

SMD ■ MID Power LED

67-21S/KK5C-HXXXXXXXXX2833Z6/2T(EMM)



Features

- PLCC-2 package
- Top view white LED
- High luminous intensity output
- Wide viewing angle
- Pb-free
- RoHS compliant
- ANSI 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 – H XX XX XX XX XXXX Z6 / 2T

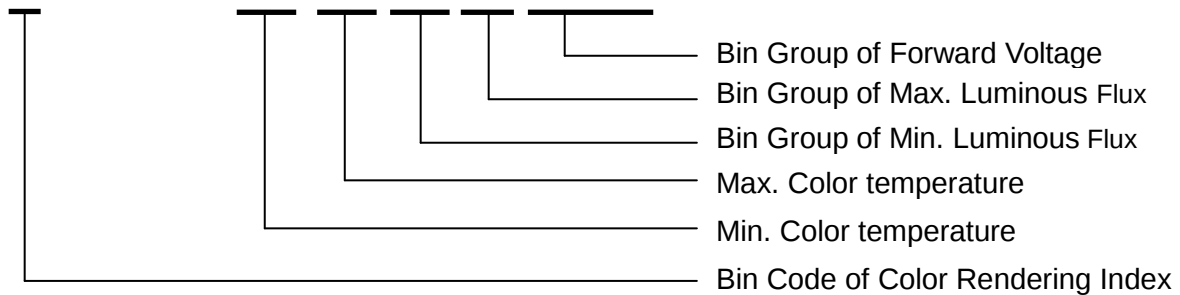


Table of Color Rendering Index

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
Z6	I _F :60mA

Example:
67-21S/KK5C-H6565N32P02833Z6/2T(EMM)

CRI	80(Min.)
CCT	6500K
Flux	26~36lm
V _F	2.8~3.3V
I _F	60mA

Mass Production List

Product	CRI Min. (1)	CCT(K)	Φ(lm) Min. (2)	Φ(lm) Max. (2)
67-21S/KK5C-H2727M41N42833Z6/2T(EMM)	80	2700K	22	33
67-21S/KK5C-H3030N3N4B2833Z6/2T(EMM)	80	3000K	24	33
67-21S/KK5C-H4040N31P02833Z6/2T(EMM)	80	4000K	25	36
67-21S/KK5C-H5050N32P02833Z6/2T(EMM)	80	5000K	26	36
67-21S/KK5C-H5757N32P02833Z6/2T(EMM)	80	5700K	26	36
67-21S/KK5C-H6060N32P02833Z6/2T(EMM)	80	6000K	26	36
67-21S/KK5C-H6565N32P02833Z6/2T(EMM)	80	6500K	26	36

Notes:

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

Device Selection Guide

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

Absolute Maximum Ratings ($T_{\text{Soldering}}=25^{\circ}\text{C}$)

Parameter	Symbol	Rating	Unit
Forward Current	I_F	75	mA
Peak Forward Current (Duty 1/10 @10ms)	I_{FP}	100	mA
Power Dissipation	P_d	250	mW
Operating Temperature	T_{opr}	-40 ~ +85	$^{\circ}\text{C}$
Storage Temperature	T_{stg}	-40 ~ +100	$^{\circ}\text{C}$
Thermal Resistance (Junction / Soldering point)	$R_{th\ J-S}$	45	$^{\circ}\text{C/W}$
Junction Temperature	T_j	125	$^{\circ}\text{C}$
Soldering Temperature	T_{sol}	Reflow Soldering : 260 $^{\circ}\text{C}$ for 10 sec. Hand Soldering : 350 $^{\circ}\text{C}$ for 3 sec.	

Note:

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

Electro-Optical Characteristics ($T_{\text{Soldering}}=25^{\circ}\text{C}$)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Luminous Flux ₍₁₎	Φ	22	-----	36	lm	$I_F=60\text{mA}$
Forward Voltage ₍₂₎	V_F	2.8	-----	3.3	V	$I_F=60\text{mA}$
Color Rendering Index ₍₃₎	Ra	80	-----	-----		$I_F=60\text{mA}$
Viewing Angle	$2\theta_{1/2}$	-----	120	-----	deg	$I_F=60\text{mA}$
Reverse Current	I_R	-----	-----	50	μA	$V_R=5\text{V}$

Notes:

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

Bin Range of Luminous Flux

Bin Code	Min.	Max.	Unit	Condition
M41	22	24	lm	I _F =60mA
N3X	24	28		
N31	25	28		
N32	26	28		
N42	28	30		
N4B	30	33		
P0	33	36		

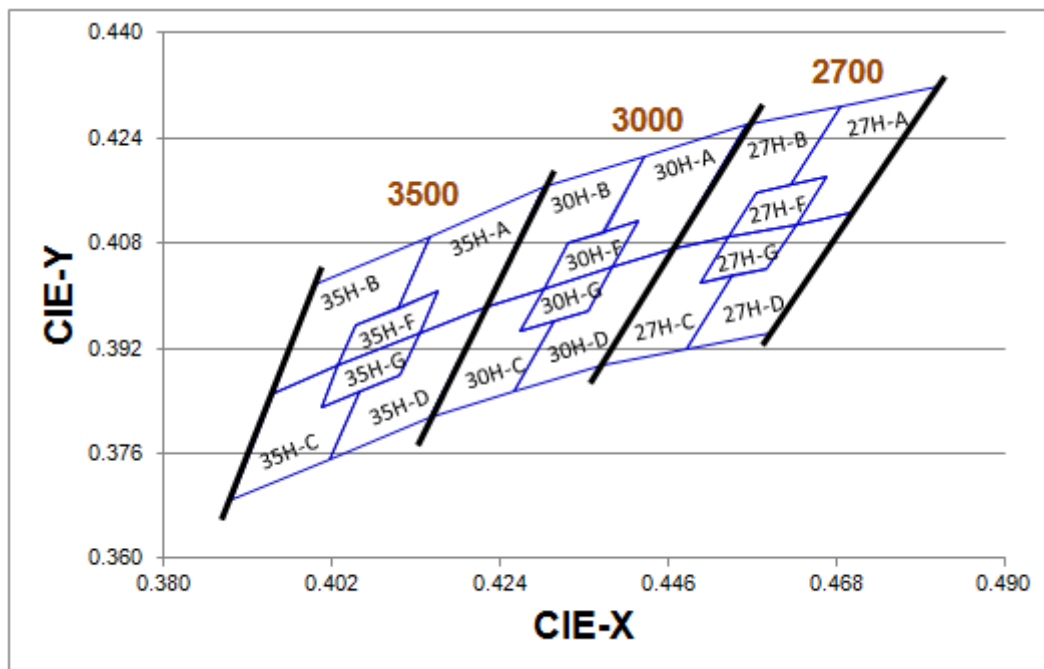
Note:
Tolerance of Luminous flux: ±11%.

