SPECIFICATION
产　　书

REFOND P/N 产　　号

RF-AUT112TS-ED

☐R&D　发

■Mass Product　产供

承 认 专 用 章

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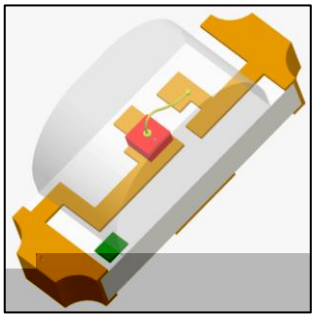
1. Description 产　介

1.1 General Description 产



The Colour LED which was fabricated using a amber chip，Package Dimension : 3.2mmX1.0mmX1.5mm.

产　为　光 LED，　　光　　，产　　：3.2mmX1.0mmX1.5mm。

1.2 Features 产

Extremely wide viewing angle.发光

Suitable for all SMT assembly and solder process.　　于　　SMT

Moisture sensitivity level: Level 3.　　Level 3

RoHS compliant.　　RoHS

1.3 Application 产

Optical indicator.光

Switch and symbol, display.　关　　，

General use.其他

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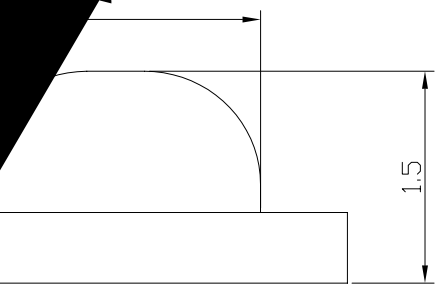
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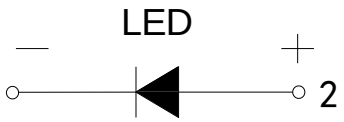
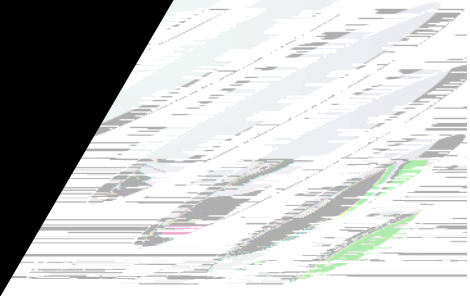

LED
2



1.5 Product Parameters 产　参

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

Item	Test Condition 件	Symbol 号		Value Min. (值)	Value Typ. （典 值）	Value Max. （ 值）	Unit 单位
Spectral Half Bandwidth 半	I_F=20mA	Δ		--	15	--	nm
Forward Voltage 压	I_F=20mA	V_F	1L	1.8	--	2.4	V
Dominant Wavelength 主	I_F=20mA	λ_D	A00	600	--	605	nm
			B00	605	--	610	nm
Luminous Intensity 发光	I_F=20mA	I_V	1DW	70	--	90	mcd
			1AP	90	--	120	mcd
			G20	120	--	150	mcd
Viewing Angle 发光	I_F=20mA			--	140	--	deg
Reverse Current	V_R=5V	I_R		--	--	10	μA
Thermal Resistance.	I_F=20mA	R_{THJ-S}		--	--	450	℃/W

Notes　　: V_R=5V　For test conditions. V_R=5V 为　　分　　件。

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

Parameter（参 ）	Symbol（ 号）	Rating（值）	Units（单位）
Power Dissipation （功 ）	P_d	48	mW
Forward Current （ ）	I_F	20	mA
Peak Forward Current Of Pulse （ 冲 值 ）	I_{FP}	60	mA
Electrostatic Discharge (HBM)（ ）	E_{SD}	2000	V
Operating Temperature （ 作 ）	T_{opr}	-40 ~ +85	℃
Storage Temperature （储 ）	T_{stg}	-40 ~ +85	℃
Junction Temperature （ ）	T_j	95	℃

Notes ：

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

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

3. The above dominant wavelength measurement allowance tolerance is ±2nm. 以主 ±2nm.

4. The above luminous intensity measurement allowance tolerance ±10%. 上 发光 允 公 为± %.

5. Care is to be taken that power dissipation does not exceed the absolute maximum rating of the product. 使 功 不 值。

6. All measurements were made under the standardized environment of Refond. 于 丰 准 台。

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 使 件 , 不 值。

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1.6 Typical Optical Characteristics Curves 典　光

