

# SPECIFICATION

REFOND P/N

RF-A2P08-R315-R0

R&D

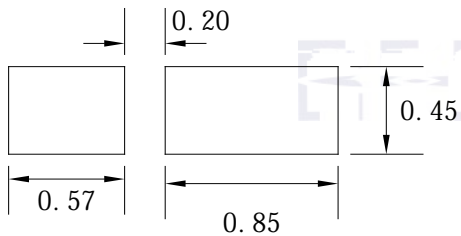
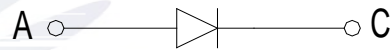
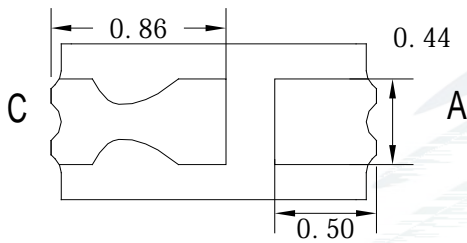
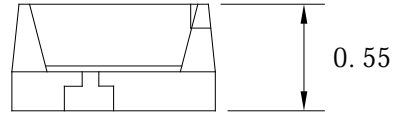
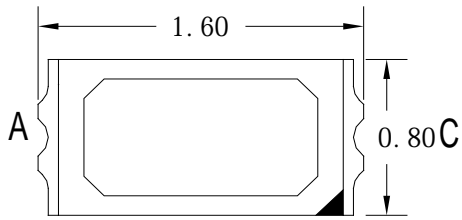
Mass Production







## 1.4 Package Dimension



### Notes

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



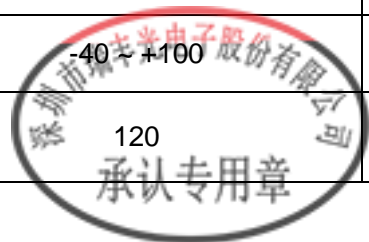
## 1.5 Product Parameters

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

Item	Symbol	Test Condition	Value			Unit
			Min.	Typ.	Max.	
Forward Voltage	$V_F$	$I_F=20mA$	1.8	2.1	2.4	V
Reverse Current	$I_R$	$V_R=5V$	---	---	10	$\mu A$
Luminous Intensity	$I_V$	$I_F=20mA$	80	120	150	mcd
Dominant wavelength	$\lambda_d$	$I_F=20mA$	627.5	630	637.5	nm
Viewing Angle		$I_F=20mA$	---	120	---	deg
Thermal Resistance.	$R_{THJ-S}$	$I_F=20mA$	---	---	300	$^{\circ}W$

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

Parameter	Symbol	Rating	Units
Power Dissipation	$P_D$	78	mW
Forward Current	$I_F$	30	mA
Peak Forward Current	$I_{FP}$	100	mA
Reverse Voltage	$V_R$	5	V
Electrostatic Discharge (HBM)	$E_{SD}$	2000	V
Operating Temperature	$T_{OPR}$	-40 ~ +100	
Storage Temperature	$T_{STG}$	-40 ~ +100	
Junction Temperature	$T_J$	120	



Notes

1. 1/10 Duty cycle, 10ms pulse width.      10ms,      1/10.
2. The above forward voltage measurement allowance tolerance is  $\pm 0.1V$ .       $\pm 0.1V$ .
3. The above color coordinates measurement allowance tolerance is  $\pm 0.005$ .       $\pm 0.005$ .
4. The above luminous intensity measurement allowance tolerance  $\pm 10\%$ .  
 $\pm 10\%$ .
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

## 1.6 Bin Range Of Forward Voltage and Luminous Intensity (IF=20mA)

### BIN (IF=20mA)

Table 1-3

VF	B1	B2	C1	C2	D1	D2
	1.8-1.9	1.9-2.0	2.0-2.1	2.1-2.2	2.2-2.3	2.3-2.4
IV mcd	F2	G1	G2			
	80-100	100-120	120-150			
WD(nm)	F2	G1	G2	H1		
	627.5-630	630-632.5	632.5-635	635-637.5		



