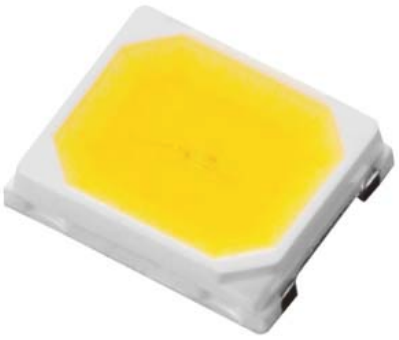
DATASHEET

SMD ▪ MID Power LED
67-21S/KK3C-HXXXXXXXX2833Z6/2T/EU



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 3 C – H XX XX XX XX XXXX Z6 / 2T

- Bin Group of Forward Voltage
- Bin Group of Max. Luminous Flux
- Bin Group of Min. Luminous Flux
- Max. Color temperature
- Min. Color temperature
- Bin Code of Color Rendering Index

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
Z6	I_F:60mA

Example:
67-21S/KK3C-H2424L9N32833Z6/2T/EU

CRI	80(Min.)
CCT	2400K
Flux	18~27lm
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/KK3C-H2020L7M42833Z6/2T/EU	80	2000K	16	24
67-21S/KK3C-H2424L9N32833Z6/2T/EU	80	2400K	18	27

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

Device Selection Guide

Chip Materials	Emitted Color	Resin Color
InGaN	Warm White	Water Clear

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

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	℃
Storage Temperature	T_{stg}	-40 ~ +100	℃
Thermal Resistance (Junction / Soldering point)	$R_{th\ J\text{-}S}$	50	℃/W
Junction Temperature	T_j	125	℃
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	16	-----	27	lm	I_F=60mA
Forward Voltage(2)	V_F	2.8	-----	3.3	V	I_F=60mA
Color Rendering Index(3)	Ra	80	-----	-----		I_F=60mA
Viewing Angle	$2\theta_{1/2}$	-----	120	-----	deg	I_F=60mA
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

Bin Code	Min.	Max.	Unit	Condition
L7	16	17	lm	I_F=60mA
L8	17	18		
L9	18	19		
M3	19	21		
M4	21	24		
N3	24	27		

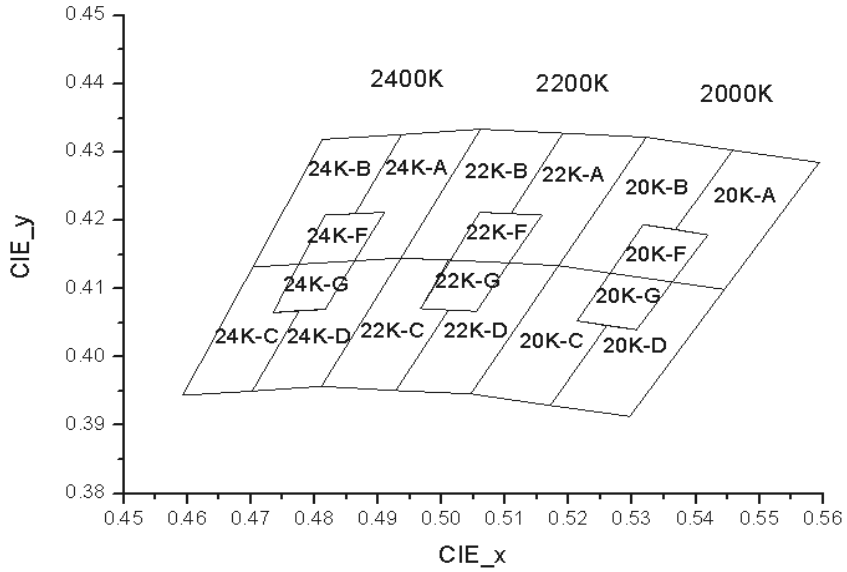
Note:
Tolerance of Luminous flux: ±11%.

