

Free Space Optical Isolator

(405-1060nm, 2mm to 40mm apertures, TGG Crystal)



DATASHEET

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Features

- Low Insertion Loss
- High Isolation
- High Stability
- High Reliability
- Cost Effective

Applications

- Optic Sensor
- Laser Systems
- Test and Measurement
- Instrumentation

The OITG Series Free-Space Optical Isolator is a unidirectional light valve designed to transmit light in the forward direction while blocking back-reflection and back-scattering in the reverse direction, ensuring effective protection of laser sources from destabilizing feedback or damage. Each isolator uses high-quality TGG Faraday crystals with low loss and high optical-power tolerance, making them ideal for demanding applications. The OITG family is available with a range of options, including mounted polarizers, peak-wavelength tuning configurations, and integrated tap monitors for feedback control. Adding polarizers enhances isolation by removing unwanted polarization components. For high-power systems, fused-silica PBS cubes are used, while thin-film PolaCore elements support low-power and compact configurations. An optional waveplate allows users to tune the peak isolation wavelength by rotation and fixation. Agiltron also offers customized design solutions to meet application-specific requirements, ensuring optimal performance and flexibility. The TGG optical-damage thresholds for both 1060 nm and 532 nm are provided so customers can determine the required beam diameter for safe operation and select isolators with matching apertures. We also provide beam-expansion and re-collimation collimators, and for extreme power handling we offer broadband kW-class isolators engineered to eliminate thermal-lensing effects.

Specifications

Parameter		Min	Typical	Max	Unit
Center Wavelength		450		1060	nm
Insertion Loss			0.3	0.6	dB
Wavelength Dependent Loss				0.2	dB
Isolation Single Stage		25	35	38	dB
Isolation Double Stage		40	45	55	dB
Optical Aperture Ø		2	5	40	mm
Pulse Damage Threshold @10ns	1060nm	3.5		5	J/cm ²
	532nm	8		12	J/cm ²
CW Damage Threshold	1060nm	200		400	W/cm ²
	532nm	100		150	W/cm ²
Operating Temperature		-10		45	°C
Polarizer Type		Horizontal			
Polarizer Type		PBS Cube, Polacore			

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.



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Free Space Optical Isolator

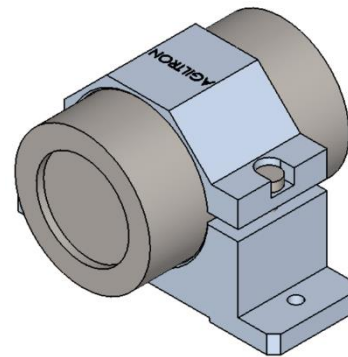
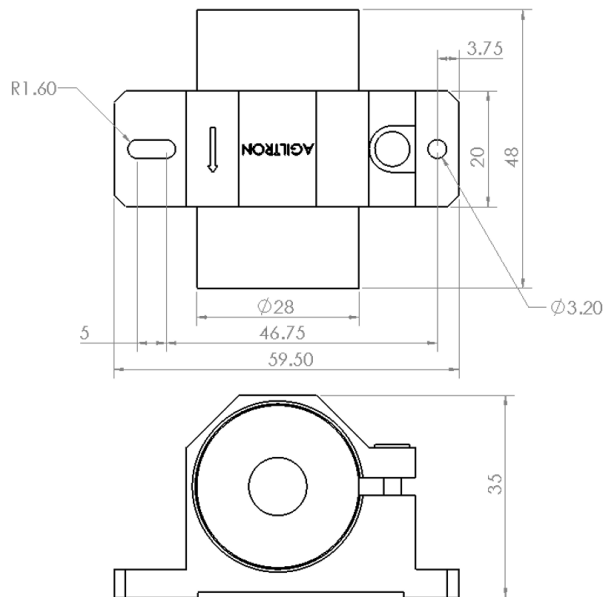
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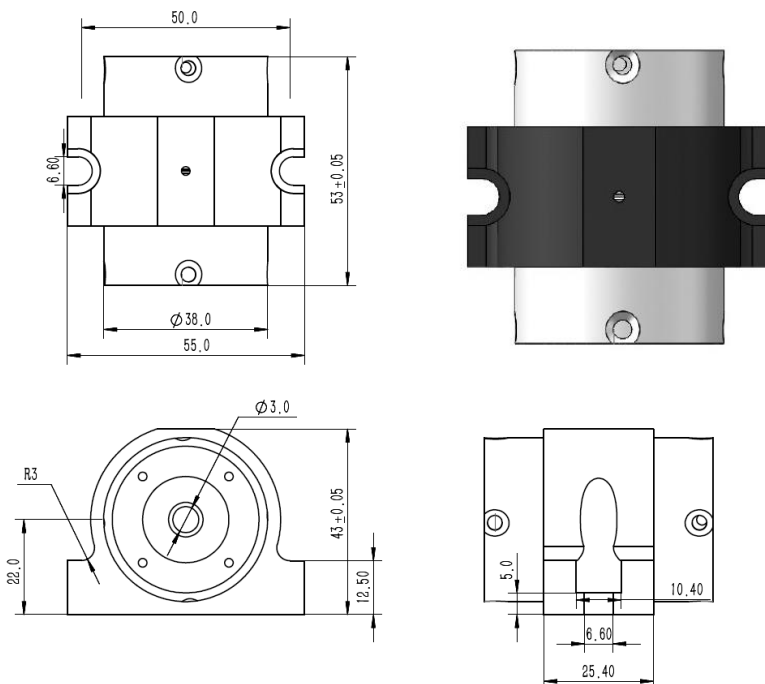
Mechanical Dimensions (mm) – Single Stage

