SPECIFICATION

'a1w“ TT&ü

REFOND P/N 'a1w6 0?

RF-A3H22-W64P-E5

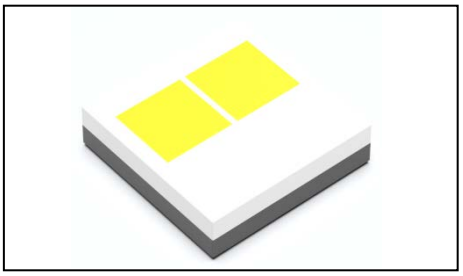
Î 3 % pG0

ÍMass Production¡€'a(Ø™

Contents naE6

1. Description 'a1w'•}O

1.1 General Description 'a1wL½•£



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

Product Package:3.0mmX3.0mmX0.8mm.

—*'a1w&¹m¯+Õ & ‰{PýkK‰°+Õ„ÿfYah0 †ƒ+ÕxË•\ENIíæ{'a1w?o? ö; N N 9 N N 9 N N o

1.2 Features 'a1wfµE„

► Ceramic Package. ©2jØ? ‘3

► Extremely wide viewing angle.0 +Õ“-CÞ8Ð

► Suitable for all SMT assembly and solder process.•Ók='5J>Rcm¸ 4 . ⅋F‘31$cÒLyB¨„Œ

► Available on tape and reel.•Ók='5œ¿C /ú/wœ¶

► Moisture sensitivity level: Level 2.¨È`Ðv }) - F W F M

► RoHS compliant._Ø™È P) ’4[

► Qualifications: The product qualification test plan is based on the guidelines of AEC-Q102 Stress Test Qualification for Automotive Grade Discrete Semiconductors™4TTö;'a1w™4TT]5— –æ-" 6Ç'5 " & $2 [üœ¨})- u(/1? (dC¾.]5— ™4TT,¥--

1.3 Application 'a1wC¾k=

► Automotive Lighting Exterior.œ¨8ªd‘PÈ

1.5 Product Parameters 'a1w/ìO¨

Table 1-1 Electrical / Optical Characteristics at Ts=25°C kOF•&x+Õ=ÖfµF•

Item ¬àna	Symbol u×0?	Test Condition]5— Rõ'Ý	Value			Unit /@(Y
			Min. æwRR?-)éa	Typ. æw,)6)éæx	Max. æwRR8Ð)é	
Forward Voltage æwYû0bkO/“æx	VF	IF=1000mA	5.8	---	7.0	V
Reverse Current æw/ÿ0bkO](æx	IR	VR=10V	---	---	10	uA
Luminous Flux æw+Õž ¡€æx	Φ	IF=1000mA	670	---	1000	lm
Viewing Angle æw0 +Õ“-CÞæx	2θ1/2	IF=1000mA	---	120	---	deg
Thermal Resistance. æwcš¨Öæx	RTHJ-S	IF=1000mA	---	---	3.65	/W

Table 1-2 Absolute Maximum Ratings at Ts=25°C }_? RR8Ð)é

Parameteræw/ìO¨æx	Symbolæwu×0?æ	Ratingæw)éæx	Unitsæw/@(Yæ
Power Dissipation æw. •ræx	P_D	8400	mW
Forward Current æwYû0bkO](æx	I_F	1200	mA
Peak Forward Current æw@½)ékO](æx	I_{FP}	2000	mA
Reverse Voltage æw/ÿ0bkO/“æx	V_R	10	V
Electrostatic Discharge (HBM)æwªýkOæx	E_{SD}	8000	V
Operating Temperature æwN|(r^›CÞæx	T_{OPR}	-40 ~ +125	℃
Storage Temperature æẄ=¸^›CÞæx	T_{STG}	-40 ~ +125	℃
Junction Temperature æẏU^›æx	T_J	150	℃

Notes 8Š\¤ö;

1. 1/10 Duty cycle, 10ms pulse width. •a>ˆ N T/Qt_Zñ

2. The above forward voltage measurement allowance tolerance is ±0.1V. 'Ä&sJ>r kO/“]5¡€—4Bµ p 7

3. The above color coordinates measurement allowance tolerance is p0.005. 'Ä&sJ>r 5ÂSû]5¡€—4Bµp

4. The above luminous intensity measurement allowance tolerance ±10%. &s•£0 +ÕE CÞm¸]5— +È–ý, Bµ&¹ p

5. Care is to be taken that power dissipation does not exceed the absolute maximum rating of the product. (ªk= . hg&v•J™„•B“ >Am¸RR8Ð)é o

