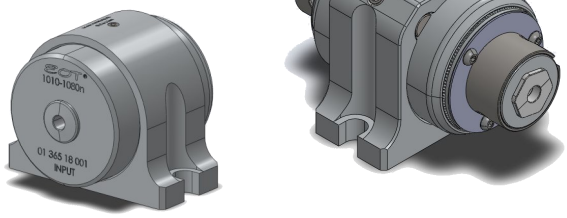
Electro-Optics Technology, Inc.

4 mm PAVOS+

Faraday Rotators & Isolators
1010 nm to 1080 nm

Innovative High Quality Laser Solutions

NEW!



Designed to meet the demanding performance required from today's solid state lasers, the new 4 mm PAVOS+ is ideal for preventing feedback and back reflections.

The new 4 mm PAVOS+ isolator builds on the existing line of PAVOS isolators adding flexibility and performance at a competitive price.

Improved Performance

- Minimum isolation increases from 30 dB to 33 dB with typical isolation exceeding 37 dB
- Improved thermal lens due to shorter rotator material[a]
- 2° tipped parallelogram PBS cubes for improved back reflection protection and perpendicular rejected beams
- Tunable for laser power and operating temperature

FEATURES

- Completely passive; no tuning required
- Stable performance to 50 W
- Optically contacted PBS cubes for improved damage threshold
- Input polarization adjustability

OPTIONS

- Optional waveplate on the output
- Precision mounting available
- Precision rejected beam pointing available
- Customization requests encouraged

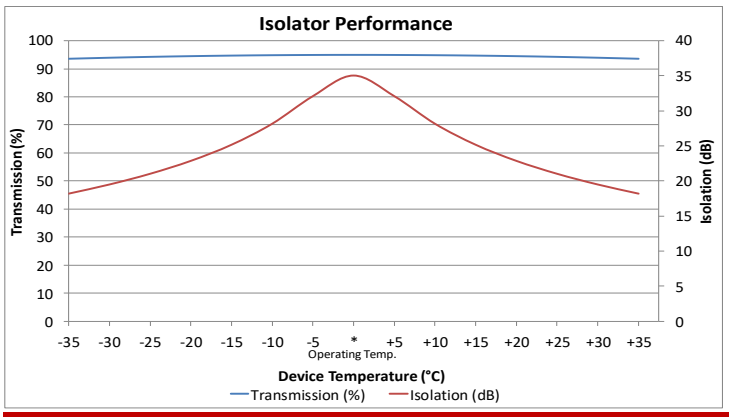
APPLICATIONS

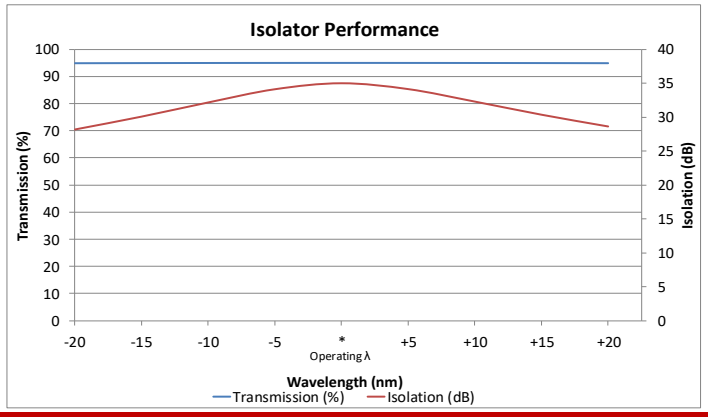
- Elimination of ASE in amplified systems, including CPA, MOPA, and regeneratively amplified mode-locked lasers
- Protecting lasers from back reflection caused by illuminating highly reflective materials
- Preventing frequency instability in seed lasers and other single frequency lasers

SPECIFICATIONS

	PAVOS+ Rotators	PAVOS+ Isolators[b]
Clear Aperture	4 mm	4 mm
Peak Transmission	≥98%[c]	≥95%[c]
Peak Isolation	N/A	≥33 dB[c]
Peak Extinction	≥33 dB[c]	N/A
Peak Rotation	45° ± 2.0°	45° ± 2.0°
Damage Threshold[c]	10 J/cm² at 10 ns 1 J/cm² at 8 ps 1 MW/cm² CW	10 J/cm² at 10 ns 1 J/cm² at 8 ps 1 MW/cm² CW
Storage Temperature Range	–20 °C to 60 °C	–20 °C to 70 °C
Factory Tunable Temperature Range	10 °C to 28 °C[d]	10 °C to 30 °C[d]

