

Customer :

Specification for Approval

Part Name : WB30EVA-xx80A

(Preliminary)

Customer : _____ 2015. ____ . ____ .

Checked	Checked	Approved	Remark
/	/	/	

WOOREE E&L Co., Ltd. 2015. 11 . 16 .

Designed	Checked	Approved
/	/	/

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 **WOOREE** E&L Co.,Ltd.

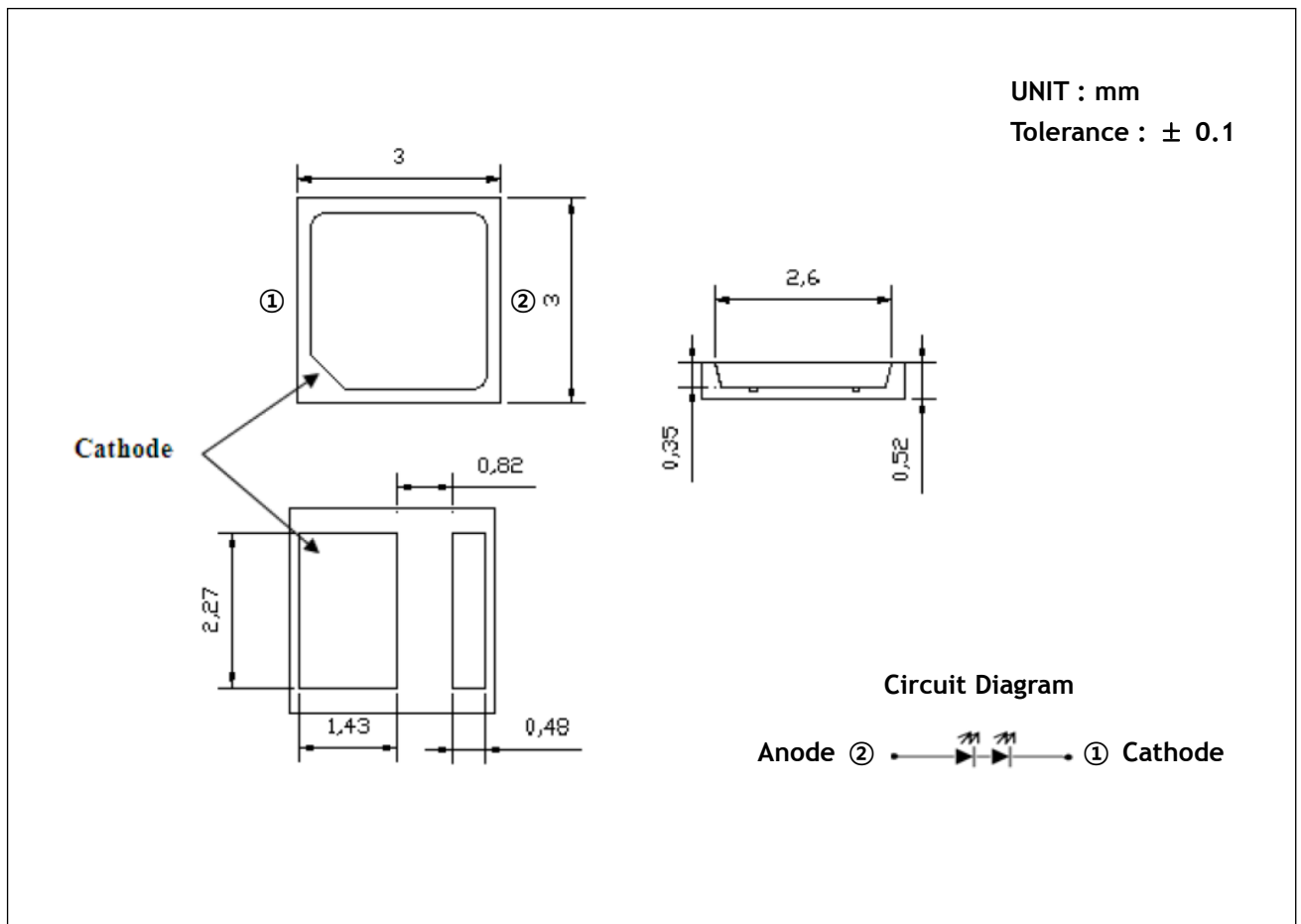
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1. Features

- EMC Housing
- Mid Power to High Power, up to 1.5W
- Max. Driving Current 240mA
- Compact Package Size
- High Color Quality with CRI Min. 80
- Pb-free Reflow Soldering Application

2. Outline Dimension



3. Absolute maximum ratings

Item	Symbol	Absolute Maximum Ratings	Unit
Forward Current	I_F	240	mA
Pulse Forward Current	I_{FP}	280	mA
Power Dissipation	P_D	1500	mW
Reverse Voltage	V_R	10	V
Operating Temperature	T_{OPR}	-40 ~ +105	°C
Storage Temperature	T_S	-40 ~ +105	°C
Solder Temperature	T_{SLD}	Reflow Soldering : 260°C <10sec	-
Junction Temperature	T_J	125	°C
Allowable Reflow Cycles	-	3	times

* I_{FP} condition with Pulse: Width \leq 10ms, Duty cycle \leq 1/10

* LED's properties might be different from suggested values like above and below tables if operation condition will be exceeded our parameter range. Care is to be taken that power dissipation does not exceed the absolute maximum rating of the product.

