VENUSLAB
OPTOELECTRONICS

Precision
Meets
Simplicity

Infrared LED

One Platform Many Possibilities

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Venuslab™: Redefining Laboratory-Grade Precision Light Sources

The Venuslab™Laboratory Precision Infrared/Optoelectronic LED Series represents the pinnacle of high-performance solid-state illumination technology, engineered to meet the rigorous demands of modern photonics research, biomedical instrumentation, and high-precision industrial sensing.Unlike standard commercial-grade LEDs, the Venuslab series not only covers a vast spectral range from Ultraviolet (UV) and Visible to Near-Infrared (NIR) and Short-Wave Infrared (SWIR), but also delivers a qualitative leap in **beam quality** and **radiometric stability**.

This series features industrial-standard TO-18, TO-39, and T-1 3/4 hermetic metal or epoxy package s, integrated with high-precision glass lenses or parabolic reflectors. This optical design significantly enhances photon extraction efficiency, generating high-intensity output beams. Addressing the inherent divergence of LEDs, the Venuslab series is optimized to function either as standalone high-radiance point sources or to couple perfectly with Venuslab ' s aspheric lens kits to output high-quality collimated parallel light, thereby solving the technical bottleneck of coupling traditional LEDs into optical fibers or spectrometers.

Detailed Applications

1.Optical Coherence Tomography (OCT): Utilizing the deep tissue penetration capabilities of the 1050nm and 1300nm bands, these serve as low-coherence light sources for OCT systems used in ophthalmic retinal scanning and skin tomography.

2.Non-invasive Glucose & SpO2 Monitoring: Specific wavelengths from 850nm to 940nm correspond to the absorption peaks of oxygenated hemoglobin, widely used in the development of pulse oximeters and non-invasive glucose monitoring devices.

3.Fluorescence Excitation: Short-wavelength models function as excitation sources for compact fluorescence microscopes, used for observing fluorescently labeled biological samples.

4.NIR Spectroscopy Analysis: Based on the water and organic matter absorption characteristics in the 900nm-1500nm bands, these are used for grain sorting in agriculture, food brix testing, and on-line ingredient analysis in pharmaceutical production lines.

5.Gas Sensing & Environmental Monitoring: Infrared light of specific wavelengths is strongly absorbed by methane, carbon dioxide, or water vapor. Venuslab LEDs are ideal sources for manufacturing Non-Dispersive Infrared (NDIR) gas sensors.

6.Security & Night Vision Illumination: High-power 850nm and 940nm versions (e.g., VL-LED880G-Max) provide active illumination invisible to the human eye, used for night vision enhancement in CCTV surveillance systems and license plate recognition.

7.Fiber Optic Component Testing:1300nm (O-band) and 1550nm (C-band) are the low-loss windows for fiber communications. With a broad spectral FWHM (~100nm), these LEDs serve as broadband incoherent sources,perfect for testing the spectral response of passive components (like gratings, filters, attenuators) while avoiding the coherent speckle noise generated by lasers.

8.Free Space Optics (FSO): Acting as signal transmitters in short-range wireless optical communica tion systems.

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Usage & Storage Recommendations

Drive & Thermal Management: LEDs are current-driven devices and must be powered by a **Constant Current Source**. For high-power models exceeding 100mA (e.g., TO-39 packages), it is recommended to mount them on aluminum or copper heat sinks to prevent junction temperature rise, which can cause wavelength drift or lifetime degradation.

ESD Protection: Infrared LED chips are sensitive to electrostatic discharge. Always wear anti-static wrist straps when handling and ensure soldering equipment is properly grounded.

Optical Cleaning: If dust accumulates on the glass lens surface, gently wipe it with anhydrous ethanol and optical lens paper. Do not use rough cloths to avoid scratching the lens surface and degrading beam quality.

Technical Specifications Table

Model Name	Center Wavelength	Optical Power	Spectral FWHM	Viewing Half Angle	Max DC Forward Current	Package
VL-LED781G	780 nm	6 mW	35 nm	55°	100 mA	TO-18
VL-LED780G	780 nm	18 mW	30 nm	10°	100 mA	T-1 3/4
VL-LED851G-W	850 nm	8 mW	40 nm	55°	100 mA	TO-18
VL-LED851G-N	850 nm	18 mW	40 nm	10°	100 mA	TO-18
VL-LED870G	870 nm	22 mW	40 nm	10°	100 mA	T-1 3/4
VL-LED880L-Pro	880 nm	50 mW (0.6 W Pulsed)	80 nm	7°	500 mA	TO-39
VL-LED880G-Max	880 nm	100 mW	80 nm	55°	500 mA	TO-39
VL-LED910G	910 nm	12 mW	35 nm	7°	100 mA	T-1 3/4
VL-LED940G	940 nm	18 mW	50 nm	10°	100 mA	T-1 3/4
VL-LED1050G	1050 nm	2.5 mW	55 nm	15°	100 mA	T-1 3/4
VL-LED1070G	1070 nm	7.5 mW	80 nm	15°	100 mA	T-1 3/4
VL-LED1200G	1200 nm	2.5 mW	100 nm	15°	100 mA	T-1 3/4
VL-LED1300G	1300 nm	2 mW	100 nm	15°	100 mA	T-1 3/4
VL-LED1450G	1450 nm	2 mW	100 nm	15°	100 mA	T-1 3/4
VL-LED1550G	1550 nm	2 mW	100 nm	15°	100 mA	T-1 3/4

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Let us help you move science forward — faster and smarter.