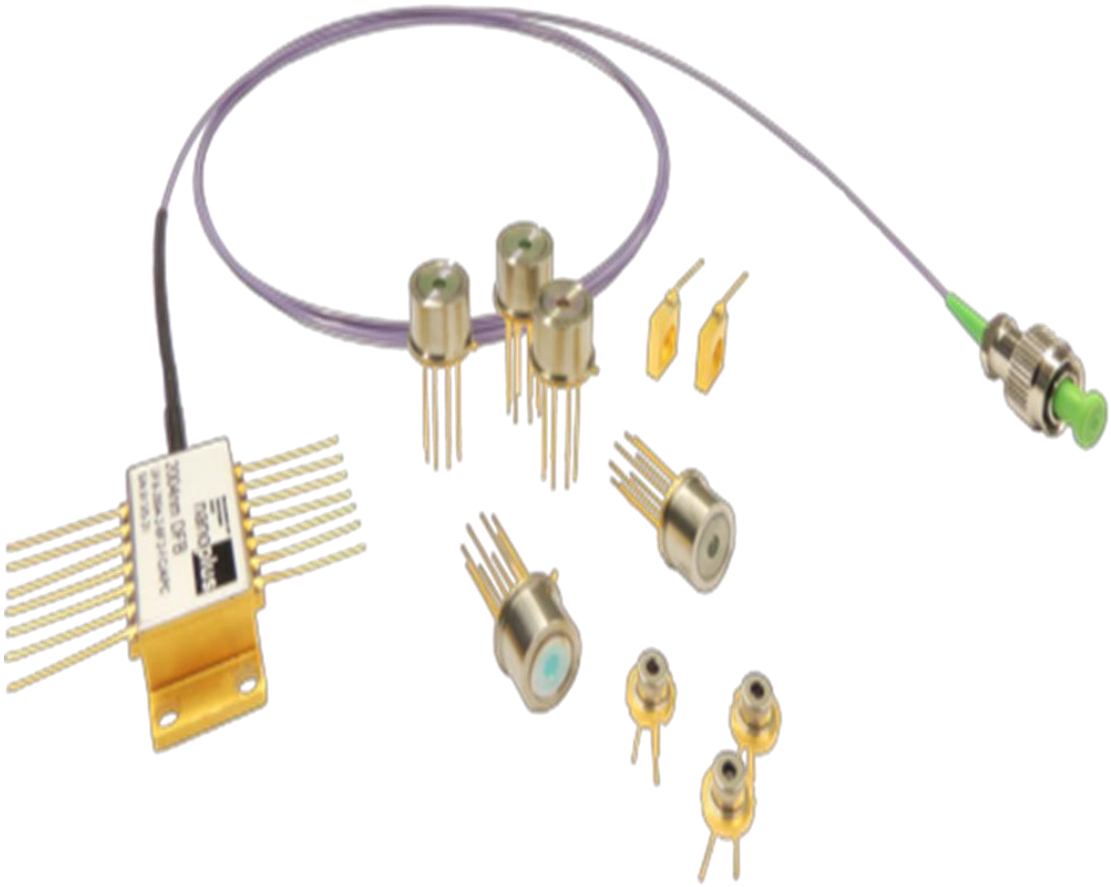
Distributed Feedback Lasers DFB 760.5 nm for Measuring High-temperature Oxygen



Our patented distributed feedback laser diodes deliver single mode emission with well defined optical properties enabling a wide range of applications. Our 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 ：

monomode
continuous wave
room temperature
tunable
custom wavelengths
stable longitudinal and transversal single mode emission
precise selection of target wavelength
narrow laser linewidth
mode-hop-free wavelength tunability

fast wavelength tuning
typically > 5 mW output power
small size
easy usability
high efficiency
long-term stability

application areas
high performance gas sensing for process and environmental control
precision metrology
atomic clocks
spectroscopy
space technology

our lasers with excellent performance are specifically designed and characterized to fit your needs. This data sheet summarizes typical properties of our DFB lasers. Overleaf data for lasers used for high performance O2 sensing are given as an example.

general ratings (T = 25 °C)	symbol	unit	typical
optical output power	P_{out}	mW	5
typical maximum operating voltage	V_{op}	V	2
forward current	I_f	mA	30
side mode suppression ratio (SMSR)		dB	> 35

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

DFB laser diodes at 760 nm

A wide variety of gas molecules exhibit characteristic absorption lines in the near infrared. At about 760 nm for example, there is a strong absorption line of O2, which can be used for laser based sensing with very high sensitivity. This data sheet reports performance data of laterally and longitudinally single mode our DFB lasers at this wavelength.

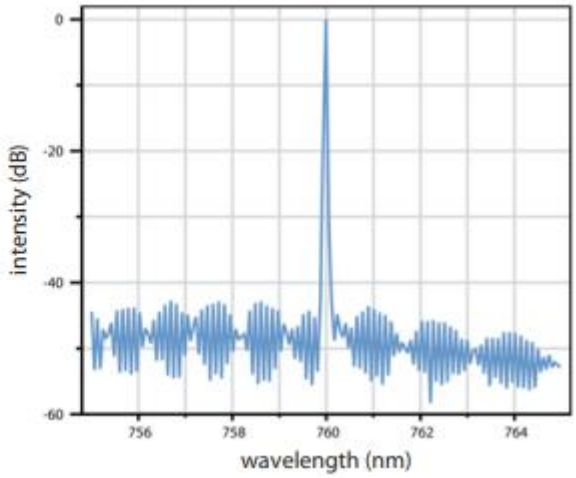


Fig. 1
Room temperature cw spectrum of a nanoplus DFB laser diode operating at 760 nm

In many applications, temperature and / or current variations are used to adjust the laser emission precisely to the target wavelength, here on and off the O_2 absorption.

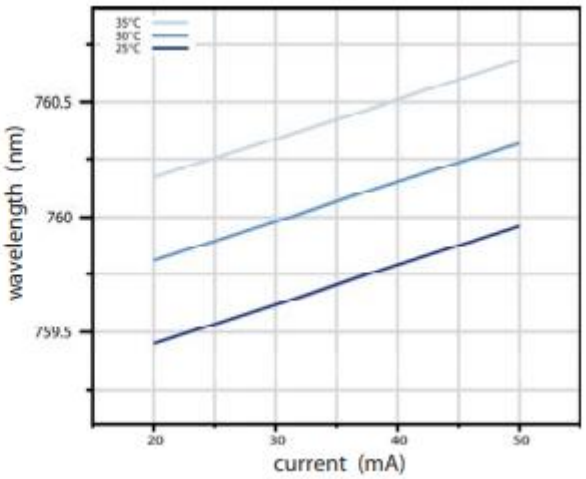


Fig. 2
Mode hop free tuning of a nanoplus 760 nm DFB laser diode by current variation at different temperatures

electrooptical characteristics (T = 25 °C)	symbol	unit	min	typ	max
peak wavelength	λ	nm	759	760	761
threshold current	I_{th}	mA	10	15	30
temperature tuning coefficient	C_T	nm / K	0.04	0.05	0.07
current tuning coefficient	C_I	nm / mA	0.010	0.020	0.025
slow axis (FWHM)		degrees	30	35	40
fast axis (FWHM)		degrees	50	60	65
emitting area	W x H	µm x µm	1. 2 x 1.3	1.5 x 2	2 x 2. 2
storage temperatures	T_S	°C	- 40	+ 20	+ 80
operational temperature at case	T_c	°C	- 20	+ 25	+ 50