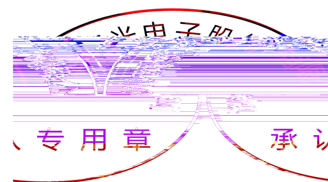
SPECIFICATION

REFOND P/N：

RF-A2E3C-2W2H-B1

Mass Production



1. Description

1.1

The White LED, which was fabricated by using a blue chip and the phosphor.

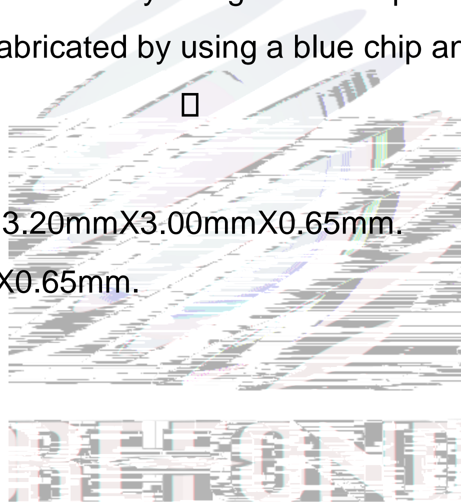
The Yellow LED, which was fabricated by using a blue chip and the phosphor.

BA

BA

The LED package dimension:3.20mmX3.00mmX0.65mm.

3.20mmX3.00mmX0.65mm.



1.2Features

EMC Package.B

Extremely wide viewing angle.

Suitable for all SMT assembly and solder process. P

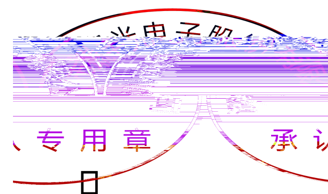
Available on tape and reel.

Moisture sensitivity level: Level 2. bsb /

Compliance with RoHS and REACH. l E P B E

Qualifications: The product qualification test plan is based on the guidelines of AEC-Q101 Stress Test Qualification for Automotive Grade Discrete Semiconductors

AEC-Q101



1.3 Application

Automotive Lighting Interior and Exterior.

1.4 Package Dimension

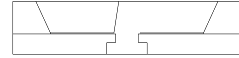
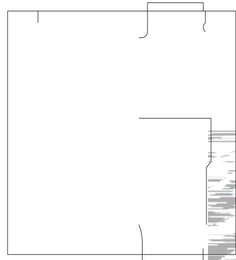


Fig.1-1 Top View Fig.1-2SideView



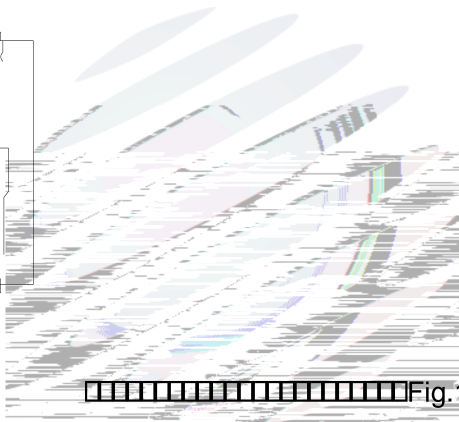


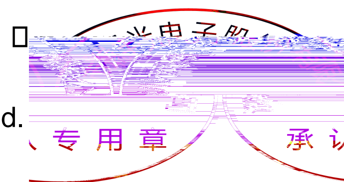
Fig.1-3BottomView Fig.1-4Polarity

Fig.1-5Soldering Patterns

Notes

. All dimensions units are millimeters.

/ All dimensions tolerances are ±0.2mm unless otherwise noted.



1.5 Product Parameters

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

Item	Symbol	Test Condition	Value			Unit
			Min.	Typ.	Max.	
Forward Voltage	VF	IF=350mA	2.8	3.1	3.4	V
Reverse Current	IR	VR=5V	---	---	10	uA
Luminous Flux White		IF=350mA	117	137	160	lm
Luminous Flux Amber		IF=350mA	83.7	102	117	lm
Viewing Angle		IF=350mA	---	120	---	deg
Thermal Resistance.	R_{THJ-S}	IF=350mA	---	---	20	/W

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

Parameter	Symbol	Rating	Units
Power Dissipation	P_D	2720	mW
Forward Current	I_F	400	mA
Peak Forward Current	I_{FP}	700	mA
Reverse Voltage	V_R	5	V
Electrostatic Discharge (HBM)	E_{SD}	2000	V
Operating Temperature	T_{OPR}	-40	

Notes □

1. 1/10 Duty cycle, 10ms pulse width. . - . , . -

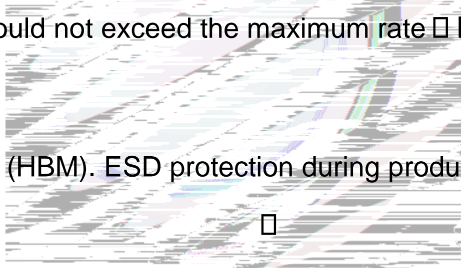
2. The above forward voltage measurement allowance tolerance is ±0.1V. □..' %M□

