SPECIFICATION

REFOND P/N

RF-A3H21-2B1P-E5

R&D
Mass Production

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1. Description

1.1 General Description

This product uses the ceramics package, it has a high reliability. it also be widely application for Automotive Exterior Lighting. Size(mm): 3.00X2.00X0.80mm.

. . 3.00X2.00X0.80mm

1.2 Features

Ceramic Package.
High Power Output and High Luminance.
Pb-free reflow soldering application.
Moisture sensitive level:Level2. 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
AEC-Q101

1.3

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1.4 Package Dimension

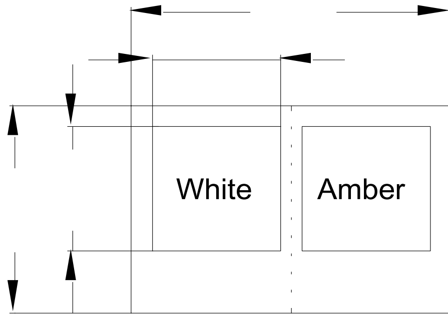


Fig.1-1 Top View

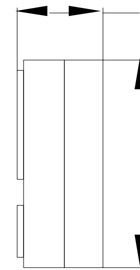


Fig.1-2SideView

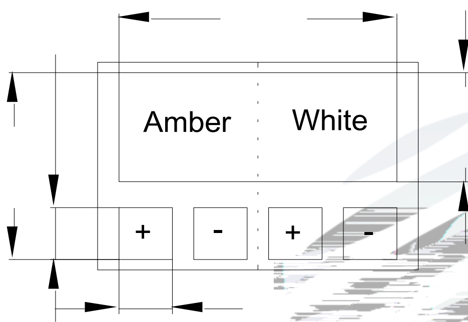


Fig.1-3BottomView

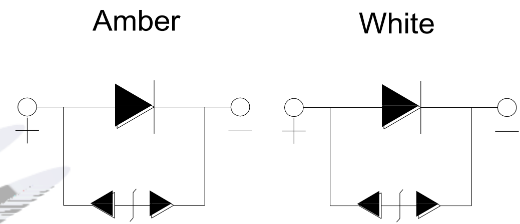


Fig.1-4Polarity

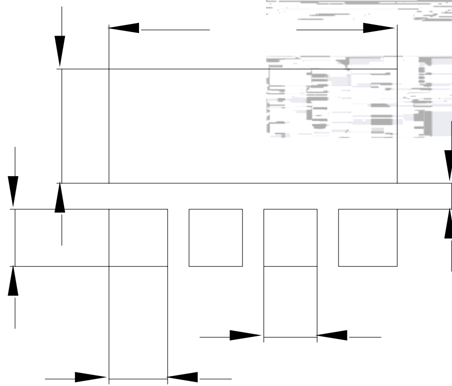


Fig.1-5Soldering Patterns

Notes

1. All dimensions units are millimeters.

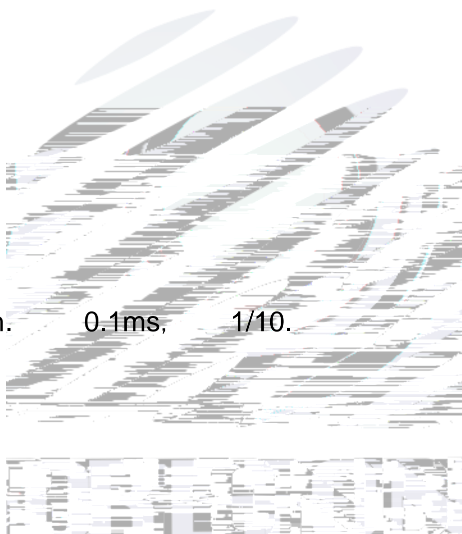
2. All dimensions tolerances are ±0.2mm unless otherwise noted. 0. 2

1.5 Product Parameters

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

Item	Symbol	Test Condition	White			Unit
			Min.	Typ	Max.	
Forward Voltage						

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



Notes

1. 1/10 Duty cycle, 0.1ms pulse width. 0.1ms, 1/10.

