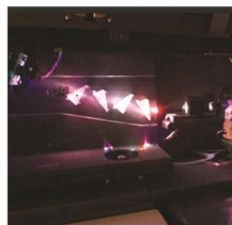


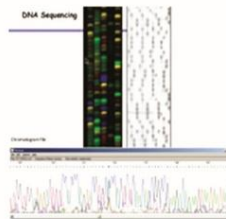
**PHOTONICS SOLUTIONS**  
 LASERS & DETECTORS covering UV to IR

**PRECISELY DESIGNED**  
 and tailored to your application

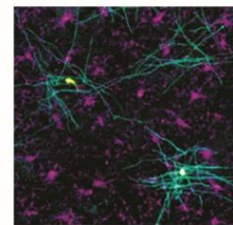
**FOR YOU**  
 to be successful



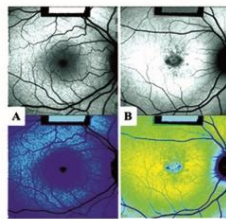
Flow Cytometry



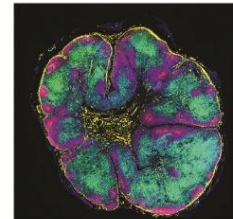
DNA Sequencing



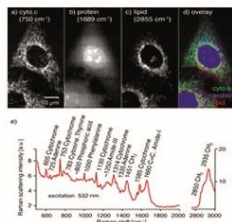
Confocal Microscopy



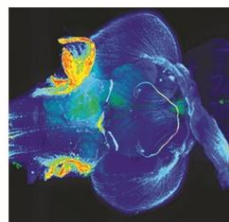
Ophthalmology



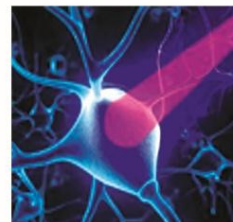
Spatial Omics



Raman Spectroscopy



Lightsheet Imaging



Optogenetics

**For Biomedical & Sensing Applications**  
**WhisperIT PICel<sup>®</sup>**  
**Blue-Green-Yellow green-Yellow-Orange Lasers**

# *WhisperIT PICel<sup>®</sup>*

## Blue-Green-Yellow green-Yellow-Orange Lasers

Based on PICel's Quantum well (QW) technology

### WMP/WCP/WSL/WHP Series Continuous Wave Lasers

**WMP**



**L\*W\*H: 52\*27\*13mm**

**WCP**



**70\*40\*38mm**

**WSL**



**125\*70\*34mm**

**WHP**



**130\*52\*34mm**

- Blue 488nm, Green 532nm, 544nm, Yellow-green 553nm, 561nm, Yellow 577nm, 580nm, 588nm, Orange 594nm, and nIR 920nm, 976nm, 1064nm, 1088nm, 1106nm, 1154nm, 1176nm, 1188nm
- CW single-mode TEM<sub>00</sub> free space and fiber output from WMP/WCP/WSL package: 20, 50, 100, 200mW, high power output from WSL/WHP package: 300mW, 500mW, 1W, 2W
- CW multi-mode free space and fiber output from WHP package: 300mW, 500mW, 1W, 2W, 5W, 8W

### WSL/WHP Series Single-Frequency Lasers

**WSL SF**

**High Power WHP SF**



**125\*70\*34mm**



**130\*52\*34mm**

- Blue 488nm, Green 532nm, 544nm, Yellow-green 553nm, 561nm, Yellow 577nm, 580nm, 588nm, Orange 594nm, and nIR 920nm, 976nm, 1064nm, 1088nm, 1106nm, 1154nm, 1176nm, 1188nm
- Single-frequency CW TEM<sub>00</sub> mode free space and fiber output from WSL package: 20, 50, 100, 200mW, high power output from WHP package: 300mW, 500mW, 1W, 2W

# WhisperIT PICel® CW WMP Series Lasers

The WMP lasers offer robust packaging CW visible lasers based on PICel Quantum well (QW) technology. It utilizes most efficient heat removal technique by sandwiching the QW between two heat spreaders. This results in a high reliability & consistent performance laser product which enables demanding biomedical and scientific instrumentation applications.

The WCP series lasers with a flexible and compatible interface: Analog or digital.

The WMP lasers are available with round beam and other customized beam for applications that is tailored to specific application requirements.

