# SPECIFICATION
# 产品规格书

REFOND P/N 产品型号

RF-W1SA35IS-A40

□R&D 研发

■Mass Product 量产供货

深圳市瑞丰光电子股份有限公司 承认专用章



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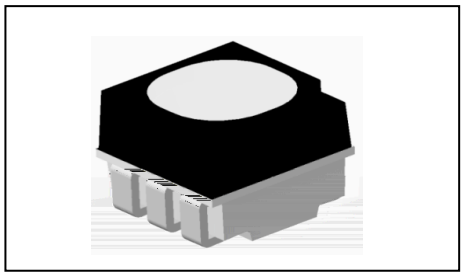
# 1. Description 产品介绍

## 1.1 General Description 产品描述



The product is a full-color LED device, High contrast(Surface brush design ). The product size: 3.7mmX3.5mmX2.8mm.

该产品为全彩 LED 器件，高对比度(表面刷墨设计)，产品尺寸: 3.7mmX3.5mmX2.8mm。

## 1.2 Features 产品特征

Extremely wide viewing angle. 发光角度大

High luminous Intensity, Low power dissipation, Good reliability and Long life.
光强高、功耗低、可靠性好、寿命长

Water-resistant (IPX6). 防水等级(IPX6)

Moisture sensitivity level: 5a. 潮湿敏感等级:5a

RoHS compliant. 满足RoHS要求

Matte surface. 哑光表面

Pb-free reflow soldering application. 无铅回流焊

## 1.3 Application 产品应用

Outdoor full-color video screen. 户外全彩显示屏

Indoor and outdoor decorative lighting. 室内外装饰照明

Amusement. 娱乐产品

General use. 其他应用

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## 1.4 Package Dimension 封装尺寸

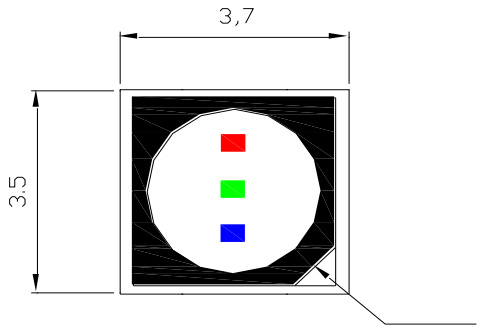


Fig.1-1 Top view 正面视图

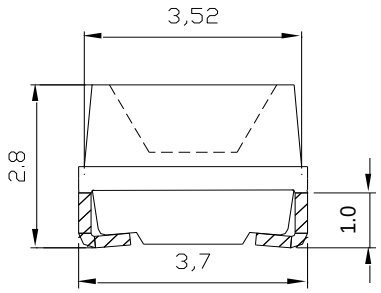


Fig.1-2 Side view 侧面视图

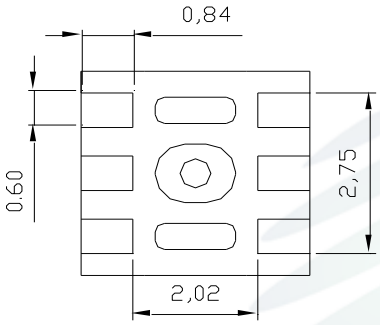


Fig.1-3 Bottom view 背面视图

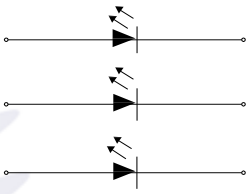

Fig.1-4 Polarity 极性

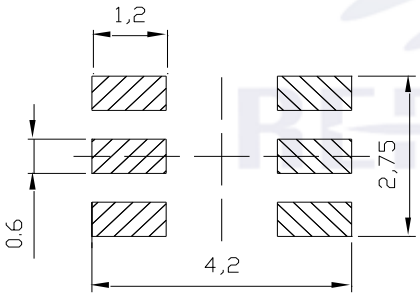


Fig.1-5 Soldering pattern 推荐焊盘

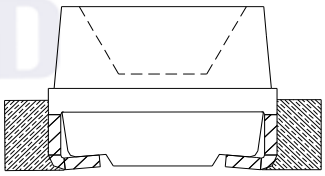

Fig.1-6 Glue filling 灌胶

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 ±0.1mm unless otherwise noted.除特别标注外，所有尺寸公差为±0.1 毫米
3. Recommendation for glue filling: filling height must be higher than or equal to 1.2 mm. 灌胶建议：灌胶高度必须大于等于 1.2 mm


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## 1.5 Product Parameters 产品参数

Table 1-1 Electrical / Optical Characteristics at Ts=25°C 电性与光学特性

| Item 项目 | Symbol 符号 | Test Condition 测试条件 | Value | Unit 单位 |
|---|---|---|---|---|


