

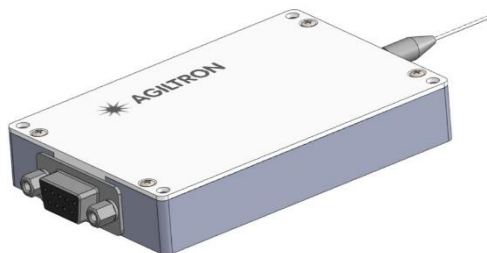
Narrow Linewidth Semiconductor Lasers



<10kHz Linewidth, 1550nm

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Features

- Single Mode, Wavelength (C, L)
- Ultra-Low Noise
- Ultra-Low Relative Intensity Noise (RIN)
- Low Susceptibility to Vibration and Noise
- Narrow Linewidth (<10 kHz)
- Long Coherent Length
- Wavelength Stability Over Lifetime and Temperature

Applications

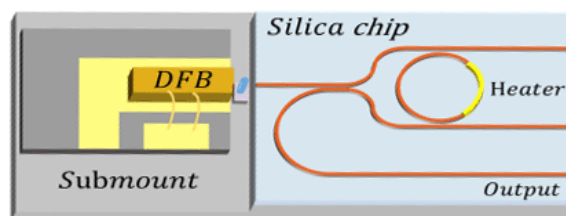
- Quantum Sensing
- Long Range Sensing
- Lidar, FOG
- Optical Inspection
- Scientific Research



The NLLD narrow-linewidth tunable fiber-coupled laser features a <10 kHz spectral linewidth with wavelength tunability, utilizing a semiconductor gain chip and an external tunable silicon waveguide cavity for superior performance. With an ultra-long coherence length (~100 km), it enables high-precision interferometric and long fiber sensing while its low spectral noise enhances SNR for detecting weak signals in interferometry and backscatter-based sensing. Its low phase noise and high stability make it ideal for atomic clocks, quantum sensing, gravimeters, fiber optic gyroscopes (FOGs), LiDAR, and Doppler velocimetry, while minimal frequency drift ensures long-term measurement stability. Integrated driving electronics allow precise output power and wavelength control, making it a highly reliable solution for cutting-edge scientific and industrial applications.

We offer driving electronics to precisely control both the output power and wavelength.

Due to their high sensitivity to electrostatic discharge, warranty coverage applies only to fully metal covered modules the benchtops, which include proper protection. Other versions of the lasers and photodetectors are not covered by any warranty. Please use them with great caution.



Specifications

Parameter		Min	Typical	Max	Unit
Output Power		20	40		mW
Center Wavelength (Custom)		1530	1550	1565	nm
Thermal Frequency Tuning Range		50			GHz
Frequency Modulation Range		800	1000		MHz
Relative Intensity Noise (RIN @100kHz)			-135		dB/Hz
Phase Noise (@100kHz)			-130		dB/Hz
Optical Isolation		40			dB
Power Supply		5.7	5.9	6.5	V
Fiber		SMF-28, PMF, FC/APC			
Spectral Linewidth	Grade 1		≤ 10		kHz
	Grade 2		≤ 5		
	Grade 3		≤ 3		
Operating Temperature		10		50	°C
Storage Temperature		-40		85	°C
Control Mode		RS232			
Communication Interface		DB9 Female			

