# VioBeam-1X1-310-V1 | Ultra Narrow Beam 310nm UV LED

The VioBeam-1X1-310-V1 is an ultra narrow beam chip-on-board (COB) UV LED with a peak wavelength of 308±5nm. The COB has an integrated 10° TIR optic that delivers an exceptionally focused and narrow beam, achieving high intensities at longer throw distances. The VioBeam-1X1 series is designed for direct integration (solder-free) and is ideal for applications requiring high far-field intensity and/or focused spot illumination.

## Features & Benefits

- Dimensions: 32mm x 32mm x 9.4mm
- Typical Peak Wavelength: 308nm
- Equipped with a 10° fused silica lens
- Ready for plug and play (solder-free) with poke-in connectors and TVS diode
- Integrated thermal technology in LED chip and MCPCB for lowest thermal resistance & reduced thermal decay
- Specialized for collimation, focused illumination, long distance, and fiber coupling applications:

| | |
|---|---|
| - Disinfection | - Life Sciences |
| - Air Purification | - Curing |
| - Spectroscopy | - Sensing |
| - Fluorescence | - Research |

## Electro-Optical Characteristics at $I_F$=700mA and $T_A$=25°C

| Parameter | Symbol | Unit | Min | Typical | Max |
|---|---|---|---|---|---|
| Peak Wavelength | $\lambda_P$ | nm | 303 | 308 | 313 |
| Forward Voltage | $V_F$ | V | 5.5 | 6.0 | 7.0 |
| Radiant Flux | $P_O$ | mW | 80 | 100 | 120 |
| Full Width of Half Magnitude | $\Delta\lambda$ | nm | - | 15 | - |
| Radiant Angle | $2\Phi_{1/2}$ | Degree | - | 10 | - |
| Thermal Resistance, Junction to COB Bottom Surface | $R_{th}$(J-B) | °C/W | - | 0.9 | - |

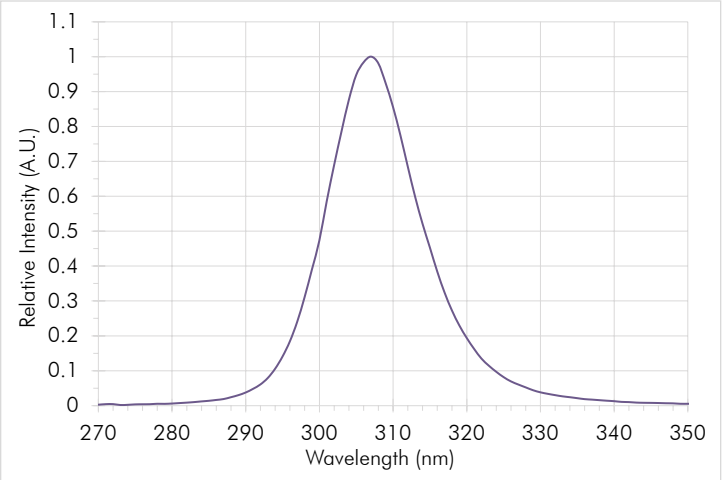
*Peak Wavelength Tolerance:±3nm; Forward Voltage Tolerance: 0.1V; Radiant Flux Tolerance: ±10%*

## Absolute Maximum Ratings

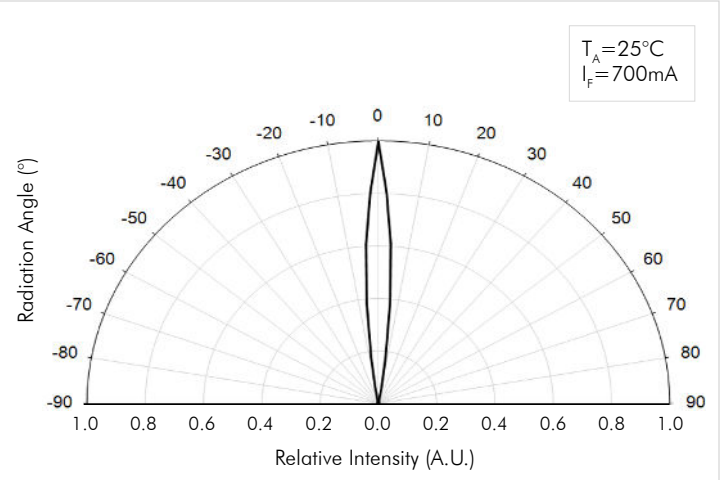
| Parameter | Symbol | Unit | Value |
|---|---|---|---|
| Forward Current | $I_F$ | mA | 1000 |
| Reverse Voltage | $V_R$ | V | 5 |
| Power | $P_D$ | W | 6.5 |
| Junction Temperature | $T_J$ | °C | 90 |
| Operating Temperature | $T_{OPR}$ | °C | -30 ~ 85 |
| Storage Temperature | $T_{STG}$ | °C | -40 ~ 100 |