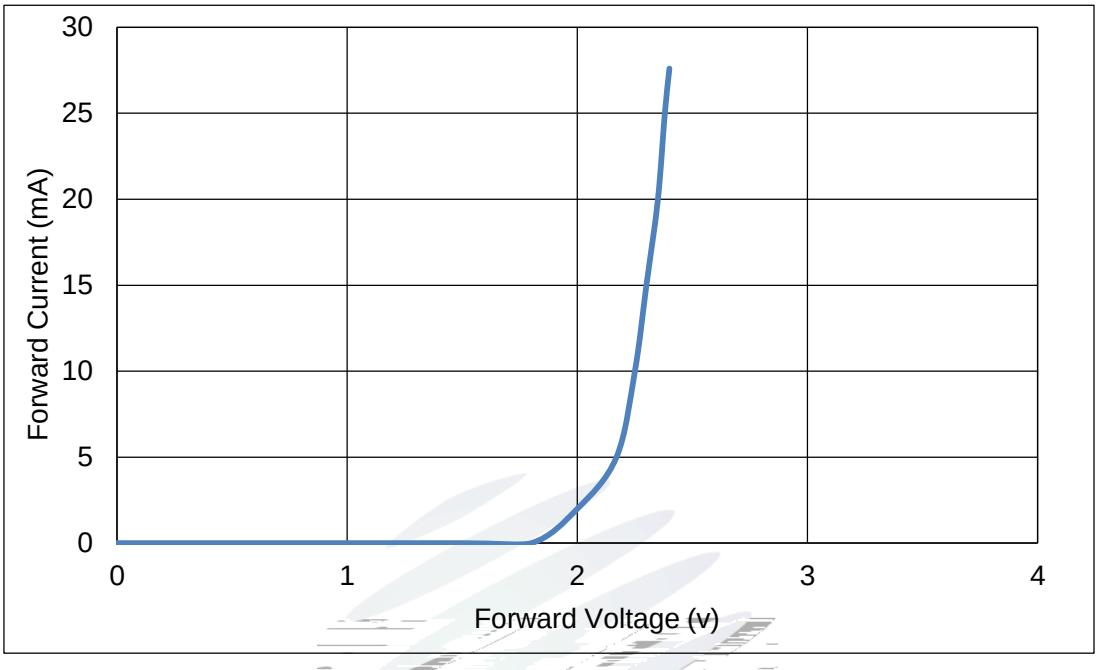

Fig 1-6 Forward Voltage Vs Forward Current 伏

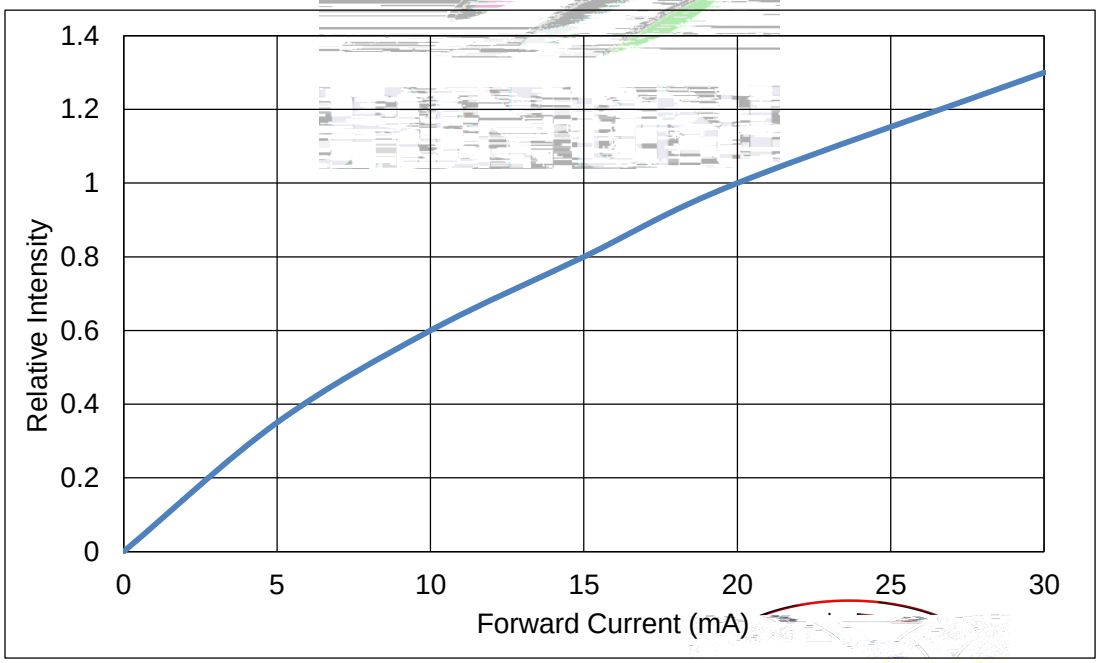

Fig 1-7 Forward Current