

SPECIFICATION

REFOND P/N

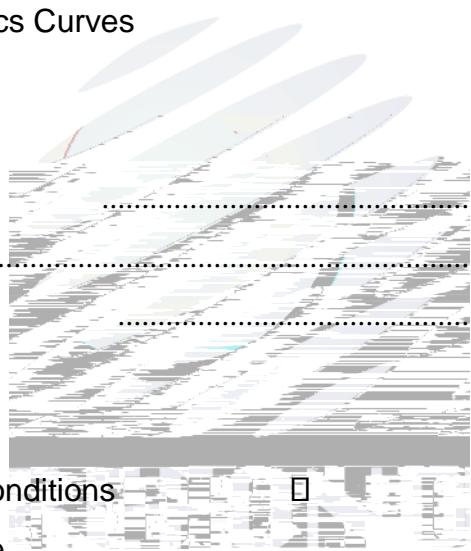
RF-A2P08-B695-A2

R&D

Mass Production

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1. Description

1.1 General Description



The Blue source color devices are made with GaN on Substrate Light Emitting Diode .
 Product Package:1.60mmX0.80mmX0.55mm.

LED GaN

1.60mmX0.80mmX0.55mm.

1.2 Features

PLCC2 Package.PLCC2

Extremely wide viewing angle.

Suitable for all SMT assembly and solder process. 上 SMT

Available on tape and reel. 上

Moisture sensitivity level: Level 2. Level2

Compliance with RoHS and REACH. RoHS REACH

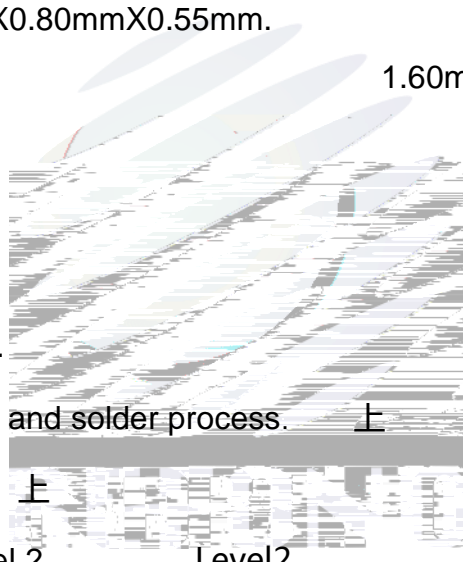
Qualifications: The product qualification test plan is based on the guidelines of AEC-Q101
 Stress Test Qualification for Automotive Grade Discrete Semiconductors

上AEC-Q101

1.3 Application

Automotive Lighting Interior.

Switches.



