Electro-Optics Technology, Inc.

Faraday Rotators & Isolators
1525 nm to 1575 nm

Innovative High Quality Laser Solutions

EOT's 1525 nm to 1575 nm Faraday devices rotate the plane of polarized light 45° in the forward direction and an additional 45° of non-reciprocal rotation in the reverse direction while maintaining the light's linear polarization. An optical isolator shields lasers from destabilizing and potentially destructive back-reflected light from interfaces on downstream optics or back-scattered ASE from optical amplifiers.

Based on high Verdet constant, low absorption coefficient rotating material, and developed to work with up to 20 W of average input power in the 1525 nm to 1575 nm wavelength range, these EOT devices provide the ultimate protection for polarized lasers.

FEATURES

- Completely passive; no tuning required
- All isolators contain escape ports; all rejected beams are deflected at 90°.

OPTIONS

- Optional waveplate for manipulation of polarization
- Customization available

APPLICATIONS

- Mapping
- LIDAR
- Medical & Biosciences
- Chirped Pulsed Amplification (CPA)

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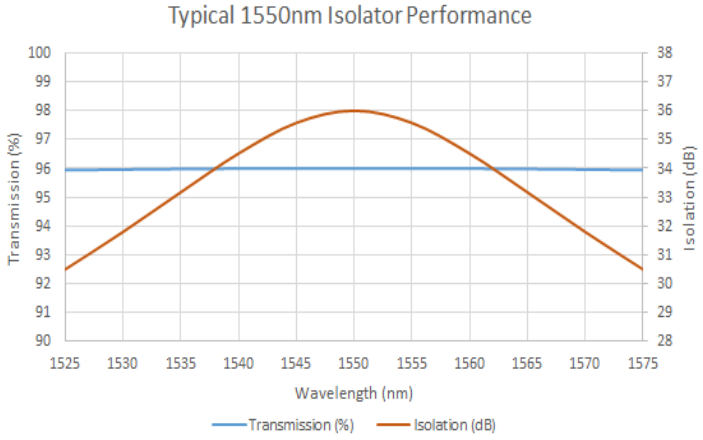
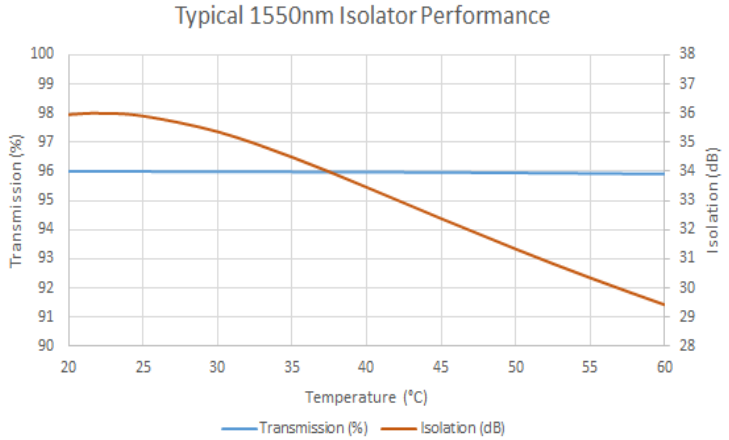
SPECIFICATIONS

	Rotator	Isolator[a]
Clear Aperture	4 mm	4 mm
Transmission at 22 °C	≥92%	≥92%
Isolation at 22 °C	N/A	>30 dB
Pulsed Damage Threshold	1 J/cm^2 at 10 ns	1 J/cm^2 at 10 ns
Power Handling	20 W	20 W

Product specifications are typical and subject to change. All products are RoHS compliant.
[a] Escape ports should be used if rejected light is >1 W or 0.15 J/cm^2 at 10 ns. All stray beams should be properly terminated.
NOTE: Return loss-free working distance ≥ 25 mm for a collimated beam





