MAP Variable Optical Attenuator

(mVOA-C1)

The Multiple Application Platform (MAP) Variable Optical Attenuator (mVOA-C1) is a stepper motor and filter-based attenuator that delivers metrology-grade attenuation performance in the industry's most compact modular package.

With more than 20 years of leadership in high-performance attenuators for lab and manufacturing applications, the mVOA-C1, now in its 5th generation, is available in single, dual, and/or quad configurations. Also, it works in all MAP-200 platforms, including the new two-slot MAP-220.

The MAP-200 is the first photonic layer lab and manufacturing platform that complies with LAN Extensions for Instrumentation (LXI) by conforming to the required physical attributes, Ethernet connectivity, and interchangeable virtual instrument (IVI) drivers. The optimized MAP-200 platform's industry-leading density and maximum configurability meets specific application requirements within the smallest footprint.

Chassis Flexibility

Leveraging the modularity of the MAP-200 chassis system, the mVOA-C1 can be deployed in several configurations and in many different environments.

For the basic lab bench, a single VOA module can be deployed in a compact MAP-220C LightDirect chassis. This simple two-slot solution is ideal for situations that require simplicity, a local touch screen GUI, and lab portability. When fast, simple, and accurate measurements are necessary, it eliminates the need to use inferior handheld tools or to control the device from a PC. The second slot is ideal for flexibly deploying power meters or optical switches. The MAP-220C can be easily rack-mounted in an automated test environment that requires one to eight VOAs.

Larger, automated production projects require moving up to the MAP-230B or MAP-280. The MAP-280 can fit up to 32 VOAs in just 3U of rack height. All VOAs can be controlled through a simple, common GUI or remote control interface.

Key Benefits

- Ultra low insertion loss (<0.9 dB) and outstanding spectral uniformity minimize loss budget utilization
- Fastest transition speed and settling time in its class reduces testing time
- User-configurable 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 multimode fiber)

Key Features

- High accuracy and high repeatability reduces measurement uncertainty
- Flat spectral response reduces wavelength-dependent uncertainty in CWDM and DWDM multi-wavelength applications
- Low backreflection reduces instabilities due to reflected light
- Optional built-in wavelength calibrated power meter reduces uncertainty by reducing external connections
- High input power capability for EDFA testing and multi-wavelength applications

Applications

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

Safety Information

- Complies with CE, CSA/UL/IEC61010-1, plus LXI class C requirements when installed in a MAP chassis

Figure 1. Deployed in the MAP-280 chassis, the Quad mVOA-C1 delivers up to 32 VOA channels in just 3U of equipment rack space.

The MAP variable optical attenuator is a hot-pluggable cassette designed for use within the MAP, which 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.

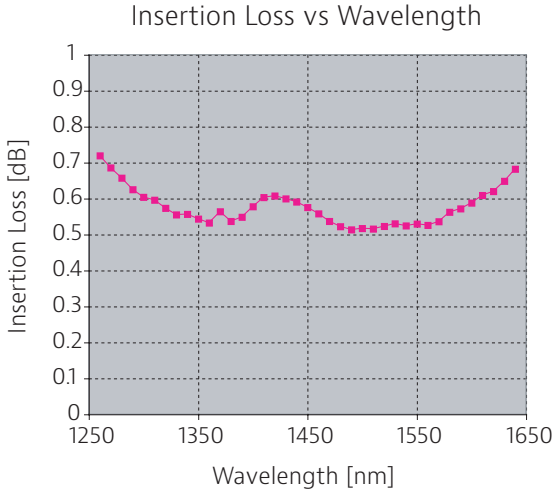


Figure 2. Example of insertion loss of the MAP variable optical attenuator with single-mode fiber