3. The above color coordinates measurement allowance tolerance is ±0.005. ±□ - - 2□

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

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

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



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 □ BA

□

8. ESD yield is over 90% at 2000V ESD (HBM). ESD protection during products handing is needed. 6-" BA

BPA/---S□ □ □

□

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

BIN (IF=350mA)

Table 1-3

VF V White	G1	G2	H1	H2	I1	I2
	2.8-2.9	2.9-3.0	3.0-3.1	3.1-3.2	3.2-3.3	3.3-3.4
lm White	SB	TA	TB			
	117-130	130-144	144-160			

1.7 Typical Optical Characteristics Curves

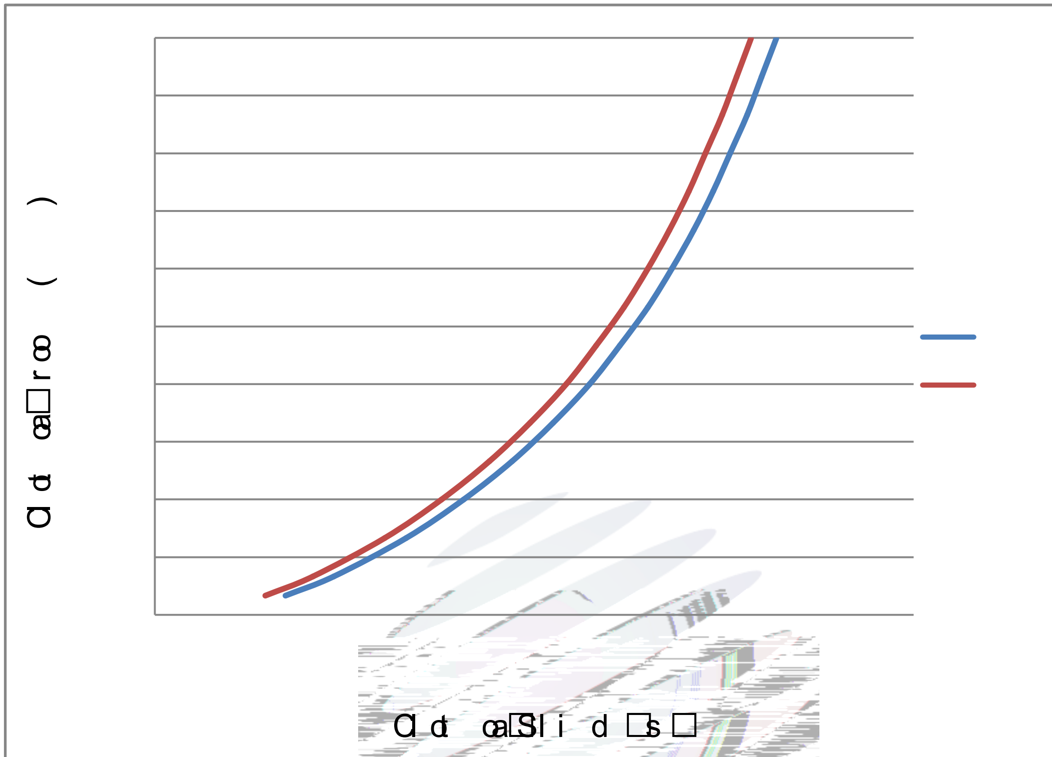


Fig. 1-7 Forward Voltage Vs Forward Current

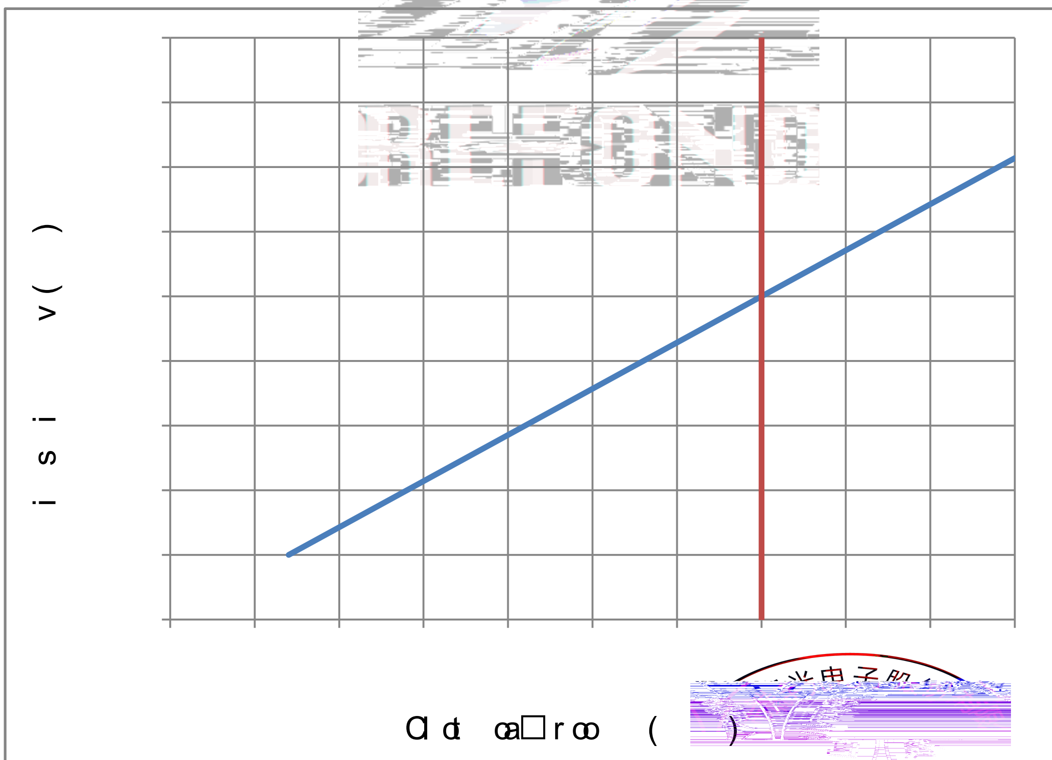


Fig. 1-8 Forward Current Vs Relative Intensity

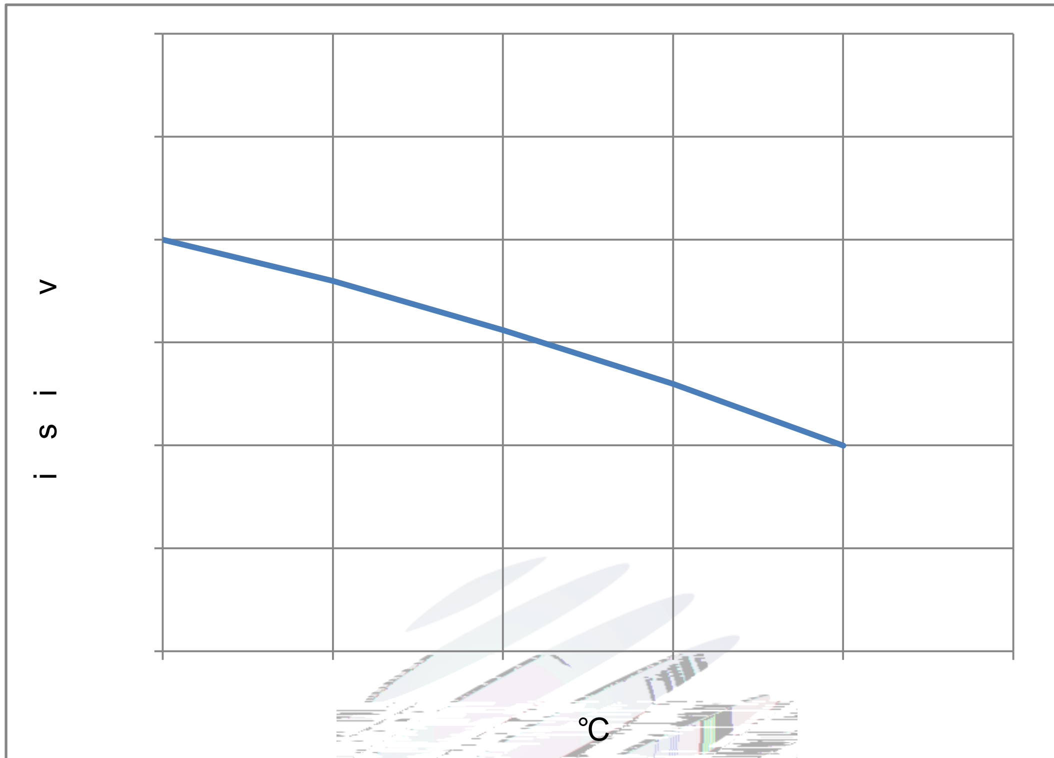


Fig. 1-9　Solder Temperature Vs Relative Intensity

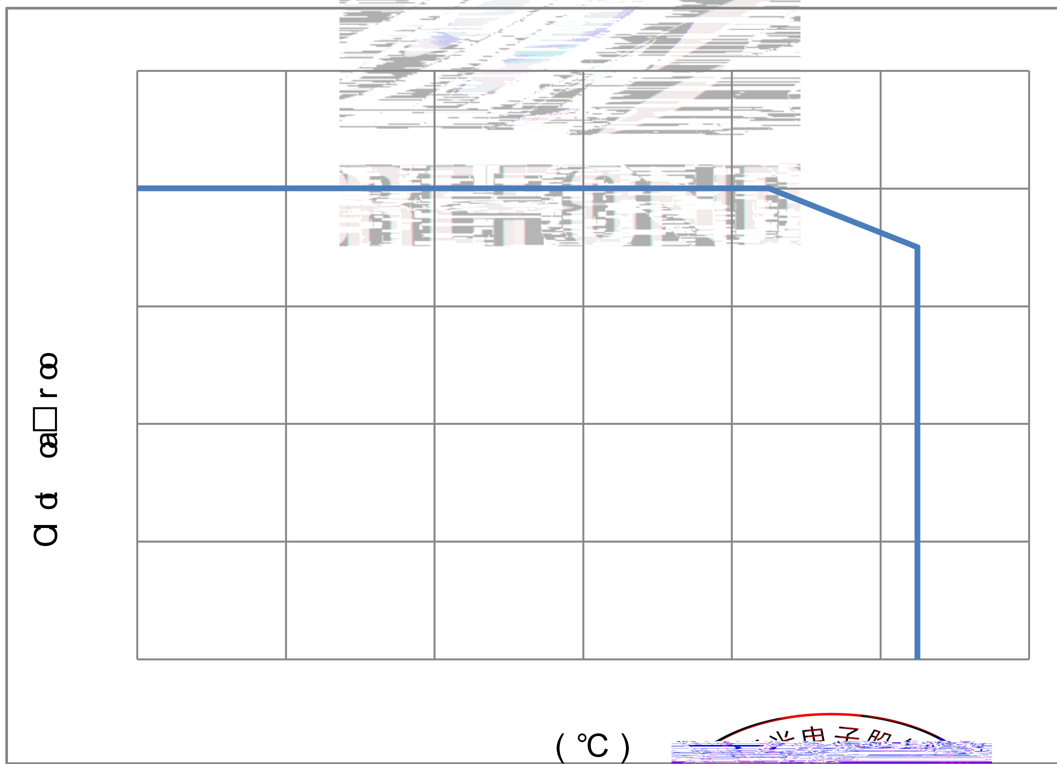
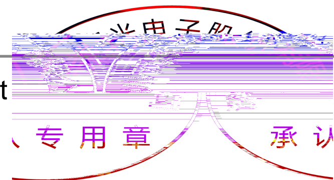


