



# CHP-EDFA Erbium Doped Fiber Amplifiers Technical Specification

## Specifications

| Models                                  | Constant Gain/Power |           |           |           | Constant Power |           |           |           |           |                   | High Input, Constant Gain |                    |
|---|---------------------|-----------|-----------|-----------|----------------|-----------|-----------|-----------|-----------|-------------------|---------------------------|--------------------|
|   | 1530-1562           | 1530-1562 | 1530-1562 | 1530-1562 | 1535-1562      | 1535-1562 | 1535-1562 | 1535-1562 | 1535-1562 | 1535-1562         | 1528-1562 (Note 2)        | 1528-1562 (Note 2) |
| <b>General Specifications</b>           |                     |           |           |           |                |           |           |           |           |                   |                           |                    |
| Optical Wavelength Range, nm            | 1530-1562           | 1530-1562 | 1530-1562 | 1530-1562 | 1535-1562      | 1535-1562 | 1535-1562 | 1535-1562 | 1535-1562 | 1535-1562         | 1528-1562 (Note 2)        | 1528-1562 (Note 2) |
| Total EDFA Power, nominal, dBm (Note 3) | 13                  | 16        | 19        | 22        | 16             | 22        | 19        | 22        | 25        | 29                | 20.5                      | 23.5               |
| Number of Output Ports                  | 1                   | 1         | 1         | 1         | 1              | 4         | 1         | 2         | 4         | 8                 | 1                         | 1                  |
| Output Power per Port (Note 4)          | 13                  | 16        | 19        | 22        | 16             | 16        | 19        | 19        | 19        | 20                | 20.5                      | 23.5               |
| Optical Input Range                     |                     |           |           |           |                |           |           |           |           |                   |                           |                    |
| Constant Gain Mode (AGC), dBm (Note 5)  | -10 to 12           | -10 to 12 | -10 to 12 | -10 to 12 | -              | -         | -         | -         | -         | -                 | 0 to 14.5                 | 2 to 15            |
| Constant Power Mode (APC), dBm (Note 6) | -3 to 12            | -3 to 12  | -3 to 12  | -3 to 12  | -3 to 12       | -3 to 12  | -3 to 12  | -3 to 12  | -3 to 12  | -3 to 12          | -                         | -                  |
| Optical Power Stability, dB (Note 7)    | ±0.5                | ±0.5      | ±0.5      | ±0.5      | ±0.5           | ±0.5      | ±0.5      | ±0.5      | ±0.5      | ±0.5              | ±0.5                      | ±0.5               |
| Input Isolation, dB                     | >30                 | >30       | >30       | >30       | >30            | >30       | >30       | >30       | >30       | >30               | >30                       | >30                |
| Output Isolation, dB                    | >30                 | >30       | >30       | >30       | >30            | >30       | >30       | >30       | >30       | >30               | >30                       | >30                |
| Remnant Pump Power, dBm                 | <-25                | <-25      | <-25      | <-25      | <-25           | <-25      | <-25      | <-25      | <-25      | <-25              | <-25                      | <-25               |
| <b>Noise Figure (Note 8)</b>            |                     |           |           |           |                |           |           |           |           |                   |                           |                    |
| In 1550 ±5 nm, dB, typ./max.            | 4.5/4.8             | 4.5/4.8   | 4.5/4.8   | 4.5/4.8   | 5.0/5.5        | 5.0/5.5   | 5.0/5.5   | 5.0/5.5   | 5.0/5.5   | 5.0/5.5           | 5.0/6.0 (Note 9)          | 5.0/5.5 (Note 9)   |
| In Range λ, dB, max. (Note 10)          | 5.8                 | 5.8       | 5.8       | 5.8       | 6.5            | 6.5       | 6.5       | 6.5       | 6.5       | 6.5               | 7.0 (Note 11)             | 6.5 (Note 11)      |
| <b>Gain Flatness (dB)</b>               |                     |           |           |           |                |           |           |           |           |                   |                           |                    |
| Optimum Gain per port                   | 12.0                | 15.0      | 18.0      | 21.0      | -              | -         | -         | -         | -         | -                 | 8.0                       | 10.0               |
| Allowable Gain Variation, dB            | ±3.0                | ±3.0      | ±3.0      | ±3.0      | -              | -         | -         | -         | -         | -                 | ±2.0                      | ±2.0               |
| Gain Flatness, P-V at optimum gain      | 2.2                 | 2.5       | 2.7       | 3.2       | -              | -         | -         | -         | -         | 1.3/5.2 (Note 12) | 1.5/2.0 (Note 13)         | 1.5/3.0 (Note 14)  |
| <b>Power Specifications</b>             |                     |           |           |           |                |           |           |           |           |                   |                           |                    |
| Power Consumption, W, max.              | 21.7                | 21.7      | 21.7      | 21.7      | 21.7           | 43.4      | 21.7      | 43.4      | 43.4      | 65.1              | 15                        | 15                 |

