

SPECIFICATION



Mass Product

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1. Description

1.1 General Description

The product is a full-color LED device, Common cathode RGB SMD, High contrast(Designed on all black surface),The product size: 2.05mmX2.15mmX1.9mm.

LED ()
 2.05mmX2.15mmX1.9mm

1.2 Features

Extremely wide viewing angle.
 High luminous Intensity, Low power consumption and Long life.

Water-resistant (IPX6).

Moisture sensitivity level: 5a. :5a

RoHS compliant. RoHS

Matte surface.

Pb-free reflow soldering applic(en-US.97 TJ)JTJETQq0.000008871 0 595.32 842.04 reW* nBT/F3 12 T

1.4 Package Dimension

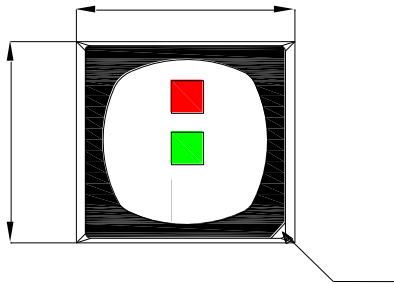


Fig.1-1 Top view

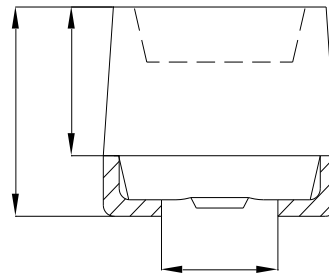


Fig.1-2 Side view

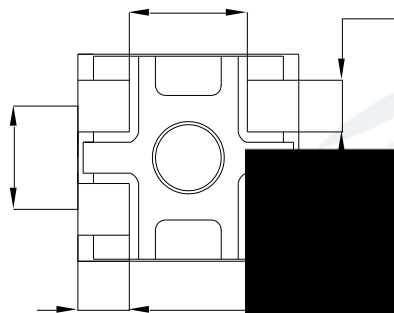


Fig.1-3 Bottom view

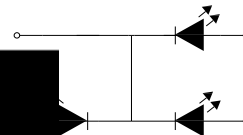


Fig.1-4 Polarity

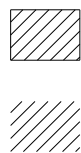


Fig.1-5 Soldering patterns

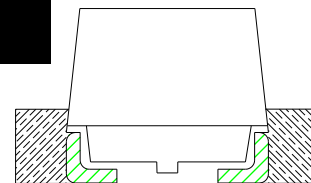
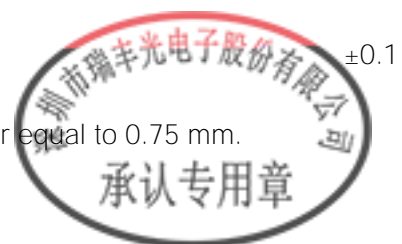


Fig.1-6 Glue filling

Notes

1. All dimensions units are millimeters.
2. All dimensions tolerances are ± 0.1 mm unless otherwise noted.
3. Recommendation for glue filling: filling height must be higher than or equal to 0.75 mm.

0.75 mm



1.5 Product Parameters

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

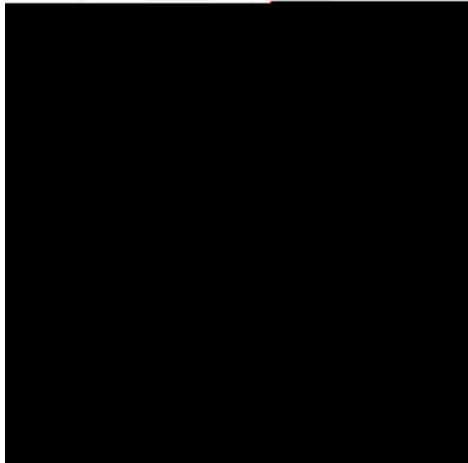
Item	Symbol	Test Condition	Value			Unit
			R	G	B	
Reverse Current	I_R	$V_R=5V$	6	6	6	
Forward Voltage	V_F (min)	R $I_F = 15mA$ G $I_F = 15mA$ B	1.7	2.7	2.7	V
	V_F (max)		2.4	3.4	3.4	V
Dominant Wavelength	λ_D		617~ 628	520~540	460~475	nm
			5nm per Bin	3nm per Bin	3nm per Bin	
Spectrum Radiation Bandwidth			24	38	30	nm
Luminous Intensity	$I_{V(min)}$		265	550	68	mcd
	$I_{V(avg)}$			880	110	mcd
	$I_{V(max)}$			1400	175	mcd
	BIN Range			1:1.3	1:1.3	
Viewing Angle	1/2			110		deg