*Note: Operating the LED at or above the listed absolute maximum ratings may affect device reliability and result in permanent LED failure.*

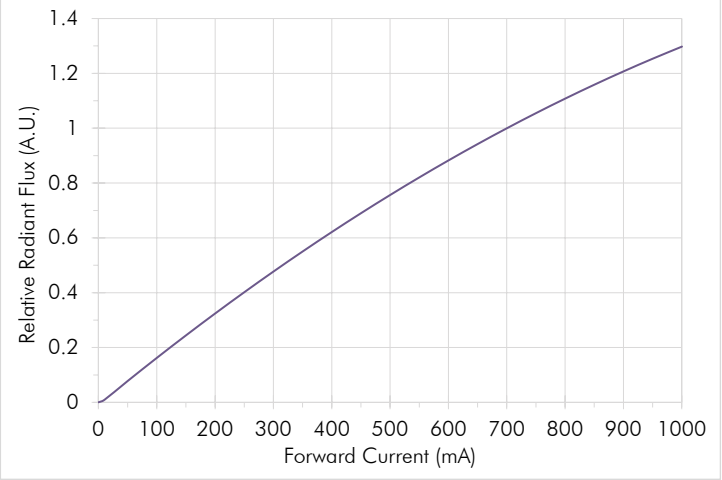
## Spectral Output



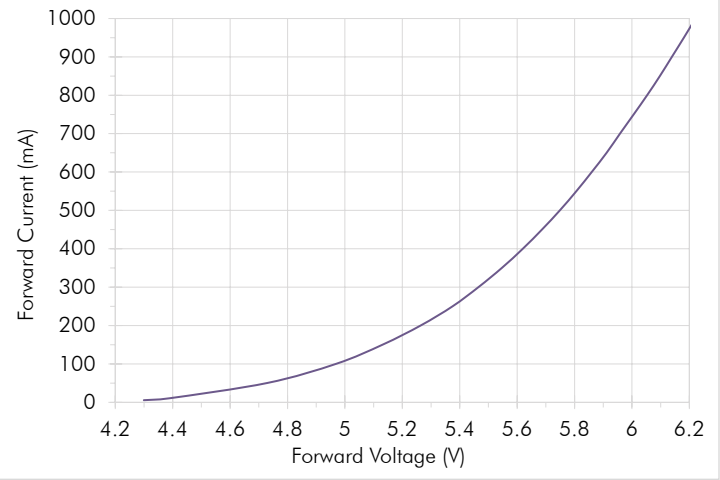

## Radiation Pattern



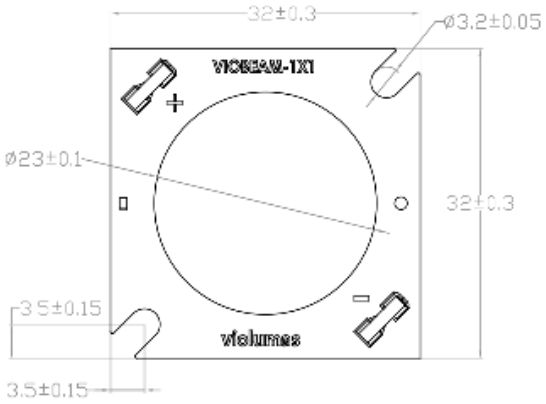

## Forward Current vs. Relative Radiant Flux

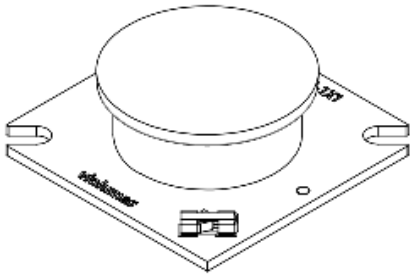



## Forward Voltage vs. Forward Current

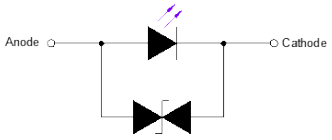


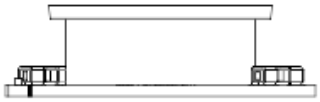
## Mechanical Dimensions

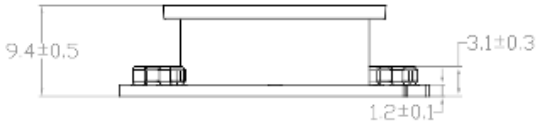


LED Circuit



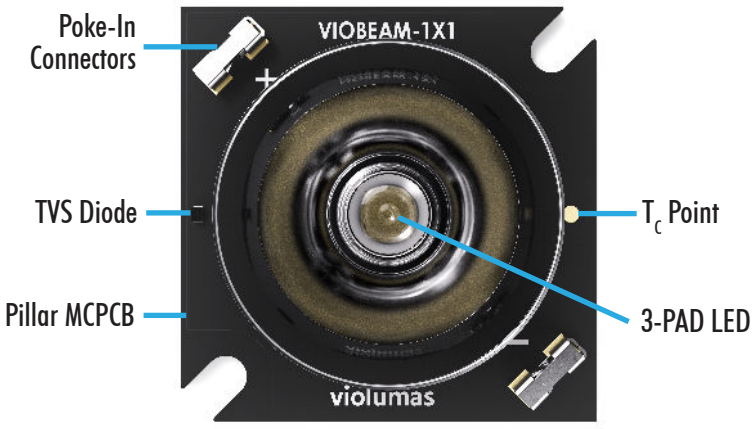






*Note: The maximum offset (tolerance) for lens alignment over the LED is 0.2mm.*

