H3C Transceiver Modules User Guide

New H3C Technologies Co., Ltd.
http://www.h3c.com

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Preface

H3C Transceiver Modules User Guide describes the types, views, and speficications of transceiver modules and network cables available for H3C devices.

This preface includes the following topics about the documentation:

- Audience.
- Conventions.
- Documentation feedback.

Audience

This documentation is intended for:

- Network planners.
- Field technical support and servicing engineers.
- Network administrators working with the devices.

Conventions

The following information describes the conventions used in the documentation.

Command conventions

Convention	Description
Boldface	**Bold** text represents commands and keywords that you enter literally as shown.
Italic	*Italic* text represents arguments that you replace with actual values.
[ ]	Square brackets enclose syntax choices (keywords or arguments) that are optional.
{ x | y | ... }	Braces enclose a set of required syntax choices separated by vertical bars, from which you select one.
[x | y | ...]	Square brackets enclose a set of optional syntax choices separated by vertical bars, from which you select one or none.
{ x | y | ... } *	Asterisk marked braces enclose a set of required syntax choices separated by vertical bars, from which you select a minimum of one.
[x | y | ...] *	Asterisk marked square brackets enclose optional syntax choices separated by vertical bars, from which you select one choice, multiple choices, or none.
&<1-n>	The argument or keyword and argument combination before the ampersand (&) sign can be entered 1 to n times.
#	A line that starts with a pound (#) sign is comments.

GUI conventions

Convention	Description
Boldface	Window names, button names, field names, and menu items are in Boldface. For example, the **New User** window opens; click **OK**.
>	Multi-level menus are separated by angle brackets. For example, **File** > **Create** > **Folder**.

Symbols

Convention	Description
WARNING!	An alert that calls attention to important information that if not understood or followed can result in personal injury.
CAUTION:	An alert that calls attention to important information that if not understood or followed can result in data loss, data corruption, or damage to hardware or software.
IMPORTANT:	An alert that calls attention to essential information.
NOTE:	An alert that contains additional or supplementary information.
TIP:	An alert that provides helpful information.

Network topology icons

Convention	Description
	Represents a generic network device, such as a router, switch, or firewall.
	Represents a routing-capable device, such as a router or Layer 3 switch.
	Represents a generic switch, such as a Layer 2 or Layer 3 switch, or a router that supports Layer 2 forwarding and other Layer 2 features.
	Represents an access controller, a unified wired-WLAN module, or the access controller engine on a unified wired-WLAN switch.
	Represents an access point.
	Represents a wireless terminator unit.
	Represents a wireless terminator.
	Represents a mesh access point.
	Represents omnidirectional signals.
	Represents directional signals.
	Represents a security product, such as a firewall, UTM, multiservice security gateway, or load balancing device.
	Represents a security module, such as a firewall, load balancing, NetStream, SSL VPN, IPS, or ACG module.

Examples provided in this document

Examples in this document might use devices that differ from your device in hardware model, configuration, or software version. It is normal that the port numbers, sample output, screenshots, and other information in the examples differ from what you have on your device.

Documentation feedback

You can e-mail your comments about product documentation to info@h3c.com.

We appreciate your comments.

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Overview

Table 1 describes transceiver modules and network cables available for H3C devices. All these transceiver modules and network cables are hot swappable.

Table 1 Transceiver modules and network cables available for H3C devices

Transceiver module and network cable type		Interface connector	Data rate
OSFP800 module (transceiver)	OSFP800 optical transceiver module	MPO	800 Gbps
		Dual MPO	
QSFP112 module (transceiver)	QSFP112 optical transceiver module	MPO	400 Gbps
	QSFP112 optical transceiver module	LC	
	QSFP112 fiber cable	N/A	
	QSFP112 copper cable		
	QSFP112 to QSFP112 fiber cable		
	QSFP112 to OSFP-RHS fiber cable		
QSFP-DD module (transceiver)	QSFP-DD optical transceiver module	Dual LC	400 Gbps
	QSFP-DD optical transceiver module	MPO	
	QSFP-DD copper cable	N/A	
	QSFP-DD to QSFP56 copper cable		
	QSFP-DD to QSFP56 fiber cable		
	QSFP-DD to OSFP-RHS copper cable		
OSFP-RHS module (transceiver)	OSFP-RHS optical transceiver module	MPO	400 Gbps
QSFP56 module (transceiver)	QSFP56 optical transceiver module	MPO	200 Gbps
	QSFP56 optical transceiver module	LC	
	QSFP56 copper cable	N/A	
	QSFP56 to QSFP56 copper cable		
	QSFP56 fiber cable		
QSFP28 module (transceiver)	QSFP28 optical transceiver module	MPO/dual LC	100/50 Gbps
	QSPF28 BIDI optical transceiver module	Dual LC	100 Gbps
	QSFP28 copper cable	N/A	
	QSFP28 fiber cable		
DSFP module (transceiver)	DSFP fiber cable	N/A	100 Gbps
CFP module (transceiver)	100-Gigabit CFP optical transceiver module	Dual LC	100 Gbps
	40-Gigabit CFP optical transceiver module		
CFP2 module (transceiver)	CFP2 optical transceiver module	MPO/dual LC	100 Gbps

