SPECIFICATION

REFOND P/N

RF-Q30SA**A-24-J2

☐R&D

■Mass Product

深圳市瑞丰光电子股份有限公司 承认专用章

Contents

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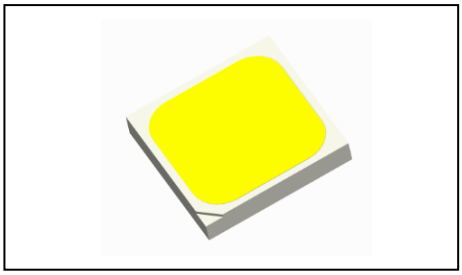
1. Description

1.1General Description



The White LED which was fabricated using a blue chip and the phosphor

3.0mmX3.0mmX0.65mm。

1.2Features

► EMC Package.EMC.

►Extremely wide viewing angle.

►Suitable for all SMT assembly and solder process.

► Package:5000pcs/reel.

►Moisture sensitivity level: Level 3.

►RoHS compliant.

1.3Application

► Optical indicator.

►Indoor display.

►Outdoor lighting

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1.4Package Dimension

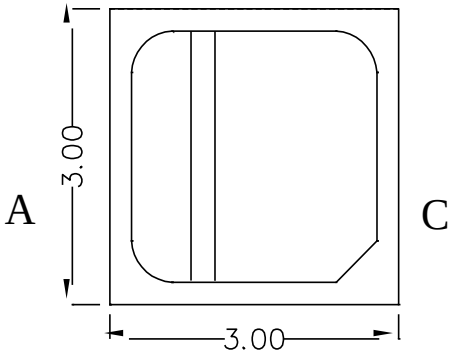

Fig.1-1 Top view

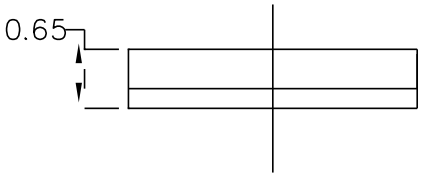

Fig.1-2Side view

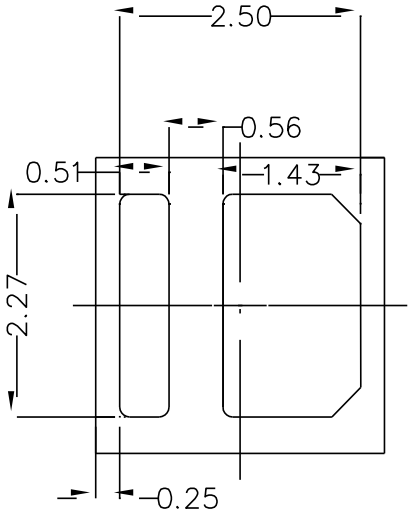

Fig.1-3Bottom view

Polarity
A:anode
C:cathode

Fig.1-4Polarity

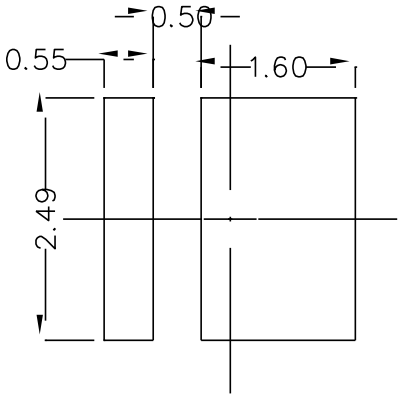

Fig.1-5Soldering patterns

Notes:

1. All dimensions units are millimeters.
2. All dimensions tolerances are ±0.05mm unless otherwise noted.

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1.5Product Parameters

Table 1-1 Electrical / Optical Characteristics at Ts=25°C

Product		Symbol	test condition	Value			unit
				Min.	Max.	Typ.	
Forward Voltage	Rank R1	Vf	I_F =150mA	5.8	6.0	---	V
	Rank R2			6.0	6.2	---	V
	Rank S1			6.2	6.4	---	V
RF-Q30SA27A-24-J2（2580-2850K）	Rank FC6	Φ	I_F =150mA	140	150	151	lm
	Rank FC7			150	160		lm
RF-Q30SA30A-24-J2（2850-3210K）	Rank FC7	Φ	I_F =150mA	150	160	158	lm
	Rank FC8			160	170		lm
RF-Q30SA40A-24-J2（3690-4255K）	Rank FC7	Φ	I_F =150mA	150	160	165	lm
	Rank FC8			160	170		lm
	Rank FC9			170	180		lm
RF-Q30SA50A-24-J2（4700-5350K）	Rank FC7	Φ	I_F =150mA	150	160	165	lm
	Rank FC8			160	170		lm
	Rank FC9			170	180		lm
RF-Q30SA57A-24-J2（5260-6155K）	Rank FC7	Φ	I_F =150mA	150	160	165	lm
	Rank FC8			160	170		lm
	Rank FC9			170	180		lm
RF-Q30SA65A-24-J2（6035-7120K）	Rank FC7	Φ	I_F =150mA	150	160	165	lm
	Rank FC8			160	170		lm
	Rank FC9			170	180		lm
Reverse Current		IR	Vr=10V	---	10	---	uA
Viewing Angle		2Θ1/2	I_F =150mA	---	---	120	Deg
Color Rendering Index		Ra	I_F =150mA	70	---	72	---
Thermal resistance		Rth(j-s)	I_F =150mA	---	---	10	℃/W

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Table 1-2 Absolute Maximum Ratings at Ts=25°C

Parameter	Symbol	Rating	Units
Power Dissipation	P_D	1200	mW
Forward Current	I_F	200	mA
Peak Forward Current	I_{FP}	240	mA
Reverse Voltage	V_R	10	V
Electrostatic Discharge(HBM)	E_{SD}	2000	V
Operating Temperature	T_{OPR}	-40 ~ +100	℃
Storage Temperature	T_{OPR}	-40 ~ +100	℃
Junction Temperature	T_J	125	℃

Notes：

1. 1/10 Duty cycle, 0.1ms pulse width.

2. The above forward voltage measurement allowance tolerance is ±0.1V.

3. The above color coordinates measurement allowance tolerance is ±0.005.

4. The above luminous intensity measurement allowance tolerance ±10%.

5. Care is to be taken that power dissipation does not exceed the absolute maximum rating of the product.

6. All measurements were made under the standardized environment of Refond.

7.When the LEDs are in operation the maximum current should be decided after measuring the package temperature，junction temperature should not exceed the maximum rate.