Fig. 1-10 Solder Temperature Vs Forward Current



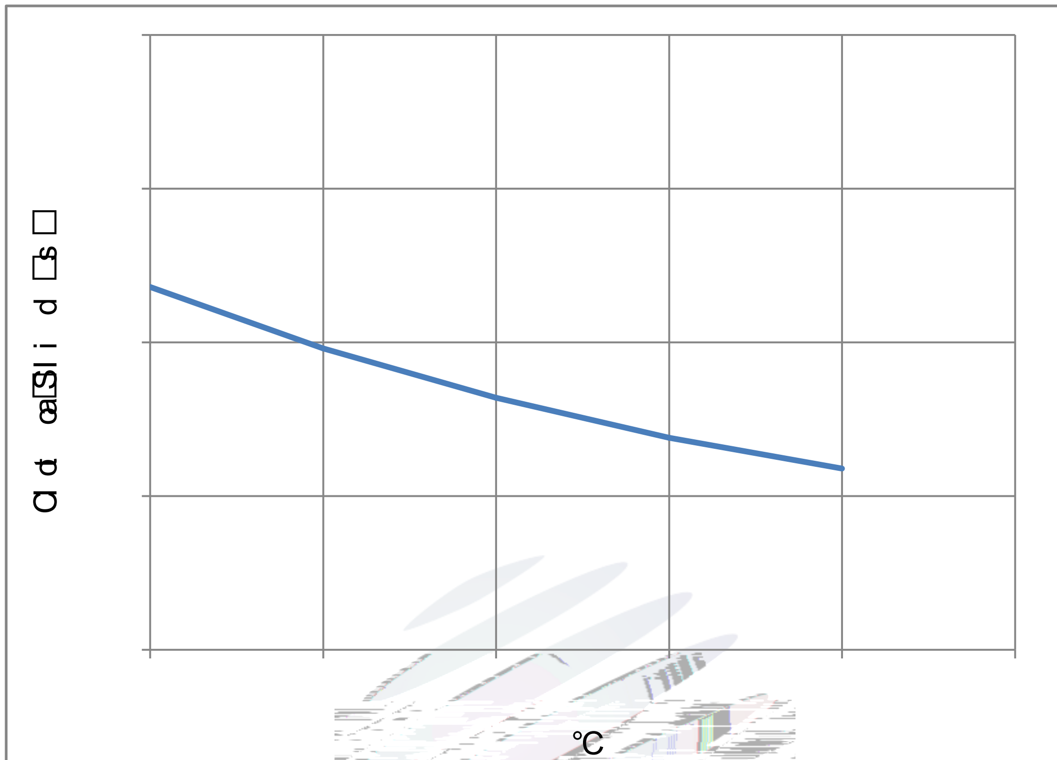


Fig. 1-11 Forward Voltage Vs Solder Temperature

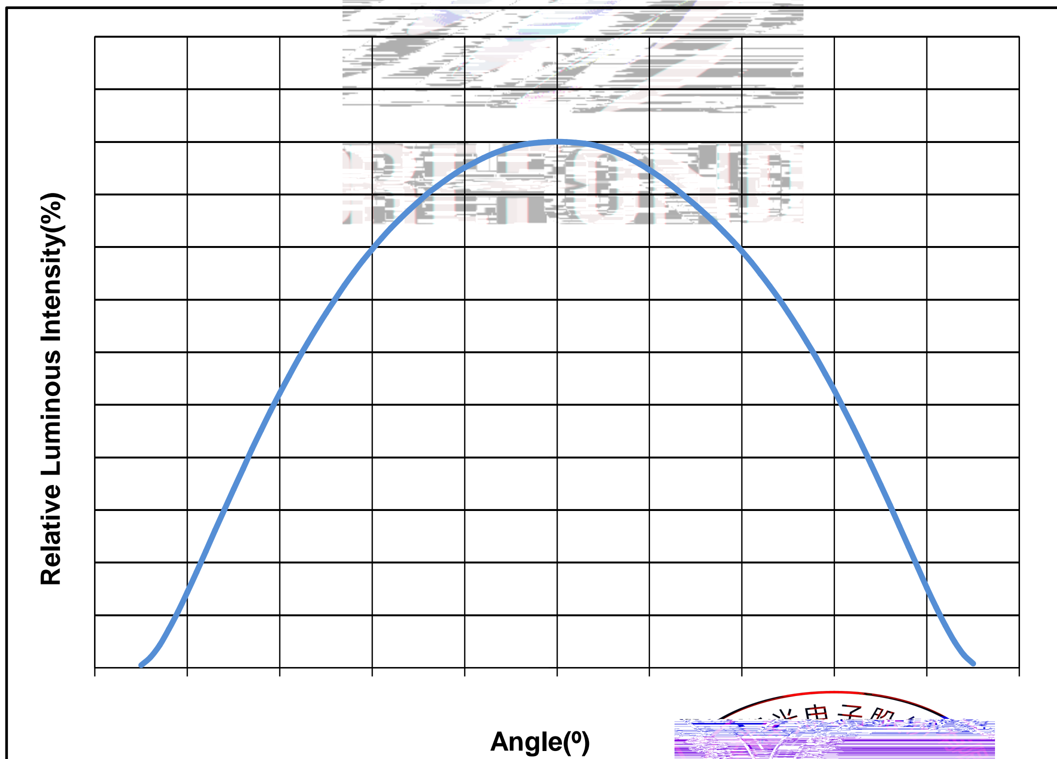
