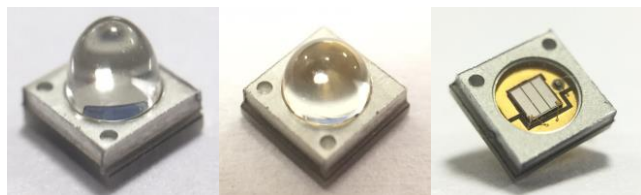


# 3939 UVA Quartz LED

## 3939 Quartz LED Series



(30D)

Quartz Lens

(60D)

Quartz Lens

(120D)

Quartz Lens

◆ Outline :

3 0° : 3.9\*3.9\*3.2mm

6 0° : 3.9\*3.9\*2.6mm

120° : 3.9\*3.9\*1.6mm

- ◆ High Efficiency & Power 5W
- ◆ Good Thermal Dissipation
- ◆ Optional Optical Quartz Lens

### Table of contents

Features-----	1
Typical type product list-----	2
Maximum rating-----	3
High power type product list-----	4
Maximum rating-----	5
Power binning-----	6
Forward voltage binning-----	6
Peak wavelength binning-----	7
Relative spectral power distribution-----	8
Electronic-optical characteristics -----	8
Typical spatial distribution-----	9
Thermal design for de-rating-----	9
Dimensions-----	10
Packing-----	12
Reflow profile-----	15
Precautions-----	16
Test items and results of reliability-----	17

### Features

- ROHS and REACH-compliant
- MSL 4 qualified according to J-STD 020
- ESD 8KV

### Applications

- UV Curing
- Medical applications
- Industrial facility applications

# 3939 UVA Quartz LED

## ■ Maximum rating (Ta : 25°C)

Characteristics	Symbol	Min.	Typical	Max.	Unit
DC Forward Current <sup>1</sup>	I <sub>F</sub>	---	1,000	1,200	mA
Pulse Current(@1/10 duty) <sup>2</sup>	I <sub>p</sub>	---	---	1,500	mA
Forward Voltage	V <sub>F</sub>	3.0	---	4.4	V
Reverse Voltage	V <sub>R</sub>	---	---	-5	V
Power Dissipation	PD	---	---	6.6	W
Leakage Current (5V)	I <sub>R</sub>	---	---	10	μA
Junction Temperature <sup>3</sup>	T <sub>j</sub>	---	105	---	°C
Storage Temperature Range	T <sub>sto</sub>	-40	---	80	°C
Soldering Temperature	T <sub>sol</sub>	---	---	260	°C
Thermal Resistance Junction / Solder Point	R <sub>th</sub>	---	4.5	---	°C/W
Beam Angle	2θ <sub>1/2</sub>	---	30 60 120	---	Deg

### ◇ Notes:

1. For other ambient, limited setting of current will depend on de-rating curves.
2. D=0.01s duty 1/10.
3. When driving at maximum current the T<sub>j</sub> must be kept below 85°C
4. Viewing angle(2θ<sub>1/2</sub>) ± 10°

# 3939 UVA Quartz LED

## ■ Product List

Peak Wavelength Range	Beam Angle	Part Number
365~370nm	30°	3939A36503F002
	60°	3939C36503F002
	120°	3939F36503F002
380~390nm	30°	3939A38503F002
	60°	3939C38503F002
	120°	3939F38503F002
390~400nm	30°	3939A39503F002
	60°	3939C39503F002
	120°	3939F39503F002
400~410nm	30°	3939A40503F002
	60°	3939C40503F002
	120°	3939F40503F002

# 3939 UVA Quartz LED

## ■ Peak-Wavelength Binning

Peak Wavelength			unit: nm@1000mA
Bin Code	Min	Max	
R1	365.0	370.0	
S1	380.0	385.0	
S2	385.0	390.0	
T1	390.0	395.0	
T2	395.0	400.0	
U1	400.0	405.0	
U2	405.0	410.0	

