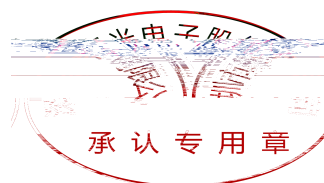
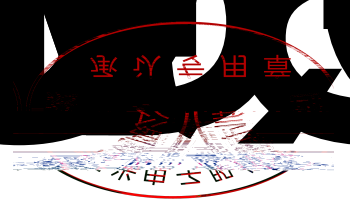
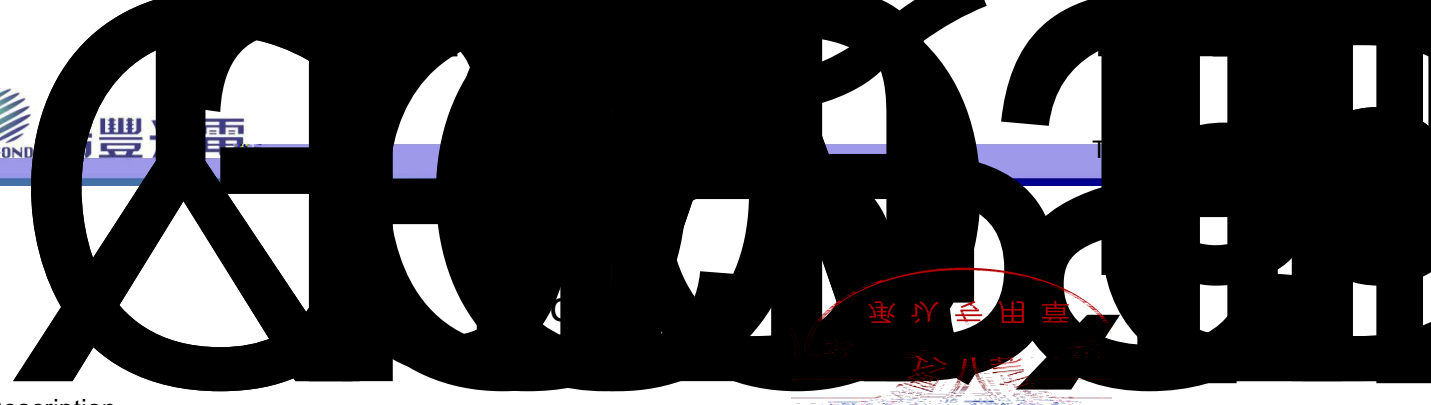


REFOND P/N
RF-AUB190TS-ED

Mass Product





1. Description

1.1 General Description

1.2 Features

1.3 Application

1.4 Package Dimension

1.5 Product Parameters = REFOND 'P', 'Da' [

1.6 Typical Optical Characteristics Curves

2. Packaging

2.1 Packaging Specification

2.1.1 Carrier Tape Dimension

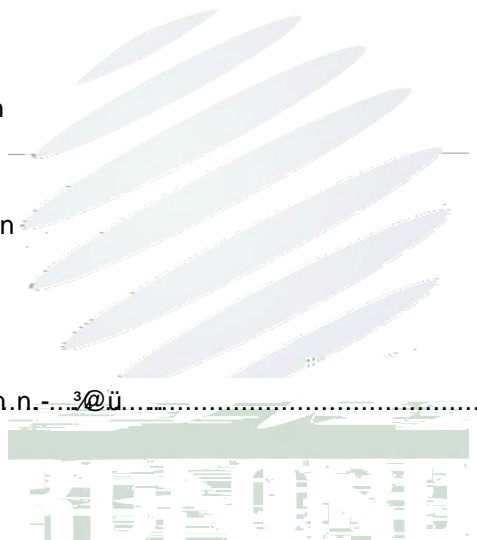
2.1.2 Reel Dimension

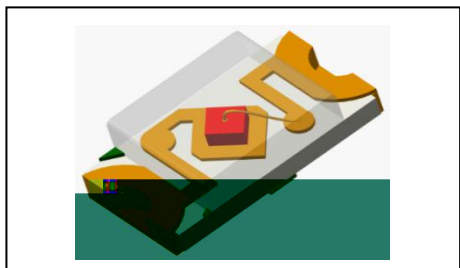
2.1.3 Label Form Specification

2.2 Moisture Resistant Packing

2.3 Cardboard Box

2.4 REFOND Test Items and Conditions n. 3@ü 1bur





The Colour LED which was fabricated using a amber chip Package Dimension :
1.6mmX0.8mmX0.7mm.

LED

1.6mmX0.8mmX0.7mm

Extremely wide viewing angle.

Suitable for all SMT assembly and solder process.

