

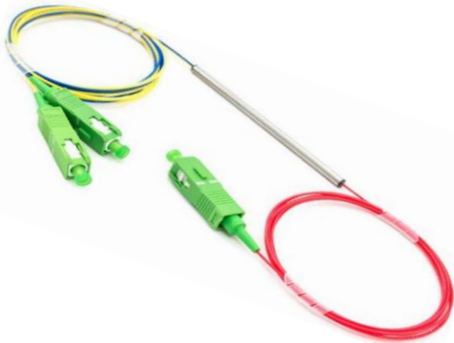
Double-Clad Fiber Coupler/Splitter 430nm to 1550nm

(efficient collecting back reflection lights)



DATASHEET

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Features

- Single Mode Core Guide
- Multimode Reflection Guide
- Low Loss Transmission
- High Efficient Collection
- Versatile

Applications

- LiDAR
- OCT
- Fluorescence Imagine
- Confocal Microscopy
- Endoscopy



Agiltron's double-clad 2x2 fiber coupler is made by fusing a large core fiber (200 μm) to the outer cladding layer of a double-clad fiber (single mode core surrounded by an inner cladding and an outer thick cladding). Light in the double-clad fiber's (DCF) single-mode core propagates through the coupler with little loss. While the reflected lights are collected mainly by the thick outer cladding of the DCF and transferred to the 200 μm large core output fiber with $\geq 60\%$ coupling efficiency. It forms a miniature fiber optical sensor head for various applications.

Couplers are highly efficient in splitting light with little loss, about 0.2dB per joint, but incur significant losses when combining lights; for example, a 50/50 coupler produces a 50% loss to each beam when combined. For beam-combining applications, search Combiner.

Specifications

Parameter	Min	Typical	Max	Unit
Operation Wavelength	1260		1550	nm
	960		1260	
	430		680	
Single Mode Core Insertion Loss ^[1]		0.3	0.6	dB
Multimode Inner Cladding Transfer ^[2]		60	70	%
Optical Power Handling	1260-1550		500	mW
	960-1260		100	
	430-680		50	
Core Diameter	1260-1550 (NA 0.12) ^[3]	9		μm
	960-1260 (NA 0.19) ^[4]	4		
	430-680 (NA 0.11) ^[5]	3		
Inner Cladding Diameter	1260-1550 (NA 0.12) ^[3]	105		μm
	960-1260 (NA 0.24) ^[4]	102		
	430-680 (NA 0.19) ^[5]	15		
Collection Fiber Diameter (NA=0.26)		200		μm
Operating Temperature	-40		70	$^{\circ}\text{C}$
Storage Temperature	-40		85	$^{\circ}\text{C}$

Notes:

- [1]. Exclude connectors and fiber loss, the loss may degrade over time due to shortwave radiation
- [2]. Port 2 to 3. Exclude connectors and the water absorption region around 1383 nm
- [3]. Fiber Type - DCF13
- [4]. Fiber Type - DC1060

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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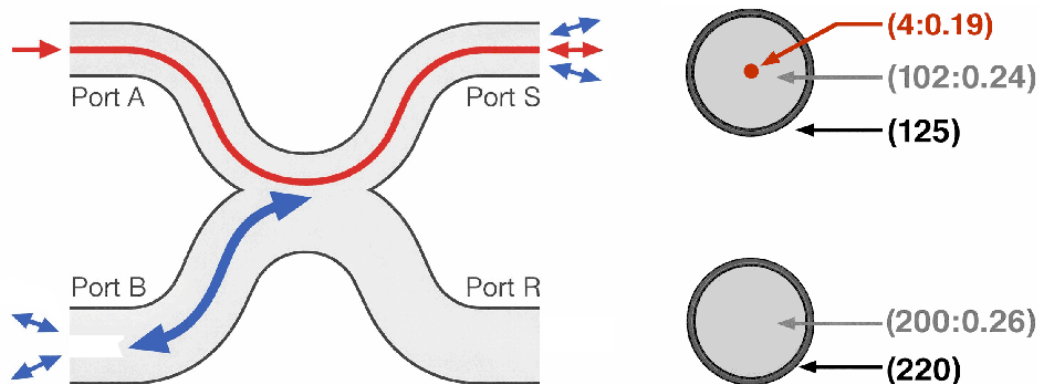
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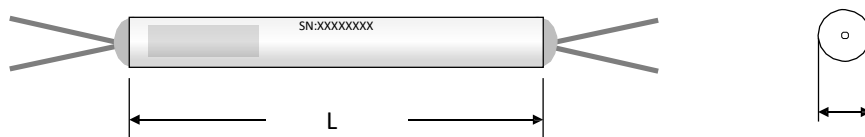


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Function Diagram



Device Dimension



L: 60mm for 250 μ m fiber
L: 76mm for 900 μ m fiber

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Ordering Information (Part Number)

	☐	2	☐ ☐	☐	☐	☐	☐	☐
Prefix	Center Wavelength	Collect Fiber	Double Cladding	Pigtail Style	Fiber Length	Connector Input ^[1]	Connector Output ^[1]	Connector Signal ^[1]
DCFC-	1060 = 1 1310 = 3 780 = 7 1550 = 5 Special = 0	200 μ m NA = 0.22 Special = 0	DCF 13 = 13 DCF 1060 = 10 Special = 00	900um Jacket = 2 Special = 0	0.25m = 1 0.5m = 2 1.0m = 3 Special = 0	None = 1 FC/PC = 2 FC/APC = 3	None = 1 FC/PC = 2 FC/APC = 3 SMA = 4	None = 1 FC/PC = 2 FC/APC = 3 SMA = 4

[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.

Application Notes

Fiber Core Alignment

Note that the minimum attenuation for these devices depends on excellent core-to-core alignment when the connectors are mated. This is crucial for shorter wavelengths with smaller fiber core diameters that can increase the loss of many decibels above the specification if they are not perfectly aligned. Different vendors' connectors may not mate well with each other, especially for angled APC.

Fiber Cleanliness

Fibers with smaller core diameters (<5 μ m) must be kept extremely clean, contamination at fiber-fiber interfaces, combined with the high optical power density, can lead to significant optical damage. This type of damage usually requires re-polishing or replacement of the connector.

Maximum Optical Input Power

Due to their small fiber core diameters for short wavelength and high photon energies, the damage thresholds for device is substantially reduced than the common 1550nm fiber. To avoid damage to the exposed fiber end faces and internal components, the optical input power should never exceed 20 mW for wavelengths shorter 650nm. We produce a special version to increase the how handling by expanding the core side at the fiber ends.

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