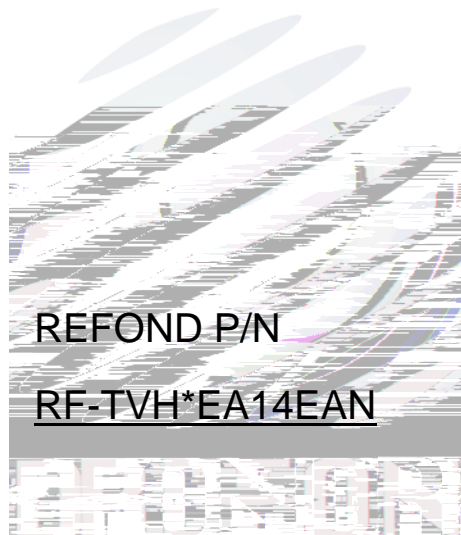


# SPECIFICATION



Mass Product



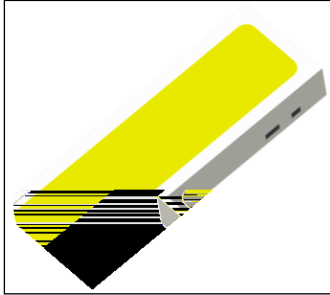
## Contents/

1.Description	3
1.1 Description	3
1.1.1 Features	3
1.1.2 Applications	3
1.2 Package Dimension	4
1.3 Product Parameters	5
1.4 Bin Range Of Forward Voltage and Luminous Flux (IF=90mA)           BIN   (IF=90mA)	6
1.5 Typical optical characteristics curves	9
2.Packaging	13
2.1 Packaging Specifications	13
2.1.1 Carrier Tape Dimensions	13
2.1.2 Reel Dimension	13
2.1.3 Label Form Specification	14
2.1.4 Moisture Resistant Packing Process	14
2.1.5 Cardboard Box	14
2.1.6 Reliability Test Items And Conditions	15
2.1.7 Criteria For Judging Damage	16
3.SMT Reflow Soldering Instructions   SMT	17
3.1.1 Soldering Iron	18
3.1.2 Repairing	18
3.1.3 Cautions	18
4.Handling Precautions	19



# 1. Description

## 1.1 Description



The White LED which was fabricated using a blue chip and the phosphor, outline size 4.0mm  
 1.4mm 0.6mm. LED 4.0mm

1.4mm 0.6mm

### 1.1.1 Features

PLCC Package. PLCC

Extremely wide viewing angle.

Suitable for all SMT assembly and solder process.

Available on tape and reel.

Moisture sensitivity level: Level 3. Level 3

RoHS compliant. RoHS

### 1.1.2 Applications

Backlight for LCD, TV or monitor. LCD

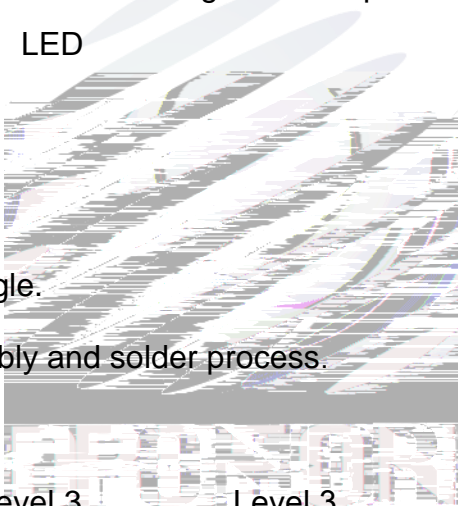
Switch and symbol, display.

Optical indicator.

Indoor display.

Tubular light application.

General use.



