




## UVTOP250-BL-TO39

- Deep Ultraviolet Light Emission Source
- 255 nm, 0.4 mW
- TO39 Package
- Ball sapphire lens
-  Biological and Chemical Analysis



### Description

**UVTOP250-BL-TO39** is a deep ultraviolet light emission source, based on **AlGaN** quantum structures, typically emitting at **255 nm** with an optical output power of **0.4 mW**. It comes in hermetically sealed TO39 metal can package with a ball sapphire lens, is Lead-free, and RoHS compliant. **UVTOP250-BL-TO39** is widely used for biological and chemical analysis, disinfection, optical sensing, and fluorescent spectroscopy applications.

### Maximum Rating ( $T_{CASE} = 25^{\circ}C$ )

| Parameter              | Symbol    | Values |       | Unit        |
|------------------------|-----------|--------|-------|-------------|
|                        |           | Min.   | Max.  |             |
| Power Dissipation, DC  | $P_D$     |        | 180   | mW          |
| Forward Current*       | $I_F$     |        | 30    | mA          |
| Operating Temperature* | $T_{OPR}$ | - 30   | + 55  | $^{\circ}C$ |
| Storage Temperature    | $T_{STG}$ | - 30   | + 100 | $^{\circ}C$ |
| Soldering Temperature  | $T_{SOL}$ |        | + 190 | $^{\circ}C$ |

\* Operation close to the absolute maximum ratings may affect device reliability

### Electro-Optical Characteristics ( $T_{CASE} = 25^{\circ}C$ , $I_F = 20$ mA)

| Parameter                     | Symbol          | Values |      |      | Unit          |
|-------------------------------|-----------------|--------|------|------|---------------|
|                               |                 | Min.   | Typ. | Max. |               |
| Peak Wavelength* <sup>1</sup> | $\lambda_P$     | 250    |      | 260  | nm            |
| Spectral Width (FWHM)         | $\Delta\lambda$ |        | 11   | 15   | nm            |
| Forward Voltage* <sup>2</sup> | $V_F$           |        | 6.0  | 7.5  | V             |
| Radiated Power* <sup>3</sup>  | $P_O$           | 0.2    | 0.4  |      | mW            |
| Beam Angle                    | $2\theta_{1/2}$ |        | 7    |      | deg.          |
| Thermal Resistance            | $R_{th}$        |        | 50   |      | $^{\circ}C/W$ |

\*<sup>1</sup>wavelength measurement tolerance:  $\pm 3$  nm

\*<sup>2</sup>forward voltage measurement tolerance:  $\pm 3$  %

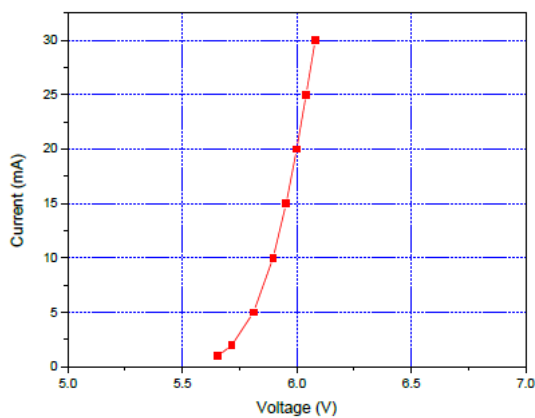
\*<sup>3</sup>output power measurement tolerance:  $\pm 10$  %



