

CHP Max Headend Optics Platform

CHP EDFA Headend Erbium Doped Fiber Amplifiers

FEATURES

- Convenient, cost-effective solution for high quality signal transmission, suitable for supertrunking, blast and split, redundant rings, high power distribution architectures, RFoG, and video overlay in all fiber networks
- High Gain with Low Noise Figure
- High isolation from input to output ports
- Available with a range of output powers with 1, 2, 4 or 8 ports and a constant power feature
- Constant gain, constant power models for single wavelength transmitters, and high input constant gain, constant power models for multiwavelength transmitters
- Local or remote monitoring and configuration control using CORView™ or SNMP with HMS compliant element management systems



PRODUCT OVERVIEW

ARRIS CHP Erbium-Doped Fiber Amplifiers (EDFAs) are designed to increase signal transmission distance, making them ideal optical amplification solutions for long links, redundant rings, blast and split, and other applications. Fully scalable, EDFAs are also excellent choices for operators who need to perform hub collapses. Operators can use the CHP EDFA series with CHP CORWave® II and CORWave® 3 multiwavelength 1550 nm transmitters and CHP GMOD high power 1550 nm broadcast transmitters to realize installation flexibility, achieve low noise figures for high quality amplification over long distances, and activate integrated element management capability within their networks.

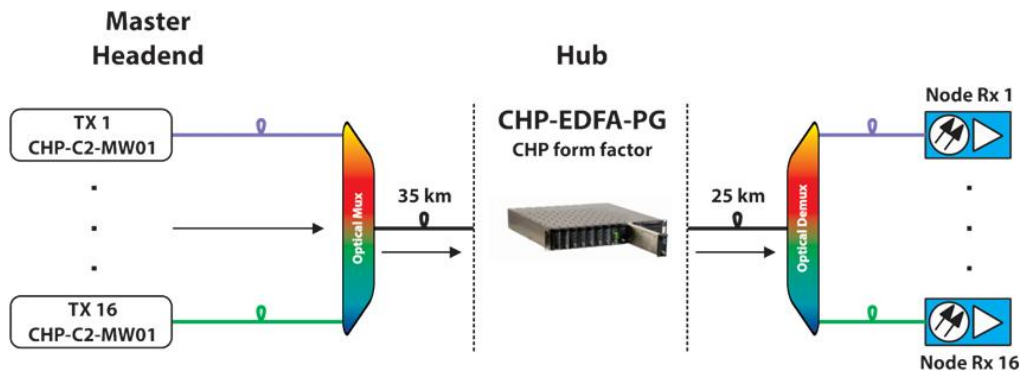
CHP EDFA modules are available in the following modes:

- Constant gain (CHP-EDFA-CG) mode for single wavelength applications, which allows the EDFA to amplify the optical input by a fixed amount regardless of optical input power
- Constant power (CHP-EDFA) mode for single wavelength applications, which allows the EDFA to provide consistent optical output power regardless of optical input power levels
- High input constant gain/constant power (CHP-EDFA-PG) mode for multiple wavelength applications

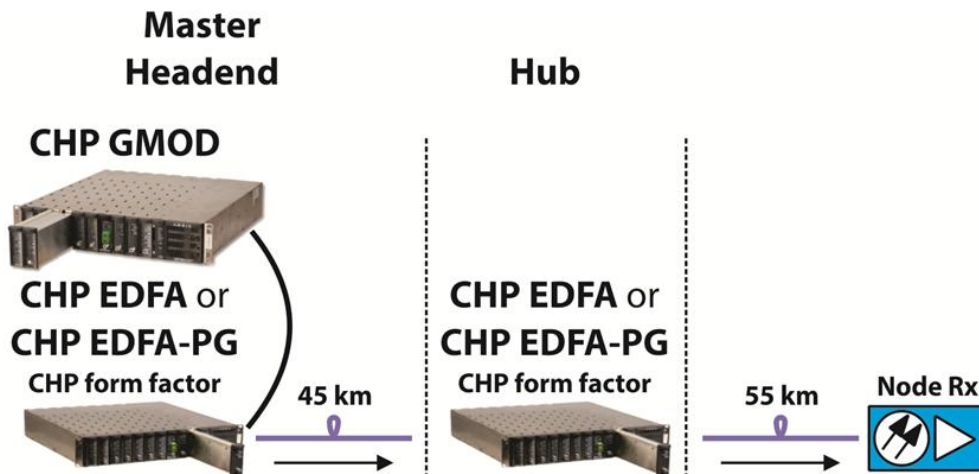
All CHP EDFA modules feature integrated monitoring and configuration control, available via the ARRIS CORView™ EMS system, the GUI Craft interface, or SNMP with HMS compliant element management.

