SPECIFICATION

REFOND P/N

RF-A2A31-WYS8-A4

R& D
Mass Production

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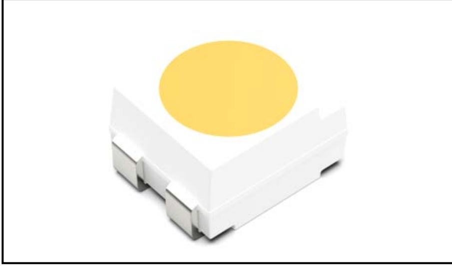
4.1 Handling Precautions

1. Description

1.1General Description



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

Product Package:3.50mmX2.80mmX1.85mm.

LED :3.50mmX2.80mmX1.85.

1.2Features

PLCC4 Package.

Extremely wide viewing angle.

Suitable for all SMT assembly and solder process.

Available on tape and reel.

Moisture sensitivity level: Level 2.

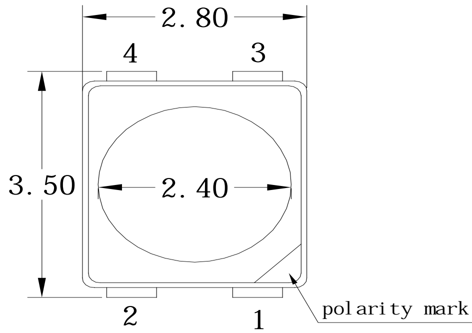
Compliance with RoHS and REACH. RoHS REACH

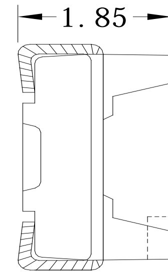
Qualifications: The product qualification test plan is based on the guidelines of AEC-Q101 Stress Test Qualification for Automotive Grade Discrete Semiconductors

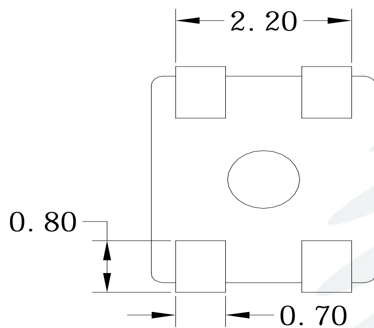
1.3Application

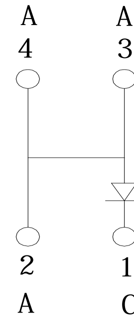
Automotive Lighting Interior and Exterior.

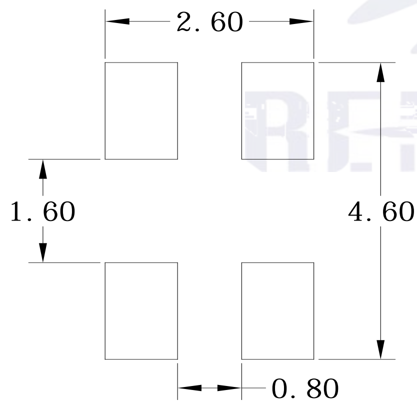
1.4Package Dimension











Notes

All dimensions units are millimeters.

All dimensions tolerances are ±0.2mm unless otherwise noted.

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=50mA	2.8	3.0	3.4	V
Reverse Current	I_R	V_R=5V	---	---	10	uA
Luminous Intensity	IV	I_F=50mA	3500	5300	6500	mcd
Viewing Angle		I_F=50mA	---	120	---	deg
Thermal Resistance.	R_{THJ-S}	I_F=50mA	---	---	180	/W

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

Parameter	Symbol	Rating	Units
Power Dissipation	P_D	238	mW
Forward Current	I_F	70	mA
Peak Forward Current	I_{FP}	100	mA
Reverse Voltage	V_R	5	V
Electrostatic Discharge (HBM)	E_{SD}	2000	V
Operating Temperature	T_{OPR}	-40 ~ +100	
Storage Temperature	T_{STG}	-40 ~ +100	
Junction Temperature	T_J	120	

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Notes

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

2. The above forward voltage measurement allowance tolerance is ±0.1V. ±0.1V.

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

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

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. LED

8. ESD yield is over 90% at 2000V ESD (HBM). ESD protection during products handing is needed. 90% LED ESD 0V ,

1.6Bin Range Of Forward Voltage and Luminous Intensity (IF=50mA)