SMT



## 1.2 Package Dimension

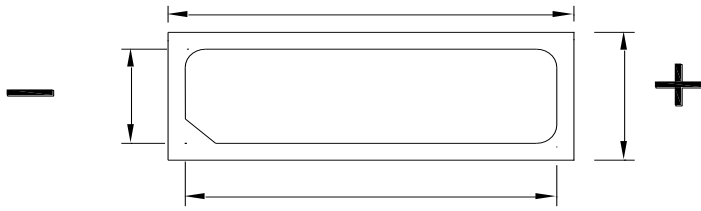


Fig.1-1 Top view

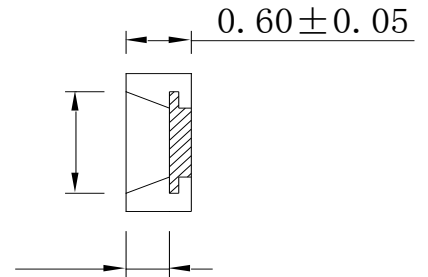


Fig.1-2 Side view

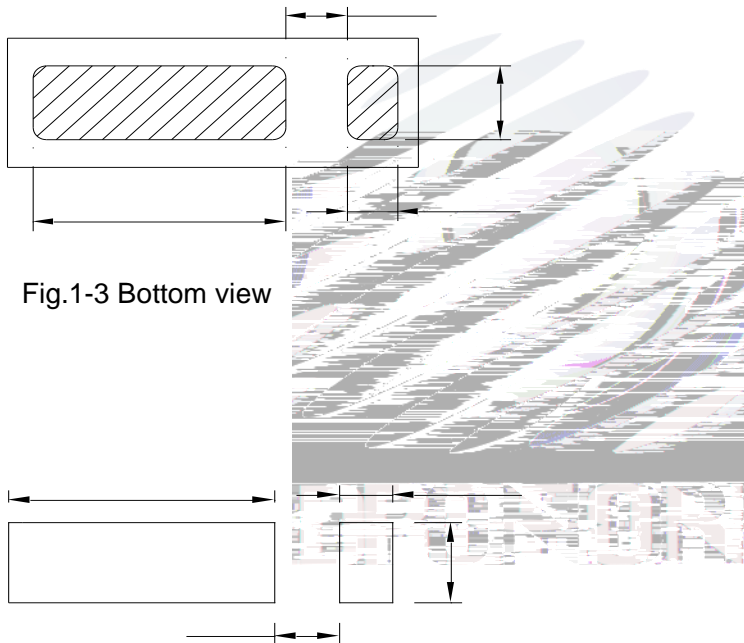


Fig.1-3 Bottom view

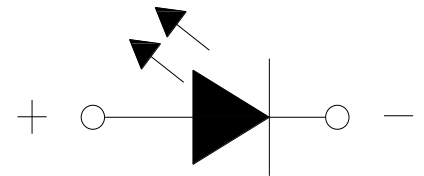


Fig.1-4 Polarity

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.



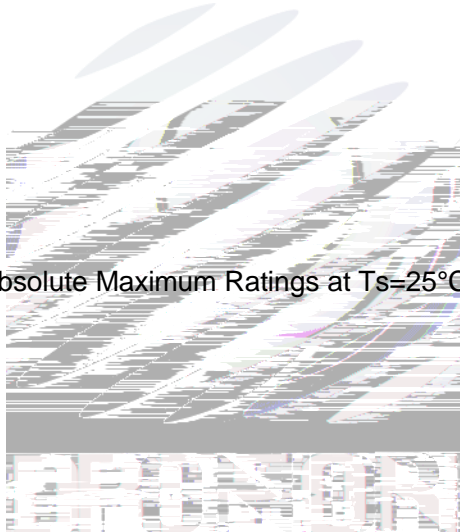
0.2

### 1.3 Product Parameters

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

Item	Symbol	Test condition	Value			Unit
			Min.	Typ	Max.	
Forward Voltage	$V_F$					

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

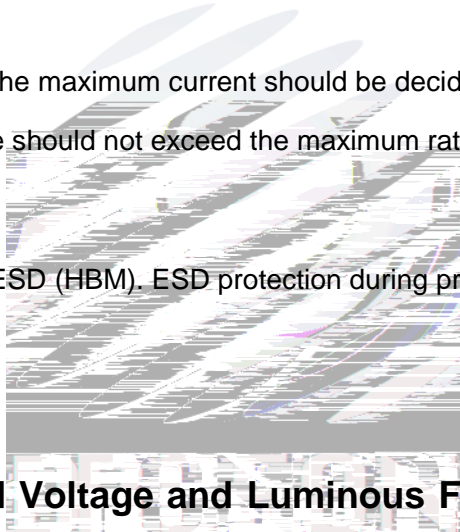


Notes

- (1) 1/10 Duty cycle, 0.1ms pulse width.      0.1ms,      1/10.
- (2) The above forward voltage measurement allowance tolerance is  $\pm 0.1V$ .
- (3) The above color coordinates measurement allowance tolerance is 0.005.      0.005.
- (4) The above luminous intensity measurement allowance tolerance  $\pm 5\%$ .      5%.
- (5) Care is to be taken that power dissipation does not exceed the absolute maximum rating of the product.
- (6) All measurements were made under the standardized environment of Refond.

(7) 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

(8) ESD yield is over 90% at 2000V ESD (HBM). ESD protection during products handing is needed. 90% LED ESD2000V ,



### 1.4 Bin Range Of Forward Voltage and Luminous Flux (IF=90mA)

#### BIN (IF=90mA)

Table 1-3 Bin Range Of Forward Voltage and Luminous Flux

BIN (IF=90mA)

V <sub>F</sub> (V)	G1	G2	H1	H2	I1	I2	J1	J2
		2.8-2.9	2.9-3.0	3.0-3.1	3.1-3.2	3.2-3.3	3.3-3.4	3.4-3.5
(lm)	T26	T28	T30	T32	T34	T36	T38	T40
	26-28	28-30	30-32	32-34	34-36	36-38	38-40	40-42