Table 1-2 Absolute Maximum Ratings

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	51	51	mW
Thermal Junction to Ambient	T_J	100	100	100	
Electrostatic Discharge (HBM)	E_{SD}	1000V			



Fig 1-7



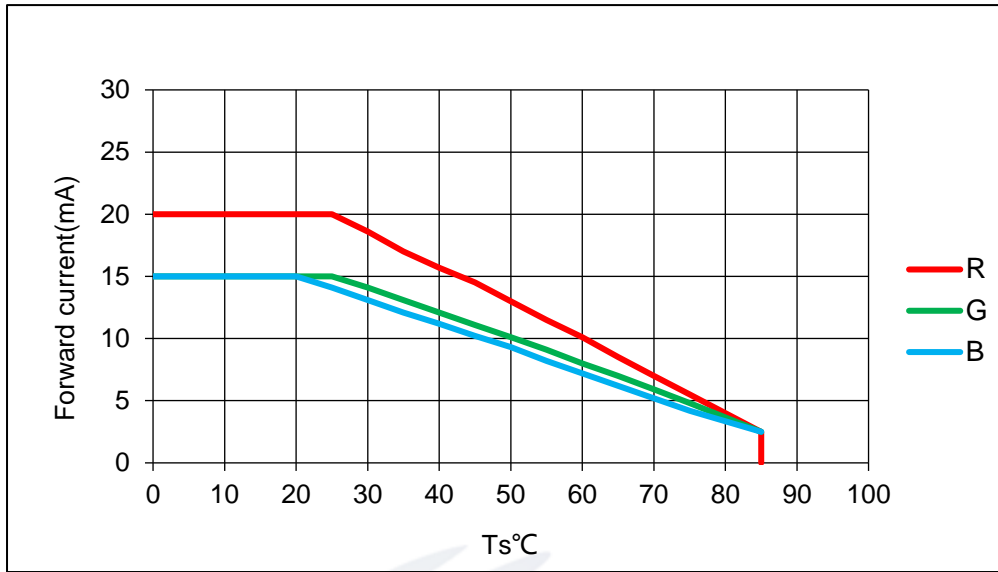


Fig 1-9 Solder Temperature

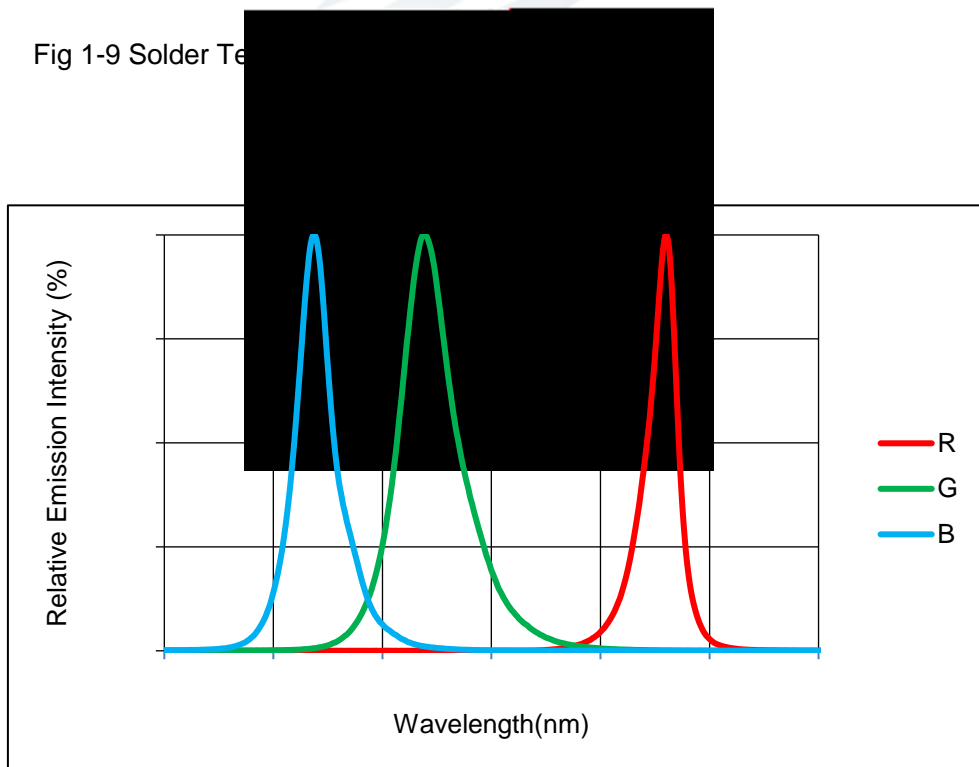


Fig 1-10 Spectrum Distribution



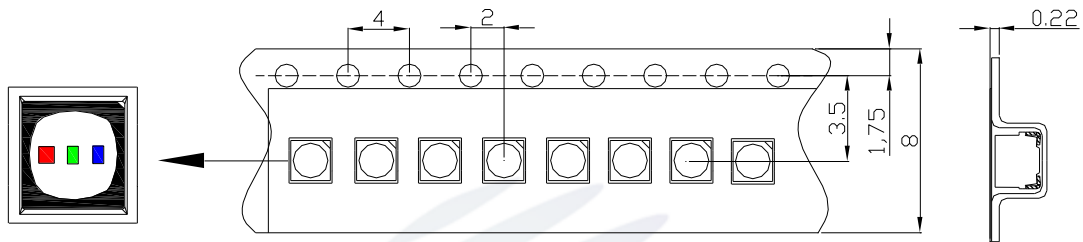


2. Packaging

2.1 Packaging Specification

Package:13000pcs/reel. 13000pcs

2.1.1 Carrier Tape Dimension



2.1.2 Reel Dimension

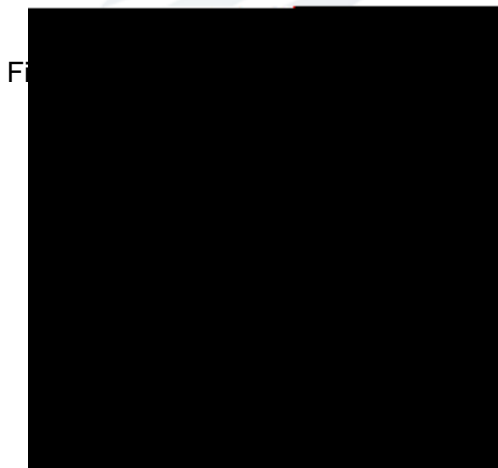


Table 2-1 Dimension

