SPECIFICATION

REFOND P/N

RF-A4H50-W60P-E5

□ R&D

■ Mass Production

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Contents

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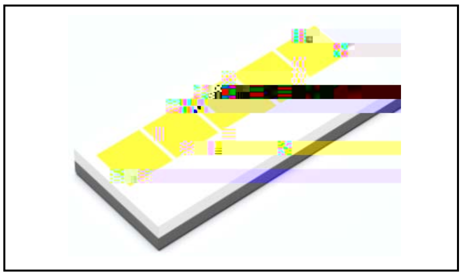
1. Description

1.1 GeneralDescription



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

Product Package: 6.9mmX3.0mmX0.8mm.

LED 6.9mmX3.0mmX0.8mm

1.2 Features

y Ceramic Package.

y Extremely wide viewing angle.

y Suitable for all SMT assembly and solder process. SMT

y Available on tape and reel.

y Moisture sensitivity level: Level 2. Level2

y RoHS compliant. RoHS

y Qualifications: The product qualification test plan is based on the guidelines of AEC-Q102 Stress Test Qualification for Automotive Grade Discrete Semiconductors

AEC-Q102

1.3 Application

y Automotive Lighting Exterior.

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1.4 Package Dimension

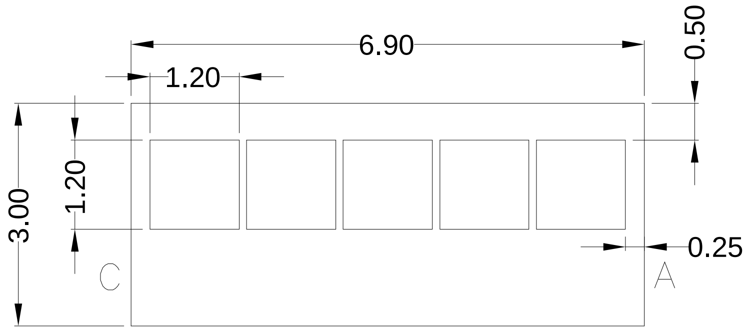

Fig.1-1 Top View !“M’?ö .

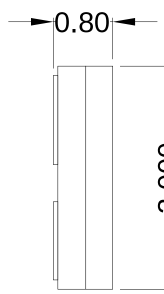

Fig.1-2 Side View ×M’?ö .

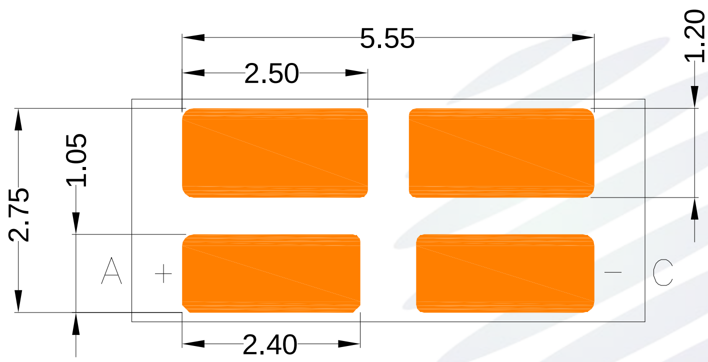

Fig.1-3 Bottom View 6üM’?ö .

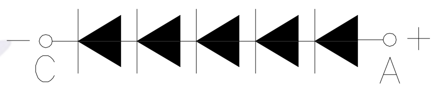

Fig.1-4 Polarity ± W

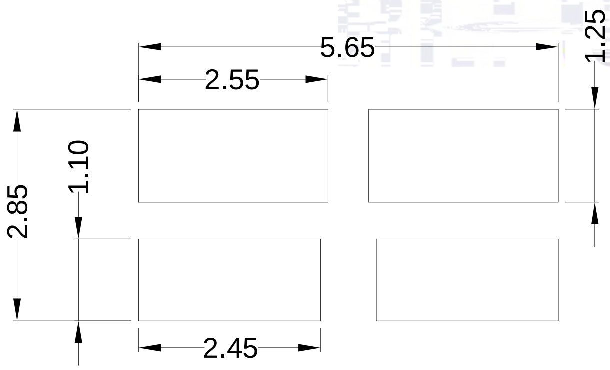

Fig.1-5 Soldering Patterns Ø9€':-

Notes

1. All dimensions units are millimeters.

2. All dimensions tolerances are r0.2mm unless otherwise noted. ± 0.2

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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=1000mA	14	---	17	V
Reverse Current	I_R	V_R=20V	---	---	10	uA
Luminous Flux	-	I_F=1000mA	1600	---	2200	lm
Viewing Angle		I_F=1000mA	---	120	---	deg
Thermal Resistance (Junction to Solder)	Rth JS real	I_F=1000mA	---	1.25	1.7	/W
	Rth JS el	I_F=1000mA	---	0.7	0.95	/W

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

Parameter	Symbol	Rating	Units
Power Dissipation	P_D	25500	mW
Forward Current	I_F	1500	mA
Peak Forward Current	I_{FP}	2000	mA
Reverse Voltage	V_R	20	V
Electrostatic Discharge (HBM)	E_{SD}	8000	V
Operating Temperature	T_{OPR}	-40 ~ +125	-
Storage Temperature	T_{STG}	-40 ~ +125	-
Junction Temperature	T_J	150	-