1.4 Package Dimension

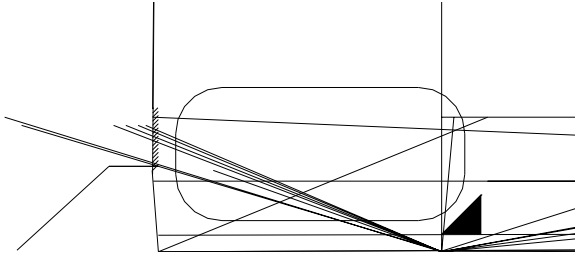


Fig.1-1 Top View

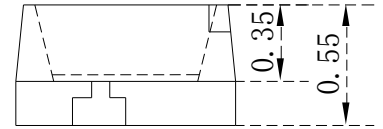


Fig.1-2 Side View

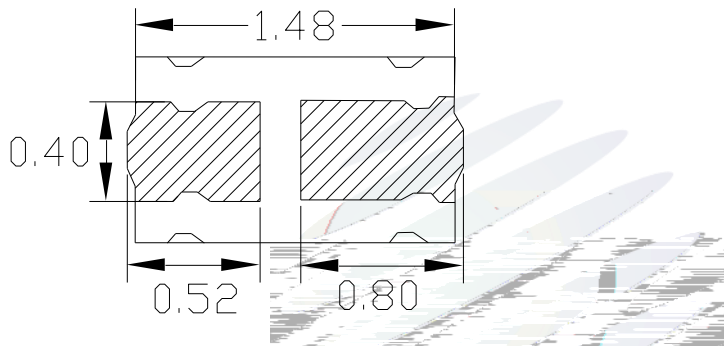


Fig.1-3 Bottom View

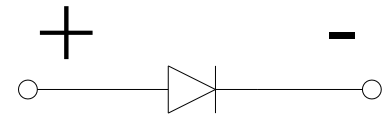


Fig.1-4 Polarity

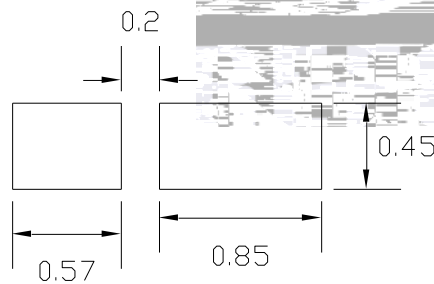


Fig.1-5 Soldering Patterns

Notes

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

0.2

1.5 Product Parameters

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

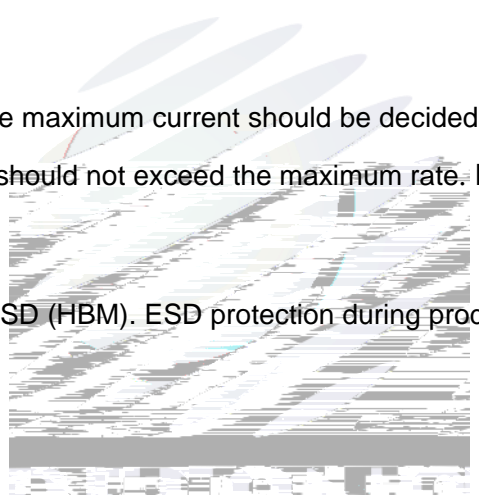
Item □	Symbol	Test Condition	Value			Unit
			Min.	Typ.	Max.	
Forward Voltage	V_F	$I_F=20mA$	2.8	3.0	3.4	V
Reverse Current	I_R	$V_R=5V$	---	---	10	μA
Luminous Intensity	I_V	$I_F=20mA$	280	400	530	mcd
Dominant wavelength	λ_d	$I_F=20mA$	465	---	475	nm
Viewing Angle		$I_F=20mA$	---	120	---	deg
Thermal Resistance.	R_{THJ-S}	$I_F=20mA$	---	300	---	$^{\circ}C/W$

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

Parameter	Symbol	Rating	Units
Power Dissipation	P_D	102	mW
Forward Current	I_F	30	mA
Peak Forward Current	I_{FP}	50	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. 10ms, 1/10.
2. The above forward voltage measurement allowance tolerance is $\pm 0.1V$.
3. The above color coordinates measurement allowance tolerance is 0.005.
4. The above luminous intensity measurement allowance tolerance $\pm 10\%$.
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. 上
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
 丰 ESD2000V ,



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	I2	J1	J2			
	280-350	350-430	430-530			
WD(nm)	D1	D2	E1	E2		
	465-467.5	467.5-470	470-472.5	472.5-475		

