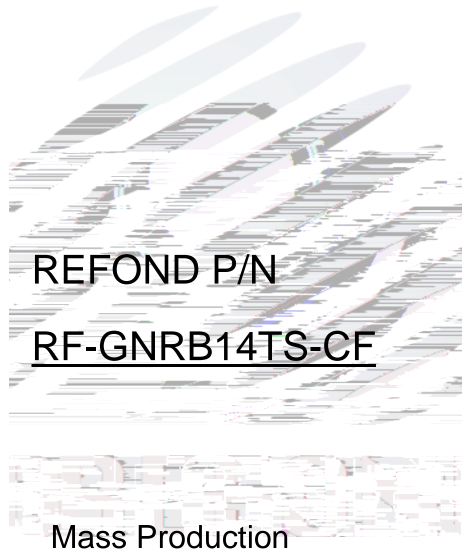
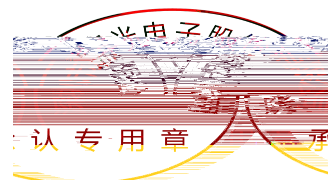
SPECIFICATION


REFOND P/N

RF-GNRB14TS-CF

Mass Production



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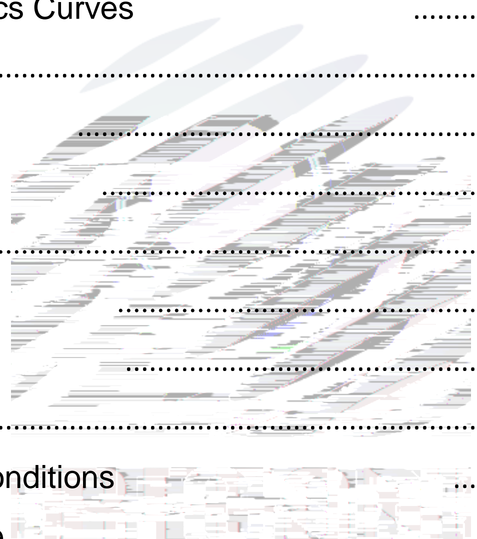
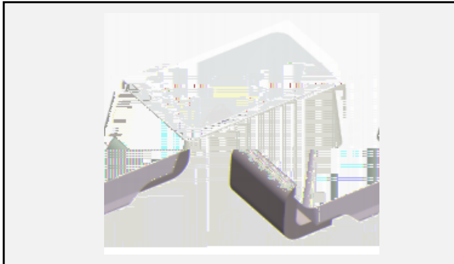
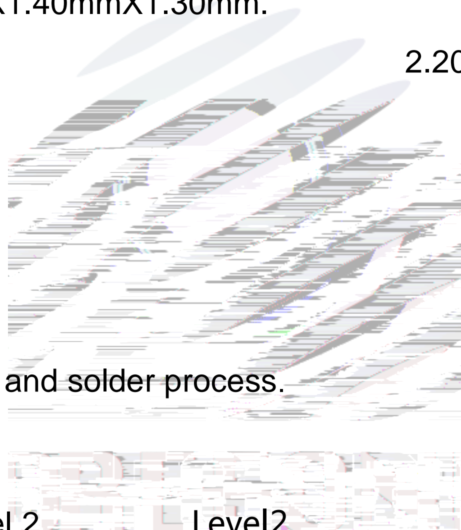


1. Description 产品介绍

1.1 产品描述



The Green source color devices are made with InGaN on Substrate Light Emitting Diode.
Product Package:2.20mmX1.40mmX1.30mm.
LED InGaN 2.20mmX1.40mmX1.30mm.



1.2Features 产品特征

PLCC Package. PLCC

Extremely wide viewing angle.

Suitable for all SMT assembly and solder process. SMT

Available on tape and reel.

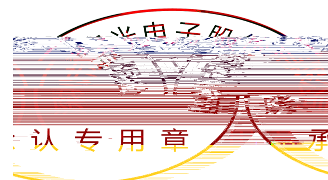
Moisture sensitivity level: Level 2. Level2

RoHS compliant. RoHS

Qualifications: The product qualification test plan is based on the guidelines of AEC-Q101 Stress Test Qualification for Automotive Grade Discrete Semiconductors
AEC-Q101

1.3Application 产品应用

Automotive Lighting Interior and Exterior.



1.4Package Dimension 封装尺寸

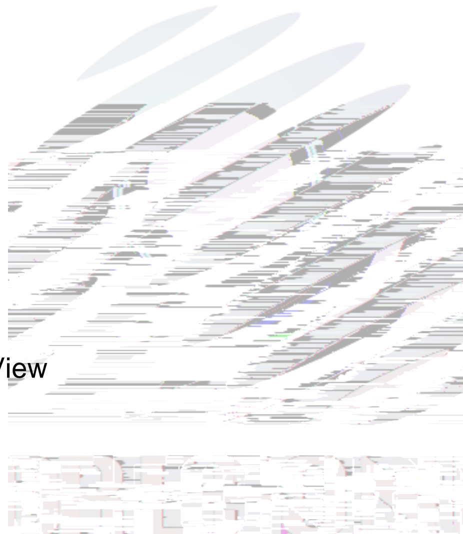


Fig.1-3BottomView

Fig.1-4Polarity

Fig.1-5Soldering Pattern

1.5Product Parameters

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

Item	Symbol	Test Condition	Value			Unit
			Min.	Typ.	Max.	
Forward Voltage	V_F	I_F=20mA	2.8	---	3.5	V
Reverse Current	I_R	V_R=5V	---	---	10	uA
Luminous Intensity	IV	I_F=20mA	800	---	1500	mcd
Dominant wavelength	Wd	I_F=20mA	515	---	525	nm
Viewing Angle		I_F=20mA	---	120	---	deg
Thermal Resistance.	R_{THJ-S}	I_F=20mA	---	---	300	/W

