Pluggable Optical Modules: Transceivers for the Cisco ONS Family

What You Will Learn

This document provides technical descriptions, applications, and compatibility information for the following categories of optics modules in the Cisco® ONS product family:

- Gigabit Interface Converter (GBIC)
- Small Form-Factor Pluggable (SFP)
- 10-Gigabit Small Form-Factor Pluggable (XFP)
- 10-Gigabit Enhanced Small Form-Factor Pluggable (SFP+)
- CXP
- C Form-Factor Pluggable (CFP)
- Quad Small Form-Factor Pluggable (QSFP+)
- Cisco CPAK™
- C Form-Factor Pluggable 2 (CFP2)
- C Form-Factor high density pluggable (CXP2)

Introduction

Cisco offers a comprehensive range of pluggable optical modules for the Cisco ONS family of multiservice platforms. The wide variety of modules gives you flexible and cost-effective options for all types of interfaces. Cisco offers a range of GBIC, SFP, XFP, SFP+, CXP, CFP, Cisco CPAK, and QSFP+ pluggable modules. These small, modular optical interface transceivers offer a convenient and cost-effective solution for an array of applications in the data center, campus, metropolitan-area access and ring network, storage area network, and long-haul network.

Technical Overview

SFP Module

An SFP transceiver module (Figure 1) is a bidirectional device with a transmitter and receiver in the same physical package. The module interfaces to the network through a connector interface on the electrical ports and through an LC termination connector on the optical ports. Electrical interfaces and dimensions are defined in the SFF-8472 industry-standard Multisource Agreement (MSA).

Figure 1. SFP Transceiver Modules for the Cisco ONS Family

XFP Module

The XFP transceiver module (Figure 2) is a bidirectional device with a transmitter and receiver in the same physical package. The XFP module contains a 30-pin surface mount connector on the electrical interface and a duplex LC connector on the optical interface.

Figure 2. XFP Transceiver Module for the Cisco ONS Family

SFP+ Module

An SFP+ transceiver module (Figure 3) is a bidirectional device with a transmitter and receiver in the same physical package. The module interfaces to the network through a connector interface on the electrical ports and through an LC termination connector on the optical ports. It is identical in size to SFP modules, but capable of 10-Gbps transmission.

Figure 3. An SFP+ Transceiver Module for the Cisco ONS Family

CXP Module

An CXP transceiver module (Figure 4) is a bidirectional device with a transmitter and receiver in the same physical package. The module interfaces to the network through a connector interface on the electrical ports and through a Multifiber Push On (MPO) termination connector on the optical ports. It is dedicated usually for 100-Gbps transmission, and it is only capable of 100GBASE-SR10 connectivity.

Figure 4.   A CXP Transceiver Module for the Cisco ONS Family

CFP Module

A CFP transceiver module (Figure 5) is a bidirectional device with a transmitter and receiver in the same physical package. The module interfaces to the network through a connector interface on the electrical ports and through an MPO or LC connector on the optical ports. The electrical connection of a CFP uses 10x10-Gbps lanes in each direction (receive and transmit), while the optical connection can support both 10x10-Gbps and 4x25-Gbps variants of 100-Gbps interconnects (typically referred to as 100GBASE-SR10 and 100GBASE-LR4 in 10 km reach).

Figure 5.   A CFP Transceiver Module for the Cisco ONS Family

QSFP+ Module

The Cisco 40GBASE QSFP portfolio offers customers a wide variety of high-density and low-power 40 Gigabit Ethernet connectivity options for data center, high-performance computing networks, enterprise core and distribution layers, and service provider applications.

Figure 6.   A QSFP+ Transceiver Module for the Cisco ONS Family

Cisco CPAK Module

Cisco CPAK 100GBASE fiber modules offer a selection of high-density 100-Gbps connectivity solutions. By using CMOS photonics technology, Cisco CPAK is smaller and consumes significantly less power than alternative form factors (Figure 7). They are fully interoperable with other IEEE-compliant interfaces.

Figure 7.   Cisco CPAK Module

Pluggable Modules: List and Description

Cisco ONS Family modules have well-defined product IDs, making it easy for you to order the appropriate module.

The product ID is structured as follows: ONS-AB-CCC-DD. The variables in the ID include:

- **For the A variable:** S stands for SFP, G for GBIC, X for XFP, and SB+ for SFP+.
- **For the B variable:** C stands for commercial temperature (0 to 70°C), E for extended temperature (-10 to 85°C), and I for industrial temperature (-40 to 85°C).
- **The CCC variable** indicates the supported bit-rate or signal type, such as 155 Mbps for OC-12/STM-1 signal or 2 GF for a tri-rate Gigabit Ethernet, Fibre Channel, and 2G Fibre Channel signal support.
- **The DD variable** indicates the supported reach, such as S1 for short-reach or intraoffice 1310 nm interface or SX for Ethernet.
- CXPs are denoted by the tag CXP directly.
- CFPs are denoted by the tag CC.
- QSFPs are denoted by the tag QSFP.
- Cisco CPAKs are denoted by the tag CPAK.

Chapter 1: List of Pluggables by product ID and Cisco Part number

SONET/SDH SFP Modules

Cisco offers a wide range of SFP modules that are fully compliant with SONET and SDH standards.

Table 1 provides the details.

Table 1. SONET/SDH SFP Modules

Product ID	Product Description	Part Number	Applicable Standard	Temperature Range (°C)
ONS-SE-2G-S1=	SFP - OC48/STM16 - 1310 nm, SR - SM LC	10-2017-01	GR253 OC48 SR G.957 I-16	-10 to +85
ONS-SE-2G-L2=	OC48/STM16, LR2, 1550 nm, SFP, EXT	10-2013-01	GR253 OC48 LR2 G.957 L-16.2	-10 to +85
ONS-SI-155-SR-MM=	SFP - OC3, SR, 1310 nm, MULTI MODE, I-TEMP	10-2279-01	GR253	-40 to +85
ONS-SI-155-I1=	SFP - OC3/STM1 IR1/S-1.1 1310 nm, ITEMP	10-1938-02	GR253 OC3 IR1 G.957 S-1.1	-40 to +85
ONS-SI-155-L1=	SFP - OC3/STM1 LR, L-1.1, 1310 nm, ITEMP	10-1957-02	GR253 OC3 LR1 G.957 L-1.1	-40 to +85
ONS-SI-155-L2=	SFP - OC3/STM1 LR-2, L-1.2, 1550 nm, ITEMP	10-1937-02	GR253 OC3 LR2 G.957 L-1.2	-40 to +85
ONS-SI-622-SR-MM=	SFP - OC12, SR, 1310 NM, MULTI MODE, I-TEMP	10-2280-01	GR253	-40 to +85
ONS-SI-622-I1=	SFP - OC12/STM4 and OC3/STM1 IR, S-4.1, S-1.1, 1310 nm, ITEMP	10-1956-02	GR253 OC3/OC12 IR1 G.957 S-4.1/S-1.1	-40 to +85
ONS-SI-622-L1=	SFP - OC12/STM4 LR, L-4.1, 1310 nm, ITEMP	10-1958-02	GR253 OC12 LR1 G.957 L-4.1	-40 to +85
ONS-SI-622-L2=	SFP - OC12/STM4 LR, L-4.2, 1550 nm, ITEMP	10-1936-02	GR253 OC12 LR2 G.957 L-4.2	-40 to +85
ONS-SI-2G-S1	SFP - OC48/STM16, SR, 1310 nm, ITEMP, LC	10-1992-02	GR253 OC48 SR G.957 I-16	-40 to +85
ONS-SI-2G-I1=	SFP - OC48/STM16, IR, 1310 nm, ITEMP, LC	10-1993-02	GR253 OC48 IR1 G.957 S-16.1	-40 to +85
ONS-SI-2G-L1=	SFP - OC48/STM16, LR1, 1310 nm, ITEMP, LC	10-2102-02	GR253 OC48 LR1 G.957 L-16.1	-40 to +85
ONS-SI-2G-L2=	SFP - OC48/STM16, LR2, 1550 nm, ITEMP, LC	10-1990-02	GR253 OC48 LR2 G.957 L-16.2	-40 to +85

Data SFP Modules

Cisco offers a wide range of data SFP modules capable of transmitting Gigabit Ethernet, Fibre Channel, IBM Fiber Connection (FICON), and Enterprise Systems Connection (ESCON) signal format. Table 2 provides the details.

Table 2. Data SFP Modules

Product ID	Product Description	Part Number	Applicable Standard	Temperature Range (°C)
ONS-SE-100-LX10=	SFP - 100 Mbps Long Reach - 1310 nm - SM - LC, EXT-TEMP	10-2213-01	100BASE LX IEEE-802.3	-10 to +85
ONS-SI-100-LX10=	SFP - 100 Mbps Long Reach - 1310 nm - SM - LC, I-TEMP	10-2294-01	100BASE LX IEEE-802.3	-40 to +85
ONS-SE-100-FX=	SFP - 100 Mbps Short Reach - 1310 nm - MM - LC, EXT-TEMP	10-2212-01	100BASE FX IEEE-802.3	-10 to +85
ONS-SI-100-FX=	SFP - 100 Mbps Short Reach - 1310 nm - MM - LC, I-TEMP	10-2350-01	100BASE FX IEEE-802.3	-40 to +85

Product ID	Product Description	Part Number	Applicable Standard	Temperature Range (°C)
ONS-SE-100-BX10U=	SFP - 10/100 BX-U, EXT	10-2353-01	100BASE BX-U IEEE-802.3	-10 to +85
ONS-SE-100-BX10D=	SFP - 10/100 BX-D, EXT	10-2352-01	1000BASE BX-D IEEE-802.3	-10 to +85
ONS-SE-GE-BXU=	SFP - 1000BASE-BX U - GE Bidirectional Upstream - Ext Temp		100BASE BX-U IEEE-802.3	-10 to +85
ONS-SE-GE-BXD=	SFP - 1000BASE BX D - GE Bidirectional Downstream Ext Temp		1000BASE BX-D IEEE-802.3	-10 to +85
15327-SFP-LC-SX=EOS	1000BASE-SX LC, SFP	30-1301-01	1000BASE SX IEEE-802.3	0 to +70
15327-SFP-LC-LX=EOS	1000BASE-LX LC, SFP	30-1299-01	1000BASE SX IEEE-802.3	0 to +70
15454-SFP-LC-SX=	1000BASE-ASESX LC, SFP	30-1301-01	1000BASE SX IEEE-802.3	0 to +70
15454-SFP-LC-LX=	1000BASE LX LC, SFP	30-1299-01	1000BASE LX IEEE-802.3	0 to +70
ONS-SC-GE-SX=[1]	1000BASE SX SFP - 850 nm - LC - C Temp	10-2301-01	1000BASE SX IEEE-802.3	0 to +70
ONS-SI-GE-SX=	SFP - 1000BASE-SX Gigabit Ethernet, 850 nm, MM, I-TEMP	10-2295-01	1000BASE SX IEEE-802.3	-40 to +85
ONS-SC-GE-LX=[2]	1000BASE LX SFP - 1310 nm - LC - C Temp	10-2298-01	1000BASE LX IEEE-802.3	0 to +70
ONS-SI-GE-LX=	SFP - 1000BASE-LX Gigabit Ethernet, 1310 nm, SM, I-TEMP	10-2300-01	1000BASE SX IEEE-802.3	-40 to +85
15454-SFP-GE+-LX=EOS	SFP - GE/1G-FC/2G-FC - 1310 nm - MM - LC	10-1832-03	1000BASE LX IEEE-802.3, 100-M5-SN-I 200-M5-SN-I	-10 to +85
15454-SFP-GEFC-SX=EOS	SFP - GE/1G-FC/2G-FC - 850 nm - MM - LC	10-1833-02	1000BASE SX IEEE-802.3, 100-M5-SN-I 100-M6-SN-I 200-M5-SN-I 200-M6-SN-I	-10 to +85
ONS-SE-G2F-SX=	SFP - GE/1G-FC/2G-FC - 850 nm - MM - LC - EXT TEMP	10-2272-02	1000BASE SX IEEE-802.3, 100-M5-SN-I 100-M6-SN-I 200-M5-SN-I 200-M6-SN-I	-10 to +85
ONS-SE-G2F-LX=	SFP - GE/1G-FC/2G-FC/HDTV - 1310 nm - SM - LC - EXT TEMP	10-2273-02	1000BASE LX IEEE-802.3, 100-SM-LC-L 200-SM-LC-L	-10 to +85
ONS-SI-GE-ZX=	SFP - 1000BASE-ZX Gigabit Ethernet, 1550 nm, SM, I-Temp	10-2296-01	1000BASE ZX IEEE-802.3	-40 to +85
ONS-SE-GE-ZX=	SFP - 1000BASE-ZX Gigabit Ethernet, 1550, SM, Ext-Temp	10-2354-01	1000BASE ZX IEEE-802.3	-10 to +85
15454-SFP-200=	SFP-ESCON - 1310 nm - MM - LC	10-1750-01	ESCON	0 to +70
ONS-SE-200-MM=	SFP-ESCON - 1310 nm - MM - LC - EXT TEMP	10-2248-01	ESCON	-10 to +85
ONS-SE-4G-MM=	4G FC SFP, 850 nm, LC, MM - EXT TEMP	10-2259-01	400-M5-SN-I and 400-M6-SN-I	-10 to +85
ONS-SE-4G-SM=	4G FC SFP, 1310 nm, LC, SM - EXT TEMP	10-2252-01	400-SM-LC-L	-10 to +85

[1] This SFP module will replace the 15327-SFP-LC-SX= and 15454-SFP-LC-SX=, which have begun the end-of-life process.

[2] This SFP module will replace the 15327-SFP-LC-LX= and 15454-SFP-LC-LX=, which have begun the end-of-life process.

Electrical SFP Modules

Cisco offers electrical SFP modules for the Cisco ONS platform. Details are shown in Table 3.

Table 3.   Electrical SFP Modules

Product ID	Product Description	Part Number	Applicable Standard	Temperature Range (°C)
ONS-SE-ZE-EL=	SFP - 10/100/1000 Ethernet BASE-T Multirate Copper RJ-45	10-2351-01	IEEE-802.3	-10 to +85
ONS-SC-155-EL=	SFP - STM1 Electrical	10-2363-01	ITU-T G.703 (ES1)	0 to +70
ONS-SC-E3-T3-PW=	SFP - E3/DS3 PDH over FE Pseudowire - Commercial Temp	30-1450-01	ITU-T G.703	0 to +70
ONS-SC-E1-T1-PW=	SFP - E1/DS1 PDH over FE Pseudowire - Commercial Temp	30-1447-01	ITU-T G.703	0 to +70
ONS-SC-EoP1=	SFP - FE over DS1/E1 - Commercial Temp	30-1446-01	ITU-T G.703	0 to +70
ONS-SC-EOP3=	SFP - FE over DS3/E3 - Commercial Temp	30-1449-01	ITU-T G.703	0 to +70

Multirate SFP Module

Cisco offers a multirate SFP module for the Cisco ONS 15600 Series and 15454 platforms. Table 4 provides details.

Table 4.   Multirate SFP Modules

Product ID	Product Description	Part Number	Applicable Standard	Temperature Range (°C)
ONS-SE-Z1=	SFP-OC-48IR1,12/3SR1, GE LX STM S-16.1, I-4, I-1, 1310nm EXT-TEMP	10-1971-02	1000BASE-LX IEEE-802.3, GR253 OC-48 IR1 OC-12 SR, OC-3 SR G.957 S-16.1, I-4.1, I-1.1	-10 to +85

Optical Service Channel SFP Module

Cisco offers an optical service channel SFP module for the Cisco ONS 15454 MSTP. Table 5 provides details.

Table 5.   Multirate SFP Module

Product ID	Product Description	Part Number	Applicable Standard	Temperature Range (°C)
ONS-SC-OSC-ULH=	SFP-OC-3/STM-1/FE Optical Service Channel SFPs ULH-Commercial Temp	10-2469-01	FE IEEE-802.3, GR253 OC3 G.957 STM-1	0 to +70
ONS-SC-OSC-18.0=	SFP FE/OC3/STM1 OSC for RAMAN application 1518.0nm	10-2737-01	FE IEEE-802.3, GR253 OC3 G.957 STM-1	0 to +70

DWDM SFP Modules

Cisco offers a wide range of Dense Wavelength-Division Multiplexing (DWDM) ITU-T-compliant SFP modules. Table 6 lists details.

Table 6.   DWDM SFP Modules

Product ID	Product Description	Part Number	Applicable Standard	Temperature Range (°C)
ONS-SC-2G-28.7=	OC-48/STM-16, SFP, 1528.77, 100 GHz, LC	10-2307-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-30.3=	OC-48/STM-16, SFP, 1530.33, 100 GHz, LC	10-2155-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-31.1=	OC-48/STM-16, SFP, 1531.12, 100 GHz, LC	10-2156-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-31.9=	OC-48/STM-16, SFP, 1531.90, 100 GHz, LC	10-2157-02	ITU G694, GR2918	0 to +70

Product ID	Product Description	Part Number	Applicable Standard	Temperature Range (°C)
ONS-SC-2G-32.6=	OC-48/STM-16, SFP, 1532.68, 100 GHz, LC	10-2158-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-33.4=	OC-48/STM-16, SFP, 1533.47, 100 GHz, LC	10-2306-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-34.2=	OC-48/STM-16, SFP, 1534.25, 100 GHz, LC	10-2159-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-35.0=	OC-48/STM-16, SFP, 1535.04, 100 GHz, LC	10-2160-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-35.8=	OC-48/STM-16, SFP, 1535.82, 100 GHz, LC	10-2161-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-36.6=	OC-48/STM-16, SFP, 1536.61, 100 GHz, LC	10-2162-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-37.4=	SFP - OC-48/STM16, 1537.40nm, 100 GHz, SM, LC	10-2668-01	ITU G694, GR2918	0 to +70
ONS-SC-2G-38.1=	OC-48/STM-16, SFP, 1538.19, 100 GHz, LC	10-2163-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-38.9=	OC-48/STM-16, SFP, 1538.98, 100 GHz, LC	10-2164-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-39.7=	OC-48/STM-16, SFP, 1539.77, 100 GHz, LC	10-2165-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-40.5=	OC-48/STM-16, SFP, 1540.56, 100 GHz, LC	10-2185-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-41.3=	OC-48/STM-16, SFP, 1541.35, 100 GHz, LC	10-2305-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-42.1=	OC-48/STM-16, SFP, 1542.14, 100 GHz, LC	10-2166-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-42.9=	OC-48/STM-16, SFP, 1542.94, 100 GHz, LC	10-2167-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-43.7=	OC-48/STM-16, SFP, 1543.73, 100 GHz, LC	10-2168-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-44.5=	OC-48/STM-16, SFP, 1544.53, 100 GHz, LC	10-2169-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-45.3=	SFP - OC-48/STM16, 1545.32nm, 100 GHz, SM, LC	10-2670-01	ITU G694, GR2918	0 to +70
ONS-SC-2G-46.1=	OC-48/STM-16, SFP, 1546.12, 100 GHz, LC	10-2170-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-46.9=	OC-48/STM-16, SFP, 1546.92, 100 GHz, LC	10-2171-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-47.7=	OC-48/STM-16, SFP, 1547.72, 100 GHz, LC	10-2172-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-48.5=	OC-48/STM-16, SFP, 1548.51, 100 GHz, LC	10-2173-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-49.3=	OC-48/STM-16, SFP, 1549.32, 100 GHz, LC	10-2304-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-50.1=	OC-48/STM-16, SFP, 1550.12, 100 GHz, LC	10-2186-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-50.9=	OC-48/STM-16, SFP, 1550.92, 100 GHz, LC	10-2174-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-51.7=	OC-48/STM-16, SFP, 1551.72, 100 GHz, LC	10-2175-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-52.5=	OC-48/STM-16, SFP, 1552.52, 100 GHz, LC	10-2176-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-53.3=	SFP - OC-48/STM16, 1553.33nm, 100 GHz, SM, LC	10-2669-01	ITU G694, GR2918	0 to +70
ONS-SC-2G-54.1=	OC-48/STM-16, SFP, 1554.13, 100 GHz, LC	10-2177-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-54.9=	OC-48/STM-16, SFP, 1554.94, 100 GHz, LC	10-2178-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-55.7=	OC-48/STM-16, SFP, 1555.75, 100 GHz, LC	10-2179-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-56.5=	OC-48/STM-16, SFP, 1556.55, 100 GHz, LC	10-2180-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-57.3=	OC-48/STM-16, SFP, 1557.36, 100 GHz, LC	10-2308-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-58.1=	OC-48/STM-16, SFP, 1558.17, 100 GHz, LC	10-2181-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-58.9=	OC-48/STM-16, SFP, 1558.98, 100 GHz, LC	10-2182-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-59.7=	OC-48/STM-16, SFP, 1559.79, 100 GHz, LC	10-2183-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-60.6=	OC-48/STM-16, SFP, 1560.61, 100 GHz, LC	10-2184-02	ITU G694, GR2918	0 to +70
ONS-SC-4G-30.3=	SFP - 4G FC 1530.33, 100 GHz, LC - Commercial Temp	10-2487-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-31.1=	SFP - 4G FC 1531.12, 100 GHz, LC - Commercial Temp	10-2488-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-31.9=	SFP - 4G FC 1531.90, 100 GHz, LC - Commercial Temp	10-2489-01	ITU G694, GR2918	0 to +70