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Notes 备注：

1. The above forward voltage measurement allowance tolerance is ±0.1V. 上述电压的测试公差范围 ±0.1V。

2. The above Tolerance of measurement of dominant wavelength ±1nm. 上述波长的测试公差范围 ±1nm。

3. The above luminous intensity measurement allowance tolerance ±10%. 上述发光强度的测试公差范围±10%

4. Care is to be taken that power dissipation does not exceed the absolute maximum rating of the product. 使用功率不能超过规定的最大额定值。

5. All measurements were made under the standardized environment of Refond. 所有测试都是基于瑞丰现有的标准测试平台。

6. Luminous intensity range is for reference only,specific parameters please refer to the label. 发光强度范围仅供参考,请以实物标签为准。

## 1.6 Typical optical characteristics curves 典型光学特性曲线

Fig 1-6 Forward Voltage Vs. Forward Current 伏安特性曲线


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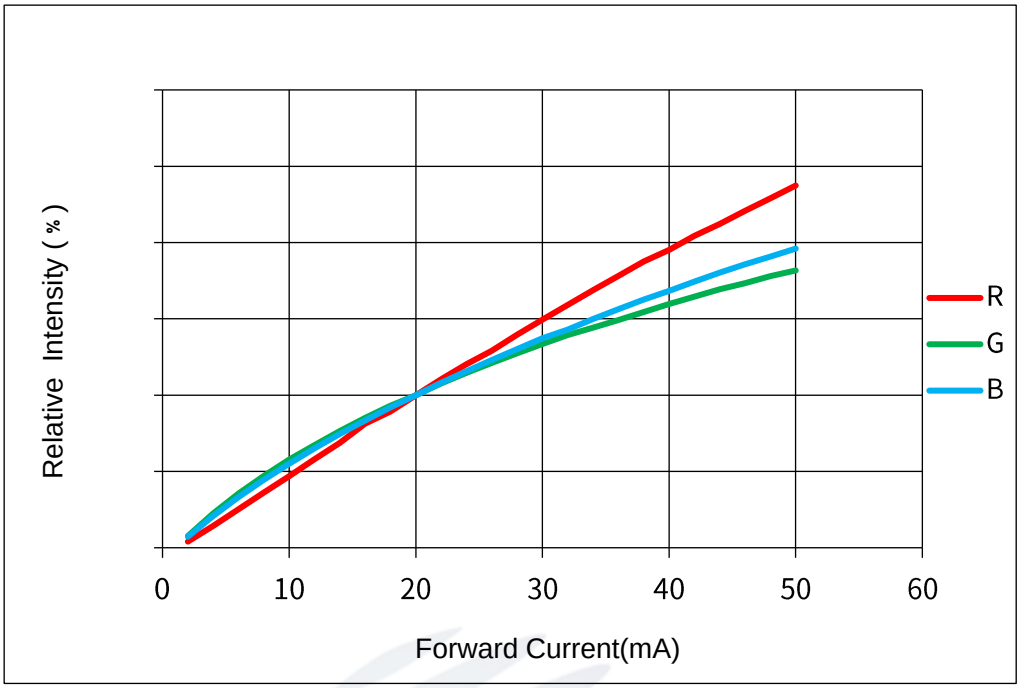


