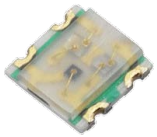
TOP VIEW SMD

AOS-TGB1616RGB-D120

Feature

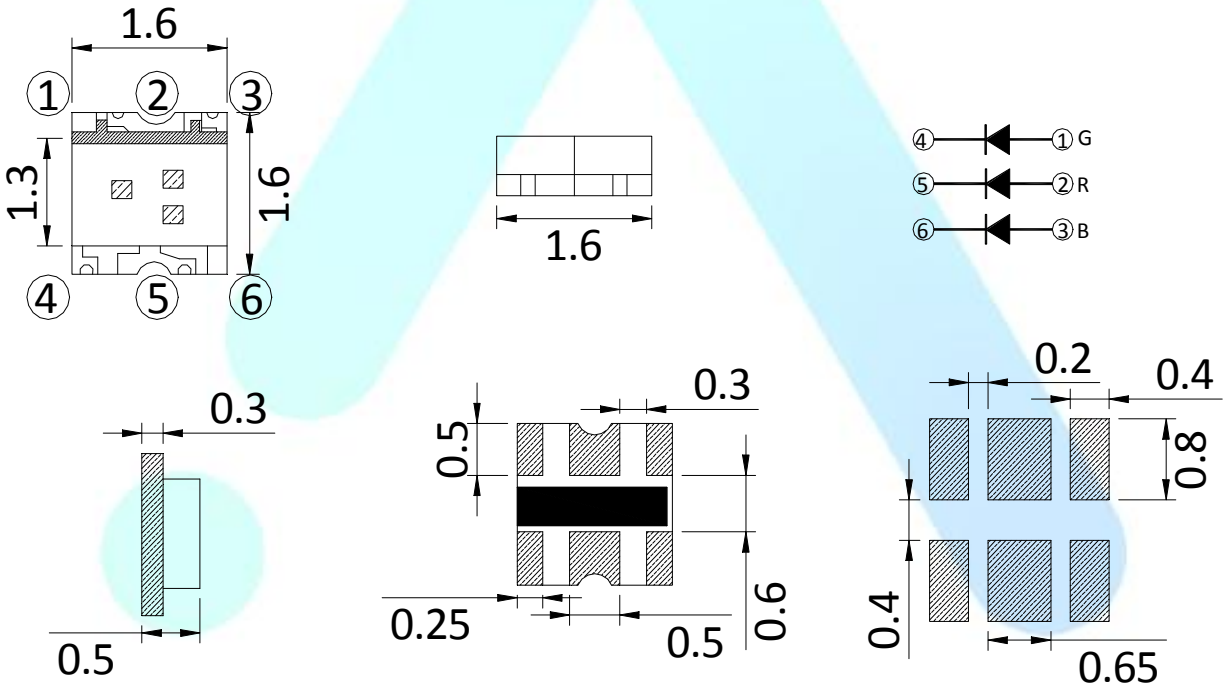
- Meet RoHS.
- Extra Thin (0.5H mm) Full Color Chip LED
- Ultra Bright InGaN / AlInGaP Chip LED.
- Package in 8mm tape on 7" diameter reels.
- EIA STD Package.
- I.C. Compatible.
- Compatible with Automatic Placement Equipment.
- Compatible with Infrared Reflow Solder Process.



Applications

- Telecommunication, Office automation, home appliances,industrial equipment
- Keypad/Keyboard Backlighting
- Status indicator
- Micro displays
- Signal and Symbol Luminary

Package Dimension



Note:
Nick Mark, All dimensions in mm. Tolerances unless mentioned is ±0.1 mm.

Rev	Date	Drawn by	Checked by	Approved by
A0	07-06-2020	Xavier	Eric	Sumeng

Selection Guide

Part No.	Dice	Lens Type	Luminous intensity (mcd)@20mA		Viewing Angle
			Min	Typ	$2\theta_{1/2}$
AOS-TGB1616RGB-D120	Red(AlGaInP)	Water Clear	255	300	120°
	Green(InGaN)	Water Clear	255	300	
	Blue(InGaN)	Water Clear	255	300	

Note:

1、$2\theta_{1/2}$ is the angle from optical center line where the luminous intensity is 1/2 the optical center line value.

2、The above luminous intensity measurement allowance tolerance is ±10%.

Absolute Maximum Ratings at Ta=25℃

Parameter	Symbol	Value (Red)	Value (Green)	Value (Blue)	Units
Forward Current	I_F	30	20	20	mA
Reverse Voltage	V_R	5	5	5	V
Power Dissipation	P_d	75	76	76	mW
Operating Temperature	T_{opr}	- 40 ~ +85			℃
Storage Temperature	T_{stg}	- 40 ~ +100			℃
Peak Forward Current [1]	I_{FP}	100	80	100	mA

*Note:

1. 1/10 Duty cycle, 0.1ms pulse width.
2. The above forward voltage measurement allowance tolerance is ±0.1V.
3. The above dominate wavelength measurement allowance tolerance is ±1nm.

