

# DFB laser diodes from 1650 nm to 1850 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  $< 3\text{ MHz}$
- 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 1650

nm to 1850nm range. In this wavelength range e.g. methane, nitric oxide and hydrogen chloride can be detected with high sensitivity. Overleaf data is given as an example for DFB lasers used for high sensitivity HCl sensing

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	70
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

## DFB laser diodes at 1742 nm

A wide variety of gas molecules exhibit characteristic absorption lines in the near infrared. DFB lasers emitting at 1742 nm are highly suited for sensitive detection of small HCl concentrations. For this application, highly stable laterally and longitudinally single mode lasers are required.

This data sheet reports performance data of DFB lasers at this wavelength. Similar performance data are obtained in the entire wavelength range from 1650 nm to 1850 nm.

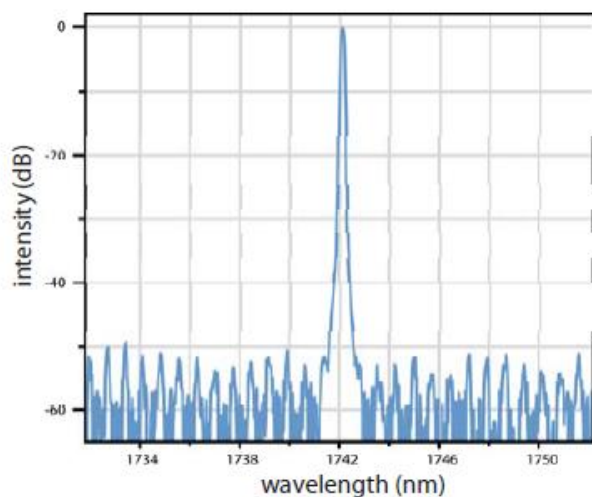
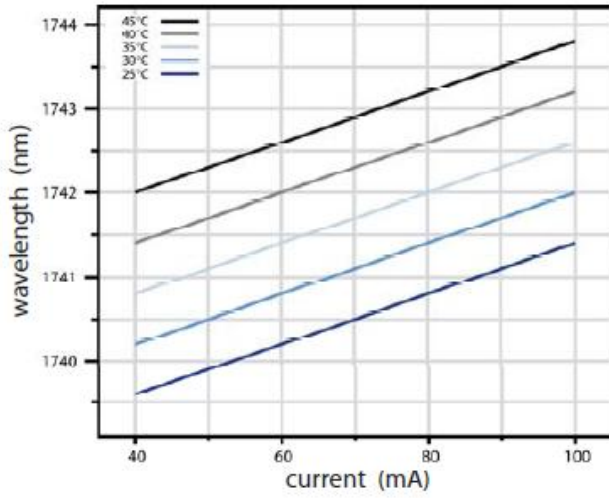


Fig. 1  
Room temperature cw spectrum of a DFB laser diode operating at 1742 nm



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 1742 nm based DFBs by current variation at different temperatures

electrooptical characteristics (T = 25 °C)	symbol	unit	min	typ	max
peak wavelength	$\lambda$	nm	1741	1742	1743
threshold current	$I_{th}$	mA	20	35	65
temperature tuning coefficient	$C_T$	nm / K	0.07	0.10	0.14
current tuning coefficient	$C_I$	nm / mA	0.008	0.02	0.03
slow axis (FWHM)		degrees	20	30	40
fast axis (FWHM)		degrees	40	50	60
emitting area	W x H	$\mu\text{m} \times \mu\text{m}$	2 x 1	3 x 1.5	5 x 2
storage temperatures	$T_S$	°C	- 40	+ 20	+ 80
operational temperature at case	$T_c$	°C	- 20	+ 25	+ 50