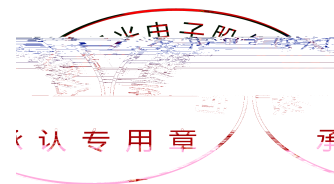
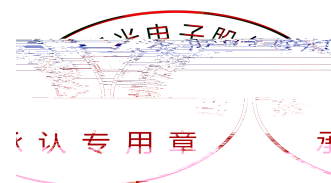
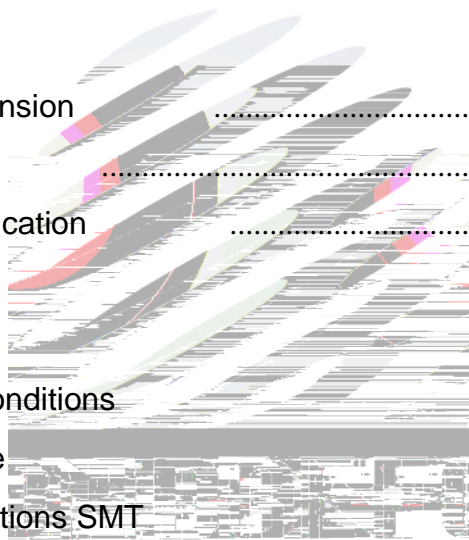


# SPECIFICATION



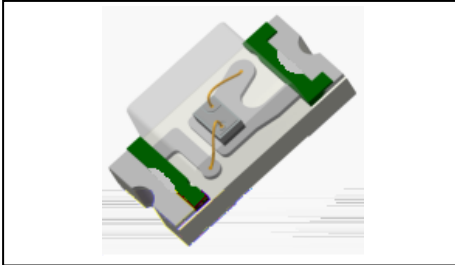
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4.1 Handling Precautions	



# 1. Description

## 1.1 General Description



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

LED

1.6mmX0.8mmX0.4mm

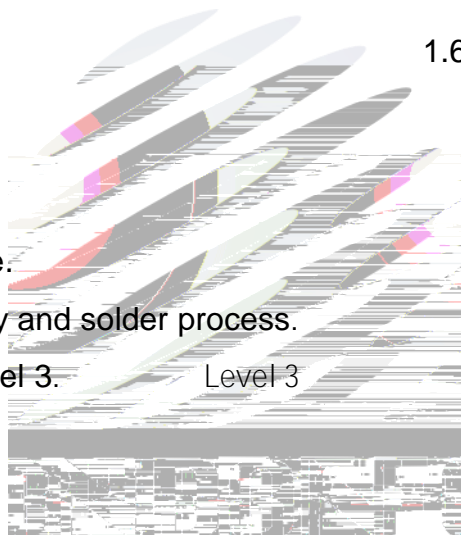
## 1.2 Features

Extremely wide viewing angle.

Suitable for all SMT assembly and solder process.

Moisture sensitivity level: Level 3.

RoHS compliant. RoHS



SMT

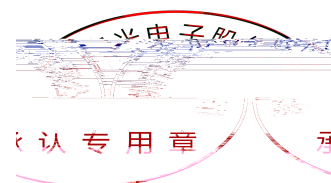
Level 3

## 1.3 Application

Optical indicator.

Switch and symbol, display.

General use.