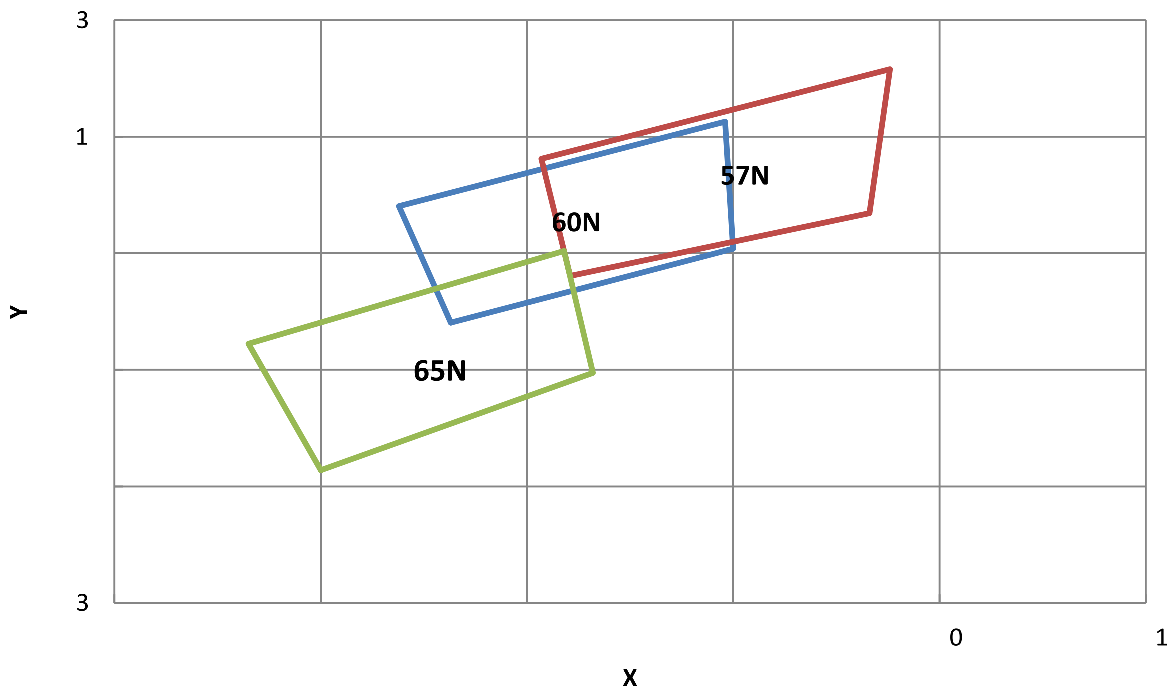
1.6 Bin Range Of Forward Voltage and Luminous Flux (IF=1000mA)

BIN (IF=1000mA)

Table 1-3

VF V		G0	H0	I0	J0	/	/
		2.8-3.0	3.0-3.2	3.2-3.4	3.4-3.6	/	/
(lm)	White	WD	WE	WF	XA	/	/
		280-300	300-320	320-340	340-360	/	/
	Amber	TB	UA	UB	/	/	/
		144-160	160-177	177-196	/	/	/

The Chromaticity Diagram



Bin data

BIN CODE	X1	Y1	X2	Y2	X3	Y3	X4	Y4
60N	0.3163	0.3181	0.3138	0.3381	0.3296	0.3526	0.3300	0.3308
57N	0.3221	0.3261	0.3207	0.3462	0.3376	0.3616	0.3366	0.3369
65N	0.3100	0.2928	0.3065	0.3145	0.3218	0.3304	0.3232	0.3095

