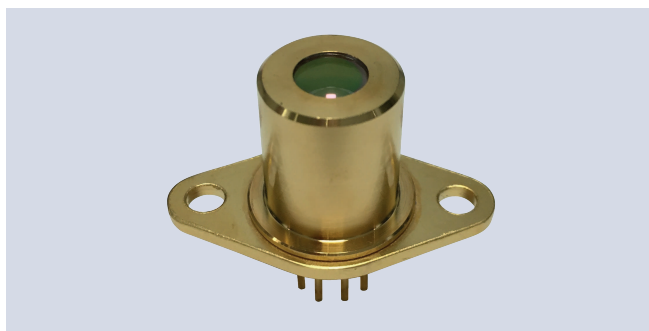


## CW-DFB-ICL Interband Cascade Lasers

Interband Cascade Lasers (ICL) are a mid-IR light source with emission in the 2.7–3.9  $\mu\text{m}$  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.



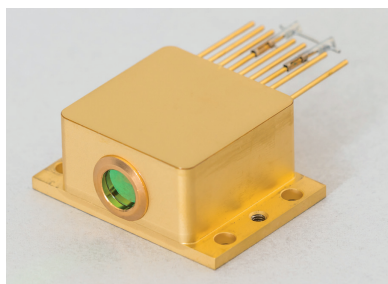
ICL devices are based on a different design principle than QCL, which cause some technical differences. The main difference is that the current, voltage and power dissipation are much lower which allows for easy integration in smaller packages and systems. The output power is also typically lower. The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

### Key Features

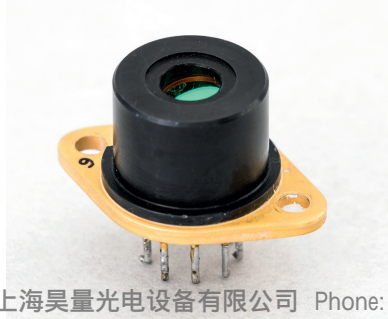
- Continuous Wave
- Single-Mode Spectrum
- Tunable source
- Low Dissipation
- High Beam Quality
- Narrow Linewidth

### Key Applications

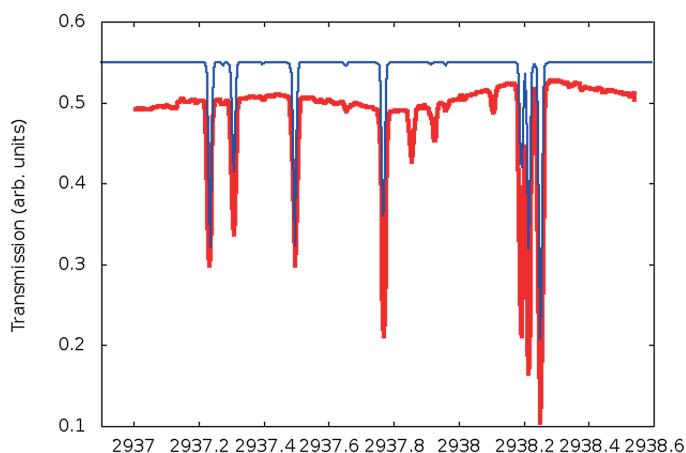
- Gas Spectroscopy
- Hydrocarbon detection
- Metrology



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  $2937.8 \text{ cm}^{-1}$  being used to measure absorption through a 5 cm gas cell with  $\text{CH}_4$  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 2898 2913 2946	2950	cm-1	Currently available range; additional wavelengths expected soon.
Operating Wavelength	3390	3394 3433 3450 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 <sub>op</sub> = +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 <sup>-1</sup> ]	MIN GUARANTEED POWER [mW]	TYPICAL MAX POWER [mW]	TYPICAL TUNING RANGE [cm <sup>-1</sup> ]	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.