

# **SPECIFICATION FOR Near UV LED**

## **3535 UVA 405nm LED PKG**

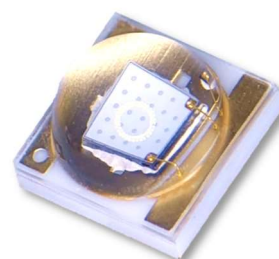
### **DESCRIPTION**

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The AO35LV405L01X is a UV LED package based on Al<sub>2</sub>O<sub>3</sub> with a peak wavelength of 405 nm.

This product is generally used as indicator and luminary for electronic equipment.

And it This product is mainly used as industrial UV curing and general.



### **FEATURES**

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- Dimension (L x W x H) in mm
  - 3.45 x 3.45 x 2.2
- Forward current: up to 1,500 mA
- Radiant power (typ.)
  - 1,200 mW at 500 mA
- Viewing Angle ( $2\theta_{1/2}$ )
  - Typical 120°
- Built in ESD Protection device

### **APPLICATIONS**

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- UV Curing
- Moth killing
- Nail gel cure
- Counterfeit Detectors

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## 1. PKG Specifications

### 1) Absolute maximum ratings

[Ta=25°C]

Parameters	Symbol	Value	Unit
Forward current	If	1,500	mA
Power dissipation	Pd	5.60	W
Operating temperature	Topr	- 30 ~ +80	°C
Storage temperature	Tstg	- 40 ~ +100	°C
Junction Temperature	Tj	125	°C
Soldering temperature	Tsol	260*)	°C
ESD Classification		Class2**)	

#### Notes

\*) Recommend JEDEC-J-STD-020D for reflow soldering.

\*\*) The ESD test follows JESD22-A114.

### 2) Electrical and Optical Characteristics

[Ta=25°C]

Parameter	Symbol	If	Min	Typ	Max	Unit
Peak wavelength	$\lambda_p$	500mA	400	405	410	nm
Radiant Flux	$\Phi_e$	500mA	1,010	1,200	1,450	mW
Forward voltage	Vf	500mA	3.2	3.35	3.6	V
Full Width at Half Maximum	$\Delta\lambda$	500mA	11.0			nm
Viewing angle	$2\theta_{1/2}$	500mA	120			deg
Thermal resistance	$R\theta_{J-S}$	500mA	3.1			°C/W

#### Notes

- Peak Wavelength( $\lambda_p$ ) Measurement tolerance is  $\pm 3$ nm.
- Radiant Flux( $\Phi_e$ ) Measurement tolerance is  $\pm 10\%$ .
- Forward Voltage(Vf) Measurement tolerance is  $\pm 3\%$ .
- Viewing angle(deg) Measurement tolerance is  $\pm 5$ deg.

## 2. Bin Structures

[If=500mA, Ta=25°C]

Item	Bin	Min	Max	Unit
Peak Wavelength	W1	400	405	nm
	W2	405	410	
Radiant Flux	R1	1,010	1,120	mW
	R2	1,120	1,230	
	R3	1,230	1,340	
	R4	1,340	1,450	
Forward Voltage	V1	3.2	3.3	V
	V2	3.3	3.4	
	V3	3.4	3.5	
	V4	3.5	3.6	

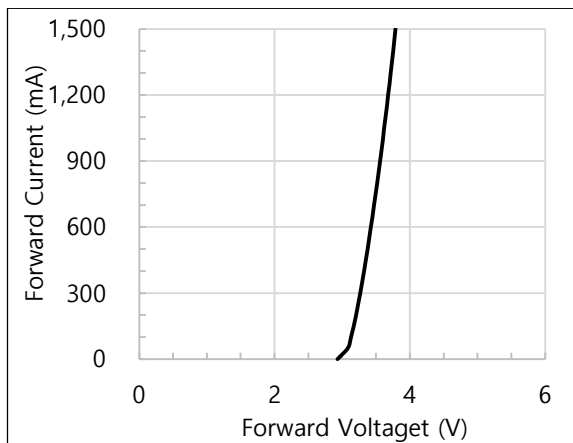
### Notes

- Peak Wavelength( $\lambda_p$ ) Measurement tolerance is  $\pm 3\text{nm}$ .
- Radiant Flux( $\Phi_e$ ) Measurement tolerance is  $\pm 10\%$ .
- Forward Voltage( $V_f$ ) Measurement tolerance is  $\pm 3\%$ .

