Fiber Coupled Laser Multimode High Power

793nm, 808nm, up to 10W, 50/125μm Fiber

DATASHEET

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The FCMH series diode lasers deliver up to 500 W of power through a 50/125 μm fiber. They provide high brightness and simplified thermal management by distributing the diodes (heat sources), allowing for a water-cooled architecture with reliable, predictable performance. A turn-key benchtop unit is available, integrating the power supply, water cooling, power control, and safety shut-off features.

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.

Features

- High Sensitivity and Overload Power with Wide Dynamic Range
- High Coupling Efficiency
- Isolated Electrical Contacts
- High Quality, High Reliability and Stability

Applications

- OCT
- Medical care
- Printing
- Material processing
- Pump source

Specifications (793nm, up to 10W, 50/125μm Fiber)

Parameter	Min	Typical	Max	Unit
Center Wavelength λ	783	793	803	nm
Output Power			10	W
Working mode		CW		
Fiber Core Diameter		50/125		μm
Fiber Numerical Aperture		0.22		NA
Fiber Connector		Bare end		
Fiber Length		1		m
Operating Current Lop		12		A
Threshold Current Lth		2		A
Operating Voltage Vop		73		V
Operating Temperature		25		℃
Wave Temp Coefficient		0.3		nm/℃

Specifications (808nm, up to 10W, 50/125μm Fiber)

Parameter	Min	Typical	Max	Unit
Center Wavelength λ	803	808	913	nm
Output Power			10	W
Spectral Width FWHM		5		nm
Operating Current Iop		4		A
Threshold Current Ith		0.7		A
Operating Voltage Vop		1.7		V
Power Conversion Efficiency		~45%		%
Fiber Bend Radius	60			mm
Buffer Diameter		320		μm
Fiber Cladding Diameter		220		μm
Fiber Core Diameter		50/125		μm
Fiber Numerical Aperture		0.22		NA
Fiber Connector		FC/SMA905/ST		
Fiber Length		1		m
Operating Temperature	15		55	℃
Storage Temperature	-30		70	℃
Lead Soldering Temperature, 10 Sec max		250		℃

Note: The specifications provided are for general applications with a cost-effective approach. If you need to narrow or expand the tolerance, coverage, limit, or qualifications, please [click this link]:
*The contact resistance between the diode and the heat sink is less than 1cm2 K/W.

RoHS COMPLIANT

ATTENTION
OBSERVE PRECAUTIONS FOR HANDLING ELECTROSTATIC

Warning: The device can be damaged by a spike in applying voltage. Do not touch by hand or use a regular power supply. The device mounted on PCB is a cost-effective OEM module for professional system integration only, not intended for laboratory use, which be a protected turn-key boxed package. Information is believed to be accurate and is subject to change without notice. Some specific combinations of options may not be available. The user assumes all risks and liability in connection with the use of a product or its application.

