Specification
规格书

Customer name : _____
客户名称

Customer P/N : _____
客户品号

Refond P/N : RE35S9-IRB-FR
公司型号

Sending Date: _____
供货日期

■Technical Reference 技术参考			☐Sample 样品		☐Mass Product 量产供货
Client approval 客户审核			**Refond approval** 瑞丰审核		
Approval 核准	**Audit** 确认		**Approval** 核准	**Audit** 确认	**Confirmation** 制作
☐Qualified 接受	☐Disqualified 不接受		**Date ：** 日期：		

Address: 1-8th Floor, Building #1,10th Industrial Zone, Tian Liao Community, Gong Ming Area, Guang Ming New District, Shenzhen, China.
地址： 深圳市光明新区公明办事处田寮社区第十工业区 1 栋一至八楼
Tel/电话：0755-66839118 Fax/传真： 0755-66839300 Web/网址： www.refond.com

注：1. This specification is written both in English and in Chinese and the latter is formal.此规格书以中英文方式书写，若有冲突以中文版本为准.

2. Both the customers and Refond will agree on official specifications of supplied products before a customer’ s volume production. The specification is valid only after be signed. And Refond reserves the right to further modify the specification for technical reference and sample without noticing the customers 在量产供货前，瑞丰需与客户签署一份正式的产品规格书并各自备份。规格书签核后方有效，对于作为技术参考以及送样时提供的规格书，瑞丰保留进一步修改而不需通知客户的权力。

3. Consult Refond’ s sales staff in advance for information on the applications in which exceptional quality and reliability are required. 如产品需要用在有特殊质量要求及可靠性要求的地方，请提前咨询瑞丰的销售人员以取得相关信息。

4.The customer shall not disassemble or analyse the LEDs without having consent from Refond. When defective LEDs are found, the customer shall inform Refond in writing directly before disassembling or analysis.在取得瑞丰的同意前，客户不应该对产品进行拆解分析，如发现失效产品，请直接书面通知瑞丰。

REFOND IR LED
RE35S9-IRB-FR

产品描述 Product description

本产品采用 EMC Molding 封装结构, 具有发光角度大, 可靠性高. 广泛运用于各类安防监控和传感器的电子产品中， 如 CCB 摄像机，监视系统，红外相机，机器视觉系统。

This product uses the EMC Molding package, it has a wide viewing angle, high reliability. it also be widely application for security monitoring and sensor, Such as CCB cameras，Surveillance systems ，Infrared Illumination for cameras and Machine vision systems.

产品特征

- 产品尺寸(mm)：3.50×3.50×2.30mm
- 半角±45°
- 高可靠性
- 低电压
- 峰值波长850nm
- 无铅回流焊
- 符合RoHS
- 包装：每卷500pcs
- 防潮等级：MSL1

Features

- The product size(mm): 3.50×3.50×2.30mm
- Half angle:±45deg
- High reliability
- Low forward voltage
- Peak wavelength λp=850nm
- Pb-free reflow soldering application
- RoHS compliant、
- Package:500pcs/reel
- Moisture Sensitive Level:Level 1

产品运用

- CCB摄像机
- 监视系统
- 红外相机
- 机器视觉系统

Applications

- CCB cameras
- Surveillance systems
- Infrared Illumination for cameras
- Machine vision systems

极限参数(温度=25°C)　　Absolute Maximum Ratings (Ta = 25°C)

参数名称 Parameter	符号 Symbol	极限参数 Absolute Maximum Rating	单位 Unit
正向电流 Forward Current	I_F	1000	mA
反向电压 Reverse Voltage	VR	5	V
工作温度 Operating Temperature	T_{OPR}	-40 ~ +85	℃
贮存温度 Storage Temperature	T_{stg}	-40 ~ +100	℃
功耗 Power Dissipation	P_D	1.8	W
静电放电(人体模式) Electrostatic Discharge (HBM)	ESD	2000	V

光电参数（温度=25°C）　Typical Electrical & Optical Characteristics (Ta = 25°C)

