

## Mini Shutter Variable Optical Attenuator (Dark Type)

### Description

Broadex Technologies offers a MEMS-based VOA with a shutter type mechanism that is extremely compact and easy to integrate into any optical network. This thermally actuated VOA is available in both bright and dark configurations and features very low insertion loss and polarization dependent loss along with high dynamic range and high off-state extinction. The hermetically sealed packaging is highly insensitive to shock and vibration and is ESD safe up to 500V. Broadex Technologies Shutter MEMS VOA is ideal for receiver protection or transponder power control, and it is also widely used in EDFAs for power equalization of all channels in multi-channel systems.

### Features

- Compact size
- Low insertion loss, low PDL
- Low wavelength dependence loss
- Fast response time
- Hermetically sealed MEMS chip
- Insensitive to shock and vibration
- Low power consumption



### Applications

- Optical network power management
- Gain-tilt control in EDFA
- Receiver protection
- Channel on/off switching
- Mux and Demux module, OADM node

## Specifications

### ● Absolute Maximum ratings

Parameters	Unit	Spec		
		min	Typical	max
Storage Temperature	Degree	-40		85
Operating Temperature	Degree	-5		75
Storage Relative Humidity	%	5		95
Operating Relative Humidity	%	5		95
Power Consumption	mW	150		
ESD Level(HBM)	V	500		

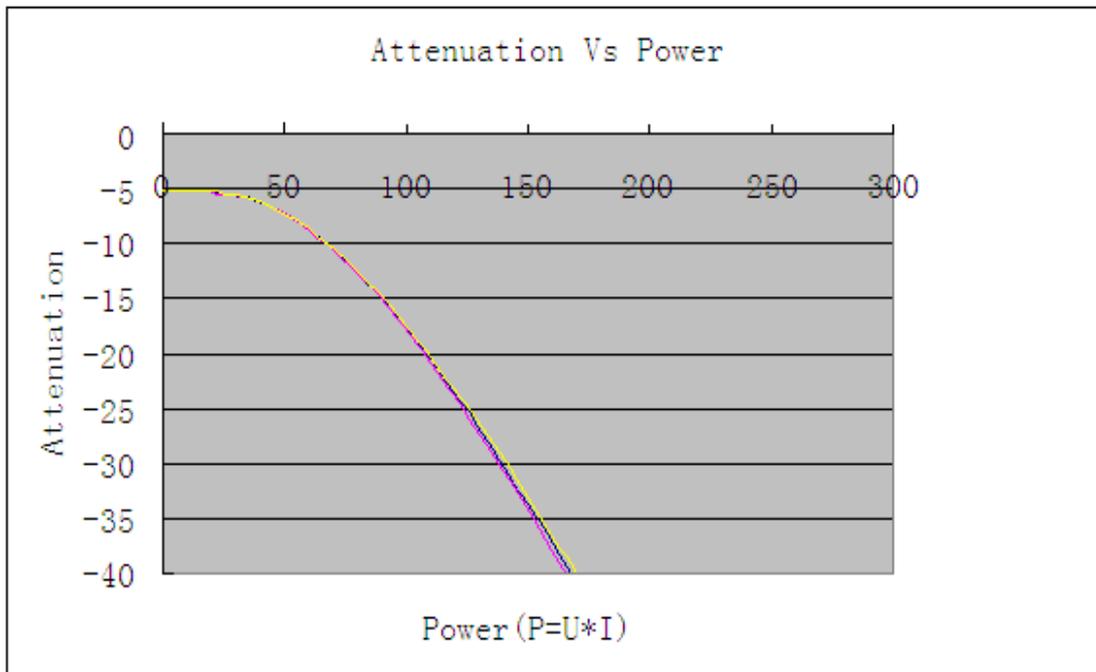
### ● Function and performance requirements

Item	Parameters	Min	Typical	Max	Units
1	Operating Wavelength Range	1525~1570			nm
2	Insertion Loss@4V			0.8	dB
3	Attenuation Range(dynamic range)	25			dB
4	Polarization Dependent Loss	0~10dB		0.2	dB
		10~20dB		0.3	dB
5	Temperature dependence of attenuation	@0dB		±0.3	dB
		@10dB		±1.2	dB
		@20dB		±1.5	dB
6	Wavelength dependence of attenuation	@0dB		0.2	dB
		@10dB		0.3	dB
		@20dB		0.4	dB
7	Attenuation accuracy			0.5	dB
8	PMD			0.1	PS
9	Resolution			0.1	dB
10	Repeatability			0.1	dB
11	Stability			0.1	dB
12	Attenuation Slop			20	
13	Return Loss	45			dB
14	Attenuation Dark	30			dB
15	Tuning speed			20	ms
16	Optical power capability			23	dBm
17	Drive voltage			4.1	V

