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SPECIFICATION FOR APPROVAL

CUSTOMER'S CODE

DESCRIPTION

UV LED PKG

SPECIFICATION

3535 UV-C

DATE

2018-06-25

PART NO.

HH-SMD3535UVC275-Y-P-MZ

REFERENCE No.

NUMBER OF SAMPLE

COPY OF ACKNOWLEDGEMENT

Approved By Customer	Qualified By	Form Designer

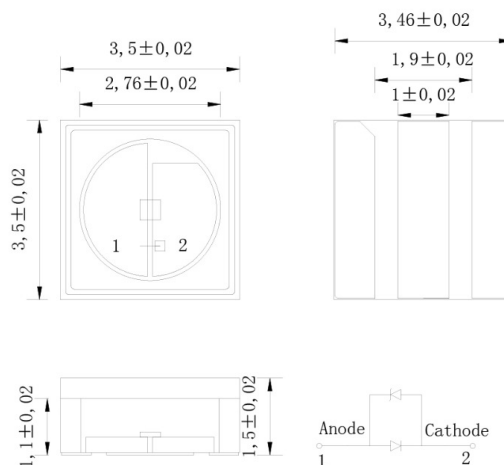
◆ **PRELIMINARY SPEC**

3.5x3.5mm Flip-type UV-C Chip
 AlN Ceramic Package
 PART NO:HH-SMD3535UVC275-Y-P-MZ

◆ **Features**

- AlGaN-based flip-type LED chip technology
- Transparent sapphire substrate
- High power and efficiency, high reliability
- Long operation lifetime, low light failure
- Environmental protection, energy saving
- Zener diode protection device

◆ **Package Dimensions**



◆ **ATTENTION**

OBSERVE PRECAUTIONS
 FOR HANDLING
 ELECTROSTATIC
 DISCHARGE
 SENSITIVE
 DEVICES



◆ **Applications**

- Disinfection / Sterilization
- Bio-Analysis / Detection
- Fluorescent Spectroscopy
- Air and water purification
- Food processing and preservation
- Medical treatment, dermatology, etc

3 UV-C LED 44.5mm 8.8mm



5 UV-C LED 44.5mm 8.8mm



◆ **NOTES:**

1. All dimensions are in millimeters.
2. Tolerance is ± 0.25 unless otherwise noted.
3. Specifications are subject to change without notice.



◆ **Device Selection Guide**

Part No.	Chip		Lens color
HH-SMD3535UVC275-Y-P-MZ	Material	Emitted color	Quartz Glass
	(AlGaIn)	UV-C	

◆ **Absolute Maximum Ratings**

Ta=25°C

Parameter	Symbol	Value	Unit
Power Dissipation 1 LED	P _D	700	mW
Forward Current	I _F	100	mA
Reverse Voltage	V _R	5	V
Operating Temperature	T _{opr}	-40 ~ +85	°C
Storage Temperature	T _{stg}	-40 ~ +85	°C
Soldering Temperature	T _{sol}	260	°C

NOTES:

1. Maximum ratings are package dependent;
2. The above maximum ratings were determined using a Metal Core Printed Circuit Board without encapsulation;
3. Stresses in excess of the absolute maximum ratings such as forward current and junction temperature may cause damage to the LED.

◆ **Electrical/Optical Characteristics**

Ta=25°C

Parameter	Symbol	Testing Conditions	Min.	Typ.	Max.	Unit
Forward Voltage (1 LED)	V _F	I _F =40mA	5	-	8	V
Forward Voltage (3/5 LED)	V _F	I _F =40mA	11	12	13	V
Radiant Power 1 LED	Φ _e	I _F =40mA	2	-	5	mW
Radiant Power 3 LED	Φ _e	I _F =40mA	6	-	15	mW
Radiant Power 5 LED	Φ _e	I _F =40mA	10	-	25	mW
Peak Emission Wavelength	λ _p	I _F =40mA	265	275	285	nm
Spectral bandwidth at 50%	Δλ	I _F =40mA	9	-	14	nm

NOTES:

1. Custom-made special requirements are welcome;
2. Electro-optical Characteristics are measured on bare chips. The measured tolerances of Forward Voltage, Peak Wavelength, Radiant Flux are ±0.1V, ±2nm, ±5% respectively;
3. UV LED is Electrostatic Sensitive Device, Please pay attention to electrostatic protection measures.

