VIAVI Solutions

VIAVI
O-band Optical Fiber Amplifier (mOFA-C1)

An Amplifier Design Optimized for Use in the Systems Lab
or for Optical Test for the MAP Series

The Multiple Application Platform (MAP) Optical Fiber Amplifier (mOFA-C1) is a revolutionary new fiber amplifier designed to work in the O-band. Based on Bismuth doped optical fiber, the mOFA-C1 is ideal for amplification of LAN WDM and CWDM formats with a single amplifier. The low noise figure and linear performance make it ideal for 400/800GE+ transmission testing. The mOFA-C1 is simple to use, with integrated power and gain control options.

The MAP Optical Fiber Amplifier (mOFA-C1) is the first fiber amplifier optimized for test and measurement applications in the O-band. While simple to control from the front panel or over the remote interface, mOFA-C1 amplifiers meet some of the most demanding optical specifications, including a low noise figure (<6.0 dB) and broad gain across the LAN WDM spectrum.

These low noise amplifiers are essential for test automation implementations where system path loss requires a test signal power boost prior to the DUT or sensitive analyzers. In most cases OSNR impairments must be kept to a minimum and all wavelengths need to be amplified.

Auto gain and power control options are designed to simplify power management.

Features and Benefits

- Low noise figure of <6.0 dB and 15 dBm saturated output power
- Gain from 1270 nm to 1335 nm
- Supports multichannel applications like LAN WDM and CWDM in a single amplifier
- Automated gain and power control options
- Unlike SOA, low polarization dependent gain and independent of back reflection

Applications

- Automated test systems for 400GE and 800GE+ transceivers
- Power saturation recovery testing
- OSNR noise loading for next generation O-band coherent transmission

Compliance

- The MAP mOFA-C1 module, when installed in a MAP chassis, complies to CE, CSA/UL/IEC61010–1, LXI Class C requirements, meets the requirements of Class 1M in standard IEC 60825–1 (2014), and complies with 21 CFR 1040.1 except deviations per Laser Notice No. 56, May 8, 2019

LASER RADIATION
DO NOT EXPOSE USERS
OF TELESCOPIC OPTICS
CLASS 1M PRODUCT
(IEC 60825-1)

Functional Description

The mOFA-C1 uses optically pumped gain fiber to generate gain. VIAVI has partnered with OFS to use a new type of gain fiber instead of C- or L-band amplifiers, which use traditional erbium doped fiber (EDF). The OFS Bismuth doped fiber (BDF) and supporting optical components are specifically designed to achieve maximum output power, low noise figure and low polarization response across the key region of the O-band.

Compared to semiconductor optical amplifiers (SOA), the mOFA-C1 has superior gain, linearity, noise and polarization dependence. Compared to alternate gain fibers like Praseodymium, Bismuth has the gain flatness to allow amplification of LR4 and LR8 formats in a single amplifier.
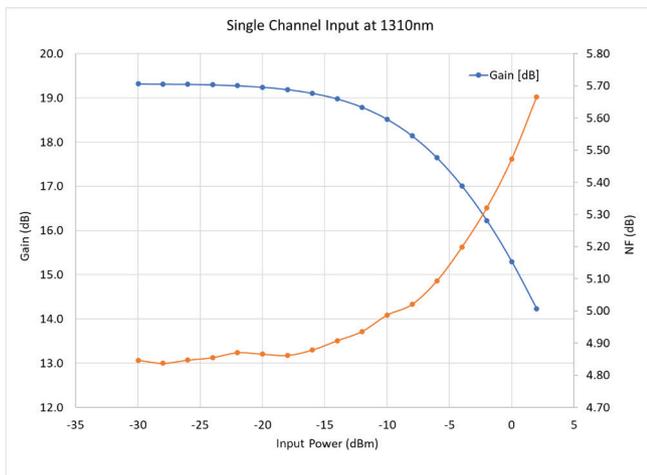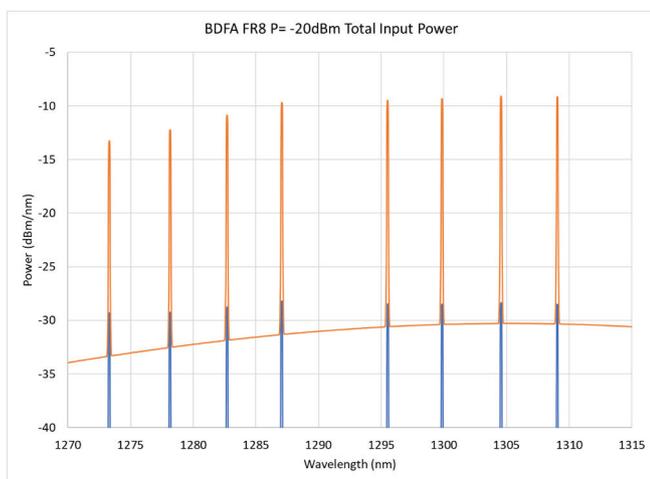