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Notes

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

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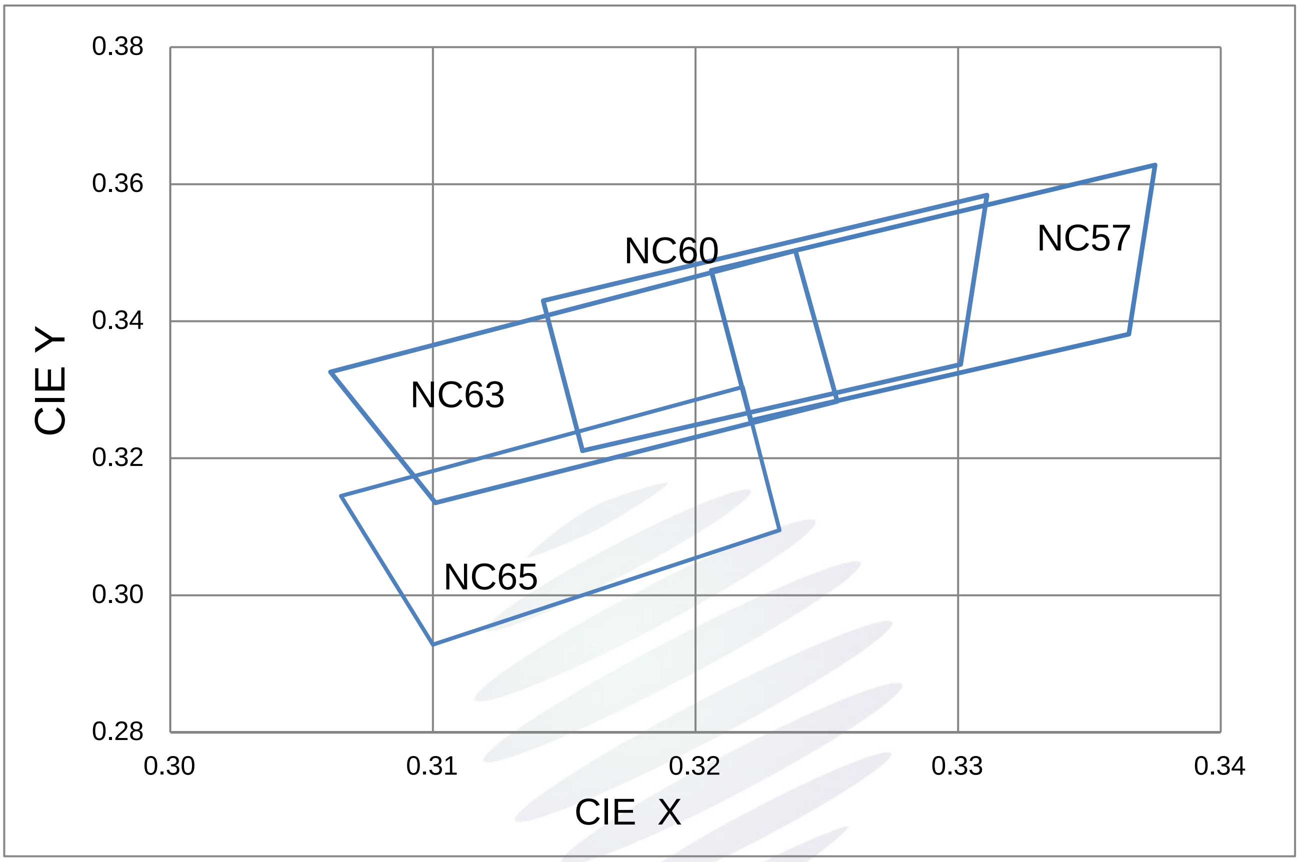

Fig. 1-6 The C.I.E Chromaticity Diagram CIE

Table 1-4

BIN CODE	CIE-X1	CIE-Y1	CIE-X2	CIE-Y2	CIE-X3	CIE-Y3	CIE-X4	CIE-Y4
NC57	0.3221	0.3255	0.3206	0.3474	0.3375	0.3628	0.3365	0.3381
NC60	0.3157	0.3211	0.3142	0.3430	0.3311	0.3584	0.3301	0.3337
NC63	0.3101	0.3135	0.3061	0.3326	0.3238	0.3503	0.3254	0.3283
NC65	0.3100	0.2928	0.3065	0.3145	0.3218	0.3304	0.3232	0.3095