BIN (IF=50mA)

Table 1-3

V_F V	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
IV mcd	O2	P1	P2			
	3500-4300	4300-5300	5300-6500			

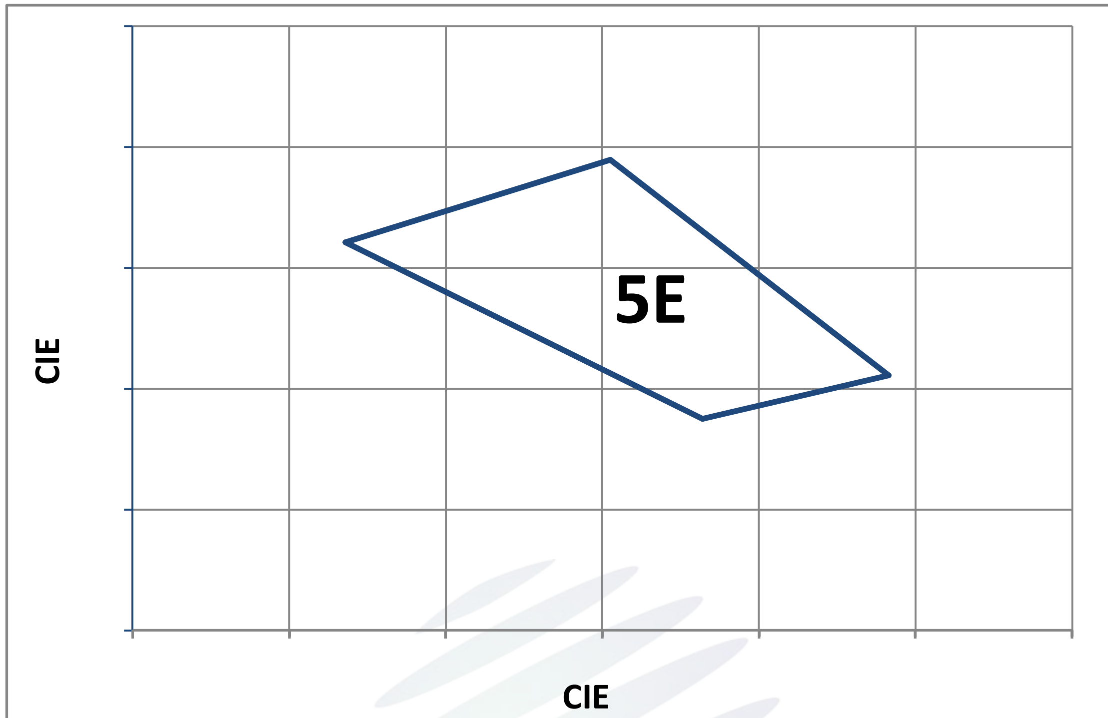


Fig. 1-6 The C.I.E Chromaticity Diagram CIE

Table 1-4

BIN CODE	CIE-X1	CIE-Y1	CIE-X2	CIE-Y2	CIE-X3	CIE-Y3	CIE-X4	CIE-Y4
	0.5536	0.4221	0.5764	0.4075	0.5883	0.4111	0.5705	0.4289

