

SPECIFICATION

'a1w“ TT&ü

REFOND P/N 'a1w6 0?
RF-A3E27-W60H-B2

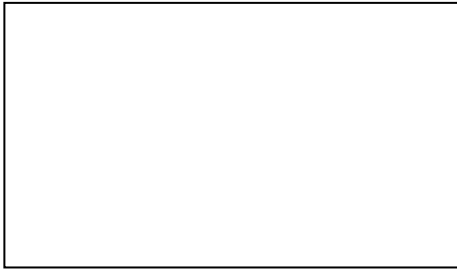
Î 3 % pG0
ÍMass Production j€'a(Ø™

Contents naE6

1. Description 'a1w'•}O	3.....
1.1 General Description 'a1wL½•£.....	3.....
1.2 Features 'a1wfμE,,	3.....
1.3 Application 'a1wC¾k=.....	3.....
1.4 Package Dimension ? '3?o?	4.....
1.5 Product Parameters 'a1w/îO"	5.....
1.6 Bin Range Of Forward Voltage and Luminous Flux (IF=350mA)kO/"&x+Œž j€- BIN ...´55 (IF=350mA)	6.....
1.7 Typical Optical Characteristics Curves ,)6 +Œ=ŒfμF•R<}A.....	8....
2. Packaging 'a1w.«'3	13.....
2.1 Packaging Specification .«'3" TT	13.....
2.1.1 Carrier Tape Dimension œžC ?o?.....	13
2.1.2 Reel Dimension /wn9?o?	13
2.1.3 Label Form Specification SûvŠ" TT.....	14
2.2 Moisture Resistant Packing "È`Đ.«'3	14.....
2.3 Cardboard Box .«'3}:vò	14.....
2.4 Reliability Test Items And Conditions)L™FF•]5— -àna/úRđ'Ý.....	15.
2.5 Criteria For Judging Damage 8ßOj-<>ASû,¥.....	16.....
3. SMT Reflow Soldering Instructions SMT 5](cÒ—9PÈ.....	17...
3.1 SMT Reflow Soldering Instructions SMT 5](cÒ—9PÈ.....	17...
4. Handling Precautions 'a1w(ªk=\\ªH '2-à	19.....
4.1 Handling Precautions 'a1w(ªk=\\ªH '2-à	19.....

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:2.7mmX2.0mmX0.6mm.

—* 'a1w&¹m¯+Ö& 86{PýkK%°+Ö„ÿfYah0 †f+ÖxË•\ENlíæ{ 'a1w?o? ö; N N 9 N N 9 o N N

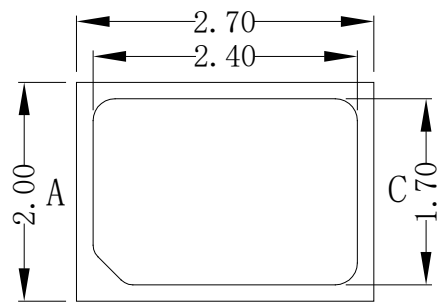
1.2 Features 'a1wfµE,,

- ▶ EMC Package. & . \$ '3
- ▶ Extremely wide viewing angle.0 +Ö“-CP8Ð
- ▶ Suitable for all SMT assembly and solder process.•Ók='5J>Rcm, 4 . þ'31\$còLyB¨„Æ
- ▶ Available on tape and reel.•Ók='5æ¿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-Q102 Stress Test Qualification for Automotive Grade Discrete Semiconductors™4TTö; 'a1w™4TT]5— -æ-" 6Ç'5 " & \$2 [üæ¨])- u(/1? (dC¾.]5— ™4TT,¥--

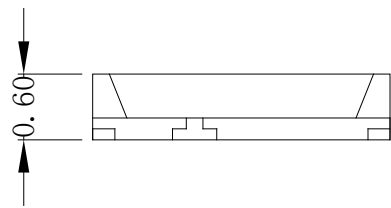
1.3 Application 'a1wC¾k=

- ▶ Automotive Lighting Interior and Exterior. [üæ¨; ;@Ñ1\$8ª@Ñd'PÈ

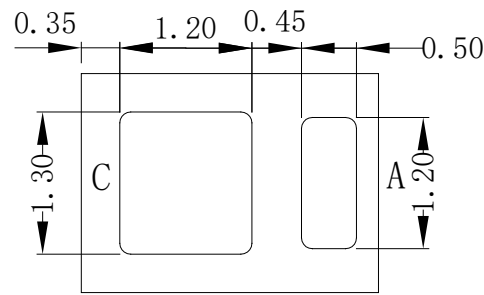
1.4Package Dimension ？'3?o?



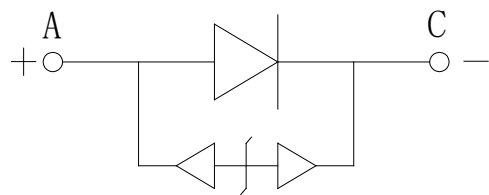
正面视图



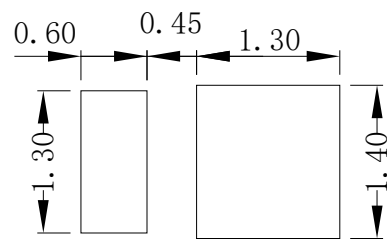
侧面视图



背面视图



极性



推荐焊盘

Notes 8Š\ǎö;

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

All dimensions tolerances are ±0.2mm unless otherwise noted.© fμ-FSû\ǎ8æ{J>Rc?o? , Bμ&¹ p [x>