参数名称 Parameter	符号 Symbol	条件 Condition	参数 Value			单位 Unit
			Min	Max	Typ	
反向电流(最大) Reverse Current(max.)	I_R	V_R = 5V	---	10	---	μA
正向电压 Forward Voltage	V_F	I_F = 1000mA	1.4	2.2	1.8	V
峰波长 Peak Wavelength	λ_p	I_F = 1000mA	840	---	850	nm
半波宽 Spectrum Radiation Bandwidth	Δ λ	I_F = 1000mA	---	---	35	nm
辐射功率 Total radiant flux	Φe	I_F = 1000mA	800	---	950	mW
辐射强度 Radiant Intensity	I e	I_F = 1000mA	550	---	700	mW/sr
半角 Half Angle	φ	I_F = 1000mA	±45			deg

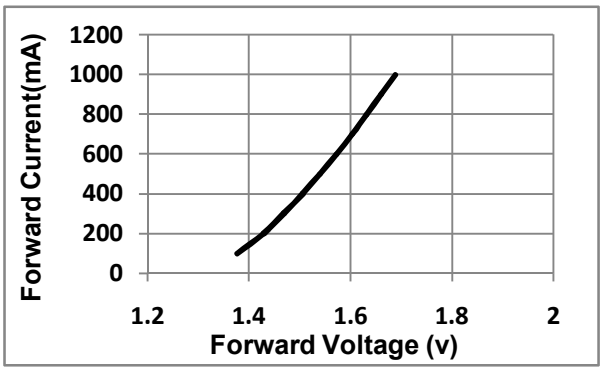
备注　note

1. 辐射功率/强度测量公差 :±10%　　Tolerance of measurement of Total radiant flux/ Radiant Intensity :±10%.
2. 波长测量公差　　：　±2nm　　Tolerance of measurement of dominant wavelength: ±2nm.
3. 正向电压测量公差　：　±0.05V　　Tolerance of measurement of forward voltage±0.05V.
4. 以上参数仅供参考,请以实物标签为准　　All the datas are just for reference, specific parameters please refer to the label.