Parameter	Symbol	Rating	Units
Power Dissipation	P_D	105	mW
Forward Current	I_F	30	mA
Peak Forward Current	I_{FP}	100	mA
Reverse Voltage	V_R	5	V
Electrostatic Discharge (HBM)	E_{SD}	2000	V
Operating Temperature	T_{OPR}	-40 ~ +100	
Storage Temperature	T_{OPR}	-40 ~ +100	

Junction Temperature	T_J	120	

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

Notes

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

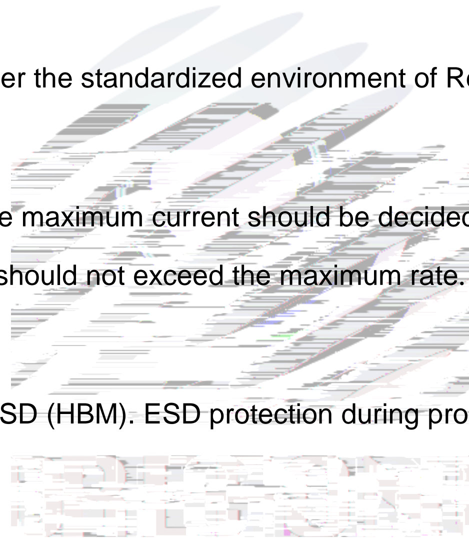
2. The above forward voltage measurement allowance tolerance is ±0.1V.

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



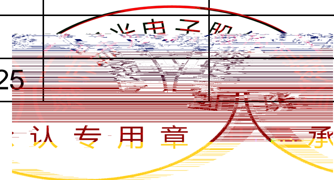
7.When the LEDs are in operation the maximum current should be decided after measuring the package temperature,junction temperature should not exceed the maximum rate. LED

8. ESD yield is over 90% at 2000V ESD (HBM). ESD protection during products handing is needed. 90% LED ESD2000V ,

1.6 Bin Range Of Forward Voltage and Luminous Intensity (IF=20mA)电压与发光强度分 BIN 范围(IF=20mA)

Table 1-3

V_F V	G1	G2	H1	H2	I1	I2	J1
	2.8-2.9	2.9-3.0	3.0-3.1	3.1-3.2	3.2-3.3	3.3-3.4	3.4-3.5
IV mcd	L1	L2	M1				
	800-1000	1000-1200	1200-1500				
WD(nm)	D1	D2	E1	E2			
	515-517.5	517.5-520	520-522.5	522.5-525			



