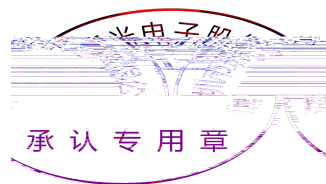
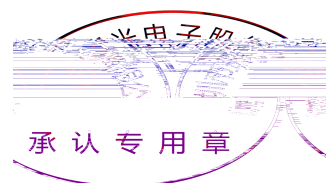
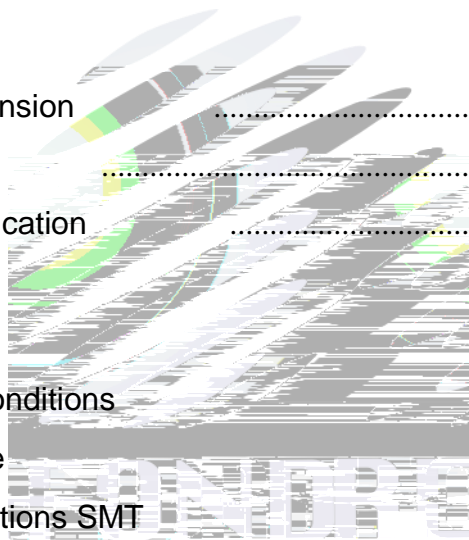


SPECIFICATION



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4.1 Handling Precautions	



1. Description

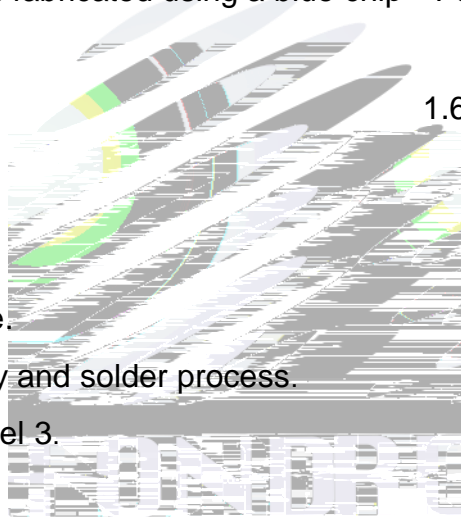
1.1 General Description



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

LED

1.6mmX0.8mmX0.7mm

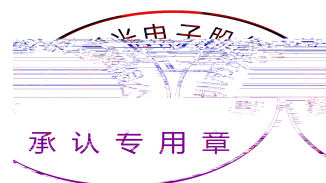


1.2 Features

- Extremely wide viewing angle.
- Suitable for all SMT assembly and solder process.
- Moisture sensitivity level: Level 3.
- RoHS compliant.

1.3 Application

- Optical indicator.
- Switch and symbol, display.
- General use.