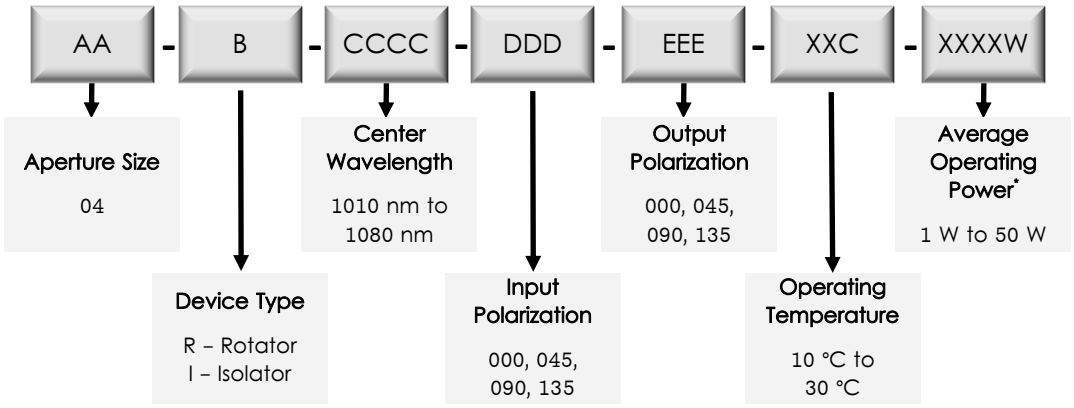
Product specifications are subject to change. All products are RoHS compliant.
[a] See technical bulletin, *Advantages of the PAVOS Product Line*
[b] Escape ports should be used if rejected light is >1 W or 0.15 J/cm² at 10 ns or forward light is >25 W. All stray beams should be properly terminated.
[c] At customer-specified wavelength and temperature
[d] Tunable Temperature Range applies to wavelengths 1010 nm to 1064 nm. >1064 nm is 22 °C.
NOTE: Devices will be tuned for a default operating temperature of 22 °C and a default operating power of 1 W unless otherwise specified by customer.





MODEL NUMBER SCHEME

AA–B–CCCC–DDD–EEE–XXC–XXXXW



* Power levels above 50 W may result in a change in specification. Contact EOT to discuss.

AA: Aperture (mm)
B: Device Type
CCCC: Wavelength (nm)
DDD: Input polarization
N/A for Rotators. Defaults to 000 (horizontal) unless otherwise specified
EEE: Output polarization
*N/A for Rotators. Defaults to 045 (45° clockwise from input) unless otherwise specified***
** The addition of a waveplate will add an additional 45° or 135° of rotation through the device.

XXC: Nominal operating temperature
Defaults to 22C (22 °C) unless otherwise specified
XXXXW: Nominal operating average power
Defaults to 0001W (1 W) unless otherwise specified

Electro-Optics Technology, Inc.

Innovative High Quality Laser Solutions

PAVOS

Faraday Rotators & Isolators 1010 nm to 1080 nm

EOT's PAVOS line of Faraday devices builds on over 30 years of experience in successfully protecting lasers from destabilizing and potentially damaging back reflections. The PAVOS line has been specifically designed to meet the needs of high power and high energy 1 µm (1010 nm to 1080 nm) lasers.

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

EOT's PAVOS 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. The PAVOS is available as a rotator or an isolator.