Bin Range of Forward Voltage

Group	Bin Code	Min.	Max.	Unit	Condition
2833	35	2.8	2.9	V	I _F =60mA
	36	2.9	3.0		
	37	3.0	3.1		
	38	3.1	3.2		
	39	3.2	3.3		

Note:
Tolerance of Forward Voltage: ±0.1V.

The C.I.E. 1931 Chromaticity Diagram

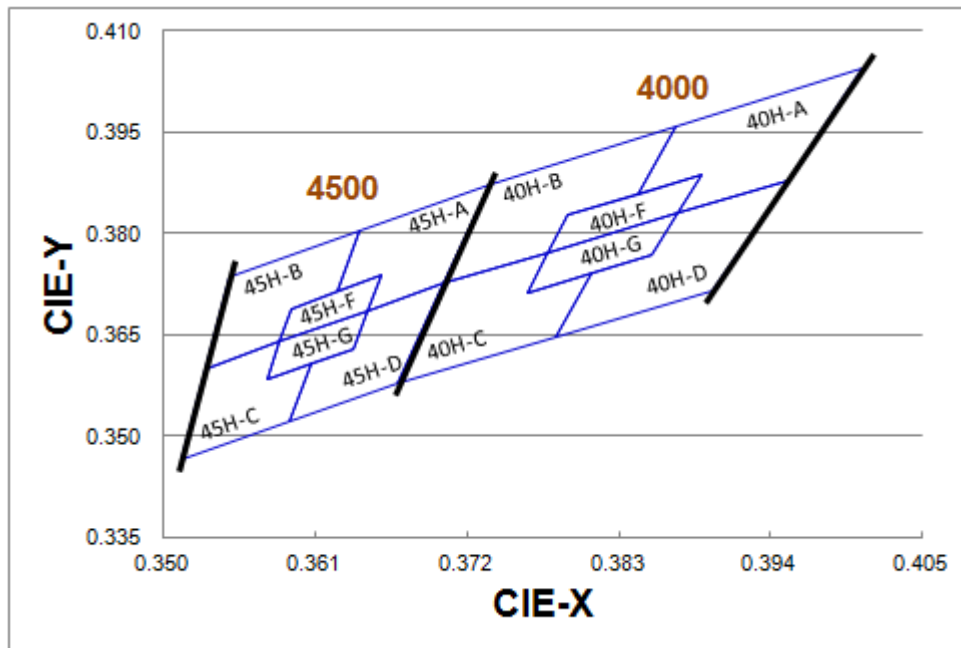


Bin Range of Chromaticity Coordinates

CCT	Bin Code	CIE_x	CIE_y	Bin Code	CIE_x	CIE_y
2700K	27H-A	0.4813	0.4319	27H-D	0.4700	0.4126
		0.4687	0.4289		0.4627	0.4109
		0.4621	0.4169		0.4588	0.4041
		0.4667	0.4180		0.4544	0.4030
		0.4627	0.4109		0.4483	0.3919
		0.4700	0.4126		0.4593	0.3944
	Reference Range:2580K~2700K					
	27H-B	0.4687	0.4289	27H-C	0.4465	0.4071
		0.4562	0.4260		0.4373	0.3893
		0.4465	0.4071		0.4483	0.3919
		0.4539	0.4088		0.4544	0.4030
		0.4576	0.4158		0.4502	0.4020
		0.4621	0.4169		0.4539	0.4088
	Reference Range:2700K~2870K					
	27H-F	0.4667	0.4180	27H-G	0.4627	0.4109
		0.4576	0.4158		0.4539	0.4088
		0.4539	0.4088		0.4502	0.4020
		0.4627	0.4109		0.4588	0.4041
	Reference Range: 2665K~2770K					

CCT	Bin Code	CIE_x	CIE_y	Bin Code	CIE_x	CIE_y
3000K	30H-A	0.4562	0.4260	30H-D	0.4465	0.4071
		0.4430	0.4212		0.4388	0.4043
		0.4375	0.4096		0.4355	0.3977
		0.4422	0.4113		0.4311	0.3962
		0.4388	0.4043		0.4259	0.3853
		0.4465	0.4071		0.4373	0.3893
	Reference Range:2870K~3000K					
	30H-B	0.4430	0.4212	30H-C	0.4221	0.3984
		0.4299	0.4165		0.4147	0.3814
		0.4221	0.3984		0.4259	0.3853
		0.4297	0.4011		0.4311	0.3962
		0.4328	0.4079		0.4267	0.3946
		0.4375	0.4096		0.4297	0.4011
	Reference Range:3000K~3220K					
	30H-F	0.4422	0.4113	30H-G	0.4388	0.4043
		0.4328	0.4079		0.4297	0.4011
		0.4297	0.4011		0.4267	0.3946
		0.4388	0.4043		0.4355	0.3977
	Reference Range:2960K~3080K					