1.7 Typical Optical Characteristics Curves

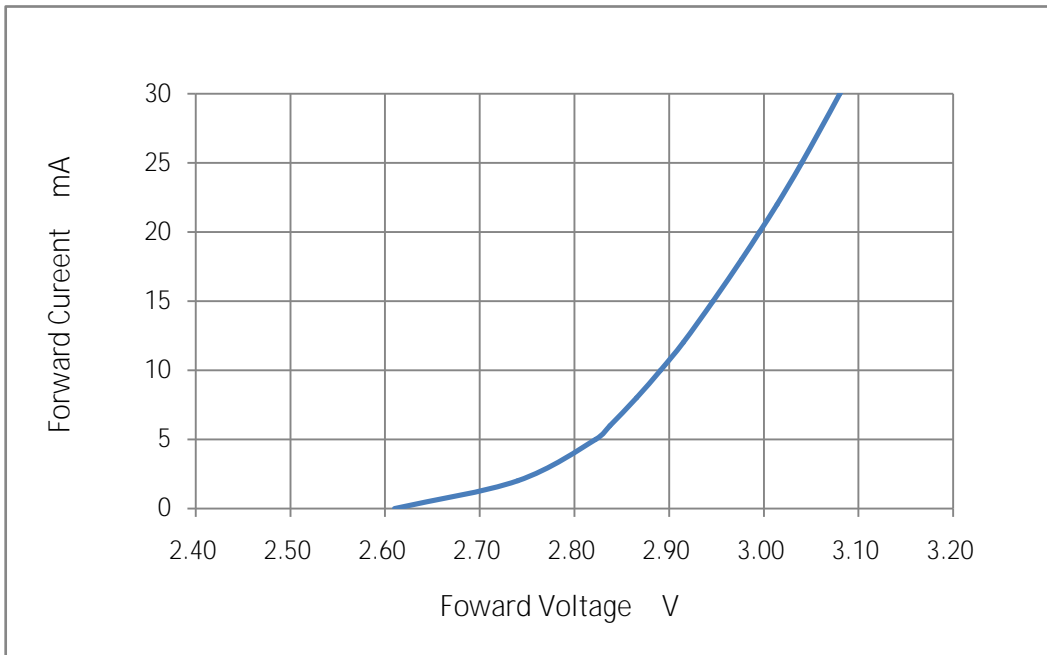


Fig. 1-7 Forward Voltage Vs Forward Current

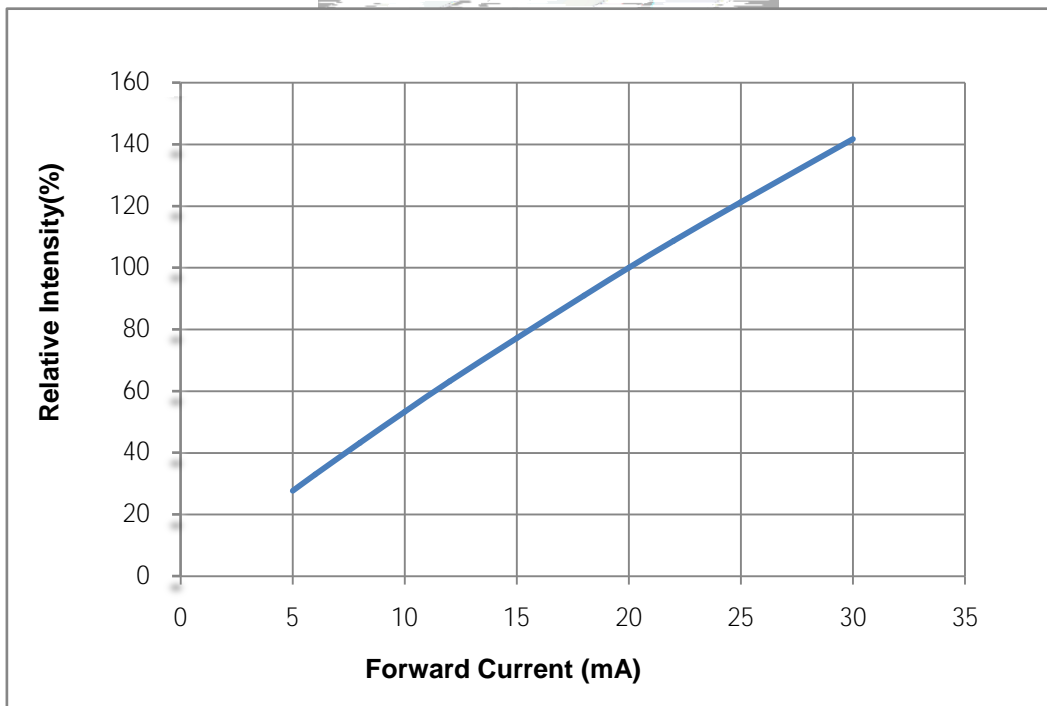