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
2000K	20K-A	0.5574	0.4287	20K-D	0.5398	0.4105
		0.5423	0.4308		0.5312	0.4116
		0.5321	0.4193		0.5246	0.4048
		0.5378	0.4185		0.5199	0.4054
		0.5312	0.4116		0.5097	0.3938
		0.5398	0.4105		0.5221	0.3922
	Reference Range:1850K~1990K					
	20K-B	0.5423	0.4308	20K-C	0.5207	0.4130
		0.5265	0.4330		0.5119	0.4142
		0.5119	0.4142		0.4973	0.3954
		0.5207	0.4130		0.5097	0.3938
		0.5262	0.4201		0.5199	0.4054
		0.5321	0.4193		0.5152	0.4060
	Reference Range:1990K~2130K					
	20K-F	0.5378	0.4185	20K-G	0.5312	0.4116
		0.5262	0.4201		0.5207	0.4130
		0.5207	0.4130		0.5152	0.4060
		0.5312	0.4116		0.5246	0.4048
	Reference Range: 1940K~2045K					

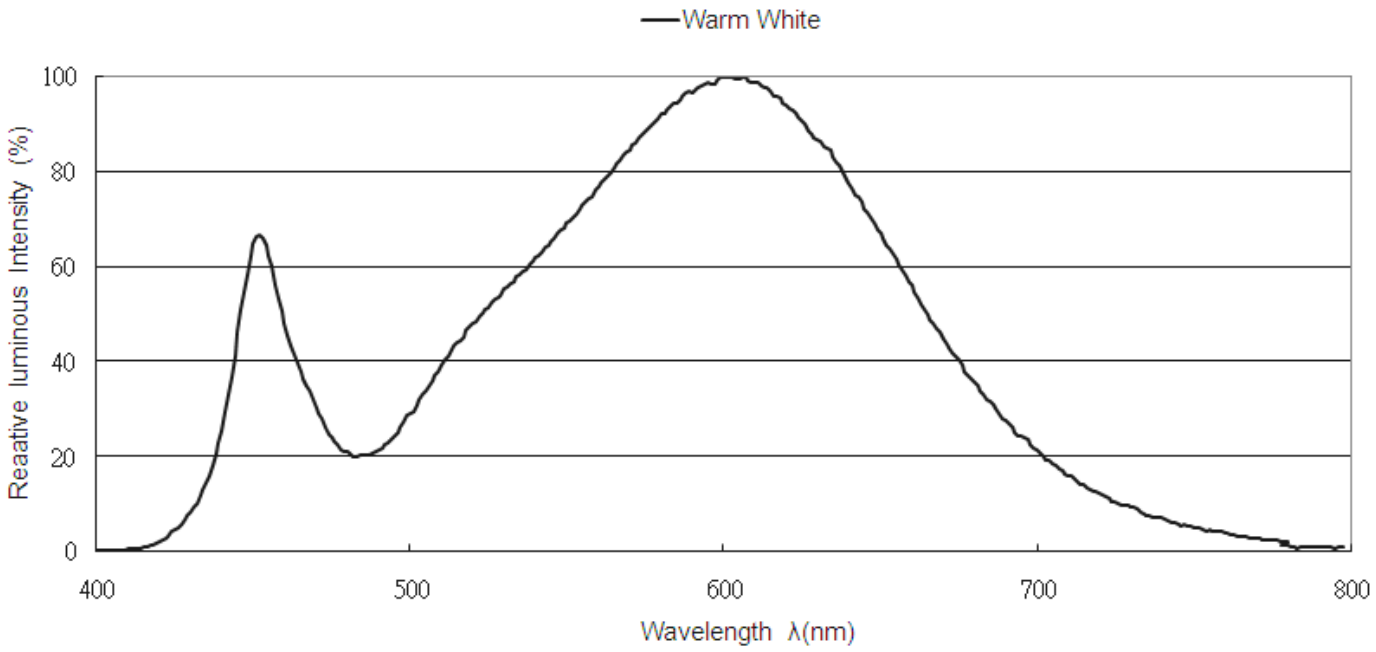
Bin Range of Chromaticity Coordinates

CCT	Bin Code	CIE_x	CIE_y	Bin Code	CIE_x	CIE_y
