



BRIGHTEK OPTOELECTRONIC CO., LTD

SPECIFICATION

产品规格书

Part No.(品號): N0M03S90

◆**Outline (L*W*H): 3.5*3.5*2.5mm**

◆**Specification: T50120A20A15000**

APPROVED SIGNATURES

顧客確認

SPECIFICATION FOR APPROVAL



Features

- § Forward currents: Blue, Green $\leq 30\text{mA}$; Red $\leq 50\text{ mA}$;
- § Viewing angle: 120°
- § Operating temperature: $-40\sim 80^\circ\text{C}$
- § Storage temperature: $-40\sim 100^\circ\text{C}$
- § RoHS and REACH-compliant
- § Max. junction temperature: 110°C
- § Package: 500pcs per reel.
- § Qualified according to JEDEC moisturevity Level 3
- § Chips material: AlGaInP for Red, InGaN for Blue and Green
- § Reverse Voltage: -5V

**Electrical-Optical Characteristics(Ta=25°C)**

SPECIFICATION FOR APPROVAL

Parameter	Symbol		Value			Unit	Test condition
			Min.	Typ.	Max.		
Forward Voltage	V _F	R	1.7	1.9	2.6	V	I _F =20mA
		G	2.8	3.2	3.8		
		B	2.8	3.2	3.8		
Luminous Intensity	I _v	R	-	800	-	mcd	I _F =20mA
		G	-	1800	-		
		B	400	450	-		
Dominate Wavelength	λ _d	R	615	-	630	nm	I _F =20mA
		G	519	-	534		
		B	461	-	476		
Reverse Current	I _R		-	-	10	μA	V _R =5V
Viewing Angle	2*θ _{1/2}		-	120	-	Deg	I _F =20mA
Max. junction Temperature	T _j		-	-	110	°C	
Electrostatic Discharge Classification	ESD		1000V				

1. Measurement errors:Forward Voltage: ±0.1V, Luminous intensity: ±10%I_v, Dominate wavelength: ±0.5nm**2. Electrostatic Discharge Classification: HBM 1000V for R, G& B LEDs**



Range of Bins

Luminous Intensity Bins ($I_F = 20\text{mA}$)

Red		
Bin Code	Min.(mcd)	Max.(mcd)
12	540	675
13	675	840
14	840	1050

Green		
Bin Code	Min.(mcd)	Max.(mcd)
12	1125	1405
13	1405	1755
14	1755	2195

Blue		
Bin Code	Min.(mcd)	Max.(mcd)
14	400	500
15	500	625
16	625	785

Dominate Wavelength Bins ($I_F = 20\text{mA}$)

Red		
Bin Code	Min.(nm)	Max.(nm)
2	615	620
3	620	625
4	625	630

Green		
Bin Code	Min.(nm)	Max.(nm)
2	519	524
3	524	529
4	529	534

Blue		
Bin Code	Min.(nm)	Max.(nm)
2	461	466
3	466	471
4	471	476

- ※ Tolerance of measurement of luminous intensity is $\pm 10\%$.
- ※ Tolerance of measurement of dominate wavelength is $\pm 0.5\text{nm}$.
- ※ Please check sorting method, we will amend the Bin code to maintain bin code centralize.

