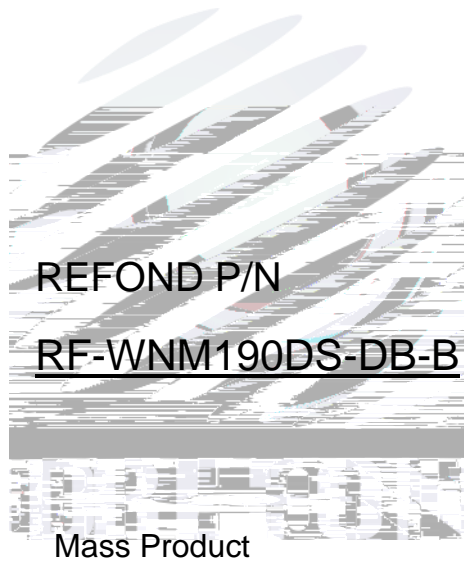
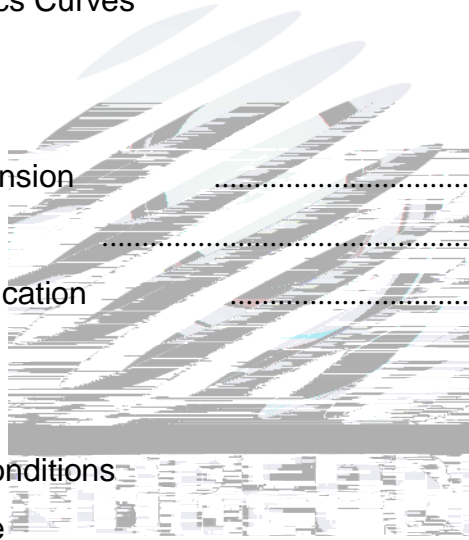


SPECIFICATION



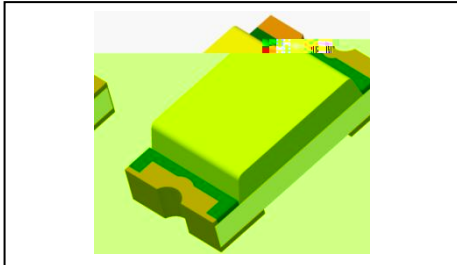
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1. Description

1.1 General Description



The White LED, which was fabricated by using a blue chip and phosphor.

Product Package: 1.6mm X 0.8mm X 0.4mm.

1.6mm X 0.8mm X 0.4mm

1.2 Features

- ▶ Extremely wide viewing angle.
- ▶ Suitable for all SMT assembly and solder process.
- ▶ Moisture sensitivity level: Level 3.
- ▶ RoHS compliant.

SMT

Level 3

RoHS

1.3 Application

- ▶ Optical indicator.
- ▶ Switch and Symbol, Display.
- ▶ General use.



