SPECIFICATION
产品规格书

REFOND P/N 产品型号

RF-A1P14-W455-A4

☐R&D 研发

■Mass Production 量产供货

Contents 目录

1. Description 产品介绍

1.1General Description 产品描述

1.2Features 产品特征

1.3Application 产品应用

1.4Package Dimension 封装尺寸

1.5Product Parameters 产品参数

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

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

2. Packaging 产品包装

2.1 Packaging Specification 包装规格

2.1.1Carrier Tape Dimension 载带尺寸 ....

2.1.2Reel Dimension 卷盘尺寸 ....

2.1.3Label Form Specification 标签规格 ....

2.2Moisture Resistant Packing 防潮包装

2.3Cardboard Box 包装纸箱

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

2.5 Criteria For Judging Damage 失效判定标准

3. SMT Reflow Soldering Instructions SMT 回流焊说明

3.1SMT Reflow Soldering Instructions SMT 回流焊说明

4. Handling Precautions 产品使用注意事项

4.1 Handling Precautions 产品使用注意事项

1. Description 产品介绍

1.1 产品描述

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

Product Package:2.20mmX1.40mmX1.30mm.

该产品为白色光 LED，是由蓝光芯片激发荧光粉而形成。产品尺寸：2.20mmX1.40mmX1.30mm.

1.2Features 产品特征

PLCC Package. PLCC封装

Extremely wide viewing angle.发光角度大

Suitable for all SMT assembly and solder process.适用于所有的SMT组装和焊接工艺

Available on tape and reel.适用于载带及卷轴

Moisture sensitivity level: Level 2.防潮等级 Level2

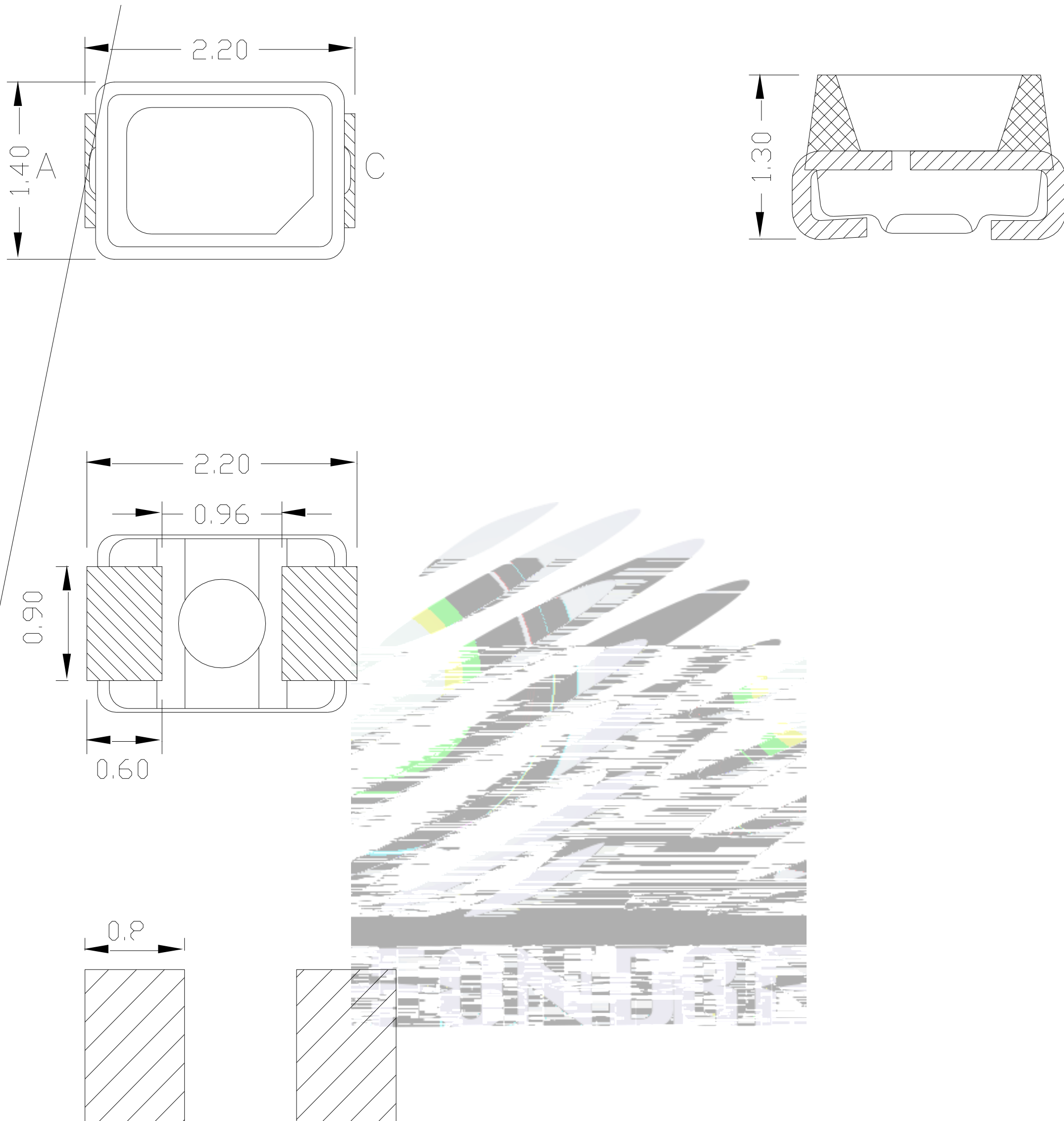
Compliance with RoHS and REACH.符合RoHS和REACH要求

