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4.1 Handling Precautions	20

1. Description

1.1



The White LED which was fabricated using a blue chip and the phosphor.

Dimension :3.0mmX1.5mmX1.38mm.

LED è ¾ GAWI#OU>DÖBO&`Uö#OO R!0MÉ. ‡ ö 3.0mmX1.5mmX1.38mm í

1.2 Features

PLCC Package. PLCC.

Extremely wide viewing angle. &`#Ø\ a15+¶

Suitable for all SMT assembly and solder process. b'G-! 4I9~I SMTQS[T' C™640tU

Available on tape and reel. b'G-! b 0µ&Y& b

Moisture sensitivity level: Level 3. hÁÁýMØQ6 Level 3

RoHS compliant. Ap`BRoHS\ >Ñ

1.3 Application

Hotels, markets, offices, household and other indoor uses. cá1& `iÕ)É `%-#û.3 ì.E.Ô &Y\$!e.3\$ G·b£

Optical indicator. #Ø-õ5-KÉ

Indoor display. .3\$ 8ÍKÉ

Decorative lighting. [TkÿCö8•MØ

General use. \$!e1#G·

1.4 Package Dimension .•[T.É.‡

Fig.1-1 Top view =òĩñ\U)•

Fig.1-2 Side view "6ĩñ \U)•

Fig.1-3 Bottom view S[iĩñ\U)•

Fig.1-4 Side view "6ĩñ \U)•

Fig.1-5 Soldering patterns 67U3C701E3 10.56 T100 0 1 T43TETIEMC 1()IETIEMC 40 M(F)IEM

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	$I_F=20\text{mA}$	2.6	---	3.4	V
Reverse Current	I_R	$V_R=5\text{V}$	---	---	10	μA
Luminous Flux		$I_F=20\text{mA}$	6	---	12	lm
Viewing Angle	2 1/2	$I_F=20\text{mA}$	---	120	---	deg
Color Rendering Index ()	R_a	$I_F=20\text{mA}$	80	---	---	---
Thermal Resistance.	R_{THJ-S}	$I_F=20\text{mA}$	---	65	---	$^{\circ}\text{C}/\text{W}$

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

Parameter	Symbol	Rating	Units
Power Dissipation	P_D	132	mW
Forward Current	I_F	40	mA
Peak Forward Current	I_{FP}	100	mA
Reverse Voltage	V_R	5	V

Notes

1. 1/10 Duty cycle, 0.1ms pulse width. $S \sim L 0.1ms, \%iM > d/10$.
2. The above forward voltage measurement allowance tolerance is $\pm 0.1V$. $It \text{ } ^{TM}4\ddot{K}\acute{E}G\ddot{A}\& \text{ } ?\acute{U}d\wedge\sim 0\ddot{s} \quad 9$
3. The above color coordinates measurement allowance tolerance is $s0.005$. $It \text{ } ^{TM}4\ddot{K}\acute{E})\beta:-? \acute{U}d\wedge\sim 0\} \text{ } s0.005$.
4. The above luminous intensity measurement allowance tolerance $\pm 10\%$. $^{TM}b\bullet\& \text{ } \#01\acute{E}15I \text{ } ?\acute{U}d\#D\wedge G\#\acute{u}0\} \text{ } \acute{E}$
5. The above Color Rending Index measurement allowance tolerance is ± 1 . $It \text{ } ^{TM}4\ddot{K}\acute{E}Ra? \acute{U}d\wedge\sim 0\} \text{ } \pm 1$.
6. Care is to be taken that power dissipation does not exceed the absolute maximum rating of the product. $'D\acute{D} \text{ } \%F \text{ } \acute{\alpha}S\acute{C}\acute{E} \text{ } bV\wedge S.)I \text{ } 9\bullet+\ddot{r}\text{ } \acute{E} \text{ } \acute{I}$
7. All measurements were made under the standardized environment of Refond. $4\ddot{I}9\sim? \acute{U}d\wedge c\acute{C}\acute{E}8\frac{3}{4}\%!\text{ } F\acute{I} \text{ } \acute{J}F?9\text{ } \acute{I} :- \text{ } \$U? \acute{U}d1 \text{ } \&\bullet \text{ } \acute{I}$
8. 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. $LED \text{ } " \text{ } G\text{ } \cdot \text{ } I \text{ } 9\bullet+\ddot{r}\text{ } \text{ } G\ddot{A}?\acute{D}i\wedge \text{ } : \acute{E}5\acute{y}7\delta C| \text{ } 9\delta! \dots \acute{J}\acute{y}.) \text{ } \acute{e}Qb@, \text{ } \acute{\alpha}S\acute{C}\acute{E} \text{ } bV9\bullet+\ddot{r}\text{ } \acute{E} \text{ } \acute{I}$