典型特性曲线 Typical Characteristics Curves

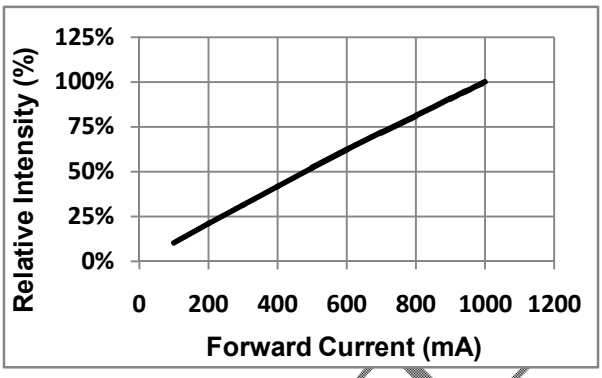
伏安特性曲线

Forward Voltage Vs. Forward Current



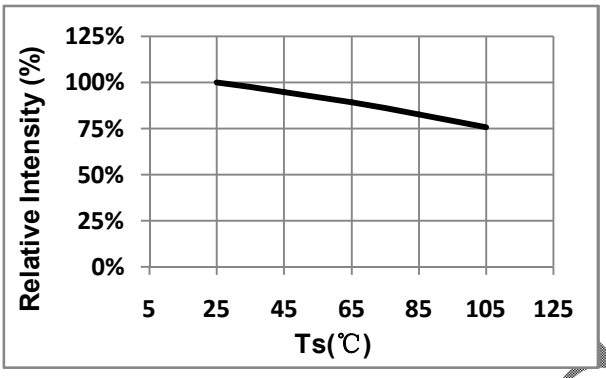
正向电流与相对强度特性曲线

Forward Current Vs. Relative Intensity



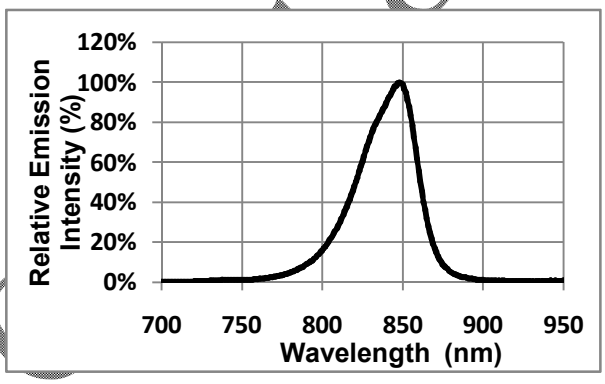
焊盘温度与相对强度特性曲线

Ts Temperature Vs. Relative Intensity



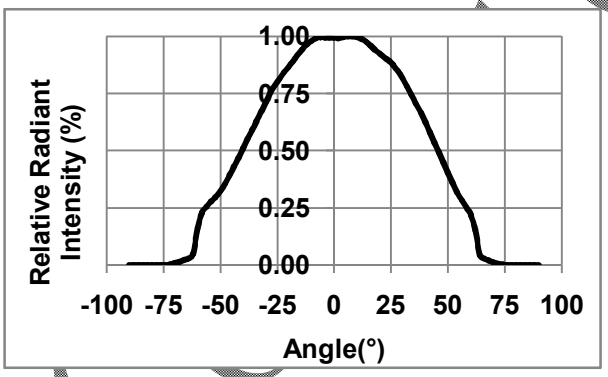
光谱分布特性曲线

Spectrum Distributio



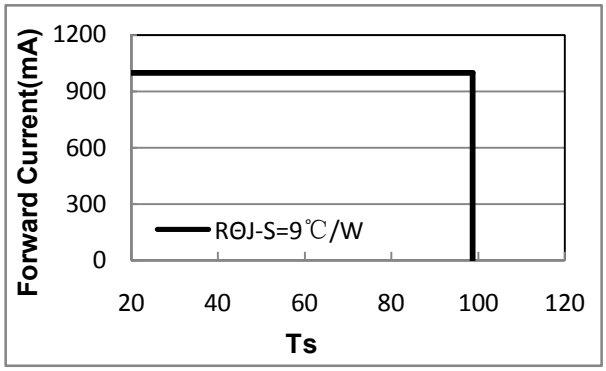
热阻特性曲线

Radiation diagram



热阻特性曲线

Driving Forward DC Current vs. Ts Temperature



备注: Note:

1. 所有测试都是基于瑞丰现有的标准测试平台.
   All measurements were made under the standardized environment of Refond.
2. 降额等级基于最大结温Tj 115℃.
   De-Rating based on Tj(max)=115℃.

可靠性试验 Reliability Test Items Conditions

实验项目 Test Items	参考标准 reference Criterion	实验条件 Test Conditions	时间 Time	样品数 Quantity	判定 Criterion
高温储存 High Temperature Storage	JESD22-A103	Ta=100°C	1000H	11	0/11
低温储存 Low Temperature Storage	JESD22-A119	Ta=-40°C	1000H	11	0/11
常温寿命测试 Room Temperature Operating Life	JESD22-A108	Ta=25°C, IF=1000mA	1000H	11	0/11
高温高湿寿命测试 High Temperature High Humidity Life Test	JESD22-A101	Ta=85°C,RH=85% IF=1000mA	1000H	11	0/11
冷热冲击 Thermal Shock	JESD22-A104	-40°C(15min)←→100°C(15 min)	300 cycles	11	0/11
温度循环 Temperature Cycle	JESD22-A104	-40°C(30min)←(5min)→100 °C(30min)	300 cycles	11	0/11
耐焊接热 Resistance to Soldering Heat	JESD22-B106	Tsld=260℃,10sec	3 times	11	0/11

