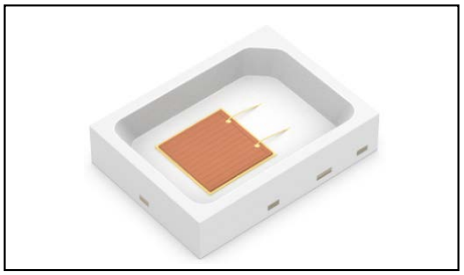
Contents

深圳市瑞丰光电子股份有限公司 承认专用章

1. Description

1.1General Description



The Wcjjmu source color devices are made with AlGaInp on Substrate Light Emitting Diode .

Product Package: 2.7mmX2.0mmX0.6mm.

JCB ?jE_jln 0,5kkV0,.kkV.,4kk,

1.2Features

PLCC Package.NJAA

Extremely wide viewing angle.

Suitable for all SMT assembly and solder process. QKR

Available on tape and reel.

Moisture sensitivity level: Level 2. Jctcj0

RoHS compliant. PmFQ

Qualifications: The product qualification test plan is based on the guidelines of AEC-Q102 Stress Test Qualification for Automotive Grade Discrete Semiconductors

?CA+O/.0

1.3Application

Automotive Lighting Interior and Exterior.

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1.5Product Parameters

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

Item	Symbol	Test Condition	Value			Unit
			Min.	Typ.	Max.	
Forward Voltage	V_F	I_F=350mA	2.0	---	2.6	V
Reverse Current	I_R	V_R=5V	---	---	10	uA
Dominant Wavelength	$_D$	I_F=350mA	587.5	---	595	nm
Luminous Flux		I_F=350mA	40.9	---	55.3	lm
Viewing Angle		I_F=350mA	---	120	---	deg
Thermal Resistance.	R_{THJ-S}	I_F=350mA	---	---	25	/W

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

Parameter	Symbol	Rating	Units
Power Dissipation	P_D	1092	mW
Forward Current	I_F	420	mA
Peak Forward Current	I_{FP}	500	mA
Reverse Voltage	V_R	5	V
Electrostatic Discharge (HBM)	E_{SD}	2000	V
Operating Temperature	T_{OPR}	-40 ~ +125	
Storage Temperature	T_{STG}	-40 ~ +125	
Junction Temperature	T_J	150	

Notes

1. 1/10 Duty cycle, 10ms pulse width. / . k q* /-/ . ,

2. The above forward voltage measurement allowance tolerance is ±0.1V. ® . , / T,

3. The above color coordinates measurement allowance tolerance is ±0.005. ± . , . . 3,

4. The above luminous intensity measurement allowance tolerance ±10%.

® / . # ,

5. Care is to be taken that power dissipation does not exceed the absolute maximum rating of the product.

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6. All measurements were made under the standardized environment of Refond.

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7.When the LEDs are in operation the maximum current should be decided after measuring the package temperature,junction temperature should not exceed the maximum rate, JCB

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8. ESD yield is over 90% at 2000V ESD (HBM). ESD protection during products handing is needed. 7 . # JCB

CQB0 . . . T * k

1.6Bin Range Of Forward Voltage and Luminous Flux (IF=350mA)

BIN (IF=350mA)

Table 1-3

V_F	C0	D0	E0
	2.0-2.2	2.2-2.4	2.4-2.6
lm	NB	OA	OB
	40.9-45.3	45.3-50	50-55.3
WD(nm)	D2	E1	E2
	587.5-590	590-592.5	592.5-595