1.4 Package Dimension

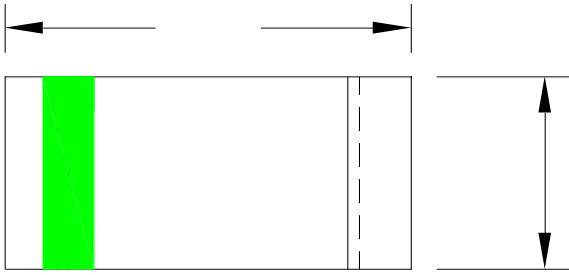


Fig.1-1 Top view

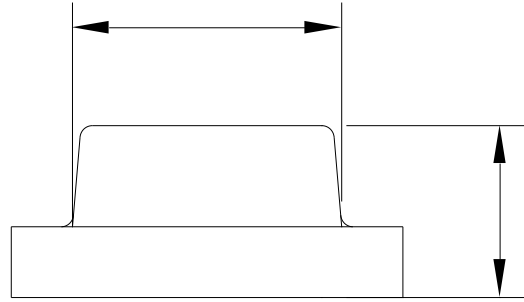


Fig.1-2 Side view

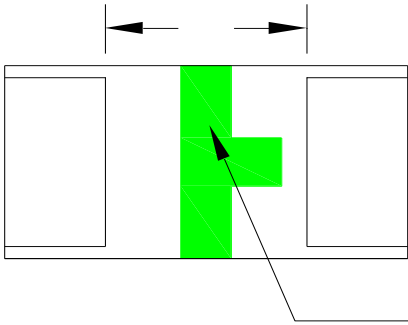


Fig.1-3 Bottom view

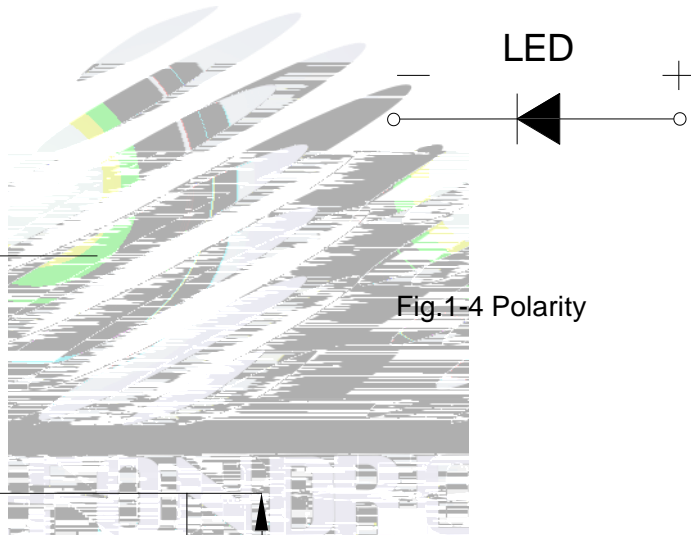


Fig.1-4 Polarity

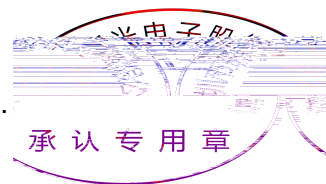


Fig.1-5 Soldering patterns

Notes

All dimensions units are millimeters.

All dimensions tolerances are 0.2mm 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 =20mA	Δ	--	30	--	nm	
Forward Voltage	I _F =20mA	V _F	G1	2.8	--	2.9	V
			G2	2.9	--	3.0	V
			H1	3.0	--	3.1	V
			H2	3.1	--	3.2	V
			I1	3.2	--	3.3	V
			I2	3.3	--	3.4	V
			J1	3.4	--	3.5	V
Dominant Wavelength	I _F =20mA	D	4F	465	--	466	nm
			1A	466	--	467	nm
			1B	467	--	468	nm
			1C	468	--	469	nm
			1D	469	--	470	nm
			1E	470	--	471	nm
			1G	471	--	472	nm
			1H	472	--	473	nm
			1I	473	--	474	nm
			5HC	474	--	475	nm
Luminous Intensity	I _F =20mA	I _v	1BL	120	--	140	mcd
			1BM	140	--	160	mcd
			1BW	160	--	180	mcd
			1BX	180	--	200	mcd
			1IW	200	--	220	mcd
			1GV	220	--	240	mcd
			1HB	240	--	260	mcd
			1LI	260	--	280	mcd
			1LJ	280	--	300	mcd
1LK	300	--	320	mcd			
Viewing Angle	I _F =20mA		--	140	--	deg	
Reverse Current	V _R =5V	I _R	--	--	10	A	
Thermal Resistance.	I _F =20mA	R _{THJ-S}	--	--	450	/W	

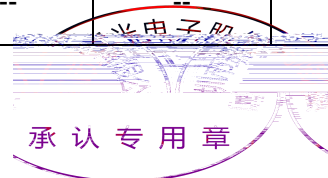
 Notes : V_R=5V For test conditions. V_R=5V


