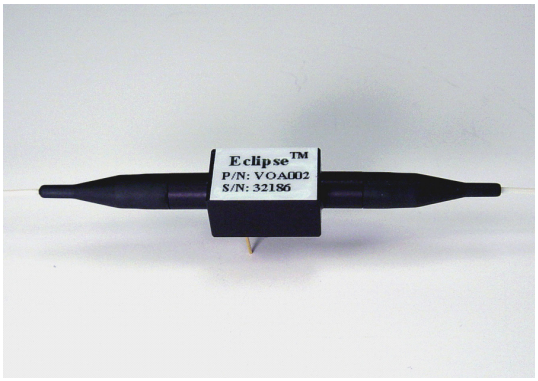
# *Eclipse™* Variable Optical Attenuators/Modulators

*High-speed Attenuation Control with Optional Modulator*

Boston Applied Technologies' Eclipse™ Variable Optical Attenuators (VOAs), including dual-function VOA/PIMs (Polarization Independent Modulators), enable all solid-state, high-speed performance in a very compact package. Depending on the specific application, the VOAs may be set to maintain an electronically adjustable value of either attenuation or output power. The VOA/PIMs enable modulation of an optical signal traveling over standard single mode fiber while simultaneously maintaining a specified level of attenuation. All VOAs are electrically controlled, and employ OptoCeramic® electro-optic technology. Evaluation kits with control circuit are available for easy lab bench operation.




**Features**

- Precise, high-speed attenuation control
- Excellent optical performance
- All solid-state construction in a compact rugged package
- Superb temperature stability
- Meets or exceeds Telcordia GR1221, GR910, and GR1209 specifications
- Optional modulator offers polarization insensitive modulation up to 750KHz
- Enabling hybrid integration for space and cost saving and performance enhancement

**Applications**

- Channel Equalization/pre-emphasis
- Optical amplification
- Instrumentation
- Metropolitan and long-haul networks
- Wavelength tagging (VOA/modulator only)

BATi
Boston Applied Technologies,Inc.

## Key Optical Specifications

| | Performance | |
|---|---|---|
| **Attributes**[1,2] | **VOA001** | **VOA002** |
| **Wavelength**[3] | 1530-1565, 1570-1610 nm | 1530-1565, 1570-1610 nm |
| **Insertion Loss** | ≤ 0.9 dB | ≤ 0.6dB(≤ 0.4 dB,A version) |
| **Dynamic Range** | ≥ 20 dB | ≥ 25 dB |
| **Spectral Flatness @ 15 dB Attenuation** | 0.3 dB typical | 0.1 dB typical[4] |
| **Polarization Dependent Loss @ 1550nm and 15dB Attenuation** | 0.3 dB typical | 0.1 dB typical[4] |
| **Response Time (Full Range)**[5] | <30 μs | <30 μs |
| **Input Power** | ≤ 500 mW | ≤ 500 mW |
| **Return Loss** | ≥ 55 dB | ≥ 55 dB |
| **Modulation Rate** | ≤ 1 MHz | ≤ 1 MHz |
| **Modulation Depth**[6] | 5% typical | 5% typical |
| **Operating Temperature Range** | 0°C to 70°C | 0°C to 70°C |
| **Storage Temperature Range** | -40°C to 85°C | -40°C to 85°C |
| **Dimensions (Approximate)** | 26 x 10 x 9 mm | 26 x 10 x 9 mm |

***Notes:***

1. Unless otherwise specified, all measurements are at 25°C.
2. Normally opaque at zero applied voltage for VOA001, normally transparent at zero applied voltage for VOA002.
3. 1310nm and other wavelength also available.
4. For applications attenuating a single wavelength utilizing BATi's feedback circuit. Contact BATI for special multi-wavelength VOA002.
5. Devices with less than 5μs are also available.
6. Measured at 3 dB attenuation with a sinusoidal signal at 1 MHz.

## Contact Information

For more information about BATi's' leadership in variable optical attenuation and modulation technology and other optical networking modules and components, visit our website at www.bostonati.com.

To obtain additional technical information or to place an order for this product, please contact us at:

Phone: 1-781-935-2800
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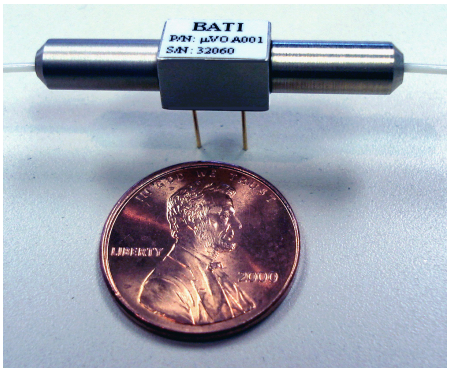
E-mail: sales@bostonati.com

# *Eclipse*™ Micro Variable Optical Attenuators

*High-speed attenuation control with modulation capability*

Boston Applied Technologies' Micro Variable Optical Attenuator (μVOA) is a voltage controlled optical variable attenuator. Based on the patented proprietary OptoCeramic® technology platform, the Eclipse™ μVOA provides high speed, high dynamic range, low insertion loss, low polarization dependence loss and the best reliability in a very compact package. The device also enables polarization independent modulation of an optical signal traveling over standard single mode fiber while simultaneously maintaining a specified level of attenuation.




