DATASHEET

SMD ▪ MID Power LED
67-21ST/RKE-NXXXX34Z15/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,CI<900ppm,Br+CI<1500ppm)

Description

The Everlight 67-21ST 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

67-21ST/ R KE – N XX XX XX Z15 /SZM/ 2 T

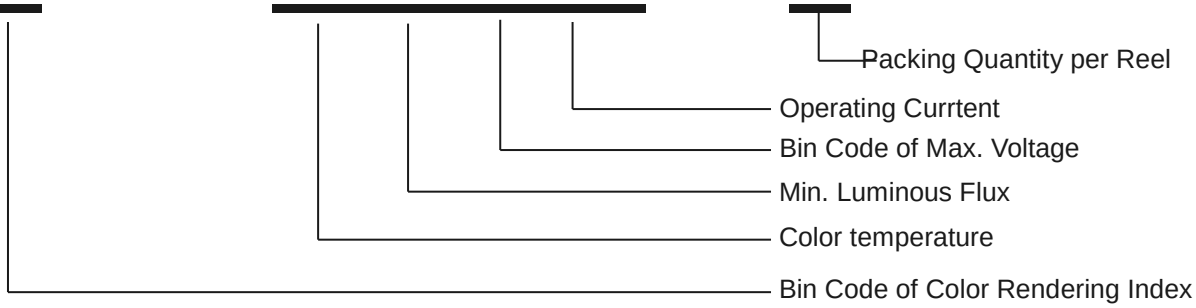


Table of Color Rendering Index

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
R	CRI(Min.) : 90, R9(Min.) : 50

Note:
Tolerance of Color Rendering Index: ±2

Table of Forward Current Index

Symbol	Description
Z15	I_F:150mA

Table of Forward Voltage Index

Symbol	Description
34	3.4V max

Example:
67-21ST/RKE-N406334Z15/SZM/2T

CRI	90(Min.)
CCT	4000K
Flux	63lm min
V_F	3.4V max
I_F	150mA
R9	50(Min.)

Mass Production List

Product	CRI Min.(1)	R9 Min.(1)	CCT(K)	Φ(lm) Min. (2)
67-21ST/RKE-N275534Z15/SZM/2T	90	50	2700K	55
67-21ST/RKE-N305834Z15/SZM/2T	90	50	3000K	58
67-21ST/RKE-N406334Z15/SZM/2T	90	50	4000K	63
67-21ST/RKE-N506334Z15/SZM/2T	90	50	5000K	63
67-21ST/RKE-N576334Z15/SZM/2T	90	50	5700K	63
67-21ST/RKE-N656334Z15/SZM/2T	90	50	6500K	63

Notes:
1. Tolerance of Color Rendering Index: ±2
2. Tolerance of Luminous flux: ±11%.

Device Selection Guide

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

Absolute Maximum Ratings ($T_{Soldering}$=25℃)

Parameter	Symbol	Rating	Unit
Forward Current	I_F	180	mA
Peak Forward Current (Duty 1/10 @10ms)	I_{FP}	300	mA
Power Dissipation	P_d	630	mW
Operating Temperature	T_{opr}	-40 ~ +85	℃
Storage Temperature	T_{stg}	-40 ~ +100	℃
Thermal Resistance (Junction / Soldering point)	$R_{th\ J\text{-}S}$	19	℃/W
Junction Temperature	T_j	115	℃
Soldering Temperature	T_{sol}	Reflow Soldering : 260 ℃ for 10 sec. Hand Soldering : 350 ℃ for 3 sec.	

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

Electro-Optical Characteristics ($T_{Soldering}$=25℃)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Luminous Flux(1)	Φ	55	-----	-----	lm	I_F=150mA
Forward Voltage(2)	V_F	2.7	-----	3.4	V	I_F=150mA
Color Rendering Index(3)	Ra	90	-----	-----		I_F=150mA
	R9	50	-----	-----		I_F=150mA
Viewing Angle	$2\theta_{1/2}$	-----	120	-----	deg	I_F=150mA
Reverse Current	I_R	-----	-----	50	μA	V_R =5V

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

2700K

Bin Code	Min.	Max.	Unit	Condition
55L5	55	60	lm	I_F=150mA
60L5	60	65		
65L5	65	70		

3000K,4000K,5000K,5700K,6500K

Bin Code	Min.	Max.	Unit	Condition
58L5	58	63	lm	I_F=150mA
63L5	63	68		
68L5	68	73		

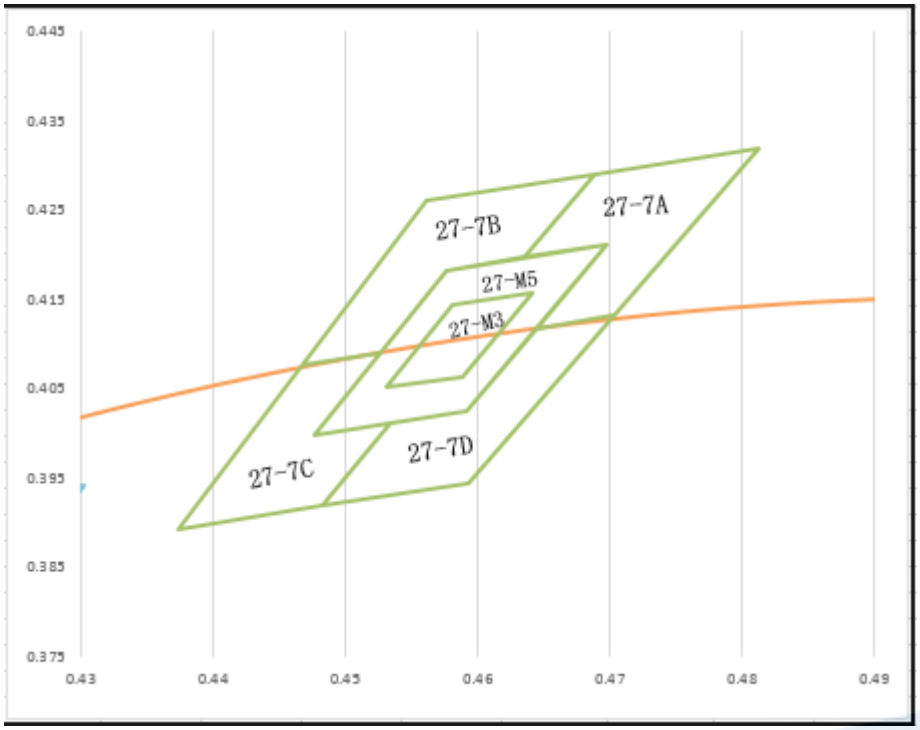
Note:
Tolerance of Luminous flux: ±11%.

Bin Range of Forward Voltage

Group	Bin Code	Min.	Max.	Unit	Condition
2734	27A	2.7	2.8	V	I_F=150mA
	28A	2.8	2.9		
	29A	2.9	3.0		
	30A	3.0	3.1		
	31A	3.1	3.2		
	32A	3.2	3.3		
	33A	3.3	3.4		

Note:
Tolerance of Forward Voltage: ±0.1V.