CXP module (transceiver)	100-Gigabit CXP optical transceiver module	MPO	100 Gbps
	100-Gigabit CXP fiber cable	N/A	
QSFP+ module (transceiver)	QSFP+ optical transceiver module	MPO/dual LC	40 Gbps
	QSPF+ BIDI optical transceiver module	Dual LC	
	QSFP+ copper cable (for interconnecting QSFP+ ports)	N/A	
	QSFP+ to SFP+ copper cable (for connecting one 40-Gigabit QSFP+ port to four 10-Gigabit SFP+ ports)	N/A	
	QSFP+ fiber cable		
SFP28 module (transceiver)	SFP28 dual rate optical transceiver module	Dual LC	25/10 Gbps
	SFP28 optical transceiver module	Dual LC	25 Gbps
	SFP28 copper cable	N/A	
	SFP28 fiber cable		
SFP+ module (transceiver)	SFP+ optical transceiver module	Dual LC/SC	10 Gbps
	SFP+ BIDI optical transceiver module	Dual LC	
	SFP+ copper cable (for interconnecting devices)	N/A	
	SFP+ fiber cable		
	10G EPON OLT optical transceiver module	SC	10/1 Gbps
	10G GPON OLT optical transceiver module		10 Gbps
	10G EPON ONU optical transceiver module		10 Gbps
	XGPON ONU optical transceiver module		10/2.5 Gbps
	XSGPON OLT optical transceiver module		10/2.5 Gbps
	XSGPON ONU optical transceiver module		10 Gbps
PSFP+ module	PSFP+ optical transceiver module	PELC	10/5/2.5/1 Gbps
10-Gigabit small form-factor pluggable (XFP) module (transceiver)	XFP optical transceiver module	Dual LC	See Table 94.
	10G EPON OLT optical transceiver module	SC	See Table 96.
10-Gigabit CX4 cable (for interconnecting devices)		N/A	12 Gbps

PSFP module	PSFP optical transceiver module	PELC	1250 Mbps
Small form-factor pluggable (SFP) module (transceiver)	2.5-Gigabit SFP optical transceiver module	Dual LC	2.5 Gbps
	Gigabit SFP optical transceiver module		1250 Mbps
	622-Megabit SFP optical transceiver module		622 Mbps
	100-Megabit SFP optical transceiver module		155 Mbps
	Gigabit bi-direction (BIDI) optical transceiver module	Dual LC	1250 Mbps
	100-Megabit bi-direction (BIDI) optical transceiver module		155 Mbps
	BIDI GEPON OLT optical transceiver module	SC	1250 Mbps
	Gigabit GPON ONU optical transceiver module	SC	1250 Mbps
	Gigabit coarse wavelength division multiplexing (CWDM) optical transceiver module	Dual LC	1250 Mbps
	Gigabit SFP copper transceiver module	RJ-45	1250 Mbps
	Gigabit SFP copper cable (for interconnecting devices)	N/A	1250 Mbps
CSFP module (transceiver)	CSFP optical transceiver module	LC	1.25 Gbps/125 Mbps

IMPORTANT:

The commercial outer casing temperature range is 0°C to 70°C (32°F to 158°F) and industrial outer casing temperature range is –40°C to +85°C (–40°F to +185°F) for H3C transceiver modules. The commercial temperature range is applicable to all transceiver modules except for transceiver modules marked with * and transceiver modules with special temperature requirements specified in this document. An abnormal outer casing temperature might reduce the performance, signal transmission quality, and link status of the transceiver module, and even damage the transceiver module.

NOTE:

- The available transceiver modules and network cables vary by device models and are subject to change over time. For the most up-to-date list of transceiver modules and network cables, contact your H3C sales representative or technical support engineer.
- For information about the transceiver modules and network cables available for each device model, see the installation guides.

Optical transceiver modules

Optical modules transmit signals over optical fibers. Optical transmission features low loss and is fit for long distance transmission.

H3C devices support optical module models of different specifications. You can choose optical modules as needed for data transmission over optical fibers.

The optical modules include optical transmitters, optical receivers, transceivers, and transponders.

H3C devices support transceivers. Transceivers are mainly used for optical-to-electrical and electrical-to-optical conversions and provide the following functions: optical power control, modulation transmission, signal probe, IV conversion, and limiting amplifier and decision regeneration. In addition, transceivers provide some other functions, such as counterfeit-prevention query and TX-disable. Common form factors for transceiver modules include OSFP800, QSFP112, QSFP-DD, QSFP56, QSFP28, CFP, CFP2, CXP, QSFP+, SFP28, SFP+, and SFP.

Data rate

Data rate is the number of bits transmitted per second, measured in Megabits per second (Mbps) or Gigabits per second (Gbps). Optical transceiver modules available for H3C devices mainly provide the following levels of data rates: 800 Gbps, 400 Gbps, 200 Gbps, 100 Gbps, 50 Gbps, 40 Gbps, 32 Gbps, 25 Gbps, 16 Gbps, 10 Gbps, 8 Gbps, 4 Gbps, 2.5 Gbps, 2 Gbps, 1 Gbps, 622 Mbps, 155 Mbps, and 100 Mbps.

Transmission distance

The transmission distance of optical transceiver modules is divided into short and long-range types. A distance of 2 km (1.24 miles) and below is generally considered as short-range type. 10 km (6.21 miles) is considered as long-range type.

Transmission distances provided by optical transceiver modules are mainly limited by certain loss and dispersion suffered during the transmission of optical signals over optical fibers.

- Loss is the optical energy loss due to the absorption, dispersion, and leakage over the media when light travels through optical fibers. This loss increases in direct ratio to transmission distance.
- Dispersion happens mainly because electromagnetic waves of different wavelengths travel at different rates over the same medium, causing different wave components of optical signals to reach the receiving end early or late as the transmission distance increases, which in turn causes impulse broadening, making the signal values indistinguishable.

To meet different transmission distance requirements, choose optical transceiver modules according to actual networking conditions.

Central wavelength

Central wavelength represents the wave band used for optical signal transmission. At present, there are mainly three central wavelengths for common optical transceiver modules: 850 nm, 1310 nm, and 1550 nm, respectively representing three wavebands.