## 1.4 Package Dimension

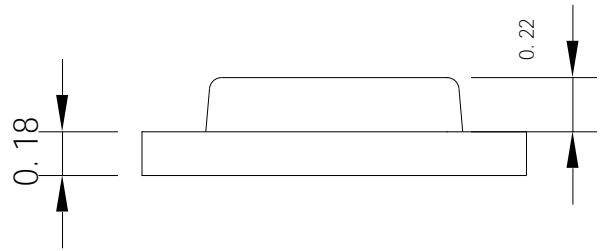


Fig.1-1 Top view

Fig.1-2 Side view

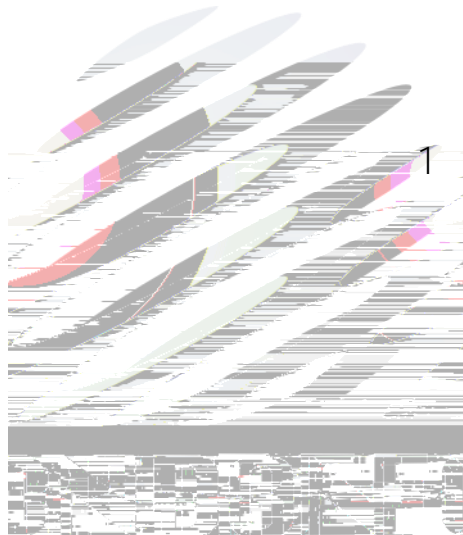


Fig.1-3 Bottom view

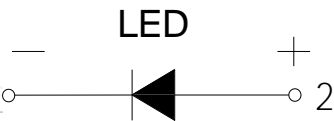


Fig.1-4 Polarity

## 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 <sub>F</sub> =2mA	Δ	--	15	--	nm	
Forward Voltage	I <sub>F</sub> =2mA	V <sub>F</sub>	D2	2.3	--	2.4	V
			E1	2.4	--	2.5	V
			E2	2.5	--	2.6	V
			F1	2.6	--	2.7	V
			F2	2.7	--	2.8	V
			G1	2.8	--	2.9	V
			G2	2.9	--	3.0	V
Dominant Wavelength	I <sub>F</sub> =2mA	λ <sub>D</sub>	F10	525	--	527.5	nm
			F20	527.5	--	530	nm
			G10	530	--	532.5	nm
			G20	532.5	--	535	nm
Luminous Intensity	I <sub>F</sub> =2mA	I <sub>V</sub>	FD0	90	--	100	mcd
			GA0	100	--	110	mcd
			GB0	110	--	120	mcd
			1FJ	120	--	130	mcd
			1FQ	130	--	140	mcd
			1FR	140	--	150	mcd
			1FS	150	--	160	mcd
Viewing Angle	I <sub>F</sub> =2mA		--	140	--	deg	
Reverse Current	V <sub>R</sub> =5V	I <sub>R</sub>	--	--	10	A	
Thermal Resistance.	I <sub>F</sub> =2mA	R <sub>THJ-S</sub>	--	--	450	/W	

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

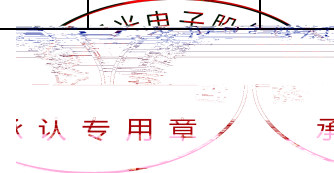
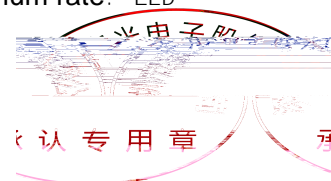


Table 1-2 Absolute Maximum Ratings at Ts=25°C

Parameter	Symbol	Rating	Units
Power Dissipation	$P_d$	60	mW
Forward Current	$I_F$	20	mA
Peak Forward Current Of Pulse	$I_{FP}$	60	mA
Electrostatic Discharge (HBM)	$E_{SD}$	1000	V
Operating Temperature	$T_{opr}$	-40 ~ +85	
Storage Temperature	$T_{stg}$	-40 ~ +85	
Junction Temperature	$T_j$	95	