◆ **Typical Electro-optical Characteristics Curves**

Fig. 1 Relative Flux vs. Forward Current

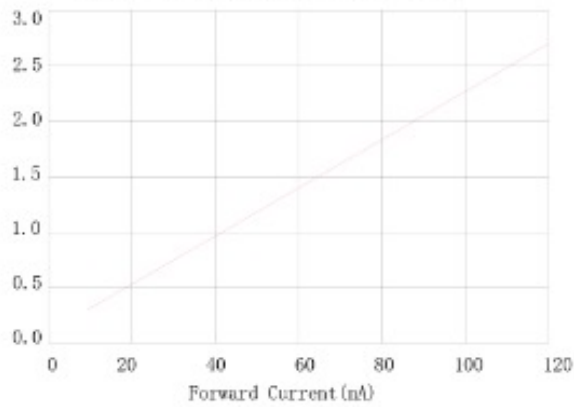


Fig. 2 Forward Voltage vs. Forward Current

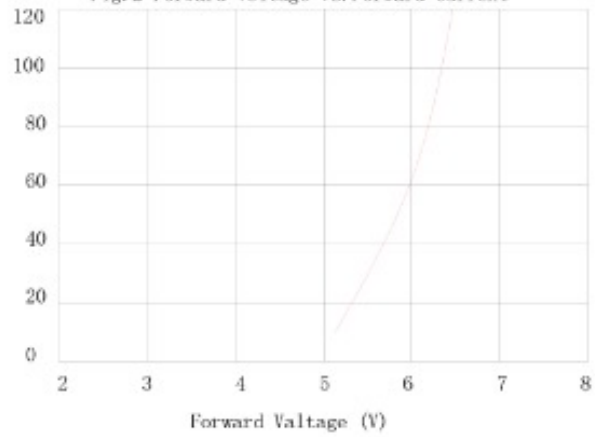


Fig. 3 Peak Wavelength vs. Forward Current

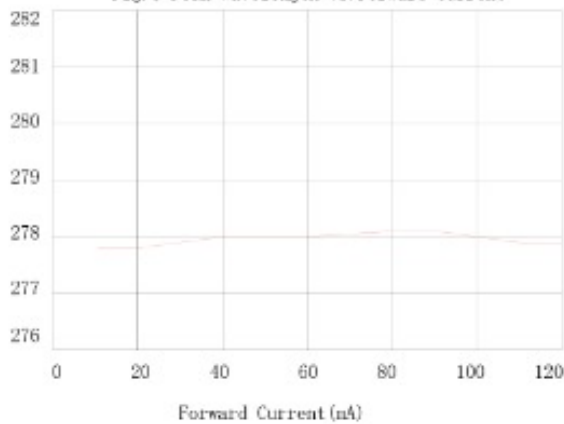
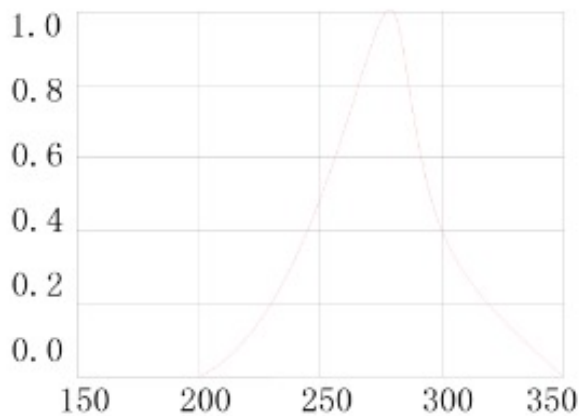
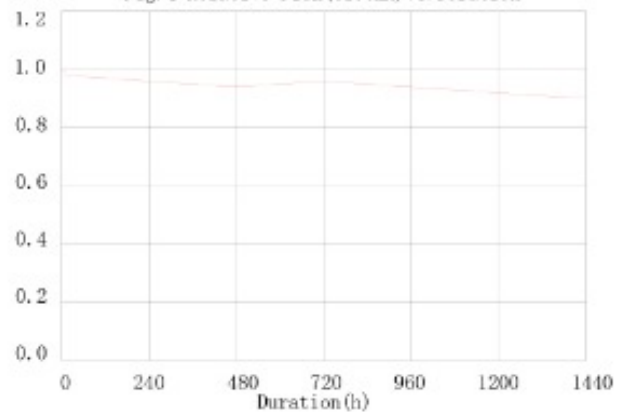
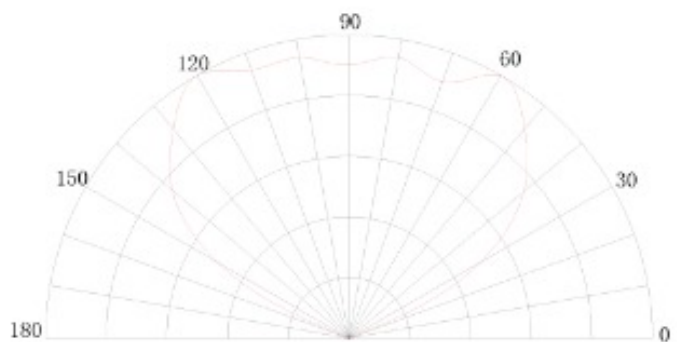