1.5 Product Parameters 'a1w/îO''

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

Item ààna	Symbol u×0?	Test Condition]5— Rð'Ý	Value			Unit /@(Y
			Min. æwRR?-)éa	Typ. æw,)6)éæx	Max. æwRR8Ð)éa	
Forward Voltage æwYû0bkO/'æx	V _F	I _F =350mA	2.8	---	3.4	V
Reverse Current æw/ÿ0bkO](æx	I _R	V _R =5V	---	---	10	uA
Luminous Flux æw+Õž jææx	Φ	I _F =350mA	105	---	160	lm
Viewing Angle æw0 +Õ"-Cðæx	2θ1/2	I _F =350mA	---	120	---	deg
Thermal Resistance. æwcš"Öæx	R _{THJ-S real}	I _F =350mA	---	31.7	42.6	°C/W
	R _{THJ-S el}	I _F =350mA	---	19.3	26	°C/W

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

Parameteræw/îO''æx	Symbolæwu×0?æx	Ratingæw)éæx	Unitsæw/@(Yæ
Power Dissipation æw. •ræx	P _D	1428	mW
Forward Current æwYû0bkO](æx	I _F	420	mA
Peak Forward Current æw@½)ékO](æx	I _{FP}	700	mA
Reverse Voltage æw/ÿ0bkO/'æx	V _R	5	V
Electrostatic Discharge (HBM)æwáýkOæx	E _{SD}	8000	V
Operating Temperature æwN](r^>Cðæx	T _{OPR}	-40 ~ +125	°C
Storage Temperature æwŵ=, ^>Cðæx	T _{STG}	-40 ~ +125	°C
Junction Temperature æwŵ^>æx	T _J	150	°C

Notes 8Š\ǎö;

- 1/10 Duty cycle, 10ms pulse width. •a>^ N T /Qt_Zñ
- The above forward voltage measurement allowance tolerance is $\pm 0.1V$. 'Ä&sJ>r kO/"j5j€—4Bμ p 7
- The above color coordinates measurement allowance tolerance is ± 0.005 . 'Ä&sJ>r 5ÂSûj5j€—4Bμ±
- The above luminous flux measurement allowance tolerance $\pm 10\%$. &s•£+Öž j€m,j5— +Ëý, Bμ&¹ p
- 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
- All measurements were made under the standardized environment of Refond. J>Rc]5— ŸêPý6Ç'5i°&ªh;Rcm, Sû,¥j5— C,05 o
- 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 - &(ªk=m,RR8ÐkOj(ª='³TOL O"çšRö 'ÝpÁ>Aæ{}U^>&v•J™,„•BRR8Ð)é o
- ESD yield is over 90% at 8000V ESD (HBM). ESD protection during products handling is needed. m, - & % ž •B'f(dW·D- & 4 % 7 j5— 5^Nj(rPž—<lªH ¢ýkO`ÈJá o
- At 25°C, pulse mode test, photoelectric conversion efficiency $\eta_e=39\%$. 5^25°C&tae{•a,~W·D-j5— æ{+ÖkOæ®L Oj hg&¹39% o

1.6 Bin Range Of Forward Voltage and Luminous Flux (IF=350mA)kO/"&x+Öž j€

- BIN ...´55F=350mA)

Table 1-3

V _F (V)	G0	H0	I0	
	2.8-3.0	3.0-3.2	3.2-3.4	
φ (lm)	SA	SB	TA	TB
	105-117	117-130	130-144	144-160

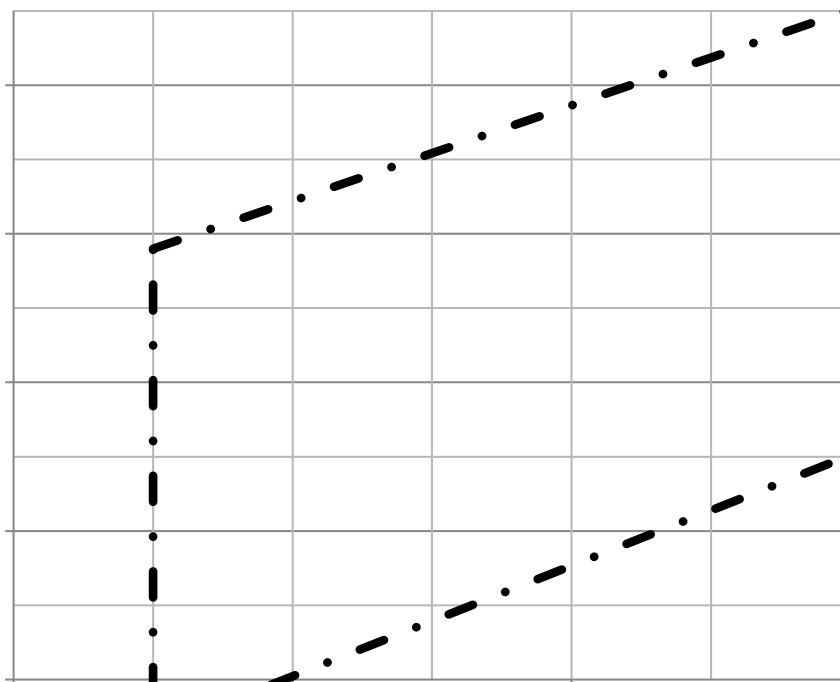


Fig. 1-6 The C.I.E Chromaticity Diagram CIE,€Cp5C

Table 1-4

BIN CODE	CIE-X1	CIE-Y1	CIE-X2	CIE-Y2	CIE-X3	CIE-Y3	CIE-X4	CIE-Y4
VM1	0.3150	0.2995	0.3115	0.3212	0.3268	0.3371	0.3282	0.3162
VM2	0.3210	0.3060	0.3190	0.3280	0.3340	0.3420	0.3340	0.3230
VM3	0.3270	0.3140	0.3270	0.3360	0.3420	0.3490	0.3410	0.3300
VM4	0.3340	0.3230	0.3340	0.3420	0.3480	0.3535	0.3480	0.3370
VM5	0.3165	0.3180	0.3140	0.3380	0.3298	0.3525	0.3302	0.3307
VM6	0.3223	0.3260	0.3209	0.3461	0.3378	0.3615	0.3368	0.3368
VM7	0.3302	0.3307	0.3298	0.3525	0.3457	0.3666	0.3442	0.3434

