SPECIFICATION

REFOND P/N

RF-W1SA15IS-A47A

H ：

Mass Product

深圳市瑞丰光电子股份有限公司
承认专用章

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Contents

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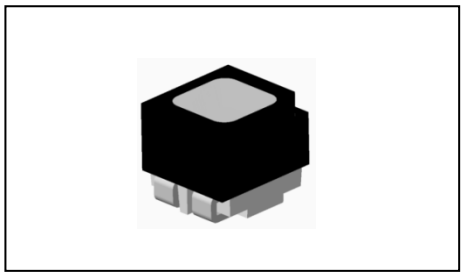
1. Description

1.1 General Description



The product is a full-color LED device, Common anode RGB SMD, High contrast (Surface brush ink technology),The product size: 1.6mmX1.7mmX1.6mm.

丰 LED RGB SMD

1.6mmX1.7mmX1.6mm

1.2 Features

Extremely wide viewing angle.

High luminous Intensity, Low power dissipation, Good reliability and Long life.

Water-resistant (IPX6). (IPX6)

Moisture sensitivity level: 5a. 5a

RoHS compliant. He

Matte surface.

Pb-free reflow soldering application.

1.3 Application

Outdoor full-color video screen.

Indoor and outdoor decorative lighting.

Amusement.

General use.

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1.5 Product Parameters

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

Item	Symbol	Test Condition	Value			Unit
			R	G	B	
Reverse Current	I_R	V_R=5V	6	6	6	
Forward Voltage	$V_{F\ (min)}$	R I_F = 10mA G I_F = 10mA B I_F = 5mA	1.7	2.5	2.5	V
	$V_{F\ (max)}$		2.4	3.3	3.3	V
Dominant Wavelength	λ_D		617~ 628	520~545	460~475	nm
			5nm per Bin	3nm per Bin	3nm per Bin	
Spectrum Radiation Bandwidth			24	38	30	nm
Luminous Intensity	$I_{V(min)}$		225	580	70	mcd
	$I_{V(avg)}$		360	925	120	mcd
	$I_{V(max)}$		575	1480	205	mcd
	BIN Range		1:1.3	1:1.3	1:1.3	
Viewing Angle	1/2		110			deg

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

Parameter	Symbol	Absolute Maximum Ratings			Unit
		R	G	B	
Forward Current	I_F	20	15	15	mA
Reverse Voltage	V_R	5	5	5	V
Operating Temperature	T_{OPR}	-30 ~ +85			
Storage Temperature	T_{STQ}	-40 ~ +100			
Power Dissipation	P_D	48	49.5	49.5	mW
mr sl argml ck ncp rspc	T_J	100	100	100	
Electrostatic Discharge (HBM)	E_{SD}	1000V			

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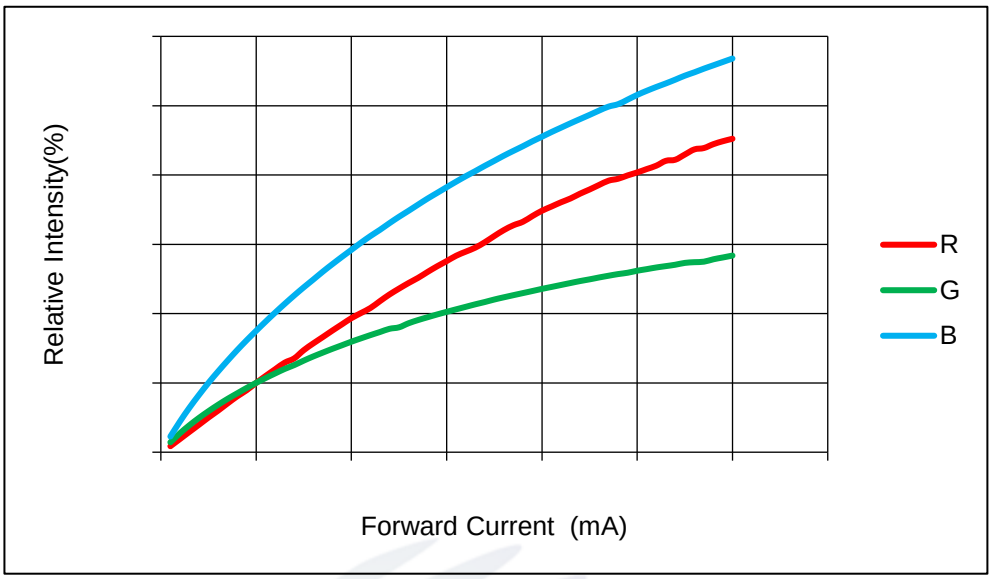