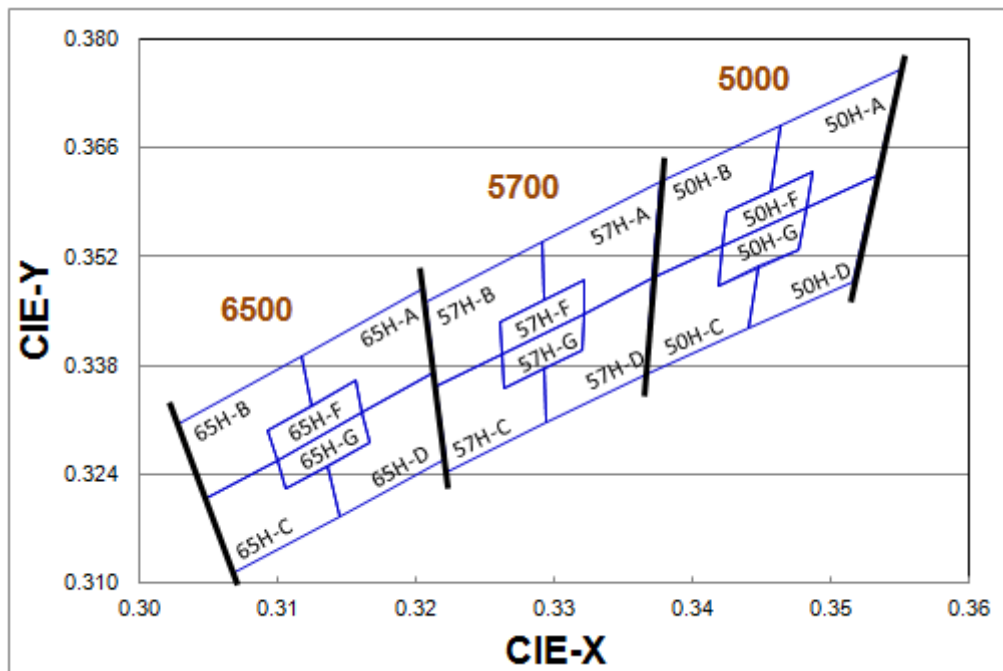
The C.I.E. 1931 Chromaticity Diagram



Bin Range of Chromaticity Coordinates

CCT	Bin Code	CIE_x	CIE_y	Bin Code	CIE_x	CIE_y
4000K	40H-A	0.4006	0.4044	40H-D	0.3952	0.3880
		0.3871	0.3959		0.3873	0.3831
		0.3843	0.3858		0.3854	0.3768
		0.3890	0.3887		0.3810	0.3741
		0.3873	0.3831		0.3784	0.3647
		0.3952	0.3880		0.3898	0.3716
	Reference Range:3700K~3970K					
	40H-B	0.3871	0.3959	40H-C	0.3703	0.3726
		0.3736	0.3874		0.3670	0.3578
		0.3703	0.3726		0.3784	0.3647
		0.3779	0.3773		0.3810	0.3741
		0.3793	0.3828		0.3764	0.3713
		0.3843	0.3858		0.3779	0.3773
	Reference Range:3970K~4270K					
	40H-F	0.3890	0.3887	40H-G	0.3873	0.3831
		0.3793	0.3828		0.3779	0.3773
		0.3779	0.3773		0.3764	0.3713
		0.3873	0.3831		0.3854	0.3768
	Reference Range:3870K~4080K					

The C.I.E. 1931 Chromaticity Diagram



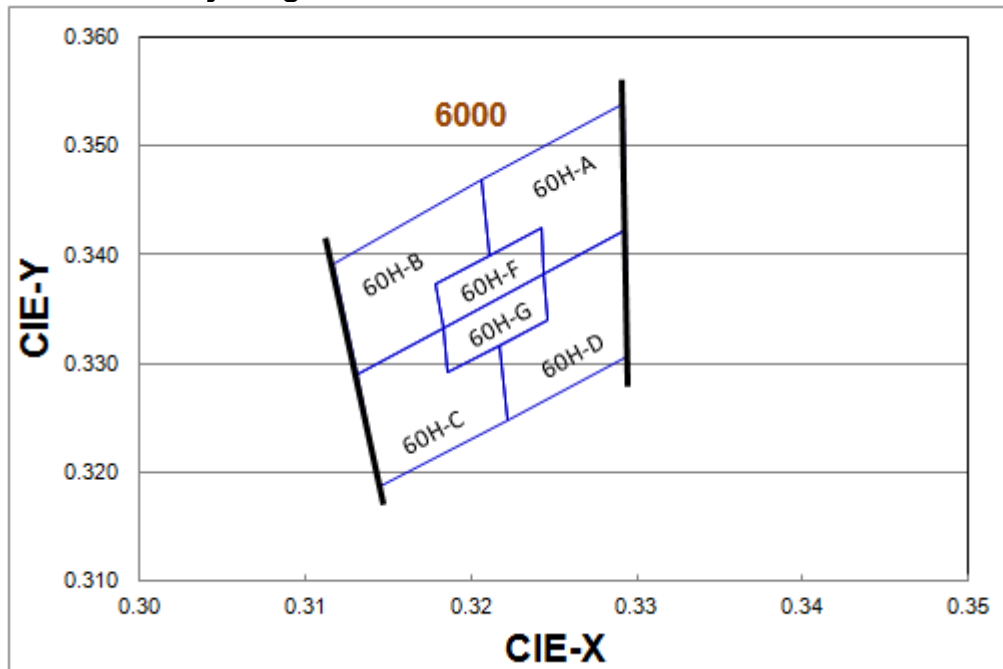
Bin Range of Chromaticity Coordinates

CCT	Bin Code	CIE_x	CIE_y	Bin Code	CIE_x	CIE_y
5000K	50H-A	0.3551	0.3760	50H-D	0.3533	0.3624
		0.3464	0.3688		0.3482	0.3583
		0.3456	0.3604		0.3477	0.3530
		0.3487	0.3629		0.3448	0.3507
		0.3482	0.3583		0.3441	0.3428
		0.3533	0.3624		0.3515	0.3487
	Reference Range:4745K~5000K					
	50H-B	0.3464	0.3688	50H-C	0.3371	0.3493
		0.3376	0.3616		0.3366	0.3369
		0.3371	0.3493		0.3441	0.3428
		0.3422	0.3533		0.3448	0.3507
		0.3425	0.3579		0.3418	0.3483
		0.3456	0.3604		0.3422	0.3533
	Reference Range:5000K~5310K					
	50H-F	0.3487	0.3629	50H-G	0.3482	0.3583
		0.3425	0.3579		0.3422	0.3533
		0.3422	0.3533		0.3418	0.3483
		0.3482	0.3583		0.3477	0.3530
	Reference Range:4910K~5120K					