1.4 Package Dimension



Fig.1-1 Top view

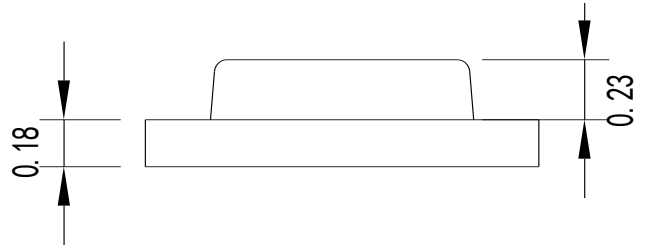


Fig.1-2 Side view

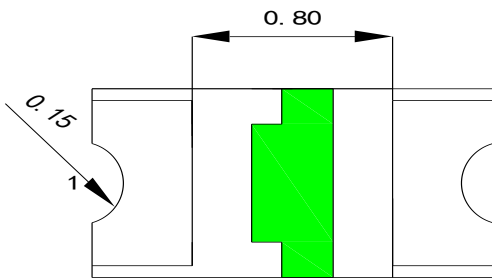


Fig.1-3 Bottom view

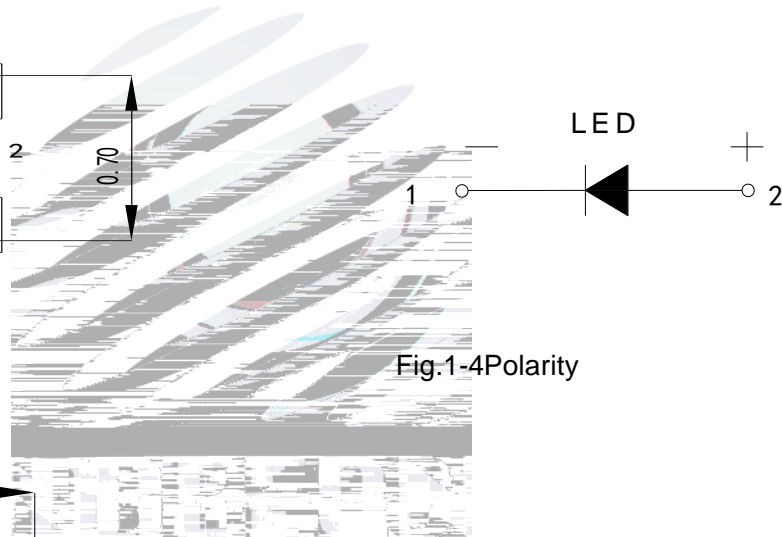


Fig.1-4 Polarity

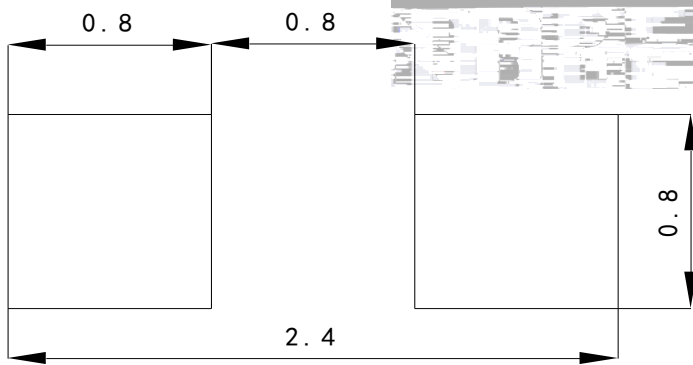


Fig.1-5 Soldering patterns

Notes

All dimensions units are millimeters.

All dimensions tolerances are $\pm 0.2\text{mm}$ unless otherwise noted.



1.5 Product Parameters

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

Item	Test Condition	Symbol		Value			Unit
				Min.	Typ. ()	Max. ()	
Forward Voltage	I _F =5mA	V _F	F1	2.6	--	2.7	V
			F2	2.7	--	2.8	V
			G1	2.8	--	2.9	V
			G2	2.9	--	3.0	V
			H1	3.0	--	3.1	V
			H2	3.1	--	3.2	V
			I1	3.2	--	3.3	V
			I2	3.3	--	3.4	V
			J1	3.4	--	3.5	V
Luminous Intensity	I _F =5mA	I _v	1AP	90	--	120	mcd
			G20	120	--	150	mcd
			1AW	150	--	200	mcd
			1AX	200	--	250	mcd
			1AY	250	--	300	mcd
Viewing Angle	I _F =5mA	2θ _{1/2}	--	140	--	deg	
Reverse Current	V _R =5V/10ms	I _R	--	--	10	μA	
Thermal Resistance.	I _F =5mA	R _{THJ-S}	--	--	450	/W	

Notes : V_R=5V For test conditions. V_R=5V

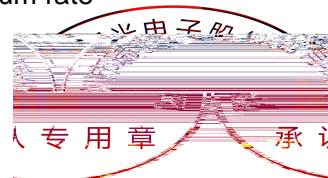


Table 1-2 Absolute Maximum Ratings at Ts=25°C

Parameter	Symbol	Rating	Units
Power Dissipation	P_d	105	mW
Forward Current	I_F	30	mA
Peak Forward Current Of Pulse	I_{FP}	60	mA
Electrostatic Discharge (HBM)	E_{SD}	1000	V
Operating Temperature	T_{opr}	-40 ~ +85	°C
Storage Temperature	T_{stg}	-40 ~ +85	°C
Junction Temperature	T_j	95	°C