1.7 Typical Optical Characteristics Curves 典型光学特性曲线

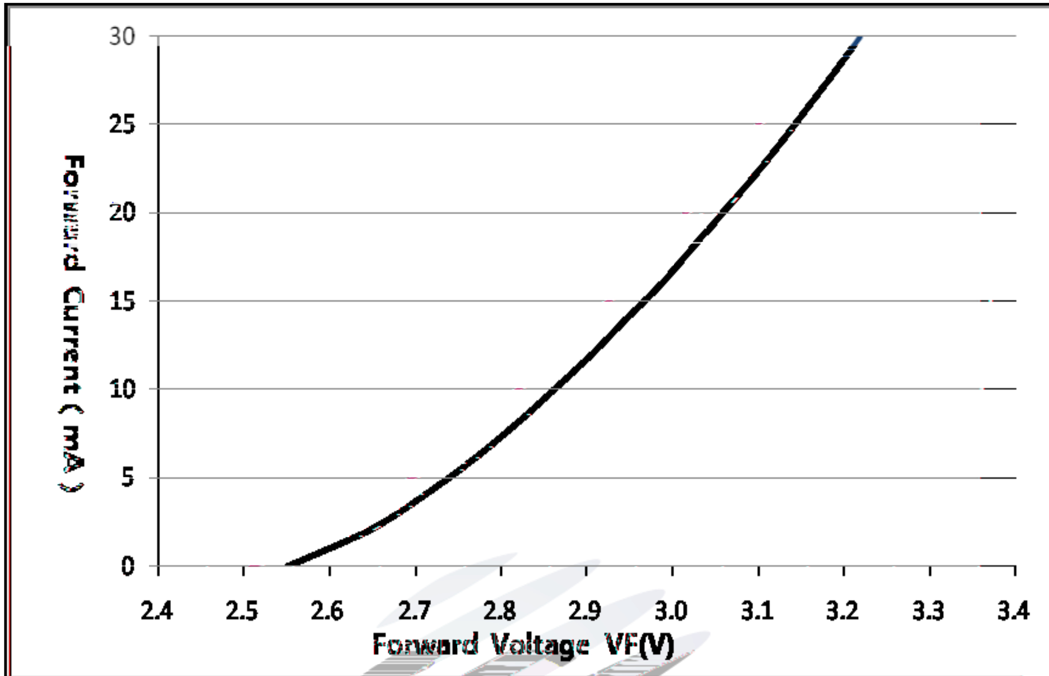


Fig. 1-7 Forward Voltage Vs Forward Current

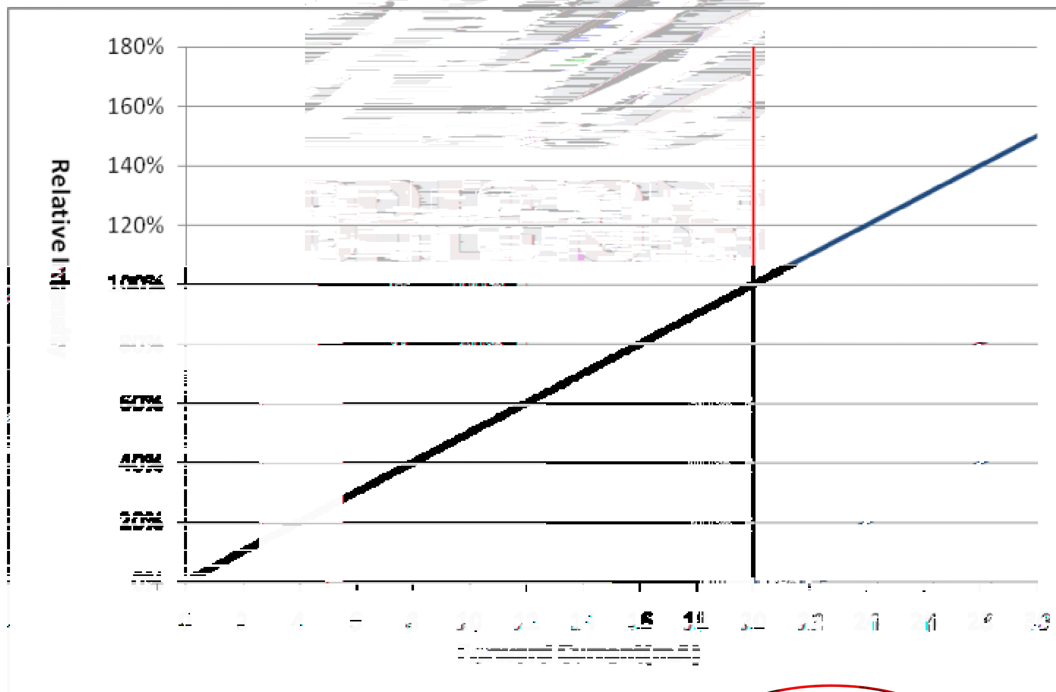
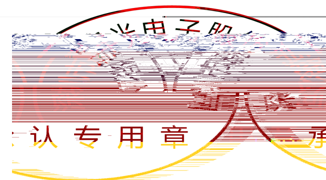


