

Sapphire SF NX

CW Free Space and Fiber Pigtailed Single-Frequency Lasers

Sapphire SF NX is a series of compact CW visible single-frequency lasers based on Coherent's unique OPSSL (Optically Pumped Semiconductor Laser) technology. Sapphire SF NX lasers come with an ultra-narrow linewidth of <math><1.5\text{ MHz}</math>, a high quality diffraction-limited beam with excellent pointing stability, high power stability and low noise.

Sapphire lasers are manufactured in cleanrooms using Coherent's patented PermAlign™ technology for optimal aligning and solder-bonding the optics. Sapphire SF NX lasers come with a flexible interface concept: Analog, RS-232 or USB – it is up to the user to select the appropriate communication channel.

Sapphire SF NX lasers are intended for applications that need narrow and ultra-narrow linewidth light such as Raman spectroscopy, interferometry, holography, metrology, and inspection.

FEATURES & BENEFITS

- Ultra-narrow linewidth
- Outstanding power and wavelength stability
- Output power
 - Up to 150 mW at 488 nm / 100 mW fiber pigtailed
 - Up to 200 mW at 532 nm / 150 mW fiber pigtailed
- Ultra-low noise
- Superior beam quality
- PermAlign technology
 - Permanent optimal alignment
 - Unsurpassed robust and stable
- OEM and end-user versions
- Proven Sapphire reliability

APPLICATIONS

- Raman Spectroscopy
- Interferometry
- Holography
- Metrology
- Inspection



| SPECIFICATIONS | Sapphire 488 SF NX | Sapphire 532 SF NX |
|--|--|---------------------------|
| Wavelength ¹ (nm) | 488.0 | 532.0 |
| Wavelength Accuracy ² (nm) | 0.1 | |
| Single-longitudinal Mode, Linewidth (MHz) | <1.5 | |
| Output Power ³ (mW) | 20, 50, 75, 100, 150 | 20, 50, 75, 100, 150, 200 |
| Spatial Mode | TEM ₀₀ , M ² <1.1 | |
| Beam Asymmetry | 0.9 to 1.1 | |
| Beam Diameter at 1/e ² (mm) | 0.70 ±0.05 | |
| Beam Divergence (mrad) | <1.3 | |
| Pointing Stability (μrad) (over 2 hours after warm-up and ±3°C) | <30 | |
| Noise (%) | | |
| 20 Hz to 2 MHz, rms | <0.25 | |
| 20 Hz to 20 kHz, peak-to-peak | <1 | |
| Long-term Power Stability (%) (2 hours, ±3°C) | <2 | |
| Warm-up Time (minutes) | <5 | |
| Polarization Ratio | >100:1, vertical | |
| Static Alignment Tolerances ⁴ | | |
| Beam Position (mm) | ±0.25 | |
| Beam Angle (mrad) | ±2.5 | |
| Beam Waist Position with respect to Exit Window | ±200 ⁵ | |
| UTILITY AND ENVIRONMENTAL REQUIREMENTS | | |
| Interfacing | Analog, RS-232, USB | |
| Operating Voltage ⁶ (VDC) | +12.0 to 13.2 | |
| Power Consumption (W) | <60 | |
| Max. Laser Head Baseplate Temperature ⁷ | +50°C (122°F) | |
| Max. Heat Dissipation of Head (W) | 25 (baseplate at 50°C) | |
| Ambient Temperature | | |
| Operating Condition | 10 to 40°C (50 to 104°F) non-condensing | |
| Non-Operating Condition | -30 to 60°C (-22 to 140°F) | |
| Shock Tolerance (6 ms) | 7 g laterally, 15 g vertically | |
| Dimensions (L x W x H) | | |
| Laser Head | 125 x 70 x 34 mm (4.9 x 2.8 x 1.3 in.) | |
| Controller | 123.3 x 76.2 x 38.1 mm (4.9 x 3.0 x 1.5 in.) | |
| Heat Sink (optional) | 200 x 80 x 50 mm (7.9 x 3.2 x 2 in.) | |
| DC Power Supply (optional) | 171 x 104 x 55 mm (6.7 x 4.1 x 2.2 in.) | |
| Cable — Laser Head to Controller | 2 m (6.56 ft.) | |
| Weights | | |
| Laser Head | 0.35 kg (0.77 lbs.) | |
| Controller | 0.25 kg (0.55 lbs.) | |
| Heat Sink (optional) | 0.75 kg (1.65 lbs.) | |
| DC Power Supply (optional) | 0.95 kg (incl. line cable) (2.1 lbs.) | |
| Packaged System (head+controller+cable>manual) | 1.7 kg (3.7 lbs.) | |
| Cable — Laser Head to Controller | 0.3 kg (0.66 lbs.) | |