Qualifications: The product qualification test plan is based on the guidelines of AEC-Q101 Stress Test Qualification for Automotive Grade Discrete Semiconductors 资格：产品资格测试计划基于AEC-Q101汽车级分立半导体应力测试资格准则

1.3Application 产品应用

Automotive Lighting Interior.汽车内饰照明

1.4Package Dimension 封装尺寸



Notes 备注：

1. All dimensions units are millimeters. 所有尺寸标注单位为毫米

2. All dimensions tolerances are 0.20mm unless otherwise noted.除特别标注外，所有尺寸公差为±0.20 毫米

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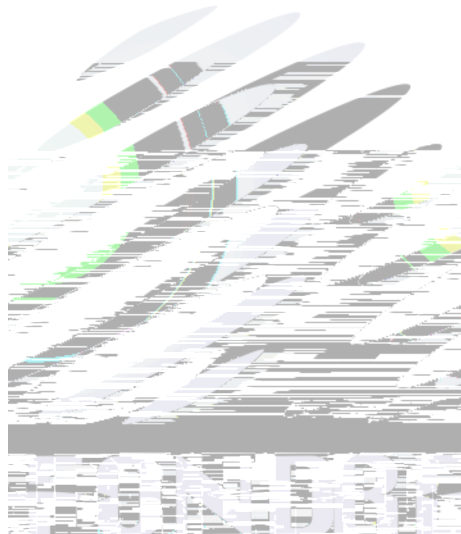
1.6Bin Range Of Forward Voltage and Luminous Intensity (IF=20mA)电压与发光强度分 BIN 范围(IF=20mA)