The C.I.E. 1931 Chromaticity Diagram



Bin Range of 3 STEP

CCT	Bin Code	CIE_x	CIE_y
2700K	27-M3	0.4581	0.4143
		0.4641	0.4157
		0.4589	0.4064
		0.4531	0.4051
	Reference Range:2681K~2754K		

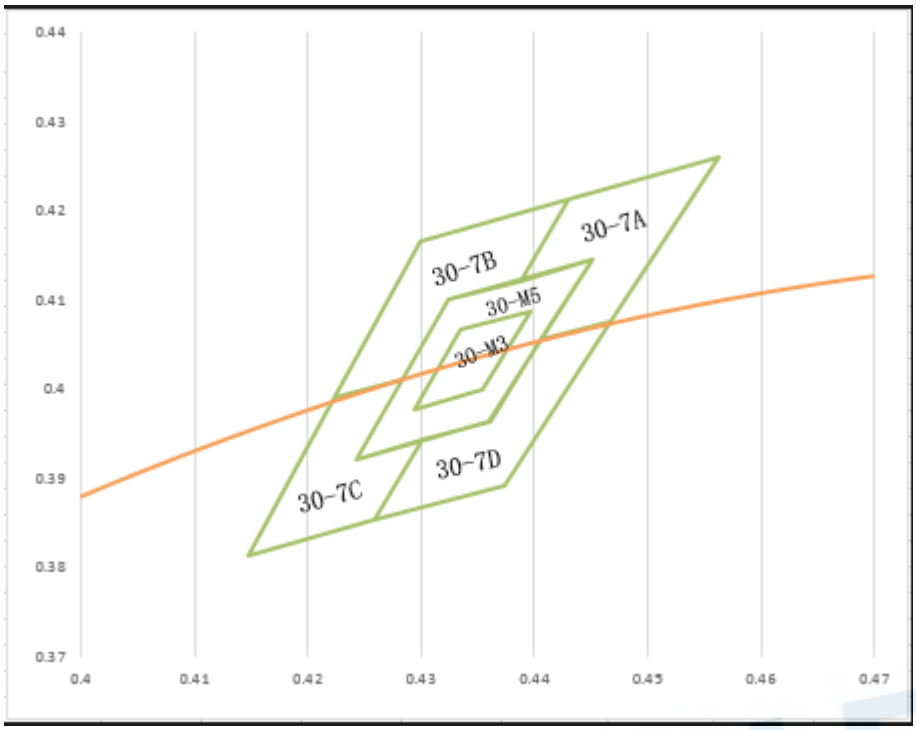
Bin Range of 5 STEP

CCT	Bin Code	CIE_x	CIE_y
2700K	27-M5	0.4697	0.4211
		0.4576	0.4183
		0.4477	0.3998
		0.4591	0.4025
	Reference Range:2647K~2792K		

Bin Range of Chromaticity Coordinates

CCT	Bin Code	CIE_x	CIE_y	Bin Code	CIE_x	CIE_y
2700K	27-7A	0.4688	0.429	27-7D	0.4644	0.4118
		0.4813	0.4319		0.4703	0.4132
		0.4703	0.4132		0.4593	0.3944
		0.4644	0.4118		0.4483	0.3919
		0.4697	0.4211		0.4534	0.4011
		0.4636	0.4197		0.4591	0.4025
	Reference Range:2580K~2718K					
	27-7B	0.4562	0.426	27-7C	0.4468	0.4077
		0.4688	0.429		0.4526	0.409
		0.4636	0.4197		0.4477	0.3998
		0.4576	0.4183		0.4534	0.4011
		0.4526	0.409		0.4483	0.3919
		0.4468	0.4077		0.4373	0.3893
	Reference Range:2718K~2868K					

The C.I.E. 1931 Chromaticity Diagram



Bin Range of 3 STEP

CCT	Bin Code	CIE_x	CIE_y
3000K	30-M3	0.4335	0.4067
		0.4294	0.3978
		0.4354	0.3999
		0.4396	0.4088
	Reference Range:2979K~3059K		

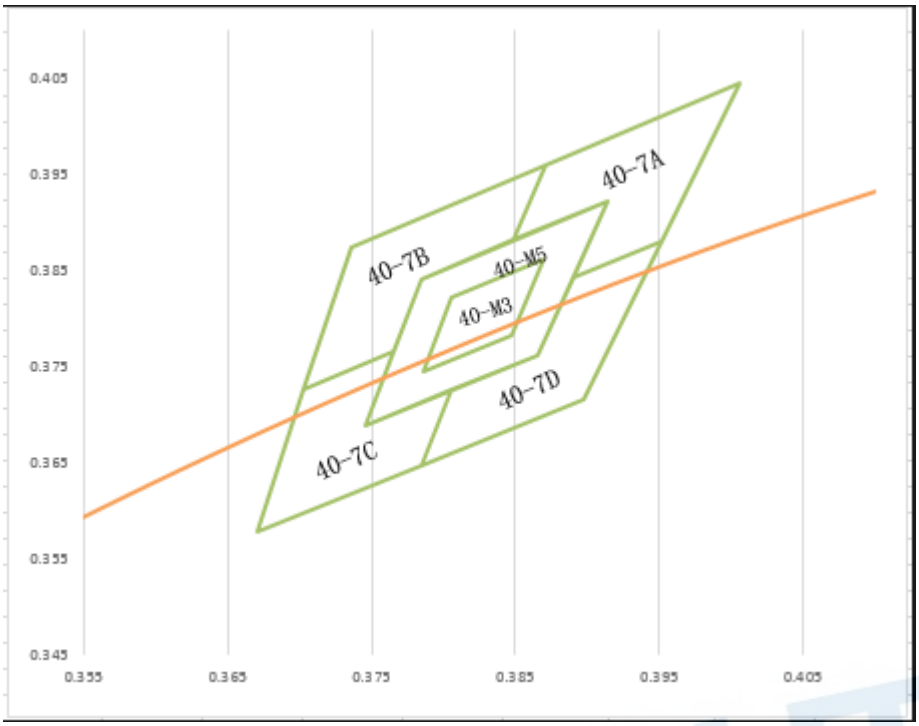
Bin Range of 5 STEP

CCT	Bin Code	CIE_x	CIE_y
3000K	30-M5	0.4451	0.4145
		0.4324	0.41
		0.4243	0.3922
		0.436	0.3964
	Reference Range:2941K~3105K		