Fig 1-7 Forward Current Vs. Relative Intensity

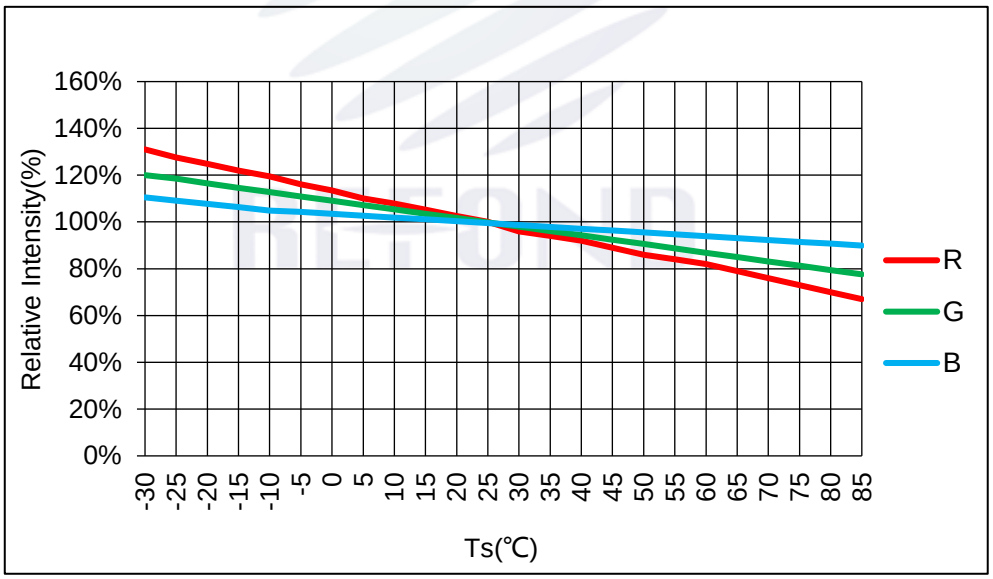

Fig 1-8 Luminous Intensity VS Ambient Temperature

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Fig 1-9 Solder Temperature Vs Forward Current

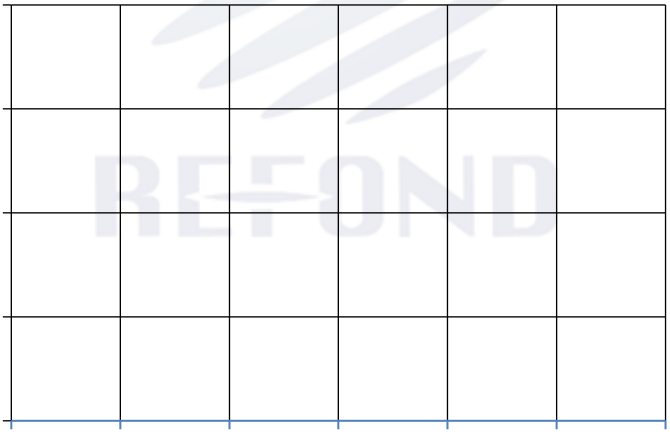

Fig 1-10 Spectrum Distribution

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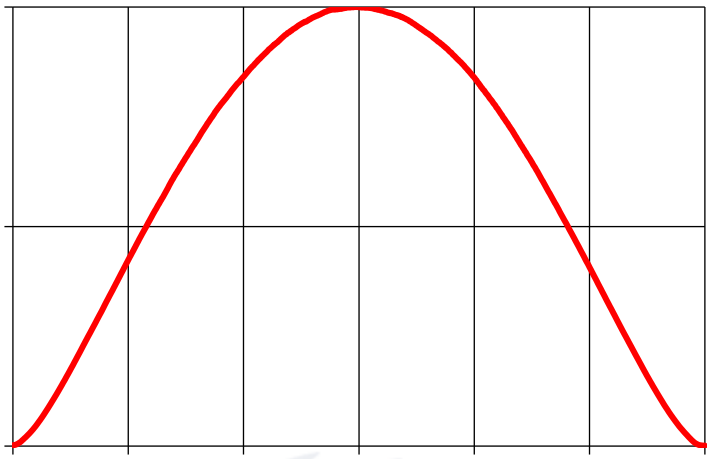