Table 1-3

V_F V	E2	F1	F2	G1	G2	H1



1.7 Typical Optical Characteristics Curves

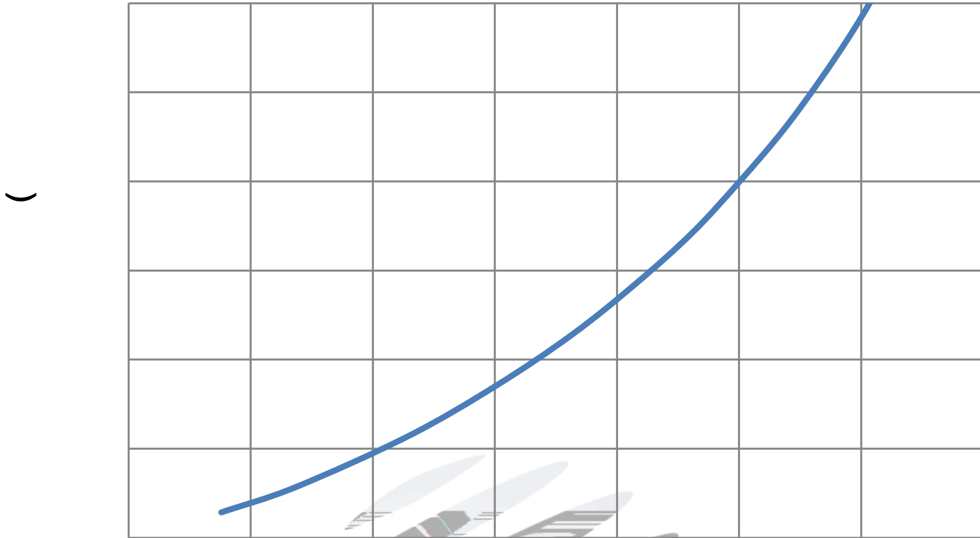


Fig. 1-7 Forward Voltage Vs Forward Current伏安特性曲线

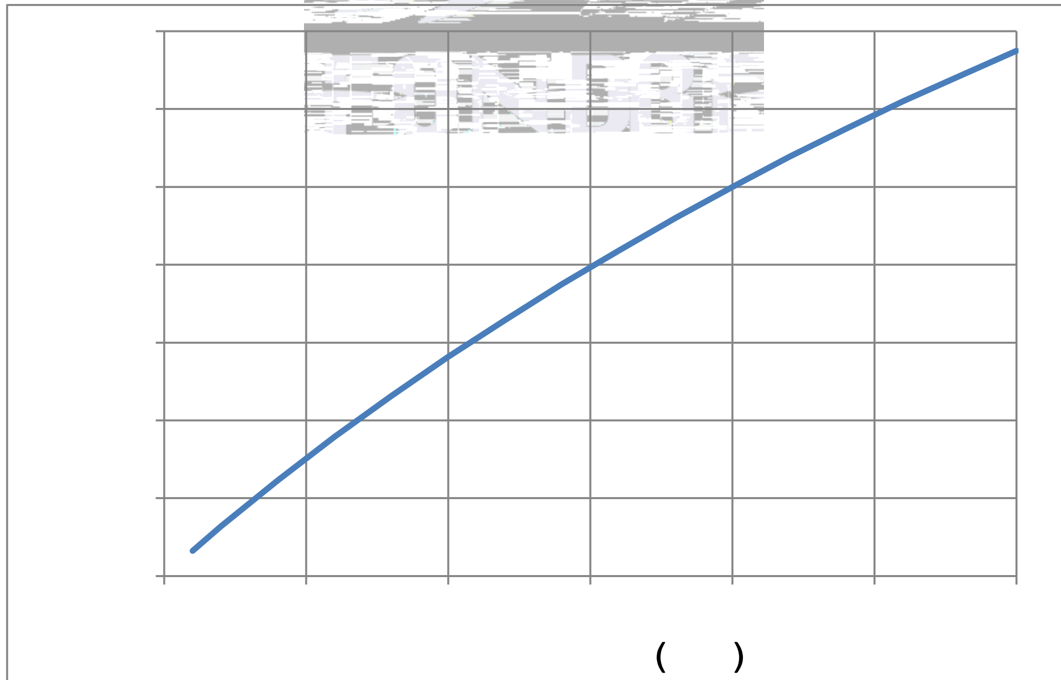


Fig. 1-8 Forward Current Vs Relative Intensity

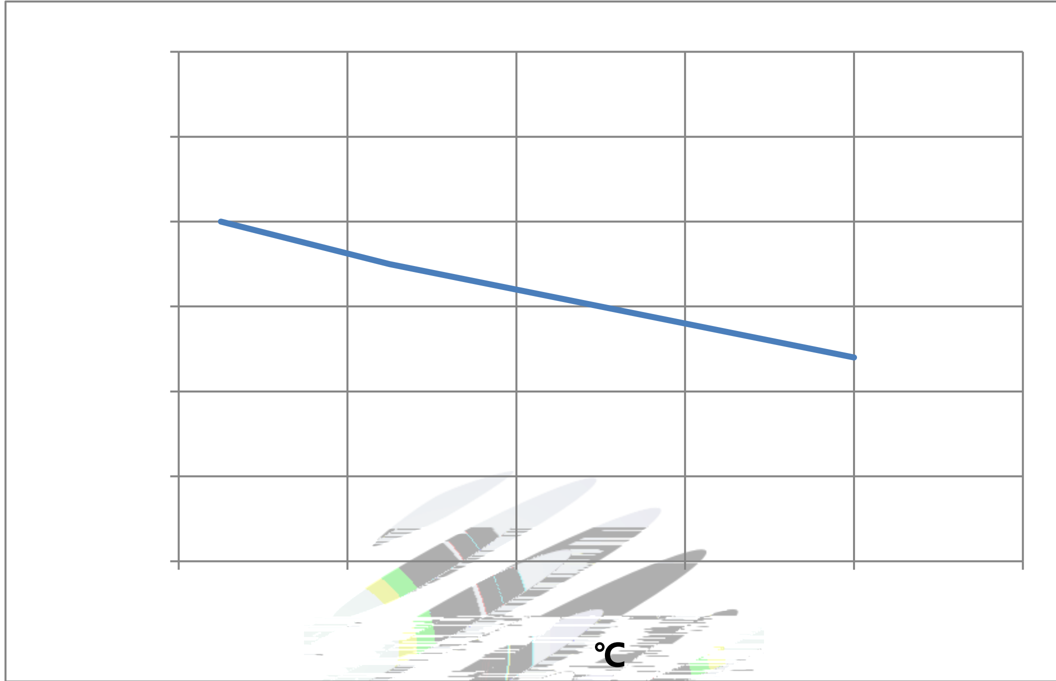
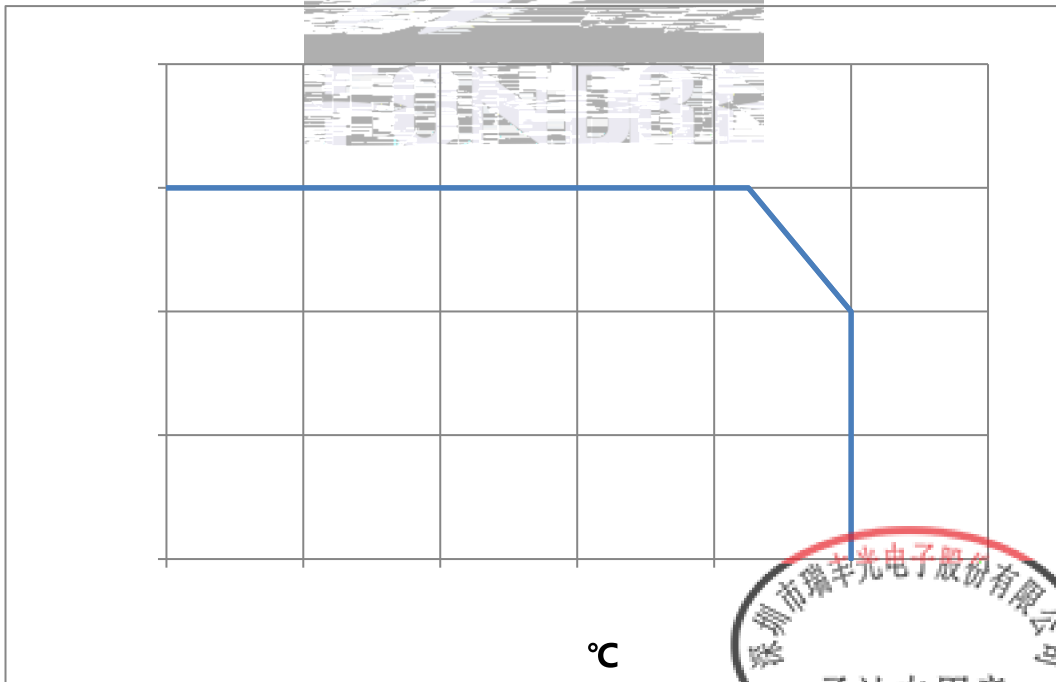


