Fiber Compact Collimators Distance Up to 1.2 m

Diameter 6.1 mm, SM, PM, 5 W, 10 W

DATASHEET

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We offer a comprehensive range of miniature fiber optic collimators designed for low loss, high return loss, and high optical power handling of up to 10 W, with no organic materials in the light path. These collimators are integrated into many of our products, and we specialize in delivering custom solutions to meet specific application requirements. Our miniature collimators are optimized for working distances up to 1.2 m. For applications requiring longer working distances, we recommend our High-Power Fiber Optic Collimator. For the 1950 nm band, we uniquely provide lower-loss collimating lenses made with NSF11 glass, reducing coupling loss between a pair of collimators by approximately 0.3 dB compared to standard glass lenses.

Features

- Working Distance Up to 80 mm
- Diameter 1.2 to 3.2 mm
- Low Loss
- High Power
- Long Distance
- Compact

Applications

- Device
- Test
- Special Solution

Specifications

Parameter		Min	Typical	Max	Unit
Insertion Loss [1]	630, 632, 650 ±20nm		0.8	1	dB
	780, 850, 980 ±20nm		0.3	0.4	
	1060, 1220 ±30nm		0.3	0.3	
	1310 - 1600 nm		0.2	0.25	
	1900 - 2400nm		0.4	0.5	
Working Distance		1	5	500	mm
PMD (SMF Switch only)			0.1	0.3	ps
Extinction Ratio (PMF only)		18	25		dB
Return Loss			55	60	dB
Optic power Handling [4]	Normal power version		0.3	0.5	W
	High power version			5, 10	W
Operating Temperature	Standard	–5		+75	°C
	Special version	–40		+85	
Storage Temperature		–45		+100	°C

Notes:

[1]. Measured with a pair and without connectors

RoHS COMPLIANT

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]:

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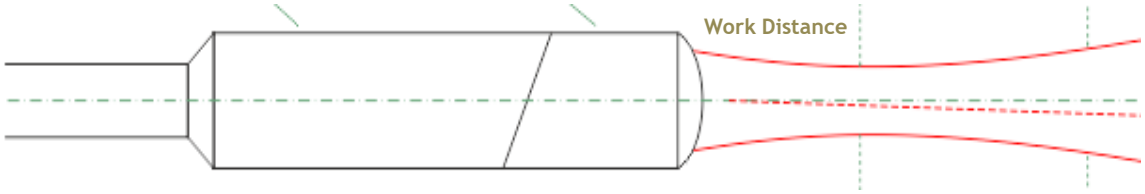
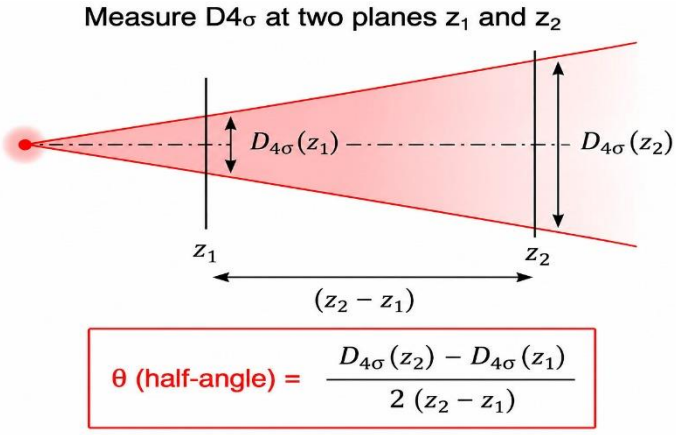
Typical Collimator Beam Profile



Fiber collimators produce parallel output beams, but perfect collimation is theoretically impossible because of fundamental diffraction limits, where the divergence angle $\theta \approx \lambda / \pi D$ depends on the wavelength (λ) and the beam diameter (D). Larger beam diameters yield lower divergence, enabling longer working distances. Practical fiber collimators are therefore optimized for a specific working distance and diffraction-limited beam size, with a typical beam profile shown below. For multimode collimators, performance also depends on the launch mode distribution, so a similar-profile source is used during fabrication and testing to ensure consistency with customer conditions. With more than 20 years of experience, we employ proprietary fiber-end lensing, precision V-groove assemblies, and custom-built metrology tools to manufacture high-performance custom fiber collimators with superior optical characteristics..

Diverging Optical Collimators



For some applications, fiber collimators are required to produce a diverging output beam with a specified divergence half-angle, θ. The divergence angle is commonly characterized using the second-moment (D4σ) beam-divergence method, as illustrated above by measuring the beam diameter at two specified positions. Agiltron produces this type of diverging fiber collimators as special orders.

