

SHENZHEN ATFU ELECTRONICS TECHNOLOGY CO.,LTD

**SPECIFICATION FOR APPROVAL**

客户名称 (Customer Name) :	
客户料号 (Customer NO.) :	
产品名称 (Product Name) :	020 Side View RGB SMD LED
产品型号 (Product No.) :	AT-020RGB
制定日期 (Date Prepared) :	2012-12-25

CUSTOMER CONFIRMATION			



SUPPLIER CONFIRMATION	
Designed by	
Check by	
Approval by	
Date	

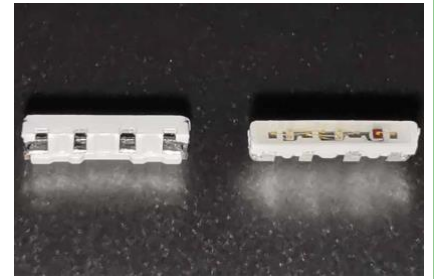
SHENZHEN ATFU ELECTRONICS TECHNOLOGY CO.,LIMITED

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◆ **Features:**

1. RGB SMT package.
2. Package: 3.8\*1.0\*0.6mm.
3. Side view RGB LED.
4. Wide viewing angle.
5. Low Power Dissipation.
6. Lead frame package with individual 4 pins.
7. Compatible with automatic placement equipment.
8. Compatible with infrared and vapor phase reflow solder process.
9. The product itself will remain within RoHS & REACH compliant Version.



◆ **Applications:**

1. Automotive: Backlighting in dashboard and switch.
2. Telecommunication: Indicator and backlighting in telephone and fax.
3. Flat backlight for keyboard, switch and symbol.
4. Indoor signboard use.
5. LCD Backlight.
6. Indicators.
7. Mobile phones.
8. General use.

◆ **Absolute Maximum Ratings at Ta=25°C**

Parameters	Symbol	MAX	Unit
Power Dissipation	Hyper Red	75	mW
	Pure Green	115	
	Blue	115	
Peak Forward Current (1/10 Duty Cycle, 0.1ms Pulse Width)	Hyper Red	100	mA
	Pure Green	100	
	Blue	100	
Continuous Forward Current	Hyper Red	30	mA
	Pure Green	30	
	Blue	30	
Reverse Voltage	VR	5	V
Electrostatic Discharge (HBM)	Hyper Red	2000	V
	Pure Green	1000	
	Blue	1000	

Operating Temperature Range	Topr	-40°C to +85°C
Storage Temperature Range	Tstg	-40°C to +100°C
Soldering Temperature	Tsld	260°C for 5 Seconds

◆ **Electrical Optical Characteristics at Ta=25°C**

Parameters	Symbol	Emitting Color	Min.	Typ.	Max.	Unit	Test Condition
Luminous Intensity	IV	Hyper Red	650	780	---	mcd	IF=20mA (Note 1)
		Pure Green	1300	1500	---		
		Blue	350	470	---		
Viewing Angle	2θ <sub>1/2</sub>	Hyper Red	---	120	---	Deg	IF=20mA (Note 2)
		Pure Green	---	120	---		
		Blue	---	120	---		
Peak Emission Wavelength	λp	Hyper Red	---	632	---	nm	IF=20mA (Measurement @Peak)
		Pure Green	---	520	---		
		Blue	---	468	---		
Dominant Wavelength	λd	Hyper Red	---	624	---	nm	IF=20mA (Note 3)
		pure Green	---	525	---		
		Blue	---	470	---		
Spectral Line Half-Width	Δλ	Hyper Red	---	20	---	nm	IF=20mA
		Pure Green	---	35	---		
		Blue	---	25	---		
Forward Voltage	VF	Hyper Red	1.80	2.20	2.40	V	IF=20mA
		Pure Green	3.00	3.30	3.80		
		Blue	3.00	3.30	3.80		
Reverse Current	IR	Hyper Red	---	---	10	μA	V <sub>R</sub> =5V
		Pure Green			10		
		Blue			10		