1.7 Typical Optical Characteristics Curves

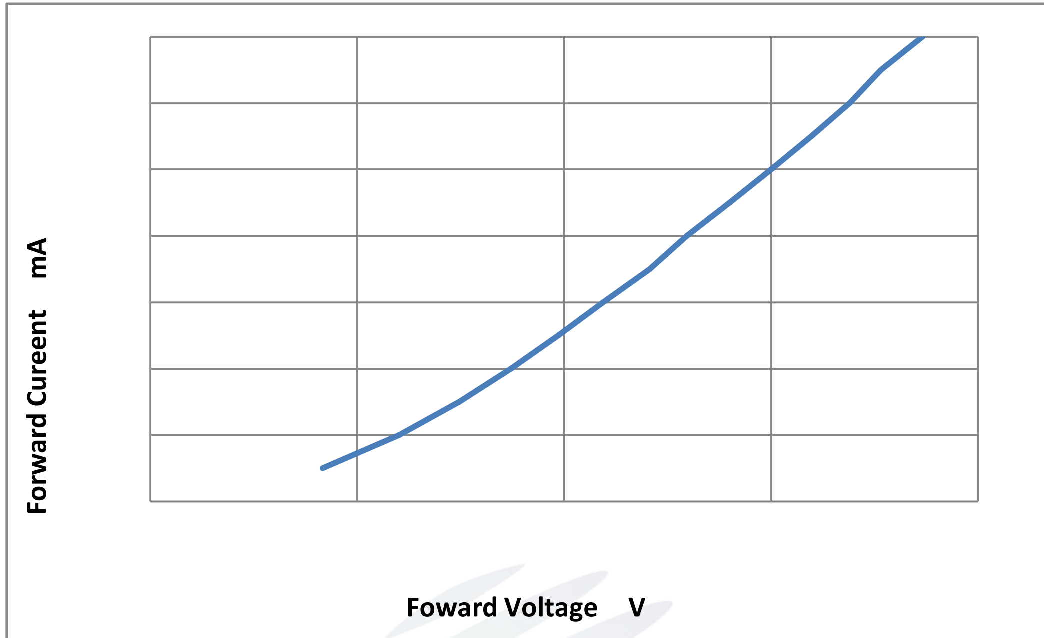


Fig. 1-7 Forward Voltage Vs Forward Current

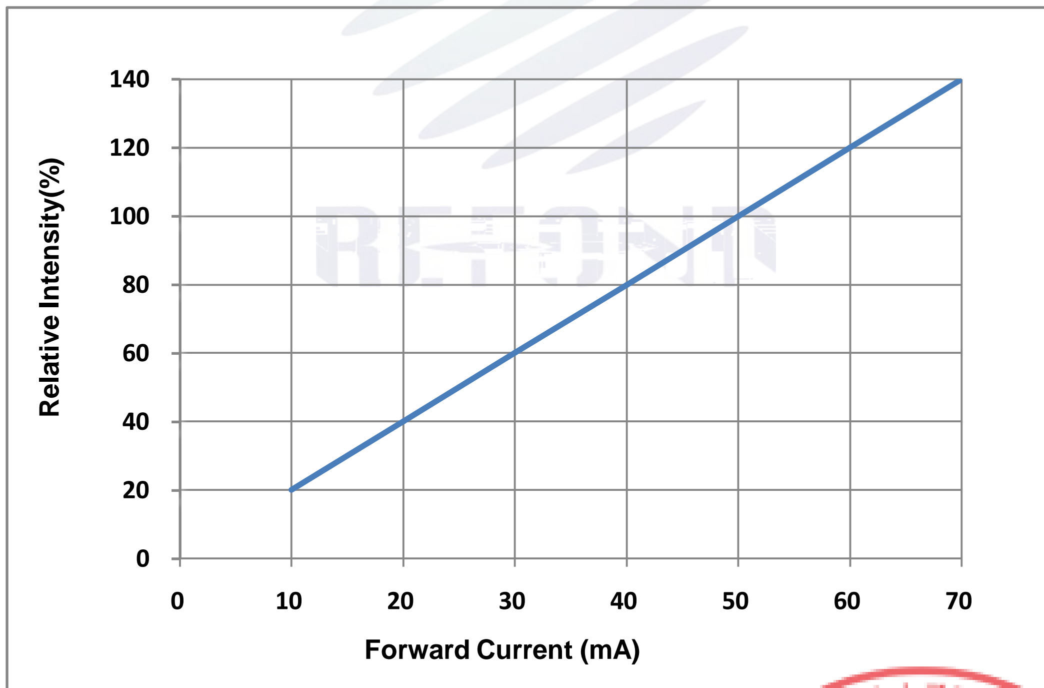


