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SMD 5630 Top View LED

Device No. : AT56SNW-B□□□□(PGWH)

Features

- Package : Top View LED in Slug Type
- Size : 5.6(L) X 3.0(W) X 0.9(T) mm
- Viewing Angle : $2\theta_{1/2}$ = 120deg
- Color : White (Plant Growth)
- CRI : Min. 80

Applications

- Plant Growth

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Document Revision V2. 2017.04.19

1. SMD Part Number Description

A T 56S N W – B □ □ □ □ (PGWH)

<table>
<tr><td>A</td><td colspan="4">ALLIX</td></tr>
<tr><td>T</td><td colspan="4">External Shape

T : Top View(SMD)</td></tr>
<tr><td rowspan="4">56S</td><td colspan="4">Package Size</td></tr>
<tr><td rowspan="3">SMD</td><td>28S: 2835 Slug</td><td>35B : 3528 Bending</td><td>35S:3535 Slug</td></tr>
<tr><td>20S:3020 Slug</td><td>30S:3030 Slug</td><td>54B: 5450 Bending</td></tr>
<tr><td>54S: 5450 Slug</td><td>56S : 5630 Slug</td><td>92S: 9280 Slug</td></tr>
<tr><td>N</td><td colspan="4">ESD Protection

Z : Zener Diode, N : Non Zener Diode</td></tr>
<tr><td>W</td><td colspan="4">Emission Color

W(white) R(red) G(green) B(blue) I(infrared) U(ultra violet)
A(amber) Y(yellow) S(Skyblue) O(orange) P(pink) F(R,G,B Full)</td></tr>
<tr><td>A</td><td colspan="4">Color Rendering Index

A : High (Ra≥90), B : Medium (Ra=80~89), C : Low (Ra≤79)</td></tr>
<tr><td>□</td><td colspan="4">Color Rank(CCT)

A:10,000K, B:8,000K, C:6,500K, D:5,700K, E:5,000K, F:4,500K, G:4,000K,
H:3,500K, I:3,000K, J:2,700K, K:2,500K, L:2,200K, M:2,000K</td></tr>
<tr><td>□</td><td colspan="4">I_V (mcd), Φ_V (lm) Rank</td></tr>
<tr><td>□</td><td colspan="4">PG : Plant Growth , WH : white</td></tr>
</table>

2. Specifications

■ Absolute Maximum Ratings

(T_a=25℃)

Parameter	Symbol	Absolute Maximum Rating	Unit	Remark
Power Dissipation	P_D	680	mW	
Forward Current	I_F	200	mA	
Pulse Forward Current(1)	I_{FP}	600	mA	
Reverse Voltage	V_R	5	V	
Operating Temperature	T_{opr}	-40 to +85	℃	
Storage Temperature	T_{stg}	-40 to +100	℃	
Junction Temperature	T_J	125	℃	
Temperature during Packaging (reflow)	T_{sld}	< 5sec @260℃	sec	

*Note
1) Duty ratio = 1/10, pulse width = 10msec

■ Initial Electrical/Optical Characteristics

(T_a=25℃)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Forward Voltage(1)	V_F	I_F = 65㎃	-	2.9	3.4	V
Luminous Intensity(2)	I_V	I_F = 65㎃	-	6800	-	mcd
Luminous Flux	Φ_V	I_F = 65㎃	-	19	-	lm
Optical Efficiency	η_{elc}	I_F = 65㎃	-	101	-	lm/W
Color Temperature (=3,500K)	CCT	I_F = 65㎃	-	3,300	-	K
Color Rendering Index	Ra	I_F = 65㎃	-	89	-	
Reverse Current	I_R	V_R = 5V	-	-	1	㎂

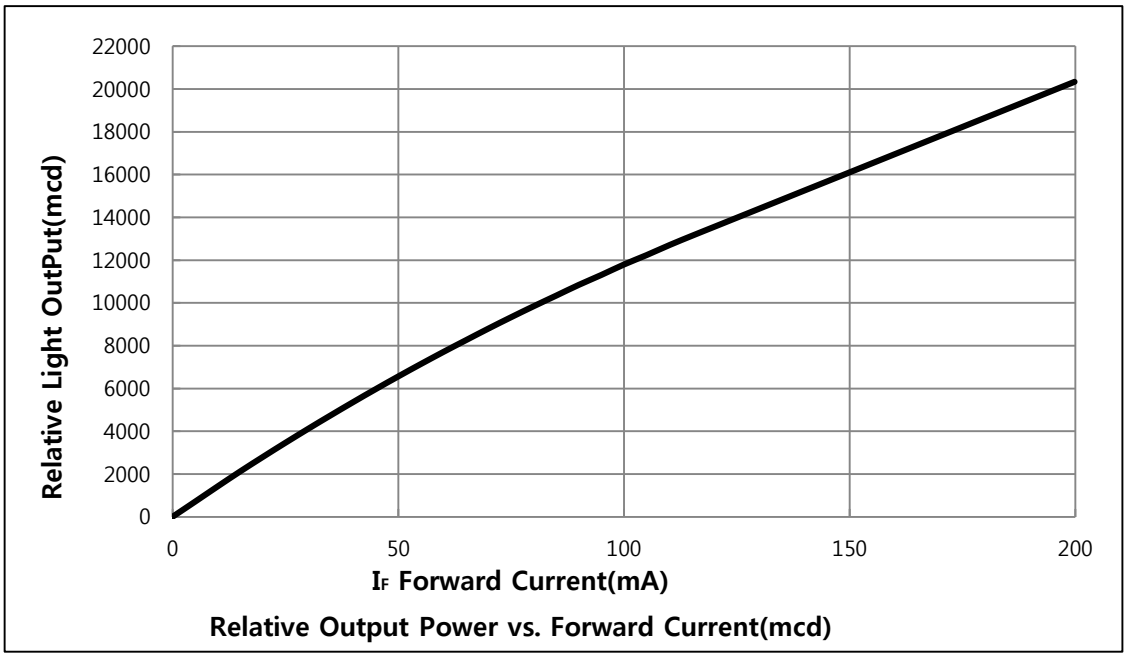
*Note
1) Forward Voltage Measurement allowance is ± 10%
2) Luminous Intensity Measurement allowance is ± 5%, Measuring equipment : OPI-100 (Optel System)

