

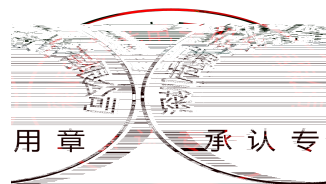
# SPECIFICATION

REFOND P/N

RF-P1S191TS-B38-B1

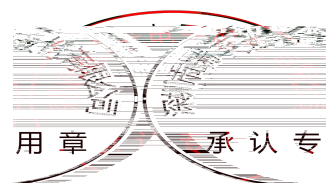
R&D

Mass Product



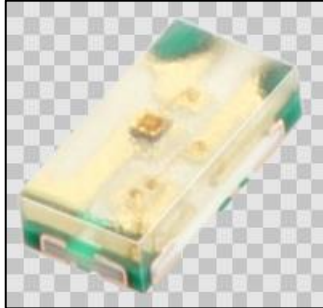
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4.1 Handling Precautions	



# 1. Description

## 1.1 General Description



The Colour LED which was fabricated using a blue chip and a orange chip Package  
Dimension : 1.6mmX0.8mmX0.4mm.

LED

1.6mmX0.8mmX0.4mm

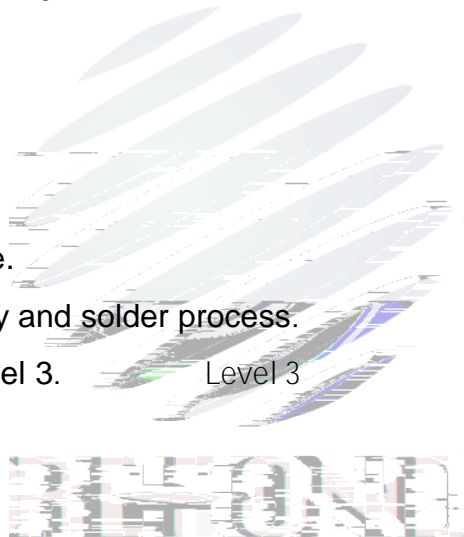
## 1.2 Features

Extremely wide viewing angle.

Suitable for all SMT assembly and solder process.

Moisture sensitivity level: Level 3.

RoHS compliant. RoHS



SMT

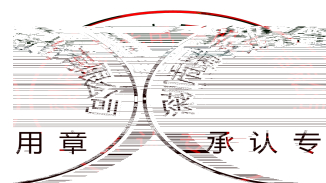
Level 3

## 1.3 Application

Optical indicator.

Switch and symbol, display.

General use.



