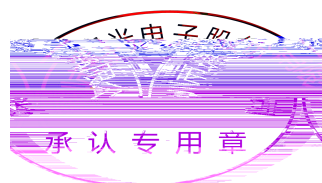


SPECIFICATION

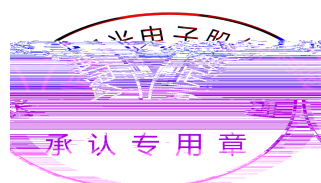


Mass Production



Contents

1. Description	3
1.1 General Description	3
1.2 Features	3
1.3 Application	3
1.4 Package Dimension	4
1.5 Product Parameters	5
1.6 Bin Range Of Forward Voltage and Luminous Intensity (IF=20mA)	BIN
(IF=20mA).....	6
1.7 Typical Optical Characteristics Curves	8
2. Packaging	12
2.1 Packaging Specification	12
2.1.1 Carrier Tape Dimension	12
2.1.2 Reel Dimension	12
2.1.3 Label Form Specification	13
2.2 Moisture Resistant Packing	13
2.3 Cardboard Box	14
2.4 Reliability Test Items And Conditions	14
2.5 Criteria For Judging Damage	15
3. SMT Reflow Soldering Instructions SMT	16
3.1 SMT Reflow Soldering Instructions SMT	16
4. Handling Precautions	18
4.1 Handling Precautions	18



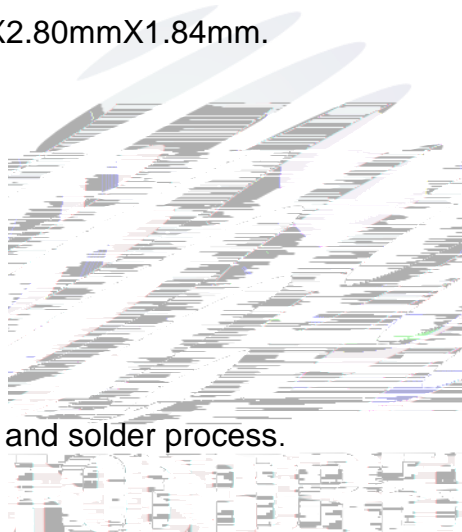
1. Description

1.1 General Description



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

Product Package: 3.50mmX2.80mmX1.84mm.



3.50mmX2.80mmX1.84mm

1.2 Features

PLCC2 Package.

Extremely wide viewing angle.

Suitable for all SMT assembly and solder process.

Available on tape and reel.

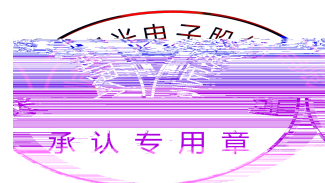
Moisture sensitivity level: Level 2.

Compliance with RoHS and REACH. 符合RoHS和REACH要求

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

1.3 Application

Automotive Interior Lighting. 汽 内 照 明
Switches. 开 关



1.4 Package Dimension

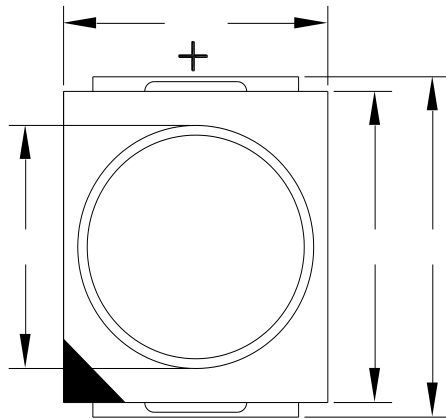


Fig.1-1 Top View

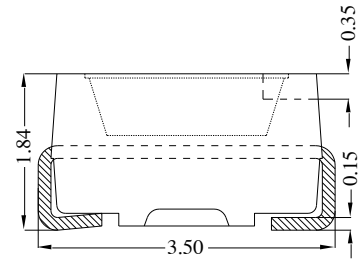


Fig.1-2 Side View

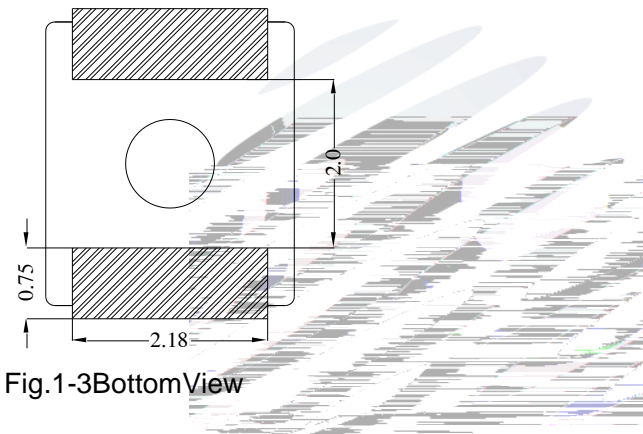


Fig.1-3 Bottom View

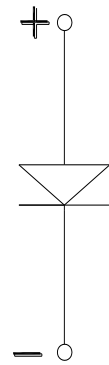


Fig.1-4 Polarity



Fig.1-5 Soldering Patterns

Notes

All dimensions units are millimeters.