6. All measurements were made under the standardized environment of Refond. J>Rc]5— ŸêPý6Ç'5i°&ªh¡Rcm¸ Sû,¥]5— C,05 o

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 - &(%=m¸RR8ÐkO](ª='³TOL O”cšRõ 'ÝpÁ>Aæ{}U^›&v•J™„•BRR8Ð)é o

8. ESD yield is over 90% at 8000V ESD (HBM). ESD protection during products handing is needed. m¸ - & % ž •B'ƒ(dW·D- & 4 % 7]5— 5ˆN|(rPž—<\¤H ªýkO¨ÈJá o

1.6 Bin Range Of Forward Voltage and Luminous Flux (IF= 1000mA) kO/“&x](PÈ - BIN …´5(IF=1000mA) I bVÐÙ bb–vSÓ%ñøE"gƒM•

Fig. 1-6 The C.I.E Chromaticity Diagram CIE„€CÞ5C

Table 1-4

BIN CODE	CIE-X1	CIE-Y1	CIE-X2	CIE-Y2	CIE-X3	CIE-Y3	CIE-X4	CIE-Y4
6N1	0.3073	0.3043	0.3139	0.3107	0.3110	0.3310	0.3033	0.3234
6N2	0.3139	0.3107	0.3206	0.3171	0.3187	0.3386	0.3110	0.3310
6N3	0.3206	0.3171	0.3272	0.3235	0.3264	0.3462	0.3187	0.3386