◇ **Notes:**

1. Binning current is 1000mA
2. Wavelength tolerance  $\pm 2.5\text{nm}$

# 3939 UVA Quartz LED

## ■ Voltage Binning

Voltage			
Peak Wavelength	Bin Code	Min	Max
365nm	V1	3.2	3.4
	V2	3.4	3.6
	V3	3.6	3.8
	V4	3.8	4.0
	V5	4.0	4.2
	V6	4.2	4.4
385nm	V1	3.2	3.4
	V2	3.4	3.6
	V3	3.6	3.8
	V4	3.8	4.0
395nm	V1	3.2	3.4
	V2	3.4	3.6
	V3	3.6	3.8
	V4	3.8	4.0
405nm	V1	3.2	3.4
	V2	3.4	3.6
	V3	3.6	3.8
	V4	3.8	4.0

### ◇ Notes:

1. Binning current is 1000mA
2. Voltage tolerance  $\pm 0.12V$

# 3939 UVA Quartz LED

## ■ Radiant flux (Power) binning

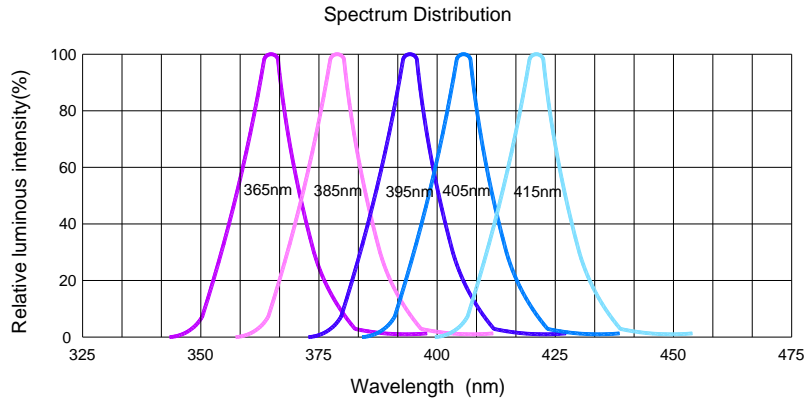
Radiant flux (Power)			
			unit: mw@1000mA
Peak Wavelength	Bin Code	Min	Max
365nm	H1	1600	1750
	H2	1750	1900
	H3	1900	2150
385nm	H2	1750	1900
	H3	1900	2150
	H4	2150	2300
	H5	2300	2450
395nm	H2	1750	1900
	H3	1900	2150
	H4	2150	2300
	H5	2300	2450
405nm	H2	1750	1900
	H3	1900	2150
	H4	2150	2300
	H5	2300	2450

◇ Notes:

1. Binning current is 1000mA
2. Power tolerance  $\pm 10\%$

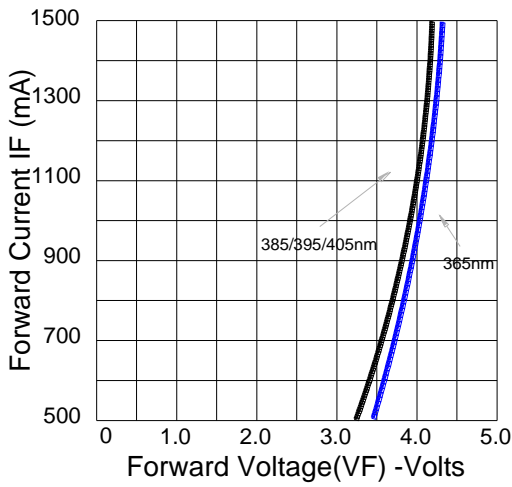
# 3939 UVA Quartz LED

## Relative spectral power distribution

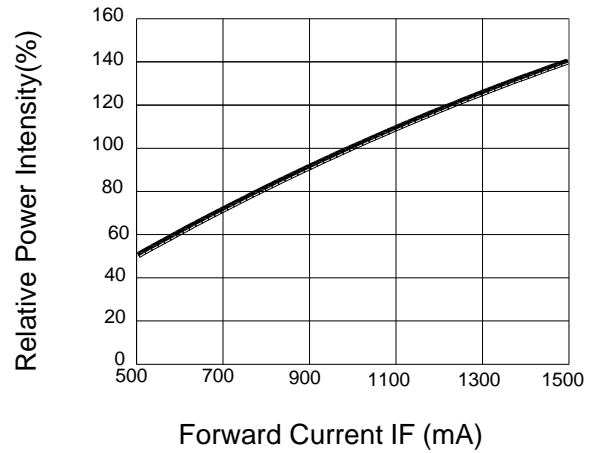


## Characteristics

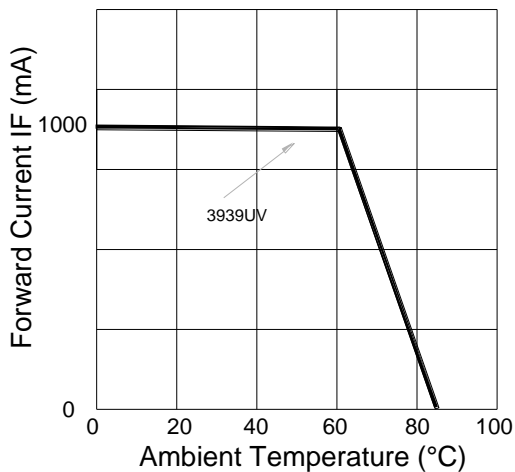
Forward Current VS. Forward Voltage



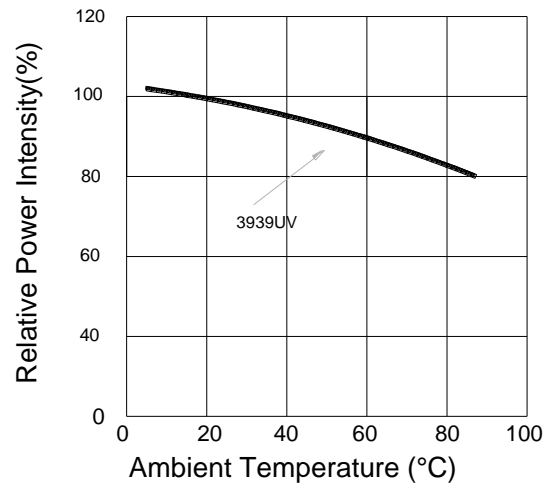
Relative Radiant Flux VS. Forward Current