Notes

- 1/10 Duty cycle, 0.1ms pulse width.
- The above forward voltage measurement allowance tolerance is $\pm 0.1V$.
- The above color coordinates measurement allowance tolerance is ± 0.005 .
- The above luminous intensity measurement allowance tolerance $\pm 10\%$.
- Care is to be taken that power dissipation does not exceed the absolute maximum rating of the product.
- All measurements were made under the standardized environment of Refond.
- 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





1.7 Typical Optical Characteristics Curves

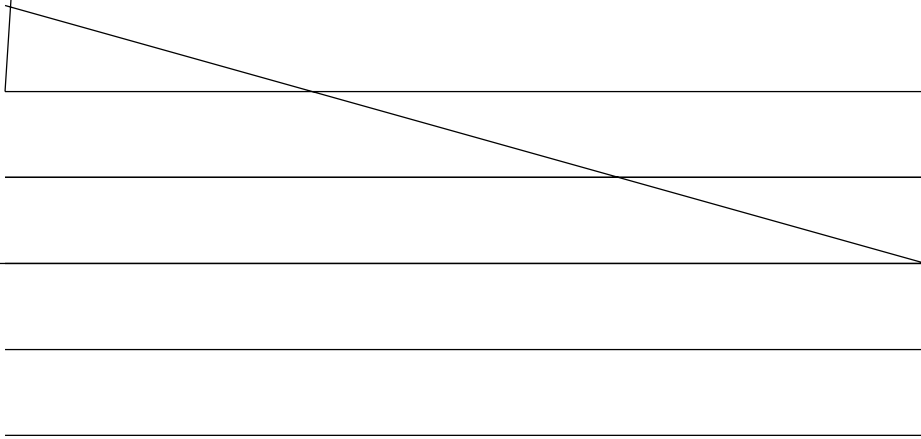


Fig 1-8 Forward Voltage Vs Forward Current

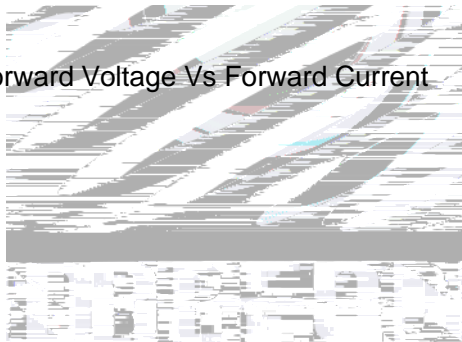


Fig 1-9 Forward Current Vs Relative Intensity

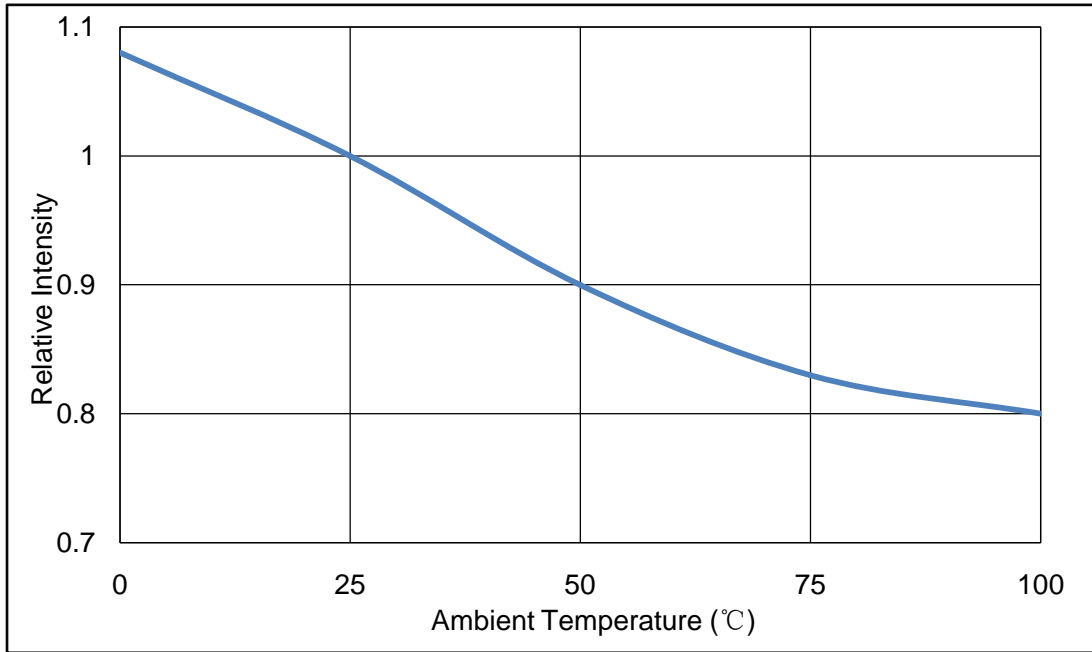


Fig 1-10 Pin Temperature Vs Relative Intensity

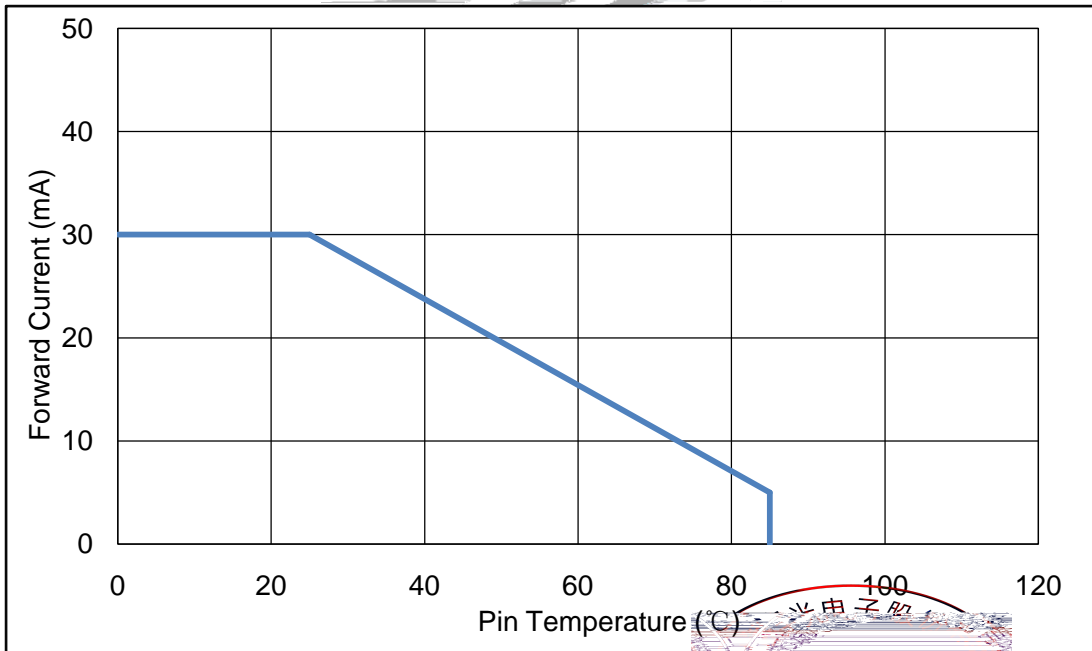
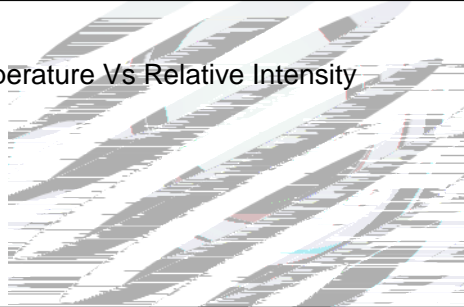
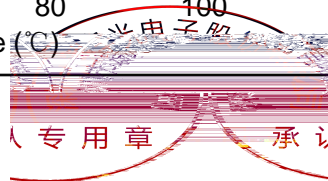