HALT 试验 HALT Test Items Condition

连续试验顺序：低温阶梯应力→高温阶梯应力→快速温变循环→振动阶梯应力→快速温变循环和振动复合应力

实验项目 Test Items	实验条件 Test Conditions	时间 Time	样品数 Quantity	判定 Criterion
低温阶梯应力测试 Low Temperature Step Stress Test	20°C →60°C/min, -5°C/Step, 10 min/ Step→ -70°C ,IF=1000mA	1 times	32	0/32
高温阶梯应力测试 High Temperature Step Stress Test	30°C →60°C/min, +5°C/Step, 10 min/ Step→ 90°C ,IF=1000mA	1 times		
快速温变循环测试 Rapid Thermal Transition Stress Test	-65°C←40°C/min, 10 min/ Step→85°C ,IF=1000mA	10 cycles		
振动阶梯应力测试 Vibration Step Stress Test	Ta=25°C, 5Grms←5Grms/step, 10 min/ Step→85°C ,IF=1000mA	1 times		
快速温变循环和振动复合应力测试 Combined Thermal Transition Cycling&Vibration Stress Test	5Grms←5Grms/step→85°C -65°C←30°C/min, 10 min/ Step→85°C, IF=1000mA	9 cycles		

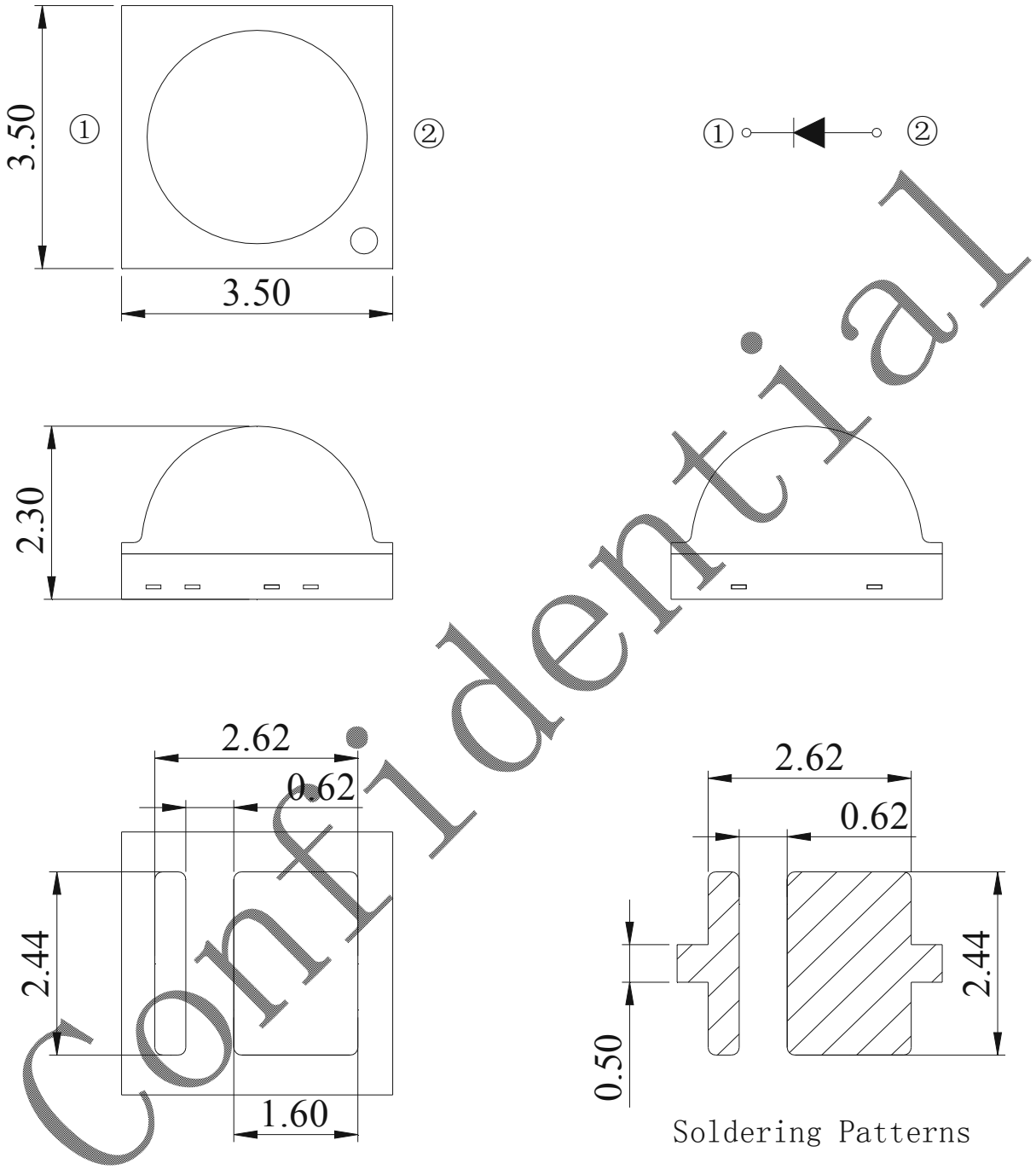
HALT试验为连续试验，试验项目顺序是由上至下。
The HALT test is continuous, the order of test project is from top to bottom.

