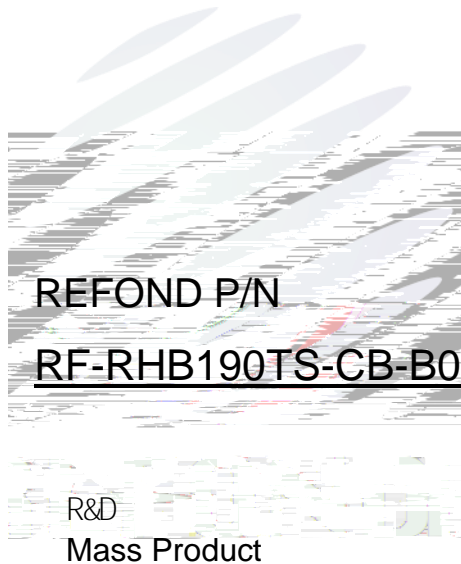




# SPECIFICATION

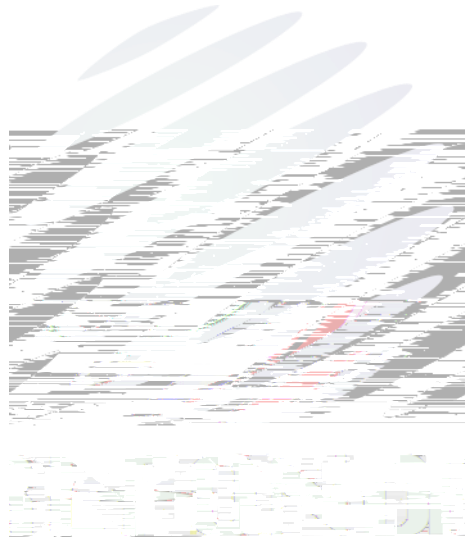




REFOND

瑞豐元電

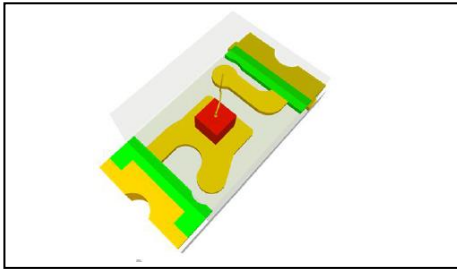
TEL: 0755-266839118





# 1. Description

## 1.1 General Description



The Colour LED which was fabricated using a red chip Package Dimension :  
1.6mmX0.8mmX0.7mm.

LED

1.6mmX0.8mmX0.7mm

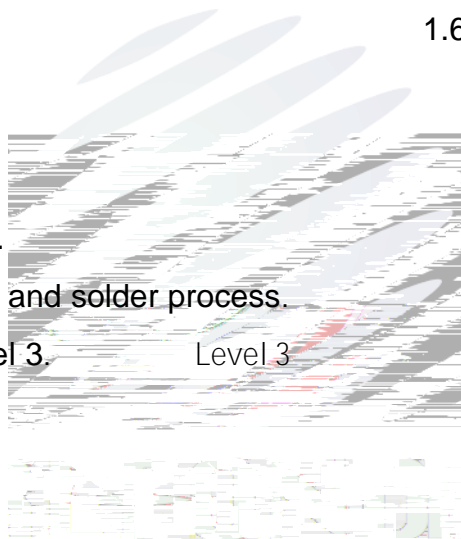
## 1.2 Features

Extremely wide viewing angle.

Suitable for all SMT assembly and solder process.

Moisture sensitivity level: Level 3.

RoHS compliant. RoHS



SMT

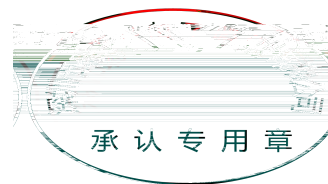
Level 3

## 1.3 Application

Optical indicator.

Switch and symbol, display.

General use.