- The 850 nm wave band is mainly used for short-reach transmission.
- The 1310 nm and 1550 nm wave bands are mainly used for middle- and long-reach transmission.

Fiber

Fiber types

Fibers are classified as multimode fibers and single-mode fibers.

- Multimode fibers

  Multimode fibers (MMFs) have thicker fiber cores and can transport light in multiple modes. However, the inter-mode dispersion is greater and worsens as the transmission distance increases.

  Multimode fibers can be classified into multiple grades according to their diameters and modal bandwidth. For more information, see Table 2. The modal bandwidth of a multimode fiber is

determined by the expression *the modulation frequency of the maximum modulation frequency pulse that can pass a fiber* × *the fiber length*. The modal bandwidth is a comprehensive index reflecting the optical characteristics of a multimode fiber.

International Telecommunication Union (ITU) defines multimode fiber types in its G series standards. The commonly-used multimode fiber is defined in the ITU G.651 standard. The G.651-compliant fiber transmits light at the wavelength range 800 nm to 900 nm or 1200 nm to 1350 nm.

Table 2 Multimode fiber grades

Fiber mode	Fiber grade	Fiber diameter (μm)	Modal bandwidth at 850 nm (MHz*km)
Multimode fiber	OM1	62.5/125	200
	OM2	50/125	500
	OM3	50/125	2000
	OM4	50/125	4700

Other factors that influence the transmission distance of multimode fibers include interface type, central wavelength, and fiber grade. For more information, see Table 3.

Table 3 Multimode fiber specifications

Interface type	Central wavelength (nm)	Fiber grade	Transmission distance
1000BASE-SX	850	OM1	< 275 m (902.23 ft)
		OM2	< 550 m (1804.46 ft)
10GBASE-SR	850	OM1	< 33 m (108.27 ft)
		OM2	< 82 m (269.03 ft)
		OM3	< 300 m (984.25 ft)
		OM4	< 400 m (1312.34 ft)
40GBASE-CSR4	850	OM3	< 300 m (984.25 ft)
		OM4	< 400 m (1312.34 ft)
40GBASE-SR4	850	OM3	< 70 m (229.66 ft)
		OM4	< 100 m (328.08 ft)
100GBASE-eSR4	850	OM4	< 300 m (984.25 ft)
100GBASE-SR4	850	OM3	< 70 m (229.66 ft)
		OM4	< 100 m (328.08 ft)
200GBASE-SR4	850	OM3	< 70 m (229.66 ft)
		OM4	< 100 m (328.08 ft)
400GBASE-SR8	850	OM3	< 70 m (229.66 ft)
		OM4	< 100 m (328.08 ft)
400GBASE-VR4	850	OM3	< 30 m (98.43 ft)
		OM4	< 50 m (164.04 ft)
25GBASE-SR	850	OM3	< 70 m (229.66 ft)
		OM4	< 100 m (328.08 ft)

800GBASE-VR8	855	OM3	< 30 m (98.43 ft)
		OM4	< 50 m (164.04 ft)
		OM5	< 50 m (164.04 ft)

- Single-mode fibers

  Single-mode fibers (SMFs) have a small core size, typically 9 μm or 10 μm, and can transmit light in only one mode. Single-mode fibers suffer little inter-mode dispersion and are suitable for long-reach communication. Single-mode fibers transmit light at the central wavelength of 1310 nm or 1550 nm.

  Telecommunication Industries Alliance (TIA)/Electronic Industries Alliance (EIA) defines that single-mode fibers use yellow outer jackets with the mark "SM".

  ITU defines single-mode fiber types in its G series standards. The mostly-commonly used single-mode fibers are defined in ITU G.652 and G.655 standards. Table 4 describes features of the G.652 and G.655-compliant fibers.

  Table 4 Features of G.652 and G.655-compliant fibers

Single-mode fiber type	Wavelength (nm)	Features	Applications
G.652-compliant fiber (standard single-mode fiber)	• 1260 to 1360 • 1530 to 1565	Zero dispersion at 1310 nm.	Connecting transceiver modules with a central wavelength of 1310 nm or 1550 nm.
G.655-compliant fiber (non-zero dispersion shifted fiber)	1530 to 1565	Near-zero dispersion around 1550 nm.	For 1550-nm wavelength-division multiplexing (WDM) transmissions.

Fiber diameter

Fiber diameter is generally expressed as core diameter/cladding diameter, in μm. For example, 9/125 μm means the fiber core diameter is 9 μm and the fiber cladding diameter is 125 μm.

For the H3C devices, the following fiber diameters are recommended:

- **G.652 standard single-mode fiber**—9/125 μm.
- **G.655 single-mode fiber**—9/125 μm.
- **G.651 standard multimode fiber**—50/125 μm or 62.5/125 μm.

Connector

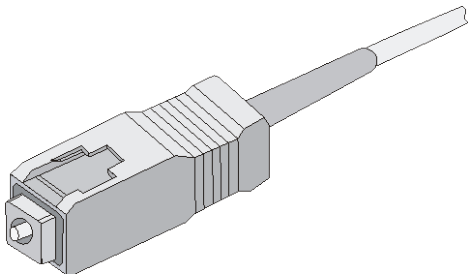
CAUTION:

Cover the connector with a dust cap when it is not connected to any optical fiber.

Connectors connect transceiver modules to the corresponding transmission media. The optical transceiver modules available for H3C devices use the following types of connectors:

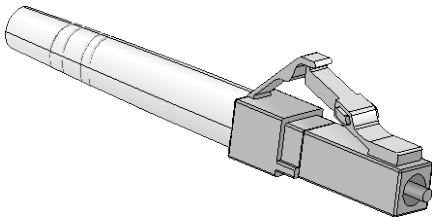
- Subscriber connector standard connector (SC).

