

# MENHIR-1550 SERIES – 1.00 GHz

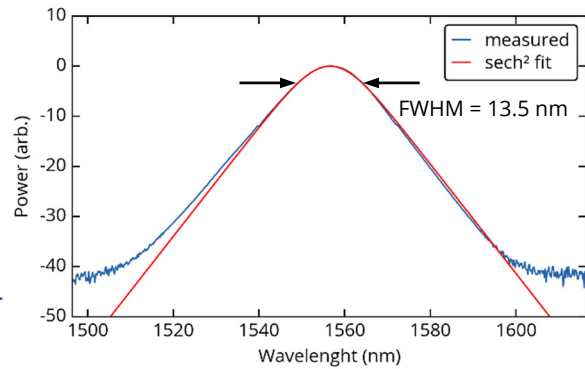
The MENHIR-1550-SERIES is the first industrial-grade femtosecond laser operating around 1550 nm with GHz repetition-rate and ultra-low noise performances. In this document, you can find the full characterization of the same MENHIR-1550 operating at 1.00 GHz. The laser performance, the noise characteristics as well as the options of this laser were tested.

## Key Laser Parameters

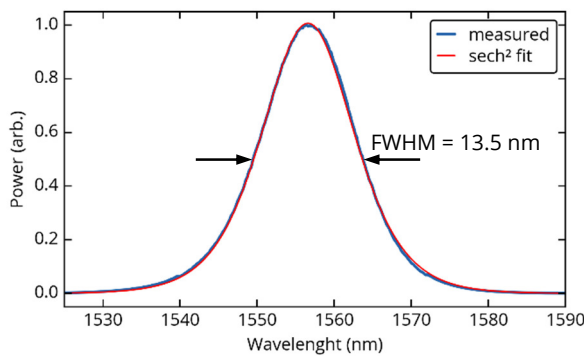
- $f_{rep} = 1.00$  GHz
- $< 200$  fs (supported)
- Power  $> 50$  mW
- Bandwidth  $> 12.5$  nm
- $\lambda_0 = 1556$  nm
- Sech<sup>2</sup> shape spectrum
- Clean soliton pulse
- TEM<sub>00</sub> - M<sub>2</sub>  $< 1.05$

## Laser Parameters

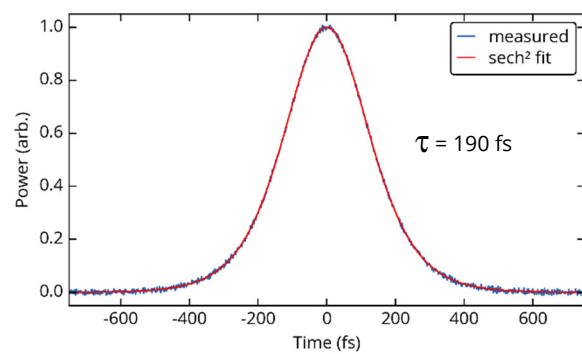
Optical spectrum (log scale)



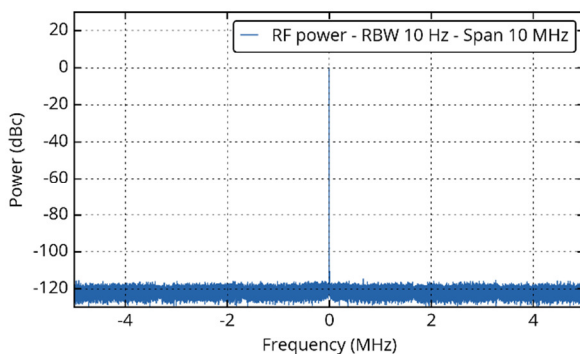
Optical spectrum (linear scale)



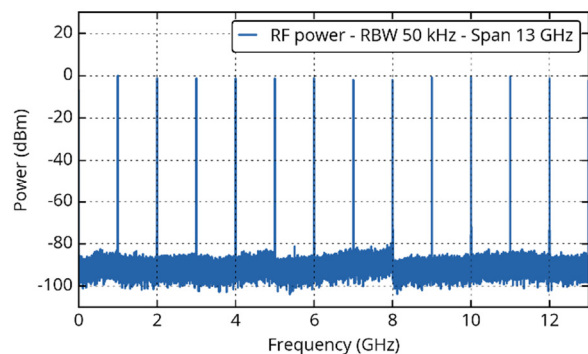
Autocorrelator trace



RF spectrum (zoom on  $f_{rep}$ )