3. Rank

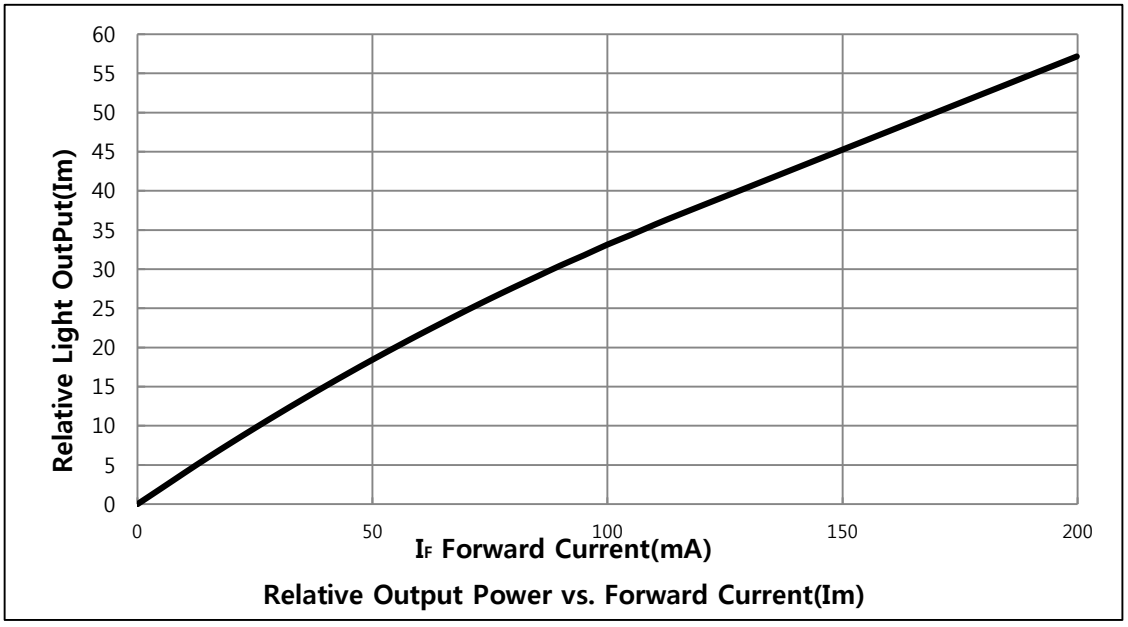
CCT Range	CRI		Base Order Codes Min. Luminous Flux @65mA			PGWH Rank	Part No.
	Min	Typ	Group	Flux(cd) @25℃	Flux(lm) @ 25℃	Chromaticity Region	
3,300K	80	84	S0	5.5-6.0	16.0-17.4	PGWH	AT56SNW-BPGS0
			T0	6.0-6.5	17.4-18.9		AT56SNW-BPGT0
			S0	6.5-7.0	18.9-20.3		AT56SNW-BPGS0
			T0	7.0-7.5	20.3-21.8		AT56SNW-BPGT0
			U0	7.5-8.0	21.8-23.2		AT56SNW-BPGU0

4. Characteristics Diagrams

(T_a=25℃)

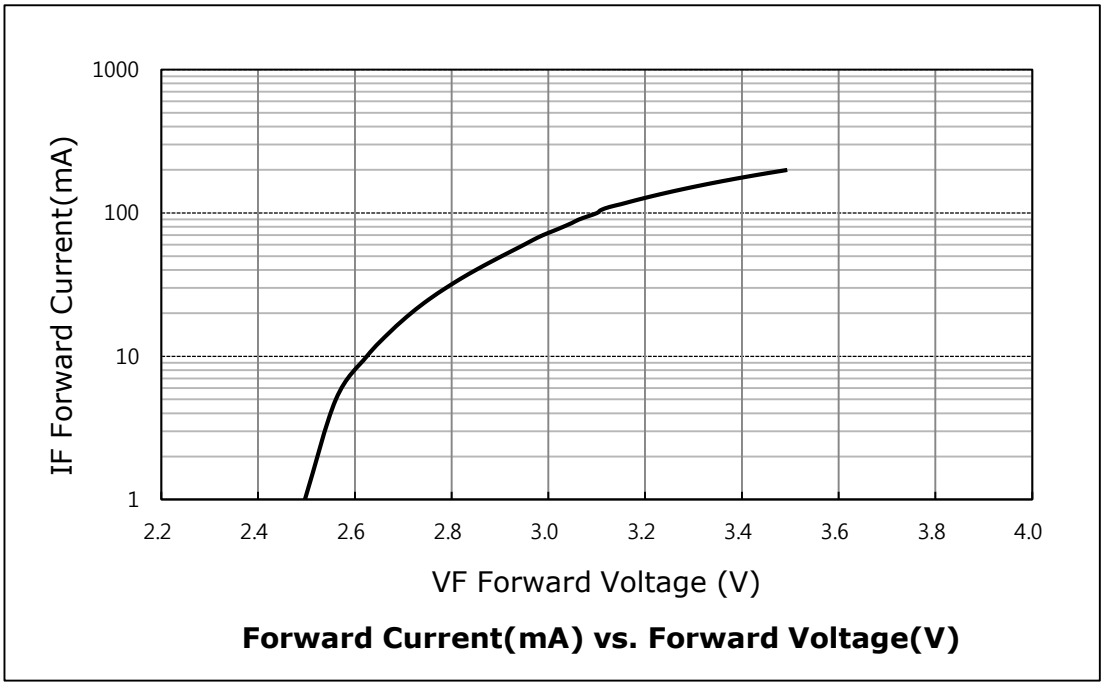


Relative Output Power vs. Forward Current(mcd)

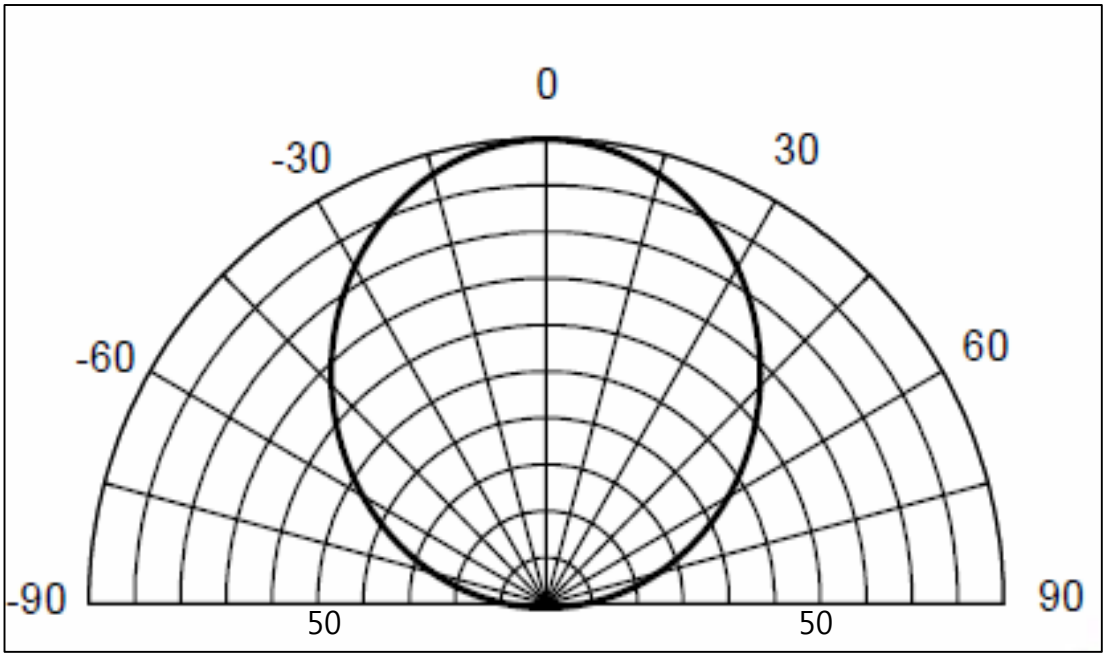


Relative Output Power vs. Forward Current(Im)