Vs Relative Intensity 与　光

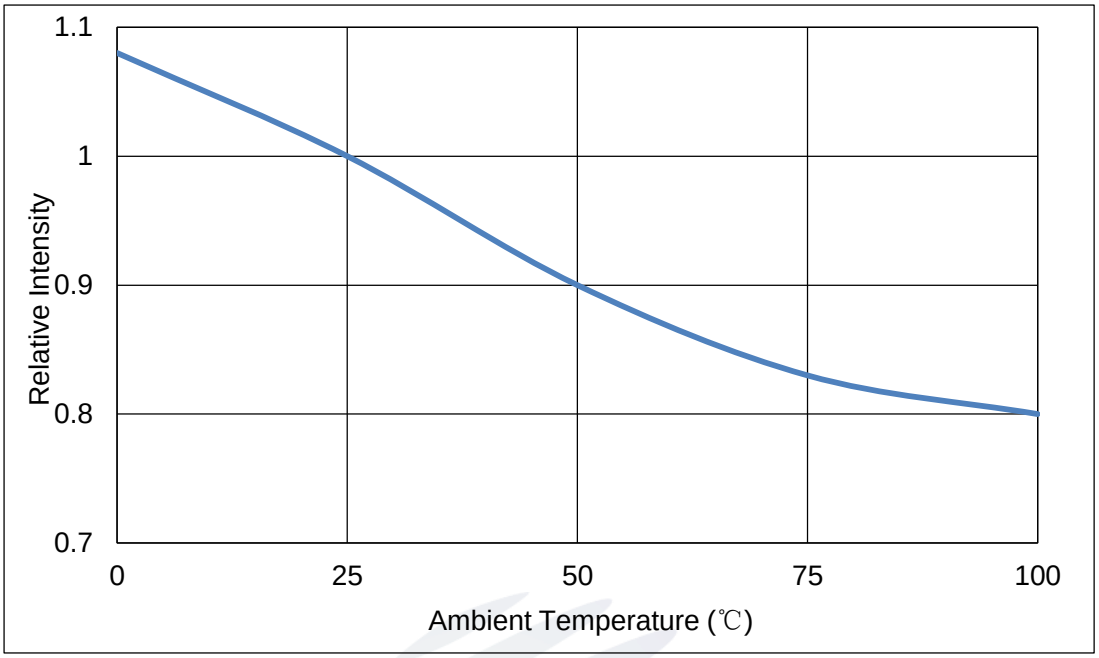

Fig 1-8 Pin Temperature Vs Relative Intensity 与 光

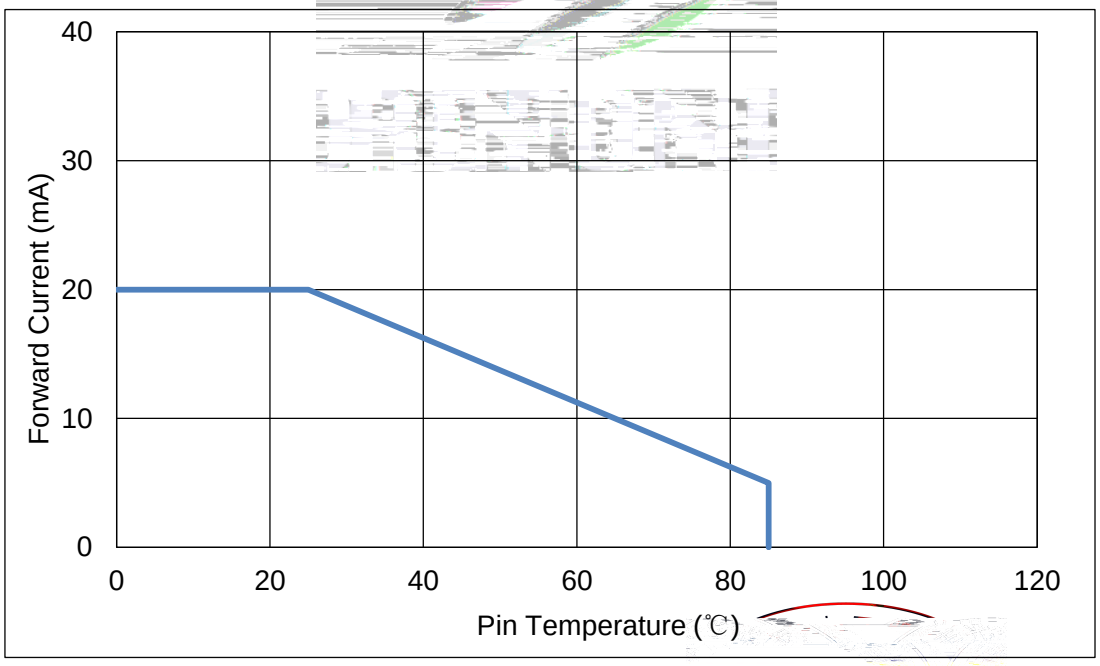

