HK-TO39-245NM-Z2S

Specification Datasheet



CFCL Optoelectronics (Shenzhen) Co., Ltd.

Model No.:HK-TO39-245nm-Z2S

Product: TO39 package Quartz lens 7° vertical beam (20*20mil Chip)

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1. General Description

The HK-TO39 (240–250 nm) is a high-precision deep-ultraviolet LED housed in a hermetically sealed TO39 metal-can package with a hemispherical sapphire lens. It integrates an AlGaN-based deep-UV chip emitting in the 240–250 nm short-wave UVC band, delivering a narrow spectral bandwidth and a highly collimated beam with a typical viewing angle of 7°.

Optimized for low-current operation (20 mA typical), the device provides stable and repeatable UV output tailored for analytical and sensing applications. The hermetic TO39 construction ensures excellent resistance to moisture, corrosion and mechanical shock, enabling long-term reliability when integrated into professional analytical instruments, industrial monitoring systems and OEM sensing modules.

2. Key Features

- Peak wavelength range: 240.0 – 250.0 nm
- Hermetic TO39 metal can with hemispherical sapphire lens
- Narrow beam angle: ~7° typical, highly collimated output
- Low forward current (20 mA typical) for precision sensing
- Mercury-free, ozone-free, RoHS/REACH compliant
- Instant on/off and high-speed pulse modulation
- Standard 3-pin through-hole TO39 footprint
- Superior thermal stability and long operating lifetime
- Solid-state design, vibration and shock resistant

3. Application Fields

- Chemical & Analytical Instrumentation — HPLC / LC-UV detectors, UV absorbance spectrophotometers, compact deuterium-lamp replacement modules
- Water Quality Monitoring — dissolved organic matter detection, aromatic compound analysis, organic contamination tracing, inline process monitoring
- Gas Analysis & Environmental Sensing — UV-absorption gas detectors, atmospheric pollutant monitoring, industrial stack gas analysis
- Biochemical & Life-Science Research — protein / peptide absorbance detection, intrinsic fluorescence excitation, nucleic acid quantification
- Medical Diagnostics — optical biosensor excitation, point-of-care testing devices, clinical analytical instruments
- Industrial Process Control — inline concentration measurement, thin-film thickness monitoring, material identification and sorting

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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)	$I_{F(peak)}$	120	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	240.0	247.0	250.0	nm
Spectral Half-Width	Δλ	-	12	-	nm
Forward Voltage	V_F	5.0	5.8	6.2	V
Radiant Output Power	P_e	1.0	2.0	2.5	mW
Viewing Angle (Half Intensity)	$2\theta_{1/2}$	-	7	-	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)	5.0	5.2	5.4	5.6	5.8	6.0
Max. (V)	5.2	5.4	5.6	5.8	6.0	6.2

6.2 Radiometric Power Binning

Level	-				
Min.	1.0 mW	1.5 mW	2.0 mW	2.5 mW	-
Max.	1.5 mW	2.0mW	2.5 mW	3.0 mW	-

6.3 Dominant Wavelength Binning

Level	245A	245B
Min.	240.0 nm	245.0 nm
Max.	245.0 nm	250.0 nm

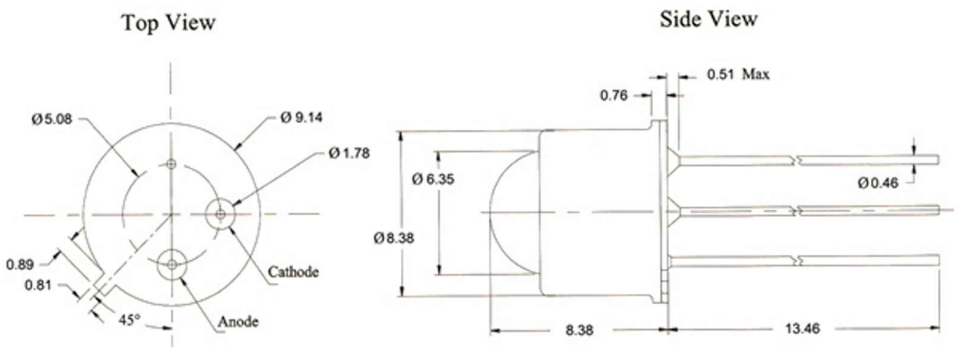
7. Outline Dimensions

- **Package Type:** TO39 package Quartz lens 7° vertical beam
- **Overall Dimensions:** 9.14 ± 0.10 mm (φ) × 8.38 ± 0.10 mm (Shell Height) ×

13.46 ± 0.10 mm (PIN Height)

- **Pad Layout:** Quartz lens 7° vertical beam

8. Packaging & Storage



8.1 Packaging

- Packaging type: Anti-static bag
- Quantity per roll: Up to 50 pieces
- Bag size: 145mm * 100mm
- 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. UVC 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.