SPECIFICATION

'a1w“ TT&ü

REFOND P/N 'a1w6 0?

<u>RF-A3E31-WYSE-B1</u>

Î 3 % pG0

ÍMass Production ¡€'a(Ø™

Contents naE6

1. Description 'a1w'•}O

1.1General Description 'a1wL½•£

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

Product Package:3.0mmX3.0mmX0.55mm.

—*'a1w&¹·•+Õ- & %æ{PýkK‰°+Õ„ÿfYah0 †ƒ+ÕxË•\ENIíæ{'a1w?o? ü;3.0X3.0mmX0.55mm

1.2Features 'a1wfµE„

EMC Package. & . $? '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™ÈRoHS'³[

Qualifications: The product qualification test plan is based on the guidelines of AEC-Q102Stress Test Qualification for Automotive Grade Discrete Semiconductors™4TTö;'a1w™4TT]5— –æ-"6Ç'5 " & $2 [üœ¨})- u(/1? (dC¾.]5— ™4TT,¥--

1.3Application 'a1wC¾k=

Automotive Lighting Interior and Exterior. [üœ¨,;®Ñ1$8ª®Ñd'PÈ

1.4Package Dimension ? ‘3?o?

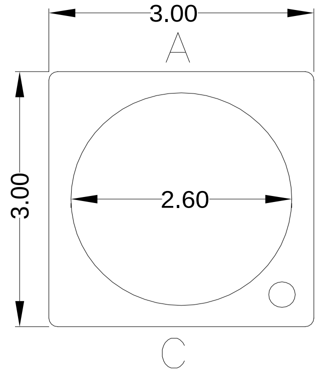

Fig.1-1 Top View

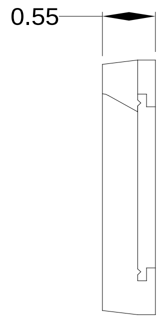

Fig.1-2 Side View

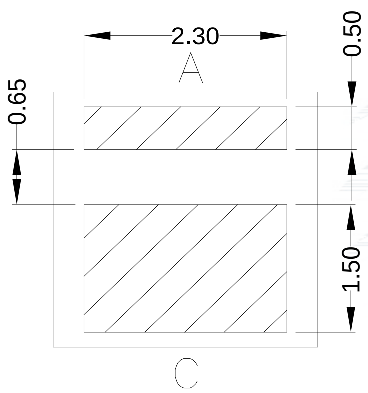

Fig.1-3 Bottom View

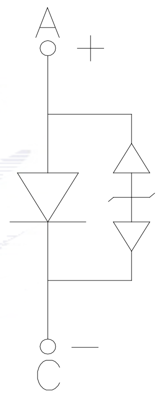

Fig.1-4 Polarity

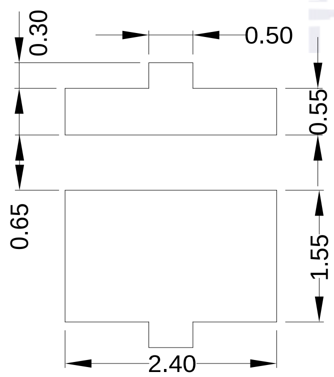

Fig.1-5 Soldering Patterns

Notes 8Š\¤ö;

All dimensions units are millimeters. J>Rc?o? Sû\¤/@(Y&¹[x›

All dimensions tolerances are 0.2mm unless otherwise noted.© fµ-FSû\¤8ªæ{J>Rc?o? , Bµ&¹ p [x›

1.5Product 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?-)éæ	Typ. æw,)6)éæx	Max. æwRR8Ð)éæ	
Forward Voltage æwYû0bkO/“æx	V_F	I_F=150mA	2.8	---	3.4	V
Reverse Current æw/ÿ0bkO](æx	I_R	V_R=5V	---	---	10	uA
Luminous Flux æw+Õž ¡€æx		I_F=150mA	40.9	---	61.2	lm
Viewing Angle æw0 +Õ“-CÞæx		I_F=150mA	---	120	---	deg
Thermal Resistance. æwcš¨Öæx	R_{THJ-S}	I_F=150mA	---	14	18	/W

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

Parameteræw/ìO¨æx	Symbolæwu×0?æx	Ratingæw)éæx	Unitsæw/@(Yæ
Power Dissipation æw. •ræx	P_D	1020	mW