(T_a=25℃)

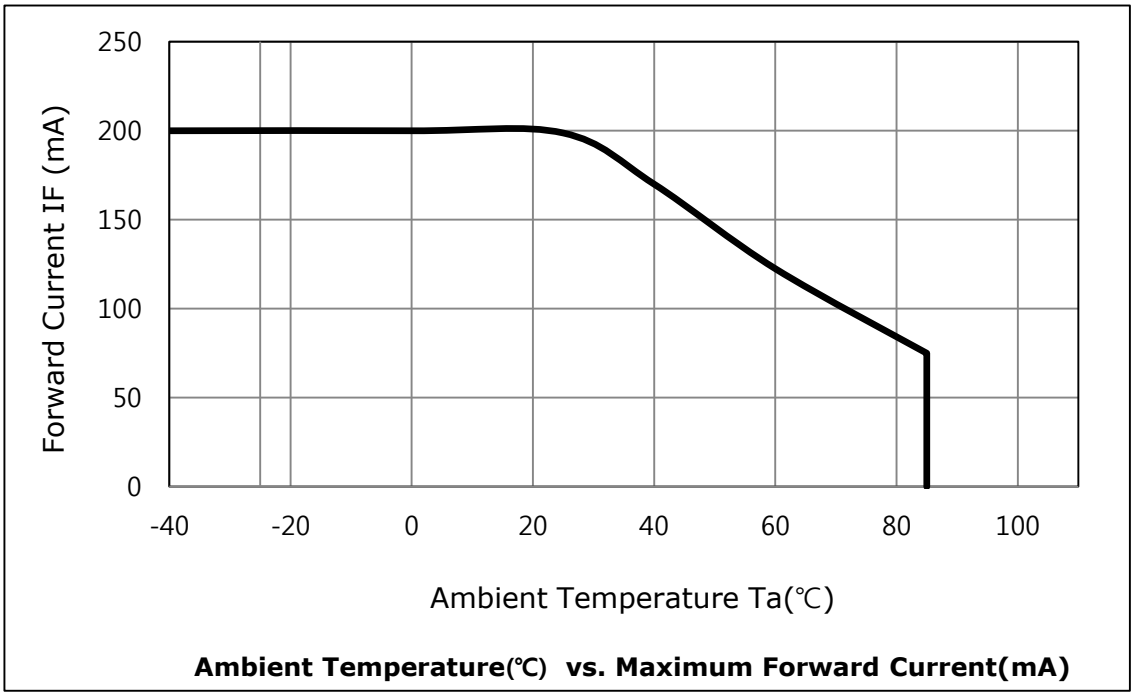


Forward Current(mA) vs. Forward Voltage(V)

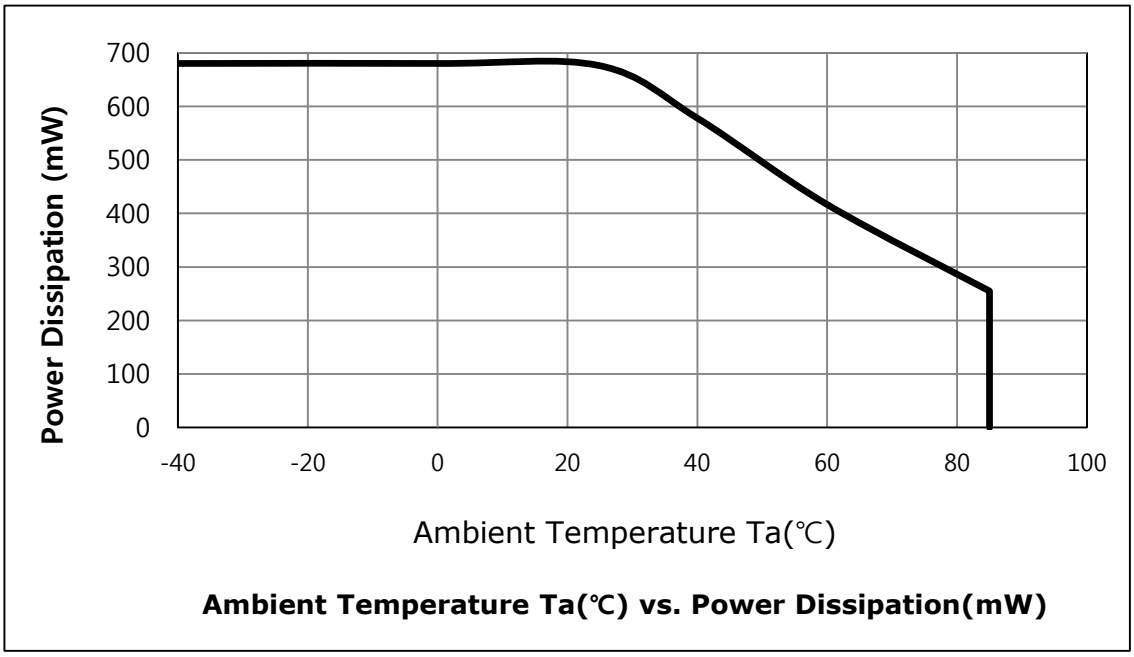


Directivity

(T_a=25℃)