## FEATURES

- **Ultra-low Noise**
- **Miniaturized for Integration**
- **Reliable and Robust**

## APPLICATIONS

- **Flow Cytometry**
- **Confocal Microscopy**
- **DNA Sequencing**
- **Medical Imaging**



**Table 1. Optical Specification**

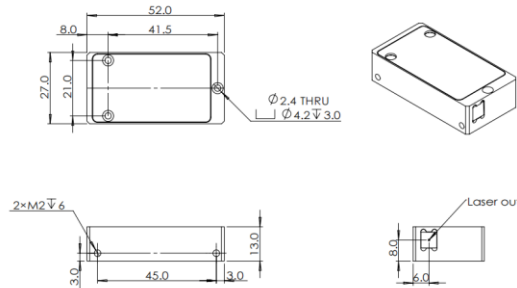
FREE SPACE SPECIFICATIONS	488	532	544	553	561	577	588	594
Wavelength (nm) *	488±2	532±2	544±2	553±2	561±2	577±2	588±2	594±2
Spatial Mode	TEM <sub>00</sub>							
Output Power (mW)*	20, 50, 80, 100, 150, 200							
RMS Noise (20Hz to 20MHz) (%)	≤0.25							
Peak to Peak Noise (20Hz to 20kHz) (%)	<1							
Long-Term Power Stability (2hrs, ±3°C) (%)	<2							
Beam Quality (M <sup>2</sup> )	≤1.1							
Beam Symmetry	≤1:1.1							
Beam Diameter at 1/e <sup>2</sup> (mm)	0.7±0.1							
Beam Divergence Angle (mrad, full angle)	<1.2							
Pointing Stability (μrad) (Over 2 hours after warm up and ±3°C)	<30							
Pointing Stability Over Temperature (μrad/°C)	<5							
Warm-up Time (From cold start) (minutes)	<5							
Polarization Extinction Ratio	>100:1							
Polarization Orientation (Reference to baseplate)	Vertical ±5°							

\*Other wavelengths are available upon request.

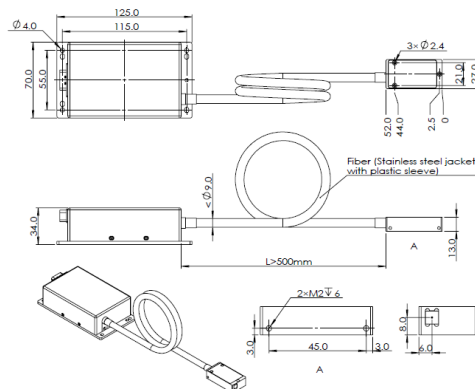
\*Output power is variable in CW mode from 10% to 100% of rated power. Specifications are valid for 100% power.

**MECHANICAL SPECIFICATIONS**

**Laser Head**



**With Control Box**



# WhisperIT PICel® CW WCP Series Lasers

The WCP series lasers offer robust packaging CW visible lasers based on PICel Quantum well technology. High reliability & consistent performance enables demanding biomedical and scientific instrumentation applications.

The WCP series lasers with a flexible and compatible interface: Analog or digital.

The WCP series lasers are available with round beam and fiber coupled for applications that need narrow linewidth and are tailored to specific application requirements.

## FEATURES

- Ultra-low Noise
- Superior Beam Quality
- Reliable and Robust
- Analog, Digital control

## APPLICATIONS

- Flow Cytometry
- Confocal Microscopy
- DNA Sequencing
- Medical Imaging
- Inspection