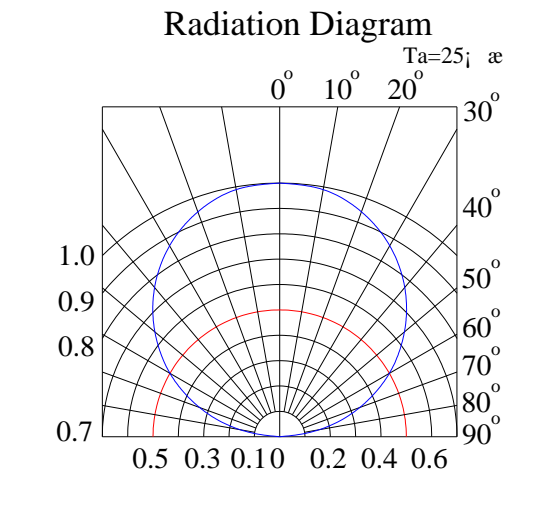
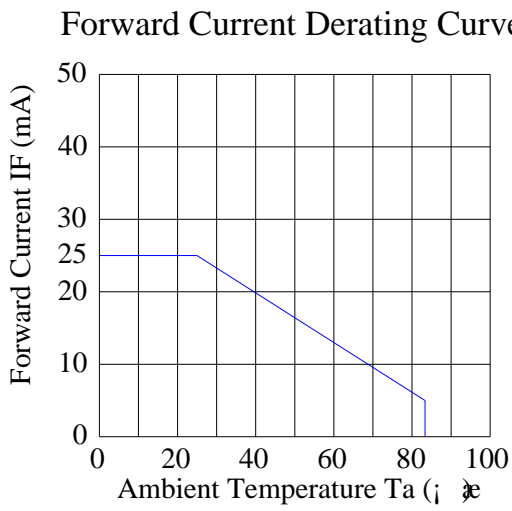
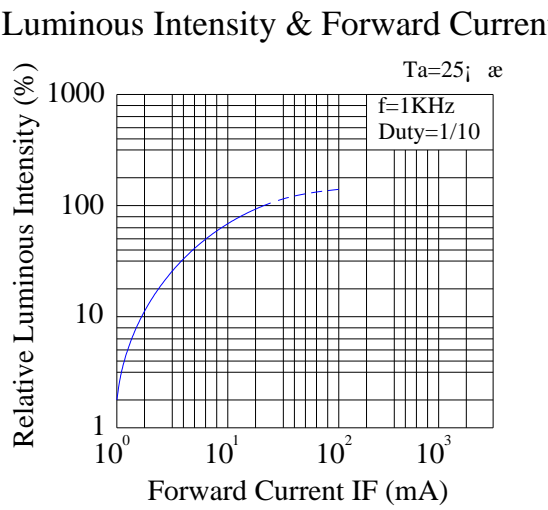
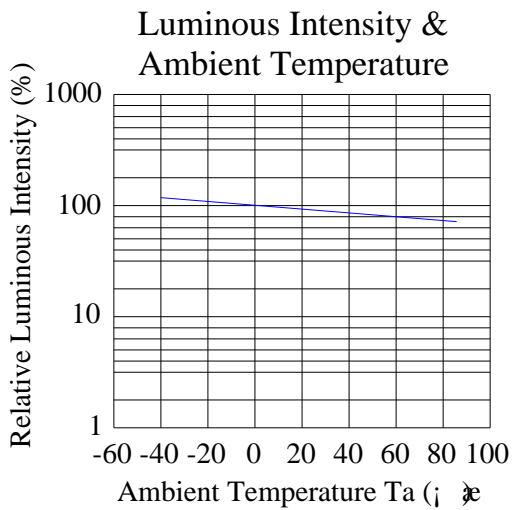
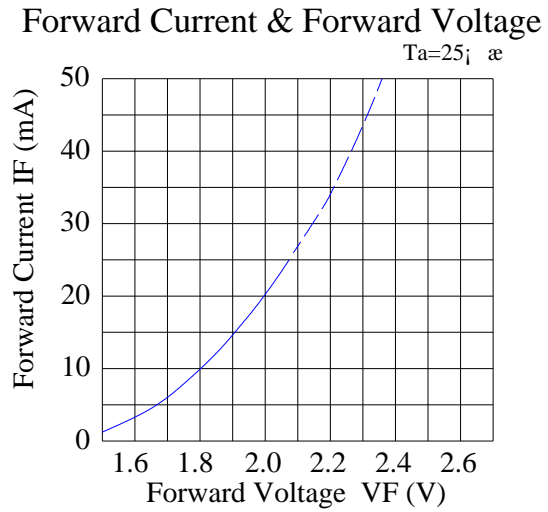
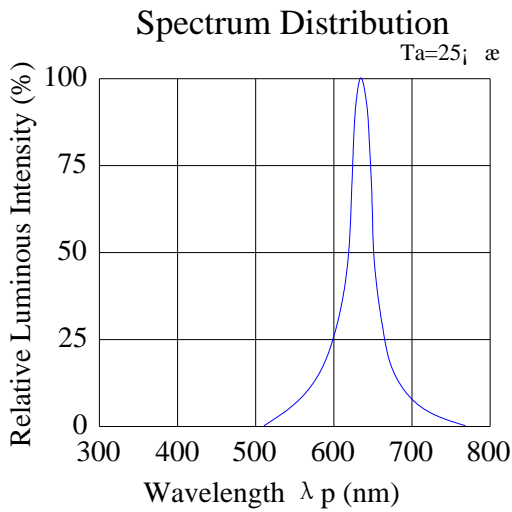
Notes:

1. Luminous Intensity Measurement allowance is ± 10%.
2. θ<sub>1/2</sub> is the off-axis angle at which the luminous intensity is half the axial luminous intensity.
3. It use many parameters that correspond to the CIE 1931 2°. X, Y, and Z are CIE 1931 2° values of Red, Green and Blue content of the measurement.

◆ **Typical Electrical / Optical Characteristics Curves**

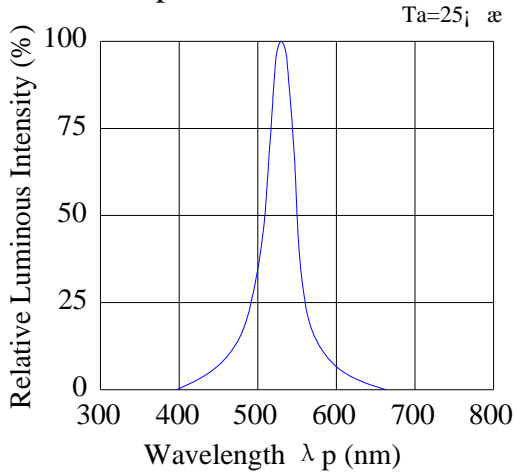
(25°C Ambient Temperature Unless Otherwise Noted)

Hyper Red:

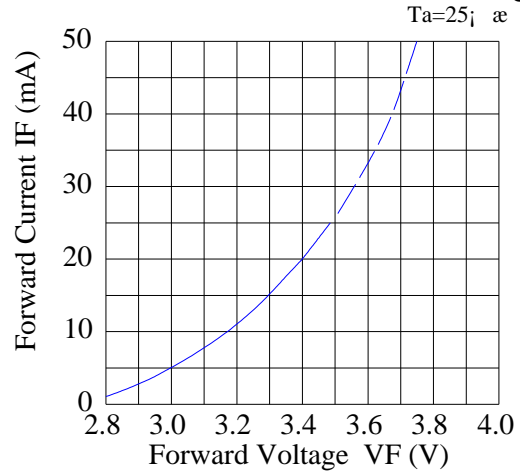


Pure Green:

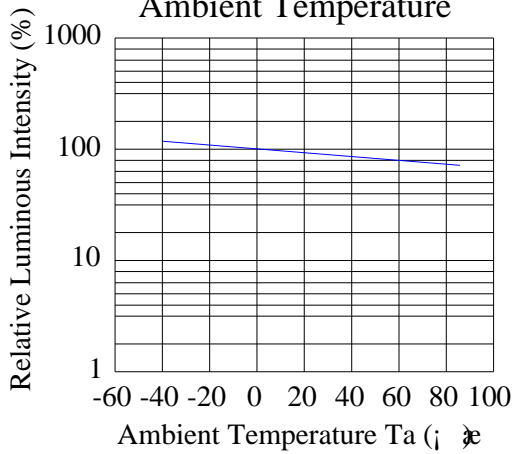
**Spectrum Distribution**



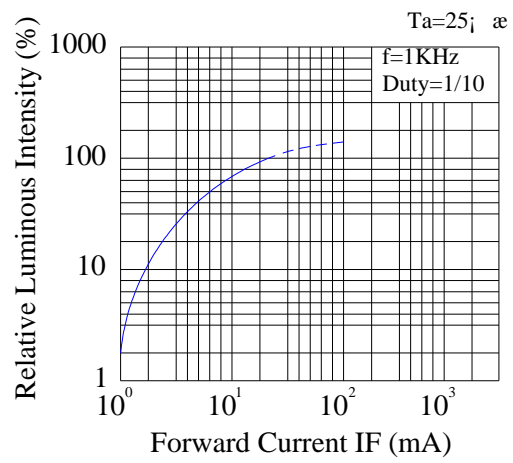
**Forward Current & Forward Voltage**



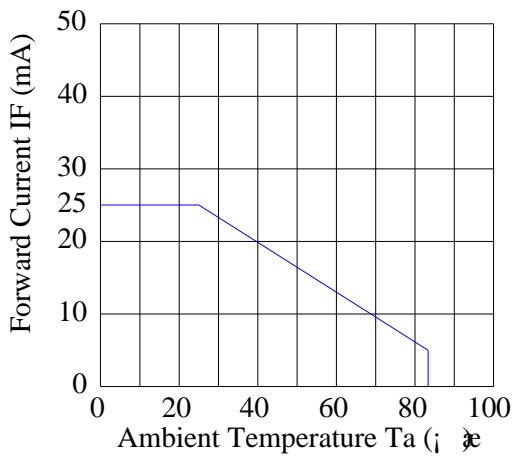
**Luminous Intensity & Ambient Temperature**



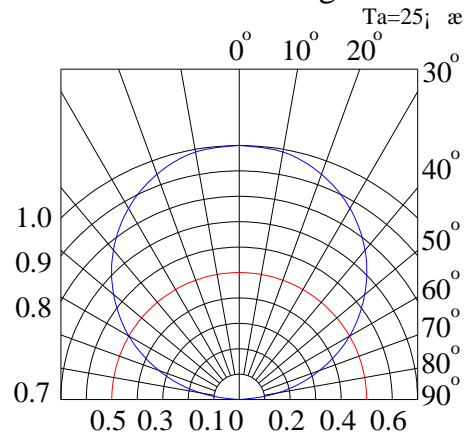
**Luminous Intensity & Forward Current**