1.7 Typical Optical Characteristics Curves

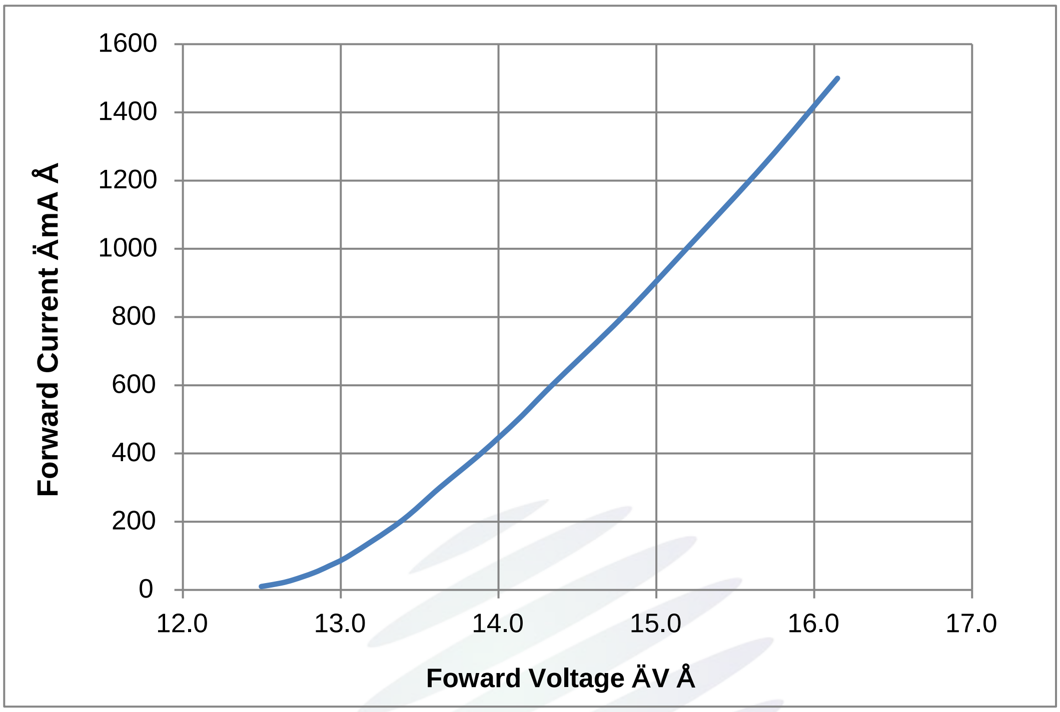

Fig. 1-7 Forward Voltage Vs Forward Current

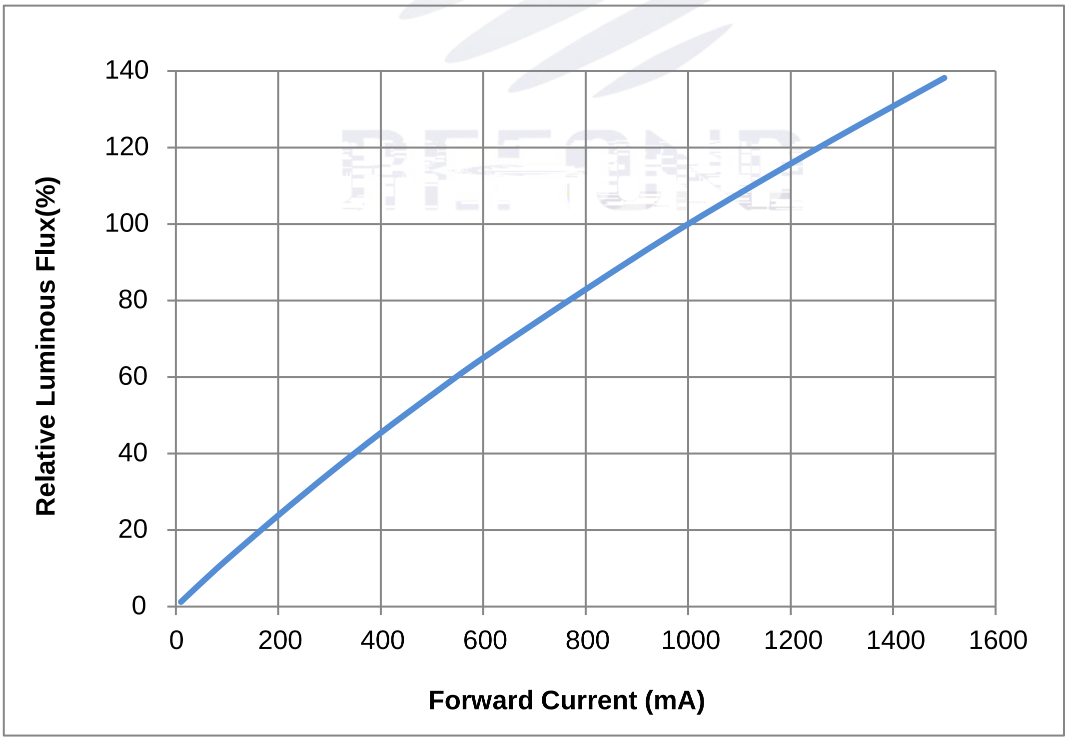