* All measurements were made under the standardized environment of WOOREE E&L.

4. Electrical/Optical characteristics

(Ta=25℃)

Item	Symbol	Condition	Value			Unit
			Min	Typ.	Max	
Forward Voltage	V_F	$I_F=120\text{mA}$	5.80	6.10	6.40	V
Viewing Angle	$2\theta_{1/2}$	$I_F=120\text{mA}$	-	120	-	Deg.
Luminous Flux	Φ_V	$I_F=120\text{mA}$	96.0	-	114.0	lm
Color Temperature	CCT	$I_F=120\text{mA}$	2535	-	6730	K
Color Rendering Index	Ra	$I_F=120\text{mA}$	80	-	-	-
Thermal resistance	$(R_{th\ j-sp})$	$I_F=120\text{mA}$	-	11	17	°C/W
Electrostatic Discharge	ESD	HBM	2000	-	-	V

* All data in this datasheet follows WOOREE E&L reading.

* The measurement of forward voltage maintains a tolerance of $\pm 0.05\text{V}$, flux maintains a tolerance of $\pm 6\%$.

* Ra measurement tolerance is ± 2 .

* Rth j-sp is the thermal resistance from LED junction to solder point on MCPCB with electrical power.

* All correlated color temperature in this datasheet is derived from CIE 1931 Chromaticity diagram.

5. Ranks

(1) Forward Voltage

(Ta=25℃)

Rank	Condition	Min.	Max.	Unit
H1	I _F = 120mA	5.80	6.00	V
H2		6.00	6.20	
H3		6.20	6.40	

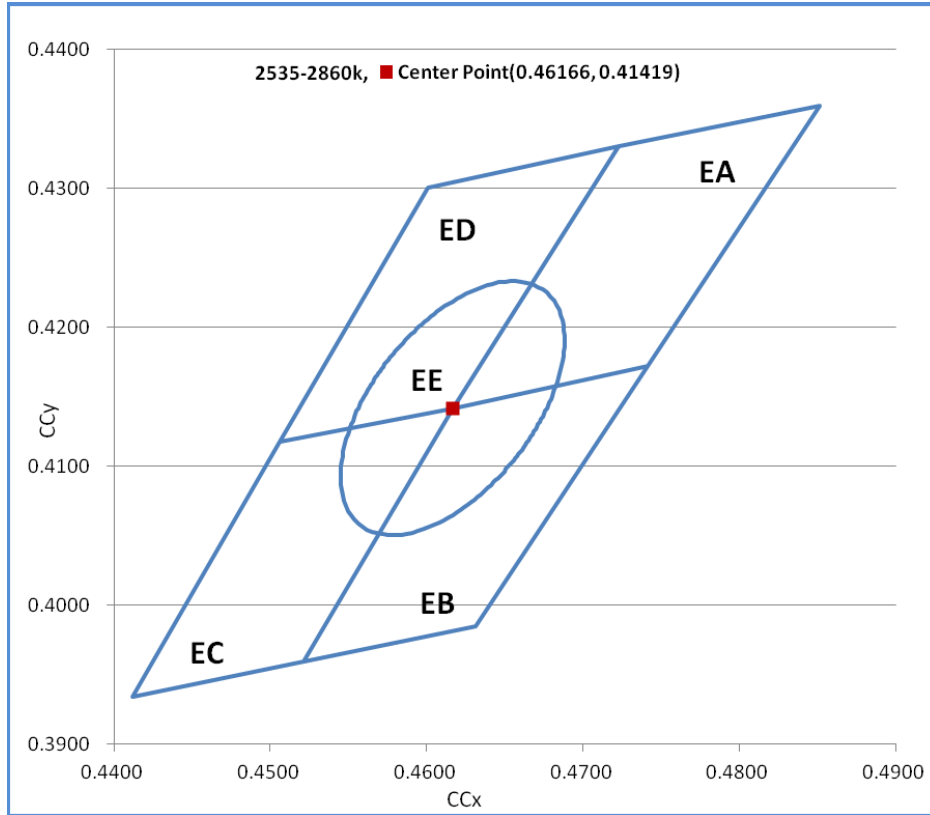
(2) Luminous Flux

(Ta=25℃)

Rank	Condition	2700K	4000K	5000K	6500K	Unit
Q3	I _F = 120mA	96 - 99	-	-	-	lm
Q4		99 - 102	-	-	-	
Q5		102 - 104	102 - 104	102 - 104	102 - 104	
Q6		-	104 - 106	104 - 106	104 - 106	
Q7		-	106 - 108	106 - 108	106 - 108	
Q8		-	108 - 110	108 - 110	108 - 110	
Q9		-	110 - 112	110 - 112	110 - 112	
J1		-	112 - 114	112 - 114	112 - 114	

(3) Chromaticity coordinates - CCT 2700K

($I_F=120\text{mA}$, $T_a=25^\circ\text{C}$)