1.7 Typical Optical Characteristics Curves ,)6 +Ö=ÖfμF•R<}A

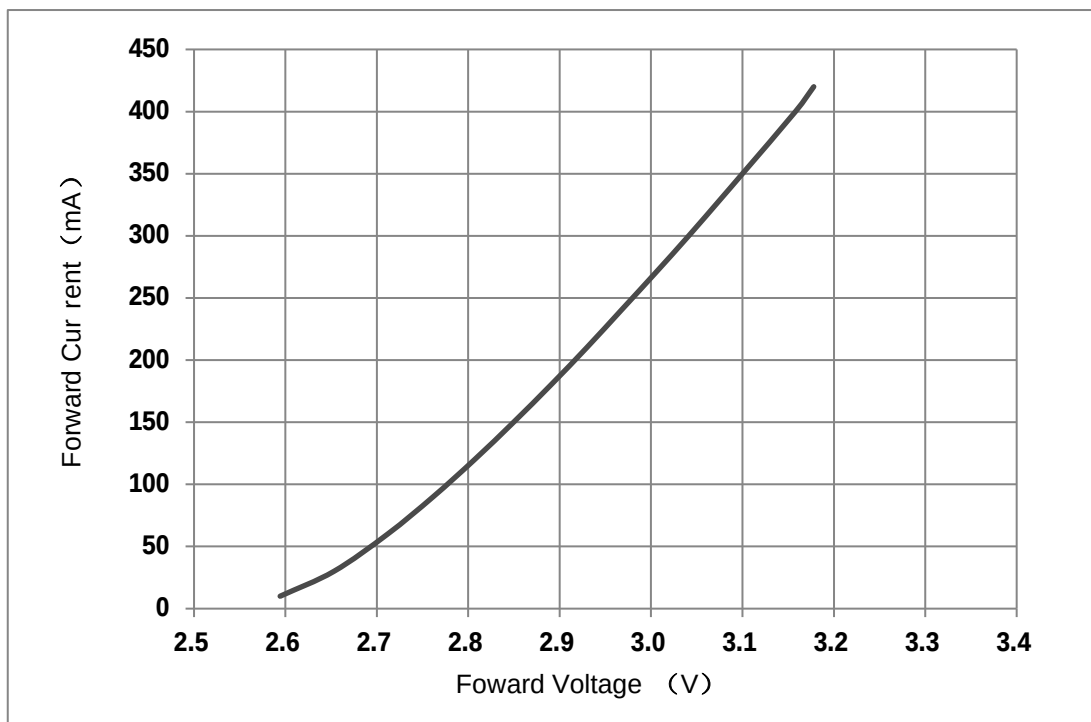


Fig. 1-7 Forward Voltage Vs Forward Current (> fμF•R<}A

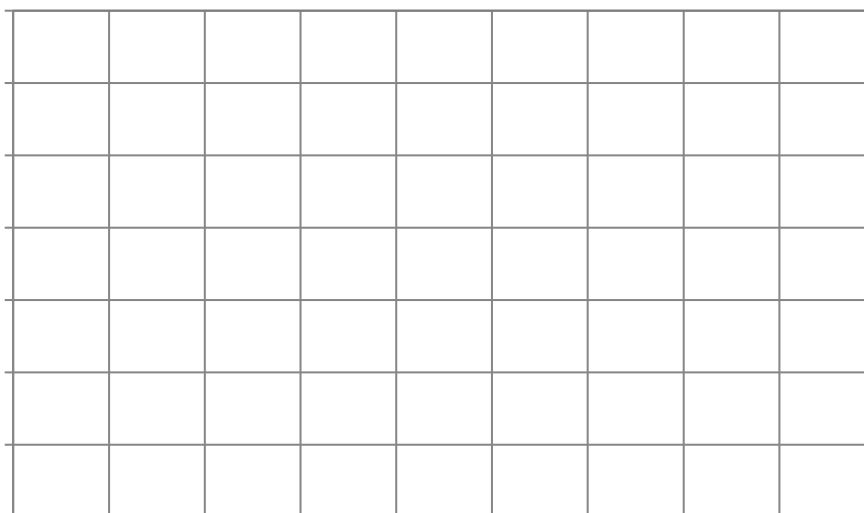


Fig. 1-8 Forward Current Vs Relative Luminous Flux Yû0bkO](&xnq? +Ö j€ fμF•R<}A