Fig. 1-8 Forward Current Vs Relative Intensity

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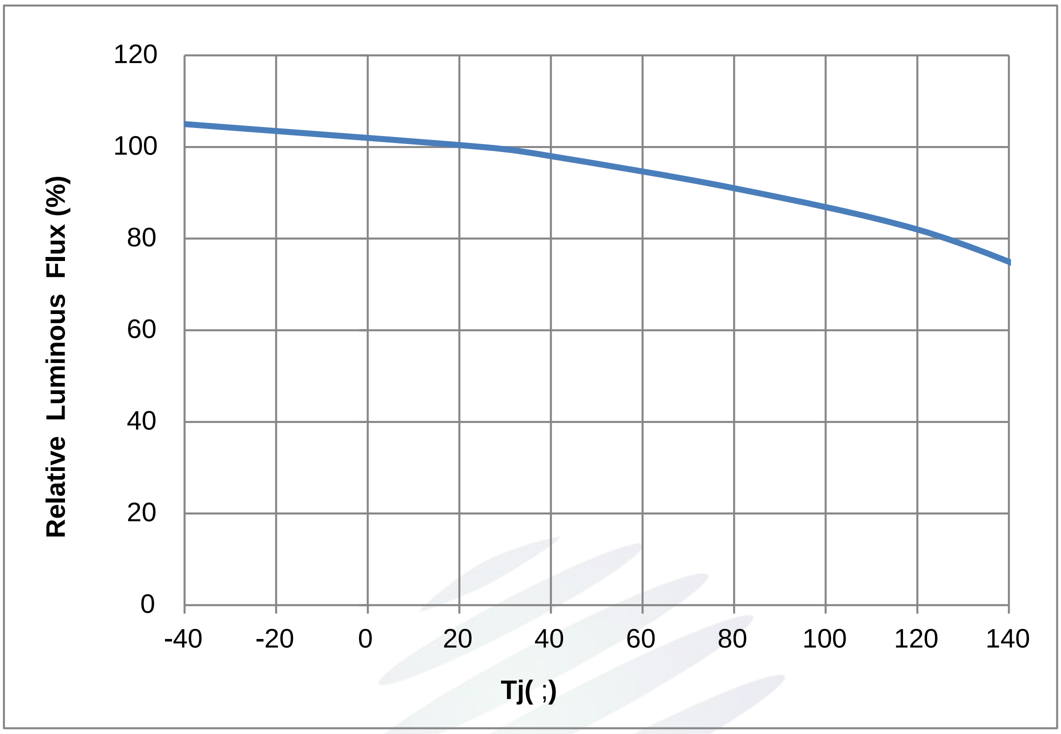