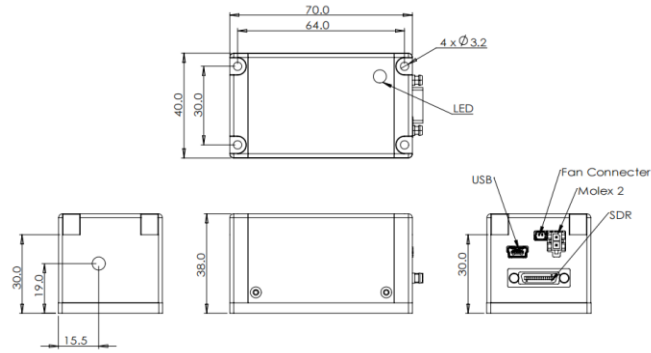
**Table 1. Optical Specification**

<b>FREE SPACE SPECIFICATIONS</b>	<b>488</b>	<b>532</b>	<b>544</b>	<b>553</b>	<b>561</b>	<b>577</b>	<b>588</b>	<b>594</b>
Wavelength (nm) *	488±2	532±2	544±2	553±2	561±2	577±2	588±2	594±2
Spatial Mode	TEM <sub>00</sub>							
Output Power (mW)*	20, 50, 80, 100, 150, 200							
RMS Noise (20Hz to 20MHz) (%)	≤0.1							
Peak to Peak Noise (20Hz to 20kHz) (%)	<0.5							
Long-Term Power Stability (2hrs, ±3°C) (%)	<2							
Beam Quality (M <sup>2</sup> )	≤1.1							
Beam Symmetry	≤1:1.1							
Beam Diameter at 1/e <sup>2</sup> (mm)	0.7±0.1							
Beam Divergence (mrad, full angle)	<1.2	<1.3					<1.4	
Pointing Stability (μrad) (Over 2 hours after warm up and ±3°C)	<30							
Pointing Stability Over Temperature (μrad/°C)	<5							
Warm-up Time (From cold start) (minutes)	<5							
Polarization Extinction Ratio	>100:1							
Polarization Orientation (Reference to baseplate)	Vertical ±5°							
<b>FIBER COUPLED SPECIFICATIONS</b>	<b>488</b>	<b>532</b>	<b>544</b>	<b>553</b>	<b>561</b>	<b>577</b>	<b>588</b>	<b>594</b>
Wavelength (nm)	488±2	532±2	544±2	553±2	561±2	577±2	588±2	594±2
Spatial Mode	TEM <sub>00</sub>							
Output Power (mW)*	20, 50, 80, 100, 150, 200							
RMS Noise (20Hz to 2MHz) (%)	≤0.25							
Peak to Peak Noise (20Hz to 20kHz) (%)	<2							
Long-Term Power Stability (2hrs, ±3°C) (%)	<2							
Beam Quality (M <sup>2</sup> )	≤1.1							
Beam Symmetry	≤1:1.1							
Fiber Type	PM							
Fiber Length (m)	1							
Fiber Connector	FC/APC							
Warm-up Time (From cold start) (minutes)	<5							
Polarization Extinction Ratio	>100:1							

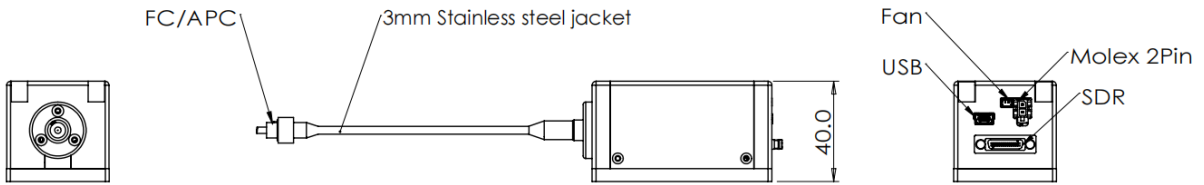
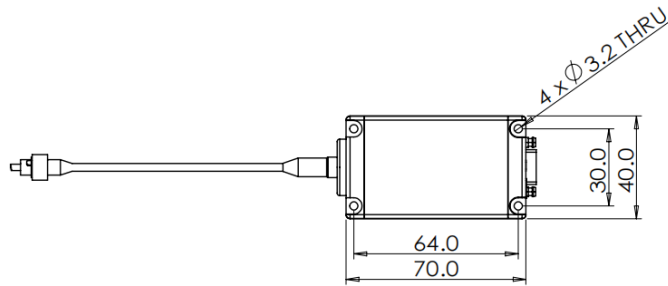
\*Other wavelengths are available upon request.

\*Output power is variable in CW mode from 10% to 100% of rated power. Specifications are valid for 100% power.

**MECHANICAL SPECIFICATIONS**



**Free Space**



**Fiber Coupled**

# WhisperIT PICel® CW WSL Series Lasers

The WSL series lasers offer robust packaging CW visible TEM<sub>00</sub> lasers and single-frequency lasers based on PICel Quantum well technology. High reliability & consistent performance enables demanding biomedical and scientific instrumentation applications.