CCT	Bin Code	CIE_x	CIE_y	Bin Code	CIE_x	CIE_y
5700K	57H-A	0.3376	0.3616	57H-D	0.3371	0.3493
		0.3292	0.3539		0.3321	0.3447
		0.3292	0.3464		0.3320	0.3401
		0.3321	0.3490		0.3293	0.3377
		0.3321	0.3447		0.3294	0.3306
		0.3371	0.3493		0.3366	0.3369
	Reference Range:5310K~5700K					
	57H-B	0.3292	0.3539	57H-C	0.3215	0.3353
		0.3207	0.3462		0.3222	0.3243
		0.3215	0.3353		0.3294	0.3306
		0.3262	0.3395		0.3293	0.3377
		0.3261	0.3436		0.3263	0.335
		0.3292	0.3464		0.3262	0.3395
	Reference Range:5700K~6020K					
	57H-F	0.3321	0.3490	57H-G	0.3321	0.3447
		0.3261	0.3436		0.3262	0.3395
		0.3262	0.3395		0.3263	0.3350
		0.3321	0.3447		0.3320	0.3401
	Reference Range:5520K~5780K					

CCT	Bin Code	CIE_x	CIE_y	Bin Code	CIE_x	CIE_y
6500K	65H-A	0.3205	0.3481	65H-D	0.3213	0.3371
		0.3117	0.3393		0.3161	0.3320
		0.3125	0.3328		0.3166	0.3281
		0.3157	0.3360		0.3136	0.3251
		0.3161	0.3320		0.3145	0.3187
		0.3213	0.3371		0.3221	0.3261
	Reference Range:6020K~6500K					
	65H-B	0.3117	0.3393	65H-C	0.3048	0.3209
		0.3028	0.3304		0.3068	0.3113
		0.3048	0.3209		0.3145	0.3187
		0.3100	0.3259		0.3136	0.3251
		0.3093	0.3297		0.3106	0.3222
		0.3125	0.3328		0.31	0.3259
	Reference Range:6500K~7050K					
	65H-F	0.3157	0.3360	65H-G	0.3161	0.3320
		0.3093	0.3297		0.3100	0.3259
		0.3100	0.3259		0.3106	0.3222
		0.3161	0.3320		0.3166	0.3281
	Reference Range:6300K~6690K					