The Chromaticity Diagram

1.7 Typical optical characteristics curves

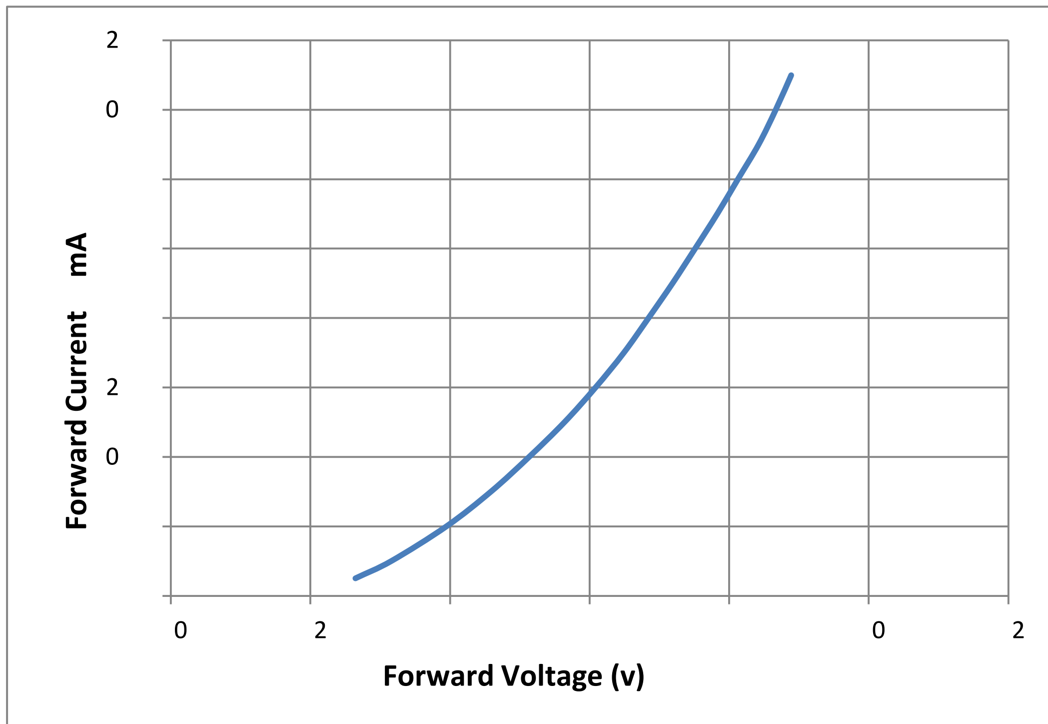


Fig 1-6 Forward Voltage Vs. Forward Current

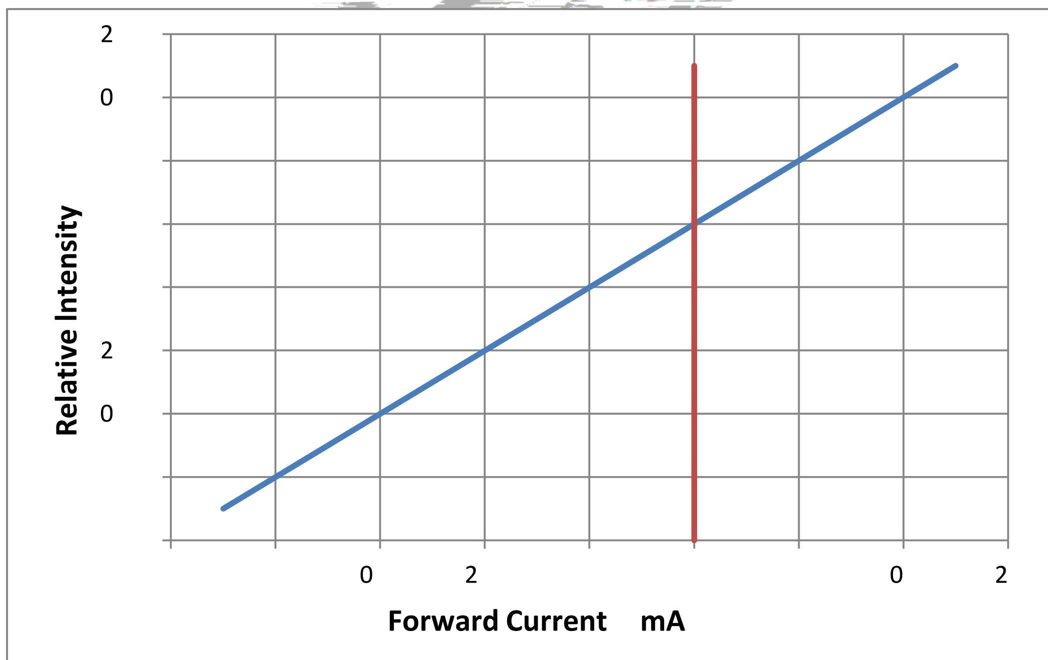


Fig 1-7 Forward Current Vs. Relative Intensity