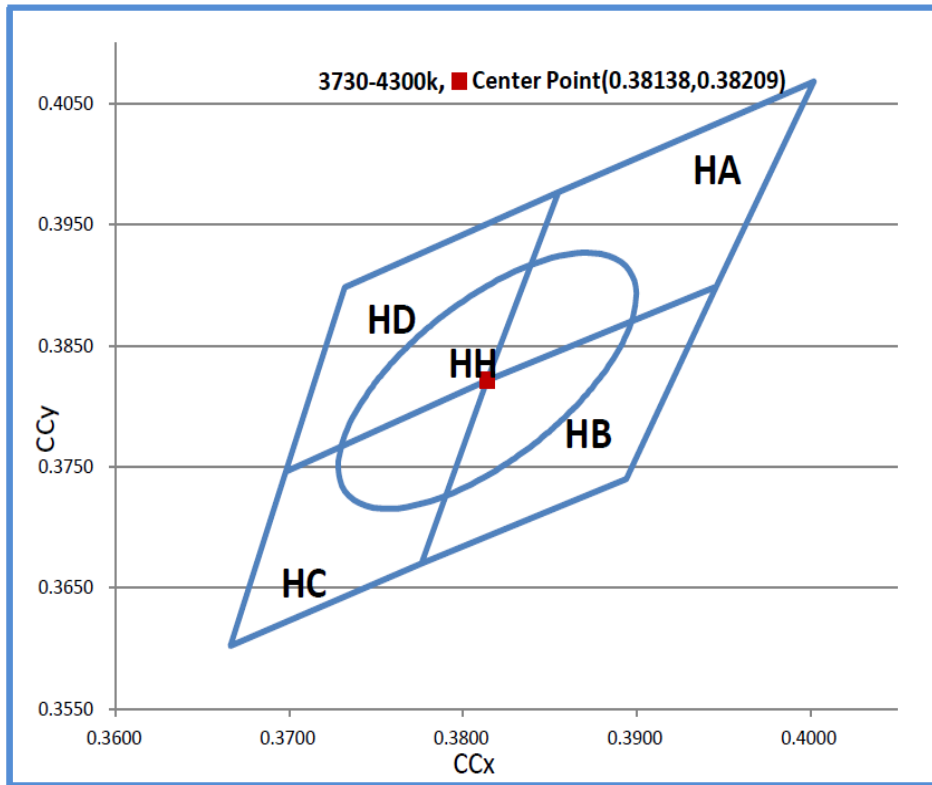
*4-step MacAdam Ellipse Color Definition

Normal ANSI CCT	Color space	Center Point (Cx, Cy)	Major Axis a	Minor Axis b	Ellipse Rotation Angle
2700K (EE)	Single 4-step MacAdam ellipse	(0.46166, 0.41419)	0.0103108	0.0053480	57.28

EA		EB		EC		ED	
x	y	x	y	x	y	x	y
0.4852	0.4360	0.4632	0.3985	0.4412	0.3934	0.4601	0.4301
0.4723	0.4330	0.4742	0.4172	0.4522	0.3959	0.4506	0.4117
0.4617	0.4142	0.4617	0.4142	0.4617	0.4142	0.4617	0.4142
0.4742	0.4172	0.4522	0.3959	0.4506	0.4117	0.4723	0.4330

(4) Chromaticity coordinates - CCT 4000K

($I_F=120\text{mA}$, $T_a=25^\circ\text{C}$)



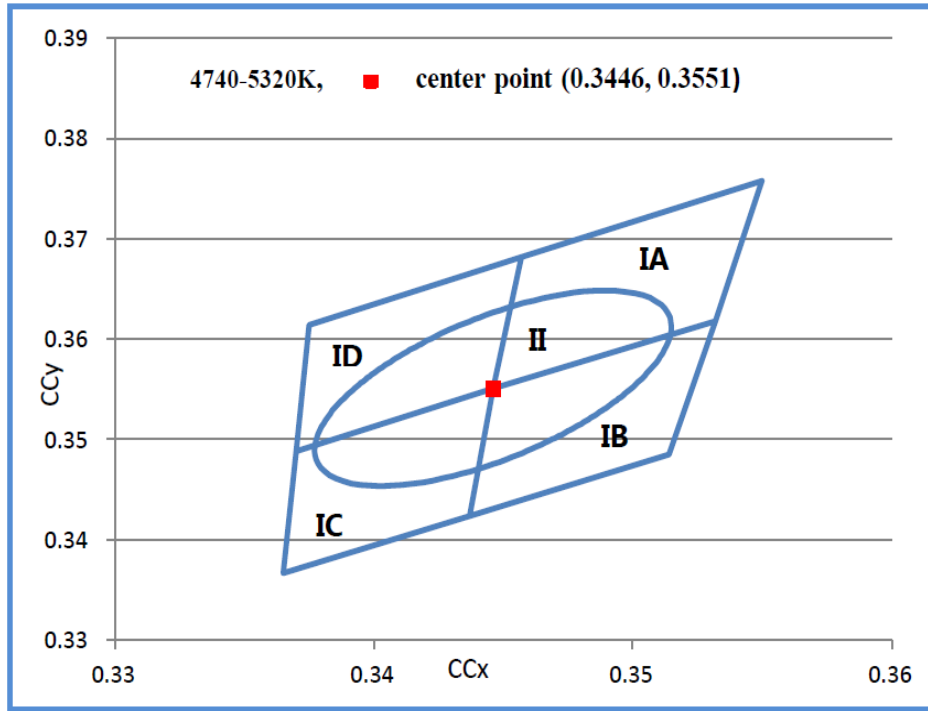
*4-step MacAdam Ellipse Color Definition

