

MEMS VOA SERIES



MINI VOA

Dark or Bright



MEMS OPTIC VOA SERIES - SM *cylindrical package*

DESCRIPTION

MEMS VOA is based on micro-electro-mechanical system technology. It allows a precise level of attenuation by rotating the MEMS mirror to change the coupling of light between the input and output fibers.

There are 2 variants available with different default states: The bright type or dark type. The bright type has its lowest loss state at 0 V, while the dark type reaches its lowest insertion loss at a voltage between 4.5-5V.

The VOA offers highly reliable, durable, long-life operation in a compact package.

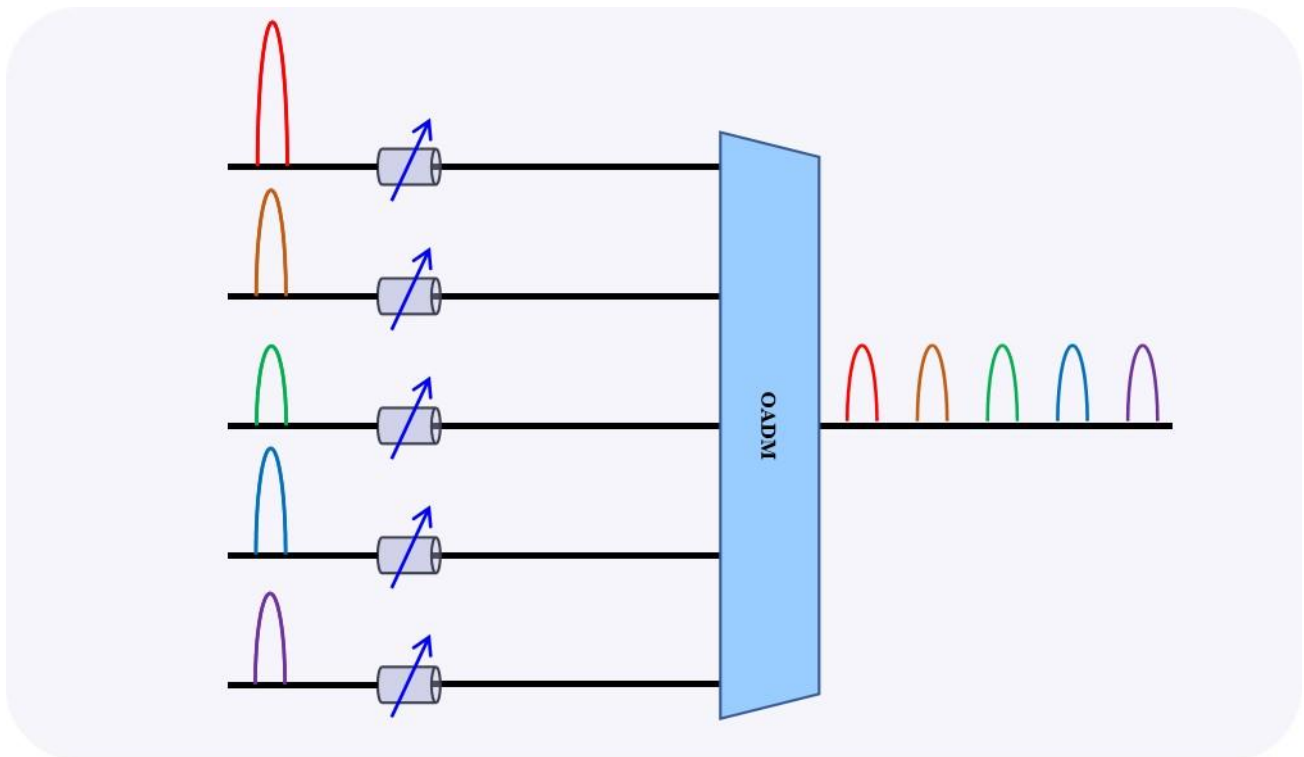
FEATURES

- ✓ Proven MEMS durability and reliability
- ✓ Compact form factor
- ✓ Qualified to Telcordia GR-1221 and RoHS requirements