Fig. 1-9 Junction Temperature Vs Relative Intensity

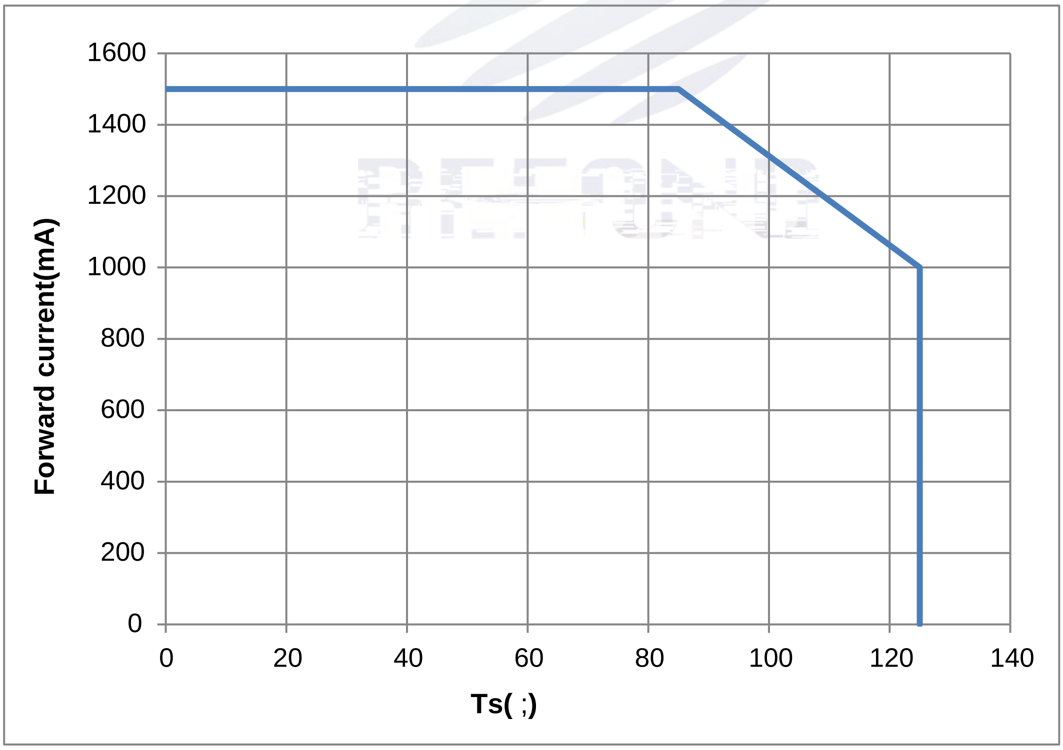

Fig. 1-10 Solder Temperature Vs Forward Current

Tj ≤ 150

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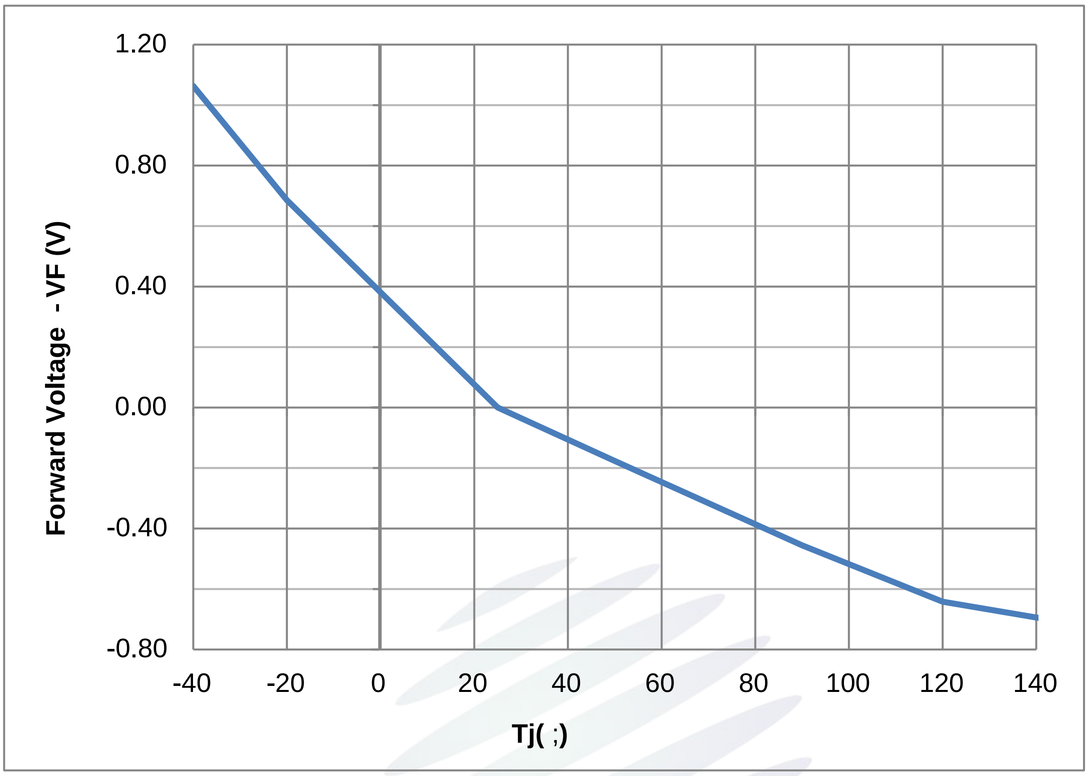