Forward Current VS. Ambient Temperature

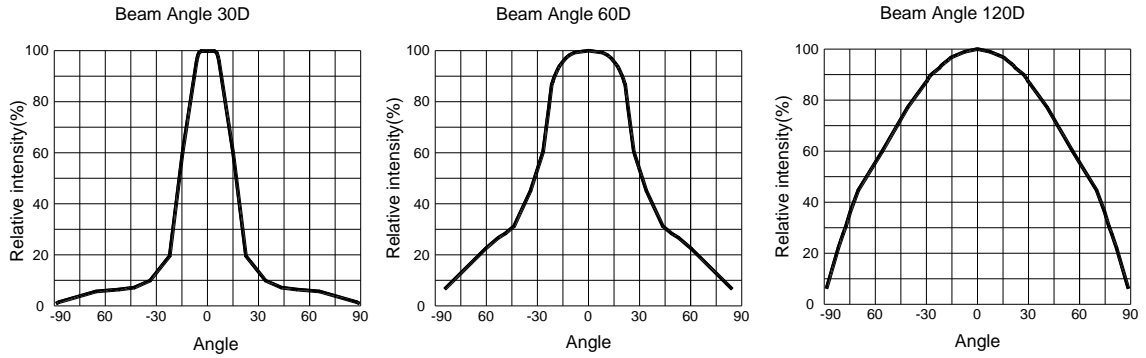


Radiant Power VS. Ambient Temperature



# 3939 UVA Quartz LED

## ■ Typical spatial distribution ( $2\theta_{1/2}$ )

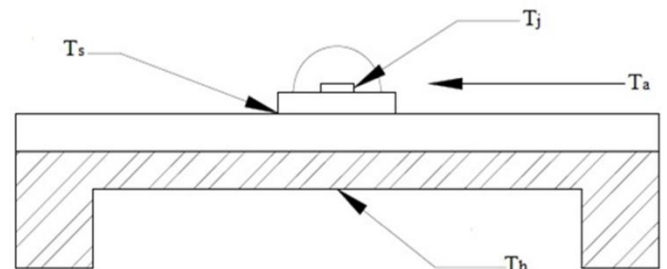
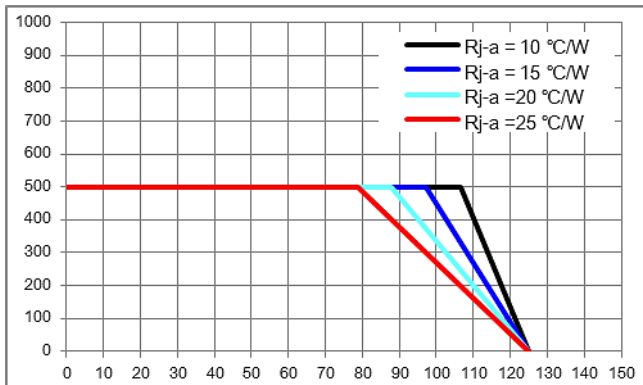


### ◇ Notes:

Viewing angle( $2\theta_{1/2}$ )  $\pm 10^\circ$

## ■ Thermal design for de-rating

The maximum forward current is determined by the thermal resistance between the LED junction and solder point. It is crucial for the end product to be designed in a manner that minimizes the thermal resistance from the junction to the solder point order to optimize LED life and optical characteristics.

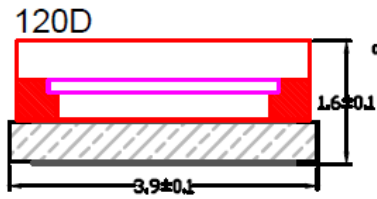
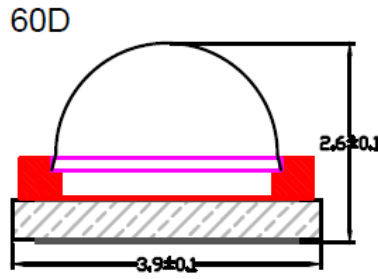
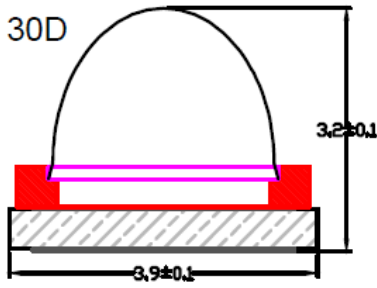
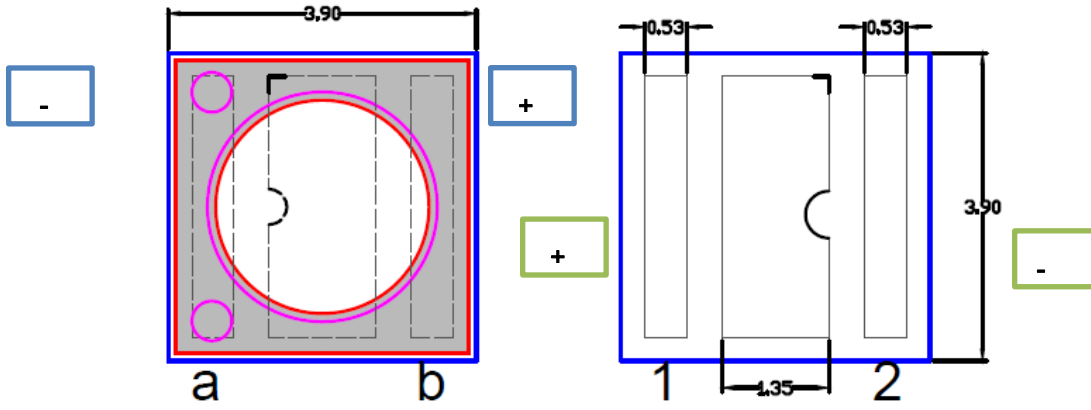