Fig. 1-8 Forward Current Vs Relative Intensity



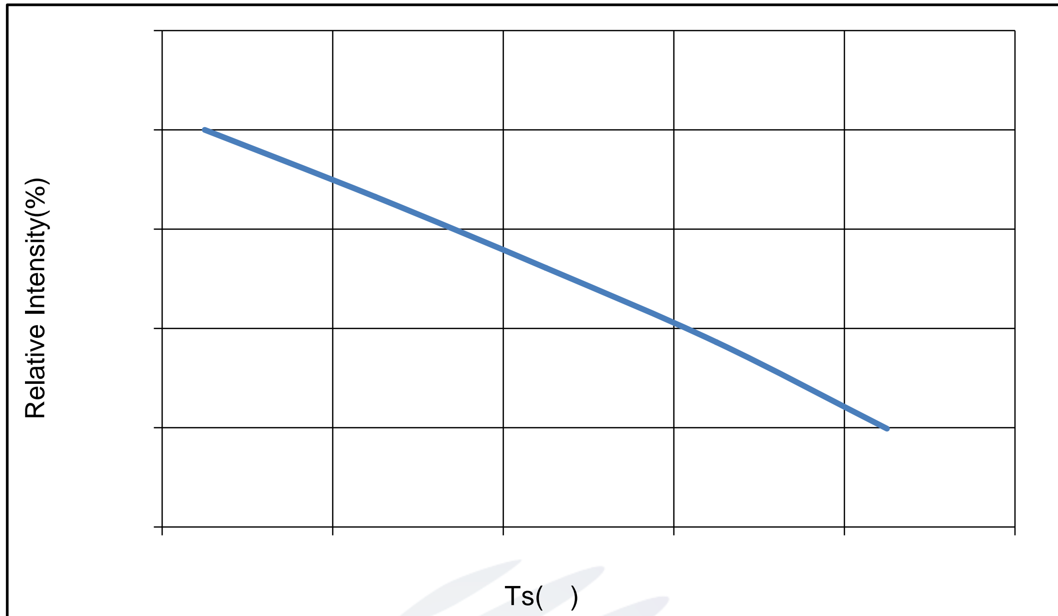


Fig. 1-9　Solder Temperature Vs Relative Intensity

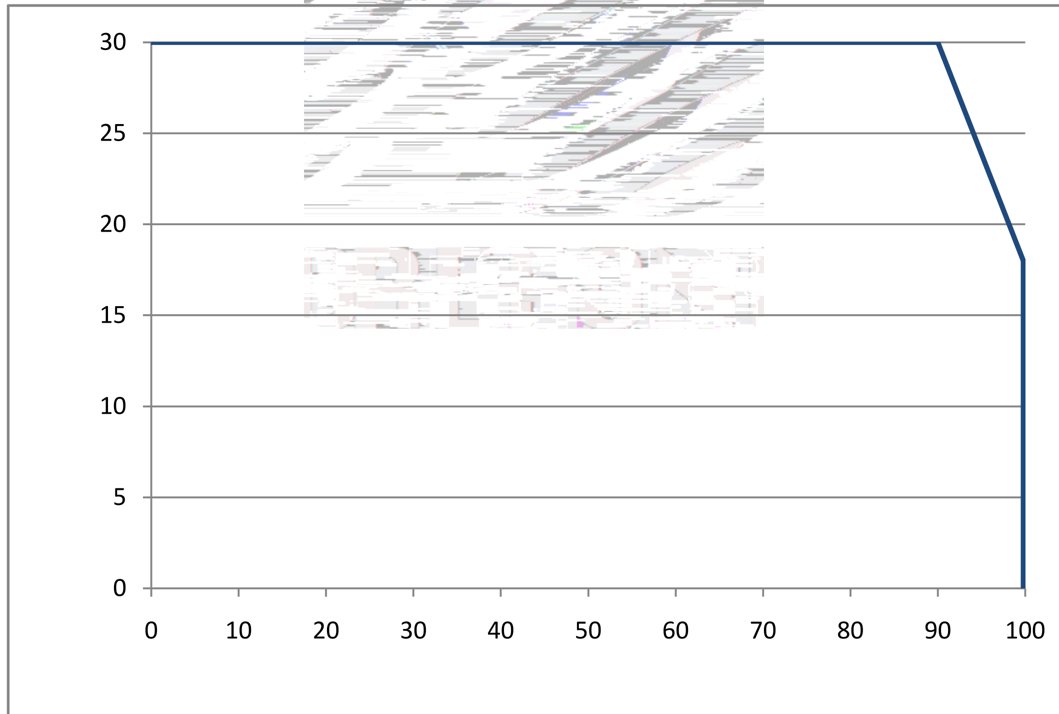
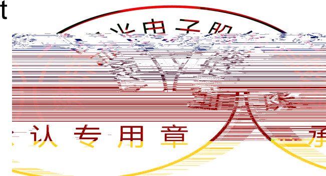


