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MAP Variable Optical Attenuator

mVOA-A1

Key Features

- **Ultra low insertion loss (<1.0 dB) and outstanding spectral uniformity**
- **Fastest transition speed in its class (up to 25 dB/s)**
- **Configurable by user at time of order (fiber type, density, built-in options, high power option)**
- **Optional built-in power monitor provides comprehensive closed-loop power control settings**
- **Optional higher power capability can withstand up to 2W input power for single-mode fiber (500 mW for MMF)**

Applications

- Transmitter dispersion testing and eye mask testing
- Receiver sensitivity testing
- EDFA noise figure and gain flatness testing
- Power meter calibration
- Loss simulation

Safety Information

- This cassette, when installed in a MAP Chassis, complies to CE requirements plus UL3101-1 and CAN/CSA-C22.2 No. 1010.1

Today's transmission systems are designed to provide increased throughput, reduced costs, and improved reliability. To validate these network systems and underlying sub-components, test equipment must perform the required rigorous testing quickly and accurately. The latest MAP Variable Optical Attenuator was designed with those constraints in mind. The stepper motor and filter based design takes advantage of the latest available technologies to provide the highest performance optical power level control solution with the lowest optical impairments.

– Ultra low insertion loss to minimize loss budget utilization

– High accuracy and high repeatability to reduce measurement uncertainty

– Fast transition speed to reduce testing time

– Flat spectral response to reduce wavelength dependent uncertainty in multi-wavelength applications (CWDM, DWDM)

– Low backreflection to reduce instabilities due to reflected light

– Optional built-in wavelength calibrated power meter reduces the uncertainty by reducing external connections

– High input power capability for EDFA testing and multi-wavelength applications

The MAP Variable Optical Attenuator is a hot-pluggable cassette designed for use within the Multiple Application Platform (MAP). The MAP is a general purpose high density test and measurement platform for lab or production environments. Up to 16 independently controlled attenuators can be installed in a single MAP chassis.

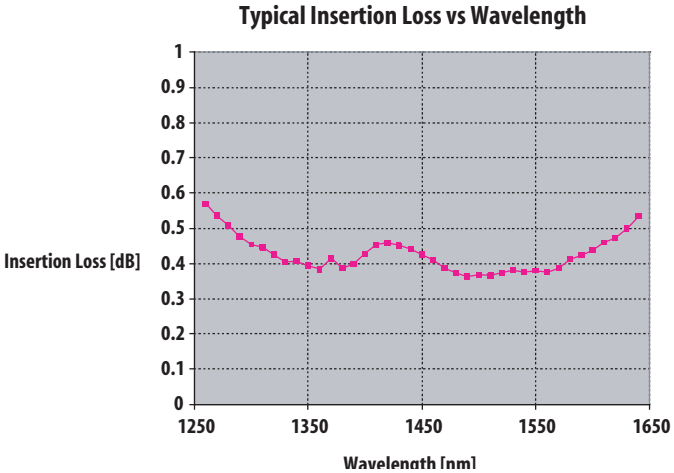


Figure 1: Typical spectral uniformity relative to 0 dB attenuation

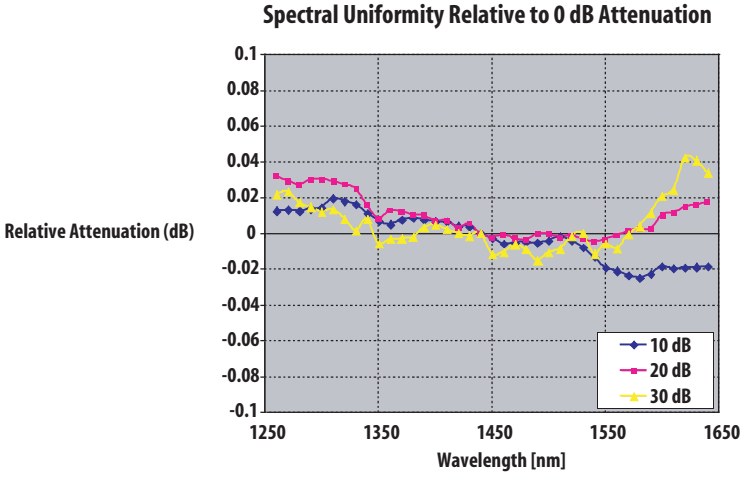


Figure 2: Typical insertion loss of the MAP Variable Optical Attenuator with single-mode fiber