Fig. 1-9Solder Temperature Vs Relative Intensity管脚温度与相对光强特性曲线



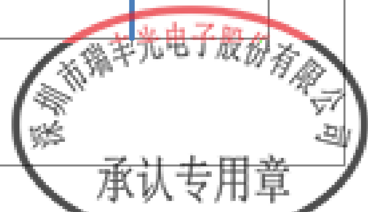


Fig. 1-10 Solder Temperature Vs Forward Current管脚温度与正向电流特性曲线

Fig. 1-11 Forward Voltage Vs Solder Temperature电压与管脚温度特性曲线

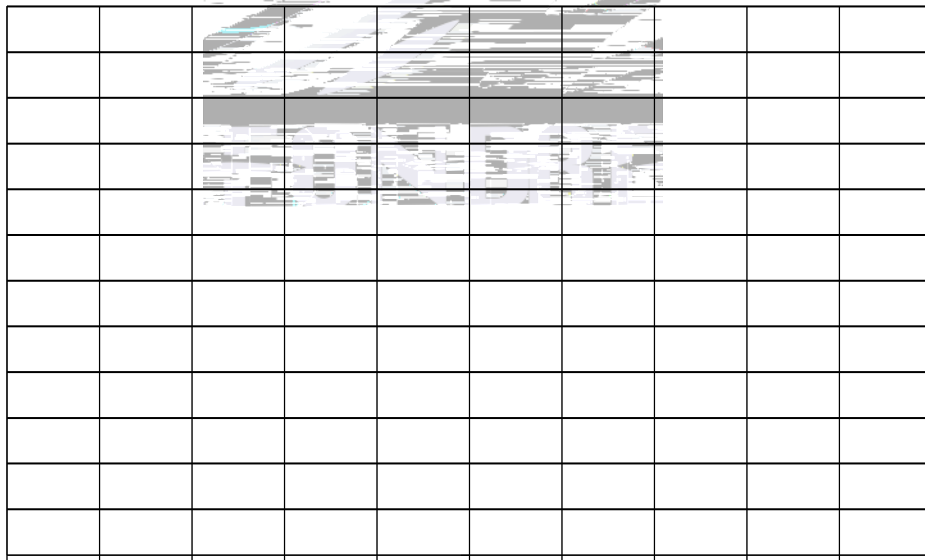
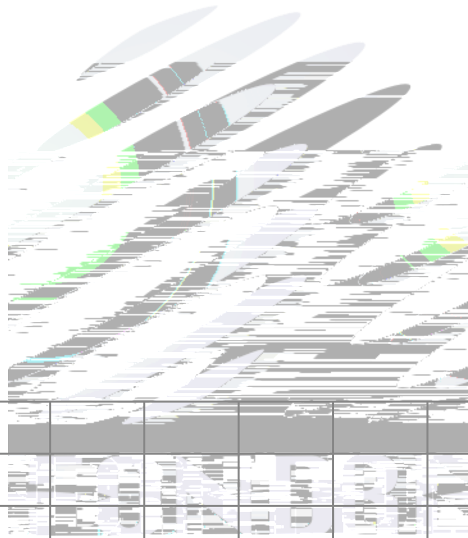


