EVERLIGHT

SMD ▪ MID Power LED
67-21S/KK7C-HXXXX34Z15/2T(GC)

Preliminary

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

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Product Number Explanation

67–21S / K K 7 C – H XX XX XX Z15 / 2T

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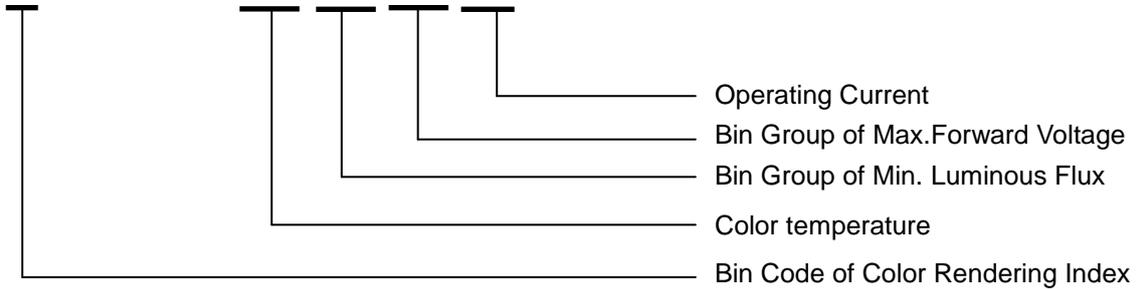
Table of Color Rendering Index

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
Z15	I_F:150mA

Example:
67-21S/KK7C-H407034Z15/2T(GC)

CRI	80(Min.)
CCT	4000K
Flux	70lm min
V_F	3.4V max
I_F	150mA

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Mass Production List

Product	CRI Min.(1)	CCT(K)	Φ(lm) Min. (2)
67-21S/KK7C-H306534Z15/2T(GC)	80	3000K	65
67-21S/KK7C-H356534Z15/2T(GC)	80	3500K	65
67-21S/KK7C-H407034Z15/2T(GC)	80	4000K	70
67-21S/KK7C-H507034Z15/2T(GC)	80	5000K	70

Notes:
1. Tolerance of Color Rendering Index: ±2
2. Tolerance of Luminous flux: ±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$_{Soldering}$=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$_d$	612	mW
Operating Temperature	T$_{opr}$	-40 ~ +85	℃
Storage Temperature	T$_{stg}$	-40 ~ +100	℃
Thermal Resistance (Junction / Soldering point)	R$_{th\ J-S}$	21	℃/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	65	-----	-----	lm	I$_F$=150mA
Forward Voltage(2)	V$_F$	-----	-----	3.4	V	I$_F$=150mA
Color Rendering Index(3)	Ra	80	-----	-----		I$_F$=150mA
Viewing Angle	2θ$_{1/2}$	-----	120	-----	deg	I$_F$=150mA
Reverse Current	IR	-----	-----	50		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
R4	65	70		
R5	70	76		
R6	76	83	lm	I_F=150mA
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		
	36	2.9	3.0		
	37	3.0	3.1	V	I_F=150mA
	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
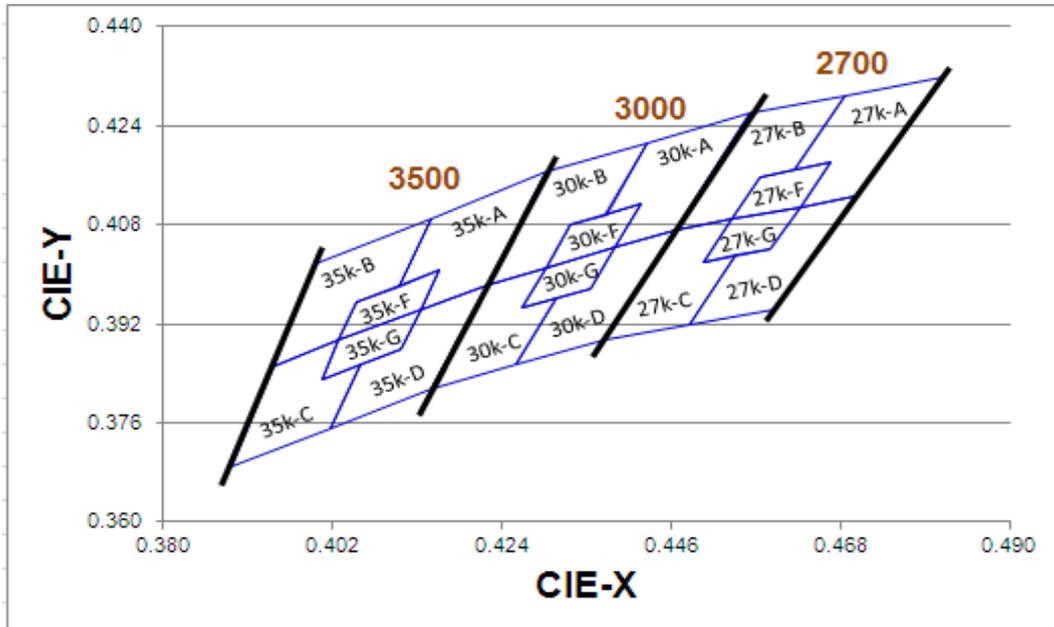
CCT	Bin Code	CIE_x	CIE_y	Bin Code	CIE_x	CIE_y
3000K	30K-A	0.4562	0.4260	30K-D	0.4465	0.4071
		0.4430	0.4212		0.4388	0.4043
		0.4375	0.4096		0.4355	0.3977
		0.4422	0.4113		0.4311	0.3962
		0.4388	0.4043		0.4259	0.3853
		0.4465	0.4071		0.4373	0.3893
	Reference Range:2870K~3000K					
	30K-B	0.4430	0.4212	30K-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					
	30K-F	0.4422	0.4113	30K-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					

