Erbium-Doped Fiber Amplifier (EDFA) - GS Series

Nanovation's GS series of EDFA products is specifically designed and ideally suited for single- channel SONET/SDH, metro and access applications. They are available in Booster, Inline and Preamplifier configurations to cover the entire C-Band. These EDFAs offer cost-efficient solutions and outstanding performance in a compact package. The GS series is supplied without internal electronics for those systems that use external electronics to monitor and control the EDFA

Features

- 1530 – 1565nm operating wavelength ranges
- High optical gain and saturated output power
- Low noise figure
- Wide operating temperature and humidity ranges
- Compact packaging
- Bellcore GR-1312-CORE qualified and ISO 9001 certified

Applications

- High performance single channel SONET/SDH, Metro or access systems
- Booster, Inline and Preamplifier configurations

Product Description

General

The GS series of EDFAs has been specially designed to provide flexibility by working with a customer's own drive and control circuitry to provide a specific product for use in SONET/SDH, metro and access transmission systems as a booster, inline, or preamplifier.

Optical

This module is based on an erbium-doped fiber amplifier (EDFA), which is pumped with high quality pump lasers. Input and output ports are optically isolated to maintain stable operation of the amplifier. An optical splitter on the output port taps a small amount of light onto photodiodes to enable optical power monitoring.

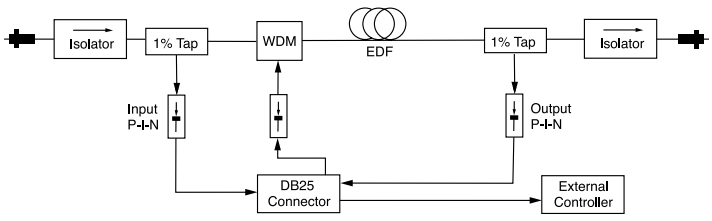
Electrical

Electrical connection is through a standard DB25 male connector.

Package

The units are housed within very small modules with input and output connections through single mode fiber pigtails and are fitted as standard with super-polished FC/UPC or FC/APC connectors. Other types of connectors are available on request.

Block Diagram



Absolute Maximum Ratings

(in accordance with Bellcore GR-1312-CORE)

Parameter	Min.	Typical	Max.	Unit
DC Operating Voltage	+4.75	+5.0	+5.25	V
Operating Temperature Range	0	-	70	℃
Storage Temperature Range	-25	-	85	℃
Operating Humidity Range	5	-	85	%

Optical Parameters

(over the full operating temperature range)

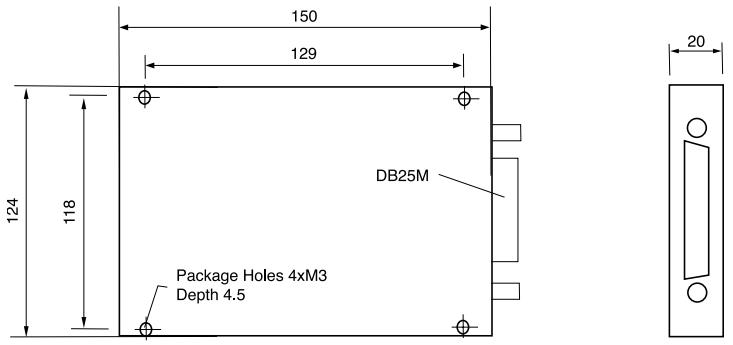
Parameter	Minimum	Typical	Maximum	Units	Notes
Wavelength (ITU-T G.692)	1530	-	1565	nm	
Input Power	-6	-	-	dBm	Booster
	-20	-	-	dBm	Inline
	-40	-	-	dBm	Preamplifier
Saturated Output Power	-	-	17	dBm	Booster
	-	-	13	dBm	Inline
	-	-	-5	dBm	Preamplifier
Signal Gain	-	20	-	dB	Booster
	-	30	-	dB	Inline
	-	30	-	dB	Preamplifier
Optical Isolation	30	35	-	dB	-
Input Return Loss	50	-	-	dB	UPC/APC
Noise Figure	-	5.0	5.5	dB	-
Polarization Dependent Gain	-	-	0.5	dB	-
Polarization Mode Dispersion	-	-	0.2	ps	-
Pump Leakage	-	-	-30	dBm	-
Reverse ASE Power	-	< -20	-	dBm	-

Pigtail Fiber

Fiber Type	Standard single-mode fiber
Fiber/Buffer Diameter (mm)	0.9
Pigtail Length (m)	1.0 (or user defined)