Fig. 1-8 Forward Current Vs Relative Intensity

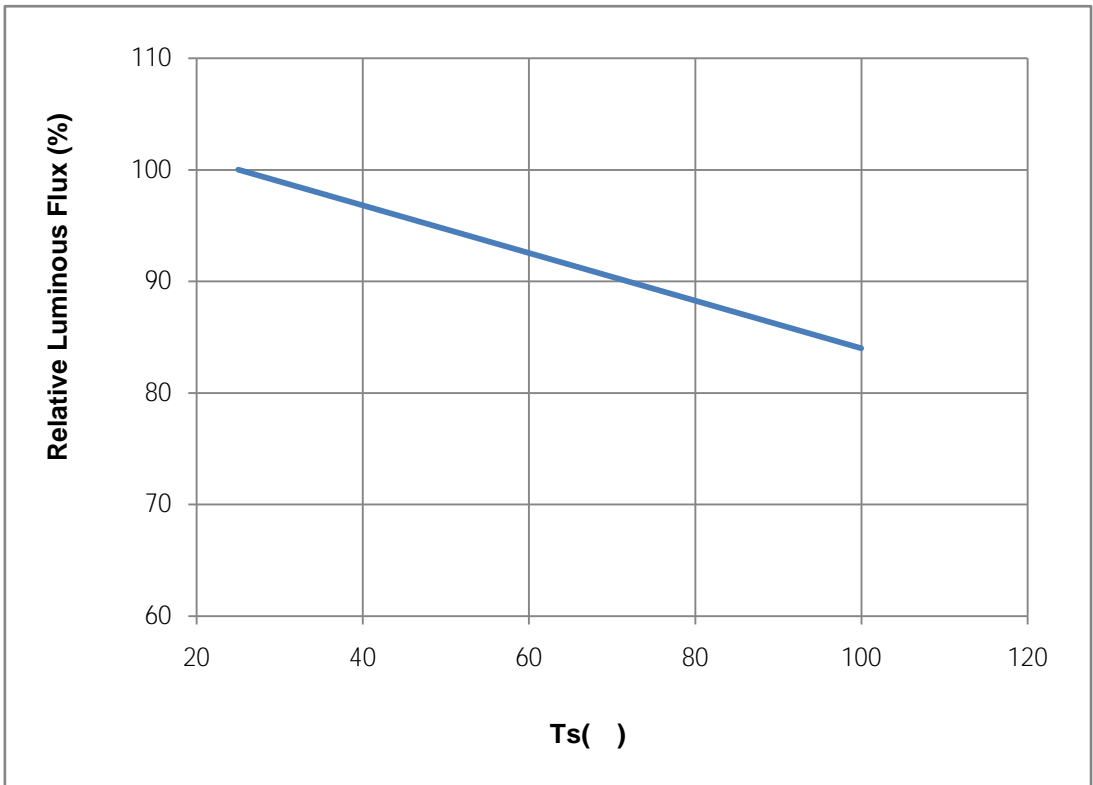


Fig. 1-9 Solder Temperature Vs Relative Intensity

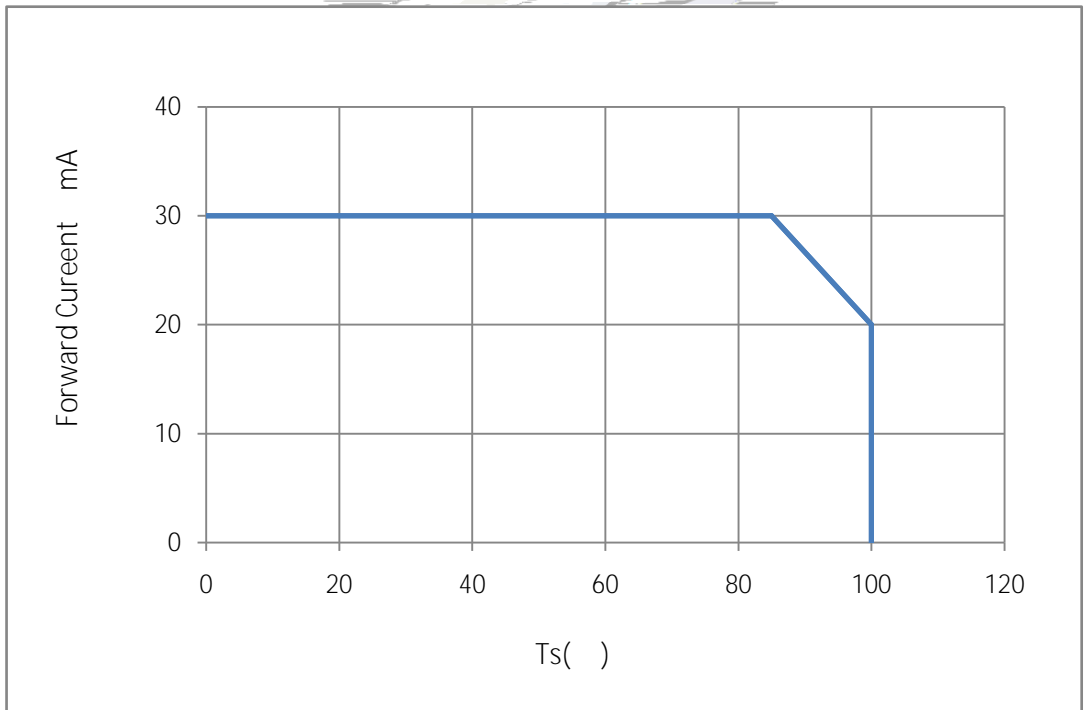


Fig. 1-10 Solder Temperature Vs Forward Current

Tj 120

Fig. 1-11



Fig. 1-13



2. Packaging

2.1 Packaging Specification

Package:4000pcs/reel.

