

## Technical Data Sheet

### Luminosity White color LED

**61-238/XK2C-BXXXXXXXXXX/ET**

#### Features

- Super-luminosity chip LED.
- White SMT package.
- Lead frame package with individual 6 pins.
- Wide viewing angle.
- Soldering methods: IR reflow soldering.
- Pb-free.
- The product itself will remain within RoHS compliant version.



#### Descriptions

- Due to the package design, 61-238 has wide viewing angle, low power consumption and white LEDs are devices which are materialized by combing Blue LEDs and special phosphors. This feature makes the LED ideal for light guide application.

#### Applications

- General lighting
- Decorative and Entertainment Lighting.
- Indicators.
- Illuminations.

#### Device Selection Guide

Chip	Emitted Color	Resin Color
Material		
InGaN	Cool White Warm White	Water Clear



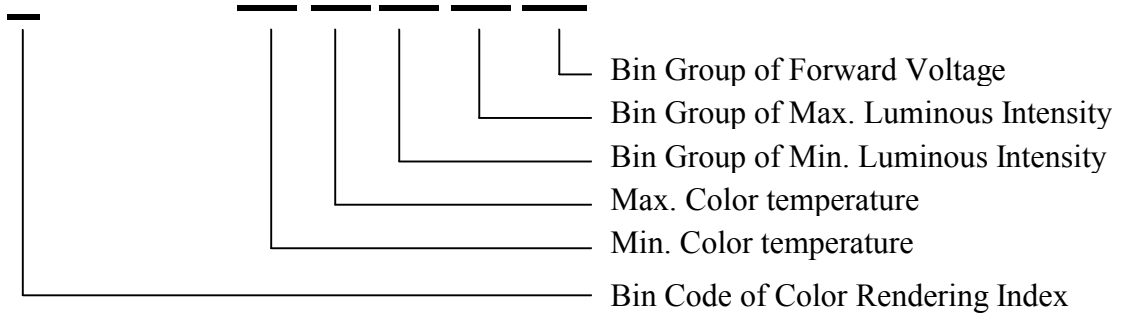
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Product Number Explanation

61-238 / X K 2 C - B XX XX XX XX XX / ET



Notes

Table of Color Rendering Index

Symbol	Description
M	CRI <sub>(min)</sub> : 60
N	CRI <sub>(min)</sub> : 65
L	CRI <sub>(min)</sub> : 70
Q	CRI <sub>(min)</sub> : 75
K	CRI <sub>(min)</sub> : 80
H	CRI <sub>(min)</sub> : 90

Notes:

1. Tolerance of Color Rendering Index: ±2

Example:

61-238/QK2C-B45562FAGB2/2T

CRI	Min=75
CCT	4500K~5650K
IV	5000mcd~6000mcd
VF	2.9V~3.6V



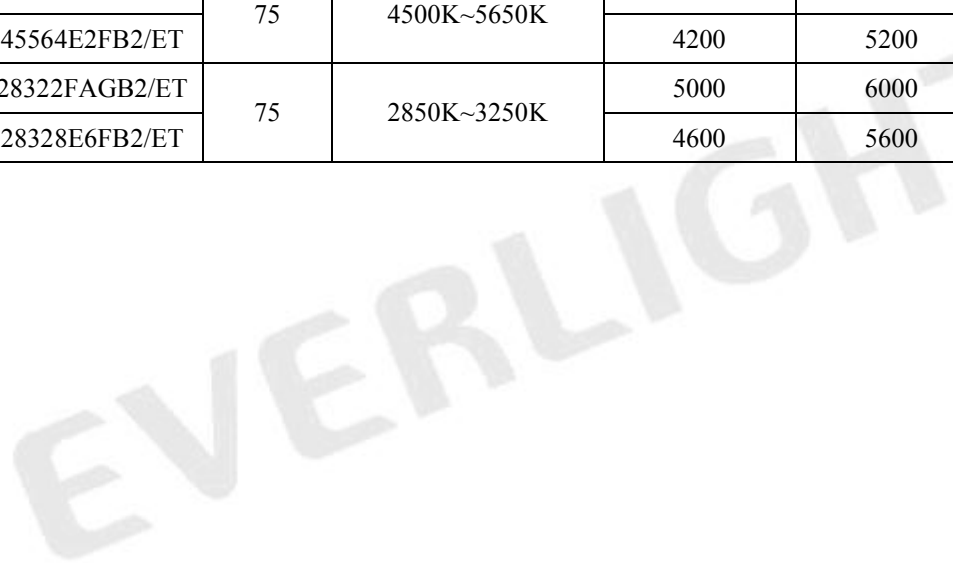
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Mass Production list