Fig 1-9 Pin Temperature Vs Forward Current 与

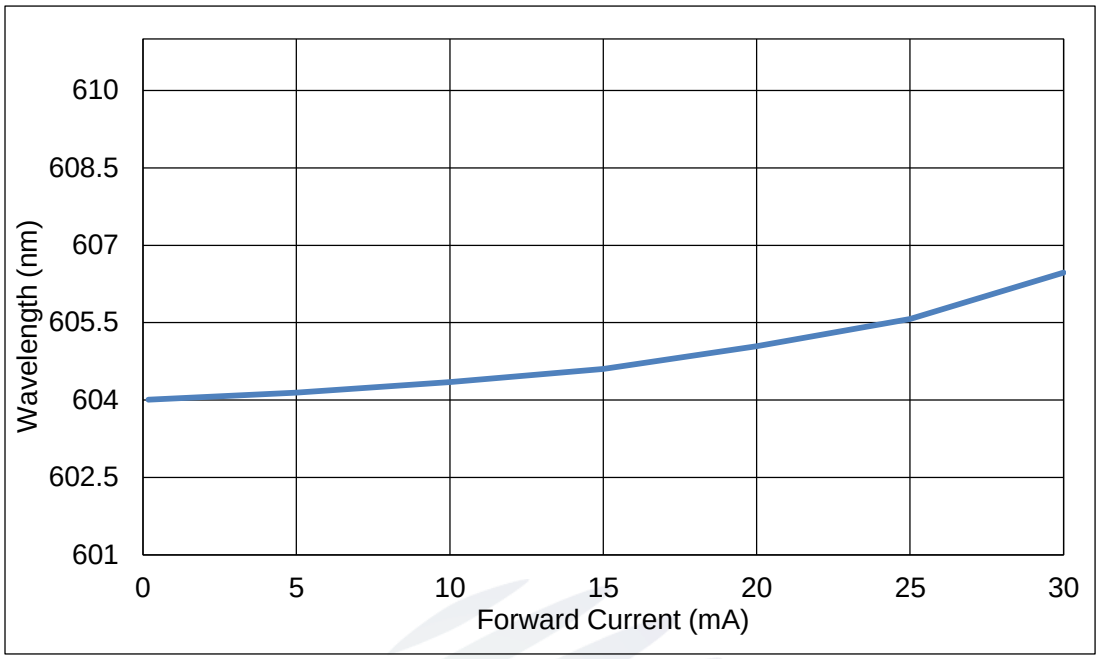

Fig 1-10 Forward Current Vs Dominate Wavelength (Ta=25℃)