Fig 1-7 Forward Current Vs. Relative Intensity 正向电流与相对光强特性曲线

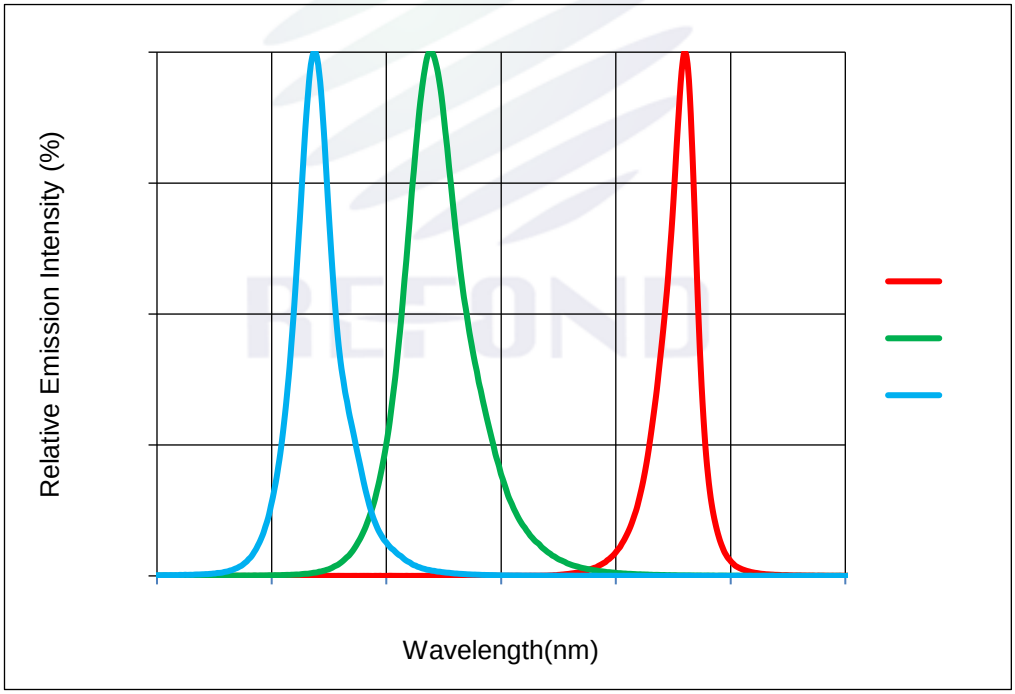


Fig 1-8 Luminous Intensity VS Ambient Temperature 相对光强与环境温度曲线

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Fig 1-9 Solder Temperature Vs Forward Current 管脚温度与正向电流特性曲

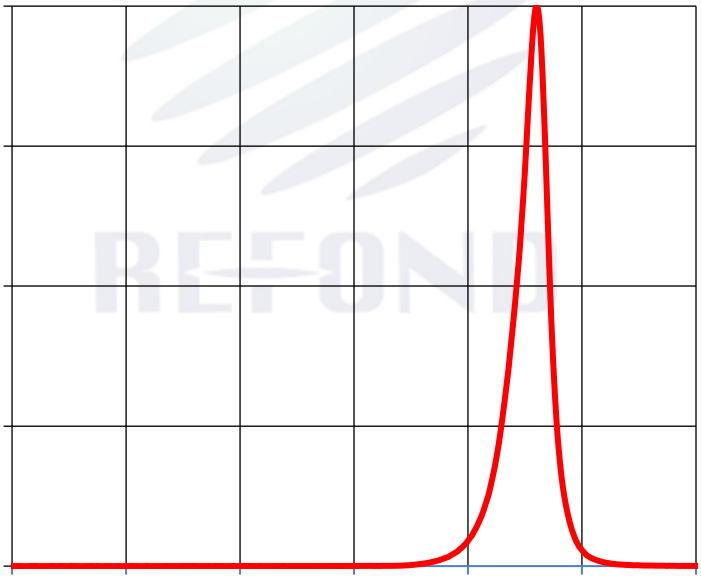

Fig 1-10 Spectrum Distribution光谱分布特性曲线


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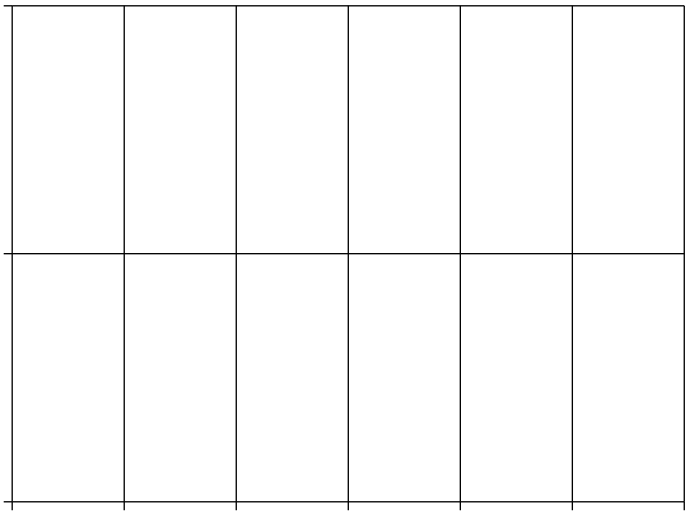

