# NanoSpeed™
# Mini Variable Fiber Optical Attenuator

## SMF, PMF, Bidirectional, 5x16x23mm

DATASHEET

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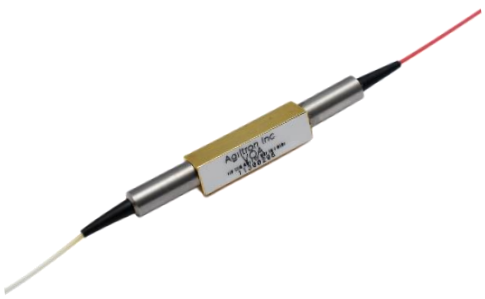

The Mini Nano-speed Variable Fiber Optical Attenuator (MNVA) provides high-speed electrical control of optical power through a patent-pending configuration activated by a voltage control signal. Its solid-state optical crystal design eliminates mechanical movement and the need for organic materials, ensuring long-lasting durability and optimal performance. The MNVA Series Variable Optical Attenuators are engineered to meet demanding operational requirements, offering ultra-high reliability, rapid response times, and a compact footprint, as well as space qualification. The MNVA operates bidirectionally and is available in two configurations: Normally-transparent, where light passes through without voltage applied. Normally-opaque, where light is blocked until voltage is applied. The attenuation level is dependent on the operational stage, while the response speed is influenced by both the attenuation level and driver power (repetition rate). Bare component or mounted on an electronic driving PCB board with a 0–5V control input are available configurations. Agiltron also offers customized electronic designs tailored to specific control requirements and applications.

## Features

- Solid-State
- High speed
- Ultra-high reliability
- Low insertion loss
- Compact

## Applications

- Optical blocking
- Configurable operation
- Instrumentation

## Specifications

| Parameter | | Min | Typical | Max | Unit |
|---|---|---|---|---|---|
| Central wavelength [1] | | 960 | | 2300 | nm |
| Insertion Loss [2] | 1260~1650nm | | 1.5 | 1.9 | dB |
| | 960~1100nm | | 2 | 2.3 | |
| Attenuation Range [3] | | 18 | 22 | 32 | dB |
| Vpi @1550nm | | | 260 | 300 | V |
| Capacitor | | | 60 | | pf |
| PDL (SMF VOA only) | | | 0.1 | 0.3 | dB |
| PMD (SMF VOA only) | | | 0.1 | 0.3 | ps |
| ER (PMF VOA only) | | 18 | 25 | 28 | dB |
| Resolution | | | Continuous | | dB |
| Return Loss | | 45 | 50 | 60 | dB |
| Fiber Type | | | SMF-28, Panda PM, or equivalent | | |
| Driver Repeat Rate | 20kHz driver | DC | 20 | | kHz |
| | 100kHz driver | DC | 100 | | kHz |
| Modulation rate [4] | | 0.1 | | 5 | MHz |
| Optic Power Handling | | | 300 | | mW |
| Operating Temperature | | -5 | | 70 | °C |
| Storage Temperature | | -40 | | 85 | °C |

**Notes**:

[1]. Operation bandwidth is ±25nm approximately at 1550nm.

[2]. Measured without connectors. For other wavelength, please contact us.

[3]. Full attenuation is measured at 5kHz, which may be degraded at the high repeat rate.

[4]. Special circuit for narrow frequency range, maximum modulation depth is 5~10%.

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RoHS COMPLIANT

Warning: **The device mounted on the PCB is an OEM module designed for system integration only, not for general uses. Do not touch the PCB by hand. The electrical static can kill the chips even without a power plug-in, and unpleasant electrical shock may also be felt. For laboratory use, please buy a protected Turnkey system.**