## Notes

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

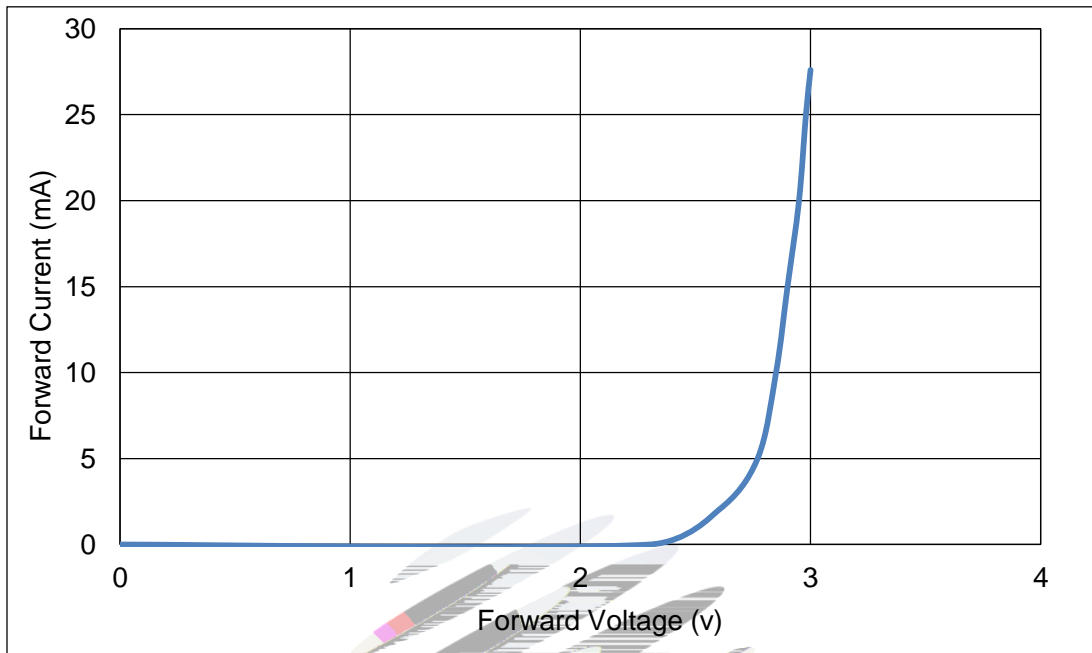


Fig 1-6 Forward Voltage Vs Forward Current

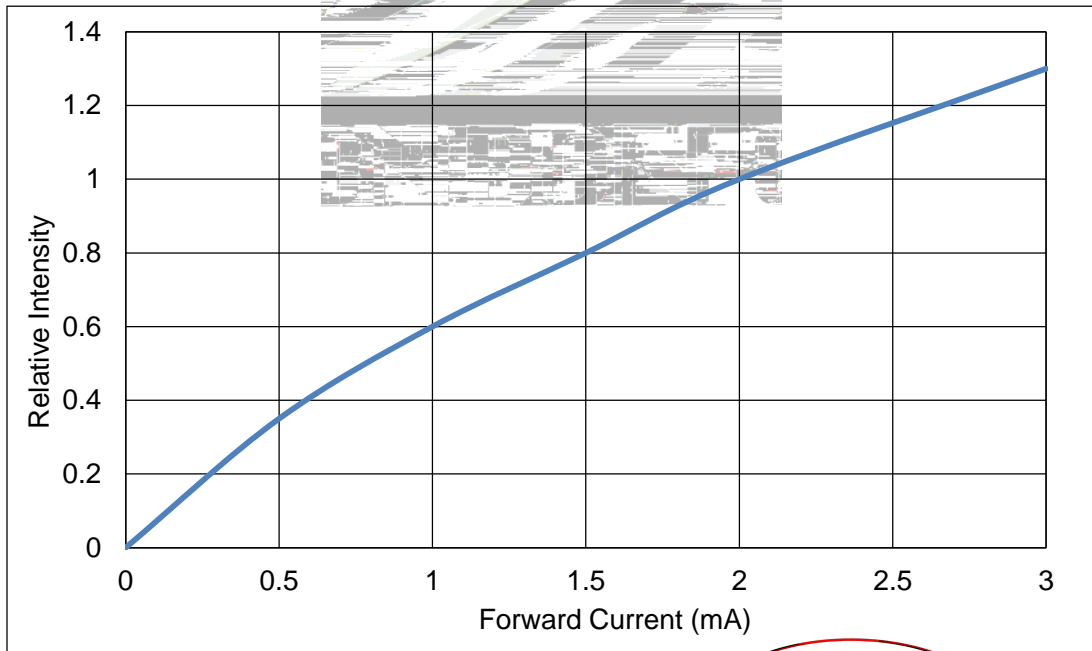
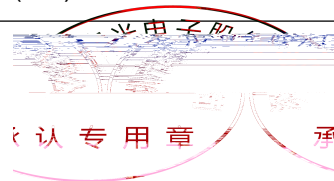


