

## DFB Quantum Cascade Lasers

nanoplus is the only manufacturer world-wide routinely providing single- and multi-mode lasers at any wavelength from 760 to 6000 nm. At wavelengths up to 14  $\mu\text{m}$ , 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  $\mu\text{m}$  up to 14  $\mu\text{m}$ . 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.

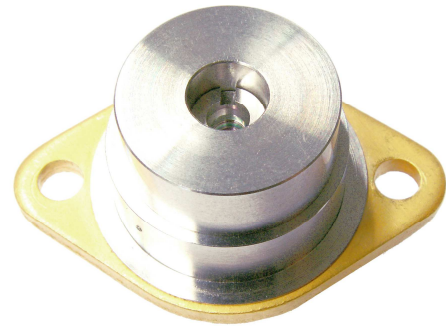
#### laser packaging options

TO8 header with or without cap

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).

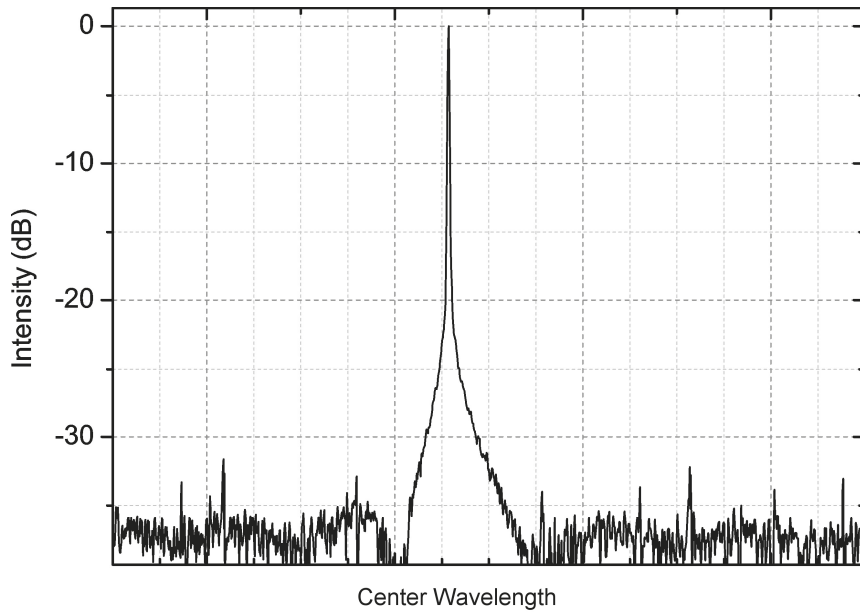


Fig. 1 Spectrum of a nanoplus DFB QCL at a temperature of 290 K

electrooptical characteristics (T = 25 °C)	symbol	unit	min	typ	max
available wavelengths are between 5 μm and 14 μm					
SMSR		dB	30		
threshold current	$I_{th}$	A	0.5		2.5
operation current	$I$	A	0.8		4
operation voltage	$U$	V	10	15	20
peak output power	$P_{peak}$	mW	10	100	1000
average output power	$P_{avg}$	mW	1	3	20
temperature tuning coefficient	$C_T$	nm/K ( $cm^{-1}/K$ )	0.4 (0.13) @ 5.2 μm		1.1 (0.05) @ 14.4 μm
repetition frequency	$f$	kHz	-	100	2000
pulse length	$t$	ns	-	100	300
duty-cycle		%	-	3	10
operation temperature at case	$T$	°C	-20	20	80
slow axis (FWHM)		°	20	25	30
fast axis (FWHM)		°	50	60	70

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

