

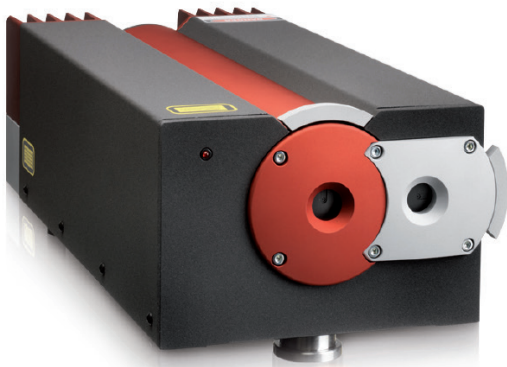
Prometheus

Ultra-Narrow Linewidth CW DPSS Green Laser

Prometheus is a frequency doubled Nd:YAG laser providing both 532 nm and 1064 nm outputs in a single package. Being based on a widely recognized Non-Planar Ring Oscillator (NPRO) configuration Prometheus features frequency and intensity stability parameters unmatched by any other commercial product. The diode-pumped NPRO crystal is extremely compact, impervious to contamination and other degradation processes. Prometheus laser is simple to stabilize in temperature and easy to fine-tune by using an integrated PZT. The intrinsic stability of the laser is further improved by our acclaimed Noise Eater (NE) technology. This active intensity noise reduction circuitry is included with all Prometheus variants as standard.

With most demanding scientific and OEM applications in mind, Prometheus' output frequency can be tuned over 60 GHz in green with extraordinarily narrow linewidth of 1 kHz. Extremely low noise (-135 dB/Hz RIN) is another unique characteristic of this laser. Prometheus is available at power levels of 20, 50 and 100 mW at 532 nm and corresponding powers of 500, 1000 and 1500 mW at 1064 nm from the second output.

Unique combination of narrow linewidth, frequency tuning and extremely low noise makes Prometheus ideal laser source for applications such as Iodine frequency stabilization systems, optical length and frequency standards, quantum optics studies, micro-cavity experiments, nonlinear optics pumping (SHG, DFG, OPO), gravitational waves studies, optical heterodyning and others.



Superior Reliability & Performance

Prometheus Features:

- **Monolithic non-planar ring oscillator (NPRO) technology for ultra-stable and narrow linewidth**
- **Fundamental and doubled wavelengths available simultaneously**
- **Efficient and stable extra-cavity doubling stage**
- **Extremely long coherence length**
- **Noise Eater – active intensity noise reduction technology**
- **User-installed, turn-key operation**
- **Low noise control electronics**

Prometheus Applications:

- **Optical Length and Frequency Standards (Iodine frequency stabilization)**
- **Gravitational Wave Studies**
- **Laser-based Metrology**
- **Quantum Optics (optical trapping, optical lattice, squeezing)**
- **Nonlinear Optics Pump Source (SHG, DFG, OPO)**

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Specifications

Prometheus

Laser Power (mW)	20, 50, 100
532 nm	500, 1000, 1500
1064 nm	
Laser Control Electronics	Analog, stand-alone
Operational Mode	Continuous wave
Spatial Mode	TEM ₀₀ (M ² <1.2)
Beam Roundness (at exit)	<1.3
Thermal Tuning Coefficient ¹ (GHz/K)	-6
Thermal Tuning Range ¹ (GHz)	60
Thermal Response Bandwidth (Hz)	1
PZT Tuning Coefficient ¹ (MHz/V)	≅2
PZT Tuning Range ¹ (MHz)	±65 and ±130
PZT Response Bandwidth (kHz)	100
Emission Spectrum	Single-frequency
Spectral Linewidth (kHz)(over 100 ms)	≅1
Coherence Length (km)	>1
Frequency Stability ^{1,2} (MHz/min.)	≅2
Relative Intensity Noise (RIN)(dB/Hz), f >20 kHz	<-135
Intensity Noise, 10 Hz to 2 MHz (% rms)	<0.06
Waist Location (inside laser head)(mm)	≅105
Type of Second Harmonic Generation	Single-path
Laser Head Size (L x W x H)	337 x 150 x 113 mm (13.3 x 5.9 x 4.4 in.)
Laser Head Weight	6.8 kg (15 lbs.)
Laser Controller Size (L x W x H)	135 x 340 x 345 mm (5.3 x 13.4 x 13.6 in.)
Laser Controller Weight ²	9.2 kg (20.3 lbs.)

¹ At 532 nm.

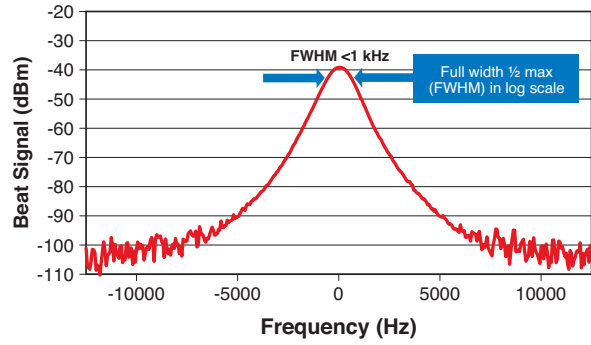
² Measured at constant room temperature.