The C.I.E. 1931 Chromaticity Diagram



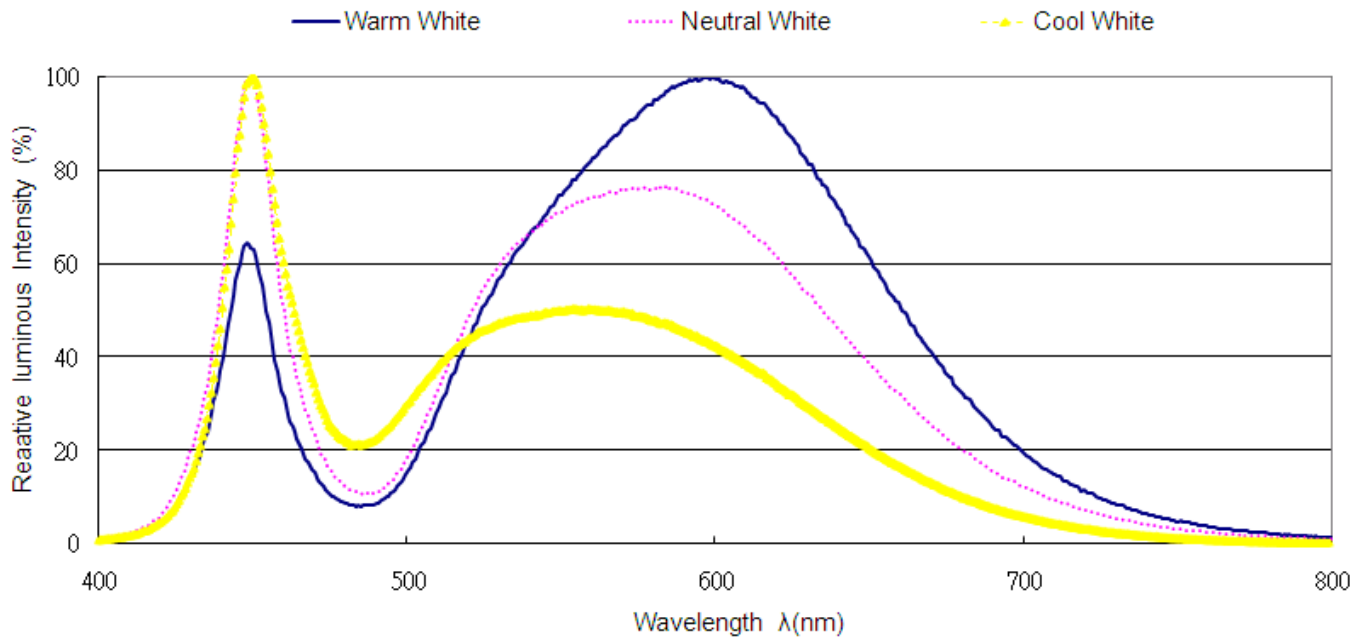
Bin Range of Chromaticity Coordinates

CCT	Bin Code	CIE_x	CIE_y	Bin Code	CIE_x	CIE_y
6000K	60H-A	0.3292	0.3539	60H-D	0.3293	0.3423
		0.3206	0.3468		0.3244	0.3382
		0.3211	0.3399		0.3246	0.3340
		0.3242	0.3424		0.3217	0.3317
		0.3244	0.3382		0.3222	0.3248
		0.3293	0.3423		0.3294	0.3306
	Reference Range:5700K~6020K					
	60H-B	0.3206	0.3468	60H-C	0.3131	0.3290
		0.3117	0.3392		0.3145	0.3187
		0.3131	0.3290		0.3222	0.3248
		0.3183	0.3332		0.3217	0.3317
		0.3179	0.3373		0.3186	0.3292
		0.3211	0.3399		0.3183	0.3332
	Reference Range:6020K~6500K					
	60H-F	0.3242	0.3424	60H-G	0.3244	0.3382
		0.3179	0.3373		0.3183	0.3332
		0.3183	0.3332		0.3186	0.3292
		0.3244	0.3382		0.3246	0.3340
	Reference Range: 5870K~6190K					

Notes:

1. The value is based on driving current by 60mA.
2. Tolerance of Chromaticity Coordinates: ± 0.01 .

Spectrum Distribution



Typical Electro-Optical Characteristics Curves

Fig.1 – Forward Voltage Shift vs. Junction Temperature

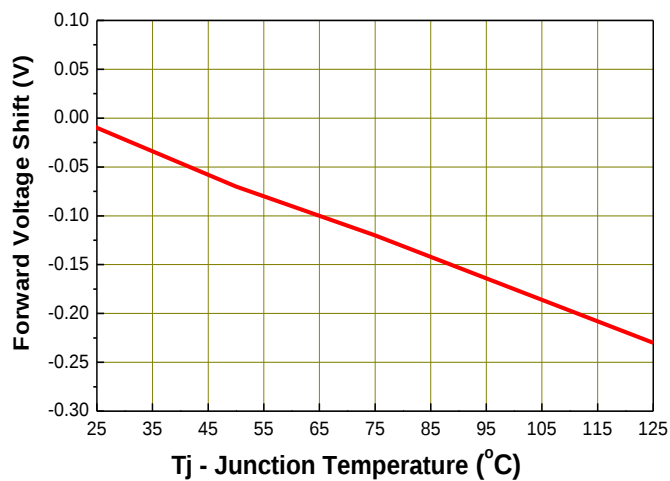
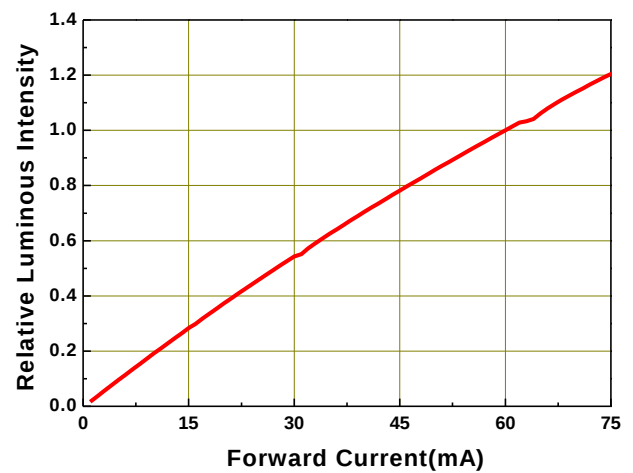