All dimensions tolerances are $\pm 0.2\text{mm}$ unless otherwise noted.



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1.5 Product Parameters

 Table 1-1 Electrical / Optical Characteristics at $T_s=25^\circ\text{C}$

Item	Symbol	Test Condition	Value			Unit
			Min.	Typ.	Max.	
Forward Voltage	V_F	$I_F=20\text{mA}$	2.8	2.85	3.4	V
Reverse Current	I_R	$V_R=5\text{V}$	---	---	10	μA
Luminous Intensity	I_V	$I_F=20\text{mA}$	2300	3000	3500	mcd
Viewing Angle		$I_F=20\text{mA}$	---	120	---	deg
Thermal Resistance.	R_{THJ-S}	$I_F=20\text{mA}$	---	---	300	$^{\circ}\text{C}/\text{W}$

 Table 1-2 Absolute Maximum Ratings at $T_s=25^\circ\text{C}$

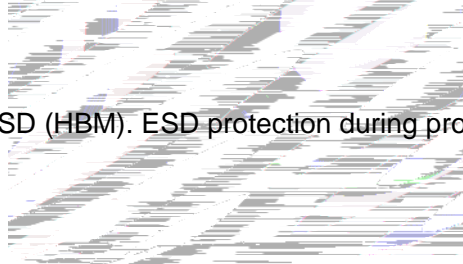
Parameter	Symbol	Rating	Units
Power Dissipation	P_D	102	mW
Forward Current	I_F	30	mA
Peak Forward Current	I_{FP}	100	mA
Reverse Voltage	V_R	5	V
Electrostatic Discharge (HBM)	E_{SD}	2000	V
Operating Temperature	T_{OPR}	-40 ~ +100	
Storage Temperature	T_{OPR}	-40 ~ +100	
Junction Temperature	T_J	120	



Notes

1. 1/10 Duty cycle, 10ms pulse width.
2. The above forward voltage measurement allowance tolerance is $\pm 0.1V$. $\pm 0.1V$.
3. The above color coordinates measurement allowance tolerance is ± 0.005 . \pm
4. The above luminous intensity measurement allowance tolerance $\pm 10\%$. $\pm 10\%$.
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



8. ESD yield is over 90% at 2000V ESD (HBM). ESD protection during products handling is needed.

1.6 Bin Range Of Forward Voltage and Luminous Intensity (IF=20mA)

BIN (IF=20mA)

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)	NC0	ND0	OA0	OB0		
	2300-2550	2550-2800	2800-3150	3150-3500		

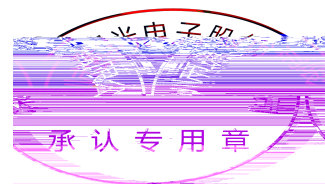
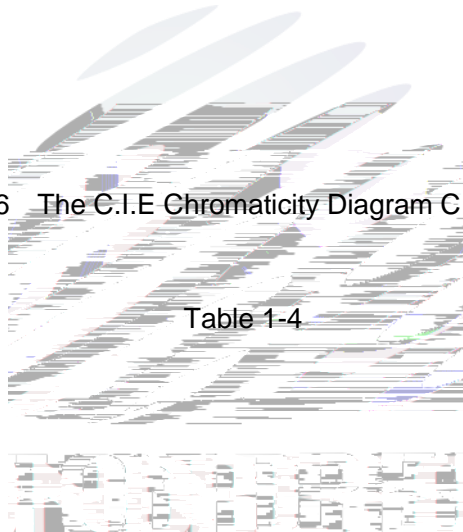


