About Violumas

Violumas is dedicated to producing the world’s most powerful ultraviolet LEDs. Originating from Flip Chip Opto, our patented chip technology allows us to engage in unparalleled applications of ultraviolet technology with brighter, more powerful, and safer solutions. As a company that carries the whole spectrum of UV products from wafers to modules in the UVA to UVC range (405 nm to 265 nm), Violumas aims to be the world-leading supplier of high performance ultraviolet LEDs and solutions.

Capabilities

Violumas is a one-stop-shop UV solutions provider with a full UV LED product line and capabilities in MCPCB production, optical design, thermal management, LED packaging, custom modules, and fixture design. With roots in thermal management, our vast range of expertise has allowed us to develop our patented 3-PAD chip technology as well as numerous consequent application patents, giving us the capability to produce the world’s most powerful UV LED lights with the lowest thermal resistance. As a global company with offices in the U.S., Canada, Taiwan, and China, we are ISO 9000 certified with resources for global impact.

Products

- Wafers/Chips
- SMD Packages
- COB Modules
- MCPCBs
- Cooling Solutions
- Custom Modules

We provide powerful, reliable, and affordable UV LED technology to people, emphasizing health and non-toxic solutions for the future.
Introducing the 3-PAD Flip Chip

Experience the 3-PAD difference. Highest reliability and optical output, driven at maximum currents.

All of Violumas UV LEDs are packaged with our core chip technologies, the patented 3-PAD LED Flip Chip and Pillar MCPCB. When combined, these technologies coordinate to optimize heat dissipation through a unique thermal structure. The 3-PAD innovation minimizes thermal resistance between the chip and the board, thus increasing optical output and LED lifetime.

Patented 3-PAD technology maximizes UV output per dollar value through exceptional thermal management.

More UV output with higher driving currents:
While typical operating currents are set at 350mA, 3-PAD LEDs can be driven up to 1000mA per chip for up to 50% more output with no signs of thermal decay.

Longer lifetime and reliable performance:
With extreme thermal dissipation as low as 0.2°C/W, our LEDs have lower junction temperatures and have industry-leading lifetimes up to 5,000 hours in the UVC range.

Minimized cooling with maximum heat dissipation:
Violumas LEDs are more efficient and generate less heat, reducing thermal budgets and increasing design flexibility. With less heat, 3-PAD LEDs are ideal for high power UV applications.

2-PAD vs. 3-PAD

While conventional LEDs must diffuse thermal energy through an insulation layer that has poor thermal conductivity, our 3-PAD UV LEDs enable direct dissipation from the Flip Chip to the metal core through the MCPCB pillar structure.

Violumas’ groundbreaking technologies have the potential to transform the performance of the UV LED industry as thermal issues remain a persistent obstacle to achieving high optical power, particularly in the deep UV range, where up to 98% of energy can be dissipated as heat rather than optical radiation. Violumas is able to offer the most powerful UVC LED solutions on the market today with our expertise in thermal management and packaging solutions.

Achieve 50% more UV output than conventional LEDs driving at 600mA.

Every 20°C drop in junction temperature means your LED will last four times longer.
Violumas specializes in standard SMDs (surface mount device) packaged with optics to allow for maximum UV output. We offer mid and high power SMDs suitable for every application from curing to disinfection with flexible integration.

**VS5252 Series**
- **Mid Power SMD**
  - Single Chip Package
  - Dimensions: 5.2x5.2mm
  - Thermal Resistance: 0.9°C/W

**VS7272 Series**
- **High Power SMD**
  - Four Chip Package
  - Dimensions: 7.2x7.2mm
  - Thermal Resistance: 0.2°C/W

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Wavelength (nm)</th>
<th>Forward Current (mA)</th>
<th>Optical Output (mW)</th>
<th>Forward Voltage (V)</th>
<th>Viewing Angle (degree)</th>
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**VS3535 Series**
- **Low Power SMD**
  - Single Chip Package
  - Dimensions: 3.5x3.5mm
  - Thermal Resistance: 9-16°C/W

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All standard products (SMDs and COBs) are offered in wavelengths 405nm to 265nm with options of 30°, 60°, 90°, 120°, or flat lens. Standard heat sinks and starboards are available for testing purposes for each SMD and COB product.
COB Module Lineup

With chips bonded directly on MCPCBs, COB (chip on board) solutions are ready for plug and play use (solder-free) with no need for PCB mounting. Ideal for prototyping purposes, our standard COBs are fitted with connectors and TVS for maximum ease in testing.

