

# Fiber Optical Circulator

1310nm, 1550 nm



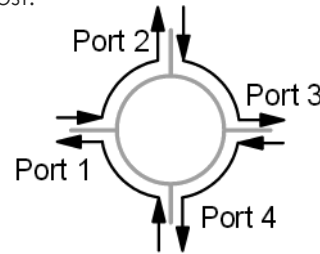
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The OC Series 1310/1550 Optical Circulators are non-reciprocal devices that redirect light at 1310/1550 nm from port-to-port in only one direction while minimizing back reflection and back scattering in the reverse directions for any state of polarization. Employing Agiltron's advanced micro optics design, it features low insertion loss, low polarization sensitivity, high isolation, compact structure, and high stability. The excellent characteristics of this product make it an ideal choice for application in fiber amplifier systems, pump laser diodes, and optical fiber sensors.

It is possible to produce a circulator with complete circulation at an exceptionally high cost.



## 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

## Specifications

OC Series 1310/1550 Circulator		Specifications			Unit
Operating Wavelength	1310	1295 ~ 1325			nm
	C Band	1530 ~ 1570			nm
	L Band	1570 ~ 1610			nm
	C + L	1525 ~ 1610			nm
Type		3- Port		4- Port	
		1310	C, L	C + L	1310, C, L
Insertion Loss <sup>[1]</sup>	Typical	0.6	0.7	0.7	dB
	Maximum	0.9	1.0	1.0	dB
Isolation (2@1, 3@2, or 4@3) <sup>[2]</sup>		36	30	36	dB
Directivity (1@3 or 2@4)		> 50			dB
Polarization Dependent Loss		< 0.10		< 0.15	dB
Polarization Mode Dispersion		< 0.1			Ps
Return Loss <sup>1</sup>		> 50			dB
Optical Power Handling		< 500			mW
Operating Temperature Range		0 ~ 70			°C
Storage Temperature		-40 ~ 85			°C
Fiber Type		Corning SMF-28			
Fiber Length		> 1			m
Package Dimension		Φ5.5x 58.0(L)		Φ5.5x 65.0(L)	mm

### Notes:

- [1] Excluding connectors
- [2] @λop, 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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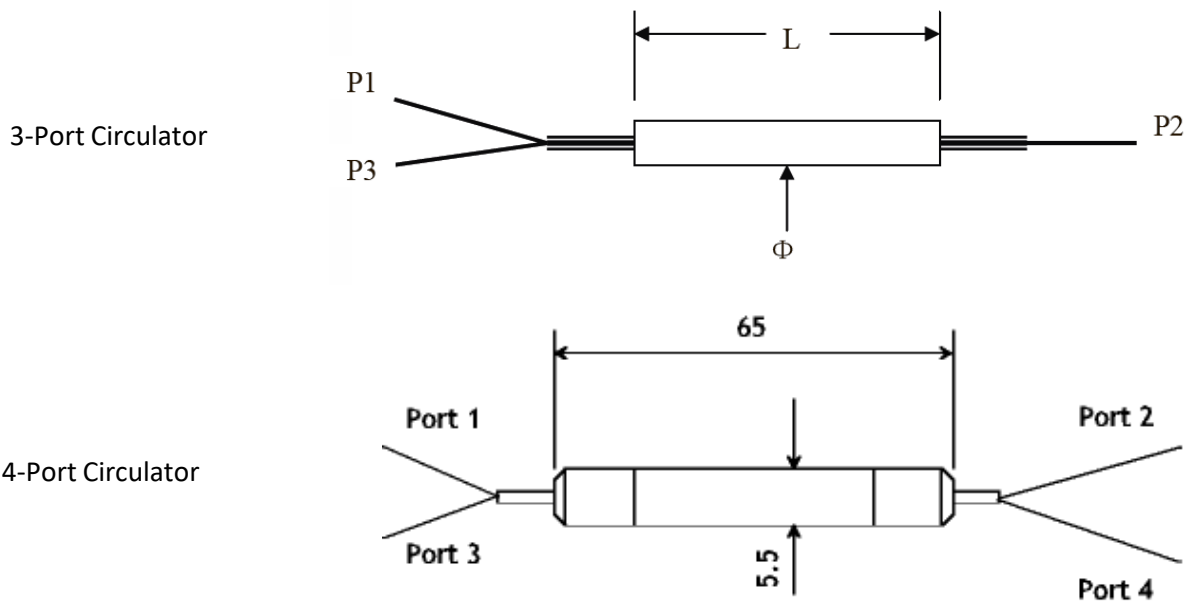
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### Mechanical Dimensions (mm)



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

### Loose Tube Color Key

- Port 1 = red 900 μm loose tube
- Port 2 = blue 900 μm loose tube
- Port 3 = white 900 μm loose tube

### Ordering Information (Part Number)

Prefix	Type	Wavelength	Grade	Package Type	Fiber Type	Fiber Cover	Fiber Length	Connector <sup>[3]</sup>
OCPI-	3 Port = 30 4 Port Partial <sup>[1]</sup> = 40 4 Port Full <sup>[2]</sup> = 44 Special = 00	1525~1610 nm = 2 1295~1325 nm = 3 1530~1570 nm = 5 1570~1610 nm = L	Standard = 1 Special = 2	5.5 x 58 = 1 3.8 x 45 = M 3.8 x 30 = N 5.5 x 38 = 3 5.5 x 65 = 2 Special = 0	SMF-28 = 1 Special = 0	Bare fiber = 1 900um loose tube = 3 Special = 0	0.25m = 1 0.5m = 2 1.0m = 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]. 4 Port Partial – 1 to 2, 2 to 3, and 3 to 4.

