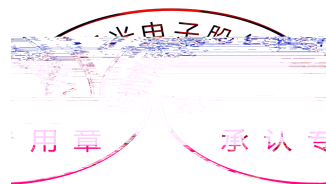


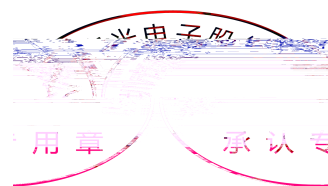
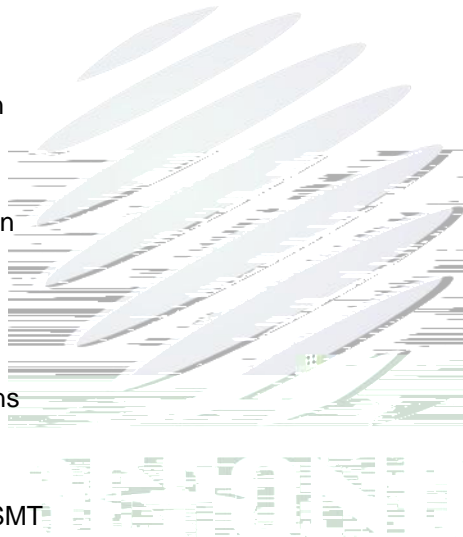
REFOND P/N
RF-RUB190TS-CA

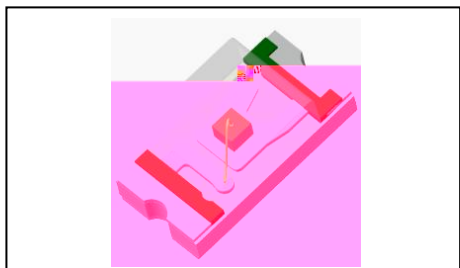
Mass Product



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 - 4.1 Handling Precautions

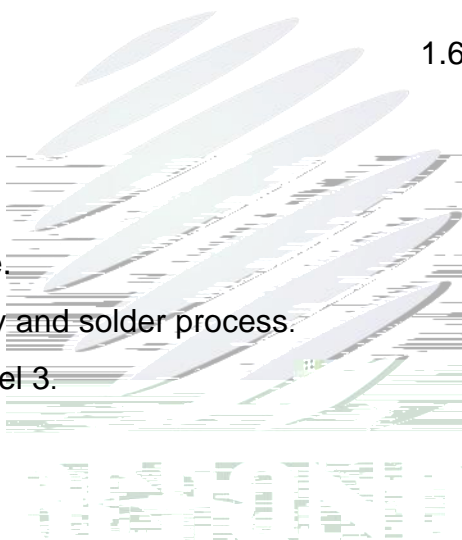




The Colour LED which was fabricated using a red chip Package Dimension :
1.6mmX0.8mmX0.7mm.

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.

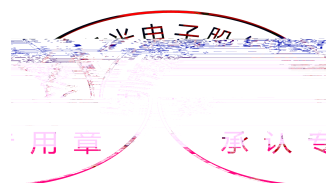




Table 1-1 Electrical / Optical Characteristics at Ts=25°C

Item	Test Condition	Symbol	Value			Unit	
			Min. ()	Typ.	Max.		
Spectral Half Bandwidth	I _F =20mA		--	15	--	nm	
Forward Voltage	I _F =20mA	V _F	B1	1.8	--	1.9	V
			B2	1.9	--	2.0	V
			C1	2.0	--	2.1	V
			C2	2.1	--	2.2	V
			D1	2.2	--	2.3	V
			D2	2.3	--	2.4	V
Dominant Wavelength	I _F =20mA	λ _D	F10	625.0	--	627.5	nm
			F20	627.5	--	630.0	nm
			G10	630.0	--	632.5	nm
			G20	632.5	--	635.0	nm
			H10	635.0	--	637.5	nm
			H20	637.5	--	640.0	nm
Luminous Intensity	I _F =20mA	I _v	1E0	30	--	50	mcd
			1EP	50	--	90	mcd
Viewing Angle	I _F =20mA	2 1/2	--	140	--	deg	
Reverse Current	V _R =5V	I _R	--	--	10	μA	
Thermal Resistance.	I _F =20mA	R _{THJ-S}	--	--	450	/W	

