

SPECIFICATION



REFOND P/N

RF-A3E27-W60E-B1

P\$B

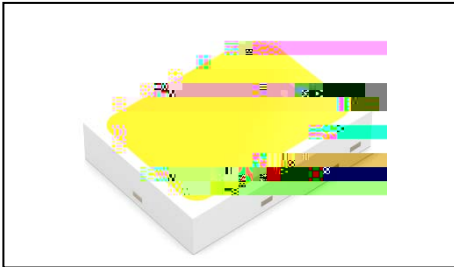
Mass Production

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1. Description

1.1 General Description



The White LED, which was fabricated by using a blue chip and the phosphor.

Product Package: 2.7mmX2.0mmX0.6mm.

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2.7mmX2.0mmX0.6mm

1.2 Features

EMC Package.CKA

Extremely wide viewing angle.

Suitable for all SMT assembly and solder process. QKR

Available on tape and reel.

Moisture sensitivity level: Level 2. Jctcj0

RoHS compliant. RoHS

Qualifications: The product qualification test plan is based on the guidelines of AEC-Q102 Stress Test Qualification for Automotive Grade Discrete Semiconductors

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1.3 Application

Automotive Lighting Interior and Exterior.

1.4 Package Dimension

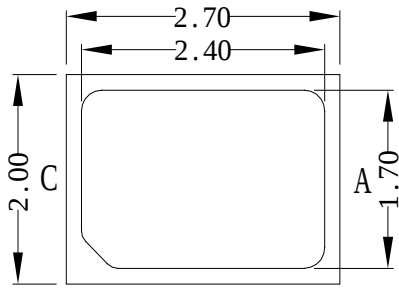


Fig.1-1 Top View

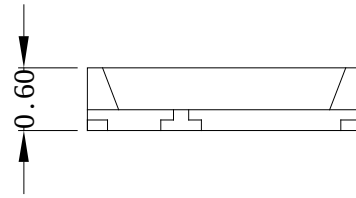


Fig.1-2 Side View

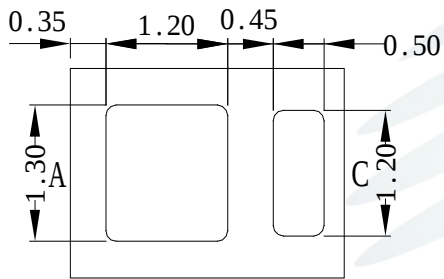


Fig.1-3 Bottom View

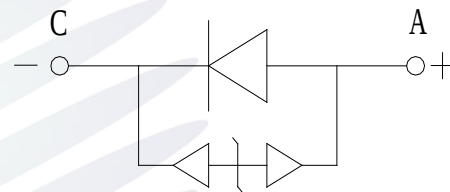


Fig.1-4 Polarity

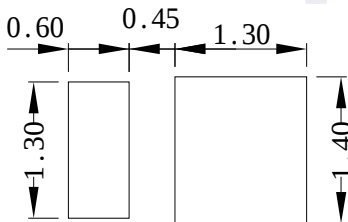


Fig.1-5 Soldering Patterns

Notes

1, All dimensions units are millimeters.

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

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1.5 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	$I_F=150\text{mA}$	2.8	---	3.4	V
Reverse Current	I_R	$V_R=5\text{V}$	---	---	10	μA
Luminous Flux		$I_F=150\text{mA}$	50	---	75.3	lm
Viewing Angle		$I_F=150\text{mA}$	---	120	---	deg
Thermal Resistance.	R_{THJ-S}	$I_F=150\text{mA}$	---	17	25	$^{\circ}\text{C/W}$

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

Parameter	Symbol	Rating	Units
Power Dissipation	P_D	850	mW
Forward Current	I_F	250	mA
Peak Forward Current	I_{FP}	300	mA
Reverse Voltage	V_R	5	V
Electrostatic Discharge (HBM)	E_{SD}	8000	V
Operating Temperature	T_{OPR}	-40 ~ +125	
Storage Temperature	T_{STG}	-40 ~ +125	
Junction Temperature	T_J	150	