Fig 1-11 Pin Temperature Vs Forward Current



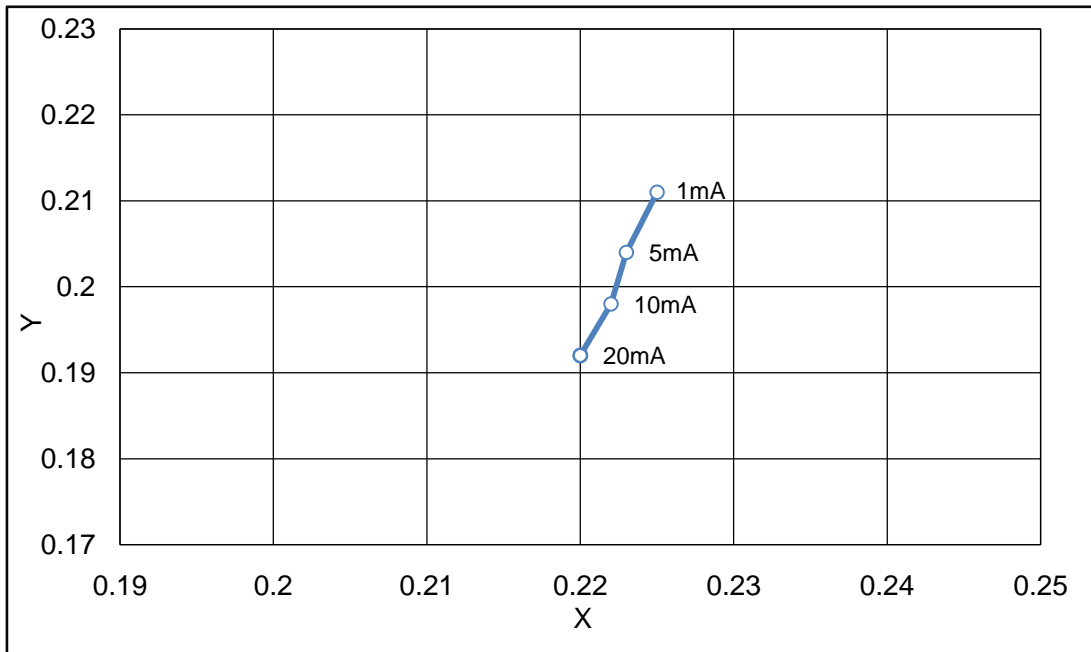


Fig.1-12 Forward Current Vs Dominate Wavelength (Ta=25°C)

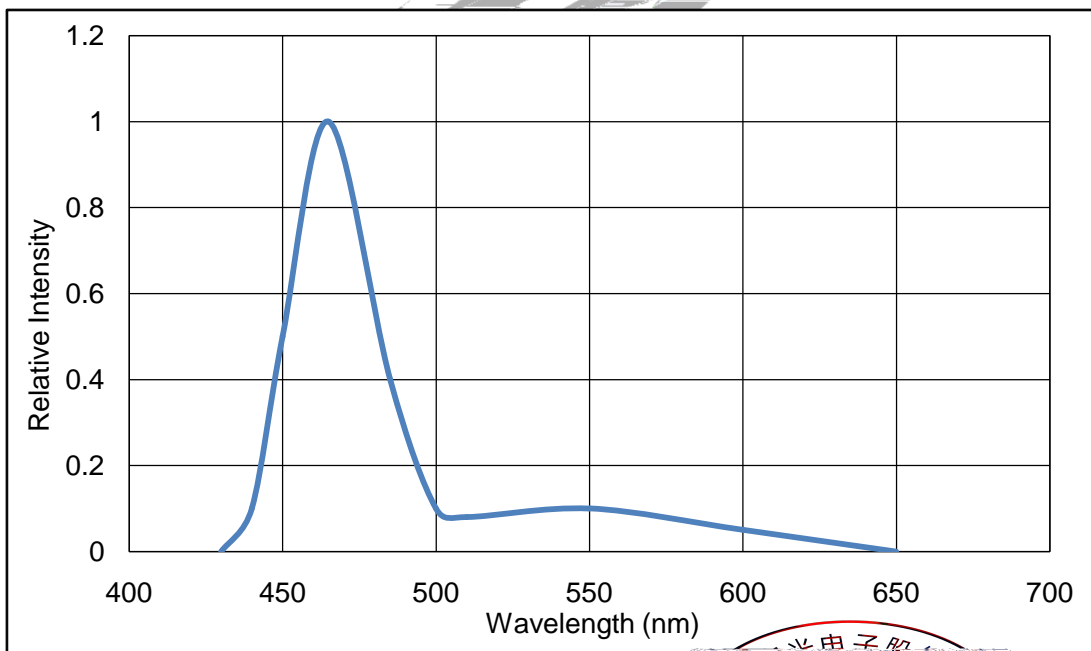
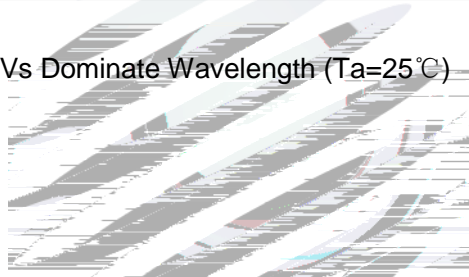