FEATURES

- Completely passive; no tuning required
- Rugged design suitable for harsh operating environments
- Specified performance to 50 W; tested to >400 W
- Optically contacted PBS cubes for improved damage threshold
- All isolators contain rejected beam escape ports
- Input polarization adjustability

OPTIONS

- Input/Output waveplates available
- Precision mounting available
- Precision rejected beam pointing available
- Customization requests encouraged

APPLICATIONS

- Ultrafast, pulsed, and CW lasers
- Microelectronics
- Medical Systems & Device Manufacturing
- Micromachining
- Particle Acceleration

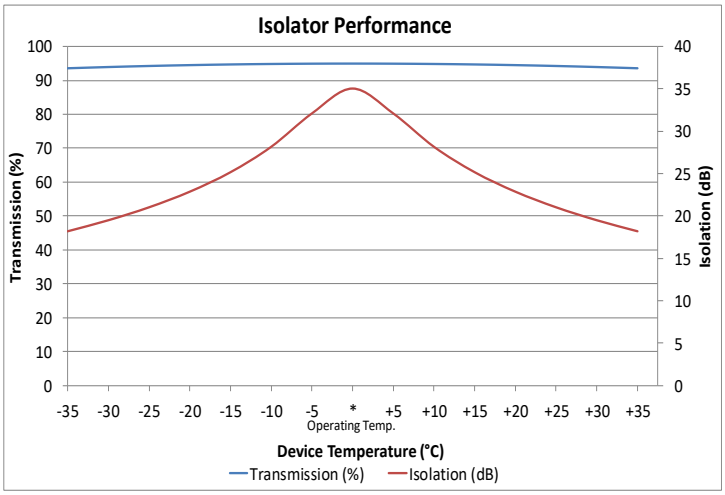
Electro-Optics Technology, Inc.

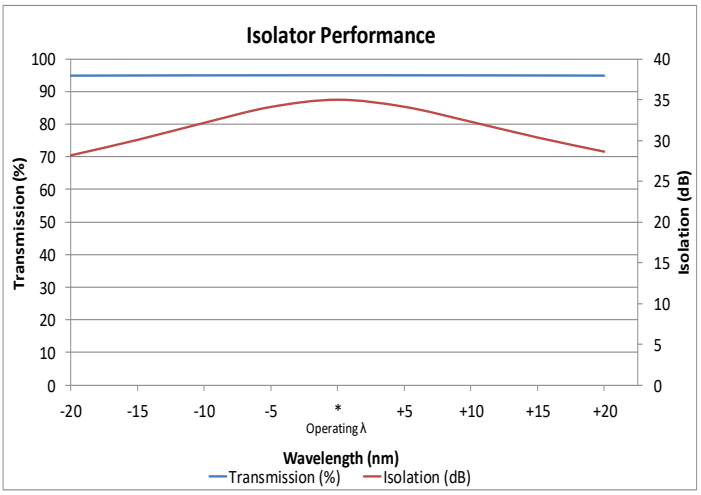
Innovative High Quality Laser Solutions

SPECIFICATIONS

	Small Aperture Rotators	Small Aperture Isolators[a]	Large Aperture Rotators	Large Aperture Isolators[a]
Clear Aperture	2 mm, 5 mm	2 mm, 5 mm	8 mm, 12 mm, 15 mm, 20 mm, 25 mm, 35 mm, 45 mm	8 mm, 12 mm, 15 mm, 20 mm, 25 mm, 35 mm, 45 mm
Peak Transmission	>98%[b]	>95%[b]	>98%	>92%
Peak Isolation	N/A	>33 dB[b] Typical >37 dB	N/A	>30 dB Typical >35 dB
Peak Rotation	45° ± 0.5°	45° ± 0.5°	45° ± 2°	45° ± 2°
Damage Threshold[b]	10 J/cm^2 at 10 ns 1 J/cm^2 at 8 ps 1 MW/cm^2 CW	10 J/cm^2 at 10 ns 1 J/cm^2 at 8 ps 1 MW/cm^2 CW	10 J/cm^2 at 10 ns 1 J/cm^2 at 8 ps 1 MW/cm^2 CW	10 J/cm^2 at 10 ns 1 J/cm^2 at 8 ps 1 MW/cm^2 CW
Storage Temperature Range	–40 °C to 70 °C	–40 °C to 70 °C	–10 °C to 60 °C	–10 °C to 60 °C
Factory Tunable Temperature Range	10 °C to 30 °C	10 °C to 30 °C	Upon request	Upon request
Isolated Beam Pointing[c]	N/A	<5 mrad	N/A	Upon request

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.
[b] At customer-specified wavelength and temperature
[c] Input cube only





海纳光学

January 14, 2020

Electro-Optics Technology, Inc.

