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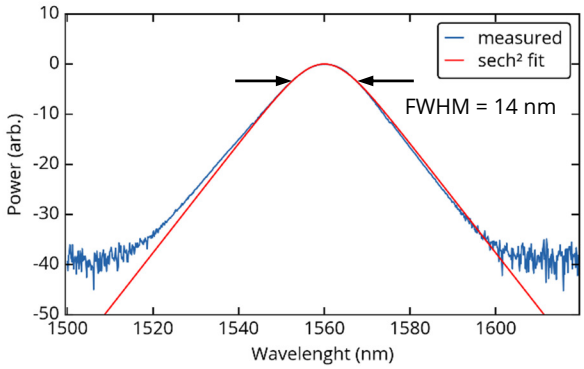
MENHIR-1550 SERIES - 250 MHz

The MENHIR-1550-SERIES is the first industrial-grade femtosecond laser operating around 1550 nm with GHz repetition-rate and ultra-low noise performances. In this document, you can find the full characterization of the same MENHIR-1550 operating at 250 MHz. The laser performance, the noise characteristics as well as the reliability of this laser were tested.

Key Laser Parameters

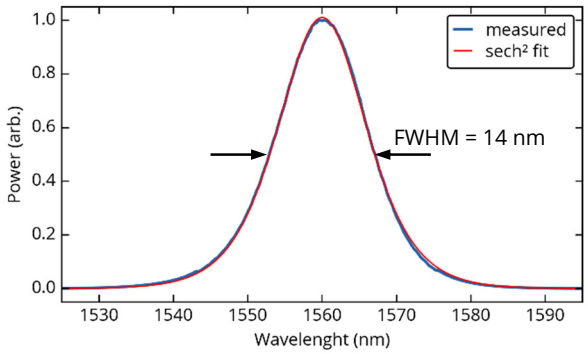
- f_{rep} = 250.0 MHz
- Power > 100 mW
- λ_0 = 1560 nm
- Clean soliton pulse
- < 200 fs (supported)
- Bandwidth > 12.5 nm
- Sech^2 shape spectrum
- TEM_{00} - M^2 < 1.05

Optical spectrum (log scale)

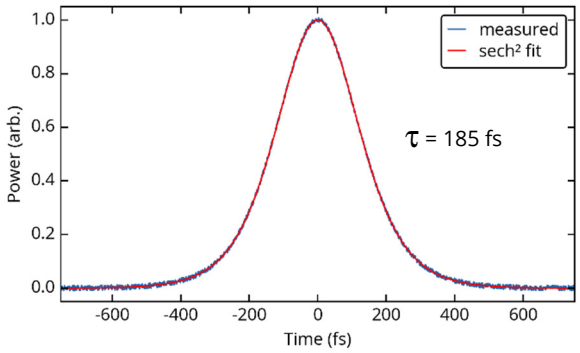


Laser Parameters

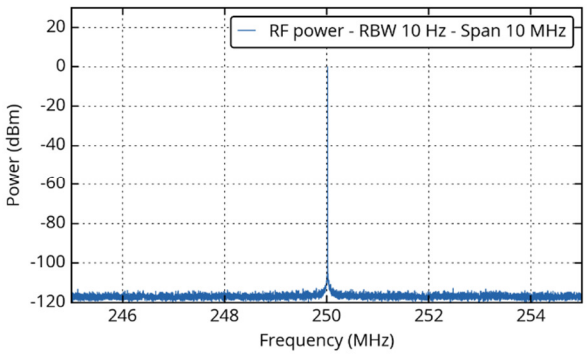
Optical spectrum (linear scale)



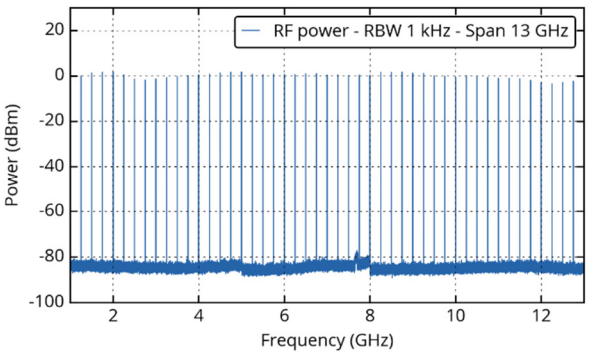
Autocorrelator trace



RF spectrum (zoom on f_{rep})