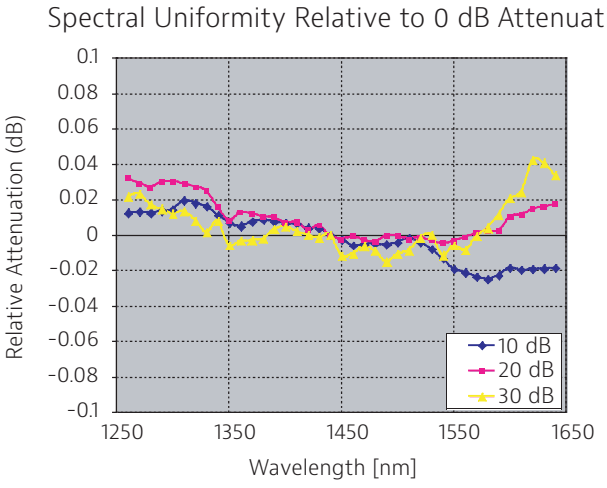
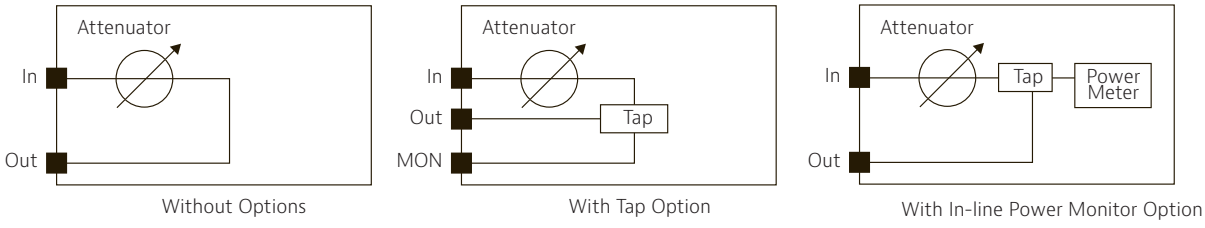


Figure 3. Example of spectral uniformity relative to 0 dB attenuation

LightDirect Family

The MVOA-C1 is a member of MAP-200 LightDirect family of basic fiber optic test tools. LightDirect modules can be deployed in all available MAP chassis systems, including the MAP-220C 2-slot benchtop chassis. The MAP-220C is ideal for bench use or small automated test projects and features a local touch screen as well as Ethernet or GPIB automation. The second slot is ideal for an optical power meter or variable optical attenuators. The MAP-230B (3-slot) or MAP-280 (8-slot) is ideal for large deployments and is the most compact optical test solution on the market.

Light Direct



Specifications

Parameter	Single-Mode		Multimode	
	Standard	***With Output Power Monitor***	***Standard***	***With Output Power Monitor***
Insertion loss at 0 dB[1,2,3,4]	≤0.9 dB (≤1.5 dB tap option)	≤1.5 dB	≤1.5 dB (≤2.4 dB tap option)	≤2.4 dB
Polarization-dependent loss[5]	≤ 0.08 dB (≤0.15 dB tap option)	≤0.15 dB	N/A	
Return loss[1,2,6]	≥55 dB		≥45 dB	
Maximum input power[9] (standard power/high-power option)	+23 dBm/+33 dBm		+23 dBm/+27 dBm	
Wavelength range	1260 to 1650 nm		750 to 1350 nm	
Attenuation range[1,2]	70 dB		65 dB	
Shutter isolation	≥80 dB		≥75 dB	
Attenuation flatness[8,10]	±0.04 dB		N/A	
Attenuation slew rate	≥25 dB/s		≥20 dB/s	
Relative attenuation uncertainty[1,2,3,7,10,11,13]	±0.1 dB			
Attenuation repeatability[3,7,11,13]	±0.01 dB			
Attenuation resolution[14]	0.001 dB			
Attenuation settling time	≤55 ms			
Closed-loop power range[1,2]	N/A	+11 to −49 dBm	N/A	+5 to −40 dBm
Power monitor linearity[1,2,3,10]	N/A	±0.03 dB	N/A	±0.03 dB
Power setting repeatability[1,2,10]	N/A	±0.015 dB	N/A	±0.015 dB
Power setting resolution	N/A	0.001 dB	N/A	0.001 dB
Warm-up time	30 min			
Calibration period	3 years			
Operating temperature	0 to 50°C			
Storage temperature	−30 to 60°C			
Operating humidity	15 to 80% RH, 0 to 40°C noncondensing			
Dimensions (W x H x D)	4.1 x 13.3 x 37.0 cm			
Weight	1.1 kg (single)/1.3 kg (dual)/1.7 kg (quad)			

