DATA SHEET

Optical Node Series (NC)

FA4520x-03 EDFA

High Output, Gain Flattened, Single Slot Optical Amplifiers

FEATURES

- Gain Flattened for C-Band
- 20 dBm output power
- Extended optical range ITU Channels 62–14, 1527.9–1566.3 nm
- User-selectable Constant Current or Constant Gain mode
- User settable output level
- Extended optical input sensor range -30 to +10 dBm
- Low noise figure
- Optical path isolation (input and output)
- Remote status monitoring and control
- Full auto-recovery
- ASE muting with variable threshold
- Auto-limiting optical output for eye safety
- Hot plug-in/out

The CommScope FA4520E-03, FA4520F-03, and FA4520H-03 modules are high-output, gain-flattened, extremely compact optical amplifiers with an output power limiting function that limits the optical output power to ensure compliance with Class 1M laser products. These high-performance amplifiers allow operators to use 1550 nm DWDM transmitters over the extended optical range between ITU channels 14 to 62 to deliver high-quality, full spectrum broadcast and digital narrowcast content over significant transmission distances in applications where a flat amplifier gain spectrum is required.

These third-generation optical amplifiers introduce a microprocessor to offer significant enhancements in the deployment of traditional HFC, Fiber Deep, and fiber to the home (FTTH) networks. The modules can be user selectable to operate in two modes, either constant current which delivers a fixed optical output power, typically used for single wavelength deployments; or constant gain, which is intended for multiwavelength applications where the optical level per wavelength remains constant as the number of wavelengths is increased, within the constraints of the total operating power.

This latest model offers extended amplification of optical input range down to -26 dBm per wavelength* to better support low level data signals. Input sensor range is extended down to -30 dBm. The automatic ASE muting has user settable thresholds where the EDFA output is muted when the incoming optical signal is below the threshold value with optical power automatically restored when the signal returns.

*See detailed specifications regarding minimum input power and OSNR.

Operational monitoring has been increased. This includes remote monitoring of optical levels, laser operating conditions, and alarm status with the option to set alarm parameters to suit local operating conditions.

The units are designed as plug-in modules for CommScope's NC4000™ series Fiber Node Platforms, including the NH4000 "Virtual Hub" and Universal Virtual Hub (UVHub), and, when used in the latter, provides a practical alternative to OTN-style cabinets.