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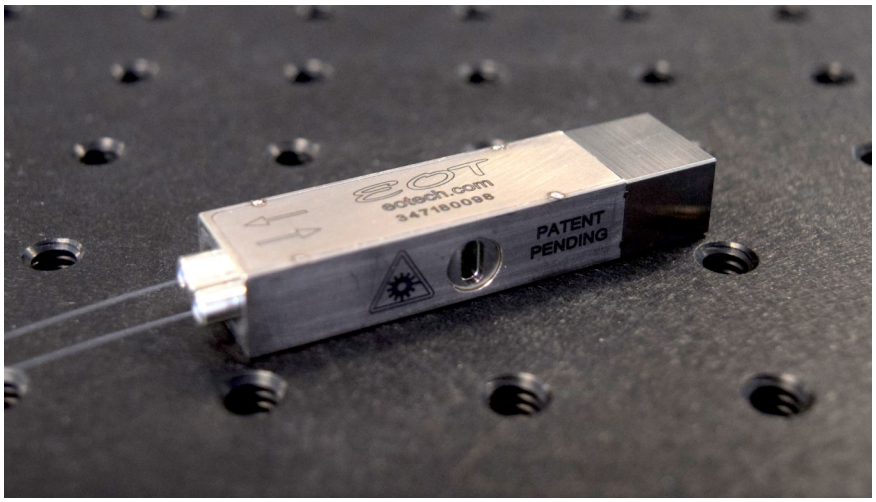
Innovative High Quality Laser Solutions

30 W Fiber-to-Fiber

Polarization Maintaining Broadband Isolators



FEATURES

- Broadband Isolation
- Window for rejected beams
- Same Face Fiber Input/ Output
- Small size, Lightweight (26 g)
- Low stray magnetic fields

OPTIONS

- Performance optimized for customer operating conditions
- Integrated bandpass filter for ASE suppression

EOT's 30 W Fiber-to-Fiber isolators are compact in size, light in weight, and employ EOT's proprietary Fiber Fuse End Cap Technology assuring high levels of reliability and resistance to damage. They also have a wide spectral range providing good isolation over the complete Yb^{+3} gain bandwidth. Because the input and output of these isolators are on the same end, they consume less space in a laser system. They can be easily placed in corners or other locations within a laser system where isolators having fiber on the input and output would not be practical. These isolators are ideally suited for separating amplifier stages in MOPA fiber lasers. They are designed for only CW fiber lasers. Additionally, these isolators are available with ASE filters.

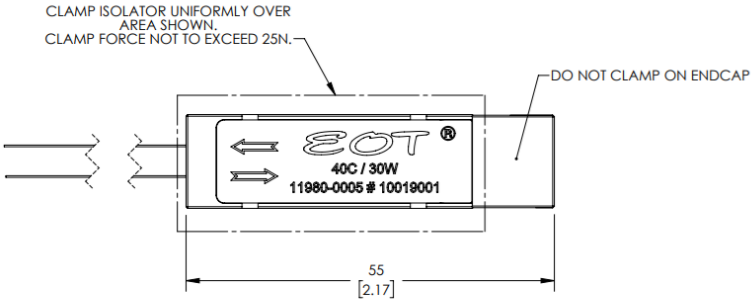
Electro-Optics Technology, Inc.