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

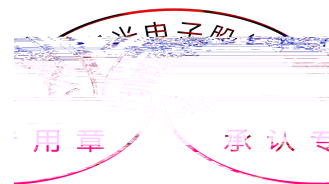
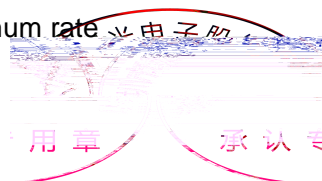


Table 1-2 Absolute Maximum Ratings at Ts=25°C

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



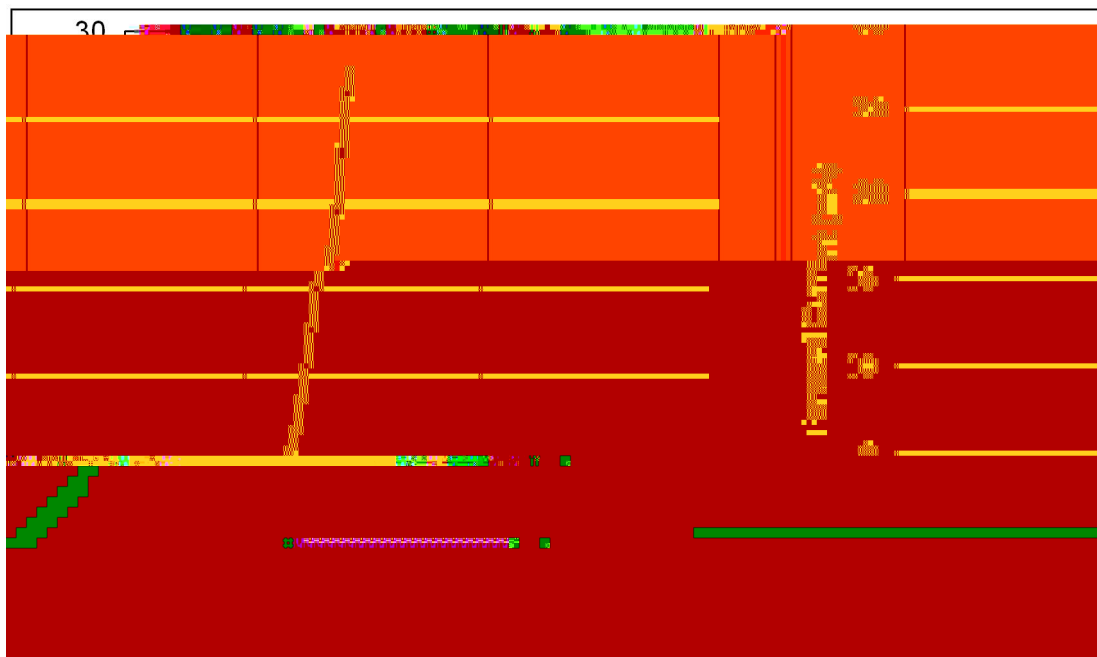


Fig 1-6 Forward Voltage Vs Forward Current

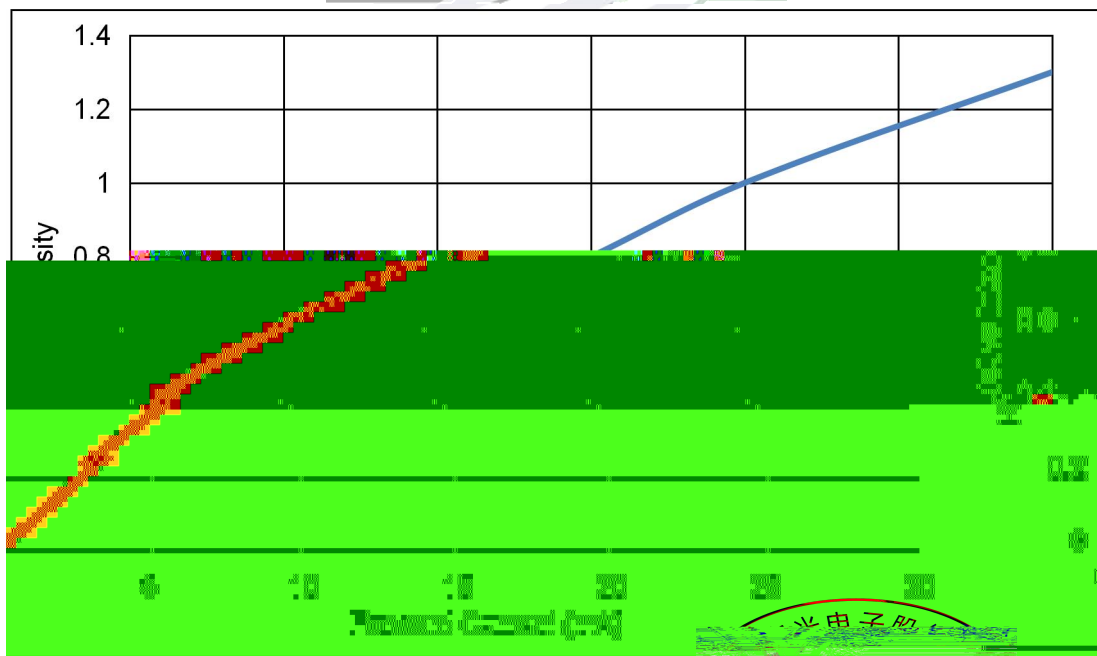
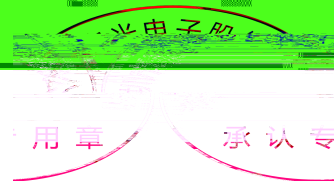