Product ID	Product Description	Part Number	Applicable Standard	Temperature Range (°C)
ONS-SC-4G-32.6=	SFP - 4G FC 1532.68, 100 GHz, LC - Commercial Temp	10-2490-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-33.4=	SFP - 4G FC 1533.47, 100 GHz, LC - Commercial Temp	10-2491-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-34.2=	SFP - 4G FC 1534.25, 100 GHz, LC - Commercial Temp	10-2523-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-35.0=	SFP - 4G FC 1535.04, 100 GHz, LC - Commercial Temp	10-2492-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-35.8=	SFP - 4G FC 1535.82, 100 GHz, LC - Commercial Temp	10-2493-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-36.6=	SFP - 4G FC 1536.61, 100 GHz, LC - Commercial Temp	10-2494-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-37.4=	SFP - 4G FC 1537.40, 100 GHz, LC - Commercial Temp	10-2495-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-38.1=	SFP - 4G FC 1538.19, 100 GHz, LC - Commercial Temp	10-2496-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-38.9=	SFP - 4G FC 1538.98, 100 GHz, LC - Commercial Temp	10-2497-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-39.7=	SFP - 4G FC 1539.77, 100 GHz, LC - Commercial Temp	10-2502-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-40.5=	SFP - 4G FC 1540.56, 100 GHz, LC - Commercial Temp	10-2503-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-41.3=	SFP - 4G FC 1541.35, 100 GHz, LC - Commercial Temp	10-2498-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-42.1=	SFP - 4G FC 1542.14, 100 GHz, LC - Commercial Temp	10-2499-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-42.9=	SFP - 4G FC 1542.94, 100 GHz, LC - Commercial Temp	10-2500-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-43.7=	SFP - 4G FC 1543.73, 100 GHz, LC - Commercial Temp	10-2501-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-44.5=	SFP - 4G FC 1544.53, 100 GHz, LC - Commercial Temp	10-2521-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-45.3=	SFP - 4G FC 1545.32, 100 GHz, LC - Commercial Temp	10-2527-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-46.1=	SFP - 4G FC 1546.12, 100 GHz, LC - Commercial Temp	10-2520-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-46.9=	SFP - 4G FC 1546.92, 100 GHz, LC - Commercial Temp	10-2519-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-47.7=	SFP - 4G FC 1547.72, 100 GHz, LC - Commercial Temp	10-2518-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-48.5=	SFP - 4G FC 1548.51, 100 GHz, LC - Commercial Temp	10-2517-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-49.3=	SFP - 4G FC 1549.32, 100 GHz, LC - Commercial Temp	10-2516-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-50.1=	SFP - 4G FC 1550.12, 100 GHz, LC - Commercial Temp	10-2515-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-50.9=	SFP - 4G FC 1550.92, 100 GHz, LC - Commercial Temp	10-2514-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-51.7=	SFP - 4G FC 1551.72, 100 GHz, LC - Commercial Temp	10-2526-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-52.5=	SFP - 4G FC 1552.52, 100 GHz, LC - Commercial Temp	10-2513-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-53.3=	SFP - 4G FC 1553.33, 100 GHz, LC - Commercial Temp	10-2512-01	ITU G694, GR2918	0 to +70

Product ID	Product Description	Part Number	Applicable Standard	Temperature Range (°C)
ONS-SC-4G-54.1=	SFP - 4G FC 1554.13, 100 GHz, LC - Commercial Temp	10-2525-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-54.9=	SFP - 4G FC 1554.94, 100 GHz, LC - Commercial Temp	10-2511-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-55.7=	SFP - 4G FC 1555.75, 100 GHz, LC - Commercial Temp	10-2510-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-56.5=	SFP - 4G FC 1556.55, 100 GHz, LC - Commercial Temp	10-2509-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-57.3=	SFP - 4G FC 1557.36, 100 GHz, LC - Commercial Temp	10-2524-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-58.1=	SFP - 4G FC 1558.17, 100 GHz, LC - Commercial Temp	10-2508-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-58.9=	SFP - 4G FC 1558.98, 100 GHz, LC - Commercial Temp	10-2507-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-59.7=	SFP - 4G FC 1559.79, 100 GHz, LC - Commercial Temp	10-2506-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-60.6=	SFP - 4G FC 1560.61, 100 GHz, LC - Commercial Temp	10-2505-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-61.4=	SFP - 4G FC 1561.43, 100 GHz, LC - Commercial Temp	10-2504-01	ITU G694, GR2918	0 to +70

CWDM SFP Modules

Cisco offers a wide range of Coarse Wavelength-Division Multiplexing (CWDM) ITU-T-compliant SFP modules.
Table 7 lists the details.

Table 7.   CWDM SFP Modules

Product ID	Product Description	Part Number	Applicable Standard	Temperature Range (°C)
ONS-SE-155-1470=	SFP - OC-3/STM-1, CWDM, 1470 nm, EXT	10-1996-01	ITU-T G.694.2	-10 to +85
ONS-SE-155-1490=	SFP - OC-3/STM-1, CWDM, 1490 nm, EXT	10-1998-01	ITU-T G.694.2	-10 to +85
ONS-SE-155-1510=	SFP - OC-3/STM-1, CWDM, 1510 nm, EXT	10-1999-01	ITU-T G.694.2 IEEE 802.3 FE	-10 to +85
ONS-SE-155-1530=	SFP - OC-3/STM-1, CWDM, 1530 nm, EXT	10-2000-01	ITU-T G.694.2	-10 to +85
ONS-SE-155-1550=	SFP - OC-3/STM-1, CWDM, 1550 nm, EXT	10-2001-01	ITU-T G.694.2	-10 to +85
ONS-SE-155-1570=	SFP - OC-3/STM-1, CWDM, 1570 nm, EXT	10-2002-01	ITU-T G.694.2	-10 to +85
ONS-SE-155-1590=	SFP - OC-3/STM-1, CWDM, 1590 nm, EXT	10-2003-01	ITU-T G.694.2	-10 to +85
ONS-SE-155-1610=	SFP - OC-3/STM-1, CWDM, 1610 nm, EXT	10-1997-01	ITU-T G.694.2	-10 to +85
ONS-SE-622-1470=	SFP - OC-12/STM-4, CWDM, 1470 nm, EXT	10-2004-01	ITU-T G.694.2	-10 to +85
ONS-SE-622-1490=	SFP - OC-12/STM-4, CWDM, 1490 nm, EXT	10-2005-01	ITU-T G.694.2	-10 to +85
ONS-SE-622-1510=	SFP - OC-12/STM-4, CWDM, 1510 nm, EXT	10-2006-01	ITU-T G.694.2	-10 to +85
ONS-SE-622-1530=	SFP - OC-12/STM-4, CWDM, 1530 nm, EXT	10-2007-01	ITU-T G.694.2	-10 to +85
ONS-SE-622-1550=	SFP - OC-12/STM-4, CWDM, 1550 nm, EXT	10-2008-01	ITU-T G.694.2	-10 to +85
ONS-SE-622-1570=	SFP - OC-12/STM-4, CWDM, 1570 nm, EXT	10-2009-01	ITU-T G.694.2	-10 to +85
ONS-SE-622-1590=	SFP - OC-12/STM-4, CWDM, 1590 nm, EXT	10-2010-01	ITU-T G.694.2	-10 to +85
ONS-SE-622-1610=	SFP - OC-12/STM-4, CWDM, 1610 nm, EXT	10-2011-01	ITU-T G.694.2	-10 to +85
ONS-SC-Z3-1470=	SFP - OC-48/STM-16/GE, CWDM, 1470 nm	10-2285-01	ITU-T G.694.2	0 to +70
ONS-SC-Z3-1490=	SFP - OC-48/STM-16/GE, CWDM, 1490 nm	10-2286-01	ITU-T G.694.2	0 to +70
ONS-SC-Z3-1510=	SFP - OC-48/STM-16/GE, CWDM, 1510 nm	10-2287-01	ITU-T G.694.2	0 to +70
ONS-SC-Z3-1530=	SFP - OC-48/STM-16/GE, CWDM, 1530 nm	10-2288-01	ITU-T G.694.2	0 to +70

Product ID	Product Description	Part Number	Applicable Standard	Temperature Range (°C)
ONS-SC-Z3-1550=	SFP - OC-48/STM-16/GE, CWDM, 1550 nm	10-2289-01	ITU-T G.694.2	0 to +70
ONS-SC-Z3-1570=	SFP - OC-48/STM-16/GE, CWDM, 1570 nm	10-2290-01	ITU-T G.694.2	0 to +70
ONS-SC-Z3-1590=	SFP - OC-48/STM-16/GE, CWDM, 1590 nm	10-2291-01	ITU-T G.694.2	0 to +70
ONS-SC-Z3-1610=	SFP - OC-48/STM-16/GE, CWDM, 1610 nm	10-2292-01	ITU-T G.694.2	0 to +70
ONS-SE-2G-1470=	SFP - OC-48/STM-16/GE, CWDM, 1470 nm Ext Temp	10-2461-01	ITU-T G.694.2	0 to +85
ONS-SE-2G-1490=	SFP - OC-48/STM-16/GE, CWDM, 1490 nm Ext Temp	10-2462-01	ITU-T G.694.2	0 to +85
ONS-SE-2G-1510=	SFP - OC-48/STM-16/GE, CWDM, 1510 nm Ext Temp	10-2463-01	ITU-T G.694.2	0 to +85
ONS-SE-2G-1530=	SFP - OC-48/STM-16/GE, CWDM, 1530 nm Ext Temp	10-2464-01	ITU-T G.694.2	0 to +85
ONS-SE-2G-1550=	SFP - OC-48/STM-16/GE, CWDM, 1550 nm Ext Temp	10-2465-01	ITU-T G.694.2	0 to +85
ONS-SE-2G-1570=	SFP - OC-48/STM-16/GE, CWDM, 1570 nm Ext Temp	10-2466-01	ITU-T G.694.2	0 to +85
ONS-SE-2G-1590=	SFP - OC-48/STM-16/GE, CWDM, 1590 nm Ext Temp	10-2467-01	ITU-T G.694.2	0 to +85
ONS-SE-2G-1610=	SFP - OC-48/STM-16/GE, CWDM, 1610 nm Ext Temp	10-2468-01	ITU-T G.694.2	0 to +85

Grey GBICs

Cisco offers a range Grey of GBICs. Table 8 provides the details.

Table 8.   Grey GBICs

Product ID	Product Description	Part Number	Applicable Standard	Temperature Range (°C)
ONS-GC-GE-LX=	1000BASE-LX, SC, SM, or MM	10-2191-01	1000BASE-SX IEEE-802.3	0 to +70
ONS-GC-GE-SX=	1000BASE-SX, SC, MM	10-2192-01	1000BASE-LX IEEE-802.3	0 to +70
ONS-GC-GE-ZX=	1000BASE-ZX, SM	10-2190-01	1000BASE-ZX IEEE-802.3	0 to +70
ONS-GX-2FC-MMI=	1 Gbps or 2 Gbps, 850 nm, SC, MM	10-2015-01	100-M5-SN-I, 100-M6-SN-I, 200-M5-SN-I, 200-M6-SN-I	-10 to +85
ONS-GX-2FC-SML=	1 Gbps or 2 Gbps, 1310 nm, SC, SM	10-2016-01	100-SM-LC-L 200-SM-LC-L	-10 to +85

CWDM GBICs

Cisco offers a range of CWDM GBICs. Table 9 lists details.

Table 9.   CWDM GBICs

Product ID	Product Description	Part Number	Applicable Standard	Temperature Range (°C)
15454-GBIC-1470= EOS	1000BASE-CWDM 1470 nm GBIC (single mode only)	10-1453-01	ITU-T G.694.2	0 to +70
15454-GBIC-1490= EOS	1000BASE-CWDM 1490 nm GBIC (single mode only)	10-1454-01	ITU-T G.694.2	0 to +70
15454-GBIC-1510= EOS	1000BASE-CWDM 1510 nm GBIC (single mode only)	10-1455-01	ITU-T G.694.2	0 to +70
15454-GBIC-1530= EOS	1000BASE-CWDM 1530 nm GBIC (single mode only)	10-1456-01	ITU-T G.694.2	0 to +70

Product ID	Product Description	Part Number	Applicable Standard	Temperature Range (°C)
15454-GBIC-1550= EOS	1000BASE-CWDM 1550 nm GBIC (single mode only)	10-1457-01	ITU-T G.694.2	0 to +70
15454-GBIC-1570= EOS	1000BASE-CWDM 1570 nm GBIC (single mode only)	10-1458-01	ITU-T G.694.2	0 to +70
15454-GBIC-1590= EOS	1000BASE-CWDM 1590 nm GBIC (single mode only)	10-1459-01	ITU-T G.694.2	0 to +70
15454-GBIC-1610= EOS	1000BASE-CWDM 1610 nm GBIC (single mode only)	10-1460-01	ITU-T G.694.2	0 to +70

DWDM GBICs

Cisco offers a wide range of DWDM GBICs. Table 10 lists the details.

Table 10. DWDM GBICs

Product ID	Product Description	Part Number	Applicable Standard	Temperature Range (°C)
15454-GBIC-30.3= EOS	1000BASE-DWDM 1530.33 nm GBIC	10-1845-01	ITU G694, GR2918	0 to +70
15454-GBIC-31.1= EOS	1000BASE-DWDM 1531.12 nm GBIC	10-1846-01	ITU G694, GR2918	0 to +70
15454-GBIC-31.9= EOS	1000BASE-DWDM 1531.90 nm GBIC	10-1847-01	ITU G694, GR2918	0 to +70
15454-GBIC-32.6= EOS	1000BASE-DWDM 1532.68 nm GBIC	10-1848-01	ITU G694, GR2918	0 to +70
15454-GBIC-34.2= EOS	1000BASE-DWDM 1534.25 nm GBIC	10-1849-01	ITU G694, GR2918	0 to +70
15454-GBIC-35.0= EOS	1000BASE-DWDM 1535.04 nm GBIC	10-1850-01	ITU G694, GR2918	0 to +70
15454-GBIC-35.8= EOS	1000BASE-DWDM 1535.82 nm GBIC	10-1851-01	ITU G694, GR2918	0 to +70
15454-GBIC-36.6= EOS	1000BASE-DWDM 1536.61 nm GBIC	10-1852-01	ITU G694, GR2918	0 to +70
15454-GBIC-38.1= EOS	1000BASE-DWDM 1538.19 nm GBIC	10-1853-01	ITU G694, GR2918	0 to +70
15454-GBIC-38.9= EOS	1000BASE-DWDM 1538.98 nm GBIC	10-1854-01	ITU G694, GR2918	0 to +70
15454-GBIC-39.7= EOS	1000BASE-DWDM 1539.77 nm GBIC	10-1855-01	ITU G694, GR2918	0 to +70
15454-GBIC-40.5= EOS	1000BASE-DWDM 1540.56 nm GBIC	10-1856-01	ITU G694, GR2918	0 to +70
15454-GBIC-42.1= EOS	1000BASE-DWDM 1542.14 nm GBIC	10-1857-01	ITU G694, GR2918	0 to +70
15454-GBIC-42.9= EOS	1000BASE-DWDM 1542.94 nm GBIC	10-1858-01	ITU G694, GR2918	0 to +70
15454-GBIC-43.7= EOS	1000BASE-DWDM 1543.73 nm GBIC	10-1859-01	ITU G694, GR2918	0 to +70
15454-GBIC-44.5= EOS	1000BASE-DWDM 1544.53 nm GBIC	10-1860-01	ITU G694, GR2918	0 to +70
15454-GBIC-46.1= EOS	1000BASE-DWDM 1546.12 nm GBIC	10-1861-01	ITU G694, GR2918	0 to +70
15454-GBIC-46.9= EOS	1000BASE-DWDM 1546.92 nm GBIC	10-1862-01	ITU G694, GR2918	0 to +70
15454-GBIC-47.7= EOS	1000BASE-DWDM 1547.72 nm GBIC	10-1863-01	ITU G694, GR2918	0 to +70
15454-GBIC-48.5= EOS	1000BASE-DWDM 1548.51 nm GBIC	10-1864-01	ITU G694, GR2918	0 to +70

Product ID	Product Description	Part Number	Applicable Standard	Temperature Range (°C)
15454-GBIC-50.1= EOS	1000BASE-DWDM 1550.12 nm GBIC	10-1865-01	ITU G694, GR2918	0 to +70
15454-GBIC-50.9= EOS	1000BASE-DWDM 1550.92 nm GBIC	10-1866-01	ITU G694, GR2918	0 to +70
15454-GBIC-51.7= EOS	1000BASE-DWDM 1551.72 nm GBIC	10-1867-01	ITU G694, GR2918	0 to +70
15454-GBIC-52.5= EOS	1000BASE-DWDM 1552.52 nm GBIC	10-1868-01	ITU G694, GR2918	0 to +70
15454-GBIC-54.1= EOS	1000BASE-DWDM 1554.13 nm GBIC	10-1869-01	ITU G694, GR2918	0 to +70
15454-GBIC-54.9= EOS	1000BASE-DWDM 1554.94 nm GBIC	10-1870-01	ITU G694, GR2918	0 to +70
15454-GBIC-55.7= EOS	1000BASE-DWDM 1555.75 nm GBIC	10-1871-01	ITU G694, GR2918	0 to +70
15454-GBIC-56.5= EOS	1000BASE-DWDM 1556.55 nm GBIC	10-1872-01	ITU G694, GR2918	0 to +70
15454-GBIC-58.1= EOS	1000BASE-DWDM 1558.17 nm GBIC	10-1873-01	ITU G694, GR2918	0 to +70
15454-GBIC-58.9= EOS	1000BASE-DWDM 1558.98 nm GBIC	10-1874-01	ITU G694, GR2918	0 to +70
15454-GBIC-59.7= EOS	1000BASE-DWDM 1559.79 nm GBIC	10-1875-01	ITU G694, GR2918	0 to +70
15454-GBIC-60.6= EOS	1000BASE-DWDM 1560.61 nm GBIC	10-1876-01	ITU G694, GR2918	0 to +70

XFP Modules

Cisco offers a range of XFP modules, listed in tables 11, 12, and 13.