### 1.4 Package Dimension

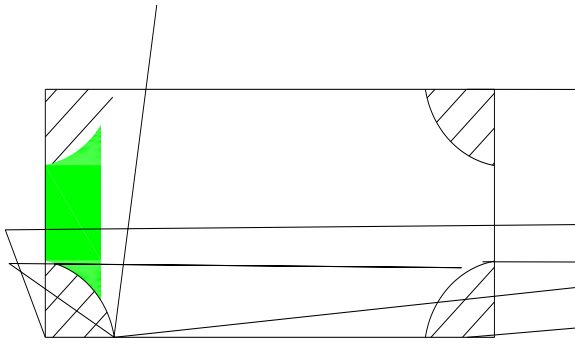


Fig.1-1 Top view

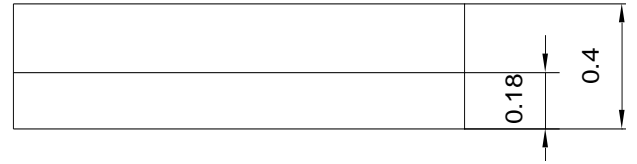


Fig.1-2 Side view

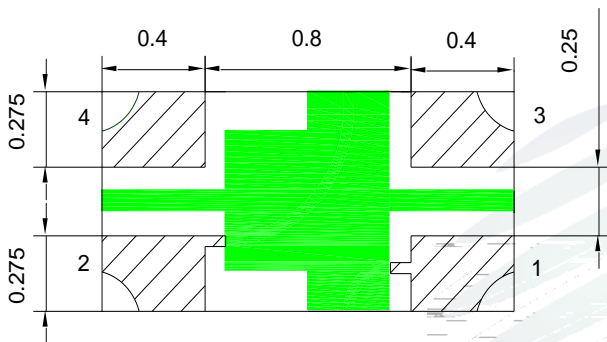


Fig.1-3 Bottom view

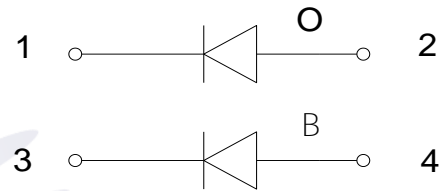


Fig.1-4 Polarity

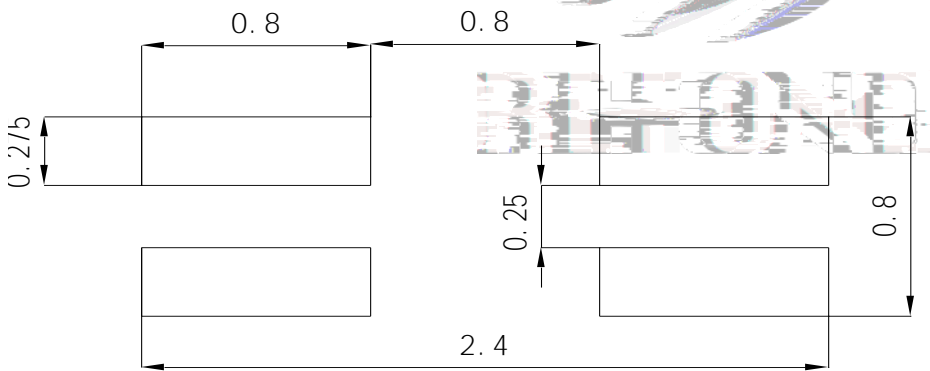
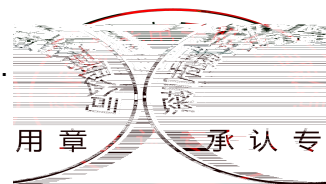


Fig.1-5 Soldering patterns

Notes

1. All dimensions units are millimeters.

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



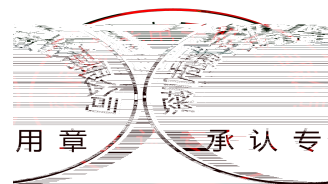
$\pm 0.2$

## 1.5 Product Parameters

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

Item	Test Condition	Symbol		Code	Value			Unit
					Min. ( )	Typ.	Max.	
Spectral Half Bandwidth	I <sub>F</sub> =5mA	Δ	O	/	--	30	--	nm
			B		--	30	--	
Forward Voltage	I <sub>F</sub> =5mA	V <sub>F</sub>	O	2P	1.6	--	2.4	V
			B	1U	2.6	--	3.2	
Dominant wavelength	I <sub>F</sub> =5mA	λ <sub>d</sub>	O	2P	620	--	630	nm
			B	2S	465	--	475	
Luminous Intensity	I <sub>F</sub> =5mA	I <sub>v</sub>	O	1MD	43	--	150	mcd
			B	1MC	28	--	100	
Viewing Angle	I <sub>F</sub> =5mA	θ <sub>1/2</sub> , *			--	140	--	deg
Reverse Current	V <sub>R</sub> =5V	I <sub>R</sub>			--	--	10	μA
Thermal Resistance.	I <sub>F</sub> =5mA	R <sub>THJ-S</sub>			--	--	450	/W