Fig. 1-11 Voltage Shift Vs Junction Temperature

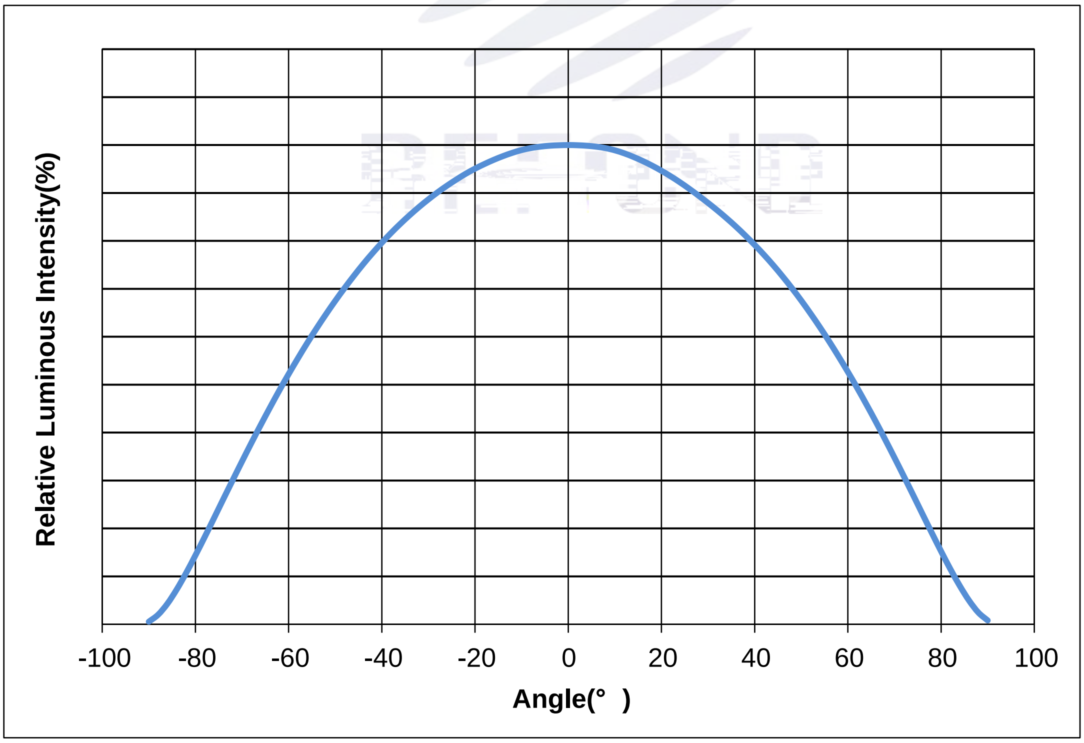

Fig. 1-12 Radiation diagram

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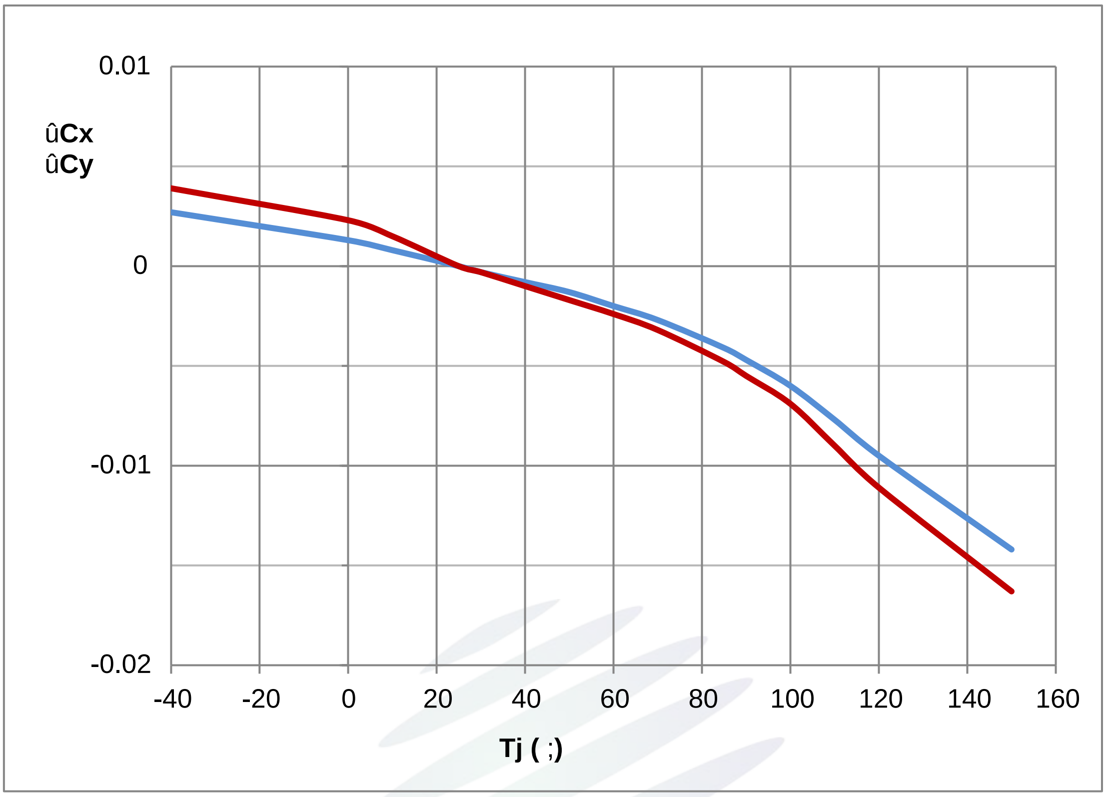

