SPECIFICATION

REFOND P/N

RF-TUL191TS-BC-E1

■

□Mass Product

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4.1 Handling Precautions

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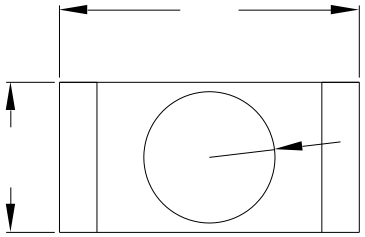


Fig.1-1 Top view

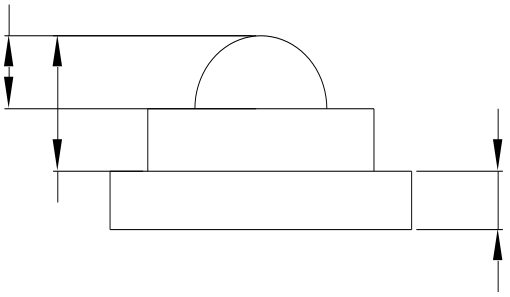


Fig.1-2Side view

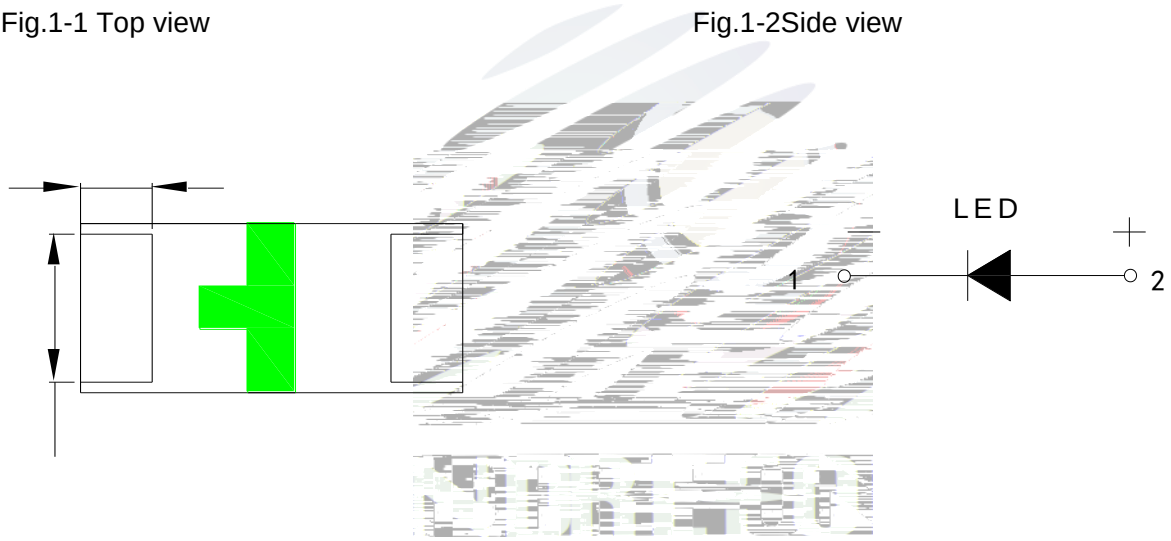


Fig.1-3Bottom view

Fig.1-4Polarity

Notes

All dimensions units are millimeters.

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

1.5 Product Parameters

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	Δ		--	15	--	nm
Forward Voltage	I_F=20mA	V_F	E0	2.4	--	2.6	V
			F0	2.6	--	2.8	V
			G0	2.8	--	3.0	V
			H0	3.0	--	3.2	V
			I0	3.2	--	3.4	V
			J0	3.4	--	3.6	V
Luminous Intensity	I_F=20mA	I_V	D00	515	--	520	nm
			E00	520	--	525	nm
			F00	525	--	530	nm
			G00	530	--	535	nm
			J00	350	--	530	mcd
			K00	530	--	800	mcd
			L00	800	--	1200	mcd
Viewing Angle at 50% IV	I_F=20mA			--	60	--	deg
Reverse Current	V_R=5V	I_R		--	--	10	μA
Thermal Resistance	I_F=20mA	R_{THJ-S}		--	--	450	/W

Note :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	108	mW
Forward Current	I_F	30	mA
Peak Forward Current Of Pulse	I_{FP}	60	mA
Electrostatic Discharge (HBM)	E_{SD}	1000	V
Operating Temperature	T_{opr}	-40 ~ +85	
Storage Temperature	T_{stg}	-40 ~ +85	
Junction Temperature	T_j	95	

Notes

1. 1/10 Duty cycle, 0.1ms pulse width.

