



ERBIUM-DOPED FIBER AMPLIFIER (EDFA)

Features:

- Up to 37 dBm (5 W) output power
- C-band, L-band and C+L-band models
- Near quantum-limited noise figure preamplifiers
- Wide selection of different type of amplifiers
- Optional RS232 or USB interface
- High performance-to-cost ratio
- Multi-Output Option-up to 4 ports
- Custom design flexibility
- Linear polarization option

Preliminary

Applications:

- Analog and digital CATV optical transmission networks
- Long-Haul transmission
- Access Networks
- Instrumentation
- Research and Development



Erbium Doped Fiber Amplifier

Product Description:

Erbium-doped Fiber Amplifiers (EDFA) are devices which provide amplification to low-level optical signals. The Rack Mount EDFA series of high performance, low noise and high output power amplifiers provide the perfect opportunity to build a flexible CATV network system. These units include a wide selection of Boosters, Pre-amplifiers, In-Line, Mid-Stage access and Gain-Flattened amplifiers. These EDFAs are available in both single channel and DWDM configurations.

Amplifiers are available to cover the C-band, L-band, or both the C & L bands together. A range of output powers are available. EDFAs

are available with either a flattened spectral output for stringent applications, or a non-flattened response for less demanding or cost-sensitive applications. The user can control the optical gain to suit the application.

Fiber amplifiers are connected to the system through input and output female connector receptacles. A variety of standard connector types are offered. Custom connectors can also be accommodated. A built-in microprocessor can be included for applications that require the amplifier to operate under computer control. Either RS-232 or USB interfaces are offered.

Ordering Information For Standard Parts

Bar Code	Part Number	Description
TBD	OFA-1-B-12-1525/1570-1-N-3A-B-X	Basic single output Optical Fiber Amplifier providing up to 12 dBm output power for the C band (1525 - 1570 nm), in a bench top unit with angled FC/PC receptacles. The spectral response is not flattened. Universal power supply with North American power cord included. Other types of power cords available separately.
TBD	OFA-1-B-28-1525/1570-1-N-3A-B-X	Basic single output Optical Fiber Amplifier providing up to 28 dBm output power for the C band (1525 - 1570 nm), in a bench top unit with FC receptacles. The spectral response is not flattened. Universal power supply with North American power cord included. Other types of power cords available separately.
2737	POWER CORD - EUROPE	Power cord for European 4mm round pin plug to IEC connection.
2736	POWER CORD - UK	Power cord for UK plug to IEC connection.

Typical Specifications For C-band Amplifiers

Parameters	Unit	Booster amplifier	Pre-amplifier	In-Line amplifier	Mid-access amplifier	Gain-Flattened amplifier
Saturated output power ¹	dBm	14-28 (30-37)	14-17	14-20	14-24	12-24
Operating wavelength range	nm	1525-1565 (1535-1565)	1525-1565 1540-1565	1525-1565 1540-1565	1528-1565 1540-1565	1528-1563 1542-1561
Noise figure ²	dB	<4.8 (<6.0)	<3.2	<3.6	<4.5	<4.5
Small signal gain ³	dB	Up to 40	Up to 40	Up to 43	12-34	16-32
Gain flatness	dB					1.0-1.5
PDL (maximum)	dB	0.2			0.3	0.25
PMD (maximum)	ps	0.2			0.3	0.3
Operating temperature range	°C	0 to +50	0 to +50	0 to +50	0 to +50	0 to +50
Storage temperature range	°C	-40 to +80	-40 to +80	-40 to +80	-40 to +80	-40 to +80
Humidity ⁴	%	0 to 95	0 to 95	0 to 95	0 to 95	0 to 95

¹ $P_{in} = -4$ dBm for Booster, Pre-amplifier and In-Line amplifiers at 1550 nm. P_{in} determined per customer request at 1550 nm for Mid-access and Gain Flattened amplifiers

² $P_{in} = -4$ dBm for Booster, $P_{in} = -20$ dBm for Pre-amplifier and In-Line amplifiers at 1550 nm. P_{in} determined per customer request at 1550 nm for Mid-access and Gain Flattened amplifiers

³ $P_{in} = -20$ dBm for Booster, $P_{in} = -30$ dBm for Pre-amplifier and In-Line amplifiers at 1550 nm. P_{in} determined per customer request at 1550 nm for Mid-access and Gain Flattened amplifiers

⁴ Non-condensing

Typical Specifications For L-band Amplifiers

Parameters	Unit	Booster amplifier	Pre-amplifier	In-Line amplifier	Mid-access amplifier	Gain-Flattened amplifier
Saturated output power ¹	dBm	14-26	14-17	14-21	14-22	12-24
Operating wavelength range	nm	1565–1610	1565–1610	1565–1610	1570–1605	1570–1603
Noise figure ²	dB	<5.5	<5.0	<5.5	<5.8	<5.5
Small signal gain ³	dB	Up to 30	Up to 24	Up to 25	12-28	14-26
Gain flatness	dB					1.0-1.7
PDL (maximum)	dB	0.2			0.3	0.25
PMD (maximum)	ps	0.35			0.45	0.4
Operating temperature range	°C	0 to +50	0 to +50	0 to +50	0 to +50	0 to +50
Storage temperature range	°C	-40 to +80	-40 to +80	-40 to +80	-40 to +80	-40 to +80
Humidity ⁴	%	0 to 95	0 to 95	0 to 95	0 to 95	0 to 95

¹ $P_{in} = -2$ dBm for Booster, Pre-amplifier and In-Line amplifiers at 1590 nm. P_{in} determined per customer request at 1590 nm for Mid-access and Gain Flattened amplifiers