## 1.7 Typical Optical Characteristics Curves

Fig. 1-7 Forward Voltage Vs Forward Current

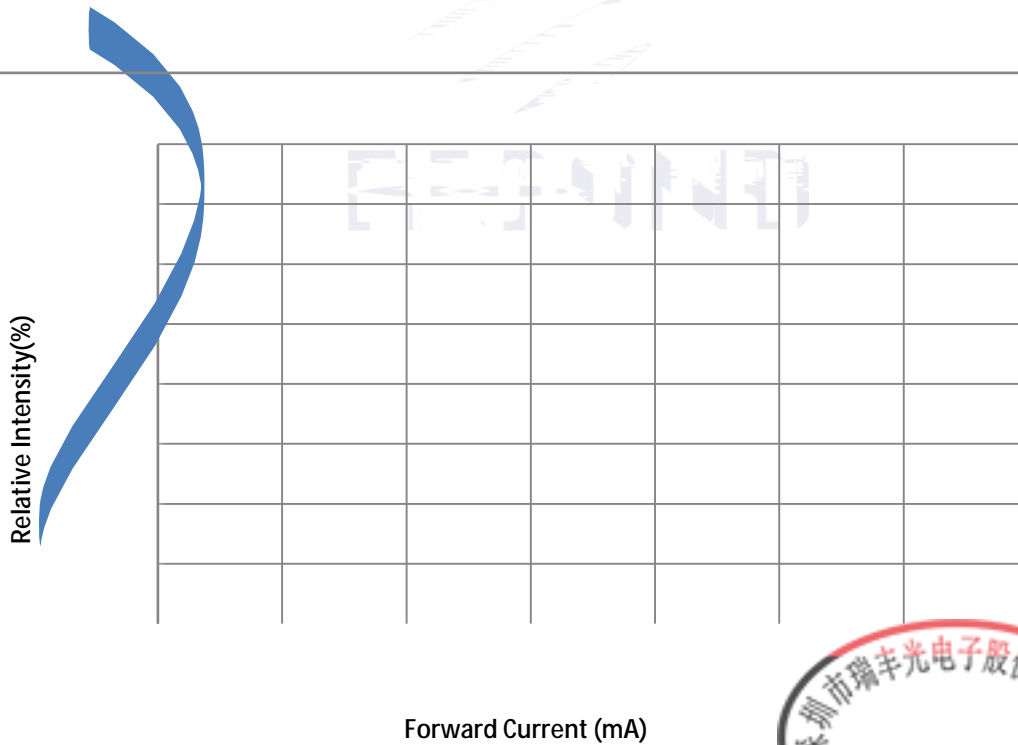


Fig. 1-8 Forward Current Vs Relative Intensity



Fig. 1-9 Solder Temperature Vs Relative Intensity


Fig. 1-10 Solder Temperature Vs Forward Current