8. ESD yield is over 90% at 2000V ESD (HBM). ESD protection during products handing is needed.

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1.6The C.I.E Chromaticity Diagram CIE

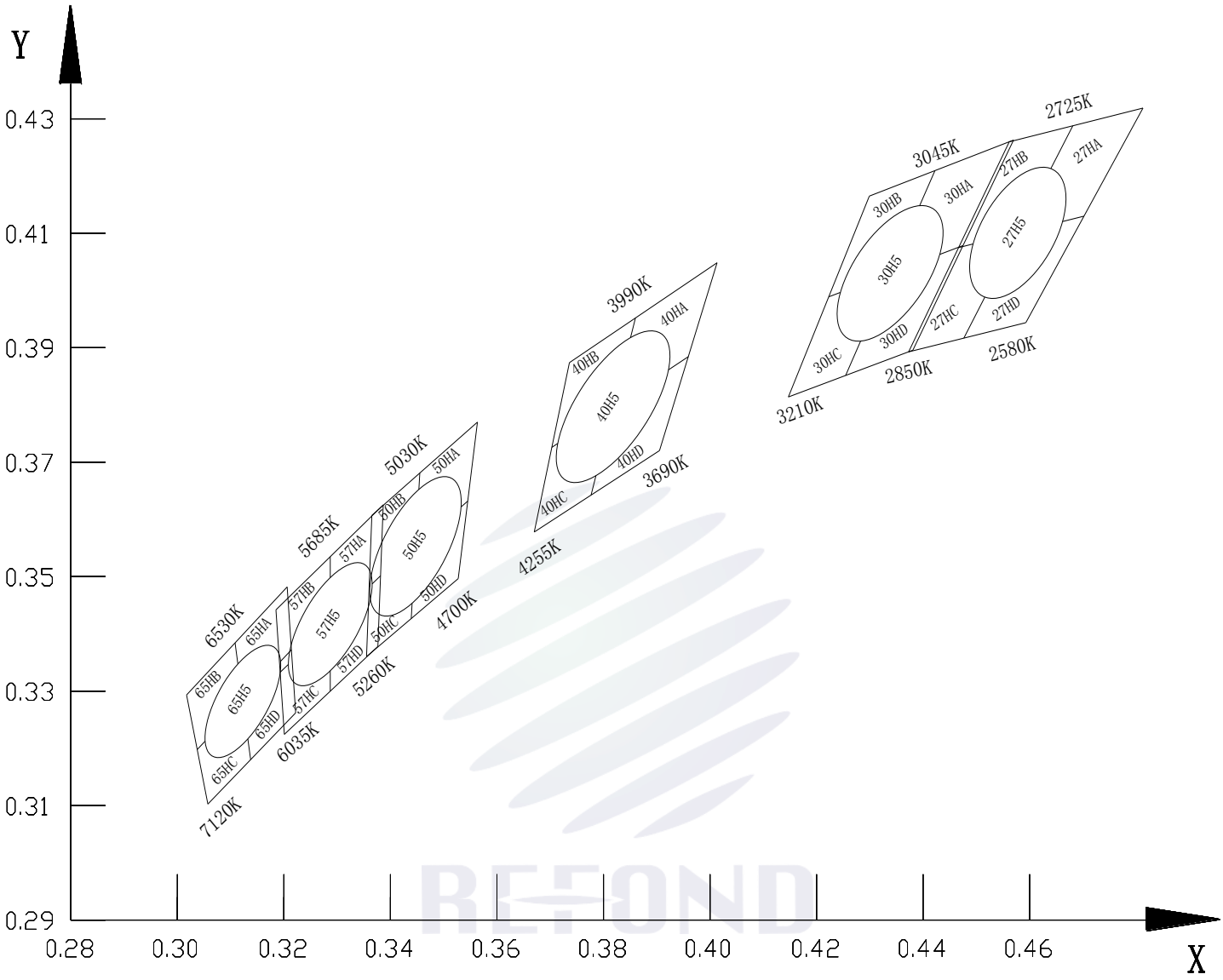

Fig 1-6 The C.I.E Chromaticity Diagram

Bin data：

ANSI 5-Step					
Bin Code	X	Y	a	b	θ
27H5	0.4578	0.4101	0.0135	0.007	53°42’
30H5	0.4338	0.4030	0.0139	0.0068	53°13’
40H5	0.3818	0.3797	0.01565	0.0067	53°43’
50H5	0.3447	0.3553	0.0137	0.0059	62°37’
57H5	0.3287	0.3417	0.01243	0.00533	62°09’
65H5	0.3123	0.3282	0.01115	0.00475	62°34’

ANSI 7-Step										
Bin Code	X1	Y1	X2	Y2	X3	Y3	X4	Y4	X5	Y5
27HA	0.4813	0.4319	0.4681	0.4288	0.4640	0.4213	0.4662	0.4121	0.4702	0.4130
27HB	0.4562	0.4260	0.4467	0.4075	0.4494	0.4081	0.4640	0.4213	0.4681	0.4288
27HC	0.4373	0.3893	0.4477	0.3917	0.4516	0.3988	0.4494	0.4081	0.4467	0.4075
27HD	0.4593	0.3944	0.4702	0.4130	0.4662	0.4121	0.4516	0.3988	0.4477	0.3917
30HA	0.4570	0.4263	0.4422	0.4209	0.4394	0.4148	0.4431	0.4063	0.4475	0.4079
30HB	0.4299	0.4165	0.4223	0.3989	0.4245	0.3997	0.4394	0.4148	0.4422	0.4209
30HC	0.4147	0.3814	0.4255	0.3852	0.4283	0.3912	0.4245	0.3997	0.4223	0.3989
30HD	0.4381	0.3896	0.4475	0.4079	0.4431	0.4063	0.4283	0.3912	0.4255	0.3852
40HA	0.4013	0.4049	0.3860	0.3952	0.3851	0.3918	0.3922	0.3861	0.3959	0.3884
40HB	0.3736	0.3874	0.3703	0.3726	0.3714	0.3733	0.3851	0.3918	0.3860	0.3952
40HC	0.3670	0.3578	0.3777	0.3643	0.3786	0.3677	0.3714	0.3733	0.3703	0.3726
40HD	0.3905	0.3720	0.3959	0.3884	0.3922	0.3861	0.3786	0.3677	0.3777	0.3643
50HA	0.3563	0.3770	0.3455	0.3681	0.3453	0.3652	0.3533	0.3622	0.3545	0.3632
50HB	0.3365	0.3607	0.3360	0.3483	0.3361	0.3484	0.3453	0.3652	0.3455	0.3681
50HC	0.3355	0.3360	0.3439	0.3427	0.3441	0.3454	0.3361	0.3484	0.3360	0.3483
50HD	0.3527	0.3497	0.3545	0.3632	0.3533	0.3622	0.3441	0.3454	0.3439	0.3427
57HA	0.3386	0.3626	0.3287	0.3535	0.3287	0.3498	0.3366	0.3487	0.3381	0.3502
57HB	0.3185	0.3442	0.3193	0.3333	0.3208	0.3347	0.3287	0.3498	0.3287	0.3535
57HC	0.3201	0.3224	0.3287	0.3300	0.3287	0.3336	0.3208	0.3347	0.3193	0.3333
57HD	0.3376	0.3378	0.3381	0.3502	0.3366	0.3487	0.3287	0.3336	0.3287	0.3300
65HA	0.3206	0.3482	0.3108	0.3384	0.3114	0.3347	0.3194	0.3352	0.3214	0.3372
65HB	0.3017	0.3293	0.3037	0.3198	0.3052	0.3213	0.3114	0.3347	0.3108	0.3384
65HC	0.3057	0.3103	0.3138	0.3180	0.3132	0.3217	0.3052	0.3213	0.3037	0.3198
65HD	0.3222	0.3262	0.3214	0.3372	0.3194	0.3352	0.3132	0.3217	0.3138	0.3180