Fig. 1-10 Solder Temperature Vs Forward Current



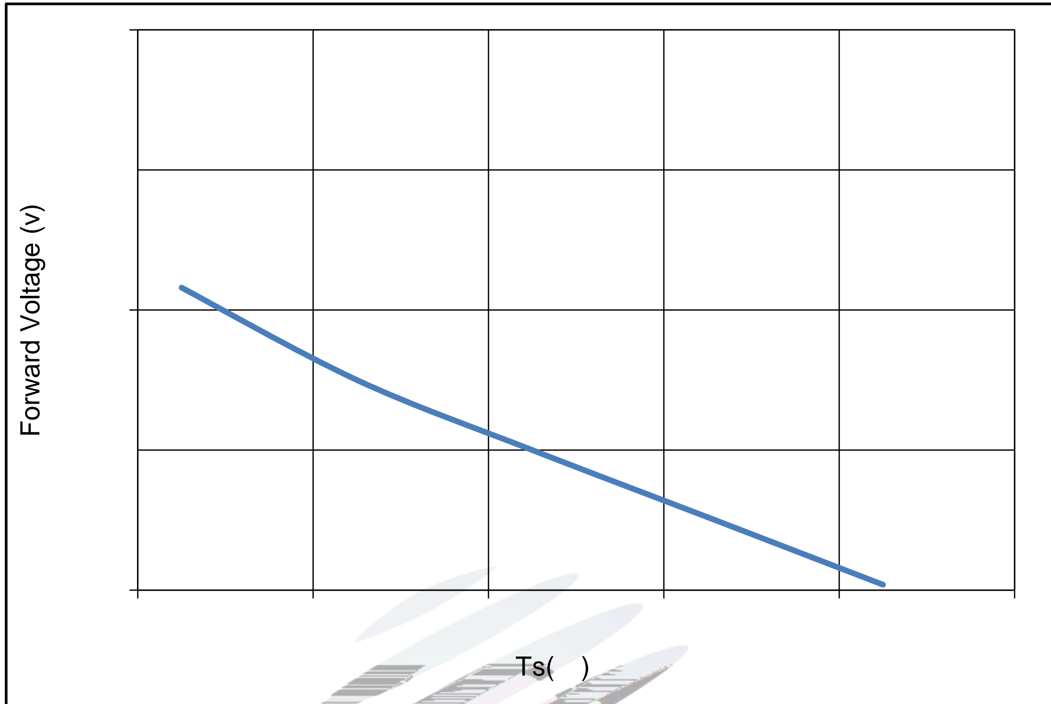


Fig. 1-11 Forward Voltage Vs Solder Temperature

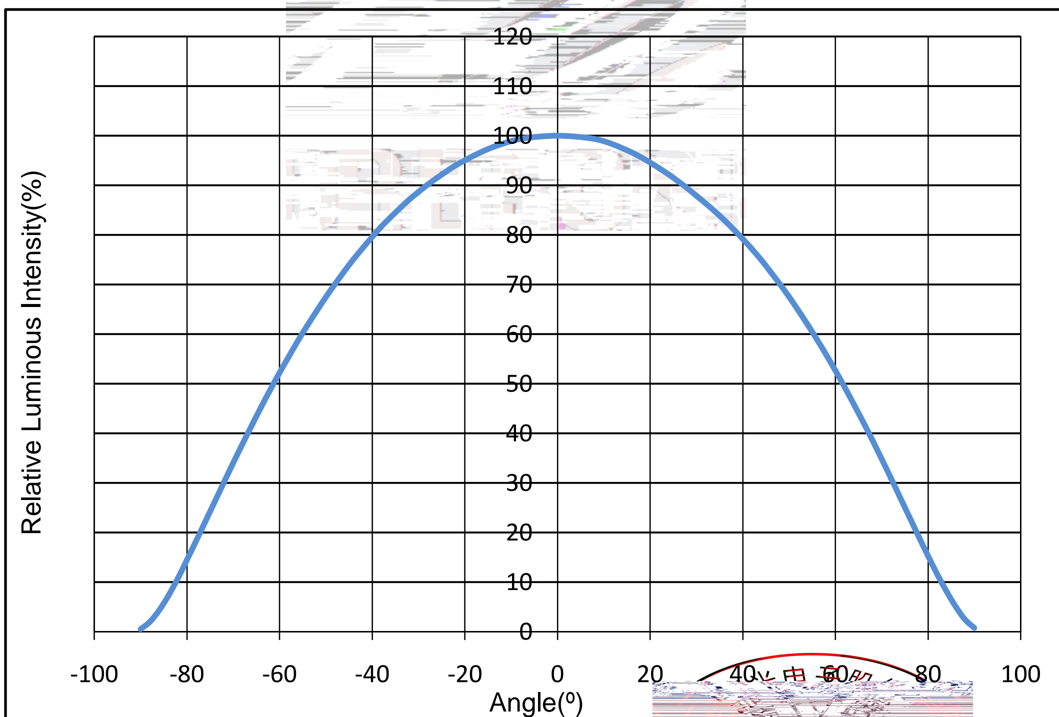
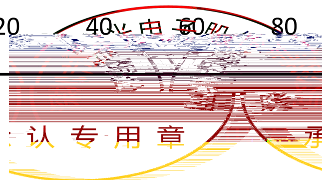


Fig. 1-12 Radiation diagram



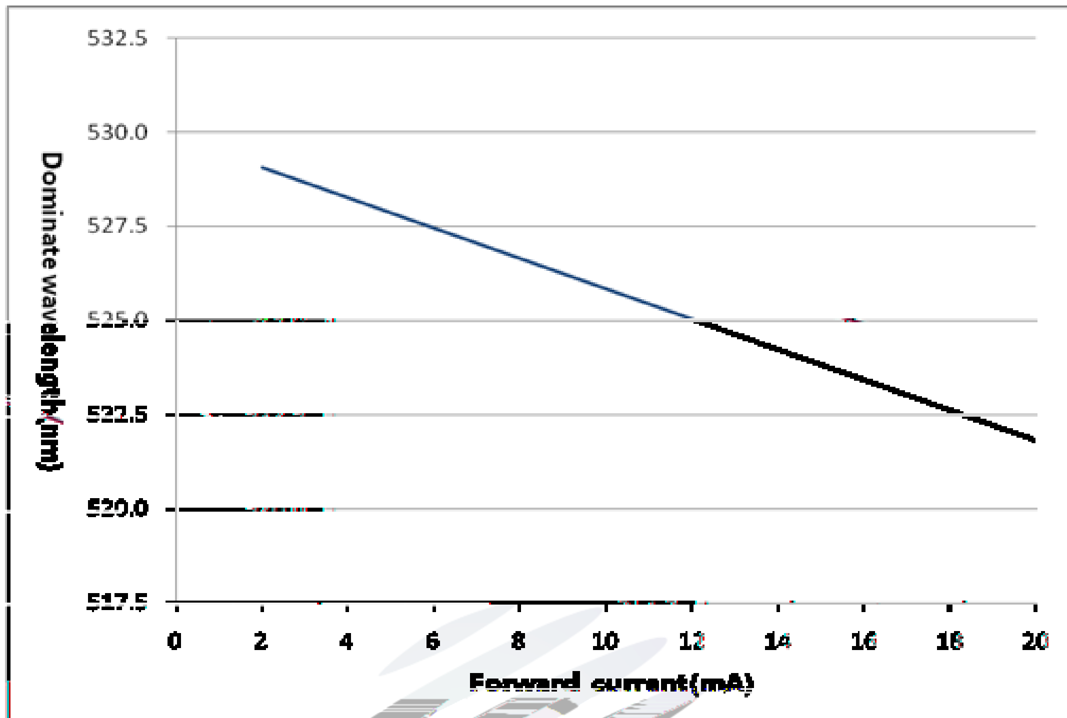


Fig. 1-13 Forward Current vs. Color Shift (Ts=25°C)