### 1.4 Package Dimension

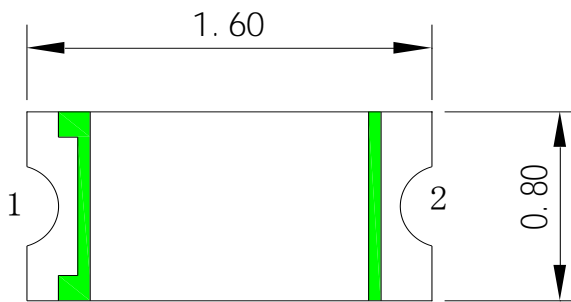


Fig.1-1 Top view

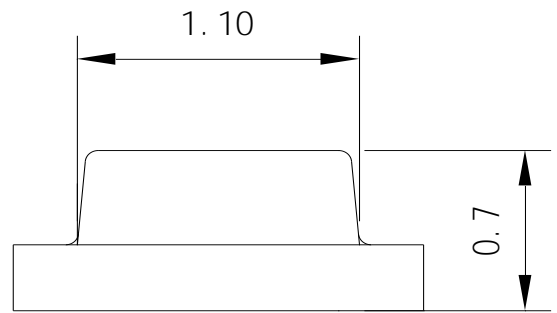


Fig.1-2 Side view

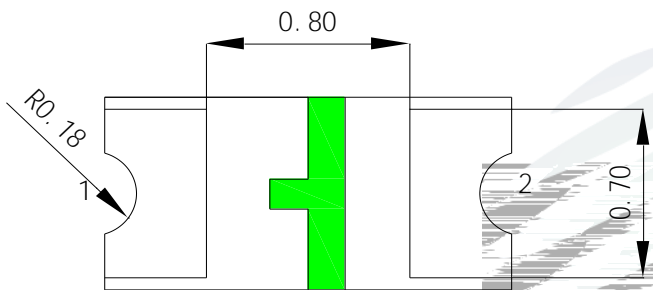


Fig.1-3 Bottom view

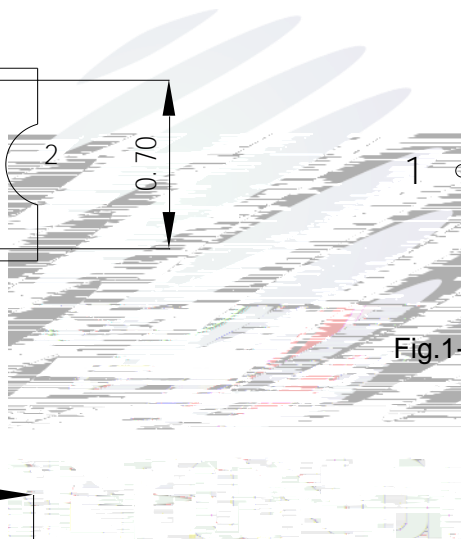


Fig.1-4 Polarity

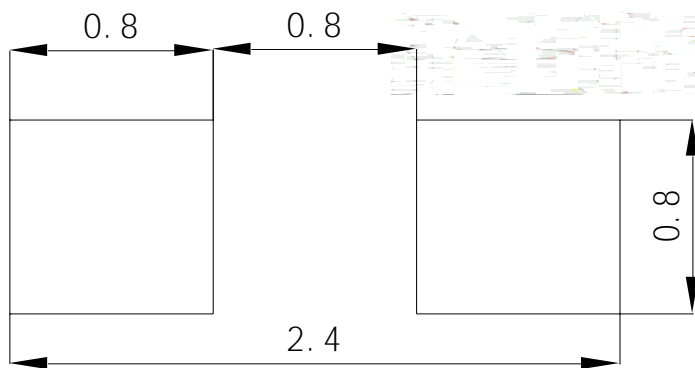
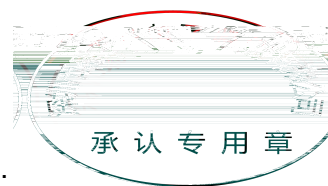


Fig.1-5 Soldering patterns

#### Notes

1. All dimensions units are millimeters.
2. 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	Value			Unit	
			Min. ( )	Typ.	Max.		
Spectral Half Bandwidth	$I_F=5mA$	$\Delta$	--	15	--	nm	
Forward Voltage	$I_F=5mA$	$V_F$	A2	1.7	--	1.8	V
			B1	1.8	--	1.9	V
			B2	1.9	--	2.0	V
			C1	2.0	--	2.1	V
			C2	2.1	--	2.2	V
			D1	2.2	--	2.3	V
Dominant Wavelength	$I_F=5mA$	$\lambda_D$	G10	625	--	630	nm
			G00	630	--	635	nm
			H00	635	--	640	nm
Luminous Intensity	$I_F=5mA$	$I_v$	A00	8	--	12	mcd
			B00	12	--	18	mcd
			C00	18	--	28	mcd
Viewing Angle	$I_F=5mA$	"	--	140	--	deg	
Reverse Current	$V_R=5V$	$I_R$	--	--	10	$\mu A$	
Thermal Resistance.	$I_F=5mA$	$R_{THJ-S}$	--	--	450	$\text{W}$	