² $P_{in} = -2$ dBm for Booster, $P_{in} = -20$ dBm for Pre-amplifier and In-Line amplifiers at 1590 nm. P_{in} determined per customer request at 1590 nm for Mid-access and Gain Flattened amplifiers

³ $P_{in} = -20$ dBm for Booster, $P_{in} = -30$ dBm for Pre-amplifier and In-Line amplifiers at 1590 nm. P_{in} determined per customer request at 1590 nm for Mid-access and Gain Flattened amplifiers

⁴ Non-condensing

Typical Specifications For C+L-band amplifiers

Parameters	Unit	Booster amplifier	In-Line amplifier
Saturated output power ¹	dBm	20	14
Operating wavelength range	nm	1525-1560 & 1570-1610	1525-1560 & 1570-1610
Noise figure ²	dB	<6.0	<6.0
Small signal gain ³	dB	Up to 22	Up to 20
PDL (maximum)	dB	0.3	0.25
PMD (maximum)	ps	0.35	0.35
Operating temperature range	°C	0 to +50	0 to +50
Storage temperature range	°C	-40 to +80	-40 to +80
Humidity ⁴	%	0 to 95	0 to 95

¹ $P_{in} = -2$ dBm at 1550nm and 1590 nm.

² $P_{in} = -2$ dBm for Booster, $P_{in} = -20$ dBm for In-Line amplifiers at 1550 nm and 1590 nm.

³ $P_{in} = -20$ dBm for Booster, $P_{in} = -30$ dBm for In-Line amplifiers at 1550nm and 1590 nm.

⁴ Non-condensing

Ordering Examples For Standard Parts

A customer needs to increase a nominal 10 μ W signal to at least 100 μ W before it reaches a detector circuit. The wavelength is 1550 nm. She can do this with the following part:

Bar Code	Part Number	Description
TBD	OFA-1-B-12-1525/1570-1-N-3A-B-X	Basic single output Optical Fiber Amplifier providing up to 12 dBm output power for the C band (1525 - 1570 nm), in a bench top unit with angled FC/PC receptacles. The spectral response is not flattened. Universal power supply with North American power cord included. Other types of power cords available separately.

Questionnaire

1. What gain do you require?
2. How flat do you require the spectrum of the amplifier to be?
3. Do you require that the amplifier be remotely controllable? If yes, what sort of interface do you prefer?
4. What sort of amplifier do you need (booster, pre-amplifier, In-line amplifier or Mid-Span amplifier)?
5. What is your operating wavelength range?
6. What style of fiber connectors do you use?
7. Do you need more than one output?
8. What sort of enclosure do you prefer?

Description

Optical Fiber Amplifier

N Number of Output Ports.
Specify 1, 2 or 4. The input signal will be amplified and split amongst the output ports.

C Configuration:
B = Booster
P = Pre-amplifier
L = In-line
M = Mid-span

P Maximum Output Power in dBm:
Specify a value between 12 and 28 ,
corresponding to 12 and 28 dBm
respectively

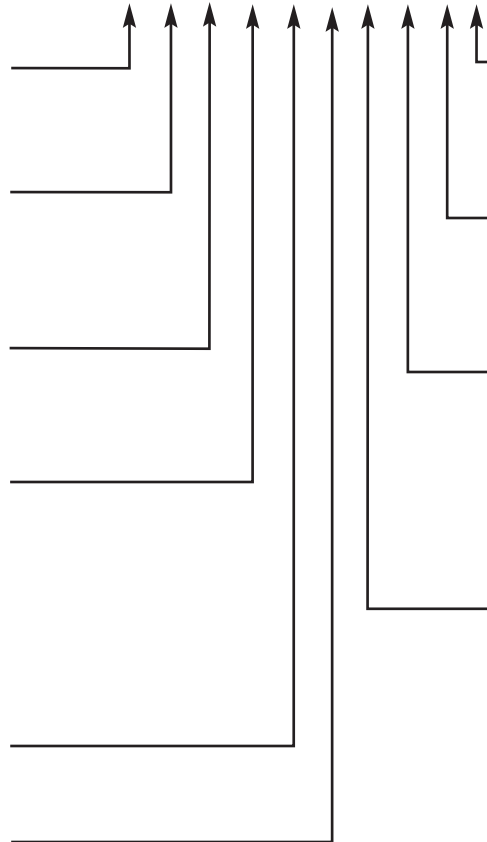
W Wavelength range:
1525/1570 = 1525 to 1570 nm
1540/1560 = 1540 to 1560 nm
1570/1605 = 1570 to 1605 nm
1525/1605 = 1525 to 1560 and 1570
to 1605 nm
(Custom wavelength ranges are
available. Contact OZ Optics with your
specific requirements)

F Fiber type:
S = Singlemode
P = Polarization maintaining

S Packaging style:
1 = Bench top
2 = Rack mountable
3 = OEM module
4 = Gain Block - No electronics
provided, user must provide pump
driver
9 = Custom

Part Number

OFA-N-C-P-W-F-S-L-X-O-I



I Control interface:
R = RS232
U = USB
X = Not Applicable - ie. gain block
version or basic version

O Options:
A = Automatic gain control with
microprocessor
B = Basic version
M = Microprocessor controlled.

X Receptacle style:
3 = Standard flat, Super, or Ultra FC/PC
3A = Angled FC/PC
8 = AT&T-ST
SC = SC
SCA = Angled SC
LC = LC
MU = MU

L Flatness:
N = Non-flattened
F = Flattened