H01	0.2913	0.2670	0.2846	0.2707	0.2891	0.2797	0.2958	0.2760
H02	0.2868	0.2580	0.2801	0.2617	0.2846	0.2707	0.2913	0.2670
H03	0.2823	0.2490	0.2756	0.2527	0.2801	0.2617	0.2868	0.2580
H04	0.2778	0.2400	0.2711	0.2437	0.2756	0.2527	0.2823	0.2490
H05	0.2733	0.2310	0.2666	0.2347	0.2711	0.2437	0.2778	0.2400
H06	0.2688	0.2220	0.2621	0.2257	0.2666	0.2347	0.2733	0.2310
H07	0.2643	0.2130	0.2576	0.2167	0.2621	0.2257	0.2688	0.2220
H08	0.2598	0.2040	0.2531	0.2077	0.2576	0.2167	0.2643	0.2130
H09	0.2553	0.1950	0.2486	0.1987	0.2531	0.2077	0.2598	0.2040
H10	0.2508	0.1860	0.2441	0.1897	0.2486	0.1987	0.2553	0.1950
H20	0.3003	0.2850	0.2936	0.2887	0.2981	0.2977	0.3048	0.2940
H21	0.3048	0.2940	0.2981	0.2977	0.3026	0.3067	0.3093	0.3030
H22	0.3071	0.3157	0.3026	0.3067	0.3093	0.3030	0.3138	0.3120
K00	0.2891	0.2797	0.2824	0.2834	0.2869	0.2924	0.2936	0.2887
K01	0.2846	0.2707	0.2779	0.2744	0.2824	0.2834	0.2891	0.2797
K02	0.2801	0.2617	0.2734	0.2654	0.2779	0.2744	0.2846	0.2707
K03	0.2756	0.2527	0.2689	0.2564	0.2734	0.2654	0.2801	0.2617
K04	0.2711	0.2437	0.2644	0.2474	0.2689	0.2564	0.2756	0.2527
K05	0.2666	0.2347	0.2599	0.2384	0.2644	0.2474	0.2711	0.2437
K06	0.2621	0.2257	0.2554	0.2294	0.2599	0.2384	0.2666	0.2347
K07	0.2576	0.2167	0.2509	0.2204	0.2554	0.2294	0.2621	0.2257
K08	0.2531	0.2077	0.2464	0.2114	0.2509	0.2204	0.2576	0.2167
K09	0.2486	0.1987	0.2419	0.2024	0.2464	0.2114	0.2531	0.2077
K10	0.2441	0.1897	0.2374	0.1934	0.2419	0.2024	0.2486	0.1987
K20	0.2936	0.2887	0.2869	0.2924	0.2914	0.3014	0.2981	0.2977
K21	0.2981	0.2977	0.2914	0.3014	0.2959	0.3104	0.3026	0.3067
K22	0.3004	0.3194	0.2959	0.3104	0.3026	0.3067	0.3071	0.3157
T00	0.2824	0.2834	0.2757	0.2871	0.2802	0.2961	0.2869	0.2924
T01	0.2779	0.2744	0.2712	0.2781	0.2757	0.2871	0.2824	0.2834
T02	0.2734	0.2654	0.2667	0.2691	0.2712	0.2781	0.2779	0.2744
T03	0.2689	0.2564	0.2622	0.2601	0.2667	0.2691	0.2734	0.2654
T04	0.2644	0.2474	0.2577	0.2511	0.2622	0.2601	0.2689	0.2564
T05	0.2599	0.2384	0.2532	0.2421	0.2577	0.2511	0.2644	0.2474
T06	0.2554	0.2294	0.2487	0.2331	0.2532	0.2421	0.2599	0.2384
T07	0.2509	0.2204	0.2442	0.2241	0.2487	0.2331	0.2554	0.2294
T08	0.2464	0.2114	0.2397	0.2151	0.2442	0.2241	0.2509	0.2204
T09	0.2419	0.2024	0.2352	0.2061	0.2397	0.2151	0.2464	0.2114
T10	0.2374	0.1934	0.2307	0.1971	0.2352	0.2061	0.2419	0.2024
T20	0.2869	0.2924	0.2802	0.2961	0.2847	0.3051	0.2914	0.3014
T21	0.2914	0.3014	0.2847	0.3051	0.2892	0.3141	0.2959	0.3104
T22	0.2937	0.3231	0.2892	0.3141	0.2959	0.3104	0.3004	0.3194