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CCT	Bin Code	CIE_x	CIE_y	Bin Code	CIE_x	CIE_y
3500K	35K-A	0.4299	0.4165	35K-D	0.4221	0.3984
		0.4148	0.4090		0.4134	0.3943
		0.4106	0.3981		0.4108	0.3878
		0.4159	0.4007		0.4057	0.3853
		0.4134	0.3943		0.4018	0.3752
		0.4221	0.3984		0.4147	0.3814
	Reference Range:3220K~3500K					
	35K-B	0.4148	0.4090	35K-C	0.3943	0.3853
		0.3996	0.4015		0.3889	0.3690
		0.3943	0.3853		0.4018	0.3752
		0.4029	0.3893		0.4057	0.3853
		0.4051	0.3954		0.4006	0.3829
		0.4106	0.3981		0.4029	0.3893
	Reference Range:3500K~3710K					
	35K-F	0.4159	0.4007	35K-G	0.4134	0.3943
		0.4051	0.3954		0.4029	0.3893
		0.4029	0.3893		0.4006	0.3829
		0.4134	0.3943		0.4108	0.3878
	Reference Range:3360K~3540K					

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The C.I.E. 1931 Chromaticity Diagram
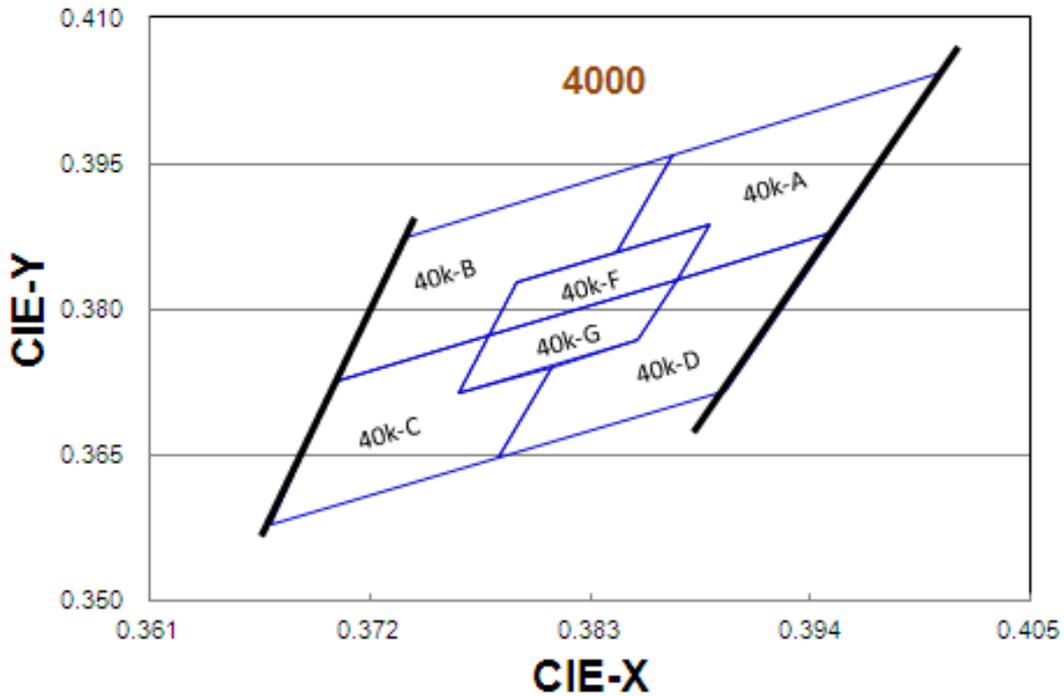
Bin Range of Chromaticity Coordinates

CCT	Bin Code	CIE_x	CIE_y	Bin Code	CIE_x	CIE_y
4000K	40K-A	0.4006	0.4044	40K-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					
	40K-B	0.3871	0.3959	40K-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					
	40K-F	0.3890	0.3887	40K-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					