Product	CRI min	CCT(K)	I <sub>v</sub> (mcd) Min	I <sub>v</sub> (mcd) Max	Φ(lm) Typ.
61-238/LK2C-B56706F4GB2/ET	70	5650K~7000K	5400	6400	18.6
61-238/LK2C-B50638F6GB2/ET	70	5000K~6300K	5600	6600	19.2
61-238/LK2C-B50632FAGB2/ET			5000	6000	17.0
61-238/LK2C-B45568F6GB2/ET	70	4500K~5650K	5600	6600	19.2
61-238/LK2C-B45562FAGB2/ET			5000	6000	17.0
61-238/LK2C-B28322FAGB2/ET	70	2850K~3250K	5000	6000	17.0
61-238/LK2C-B28328E6FB2/ET			4600	5600	16.1
61-238/QK2C-B50632FAGB2/ET	75	5000K~6300K	5000	6000	17.0
61-238/QK2C-B50634E2FB2/ET			4200	5200	14.5
61-238/QK2C-B45562FAGB2/ET	75	4500K~5650K	5000	6000	17.0
61-238/QK2C-B45564E2FB2/ET			4200	5200	14.5
61-238/QK2C-B28322FAGB2/ET	75	2850K~3250K	5000	6000	17.0
61-238/QK2C-B28328E6FB2/ET			4600	5600	16.1

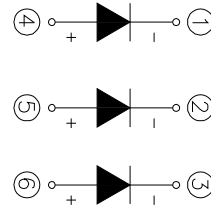
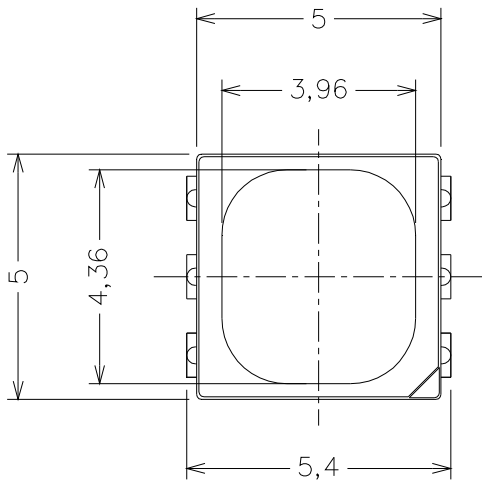


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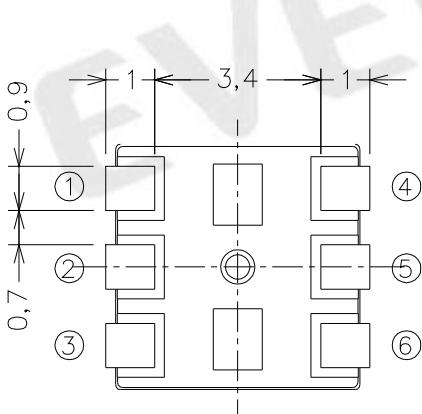
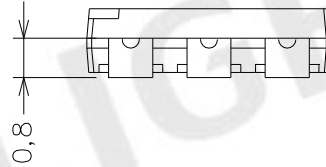
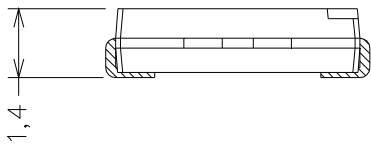
**Luminosity White color LED**