1. At both 1550 ±15 nm and 1310 ±15 nm for single-mode.
2. At both 850 ±15 nm and 1310 ±15 nm for multimode.
3. +23/−5°C only.
4. Excludes connectors, add 0.2 dB typically for connectors.
5. For 0 to 25 dB.
6. Return loss excludes connectors.
7. For range of 0 to 45 dB.
8. For range of 0 to 30 dB over 1480 to 1640 nm.
9. Input to output port only.
10. For light with DOP <5%.
11. For low-coherence laser source (>500 MHz).
12. Consecutive measurements.
13. Relative to 0 dB position.
14. 0 to 65 dB for single-mode, 0 to 50 dB for multimode.

Configuration and Ordering

For more information on this or other products and their availability, please contact your local Viavi account manager or Viavi directly at 1-844-GO-VIAVI (1-844-468-4284) or to reach the Viavi office nearest you, visit viavisolutions.com/contacts.

All mVOA-C1 attenuators are configured by a single part number that defines the function and options of the module.

The structure of the part number mVOA-C1**ABC**-M**XXX**-M**YY** is as follows:

A refers to the number of mVOA-C1 attenuators in the module (S=1, D=2, Q=4)

B refers to the power rating of the attenuator (S=Standard, H=High Power[1])

C defines the options (0 = no option, 1 = 5% Tap[2], 2=Power Monitor, E=Extended Range[3])

XXX defines the fiber type, refer to Table 1

YY defines the connector type, refer to Table 2

Available Configurations

Order Code	Description
MVOA-C1SS0-MXXX-MYY	Single VOA, Standard Power, No Option
MVOA-C1DS0- MXXX-MYY	Dual VOA, Standard Power, No Option
MVOA-C1QS0- MXXX-MYY	Quad VOA, Standard Power, No Option
MVOA-C1SSM- MXXX-MYY	Single VOA, Standard Power, Monitor Option
MVOA-C1DSM- MXXX-MYY	Dual VOA, Standard Power, Monitor Option
MVOA-C1QSM- MXXX-MYY	Quad VOA, Standard Power, Monitor Option
MVOA-C1SH0- MXXX-MYY	Single VOA, High Power, No Option
MVOA-C1DH0- MXXX-MYY	Dual VOA, High Power, No Option
MVOA-C1SHM- MXXX-MYY	Single VOA, High Power, Monitor Option
MVOA-C1DHM- MXXX-MYY	Dual VOA, High Power, Monitor Option
MVOA-C1SS1-M100-MYY	Single VOA, Standard Power, Tap Option, Single Mode Fiber
MVOA-C1DS1-M100-MYY	Dual VOA, Standard Power, Tap Option, Single Mode Fiber
MVOA-C1QS1-M100-MYY	Quad VOA, Standard Power, Tap Option, Single Mode Fiber
MVOA-C1SSE-M100-MYY	Single VOA, Standard Power, Extended Range Option, Single Mode Fiber

Table 1

XXX Code	**Fibre Type**
M100	9µm Single Mode
M101	50µm (OM3)
M102	62.5µm (OM1)

Table 2

YY Code	**Connector Type**
MFP	FC/PC
MFA	FC/APC
MSC	SC/PC
MSU	SC/APC
MLC	LC/PC
MLU	LC/APC

Notes

1. High Power is available only for Single or Dual VOA configurations
2. Tap option is available only for single mode, standard power configurations
3. Extended Range is available only for single VOA, standard power, single mode configuration

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