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

3. The above dominant wavelength measurement allowance tolerance is±2nm. ±

4. The above luminous intensity measurement allowance tolerance ±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

1.6 Typical optical characteristics curves

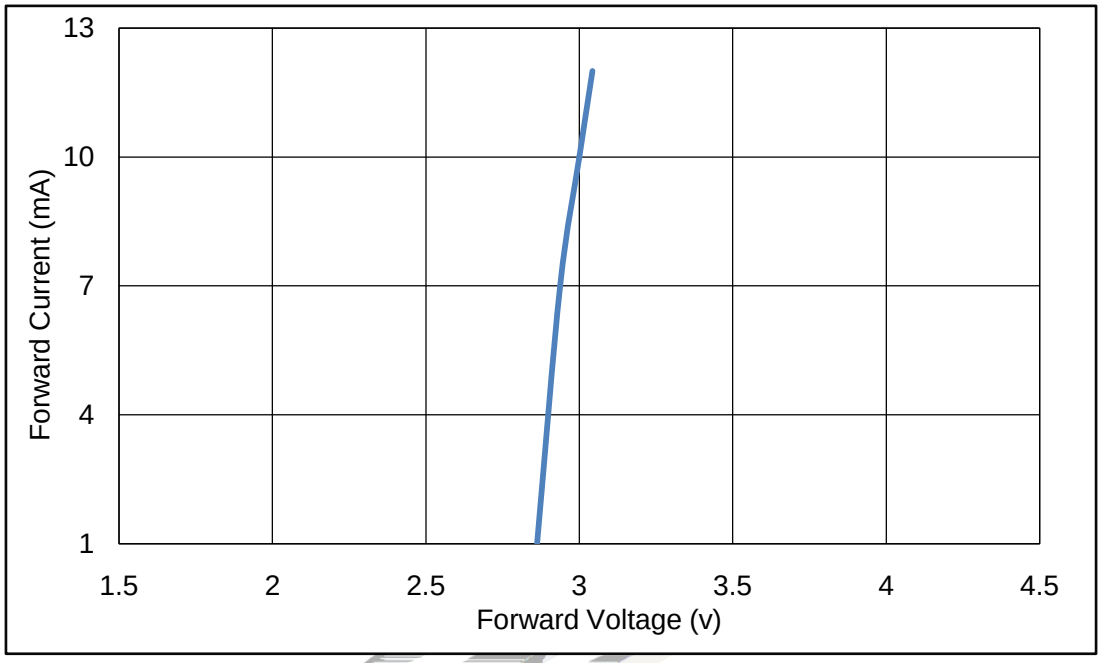


Fig 1-6Forward Voltage Vs. Forward Current

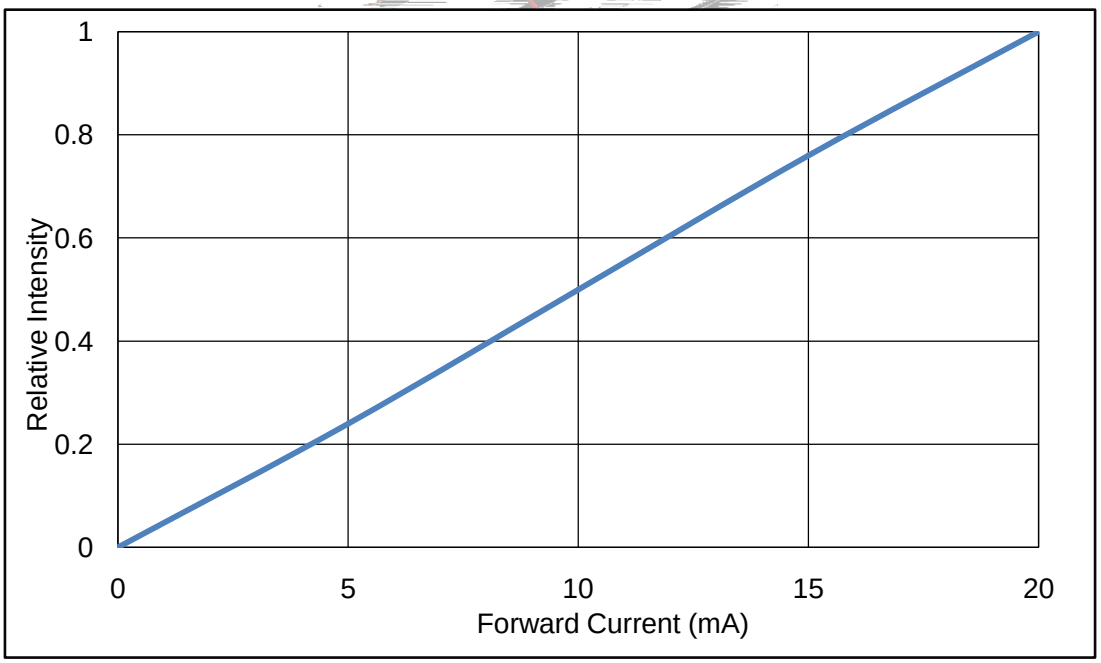


Fig 1-7Forward Current Vs. Relative Intensity

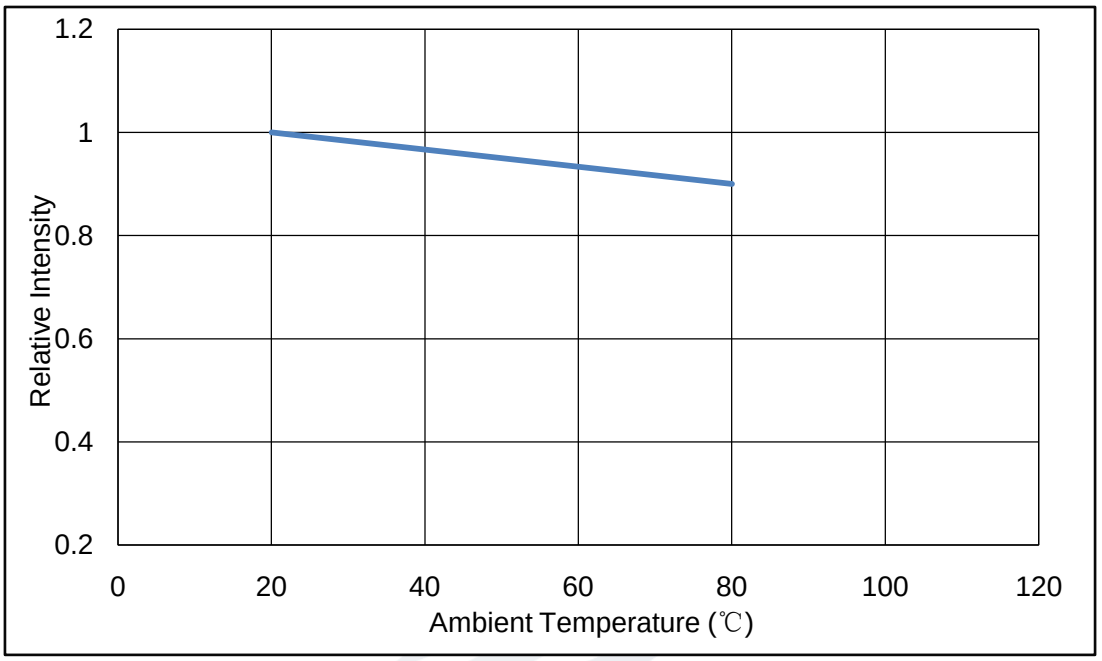


