SPECIFICATION

REFOND P/N

RF-A2E31-RGBE-W1

□R&D

■Mass Production

1. Description

1.1General Description

The Red LED which was fabricated using a red chip LED

The Green LED which was fabricated using a green chip LED

The Blue LED which was fabricated using a blue chip LED

The LED package dimension:3.0mmX3.0mmX0.65mm 3.0mmX3.0mmX0.65mm

1.2Features

EMC Package.EMC.

Extremely wide viewing angle.

Suitable for all SMT assembly and solder process. SMT

Available on tape and reel.

Moisture sensitivity level: Level 2. Level2

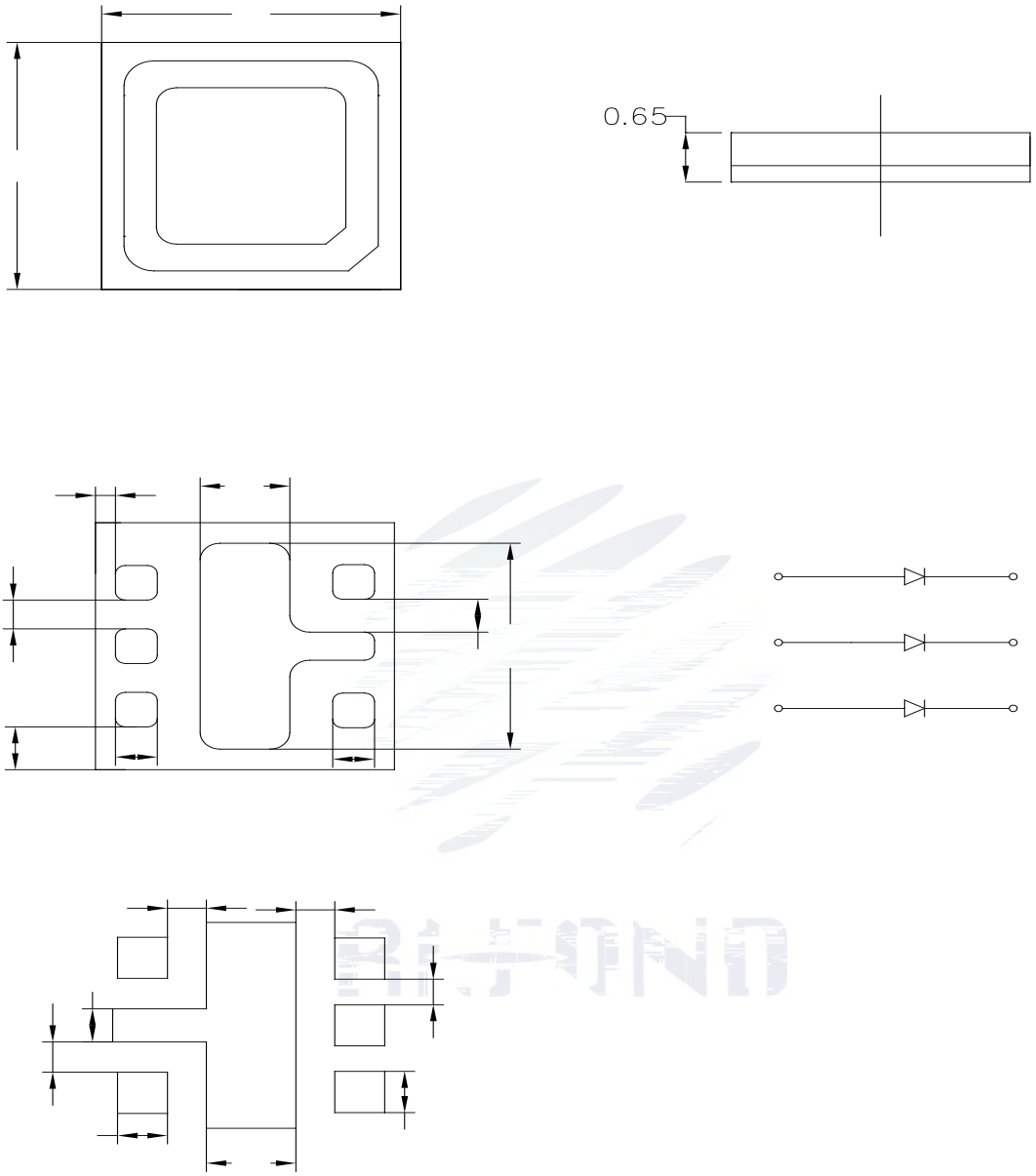
Compliance with RoHS and REACH. RoHS REACH

Qualifications: The product qualification test plan is based on the guidelines of AEC-Q101 Stress Test Qualification for Automotive Grade Discrete Semiconductors AEC-Q101

1.3Application

Automotive Interior Lighting.