Fig.1-13 Relative Intensity Vs Wavelength (Ta=25°C)



Fig.1-



2. Packaging

2.1 Packaging Specification

Package: 4000pcs/reel. 4000pcs

2.1.1 Carrier Tape Dimension

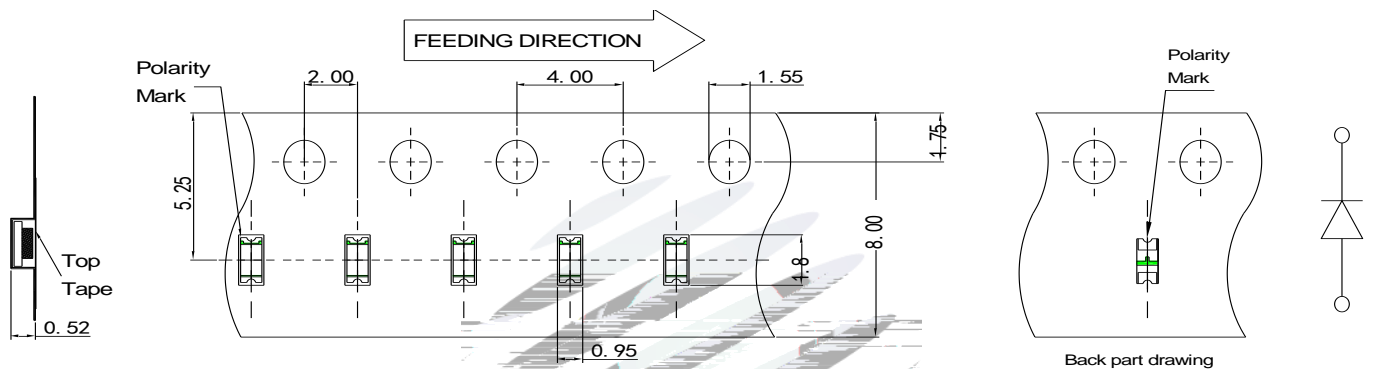
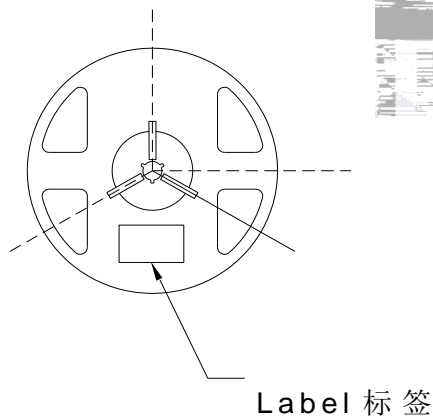