### 3. Typical Characteristics Graphs

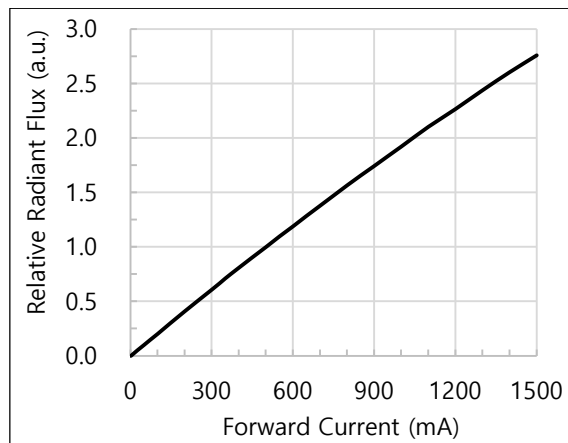
1) Forward Current vs. Forward Voltage

[Ta=25°C]



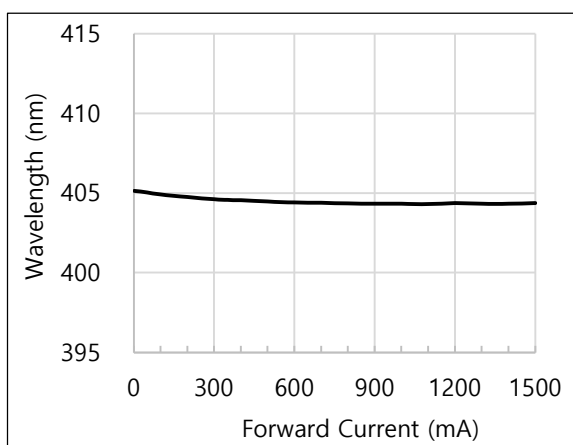
2) Relative Radiant Flux vs. Forward Current

[Ta=25°C]



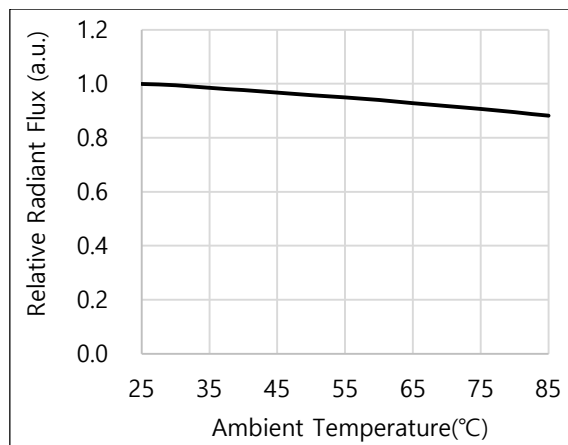
3) Peak Wavelength vs. Forward Current

[Ta=25°C]



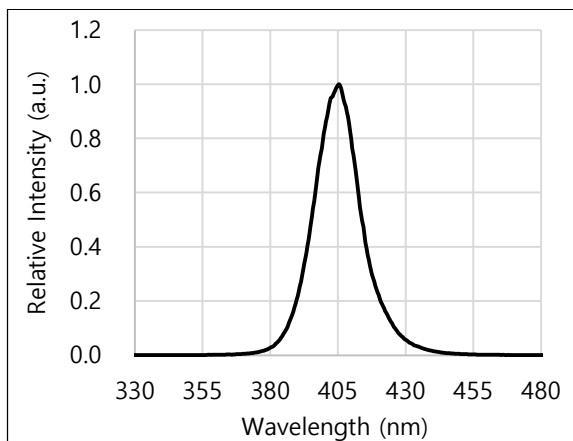
4) Ambient Temp. vs. Relative Radiant Flux

[Ta=25°C]



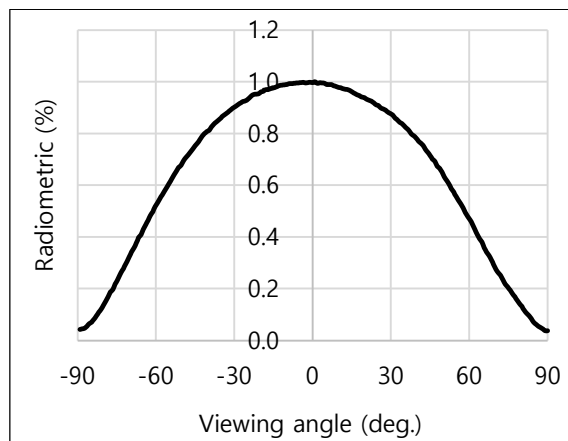
5) Spectrum

[Ta=25°C]



