Electro-Optics Technology, Inc.



# TORNOS

## Faraday Rotators & Isolators
## 500 nm to 1030 nm

Innovative High Quality Laser Solutions


EOT's TORNOS 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 laser diodes from the deleterious effects of back reflections.

TORNOS Optical Isolators can be ordered with dichroic glass polarizers to minimize the size of the device for low power applications or they can be ordered with polarizing beam splitter cube polarizers for applications where maximum transmission is required and power levels do not permit the use of dichroic glass polarizers. By aligning the output polarizer orthogonal to the backward traveling light, isolation can be maximized within the usable wavelength range of the optical isolator.

## FEATURES

- Wavelength tunability
- Attain 60 dB using two isolators in series
- Mounting clamp
- All isolators contain rejected beam escape ports

## OPTIONS

- Choice of dichroic glass polarizers or polarizing beam splitter cube polarizers
- Input/Output waveplates available
- Customization available

## APPLICATIONS

- Environmental Sensing
- Microscopy
- Spectroscopy
- DNA Sequencing
- Laboratory and R&D use
- Protecting pump lasers in amplified systems

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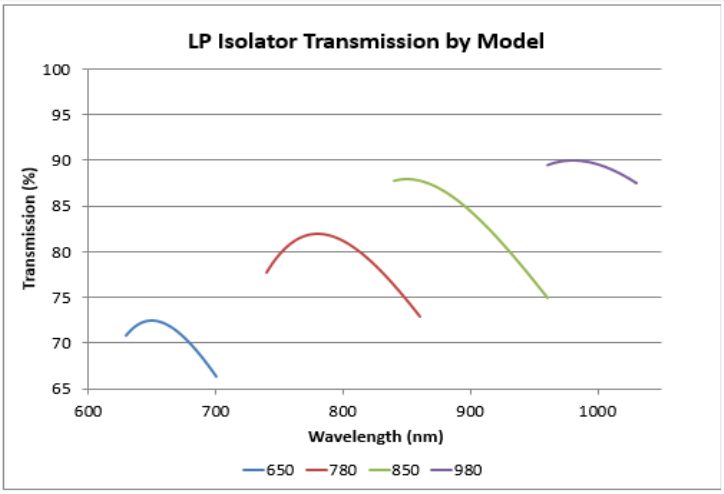
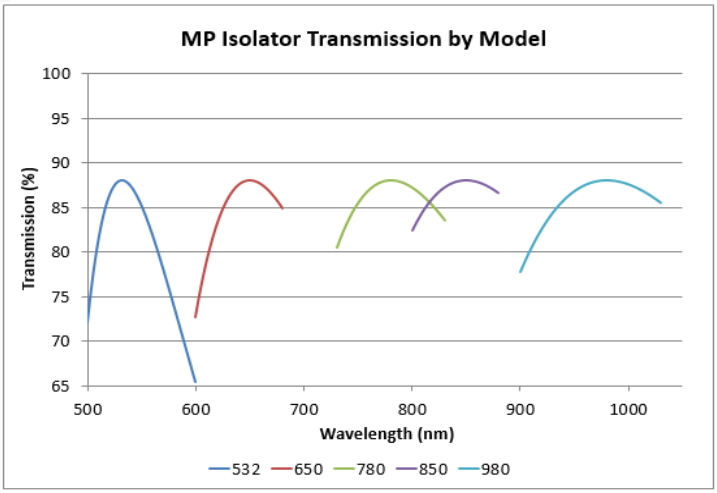
## SPECIFICATIONS

| Rotators | | | |
|---|---|---|---|
| **Center Wavelength** | **Isolation at 22 °C[a]** | **Transmission at 22 °C[b]** | **Pulsed Damage Threshold** |
| 532 nm | ≥ 30 dB | >97% | 3 J/cm$^2$ at 10 ns |
| 650 nm | ≥ 30 dB | >98% | 3 J/cm$^2$ at 10 ns |
| 780 nm | ≥ 30 dB | >98% | 3 J/cm$^2$ at 10 ns |
| 850 nm | ≥ 30 dB | >98% | 3 J/cm$^2$ at 10 ns |
| 980 nm | ≥ 30 dB | >98% | 3 J/cm$^2$ at 10 ns |

