Hardware Specifications

This appendix provides detailed shelf assembly hardware specifications for the Cisco ONS 15600 SDH. It includes the following sections:

A.1 Shelf Specifications

This section provides bandwidth specifications; slot assignments; lists of cards and topologies; shelf dimensions; Cisco Transport Controller (CTC) specifications; the LAN, TL1, modem, and alarm interface specifications; and timing, database, environmental, and power specifications.

A.1.1 Bandwidth

The ONS 15600 SDH has the following bandwidth specifications:

- Total bandwidth: 320 Gbps
- Optical bandwidth: 40 Gbps per slot

A.1.2 Slot Assignments

The ONS 15600 SDH has the following slot assignments:

- Total card slots: 14
- Optical cards: Slots 1 to 4, 11 to 14
- TSC: Slots 5, 10
- SSXC: Slots 6/7, 8/9

A.1.3 Cards

The ONS 15600 SDH has the following cards:

- TSC

- SSXC

- ASAP

- OC48/STM16 LR16 1550

- OC48/STM16 SR16 1310

- OC192/STM64 LR4 1550

- OC192/STM64 SR4 1310

- OC192/STM64 4 Port ITU C-Band

A.1.4 Configurations

The ONS 15600 SDH has the following configurations:

- 1+1 automatic protections switching (APS) for point-to-point and linear configurations

- Two-fiber subnetwork connection protection ring (SNCP)

- Path-protected mesh network (PPMN)

- Two-fiber multiplex section-shared protection ring (MS-SPRing)

- Four-fiber multiplex section-shared protection ring (MS-SPRing)

- Unprotected

A.1.5 Dimensions

The ONS 15600 SDH has the following dimensions:

- Height: 83.9 inches (2130 mm)

- Width: 23.6 inches (600 mm)

- Depth: 23.6 inches (600 mm)

- Weight: 500 lb (226.8 kg) (without cards)

A.1.6 Cisco Transport Controller

CTC has the following specifications:

- 10/100BaseT

- TSC access: RJ-45 connector

- Backplane access: RJ-45 connector

A.1.7 External LAN Interface

The external LAN interface has the following specifications:

- 10/100BaseT Ethernet

- Backplane access: RJ-45 connector

A.1.8 TL1 Craft Interface

The TL1 craft interface has the following specifications:

- Speed: 9600 bps
- Backplane (CAP/CAP2) access: EIA/TIA-232 DB-9 type connector

A.1.9 Modem Interface

The modem interface has the following specifications:

- Hardware flow control
- Backplane (CAP/CAP2) access: EIA/TIA-232 DB-9 type connector

A.1.10 Alarm Interface

The alarm interface has the following specifications:

- Visual: Critical, Major, Minor, Remote
- Audible: Critical, Major, Minor, Remote
- Alarm contacts: 0.045 mm, –48 VDC, 50 mA
- Backplane (CAP/CAP2) access: Alarm pin fields

A.1.11 BITS Interface

The building integrated timing supply (BITS) interface has the following specifications:

- 2 DS-1 BITS inputs
- 2 derived STM-N outputs

A.1.12 System Timing

The ONS 15600 SDH has the following system timing specifications:

- Holdover stability: Stratum 3E per Telcordia GR-253-CORE
- Free running accuracy: +/– 4.6 ppm
- Reference: External BITS, line, internal

A.1.13 Database Storage

The ONS 15600 SDH has the following database storage specifications:

- Nonvolatile memory: 512 MB, IDE FLASH memory

A.1.14 Environmental Specifications

The ONS 15600 SDH has the following environmental specifications:

- Operating temperature: 23 to 122 degrees Fahrenheit (–5 to +50 degrees Celsius)
- Operating humidity: 5 to 95 percent, non-condensing

A.1.15 Power Specifications

The ONS 15600 SDH has the following power specifications:

- Input voltage: –48 VDC
- Input current: 80 A per feed (six feeds provided)
- Power terminals: Lug

Table A-1 lists the power requirements for each card.

Table A-1   Power Requirements for Individual Cards

Card Type	Card Name	Watts
Control Cards	TSC	58
	SSXC	165
Optical Cards	OC48/STM16 LR16 1550	170
	OC48/STM16 SR16 1310	180
	OC192/STM64 LR4 1550	180
	OC192/STM64 SR4 1310	165
	OC192/STM64 4 Port ITU C-Band	180
Multifunction Cards	ASAP	170

Table A-2 lists the power requirements for an individual fan in the fan-tray assembly.

