

# DFB laser diodes from 760 nm to 830 nm



## Single mode laser diodes

At wavelengths up to 14  $\mu\text{m}$ , QCLs complete ' laser portfolio. Our patented distributed feedback laser diodes deliver single mode emission with well defined optical properties enabling a wide range of applications.

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

Lasers with excellent performance are specifically designed and characterized to fit your needs.

This data sheet summarizes typical properties of DFB lasers in the range from 760 nm to 830nm. Overleaf data for lasers used for high performance O<sub>2</sub> 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, such as 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

Further packaging options are available on request.

DFB laser diodes at 760 nm

A wide variety of gas molecules exhibit characteristic absorption lines in the near infrared. At about 760nm for example, there is a strong absorption line of O<sub>2</sub>, which can be used for laser based sensing with very high sensitivity. This data sheet reports performance data of laterally and longitudinally single mode DFB lasers at this wavelength. Similar performance data are obtained in the entire wavelength range from 760 nm to 830 nm.

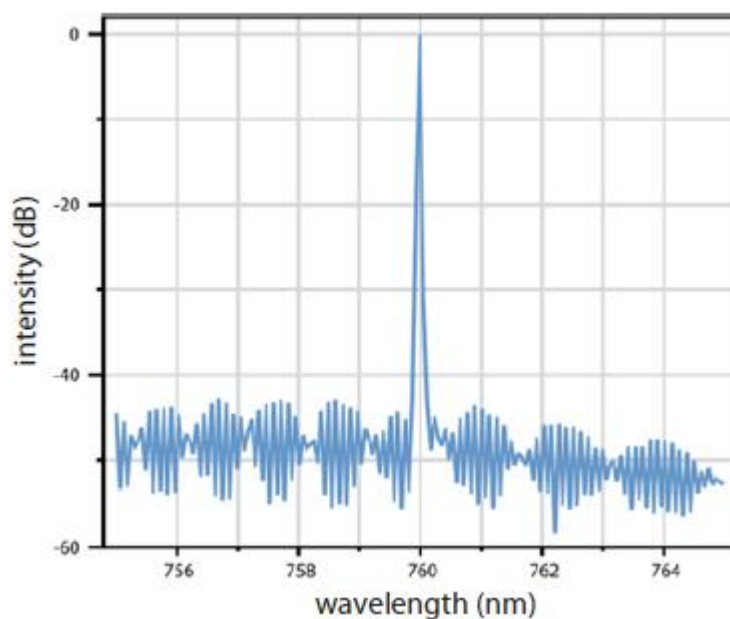
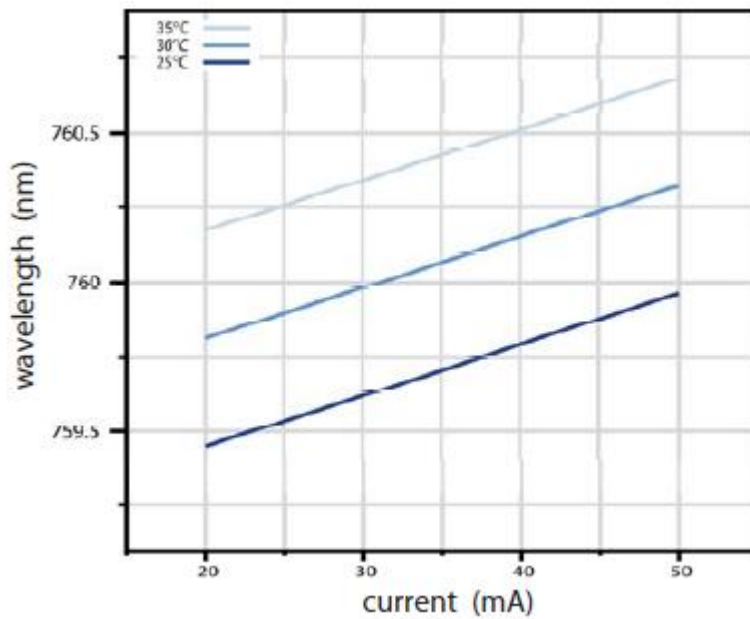


Fig. 1  
Room temperature cw spec-trum of a DFB laser diode operating at 760 nm



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 O2 absorption.

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

electrooptical characteristics (T = 25 °C)	symbol	unit	min	typ	max
peak wavelength	$\lambda$	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	$\mu\text{m} \times \mu\text{m}$	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