1.7 Typical Optical Characteristics Curves

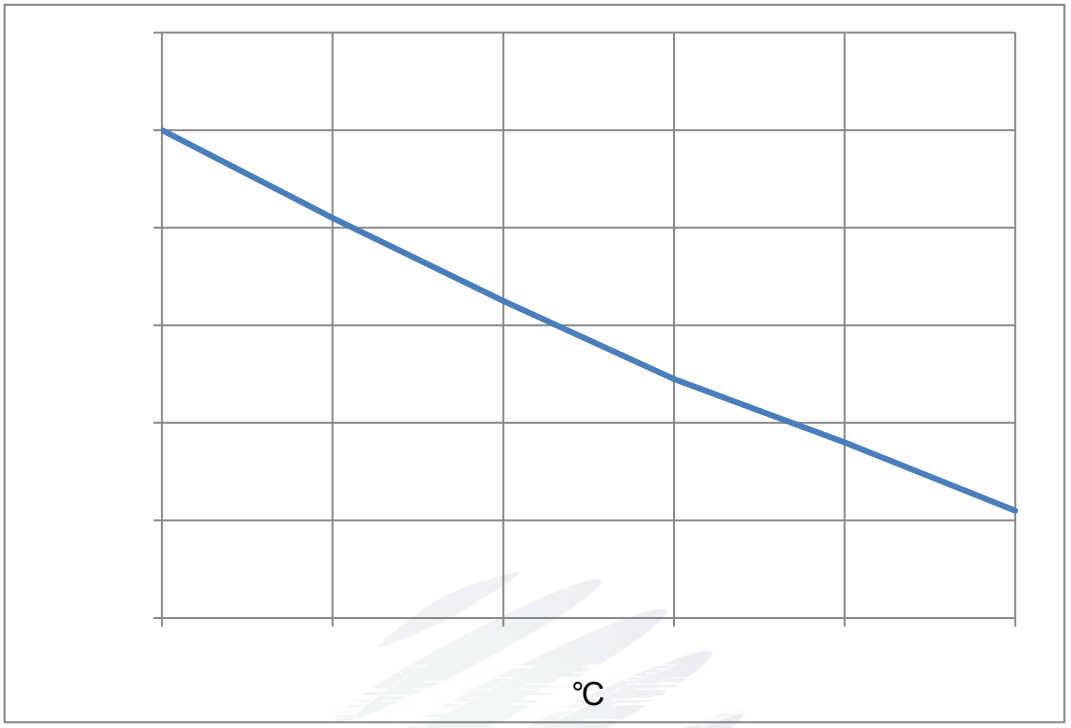


Fig. 1-9 Solder Temperature Vs Relative Intensity