Fig 1-7 Forward Current Vs Relative Intensity



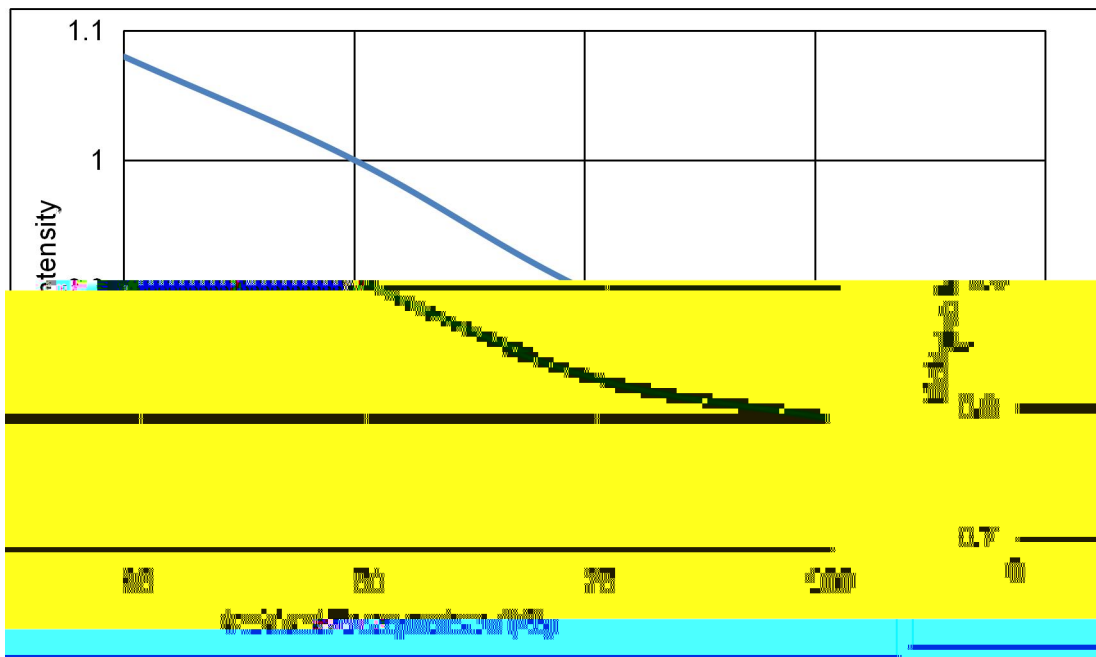


Fig 1-8 Pin Temperature Vs Relative Intensity

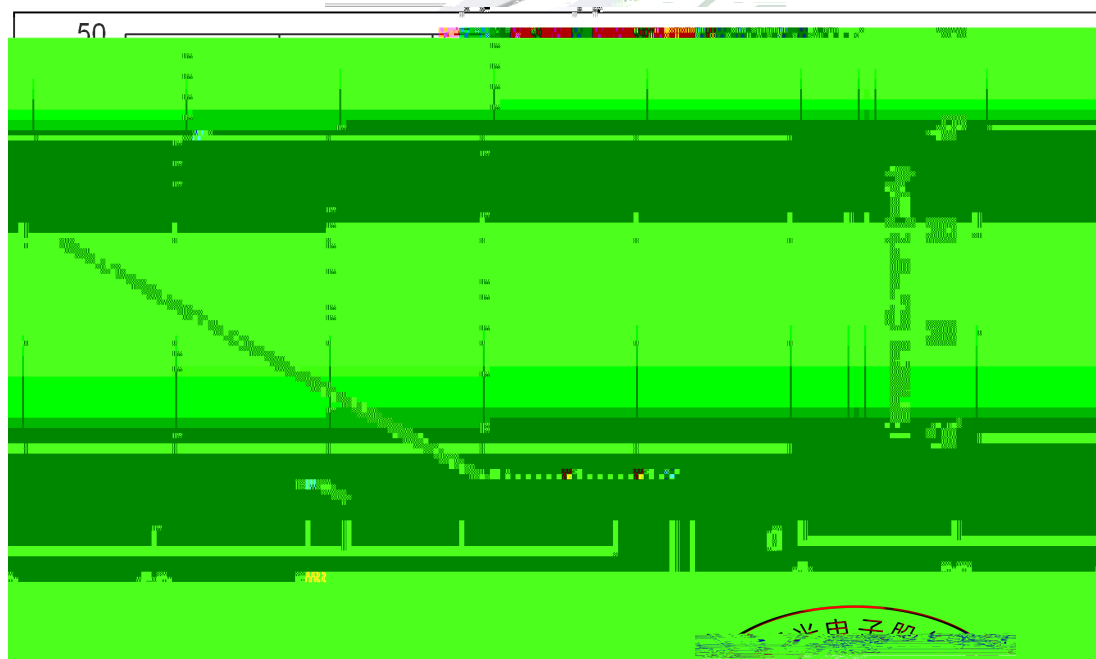