APPLICATIONS

- ✓ Distributed power equalization within OADMs, MUX/DMUXes, Band Equalizers, Channel Equalizers, OXC, Line Cards and Transponders
- ✓ Input power adjustment in EDFA

APPLICATION - POWER ADJUSTMENT



DEVICE SERIES SPECIFICATIONS

DEVICE TYPE	PIN NUM	DIMENSIONS (mm)	SUPPLY VOLTAGE (V)
CYLINDRIC	2	$\Phi 5.5 \times 26$	< 6
CYLINDRIC MINI	2	$\Phi 3.5 \times 15$	< 6

OPTICAL SPECIFICATIONS¹

PARAMETER	UNIT	VALUE
Wavelength	nm	13:1290 ~ 1330 15:1525 ~ 1568 16:1600 ~ 1650
Test Wavelength	nm	1310 / 1550 / 1625
Attenuation Type		Dark or Bright
Attenuation Range	dB	0 ~ 40
Attenuation Resolution		Continue
Attenuation Repeatability ²	dB	≤ 0.1
Insertion Loss ³	dB	≤ 0.8
PDL	dB	≤ 0.3
WDL ⁴	dB	≤ 1.0
		≤ 0.5
Return Loss	dB	≥ 50
Durability	cycle	≥ 1 x 10 ⁹
Maximum Optical Power	mW	≤ 500
Latching Type		Non-latching

1. All specifications are without connectors.

2. Repeatability is defined after 100 cycles

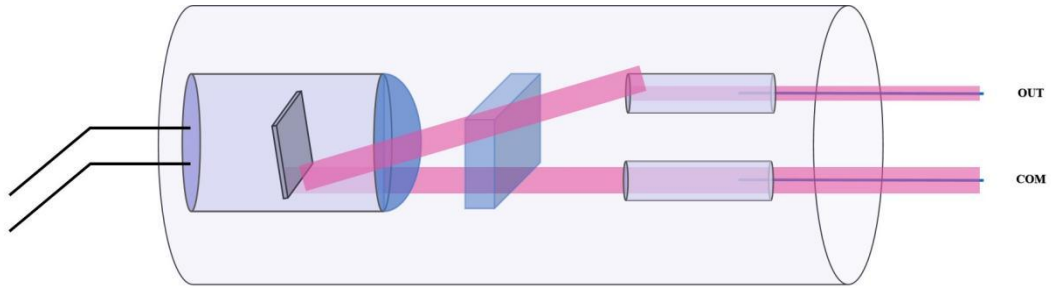
3. IL is measured at CWL, 23°C. If with connectors, IL increases by 0.2~0.3dB.

4. ≤ 0.5 @15dB is LOW WDL.

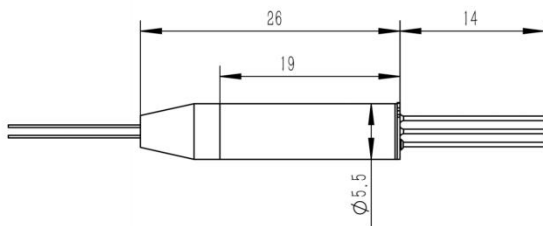
ENVIRONMENTAL CONDITIONS

PARAMETER	UNIT	VALUE
Operation Temperature	°C	- 5 ~ 65
Storage Temperature	°C	- 40 ~ 85
Operation Humidity	%RH	5 ~ 95
Storage Humidity	%RH	5 ~ 95

