

# Erbium Doped Fiber Amplifier (mEDFA-C1)

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

The Multiple Application Platform (MAP) Erbium Doped Fiber Amplifier (mEDFA-C1) is a third-generation amplifier design, optimized for use in the systems-lab or for optical test and measurement applications. The simplified control and modular design make the module extremely simple to integrate and use, removing the need to “work-around” networking management protocols that often frustrate the R&D and manufacturing engineers and slow down test automation.

MAP Erbium-Doped Fiber Amplifier (mEDFA) Modules combine the optical performance of the traditional VIAVI benchtop models with the flexibility and modularity of the MAP series. The variants of the EDFA target diverse applications such as amplifier emulation, OSNR (optical signal-to-noise ratio) experiments, and network compliance tests.

While simple to control from the front panel or over the remote interface, mEDFA-C1 amplifiers meet some of the most demanding optical specifications including a low noise version with <math><3.7\text{dB}</math> noise figure. These low noise amplifiers are essential for test automation implementations where system path loss requires a test signal power boost prior to application to the DUT. In most cases OSNR impairments must be kept to a minimum. Auto gain and power control options are designed to simplify power management, in particular when a single channel tunable source is used. DWDM, High Power and an L-band version are also available.



### Key Features and Benefits

- Variant options to cover low noise figure (<math><3.7\text{dB}</math>) or high power (>25dBm) requirements
- Single-channel Extended C and L band versions
- Gain flattened DWDM multichannel extended C band versions
- Automated gain and power control options

### Applications

- Amplification of sensitive signals in automated test systems
- Power saturation recovery testing
- OSNR noise loading

### Compliance

- The MAP-200 mEDFA-C1 module, when installed in a MAP chassis, complies to CE, CSA/UL/IEC61010-1, LXI Class C requirements, meets the requirements of Class 3B in standard IEC 60825-1(2014), and complies with 21 CFR 1040.1 except deviations per Laser Notice No. 50, July 2001

INVISIBLE LASER RADIATION  
DO NOT VIEW DIRECTLY WITH  
OPTICAL INSTRUMENTS  
CLASS 1M PRODUCT  
(IEC 60825-1)

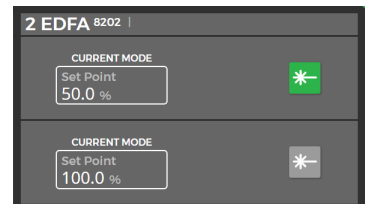
## Functional Description

The optics of the MAP series EDFA module consists of an erbium-doped fiber amplifier (EDFA) gain stage with supporting optical components specifically designed to achieve maximum output power at the bulkhead mounted optical connector while maximizing input/output isolation. An optical fiber doped with the rare-earth erbium can be made to amplify light signals passing through it by exciting the erbium atoms.

## GUI and Remote Interfaces

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 MAP platform’s industry-leading density and maximum configurability meets specific application requirements within the smallest footprint. All MAP series modules and platforms commands generally conform to the Standard Commands for Programmable Instruments (SCPI) command language.

The MAP-300 chassis GUIs are easily accessed through Google Chrome, Mozilla Firefox and Microsoft Edge web browsers or a remote VNC. As shown in figure 1, the MAP-300 GUI for the mEDFA allows the change of current mode set point for multiple devices, while also giving control of the pump laser state. For legacy MAP-200 users the GUI is still accessible through remote VNC.



mEDFA MAP-300 GUI

## 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 mEDFA-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. Alongside the many other modules, such as light sources, polarization scramblers, power meters, and spectrum analyzers, the MAP series is the ideal, modular photonics test platform for 100G+ test applications. The mEDFA is compatible with all current MAP-300 and MAP-200 chassis.



## Options and Configurations

The mEDFA-C1 has six carefully selected variants designed to span the most critical application requirements.