Fig 1-8Solder Temperature Vs Relative Intensity

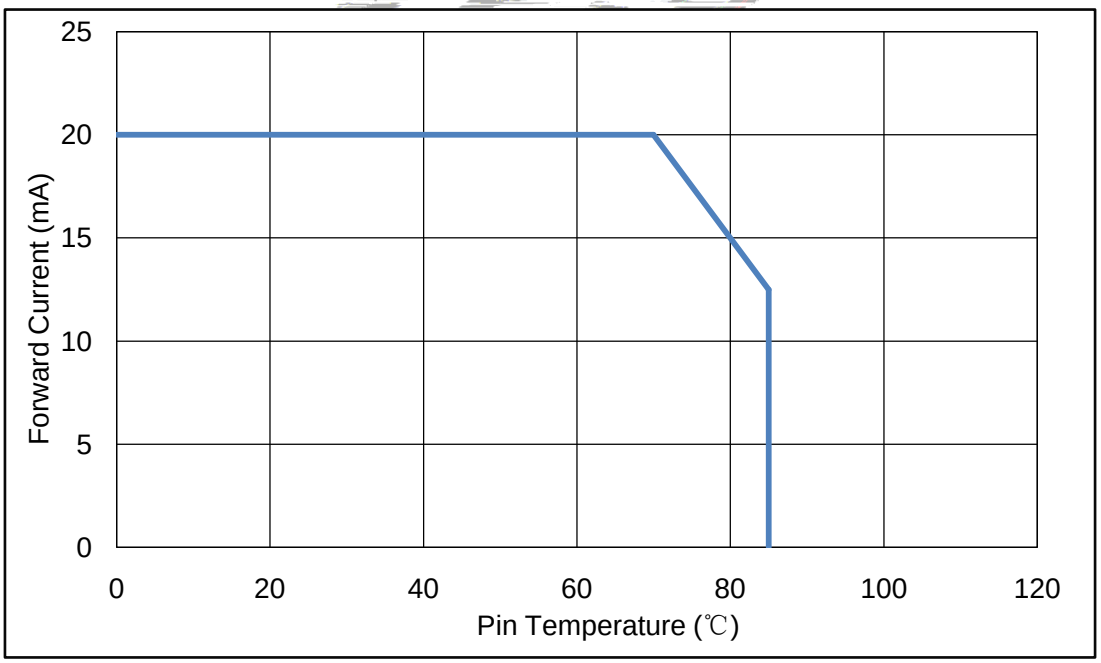
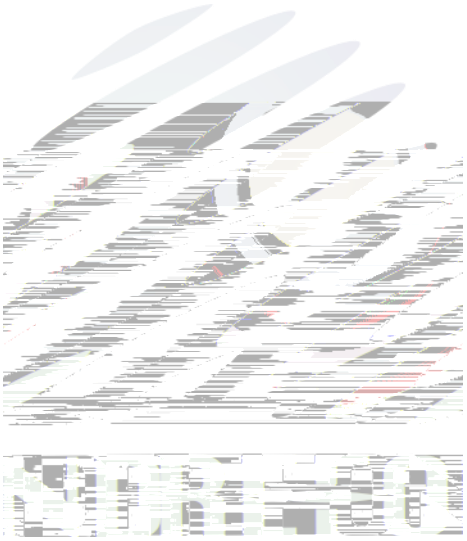


Fig 1-9Solder Temperature VsForward Current



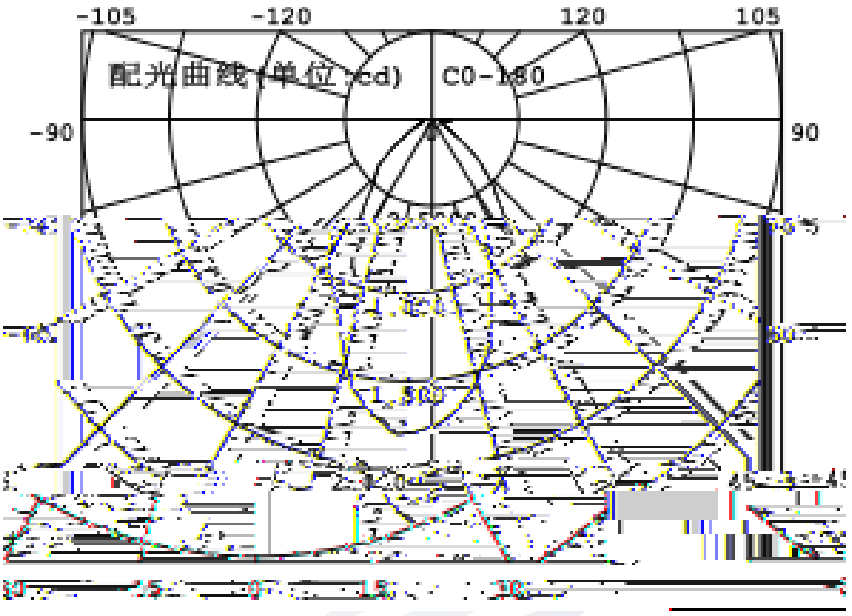
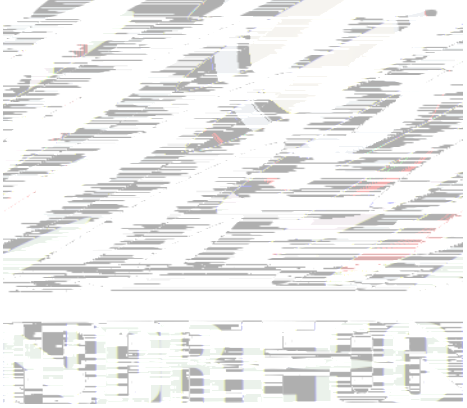