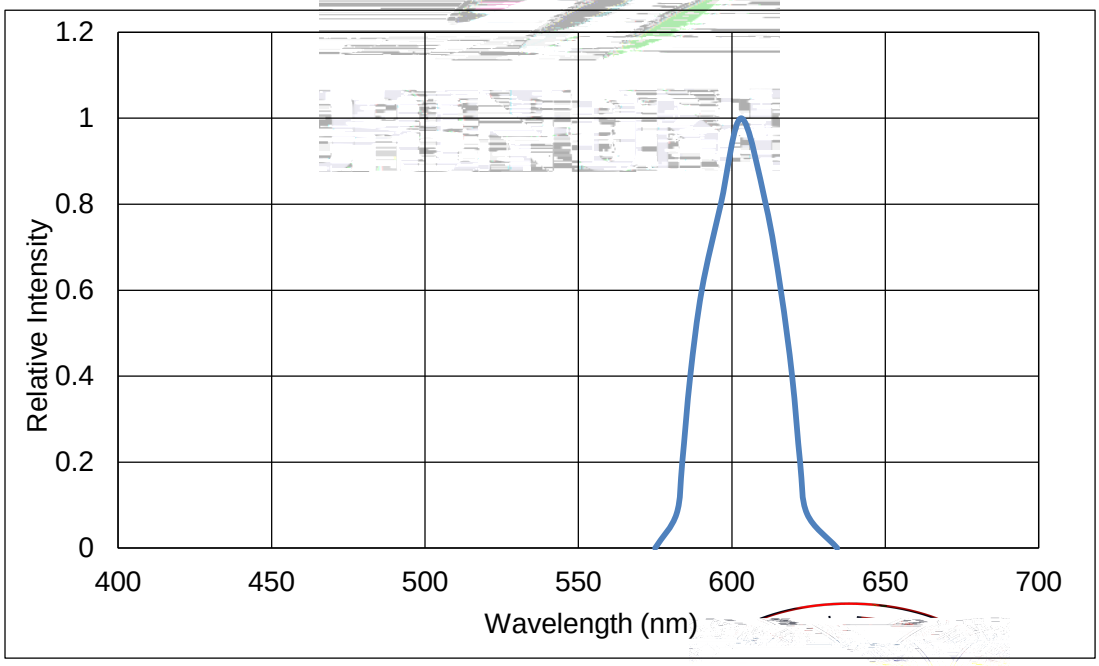

Fig 1-11 Relative Intensity Vs Wavelength (Ta=25℃)

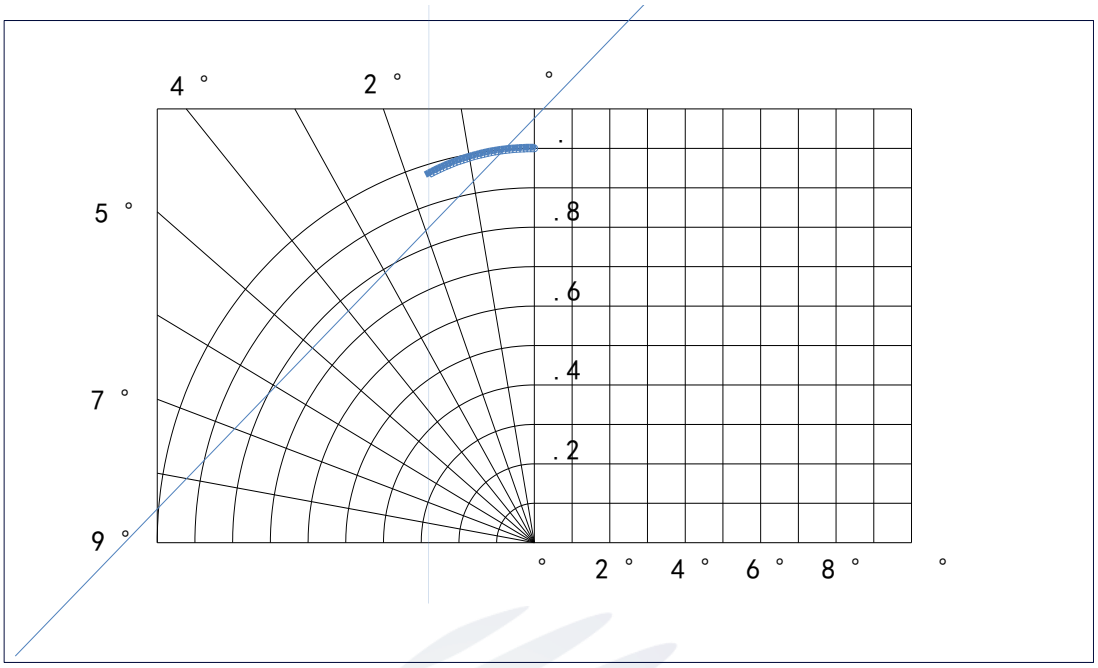

Fig 1-12 Diagram characteristics of radiation

2.1.3 Label Form Specification

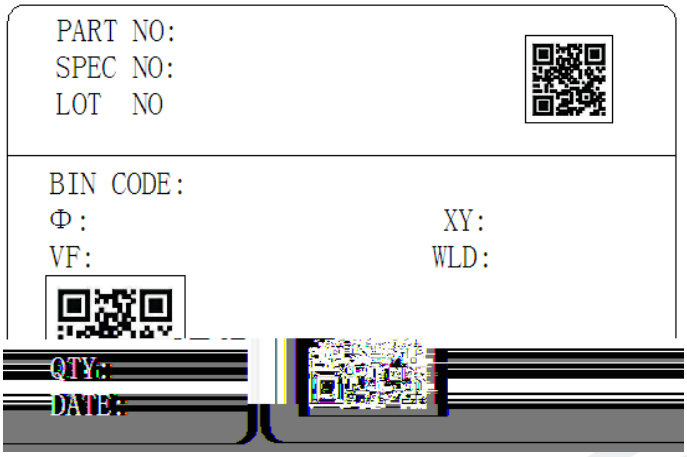

Fig. 2-3 Label Form Specification

Table 2-2 Parameter 参

PART NO.	Part Number
SPEC NO.	Spec Number
LOT NO.	Lot Number 号
BIN CODE	Bin Code 参 代
	Luminous flux 光
XY	Chromaticity Bin 区
V_F	Forward Voltage 压
WLD	Wavelength 代
QTY	Packing Quantity
DATE	Made Date 产