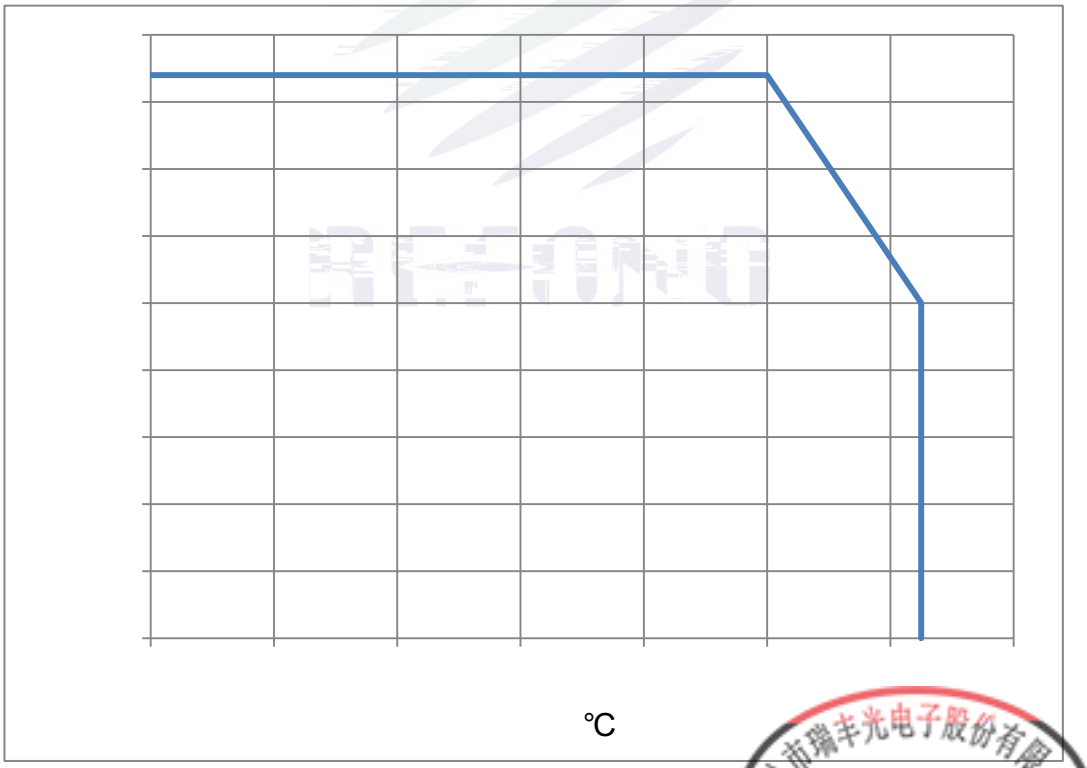


Fig. 1-10 Solder Temperature VsForward Current

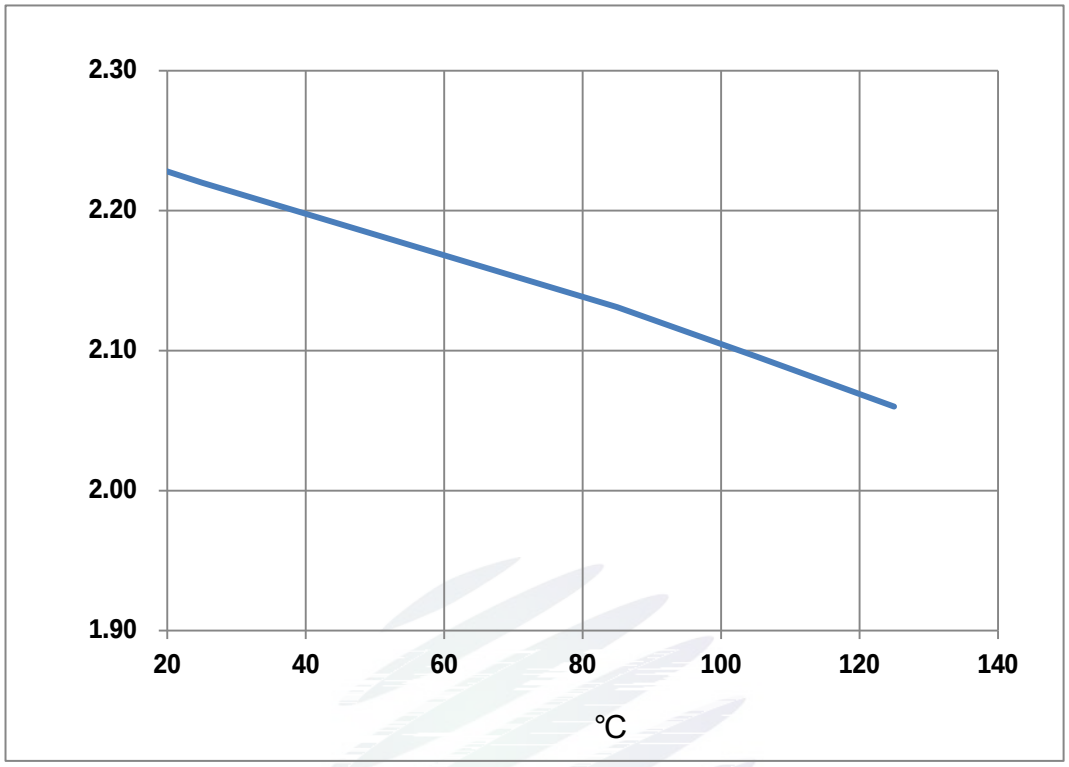