Fig. 1-6 The C.I.E Chromaticity Diagram CIE



BIN CODE CIE-X1 CIE-Y1

1.7 Typical Optical Characteristics Curves

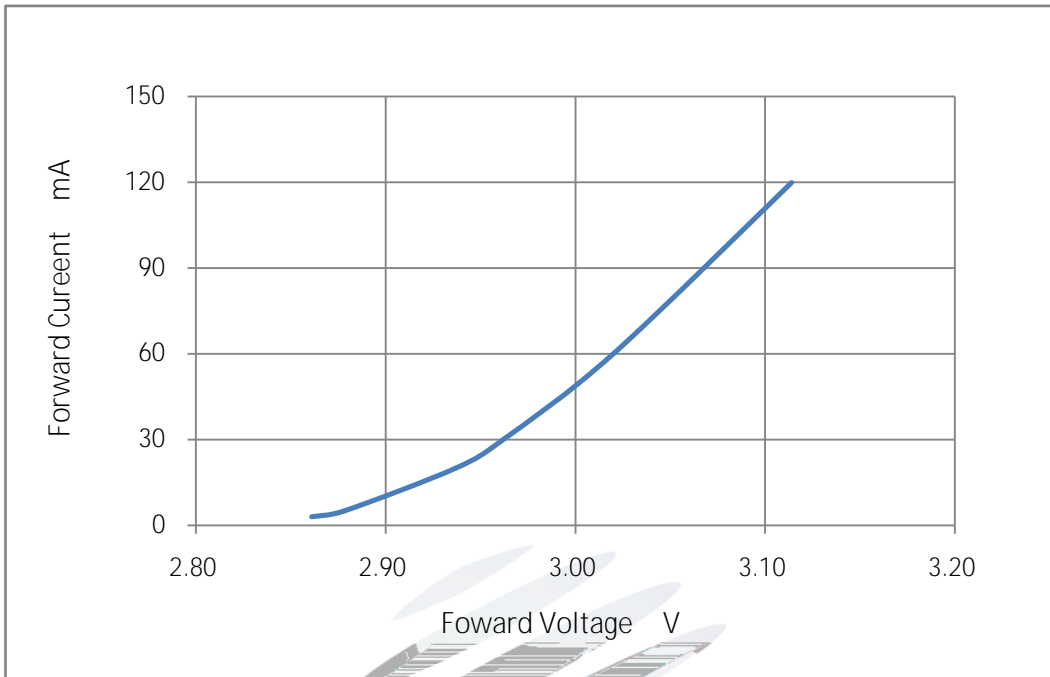


Fig. 1-7 Forward Voltage Vs Forward Current

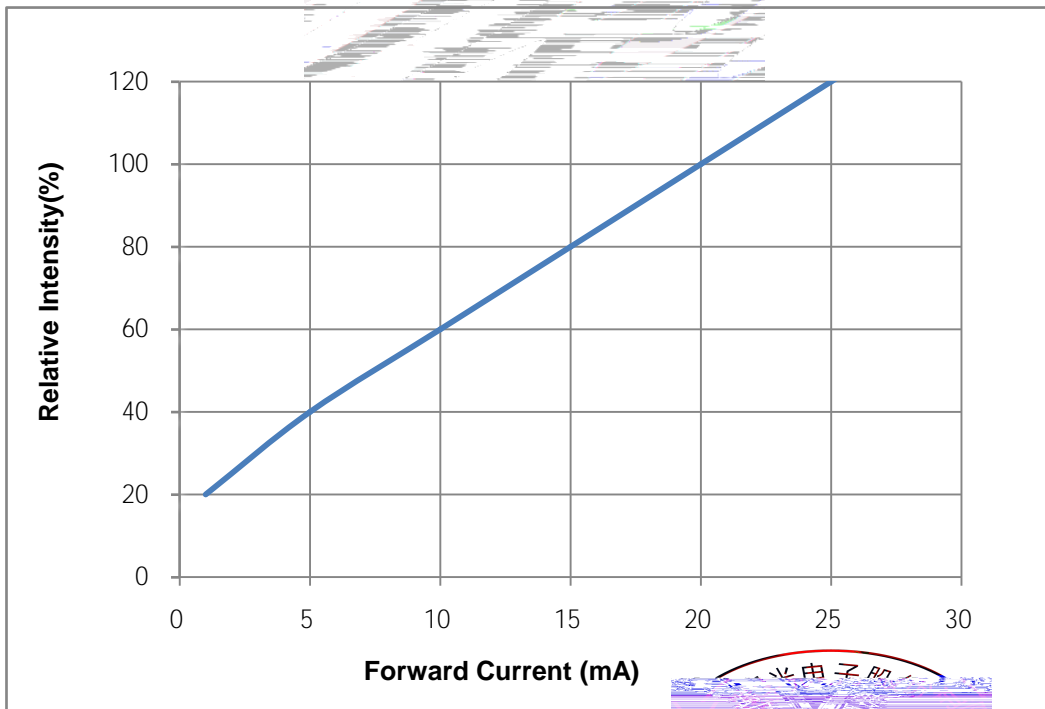


