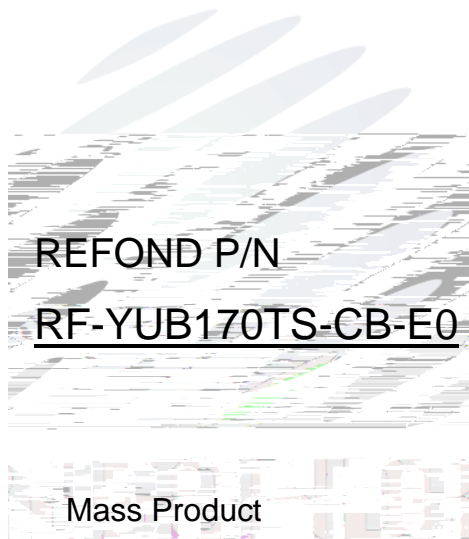


SPECIFICATION

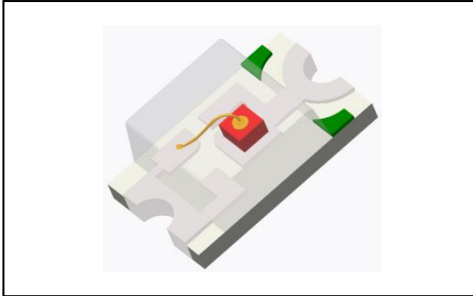


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1. Description

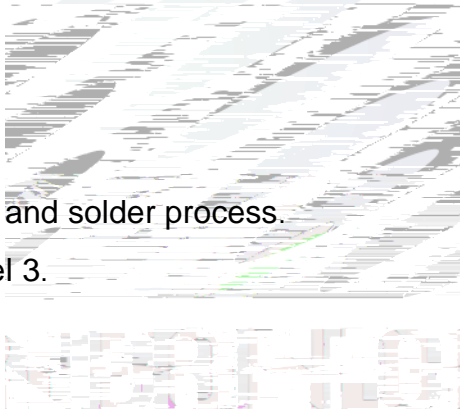
1.1 General Description



The Colour LED which was fabricated using a yellow chip Package Dimension :
2.0mmX1.25mmX0.7mm.

LED

2.0mmX1.25mmX0.7mm



1.2 Features

Extremely wide viewing angle.

Suitable for all SMT assembly and solder process.

Moisture sensitivity level: Level 3.

RoHS compliant.

1.3 Application

Optical indicator.

Switch and symbol, display.

General use.

