

## SMD- Top view LEDs 67-21/KKE-5MXXX30U2/2T(GE)



### Features

- . P-LCC-2 package.
- . White package.
- . Optical indicator.
- . Ideal for backlight and light pipe application.
- . Inter reflector.
- . Wide viewing angle.
- . Suitable for vapor-phase reflow.
- . Computable with automatic placement equipment.
- . Pb-free.
- . The product itself will remain within RoHS compliant version.
- . Compliance with EU REACH.
- . Compliance Halogen Free .(Br<900ppm,Cl<900ppm,Br+Cl<1500ppm)
- . Precondition: Bases on JEDEC J-STD 020D Level 4

### Applications

- . Switches, symbol, mobile phone, digital camera and illuminated advertising.
- . Display for indoor and outdoor application.
- . Ideal for coupling into light guides.
- . Substitution of traditional light.
- . Amusement equipment.
- . General applications.
- . Optical indicator.

### 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>
3000K	67-21/KKE-5M301030U2/2T(GE)	80	10	3.0
4000K	67-21/KKE-5M401130U2/2T(GE)	80	11	3.0
5000K	67-21/KKE-5M501130U2/2T(GE)	80	11	3.0
6500K	67-21/KKE-5M651130U2/2T(GE)	80	11	3.0
7000K	67-21/KKE-5M701130U2/2T(GE)	80	11	3.0
7300K	67-21/KKE-5M731130U2/2T(GE)	80	11	3.0

Notes:

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

## Device Selection Guide

Chip Materials	Emitted Color	Resin Color
InGaN	White	Yellowish

## Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Rating	Unit
Forward Current	I <sub>F</sub>	30	mA
Peak Forward Current (Duty 1/10 @1KHz)	I <sub>FP</sub>	60	mA
Power Dissipation	P <sub>d</sub>	108	mW
Junction Temperature	T <sub>j</sub>	115	°C
Thermal Resistance	R <sub>th j-c</sub>	20	°C/W
Operating Temperature	T <sub>opr</sub>	-40 ~ +85	°C
Storage Temperature	T <sub>stg</sub>	-40 ~ +100	°C
ESD	ESD <sub>HBM</sub>	1000	V
Soldering Temperature	T <sub>sol</sub>	Reflow Soldering : 260 °C for 5 sec. Hand Soldering : 350 °C for 3 sec.	

## Electro-Optical Characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Luminous Intensity	Φ <sub>v</sub>	10	---	----	lm	I <sub>F</sub> =25mA
Viewing Angle	2θ <sub>1/2</sub>	---	120	---	deg	I <sub>F</sub> =25mA
Forward Voltage	V <sub>F</sub>	2.6	---	3.0	V	I <sub>F</sub> =25mA
Reverse Current	I <sub>R</sub>	---	---	50	μA	V <sub>R</sub> =5V

### Notes:

1. Tolerance of Luminous Intensity: ±11%
2. Tolerance of Forward Voltage: ±0.1V

### Bin Range of Luminous Intensity

Bin Code	Min.	Max.	Unit	Condition
10L1	10	11	lm	I <sub>F</sub> =25mA
11L1	11	12		
12L1	12	13		
13L1	13	14		