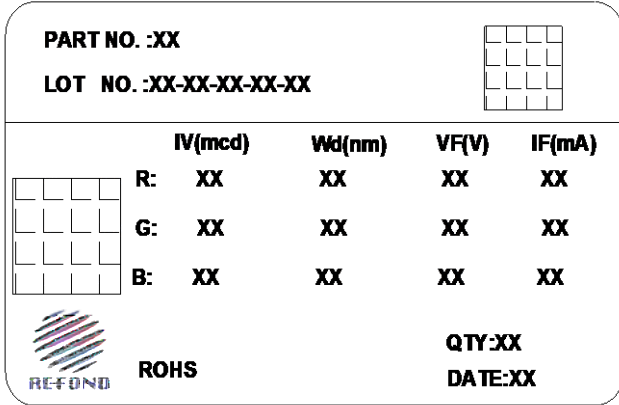
Fig.2-2 Reel

Notes

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

2.1.3 Label Form Specification

Table 2-2 Description



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

Fig 2-3 Label

2.2 Moisture Resistant Pack

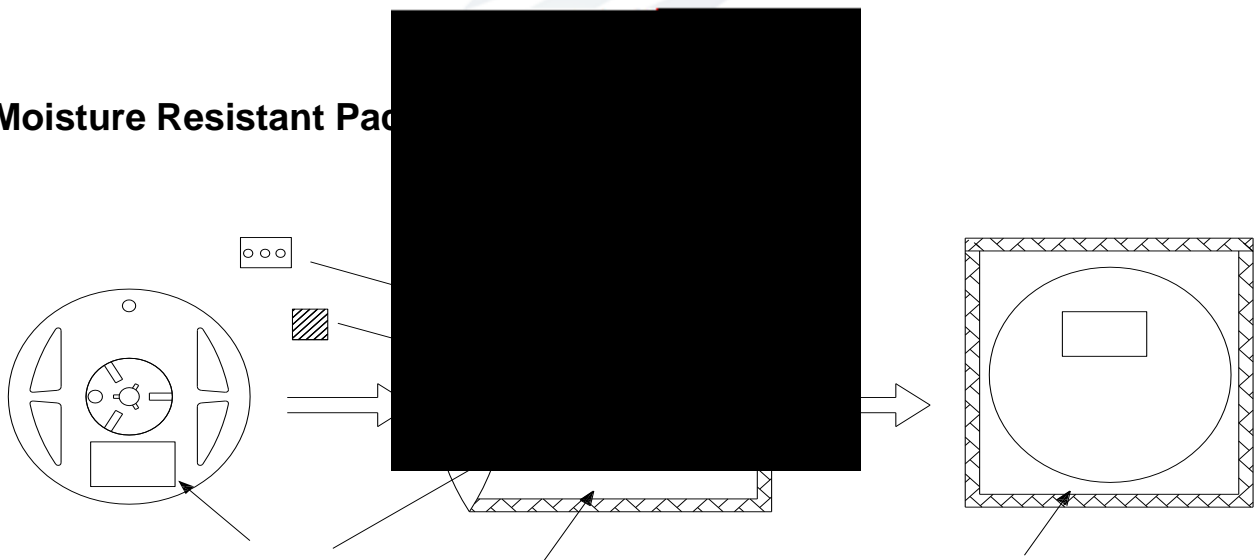


Fig.2-4 Pack





Low Temperature Storage	JEITA ED-4701 200 202	Temp:-40	1000hrs.	22pcs.	0/1
Room Temperature Operating Life	JESD22-A108	T _A =25 I _F =15mA	1000hrs.	22pcs.	0/1
High Temperature High Humidity Life Test	JESD22-A101	85 / 85%RH I _F =10mA	500hrs.	22pcs.	0/1
Temperature Humidity Storage	JEITA ED-4701 100 103	T _A =85 R _H =85%	1000hrs.	22pcs.	0/1
Low Temperature Life Test	JES		1000hrs.	22pcs.	0/1

2.5 Criteria For Judging Data

Test Items	Symbol	Test Condition	Criteria For Judgement
Forward Voltage	V _F	I _F =20mA	Initial Data±10% ±10%
Reverse Current	I _R	V _R = 5V	I _R
Luminous Intensity	I _V	I _F =20mA	Average I _V degradation rate 30%
Material appearance	/	/	No internal cracks, no material between stripped, no deaded light

Notes

1. 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 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.

