

# DFB laser diodes from 1850 nm to 1900 nm

## nanoplus single mode laser diodes

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.

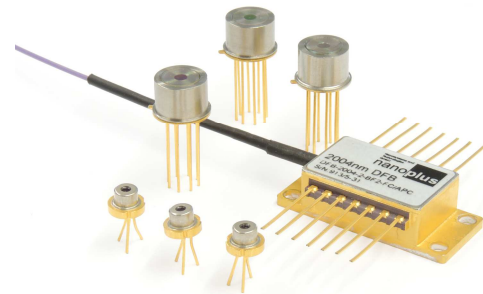
### key features

- ✓ 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 1850 nm to 1900 nm. In this wavelength range water vapor can be detected with very high sensitivity. Overleaf data for DFB lasers used in this application is given as an example.



general ratings (T = 25 °C)	symbol	unit	typical
optical output power	$P_{\text{out}}$	mW	5
reverse Voltage	$V_r$	V	4
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 and PM fiber

For dimensions and accessories, please see [www.nanoplus.com](http://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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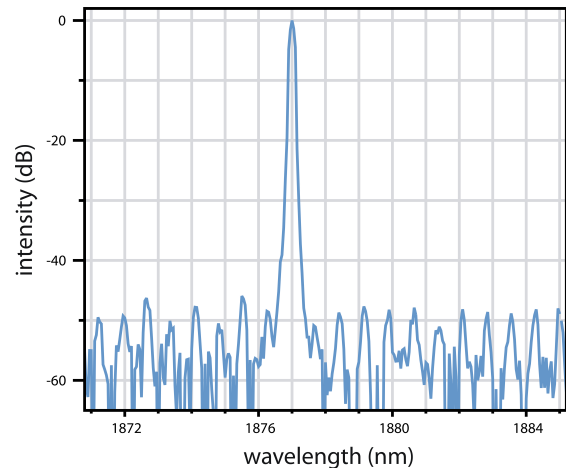
Rev. DFB1877.06

## nanoplus DFB laser diodes at 1877 nm

A wide variety of gas molecules exhibit characteristic absorption lines in the near infrared. DFB lasers emitting at 1877 nm are perfectly suited for sensitive detection of small H<sub>2</sub>O concentrations. For this application, highly stable laterally and longitudinally single mode lasers are required.

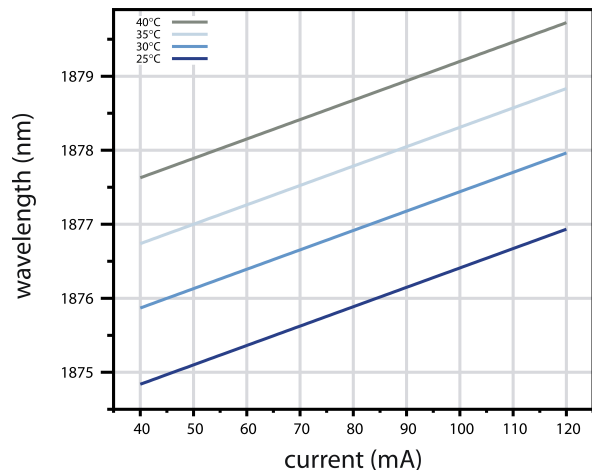
This data sheet reports performance data of nanoplus DFB lasers at this wavelength. Similar performance data are obtained in the entire wavelength range from 1850 nm to 1900 nm. For examples of performance data of nanoplus lasers in other wavelength ranges, please see [www.nanoplus.com](http://www.nanoplus.com) or contact [sales@nanoplus.com](mailto:sales@nanoplus.com)

**Fig. 1**  
Room temperature cw spectrum  
of a nanoplus DFB laser diode  
operating at 1877 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 1877 nm  
based DFBs by current variation at  
different temperatures



electrooptical characteristics (T = 25 °C)	symbol	unit	min	typ	max
peak wavelength	$\lambda$	nm	1876	1877	1878
threshold current	$I_{th}$	mA	20	35	65
slope efficiency	$e$	mW / mA	0.07	0.10	0.23
temperature tuning coefficient	$C_T$	nm / K	0.17	0.20	0.23
current tuning coefficient	$C_I$	nm / mA	0.015	0.020	0.035
slow axis (FWHM)		degrees	20	30	40
fast axis (FWHM)		degrees	40	50	60
emitting area	W x H	$\mu\text{m} \times \mu\text{m}$	3 x 1	4 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](mailto:sales@nanoplus.com)