2400K	24K-A	0.5061	0.4334	24K-D	0.4936	0.4145
		0.4937	0.4326		0.4863	0.4141
		0.4864	0.4210		0.4817	0.4070
		0.4910	0.4212		0.4776	0.4068
		0.4863	0.4141		0.4702	0.3950
		0.4936	0.4145		0.4811	0.3957
	Reference Range:2315K~2440K					
	24K-B	0.4937	0.4326	24K-C	0.4775	0.4136
		0.4813	0.4319		0.4703	0.4132
		0.4703	0.4132		0.4593	0.3944
		0.4775	0.4136		0.4702	0.3950
		0.4817	0.4208		0.4776	0.4068
		0.4864	0.4210		0.4735	0.4065
	Reference Range:2440K~2580K					
	24K-F	0.4910	0.4212	24K-G	0.4863	0.4141
		0.4817	0.4208		0.4775	0.4136
		0.4775	0.4136		0.4735	0.4065
		0.4863	0.4141		0.4817	0.4070
	Reference Range: 1910K~1995K					

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

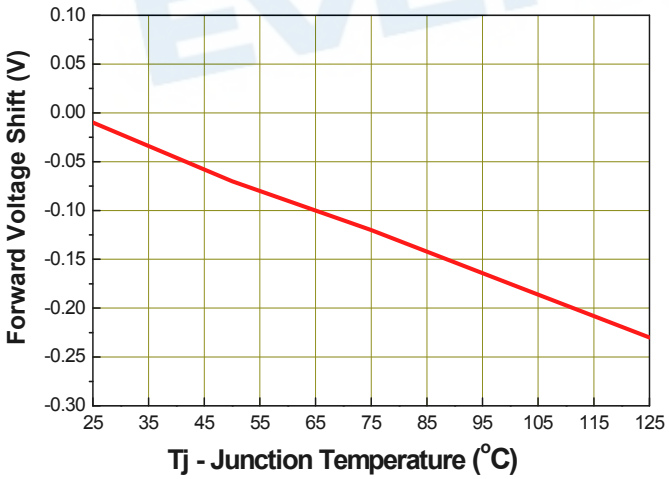
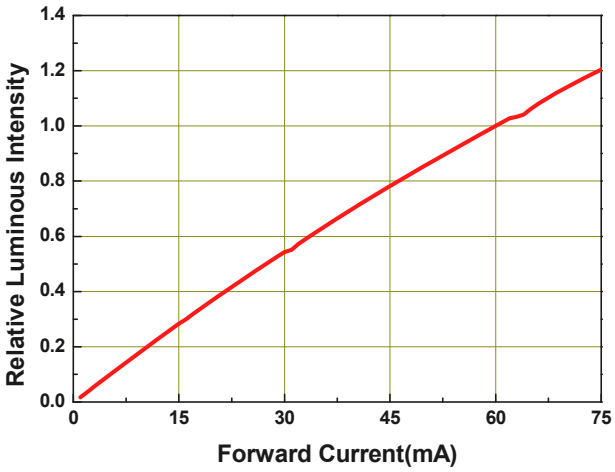