失效判断标准 Criteria for Judgment

测试项目 Test Items	符号 Symbol	测试条件 Test Conditions	判定标准 Criteria for Acceptance
正向电压 Forward Voltage	V_F	IF =1000mA	初始值±10% Initial Data±10%
反向电流 Reverse Current	I_R	VR=5V	IR≤10μA
辐射功率 Total radiant flux	Φe	IF=1000mA	平均 Φe 衰减≤30% Average Φe degradation rate≤30%

数据工作表中所示的技术信息仅限于典型特征和电路实例引用的产品.它既不构成工业特性的保证,也不构成任何许可的授权。
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.

外型尺寸 Outline Dimension

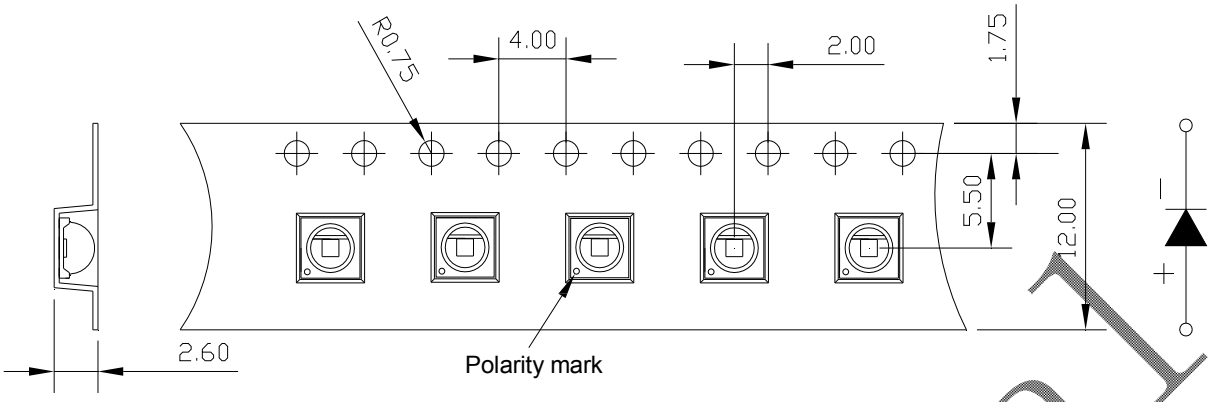


备注: 所有尺寸单位均为 mm,如无特殊说明误差范围为±0.02mm.

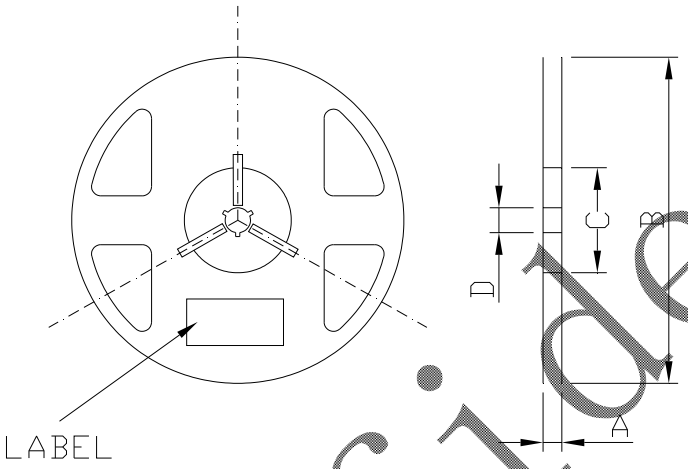
Note: All dimensions in mm ,tolerance is ±0.02mm unless otherwise noted.