Tj 120



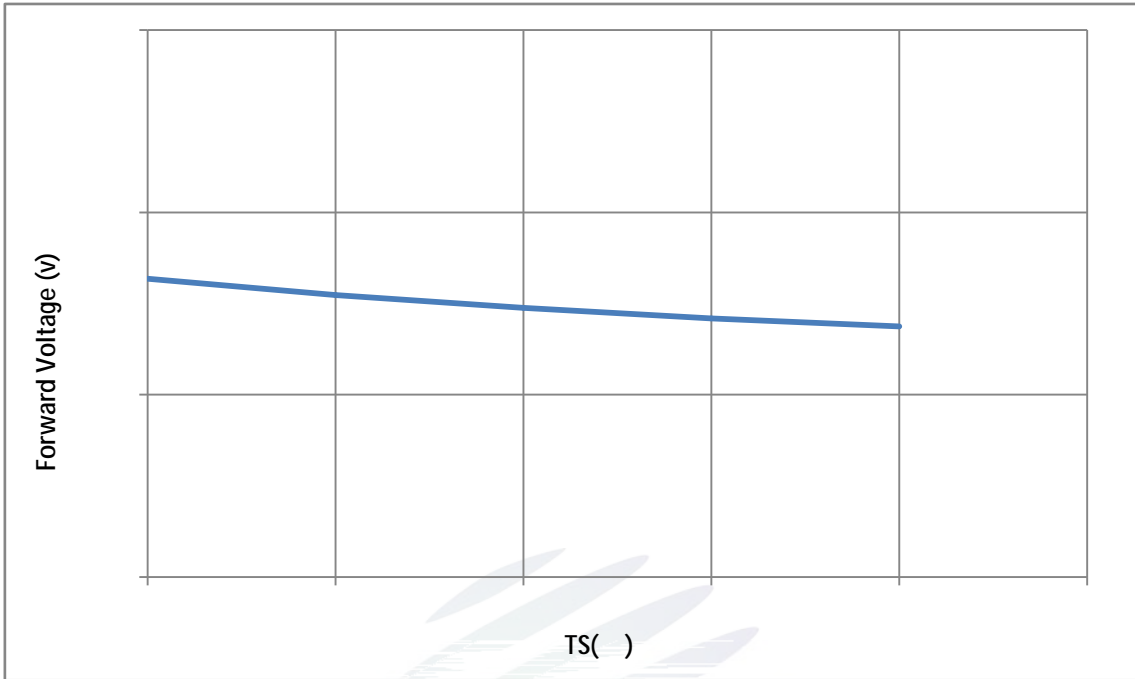


Fig. 1-11 Forward Voltage Vs Solder Temperature

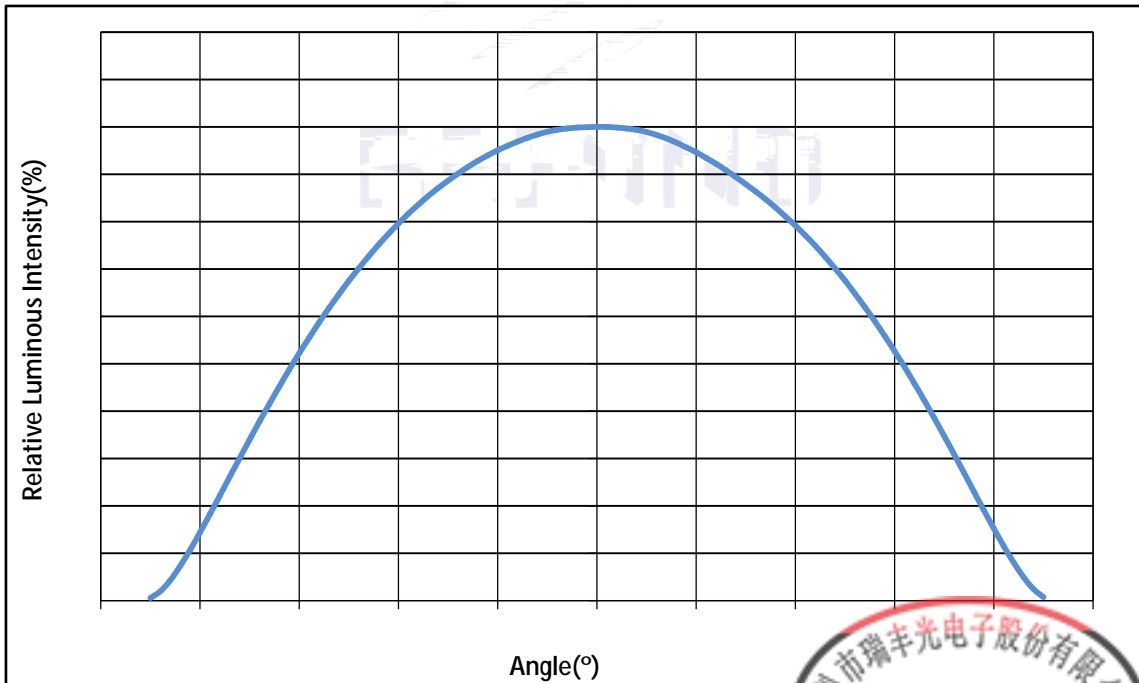


Fig. 1-12 Radiation diagram



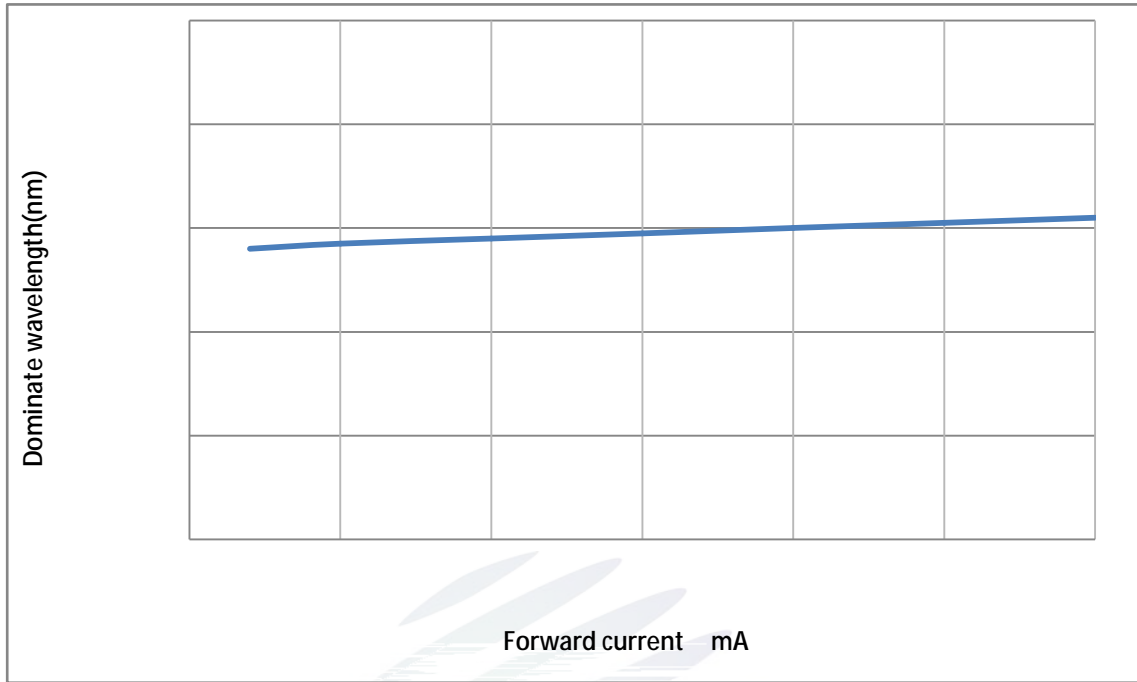


Fig. 1-13

(Ts=25°C)

