



Preliminary Product Brief

Ultra-Narrow Linewidth Laser Source

Whispering Gallery Mode Micro-Resonator Enabled Laser Module



Features

- Ultra-Narrow Instantaneous & Dynamic Laser Linewidth
- Ultra-Low Phase/Frequency Noise
- C & L Band Wavelength Support
- Wide Thermal Tuning Range
- Frequency Modulation Capability
- Low Vibration Sensitivity
- Low Residual Amplitude Modulation
- Wavelength Stability
- Wide Operating Case Temperature
- Compact Package
- Optional Output Interface

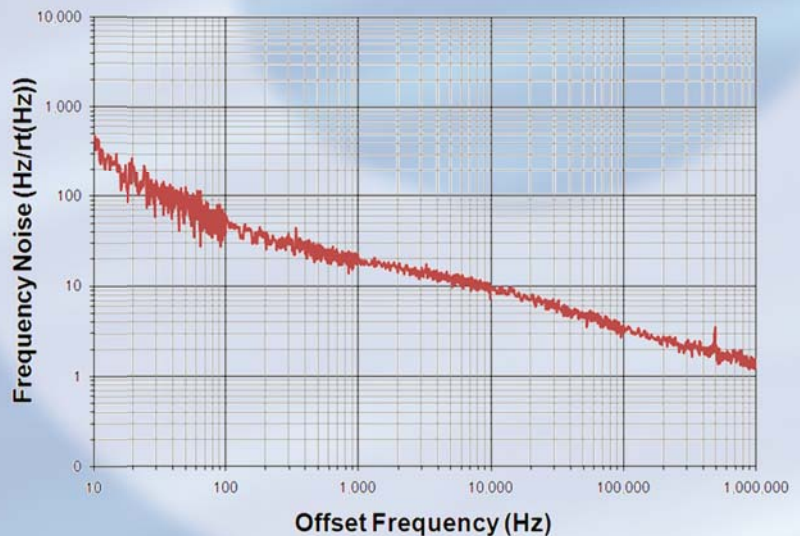
OEwaves Ultra-Narrow Linewidth Laser Source, based on a high quality factor (Q) Whispering Gallery Mode (WGM) micro-resonator, offers super-fine instantaneous and dynamic optical spectral linewidth of less than **300Hz** and ultra-low phase/frequency noise in a small form factor. The laser is scalable to a variety of wavelengths in C and L bands.

Applications

- LIDAR
- B-OTDR Temperature and Strain Sensing
- Optical Metrology and Spectroscopy
- Acoustic Sensing
- Oil and Gas Exploration
- Leak Detection and Monitoring
- Interferometric Optical Sensing
- Coherent Communication
- Test and Measurement

The unique design of the OEwaves Ultra-Narrow Linewidth Laser Source is based on the self-injection locking of a suitable commercially available laser diode via a resonant optical feedback from a high-Q WGM micro-resonator. Its monolithically integrated approach along with micro-scale mass and volume make the laser virtually insensitive to environmental vibrations. The laser is available in standard or custom compact packages installed with either an SMF or PM pigtail fiber, suitable for a broad range of sensing, monitoring, and metrology applications where high resolution, high precision, and absolute accuracy are required.

Frequency noise of the laser measured by beating two 1550nm self-injection-locked lasers on a fast photodiode. →



Specifications

Parameter	NLWL	Notes
Wavelength	C-Band L-Band	Single Mode CW
Instantaneous Linewidth	300 Hz	Lorentzian; 10 us
Dynamic Linewidth	300 Hz	
Output Power	+10 mW	
Frequency Noise	60 Hz/rt(Hz) 10 Hz/rt(Hz) 2 Hz/rt(Hz)	100 Hz Offset 10 kHz Offset 1 MHz Offset
Allan Deviation	8×10^{-10} @ 1 s	At constant case temperature.
Frequency Stability	+/-15 MHz/day	At constant case temperature.
Thermal Tuning Range	+/- 1 nm 90 GHz	Complete Coverage Min, Mode Hop Free
Thermal Tuning Rate	10 GHz/s	
Frequency Modulation Response	100 MHz – 500 MHz	
Frequency Modulation Range	100 MHz	Min
Residual AM	1%	Max (in-band)
Side-Mode Suppression Ratio	50 dB	Min
RIN	-160 dBc/Hz	10 MHz
Operating Temp. Range	-5° - +75° C	Case
Storage Temp. Range	-30° - +80° C	Case
Package	14-pin butterfly	
Fiber Pigtail	SMF	
Connector	FC/APC	
Options		
Fiber Pigtail	PM	PANDA
Connector	FC/PC, SC/APC	

Laser Safety: This product meets the appropriate standard in Title 21 of the Code of Federal Regulations (CFR) 1040 and is classified as FDA/CDRH Class 3b laser product.



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NOTE:

These specifications are subject to change without notice. Unless otherwise noted, all specifications in this document are to be treated as "typical".

This product line is covered by one or more of the following U.S. patents: 7,991,025; 7,769,472 Other patents pending.
 ECCN: 6A995.b.1