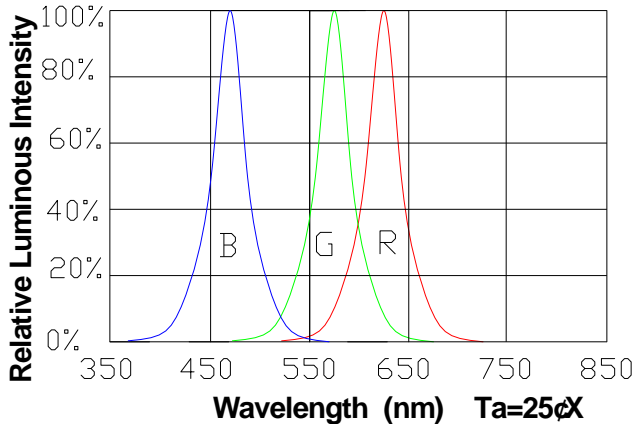




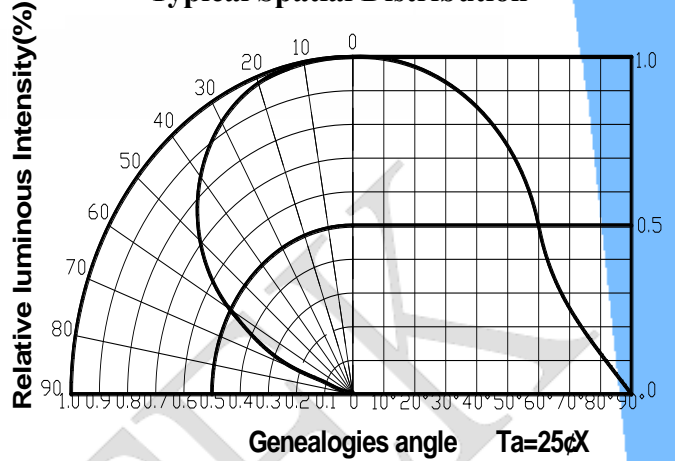
Optical Characteristics

SPECIFICATION FOR APPROVAL

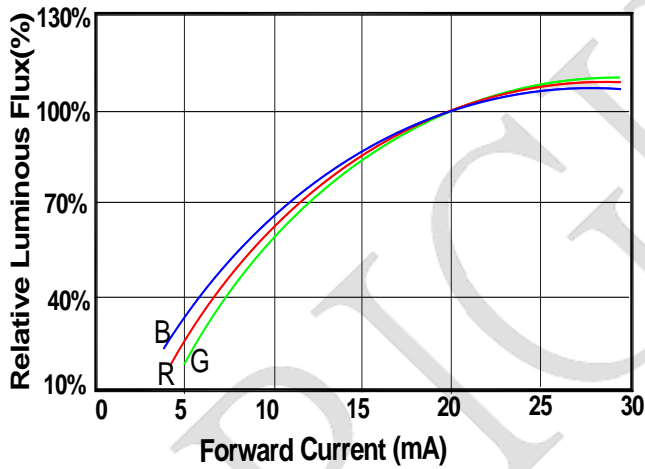
Relative Spectral Distribution



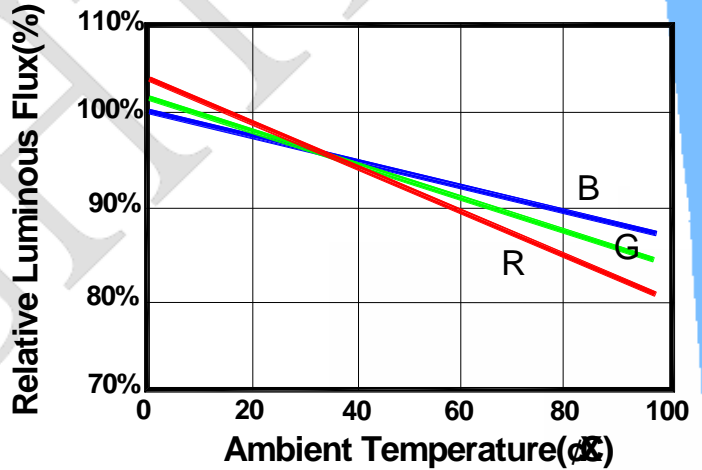
Typical Spatial Distribution



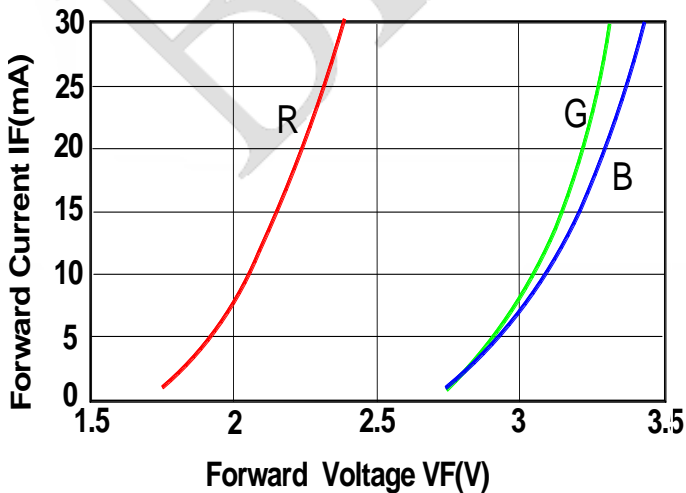
Relative Luminous Flux .Current



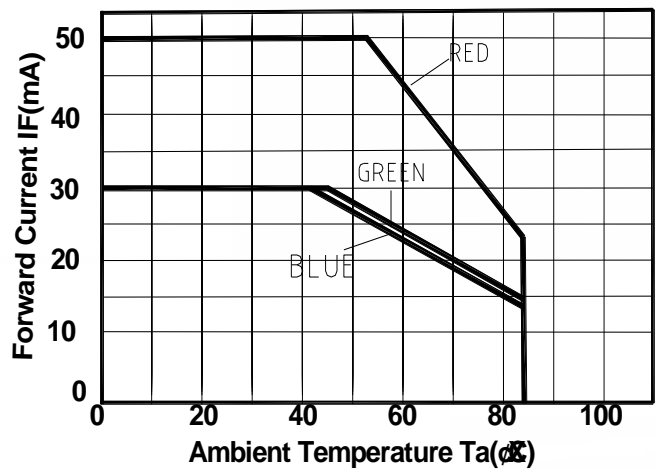
Relative Luminous Flux .Ambient Temperature