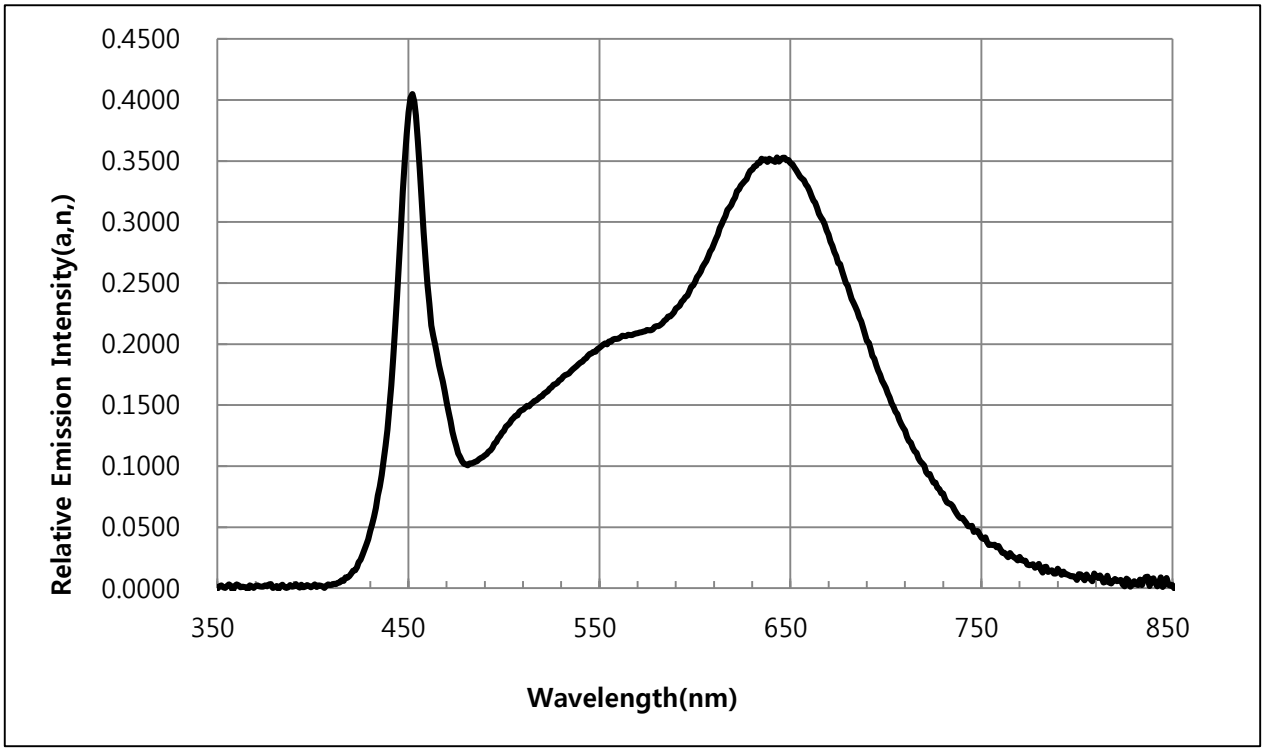


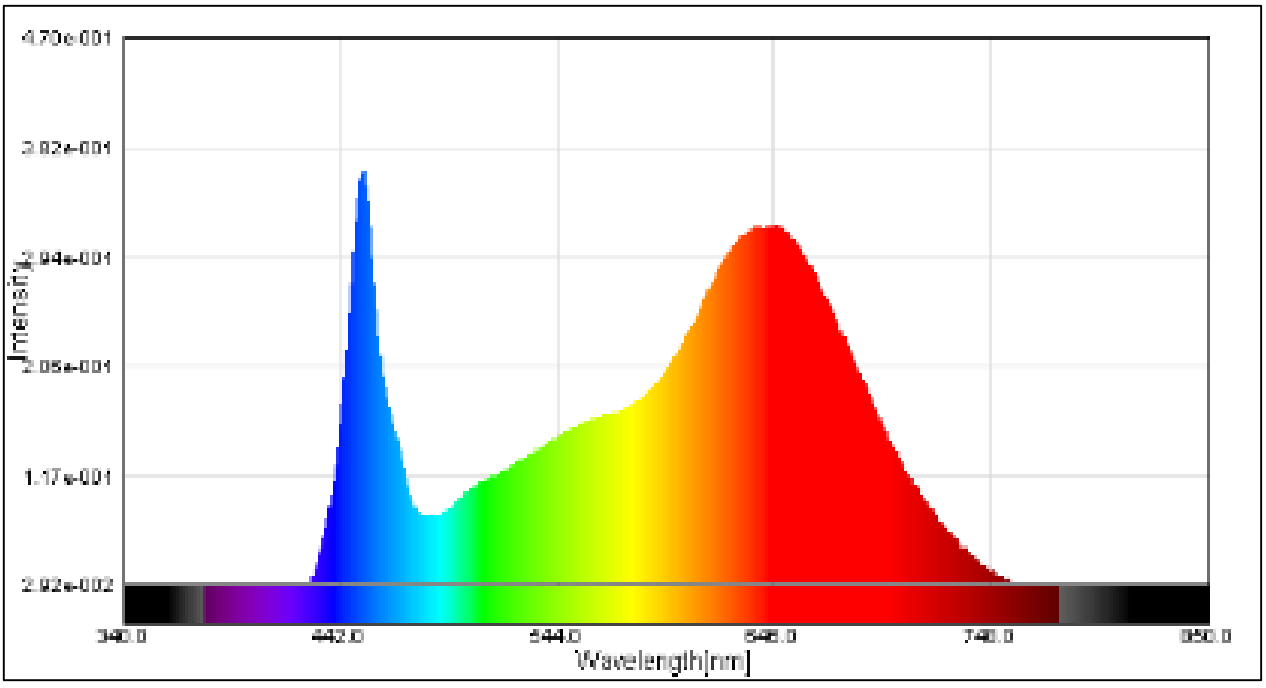
Ambient Temperature(℃) vs. Maximum Forward Current(mA)



Ambient Temperature Ta(℃) vs. Power Dissipation(mW)

(T_a=25℃)