1.4 Package Dimension

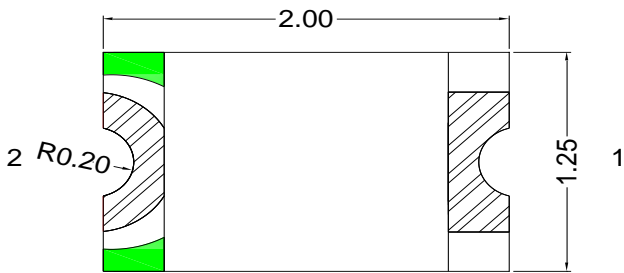


Fig.1-1 Top view

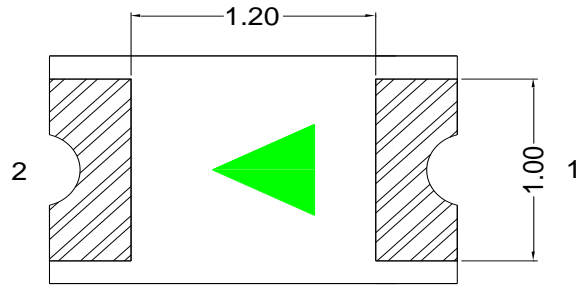


Fig.1-2 Bottom view

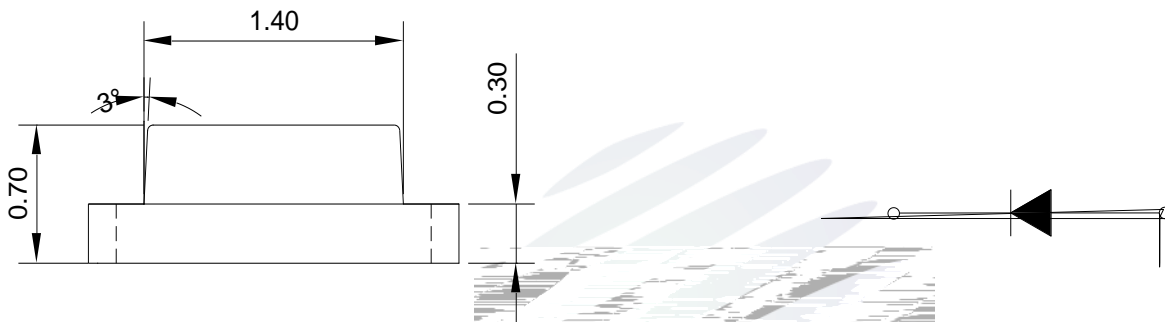


Fig.1-3 Side view

Fig.1-4 Polarity



Fig.1-5 Soldering patterns

Notes

All dimensions units are millimeters.

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

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	$I_F=20\text{mA}$	Δ		--	15	--	nm
Forward Voltage	$I_F=20\text{mA}$	V_F	B0	1.8	--	2.0	V
			C0	2.0	--	2.2	V
			D0	2.2	--	2.4	V
Dominant Wavelength	$I_F=20\text{mA}$	λ_D	2K	585	--	590	nm
			2L	590	--	595	nm
Luminous Intensity	$I_F=20\text{mA}$	I_v	F00	65	--	100	mcd
			G00	100	--	150	mcd
			H00	150	--	230	mcd
			I00	230	--	350	mcd
Viewing Angle	$I_F=20\text{mA}$			--	140	--	deg
Reverse Current	$V_R=5\text{V}$	I_R		--	--	10	μA

Notes : $V_R=5\text{V}$ For test conditions. $V_R=5\text{V}$

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

Parameter	Symbol	Rating	Units
Power Dissipation	P_d	72	mW
Forward Current	I_F	30	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

Notes

- 1/10 Duty cycle, 0.1ms pulse width.
- The above forward voltage measurement allowance tolerance is $\pm 0.1V$.
- The above dominant wavelength measurement allowance tolerance is $\pm 2nm$.
- The above luminous intensity measurement allowance tolerance $\pm 10\%$.
- 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