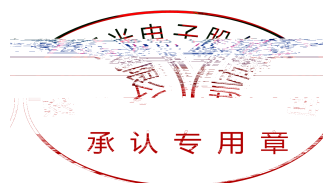
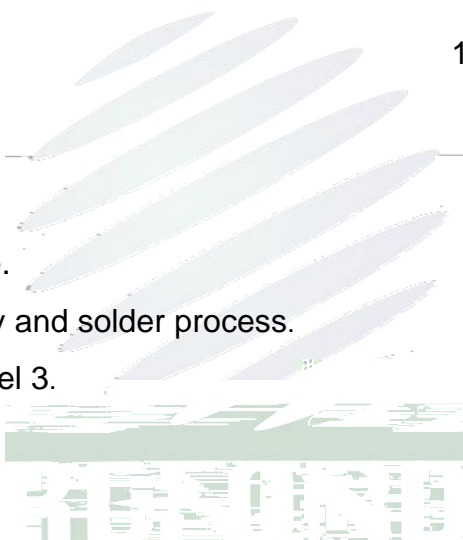
Moisture sensitivity level: Level 3.

RoHS compliant.

Optical indicator.

Switch and symbol, display.

General use.



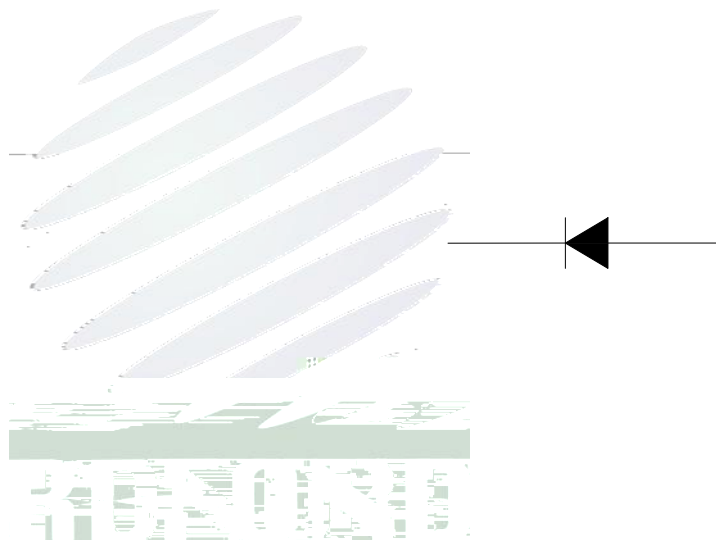
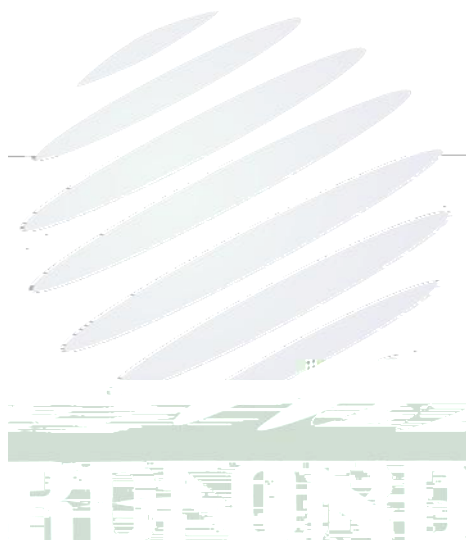


Table 1-1 Electrical / Optical Characteristics at Ts=25°C

Item	Test Condition	Symbol	Value			Unit
			Min. ()	Typ.	Max.	
Spectral Half Bandwidth	I _F =20mA		--	15	--	nm
Forward Voltage		B0	1.8	-0	2.0	V
	I _F =20mA	V _F C0				



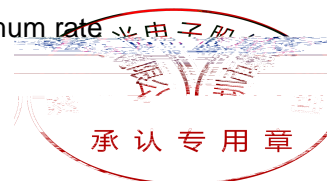
Notes : V_R=5V For test conditions. V_R=5V

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

Parameter	Symbol	Rating	Units
Power Dissipation	P_d	72	mW
Forward Current	I_F	30	mA
Peak Forward Current Of Pulse	I_{FP}	60	mA
Electrostatic Discharge (HBM)	E_{SD}	2000	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.
- The above forward voltage measurement allowance tolerance is $\pm 0.1V$.
- The above dominant wavelength measurement allowance tolerance is $\pm 2nm$.
- 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