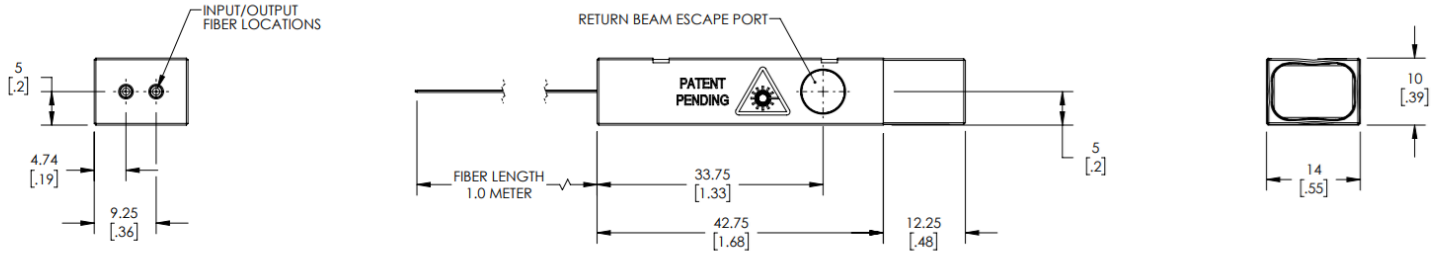
Innovative High Quality Laser Solutions

SPECIFICATIONS

Polarization Maintaining							
	No ASE			With ASE			Comments
	Min.	Typical	Max.	Min.	Typical	Max.	
Center Design Wavelengths & Bandwidths of Broadband Operation	1030 nm	1064 nm	1080 nm	1030 nm; ASE Filter Bandpass: 1063 nm	1064 nm	1080 nm; ASE Filter Bandpass: 1065 nm	Other center wavelengths available upon request
Operating Temperature Range[a]	15 °C	25 °C	35 °C	15 °C	25 °C	35 °C	
Insertion Loss within Operating Wavelength	–1.0 dB	–0.6 dB		–1.1 dB			At operating heat sink temp. and power
Insertion Loss within Operating Wavelength over Operating Range	–1.2 dB			–1.3 dB			Over operating temp. range and forward power range
Broadband Isolation within Operating Wavelength at		–35 dB	–27 dB		–35 dB	–27 dB	At operating heat sink temp. and forward power
Broadband Isolation within Operating Wavelength over Operating Range			–24 dB			–24 dB	Over operating temp. range and forward power range
Return Loss (forward or reverse)		–50 dB	–48 dB		–50 dB	–48 dB	
Fiber Type	Double-clad Fiber						Or as specified by customer
Forward Power	0 W	25 W	30 W	0 W	25 W	30 W	
Reverse Power	0 W		4 W	0 W		4 W	

[a] Custom operating temperature and operating forward power contingent upon EOT approval.





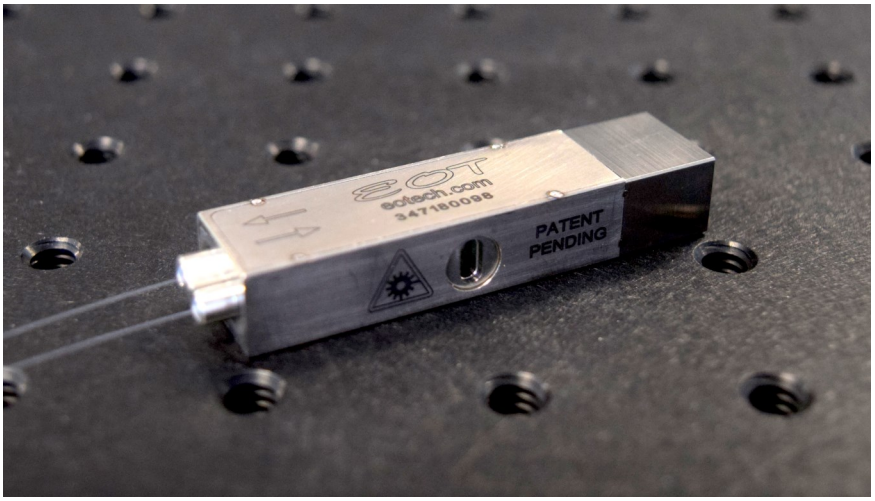
For questions or quotations please email or call our sales representatives at SALES@EOTECH.COM or +1.231.935.4044.

Electro-Optics Technology, Inc.

Innovative High Quality Laser Solutions

40 W Fiber-to-Fiber

Polarization Insensitive Broadband Isolators



FEATURES

- Broadband Isolation
- Window for rejected beams
- Same Face Fiber Input/ Output
- Small size, Lightweight (28 g)
- Low stray magnetic fields

OPTIONS

- Pulsed or Continuous Operation
- Performance optimized for customer operating conditions
- Integrated bandpass filter for ASE suppression