Fig.2-1 Carrier Tape Dimension

2.1.2 Reel Dimension



Label 标签

Table 2-1 Dimension

A	8.0 0.1mm
B	178 1mm
C	60 1mm
D	13.0 0.5mm

Fig.2-2 Reel Dimension

Notes

The tolerances unless mentioned $\pm 0.1\text{mm}$. Unit : mm



2.1.3 Label Form Specification

Table 2-2 Parameter

Fig. 2-3 Label Form Specification



2.2 Moisture Resistant Packing

2.3 Cardboard Box

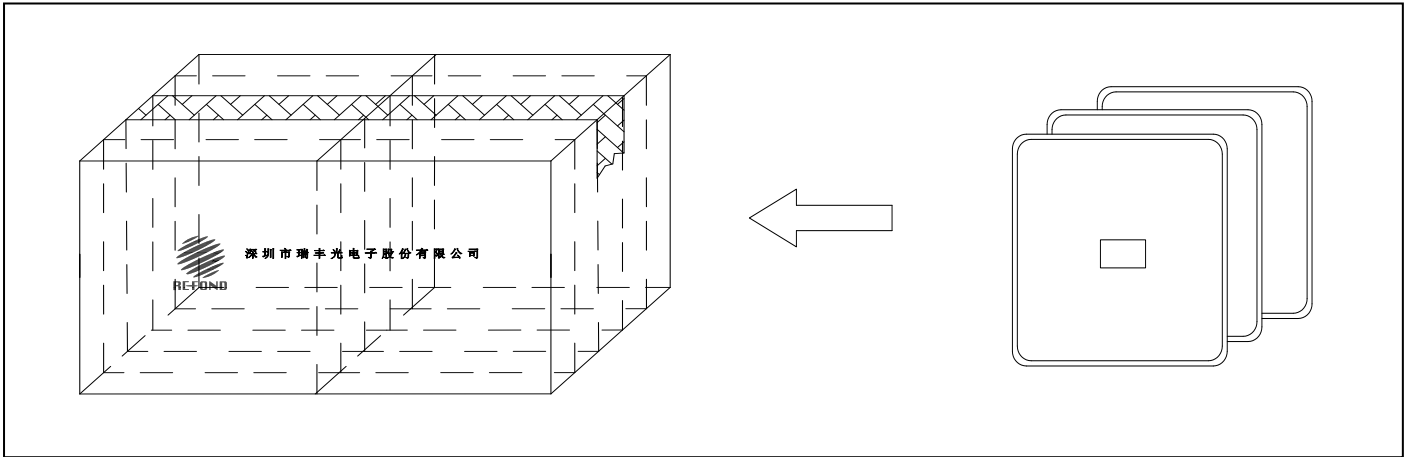


Fig.2-5 Cardboard Box

2.4 Reliability Test Items And Conditions

Table 2-3 Reliability Test Items And Conditions

Test Items	Ref.Standard	Test Condition	Time	Quantity	Ac/Re /
Reflow	JESD22-B106	Temp:260 max T=10 sec	2 times	22Pcs.	0/1
Temperature Cycle	JESD22-A104	100 30 min ↑↓5 min -40 30 min	100 cycles	22Pcs.	0/1
Thermal Shock	JESD22-A106	-40 15min ↑↓ 100 15min	300 cycles	22Pcs.	0/1
High Temperature Storage	JESD22-A103	T _{emp} :100	1000 hrs.	22Pcs.	0/1
Low Temperature Storage	JESD22-A119	T _{emp} :-40	1000 hrs.	22Pcs.	0/1
Life Test	JESD22-A108	T _a =25 I _f =5mA	1000 hrs.	22Pcs.	0/1

2.5 Criteria For Judging Damage

Table 2-4 Criteria For Judging Damage

Test Items



3. SMT Reflow Soldering Instructions SMT

3.1 SMT Reflow Soldering Instructions SMT

Fig.3-1 SMT Reflow Soldering Instructions SMT

Table 3-1 Parameter

Average temperature rise speed

T_{smax} T_p

3 °C/ Max 3 °C/ s



Notes

(1) Reflow soldering should not be done more than twice. If more than 24 hours between the two solderings, LED will be damaged.