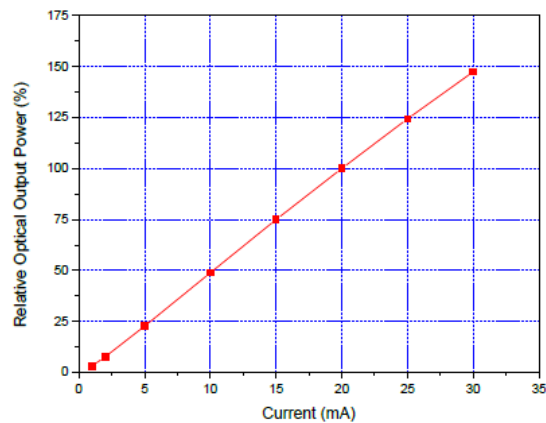


## Performance Characteristics

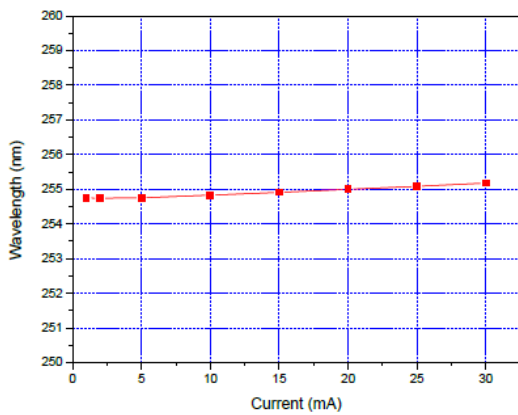
### Forward Current vs. Forward Voltage



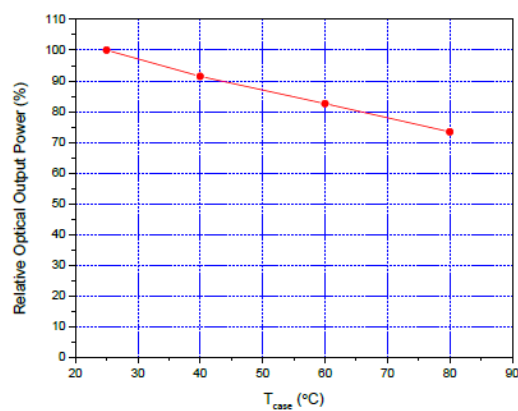
### Rel. Optical Power vs. Forward Current



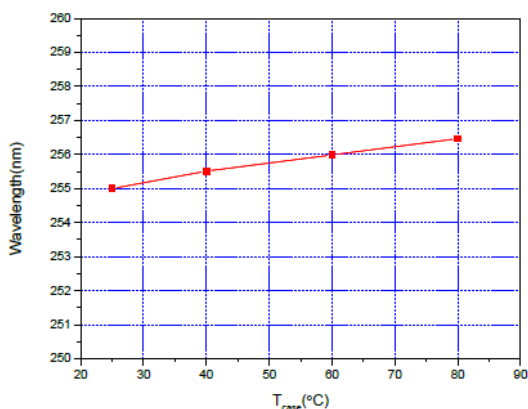
### Peak Wavelength vs. Forward Current



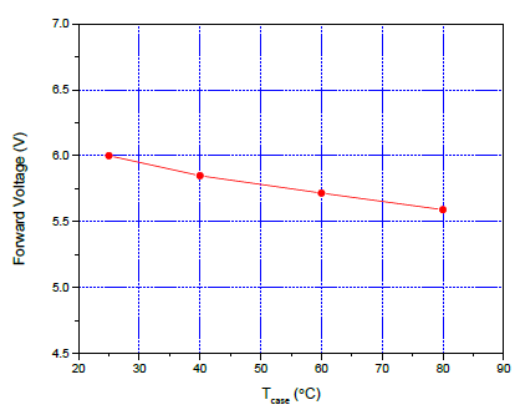
### Rel. Optical Power vs. Case Temperature



### Peak Wavelength vs. case Temperature



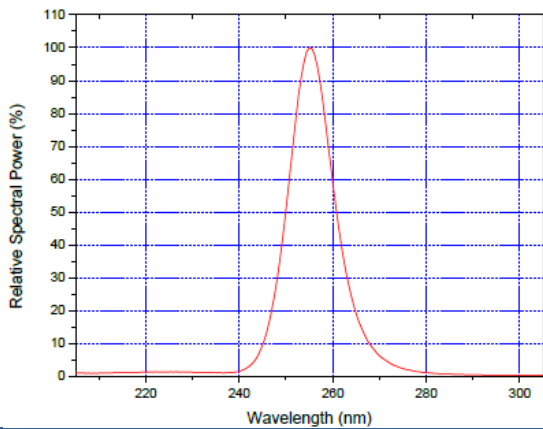
### Forward Voltage vs. Case Temperature





## Performance Characteristics

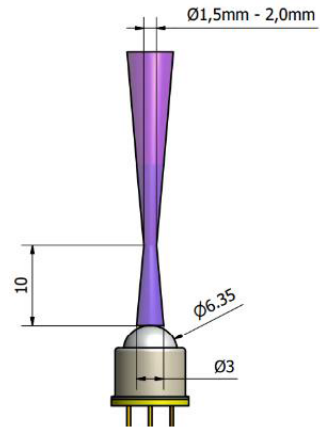
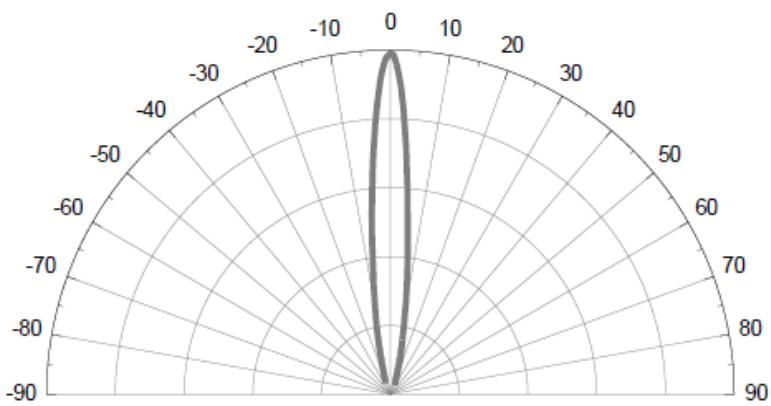
Spectrum