(a)
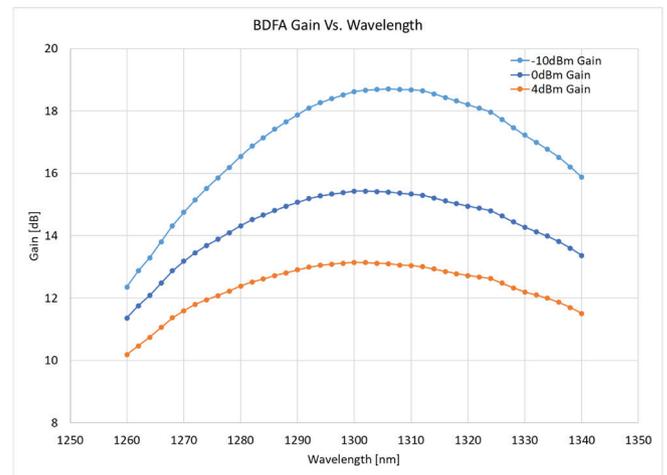
(b)

Figure 1: (a) A typical Gain and Noise Figure plot for 1310 nm signal
(b) The wavelength dependent gain across the range at -10 dBm, 0 dBm and 4 dBm input power

(a)

(b)

Figure 2: (a) Example LR4 spectrum comparing input (blue) with output (orange)
(b) Example LR8 spectrum comparing input (blue) with output (orange)

GUI and Remote Interfaces

The MAP-300 chassis UIs are easily accessed through the Google Chrome or Microsoft Edge web browser. As shown in Figures 3 and 4, the mOFA-C1 has a simple, intuitive user interface.

The MAP Series 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, which are intuitive and optimized for ease of use with popular Application Development Environments such as LabVIEW, Visual C++, Visual Basic, and LabWindows™. The optimized platform offers industry-leading density and maximum configurability to meet specific application requirements within the smallest footprint. All commands used with MAP series modules and platforms generally conform to the Standard Commands for Programmable Instruments (SCPI) command language.
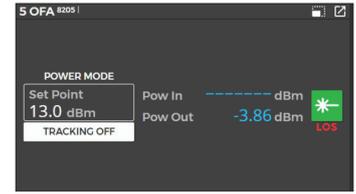

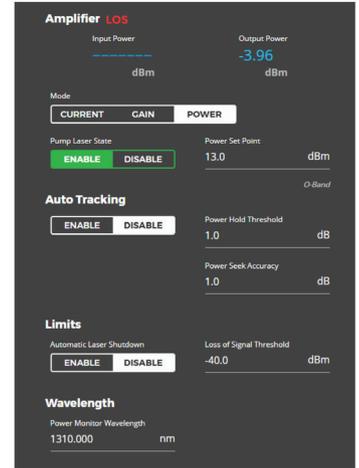Figure 3: mOFA-C1 simplified control UI

Figure 4: mOFA-C1 detailed control UI

Chassis and Modular Family

The VIAVI Multiple Application Platform (MAP) is an optical test and measurement platform optimized for cost effective development and manufacturing of optical transmission techniques. The mOFA-C1 is part of the LightDirect module family, which is a subset of the larger MAP Series. These modules are characterized by their simple control interface and single function nature. Individually or together, they form the foundation of most optical test applications. With a diversity of modules, such as light sources, polarization scramblers, power meters, and spectrum analyzers, the MAP Series is the ideal, modular photonics test platform for high data rate test applications.