### 1.5 Typical optical characteristics curves

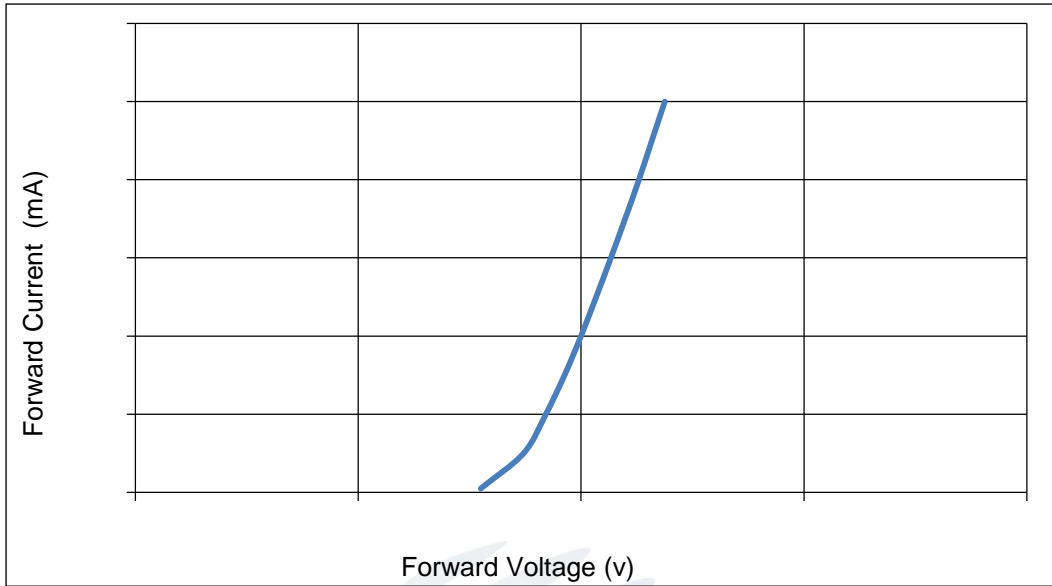


Fig 1-7 Forward Voltage Vs. Forward Current

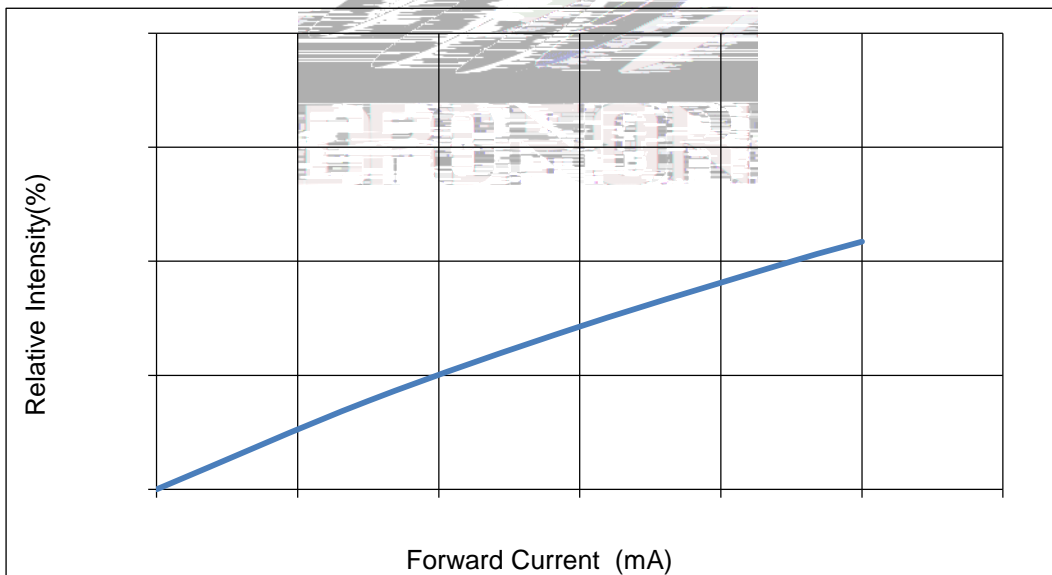


Fig 1-8 Forward Current Vs. Relative Intensity



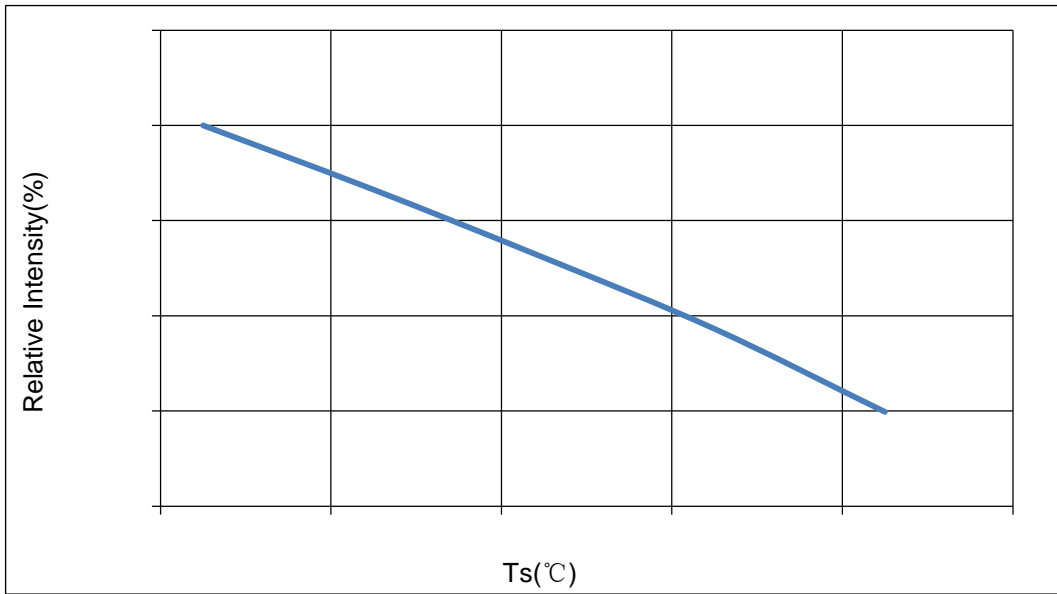


Fig 1-9 Solder Temperature Vs Relative Intensity