Notes : V<sub>R</sub>=5V For test conditions. V<sub>R</sub>=5V







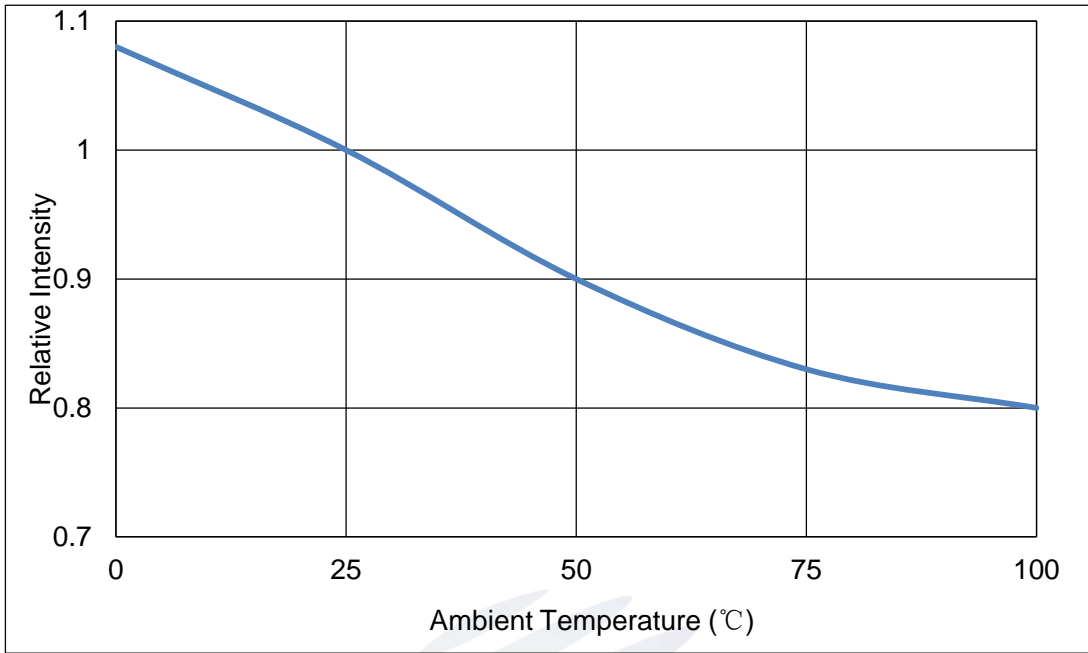


Fig.1-8 Pin Temperature Vs Relative Intensity

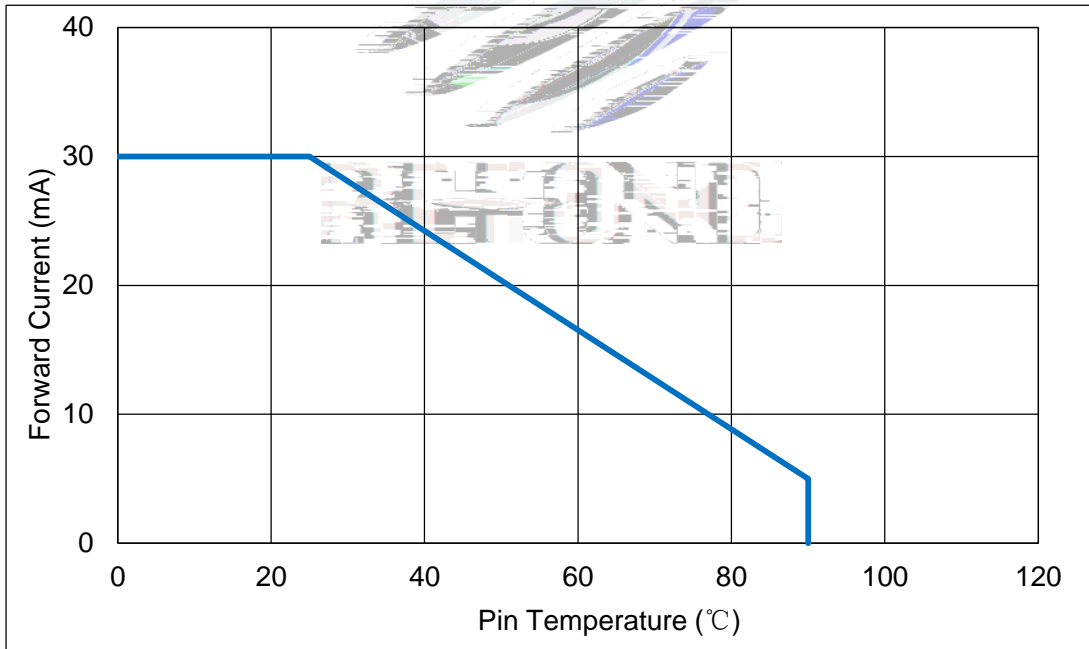
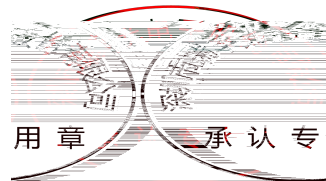