Figure 1 SC connector



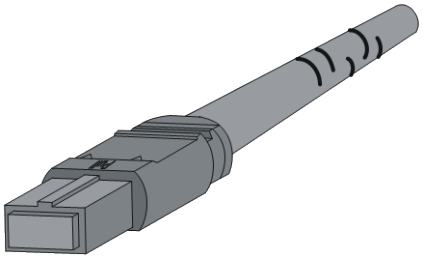
- Lucent connector or local connector (LC).

  Figure 2 LC connector



- Multi-fiber Push On connector (MPO).

  Figure 3 MPO connector



H3C transceiver modules use only female MPO connectors, which have guide holes in the end face.

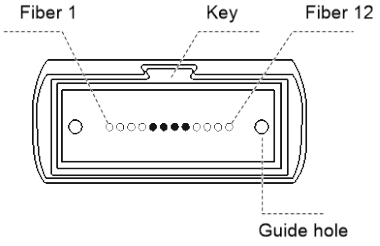
MPO connectors are classified as the following types based on the polish type:

- **Physical contact (PC)**—End face polished flat.
- **Angle-polished contact (APC)**—End face polished with an angle, typically 8°.

MPO connectors are available with 12 fibers, 16 fibers, or 24 fibers:

- 12-fiber MPO connector

  Figure 4 End face of a 12-fiber connector

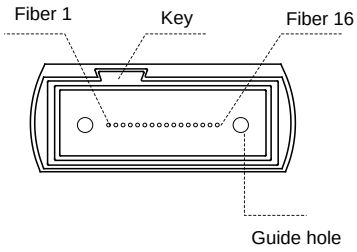


NOTE:

40G, 100G, 200G, or 400G optical transceiver modules that use the 12-fiber MPO connector use 4 channels to transmit light and 4 channels to receive light. Therefore, a total of 8 channels are required for connecting 2 such transceiver modules. For these transceiver modules, 8 fibers and 12 fibers are equivalent in functionality. When you use 12 fibers for connecting two transceiver modules, four channels are unused.

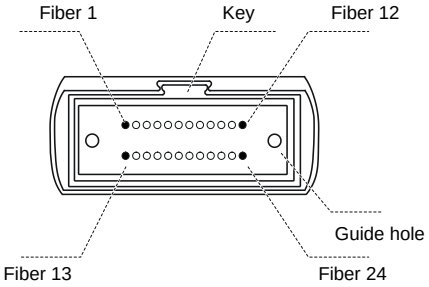
- 16-fiber MPO connector

  Figure 5 End face of a 16-fiber connector



- 24-fiber MPO connector

  Figure 6 End face of a 24-fiber connector



Optical specifications

CAUTION:

The average transmit power of a long-haul optical transceiver module is greater than the saturated optical power. Be careful about the length of the optical fiber you use to make sure the actual receive power reaching the optical transceiver module is less than its saturated optical power. Otherwise, the optical transceiver module might be damaged.

NOTE:

Average transmit and receive power ranges are provided for transceiver modules in this guide.

Transmit power

Transmit power is the power at which the transmitter of an optical transceiver module transmits optical signals, in dBm.

Receive power

Receive power is the power at which the receiver of an optical transceiver module receives optical signals, in dBm.

Receiving sensitivity

Receiving sensitivity is the minimum optical power that is needed at the receiving end for the optical module to receive optical signals at a given data rate and bit error rate, in dBm. The higher the data rate is, the worse the receiving sensitivity is, the greater the minimum receive power is. A greater receive power has higher requirements on the receiving components of the optical module.

Saturated optical power

Saturated optical power (also known as optical saturation) is the maximum receive power at a given data rate and bit error rate range (10^{-10} to 10^{-12}), in dBm.

Saturated photocurrent occurs if a fiber probe is irradiated by intensive light. When this occurs, it takes the probe some time to recover. In this case, the receiving sensitivity worsens and the received signals may be decided incorrectly, causing bit errors. This will probably damage the receiving probe. Therefore, when you perform operations, try to maintain a normal saturated optical power level.

Copper transceiver modules

Copper transceiver modules, also called RJ-45 modules, transmit electrical signals over twisted pair cables and do not provide conversion between electrical and optical signals. Compared with optical fibers, twisted pair cables provide a short transmission distance, suitable only for small-scale networking environments.

You can use copper transceiver modules to connect two fiber ports over a network cable.

H3C devices support SFP and SFP+ copper transceiver modules.

Data rate

Data rate refers to the number of bits transmitted per second. Data rates of copper transceiver modules are typically measured in Mbps or Gbps.

10 Gbps, 1250 Mbps, and 100 Mbps copper transceiver modules are available for H3C devices.

Transmission distance

Through UTP cables, electrical signals can be transmitted over a distance of 100 m (328.08 ft) only. This is because electrical signals attenuate during transmission through the UTP cables.

Attenuation refers to the dissipation of the power of a transmitted signal as it travels over a cable. Attenuation occurs because signal transmission suffers certain resistance from the cable, which weakens the electrical signals as they travel over the cable. When signals are transmitted over a very long distance, signal strength decreases very significantly, causing the signal-to-noise ratio to drop below the accepted level. This makes it impossible to distinguish between signals and noise, resulting in decision errors.

To transmit signals over a short distance, use copper transceiver modules only.

Connector

RJ-45 (Registered Jack-45) twisted pair connectors are used as the connectors for copper transceiver modules. Figure 7 shows the appearance of an RJ-45 connector.