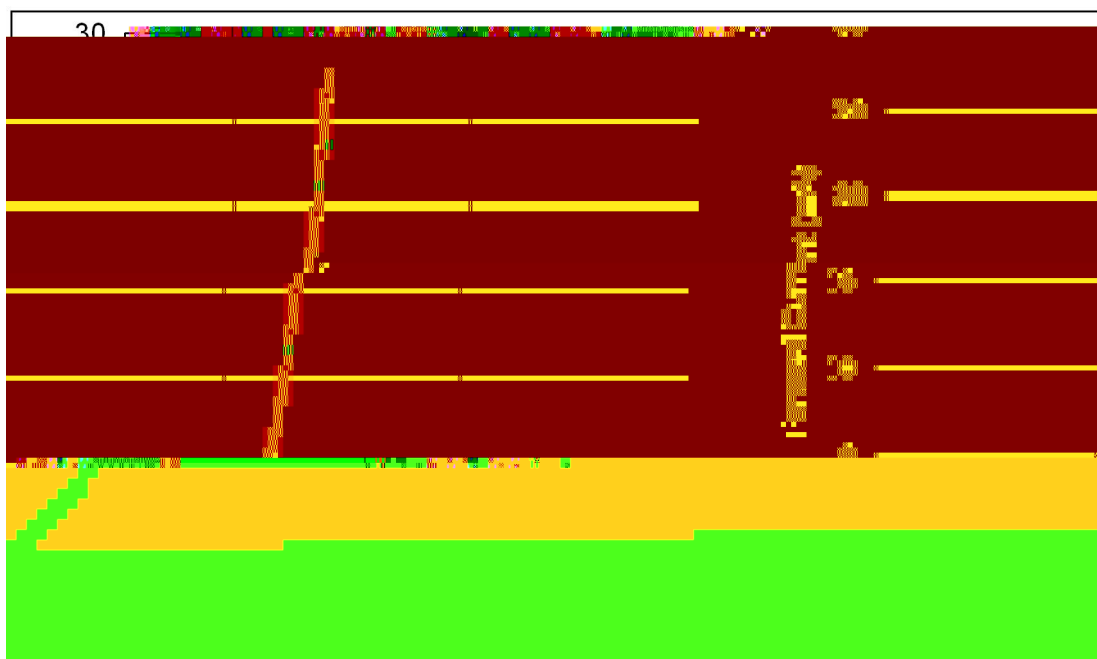


Fig 1-6 Forward Voltage Vs. Forward Current

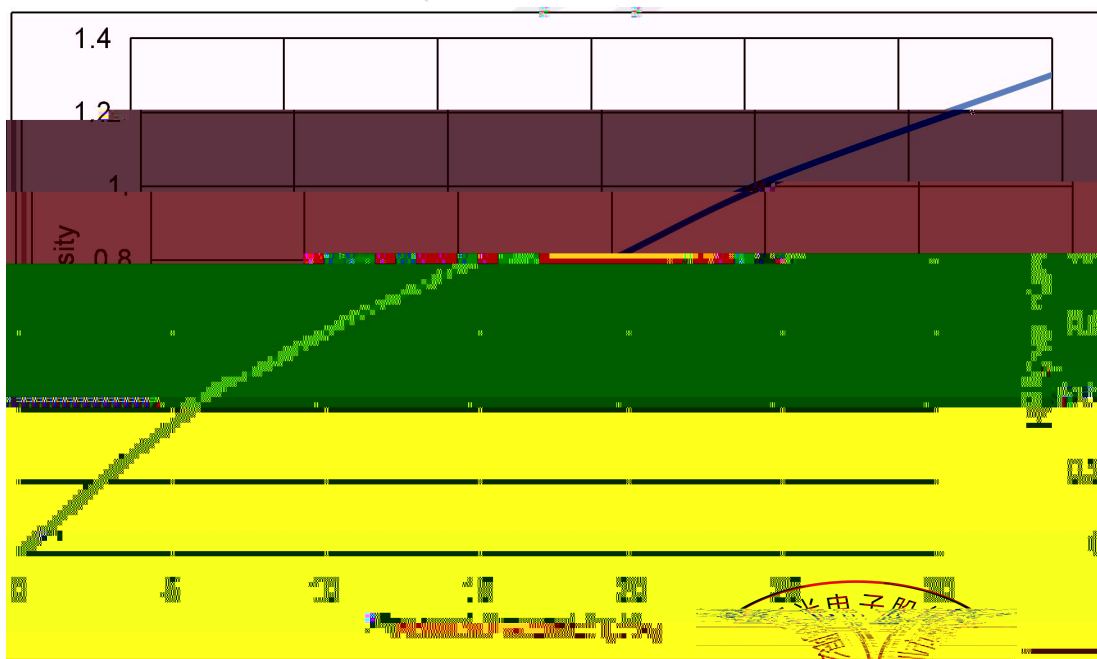
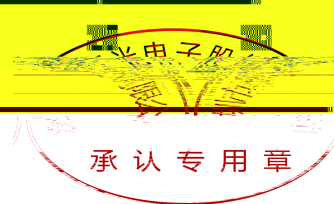