Fig.1-9 Pin Temperature Vs Forward Current





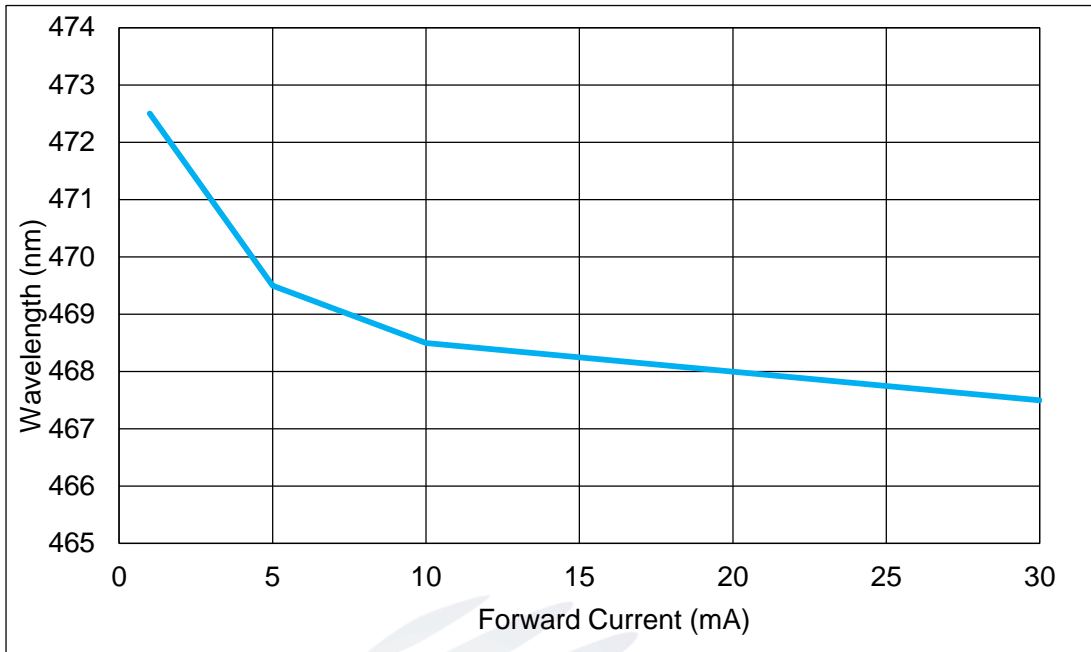


Fig.1-10 Forward Current Vs Dominate Wavelength (Ta=25 )