1.6 Typical Optical Characteristics Curves

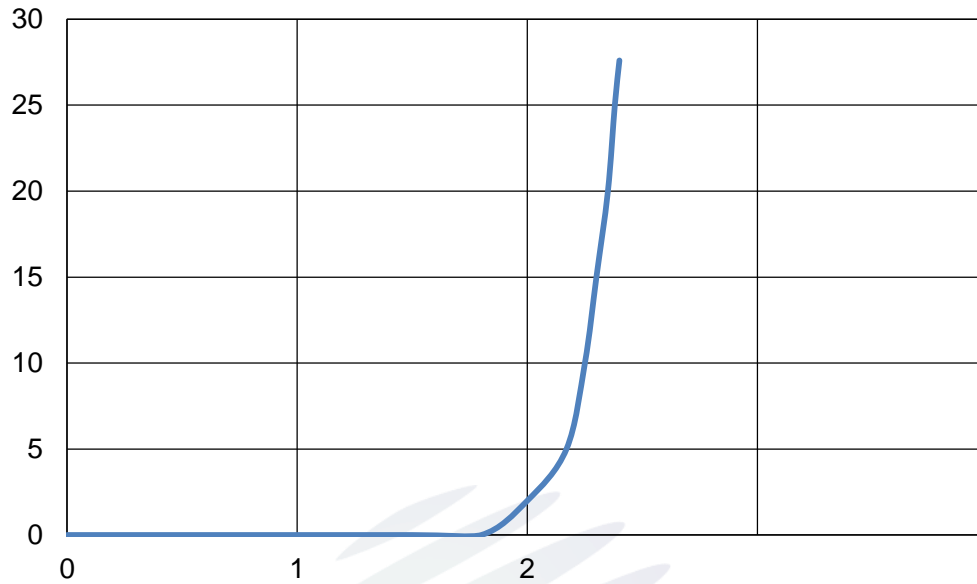


Fig 1-6 Forward Voltage Vs Forward Current

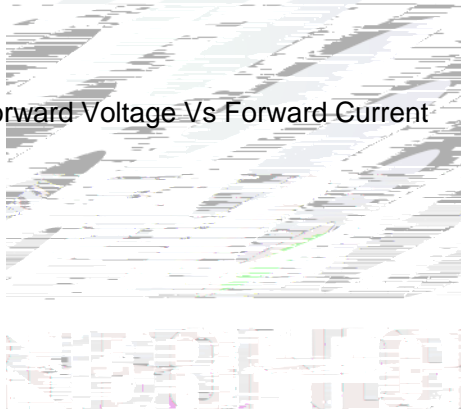


Fig 1-7 Forward Current Vs Relative Intensity

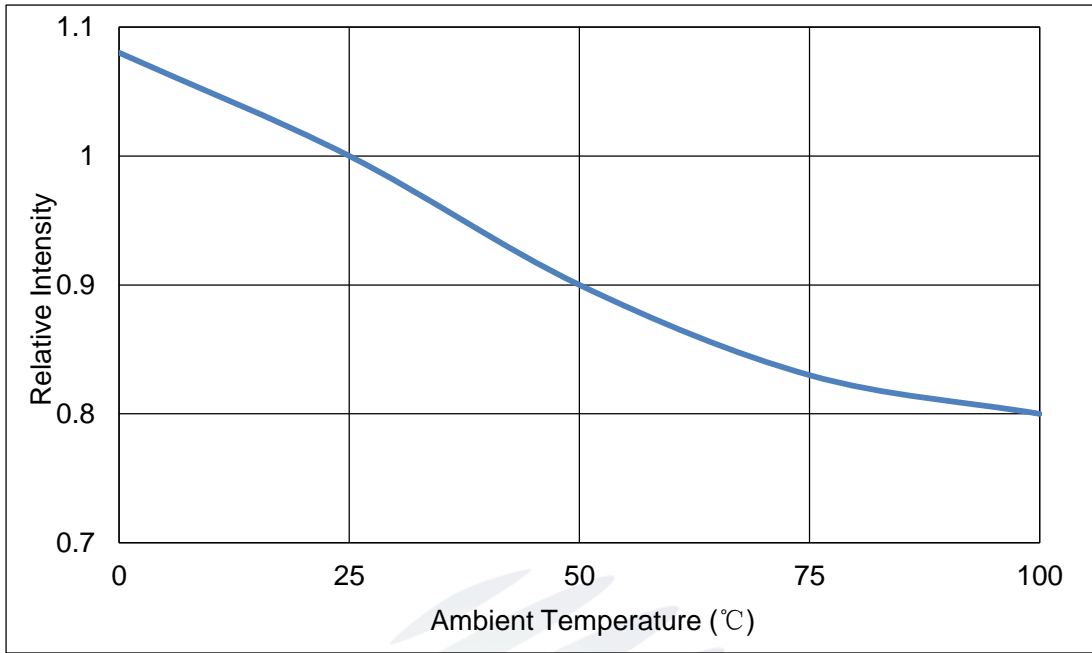


Fig 1-8 Pin Temperature Vs Relative Intensity

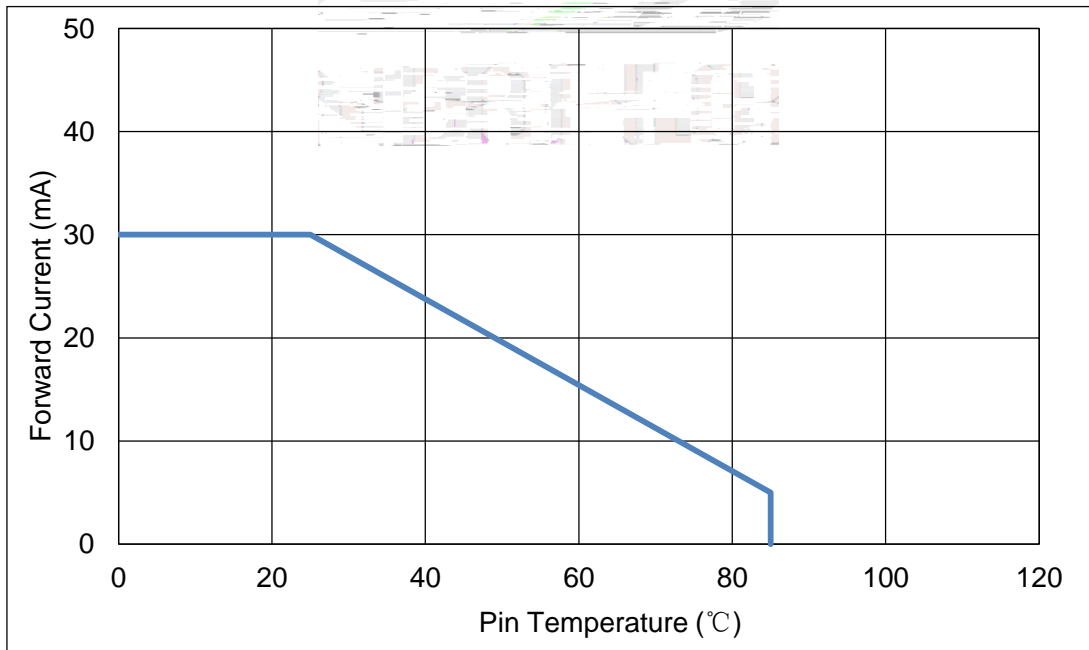
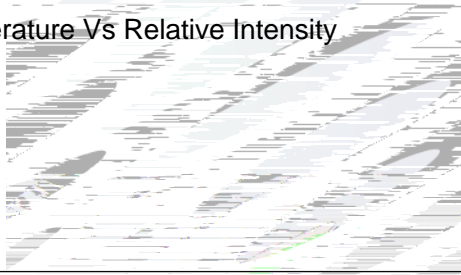