Fig 1-7 Forward Current Vs. Relative Intensity



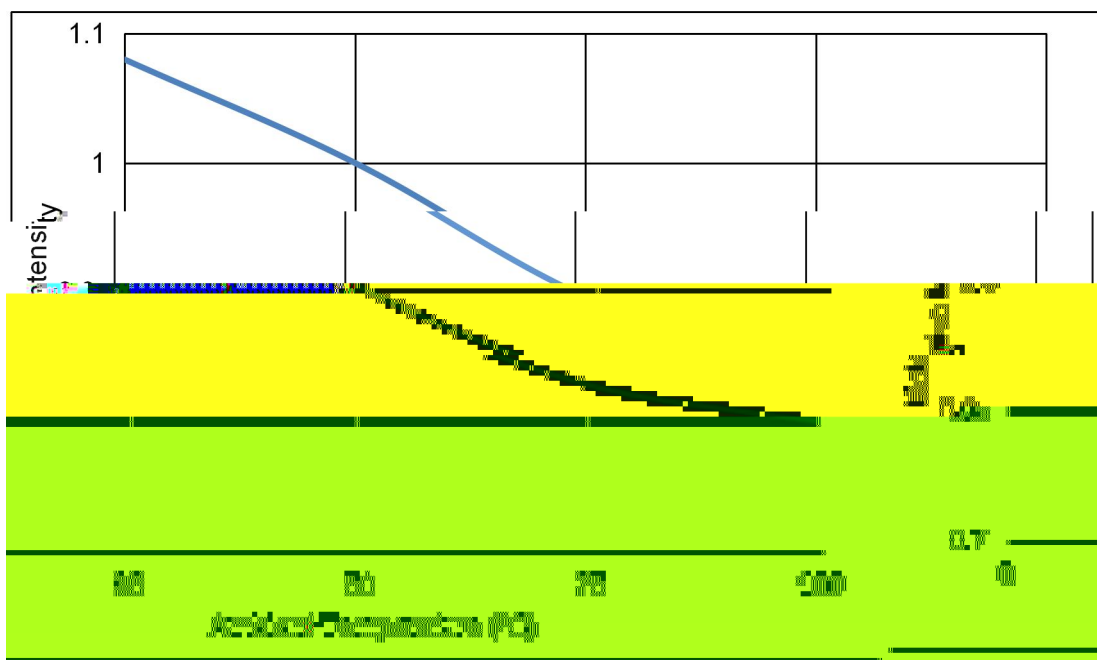


Fig 1-8 Pin Temperature Vs Relative Intensity

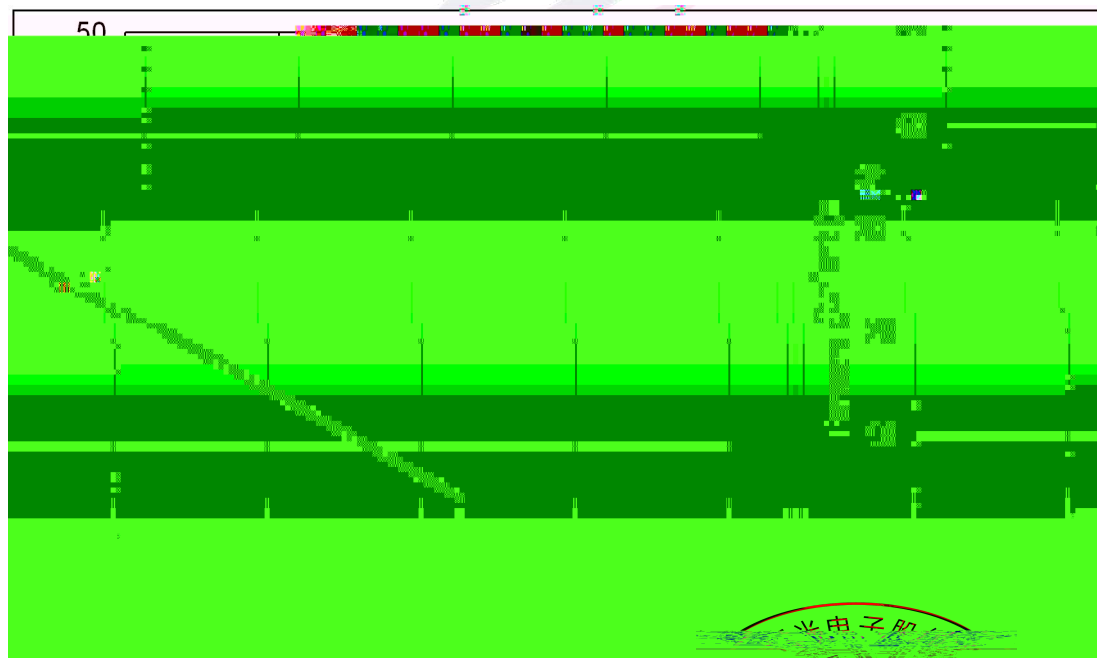
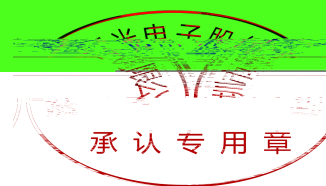