1.4Package Dimension



Notes

1. All dimensions units are millimeters.

2. All dimensions tolerances are ±0.2mm unless otherwise noted. ± 0.2

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

Parameter	Symbol	Rating		Units
Power Dissipation	P_D	R	468	mW
		G	612	mW
		B	612	mW
Forward Current	I_F	R/G/B:150		mA
Peak Forward Current	I_{FP}	180		mA
Reverse Voltage	V_R	5		V
Electrostatic Discharge(HBM)	E_{SD}	2000		V
Operating Temperature	T_{OPR}	-40 ~ +110		
Storage Temperature	T_{STG}	-40 ~ +110		
Junction Temperature	T_J	125		

Notes

1. 1/10 Duty cycle, 10ms pulse width. 10ms, 1/10.

2. The above forward voltage measurement allowance tolerance is ±0.1V. ± 0.1V.

3. The above color coordinates measurement allowance tolerance is ± 0.005. ± 0.005.

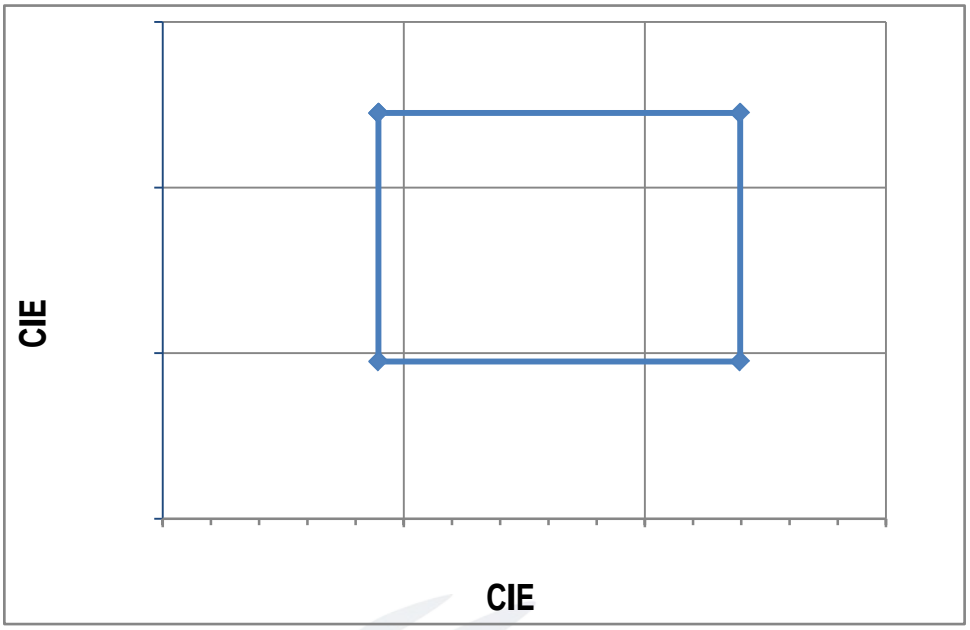
4. The above luminous intensity measurement allowance tolerance ±10%.
   ± 10%.