Fig. 1-8 Forward Current Vs Relative Intensity

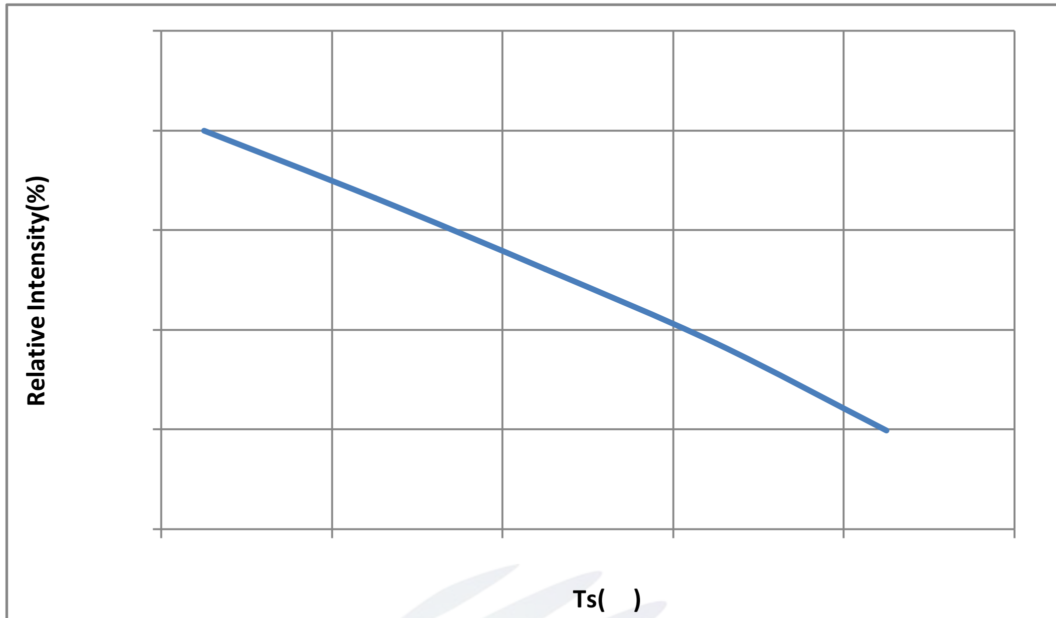


Fig. 1-9　Solder Temperature Vs Relative Intensity

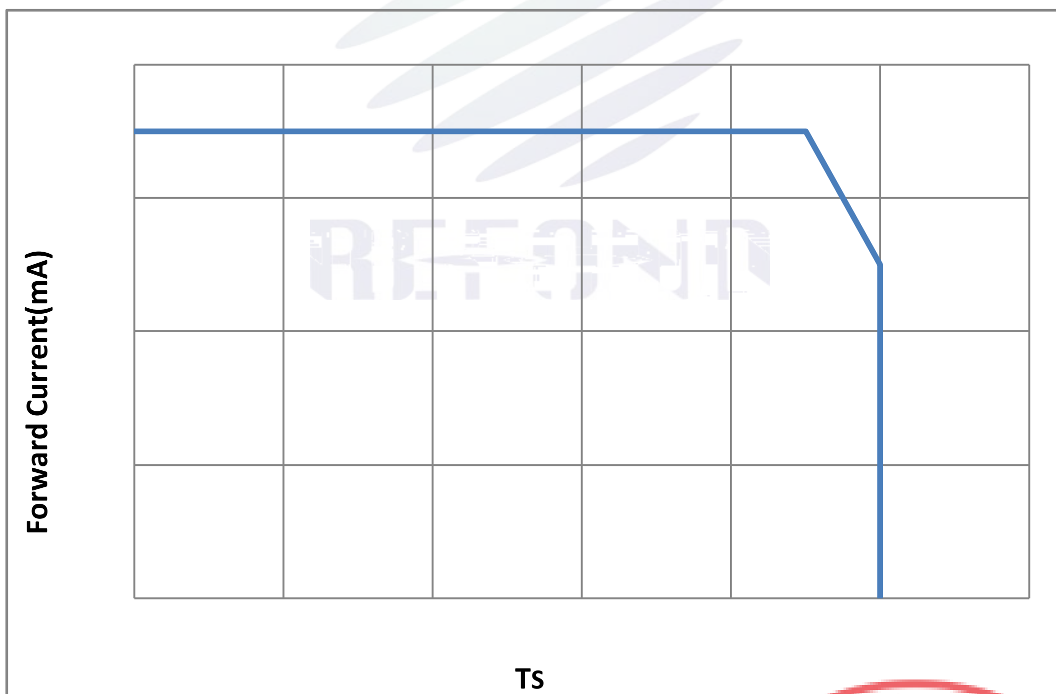


Fig. 1-10 Solder Temperature Vs Forward Current

