

SAPPHIRE XT

Sapphire XT is the next generation of mid-power lasers with emission in the visible spectral region. This new platform relies on Coherent's unique Optically Pumped Semiconductor Laser technology (OPSL). The Sapphire XT delivers 1 W of laser output power in an impressively compact box. The innovative electronic design enables a significant reduction of the footprint compared to previous laser models by integrating the controller into the laser box. The new generation of OPSL lasers also introduces an interface for direct power modulation which is often a critical performance factor for cutting edge laser applications. The electronic design enables very short rise times while reducing overshoot effects to a minimum level at the same time.

Sapphire lasers are manufactured using Coherent's patented PermAlign™ technology for optimal aligning and solder-bonding the optics to provide the best beam quality, power stability, and lowest noise over the complete lifetime of the laser. Sapphire lasers deliver superior performance, proven reliability, and low-cost of ownership making them the ideal laser solution for a multitude of applications.



FEATURES

- Integrated Controller
- 1 W of output power
- 488 nm, 532 nm and 561 nm
- Direct Power Modulation Interface
- Ultra-low Noise

APPLICATIONS

- Super-resolution Imaging
- DNA Sequencing
- Semiconductor Inspection and Metrology
- Quantum Sensing
- Holography

| Specifications | Sapphire XT 488 | Sapphire XT 532 | Sapphire XT 561 |
|--|---|-----------------|-----------------|
| Wavelength ¹ | 488 ±2 nm | 532 ±2 nm | 561 ±2 nm |
| Output Power ² | 1000 mW | | |
| Power Set Range | 2 – 110 % | | |
| Spatial Mode | TEM ₀₀ | | |
| M2 (Beam Quality) | ≤1.1 | | |
| Beam Asymmetry | 0.9 – 1.1 | | |
| Beam Diameter at 1/e ² | 0.7 ± 0.05 mm | | |
| Beam Divergence (Full Angle) | < 1.1 mrad | < 1.2 mrad | < 1.3 mrad |
| Pointing Stability (over 2 hours after warm-up and ±3°C) | <30 µrad | | |
| Pointing Stability Over Temperature | <5 µrad/°C | | |
| Beam Waist Location | ± 200 mm from front | | |
| RMS Noise (20 Hz to 2 MHz) | ≤ 0.25 % | | |
| Peak-to-Peak Noise (20 Hz to 20 kHz) | ≤ 1 % | | |
| Long-Term Power Stability (2 hours, ±5°C) | < 2 % | | |
| Warm-Up Time (from Cold Start) ³ | < 5 minutes | | |
| Emission ready time from standby (warm start) | < 10 s | | |
| Polarization Ratio | Minimum 100:1, Vertical ±5° | | |
| Laser Drive Modes | CW, Analog Modulation, Digital Modulation | | |
| Laser Safety Classification | 4 | | |
| Modulation Properties | | | |
| Digital Modulation | | | |
| Rise Time | ≤ 80 µs | | |
| Fall Time | ≤ 20 µs | | |
| Power Modulation Frequency | 10 Hz to 10 kHz | | |
| Overshoot | < 5% (constant over set-power range) | | |
| Analog Modulation | | | |
| Rise Time | ≤ 20 µs | | |
| Fall Time | ≤ 20 µs | | |
| Power Modulation Frequency | 10 Hz to 20 kHz | | |
| Modulation Depth | ≥ 50:1 | | |
| Overshoot | < 5% (constant over set-power range) | | |
| Static Alignment Tolerances | | | |
| Beam Position from Reference ⁴ (mm) | ± 0.25 | | |
| Beam Angle (mrad) | < 2.5 | | |
| Electrical Interface | | | |
| Power Supply Voltage | 12 V +/- 10% | | |
| Power Supply | 4-Pin Molex | | |
| Power Consumption | < 63 W (startphase), < 42 W in normal operating condition | | |

| Ambient Temperature | |
|--|---------------------------------------|
| Ambient Operating Temperature ⁵ | 10 to 40 °C |
| Non-Operating Temperature ⁶ | - 20 to + 60 °C |
| Laser Head Baseplate Temperature | 15 - 45 °C |
| Heat Dissipation of Laser Head | < 43 W (worst case), < 36 W (typical) |
| Shock Tolerance (6 ms) | 7g laterally, 15g vertically |
| Utility and Environmental Requirements | |
| Dimensions (L x W x H) | 125 x 70 x 40 mm |
| Weight | 450 g |
| Orientation to Gravity | any |

Footnotes:

1 Laser-to-laser tolerance, wavelength in air, all Sapphire XT versions ± 2 nm.

2 All specifications are valid for 100% power.

3 Typical warm-up time 1 minute at 25 °C ambient temperature

4 See mechanical drawing for exit beam location.

5 Non-condensing with Sapphire XT heat sink or other equivalent heat sink.

6 Non-condensing

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