包装规格 Packaging Specifications

载体尺寸 Carrier Tape Dimensions



卷材尺寸 Reel Dimension



A	13.5±1mm
B	178±1mm
C	60±1mm
D	13.3±0.5mm

备注 Note:

- 标注公差为±0.1毫米，单位：毫米。The tolerances unless mentioned ±0.1mm. Unit : mm

标签格式规范 Label Form Specification

PART NO.
SPEC NO.
LOT NO.

BIN CODE:
ΦE:
VF:

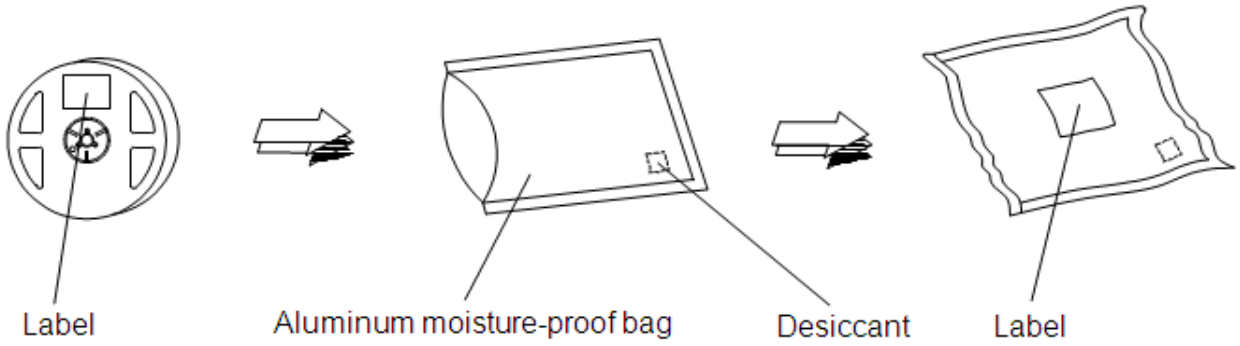
WLP:

QTY:

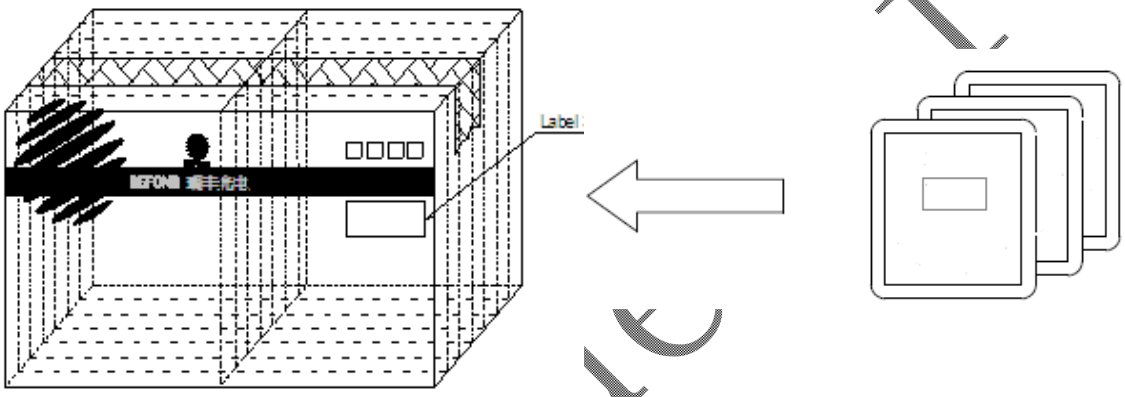
DATE:

PART NO.	Part Number
SPEC NO.	Spec Number
LOT NO.	Lot Number
BIN CODE	Bin Code
Φe	Total radiant flux
WLP	Peak Wavelength
VF	Forward Voltage
QTY	Packing Quantity
DATE	Made Date