Innovative High Quality Laser Solutions

PAVOS Ultra

Faraday Rotators & Isolators 1010 nm to 1080 nm

The PAVOS Ultra line of Faraday devices offers roughly 1/10th the absorption and thermal lens focal shift and can theoretically provide ten times lower non-linear refractive index compared to the standard PAVOS rotators and isolators. This results in less Kerr Lens focal shift and a lower B-integral - protecting against catastrophic whole beam self-focusing. The PAVOS Ultra line has been specifically designed to meet the needs of the high power and high energy 1 µm (1010 nm to 1080 nm) laser market with stable performance up through 400 W* of average power.

Our PAVOS Ultra rotators and isolators delivery industry-best laser reliability and performance. The PAVOS Ultra family of Faraday devices provide superior isolation, especially at higher average power levels, while maintaining very high transmission values.

EOT's PAVOS Ultra 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. The PAVOS Ultra is available as a rotator or an isolator.

FEATURES

- 1/10th the absorption and thermal lens focal shift compared to standard PAVOS
- Theoretically ten times lower non-linear refractive index
- Complete passive; no tuning required
- Specified performance to 400 W; tested to 1.2 kW average power
- Optically contacted PBS cubes for improved damage threshold
- All isolators contain escape ports
- Adjustable to handle any angle of linear input polarization without additional optics

OPTIONS

- Input/Output waveplates available
- Precision mounting capability
- Precision rejected beam pointing available
- Customization available

APPLICATIONS

- High average power applications
- Ultrafast R&D
- Microelectronics
- Medical Systems & Device Manufacturing
- Micromachining
- Particle Acceleration

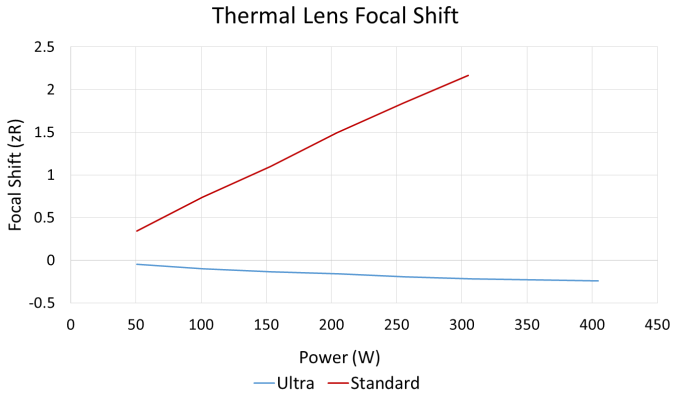
Electro-Optics Technology, Inc.