1.6 Bin Range Of Forward Voltage and Luminous Flux (IF=20mA)GÄ& •?D8•\$• BIN U')f (IF=20mA)

Table 1-3

V _F (V)	F2	G1	G2	H1	H2	I1	I2
	2.7-2.8	2.8-2.9	2.9-3.0	3.0-3.1	3.1-3.2	3.2-3.3	3.3-3.4

RF-27HC

1.8 Typical optical characteristics curves \$ * #Ø-õE 2¶9•QN

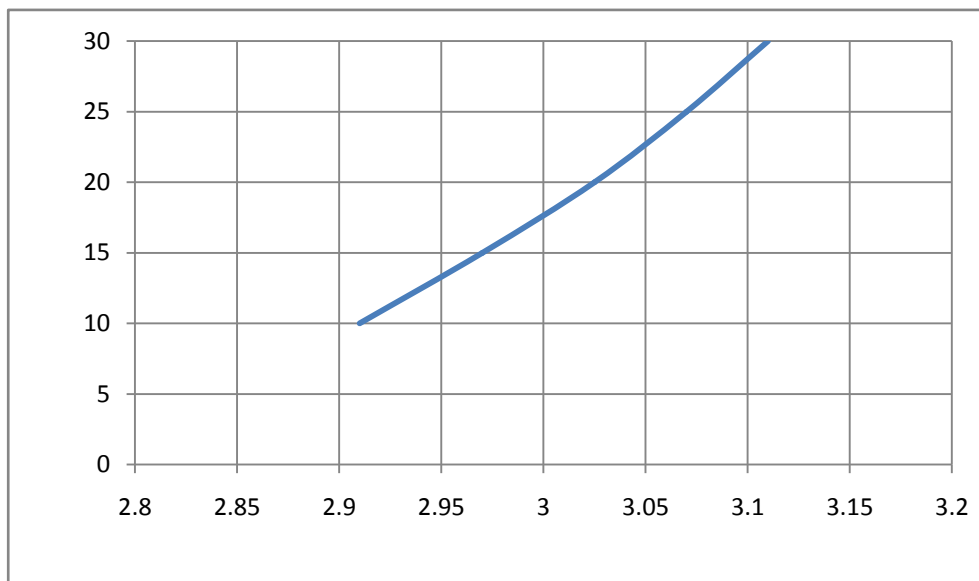


Fig 1-8 Forward Voltage Vs. Forward Current !ž. E 2¶9•QN

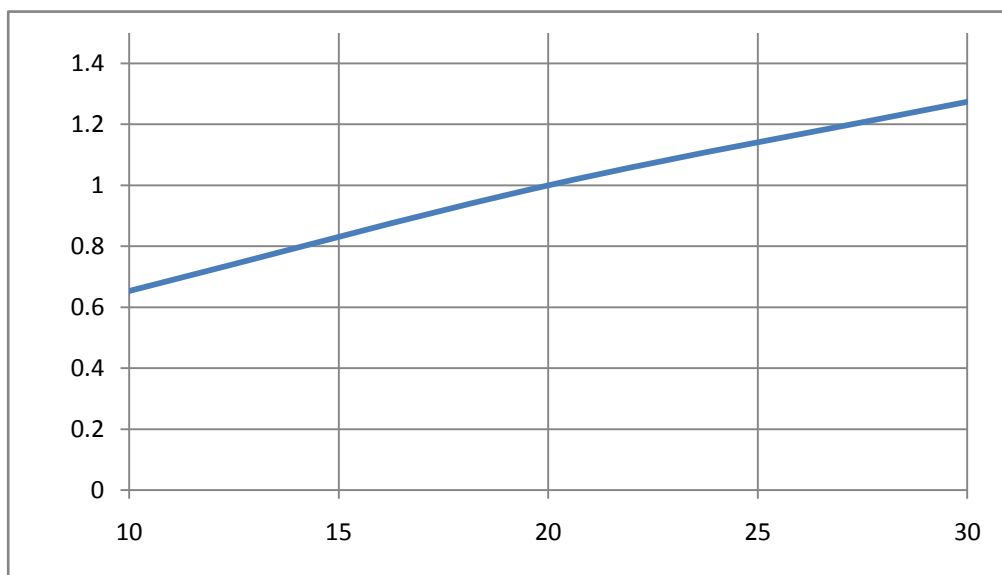


Fig 1-9 Forward Current Vs. Relative Intensity =ò& GÄ?Đ •!ž. #Ø1ÉE 2¶9•QN