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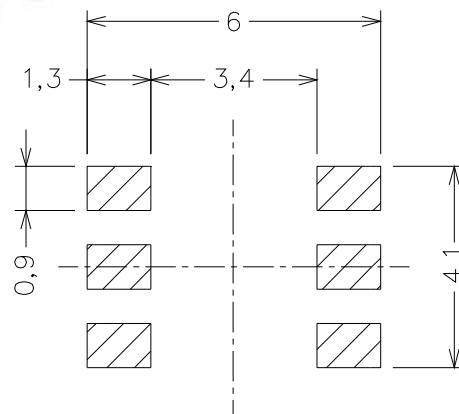
**Package Outline Dimensions**



Polarity



Bot. view



Soldering patterns

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

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**Absolute Maximum Ratings (Ta=25 )<sup>\*1</sup>**

Parameter	Symbol	Rating	Unit
Reverse Voltage <sup>*1</sup>	R	5	V
Forward Current <sup>*1</sup>	I <sub>F</sub>	30	mA
Peak Forward Current(Duty 1/10 @ 1KHZ) <sup>*1</sup>	I <sub>FP</sub>	100	mA
Power Dissipation <sup>*1</sup>	P <sub>d</sub>	110	mW
Electrostatic Discharge(HBM) <sup>*1</sup>	ESD	1000	V
Operating Temperature	Topr	-40 ~ +85	
Storage Temperature	Tstg	-40~ +90	
Soldering Temperature	Tsol	Reflow Soldering : 260 Hand Soldering : 350	for 10 sec. for 3 sec.

\* 1. The value are based on 1 die performance

**Electro-Optical Characteristics (Ta=25 )**

Parameter	Symbol	Min.	Typ.	Max.	Units	Condition
Viewing Angle <sup>*1</sup>	2 1/2	-----	120	-----	deg	I <sub>F</sub> =20mA <sup>*2</sup>
Reverse Current	I <sub>R</sub>	-----	-----	50	μ A	V <sub>R</sub> <sup>*2</sup> =5V

\*1 When three LED dies are operated simultaneously.

\*2 For each die.



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Bin Range of Luminous Intensity\*1

Bin Code	Min.	Max.	Unit	Condition
4D	3200	3400	mcd	I <sub>F</sub> =20*2mA
6D	3400	3600		
8D	3600	3800		
AE	3800	4000		
2E	4000	4200		
4E	4200	4400		
6E	4400	4600		
8E	4600	4800		
AF	4800	5000		
2F	5000	5200		
4F	5200	5400		
6F	5400	5600		
8F	5600	5800		
AG	5800	6000		
2G	6000	6200		
4G	6200	6400		
6G	6400	6600		

Notes:

- \*1 When three LED dies are operated simultaneously.
- \*2 For each die.
- Tolerance of Luminous Intensity ±11%