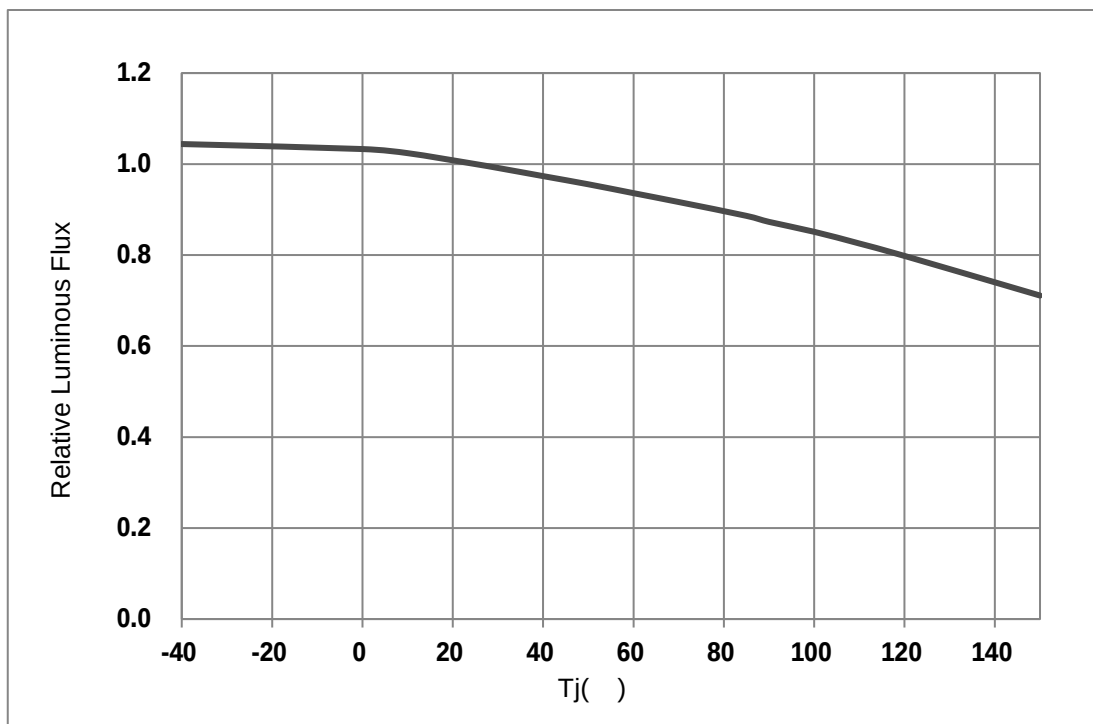


Fig. 1-9 Junction Temperature Vs Relative Luminous Flux

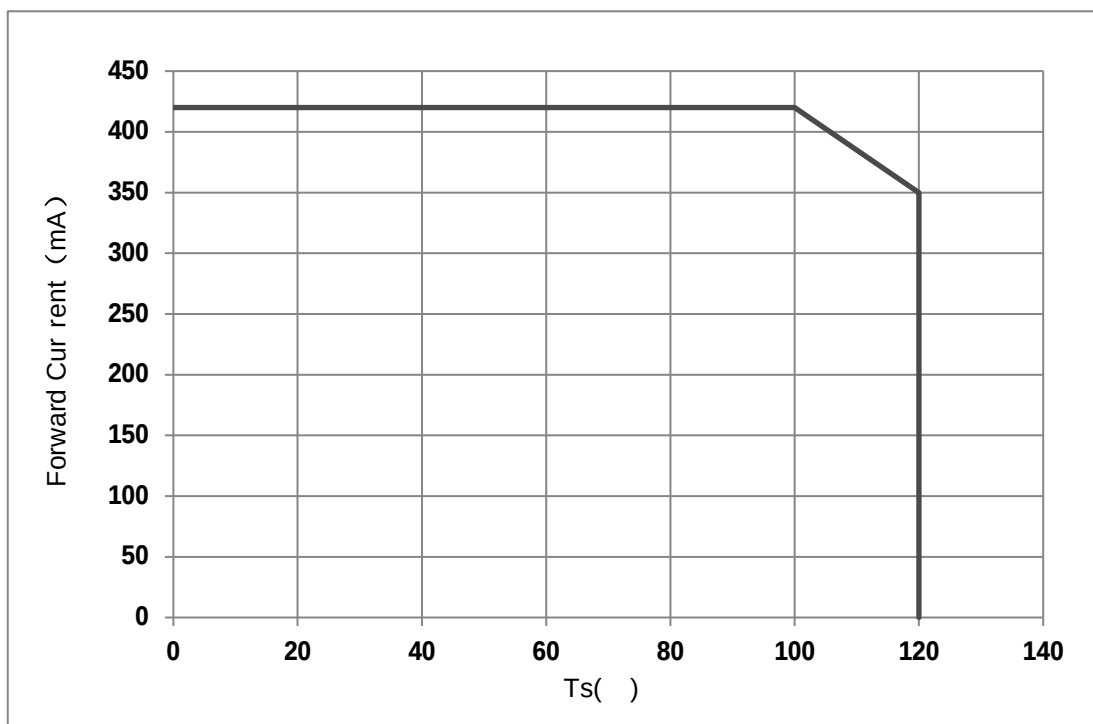


Fig. 1-10 Solder Temperature Vs Forward Current

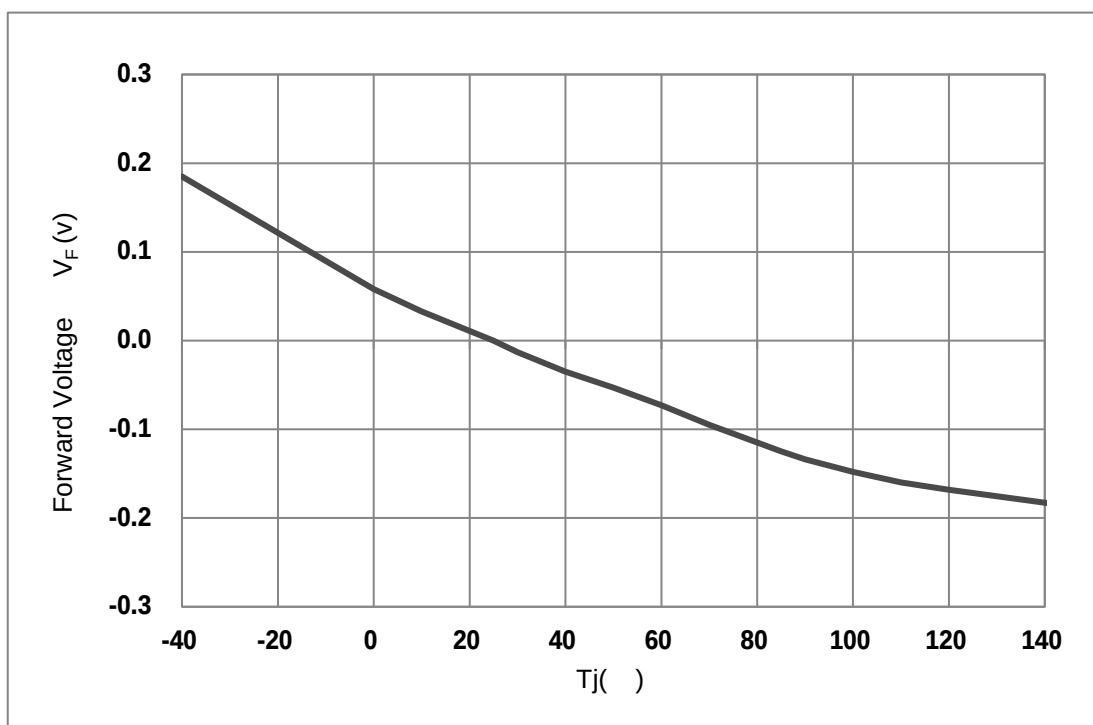


