Data Sheet

Cisco ONS 15501 Erbium Doped Fiber Amplifier

The Cisco® ONS 15501 is a low-noise, gain-flattened C-band optical erbium doped fiber amplifier (EDFA) designed to extend the distance of today's high-speed optical infrastructure. The Cisco ONS 15501 complements the Cisco ONS 15500 dense wavelength-division multiplexing (DWDM) solution, providing customers with the capability to extend their 100-GHz, 32-channel, 2.5-Gbps, or 10-Gbps optical infrastructure over greater distances. Furthermore, the Cisco ONS 15501 integrates seamlessly with the Cisco Catalyst® 6500 Series, Cisco 7600 Series, and Cisco 12000 Series to provide inter-point-of-presence (POP) extension and the interconnection of remote campuses over 10 Gigabit Ethernet or SONET/SDH OC-192/STM-64. Packaged in a one-rack-unit (1RU) chassis, the Cisco ONS 15501 incorporates features such as 17-dB constant flat gain, automatic gain control (AGC), and low noise figure for excellent optical signal-to-noise ratio (OSNR) characteristics.

Enterprises using the Cisco ONS 15501 EDFA to extend their metropolitan-area (metro) DWDM network to remote data centers and branch offices can lower the total cost of ownership and deliver e-business solutions faster and more efficiently to all areas of their metro DWDM network.

With the Cisco ONS 15501 EDFA in a Cisco ONS 15500 network, service providers will realize greater revenue and profitability by extending the reach of their network infrastructure and services to remote customers.

Primary Product Features and Benefits

- *Constant flat gain of 17 dB over the 1530- to 1563-nm band*
  - Constant gain and noise figure over the input power range of –29 to 0 dBm simplifies network design.
- *Metro optimized automatic gain control*
  - Highly precise, rapid AGC capabilities allow the Cisco ONS 15501 to be used as a booster or inline amplifier.
- *Variable gain*
  - The variable gain capabilities of the Cisco ONS 15501 are critical to network designs in which amplifier spacing must be flexible.

Figure 1
Cisco ONS 15501 EDFA DC

Figure 2
Cixco ONS 15501 EDFA AC

- Variable gain allows for the addition or elimination of optical elements, such as optical add/drop multiplexing (OADM), without drastic network redesigns or costly equipment changes.
- The adjustable gain of the Cisco ONS 15501 can be used to reset a network to a better operating point after a change in span loss.

- *Typical transient suppression within 50 microseconds*
  - The overshoot and undershoot amplitudes are consistently <1.0 dB, even for the most drastic optical power level changes.
- *Low noise figure of < 6.0 dB*
  - The low noise figure allows the use of up to six Cisco ONS 15501 amplifiers in cascade, while maintaining excellent OSNR for all channels.
- *Input power range of –29 to 0 dBm*
  - The higher input power range available with the Cisco ONS 15501 can be used to increase the number of wavelengths in a system to 128 from the current 32 used, while avoiding spectral gain tilt effects.
- *Useful network management features*
  - The Cisco ONS 15501 is fully manageable through Simple Network Management Protocol (SNMP), and has a console port to facilitate setup and monitoring of the unit.
  - Using the supplied MIB file, all parameters that can be monitored and set can be made available remotely.

Technical Data

Table 1 gives the specifications of the Cisco ONS 15501.

Table 1 Cisco ONS 15501 Specifications

Optical	
Wavelength range	1530 to 1563 nm
Input power range	–29 to 0 dBm
Saturated output power	17.3 0.3 dBm
Noise figure	< 6.0 dB
Nominal gain	+17 dB
Gain flatness	< 1.5 dB
Settable variable gain	17 dB to 7 dB (gain flatness is < 1.5 dB for 17 to 13 dB; < 2.0 dB for 7 to 13 dB)
AGC accuracy	10 dB
Transient suppression response time	50 microseconds
Backward amplified-spontaneous-emission (ASE) power	< 25 dBm
Polarization mode dispersion (PMD)	< 0.6 ps
Mode of operation	Unidirectional
Optical return loss	> 27 dB

Table 1 Cisco ONS 15501 Specifications

Input and output isolation	> 30 dB
Polarization sensitivity	< 0.5 dB
Electrical (DC)	
Input voltage	–48 VDC
Power consumption	15W maximum; 8W typical
Minimum supply voltage	–40.5 VDC
Maximum supply voltage	–57.0 VDC
Input power cable	18 AWG wire
Electrical (AC)	
Input voltage	100–240 VAC
Power consumption	15W maximum; 8W typical
Power source	Dual power entries
Internal power supply	Dual power supply
Mechanical	
Dimensions (H x W x D)	1.7 x 19.0 x 17.0 in.
Weight	6.8 lb
Ambient operating temperature	0 to 50 C
Storage temperature	–40 to 85 C
Humidity	Up to 95%, noncondensing
Humidity storage	Up to 95%, noncondensing
Connector type	SC/UPC
Network Management	
Access to unit	EIA/TIA-232 for console port; RJ-45 for alarm out

ONS 15501 EDFA DC

Regulatory Compliance
• CE Marking
Safety
• UL 60950
• CAN/CSA-C22.2 No. 60950
• EN 60950
• IEC 60950
• TS 001
• AS/NZS 3260
• IEC 60825-1
• IEC 60825-2
• EN 60825-1
• EN 60825-2
• 21CFR 1040
EMC
• FCC Part 15 (CFR 47) Class A
• ICES-003 Class A
• EN 55022 Class A
• CISPR22 Class A
• AS/NZS 3548 Class A
• VCCI Class A
• EN 55024
• EN 300 386
• EN 50082-1
• EN 61000-3-2
• EN 61000-3-3
• EN 61000-6-1
NEBS
• GR-63-Core NEBS Level 3 Requirements
• GR-1089-Core NEBS Level 3 Requirements
ETSI
• ETS 300 019 Storage Class 1.1
• ETS 300 019 Transportation Class 2.3
• ETS 300 019 Stationary Use Class 3.1

ONS 15501 EDFA AC

Regulatory Compliance
• CE Marking
Safety
• UL 60950
• CAN/CSA-C22.2 No. 60950
• EN 60950
• IEC 60950
• TS 001
• AS/NZS 3260
• IEC 60825-1
• IEC 60825-2
• EN 60825-1
• EN 60825-2
• 21CFR 1040
EMC
• FCC Part 15 (CFR 47) Class A
• ICES-003 Class A
• EN 55022 Class A
• CISPR22 Class A
• AS/NZS 3548 Class A
• VCCI Class A
• EN 55024
• EN 300 386
• EN 50082-1
• EN 61000-3-2
• EN 61000-3-3
– EN 61000-6-1

Product Code	Description
15501-EDFA=	Cisco ONS 15501 Erbium Doped Fiber Amplifier: –48 VDC
15501-EDFA-AC	Cisco ONS 15501 Erbium Doped Fiber Amplifier: 100 – 240 VAC
15500-CAB-AC	AC power cable—North America
15500-CAB-ACA	AC power cable—Australia
15500-CAB-ACE	AC power cable—Europe
15500-CAB-ACU	AC power cable—United Kingdom
15500-CAB-ACI	AC power cable—Italy
15500-CAB-ACR	AC power cable—Argentina

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