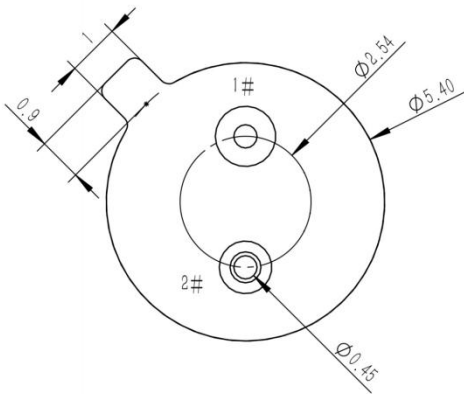
FUNCTIONAL BLOCK DIAGRAM



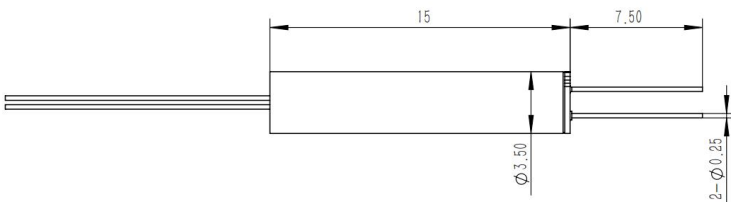
CYLINDRIC PACKAGE - DIMENSIONS AND PINOUT