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

Parameter	Symbol	Rating	Units
Forward Current	I_F	20	mA

Peak Forward Current Of Pulse

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

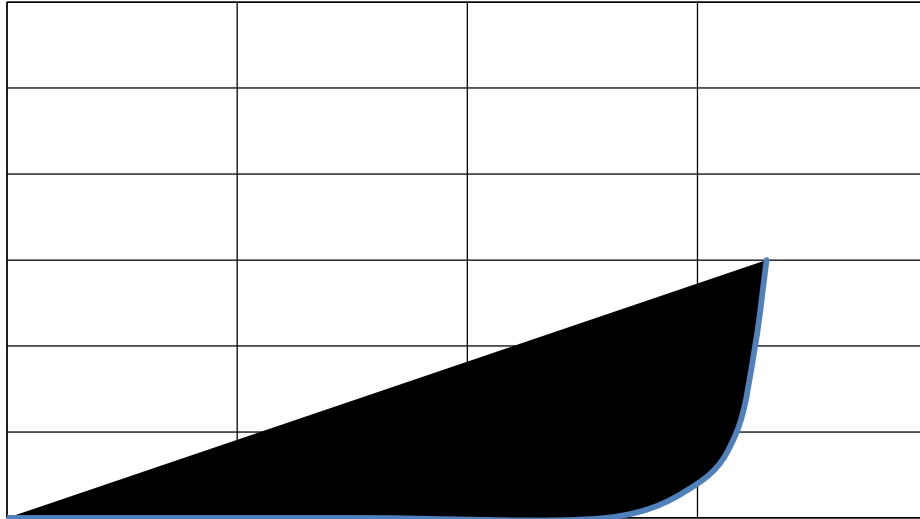


Fig 1-6 Forward Voltage Vs Forward Current