Rev 06/25/26

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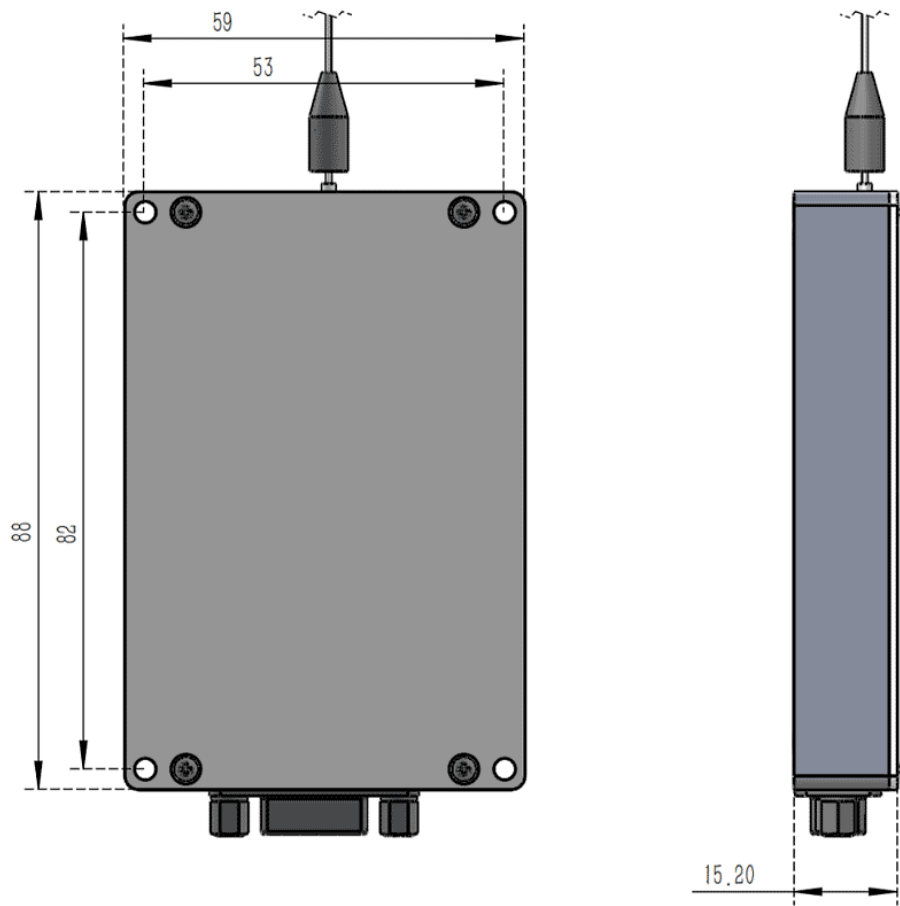
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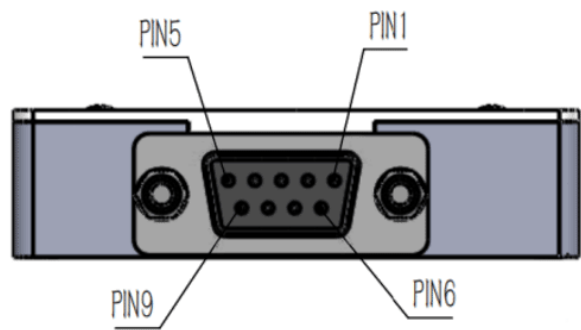
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Mechanical Dimension (mm)



*Product dimensions may change without notice. This is sometimes required for non-standard specifications.

PIN Assignment



PIN	Description	PIN	Description
1	VCC	6	3V3
2	VCC	7	GND
3	GND	8	-
4	RX	9	-
5	TX		

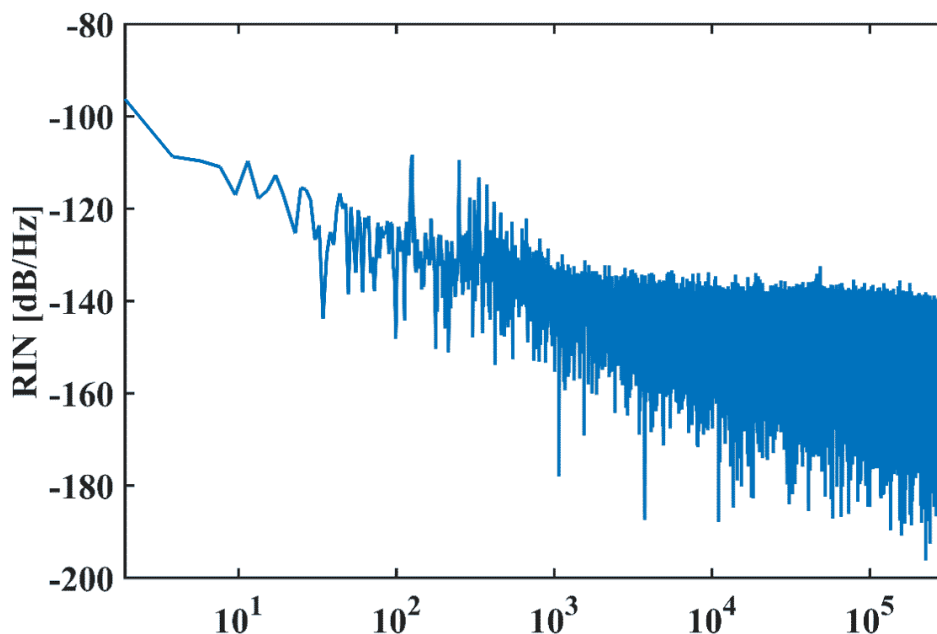
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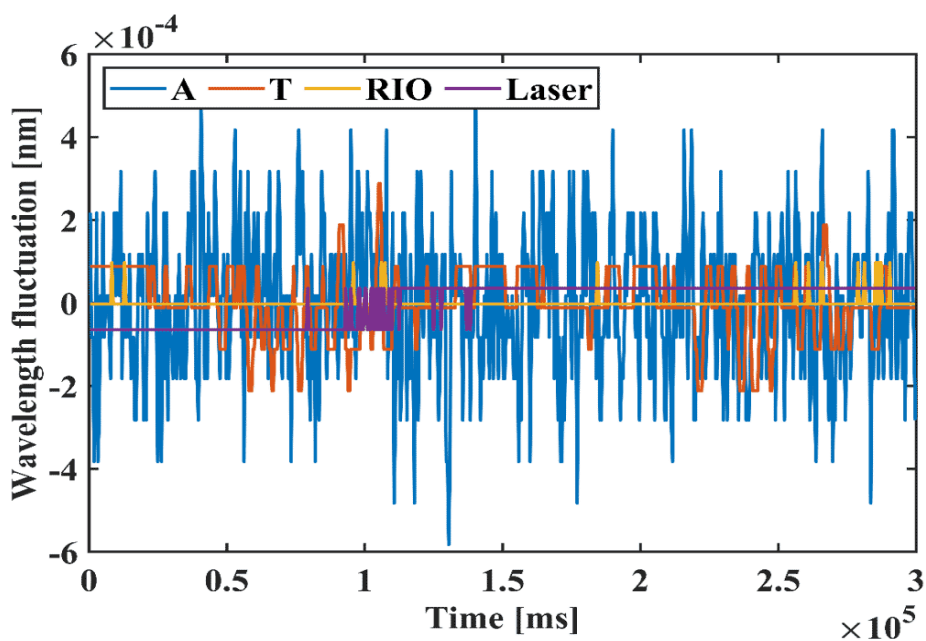
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Relative Intensity Noise (RIN)