Note:  
Tolerance of Luminous Intensity: ±11%

### Bin Range of Forward Voltage

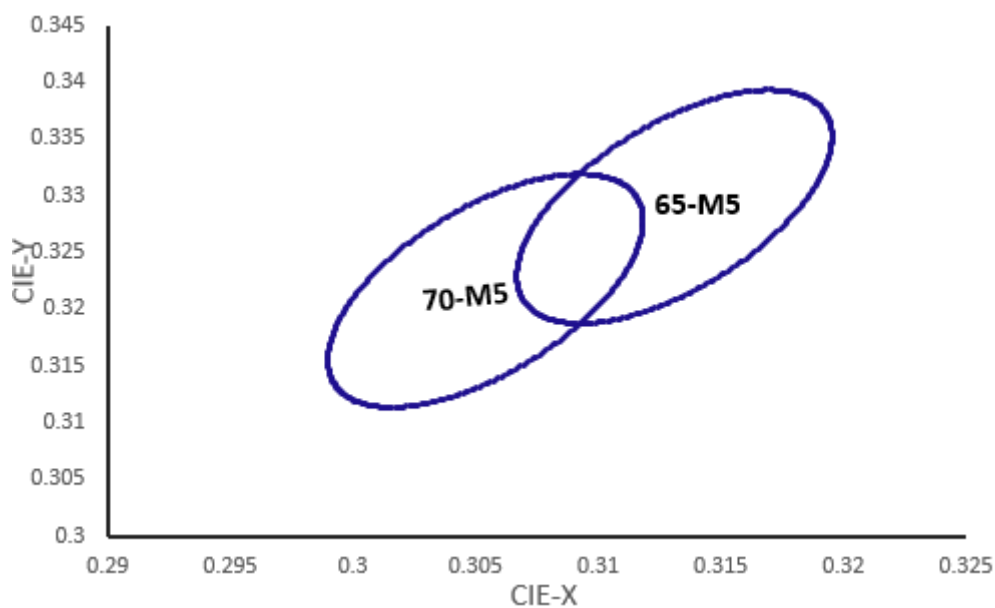
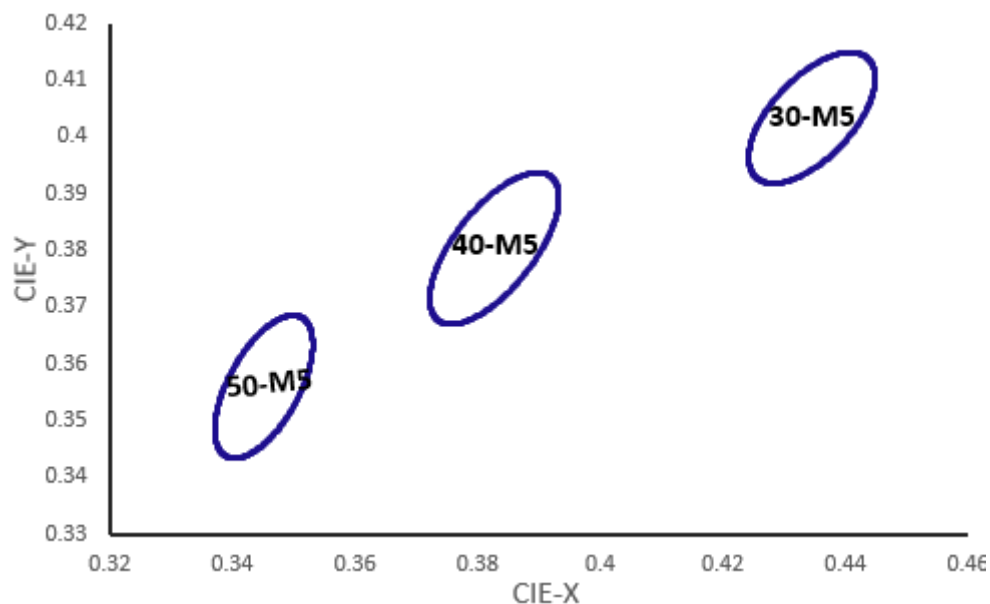
Bin Code	Min.	Max.	Unit	Condition
26A	2.60	2.70	V	I <sub>F</sub> =25mA
27A	2.70	2.80		
28A	2.80	2.90		
29A	2.90	3.00		

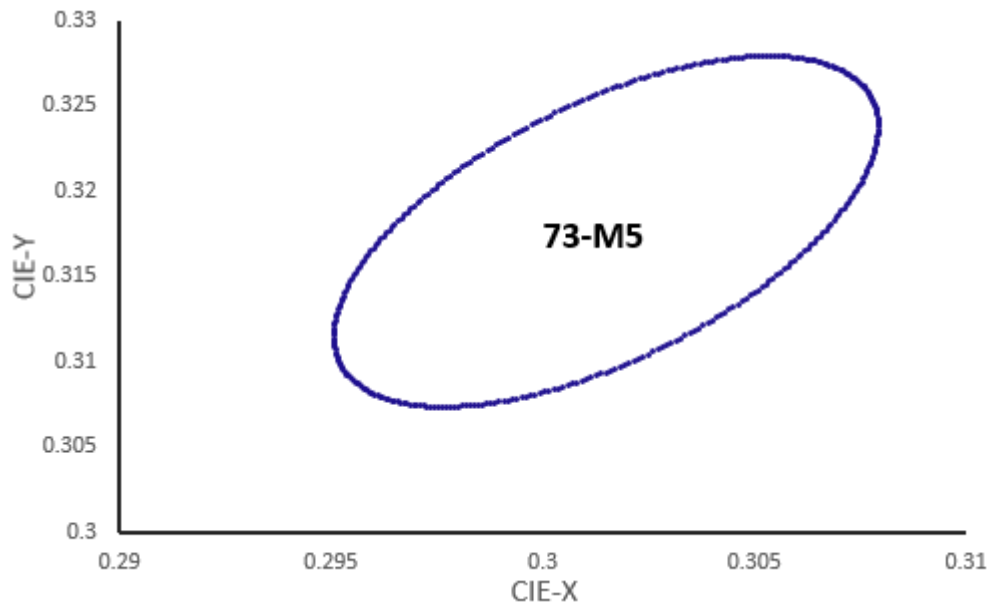
Note:  
Tolerance of Forward Voltage: ±0.1V

