

# MEMS Ultra Mini Variable Optical Attenuator

Vibration Insensitive, Smallest Size on the Market

(US patent 8,666,218 and other patents pending)

## Product Description

The *et*MEMS Series VOA is based on a patented thermal micro-electro-mechanical mechanism featuring vibration insensitive, ultra-compact design, low voltage direct drive, vacuum compatible, and excellent optical performance. The *et*MEMS series VOA is compliant with the Telcordia 1209 and 1221 high-reliability standards. The electrical connection is a flexible PCB with two holes at the end to mate with two pins on the board. A mini surface resistor can be pre-installed in series on the flexible PCB so that the maximum driving voltage matches the customer application. A temperature compensation resistor can also be mounted to the device.

The *et*MEMS series VOA is available in either normally-open or normally-closed configurations and with an integrated tap option. The VOA is driven by applying an electrical voltage.



## Performance Specifications

SM series VOA	Min	Typical	Max	Unit
Wavelength	1260		1620	nm
Insertion Loss <sup>[1]</sup>		1.2	1.4	dB
Wavelength Dependent Loss	@10dB	0.2	0.4	dB
	@20dB	0.4	0.7	dB
Attenuation Resolution		Continuous		dB
Return Loss	38			dB
Response Time		1	5	ms
Mechanical Resonance Frequency	2K			Hz
Optical Power Handling (CW)		300	500	mW
Driving Voltage <sup>[3]</sup>	3.5	4.5	5.5	VDC
Power Consumption <sup>[3]</sup>		80	120	mW
Reliability	Telcordia 1209 and 1221			
Operating Temperature		-20 ~ 75		°C
Storage Temperature		-40 ~ 85		°C
Fiber Type	SMF-28			
Package Dimension	See drawing below			mm

Notes:  
 [1]: Excluding connectors  
 [2]: Reference to room temperature  
 [3]: For full dynamic range, it is selectable on the order part number

## Features

- Compact
- Vibration Insensitive
- High Reliability

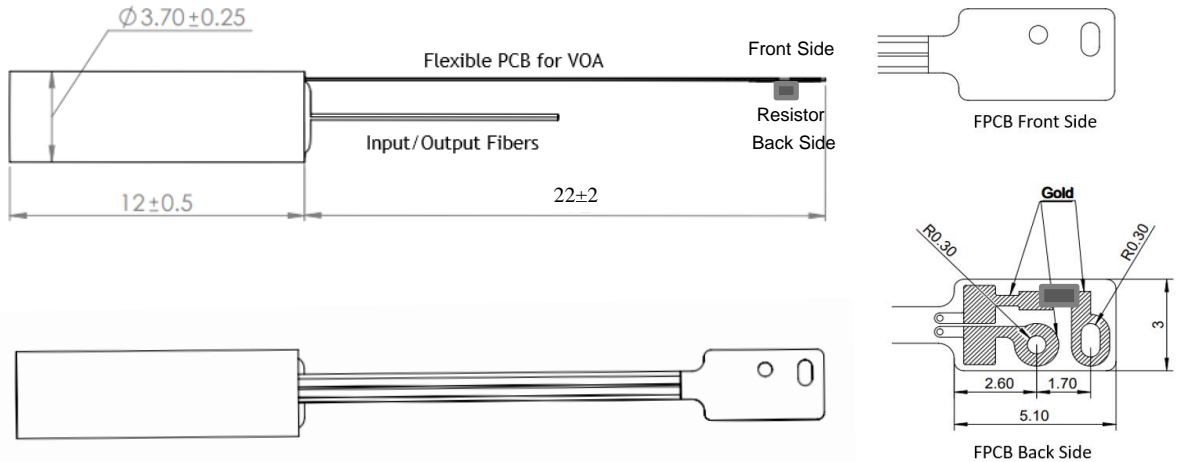
## Applications

- Power Control
- Power Regulate
- Channel Balance
- Instrumentation



# etMEMS™ Variable Optical Attenuator

## Mechanical Footprint Dimensions (mm)



## Electrical Driving Instruction

- The maximum control voltage corresponding to the part number, higher than the corresponding value may cause device damage.
- The electrical character is similar to a pure resistor, no polarity, and ESD insensitive.