Table A-2   Power Requirements for Individual Fans

Condition	Watts	Amps	BTU/Hr.
Minimum. at 48 V (ambient temperature less than 25 degrees Celsius (77 degrees Fahrenheit)	12	0.25	41
Maximum at 48 V (ambient temperature greater than 25 degrees Celsius (77 degrees Fahrenheit)	46	0.95	157

A.2 Card Specifications

This section provides specifications for the following cards:

- TSC
- SSXC

- OC48/STM16 LR/LH 16 Port 1550

- OC48/STM16 SR/SH 16 Port 1310

- OC192/STM64 LR/LH 4 Port 1550

- OC192/STM64 SR/SH 4 Port 1310

- OC192/STM64 4 Port ITU C-Band ASAP

- Filler

A.2.1 TSC Card Specifications

Table A-3 shows the TSC card specifications.

Table A-3   TSC Card Specifications

Specification Type	Description
CTC software	Interface: 10/100BaseT LAN
	Backplane (CAP/CAP2) access: RJ-45
TL1 craft interface	Speed: 10/100BaseT LAN
	Front panel access: RJ-45 type connector
	Backplane access: RJ-45 and EIA/TIA-232 DB-9 type connector
Synchronization	Stratum 3E, per Telcordia GR-1244
	Free running access: Accuracy 4.6 ppm
	Holdover stability: 3.7 x10^{-7} ppm/day including temperature (< 255 slips in first 24 hours)
	Reference: External BITS, line, internal
Operating temperature	23 to 122 degrees Fahrenheit (–5 to +50 degrees Celsius)
Operating humidity	5 to 95 percent, non-condensing
Dimensions	Height: 16.50 in. (419 mm)
	Width: 1.10 in. (28 mm)
	Depth: 18.31 in. (465 mm)
	Card weight: 4.0 lb (1.81 kg)
Compliance	When installed in a node, ONS 15600 SDH cards comply with these safety standards: UL 60950, CSA C22.2 No. 950, EN 60950, IEC 60950

A.2.2 SSXC Specifications

Table A-4 shows the SSXC card specifications.

Table A-4   *SSXC Card Specifications*

Specification Type	Description
Cross-connect	Connection setup time: 7 microseconds
	Latency: 0.5 microseconds
Operating temperature	23 to 122 degrees Fahrenheit (–5 to +50 degrees Celsius)
Operating humidity	5 to 95 percent, non-condensing
Dimensions	Height: 16.50 in. (419 mm)
	Width: 2.36 in. (60 mm)
	Depth: 18.31 in. (465 mm)
	Card weight: 5.0 lb (2.27 kg)
Compliance	When installed in a node, ONS 15600 SDH cards comply with these safety standards: UL 60950, CSA C22.2 No. 950, EN 60950, IEC 60950

A.2.3 OC48/STM16 LR/LH 16 Port 1550 Specifications

Table A-5 shows the OC48/STM16 LR/LH 16 Port 1550 card specifications.

Table A-5   *OC48/STM16 LR/LH 16 Port 1550 Card Specifications*

Specification Type	Description
Line	Bit rate: 2.49 Gbps
	Code: Scrambled nonreturn to zero (NRZ)
	Fiber: 1550 nm single-mode
	Loopback mode: Facility
	Connectors: OGI
	Compliance: Telcordia GR-253
Transmitter	Max. transmitter output power: +3 dBm
	Min. transmitter output power: –2 dBm
	Center wavelength: 1500 nm to 1580 nm
	Nominal wavelength: 1550 nm
	Transmitter: Distributed feedback (DFB) laser
	Note The CTC Maintenance > Transceiver tab shows the optical power transmitted (OPT) levels. CTC might show OPT levels at 1 dBm greater or less than the actual card OPT level.