**VC1X1 Series**
- Single Chip Module
- Dimensions: 15x15mm
- Thermal Resistance: 0.9°C/W

**VC2X2 Series**
- Four Chip Module
- Dimensions: 20x20mm
- Thermal Resistance: 0.3°C/W

**Mid Power COB**
- Part Number | Wavelength (nm) | Forward Current (mA) | Optical Output (mW) | Forward Voltage (V) | Viewing Angle (degree)
---|---|---|---|---|---
VC1X1C45L6-405 | 405 | 700 | 1285 | 3.7 | 60°
VC1X1C45L6-395 | 395 | 700 | 1280 | 3.7 | 60°
VC1X1C45L6-385 | 385 | 700 | 1300 | 3.9 | 60°
VC1X1C45L6-375 | 375 | 700 | 930 | 3.9 | 60°
VC1X1C45L6-365 | 365 | 700 | 775 | 4.1 | 60°
VC1X1C4BL3-310 | 310 | 700 | 48 | 6.0 | 30°
VC1X1C4BL3-275 | 275 | 700 | 50 | 6.6 | 30°
VC1X1C4BL3-245 | 245 | 700 | 43 | 6.4 | 30°

**VC2X2 Series**
- Four Chip Module
- Dimensions: 20x20mm
- Thermal Resistance: 0.3°C/W

**VC12X1 Series**
- Twelve Chip Module
- Dimensions: 20x20mm
- Thermal Resistance: 0.11°C/W

**Light Bar COB**
- Part Number | Wavelength (nm) | Forward Current (mA) | Optical Output (mW) | Forward Voltage (V) | Viewing Angle (degree)
---|---|---|---|---|---
VC12X1C45L6-405 | 405 | 700 | 12 | 43.5 | 60°
VC12X1C45L6-395 | 395 | 700 | 13 | 43.5 | 60°
VC12X1C45L6-385 | 385 | 700 | 12 | 43.5 | 60°
VC12X1C45L6-375 | 375 | 700 | 9 | 43.5 | 60°
VC12X1C45L6-365 | 365 | 700 | 6 | 46.8 | 60°
VC12X1C48L6-310 | 310 | 1400 | 0.6 | 36.0 | 60°
VC12X1C48L6-275 | 275 | 1400 | 0.6 | 39.6 | 60°
VC12X1C48L6-265 | 265 | 1400 | 0.5 | 38.4 | 60°

**Custom COB Modules**

Custom COB solutions give you more power in an optimized design. Chips are bonded directly on an MCPCB in close configurations for increased efficiency and target illumination. With our optical simulation and design services, COBs can be customized to your system with minimized material costs.

**FEATURES**
- Customized array for target application
- Multi-wavelength capability
- Lens options for various viewing angles
- Connectors for wiring
- TVS for ESD protection

**SERVICES**
- Optical Simulation
- Optical Design
- Circuit Design
- Thermal Simulation
- Thermal Design
UV LED Applications

Printing UV LEDs save costs in curing with higher efficiencies, less electrical consumption, less heat, faster print cycles, and longer lifetimes compared to traditional lamps, and can be easily retrofitted into existing systems. UV LEDs also allow for design innovations in additive manufacturing systems, producing reliable parts with surface finish and mechanical properties.

Wavelengths: 405nm-365nm, 265nm.

Pest Control UV light has long been known to attract insects and is largely utilized in insect light traps. UV LEDs increase the design potential, convenience, and efficacy of insect traps with more targeted efficiency and less power consumption. Recent research has targeted the lethal effects of UV and UVC light on horticultural pests such as mites in greenhouses. Wavelengths: 550nm-365nm, 280nm.

Horticulture/Agriculture When exposed to UV light, the antioxidant and health properties of plants like grapes, carrots, and peppermint have been shown to increase. UV light has also been shown to reduce the growth of molds like powdery mildew as well as increase crop yields like lettuce and broccoli by up to 20%, showing promising potential for the agricultural industry. Wavelengths: 365nm–310nm.

Phototherapy UV LEDs pose a unique advantage in this industry due to narrowband UVB emission for treating psoriasis, vitiligo, and eczema and less power consumption and heat emission than lamps. UV LEDs can be employed in self-care devices to be used at home, improving healthcare access for more patients and eliminating costly clinic visits. Wavelengths: 460-450nm, 310nm.

Food Disinfection Foods like produce or meats are particularly susceptible to bacterial spoilage and can be disinfected with UV light for a non-toxic and residue-free method of deactivation while retaining nutritional value and sensorial attributes. UV light has also been recently replacing liquid pasteurization methods with more efficient and cheaper disinfection of milk, juices, and broths. Wavelengths: 280nm-265nm.

Medical Disinfection High rates of hospital acquired infections have brought attention to hardy bacteria that are difficult to eliminate with conventional cleaning methods. UV light works effectively and rapidly to eradicate bacteria like Clostridium difficile. UV LEDs have new applications for disinfecting medical equipment, personal devices, and hospital rooms. Wavelengths: 280nm-265nm.

Water Disinfection Access to clean water remains a critical problem today. UV CLEDs are a compact but powerful method of disinfecting harmful microorganisms in water like giardia. UV LEDs have opened up point-of-use water disinfection technologies such as battery-powered water bottles or faucet-attaching modules. Wavelengths: 280nm-265nm.
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