**Features**

- Precise, high-speed attenuation control
- Excellent optical performance
- All solid-state construction in a compact rugged package
- Superb temperature stability
- Meets or exceeds Telcordia GR1221, GR910, and GR1209 specifications
- Enables polarization insensitive modulation up to 1MHz

**Applications**

- Channel Equalization/pre-emphasis
- Optical amplification
- Instrumentation
- Wavelength tagging or supervisory channel encoding (using modulation function)

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Boston Applied Technologies,Inc.

## Key Optical Specifications

| | Performance | |
|---|---|---|
| **Attributes**[1,2] | **μVOA001** | **μVOA002** |
| **Wavelength**[3] | 1530-1565, 1570-1610 nm | 1530-1565, 1570-1610 nm |
| **Insertion Loss** | ≤ 0.9 dB | ≤ 0.6dB (≤ 0.4 dB, A version) |
| **Dynamic Range** | ≥ 20 dB | ≥ 25 dB |
| **Spectral Flatness @ 15 dB Attenuation** | 0.5 dB max. 0.3 dB typical | 0.1 dB typical[4] |
| **Polarization Dependent Loss @ 1550nm and 15dB Attenuation** | 0.5 dB maximum<br>0.3 dB typical | 0.1 dB typical[4] |
| **Response Time (Full Range)**[5] | < 30 μs | < 30 μs |
| **Attenuation Resolution** | Continuous | Continuous |
| **Input Power** | ≤ 500 mW | ≤ 500 mW |
| **Return Loss** | ≥ 55 dB | ≥ 55 dB |
| **Modulation Rate** | ≤ 1 MHz | ≤ 1 MHz |
| **Modulation Depth**[6] | 0.5 dB typical | 0.5 dB typical |
| **Operating Temperature Range** | 0°C to 70°C | 0°C to 70°C |
| **Storage Temperature Range** | -40°C to 85°C | -40°C to 85°C |
| **Dimensions (L x W x H)** | 35 x 6.5 x 6 (mm) | 35 x 6.5 x 6 (mm) |

***Notes:***

1. Unless otherwise specified, all measurements are at 25°C.
2. Normally opaque at zero applied voltage for μVOA001, normally transparent at zero applied voltage for μVOA002.
3. 1310nm and other wavelength also available.
4. For applications attenuating a single wavelength utilizing BATI's feedback circuit. Contact BATI for special multi-wavelength μVOA002.
5. Devices with less than 5μs are also available.
6. Measured at 3 dB attenuation with a 20V sinusoidal signal at 150 kHz.

## Contact Information

For more information about BATi' leadership in variable optical attenuation and modulation technology and other optical networking modules and components, visit our website at www.bostonati.com.

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Phone: 1-781-935-2800
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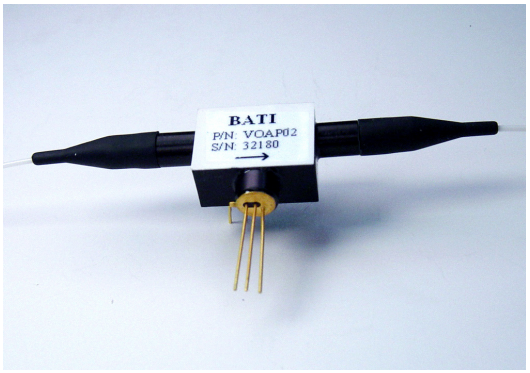
# *Eclipse*™ Polarization Maintaining Variable Optical Attenuators

*Polarization-preserving, High-speed Attenuation Control*

For the first time, polarization-preserving, high-speed attenuation is available in a compact package. Boston Applied Technologies' Polarization Maintaining Variable Optical Attenuator (PM-VOA) maintains constant polarization output regardless of wavelength and level of attenuation. Based on the revolutionary OptoCeramic® electro-optic technology, the PM-VOA achieves a very high-speed performance (typical transition time of less than 30 microseconds) in a compact solid-state device. The PM-VOA includes an integral tap/output monitor and a photo detector. This eliminates the need for an external polarization-maintaining coupler and photo detector—substantially reducing cost and space requirements.




**Features**

- Precise, high-speed attenuation control
- Constant polarization output
- Excellent optical performance
- Integral optical monitor tap
- All solid-state construction in a compact package
- Superb temperature stability

**Applications**

- Optical networks using polarization-maintaining fiber
- Instrumentation

BATI
Boston Applied Technologies,Inc.

## Key Optical Specifications

| Attributes[1,2] | Performance |
|---|---|
| **Wavelength Range**[3] | 1530-1565 nm |
| **Insertion Loss** | 1 dB |
| **Dynamic Range** | 30 dB |
| **Spectral Flatness** | 0.1 dB @ 15 dB attenuation[4] |
| **Extinction Ratio** | 20 dB |
| **Tap Output** | 0.05 μA/μW of output power |
| **Input Power** | < 500 mW |
| **Return Loss** | ≥ 55 dB |
| **Response Time (Full Range)**[5] | < 30 μs |
| **Attenuation Resolution** | Continuous |
| **Operating Temperature Range** | 0°C to 70°C |
| **Storage Temperature Range** | -40°C to 85°C |
| **Dimensions (Approximately)** | 29 x 12 x 8 mm |

***Notes:***

1. Unless otherwise specified, all measurements are at 25°C.
2. Meets or exceeds Telcordia GR1221 and GR1209 specifications.
3. Also operates in the L-Band with 0.2 dB additional insertion loss.
4. For single-wavelength applications.
5. Devices with less than 5μs are also available.

