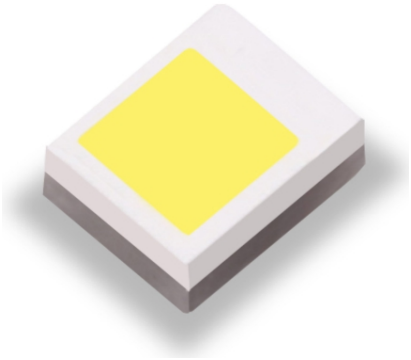
01.JA.1AP2016W65P01 Specification



Features & Benefits

- Package: 1.9mm×1.5mm×0.8 mm
- Typical Luminous Flux: 420lm@1 A
- Built-in ESD Protection Device
- Soldering methods: All SMT assembly methods
- Moisture sensitivity level: Level 1
- Loaded quantity: 4000 pcs/reel
- RoHS compliant & Pb free
- Compliance to AEC-Q102 Standard

Typical Application:

- Day time running light
- Low beam
- High beam

1. Absolute Maximum Ratings

Parameter	Symbol	Rating	Unit
DC Forward Current (min)	I_F	50	mA
DC Forward Current (max)	I_F	1500	mA
Peak Pluse Current	I_{FP}	2000	mA
Reverse Voltage	V_R	Note1	
Junction Temperature	Tj	150	℃
ESD Resistance（HBM）	ESD	8000	V
Soldering Temperature	Tsol	Reflow soldering (260℃ for 10seconds) Hand soldering (300℃ for 3 seconds)	
Operating Temperature	Topr	-40℃~+135	℃
Storage Temperature	Tstg	-40℃~+135	℃
Allowable Reflow Cycles	-	3	Cycles

Notes:

1. The LEDs are not designed for reverse bias used.
2. I_{FP} condition: pulse width ≤10msec, duty cycle ≤1/10.
3. Avoid operating LEDs at maximum operating temperature exceed 1hour.
4. Operate LED component at maximum rating conditions continuously will cause possible permanent damage and de-rating parameters. Exercise multiple maximum rating parameters simultaneously should not be allowed. When maximum rating parameters are applied over a long period will result potential reliability issue.

2. Electrical-optical characteristics(Tj=25℃)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Forward Voltage	Vf	2.75	--	3.75	V	IF=1000mA
Luminous Flux	Φ	330	420	--	lm	
Color Temperature	CCT	5350	--	6700	K	
Viewing Angle	2θ1/2	-	120	-	Deg	
Reverse Current	IR	-	-	1	uA	VR=5V
Thermal Resistance	Rthj-s	-	3	4.5	℃/W	-

Notes:

1. Luminous flux measurement tolerance: ±5%.
2. Forward voltage tolerance: ±0.1V.
3. View angle measurement tolerance : ±5°.

3. Product Binning

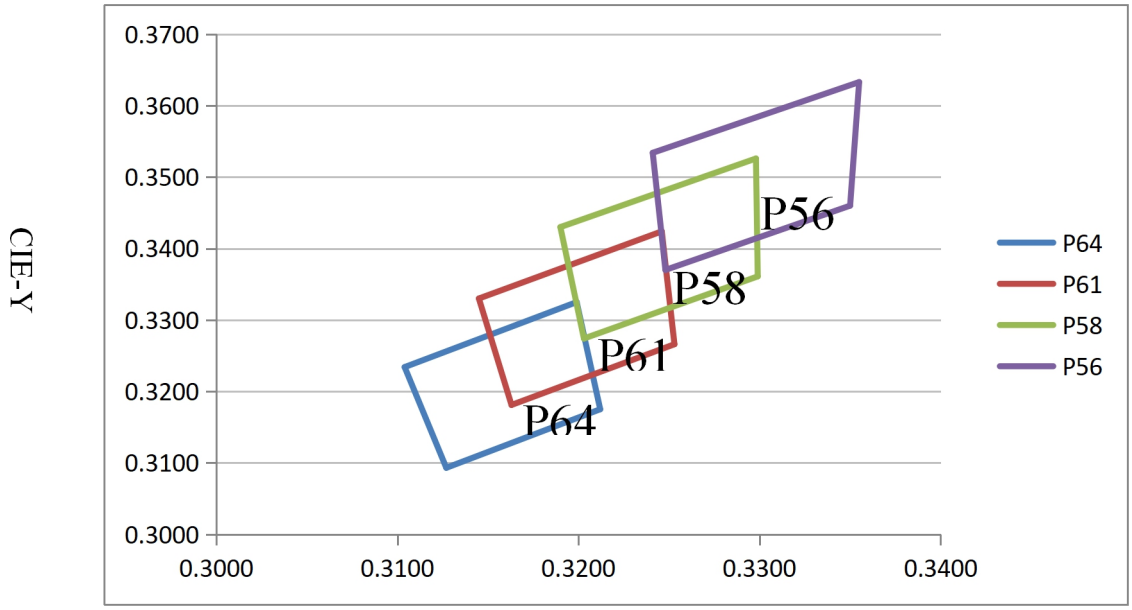
a). Luminous flux

BIN code	Min (lm)	Max (lm)
37	370	410
41	410	450
45	450	490
39B	395	425
42B	425	455