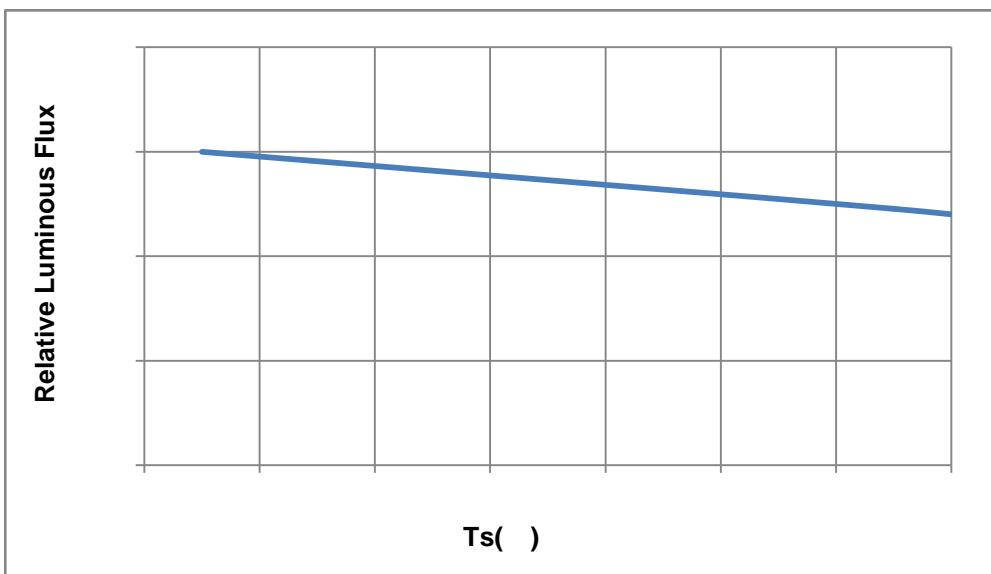


Fig 1-10 Solder Temperature Vs Relative Intensity N0S©@,15 •İ.ˆ#Ø1ÉE 2¶9•QN

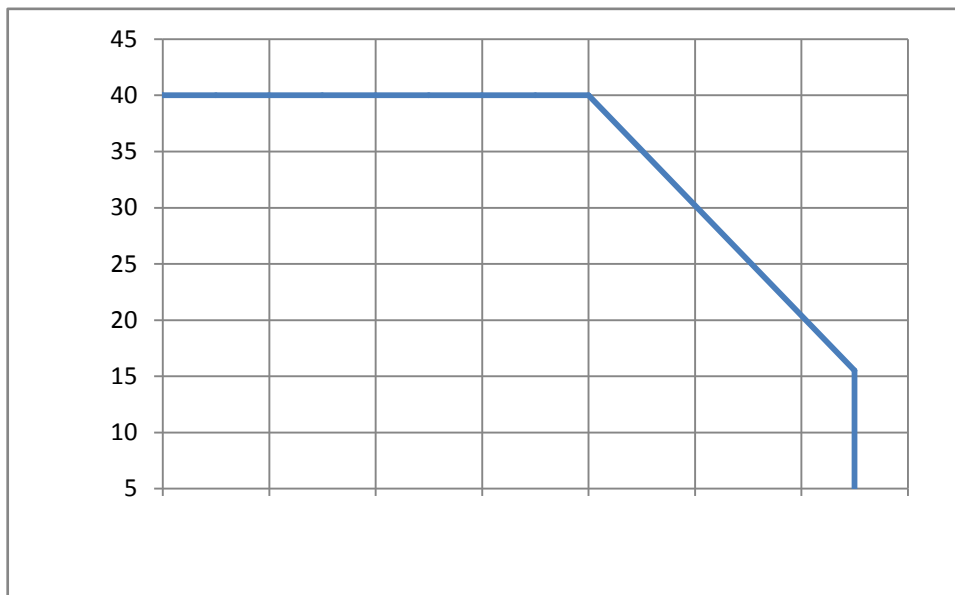


Fig 1-11 Solder Temperature Vs Forward Current N0S©@,15 •=ò& GÄ?DE 2¶9•QN

Tj 72

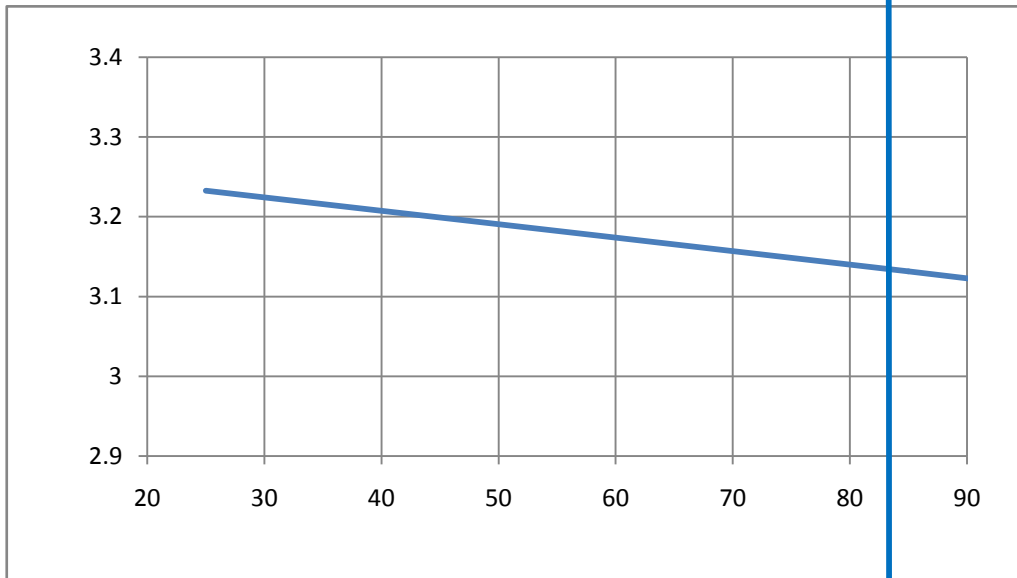


Fig 1-12 Forward Voltage Vs Solder Temperature

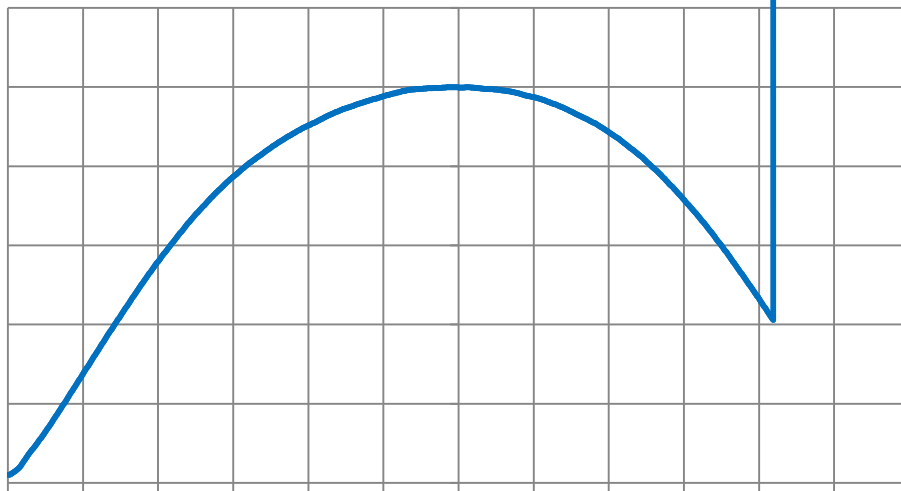


Fig 1-13 Radiation diagram

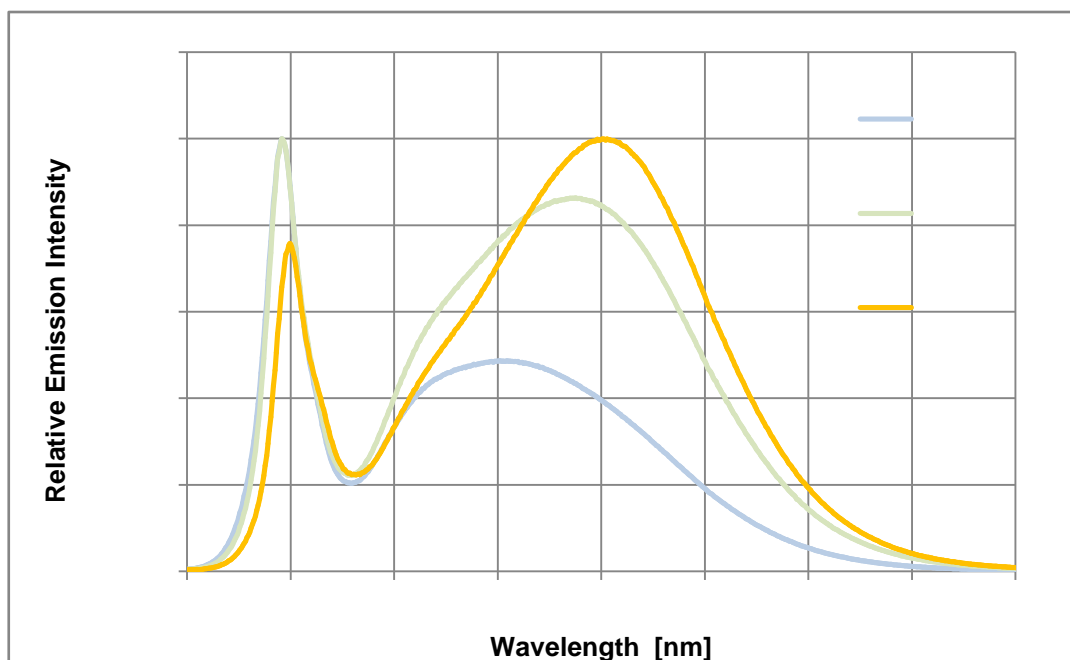