Fig. 1-8 Forward Current Vs Relative Intensity



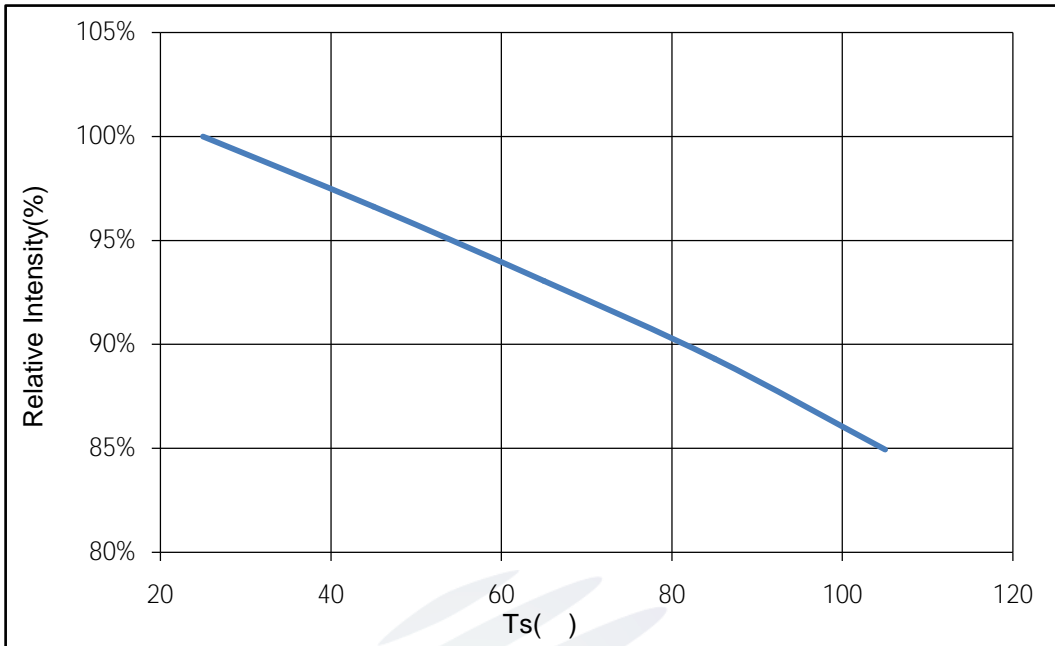


Fig. 1-9 Solder Temperature Vs Relative Intensity

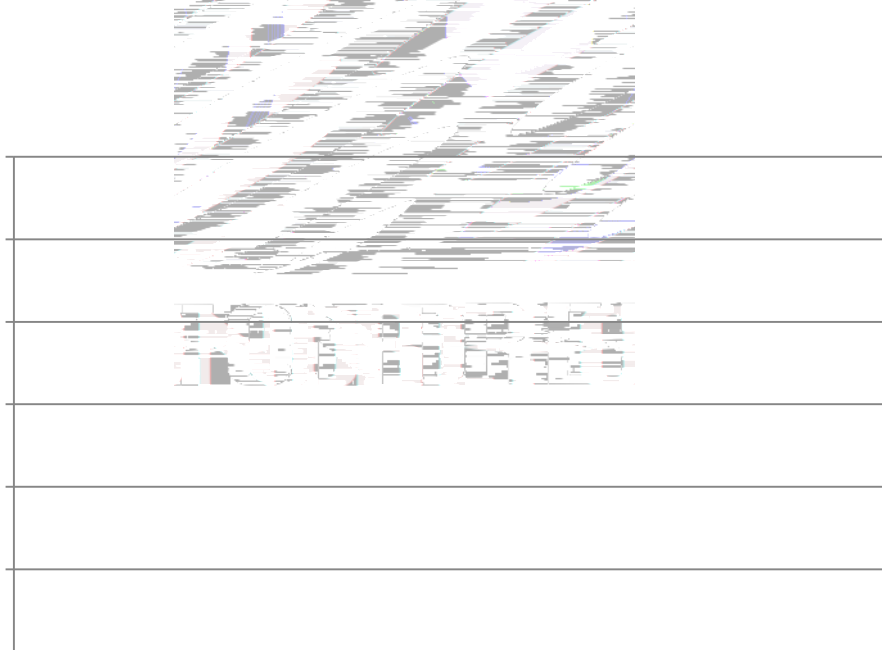


Fig. 1-10 Solder Temperature Vs Forward Current

