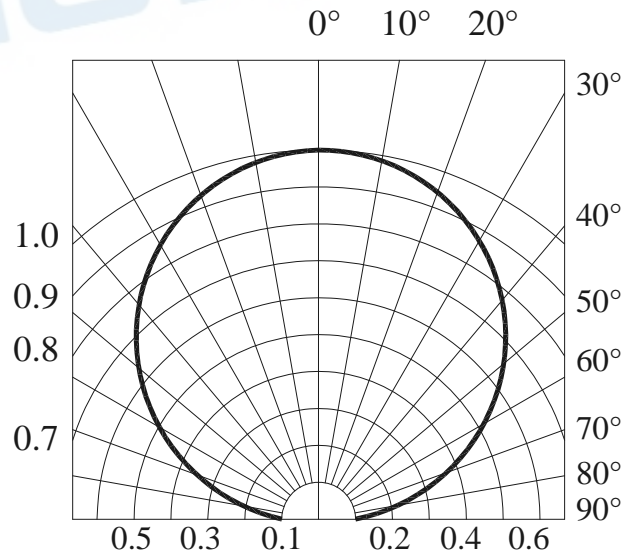
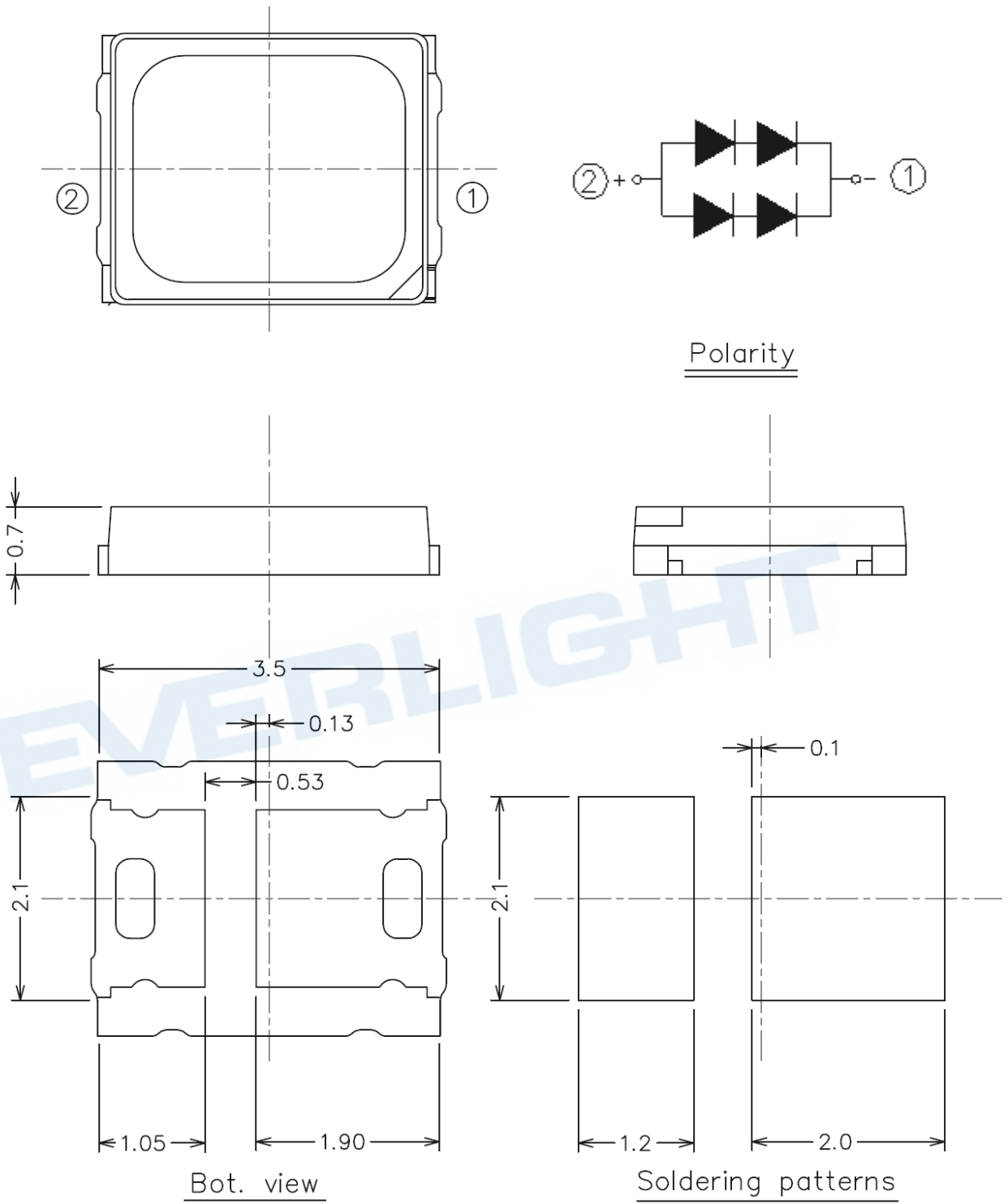