### Bin Code of Macadam 5 step

Step	CCT	Bin Code	Cx	Cy	a	b	theta
5	3000	30-M5	0.4345	0.4033	0.01390	0.00680	50.22
	4000	40-M5	0.3827	0.3803	0.01565	0.00670	54.80
	5000	50-M5	0.3451	0.3559	0.01370	0.00590	64.12
	6500	65-M5	0.3131	0.3290	0.01115	0.00475	64.57
	7000	70-M5	0.3054	0.3216	0.01115	0.00475	64.57
	7300	73-M5	0.3015	0.3176	0.01115	0.00475	64.57

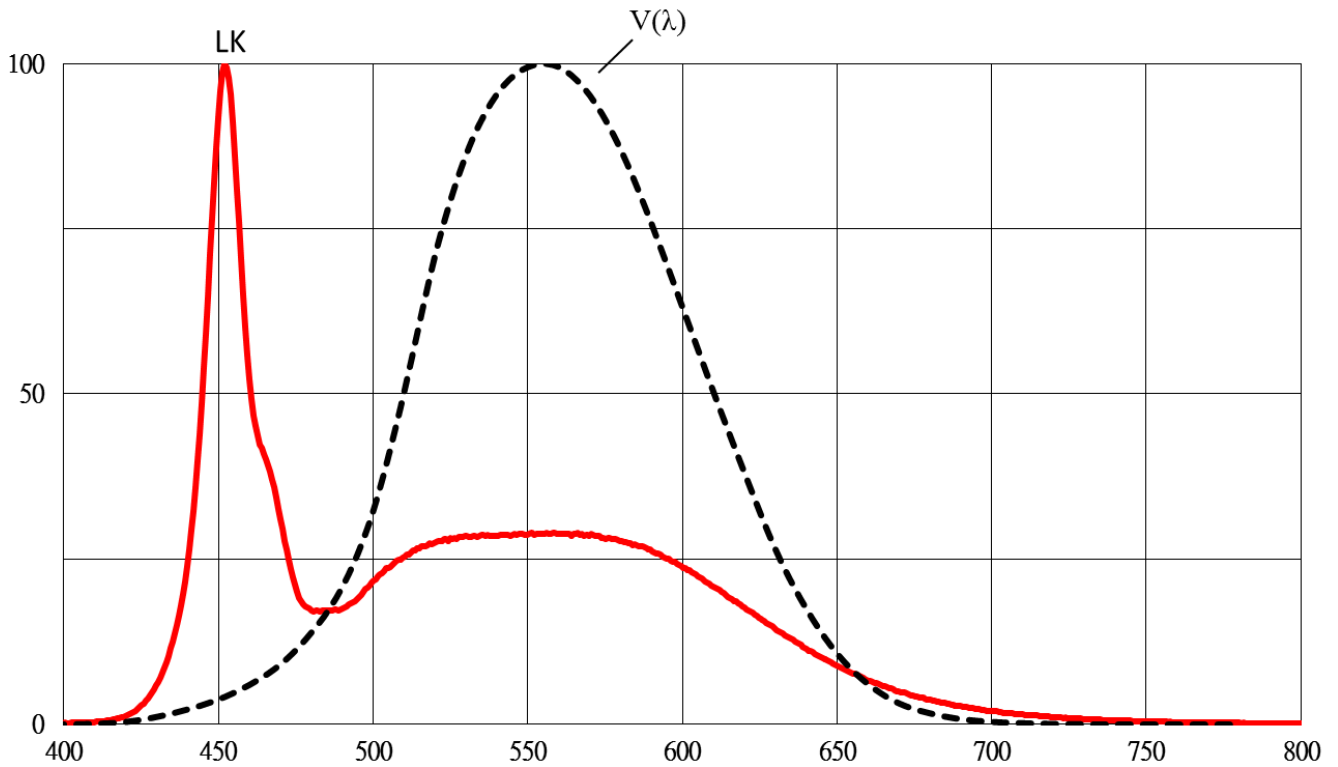
### The C.I.E. 1931 Chromaticity Diagram