Table 11.   Grey (Non-DWDM) XFP Modules

Product ID	Product Description	Part Number	Applicable Standard	Temperature Range (°C)
ONS-XC-10G-S1=	XFP - OC-192/STM-64/10GE - 1310 SR - SM LC	10-2012-03	ITU G694 I-64.1 GR253 SR-1 10GE BASE LR 1200-SM-LL-L IB-1x-DDR-LX	0 to +70
ONS-XC-10G-I2=	XFP - OC-192/STM-64/10GE - 1550 IR2 - SM LC	10-2193-02	ITU G694 S-64.2b GR253 IR-2 10GE BASE-ER	0 to +70
ONS-XC-10G-L2=	XFP - OC-192/STM-64 - 1550 LR2 - SM LC	10-2194-02	ITU G959.1 P1L1-2D2 GR253 LR-2 10GE BASE-ZR	0 to +70
ONS-XC-10G-SR-MM=	XFP - Ultra Short Reach MM -10GE BASE SR	10-2420-01	1200-MX-SN-I/ 10GE BASE-SR	0 to +70
ONS-XC-8G-FC-SM=	8G FC XFP SM	10-2484-01	FC-PI-4 800-SN-LC-L	0 to +70
ONS-XC-8G-FC-MM=	8G FC XFP MM	10-2623-01	800-M5-SN-I 800-M6-SN-I	0 to +70

Table 12. DWDM XFP Modules

Product ID	Product Description	Part Number	Applicable Standard	Temperature Range (°C)
ONS-XC-10G-C=	10G Multirate Full C Band Tunable DWDM XFP, 50 GHz, LC	10-2480-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-96C=	XFP - 10G 96 ch Full C Band Tunable DWDM XFP, 50 GHz, LC	10-2789-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-30.3=	OC-192/STM-64/10GE, XFP, 1530.33, 100 GHz, LC	10-2347-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-31.1=	OC-192/STM-64/10GE, XFP, 1531.12, 100 GHz, LC	10-2346-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-31.9=	OC-192/STM-64/10GE, XFP, 1531.90, 100 GHz, LC	10-2344-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-32.6=	OC-192/STM-64/10GE, XFP, 1532.68, 100 GHz, LC	10-2345-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-33.4=	OC-192/STM-64/10GE, XFP, 1533.47, 100 GHz, LC	10-2343-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-34.2=	OC-192/STM-64/10GE, XFP, 1534.25, 100 GHz, LC	10-2342-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-35.0=	OC-192/STM-64/10GE, XFP, 1535.04, 100 GHz, LC	10-2341-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-35.8=	OC-192/STM-64/10GE, XFP, 1535.82, 100 GHz, LC	10-2340-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-36.6=	OC-192/STM-64/10GE, XFP, 1536.61, 100 GHz, LC	10-2339-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-37.4=	OC-192/STM-64/10GE, XFP, 1537.40, 100 GHz, LC	10-2338-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-38.1=	OC-192/STM-64/10GE, XFP, 1531.90, 100 GHz, LC	10-2337-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-38.9=	OC-192/STM-64/10GE, XFP, 1538.19, 100 GHz, LC	10-2336-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-39.7=	OC-192/STM-64/10GE, XFP, 1539.77, 100 GHz, LC	10-2335-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-40.5=	OC-192/STM-64/10GE, XFP, 1540.56, 100 GHz, LC	10-2348-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-41.3=	OC-192/STM-64/10GE, XFP, 1541.35, 100 GHz, LC	10-2334-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-42.1=	OC-192/STM-64/10GE, XFP, 1542.14, 100 GHz, LC	10-2333-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-42.9=	OC-192/STM-64/10GE, XFP, 1542.94, 100 GHz, LC	10-2332-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-43.7=	OC-192/STM-64/10GE, XFP, 1543.73, 100 GHz, LC	10-2331-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-44.5=	OC-192/STM-64/10GE, XFP, 1544.53, 100 GHz, LC	10-2330-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-45.3=	OC-192/STM-64/10GE, XFP, 1545.32, 100 GHz, LC	10-2329-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-46.1=	OC-192/STM-64/10GE, XFP, 1546.12, 100 GHz, LC	10-2328-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-46.9=	OC-192/STM-64/10GE, XFP, 1546.92, 100 GHz, LC	10-2327-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-47.7=	OC-192/STM-64/10GE, XFP, 1547.72, 100 GHz, LC	10-2326-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-48.5=	OC-192/STM-64/10GE, XFP, 1548.51, 100 GHz, LC	10-2325-02	ITU G694, GR2918	0 to +70

Product ID	Product Description	Part Number	Applicable Standard	Temperature Range (°C)
ONS-XC-10G-49.3=	OC-192/STM-64/10GE, XFP, 1549.32, 100 GHz, LC	10-2324-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-50.1=	OC-192/STM-64/10GE, XFP, 1550.12, 100 GHz, LC	10-2323-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-50.9=	OC-192/STM-64/10GE, XFP, 1550.92, 100 GHz, LC	10-2322-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-51.7=	OC-192/STM-64/10GE, XFP, 1551.72, 100 GHz, LC	10-2321-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-52.5=	OC-192/STM-64/10GE, XFP, 1552.52, 100 GHz, LC	10-2320-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-53.3=	OC-192/STM-64/10GE, XFP, 1553.33, 100 GHz, LC	10-2319-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-54.1=	OC-192/STM-64/10GE, XFP, 1554.13, 100 GHz, LC	10-2318-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-54.9=	OC-192/STM-64/10GE, XFP, 1554.94, 100 GHz, LC	10-2317-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-55.7=	OC-192/STM-64/10GE, XFP, 1555.75, 100 GHz, LC	10-2316-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-56.5=	OC-192/STM-64/10GE, XFP, 1556.55, 100 GHz, LC	10-2315-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-57.3=	OC-192/STM-64/10GE, XFP, 1557.36, 100 GHz, LC	10-2314-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-58.1=	OC-192/STM-64/10GE, XFP, 1558.17, 100 GHz, LC	10-2313-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-58.9=	OC-192/STM-64/10GE, XFP, 1558.98, 100 GHz, LC	10-2312-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-59.7=	OC-192/STM-64/10GE, XFP, 1559.79, 100 GHz, LC	10-2311-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-60.6=	OC-192/STM-64/10GE, XFP, 1560.61, 100 GHz, LC	10-2310-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-61.4=	OC-192/STM-64/10GE, XFP, 1561.43, 100 GHz, LC	10-2309-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP30.3=	10G MR, XFP, Edge Performance 1530.33, 100 GHz, LC	10-2577-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP31.1=	10G MR, XFP, Edge Performance 1531.12, 100 GHz, LC	10-2579-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP31.9=	10G MR, XFP, Edge Performance 1531.90, 100 GHz, LC	10-2580-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP32.6=	10G MR, XFP, Edge Performance 1532.68, 100 GHz, LC	10-2581-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP33.4=	10G MR, XFP, Edge Performance 1533.47, 100 GHz, LC	10-2582-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP34.2=	10G MR, XFP, Edge Performance 1534.25, 100 GHz, LC	10-2578-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP35.0=	10G MR, XFP, Edge Performance 1535.04, 100 GHz, LC	10-2611-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP35.8=	10G MR, XFP, Edge Performance 1535.82, 100 GHz, LC	10-2604-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP36.6=	10G MR, XFP, Edge Performance 1536.61, 100 GHz, LC	10-2615-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP37.4=	10G MR, XFP, Edge Performance 1537.40, 100 GHz, LC	10-2608-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP38.1=	10G MR, XFP, Edge Performance 1538.19, 100 GHz, LC	10-2610-01	ITU G694, GR2918	0 to +70

Product ID	Product Description	Part Number	Applicable Standard	Temperature Range (°C)
ONS-XC-10G-EP38.9=	10G MR, XFP, Edge Performance 1538.98, 100 GHz, LC	10-2612-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP39.7=	10G MR, XFP, Edge Performance 1539.77, 100 GHz, LC	10-2609-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP40.5=	10G MR, XFP, Edge Performance 1540.56, 100 GHz, LC	10-2607-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP41.3=	10G MR, XFP, Edge Performance 1541.35, 100 GHz, LC	10-2606-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP42.1=	10G MR, XFP, Edge Performance 1542.14, 100 GHz, LC	10-2605-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP42.9=	10G MR, XFP, Edge Performance 1542.94, 100 GHz, LC	10-2603-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP43.7=	10G MR, XFP, Edge Performance 1543.73, 100 GHz, LC	10-2590-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP44.5=	10G MR, XFP, Edge Performance 1544.53, 100 GHz, LC	10-2602-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP45.3=	10G MR, XFP, Edge Performance 1545.32, 100 GHz, LC	10-2601-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP46.1=	10G MR, XFP, Edge Performance 1546.12, 100 GHz, LC	10-2589-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP46.9=	10G MR, XFP, Edge Performance 1546.92, 100 GHz, LC	10-2588-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP47.7=	10G MR, XFP, Edge Performance 1547.72, 100 GHz, LC	10-2600-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP48.5=	10G MR, XFP, Edge Performance 1548.51, 100 GHz, LC	10-2599-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP49.3=	10G MR, XFP, Edge Performance 1549.32, 100 GHz, LC	10-2587-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP50.1=	10G MR, XFP, Edge Performance 1550.12, 100 GHz, LC	10-2598-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP50.9=	10G MR, XFP, Edge Performance 1550.92, 100 GHz, LC	10-2597-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP51.7=	10G MR, XFP, Edge Performance 1551.72, 100 GHz, LC	10-2596-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP52.5=	10G MR, XFP, Edge Performance 1552.52, 100 GHz, LC	10-2614-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP53.3=	10G MR, XFP, Edge Performance 1553.33, 100 GHz, LC	10-2595-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP54.1=	10G MR, XFP, Edge Performance 1554.13, 100 GHz, LC	10-2586-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP54.9=	10G MR, XFP, Edge Performance 1554.94, 100 GHz, LC	10-2585-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP55.7=	10G MR, XFP, Edge Performance 1555.75, 100 GHz, LC	10-2594-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP56.5=	10G MR, XFP, Edge Performance 1556.55, 100 GHz, LC	10-2613-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP57.3=	10G MR, XFP, Edge Performance 1557.36, 100 GHz, LC	10-2584-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP58.1=	10G MR, XFP, Edge Performance 1558.17, 100 GHz, LC	10-2583-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP58.9=	10G MR, XFP, Edge Performance 1558.98, 100 GHz, LC	10-2593-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP59.7=	10G MR, XFP, Edge Performance 1559.79, 100 GHz, LC	10-2576-01	ITU G694, GR2918	0 to +70

Product ID	Product Description	Part Number	Applicable Standard	Temperature Range (°C)
ONS-XC-10G-EP60.6=	10G MR, XFP, Edge Performance 1560.61, 100 GHz, LC	10-2592-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP61.4=	10G MR, XFP, Edge Performance 1561.43, 100 GHz, LC	10-2591-01	ITU G694, GR2918	0 to +70

Table 13. CWDM XFP Modules

Product ID	Product Description	Part Number	Applicable Standard	Temperature Range (°C)
ONS-XC-10G-1470=	OC192/10GE/OTU2, CWDM, 1470mn, XFP C-Temp, 40km range	10-2548-01	ITU G694.2	0 to +70
ONS-XC-10G-1490=	OC192/10GE/OTU2, CWDM, 1490mn, XFP C-Temp, 40km range	10-2551-01	ITU G694.2	0 to +70
ONS-XC-10G-1510=	OC192/10GE/OTU2, CWDM, 1510mn, XFP C-Temp, 40km range	10-2552-01	ITU G694.2	0 to +70
ONS-XC-10G-1530=	OC192/10GE/OTU2, CWDM, 1530nm, XFP C-Temp, 40km range	10-2553-01	ITU G694.2	0 to +70
ONS-XC-10G-1550=	OC192/10GE/OTU2, CWDM, 1550nm, XFP C-Temp, 40km range	10-2554-01	ITU G694.2	0 to +70
ONS-XC-10G-1570=	OC192/10GE/OTU2, CWDM, 1570nm, XFP C-Temp, 40km range	10-2555-01	ITU G694.2	0 to +70
ONS-XC-10G-1590=	OC192/10GE/OTU2, CWDM, 1590nm, XFP C-Temp, 40km range	10-2556-01	ITU G694.2	0 to +70
ONS-XC-10G-1610=	OC192/10GE/OTU2, CWDM, 1610nm, XFP C-Temp, 40km range	10-2557-01	ITU G694.2	0 to +70

Video SFP Modules

Cisco offers two types of video SFP modules, one for transmission and the other for reception of video. The video protocols supported by this pluggable is High Definition (HD) 3G, Standard Definition (SD) Serial Digital Interface (SDI). Table 14 lists the details.

Table 14. Video SFP Modules

Product ID	Product Description	Part Number	Applicable Standard	Temperature Range (°C)
ONS-SC-HD3GV-TX=	SFP - 3G HD Video Tx	10-2630-01	SMPTE 259M SD-SDI SMPTE 292M HD-SDI SMPTE 424M 3G-SDI	0 to +70
ONS-SC-HD3GV-RX=	SFP - 3G HD Video RX	10-2629-01	SMPTE 259M SD-SDI SMPTE 292M HD-SDI SMPTE 424M 3G-SDI	0 to +70

SFP+ Modules

Cisco offers a wide range of SFP+ modules listed in tables 15, 16, and 17.

Table 15. Grey SFP+ Modules

Product ID	Product Description	Part Number	Applicable Standard	Temperature Range (°C)
ONS-SC+-10G-SR=	SFP+ SR - Commercial Temp	10-2620-01	IEEE 802.3 10GE BASE SR, OIF VSR4-1, FC-PI-4, ITU-T G.709	0 to +70
ONS-SC+-10G-ER=	SFP+ ER - Commercial Temp	10-2619-01	IEEE 802.3 10GE BASE-ER, Telcordia GR-253 OC192 IR2, FC-PI-4, ITU-T G.709	0 to +70

Product ID	Product Description	Part Number	Applicable Standard	Temperature Range (°C)
ONS-SC+-10G-LR=	SFP+ LR - Commercial Temp	10-2618-01	IEEE 802.3 10GE BASE-LR, Telcordia GR-253 OC192 SR1, FC-PI-4, ITU-T G.709	0 to +70
ONS-SC+-10G-ZR=	SFP+ ZR - Commercial Temp	10-2730-01	IEEE 802.3 10GE BASE-ZR, Telcordia GR-253 OC192 LR2, FC-PI-4, ITU-T G.709	0 to +70

Note: Pluggables in Table 15 are multi-rate pluggables that support OC-192, STM-64, 10 Gigabit Ethernet, OTU2e, and 8G Fibre Channel rates.

Table 16. DWDM SFP+ Modules

Product ID	Product Description	Part Number	Temperature Range (°C)
ONS-SC+-10G-C=	SFP+ -10G MR, Full C Band Tunable DWDM SFP+, 50 GHz, LC	10-2841-01	0 to +70
ONS-SC+-10G-30.3=	10G MR, SFP+ 1530.33, 100 GHz, LC	10-2690-01	0 to +70
ONS-SC+-10G-31.1=	10G MR, SFP+ 1531.12, 100 GHz, LC	10-2693-01	0 to +70
ONS-SC+-10G-31.9=	10G MR, SFP+ 1531.90, 100 GHz, LC	10-2691-01	0 to +70
ONS-SC+-10G-32.6=	10G MR, SFP+ 1532.68, 100 GHz, LC	10-2692-01	0 to +70
ONS-SC+-10G-33.4=	10G MR, SFP+ 1533.47, 100 GHz, LC	10-2694-01	0 to +70
ONS-SC+-10G-34.2=	10G MR, SFP+ 1534.25, 100 GHz, LC	10-2698-01	0 to +70
ONS-SC+-10G-35.0=	10G MR, SFP+ 1535.04, 100 GHz, LC	10-2699-01	0 to +70
ONS-SC+-10G-35.8=	10G MR, SFP+ 1535.82, 100 GHz, LC	10-2700-01	0 to +70
ONS-SC+-10G-36.6=	10G MR, SFP+ 1536.61, 100 GHz, LC	10-2695-01	0 to +70
ONS-SC+-10G-37.4=	10G MR, SFP+ 1537.40, 100 GHz, LC	10-2696-01	0 to +70
ONS-SC+-10G-38.1=	10G MR, SFP+ 1538.19, 100 GHz, LC	10-2701-01	0 to +70
ONS-SC+-10G-38.9=	10G MR, SFP+ 1538.98, 100 GHz, LC	10-2702-01	0 to +70
ONS-SC+-10G-39.7=	10G MR, SFP+ 1539.77, 100 GHz, LC	10-2703-01	0 to +70
ONS-SC+-10G-40.5=	10G MR, SFP+ 1540.56, 100 GHz, LC	10-2704-01	0 to +70
ONS-SC+-10G-41.3=	10G MR, SFP+ 1541.35, 100 GHz, LC	10-2705-01	0 to +70
ONS-SC+-10G-42.1=	10G MR, SFP+ 1542.14, 100 GHz, LC	10-2706-01	0 to +70
ONS-SC+-10G-42.9=	10G MR, SFP+ 1542.94, 100 GHz, LC	10-2707-01	0 to +70
ONS-SC+-10G-43.7=	10G MR, SFP+ 1543.73, 100 GHz, LC	10-2708-01	0 to +70
ONS-SC+-10G-44.5=	10G MR, SFP+ 1544.53, 100 GHz, LC	10-2709-01	0 to +70
ONS-SC+-10G-45.3=	10G MR, SFP+ 1545.32, 100 GHz, LC	10-2710-01	0 to +70
ONS-SC+-10G-46.1=	10G MR, SFP+ 1546.12, 100 GHz, LC	10-2711-01	0 to +70
ONS-SC+-10G-46.9=	10G MR, SFP+ 1546.92, 100 GHz, LC	10-2697-01	0 to +70
ONS-SC+-10G-47.7=	10G MR, SFP+ 1547.72, 100 GHz, LC	10-2712-01	0 to +70
ONS-SC+-10G-48.5=	10G MR, SFP+ 1548.51, 100 GHz, LC	10-2722-01	0 to +70
ONS-SC+-10G-49.3=	10G MR, SFP+ 1549.32, 100 GHz, LC	10-2723-01	0 to +70
ONS-SC+-10G-50.1=	10G MR, SFP+ 1550.12, 100 GHz, LC	10-2713-01	0 to +70
ONS-SC+-10G-50.9=	10G MR, SFP+ 1550.92, 100 GHz, LC	10-2724-01	0 to +70
ONS-SC+-10G-51.7=	10G MR, SFP+ 1551.72, 100 GHz, LC	10-2725-01	0 to +70
ONS-SC+-10G-52.5=	10G MR, SFP+ 1552.52, 100 GHz, LC	10-2717-01	0 to +70
ONS-SC+-10G-53.3=	10G MR, SFP+ 1553.33, 100 GHz, LC	10-2714-01	0 to +70
ONS-SC+-10G-54.1=	10G MR, SFP+ 1554.13, 100 GHz, LC	10-2718-01	0 to +70

