Cisco XFP Modules for 10 Gigabit Ethernet and Packet Over-Sonet Applications

Contents

The Cisco® XFP Module (Figure 1) offers customers a variety of 10 Gigabit Ethernet and Packet-over-SONET/SDH (POS) connectivity options for data center, enterprise wiring closet, and service provider transport applications.

Figure 1.
Cisco XFP Module

Main features of the Cisco XFP Module include:

- Supports 10GBASE Ethernet and OC-192/STM-64 data rates
- Hot-swappable input/output device plugs into a XFP port of a Cisco Systems® router to link the port with the network
- Provides flexibility of interface choice
- Supports “pay-as-you-populate” model
- Supports the digital optical monitoring capability
- Supports the Cisco quality identification (ID) feature that helps enable a Cisco switch or router to identify whether the module is a Cisco certified and tested XFP
- Supports optical interoperability with respective Cisco 10GBASE XENPAK and X2, and SFP+ modules on the same link

Cisco 10GBASE-SR XFP module for MMF

The 10GBASE-SR XFP is dedicated to Ethernet applications only. It supports a link length of 26m on standard FDDI-grade MMF. Up to 300m link lengths are possible when using 2000 MHz/km MMF (OM3). Up to 400m link lengths are possible when using 4700MHz*km MMF (OM4).

Cisco Multirate 10GBASE-LR, 10GBASE-LW and OC-192/STM-64 SR-1 XFP Module for SMF

The multirate XFP supports both 10GBASE-LR and 10GBASE-LW Ethernet applications and OC-192/STM-64 Short-Reach (SR-1) POS applications. Cisco offers both common and industrial temperature range products.

Cisco Multirate 10GBASE-ER, 10GBASE-EW and OC-192/STM-64 IR-2 XFP Module for SMF

The multirate XFP supports both 10GBASE-ER and 10GBASE-EW Ethernet applications and OC-192/STM-64 Intermediate Reach (IR-2) POS applications. Cisco offers both common and industrial temperature range products.

Cisco Multirate 10GBASE-ZR, 10GBASE-ZW and OC-192/STM-64 LR-2 XFP Module for SMF

The multirate XFP supports both 10GBASE-ZR and 10GBASE-ZW Ethernet applications and OC-192/STM-64 Long-Reach (LR-2) POS applications. Cisco offers both common and industrial temperature range products.

Technical specifications

Platform support

Cisco XFP modules are supported on Cisco switches and routers. For more details, refer to the document Cisco 10 Gigabit Ethernet Transceiver Module Compatibility Matrix: http://www.cisco.com/en/US/docs/interfaces_modules/transceiver_modules/compatibility/matrix/OL_6974.html.

Connectors and Cabling

Connectors: Dual LC/PC connector

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.

Table 1 provides cabling specifications for the Cisco XFP Module.

Table 1. Cisco XFP Port cabling specifications

	Wavelength (nm)	Cable Type	Core Size (micron)	Modal Bandwidth (MHz*km)	Cable Distance*
Cisco 10GBASE-SR XFP module for MMF	850nm	MMF	62.5 62.5 50.0 50.0 50.0 50.0	160 (FDDI-grade) 200 (OM1) 400 500 (OM2) 2000 (OM3) 4700 (OM4)	• 26 m • 33 m • 66 m • 82 m • 300 m • 400 m
Cisco Multirate 10GBASE-LR/-LW and OC-192/STM-64 SR-1 XFP Module for SMF	1310	SMF	G.652	-	• 10 km (10 Gigabit Ethernet) • 2 km (OC-192/STM-64 SR-1)
Cisco Multirate 10GBASE-ER/-EW and OC-192/STM-64 IR-2 XFP Module for SMF**	1550	SMF	G.652	-	• 40 km*** (10 Gigabit Ethernet) • 40 km (OC-192/STM-64 IR-2)
Cisco Multirate 10GBASE-ZR/-ZW and OC-192/STM-64 LR-2 XFP Module for SMF2	1550	SMF	G.652	-	• 80 km (10 Gigabit Ethernet) • 80 km (OC-192/STM-64 IR-2)

* Minimum cabling distance for optical XFP module is 2 meters, according to the IEEE 802.3ae standard.

** Requires 5 dB 1550 nm fixed loss attenuator for < 20 km. Attenuator is available as a spare. The part number is 15216 ATT LC 5=.

*** Links longer than 30 km are considered engineered links.

Table 2 shows the main optical characteristics for the Cisco optical XFP modules. A multirate module, the XFP module can operate at 10 Gigabit Ethernet LAN rate (10.3125 Gbps line rate), 10 Gigabit Ethernet WAN rate (9.95328 Gbps line rate) or OC-192/STM-64 (9.95328 Gbps line rate).