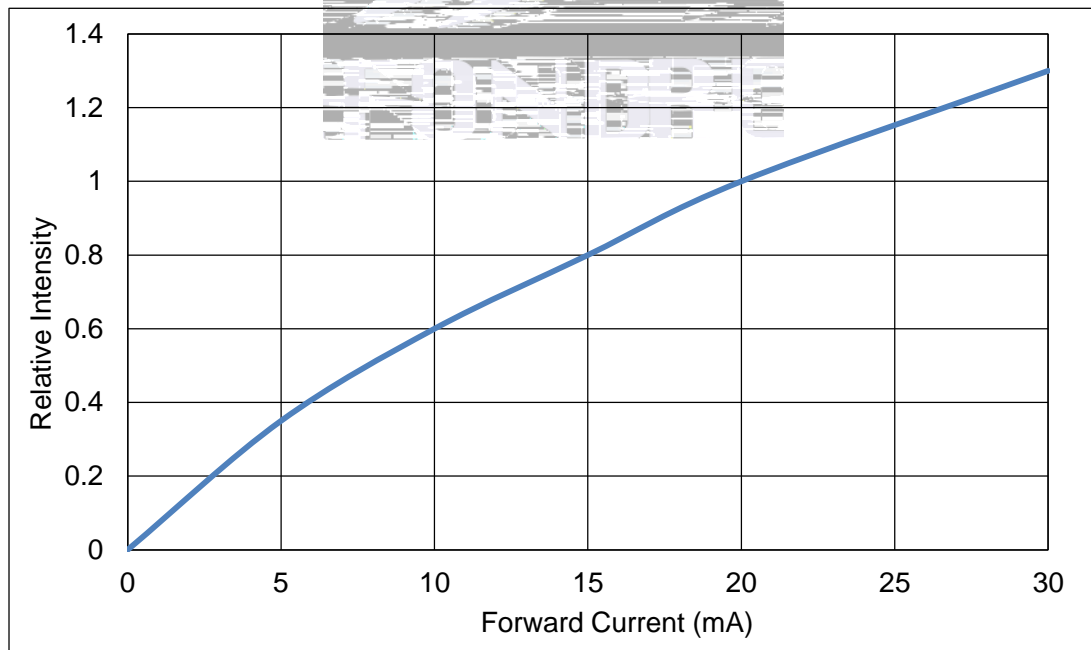


Fig 1-7 Forward Current Vs Relative Intensity

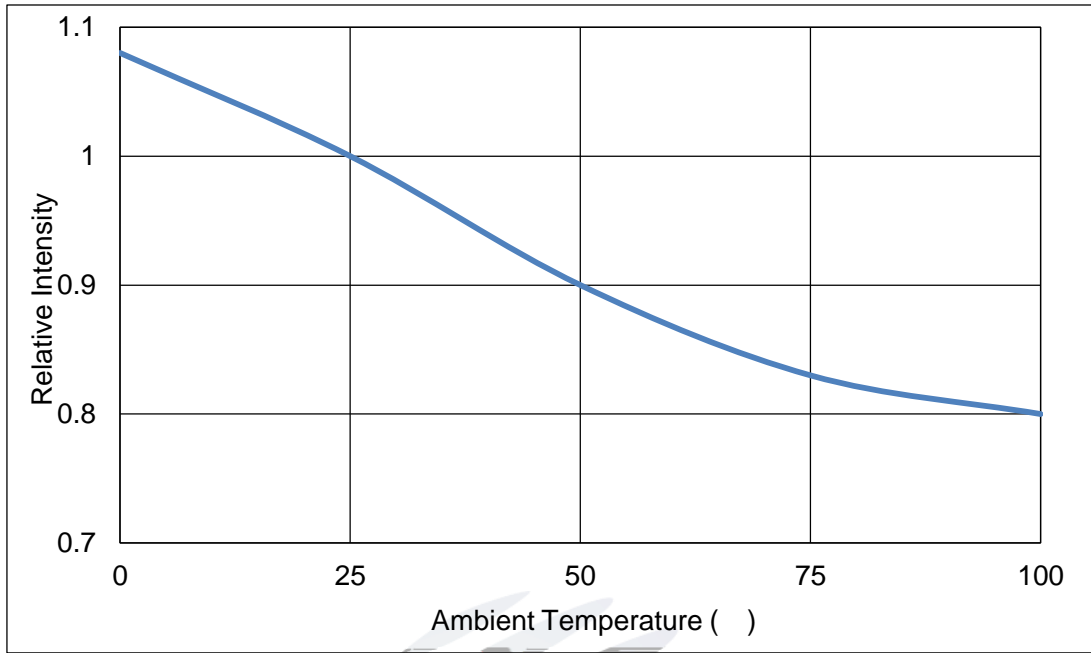


Fig 1-8 Pin Temperature Vs Relative Intensity

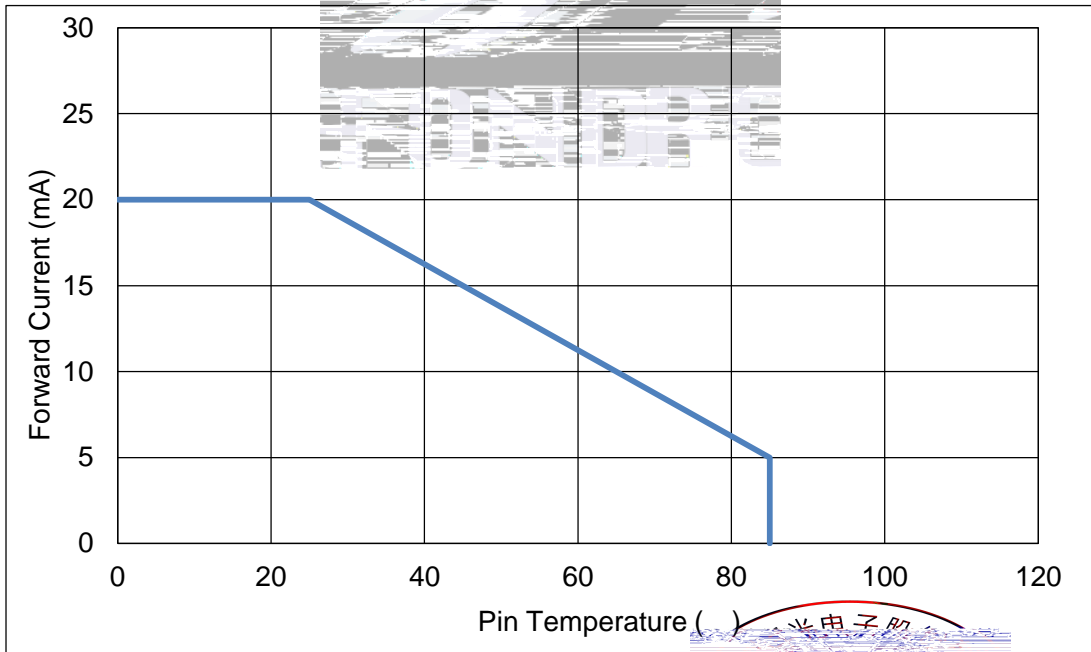
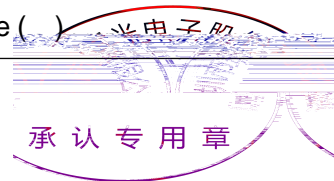