2.1.1 Carrier Tape Dimension

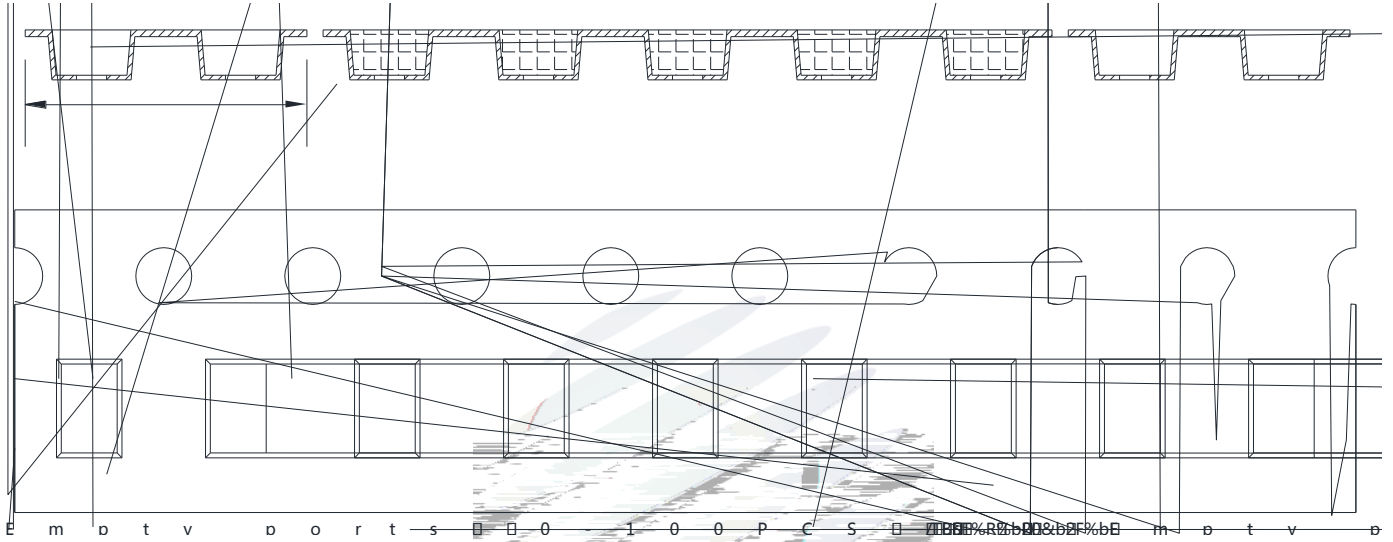


Fig.2-1 Carrier Tape Dimension

2.1.2 Reel Dimension

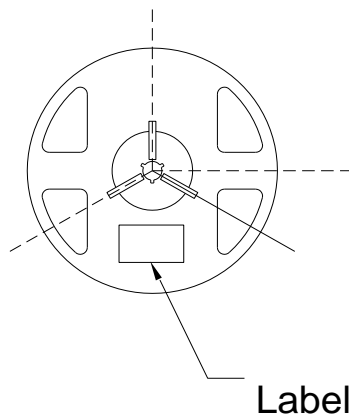


Fig.2-2 Reel Dimension

Table 2-1 Reel Dimension

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

Notes

The tolerances unless mentioned $\pm 0.1\text{mm}$. Unit : mm

1

2.1.3 Label Form Specification

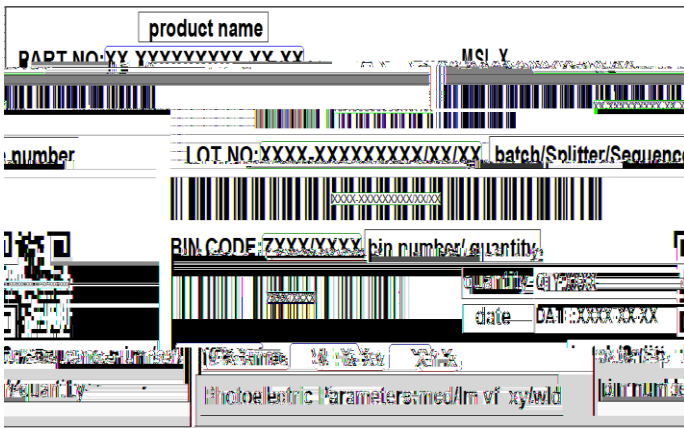


Fig. 2-3 Label Form Specification

Table 2-2 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

2.2 Moisture Resistant Packing



Fig.2-4 Moisture Resistant Packing

2.3 Cardboard Box

Fig.2-5 Cardboard Box

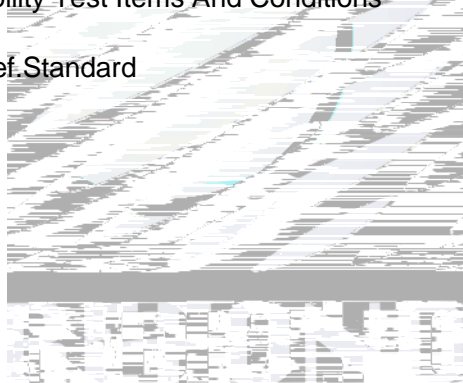
2.4 Reliability Test Items And Conditions

Table 2-3 Reliability Test Items And Conditions

Test Items

Ref. Standard

□



□

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

□ LED 上

上 □ / 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.