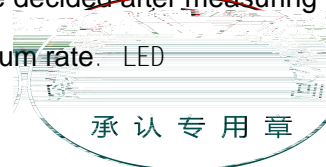
 Notes :  $V_R=5V$  For test conditions.  $V_R=5V$ 


Parameter	Symbol	Rating	Units
Power Dissipation	$P_d$	46	mW
Forward Current	$I_F$	20	mA
Peak Forward Current Of Pulse	$I_{FP}$	60	mA
Electrostatic Discharge (HBM)	$E_{SD}$	2000	V
Operating Temperature	$T_{opr}$	-40 ~ +85	°C
Storage Temperature	$T_{stg}$	-40 ~ +85	°C
Junction Temperature	$T_j$	95	°C

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

## Notes

- 1/10 Duty cycle, 0.1ms pulse width.  $0.1\text{ms}$ ,  $1/10$ .
- The above forward voltage measurement allowance tolerance is  $\pm 0.1\text{V}$ .  $\pm 0.1\text{V}$ .
- The above dominant wavelength measurement allowance tolerance is  $\pm 2\text{nm}$ .  $\pm 2\text{nm}$ .
- The above luminous intensity measurement allowance tolerance  $\pm 10\%$ .  $\pm 10\%$ .
- Care is to be taken that power dissipation does not exceed the absolute maximum rating of the product.
- All measurements were made under the standardized environment of Refond.
- 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