Fig.6 - Radiation Diagram



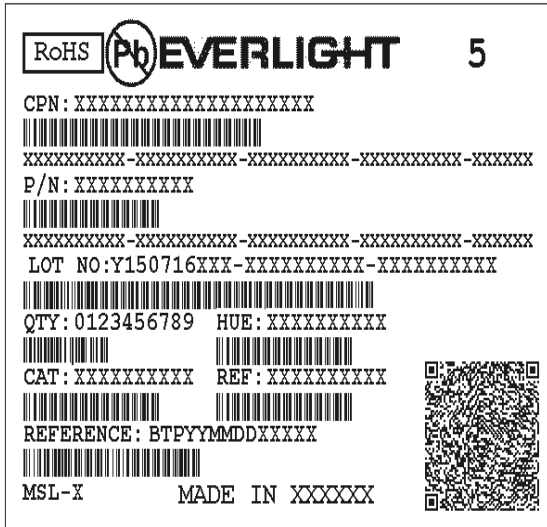
Package Dimension



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

**Moisture Resistant Packing Materials**

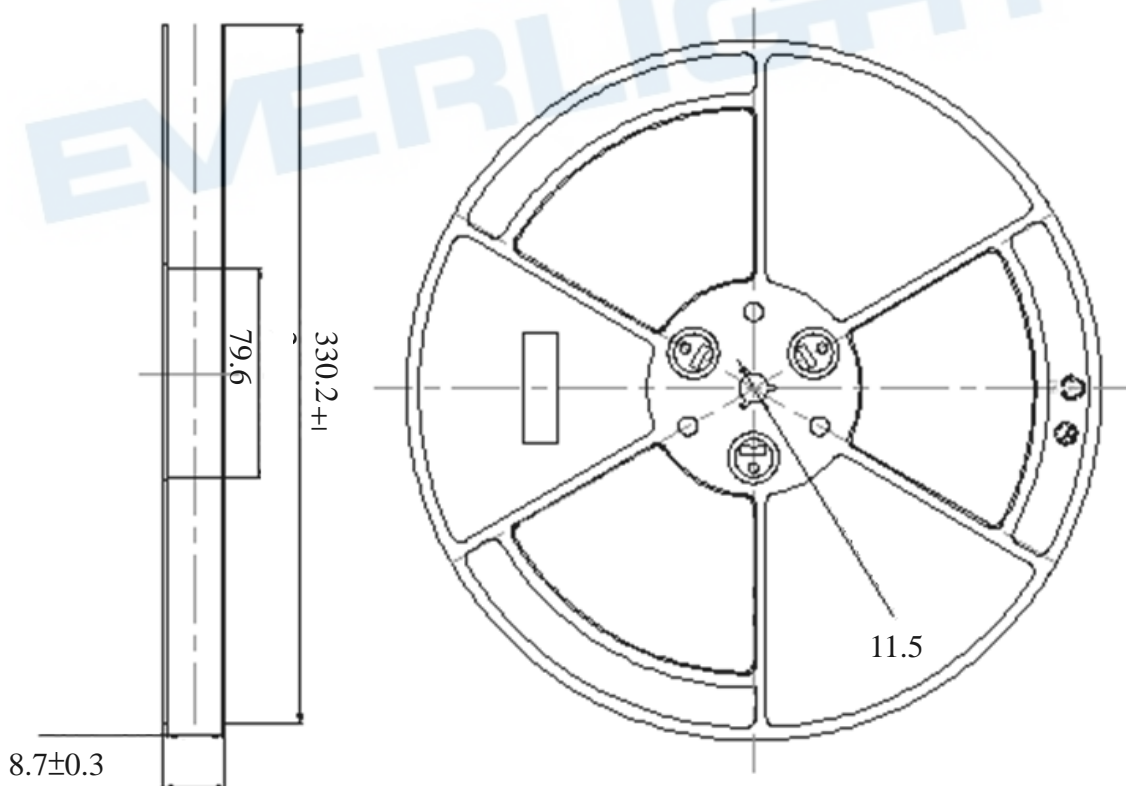
