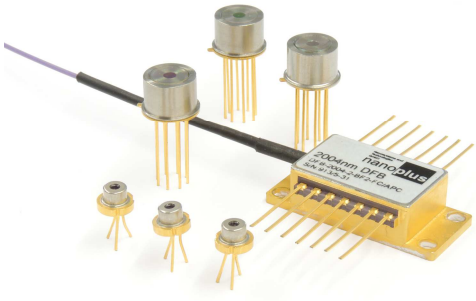
DFB laser diodes from 1900 nm to 2200 nm

Nanosystems and Technologies GmbH
nanoplus

nanoplus single mode laser diodes

nanoplus is the only manufacturer worldwide 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 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.



key features

- ✓ very high spectral purity
- ✓ narrow linewidth typically < 3 MHz
- ✓ excellent reliability
- ✓ wide variety of packaging options
- ✓ customer-specific designs available

application areas

- ✓ high performance gas sensing for process and environmental control
- ✓ precision metrology
- ✓ atomic clocks
- ✓ 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 1900 nm to 2200 nm. This wavelength regime permits, e. g. trace gas sensing of CO_2, N_2O, H_2CO, HBr, with excellent sensitivity. Overleaf data for lasers used for high performance CO_2 sensing are given as an example.

general ratings (T = 25 °C)	symbol	unit	typical
optical output power	P_{out}	mW	3
reverse voltage	V_r	V	1.8
forward current	I_f	mA	100
side mode suppression ratio (SMSR)		dB	> 32

On request, lasers with specifically optimized properties, e. g. higher output power, are available.

laser packaging options
TO5.6 header with or without cap
TO5 header with TEC and NTC
butterfly housing with SM or PM fiber coupling

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

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

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REGISTERED COMPANY ISO 9001:2008

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nanoplus DFB laser diodes at 2004 nm

A wide variety of gas molecules exhibit characteristic absorption lines in the near infrared. At 2004 nm for example, there is a strong absorption line of CO_2, which can be used for laser based sensing with very high sensitivity. This data sheet reports performance data of nanoplus DFB lasers at this wavelength. Similar performance data are obtained in the entire wavelength range from 1900 nm to 2200 nm. For examples of performance data of nanoplus lasers in other wavelength ranges, please see www.nanoplus.com or contact sales@nanoplus.com

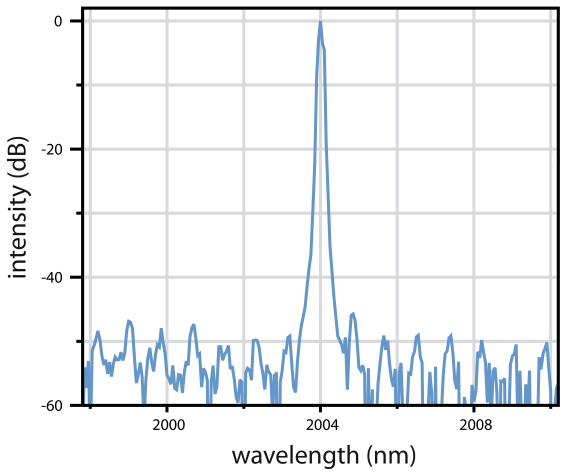

Fig. 1
Room temperature cw spectrum of a nanoplus DFB laser diode operating at 2004 nm

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

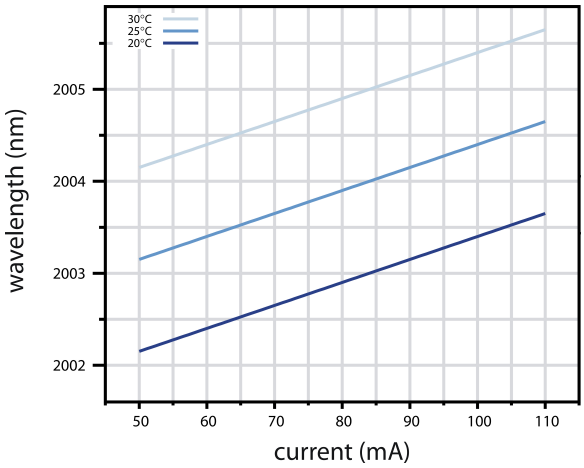

Fig. 2
Mode hop free tuning of a nanoplus 2004 nm DFB laser diode by current variation at different temperatures

electrooptical characteristics (T = 25 °C)	symbol	unit	min	typ	max
peak wavelength	λ	nm	2003	2004	2005
threshold current	I_{th}	mA	20	25	50
slope efficiency	e	mW / mA	0.10	0.20	0.23
temperature tuning coefficient	C_T	nm / K	0.18	0.20	0.22
current tuning coefficient	C_I	nm / mA	0.01	0.02	0.03
slow axis (FWHM)		degrees	17	20	25
fast axis (FWHM)		degrees	35	40	45
emitting area	W x H	µm x µm	3 x 1	4.5 x 1.5	5 x 2
storage temperatures	T_S	°C	- 40	+ 20	+ 80
operational temperature at case	T_c	°C	- 20	+ 25	+ 50

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

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