1 Measured in air.

2 Laser-to-laser tolerance and wavelength tolerance over guaranteed lifetime.

3 Output power is adjustable via analog or digital interface from 10% to 110%. Specifications are valid for 100% power.

4 Static alignment tolerances are relative to the right bottom edge (in beam direction).

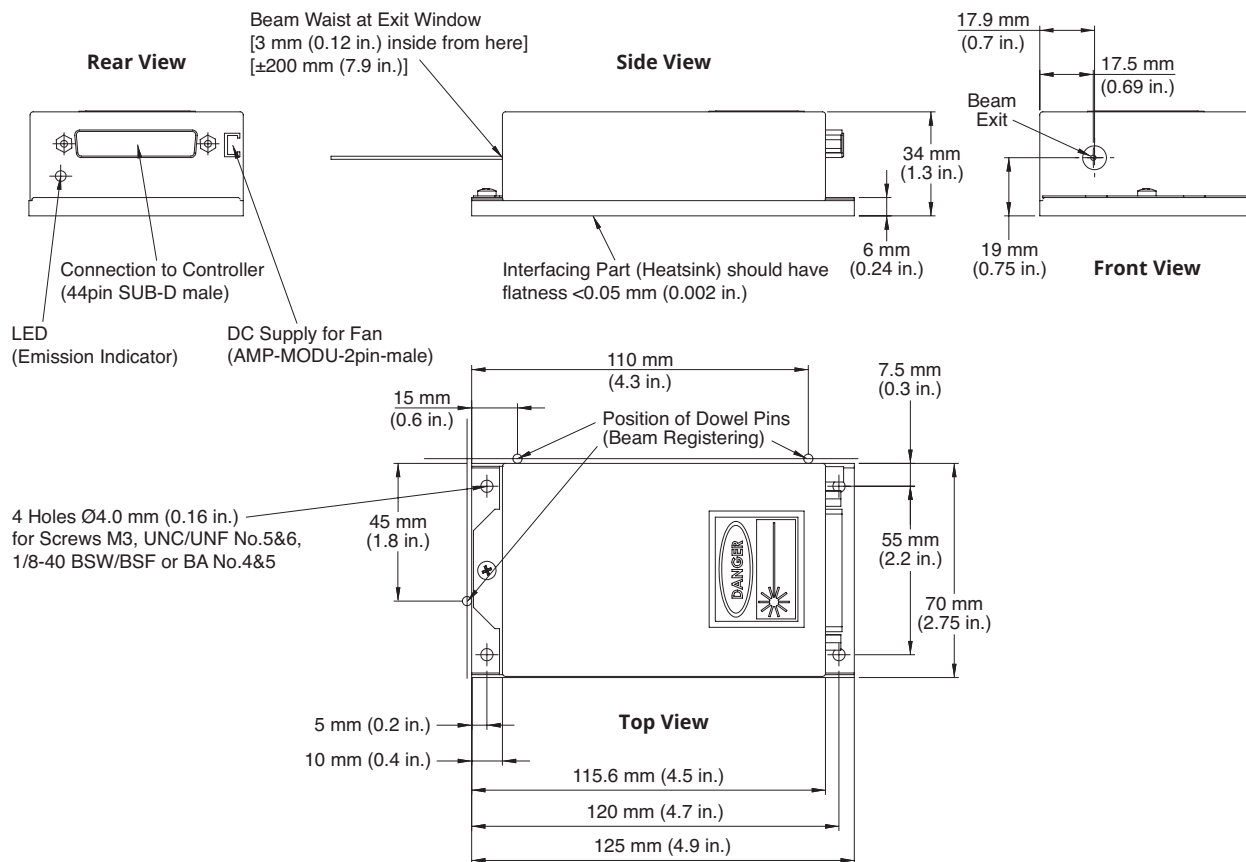
5 200 mm is ~25% of Rayleigh Range at 488 nm and ~30% of Rayleigh Range at 532 nm.

6 If user-supplied, the DC power supply has to meet the following requirements: Power >60W; ripple <5% peak-to-peak; line regulation <0.5%.