## Contact Information

For more information about BATi's leadership in variable optical attenuation technology and other optical networking modules and components, visit our website at www.bostonati.com.

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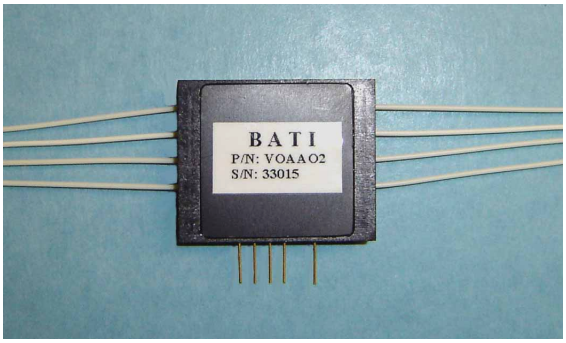
# Eclipse™ Variable Optical Attenuator Arrays

## High-speed Multi-Channel Attenuation Control




*Boston Applied Technologies' Variable Optical Attenuator Array (Array VOA) is designed for multi-channel optical power adjustment. Based on OptoCeramic® electro-optic technology, Array VOA enables all solid state high-speed performance. BATI's Array VOA contains no moving parts and offers high speed, low insertion loss, low polarization dependence loss (PDL), and a wide dynamic range. The standard products include 4 and 8 channel VOA arrays. BATI's advanced micro-optical design also enables integration for space, cost saving and performance enhancement.*

### Features

- Precise, high-speed attenuation control
- Excellent optical performance
- All solid-state construction in a compact rugged package
- Superb temperature stability
- Optical modulation capability
- Enabling hybrid

### Applications

- Power control and balancing in multi-channel system
- Power equalization for system reconfiguration and optical add-drop multiplexing
- Power adjustment for receiver protection
- Modulation of optical channel information

BATI
Boston Applied Technologies,Inc.

## Key Optical Specifications

| Attributes[1,2] | Performance |
|---|---|
| Wavelength Range[3] | 1530-1565 nm, 1570-1610 nm |
| Insertion Loss | ≤ 0.6dB |
| Dynamic Range | ≥ 25 dB |
| Spectral Flatness @ 15 dB Attenuation | 0.1 dB typical[4] |
| PDL @ 1550nm and 15dB Attenuation | 0.1 dB typical[4] |
| Response Time (10% - 90%) | 30 µs typical |
| Input Power | < 500 mW |
| Return Loss | ≥ 55 dB |

***Notes:***

1. Unless otherwise specified, all measurements are at 25°C.
2. Compliant to Telcordia GR1221 and GR1209 specifications.
3. 1310nm and other wavelength also available.
4. For applications attenuating a single wavelength utilizing BATI's feedback circuit.

## Environmental Parameters

| | |
|---|---|
| Operating Temperature Range | 0°C to 70°C |
| Storage Temperature Range | -40°C to 85°C |
| Dimensions (for a 4 channel device) | 49 x 36 x 7.6 mm |

### For More Information

For More information about Boston Applied Technologies' leadership in variable optical attenuation technology and other optical networking modules and components, visit our website at www.bostonati.com.

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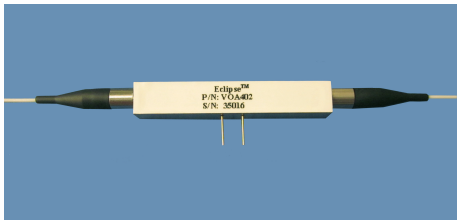
# *Eclipse*™ High Speed Variable Optical Attenuator

*Ultra-high Speed, High Precision Optical Power Control*

Boston Applied Technologies' high speed variable optical attenuator (HVOA) has nano-second response speed and low insertion loss. It provides an ultimate solution for optical power stabilizing and limiting based on the high performance, high precision control circuits. HVOA can be set to maintain the output optical power at a constant level, countering the power fluctuations caused by PDL, channel add/drop, and other sources. The output power fluctuation level can be reduced to less than 0.01 dB. HVOA can also be used as an optical power limiter to protect the down streams. It can be offered either as a stand-alone optical power regulator (OPR) unit or as a module (as shown) for system integration.




**Features**

- Precise optical power control better than 0.01 dB
- Fast response (**<250 ns**)
- Excellent optical performance
- All solid-state construction
- Superb temperature stability

**Applications**

- Optical power limiting
- Optical power stabilization
- Noise filtering
- Optical spark suppression
- Network protection

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## Key Optical Specifications

| Attributes | Performance |
|---|---|
| **Wavelength Range** | 1550nm (S,C,L) |
| **Insertion Loss** | < 1.0 dB |
| **Polarization Dependent Loss** | < 0.1dB |
| **Dynamic Range** | > 20 dB[1] |
| **Polarization Extinction Ratio** | > 20 dB |
| **Response Time** | < 250 ns |
| **Input Power Range** | < 500 mW |
| **Return Loss** | ≥ 55 dB |
| **Modulation Rate[2]** | ≤ 1MHz |
| **Operating Temperature Range** | 0 to 70°C |
| **Storage Temperature Range** | -40 to 85°C |
| **Dimensions (Approximate)** | 48X 8 X 7 mm |

***Notes:***

1. Higher dynamic range available upon request.
2. Measured with square wave 100% modulated at 1 MHz.

## Contact Information

For more information about Boston Applied Technologies' leadership in optical power control technology and other electro-optical modules and components, visit our website at www.bostonati.com.

