DATA SHEET

# CISCO ONS 15530 8-PORT MULTISERVICE MUXPONDER CARD

The Cisco® ONS 15530 8-Port Multiservice Muxponder Card for the Cisco ONS 15530 DWDM Multiservice Aggregation Platform provides cost-effective and efficient wavelength usage by aggregating up to 8 copper- or optical-based services onto a single, self-contained module with an integrated 2.5-Gbps wavelength trunk. This enhancement makes the Cisco ONS 15530 the ideal solution for cost-effective low-speed or multiservice applications. (Refer to Figure 1.)

**Figure 1**
Cisco ONS 15530 8-Port Multiservice Muxponder Card

## PRIMARY BENEFITS OF CISCO ONS 15530 8-PORT MULTISERVICE MUXPONDER CARD

- Multiservice aggregation—The multiservice muxponder card provides industry-leading aggregation of up to 8 copper- or optical-based services with data-rate support ranging from 1.54 Mbps to 1.25 Gbps. Protocols supported include T1, E1, Fast Ethernet, Enterprise Systems Connection (ESCON), OC-3/STS-1, Digital Video Broadcast/Access Server Integration (DVB-ASI) and Serial Data Interface (SDI) video, 1-Gbps Fibre Channel, FICON, and Gigabit Ethernet. The multiservice muxponder is a self-contained aggregation blade that multiplexes up to 8 services onto a 2.5-Gbps ITU wavelength. When used with a 32-wavelength system, such as the Cisco ONS 15540, up to 256 services can be supported per fiber pair.
- Investment protection—The multiservice muxponder card protects customer investments by supporting scalable, entry-level, low-density multiservice aggregation and high-density deployments in the same Network Equipment Building Standards (NEBS) or ETSI chassis. Support for 1- and 2-Gbps Fibre Channel, FICON, ESCON, and Gigabit Ethernet aggregation provided by other Cisco ONS 15530 aggregation cards allows the network to grow and evolve with customer requirements.

- Scalability—The multiservice muxponder card supports the ability to scale the network without service interruption as new copper- and optical-based muxponder or aggregation card-based services are added.
- Protection options—The multiservice muxponder card offers several protection options for customers requiring an enhanced level of service availability, including splitter, nonsplitter, and protection-switch-module (PSM)-based protection.
- Operational ease—Cisco IOS® Software-based command-line interface (CLI), Simple Network Management Protocol (SNMP), Transaction Language One (TL-1), CiscoView, and Cisco Transport Manager support provide customers added visibility into protocol statistics and optical signal performance.
- New application support—Aggregation of multiple DVB-ASI and SDI 270-Mbps coaxial-based video services over a dense wavelength-division multiplexing (DWDM) optical transport meets ANSI/SMPTE 259M-1997 specifications.

Table 1 gives ordering information for the Cisco ONS 15330 8-Port Multiservice Muxponder Card, and Table 2 gives the available optical client Small Form-Factor Pluggable (SFP) protocols and data rates.

**Table 1.** Ordering Information for Cisco ONS 15330 8-Port Multiservice Muxponder Card

| Product Code | Description | Minimum Cisco IOS Software Release |
|---|---|---|
| 15530-MSMP-xx12[1] | Cisco ONS 15530 8-Port Multiservice Muxponder Card with splitter | S15530C-12.2(25)S |
| 15530-MSMP-xx22[1] | Cisco ONS 15530 8-Port Multiservice Muxponder Card without splitter | S15530C-12.2(25)S |

1. xx = The ITU trunk channel selection. For example, channel 1/2, 3/4, 5/6, etc.

**Table 2.** Available Optical Client SFPs Protocols and Data Rates

| Part Number | Protocols or Clock Rates | Fiber Type | Wavelength | Connector Type |
|---|---|---|---|---|
| 15500-XVRA-10A2[1] | High-temperature low band 8 to 200 Mbps | Multimode 50 and 125 micrometers; Multimode 62.5 and 125 micrometers | 1310 nm | LC |
| 15500-XVRA-10B2[1] | High-temperature low band 8 to 200 Mbps | Single mode 9 and 125 micrometers | 1310 nm | LC |
| 15500-XVRA-11A2[1] | High-temperature midband 200 to 622 Mbps | Multimode 62.5 and 125 micrometers | 1310 nm | LC |
| 15500-XVRA-11B2[1] | High-temperature midband 200 to 1.25 Gbps | Single mode 9 and 125 micrometers | 1310 nm | LC |
| 15500-XVRA-12B1[1] | High-temperature high band 1.062 to 2.488 Gbps | Single mode 9 and 125 micrometers | 1310 nm | LC |
| 15454-SFP-GEFC-SX | Fibre Channel 2.125 Gbps; Fibre Channel 1.062 Gbps; 1000 Base-LX Ethernet | Multimode 50 and 125 micrometers; Multimode 62.5 and 125 micrometers | 850 nm | LC |

1. New High-Temperature Rated SFPs 0–50℃

Table 3 gives available copper client SFP protocols and data rates.

