

UniMir DFB CW QCLs

Perfect to measure **CH₃i** in nuclear industry

Wavelength: **~11.3 μm ~ 885 cm^{-1}**

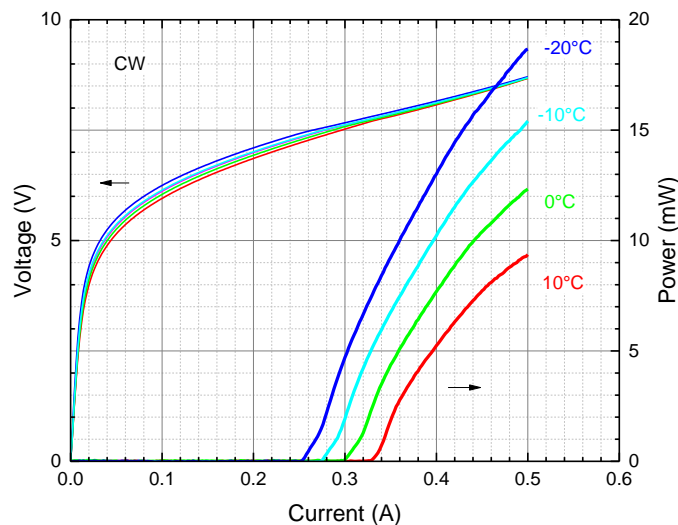


The UniMir products are Distributed Feedback (DFB) Quantum Cascade lasers (QCL) that emit CW (continuous wavelength) infrared light at room temperature. The laser is mounted on a thermoelectric cooler inside a sealed High Heat Load (HHL) package integrating a collimation lens and a thermistor to readout the laser chip temperature.

By controlling the chip's operating temperature through the Peltier element inside the laser's package, customers tune the emission wavelength without mode hopping while keeping a longitudinal single-mode operation.

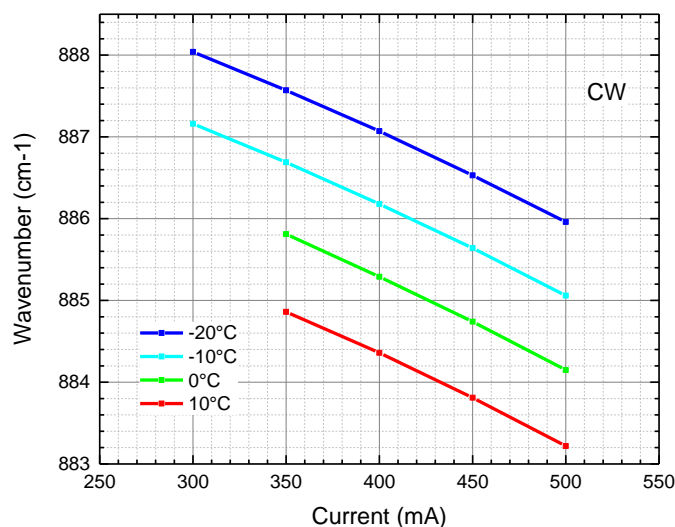


Typical laser characteristics



The curves on the left indicate the voltage of the laser as a function of the applied DC current and laser chip temperature.

The curves on the right indicate the output power as a function of the applied DC current and laser chip temperature.



The curves indicate the laser singlemode emission wavelength as a function of the applied DC current and laser chip temperature. Lasers with slightly shifted wavelength are also available.

Optical features

| | |
|---|--|
| Laser type | QCL single mode DFB |
| Mode of operation | CW |
| Typical Optical Power at 885 cm ⁻¹ | 10mW (with the base plate of the HHL-package at +20°C) |
| Full accessible wavelength range | >3 cm ⁻¹ |
| Continuous tuning range | >1 cm ⁻¹ |
| Side mode suppression ratio | SMSR > 25 dB |
| Linewidth (FWHM) | < 100 Mhz (free-running with suitable electronics) |
| Divergence | < 10mrad |
| Beam quality | TM00 |
| Output beam diameter (window output) | Typically 4 mm |
| Polarization | Linear vertically polarized |

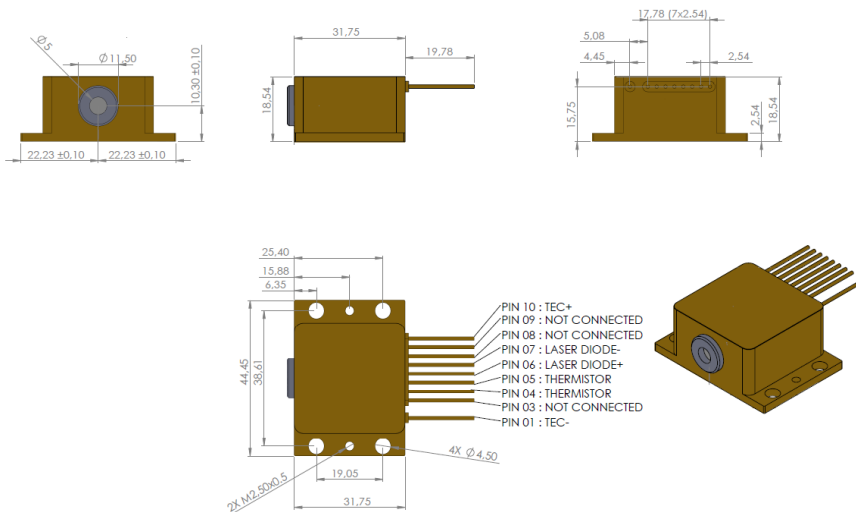
Mechanical and electrical features

| | |
|---|---|
| Packaging | Sealed with nitrogen gas fill inside a High-Heat Load (HHL) package. |
| Operating temperature of the laser HHL casing | +10°C to +50°C ⁽¹⁾ |
| Operating temperature of the QCL chip (for casing temperature < 20°C) | -20°C to +20°C ⁽²⁾ |
| Operating temperature of the QCL chip (for casing temperature equal to +45°C) | 0°C to +20°C ⁽²⁾ |
| Storage temperature | +10°C to +50°C |
| Built-in temperature sensor | Thermistor $R_0 = 12 \text{ k}\Omega$, @ 25°C, $\beta = 3740 \text{ K}^{-1}$ |

⁽¹⁾Avoid water condensation

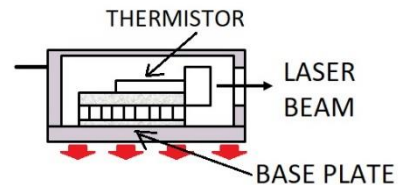
⁽²⁾The temperature of the QC-laser when operated is monitored by the built-in thermistor

Drawings and pinout (dimensions in mm)



Electrical connections (pinout MPL):

| pin # | |
|-------|----------------------------|
| 1 | TEC (-) |
| 2 | no pin |
| 3 | NC |
| 4 | Thermistor (12k Ω) |
| 5 | Thermistor (12k Ω) |
| 6 | QCL (+) |
| 7 | QCL (-) |
| 8 | NC |
| 9 | NC |
| 10 | TEC (+) |



The above HHL-package diagram shows the built-in thermistor that indicates the laser chip temperature. The diagram also shows the base plate that dissipates the heat (because typically the built-in TEC will cool down the laser chip).