Fig. 1-11 Voltage Shift Vs Junction Temperature kO/'* st&x}U^>fµF•R<}A

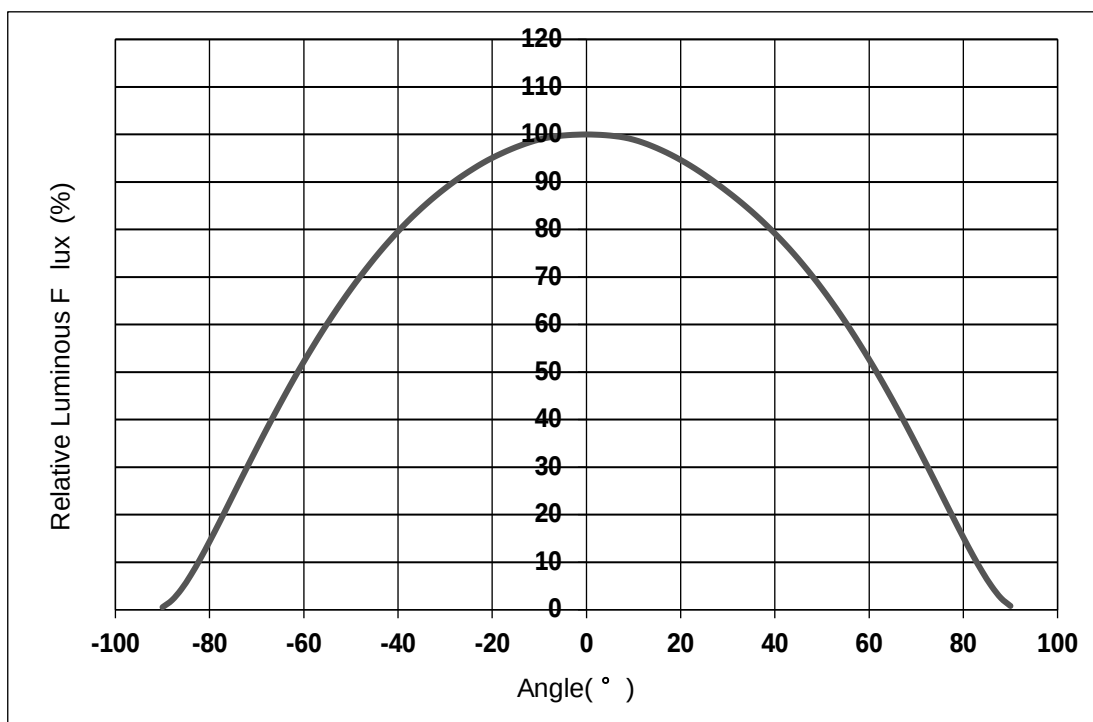


Fig. 1-12 Radiation Diagram œÒ? fµF•R<}A

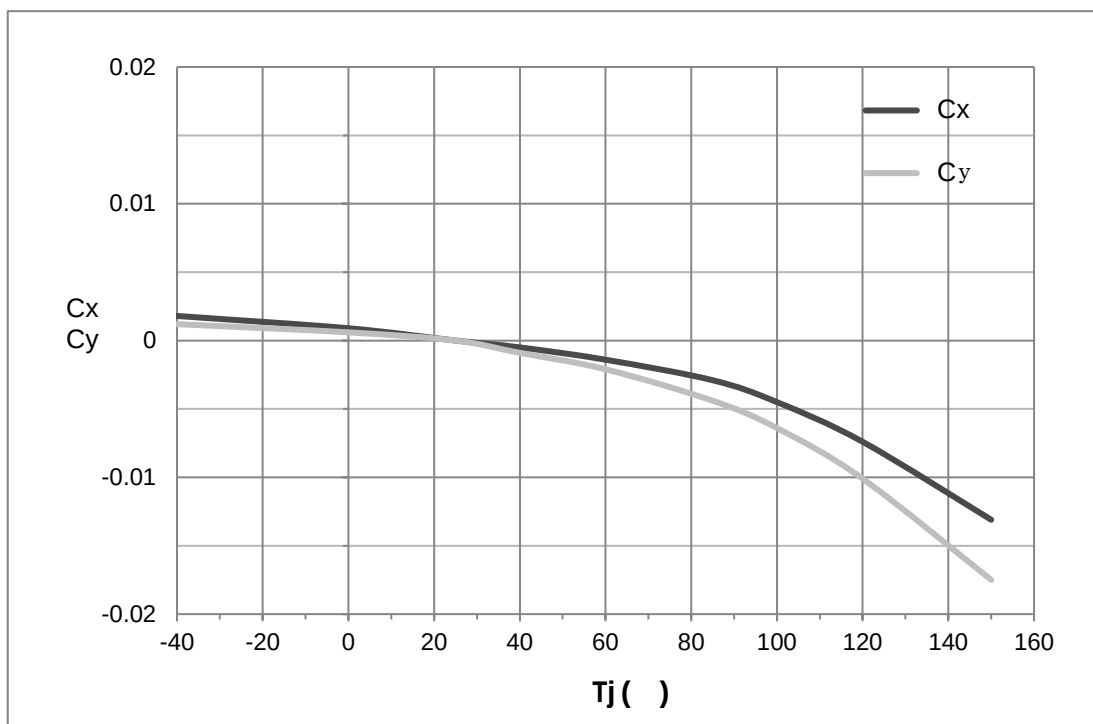


Fig. 1-13 Chromaticity Coordinate Shift Vs Junction Temperature „€5ÂŜ* st&x}U^>fμF•R<}A

