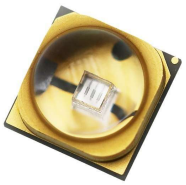
HK295S39CL-250



Specification Datasheet

CFCL Optoelectronics (Shenzhen) Co., Ltd.

Model No.: HK295S39CL-250

Product: 3939 high-purity quartz glass lens package UVB LED (20 × 20 mil chip)

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1. General Description

The HK295S39CL-250 is a high-performance medium-wave ultraviolet-B (UVB) LED in a 3939 (3.9 × 3.9 mm) SMD package with a high-purity quartz glass lens (60° viewing angle), integrating a 20 × 20 mil high-efficiency UVB LED chip. It delivers stable ultraviolet output in the 290–300 nm range, with excellent thermal dissipation and a long operating lifetime.

This device is fully compatible with standard surface mount technology (SMT) assembly processes, and is suitable for Vitamin D_3 biosynthesis. All products undergo 100% testing and sorting by forward voltage, optical power and wavelength before delivery.

2. Key Features

- Peak wavelength range: 290.0 – 300.0 nm
- 20 × 20 mil UVB LED chip
- High-purity quartz glass lens (60° viewing angle) on the 3939 SMD package
- Package dimensions: 3.90 × 3.90 × 2.95 mm (Length × Width × Height)
- Gold (Au) positive and negative electrodes for high reliability
- Low thermal resistance ceramic substrate
- RoHS, CE and REACH compliant
- 100% visual and electrical inspection before shipment
- Optimal spectral window for pre-vitamin D_3 photoconversion
- Balanced biological activity and safety profile for controlled therapeutic exposure

3. Application Fields

- Vitamin D_3 biosynthesis (therapeutic human exposure and dietary supplement production; peak efficiency at 294–304 nm)
- Dermatological treatment of vitamin D deficiency and related conditions
- Agricultural phytochemical enhancement (induction of secondary metabolites in crops and horticultural plants)
- Experimental cancer phototherapy and immunomodulation research

4. Absolute Maximum Ratings

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

Parameter	Symbol	Rating	Unit
Forward Current	I_F	100	mA
Peak Forward Current (10% duty cycle, 1ms pulse)	$I_{F(peak)}$	150	mA
Reverse Voltage	V_R	5	V
Operating Temperature Range	T_{opr}	-40 ~ +85	°C
Storage Temperature Range	T_{stg}	-40 ~ +100	°C
Maximum Junction Temperature	T_j	105	°C

5. Electro-Optical Characteristics

(Test condition: Ta = 25°C, Forward current I_F = 100 mA)

Parameter	Symbol	Min.	Typ.	Max.	Unit
Peak Wavelength	λ_p	290.0	295.0	300.0	nm
Spectral Half-Width	Δλ	-	12	-	nm
Forward Voltage	V_F	4.8	5.4	6.0	V
Radiant Output Power	P_e	15.0	20.0	40.0	mW
Viewing Angle (Half Intensity)	$2\theta_{1/2}$	-	60	-	deg
Reverse Leakage Current	I_R	-	-	10	μA
Thermal Resistance (Junction to Board)	$R_{th(j-b)}$	-	18	-	°C/W

6. Binning Specifications

(Test condition: Ta = 25°C, I_F = 100 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

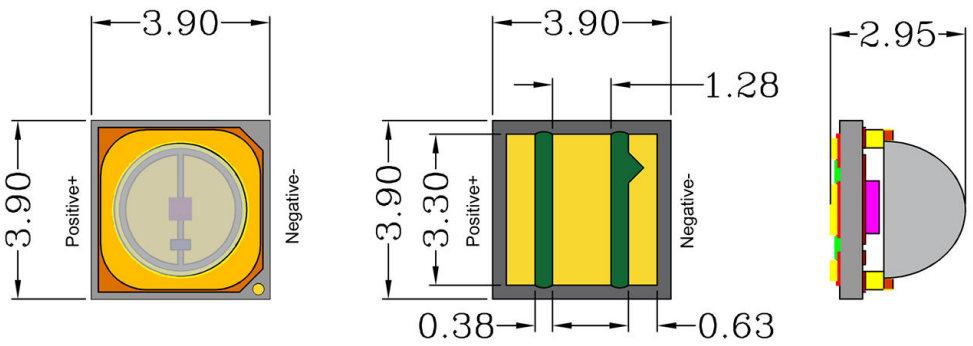
Level	P1	P2	P3	P4
Min.	15.0 mW	20.0 mW	25.0 mW	30.0 mW
Max.	20.0 mW	25.0 mW	30.0 mW	40.0 mW

6.3 Peak Wavelength Binning

Level	295A	295B
Min.	290.0 nm	295.0 nm
Max.	295.0 nm	300.0 nm

7. Outline Dimensions

- **Package Type: 3939 SMD high-purity quartz glass lens package**
- **Overall Dimensions:** 3.90 ± 0.10 mm (Length) × 3.90 ± 0.10 mm (Width) × 2.95 ± 0.10 mm (Height)
- **Lens Diameter: φ3.0 mm (High-purity quartz glass)**
- **Pad Layout:** Standard 3939 SMD footprint



8. Packaging & Storage

8.1 Packaging

- Packaging form: Tape and reel
- Quantity per reel: 600 pieces
- Reel diameter: 178 mm (7 inch)
- Moisture Sensitivity Level: MSL 3

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: ± 3.5 nm
2. Radiant flux measurement tolerance: ± 10%
3. Forward voltage tolerance: ± 10%
4. All parameters are measured at chip level by UV-CHIPS
5. UVB LEDs emit high-energy ultraviolet radiation. Avoid direct exposure to eyes or skin during operation.
6. The device is sensitive to electrostatic discharge (ESD). Proper ESD protection is required during handling and assembly.
7. Operating beyond absolute maximum ratings may cause permanent damage to the device.