Figure 7 RJ-45 connector

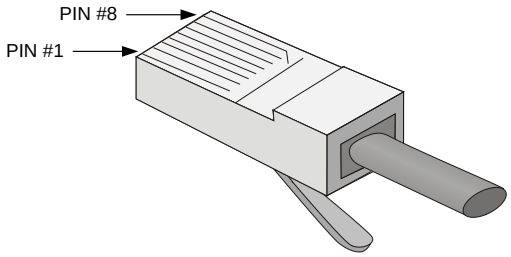


Table 5 RJ-45 GE connector pin assignment

Pin	Signal	Function
1	MX_0+	Data transmit/receive
2	MX_0-	Data transmit/receive
3	MX_1+	Data transmit/receive
4	MX_2+	Data transmit/receive
5	MX_2-	Data transmit/receive
6	MX_1-	Data transmit/receive
7	MX_3+	Data transmit/receive
8	MX_3-	Data transmit/receive

Hybrid copper-fiber transceiver modules

A hybrid copper-fiber transceiver module is typically used to connect a hybrid copper-fiber cable to an optical host in a hybrid fiber-copper deployment. Compared with common transceiver modules, a hybrid copper-fiber transceiver module can transmit data over an optical fiber and power over a copper cable. A hybrid copper-fiber transceiver module must be used together with a hybrid copper-fiber cable, hybrid fiber-copper pigtail, and hybrid copper-fiber interface (such as PSFP or PSFP+ interface) for data and power transmission. The transmission method of hybrid copper-fiber transceiver module in combination with the hybrid copper-fiber cable greatly extends the power supply and data transmission distance compared to the twisted pair transmission method, applicable for large-scale network environments.

H3C devices support SFP and SFP+ hybrid copper-fiber transceiver modules.

Data rate

Data rate refers to the number of bits transmitted per second, measured in Mbps or Gbps. The hybrid copper-fiber transceiver module supported by H3C devices mainly provide the following transmission rates: 10 Gbps, 5000 Mbps, 2500 Mbps, and 1250 Mbps.

Transmission distance

The transmission distance of hybrid copper-fiber transceiver modules is divided into short and long-range types. A distance of 2 km (1.24 miles) and below is generally considered as short-range type. 10 km (6.21 miles) is considered as long-range type.

Transmission distances provided by hybrid copper-fiber transceiver modules are limited by the following factors:

- Certain loss and dispersion suffered during the transmission of optical signals over optical fibers in hybrid copper-fiber cables.
  - Loss is the optical energy loss due to the absorption, dispersion and leakage over the media when light travels through optical fibers. This loss increases in direct ratio to transmission distance.
  - Dispersion happens mainly because electromagnetic waves of different wavelengths travel at different rates over the same medium, causing different wave components of optical signals to reach the receiving end early or late as the transmission distance increases, which in turn causes impulse broadening, making the signal values indistinguishable.
- Power of the power supply ports on the optical switch. A longer transmission distance indicates more power consumption for the powered devices and larger power for the power supply ports.
- Cable impedance. A longer transmission distance indicates larger cable impedance and larger power for the power supply ports.
- Total power consumption of the remote powered devices (PDs) and wireless APs and PDs that connect to the remote PDs.

Choose compatible hybrid copper-fiber transceiver modules, pigtails, and hybrid copper-fiber cables as required.

Central wavelength

Central wavelength represents the wave band used for optical signal transmission. Currently, the central wavelength used by H3C hybrid copper-fiber transceiver modules is 1310 nm.

Fiber

H3C hybrid copper-fiber transceiver modules use single-mode optical fibers (SMFs). For more information, see "Optical transceiver modulesFiber."

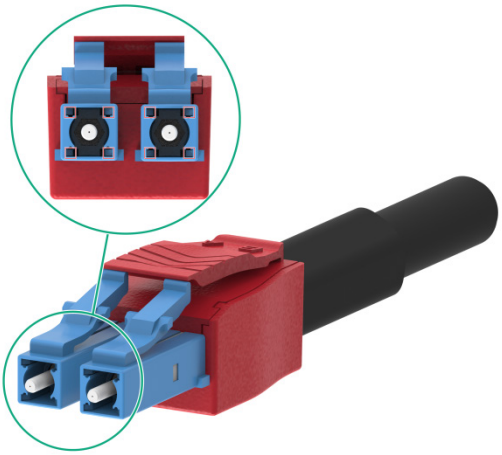
Connector

CAUTION:

- Cover the connector with a dust cap when it is not connected to any optical fiber.
- You can insert only a Power Ethernet Lucent Connector (PELC) connector, not an LC connector, into a hybrid copper-fiber transceiver module.

H3C hybrid copper-fiber transceiver modules use PELC connectors. With conductive terminals, a PELC connector can provide high-speed and long-range data transmission and supply power for remote devices. As shown in Figure 8, the parts marked in small red square boxes are conductive terminals.

Figure 8 PELC connector



Optical specifications

Hybrid copper-fiber transceiver modules have the same optical specifications as common optical transceiver modules. For more information, see "Optical specifications."

H3C iOptic 3.0 transceiver modules

Introduction

H3C iOptic 3.0 dedicated transceiver module, similar to the hybrid copper-fiber transceiver module, is used to connect a hybrid copper-fiber cable and an optical host for long-distance power and data transmission. However, significant differences exist between the iOptic 3.0 dedicated transceiver module, hybrid copper-fiber transceiver module, and ordinary transceiver module in terms of use method, appearance, and connector, as descripted in Table 6.