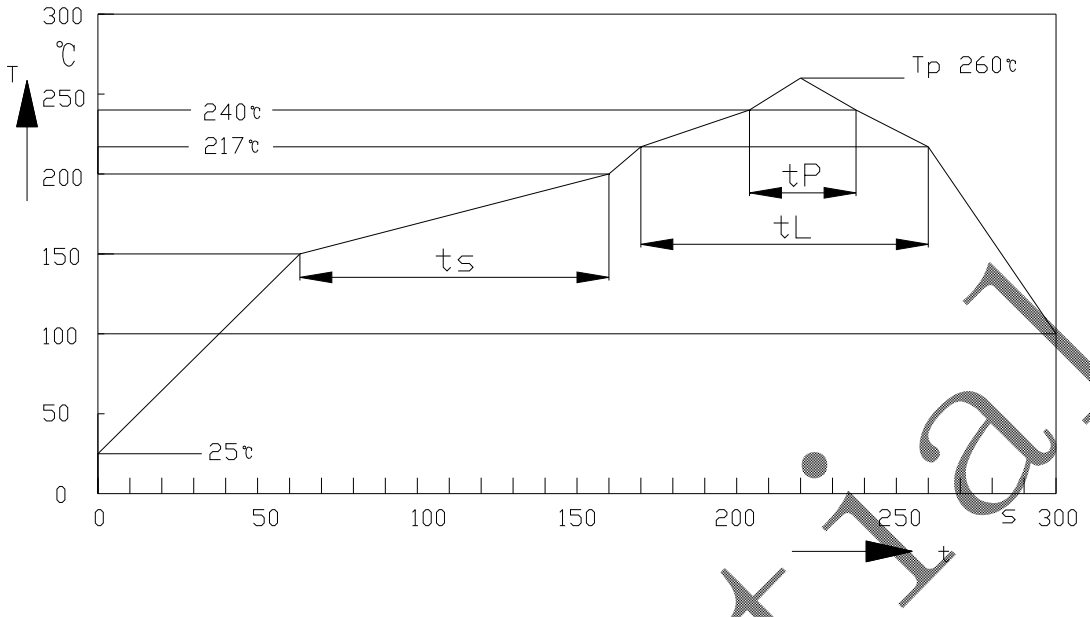
防潮包装过程 Moisture Resistant Packing Process



装箱 Cardboard Box



SMT 回流焊说明 SMT Reflow Soldering Instructions



Profile Feature	符号 Symbol	无铅锡膏 Pb-Free(SnAgCu)Assembly			单位 Unit
		Min	Tpy	Max	
平均升温速度（Tsmax 至 Tp） Ramp-up rate to preheat (25℃ to 150℃)			2	3	℃/s
预热：时间（tsmin 至 tsmax） Time ts (Tsmin to Tsmax)	ts	60	100	120	s
Tsmax升至峰值温度的速度 Ramp-up rate to peak (Tsmax to Tp)			2		℃/s
限时维持高温：温度 (TL) Liquidus temperature	TL	217	℃		℃
限时维持高温：时间 (tL) Time above liquidus temperature	tL		80	100	s
峰值 / 分类温度 (Tp) Peak temperature	Tp		245	260	℃/s
与实际峰值温度(tp)相差 5 °C 以内的保持时间 Time within 5℃ of the specified peak temperature Tp-5℃	tP	10	20	30	s
降温速度 Ramp-down rate（Tp to 100℃）			3	6	℃/s
降温速度 Time（25℃ toTp）				480	s

1. 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。
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. 当焊接时,不要在材料受热时用力压胶体表面。
When soldering , do not put stress on the LEDs during heating.

烙铁焊接 Soldering Iron

1. 当手工焊接时，烙铁的温度必须小于300℃，时间不可超过3秒。
   When hand soldering, keep the temperature of iron below less 300℃ less than 3 seconds.
2. 手工焊接只可焊接一次。
   The hand solder should be done only one time.

修补 Repairing

LED回流焊后不应该修复，当修复是不可避免时，必须使用双头烙铁，但必须事先确认此种方式会或不会损坏LED本身的特性。

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.