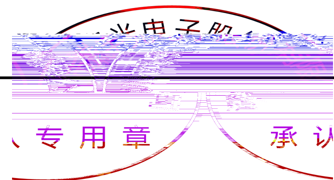


Fig. 1-12 Radiation diagram



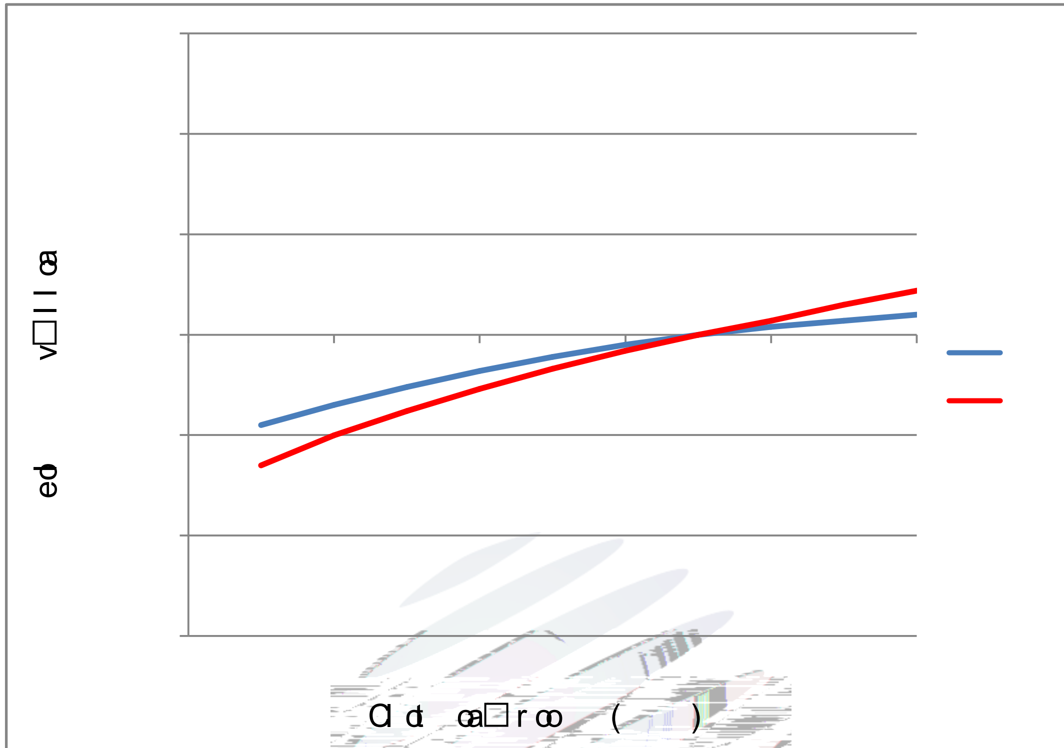


Fig. 1-13 Chromaticity Coordinate Shift Vs Forward Current (White)