## 1.6 Typical Optical Characteristics Curves

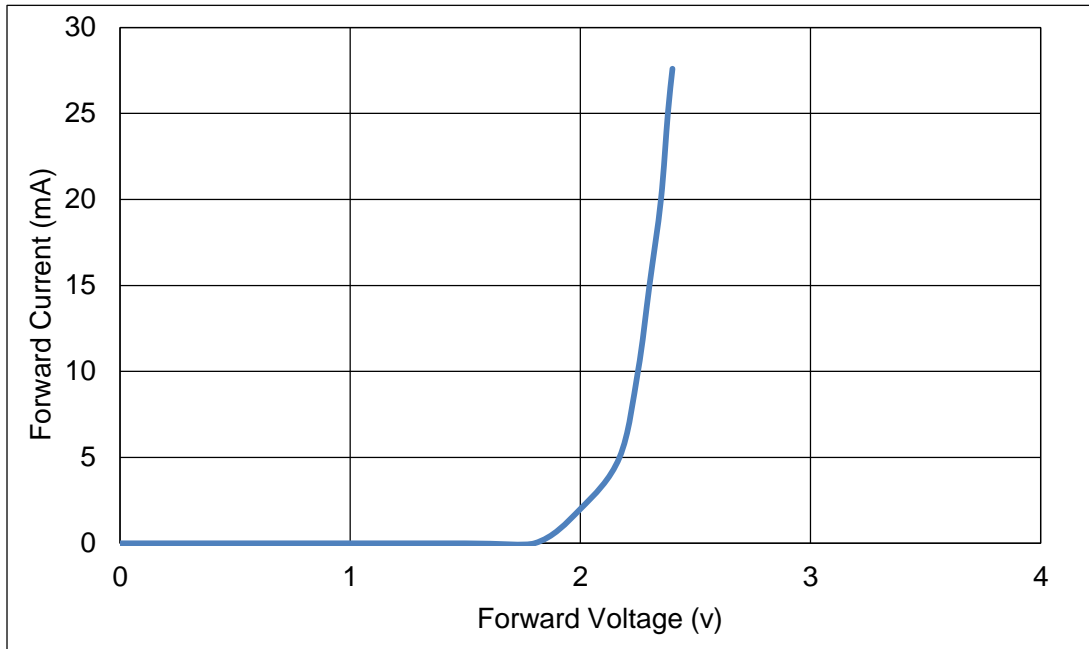


Fig 1-6 Forward Voltage Vs Forward Current

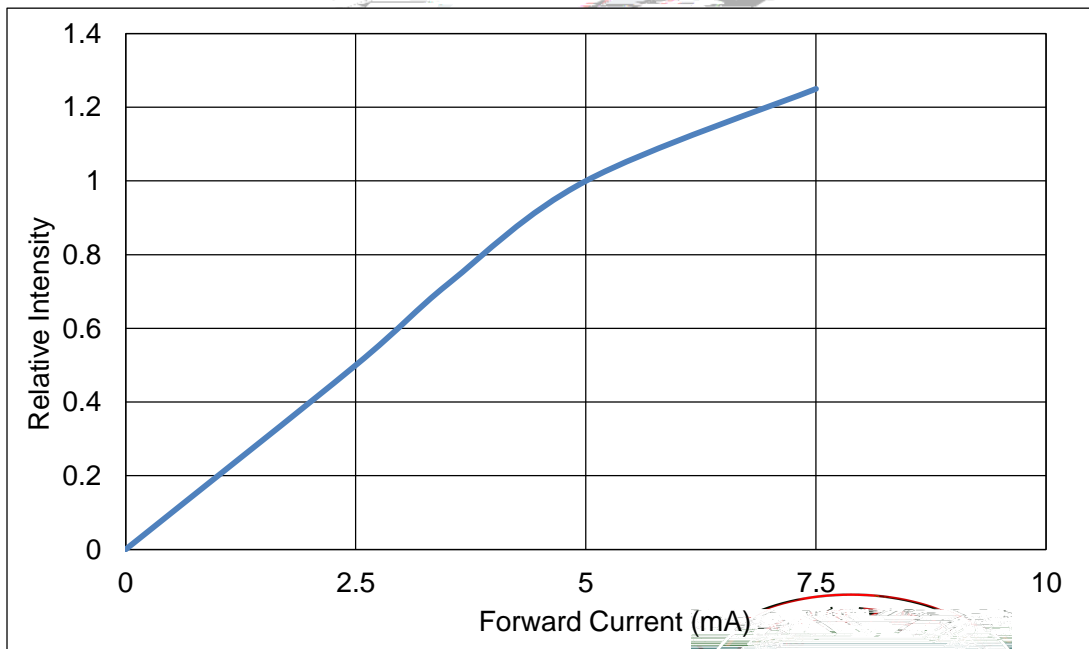
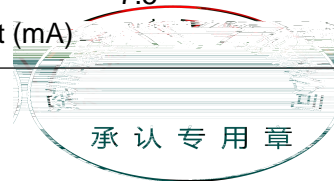
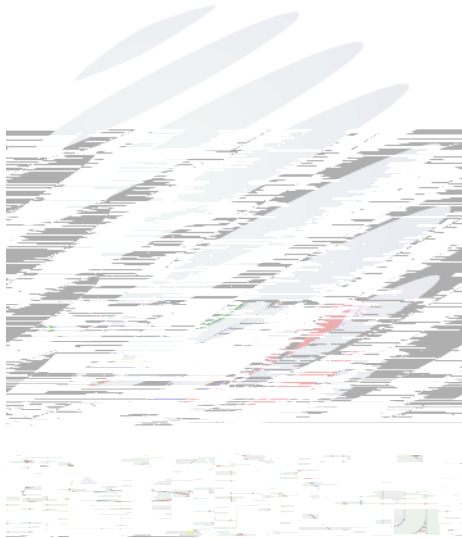