Forward Current

iB D102 mW

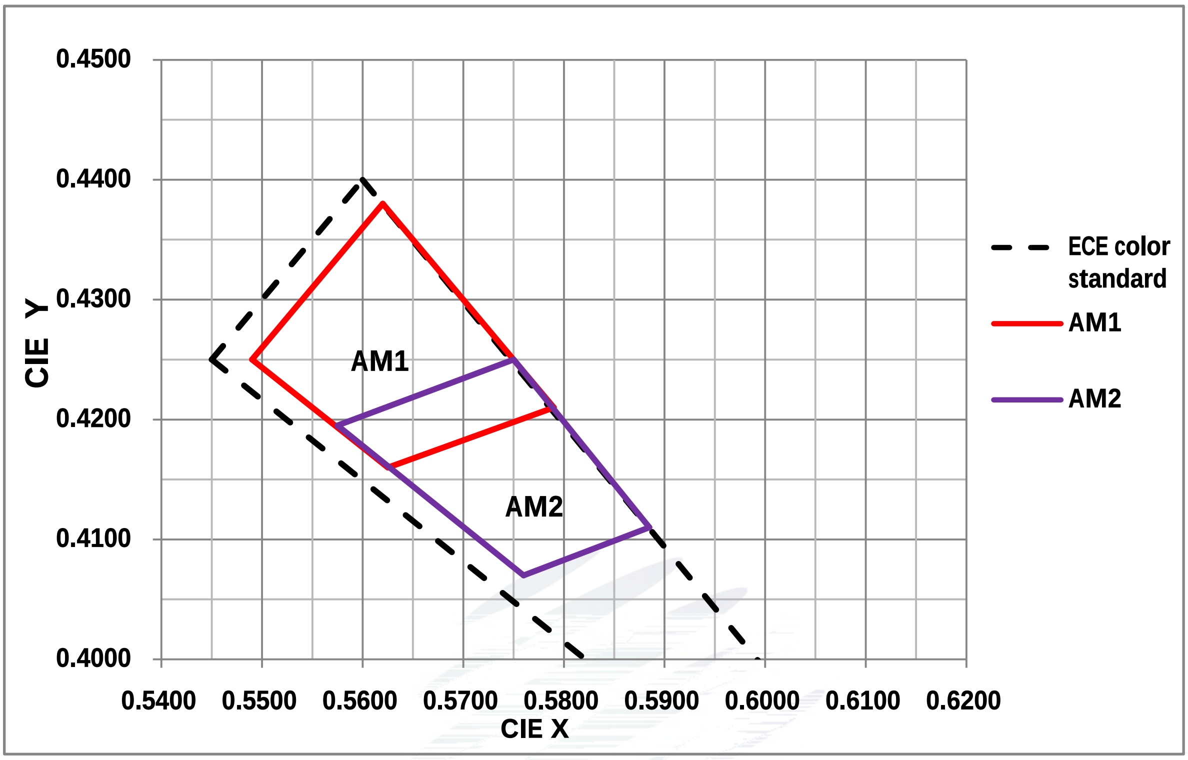

Fig. 1-6 The C.I.E Chromaticity Diagram CIE„€CÞ5C

Table 1-4

BIN CODE	CIE-X1	CIE-Y1	CIE-X2	CIE-Y2	CIE-X3	CIE-Y3	CIE-X4	CIE-Y4
AM1	0.5625	0.4160	0.5490	0.4250	0.5620	0.4380	0.5790	0.4210
AM2	0.5760	0.4070	0.5575	0.4195	0.5750	0.4250	0.5885	0.4110

