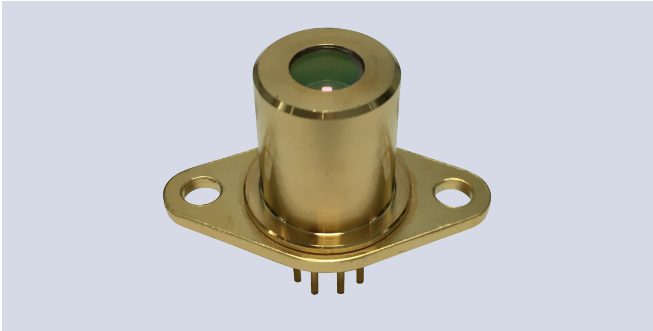
ALPES LASERS

pioneering photonics for a brighter future

# CW-DFB-ICL Interband Cascade Lasers

Interband Cascade Lasers (ICL) are a mid-IR light source with emission in the 2.7 – 3.9 µm range, which is important particular for hydrocarbon detection and other gases of interest. With lower dissipation than traditional QCLs some ICL lasers are available in TO-66 housing in addition to the standard TO3 and HHL.



ICL devices are based on a different design principle than QCL, which cause some technical differences. The main difference is that the current, voltage and power dissipation are much lower which allows for easy integration in smaller packages and systems. The output power is also typically lower. The emitted light is also linearly polarized with TE polarization; in a HHL package this translates in an horizontal polarization.

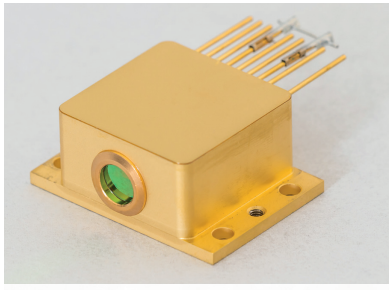
## Key Features

- Continuous Wave
- Single-Mode Spectrum
- Tunable source
- Low Dissipation
- High Beam Quality
- Narrow Linewidth

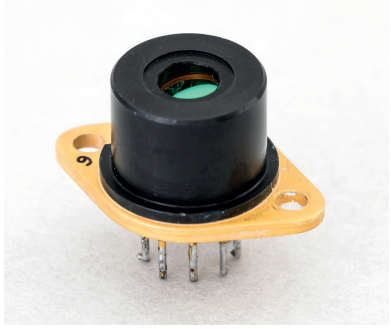
## Key Applications

- Gas Spectroscopy
- Hydrocarbon detection
- Metrology

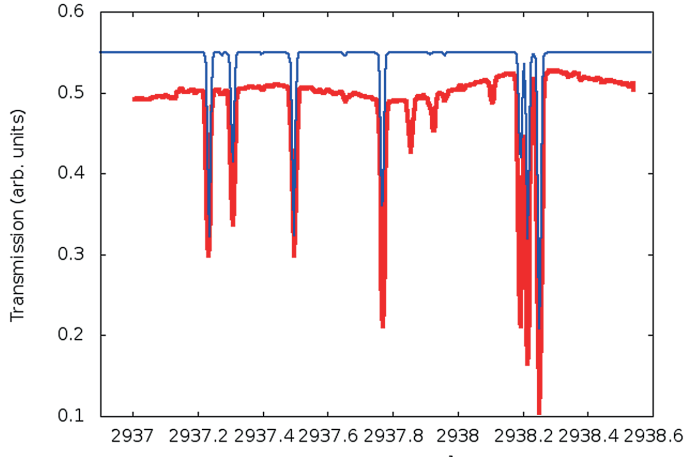

SWISS MADE



HHL package available for all CW-DFB-ICL



TO3 package available for some CW-DFB-ICL




This sample spectrometric measurement shows a typical ICL-DFB laser centered around 2937.8 $cm^{-1}$ being used to measure absorption through a 5 cm gas cell with with $CH_4$ at 5 mbar of pressure. The blue line shows the expected transmission as extracted from HITRAN data and the red line shows the experimental results, showing good agreement and showcasing the narrow linewidth of the laser.

# Specifications

| PARAMETER NAME | MINIMUM VALUE | TYPICAL VALUE | MAXIMUM VALUE | UNIT | NOTE |
|---|---|---|---|---|---|
| Operating Frequency | 2828 | 2853<br>2898<br>2913<br>2946 | 2950 | cm-1 | Currently available range; additional wavelengths expected soon. |
| Operating Wavelength | 3390 | 3394<br>3433<br>3450<br>3505 | 3540 | nm | |
| Tuning Range | 6 | 10 | 25 | cm-1 | Lasers tune with the operation temperature and current, tuning range availability depends on the central wavelength. A minimum tuning range can be specified. |
| Optical Output Power | 0.5 | 1 | 8 | mW | at T_op = +10°C |
| Operating Current | 40 | 80 | 140 | mA | |
| Operating Voltage | 7 | 9 | 12 | V | |
| Threshold Current | 25 | 40 | 80 | mA | |
| Side Mode Suppression Ratio | | 20 | 30 | dB | |
| Current Tuning Coefficient | 60 | 80 | 100 | cm-1/mA | |
| Temperature Tuning Coefficient | 0.28 | 0.3 | 0.32 | cm-1/°C | |
| Chip Operating Temperature | -20 | 10 | 40 | °C | |
| Housing Operating Temperature | 5 | 20 | 30 | °C | Always keep above dew point |
| Storage Temperature | 15 | 20 | 65 | °C | Always keep above dew point |

These general specifications apply to all ICL products.
Some specific requests may require additional development time.

# Currently available products

| OPERATING FREQUENCY [$cm^{-1}$] | MIN GUARANTEED POWER [mW] | TYPICAL MAX POWER [mW] | TYPICAL TUNING RANGE [$cm^{-1}$] | HOUSING |
|---|---|---|---|---|
| 2853 | 0.5 | 2 | 10 | TO66 / TO3 / HHL |
| 2898 | 1 | 5 | 10 | TO66 / TO3 / HHL |
| 2913 | 0.5 | 2 | 10 | TO66 / TO3 / HHL |
| 2946 | 0.5 | 2 | 10 | HHL only |

These products are available with a 8 weeks lead time.

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