Fig.2 - Relative Luminous Intensity vs. Forward Current



Typical Electro-Optical Characteristics Curves

Fig.3 - Relative Luminous Intensity vs. Junction Temperature

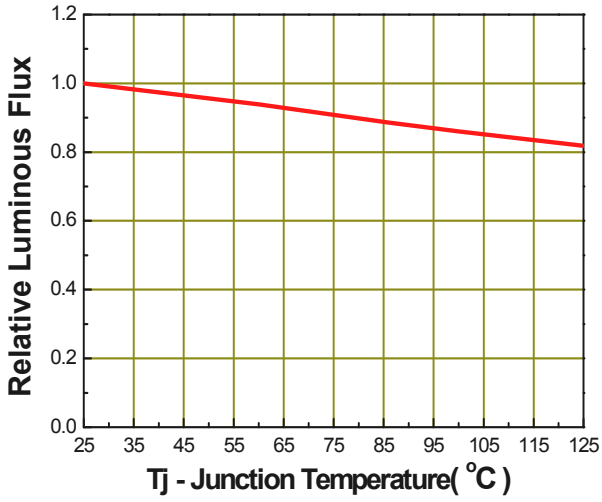


Fig.4 - Forward Current vs. Forward Voltage

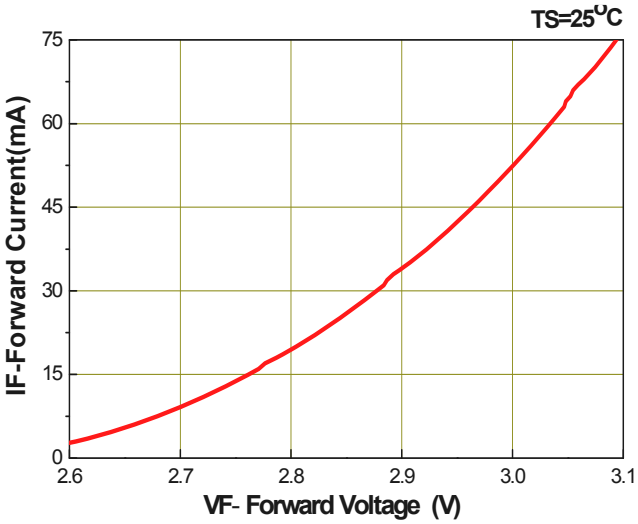


Fig.5 – Max. Driving Forward Current vs. Soldering Temperature

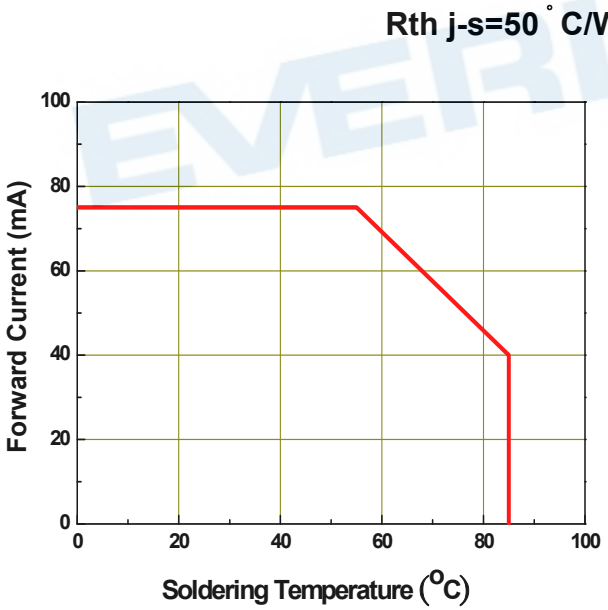
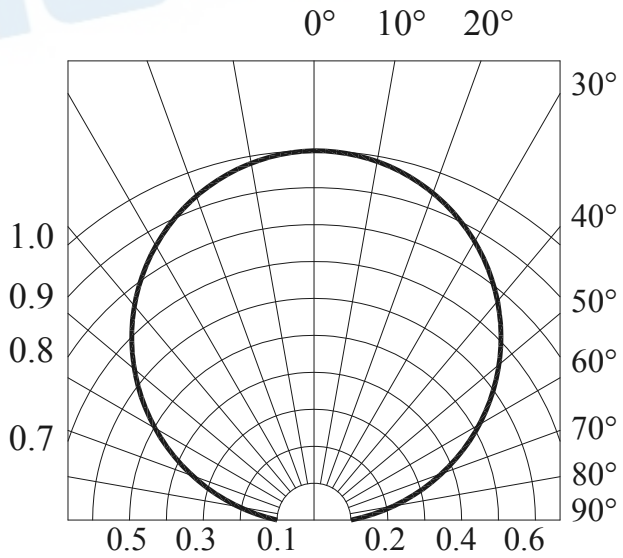
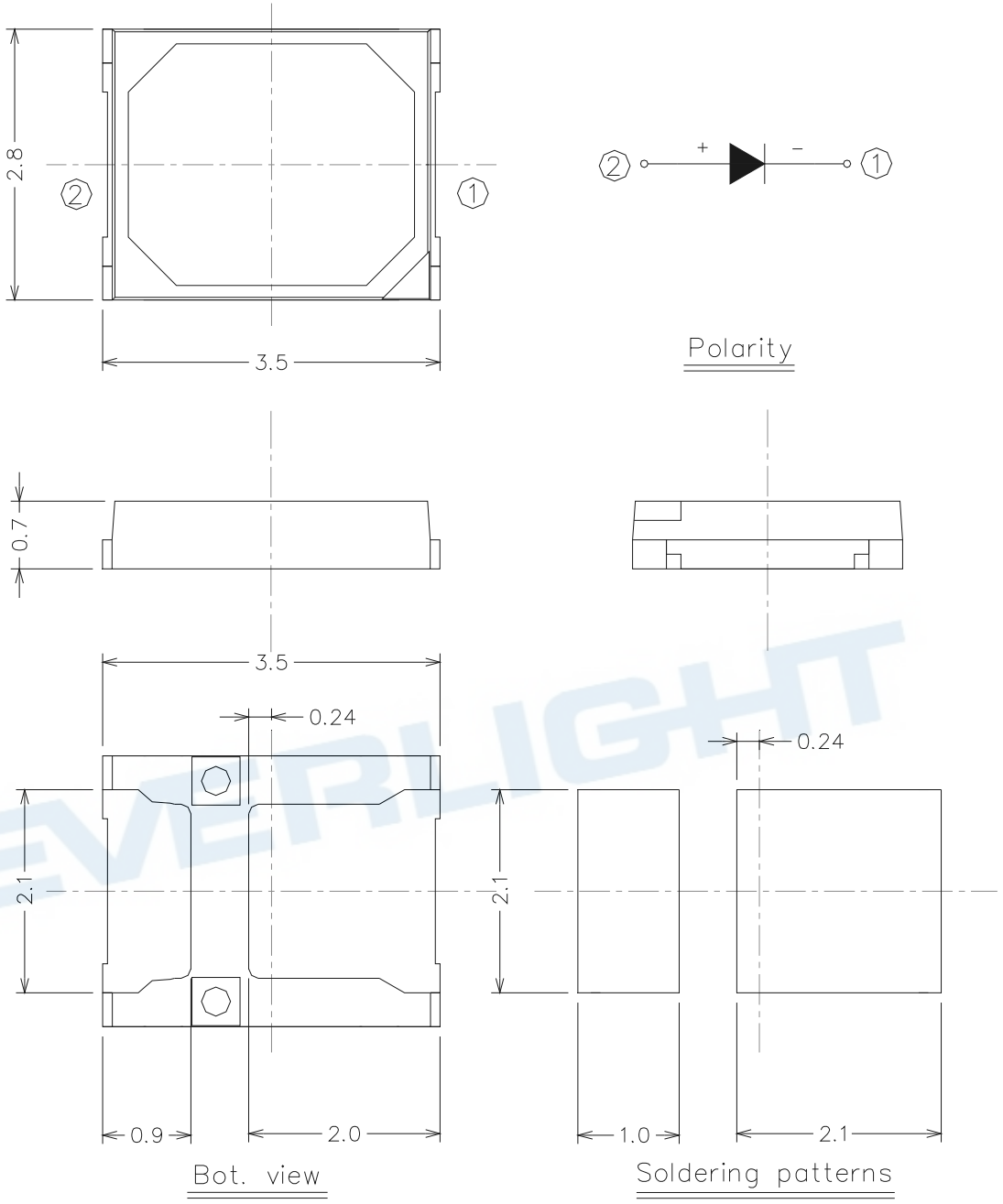