Fig 1-7 Forward Current Vs Relative Intensity





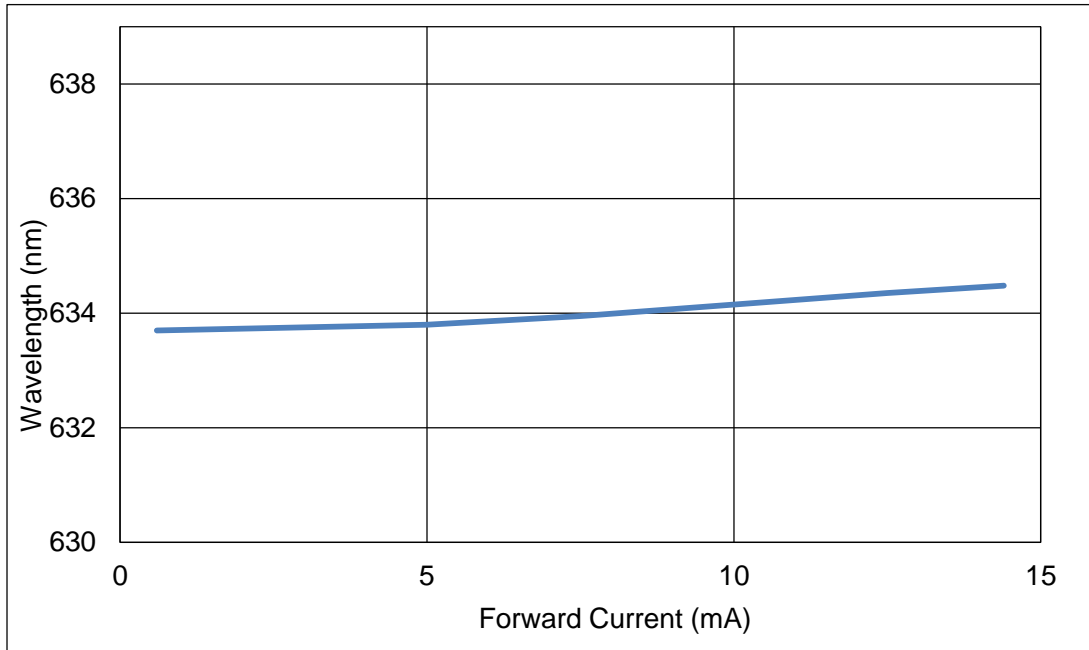


Fig1-10 Forward Current Vs Dominate Wavelength (Ta=25°C)

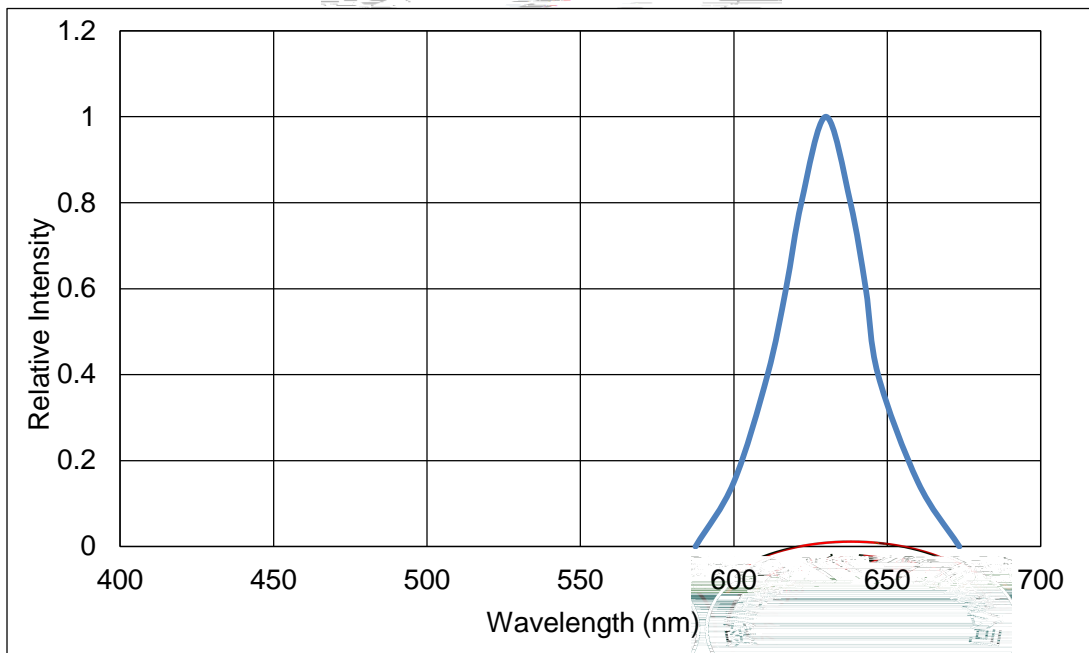
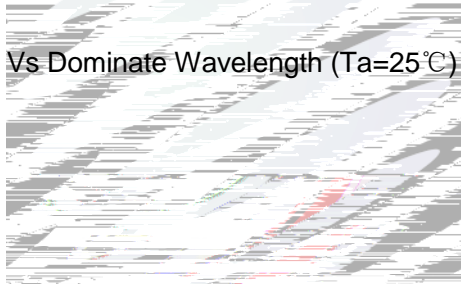


Fig 1-11 Relative Intensity Vs Wavelength (Ta=25°C)