1.7 Typical Optical Characteristics Curves

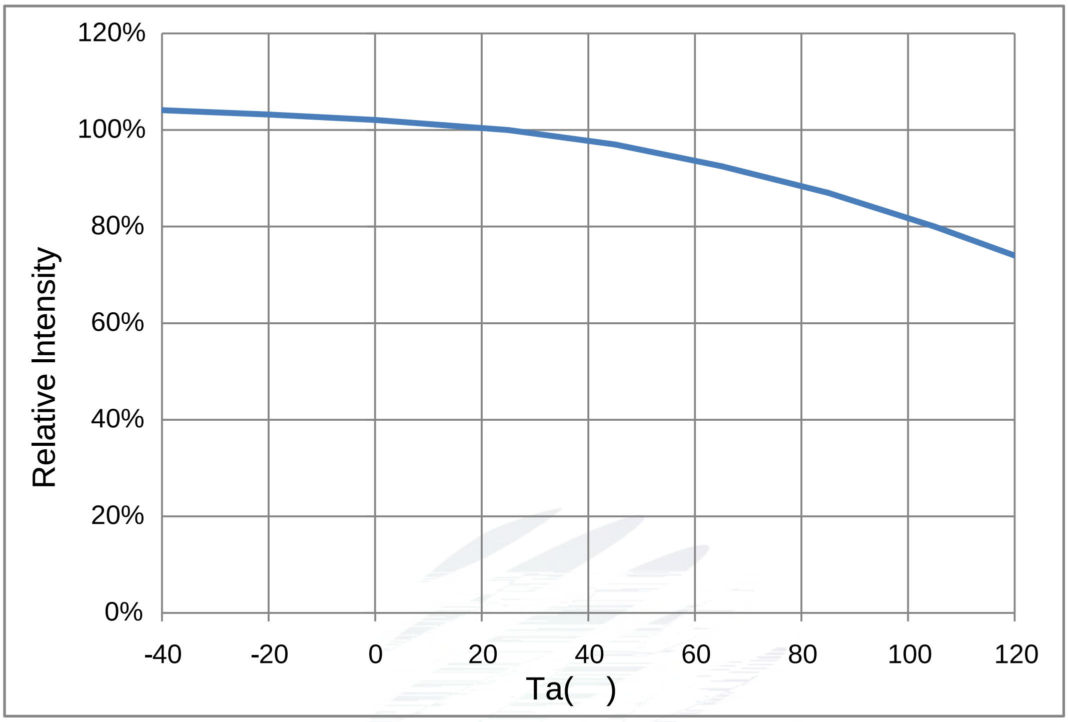

Fig. 1-9　Solder Temperature Vs Relative Intensityv×•ƒ^›CÞ&xnq? +ÕE fµF•R<}A

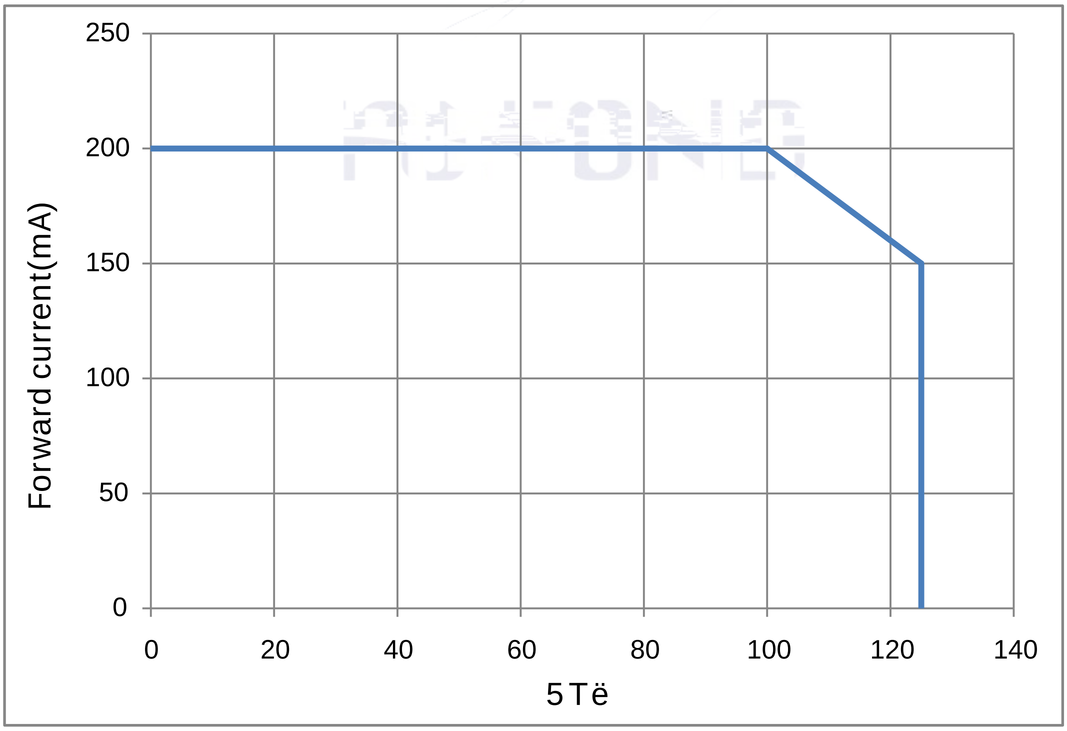

Fig. 1-10 Solder Temperature Vs Forward Currentv×•ƒ^›CÞ&xYû0bkO](fµF•R<}A
Tjö0150 ë

