

760 - 830 nm
830 - 920 nm
920 - 1100 nm
1100 - 1300 nm
1300 - 1450 nm
1450 - 1650 nm
1650 - 1850 nm
1850 - 1900 nm
1900 - 2200 nm
2200 - 2600 nm
2600 - 2800 nm
2800 - 4000 nm
4000 - 4600 nm
4600 - 5300 nm
5300 - 5800 nm
5800 - 6500 nm
6000 - 14000 nm

# DFB Quantum Cascade Lasers



nanoplus is the only manufacturer world-wide routinely providing single- and multi-mode lasers at any wavelength from 760 to 6500 nm. At wavelengths up to 14 μm, QCLs complete nanoplus' laser portfolio. Our patented distributed feedback laser diodes deliver single mode emission with well defined optical properties enabling a wide range of applications.

nanoplus lasers operate reliably in tens of thousands of installations worldwide, including chemical and metallurgical industries, gas pipelines, power plants, medical systems, airborne and satellite applications.

### nanoplus single mode QCL

nanoplus provides single mode emitting Quantum Cascade Lasers in a broad wavelength range from 6 μm up to 14 μm. Our patented process technology delivers single mode emission with well defined optical properties enabling a wide range of applications.

### key features

- ✓ very high spectral purity
- ✓ excellent reliability
- ✓ wide variety of packaging options
- ✓ customer-specific designs available
- ✓ intrapulse and interpulse tuning

### application areas

- ✓ high performance gas sensing for process and environmental control
- ✓ sensing of liquids
- ✓ illumination

nanoplus QC lasers with excellent performance are specifically designed and characterized to fit your needs. This data sheet summarizes typical properties of nanoplus DFB QC lasers. In this wavelength range, gases such as nitrogen monoxide (NO), ammonia (NH<sub>3</sub>) or acetylene (C<sub>2</sub>H<sub>2</sub>) can be detected with particularly high sensitivity.



laser packaging options
TO3 header with or without cap
c-mount

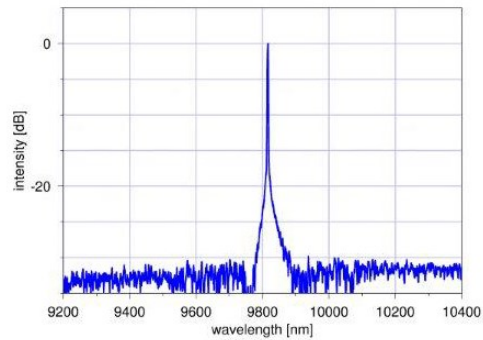
For dimensions and accessories, please see [www.nanoplus.com](http://www.nanoplus.com)  
Further packaging options available on request.



# nanoplus DFB quantum cascade lasers

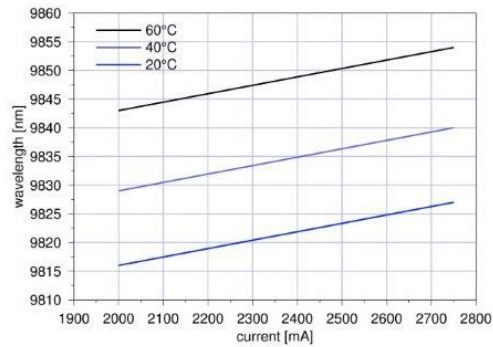
A wide variety of gas molecules exhibit strong characteristic absorption lines in the mid infrared. DFB Quantum Cascade Lasers are perfectly suited for highly sensitive detection of gases down to ultralow concentrations. For this application, highly stable laterally and longitudinally single mode lasers are required. This data sheet reports performance data of nanoplus QCL DFB lasers. For performance data of nanoplus lasers in other wavelength ranges, please see [www.nanoplus.com](http://www.nanoplus.com) or contact [sales@nanoplus.com](mailto:sales@nanoplus.com).

*Fig. 1  
Room temperature cw spectrum of a nanoplus interband cascade DFB laser operating at 9800 nm*



In many applications, temperature and / or current variations are used to adjust the laser emission precisely to the target wavelength.

*Fig. 2  
Mode hop free tuning of a nanoplus 9800 nm DFB laser by current variation at different temperatures*



electrooptical characteristics (T = 25 °C)	symbol	unit	typ
SMSR		dB	30
threshold current	$I_{th}$	A	0.5
operation current	$I$	A	2
operation voltage	$U$	V	15
peak output power	$P_{peak}$	mW	100
average output power	$P_{avg}$	mW	3
temperature tuning coefficient	$C_T$	nm/K	0.8
repetition frequency	$f$	kHz	100
pulse length	$t$	ns	100
duty-cycle		%	3
slow axis (FWHM)		°	25
fast axis (FWHM)		°	60
operation temperature at case	$T$	°C	20



We will be happy to answer further questions. Please contact us at [sales@nanoplus.com](mailto:sales@nanoplus.com)