2.2 Moisture Resistant Packing 包

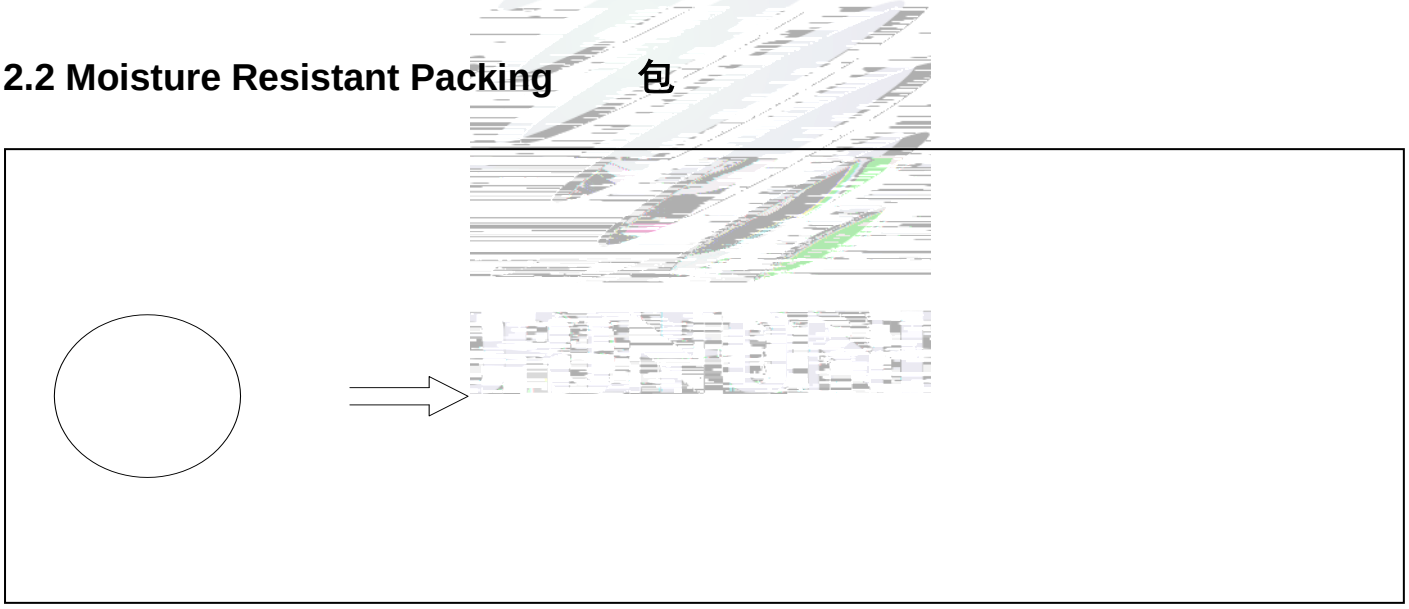

Fig.2-4 Moisture Resistant Packing 包

2.3 Cardboard Box 包

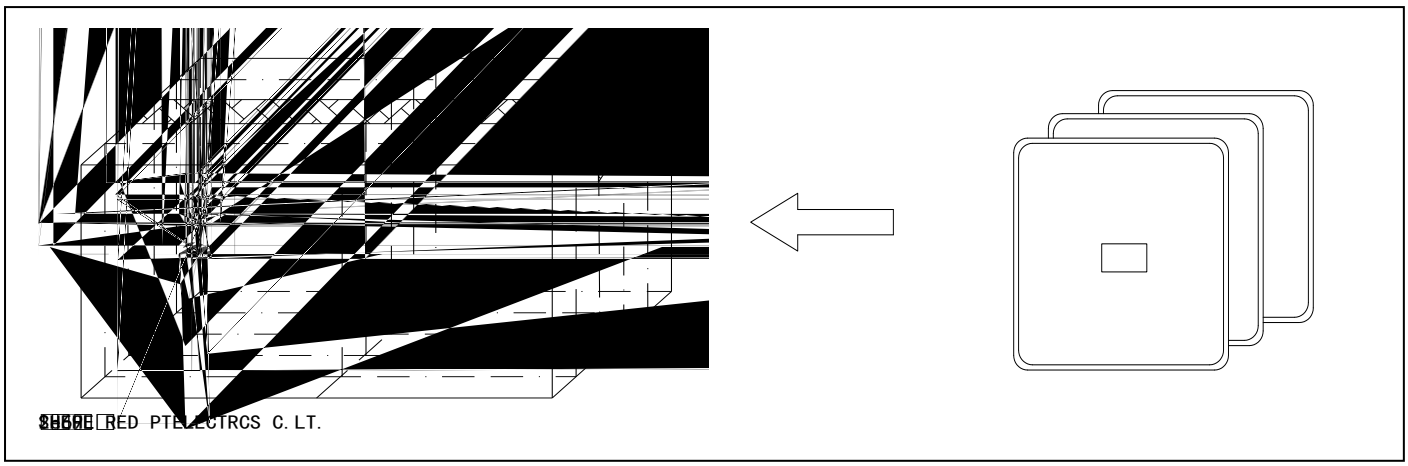

Fig.2-5 Cardboard Box 包

2.4 Reliability Test Items And Conditions 信 及 件

Table 2-3 Reliability Test Items And Conditions 信 及 件

Test Items	Ref.Standard 参 准	Test Condition 件	Time	Quantity	Ac/Re /
Reflow	JESD22-B106	T_{emp}:260˚Cmax T=10 sec	2 times	22Pcs.	0/1
Temperature Cycle	JESD22-A104	100˚C 30 min 5 min -40˚C 30 min	100 cycles	22Pcs.	0/1
Thermal Shock 冷 冲击	JESD22-A106	-40˚C 15min 100˚C 15min	300 cycles	22Pcs.	0/1
High Temperature Storage 保	JESD22-A103	T_{emp}:100˚C	1000 hrs.	22Pcs.	0/1
Low Temperature Storage 低 保	JESD22-A119	T_{emp}:-40˚C	1000 hrs.	22Pcs.	0/1
Life Test	JESD22-A108	T_a=25˚C I_F=20mA	1000 hrs.	22Pcs.	0/1

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2.5 Criteria For Judging Damage 判 准

Table 2-4 Criteria For Judging Damage 判 准

Test Items	Symbol 号	Test Condition 件	Criteria For Judgement 判 准	
			Min.	Max.
Forward Voltage 压	V_F	I_F=20mA	-	U.S.L*)x1.1
Reverse Current	I_R	V_R= 5V	-	U.S.L*)x2.0
Luminous Flux 光		I_F=20mA	L.S.L*)x0.7	-

Notes ：

1.U.S.L: Upper standard level 上 L.S.L: Lower standard level 下

2.The above reliability tests is based on the verification of a single/strip LED of Refond's existing experimental platform,the reliability experiment was taken under good heat dissipation conditions. When customers applies the LED to the series and parallel circuit,should take consideration of all the factors such as the current, voltage distribution, heat dissipation and others. 以上可 于 丰 台单 / LED 件 下 。 LED 于串、 ， 估 、 压分 、 。

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. 以上 仅为产 典 值，只作为参 ，不作为任何 件及 保 。

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3. SMT Reflow Soldering Instructions SMT 回流焊说明