The WSL SF lasers are available with round beam and fiber coupled for applications that need narrow linewidth and are tailored to specific application requirements.

The PICel 488 SF offers improvements over argon laser lines: size, light background, power consumption, cost of ownership.

The PICel 532 SF is an alternative to Nd: YAG or Nd: YVO<sub>4</sub> based lasers avoiding thermal lensing and green noise problems.

## FEATURES

- **Ultra-Low Noise**
- **Narrow Linewidth**
- **Superior Beam Quality**
- **Reliable and Robust**

## APPLICATIONS

- **Flow Cytometry**
- **Confocal Imaging**
- **DNA Sequencing**
- **Raman Spectroscopy**
- **Interferometry**
- **Metrology**
- **Inspection**



## CW TEM<sub>00</sub> WSL Lasers

**Table 1. Optical Specification**

FREE SPACE SPECIFICATIONS	488	532	544	553	561	577	588	594
Wavelength (nm) *	488±2	532±2	544±2	553±2	561±2	577±2	588±2	594±2
Spatial Mode	TEM <sub>00</sub>							
Output Power (mW)*	20, 50, 80, 100, 150, 200							
RMS Noise (20Hz to 2MHz) (%)	≤0.25							
Peak to Peak Noise (20Hz to 20kHz) (%)	<1							
Long-Term Power Stability (2hrs, ±3°C) (%)	<2							
Beam Quality (M <sup>2</sup> )	≤1.1							
Beam Symmetry	≤1:1.1							
Beam Diameter at 1/e <sup>2</sup> (mm)	0.7±0.1							
Beam Divergence (mrad, full angle)	<1.2	<1.3					<1.4	
Pointing Stability (μrad) (Over 2 hours after warm up and ±3°C)	<30							
Pointing Stability Over Temperature (μrad/°C)	<5							
Warm-up Time (From cold start) (minutes)	<5							
Polarization Extinction Ratio	>100:1							
Polarization Orientation (Reference to baseplate)	Vertical ±5°							

\*Other wavelengths are available upon request.

\*Output power is variable in CW mode from 10% to 100% of rated power. Specifications are valid for 100% power.

**Table 2. Mechanical & Environmental Specification**

STATIC ALIGNMENT TOLERANCES	All Wavelengths
Beam Position from Reference (mm)	±0.5
Beam Waist Position from Exit Window (mm)	±200
Dimensions (L x W x H) (mm)	125 x 70 x 34
Laser Head Baseplate Temperature (Max. °C)	40
Heat Dissipation of Laser Head (W)	≤12
Operating Temperature (°C)	10 to 50
Storage Temperature (°C)	-20 to 60
Humidity (%)	10 to 90
Shock (11ms duration) (Operating) (g)	1
Shock (11ms duration) (Non-operating) (g)	30
Vibration (5Hz – 500Hz) (Operating) (g)	0.3
Vibration (5Hz – 500Hz) (Non-operating) (g)	3
Laser Safety Classification	3b

## Single-frequency WSL SF Lasers

Table 1. Optical Specification

FREE SPACE SPECIFICATIONS	488	532	544	553	561	577	588	594
Wavelength (nm)*	488 ±2	532± 2	544 ±2	553 ±2	561 ±2	577 ±2	588 ±2	594 ±2
Wavelength Accuracy (nm)	±0.1							
Spatial Mode	TEM <sub>00</sub>							
Output Power (mW)*	20, 50, 80, 100, 150, 200, 300, 500							
RMS Noise (20Hz to 2MHz) (%)	≤0.25							
Peak to Peak Noise (20Hz to 20kHz) (%)	<1							
Long-Term Power Stability (2hrs, ±3°C) (%)	<2							
Beam Quality (M <sup>2</sup> )	≤1.1							
Beam Symmetry	≤1:1.1							
Beam Diameter at 1/e <sup>2</sup> (mm)	0.7±0.1							
Beam Divergence (mrad, full angle)	<1.2	<1.3					<1.4	
Pointing Stability (µrad) (Over 2 hours after warm up and ±3°C)	<30							
Pointing Stability Over Temperature (µrad/°C)	<5							
Warm-up Time (From cold start) (minutes)	<5							
Polarization Extinction Ratio	>100:1							
Polarization Orientation (Reference to baseplate)	Vertical ±5°							
FIBER COUPLED SPECIFICATIONS	488	532	544	553	561	577	588	594
Wavelength (nm)*	488 ±2	532 ±2	544 ±2	553 ±2	561 ±2	577 ±2	588 ±2	594 ±2
Wavelength Accuracy (nm)	±0.1							
Spatial Mode	TEM <sub>00</sub>							
Output Power (mW)*	20, 50, 80, 100, 150, 200							
RMS Noise (20Hz to 2MHz) (%)	≤0.25							
Peak to Peak Noise (20Hz to 20kHz) (%)	<1							
Long-Term Power Stability (2hrs, ±3°C) (%)	<2							
Beam Quality (M <sup>2</sup> )	≤1.1							
Beam Symmetry	≤1:1.1							
Fiber Type	PM							
Fiber Length (m)	1							
Fiber Connector	FC/APC							
Warm-up Time (From cold start) (minutes)	<5							
Polarization Extinction Ratio	>100:1							