Fig. 1-11 Forward Voltage Vs Solder Temperature

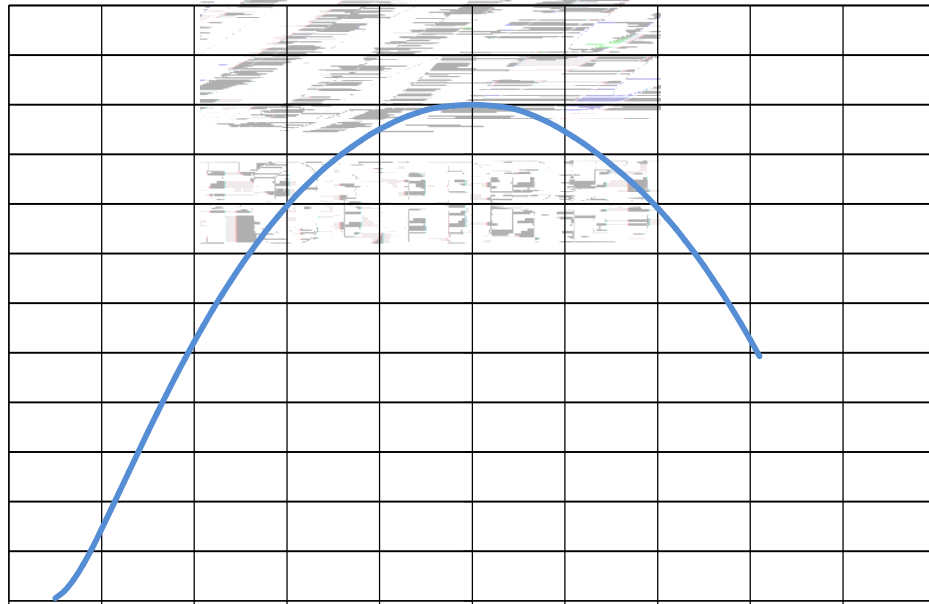
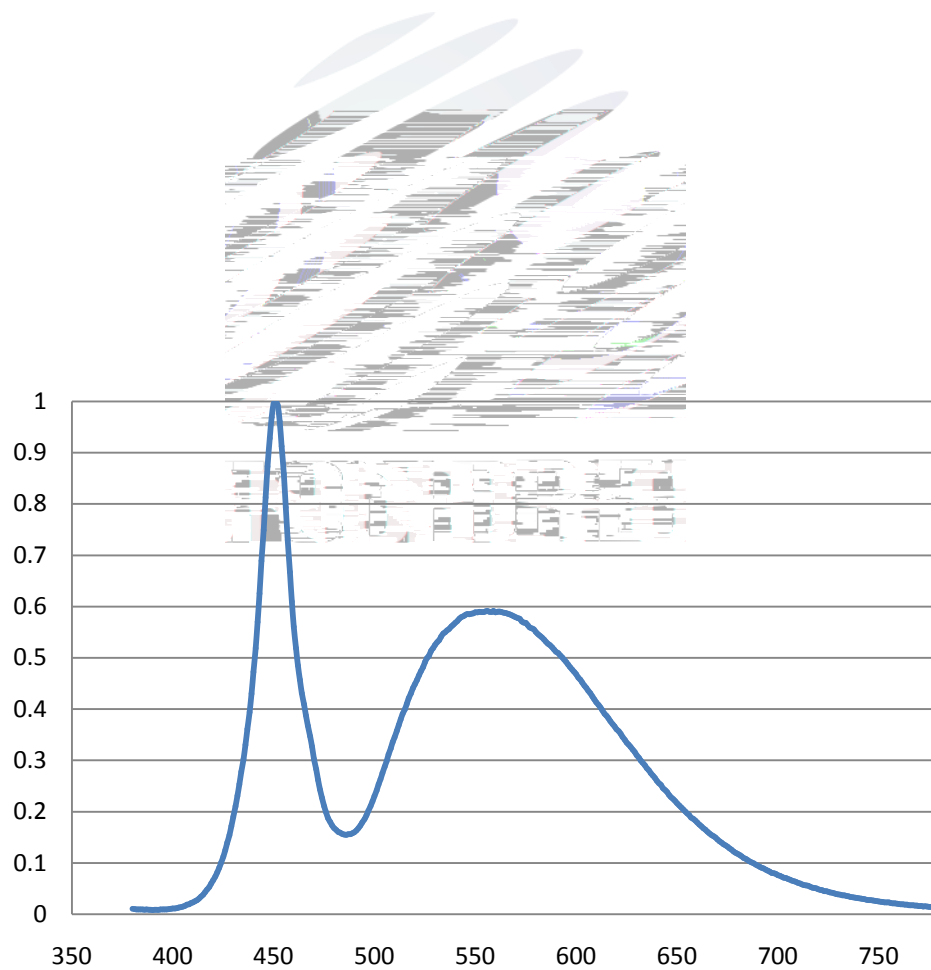


Fig. 1-12 Radiation diagram





2. Packaging

2.1 Packaging Specification

Package:2000pcs/reel.