Fig. 1-12 Radiation diagram辐射特性曲线



2. Packaging 产品包装

2.1 Packaging Specification 包装规格

Package:3000pcs/reel.包装每卷 。

2.1.1Carrier Tape Dimension 载带尺寸

P2

Symbol

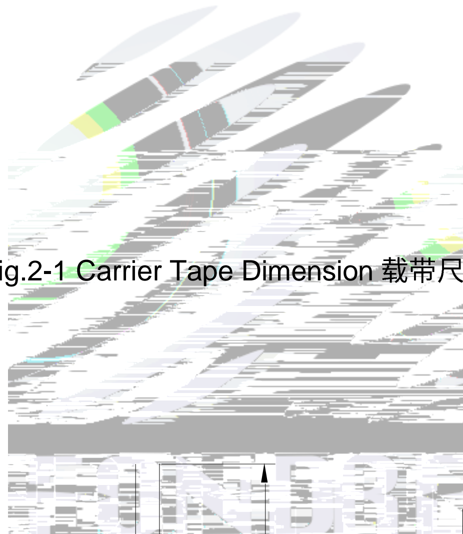


Fig.2-1 Carrier Tape Dimension 载带尺寸

2.1.2Reel Dimension 卷盘尺寸

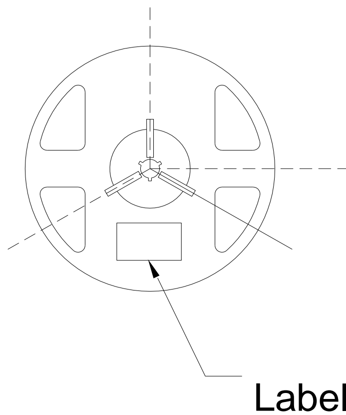


Fig.2-2Reel Dimension 卷盘尺寸

Table 2-1Reel Dimension 卷盘尺寸

A	8.0±0.1mm
B	178.0±1.0mm
C	60.0±1.0mm
D	13.0±0.5mm

Notes 备注:

The tolerances unless mentioned ±0.1mm. Unit : mm注：未注公差为±0.1毫米，尺寸单位：毫米。

2.1.3Label Form Specification 标签规格

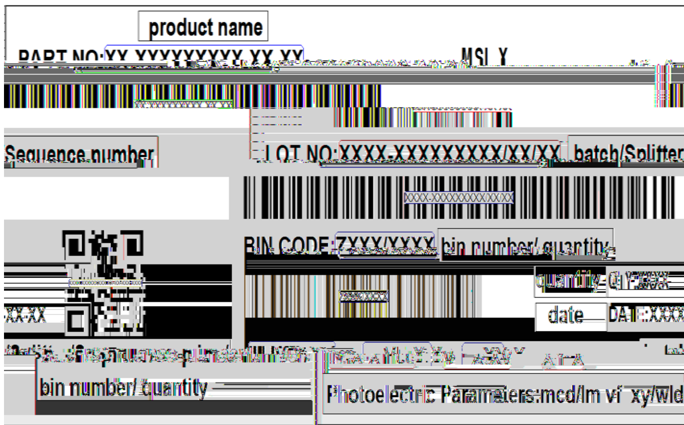


Fig. 2-3Label Form Specification 标签规格

Table 2-2Specification 规格

PART NO.	Part Number 品名
SPEC NO.	Spec Number 规格
LOT NO.	Lot Number 批次号
BIN CODE	Bin Code 参数代码
IV	Luminous Intensity发光强度
XY	Chromaticity Bin 色区
V_F	Forward Voltage 正向电压
WLD	Wavelength 波长代码
QTY	Packing Quantity 数量
DATE	Made Date 生产日期