\*Other wavelengths are available upon request.

\*Output power is variable in CW mode from 10% to 100% of rated power. Specifications are valid for 100% power.

## Single-frequency WSL SF Lasers (nIR)

Table 1. Optical Specification

FREE SPACE SPECIFICATIONS	920	976	1064	1088	1106	1122	1154	1176	1188
Wavelength (nm)	920 ±3	976 ±3	1064 ±3	1088 ±3	1106 ±3	1122 ±3	1154 ±3	1176 ±3	1188 ±3
Spatial Mode	TEM <sub>00</sub>								
Output Power (mW)*	50, 80, 100, 150, 200, 300, 500								
RMS Noise (20Hz to 2MHz) (%)	≤0.25								
Peak to Peak Noise (20Hz to 20kHz) (%)	<1								
Long-Term Power Stability (2hrs, ±3°C) (%)	<2								
Beam Quality (M <sup>2</sup> )	≤1.1								
Beam Symmetry	≤1:1.1								
Beam Diameter at 1/e <sup>2</sup> (mm)	0.7±0.1								
Beam Divergence (mrad, full angle)	<1.4								
Pointing Stability (μrad) (Over 2 hours after warm up and ±3°C)	<30								
Pointing Stability Over Temperature (μrad/°C)	<5								
Warm-up Time (From cold start) (minutes)	<5								
Polarization Extinction Ratio	>100:1								
Polarization Orientation (Reference to baseplate)	Vertical ±5°								

FIBER COUPLED SPECIFICATIONS	920	976	1064	1088	1106	1122	1154	1176	1188
Wavelength (nm)	920 ±3	976 ±3	1064 ±3	1088 ±3	1106 ±3	1122 ±3	1154 ±3	1176 ±3	1188 ±3
Spatial Mode	TEM <sub>00</sub>								
RMS Noise (20Hz to 2MHz) (%)	≤0.25								
Peak to Peak Noise (20Hz to 20kHz) (%)	<1								
Long-Term Power Stability (2hrs, ±3°C) (%)	<2								
Beam Quality (M <sup>2</sup> )	≤1.1								
Beam Symmetry	≤1:1.1								
Fiber Type	PM								
Fiber Length (m)	1								
Fiber Connector	FC/APC								
Warm-up Time (From cold start) (minutes)	<5								
Polarization Extinction Ratio	>100:1								



# WhisperIT PICel® CW WHP Series Lasers

The WHP series lasers offer robust packaging CW visible or nIR TEM<sub>00</sub>, multi-mode, single- frequency lasers based on PICel Quantum well technology. It utilizes most efficient heat removal technique by sandwiching the QW between two heat spreaders. This results in a high reliability & consistent performance laser product which enables demanding biomedical and scientific instrumentation applications.

The WHP multi-mode lasers output power up to 8W of visible laser or up to 10W of nIR laser.

The WHP lasers are available match for highest performance applications and are tailored to specific application requirements.