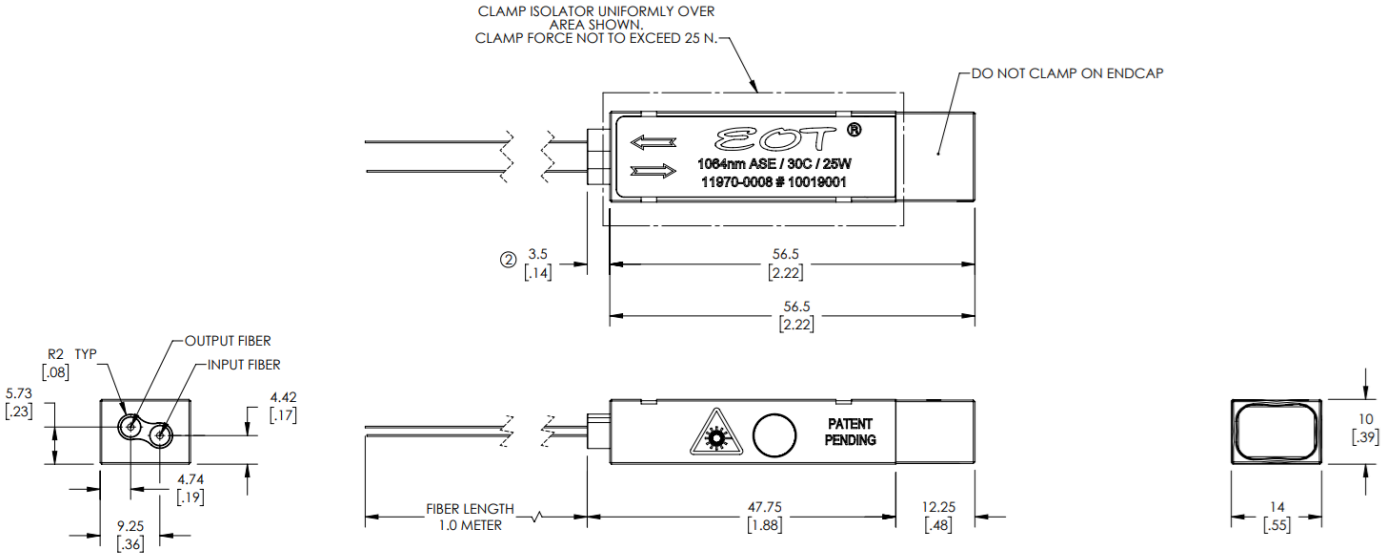
EOT's 40 W Fiber-to-Fiber isolators are compact in size, light in weight, and employ EOT's proprietary Fiber Fuse End Cap Technology assuring high levels of reliability and resistance to damage. They also have a wide spectral range providing good isolation over the complete Yb^{+3} gain bandwidth. Because the input and output of these isolators are on the same end, they consume less space in a laser system. They can be easily placed in corners or other locations within a laser system where isolators having fiber on the input and output would not be practical. These isolators are ideally suited for separating amplifier stages in MOPA fiber lasers. They are designed for both CW and pulsed fiber lasers. Additionally, these isolators are available with ASE filters.

Electro-Optics Technology, Inc.

Innovative High Quality Laser Solutions

SPECIFICATIONS

Polarization Insensitive							
	No ASE			With ASE			Comments
	Min.	Typical	Max.	Min.	Typical	Max.	
Center Design Wavelengths & Bandwidths of Broadband Operation	1030 nm	1064 nm	1080 nm	1030 nm; ASE Filter Bandpass: 1063 nm	1064 nm	1080 nm; ASE Filter Bandpass: 1065 nm	Other center wavelengths available upon request
Operating Temperature Range	15 °C	25 °C	35 °C	15 °C	25 °C	35 °C	
Insertion Loss within Operating Wavelength	–1.0 dB			–1.1 dB			At operating heat sink temp. and power
Insertion Loss within Operating Wavelength over Operating Range	–1.2 dB			–1.3 dB			Over operating temp. range and forward power range
Broadband Isolation within Operating Wavelength at Operating Conditions		–35 dB	–27 dB		–35 dB	–27 dB	At operating heat sink temp. and forward power
Broadband Isolation within Operating Wavelength over Operating Range			–24 dB			–24 dB	Over operating temp. range and forward power range
Return Loss (forward or reverse)		–50 dB	–48 dB		–50 dB	–48 dB	
Fiber In Fiber Out	10/125 or 10/130						Or as specified by customer
Forward Power	0 W	25 W	40 W	0 W	25 W	40 W	
Reverse Power	0 W		8 W	0 W		8 W	
Pulse Energy			0.8 mJ			0.8 mJ	Or fiber limited
Peak Power			10 kW			10 kW	For pulsewidths ≥ 1 nsec.



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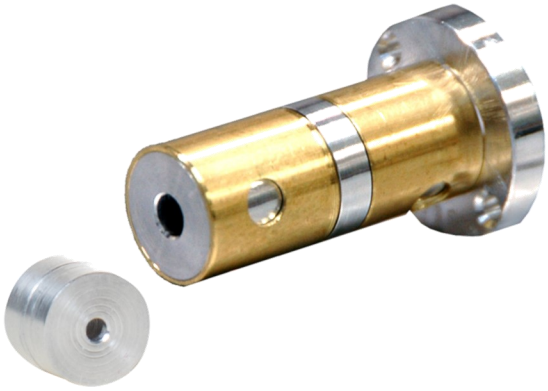
Electro-Optics Technology, Inc.

