



MAP-200 Erbium Doped Fiber Amplifier, MEDFA-C1



The Multiple Application Platform (MAP-200) 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.

While simple to control from the front panel or over the remote interface, the mEDFA-C1 amplifiers meet some of the most demanding optical specifications including a low noise version with $<3.7\text{dB}$ 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.

Features and Benefits

- Variant options to cover low noise figure ($< 3.7\text{dB}$) or high power ($>25\text{dBm}$) 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

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

Version	Amplifiers 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 is 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 saturation recovery testing.
MEDFA-C11LB L-band Booster	1	Single Channel	L	Yes	Standard	L-band version of the Booster amplifier.

The mEDFA-C1 module, as part of the MAP-200 family, is an Ethernet or GPIB modular instrument that can be directly managed from your PC-based automation system. A member of the LightDirect Family of MAP-200 modules, the mEDFA-C1 can be deployed in the compact MAP-220C 2-slot chassis or the larger 3 and 8 slot rack-mount chassis systems (MAP-230B or MAP-280). Alongside the many other modules, such as amplifiers, precision attenuators, power meters and spectrum analyzers; the MAP-200 is the ideal, modular photonics test platform for 100G+ test applications.



MAP-200 LightDirect Family of modules

Specifications

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

1. All optical measurements were done after minimum 30 minutes warming up measured at constant temperature of $23\pm 3^{\circ}\text{C}$
2. Saturated power was measured with input signal at 1550nm for C-band and 1590nm for L-band
3. Measured at wavelength of 1550nm for C-band and 1590nm for L-band
4. Measured with input power of -4dBm at 1550nm for C-band and 0dBm at 1590nm for L-band
5. Classified as per standard IEC60825-1:2014 with the maximum input power +4dBm

DWDM Multichannel Input Optical Specification ¹		mEDFA-C11CF
Operating Wavelength Range		1528nm –1569nm
Saturated Power ²		≥ 21dBm (-4dBm input)
Noise Figure ²	$P_{in} = -4\text{dBm}$	≤ 5.5dB
	$P_{in} = -20\text{dBm}$	≤ 5.2dB
Small Signal Gain ³	$P_{in} = -4\text{dBm}$	≥ 25dB
	$P_{in} = -20\text{dBm}$	≥ 35dB
Input Output Power Monitor		Yes
Spectral Gain Flatness ³		≤ 2.0dB
PDL/PDG ⁴		≤ 0.2dB
Laser Safety Class ⁵		1M

1. All optical measurements were done after minimum 30 minutes warming up measured at constant temperature of $23\pm 3^{\circ}\text{C}$
2. Measured at wavelength of 1550nm
3. Measured with input power of -4dBm for the wavelength range of 1528nm –1563nm
4. Measured at wavelength of 1550nm, -4dBm input power
5. Classified as per standard IEC60825-1:2014 with the maximum input power +4dBm



High Power Single Channel Optical Specification¹

mEDFA-C11CD

Operating Wavelength Range		1528nm –1569nm
Saturated Power ²		≥ 25dBm (-4dBm input)
Noise Figure ²	P _{in} = -4dBm	≤ 5.5dB
	P _{in} = -20dBm	≤ 5.2dB
Small Signal Gain ²	P _{in} = -4dBm	≥ 25dB
	P _{in} = -20dBm	≥ 35dB
Input Output Power Monitor		Yes
PDL/PDG ³		≤ 0.2dB
Laser Safety Class ⁴		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
Operation temperature	0 – 40° C
Operation humidity	Maximum 95% RH, 0 to 40° C non condensing
Storage temperature	-30 to 60°
Dimensions (W x H x D)	4.06cm x 13.26cm x 37.03cm
Weight	2.3kg

Part Numbers

Part Number	
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