Electrical Characteristics



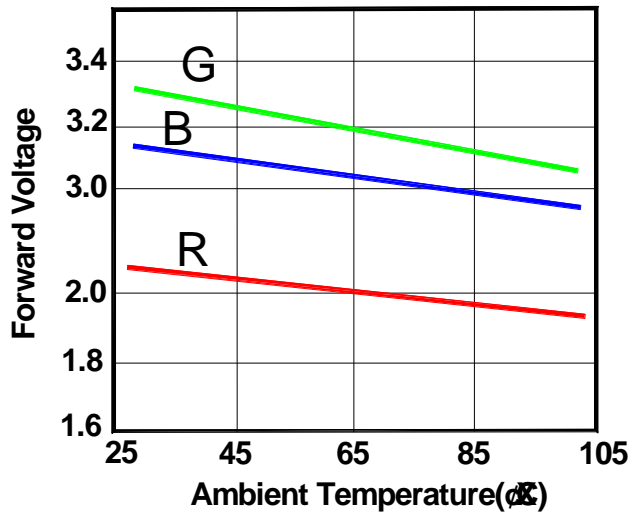
Thermal Design



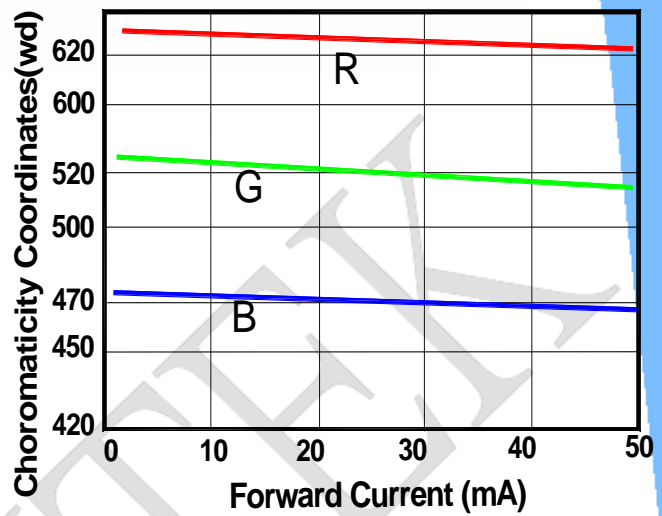


Optical Characteristics

Forward Voltage Temperature



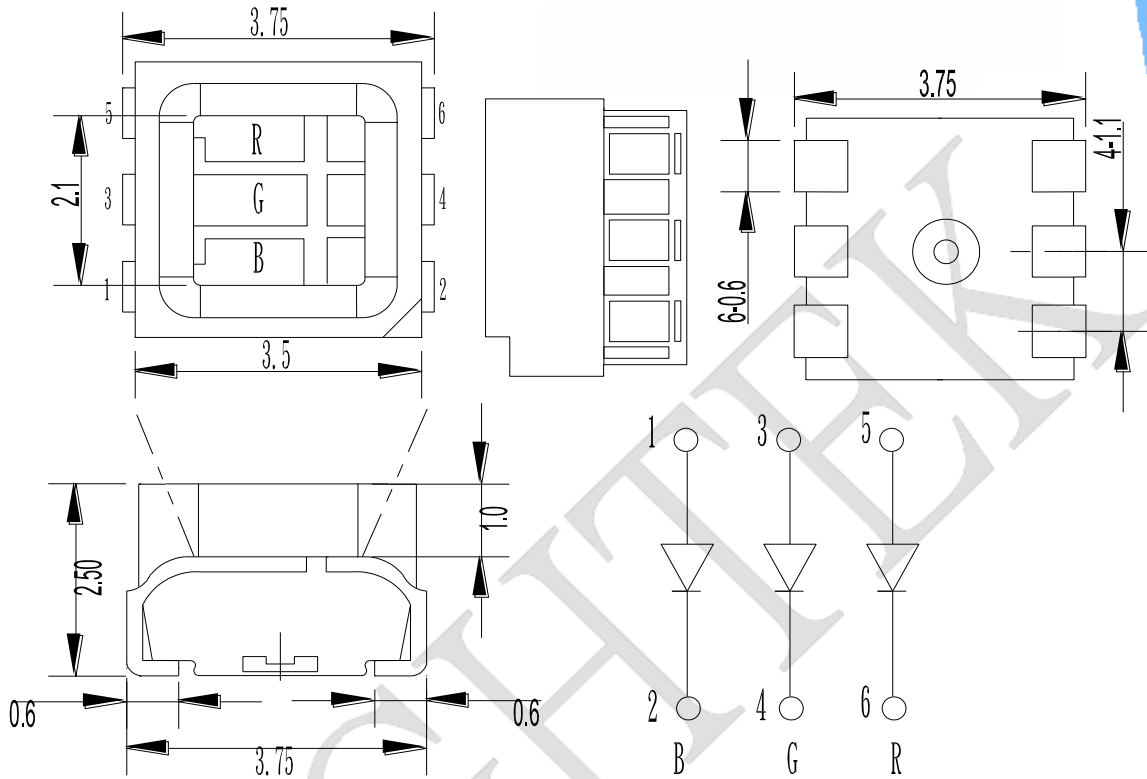
Wavelength and current



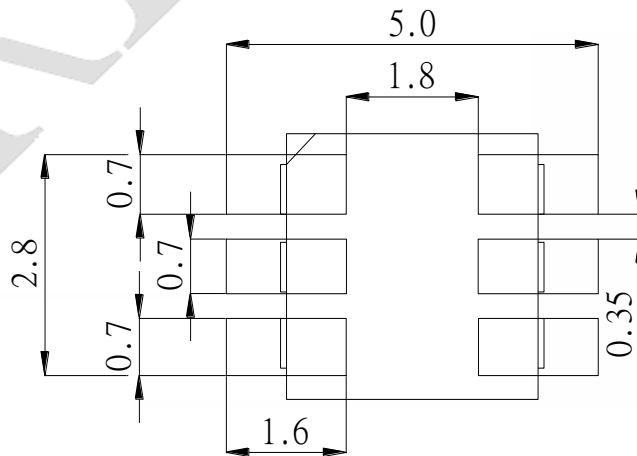
BRIGHTTEK



Outline Dimensions