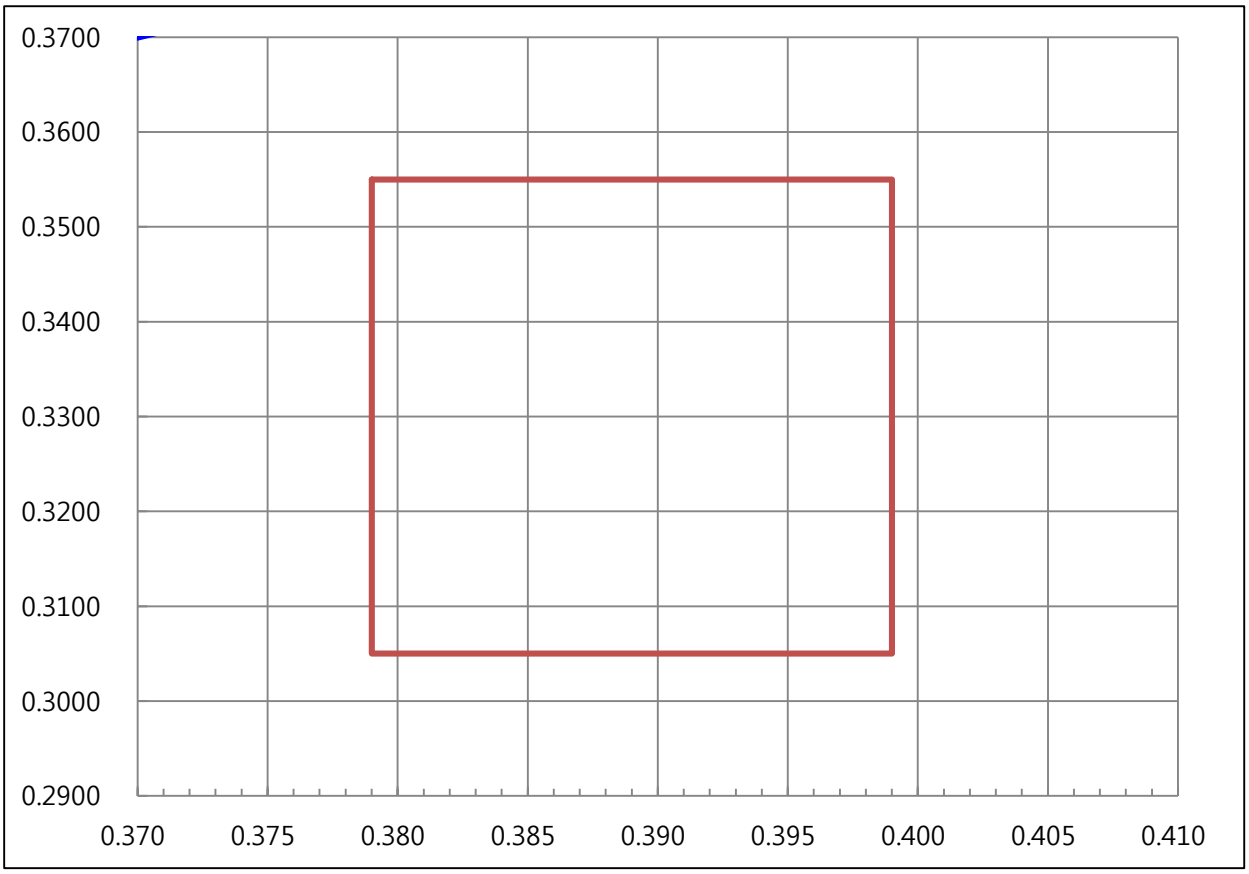




Color Spectrum

5. Chromaticity Diagram

(T_a=25℃)



6. Color Rank

(at I_F=65㎃, T_a=25℃)

PGWH	
CIE-x	**CIE-y**
0.3790	0.3550
0.3790	0.3050
0.3990	0.3050
0.3990	0.3550

Note

1) Chromaticity coordinates measurement allowance is ±0.01.
2) The Chromaticity coordinates refer to CIE 1931 chromaticity diagram.

7. Results of Reliability Tests

(1) Static Electricity

Test Item	Standard	Test Condition	Notes	No. of Damaged
Temperature Cycle	JEITA ED-4701 100 105	-40℃~25℃ ~ 100℃~25℃ (30min~5min~30min)	100 cycle	0/22
Steady State Operating Life		T_a=25℃, I_F=200㎃	1,000 hrs	0/22
Steady State Operating Life of High Temperature		T_a=85℃, I_F=65㎃	1,000 hrs	0/22
Steady State Operating Life of high Humidity Heat		T_a=60℃, RH=90%, I_F=50㎃	500 hrs	0/22
High Temperature Storage	JEITA ED-4701 200 201	T_a=100℃	1,000 hrs	0/22
High Temperature & Humidity Storage	JEITA ED-4701 100 103	T_a=60℃, RH=90%	1,000 hrs	0/22
Low Temperature Storage	JEITA ED-4701 200 202	T_a=-40℃	1,000 hrs	0/22
Resistance to Soldering Heat	JEITA ED-4701 300 301	T_{max}=260℃, 10sec	2 time	0/22

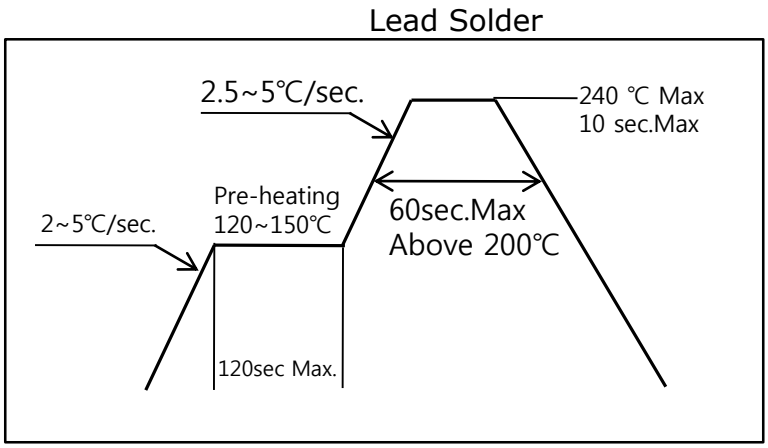
8. Soldering Cautions

* Reflow soldering should not be done more than two times.
* When soldering, do not put stress on the LEDs during heating.
* After soldering, do not wrap the circuit board.
* The LEDs can be soldered on place using the reflow soldering method.
* Occasionally, there is decrease in brightness caused by the influence of heat or ambient atmosphere during air reflow.
* It is recommended that the user use the nitrogen reflow method.

■ Reflow Soldering Profile

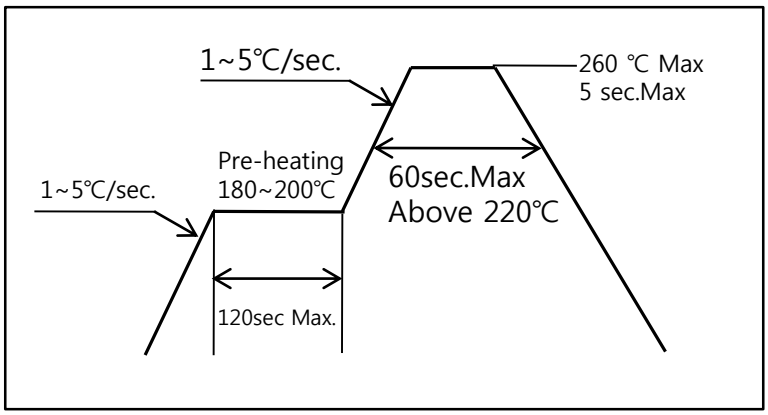
1) Lead Solder

Lead Solder	
Pre-heat	120~150℃
Pre-heat time	120 sec. Max.
Peak-Temperature	240℃ Max
Soldering time Condition	10 sec. Max.



2) Lead-Free Solder

Lead Solder	
Pre-heat	180~200℃
Pre-heat time	120 sec. Max.
Peak-Temperature	260℃ Max
Soldering time Condition	5 sec. Max.



9. Precautions

(1) Storage

1. After opening the moisture-proof aluminum bag, the soldering process should be performed within the range of the following condition. Unused remaining LEDs should be stored with silica gel desiccants in a sealed container, preferably the moisture-proof bags for storage. Included silica gel desiccants change from orange to green if moisture had penetrated bags.