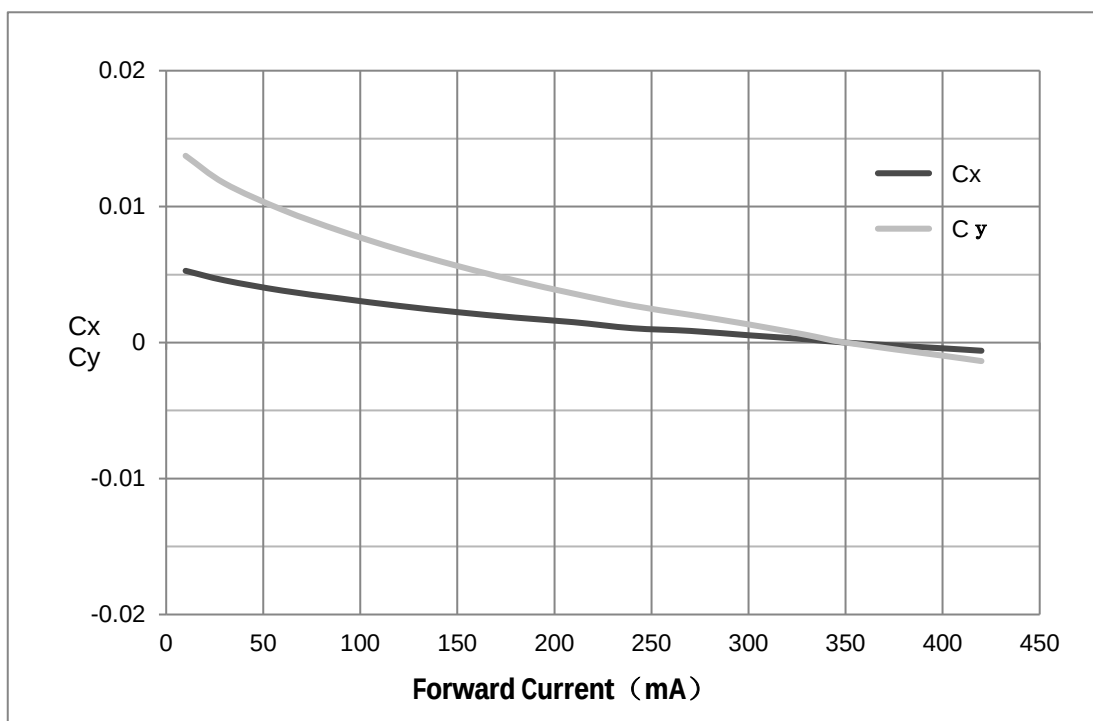


Fig. 1-14 Chromaticity Coordinate Shift Vs Forward Current „€5ÂŜ* st&xYû0bkO}(fμF•R<}A

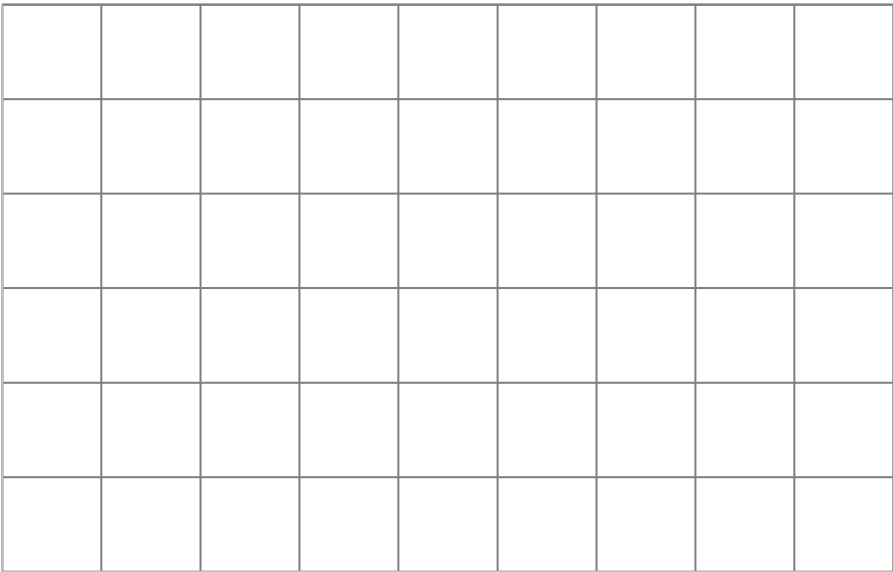


Fig. 1-15 Spectrum Distribution +Ö—v- BÒfµF•R<}A

2. Packaging 'a1w.«'3

2.1 Packaging Specification .«'3“ TT

Package:4000pcs/reel..«'3Zæ/w 4000pcs

2.1.1Carrier Tape Dimension œ¿C ?o?