Notes

- 1/10 Duty cycle, 10ms pulse width. / . k q* / - / . ,
- The above forward voltage measurement allowance tolerance is $\pm 0.1V$. ° . , / T,
- The above color coordinates measurement allowance tolerance is ± 0.005 . $\pm$. , . . 3,
- 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, JCB
- ESD yield is over 90% at 8000V ESD (HBM). ESD protection during products handing is needed. 7. # JCB
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1.6 Bin Range Of Forward Voltage and Luminous Flux (IF=150mA)

BIN (IF=150mA)

Table 1-3

V _F (V)	G0	H0	I0	
	2.8-3.0	3.0-3.2	3.2-3.4	
(Im)	OB	PA	PB	QA
	50-55.3	55.3-61.2	61.2-67.8	67.8-75.3

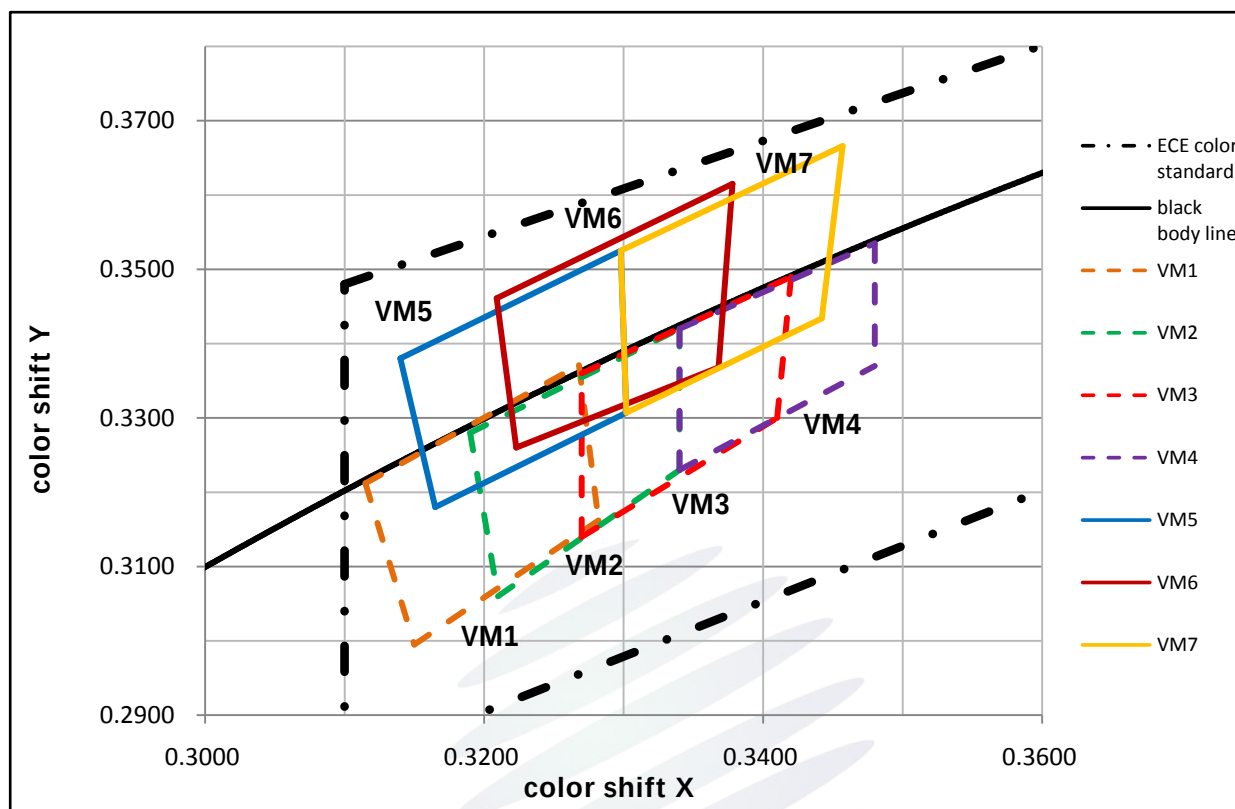


Fig. 1-6 The C.I.E Chromaticity Diagram CIE

Table 1-4

BIN CODE	CIE-X1	CIE-Y1	CIE-X2	CIE-Y2	CIE-X3	CIE-Y3	CIE-X4	CIE-Y4
VM1	0.3150	0.2995	0.3115	0.3212	0.3268	0.3371	0.3282	0.3162
VM2	0.3210	0.3060	0.3190	0.3280	0.3340	0.3420	0.3340	0.3230
VM3	0.3270	0.3140	0.3270	0.3360	0.3420	0.3490	0.3410	0.3300
VM4	0.3340	0.3230	0.3340	0.3420	0.3480	0.3535	0.3480	0.3370
VM5	0.3165	0.3180	0.3140	0.3380	0.3298	0.3525	0.3302	0.3307
VM6	0.3223	0.3260	0.3209	0.3461	0.3378	0.3615	0.3368	0.3368
VM7	0.3302	0.3307	0.3298	0.3525	0.3457	0.3666	0.3442	0.3434