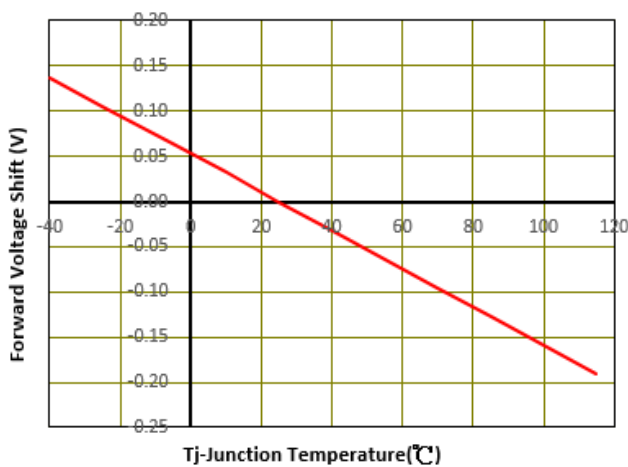
1. The value is based on driving current by 25mA.
2. Tolerance of Chromaticity Coordinates:  $\pm 0.01$ .

### Spectrum Distribution

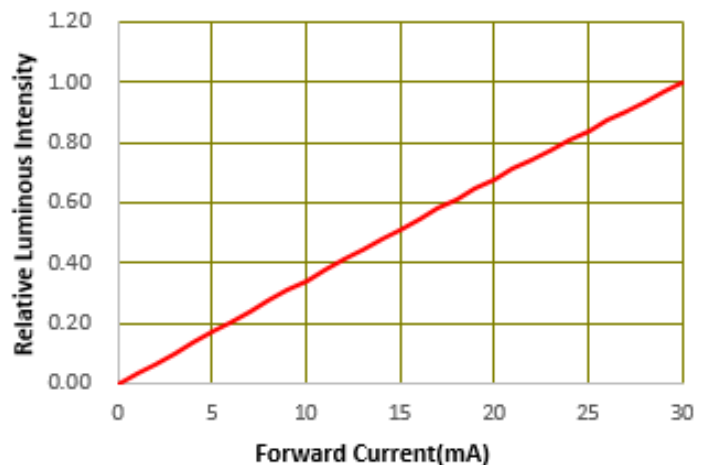


### Typical Electro-Optical Characteristics Curves

**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

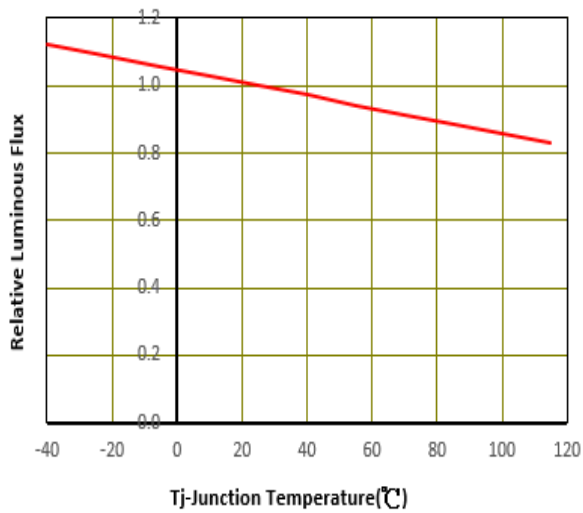


Fig.4 - Forward Current vs. Forward Voltage

