DATA SHEET

Optical Node Series (NC)

FA45xxS-03

Constant Current/Constant Gain
Single Slot Amplifier

FEATURES

- 14, 17, 21, or 24 (2 x 21) dBm output power
- Extended optical range ITU Channels 14–62, 1566.75–1527.6 nm
- Operates in Constant Current or Constant Gain mode
- Variable output level or gain
- Extended optical input range -30 to +10 dBm
- Low noise figure, 4.5 dB typical
- High output to input optical isolation
- Remote status monitoring and control
- Full auto-recovery
- ASE muting with variable threshold
- Hot plug-in/out

The CommScope FA4514S-03, FA4517S-03, FA4521S-03, and FA4524S-03 modules are high performance 1550 nm optical amplifiers that enable operators to transport broadcast and digital content via DWDM analog transmitters over significant distances.

These third-generation optical amplifiers introduce a microprocessor to offer significant operational enhancements for operators deploying traditional HFC, Fiber Deep, or Fiber to the home (FTTH) networks. The modules may be operated in either constant current mode which delivers a fixed, user-set optical output power, typically used for single wavelength deployments; or constant gain mode intended for multiwavelength applications where the optical level per wavelength remains constant regardless of the number of wavelengths.

These latest models offer 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 ASE muting feature has user settable threshold values where the EDFA output is muted when the incoming optical signal is below threshold value with optical power automatically restored when the signal returns.

* See detailed specifications regarding minimum input power and OSNR.

Operational monitoring has been expanded to include remote monitoring of optical levels, laser operating conditions, and alarm status. Alarm parameters are user programmable 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	FA4514 and FA4517: 9 W max FA4521: 10 W max FA4524: 14 W max			
Status Indicator LEDs				
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.			
Optical				
Input Signal Wavelength	1566.75–1527.6 nm, ITU Channels 14–62			
Optical Signal Path Isolation, Input	FA4521, FA4524: > 30 dB: all temperatures FA4514, FA1517: > 30 dB: -20° to 70°C, > 20 dB otherwise			
Output Power Stability	Constant Current Mode: ± 0.6 dB Constant Gain Mode: ± 0.7 dB			
Performance Parameters				
	FA4514S-03	**FA4517S-03**	**FA4521S-03**	**FA4524S-03**
Nominal Output Power (dBm) (with 0 dBm input)	14	17	21	21 (x2)
Noise Figure (dB) (at 0 dBm Input, over all Wavelengths and Temperatures)	6.2 (typ 5.6)	5.8 (typ 5.2)	5.8 (typ 5.2)	5.8 (typ 5.2)
Noise Figure, Broadcast (dB) (1545–1563 nm input)	5.2 (typ 4.7)	5.0 (typ 4.5)	5.0 (typ 4.5)	5.0 (typ 4.5)
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.			
Limits (for Constant Current Mode and Constant Gain Mode)				
Output Power minimum	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.			
Input Power minimum	-25 dBm			
Input Power maximum	10 dBm			
Gain Control Step	0.25 dB			
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			

ORDERING INFORMATION

Model Name	Description
FA4514S-03-AS	High Output, Constant Current/Constant Gain, Single Slot Optical Amplifier, SC/APC Connector 14 dBm nominal output power
FA4517S-03-AS	High Output, Constant Current/Constant Gain, Single Slot Optical Amplifier, SC/APC Connector 17 dBm nominal output power
FA4521S-03-AS	High Output, Constant Current/Constant Gain, Single Slot Optical Amplifier, SC/APC Connector 21 dBm nominal output power
FA4524S-03-AS	High Output, Constant Current/Constant Gain, Single Slot Optical Amplifier, SC/APC Connector 21 x 2 dBm nominal output power

RELATED PRODUCTS

NC4000 HFC Nodes	NH/VH4000 VHub/UVHub
XE4202M 10G EPON R-OLT	RFoG and OR41x8 Receivers
Fiber Service Cable	CP8xxx Optical Network Units

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Note: Specifications are subject to change without notice.

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