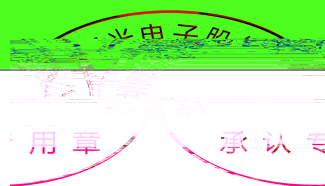


Fig 1-9 Pin Temperature Vs Forward Current



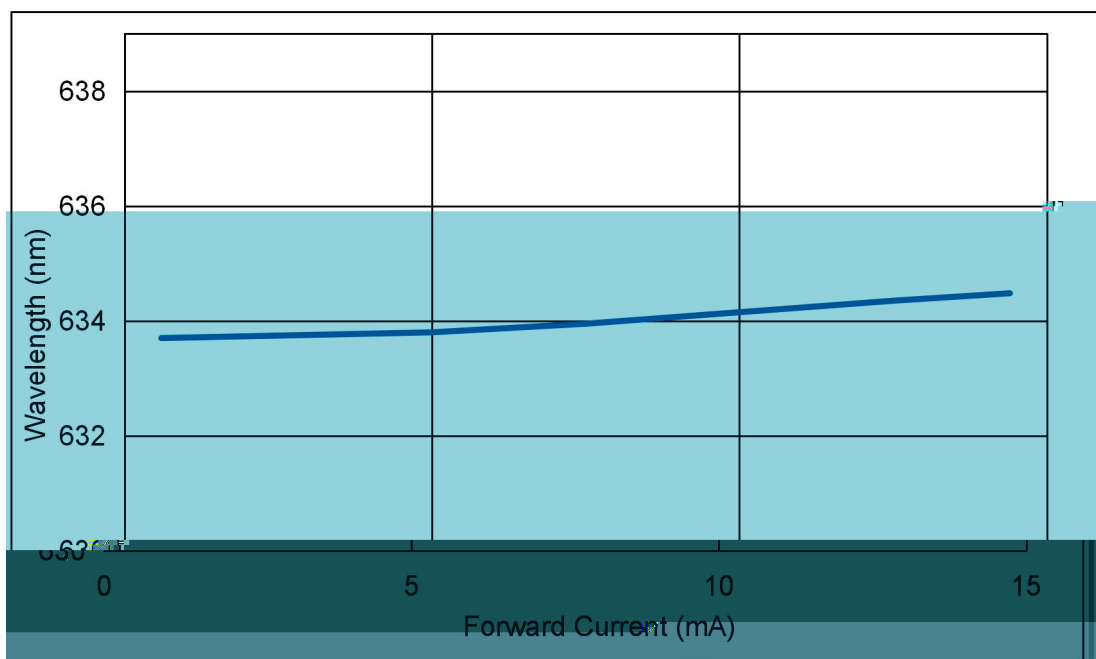


Fig 1-10 Forward Current Vs Dominate Wavelength (Ta=25 °C)