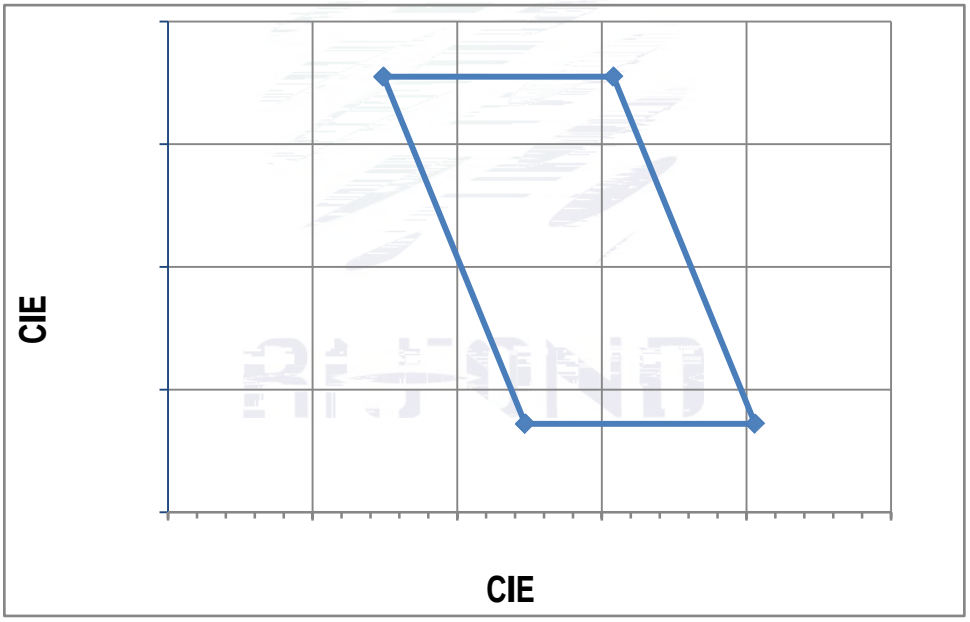
5. Care is to be taken that power dissipation does not exceed the absolute maximum rating of the product.

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 ,





BIN C0DE	CIE-X1	CIE-Y1	CIE-X2	CIE-Y2	CIE-X3	CIE-Y3	CIE-X4	CIE-Y4
R	0.6876	0.2929	0.7034	0.2929	0.694	0.3214	0.6782	0.3214
G	0.1479	0.7245	0.1779	0.7245	0.1779	0.7095	0.1479	0.7095
B	0.1347	0.0372	0.1506	0.0372	0.1408	0.0655	0.1249	0.0655