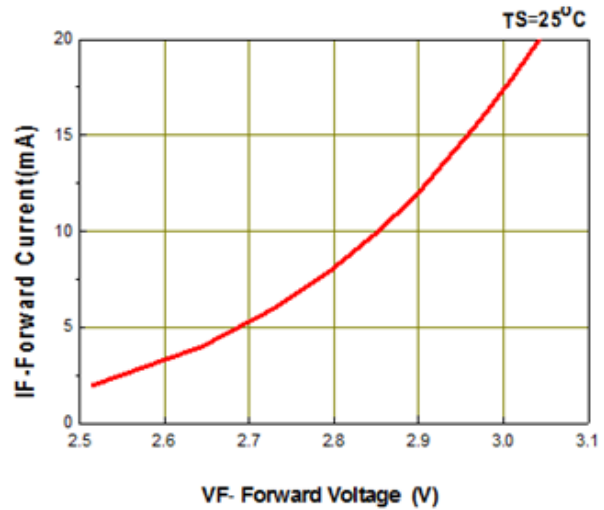


Fig.5 – Max. Driving Forward Current vs. Soldering Temperature

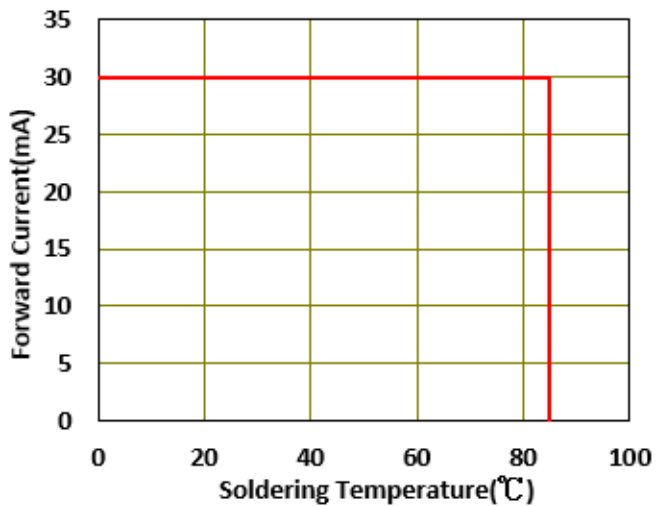


Fig.6 –Relative Luminous Intensity vs. Ambient Temperature Ta

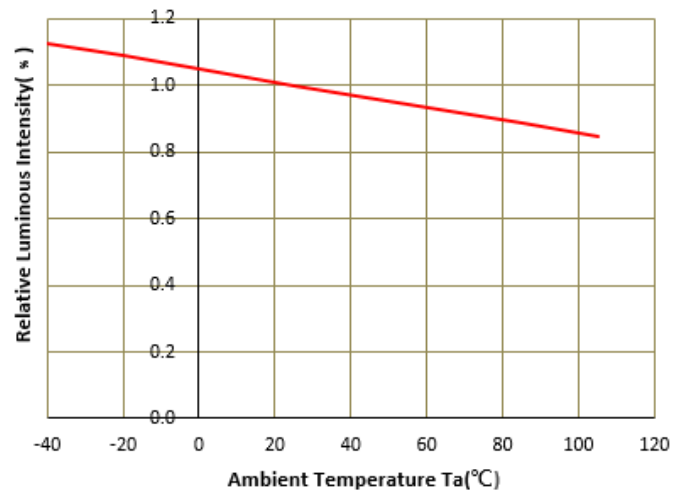
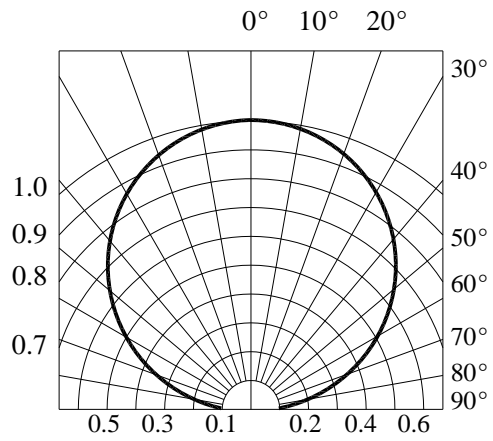
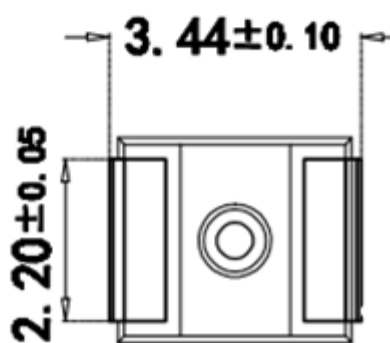
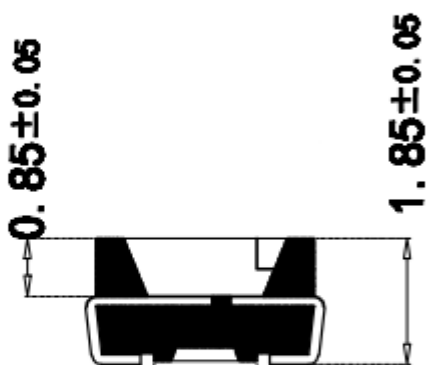
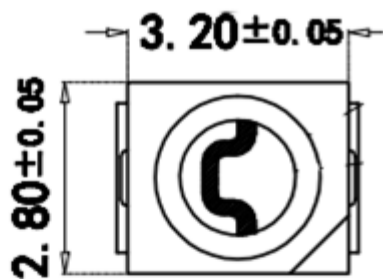