Fig 1-14 Spectrum Distribution#0^À\$•0'E 2¶9•QN

2. Packaging !6'P%"[T

2.1 Packaging Specification %"[\S:Ë

Package:Max 3000pcs/reel l.%"[\T>^& 9•+©3000pcs í

2.1.1 Carrier Tape Dimension b 0μ.É.‡

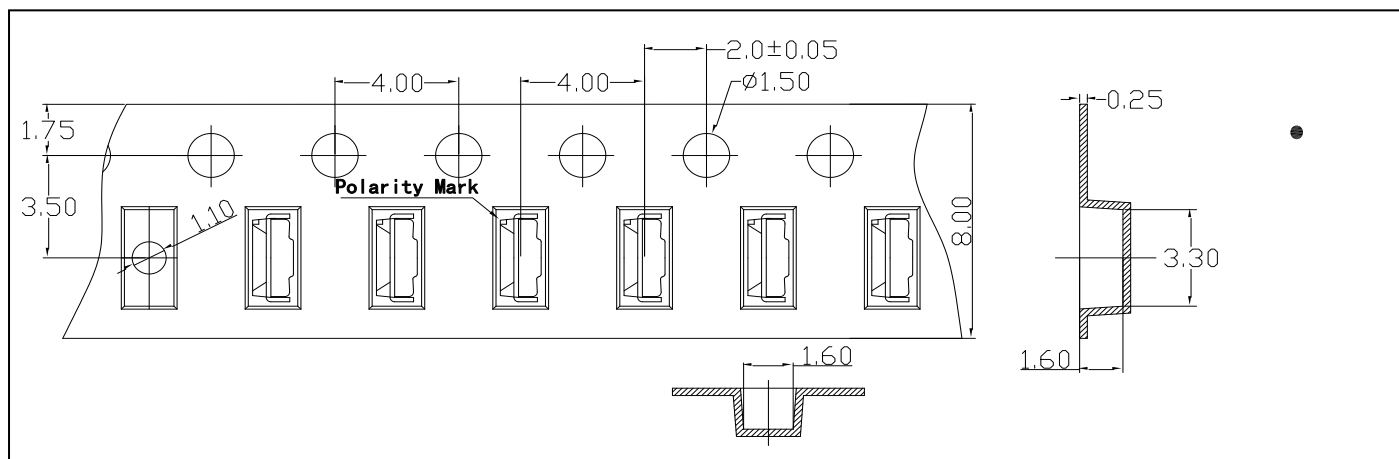


Fig.2-1 Carrier Tape Dimension b 0μ.É.‡

2.1.2 Reel Dimension & Ig.É.‡

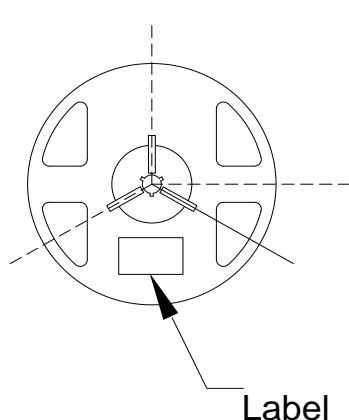


Fig.2-2

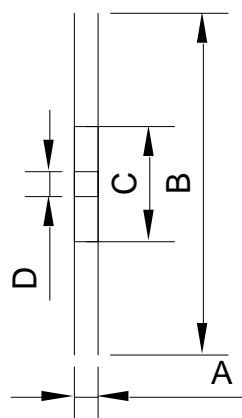


Table 2-1

A	11.7 ±0.1mm
B	178 ±1mm
C	58.5 ±1mm
D	13.5 ±0.5mm