Product ID	Product Description	Part Number	Temperature Range (°C)
ONS-SC+-10G-54.9=	10G MR, SFP+ 1554.94, 100 GHz, LC	10-2715-01	0 to +70
ONS-SC+-10G-55.7=	10G MR, SFP+ 1555.75, 100 GHz, LC	10-2716-01	0 to +70
ONS-SC+-10G-56.5=	10G MR, SFP+ 1556.55, 100 GHz, LC	10-2726-01	0 to +70
ONS-SC+-10G-57.3=	10G MR, SFP+ 1557.36, 100 GHz, LC	10-2729-01	0 to +70
ONS-SC+-10G-58.1=	10G MR, SFP+ 1558.17, 100 GHz, LC	10-2719-01	0 to +70
ONS-SC+-10G-58.9=	10G MR, SFP+ 1558.98, 100 GHz, LC	10-2727-01	0 to +70
ONS-SC+-10G-59.7=	10G MR, SFP+ 1559.79, 100 GHz, LC	10-2720-01	0 to +70
ONS-SC+-10G-60.6=	10G MR, SFP+ 1560.61, 100 GHz, LC	10-2728-01	0 to +70
ONS-SC+-10G-61.4=	10G MR, SFP+ 1561.43, 100 GHz, LC	10-2721-01	0 to +70
ONS-SC+-10GEP30.3=	10G MR, Edge Performance SFP+ 1530.33, 100 GHz, LC	10-2873-01	0 to +70
ONS-SC+-10GEP30.7=	10G MR, Edge Performance SFP+ 1530.72, 100 GHz, LC	10-2835-01	0 to +70
ONS-SC+-10GEP31.1=	10G MR, Edge Performance SFP+ 1531.12, 100 GHz, LC	10-2881-01	0 to +70
ONS-SC+-10GEP31.5=	10G MR, Edge Performance SFP+ 1531.51, 100 GHz, LC	10-2829-01	0 to +70
ONS-SC+-10GEP31.9=	10G MR, Edge Performance SFP+ 1531.90, 100 GHz, LC	10-2871-01	0 to +70
ONS-SC+-10GEP32.2=	10G MR, Edge Performance SFP+ 1532.29, 100 GHz, LC	10-2828-01	0 to +70
ONS-SC+-10GEP32.6=	10G MR, Edge Performance SFP+ 1532.68, 100 GHz, LC	10-2882-01	0 to +70
ONS-SC+-10GEP33.0=	10G MR, Edge Performance SFP+ 1533.07, 100 GHz, LC	10-2836-01	0 to +70
ONS-SC+-10GEP33.4=	10G MR, Edge Performance SFP+ 1533.47, 100 GHz, LC	10-2874-01	0 to +70
ONS-SC+-10GEP33.8=	10G MR, Edge Performance SFP+ 1533.86, 100 GHz, LC	10-2834-01	0 to +70
ONS-SC+-10GEP34.2=	10G MR, Edge Performance SFP+ 1534.25, 100 GHz, LC	10-2891-01	0 to +70
ONS-SC+-10GEP34.6=	10G MR, Edge Performance SFP+ 1534.64, 100 GHz, LC	10-2833-01	0 to +70
ONS-SC+-10GEP35.0=	10G MR, Edge Performance SFP+ 1535.04, 100 GHz, LC	10-2883-01	0 to +70
ONS-SC+-10GEP35.4=	10G MR, Edge Performance SFP+ 1535.43, 100 GHz, LC	10-2832-01	0 to +70
ONS-SC+-10GEP35.8=	10G MR, Edge Performance SFP+ 1535.82, 100 GHz, LC	10-2884-01	0 to +70
ONS-SC+-10GEP36.2=	10G MR, Edge Performance SFP+ 1536.22, 100 GHz, LC	10-2830-01	0 to +70
ONS-SC+-10GEP36.6=	10G MR, Edge Performance SFP+ 1536.61, 100 GHz, LC	10-2885-01	0 to +70
ONS-SC+-10GEP37.0=	10G MR, Edge Performance SFP+ 1537.00, 100 GHz, LC	10-2827-01	0 to +70
ONS-SC+-10GEP37.4=	10G MR, Edge Performance SFP+ 1537.40, 100 GHz, LC	10-2875-01	0 to +70
ONS-SC+-10GEP37.7=	10G MR, Edge Performance SFP+ 1537.79, 100 GHz, LC	10-2831-01	0 to +70
ONS-SC+-10GEP38.1=	10G MR, Edge Performance SFP+ 1538.19, 100 GHz, LC	10-2876-01	0 to +70
ONS-SC+-10GEP38.5=	10G MR, Edge Performance SFP+ 1538.58, 100 GHz, LC	10-2826-01	0 to +70
ONS-SC+-10GEP38.9=	10G MR, Edge Performance SFP+ 1538.98, 100 GHz, LC	10-2886-01	0 to +70
ONS-SC+-10GEP39.3=	10G MR, Edge Performance SFP+ 1539.37, 100 GHz, LC	10-2825-01	0 to +70
ONS-SC+-10GEP39.7=	10G MR, Edge Performance SFP+ 1539.77, 100 GHz, LC	10-2887-01	0 to +70
ONS-SC+-10GEP40.1=	10G MR, Edge Performance SFP+ 1540.16, 100 GHz, LC	10-2824-01	0 to +70
ONS-SC+-10GEP40.5=	10G MR, Edge Performance SFP+ 1540.56, 100 GHz, LC	10-2888-01	0 to +70
ONS-SC+-10GEP40.9=	10G MR, Edge Performance SFP+ 1540.95, 100 GHz, LC	10-2823-01	0 to +70
ONS-SC+-10GEP41.3=	10G MR, Edge Performance SFP+ 1541.35, 100 GHz, LC	10-2872-01	0 to +70
ONS-SC+-10GEP41.7=	10G MR, Edge Performance SFP+ 1541.75, 100 GHz, LC	10-2819-01	0 to +70
ONS-SC+-10GEP42.1=	10G MR, Edge Performance SFP+ 1542.14, 100 GHz, LC	10-2889-01	0 to +70
ONS-SC+-10GEP42.5=	10G MR, Edge Performance SFP+ 1542.54, 100 GHz, LC	10-2822-01	0 to +70
ONS-SC+-10GEP42.9=	10G MR, Edge Performance SFP+ 1542.94, 100 GHz, LC	10-2877-01	0 to +70
ONS-SC+-10GEP43.3=	10G MR, Edge Performance SFP+ 1543.33, 100 GHz, LC	10-2821-01	0 to +70

Product ID	Product Description	Part Number	Temperature Range (°C)
ONS-SC+-10GEP43.7=	10G MR, Edge Performance SFP+ 1543.73, 100 GHz, LC	10-2878-01	0 to +70
ONS-SC+-10GEP44.1=	10G MR, Edge Performance SFP+ 1544.13, 100 GHz, LC	10-2820-01	0 to +70
ONS-SC+-10GEP44.5=	10G MR, Edge Performance SFP+ 1544.53, 100 GHz, LC	10-2879-01	0 to +70
ONS-SC+-10GEP44.9=	10G MR, Edge Performance SFP+ 1544.92, 100 GHz, LC	10-2818-01	0 to +70
ONS-SC+-10GEP45.3=	10G MR, Edge Performance SFP+ 1545.32, 100 GHz, LC	10-2880-01	0 to +70
ONS-SC+-10GEP45.7=	10G MR, Edge Performance SFP+ 1545.72, 100 GHz, LC	10-2816-01	0 to +70
ONS-SC+-10GEP46.1=	10G MR, Edge Performance SFP+ 1546.12, 100 GHz, LC	10-2890-01	0 to +70
ONS-SC+-10GEP46.5=	10G MR, Edge Performance SFP+ 1546.52, 100 GHz, LC	10-2804-01	0 to +70
ONS-SC+-10GEP46.9=	10G MR, Edge Performance SFP+ 1546.92, 100 GHz, LC	10-2892-01	0 to +70
ONS-SC+-10GEP47.3=	10G MR, Edge Performance SFP+ 1547.32, 100 GHz, LC	10-2815-01	0 to +70
ONS-SC+-10GEP47.7=	10G MR, Edge Performance SFP+ 1547.72, 100 GHz, LC	10-2895-01	0 to +70
ONS-SC+-10GEP48.1=	10G MR, Edge Performance SFP+ 1548.11, 100 GHz, LC	10-2814-01	0 to +70
ONS-SC+-10GEP48.5=	10G MR, Edge Performance SFP+ 1548.51, 100 GHz, LC	10-2893-01	0 to +70
ONS-SC+-10GEP48.9=	10G MR, Edge Performance SFP+ 1548.91, 100 GHz, LC	10-2803-01	0 to +70
ONS-SC+-10GEP49.3=	10G MR, Edge Performance SFP+ 1549.32, 100 GHz, LC	10-2894-01	0 to +70
ONS-SC+-10GEP49.7=	10G MR, Edge Performance SFP+ 1549.72, 100 GHz, LC	10-2817-01	0 to +70
ONS-SC+-10GEP50.1=	10G MR, Edge Performance SFP+ 1550.12, 100 GHz, LC	10-2897-01	0 to +70
ONS-SC+-10GEP50.5=	10G MR, Edge Performance SFP+ 1550.52, 100 GHz, LC	10-2802-01	0 to +70
ONS-SC+-10GEP50.9=	10G MR, Edge Performance SFP+ 1550.92, 100 GHz, LC	10-2896-01	0 to +70
ONS-SC+-10GEP51.3=	10G MR, Edge Performance SFP+ 1551.32, 100 GHz, LC	10-2813-01	0 to +70
ONS-SC+-10GEP51.7=	10G MR, Edge Performance SFP+ 1551.72, 100 GHz, LC	10-2899-01	0 to +70
ONS-SC+-10GEP52.1=	10G MR, Edge Performance SFP+ 1552.12, 100 GHz, LC	10-2801-01	0 to +70
ONS-SC+-10GEP52.5=	10G MR, Edge Performance SFP+ 1552.52, 100 GHz, LC	10-2900-01	0 to +70
ONS-SC+-10GEP52.9=	10G MR, Edge Performance SFP+ 1552.93, 100 GHz, LC	10-2811-01	0 to +70
ONS-SC+-10GEP53.3=	10G MR, Edge Performance SFP+ 1553.33, 100 GHz, LC	10-2902-01	0 to +70
ONS-SC+-10GEP53.7=	10G MR, Edge Performance SFP+ 1553.73, 100 GHz, LC	10-2812-01	0 to +70
ONS-SC+-10GEP54.1=	10G MR, Edge Performance SFP+ 1554.13, 100 GHz, LC	10-2901-01	0 to +70
ONS-SC+-10GEP54.5=	10G MR, Edge Performance SFP+ 1554.54, 100 GHz, LC	10-2809-01	0 to +70
ONS-SC+-10GEP54.9=	10G MR, Edge Performance SFP+ 1554.94, 100 GHz, LC	10-2903-01	0 to +70
ONS-SC+-10GEP55.3=	10G MR, Edge Performance SFP+ 1555.34, 100 GHz, LC	10-2808-01	0 to +70
ONS-SC+-10GEP55.7=	10G MR, Edge Performance SFP+ 1555.75, 100 GHz, LC	10-2904-01	0 to +70
ONS-SC+-10GEP56.1=	10G MR, Edge Performance SFP+ 1556.15, 100 GHz, LC	10-2810-01	0 to +70
ONS-SC+-10GEP56.5=	10G MR, Edge Performance SFP+ 1556.55, 100 GHz, LC	10-2905-01	0 to +70
ONS-SC+-10GEP56.9=	10G MR, Edge Performance SFP+ 1556.96, 100 GHz, LC	10-2807-01	0 to +70
ONS-SC+-10GEP57.3=	10G MR, Edge Performance SFP+ 1557.36, 100 GHz, LC	10-2906-01	0 to +70
ONS-SC+-10GEP57.7=	10G MR, Edge Performance SFP+ 1557.77, 100 GHz, LC	10-2806-01	0 to +70
ONS-SC+-10GEP58.1=	10G MR, Edge Performance SFP+ 1558.17, 100 GHz, LC	10-2908-01	0 to +70
ONS-SC+-10GEP58.5=	10G MR, Edge Performance SFP+ 1558.58, 100 GHz, LC	10-2805-01	0 to +70
ONS-SC+-10GEP58.9=	10G MR, Edge Performance SFP+ 1558.98, 100 GHz, LC	10-2907-01	0 to +70
ONS-SC+-10GEP59.3=	10G MR, Edge Performance SFP+ 1559.39, 100 GHz, LC	10-2800-01	0 to +70
ONS-SC+-10GEP59.7=	10G MR, Edge Performance SFP+ 1559.79, 100 GHz, LC	10-2909-01	0 to +70
ONS-SC+-10GEP60.2=	10G MR, Edge Performance SFP+ 1560.20, 100 GHz, LC	10-2799-01	0 to +70
ONS-SC+-10GEP60.6=	10G MR, Edge Performance SFP+ 1560.61, 100 GHz, LC	10-2910-01	0 to +70

Product ID	Product Description	Part Number	Temperature Range (°C)
ONS-SC+-10GEP61.0=	10G MR, Edge Performance SFP+ 1561.01, 100 GHz, LC	10-2798-01	0 to +70
ONS-SC+-10GEP61.4=	10G MR, Edge Performance SFP+ 1561.42, 100 GHz, LC	10-2911-01	0 to +70
ONS-SC+-10GEP61.8=	10G MR, Edge Performance SFP+ 1561.83, 100 GHz, LC	10-2797-01	to +70

Note: MR refers to multi-rate. 10G MR pluggables will support OC-192, STM-64, 10 Gigabit Ethernet, OTU2e, and 8G Fibre Channel rates. The applicable standards to the above DWDM SFP+ in Table 16 are: IEEE 802.3: 10-Gigabit Ethernet, ITU-T G.709, ITU-T G.975: GFEC, ITU-T G.975.1: EFECs, ITU-T694.1: DWDM

SFP+ Smart Cables

Cisco offers a range of copper-based smart SFP+ cable modules. Table 17 lists the details.

Table 17. Active Cable

Product ID	Product Description	Part Number	Applicable Standard	Temperature Range (°C)
ONS-SC+-10G-CU1=	10GBASE-CU SFP+ Cable 1 Meter	37-1188-01	10GE	0 to +70
ONS-SC+-10G-CU3=	10GBASE-CU SFP+ Cable 3 Meter	37-1197-01	10GE	0 to +70
ONS-SC+-10G-CU5=	10GBASE-CU SFP+ Cable 5 Meter	37-1198-01	10GE	0 to +70
ONS-SC+-10G-CU7=	10GBASE-CU SFP+ Cable 7 Meter	37-1196-01	10GE	0 to +70

CXP and CFP Modules

Tables 18 and 19 list the details of the CXP and CFP modules currently offered for the Cisco ONS family.

Table 18. CXP Modules

Product ID	Product Description	Part Number	Applicable Standard	Temperature Range (°C)
ONS-CXP-100G-SR10=	CXP - 100GBASE-SR - Commercial temp	10-2790-01	InfiniBand CXP 12x QDR standard	0 to +70

Table 19. CFP Modules

Product ID	Product Description	Part Number	Applicable Standard	Temperature Range (°C)
ONS-CC-100G-LR4=	100G Multirate CFP - LR4 - Commercial temp	10-2736-01	CFP MSA; IEEE 802.3ba 100GBASE-LR4	0 to +70
ONS-CC-40G-LR4=	40G Multirate CFP - LR4 - Commercial Temp	10-2744-01	CFP MSA; IEEE 802.3ba 40GBASE-LR4	0 to +70
ONS-CC-40G-FR=	40G Multirate CFP- FR - Commercial Temp	10-2839-01	IEEE 802.3bg 40GBASE-FR	0 to +70
ONS-CC-100GE-LR4=	100GE Single rate CFP - LR4 - Commercial temp	10-2795-01	CFP MSA; IEEE 802.3ba 100GBASE-LR4	0 to +70

Cisco offers a range of cables to interconnect CXP and CFPs. Table 20 lists the details.

Table 20. Active Cable

Product ID	Product Description	Part Number	Temperature Range (°C)
ONS-CCC-100G-5=	CXP-CFP MPO cable, 5m long	39-0296-01	0 to +70
ONS-CCC-100G-10=	CXP-CFP MPO cable, 10m long	39-0294-01	0 to +70
ONS-CCC-100G-20=	CXP-CFP MPO cable, 20m long	39-0295-01	0 to +70

Cisco CPAK Modules

Cisco offers a range of Cisco CPAK modules listed in Table 21.

Table 21.   Cisco CPAK Modules

Product ID	Product Description	Part Number	Applicable Standard	Temperature Range (°C)
CPAK-100G-LR4=	CPAK-100G-LR4 Transceiver module, 10km SMF	800-39910-07	GR-20-CORE, GR-326-CORE, GR-1435-CORE, IEEE 802.3ba	0 to +70
CPAK-100G-SR10=	CPAK-100G-SR10 Transceiver module, 100m OM3 MMF	800-41495-01	GR-20-CORE, GR-326-CORE, GR-1435-CORE, IEEE 802.3ba	0 to +70
CPAK-100G-SR4=	100GBASE-SR4 Cisco CPAK Module for MMF	800-103176-01	GR-20-CORE, GR-326-CORE, GR-1435-CORE, IEEE 802.3ba	0 to +70

QSFP+ Modules

Cisco offers a range of QSFP+ modules listed in Table 22.

Table 22.   QSFP+ Modules

Product ID	Product Description	Part Number	Applicable Standard	Temperature Range (°C)
QSFP-40G-SR4=	40GBASE-SR4 QSFP Transceiver Module with MPO Connector	10-2672-03	GR-20-CORE, GR-326-CORE, GR-1435-CORE, IEEE 802.3ba	0 to +70
QSFP-100G-LR4-S=	100GBASE LR4 QSFP Transceiver, LC, 10km over SMF	10-3146-01	GR-20-CORE, GR-326-CORE, GR-1435-CORE, GR-468-CORE, IEEE 802.3ba, IEEE 802.3bm	0 to +70
QSFP-100G-SR4-S=	100GBASE SR4 QSFP Transceiver, MPO, 100m over OM4 MMF	10-3142-01	GR-20-CORE, GR-326-CORE, GR-1435-CORE, GR-468-CORE, IEEE 802.3ba, IEEE 802.3bm	0 to +70
QSFP-4X10G-LR-S=	QSFP 4x10G Transceiver Module, SM MPO, 10KM, Enterprise-Class	10-3118-02	GR-20-CORE, GR-326-CORE, GR-1435-CORE	0 to +70
QSFP-40G-LR4=	Cisco 40GBASE-LR4 QSFP Module for SMF	10-2842-02	GR-20-CORE, GR-326-CORE, GR-1435-CORE, IEEE 802.3ba	0 to +70
ONS-QSFP-4X10-MLR=	4x10Gbps Multi-rate QSFP+, LR	10-3205-01	GR-20-CORE, GR-326-CORE, GR-1435-CORE	0 to +70
ONS-QSFP28-LR4=	100Gbps Multi-rate QSFP28, LR	10-3204-01	GR-20-CORE, GR-326-CORE, GR-1435-CORE, GR-468-CORE, IEEE 802.3ba, IEEE 802.3bm	0 to +70
ONS-QC-16GFC-SW=	4 X 16G Channel QSFP+, MM, C Temp	10-3313-01	Derived from FC-PI-5.	0 to +70
QSFP-100G-SM-SR	100GBASE CWDM4 Lite QSFP Transceiver, 2km over SMF, 10-60C	10-3220-02	100G BASE CWDM4	+10 to +60
ONS-QC-16GFC-LW=	4 X 16G Fiber Channel QSFP+, SM, C Temp	10-3323-01	Derived from FC-PI-5.	0 to +70

CFP2 Modules

Cisco offers brand new Analog CFP2 WDM pluggables capable of operation at 100G, 200G and 250G line rates. The pluggables available currently are listed in Table 23 alongside the new CXP2 pluggables used for multichassis interconnections on the NCS4000 and NCS6000 platforms.

