



# Erbium Doped Fiber Amplifiers

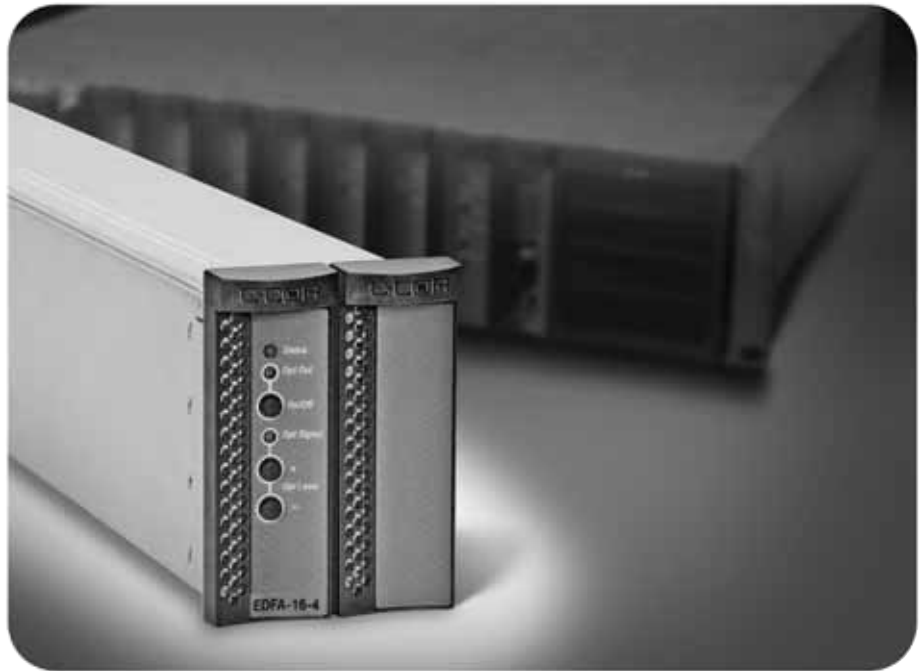
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## CHP-EDFA

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### C-COR® CHP Max5000

- Low noise, high performance EDFA series
- EDFAs available with constant gain and constant power operating modes
- Simplified installation and control with graphical user interface
- Universal management through Craft interface and SNMP with HMS



CHP Max5000 Erbium-Doped Fiber Amplifiers (EDFAs) offer a scalable optical amplification solution. The CHP Max5000 EDFA series is designed for use with CHP Max5000 1550 nm transmitters, simplifying applications by providing low noise, integrated element management capability, reduced rack space, and power requirements.

CHP Max5000 EDFAs are offered with single, dual, and triple-width modules based on the configuration option. The 2RU CHP Max5000 chassis can accommodate up to 10 single-width modules (up to 200 single-width modules in one standard 40RU rack) to relieve the pressure on precious headend space as you expand your network offering advanced service applications.

CHP Max5000 EDFA modules are available with or without constant gain. Constant gain modules can be set for either constant gain or constant power, whereas modules without constant gain only have a constant power mode. In constant gain mode, EDFAs amplify the optical input by a fixed amount regardless of optical input power. In constant power mode, EDFAs provide a consistent optical output power regardless of optical input power.

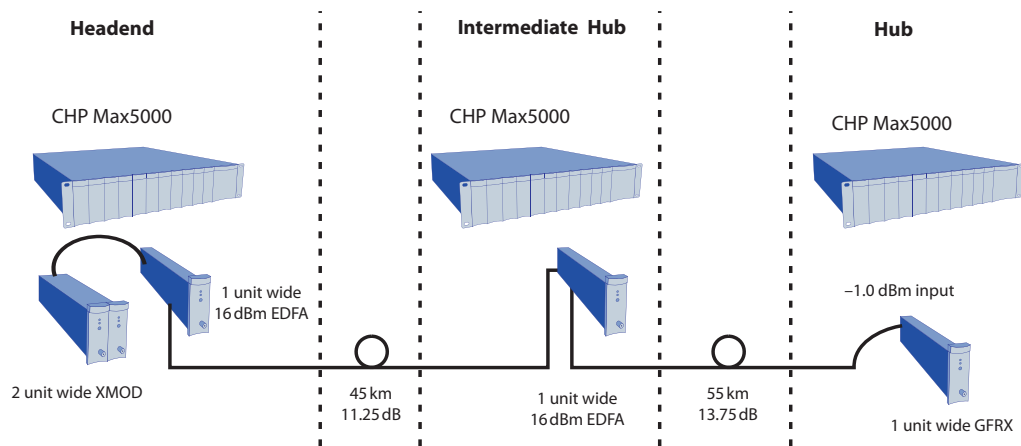
CHP Max5000 EDFA series offer hot-swapping and integrated monitoring and configuration control through a Craft graphical user interface with local or remote access. Remote management is accessible through the SNMP HMS-compliant interface for external connection to an element manager. Energy efficient internal components and effective thermal design keep optical components cool to ensure effective, reliable performance.