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Luminosity White color LED

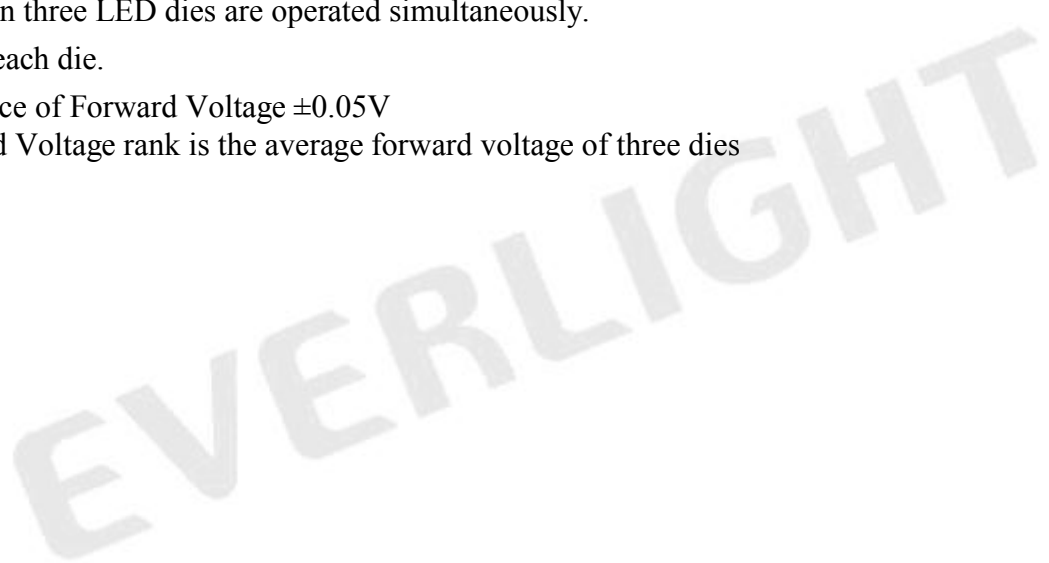
61-238/XK2C-BXXXXXXXXXX/ET

Bin Range of Forward Voltage \*1

Group	Bin Code	Min.	Max.	Unit	Condition	
G		34	2.7	2.8	V	I <sub>F</sub> =20 <sup>*2</sup> mA
		35	2.8	2.9		
	B2	36	2.9	3.0		
		37	3.0	3.1		
		38	3.1	3.2		
		39	3.2	3.3		
		40	3.3	3.4		
		41	3.4	3.5		
		42	3.5	3.6		
		43	3.6	3.7		

Notes:

- \*1 When three LED dies are operated simultaneously.
- \*2 For each die.
- Tolerance of Forward Voltage ±0.05V
- Forward Voltage rank is the average forward voltage of three dies





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Luminosity White color LED

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Bin Range of Chromaticity Coordinates \*1

I<sub>F</sub> \*2=20mA

CCT	Bin Code	CIE_x	CIE_y	CCT	Bin Code	CIE_x	CIE_y
7000K ~6300K	X5	0.3031	0.3327	5000K ~4500K	U5	0.3469	0.3717
		0.3148	0.3444			0.3642	0.3829
		0.3160	0.3332			0.3622	0.3716
		0.3052	0.3224			0.3458	0.3592
	X6	0.3052	0.3224		U6	0.3458	0.3592
		0.3160	0.3332			0.3622	0.3716
		0.3175	0.3204			0.3594	0.3557
		0.3076	0.3108			0.3444	0.3442
6300K ~5650K	W5	0.3148	0.3444	3250K ~3050K	P5	0.4312	0.4234
		0.3288	0.3569			0.4456	0.4287
		0.3290	0.3451			0.4376	0.4116
		0.3160	0.3332			0.4240	0.4065
	W6	0.3160	0.3332		P6	0.4240	0.4065
		0.3290	0.3451			0.4376	0.4116
		0.3292	0.3313			0.4294	0.3943
		0.3175	0.3204			0.4165	0.3890
5650K ~5000K	V5	0.3288	0.3569	3050K ~2850K	N5	0.4456	0.4287
		0.3469	0.3717			0.4614	0.4333
		0.3458	0.3592			0.4525	0.4162
		0.3290	0.3451			0.4376	0.4116
	V6	0.3290	0.3451		N6	0.4376	0.4116
		0.3458	0.3592			0.4525	0.4162
		0.3444	0.3442			0.4436	0.3991
		0.3292	0.3313			0.4294	0.3943

Note:

1. Tolerance of Chromaticity Coordinates: ±0.01
2. \*1 When three LED dies are operated simultaneously.
3. \*2 For each die.