Electro-optical Characteristics (Temperature=25°C)

Parameter	Symbol	Red			Green			Blue			Units	Test Conditions
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max		
Forward Voltage	V_F	1.6	-	2.4	2.2	-	3.0	2.2	-	3.0	V	IF: B=3mA R=4.8mA G=2mA
Reverse Current	I_R	-	-	10	-	-	10	-	-	10	μA	VR = 5V
Dominate Wavelength	λ_d	-	624	-	-	525	-	-	470	-	nm	IF: B=3mA R=4.8mA G=2mA

Notes:

- 1. Luminous intensity is measured with a light sensor and filter combination that approximates the CIE eye-response curve.
- 2. Iv classification code is marked on each packing bag.
- 3. The chromaticity coordinates (x, y) is derived from the 1931 CIE chromaticity diagram.
- 4. Caution in ESD: Static Electricity and surge damages the LED. It is recommend to use a wrist band or anti-electrostatic glove when handling the LED. All devices, equipment and machinery must be properly grounded.
- 5. Tester CAS140B is for the chromaticity coordinates (x, y) and Iv.
- 6. The chromaticity coordinates (x, y) guarantee should be added ± 0.01 tolerance
- 7. The dominant wavelength, λd is derived from the CIE chromaticity diagram and represents the single wavelength which defines the color of the device.
- 8. Reverse voltage (VR) condition is applied to IR test only. The device is not designed for reverse operation

Bin Rank

Bin code list IV Rank

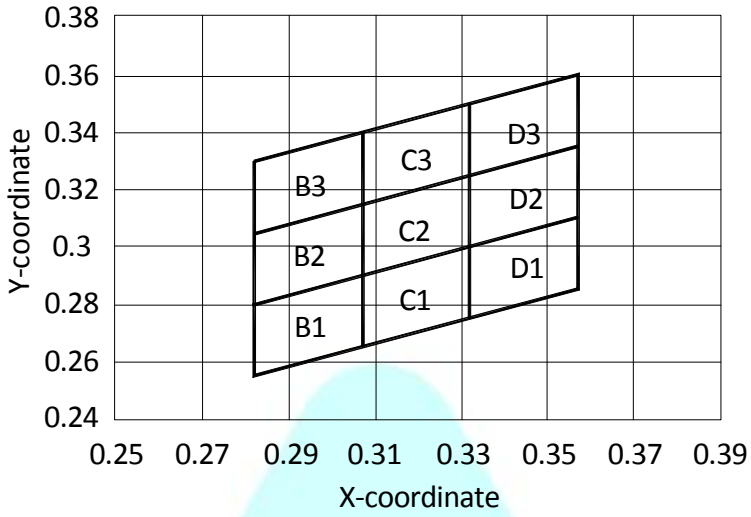
Luminous Intensity	Unit: mcd @ IF : Green=2mA, Red=4.8mA, Blue=3mA	
Bin Code	Min.	Max.
S2	225	285
T1	285	355