Fig.6 – Radiation Diagram



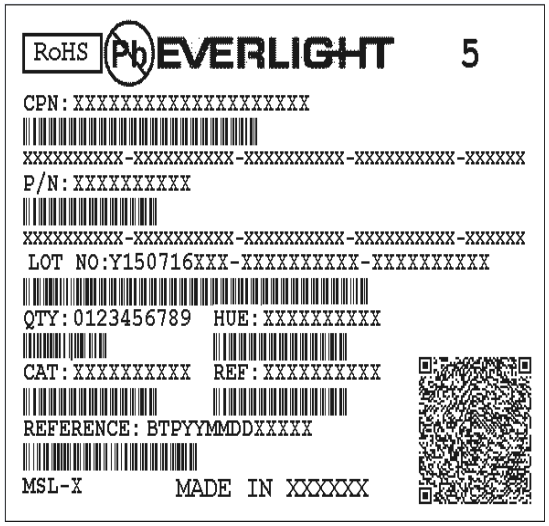
Package Dimension



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

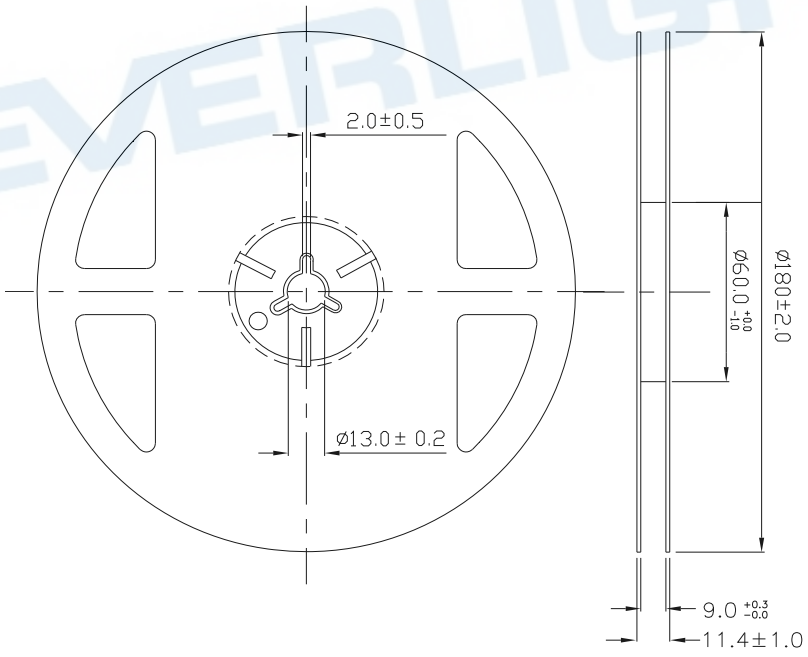
Moisture Resistant Packing Materials

Label Explanation



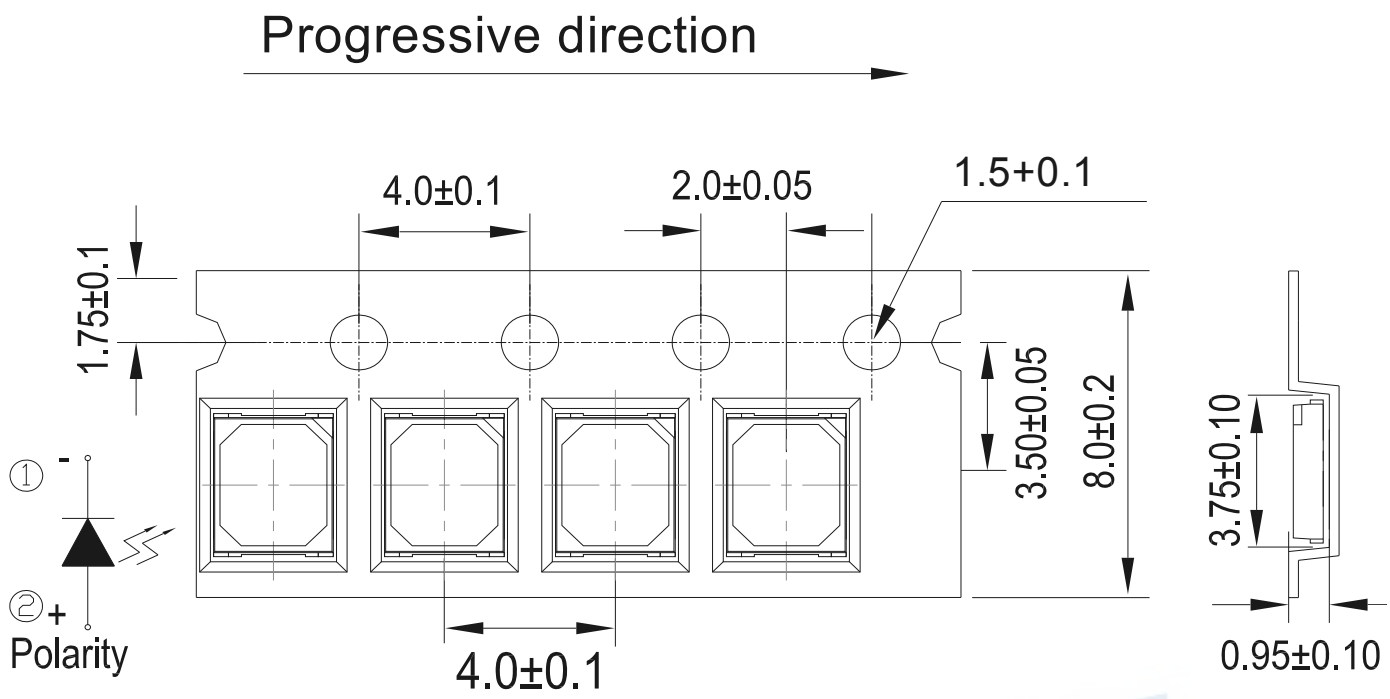