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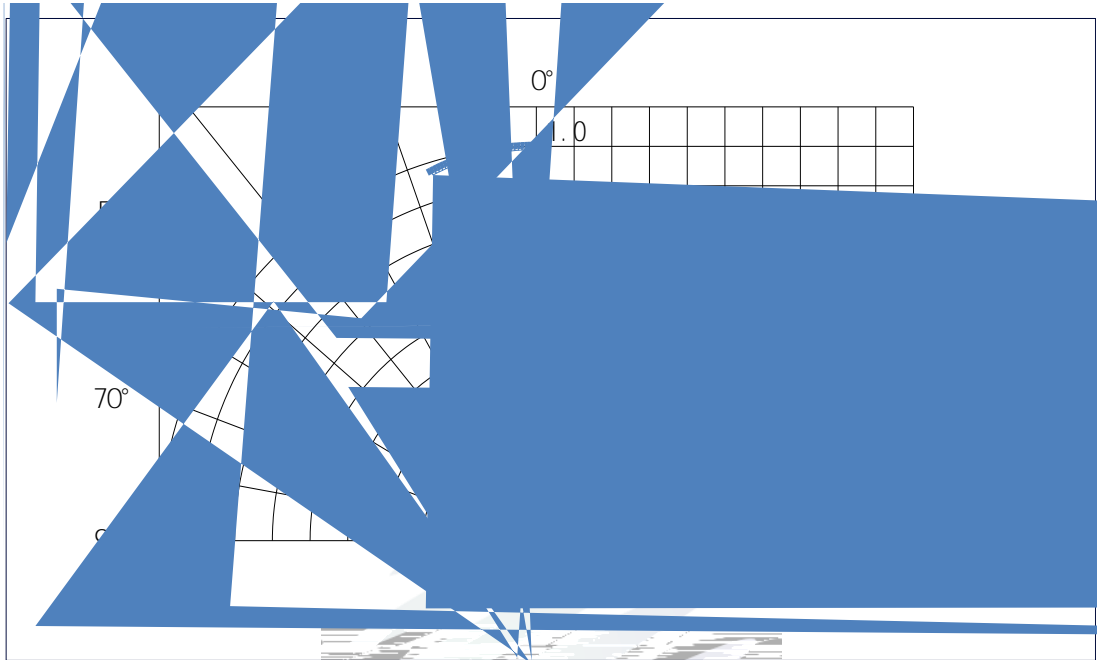
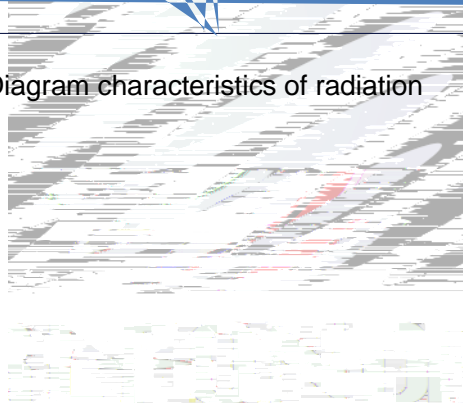


Fig 1-12 Diagram characteristics of radiation



## 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

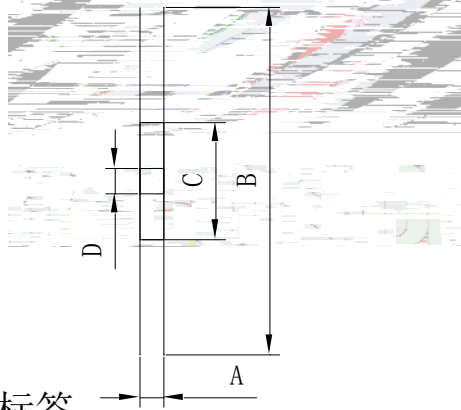
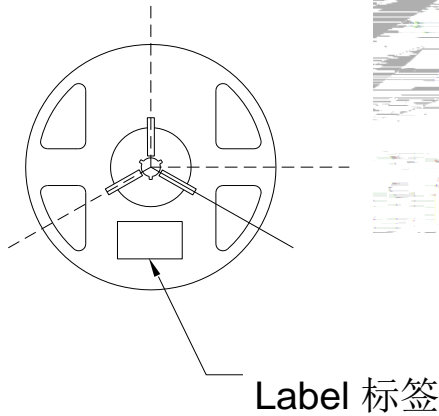