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The C.I.E. 1931 Chromaticity Diagram
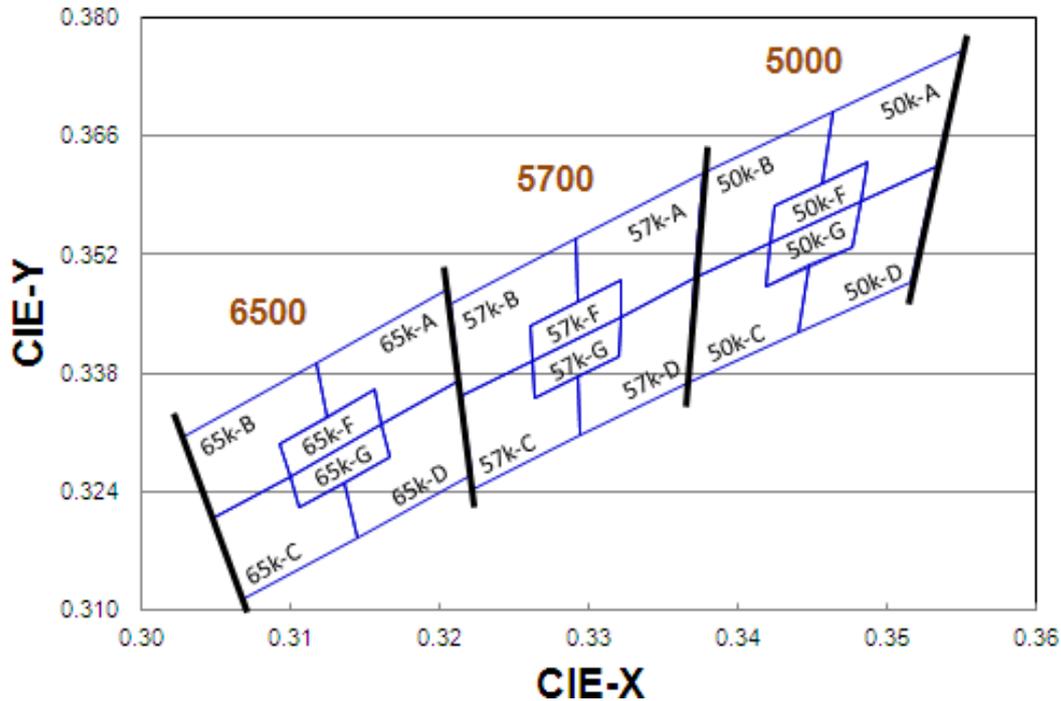
Bin Range of Chromaticity Coordinates

CCT	Bin Code	CIE_x	CIE_y	Bin Code	CIE_x	CIE_y
5000K	50K-A	0.3551	0.3760	50K-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					
	50K-B	0.3464	0.3688	50K-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					
	50K-F	0.3487	0.3629	50K-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					

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

Spectrum Distribution

Warm White ────── Neutral White ········· Cool White – ▲ –

Reaative luminous Intensity (%) vs. Wavelength λ(nm)
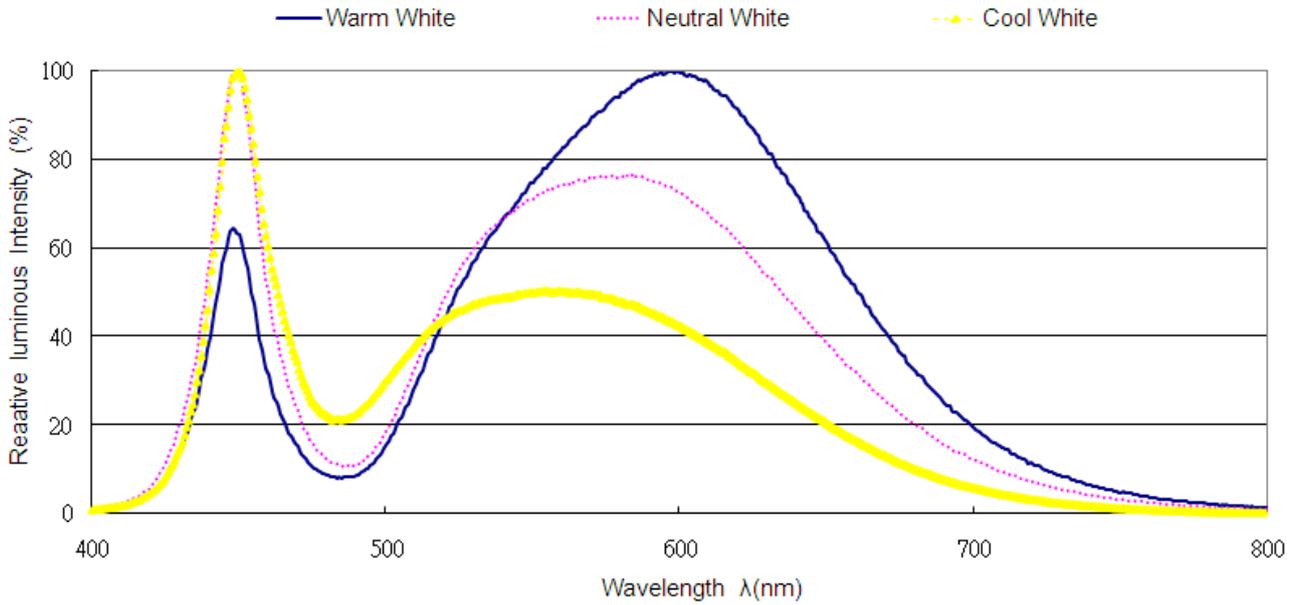
Typical Electro-Optical Characteristics Curves

