



Cisco 10GBASE Dense Wavelength-Division Multiplexing XFP Module

Contents

| | |
|-------------------------------------|---|
| Product overview | 3 |
| Platform support | 3 |
| Warranty | 7 |
| Ordering information | 7 |
| Regulatory and standards compliance | 7 |
| For more information | 8 |
| Cisco Capital | 8 |

Product overview

The Cisco® Dense Wavelength-Division Multiplexing (DWDM) XFP pluggable module (Figure 1) allows enterprise companies and service providers to provide scalable and easy-to-deploy 10 Gigabit LAN, WAN, and Optical Transport Network (OTN) services in their networks.



Figure 1.
Cisco DWDM XFP module

Main features of the Cisco DWDM XFP include:

- The Cisco DWDM XFP supports 10-Gigabit data rates from 9.9G to 11.1G (LAN, WAN, and OTU2/OTU2e).
- The hot-swappable input/output device plugs into an Ethernet XFP port of a Cisco switch or router to link the port with the network.
- The Cisco DWDM XFP supports the Cisco quality identification (ID) feature, which enables a Cisco switch or router to identify whether or not the module is an XFP module certified and tested by Cisco.
- The tunable Cisco DWDM XFP supports 80 tunable ITU 50-GHz wavelengths.
- Cisco DWDM XFP module supports digital optical monitoring capability.

Platform support

The Cisco DWDM XFP is supported across a variety of Cisco switches, routers, and optical transport devices. For more details, refer to the Cisco 10-Gigabit transceivers compatibility matrix at https://www.cisco.com/en/US/docs/interfaces_modules/transceiver_modules/compatibility/matrix/OL_6974.pdf.

Connectors and cabling

- Equipment: standard XFP interface
- Network: dual LC/PC connector

Note: Only connections with patch cords with PC or UPC connectors are supported. Patch cords with APC connectors are not supported. All cables and cable assemblies used must be compliant with the standards specified in the standards section.

Dimensions

- Dimensions (L x W x H): 71 x 18.5 x 8.5 mm. Cisco XFPs typically weigh less than 300 grams.
- Environmental conditions and power requirements:
 - Operating temperature range: 32 to 158°F (0 to 70°C).
 - Storage temperature range: -40 to 185°F (-40 to 85°C).
 - The maximum power consumption per Cisco XFP module is 3.5W.

Optical parameters

Table 1. shows the main optical characteristics for the tunable Cisco DWDM XFP modules.

Table 1. Optical parameters for tunable DWDM XFP

| Parameter | Symbol | Minimum | Typical | Maximum | Units | Notes and Conditions |
|--|--------|---------|---------|---------|-------|--|
| Transmitter | | | | | | |
| Spectral width | | | | 0.2 | nm | Full width, -20 dB from maximum, with resolution bandwidth (RBW) = 0.01 nm |
| Transmitter center wavelength | | x - 25 | x | x + 25 | pm | Refer to Table 3 for center wavelengths |
| Side-mode suppression ratio | SMSR | 30 | | | dB | |
| Transmitter extinction ratio | | 9 | | | dB | |
| Transmitter optical output power | Pout | 0.0 | | 3.0 | dBm | Average power coupled into single-mode fiber |
| Receiver | | | | | | |
| Receiver optical input wavelength | | 1530 | | 1565 | nm | |
| Receiver damage threshold | | 4.0 | | | dBm | |
| Receiver overload | | -7.0 | | | dBm | |

| Parameter | Symbol | Minimum | Typical | Maximum | Units | Notes and Conditions |
|---|--------|---------|---------|-----------|-------|--|
| Receiver Power Performance | | | | | | |
| | | Units | | Range | | Notes and Conditions |
| Performance at 10G LAN and 10G WAN Rates (NO-FEC Applications) | | | | | | |
| Input power range | | dBm | | -7 to -24 | | At BER=1E-12, back-to-back, unamplified link |
| Input power range (dispersion-limited) | | dBm | | -7 to -22 | | At BER=1E-12, -500 to 1600 ps/nm chromatic dispersion, unamplified link |
| Input power range (dispersion- and noise-limited) | | dBm | | -7 to -20 | | At BER=1E-12, -500 to 1600 ps/nm chromatic dispersion, amplified link with min 26dB OSNR (0.1nm RBW) |
| Performance at OTU2/OTU2e Rates (FEC Applications) | | | | | | |
| Input power range | | dBm | | -7 to -27 | | At BER=1E-3 (pre-EFEC), back-to-back, unamplified link |
| Input power range (dispersion-limited) | | dBm | | -7 to -26 | | At BER=1E-3 (pre-EFEC), -400 to 1300 ps/nm chromatic dispersion, unamplified link |
| Input power range (dispersion- and noise-limited) | | dBm | | -7 to -20 | | At BER=1E-3 (pre-EFEC), -400 to 1300 ps/nm chromatic dispersion, amplified link with min 14.5dB OSNR (0.1nm RBW) |
| Input power range (dispersion- and noise-limited) | | dBm | | -7 to -18 | | At BER=1E-5 (pre-GFEC), -400 to 1100 ps/nm chromatic dispersion, amplified link with min 17dB OSNR (0.1nm RBW) |

Note:

- Parameters are specified over temperature and at end of life unless otherwise noted.
- When shorter distances of single-mode fiber are used, an inline optical attenuator must be used to avoid overloading and damaging the receiver.

Table 2. shows the 80 DWDM ITU-50GHz channels to which the device can be tuned.