Tolerance on each Luminous Intensity bin is +/- 15%

Hue Rank

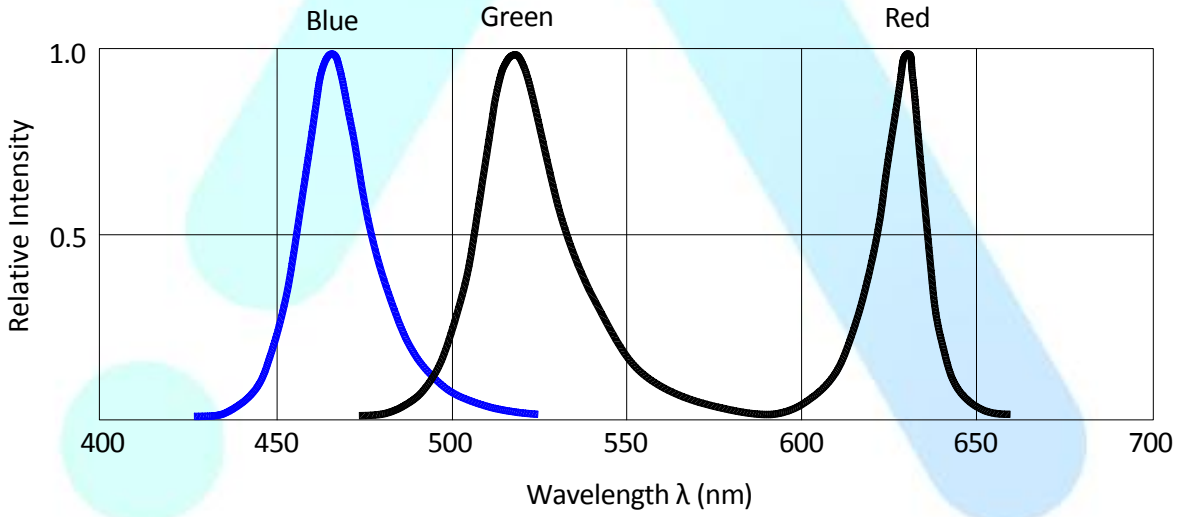
Color bin limits at IF : Green=2mA, Red=4.8mA, Blue=3mA					
Bin Code	CIE 1931Chromaticity coordinates				
B1	X	0.282	0.282	0.307	0.307
	Y	0.255	0.280	0.290	0.265
B2	X	0.282	0.282	0.307	0.307
	Y	0.280	0.305	0.315	0.290
B3	X	0.282	0.282	0.307	0.307
	Y	0.305	0.330	0.34	0.315
C1	X	0.307	0.307	0.332	0.332
	Y	0.265	0.290	0.300	0.275
C2	X	0.307	0.307	0.332	0.332
	Y	0.290	0.315	0.325	0.300
C3	X	0.307	0.307	0.332	0.332
	Y	0.315	0.340	0.350	0.325
D1	X	0.332	0.332	0.357	0.357
	Y	0.275	0.300	0.310	0.285
D2	X	0.332	0.332	0.357	0.357
	Y	0.300	0.325	0.335	0.310
D3	X	0.332	0.332	0.357	0.357
	Y	0.325	0.350	0.360	0.335

C.I.E 1931 Chromaticity Diagram



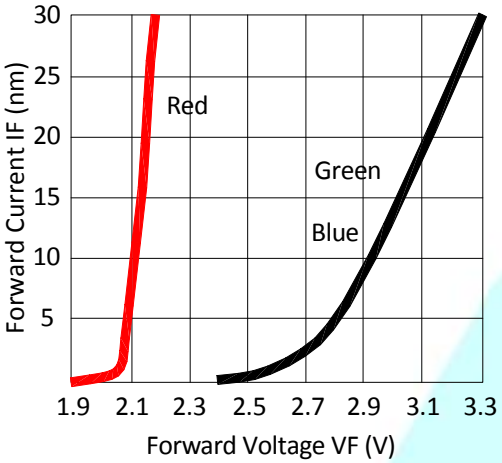
Typical Electrical / Optical Characteristics Curves

(25℃ Ambient Temperature Unless Otherwise Noted)



Typical Electro-optical Characteristics Curves

Fig.1 Relative Intensity vs.Wavelength



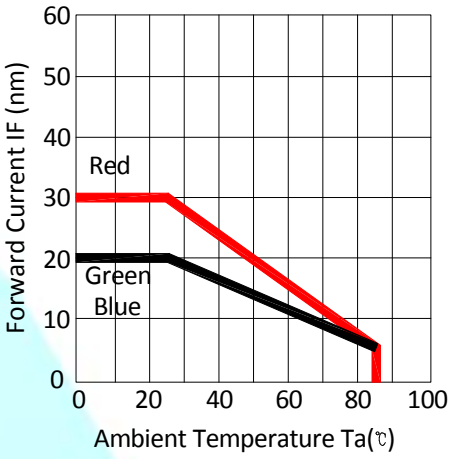
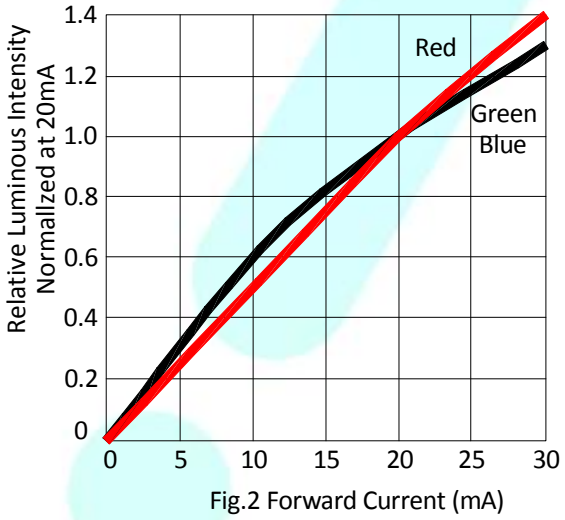
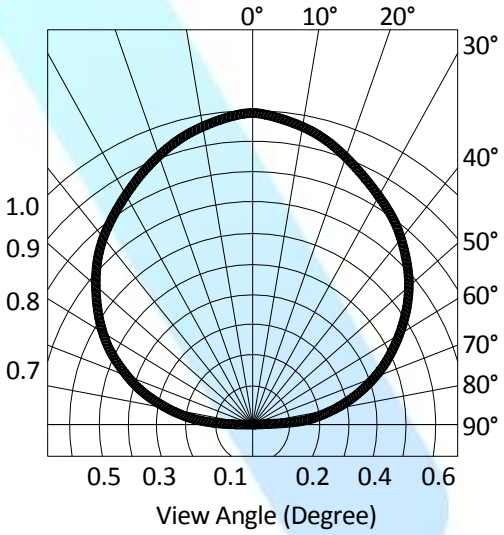


