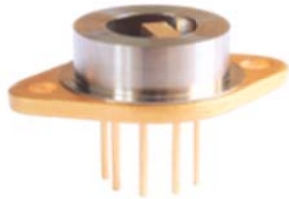


Fabry Perot Lasers: 6000 nm – 14000 nm

nanoplus offers FP quantum cascade lasers at any wavelength between 6000 nm and 14000 nm.



Key features of nanoplus FP quantum cascade lasers

- spectral multimode
- lateral single mode
- pulsed operation
- room temperature
- custom wavelengths

Why choose nanoplus FP quantum cascade lasers

- precise selection of target wavelength
- typically > 5 mW output power
- small size
- easy usability
- high efficiency
- long-term stability

For more than 15 years nanoplus has been the technology leader for lasers in gas sensing. We produce lasers at large scale at our own fabrication sites in Gerbrunn and Meiningen. nanoplus cooperates with the leading system integrators in the [TDLAS](#) based analyzer industry. More than 20,000 installations worldwide prove the reliability of nanoplus lasers.

Quick description of nanoplus FP laser technology

nanoplus uses a unique and patented technology for FP laser diode manufacturing. We follow a ridge waveguide approach, which is independent of the material system.

Related Information for nanoplus FP QCLs between 6000 nm and 14000 nm

Specifications

The following table summarizes the typical FP laser specifications in the 6000 nm to 14000 nm range:

parameters (T = 25 ° C)	symbol	unit	minimum	typical	maximum
wavelength precision	δ	nm	5	50	100
average output power	P_{avg}	mW	1	5	20
peak output power	P_{peak}	mW	10	200	1000
pulsed operation current	I_f	mA	1000		3600
pulsed threshold current	I_{th}	mA	500		2000
operation voltage	U	V	10	15	20
peak slope efficiency	e	mW / A	200	500	800
repetition frequency	f	kHz	0.001	100	2000
pulse length	t	ns	2	100	3000
duty cycle	d. c.	%	0	3	10
side mode suppression ratio	SMSR	dB		> 30	
slow axis (FWHM)		degrees	20	25	30
fast axis (FWHM)		degrees	50	60	70
emitting area	W x H	$\mu\text{m} \times \mu\text{m}$	15 x 4	20 x 5	30 x 6
storage temperature	T_s	° C	-40	20	80
operational temperature at case T_c		° C	-20	+25	+80

nanoplus FP lasers show outstanding spectral and electrical properties. They are demonstrated in figures 1 and 2. Click on the graphics to enlarge.

Figure 1: Spectrum of nanoplus 9400 nm FP quantum cascade laser

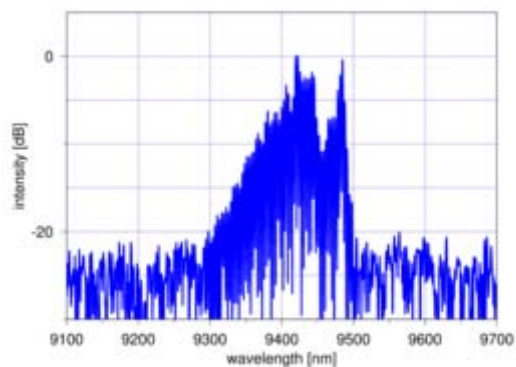
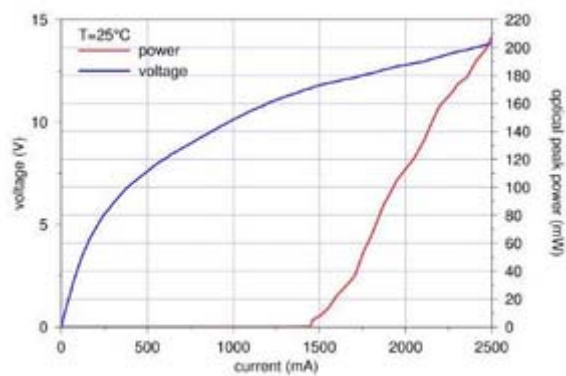


Figure 2: Typical power, voltage and current characteristics of nanoplus 9400 nm DFB quantum cascade laser



If you are uncertain whether you require a FP laser, compare the specifications with our [Distributed Feedback Lasers](#) or [contact us](#).