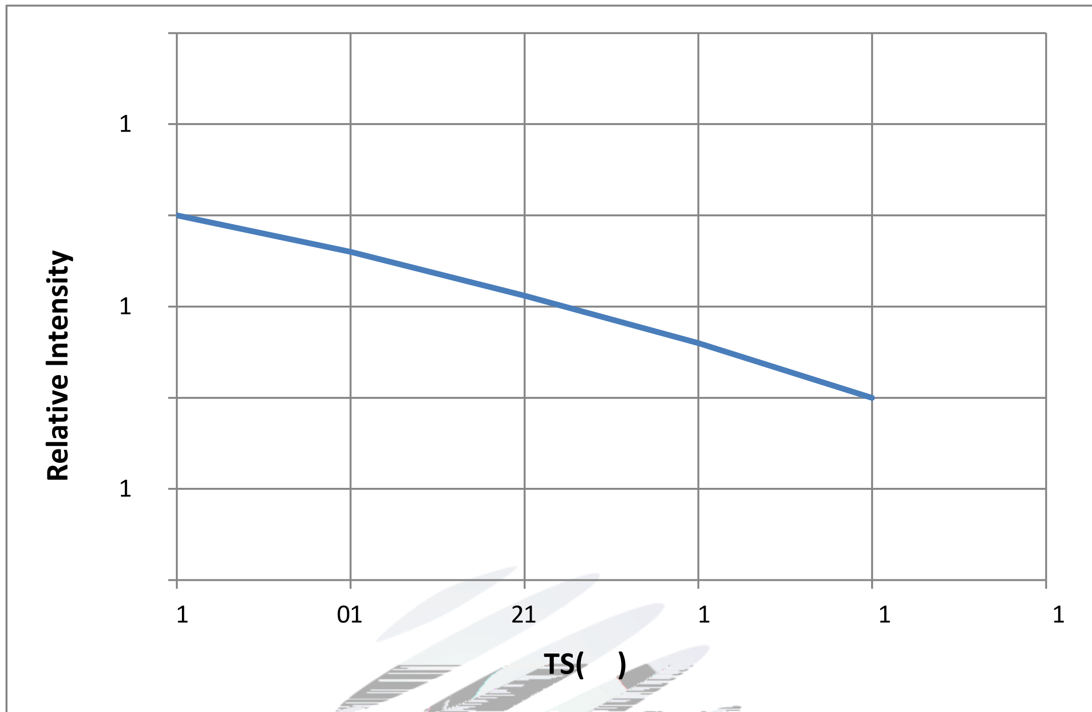


Fig 1-8　Ts Temperature Vs Relative Intensity

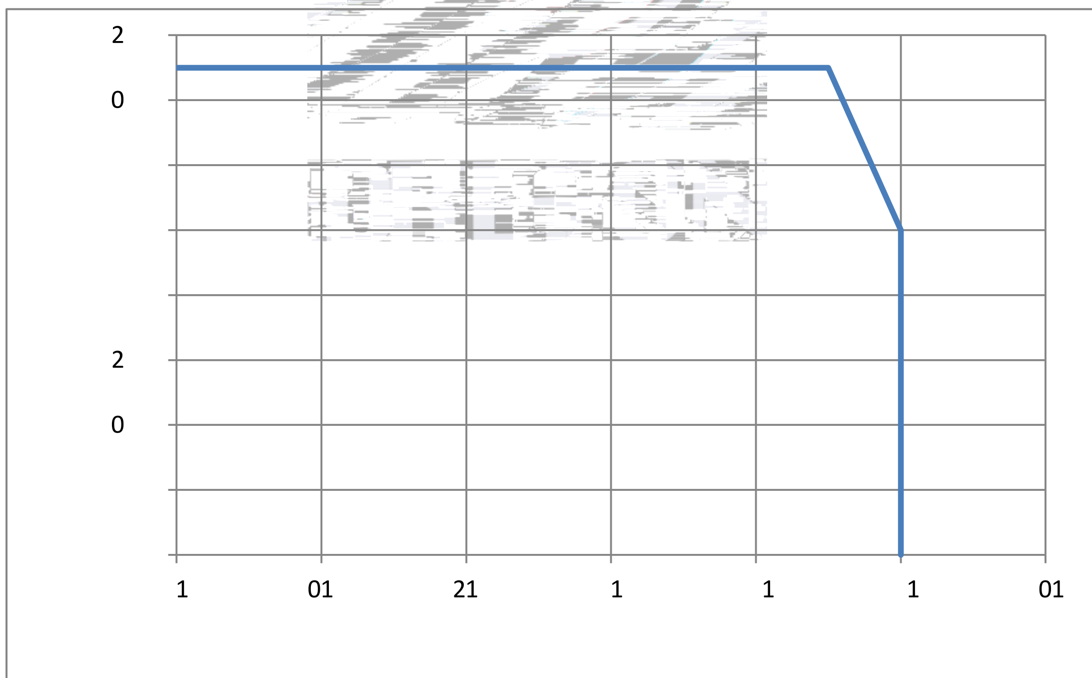
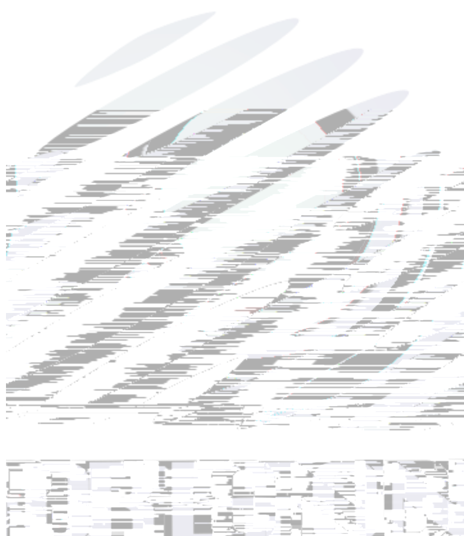
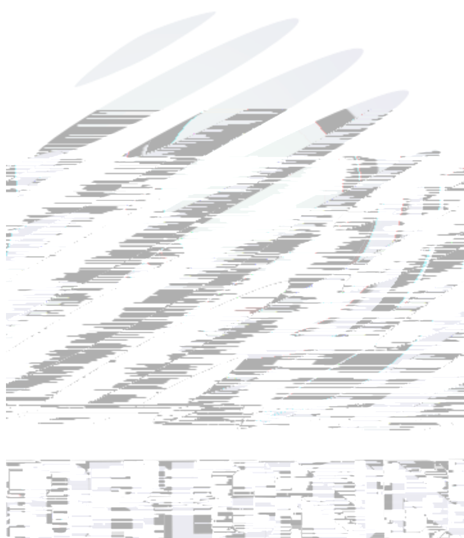