Normal ANSI CCT	Color space	Center Point (Cx, Cy)	Major Axis a	Minor Axis b	Ellipse Rotation Angle
4000K (HH)	Single 4-step MacAdam ellipse	(0.38138, 0.38209)	0.0125151	0.005380	53.71

HA		HB		HC		HD	
x	y	x	y	x	y	x	y
0.4002	0.4068	0.3946	0.3899	0.3776	0.3670	0.3855	0.3977
0.3946	0.3899	0.3894	0.3740	0.3666	0.3602	0.3814	0.3821
0.3814	0.3821	0.3776	0.3670	0.3698	0.3746	0.3698	0.3746
0.3855	0.3977	0.3814	0.3821	0.3814	0.3821	0.3732	0.3898

(5) Chromaticity coordinates - CCT 5000K

($I_F=120\text{mA}$, $T_a=25^\circ\text{C}$)



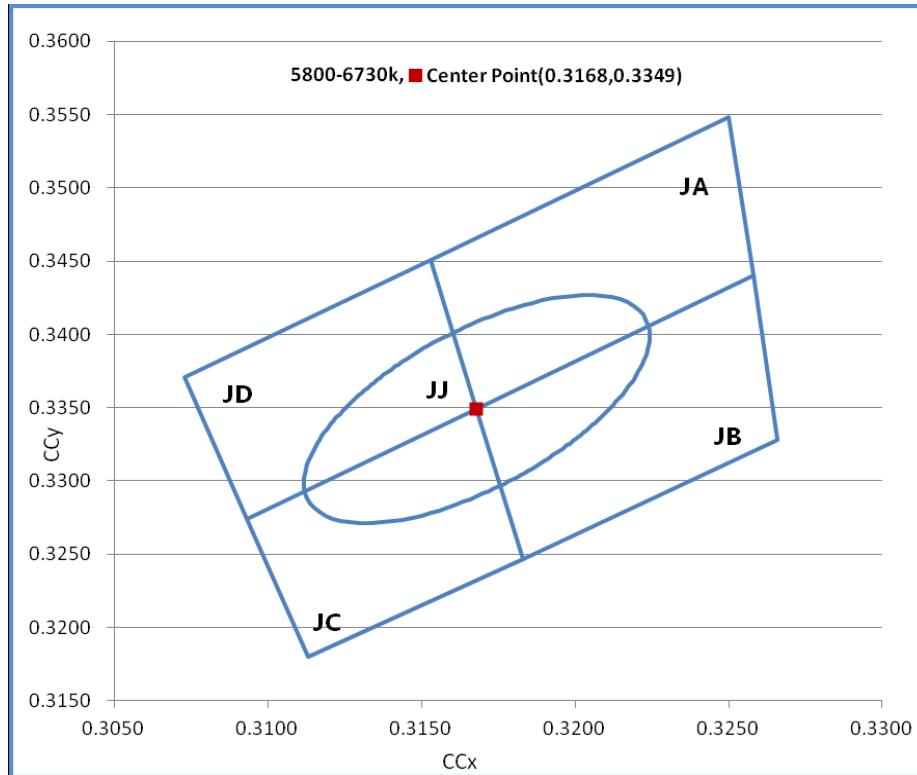
*4-step MacAdam Ellipse Color Definition

Normal ANSI CCT	Color space	Center Point (Cx, Cy)	Major Axis a	Minor Axis b	Ellipse Rotation Angle
5000K (II)	Single 4-step MacAdam ellipse	(0.3446, 0.3551)	0.0109488	0.004759	59.62

IA		IB		IC		ID	
x	y	x	y	x	y	x	y
0.3550	0.3758	0.3532	0.3618	0.3446	0.3551	0.3457	0.3682
0.3532	0.3618	0.3514	0.3485	0.3437	0.3424	0.3446	0.3551
0.3446	0.3551	0.3437	0.3424	0.3365	0.3367	0.3370	0.3488
0.3457	0.3682	0.3446	0.3551	0.3370	0.3488	0.3375	0.3614

(6) Chromaticity coordinates - CCT 6500K

($I_F=120\text{mA}$, $T_a=25^\circ\text{C}$)



*4-step MacAdam Ellipse Color Definition

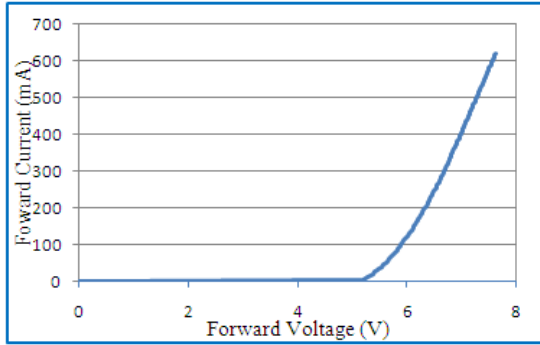
Normal ANSI CCT	Color space	Center Point (Cx, Cy)	Major Axis a	Minor Axis b	Ellipse Rotation Angle
6500K (JJ)	Single 4-step MacAdam ellipse	(0.3168, 0.3349)	0.008823	0.003806	58.56