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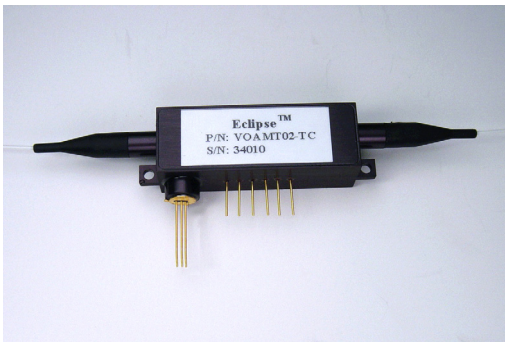
# *Eclipse*™ Multimode Variable Optical Attenuator

*High-Speed Attenuation Control*

Boston Applied Technologies' Eclipse™ Multimode Variable Optical Attenuators (MM-VOAs) maintain a constant output optical power in the multimode fiber transmission line, regardless of the wavelength and the level of attenuation. Based on the revolutionary OptoCeramic® electro-optic technology, the MM-VOAs achieve very high speeds (with a typical transition time of less than a few microseconds) in a compact solid-state device. The MM-VOAs with integrated input tap or output tap (photo detector) are also available to eliminate the need of an external optical power detection component, substantially reducing the cost and space requirements.




**Features**

- Precise, high-speed attenuation control
- Multimode fiber with low mode dependent loss
- Excellent optical performance
- All solid-state construction in a compact package
- Superb temperature stability

**Applications**

- Optical power control in multimode optical system
- Instrumentation

BATi
Boston Applied Technologies,Inc.

## Key Optical Specifications

| Attributes[1,2] | Performance |
|---|---|
| **Wavelength Range[3]** | 1530-1565 nm[4] |
| **Insertion Loss** | 1 dB |
| **Mode Dependent Loss** | 0.2dB |
| **Dynamic Range** | 20 dB |
| **Input Power** | < 500 mW |
| **Return Loss** | ≥ 40 dB |
| **Response Time (Full Range)[5]** | < 5 μs |
| **Attenuation Resolution[6]** | Continuous |
| **Operating Temperature Range** | 0°C to 70°C |
| **Storage Temperature Range** | -40°C to 85°C |
| **Dimensions (Approximately)** | 34 x 11 x 9 mm |

***Notes:***

1. Unless otherwise specified, all measurements are at 25°C.
2. Designed to meets or exceeds Telcordia GR1221 and GR1209 specifications.
3. Also operates in the L-Band with 0.2 dB additional insertion loss.
4. For single-wavelength applications.
5. Design dependent. 1μs device is also available.
6. The 0~5V control signal, amplified by the driver electronics, controls the optical power/attenuation.

## Contact Information

For more information about BATi's leadership in variable optical attenuation technology and other optical networking modules and components, visit our website at www.bostonati.com.

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# Optical Power Regulator/Limiter

*High-speed, High Precision Optical Power Control*


*Based on a high performance Eclipse™ variable optical attenuator (VOA) and high precision control circuits, Boston Applied Technologies' optical power regulator/limiter provides an ultimate solution for optical power stabilizing and limiting. The unit can be set to maintain the output optical power at a constant level, countering the power fluctuations caused by PDL, channel add/drop, and other sources; the output power fluctuation level can be reduced to less than 0.01 dB. The unit can also be used as an optical power limiter to protect the down streams. It can be offered either as a stand-alone unit (as shown) or as a module for the system integration.*

### Features

- Precise optical power control better than 0.01 dB
- Fast response (<300ns)
- Excellent optical performance
- All solid-state construction
- Superb temperature stability

### Applications

- Optical power limiting
- Optical power stabilization
- Noise filtering
- Optical spark suppression
- Network protection

BATi
Boston Applied Technologies,Inc.

## Key Optical Specifications

| Attributes | Performance |
|---|---|
| Wavelength Range | 1310nm/1550nm (S,C,L) |
| Insertion Loss | < 1 dB |
| Dynamic Range | > 25 dB[1] |
| Polarization Dependent Loss (PDL) | 0.1 dB |
| Response Time | < 300 ns |
| Input Power Range | < 500 mW |
| Return Loss | ≥ 55 dB |
| Operating Temperature Range | 0 to 70°C |
| Storage Temperature Range | -40 to 85°C |

***Notes:***

1. Higher dynamic range available upon request.

## For More Information

For More information about Boston Applied Technologies' leadership in optical power control technology and other electro-optical modules and components, visit our website at www.bostonati.com.

