

Cisco ONS 15540 ESPx 10 Gigabit Ethernet Transponder Module

The Cisco® ONS 15540 ESPx is a highly modular, flexible, and scalable next-generation dense-wavelength-division-multiplexing (DWDM) platform that integrates data networking, storage networking, SONET, and SDH technologies over an ultrahigh-bandwidth, intelligent, optical infrastructure. The Cisco ONS 15540 ESPx 10 Gigabit Ethernet transponder modules further extend this scalability by increasing the carrying capacity per wavelength. The addition of the 10 Gigabit Ethernet transponders allows the Cisco ONS 15540 ESPx to scale from 2.5 Gbps to 10 Gbps, effectively and efficiently accommodating the growing demands in today's optical DWDM metropolitan-area (metro) networks.

Benefits of the Cisco ONS 15540 ESPx follow:

- *Scalable bandwidth*—In addition to the support for the common storage, data, and legacy services from 16 Mbps to 2.5 Gbps on the Cisco ONS 15540 ESPx today, the 10 Gigabit Ethernet transponder module further increases the bandwidth per wavelength by a factor of 4.
- *Capacity*—The 10 Gigabit Ethernet transponder modules allow customers to scale the network capacity from a 2.5-Gbps-based network to a 10-Gbps infrastructure. At 32 wavelengths over a single pair of fiber, customers can efficiently grow the network backbone up to 320 Gbps.
- *10GBASE-LR standards based*—The 10 Gigabit Ethernet transponder client interface is based on the IEEE 802.3ae 10GBASE-LR standards. The standards-based client interface ensures full interoperability with the 10 Gigabit Ethernet LAN physical layer (PHY) interfaces becoming common in next-generation enterprise switches and routers.
- *Cost-effectiveness*—The 10 Gigabit Ethernet transponder module provides significant cost savings over the 2.5-Gbps solution for aggregated traffic.
- *Protection options*—The Cisco ONS 15540 10 Gigabit Ethernet transponder module can be deployed with optical, splitter-based protection or 1 + 1 protection to provide enhanced service protection by sending the optical trunk signal simultaneously over both east and west fiber paths.

Figure 1
 Cisco ONS 15540 ESPx





- **Data networking**—The 10 Gigabit Ethernet transponder module enables the Cisco ONS 15540 to extend Gigabit Ethernet services over a 10-Gbps metro DWDM backbone for high-bandwidth, intercampus networking applications. By networking 10 Gigabit Ethernet IP traffic from end to end in its native Ethernet format at wire speed and with full operations, administration, and management (OAM) capabilities, enterprises can avoid the added complexity and cost of protocol conversion and rate adaptation into another metropolitan- or wide-area network (MAN or WAN) protocol.
- **Performance monitoring**—The 10 Gigabit Ethernet transponder module offers both optical and digital performance monitoring, providing the customer added visibility into protocol and signal performance. Cisco patented technology will allow operations, administration, management, and provisioning (OAM&P) capabilities over these wavelengths to extend from a Cisco switch or router at the customer premises through the optical domain to the customer premises at the far end.

Optical Specifications

Table 1 gives specifications of the Cisco ONS 15540 ESPx, and Table 2 gives client specifications.

Table 1 Cisco ONS 15540 10-Gbps, 1550-nm, DWDM ITU Specification

Receiver Specifications	Minimum	Maximum
Receiver sensitivity	-22 dBm	-
Optical signal-to-noise ratio (OSNR) (0.1-nm bandwidth)	26 dB	-
Maximum overload	-	-8 dBm
Transmitter Specification	Minimum	Maximum
Output power	1 dBm	6 dBm
Dispersion tolerance ¹	-	100 ps/nm
Wavelength range	1529 nm	1562 nm

1. Add proper network level penalty to the OSNR or receive power sensitivity base on actual network topology characteristics such as dispersion.

Table 2 Cisco ONS 15540 10-Gbps, 1310-nm Client Specification²

Receiver Characteristics	Minimum	Maximum
Receiver sensitivity	-13.23 dBm	-
Maximum overload	-	0.5 dBm
Transmitter Characteristics	Minimum	Maximum
Average launch power	-5.2 dBm	0.5 dBm
Wavelength range	1260 nm	1355 nm

2. Supports IEEE 802.3ae 10GBASE-LR specification

Physical Specifications

- Occupies _ slot in the Cisco ONS 15540 ESPx chassis
- Two transponders per slot in a motherboard, for a total of 16 transponders per chassis
- Dimensions (H x W x D):
 - 10 Gigabit Ethernet transponder: 6.4 x 1.3 x 7.6 in.
 - 10 Gigabit Ethernet motherboard: 18.1 x 1.3 x 9.1 in.
- Bit rate: 10 Gigabit Ethernet DWDM LAN PHY
- Standards protocol: IEEE 802.3ae 10 GBASE-LR
- Digital monitoring: 64b/66b code errors

Ordering Information

Table 3 gives ordering information for the Cisco ONS 15540 ESPx 10 Gigabit Ethernet transponder.

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Product Part Number	Description	Minimum Cisco IOS® Software Release
15540-10G E-03B3xy	10 Gigabit Ethernet 1310-nm SM transponder with SC channel = xy	SO15C-12110EV

Note: Common Language Equipment Identifier (CLEI) codes are available upon request.



Corporate Headquarters
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
www.cisco.com
Tel: 408 526-4000
800 553-NETS (6387)
Fax: 408 526-4100

European Headquarters
Cisco Systems International BV
Haarlerbergpark
Haarlerbergweg 13-19
1101 CH Amsterdam
The Netherlands
www-europe.cisco.com
Tel: 31 0 20 357 1000
Fax: 31 0 20 357 1100

Americas Headquarters
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
www.cisco.com
Tel: 408 526-7660
Fax: 408 527-0883

Asia Pacific Headquarters
Cisco Systems, Inc.
Capital Tower
168 Robinson Road
#22-01 to #29-01
Singapore 068912
www.cisco.com
Tel: +65 6317 7777
Fax: +65 6317 7799

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