7 With factory-provided or other adequate heat sink.

MECHANICAL SPECIFICATIONS

Sapphire SF NX



| SPECIFICATIONS | Sapphire 488 SF FP NX | Sapphire 532 SF FP NX |
|--|--|--------------------------|
| Wavelength ¹ (nm) | 488.0 | 532.0 |
| Wavelength Accuracy ² (nm) | 0.1 | |
| Single-longitudinal Mode, Linewidth (MHz) | <1.5 | |
| Output Power at Fiber Exit ³ (mW) | 20, 50, 100 | 20, 50, 100, 150 |
| Fiber Type | SM-PM ⁴ | |
| Fiber Length (m) | 1 | |
| Fiber Numerical Aperture (NA) (1/e ²) | 0.06 | |
| Fiber Output | FC/APC; 8° angled ⁵ | |
| Spatial Mode | TEM ₀₀ , M ² <1.1 | |
| Beam Asymmetry | <1:1.1 | |
| Noise (%) | | |
| 20 Hz to 2 MHz, rms | <0.25 | |
| 20 Hz to 20 kHz, peak-to-peak | <1 | |
| Long-term Power Stability (%) (2 hours, ±3°C) | <2 | |
| Warm-up Time (minutes) | <5 | |
| Polarization Ratio | >100:1, linear, vertical | |
| UTILITY AND ENVIRONMENTAL REQUIREMENTS | | |
| Interfacing | Analog, RS-232, USB | |
| Operating Voltage ⁶ (VDC) | +12.0 to 13.2 | |
| Power Consumption (W) | <60 | |
| Max. Laser Head Baseplate Temperature ⁷ | +50°C (122°F) | |
| Max. Heat Dissipation of Head (W) | 25 (baseplate at 50°C) | |
| Ambient Temperature | | |
| Operating Condition | 10 to 40°C (50 to 104°F) non-condensing | |
| Non-Operating Condition | -30 to 60°C (-22 to 140°F) | |
| Shock Tolerance (6 ms) | 7 g laterally, 15 g vertically | |
| Dimensions (L x W x H) | | |
| Laser Head ⁸ | 125 x 70 x 34 mm (4.9 x 2.8 x 1.3 in.) | |
| Controller | 123.3 x 76.2 x 38.1 mm (4.9 x 3.0 x 1.5 in.) | |
| Heat Sink (optional) | 200 x 80 x 50 mm (7.9 x 3.2 x 2 in.) | |
| DC Power Supply (optional) | 171 x 104 x 55 mm (6.7 x 4.1 x 2.2 in.) | |
| Cable — Laser Head to Controller | 2 m (6.56 ft.) | |
| Weights | | |
| Laser Head ⁸ | 0.35 kg (0.77 lbs.) | |
| Controller | 0.25 kg (0.55 lbs.) | |
| Heat Sink (optional) | 0.75 kg (1.65 lbs.) | |
| DC Power Supply (optional) | 0.95 kg (incl. line cable) (2.1 lbs.) | |
| Packaged System (head+controller+cable>manual) | 1.7 kg (3.7 lbs.) | |
| Cable — Laser Head to Controller | 0.3 kg (0.66 lbs.) | |

1 Measured in air.

2 Laser-to-laser tolerance and wavelength tolerance over guaranteed lifetime.

3 Output power is adjustable via analog or digital interface from 10% to 110%. Specifications are valid for 100% power.

4 Single-mode, polarization maintaining fiber, bending radius min. 50 mm.

5 Fiber FC/APC connector output not compatible for patchcord-to-patchcord connection.

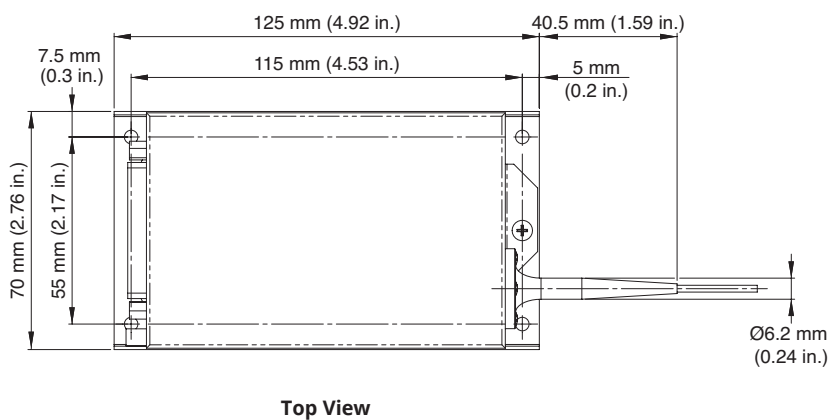
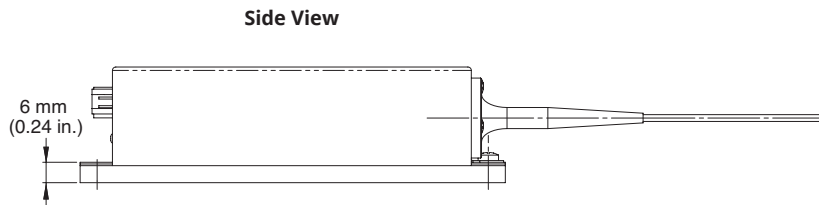
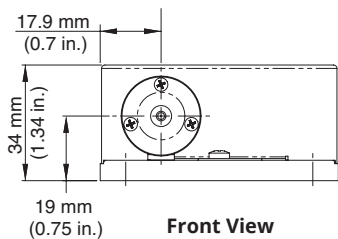
6 If user-supplied, the DC power supply has to meet the following requirements: power >60W; ripple <5% peak-to-peak; line regulation <0.5%.