Fig 1-11 Ts Temperature Vs Forward Current





2. Packaging

2.1 Packaging Specification

Package: 4000pcs/reel. 4000pcs

2.1.1 Carrier Tape Dimension

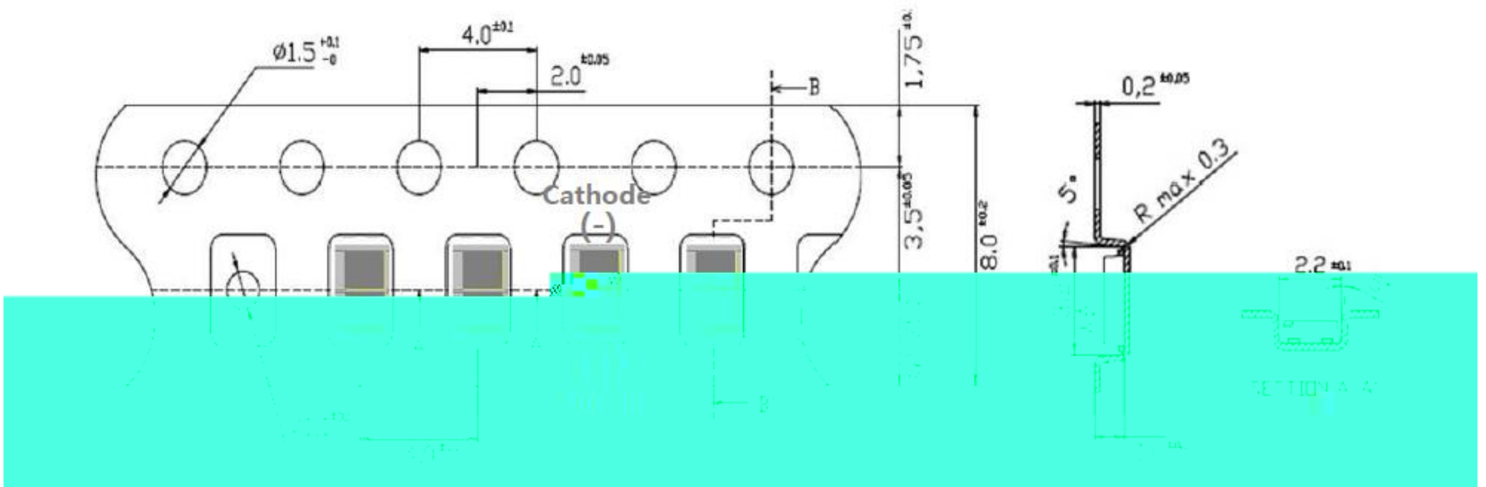
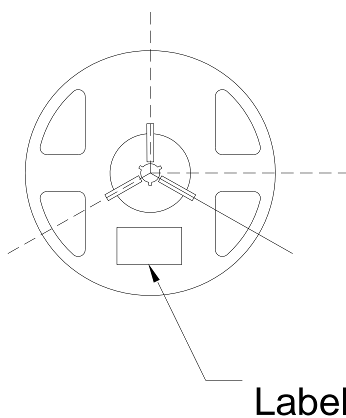