Fig. 1-11 Forward Voltage Vs Solder Temperature

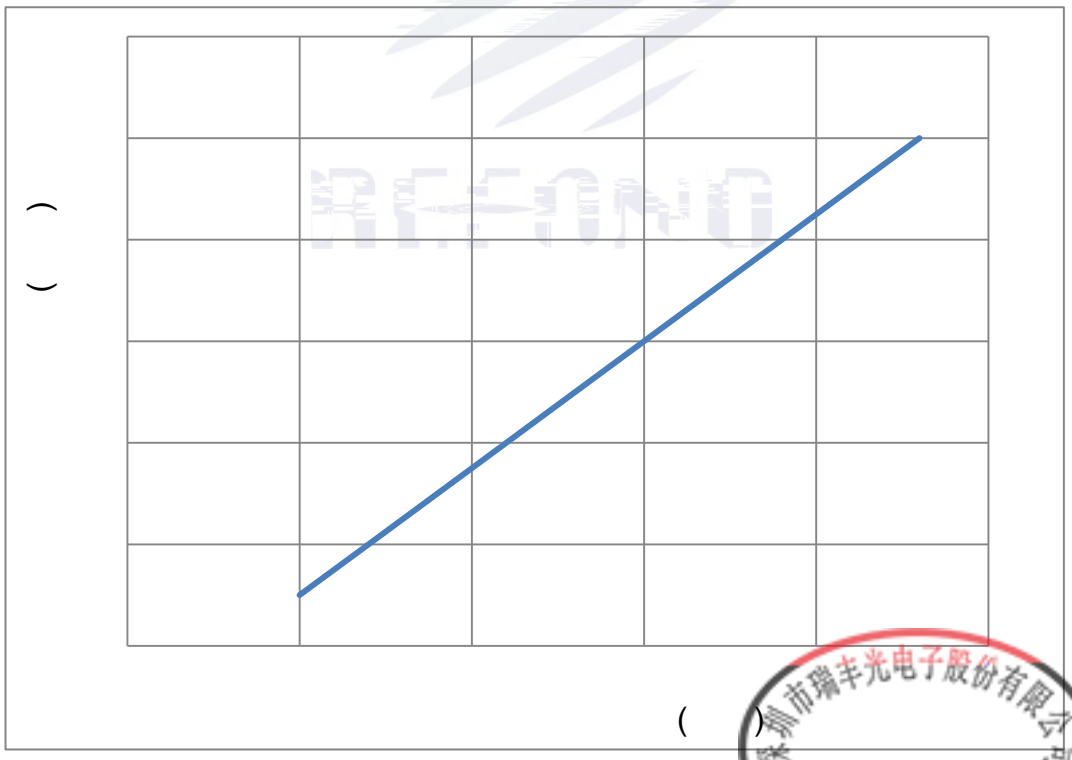


Fig. 1-12 Forward current vs. (Ts=25℃)