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1.7 Typical optical characteristics curves

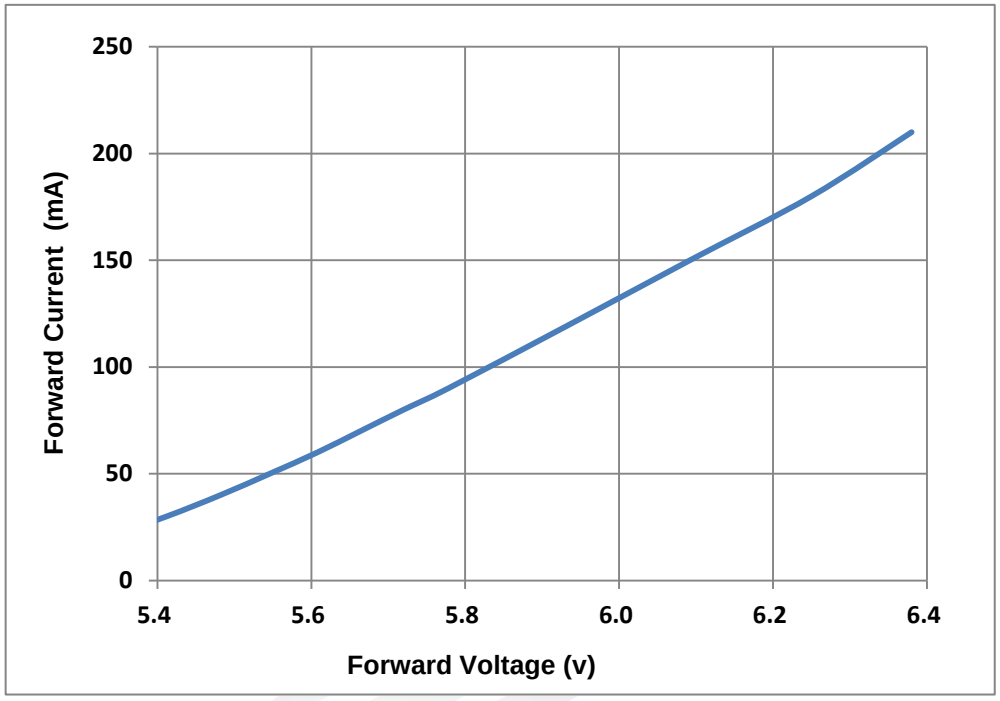

Fig 1-7 Forward Voltage Vs. Forward Current Ts=25℃

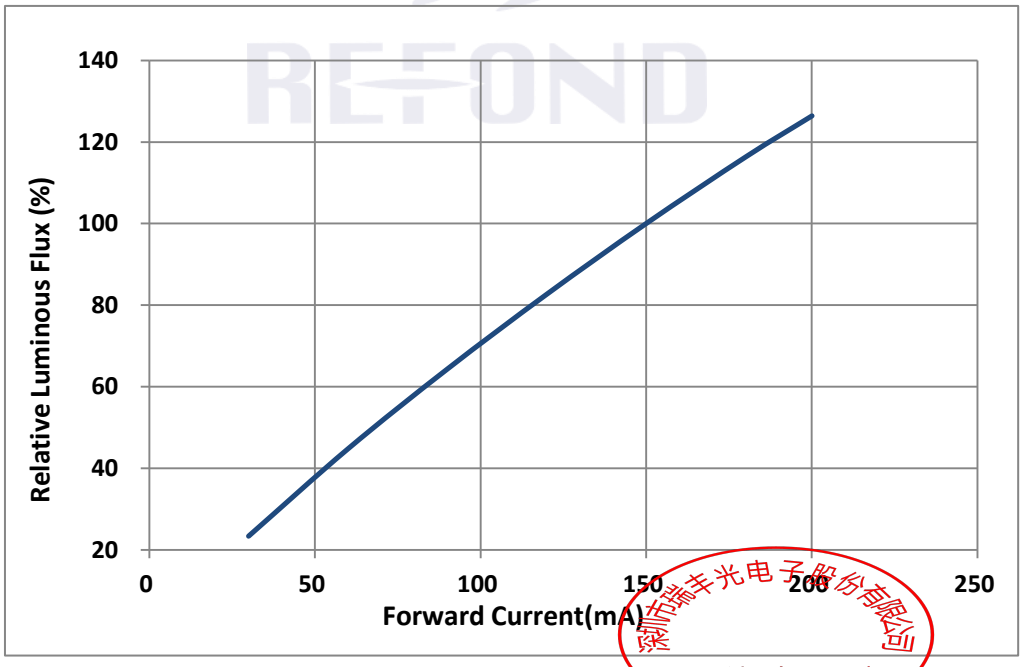

Fig 1-8 Forward Current Vs. Relative Intensity Ts=25℃