# CHP-EDFA Technical Specifications

## Specifications Continued...

| Models                              | Constant Gain/Power  |   |   |   | Constant Power |   |   |   | High Input, Constant Gain |   |   |   |
|-------------------------------------|--|---|---|---|----------------|---|---|---|---------------------------|---|---|---|
| <b>Physical &amp; Environmental</b> |  |   |   |   |                |   |   |   |                           |   |   |   |
| Slot Width                          | 1  | 1 | 1 | 1 | 1              | 2 | 1 | 2 | 2                         | 3 | 1 | 1 |
| Dimensions (W x H x D)              | Single: 3.18 x 8.7 x 47.0cm (1.25 x 3.4 x 18.5in.), Double: 6.36 x 8.7 x 47.0cm (2.5 x 3.4 x 18.5in.), Triple: 9.6 x 8.7 x 47.0cm (3.75 x 3.4 x 18.5in.) |   |   |   |                |   |   |   |                           |   |   |   |
| Operating Temperature               | Operating: 0 to 50°C (32 to 122°F), Storage: -40 to 70°C (-40 to 158°F)  |   |   |   |                |   |   |   |                           |   |   |   |
| Operating Humidity, max.            | 85% noncondensing  |   |   |   |                |   |   |   |                           |   |   |   |

### Notes:

- Specifically for CORWave II 16-wavelength forward applications
- The range 1540-1562 nm is the optimized wavelength range.
- The total output power is within 1dB of the nominal output power with an input between -6 and -3dBm; the total output power is within 3dB of the nominal output power with an input between -10 and -6dBm.
- Factory set point accuracy approximately ±0.25dB.
- When operating in the AGC mode, the sum of input power and gain set-point should not exceed the nominal output power (Input Power + Gain Set-point < Nominal Output Power) or high output power shutdown may be triggered. If the input power is < -10dBm, no optical power is emitted.
- EDFAs operating in APC mode will meet output power specifications with input power levels > -3dBm. At input power levels between -10 and -3dBm, the EDFA will attempt to maintain the set-point output power but it may be less than specifications.
- Over temperature, wavelength, and polarization.
- Specified for 0dBm optical input.
- The Noise Figure is 5.0 dB for the 1540 to 1562 nm range.
- See Optical Wavelength Range specification above.
- The Noise Figure is 6.0 dB typical for CHP-EDFA-HG-20-1-S and 6.5 dB maximum for CHP-EDFA-HG-23-1-S in the 1527 to 1562 nm range.
- For CHP-EDFA-20-8-L, optical power in = 6dBm, optical power out = 20dBm/port. The peak to valley gain flatness is 1.3dB over bandwidth 1550 to 1562nm and 5.2dB over bandwidth 1535 to 1562nm.
- For CHP-EDFA-HG-20-1-S, the Gain Rating is 1.5 P-V at optimum gain for the 1540 to 1562 nm range and 1.5 P-V at optimum gain for the 1528 to 1562 nm range.
- For CHP-EDFA-HG-23-1-S, the Gain Rating is 1.5 P-V at optimum gain for the 1540 to 1562 nm range and 3.0 P-V at optimum gain for the 1528 to 1562 nm range.

## Ordering Information

| Part Number                               | Description   |
|---|---|
| <b>Constant Gain/Constant Power EDFAs</b> |   |
| CHP-EDFA-CG-13-1-S                        | 13dBm, 1 output port, 1530–62nm, constant gain/power, SC/APC, 1-wide module             |
| CHP-EDFA-CG-16-1-S                        | 16dBm, 1 output port, 1530–62nm, constant gain/power, SC/APC, 1-wide module             |
| CHP-EDFA-CG-19-1-S                        | 19dBm, 1 output port, 1530–62nm, constant gain/power, SC/APC, 1-wide module             |
| CHP-EDFA-CG-22-1-S                        | 22dBm, 1 output port, 1530–62nm, constant gain/power, SC/APC, 1-wide module             |
| <b>Constant Power EDFAs</b>               |   |
| CHP-EDFA-16-1-S                           | 16dBm, 1 output port, 1535–62nm, constant power, SC/APC, 1-wide module                  |
| CHP-EDFA-16-4-L                           | 22dBm, 4 output ports, 16dBm per port, 1535–62nm, constant power, LC/APC, 2-wide module |
| CHP-EDFA-19-1-S                           | 19dBm, 1 output port, 1535–62nm, constant power, SC/APC, 1-wide module                  |
| CHP-EDFA-19-2-S                           | 22dBm, 2 output ports, 19dBm per port, 1535–62nm, constant power, SC/APC, 2-wide module |
| CHP-EDFA-19-4-L                           | 25dBm, 4 output ports, 19dBm per port, 1535–62nm, constant power, LC/APC, 2-wide module |
| CHP-EDFA-20-8-L                           | 29dBm, 8 output ports, 20dBm per port, 1535–62nm, constant power, LC/APC, 3-wide        |
| <b>High Input and Constant Gain EDFAs</b> |   |
| CHP-EDFA-HG-20-1-S                        | 20dBm, 1 output port, 1527–62nm, high input constant gain, SC/APC, 1-wide module        |
| CHP-EDFA-HG-23-1-S                        | 23dBm, 1 output port, 1528–62nm, high input constant gain, SC/APC, 1-wide module        |

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