**Table 3.** Available Copper Client SFP Protocols and Data Rates

| Part Number | Protocols or Clock Rates | Cable Type | Connector Type | Distance |
|---|---|---|---|---|
| 15500-XVRA-08D1 | T1 1.544 Mbps | Copper | RJ-45 | |
| 15500-XVRA-09D1 | E1 2.048 Mbps | Copper | RJ-45 | |
| 15500-XVRA-10E1[1, 2] | SDI and DVB-ASI | Copper DV | Mini-SMB coaxial | 200m |
| 15500-XVRA-11D1[3] | Fast Ethernet 125 Mbps<br>Gigabit Ethernet 1.25 Gbps | Copper | RJ-45 | |

1. In a normal operating environment, the maximum digital video application connection length using a Belden 1694A cable is 200m (218 yd). If the chassis ambient operating temperature is above 113℉ (45℃) and ports 0 and 1 are used for video applications with this SFP, the maximum cable connection length may be less than the specified 200m (218 yd), depending on the operating environment.

2. SDI jitter generation is below the SMPTE 259M specification of 0.2UI (0.74 ns) with the exception of low-frequency timing jitter. However, purely digital systems will operate correctly with significant amounts of low-frequency jitter, as also indicated in Annex B of SMPTE 259M of the Timing Jitter Specification.

3. To ensure proper operation of the 15500-XVRA-11D1 SFP, the ambient operating temperature should not exceed 113℉ (45℃).

Table 4 gives general specifications of the Cisco ONS 15530 8-Port Multiservice Muxponder Card.

**Table 4.** General Specifications of Cisco ONS 15530 8-Port Multiservice Muxponder Card

| Client Ports (pluggable optics) | Configuration Options | Specifications |
|---|---|---|
| Up to 8 pluggable SFP slots<br>• Single- and multimode options (Table 3)<br>• Bit rate: 1.544 Mbps to 1.25 Gbps per port<br>• Connector type: Duplex LC<br>• Copper SFPs (Table 4) | Up to 4 cards per chassis<br>Compatible in slots 1–4 and slots 7–10 | Refer to Cisco ONS 15530 Installation Guide Appendix A—Specifications |

Table 5 gives the 2.5-Gb trunk optical specification for the Cisco ONS 15530 8-Port Multiservice Muxponder Card.

**Table 5.** 2.5-Gb Trunk Optical Specification

| Description | Specification | |
|---|---|---|
| Fiber type | G. 652 (SMF 28) | |
| Connector type | MU-PC | |
| **Receiver Sensitivity** | **Optical Signal-to-Noise Ratio (OSNR[1])** | **Dispersion** |
| –26 dBm | 20 dB | ±1000 picoseconds per nanometer (ps/nm) |
| –24 dBm | 21 dB | 1000 to 2100 ps/nm |
| –23 dBm | 22 dB | 2100 to 3200 ps/nm |
| **Receiver** | **Minimum** | **Maximum** |
| Overload | | –8 dBm |
| Wavelength | 1260 nm | 1580 nm |
| **Transmitter[2]** | **Minimum** | **Maximum** |
| Transmitter power | 5 dBm | 10 dBm |

1. OSNR is defined as 0.1-nm bandwidth for noise signal.

2. Although the 8-port multiservice muxponder uses a SONET-like framing structure to aggregate multiple client data streams, it is not SONET-compliant on the optical trunk output. The muxponder ITU-compliant optical trunk output must be used in an end-to-end configuration and cannot be connected to a SONET/SDH optical add/drop multiplexer (OADM).

Table 6 gives SDI jitter performance data.

**Table 6.** SDI Jitter Performance

| Hp Filter | 10 Hz[1] | 1 kHz | 10 kHz | 100 kHz |
|---|---|---|---|---|
| Jitter generation (p–p) UI/Time | 0.5 UI[1] | 0.06 UI | 0.06 UI | 0.06 UI |
| | 1.85 ns[1] | 220 ps | 220 ps | 220 ps |

1. Maximum jitter generation is below the SMPTE 259M specification of 0.2UI (0.74 ns) with the exception of low-frequency timing jitter. However, a purely digital system will operate correctly with significant amounts of low-frequency jitter, as also indicated in Annex B of SMPTE 259M of the Timing Jitter Specification.

## SDI SIGNAL TESTING

The SDI video signal is compliant to the ANSI/SMPTE 259M-1997 standard.

For pathological patterns, the SDI signal testing is performed with the Tektronix TG700TV Signal Generator Platform and Tektronix WFM700 Wave Form Monitor. In addition to the general measurements, pathological patterns and other standard patterns are tested. Tests were performed with this instrument and the following patterns:

- Equalizer Test
- PLL Test
- SDI Matrix
- 75-Percent SMPT Pattern

All patterns were tested over the temperature range of 23, 77, and 131°F (–5, 25, and 55°C) for 5 hours. The test setup included two SDI client interfaces looped through a maximum length of Belden 1694A 300m cables. All tests passed on the 300m environment. The specification is 200m to have a conservative margin.

Table 7 gives typical latencies.

**Table 7.** Typical Latencies (unidirectional—End-to-end tests with 0-km fiber)

| Protocol | Typical | Maximum |
|---|---|---|
| ESCON | 10 microseconds | 13 microseconds |
| Fibre Channel | 4 microseconds | 6 microseconds |
| Gigabit Ethernet Optical | 6 microseconds | 8 microseconds |
| Fast Ethernet Optical | 14 microseconds | 17 microseconds |
| SDI | 17 microseconds | 20 microseconds |
| DVB-ASI | 9 microseconds | 11 microseconds |


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