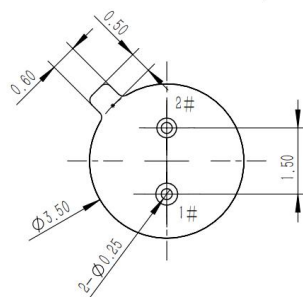
Pin number	Description
1	Anode
2	GND



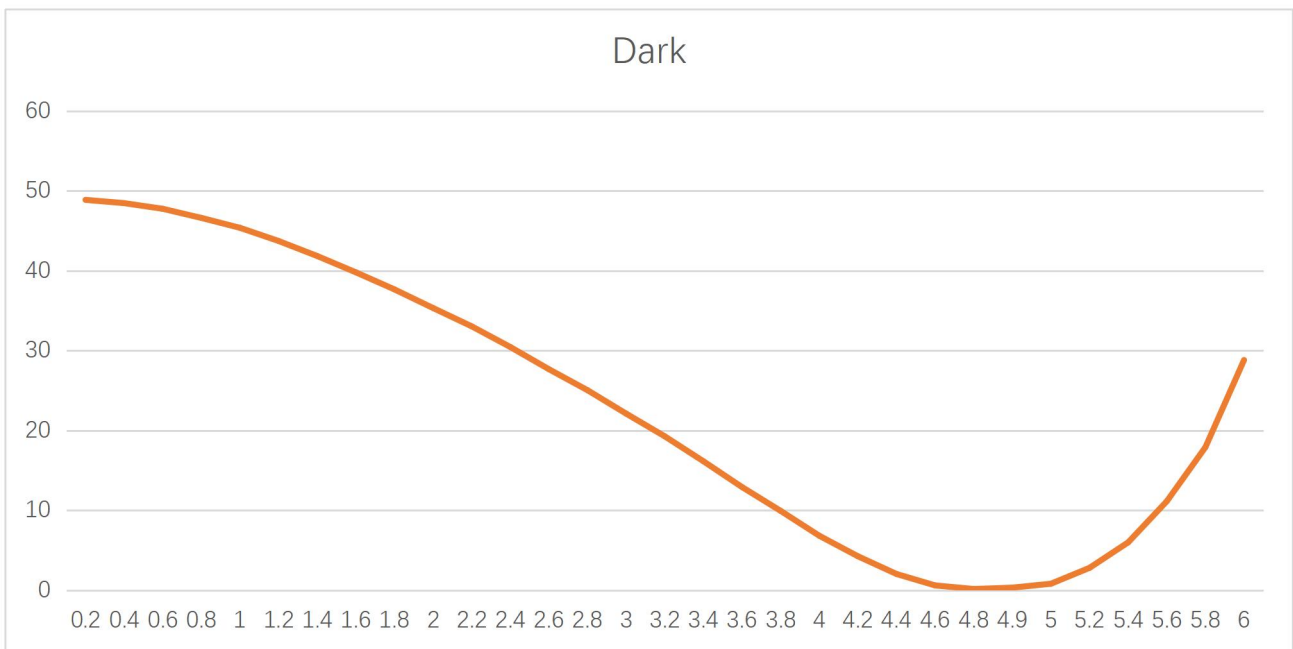
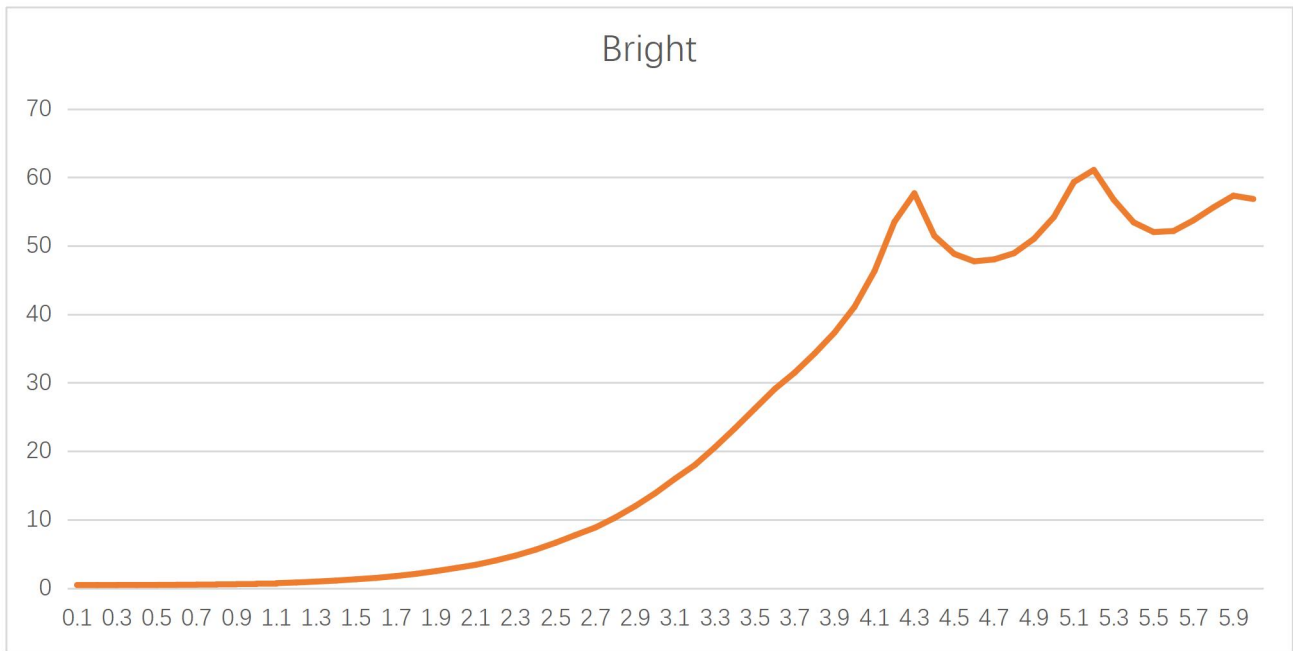
CYLINDRIC PACKAGE MINI - DIMENSIONS AND PINOUT