Table 2. ITU 50-GHz center wavelengths and channel numbering

| Channel ID | Frequency (THz) | Wavelength (nm) | Channel ID | Frequency (THz) | Wavelength (nm) |
|------------|-----------------|-----------------|------------|-----------------|-----------------|
| 80 | 195.9 | 1530.33 | 79 | 195.85 | 1530.72 |
| 78 | 195.8 | 1531.12 | 77 | 195.75 | 1531.51 |
| 76 | 195.7 | 1531.90 | 75 | 195.65 | 1532.29 |
| 74 | 195.6 | 1532.68 | 73 | 195.55 | 1533.07 |

| Channel ID | Frequency (THz) | Wavelength (nm) | Channel ID | Frequency (THz) | Wavelength (nm) |
|------------|-----------------|-----------------|------------|-----------------|-----------------|
| 72 | 195.5 | 1533.47 | 71 | 195.45 | 1533.86 |
| 70 | 195.4 | 1534.25 | 69 | 195.35 | 1534.64 |
| 68 | 195.3 | 1535.04 | 67 | 195.25 | 1535.43 |
| 66 | 195.2 | 1535.82 | 65 | 195.15 | 1536.22 |
| 64 | 195.1 | 1536.61 | 63 | 195.05 | 1537.00 |
| 62 | 195.0 | 1537.40 | 61 | 194.95 | 1537.79 |
| 60 | 194.9 | 1538.19 | 59 | 194.85 | 1538.58 |
| 58 | 194.8 | 1538.98 | 57 | 194.75 | 1539.37 |
| 56 | 194.7 | 1539.77 | 55 | 194.65 | 1540.16 |
| 54 | 194.6 | 1540.56 | 53 | 194.55 | 1540.95 |
| 52 | 194.5 | 1541.35 | 51 | 194.45 | 1541.75 |
| 50 | 194.4 | 1542.14 | 49 | 194.35 | 1542.54 |
| 48 | 194.3 | 1542.94 | 47 | 194.25 | 1543.33 |
| 46 | 194.2 | 1543.73 | 45 | 194.15 | 1544.13 |
| 44 | 194.1 | 1544.53 | 43 | 194.05 | 1544.92 |
| 42 | 194.0 | 1545.32 | 41 | 193.95 | 1545.72 |
| 40 | 193.9 | 1546.12 | 39 | 193.85 | 1546.52 |
| 38 | 193.8 | 1546.92 | 37 | 193.75 | 1547.32 |
| 36 | 193.7 | 1547.72 | 35 | 193.65 | 1548.11 |
| 34 | 193.6 | 1548.51 | 33 | 193.55 | 1548.91 |
| 32 | 193.5 | 1549.32 | 31 | 193.45 | 1549.72 |
| 30 | 193.4 | 1550.12 | 29 | 193.35 | 1550.52 |
| 28 | 193.3 | 1550.92 | 27 | 193.25 | 1551.32 |
| 26 | 193.2 | 1551.72 | 25 | 193.15 | 1552.12 |
| 24 | 193.1 | 1552.52 | 23 | 193.05 | 1552.93 |
| 22 | 193.0 | 1553.33 | 21 | 192.95 | 1553.73 |
| 20 | 192.9 | 1554.13 | 19 | 192.85 | 1554.54 |
| 18 | 192.8 | 1554.94 | 17 | 192.75 | 1555.34 |
| 16 | 192.7 | 1555.75 | 15 | 192.65 | 1556.15 |
| 14 | 192.6 | 1556.55 | 13 | 192.55 | 1556.96 |
| 12 | 192.5 | 1557.36 | 11 | 192.45 | 1557.77 |
| 10 | 192.4 | 1558.17 | 9 | 192.35 | 1558.58 |

| Channel ID | Frequency (THz) | Wavelength (nm) | Channel ID | Frequency (THz) | Wavelength (nm) |
|------------|-----------------|-----------------|------------|-----------------|-----------------|
| 8 | 192.3 | 1558.98 | 7 | 192.25 | 1559.39 |
| 6 | 192.2 | 1559.79 | 5 | 192.15 | 1560.20 |
| 4 | 192.1 | 1560.61 | 3 | 192.05 | 1561.01 |
| 2 | 192.0 | 1561.42 | 1 | 191.95 | 1561.83 |

Warranty

- Standard warranty: 1 year
- Expedited replacement available via a Cisco SMARTnet® Service support contract

Ordering information

Table 3. gives details about ordering Cisco DWDM XFP.

Table 3. Cisco DWDM XFP ordering information

| Product Number | Description | ITU Channel |
|----------------|--|-------------|
| DWDM-XFP-C | 10GBASE-DWDM tunable XFP (50-GHz ITU grid) | See table 3 |

Regulatory and standards compliance

Standards

- GR-20-CORE: Generic Requirements for Optical Fiber and Optical Fiber Cable
- GR-326-CORE: Generic Requirements for Single-Mode Optical Connectors and Jumper Assemblies
- GR-1435-CORE: Generic Requirements for Multifiber Optical Connectors
- IEEE 802.3: 10-Gigabit Ethernet
- ITU-T G.709: Interfaces for the Optical Transport Network (OTN)
- ITU-T G.975: GFEC
- ITU-T G.975.1: EFEC
- ITU-T G.694.1: DWDM frequency grid

Safety

- Laser Class I 21CFR1040 and IEC 60825

For more information

For more information about Cisco 10GBASE DWDM XFP modules, contact your sales representative.

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