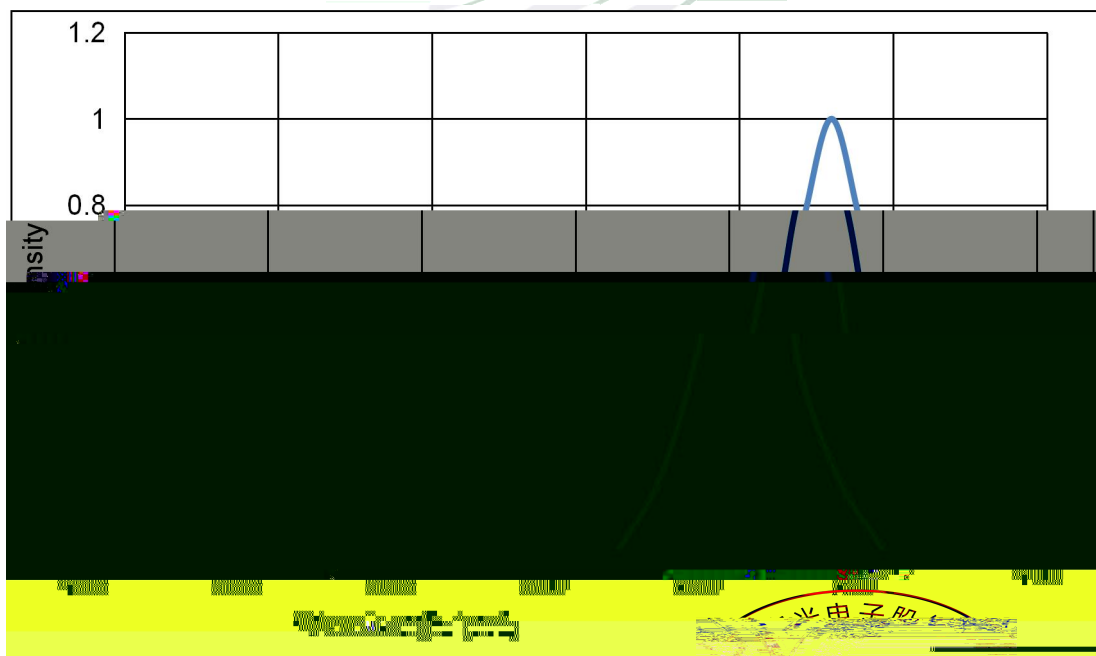


Fig 1-11 Relative Intensity Vs Wavelength (Ta=25 °C)