Important Note: The CXP2 shipping today supports only 23Gbps per lane as the maximum linerate.

Table 23. CFP2 and CXP2 Modules

Product ID	Product Description	Part Number	Temperature Range (°C)
ONS-CFP2-WDM=	100G QPSK/200G 16-QAM - WDM CFP2 Pluggable	10-3128-02	-5 to +75
ONS-CFP2-WDM-1KE=	100G QPSK / 200G 16-QAM - WDM CFP2 Pluggable, Enhanced	10-3231-01	0 to +70
ONS-CFP2-WDM-1KL=	100G QPSK / 200G 16-QAM - WDM CFP2 Pluggable, C temp	10-3230-01	0 to +70
ONS-CXP2-SR25	CXP2 Transceiver module - 12x25G - Fabric Interconnect	10-3250-01	0 to +70

Chapter 2: Pluggable Transceiver Technical Specifications

SONET/SDH SFP Modules

Cisco SFP modules are compatible with SONET/SDH standards, and they support the digital diagnostic functions specified in the SFF-8742 Multi-Source Agreement (MSA). Table below lists the optical parameters for the Cisco ONS SONET/SDH SFP modules.

Table 24. SONET/SDH SFP Modules: Optical Specifications

Product ID	Operating Wavelength Range (nm)	Transmit Power Range (dBm)	Receiver Power Range (dBm)	Maximum Dispersion (ps/nm)
15454-SFP3-1-IR= ONS-SI-155-I1=	1261-1360	-15 to -8	-28 to -8	96 (at 155.52 Mbps)
ONS-SI-155-L1=	1263-1360	-5 to 0	-34 to -10	-
ONS-SI-155-L2=	1480-1580	-5 to 0	-34 to -10	-
ONS-SI-155-SR-MM=	1270-1380	-20 to -14	-30 to -14	-
ONS-SI-622-SR-MM=	1270-1380	-20 to -14 (50 μm) -24 to -14 (62.5 μm)	-26 to -14	-
15454-SFP12-4-IR= ONS-SI-622-I1=	1293-1334	-15 to -8	-28 to -8	46 (at 622.08 Mbps)
ONS-SI-622-L1=	1280-1335	-3 to +2	-28 to -8	-
ONS-SI-622-L2=	1480-1580	-3 to +2	-28 to -8	-
ONS-SE-2G-S1= ONS-SI-2G-S1=	1266-1360	-10 to -3	-18 to -3	12
ONS-SI-2G-I1= 15454-SFP-OC48-IR=	1260-1360	-5 to 0	-18 to 0	-
ONS-SI-2G-L1=	1280-1335	-2 to +3	-27 to -9	-
ONS-SE-2G-L2= ONS-SI-2G-L2=	1500-1580	-2 to +3	-28 to -9	1200-1600[1]

[1] The indicated dispersion range corresponds to the approximate worst-case dispersion for 80 km G.652/G.654 fiber over the wavelength range 1500-1580 nm.

GBIC and Data SFP Modules

The GBIC and data SFP modules for the Cisco ONS family are compatible with the IEEE 802.3, Single-Byte Command Code Sets Connection architecture (SBCON) Rev. 2.3 [ESCON], as well as ANSI INCITS 352-2002 Information technology - Fibre Channel - Physical Interfaces (FC-PI) Rev. 13 [1xFC and 2xFC]. They also support the digital diagnostic functions specified in the SFF-8742 MSA.

Tables below list the optical parameters for the GBIC and data SFP modules for the Cisco ONS Family.

Table 25. Ethernet Pluggable Modules: Optical Specifications

Product ID	Operating Wavelength Range (nm)	Transmit Power Range (dBm)	Receiver Power Range (dBm)	Maximum Dispersion (ps/nm)	Maximum Target Distance
ONS-SE-100-LX10=	1260-1360	-15 to -8	-28 to -8	-	10 km
ONS-SE-100-FX=	1270-1380	-20 to -14[1]	-31 to -14	-	
ONS-SE-100-BX10U=	1260-1360 (TX) 1480-1580 (RX)	-14 to -8	-28.2 to -7	-	10 km
ONS-SE-100-BX10D=	1480-1580 (TX) 1260-1360 (RX)	-14 to -8	-28.2 to -7	-	10 km
ONS-SE-GE-BXU=	1260-1360 (TX) 1480-1500 (RX)	-9 to -3	-19.5 to -3	-	10 km
ONS-SE-GE-BXD=	1480-1500 (TX) 1260-1360 (RX)	-9 to -3	-19.5 to -3	-	10 km
15327-SFP-LC-SX= 15454-SFP-LC-SX= ONS-SC-GE-SX= ONS-SI-GE-SX= 15454-SFP-GEFC-SX= ONS-SE-G2F-SX= ONS-GC-GE-SX=	770-860	-9.5 to 0	-17 to 0[2]	-	0.5 to 500 m (50/125 μm fiber) 0.5 to 300 m (62.5/125 μm fiber)
15327-SFP-LC-LX= 15454-SFP-LC-LX/LH= 15454-SFP-GE+-LX= ONS-SC-GE-LX= ONS-SI-GE-LX= ONS-SE-G2F-LX= ONS-GC-GE-LX=	1270-1355	-9.5 to -3	-19 to -3[3]	-	10 km
ONS-GC-GE-ZX= ONS-SI-GE-ZX= ONS-SE-GE-ZX=	1500-1580	0 to +5	-23 to -3	1200-1600[4]	80 km

[1] 62.5/125 μm, NA = 0.275 fiber.

[2] Minimum Stressed Sensitivity (10^{-12}): -12.5(62.5um) and -13.5(50um) dBm.

[3] Minimum Stressed Sensitivity (10^{-12}): -14.4 dBm.

[4] The indicated dispersion range corresponds to the approximate worst-case dispersion for 80 km G.652/G.654 fiber over the wavelength range 1500-1580 nm.

Table 26. ESCON SFP Module: Optical Specifications

Product ID	Operating Wavelength Range (nm)	Transmit Power Range (dBm)	Receiver Power Range (dBm)	Maximum Dispersion (ps/nm)	Maximum Target Distance
15454-SFP-200= ONS-SE-200-MM=	1280-1380	-20.5 to -15	-14 to -29[1]	-	2 km

[1] Based on any valid 8B/10B code pattern measured at, or extrapolated to, 10E-15 BER measured at center of eye.

Table 27. Fibre Channel/FICON Pluggable Modules: Optical Specifications

Product ID	Operating Wavelength Range (nm)	Transmit Power Range (dBm)	Receiver Sensitivity (dBm)	Operating Distance (m)
1G FC/FICON (1062.5 Kbps)				
15454-SFP-GEFC-SX= ONS-SE-G2F-SX=	770-860	-10 to -3.5	-22	0.5 to 500 m (50/125 μm fiber) 0.5 to 300 m (62.5/125 μm fiber)
ONS-GX-2FC-MMI=	770-860	-10 to -2.5	-22	0.5 to 500 m (50/125 μm fiber) 0.5 to 300 m (62.5/125 μm fiber)
15454-SFP-GE+-LX= ONS-SE-G2F-LX=	1270-1360	-10 to -3.5	-22	2 to 10,000
ONS-GX-2FC-SML=	1270-1355	-9 to -3	-23.5	2 to 10,000

Product ID	Operating Wavelength Range (nm)	Transmit Power Range (dBm)	Receiver Sensitivity (dBm)	Operating Distance (m)
2G FC/FICON (2125 Kbps)				
15454-SFP-GEFC-SX= ONS-SE-G2F-SX=	830-860	-10 to -3.5	-20	0.5 to 300
ONS-GX-2FC-MMI=	820-860	-9.5 to -5	-15	0.5 to 300
15454-SFP-GE+-LX= ONS-SE-G2F-LX=	1270-1360	-10 to -3.5	-21	2 to 10,000
ONS-GX-2FC-SML=	1270-1355	-9 to -3	-23.5	2 to 10,000
4G FC/FICON (4250 Kbps)				
ONS-SE-4G-MM=	830-860	-9 to -3.5	-15	0 to 150 (50/125 μm fiber) 0 to 70 (62.5/125 μm fiber)
ONS-SE-4G-SM=	1270-1355	-8.4 to -3	29 μW OMA[1]	2 to 10,000

[1] Specified OMA at 4.25 Gbps is equivalent to an average power of -17.3 dBm at an ER of 9 dB.

Multirate SFP Module and Video SFP Modules

Table 28 shows the optical parameters of the multirate SFP module. Table below shows the parameters of video SFP modules.

Table 28.   Multirate SFP Module: Optical Parameters

Product ID	Operating Wavelength Range (nm)	Optical Transmit Power (dBm)	Receive Sensitivity (dBm)
ONS-SE-Z1=	1270-1360 (Tx) 1270-1600 (Rx)	-5 to 0	-18 (OC-48/STM-16 -22 (GE) -23 (OC-12/STM-4) -23 (OC-3/STM-1)

Table 29.   Video SFP Modules: Optical Parameters

Product ID	Operating Wavelength Range (nm)	Optical Transmit Power (dBm)	Receive Sensitivity (dBm)
ONS-SC-HD3GV-TX=	1270 - 1350 (min - max), 1310 (typical)	-3 to 0	-20
ONS-SC-HD3GV-RX=	1270 - 1350 (min - max), 1310 (typical)	-3 to 0	-20

Optical Service Channel SFP Module

Table below shows the optical parameters of the multirate Optical Service Channel SFP module.

Table 30.   Multirate Optical Service Channel SFP Module: Optical Parameters

Product ID	Operating Wavelength Range (nm)	Optical Transmit Power (dBm)	Maximum Dispersion (ps/nm)	Receive Sensitivity (dBm)
ONS-SC-OSC-ULH=	1500-1520	1 to 5	4000	-43
ONS-SC-OSC-18.0=	1518	2.5 to 7	4000	-43

CWDM and DWDM GBICs

Cisco ONS 15454 GBICs support both CWDM and DWDM. The specifications are shown in the tables below.

Table 31.   CWDM GBIC: Optical Specifications

Product ID	Transmit Power Range (dBm)	Receiver Wavelength Range (nm)	Receiver Power Range (dBm)	Dispersion Penalty (dB)
15454-GBIC-xxxx=[1]	+1 to +5	1450-1620	-29 to -7	2 (at 60 km) 3 (at 100 km)

[1] Product ID xxxx ranges from 1470 to 1610.

Table 32. DWDM GBIC: Optical Specifications

Product ID	Receiver Wavelength Range (nm)	Transmitter Stability (pm)	Transmit Power Range (dBm)	Receiver Power Range (dBm)	Dispersion Penalty (dB)
15454-GBIC-xx.x=[1]	1450-1620	-100 to +100 (100GHz spacing)	-2 to +3	-28 to -7 (BER 10-12)	2 (at 60 km) 3 (at 100 km)

[1]Product ID xx.x ranges from 30.3 to 60.6.

CWDM and DWDM SFP Modules

Cisco offers a set of CWDM SFP modules for 155 Mbps and 622 Mbps, as well as DWDM SFPs for 2.5-Gbps applications.

Table 33. CWDM SFP Modules: Optical Specifications

Product ID	Receiver Wavelength Range (nm)	Spectral Width (nm)	Transmit Power Range (dBm)	Receiver Power Range (dBm)
ONS-SE-155-xxxx=[1]	1460-1620	1	0 to +5	-34 to -3 (BER 10-10)
ONS-SE-622-xxxx=	1460-1620	1	0 to +5	-28 to -3 (BER 10-10)
ONS-SC-Z3-xxxx=	1460-1620	1	0 to +4	-28 to -9 (BER 10-10)
ONS-SE-2G-xxxx=	1460-1620	1	-1 to +4	-28 to -9 (BER 10-12)

[1] Product ID xxxx ranges from 1470 to 1610.

Table 34. DWDM SFP Modules: Optical Specifications

Product ID	Receiver Wavelength Range (nm)	Transmitter Stability (pm)	Spectral Width (pm)	Transmit Power Range (dBm)
ONS-SC-2G-xx.x=[1]	1260-1620[2]	-100 to +100 (100 GHz spacing)	200	0 to +4
ONS-SC-4G-xx.x=	1260-1620	-100 to +100 (100 GHz spacing)	200	+3 to +7

[1] Product ID xx.x ranges from 30.3 to 60.6.

[2] Receiver sensitivity specified over 1528-1561 nm only, with 2 dB degradation permitted outside of this range.

Table 35. DWDM SFP Modules: Optical Performance

Optical Performance					
Power-Limited Performances					
		2G DWDM SFP		4G DWDM SFP	
Input power range	dBm	-9 to -28	At BER=10e-12 with SONET framed PRBS23 at OSNR of 21dB, 0.1nm BW	-9 to -22	At BER=10e-12 with SONET framed PRBS23 at OSNR of 26dB, 0.1nm RBW
Dispersion tolerance	ps/nm	-800 to +2400	Power Penalty=3dB, OSNR=21dB at 0.1nmBW (Noise Penalty=0dB)	-800 to +1600	-9 to -20 dBm with OSNR=26dB at 0.1nm RBW (Noise Penalty=0dB)
Noise-Limited Performances					
Input power range	dBm	-9 to -22	At BER=10e-12 with SONET framed PRBS23 at OSNR of 16dB at 0.1nm bandwidth	-9 to -18	At BER=10e-12 with SONET framed PRBS23 at OSNR of 22dB at 0.1nm bandwidth
Dispersion tolerance	ps/nm	-800 to +2400	Noise Penalty=3dB, OSNR=19dB at 0.1nmBW (Power Penalty=0dB)	-800 to +1600	-9 to -18 dBm with OSNR=25dB at 0.1nmBW (Power Penalty=0dB)

Grey XFP Modules

Cisco offers a set of Grey XFP modules for 10-Gbps applications. Table below lists the optical parameters.

Table 36. XFP Modules: Optical Specifications

Product ID	Transmitter Wavelength Range (nm)	Transmit Power Range (dBm)	Receiver Wavelength Range (nm)	CD Robustness (ps/nm)	Receiver Power Range (dBm)
ONS-XC-10G-S1=	1260-1335	-6 to -1[1] -8.2 to +0.5[2]	1260-1565	6.6	-11 to -1[1] -14.4 to +0.5[2, 3]
ONS-XC-10G-I2=	1530-1565	-1 to +2	1260-1565	800	-14 to +2
ONS-XC-10G-L2=	1530-1565	0 to +4	1260-1565	1600	-24 to -7
ONS-XC-10G-SR-MM=	840-860	-7.3 to -1	840-860	-	-9.9 to -1
ONS-XC-8G-SM=	1260-1360	-8.4 to +0.5	1260-1360	-	-13.8 (-11.8 stressed) to +0.5 (targeting up to 10km distance)
ONS-XC-8G-MM=	840-860	-8.2 to -1.5	840-860	-	0.151 mW (stressed received in OMA)

[1] SONET/SDH application

[2] 10 Gigabit Ethernet/10G Fibre Channel application

[3] Stressed receiver sensitivity (maximum) in OMA is -10.3 dBm

DWDM XFP Modules

Cisco offers a set of DWDM XFP modules for 10-Gbps applications. Tables 37-39 list the optical specifications of all the variants.

Table 37. DWDM XFP Modules: Optical Specifications

Product ID	Receiver Wavelength Range (nm)	Transmitter Stability (pm)	Spectral Width (pm)	Transmit Power Range (dBm)
ONS-XC-10G-xx.x=[1]	1260-1607	-100 to +100 (100 GHz spacing)	200	-1 to +3
ONS-XC-10G-C=	1260-1607	-25 to +25 (50 GHz spacing)	200	0 to +3
ONS-XC-10G-96C=	1260-1607	-25 to +25 (50 GHz spacing)	200	0 to +3

[1] Product ID xx.x ranges from 30.3 to 61.4.

Table 38. Fixed Wavelength DWDM XFP Modules: Optical Performance

Optical Performance			
Short Wavelength Performances			
Input power range	dBm	-7 to -20	At BER=10e-12 (at 1310 nm ± 20 nm) applicable at 9.9G, 10.3G only
Long Wavelength Performances C Band NO-FEC Applications Power-Limited			
Input power range	dBm	-7 to -23	At BER=10e-12 applicable at 9.9G, 10.3G only 23 dB OSNR (0.5 nm RBW)
Input power range	dBm	-7 to -20	At BER=10e-12 (-500 to +1600 ps/nm) applicable at 9.9G, 10.3G only - 23 dB OSNR (0.5nm RBW)
Long Wavelength Performances C Band NO-FEC Applications Noise-Limited			
Input power range	dBm	-7 to -18	At BER=10e-12 applicable at 9.9G, 10.3G only 17dB OSNR (0.5 nm RBW)
Input power range	dBm	-7 to -18	At BER=10e-12 (-500 to +1600 ps/nm) applicable at 9.9G, 10.3G only - 20 dB OSNR (0.5 nm RBW)

Optical Performance			
Long Wavelength Performances C Band FEC Applications Noise-Limited			
Input power range	dBm	-7 to -18	At BER PREFEC <10e-5 applicable at 10.7G, 11.1G only - 11 dB OSNR (0.5 nm RBW)
Input power range	dBm	-7 to -18	At BER PREFEC <10e-5 (-500 to +1100 ps/nm) applicable at 10.7G, 11.1G only - 12dB OSNR (0.5 nm RBW)
Long Wavelength Performances C Band E-FEC Applications Power-Limited			
Input power range	dBm	-7 to -27	At BER PREFEC <7*10e-4 applicable at 10.7G, 11.1G only - 23dB OSNR
Input power range	dBm	-7 to -24	At BER PREFEC <7*10e-4 (-500 to +1300 ps/nm) applicable at 10.7G, 11.1G only - 23 dB OSNR (0.5 nm RBW)
Long Wavelength Performances C Band E-FEC Applications Noise-Limited			
Input power range	dBm	-7 to -18	At BER PREFEC <7*10e-4 applicable at 10.7G, 11.1G only - 8 dB OSNR (0.5 nm RBW)
Input power range	dBm	-7 to -18	At BER PREFEC <7*10e-4 (-500 to +1100 ps/nm) applicable at 10.7G, 11.1G only - 9 dB OSNR (0.5 nm RBW)

Table 39. Edge Performance Fixed Wavelength DWDM XFP Modules: Optical Performance