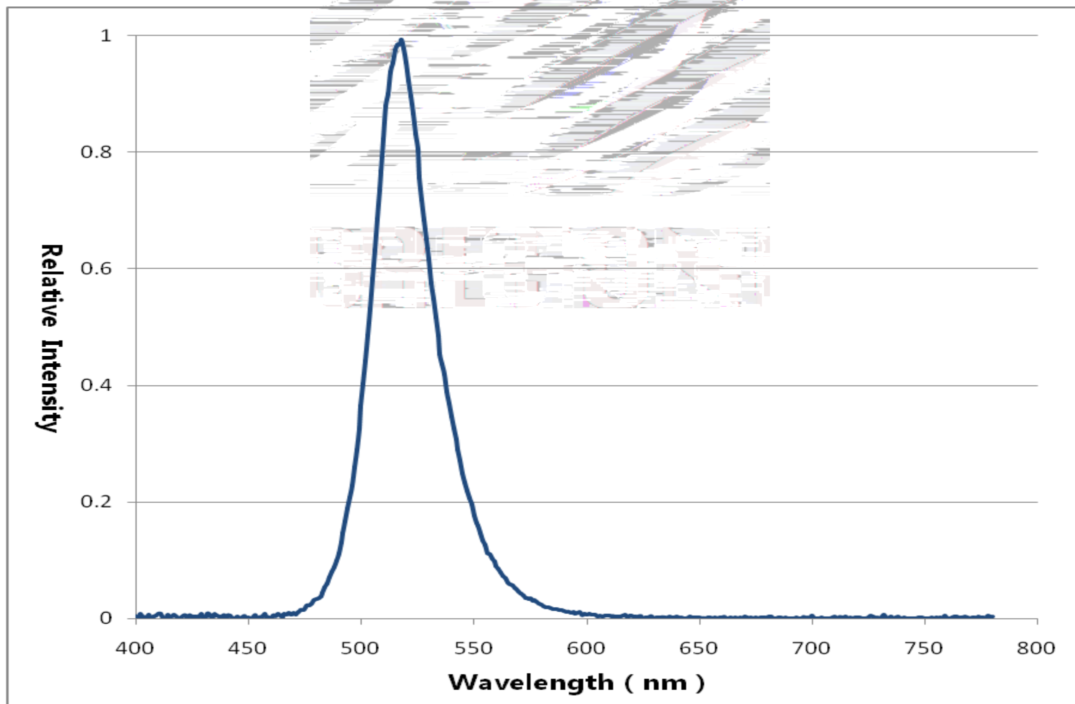
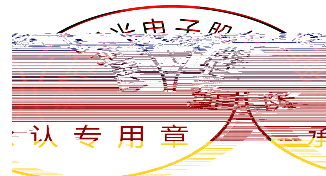


Fig. 1-14 Spectrum Distribution

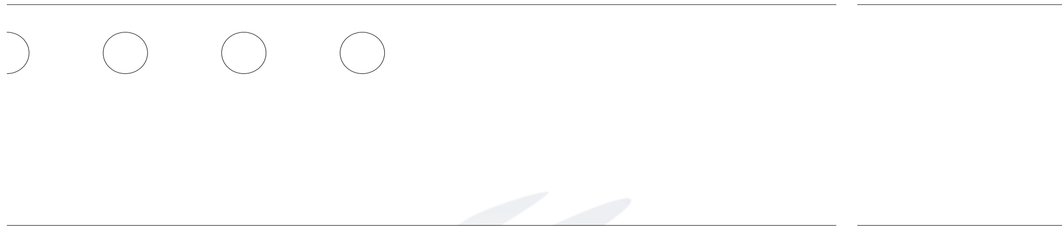


2. Packaging 产品包装

2.1 Packaging Specification 包装规格

Package:3000pcs/reel. 3000pcs

2.1.1Carrier Tape Dimension



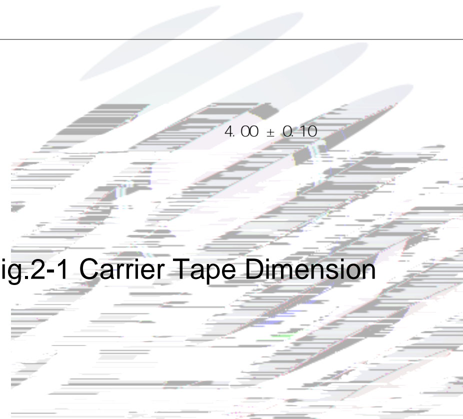
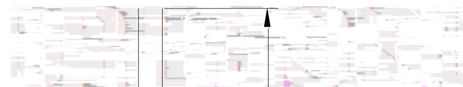


