

# FINISAR®

## Key Features

- ▶ Low power consumption
- ▶ Compact form factor
- ▶ Up to 22 dBm output power
- ▶ Flat gain
- ▶ Low noise figure
- ▶ Fast transient suppression
- ▶ Can support G.657 low bend radius fiber connectors
- ▶ Software-configurable as pre-amplifier or booster in same part number
- ▶ RS232 and I2C communication, full set of control options and alarms
- ▶ Qualified to Bellcore GR1312 and GR1089
- ▶ Class 1M\* laser product classification

## Applications

- ▶ Metro and regional DWDM networks
- ▶ Sonet/SDH and Datacom networks
- ▶ Free space optics communications
- ▶ Military and industrial applications
- ▶ Test and measurement systems
- ▶ Video surveillance systems
- ▶ LIDAR
- ▶ Microwave optics

## Fixed Gain EDFA

### Overview

Finisar's 70x90 mm Fixed Gain (FG) EDFA product line supports a full range of C- or L-band fixed gain WDM EDFAs, as well as narrow band, CWDM and single channel EDFAs. The products support either cooled or uncooled pumps, thus allowing the optimal combination of size, power consumption and performance to be achieved for each application.

The platform incorporates advanced control and monitoring functions, and provides fast transient suppression for stable gain in all operating conditions. The FG EDFA can be software-configured as a pre-amplifier, booster or inline amplifier, thus allowing a single part-number to address different network functions.

These products are available in a wide variety of gain configurations targeting different output powers. In addition, they can be configured with a VOA (Variable Optical Attenuator) to more precisely maintain optical output power.