JA		JB		JC		JD	
x	y	x	y	x	y	x	y
0.3250	0.3548	0.3258	0.3440	0.3168	0.3349	0.3153	0.3451
0.3258	0.3440	0.3266	0.3328	0.3183	0.3247	0.3168	0.3349
0.3168	0.3349	0.3183	0.3247	0.3113	0.3180	0.3093	0.3274
0.3153	0.3451	0.3168	0.3349	0.3093	0.3274	0.3073	0.3371

6. Characteristic Diagrams

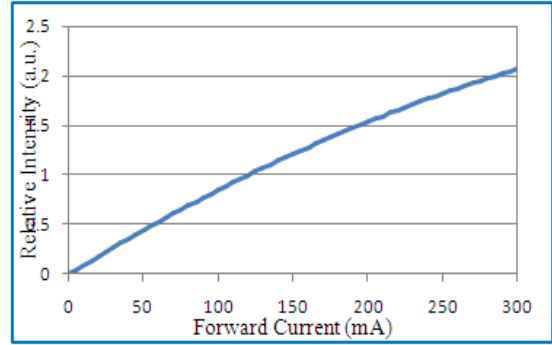
(1) Forward Voltage - Forward Current

($T_a=25^\circ\text{C}$)



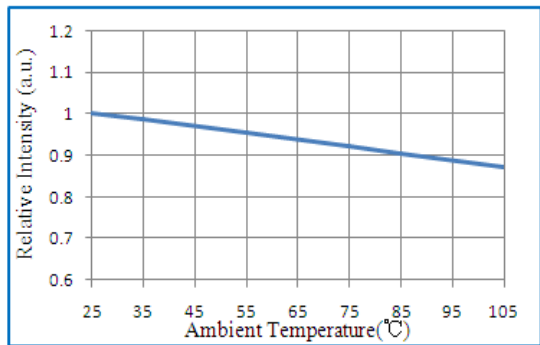
(2) Forward Current - Relative Intensity

($T_a=25^\circ\text{C}$)



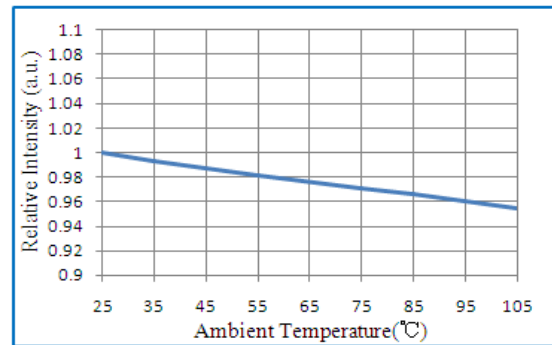
(3) T_a - Relative Intensity

($I_f=120\text{mA}$)



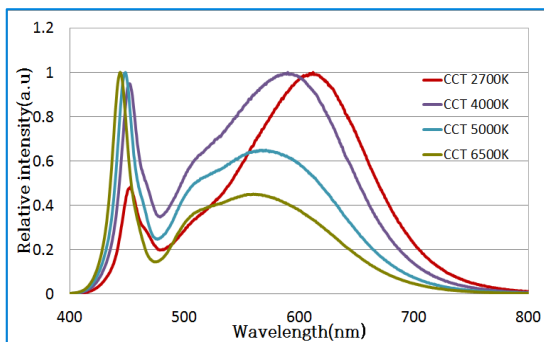
(4) T_a - Forward Voltage

($I_f=120\text{mA}$)

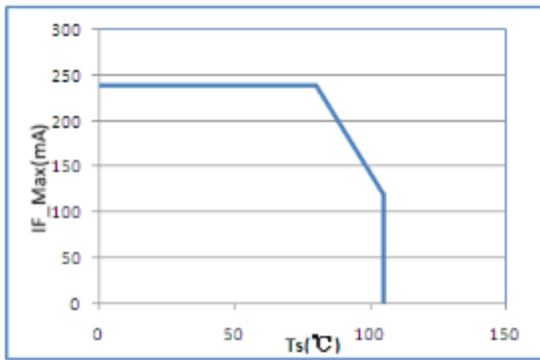


(5) Spectrum

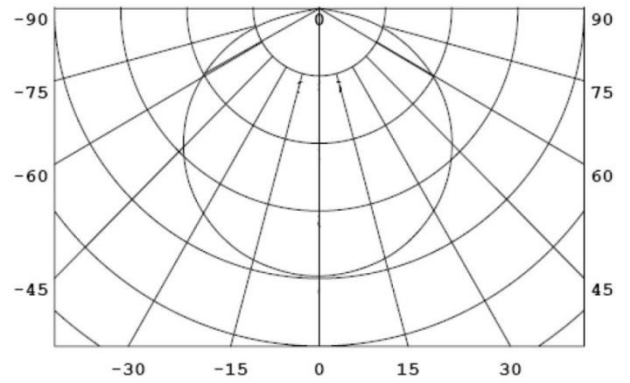
($T_a=25^\circ\text{C}$, $I_f=120\text{mA}$)