Innovative High Quality Laser Solutions

Low Power Faraday Rotators & Isolators 1050 nm to 1080 nm



EOT's 1050 nm to 1080 nm Low Power Faraday Rotators rotate the plane of polarized light 45° in the forward direction and an additional 45° of non-reciprocal rotation in the reverse direction while maintaining the light's linear polarization. When placed between crossed polarizers, a Faraday rotator becomes an optical isolator. An optical isolator provides high transmission in the forward direction and strongly attenuates any light traveling in the reverse direction effectively protecting seed sources from the deleterious effects of back reflections.

EOT's 1050 nm to 1080 nm Low Power Isolators can be ordered with either dichroic glass polarizers or with polarizing beam splitter cubes. If protecting a seed source from back reflections from a Q-switched laser, EOT recommends using polarizing beam splitter cubes due to their ability to withstand high pulse energies. Two isolators can be used in series if 60 dB isolation is required to assure back reflections do not cause frequency instability from a single frequency single seed laser.

SPECIFICATIONS

	Rotator	Isolator	
Polarizer Type	N/A	Polarcor	PBS Cube
Clear Aperture	1.5 mm	1.5 mm	1.5 mm
Transmission at 22 °C	≥78%	≥75%	≥75%
Isolation at 22 °C	N/A	≥30 dB	≥30 dB
Damage Threshold	8 J/cm^2 at 10 ns or 20 ns	500 mW CW	1 MW/cm^2 at 10 ns

Product specifications are subject to change. All products are RoHS compliant.

FEATURES

- Completely passive; no tuning required
- Compact size

OPTIONS

- Choice of dichroic glass polarizers or polarizing beam splitter cube polarizers
- Customization available

APPLICATIONS

- Laser Pumping
- Amplification
- Protection of single frequency injection seed source

Electro-Optics Technology, Inc.

Innovative High Quality Laser Solutions

MAKROS

Faraday Rotators & Isolators
1900 nm to 2100 nm

EOT's MAKROS line of Faraday devices builds on over 30 years of experience in successfully protecting lasers from destabilizing and potentially damaging back reflections. The MAKROS line has been specifically designed to meet the needs of high power and high energy 2 µm (1900 nm to 2100 nm) lasers.

Our MARKOS rotators and isolators deliver industry-best laser reliability and performance while providing superior isolation and maintaining very high transmission.

EOT's MAKROS products rely on the Faraday effect from high Verdet constant, low absorption materials to rotate the plane of linearly polarized light in the forward direction and an additional 45° of non-reciprocal rotation in the reverse direction. When these Faraday rotators are placed between crossed polarizers, they can be used as a Faraday Isolator. The MAKROS is available as a rotator or an isolator.

FEATURES

- Completely passive; no tuning required
- Rugged design suitable for harsh operating environments
- Specified performance to 30 W
- Optically contacted PBS cubes for improved damage threshold
- All isolators contain rejected beam escape ports

OPTIONS

- Input/Output waveplates available
- Precision mounting available
- Customization requests encouraged

APPLICATIONS

- Ho or Tm lasers
- High Harmonic Conversion
- High Energy Physics
- Biological & Medical Systems, Research, & Device Manufacturing
- Ultrafast R&D
- Microelectronics
- Micromachining
- Particle Acceleration

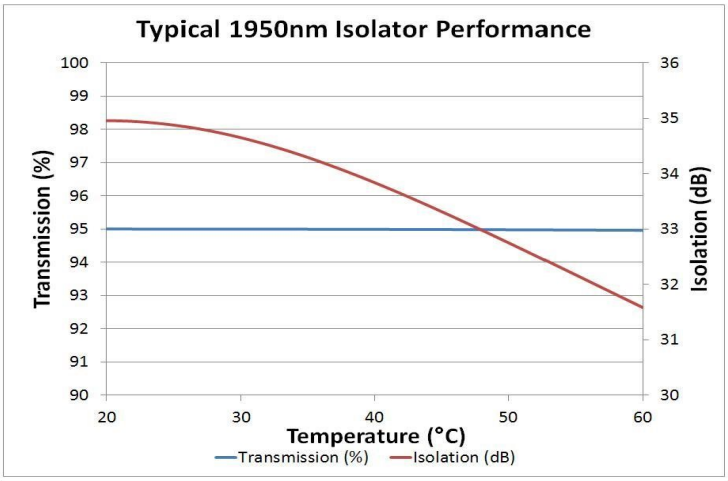
Electro-Optics Technology, Inc.