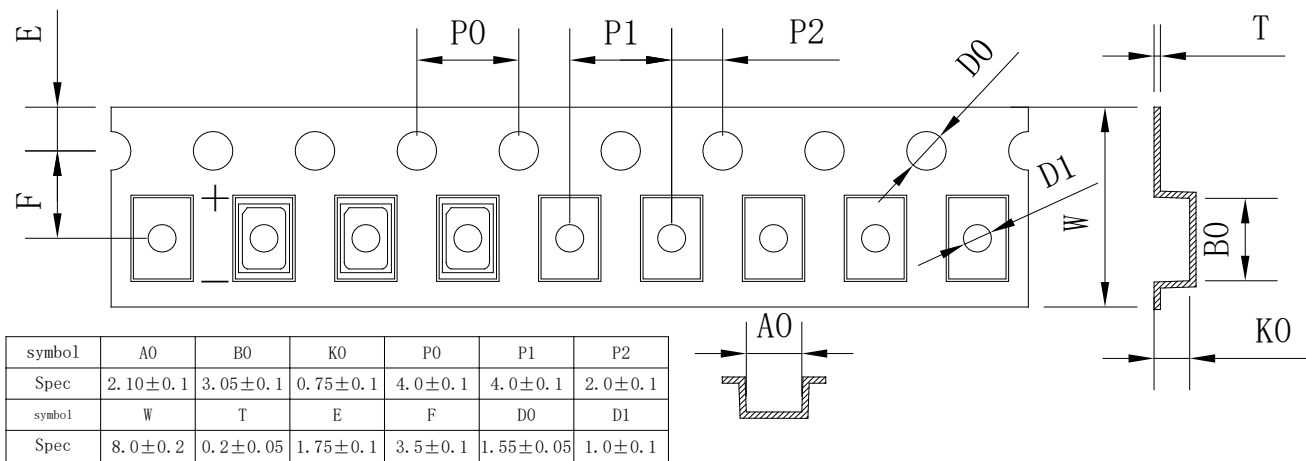


Fig.2-1 Carrier Tape Dimension œ¿C ?o?

2.1.2Reel Dimension /wn9?o?

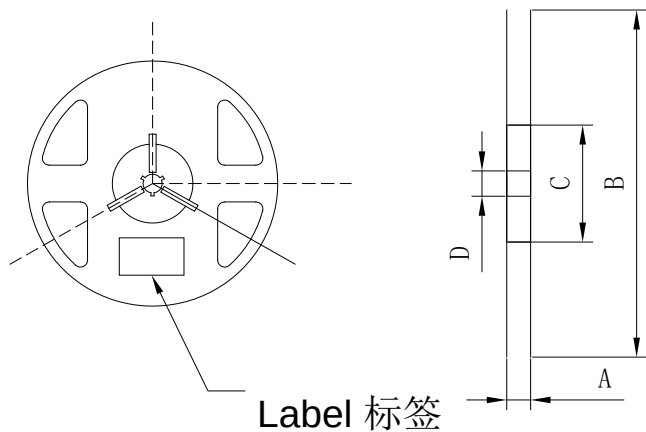


Fig.2-2Reel Dimension /wn9?o?

5 B C M Reel Dimension /wn9?o?

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

Notes 8Š\œö;

The tolerances unless mentioned ±0.1mm. Unit : mm\œö;Rç\œ, Bµ&¹ p [x>æ{?o? /@ (Yö;[x> o

2.1.3 Label 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 Yf0?
BIN CODE	Bin Code /iO""čp&
Φ	Luminous flux +Ůž j€
XY	Chromaticity Bin „€/
V _F	Forward Voltage Yû0bkO/“
WLD	Wavelength \ššĚ'čp&
QTY	Packing Quantity O“j€
DATE	Made Date k0'aP^R•

Fig. 2-3 Label Form Specification SûvŠ“ TT

2.2 Moisture Resistant Packing “Ě`Đ.«'3

Fig.2-4 Moisture Resistant Packing “Ě`Đ.«'3

2.3 Cardboard Box .«'3}:vò

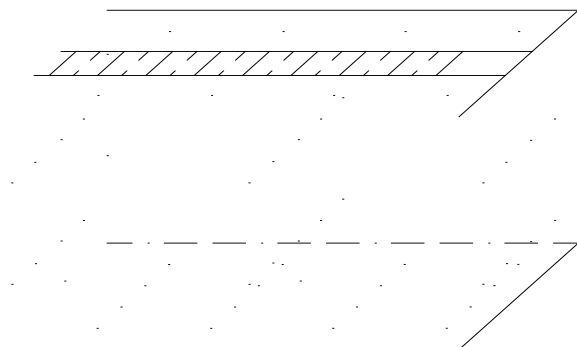


Fig.2-5 Cardboard Box .«'3}:vò

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

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

Test Items —àna	Symbol u×0?	Test Condition]5— Rð'Ý	Criteria For Judgement -<>ASû,¥	
			Min. RR?-	Max. RR8Ð
Forward Voltage Yû0bkO/“	V_F	$I_F=350\text{mA}$	-	U.S.L*)x1.1
Reverse Current /ÿ0bkO](	I_R	$V_R = 5\text{V}$	-	U.S.L*)x2.0
Luminous Flux +Öž j€	Φ	$I_F=350\text{mA}$	L.S.L*)x0.7	-

Notes 8Š\œö;

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/@-ßð - & %^„{9iO”cŠ Rð'Ý°%— &tm,}USS o>PJ*un? & %¾k='5&® nC‡•ë)AŠžæ{ª=fH•d— (.kO](nkO/“- • nO”cšv ”|—ÿ o

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 “&'a1wm,,)6)éæ{0+(r&'i•Læ{&v(r&'ã(fC¾k=Rð'Ý/úC¾k=P0D-m,)B— o

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

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

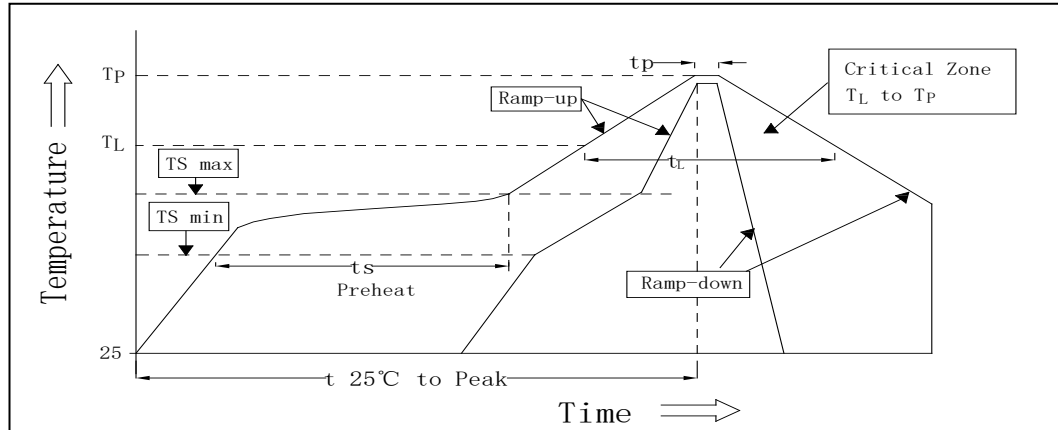


Fig.3-1SMT Reflow Soldering Instructions SMT 5](cÒ—9PÈ

Table 3-1Reflow parameters 5](cÒ/iO"