3. SMT Reflow Soldering Instructions SMT

3.1 SMT Reflow Soldering Instructions SMT

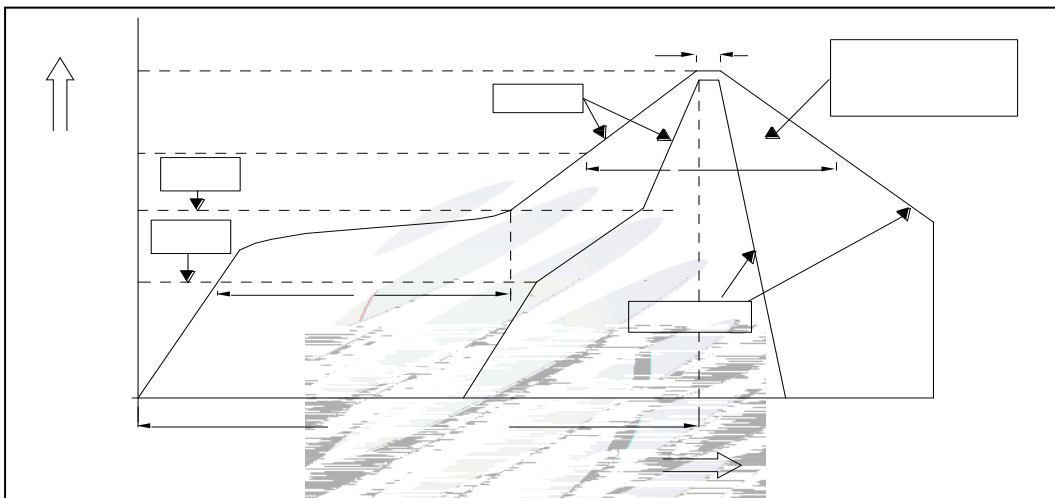


Fig.3-1 SMT Reflow Soldering Instructions SMT

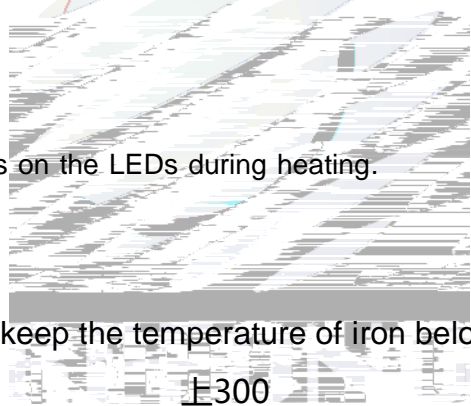
Table 3-1 Reflow parameters

Average temperature rise speed	T_{smx} - T_p	\square 3 °C/ Max 3 °C/ s
Preheating: minimum temperature	(T_{smin})	150 °C
Preheating: Max temperature	\square (T_{smx})	200 °C
Preheating: Time	T_{smin} T_{smx}	60 - 120 60s-120s
Time limited to maintain high temperature: the temperature (T_L)	\square	217 °C
Time limited to maintain high temperature: The Time (t_L)	\square	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)Whensoldering , 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

LED

(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 the use of any chemicals or materials that have been found or are suspected to have an adverse effect on device performance or reliability. To verify compatibility, Refond recommends that all chemicals and materials be tested in the specific application and environment for which they are intended to be used. Attaching LEDs, do not use adhesives that outgas organic vapor.

LED
LED
LED

LED

(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.

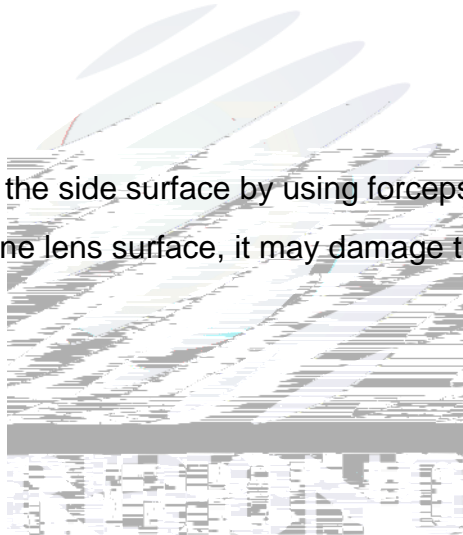


Fig 4-1 Handling Precautions

□

(5) In designing a circuit, the current through each LED can not exceed the absolute maximum

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 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	60%	Recommended for use within 24 hours 24H
Baking		60 5	-	24hours 上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 based on the following condition 65 5 for above 24 hours.

60 5 上 24

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

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

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







Declare

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