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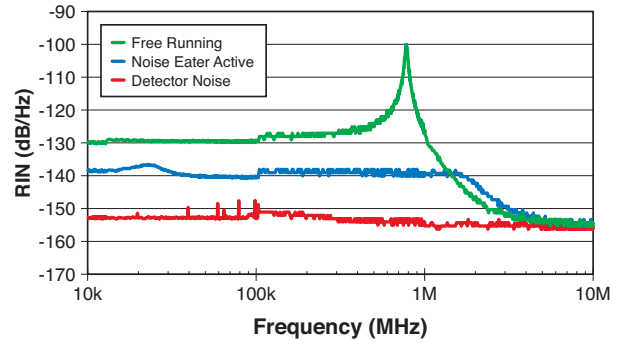
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Typical Performance Data

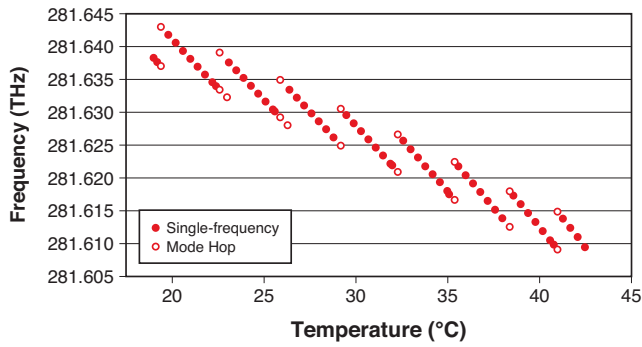
Spectral Linewidth



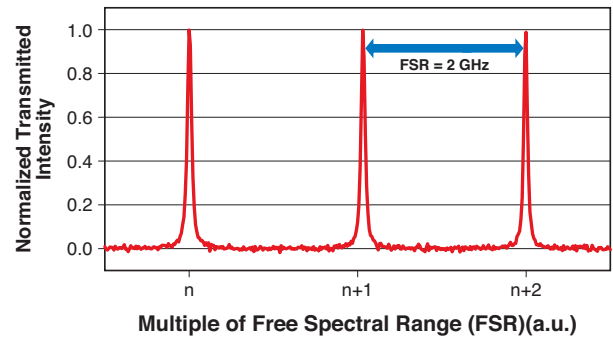
Relative Intensity Noise



Thermal Frequency Tuning



Fabry-Perot Spectrum

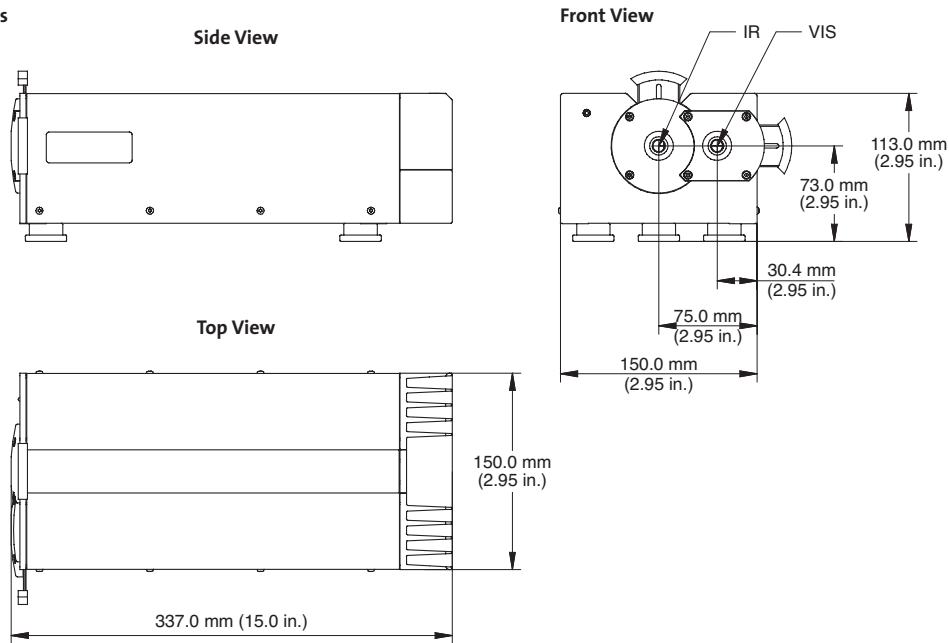


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Mechanical Specifications

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Coherent follows a policy of continuous product improvement. Specifications are subject to change without notice.

Coherent's scientific and industrial lasers are certified to comply with the Federal Regulations (21 CFR Subchapter J) as administered by the Center for Devices and Radiological Health on all systems ordered for shipment after August 2, 1976.

Coherent offers a limited warranty for all Prometheus lasers. For full details of this warranty coverage, please refer to the Service section at www.Coherent.com or contact your local Sales or Service Representative.