Bin Range of Chromaticity Coordinates

CCT	Bin Code	CIE_x	CIE_y	Bin Code	CIE_x	CIE_y
3000K	30-7A	0.443	0.4212	30-7D	0.4406	0.4055
		0.4387	0.4122		0.4468	0.4077
		0.4451	0.4145		0.4373	0.3893
		0.4406	0.4055		0.4259	0.3853
		0.4468	0.4077		0.4302	0.3943
		0.4562	0.426		0.4361	0.3964
	Reference Range:2868K~3019K					
	30-7B	0.443	0.4212	30-7C	0.4284	0.4011
		0.4299	0.4165		0.4223	0.399
		0.4223	0.399		0.4147	0.3814
		0.4284	0.4011		0.4259	0.3853
		0.4324	0.41		0.4302	0.3943
		0.4387	0.4122		0.4243	0.3922
	Reference Range:3019K~3208K					

The C.I.E. 1931 Chromaticity Diagram



Bin Range of 3 STEP

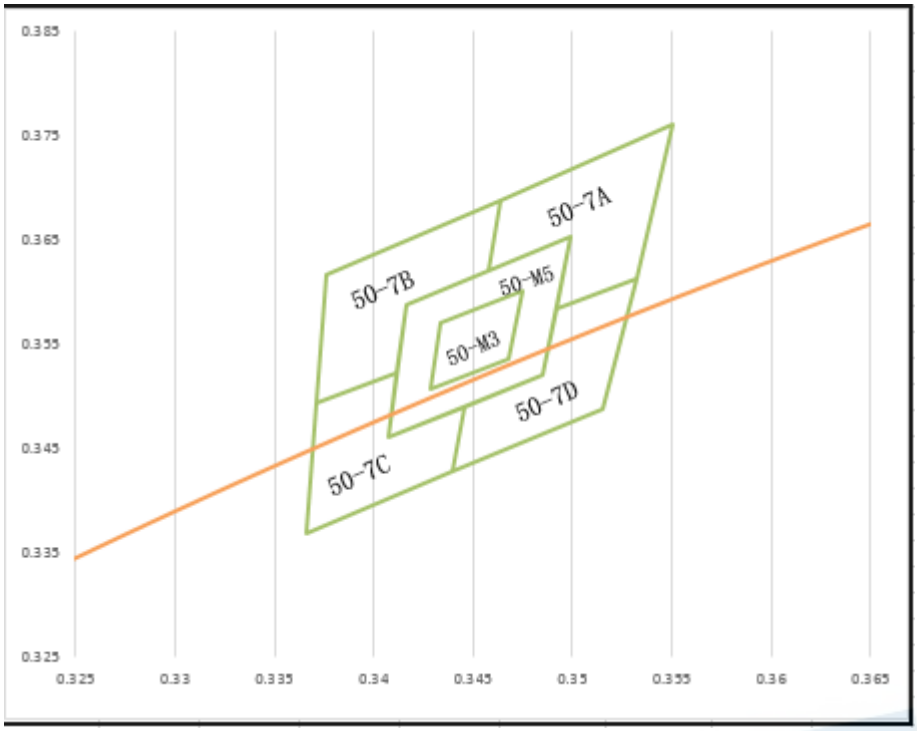
CCT	Bin Code	CIE_x	CIE_y
4000K	40-M3	0.3806	0.3823
		0.3786	0.3746
		0.3847	0.3783
		0.387	0.3862
	Reference Range:3897K~4036K		

CCT	Bin Code	CIE_x	CIE_y
4000K	40-M5	0.3914	0.3922
		0.3784	0.3841
		0.3746	0.3689
		0.3865	0.3762
	Reference Range:3832K~4107K		

Bin Range of Chromaticity Coordinates

CCT	Bin Code	CIE_x	CIE_y	Bin Code	CIE_x	CIE_y
4000K	40-7A	0.3871	0.3959	40-7D	0.389	0.3842
		0.3849	0.3882		0.3952	0.3881
		0.3914	0.3922		0.3897	0.3716
		0.389	0.3842		0.3784	0.3647
		0.3952	0.3881		0.3806	0.3726
		0.4006	0.4044		0.3865	0.3762
	Reference Range:3709K~3965K					
	40-7B	0.3871	0.3959	40-7C	0.3765	0.3765
		0.3736	0.3874		0.3703	0.3727
		0.3703	0.3727		0.367	0.3578
		0.3765	0.3765		0.3784	0.3647
		0.3784	0.3841		0.3806	0.3726
		0.3849	0.3882		0.3746	0.3689
	Reference Range:3965K~4259K					

The C.I.E. 1931 Chromaticity Diagram



Bin Range of 3 STEP

CCT	Bin Code	CIE_x	CIE_y
5000K	50-M3	0.3434	0.3571
		0.3475	0.3602
		0.3468	0.3536
		0.3429	0.3507
	Reference Range:4940K~5082K		

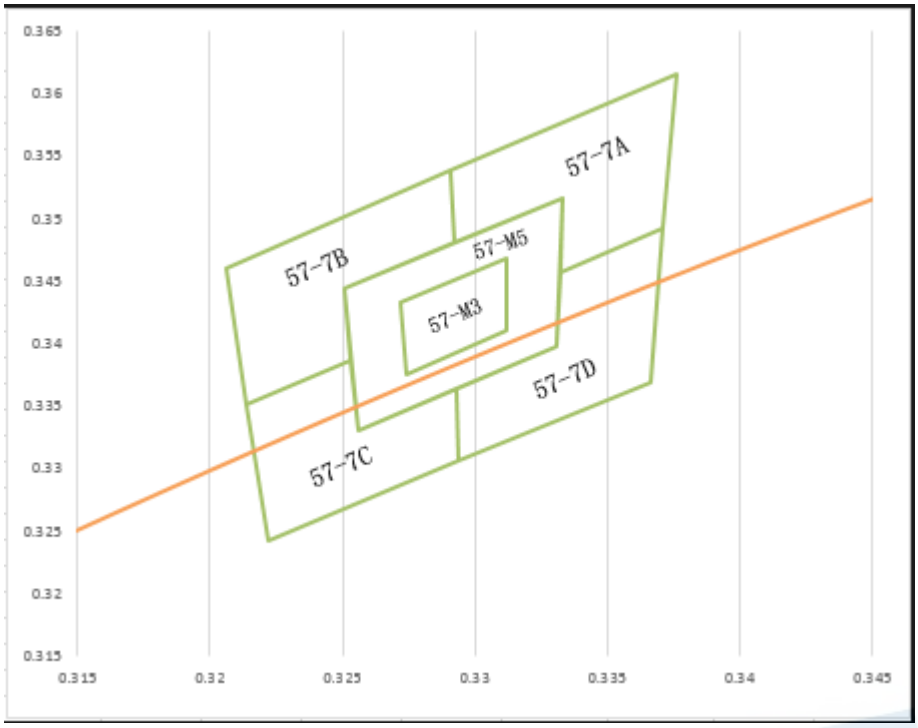
Bin Range of 5 STEP

CCT	Bin Code	CIE_x	CIE_y
5000K	50-M5	0.3499	0.3653
		0.3416	0.3587
		0.3407	0.3461
		0.3485	0.352
	Reference Range:4872K~5156K		