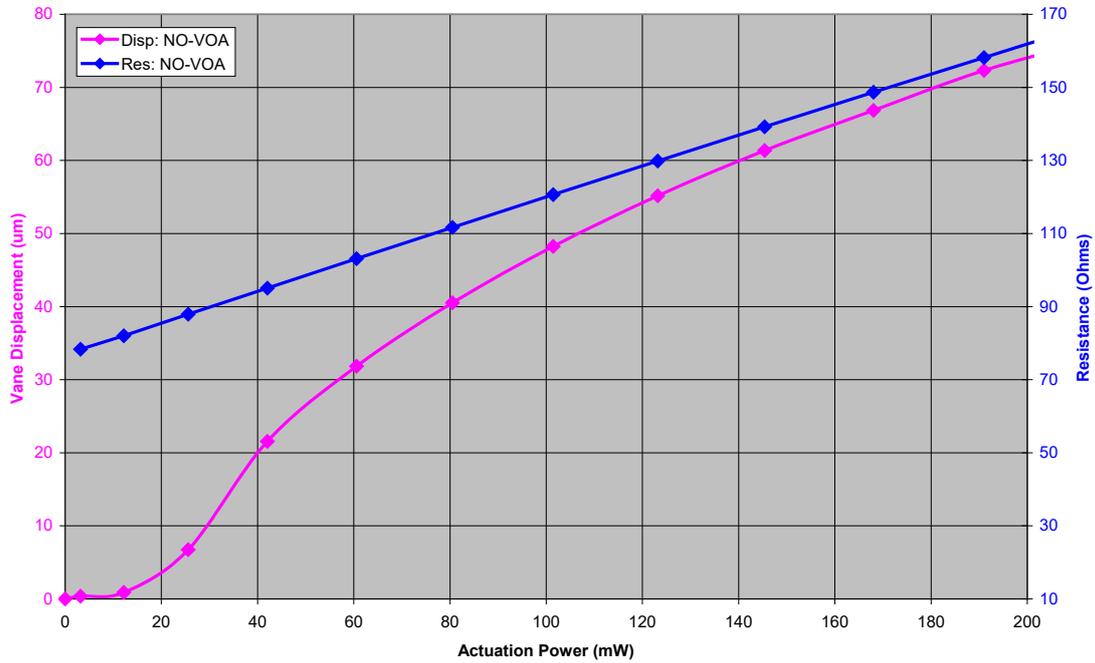
● **Design and Construction**

Parameters	Spec	Unit
Package Dimension	17*8.3*6.1	mm
Connector	N/A	
Fiber type	G652 D fiber	
Fiber Length	100 or customized	cm
Fiber color	Input fiber color is white; Output fiber color is red	

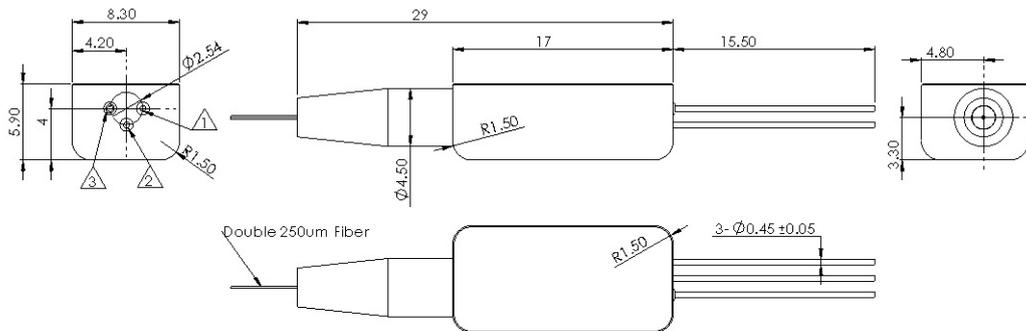
**Typical Attenuation Plot**



### Resistance & Position versus Power

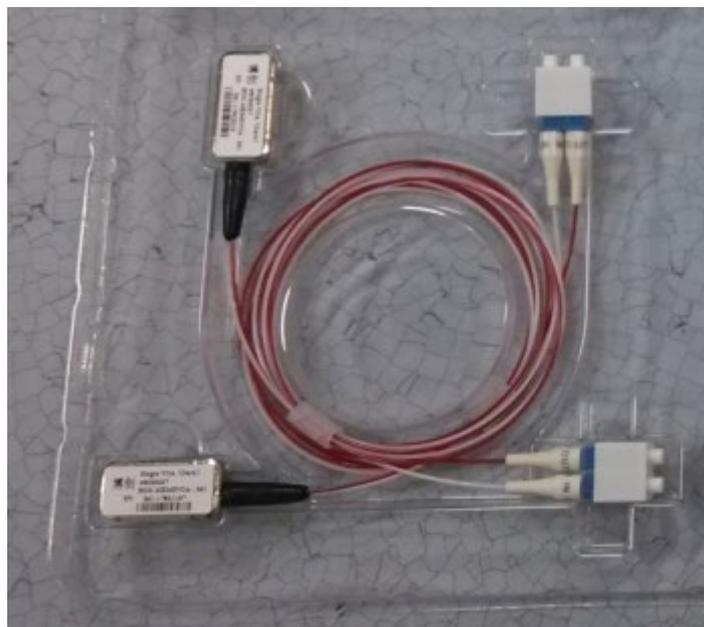


### Mechanical Drawing



Pin Number	Description	Comment
1	drive	Connected to stabilized negative or positive supply
2	drive	Connected to stabilized negative or positive supply
3	N/C	Supporting PIN

## Packaging



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