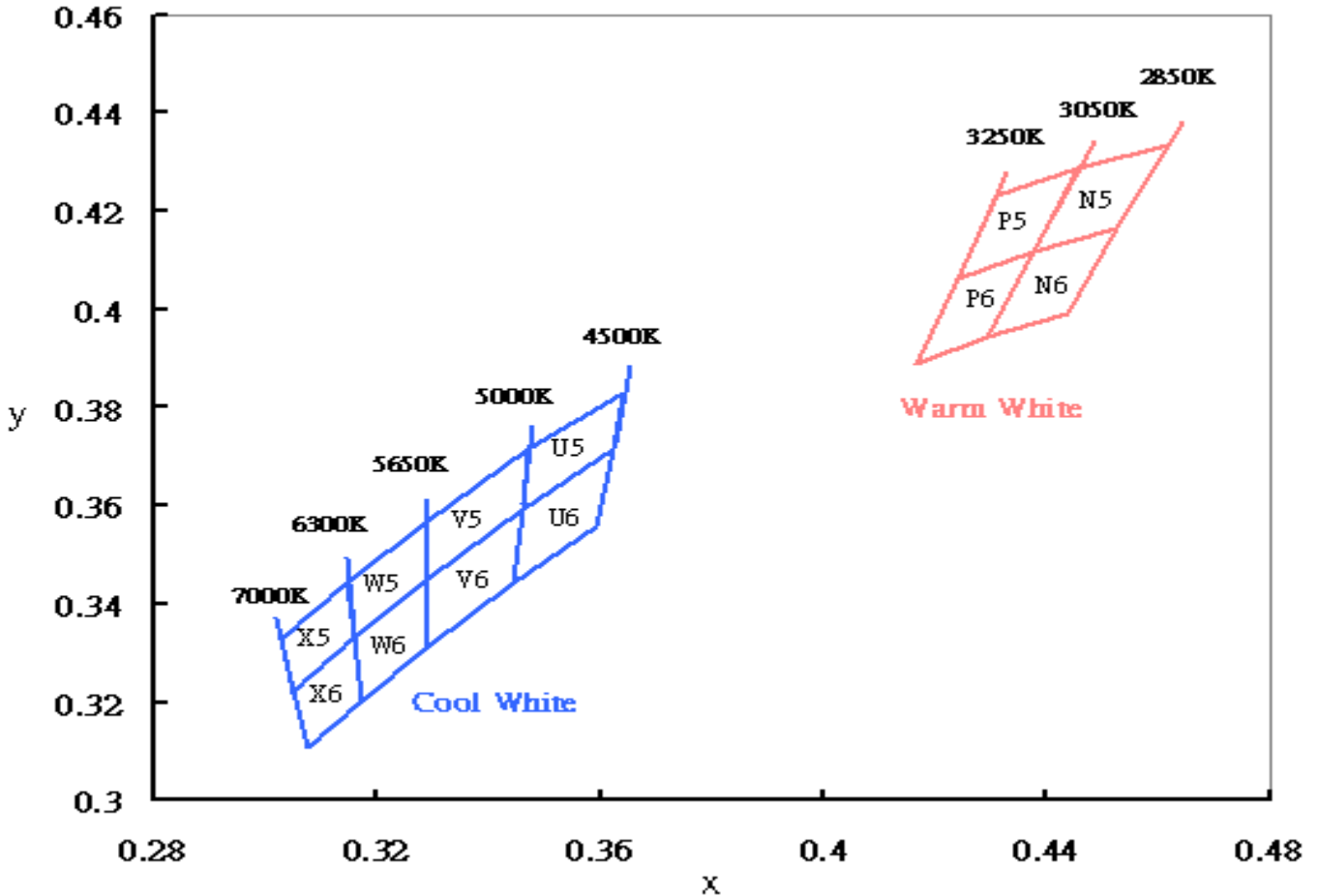


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**The C.I.E. 1931 Chromaticity Diagram**