Bin Range of Chromaticity Coordinates

CCT	Bin Code	CIE_x	CIE_y	Bin Code	CIE_x	CIE_y
5000K	50-7A	0.3464	0.3688	50-7D	0.3492	0.3583
		0.3551	0.376		0.3532	0.3613
		0.3532	0.3613		0.3515	0.3487
		0.3492	0.3583		0.344	0.3428
		0.3499	0.3653		0.3446	0.349
		0.3458	0.362		0.3485	0.352
	Reference Range:4743K~5008K					
	50-7B	0.3376	0.3616	50-7C	0.3371	0.3493
		0.3464	0.3688		0.3411	0.3523
		0.3458	0.362		0.3407	0.3461
		0.3416	0.3587		0.3446	0.349
		0.3411	0.3523		0.344	0.3428
		0.3371	0.3493		0.3366	0.3369
	Reference Range:5008K~5309K					

The C.I.E. 1931 Chromaticity Diagram



Bin Range of 3 STEP

CCT	Bin Code	CIE_x	CIE_y
5700K	57-M3	0.3272	0.3433
		0.3312	0.3469
		0.3312	0.341
		0.3274	0.3376
	Reference Range:5553K~5731K		

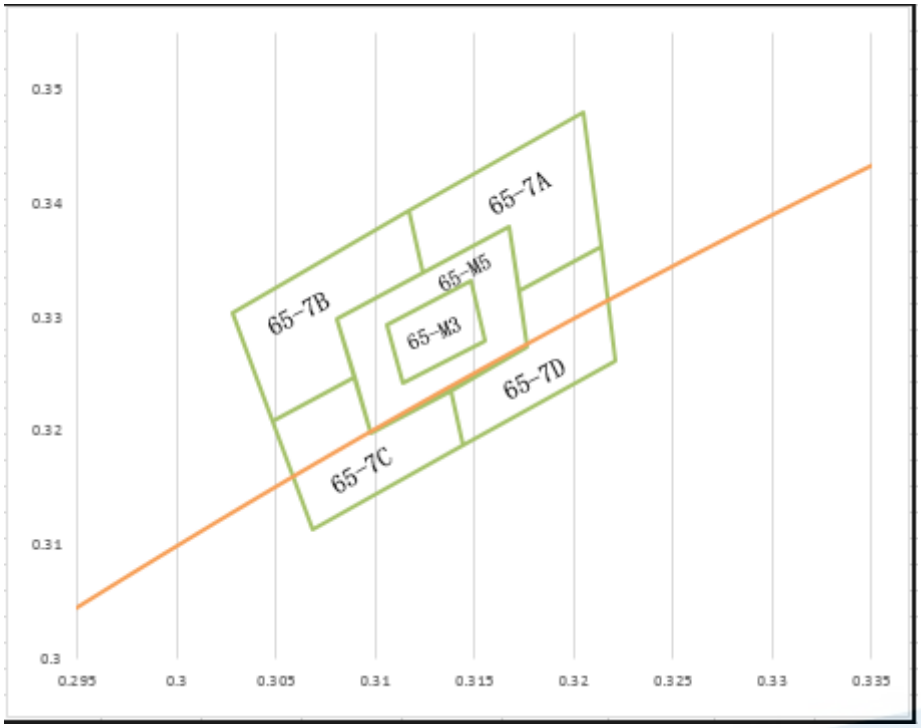
Bin Range of 5 STEP

CCT	Bin Code	CIE_x	CIE_y
5700K	57-M5	0.3333	0.3517
		0.3251	0.3444
		0.3256	0.3331
		0.3331	0.3397
	Reference Range:5466K~5823K		

Bin Range of Chromaticity Coordinates

CCT	Bin Code	CIE_x	CIE_y	Bin Code	CIE_x	CIE_y
5700K	57-7A	0.3291	0.3539	57-7D	0.3332	0.3457
		0.3376	0.3616		0.3371	0.3493
		0.3371	0.3493		0.3366	0.3369
		0.3332	0.3457		0.3294	0.3306
		0.3333	0.3517		0.3293	0.3364
		0.3292	0.3481		0.3331	0.3397
	Reference Range:5308K~5639K					
	57-7B	0.3206	0.3461	57-7C	0.3214	0.3352
		0.3291	0.3539		0.3253	0.3387
		0.3292	0.3481		0.3256	0.3331
		0.3251	0.3444		0.3293	0.3364
		0.3253	0.3387		0.3294	0.3306
		0.3214	0.3352		0.3222	0.3243
	Reference Range:5639K~6022K					

The C.I.E. 1931 Chromaticity Diagram



Bin Range of 3 STEP

CCT	Bin Code	CIE_x	CIE_y
6500K	65-M3	0.3106	0.3293
		0.3148	0.3332
		0.3155	0.328
		0.3114	0.3242
	Reference Range:6359K~6617K		

Bin Range of 5 STEP

CCT	Bin Code	CIE_x	CIE_y
6500K	65-M5	0.3167	0.338
		0.3081	0.3298
		0.3098	0.3198
		0.3177	0.3274
	Reference Range:6240K~6752K		