1.7 Typical Optical Characteristics Curves

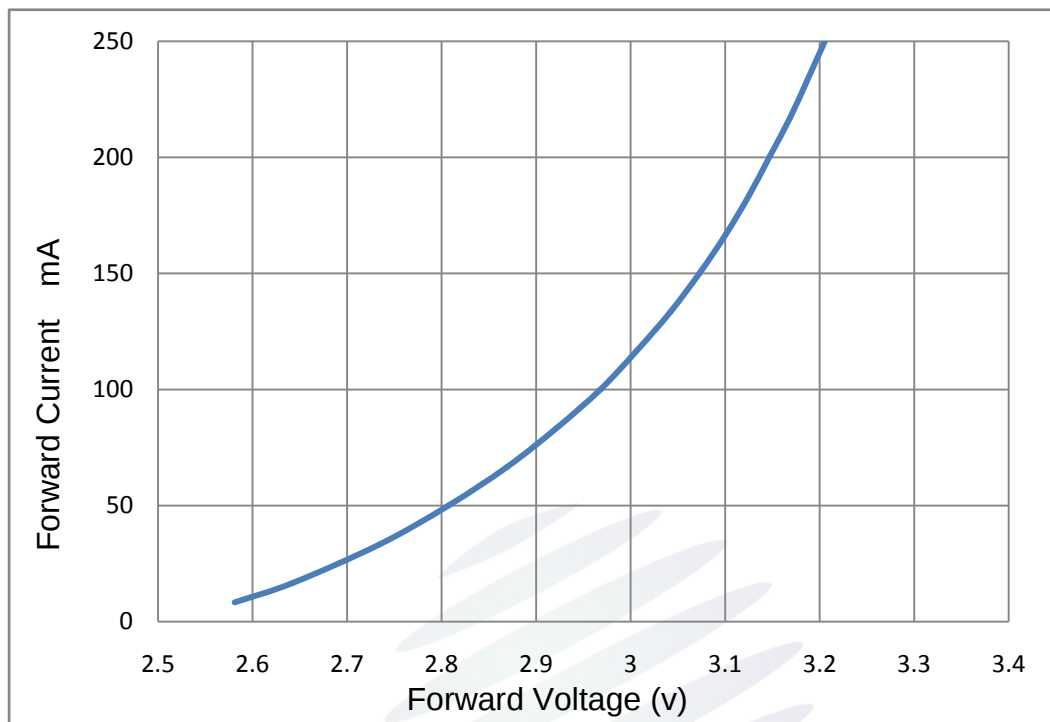


Fig. 1-7 Forward Voltage Vs Forward Current

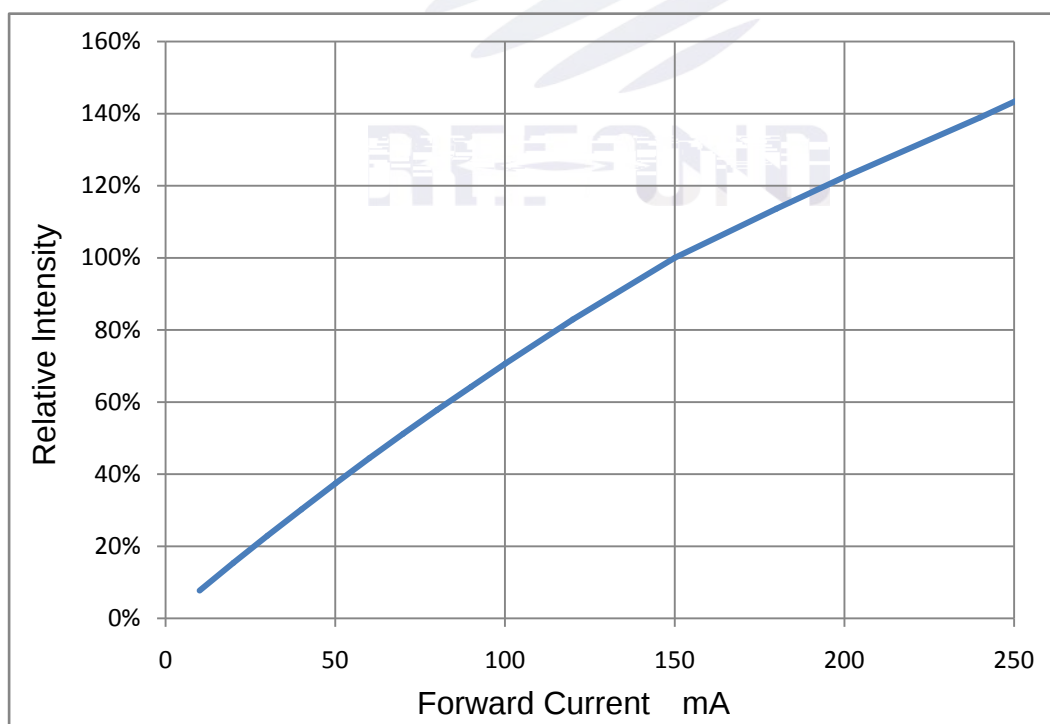


Fig. 1-8 Forward Current Vs Relative Intensity