Fig 1-11 Directivity X-X radiation angle X轴方向辐射角度

Fig 1-12 Directivity Y-Y radiation angle Y轴方向辐射角度

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# 2. Packaging 产品包装

## 2.1 Packaging Specification 包装规格

Package:4000pcs/reel.包装每卷 4000pcs。

### 2.1.1 Carrier Tape Dimension 载带尺寸

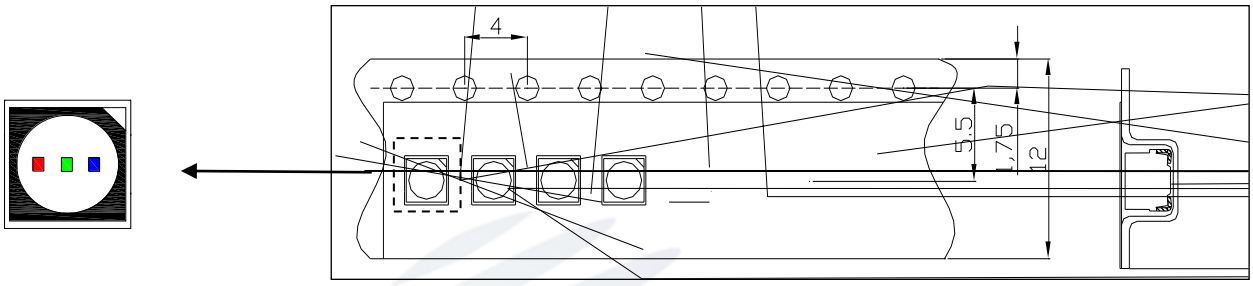


Fig.2-1 Carrier Tape Dimension 载带尺寸

### 2.1.2 Reel Dimension 卷盘尺寸

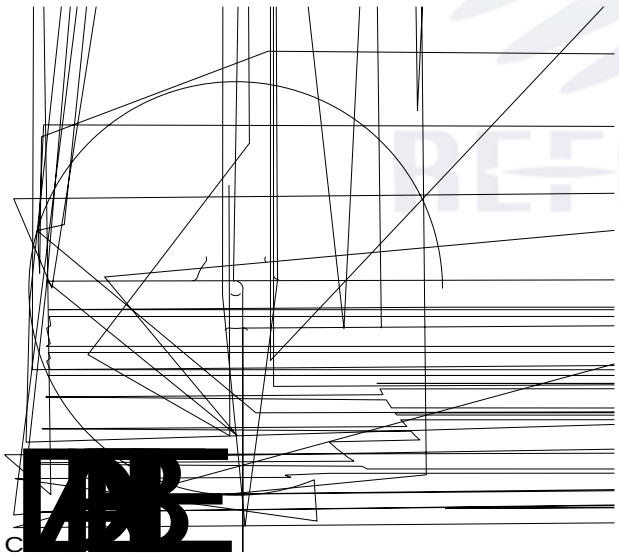

Fig.2-2 Reel 卷盘

Table 2-1 Dimension 描述

| | |
|---|---|
| A | 400±2mm |
| B | 100.0±0.4mm |
| C | 14.3±0.3mm |
| D | 2.6±0.2mm |
| E | 16.4±0.3mm |
| F | 12.7 + 0.8/-0.3 mm |
| T | 1.9±0.2mm |

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。


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### 2.1.3 Label Form Specification 标签规格

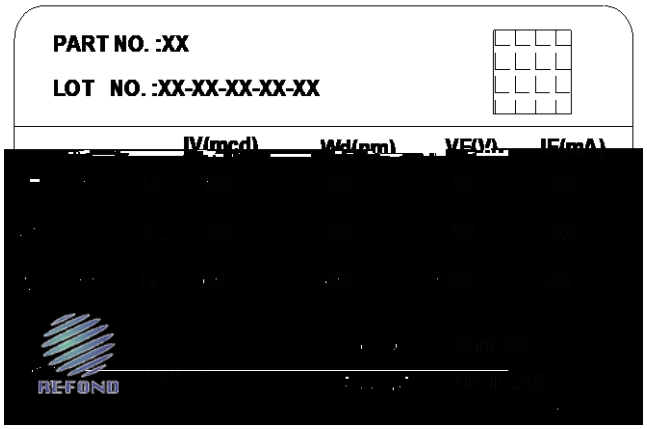


Fig 2-3 Label 标签

Table 2-2 Description 描述

| | |
|---|---|
| PART NO. | Part Number 品名 |
| LOT NO. | Lot Number + Packing Machine No. + Serial Number +BIN No. + Quantity (K)<br>批次号 +包装机台号+流水号+BIN 号+数量（K） |
| IV | Llight intensity 光强 |
| VF | Forward Voltage 正向电压 |
| Wd | Wavelength 波长代码 |
| IF | Forward current 正向电流 |
| QTY | Packing Quantity 数量 |
| DATE | Made Date 生产日期 |