Fig.6 – Radiation Diagram



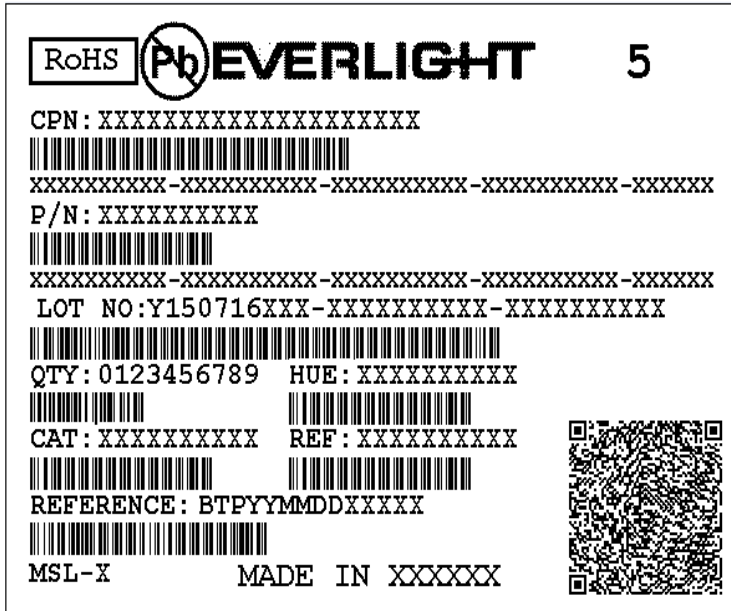
Package Dimension



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

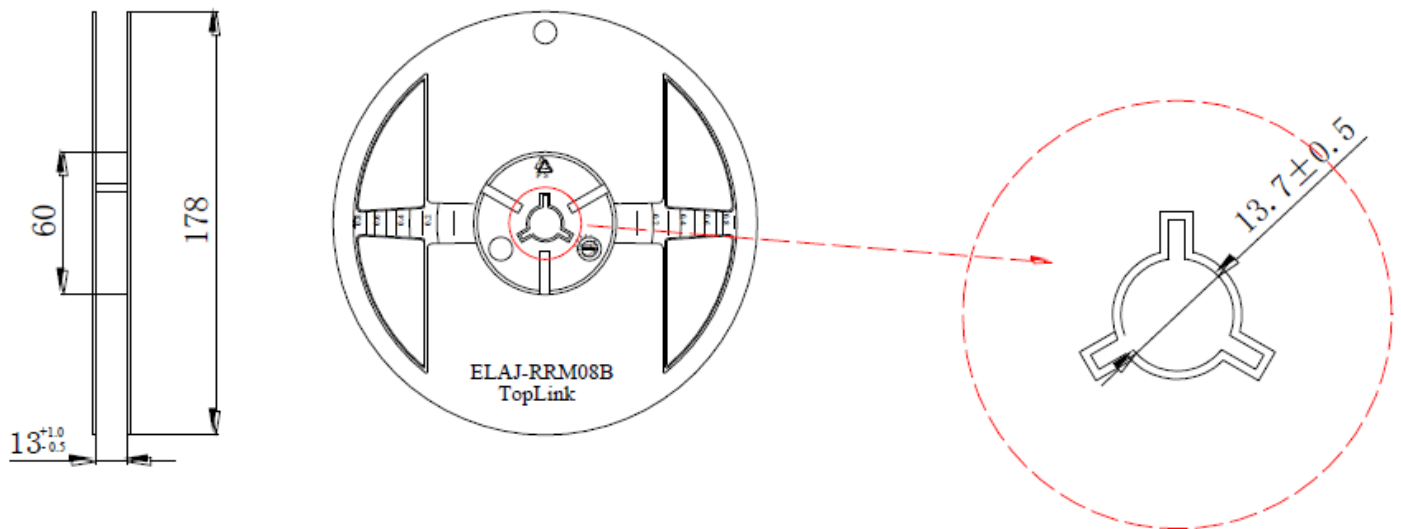
Moisture Resistant Packing Materials

Label Explanation



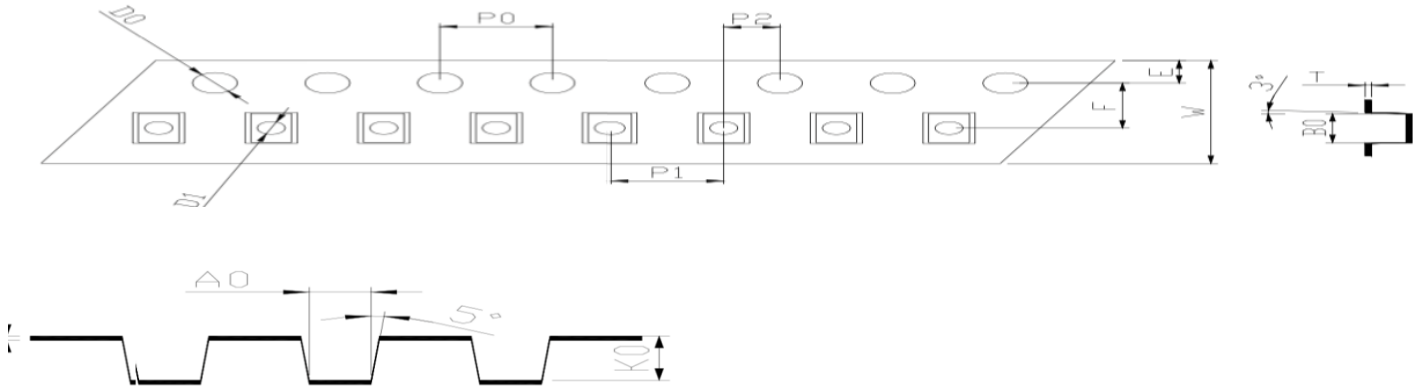
- CPN: Customer's Product Number