Fig 1-7 Forward Current Vs Relative Intensity



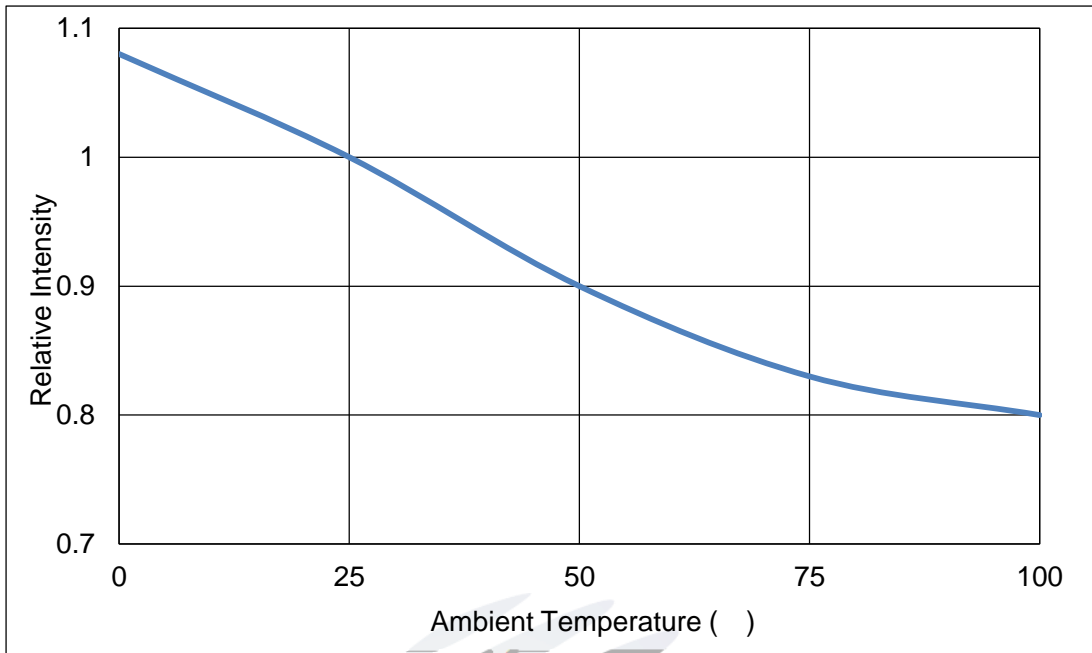


Fig 1-8 Pin Temperature Vs Relative Intensity

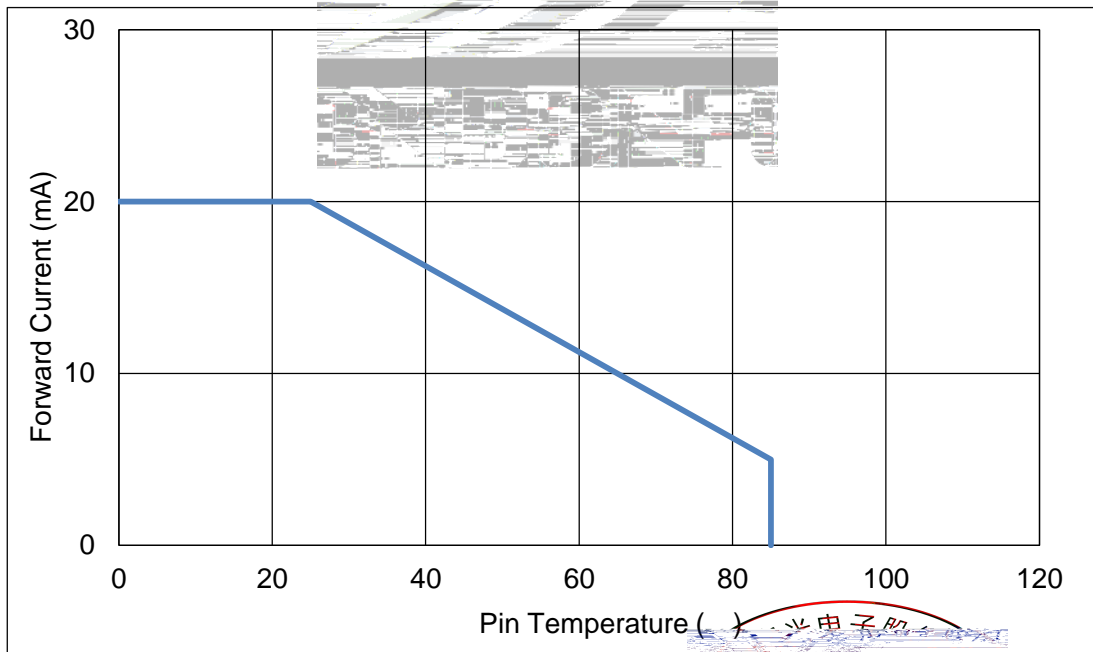
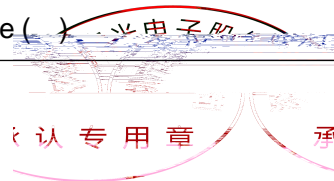