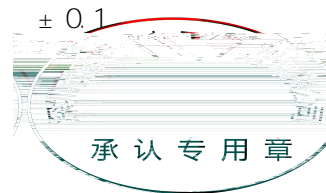
Table 2-1 Dimension

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

Fig.2-2 Reel Dimension

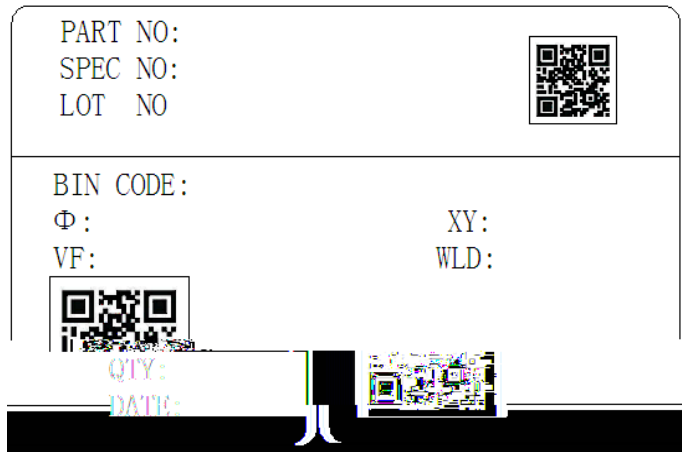
#### Notes

The tolerances unless mentioned  $\pm 0.1$ 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

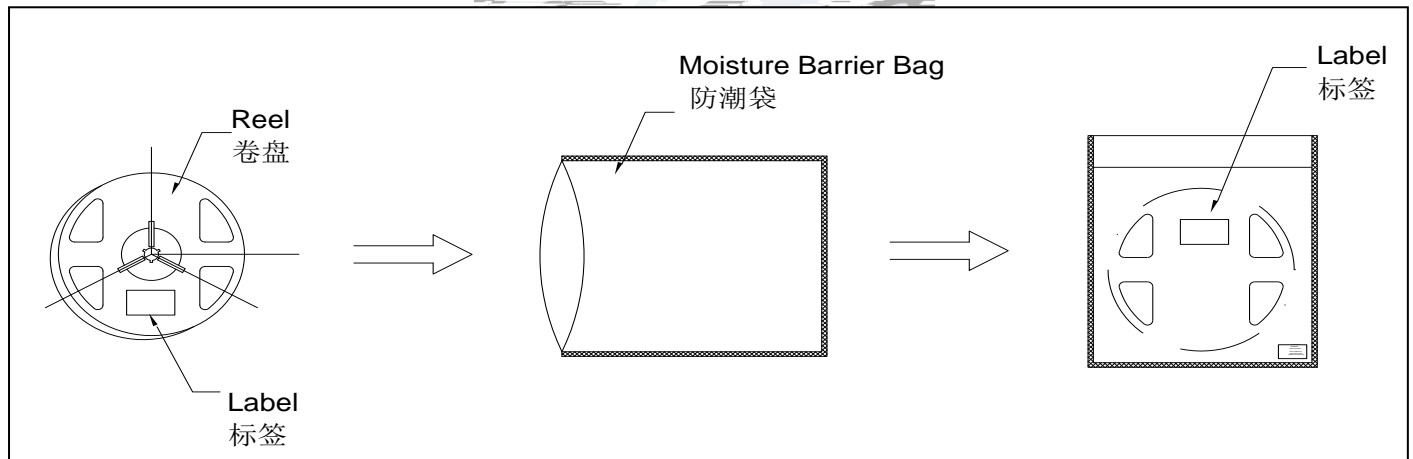
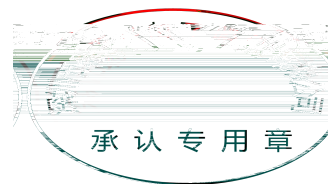