Fig 1-9 Pin Temperature Vs Forward Current



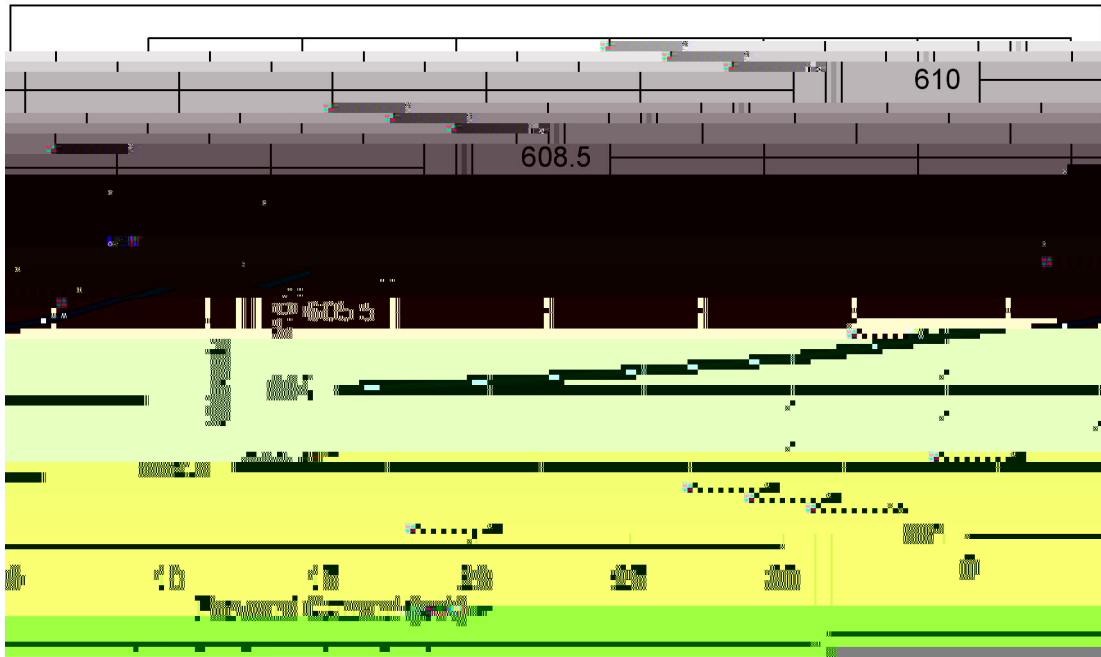


Fig 1-10 Forward Current Vs. Dominate Wavelength (Ta=25 °C)

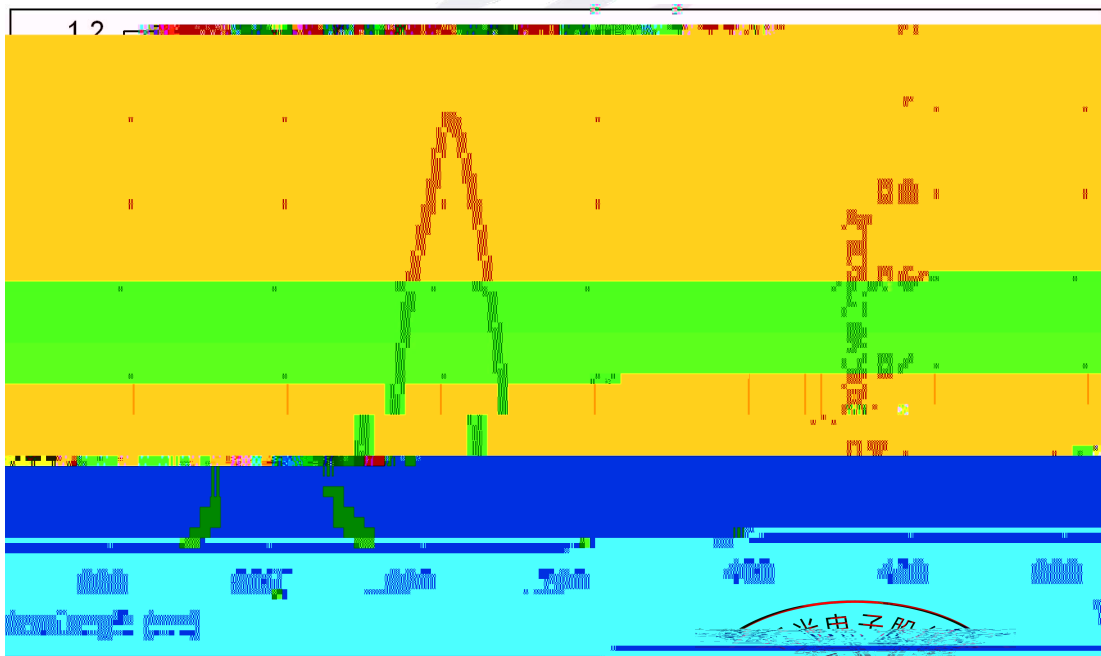
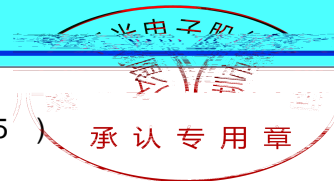