Fig.2-1 Carrier Tape Dimension

2.1.2 Reel Dimension



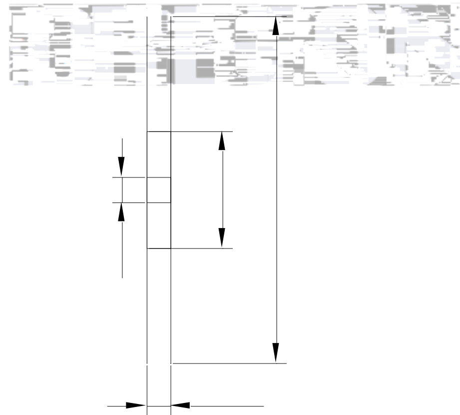


Fig.2-2Reel Dimension

Table 2-1 Dimension

A	11.4 0.3mm
B	180±2mm
C	60.0±1mm
D	13.0±0.2mm

Notes

The tolerances unless mentioned ±0.1mm. Unit : mm 注：未注公差为±0.1毫米 尺寸单位：毫米

2.1.3 Label Form Specification

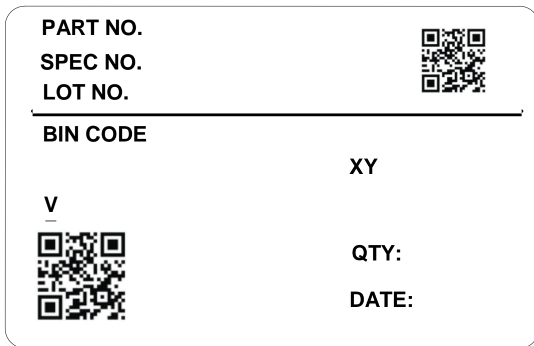


Fig 2-3 Label Form Specification

Table 2-2 Label Form Specification

PART NO	Part Number
SPEC NO	Spec Number
LOT NO	Lot Number
BIN CODE	Bin Code
	Luminous flux
X/Y	Chromaticity Bin
V_F	Forward Voltage
QTY	Packing Quantity
DATE	Made Date