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

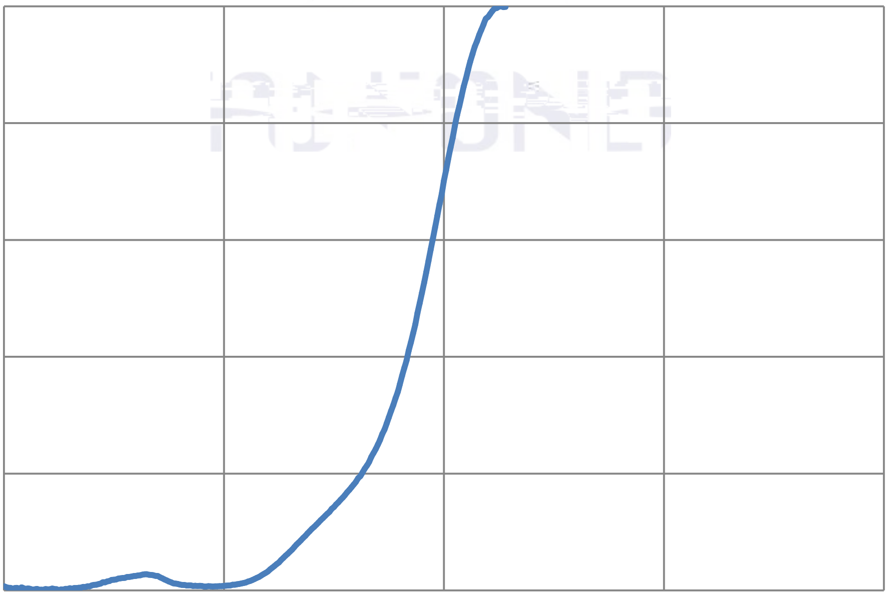

Fig. 1-14 Spectrum Distribution+Õ—v- BÒfµF•R<}A

2. Packaging 'a1w.«‘3

2.1 Packaging Specification .«‘3“ TT

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

2.1.1Carrier Tape Dimension œ¿C ?o?

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

2.1.2Reel Dimension /wn9?o?

5 B C M ÍReel Dimension /wn9?o?

A	12 p 0.1mm
B	180 p 1mm
C	60 p 1mm
D	13.0 p 0.5mm

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

Notes 8Š\¤ö;

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

2.1.3Label Form Specification SûvŠ“ TT

B C M F Specification“ TT	
PART NO.	Part Number 1w0\
SPEC NO.	Spec Number “ TT
LOT NO.	Lot Number J Yƒ0?
BIN CODE	Bin Code /ìO¨'¿p&
	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

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

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

2.3Cardboard Box **.«‘3}:vò**

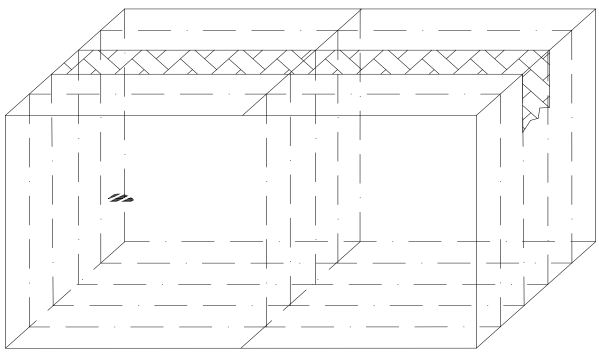

Fig.2-5Cardboard Box .«‘3}:vò

2.4Reliability 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 LyOFK(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%RH	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=105 ë IF=150mA	1000hrs.	20pcs.	0/1
High Temperature High Humidity Life Test ± ^›± _*]5—	JESD22-A101	85 ë/ 85%RH IF=150mA	1000hrs.	20pcs.	0/1

3. SMT Reflow Soldering Instructions SMT

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

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

Table 3-1Reflow parameters

Average temperature rise speedC,5²/.^›ž CÞæwTsmaxƒ[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¨,æwTsminƒ[Tsmaxæx	60 - 120s2 60s-120s
Time limited to maintain high temperature: the temperature¨óPž}vKo± ^›ö;^›CÞ (TL)	217 °C
Time limited to maintain high temperature: The Time ¨óPž}vKo± ^›ö;Pž¨, (tL)	RR8´60s2 Max 60s
Peak /Classification of temperature:@½)é - x«^›CÞ (TP)	260 °C
Time limit classification of peak temperature time¨óPž@½)é- x«^›CÞ Pž¨,æwtpæx	RR8´10s2 Max 10s
&x>J¨â@½)é^›CÞ(TP) nqBµ5 °C 'Ä,;m¸)BKoPž¨, Hold time within 5 °C with the actual peak temperature (TP)	RR8´30s2 Max 30s
¨í^›ž CÞ Cooling speed	RR±6 °C/s2 Max 6 °C/ s