3.1 SMT Reflow Soldering Instructions SMT

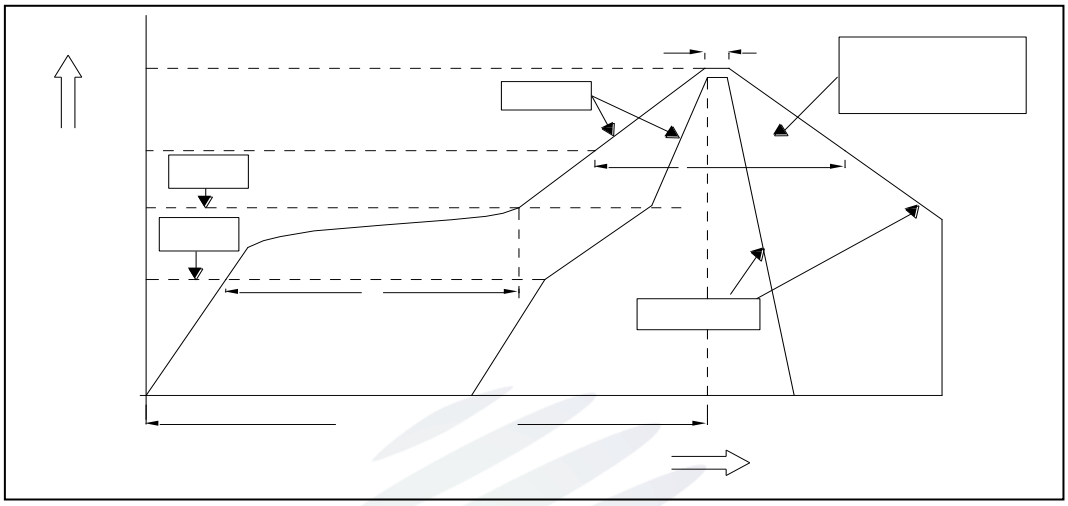

Fig.3-1 SMT Reflow Soldering Instructions SMT

Table 3-1 Parameter 参

Average temperature rise speed 升 （Tsmax Tp）	3 °C/ Max 3 °C/ s
Preheating: minimum temperature ： 低 (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
Time limited to maintain high temperature: The Time ： (t_L)	60 -150 60s-150s
Peak /Classification of temperature: 值 / 分 (T_P)	260 °C
Time limit classification of peak temperature time 值分 ： （t_p）	10 Max 10s
Hold time within 5 ° C with the actual peak temperature (TP) 与 值 (T_P) 5 °C 以内 保	30 Max 30s
Cooling speed	6 °C/ Max 6 °C/ s
Needed time from 25 °C to Tp 25 °C 升 值	8分 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. 不可以 两 ，两 24 ，LED可 于 。

(2)When soldering , do not put stress on the LEDs during heating. ，不 受 力压 体 。

3.1.1 Soldering Iron

(1) When do soldering by hand, keep the temperature of iron below less 300℃ less than 3 seconds. ， 于3 ℃， 不可 3 。

(2) Soldering by hand should be done only one time. 只可 一 。

3.1.2 Repairing 修

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 不 修 ， 修 ， 使 双 ， 且事先 会不会 LED 。

3.1.3 Cautions 事

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

(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. 之 冷却 中，不 加 力，也不 动， ，不 剧冷却 。

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4. Handling Precautions 产　使　　事

4.1 Handling Precautions 产　使　　事

(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　作　　及与 LED　　中　元　及化合　　份不可　　PPM.　只　一个　　，不作任何　　保。

(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.为了　　入 LED 内　以　　LED　　伤，　及　　件　　，单一　　元　　于 9　PPM，单一　元　　于 9　PPM，　元　与　元　　于　5　PPM.　只　一个　　，不作任何　　保。

(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 theuse of any chemicals or materials that have been found or are suspected to have an adverse affect on device performance or reliability. To verifycompatibility, Refond recommends that all chemicals and materials be tested in the specific application and environment for which they are intended tobe used. Attaching LEDs, do not use adhesives that outgas organic vapor.　　件中　发　　会　　到 LED 内　，　　产　光　及　　件下，会　　LED 变　，　　严　光　，　前了　件　　免产　些　。　丰反　使　任何　LED　件　　可　　，不　些　　了　仅仅　　。　　使　，　丰　　。　LED　候，不　使　产　　发　体　　剂。

(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. 使具从 侧 取，不可 压 体 ， 可 会 内 。

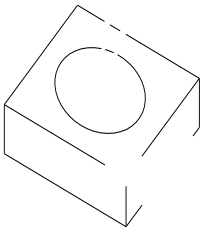


Fig 4-1 产品使用注意事项

(5) In designing a circuit,the current through each LED can not exceed the absolute maximum rating specified for each LED.In the 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. ，LED 不 值， ， 使 保 ， 则， 压变化 会变化，可 产 。 保 只 关 候出 压变化，不 加反压， 则会 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 为 发变 变， 升 会 低 LED 发光 ， 发光 ， 以 充分。

(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

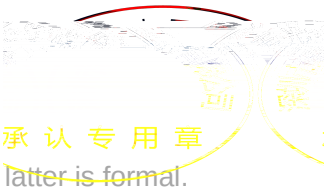
LED. 与其他 ， ， ， 别 ， 产 净 ， 以 ， 们 丙 作 剂， 到其他剂， 保 不会 体， 可 会 LED ，不 。

Table 4-1Storage 储

Conditions		Temperature	Humidity	Time
Storage 储	Before Opening Aluminum Bag 包前	≤30℃	≤75%	Within 1 Year From Date 一 内
	After Opening Aluminum Bag 包	≤30℃	≤60%	24hours 24
Baking		60±5℃	-	≥24hours 于

Version History/修　历史

Date	Revisor修	Version	Verifier	Remarks
2017.12.27	华	E/1		制
2021.08.31		E/2		书



Declare

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

产 书以中 书写， 冲 以中 为准。