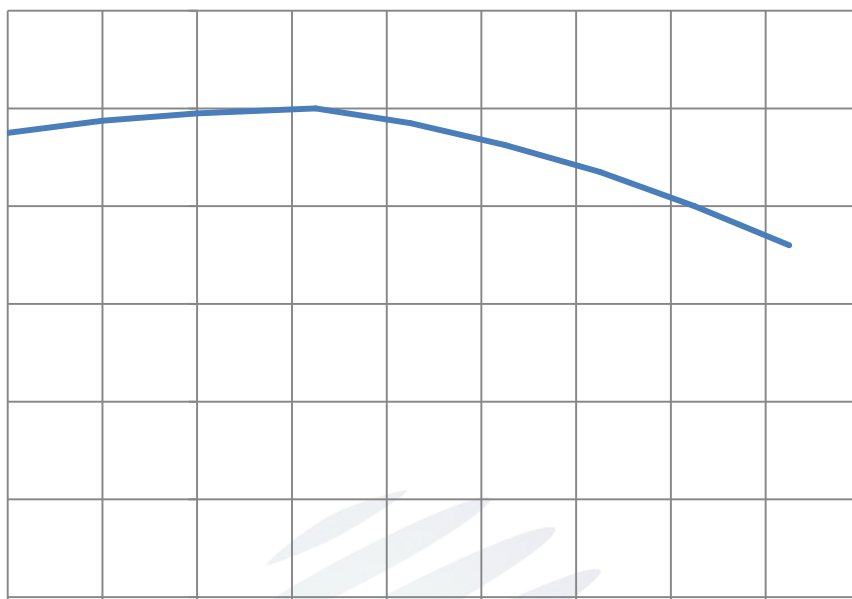


Fig. 1-9 Solder Temperature Vs Relative Intensity

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Fig. 1-10 Solder Temperature Vs Forward Current