(6) Ambient Temperature
- Allowable Forward Current



(7) Viewing Angle Distribution
($T_a=25^\circ\text{C}$, $I_F=120\text{mA}$, RH 60%)



7. Reliability

(1) Test items and results

NO	Test Item	Standard Test Method	Test Conditions	Note	Number of Damaged
1	Temperature Cycle	JEITA ED-4701 100 105	-40℃ -25℃ -100℃ -25℃ 30min. 5min. 30min. 5min	100 cycles	0/20
2	High Temperature Storage	JEITA ED-4701 200 201	Ta=100℃	1000 hrs	0/20
3	Temperature Humidity Storage	JEITA ED-4701 100 103	Ta=85℃, RH=85%	1000 hrs	0/20
4	Low Temperature Storage	JEITA ED-4701 200 202	Ta=-40℃	1000 hrs	0/20
5	Steady State Operating Life	-	Ta=25℃, I _F =150mA	1000 hrs	0/20
6	Steady State Operating Life of High Temperature	-	Ta=85℃, I _F =120mA	1000 hrs	0/20
7	Steady State Operating Life of High Humidity Heat	-	Ta=85℃, RH=85%, I _F =120mA	1000 hrs	0/20
8	Steady State Operating Life of Low Temperature	-	Ta=-40℃, I _F =120mA	1000 hrs	0/20

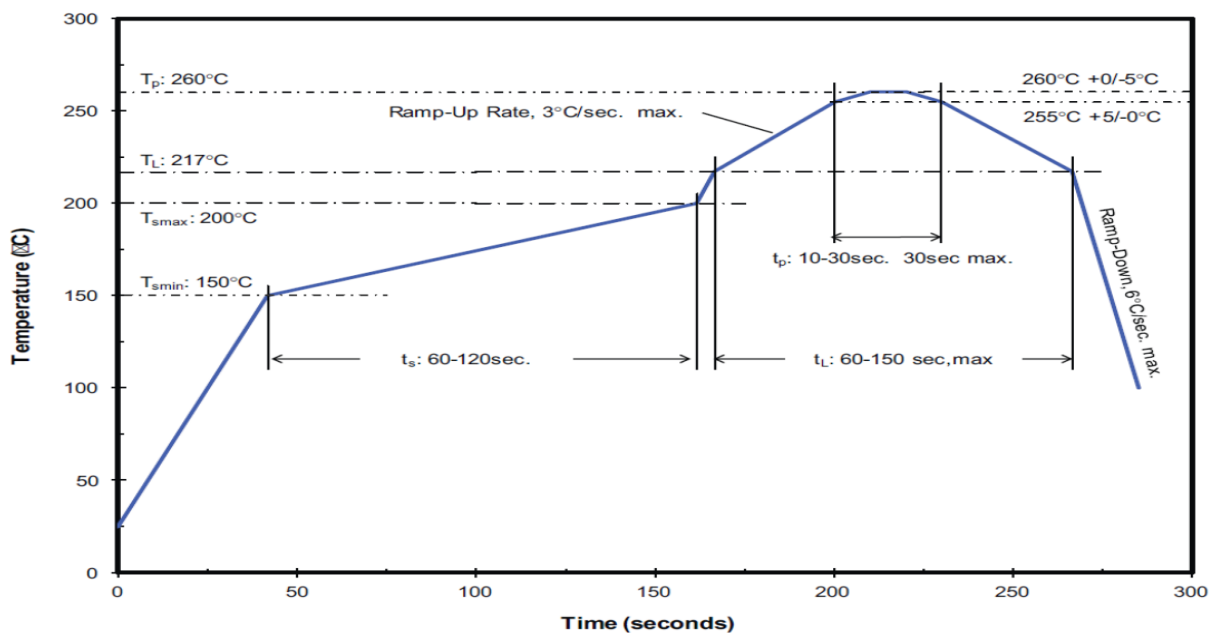
(2) Criteria for judging the damage

ITEM	Symbol	Test Condition	Criteria for Judgement	
			Min.	Max.
Forward Voltage	V _F	I _F =120mA	-	Init. Value + 0.2V
Luminous Intensity	I _v	I _F =120mA	Init. Value*0.7	

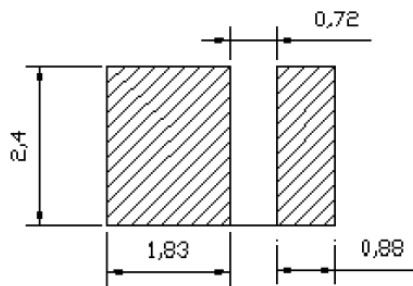
8. Recommend soldering conditions

(1) Reflow Soldering Characteristics

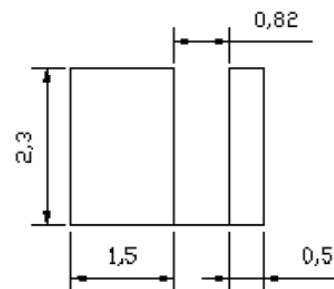
Reflow soldering	
Temperature Min (T _{smin})	150°C
Temperature Max (T _{smax})	200°C
Time(t _s)from (T _{smin} to T _{smax})	60-120 seconds.
Ramp-up rate (TL to T _p)	3°C /seconds max.
Liquidous temperature(TL)	217°C
Time(t _L) maintained above TL	60-150 seconds
Peak package body temperature(T _p)	260°C max
Time (t _p) within 5°C of the specified classification temperature(T _c).	30 seconds max
Ramp-down rate (T _p to TL)	6°C /second max
Time 25°C to peak temperature	8 min max