6) Typical Spatial Distribution

[Ta=25°C]

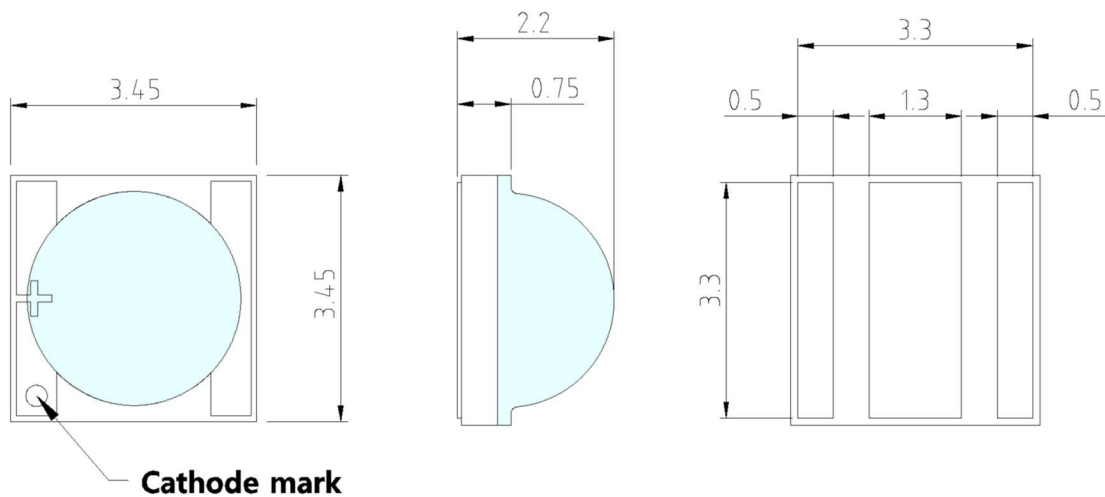


## 4. Outline Dimensions

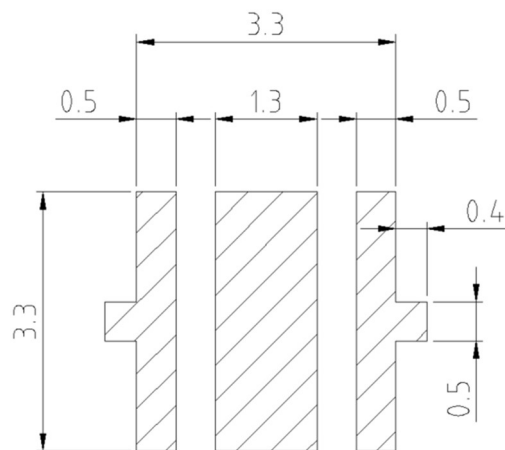
### 1) PKG Dimensions

- PKG Dimensions - 3.45 x 3.45 x 2.2(L x W x H)
- Undefined tolerance is  $\pm 0.2\text{mm}$

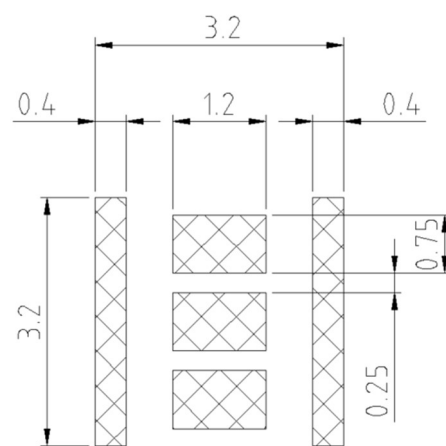
[Unit : mm]