Fig.2 - Relative Luminous Intensity vs. Forward Current



Typical Electro-Optical Characteristics Curves

Fig.3 - Relative Luminous Intensity vs. Junction Temperature

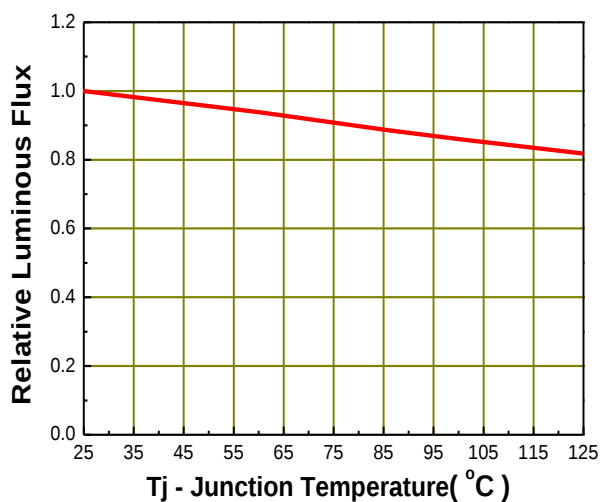


Fig.4 - Forward Current vs. Forward Voltage

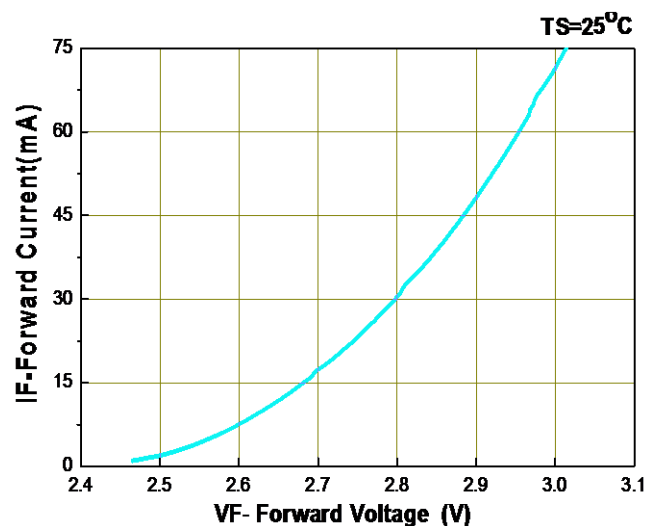


Fig.5 – Max. Driving Forward Current vs. Soldering Temperature

$R_{th\ j-s}=45\ ^\circ\text{C/W}$

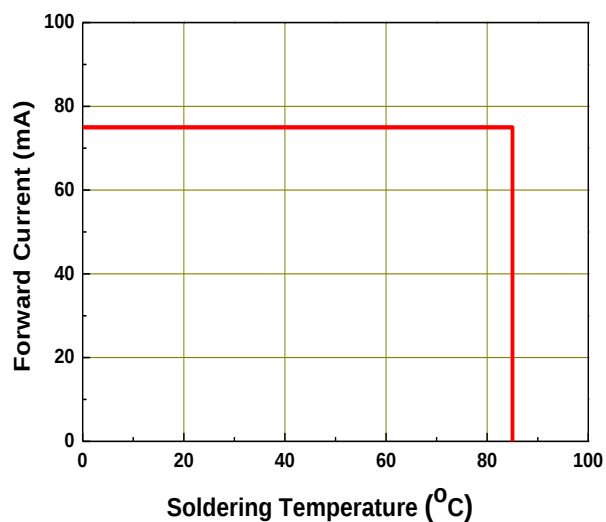
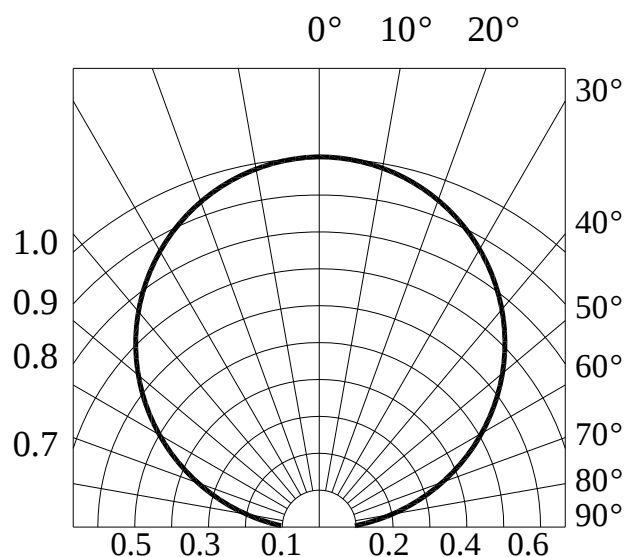
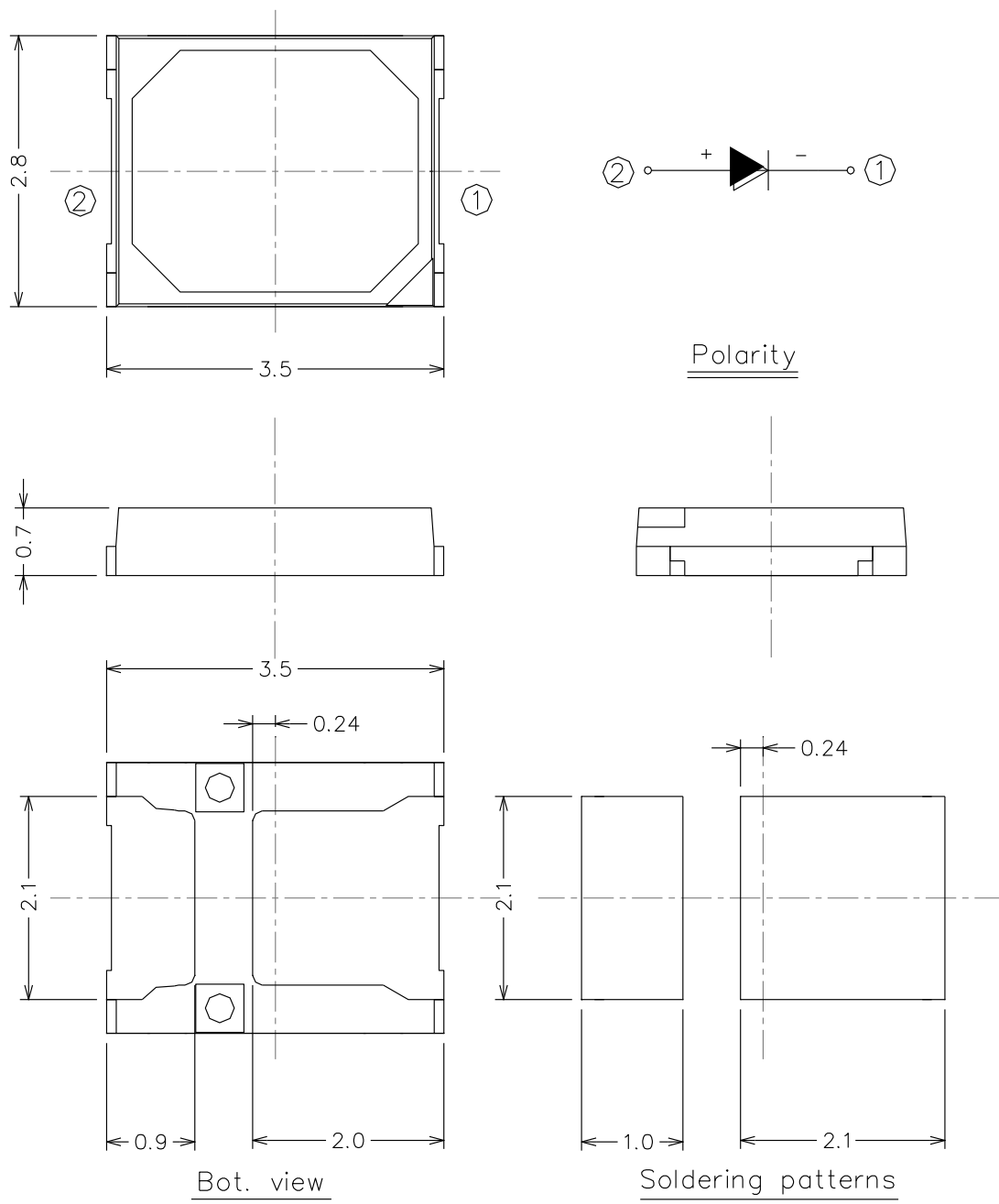