## Product Overview

COB LEDs are ready for plug and play with no soldering required. All Violumas COBs are equipped with connectors for direct wiring and a TVS diode for protection against ESD and voltage issues.

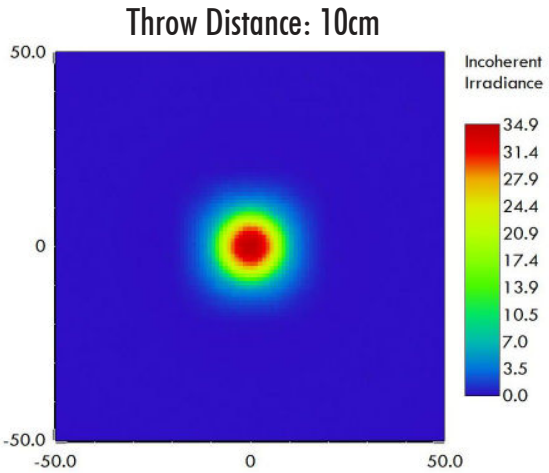



- Poke-in connectors for direct wiring (acceptable wire gauge: 20-24 AWG)
- Bi-directional TVS against 600W over-voltage surge

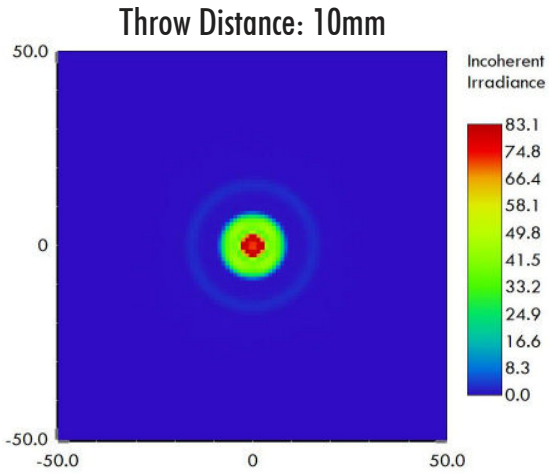
*Note: Violumas COB products may be delivered with a protective tape on the backside of the LED. The tape should be removed before operation or assembly.*

## Irradiance Simulations ($T_A$ = 25°C and $I_F$ = 700mA)

The VioBeam-1X1 series is ideal for applications requiring highly focused spot illumination or high intensities at longer throw distances. Irradiance plots below are simulated at throw distances of 10 cm and 10 mm with detector area of 100 cm$^2$.




