

| |
|-----------------------|
| 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 |

DFB laser diodes from 2200 nm to 2600 nm

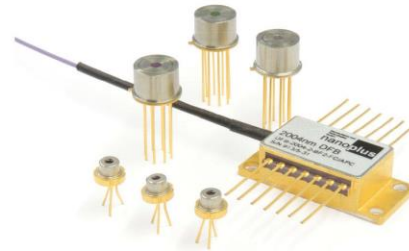
nanoplus single mode laser diodes

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
- ✓ 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 2200 nm to 2600 nm. In this wavelength regime e. g. CO, N₂O, C₂H₄ and CH₄ 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 _{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 up to 2.33 μm |

For dimensions and accessories, please see

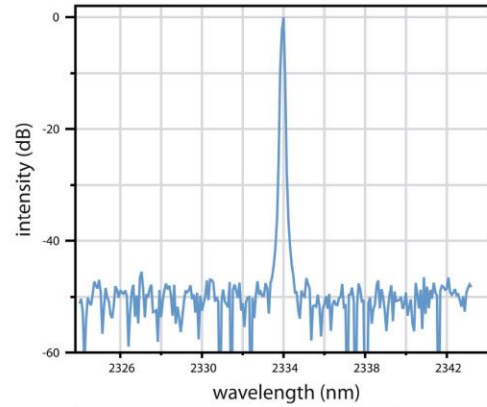
Further packaging options available on request.

nanoplus DFB laser diodes at 2334 nm

A wide variety of gas molecules 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.

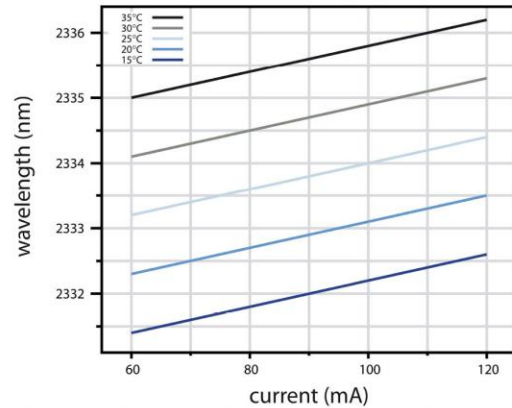
This data sheet reports performance data of nanoplus DFB lasers at this wavelength. Similar performance data are obtained in the entire wavelength range from 2200 nm to 2600 nm. For examples of performance data of nanoplus lasers in other wavelength ranges,

*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 a nanoplus 2334 nm DFB laser diode by current variation at different temperatures*



| electrooptical characteristics (T = 25 °C) | symbol | unit | min | typ | max |
|--|-----------|----------------------------------|-------|-----------|-------|
| peak wavelength | λ | 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 |