Recommend Padlayout



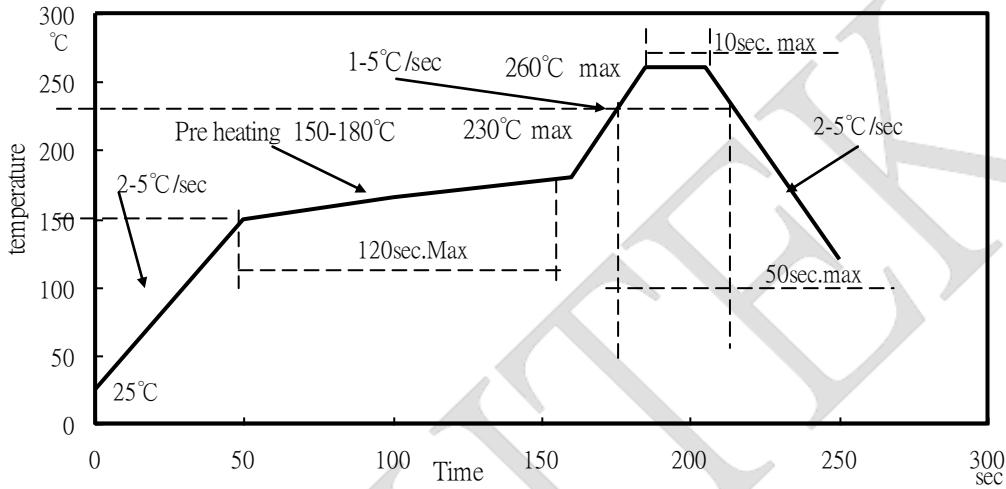
- § All dimensions are in millimeters.
- § Tolerance is ± 0.1 mm unless other specified
- § Specifications are subject to change without notice.



Reflow Profile

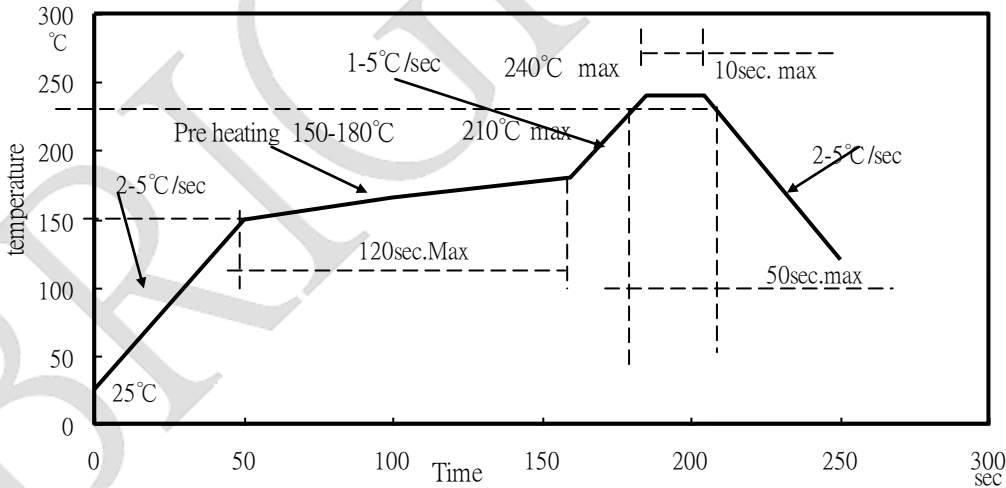
1. IR reflow soldering profile

Lead Free solder



2. IR reflow soldering profile

Lead solder



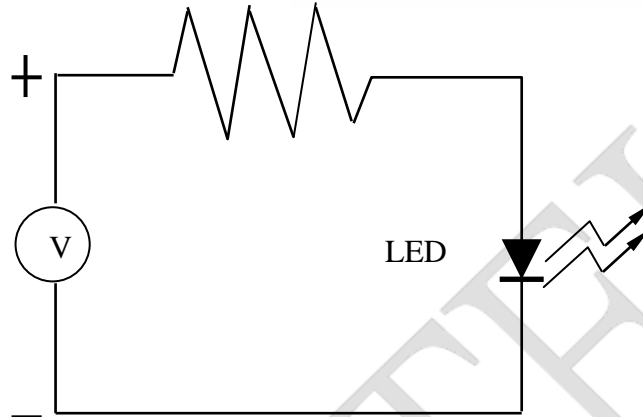
Notes:

1. We recommend the reflow temperature 240°C ($\pm 5^\circ\text{C}$).the maximum soldering temperature should be limited to 260°C.
2. Don't cause stress to the silicone resin while it is exposed to high temperature.
3. Number of reflow process shall be more than 2 times.