Tj 150

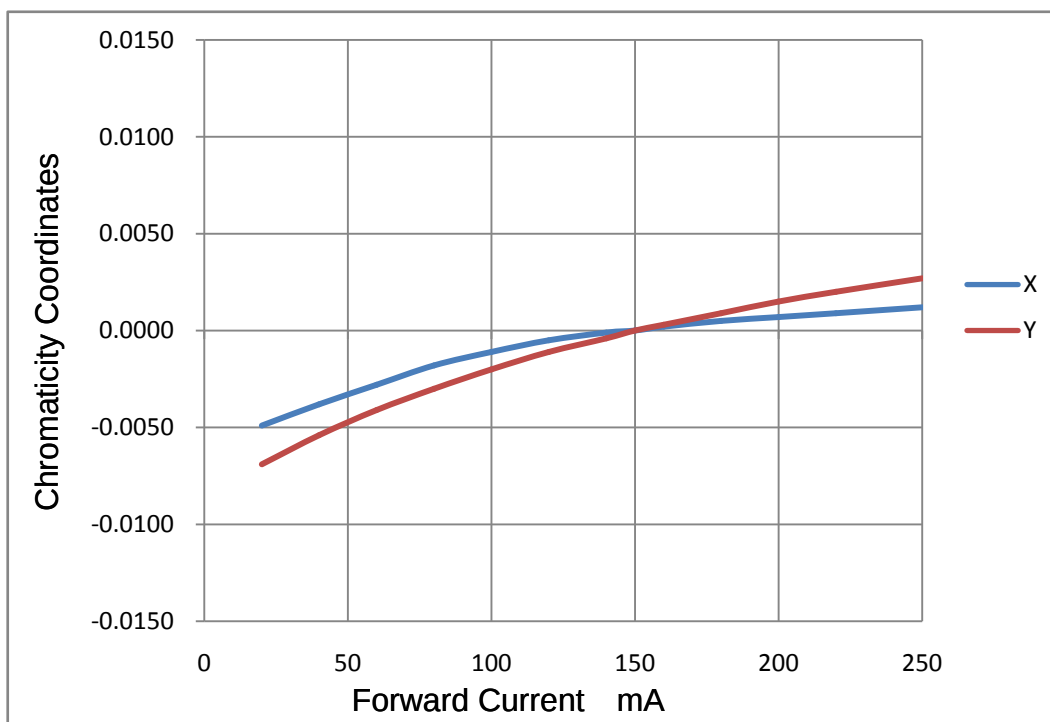


Fig. 1-13 Chromaticity Coordinate Vs Forward Current

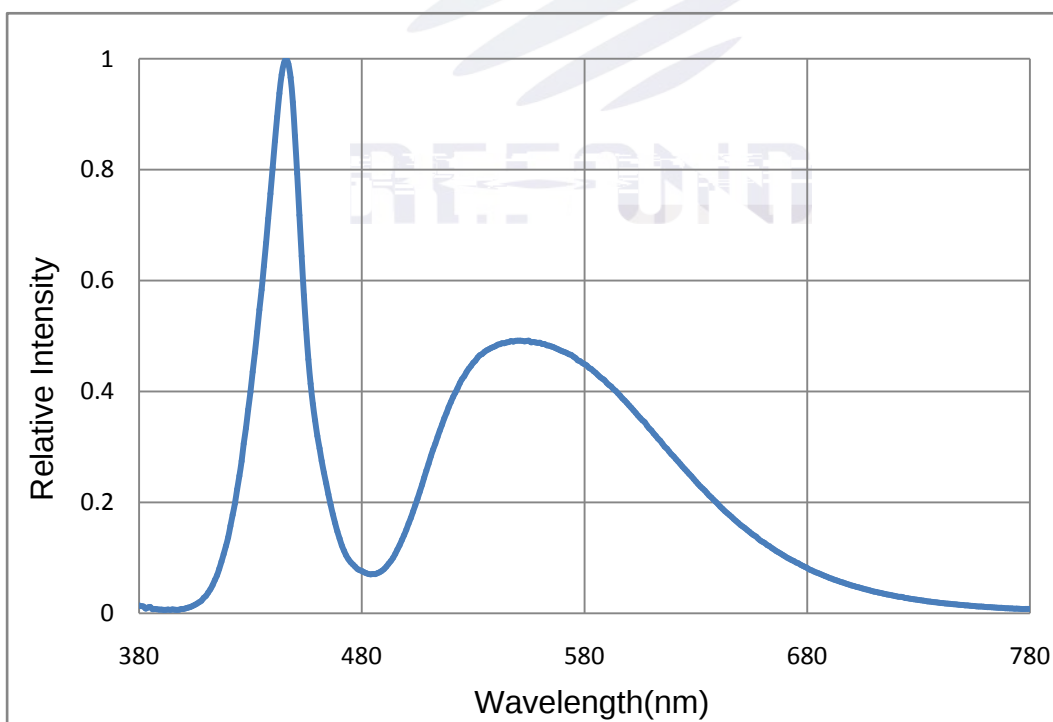


Fig. 1-14 Spectrum Distribution

2. Packaging

2.1 Packaging Specification

Package:4000pcs/reel.