Table 6 Differences between ordinary transceiver modules, hybrid copper-fiber transceiver modules, and iOptic 3.0 transceiver modules

Transceiver module type	Whether it can supply or receive power	Connector	Physical Identification	Remarks
Ordinary transceiver module	No	LC MPO	No special identification.	No special requirements.
Hybrid copper-fiber transceiver module	Yes	PELC	The metal pull handle of the transceiver module is red.	It must be used in conjunction with a hybrid copper-fiber pigtail, hybrid copper-fiber cable, and hybrid copper-fiber interface for simultaneous transmission of power and data.
iOptic 3.0 transceiver	Yes	LC	Words "All-Optical 3.0" are printed on the colored QR code label	The iOptic 3.0 transceiver module itself does not support

module			affixed to the transceiver module.	power supply/reception. It must be used in conjunction with the combined fiber-copper pigtail, hybrid copper-fiber cable, and combined copper-fiber interface for simultaneous transmission of power and data.

H3C devices support SFP28, SFP+, and SFP iOptic 3.0 dedicated transceiver modules.

Data rate

Data rate refers to the number of bits transmitted per second, measured in Mbps or Gbps. The iOptic 3.0 dedicated transceiver modules supported by H3C devices mainly provide the following transmission rates: 25 Gbps, 10 Gbps, 2500 Mbps, and 1250 Mbps.

Transmission distance

The transmission distance of iOptic 3.0 dedicated transceiver modules is divided into short and long-range types. A distance of 2 km (1.24 miles) and below is generally considered as short-range type. 10 km (6.21 miles) is considered as long-range type.

Transmission distances provided by iOptic 3.0 dedicated transceiver modules are limited by the following factors:

- Certain loss and dispersion suffered during the transmission of optical signals over optical fibers in hybrid copper-fiber cables.
  - Loss is the optical energy loss due to the absorption, dispersion, and leakage over the media when light travels through optical fibers. This loss increases in direct ratio to transmission distance.
  - Dispersion happens mainly because electromagnetic waves of different wavelengths travel at different rates over the same medium, causing different wave components of optical signals to reach the receiving end early or late as the transmission distance increases, which in turn causes impulse broadening, making the signal values indistinguishable.
- Power of the power supply ports on the optical host. A longer transmission distance indicates more power consumption for the powered devices and larger power for the power supply ports.
- Cable impedance. A longer transmission distance indicates larger cable impedance and larger power for the power supply ports.
- Total power consumption of the remote powered devices (PDs) and wireless APs and PDs that connect to the remote PDs.

Choose compatible iOptic 3.0 dedicated transceiver modules, pigtails, and hybrid copper-fiber cables as required.

Central wavelength

Central wavelength represents the wave band used for optical signal transmission. Currently, the Central wavelength used by H3C iOptic 3.0 dedicated transceiver modules is 1310 nm.

Fiber

H3C iOptic 3.0 dedicated transceiver modules use SMFs. For more information, see "Fiber."

Connector

The H3C iOptic 3.0 dedicated transceiver module supports using an LC connector for data transmission. When it is used with a combined copper-fiber interface, you can use a Power over Double Lucent Connector (PoDLC) connector for data transmission and power supply/reception. Compared with to an ordinary LC connector, a PoDLC connector has two parts. The upper part is an LC connector, similar to a regular LC connector, used to connect the iOptic 3.0 dedicated transceiver module. The lower part is a conductive terminal, used to connect the PoE interface (terminal block) of the iOptic host.

NOTE:

An ordinary LC transceiver module does not support working in conjunction with a combined copper-fiber interface for data transmission and power supply/reception with a PoDLC connector.

Figure 9 PoDLC connector



Optical specifications

The optical specifications of the iOptic 3.0 dedicated transceiver modules are the same as those of the ordinary transceiver modules. For more information, see "Optical specifications."

Immersive liquid-cooled transceiver modules

Introduction

The immersive liquid-cooled transceiver module, abbreviated as liquid-cooled transceiver module, is typically used to connect an immersive liquid-cooled device to another device. Differences exist between liquid-cooled transceiver modules and ordinary transceiver modules, as shown in Table 7.

Table 7 Differences between liquid-cooled transceiver modules and ordinary transceiver modules

Transceiver module type	Transmission medium	Physical identification	Use method
Ordinary transceiver module	Optical fiber	No special identification.	Insert it into a fiber port and then connect a fiber optic connector to it.
Liquid-cooled transceiver modules	Optical fiber	The transceiver module is integrated with the pigtail, and the pigtail connector is an MPO male connector.	• It must be used in conjunction with an MPO adapter or a wiring rack that supports MPO adapters. • The transceiver module body will be completely immersed

			in the liquid during use. • Be careful not to immerse the MPO connector part into the liquid.

H3C devices support multiple liquid-cooled transceiver modules that are different in specifications. You can choose the appropriate liquid-cooled transceiver module as needed and connect an optical fiber to it for data transmission.

The common packaging types of liquid-cooled transceiver modules are mainly QSFP28 and SFP28.

Data rate

Data rate refers to the number of bits transmitted per second, measured in Mbps or Gbps. The liquid-cool transceiver modules supported by H3C devices mainly provide a transmission rate of 100 Gbps.

Transmission distance

Currently, H3C liquid-cooled transceiver modules are mainly for short-distance transmission, with a transmission distance of 100 m (328.08 ft) or less.

Central wavelength

The center wavelength refers to the wave band used for optical signal transmission. Currently, the center wavelength of commonly used liquid-cooled transceiver modules is mainly 850 nm, which is often used for short-distance transmission.

Fiber

Currently, H3C liquid-cooled transceiver modules use multimode optical fibers (MMFs). For more information about optical fibers, see "Fiber."

Connector

H3C liquid-cooled transceiver module integrates the transceiver module and pigtail together, and the pigtail connector is an MPO male connector.