Fig. 4 Relative Flux (@100mA) vs. Duration



Peak Wavelength (nm)



Radiation Characteristics

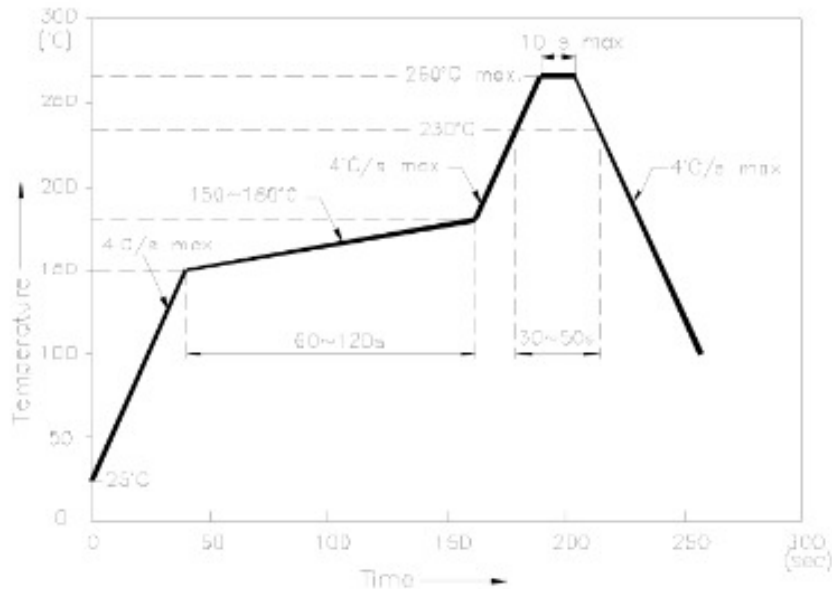


◆ **Test items and results of reliability**

Type	Test Item	Test Conditions	Note	Number of Damaged
Environmental Sequence	Temperature Cycle	-40°C 30min ↑ → (25°C/5min) ↓ 100°C 30min	100 cycle	0/22
	Thermal Shock	-40°C 15min ↑ ↓ 100°C 15min	100 cycle	0/22
	High Humidity Heat Cycle	30°C ↔ 65°C 90%RH 24hrs/1cycle	10 cycle	0/22
	High Temperature Storage	Ta=100°C	1000 hrs	0/22
	Humidity Heat Storage	Ta=60°C RH=95%	1000 hrs	0/22
	Low Temperature Storage	Ta=-40°C	1000 hrs	0/22
Operation Sequence	Life Test	Ta=25°C IF=40mA	1000 hrs	0/22
	High Humidity Heat Life Test	60°C RH=95% IF=40mA	500 hrs	0/22
	Low Temperature Life Test	Ta=-20°C IF=40mA	1000 hrs	0/22