Fig 1-9 Pin Temperature Vs Forward Current



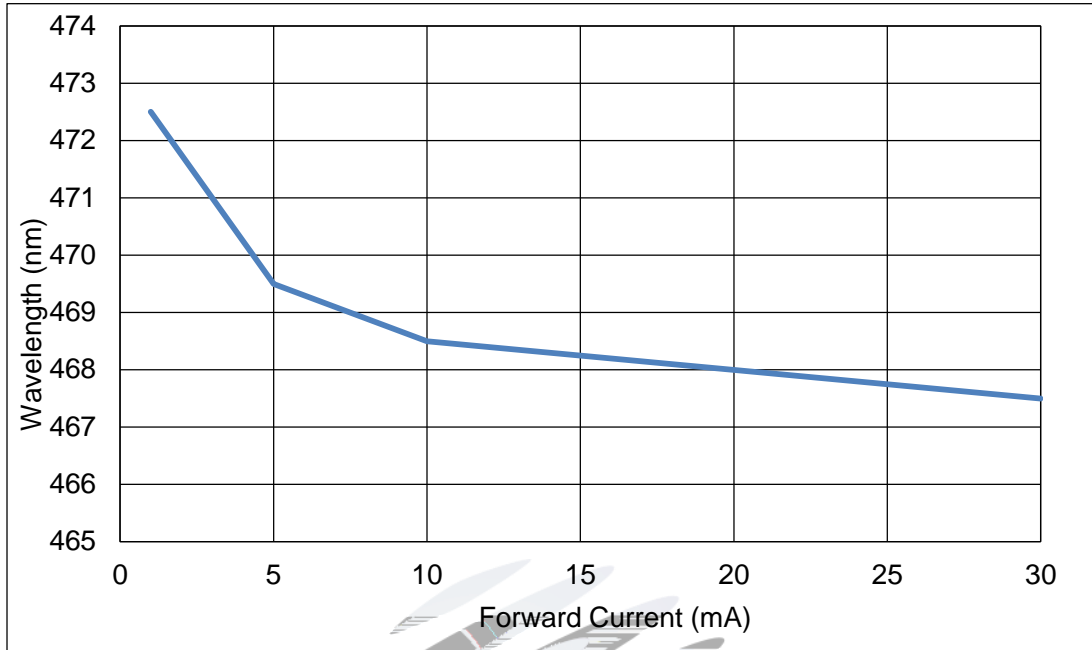


Fig 1-10 Forward Current Vs Dominate Wavelength (Ta=25)

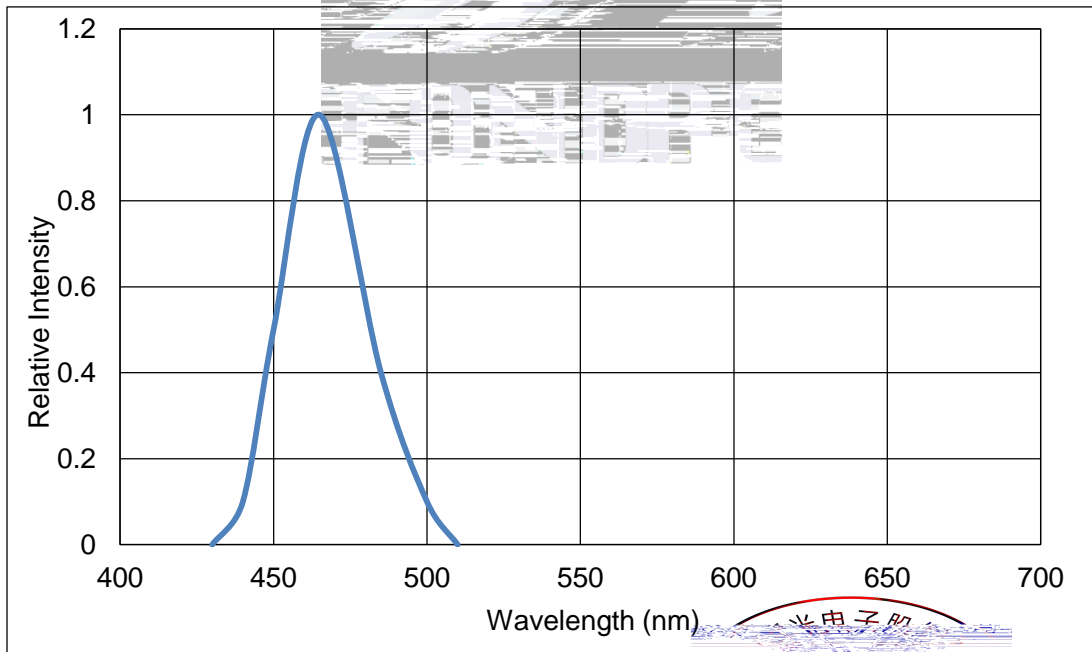
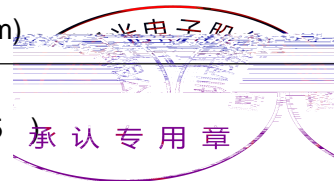


Fig 1-11 Relative Intensity Vs Wavelength (Ta=25)



