

# 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, or 4 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.

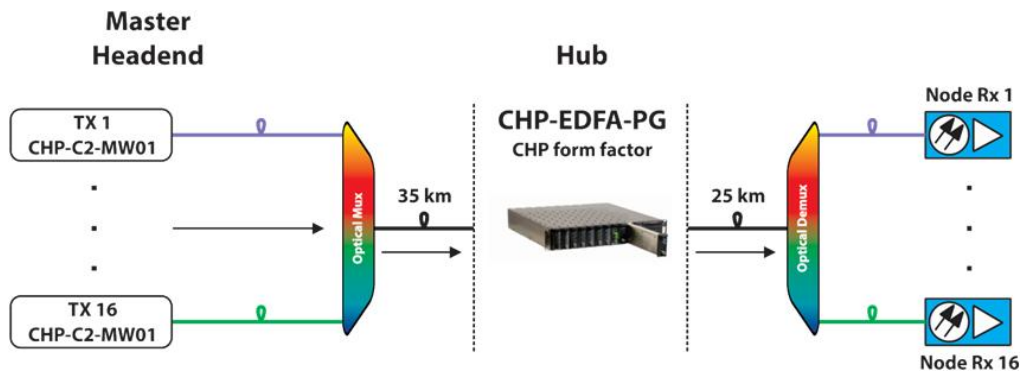
CHP EDFA modules are available in the following modes:

- 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

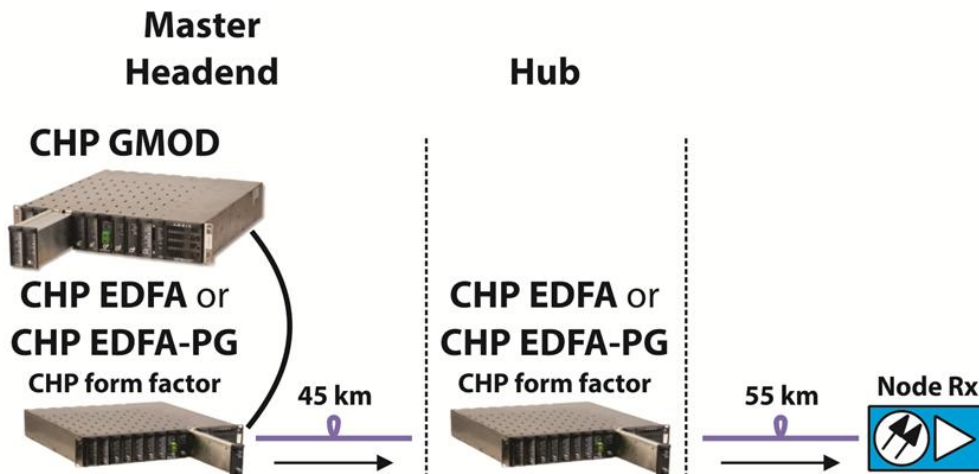
All CHP EDFA modules feature integrated monitoring and configuration control, available via the ARRIS CORView™ EMS system, the GUI Craft interface, or SNMP with HMS compliant element management.

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	19-4-L	20-8-L
<b>General Specifications</b>										
Optical Wavelength Range, nm	1530 - 1562				1535 - 1562					
Total EDFA Power, nominal, dBm <sup>3</sup>	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 <sup>4</sup>	13	16	19	22	16	16	19	19	19	20
<b>Optical Input Range</b>										
Constant Gain Mode (AGC), dBm <sup>5</sup>	-10 to 12	-10 to 12	-10 to 12	-10 to 12	—	—	—	—	—	—
Constant Power Mode (APC), dBm <sup>6</sup>	-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 <sup>7</sup>	± 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<sup>8</sup></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 Range λ, dB, max. <sup>10</sup>	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	± 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 <sup>12</sup>
<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 &amp; Environmental</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 47.0 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-S	23-1-S
<b>General Specifications</b>		
Optical Wavelength Range, nm	1528 - 1562 <sup>1,2</sup>	1527 - 1562 <sup>1,2</sup>
Total EDFA Power, nominal, dBm <sup>3</sup>	20	23.5
Number of Output Ports	1	1
Output Power per Port <sup>4</sup>	20.5	23.5
Optical Input Range		
Constant Gain Mode (AGC), dBm <sup>5</sup>	1 to 14.5	1 to 15
Constant Power Mode (APC), dBm <sup>6</sup>	7 to 17	7 to 17
Optical Power Stability, dB <sup>7</sup>	± 0.5	± 0.5
Input Isolation, dB	> 30	> 30
Output Isolation, dB	> 30	> 30
Remnant Pump Power, dBm	< -5	< -25
<b>Noise Figure <sup>8</sup></b>		
In 1550 ± 5 nm, dB, typ./max.	5.0/6.0 <sup>9</sup>	5.0/5.5 <sup>9</sup>
In Range λ, dB, max. <sup>10</sup>	7.0 <sup>11</sup>	6.5 <sup>11</sup>
<b>Gain Flatness (dB)</b>		
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 <sup>13</sup>	1.1/3.5 <sup>14</sup>
<b>Power Specifications</b>		
Power Consumption, W, max.	15	15
<b>Physical &amp; Environmental</b>		
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 1dB of the nominal output power with an input between -6 and -3dBm; 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 -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 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 in the 1527 to 1562 nm range.
- 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 1562nm.
- 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 1540 to 1562 nm range and 3.5 P-P 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	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
<b>Constant Power EDFAs</b>	
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-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
<b>High Input and Constant Gain/Constant Power EDFAs</b>	
CHP-EDFA-PG-20-1-S	20 dBm, 1 output port, 1528 - 1562 nm, high input, constant gain/power, SC/APC, 1-wide module
CHP-EDFA-PG-23-1-S	23 dBm, 1 output port, 1527 - 1562 nm, high input, constant gain/power, SC/APC, 1-wide module

### 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
- International: +1-678-473-5656

**Note:** Specifications are subject to change without notice.

**Copyright Statement:** ©ARRIS Enterprises, Inc. 2015 All rights reserved. No part of this publication may be reproduced in any form or by any means or used to make any derivative work (such as translation, transformation, or adaptation) without written permission from ARRIS Enterprises, Inc. ("ARRIS"). ARRIS reserves the right to revise this publication and to make changes in content from time to time without obligation on the part of ARRIS to provide notification of such revision or change. ARRIS and the ARRIS logo are all registered trademarks of ARRIS Enterprises, Inc. Other trademarks and trade names may be used in this document to refer to either the entities claiming the marks and the names of their products. ARRIS disclaims proprietary interest in the marks and names of others. The capabilities, system requirements and/or compatibility with third-party products described herein are subject to change without notice.

CHP EDFA\_DS\_17MAR15

(rev 03-2015)