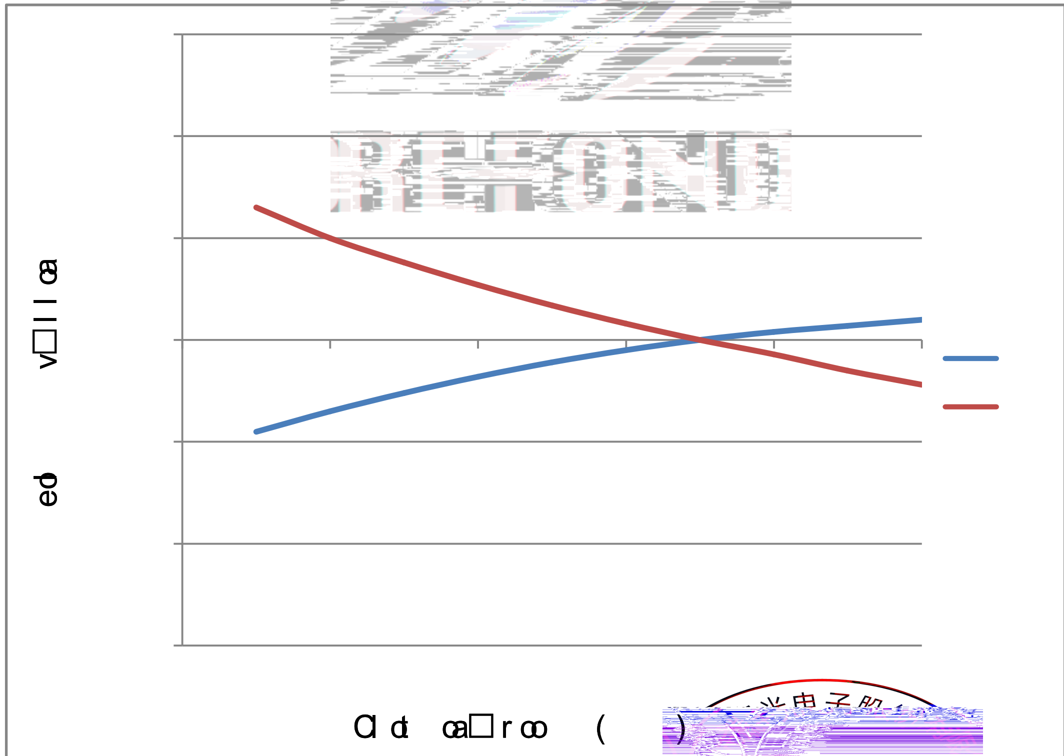


Fig. 1-13 Chromaticity Coordinate Shift Vs Forward Current (Amber)

Fig. 1-14 Spectrum Distribution(White)

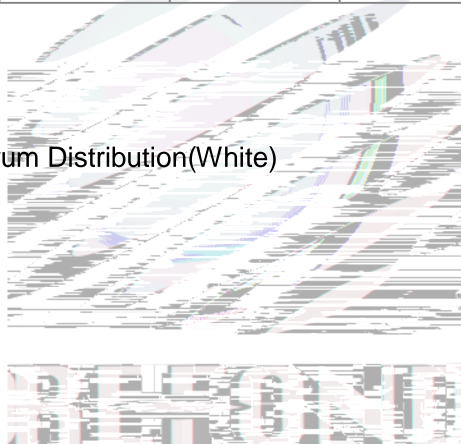


Fig. 1-14 Spectrum Distribution(Amber)