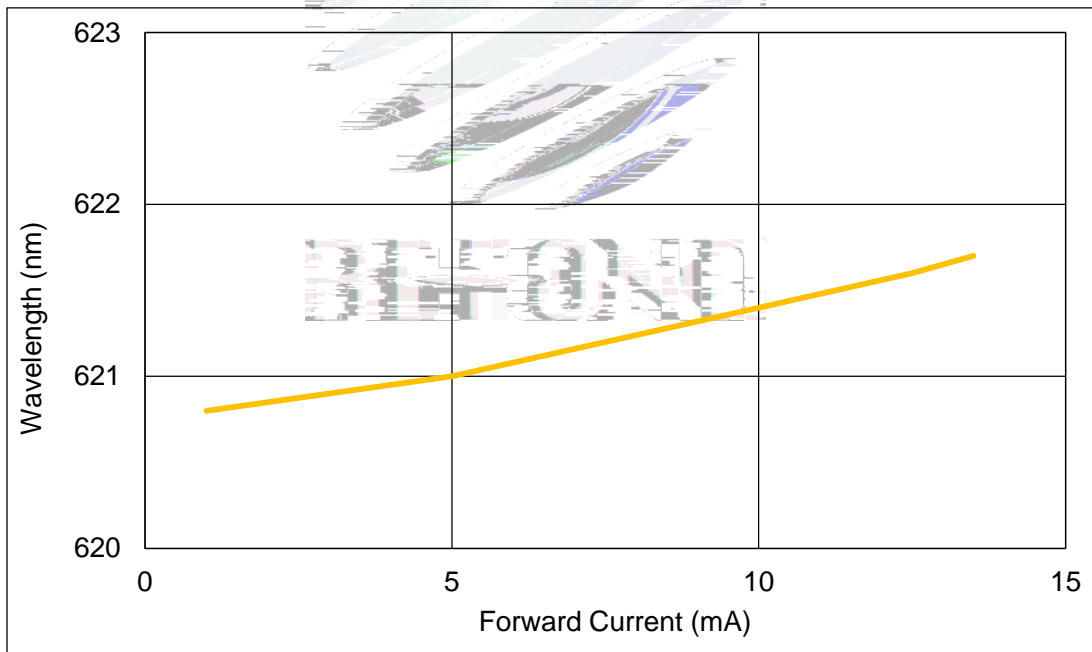
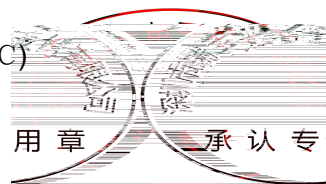


Fig.1-11 Forward Current Vs Dominate Wavelength (Ta=25°C)