Fig.2-1 Carrier Tape Dimension

2.1.2Reel Dimension



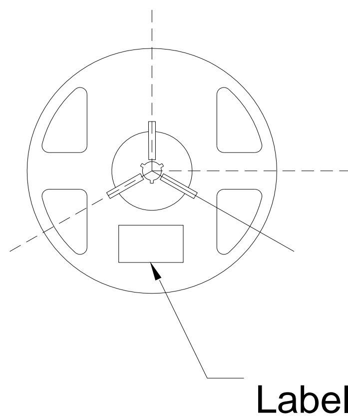


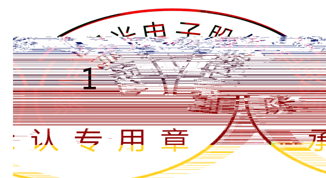
Fig.2-2 Reel Dimension

Table 2-1 Reel Dimension

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

Notes

The tolerances unless mentioned ±0.1mm. Unit : mm



2.1.3Label Form Specification

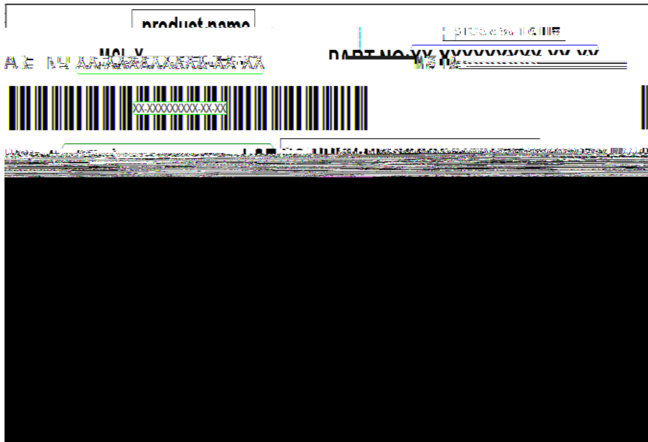


Fig. 2-3 Label Form Specification

Table 2-2 Label Form Specification

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

2.2Moisture Resistant Packing 防潮包装

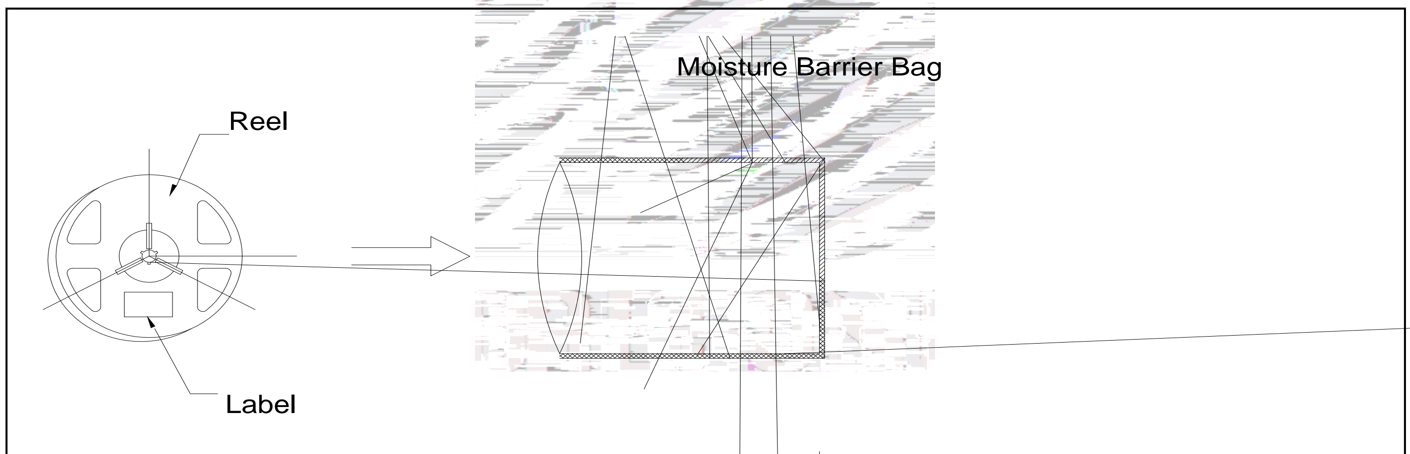


Fig.2-4 Moisture Resistant Packing

2.3Cardboard Box 包装纸箱

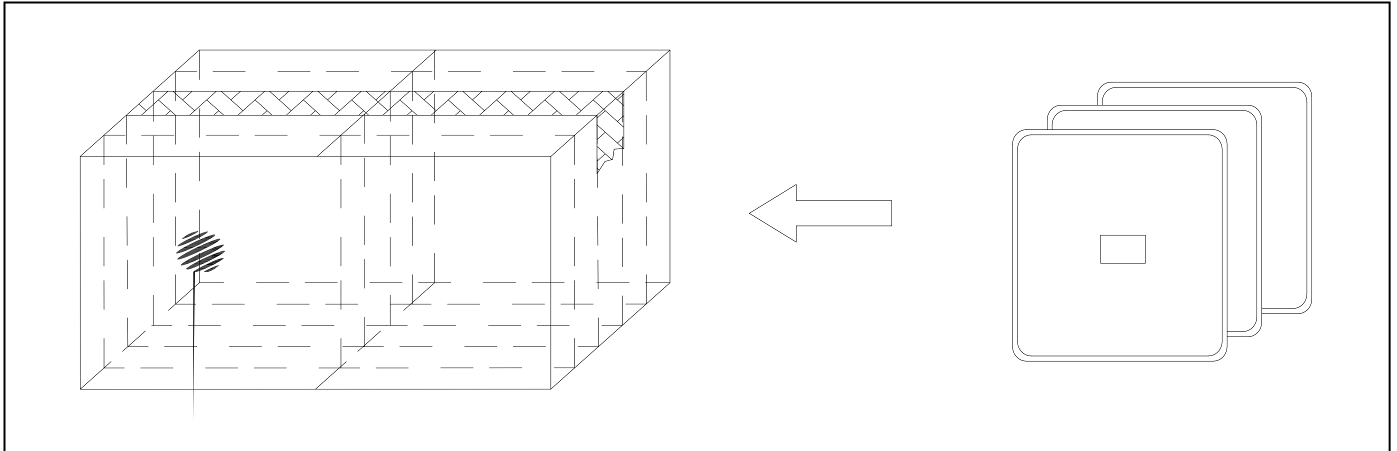


Fig.2-5 Cardboard Box

2.4Reliability Test Items And Conditions 信赖性测试项目及条件

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	2times	20pcs.	0/1
Thermal Shock	JEITAED-4701 300307	-40 15min 10s 125 15min	1000 cycle	20pcs.	0/1
High Temperature Storage	JEITAED-4701 200 201	Temp:125	1000hrs.	20pcs.	0/1
Low Temperature Storage	JEITA ED-4701 200 202	Temp:-40	1000hrs.	20pcs.	0/1
Life Test	JESD22-A108	Ta=25 I_F=20mA	1000hrs.	20pcs.	0/1

High Temperature High Humidity Life Test	JESD22-A101	85 / 85%RH IF=20mA	1000hrs.	20pcs.	0/1

Temperature

Humidity Storage

3.The technical information shown in the data sheets is 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.