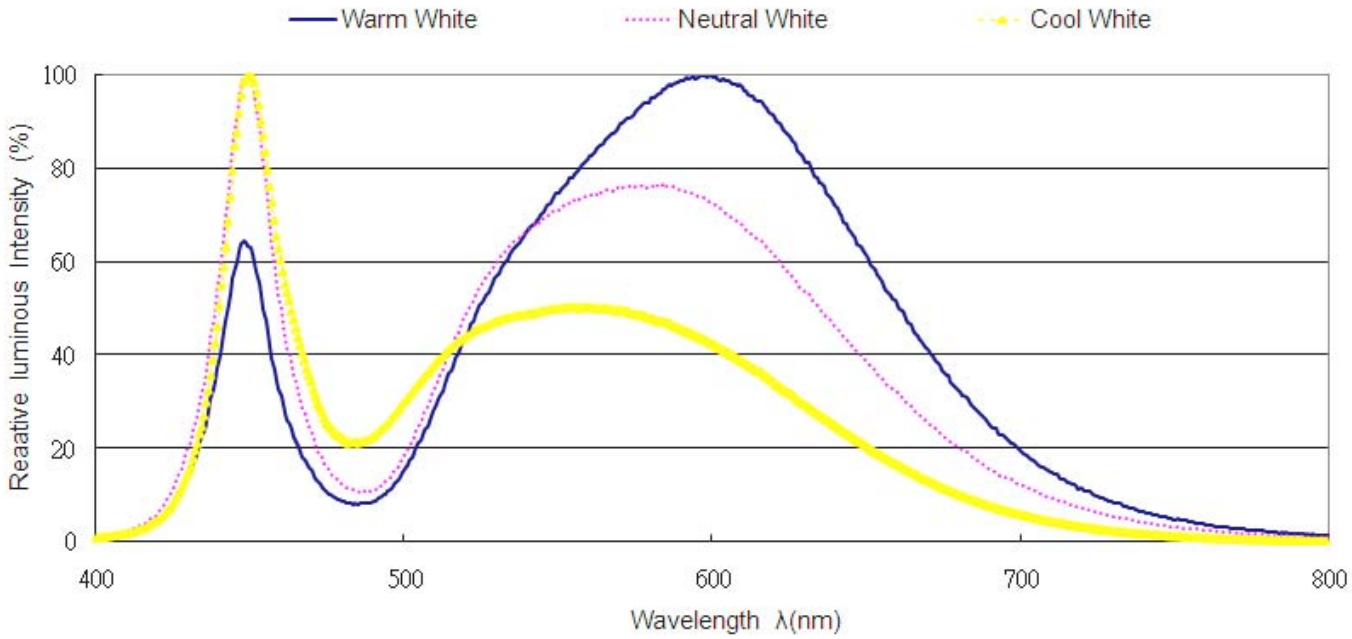
Bin Range of Chromaticity Coordinates

CCT	Bin Code	CIE_x	CIE_y	Bin Code	CIE_x	CIE_y
6500K	65-7A	0.3117	0.3393	65-7D	0.3172	0.3324
		0.3205	0.3481		0.3214	0.3362
		0.3214	0.3362		0.3221	0.3261
		0.3172	0.3324		0.3144	0.3187
		0.3167	0.338		0.3138	0.3236
		0.3124	0.3339		0.3177	0.3274
	Reference Range:6017K~6484K					
	65-7B	0.3028	0.3304	65-7C	0.3048	0.3209
		0.3117	0.3393		0.309	0.3247
		0.3124	0.3339		0.3098	0.3198
		0.3081	0.3298		0.3138	0.3236
		0.309	0.3247		0.3144	0.3187
		0.3048	0.3209		0.3068	0.3113
	Reference Range:6482K~7042K					

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

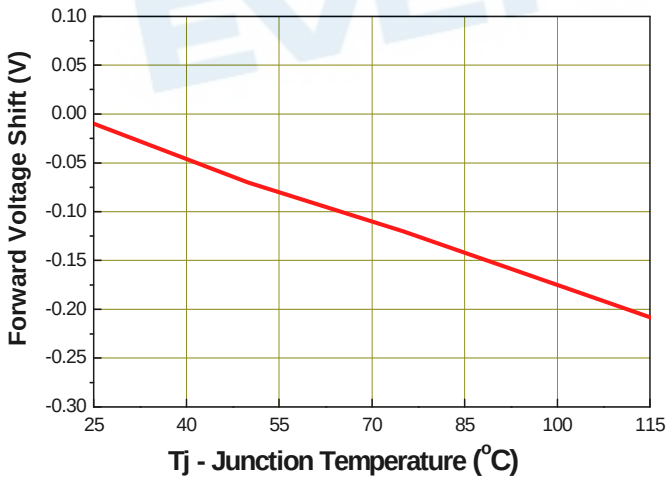
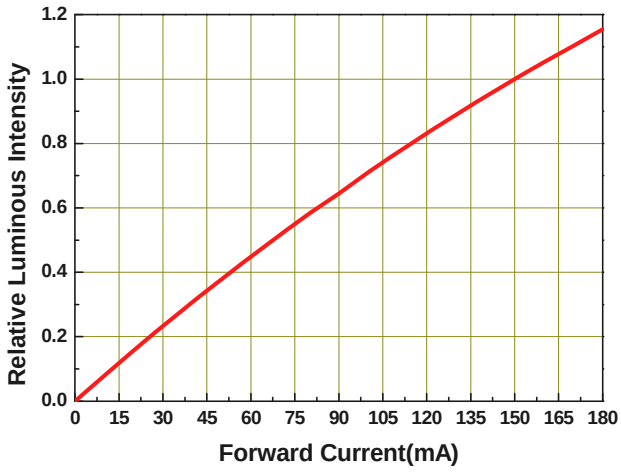