Fig 1-11 Relative Intensity Vs. Wavelength (Ta=25 °C)



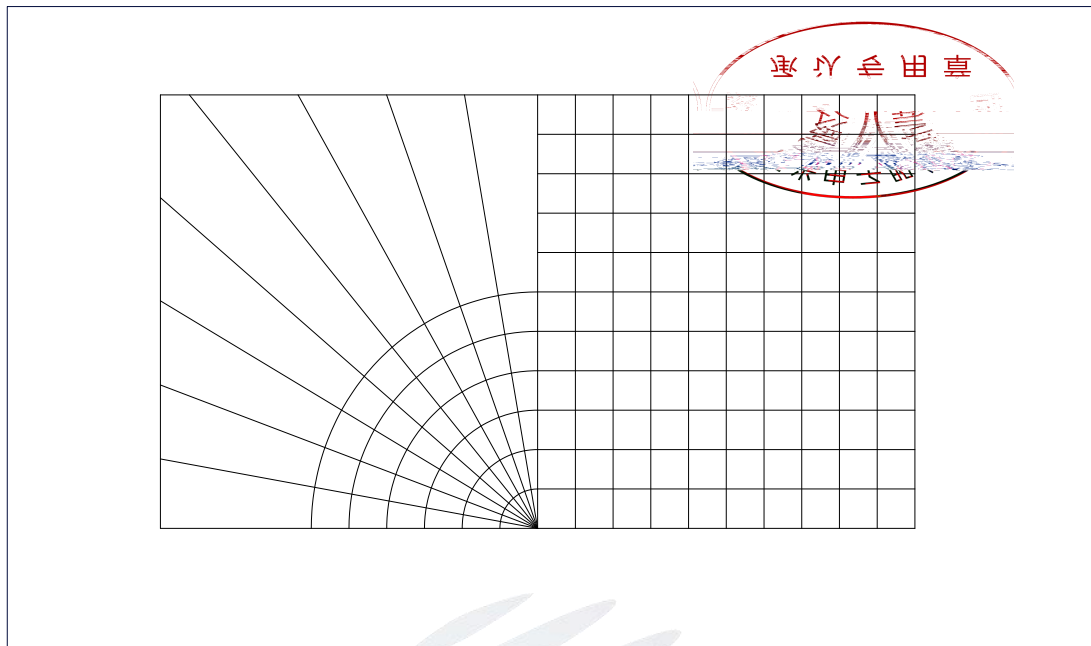


Fig 1-12 Diagram characteristics of radiation



Package:4000pcs/reel.

4000pcs

2.1.1 Carrier Tape Dimension

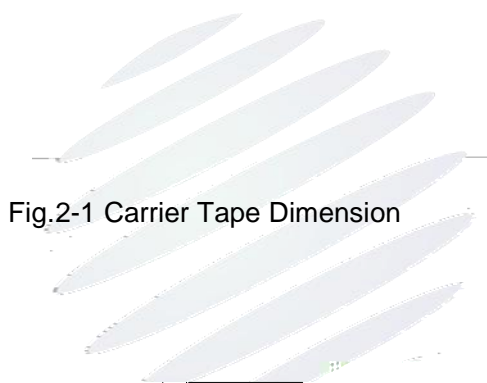


Fig.2-1 Carrier Tape Dimension

2.1.2 Reel Dimension

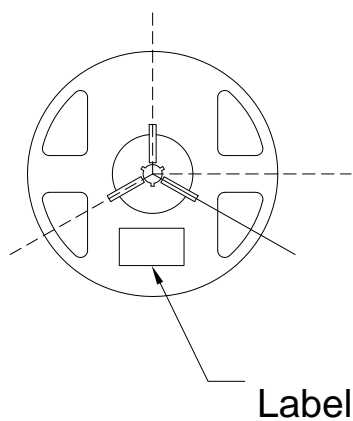


Fig.2-2 Reel Dimension

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 $\pm 0.1\text{mm}$. 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