SMT Reflow Soldering Instructions SMT 回流焊说明

3.1SMT Reflow Soldering Instructions SMT 回流焊说明

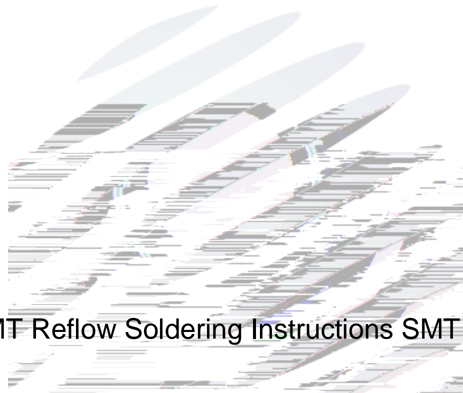


Fig.3-1 SMT Reflow Soldering Instructions SMT

Table 3-1 Reflow parameters

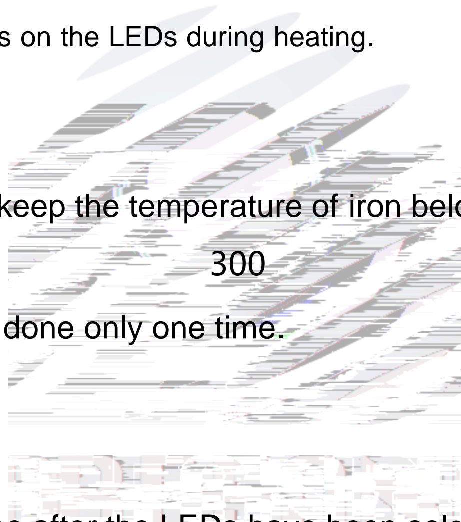
Average temperature rise speed Tsmax TP	3 °C/ Max 3 °C/ s
Preheating: minimum temperature (Tsmin)	150 °C
Preheating: Max temperature (Tsmax)	200 °C
Preheating: Time Tsmin Tsmax	60 - 120 60s-120s
Time limited to maintain high temperature: the temperature (T_L)	217 °C

(TP) 5 °C Hold time within 5 C with the actual peak temperature (TP)	30 Max 30s
Cooling speed	6 °C/ Max 6 °C/ s
25 °C Needed time from 25 °C to Tp	8 Max 8 minutes

Notes

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

(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 less than 3 seconds. , 300 3

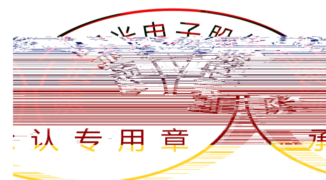
(2) Soldering by hand should be done only one time.

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

LED



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 impacted on 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. LED

LED

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

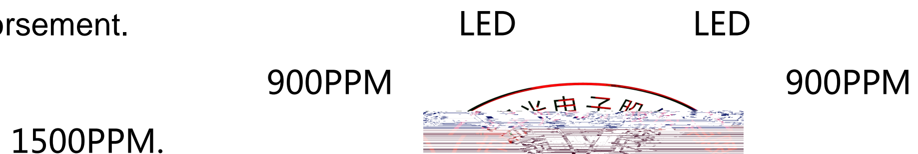
(3) Do not apply mechanical force or excess vibration during the cooling process to normal temperature after soldering. Do not rapidly cool device after soldering.

4. Handling Precautions 产品使用注意事项

4.1 Handling Precautions 产品使用注意事项

(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 LED
100PPM.

(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. LED LED
900PPM 900PPM
1500PPM.



(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. LED

LED

LED

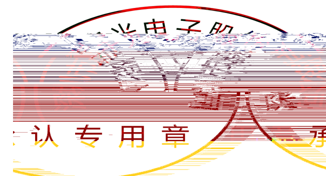
LED

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

Fig 4-1 **Handling Precautions 产品使用注意事项**

(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,other wise 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. LED

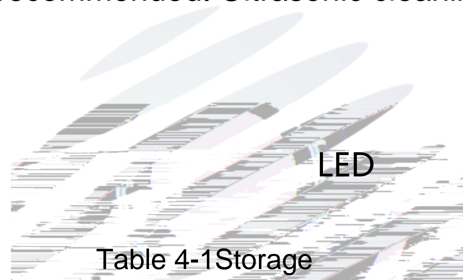
LED



(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.LED

LED

(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.



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%	Recommended for use within 24 hours 24
Baking		60 5	-	24hours 24

(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

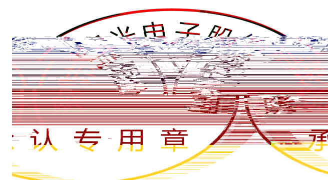
following condition 65±5 for above 24 hours.

60 5 24

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). LED

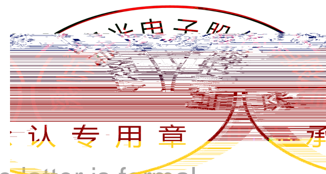
(10) Other points for attention, please refer to our relevant information.



Version History/

Date	Revisor	Version	Verifier	Remarks
2020/7/22		E0		

www.refond.com



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