Table A-5   OC48/STM16 LR/LH 16 Port 1550 Card Specifications (continued)

Specification Type	Description
Receiver	Max. receiver level: –9 dBm
	Min. receiver level: –28 dBm
	Receiver: InGaAs Avalanche Photo Diode (APD) photo detector
	Link loss budget: 26 dB minimum, with 1 dBm dispersion penalty
Loopback mode	Facility (Line)
	Note Use a 19 to 24 dBm fiber attenuator (15 to 20 dBm is recommended) when connecting a fiber loopback to an OC48/STM16 LR/LH 16 Port 1550 card. Never connect a direct fiber loopback.
Operating temperature	23 to 122 degrees Fahrenheit (–5 to +50 degrees Celsius)
Operating humidity	5 to 95 percent, non-condensing
Dimensions	Height: 16.50 in. (419 mm)
	Width: 1.50 in. (38 mm)
	Depth: 18.31 in. (465 mm)
	Card weight: 5.0 lb (2.27 kg)
Compliance	Telcordia GR-253
	When installed in a node, ONS 15600 SDH cards comply with these safety standards: UL 60950, CSA C22.2 No. 950, EN 60950, IEC 60950
	Eye safety compliance: Class 1 (21 CFR 1040.10 and 1040.11) and Class 1 (IEC 60825) laser products

A.2.4 OC48/STM16 SR/SH 16 Port 1310 Specifications

Table A-6 shows the OC48/STM16 SR/SH 16 Port 1310 card specifications.

Table A-6   *OC48/STM16 SR/SH 16 Port 1310 Card Specifications*

Specification Type	Description
Line	Bit rate: 2.49 Gbps
	Code: Scrambled NRZ
	Fiber: 1310 nm single-mode
	Loopback mode: Facility
	Connectors: OGI
	Compliance: Telcordia GR-253
Transmitter	Max. transmitter output power: –3 dBm
	Min. transmitter output power: –10 dBm
	Center wavelength: 1266 nm to 1360 nm
	Nominal wavelength: 1310 nm
	Transmitter: Fabry Perot laser
	Note The CTC Maintenance > Transceiver tab shows the OPT levels. CTC might show OPT levels at 1 dBm greater or less than the actual card OPT level.
Receiver	Max. receiver level: –3 dBm
	Min. receiver level: –18 dBm
	Receiver: Positive-intrinsic-negative (PIN) diode
	Link loss budget: 8 dBm min., with 1 dBm dispersion penalty
Loopback mode	Facility (Line)
	Note You must use a 3-dBm fiber attenuator when connecting a fiber loopback to an OC48/STM16 SR/SH 16 port 1310 card. Never connect a direct fiber loopback.
Operating temperature	23 to 122 degrees Fahrenheit (–5 to +50 degrees Celsius)
Operating humidity	5 to 95 percent, non-condensing
Dimensions	Height: 16.50 in. (419 mm)
	Width: 1.50 in. (38 mm)
	Depth: 18.31 in. (465 mm)
	Card weight: 5.0 lb (2.27 kg)
Compliance	Telcordia GR-253
	When installed in a node, ONS 15600 SDH cards comply with these safety standards: UL 60950, CSA C22.2 No. 950, EN 60950, IEC 60950
	Eye safety compliance: Class 1 (21 CFR 1040.10 and 1040.11) and Class 1 (IEC 60825) laser products

A.2.5 OC192/STM64 LR/LH 4 Port 1550 Specifications

Table A-7 shows the OC192/STM64 LR/LH 4 Port 1550 card specifications.

Table A-7   OC192/STM64 LR/LH 4 Port 1550 Card Specifications

Specification Type	Description
Line	Bit rate: 9.96 Gbps
	Code: Scrambled NRZ
	Fiber: 1550 nm single mode
Transmitter	Max. transmitter output power: +7 dBm
	Min. transmitter output power: +4 dBm
	Center wavelength: 1530 nm to 1565 nm
	Nominal wavelength: 1550 nm
	Transmitter: Lithium niobate (LN) external modulator transmitter
Receiver	Max. receiver level: –9 dBm
	Min. receiver level: –22 dBm
	Receiver: APD/TIA
	Link loss budget: 24 dB min., with no dispersion or 22 dB optical path loss at BER = 1^{-12} including dispersion
Loopback mode	Payload
	Note Use a 19 to 24 dB fiber attenuator (15 to 20 is recommended) when connecting a fiber loopback to an OC192/STM64 LR/LH 4 Port 1550 card. Never connect a direct fiber loopback.
Connectors	OGI
Operating temperature	23 to 122 degrees Fahrenheit (–5 to +50 degrees Celsius)
Operating humidity	5 to 95 percent, non-condensing
Dimensions	Height: 16.50 in. (419 mm)
	Width: 1.50 in. (38 mm)
	Depth: 18.31 in. (465 mm)
	Card weight: 12.0 lb (5.44 kg)
Compliance	Telcordia GR-253
	When installed in a node, ONS 15600 SDH cards comply with these safety standards: UL 60950, CSA C22.2 No. 950, EN 60950, IEC 60950
	Eye safety compliance: Class 1 (21 CFR 1040.10 and 1040.11) and Class 1 (IEC 60825) laser products

A.2.6 OC192/STM64 SR/SH 4 Port 1310 Specifications

Table A-8 shows the OC192/STM64 SR/SH 4 Port 1310 card specifications.