Fig.2 Forward Current vs.Forward Voltage

Fig.3 Forward Current Derating Curve





Reliability Test Items and Conditions

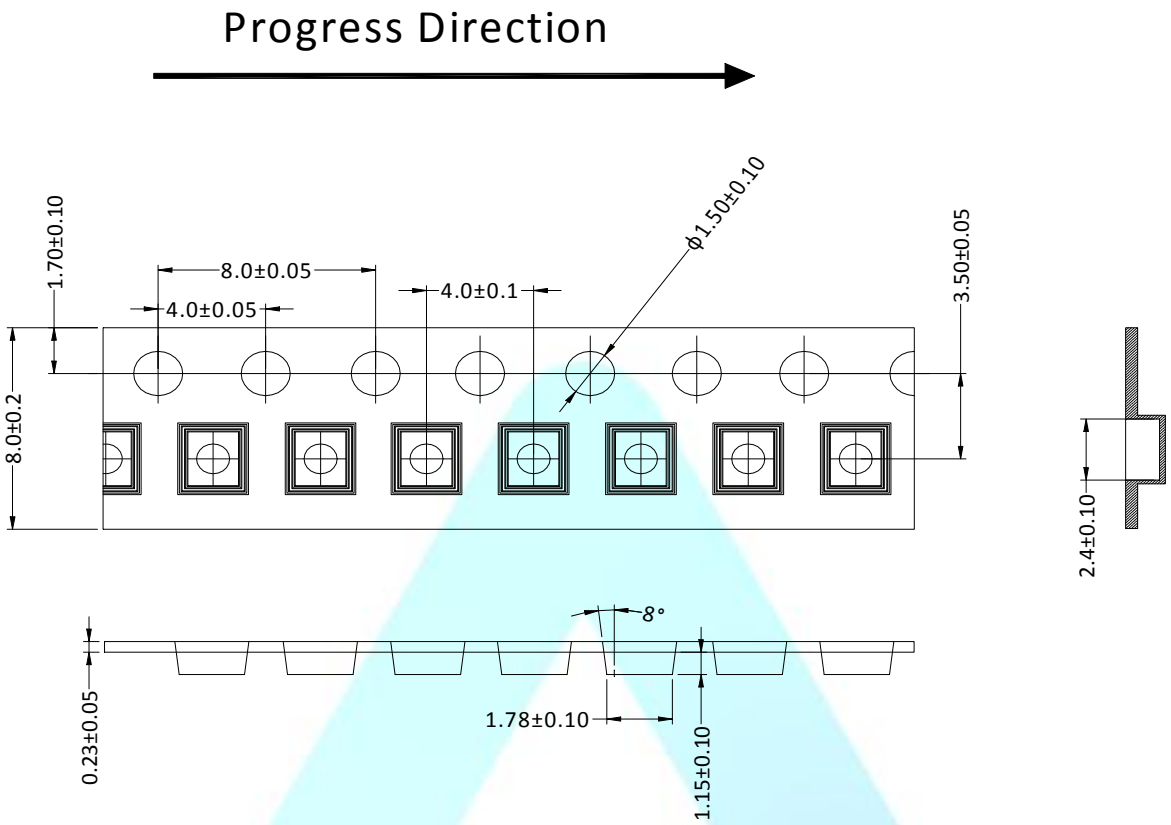
Test Items	Ref. Standard	Test Conditions	Time	Quantity	Criterion
Reflow	JESD22-B106	Temp:255℃max T=10 sec	3 times.	22	22/22
Temperature Cycle	JESD22-A104	100℃±5℃ 30 min. ↑↓5 min -40℃±5℃ 30 min.	100 Cycles	22	22/22
High Temperature Storage	JESD22-A103	Temp:100℃±5℃	1000Hrs.	11	11/11
Low Temperature Storage	JESD22-A119	Temp:-40℃±5℃	1000Hrs.	11	11/11
Life Test	JESD22-A108	Ta=25℃±5℃ IF=20mA	1000Hrs.	11	11/11
High Temperature High Humidity Life Test	JESD22-A101	85℃±5℃/ 85%RH IF=20mA	1000Hrs.	11	11/11