Fig.6 – Radiation Diagram



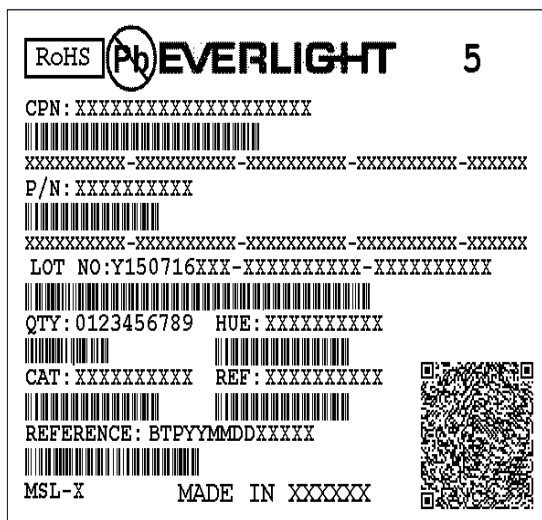
Package Dimension



Note:
Tolerance unless mentioned is ± 0.15 mm; Unit = mm

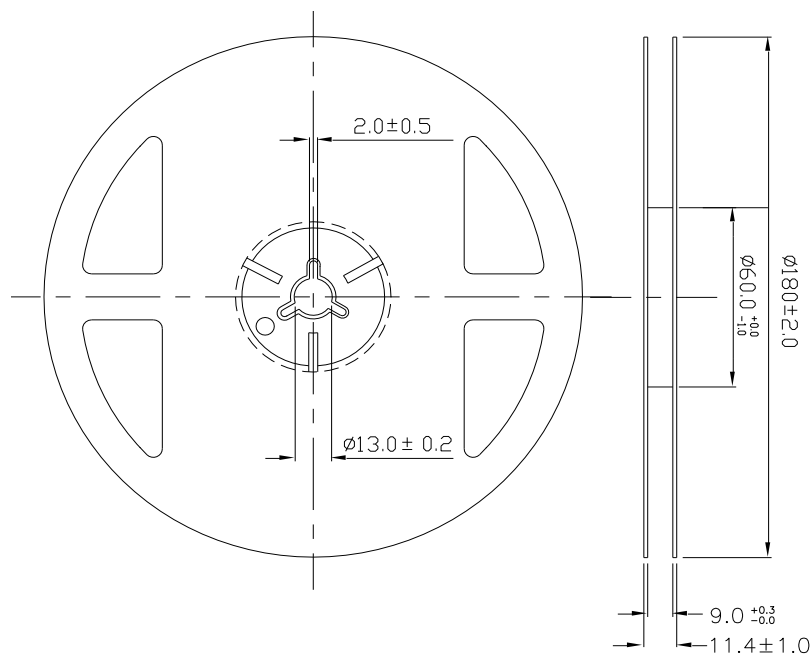
Moisture Resistant Packing Materials

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

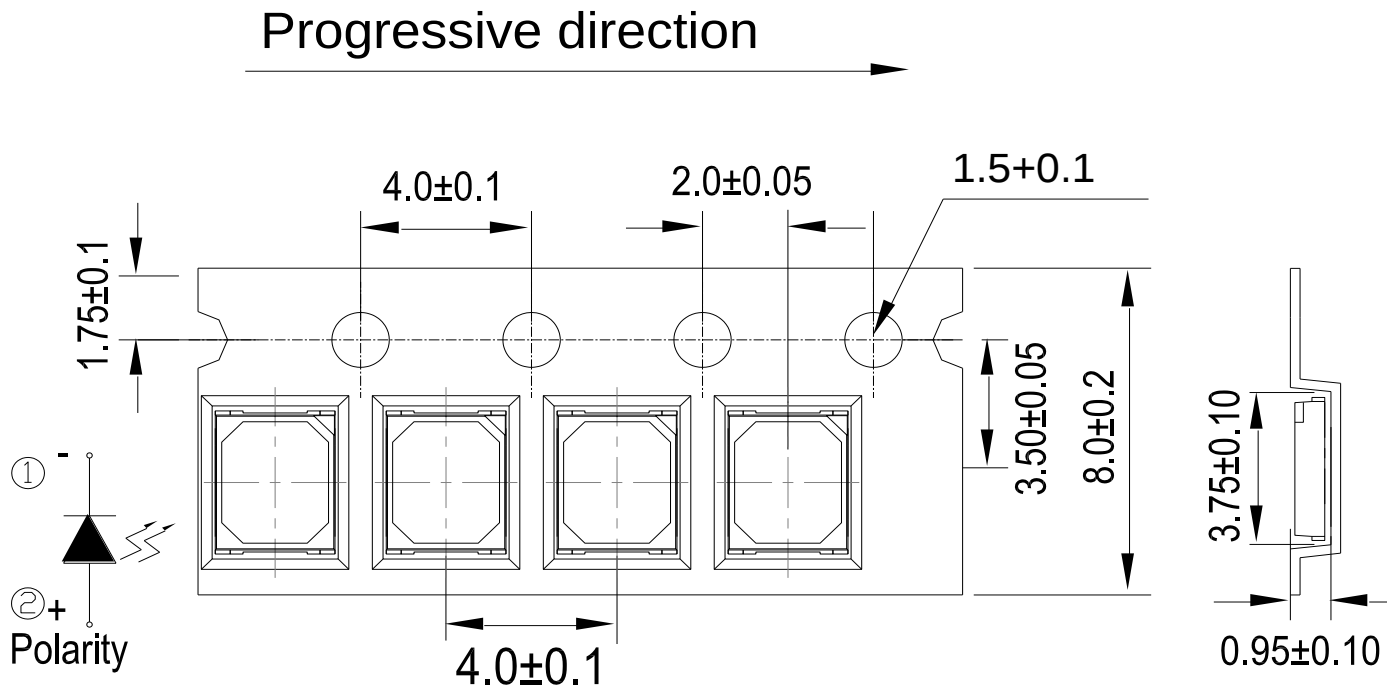
Reel Dimensions



Note:

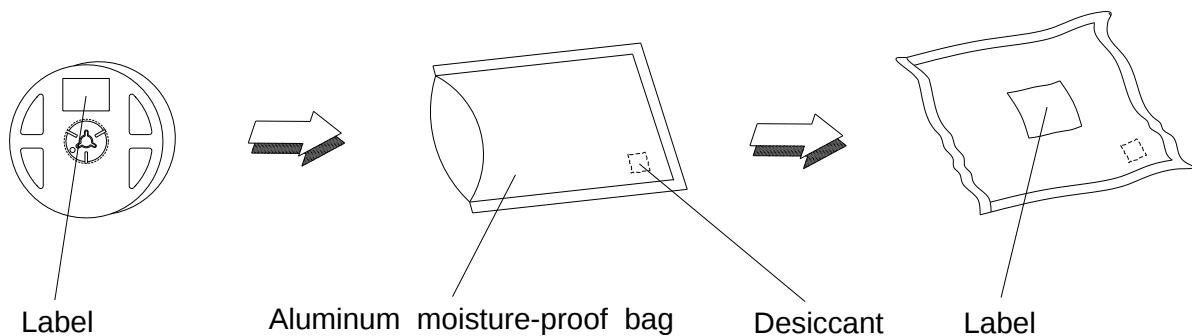
Tolerances unless mentioned ± 0.1 mm. Unit = mm

Carrier Tape Dimensions: Loaded Quantity 4000 pcs Per Reel



Note:
1. Tolerance unless mentioned is ± 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 _F = 40 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 _F = 75 mA	1000 Hrs.	22 PCS.	0/1
9	High Temperature Operation/ Life#1	Ta=25°C, I _F = 75 mA	1000 Hrs.	22 PCS.	0/1
10	High Temperature Operation/ Life#2	Ta=55°C, I _F =75 mA	1000 Hrs.	22 PCS.	0/1
11	High Temperature Operation/ Life#3	Ta=85°C, I _F = 40 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.

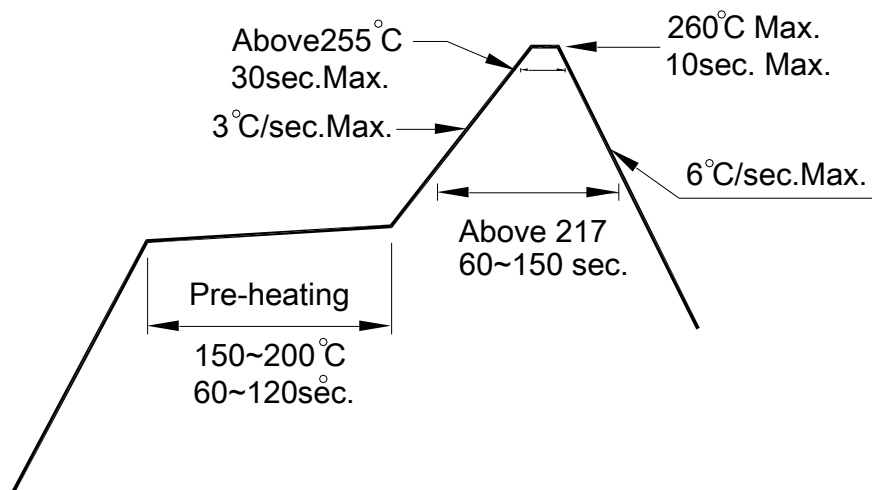
2.3 After opening the package: The LED's floor life is 168 Hrs under 30°C or less and 60% RH or less. If unused LEDs remain, it should be stored in moisture proof packages.

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.

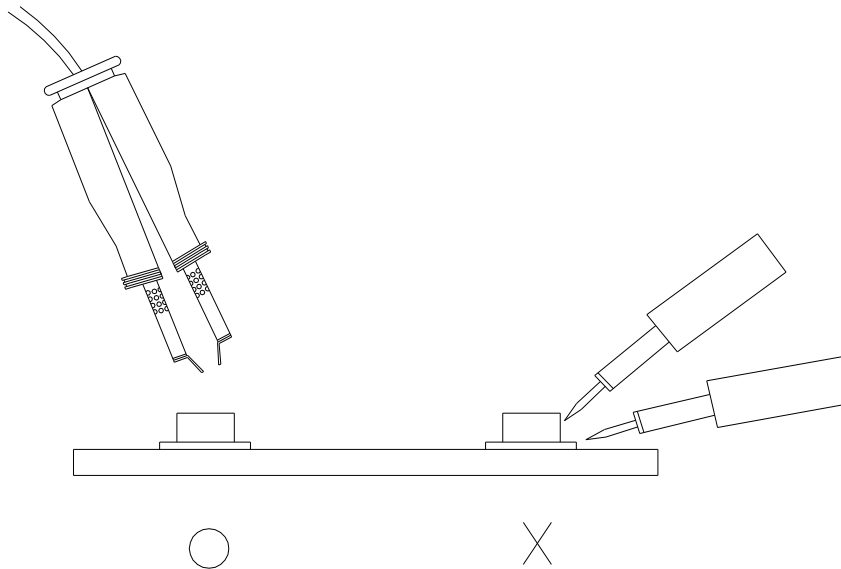
3.4 After soldering, do not warp the circuit board.

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.
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6. This product is not intended to be used for military, aircraft, automotive, medical,