■ 850-1060nm 2mm Aperture



Note: The listed dimensions are for using thin polacore, for PBS version both ends add about 5mm extrusions

■ 850-1060nm 3/5 mm Aperture



Polarizer Type: High Power(HP)
Transmission@1020-1060nm >92%
Clear Aperture: 3mm/5mm
Optical Rotation: 45.5°
Damage Threshold: 10J/cm²@10ns

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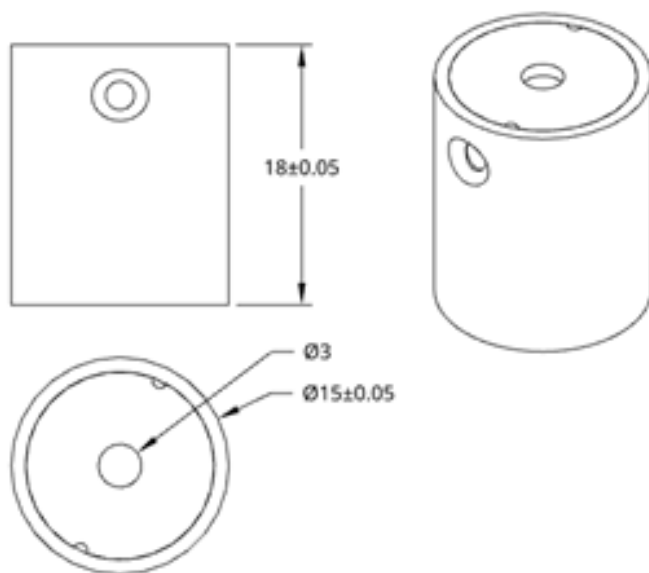
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Mechanical Dimensions (mm)

- <5300nm 3/mm Aperture without polarizers



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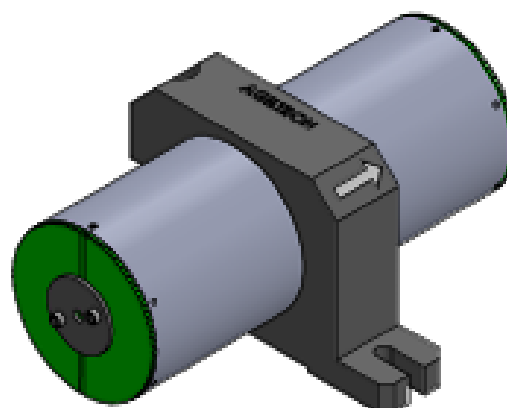
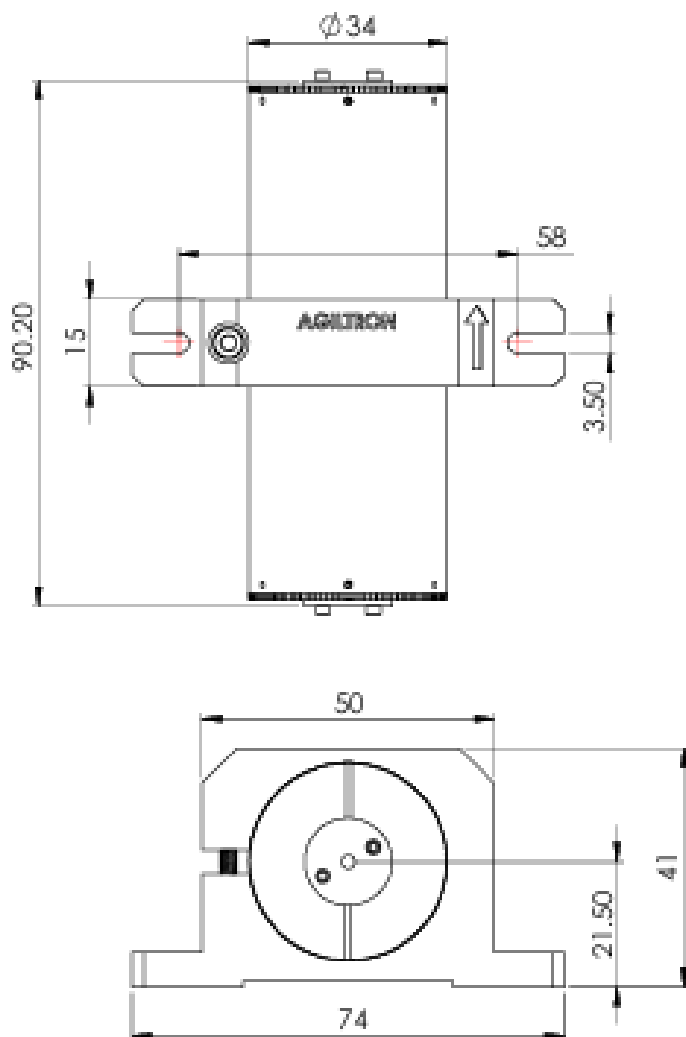
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Mechanical Dimensions (mm)