Failure Criteria

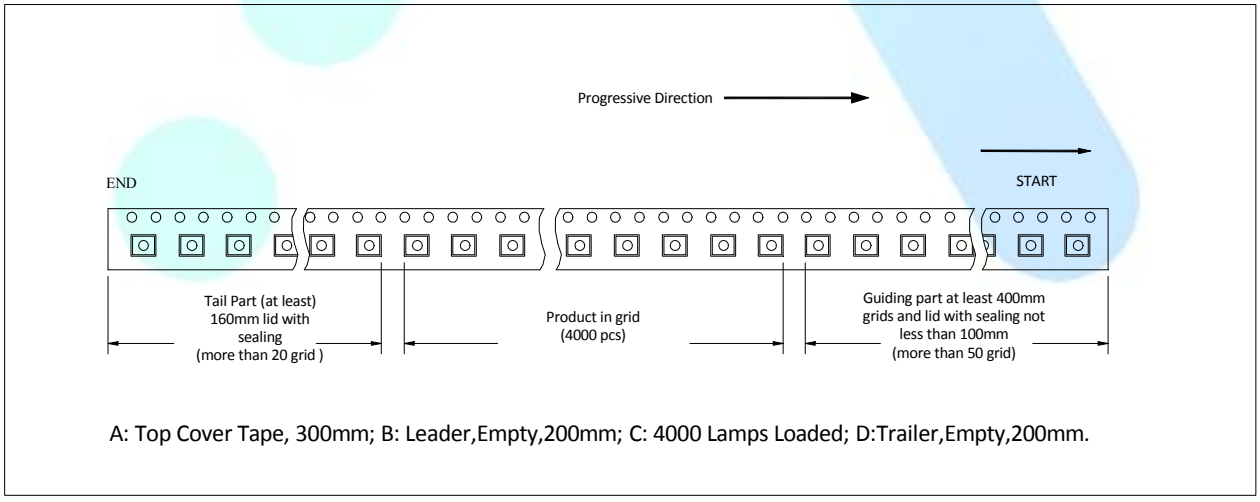
Test Items	Symbol	Test Conditions	Failure Criteria	
			Min	Max
Forward Voltage	V_F	IF=20mA	-	U.S.L*)x1.1
Reverse Current	I_R	VR=5V	-	10uA
Luminous Flux	lm	IF=20mA	L.S.L*)x0.7	-