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

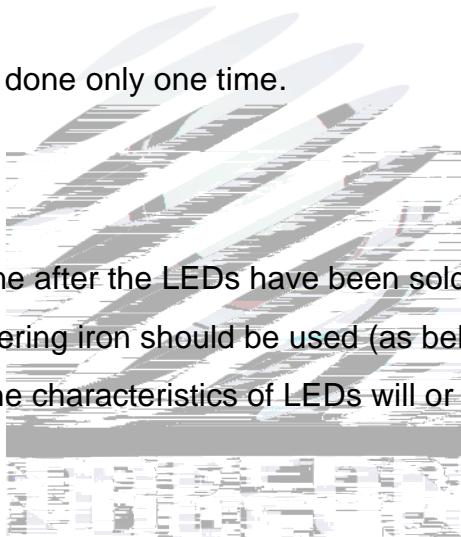
3.1.1 Soldering Iron

(1) When do soldering by hand, keep the temperature of iron below less 300°C less than 3 seconds.

(2) Soldering by hand should be done only one time.

3.1.2 Repairing

Repairing 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 not be damaged by repairing.

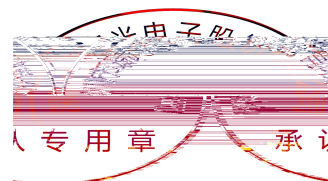


LED

3.1.3 Cautions

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

(2) 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. LED

(2) In order to prevent external 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 element is 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 0 0 1 152()-3(A3(a)-5(d)-13(v)10(e)-13(r)-6 0 0 1 194.93



(4) In designing a circuit, the current through each LED can 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. 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.

(5) 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. LED

(6) Storage

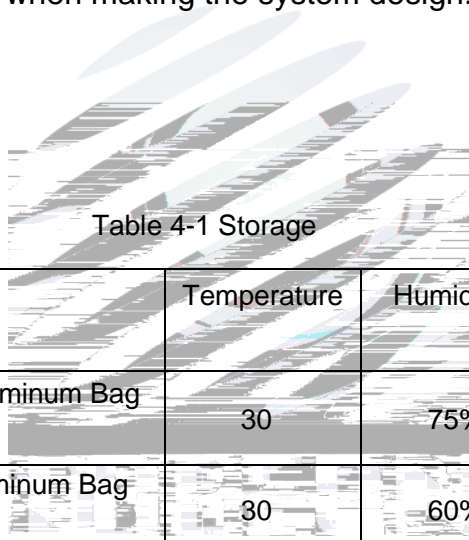


Table 4-1 Storage

Conditions		Temperature	Humidity	Time
Storage	Before Opening Aluminum Bag	30	75%	Within 1 Year From Date
	After Opening Aluminum Bag	30	60%	168hours 168
Baking		60 5	-	24hours 24

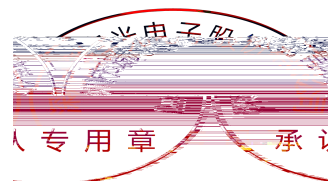
(7) If the moisture absorbent material (silica gel) has faded away or the LEDs have exceeded the storage time , baking treatment should be performed after unpacking and based on the following condition (60±5) °C for above 24 hours.

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



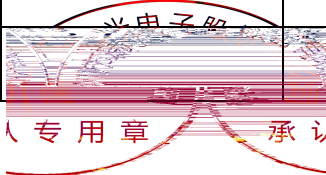
(8) Similar to most Solid state devices; LEDs are sensitive to Electro-Static Discharge (ESD) and Electrical Over Stress (EOS).

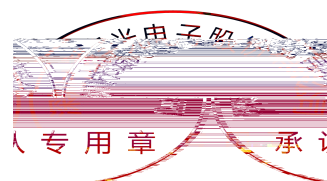
(9) Other points for attention, please refer to our relevant information.



Version History/

Date	Revisor	Version	Verifier	Remarks
2020.01.04		E0		





Declare

This specification is written both in English and in Chinese and the latter is formal.