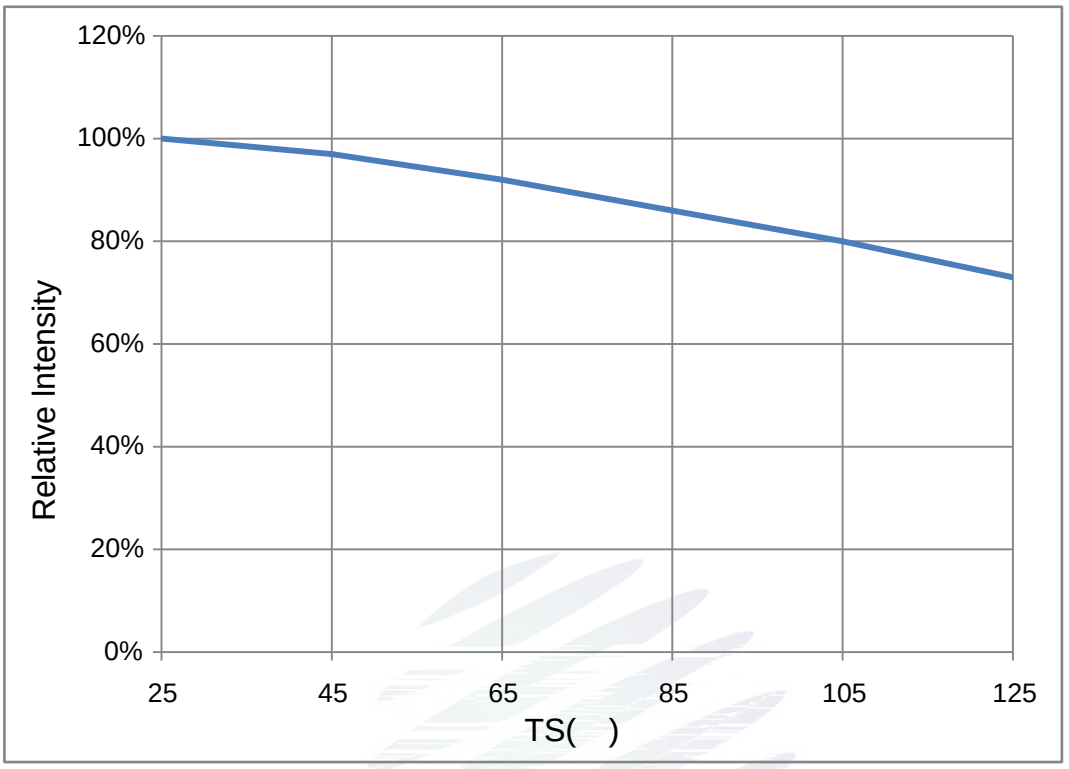


Fig. 1-9 Solder Temperature Vs Relative Intensityv×•ƒ^›CÞ&xnq? +ÕE fµF•R<}A

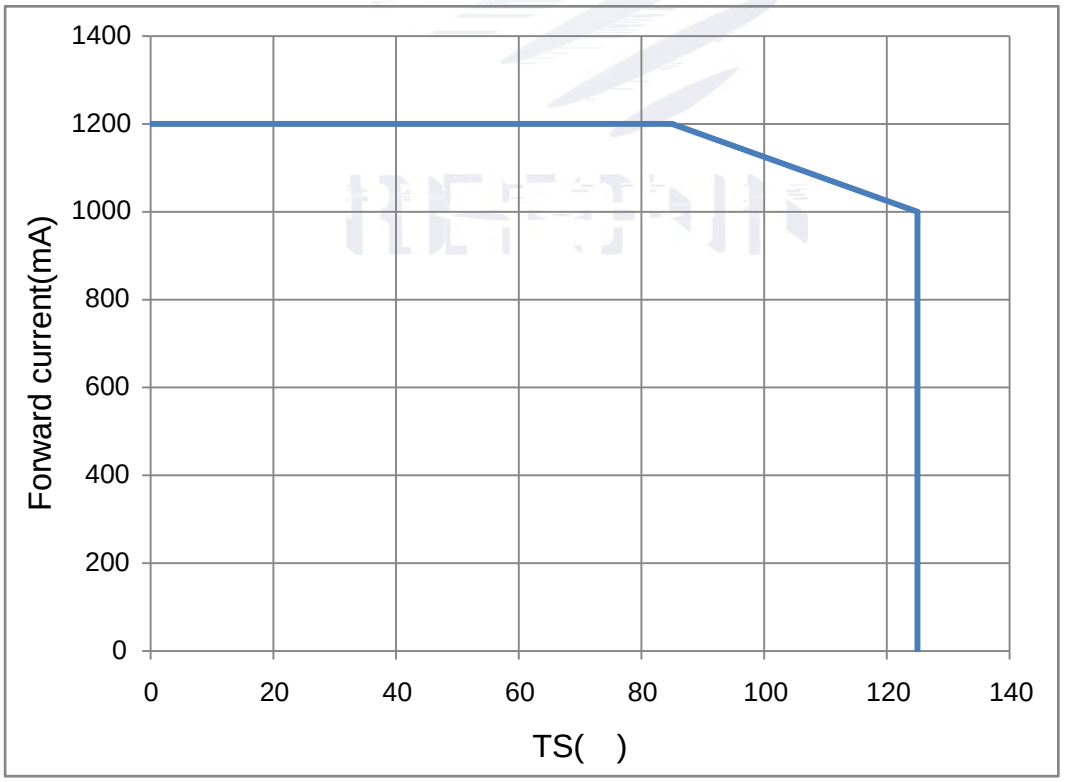


Fig. 1-10 Solder Temperature VsForward Currentv×•ƒ^›CÞ&xYû0bkO](fµF•R<}A

Tjö0150 ë

Fig. 1-13 Chromaticity Coordinate Vs Solder Temperature„€5ÂSû&xv×•ƒ^›CÞfµF•R<}A

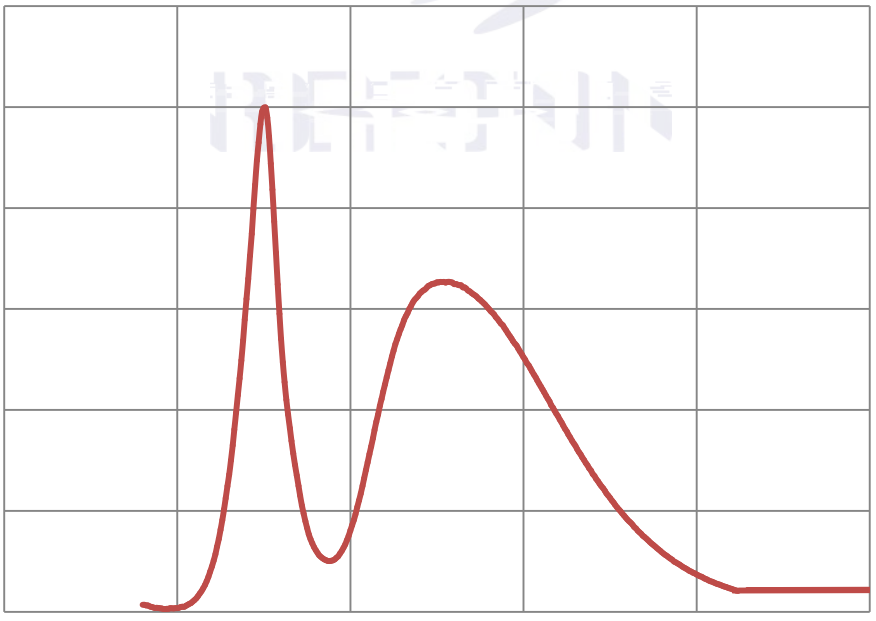