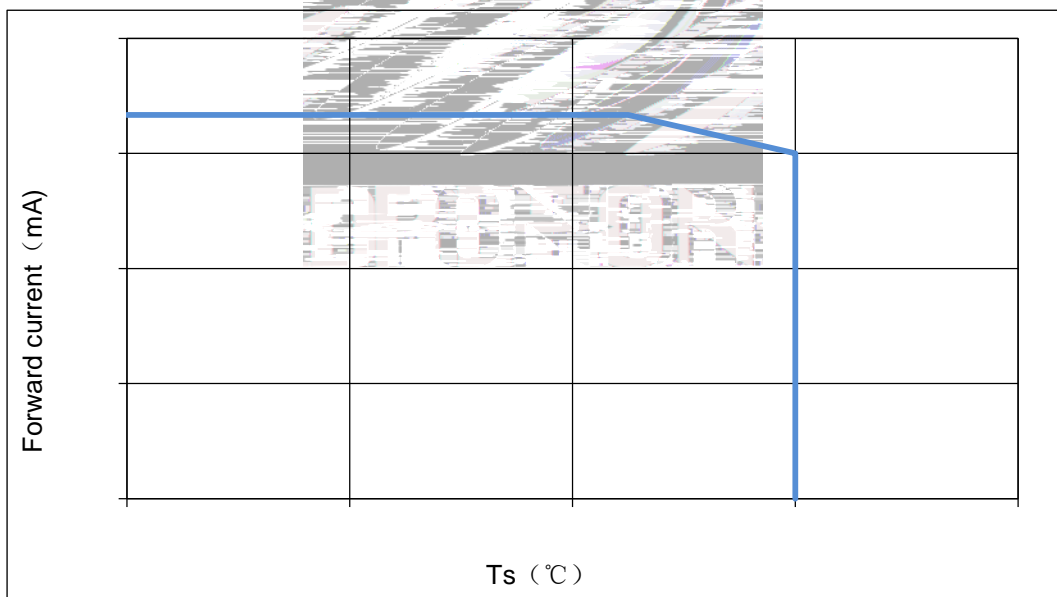


Fig 1-10 Solder Temperature Vs Forward Current



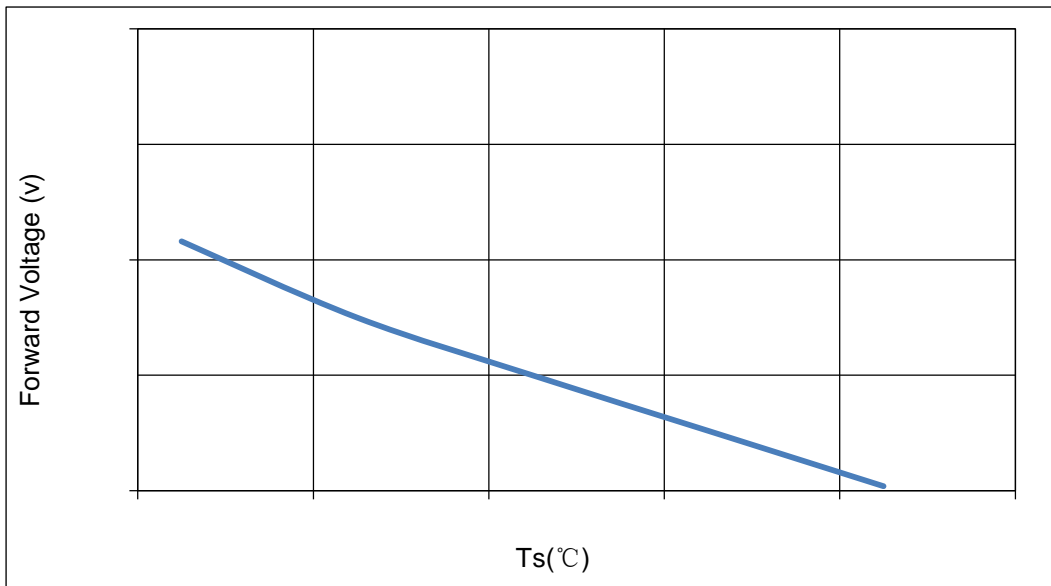


Fig 1-11 Forward Voltage Vs Solder Temperature

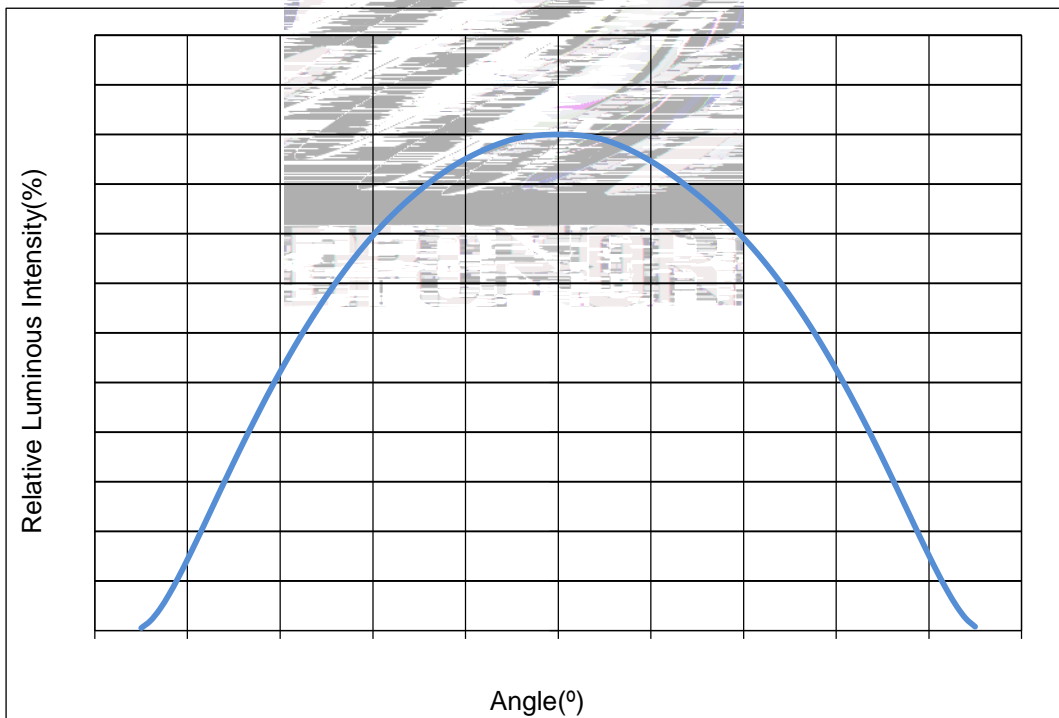


Fig 1-12 Radiation diagram



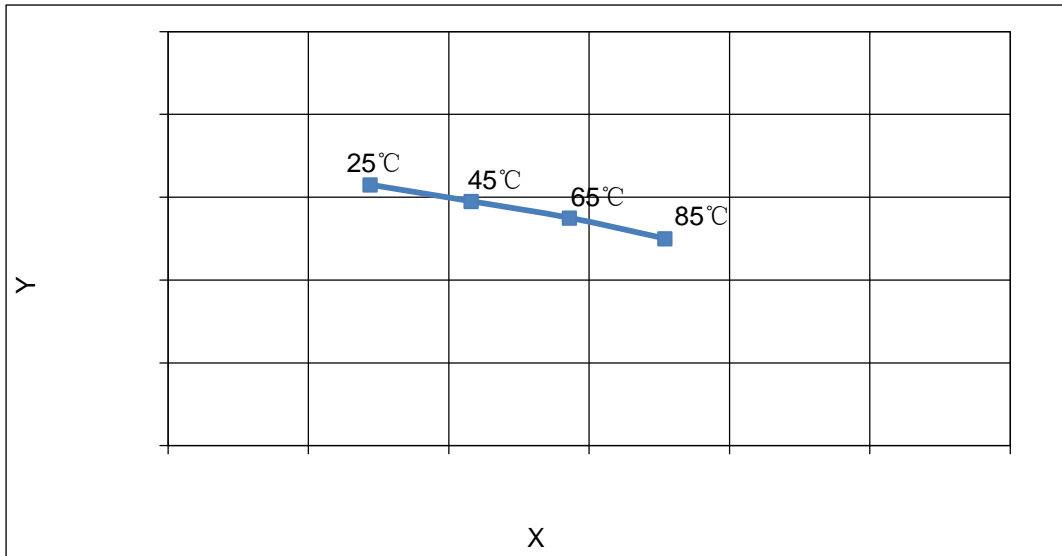