- P/N: Product Number
- QTY: Packing Quantity
- CAT: Luminous Intensity Rank
- HUE: Dom. Wavelength Rank
- REF: Forward Voltage Rank
- LOT No: Lot Number

Reel Dimensions (GS)



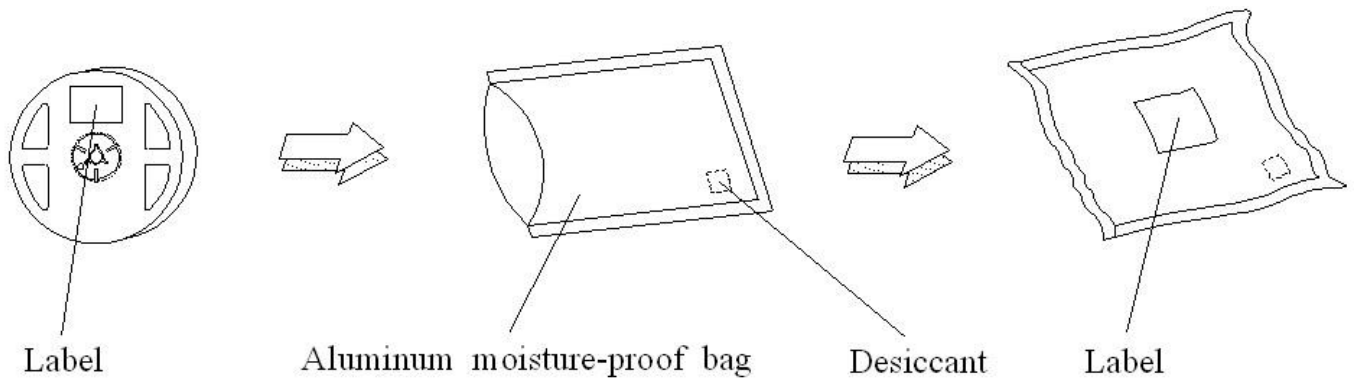
**Note:** The tolerances unless mentioned is  $\pm 0.1\text{mm}$ , Unit = mm