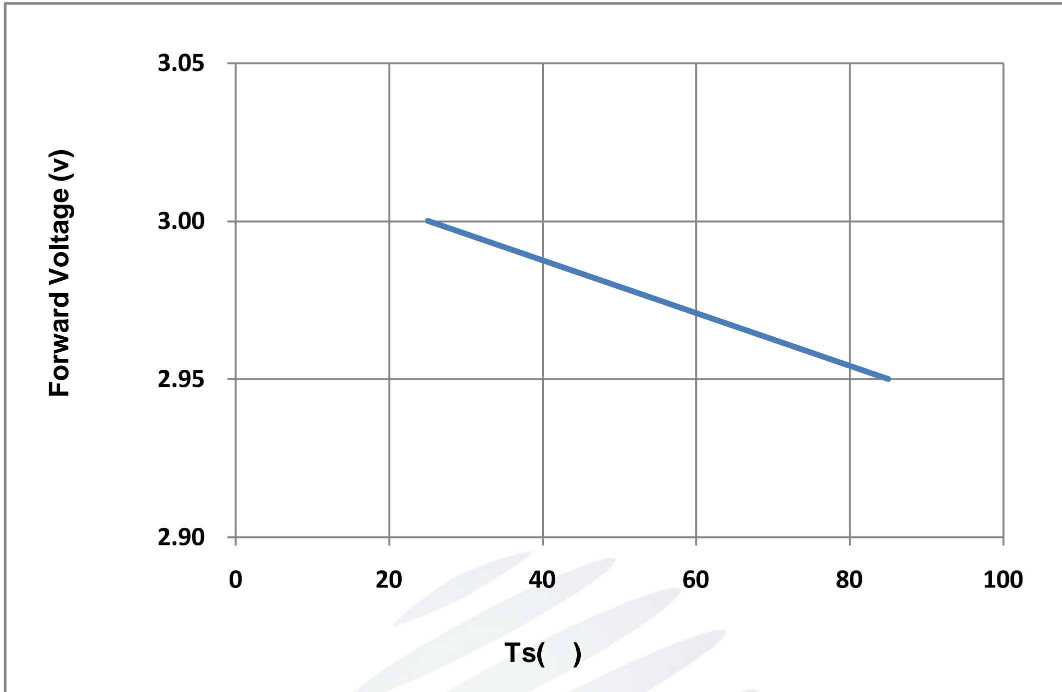


Fig. 1-11 Forward Voltage Vs Solder Temperature

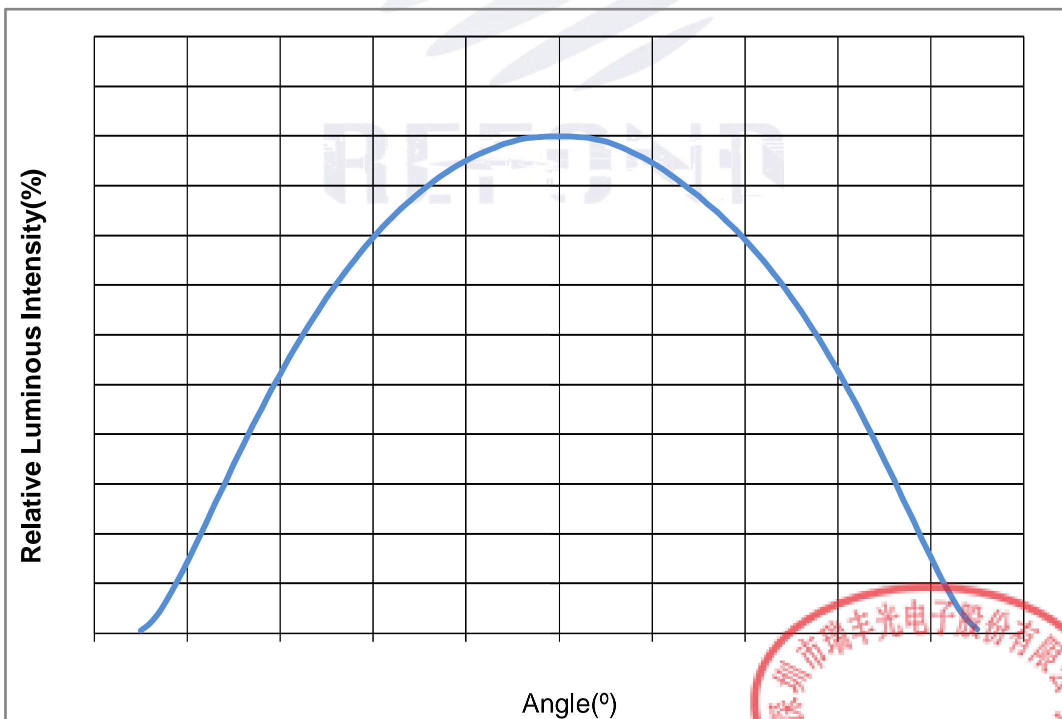
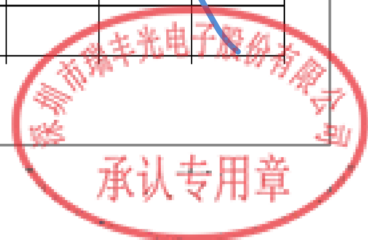