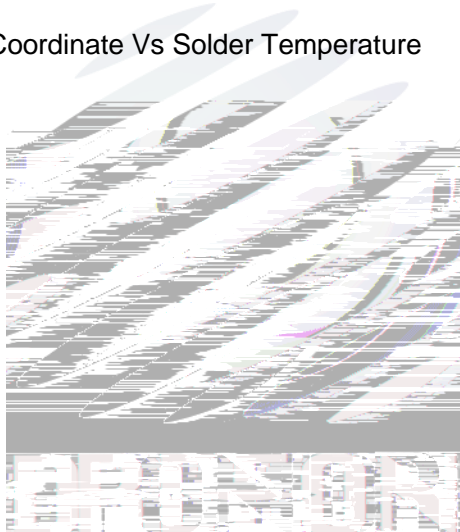


Fig 1-13 Chromaticity Coordinate Vs Solder Temperature



## 2. Packaging

### 2.1 Packaging Specifications

Package: 4000pcs/reel. 4000pcs.

#### 2.1.1 Carrier Tape Dimensions

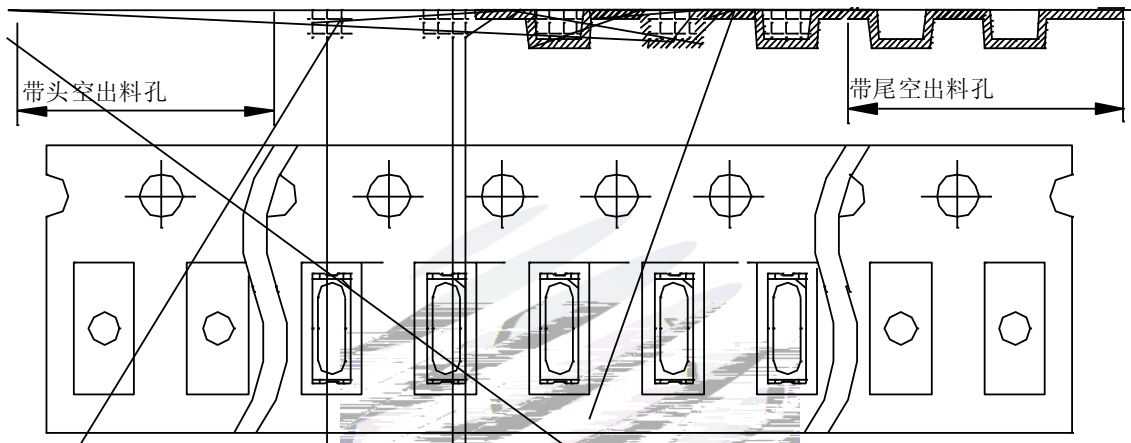
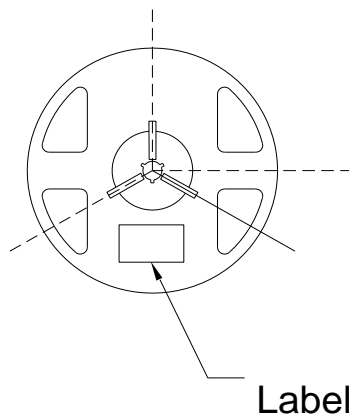