Fig.1 – Forward Voltage Shift vs. Junction Temperature
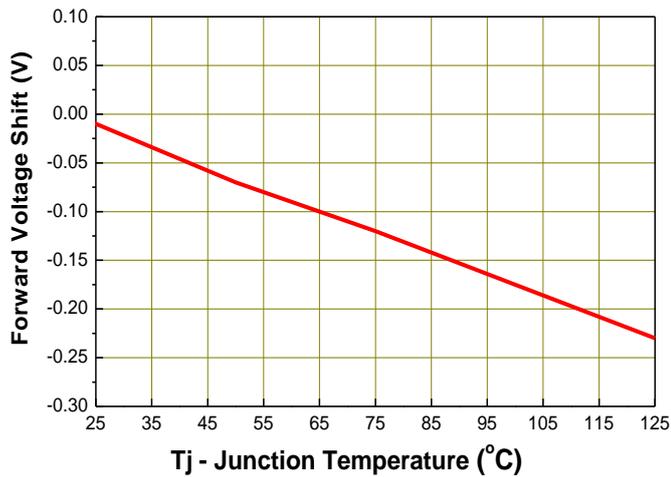
Forward Voltage Shift (V) vs. Tj - Junction Temperature (°C)

Fig.2 - Relative Luminous Intensity vs. Forward Current

Relative Luminous Intensity vs. Forward Current(mA)
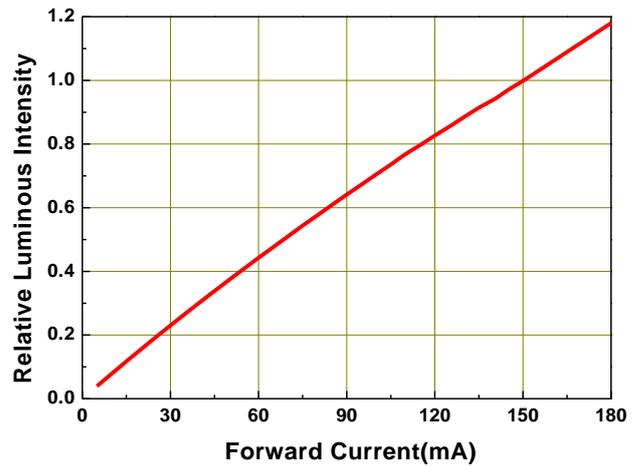
Typical Electro-Optical Characteristics Curves

Fig.3 - Relative Luminous Intensity vs. Junction Temperature
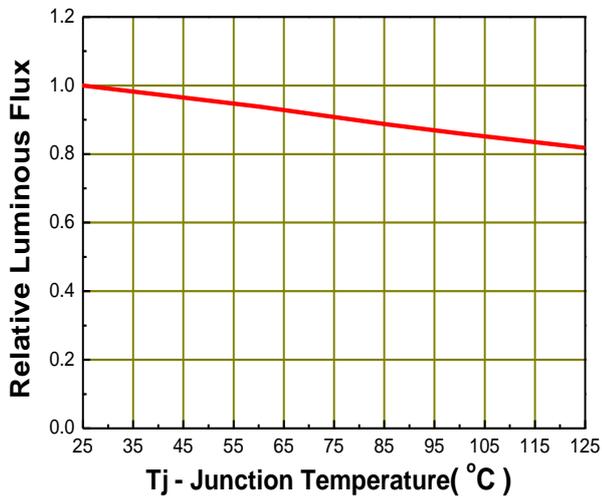
Fig.4 - Forward Current vs. Forward Voltage
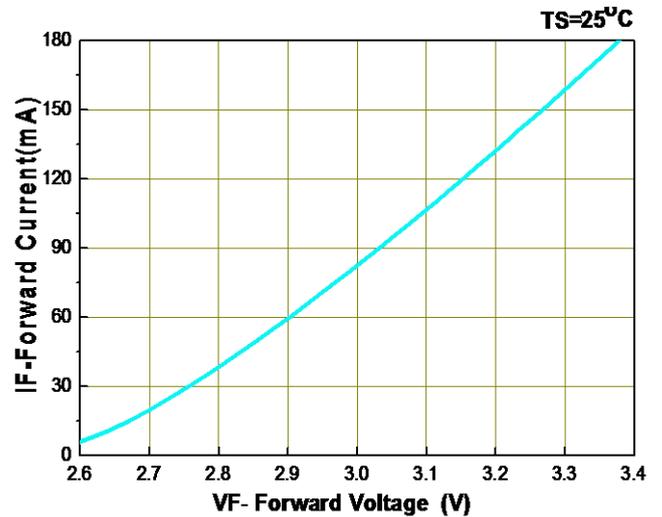
Fig.5 – Max. Driving Forward Current vs. Soldering Temperature