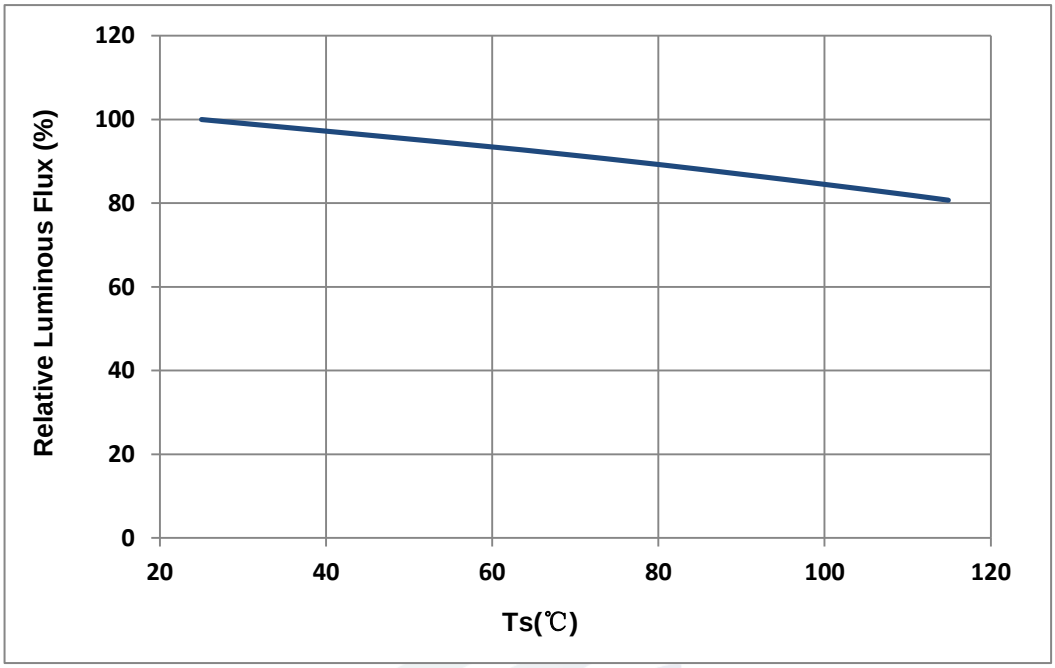

Fig 1-9 Solder Temperature Vs Relative Intensity

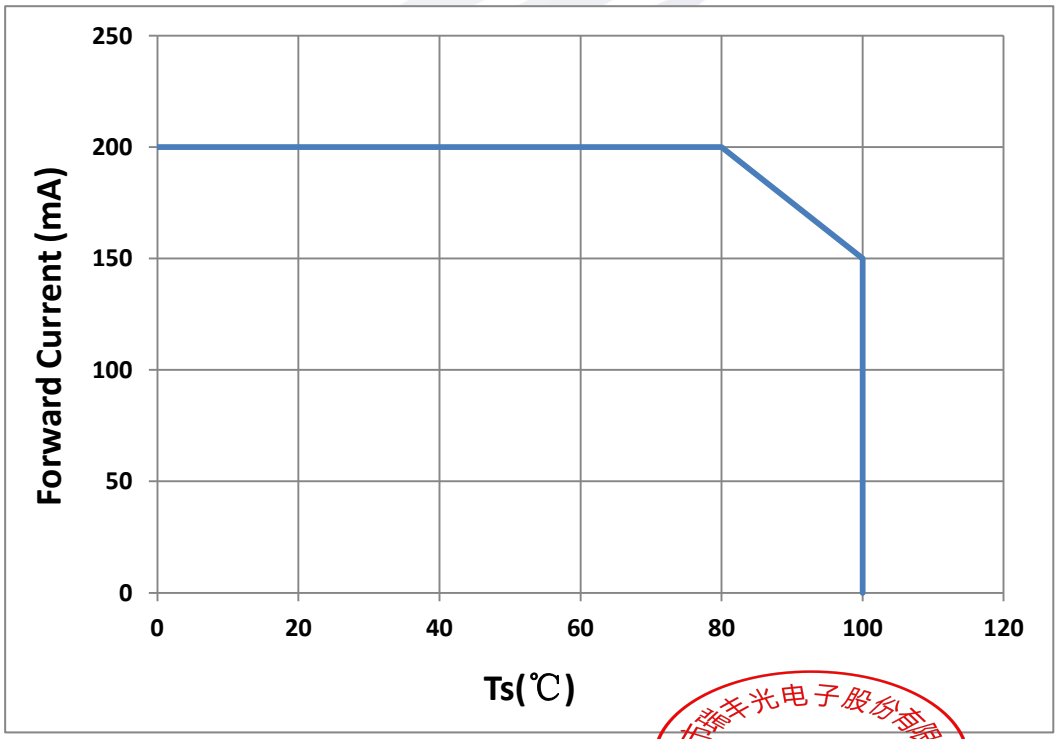

Fig 1-10 Solder Temperature Vs.Forward Current

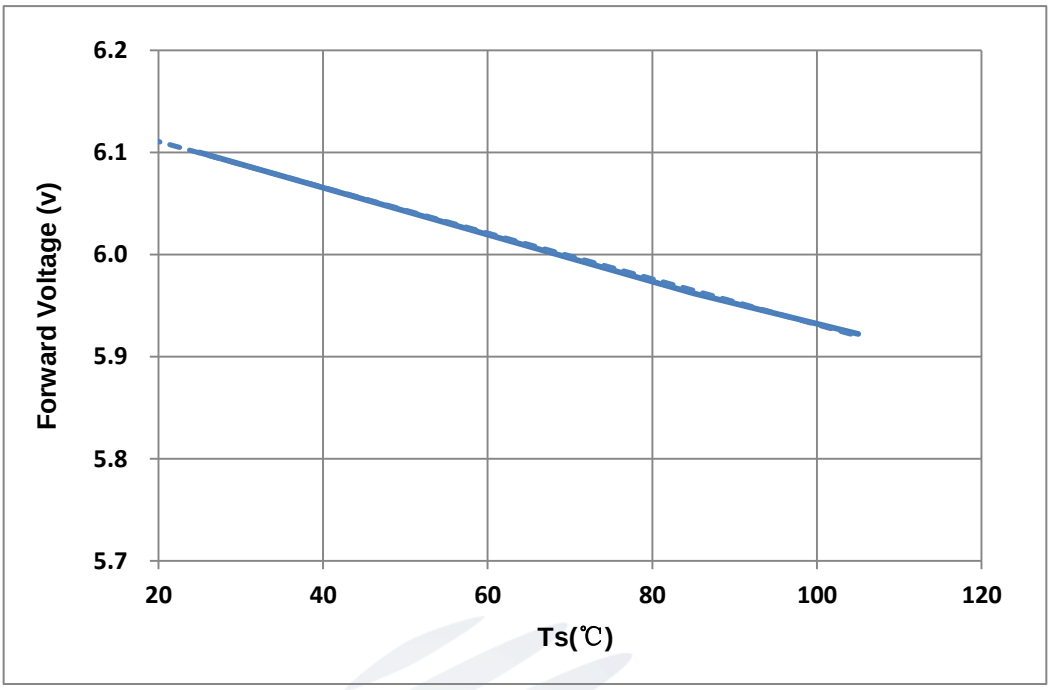

Fig 1-11 Forward Voltage Vs Solder Temperature