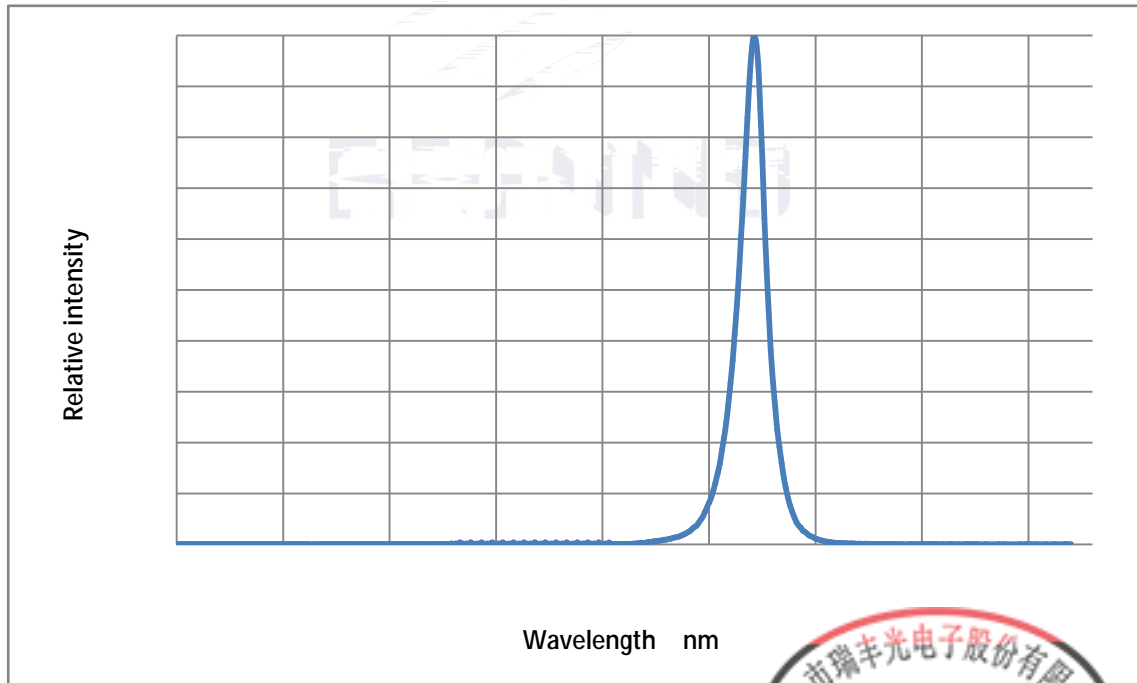


Fig. 1-14 Spectrum Distribution







## 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=85 If=20mA	1000hrs.	20pcs.	0/1
High Temperature High Humidity Life Test	JESD22-A101	85 / 85%RH If=20mA	1000hrs.	20pcs.	0/1