Rth j-s=21 °C/W
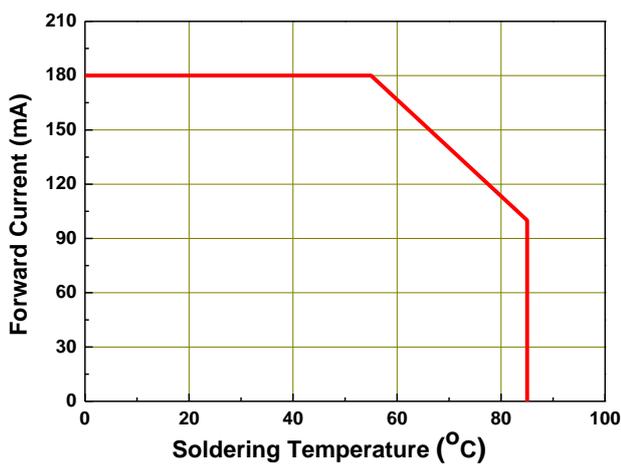
Fig.6 – Radiation Diagram

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Package Dimension

2.8

3.5

② ①

0.7

3.5

0.24

2.1

0.9 2.0

Bot. view

② + ▶ — ①

Polarity

0.24

2.1

1.0 2.1

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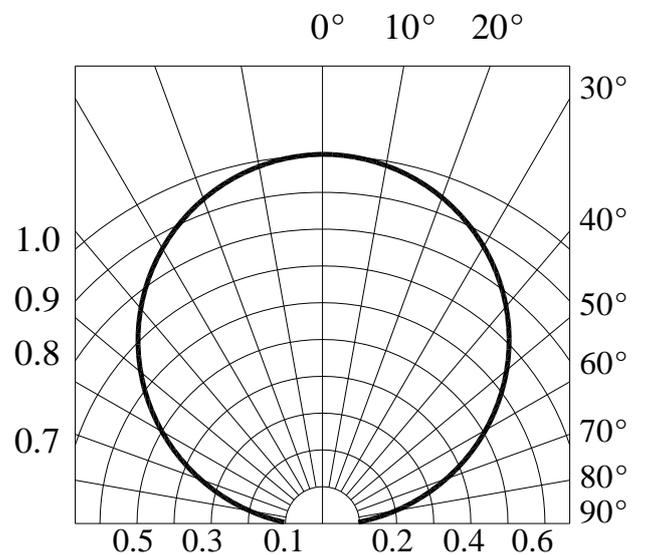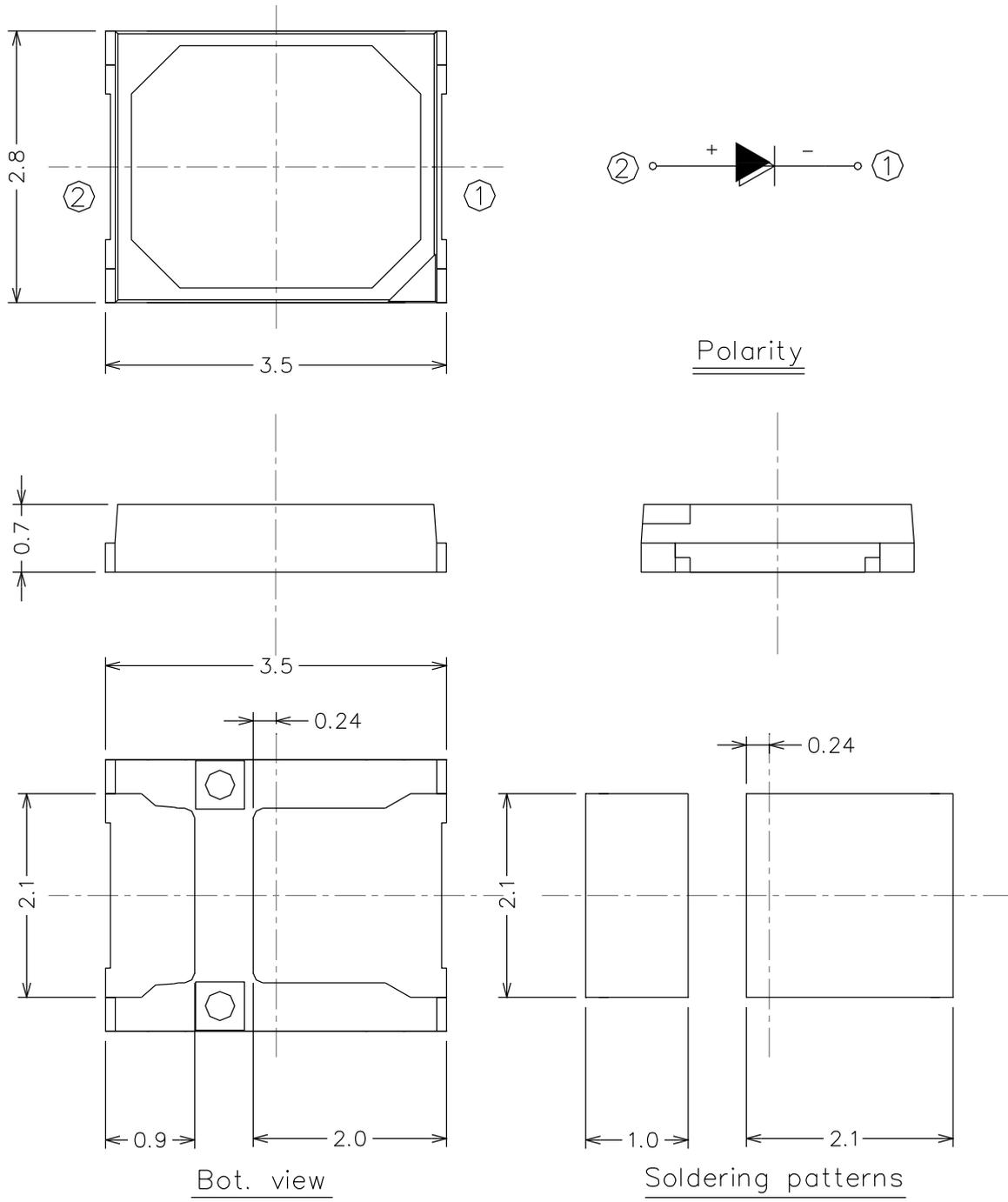
Note:
Tolerance unless mentioned is ±0.15 mm; Unit = mm