Fig.1-13 Diagram characteristics of radiation



2. Packaging

2.1 Packaging Specification

Package:4000pcs/reel. 4000pcs

Carrier Tape Dimension

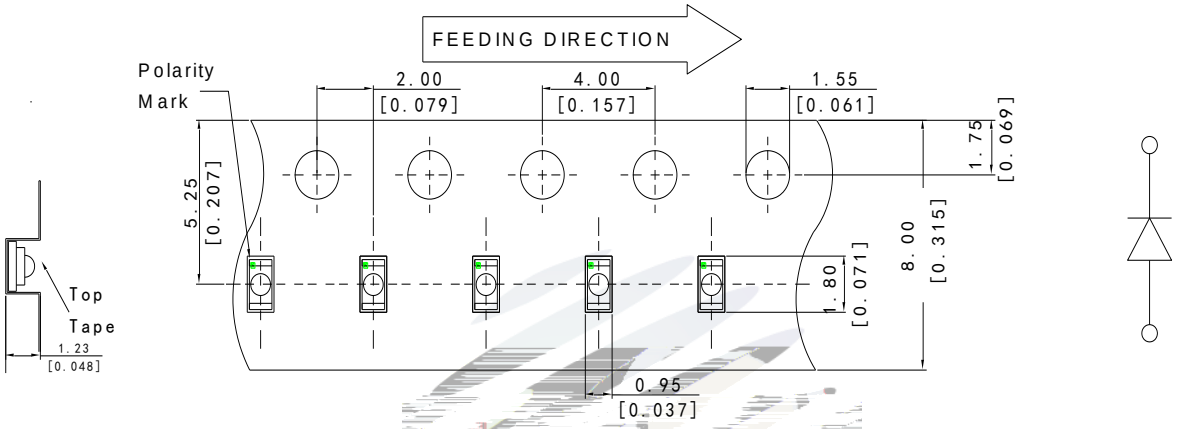
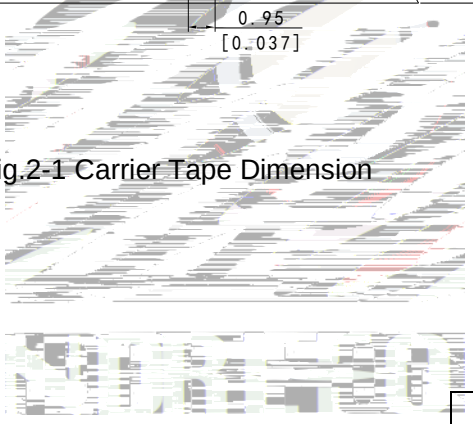


Fig.2-1 Carrier Tape Dimension

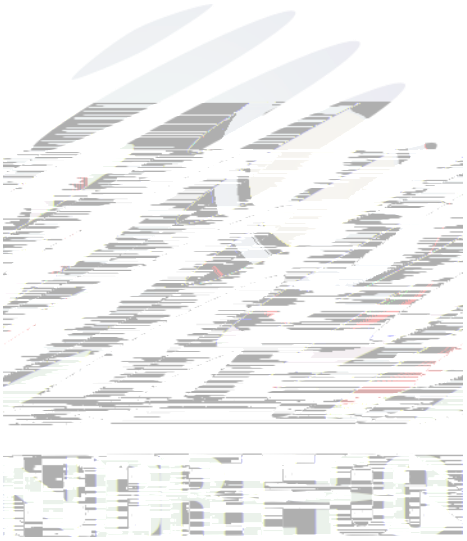
2.1.2 Reel Dimension



A	8.0±0.1mm
B	178±1mm

Fig 2-2 Reel Dimension

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



2.3 Cardboard Box

Fig 2-5 Cardboard Box

2.4 Reliability Test Items And Conditions

Table 2-3 Reliability Test Items And Conditions

Test Items	Ref.Standard

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=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 Reliability tests are based on Refond existing test platform.