* Note:
1、U.S.L: Upper Specification Limit
2、L.S.L: Lower Specification Limit

Packaging Carrier Tape

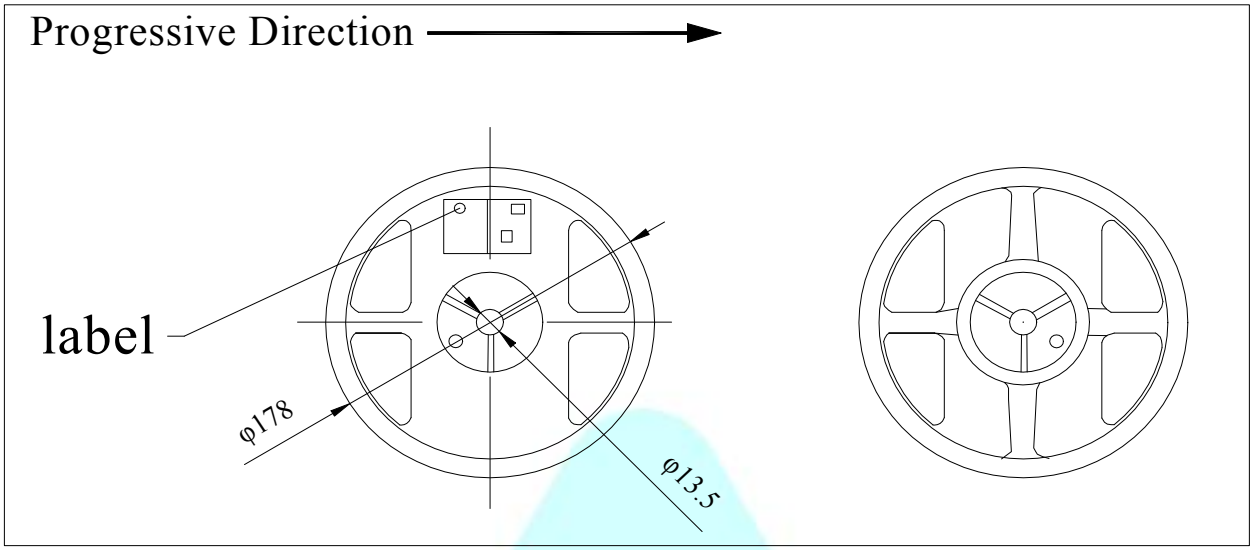


Details of Carrier Tape

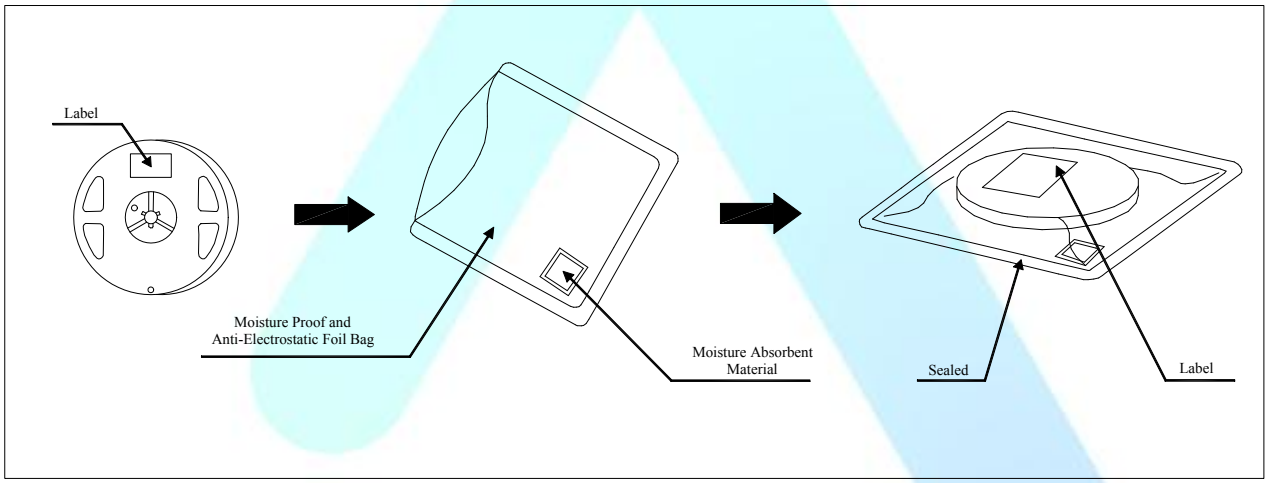


A: Top Cover Tape, 300mm; B: Leader,Empty,200mm; C: 4000 Lamps Loaded; D:Trailer,Empty,200mm.