Test Circuit and Handling Precautions

■ Test circuit



■ Handling precautions

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 It is recommended to store the products in the following conditions:

Humidity: 60% R.H. Max.

Temperature: 5°C~30°C(41°F~86°F)

2.2 Shelf life in sealed bag: 12 month at <5°C~30°C and <60% R.H. after the package is opened, the products should be used within a week or they should be stored at ≤0%R.H. with zip-lock sealed.

3. Baking

It is recommended to baking before soldering when the pack is unsealed after 24hrs. The Conditions are as followings:

3.1 70±3°C 24hrs and <5% RH, for reel

3.2 100±3°C 2hrs, for single LED

3.3 130±3°C(15~30min), for single LED

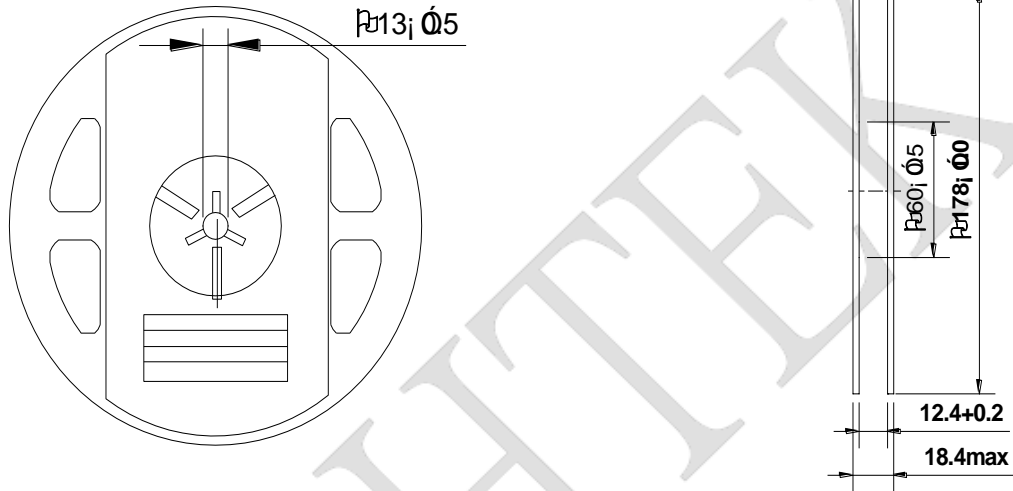
It shall be normal to see color light yellow fading of carrier after baking in process



Packing

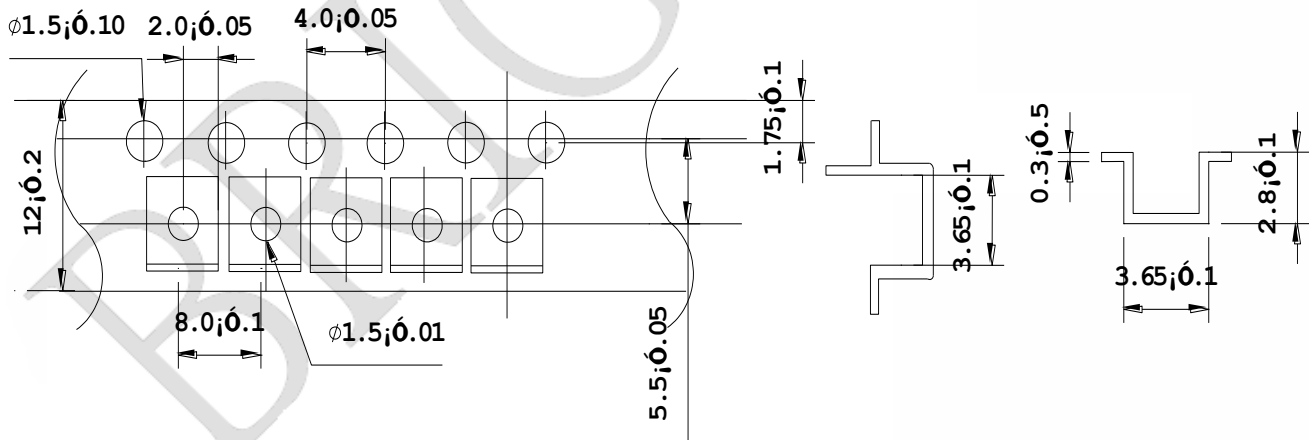
3535 Full-Color High Performance SMD Top LEDs Packaging Specifications