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

3. SMT Reflow Soldering Instructions SMT

3.1SMT Reflow Soldering Instructions SMT

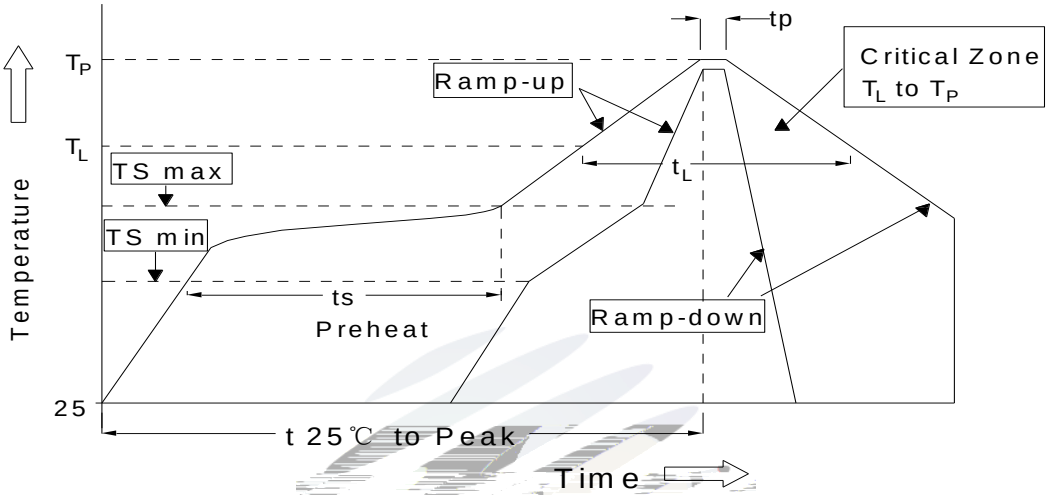


Fig.3-1SMT Reflow Soldering Instructions SMT 回流焊说明

Table 3-1Parameter 参数

Tsmax TP	3 °C/
(Tsmin)	150 °C
(Tsmax)	200 °C
Tsmin Tsmax	60 - 120
(TL)	217 °C
(tL)	60
/ (TP)	260 °C
tp	10
(TP) 5 °C	30
	6 °C/
25 °C	8

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 LEDmating 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 may cause 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,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.

(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 theuse of any chemicals or materials that have been found or are suspected to have an adverse affect on device performance or reliability. To verifycompatibility, Refond recommends that all chemicals and materials be tested in the specific application and environment for which they are intended tobe used. Attaching LEDs, do not use adhesives that outgas organic vapor.

(4) Handle the component along the side surface by using forceps or appropriate tools; do not directlytouch or Handle the silicone lens surface, it may damage the internal circuitry.

(5) In designing a circuit,the current through each LED must be exceed the absolute maximum rating specified for each LED.In the meanwhile,resistors for protection should beapplied, 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.

(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)Storage

Table 4-1 Storage

Conditions		Temperature	Humidity	Time
Storage	Before Opening Aluminum Bag	℃	75%	Within 1 Year from Delivery Date
	After Opening Aluminum Bag	℃		168hours 168
Baking		60±5℃	-	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

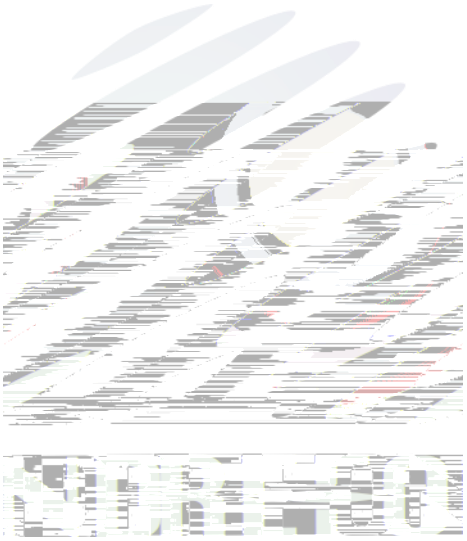
following condition（60±5）℃ for above 24 hours.

±

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

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

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



Version History/

Date	Revisor	Version	Verifier	Remarks
2018-12-23		E0		

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Declare

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