/

/

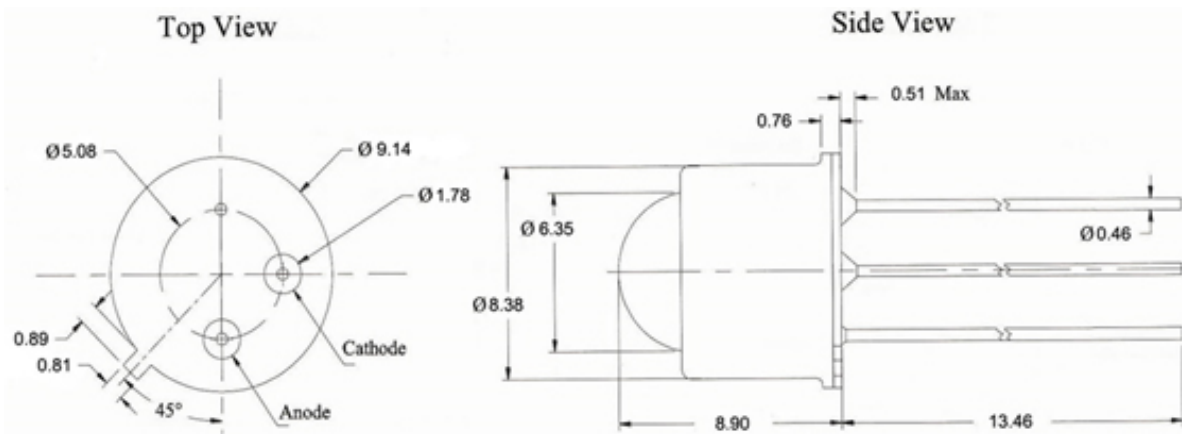
Angular Diagram / Beam Characteristics





## Outline Dimensions

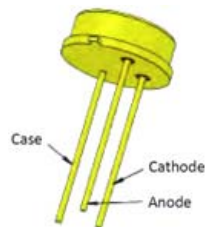
### TO-39 ball lens



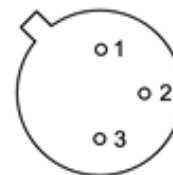
All dimensions in mm

## Electrical Connection

| Pin # | Function |
|-------|----------|
| Pin 1 | Anode    |
| Pin 2 | Cathode  |
| Pin 3 | Case     |



### Bottom View:



## Device Materials

| Pin #         | Material                  |
|---------------|---------------------------|
| Header        | Fe-Ni alloy, plated Ni-Au |
| Leads         | Fe-Ni alloy, plated Ni-Au |
| Bonding wires | Au                        |
| Lens          | SiO <sub>2</sub>          |





## Precautions

### Soldering:

- Do avoid overheating of the LED
- Do avoid electrostatic discharge (ESD)
- Do avoid mechanical stress, shock, and vibration
- Do only use non-corrosive flux.
- Do only solder the leads. Soldering of header or cap will damage the LED
- Do only cut the leads at room temperature with an ESD protected tool
- Do not solder closer than 3 mm from base of the header
- Do form leads prior to soldering
- Do not impose mechanical stress on the header when forming the leads
- Do not apply current to the LED until it has cooled down to room temperature after soldering

### Recommended soldering conditions:

| dip soldering           |            | hand soldering     |            |
|-------------------------|------------|--------------------|------------|
| pre-heat time           | max 30 s   | soldering time     | max 5 s    |
| dipping time            | max 5 s    |                    |            |
| solder bath temperature | max 190 °C | solder temperature | max 190 °C |

It is strongly advised to perform soldering at the shortest time and lowest temperature possible.



### Cleaning:

Cleaning with isopropyl alcohol, propanol, or ethyl alcohol is recommended

DO NOT USE acetone, chloroform, trichloroethylene, or MKS

DO NOT USE ultrasonic cleaners

### Static Electricity:

UVTOP are sensitive to electrostatic discharge (ESD). Precautions against ESD must be taken when handling or operating these LEDs. Surge voltage or electrostatic discharge can result in complete failure of the device.

### UV-Radiation:

During operation these LEDs do emit **high intensity ultraviolet light**, which is hazardous to skin and eyes, and may cause cancer. Do avoid exposure to the emitted UV light. **Protective glasses are recommended.** It is further advised to attach a warning label on products/systems that do utilize UV-LEDs:



### Operation:

Do **only** operate UVTOP LEDs with a current source.

Running these LEDs from a voltage source *will* result in complete failure of the device.

Current of a LED is an exponential function of the voltage across it. Usage of current regulated drive circuits is mandatory