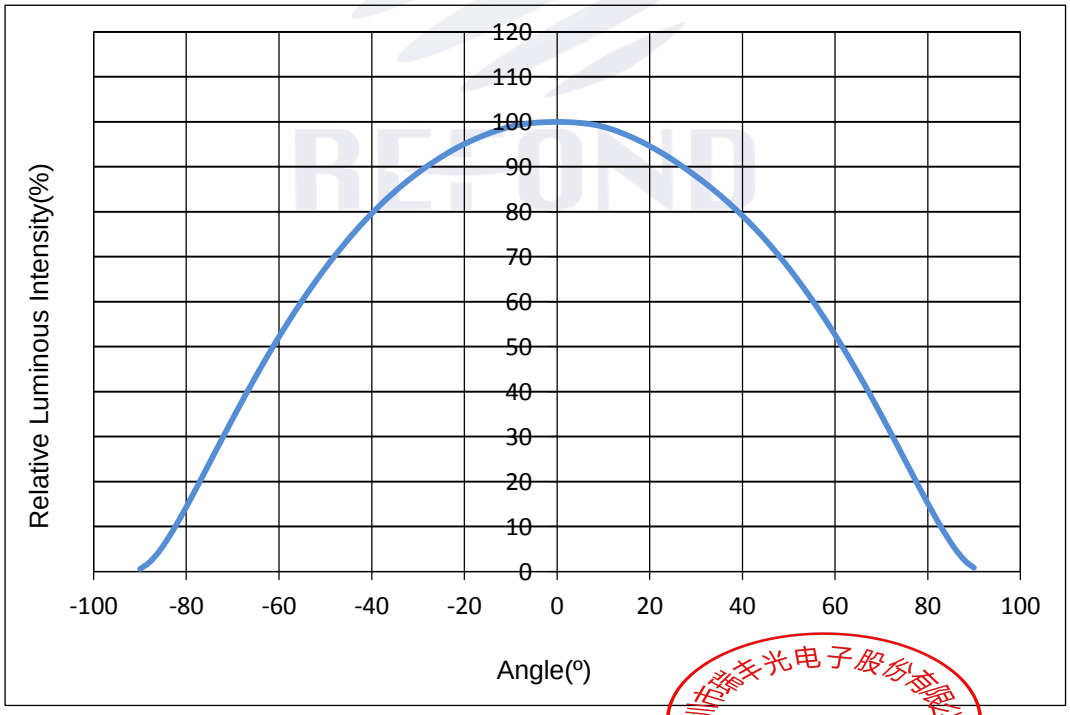

Fig 1-12 Radiation diagram

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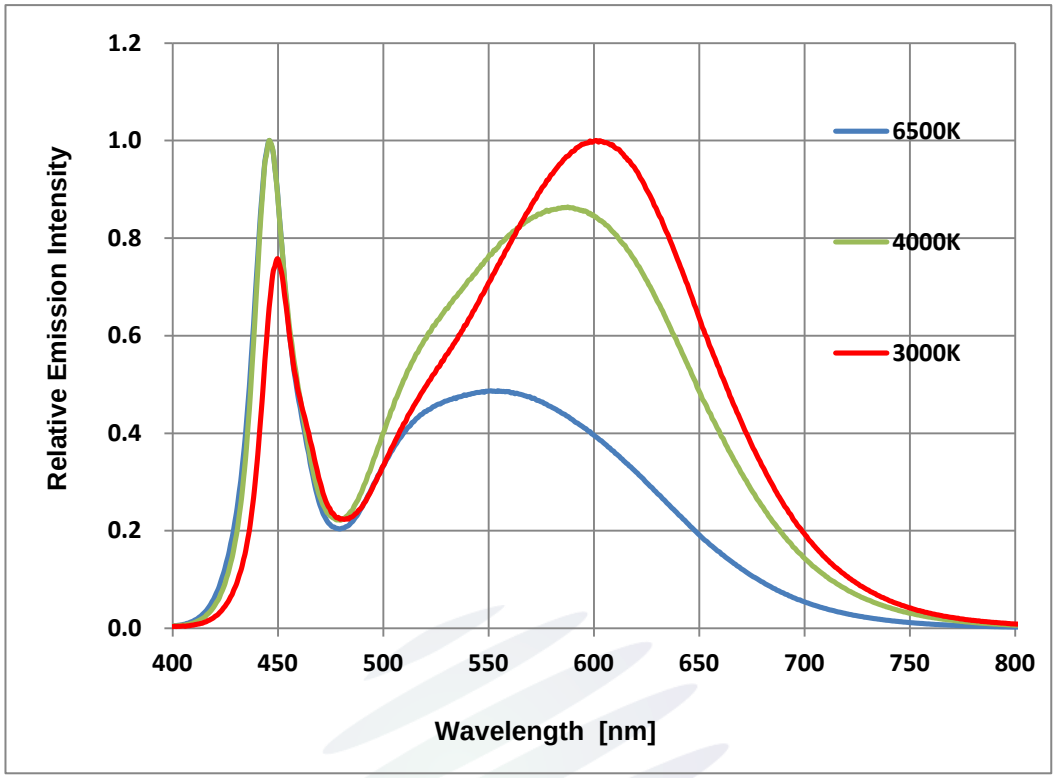


Fig 1-13 Spectrum Distribution

2. Packaging

2.1 Packaging Specification

Package:5000pcs/reel.