## 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	$V_F$	$I_F=20mA$	-	U.S.L*)x1.1



### 3. SMT Reflow Soldering Instructions SMT

#### 3.1 SMT Reflow Soldering Instructions SMT

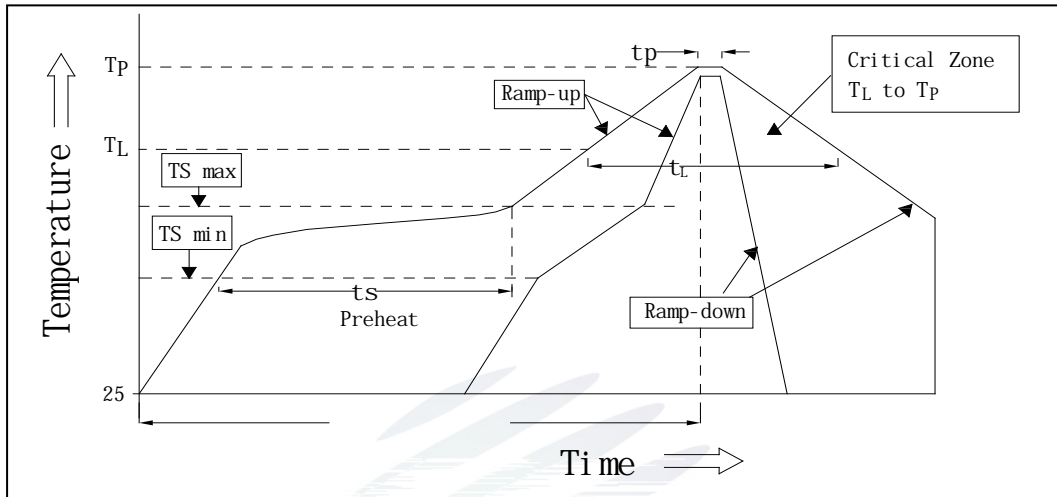
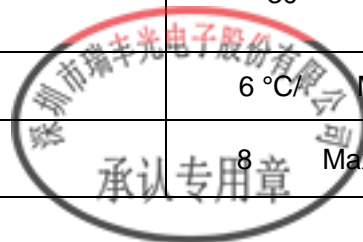


Fig.3-1 SMT Reflow Soldering Instructions SMT

Table 3-1 Reflow parameters

Average temperature rise speed	Tsmax	TP	3 °C/	Max 3 °C/ s
Preheating: minimum temperature	(Tsmi n)		150 °C	
Preheating: Max temperature	(Tsmax)		200 °C	
Preheating: Time	Tsmin	Tsmax	60 - 120	60s-120s
Time limited to maintain high temperature: the temperature	(TL)		217 °C	
Time limited to maintain high temperature: The Time	(tL)		60	Max 60s
Peak /Classification of temperature:	/	(TP)	260 °C	
Time limit classification of peak temperature time		tp	10	Max 10s
(TP) 5 °C		Hold time within 5 °C with the	30	Max 30s
actual peak temperature (TP)				
Cooling speed			6 °C/	Max 6 °C/ s
25 °C		Needed time from 25 °C to Tp	8	Max 8 minutes









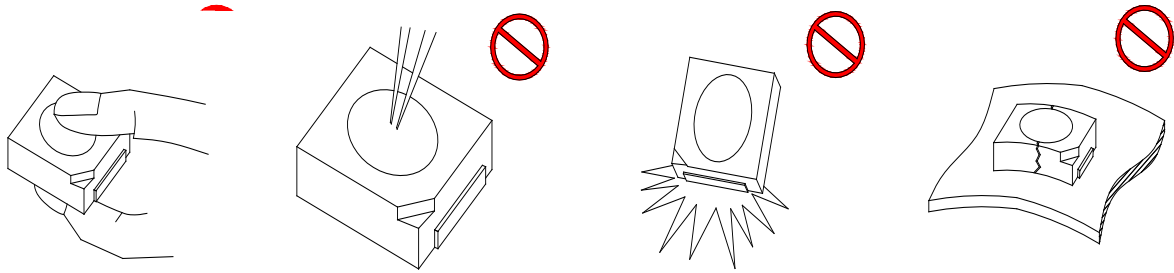


Fig 4-1 Handling Precautions

(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

(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