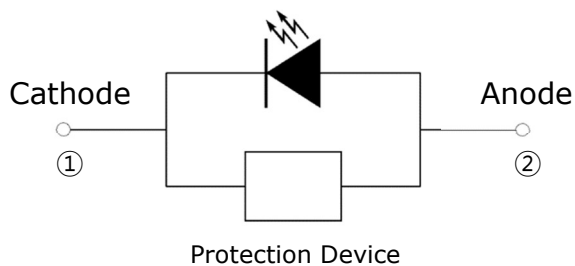
### 2) Recommended Solder Pad



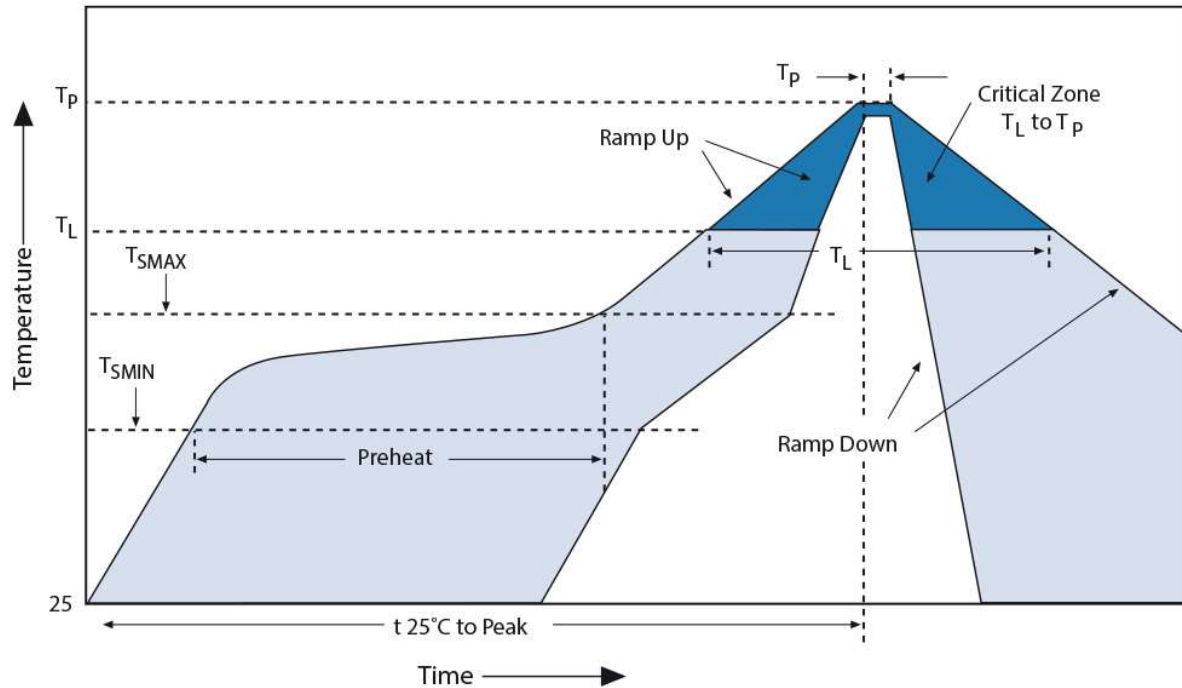
### 3) Recommended Stencil Pattern



### 4) Internal Circuit



## 5. Reflow Soldering Profile



[ Classification Reflow Profiles ]

Profile Feature	Pb-free Assembly	Sn-Pb Eutectic Assembly
Average ramp-up rate ( $T_{Smax}$ to $T_p$ )	3°C/second max	3°C/second max
Preheat		
- Temperature Min ( $T_{Smin}$ )	150 °C	100 °C
- Temperature Max ( $T_{Smax}$ )	200 °C	150 °C
- Time ( $T_{Smin}$ to $T_{Smax}$ ) (ts)	60-180 seconds	60-120 seconds
Time maintain above:		
- Temperature ( $T_L$ )	217 °C	183 °C
- Time ( $t_L$ )	60-150 seconds	60-150 seconds
Peak Temperature ( $T_p$ )	260 °C	235 °C
Time within 5°C of actual Peak Temperature ( $t_p$ ) <sup>2</sup>	20-40 seconds	10-30 seconds
Ramp-down Rate	6 °C/second max	6 °C/second max
Time 25°C to Peak Temperature	8 minutes max.	6 minutes max.