2.2Moisture Resistant Packing 防潮包装

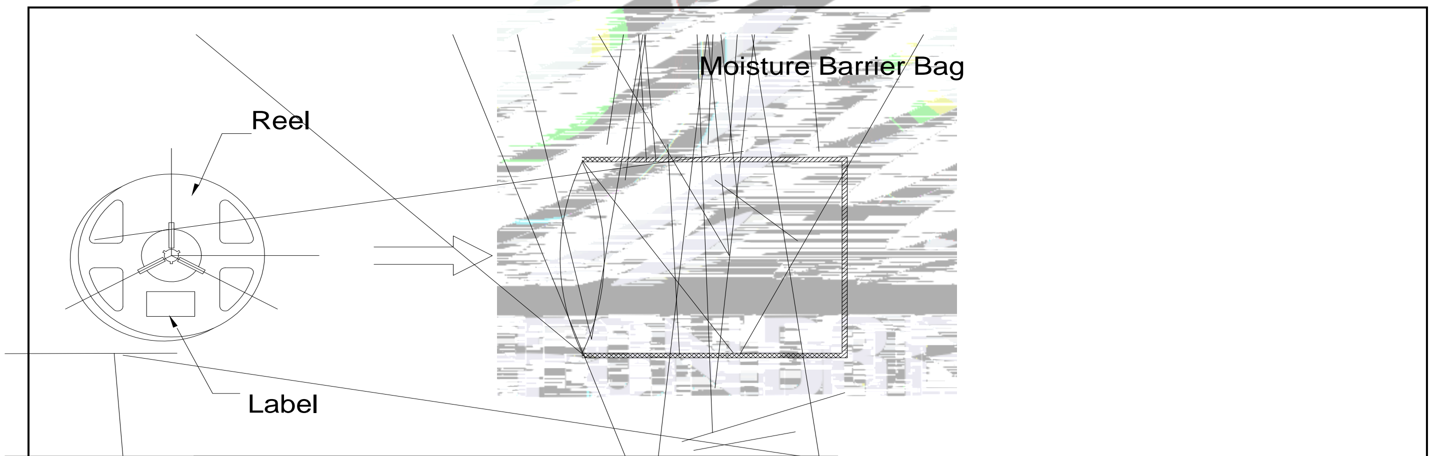


Fig.2-4Moisture Resistant Packing 防潮包装

2.3Cardboard Box 包装纸箱

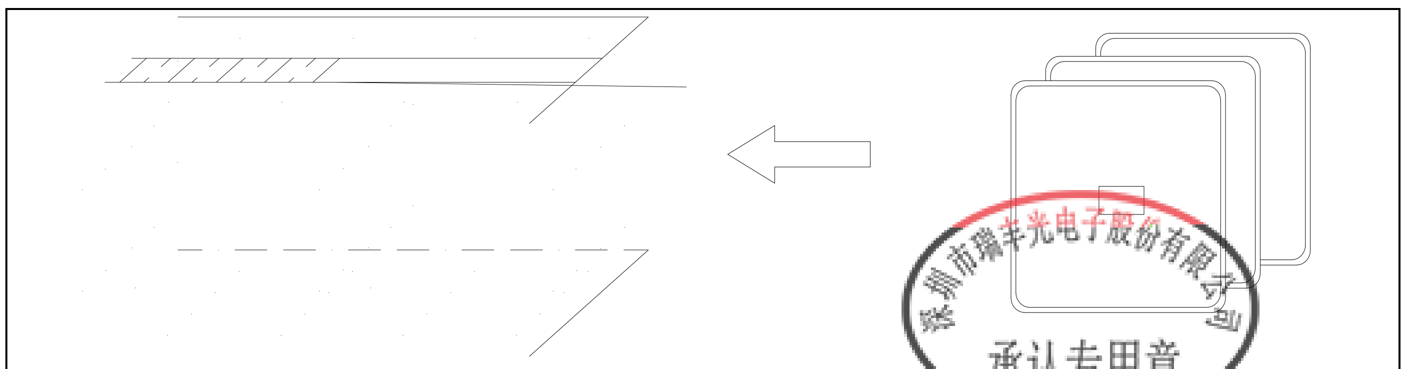


Fig.2-5Cardboard Box 包装纸箱

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

Table 2-3 Reliability Test Items And Conditions 信赖性测试项目及条件

Test Items 项目	Ref.Standard 参考标准	Test Condition 测试条件	Time 时间	Quantity 数量	Ac/Re 接收/拒收
Reflow 回流焊	JESD22-B106	Temp:260°Cmax T=10 sec	2times	20pcs.	0/1
MSL2 2	JESD22-A113	85°C/ 60%R	168 hrs.	20pcs.	0/1
Thermal Shock	JEITAED-4701 300307	-40 15min . - 125 15min	1000 cycle	20pcs.	0/1
Life Test	JESD22-A108	Ta=105 IF=20mA	1000hrs.	20pcs.	0/1
High Temperature High Humidity Life Test	JESD22-A101	85 / 85%RH IF=20mA	1000hrs.	20pcs.	0/1

2.5 Criteria For Judging Damage 失效判定标准

Table 2-4Criteria For Judging Damage 失效判定标准

Test Items 项目	Symbol 符号	Test Condition 测试条件	Criteria For Judgement 判定标准	
			Min. 最小	Max. 最大
Forward Voltage 正向电压	V_F	IF=20mA	-	U.S.L*)x1.1
Reverse Current 反向电流	I_R	V_R = 5V	-	U.S.L*)x2.0
Luminous Intensity 发光强度	IV	IF=20mA	L.S.L*)x0.7	-

Notes 备注:

1.U.S.L: Upper standard level 规格上限 L.S.L: Lower standard level 规格下限

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.以上可靠性测试是基于瑞丰现有实验平台单颗/条 LED 在良好散热条件验证下的结果。客户端将 LED 应用于串、并联线路时，需自行评估电流、电压分配、散热等问题。

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. 以上技术数据仅为产品的典型值，只作为参考，不作为任何应用条件及应用方式的保证。

3. SMT Reflow Soldering Instructions SMT 回流焊说明

3.1SMT Reflow Soldering Instructions SMT 回流焊说明

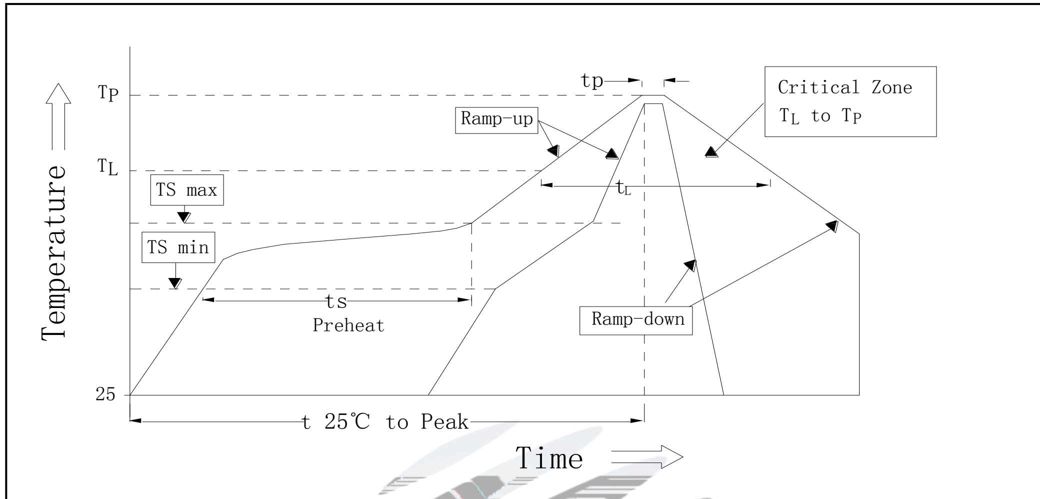
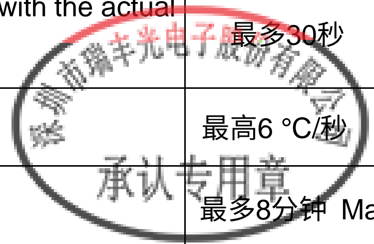