Fig.2 - Relative Luminous Intensity vs. Forward Current



Typical Electro-Optical Characteristics Curves

Fig.3 - Relative Luminous Intensity vs. Junction Temperature

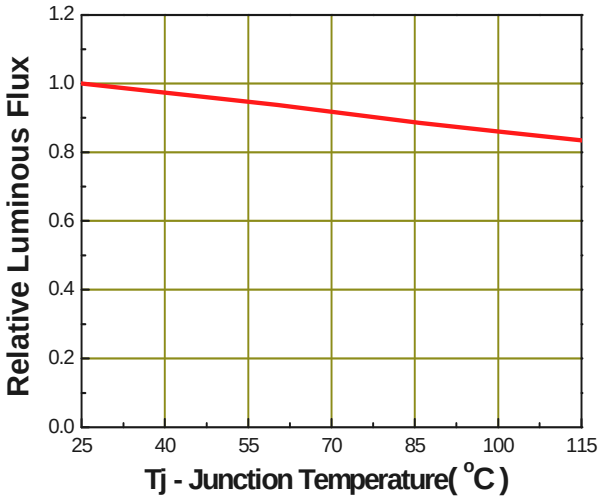


Fig.4 - Forward Current vs. Forward Voltage

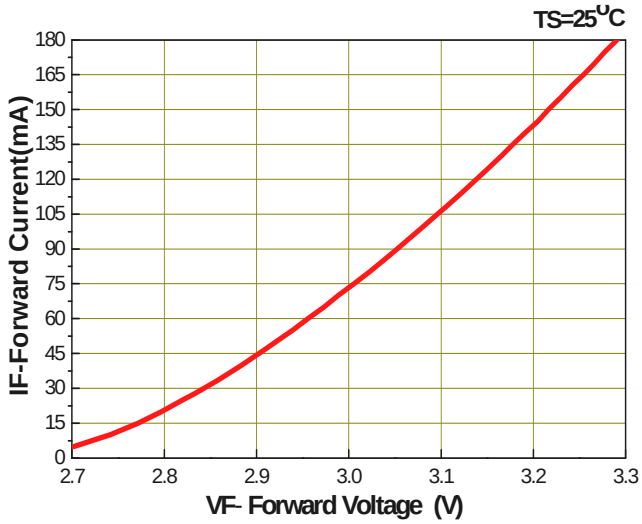


Fig.5 – Max. Driving Forward Current vs. Soldering Temperature

Rth j-s=19˚C/W

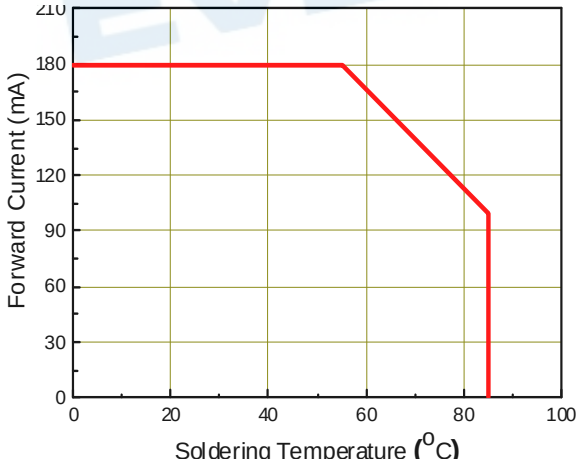
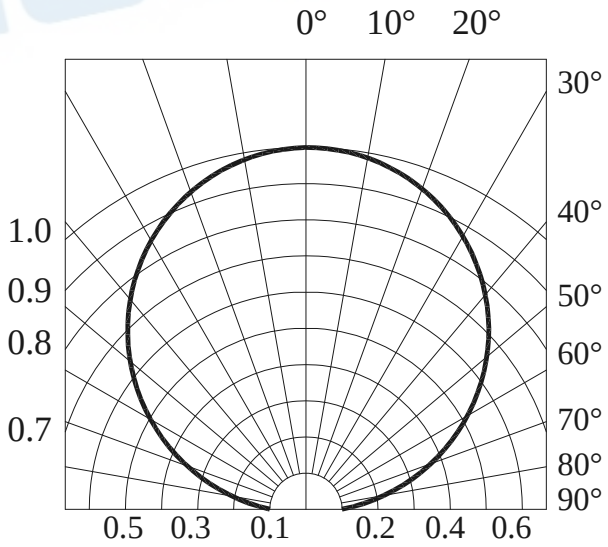
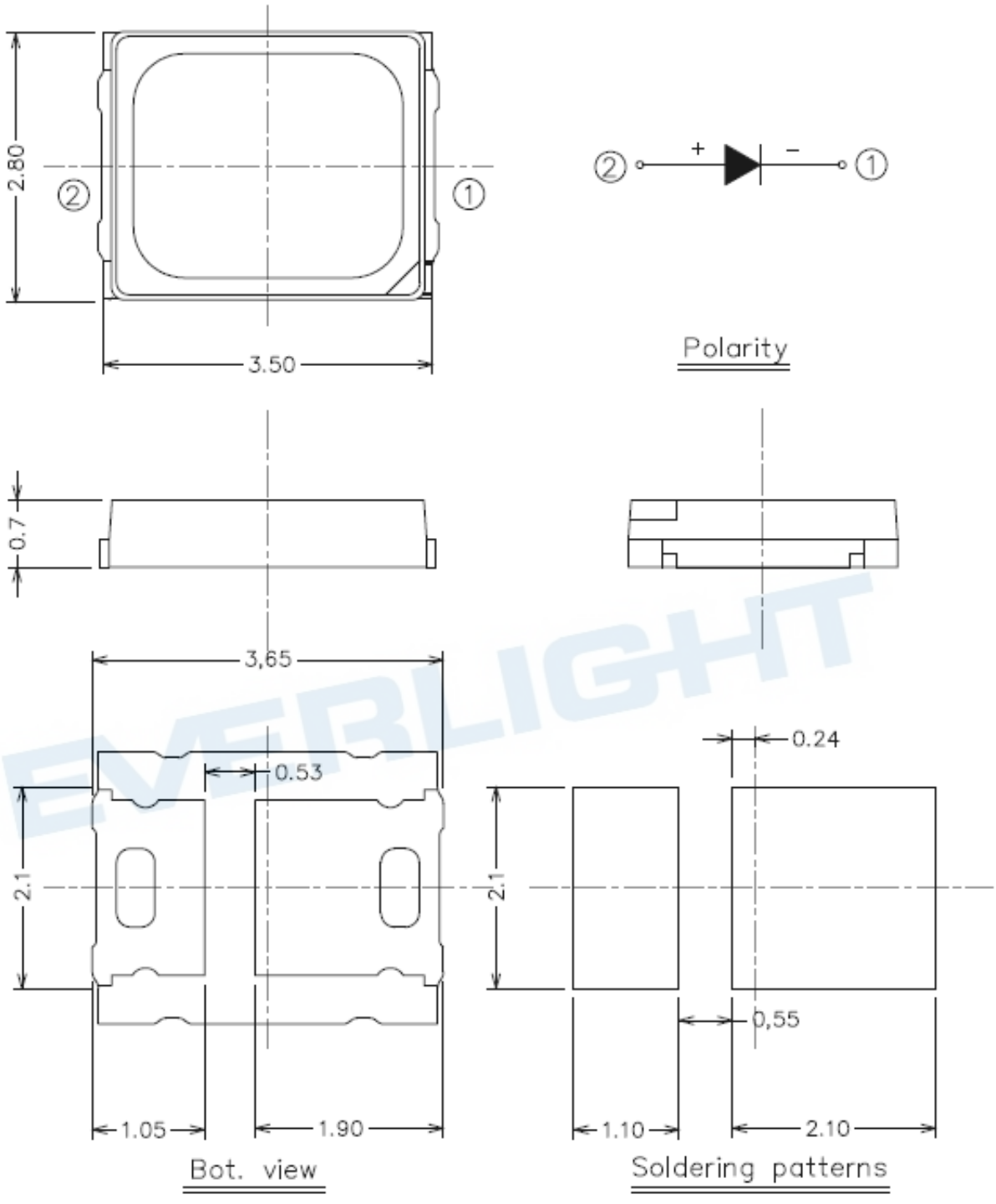