SPECIFICATIONS

Characteristics	Specification		
Physical			
Dimensions	4.0” L x 2.2” H x 2.3” W (10.2 cm x 5.6 cm x 5.8 cm)		
Weight	0.6 lbs (0.3 kg)		
Environmental			
Operating Temperature Range	-40° to +85°C (-40° to 185°F)		
Storage Temperature Range	-40° to +85°C (-40° to 185°F)		
Humidity	5% to 95% non-condensing		
General			
	Hot plug-in/out		
Modes of Operation	Constant Current or Constant Gain		
ASE Muting	User enable/disable. When enabled, settable levels from -29 dBm to 10 dBm; power level for recovery is +1 dB from set level.		
Optical Interface			
Optical Connectors	SC/APC		
Power Requirements			
Input Voltage	24 V_{DC}		
Power Consumption	10 W		
Status Indicator LEDs (5)			
CC (Constant Current Mode) LED	On/Green = operating in constant current (power) mode		
CG (Constant Gain Mode) LED	On/Green = operating in constant gain mode		
Warning LED	On/Yellow = when • At least one Major Alarm has occurred • At least one Minor Alarm has occurred (Summary of Minor Alarms) • Any Alarm History is available		
Alarm LED Major Alarm(s)	On/Red = when at least one Major Alarm has occurred (Yellow Warning LED will also be on)		
	NOTE: Available module status alarm options are viewed and managed in Opti-Trace® CMS. Alarm severity (Major or Minor) for each parameter and threshold (alarm) minimum/maximum levels for Major and Minor alarms can be manually set in Opti-Trace CMS. Status indicator LEDs (Warning, Alarm, Status) are activated when a set threshold is exceeded.		
Status LED	Red = laser switched off Green = laser switched on		
Optical			
Input Signal Wavelength	1527.9–1566.3 nm (ITU 62–14)		
Optical Signal Path Isolation	< -30 dB		
Gain Flatness (Peak to Valley)	2.5 dB for 1527.9 to 1564.7 nm (ITU 62–16) 4.5 dB for 1527.9 to 1566.3 nm (ITU 62–14)		
Constant Gain Mode (Preferred Operation Mode)	The gain range is user settable from 6 to 30 dB. Full gain range may not be accessible depending upon input and operating conditions. Gain ranges and composite input power ranges for the specified gain flatness are as follows:		
	FA4520E	**FA4520F**	**FA4520H**
Gain Range[1,2]	16 to 20 dB	12 to 16 dB	8 to 12 dB
Input Power Range	-10 to 4 dBm	-10 to 8 dBm	-10 to 12 dBm
Constant Current Mode			
Composite Input Power Ranges for Specified Gain Flatness	0 to 4 dBm	4 to 8 dBm	8 to 12 dBm
Nominal Output Power of 20 dBm Under Constant Current Mode at Mid-point Input Power Range	2 dBm	6 dBm	10 dBm
Output Power Stability	Constant Gain Mode ± 0.7 dB Constant Current Mode: ± 0.6 dB		
Output Power Margin	0.1 dB min; 0.4 dB max		
Output Power Min	2 dBm. Automatically ensured by the module to prevent pump laser power from being near its threshold. This is to avoid pump laser fluctuation. Output power is kept 2 dBm or above regardless input power, constant gain or constant current mode.		
Noise Figure Within the Above Specified Constant Gain and Constant Current Modes	FA4520E: 5.0 dB typical, 5.5 dB max FA4520F: 5.5 dB typical, 6.0 dB max FA4520H: 6.0 dB typical, 6.5 dB max		
Input Power for OSNR of 25 dB	-26 dBm per wavelength (λ) with one EDFA (FA4521V) in system. With N units of FA4521V in the link, the required input power for 25 dB OSNR is -26 dBm/λ + 10 $\log_{10}$(N). OSNR is defined as the ratio of signal power per wavelength to noise power in 0.1 nm bandwidth at the output of the EDFA.		
Remote Monitoring/Control Parameters			
Status Displayed	Optical input and output power, EDFA gain, board temperature, ASE muting status, laser status, local summary. Local parameters for monitoring are displayed through USB port access.		
Control Parameter	Constant gain and gain value; constant current mode and output power; ASE muting enable and threshold		

NOTE:

1. Gain can be set at 0.25 dB per step.
2. When the actual EDFA gain (output power – input power) of a model falls within the respective range, specified gain flatness can be expected. Actual EDFA gain may be different from set gain due to the limits of max output power (20 dBm) and minimum output power (2 dBm).

ORDERING INFORMATION

Model Name	Description
FA4520E-03-AS	Gain flattened EDFA, Single 20 dBm Output with variable level, ASE Muting & Power Limiting, Optimized for 18 dB Gain, Input power 0 to 4 dBm, Single slot module, SC/APC connectors
FA4520F-03-AS	Gain flattened EDFA, Single 20 dBm Output with variable level, ASE Muting & Power Limiting, Optimized for 14 dB Gain, Input power 4 to 8 dBm, Single slot module, SC/APC connectors
FA4520H-03-AS	Gain flattened EDFA, Single 20 dBm Output with variable level, ASE Muting & Power Limiting, Optimized for 10 dB Gain, Input power 8 to 12 dBm, Single slot module, SC/APC connectors

RELATED PRODUCTS

NC4000 Optical Nodes	NH/VH4000 VHub, UVHub
Optical Patch Cords	Optical Passives
Fiber Service Cable	Installation Services

Contact Customer Care for product information and sales:

- United States: 866-36-ARRIS
- International: +1-678-473-5656

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Note: Specifications are subject to change without notice.

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