**Label Explanation**



- 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

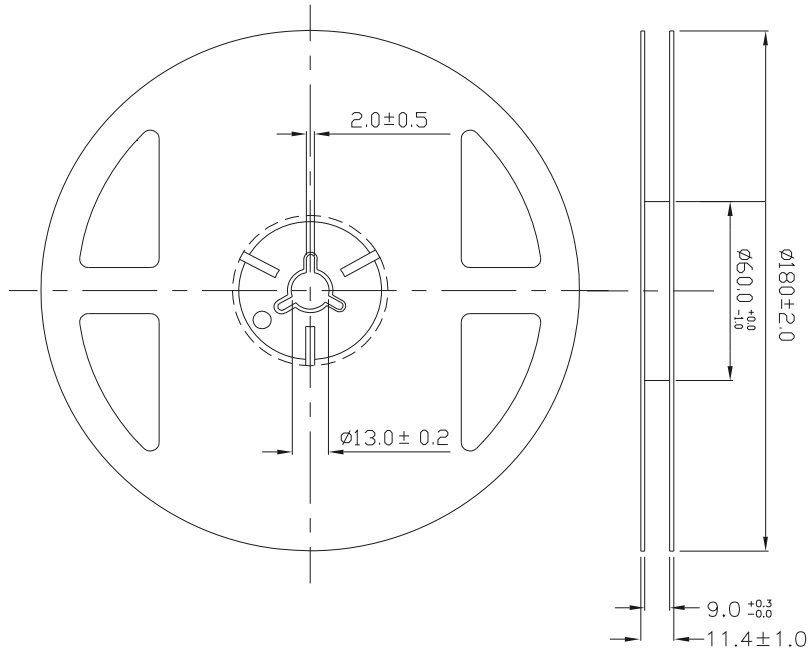
**Reel Dimensions**

**1.Carrier Tape Dimensions:**



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

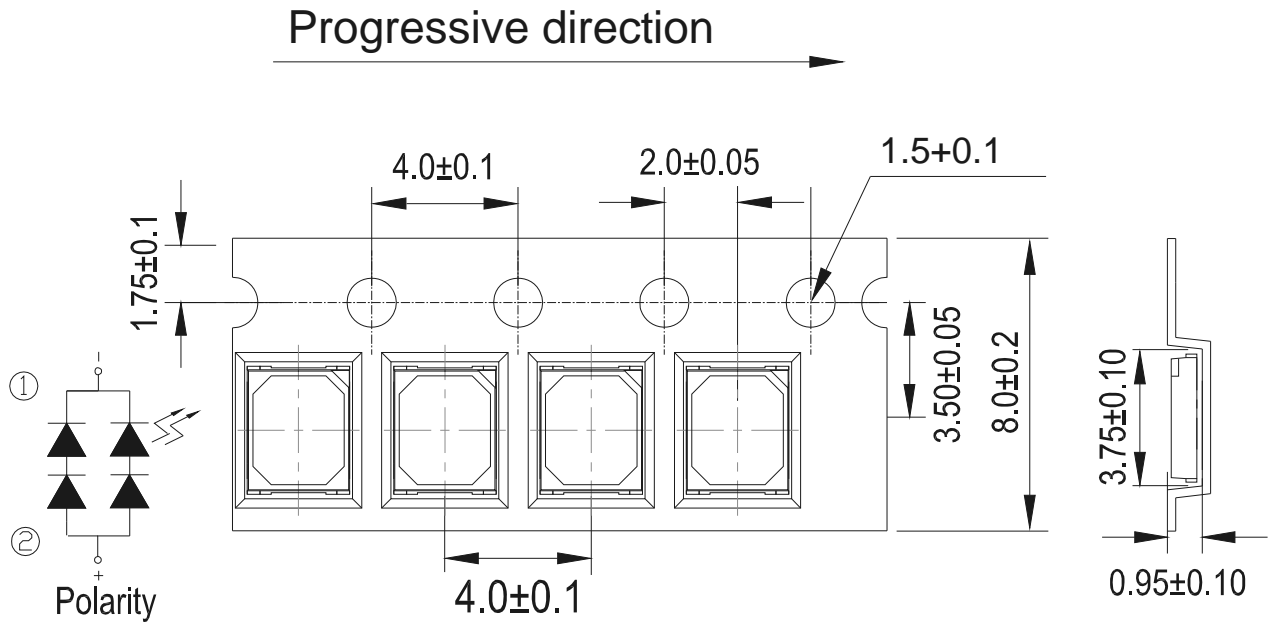
## 2. Carrier Tape Dimensions:



### 2-1. Loaded Quantity 500/1000/1500/2000/2500/3000/3500/4000 pcs Per Reel

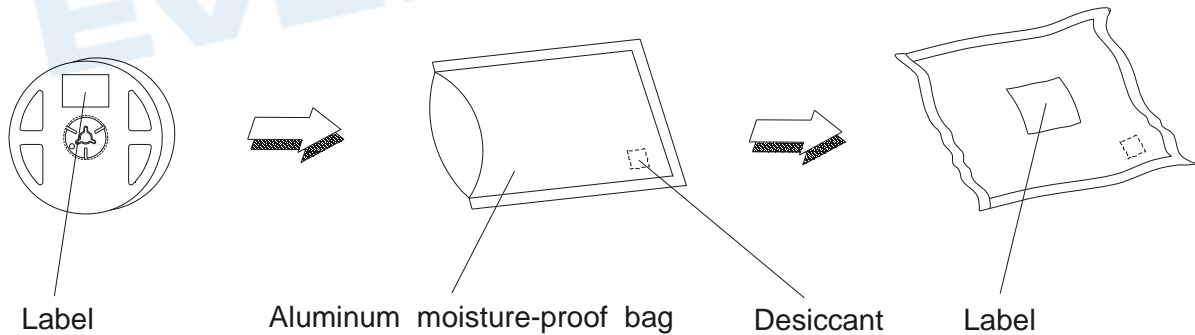
Note:  
Tolerances unless mentioned  $\pm 0.1$  mm. Unit = mm

EVERLIGHT



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> = 60mA	1000 Hrs.	8 PCS.	0/1
4	Low Temperature Life	Ta=-40°C, I <sub>F</sub> = 60 mA	1000 Hrs.	8 PCS.	0/1
5	High Temperature Life	Ta=60°C, I <sub>F</sub> =60 mA	3000 Hrs.	8 PCS.	0/1
6	High Temperature Life	Ta=85°C, I <sub>F</sub> =60 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> = 40 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.

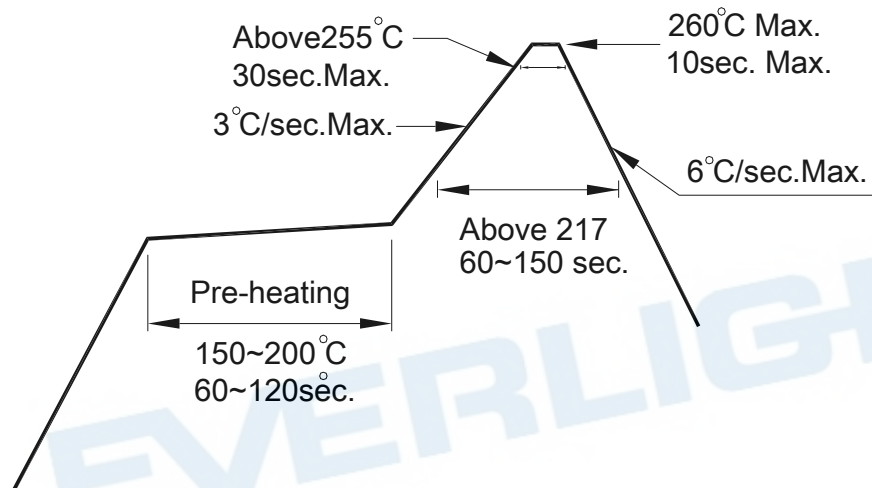
2.3 After opening the package: The LED's floor life is 168 Hrs under 30°C or less and 60% RH or less. If unused LEDs remain, it should be stored in moisture proof packages.

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.

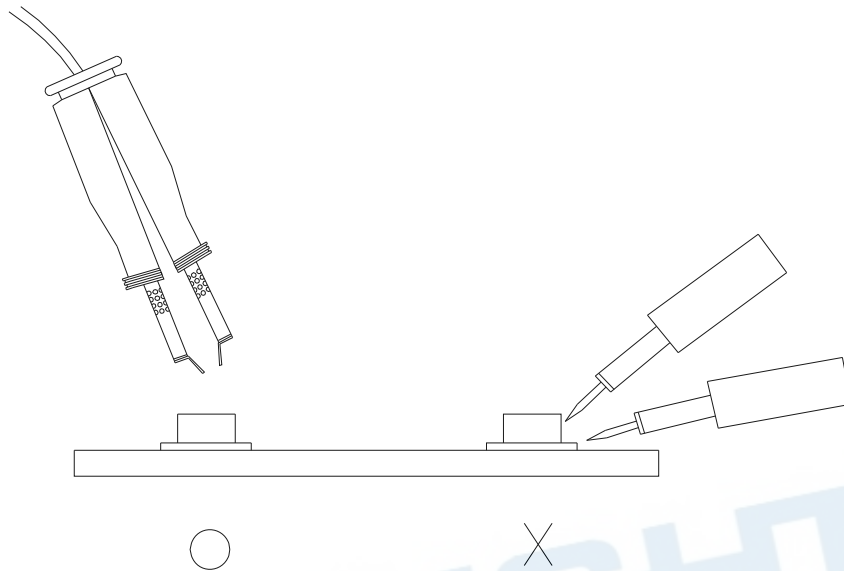
3.4 After soldering, do not warp the circuit board.

#### 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.



EVERLIGHT

## 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,

EVERLIGHT