Frequency stability



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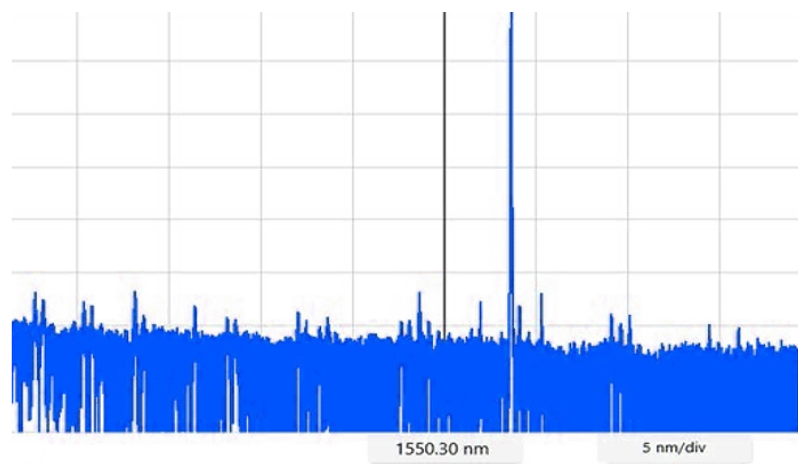
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Typical Spectrum



Ordering Information (Part Number)

	☐	☐	☐	☐	☐	☐	☐	☐	☐
Prefix	Wavelength	Output Power	Linewidth	Benchtop ^[1]	Type	Fiber Type	Fiber Buffer	Fiber Length	Connector ^[2]
NLLD-	1550nm = 5 Special = 0	10mW = 1 20mW = 2 30mW = 3 40mW = 4 120mw = C 150mw = E	5kHz = 5 3kHz = 3 2kHz = 2 1kHz = 1 6kHz = 6 8kHz = 8 9kHz = 9	No = 1 Yes = 2	Standard = 1 Special = 0	SM28 = 1 PM1550 = 4 Special = 0	900µm Tube = 3 Special = 0	0.25m = 1 0.5m = 2 1.0 m = 3 1.5 m = 5 Special = 0	None = 1 FC/PC = 2 FC/APC = 3 SC/PC = 4 SC/APC = 5 ST/PC = 6 LC/PC = 7

[1]. Benchtop is a plug-play unit integrated with power supply with wavelength and power controls

[2]. The default connector configuration uses fiber with 0.9 mm buffer protection. The connector cannot be installed directly onto bare fiber because the bare fiber is prone to damage during shipping. However, the connector can be assembled on bare fiber if a 3 cm protective loose tube is added for reinforcement. The customer may remove this protective tube after testing. The optical power handling of a standard connector is less than 0.5 W for SMF-28 fiber and decreases further for smaller-core fibers.

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Caution Electrostatic Sensitivity



- Never touch laser diode and the module using hands
- Always use protections when handle a laser diode
- Recommend mounting the laser diode using an ionic gun and ESD finger cots



Laser Safety

This product meets the appropriate standard in Title 21 of the Code of Federal Regulations (CFR). FDA/CDRH Class 1M laser product. This device has been classified with the FDA/CDRH under accession number 0220191. All versions of this laser are Class 1M laser products, tested according to IEC 60825-1:2007 / EN 60825-1:2007. An additional warning for Class 1M laser products. For diverging beams, this warning shall state that viewing the laser output with certain optical instruments (for example eye loupes, magnifiers, and microscopes) within a distance of 100 mm may pose an eye hazard. For collimated beams, this warning shall state that viewing the laser output with certain instruments designed for use at a distance (for example telescopes and binoculars) may pose an eye hazard.

Wavelength = 1.3/1.5 μm .

Maximum power = 30 mW.



*Caution - Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

*IEC is a registered trademark of the International Electrotechnical Commission.

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