Pin number	Description
1	Anode
2	GND



VOA VOLTAGE ATTENUATION MAP



ORDERING INFORMATION

MVOA- - - - - - - -

Product Code

MVOA MEMS VOA

VOA Configuration

B Bright or Transparent
D Dark or Opaque

Wavelength Range

13 1290 – 1330 nm
15 1525 – 1568 nm
16 1600 – 1650 nm
 Or customer specify

Attenuator Range

30 30 dB min.
40 40 dB min.
 Or customer specify

Fiber Type

S Single Mode, G657A2

Jacket Type

025 Φ 0.25 mm, bare fiber
09 Φ 0.9 mm, loose tube

Pigtail Length

1 1 meter
 Or customer specify

Connector Type

LC/UPC
 FC/APC
 Or customer specify

Package

C Cylindric package, Φ 5.5
CM Cylindric package, Φ 3.5
CLW LOW WDL



MEMS OPTIC VOA SERIES - SM *Module Type*

DEVICE SERIES SPECIFICATIONS

MODULE TYPE	CONTROL TYPE¹	DIMENSIONS (mm)	SUPPLY VOLTAGE (V)
M1	①	120 x 90 x 15	5 ~ 12

1. ① UART ② IIC ③ RS232

OPTICAL SPECIFICATIONS¹

PARAMETER		UNIT	VALUE
Wavelength		nm	13:1290 ~ 1330 15:1525 ~ 1568 16:1600 ~ 1650
Test Wavelength		nm	1310 / 1550 / 1625
VOA-PD Num			1 ~ 8
Attenuation Type			Dark or Bright
Attenuation Range		dB	30 ~ 40
Attenuation Resolution		dB	0.1
Attenuation Repeatability ²		dB	≤ 0.1
Attenuation Accuracy			≤ 0.3, typical 0.2
PD Detection Range		dBm	- 50 ~ 20
PD Resolution		dB	0.1
PD Detection Accuracy	10 ~ 20	dBm	≤ 0.4 typical 0.3
	- 40 ~ 10		≤ 0.3, typical 0.2
	- 50 ~ - 40		≤ 0.4 typical 0.3
Insertion Loss ³		dB	≤ 0.8, typical 0.6 without PDs ≤ 1.1, typical 0.9 with PDs
PDL		dB	≤ 0.4
WDL ⁴		dB	≤ 1.0
			≤ 0.5
Return Loss		dB	≥ 40
Durability		cycle	≥ 1 x 10 ⁹
Maximum Optical Power		mW	≤ 500
Latching Type			Non-latching

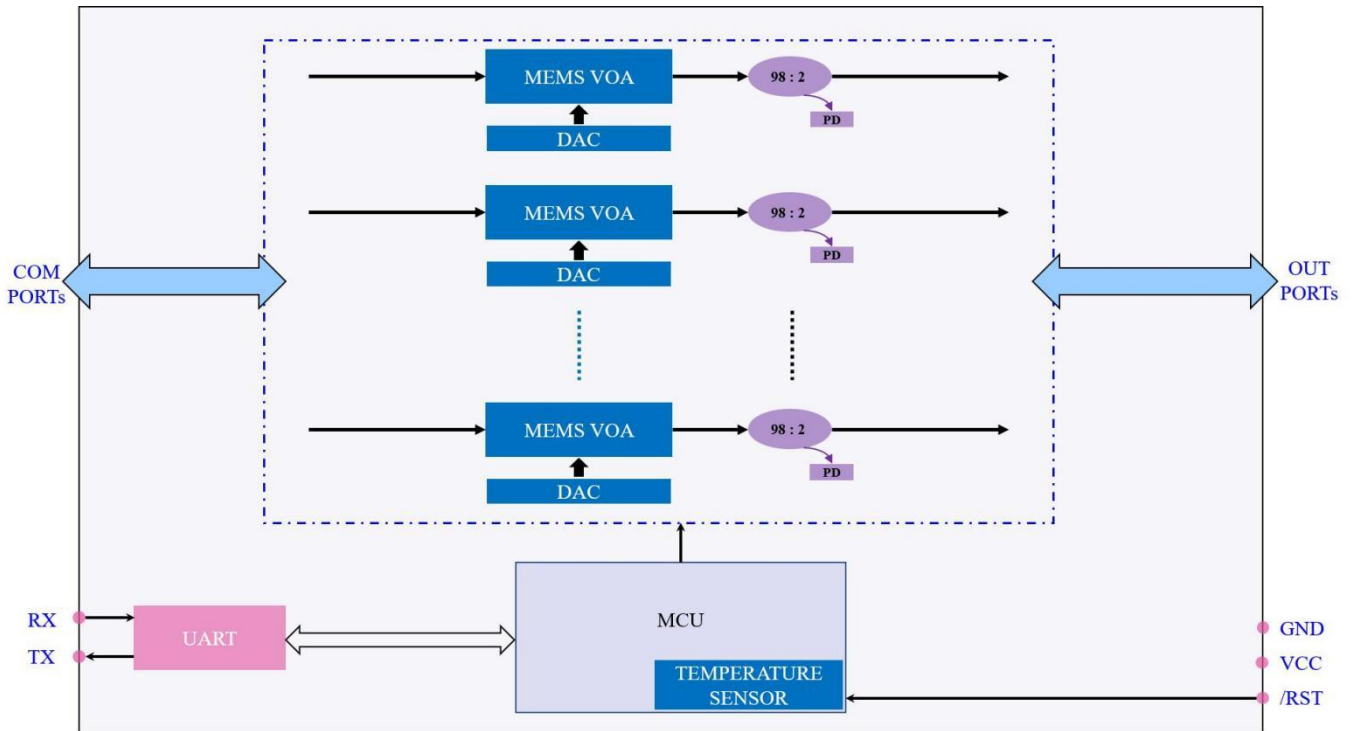
1. All specifications are without connectors.