Fig. 1-12 Radiation diagram



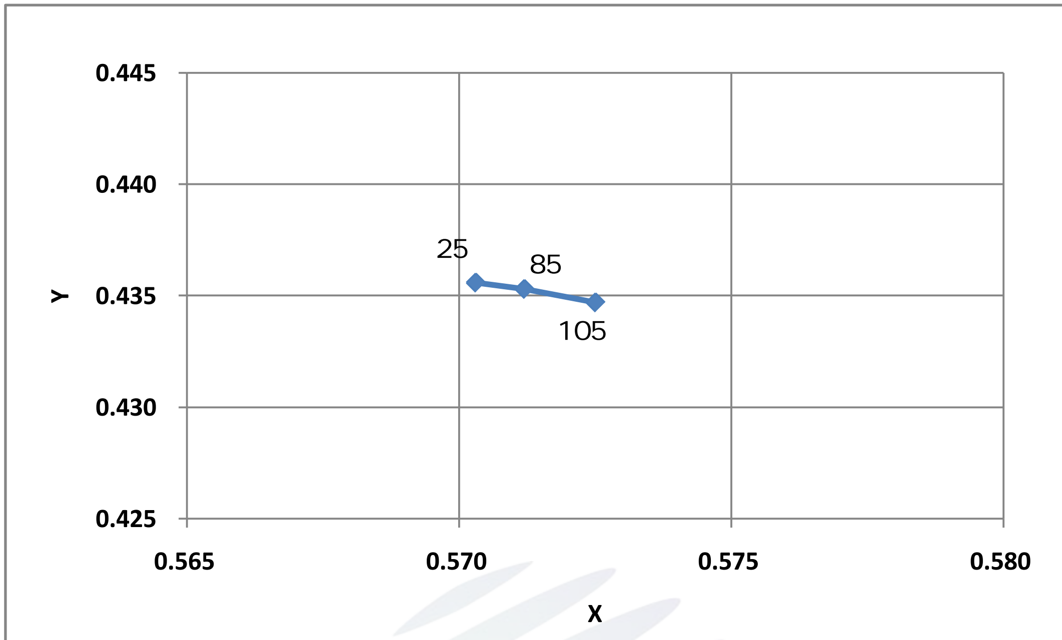


Fig. 1-13 Chromaticity Coordinate Shift Vs Forward Current

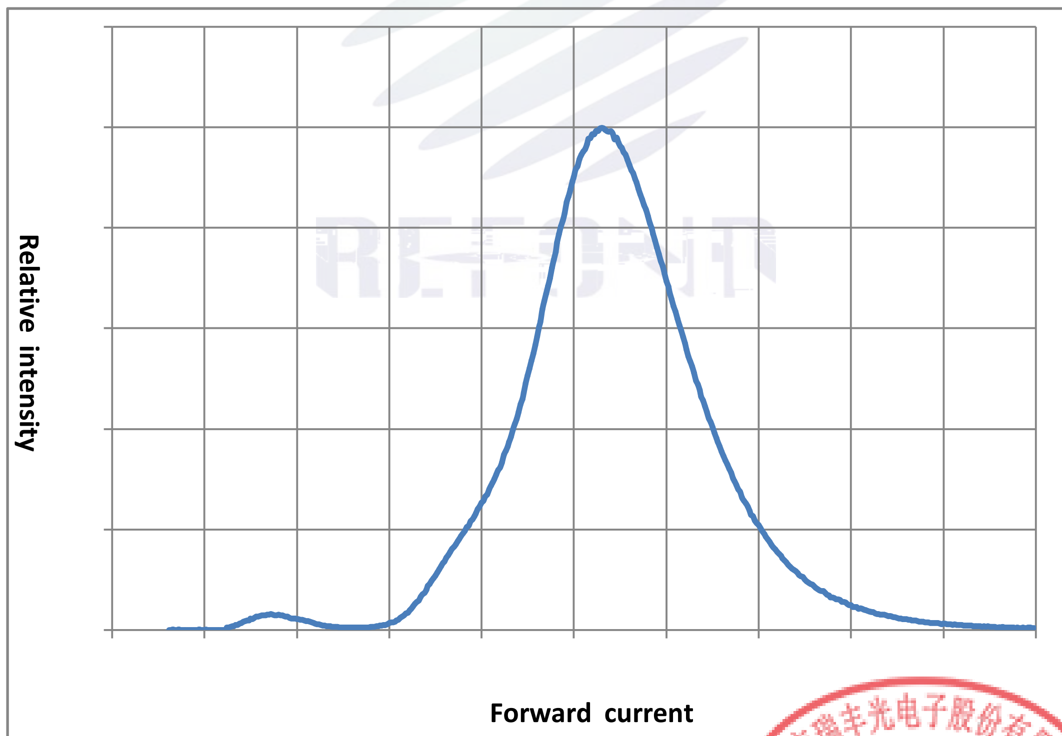


Fig. 1-14 Spectrum Distribution

2. Packaging

2.1 Packaging Specification

Package:2000pcs/reel.

2.1.1Carrier Tape Dimension