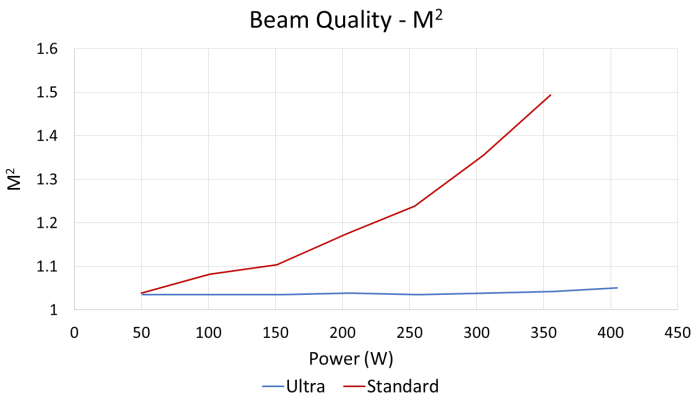
Innovative High Quality Laser Solutions

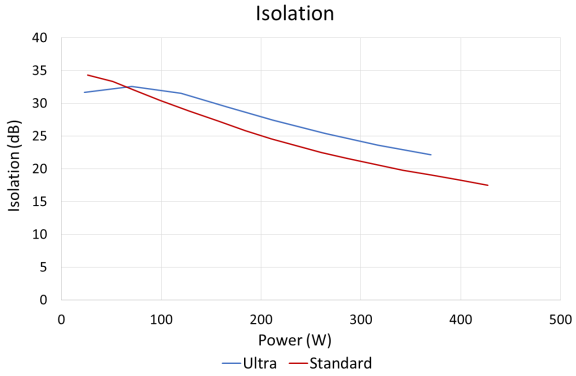
SPECIFICATIONS

	Rotator	Isolator[a]
Clear Aperture	5 mm, 8 mm, 12 mm	5 mm, 8 mm, 12 mm
Peak Transmission[b]	>95%	>95%
Peak Isolation[b]	N/A	>33 dB typical >27 dB minimum
Extinction	>36 dB typical >30 dB minimum	N/A
Rotation	45° +2/–5°	45° +2/–5°
Storage Temperature Range	–40 °C to 70 °C	–40 °C to 70 °C
Operational Temperature Range	10 °C to 30 °C	10 °C to 30 °C
Isolated Beam Pointing[c]	N/A	<5 mrad
Damage Threshold[b]	7 J/cm^2 at 10 ns 600 mJ/cm^2 at 8 ps	7 J/cm^2 at 10 ns 600 mJ/cm^2 at 8 ps

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.
[b] At customer-specified wavelength and temperature
[c] Input cube only
*NOTE: For powers higher than 400 W, contact EOT.







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PAVOS Ultra

Faraday Rotators & Isolators 1010 nm to 1080 nm

The PAVOS Ultra line of Faraday devices offers roughly 1/10th the absorption and thermal lens focal shift and can theoretically provide ten times lower non-linear refractive index compared to the standard PAVOS rotators and isolators. This results in less Kerr Lens focal shift and a lower B-integral - protecting against catastrophic whole beam self-focusing. The PAVOS Ultra line has been specifically designed to meet the needs of the high power and high energy 1 µm (1010 nm to 1080 nm) laser market with stable performance up through 400 W* of average power.

Our PAVOS Ultra rotators and isolators delivery industry-best laser reliability and performance. The PAVOS Ultra family of Faraday devices provide superior isolation, especially at higher average power levels, while maintaining very high transmission values.

EOT's PAVOS Ultra 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. The PAVOS Ultra is available as a rotator or an isolator.

FEATURES

- 1/10th the absorption and thermal lens focal shift compared to standard PAVOS
- Theoretically ten times lower non-linear refractive index
- Complete passive; no tuning required
- Specified performance to 400 W; tested to 1.2 kW average power
- Optically contacted PBS cubes for improved damage threshold
- All isolators contain escape ports
- Adjustable to handle any angle of linear input polarization without additional optics

OPTIONS

- Input/Output waveplates available
- Precision mounting capability
- Precision rejected beam pointing available
- Customization available

APPLICATIONS

- High average power applications
- Ultrafast R&D
- Microelectronics
- Medical Systems & Device Manufacturing
- Micromachining
- Particle Acceleration

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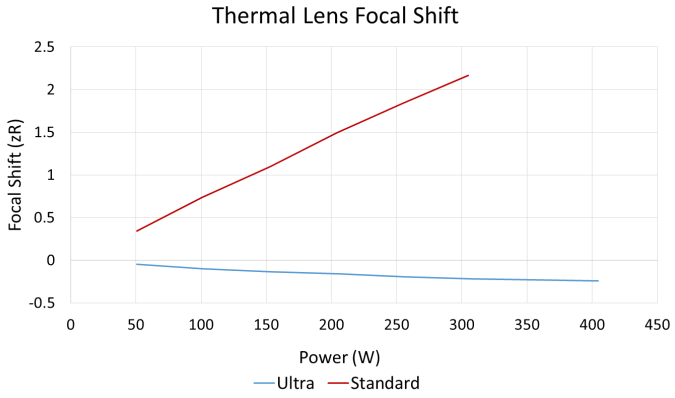
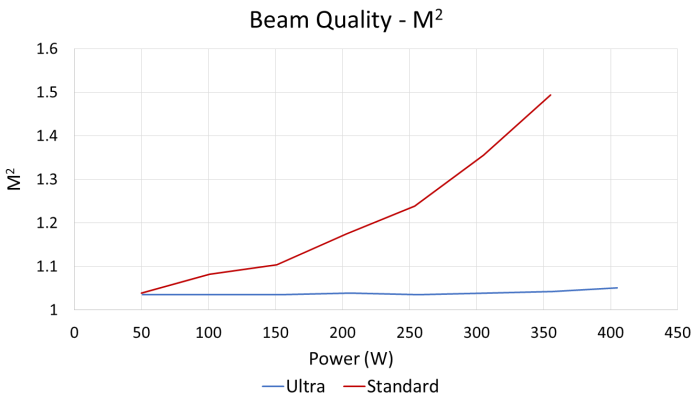
Innovative High Quality Laser Solutions