T<sub>s</sub> : Solder Point Temp.  
T<sub>h</sub> : Heat Sink Temp.  
T<sub>a</sub> : Ambient Temp.  
R<sub>th(j-a)</sub> : Thermal Resistance form Point "T<sub>j</sub>" to Point "T<sub>a</sub>"

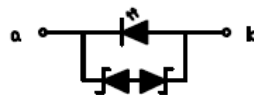


# 3939 UVA Quartz LED

## ■ Dimensions & Polarity



Electrical Test Point: (P up)

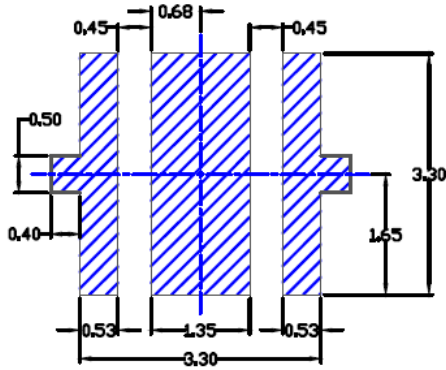


Test Point	1+	2-
a-	×	○
b+	○	×

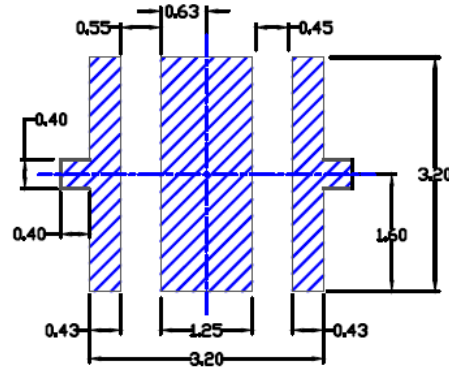
X = Open  
O = Short

# 3939 UVA Quartz LED

## ■ Suggest stencil pattern (Recommendations for Reference)



RECOMMENDED PCB SOLDER PAD



RECOMMENDED STENCIL PATTERN  
(HATCHED AREA IS OPENING)

§ Suggest stencil  $t = 0.12$  mm

### ◇ Note:

§ All dimensions are in millimeters.

§ Tolerance is  $\pm 0.13$  mm unless other specified.

# 3939 UVA Quartz LED

## ■ Test Items and Results of Reliability

Test Item	Test Conditions	Duration/ Cycle	Number of Damage	Reference
<b>Thermal Shock</b>	-40°C 30min ↑↓5min 100°C 30min	100 cycles	0/22	AECQ101
<b>High Temperature Storage</b>	Ta=100°C	1000 hrs	0/22	EIAJ ED-4701 200 201
<b>Humidity Heat Storage</b>	Ta=85°C RH=85%	1000 hrs	0/22	EIAJ ED-4701 100 103
<b>Low Temperature Storage</b>	Ta=-40°C	1000 hrs	0/22	EIAJ ED-4701 200 202
<b>Life Test</b>	Ta=25°C If=500mA	1000 hrs	0/22	Tested with UVT standard
<b>High Humidity Heat Life Test</b>	85°C RH=85% If=500mA	1000 hrs	0/22	Tested with UVT standard
<b>High Temperature Life Test</b>	Ta=85°C	1000 hrs	0/22	Tested with UVT standard
<b>ESD(HBM)</b>	8KV at 1.5kΩ;100pf	3 Times	0/22	MIL-STD-883