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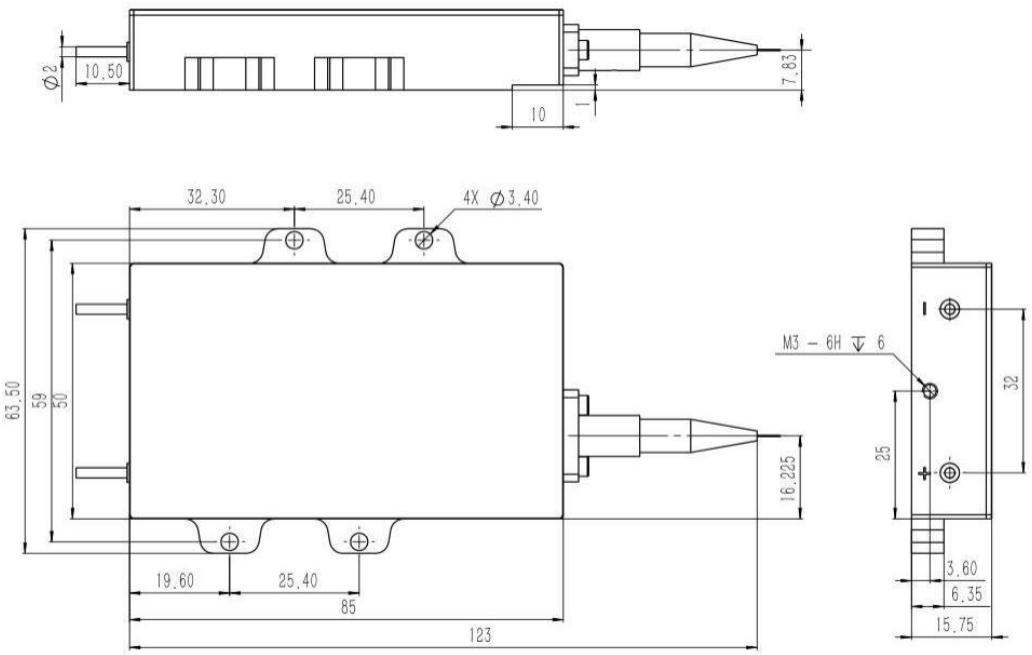
Mechanical Dimensions (mm) 200W



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

Ordering Information (Part Number)

	□□□	□□	□	□	□	□	□
Prefix	**Wavelength**	**Output Power**	**Package**	**Fiber Type**	**Fiber Buffer**	**Fiber Length**	**Connector** [1]
FCMH-	793nm = 793 808nm = 808	3W = 03 6W = 06 10W = 01 50W = 05 100W = 10 200W = 20 250W = 25 300W = 30 320W = 32 340W = 34 900W = 90	A = A	50/125 µm = A 200 µm = 2 400 µm = 4 135 µm = 1	0.9mm Tube = 1 3mm Tube = 3 Armor = A	0.5m = 1 1m = 2 1.5m = 3	Non = 1 SMA = 2

[1]. 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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Benchtop Turnkey Unit

The HPML series High Power Fiber Coupled Laser Source is a turn-key unit, featuring ease of use and low cost with a manual or USB/GUI control. These all-in-one benchtop lasers integrate a laser, output tap monitor, controller, and heat dissipator, providing a convenient and reliable high-power laser source. The control has three options: low-cost constant current mode, and feedback constant output mode (having an output monitor). The unit can generate pulse output via modulating the laser directly (power and duration are settable via USB interface). Moreover, we offer a red-laser integrated fiber output for visual aid as well as a collimator at the fiber end options. A safety interlock is provided at the back. For power below 50W, the unit is cooled with internal fans. For higher power water cooling is required. We further offer matching chiller.

For details please click: https://agiltron.com/product/high-power-fiber-coupled-laser-source-multimode/

Ordering Information (Part Number)

	☐	☐☐☐	☐	☐	☐	☐	☐	☐	☐	☐
Prefix	**Wavelength**	**Power**	**Feedback ***	**Red Laser ****	**Cooling**	**Modulation**	**Fiber Core**	**Fiber Length**	**Connector[1]**	**Collimator *****
HPML-	980nm = 9 880nm = 8 808nm = 7 650nm = 6 532nm = 5 455nm = 4 355nm = 3 967nm = B 915nm = A Special = 0	5W = AA5 8W = AA8 10W = A10 22W = A12 ... 100W = 100 ... 200W = 200 280W = 280 500W = 500	No = 1 Yes = 2	No = 1 Yes = 2	Fan = 1 Water = 2	No = 1 Yes = 2	135µm = 1 200µm = 2 105µm = 5 400µm = 4 Special = 0	0.25m = 1 0.5m = 2 1m = 3 1.5m = 4 2m = 5 Special = 0	No = 1 SMA = 2 Special = 0	No = 1 Yes = 2