2000pcs

2.1.1 Carrier Tape Dimension

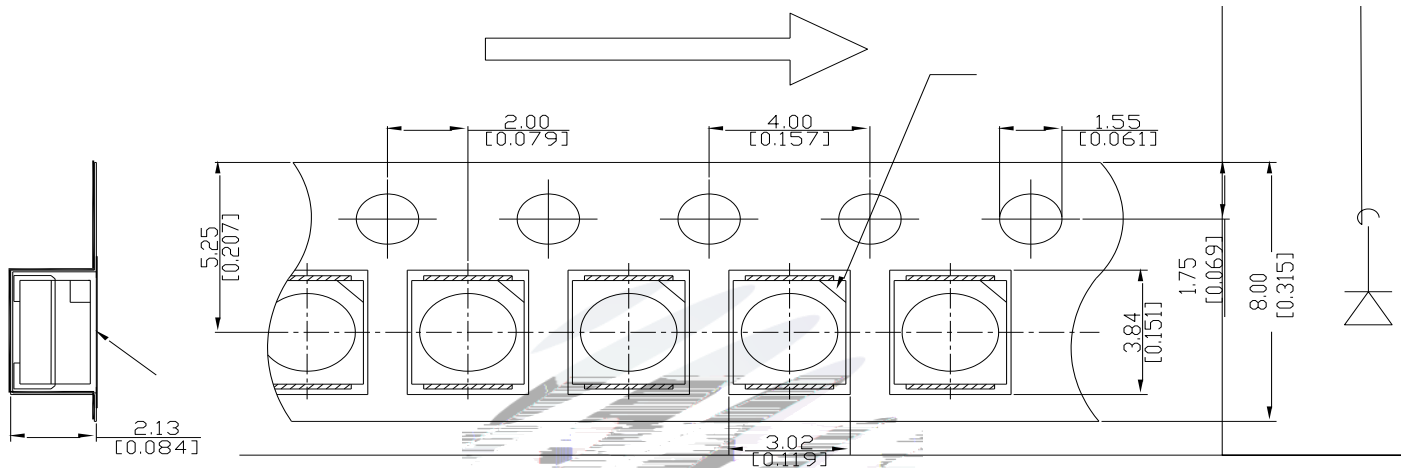
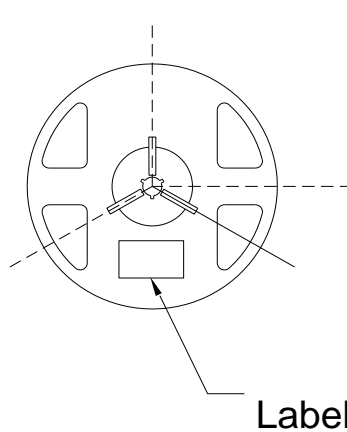