Conditions		Humidity	Temperature	Time
Storage	Before opening Aluminum Bag	≤30°C	≤90%RH	Within 1 year from Delivery Date
	After opening Aluminum Bag	≤30°C	≤70%RH	≤168hours
Baking		65±5°C	-	≥24hours

2. After the storage time after opening has been exceeded or silica gel desiccants are no longer orange, the products should be baked. Baking should only be done once.

3. Products should be packed in moisture-proof aluminum bag to minimize moisture absorption during transportation and storage. Absorbed moisture can cause delamination of interface and result in optical performance degradation.

4. Customers are advised to keep the LEDs in an airtight container when not using. Exposing LEDs to a corrosive environment may cause the plated metal parts of the product to tarnish, which could have harmful influence on soldering and optical characteristics.

5. After assembly and during use, silver plating can be affected by the corrosive gases released by materials and components close to the LEDs within an end product, and the gases entering into the product from the external atmosphere. Resin materials, particularly, may contain substances which can affect silver plating, such as halogen.

6. To prevent water condensation, please avoid large fluctuation of temperature and humidity for the storage conditions.

7. Do not make the LEDs exposed to direct sunlight or/and to an environment where the temperature is higher than that of normal rooms.

(2) Electrostatic Discharge(ESD)

1. Ensure that tools jigs and machines that are used are properly grounded and that proper grounding techniques are used in work place. Protection against surge voltages should also be used for devices or equipment which mount the LEDs.

2. If tools or equipment contain insulating materials such as glass or plastic, the following measures against electrostatic discharge are recommended :

   - Dissipating static charge with conductive materials
   - Preventing charge generation with moisture
   - Neutralizing the charge with ionizers

(3) Storage

1. The current through each LED must not exceed the Absolute Maximum Rating when designing a circuit.

2. Make sure that excessive voltages such as lightning surges are not applied to the LEDs.

3. This product should be operated using forward current. When used in displays that are not used for a long time, the main power supply should be switched off for safety.

4. For outdoor use, necessary measures should be taken to prevent water, moisture and salt air damage.

(4) Handling Precaution

1. Do not handle the LEDs with bare hands because it will contaminate the LED surface and may affect the optical characteristics. It might cause the LED to be deformed and/or the wire to break, causing the LED not to illuminate.

2. Be careful not to drop the product, which can cause damage.

3. When handling the product with tweezers, be careful not to apply excessive force to the resin.

4. Do not stack assembled PCBs together. Failure to comply can cause the resin portion of the product to be cut, chipped, delaminated and/or deformed. It may cause wire to break, leading to failures.

(5) Thermal Management

1. Proper thermal management is important when designing product with LEDs. LED die temperature is affected by PCB thermal resistance and LED spacing on the board. Please design products in a way that the LED die temperature does not exceed the maximum Junction Temperature.

2. To dissipate the heat from the product, drive current should be determined for the surrounding ambient temperature.

(6) Cleaning

1. The LEDs should not be cleaned with water, benzene, or thinner.

2. When dust and/or dirt adheres to the LEDs, soak a cloth with isopropyl alcohol (IPA), then squeeze it before wiping the LEDs.

3. Isopropyl alcohol(IPA) should be used if necessary. Other solvents may cause failure to the LEDs due to the damage to the resin portion. The effects of such solvents should be certified prior to use. In addition, the use of CFCs is heavily regulated.

(8) Design Consideration

1. PCB warpage after the products are mounted onto a PCB can make the package to break. The LED should be placed in a way to minimize the force on the LEDs due to PCB bow and twist.

2. Board separation should not be performed using hands, but using special jigs.

3. The position and orientation of the LEDs affect how much mechanical stress is exerted on the LEDs placed near the score lines. The LED should be placed in a way to minimize the force on the LEDs due to board fixing.

4. Volatile organic compounds that have been released from material around the LEDs may penetrate the LED lens and/or encapsulating resin.

   If the LEDs are being used in a sealed environment, these volatile compounds can discolor after being exposed to heat and/or photon energy and it may greatly reduce the LED light output and/or cause a color shift.

   In this case, ventilating the environment may improve the reduction in light output and/or color shift.

   Perform a light-up test of the chosen application for optical evaluation to ensure that there are no issues, especially if the LEDs are planned to be used in a sealed environment.

(9) Others

1. The LEDs described in this brochure are intended to be used for ordinary electronic equipment (such as household appliances, office equipment, communications equipment, and measurement instruments.)

2. When defective LEDs are found, the customer shall inform ALLIX before disassembling or analysis.

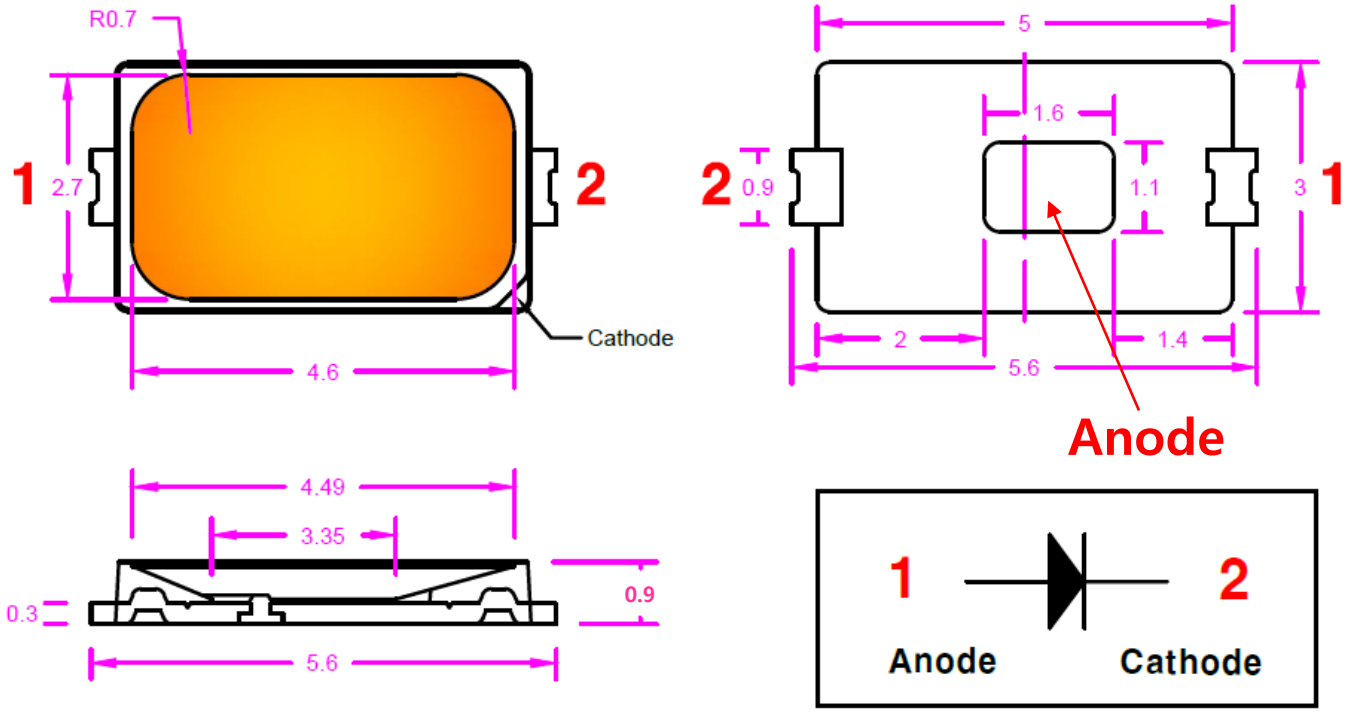
3. Contact in advance ALLIX's sales staff for information on the applications in which exceptional quality and reliability are required, in particular when the malfunction or failure of the LEDs may directly threat life or health (such as airplanes, aerospace, automobiles, submersible repeaters, traffic control equipment, nuclear reactor control system, and safety devices).