## FEATURES

- **Ultra-Low Noise**
- **Superior Beam Quality**
- **Reliable and Robust**
- **TEM<sub>00</sub> power up to 2W**
- **Multi-mode power up to 10W**

## APPLICATIONS

- **Microscopy**
- **DNA Sequencing**
- **Spatial Omics**
- **Ophthalmology**
- **Photocoagulation**
- **Microscopy**
- **Inspection**



## CW TEM<sub>00</sub> WHP Lasers

Table 1. Optical Specification

FREE SPACE SPECIFICATIONS	488	532	544	553	561	577	588	594
Wavelength (nm) *	488±3	532±3	544±3	553±3	561±3	577±3	588±3	594±3
Spatial Mode	TEM <sub>00</sub>							
Output Power (mW)*	300, 500, 1000, 1500, 2000							
RMS Noise (20Hz to 2MHz) (%)	≤0.1							
Peak to Peak Noise (20Hz to 5kHz) (%)	<1							
Long-Term Power Stability (2hrs, ±3°C) (%)	<2							
Beam Quality (M <sup>2</sup> )	≤1.1							
Beam Symmetry	≤1:1.1							
Beam Diameter at 1/e <sup>2</sup> (mm)	0.7±0.1							
Beam Divergence Angle (mrad, full angle)	<1.2	<1.3					<1.4	
Pointing Stability (μrad) (Over 2 hours after warm up and ±3°C)	<30							
Pointing Stability Over Temperature (μrad/°C)	<5							
Warm-up Time (From cold start) (minutes)	<5							
Polarization Extinction Ratio	>100:1							
Polarization Orientation (Reference to baseplate)	Vertical ±5°							

\*Other wavelengths are available upon request.

\*Output power is variable in CW mode from 10% to 100% of rated power. Specifications are valid for 100% power.

FREE SPACE SPECIFICATIONS	920	976	1064	1088	1106	1122	1154	1176	1188
Wavelength (nm)	920 ±3	976 ±3	1064 ±3	1088 ±3	1106 ±3	1122 ±3	1154 ±3	1176 ±3	1188 ±3
Spatial Mode	TEM <sub>00</sub>								
Output Power (mW)*	300, 500, 1000, 1500, 2000								
RMS Noise (20Hz to 10MHz) (%)	≤0.1								
Peak to Peak Noise (20Hz to 5kHz) (%)	<1								
Long-Term Power Stability (2hrs, ±3°C) (%)	<2								
Beam Quality (M <sup>2</sup> )	≤1.1								
Beam Divergence Angle (mrad, full angle)	<1.4								
Pointing Stability Over Temperature (μrad/°C)	<5								
Warm-up Time (From cold start) (minutes)	<10								
Polarization Extinction Ratio	>100:1								
Polarization Orientation (Reference to baseplate)	Vertical ±5°								

## CW Multi-mode WHP Lasers

**Table 1. Optical Specification**

FREE SPACE SPECIFICATIONS	488	532	544	553	561	577	588	594
Wavelength (nm)	488 ±3	532 ±3	544 ±3	553 ±3	561 ±3	577 ±3	588 ±3	594 ±3
Spatial Mode	Multi-mode							
Output Power (mW)*	300, 500, 1000, 2000, 3000, 5000							
RMS Noise (20Hz to 10MHz) (%)	<1							
Peak to Peak Noise (20Hz to 5kHz) (%)	<10							
Long-Term Power Stability (2hrs, ±3°C) (%)	<2							
Beam Quality (M <sup>2</sup> )	<7							
Beam Diameter	1.8							
Beam Divergence Angle (mrad, full angle)	<1.4							
Pointing Stability Over Temperature (µrad/°C)	<5							
Warm-up Time (From cold start) (minutes)	<10							
Polarization Extinction Ratio	>100:1							
Polarization Orientation (Reference to baseplate)	Vertical ±5°							

\*Output power is variable in CW mode from 10% to 100% of rated power. Specifications are valid for 100% power.

\*Output power up to 8W.

FREE SPACE SPECIFICATIONS	920	976	1064	1088	1106	1122	1154	1176	1188
Wavelength (nm)	920 ±5	976 ±5	1064 ±5	1088 ±5	1106 ±5	1122 ±5	1154 ±5	1176 ±5	1188 ±5
Spatial Mode	Multi-mode								
Output Power (mW)*	4000	6000	10000	8000	8000	8000	7000	7000	6000
RMS Noise (20Hz to 10MHz) (%)	<1								
Peak to Peak Noise (20Hz to 5kHz) (%)	<10								
Long-Term Power Stability (2hrs, ±3°C) (%)	<2								
Beam Quality (M <sup>2</sup> )	<3								
Beam Divergence Angle (mrad, full angle)	<3.5								
Pointing Stability Over Temperature (µrad/°C)	<5								
Warm-up Time (From cold start) (minutes)	<10								
Polarization Extinction Ratio	>100:1								
Polarization Orientation (Reference to baseplate)	Vertical ±5°								