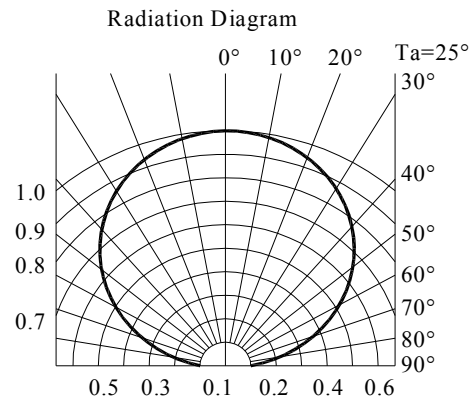
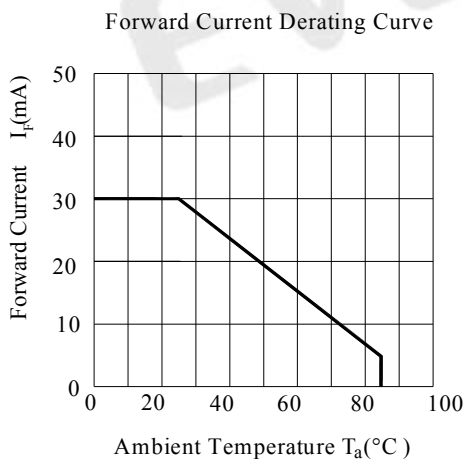
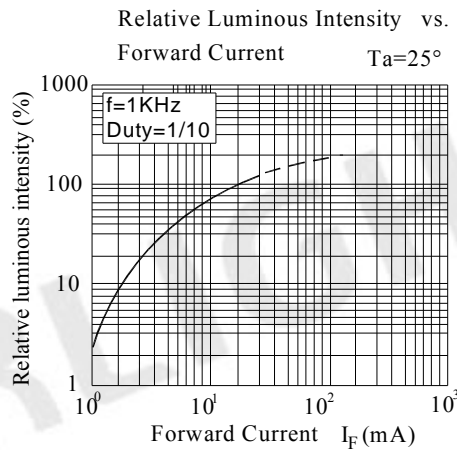
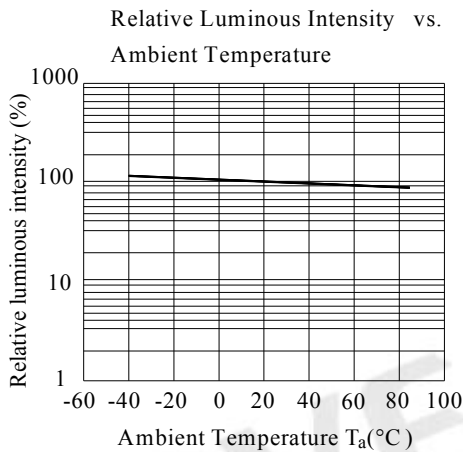
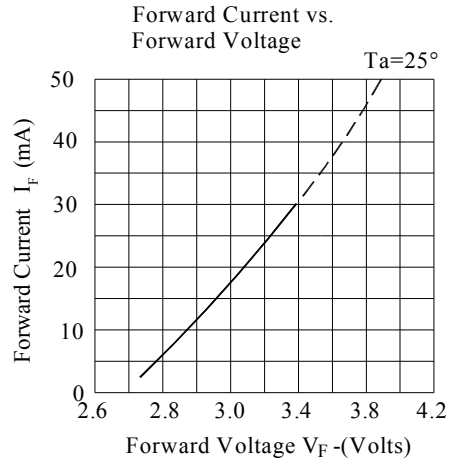
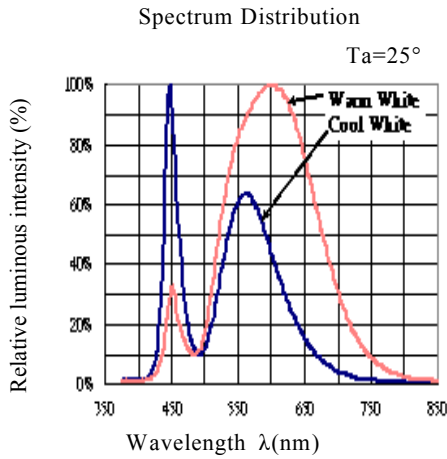