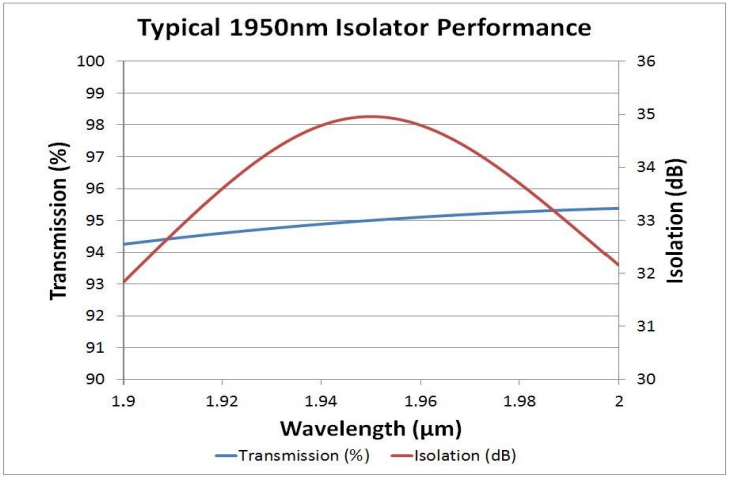
Innovative High Quality Laser Solutions

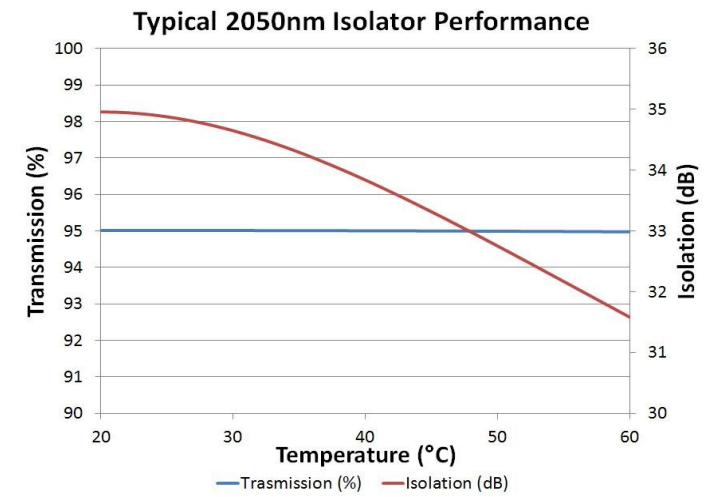
SPECIFICATIONS

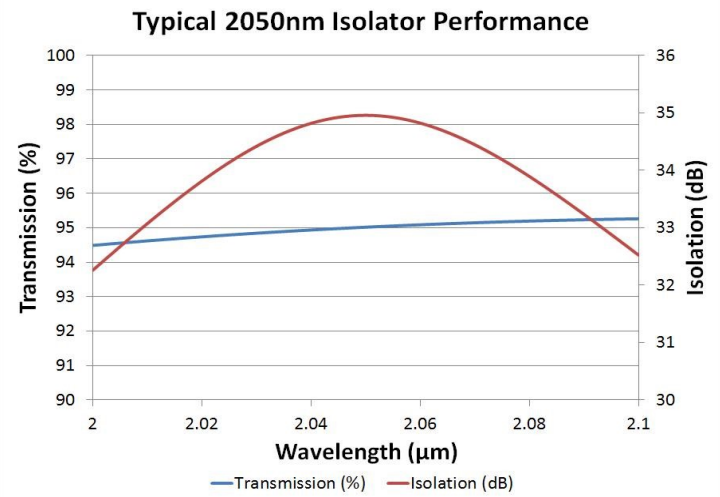
	Rotator	Isolator[a]
Clear Aperture	4 mm	4 mm
Transmission at 22 °C	>95%	>92%
Isolation at 22 °C	N/A	>30 dB
Pulsed Damage Threshold	5 J/cm^2 at 10 ns	5 J/cm^2 at 10 ns
Power Handling	30 W	30 W

Product specifications are subject to change. All products are RoHS compliant.
[a] Escape ports should be used if rejected light is >1 W or 0.15 J/cm^2 at 10 ns or forward light is >25 W. All stray beams should be properly terminated.
NOTE: Return loss-free working distance ≥25 mm for a collimated beam









The standard MAKROS models are available at wavelengths common to many applications but we can also supply the MAKROS optimized for non-standard wavelengths and at various operating temperatures. All customization requests are strongly encouraged. For questions or quotations please email or call our sales representatives at SALES@EOTECH.COM or +1.231.935.4044.