Fig. 1-13 Chromaticity Coordinate Shift Vs Junction Temperature

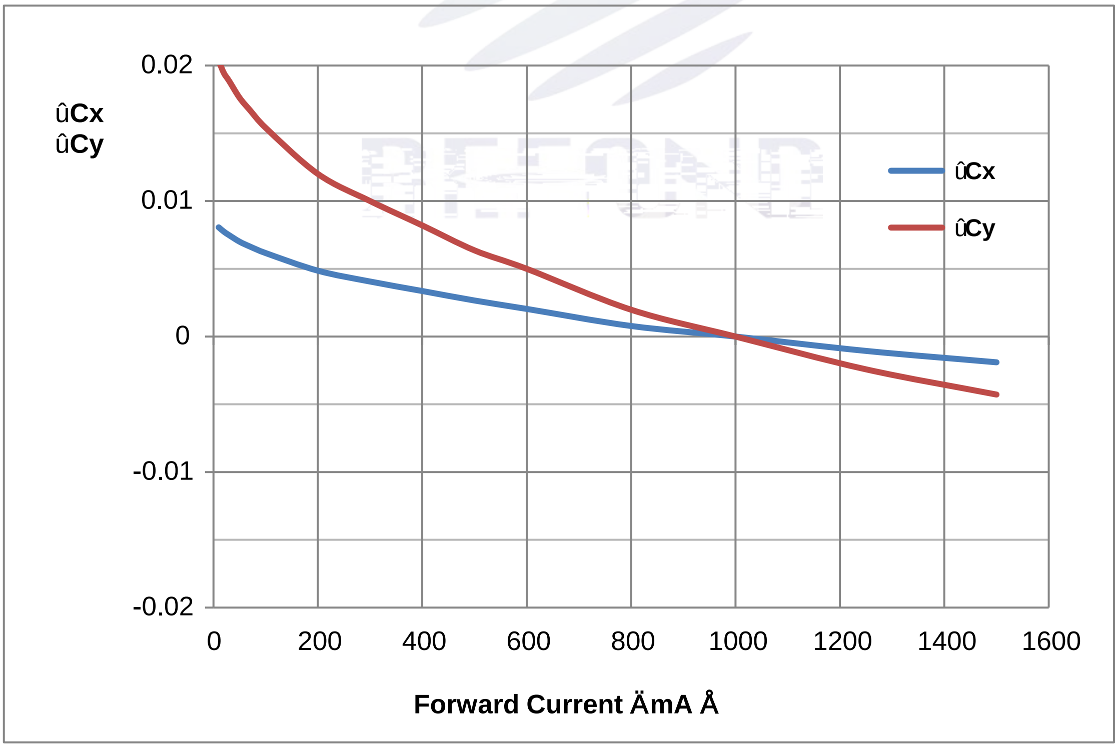

Fig. 1-14 Chromaticity Coordinate Shift Vs Forward Current

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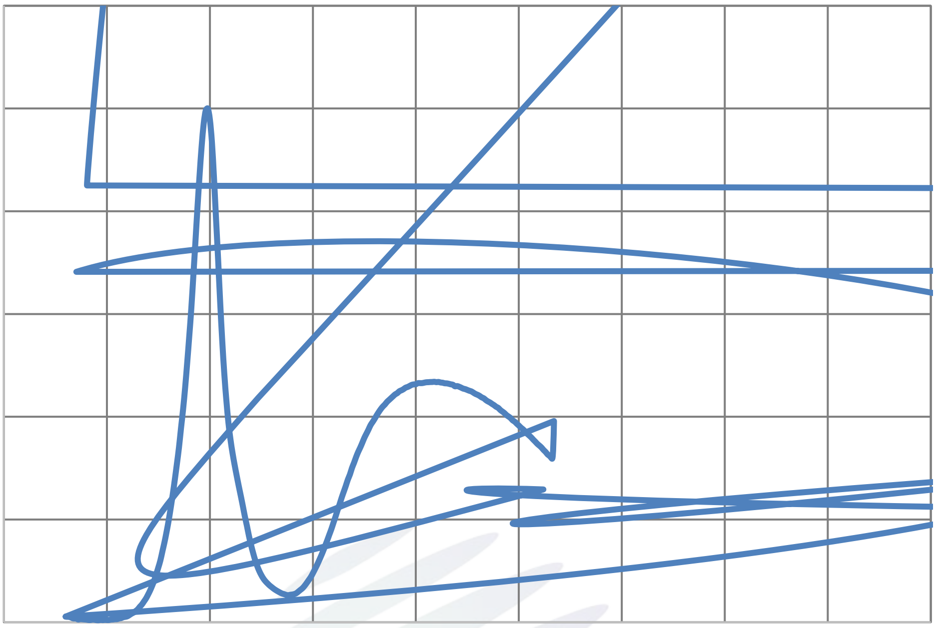

Fig 1-15 Spectrum Distribution

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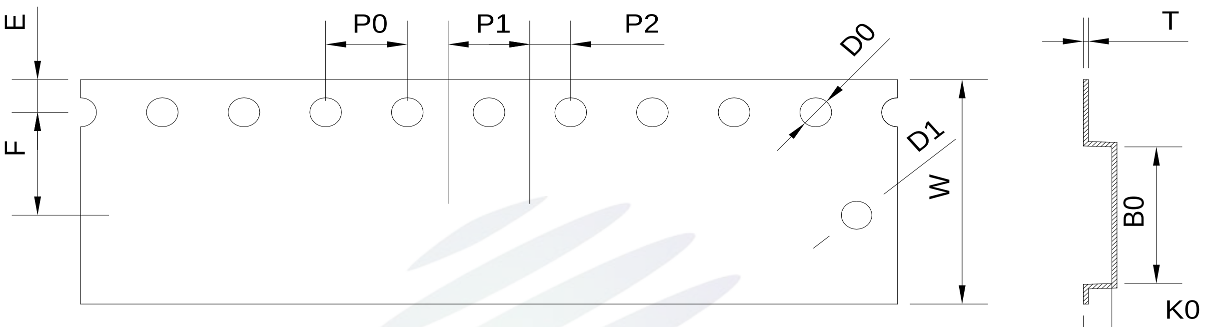
2. Packaging

2.1 Packaging Specification

Package: 4000pcs/reel.