● Dimensions of Reel (Unit: mm)



● Dimensions of Tape (Unit: mm)

Note: 01. The tolerance unless mentioned is ± 0.1 mm.
02. The measured unit is "mm".



Notes:

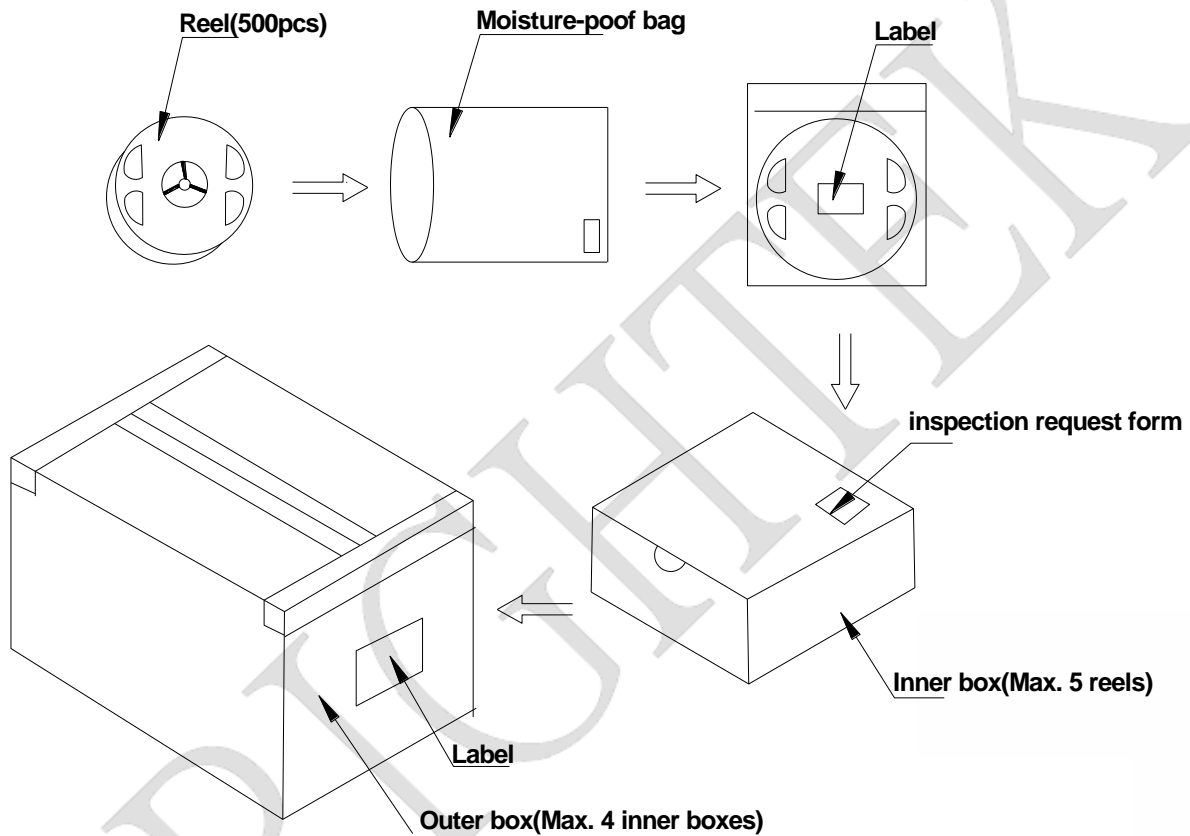
1. Empty component pockets are sealed with top cover tape;
2. The max loss number of SMD is two pcs;
3. The cathode is oriented towards the tape sprocket hole in accordance with ANSI/EIA RS-481 specifications;
4. 500pcs per reel