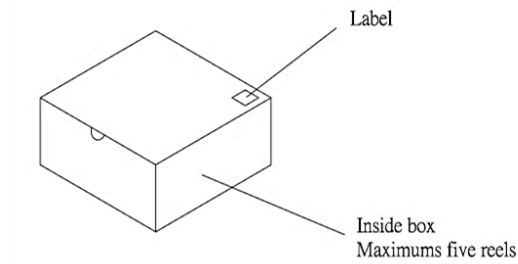
Criteria for Judging the Damage				
Item	Symbol	Condition	Criteria for Judgment	
			Min	Max
<b>Forward Voltage</b>	VF	If=500mA	LSL x0.9	USL x1.1
<b>Reverse Current</b>	IR	VR =5V	-	100μA
<b>Luminous Intensity</b>	Iv	If=500mA	LSL x0.7	USL x1.2

Notes:

1. USL: Upper specification level
2. LSL: Lower specification level



# 3939 UVA Quartz LED



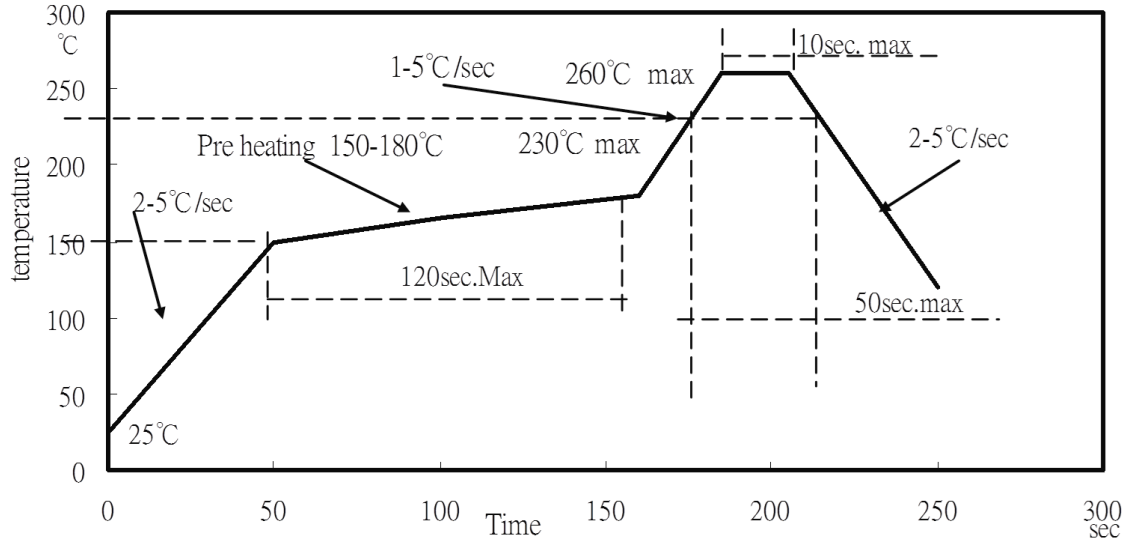
## Notes:

1. Each Reel (minimum number of pieces is 100 and maximum is 500(30D)/ 500 (60D)/500 (120D) is packed in a moisture-proof bag along with 2 packs of desiccant and a humidity indicator card;
2. A maximum of 5 moisture-proof bags are packed in an inner box (size: 240mm x 200mm x 105mm  $\pm$ 5mm)
3. A maximum of 4 inner boxes are put in an outer box (size: 410mm x 255mm x 230mm  $\pm$  5mm)
4. Part No., Lot No., quantity should be indicated on the label of the moisture-proof bag and the cardboard box.