2.1.1 Carrier Tape Dimension



symbol	A0	B0	K0	P0	P1	P2
Spec	3.40±0.1	7.30±0.1	1.00±0.1	4.00±0.1	4.00±0.1	2.00±0.05
symbol	W	T	E	F	D0	D1
Spec	12.0±0.1	0.25±0.05	1.75±0.1	5.50±0.1	1.50±0.1	1.50±0.1

Fig.2-1 Carrier Tape Dimension

2.1.2 Reel Dimension

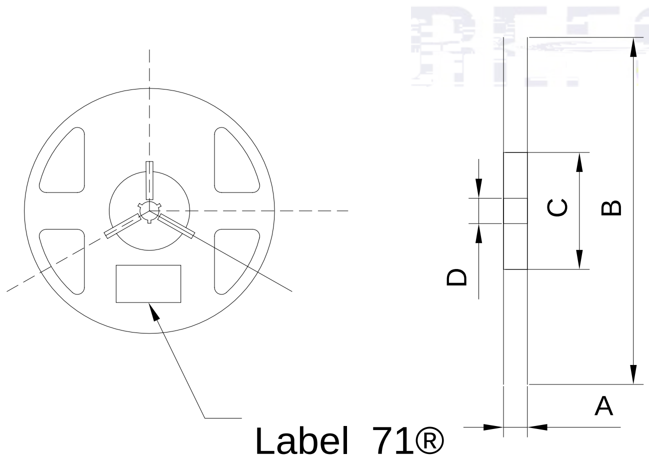


Fig.2-2 Reel Dimension

Table 2-1 Reel Dimension

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

Notes

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

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2.4 Reliability Test Items And Conditions

Table 2-3 Reliability Test Items And Conditions

Test Items	Ref. Standard	Test Condition	Time	Quantity	Ac/Re /
Reflow	JESD22-B106	Temp:260 max T=10 sec	2times	20pcs.	0/1
MSL2 2	JESD22-A113	85 / 60%R_H	168 hrs.	20pcs.	0/1
Thermal Shock	JEITAED-4701 300307	-40 15min 9 ;10s 125 15min	1000 cycle	20pcs.	0/1
Life Test	JESD22-A108	Ta=120 I_F=1000mA	1000hrs.	20pcs.	0/1
High Temperature High Humidity Life Test	JESD22-A101	85 / 85%R_H I_F=1000mA	1000hrs.	20pcs.	0/1

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2.5 Criteria For Judging Damage

Table 2-4 Criteria For Judging Damage

Test Items	Symbol	Test Condition	Criteria For Judgement	
			Min.	Max.
Forward Voltage	V_F	I_F=1000mA	-	U.S.L*)x1.1
Reverse Current	I_R	V_R = 20V	-	U.S.L*)x2.0
Luminous Flux	N	I_F=1000mA	L.S.L*)x0.7	-

Notes

1.U.S.L: Upper standard level L.S.L: Lower standard level

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. / LED

LED

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.

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Notes

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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

LED 100PPM.

(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. LED

LED 900PPM

900PPM 1500PPM.

(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. LED

LED LED

LED

(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.

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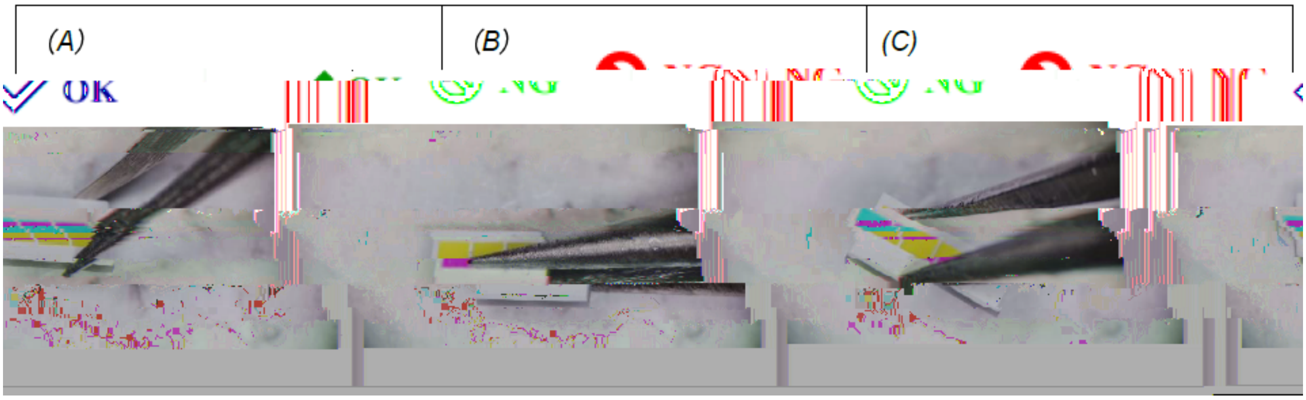

Fig 4-1 Cautions

(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. LED

LED

(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 LED

(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.

LED

Table 4-1Storage

Conditions		Temperature	Humidity	Time
Storage Ø ˆ	Before Opening Aluminum Bag	≤ 30	≤ 75%	Within 1 Year From Date
	After Opening Aluminum Bag	≤ 30	≤ 60%	Recommended for use within 24 hours 1‰^= .ž8…$ " G·
Baking		60 ± 5	-	≥ 24hours 24

(8) If the moisture absorbent materialp· silica gelp¸ has faded away or the LEDs have exceeded the storage time, baking treatment should be performed after unpacking and based on the following conditionp· 60±5pe¸ p 3` ï4 0p-P

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Date	Revisor	Version	Verifier	Remarks
2022/05/10	Xian Zhou	E0	Zhu Yiming	New issue
2023/09/27	Xian Zhou	E1	Zhu Yiming	Version update

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Declare

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

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