(2) Recommended soldering pad design

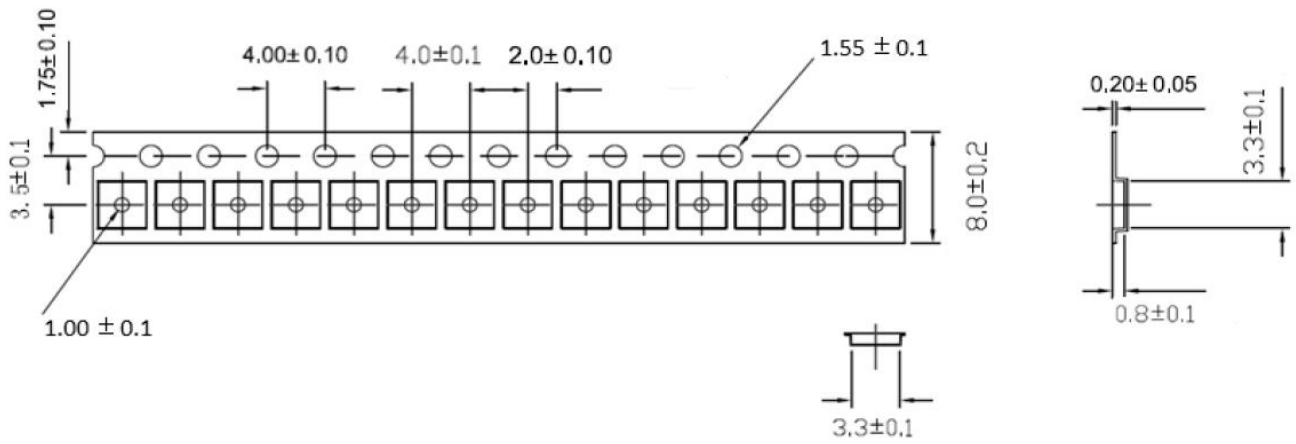


(3) Recommended stencil aperture



9. Packing

(1) Taping part

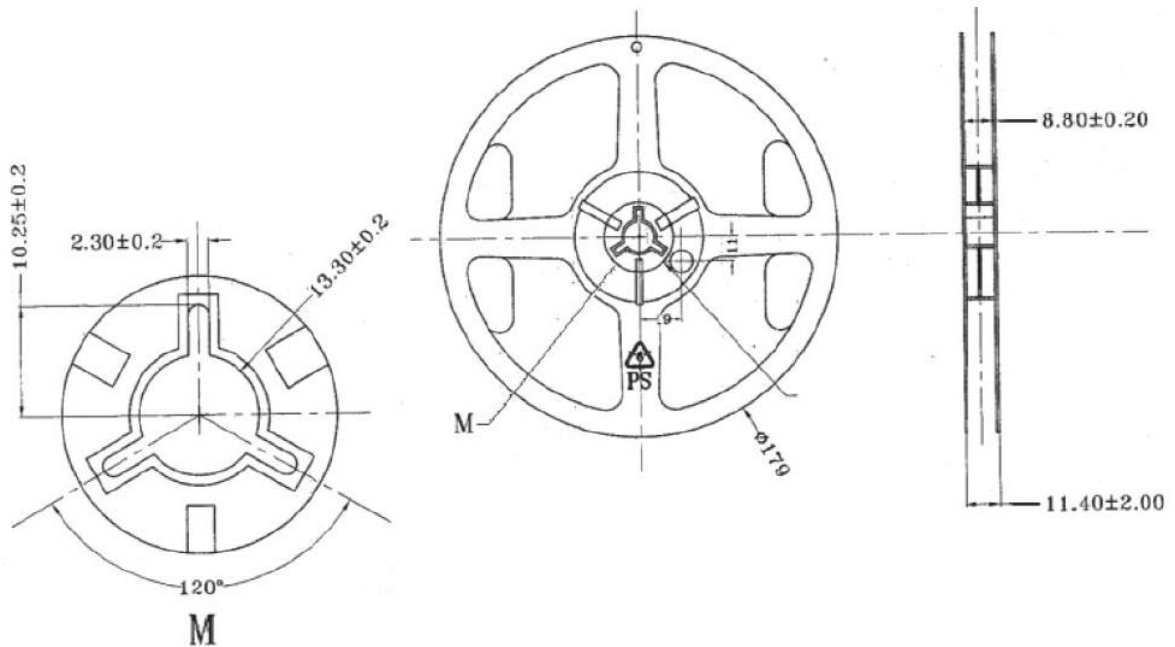


*Quantity : 3000pcs/Reel

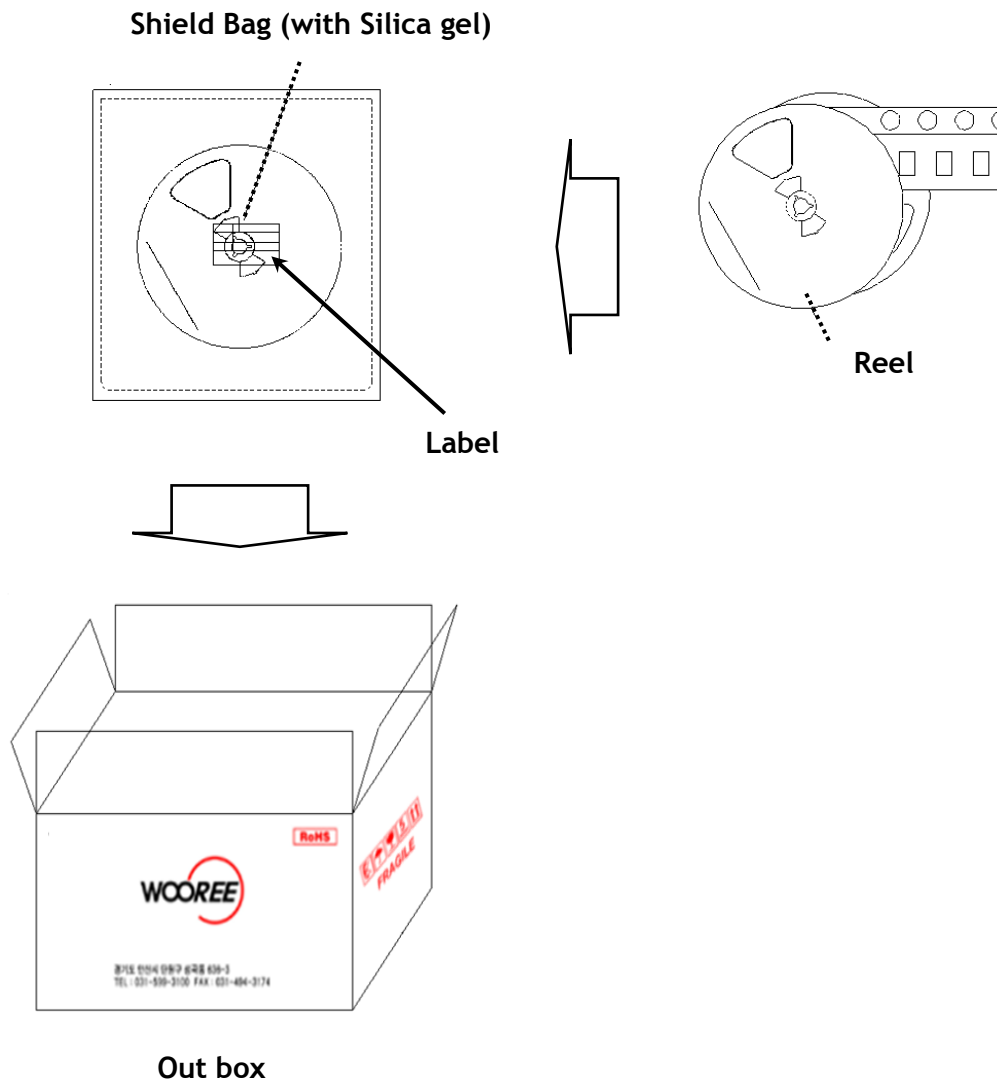
*Cumulative Tolerance : Cumulative Tolerance/10 pitches to be $\pm 0.2\text{mm}$

*Adhesion Strength of Cover Tape Adhesion strength to be 0.1-0.7N when the cover tape is turned off from the carrier tape at the angle of 10° to the carrier tape.

(2) Reel part



(3) Boxing



Box	Dimension (mm)	Reel/Box	Quantity/Box
