

VERTILAS GmbH with headquarters in Garching near Munich is the first company worldwide to develop, produce and market Vertical Cavity Surface Emitting Laser diodes (**VCSEL**) in the wavelengths range from **1300nm to 2050nm**.

Based on the reliable Indium Phosphide system, the proven Buried Tunnel Junction (BTJ) technology (see Figure 1) provides high-performance single-mode and multi-mode lasers with a circular output beam with a small divergence angle.

Due to their ability to use current for wavelength modulation instead of temperature these VCSELs allow modulation rates up to 10GHz with a wide tuning range up to 4 nm and a high spectral purity at optical power levels higher than 1 mW. This makes the BTJ-VCSELs an ideal light source for **Optical Sensing** applications in the near infrared and for **Optical Communications** with various wavelengths on the CWDM upper grid.

These lasers exhibit threshold currents under 1mA at room temperature and maximum operating temperatures exceeding 80°C making them ideally suited for a large variety of environmental conditions. Thanks to low operating current and voltage, a compact and low power consuming electrical circuitry can be designed.

VERTILAS BTJ structure

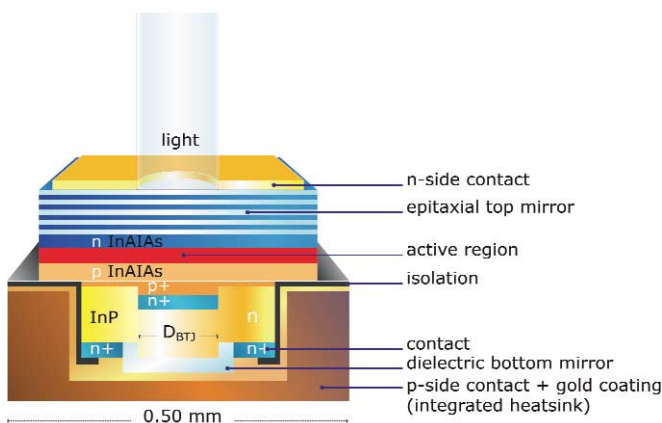


Figure 1

U-I and P-I Curve and Spectrum

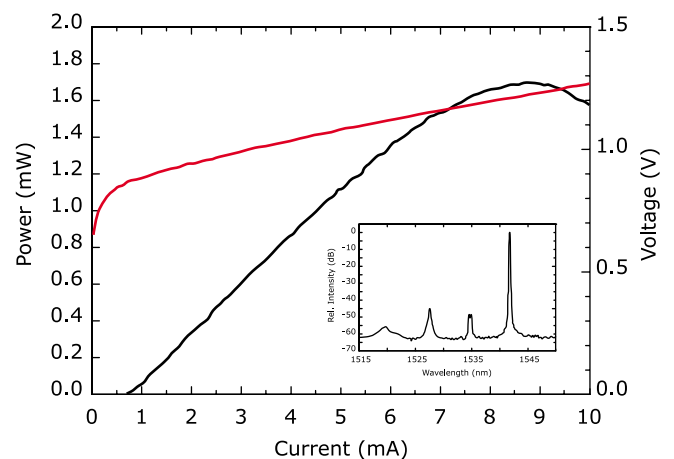


Figure 2

Tunable Diode Laser Absorption Spectroscopy (TDLAS)

A molecule such as methane (CH₄) or water vapor (H₂O) absorbs light only at certain wavelengths (or 'colors'), mainly in the infrared. These absorption wavelengths are characteristics of the molecules like a fingerprint and are called its absorption spectrum. Thanks to VERTILAS lasers emitting a single pure wavelength where all its power is concentrated, many gas lines can now be detected and measured in very low concentration levels.

Standard Wavelengths* available for gas sensing					
Absorbing Element	Wavelength	Absorbing Element	Wavelength	Absorbing Element	Wavelength
CO	1560, 1579nm	HCl	1730, 1742nm	NH ₃	1512nm
NO	1790nm	H ₂ S	1579nm	N ₂ O	1960nm
H ₂ O	1800, 1854, 1877nm	CH ₄	1654, 1684nm	CO ₂	2003, 2012nm

*Other wavelengths on request

Near Infrared spectrum covered by VERTILAS Lasers