Optical Performance			
Short Wavelength Performances			
Input power range	dBm	-7 to -20	At BER=10e-12 (at 1310 nm ± 20 nm) applicable at 9.9G, 10.3G only
Long Wavelength Performances C Band NO-FEC Applications Power-Limited			
Input power range	dBm	-7 to -23	At BER=10e-12 applicable at 9.9G, 10.3G only 23 dB OSNR (0.5 nm RBW)
Input power range	dBm	-7 to -20	At BER=10e-12 (-500 to +1100 ps/nm) applicable at 9.9G, 10.3G only - 23 dB OSNR (0.5 nm RBW)
Long Wavelength Performances C Band NO-FEC Applications Noise-Limited			
Input power range	dBm	-7 to -18	At BER=10e-12 applicable at 9.9G, 10.3G only 17 dB OSNR (0.5 nm RBW)
Input power range	dBm	-7 to -18	At BER=10e-12 (-500 to +1100 ps/nm) applicable at 9.9G, 10.3G only - 20 dB OSNR (0.5 nm RBW)
Long Wavelength Performances C Band FEC Applications Noise-Limited			
Input power range	dBm	-7 to -18	At BER PREFEC <10e-5 applicable at 10.7G, 11.1G only - 11 dB OSNR (0.5 nm RBW)
Input power range	dBm	-7 to -18	At BER PREFEC <10e-5 (-500 to +1100 ps/nm) applicable at 10.7G, 11.1G only - 12 dB OSNR (0.5 nm RBW)
Long Wavelength Performances C Band E-FEC Applications Power-Limited			
Input power range	dBm	-7 to -27	At BER PREFEC <7*10e-4 applicable at 10.7G, 11.1G only - 23 dB OSNR
Input power range	dBm	-7 to -24	At BER PREFEC <7*10e-4 (-500 to +1100 ps/nm) applicable at 10.7G, 11.1G only - 23 dB OSNR (0.5 nm RBW)
Long Wavelength Performances C Band E-FEC Applications Noise-Limited			
Input power range	dBm	-7 to -18	At BER PREFEC <7*10e-4 applicable at 10.7G, 11.1G only - 8 dB OSNR (0.5 nm RBW)
Input power range	dBm	-7 to -18	At BER PREFEC <7*10e-4 (-500 to +1100 ps/nm) applicable at 10.7G, 11.1G only - 9 dB OSNR (0.5 nm RBW)

Table 40. Full C Band Tunable Wavelength DWDM XFP Modules: Optical Performance
[ONS-XC-10G-C= and ONS-XC-10G-96C=]

Optical Performance			
Short Wavelength Performances			
Input power range	dBm	-7 to -20	At BER=10e-12 (at 1310 nm ± 20nm) applicable at 9.9G, 10.3G only
Long Wavelength Performances C Band NO-FEC Applications Power-Limited			
Input power range	dBm	-7 to -24	At BER=10e-12 applicable at 9.9G, 10.3G only 23dB OSNR (0.5nm RBW)
Input power range	dBm	-7 to -22	At BER=10e-12 (-500 to +1600 ps/nm) applicable at 9.9G, 10.3G only - 23 dB OSNR (0.5 nm RBW)

Optical Performance			
Long Wavelength Performances C Band NO-FEC Applications Noise-Limited			
Input power range	dBm	-7 to -22	At BER=10e-12 applicable at 9.9G, 10.3G and 10.5 only 19dB OSNR (0.5 nm RBW)
Input power range	dBm	-7 to -20	At BER=10e-12 (-500 to +1600 ps/nm) applicable at 9.9G, 10.3G and 10.5G only - 19 dB OSNR (0.5 nm RBW)
Long Wavelength Performances C Band FEC Applications Noise-Limited			
Input power range	dBm	-7 to -18	At BER PREFEC <10e-5 applicable at 10.7G, 11.1G only - 8.5 dB OSNR (0.5 nm RBW)
Input power range	dBm	-7 to -18	At BER PREFEC <10e-5 (-400 to +1000 ps/nm) applicable at 10.7G, 11.1G only - 10 dB OSNR (0.5 nm RBW)
Long Wavelength Performances C Band E-FEC Applications Power-Limited			
Input power range	dBm	-7 to -27	At BER PREFEC <7*10e-4 applicable at 10.7G, 11.1G only - 19 dB OSNR
Input power range	dBm	-7 to -26	At BER PREFEC <7*10e-4 (-400 to +1300 ps/nm) applicable at 10.7G, 11.1G and 11.3G only - 19 dB OSNR (0.5 nm RBW)
Long Wavelength Performances C Band E-FEC Applications Noise-Limited			
Input power range	dBm	-7 to -20	At BER PREFEC <7*10e-4 applicable at 10.7G, 11.1G only - 5 dB OSNR (0.5 nm RBW)
Input power range	dBm	-7 to -20	At BER PREFEC <7*10e-4 (-400 ps/nm) applicable at 10.7G, 11.1G and 11.3G only - 7.5 dB OSNR (0.5 nm RBW)
Input power range	dBm	-7 to -20	At BER PREFEC <7*10e-4 +1300 ps/nm) applicable at 10.7G, 11.1G and 11.3G only - 7 dB OSNR (0.5 nm RBW)

CWDM XFP Module

Cisco offers a CWDM XFP module for 10-Gbps applications. Table below lists the optical parameters.

Table 41. CWDM XFP Modules: Optical Specifications

Product ID	Wavelength Range Rx (nm)	Sensitivity Rx (dBm)	Stability Tx (nm)	Dispersion Tolerance (ps/nm)	Tx Power Range (dBm)	Supported Bit Rate	Target Distance
ONS-XC-10G-xxxx=[1]	1450-1620	-14	+/- 6.5	0 to +800	+3 to +7	10GE OTU2 OTU2e (up to 11.1Gbps) 10G FC	40 km (OTU2 and 10GE)

[1] Product ID xxxx ranges from 1470 to 1610.

Electrical SFP Modules

Cisco offers multiple options for copper SFP modules. Table below lists the main characteristics.

Table 42. Electrical SFP Module Specifications

Product ID	Bit Rate	Connector	Typical Distance
ONS-SE-ZE-EL=	10/100/1000 Mbps	RJ-45	100 m
ONS-SC-155-EL=	155 Mbps	Standard Coaxial Connector 75Ω	100m
ONS-SC-E3-T3-PW=	34.368 Mbps and 44.736 Mbps	RJ-48	See note
ONS-SC-E1-T1-PW=	1.544 and 2.048 Mbps	RJ-48 (100Ω for T1 and 120Ω for E1)	See note
ONS-SC-EoP1=	1.544 and 2.048 Mbps	RJ-48 (100Ω for T1 and 120Ω for E1)	See note
ONS-SC-EOP3=	34.368 and 44.736 Mbps	RJ-48	See note

Table below lists the specifications for SFP's with electrical interfaces supporting PDH protocols over Ethernet. The table beyond describes the pinout for the electrical connector.

Table 43.   PDHoEthernet SFPs

Product ID	Line Impedance	Cable Type	Cable Length	Short Haul	Long Haul	Connector
ONS-SC-E1-T1-PW= for E1	120Ω, balanced	UTP CAT-5	max, 22 AWG wire	770m (2530 ft)	2664m (8740 ft)	RJ-48
ONS-SC-E1-T1-PW= for T1	100Ω, balanced	UTP CAT-5	max, 22 AWG	1192m (3910 ft)	2874m (9430 ft)	RJ-48
ONS-SC-EoP1= for E1	100Ω, balanced		max, up to 1829m (6000 ft) for AWG 22 cable			
ONS-SC-EoP1= for T1	120Ω, balanced		max, up to 2500m (8202 ft) for AWG 22 cable			
ONS-SC-E3-T3-PW= and ONS-SC-EoP3= for E3	75Ω, unbalanced		max, up to 275m (900 ft)			hDIN 1.0/2.3 connector
ONS-SC-E3-T3-PW= and ONS-SC-EoP3= for T3	75Ω, unbalanced		max, up to 275m (900 ft)			DIN 1.0/2.3 connector

Table 44.   E1/T1 Connector Pin Out

Pin	Function
1	Tx Ring
2	Tx Tip
3, 6, 7, 8	-
4	Rx Ring
5	Rx Tip
S = Conn. Body	FGND/GND

SFP+ Modules

Cisco offers multiple options for SFP+ modules. Technical specifications of various SFP+ units are provided in tables 45 through 51.

Table 45.   SFP+ Modules

Product ID	Transmitter Wavelength Range (nm)	Transmit Power Range (dBm)	Receiver Wavelength Range (nm)	Optical Reach	Receiver Power Range (dBm)
ONS-SC+-10G-SR=	840-860	-7.3 to -1.3	840-860	26 m (FDDI-Grade/62.5 micron) 33 m (OM1/62.5 micron) 66 m (50.0 micron) 82 m (OM2/50.0 micron) 300 m (OM3/50.0 micron)	-11.1 (in OMA) to -1
ONS-SC+-10G-LR=	1260-1355	-8.2 to +0.5	1260-1355	10km	-12.6 (in OMA) to 0.5
ONS-SC+-10G-ER=	1530-1565	-4.7 to +4	1530-1565	40km	-14.1 (in OMA) to -1
ONS-SC+-10G-ZR=	1530-1565	0 to +4	1260-1565	80km	-24 to -7 (no FEC); -27 to -7 (w/ FEC)

Table 46.   DWDM SFP+ Modules: Optical Specifications

Product ID	Receiver Wavelength Range (nm)	Transmitter Stability (pm)	Max Spectral Width (pm)	Transmit Power Range (dBm)	Number of Channels Tunable to
ONS-SC+-10G-xx.x=	1530.3-1560.01	-100 to +100 (100 GHz spacing)	200	-1 to +3	1
ONS-SC+-10GEPxx.x=	1528.77-1566.72	-100 to +100 (100 GHz spacing)	200	-2 to +2	1

ONS-SC+-10G-C=	1528.77-1566.72	50 GHz spacing	200	-1 to +3	96

Table 47. Fixed Wavelength DWDM SFP+ Modules: Optical Performance

Optical Performance: ONS-SC+-10G-xx.x=			
NO FEC Application (10GE LAN and 10GE WAN) - Power Limited			
Input power range	dBm	-7 to -23	At BER=1E-12 with PRBS31 and 10GE frame; Back-to-Back w/ 23 dB OSNR (0.5nm RBW)
Input power range	dBm	-7 to -20	At BER=1E-12 with PRBS31 and 10GE frame; CD of -500 to 900 ps/nm, w/ 23 dB OSNR (0.5nm RBW)
NO FEC Application (10GE LAN and 10GE WAN) - Noise Limited			
Input power range	dBm	-7 to -17	At BER=1E-12 with PRBS31 and 10GE frame; Back-to-Back w/ 17 dB OSNR (0.5nm RBW)
Input power range	dBm	-7 to -17	At BER=1E-12 with PRBS31 and 10GE frame; CD of -500 to 900 ps/nm, w/ 20 dB OSNR (0.5nm RBW)
GFEC Application (OTU2 and OTU2e) - Noise Limited			
Input power range	dBm	-7 to -17	At Pre-FEC BER=1E-5 with PRBS31 and OTU2 frame.; Back-to-Back w/ 11 dB OSNR (0.5nm RBW)
Input power range	dBm	-7 to -17	At Pre-FEC BER=1E-5 with PRBS31 and OTU2 frame.; CD of -500 to 1100 ps/nm, w/ 12 dB OSNR (0.5nm RBW)
EFEC Application (OTU2 and OTU2e) - Power Limited			
Input power range	dBm	-7 to -27	At Pre-FEC BER=1E-3 with PRBS31 and OTU2 frame.; Back-to-Back w/ 23 dB OSNR (0.5nm RBW)
Input power range	dBm	-7 to -24	At Pre-FEC BER=1E-3 with PRBS31 and OTU2 frame.; CD of -500 to 1300 ps/nm, w/ 23 dB OSNR (0.5nm RBW)
EFEC Application (OTU2 and OTU2e) - Noise Limited			
Input power range	dBm	-7 to -17	At Pre-FEC BER=1E-3 with PRBS31 and OTU2 frame.; Back-to-Back w/ 8 dB OSNR (0.5nm RBW)
Input power range	dBm	-7 to -17	At Pre-FEC BER=1E-3 with PRBS31 and OTU2 frame.; CD of -500 to 1100 ps/nm, w/ 9 dB OSNR (0.5nm RBW)

[1] PMD penalty @30ps DGD: The maximum allowable PMD penalty is 1dB of optical power in Power Limited condition or 1 dB of OSNR in Noise Limited condition, when the residual Chromatic Dispersion is 0ps/nm (BTB condition).

[2] PMD penalty @15ps DGD: The maximum allowable PMD penalty is 1dB of optical power in Power Limited condition or 1 dB of OSNR in Noise Limited condition, when the residual Chromatic Dispersion is 1100ps/nm (System condition).

Table 48. Fixed Wavelength Edge Performance DWDM SFP+ Modules: Optical Performance

Optical Performance: ONS-SC+-10GEPxx.x=			
NO FEC Application (10GE LAN and 10GE WAN) - Power Limited			
Input power range	dBm	-7 to -16	At BER=1E-12 with PRBS31 and 10GE frame; With 23 dB OSNR (0.5nm RBW); CD ranging from -400 to 800 ps/nm
Input power range	dBm	-7 to -14	At BER=1E-12 with PRBS31 and 10GE frame; With 23 dB OSNR (0.5nm RBW); CD ranging from -400 to 800 ps/nm
GFEC Application (OTU2 and OTU2e) - Noise Limited			
Input power range	dBm	-7 to -16	At Pre-FEC BER=1E-5 with PRBS31 and OTU2 frame; Back-to-Back w/ 13 dB OSNR (0.5nm RBW)
Input power range	dBm	-7 to -16	At Pre-FEC BER=1E-5 with PRBS31 and OTU2 frame; With 14 dB OSNR (0.5nm RBW); CD ranging from -400 to 800 ps/nm
EFEC Application (OTU2 and OTU2e) - Noise Limited			
Input power range	dBm	-7 to -16	At Pre-FEC BER=1E-3 with PRBS31 and OTU2 frame.; Back-to-Back w/ 8.5 dB OSNR (0.5nm RBW)
Input power range	dBm	-7 to -16	At Pre-FEC BER=1E-3 with PRBS31 and OTU2 frame.; CD of -400 to 800 ps/nm, w/ 9.5 dB OSNR (0.5nm RBW)

[1] PMD penalty @30ps DGD: The maximum allowable PMD penalty is 1dB of optical power in Power Limited condition or 1 dB of OSNR in Noise Limited condition, when the residual Chromatic Dispersion is 0ps/nm (BTB condition).

[2] PMD penalty @15ps DGD: The maximum allowable PMD penalty is 1dB of optical power in Power Limited condition or 1 dB of OSNR in Noise Limited condition, when the residual Chromatic Dispersion is 800ps/nm (System condition).

Table 49.   Fully Tunable 96 ch DWDM SFP+ Modules: Optical Performance

Optical Performance: ONS-SC+-10G-C=			
NO FEC Application (10GE LAN and 10GE WAN) - Power Limited			
Input power range	dBm	-7 to -23	At BER=1E-12 with PRBS31 and 10GE frame; Back-to-Back w/ 23 dB OSNR (0.5nm RBW)
Input power range	dBm	-7 to -20	At BER=1E-12 with PRBS31 and 10GE frame; CD of -500 to 1600 ps/nm, w/ 23 dB OSNR (0.5nm RBW)
NO FEC Application (10GE LAN and 10GE WAN) - Noise Limited			
Input power range	dBm	-7 to -18	At BER=1E-12 with PRBS31 and 10GE frame; Back-to-Back w/ 23 dB OSNR (0.5nm RBW)
Input power range	dBm	-7 to -18	At BER=1E-12 with PRBS31 and 10GE frame; CD of -500 to 1100 ps/nm, w/ 20 dB OSNR (0.5nm RBW)
GFEC Application (OTU2 and OTU2e) - Noise Limited			
Input power range	dBm	-7 to -18	At Pre-FEC BER=1E-5 with PRBS31 and OTU2 frame.; Back-to-Back w/ 11 dB OSNR (0.5nm RBW)
Input power range	dBm	-7 to -18	At Pre-FEC BER=1E-5 with PRBS31 and OTU2 frame.; CD of -500 to 1100 ps/nm, w/ 12 dB OSNR (0.5nm RBW)
EFEC Application (OTU2 and OTU2e) - Power Limited			
Input power range	dBm	-7 to -27	At Pre-FEC BER=1E-3 with PRBS31 and OTU2 frame.; Back-to-Back w/ 23 dB OSNR (0.5nm RBW)
Input power range	dBm	-7 to -24	At Pre-FEC BER=1E-3 with PRBS31 and OTU2 frame.; CD of -500 to 1600 ps/nm, w/ 23 dB OSNR (0.5nm RBW)
EFEC Application (OTU2 and OTU2e) - Noise Limited			
Input power range	dBm	-7 to -18	At Pre-FEC BER=1E-3 with PRBS31 and OTU2 frame.; Back-to-Back w/ 8 dB OSNR (0.5nm RBW)
Input power range	dBm	-7 to -18	At Pre-FEC BER=1E-3 with PRBS31 and OTU2 frame.; CD of -500 to 1100 ps/nm, w/ 9 dB OSNR (0.5nm RBW)

[1] PMD penalty @30ps DGD: The maximum allowable PMD penalty is 1dB of optical power in Power Limited condition or 1 dB of OSNR in Noise Limited condition, when the residual Chromatic Dispersion is 0ps/nm (BTB condition).

[2] PMD penalty @15ps DGD: The maximum allowable PMD penalty is 1dB of optical power in Power Limited condition or 1 dB of OSNR in Noise Limited condition, when the residual Chromatic Dispersion is 1600ps/nm (System condition).

Table 50.   Active Cables

Product ID	Interface Standard Compliance	Cable Length	Connector
ONS-SC+-10G-CU1=	SFF-8431, Appendix E, SFF-8432 and SFF-8472	1m	SFP+ MSA
ONS-SC+-10G-CU3=	SFF-8431, Appendix E, SFF-8432 and SFF-8472	3m	SFP+ MSA
ONS-SC+-10G-CU5=	SFF-8431, Appendix E, SFF-8432 and SFF-8472	5m	SFP+ MSA
ONS-SC+-10G-CU7=	SFF-8431, Appendix E, SFF-8432 and SFF-8472	7m	SFP+ MSA

CXP and CFP Modules

Cisco offers multiple options for CXP and CFP modules. Technical specifications of the units are provided in the tables below.

Table 51.   CXP Modules

Product ID	Transmitter Wavelength Range (nm)	Transmit Power Range (dBm)	Receiver Wavelength Range (nm)	Optical Reach	Receiver Power Range (dBm)
ONS-CXP-100G-SR10=	840-860 (central wavelength range)	Average launch power, each lane	Same as Tx range	Up to 100m (OM3 MMF)	Average receive power, each lane

		(max): 1 Average launch power, each lane (min): -7.6		Up to 150m (OM4 MMF)	(max): 2.4 Average receive power, each lane (min): -9.5

Table 52.   CFP Modules

Product ID	Transmitter Wavelength Range (nm)	Transmit Power Range (dBm)	Receiver Wavelength Range (nm)	Optical Reach	Receiver Power Range (dBm)
ONS-CC-100G-LR4= **and** **ONS-CC-100GE-LR4=**	1295.56 ±1.03 (lane 1) 1300.055 ±1.035 (lane 2) 1304.585 ±1.045 (lane 3) 1309.14 ±1.05 (lane 4)	Total average launch power (max): 10.5 Average launch power, each lane (max): 4.5 Average launch power, each lane (min): -4.3	Same as Tx range	2km to 10km	Total average receive power (max): 10.5 Average receive power, each lane (max): 4.5 Average receive power, each lane (min): -10.6
ONS-CC-40G-LR4=	1271 ±6.5 (lane 1) 1291 ±6.5 (lane 2) 1311 ±6.5 (lane 3) 1331 ±6.5 (lane 4)	Total average launch power (max): 8.3 Average launch power, each lane (max): 2.3 Average launch power, each lane (min): -7	Same as Tx range	2km to 10km	Total average receive power (max): 8.3 Average receive power, each lane (max): 2.3 Average receive power, each lane (min): -13
ONS-CC-40G-FR=	1547.5 ±17.5 (lane 1)	Average launch power (max): 3 Average launch power (min): 0	Same as Tx range	2km	Average receive power (max): 3 Average receive power (min): -6

Cisco CPAK Modules

Technical specifications of the various Cisco CPAK modules offered by Cisco are provided in the table below.