Figure 10 MPO male connector



The MPO connector used by the H3C liquid-cooled transceiver module is a male connector with a guide pin. The MPO connector is a PC-polished, 12-core fiber MPO connector. For more information about the MPO connector, see "Connector."

Optical specifications

The optical specifications of H3C liquid-cooled transceiver modules are the same as those of the ordinary transceiver modules. For more information, see "Optical specifications."

CSFP transceiver modules

Introduction

The Compact Small Form-factor Pluggable (CSFP) transceiver module is a compact, small form-factor, and hot-swappable transceiver module mainly used in fiber-optic communication networks to achieve optical-electrical signal conversion. It features a highly compact design with an innovative architecture that supports independent transmission of two channels within a single module, which increases transmission channels and improves port utilization. The CSFP transceiver module is primarily used in data centers and high-density enterprise networks.

The CSFP transceiver module uses a dual-port design, with each port supporting single-fiber bidirectional transmission. A port can simultaneously send and receive optical signals of two wavelengths through one optical fiber. You can connect a port on the CSFP transceiver module to two Gigabit BIDI transceiver module ports. During connection, make sure the transmit wavelength of the local end matches the receive wavelength of the peer end, and the receive wavelength of the local end matches the transmit wavelength of the peer end.

Data rate

Data rate refers to the number of bits transmitted per second, measured in Mbps or Gbps. The CSFP transceiver modules supported by H3C devices mainly provide transmission rates of 1250 Mbps and 125 Mbps.

Transmission distance

Currently, H3C CSFP transceiver modules are mainly for long-distance transmission, with a maximum transmission distance of 10 km (6.21 miles).

Central wavelength

The center wavelength refers to the wave band used for optical signal transmission. Currently, the center wavelengths of H3C CSFP transceiver modules are 1310 nm and 1490 nm.

Fiber

H3C CSFP transceiver modules use SMFs. For more information, see "Fiber."

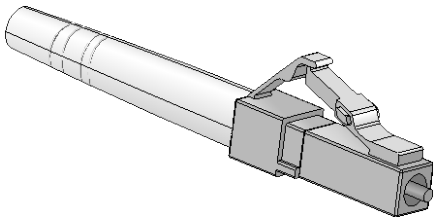
Connector

CAUTION:

- Cover the connector with a dust cap when it is not connected to any optical fiber.
- As a best practice, use H3C fiber connectors and fibers. If you use a fiber connector and a fiber from other vendors, make sure the fiber connector is compatible with the H3C transceiver module and the fiber quality is good.

CSFP transceiver modules use LC connectors.

Figure 11 LC connector



Optical specifications

The optical specifications of H3C CSFP transceiver modules are the same as those of common transceiver modules. For more information, see "Optical transceiver modules."

Safety and Regulatory Compliance Information

Table 8 Safety and Regulatory Compliance Information

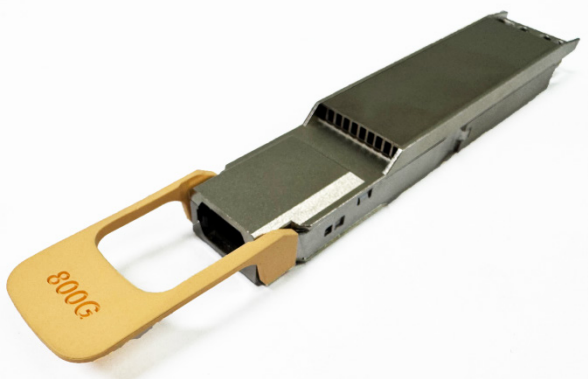
IEEE802.3df
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IEEE 802.3bs
IEEE 802.3bz
IEEE 802.3cd
IEEE 802.3ck
IEEE 802.3cn
IEEE 802.3z
SFF-8418

SFF-8431
SFF-8432
SFF-8472
SFF-8636
SFF-8661
SFF-8679
INF-8074
INF-8077
ITU-T G.957
ITU-T G.984
ITU-T G.988
QSFP-DD Hardware Rev 5.0
Common Management Interface Specification Rev 4.0
400G-LR4-10 Technical Specification Draft 1.0
CFP MSA Hardware Specification Revision 1.4
CFP MSA CFP2 Hardware Specification Draft Revision 0.3
CFP MSA Management Interface Specification Version 2.2 r06a
IEC 61280-1-4
IEC 61754-7-2004
T-REC-G.595.1
GR-468-CORE-2004
RoHS compliant and lead-free per Directive 2011/65/EU
UL
CE
Monitored by Digital Diagnostics Monitoring (DDM)
OSFP Module Specification Rev 5.0
Common Management Interface Specification Rev 5.0

OSFP800 modules

OSFP800 optical transceiver modules (MPO interface)

Figure 12 OSFP800 optical transceiver module (MPO interface)



Models and specifications

OSFP800 optical transceiver modules (MPO) provide a transmission rate of 800 Gbps.