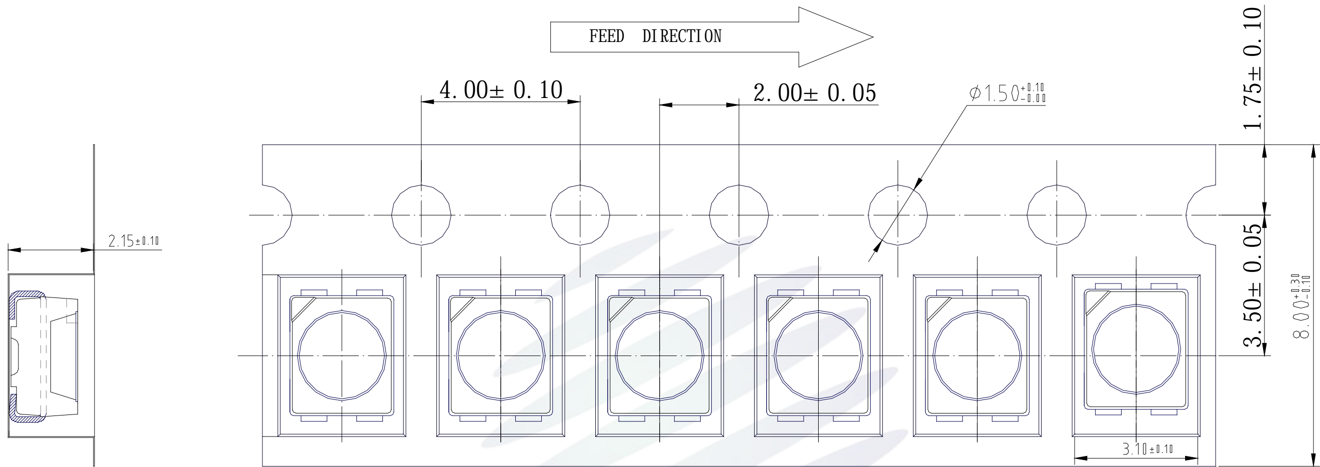


Fig.2-1 Carrier Tape Dimension

2.1.2Reel Dimension

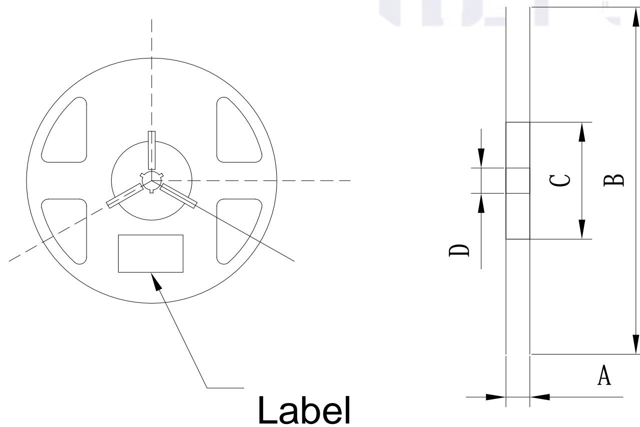


Fig.2-2Reel Dimension

Table Reel Dimension

A	8.0± 0.1mm
B	330± 1mm
C	100± 1mm
D	13.0± 0.5mm

Notes

The tolerances unless mentioned ±0.1mm. Unit : mm ±0.