## Moisture Resistant Packing Materials

Label Explanation

```
RoHS  Pb EVERLIGHT          5
CPN: XXXXXXXXXXXXXXXXXXX
||||||||||||||||||||||||||||||
XXXXXXXXXX-XXXXXXXXXX-XXXXXXXXXX-XXXXXXXXXX-XXXXXX
P/N: XXXXXXXXXX
||||||||||||||||||||||||||||||
XXXXXXXXXX-XXXXXXXXXX-XXXXXXXXXX-XXXXXXXXXX-XXXXXX
 LOT NO:Y150716XXX-XXXXXXXXXX-XXXXXXXXXX
||||||||||||||||||||||||||||||
QTY:0123456789  HUE:XXXXXXXXXX
||||||||||||||||  |||||||||||||||
CAT:XXXXXXXXXX  REF:XXXXXXXXXX
||||||||||||||||  |||||||||||||||
REFERENCE: BTPYYMMDDXXXXX
||||||||||||||||||||||||||||||
MSL-X          MADE IN XXXXXX
```
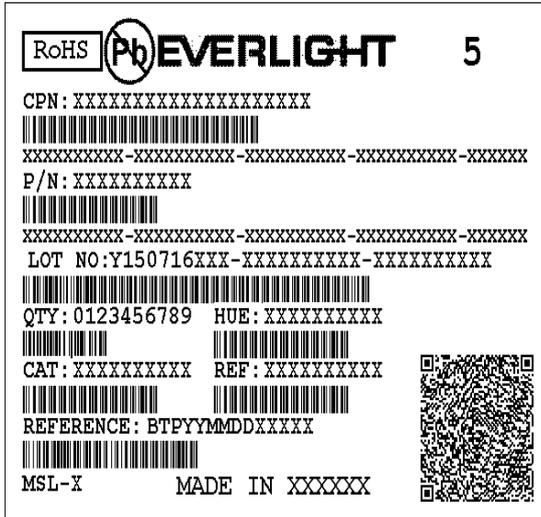
- CPN: Customer's Product Number
- P/N: Product Number
- QTY: Packing Quantity
- CAT: Luminous Intensity Rank
- HUE: Dom. Wavelength Rank
- REF: Forward Voltage Rank
- LOT No: Lot Number