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**Typical Electro-Optical Characteristics Curves**



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**Label Explanation**

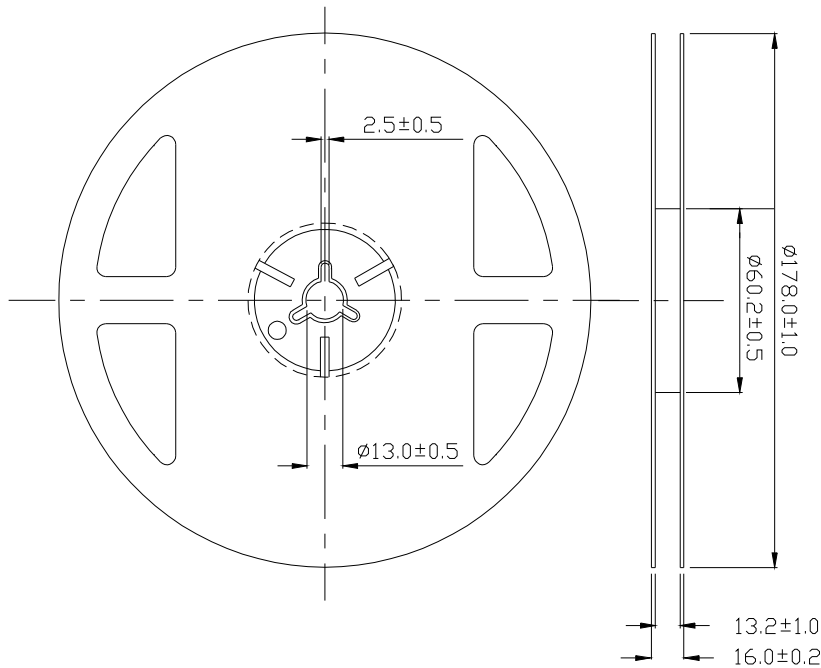
CAT: Luminous Intensity Rank

HUE: Dom. Wavelength Rank

REF: Forward Voltage Rank



**Reel Dimensions**



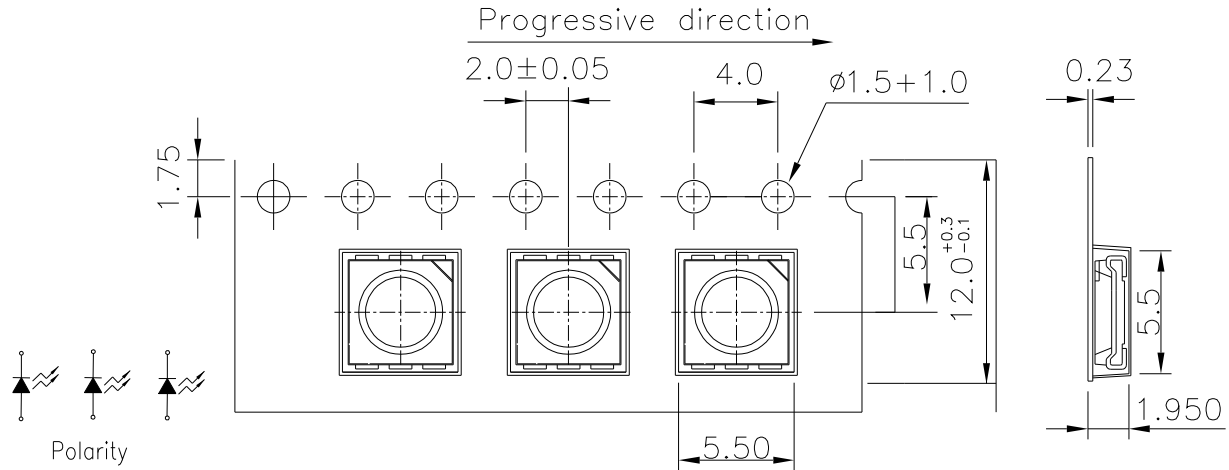
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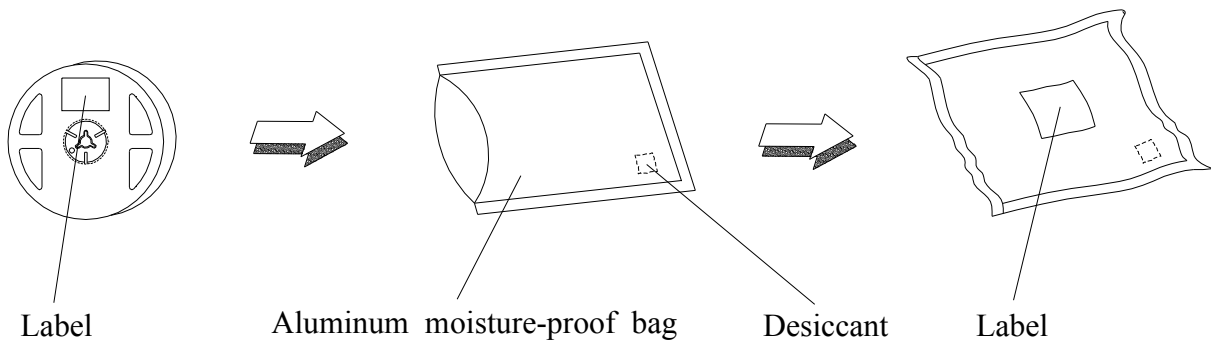
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**Carrier Tape Dimensions: Loaded Quantity 800 pcs Per Reel**



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

**Moisture Resistant Packaging**





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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 ±5 Max. 10sec.	6 Min.	22 PCS.	0/1
2	Temperature Cycle	H : +100 15min ↓ 5 min L : -40 15min	300 Cycles	22 PCS.	0/1