Fig 1-11 Directivity X-X radiation angle X

Fig 1-12 Directivity Y-Y radiation angle Y

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2. Packaging

2.1 Packaging Specification

Package:15500pcs/reel. 15500pcs

2.1.1 Carrier Tape Dimension

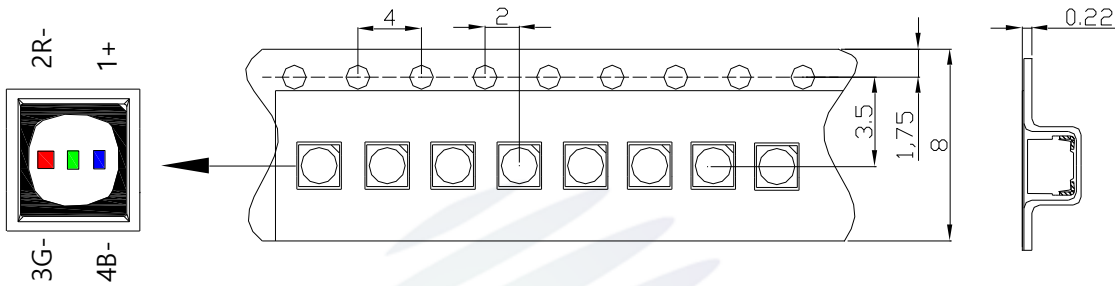

Fig.2-1 Carrier Tape Dimension

2.1.2 Reel Dimension

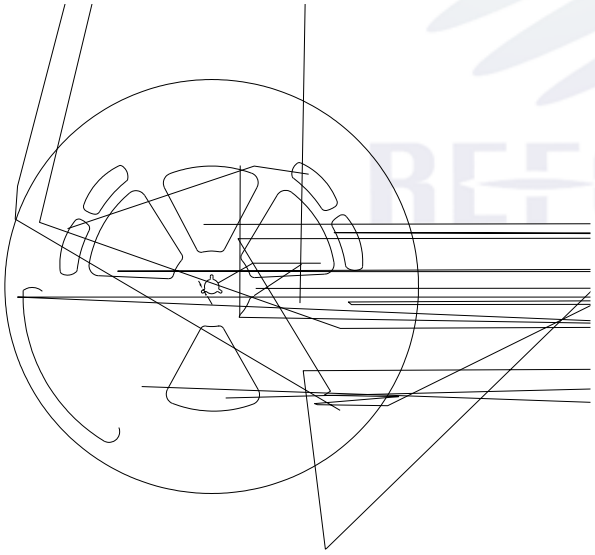

Fig.2-2 Reel

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A	400 2mm
B	100.0 0.4mm
C	14.3 0.3mm
D	2.6 0.2mm
E	12.4 0.3mm
F	8.6 0.2/-0.3 mm
T	1.9 0.2mm

Notes

The tolerances unless mentioned ±0.1mm. Unit : mm ±0.1

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2.1.3 Label Form Specification

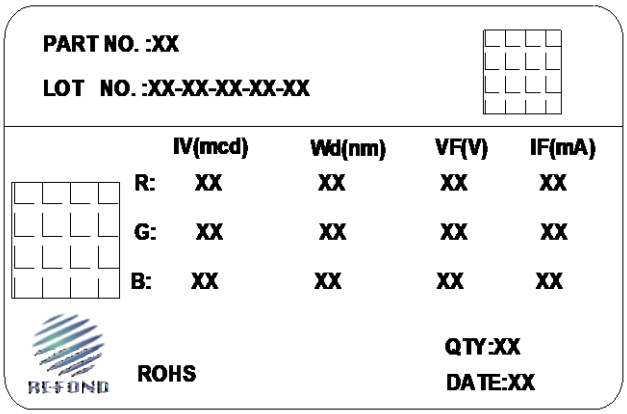

Fig 2-3 Label

Table 2-2 Description

PART NO.	Part Number
LOT NO.	Lot Number + Packing Machine No. + Serial Number +BIN No. + Quantity (K) + + +BIN + K
IV	Llight intensity
VF	Forward Voltage
Wd	Wavelength
IF	Forward current
QTY	Packing Quantity
DATE	Made Date