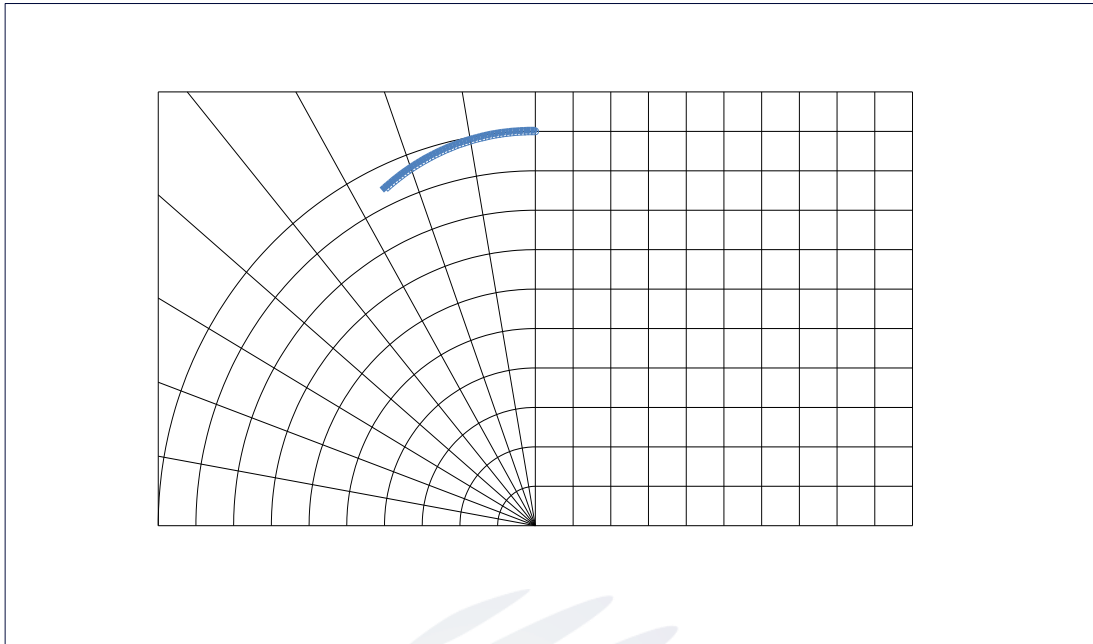
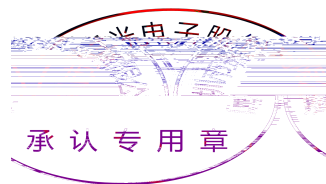
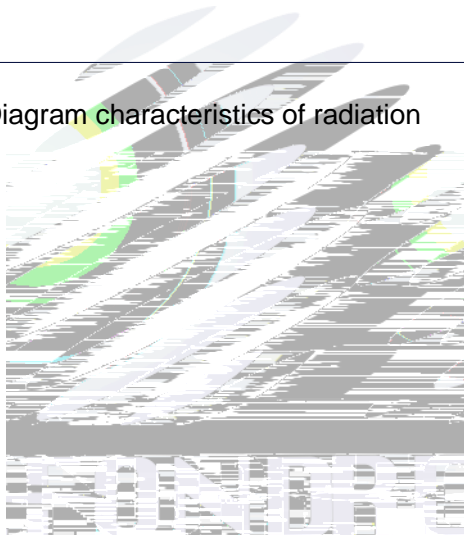


Fig 1-12 Diagram characteristics of radiation



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

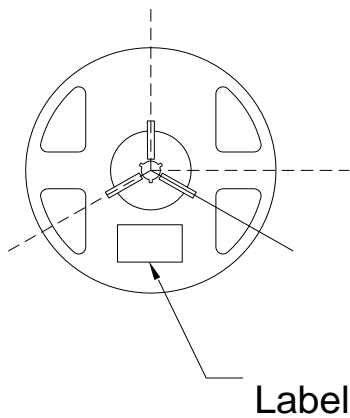


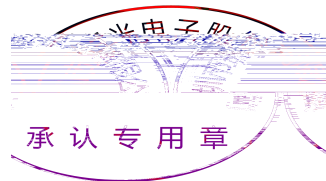
Fig.2-2 Reel Dimension

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

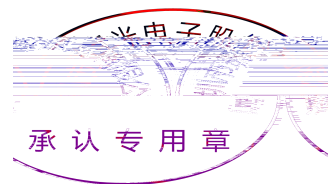
PART NO.	Part Number
SPEC NO.	Spec Number
LOT NO.	Lot Number
BIN CODE	Bin Code
	Luminous flux
XY	Chromaticity Bin
V _F	Forward Voltage
WLD	Wavelength
QTY	Packing Quantity
DATE	Made Date

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

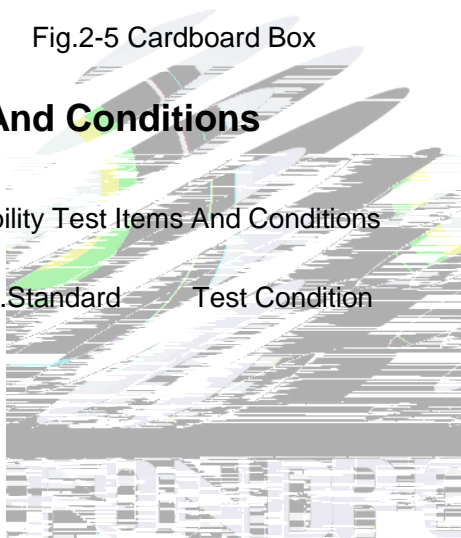
2.4 Reliability Test Items And Conditions