- 780/850nm dual stage free space isolator.



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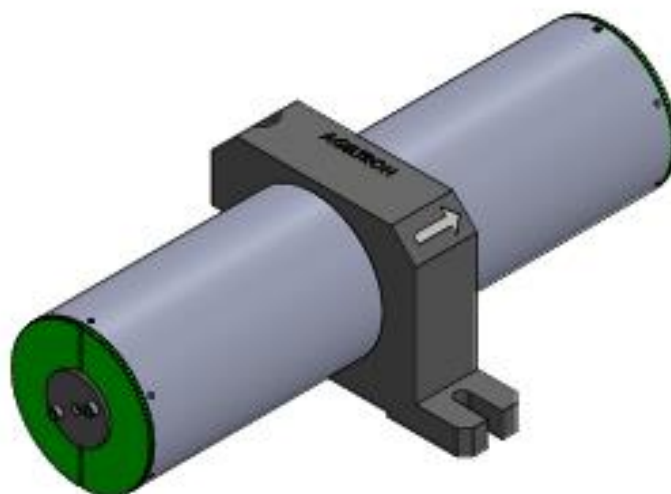
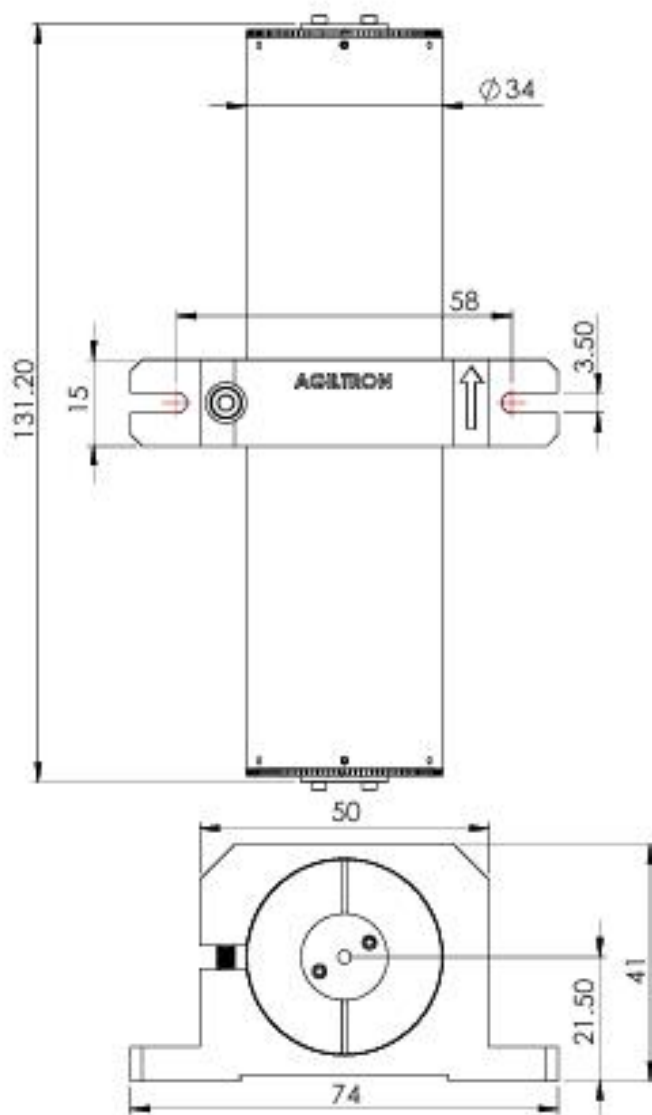
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Mechanical Dimensions (mm)

- 1060nm dual stage free space isolator.