2.2 Moisture Resistant Packing

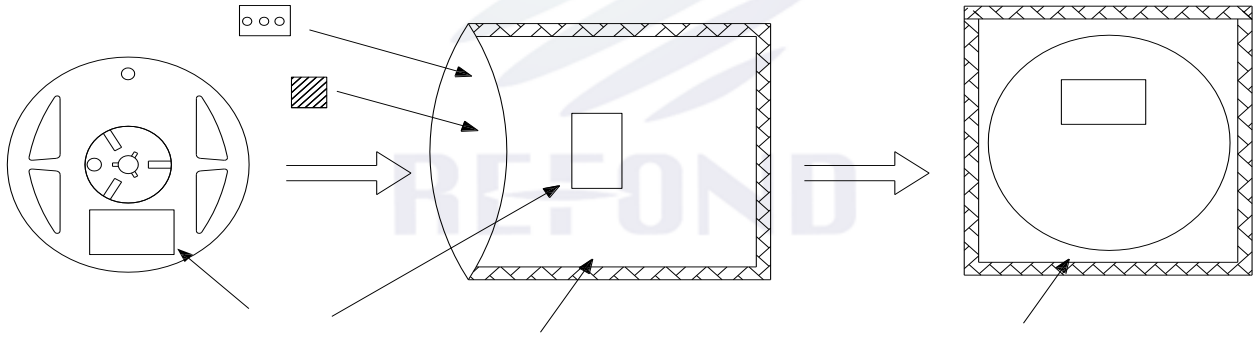

Fig.2-4 Pack

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2.3 Cardboard Box

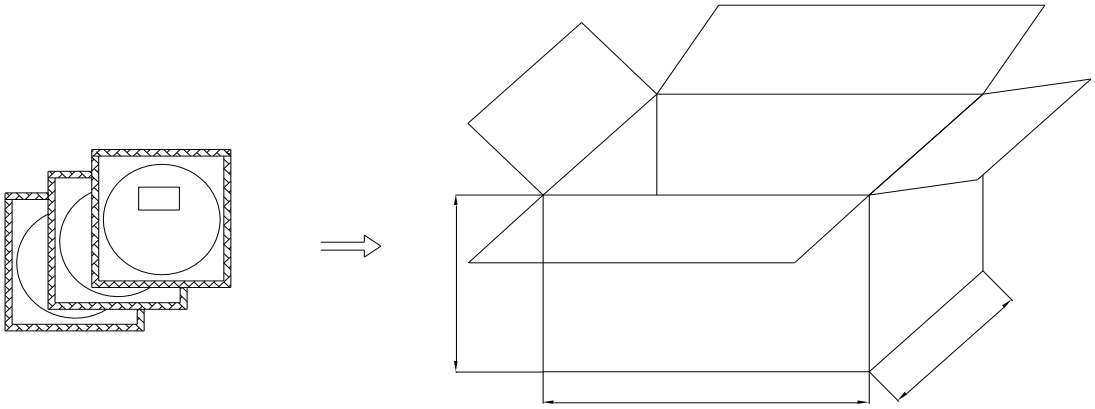

Fig.2-5 Box

2.4 Reliability Test Items And Conditions

Table 2-3 Reliability Condition

Test Items	Ref.Standard	Test Condition	Time	Quantity	Ac/Re /
Resistance to Soldering Heat	JESD22-B106	Temp:250 max T=10 sec	3times	22pcs.	0/1
Thermal Shock	JEITAED-4701 300 307	-40 15min 10s 100 15min	500cycle	22pcs.	0/1
Moisture Resistance	IPC/JEDEC J-STD-020D.1	1. Moisture Absorption Ta=85 / RH=85%/12HR 2. Tsol=250 , T=10s Reflow Soldering	3times	22pcs.	0/1
High Temperature Storage	JEITAED-4701 200 201	Temp:100	1000hrs.	22pcs.	0/1

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Low Temperature Storage	JEITA ED

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Notes

The Reliability tests are based on Refond existing test platform.