Table 53.   Cisco CPAK Modules Technical Specifications

Product ID	Tx & Rx Wavelength Range (nm)	Tx Range (dBm)	Rx Range (dBm)	Optical Reach	Type
CPAK-100G-LR4=	Four lanes: 1294.53 to 1296.59 1299.02 to 1301.09 1303.54 to 1305.63 1308.09 to 1310.19	-4.3 to 4.5 (per lane)	-10.6 to 4.5 (per lane)	2km to 10km	100GBASE-LR4 1310 nm SMF
CPAK-100G-SR10=	Ten lanes: 850 to 860 nm	-7.6 to -1 (per lane)	-9.5 to 2.4 (per lane)	100m - 150m	100GBASE-SR10 850 nm MMF
CPAK-100G-SR4=	Four lanes: 840 to 860 nm	-8.4 to +2.4 (per lane)	-5.2 to +2.4 (per lane)	70m – 100m	100G BASE SR4 850nm MMF

QSFP+ Modules

Technical specifications of the various QSFP+ modules offered by Cisco are provided in the table below.

Table 54.   QSFP+ Modules Technical Specifications

Product ID	Tx & Rx Wavelength Range (nm)	Tx Range (dBm)	Rx Range (dBm)	Optical Reach	Type
QSFP-40G-SR4=	840 - 860	-7.6 to -1 (per lane)	-9.5 to +2.4 (per lane)	30m (OM2), 100m (OM3), 150m (OM4)	40GBASE-SR4, 4 lanes, 850 nm MMF (4x10GE) and 40GE
QSFP-100G-LR4-S=	Four lanes:1295, 1300, 1304, 1309	-4.3 to +4.5 (per lane)	-8.6 to +4.5 (per lane)	10km	100G BASE LR4

Product ID	Tx & Rx Wavelength Range (nm)	Tx Range (dBm)	Rx Range (dBm)	Optical Reach	Type
QSFP-100G-SR4-S=	840-860	-8.4 to +2.4 (per lane)	-5.2 to +2.4 (per lane)	70m (OM3), 100m (OM4)	100G BASE SR4
QSFP-4X10G-LR-S=	1260 to 1355	-8.2 to +0.5 (per lane)	-14.4 to +0.5 (per lane)	10km	4X10G BASE LR
QSFP-40G-LR4=	Four lanes: 1271, 1291, 1311, 1331	-7 to +2.3 (per lane)	-13.7 to +2.3 (per lane)	10km	40GE BASE LR4
ONS-QSFP-4X10-MLR=	1260 to 1355	-8.2 to +0.5 (per lane)	-14.4 to +0.5 (per lane)	10km	4X10G BASE LR
ONS-QSFP28-LR4=	Four lanes: 1295.56, 1300.05, 1304.58, 1309.14	-4.3 to +4.5 (per lane) – 100GE -0.6 to +4.0 (per lane) – OTU4	-10 to +4.6 (per lane) – 100GE -8.8 to +2.9 (per lane) – OTU4	10km	100G BASE LR4, OTU4
ONS-QC-16GFC-SW=	840 to 860	0 to -7.6 (per lane)	-8.2 to +2.4 (per lane	66m (OM3), 100m (OM4)	16G FC
QSFP-100G-SM-SR	1271, 1291, SMF 1311, 1331	-6.9 to +2.5 (per lane)	-11.1 to +2.5 (per lane)	2km	100G BASE CWDM4
ONS-QC-16GFC-LW=	1325 to 1295 (centered at 1310)	-5 to +2 (per lane)	-11.4 to +2 (per lane)	2km (SMF)	16G FC

CFP2 Modules

Technical specifications of the CFP2-WDM pluggables are detailed in the table below.

The Rx power can go down to -20dB given OSNR penalty is paid per:

0.3 dB for QPSK SD-FEC

0.5 for QPSK HG-FEC (4e-3)

0.8 for QPSK GFEC (1e-5)

1.5 for 200G 16QAM SD-FEC

4.0 for 250G 16QAM 7% SD-FEC

2.5 for 250G 16QAM 20% SD-FEC

Without any OSNR penalty, the Rx power can go to -14dBm for QPSK / BPSK and -12dBm for 16QAM.

Table 55.   Technical Specifications of **ONS-CFP2-WDM=**

Modulation Format		QPSK				16QAM			
Line Rate		100G				200G		250G	
FEC Type		7% GFEC	7% EFEC	7% SD-FEC	20% SD-FEC	7% SD-FEC	20% SD-FEC	7% SD-FEC	20% SD-FEC
Tx Power Tolerance (-5 to -1.5dBm)	Max	+2.5 dB				+2.5 dB			
	Min	0 dB				0 dB			
Tx Power Tolerance (-10 to -5dBm)	Max	+3.3 dB				+3.3 dB			
	Min	0 dB				0 dB			
Tx Power Range	Max	-1.5 dBm				-1.5 dBm			
	Min	-10 dBm				-10 dBm			
Rx Power Range	Max	0 dBm				0 dBm			
	Min	-20 dBm				-20 dBm			

Table 56.   Technical Specifications of **ONS-CFP2-WDM-1KL=**

Modulation Format		QPSK				16QAM			
Line Rate		100G				200G		250G	
FEC Type		7% GFEC	7% EFEC	7% SD-FEC	20% SD-FEC	7% SD-FEC	20% SD-FEC	7% SD-FEC	20% SD-FEC
Tx Power Tolerance (-6.5 to -1.5dBm)	Max	+2.5 dB				+2.5 dB			
	Min	0 dB				0 dB			
Tx Power Tolerance (-11.5 to -6.5dBm)	Max	+3.3 dB				+3.3 dB			
	Min	0 dB				0 dB			
Tx Power Range	Max	-1.5 dBm				-1.5 dBm			
	Min	-11.5 dBm				-11.5 dBm			
Rx Power Range	Max	0 dBm				0 dBm			
	Min	-20 dBm				-20 dBm			

Table 57.   Technical Specifications of **ONS-CFP2-WDM-1KE=**

Modulation Format		QPSK				16QAM			
Line Rate		100G				200G		250G	
FEC Type		7% GFEC	7% EFEC	7% SD-FEC	20% SD-FEC	7% SD-FEC	20% SD-FEC	7% SD-FEC	20% SD-FEC
Tx Power Tolerance (-3 to +2dBm)	Max	+2.5 dB				+2.5 dB			
	Min	0 dB				0 dB			
Tx Power Tolerance (-8 to -3dBm)	Max	+3.3 dB				+3.3 dB			
	Min	0 dB				0 dB			
Tx Power Range	Max	+2 dBm				+2 dBm			
	Min	-8 dBm				-8 dBm			
Rx Power Range	Max	0 dBm				0 dBm			
	Min	-20 dBm				-20 dBm			

CXP2 Pluggable

Technical specifications of the CXP2 are detailed in the table below.

Table 58. Technical Specifications of **ONS-CXP2-SR25**

Product ID	Transmitter & Receiver Wavelength Range (nm)	Transmit Power Range (dBm)	Receiver Power Range (dBm)	Reach / Sensitivity (dBm)	LOS (dBm)
ONS-CXP2-SR25	840-865 (central wavelength range)	Average launch power, each lane at 23Gbps (max): +4 Average launch power, each lane at 23Gbps (min): -6.5	Average receive power, each lane (max): +4 Average receive power, each lane (min): -8.4 Peak Power (per lane) / damage threshold: +7	Receiver Sensitivity (OMA) at 23Gbps: -8.3	LOS Assert threshold: -14.4 to -30 LOS De-Assert threshold: -12.4

Chapter 3: Compatibility Matrix

Tables below indicate which SFP modules are supported on different Cisco optical platforms and line cards.

Table 59. Cisco ONS 15454 MSPP

Product ID	Cisco ONS 15454 MSPP Line Cards												
	E1000-2-G	FC-MR-4	G1K-4	CE1000-4	ML1000-2	ML100-X-8	10G-SR1	10G-XR	MRC-12	MRC-4	MRC-12-2.5G	ML-MR-10	CE-MR-10
ONS-GC-GE-LX=	4.x		4.x	7.0									
ONS-GC-GE-SX=	4.x		4.x	7.0									
ONS-GC-GE-ZX=			4.x	7.0									
15454-GBIC-xx.x=[1]			4.x										
15454-GBIC-xxxx=[2]			4.x										
ONS-GX-2FC-MMI=		5.0											
ONS-GX-2FC-SML=		5.0											
ONS-SE-100-LX10=						6.0							
ONS-SI-100-LX10=						9.0						8.5	8.5
ONS-SE-100-FX=						6.0							
ONS-SI-100-FX=						9.0						8.5	8.5
ONS-SE-100-BX10D=						9.0						8.5	8.5
ONS-SE-100-BX10U=						9.0						8.5	8.5
15454-SFP-LC-SX=					4.x								
15454-SFP-LC-LX/LH=					4.x								
ONS-SC-GE-SX=					4.x								
ONS-SI-GE-SX=					9.0							8.5	8.5
ONS-SC-GE-LX=					4.x								
ONS-SI-GE-LX=					9.0							8.5	8.5
ONS-SI-GE-ZX=					9.0							8.5	8.5
ONS-SE-ZE-EL=												8.5	8.5
ONS-SI-155-SR-MM=									8.0	8.0	8.0		
ONS-SI-155-I1=									6.0	8.0	8.0		

Product ID	Cisco ONS 15454 MSPP Line Cards												
	E1000-2-G	FC-MR-4	G1K-4	CE1000-4	ML1000-2	ML100-X-8	10G-SR1	10G-XR	MRC-12	MRC-4	MRC-12-2.5G	ML-MR-10	CE-MR-10
ONS-SI-155-L1=									6.0	8.0	8.0		
ONS-SI-155-L2=									6.0	8.0	8.0		
ONS-SE-ZE-EL=												8.5	8.5
ONS-SC-155-EL=[3]									8.5		8.5		
ONS-SI-622-SR-MM=									8.0	8.0	8.0		
ONS-SI-622-I1=									6.0	8.0	8.0		
ONS-SI-622-L1=									6.0	8.0	8.0		
ONS-SI-622-L2=									6.0	8.0	8.0		
ONS-SI-2G-S1									6.0	8.0	8.0		
ONS-SI-2G-I1=									6.0	8.0	8.0		
ONS-SI-2G-L1=									6.0	8.0	8.0		
ONS-SI-2G-L2=									6.0	8.0	8.0		
ONS-SE-Z1=									8.0	8.0	8.0		
ONS-SE-155-xxxx[4]									6.0	8.0	8.0		
ONS-SE-622-xxxx[5]									6.0	8.0	8.0		
ONS-SC-2G-xx.x=[6]									6.0	8.0	8.0	9.0[9]	9.0[9]
ONS-SC-Z3-xxxx=[7]									8.0	8.0	8.0	9.0[9]	9.0[9]
ONS-XC-10G-S1=							6.0	6.0					
ONS-XC-10G-I2=								6.0					
ONS-XC-10G-L2=								6.0					
ONS-XC-10G-xx.x=8								8.5					
ONS-XC-10G-EPxx.x=[8]								9.2.1					
ONS-XC-10G-C=								9.1					

[1] For DWDM GBIC, xx.x ranges from 30.3 to 60.6

[2] For CWDM GBIC, xxxx ranges from 1470 to 1610

[3] Valid only for the ETSI/SDH platform

[4] For CWDM 155-Mbps SFP modules, xxxx ranges from 1470 to 1610

[5] For CWDM 622-Mbps SFP modules, xxxx ranges from 1470 to 1610

[6] For DWDM SFP modules, xx.x ranges from 30.3 to 60.6; wavelength 28.7, 33.4, 41.3, 49.3, 57.3 requires Release 8.5

[7] For CWDM SFP modules, xxxx ranges from 1470 to 1610

[8] For DWDM XFP modules, xx.x ranges from 30.3 to 61.4

[9] A maximum of four DWDM or CWDM SFPs can be placed in the ML-MR and CE-MR cards. No other SFPs can be placed in the board. The maximum ambient temperature suitable for this configuration is +45°C

Table 60. Cisco ONS 15454 MSTP

Product ID	Cisco ONS 15454 MSTP Line Cards															
	100M-2.5G MR-TXP	2.5G MR DataMux	4x2.5G FEC MXP	4x2.5G EFEC MXP and MLSE MXP	10G EFEC TXP / 10G MLSE TXP	10G MR DME and MLSE DME	ADM-10G	GE-XP	GE-XPE	10GE-XP(E)	OTU2-XP	40G-MXP/40E-MXP,40ME-MXP	TNC	AR-MXP and AR-XP	AR-XPE	WSE (Encryption)
15454-SFP3-1-IR=	4.5															
ONS-SC-155-EL=							9.0							9.4	9.6	
ONS-SI-155-SR-MM=	8.0													9.4	9.6	
ONS-SI-155-I1=	9.0													9.4	9.6	
ONS-SI-155-L2=							8.0							9.4	9.6	
15454-SFP12-4-IR=	4.5															
ONS-SI-622-I1=	9.0						8.0							9.4	9.6	
15454-SFP-OC48-IR=	4.5		4.6	4.7												
ONS-SE-2G-S1=	5.0		5.0	5.0												
ONS-SE-2G-L2=	5.0			5.0												
ONS-SI-2G-S1	9.0			9.0			8.0									
ONS-SI-2G-I1=	9.0			9.0			8.0									
ONS-SI-2G-L1=				9.2										9.4	9.6	
ONS-SI-2G-L2=	9.0			9.0			8.0							9.4	9.6	
ONS-SE-Z1=	9.1						8.0							9.4	9.6	
ONS-SE-ZE-EL=							8.0	8.0	9.0					9.4	9.6	
15454-SFP-GE+-LX=	4.5	5.0				7.0										
15454-SFP-GEFC-SX=	4.5	5.0				7.0										
ONS-SE-G2F-SX=	5.0	5.0				7.0	8.0	8.0	9.0							
ONS-SE-G2F-LX=	5.0	5.0				7.0	8.0	8.0	9.0							
ONS-SE-GE-ZX=	7.0	7.0														
ONS-SI-GE-ZX=						8.5[1]	8.0	8.0	9.0					9.4	9.6	
ONS-SE-GE-BXU=								9.1	9.1					9.4	9.6	
ONS-SE-GE-BXD=								9.1	9.1					9.4	9.6	
ONS-SI-100-LX10=									9.1					9.4	9.6	
ONS-SI-100-FX=									9.1					9.4	9.6	
ONS-SC-E3-T3-PW=									9.2[13]							
ONS-SC-E1-T1-PW=									9.2[13]							
ONS-SC-EoP1=									9.2[13]							
ONS-SC-EOP3=									9.2[13]							
15454-SFP-200=	4.5															
ONS-SE-200-MM=	7.0	7.0												9.4	9.6	
ONS-SE-4G-MM=						7.0								9.4	9.6	
ONS-SE-4G-SM=						7.0								9.4	9.6	
ONS-SC-OSC-ULH=													9.2			
ONS-SC-OSC-18.0=													9.4			

Product ID	Cisco ONS 15454 MSTP Line Cards															
	100M-2.5G MR-TXP	2.5G MR DataMux	4x2,5G FEC MXP	4x2,5G EFEC MXP and MLSE MXP	10G EFEC TXP / 10G MLSE TXP	10G MR DME and MLSE DME	ADM-10G	GE-XP	GE-XPE	10GE-XP(E)	OTU2-XP	40G-MXP/40E-MXP,40ME-MXP	TNC	AR-MXP and AR-XP	AR-XPE	WSE (Encryption)
ONS-SE-155-xxxx=													9.2	9.4	9.6	
ONS-SC-2G-xx.x=[3]	8.5			8.5			8.5	8.5	9.0				9.4	9.4	9.6	
ONS-SC-Z3-xxxx=[4]	8.5	8.5		8.5			8.5	8.5	9.0				9.2[12]			
ONS-SC-HD3GV-TX=														9.4	9.6	
ONS-SC-HD3GV-RX=														9.4	9.6	
ONS-XC-10G-S1=[9]					5.0[5]		8.0	8.0	9.0	8.0	9.0	9.2		9.4	9.6	
ONS-XC-10G-I2=[6]					8.5		9.1[11]	8.5	9.0	8.5	9.0	9.2		9.4	9.6	
ONS-XC-10G-L2=[2]					7.0[8]				9.1	9.1	9.0	9.2		9.4	9.6	
ONS-XC-10G-xx.x=[7]							8.0	8.0	9.0	8.0	9.0[10]					
ONS-XC-10G-SR-MM=					9.0		9.0	9.0	9.0	9.0	9.0	9.2				
ONS-XC-8G-SM=												9.2		9.4		
ONS-XC-8G-MM=												9.3		9.4		
ONS-XC-10G-xxxx=							9.2	9.2	9.2	9.2		9.2		9.4		
ONS-XC-10G-EPxx.x=[7]							9.2.1	9.2.1	9.2.1	9.2.1	9.2.1	9.2.1		9.4		
ONS-XC-10G-C=							9.1	9.1	9.1	9.1	9.1	9.2		9.4		
ONS-SC+-10G-SR=																9.8
ONS-SC+-10G-LR=																9.8
ONS-SC+-10G-ER=																9.8
ONS-SC+-10G-ZR=																9.8
ONS-SC+-10G-xx.x=																9.8
ONS-SC+-10GEPxx.x=																9.8
ONS-SC+-10G-C=																9.8

[1] Supported in software Release 7.0 but not in 8.0. Supported in Release 8.5

[2] ONS-XC-10G-L2. 10G TXP, when equipped with LR2 XFP, needs to be placed on high-speed slot for power dissipation constraint if using FTA-3 or FTA-48V. If CC-FTA is used, there is no restriction

[3] For DWDM SFP modules, xx.x ranges from 30.3 to 60.6. For DWDM SFP modules, xx.x ranges from 30.3 to 60.6, wavelength 28.7, 33.4, 41.3, 49.3, 57.3 requires Release 8.5. Supports Gigabit Ethernet, 1G Fibre Channel, 2G Fibre Channel, and OC-48, pending board rate support. Only P/N version 02 is qualified on the Cisco ONS 15454 MSTP. DWDM SFP modules will require mandatory CC-FTA use

[4] For CWDM SFP modules, xxxx ranges from 1470 to 1610. Supports Gigabit Ethernet, 1G Fibre Channel, 2G Fibre Channel, and OC-48, pending board rate support. CWDM SFP modules will require mandatory CC-FTA use

[5] 5G IB are supported by ONS-XC-10G-S1= P/N version 03 only on 10E TXP MLSE version

[6] Only P/N version 02 is qualified on the Cisco ONS 15454 MSTP

[7] For DWDM XFP modules, xx.x ranges from 30.3 to 61.4

[8] 10GEBASE-ZR rate is supported starting by Release 8.5.2

[9] P/N 10-2012-02 supports: 10G-1200-SM-LL-L/10GE BASE-LR/10GE BASE-LW/OC192 SR1/STM-64 I-64.1/OTU-2 at 10.7G. P/N 10-2012-03 supports: 10G-1200-SM-LL-L/10GE BASE-LR/10GE BASE-WR/OC192 SR1/STM-64 I.64/OTU-2 at 10.7G, 11.05G and 11.09G

[10] P/N version 02 is required to support 10G Fibre Channel with OTN wrapping at 11.3 Gbps

[11] Supported with limited temperature range up to 45°C ambient temperature

[12] Supported only with 1510 nm wavelength

[13] Maximum of 10 per XPE line card

Table 61. 100G Line Cards for ONS 15454 MSTP and Cisco Network Convergence System 2000 Series