Peak Intensity: 34.9 mW/cm$^2$




Peak Intensity: 83.1 mW/cm$^2$

## Heatsink and Driver Kit

The VioBeam-1X1-310-V1 can be provided with a heatsink, mounting screws, and thermal pad for plug-and-play application and direct integration into systems. Driver kits are also available for testing purposes and are assembled with a power cord and plug for either 110VAC or 220VAC operation.

### 30.2.012424 Heatsink

Suitable for VioBeam-1X1 Series

### PS-700A6W Driver Kit

Suitable for VioBeam-1X1-310-V1

*See heatsink and driver kit products at: https://violumas.com/heatsinks-drivers/*

## Handling & Usage Precautions

- Exhibit extreme care when handling LEDs. Do not touch the LED with bare hands as doing so may contaminate and affect the optical characteristics of the LED. When using tweezers, do not apply excessive force, especially to the glass lens. Do not drop the LED as doing so may cause product damage.
- Ensure that electrostatic discharge specifications are followed. Static electricity and surge voltages may cause product damage. Proper electrostatic discharge protection equipment, working machinery, and protected mounting equipment are recommended.
- Do not expose the LEDs to volatile organic compounds as well as hazardous, acidic, and corrosive substances during storage and operation to avoid product damage.
- Do not apply excess mechanical force and vibration while handling the product.
- Do not expose the product to sudden changes in temperature, high humidity levels, and condensation.
- To avoid fault issues, do not couple any electrical wires to the metal substrate of the MCPCB or COB. If any electrical wires from the power source have contact with the MCPCB's metal base under power ON conditions, permanent damage may occur due to inner arcing within the LED structure.
- Avoid grounding of the LED copper substrate. Transient charges can propagate from the ground to the heatsink and finally to the copper substrate of the LED unit and damage the dielectric layer from ground charges. An insulator must be placed between the heatsink and the benchtop to avoid transient charge propagation from the ground.

## Storage Precautions

- Do not expose the product to sudden changes in temperature, high humidity levels, and condensation. It is recommended to store all products in a controlled environment under 30°C free of dust.
- Please consult the Violumas engineering team for further information on storage precautions.

## Eye Safety Precautions

- Avoid exposure to UV light during LED operation. Do not look directly into the UV light during LED operation. Do not look directly into the UV light during optical measurements even through optical instruments. Protect the body, skin, and eyes with UV protective equipment.
- Attach warning labels on all products and systems that use UV LEDs.

## Cleaning Precautions

- Do not use brushes or organic solvents for cleaning the LEDs.
- Perform electrical and optical measurements before and after cleaning to ensure optimal performance.

## Static Electricity Precautions

- Ensure that equipment and machinery are properly grounded.
- Anti-electrostatic attire (wristbands, gloves, footwear, etc.) is recommended.
- Damage inspection is recommended while performing characteristics inspection of LEDs.

## Disclaimers

Violumas is not responsible for any damages that result from inaccurate use of the recommended guidelines. The information compiled in this document is a result of careful review of reference materials and reliable sources. Violumas does not make any claims regarding warranty or guarantee. It is recommended that each customer consults the Violumas engineering team before engaging Violumas products in extreme applications where the failure of the LED and damage to human health may be possible. Each user assumes full responsibility for determining the suitability of the use of Violumas products in various applications. Disassembling Violumas products without consent is prohibited. No part of these documents may be reproduced in any form without prior written permission from Violumas. Please note that the data presented in this document is measured from the use of exclusive Violumas patented products - the 3-PAD LED Flip Chip and the Pillar MCPCB.