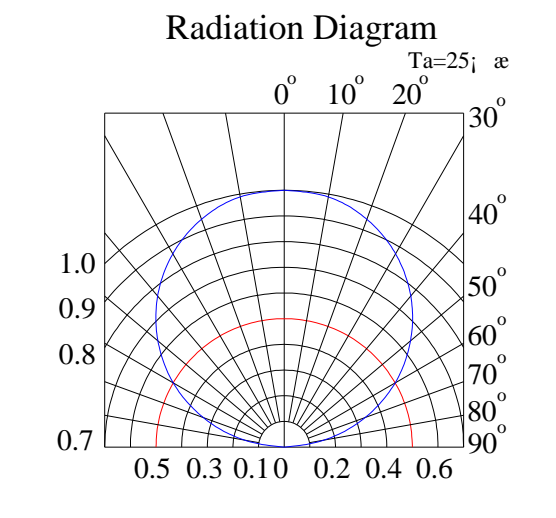
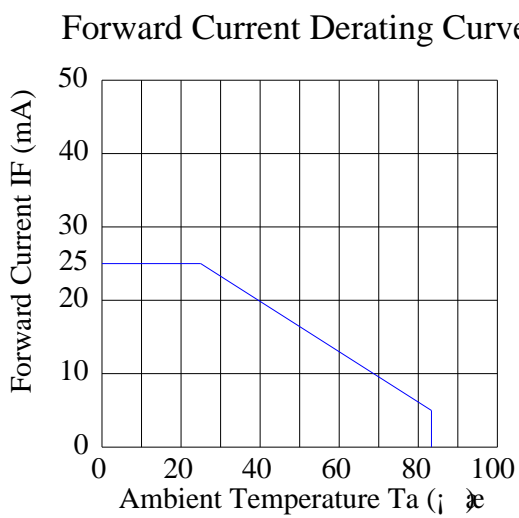
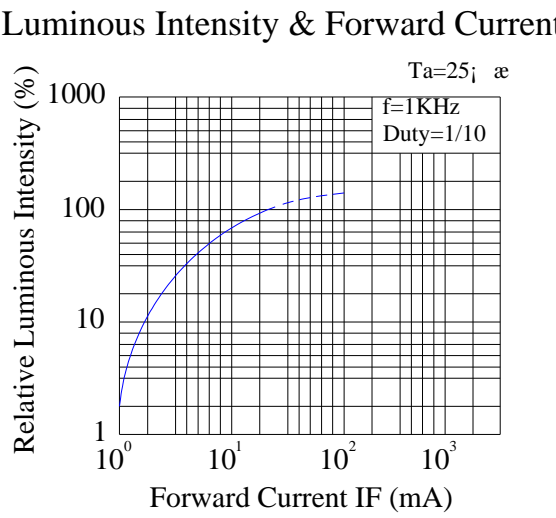
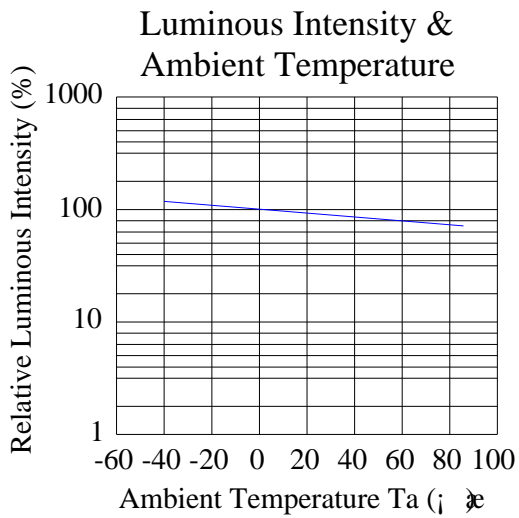
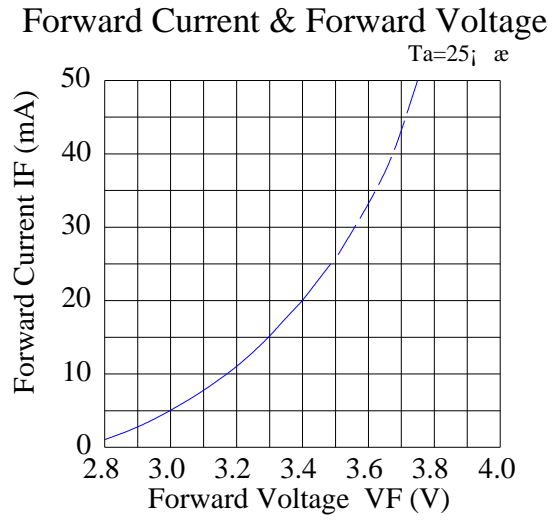
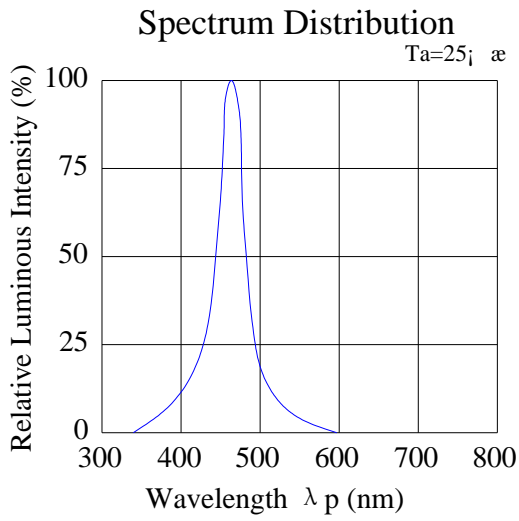
**Forward Current Derating Curve**