## 2.2 Moisture Resistant Packing 防潮包装

Fig.2-4 Pack

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## 2.3 Cardboard Box 包装纸箱

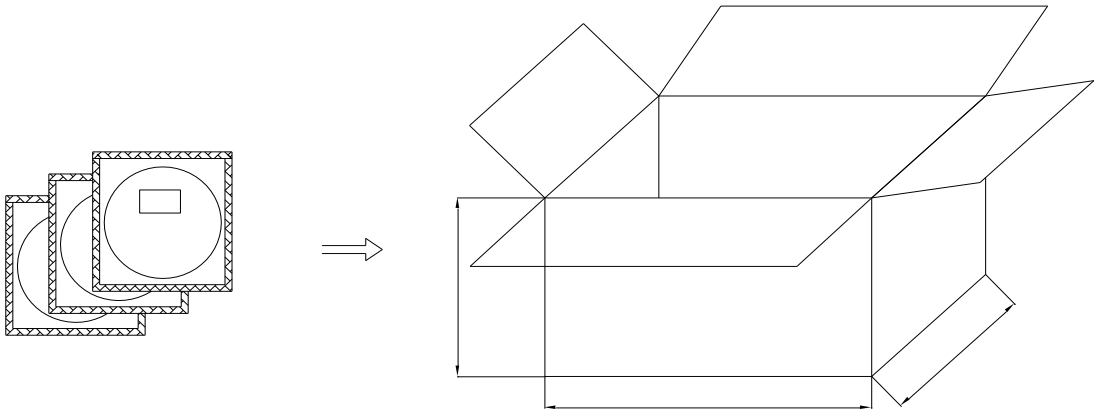

Fig.2-5 Box

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

Table 2-3 Reliability Condition 可靠性条件

| Test Items<br>项目 | Ref.Standard<br>参考标准 | Test Condition<br>测试条件 | Time<br>时间 | Quantity<br>数量 | Ac/Re<br>接收/拒收 |
|---|---|---|---|---|---|
| Resistance to Soldering Heat<br>耐焊接热 | JESD22-B106 | Temp:260°Cmax<br>T=10 sec | 3times | 22pcs. | 0/1 |
| Thermal Shock<br>冷热冲击 | JEITAED-4701 300 307 | -40°C 15min<br>10s<br>100°C 15min | 500cycle | 22pcs. | 0/1 |
| Moisture Resistance<br>防潮性 | IPC/JEDEC J-STD-020D.1 | 1. Moisture Absorption Ta=85°C/ RH=85%/12HR<br>2. Tsol=260°C, T=10s Reflow Soldering | 3times | 22pcs. | 0/1 |
| High Temperature Storage<br>高温保存 | JEITAED-4701 200 201 | Temp:100°C | 1000hrs. | 22pcs. | 0/1 |

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| | | | | | |
|---|---|---|---|---|---|
| Low Temperature Storage<br>低温保存 | JEITA ED-4701 200 202 | Temp:-40℃ | 1000hrs. | 22pcs. | 0/1 |
| Room Temperature Operating Life<br>常温寿命测试 | JESD22-A108 | $T_A$=25℃<br>$I_F$=20mA | 1000hrs. | 22pcs. | 0/1 |
| High Temperature High Humidity Life Test<br>高温高湿寿命测试 | JESD22-A101 | 85℃/ 85%$R_H$<br>$I_F$=10mA | 500hrs. | 22pcs. | 0/1 |
| Temperature Humidity Storage<br>高温高湿储存 | JEITA ED-4701 100 103 | $T_A$=85℃<br>$R_H$=85% | 1000hrs. | 22pcs. | 0/1 |
| Low Temperature Life Test<br>低温寿命 | JESD22-A108D | $T_A$=-40°C,<br>$I_F$=20mA | 1000hrs. | 22pcs. | 0/1 |

## 2.5 Criteria For Judging Damage 失效判定标准

Table 2-4 Criteria 标准

| Test Items<br>项目 | Symbol<br>符号 | Test Condition<br>测试条件 | Criteria For Judgement<br>判定标准 |
|---|---|---|---|
| Forward Voltage<br>正向电压 | $V_F$ | $I_F$=20mA | Initial Data±10%<br>初始值±10% |
| Reverse Current<br>反向电流 | $I_R$ | $V_R$ = 5V | $I_R$ % |
| Luminous Intensity<br>光强 | $I_V$ | $I_F$=20mA | Average Iv degradation rate '<br>平均 $I_V$ 衰减＜30% |
| Material appearance<br>外观 | / | / | No internal cracks, no material between stripped, no deaded light<br>材料无内部裂痕、无剥离、无死灯 |


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Notes 备注：

1. The Reliability tests are based on Refond existing test platform. 可靠性测试基于瑞丰现有的测试标准。

2.The above reliability tests is based on the verification of a single/strip LED of Refond's existing experimentalplatform,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. SMT Reflow Soldering Instructions SMT 回流焊说明