2.1.1Carrier Tape Dimension

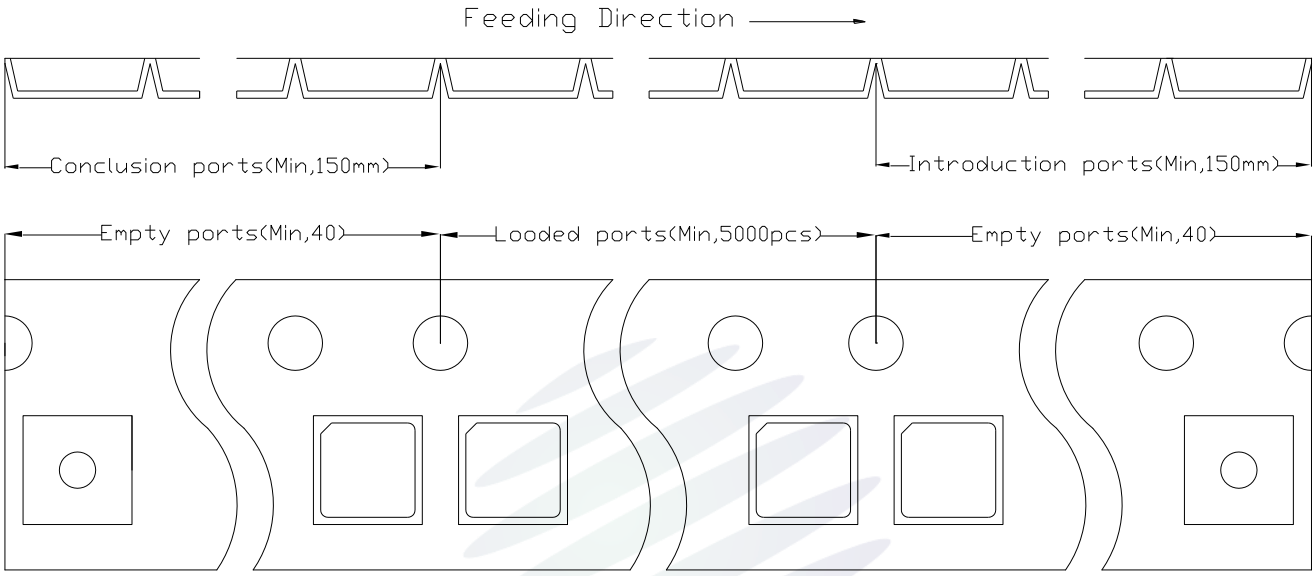
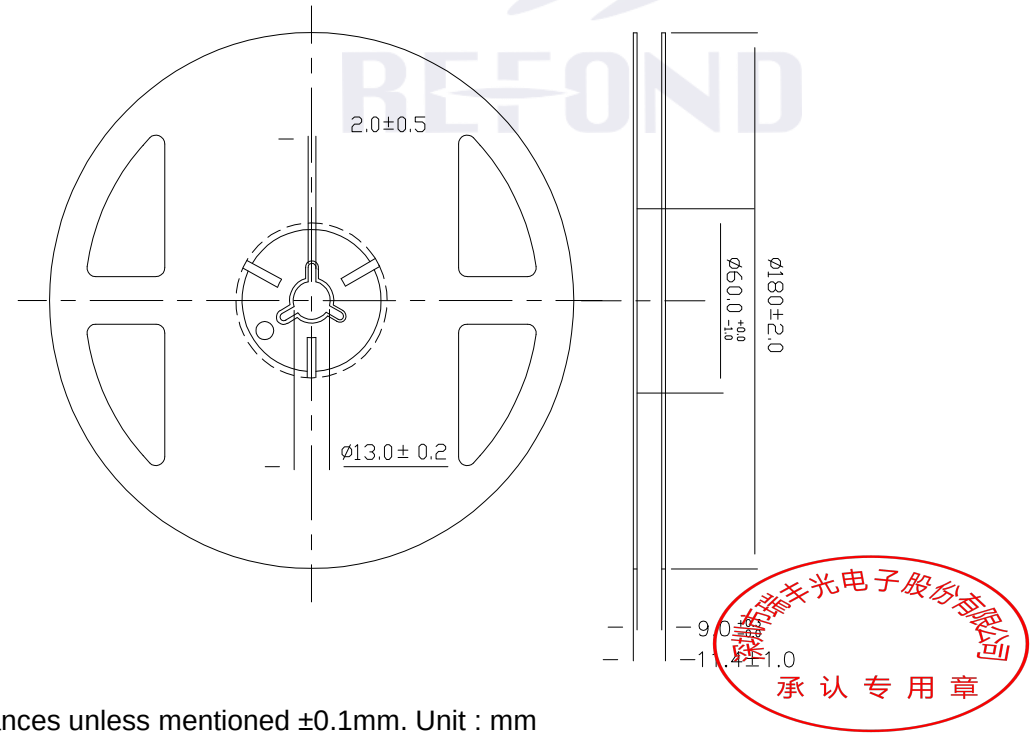


Fig.2-1 Carrier Tape Dimension

2.1.2Reel Dimension



Notes:

The tolerances unless mentioned ±0.1mm. Unit : mm

2.1.3Label Form Specification

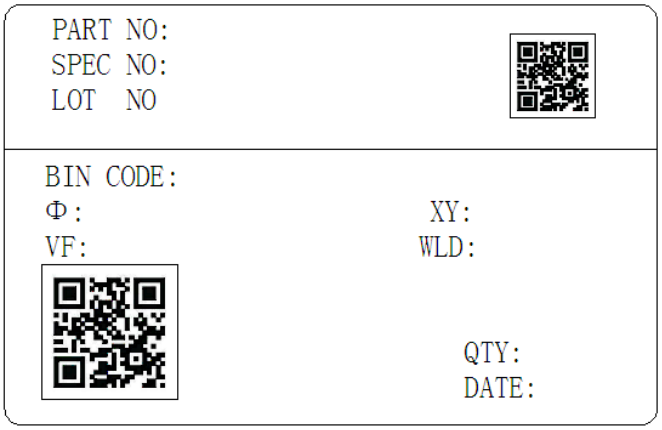


Fig 2-3 Title

Table 2-2 Title

PART NO.	Part Number
SPEC NO.	Spec Number
LOT NO.	Lot Number
BIN CODE	Bin Code
Φ	Luminous flux
XY	Chromaticity Bin
V_F	Forward Voltage
WLD	Wavelength
QTY	Packing Quantity
DATE	Made Date