To obtain additional technical information or to place an order for this product, please contact us:

Phone: 1-781-935-2800

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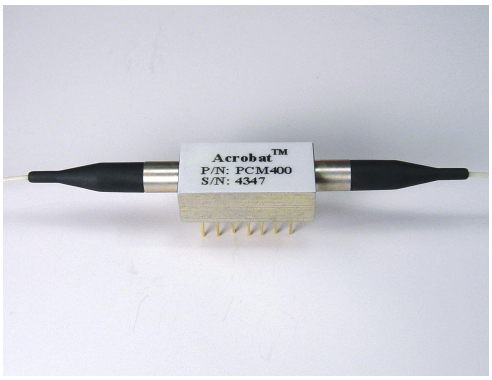
# *Acrobat™* Polarization Controller

*High-speed Polarization Control in a Compact Package*

Boston Applied Technologies' Polarization Controller converts any input state of polarization to any selectable output state of polarization through the application of voltage to independently controlled retardation plates. The device uses OptoCeramic® electro-optic materials to enable high-speed, solid-state polarization conversions in a compact package. Options include printed circuit board mounted voltage drivers as well as a complete package system for easy lab bench operation.




**Features**

- High speed
- Low loss
- Compact
- Solid state
- Meets or exceeds Telcordia GR1221 and GR1209 specifications

**Applications**

- Polarization mode dispersion compensation
- Polarization scrambler
- Polarization multiplexing
- Polarization generator
- Polarization management

**Polarization Controllers**

PCM400: Optical module (four plates)

PCM410: Polarization control kit. PCM400 and a voltage driver packaged for laboratory use, including an 110VAC to 5V power supply, BNC connectors for voltage input, and FC/PC connectors.

PCM420: PCM400 and a voltage driver, which converts a 0-4V input, signal to the drive voltage.

BATi
Boston Applied Technologies,Inc.

## Key Optical Specifications

| Attributes[1,2] | Performance |
|---|---|
| Wavelength Range[3] | 1530-1565 nm, 1570-1610 nm |
| Insertion Loss[2] | 1 dB max, ≤ 0.8 dB typical |
| Speed[4] | < 30 μs |
| Input Power[5] | < 500 mW |
| Polarization Mode Dispersion | < 0.05 ps |
| Polarization Dependent Loss | < 0.1 dB |
| Return Loss | > 55 dB |
| Activation Loss | 0.1 dB |
| Power Consumption[6] | 600 mW typical |
| Operating Temperature Range | 0°C to 70°C |
| Storage Temperature Range | -40°C to 85°C |
| Dimensions (approximate) | 22.3 x 11 x 7.8 mm (0.88 x 0.43 x 0.31 inches) |

***Notes:***

1. Unless otherwise specified, all measurements are at 25°C and 1550 nm.
2. For all wavelengths with zero volts drive.
3. 1310nm and other wavelength also available.
4. The optical response time of a single plate to a change of zero to V(π).
5. Up to 2.7W input power was tested on BATI's devices.
6. Includes voltage drivers used in the PCM420.

## PCM400 Cross-section View

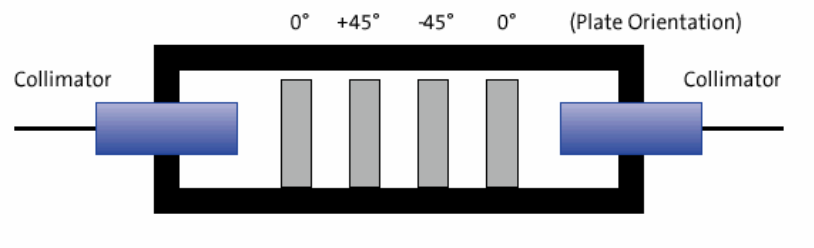



Plate number and orientation can be customer defined.

## Contact Information

For more information about BATi' leadership in polarization controller technology and other optical networking modules and components, visit our website at www.bostonati.com.

To obtain additional technical information or to place an order for this product, please contact us at:

Phone: 1-781-935-2800
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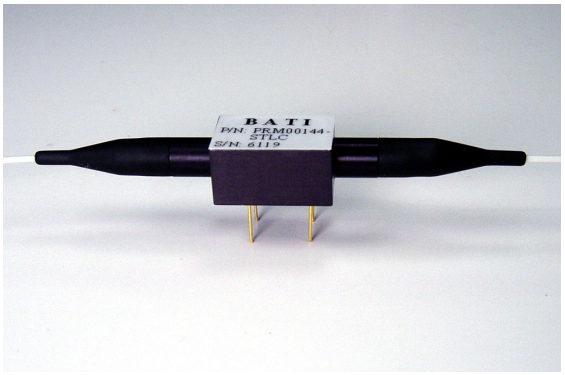
# *Acrobat*™ Dynamic Polarization Rotators

## Solid-state, High-speed Polarization Rotators

Boston Applied Technologies' Acrobat™ Polarization Rotator provides a continuous rotation of any polarized light with the applied control voltage. The device acts as a half-wave plate with a rotating axis. The OptoCeramic® technology enables high-speed, solid-state polarization rotation in a compact package. Both free space and fiber in-line versions are available, with wavelength ranges from visible to mid-infrared.




### Features

- Precise, high-speed polarization rotation control
- Excellent optical performance
- 180 degree polarization rotation
- All solid-state construction in a compact package

### Applications

- Polarization switching
- Optical networks using polarization-maintaining fiber
- Polarization management
- Instrumentation
- Variable digital group delay

BATI
Boston Applied Technologies,Inc.