7 With factory-provided or other adequate heat sink.

8 Dimensions respectively weight without fiber pigtail part.

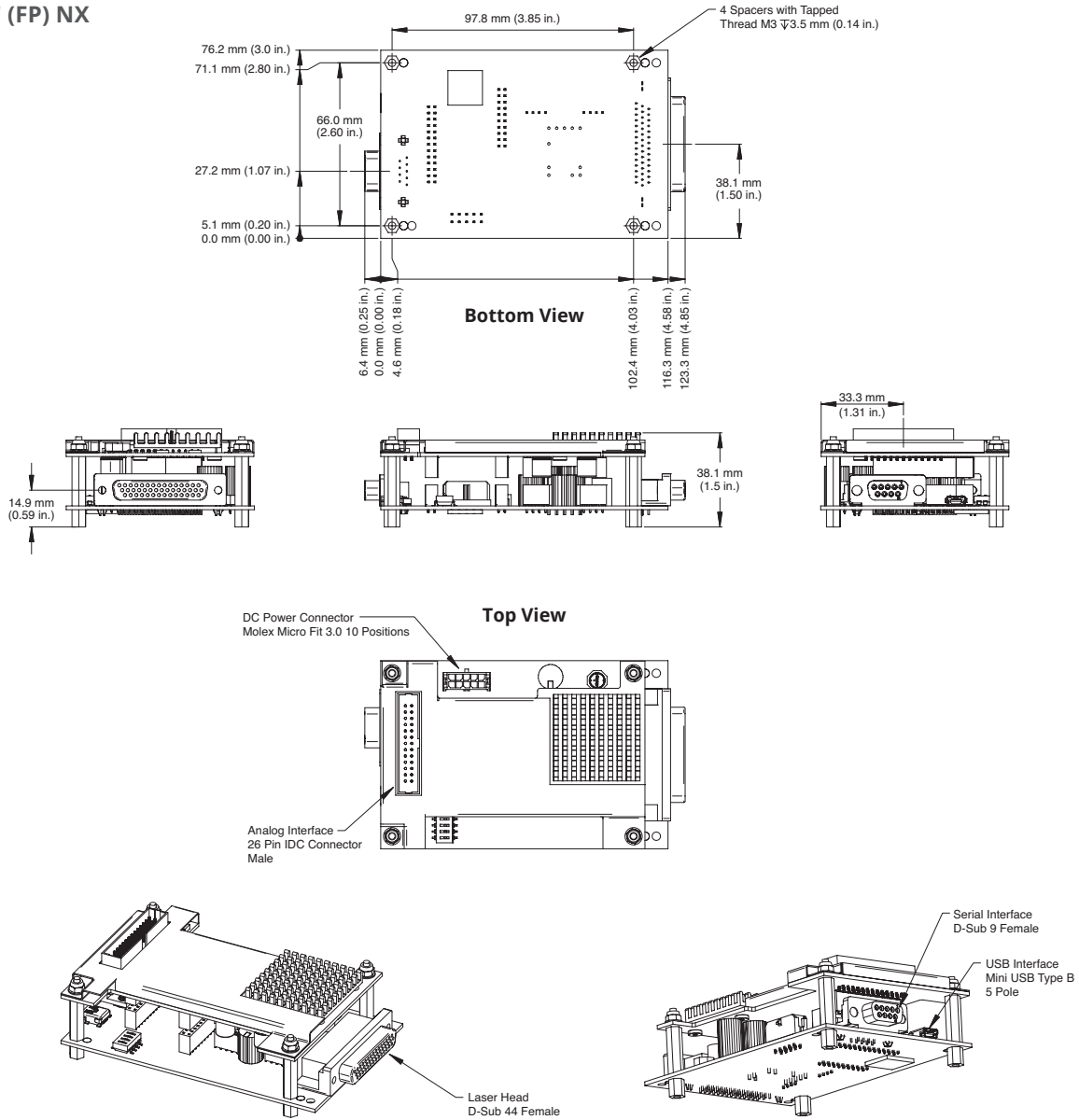
MECHANICAL SPECIFICATIONS

Sapphire SF FP NX



MECHANICAL SPECIFICATIONS

Sapphire SF (FP) NX Controller



Coherent, Inc.,
 5100 Patrick Henry Drive Santa Clara, CA 95054
 p. (800) 527-3786 | (408) 764-4983
 f. (408) 764-4646

tech.sales@coherent.com www.coherent.com

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 Sapphire 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. MC-018-11-0M0719Rev.J Copyright ©2019 Coherent, Inc.