2. Repeatability is defined after 100 cycles

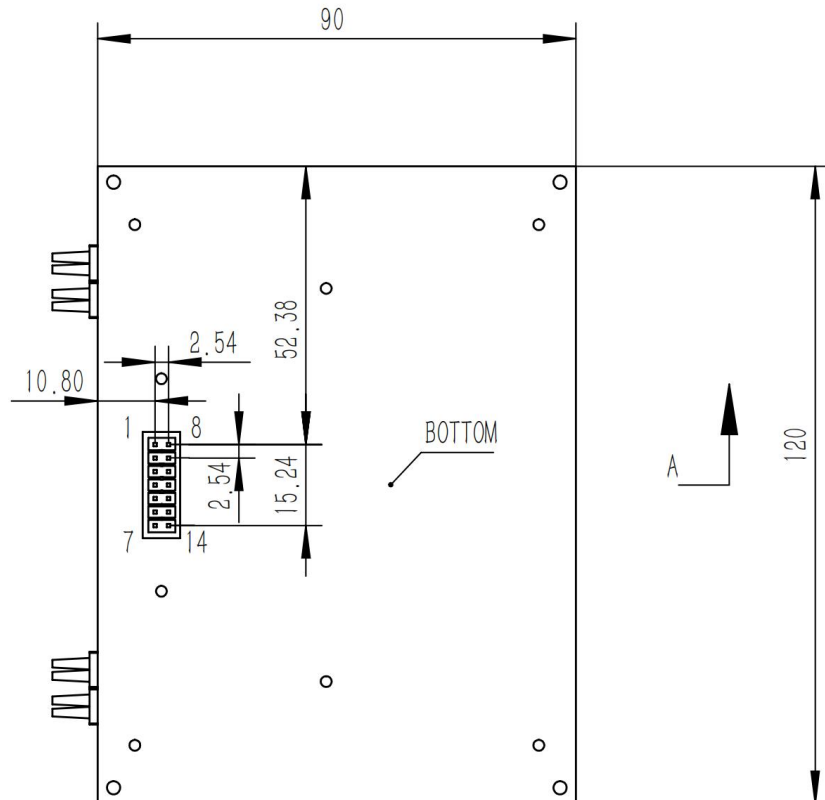
3. IL is measured at CWL, 23°C. If with connectors, IL increases by 0.2~0.3dB.