2.1.3Label Form Specification

Table 2 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

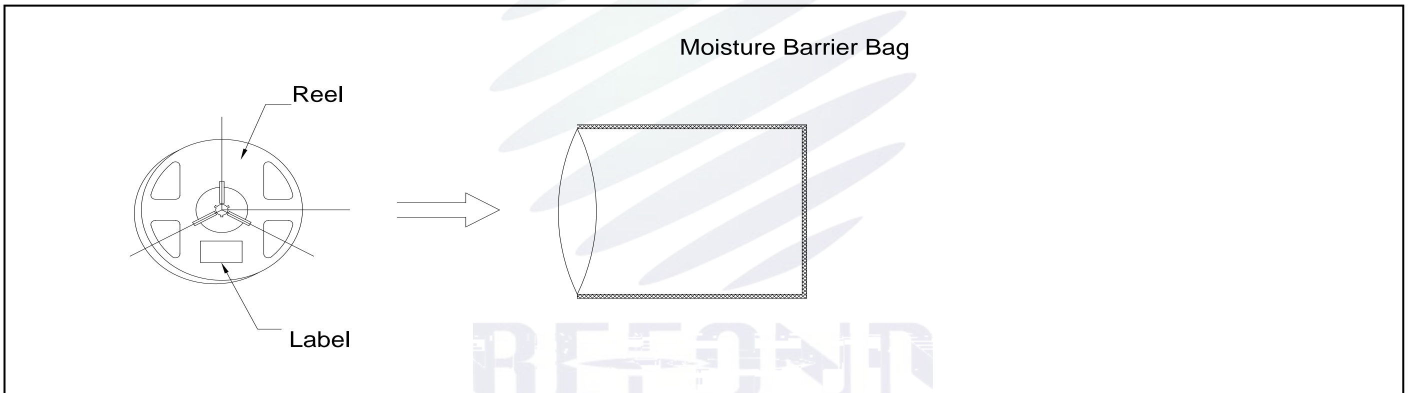


Fig.2-4Moisture Resistant Packing

2.3Cardboard Box

Fig.2-5Cardboard Box

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
MSL2 2	JESD22-A113	85 / 60%RH	168 hrs.	20pcs.	0/1
Thermal Shock	JEITAED-4701 300307	-40 15min 10s 125 15min	1000 cycle	20pcs.	0/1
Life Test	JESD22-A108	Ta=100 IF=50mA	1000hrs.	20pcs.	0/1
High Temperature High Humidity Life Test	JESD22-A101	85 / 85%RH IF=50mA	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=50mA	-	U.S.L*)x1.1
Reverse Current	I_R	V_R = 5V	-	U.S.L*)x2.0
Luminous Flux		I_F=50mA	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. LED

LED

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.

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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 M)

Notes

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

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

3.1.1 Soldering Iron

do by hand, keep the temperature of iron below less 300 less than 3 seconds

Soldering by hand 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 not be damaged by repairing.

LED LED

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

LED

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

(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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Fig 4-1Handling Precautions

(5) In designing a circuit,thecurrent through each LED can not exceed the absolute maximum rating specified for each LED.In the meanwhile,resistors for protection should be applied,other wise 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. LED

LED

(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

LED

(7) Compared to standard encapsulants, silicone is generally softer, and the surface is more likely to attraSct dust cul ˚ (gu k ı r Ê as

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Table 4-1Storage

Conditions		Temperature	Humidity	Time
Storage	Before Opening Aluminum Bag	30	75%	Within 1 Year From Date

Version History/

Date	Revisor	Version	Verifier	Remarks
2021/3/13	xianhui	E0	hu yiming	New issue
2022/08/18	Li xianhui	E1	hu Yiming	Template update

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Declare

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