## Key Optical Specifications

| Attributes[1,2] | Performance |
|---|---|
| **Wavelength Range[3]** | 1310nm / 1550nm (S, C, L) |
| **Insertion Loss** | <0.6 dB |
| **Polarization Rotation** | 180 degree |
| **Response time** | < 30μs |
| **Input Power** | < 500 mW |
| **Return Loss** | ≥ 55 dB |
| **Dimensions (Approximately)** | 26 x 10 x 8.5 mm |
| **Operating Temperature Range** | 0°C to 70°C |
| **Storage Temperature Range** | -40°C to 85°C |

***Notes:***

1. Unless otherwise specified, all measurements are at 25°C.
2. Meets or exceeds Telcordia GR1221 and GR1209 specifications.
3. Also available in visible and mid-infrared wavelength.

## Contact Information

For more information about Boston Applied Technologies' leadership in polarization control technology and other electro-optical modules and components, visit our website at www.bostonati.com.

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*Polarization-preserving, High-speed Attenuation Control*

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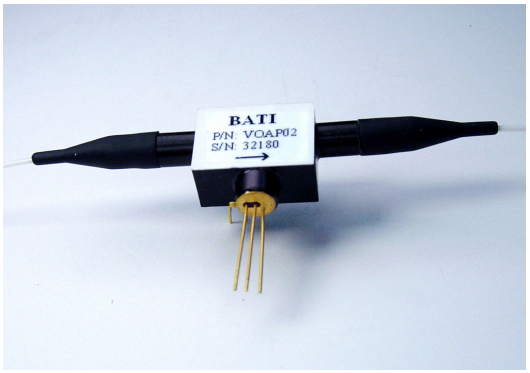


**Features**

- Precise, high-speed attenuation control
- Constant polarization output
- Excellent optical performance
- Integral optical monitor tap
- All solid-state construction in a compact package
- Superb temperature stability

**Applications**

- Optical networks using polarization-maintaining fiber
- Instrumentation

BATI
Boston Applied Technologies,Inc.

## Key Optical Specifications

| Attributes[1,2] | Performance |
|---|---|
| **Wavelength Range**[3] | 1530-1565 nm |
| **Insertion Loss** | 1 dB |
| **Dynamic Range** | 30 dB |
| **Spectral Flatness** | 0.1 dB @ 15 dB attenuation[4] |
| **Extinction Ratio** | 20 dB |
| **Tap Output** | 0.05 μA/μW of output power |
| **Input Power** | < 500 mW |
| **Return Loss** | ≥ 55 dB |
| **Response Time (Full Range)**[5] | < 30 μs |
| **Attenuation Resolution** | Continuous |
| **Operating Temperature Range** | 0°C to 70°C |
| **Storage Temperature Range** | -40°C to 85°C |
| **Dimensions (Approximately)** | 29 x 12 x 8 mm |

***Notes:***

1. Unless otherwise specified, all measurements are at 25°C.
2. Meets or exceeds Telcordia GR1221 and GR1209 specifications.
3. Also operates in the L-Band with 0.2 dB additional insertion loss.
4. For single-wavelength applications.
5. Devices with less than 5μs are also available.

## Contact Information

For more information about BATi's leadership in variable optical attenuation technology and other optical networking modules and components, visit our website at www.bostonati.com.

To obtain additional technical information or to place an order for this product, please contact us at:

Phone: 1-781-935-2800
Fax: 1-781-935-2860
E-mail: sales@bostonati.com

# Acrobat™ Linear Polarization Converter

## High-speed Polarization Controller with Compact Package

*Boston Applied Technologies' linear polarization converter converts any input state of polarization to a single linear polarization by the application of voltage to independently controlled retardation plates. The polarization controller in the linear polarization converter uses OptoCeramic® electro-optic materials to enable high-speed, solid-state polarization conversions in a compact package.*

### Features

- High speed
- Auto-reset
- Low loss
- Compact size
- Solid state

### Applications

- Polarization mode dispersion compensation
- Polarization scrambler
- Polarization multiplexing
- Polarization generator
- Polarization management

BATi
Boston Applied Technologies,Inc.

## Key Optical Specifications

| Attributes[1,2] | Performance |
|---|---|
| Wavelength Range[3] | 1530-1565 nm, 1570-1610 nm |
| Insertion Loss[2] | < 2 dB |
| State of Polarization (SOP) | Arbitrary input and single linear output |
| Input Power | < 500 mW |
| Extinction Ratio | >20dB |
| Return Loss | >55dB |
| Operating Temperature Range | 0°C to 70°C |
| Storage Temperature Range | -40°C to 85°C |

***Notes:***

1. Unless otherwise specified, all measurements are at 25°C and 1550 nm.
2. For all wavelengths with zero volts drive.
3. 1310nm and other wavelength are also available.

## For More Information

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# *Equinox*™ Variable Gain Tilt Filter

*Solid-state, High-speed Gain Equalization and Tilting*

Boston Applied Technologies' Variable Gain Tilt Filter (VGTF) is designed for dynamically compensating the gain tilt profile in Erbium Doped Fiber Amplifiers (EDFAs) and power tilt in multi-channel wavelength division multiplexing (WDM) systems. Based on OptoCeramic® technology, VGTF enables dynamically flattening or tilting the broadband signal in a real-time fashion. BATI's VGTF contains no moving parts and offers high speed, low insertion loss, low polarization dependence loss (PDL), and a wide dynamic range. BATI's advanced micro-optical design also enables the integration of the static gain flattening filter (GFF) and other components into one compact and robust package for space, cost saving and performance enhancement.