Fig 2-1 Carrier Tape Dimensions

#### 2.1.2 Reel Dimension



Label 标签

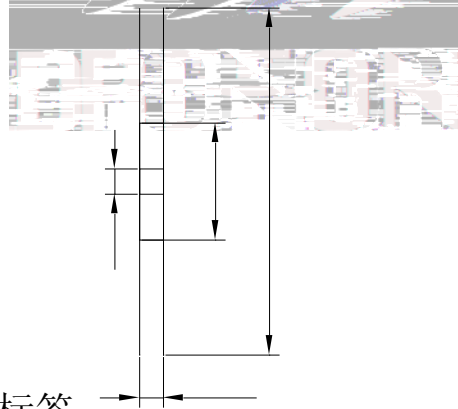


Table 2-1 Reel Dimension

A	12 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

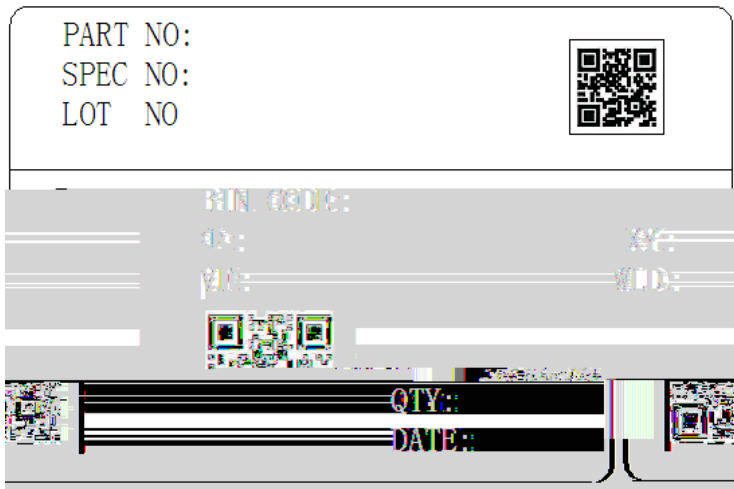


Fig 2-3 Label Form Specification

Table 2-2 Label Form Specification

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

### 2.1.4 Moisture Resistant Packing Process

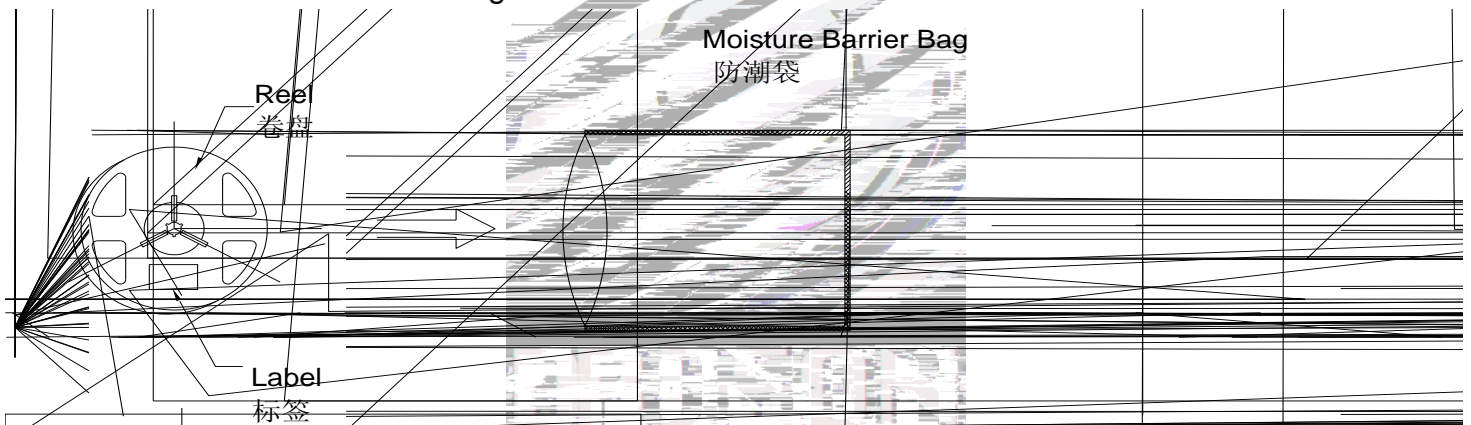


Fig 2-4 Moisture Resistant Packing Process

### 2.1.5 Cardboard Box

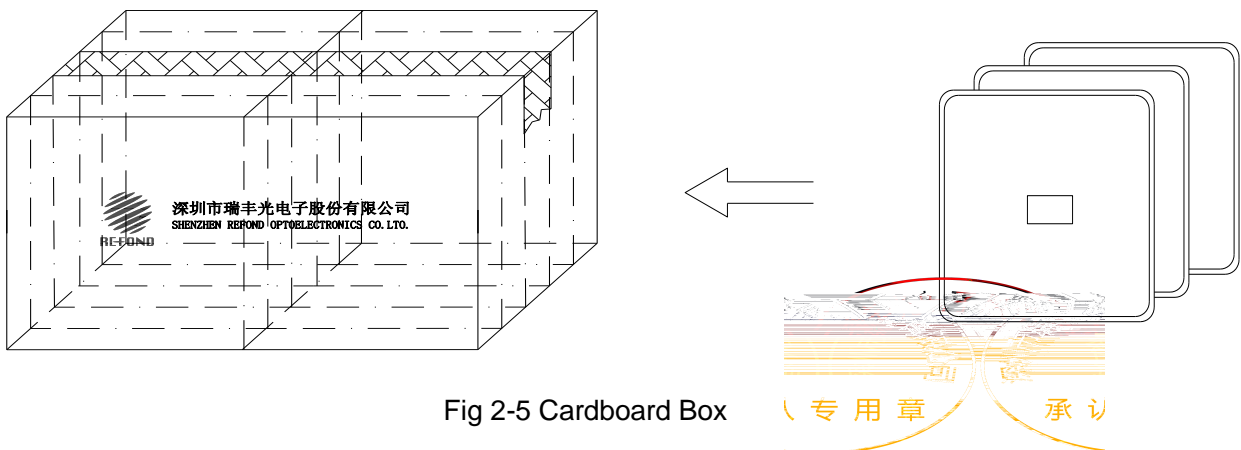


Fig 2-5 Cardboard Box

## 2.1.6 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	2times.	20Pcs	0/1
Thermal Shock	JEITAED-4701 300 307	-40 15min 10s 100 15min	100 cycle	20Pcs.	0/1
High Temperature Storage	JEITAED-4701 200 201	Temp:100	1000Hrs.	20Pcs	0/1
Low Temperature Storage	JEITA ED-4701 200 202	Temp:-40	1000Hrs.	20Pcs.	0/1
Life Test	JESD22-A108	T <sub>A</sub> =25 I <sub>F</sub> =100mA	1000Hrs.	10Pcs.	0/1
High Temperature High Humidity Life Test	JESD22-A101	60 / 90%RH I <sub>F</sub> =100mA	500Hrs.	10Pcs.	0/1
Temperature Humidity Storage	JEITA ED-4701 100 103	T <sub>A</sub> =85 RH=85%	500Hrs.	20Pcs.	0/1