[2]. 4 Port Full – 1 to 2, 2 to 3 3 to 4, and 4 to 1

[3]. The connector cannot be installed directly onto bare fiber, as it 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 can remove this protective tube after testing. The optical power handling of a standard connector is less than 0.5 W for SM28 fiber and decreases further with 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 how handling by expanding the core side at the fiber ends.

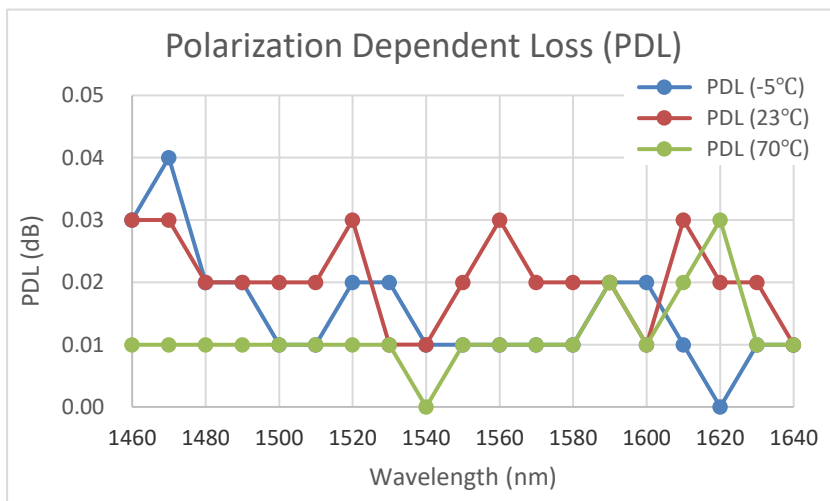
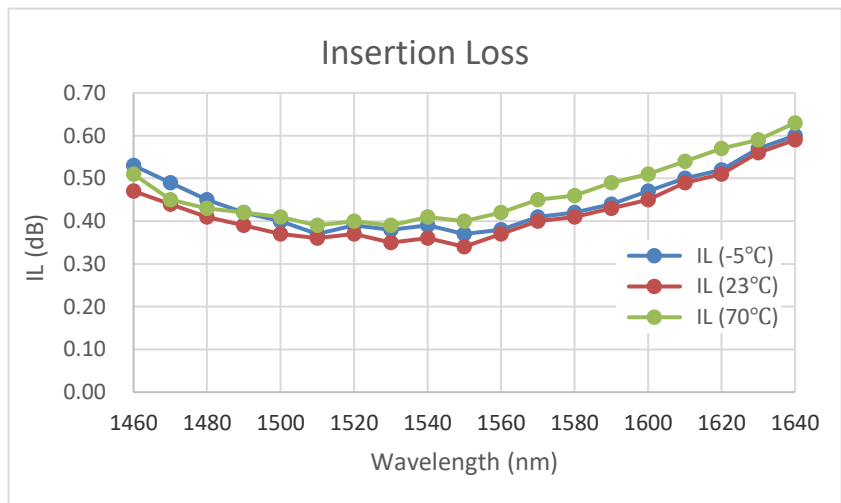
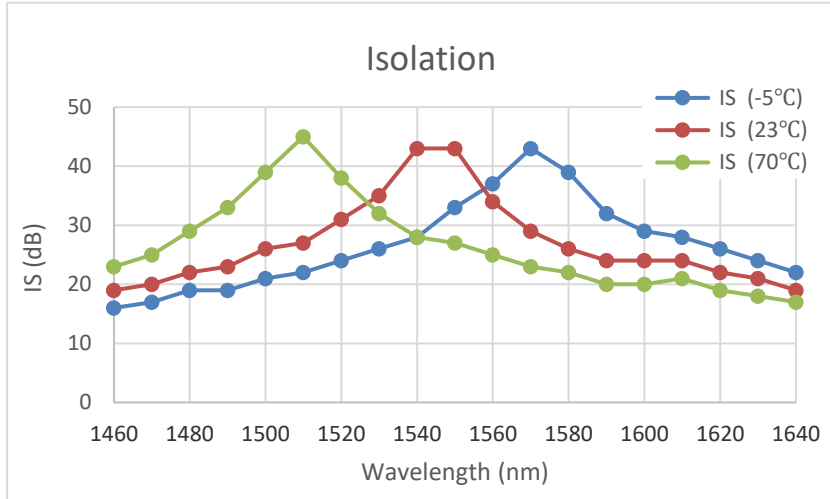
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### Typical Wavelength Dependence for Single Stage



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### Typical Wavelength Dependence for Dual Stage