Reel Dimensions

79.6

330.2± 2

8.7±0.3

11.5
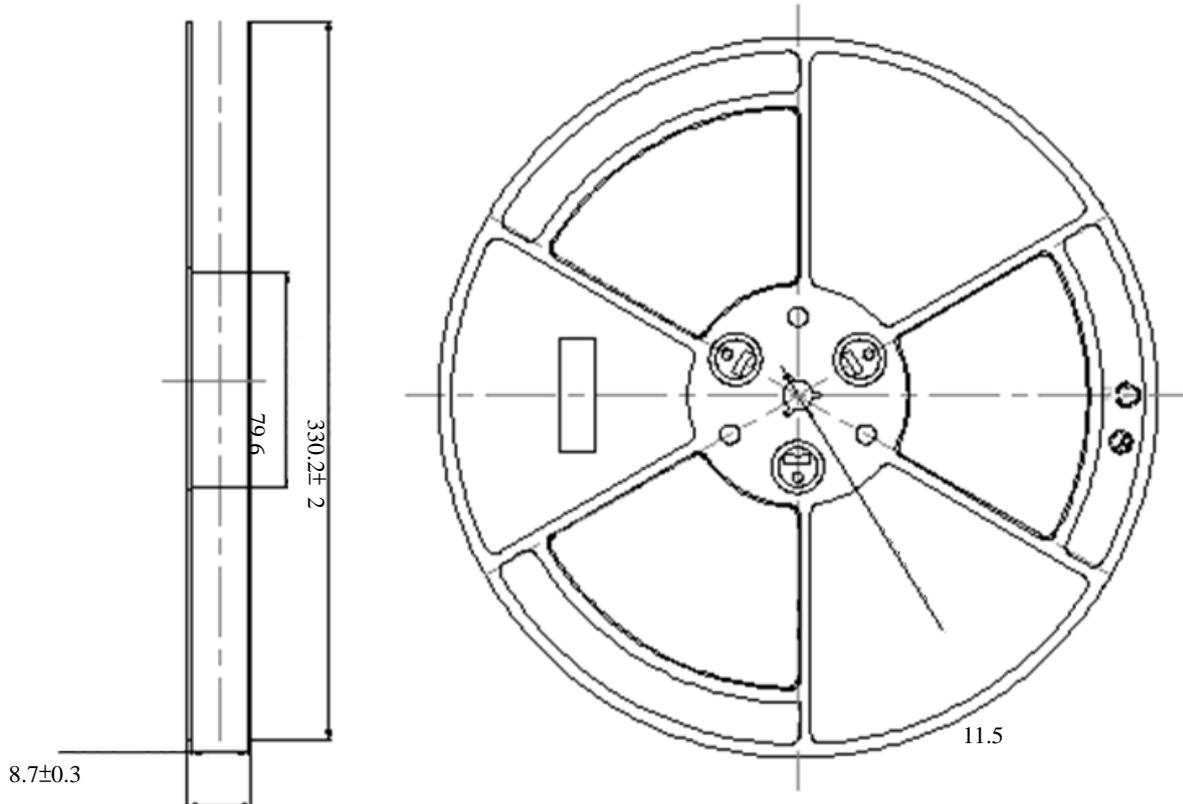
Note:
Tolerances unless mentioned ±0.1mm. Unit = mm

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Carrier Tape Dimensions: Loaded Quantity 16000 pcs Per Reel

Progressive direction

4.0±0.1   2.0±0.05   1.5+0.1

1.75±0.1

3.50±0.05   8.0±0.2

3.75±0.10

① −
② +
Polarity

4.0±0.1

0.95±0.10
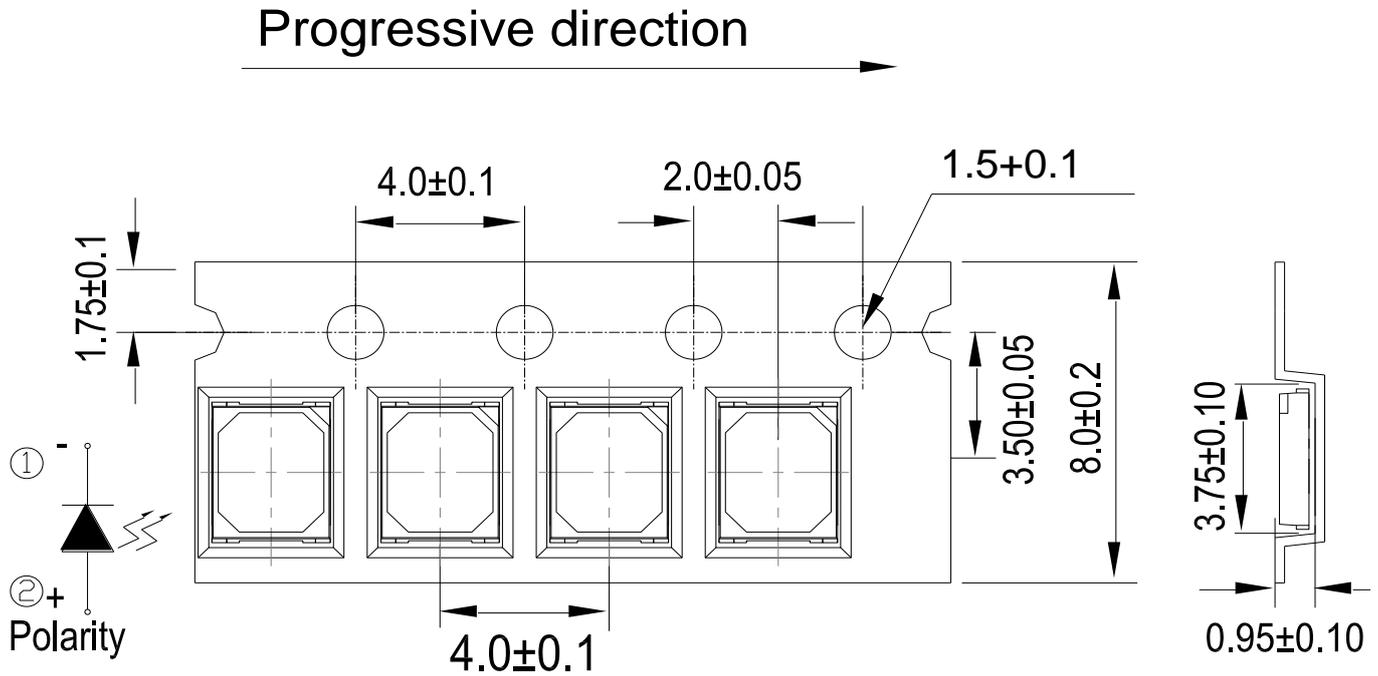
Note:
Tolerance unless mentioned is ±0.1mm; Unit = mm