**Features**

- Precise, high-speed, real time gain control
- Excellent optical performance
- Low cost, flexible integration
- All solid-state construction in a compact package

**Applications**

- Dynamic gain tilt adjustment
- EDFA

BATI
Boston Applied Technologies,Inc.

## Key Optical Specifications

| Attributes[1,2] | Performance |
|---|---|
| **Wavelength Range** | 1525-1565 nm, 1570- 1610 nm |
| **Insertion Loss** | <1.0 dB |
| **Dynamic Tilt Range** | ± 4 dB[3] |
| **Response** | < 30 μs |
| **Polarization Dependent Loss** | < 0.15 dB[4] |
| **Polarization Mode Dispersion** | < 0.05 ps |
| **Slope Resolution** | Continuous |
| **Input Power** | < 500 mW |
| **Return Loss** | ≥ 55 dB |
| **Dimensions** | 36.6 x 16 x 8 mm |
| **Operating Temperature Range** | 0°C to 70°C |
| **Storage Temperature Range** | -40°C to 85°C |

***Notes:***

1. Unless otherwise specified, all measurements are at 25°C.
2. Meets or exceeds Telcordia GR1221 and GR1209 specifications.
3. Up to 10 dB tilting achievable, 20 dB tilting also available upon request.
4. Measured at ± 4 dB tilting.

## Contact Information

For more information about BATi's leadership in dynamic gain equalization technology and other fiber optical modules and components, visit our website at www.bostonati.com.

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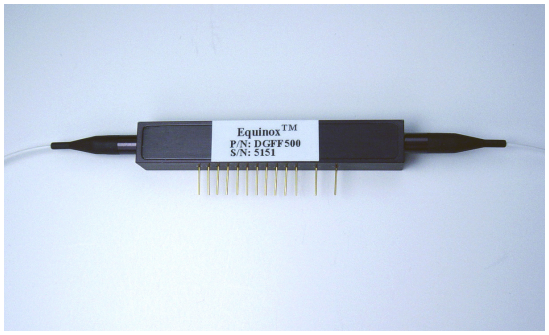
# *Equinox™* Dynamic Gain Flattening Filter

*Solid-state, High-speed Gain Equalization and Tilting*

Boston Applied Technologies' Dynamic Gain Flattening Filter (DGFF) is designed to dynamically reshape the gain curve over the whole band in Erbium Doped Fiber Amplifiers (EDFAs). DGFF also tilts the power in multi-channel wavelength division multiplexing (WDM) systems. Based on OptoCeramic® technology, DGFF enables dynamically flattening or tilting the broadband signal in a real-time fashion. BATI's DGFF contains no moving parts and offers high speed, low insertion loss, low polarization dependence loss (PDL), and a wide dynamic range. BATI's DGFF has multi sinusoidal filters. Each sinusoidal filter is a building block that has harmonic frequencies, variable amplitude, and variable phase.




The combination of multi stages with real time control can form any smooth curve represented by the sum of Fourier curves. It has a compact and robust package for space efficiency, cost saving and performance enhancement.

**Features**

- Precise, high-speed, real time gain control
- Excellent optical performance
- Low cost, flexible integration
- All solid-state construction in a compact package

**Applications**

- Dynamic gain curve reshaping
- EDFA

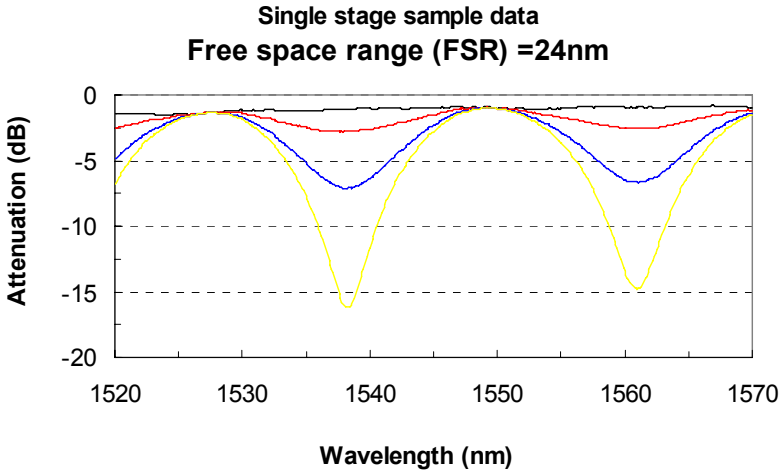
BATI
Boston Applied Technologies,Inc.

## Key Optical Specifications (single sinusoidal filter)

| Attributes[1] | Performance |
|---|---|
| **Wavelength Range** | 1525-1565 nm |
| **Insertion Loss** | < 1 dB[2] |
| **Dynamic (DR)** | > 20 dB |
| **Response** | < 100 μs |
| **Polarization Mode Dispersion** | < 0.1ps |
| **Slope Resolution** | Continuous |
| **Extinction Ratio** | > 22 dB (PM pigtail) |
| **Input Power** | < 500 mW |
| **Return Loss** | ≥ 55 dB |
| **Dimensions** | 68.5 x 11 x 10 mm[3] |
| **Operating Temperature Range** | 0°C to 70°C |
| **Storage Temperature Range** | -40°C to 85°C |

***Notes:***

1. Unless otherwise specified, all measurements are at 25°C.
2. Insertion loss increase 0.5dB for each additional stage.
3. For 5 stages devices, smaller package is available for fewer stages.