## Specifications

| Parameter                           | P/N          | FOA-M1100MB-ESC1C-AA001 |         | FOA-M1500CB-ESC1C-AA011 |        | FOA-M2200CB-EFG1C-AA002 |      | FOA-M2200CB-EFG1C-AA003 |      | FOA-M2200CB-EFG1C-AA004 |      | FOA-M2200CB-EFG1C-AA005 |      | FOA-M2200CB-EFG1C-AA006 |      | FOA-M2200CB-EFG1C-AA007 |      | FOA-M2200CB-EFG1C-AA008 |      | FOA-M2300CD-EFV1C-AA009 |      |                     |      |
|-------------------------------------|--------------|-------------------------|---------|-------------------------|--------|-------------------------|------|-------------------------|------|-------------------------|------|-------------------------|------|-------------------------|------|-------------------------|------|-------------------------|------|-------------------------|------|---------------------|------|
|                                     |              | Specification           |         | Specification           |        | Specification           |      | Specification           |      | Specification           |      | Specification           |      | Specification           |      | Specification           |      | Specification           |      | Specification           |      |                     |      |
|                                     |              | Min                     | Max     | Min                     | Max    | Min                     | Max  | Min                     | Max  | Min                     | Max  | Min                     | Max  | Min                     | Max  | Min                     | Max  | Min                     | Max  | Min                     | Max  | Min                 | Max  |
| Form Factor                         | mm           | 70x45x12                |         | 90x70x15                |        | 90x70x15                |      | 90x70x15                |      | 90x70x15                |      | 90x70x15                |      | 90x70x15                |      | 90x70x15                |      | 90x70x15                |      | 90x70x15                |      |                     |      |
| Amplifier Type                      | -            | Single Channel          |         | OSC EDFA                |        | WDM FGA                 |      | WDM FGA                 |      | WDM FGA                 |      | WDM FGA                 |      | WDM FGA                 |      | WDM FGA                 |      | WDM FGA                 |      | WDM FGA + Output VOA    |      |                     |      |
| Operating Wavelength Range          | nm           | 1528.77                 | 1567.13 | 1504.5                  | 1517.5 | 1529                    | 1563 | 1528.77                 | 1564 | 1528.77                 | 1565 | 1529                    | 1563 | 1528.77                 | 1565 | 1528.77                 | 1565 | 1529                    | 1563 | 1529.5                  | 1563 |                     |      |
| Input Power Range                   | Booster mode | dBm                     | -10     | 5                       | -2     | 7                       | -27  | 2                       | -25  | 8                       | -35  | -5                      | -24  | 5                       | -25  | 10                      | -25  | 10                      | -25  | 8                       | -18  | 2                   |      |
|                                     | Pre-amp mode |                         |         |                         |        |                         | -35  | -3                      | -40  | -5                      |      |                         |      |                         | -32  | 0                       | -35  | 0                       |      |                         |      |                     | -40  |
| Output Power Range                  | Booster mode | dBm                     | 5       | 16                      | 13     |                         | -7   | 17                      | -7   | 17.4                    | -7   | 17                      | -5   | 20                      | -5   | 21                      | -5   | 21                      | -5   | 20.8                    | -15  | 19                  |      |
|                                     | Pre-amp mode |                         |         |                         |        |                         | -10  | 13                      | -7   | 17.4                    |      |                         |      |                         | -10  | 13                      |      |                         |      |                         |      |                     |      |
| Saturated Output Power              | dBm          | 16                      |         |                         | 13     |                         | 17   |                         |      | 17.4                    | 17   |                         | 20   |                         | 20   |                         | 20   |                         | 21   |                         | 19   |                     |      |
| Settable Gain Range                 | Booster mode | dB                      | 5       | 26                      | N/A    | N/A                     | 10   | 20                      | 4    | 28                      | 15   | 30                      | 10   | 20                      | 15   | 25                      | 10   | 26                      | 10   | 20                      | 0    | 20                  |      |
|                                     | Pre-amp mode |                         |         |                         |        |                         | 13   | 25                      | 13   | 33                      |      |                         |      |                         | 13   | 25                      | 15   | 30                      |      |                         |      |                     | 15   |
| Optimal Flat Gain                   | dB           | N/A                     |         | N/A                     |        | 15                      |      | 23                      |      | 23                      |      | 15                      |      | 22                      |      | 26                      |      | 20                      |      | 22                      |      |                     |      |
| Gain/Power Setting Accuracy         | Booster mode | dB                      | -0.5    | 0.5                     | -0.5   | 1                       | -0.5 | 0.5                     | -0.5 | 0.5                     | -0.5 | 0.5                     | -0.5 | 0.5                     | -0.5 | 0.5                     | -0.5 | 0.5                     | -0.5 | 0.5                     | -0.5 | 0.5                 |      |
|                                     | Pre-amp mode |                         |         |                         |        |                         | -0.5 | 0.5                     | -0.5 | 0.5                     |      |                         |      |                         | -0.5 | 0.5                     | -0.5 | 0.5                     |      |                         |      |                     | -0.5 |
| Gain Flatness vs. Wavelength        | dB           | N/A                     |         | N/A                     |        | ±0.6                    |      | ±0.6                    |      | ±0.5                    |      | ±0.6                    |      | ±0.6                    |      | ±0.6                    |      | ±0.6                    |      | ±0.6                    |      | 1.5pk-pk            |      |