* Feedback control automatically maintains a constant laser power $2350

** This option provided visual of the laser spot. $980

*** Collimator selections go to https://agiltron.com/product/high-power-fiber-optic-collimator/

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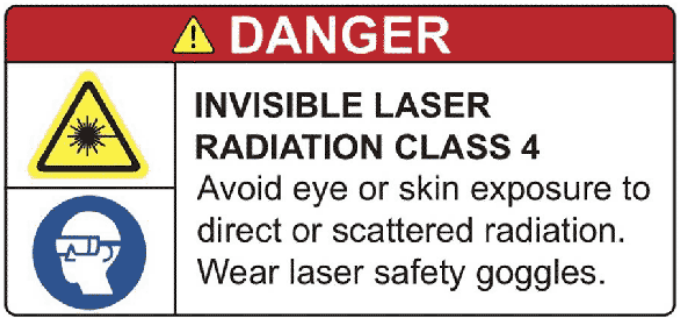
Laser Safety



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

*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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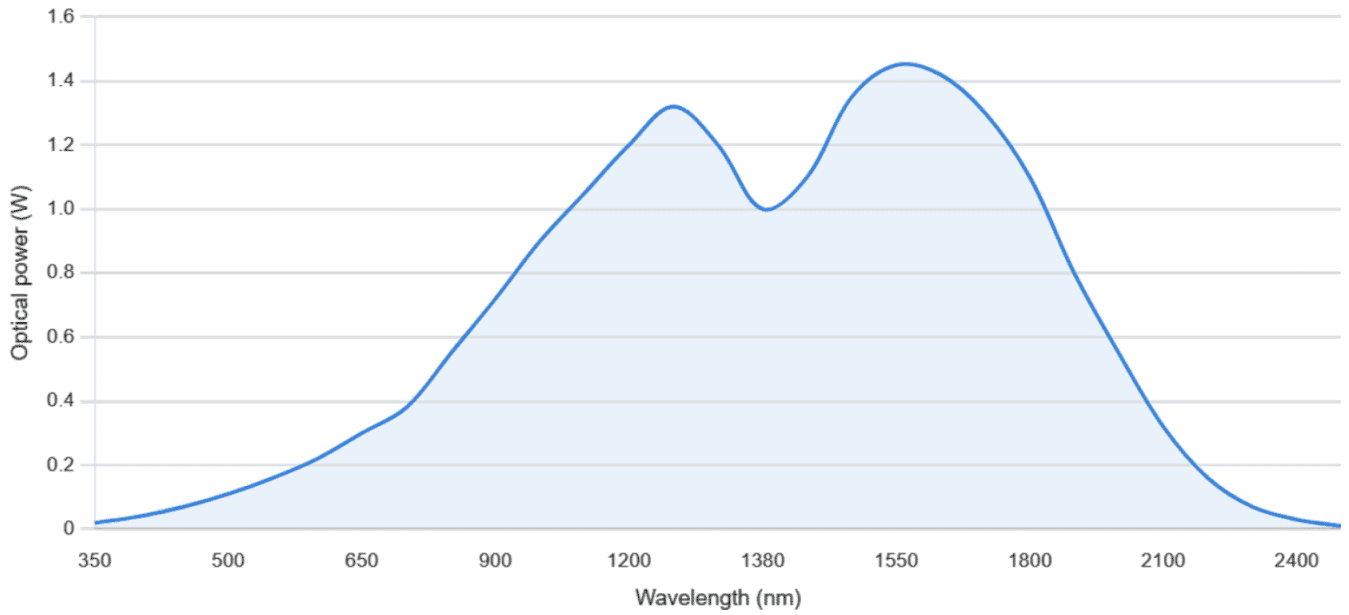
Regular Single Mode / Polarization Maintaining Fiber Optical Power Handing vs Wavelength



Single mode fiber optical power is limited by nonlinear effects in addition to absorption that increase loss and generate heat. The curve shows the approximate safe CW power envelope for standard single-mode fiber. Actual limits depend on fiber design, core size, length, and laser characteristics. Specialty fibers can significantly increase the power limit.

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