**Radiation Diagram**



Blue:



◆ **Reliability Test Items And Conditions:**

The reliability of products shall be satisfied with items listed below:

Confidence level: 90%.

LTPD: 10%.

1) Test Items and Results:

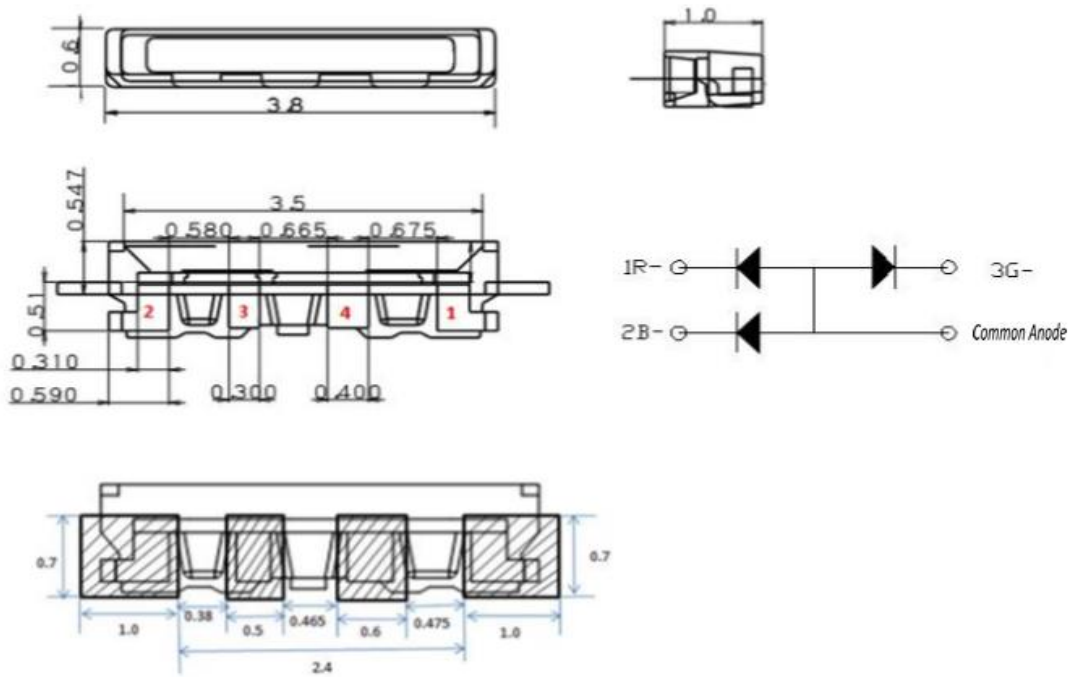
No.	Test Item	Test Hours/Cycles	Test Conditions	Sample Size	Ac/Re
1	Resistance for Soldering Heat	2 times	Tsld=260±5℃, Min. 5sec	25pcs	0/25
2	Thermal Shock	300 Cycles	H: +100℃ 5min ~10 sec L: -10℃ 5min	25pcs	0/25
3	Temperature Cycle	300 Cycles	H: +100℃ 15min ~5min L: -40℃ 15min	25pcs	0/25
4	DC Operating Life	1000Hrs.	Ta=25℃ IF=20mA	25pcs	0/25
5	High Temperature Storage	1000Hrs.	Temp: 100℃	25pcs	0/25
6	Low Temperature Storage	1000Hrs.	Temp: -40℃	25pcs	0/25
7	High Temperature/ High Humidity	1000Hrs.	85℃/85%RH	25pcs	0/25

2) Criteria for Judging the Damage:

Item	Symbol	Test Conditions	Criteria for Judgment	
			Min	Max
Forward Voltage	VF	IF=20mA	---	F.V.*)×1.1
Reverse Current	IR	VR=5V	---	F.V.*)×2.0
Luminous Intensity	IV	IF=20mA	F.V.*)×0.7	---

\*) F.V.: First Value.