b). Forward voltage

BIN Code	Min (V)	Max (V)
27	2.75	3.0
30	3.0	3.25
32	3.25	3.5
35	3.5	3.75

c). Chromaticity Coordinate Groups



CIE-X

Chromaticity coordinates

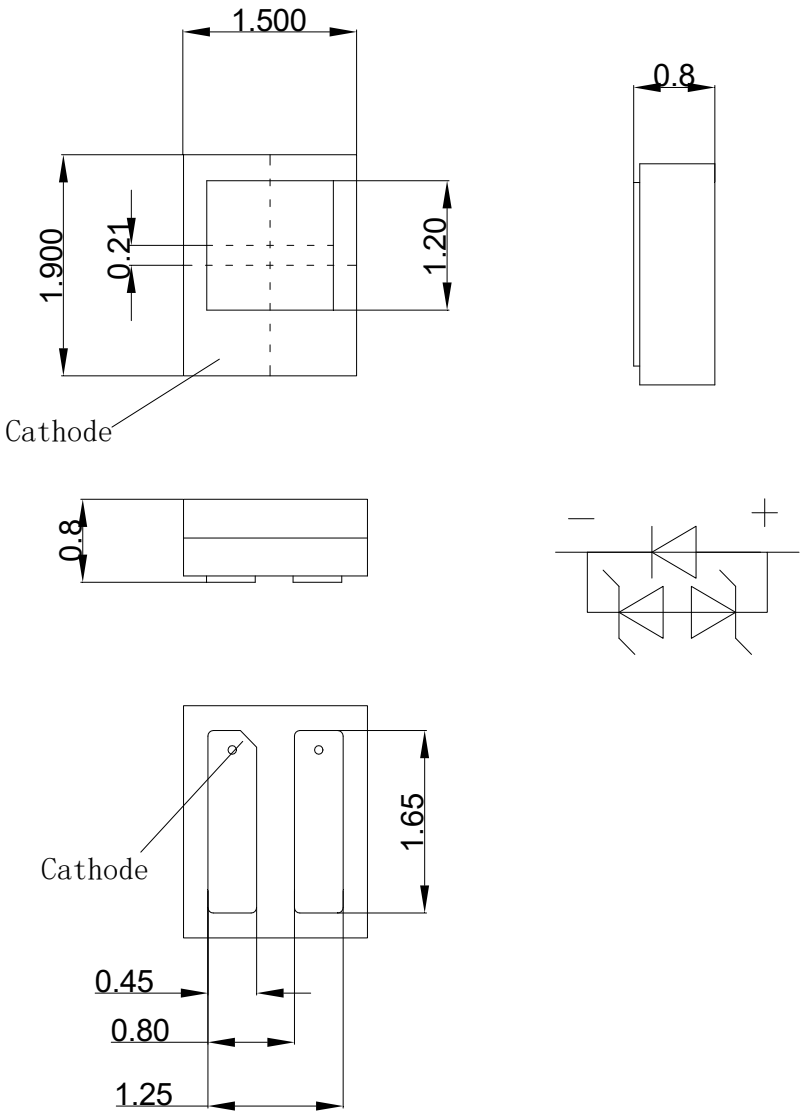
CCT Reference Range（K）	CIE-X	CIE-Y	BIN
6100K-6700K	0.3127	0.3093	P64
	0.3212	0.3175	
	0.3199	0.3325	
	0.3104	0.3234	
5850K-6400K	0.3163	0.3181	P61
	0.3253	0.3266	
	0.3246	0.3424	
	0.3145	0.333	
5600K-6100K	0.3203	0.3274	P58
	0.3299	0.3361	
	0.3298	0.3526	
	0.319	0.343	
5350K-5850K	0.3248	0.337	P56
	0.335	0.346	
	0.3355	0.3633	
	0.3241	0.3534	

Notes:

1. XY tolerance : ±0.01.
2. XY are tested at IF=1000mA.

4. Package Outline Dimension

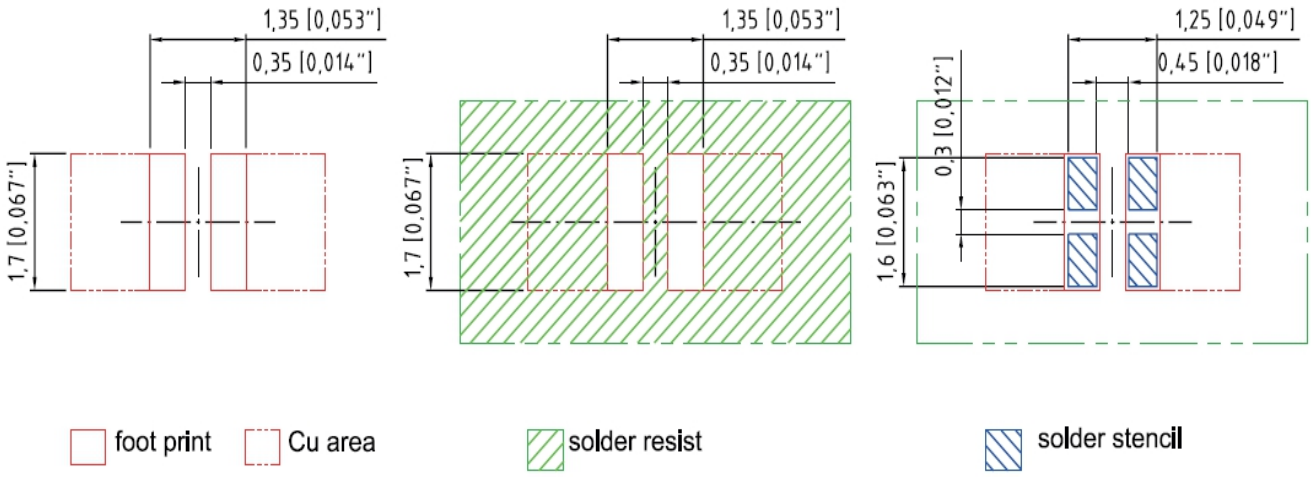
4.1 Package Outline



Notes:

1. All dimensions units are millimeters.
2. Tolerance is ±0.10mm unless otherwise specified.

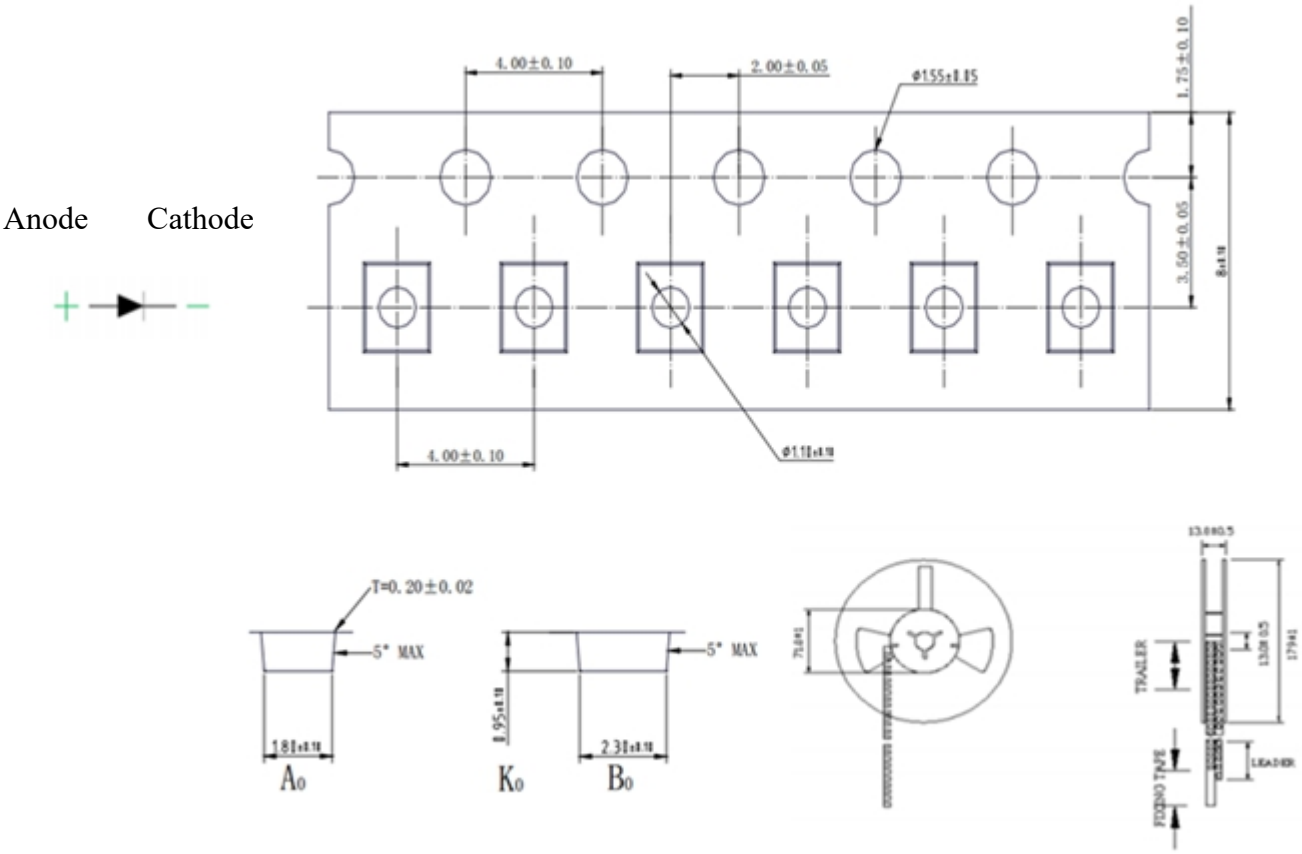
4.2 Recommended Solder Pad

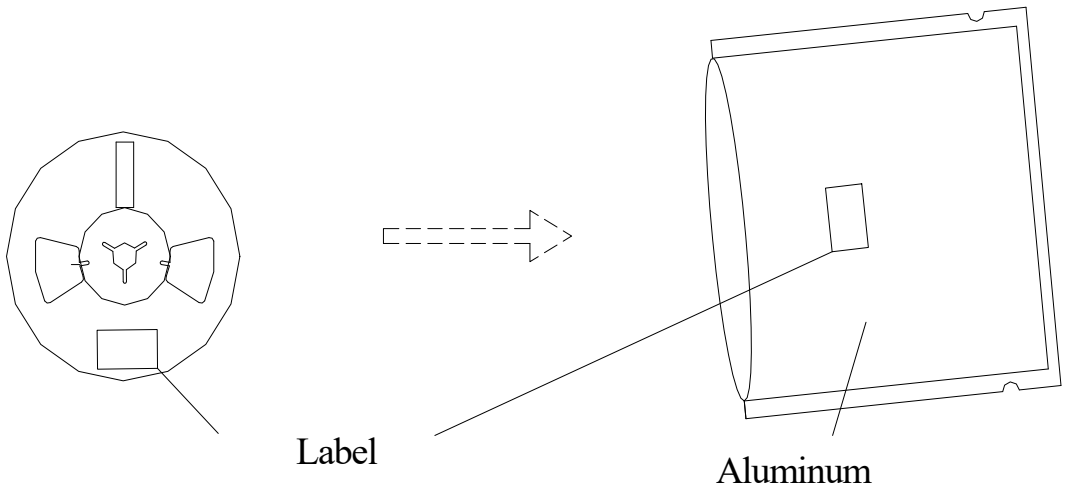


Notes:

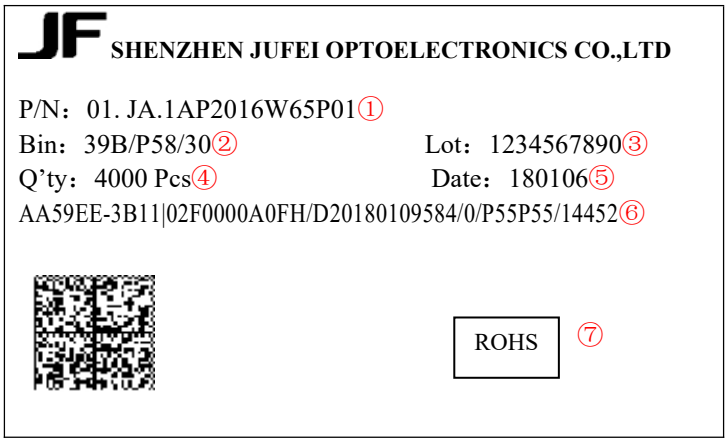
- For superior solder joint connectivity results we recommend soldering under standard nitrogen atmosphere.

5. Package Information (unit: mm)





6. Label Form Specification



6.1 Label description

①	Product Type
②	Product Bin
③	Produce Batch
④	Quantity
⑤	Produce Date
⑥	Product Tracing Number
⑦	Halogen Free

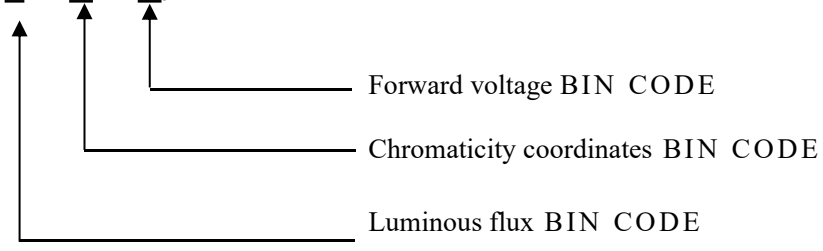
6.2 Part Number System description

$X_1X_2.X_3X_4.X_5X_6X_7X_8X_9X_{10}X_{11}X_{12}X_{13}X_{14}X_{15}$

Part Number Code	Description	Part Number	Value
X_1X_2	Production Type	01	Self-produce
X_3	Company	J	JF
X_4	Applications	A	Automotive
X_5	ESD Protection Status	1	one series
X_6		A	one parallel +Zener
X_7	Power Range	P	2.5W≤PO＜3.5W
X_8-X_{11}	Product Size	2016	1.9mm×1.5 mm
X_{12}	Emitting Color	W	white
$X_{13}X_{14}$	Color Rendering	65	CRI 65+
X_{15}	Patent Status	P	Patent
X_{16}	Water code	01	serial number

