



VARIABLE OPTICAL ATTENUATOR (VOA)

The Umachines MEMS Variable Optical Attenuator (UMVA) uses 2-D MEMS technology and features low insertion loss, low power consumption, small size, fast response time and high reliability and is designed to exceed GR-1221.



PRODUCT DESCRIPTION

The UMVA variable optical attenuator provides voltage controlled attenuation between one input fiber and one output fiber and is ideal for network power level management applications. The MEMS attenuator is operated by applying a drive voltage across two electrical pins located on the bottom of the package. Excellent temperature stability is possible when used in a closed-loop system. Repeatability and attenuation resolution are also outstanding.

Mechanically, the MEMS element is well designed to avoid both stiction and frictional wear and to withstand the shocks and vibrations associated with both transportation and system operation. The MEMS attenuator is available both as a normally-on and as a normally-off version.

Umachines also provides arrays of MEMS attenuators and customized modules that include taps, detectors, WDMs, splitters and electronics. For arrays of MEMS attenuators, the MEMS and optical elements can be easily and economically replicated in a single package, further saving board space and cost.

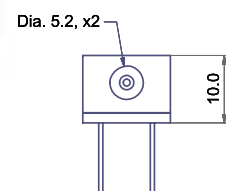
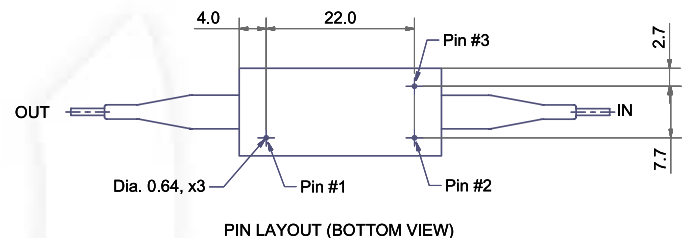
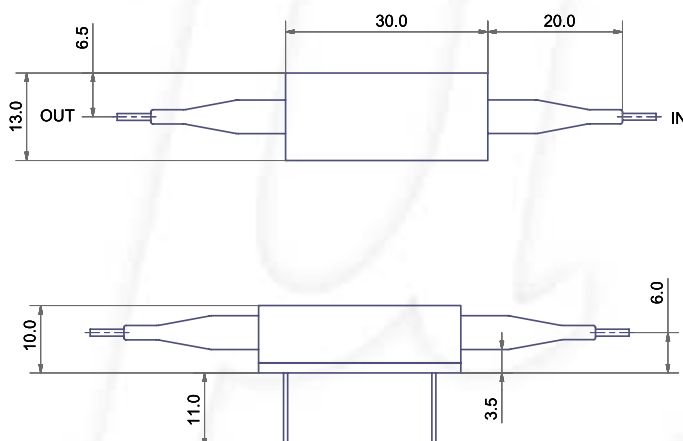
FEATURES

- Highly reliable
- Low insertion loss
- Low power consumption
- Low polarization dependence
- Ultra-fast response time
- Small form factor
- Epoxy-free optical path
- Both normally-on and normally-off versions available
- Stiction free

APPLICATIONS

- Power equalization in optical networks
- Gain-tilt control in optical amplifiers
- Dynamic gain equalization (both channel or band level)
- Shuttering and power control of lasers and receivers

All dimensions in mm





SPECIFICATIONS

Parameter	Specification	
Insertion Loss ^{1,2}	<0.5dB (0.3dB typ.)	
Wavelength Range	1525-1575nm or 1570-1610nm	
Attenuation Range	>30dB	
Attenuation Resolution	<0.01dB	
Wavelength Flatness ³	0-5dB attenuation	<0.2db
	5-10dB attenuation	<0.3db
	10-20dB attenuation	<0.4db
	20-30dB attenuation	<0.6db
Fast Ripple ⁴	±0.1dB typ., ±0.15dB max.	
Temp Dependence ⁵	±0.1dB typ., ±0.15dB max.	
Repeatability	±0.02dB	
Return Loss	>55dB	
PDL	<0.1dB	
PMD	<0.05ps	
Optical Power	500mW (higher power rating available upon request)	
Lifetime	>100M cycles	
Response Speed	<5ms	
Power Consumption	25mW	
Power Supply	0-3V	
Shock Resistance	500G	
Monotonicity	>0dB/V	
Size	30mm x 13mm x 10mm	
Operating Temp (Top)	-10 to 65C	
Operating Humidity	<85% RH, or <90% RH short term ⁶	
Storage Temp	-40 to 85C	
Storage Humidity	<85% RH, or <95% RH short term ⁶	
Control	Analog 0-3VDC	
Epoxy	No epoxy in optical path	

Specification Notes:

1. Excluding connectors
2. Over operating temperature, wavelength and inclusive of PDL.
3. For slow "S" ripple type only. Max. variation over whole C or L band.
4. For fast "F" ripple type only. Max change over 400GHz segment within C or L band.
5. At minimum loss position
6. Short term is defined as less than 96 consecutive hours and less than a total of 15 days over a one-year period.

ORDERING INFORMATION

For more information on this or other products and their availability, please contact your local Umachines sales representative or Umachines directly at 626-441-3223 in North America, or via email at info@umachinesinc.com.

Sample: **UMVAFx15910NC**

U M V A

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Code	Product Type
1	VOA - Normally-On ¹
2	VOA - Normally-Off ²

Code	# in Array
1	1

Code	Ripple Type
F	Fast Ripple ³
S	Slow Ripple ⁴

Code	Wavelength
3	1280-1340nm
5	1525-1575nm
6	1570-1610nm

Code	Fiber Length
1 0	1.0m
1 5	1.5m
2 0	2.0m
x x	specify

Code	Connector Type
N C	No connector
F C	FC/UPC
F A	FC/APC
S C	SC/UPC
S A	SC/APC
L C	LC/PC
M U	MU

Code	Fiber Type
2	9/125/250um
9	9/125/900um

Ordering Notes:

1. Normally-On has minimum attenuation when no voltage is applied.
2. Normally-Off has maximum attenuation when no voltage is applied.
3. For single channel or narrowband power adjustment such as with dynamic gain equalizers or OADMs.
4. For broadband power adjustment such as with fiber amplifiers.

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