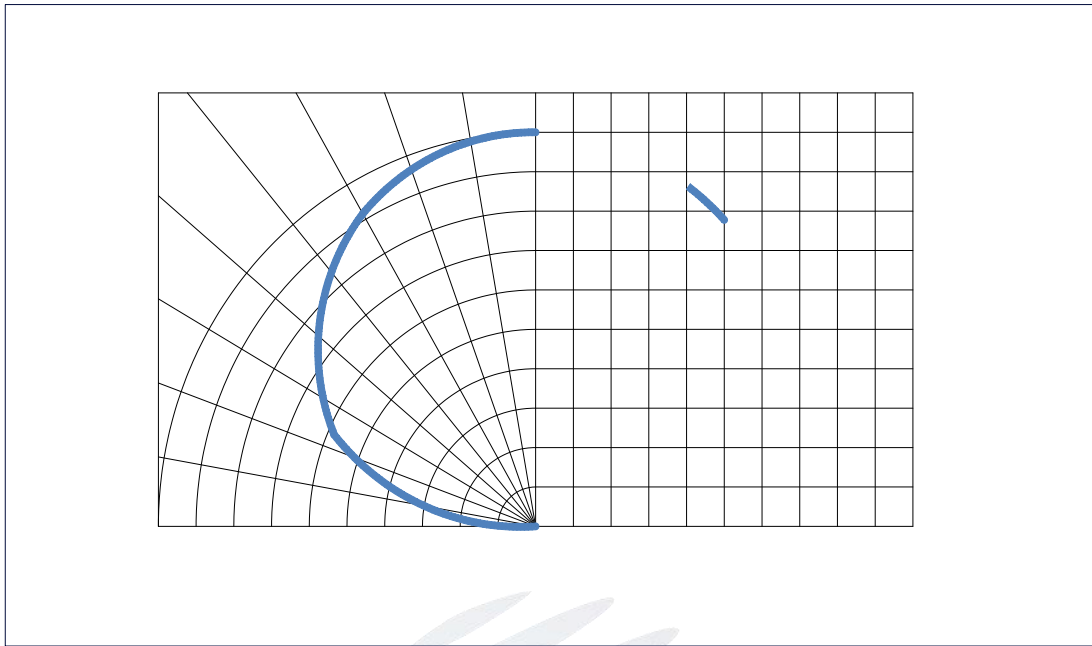
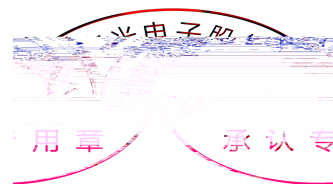
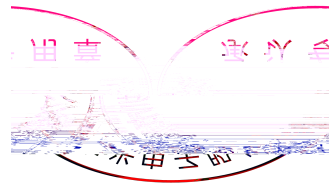


Fig 1-12 Diagram characteristics of radiation





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
	Luminous flux
XY	Chromaticity Bin
V _F	Forward Voltage
WLD	Wavelength
QTY	Packing Quantity
DATE	Made Date

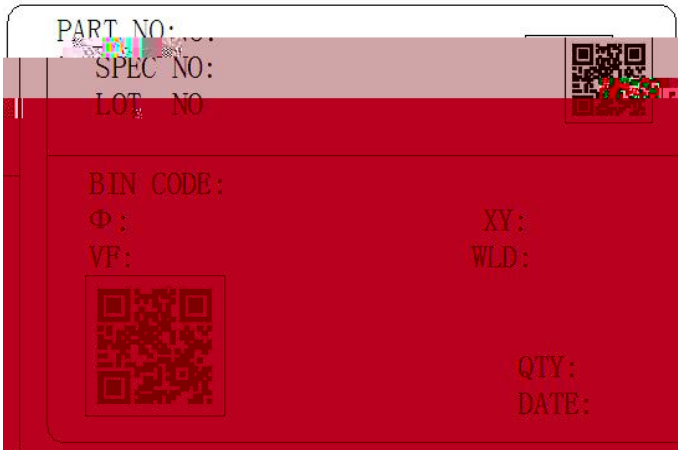


Fig. 2-3 Label Form Specification

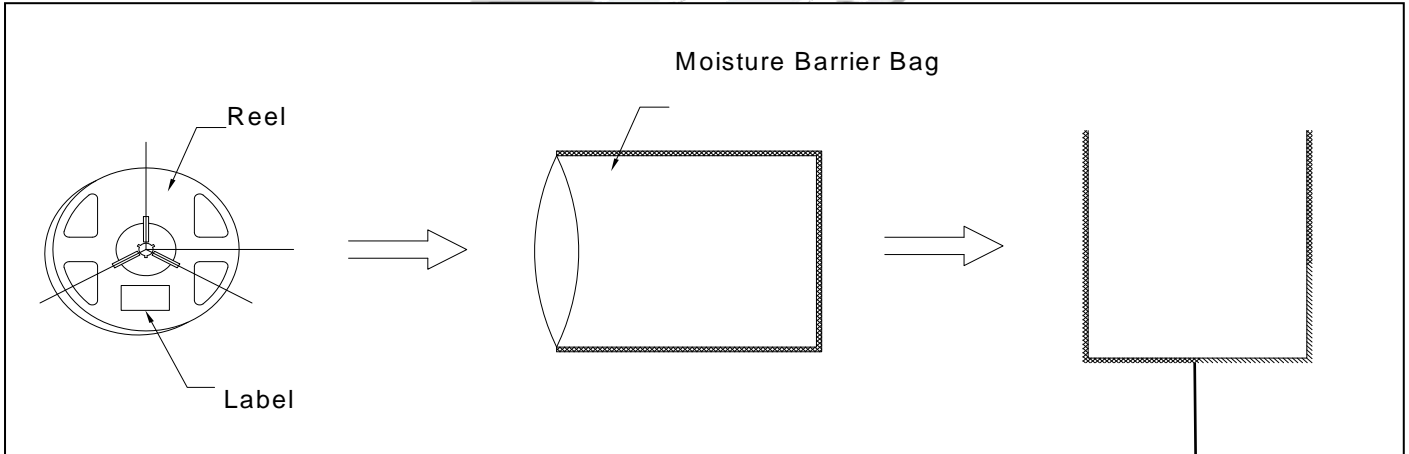
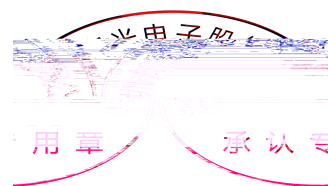


