

1310/1550 nm Three Stage Optical Circulator

(patent pending)



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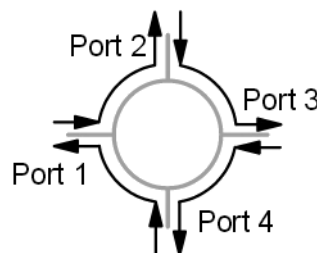
Features

- Low Insertion Loss
- Low PDL
- High Channel Isolation
- Compact Package
- High Reliability & Stability
- Cost Effective

Applications

- Optical Fiber Amplifier
- Metropolitan Area Network
- Fiber Optic Sensor
- Dispersion Compensation
- Test and Measurement
- Instrumentation

The OC Series 1310/1550 PM Optical Circulator is a non-reciprocal device that maintains polarization while redirecting light at 1310/1550 nm from port-to-port in only one direction while minimizing back reflection and back scattering in the reverse direction. Employing Agiltron's advanced micro optics design, it features low insertion loss, high extinction ratio, high isolation, compact package, and high stability. The excellent characteristics of this product make it an ideal choice for application in fiber amplifier systems, pump lasers, and optical fiber sensors.



Specifications

Parameter		Min	Typical	Max	Unit
Operating Wavelength	1310		1295 ~ 1325		nm
	C Band		1530 ~ 1565		
	L Band		1570 ~ 1610		
	C + L		1525 ~ 1610		
Insertion Loss ^[1]	3- Port		0.8	1.0	dB
	C + L		0.9	1.2	dB
	4-Port		0.9	1.2	dB
Isolation (2→1, 3→2, or 4→3) ^[2]	3- Port		48		dB
	C + L		40		dB
	4-Port		48		dB
Directivity (1→3 or 2→4)			> 50		dB
Polarization Dependent Loss	3- Port		< 0.15		dB
	4-Port		< 2.0		dB
Polarization Mode Dispersion			< 0.1		ps
Return Loss ^[1]			> 50		dB
Optical Power Handling			< 500		mW
Operating Temperature Range		0		+75	°C
Storage Temperature		-40		+85	°C
Fiber Type			Corning SMF-28		
Fiber Length			> 1		m

Notes:

[1]. Excluding connectors

[2]. @ λ_{op} , Top, SOP

Note: For a polarized input light version, the isolation is optimized to block the light reflection of the same polarization. Although lights of other polarizations may also be blocked, the extinction may be poor. PM isolators can be specially made to block backward propagating lights of all polarizations. PM isolators can also be made with a light polarizing function.

Warning: This is an OEM module designed for system integration. Do not touch the PCB by hand. The electrical static can kill the chips even without a power plug-in. Unpleasant electrical shock may also be felt. For laboratory use, please buy a Turnkey system.

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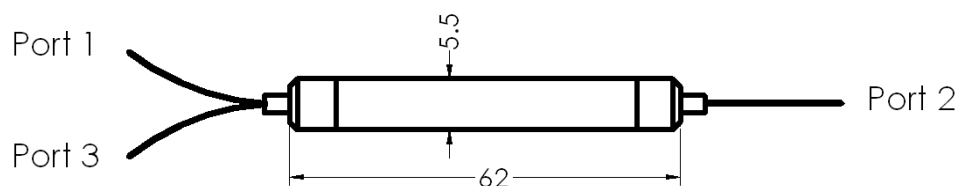
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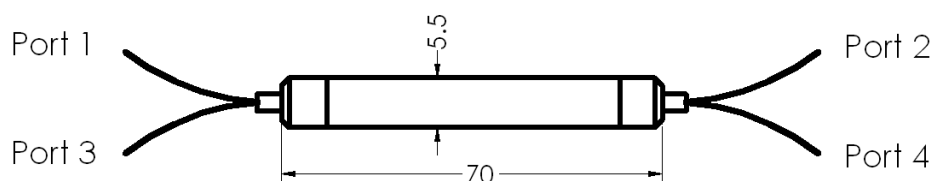
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Mechanical Dimensions (mm)

3-Port Circulator



4-Port Circulator



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

Ordering Information (Part Number)

Prefix	Type	Wavelength	Grade	Package Type	Fiber Type	Fiber Cover	Fiber Length	Connector ^[1]
OCPI-	3 Port = 33 4 Port = 43 Special = 00	1310 = 3 1550 = 5 C Band = C L Band = L C+L = 2 Special = 0	Standard = 1 Special = 0	5.5 x 62 = 1 5.5 x 70 = 2 Special = 0	SMF-28 = 1 Special = 0	Bare fiber = 1 900um loose tube = 3 Special = 0	0.25m = 1 0.5 m = 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]. 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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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 ($<5 \mu\text{m}$) 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 handling by expanding the core side at the fiber ends.