6.3 BIN description

X_1 / X_2 / X_3



7. Typical Electro-Optical Characteristics Curves

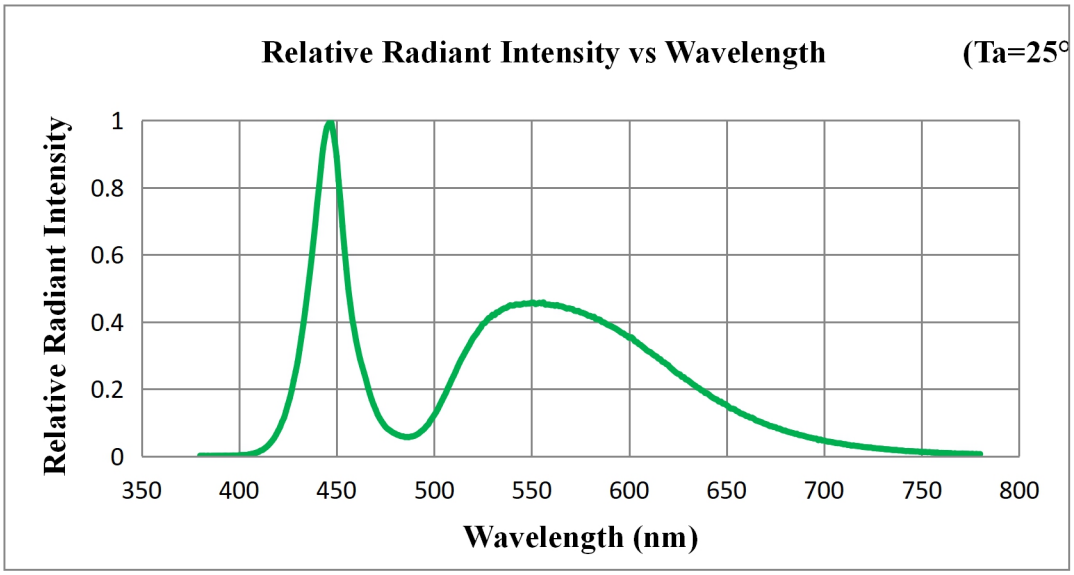


Fig.1 Relative Radiant Intensity vs Wavelength

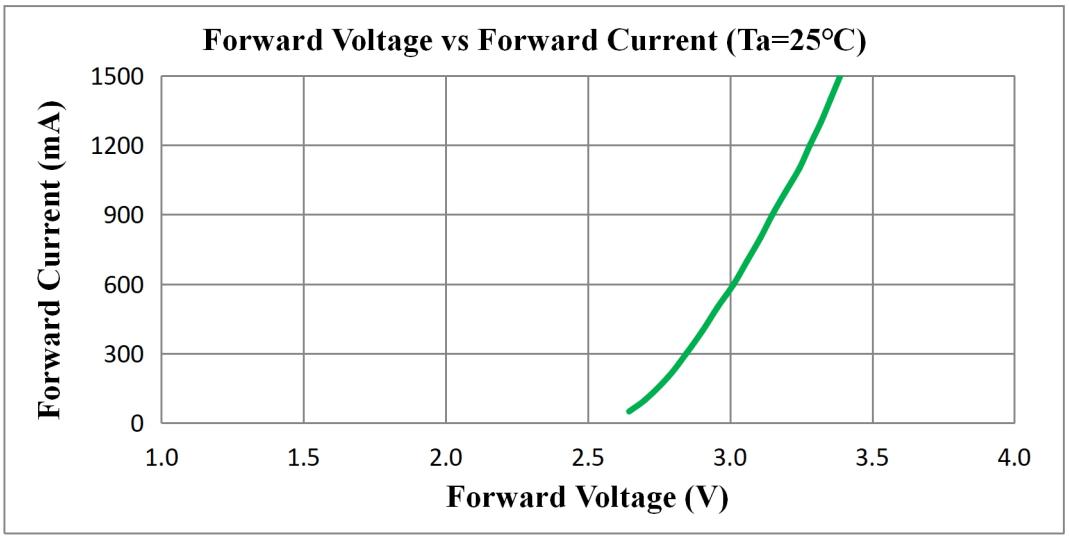


Fig.2 Forward Voltage vs Forward Current

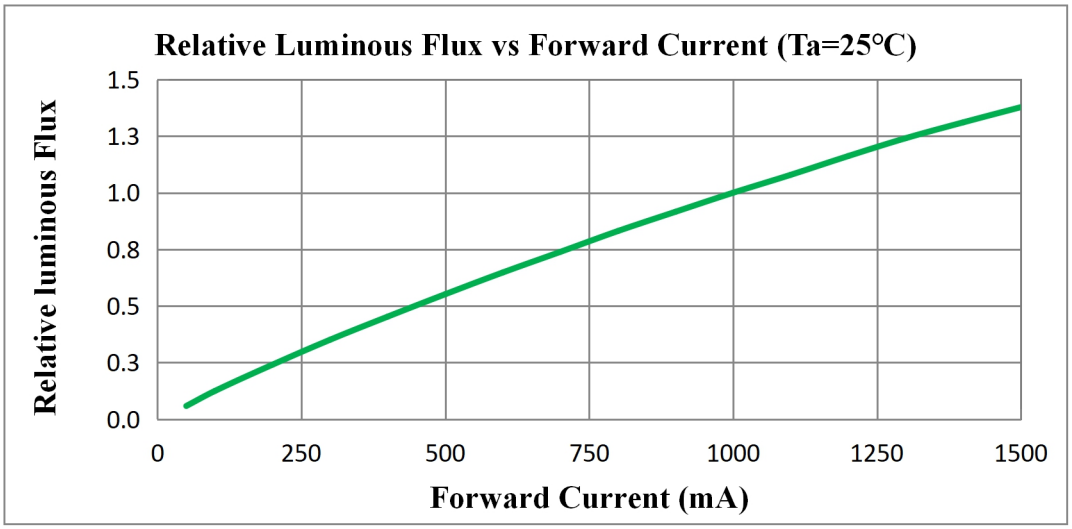


Fig.3 Relative Luminous Flux vs Forward Current

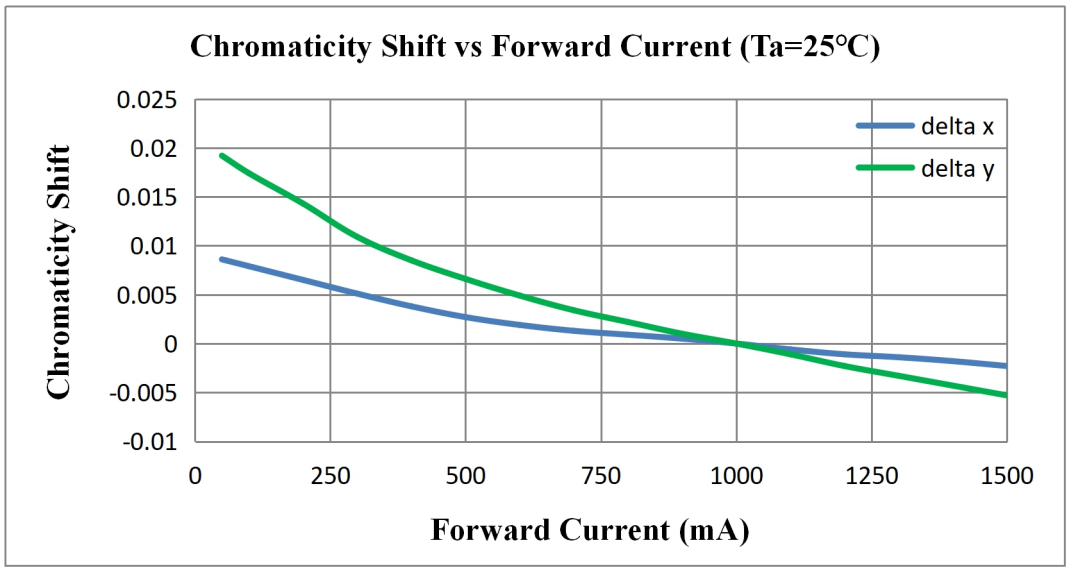


Fig.4 Chromaticity Shift vs Forward Current

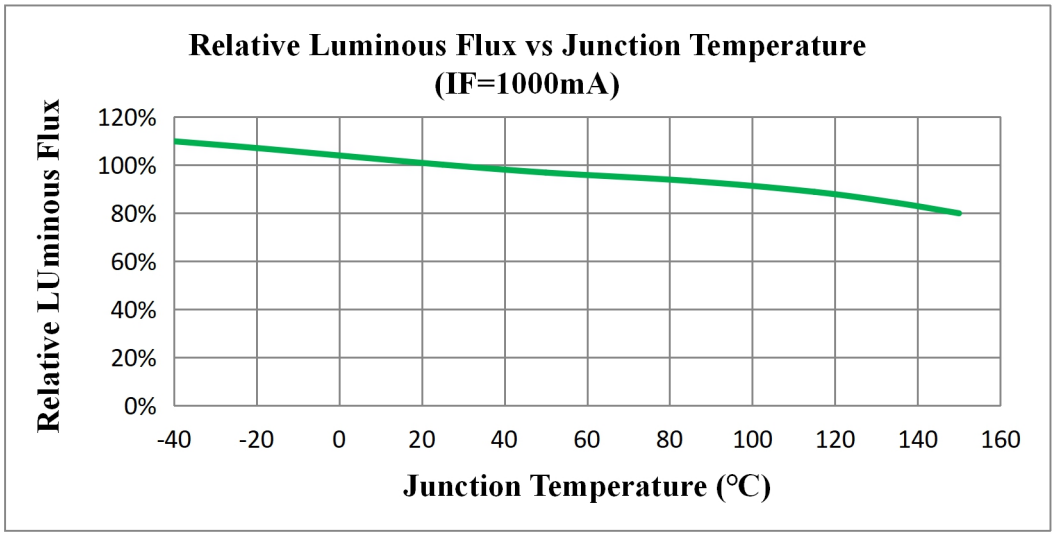


Fig.5 Relative Luminous Flux vs Junction Temperature

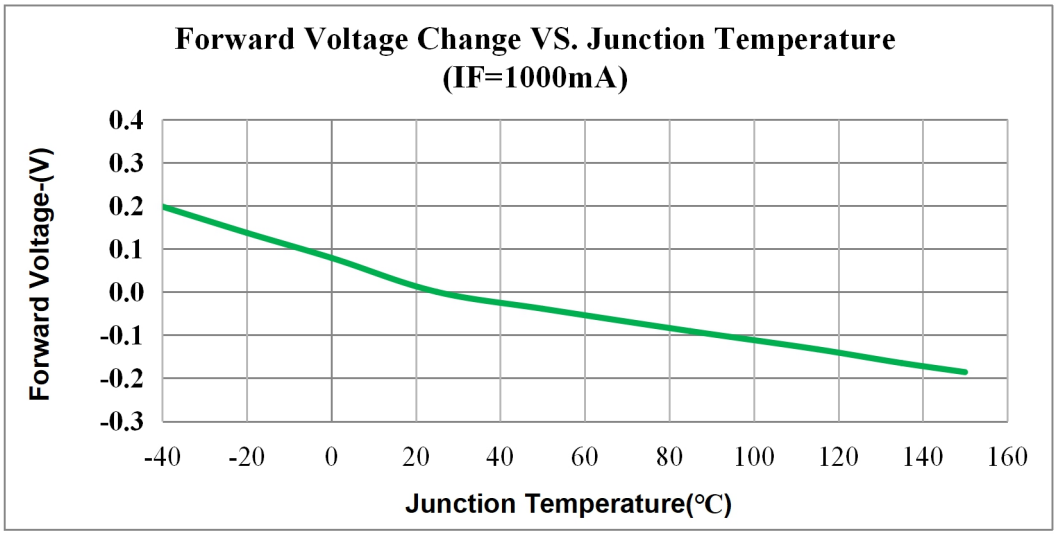


Fig.6 Forward Voltage Change VS. Junction Temperature

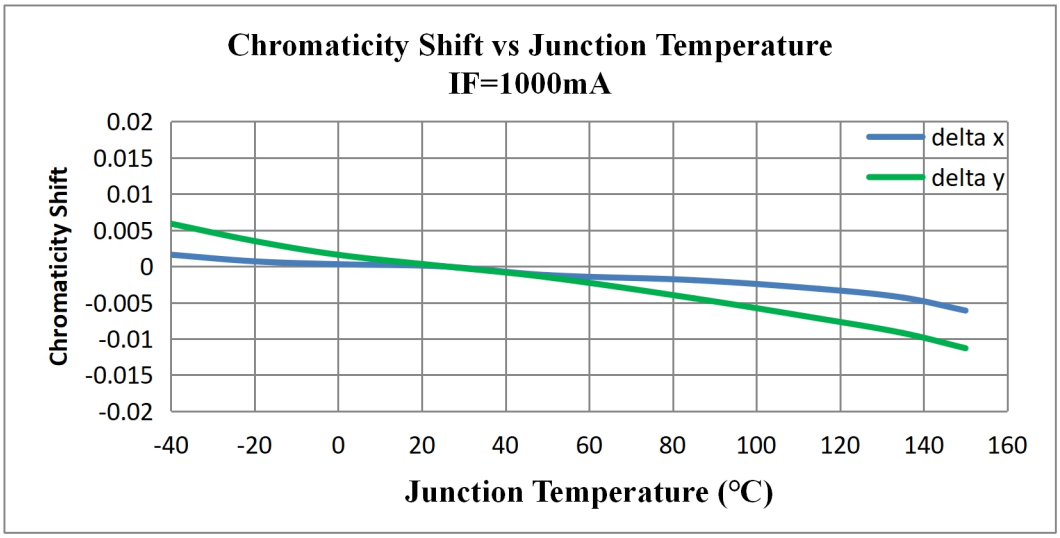