Fig 1-9 Pin Temperature Vs Forward Current





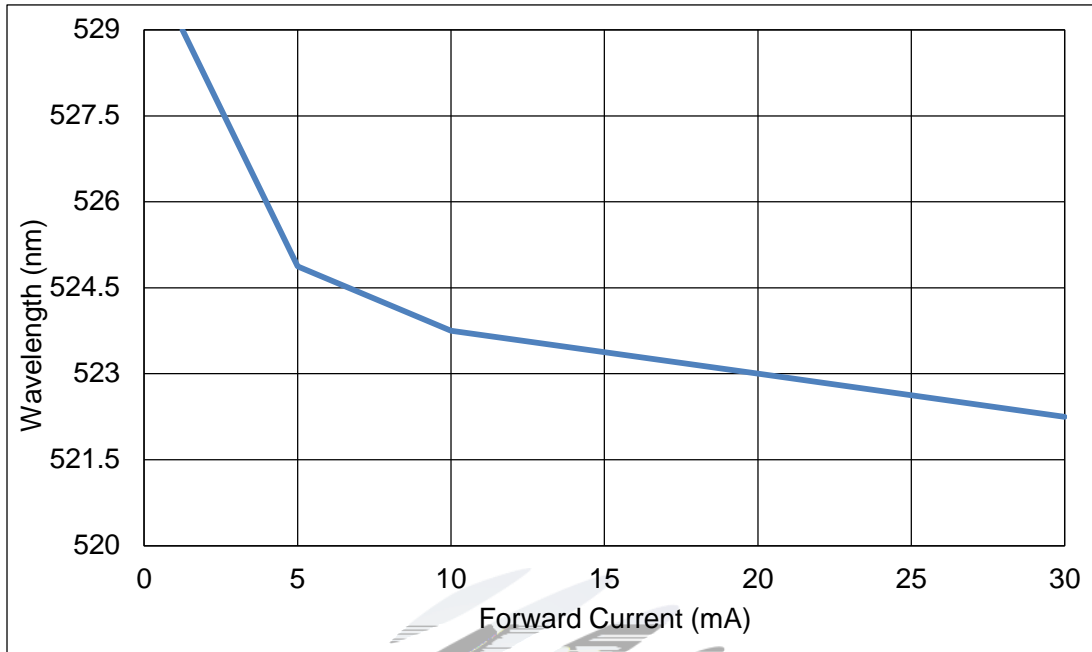


Fig 1-10 Forward Current Vs Dominate Wavelength (Ta=25 )

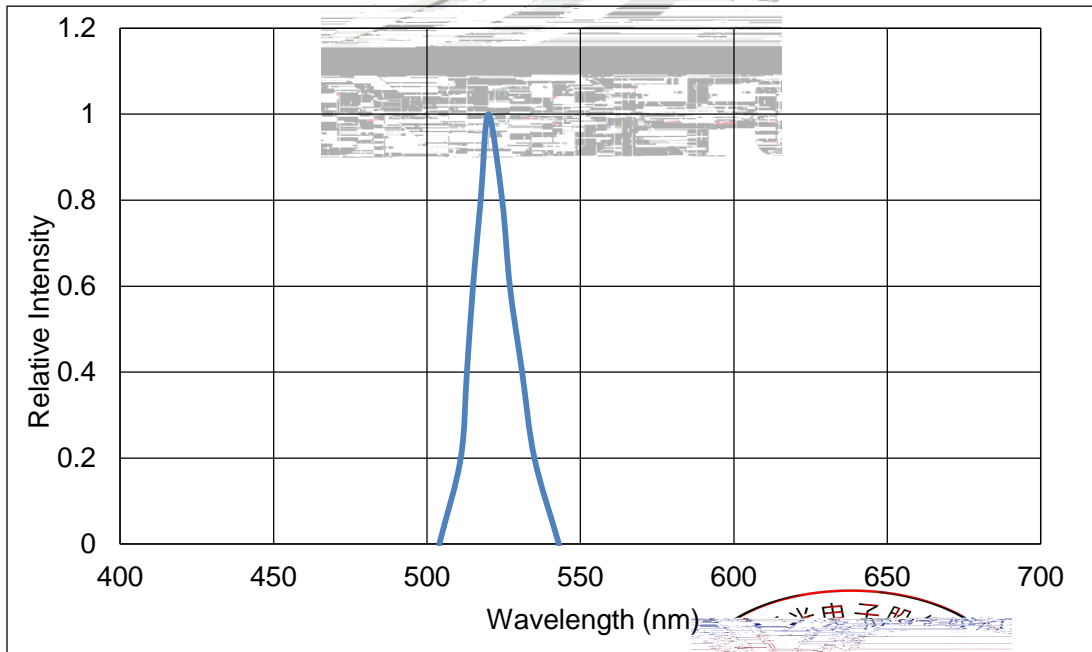


Fig 1-11 Relative Intensity Vs Wavelength (Ta=25 )