Table A-8   OC192/STM64 SR/SH 4 Port 1310 Card Specifications

Specification Type	Description
Line	Bit rate: 9.96 Gbps
	Code: Scrambled NRZ
	Fiber: 1310 nm single mode
Transmitter	Max. transmitter output power: –1 dBm
	Min. transmitter output power: –6 dBm
	Center wavelength: 1290 nm to 1330 nm
	Nominal wavelength: 1310 nm
Receiver	Max. receiver level: –1 dBm
	Min. receiver level: –11 dBm
	Link loss budget: –5 dB min., with no dispersion or 4 dB optical path loss at BER = 1^{-12} including dispersion
Loopback mode	Payload
	Note You must use a 3-dBm fiber attenuator when connecting a fiber loopback to an OC192/STM64 SR/SH 4 Port 1310 card. Never connect a direct fiber loopback.
Connectors	OGI
Operating temperature	23 to 122 degrees Fahrenheit (–5 to +50 degrees Celsius)
Operating humidity	5 to 95 percent, non-condensing
Dimensions	Height: 16.50 in. (419 mm)
	Width: 1.50 in. (38 mm)
	Depth: 18.31 in. (465 mm)
	Card weight: 12.0 lb (5.44 kg)
Compliance	Telcordia GR-253
	When installed in a node, ONS 15600 SDH cards comply with these safety standards: UL 60950, CSA C22.2 No. 950, EN 60950, IEC 60950
	Eye safety compliance: Class 1 (21 CFR 1040.10 and 1040.11) and Class 1 (IEC 60825) laser products

A.2.7 ASAP Specifications

Table A-9 shows the ASAP card specifications.

Table A-9   ASAP Card Specifications

Specification Type	Description
Carrier Card (CC)	Contains slots for four pluggable ASAP I/O cards, which can be used to provide a variety of optical line interfaces. The CC provides 4 electrical VC4-16c or Gigabit Ethernet signals to each ASAP I/O card (for 16 total) and 16 redundant electrical VC4-16c matrix interfaces to the backplane. For SDH interfaces, the CC card provides pointer processing and overhead extraction/insertion.
4PIO Pluggable I/O card	The ASAP 4PIO module is a four-port multirate optical interface card. It has four slots for Small Form-factor Pluggable (SFP) optics. The four ports can be provisioned on a per-port basis as STM-1, STM-4, STM-16, or Gigabit Ethernet interfaces.
1PIO Pluggable I/O card	The ASAP 1PIO module is a single-port single-rate optical interface card. It has one slot for XFP optics. The port can be provisioned for one STM-64 interface.
Payloads	Nonconcatenated and/or concatenated payloads at VC3, VC4, VC4-2c, VC4-3c, VC4-4c, VC4-8c, VC4-16c, and VC4-64c are supported. For Gigabit Ethernet interfaces, Layer 1 Ethernet transport is also implemented.
SFP support	ONS-SE-Z1: Supports STM-1 SR-1, STM-4 SR-1, STM-16 IR-1 or GE LX ONS-SI-155-L2: Supports STM-1 LR-2 ONS-SI-622-L2: Supports STM-4 LR-2 ONS-SE-2G-L2: Supports STM-16 LR-2 ONS-SI-2G-S1: Supports STM-16, LR-2
XFP support	ONS-XC-10G-S1: Supports STM-64 SR-1 ONS-XC-10G-L2: Supports STM-64 LR-2
Connectors	Up to 16 SFP connectors (4 per 4PIO module) or 4 XFP connectors (1 per 1PIO module), at front edge of card
Power	130 W to 180 W (maximum)
Operating temperature	23 to 131 degrees Fahrenheit (–5 to +55 degrees Celsius)
Operating humidity	5 to 95 percent, non-condensing
Dimensions	Height: 16.50 in. (419 mm) Width: 1.50 in. (38 mm) Depth: 18.31 in. (465 mm) Card weight: approximately 6 pound = 2.72155422 kilograms
Compliance	Telcordia GR-253 When installed in a system, ONS 15600 SDH cards comply with these safety standards: UL 60950, CSA C22.2 No. 950, EN 60950, IEC 60950 Eye safety compliance: Class 1 (21 CFR 1040.10 and 1040.11) and Class 1 (IEC 60825) laser products

A.2.8 Filler Card Specifications

Table A-10 shows the Filler card specifications.