Fig.7 Chromaticity Shift vs Junction Temperature

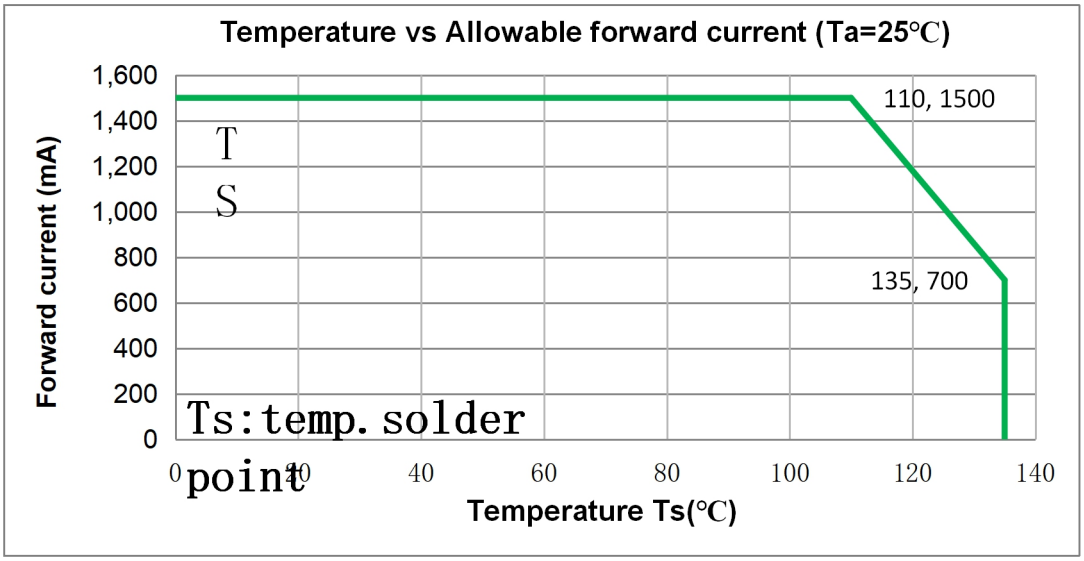


Fig.8 Temperature vs Allowable forward current

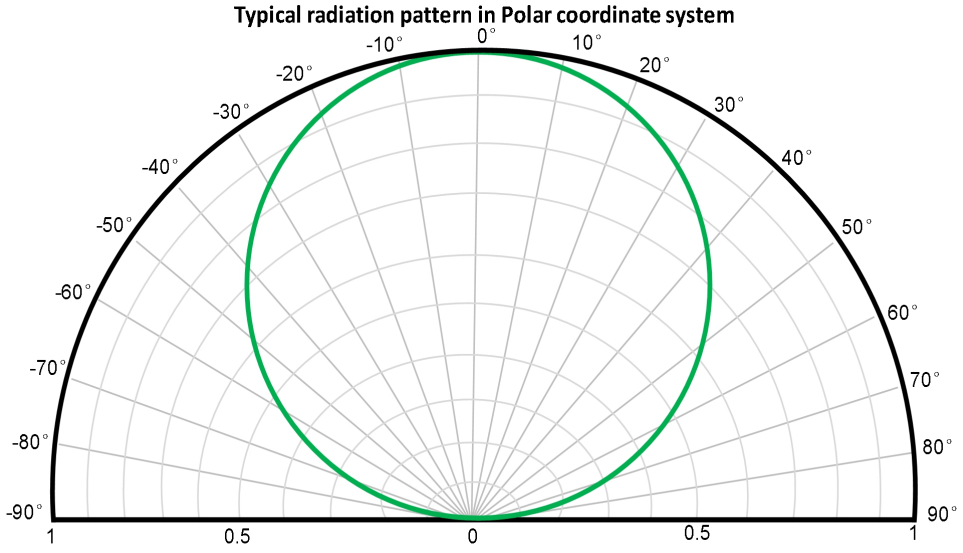


Fig.9 Typical radiation pattern in polar coordinate system

8. Reliability test items and conditions

No.	Test Item	Applicable Standard	Test Conditions	Sample size	Ac/Re
1	Resistance to Soldering Heat	JEITA ED-4701 300 301	Tsld=260℃, 10sec, 3reflows, Precondition: 85℃, 60%RH, 168hr	22	0/1
2	Thermal Shock	JEITA ED-4701 300 307	-40℃ to 100℃, 30min dwell, Precondition: 85℃, 60%RH, 168hr Test Time=1000 cycles	22	0/1
3	Temperature Cycle	JEITA ED-4701 100 105	-40℃(30min)~25(5min)~100℃ (30min)~25℃(5min) Test Time=100 cycles	22	0/1
4	High Temperature Storage	JEITA ED-4701 200 201	TA=100℃ Test time=1000hrs	22	0/1
5	Temperature Humidity Storage	JEITA ED-4701 100 103	TA=60℃,RH=90%; Test time =1000hrs	22	0/1
6	Low Temperature Storage	JEITA ED-4701 200 202	TA=-40℃ Test time=1000hrs	22	0/1
7	Room Temperature Operating	JF Standard	TA=+25℃ Test If=DC1000mA Test time=1000hrs	22	0/1
8	High Temperature Operating Life	JF Standard	TA =+85℃ Test If=DC1000mA Test time=1000hrs	22	0/1
9	Temperature Humidity Operating Life	JF Standard	85℃, RH=85% Test If=DC1000mA (30mins on/30mins off) Test time=1000hrs	22	0/1
10	Low Temperature Operating Life	JF Standard	TA=-40℃ Test If=DC1000mA Test time=1000hrs	22	0/1