## 2. Packaging

### 2.1 Packaging Specification

Package: 4000pcs/reel. 4000pcs

#### 2.1.1 Carrier Tape Dimension

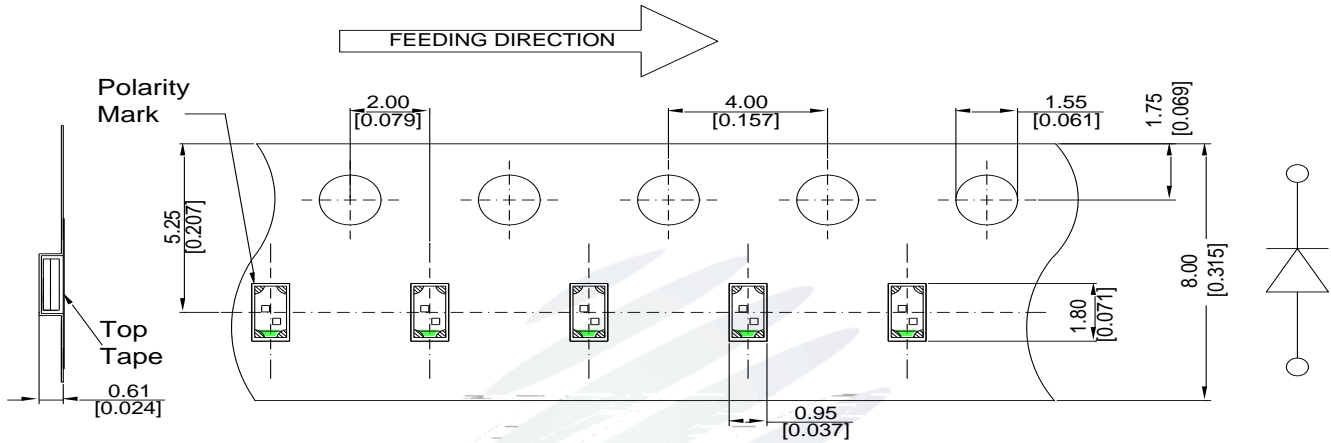


Fig.2-1 Carrier Tape Dimension

#### 2.1.2 Reel Dimension

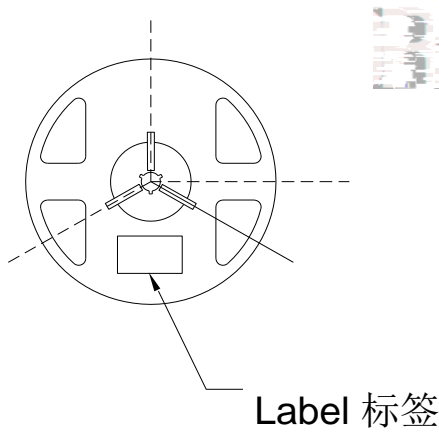


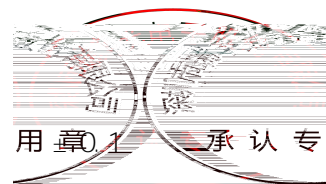
Fig.2-2 Reel Dimension

Table 2-1 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



### 2.1.3 Label Form Specification

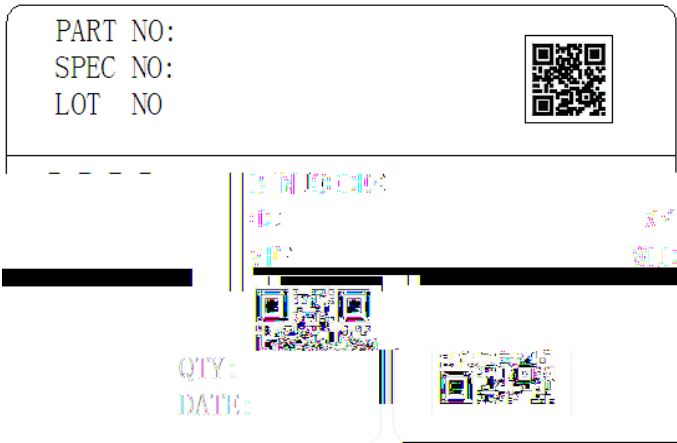


Table 2-2 Parameter

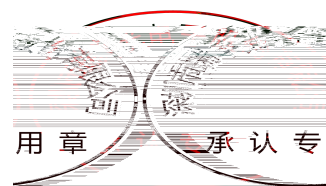
PART NO.	Part Number
SPEC NO.	Spec Number
LOT NO.	Lot Number
BIN CODE	Bin Code
	Luminous flux
XY	Chromaticity Bin
V <sub>F</sub>	Forward Voltage
WLD	Wavelength
QTY	Packing Quantity
DATE	Made Date