Fig.2-1 Carrier Tape Dimension

2.1.2 Reel Dimension



Label

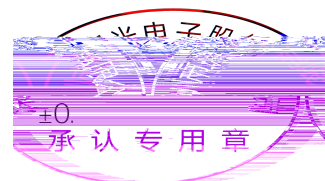
Fig.2-2 Reel Dimension

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



2.1.3 Label Form Specification

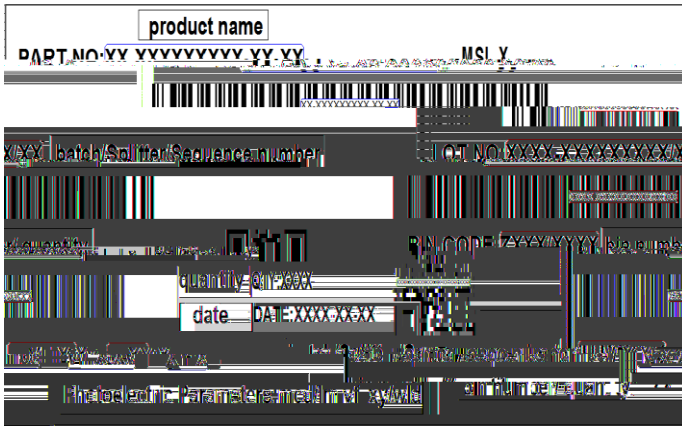


Fig. 2-3 Label Form Specification

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

2.2 Moisture Resistant Packing

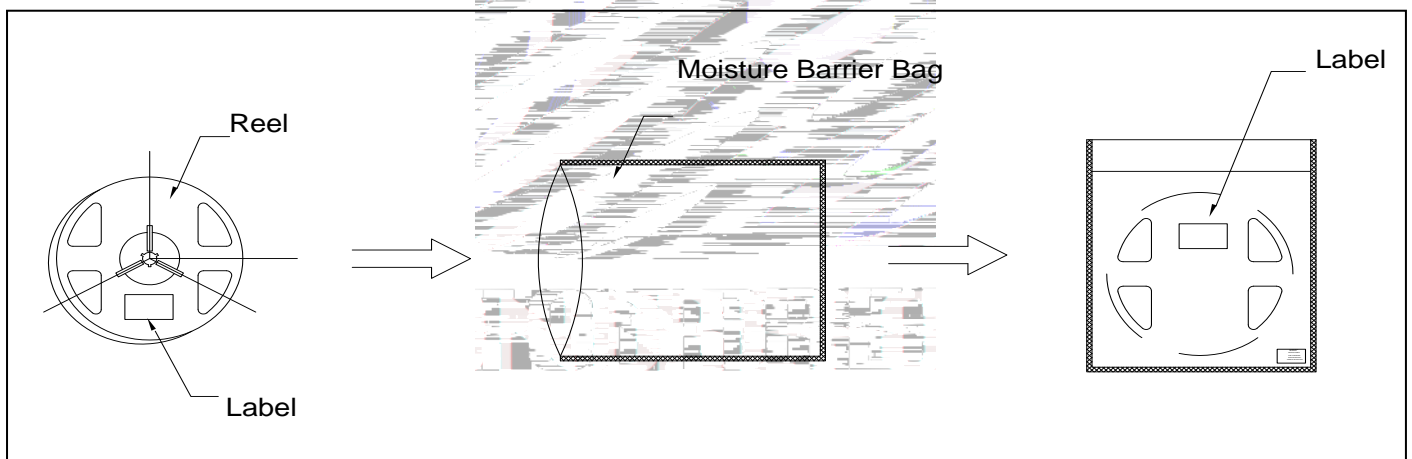
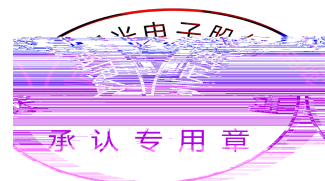


Fig.2-4 Moisture Resistant Packing



2.3 Cardboard Box

Fig.2- Cardboard Box

2.4 Reliability 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			/

High Temperature High Humidity Life Test	JESD22-A101	85 / 85%RH I _F =20mA	1000hrs.	20pcs.	0/1
Temperature Humidity Storage	JEITA ED-4701 100 103	T _A =85 RH=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 =20mA	-	U.S.L*)x1.1
Reverse Current	I _R	V _R = 5V	-	U.S.L*)x2.0
Luminous Flux		I _F =20mA	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.



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.

3. SMT Reflow Soldering Instructions SMT

3.1 SMT Reflow Soldering Instructions SMT

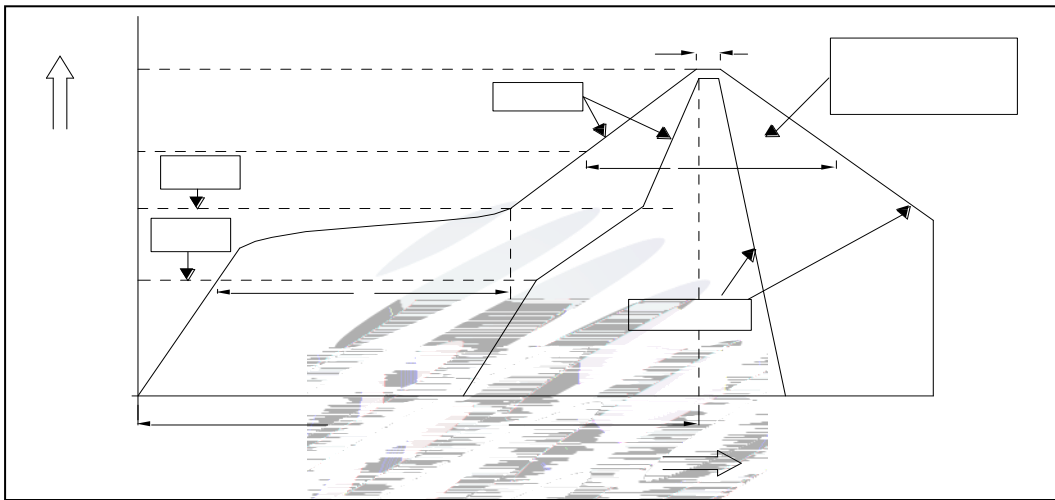


Fig.3-1 SMT Reflow Soldering Instructions SMT

Table 3-1 Reflow parameters

Average temperature rise speed	T_{smmax} T_P	3 °C/ Max 3 °C/ s
Preheating: minimum temperature	(T_{smmin})	150 °C
Preheating: Max temperature	(T_{smmax})	200 °C
Preheating: Time	T_{smmin} T_{smmax}	60 - 120 60s-120s
Time limited to maintain high temperature: the temperature (T_L)		217 °C
Time limited to maintain high temperature: The Time (t_L)		60 Max 60s
Peak /Classification of temperature:	/ (T_P)	260 °C

Time limit classification of peak temperature time t_p	10 Max 10s
(T_p) 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 T_p	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.