2.2Moisture Resistant Packing

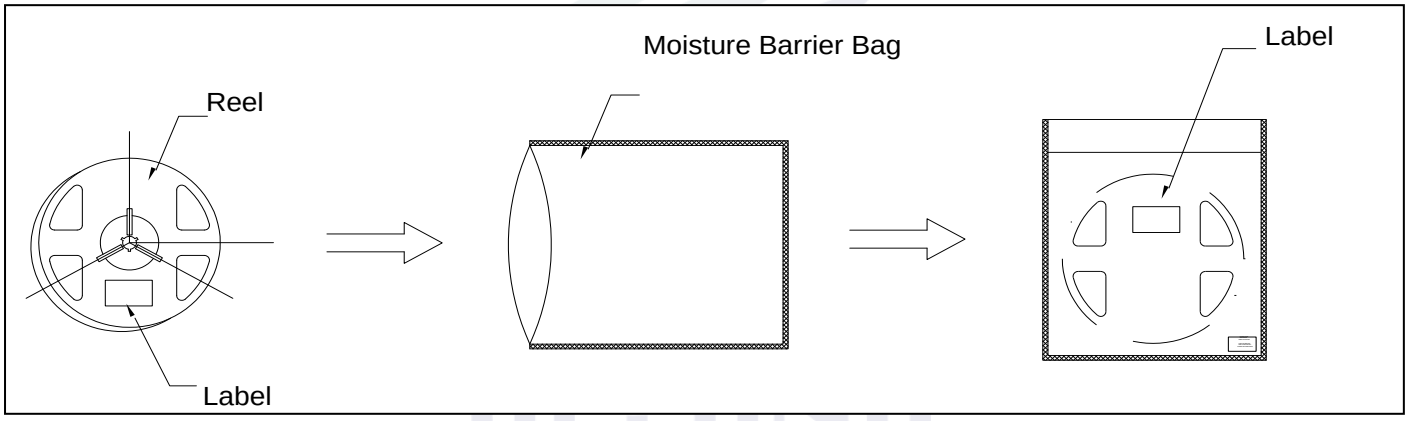


Fig.2-4Title

2.3Cardboard Box

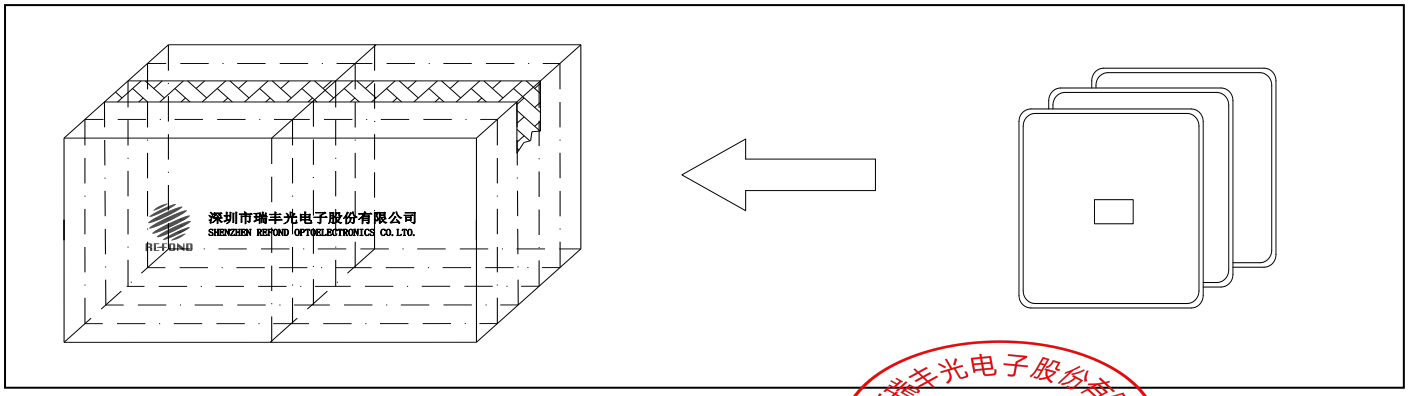


Fig.2-5Title

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2.4 Reliability Test Items And Conditions

Table 2-3 Title

Test Items	Ref.Standard	Test Condition	Time	Quantity	Ac/Re
Reflow	JESD22-B106	Temp:260℃max T=10 sec	2times.	10Pcs.	0/1
Temperature Cycle	JESD22-A104	100℃ 30 min. ↑↓5 min -40℃ 30 min.	300Cycles	10Pcs.	0/1
Thermal Shock	JESD22-A106	-40℃ 15min ↑↓10sec 100℃ 15min	300Cycles	10Pcs.	0/1
High Temperature Storage	JESD22-A103	Temp.:105℃	1000Hrs.	10Pcs.	0/1
Low Temperature Storage	JESD22-A119	Temp.:-40℃	1000Hrs.	10Pcs.	0/1
Life Test	JESD22-A108	Ta=25℃ I_F =150mA	1000Hrs.	10Pcs.	0/1
High Temperature High Humidity Life Test	JESD22-A101	60℃/ 90%RH I_F=150mA	1000Hrs.	10Pcs.	0/1

2.5 Criteria For Judging Damage

Table 2-4 Title

Test Items	Symbol	Test Condition	Criteria For Judgement	Applicable project
Forward Voltage	Vf	I_F =150mA	≤±10%	Reflow Temperature Cycle High and Low Temperature Storage Life Test
Luminous Flux	Φ	I_F =150mA	Maintenance≥85%	
High Temperature High Humidity Life Test	/	I_F =150mA	No open circuit, shortcircuit or flicke	High Temperature High Humidity Life Test

Notes：

1.The Reliability tests are based on Refond existing test platform.

2.The technical information shown in the data sheets are limited to the typical characteristics and circuit examples of the referenced products. It does not constitute the warranting of industrial property nor the granting of any license.

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3. SMT Reflow Soldering Instructions SMT

3.1SMT Reflow Soldering Instructions

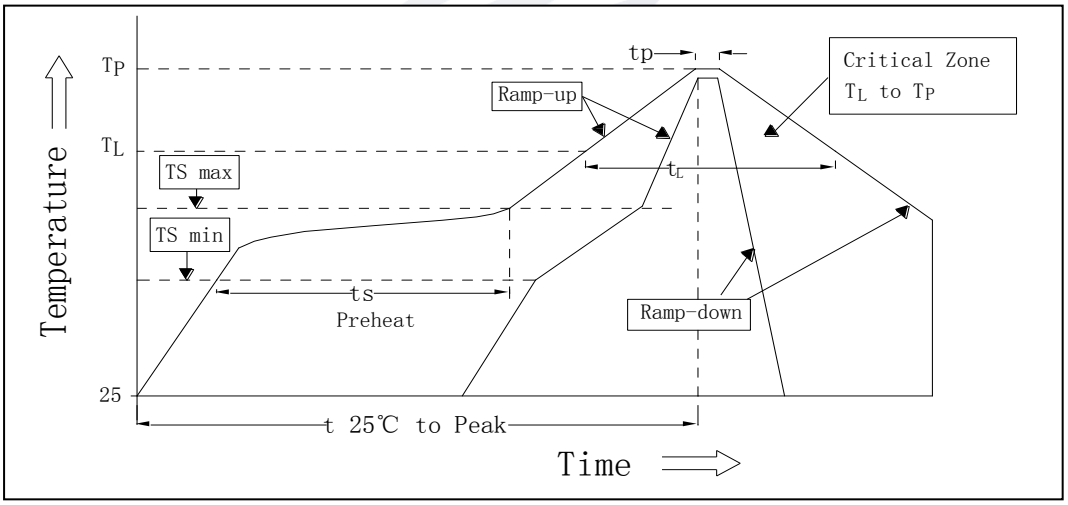

Fig.3-1Title

Table 3-1Title

Average temperature rise speed	Max 3 °C/ s
Preheating: minimum temperature	150 °C
Preheating: Max temperature	200 °C
Preheating: Time	60s-120s
Time limited to maintain high temperature: the temperature	217 °C
Time limited to maintain high temperature: The Time	Max 60s