2. Packaging

2.1 Packaging Specification

Package:4000pcs/reel. 4000pcs

2.1.1Carrier Tape Dimension

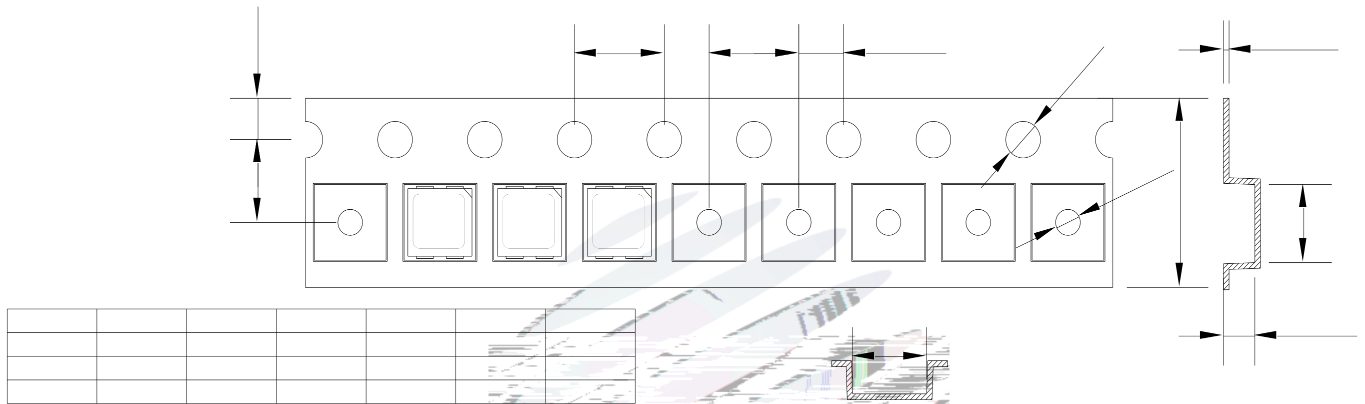


Fig.2-1 Carrier Tape Dimension

2.1.2Reel Dimension

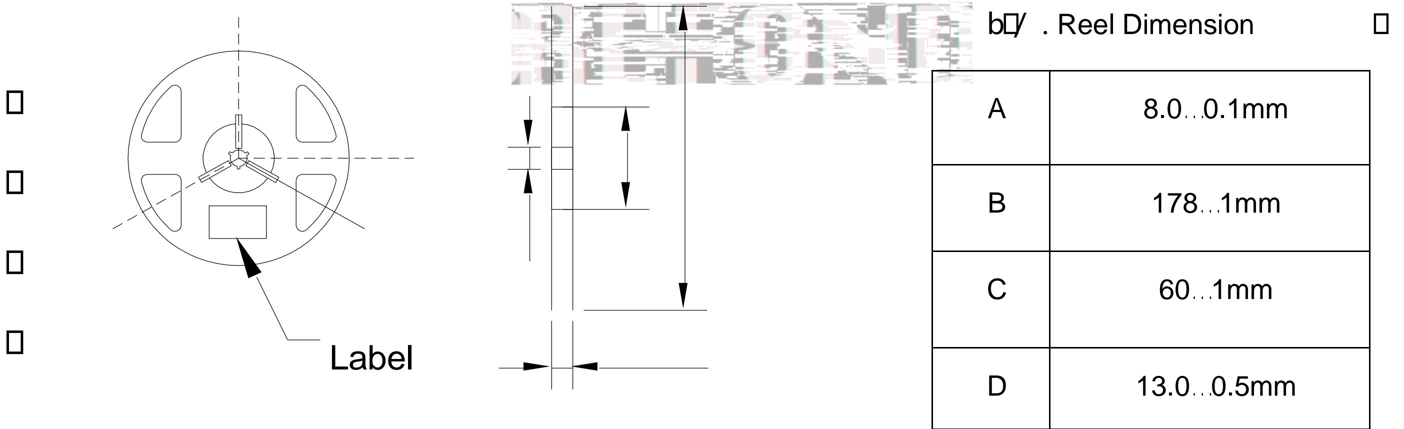


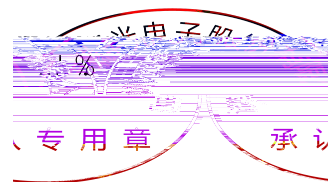
Fig.2-2Reel Dimension

Reel Dimension

A	8.0...0.1mm
B	178...1mm
C	60...1mm
D	13.0...0.5mm

Notes

The tolerances unless mentioned ±0.1mm. Unit : mm



2.4Reliability Test Items And Conditions

Table 2-3 Reliability Test Items And Conditions

Test Items	Ref.Standard	Test Condition	Time	Quantity	Ac/Re /
Reflow	JESD22-B106	Temp:260 max T=10 sec	2times	20pcs.	0/1
Thermal Shock	JEITAED-4701 300307	-40 15min 10s 125 15min	1000 cycle	20pcs.	0/1
High Temperature Storage	JEITAED-4701 200 201	Temp:125	1000hrs.	20pcs.	0/1
Low Temperature Storage	JEITA ED-4701 200 202	Temp:-40	1000hrs.	20pcs.	0/1
Life Test	JESD22-A108	Ta=25 I_F=350mA	1000hrs.	20pcs.	0/1
High Temperature High Humidity Life Test	JESD22-A101	85 / 85%R_H I_F=350mA	1000hrs.	20pcs.	0/1
Temperature Humidity Storage	JEITA ED-4701 100 103	T_A=85 R_H=85%	1000hrs.	20pcs.	0/1