Fig. 1-14 Spectrum Distribution+Õ—v- BÒfµF•R<}A

2. Packaging 'a1w.«‘3

2.1 Packaging Specification .«‘3“ TT

Package: 4000pcs/reel..«‘3Zæ/w 4000pcso

2.1.1 Carrier Tape Dimension œ¿C ?o?

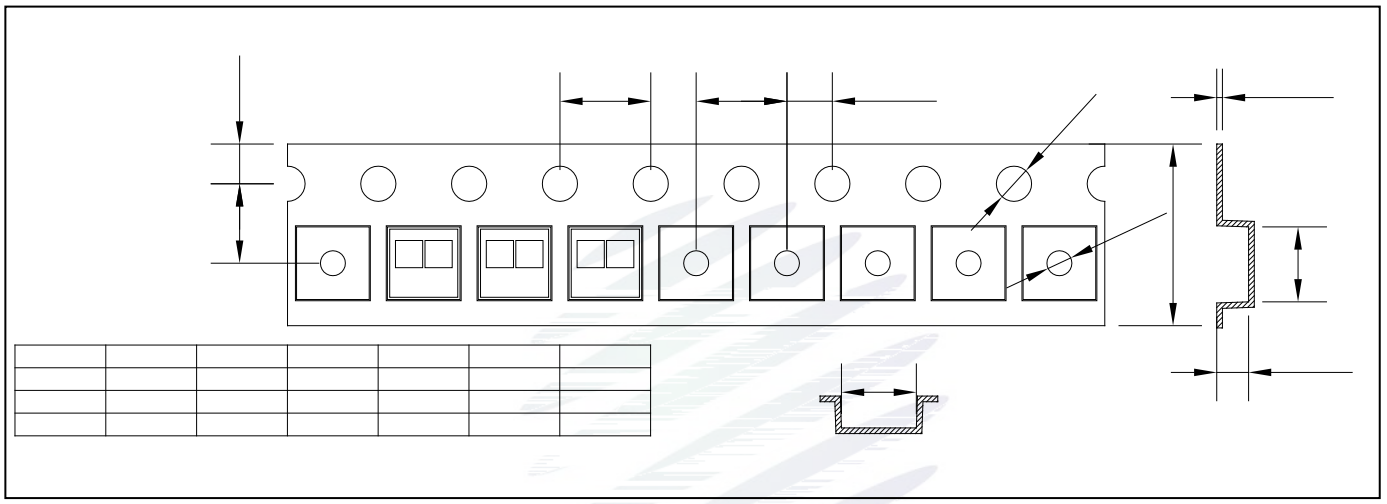


Fig.2-1 Carrier Tape Dimension œ¿C ?o?

2.1.2 Reel Dimension /wn9?o?

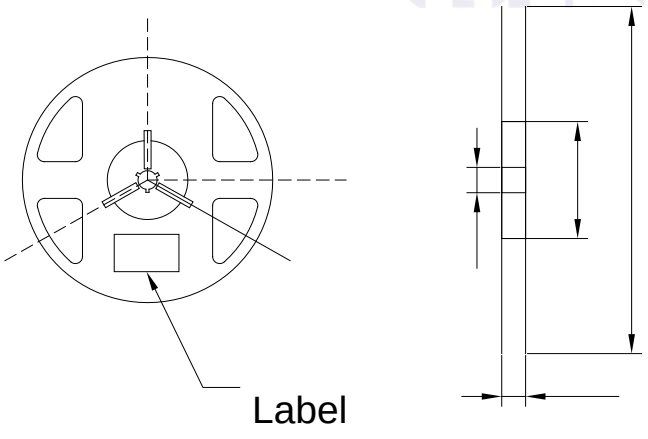


Fig.2-2 Reel Dimension /wn9?o?