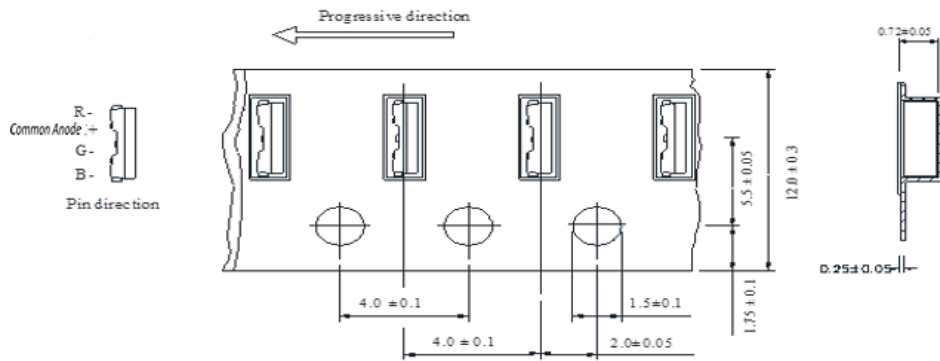
◆ Outline dimensions



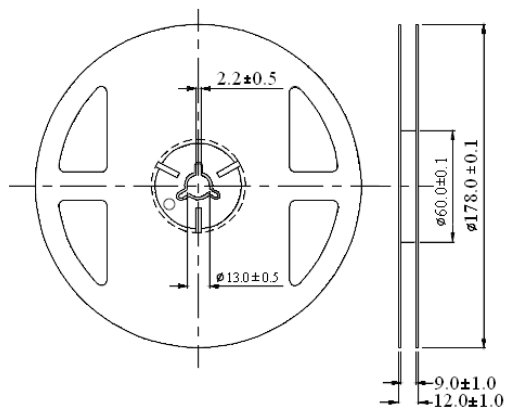
Recommended soldering pad design

◆ Carrier Tape Dimensions:

Loaded quantity 4000PCS per reel.



◆ Reel Dimensions:



Unit: mm  
Tolerance: ± 0.25mm



◆ Please read the following notes before using the product:

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 The LEDs should be used within a year.