Fig.6 – Radiation Diagram



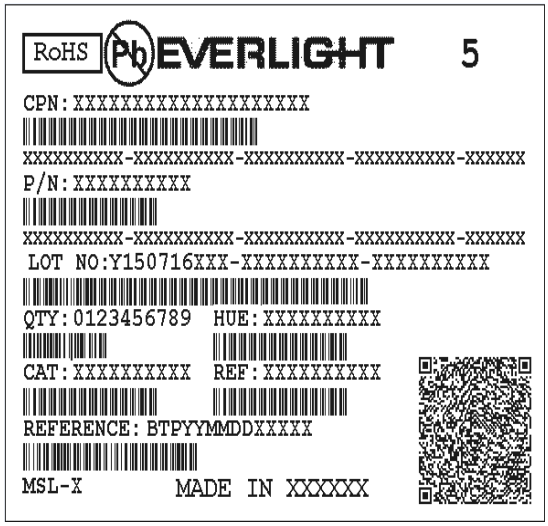
Package Dimension



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

Moisture Resistant Packing Materials

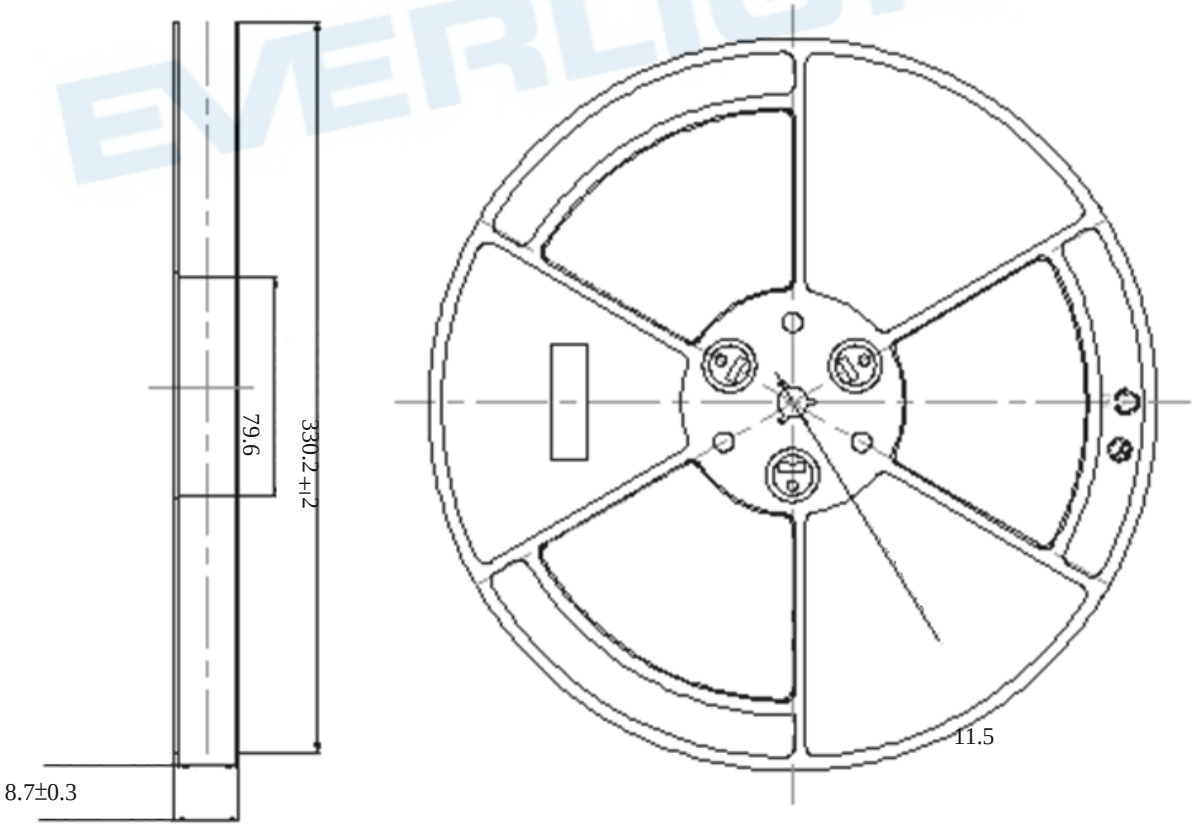
Label Explanation



- 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

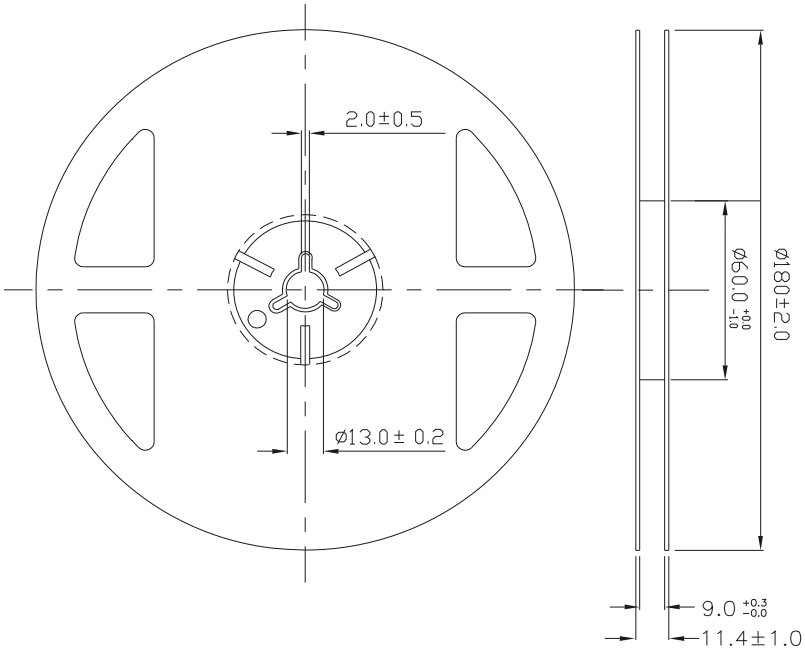
Reel Dimensions

1.Carrier Tape Dimensions:



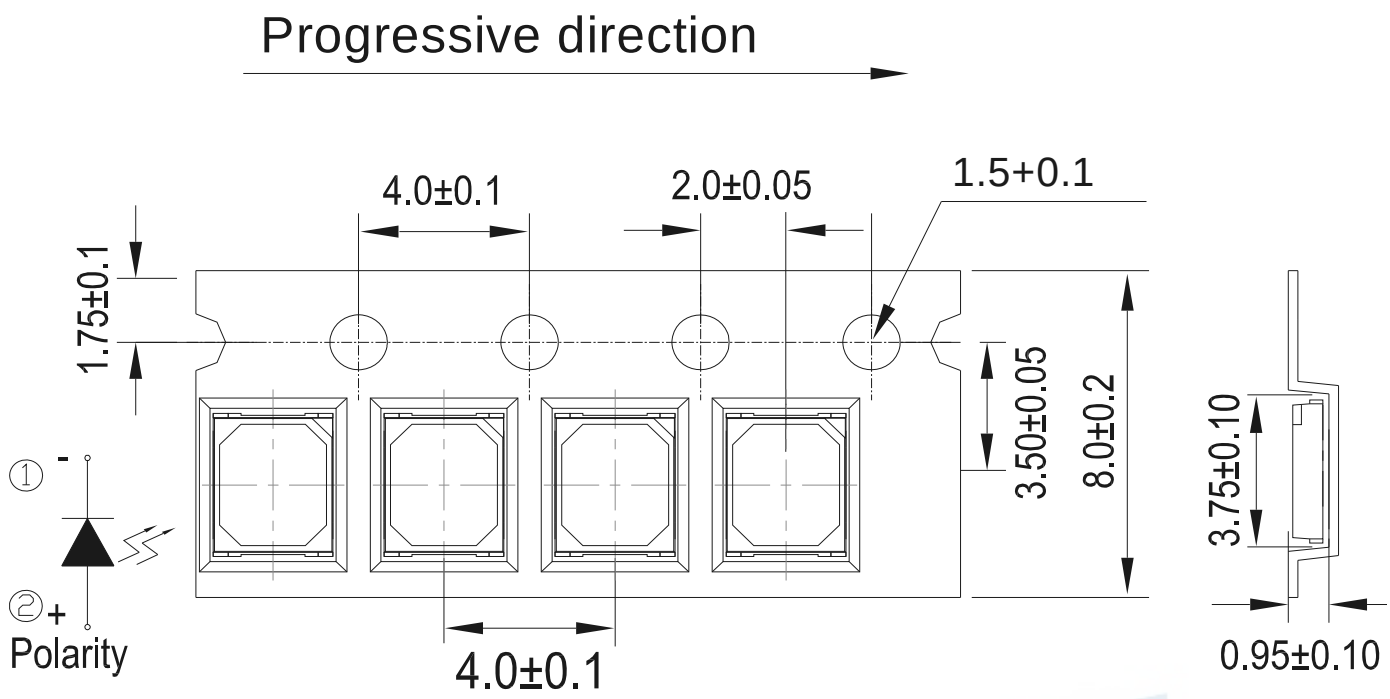
1-1. Loaded Quantity 16000 pcs Per Reel

2.Carrier Tape Dimensions:



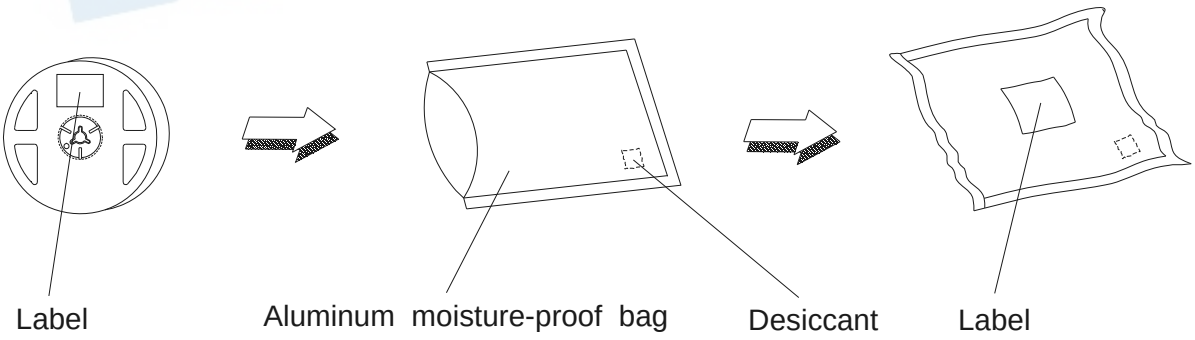
2-1.Loaded Quantity 500/1000/1500/2000/2500/3000/3500/4000 pcs Per Reel

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



Note:
1.Tolerance unless mentioned is ±0.1mm; Unit = mm

Moisture Resistant Packing Process



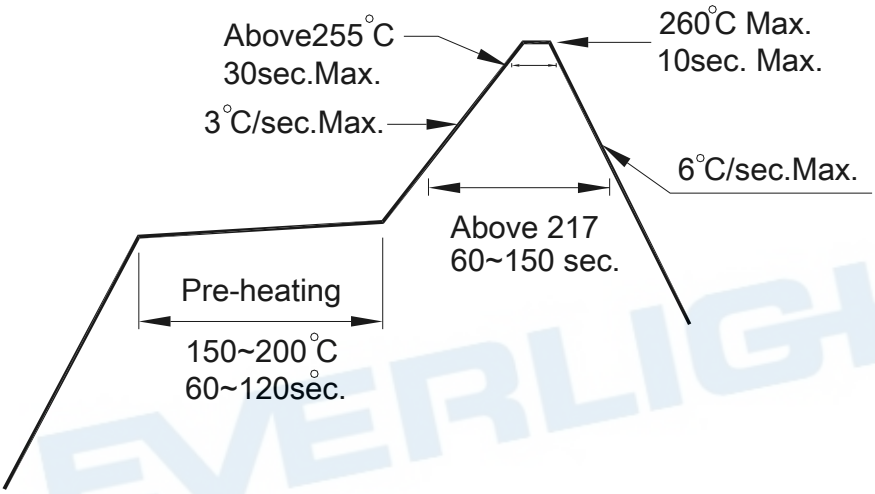
Reliability Test Items and Conditions

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℃/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℃,85%RH, I_F = 180mA	1000 Hrs.	8 PCS.	0/1
4	Low Temperature Life	Ta=-40℃, I_F = 180 mA	1000 Hrs.	8 PCS.	0/1
5	High Temperature Life	Ta=60℃, I_F =180 mA	3000 Hrs.	8 PCS.	0/1
6	High Temperature Life	Ta=85℃, I_F =180 mA	3000 Hrs.	8 PCS.	0/1
7	Pulse	ON 30ms / OFF 2500ms	30000 CYCLES	8 PCS.	0/1
8	Thermal Shock	H : +100℃ 20min ∫ 10 sec L : -10℃ 20min	200 Cycles	8 PCS.	0/1
9	Power Temperature Cycle	H : +100℃ 30min ∫ 5 min L : -40℃ 30min I_F = 120 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℃ or less and 90%RH or less.
   2.3 After opening the package: The LED's floor life is 168 Hrs under 30℃ 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℃ for 24 hours.
3. Soldering Condition
   3.1 Pb-free solder temperature profile



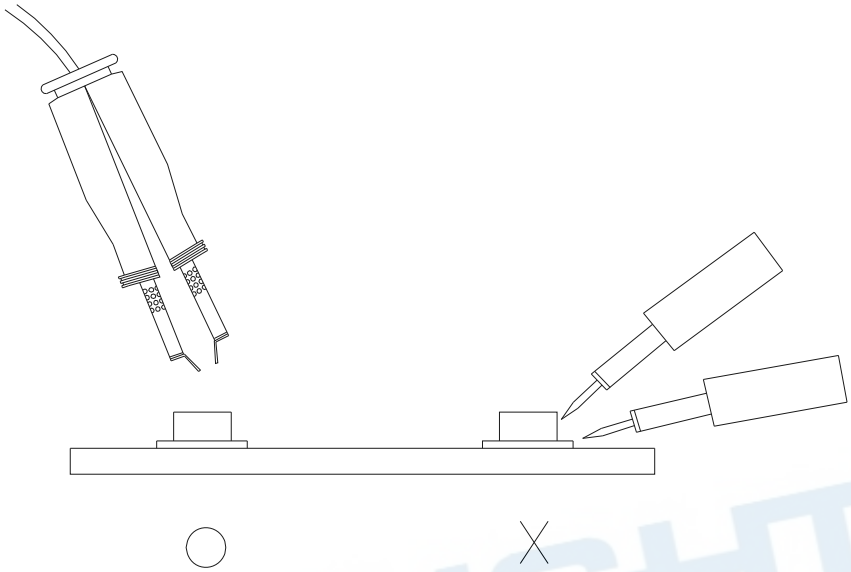
   3.2 Reflow soldering should not be done more than two times.
   3.3 When soldering, do not put stress on the LEDs during heating.
   3.4 After soldering, do not warp the circuit board.

4. Soldering Iron

Each terminal is to go to the tip of soldering iron temperature less than 350℃ 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,