Moisture Resistant Packing Process

Label   Aluminum moisture-proof bag   Desiccant   Label
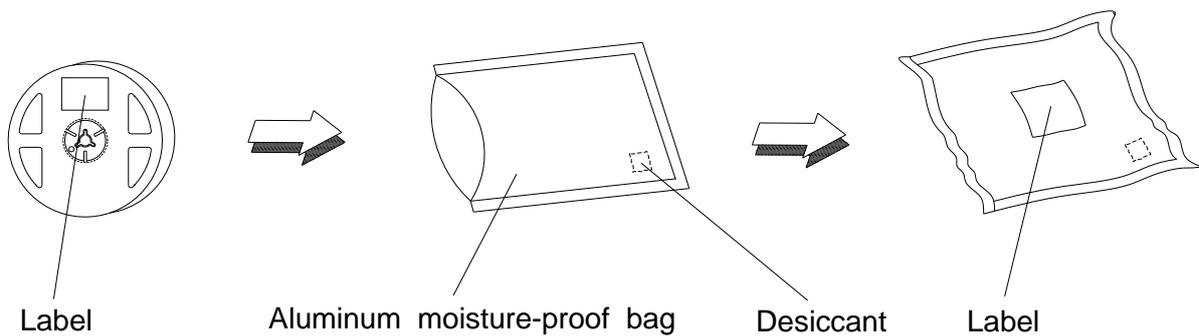
Reliability Test Items and Conditions

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 = 100 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 = 180 mA	1000 Hrs.	22 PCS.	0/1
9	High Temperature Operation/ Life#1	Ta=25℃, I_F = 180 mA	1000 Hrs.	22 PCS.	0/1
10	High Temperature Operation/ Life#2	Ta=55℃, I_F =180 mA	1000 Hrs.	22 PCS.	0/1
11	High Temperature Operation/ Life#3	Ta=85℃, I_F = 100 mA	1000 Hrs.	22 PCS.	0/1

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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

   Above255℃
   30sec.Max.

   3℃/sec.Max.

   260℃ Max.
   10sec. Max.

   6℃/sec.Max.

   Above 217
   60~150 sec.

   Pre-heating

   150~200℃
   60~120sec.
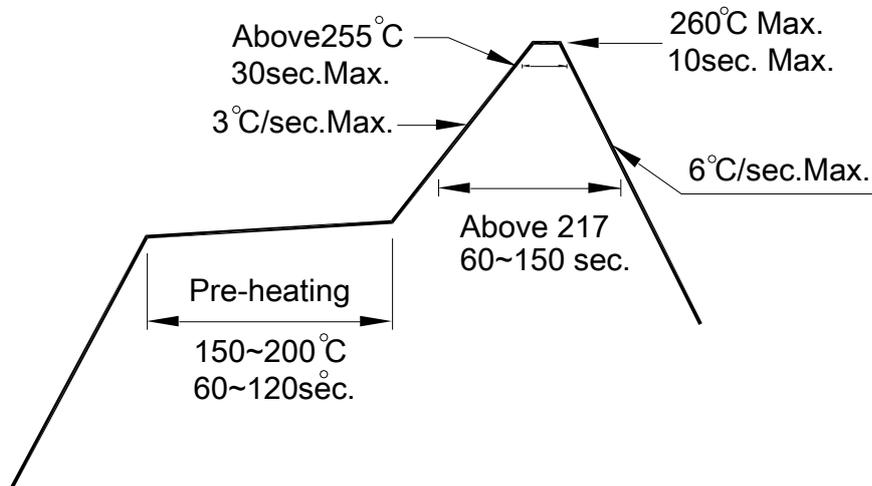
   3.2 Reflow soldering should not be done more than two times.
   3.3 When soldering, do not put stress on the LEDs during heating.
   3.4 After soldering, do not warp the circuit board.
4. Soldering Iron

   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.
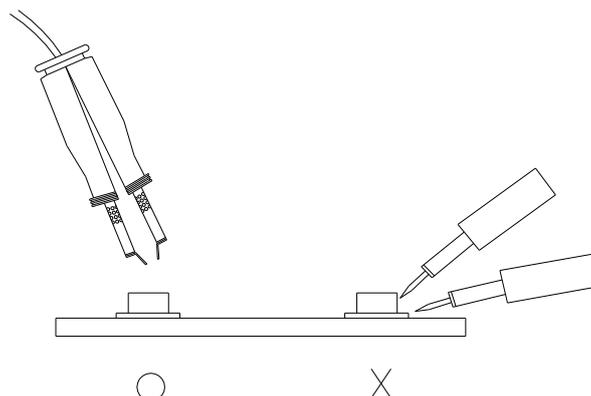
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DISCLAIMER

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,