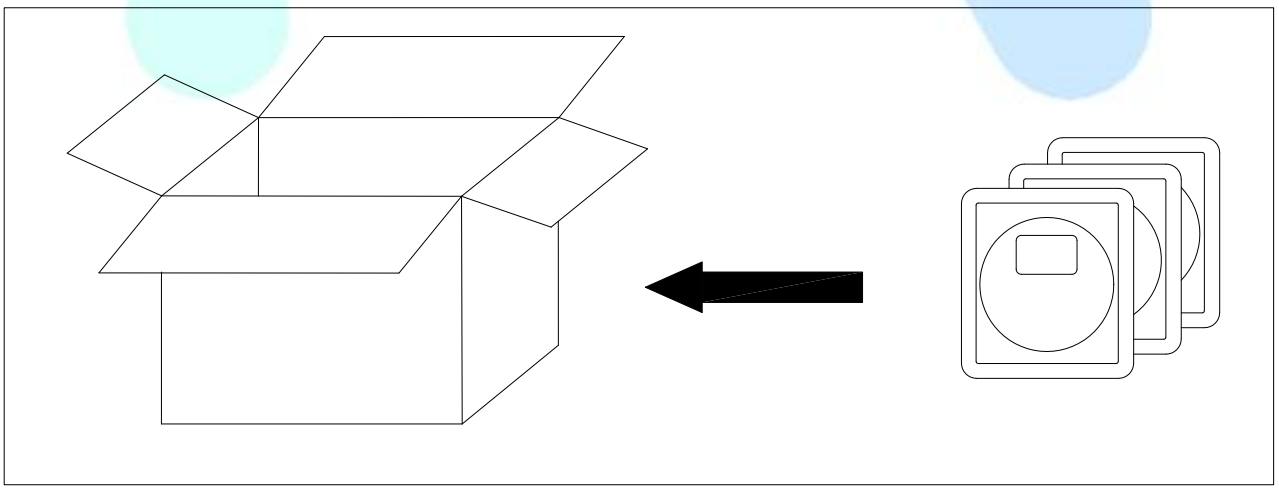
Reel Dimension



Moisture Proof and Anti-Electrostatic Foil Bag



Cardboard Box



Label explanation

CPN: Customer's Production Number

P/N: Production Number

QYY: Packing Quantity

CAT: Ranks

HUE:Peak Wavelength

REF: Reference

LOT No: Lot Number

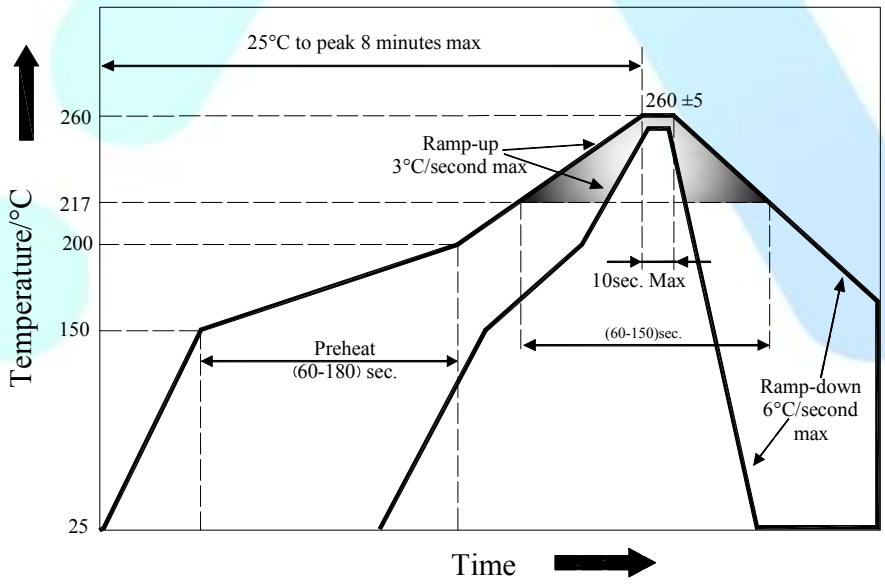
Guideline for Soldering

1.Hand Soldering

- A soldering iron of less than 20W is recommended to be used in Hand Soldering. Please keep the soldering iron under 360℃ while soldering. Each terminal of the LED is to go for less than 3 second and for one time only.
- Be careful because the damage of the product is often started at the time of the hand soldering

2.Reflow Soldering

- Use the conditions shown in the under Figure of Pb-Free Reflow Soldering.



- Reflow soldering should not be done more than two times.
- Stress on the LEDs should be avoided during heating in soldering process.
- After soldering, do not touch with the product before its temperature drop down to room temperature.

3.Cleaning

- It is recommended that alcohol be used as a solvent for cleaning after soldering. Cleaning is to go under 30℃ for 3 minutes or 50℃ for 30 seconds. When using other solvents, it should be confirmed before hand whether the solvents will dissolve the package and the resin or not.
- Ultrasonic cleaning is also an effective way for cleaning. But the influence of Ultrasonic cleaning on LED depends on factors such as ultrasonic power. Generally, the ultrasonic power should not be higher than 300W. Before cleaning, a pre-test should be done to confirm whether any damage to LEDs will occur.

Precautions

1. Storage

- Moisture proof and anti-electrostatic package with moisture absorbent material is used to keep moisture to a minimum.
- Before opening the package, the product should be kept at 30℃ or less and humidity less than80% RH, and be used within a year.
- After opening the package, the product should be stored at 30℃ or less and humidity less than 10%RH, and be soldered within 24 hours (1day). It is recommended that the product be operated at the workshop condition of 30℃ or less and humidity less than 60%RH.
- If the moisture absorbent material has faded away or the LEDs have exceeded the storage time, baking treatment should be performed based on the following condition: (80±5)℃ for 24 hours.

2. Static Electricity

- Static electricity or surge voltage damages the LEDs. Damaged LEDs will show some unusual Characteristic such as the forward voltage becomes lower, or the LEDs do not light at the low current even not light.
- All devices, equipment and machinery must be properly grounded. At the same time, it is recommended that wristbands or anti-electrostatic gloves, anti-electrostatic containers be used when dealing with the LEDs.