5 B C M ŦReel Dimension /wn9?o?

A	13.6 p 0.1mm
B	180 p 1mm
C	100 p 1mm
D	13.0 p 0.5mm

Notes 8Š\¤ö;

The tolerances unless mentioned ±0.1mm. Unit : mm\¤ö;R¢\¤, Bµ&¹ p [x›æ{?o? /@(Yö;[x› o

2.1.3 Label Form Specification SûvŠ“ TT

Specification “ TT

PART NO.	Part Number 1w0\
SPEC NO.	Spec Number “ TT
LOT NO.	Lot Number J Yƒ0?
BIN CODE	Bin Code /iO¨'¿p&
Φ	Luminous flux +Õž ¡€
XY	Chromaticity Bin „€/
V_F	Forward Voltage Yû0bkO/“
WLD	Wavelength \š§Ë'¿p&
QTY	Packing Quantity O¨¡€
DATE	Made Date k0'aPˆR•

Fig. 2-3 Label Form Specification SûvŠ“ TT

2.2 Moisture Resistant Packing ¨È`Ð.«‘3

Fig.2-4 Moisture Resistant Packing ¨È`Ð.«‘3

2.3 Cardboard Box .«‘3}:vò

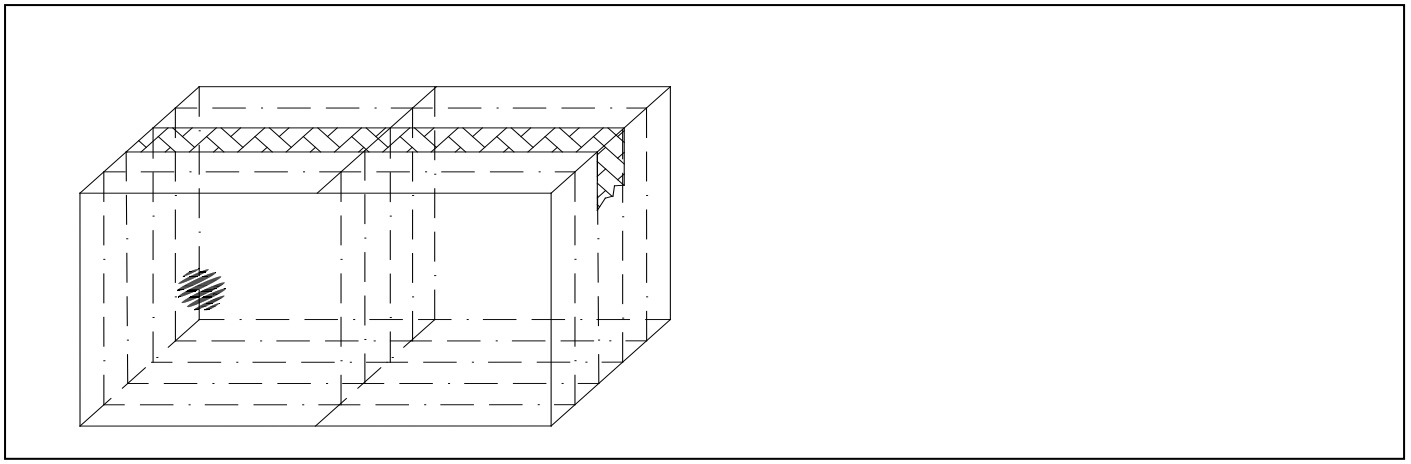


Fig.2- Cardboard Box .«‘3}:vò

2.4 Reliability Test Items And Conditions)L™FF•]5— ¬àna/úRõ'Ý

Table 2-3 Reliability Test Items And Conditions)L™FF•]5— ¬àna/úRõ'Ý

Test Items ¬àna	Ref.Standard /ì•LSû,¥	Test Condition]5— Rõ'Ý	Time Pž¨,	Quantity O¨¡€	Ac/Re LyOPK(OP
Reflow 5](cÒ	JESD22-B106	Temp:260 ë max T=10 sec	2times	20pcs.	0/1
MSL2 ¨È`Ðv })2	JESD22-A113	85 ë/ 60%R_H	168 hrs.	20pcs.	0/1
Thermal Shock ,‡cš,~-	JEITAED-4701 300307	-40 ë 15min ↑↓10s 125 ë 15min	1000 cycle	20pcs.	0/1
Life Test ± ^›]5—	JESD22-A108	Ta=125 ë I_F=1000mA	1000hrs.	20pcs.	0/1
High Temperature High Humidity Life Test ± ^›± _*]5—	JESD22-A101	85 ë/ 85%R_H I_F=1000mA	1000hrs.	20pcs.	0/1