Optical Specifications

Parameter	Single-mode		Multimode	
	No power control	With power control	No power control	With power control
Insertion loss at min attenuation [1,2,3]	≤ 1.0 dB [4, 5]	≤ 1.7 dB [5]	≤ 1.5 dB [4, 5]	≤ 2.2 dB [5]
Maximum input power (Standard Power/High Power Option) [10, 13]	+23 dBm/+33 dBm		+27 dBm	
Wavelength range	1260 to 1650 nm		750 to 1350 nm	
Attenuation range	70 dB		50 dB	
Attenuation flatness [8, 9]	± 0.04 dB from 0 to 30dB		NA	
Attenuation slew rate (nominal)	up to 25 dB/s		up to 17 dB/s	
Attenuation setting resolution	0.001 dB		0.001 dB	
Attenuation accuracy (from 0 to 45 dB) [1, 3, 12]	± 0.1 dB		± 0.1 dB	
Attenuation repeatability, 2σ [3, 11, 12]	± 0.01 dB		± 0.01 dB	
Closed loop output power range (In-line power monitor option)	NA	-49 to +11 dBm @ 1310/1550 ±15 nm	NA	-40 to +5 dBm @ 850/1310 ±15 nm
Relative power meter uncertainty [3,5,9,10]	NA	± 0.03 dB	NA	± 0.03 dB
Power setting repeatability [5,9]	NA	± 0.015 dB	NA	± 0.015 dB
Absolute power accuracy	NA	± 0.5 dB	NA	± 0.5 dB
Power setting resolution	NA	0.001 dBm	NA	0.001 dBm
Polarization dependant loss (from 0 to 25 dB) [3, 6]	<0.08 dB	<0.15 dB	NA	NA
Return loss (APC and PC connector) [7]	> 55/45 dB typical		> 35/30 dB typical	
Shutter isolation	typical 100 dB			
Warm up time	30 minutes			
Calibration period	2 years			
Operating temperature	0 to 50˚C			
Storage temperature	-30 to 60˚C			
Operating humidity (relative, non-condensing)	< 90% @ 23˚C; < 20% @ 50˚C			
Dimensions (WxHxD)	4.06x13.24x39.5 cm			
Weight	1.1 kg (single) / 1.3 kg (dual)			

1. At 1310 ± 15 and 1550 ± 15 nm for SM unit and at 850 ± 15 and 1300 ± 15 for MM unit
2. Including one mated pair of connectors
3. At 23 ± 5 °C
4. Not including tap coupler loss, if installed
5. Value shown is for 1550nm. For 1300/ 1310nm the value is typical.
6. At 1550 +/-15nm only
7. At 1550 +/-15nm for SM, 1300 +/-15nm for MM
8. From 1480 to 1640nm relative to 0 dB attenuation
9. For unpolarized light.
10. Without high power option max input power is 200mW
11. Constant wavelength, constant temperature, constant state of polarization
12. Measured using low coherence laser source
13. Damage at high optical power due to scratched or poorly cleaned connectors may result. JDSU assumes no responsibility for these user conditions.

Ordering Information:

The MAP Variable Optical Attenuators are defined by selecting the required options from the product configurator in the table below. Select one option from each of the three categories (Base Configuration, Fiber Type, and Connector Type).

Base Configurations (Select one)	
MVOA-A1SS0	Single Attenuator, Standard Power, No built-in Options
MVOA-A1SS1	Single Attenuator, Standard Power, 10/90 Splitter for external power monitor
MVOA-A1SSM	Single Attenuator, Standard Power, with Integrated Power Monitor
MVOA-A1SH0	Single Attenuator, High Power, No built-in Options
MVOA-A1SH1	Single Attenuator, High Power, 10/90 Splitter
MVOA-A1SHM	Single Attenuator, High Power, with Integrated Power Monitor
MVOA-A1DS0	Dual Attenuator, Standard Power, No built-in Options
MVOA-A1DS1	Dual Attenuator, Standard Power, 10/90 Splitter
MVOA-A1DSM	Dual Attenuator, Standard Power, with Integrated Power Monitor
MVOA-A1DH0	Dual Attenuator, High Power, No built-in Options
MVOA-A1DH1	Dual Attenuator, High Power, 10/90 Splitter
MVOA-A1DHM	Dual Attenuator, High Power, with Integrated Power Monitor

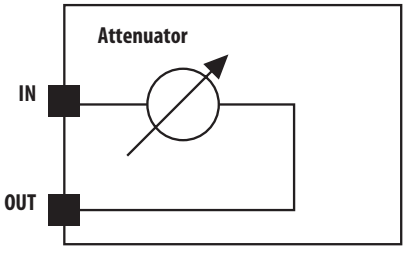
Fiber Type Options (Select one)	
M100	9/125 fiber
M101	50/125 fiber
M102	62.5/125 fiber

Connector Type Options (Select one)	
MFP	FC/PC Connector
MFA	FC/APC Connector
MSC	SC/PC Connector
MSU	SC/APC Connector

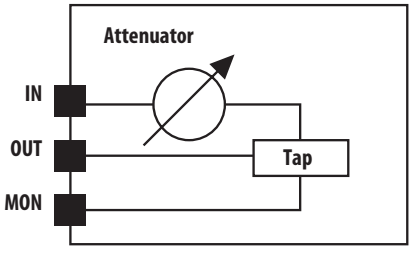
Sample Configuration:

The following configuration specifies a Single Attenuator, Standard Power, No built-in Options, 9/125 fiber, and FC/PC Connector.

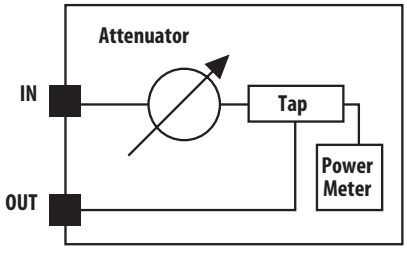
MVOA-A1SS0 with options M100 and MFP



Without Options



With Tap Option



With In-line Power Monitor Option

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