## 3.1 SMT Reflow Soldering Instructions SMT 回流焊说明

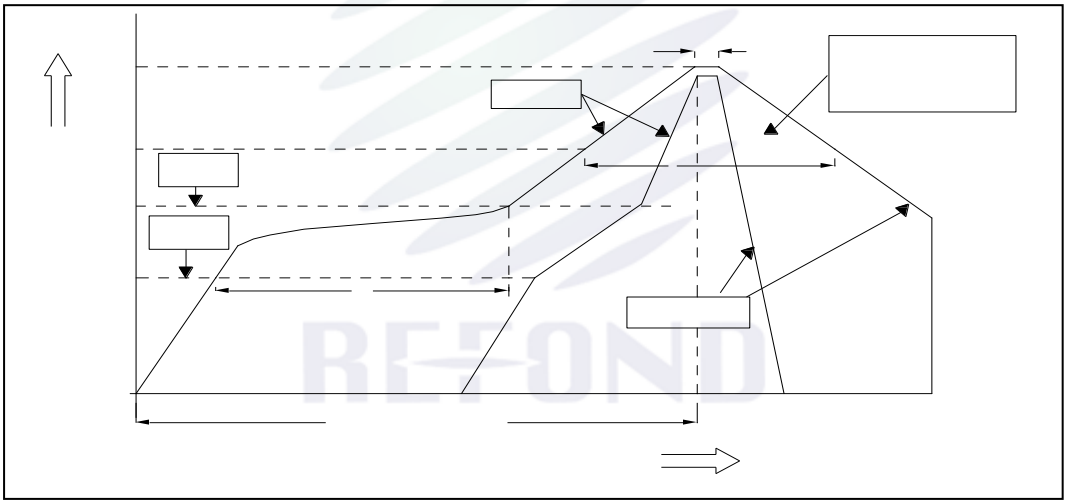

Fig.3-1 Profile


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Table 3-1 Description

| | |
|---|---|
| Average temperature rise speed平均升温速度（Tsmax至$T_P$） | Max 4 °C/ s 最高4 °C/秒 |
| 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） | 60s-120s 60 - 120秒 |
| Time limited to maintain high temperature: the temperature<br>限时维持高温：温度（$T_L$) | 217 °C |
| Time limited to maintain high temperature: The Time<br>限时维持高温：时间（$t_L$) | Max 60s 最多60秒 |
| Peak /Classification of temperature: 峰值 / 分类温度（$T_P$) | 245 °C |
| Time limit classification of peak temperature time<br>限时峰值分类温度：时间（$t_p$） | Max 10s 最多10秒 |
| Hold time within 5 °C with the actual peak temperature (TP)<br>与实际峰值温度（$T_P$）相差 5 °C 以内的保持时间 | Max 30s 最多30秒 |
| Cooling speed 降温速度 | Max 6 °C/ s 最高6 °C/秒 |
| Needed time from 25 °C to Tp<br>25 °C 升至峰值温度所需时间 | Max 8 minutes 最多8分钟 |

Notes 备注：

1.Reflow soldering should not be done more than one times.回流焊接最多只能进行一次.

2.It is recommended that use the middle temperature solder paste.推荐使用中温锡膏生产加工.

3.Stress on the LEDS should be avoided during heating in soldering process.在回流焊接过程中,不要对 LED 施加任何压力.

4.After soldering ,do not deal with the product before its temperature drop down to room temperature.在焊接完成后,待产品温度下降到室温后,再进行其它处理.

5. Nitrogen reflow soldering is recommended. Air flow soldering conditions can cause optical degradation, caused by heat or atmosphere. 建议使用氮气回流焊，在空气中焊接条件可能会因热或气体氛围而导致光学性能

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下降.

6. This product can differ in optical characteristics depending on the number of reflow cycles.In a single display, only LEDs with same number of reflow cycles should be used regardless of the applicationtype, such as rental and/or permanent installations. 本产品的光学特性可能会因回流循环次数而异，在单个显示屏中，无论使用哪种），都应仅使用回流次数相同的 类型（例如租赁或永久安装D.

7. This LED is designed to be reflow soldered on to a PCB. If dip soldered, cannot guarantee itsreliability. 此LED设计为回流焊接到PCB上，如果采用浸焊，无法保证其可靠性.

3.1.1 Soldering Iron 烙铁焊接

(1) When hand soldering, 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) The hand solder should be done only one time.手工焊接只可焊接一次。

3.1.2 Repairing 修补

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.
LED回流焊后不应该修复，当必须修复时，必须使用双头烙铁，而且事先应确认此种方式会不会损坏LED本身的特性。

3.1.3 Cleaning 清洗

The LEDs should not be cleaned with water, benzene, and/or thinner.