Table A-10   Filler Card Specifications

Specification Type	Description
Dimensions	Height: 16.50 in. (419 mm)
	Width:1.50 in. (38 mm)
	Depth: 18.31 in. (465 mm)
	Card weight: 2.5 lb (1.134 kg)

A.3 SFP/XFP Specifications

Table A-11 and Table A-12 list the specifications for Cisco ONS 15600 SDH SFPs and XFPs.

Table A-11   SFP Specifications (4PIO Only)

SFP Product ID	Interface	Transmitter Output Power Min/Max (dBm)	Receiver Input Power Min/Max (dBm)
ONS-SI-622-L2	OC-12, STM-4	–3.0 to 2.0	–28 to –8
ONS-SI-155-L2	OC-3, STM-1	–5.0 to 0.0	–34 to –10
ONS-SE-2G-L2	OC-48, STM-16	–2.0 to 3.0	–28 to –9
ONS-SE-Z1	OC-3, STM-1, OC-12, STM-4, OC-48, STM -16	–5.0 to 0	–23 to –3 (155.52/ 622.08 Mbps) –19 to –3 (1250 Mbps) –18 to 0 (2488.32 Mbps)
ONS-SI-2G-S1	OC-48, STM-16	–2.0 to 3.0	–9
ONS-SI-2G-I1	OC-48, STM-16	–5.0 to 0	–18 to 0
ONS-SI-2G-L2	OC-48, STM-16	–3.0 to 2.0	–28 to –9

Table A-12   XFP Specifications (1PIO Only)

SFP Product ID	Interface	Transmitter Output Power Min/Max (dBm)	Receiver Input Power Min/Max (dBm)
ONS-XC-10G-S1	OC-192, STM-64	–6.0 to –1.0	–11.0 to –1.0
ONS-XC-10G-L2	OC-192, STM-64	0.0 to 4.0	–24.0 to –7.0
ONS-XC-10G 30.3 through ONS-XC-10G-61.4	OC192/STM64/10 GE	–1 to +3	–27 to –7
ONS-XC-10G-I2	OC-192 IR2	–1 to +2	–14 to +2

The OC-48/STM16 also supports 32-channel SFPs for DWDM applications; 32-channel SFPs can be plugged into the four-port ASAP card 4PIO module.

Some of the parameters common across all 32 DWDM SFPs include:

- Receiver wavelength: 1260 to 1620 nm
- Minimum overload: –9 dBm
- Maximum reflectance of receiver, measured at Rupees: –27 dB
- Maximum receiver power, damage threshold: +5 dBm
- Transmitter output power min/max: 0 to +4 dBm

Table A-13 lists the available DWDM SFPs.

Table A-13   ASAP Card 4PIO DWDM SFP Specifications

SFP Product ID	Interface	Wavelength[1]
ONS-SC-2G-30.3	OC-48/STM16	1530.3 nm
ONS-SC-2G-31.1	OC-48/STM16	1531.1 nm
ONS-SC-2G-31.9	OC-48/STM16	1531.9 nm
ONS-SC-2G-32.6	OC-48/STM16	1532.6 nm
ONS-SC-2G-34.2	OC-48/STM16	1534.2 nm
ONS-SC-2G-35.0	OC-48/STM16	1535.0 nm
ONS-SC-2G-35.8	OC-48/STM16	1535.8 nm
ONS-SC-2G-36.6	OC-48/STM16	1536.6 nm
ONS-SC-2G-38.1	OC-48/STM16	1538.1 nm
ONS-SC-2G-38.9	OC-48/STM16	1538.9 nm
ONS-SC-2G-39.7	OC-48/STM16	1539.7 nm
ONS-SC-2G-40.5	OC-48/STM16	1540.5 nm
ONS-SC-2G-42.1	OC-48/STM16	1542.1 nm
ONS-SC-2G-42.9	OC-48/STM16	1542.9 nm
ONS-SC-2G-43.7	OC-48/STM16	1543.7 nm
ONS-SC-2G-44.5	OC-48/STM16	1544.5 nm
ONS-SC-2G-46.1	OC-48/STM16	1546.1 nm
ONS-SC-2G-46.9	OC-48/STM16	1546.9 nm
ONS-SC-2G-47.7	OC-48/STM16	1547.7 nm
ONS-SC-2G-48.5	OC-48/STM16	1548.5 nm
ONS-SC-2G-50.1	OC-48/STM16	1550.1 nm
ONS-SC-2G-50.9	OC-48/STM16	1550.9 nm
ONS-SC-2G-51.7	OC-48/STM16	1551.7 nm
ONS-SC-2G-52.5	OC-48/STM16	1552.5 nm
ONS-SC-2G-54.1	OC-48/STM16	1554.1 nm
ONS-SC-2G-54.9	OC-48/STM16	1554.9 nm
ONS-SC-2G-55.7	OC-48/STM16	1555.7 nm
ONS-SC-2G-56.5	OC-48/STM16	1556.5 nm