LED

/ LED

3. SMT Reflow Soldering Instructions SMT

3.1 SMT Reflow Soldering

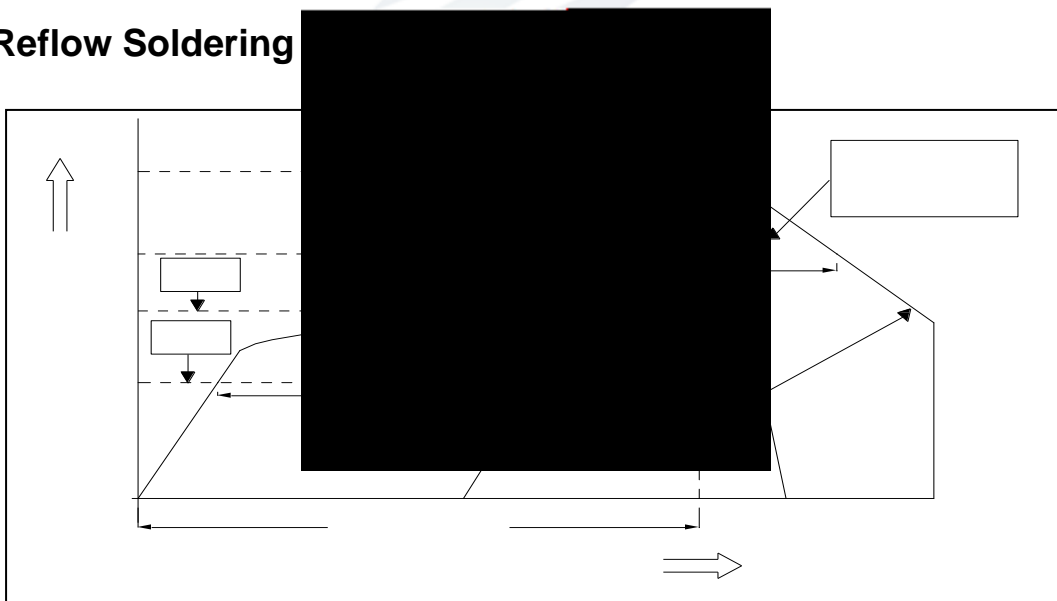


Fig.3-1 Profile

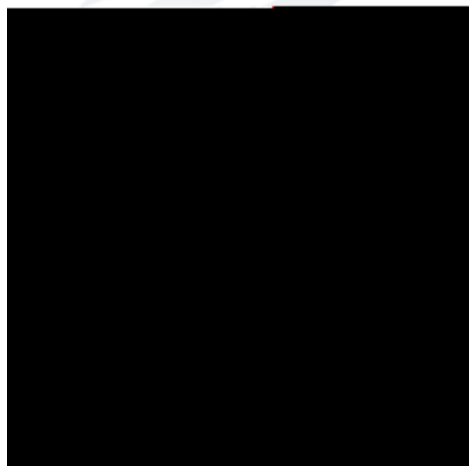


Table 3-1 Description

Average temperature rise speed	T_{smax} T_P	Max 4 °C/ s	4 °C/
Preheating: minimum temperature	(T_{smin})	150 °C	
Preheating: Max temperature	(T_{smax})	200 °C	
Preheating: Time	T_{smin} T_{smax}	60s-120s	60 - 120

Time limited to maintain high temperature: the temperature

(T.L0 G[])TJETQq73ainta



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.

(2) Storage condition: temperature $\leq 30^{\circ}\text{C}$, humidity $\leq 60\% \text{ RH}$.

(3) Before opening the package, please check the package for air leaks, if there exists any air leaks, please return the product to the manufacturer for dehumidification by baking before your second use.

(4) After the package is opened, please store in the specified environment of temperature below 30°C /humidity below $60\% \text{ RH}$ within 12HR. Unused material must be stored in the environment of temperature below 30°C and humidity below $10\% \text{ RH}$, These surplus products should be baked

12 hours at $65 \pm 5^{\circ}\text{C}$ /24H

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



4.1.2 Static Electricity

Static electricity and surge voltage damage the LEDs. Damaged LEDs will show some unusual characteristics such as the forward 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 to use anti-static bands, pads, uniforms, gloves or containers can be used as effective protection for 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.

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

LED

(5) Make sure that the reverse voltage will not exceed the Absolute MaxRatingwhen usQq3 12 TQ3 1.n)-3



-

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

(9) When power

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

LED	100
20	

(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.

(11) If the display modules are located in a high humidity environment, the moisture environment on the vessel can cause condensation. The display should be packaged to prevent moisture absorption.

(12) If a display that has been, or is, in a high humidity environment, it is possible that degradation of the LED has occurred. When transporting the display, ensure adequate 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.

LED

LED

4.1.6 Others

(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.



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

LED

LED

LED

LED

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

PCB

LED

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

4.1.7 Declare

(1) This specification is written by Refond. The latter is formal.

(2) Both the customers and Refond should check the specifications of supplied products before

Reserves the right to further modify the specifications of supplied products without notice and sample without noticing the customers.







www.refond.com



Declare

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