Fig 1-9 Pin Temperature Vs Forward Current

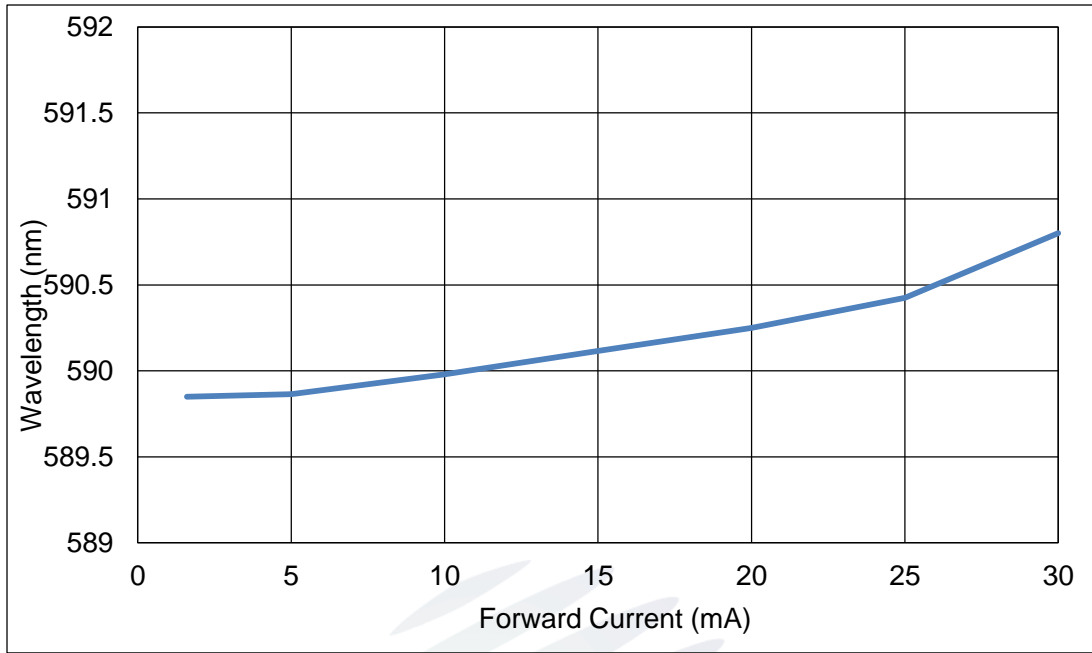


Fig1-10 Forward Current Vs Dominate Wavelength (Ta=25°C)