Fig. 2-3 Label Form Specification

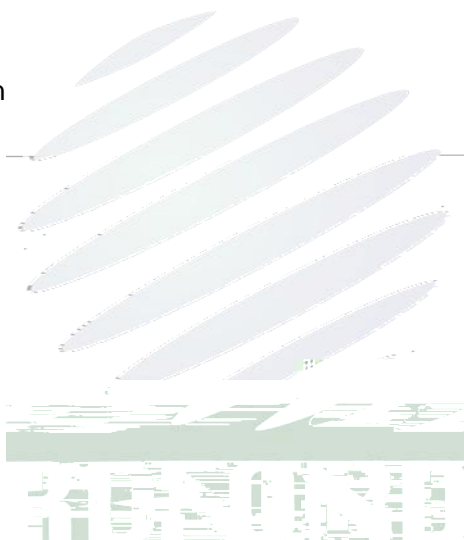


Fig.2-4 Moisture Resistant Packing

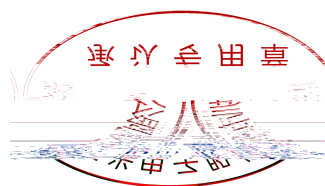


Fig.2-5 Cardboard Box

Table 2-3 Reliability Test Items And Conditions

Test Items	Ref.Standard	Test Condition	Time	Quantity	Acý
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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
Reverse Current	I_R	$V_R= 5V$	-	U.S.L*)x2.0
Luminous Flux		$I_F=20mA$	L.S.L*)x0.7	-

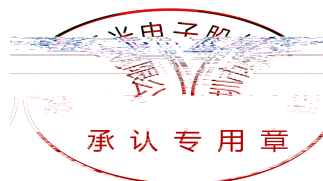
Notes

1.U.S.L: Upper standard level

L.S.L: Lower standard level

2.The above reliability tests is based on the verification of a single/strip LED of Refond's existing experimental platform,the reliability experiment was taken under good heat dissipation conditions. When customers applies the LED to the series and parallel circuit,should take consideration of all the factors such as the current, voltage distribution, heat dissipation and others.

3.The technical information shown in the data sheets is 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.



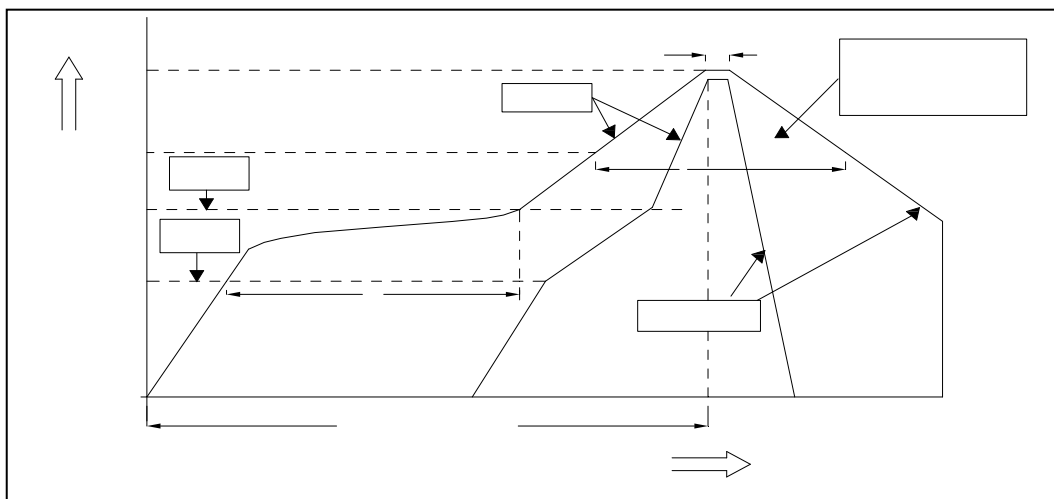
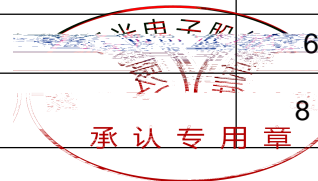


Fig.3-1 SMT Reflow Soldering Instructions SMT

Table 3-1 Parameter

Average temperature rise speed	T_{smx} T_p	3 °C/ Max 3 °C/ s
Preheating: minimum temperature	(T_{smin})	150 °C
Preheating: Max temperature	(T_{smx})	200 °C
Preheating: Time	T_{smin} T_{smx}	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
Hold time within 5 °C with the actual peak temperature (T_p)	(T_p)	30 Max 30s
Cooling speed		6 °C/ Max 6 °C/ s
Needed time from 25 °C to T_p	25 °C	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.