1.7 Typical Optical Characteristics Curves

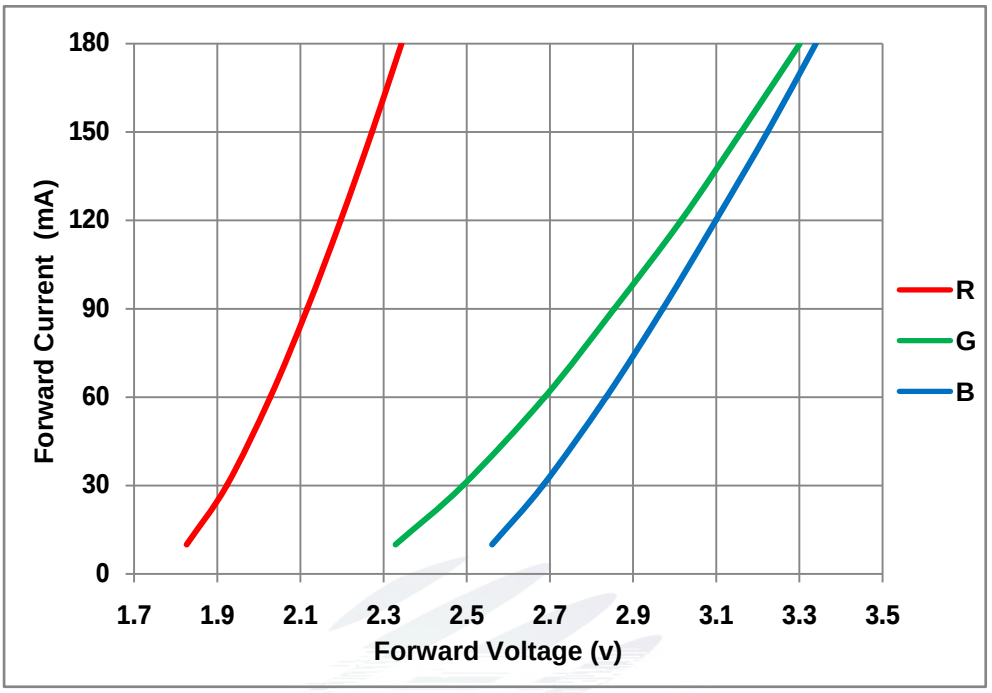


Fig. 1-7 Forward Voltage Vs Forward Current

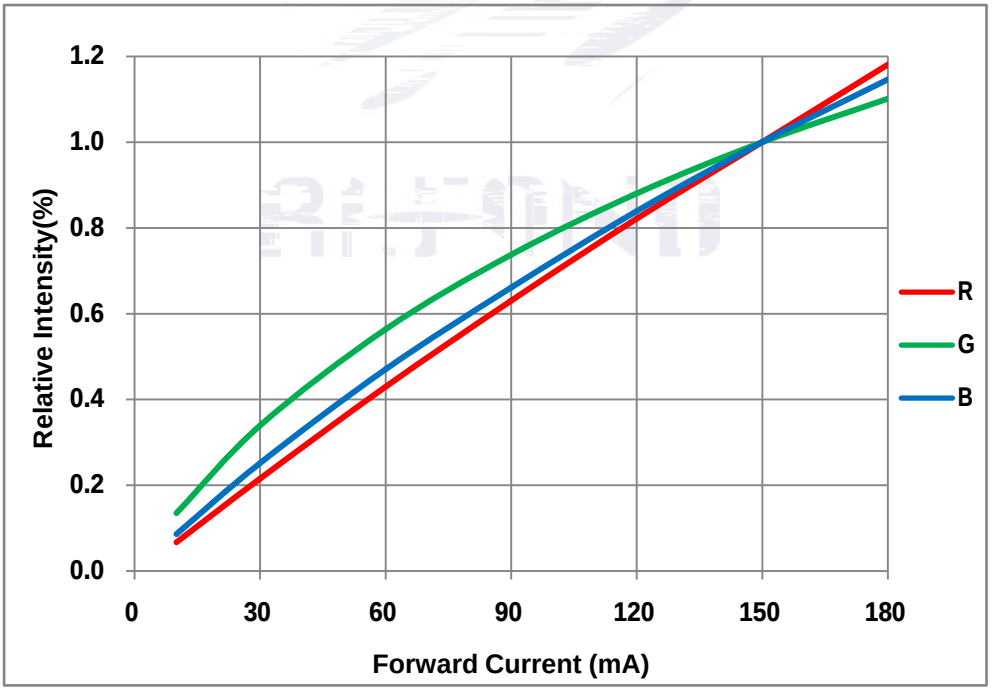


Fig. 1-8 Forward Current Vs Relative Intensity

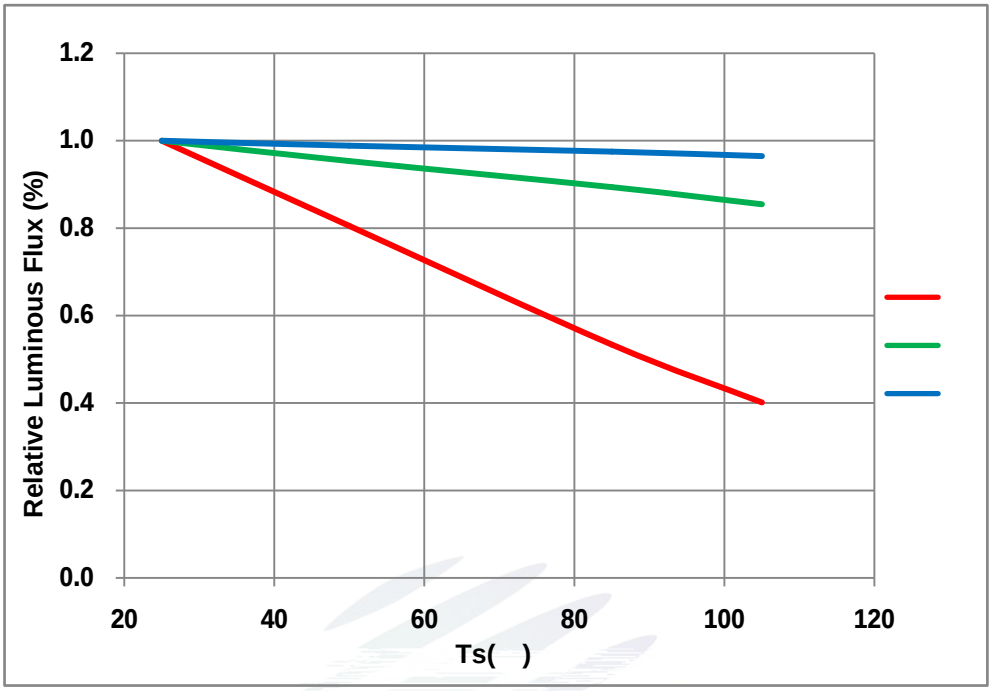


Fig. 1-9 Solder Temperature Vs Relative Intensity

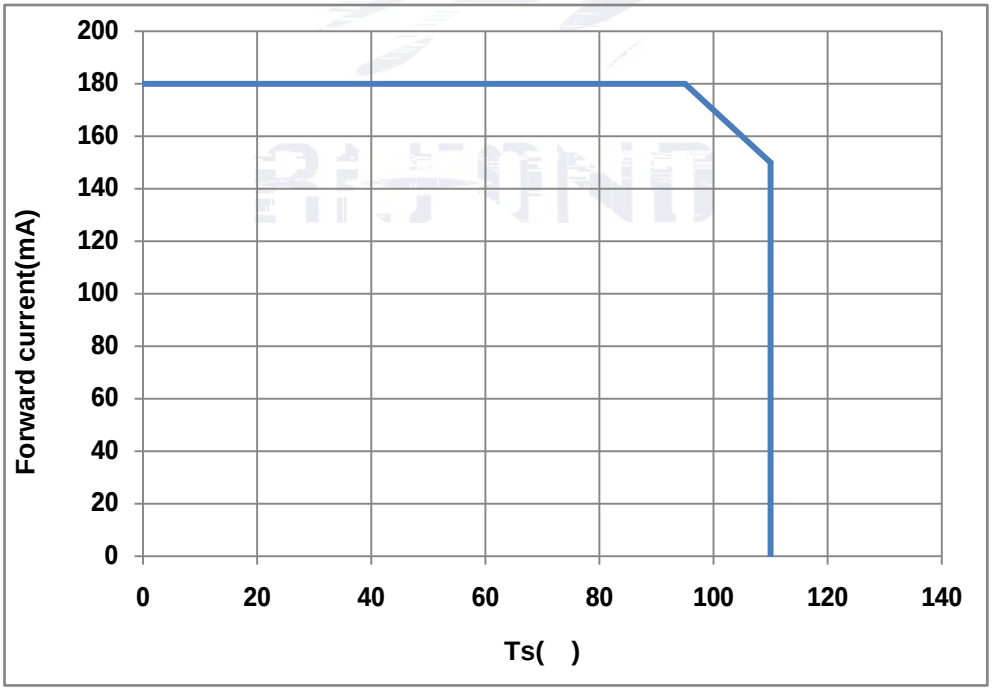


Fig. 1-10 Solder Temperature Vs Forward Current

Fig. 1-11 Forward Voltage Vs Solder Temperature

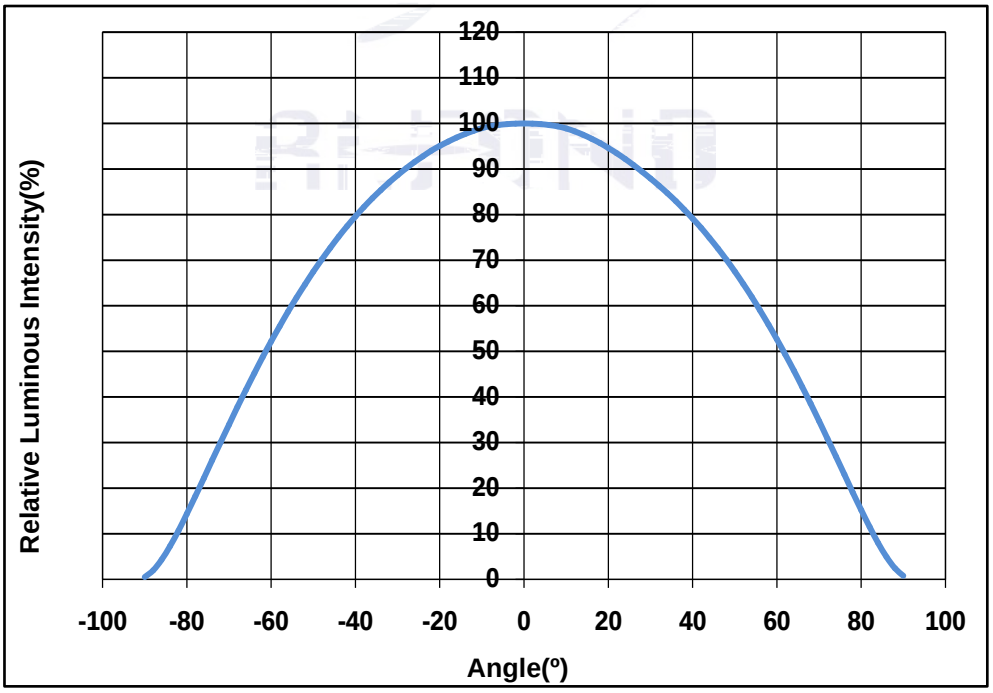


Fig. 1-12 Radiation diagram

Fig. 1-13 Forward current Vs Dominate wavelength

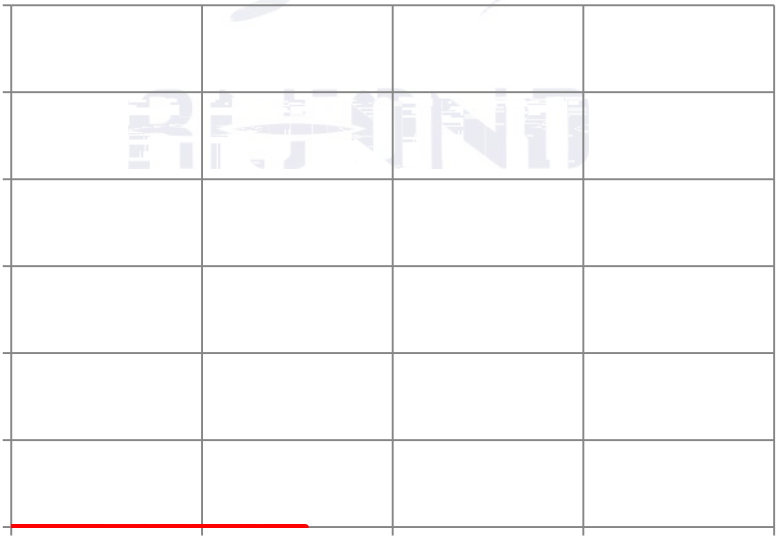


Fig. 1-14 Spectrum Distribution

2. Packaging

2.1 Packaging Specification

Package:5000pcs/reel.

2.1.1Carrier Tape Dimension

Fig.2-1 Carrier Tape Dimension

2.1.2Reel Dimension

Table 2-1Reel Dimension

A	12.0 ± 0.1mm	A12

Fig.2-2Reel Dimension

Notes

The tolerances unless mentioned ±0.1mm. Unit : mm ± 0.1

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2.1.3Label Form Specification