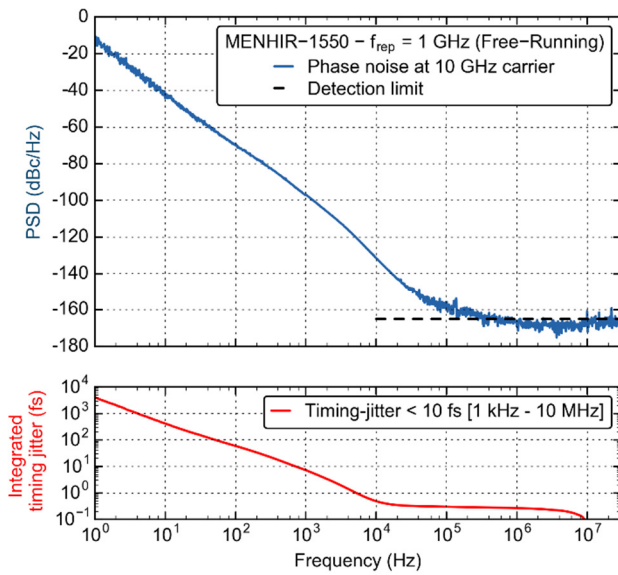


RF spectrum (large span)

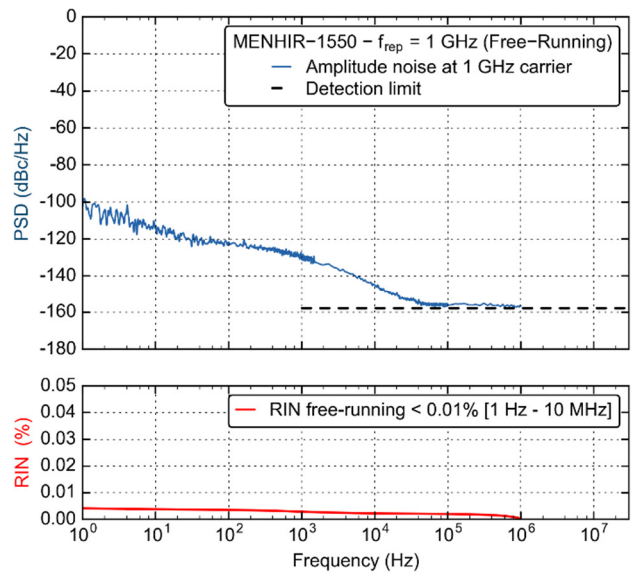


# Noise Characterization (free-running)

Phase noise



Amplitude noise

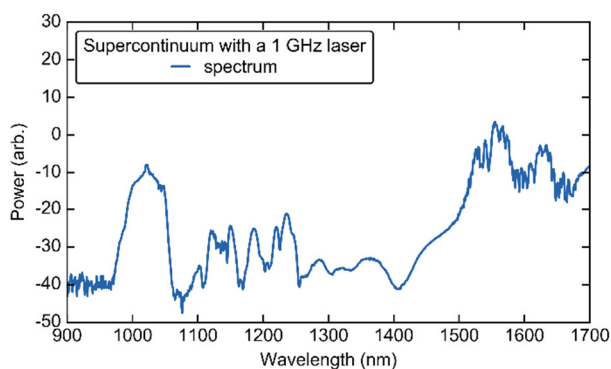


The phase noise of the laser was measured on the 10<sup>th</sup> harmonic at 10 GHz.

$f_c$ : offset from fundamental harmonic	Phase noise (dBc/Hz)		Timing-jitter [ $f_c - 10$ MHz]	Amplitude noise RMS [ $f_c - 10$ MHz]
	1 GHz carrier	10 GHz carrier		
10 kHz	< - 150	< - 130	< 1 fs	< 0.01 %
1 kHz	< - 115	< - 95	< 10 fs	< 0.01 %
100 Hz	< - 90	< - 70	< 100 fs	< 0.01 %
1 Hz	< - 30	< - 10	< 5 ps	< 0.01 %

## Possibilities and options

Supercontinuum generation



Fast actuator for  $f_{rep}$  tuning