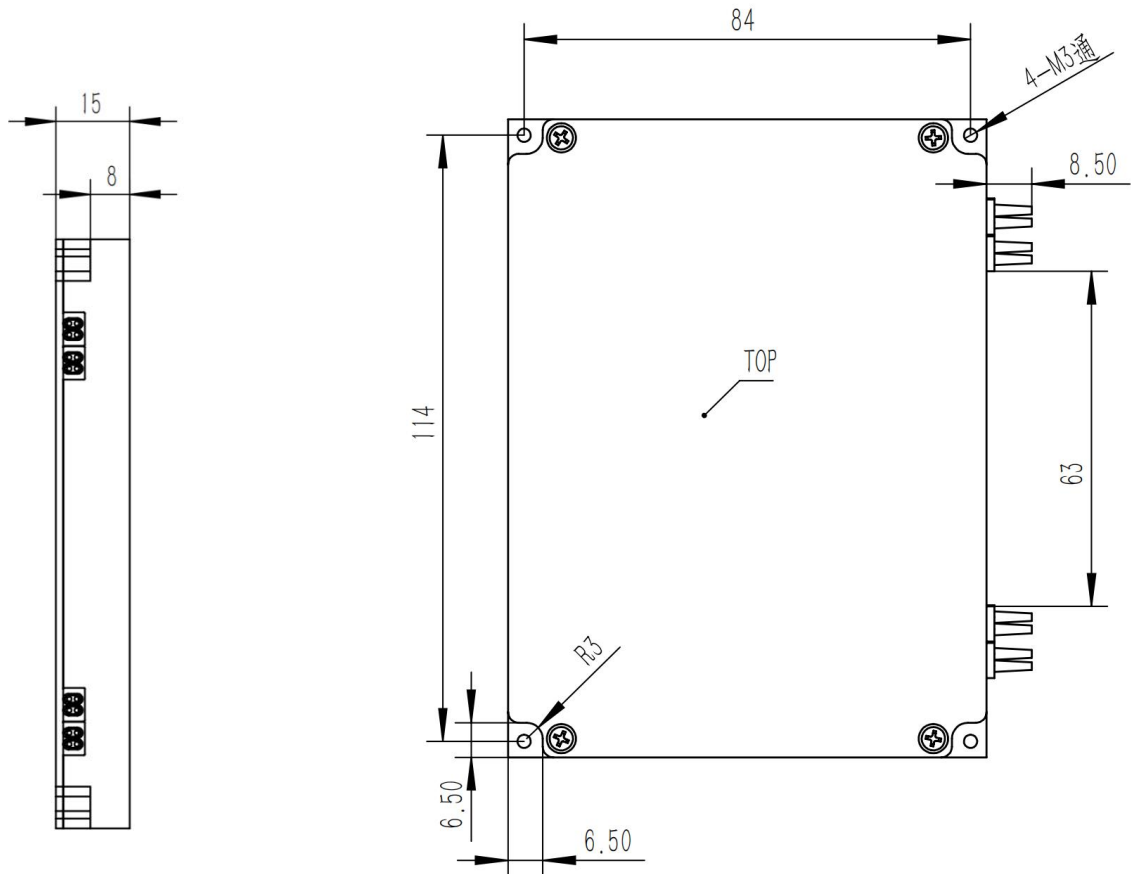
4. ≤ 0.5 @15dB is LOW WDL.

FUNCTIONAL BLOCK DIAGRAM



MODULE TYPE 1 - DIMENSIONS AND PINOUT





MODULE TYPE 1 - ELECTRONIC PIN DEFINITION

<i>PIN NO.</i>	<i>FUNCTION</i>	<i>PIN NO.</i>	<i>FUNCTION</i>
1	No Connect	8	Reserved
2	5V(VCC)	9	Reserved
3	Reserved	10	Reserved
4	Ground(GND)	11	Ground(GND)
5	Reserved	12	Reserved
6	UART TX Data	13	Reserved
7	UART RX Data	14	Hardware Reset(/RESET)

ORDERING INFORMATION

MVOA- - - - - - - - -

Product Code

MVOA MEMS VOA

VOA Configuration

N Number of VOA-PDs
B or D Bright or Dark
 1B
 4B
 8B (Specify $1 \leq N \leq 8$)