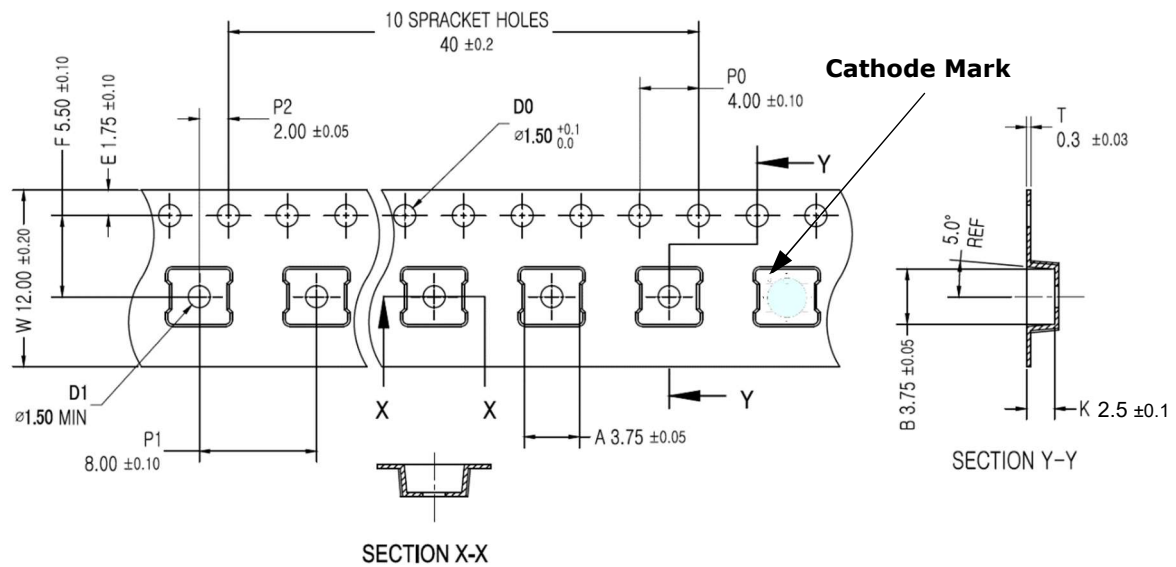
### Notes

- All temperature refer to topside of the package, measured on the package body surface.
- The LED package is designed to be reflow soldered to a PCB. If dip soldered or hand soldered, PEC will not guarantee its reliability.
- Reflow soldering must not be done more than two times.
- When the LED PKG is cooled at the maximum temperature, a rapid temperature fall is not recommended.

## 6. Taping and Reel packing

### 1) Tape

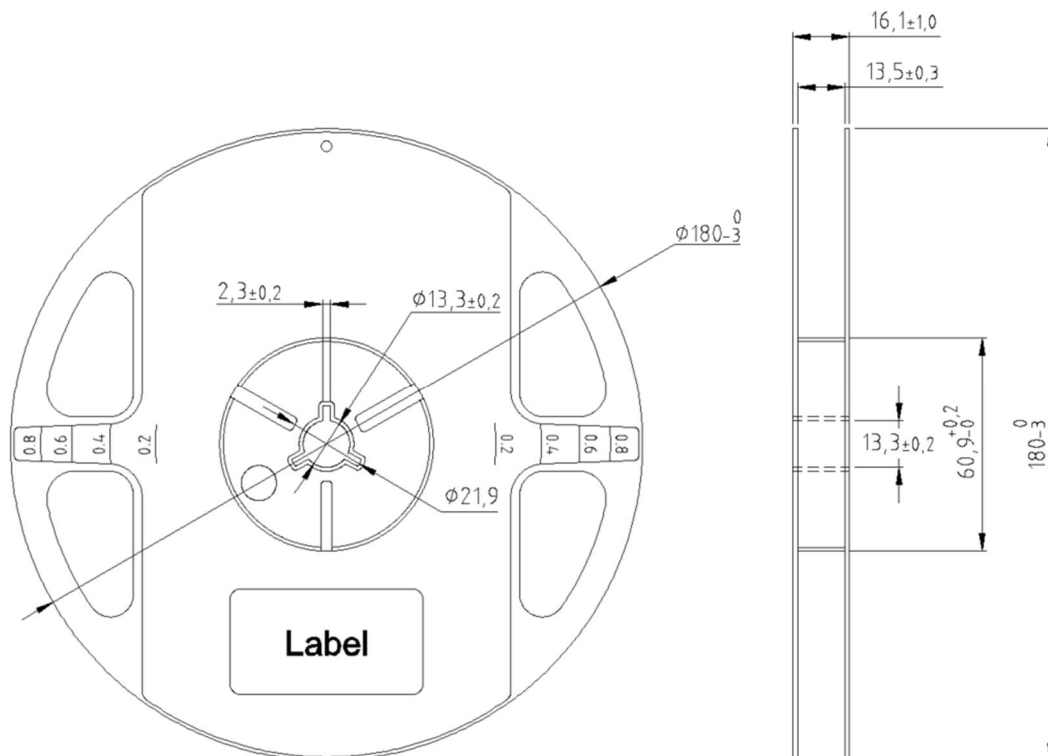
[Unit : mm]