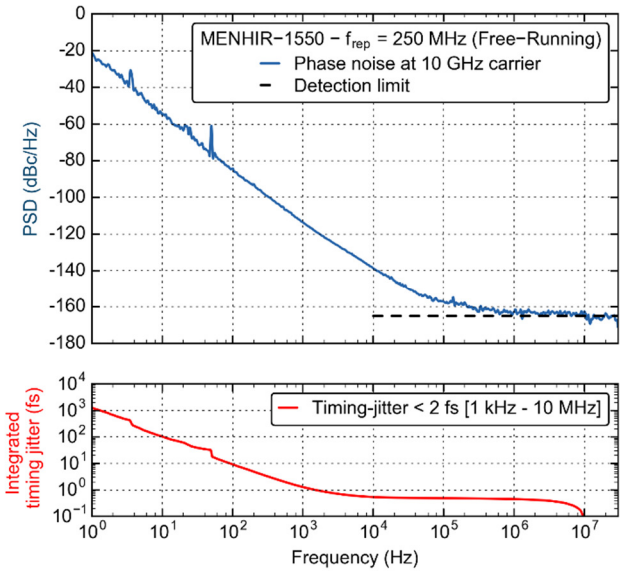


RF spectrum (large span)

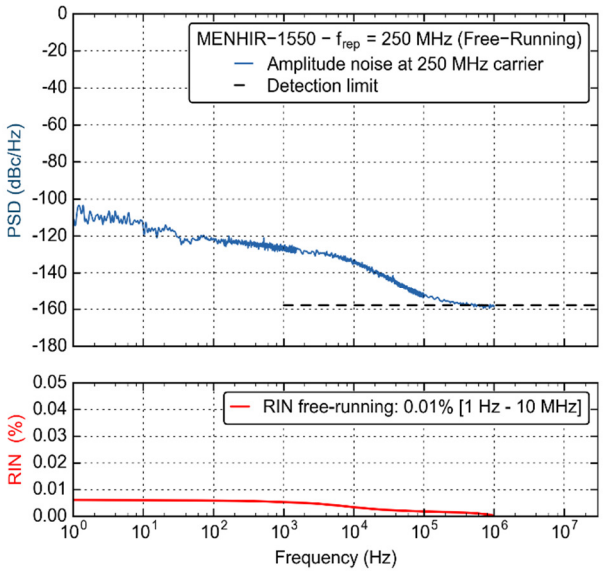


Noise Characterization (free-running)

Phase noise



Amplitude noise

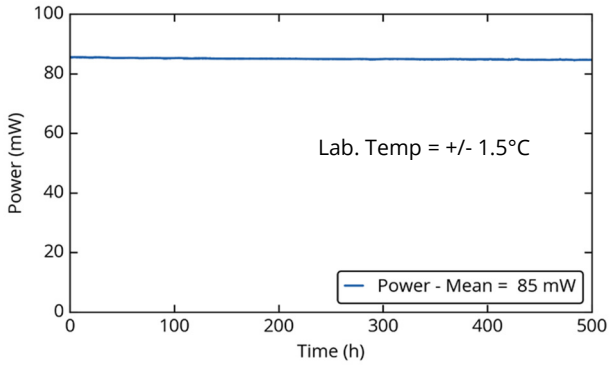


The phase noise of the laser was measured on the 40th harmonic at 10.0 GHz.

f_c : offset from fundamental harmonic	Phase noise (dBc/Hz)		Timing-jitter [fc – 10 MHz]	Amplitude noise RMS [fc – 10 MHz]
	250 MHz carrier	10 GHz carrier		
10 kHz	< - 160	< - 140	< 1 fs	< 0.01 %
1 kHz	< - 140	< - 110	< 2 fs	< 0.01 %
100 Hz	< - 110	< - 80	< 10 fs	< 0.01 %
1 Hz	< - 50	< - 20	< 1.5 ps	< 0.02 %

Reliability (free-running) and options

500 h long-term test



Fast actuator for f_{rep} tuning