- CPN: Customer's Product Number
- P/N: Product Number
- QTY: Packing Quantity
- CAT: Luminous Intensity Rank
- HUE: Dom. Wavelength Rank
- REF: Forward Voltage Rank
- LOT No: Lot Number

Reel Dimensions



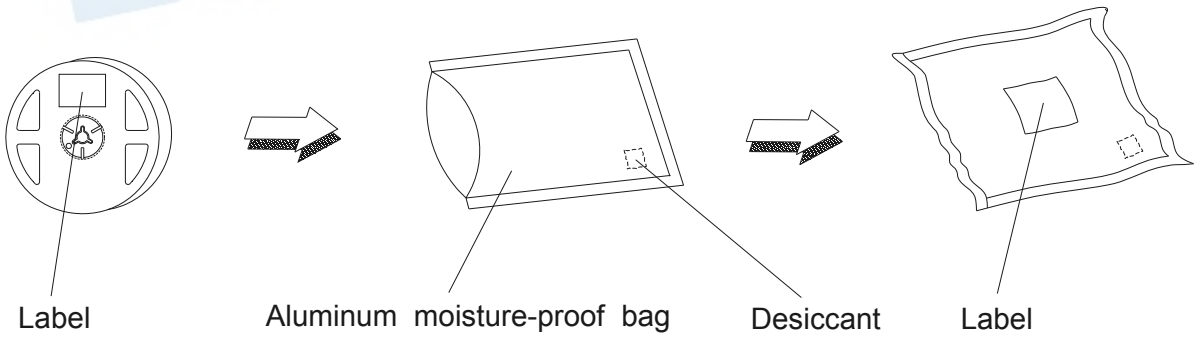
Note:
Tolerances unless mentioned ±0.1mm. Unit = mm