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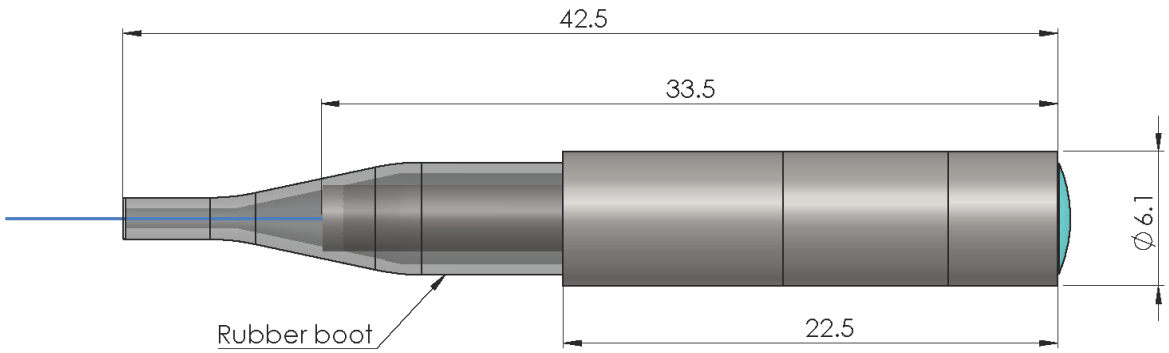
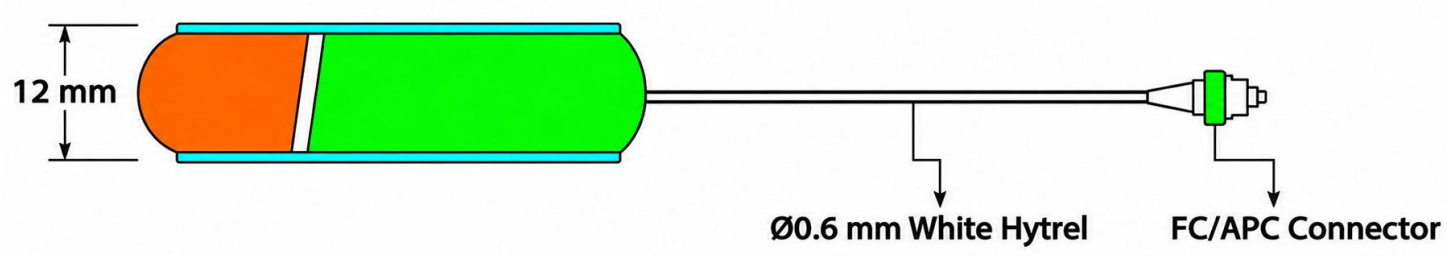
Mechanical Dimensions Standard for beam size <0.8 mm (Unit: mm)



Mechanical Dimensions Standard for beam size 0.6 mm (Unit: mm)



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

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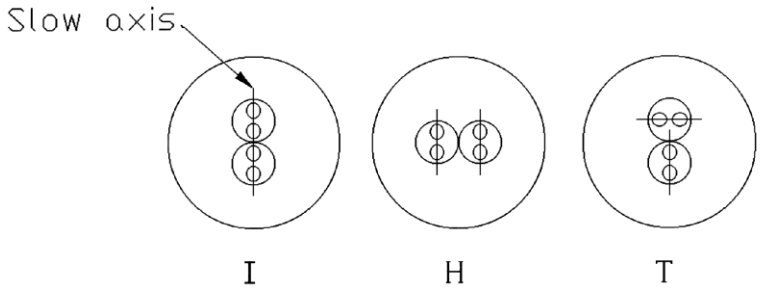
PM Stress Field Orientation



Ordering Information (Part Number)

	☐	☐	☐	☐☐☐	☐☐	☐	☐☐	☐	☐	☐
Prefix	**# Fiber**	**PM Fiber Orientation [1]**	**Wavelength**	**Working Distance (mm) [2]**	**Beam Diameter (mm)**	**Power/ Temperature**	**Fiber Type**	**Fiber Cover**	**Fiber Length**	**Connector [3]**
FCCM-	Single = 1 Dual = 2 Special = 0	N/A = 4 I = 1 H = 2 T = 3 Special = 0	1550 = 5 1060 = 1 2000 = 2 1310 = 3 1480 = 4 1625 = 6 980 = 9 850 = 8 780 = 7 650 = E 550 = F 400 = G 1265~1620 = L Special = 0	1 = 001 10 = 010 20 = 020 30 = 030 40 = 040 50 = 050 60 = 060 80 = 080 100 = 100 120 = 120 Special = 000	2 = 02 3 = 03 5 = 05 6 = 06 7 = 07 8 = 08 9 = 09 10 = 10 11 = 11 Special = 00	0.5W = 1 2W = 2 5W = 5 10W = 6 0.5W/85°C = A 2W/85°C = B 5W/85°C = C 10W/85°C = D	SMF-28 = 01 Special = 00 ***Select Below***	Bare fiber = 1 0.9mm tube = 3 3mm tube = 5 Special = 0	0.25m = 1 0.5m = 2 1.0 m = 3 Special= 0	None = 1 FC/PC = 2 FC/APC = 3 SC/PC = 4 SC/APC = 5 ST/PC = 6 LC/PC = 7 LC/APC = A LC/UPC = U Special = 0