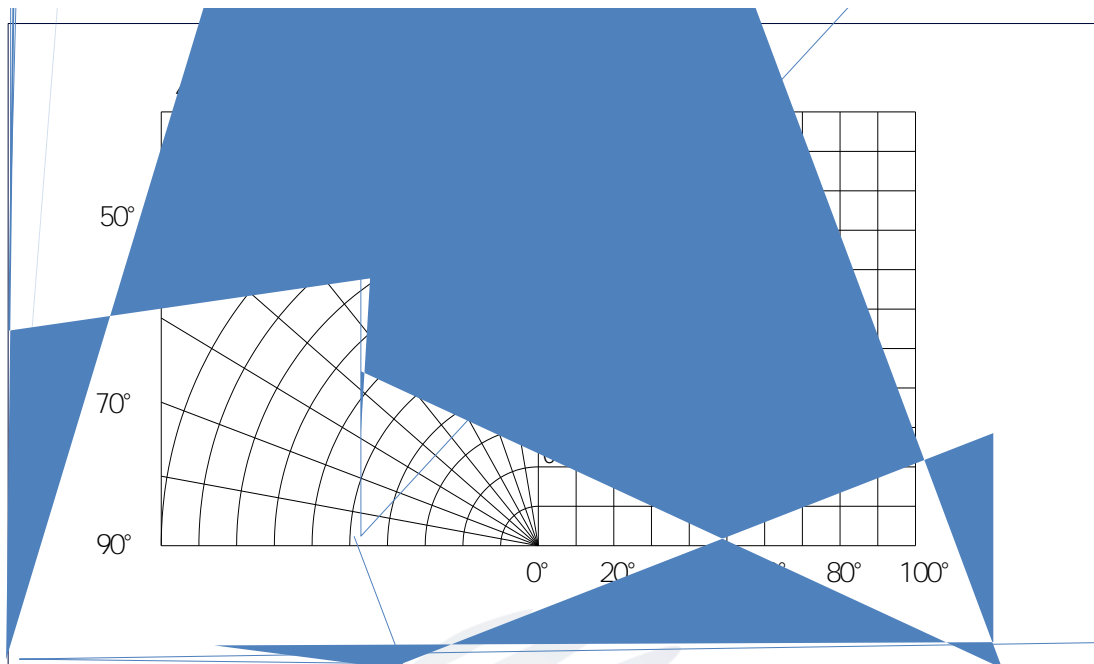
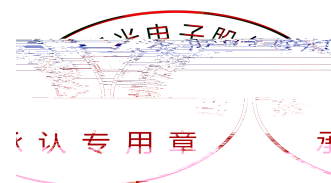
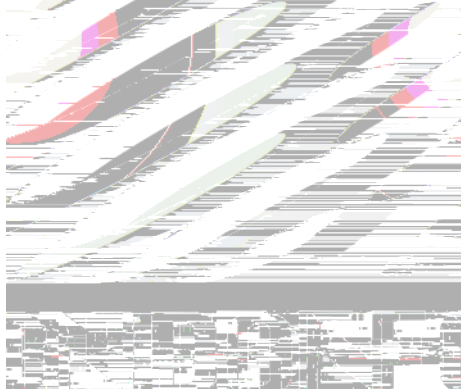