**Carrier Tape Dimensions: Loaded Quantity 500/1000/1500/2000 pcs Per Reel**



Note: Tolerances unless mentioned  $\pm 0.1$ 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> =30mA	1000 Hrs.	8 PCS.	0/1
4	Low Temperature Life	Ta=-40°C, I <sub>F</sub> = 30 mA	1000 Hrs.	8 PCS.	0/1
5	High Temperature Life	Ta=60°C, I <sub>F</sub> =30 mA	3000 Hrs.	8 PCS.	0/1
6	High Temperature Life	Ta=85°C, I <sub>F</sub> =30 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> = 20 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.

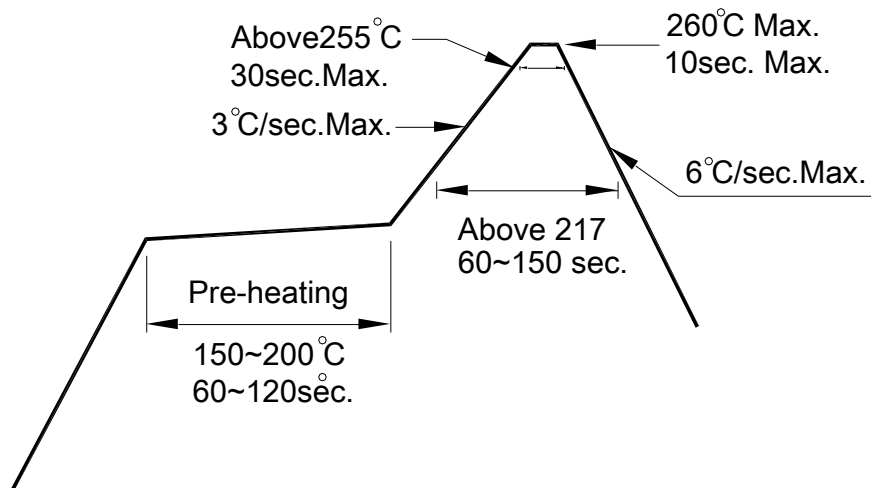
2.3 After opening the package: The LED's floor life is 168 Hrs under 30°C or less and 60% RH or less. If unused LEDs remain, it should be stored in moisture proof packages.

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.

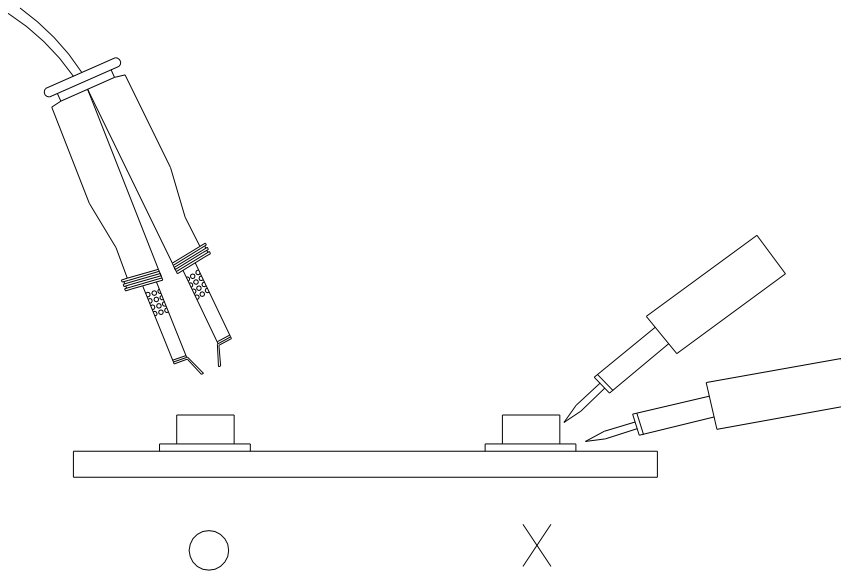
3.4 After soldering, do not warp the circuit board.

#### 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.



## **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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