### 2) Reel

- PKG Quantity : 1,000 PCS/Reel

[Unit : mm]





## 7. Precautions on use

### 1) Storage condition

- This LED PKG is vacuum-packed in an aluminum bag containing a dehumidifying agent. However, if the storage environment is not good, the LED PKG can absorb moisture.
- When soldering with LED PKG absorb moisture, vaporization of moisture may occur and internal air may expand. This may cause the quartz to peel off or deteriorate its optical properties.
- It is recommended to keep in the environment shown in the table below.

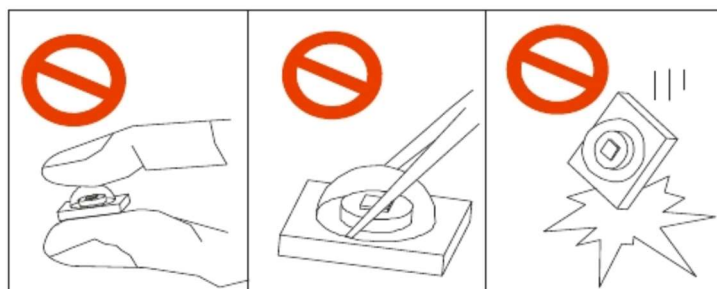
Conditions		Temperature	Humidity	Time
Storage	Before Opening Aluminum Bag	5°C ~ 30°C	< 50%RH	Within 1 Year from the Delivery Date
	After Opening Aluminum Bag	5°C ~ 30°C	< 60%RH	≤ 672 hours
Baking		65 ± 5°C	< 10%RH	10 ~ 24 hours

### 2) Circuit design

- When designing the circuit by applying the BR series, be sure to not exceed the absolute maximum ratings of each LED.
- For the BR series, it is designed to operate with forward voltage. If a reverse voltage is applied, the LED chip and the Zener diode can be damaged.
- For the current drive method, it is recommended to operate in the constant current mode.

### 3) Handling precautions

- When handling the product, touching the encapsulant with bare hands will not only contaminate its surface, but also affect on its optical characteristic.
- Excessive force to the encapsulant might result in catastrophic failure of the LEDs due to die breakage or wire deformation. For this reason, please do not put excessive stress on LEDs, especially when the LEDs are heated such as during Reflow Soldering.



- The silicon resin of encapsulant is fragile, so please avoid scratch or friction over the epoxy resin surface. While handling the product with tweezers, do not hold by the epoxy resin, be careful.

#### 4) ESD (Electrostatic Discharge)

- Use all objects and materials in the workplace for anti-static measures.
- Grounding
  - ① All instruments, JIG, and equipment in the workplace should be grounded and measured once a month by a ground resistance meter.
  - ② Workers should wear antistatic clothing and ground through a wrist strap or heel ground. Earth ring should be connected so as not to be shaken when grounding, and check for disconnection every day.
- The working surface of the work table is provided with a conductive mat and grounded. Periodically measure and check the conductivity state.
- The work table preferably has a surface resistance of  $10^5$  to  $10^9$  [ $\Omega$ /SQ], and the metal work table is not good. (Breakage due to rapid discharge)
- Install conductive tiles or mats and regularly measure and manage grounding resistance and static electricity.
- Partially high static electricity is generated such as rotating body, TV, monitor, JIG. If it is non-conductive, use ionizer or anti-static spray regularly and prevent static electricity.
- In addition to general cases, use humidity control or partial humidifier to suppress the generation of static electricity.

#### 5) Thermal Management

- Thermal management is closely related to the lifetime of LEDs.
- The temperature of the LED during operation must not exceed the junction temperature ( $T_j$ ).
- For temperature management of the LED, the thermal resistance of the PCB and the spacing between the LEDs must be considered.
- For PCBs, a Cu based metal PCB is recommended, and if necessary, a heat sink should be attached to manage the LED temperature.