| Isolators | | | | | |
|---|---|---|---|---|---|
| **Center Wavelength** | **Spectral Range** | **Isolation at 22 °C[c]** | **Transmission at 22 °C[b]** | **Polarizer Type** | **Damage Threshold[d]** |
| 650 nm | 630 nm to 700 nm | >30 dB | >72.5% | Dichroic Glass | 25 W/cm$^2$ CW |
| 780 nm | 740 nm to 860 nm | >30 dB | >82% | Dichroic Glass | 25 W/cm$^2$ CW |
| 850 nm | 840 nm to 960 nm | >30 dB | >88% | Dichroic Glass | 25 W/cm$^2$ CW |
| 980 nm | 960 nm to 1030 nm | >30 dB | >90% | Dichroic Glass | 25 W/cm$^2$ CW |
| 532 nm | 500 nm to 600 nm | >27 dB | >88% | PBS Cube | 1 J/cm$^2$ at 10 ns |
| 650 nm | 600 nm to 680 nm | >27 dB | >88% | PBS Cube | 1 J/cm$^2$ at 10 ns |
| 780 nm | 730 nm to 830 nm | >27 dB | >88% | PBS Cube | 1 J/cm$^2$ at 10 ns |
| 850 nm | 800 nm to 880 nm | >27 dB | >88% | PBS Cube | 1 J/cm$^2$ at 10 ns |
| 980 nm | 950 nm to 1010 nm | >27 dB | >88% | PBS Cube | 1 J/cm$^2$ at 10 ns |

Product specifications are subject to change. All products are RoHS compliant.
[a] When placed between crossed polarizers having an extinction ratio of ≥ 1000:1
[b] At center wavelength
[c] When tuned for maximum isolation
[d] Isolators with PBS cube polarizers have CW damage threshold of 2 KW/cm$^2$.
Note: The addition of a waveplate may restrict wavelength range.



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Innovative High Quality Laser Solutions

# TORNOS Compact

## Faraday Rotators & Isolators
## 633 nm to 1064 nm


EOT's TORNOS Compact Faraday rotators and isolators are designed for wide-ranging end applications where optical feedback can adversely affect laser performance. The TORNOS Compact provides high transmission in the forward direction while strongly attenuating light traveling in the reverse direction, protecting lasers from the deleterious effects of back reflections.

Our TORNOS Compact devices deliver industry-best laser reliability and performance. The TORNOS Compact covers a variety of wavelengths in the NIR. A range of devices is available which allow for optimal isolation and transmission at specific wavelengths, depending on the model, and within the spectral bandwidth of the device. Our standard models are available at wavelengths common to many applications. We can also supply the TORNOS Compact optimized for non-standard wavelengths upon request.

Some common applications for the TORNOS Compact are the elimination of frequency instability in single frequency lasers such as laser diodes and OPSLs, the prevention of mode-hopping in external cavity diode lasers, and the elimination of parasitic oscillations due to ASE in amplified laser systems.

The TORNOS Compact isolators contain optically-contacted polarizing beam splitter cubes resulting in high transmission as compared to other available isolators. The TORNOS Compact's industry-leading high transmission results in more photons for your application. This allows diodes to be run at lower currents extending diode lifetime. The compact design makes it highly suitable for OEM integration.

## FEATURES

- High transmission
- Extends the life of your diode
- Compact design

## OPTIONS

- Optional waveplate for manipulation of polarization
- Mounting Clamp Available
- Customization available

## APPLICATIONS

- Raman Spectroscopy
- DNA Sequencing
- Imaging
- Environmental Sensing
- Mapping
- Microscopy
- 3D Metrology
- Protecting pump lasers in amplified systems
- Cold Atom

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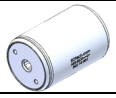
# Innovative High Quality Laser Solutions

## AVAILABLE MODELS

| Model | Product | Wavelengths |
|---|---|---|
|  | 2 mm NIR Rotator | 785 nm |
|  | 2 mm NIR Isolator | 633 nm and 785 nm |
|  | 4 mm NIR Isolator | 785 nm |
|  | 4 mm NIR+ Isolator | 850 nm |
|  | 2 mm NIR+ Rotator & Isolator | 1064 nm |

## SPECIFICATIONS

**Rotators**

| Standard Wavelength | Spectral Range | Tunable Temperature | Transmission[a] | Forward Power Handling |
|---|---|---|---|---|
| 785 nm | 780 nm to 790 nm | 10 °C to 30 °C | ≥98% | 5 W |
| 1064 nm | 1059 nm to 1069 nm | 10 °C to 30 °C | ≥98% | 5 W |

**Isolators**

| Standard Wavelength | Spectral Range | Tunable Temperature | Isolation[a] | Transmission[a] | Forward Power Handling |
|---|---|---|---|---|---|
| 633 nm | 628 nm to 638 nm | 10 °C to 30 °C | ≥33 dB | ≥95% | 5 W |
| 785 nm | 780 nm to 790 nm | 10 °C to 30 °C | ≥33 dB | ≥95% | 5 W |
| 850 nm | 845 nm to 855 nm | 10 °C to 30 °C | ≥33 dB | ≥95% | 5 W |
| 1064 nm | 1059 nm to 1069 nm | 10 °C to 30 °C | ≥33 dB | ≥95% | 5 W |

Product specifications are subject to change. All products are RoHS compliant.
[a] At specified wavelength and temperature
NOTE: For non-standard wavelengths, contact EOT for more information.