Options and Configurations

Version	Amplifier per Module	Input Type	Band	Gain and Power Control	Saturated Output Power	Application
MOFA-C11OB	1	Multichannel or Single channel	O	YES	Standard	1310 nm, LR4 or LR8 amplification with Ethernet amplification for formats using 1310nm, LR4, LR8, CWDM4. Test system loss compensation, overload testing.

Specifications

For more information about 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.

Specification [1,2]	Value
Peak Wavelength	1310 nm
Operating Wavelength	1270 to 1335 nm
Input Power Range	–30 to 0 dBm
Small Signal Gain @ 1310 nm, –25 dBm input	> 18.5 dB
Saturated Output Power @ 1310 nm, 0 dBm input	> 15 dBm
Noise Figure @ 1310 nm, –15 dBm input	< 6.0 dB
Polarization Dependent Gain @ 1310 nm –25dBm input	< 0.3 dB
Attenuation when disabled @ 1310 nm –20dBm input	> 35 dB
TEC Stabilized	Yes
Power Control Modes	Constant Current
	Constant Gain
	Constant Power
Fiber Type[3]	Single mode (SM) fiber
Connector Type	FC/APC
Platform	MAP Series mainframes
Warm-up Time	30 minutes
Operating Temperature	5 to 40°C (41 to 104°F)
Operating Humidity	Maximum 85% relative humidity, non-condensing from 5 to 40°C (41 to 104°F)
Storage Temperature	–30 to 60°C (–22 to 140°F)
Dimensions (W x H x D)	4.1 x 13.3 x 37.0 cm (1.6 x 5.23 x 14.57 in.)
Weight	1.4 kg (3.1 lb)
Calibration	1 year

[1] All optical measurements were taken after minimum 30-minute warm up; measured at constant temperature of 23°C ±3°C.

[2] Maximum current, controlled environment 23±1°C, APC connector (SM) direct to power meter or OSA

[3] For IEC 60793-2-50 Type B1.3/ ISO 11801 OS2-compliant single mode fiber.

Ordering Information

Part Number	
MOFA–C11OB–M100–MFA	MAP Series Single Optical Fiber Amplifier, BDFA, O-band, Auto Power, FC/APC

Accessories

Accessories (Optional)	Product and description	
Inspection and cleaning tools	CleanBlastPRO™	Patented CleanBlastPRO fiber end-face cleaning system provides a fast, effective, and cost-efficient solution for removing dirt and debris from connectors in most common applications.
	FiberChek Probe Microscope	One-button FiberChek Probe delivers a reliable, fully autonomous, handheld inspection solution for every fiber technician.
	P5000i Fiber Microscope	Automated Fiber Inspection and Analysis Probe provides PASS/FAIL capability to PC, laptops, mobile devices and VIAVI test solutions.
Replacement Parts	Mating sleeves	AC500; FC/PC-FC/PC Universal Connector Adapter
		AC501; FC/PC-SC/PC Universal Connector Adapter
		AC502; FC/APC-FC/APC Universal Connector Adapter
		AC503; FC/APC-SC/APC Universal Connector Adapter
Detector Adaptor	A complete range of single ferrule, duplex, and bare fiber power meter adaptors is available at VIAVI. Refer to the AC adaptor selection guide for more information.	

A wider range of inspection tools is available at VIAVI. More information about the products and accessories can be accessed through our website at viavisolutions.com. For further assistant 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.

VIAVI Care Support Plans

Increase your productivity for up to 5 years with optional VIAVI Care Support Plans:

- Maximize your time with on-demand training, priority technical application support and rapid service.
- Maintain your equipment for peak performance at a low, predictable cost.

Plan availability depends on product and region. Not all plans are available for each product or in every region. To find out which VIAVI Care Support Plan options are available for this product in your region, contact your local representative or visit: viavisolutions.com/viavicareplan

Features

*5-year plans only

Plan	Objective	Technical Assistance	Factory Repair	Priority Service	Self-paced Training	5 Year Battery and Bag Coverage	Factory Calibration	Accessory Coverage	Express Loaner
BronzeCare	Technician Efficiency	Premium	✓	✓	✓				
SilverCare	Maintenance & Measurement Accuracy	Premium	✓	✓	✓	✓*	✓		
MaxCare	High Availability	Premium	✓	✓	✓	✓*	✓	✓	✓