Product ID	ONS 15454 MSTP Line Cards			NCS 2000 Series Line Cards				
	100G LC w/CXP (15454-M-100G-LC-C, 15454-M-100G-ME-C)	2 x CFP LC (15454-M-100G-CFP-LC)	10 x 10G LC (15454-M-10x10G-LC)	100G LC w/CPAK (NCS2K-100G-CK-C)	100G LC w/SD-FEC (NCS2K-100GS-CK-C)	200G Multirate LC (NCS2K-200G-CK-C)	100G Multirate Muxponder (NCS2K-MR-MXP-LIC)	400G OTN XP (NCS2K-400G-XP=)
ONS-SC+-10G-SR=	-	-	9.6	-	-	-	10.3	-
ONS-SC+-10G-LR=	-	-	9.6	-	-	-	10.3	-
ONS-SC+-10G-ER=	-	-	9.6	-	-	-	-	-
ONS-SC+-10G-ZR=	-	-	9.6	-	-	-	-	-
ONS-SC+-10G-xx.x=	-	-	9.6	-	-	-	-	-
ONS-CXP-100G-SR10=	9.6	-	-	-	-	-	-	-
ONS-CC-100G-LR4=	-	9.6	-	-	-	-	-	-
ONS-CC-100GE-LR4=	-	9.6.03	-	-	-	-	-	-
ONS-CC-40G-LR4=	-	9.6	-	-	-	-	-	-
ONS-CC-40G-FR=	-	9.6.03	-	-	-	-	-	-
ONS-SC+-10GEPxx.x=	-	-	9.6.03	-	-	-	10.3	-
ONS-SC+-10G-C=	-	-	9.6.03	-	-	-	10.3	-
ONS-SC+-10G-CUx=	-	-	9.6.03	-	-	-	-	-
CPAK-100G-LR4=	-	-	-	10.0	10.1	10.3	-	-
CPAK-100G-SR10=	-	-	-	10.0	10.1	10.3	-	-
QSFP-40G-SR4=	-	-	-	-	-	-	10.3 (4x10G)	-
ONS-CFP2-WDM=	-	-	-	-	-	-	10.3	10.6.1
ONS-QSFP28-LR4=	-	-	-	-	-	-	-	10.6.1
ONS-QSFP-4X10-MLR=	-	-	-	-	-	-	-	10.6.2
QSFP-100G-LR4-S=	-	-	-	-	-	-	-	10.6.1
QSFP-100G-SR4-S=	-	-	-	-	-	-	-	10.6.1
QSFP-4X10G-LR-S=	-	-	-	-	-	-	-	10.6.1
QSFP-40G-LR4=	-	-	-	-	-	-	10.6.1	-
CPAK-100G-SR4=	-	-	-	10.6.1	-	10.6.1	10.6.1	-
ONS-QC-16GFC-SW=	-	-	-	-	-	-	-	10.6.2
QSFP-100G-SM-SR	-	-	-	-	-	-	-	10.7
ONS-QC-16GFC-LW=	-	-	-	-	-	-	-	10.8

Table 62. Cisco ONS 15600 Multiservice Switching Platform (MSSP)

Product ID	Cisco ONS 15600 MSSP Line Cards	
	ASAP 4PIO CARD	ASAP 1PIO CARD
ONS-SI-155-L2=	6.0	
ONS-SI-622-L2=	6.0	
ONS-SE-Z1=	6.0	
ONS-SI-2G-S1=	6.0	
ONS-SI-2G-I1=	9.0	

Product ID	Cisco ONS 15600 MSSP Line Cards	
	ASAP 4PIO CARD	ASAP 1PIO CARD
ONS-SE-2G-L2=	6.0	
ONS-SI-2G-L2=	9.0	
ONS-SC-2G-xx.x=[1]	6.0	
ONS-XC-10G-S1=		6.0
ONS-XC-10G-I2=		9.0
ONS-XC-10G-L2=		6.0
ONS-XC-10G-xx.x=		9.0

[1] For DWDM SFP modules, xx.x ranges from 30.3 to 60.6.

Table 63.   Cisco ONS 15300 Series Platforms

Product ID	Cisco ONS 15300 Series Line Cards				
	15305	15310-CE-MR-6	15310-CL	15310-MA	15327
15327-SFP-LC-SX=					X
15327-SFP-LC-LX=					X
ONS-SC-GE-SX=	X				X
ONS-SC-GE-LX=	X				X
15454-SFP-LC-SX=	X				
15454-SFP-LC-LX=	X				
ONS-SI-100-LX10=		8.5.1			
ONS-SI-100-FX=		8.5.1			
ONS-SE-100-BX10U=		8.5.1			
ONS-SE-100-BX10D=		8.5.1			
ONS-SI-GE-SX=		8.5.1			
ONS-SI-GE-LX=		8.5.1			
ONS-SI-GE-ZX=		8.5.1			
ONS-SE-ZE-EL=		8.5.1			
ONS-SC-155-EL=				9.0[4]	
ONS-SI-155-SR-MM=				9.1[4]	
ONS-SI-155-I1=			7.0	7.0	
ONS-SI-155-L1=			7.0	7.0	
ONS-SI-155-L2=			7.0	7.0	
ONS-SI-622-I1=			7.0	7.0	
ONS-SI-622-L1=			7.0	7.0	
ONS-SI-622-L2=			7.0	7.0	
ONS-SI-2G-S1=				7.0	
ONS-SI-2G-I1=				7.0	
ONS-SI-2G-L1=				7.0	
ONS-SI-2G-L2=				7.0	
ONS-SE-Z1=				8.5	
ONS-SE-155-xxxx[1]			9.0	7.0	
ONS-SE-622-xxxx[2]			9.0	7.0	

Product ID	Cisco ONS 15300 Series Line Cards				
	15305	15310-CE-MR-6	15310-CL	15310-MA	15327
ONS-SE-2G-xxxx[2]				9.0[4]	
ONS-SC-2G-xx.x=[3]				7.0	

[1] For CWDM 155 Mbps SFP modules, xxxx ranges from 1470 to 1610

[2] For CWDM SFP modules, xxxx ranges from 1470 to 1610

[3] For DWDM SFP modules, xx.x ranges from 30.3 to 60.6. For DWDM SFP modules, xx.x ranges from 30.3 to 60.6, wavelength 28.7, 33.4, 41.3, 49.3, 57.3 requires Release 8.5

[4] 9.0 for 15310-SDH version, 9.0 for 15310-SDH version, 9.1 for SONET version

Table 64.　Cisco ONS 4G Fibre Channel DWDM SFP and MDS Line Card

Cisco MDS Line Cards	Product ID ONW-SC-4G-xx.x=
DS-X9112	X
DS-X9124	X
DS-X9148	X
DS-X9224-96K9	X
DS-X9248-96K9	X
DS-X9248-48K9	X
DS-X9304-18K8	X
DS-C9222I-K9	X
DS-C9124-K9	X

Table 65.　Pluggables on NCS1000

Product ID	NCS 1000 in XR SW Release
QSFP-40G-LR4-S=	6.1.2
QSFP-40G-CSR4=	6.1.2
QSFP-4X10G-LR-S=	6.1.2
QSFP-100G-CWDM4-S=	6.1.2
QSFP-100G-SR4-S=	6.1.2
QSFP-100G-LR4-S	6.1.2
ONS-CFP2-WDM=	6.1.2
QSFP-100G-SM-SR=	6.3.1
QSFP-100G-PSM4-S=	6.3.1
QSFP-100G-AOCX= (X: 1M to 30M)	6.3.1

Table 66.　Pluggables on NCS4000

Product ID	NCS 4000 DWDM/OTN/Packet LC in XR SW Release	NCS 4000 OTN LC in XR SW Release
ONS-QSP28-LR4=	6.1.22	NA
ONS-QSFP-4X10-MLR=	6.1.22	NA
QSFP-40GE-LR4=	6.1.22	NA
ONS-SC+-10G-SR=	NA	5.2.4
ONS-SC+-10G-LR=	NA	5.2.4
ONS-SC+-10G-ER=	NA	5.2.4
ONS-SC+-10G-ZR=	NA	5.2.4
ONS-SC+-10G-C=	NA	5.2.4

Product ID	NCS 4000 DWDM/OTN/Packet LC in XR SW Release	NCS 4000 OTN LC in XR SW Release
CPAK-100G-SR10=	NA	5.2.4
CPAK-100G-LR4-	NA	5.2.4
ONS-CFP2-WDM=	6.1.22	NA

Table 67.   Pluggables on NCS6000

Product ID	NCS 6000 in XR SW Release
ONS-CXP2-SR25	6.3.2

Chapter 4: Physical Details

Tables below list reliability data, power consumption, and cable type to be used for each pluggable module.

Table 68.   SONET/SDH SFP Modules

Product ID	MTBF in Hours	Maximum Power Consumption (W)	Average Latency	Supported Cable Connection
ONS-SE-2G-S1=	3,039,499	1W	900ps	LC-LC
ONS-SE-2G-L2=	5,346,554	1W	900ps	LC-LC
ONS-SI-155-SR-MM=	4,878,048	1W	900ps	LC-LC
ONS-SI-155-I1=	3,039,499	1W	900ps	LC-LC
ONS-SI-155-L1=	5,346,554	1W	900ps	LC-LC
ONS-SI-155-L2=	5,346,554	1W	900ps	LC-LC
ONS-SI-622-SR-MM=	4,761,904	1W	900ps	LC-LC
ONS-SI-622-I1=	3,039,499	1W	900ps	LC-LC
ONS-SI-622-L1=	3,039,499	1W	900ps	LC-LC
ONS-SI-622-L2=	5,346,554	1W	900ps	LC-LC
ONS-SI-2G-S1	3,039,499	1W	900ps	LC-LC
ONS-SI-2G-I1=	9,970,080	1W	900ps	LC-LC
ONS-SI-2G-L1=	3,039,499	1W	900ps	LC-LC
ONS-SI-2G-L2=	5,346,554	1W	900ps	LC-LC

Table 69.   OSC SFP Modules

Product ID	MTBF in Hours	Maximum Power Consumption (W)	Average Latency	Supported Cable Connection
ONS-SC-OSC-ULH=	1,287,720	1W	900ps	LC-LC
ONS-SC-OSC-18.0=	1,287,720	1W	900ps	LC-LC

Table 70.   Data SFP Modules

Product ID	MTBF in Hours	Maximum Power Consumption (W)	Average Latency	Supported Cable Connection
ONS-SI-100-BXD=	9,970,080	1W	900ps	LC-LC
ONS-SI-100-BXU=	9,970,080	1W	900ps	LC-LC
ONS-SE-100-LX10=	9,970,080	1W	900ps	LC-LC
ONS-SI-100-LX10=	9,970,080	1W	900ps	LC-LC
ONS-SE-100-FX=	9,970,080	1W	900ps	LC-LC
ONS-SI-100-FX=	9,970,080	1W	900ps	LC-LC
ONS-SE-GE-BXU=	6,250,000	1W	900ps	LC-LC

Product ID	MTBF in Hours	Maximum Power Consumption (W)	Average Latency	Supported Cable Connection
ONS-SE-GE-BXD=	6,250,000	1W	900ps	LC-LC
ONS-SC-GE-SX=	7,919,921	1W	900ps	LC-LC
ONS-SI-GE-SX=	7,919,921	1W	900ps	LC-LC
ONS-SC-GE-LX=	9,970,080	1W	900ps	LC-LC
ONS-SI-GE-LX=	9,970,080	1W	900ps	LC-LC
ONS-SE-G2F-SX=	7,919,921	1W	900ps	LC-LC
ONS-SE-G2F-LX=	9,970,080	1W	900ps	LC-LC
ONS-SE-200-MM=	9,970,080	1W	900ps	LC-LC
ONS-SE-4G-MM=	7,919,921	1W	900ps	LC-LC
ONS-SE-4G-SM=	3,039,499	1W	900ps	LC-LC

Table 71.   Electrical SFP Modules

Product ID	MTBF in Hours	Maximum Power Consumption (W)	Average Latency	Supported Cable Connection
ONS-SE-ZE-EL=	4,068,349	1	450ns	RJ-45 STP CAT5e and CAT6
ONS-SC-155-EL=	5,714,286	1	450ns	75Ω DIN 1.0/2.3
ONS-SC-E3-T3-PW=	2,496,307	1.25		RJ 45
ONS-SC-E1-T1-PW=	2,496,307	1.1		RJ 45
ONS-SC-EoP1=	5,269,564	1.25		RJ 45
ONS-SC-EOP3=	6,098,205	1.25		RJ 45

Table 72.   Multirate SFP Module

Product ID	MTBF in Hours	Maximum Power Consumption (W)	Average Latency	Supported Cable Connection
ONS-SE-Z1=	3,039,499	1	900ps	

Table 73.   Video SFP Modules

Product ID	MTBF in Hours	Maximum Power Consumption (W)	Average Latency	Supported Cable Connection
ONS-SC-HD3GV-TX=	3,460,200	0.6W	900ps	LC-LC
ONS-SC-HD3GV-RX=	6,096,960	0.6W	900ps	LC-LC

Table 74.   Grey GBICs

Product ID	MTBF in Hours	Maximum Power Consumption (W)	Supported Cable Connection
ONS-GC-GE-LX=	7,919,921	1.8	SC-PC SM
ONS-GC-GE-SX=	9,970,080	1.8	SC-PC MM
ONS-GC-GE-ZX=	5,346,554	1.8	SC-PC SM
ONS-GX-2FC-MMI=	7,919,921	1.8	SC-PC MM
ONS-GX-2FC-SML=	3,039,499	1.8	SC-PC SM

Table 75. Grey XFP Modules

Product ID	MTBF in Hours	Maximum Power Consumption (W)	Average Latency	Supported Cable Connection
ONS-XC-10G-S1=	3,039,506	2.5	5ns	LC-LC
ONS-XC-10G-I2=	3,279,693	3	5ns	LC-LC
ONS-XC-10G-L2=	2,711,429	3	5ns	LC-LC
ONS-XC-10G-SR-MM=	1,974,000	1.5	5ns	LC-LC
ONS-XC-8G-SM=	3,039,506	2.5	5ns	LC-LC
ONS-XC-8G-MM=		1.5	5ns	LC-LC

Table 76. xWDM SFP Modules

Product ID	MTBF	Maximum Power Consumption (W)	Supported Cable Connection
ONS-SC-2G-xx.x=	5,346,554	1	LC-LC
ONS-SC-4G-xx.x=	1,856,000	1.25	LC-LC
ONS-SC-Z3-xxxx=	2,070,393	1.1	LC-LC
ONS-SE-155-xxxx=	5,346,554	1	LC-LC
ONS-SE-622-xxxx=	5,346,554	1	LC-LC
ONS-XC-10G-xx.x=	2,711,000	3.5	LC-LC
ONS-XC-10G-EPxx.x=	2,711,000	3.5	LC-LC
ONS-XC-10G-C=	1,000,000	3.5	LC-LC
ONS-XC-10G-xxxx=	2,711,000	3.5	LC-LC

Table 77. SFP+ Modules

Product ID	MTBF in Hours	Maximum Power Consumption (W)	Supported Cable Connection
ONS-SC+-10G-SR=	1,282,000	1	LC-LC
ONS-SC+-10G-LR=	632,000	1	LC-LC
ONS-SC+-10G-ER=	2,520,000	1	LC-LC
ONS-SC+-10G-ZR=	1,934,000	1	LC-LC
ONS-SC+-10G-xx.x=	1,934,000	1.5	LC-LC
ONS-SC+-10GEPxx.x=	1,934,000	1.5	LC-LC
ONS-SC+-10G-C=	1,934,000	1.5	LC-LC
ONS-SC+-10G-CUx=	1,934,000	1.5	LC-LC

Table 78. CXP Modules

Product ID	MTBF in Hours	Maximum Power Consumption (W)	Supported Cable Connection	Cables Available in Cisco Supported on These Units
ONS-CXP-100G-SR10=	7,100,000	6	24-fiber MPO/MTP Connector (-SR10)	ONS-CCC-100G-5= ONS-CCC-100G-10= ONS-CCC-100G-20=

Table 79. CFP Modules

Product ID	MTBF in Hours	Maximum Power Consumption (W)	Connector Type	Cable Type
ONS-CC-100G-LR4= And ONS-CC-100GE-LR4=	553,000	19	Dual SC/PC	SMF Duplex
ONS-CC-40G-LR4=	1,173,000	19	Dual SC/PC	SMF Duplex
ONS-CC-40G-FR=	1,173,000	8	Dual SC/PC	SMF Duplex

Table 80. Cisco CPAK Modules

Product ID	MTBF in Hours	Maximum Power Consumption (W)	Connector Type	Cable Type
CPAK-100G-LR4=	1,000,000	6.75	Dual SC/PC	SMF Duplex
CPAK-100G-SR10=	1,000,000	4.5	24 Fiber MPO/MTP	MMF (24 fibers)
CPAK-100G-SR4=	1,000,000	6	MPO-12 (MTP)	MMF

Table 81. QSFP+ Modules

Product ID	MTBF in Hours	Maximum Power Consumption (W)	Connector Type	Cable Type
QSFP-40G-SR4=	5,070,000	1.5	MPO12	MMF (OM2, OM3, OM4)
QSFP-100G-LR4-S=	4,385,965	3.5	LC	SMF
QSFP-100G-SR4-S=	8,904,720	3.5	MPO12	MMF OM4
QSFP-4X10G-LR-S=	1,620,746	3.5	MPO12	SMF
QSFP-40G-LR4=	5,070,000	3.5	LC	SMF
ONS-QSFP-4X10-MLR=	500,000	3.5	MPO12	SMF
ONS-QSFP28-LR4=	500,000	4	LC	SMF
ONS-QC-16GFC-SW=	1,620,746	4	MPO12	MMF (OM3, OM4)
QSFP-100G-SM-SR	500,000	3.5	LC	SMF
ONS-QC-16GFC-SW=	1,620,746	4	MPO12	SMF

Table 82. CFP2 Modules

Product ID	MTBF in Hours	Maximum Power Consumption (W)	Connector Type	Cable Type
ONS-CFP2-WDM=	500,000	12W	LC-LC	LC
ONS-CFP2-WDM-1KL=	500,000	12W	LC-LC	LC
ONS-CFP2-WDM-1KE=	500,000	12W	LC-LC	LC

Table 83. CXP2 Module

Product ID	MTBF in Hours	Maximum Power Consumption (W)	Connector Type
ONS-CXP2-SR25	500,000	6W (only Tx CDRs on) 7.2W (both Tx and Rx CDRs on)	24-fiber MPO/MTP Connector

Third-Party Equipment

The use of third-party equipment instead of Cisco ONS SFP products is allowed, but not recommended, for the following reasons.

- Cisco can guarantee Service-Level Agreements (SLAs) only on parts that have undergone the Cisco test plan and validation process. Without comprehensive testing and validation, SFP products may display anomalous behavior that can affect host-board performance.
- Cisco SFP modules reserve specific EEPROM fields to store inventory data such as Product ID, Part Number, Serial Number, and CLEI CODE that are specific to Cisco SFP modules and are required for SLAs.

End-of-Sale and End-of-Life Products

The table below lists the Cisco Pluggable modules in the Cisco ONS family that have reached end-of-sale or end-of-life status, followed by their replacement products.

Table 84.   End-of-Sale and End-of-Life SFP Modules

End-of-Life or End-of-Sale Product ID	Replacement Product ID
15454-SFP-GE+-LX=	ONS-SE-G2F-SX=
15327-SFP-LC-SX=	ONS-SC-GE-SX=
15327-SFP-LC-LX=	ONS-SC-GE-LX=
15454-SFP-LC-SX=	ONS-SC-GE-SX=
15454-SFP-LC-LX=	ONS-SC-GE-LX=

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