

Passive Fiber Mode Scrambler/De-Speckler

No-Speed limitation, Fiber Core 50-400 μm , Wavelength 400 to 2000 nm, 10W



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The PFMS is an all-fiber passive mode homogenizer designed to overcome the modulation speed limitations of mechanical mode scramblers and to operate reliably with high-power pulsed lasers. Leveraging a proprietary patent-pending design, the PFMS incorporates a mode-homogenizing element between two multimode fibers to redistribute the optical field within the fiber core. This passive scrambling process stabilizes the beam profile and suppresses modal interference. In multimode fibers, mode field fluctuations can introduce signal instability, speckle, and modal noise. The PFMS eliminates these effects by delivering a stable, homogeneous output, ensuring accurate and repeatable results. It is ideally suited for applications demanding uniform beam quality without modulation speed limitation, such as life sciences, digital laser projection, interferometry, laser beam homogenization, lithography, metrology, and fiber-based sensor systems. Compact and plug-and-play, the PFMS is engineered for seamless integration into fiber-coupled assemblies, providing robust despeckling and long-term reliability in demanding environments including space deployment.

Features

- High Power
- Low Cost
- High Stability
- High Reliability
- Wide Temperature Operation

Applications

- Test/Measurement
- Sensor Systems
- Instruments

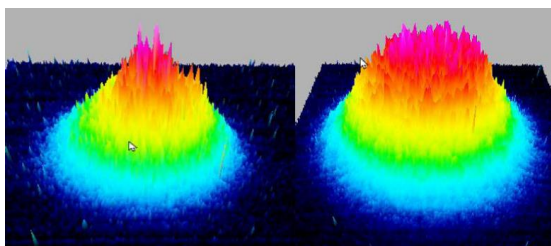
Specifications

Parameter	Min	Typical	Max	Unit
Wavelength	300		2200	nm
Insertion Loss ^[1]	0.5	1	2	dB
Optical Power Handling			10	W
Return Loss	50			dB
Operating Temperature	-20		100	°C
Storage Temperature	-40		85	°C
Fiber Diameter	50		400	μm

Notes:

[1] Without a connector, each connector adds 0.3dB

Beam spot before and after homogenization



■ Without Scrambler

■ With Scrambler

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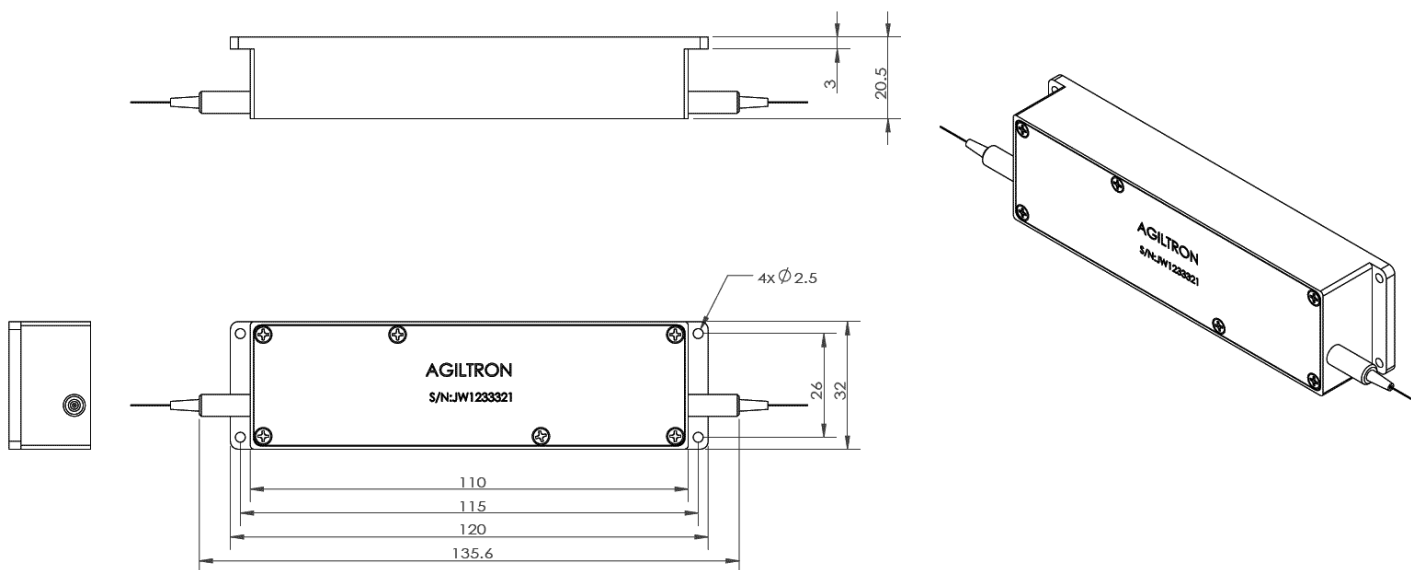
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Mechanical Dimensions (mm)



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

Ordering Information

	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Prefix	Fiber Type	Configuration	Optical Power		Fiber Protection	Fiber Length	Connector
PFMS-	200 μm = 2 400 μm = 4 50/125 Step = A 62.5/125 Step = B Special = 0	Regular = 1 Space = S	< 1W = 1 1W = 2 5W = 5 10W = 9 Special = 0		3mm = 1 Special = 0	0.5m = 5 1.0m = 1 2.0m = 2 Special = 0	None = 1 SMA = 3 Special = 0

Red color for special order