4. The specifications and appearance of this product may change without notice. ALLIX does not guarantee the contents of this specification. Both the customer and ALLIX will agree on the official specifications of supplied products before the volume production of a program begins.

10. Outline Dimension

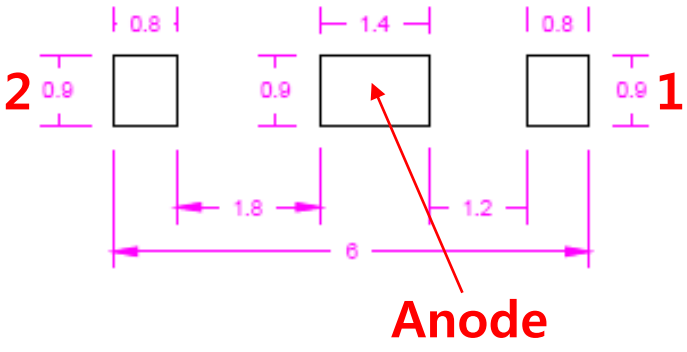
■ Outline Dimension

Unit : mm
Tolerance : ±0.1

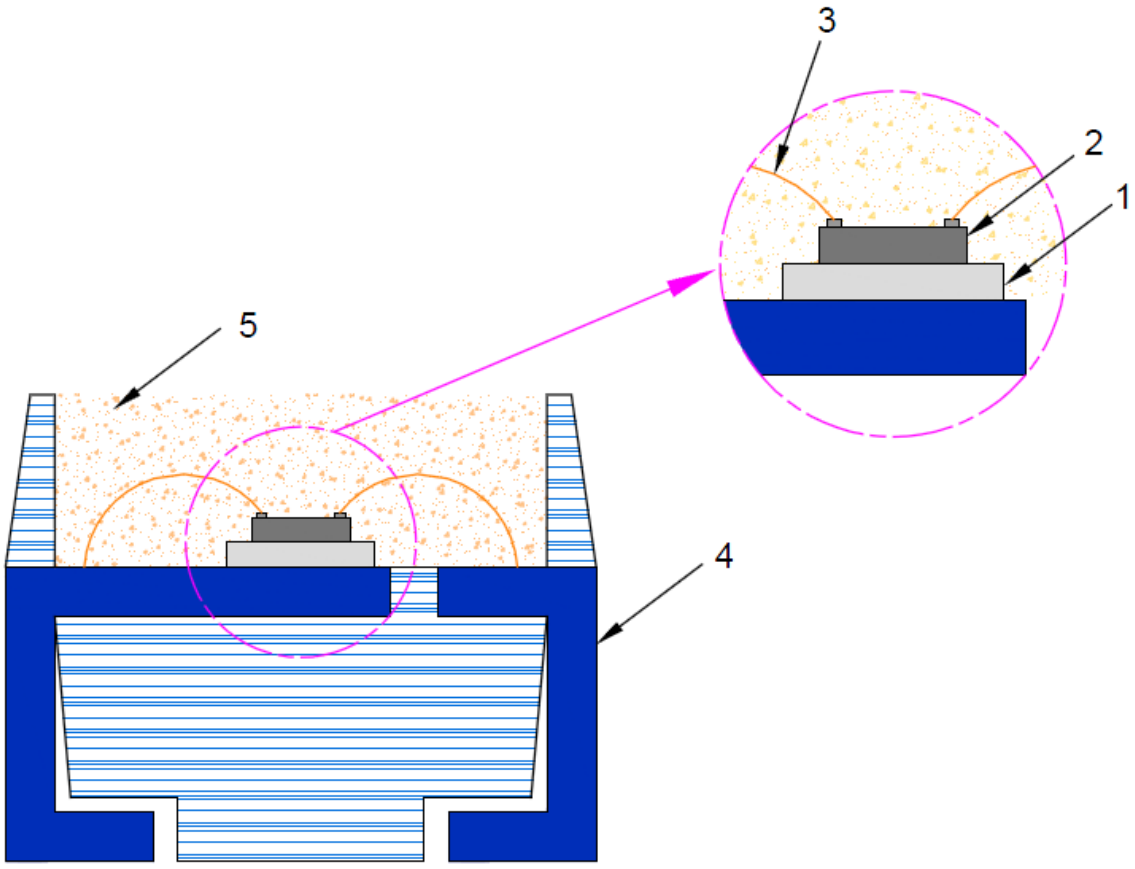