| Dynamic gain tilt                   | dB/dB        | N/A                     |         | N/A                     |        | ±0.06                   |      | 0.9                     |      | 0.9                     |      | 0.9                     |      | 0.9                     |      | 0.9                     |      | 0.9                     |      | 0.9                     |      | N/A                 |      |
| Gain / Power Stability              | dB           | -0.2                    | 0.2     | -0.1                    | 0.1    | ±0.1                    |      | ±0.1                    |      | ±0.1                    |      | ±0.1                    |      | ±0.1                    |      | ±0.1                    |      | ±0.1                    |      | ±0.1                    |      | ±0.1                |      |
| Noise Figure (at OFG or equivalent) | dB           |                         | 6.5     |                         | 8      |                         | 6    |                         | 5.5  |                         | 5.5  |                         | 6    |                         | 5.5  |                         | 5.5  |                         | 5.5  |                         | 5.5  | 5.5                 |      |
| Return loss                         | dB           | 40                      |         | 40                      |        | 40                      |      | 40                      |      | 40                      |      | 40                      |      | 40                      |      | 40                      |      | 40                      |      | 40                      |      | 40                  |      |
| PDG                                 | dB           |                         | 0.5     |                         | 0.3    |                         | 0.5  |                         | 0.4  |                         | 0.3  |                         | 0.5  |                         | 0.4  |                         | 0.4  |                         | 0.5  |                         | 0.5  | 0.5                 |      |
| PMD                                 | ps           |                         | 0.3     |                         | 0.15   |                         | 0.3  |                         | 0.2  |                         | 0.3  |                         | 0.3  |                         | 0.2  |                         | 0.2  |                         | 0.3  |                         | 0.3  | 0.3                 |      |
| Multi-Path Interference             | dB           |                         | -40     |                         | -40    |                         | -40  |                         | -40  |                         | -40  |                         | -40  |                         | -40  |                         | -40  |                         | -40  |                         | -40  | -40                 |      |
| Laser Safety Classification         | -            | Class 1M                |         | Class 1M                |        | Class 1M                |      | Class 1M                |      | Class 1M                |      | Class 1M                |      | Class 1M                |      | Class 1M                |      | Class 1M                |      | Class 1M                |      | Class 1M            |      |
| Optical Connectors                  | -            | 2: In, Out              |         | 2: In, Out              |        | 2: In, Out              |      | 3: In, Out, Out Mon     |      | 3: In, Out, Out Mon     |      | 2: In, Out              |      | 3: In, Out, Out Mon     |      | 3: In, Out, Out Mon     |      | 3: In, Out, Out Mon     |      | 3: In, Out, Out Mon     |      | 3: In, Out, Out Mon |      |
| Operating Modes                     | -            | APC, Manual             |         | APC, Manual             |        | AGC, APC, Manual        |      | AGC, APC, Manual        |      | AGC, APC, Manual        |      | AGC, APC, Manual        |      | AGC, APC, Manual        |      | AGC, APC, Manual        |      | AGC, APC, Manual        |      | AGC, APC, Manual        |      | AGC, APC, Manual    |      |
| Power Supply Voltage                | V            | 2.97                    | 3.63    | 3.13                    | 3.46   | 4.75                    | 5.25 | 4.75                    | 5.25 | 4.75                    | 5.25 | 4.75                    | 5.25 | 4.75                    | 5.25 | 4.75                    | 5.25 | 4.75                    | 5.25 | 3.15                    | 3.45 | 4.75                | 5.25 |
| Power Consumption                   | W            |                         | 2.5     |                         | 9.5    |                         | 8    |                         | 8    |                         | 8    |                         | 11   |                         | 11   |                         | 8    |                         | 12   |                         | 8    | 8                   |      |
| Operating Case Temperature          | °C           | 0                       | 70      | 0                       | 70     | 0                       | 70   | 0                       | 70   | 0                       | 70   | 0                       | 70   | 0                       | 70   | 0                       | 70   | 0                       | 70   | 0                       | 70   | 0                   | 70   |
| Communications Protocol             | -            | RS-232                  |         | RS-232                  |        | RS-232                  |      | RS-232                  |      | RS-232 LVTTL            |      | RS-232                  |      | RS-232 LVTTL            |      | RS-232 LVTTL            |      | RS-232                  |      | RS-232                  |      | RE-232 LVTTL        |      |
| Default Baud Rate                   | Baud         | 9600                    |         | 19200                   |        | 19200                   |      | 9600                    |      | 19200                   |      | 19200                   |      | 19200                   |      | 19200                   |      | 19200                   |      | 19200                   |      | 57600               |      |
| Eval Board P/N                      | -            | 1178581                 |         | 1185403                 |        | 1185403                 |      | 1185403                 |      | 1185403                 |      | 1185403                 |      | 1185403                 |      | 1185403                 |      | 1185403                 |      | 1185403                 |      | 1185403             |      |
| Eval Board Cable P/N                | -            | 18-10-0006R             |         | 18-10-0006R             |        | 18-10-0006R             |      | 18-10-0006R             |      | 18-10-0006R             |      | 18-10-0006R             |      | 18-10-0006R             |      | 18-10-0006R             |      | 18-10-0006R             |      | 18-10-0006R             |      | 18-10-0006R         |      |

Standard, available part number currently in production are listed above. Custom specifications can be considered to meet customers' needs.



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