#### 6) Eye Safety

- This UV LED PKG emits high power UV light.

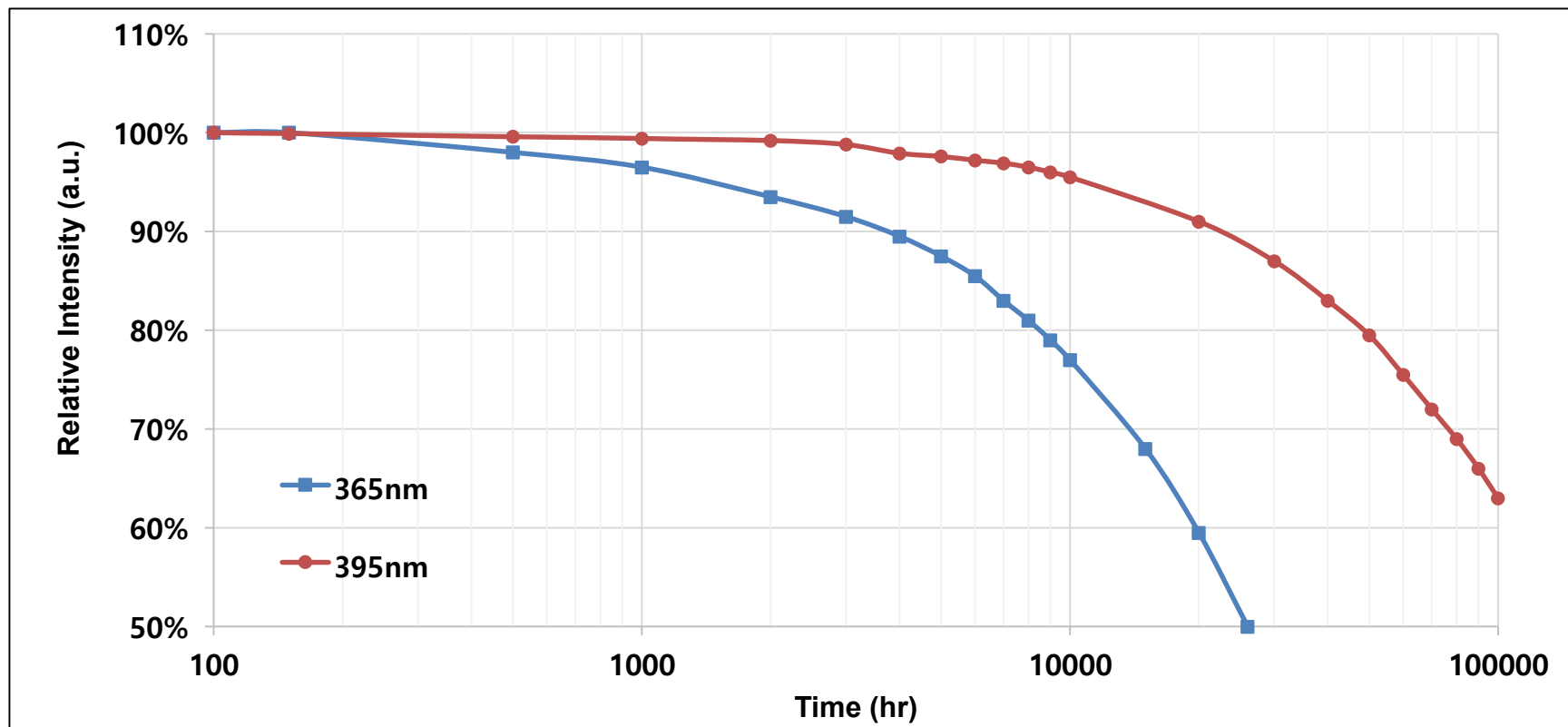
- Exposure to light with strong UV light can cause damage to the human eye and skin.
- Do not look directly or indirectly at UV light.
- If exposure to UV light is unavoidable, the body should be protected by suitable protection devices such as goggles and clothing.
- Attach the following warning labels on products/systems that use UV LEDs.