Fig 1-12 Diagram characteristics of radiation



## 2. Packaging

### 2.1 Packaging Specification

Package:4000pcs/reel.      4000pcs

#### 2.1.1 Carrier Tape Dimension

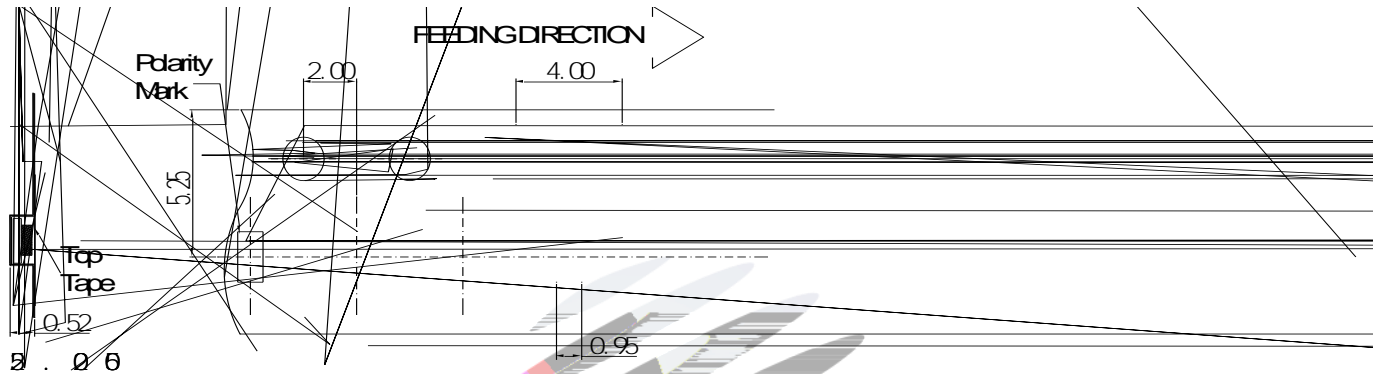


Fig.2-1 Carrier Tape Dimension

#### 2.1.2 Reel Dimension

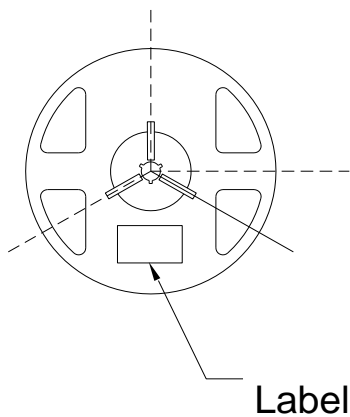


Fig.2-2 Reel Dimension

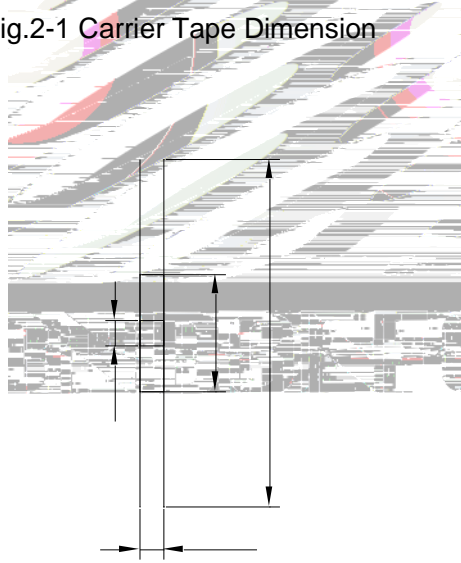
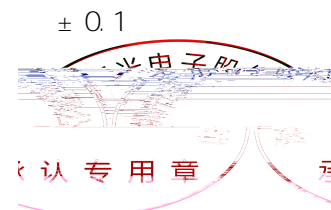


Table 2-1 Dimension

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

#### Notes

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



### 2.1.3 Label Form Specification

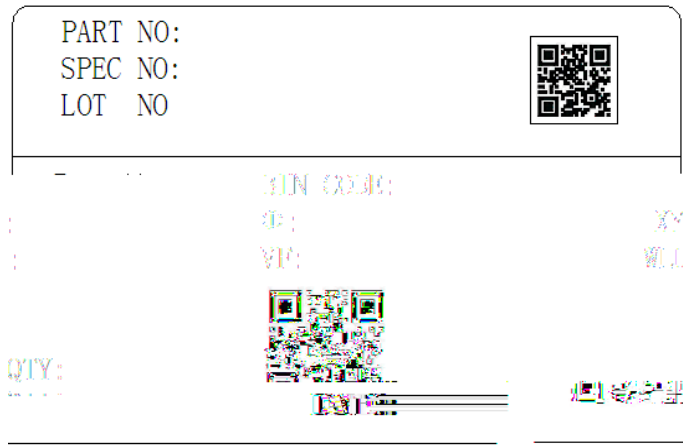


Table 2-2 Parameter

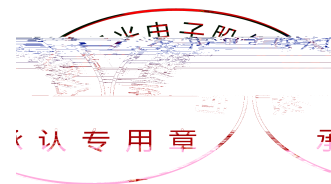
PART NO.	Part Number
SPEC NO.	Spec Number
LOT NO.	Lot Number
BIN CODE	Bin Code
	Luminous flux
XY	Chromaticity Bin
V <sub>F</sub>	Forward Voltage
WLD	Wavelength
QTY	Packing Quantity
DATE	Made Date

