

750 - 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
<b>2200 - 2600 nm</b>
2600 - 2900 nm

# DFB laser diodes from 2200 nm to 2600 nm

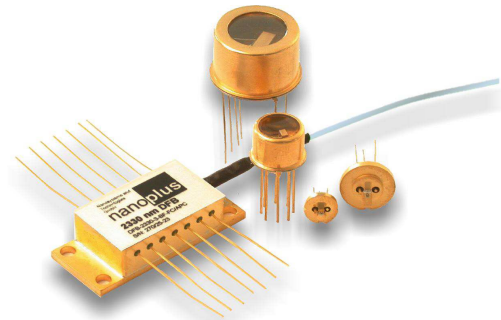
## nanoplus single mode laser diodes

nanoplus is the only manufacturer world-wide routinely providing single mode laser diodes at any wavelength from 750 nm to 2900 nm. Our patented distributed feedback laser diodes deliver single mode emission with well defined optical properties enabling a wide range of applications. At wavelengths from 7 to 12  $\mu\text{m}$ , nanoplus manufactures quantum cascade lasers.

nanoplus lasers operate reliably in more than 5000 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 2200 nm to 2600 nm range. In this wavelength range e.g. CO, N<sub>2</sub>O, C<sub>2</sub>H<sub>4</sub> and CH<sub>4</sub> can be detected with particularly high sensitivity, since the detection sensitivity typically increases at long wavelengths. Overleaf data for DFB lasers used for CO detection is shown as an example.

general ratings (T = 25 °C)	symbol	unit	typical
optical output power	P <sub>out</sub>	mW	3
reverse Voltage	V <sub>r</sub>	V	1.8
forward Current	I <sub>f</sub>	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
TO9 header with or without cap
TO5 with TEC and NTC
butterfly housing with FC/APC fibre (available up to 2.33 $\mu\text{m}$ )

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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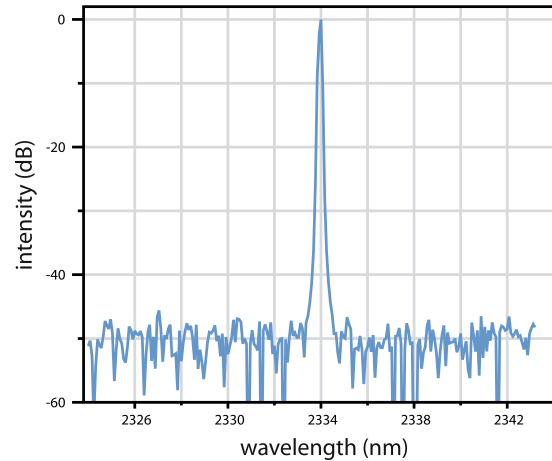


# nanoplus DFB laser diodes at 2334 nm

A wide variety of gas molecules, defects in solids etc. exhibit characteristic absorption lines in the near infrared. DFB lasers emitting at 2334 nm are perfectly suited for highly sensitive detection of CO concentrations. For this application, highly stable laterally and longitudinally single mode lasers are required.

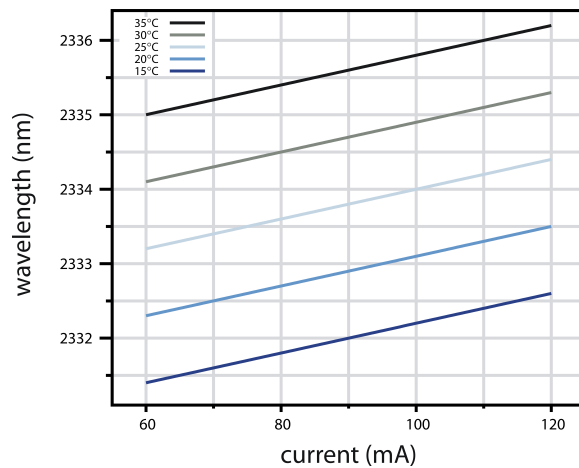
This data sheet reports performance data of nanoplus DFB lasers at this wavelength. Similar performance data are obtained in the entire wavelength range from 2200 nm to 2600 nm. For examples of performance data of nanoplus lasers in other wavelength ranges, please see [www.nanoplus.com](http://www.nanoplus.com) or contact [sales@nanoplus.com](mailto:sales@nanoplus.com).

Fig. 1  
 Room temperature cw spectrum of a nanoplus DFB laser diode operating at 2334 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 2334 nm based DFBs by current variation at different temperatures



electrooptical characteristics (T = 25 °C)	symbol	unit	min	typ	max
peak wavelength	$\lambda$	nm	2333	2334	2335
threshold current	$I_{th}$	mA	25	30	50
slope efficiency	e	mW / mA	0.10	0.15	0.20
temperature tuning coefficient	$C_T$	nm / K	0.15	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	$\mu\text{m} \times \mu\text{m}$	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](mailto:sales@nanoplus.com)