Fig.2-4 Moisture Resistant Packing



### 2.3 Cardboard Box

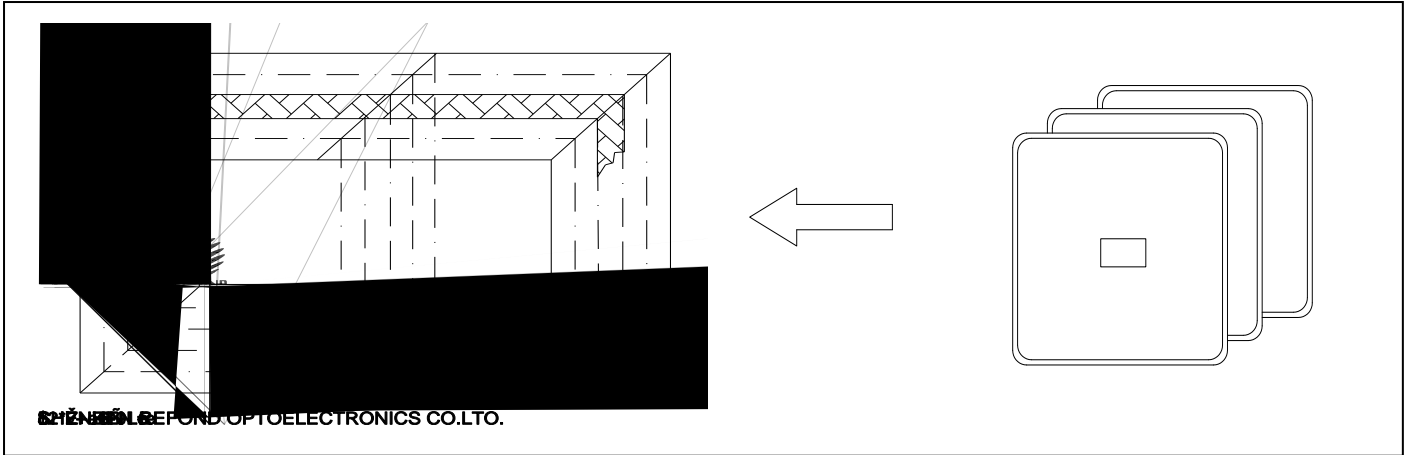


Fig.2-5 Cardboard Box

### 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	50 cycles	22Pcs.	0/1
Thermal Shock	JESD22-A106	-40 15min 100 15min	150 cycles	22Pcs.	0/1
High Temperature Storage	JESD22-A103	Temp:100	500 hrs.	22Pcs.	0/1
Low Temperature Storage	JESD22-A119	Temp:-40	500 hrs.	22Pcs.	0/1
Life Test	JESD22-A108	T <sub>a</sub> =25 I <sub>f</sub> =5mA	500 hrs.	22Pcs.	0/1

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## 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

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.





## SMT Reflow Soldering Instructions SMT

### 3.1 SMT Reflow Soldering Instructions SMT

Fig.3-1 SMT Reflow Soldering Instructions SMT

Table 3-1 Parameter 122.42 0.47002 45

Average temperature rise speed	$T_{\text{max}} - T_{\text{P}}$	3 °C/ Max 3 °C/ s
Preheating: minimum temperature	( $T_{\text{min}}$ )	150 °C
Preheating: Max temperature	( $T_{\text{max}}$ )	200 °C
Preheating: Time	$T_{\text{min}} - T_{\text{max}}$	60 - 120 60s-120s
Time limited to maintain high temperature: the temperature	( $T_{\text{L}}$ )	217 °C
Time limited to maintain high temperature: The Time	( $t_{\text{L}}$ )	60 - 150 60s-150s
Peak /Classification of temperature:	( $T_{\text{P}}$ )	260 °C
Time limit classification of peak temperature time	$t_{\text{p}}$	10 Max 10s

Hold time within 5 ° C with the actual peak temperature ( $T_{\text{P}}$ )  
5 °C



### 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.

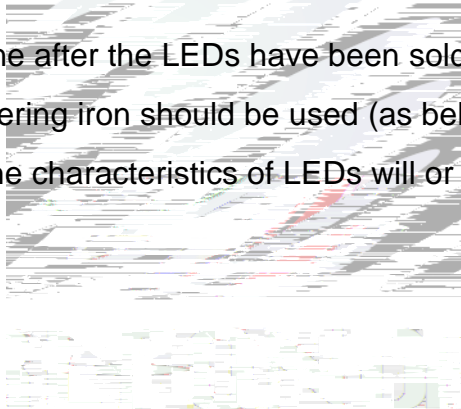
### 3.1.1 Soldering Iron

(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) In designing a circuit, the current through each LED can not 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

(5) 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

(6) Storage



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

(7) If the moisture absorbent material ( silica gelrial



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

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

(9) 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.