Version	Amplifier per Module	Input Type	Band	Gain and Power Control	Saturated Output Power	Application
MEDFA-C11CA Preamp	1	Single Channel	C	No	Standard	Preamp. Minimize noise figure while providing enough gain to ensure test signal at required power
MEDFA-C12CA Dual Preamp	2	Single Channel	C	No	Standard	Dual CA version amplifiers. Improves test system density for applications requiring more than one.
MEDFA-C11CB Booster	1	Single Channel	C	Yes	Standard	Booster. Adding gain and power control simplifies power level control but increases noise figure slightly. Ideal for single channel tunable signal applications.
MEDFA-C11CF DWDM Booster	1	DWDM	C	Yes	Standard	DWDM Booster. For full multichannel input applications. Power and gain control available.
MEDFA-C11CD Max Power	1	Single Channel	C	Yes	High	Maximum power. Amplifier optimized to deliver the maximum allowable saturated output power for standard lab safety protocols. Ideal for signal splitting or power saturated recover testing.
MEDFA-C11LB L-Band Booster	1	Single Channel	L	Yes	Standard	L-band version of the Booster amplifier.

## Specifications

For more information on 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](http://viavisolutions.com/contacts).

Single Channel Input Optical Specifications <sup>1</sup>		mEDFA-C11CA mEDFA-C12CA	mEDFA-C11CB	mEDFA-C11LB
Operating Wavelength Range		1528 nm – 1569 nm		1565 nm – 1610 nm
Saturated Power <sup>2</sup>		≥ 20 dBm (-4 dBm input)		
Noise Figure <sup>3</sup>	P <sub>in</sub> = 0 dBm	N/A	N/A	≤ 5.7 dB
	P <sub>in</sub> = -4 dBm	≤ 4.4 dB	≤ 4.5 dB	≤ 5.5 dB
	P <sub>in</sub> = -20 dBm	≤ 4.1 dB	≤ 5.3 dB	≤ 5.2 dB
	P <sub>in</sub> = -30 dBm	≤ 3.7 dB	≤ 5.5 dB	N/A
Gain <sup>3</sup>	P <sub>in</sub> = 0 dBm	N/A	N/A	≥ 20 dB
	P <sub>in</sub> = -4 dBm	≥ 24 dB	≥ 24 dB	≥ 23 dB
	P <sub>in</sub> = -20 dBm	≥ 35 dB	≥ 33 dB	≥ 28 dB
	P <sub>in</sub> = -30 dBm	≥ 37 dB	≥ 36 dB	N/A
Input Output Power Monitor		No	Yes	Yes
PDL/PDG <sup>4</sup>		≤ 0.2dB	≤ 0.2dB	≤ 0.2dB
Laser Safety Class <sup>5</sup>		1M		

- All optical measurements were done after minimum 30 minutes warming up measured at constant temperature of 23±3°C
- Saturated power was measured with input signal at 1550nm for C-band and 1590nm for L-band
- Measured at wavelength of 1550nm for C-band and 1590nm for L-band
- Measured with input power of -4dBm at 1550nm for C-band and 0dBm at 1590nm for L-band
- Classified as per standard IEC60825-1:2014 with the maximum input power +4dBm

DWDM Multichannel Input Optical Specifications <sup>1</sup>		mEDFA-C11CF
Operating Wavelength Range		1528 nm – 1569 nm
Saturated Power <sup>2</sup>		≥ 21 dBm (-4 dBm input)
Noise Figure <sup>2</sup>	P <sub>in</sub> = -4 dBm	≤ 5.5 dB
	P <sub>in</sub> = -20 dBm	≤ 5.2 dB
Gain <sup>3</sup>	P <sub>in</sub> = -4 dBm	≥ 25 dB
	P <sub>in</sub> = -20 dBm	≥ 35 dB
Input Output Power Monitor		Yes
Spectral Gain Flatness <sup>3</sup>		≤ 2.0 dB
PDL/PDG <sup>4</sup>		≤ 0.2 dB
Laser Safety Class <sup>5</sup>		1M