## 2.1.7 Criteria For Judging Damage

Table 2-4 Criteria For Judging Damage

Test Items	Symbol	Test Condition	Criteria For Judgement	
			Min.	Max.
Forward Voltage	$V_F$	$I_F=100\text{mA}$	-	U.S.L*)x1.1
Reverse Current	$I_R$	$V_R = 5V$	-	U.S.L*)x2.0
Luminous Flux		$I_F=100\text{mA}$	L.S.L*)x0.7	-

## NOTES

(1) U.S.L: Upper standard level

L.S.L: Lower standard level

(2) The Reliability tests are based on Refond existing test platform.

(3) The technical information shown in the data sheets are 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

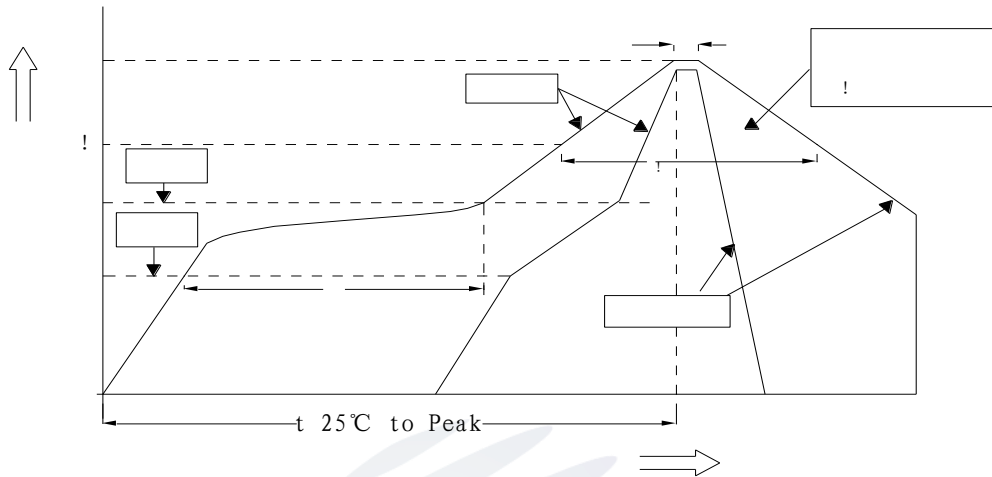


Fig 3-1 3. SMT Reflow Soldering Instructions SMT

Table 3-1 SMT Reflow Soldering Instructions SMT

Tsmax	Tp	3 °C/
(Tmin)		150 °C
(Tmax)		200 °C
Tsmin	Tsmax	60 - 120
(TL)		217 °C
(tL)		60
/	(Tp)	260 °C
	tp	10
(Tp)	5 °C	30
		6 °C/
25 °C		8



NOTES

(1) Reflow soldering should not be done more than two times. In the case of more than 24 hours passed soldering after first, LEDs will be damaged.

24

LED

(2) When soldering , do not put stress on the LEDs during heating.

3.1.1 Soldering Iron

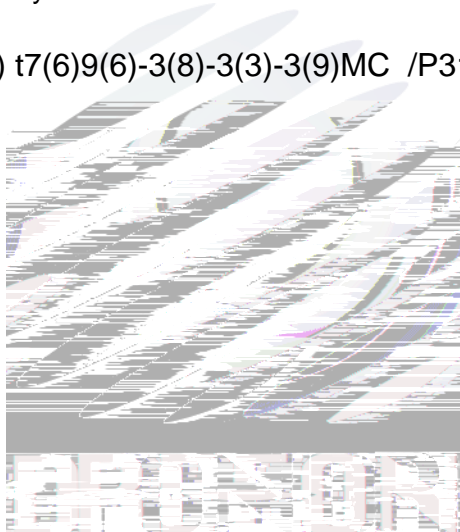
(1) When hand soldering, keep the temperature of iron below less 300 less than 3 seconds

300

3

(2) The hand solder should be done only one time.

3.1.21 0 0 1 388.75 527.11 Tm[ ) t7(6)9(6)-3(8)-3(3)-3(9)MC /P311267E439[ )]TJ0 0 een-UShgPC



## 4. Handling Precautions 项

(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 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 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 affect 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

(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

(6) In designing a circuit, the current through each LED must 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

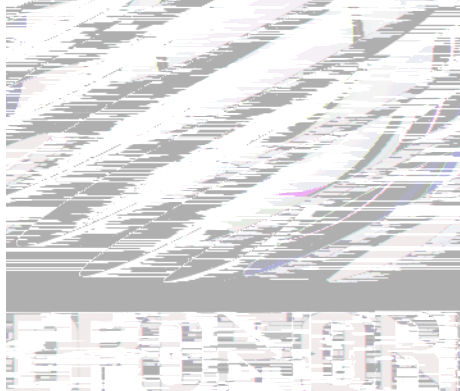


Table 4-1 Storage

Conditions		Temperature	Humidity	Time
Storage 儲存	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 for above 24 hours.

5 24

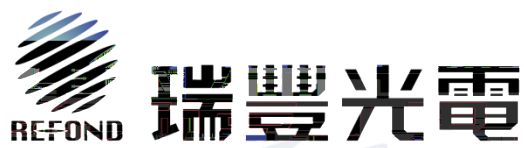
If the package is flatulence or damaged, please notify the sales staff to assist.

(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.







www.refond.com



Declare

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