3. Vulcanization

- LED curing is due to sulfur being in bracket and the +1 price of silver in the chemical reaction generated Ag 2 Sin the process. It will lead to the capacity of reflecting of silver layer reducing, light color temperature drift and serious decline, seriously affecting the performance of the product.So we should take corresponding measures to avioding vulcanization, such as to a void using sulphur volatile substance sand keeping away from high sulphur content of the material

4. Safety Advice For Human Eyes

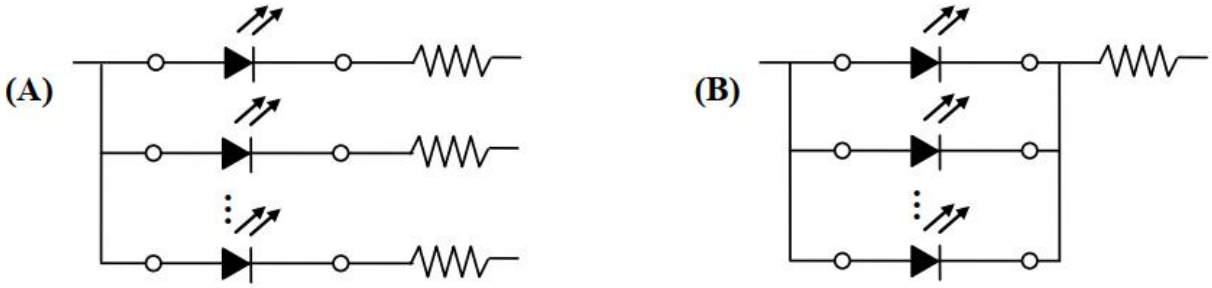
- Viewing direct to the light emitting center of the LEDs, especially those of great Luminous Intensity will cause great hazard to human eyes. Please be careful.

5. Design Consideration

- In designing a circuit, the current through each LED must not exceed the absolute maximum rating specified for each LED. In the meanwhile, resistors for protection should be applied,

otherwise slight voltage shift will cause big current change, burn out may happen.

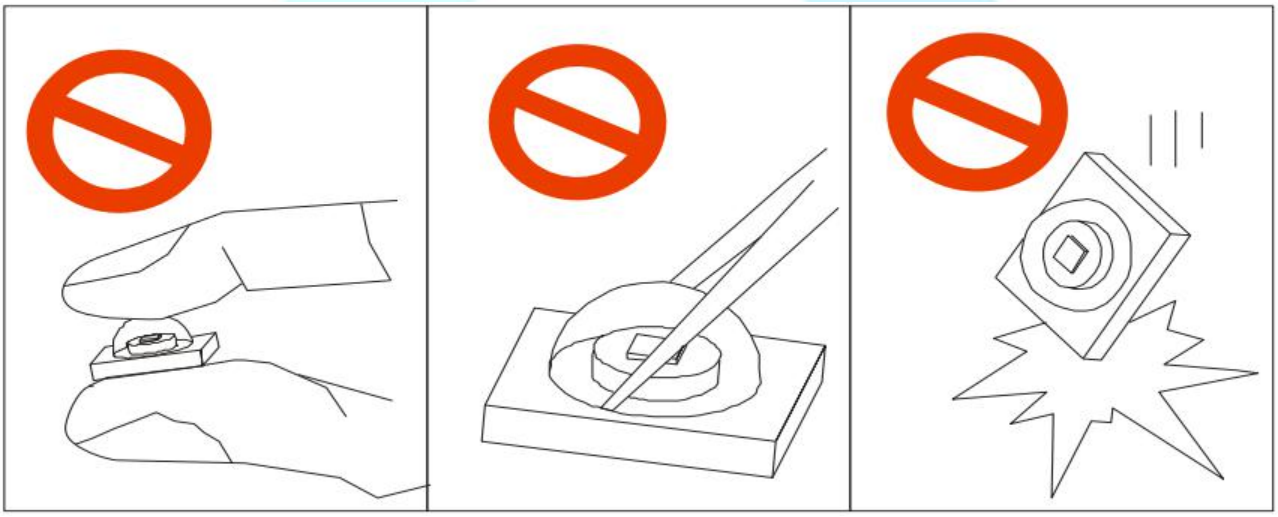
- It is recommended to use Circuit A which regulates the current flowing through each LED rather than Circuit B. When driving LEDs with a constant voltage in Circuit B, the current through the LEDs may vary due to the variation in Forward Voltage (VF) of the LEDs. In the worst case, some LED may be subjected to stresses in excess of the Absolute Maximum Rating.



- Thermal Design is paramount importance because heat generation may result in the Characteristics decline, such as brightness decreased, Color changed and so on. Please consider the heat generation of the LEDs when making the system design.

6. Others

- When handling the product, touching the encapsulate with bare hands will not only contaminate its surface, but also affect on its optical characteristic. Excessive force to the encapsulate might result in catastrophic failure of the LEDs due to die breakage or wire deformation. For this reason, please do not put excessive stress on LEDs, especially when the LEDs are heated such as during Reflow Soldering.



- The silicon resin of encapsulate is fragile, so please avoid scratch or friction over the silicon resin surface. While handling the product with tweezers, do not hold by the silicon resin, be careful.