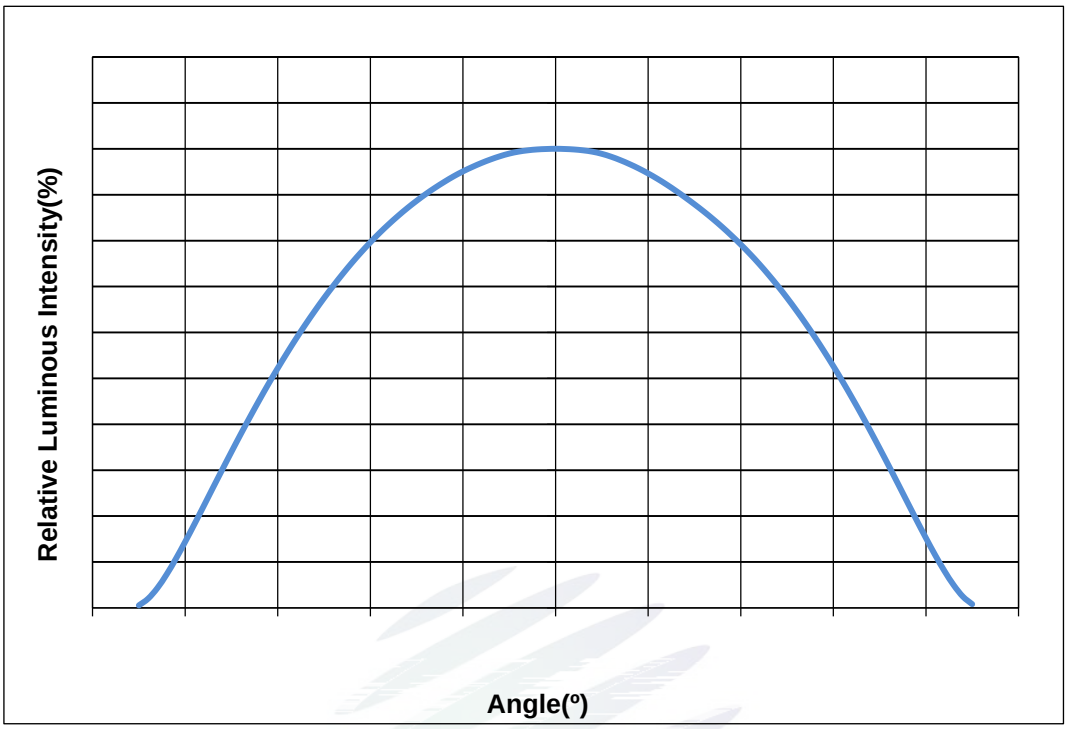


Fig. 1-13 Radiation diagram

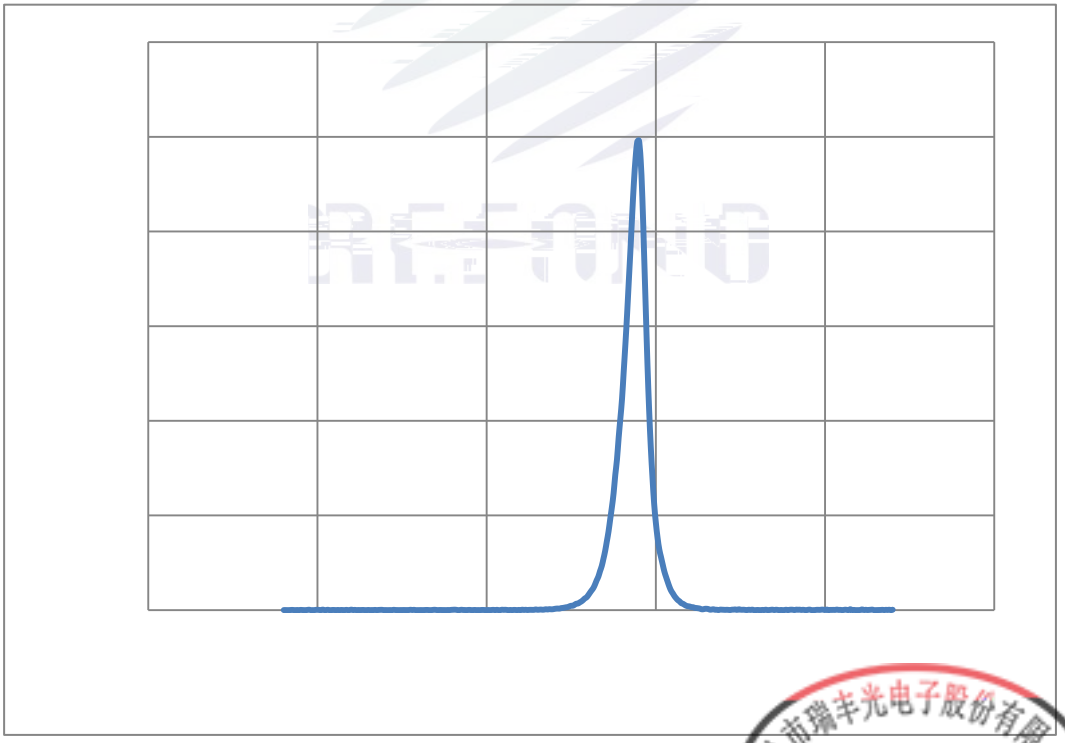


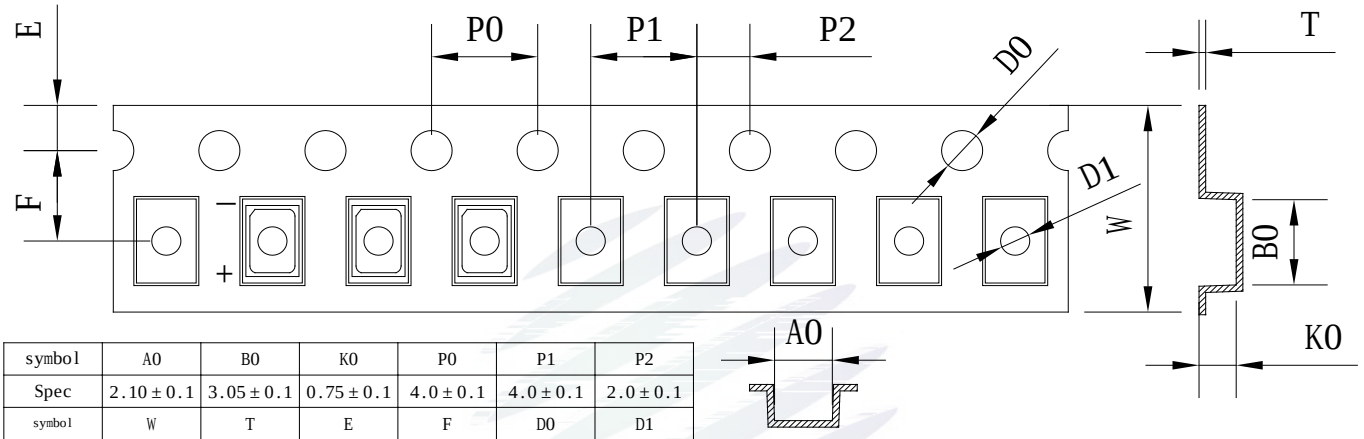
Fig. 1-14 Spectrum Distribution

2. Packaging

2.1 Packaging Specification

Package:4000pcs/reel. k

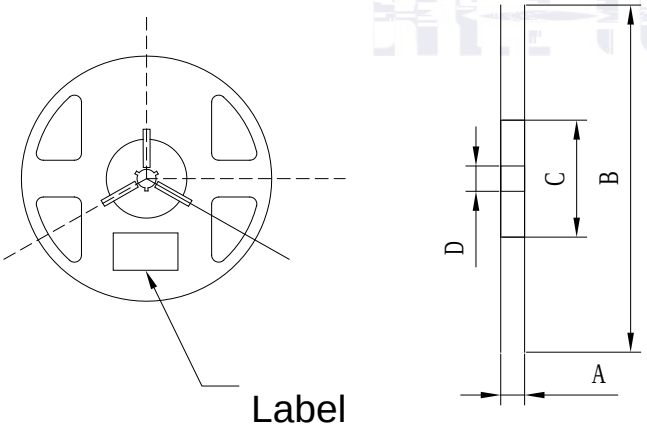
2.1.1Carrier Tape Dimension



symbol	A0	B0	K0	P0	P1	P2
Spec	2.10±0.1	3.05±0.1	0.75±0.1	4.0±0.1	4.0±0.1	2.0±0.1
symbol	W	T	E	F	D0	D1
Spec	8.0±0.2	0.2±0.05	1.75±0.1	3.5±0.1	1.55±0.05	1.0±0.1

Fig.2-1 Carrier Tape Dimension

2.1.2Reel Dimension



R_`jc 0+/Reel Dimension

A	12®0.1mm
B	180®1mm
C	60®1mm
D	13.0®0.5mm

Fig.2-2Reel Dimension

Notes

The tolerances unless mentioned ±0.1mm. Unit : mm ®.,/ k

2.1.3Label Form Specification

R_`jc 0+0 Specification

PART NO.	Part Number
SPEC NO.	Spec Number
LOT NO.	Lot Number
BIN CODE	Bin Code
	Luminous flux
XY	Chromaticity Bin
V_F	Forward Voltage
WLD	Wavelength
QTY	Packing Quantity
DATE	Made Date