Table 2. Optical transmit and receive specifications

Product	Type	Transmit Power (dBm)		Receive Power (dBm)		Transmit Wavelength (nm)	Receive Wavelength (nm)
		Maximum	Minimum	Maximum	Minimum	Range	Range
Cisco 10GBASE-SR XFP module for MMF	10GBASE-SR 850-nm MMF	-1.2*	-7.3	-1.0	-9.9	840 to 860	840 to 860
Cisco Multirate 10GBASE-LR/-LW and OC-192/STM-64 SR-1 XFP Module for SMF	10GBASE-LR/-LW 1310-nm SMF	+0.5	-8.2	+0.5	-14.4	1260 to 1355	1260 to 1565
	OC-192/STM-64 SR-1 1310-nm SMF	-1.0	-6.0	-1.0	-11.0	1290 to 1330	1260 to 1565
Cisco Multirate 10GBASE-ER/-EW OC-192/STM-64 IR-2 XFP Module for SMF	10GBASE-ER/-EW 1550-nm SMF	+4.0	-4.7	-1.0	-15.8	1530 to 1565	1260 to 1565
	OC-192/STM-64 IR-2 1550-nm SMF	+2.0	-1.0	+2.0	-14.0	1530 to 1565	1260 to 1565
Cisco Multirate 10GBASE-ZR/-ZW OC-192/STM-64 LR-2 XFP Module for SMF	10GBASE-ZR/-ZW 1550-nm SMF	+4.0	0	-7	-24	1530 to 1565	1260 to 1565
	OC-192/STM-64 LR-2 1550-nm SMF	+4.0	0	-7	-24	1530 to 1565	1260 to 1565

* The launch power shall be the lesser of the class 1 safety limit or the maximum receive power. Class 1 laser requirements are defined by IEC 60825-1: 2001.

Dimensions

Dimensions (L x W x H): 71 x 18.5 x 8.5 mm. Cisco XFP modules typically weigh under 300 grams.

Environmental conditions and power requirements

Operating temperature range:

- Commercial temperature range (COM): 0 to 70°C (32 to 158°F)
- Industrial temperature range (IND): -40 to 85°C (-40 to 185°F)
- Storage temperature range: -40 to 85°C (-40 to 185°F)

Table 3 provides the maximum power consumption and operating temperature range ratings per Cisco XFP module.

Table 3. XFP modules maximum power consumption and operating temperature range

Product	Power Consumption (W)	Operating Temperature Range
Cisco XFP-10G-MM-SR	1.5	COM
Cisco XFP-10GLR-OC192SR	3.5	COM
Cisco XFP10GLR-192SR-L	1.5	COM
Cisco XFP10GLR192SR-RGD	3.5	IND
Cisco XFP-10GER-192IR+	3.5	COM
Cisco XFP10GER-192IR-L	2.5	COM
Cisco XFP10GER192IR-RGD	3.5	IND
Cisco XFP-10GZR-OC192LR	3.5	COM
Cisco XFP10GZR192LR-RGD	3.5	IND

Warranty

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

Ordering information

Table 4 provides ordering information for the Cisco XFP Module.

Table 4. Ordering Cisco XFP and respective cables

Description	Product Number
Cisco 10GBASE-SR XFP Module for MMF	XFP-10G-MM-SR
Cisco Multirate 10GBASE-LR/-LW and OC-192/STM-64 SR-1 XFP Module for SMF	XFP-10GLR-OC192SR
Cisco Multirate 10GBASE-LR/-LW and OC-192/STM-64 SR-1 XFP Module for SMF, low power (1.5W)	XFP10GLR-192SR-L
Cisco Multirate 10GBASE-LR/-LW and OC-192/STM-64 SR-1 XFP Module for SMF, industrial temperature range	XFP10GLR192SR-RGD
Cisco Multirate 10GBASE-ER/-EW and OC-192/STM-64 IR-2 XFP Module for SMF	XFP-10GER-192IR+
Cisco Multirate 10GBASE-ER/-EW and OC-192/STM-64 IR-2 XFP Module for SMF, low power (2.5W)	XFP10GER-192IR-L
Cisco Multirate 10GBASE-ER/-EW and OC-192/STM-64 IR-2 XFP Module for SMF,	XFP10GER192IR-RGD

Description	Product Number
industrial temperature range	
Cisco Multirate 10GBASE-ZR/-ZW and OC-192/STM-64 IR-2 XFP Module for SMF	XFP-10GZR-OC192LR
Cisco Multirate 10GBASE-ZR/-ZW and OC-192/STM-64 IR-2 XFP Module for SMF, industrial temperature range	XFP10GZR192LR-RGD

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 Multi-Fiber Optical Connectors
- IEEE 802.3ae
- Telcordia GR-1377, ITU-T G.691 and G.693

Safety

- Laser Class 1 21CFR-1040 LN#50 7/2001
- Laser Class 1 IEC60825-1

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Reference links to information about key environmental sustainability topics (mentioned in the "Environment Sustainability" section of the CSR Report) are provided in the following table:

Sustainability topic	Reference
Information on product material content laws and regulations	Materials
Information on electronic waste laws and regulations, including products, batteries, and packaging	WEEE compliance

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Additional information

For more information about Cisco XFP modules, contact:

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- Australia: 61 2 9935 4107
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