4000pcs

2.1.1 Carrier Tape Dimension

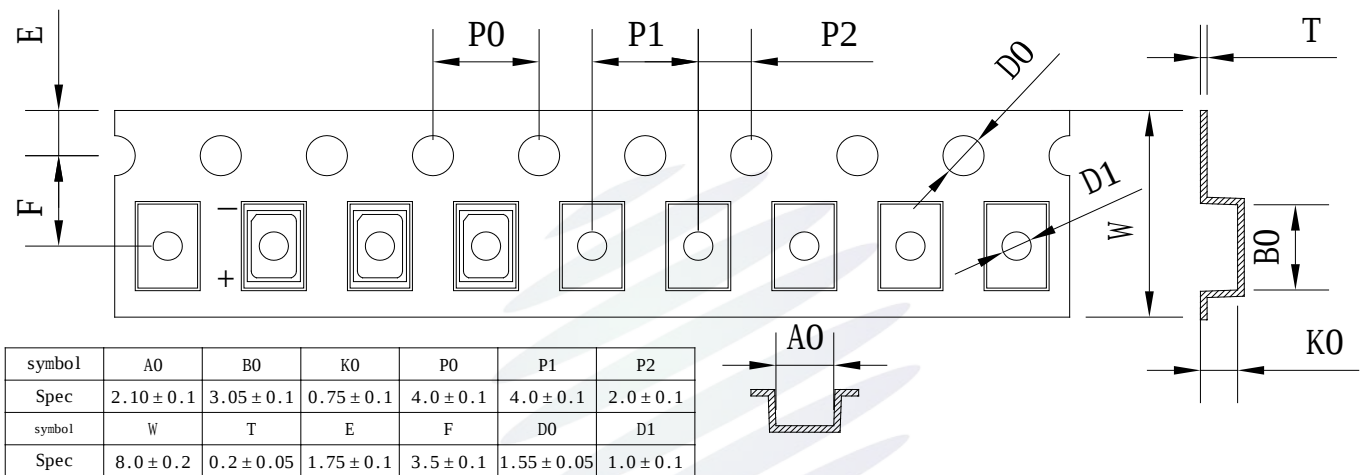


Fig.2-1 Carrier Tape Dimension

2.1.2 Reel Dimension

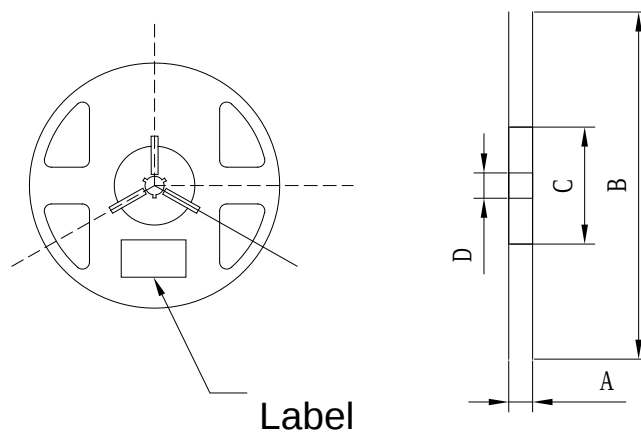


Fig.2-2 Reel Dimension

R_`jc 0+/ Reel Dimension

A	$12^\circ 0.1\text{mm}$
B	$180^\circ 1\text{mm}$
C	$60^\circ 1\text{mm}$
D	$13.0^\circ 0.5\text{mm}$

Notes

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

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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	2times	20pcs.	0/1
MSL2 2	JESD22-A113	85 / 60%RH	168 hrs.	20pcs.	0/1
Thermal Shock	JEITAED-4701 300307	-40 15min 10s 125 15min	1000 cycle	20pcs.	0/1
Life Test	JESD22-A108	Ta=105 If=150mA	1000hrs.	20pcs.	0/1
High Temperature High Humidity Life Test	JESD22-A101	85 / 85%RH If=150mA	1000hrs.	20pcs.	0/1

