

Cisco S-Class 10GBASE SFP+ Modules

Product Overview

The Cisco® S-Class 10GBASE SFP+ modules (Figure 1) offer customers a variety of 10 Gigabit Ethernet connectivity options optimized for Enterprise and data center applications. S-Class optics are available for the most common reaches needed for these applications.

Figure 1. Cisco 10GBASE SFP+ Modules



Features and Benefits

Main features of Cisco 10GBASE SFP+ modules include:

- Smallest 10G form factor
- Commercial temperature (0 to 70°C) only
- Supports 10GBASE Ethernet only
- Hot-swappable input/output device that plugs in to an Ethernet SFP+ port of Cisco platforms
- Provides flexibility of interface choice
- Supports digital optical monitoring capability
- Cisco quality identification (ID) feature that enables a Cisco platform to identify - optics supported by Cisco technology
- Optical interoperability with 10GBASE XENPAK, 10GBASE X2, and 10GBASE XFP interfaces on the same link

Cisco SFP-10G-SR-S

The Cisco 10GBASE-SR module supports a link length of 26 meters on standard Fiber Distributed Data Interface (FDDI)-grade multimode fiber (MMF). Using 2000 MHz·km MMF (OM3), up to 300-meter link lengths are possible. Using 4700 MHz·km MMF (OM4), up to 400 meter link lengths are possible.

Cisco SFP-10G-LR-S

The Cisco 10GBASE-LR module supports a link length of 10 kilometers on standard single-mode fiber (SMF, G.652).

Cisco SFP-10G-ER-S

The Cisco 10GBASE-ER module supports a link length of up to 40 kilometers on standard single-mode fiber (SMF, G.652).

Cisco SFP-10G-ZR-S

The Cisco SFP-10G-ZR module supports link lengths of up to about 80 kilometers on standard single-mode fiber (SMF, G.652). This interface is not specified as part of the 10 Gigabit Ethernet standards and is, instead, built according to Cisco specifications.

Technical Specifications

Platform Support

Cisco SFP+ modules are supported on Cisco switches. For more details, refer to the document “Cisco 10 Gigabit Ethernet Transceiver Modules 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 (-SR, -LR, -ER, -ZR).

Note: Only connections with patch cords with PC or ultra-physical contact (UPC) connectors are supported. Patch cords with angled physical contact (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 SFP+ modules.

Table 1. SFP+ Port Cabling Specifications

Cisco SFP+	Wavelength (nm)	Cable Type	Core Size (Microns)	Modal Bandwidth (MHz·km) ^{***}	Cable Distance [*]
Cisco SFP-10G-SR-S	850	MMF	62.5	160 (FDDI)	26m
			62.5	200 (OM1)	33m
			50.0	400	66m
			50.0	500 (OM2)	82m
			50.0	2000 (OM3)	300m
			50.0	4700 (OM4)	400m
Cisco SFP-10G-LR-S	1310	SMF	G.652	-	10km
Cisco SFP-10G-ER-S ^{****}	1550	SMF	G.652	-	40km ^{**}
Cisco SFP-10G-ZR-S	1550	SMF	G.652	-	80km

^{*} Minimum cabling distance for -SR, -LRM, -LR, -ER modules is 2 meters, according to the IEEE 802.3ae standard.

^{**} Links longer than 30 kilometers are considered engineered links as per the IEEE 802.3ae standard.

^{***} Specified at transmission wavelength.

^{****} Requires 5 dB 1550 nm fixed loss attenuator for less than 20 kilometers. Attenuator is available as a spare. The part number is 15216 ATT LC 5=.

Table 2 shows the main optical characteristics for the Cisco SFP+ modules.

Table 2. Optical Transmit and Receive Specifications

Product	Type	Transmit Power (dBm) [*]		Receive Power (dBm) [*]		Transmit and Receive Wavelength (nm)
		Maximum	Minimum	Maximum	Minimum	
Cisco SFP-10G-SR-S	10GBASE-SR 850nm MMF	-1.2 ^{**}	-7.3	-1.0	-9.9	840 to 860
Cisco SFP-10G-LR-S	10GBASE-LR 1310nm SMF	0.5	-8.2	0.5	-14.4	1260 to 1355
Cisco SFP-10G-ER-S	10GBASE-ER 1550nm SMF	4.0	-4.7	-1	-15.8	1530 to 1565
Cisco SFP-10G-ZR-S	10GBASE-ZR 1550nm SMF	4.0	0	-7	-24	1530 to 1565

^{*} Transmitter and receiver power is in average, unless specified.

^{**} 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.

Table 3 describes the bail latch color code for each type of optical Cisco SFP+ module.

Table 3. Cisco SFP+ Optical Modules Color Code

Product	Bail Latch Color
Cisco SFP-10G-SR-S	Beige
Cisco SFP-10G-LR-S	Blue
Cisco SFP-10G-ER-S	Red
Cisco SFP-10G-ZR-S	Green

Dimensions

Dimensions (H x W x D): 8.5 x 13.4 x 56.5 mm. Cisco SFP+ connectors typically weigh 75 grams or less.

Environmental Conditions and Power Requirements

Operating temperature range:

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

Table 4 provides the maximum power consumption and operating temperature range ratings for each Cisco SFP+ module.

Table 4. Cisco SFP+ Modules Maximum Power Consumption

Product	Power Consumption (W)	Operating Temperature Range
Cisco SFP-10G-SR-S	1	COM
Cisco SFP-10G-LR-S	1	COM
Cisco SFP-10G-ER-S	1.5	COM
Cisco SFP-10G-ZR-S	1.5	COM

Warranty

- Standard warranty: 1 year
- Extended warranty (optional): Cisco SFP+ modules can be covered in a Cisco Smart Net Total Care™ Service support contract for the Cisco platform chassis

Ordering Information

Table 5 provides the ordering information for Cisco SFP+ modules and related cables.

Table 5. Ordering Information

Description	Product Number
SFP+ Modules	
Cisco 10GBASE-SR SFP+ Module for MMF	SFP-10G-SR-S
Cisco 10GBASE-LR SFP+ Module for SMF	SFP-10G-LR-S
Cisco 10GBASE-ER SFP+ Module for SMF	SFP-10G-ER-S
Cisco 10GBASE-ZR SFP+ Module for SMF	SFP-10G-ZR-S

Regulatory and Standards Compliance

Following is information about standards and safety 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
- SFP+ MSA SFF-8431 (optical modules, active optical cables, and passive twinax cables)

Safety

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

For other SFP+ 10 gigabit modules and cables, refer to the following link:

http://www.cisco.com/c/en/us/products/collateral/interfaces-modules/transceiver-modules/data_sheet_c78-455693.html

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Additional Information

For more information about Cisco 10GBASE SFP+ fiber modules, contact your sales representative or visit <http://www.cisco.com/en/US/products/ps6574/index.html>.




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