Out box	555*515*540	144 Reel max.	432,000 ea

(4) Label Information


PART NUMBER : WB30EVA-2780A
RANK : H2Q4EE
LOT NUMBER : W15K06-001
QUANTITY : 3000 EA 2015. 10. 06

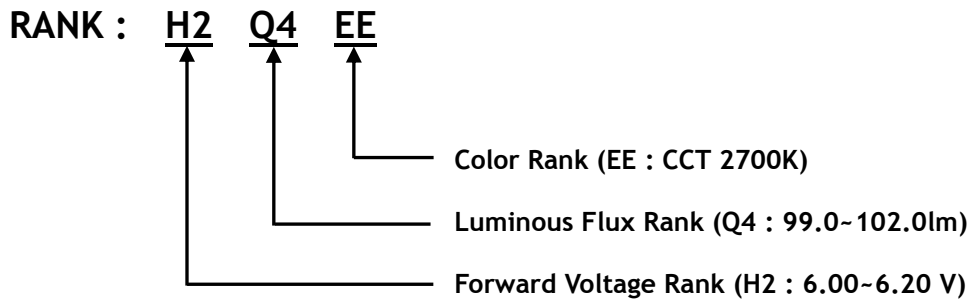


(5) Lot Number



- ① WOOREE E&L Initial
- ② Year (15 for 2015)
- ③ Month (A for Jan., B for Feb., ... , M for Dec.)
- ④ Day (01 for 1,....31 for 31)
- ⑤ WOOREE E&L Product Running Number

(6) Rank Code description



10. Revision History

Title	Specification for Approval		
Times	Date	Summary of revision	Remarks
1	2015. 11. 16	INITIAL ISSUE	R(0)