Fig. 2-4 Moisture Resistant Packing



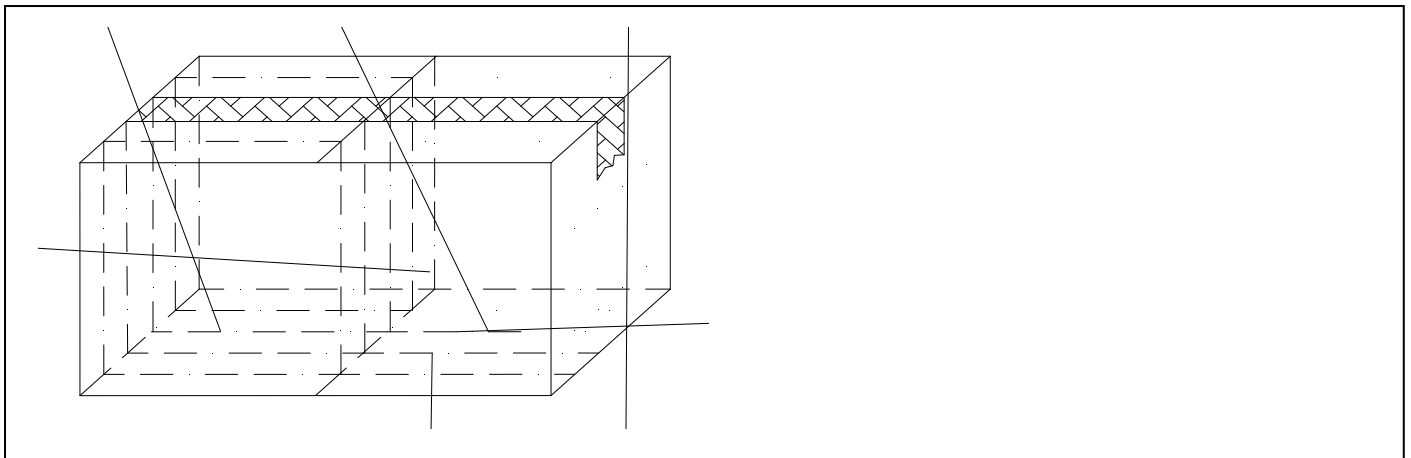


Fig.2-5 Cardboard Box

Table 2-3 Reliability Test Items And Conditions

Test Items	Ref.Standard	Test Condition	Time	Quantity	Ac/Re /
Reflow	JESD22-B106	T _{emp} :260 max T=10 sec	2 times	22Pcs.	0/1
Temperature Cycle	JESD22-A104	100 30 min 5 min -40 30 min	100 cycles	22Pcs.	0/1
Thermal Shock	JESD22-A106	-40 15min 100 15min	300 cycles	22Pcs.	0/1
High Temperature Storage	JESD22-A103	T _{emp} :100	1000 hrs.	22Pcs.	0/1
Low Temperature Storage	JESD22-A119	T _{emp} :-40	1000 hrs.	22Pcs.	0/1
Life Test	JESD22-A108	T _a =25 I _F =20mA	1000 hrs.	22Pcs.	0/1