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Peak /Classification of temperature:	260 °C
Time limit classification of peak temperature time	Max 10s
Hold time within 5 ℃ with the actual peak temperature (TP)	Max 30s
Cooling speed	Max 6 °C/ s
Needed time from 25 °C to Tp	Max 8 minutes

Notes：

(1)Reflow soldering should not be done more than two times. In the case of more than 24 hours passed soldering after first, LEDs will be damaged.

(2)When soldering , do not put stress on the LEDs during heating.

3.1.1 Soldering Iron

(1) When hand soldering, keep the temperature of iron below less 300℃ less than 3 seconds

(2) The hand solder should be done only one time.

3.1.2 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 in advance whether the characteristics of LEDs will or will not be damaged by repairing.

3.1.3 Cautions

（1）The encapsulated material of the LEDs is silicone. Therefore the LEDs have a soft surface on the top of package. The pressure to the top surface will be influence to the reliability of the LEDs. Precautions should be taken to avoid the strong pressure on the encapsulated part. So when use the picking up nozzle, the pressure on the silicone resin should be proper.

(2) Components should not be mounted on warped (non coplanar) portion of PCB. After soldering, do not warp the circuit board.

(3) Do not apply mechanical force or excess vibration during the cooling process to normal temperature after soldering. Do not rapidly cool device after soldering.

4. Handling Precautions

4.1 Handling Precautions

(1) LED operating environment and sulfur element composition cannot be over 100PPM in the LED mating usage material. This is provided for informational purposes only and is not a warranty or endorsement.

(2) In order to prevent ex-ternal material from getting into the inside of LED, which may cause the malfunction of LED, the single content of Bromine element is required to be less than 900PPM,the single content of Chlorine elementis required to be less than 900PPM,the total content of Bromine element and Chlorine element in the external materials of the application products is required to be less than 1500PPM. This is provided for informational purposes only and is not a warranty or endorsement.

(3) VOCs (Volatile organic compounds) emitted from materials used in the construction of fixtures can penetrate silicone encapsulants of LEDs and discolor when exposed to heat and photonic energy. The result can be a significant loss of light output from the fixture. Knowledge of the properties of the materials selected to be used in the construction of fixtures can help prevent these issues. Refond advises against the use of any chemicals or materials that have been found or are suspected to have an adverse affect on device performance or reliability. To verify compatibility, Refond recommends that all chemicals and materials be tested in the specific application and environment for which they are intended to be used. Attaching LEDs, do not use adhesives that outgas organic vapor.

(4) Handle the component along the side surface by using forceps or appropriate tools; do not directlytouch or Handle the silicone lens surface, it may damage the internal circuitry.

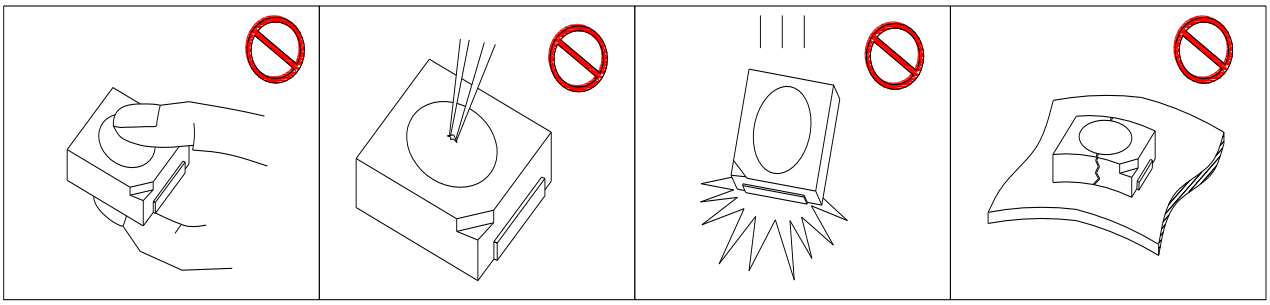

Fig 4-1 Title

(5) In designing a circuit, the current through each LED can not exceed the absolute maximum rating specified for each LED. In the mean while, resistors for protection should be applied, otherwise slight voltage shift will cause big current change, burn out may happen. The driving circuit must be designed to allow forward voltage only when it is ON or OFF. If the reverse voltage is applied to LED, migration can be generated resulting in LED damage.

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

(7) Compared to standard encapsulants, silicone is generally softer, and the surface is more likely to attract dust，requiring special care during processing. In cases where a minimal level of dirt and dust particles cannot be guaranteed, a suitable cleaning solution must be applied to the surface after the soldering of components. Refond suggests using isopropyl alcohol for cleaning. In case other solvents are used, it must be assured that these solvents do not dissolve the package or resin. Ultrasonic cleaning is not recommended. Ultrasonic cleaning may cause damage to the LED.

Table 4-1Storage

Conditions		Temperature	Humidity	Time
Storage	Before Opening Aluminum Bag	≤30℃	≤75%	Within 1 Year From Date

	After Opening Aluminum Bag	≤30℃	≤60%	24hours
Baking		60±5℃	-	≥24hours

(8) If the moisture absorbent material（silica gel）has faded away or the LEDs have exceeded the storage time，baking treatment should be performed after unpacking and based on the following condition（65±5）℃ for above 24 hours.

If the package is flatulence or damaged, please notify the sales staff to assist.

(9)Similar to most Solid state devices; LEDs are sensitive to Electro-Static Discharge (ESD) and Electrical Over Stress (EOS).

(10) Other points for attention, please refer to our relevant information.

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Version History/

Date	Revisor	Version	Verifier	Remarks
2019-12-10	ChangpengCao	E/0	YingmingZhu	Preliminary release
2020-05-28	ZujunLi	E/1	YingmingZhu	Adjusted to ANSI standard center

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