HK265S50CG-Z209



Specification Datasheet

CFCL Optoelectronics (Shenzhen) Co., Ltd.

Model No.: HK265S50CG-Z209

Product: 5050 patented package UVC LED (20 × 20 mil chip × 9)

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1. General Description

The HK265S50CG-Z209 is a high-power deep UVC LED in a patented 5050 (5.0 × 5.0 mm) SMD package with a sapphire plano lens. It integrates 9 parallel AlGaN deep-UV chips on a high-thermal-conductivity aluminum nitride (AlN) ceramic substrate, with a peak wavelength of 265 nm and a full spectral range of 260.0 – 270.0 nm.

The 9-chip parallel design delivers high radiant power and strong irradiance at a low forward voltage. The AlN ceramic substrate provides excellent heat dissipation, effectively controls junction temperature, and ensures stable optical output and long service life. It is ideal for professional disinfection systems and high-demand industrial integration.

2. Key Features

- Peak wavelength 265 nm, spectral range 260.0 – 270.0 nm, high inactivation efficacy
- 9-chip parallel architecture, low forward voltage, high radiant output and strong irradiance
- High-thermal-conductivity AlN ceramic substrate, superior heat dissipation performance
- Standard 5050 SMD footprint, compatible with conventional SMT reflow assembly
- Mercury-free, ozone-free, RoHS/REACH compliant; supports instant on/off and pulse operation
- Solid-state design, vibration and shock resistant, long operational lifetime

3. Application Fields

- Water Treatment — drinking water disinfection, pharma/semiconductor UPW systems, water purifier modules
- Medical & Healthcare — medical device surface sterilization, biosafety cabinets, cleanroom disinfection
- Air Purification — HVAC systems, fresh air units, air purifiers, cold chain air decontamination
- Food Processing — packaging film sterilization, beverage filling lines, food surface bacteriostasis
- Aquaculture & Wastewater — recirculating aquaculture water, municipal wastewater, swimming pool water

4. Absolute Maximum Ratings

(Test condition: Ambient temperature Ta = 25°C)

Parameter	Symbol	Rating	Unit
Forward Current	I_F	900	mA
Peak Forward Current (10% duty cycle, 1ms pulse)	$I_{F(peak)}$	1350	mA
Reverse Voltage	V_R	5	V
Operating Temperature Range	T_{opr}	-30 ~ +60	°C
Storage Temperature Range	T_{stg}	-40 ~ +100	°C
Maximum Junction Temperature	T_j	85	°C

5. Electro-Optical Characteristics

(Test condition: Ta = 25°C, Forward current I_F = 900 mA)

Parameter	Symbol	Min.	Typ.	Max.	Unit
Peak Wavelength	λ_p	260.0	265.0	270.0	nm
Spectral Half-Width	Δλ	-	12	-	nm
Forward Voltage	V_F	4.8	5.4	6.0	V
Radiant Output Power	P_e	135.0	180.0	270.0	mW
Viewing Angle (Half Intensity)	$2\theta_{1/2}$	-	120	-	deg
Reverse Leakage Current	I_R	-	-	10	μA
Thermal Resistance (Junction to Board)	$R_{th(j-b)}$	-	3.0	4.0	°C/W

6. Binning Specifications

(Test condition: Ta = 25°C, I_F = 900 mA)

6.1 Forward Voltage Binning

Level	A01	A02	A03	A04	A05	A06
Min. (V)	4.8	5.0	5.2	5.4	5.6	5.8
Max. (V)	5.0	5.2	5.4	5.6	5.8	6.0

6.2 Radiometric Power Binning

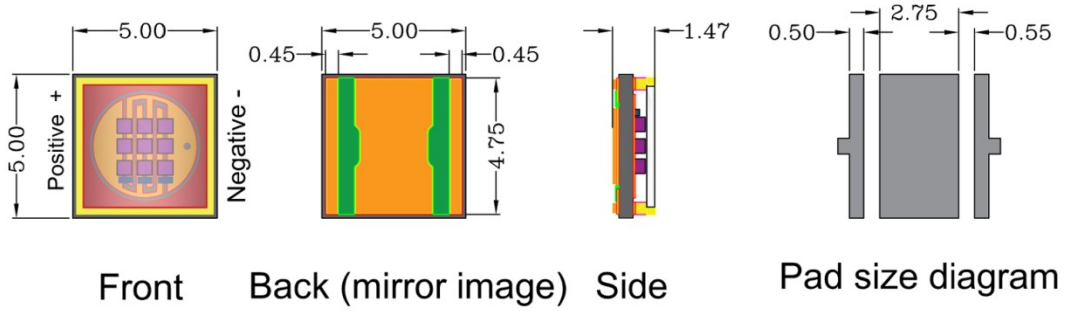
Level	P1	P2	P3
Min.	135.0 mW	180.0 mW	225.0 mW
Max.	180.0 mW	225.0 mW	270.0 mW

6.3 Peak Wavelength Binning

Level	265A	265B
Min.	260.0 nm	265.0 nm
Max.	265.0 nm	270.0 nm

7. Outline Dimensions

- **Package Type: 5050 patented package (SMD, sapphire plano lens)**
- **Overall Dimensions:** 5.00 ± 0.10 mm (Length) × 5.00 ± 0.10 mm (Width) × 1.47 ± 0.10 mm (Height)
- **Lens Diameter:** 3.80 mm (Sapphire Plano Lens)
- **Pad Layout:** Standard 5050 SMD footprint



- **Polarity: Anode (+) / Cathode (-) as marked in the front view; the back view is a mirror image**

8. Packaging & Storage

8.1 Packaging

- Packaging form: Tape and reel
- Quantity per reel: 1000 pieces
- Reel diameter: 178 mm (7 inch)
- Moisture Sensitivity Level: MSL 3
- Floor life after bag opening: 168 h at ≤ 30°C / 60% RH; bake at 125°C for 24 h if exceeded

8.2 Storage Conditions

- Store in a dry environment at room temperature
- Recommended storage: 5°C ~ 30°C, 30% ~ 70% RH
- Avoid direct sunlight, corrosive gases and high humidity
- Reseal the bag properly after opening to prevent moisture absorption

9. Notes & Precautions

1. Peak wavelength tolerance: ± 2.0 nm
2. Radiant flux measurement tolerance: ± 10%
3. Forward voltage tolerance: ± 10%
4. All parameters are measured on finished devices at Ta = 25°C and IF = 900 mA with an integrating sphere system
5. UVC LEDs emit high-energy ultraviolet radiation. Avoid direct exposure to eyes or skin during operation.

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6. The device is sensitive to electrostatic discharge (ESD). ESD withstand voltage (HBM): ± 1 000 V. Proper ESD protection is required during handling and assembly.

7. Operating beyond absolute maximum ratings may cause permanent damage to the device.

8. The suffix Z209 denotes the radiant power series of this model. The supplied grade shall be specified by its radiant power range (see 6.2) and confirmed in the purchase order.

9. The junction temperature must not exceed 85°C. Adequate thermal design is required to keep the junction temperature within the rating at the rated forward current of 900 mA.