The CHP form factor's space-saving design allows operators to install between 60 and 200 EDFAs in a 40RU rack (depending upon configuration) as opposed to a maximum of 40 in the 1RU design. Downtime is minimized with hot-swap capability. Energy efficient internal components and effective thermal design keep optical components cool to ensure effective, reliable performance.

FULL SPECTRUM 16 WAVELENGTH APPLICATION



HIGH POWER 1550 nm SINGLE WAVELENGTH APPLICATION



SPECIFICATIONS FOR STANDARD INPUT MODELS

Models	Constant Gain/Power CHP-EDFA-CG-				Constant Power CHP-EDFA-					
	13-1-S	16-1-S	19-1-S	22-1-S	16-1-S	16-4-L	19-1-S	19-2-S	SM-19-4-L	20-8-L
General Specifications										
Optical Wavelength Range, nm	1530 - 1562				1535 - 1562					
Total EDFA Power, nominal, dBm ³	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 ⁴	13	16	19	22	16	16	19	19	19	20
Optical Input Range										
Constant Gain Mode (AGC), dBm ⁵	-10 to 12	-10 to 12	-10 to 12	-10 to 12	—	—	—	—	—	—
Constant Power Mode (APC), dBm 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 ⁷	± 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
Noise Figure⁸										
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	4.5/5.0	5.0/5.5
In Range λ, dB, max. ¹⁰	5.8	5.8	5.8	5.8	6.5	6.5	6.5	6.5	6.0	6.5
Gain Flatness (dB)										
Optimum Gain per port	12.0	15.0	18.0	21.0	—	—	—	—	—	—
Allowable Gain Variation, dB	± 4.0	± 4.0	± 4.0	± 4.0	—	—	—	—	—	—
Gain Flatness, P-P at opt. gain	2.5	2.8	3.0	3.5	—	—	—	—	—	1.3/5.2 ¹²
Power Specifications										
Power Consumption, W, max.	21.7	21.7	21.7	21.7	21.7	43.4	21.7	43.4	43.4	65.1
Physical & Environmental										
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 47.0 cm (1.25 x 3.4 x 18.5 in.), Double: 6.36 x 8.7 x 47.0 cm (2.5 x 3.4 x 18.5 in.) Triple: 9.6 x 8.7 x 47.0 cm (3.75 x 3.4 x 18.5 in.)									
Weight	Single: 1.6 kg (3.6 lb.), Double: 2.2 kg (4.9 lb.), Triple: 2.8 kg (6.2 lb.)									
Operating Temperature	Ambient: 0 to 50°C (32 to 122°F), Storage: -40 to 70°C (-40 to 158°F)									
Operating Altitude (AMSL)	-60 to 4,000 meters (197 to 13,123 feet)									
Operating Relative Humidity	5 to 95 %, noncondensing									

SPECIFICATIONS FOR HIGH INPUT MODELS (FOR MULTIPLE WAVELENGTH APPLICATIONS)

High Input, Constant Gain/Power CHP-EDFA-PG-		
Models	20-1-F & 20-1-S	23-1-F & 23-1-S
General Specifications		
Optical Wavelength Range, nm	1528 - 1562 ^{1,2}	1527 - 1562 ^{1,2}
Total EDFA Power, nominal, dBm	20	23.5
Number of Output Ports	1	1
Output Power per Port ⁴	20.5	23.5
Optical Input Range		
Constant Gain Mode (AGC), dBm ⁵	1 to 14.5	1 to 15
Constant Power Mode (APC), dBm ⁶	7 to 17	7 to 17
Optical Power Stability, dB ⁷	± 0.5	± 0.5
Input Isolation, dB	> 30	> 30
Output Isolation, dB	> 30	> 30
Remnant Pump Power, dBm	< -5	< -25
Noise Figure ⁸		
In 1550 ± 5 nm, dB, typ./max.	5.0/6.0 ⁹	5.0/5.5 ⁹
In Range λ, dB, max. ¹⁰	7.0 ¹¹	6.5 ¹¹
Gain Flatness (dB)		
Optimum Gain per port	8.0	10.0
Allowable Gain Variation, dB	± 2.0	± 2.0
Gain Flatness, P-P at optimum gain	1.2/1.5 ¹³	1.1/3.5 ¹⁴
Power Specifications		
Power Consumption, W, max.	15	15
Physical & Environmental		
Slot Width	1	1
Dimensions (W x H x D)	Single: 3.18 x 8.7 x 47.0 cm (1.25 x 3.4 x 18.5 in.), Double: 6.36 x 8.7 x 47.0 cm (2.5 x 3.4 x 18.5 in.) Triple: 9.6 x 8.7 x 47.0 cm (3.75 x 3.4 x 18.5 in.)	
Weight	Single: 1.6 kg (3.6 lb.), Double: 2.2 kg (4.9 lb.), Triple: 2.8 kg (6.2 lb.)	
Operating Temperature	Ambient: 0 to 50°C (32 to 122°F), Storage: -40 to 70°C (-40 to 158°F)	
Operating Altitude (AMSL)	-60 to 4,000 meters (197 to 13,123 feet)	
Operating Relative Humidity	5 to 95 %, noncondensing	