25 °C /.ƒ[@½)é^›CÞJ>ª=Pž¨, Needed time from 25 °C to Tp RR88- ¦æ Max 8 minutes

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{03- & % •JkK'50¨_*•\L 5Á o

(2)When soldering , 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

(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 impacted on the reliability of the LEDs. Precautions should be

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 LED mating 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 - & % m¸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 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. 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 directly touch 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

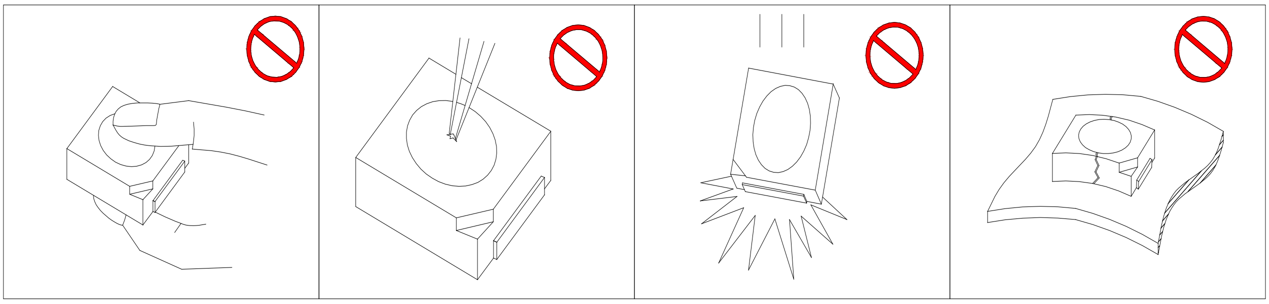

Fig 4-1Cautions \¤H '2¬à

(5) In designing a circuit,the current through each LED can not exceed the absolute maximum rating specified for each LED.In the mean while,resistors for protection should be applied,other wise 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 & %m¸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 - & %0

(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 >,PÒ5 &¹ƒH›gm¸0 cš1$h 7¯m¸^›CÞOV0 •\OV0 æ{^›CÞ/.± (¨í([- & % 0 +ÕOjhgæ{Eg1‡0 +Õ- „€æ{J>'Ä5ˆ— –æPžC¾+Î- •L• O”cš¨|¬ÿ o

(7) Compared to standard encapsulants, silicone is generally softer, and the surface is more likely to attract dust,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. &x,&'-? '3•8nqZñæ{pŠ•8ž C"œÅœ±æ{••« PÒ0¨¨á•nfŸæ{C¾k=PžC¾fµ-F\¤ H æ{E2? 'a1w\Ç,™CÞ'³[œÅ± Pžæ{5](cÒ'Ä0_ª='³¡wk=G E2m¸^a\äP0D-æ{IîÌL€†[k=D—&‹ ë(r^a\ä-kæ{9uª='³k= -L,&'-^a\ä-kæ{Eó¬â)B— &v(pv5Á? '3(dæ{™„8n^a\ä03•J(? - & %6 RûL >ræ{&vL€†[•os+^a\äP0D- o

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 DŠ–ó24?-Pž,;(ªk=
Baking cwc•		60 p5 ë	-	ö124hours 8Ð'524?-Pž

(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.9uSSC•e•-kIô.«'38ßOjæ{Iô•O'a1w&vu×0V'Ä&sRcOj*°=¸Rõ'Ýæ{ª=K .«0_•s•dcwc•æ{cwc•Rõ'Ýö; p ëæ{8Ð'5 ?-Pž o

If the package is flatulence or damaged,please notify the sales staff to assist.9uSS.«'3€Æ'Iô•OpvL æ{—<ž oü§H 2 'ƒ0×/8. 8…i o

(9)Similar to most Solid state devices; LEDs are sensitive to Electro-Static Discharge (ESD) and Electrical Over Stress (EOS). *ø,&'-m¸/1? (dkO=©4<'Ý&gTKæ{ - &?%ýkO•B](- tl« C"OuH-æ{ª='³* 9ï¨ÈJá o

(10) Other points for attention, please refer to our relevant information.,&> \¤H '2¬à—</ìd'i°&ªnq,"™4Oñ o

Version History/)]–ç/Ž07

DatePˆR•	Revisor)]–ç•O	Versionf\R¥	Verifier>NTM	Remarks8Š\¤
2023/08/01	0ï™ Xian Zhou	E0	R«n$PÈ Zhu Yiming	P 0 •d New issue

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Declare kMPÈ

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

'a1w" TT&ü'Ä&¥…‰OÒP0D-ãā[„W/Rc‚~tr'Ä&¥OÒf\R¥&¹,¥o