2.5 Criteria For Judging Damage 8ßOj-<>ASû,¥

Table 2-4 Criteria For Judging Damage 8ßOj-<>ASû,¥

Test Items ¬àna	Symbol u×0?	Test Condition]5— Rõ'Ý	Criteria For Judgement -<>ASû,¥	
			Min. RR?-	Max. RR8Ð
Forward Voltage Yû0bkO/“	V_F	I_F=1000mA	-	U.S.L*)x1.1
Reverse Current /ÿ0bkO](	I_R	V_R = 10V	-	U.S.L*)x2.0
Luminous Flux +Õž ¡€	Φ	I_F=1000mA	L.S.L*)x0.7	-

Notes 8Š\¤ö;

1.U.S.L: Upper standard level “ TT&s¨ó L.S.L: Lower standard level “ TT&t¨ó

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. 'Ä&s03« F•]5— Pý6Ç'5i°&ªh¡Rc>J°‰C,05/@¬ßõ - & %5ˆ„{9iO” cšRõ'Ý°‰— &tm¸}USS o>PJ*un? & %¾k='5&® nC‡•ë}Aš Pžæ{ª=ƒH•d— (.kO](nkO/“- • nO”cšv ¨|¬ÿ o

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. 'Ä&sJ®R©O¨L ‘'&¹'a1wm¸,)6)éæ{0+(r&¹/ì•Læ{&v(r&¹'ã(fC¾k=Rõ'Ý/úC¾k=P0D-m¸)B— o

3. SMT Reflow Soldering Instructions SMT

3.1 SMT Reflow Soldering Instructions SMT **5](cÒ—9PÈ**

Fig.3-1 SMT Reflow Soldering Instructions SMT 5](cÒ—9PÈ

Table 3-1Reflow parameters

Average temperature rise speedC,5²/.^›ž CÞæwTsmax ƒ[TPæx	RR±3 °C/s2 Max 3 °C/ s
Preheating: minimum temperature¬ëcšö;RR([^›CÞ (Tsmin)	150 °C
Preheating: Max temperature¬ëcšö;RR± ^›CÞ(Tsmax)	200 °C
Preheating: Time¬ëcšö;Pž¨,æwTsmin ƒ[Tsmaxæ‡x	60 - 1

Notes 8Š\¤ö;

(1)Reflow soldering should not be done more than twice. If more than 24 hours between the two solderings , LED will be damaged. 5](cÒYƒO¨&v03'Ä™„•B&™Yƒæ{&™Yƒ5](cÒm¸Pž¨,¨,©l9uSS™„•B ?-Pžæ{•J&k%50¨_* •\L 5Á o

(2)Whensoldering , do not put stress on the LEDs during heating.E2cÒLyPžæ{&v'³5ˆRÞOñ0 cšPžk=. /"•8(d••« o

3.1.1 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.

LED5](cÒ0_&vC¾—*)]8•æ{E2Eó¬â)]8•Pžæ{Eó¬â(ªk=/ý8âcz§ æ{•\&,'2+ÓC¾pÁ–éYüs+P0D-(&v(L 5ÁR¥&g% m¸fµF• o

3.1.2 Cautions \¤H '2¬à

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 impacted on the reliability of the LEDs. Precautions should be taken to avoid the strong pressure on the encapsulated part. So when usethe picking up nozzle, the pressure on the silicone resin should be proper. LED? '3•8&¹pŠ•8æ{••« œÅœ±æ{k=. K}/"•8(d••« (Eg1‡ - & %03« F•æ{5 YüC¾ Rc¬ë¨ÈLƒP6Ÿ +Ý5ˆK}/"4<'Ýæ{E2(ªk=0¨3ßPžæ{•8(d••« m¸/". C¾PýG E2m¸ o

(2) Components should not be mounted on warped (non coplanar) portion of PCB. After soldering, do not warp the circuit board.LED b§hß&v'³cÒLy5ˆDîR<m¸1 $ #S#&sæ{cÒLy&Ó0_æ{&ò&v'³DîJÔ}Aš S# o