[1]: For single fiber I and H is aligned to slow axis, T to fast axis.

[2]: Customer is a critical parameter in which all the performance can be measured and optimized quantitively.

[3]: 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.

Fiber Type Selection Table:

01	**SMF-28**	34	**PM1550**	71	**MM 50/125µm**
02	**SMF-28e**	35	**PM1950**	72	**MM 62.5µm**
03	**Corning XB**	36	**PM1310**	73	**105/125µm**
04	**SM450**	37	**PM400**	74	**200 µm NA 0.22**
05	**SM1950**	38	**PM480**	75	**400 µm NA 0.22**
06	**SM600**	39	**PM630**	76	**STP 50/125**
07	**Hi780**	40	**PM850**	77	**IRZS23**
08	**SM800**	41	**PM980**	78	**IRFS32**
09	**SM980**	42	**PM780**	79	
10	**Hi1060**	43	**PM350**	80	**PCF**
11	**SM400**	44	**PM405**	81	**UV180nm**
12		45	**PM460**	82	**LMA-PM-10**
13		46			

Warning: An Optical Collimator need to have a working distance stated by the customer at the time of order. The optical parameters only tested at the working distance.

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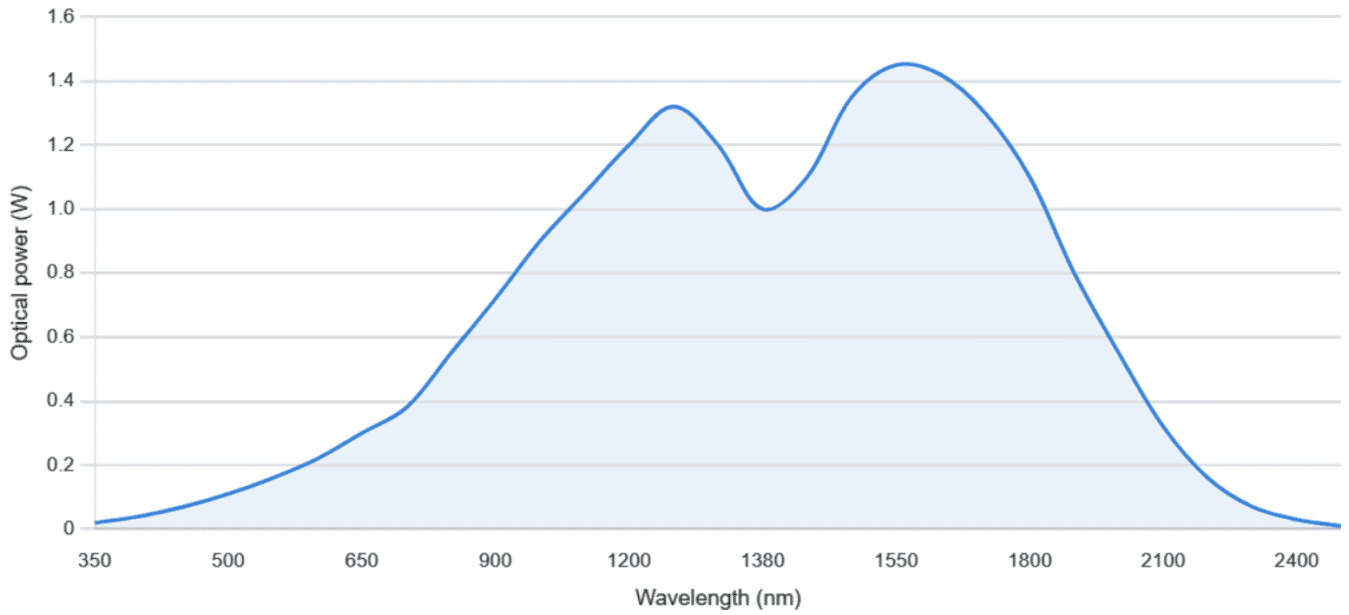
Regular Single Mode / Polarization Maintaining Fiber Optical Power Handing vs Wavelength



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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