(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

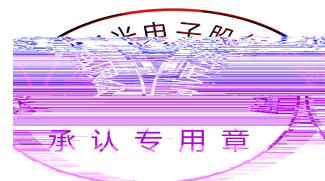
(2) Soldering by hand should be done only one time.

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

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

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

(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.

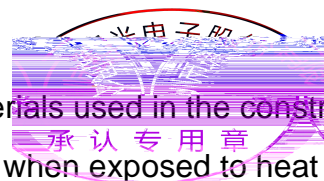
4. Handling Precautions

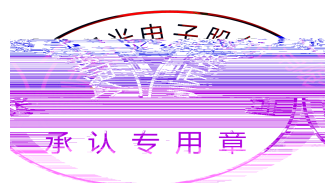
4.1 Handling Precautions

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

(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.

(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





(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

(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.



Table 4-1 Storage

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

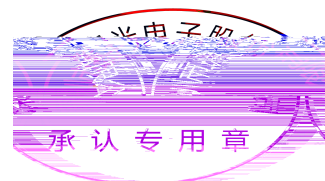
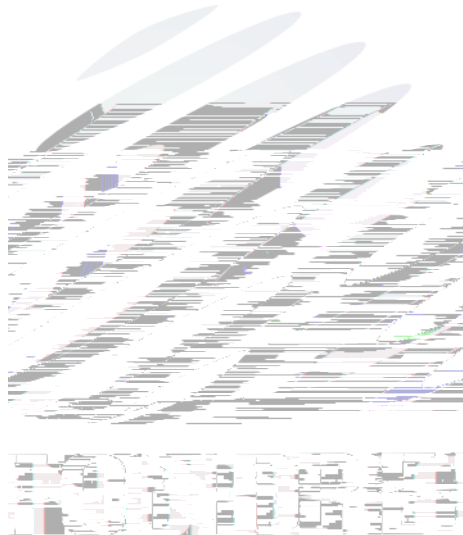
following condition 65 5 for above 24 hours.

±

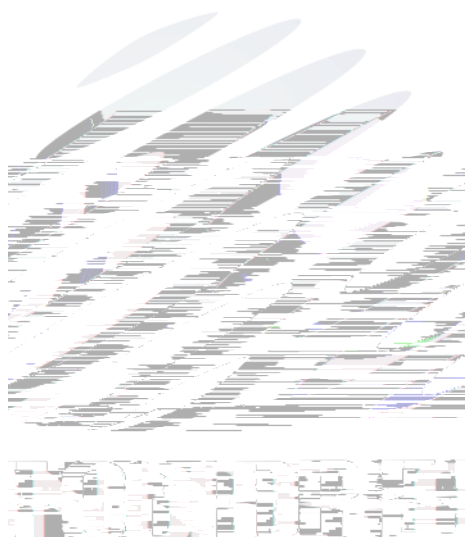
If the package is flatulence or damaged, please notify the sales staff to assist.

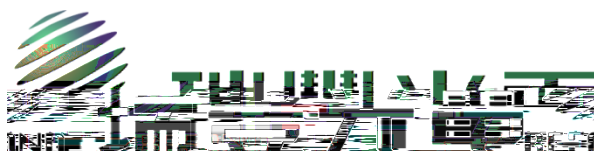
(9) Similar to most Solid state devices; LEDs are sensitive to Electro-Static Discharge (ESD) and Electrical Over Stress (EOS).

(10) Other points for attention, please refer to our relevant information.

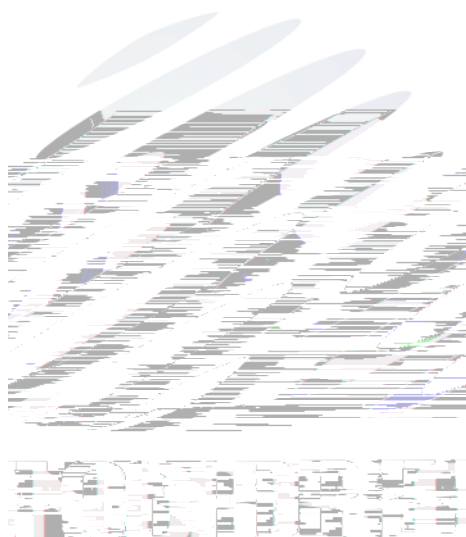


Date	Revisor	Version	Verifier	Remarks
2017/7/13		E0		





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Declare

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