Fig. 2-3 Label Form Specification

### 2.2 Moisture Resistant Packing



Fig.2-4 Moisture Resistant Packing



## 2.3 Cardboard Box

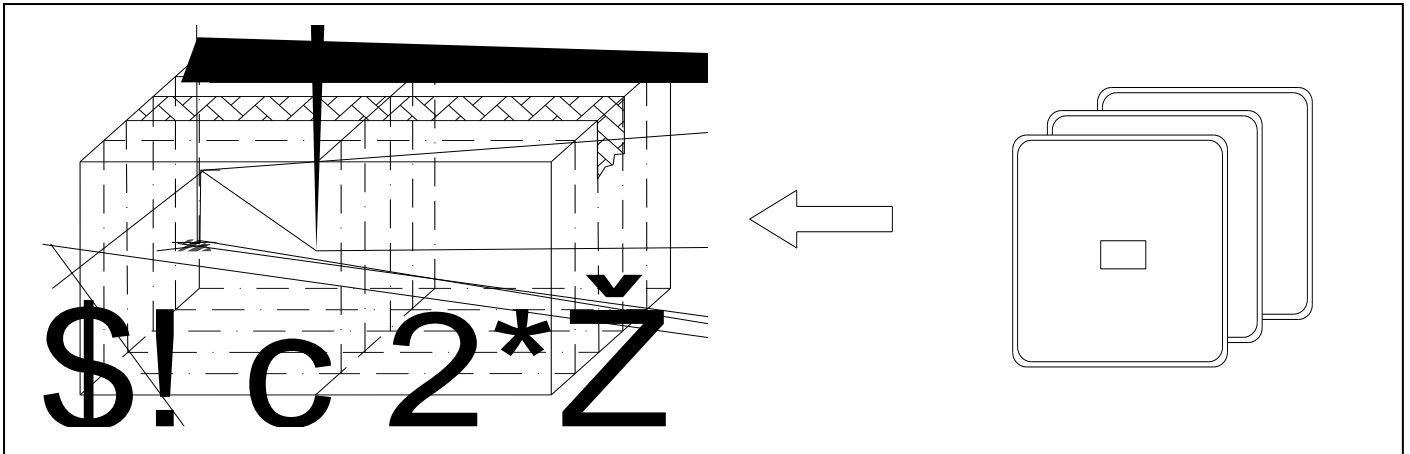


Fig.2-5 Cardboard Box

## 2.4 Reliability Test Items And Conditions

Table 2-3 Reliability Test Items And Conditions

Test Items	Ref.Standard	Test Condition	Time	Quantity	Ac/Re /
Reflow	JESD22-B106	Temp:260 max T=10 sec	2 times	22Pcs.	0/1
Temperature Cycle	JESD22-A104	100 30 min 5 min -40 30 min	100 cycles	22Pcs.	0/1
Thermal Shock	JESD22-A106	-40 15min 100 15min	300 cycles	22Pcs.	0/1
High Temperature Storage	JESD22-A103	Temp:100	1000 hrs.	22Pcs.	0/1
Low Temperature Storage	JESD22-A119	Temp:-40	1000 hrs.	22Pcs.	0/1
Life Test	JESD22-A108	T <sub>a</sub> =25 I <sub>F</sub> =5mA	1000 hrs.	22Pcs.	0/1

用章 承认专

## 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	$V_F$	$I_F=5mA$	-	U.S.L*)x1.1
Reverse Current	$I_R$	$V_R= 5V$	-	U.S.L*)x2.0
Luminous Flux		$I_F=5mA$	L.S.L*)x0.7	-