## Ordering Information

Prefix	Type	Wavelength*	Off State	Package	Fiber Type	Fiber Cover	Fiber Length	Connector
USOA-	No-resistor=01 Drive Voltage 4.5V=10 Drive Voltage 5V=11 Driving Voltage 3.5V=22 Special=00	1550 = 5 1260-1620= 8 1310=3 S+C+L=2 Special = 0	Transparent =1 Opaque = 2	L12mm=1 Special=0	SMF-28 = 1 Special = 0	Bare fiber=1 900um tube=3 Special = 0	0.25m= 1 0.5m = 2 1.0m= 3 Special =0	None = 1 FC/PC = 2 FC/APC = 3 SC/PC = 4 SC/APC = 5 ST/PC = 6 LC /PC= 7 LC/APC=8 Special = 0

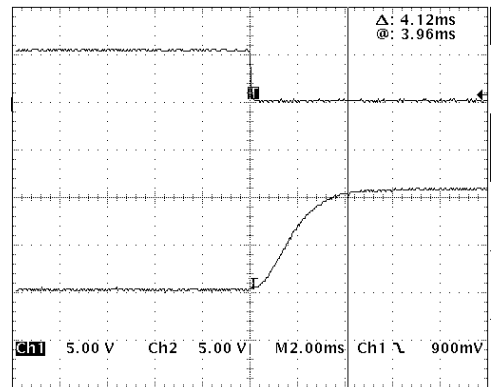
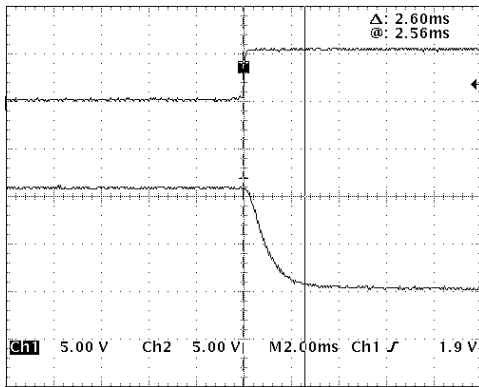
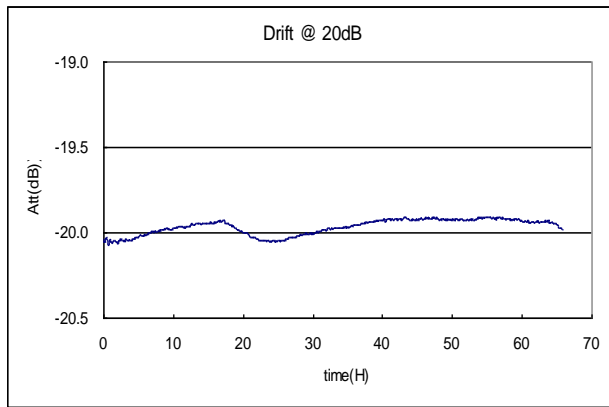
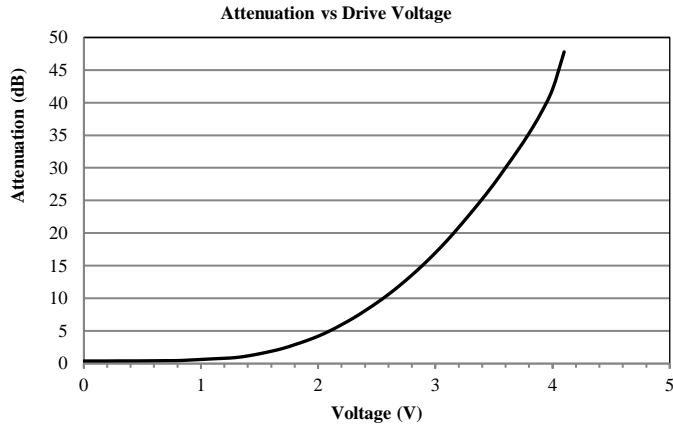
\*tested wavelength

**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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## Typical Performance Charts



# etMEMS™ Variable Optical Attenuator

## Typical Insertion Loss vs Wavelength (1240-1630nm)

1x2 MEMS Switch