不应用水、苯和/或稀释剂清洗led。推荐使用酒精进行清洗，使用其它类似溶剂清洗前,请先确认使用的溶剂不会对LED造成损伤.不要使用含有“Cl” “S”元素的离子液体清洗LED表面。

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# 4.Handling Precautions 产品使用注意事项

## 4.1Handling Precautions

### 4.1.1 Storage 贮存

(1) Moisture proof and anti-electrostatic package with moisture absorbent material is used, Suggest storage time is less than 6 months.
本产品使用密封防潮抗静电袋包装,并附有干燥剂, 储存时间不要超过6个月.

(2) Storage condition: temperature ≤30℃, humidity ≤60% RH.
开封前, 产品必须储存在温度 ' ℃、相对湿度 * F 的环境里.

(3) Before opening the package, please check the package for air leaks, if there exists any air leaks, please return the product to our company for package after dehumidification by baking before your second use.
在开包装之前，请先检查包装袋有无漏气，如果有漏气现象，请退回我司重新烘烤除湿包装后再使用。

(4) After the package is opened, the product must be used in the specified environment of temperature below 30℃/humidity below 60% RH, and soldered within 12HR. Unused material must be stored in the environment of temperature below 30℃/humidity below 10% RH , These surplus products should be baked 65±5℃/24H before next use.
包装袋开启后,产品必须：在规定环境温度30℃以内、湿度60%RH以下的条件中使用；并且需要在12小时内焊接完毕；未使用完的材料需存储于温度:30℃以内，湿度:10%RH以内的环境中，下次使用前需烘烤使用，烘烤条件:65±5℃/24H。


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4.1.2 Static Electricity 静电

Static electricity and surge voltage damage the LEDs. Damaged LEDs will show some unusual characteristics such as theforward voltage becomes lower, or the LEDs do not light at the low current and even not light.All devices, equipment and machinery must be properly grounded. At the same time, it is also recommended that anti-electrostatic wrist bands, pads, uniforms, gloves or containers can be used as effective measures when dealing with the LEDs.

静电和电涌会导致产品特性发生改变，例如正向电压降低等，如果情况严重甚至会损毁产品。所以在使用时必须采取有效的防静电措施。所有相关的设备和机器都应该正确接地，同时必须采取其他防止静电和电涌的措施。使用防静电手环，防静电垫子，防静电工作服、工作鞋、手套，防静电容器，都是有效的防止静电和电涌的措施。

4.1.3 Reverse voltage protection 反压保护

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 5V.

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发光的发生。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 5V.

4.1.4 The safe temperature for LEDs working 温度保护

(1) H Y hYa dYfUh fY a U Y h Y @98 g Luminous Intensity deceased radically, if LEDs worked in hot environment for a long time, they will be disabled easily. When LEDs are working in U WcgYX UffU Y gi Yghh Uhh Y @98 g surface temperature should be lower than 55 and the Y g temperature should be lower than75 .

LED


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products in a way that the LED die temperature does not exceed the maximum junction temperature (TJ).

在设计 产品时，适当的热管理是很重要的。 芯片温度受 热阻和 在板上的间距影响。请将产品设计成 芯片温度不超过最高结温（ ）的方式。

(3) Drive current should be determined for the surrounding ambient temperature (TA) to dissipate the heat form the product.

驱动电流应根据周围环境温度（TA）来确定，以散发产品产生的热量。

4.1.5 Directionsfor Use 使用指南

(1) Duringdesigning a circuit, the current goes through each LED chipmust not exceed the Absolute Max Rating current specified for each chip.

在打开包装之前，必须检查包装袋是否完好，在设计电路时，流经每个 LED 芯片的电流不得超过为每个芯片指定的绝对最大额定电流。

(2) It is recommended that each LED chipis driven bya constant current.

建议每个 LED 芯片均由恒定电流驱动。

(3) When having the two or more dices within this product at the same time, the total power dissipation for the LED package must be within the max value specified in this specification.

当需要同时应用两个或以上的灯珠时，LED 封装的总功耗必须在此规格书指定的最大值以内。

(4) This product should be operated with forward current. Make sure the product is not subjected to either forward or revYfgY cHU Y Y h gb h b i gY" 9gdYWU 8C BCH gi VYWi hhc continuous reverse voltage because it may cause damage to theLED chip. If the display will not be used for a long time, the main power should be switched off,Dehumidification is necessary before using the screen again.