NOTES:

- Specifically for CORWave II 16-wavelength forward applications
- The range 1540 to 1562 nm is the optimized wavelength range.
- 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.
- The Noise Figure is 5.0 dB typical for the 1540 to 1562 nm range.
- See Optical Wavelength Range specification above.
- The Noise Figure is 6.0 dB typical for CHP-EDFA-PG-20-1-S and 6.5 dB maximum for CHP-EDFA-23-1-S.
- 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 to 1562 nm and 5.2 dB over bandwidth 1535 to 1562 nm.
- For CHP-EDFA-PG-20-1-S, the Gain Rating is 1.2 P-P at optimum gain for the 1540 to 1562 nm range and 1.5 P-P at optimum gain for the 1528 to 1562 nm range.
- For CHP-EDFA-PG-23-1-S, the Gain Rating is 1.1 P-P at optimum gain for the 1527 to 1562 nm range and 3.5 P-P at optimum gain for the 1527 to 1562 nm range.

ORDERING INFORMATION

Model Name	Description
Constant Gain/Constant Power EDFAs	
CHP-EDFA-CG-13-1-S	13 dBm, 1 output port, 1530 - 1562 nm, constant gain/power, SC/APC, 1-wide module
CHP-EDFA-CG-16-1-S	16 dBm, 1 output port, 1530 - 1562 nm, constant gain/power, SC/APC, 1-wide module
CHP-EDFA-CG-19-1-S	19 dBm, 1 output port, 1530 - 1562 nm, constant gain/power, SC/APC, 1-wide module
CHP-EDFA-CG-22-1-S	22 dBm, 1 output port, 1530 - 1562 nm, constant gain/power, SC/APC, 1-wide module
Constant Power EDFAs	
CHP-EDFA-16-1-S	16 dBm, 1 output port, 1535 - 1562 nm, constant power, SC/APC, 1-wide module
CHP-EDFA-16-4-L	22 dBm, 4 output ports, 16 dBm per port, 1535 - 1562 nm, constant power, LC/APC, 2-wide module
CHP-EDFA-19-1-S	19 dBm, 1 output port, 1535 - 1562 nm, constant power, SC/APC, 1-wide module
CHP-EDFA-19-2-S	22 dBm, 2 output ports, 19 dBm per port, 1535 - 1562 nm, constant power, SC/APC, 2-wide module
CHP-EDFA-SM-19-4-L	25 dBm, 4 output ports, 19 dBm per port, 1535 - 1562 nm, constant power, LC/APC, 2-wide module
CHP-EDFA-20-8-L	29 dBm, 8 output ports, 20 dBm per port, 1535 - 1562 nm, constant power, LC/APC, 3-wide
High Input and Constant Gain/Constant Power EDFAs	
CHP-EDFA-PG-20-1-F	20 dBm, 1 output port, 1528 - 1562 nm, high input, constant gain/power, SC/APC, 1-wide module, front fiber
CHP-EDFA-PG-23-1-F	23 dBm, 1 output port, 1527 - 1562 nm, high input, constant gain/power, SC/APC, 1-wide module, front fiber
CHP-EDFA-PG-20-1-S	20 dBm, 1 output port, 1528 - 1562 nm, high input, constant gain/power, SC/APC, 1-wide module, rear fiber
CHP-EDFA-PG-23-1-S	23 dBm, 1 output port, 1527 - 1562 nm, high input, constant gain/power, SC/APC, 1-wide module, rear fiber

RELATED PRODUCTS

CHP Chassis	Optical Patch Cords
Power Supplies	Optical Passives
Control Module	Installation Services

Customer Care

Contact Customer Care for product information and sales:

- United States: 866-36-ARRIS
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