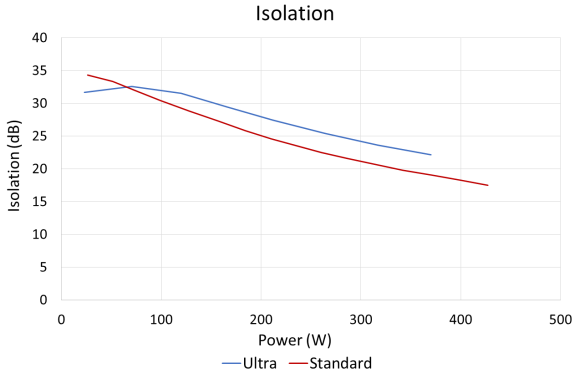
SPECIFICATIONS

	Rotator	Isolator[a]
Clear Aperture	5 mm, 8 mm, 12 mm	5 mm, 8 mm, 12 mm
Peak Transmission[b]	>95%	>95%
Peak Isolation[b]	N/A	>33 dB typical >27 dB minimum
Extinction	>36 dB typical >30 dB minimum	N/A
Rotation	45° +2/–5°	45° +2/–5°
Storage Temperature Range	–40 °C to 70 °C	–40 °C to 70 °C
Operational Temperature Range	10 °C to 30 °C	10 °C to 30 °C
Isolated Beam Pointing[c]	N/A	<5 mrad
Damage Threshold[b]	7 J/cm^2 at 10 ns 600 mJ/cm^2 at 8 ps	7 J/cm^2 at 10 ns 600 mJ/cm^2 at 8 ps

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.
[b] At customer-specified wavelength and temperature
[c] Input cube only
*NOTE: For powers higher than 400 W, contact EOT.







Electro-Optics Technology, Inc.

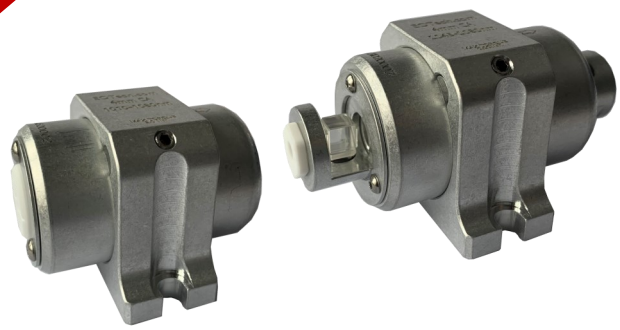
Innovative High Quality Laser Solutions

4 mm PAVOS+ Ultra

Faraday Rotators & Isolators
1010 nm to 1080 nm

NEW!

PRELIMINARY



The PAVOS+ Ultra line of Faraday devices offers roughly 1/10th the absorption and thermal lens focal shift[a] and can theoretically provide ten times lower non-linear refractive index compared to the standard PAVOS+ rotators and isolators. This results in less Kerr Lens focal shift and a lower B-integral protecting against catastrophic whole beam self-focusing. The PAVOS+ Ultra line has been specifically designed to meet the needs of the high power and high energy 1 µm (1010 nm to 1080 nm) laser market with stable performance up through 150 W of average power compared to 80 W for the standard PAVOS+.

For laser systems having large distances between amplification stages, the reduced thermal lens focal shift of the PAVOS+ Ultra results in greater coupling efficiency and simpler optical design.

Our PAVOS+ Ultra rotators and isolators deliver industry-best laser reliability and performance. The PAVOS+ Ultra family of Faraday devices provide superior isolation, especially at higher average power levels, while maintaining very high transmission values.

EOT's PAVOS+ Ultra 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. The PAVOS+ Ultra is available as a rotator or an isolator.

FEATURES

- 1/10th the absorption and thermal lens focal shift compared to standard PAVOS[a]
- Theoretically ten times lower non-linear refractive index
- Completely passive; no tuning required
- Specified performance to 150 W
- Available with polarizing beam splitting cubes or EOT's high performance thin film polarizers
- EOT's most compact and shortest optical pathlength version of the PAVOS Ultra

OPTIONS

- Input/Output waveplates available
- Precision mounting capability
- Customization available

APPLICATIONS

- High average power applications
- Ultrafast R&D
- Microelectronics
- Medical Systems & Device Manufacturing
- Micromachining
- Particle Acceleration

海纳光学

December 21, 2020

Electro-Optics Technology, Inc.