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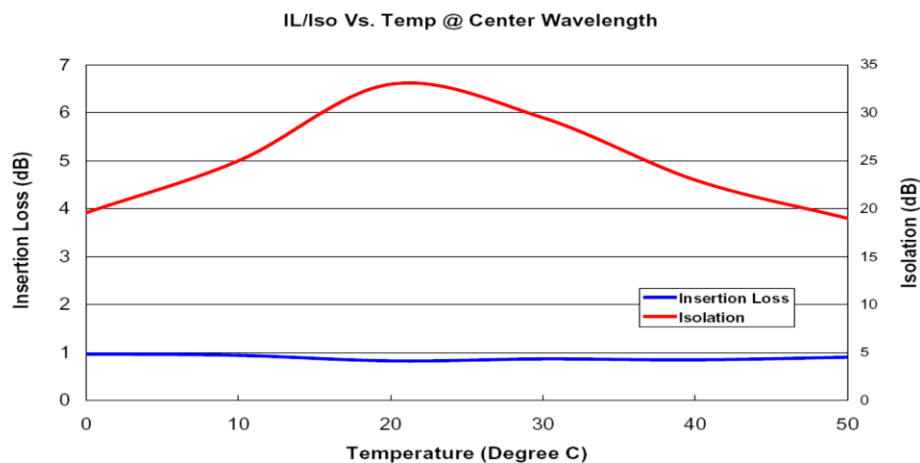
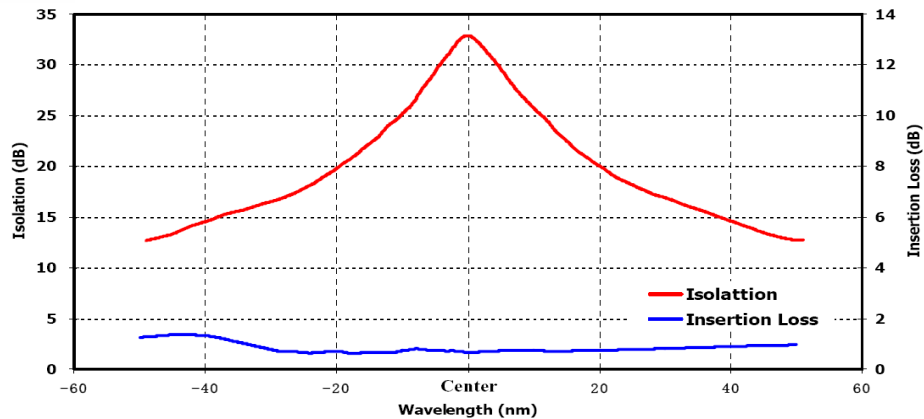
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Optical Performance (Single Stage)



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Ordering Information (Part Number)

	☐	☐ ☐	☐	☐	☐	1	☐	☐
Prefix	Type	Wavelength (nm)	Isolation Stage	Aperture	Power Handling	Waveplate Rotation ^[1]	Mounting Plate	Polarizer
OITG-	Free Space = 1 Special = 0	1060 = 16 1050 = 15 1030 = 13 980 = 98 940 = 94 895 = 89 850 = 85 830 = 83 780 = 78 633 = 63 660 = 66 670 = 67 593 = 59 589 = 58 561 = 57 560 = 56 532 = 53 495 = 49 493 = 4A 488 = 48 473 = 47 457 = 45 440 = 44 420 = 42 405 = 40	Single = 1 Double = 2 Special = 0	1.5mm = P 2mm = 1 3mm = 2 4mm = 4 5mm = 5 8mm = 8 10mm = A 25mm = B 40mm = C	0.2W = 1 1W = 2 5W = 5 10W = 6 15W = 7 Special = 0	Yes = 1	None = 2 Yes = 1	None = 1 One Cube = 2 Two Cube = 3 One Polacore = 4 Two Polacore = 5

[1]. For peak wavelength tuning

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