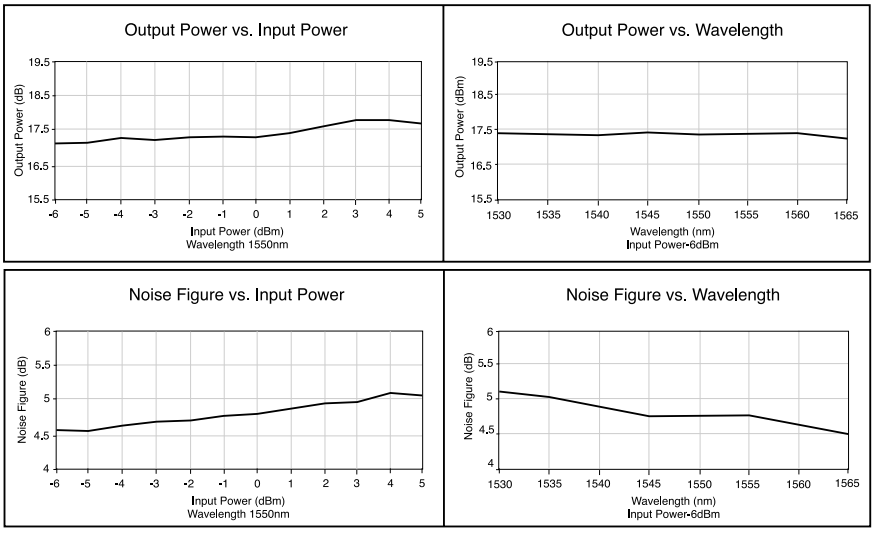
Outline Drawing

(all dimensions are in mm; drawings are not to scale)



GS EDFA Typical Performance Curves

Boost Configuration



GS Series EDFA Electrical Interface

The GS series of EDFA products is equipped with a standard male DB25 pin connector. The functionality of each pin is presented below:

Pin	Symbol	Description
1	LD1-	Pump Laser 1-Cathode
2	LD1+	Pump Laser 1-Anode
3	MPD1-	Pump Laser 1-Monitor Photo Diode Cathode
4	MPD1+	Pump Laser 1-Monitor Photo Diode Anode
5	RT1	Pump Laser 1-Thermistor
6	RT1	Pump Laser 1-Thermistor
7	TEC1+	Pump Laser 1-Thermal Electric Cooler (TEC) Positive Supply
8	TEC1-	Pump Laser 1-Thermal Electric Cooler (TEC) Negative Supply
9	PD1-	Input P-I-N Photo Detector-Cathode
10	PD1+	Input P-I-N Photo Detector-Anode
11	N/C	
12	N/C	
13	GND	Power supply ground
14	LD2-	Pump Laser 2-Cathode
15	LD2+	Pump Laser 2-Anode
16	MPD2-	Pump Laser 2-Monitor Photo Diode Cathode
17	MPD2+	Pump Laser 2-Monitor Photo Diode Anode
18	RT2	Pump Laser 2-Thermistor
19	RT2	Pump Laser 2-Thermistor
20	TEC2+	Pump Laser 2-Thermal Electric Cooler (TEC) Positive Supply
21	TEC2-	Pump Laser 2-Thermal Electric Cooler (TEC) Negative Supply
22	PD2-	Output P-I-N Photo Detector-Cathode
23	PD2+	Output P-I-N Photo Detector-Anode
24	N/C	
25	N/C	

Ordering Information

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- Connector Type
  - 0: No connector
  - 1: FC/UPC (standard)
  - 2: FC/APC
  - 3: SC/UPC
  - 4: SC/APC
- Pigtail Fiber Length
  - 0: Standard length = 1 m (standard)
  - 1: User specify
- Fiber Type
  - 0: Standard single-mode (standard)
  - 1: User specify
- Output Power
  - -5: -5 dBm
  - 13: 13 dBm
  - 15: 15 dBm
  - 17: 17 dBm
- Input Isolator
  - 0: With input isolator
  - 1: Without input isolator
- Product Series
  - 2: Booster
  - 3: Line
  - 4: Preamplifier
- Amplifier Type
  - B: Booster
  - L: Line
  - P: Preamplifier

The following table summarizes the product options and provides examples:

Part Number	Amplifier Type	Input Power (dBm)	Output Power (dBm)	Gain (dB)	Dimension (mm x mm x mm)
GSB 200 17 001	Booster	-6	17	23	150 x 124 x 20
GSL 300 13 001	Line	-20	13	33	150 x 124 x 20
GSP 400 -5 001	Preamplifier	-40	-5	35	150 x 124 x 20

To order or for additional information, please contact us at:

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Fax: 1-734-354-0934
Web: www.nanovation.com

Safety Information and Handling Precautions

EDFAs are class III laser products. Please read carefully the following safety information prior to handling and installing.

The signal output of the pump laser and EDFA is invisible, yet it can be of high power level and therefore can cause damage to the eyes or skin. Please do not look at the fiber cross section directly without protection devices.

There are precision optical devices inside the EDFA; therefore extreme care should be taken not to impose excess vibration or shaking. Care should also be taken in handling the pigtail fibers since they are easily broken.

There are static sensitive devices inside the EDFA, please make sure proper grounding and electrical power connection.

Do not attempt to open the EDFA by any unauthorized personnel. Please contact Nanovation technical support for assistance.