Notes +—?wö

The tolerances unless mentioned ±0.1mm. Unit : mm <pÉ6Ò<•! -- â ±0.1;“L è +â+ "ý öpÉ;“L í

2.5 Criteria For Judging Damage +À7x\$³.):-\$U

Table 2-4 Criteria for judging damage +À7x\$³.):-\$U

Test Items k l}	Symbol Mμ&†	Test Condition ?Ú^d9đ!...	Criteria For Judgement \$³.):-\$U	Applicable project b'G-k l}
Forward Voltage GÄ&	V _F	I _F =20mA	7 ±0%	Reflow Thermal Shock
Luminous Flux #Øb@d^		I _F =20mA	Maintenance 80% #Øb@d^Qf5•F80%	High and Low Temperature Storage Life Test
Lamp Bead Light Test BpFoCH!=?Ú^d	/	I _F =20mA	No open circuit short circuit or flicke 8o1•` ~ ìJ ` ~ ìhy&g	High Temperature High Humidity Life Test

Notes +--?wö

1.U.S.L: Upper standard level \S:Ë™hß L.S.L: Lower standard level \S:Ë šhß

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. It™&-ii2¶ ?Ú^d8¾%o! Fí ¿F?9~.m 1 &•%äk&9đ LED)-Tp, 7ò C|9đ!...m ^P šl Qb:+ í.14ÆM~.•LED 1#G-! Á ì1 RãQN` ~ 8..èi•TyZÛ^S!¿GÄ?Đ ìGÄ& \$•cÜ ì7òC|MØh}kí