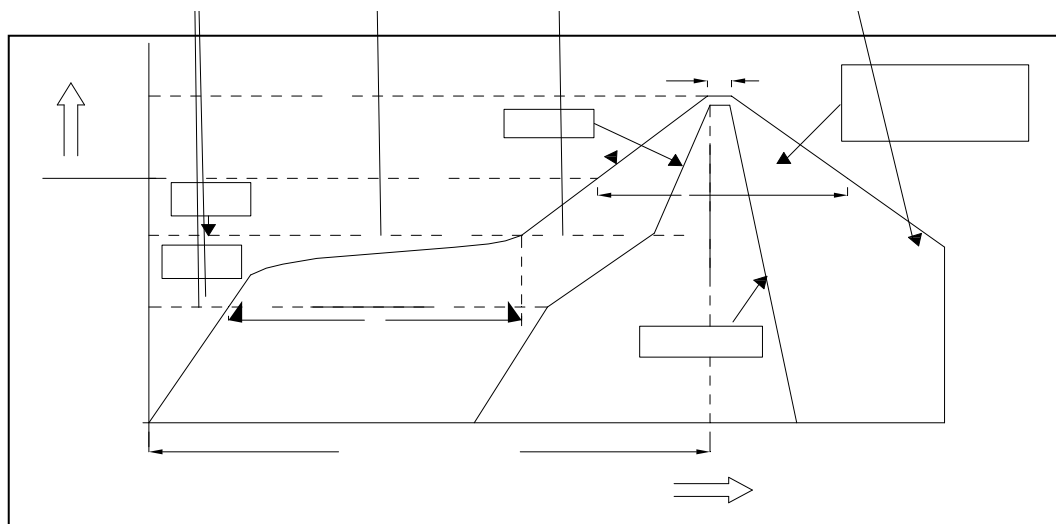


Fig.3-1 SMT Reflow Soldering Instructions – SMT

Table 3-1 Parameter

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
Hold time within 5 °C with the actual peak temperature (TP)	(T_P)	30	Max 30s
Cooling speed		6 °C/ s	Max 6 °C/ s
Needed time	to T_p	8	Max 8

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

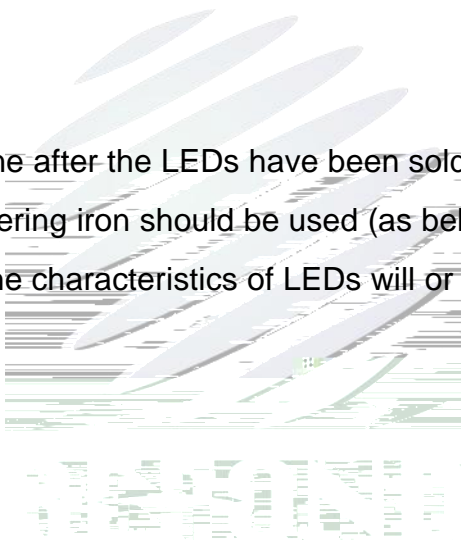
(1) When do soldering by hand, keep the temperature of iron below less 300 less than 3 seconds

(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.

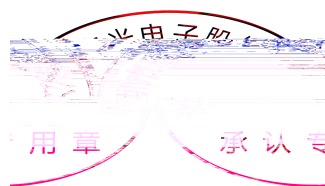
LED



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

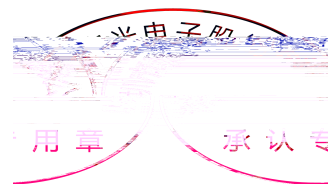
(2) Do not apply mechanical force or excess vibration during the cooling process to normal temperature after soldering. Do not rapidly cool device after soldering.



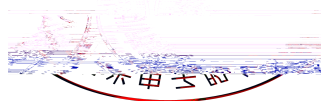
LED...ing environment and sulfur element composition cannot be over 100PPM.
LED...ing usage material. This is provided for informational purposes only and is not a warranty
or endorsement.LED

(2) In order to prevent ex-ternal material from getting into the inside of LED, which r...ctuse the
malfunction of LED, the single content of Bromine element is required to be less than
900PPM,the single content of Chlorine elementis required to be less than 900PPM,
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.

b) VOCs (volatile organic compounds) emitted from materials used in the construction of fixt...
can penetrate the silicone encapsulant...LEDs and discolor when exposed to heat and ultraviolet
energy. The result can be...ant loss of light output from the fixture. Knowledge of the
poricity.



(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 added in series.







Declare

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