Carrier Tape Dimensions: Loaded Quantity 4000 pcs Per Reel



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

Moisture Resistant Packing Process



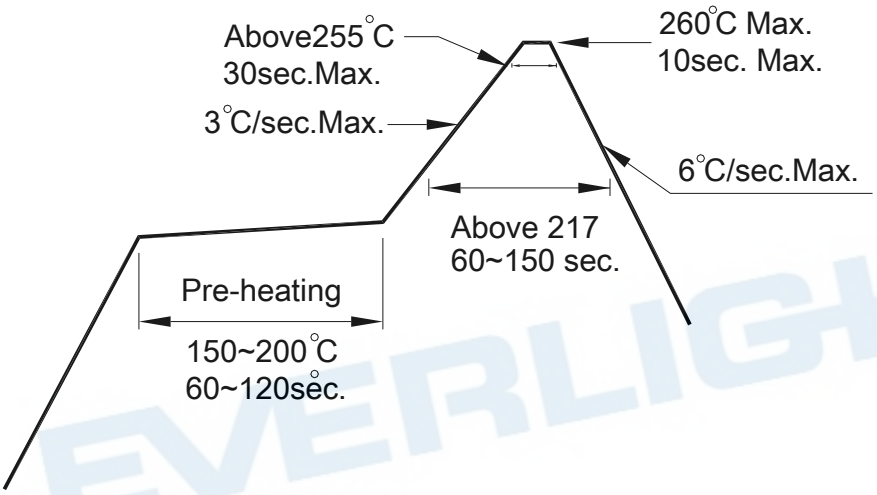
Reliability Test Items and Conditions

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	Reflow Soldering	Temp. : 260℃/10sec.	6 Min.	22 PCS.	0/1
2	Thermal Shock	H : +100℃ 20min ∫ 10 sec L : -10℃ 20min	200 Cycles	22 PCS.	0/1
3	Temperature Cycle	H : +100℃ 30min ∫ 5 min L : -40℃ 30min	200 Cycles	22 PCS.	0/1
4	High Temperature/Humidity Reverse Bias	Ta=85℃,85%RH	1000 Hrs.	22 PCS.	0/1
5	High Temperature/Humidity Operation	Ta=85℃,85%RH, I_F = 40 mA	1000 Hrs.	22 PCS.	0/1
6	Low Temperature Storage	Ta=-40℃	1000 Hrs.	22 PCS.	0/1
7	High Temperature Storage	Ta=85℃	1000 Hrs.	22 PCS.	0/1
8	Low Temperature Operation Life	Ta=-40℃, I_F = 75 mA	1000 Hrs.	22 PCS.	0/1
9	High Temperature Operation/ Life#1	Ta=25℃, I_F = 75 mA	1000 Hrs.	22 PCS.	0/1
10	High Temperature Operation/ Life#2	Ta=55℃, I_F =75 mA	1000 Hrs.	22 PCS.	0/1
11	High Temperature Operation/ Life#3	Ta=85℃, 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℃ 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



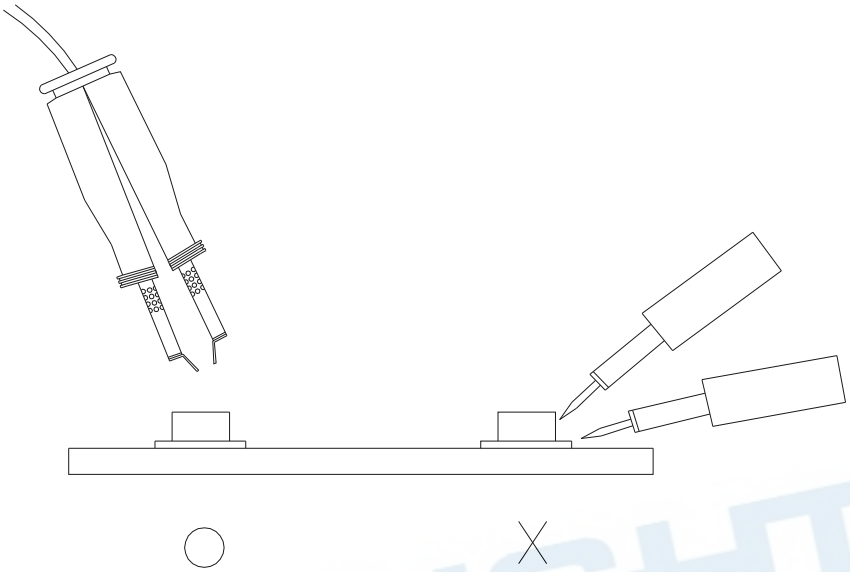
   3.2 Reflow soldering should not be done more than two times.
   3.3 When soldering, do not put stress on the LEDs during heating.
   3.4 After soldering, do not warp the circuit board.

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.
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