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. It™5 9¾47ÿ5ÿ!T É!6'PI \$ * "Ë è&y!ë É&QR' è œlë É!Š!ä1#G-9đ!...&Y1#G-8H1Žl "l ^P í

3. SMT Reflow Soldering Instructions SMT)m?ĐC™^f8•

3.1 SMT Reflow Soldering Instructions SMT)m?ĐC™^f8•

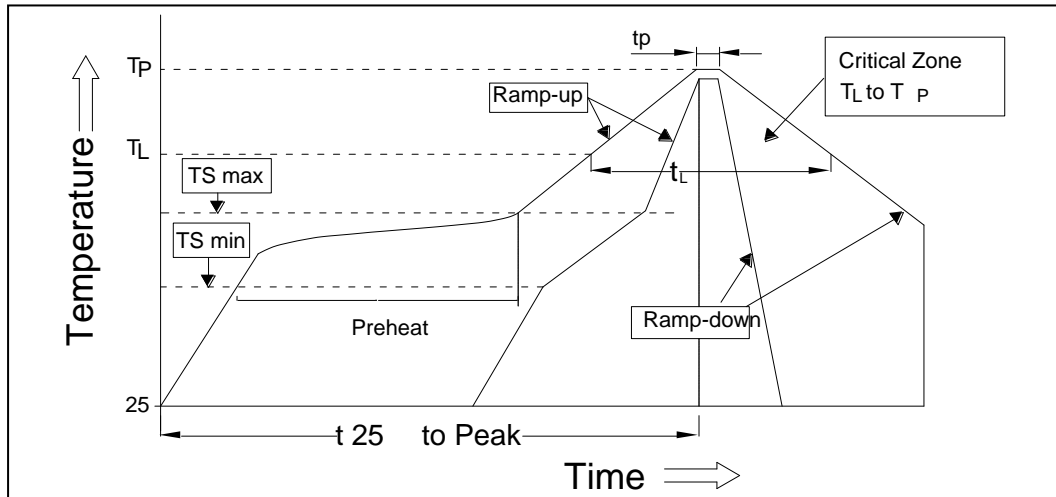


Fig.3-1 SMT Reflow Soldering Instructions SMT)m?ĐC™^f8•

Table 3-1 SMT Reflow Soldering Parameter SMT)m?ĐC™^f8•

Average temperature rise speed	T_{smax} T_P	Max 3 °C/ s 3 °C/
Preheating: minimum temperature	(T_{smin})	150 °C
Preheating: Max temperature	(T_{smax})	200 °C
Preheating: Time	T_{smin} T_{smax}	60s-120s
Time limited to maintain high temperature: the temperature	(T_L)	217 °C
Time limited to maintain high temperature: The Time	(t_L)	Max 60s 60
Peak /Classification of temperature:	(T_P)	260 °C
Time limit classification of peak temperature time	t_p	Max 10s 10
Hold time within 5 °C with the actual peak temperature (T_P) 5 °C	(T_P)	Max 30s 30
Cooling speed		Max 6 °C/ s 6 °C/
Needed time from 25 °C to T_p 25 °C		Max 8 minutes 8

Notes

(1) Reflow soldering should not be done more than two times. In the case of more than 24 hours passed soldering after first, LEDs will be damaged.

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

3.1.1 Soldering Iron

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

(2) The hand solder should be done only one time.

3.1.2 Repairing

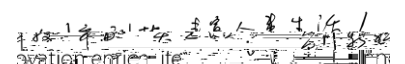
Repair should not be done after the LEDs have been soldered. When repairing is unavoidable, a double-head soldering iron should be used (as below figure). It should be confirmed in advance whether the characteristics of LEDs will or will not be damaged by repairing.

LED

3.1.3 Cautions

(1) 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 influence to 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.

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



(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.

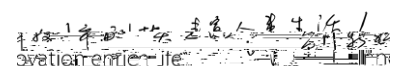
4. Handling Precautions

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.