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 condition.

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Table 3-1 Description

Average temperature rise speed Tsmax T_P	Max 4 °C/ s 4 °C/
Preheating: minimum temperature (Tsmin)	150 °C
Preheating: Max temperature (Tsmax)	200 °C
Preheating: Time Tsmin Tsmax	60s-120s 60 - 120
Time limited to maintain high temperature: the temperature (T_L)	217 °C
Time limited to maintain high temperature: The Time (t_L)	Max 60s 60
Peak /Classification of temperature: / (T_P)	245 °C
Time limit classification of peak temperature time t_p	Max 10s 10
Hold time within 5 C with the actual peak temperature (TP) (T_P) 5 °C	Max 30s 30
Cooling speed	Max 6 °C/ s 6 °C/
Needed time from 25 °C to Tp 25 °C	Max 8 minutes 8

Notes

1.Reflow soldering should not be done more than one times. .

2.It is recommended that use the middle temperature solder paste.

3.Stress on the LEDS should be avoided during heating in soldering process. " B; :

4.After soldering ,do not deal with the product before its temperature drop down to room temperature.

" "

5. Nitrogen reflow soldering is recommended. Air flow soldering conditions can cause optical degradation,

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caused by heat or atmosphere.

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.

主 B; :

7. This LED is designed to be reflow soldered on to a PCB. If dip soldered, cannot guarantee itsreliability.

B; : 丰 F 一

3.1.1 Soldering Iron

(1) When hand soldering, keep the temperature of iron below less 300 less than 3 seconds

) &&)

(2) The hand solder should be done only one time.

3.1.2 Repairing

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 上

B; :

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4.Handling Precautions

4.1Handling Precautions

4.1.1 Storage

(1) Moisture proof and anti-electrostatic package with moisture absorbent material is used, Suggest storage time is less than 6 months.

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(2) Storage condition: temperature ≤30℃, humidity ≤60% RH.

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(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.

(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.

, 30 60%RH 上

12 :30 :10%RH ,

:65 5 /24H

(5) Before SMT, LEDs need to be baked , baking requirement as below: 一

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Customer pre-treatment conditions before use				
Condition before use	undamped Production date 2 months 2	undamped Production date 2-6 months 半 2-6	undamped Production date 6-12 months 半 6-12	damped or Production date exceed 12 months 12
Pre-treatment	Baked 65 5 /12H 65 5 /12H	Baked 65 5 /24H 65 5 /24H	Baked 65 5 /48H 65 5 /48H	Return to the original factory for processing

4.1.2 Static Electricity

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.

4.1.3 Reverse voltage protection

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.

LED , .

,LED , , , .

, LED ─ 5V.

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4.1.4 The safe temperature for LEDs working

(1) Luminous Intensity deceased radically, if LEDs worked in hot environment for a long time, they will be disabled easily. When LEDs are working in surface temperature should be lower than 55 and the temperature should be lower than75 .

LED , , , , .

, 55 , 75 .

(2) Proper thermal management is an important when designing products with LEDs. LED die temperature is affected by PCB thermal resistance and LED spacing on the board. Please design products in a way that the LED die temperature does not exceed the maximum junction temperature (TJ).

C C —

C

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

TA

4.1.5 Directionsfor Use

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

LED 丰

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

LED

(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.

— LED

(4) This product should be operated with forward current. Make sure the product is not subjected to either forward or

continuous reverse voltage because it may cause damage to theLED chip. If the display will not be

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used for a long time, the main power should be switched off,Dehumidification is necessary before using the screen again.

丰 LED

(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.

LED 一

LED 一

(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.

LED

(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

LED ,

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-

- LED一

-LED

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(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.

LED 丰 LED LED

LED

(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).

PCB

上 LED

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

, SMD LED 、

4.1.7 Declare

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

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(2) Both the customers and Refond will agree on official specifications of supplied products before Refond reserves the right to further modify the specification for technical reference and sample without noticing the customers.

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Version History/

Date	Revisor	Version	Verifier	Remarks
2019-10-16		E0		
2022-01-08		E1		
2022-05-08		E2		
2023-06-05		E3		
2024-12-04		E4		

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Declare
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