◆ **Reflow Soldering Profile**

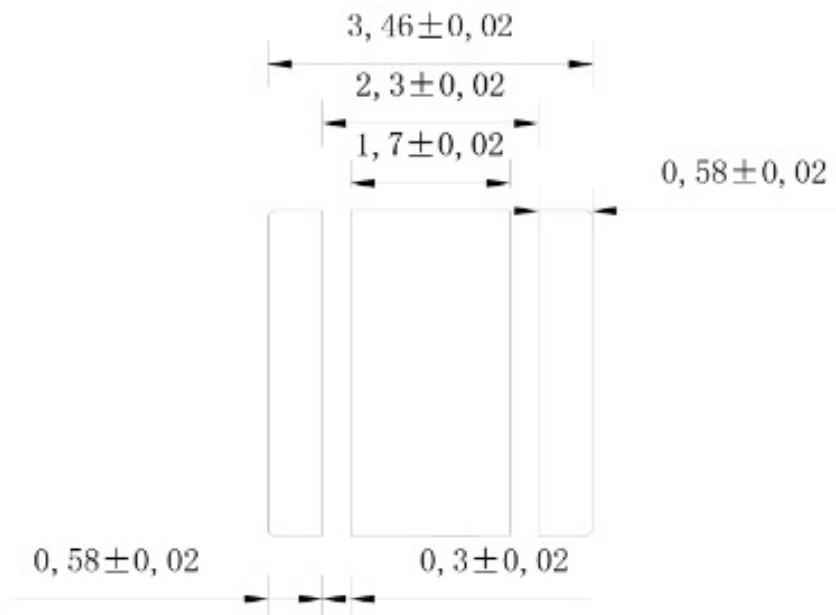
Reflow Soldering Profile For Lead-free SMT Process.



NOTES:

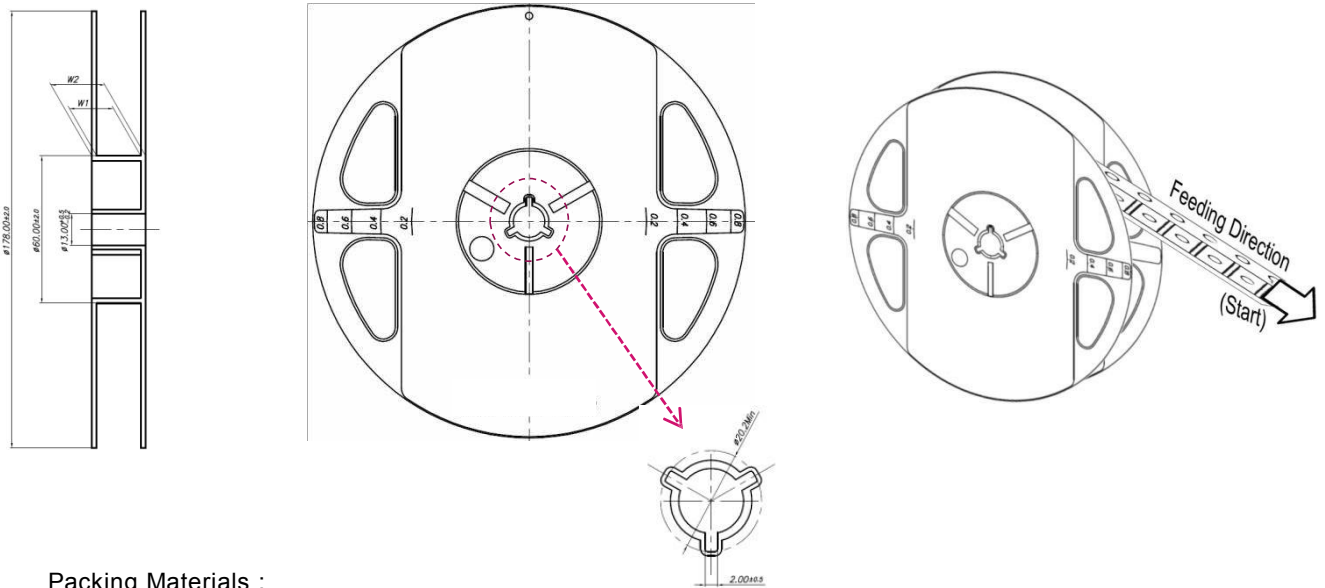
1. We recommend the reflow temperature 245°C (+/-5°C). The maximum soldering temperature should be limited to 260°C.
2. Don't cause stress to the epoxy resin while it is exposed to high temperature.
3. Number of reflow process shall be 2 times or less.