Innovative High Quality Laser Solutions

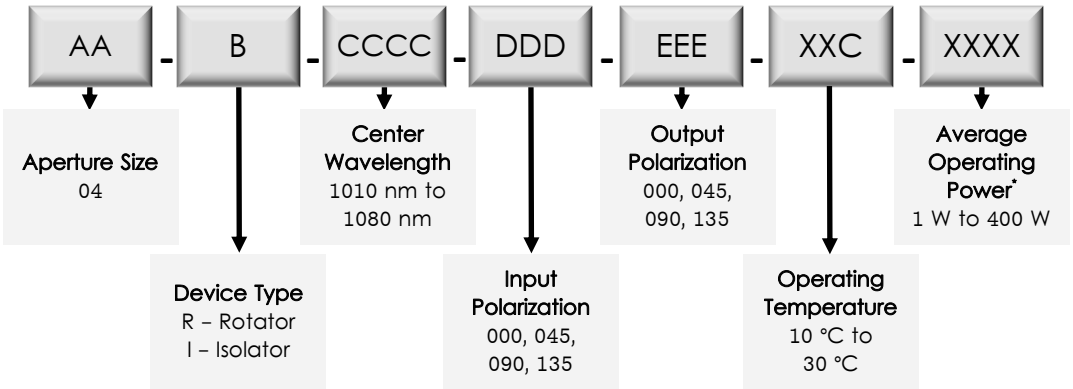
SPECIFICATIONS

	Rotator		Isolator	
	Minimum	Typical	Minimum	Typical
Clear Aperture	4 mm		4 mm	
Max. Rated Power Handling[b]	≥125 W	≥150 W	≥125 W	≥150 W
Peak Transmission[c]	≥98%		≥93%	≥95%
Peak Isolation[c]	N/A		≥30 dB[d] ≥27 dB[e]	≥33 dB[d] ≥30 dB[e]
Peak Extinction[c]	≥30 dB[d] ≥27 dB[e]	≥36 dB[d] ≥33 dB[e]	N/A	
Rotation	45° ± 2°	45° ± 1°	45° ± 2°	45° ± 1°
Storage Temperature Range	–20 °C to 60 °C		–20 °C to 60 °C	
Damage Threshold[f]	≥6 J/cm² at 10 ns ≥0.6 J/cm² at 8 ps	≥10 J/cm² at 10 ns ≥1 J/cm² at 8 ps	≥6 J/cm² at 10 ns ≥0.6 J/cm² at 8 ps	≥10 J/cm² at 10 ns ≥1 J/cm² at 8 ps

Product specifications are subject to change. All products are RoHS compliant.
[a] See technical bulletin, *Advantages of the PAVOS Product Line*
[b] Specification performance guaranteed to max. power rating, but device has been tested to >400 W without failure.
[c] At customer-specified wavelength and temperature
[d] With 1/e² beam diameter ≤ clear aperture/2 (50% encroachment), ≤5 mW power
[e] With 1/e² beam diameter ≤ clear aperture/2 (50% encroachment), max. power
NOTE: For operating conditions not specified, contact EOT.
[f] Limited by KTF crystal. Polarizers qualified to ≥10 J/cm² at 10 ns.

MODEL NUMBER SCHEME

AA–B–CCCC–DDD–EEE–XXC–XXXXW



* Power levels above 150 W may result in a change in specification. Contact EOT to discuss.

AA: Aperture (mm)
B: Device Type
CCCC: Wavelength (nm)
DDD: Input polarization
N/A for Rotators. Defaults to 000 (horizontal) unless otherwise specified
EEE: Output polarization
*N/A for Rotators. Defaults to 045 (45° clockwise from input) unless otherwise specified***

** The addition of a waveplate will add an additional 45° or 135° of rotation through the device.

XXC: Nominal operating temperature
Defaults to 22C (22 °C) unless otherwise specified
XXXXW: Nominal operating average power
Defaults to 0100W (100 W) unless otherwise specified

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December 21, 2020