Average temperature rise speedC,5°/.^ž CPæwTsmæx f[TPæx	RR± 3 °C/2 Max 3 °C/ s
Preheating: minimum temperature—ëçšö;RR([^>CP (Tsmín)	150 °C
Preheating: Max temperature—ëçšö;RR± ^>CP (Tsmæx)	200 °C
Preheating: Time—ëçšö;Pž",æwTsmín f[Tsmæxæx	60 - 120s2 60s-120s
Time limited to maintain high temperature: the temperature"óPž}vKo± ^>ö;^>CP (TL)	217 °C
Time limited to maintain high temperature: The Time "óPž}vKo± ^>ö;Pž", (tL)	RR860s2 Max 60s
Peak /Classification of temperature:@½)é - x«^>CP (TP)	260 °C
Time limit classification of peak temperature time"óPž@½)é- x«^>CPö;Pž",æwæx	RR810s2 Max 10s
&x>J"â@½)é^>CP(TP) nqBµ 5 °C 'Ä,;m,)BKoPž", Hold time within 5 c with the actual peak temperature (TP)	RR830s2 Max 30s
"í^>ž CP Cooling speed	RR± 6 °C/2 Max 6 °C/ s
25 °C /.f[@½)é^>CPJ>^=Pž", Needed time from 25 °C to Tp	RR88- æ Max 8 minutes

Notes 8Š\œö;

- (1)Reflow soldering should not be done more than twice. If more than 24 hours between the two solderings ,LED will be damaged. 5](cÒYfO`&v03'Ä™„•B&™Yfæ{&™Yf5 ](cÒm,Pž`„;©l9uSS™¿•Pžæ{ - &0%
•JkK'50`_*•l 5Á o
- (2)When soldering , do not put stress on the LEDs during heating.E2cÒLyPžæ{&v'35^RbOñ0 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=/ý8âczš æ{•l&,'2+ÓC¾pÁ-éYüs+P0D-(&v(L-5ÁP>g
m,fµF• o

3.1.2 Cautions \œH '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=\ªH '2-à

ne[F>11F>14.50P7 (S3.5P7 (S(P)M 4 (P) i)-Tf 0.n (F>14.5 [F>11)-8.6f 0.he [F>11)-LE7 (\$

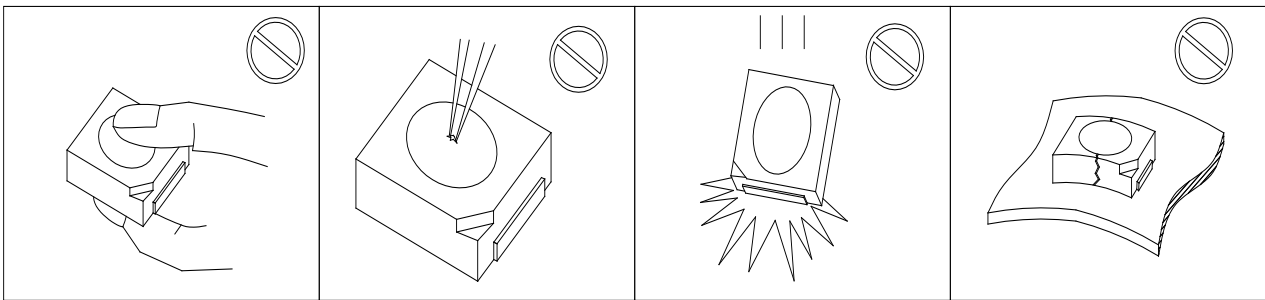


Fig 4-1Cautions

(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.

(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.

(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.

Table 4-1 Storage *°=,

Conditions S+X«		Temperature ^°Cp	Humidity _*Cp	Time Pž",
Storage 储存	Before Opening Aluminum Bag K .«-x	ö030 ë	ö075%	Within 1 Year From Date &gCf,;
	After Opening Aluminum Bag K .«0_	ö030 ë	ö060%	Recommended for use within 24 hours DŠ-ó24-Pž,;(°k=
Baking cwc•		60 p5 ë	-	ö124hours 8Đ'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•-klô.«'38ßOjæ{[lô•O'a1w&vu×0V'Ä&sRcOj*°=,Rđ'Ýæ{ª=K .«0_•s•dcwc•æ{cwc•Rđ'Ýö; p ëæ{8Đ'5 ?-Pž o

If the package is flatulence or damaged,please notify the sales staff to assist.9uSS.«'3€Æ[^lô•OpvL æ{—<ž oü\$H 2 'f0×/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{ - &ŖŧýkO•B](- tl« C"OuH-æ{ª='3* 9i"ÈJá o

(10) Other points for attention, please refer to our relevant information.,&> \pH '2-à—</id'i°&°nq,"™4Oñ o

Version History/)]-ç/Ž07

DateP^R•	Revisor)]-ç•O	Versionf\lR¥	Verifier>NTM	Remarks8Š\▯
2023/2/11	“đ°ô \$I F O+J O H	E0	R«n\$PÈ ; I V Z J N J C	P 0 •d / F X J T T V
2023/7/26	“đ°ô \$I F O+J O H	E1	R«n\$PÈ ; I V Z J N J O	)]-ç 3 F W J T F

www.refond.com

Declare kMPÈ
This specification is written both in English and in Chinese and the latter is formal.
'a1w“ TT&ü'Ä&¥...%oOÖP0D-8d,V0Rc,~tr'Ä&¥OÖfR¥&¹,¥