◆ **Recommended Soldering Pattern**



◆ Packing and Labeling

● Reel



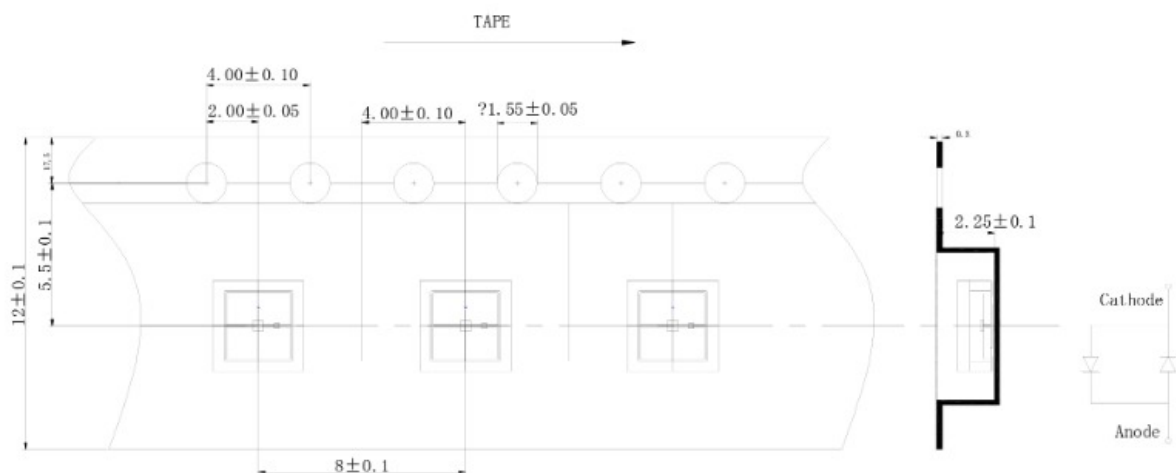
Packing Materials :

Reel : Conductive PS (Black)

Emboss Tape : Conductive PS (Black)

Cover Tape : Conductive PET Base

● Tape



● Taping Arrangement

(End)

(Start)



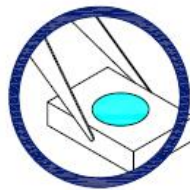
◆ Handling Precautions

Handling Precautions

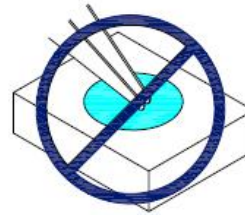
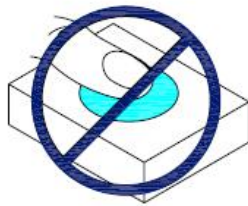
Compare to epoxy encapsulant that is hard and brittle, silicone is softer and flexible. Although its characteristic significantly reduces thermal stress, it is more susceptible to damage by external mechanical force.

As a result, special handling precautions need to be observed during assembly using silicone encapsulated LED products. Failure to comply might lead to damage and premature failure of the LED.

1. Handle the component along the side surfaces by using forceps or appropriate tools.



2. Do not directly touch or handle the silicone lens surface. It may damage the internal circuitry.



3. Do not stack together assembled PCBs containing exposed LEDs. Outside impact may scratch the silicone lens or damage the internal circuitry.



4. During surface-mounting, the pickup capillary diameter should be larger than the silicone lens to insure the capillary does not scratch or damage the lens.





◆ **Cautions:**

● **Product transportation**

Scope of application: for all products

In the course of transportation, led products need to keep face-up, moisture-proof and waterproof, need to avoid extrusion, collision and violent vibration.