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

3.1.1 Soldering Iron

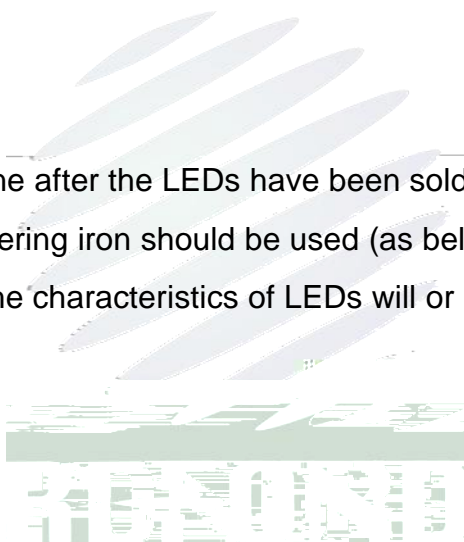
(1) When do soldering by hand, keep the temperature of iron below less 300 less than 3 seconds

(2) Soldering by hand should be done only one time.

3.1.2 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.

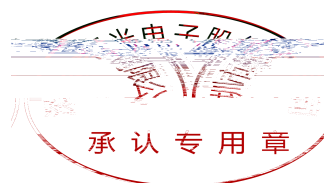
LED



3.1.3 Cautions

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

(2) Do not apply mechanical force or excess vibration during the cooling process to normal temperature after soldering. Do not rapidly cool device after soldering.



(1) LED operating environment... element composition... over 100... in the...
LED mating usage material. ... for informational pur... y and is not a warr...
... nt.LED

(2) In order to prevent ex-ter... getting into the insi... 0, which may wa...
malfunction... ED, the sing... ne element is req... e less than
... PPM... tent of... e... required to be l... 900PPM, the...
... Bromin... trine e... external... s of the... only
and is not a warranty or en...

(3) VOCs (Volatile organic compounds)... of fixtures
can penetrate silicone encapsulants of LED...
energy. The result can be a significant loss of lig...
properties of the materials selected to be used in th...
these issues. Refond advises against the use of any che...
or are suspected to have an adverse affeation

(4) 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.

(5) 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

(6) Storage

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

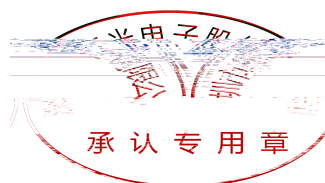
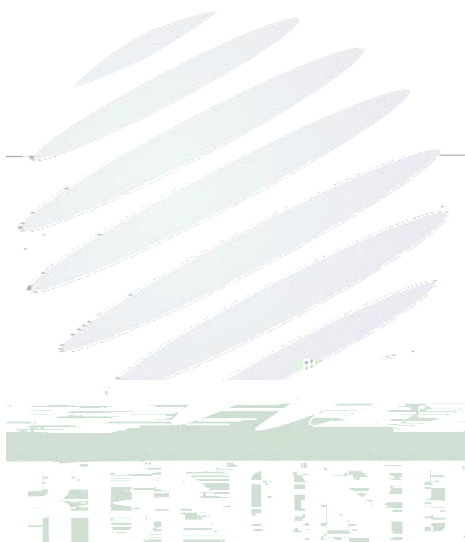
(7) If the moisture absorbent material silica gel has faded away or the LEDs have exceeded the storage time baking treatment should be performed after unpacking and based on the following condition 60±5 for above 24 hours.

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



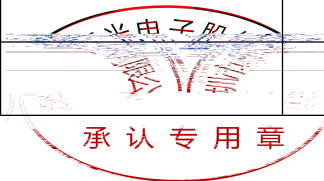
(8) Similar to most Solid state devices; LEDs are sensitive to Electro-Static Discharge (ESD) and Electrical Over Stress (EOS).

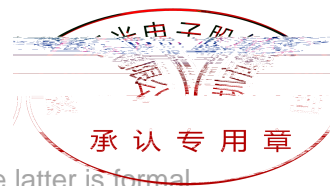
(9) Other points for attention, please refer to our relevant information.



Version History/

Date	Revisor	Version	Verifier	Remarks
2019.07.08		E2		





Declare

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