## Contact Information

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# *Nanona™* High Speed & Low Loss Optical Switch

*Solid-state, High-speed Fiber-optic Switch*

Boston Applied Technologies, Inc. (BATi)'s Nanona™ ultra-fast optical switch redirects the optical signal from one channel to another at speeds faster than 50ns. The switch utilizes the breakthrough OptoCeramic™ electro-optic material developed by BATI researchers for a variety of light-control applications. Combining the solid-state operation inside a free space propagation architecture which eliminates the moving parts and organic materials, the switch enables ultra-fast, reliable switching with low insertion loss and simple driver.


## Features

- Excellent optical performance
- High-speed operation
- High-reliability mechanism
- All solid-state construction in a compact package

## Applications

- Optical signal switching independent from data rate and data protocol
- Network protection, restoration and performance monitoring
- Instrumentation
- Variable digital group delay
- Medical, aerospace, and other manufacturing and industrial industries

BATi
Boston Applied Technologies,Inc.

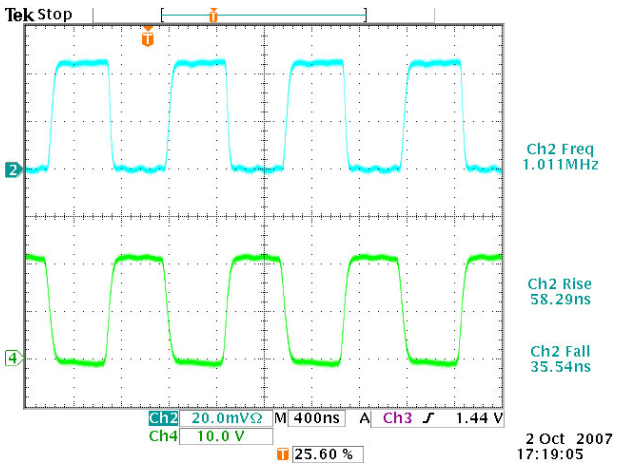
## Key Optical Specifications

| Attributes[1,2] | Performance |
|---|---|
| Wavelength Range[3] | 1310nm / 1550nm (S, C, L) |
| Insertion Loss | < 1 dB |
| Polarization Dependent Loss | < 0.2 dB |
| Cross talk | > 20 dB |
| Polarization Mode Dispersion | < 0.1 ps |
| Response time | < 60 ns (5 μs)[4] |
| Repetition Rate | Up to 1 MHz |
| Input Power | < 500 mW |
| Return Loss | ≥ 55 dB |
| Dimensions (Approximately) | 63 x 11 x 9 mm (43x11x9mm)[4] |
| Operating Temperature Range | 0°C to 70°C |
| Storage Temperature Range | -40°C to 85°C |

***Notes:***

1. Unless otherwise specified, all measurements are at 25°C.
2. Meets or exceeds Telcordia GR1221 and GR1209 specifications.
3. Also available in visible and mid-infrared wavelength.
4. Compact package with 5 μs speed.

## Speed Test Data




## Contact Information

For more information about Boston Applied Technologies' leadership in polarization control technology and other electro-optical modules and components, visit our website at www.bostonati.com.

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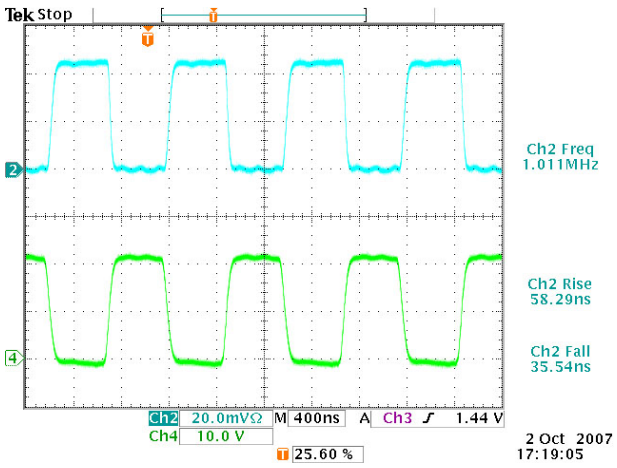


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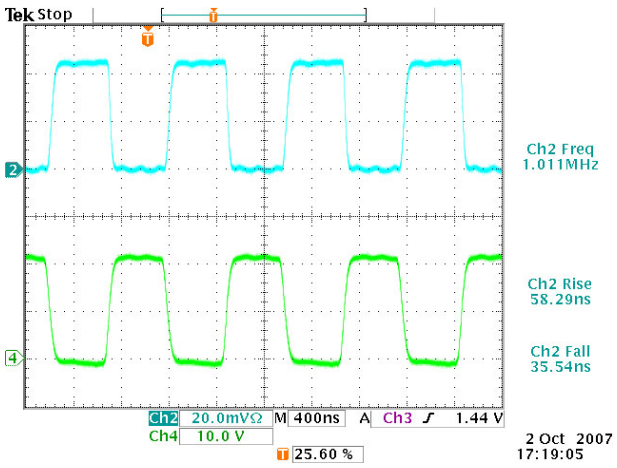


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