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



bg8¾!T!T2•H 9~.B íg .^E .)I G•b£' " G•F>+ èFí ¿1%o^=.^4Ï9~I Dø_' 9ß8(bjZÛI‡.H2¶I ?Ú^d í
)._Ã[T LED 8..."" è œ\ " G•SCE!6G@9~9É5´&`2¶>£!âI O'Qb\$Ñ í

(4) Handle the component along the side surface by using forceps or appropriate tools; do not directly touch or Handle the silicone lens surface, it may damage the internal circuitry.b@bV" G•b´
 1âI 0t\$!J9ß8("6iñ+È&e è œ&~I f64G•4Ú4¥.¥gÿd` .í& S...!âZ÷iñ è. &~SCE!©5î)P\$ cwGÄ`~ í

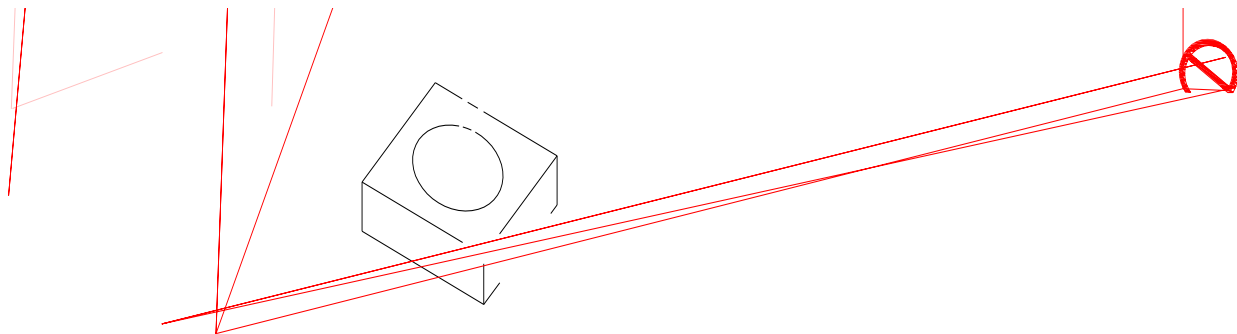
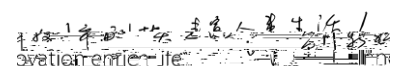


Fig 4-1 Misoperation g^~7!ë

(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 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. ^M^0GÄ`~8... èb@
 bVLED I GÄ?Ð œSCE` bV\S.)I 9•+¶"È è&›8... èbgi• G•"I53GÄhÊ è&µ\$" è2=.žI GÄ& &g%¥.•!©1¤`
 b +¶GÄ?Ð&g%¥ è&~SCE.†f!6'P5î>BÄ`~^M^02Tk "I^P&y9~).1•&¾4¥R"\$ h|| 8...""\$%F?=ò& GÄ& I
 &g%¥ è œ\ 8L%/&\& è&µ\$"!©5î)PLED í

(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 .H8ç)o ÉTya:I &`C|' F>+
 I @,157È&gR>7È&g è@,15%Ömg!©LEDY&`#Ø7×F è2 '\&`#Øk+U è4!t).^M^08...1##Ô\$•R'Xà7òC|
 h}k' í

(7) Compared to standard encapsulants, silicone is generally softer, and the surface is more likely to attract dustp»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.

Table 4-1 Storage #7-ç

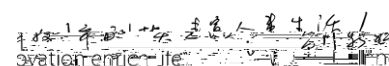
Conditions		Temperature	Humidity	Time
LLO		@,15	A 15	8...hf
Storage	Before Opening Aluminum Bag 5U%"\$Ü	730	775%	Within 1 Year From Date •1 \$
	After Opening Aluminum Bag 5U%"&•	730	760%	24hours 24.ž8...
Baking CgCs		60 s5	-	824hours +¶! 24.ž8...

(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.

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).

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





Declare GÂ8•

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

!6'P\ S :Ë òlt ¼U€8 8H1ž ò\$(è Ut9~\$AM !t ¼8 D×9» É\$Uı