## Features

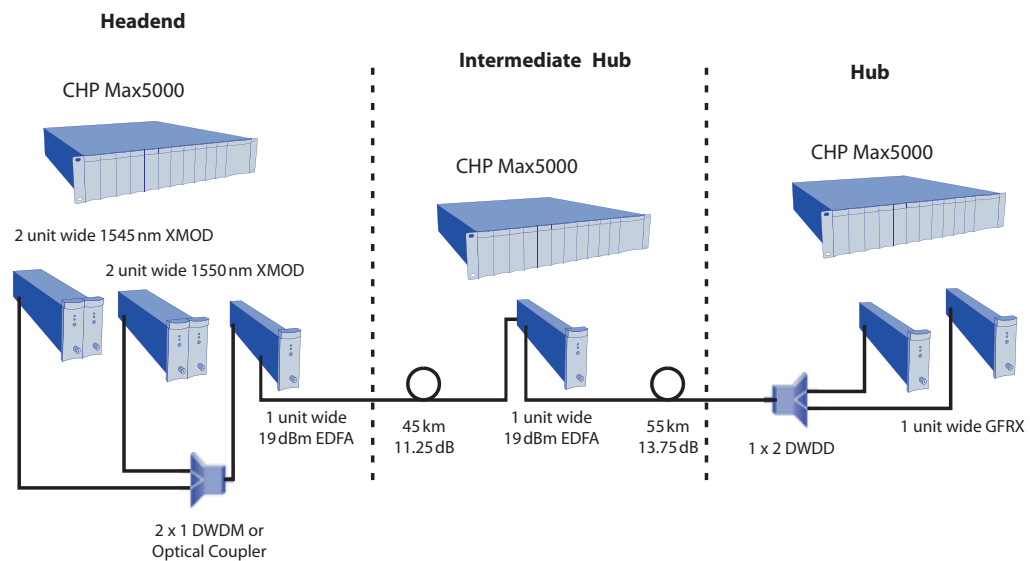
- Nominal output powers from 13 dBm to 22 dBm per port
- Constant gain and constant power models
- Adjustable output power
- High-density solution (up to 10 modules per 2RU chassis and 200 modules per 40RU rack)
- Local or remote monitoring and configuration control using the Craft GUI
- Modular system optimized for use with CHP Max5000 1550 nm transmitter series

## Applications

### 100km Single Channel Application



### 100km Split Channel Application



Note: Refer to the CHP Max5000 Externally Modulated Transmitter data sheet for 65 km Single and Split Channel application diagrams.

## Specifications

Models: CHP-EDFA-xx-xx-x-x	CG-13-1-S	CG-16-1-S	CG-19-1-S	CG-22-1-S	16-1-S	16-4-L	19-1-S	19-2-S	19-4-L	20-8-L
<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
Total EDFA Power, nominal, dBm (Note 1)	13	16	19	22	16	22	19	22	25	29
Number of Output Ports	1	1	1	1	1	4	1	2	4	8
Output Power per Port (Note 2)	13	16	19	22	16	16	19	19	19	20
Optical Input Power Range										
Constant Gain Mode (AGC), dBm (Note 3)	–10 to 12	–10 to 12	–10 to 12	–10 to 12	—	—	—	—	—	—
Constant Power Mode (APC), dBm (Note 4)	–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 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
Output Isolation, dB	>30	>30	>30	>30	>30	>30	>30	>30	>30	>30
Remnant Pump Power, dBm	<–25	<–25	<–25	<–25	<–25	<–25	<–25	<–25	<–25	<–25
<b>Noise Figure (Note 6)</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
In λ. Range, dB, max. (Note 7)	5.8	5.8	5.8	5.8	6.5	6.5	6.5	6.5	6.5	6.5
<b>Gain Flatness (dB)</b>										
Optimum Gain per port	12.0	15.0	18.0	21.0	—	—	—	—	—	—
Allowable Gain Variation, dB	±3.0	±3.0	±3.0	±3.0	—	—	—	—	—	—
Gain Flatness, P–V at optimum gain (Note 8)	2.2	2.5	2.7	3.2	—	—	—	—	—	1.3/5.2
<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
<b>Physical and Environmental Specifications</b>										
Slot Width	1	1	1	1	1	2	1	2	2	3
Dimensions (W x H x D)	Single: 3.18 x 8.7 x 47.0cm (1.25 x 3.4 x 18.5 in.) Double: 6.36 x 8.7 x 47.0cm (2.5 x 3.4 x 18.5 in.) Triple: 9.6 x 8.7 x 47.0cm (3.75 x 3.4 x 18.5 in.)									
Operating Temperature	0 to 50°C (32 to 122°F)									
Storage Temperature	–40 to 70°C (–40 to 158°F)									
Operating Humidity, max.,	85% noncondensing									

### Notes:

- The total output power is within 1 dB of the nominal output power with an input between –6 and –3 dBm; the total output power is within 3 dB of the nominal output power with an input between –10 and –6 dBm.
- Factory set point accuracy approximately ±0.25 dB.
- 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 <–10 dBm, no optical power is emitted.
- EDFAs operating in APC mode will meet output power specifications with input power levels > –3 dBm. At input power levels between –10 and –3 dBm, 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 0 dBm optical input.
- See Optical Wavelength Range specification above.
- For CHP-EDFA-20-8-L, optical power in = 6 dBm, optical power out = 20 dBm/port. The peak to valley gain flatness is 1.3 dB over bandwidth 1550–1562 nm and 5.2 dB over bandwidth 1535–1562 nm.
- All models have an output power adjustment range from preset of –1.25 to 0.5 dB in 0.25 dB steps.

Specifications subject to change without notice

# C-COR™ CHP Max5000 Erbium Doped Fiber Amplifiers

## 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 module



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