Packing

3535 Full-Color High Performance SMD Top LEDs Packaging Specifications

- Packaging specifications



Notes:

Reeled product (max.500) is packed in a sealed moisture-proof bag. Five bags are packed in an inner box (size: about 238 X 194 X 102 mm) and four inner boxes are in an outer box (size: about 410 X 254 X 229mm). On the label of moisture-proof bag, there should be the information of Part No., Lot No. and quantity number; also the total quantity number should be on inspection request form on outer box.



Precautions

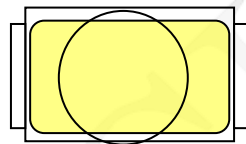
1、 Abnormal situation caused by improper setting of collet

To choose the right collet is the key issue in improving the product's quality. LED is different from other electronic components, which is not only about electrical output but also for optical output. This characteristic made LED more fragile in the process of SMT. If the collet's lowering down height is not well set, it will bring damage to the gold wire at the time of collet's picking up and loading which will cause the LED fail to light up, light up now and then or other quality problems

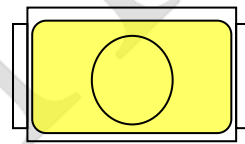
2、 How to choose the collet

During SMT, please choose the collet that has larger outer diameter than the lighting area of lens, in case that improper position of collet will damage the gold wire inside the LED. Different collets fit for different products, please refer to the following pictures cross out.

Outer diameter of collet should be larger than the lighting area



Picture 1 (√)



Picture 2 (×)

3、 Other points for attention

- A、 No pressure should be exerted to the epoxy shell of the SMD under high temperature.
- B、 Do not scratch or wipe the lens since the lens and gold wire inside are rather fragile and cross out easy to break.
- C、 LED should be used as soon as possible when being taken out of the original package, and should be stored in anti-moisture and anti-ESD package.

4、 This usage and handling instruction is only for your reference.

**Test Items and Results of Reliability**

Type	Test Item	Test Standard	Test Conditions	Note	Number of Damaged
Environmental Sequence	Temperature Cycle	JEITA ED-4701 300 303	-40°60min ↑↓5 min 100°60min	100 cycle	0/50
	Thermal Shock	JEITA ED-4701 200 303	-10°15min ↑↓5sec 100°15min	20 cycle	0/22
	High Temperature Storage	JEITA ED-4701 200 201	T _a =100°C	1000 hrs	0/22
	Humidity Heat Storage	JEITA ED-4701 100 103	T _a =60°C RH=90%	1000 hrs	0/22
	Low Temperature Storage	JEITA ED-4701 200 202	T _a =-40°C	1000 hrs	0/22
Operation Sequence	Life Test	Tested with Brightek standard	T _a =25°C I _F =20mA	1000 hrs	0/22
	High Humidity Heat Life Test	Tested with Brightek standard	T _a =60°C RH=90% I _F =15mA	500 hrs	0/22
	Low Temperature Life Test	Tested with Brightek standard	T _a =-20°C I _F =20mA	1000 hrs	0/22

Judgment Criteria of Failure for the Reliability

Measuring items	Symbol	Measuring conditions	Judgment criteria for failure
Forward voltage	V _F (V)	I _F =20mA	>V _{f0} *×1.2
Reverse current	I _R (μA)	V _R =5V	>20μA

Notes: V_{f0}* is initial state value



Revision History

Date	Revision History	Text		Writer	
				Drawn	Approved
2013/09/13	新制定		1.0	Zixin.li	HH.YI
2013/09/16	提升 Blue 的 I _V 值	1.0	1.1	Zixin.li	HH.YI
2013/09/23	修正包装	1.1	1.2	Zixin.li	HH.YI