### Notes

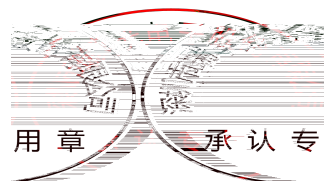
1.U.S.L: Upper standard level

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

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 回流焊说明

#### 3.1 SMT Reflow Soldering Instructions SMT

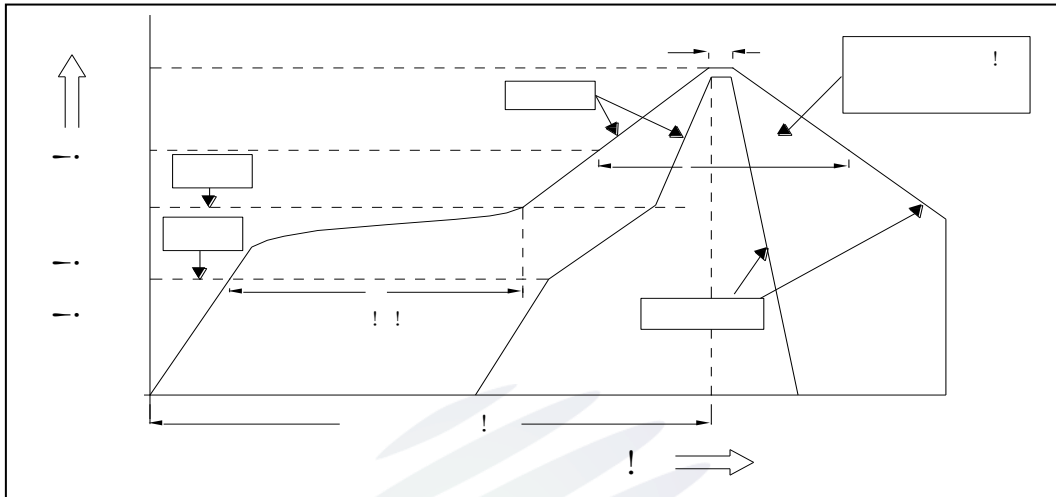


Fig.3-1 SMT Reflow Soldering Instructions – SMT

Table 3-1 Parameter

Average temperature rise speed	$T_{smax}$ $T_p$	3 °C/ s	Max 3 °C/ s
Preheating: minimum temperature	( $T_{smin}$ )	150 °C	
Preheating: Max temperature	( $T_{smax}$ )	200 °C	
Preheating: Time	$T_{smin}$ $T_{smax}$	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 - 150	60s-150s
Peak /Classification of temperature:	/ ( $T_p$ )	260 °C	
Time limit classification of peak temperature time	$t_p$	10	Max 10s
Hold time within 5 ° C with the actual peak temperature (TP)	( $T_p$ )	30	Max 30s
5 ° C			
Cooling speed		6 °C/ s	Max 6 °C/ s
Needed time from 25 ° C to $T_p$	25 ° C	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. 24 LED

(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°C less than 3 seconds. 300 3

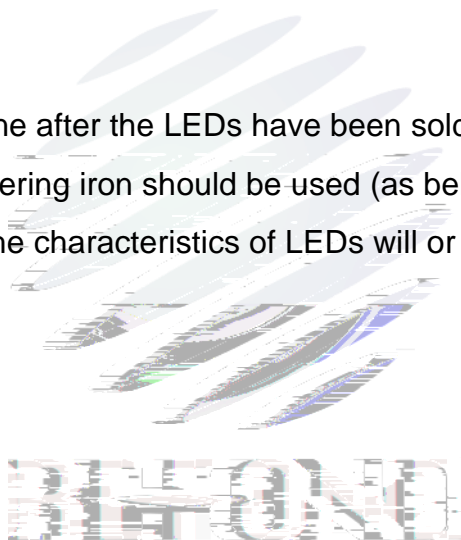
(2) Soldering by hand should be done only one time.

### 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

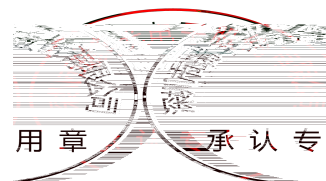
LED



### 3.1.3 Cautions

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

(2) 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 can not be over 100PPM in the LED mating usage material. This is provided for informational purposes only and is not a warranty or endorsement. LED LED 100PPM.

(2) In order to prevent external 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 element is 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.

LED LED  
900PPM 900PPM  
1500PPM.

(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





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%	24hours 24
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 ( 65±5 ) °C for above 24 hours.

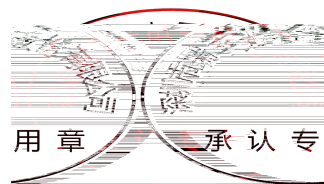
60± 5                      24

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).

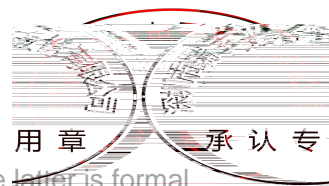
LED

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



Date	Revisor	Version	Verifier	Remarks
2021.09.23		E/0		





Declare

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