Fig.3-1SMT Reflow Soldering Instructions SMT 回流焊说明

Table 3-1Reflow parameters 回流焊参数

Average temperature rise speed平均升温速度（Tsmax至TP）	最高3 °C/秒 Max 3 °C/ s
Preheating: minimum temperature预热：最低温度（Tsmin）	150 °C
Preheating: Max temperature预热：最高温度（Tsmax）	200 °C
Preheating: Time预热：时间（Tsmin至Tsmax）	60 - 120秒 60s-120s
Time limited to maintain high temperature: the temperature限时维持高温：温度（TL）	217 °C
Time limited to maintain high temperature: The Time 限时维持高温：时间（tL）	最多60秒 Max 60s
Peak /Classification of temperature:峰值 / 分类温度（TP）	260 °C
Time limit classification of peak temperature time限时峰值分类温度：时间（tp）	最多10秒 Max 10s
与实际峰值温度（TP）相差 5 °C 以内的保持时间 Hold time within 5 °C with the actual peak temperature (TP)	最多30秒 Max 30s
降温速度 Cooling speed	最高6 °C/秒 Max 6 °C/ s
25 °C 升至峰值温度所需时间 Needed time from 25 °C to Tp	最多8分钟 Max 8 minutes



Notes 备注：

(1)Reflow soldering should not be done more than twice. If more than 24 hours between the two soldering,LED will be damaged. 回流焊次数不可以超过两次，两次回流焊的时间间隔如果超过24小时，LED可能由于吸湿而损坏。

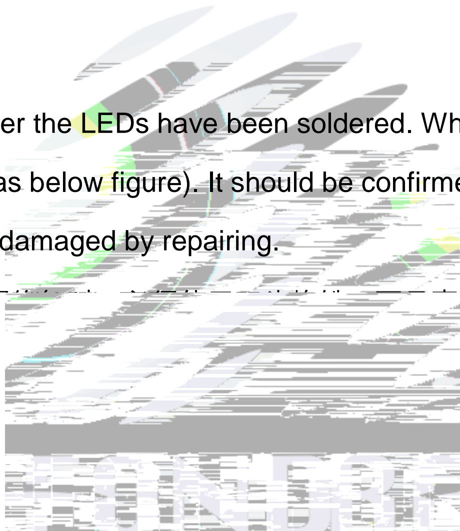
(2)When soldering , do not put stress on the LEDs during heating.焊接时，不要在材料受热时用力压胶体表面。

3.1.1 Soldering Iron 烙铁焊接

(1) When do soldering by hand, keep the temperature of iron below less 300℃ less than 3 seconds. 当手工焊接时,烙铁的温度必须小于300℃，时间不可超过3秒。

(2) Soldering by hand should be done only one time.手工焊接只可焊接一次。

3.1.2 Repairing [illegible]



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.

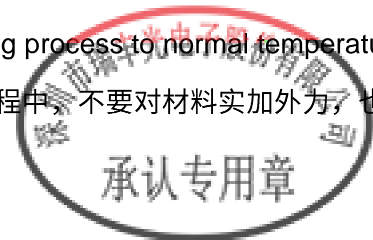
LED [illegible] LED本身的特性。

3.1.3 Cautions 注意事项

(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封装胶为硅胶，表面较软，用力按压胶体表面会影响LED可靠性，因此应有预防措施避免在按压器件，当使用吸嘴时，胶体表面的压力应是恰当的。

(2) Components should not be mounted on warped (non coplanar) portion of PCB. After soldering, do not warp the circuit board.LED 灯珠不要焊接在弯曲的 PCB 板上，焊接之后，也不要弯折线路板。

(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.回流焊之后冷却过程中，不要对材料实加外力，也不要有震动，回流焊后，不要采用激剧冷却的方式。

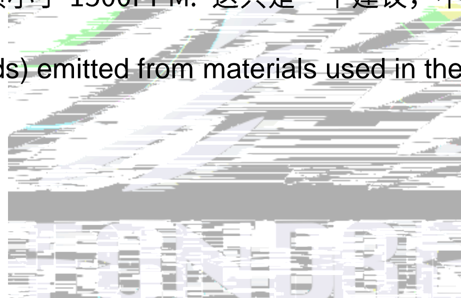


4. Handling Precautions 产品使用注意事项

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 工作环境及与 LED 适配的材料中硫元素及化合物成份不可超过 100PPM.这只是一个建议，不作任何品质担保。

(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 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.为了防止外界物质进入 LED 内部以造成 LED 的损伤，所处环境及所用套件等等，单一的溴元素含量要求小于 900PPM，单一氯元素含量要求小于 900PPM，溴元素与氯元素总含量必须小于 1500PPM. 这只是一个建议，不作任何品质担保。