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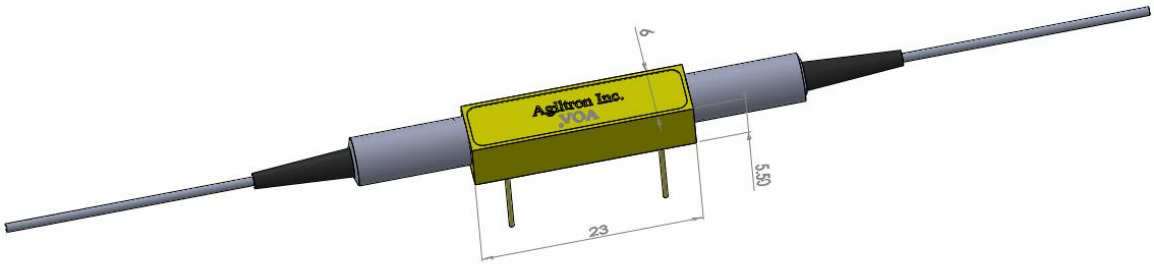
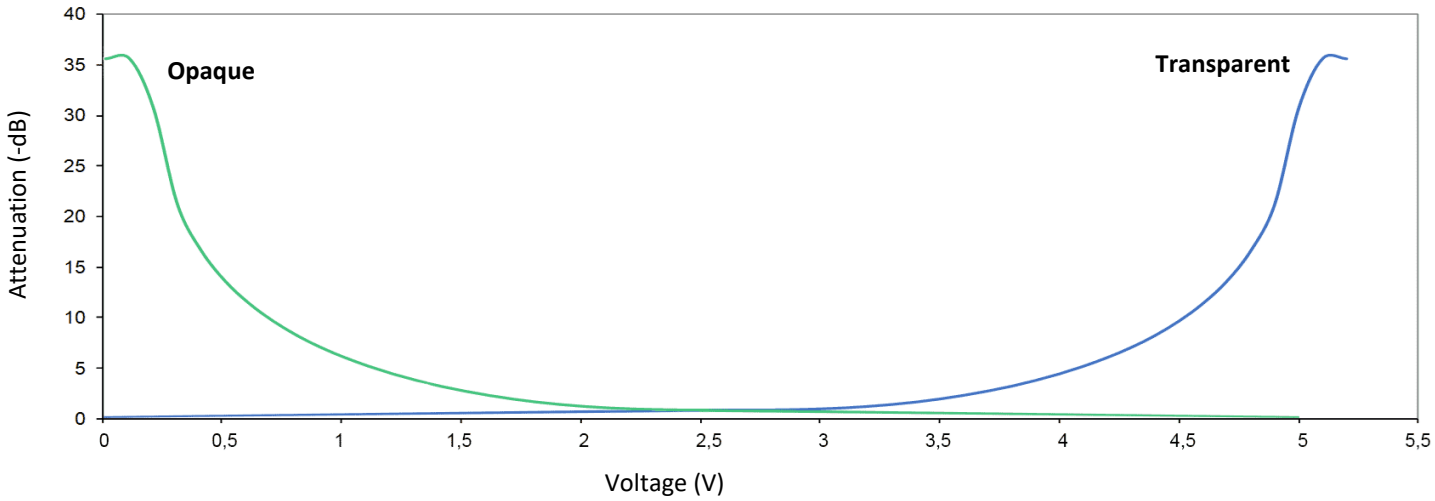
## Mechanical Dimensions (mm)

PIN 0.4mm in diameter,
Rubber boots can be removed to shorten the length




*Product dimensions may change without notice. This is sometimes required for non-standard specifications.

## Typical Attenuation versus Voltage




** Measured with Agiltron's NVDR driver*

## Driving Board Selection

| Maximum Repetition Rate | Part Number (P/N) |
|---|---|
| 20 kHz | NVDR-113235112 |
| 100 kHz | NVDR-112221112 |

**Note:** For customers that prefer to design their own driving circuit, they are responsible for the optical performance. For more technical information, please contact us.

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### Module Dimensions (mm) with Driver PCB