3	Thermal Shock	H : +100 5min ↓ 10 sec L : -10 5min	300 Cycles	22 PCS.	0/1
4	High Temperature Storage	Temp. : 100	1000 Hrs.	22 PCS.	0/1
5	Low Temperature Storage	Temp. : -40	1000 Hrs.	22 PCS.	0/1
6	DC Operating Life	$I_F^{*2} = 20 \text{ mA}$	1000 Hrs.	22 PCS.	0/1
7	High Temperature / High Humidity	85 / 85%RH	1000 Hrs.	22 PCS.	0/1

\*2 For each die

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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 °C or less and 90%RH or less.

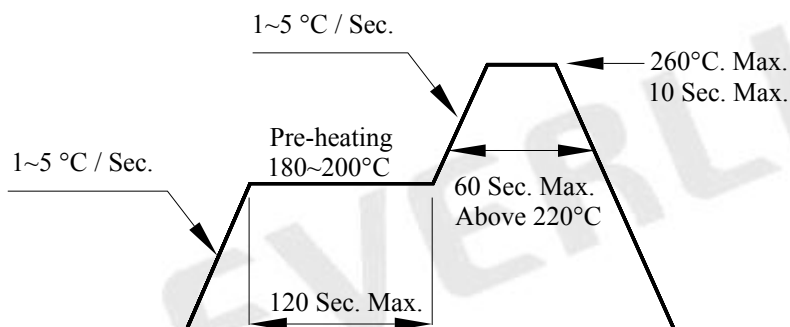
2.3 After opening the package: The LED's floor life are 168 hours under 30 °C or less and 60% RH or less. If unused LEDs remain, it should be stored in moisture proof packages.

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.

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#### 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.