# 3535UVA PKG lifetime Extrapolation

## BR35QVXXXL01X / BR35LVXXXL01X Series

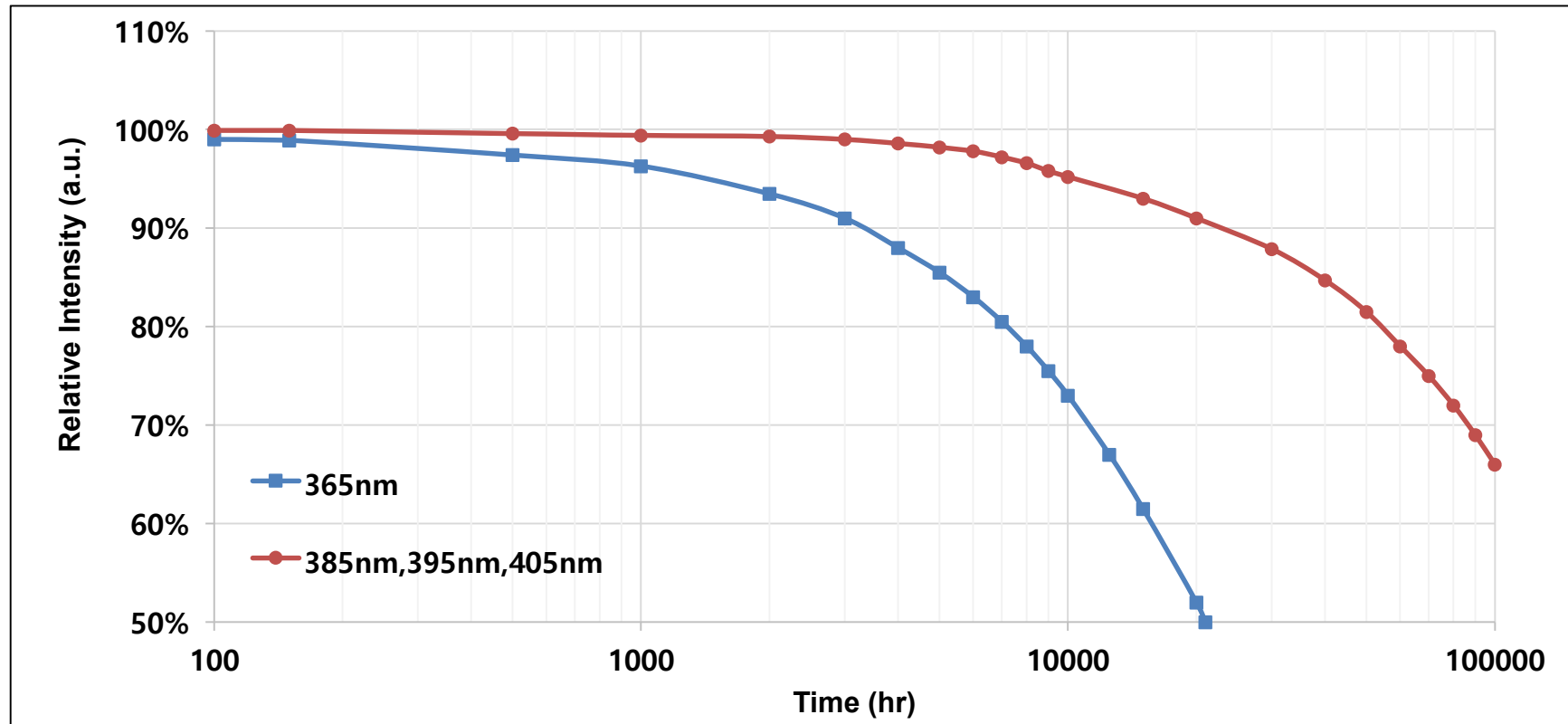


No.	Wp(nm)	If(mA)	Ta(°C)	Tj(°C)	Calculated L70	Calculated L80
1	365	500	50	75	~ 15,000	~ 9,000
2	385, 395, 405	500	50	71	~ 70,000	~ 40,000

\* All characteristics shown are for reference only and are not guaranteed.

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## AO35LLXXX01X / AO35LVXXX01X Series



No.	Wp(nm)	If(mA)	Tj(°C)	Calculated L70	Calculated L80
1	365	350	60	~ 10,000	~ 7,000
2	385, 395, 405	350	60	~ 80,000	~ 50,000

\* All characteristics shown are for reference only and are not guaranteed.