Table 2-2 Specification

Fig. 2-3Label Form Specification

2.2Moisture Resistant Packing

Fig.2-4Moisture Resistant Packing

2.3Cardboard Box

Fig.2- Cardboard Box

2.4Reliability 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%R_H	168 hrs.	20pcs.	0/1
Thermal Shock	JEITAED-4701 300307	-40 15min 125 15min	1000 cycle	20pcs.	0/1
Life Test	JESD22-A108	Ta=105 I_F=150mA	1000hrs.	20pcs.	0/1
High Temperature High Humidity Life Test	JESD22-A101	85 / 85%R_H I_F=150mA	1000hrs.	20pcs.	0/1

2.5 Criteria For Judging Damage

Table 2-4Criteria For Judging Damage

Test Items	Symbol	Test Condition	Criteria For Judgement	
			Min.	Max.
Forward Voltage	V_F	I_F=150mA	-	U.S.L*)x1.1
Reverse Current	I_R	V_R = 5V	-	U.S.L*)x2.0
Luminous Flux		I_F=150mA	L.S.L*)x0.7	-

Notes

1.U.S.L: Upper standard level L.S.L: Lower standard level

2.The above reliability tests is based on the

3. SMT Reflow Soldering Instructions SMT

30 0 21281(t 37.2705.3Q2R55.22 450.gCB7(F)-4.3(O)-4(ND:)-4(W)-4.13.982e43.Re2 459(

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

(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 LED

3.1.2 Cautions

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 LED

(2) Components should not be mounted on warped (non coplanar) portion of PCB. After soldering, do not warp the circuit board.LED PCB

(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 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 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

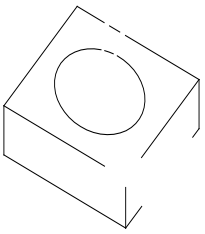

Fig 4-1Handling Precautions

(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. LED

LED

(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 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.

LED

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
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 60 5 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.

Date	Reviser	

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Declare

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