Table A-13   ASAP Card 4PIO DWDM SFP Specifications (continued)

SFP Product ID	Interface	Wavelength[1]
ONS-SC-2G-58.1	OC-48/STM16	1558.1 nm
ONS-SC-2G-58.9	OC-48/STM16	1558.9 nm
ONS-SC-2G-59.7	OC-48/STM16	1559.7 nm
ONS-SC-2G-60.6	OC-48/STM16	1560.6 nm

1.   Typical loss on a 1310-nm wavelength Single-mode fiber is 0.6 dB/km.

Table A-14 describes the power and noise limited performances parameters for the OC-SC-2G series SFPs.

Table A-14   Power and Noise Limited Performances

Parameter	Power Limited Performances		Noise Limited Performances	
Input power range	–9 to –28 dBm	At BER = 10^{-12} with SONET framed PRBS23 622 Mbps – 2.0 Gbps at OSNR[1] of 20 dB, 0.1 nm bandwidth 2.0Gbps – 2.7Gbps at OSNR of 21dB, 0.1 nm bandwidth	–9 to –22 dBm	At BER = 10^{-12} with SONET framed PRBS23 At OSNR of 16 dB at 0.1 nm bandwidth
Dispersion tolerance	–800 to 3600 dBm	622 Mbps – 2.0 Gbps Power penalty = 3 dB OSNR = 20 dB at 0.1 nm bandwidth (Noise penalty = 0 dB)	–800 to 3600 dBm	622 Mbps – 2.0 Gbps Noise penalty = 2 dB OSNR = 18 dB at 0.1 nm bandwidth (Power penalty = 0 dB)
	–800 to 2400 dBm	2.0 Gbps – 2.7 Gbps Power penalty = 3 dB OSNR = 21 dB at 0.1 nm bandwidth (Noise penalty = 0 dB)	–800 to 2400 dBm	2.0 Gbps – 2.7 Gbps Noise penalty = 3 dB OSNR = 19 dB at 0.1 nm bandwidth (Power penalty = 0 dB)

1.   OSNR

Table A-15 provides cabling specifications for the single-mode fiber (SMF) SFPs/XFPs. The ports of the listed SFPs/XFPs have LC-type connectors and the minimum cable distance for all SFPs/XFPs listed is 6.5 feet (2 m). Maximum cable distance for all SFPs/XFPs listed is 328 ft (100 m).

Table A-15   Single-Mode Fiber SFP/XFP Port Cabling Specifications

SFP Product ID	Wavelength[1]	Fiber Type	Cable Distance
ONS-SI-622-L2 Long Reach	1550 nm	9 micron SMF	80 km (49.71 mi.)
ONS-SE-2G-L2	1550 nm	9 micron SMF	80 km (49.71 mi.)
ONS-SE-Z1	1310 nm	9 micron SMF	15 km (9.3 mi.)
ONS-SI-155-L2	1550 nm	9 micron SMF	80 km (49.71 mi.)
ONS-XC-10G-S1	1310 nm	9 micron SMF	2 km (1.2 mi.)

Table A-15   ***Single-Mode Fiber SFP/XFP Port Cabling Specifications (continued)***

SFP Product ID	Wavelength[1]	Fiber Type	Cable Distance
ONS-XC-10G-L2	1550 nm	9 micron SMF	80 km (49.71 mi.)
ONS-SI-2G-S1	1310 nm	9 micron SMF	80 km (49.71 mi.)

1.   Typical loss on a 1310-nm wavelength SMF is 0.6 dB/km.