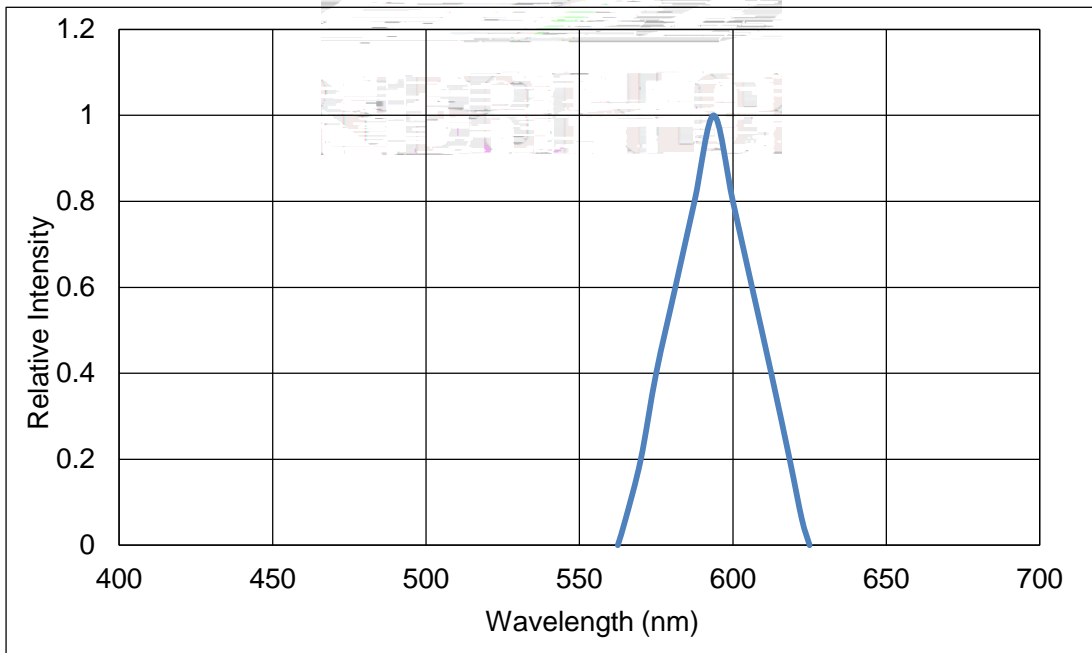


Fig 1-11 Relative Intensity Vs Wavelength (Ta=25°C)

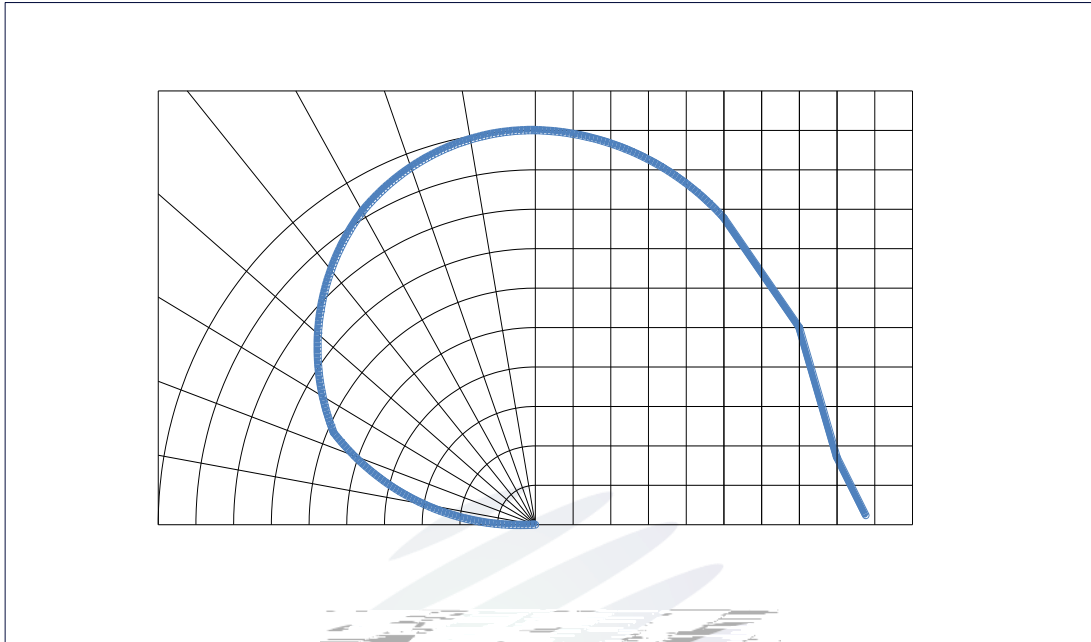
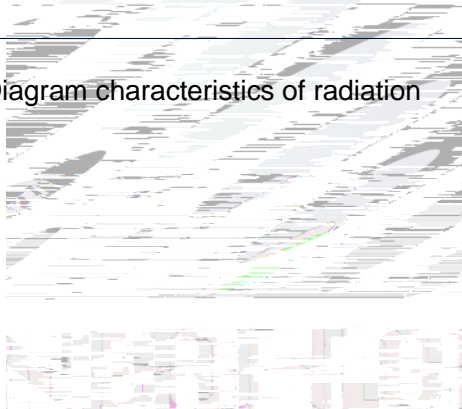