Fig. 2-3 Label

2.2Moisture Resistant Packing

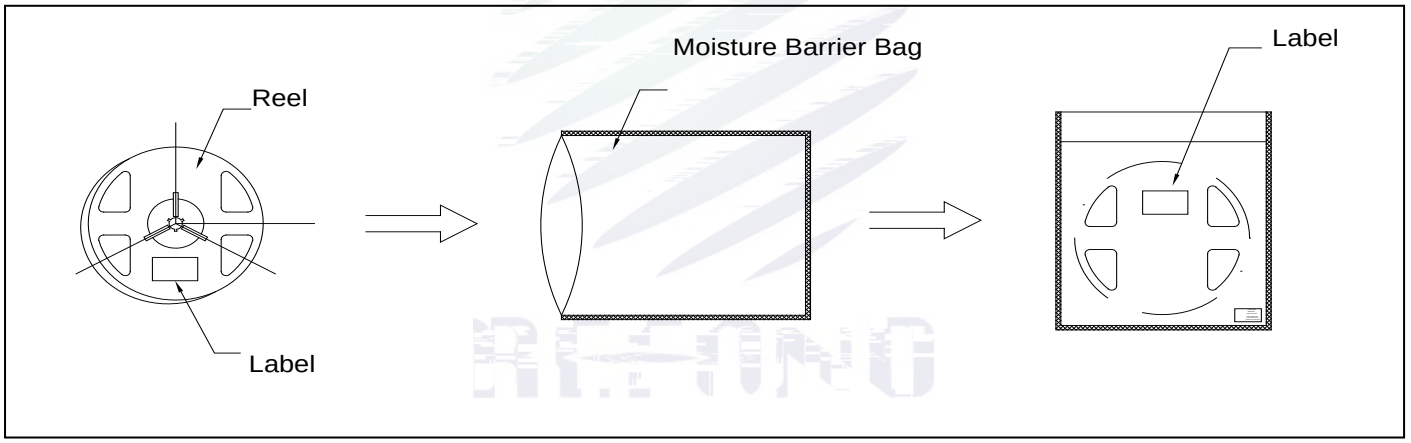


Fig.2-4Moisture Resistant Packing

2.3Cardboard Box

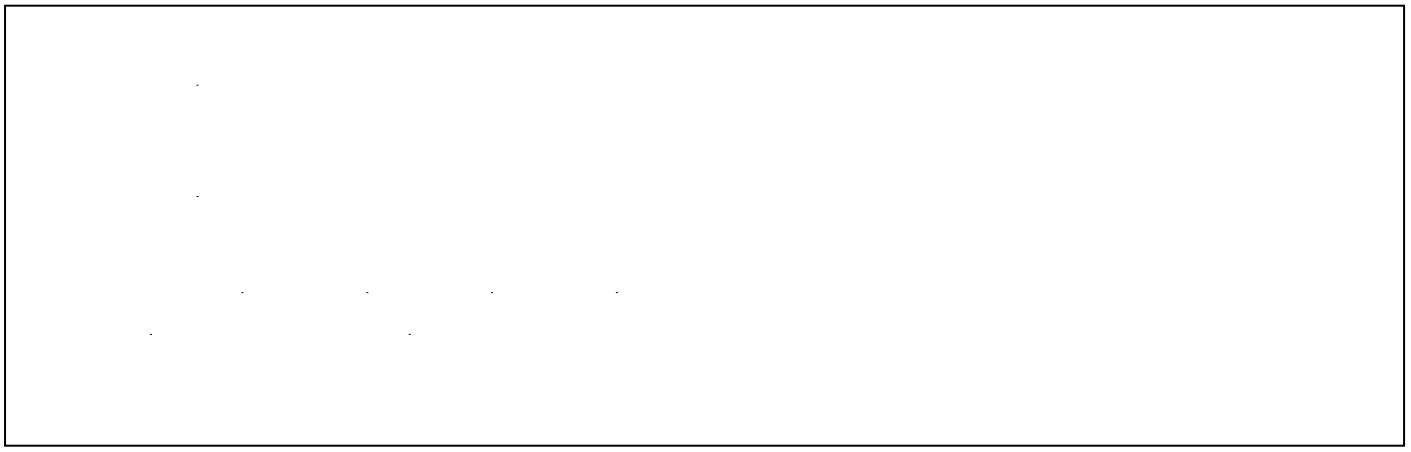


Fig.2-5Cardboard Box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2.5 Criteria For Judging Damage