● **Product storage and time limit**

Scope of application: for all products

Sealed storage at room temperature: 20°C~30°C, 40%~60%RH and product valid for six months;

Moisture-proof sealing storage: 20°C~30°C, 25%~60%RH and product valid for one year;

After unpacking, led product is recommended to complete within 24 hours (Environmental conditions temperature <30 °C, humidity <60%).

● **Dehumidification process**

Scope of application: 1w high power LED and SMD led series

LED products beyond the above deadline, or for other reasons be damp, we recommend that customers do dehumidification before use.

Dehumidification method: 60°C/12±2hours.

● **Junction temperature limit and thermal treatment**

Scope of application: for all products

When LED products are in use, please ensure that there are the necessary thermal design and if LEDs are inadequate cooling and LED internal junction temperature exceeds 125 °C, the LED luminous efficiency and service life will be reduced.

● **Electrostatic protection**

Scope of application: for all products

LED is an electrostatic sensitive product, and although Hanhua opto electronic LED products with excellent anti-static ability, every shock generated by electrostatic discharge will have a certain degree of damage to the LED. Therefore, in the process of using LED products, we need to do electrostatic protective measures, Such as wear anti-static gloves and anti-static bracelets.

● **Manual welding operation guidelines**

Scope of application: for all products

when welding, we advice the soldering iron on the bracket pin's residence time is not more than 3 seconds and if need to weld repeatedly, the interval time is not less than 2 seconds, in order to avoid long-time high temperature causing damage to the LED.

● **Eye Safety Guidelines**

Do not directly look at the light when the LEDs are on.

Proceed with caution to avoid the risk of damage to the eyes when examining the LEDs with optical instruments.

- Recommended Circuit

The current through each LED must not exceed the absolute maximum rating when designing the circuits.

In general, there can be various forward voltages for LEDs. Different forward voltages in parallel via a single resistor can result in different forward currents to each LED, which also can output different luminous flux values. In the worst case, the currents can exceed the absolute maximum ratings which can stress the LEDs. Matrix circuit with a single resistor for each LED is recommended to avoid the luminous flux fluctuations.

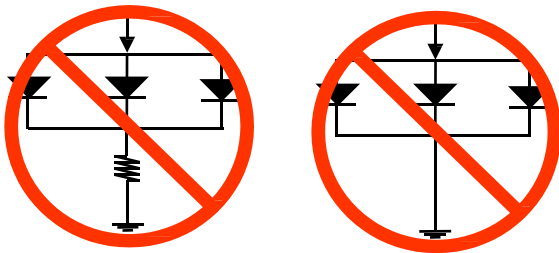


Fig.1. Abnormal Circuit :

Avoid this circuits! The current through the LEDs may vary due to the variation in LED forward voltage.

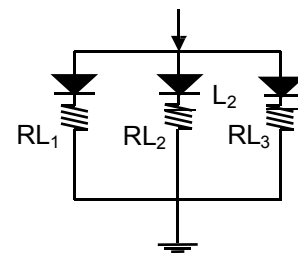


Fig.2. Recommended Circuit in Parallel Mode :

Separate resistors must be used for each LED.

The driving circuits must be designed to operate the LEDs by forward bias only.

Reverse voltages can damage the zener diode, which can cause the LED to fail.

A constant current LED driver is recommended to power the LEDs.

- Others notes:

When Using LED matrix drive, to make sure the reverse voltage does not exceed the maximum rating, and the LED light output intensity can let a person discomfort, and we must take preventive measures, in order to ensure direct vision LED no more than a few seconds. After finding defective LEDs, users should inform us, and shouldn't make the reverse process of LEDs, such as anatomy and analysis, etc.

- Important safety tips:

This product is a deep ultraviolet LED, which will produce deep ultraviolet rays after the correct operation of electricity, which is harmful to the skin and eyes of the human body. Unprotected measures should be avoided to expose directly to deep ultraviolet radiation. It is strictly prohibited that direct exposure to ultraviolet should be avoided without any protective measures, and no wearing glasses or ultraviolet rays should be strictly prohibited. Protective clothing and protective gloves and protective glasses should be worn during operation.