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		

3. SMT Reflow Soldering Instructions SMT

3.1SMT Reflow Soldering Instructions SMT

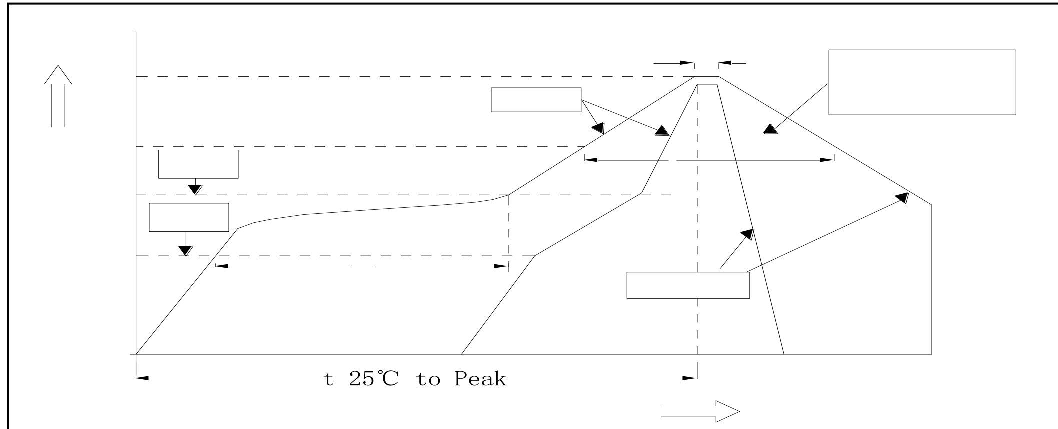


Fig.3-1SMT Reflow Soldering Instructions SMT

Table 3-1Reflow parameters

Average temperature rise speed Tsmax TP	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
Time limited to maintain high temperature: the temperature (TL)	217 °C
Time limited to maintain high temperature: The Time (tL)	60 Max 60s
Peak /Classification of temperature: / (TP)	260 °C
Time limit classification of peak temperature time tp	10 Max 10s
(TP) 5 °C Hold time within 5 „C with the actual peak temperature (TP)	30 Max 30s
Cooling speed	6 °C/ Max 6 °C/ s
25 °C Needed time from 25 °C to Tp	8 Max 8 minutes

Notes

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

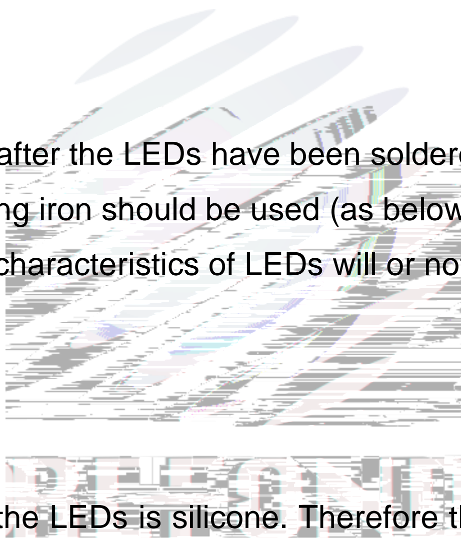
(2)When soldering , do not put stress on the LEDs during heating.

3.1.1 Soldering Iron

(1) When do soldering by hand, keep the temperature of iron below less 300℃ less than 3 seconds 0- - 0

(2) Soldering by hand should be done only one time.

3.1.2 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

BA

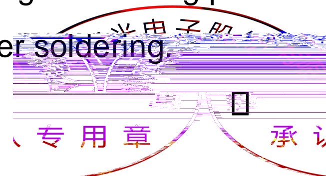
3.1.3 Cautions

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 use the picking up nozzle, the pressure on the silicone resin should be proper. LED

BA

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

(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.



(4) Handle the component along the side surface by using forceps or appropriate tools; Do not directly touch or Handle the silicone lens surface, it may damage the internal circuitry.

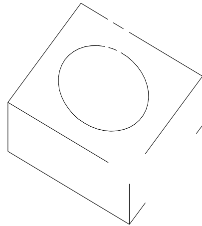


Fig 4-1 Cautions

(5) In designing a circuit, the current through each LED can not exceed the absolute maximum rating specified for each LED. In the mean while,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. BA

BA

(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

BA

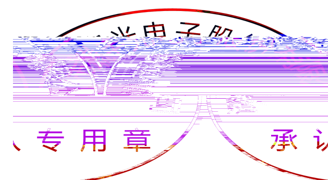
(7) Compared to standard encapsulants, silicone is generally softer, and the surface is more likely to attract dust,requiring special care during processing. In cases where a minimal level of dirt and dust particles cannot be guaranteed, a suitable cleaning solution must be applied to the surface after 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

光电子股
专用章
承认

Version History/

Date	Revisor	Version	Verifier	Remarks
2020/11/27		E0		
2021/03/20		E1		

www.refond.com



Declare ：

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