本产品应在正向电流下使用。确保产品在不使用时不承受正向或反向电压，尤其不要对它施加连续的反向电压，因为它可能会损坏 LED 芯片。如果长时间不使用显示屏，则应关闭主电源，再次使用前应先进行除湿处理。

(5) Make sure that the reverse voltage will not exceed the Absolute MaxRatingwhen using the LEDs with matrix drive. Ensure that excessive voltages such as lightning surges are not applied to the LEDs.

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在矩阵驱动的 LED 上使用时，请确保反向电压不超过绝对最大额定值。确保不要将过大的电压（例如雷电）施加到 LED 上。

(6) Aging is recommended in order todetect manufacturing and assembly defects. Particularly, make sure that excessive current and/or voltage is not applied to the LEDs. This aging should be conducted in environments where water condensation does not occur.

建议进行老化以检测制造和组装缺陷；特别要确保没有对 LED 施加过大的电流或电压。该老化应在不发生水凝结的环境中进行。

(7) when the LEDs are used in the following environments, incorporate sufficient measures into the display to prevent debris, water/moisture and gasesthat will adversely affect the product.

- where water vapor is abundant

- where water condensation is likely to occur

- where water is likely to splash onto the LEDs

- where frost is likely to form on the surface of the LEDs (e.g. freezer, ice skating rink, etc.)

- where dust, dirt, debris, loose metallic materialsand/or gases that will adversely affect the product are present

在以下环境中使用LED时，请在显示屏中采取足够的措施，以防止会对产品产生不利影响的碎屑,水分和气体。

-水蒸气丰富的地方

-可能发生水凝结的地方

-水很可能溅到LED上的地方

-LED ，溜冰场等）

(8) In areas where hydrogen sulfide, which is a sulfide-based gas, is present (e.g. hot springs and volcanicareas),and where salt is abundant (e.g. coastal areas), the life may be shortened.

沿海地区），寿命可能会缩短。

(9□K Yb dc Yf g Udd YX Zc f h Y Zfghha Y UZ Yf Xgd U g bgh U Uhcb hg ci X bch VY dc YfYX Uh

100% wattageforthe LEDs may have absorbed moisture. Before normal use of this display,operate the display at approximately 20% wattage for an initial time period.


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显示屏安装后首次通电时，因为LED[illegible]100%的功率供电。在正常使用此显示屏前，请在初始时间段内以约20%的功率运行。

(10) If the display units will be rented, those units should be selected carefully to ensure that the display as a whole will appear the same color and brightness.

如果要租借展示，则应仔细选择箱体，以确保整个显示屏的颜色和亮度相同。

(11) If the display modules are loaded onto and/or transported by ship, the moisture environment on the vessel can cause condensation; the display units should be packaged to prevent moisture absorption.

如果显示模块装在船上或由船运输，则船上潮湿的环境可能会导致冷凝；显示屏应包装好以防止吸收水分。

(12) If a display that has been, or is being, used is relocated, it is possible that degradation of the LED has occurred. When transporting this display, provide sufficient protection for the LEDs in addition to the moisture-proof packaging for the display. When this display is reinstalled, ensure to follow the installation instructions for environments and use.

如果重新搬运已经使用或正在使用的显示屏，则可能发生了LED[illegible]显示屏提供防潮包装外，还要为LED提供足够的保护。重新安装此显示屏后，请确保遵循有关环境和使用的安装说明。

4.1.6 Others 其它事项

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

请勿直接触摸或操作环氧树脂表面，这可能会损坏内部的电路，[illegible]。

(2) Do not handle the LEDs with bare hands as it will contaminate the LED surface and may affect the optical characteristics: it mightcause the LED to be deformed and/or the wire to break, which will cause the LED not to illuminate. The lead could also cause aninjury.

请勿裸手操作 LED，因为这会污染 LED 表面并可能影响光学特性：这可能会导致 LED 变形或线材断裂，从而导致 LED [illegible]。

(3) Do not stack assembled PCBs together. Otherwise, it may cause damage to the resin (e.g. cut, scratch, chip, crack, delaminationand deformation) and the wire to break causing a catastrophic failure (i.e. the LED not to illuminate).


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不要将组装好的 PCB 堆叠在一起。否则，可能会损坏树脂（例如，割伤，刮伤，碎屑，破裂，分层和变形），并且线材会断裂而导致灾难性故障（即 LED 不亮）。

(4) Other precautions, please refer to our "Ruifeng Photoelectric Full color SMD LED device User Manual".

其他注意事项,请参考我司《瑞丰光电全彩 SMD LED 器件使用手册》。

4.1.7 Declare 申明

(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 UWghca Yfg cia YdfcXi Wlcb"H YgdYWZWUhcb g UXcb UZbYf VYg bYX"5bX Refond reserves the right to further modify the specification for technical reference and sample without noticing the customers.

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Declare 申明

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