2.2 Moisture Resistant Packing

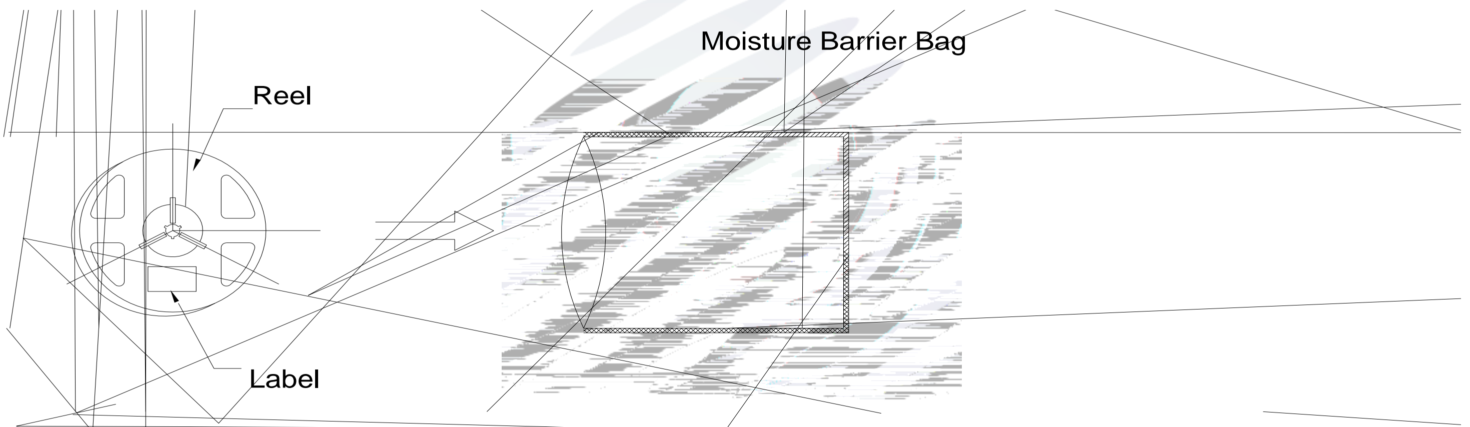


Fig.2- Moisture Resistant Packing

2.3 Cardboard Box

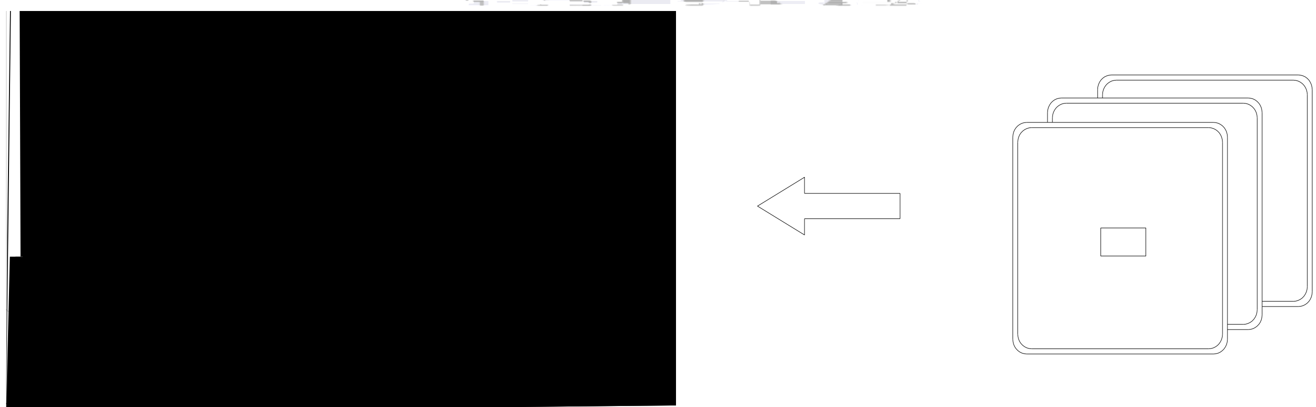
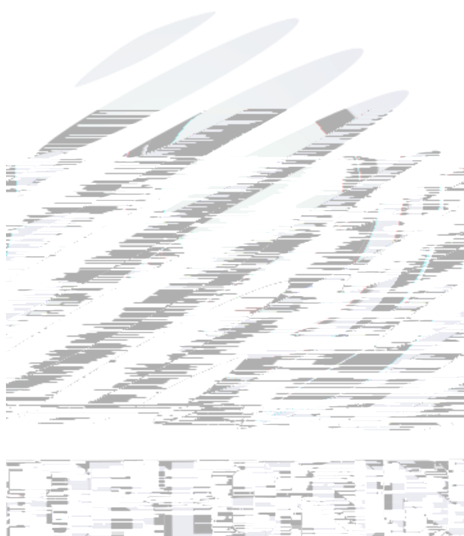


Fig.2-5 Cardboard Box

2.4 Reliability Test Items And Conditions

Table 2-3 Reliability Test Items And Conditions

Test Items	Ref.Standard	Test Condition	Time	Quantity	Ac/Re /
Reflow Soldering	JEITA ED-4701 300 301	Temp:260 max T=10 sec Precondition:85 , 85%RH 168Hrs	3times.	10Pcs.	0/1
Temperature Cycle	JESD22-A104	125 30 min. -40 30 min.	1000Cycles	10Pcs.	0/1
Thermal Shock	JESD22-A106	-40 15min 10sec 125 15min	1000Cycles	10Pcs.	0/1
High Temperature Storage	JESD22-A103	Temp.:125	1000Hrs.	10Pcs.	0/1
Low Temperature Storage	JESD22-A119	Temp.:-40	1000Hrs.	10Pcs.	0/1
Life Test	JESD22-A108	Ta=25 IF=1000mA	1000Hrs.	10Pcs.	0/1
High Temperature Life Test	JESD22-A108	Ta=105 IF=1000mA	1000Hrs.	10Pcs.	0/1
High Temperature High Humidity Life Test	JESD22-A101	85 / 85%RH IF=1000mA	1000Hrs.	10Pcs.	0/1
Low Temperature Life Test	JESD22-A108	Ta=-40 IF=1000mA	1000Hrs.	10Pcs.	0/1