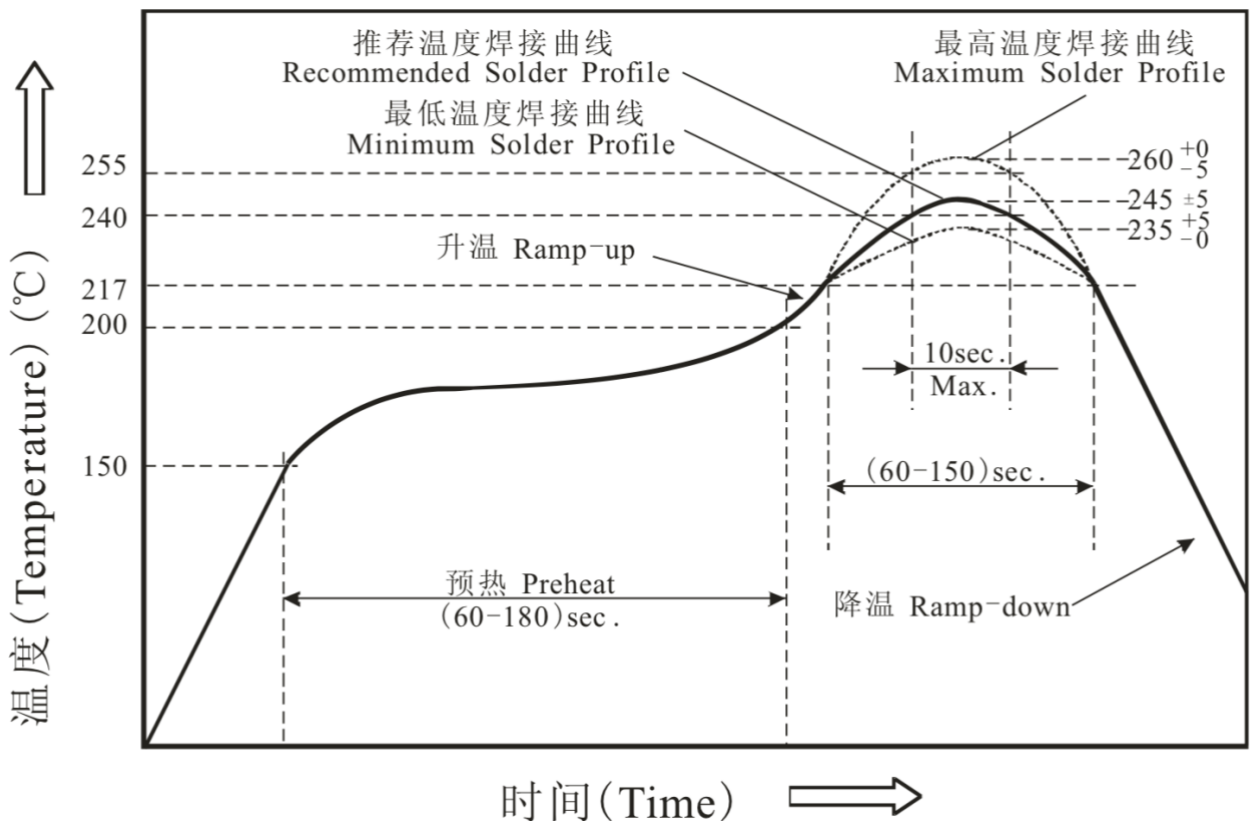
2.4 After opening the package, the LEDs should be kept at 30°C or less and 70%RH or less.

2.5 The LEDs should be used within 168 hours (7 days) after opening the package.

2.6 If the moisture adsorbent material (silica gel) has fabled 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.

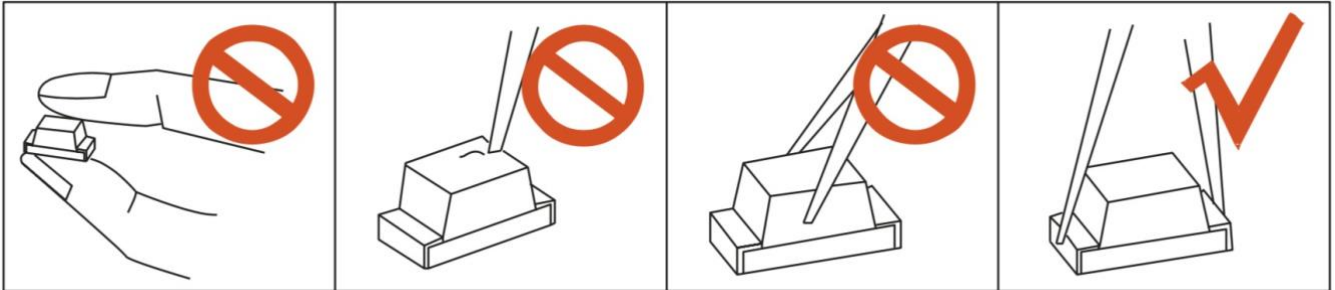
4. Soldering Iron

Each terminal is to go to the tip of soldering iron temperature less than 260°C for 5 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.



#### 6. Caution in ESD

Static Electricity and surge damages the LED. It is recommended to use a wrist band or anti-electrostatic glove when handling the LED. All devices, equipment and machinery must be properly grounded.