## Single-frequency High power WHP SF Lasers

Table 1. Optical Specification

FREE SPACE SPECIFICATIONS	488	532	544	553	561	577	588	594
Wavelength (nm) *	488 ±3	532 ±3	544 ±3	553 ±3	561 ±3	577 ±3	588 ±3	594 ±3
Wavelength Accuracy (nm)	±0.1							
Spatial Mode	TEM <sub>00</sub>							
Output Power (mW)*	1000, 2000							
RMS Noise (20Hz to 10MHz) (%)	≤0.1							
Peak to Peak Noise (20Hz to 5kHz) (%)	<10							
Long-Term Power Stability (2hrs, ±3°C) (%)	<2							
Beam Quality (M <sup>2</sup> )	≤1.1							
Beam Symmetry	≤1:1.1							
Beam Diameter at 1/e <sup>2</sup> (mm)	2.3±0.3							
Beam Divergence Angle (mrad, full angle)	<0.5							
Pointing Stability (μrad) (Over 2 hours after warm up and ±3°C)	<30							
Pointing Stability Over Temperature (μrad/°C)	<5							
Warm-up Time (From cold start) (minutes)	<10							
Polarization Extinction Ratio	>100:1							
Polarization Orientation	Horizontal ±5°							

\*Other wavelengths are available upon request.

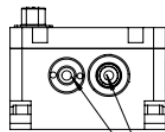
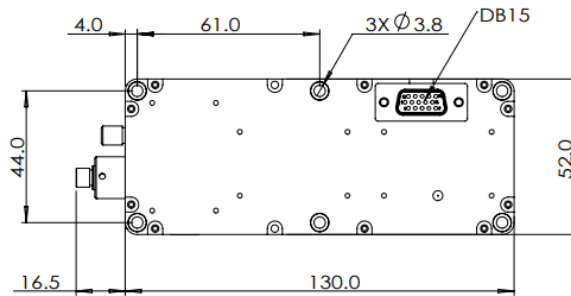
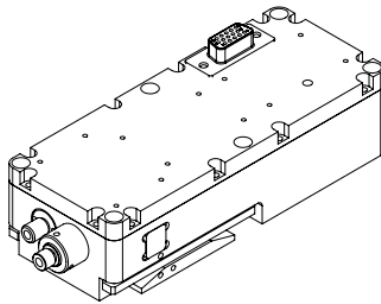
\*Output power is variable in CW mode from 10% to 100% of rated power. Specifications are valid for 100% power.

FREE SPACE SPECIFICATIONS	920	976	1064	1088	1106	1122	1154	1176	1188
Wavelength (nm)	920 ±3	976 ±3	1064 ±3	1088 ±3	1106 ±3	1122 ±3	1154 ±3	1176 ±3	1188 ±3
Wavelength Accuracy (nm)	±0.1								
Spatial Mode	TEM <sub>00</sub>								
Output Power (mW)*	300, 500, 1000, 1500, 2000								
RMS Noise (20Hz to 10MHz) (%)	≤0.1								
Peak to Peak Noise (20Hz to 5kHz) (%)	<1								
Long-Term Power Stability (2hrs, ±3°C) (%)	<2								
Beam Quality (M <sup>2</sup> )	≤1.1								
Beam Divergence Angle (mrad, full angle)	<1.4								
Pointing Stability Over Temperature (μrad/°C)	<5								
Warm-up Time (From cold start) (minutes)	<10								
Polarization Extinction Ratio	>100:1								
Polarization Orientation (Reference to baseplate)	Vertical ±5°								

**Table 2. Mechanical & Environmental Specification**

STATIC ALIGNMENT TOLERANCES	All Wavelengths
Beam Position from Reference (mm)	±0.5
Beam Angle (mrad)	±2.5
Dimensions (L x W x H) (mm)	130 x 52 x 34
Cooling Requirement	Active cooling required
Operating Temperature (°C)	10 to 50
Storage Temperature (°C)	-20 to 60
Humidity (%) non-condensing	10 to 90

**MECHANICAL SPECIFICATIONS**



Fiber connector