■ Recommended Solder Pad

Unit : mm
Tolerance : ±0.1



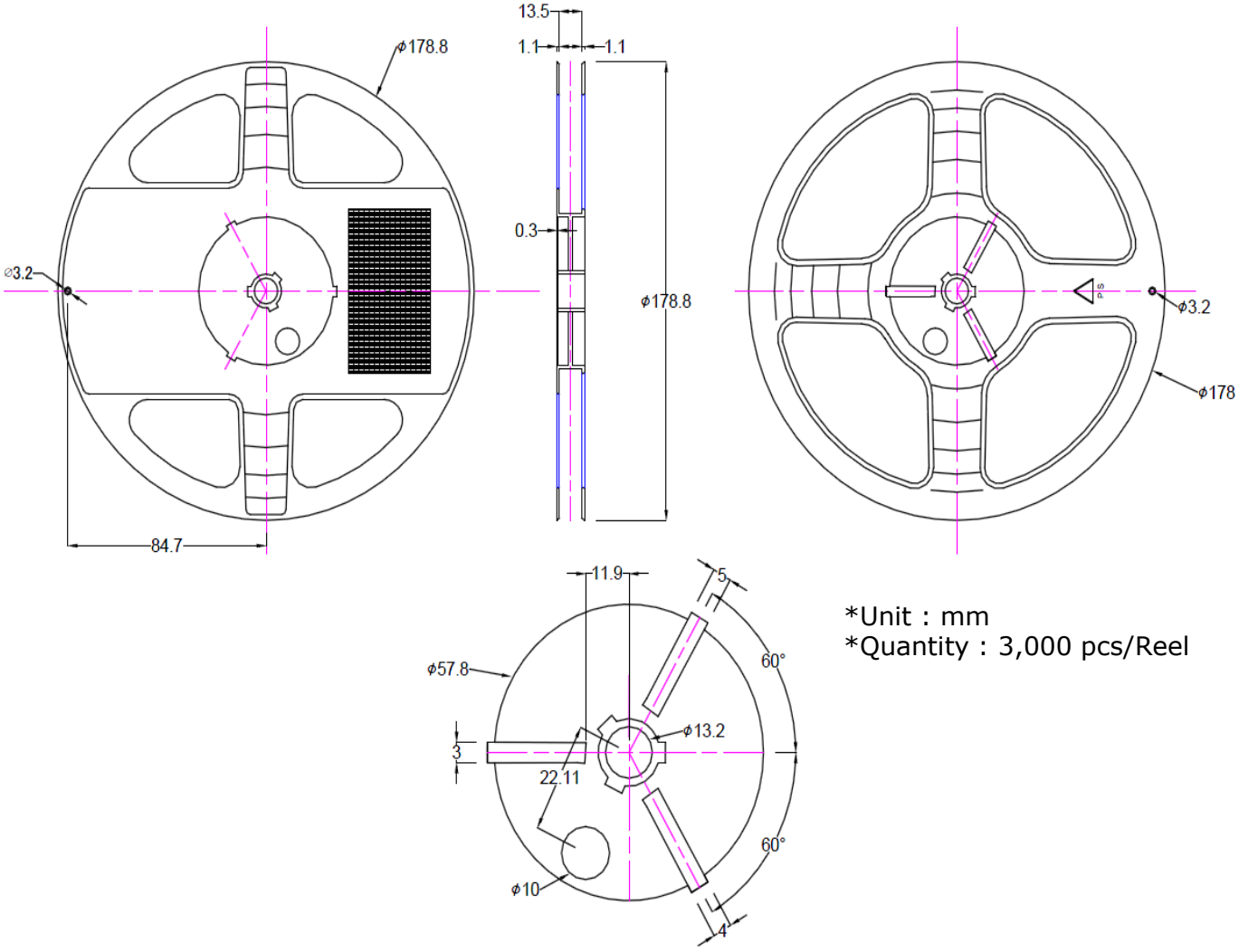
11. Composition of Package



No.	Item	Material
1	Die Paste	Ag Epoxy or Silicone
2	Chip	InGaN
3	Au Wire	1.0 ~ 1.2mil
4	Lead Frame	Cu Strike Ag
5	Potting Resin	Silicone

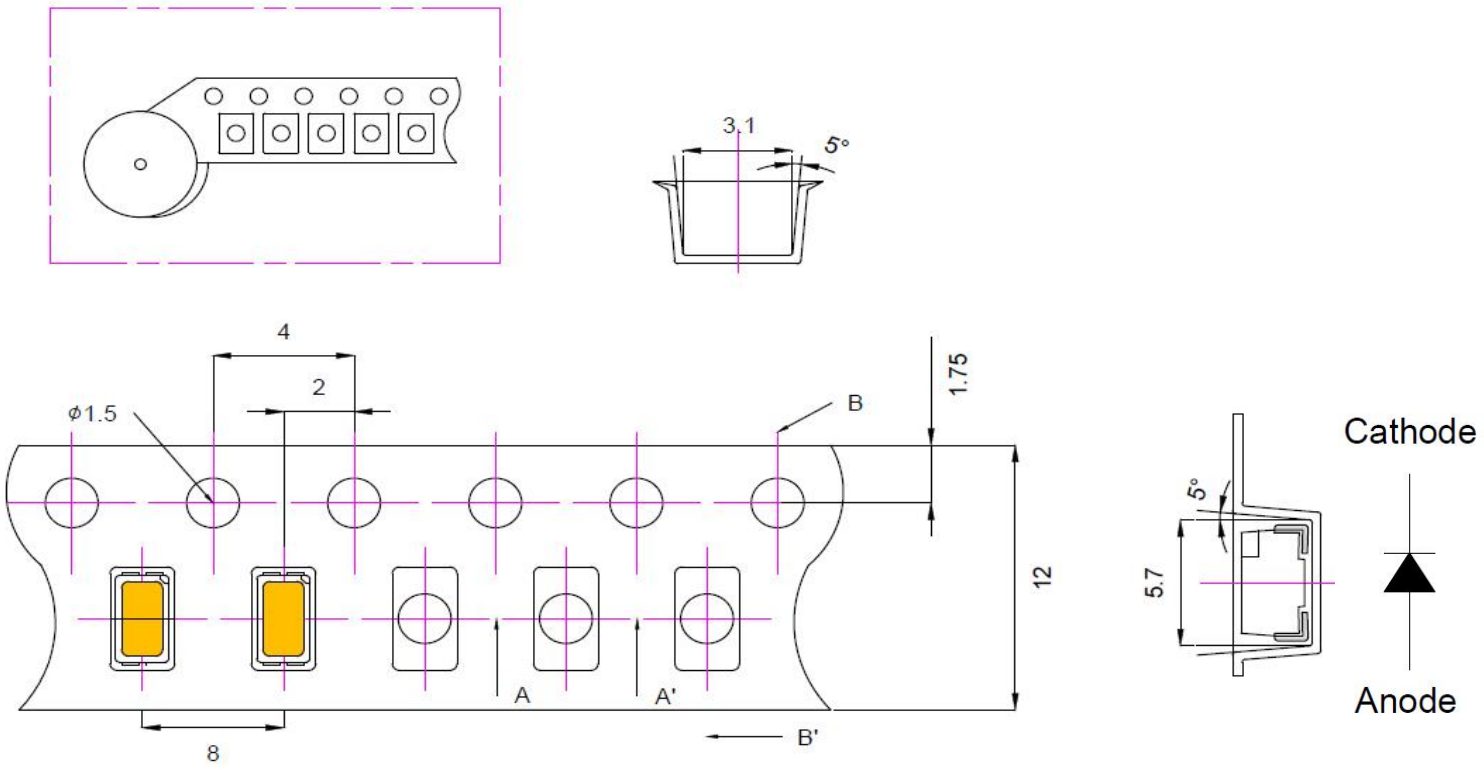
12. Taping

■ Dimension of Reel



*Unit : mm
*Quantity : 3,000 pcs/Reel

- **Dimension of Tape**



13. Packing Structure