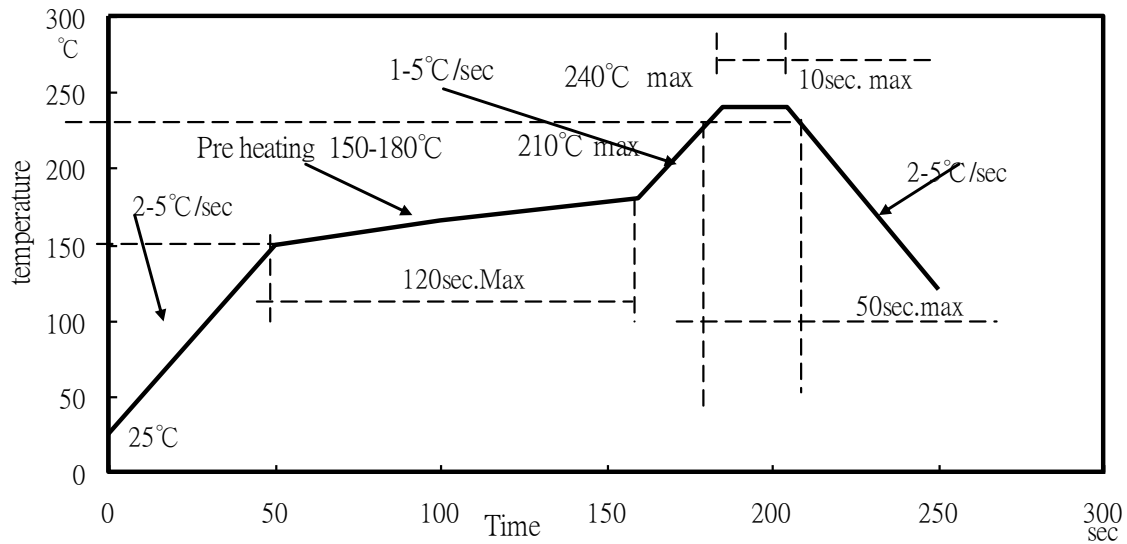
## ■ Reflow Profile

### IR reflow soldering Profile

#### Lead Free solder



#### Lead solder



#### Notes:

1. The recommended reflow temperature is 240°C(±5°C). The maximum soldering temperature should be limited to 260°C.
2. Do not stress the silicone resin while it is exposed to high temperature.
3. The number of reflow process should not exceed 3 times.

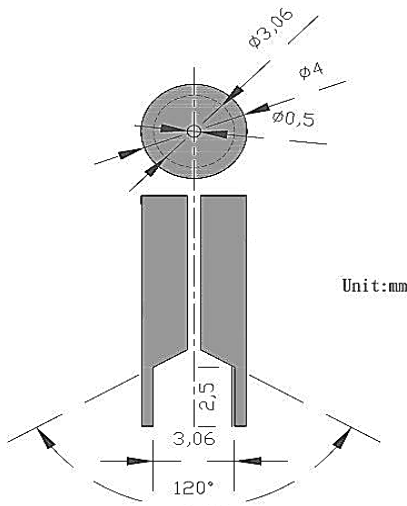
## ■ Precautions

### 1. Recommendation for using LEDs

- 1.1 The lens of LEDs should not be exposed to dust or debris. Excessive dust and debris may cause a drastic decrease in the luminosity.
- 1.2 Avoid mechanical stress on LED lens.
- 1.3 Do not touch the LED lens surface. It would affect the optical performance of the LED due to the LED lens' damage.
- 1.4 Pick & place tools are recommended for the remove of LEDs from the factory tape & reel packaging

### 2. Pick & place nozzle

The pickup tool was recommended and shown as below



### 3. Lens handling

Please follow the guideline to pick LEDs

- 3.1 Use tweezers to pick LEDs
- 3.2 Do not touch the lens by using tweezers
- 3.3 Do not touch lens with fingers
- 3.4 Do not apply more than 4N of lens (400g) directly onto the lens

### 4. Lens cleaning

In the case which a small amount of dirt and dust particles remain on the lens surface, a suitable cleaning solution can be applied.

- 4.1 Try a gentle wiping with dust-free cloth
- 4.2 If needed, use dust-free cloth and isopropyl alcohol to gently clean the dirt from the lens surface.
- 4.3 Do not use other solvents as they may directly react with the LED assembly
- 4.4 Do not use ultrasonic cleaning which will damage the LEDs