3. SMT Reflow Soldering Instructions SMT

3.1 SMT Reflow Soldering Instructions SMT

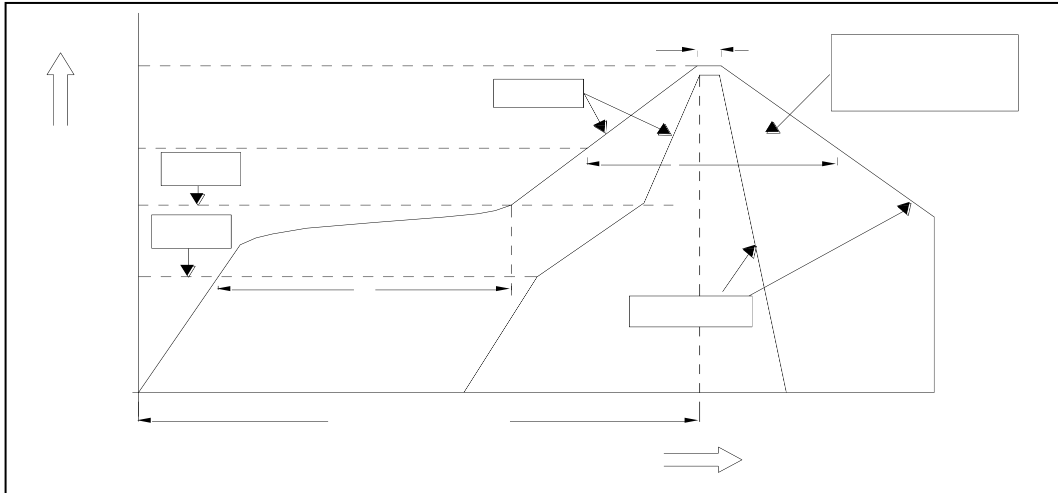


Fig.3-1 SMT Reflow Soldering Instructions SMT

Table 3-1 SMT Reflow Soldering Instructions SMT

Tsmax TP	3 °C/
(Tsmin)	150 °C
(Tsmax)	200 °C
Tsmin Tsmax	60 - 120
(TL)	217 °C
(tL)	60
/ (TP)	260 °C
tp	10
(TP) 5 °C	30
	6 °C/
25 °C	8

Notes

(1) Reflow soldering should not be done more than two times. In the case of more than 24 hours passed soldering after first, LEDs will be damaged. 24

LED

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

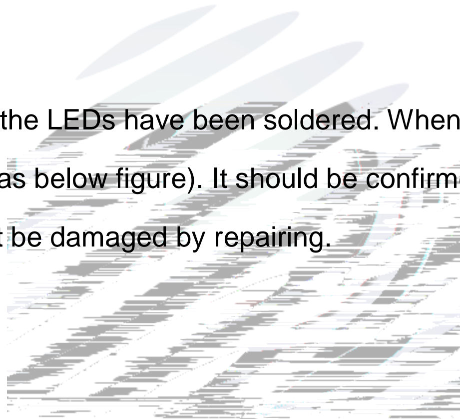
3.1.1 Soldering Iron

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

300 3

The hand solder 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 will not be damaged by repairing.

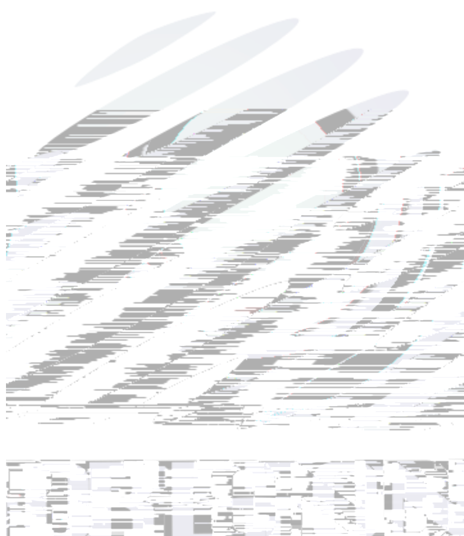
LED LED

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 influence to 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

(2) 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.



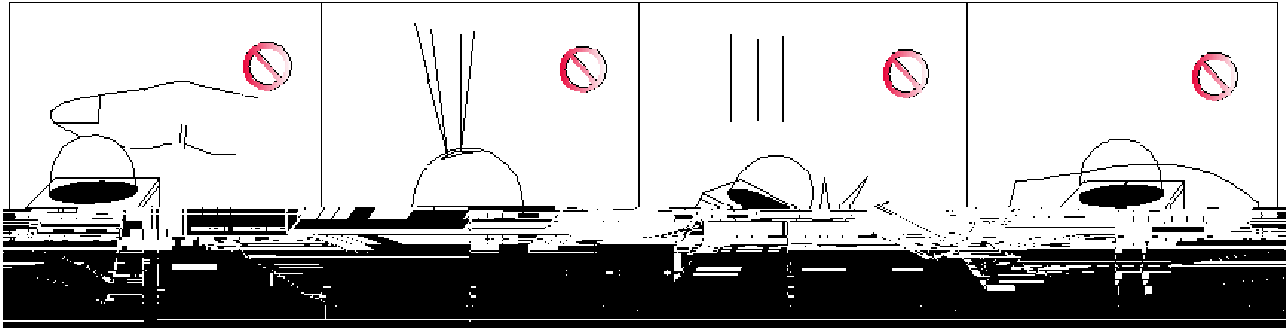


Fig 4-1

(5) In designing a circuit,the current through each LED must be 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. 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 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.

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%	168hours 168
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 based on the following condition（60±5）℃ for above 24 hours. 60 5 24

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). LED

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

Version History/

Date	Revisor	Version	Verifier	Remarks
2020.06.16		E0		

www.refond.com

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