Table 2-4**Criteria For Judging Damage**

Test Items	Symbol	Test Condition	Criteria For Judgement	
			Min.	Max.
Forward Voltage	V_F	I_F=350mA	-	U.S.L*)x1.1
Reverse Current	I_R	V_R = 5V	-	U.S.L*)x2.0
Luminous Flux		I_F=350mA	L.S.L*)x0.7	-

Notes

1.U.S.L: Upper standard level L.S.L: Lower standard level

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. - JCB

k JCB ! ! ! k

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. k

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3. SMT Reflow Soldering Instructions SMT 回流焊说明

3.1SMT Reflow Soldering Instructions SMT

Fig.3-1SMT Reflow Soldering Instructions SMT

Table 3-1Reflow parameters

Average temperature rise speed	Tsmax T_P	3 °C/ Max 3 °C/ s
Preheating: minimum temperature	(Tsmin)	150 °C
Preheating: Max temperature	(Tsmax)	200 °C
Preheating: Time	Tsmin Tsmax	60 - 120 60s-120s
[redacted]		nperature

Notes

(1)Reflow soldering should not be done more than twice. If more than 24 hours between the two solderings , LED will be damaged. 02 JCB

k

(2)Whensoldering, do not put stress on the LEDs during heating. k

3.1.1 Repairing

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 JCB

k

3.1.2 Cautions

(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 usethe picking up nozzle, the pressure on the silicone resin should be proper. LED JCB

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(2) Components should not be mounted on warped (non coplanar) portion of PCB. After soldering, do not warp the circuit board.LED NA@ k

(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.

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4. Handling Precautions

4.1 Handling Precautions

(1) LED operating environment and sulfur element composition cannot be over 100PPM in the LEDmating usage material. This is provided for informational purposes only and is not a warranty or endorsement.LED

JCB /..NNK, k

(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 elementis 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. JCB JCB

7..NNK 7..NNK

/3..NNK, k

(3) VOCs (Volatile organic compounds) emitted from materials used in the construction of fixtures can penetrate silicone encapsulants of LEDs and discolor when exposed to heat and photonic energy. The result can be a significant loss of light output from the fixture. Knowledge of the properties of the materials selected to be used in the construction of fixtures can help prevent these issues. Refond advises against theuse of any chemicals or materials that have been found or are suspected to have an adverse affect on device performance or reliability. To verifycompatibility, Refond recommends that all chemicals and materials be tested in the specific application and environment for which they are intended tobe used. Attaching LEDs, do not use adhesives that outgas organic vapor. JCB

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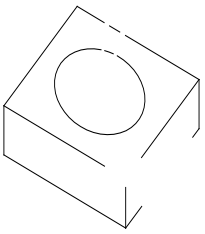

Fig 4-1Handling Precautions

(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. JCB

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JCB k

(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 JCB

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(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.

JCB k

Table 4-1Storage

Conditions		Temperature	Humidity	Time
Storage	Before Opening Aluminum Bag	30¸	75%	Within 1 Year From Date
	After Opening Aluminum Bag	30¸	60%	Recommended for use within 24 hours 24
Baking		60®5¸	-	24hours 24

(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 bDee4c 0L0.771 00 Td [(paa70.47248 re f 112.98 61

Version History/

Date	Revisor	Version	Verifier	Remarks
2022/05/10	Xian Zhou	E0	Zhu Yiming	New issue
2023/04/10	Xian Zhou	E1	Zhu Yiming	Add optical center

REFOND 瑞豐光電

www.refond.com

Declare

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

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