Table 2-3 Reliability Test Items And Conditions

Test Items

Ref.Standard

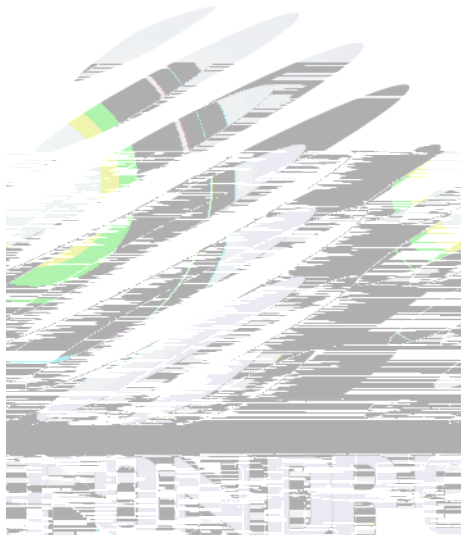
Test Condition



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	$I_F=20mA$	-	-



3. SMT Reflow Soldering Instructions SMT

3.1 SMT Reflow Soldering Instructions SMT

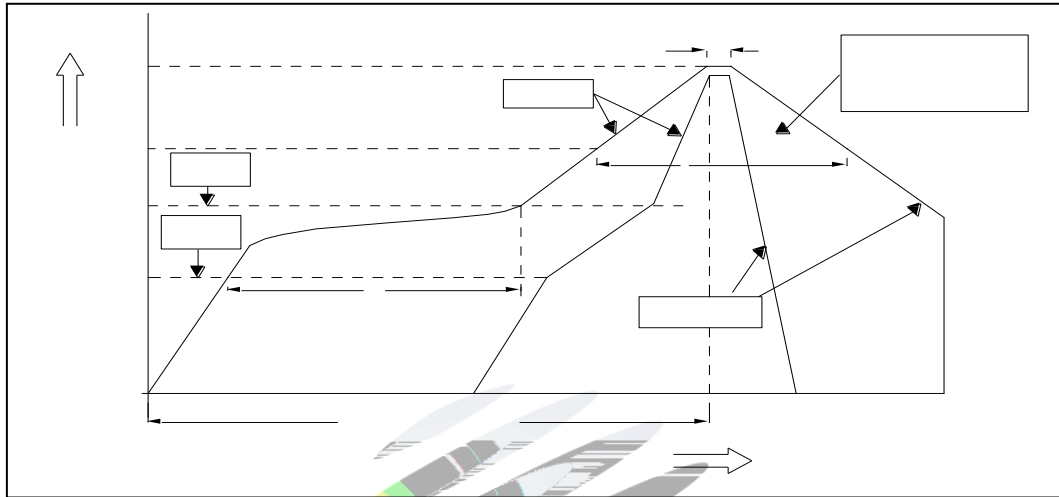
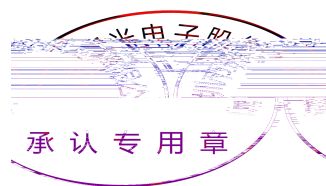
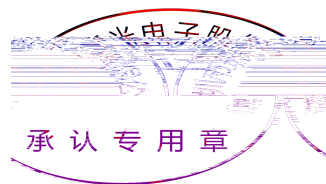
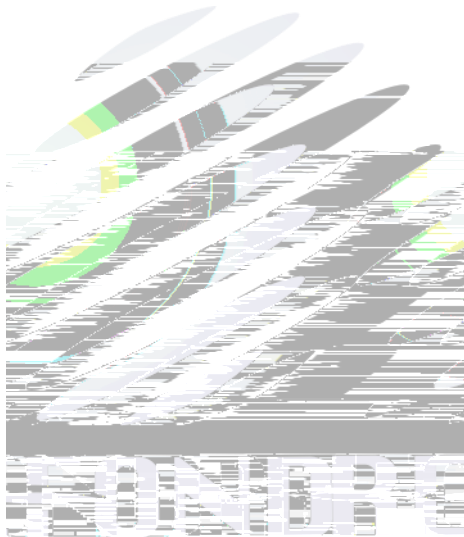


Fig.3-1 SMT Reflow Soldering Instructions SMT

Table 3-1 Parameter

Average temperature rise speed	T_{smax} T_p	3 °C/ 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 (T_p)	(T_p)	30 Max 30s
Cooling speed		6 °C/ Max 6 °C/ s
Needed time from 25 °C to T_p	25 °C	8 Max 8 minutes





(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.