(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.5](cÒ&Ó0_‡/r•Bs•&¥æ{&v'³? RÞOñ>J. 8ª. æ{&ò&v'³RcªN . æ{5](cÒ0_æ{&v'³¡wk=ah-¢‚‡/rm¸P0D- o

4. Handling Precautions 'a1w(ªk=\¤H '2¬à

4.1 Handling Precautions 'a1w(ªk=\¤H '2¬à

(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 B¨(r h 7¯/ú&x - & %Ó •m¸RÞOñ&¥p»+Ëz /ú.Ê0VfŸIí'ç&v03™„•B 1 1 .•o0+Pý&g&¡DŠ–óæ{&v(r'ã(f1w™ K)B o

(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.&¹'+¨ÈYú8ªkrfŸ™ •s, - & %ŸÈ 'Äž#Ií - & %¸L (æ{J>8…h 7¯/úJ>k=9 'Ýv v æ{/@&gm¸_ƒ+Ëz 0Ž¡€'³[?-'5 1 1 .æ{/@&g[ˆ+Ëz 0Ž¡€'³[?-'5 1 1 .æ{_ƒ+Ëz &x[ˆ+Ëz Fª0Ž¡€Eó¬â?-'5 1 1 . •o0+Pý&g&¡DŠ–óæ{&v(r'ã(f1w™ K)B o

(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. C¾k=9 'Ý&¥m¸K¦0 F•fŸ™ (^w•ó-L - & %ŸÈæ{5ˆž kO'ak0+Õ=©/úcšm¸Rõ'Ý &tæ{(? ƒ] - & %„€æ{•s•\ž#Ií&š¡~+Õ••æ{L¿-x'+“R9 'ÝRÞOñ•J8¿Ÿ +Ý'ak0•o'H¨|¬ÿ oi°&ª/ÿ? (ªk='ã(f? - & % 4<'Ým¸F••JIô•O03« F•Rc>rm¸fŸ™ IôRÞOñæ{&vv×•o'HRÞOñPýBº}Q— >J'+m¸•nPý'“‘FUkßRc>r o¦Ï? fµ>Am¸k=ž 1$ (ªk=h 7¯æ{i°&ªDŠ–ó? J>Rcm¸fŸ™ 1$RÞOñ•s•dnq>,F•m¸]5— o5ˆ™$‘3& %ž)«æ{&v'³(ªk=•J'ak0RcR¼K¦0 F•[^(d m¸xè}U-k o

(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.ž •B(ªk=•ÓE2m¸B¨,('¢RÞOñ(é« 8ê0 æ{&v03 nlLyk=J[Iô?:§X¡„?©/“•8(d••« æ{> 03•J(L 5Á,;ŸÈkOš o

Fig 4-1 Cautions \¤H '2¬à

(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. — –ækOš Pžæ{ž •B & ‰¸kO](&v•J™„•B“ >Am¸RR8Ð)éæ{0ZPžæ{•nª=(ªk=)BJákO¨Öæ{0„--æ{EÎ?-m¸kO/“0 .Ê? (D¸™pœÅ8ÐkO](0 .Êæ{03•J? ƒ]'a1wL ZÈ okOš — –æEó¬â)B— 0+Rc5ˆD“0—Iô•O,"¨{m¸Pž)«- h¡Yû0bkO/“m¸0 .Êæ{&v'³P6. /ÿ/“æ{0„--(L 5Á - & ‰

(6)

Table 4-1Storage *°=¸

Conditions s+x«		Temperature ^›CÞ	Humidity _*CÞ	Time Pž¨,
Storage	Before Opening Aluminum Bag K .«-x	ö030 ë	ö075%	Within 1 Year From Date &gCƒ,;
	After Opening Aluminum Bag K .«0_	ö030 ë	ö060%	Recommended for use within 24 hours 24
Baking cwc•		60 p5 ë	-	ö124hours 8Ð'524?-Pž

Version History/)]–ç/Ž07

DateP^R•	Revisor)]–ç•O	Versionf\R¥	Verifier>NTM	Remarks8Š\¤
2022/07/25	Xian Zhou	E0	Zhu Yiming	New issue

www.refond.com

Declare kMPÈ

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

'a1w“ TT&ü'Ä&¥…‰OÒP0D-ãaÍ„WRc‚~tr'Ä&¥OÒf\R¥&¹‚¥Ð