A miniature driver is available

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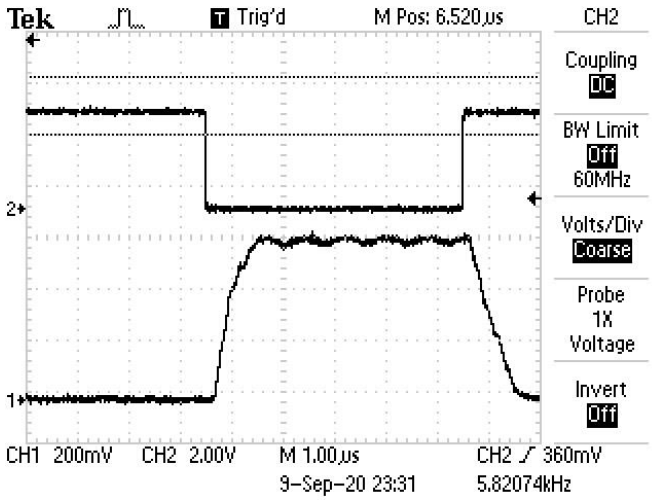
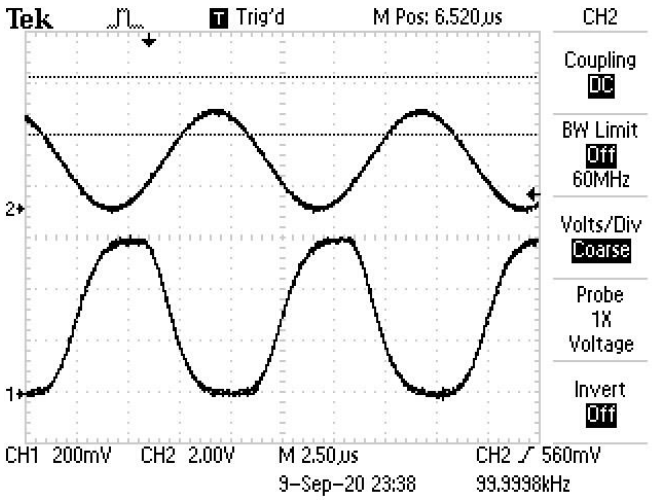
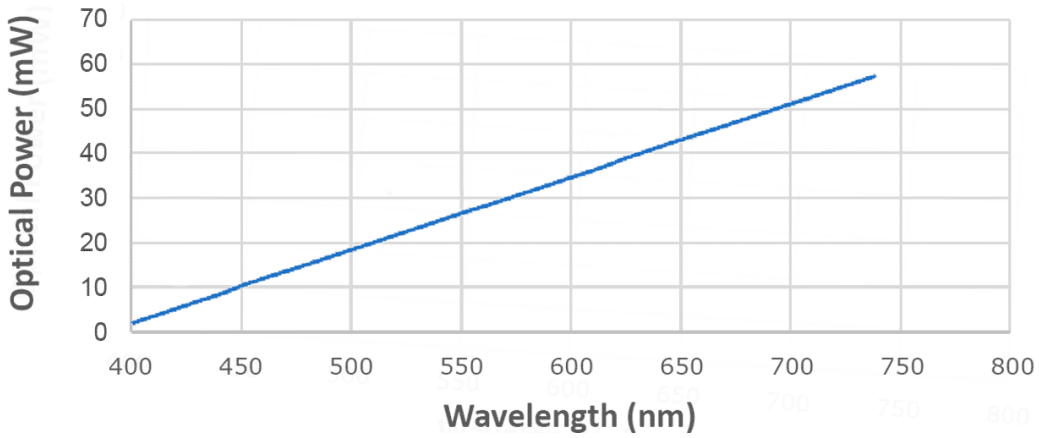
## Typical High Speed Response

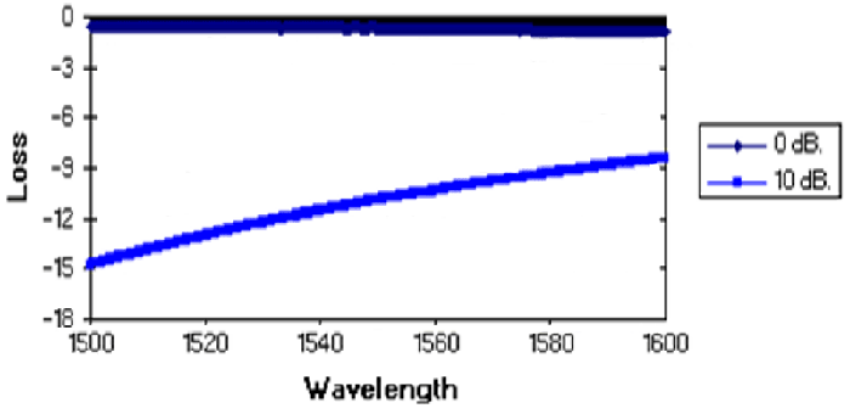



## Optical Power Handling vs Wavelength for Standard SM Fibers




## Typical WDL @10dB attenuation

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## Ordering Information

| | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
|---|---|---|---|---|---|---|---|---|---|
| **Prefix** | **Wavelength** | **Function** | **Configuration** | **Fiber Type** | **Fiber Cover** | **Fiber Length** | **Connector[4]** | **PER** | **Driver** |
| **MNVO-** | 1060 nm = 1<br>L Band = 2<br>1310 nm = 3<br>1410 nm = 4<br>1550 nm = 5<br>1950 nm = 9<br>2100 nm = 8<br>Special = 0 | Intensity = 1<br>Phase = 2 | Transparent = 1<br>Opaque = 2<br>Special = 0 | SMF-28 = 1<br>HI 1060 = 2<br>PM 1550 = 5<br>PM 1400 = C<br>PM 1310 = D<br>PM 980 = E<br>PM 1900 = 9<br>PM 2000 = 8<br>Special = 0 | Bare fiber = 1<br>0.9mm tube = 3<br>Special = 0 | 0.25 m = 1<br>0.5 m = 2<br>1.0 m = 3<br>Special = 0 | None = 1<br>FC/PC = 2<br>FC/APC = 3<br>SC/PC = 4<br>SC/APC = 5<br>ST/PC = 6<br>LC/PC = 7<br>LC/APC = 9<br>LC/UPC = U<br>Special = 0 | Non = 1<br>>18 = 2<br>>25 = 3<br>>29 = 4 | Non = 1<br>100kHz = 2<br>Mini = 3 |

**Note**:
"**transparent**" means no attenuation without applying a controlling voltage, the "**opaque**" means the highest attenuation without applying a controlling voltage.

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