Fig 1-12 Diagram characteristics of radiation



2. Packaging

2.1 Packaging Specification

Package:4000pcs/reel.

4000pcs

2.1.1 Carrier Tape Dimension

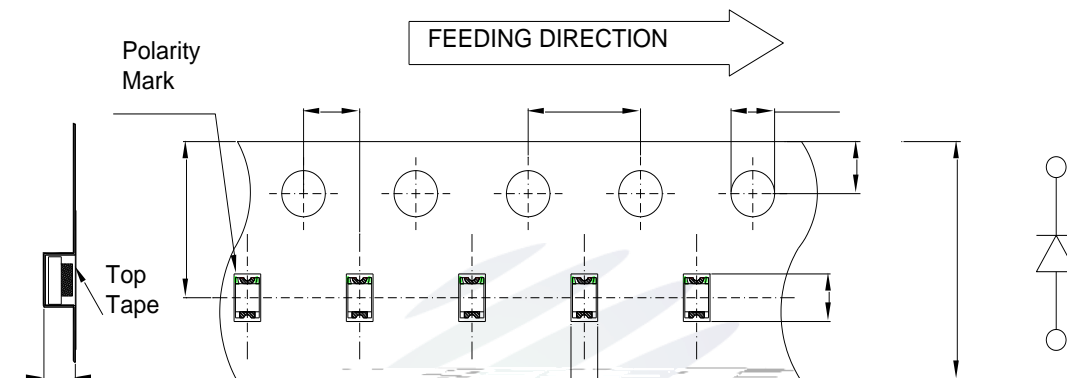


Fig.2-1 Carrier Tape Dimension

2.1.2 Reel Dimension

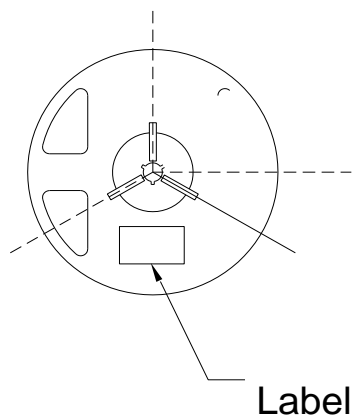


Fig.2-2 Reel Dimension

Notes

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

Table 2-1 Dimension

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



2.3 Cardboard Box

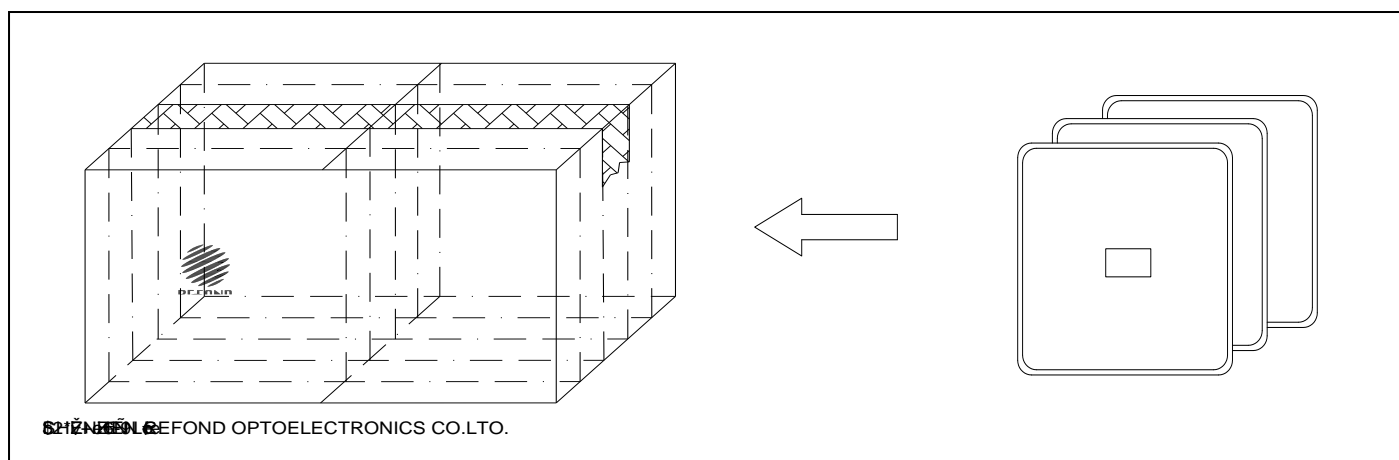


Fig.2-5 Cardboard Box

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	$T_{temp}: 260 \text{ max}$ $T=10 \text{ sec}$	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	$T_{temp}: 100$	500 hrs.	22Pcs.	0/1
Low Temperature Storage	JESD22-A119	$T_{temp}: -40$	500 hrs.	22Pcs.	0/1
Life Test	JESD22-A108	$T_a=25$ $I_F=20\text{mA}$	500 hrs.	22Pcs.	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



3. SMT Reflow Soldering Instructions SMT 回流焊说明

3.1 SMT Reflow Soldering Instructions SMT