Fig. 2-3 Label Form Specification

### 2.2 Moisture Resistant Packing



Fig.2-4 Moisture Resistant Packing



## 2.3 Cardboard Box

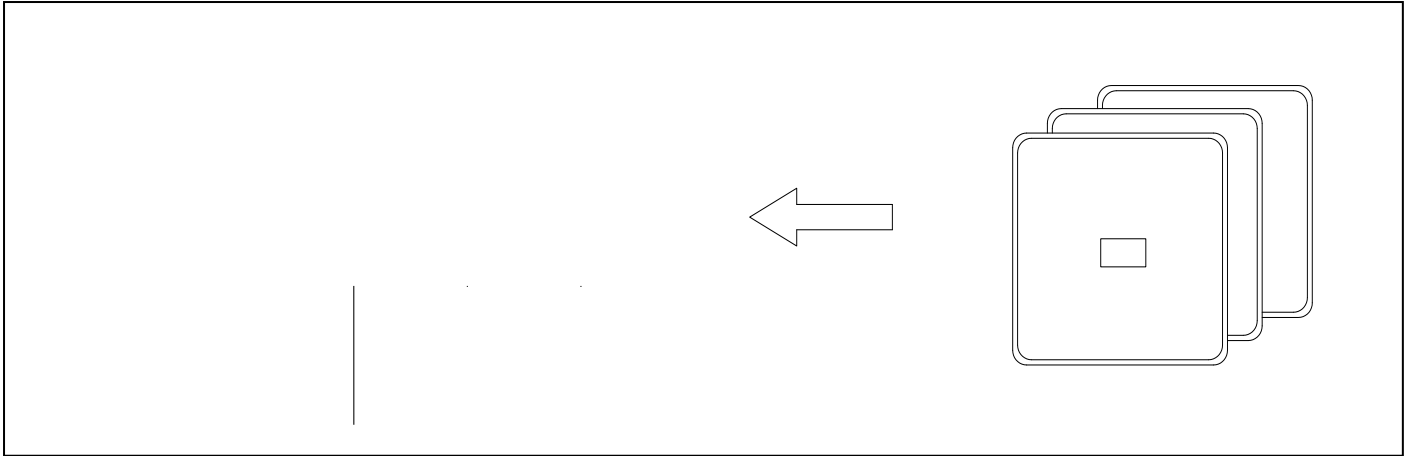


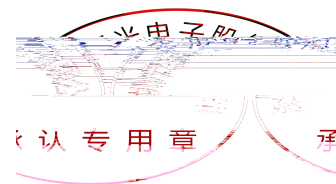
Fig.2-5 Cardboard Box

## 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	$T_{emp}: 260 \text{ max}$ $T=10 \text{ sec}$	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	$T_{emp}: 100$	1000 hrs.	22Pcs.	0/1
Low Temperature Storage	JESD22-A119	$T_{emp}: -40$	1000 hrs.	22Pcs.	0/1
Life Test	JESD22-A108	$T_a=25$ $I_f=2\text{mA}$	1000 hrs.	22Pcs.	0/1

## 2.5 Crit.01



### 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 (tL)

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





## 4. Handling Precautions

### 4.1 Handling Precautions

(1) LED operating environment and sulfur element composition cannot 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.

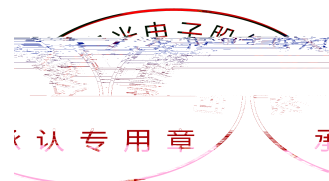
(2) In order to prevent external material from getting into the inside of LED, which may cause the malfunction of LED, the single content of Bromine element is required to be less than 900PPM, the single content of Chlorine element is required to be less than 900PPM, the total content of Bromine element 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 significant loss of light output from the fixture. Knowledge of the properties of the materials selected to be used in the construction of fixtures can help prevent these issues. Refond advises against the use of any chemicals or materials that have been found or are suspected to have an adverse effect on device performance or reliability. To verify compatibility, Refond recommends that all chemicals and materials be tested in the specific application and environment for which they are intended to be used. Attaching LEDs, do not use adhesives that outgas organic vapor. LED

LED

LED

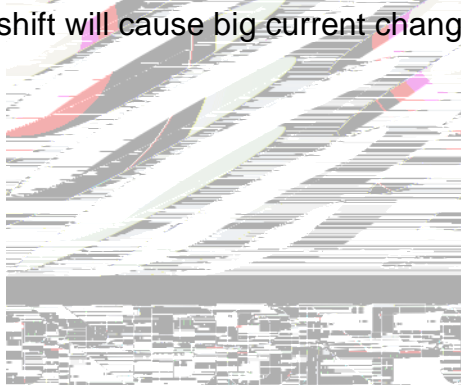
LED



(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



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 65±5 °C for above 24 hours.

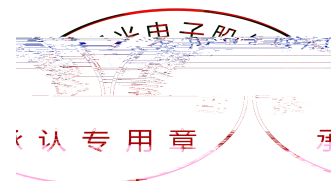
60± 5      24

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).

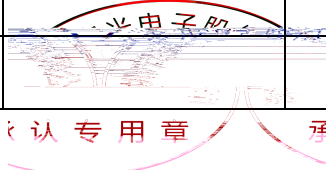
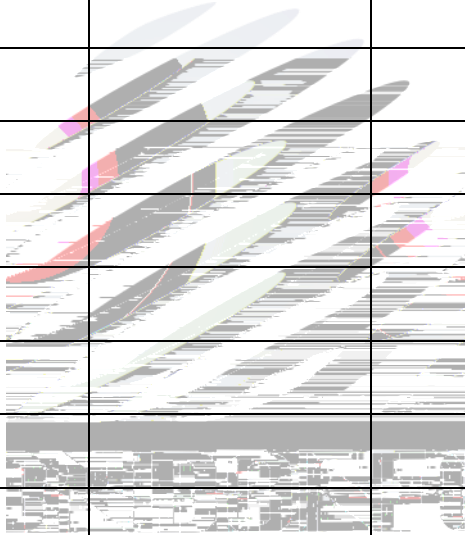
LED

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



## Version History/

Date	Revisor	Version	Verifier	Remarks
2019.07.11		E/0		
2019.10.16		E/1		
2022.01.11		E/2		P4





Declare

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