Wavelength Range

13 1290 – 1330 nm
 15 1525 – 1568 nm
 16 1600 – 1650 nm
 Or customer specify

Attenuator Range

30 30 dB min.
 40 40 dB min.
 Or customer specify

Fiber Type

S Single Mode, G657A2

Jacket Type

025 Φ 0.25 mm, bare fiber
 09 Φ 0.9 mm, loose tube

Pigtail Length

1 1 meter
 Or customer specify

Connector Type

LC/UPC
 FC/APC
 Or customer specify

Package

M1 Module, maximum support 8 VOAs and 8 PDs



MEMS OPTIC VOA SERIES - MM *cylindrical package*

DEVICE SERIES SPECIFICATIONS

DEVICE TYPE	PIN NUM	DIMENSIONS (mm)	SUPPLY VOLTAGE (V)
CYLINDRIC 60V	2	Φ 5.5 × 43	< 60

OPTICAL SPECIFICATIONS¹

PARAMETER	UNIT	VALUE
Wavelength	nm	8:850 only 9:980 only 13:1290 ~ 1330 15:1525 ~ 1568
Test Wavelength	nm	1310 / 1550 / 1625
Attenuation Type		Dark or Bright
Attenuation Range	dB	0 ~ 30
Attenuation Resolution		Continue
Attenuation Repeatability ²	dB	≤ 0.1
Insertion Loss ³	dB	≤ 0.8
PDL	dB	≤ 0.3
WDL	dB	≤ 0.5
Return Loss	dB	≥ 30
Durability	cycle	≥ 1 x 10 ⁹
Maximum Optical Power	mW	≤ 500
Latching Type		Non-latching

1. All specifications are without connectors.

2. Repeatability is defined after 100 cycles.

3. IL is measured at CWL, 23°C. If with connectors, IL increases by 0.2~0.3dB.

ORDERING INFORMATION

MVOA- - - - - - - -

Product Code

MVOA MEMS VOA

VOA Configuration

B Bright
D Dark

Wavelength Range

13 1290 – 1330 nm
15 1525 – 1568 nm
16 1600 – 1650 nm
Or customer specify

Attenuator Range

20 20 dB min.
30 30 dB min.
Or customer specify

Fiber Type

M Multimode
OM1 62.5um core
OM2 50um core
OM3 50um core
OM4 50um core

Jacket Type

025 Φ 0.25 mm, bare fiber
09 Φ 0.9 mm, loose tube

Pigtail Length

1 1 meter
Or customer specify

Connector Type

LC/UPC
FC/APC
Or customer specify

Package

C Cylindric package, Φ 5.5



MEMS OPTIC VOA SERIES - PM *cylindrical package*

DEVICE SERIES SPECIFICATIONS

<i>DEVICE TYPE</i>	<i>PIN NUM</i>	<i>DIMENSIONS (mm)</i>	<i>SUPPLY VOLTAGE (V)</i>
CYLINDRIC	2	Φ 5.5 × 26	< 6

OPTICAL SPECIFICATIONS¹

PARAMETER	UNIT	VALUE
Wavelength	nm	13:1290 ~ 1330 15:1525 ~ 1568 16:1600 ~ 1650
Test Wavelength	nm	1310 / 1550 / 1625
Attenuation Type		Dark or Bright
Attenuation Range	dB	0 ~ 40
Attenuation Resolution		Continue
Attenuation Repeatability ²	dB	≤ 0.1
Insertion Loss ³	dB	≤ 0.8
PDL	dB	≤ 0.3
WDL	dB	≤ 1.0
Extinction Ratio	dB	≥ 18
Return Loss	dB	≥ 50
Durability	cycle	≥ 1 x 10 ⁹
Maximum Optical Power	mW	≤ 500
Latching Type		Non-latching

1. All specifications are without connectors.

2. Repeatability is defined after 100 cycles

3. IL is measured at CWL, 23°C. If with connectors, IL increases by 0.2~0.3dB.

ORDERING INFORMATION

MVOA- - - - - - - -

Product Code

MVOA MEMS VOA

VOA Configuration

B Bright
D Dark

Wavelength Range

13 1290 – 1330 nm
15 1525 – 1568 nm
16 1600 – 1650 nm
Or customer specify

Attenuator Range

30 30 dB min.
40 40 dB min.
Or customer specify

Fiber Type

PM Panda fiber

Jacket Type

025 Φ 0.25 mm, bare fiber
09 Φ 0.9 mm, loose tube

Pigtail Length

1 1 meter
Or customer specify

Connector Type

LC/UPC
FC/APC
Or customer specify

Package

C Cylindric package, Φ 5.5