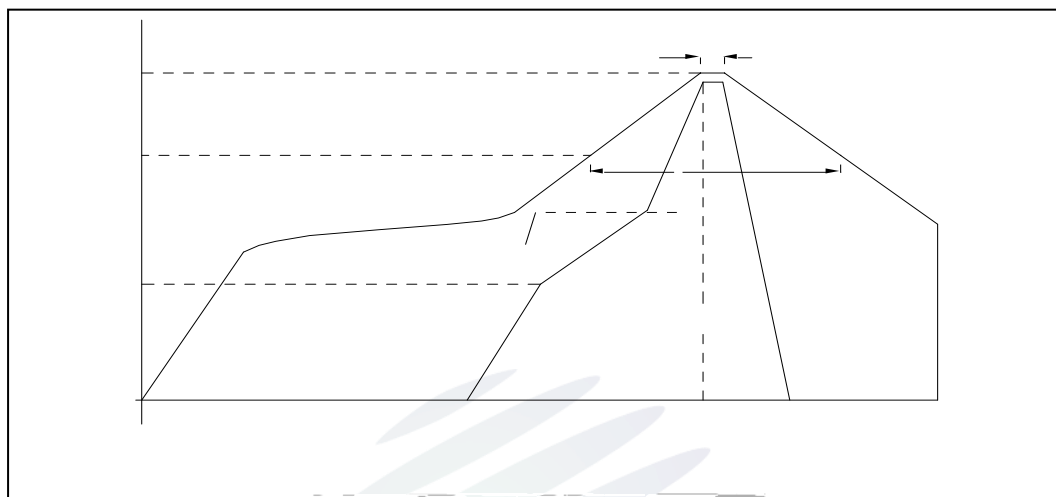


Fig.3-1 SMT Reflow Soldering Instructions SMT

Table 3-1 Parameters

Average temperature rise speed	T_{smax} T_P	3 °C/ 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
actual peak temperature (T_P)	5 °C Hold time within 5 °C with the	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

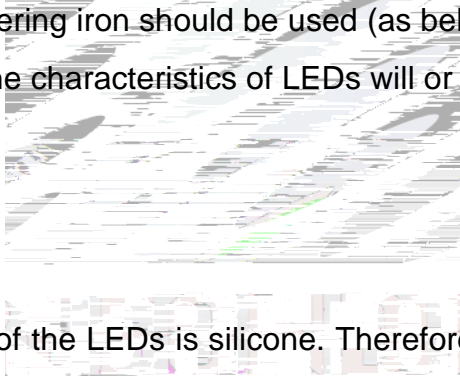
(1) When do soldering by hand, keep the temperature of iron below less 300°C less than 3 seconds.

(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

(1) 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 LEDmating usage material. This is provided for informational purposes only and is not a warranty



(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.

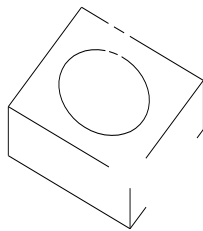


Fig 4-1 Handling Precautions 产品使用注意事项

(5) 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.

(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	60%	168hours 168

Baking

60 5



Declare

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