(3) VOCs (Volatile organic compounds) emitted from materials used in the construction of fixtures can penetrate silicone encapsulants

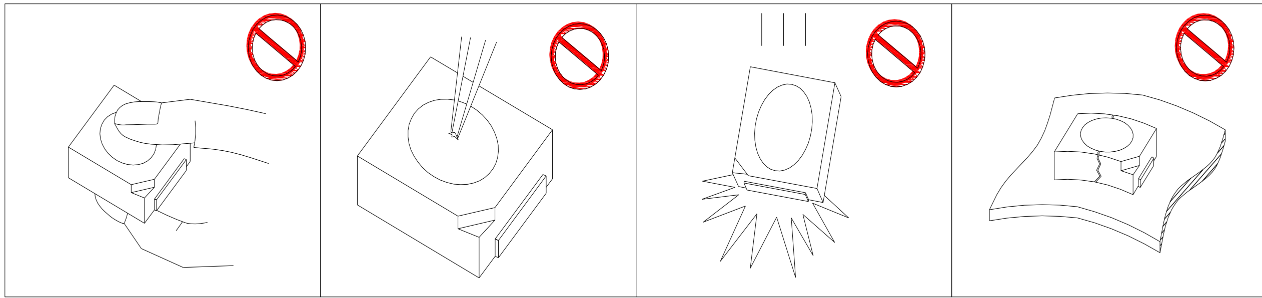


Fig 4-1Handling Precautions 产品使用注意事项

(5) In designing a circuit,the current through each LED can not exceed the absolute maximum rating specified for each LED.In the 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. 设计电路时，通过 LED 的电流不能超过规定的最大值，同时，还需使用保护电阻，否则，微小的电压变化将会引起较大电流变化，可能导致产品损毁，电路设计必须保证只有在开启或者关闭的时候出现正向电压的变化，不要施加反压，否则会损坏 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 容易因为自身的发热和环境的温度改变而改变，温度升高会降低 LED 发光效率，影响发光颜色，所以在设计时应充分考虑散热问题。

(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. 与其他封装胶相比，硅胶通常较软，表面易吸附脏物，应用时应特别注意，当对产品洁净度要求较高时，回流焊以后需要采用恰当的清洗方式，我们推荐用异丙醇作清洗剂，如需要用到其他清洗剂，必须保证不会破坏封装体，超声清洗可能会对 LED 带来损害，不推荐这种清洗方式。

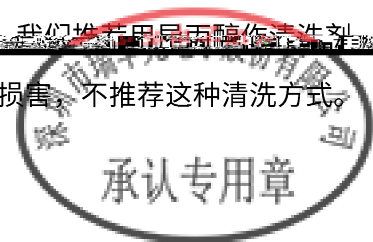


Table 4-1Storage 储存

Conditions 种类		Temperature	Humidity 湿度	Time 时间
Storage 储存	Before Opening Aluminum Bag 拆包前	≤30℃	≤75%	Within 1 Year From Date
	After Opening Aluminum Bag 拆包后	≤30℃	≤60%	Recommended for use within 24 hours 建议24小时内使用
Baking 烘烤		60±5℃	-	≥24hours 大于24小时

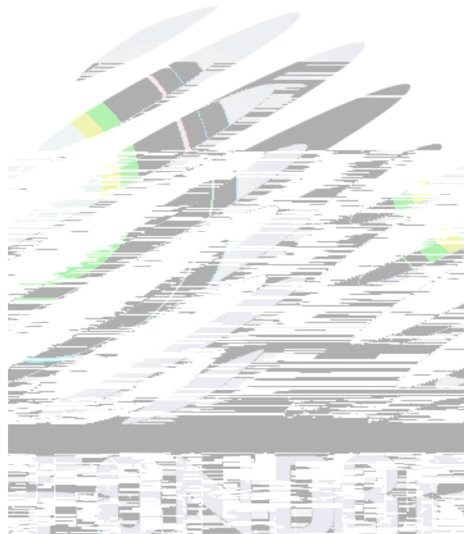
(8) If the moisture absorbent material（silica gel）has faded away or the LEDs have exceeded the storage time,baking treatment should be performed after unpacking and based on the following condition(60±5)℃ for above 24 hours.如果干燥剂或包装失效，或者产品不符合以上存储储存条件，需拆包后进行烘烤，烘烤条件为：60±5℃，大于 24 小时。

If the package is flatulence or damaged,please notify the sales staff to assist.如果包装胀气或者破损，请通知销售人员协助处理。

(9)Similar to most Solid state devices; LEDs are sensitive to Electro-Static Discharge (ESD) and Electrical Over Stress (EOS). 像其他的半导体电子器件一样，LED 对静电过流击穿非常敏感，需要做好防护。

(10) Other points for attention, please refer to our relevant information.其它注意事项请参照瑞丰相关资料。

Date日期	Revisor修订者	Version版本	Verifier审核	Remarks备注
2023/02/02	陈炜雄 Chen weixiong	E0	朱益明 Zhu Yiming	新发行



Declare