



DFB Interband Cascade Lasers from 3000 nm to 6000 nm

nanoplus single mode IC 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 μm , QCLs complete nanoplus' laser portfolio.

Our IC lasers 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.

key features

- ✓ very high spectral purity
- ✓ narrow linewidth
- ✓ excellent reliability
- ✓ wide variety of packaging options
- ✓ customer-specific designs available

application areas

- ✓ high performance gas sensing for process and environmental control
- ✓ precision metrology
- ✓ spectroscopy
- ✓ space technology

nanoplus lasers with excellent performance are specifically designed and characterized to fit your needs. This data sheet summarizes typical properties of nanoplus DFB lasers in the range from 3000 nm to 6000 nm. In this wavelength regime e. g. CH_4 , HCl , CH_2O , HBr , CO , CO_2 , NO and H_2O can be detected with particularly high sensitivity, since the detection sensitivity typically increases at long wavelengths. Overleaf data for DFB lasers optimized for CH_2O detection is shown as an example.

general ratings	symbol	unit	typical
optical output power	P_{out}	mW	>1
typical maximum operating voltage	V_{op}	V	4 - 6
forward current	I_f	mA	70
side mode suppression ratio (SMSR)		dB	> 35

On request, lasers with specifically optimized properties, such as higher output power, are available.

laser packaging options
TO66 with TEC and NTC, sealed
other packaging options will follow soon, or may be discussed on request

For dimensions and accessories, please see www.nanoplus.us Further packaging options are available on request.

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 - 3000 nm
3000 - 6000 nm
6000 - 14000 nm

device protected by
US patent 6.671.306
US patent 6.846.689
EU patent EP0984535

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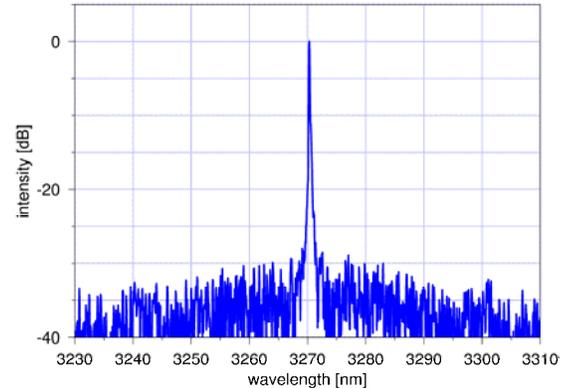
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nanoplus DFB ICL at 3270 nm

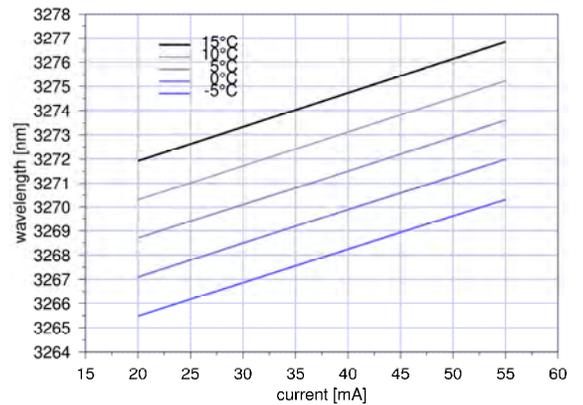
A wide variety of gas molecules exhibit characteristic absorption lines in the near infrared. DFB lasers emitting at 3270 nm are e. g. suited for highly sensitive detection of small CH₄ concentrations. For this application, highly stable laterally and longitudinally single mode lasers are required. This data sheet reports performance data of nanoplus DFB lasers at this wavelength. Similar performance data are obtained in the entire wavelength range from 3000 nm to 6000 nm. For examples of performance data of nanoplus lasers in other wavelength ranges, please see www.nanoplus.us or contact victor.perez@nanoplus.com

Fig. 1
Room temperature cw spectrum of a nanoplus interband cascade DFB laser operating at 3270 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 3270 nm DFB laser by current variation at different temperatures



electro-optical characteristics	symbol	unit	typ
peak wavelength	λ	nm	3270
threshold current	I_{th}	mA	50
temperature tuning coefficient	C_T	nm / K	0.3
current tuning coefficient	C_I	nm / mA	0.2
slow axis (FWHM)		degrees	35
fast axis (FWHM)		degrees	55
storage temperatures	T_S	°C	+ 20
operational temperature at case	T_c	°C	+ 20

We will be happy to answer further questions. Please contact us at victor.perez@nanoplus.com