注意事项 Cautions

LED封装为硅胶，故LED胶体表面较软，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封装的零件上的强大压力，当使用吸嘴时，胶体表面的压力应是恰当的。

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.

使用注意事项 Using Guide

1. 贮存 Storage

- 本产使用密封防潮抗静电袋包装,并附有干燥剂,未开封的产品保存时间一年.
  Moisture proof and anti-electrostatic package with moisture absorbent material is used, Packaged products have one year to save time.
- 开封前,产品须存放在温度不高于30℃,湿度不高于60%RH的环境中.
  Before opening the package, the product should be kept at30℃ or less and humidity less the60%RH.
- 密封防静电袋内的湿度卡应在打开袋子后立即查看袋内的湿度指示卡来确定,湿度显示小于或等于30%时,使用前须进行烘烤.
  Seal anti-electrostatic bag humidity card should immediately check bag humidity indicator card in the open the bag after, Humidity is less than or equal to 30%, Must be baked before use
- 开封后,产品必须24小时内使用完(建议工作环境温度不高于30℃,湿度不高于60%),如未使用完,余料须存放在温度不高于30℃,湿度不高于10%的环境中.
  After opening the package, the product should be soldered within 24 hours. If not, please store at 30℃or less and humidity less than 10%RH. It is recommended that the product be operated at the workshop condition of 30℃ or less and humidity less than 60%RH.
- 对于尚未焊接的LED,如果吸湿剂或包装失效,或者产品没有符合以上有效存储条件,烘烤可以起到一定的性能恢复效果.
  烘烤条件:65±5℃,持续时间24H.
  If the moisture absorbent material has fade away or the LEDs have exceeded the storage time, baking treatment should be performed based on the following condition : 65±5℃ for 24 hours.

2. 静电 Static Electricity

以下操作可降低静电破坏的可能性

The following procedures may decrease the possibility of ESD damage.

- 将产品和外界之间的摩擦减到最低以避免静电产生.
  Minimize friction between the product and surroundings to avoid static buildup.
- 所有的产品设备和测试仪器必须接地.
  All production machinery and test instruments must be electrically grounded.
- 操作人员必须配戴静电环.
  Operators must wear anti-static bracelets.
- 进入带电设备工作区域时需穿防静电服.
  Wear anti-static suit when entering work areas with conductive machinery.
- 所有操作 IC 和 ESD 敏感器件元器件的工作台必须保持低于 150V 的静电保护.
  All workstations that handle IC and ESD-sensitive components must maintain an electrostatic potential of 150V or less.

3. 反压保护 Reverse voltage protection

通常 LED 的反向漏电流都会很小,不会影响正常使用. 如果长期遭受超过其所能承受的反向电压冲击时,LED 会损伤, 反向漏电流会迅速变大,引起显示屏零灰度下串光的发生. 在设计中, 要注意控制反向电压, 建议加在 LED 上的反向电压值不超过 10V.

In generally the reverse current of LED is very small, it can't effect using the component normally, but when it often suffered the reverse voltage which exceed the limits of the component than it will be damaged, the reverse current increases rapidly causing the string light display gray scale so when designing, please pay attention to control the reverse voltage we suggest the reverse voltage less than 10V.

4. 温度保护 The safe temperature for LEDs working

LED 在高温条件下, 衰减会加速,本身应力也会增大, 若长期处于高温环境下, 极容易出现失效. 对于高密度排列使用的情况,建议在使用过程中灯面温度不超过 55℃, 灯脚温度不超过 75℃.

The high temperature will make the LED's Luminous Intensity deceased radically, if LEDs worked in hot environment for a long time, they will be disabled easily. When LEDs are working in a closed array, we suggest that the LED's surface temperature should be lower than 55℃ and the leg's temperature should be lower than75℃.

5. 其它事项 Others

请勿直接触摸或操作硅胶透镜表面，这可能会损坏内部的电路, 拿取时用镊子或合适的工具夹在元件的侧边

Do not directly touch or handle the silicone lens surface. It may damage the internal circuitry. Handle the component along the side surfaces by using forceps or appropriate tools.