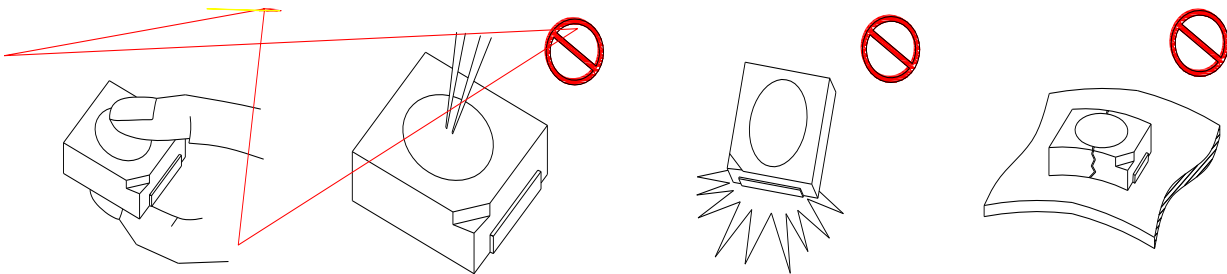
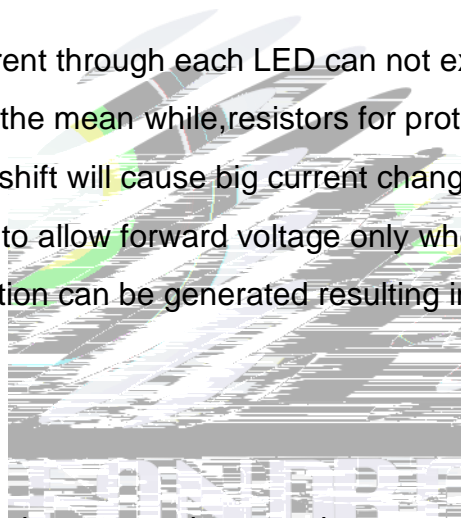


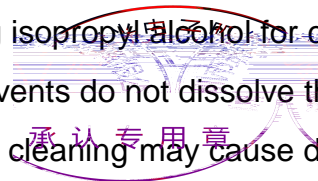
Fig 4-1

(5) In designing a circuit, the current through each LED can not exceed the absolute maximum rating specified for each LED. In the mean while, 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

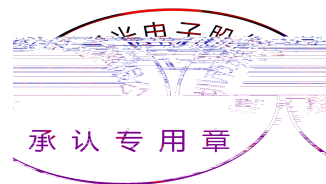
Conditions		Temperature	Humidity	Time
Storage	Before Opening Aluminum Bag	30	75%	Within 1 Year From Date
	After Opening Aluminum Bag	30	60%	24hours 24
Baking		60 5		24hours 24

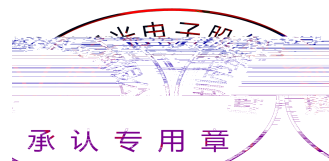
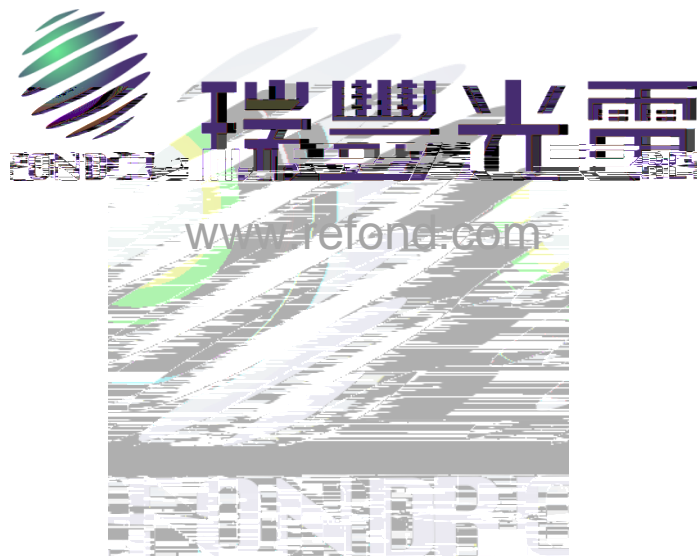
(8) If the moisture absorbent material silica gel has faded away or the LEDs have exceeded the storage time, baking treatment should be performed after unpacking and based on the following condition 65 ± 5 °C for above 24 hours.

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).

(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.