※ Judgment criteria of failure for the reliability

- Flux: Below 80% of initial values
- Vf: Over 10% of upper limit value

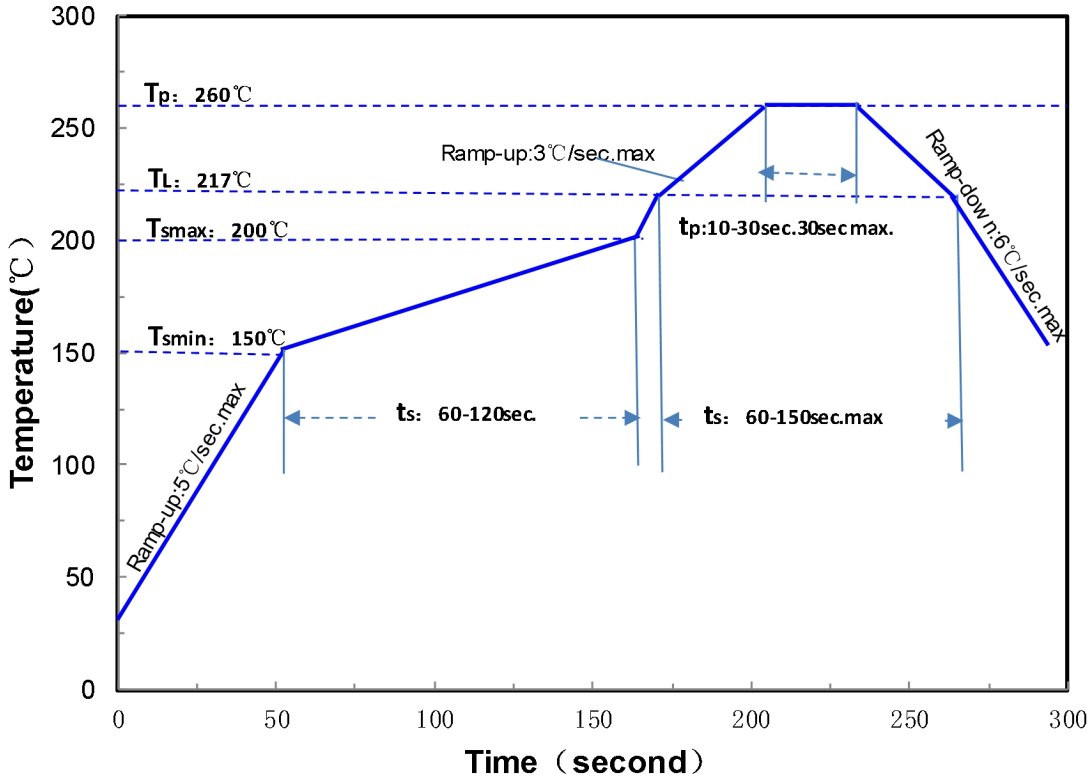
Note:

❶ The tested LED have been returned to normal ambient conditions before testing

❷ Measurement shall be taken within 2 hours

9.Precautions for use

9.1 Reference Reflow Condition



Profile Feature	Lead Free Assembly
Temperature min（T_{smin}）	150℃
Temperature max(T_{smax})	260℃
Maximum time (t_s)from Tsmin to T_{smax}	120 seconds
Ramp-up(T_L to T_P)	3℃/sec
Liquids Temperature(T_L)	217℃
Maximum Time(t_L) Maintained T_L	150 seconds
Maximum Peak Package Body Temperature(T_p)	260℃
Time Within 5℃ of the Specified Temperature	10-30seconds
Maximum Ramp-Down Rate(T_p to T_L)	6℃/seconds
Maximum Time 25℃ to Peak Temperature	8minutes

9.2 Cautions

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 influence on the reliability of the LEDs. Precautions should be taken to avoid the pressure on the encapsulated part.

9.3 Storage

a. Don't open the moisture proof bag before ready to use the LEDs.

b. The LEDs should be kept at 30℃ or less and 90%RH or less before opening the package.

c. After opening the package, the bulk LEDs should be kept at 30℃ or less and 85% RH or less.

d. If the LEDs be kept over the conditions of 20%, baking is required before mounting. Baking condition as below: 105±5℃ for 1 hours for bulk goods, 75±5℃ for 12 hours for roll goods.

e. The environment have no acid、alkali、corrosive gas、intensively shake and high magnetic field.

9.4 Thermal Management

a. For maintaining the high flux output and achieving reliability, LEDs should be mounted on a metal core printed circuit board, with proper thermal connection to dissipate approximately 1W to 5W of thermal energy normal operation.

b. Sufficient thermal management must be conducted, or the die junction temperature will be over the limit under large electronic driving and LEDs lifetime will decrease critically.

c. When operating, the solder pad temperature (or the board temperature nearby the LED) should be controlled under 70℃.

Revision History

Version: A5

Created by：

Version	Subjects(major change in previous version)	Date of change
A0	Initial Release	15 Mar.2019
A1	Page 1 changed to AEC-Q102; Page 5 Add 4.1 Package Outline Dimension ;Page 6 Add 4.2 Recommended Solder Pad Dimension;	18 Dec.2020
A2	Update thermal resistance maximum value on page 3	20 Jun.2023
A3	Change absolute maximum ratings on page 2	25 Oct.2023
A4	Update product binning on page 3	1 Nov.2023
A5	Update product binning on page 3 and update typical electro-optical characteristics curves on page 9-11	8 Apr.2024

About Jufei@

The company production plant to the implementation of 10,000 purification, temperature and humidity, anti-static, the company introduced the most advanced SMD LED automatic production equipment, strict real integrated management system of ISO9001/TS16949, QC080000, ISO14001, OHSAS18001, and passed the CQC third-party certification; products by SGS, fully comply with the RoHS / REACH / halogen-free product environmental requirements. Jufei cost photoelectric LED products, widely recognized by the customers, has become the top ten brands of Chinese LED industry market customer satisfaction, and received the title of "Shenzhen Top Brand".

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