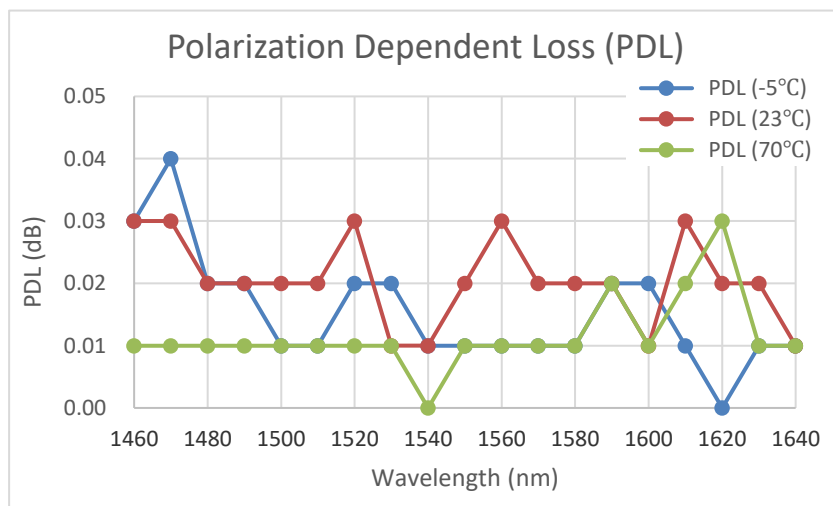
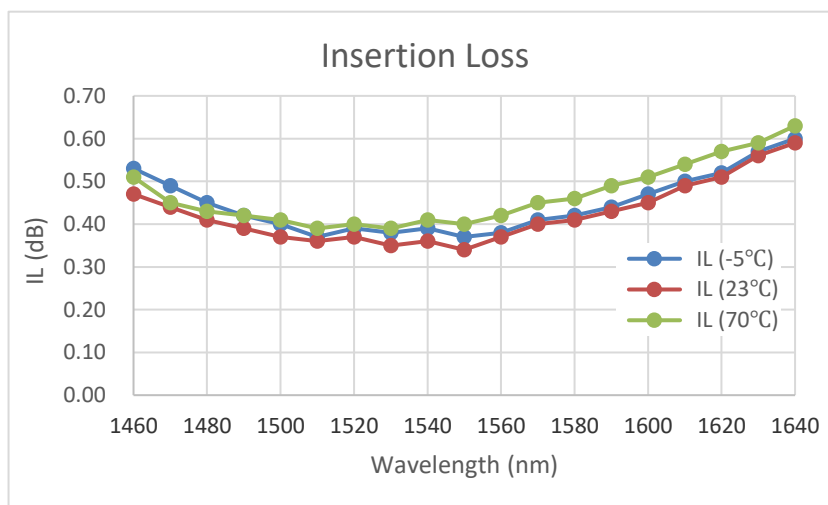
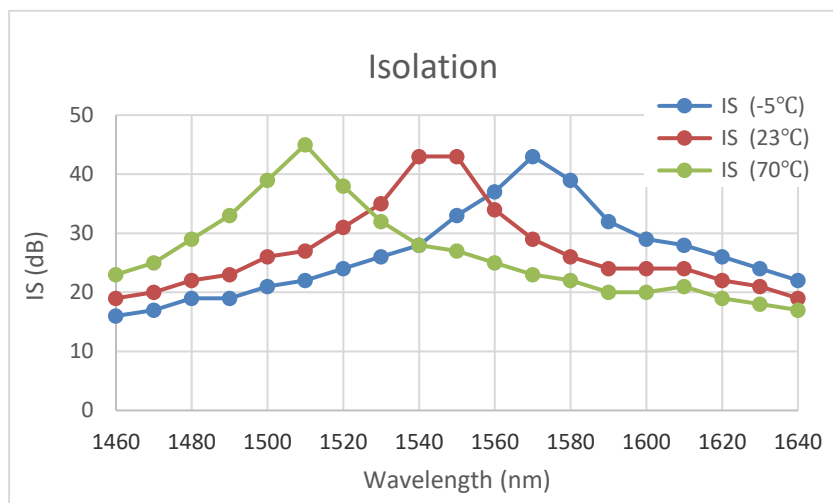
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Typical Wavelength Dependence for Single Stage



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Typical Wavelength Dependence for Dual Stage

