



# Eternal™ SlowLight™ Lasers

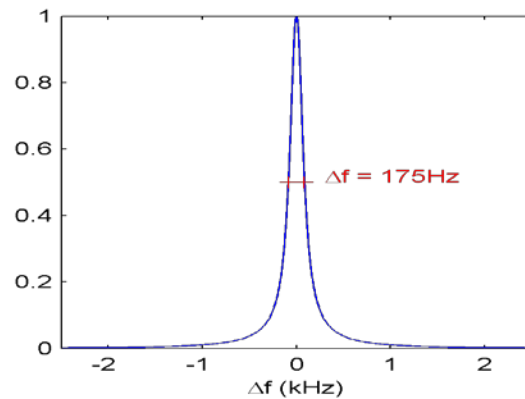
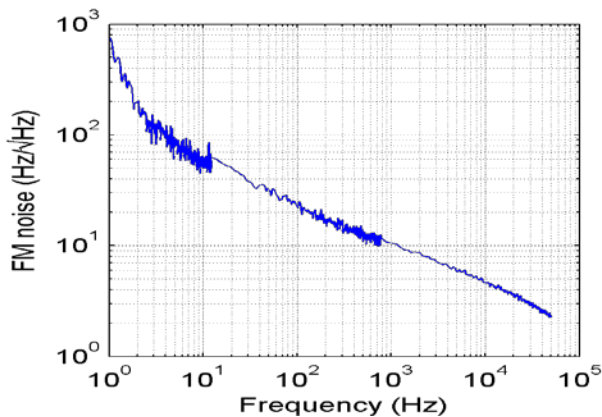
*The Lowest Noise Laser on Earth PERIOD!*

The **Eternal™ SlowLight™** lasers from Orbits Lightwave represent the state of the art in laser oscillators. The breakthrough “virtual ring” laser technology enables traveling wave oscillation in a compact, linear cavity. The traveling wave oscillation results in a pure high power (>350mw), record high signal to noise (>80dB) and side-mode suppression (>75dB).

The **SlowLight™** technology slows the light group velocity, leading to ultra-low AM and FM noises and a record ultra-narrow instantaneous <1Hz Lorentzian linewidth and <200Hz 1/f linewidth over 1ms!

Remarkably this performance is available in a compact, reliable and robust field-ready package. The **StableLase™** technology greatly reduces the susceptibility to shock and vibration. In addition, passive temperature compensation in conjunction with the **SlowLight™** technology offers the highest frequency stability in the industry.

This enables the **Eternal™ SlowLight™** fiber laser to operate at unprecedented levels of stability, reliability and low noise performance for even the most demanding research, industrial or military applications.

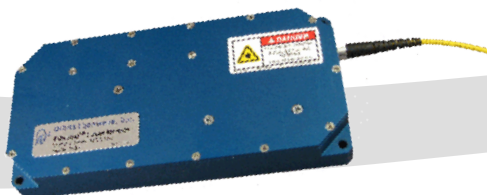


## Features:

- Compact all-fiber “virtual-Ring” **SlowLight™** architecture
- Robust **StableLase™** packaging
- > 350mW pure oscillators
- > 50W with amplification
- < 1Hz Lorentzian linewidth
- < 200 Hz linewidth over 1ms
- < 0.25 MHz/°C frequency stability
- > 80dB Optical Signal to Noise Ratio
- > 75dB Side-mode Suppression Ratio
- < -175dBc/Hz Shot noise limited RIN

## Applications:

- Acoustic sensing, marine and perimeter security
- LIDAR
- Injection seed lasers
- Coherent Communications
- RF and microwave photonics
- Spectroscopy, gas absorption testing
- Pipeline monitoring, leak detection
- Oil and gas exploration systems
- Metrology
- Space Communications

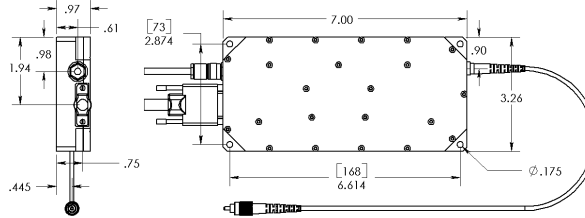




# Eternal™ SlowLight™ Laser Specifications

Wavelength selectable range (nm)	1530 to 1565	1047 to 1080
Optional Fast <sup>1</sup> PZT tuning range (GHz)	1,10	1, 10, 20
Optional Temperature tuning (GHz)	0, 20, 60	0, 20, 80, 160
Absolute wavelength accuracy (nm)	± 0.05, ± 0.02	± 0.05, ± 0.02
Output power (mW) (pure oscillator) <sup>2</sup>	10, 20, 40, 80, 100, 120, 180	
Power stability (%RMS)	± 0.1	
Beam Quality	M <sup>2</sup> < 1.05	
OSNR (dBc) (50pm RBW)	> 80	
SMSR (dBc) (3MHz RBW)	> 75	
RIN (dBc/Hz)	-138@ 1kHz, -120@1MHz, -148@10MHz (SL130) <sup>3</sup> : -130@1MHz, -160@10MHz	
RIN (dBc/Hz) (@100MHz)	<-165, (- 175 @100mW)	
White Noise (Lorentzian Linewidth) (Hz)	<10 , 1 <sup>3</sup>	
Linewidth over 1ms measurement time (Hz)	< 200	<1000
Frequency noise (Hz/√Hz) <sup>4</sup>	< 30 @ .1kHz, 20 @1kHz, 1 @100kHz	
Frequency stability (MHz/°C)	± 10, ± 0.25 <sup>5</sup>	
Polarization extinction ratio (dB)	> 23	
Fiber pigtail (PM FC/APC as standard w)	1m Panda PM	
Operating temp (°C)	10 to 55	
Power consumption (W) (10-180mW Output Power)	5 to 30	

<sup>1</sup> >10kHz modulation bandwidth, >100kHz current modulation option available (-I)  
<sup>2</sup> 350mw pure oscillator available in instrument chassis (optional 0.5-50W MOPA available)  
<sup>3</sup> With -SL130 slow light option and 40mW output power  
<sup>4</sup> 1.06 micron laser have typically 3 dB higher FM noise, low frequency FM noise power maybe increase for >80mw by 1 -2dB  
<sup>5</sup> After initial warm-up at room temperature ±1°C with -T option



Module Dimensions

### Ordering Information:

**ETH - 40 - 1550.12 - 2 - PZ10B - SL130 - TT - PM**

**Product Name:** ETH

**Power (mW):** 10, 20, 40, 80, 100, 120, 180

**Wavelength (nm):** 1530 - 1565 • 1047 - 1080 (In Vac)

**Abs. wavelength Accuracy:** 5 (±0.05nm), 2 (±0.02nm)

**Optional O/P Fiber Type:** PM, SMF

**Optional Freq Tuning:** TT

**Optional Low RIN:** SL130

**Optional PZT Range (GHz):** PZ1, PZ10B, PZ20B

### ORBITS LIGHTWAVE INC.

41 South Chester Ave., Pasadena, CA 91106, USA

Phone: 626-513-7400 • Fax: 626-513-7410 • www.orbitlightwave.com • sales@orbitlightwave.com