2.5 Criteria For Judging Damage

Table 2-4Criteria For Judging Damage



1, SMT Reflow Soldering Instructions SMT

3.1SMT Reflow Soldering Instructions SMT

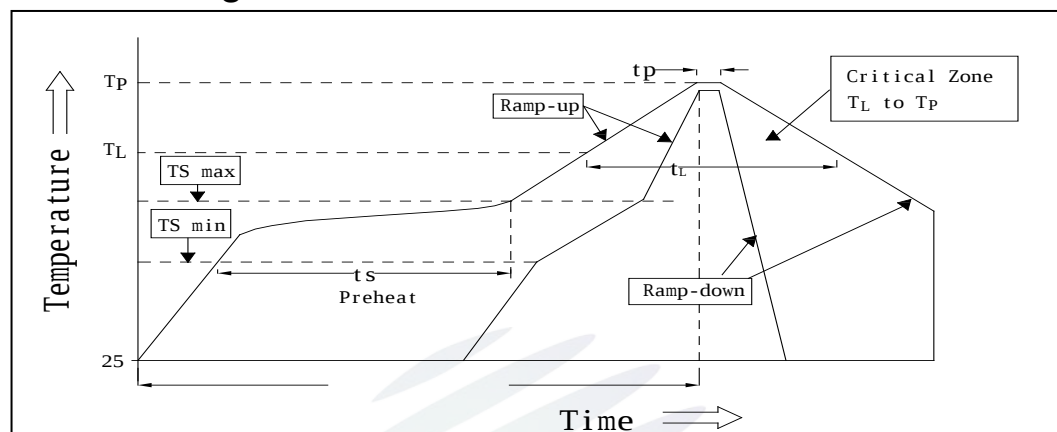


Fig.3-1SMT Reflow Soldering Instructions SMT

Table 3-1Reflow parameters

Average temperature rise speed	T_{smax} T_P	3 °C/ s	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	Max 60s
Peak /Classification of temperature:	/ (T_P)	260 °C	
Time limit classification of peak temperature time t_p		10	Max 10s
(T_P) 5 °C the actual peak temperature (T_P)	Hold time within 5 °C with	30	Max 30s
Cooling speed		6 °C/ s	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.

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

3.1.1 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

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3.1.2 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

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.

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(2) In order to prevent ex-ternal 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.

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(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.

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(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.

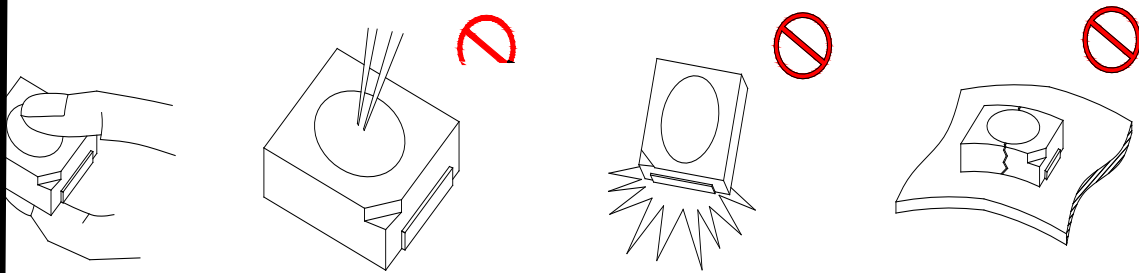


Fig 4-1Cautions

When a circuit, the current through each LED can not exceed the absolute maximum rating specified in Table 1. In the mean while, resistors for protection should be applied, otherwise slight voltage shift will cause current change, burn out may happen. The driving circuit must be designed to allow forward voltage drop when it is ON or OFF. If the reverse voltage is applied to LED, migration can be generated resulting in LED failure.

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Thermal Design is paramount importance because heat generation may result in the Characteristics of LED such as brightness decreased, Color change and so on. Please consider the heat generation of the LED when making the system design. LED

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Compared to standard encapsulants, silicone is generally softer, and the surface is more likely to attract dust. Please pay special care during processing. In cases where a minimal level of dirt and dust particles cannot be avoided, a suitable cleaning solution must be applied to the surface after the soldering of components. It is recommended to use isopropyl alcohol for cleaning. In case other solvents are used, it must be assured that the solvents do not dissolve the package or resin. Ultrasonic cleaning is not recommended. Ultrasonic cleaning may cause damage to the LED.

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Table 4-1Storage

Conditions		Temperature	Humidity	Time
Storage	Before Opening Aluminum Bag	30	75%	Within 1 Year From Date
	After Opening Aluminum Bag	30	60%	Recommended for use within 24 hours

24



Date	Revisor	Version	Verifier	Remarks
2023/10/10	Xian Zhou	E0	Zhu Yiming	New issue

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Declare

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