- All optical measurements were done after minimum 30 minutes warming up measured at constant temperature of 23±3°C
- Measured at wavelength of 1550nm
- Measured with input power of -4dBm for the wavelength range of 1528nm -1563nm
- Measured at wavelength of 1550nm, -4dBm input power
- Classified as per standard IEC60825-1:2014 with the maximum input power +4dBm

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High Power Single Channel Input Optical Specifications <sup>1</sup>		mEDFA-C11CD
Operating Wavelength Range		1528 nm – 1569 nm
Saturated Power <sup>2</sup>		≥ 25 dBm (-4 dBm input)
Noise Figure <sup>2</sup>	P <sub>in</sub> = -4 dBm	≤ 5.5 dB
	P <sub>in</sub> = -20 dBm	≤ 6.2 dB
Gain <sup>2</sup>	P <sub>in</sub> = -4 dBm	≥ 29 dB
	P <sub>in</sub> = -20 dBm	≥ 35 dB
Input Output Power Monitor		Yes
PDL/PDG <sup>3</sup>		≤ 0.2 dB
Laser Safety Class <sup>4</sup>		3B

1. All optical measurements were done after minimum 30 minutes warming up measured at constant temperature of 23±3°C
2. Measured at wavelength of 1550nm
3. Measured with input power of -4dBm at 1550nm
4. Classified as per standard IEC60825-1:2014

Common Specifications	
Connector Type	FC/APC
Operating Temperature	0 – 40°C
Operating Humidity	Maximum 95% RH, 0 to 40°C noncondensing
Storage Temperature	-30 to 60°C
Dimensions (W x H x D)	4.06 cm x 13.26 cm x 37.03 cm
Weight	2.3 kg

## Ordering Information

Part Number	Description
MEDFA-C11CA-M100-MFA	Standard power, Extended C-band amplifier, Low NF Single channel with FC/APC connectors
MEDFA-C12CA-M100-MFA	Dual independent, Standard power, Extended C-band amplifier, Low NF Single channel with FC/APC connectors
MEDFA-C11CB-M100-MFA	Standard power, Extended C-band amplifier, Single channel auto power and monitoring option with FC/APC connectors
MEDFA-C11CF-M100-MFA	Standard power, Extended C-band amplifier DWDM Gain Flattened Auto power and monitoring option with FC/APC connectors
MEDFA-C11CD-M100-MFA	High power, Extended C-band amplifier Single channel with Auto power and monitoring option with FC/APC
MEDFA-C11LB-M100-MFA	Standard power, Extended L-band amplifier, Single channel auto power and monitoring option with FC/APC connectors

## Accessories

Accessories (Optional)	Product and Description	
<i>Inspection and Cleaning Tool</i>	CleanBlast	The patented VIAVI Solutions® CleanBlast fiber end-face cleaning system provides a fast, effective, and cost-efficient solution for removing dirt and debris from connectors in most common applications. It is available in a benchtop and portable version.
	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 & Analysis Probe provides PASS/FAIL capability to PC, laptops, mobile devices and VIAVI test solutions.
<i>Replacement Parts</i>	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
<i>Detector Adaptor</i>	A complete range of single ferrule, duplex, and bare fiber power meter adaptor are available at VIAVI. Refer to the AC adaptor selection guide for more information.	

A wider range of inspection tools are available from VIAVI. More information about the products and accessories can be accessed through our website at [www.viavisolutions.com](http://www.viavisolutions.com). For further assistance 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](http://viavisolutions.com/contacts).

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### Features

Plan	Objective	Technical Assistance	Factory Repair	Priority Service	Calibration
Manufacturer Warranty	Repair Manufacturer Defects	Standard Plus	✓		
 BronzeCare	Technician Efficiency	Premium	✓	✓	
 SilverCare	Maintenance and Measurement Accuracy	Premium	✓	✓	✓



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