ALPES LASERS

pioneering photonics for a brighter future

Extended Tuning DFB Source

Alpes Lasers introduces a new class of Extended Tuning DFB, the QC-ET. These QC-ET use a dual current control to extend the mode-hop free tuning to more than 0.4 % of the central wavelength (>6 cm^{-1} at 1270 cm^{-1}). While the first laser input allows direct intensity modulation in the same manner as standard DFB lasers, the integrated heater current IT allows to offset the wavelength much faster than the temperature change of the heatsink temperature would do.

Key Features

- Wavelength and power independent control
- Standard DFB tuning
- Extended tuning at constant heat-sink temperature

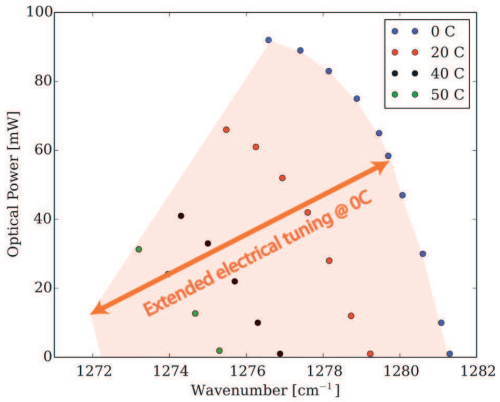
LASER RADIATION

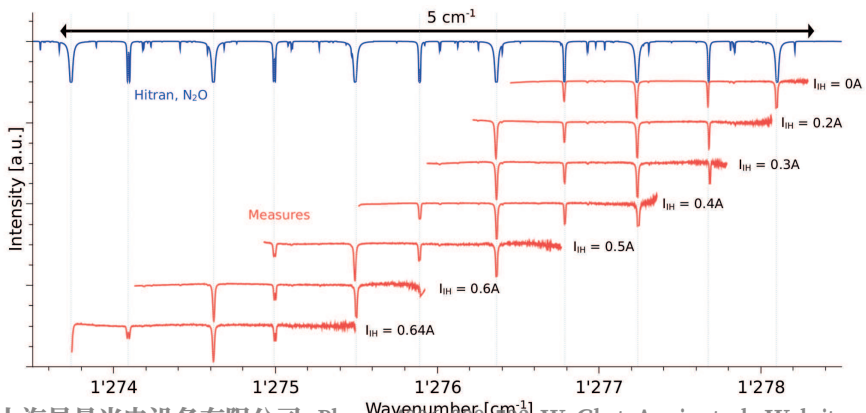
Key Applications

- Increased wavelength scanning span fully electrically
- Wavelength dither and ramps as in conventional DFB
- DFB wavelength reproducibility
- DFB linewidth and noise

SWISS MADE

The QC-ET devices provide a larger tuning than a conventional DFB at a single heat-sink temperature. These devices provide the ability to tune fully electrically the emission wavelength without changing the heat-sink temperature. The dots in the figure show the power at a given emission wavelength and heat-sink temperature for the device used as a conventional DFB i.e. without wavelength current tuning I_T . The shadowed area shows the attainable wavelength and power region for various tuner current (I_T). This area is attainable without changing the heat-sink temperature, widely increasing the speed at which a region of the spectrum may be scanned. Using proper ramps for the laser and tuner current the whole region may be explored at once with speeds in the 100 Hz to kHz range.





Example of wide scanning of a N2O gas cell, with fast I_L scans and independent I_T values.

Specifications

PARAMETER NAME	MINIMUM VALUE	TYPICAL VALUE	MAXIMUM VALUE	UNIT	NOTE
Average power	1	-	100	mW	Power varies due to the simultaneous change in laser current and wavelength control current necessary to access the full tuning range.
Min power tuning range	4	6.5	10	cm^{-1}	The MPTR is defined as the attainable wavelength range in which the minimal power of 1 mW is obtained.
Duty cycle	0	100	100		The devices typically operate CW but any type of Laser current modulation is possible within the maximum ratings.
Central wavelength	2375	1270	1000	cm^{-1}	The extended tuning technology can be applied at any QCL attainable wavelength, please enquire for the lead-time of your wavelength of choice. Presently devices at 1270 cm^{-1} are available from stock.
Laser Current	50	400	600	mA	
Tuning current	0	600	1000	mA	The electrical tuning current acts as a heatsink heater control, any current below the max can be used.
Operation Temperature	0	10	30	°C	Tuning range may be reduced at higher temperatures.
Max tuning range @ 1kHz	3	4	5	cm^{-1}	Values measured for a 1275 cm^{-1} laser
Max tuning range @ 10kHz	1.5	2	2.5	cm^{-1}	Values measured for a 1275 cm^{-1} laser
Max tuning range @ 100kHz	0.2	0.4	0.6	cm^{-1}	Values measured for a 1275 cm^{-1} laser
Electrical tuning bandwidth	2	5	10	kHz	
Full Tuning Range	5	10	15	cm^{-1}	Values measured for a 1275 cm^{-1} laser
Full Relative tuning range	0.4	0.5	0.7	%	
Package size		33×45×19		mm^3	Excluding 20 mm pins.
TEC current	1.5	2	3	A	
TEC voltage	9	12	18	V	
Heatsink cooling capacity	25	35	65	W	

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