Table 9 Specifications for OSFP800 optical transceiver modules (MPO) (1)

Model	Central wavelength (nm)	Fiber mode	Fiber diameter (μm)	Fiber cores	Modal bandwidth (MHz*km)	Transmission distance
OSFP800-800G-VR8-MM850-MPO	855	MMF	50/125	16	2000	30 m (98.43 ft)
					4700	50 m (164.04 ft)

Table 10 Specifications for OSFP800 optical transceiver modules (MPO) (2)

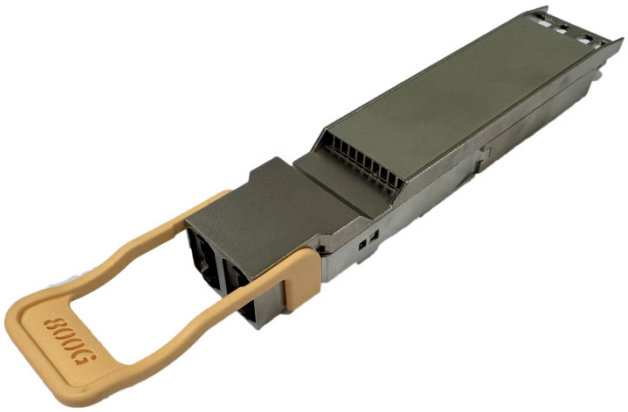
Model	Connector	Optical parameters (dBm)	
		Transmit power	Receive power
OSFP800-800G-VR8-MM850-MPO	MPO (APC polished, 16-fiber)	–4.6 to +4	–6.3 to +4

CAUTION:

The operating outer casing temperature range of the OSFP800-800G-VR8-MM850-MPO transceiver module is 15°C to 70°C (59°F to 158°F).

OSFP800 optical transceiver modules (dual MPO interfaces)

Figure 13 OSFP800 optical transceiver module (dual MPO interfaces)



Models and specifications

OSFP800 optical transceiver modules (dual MPO) provide a transmission rate of 800 Gbps.

Table 11 Specifications for OSFP800 optical transceiver modules (dual MPO) (1)

Model	Central wavelength (nm)	Fiber mode	Fiber diameter (μm)	Fiber cores	Modal bandwidth (MHz*km)	Transmission distance
OSFP800-800G-VR8-MM850-DMPO	855	MMF	50/125	2 × 8	2000	30 m (98.43 ft)
					4700	50 m (164.04 ft)
OSFP800-800G-DR8-SM1310-DMPO	1310	SMF	9/125	2 × 8	N/A	500 m (1640.42 ft)

Table 12 Specifications for OSFP800 optical transceiver modules (dual MPO) (2)

Model	Connector	Optical parameters (dBm)	
		Transmit power	Receive power
OSFP800-800G-VR8-MM850-DMPO	2 × MPO connectors (APC polished, 12-fiber)	–4.6 to +4	–6.3 to +4
OSFP800-800G-DR8-SM1310-DMPO	2 × MPO connectors (APC polished, 12-fiber)	–2.9 to +4	–5.9 to +4

CAUTION:

The operating outer casing temperature range of the OSFP800-800G-VR8-MM850-DMPO transceiver module is 15°C to 70°C (59°F to 158°F).

QSFP112 modules

QSFP112 optical transceiver modules (MPO interface)

Figure 14 QSFP112 optical transceiver module (MPO interface)



Models and specifications

QSFP112 optical transceiver modules (MPO) provide a transmission rate of 400 Gbps.

Table 13 Specifications for QSFP112 optical transceiver modules (MPO) (1)

Model	Central wavelength (nm)	Fiber mode	Fiber diameter (μm)	Fiber cores	Modal bandwidth (MHz*km)	Transmission distance
QSFP112-400G-VR4-MM850	855	MMF	50/125	8	2000	30 m (98.43 ft)
					4700	50 m (164.04 ft)
QSFP112-400G-DR4-SM1310	1310	SMF	9/125	8	N/A	500 m (1640.42 ft)
QSFP112-400G-SR8-MM850	855	MMF	50/125	16	2000	70 m (229.66 ft)
					4700	100 m (328.08 ft)
QSFP112-400G-DR4-SM1310-LPO	1310	SMF	9/125	8	N/A	500 m (1640.42 ft)

Table 14 Specifications for QSFP112 optical transceiver modules (MPO) (2)

Model	Connector	Optical parameters (dBm)	
		Transmit power	Receive power
QSFP112-400G-VR4-MM850	MPO (APC polished, 12-fiber)	–4.6 to +4	–6.4 to +4
QSFP112-400G-DR4-SM1310	MPO (APC polished, 12-fiber)	–2.9 to +4	–5.9 to +4

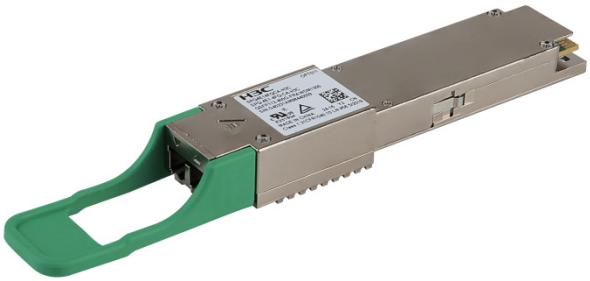
Model	Connector	Optical parameters (dBm)	
		Transmit power	Receive power
QSFP112-400G-SR8-MM850	MPO (APC polished, 16-fiber)	–6.5 to +4	–8.4 to +4
QSFP112-400G-DR4-SM1310-LPO	MPO (APC polished, 12-fiber)	–2.9 to +4	–5.9 to +4

NOTE:

The 400G QSFP112 port of the QSFP112-400G-DR4-SM1310 optical transceiver module can be split into four channels. You can connect a 400G QSFP112 port to four 100G QSFP28 ports. The QSFP112 optical transceiver module and QSFP28 optical transceiver modules to be connected must be the same in specifications, including central wavelength and fiber type.

QSFP112 optical transceiver modules (LC interface)

Figure 15 QSFP112 optical transceiver modules (LC interface)



Models and specifications

QSFP112 optical transceiver modules (LC) provide a transmission rate of 400 Gbps.

Table 15 Specifications for QSFP112 optical transceiver modules (LC) (1)

Model	Central wavelength (nm)	Fiber mode	Fiber diameter (μm)	Modal bandwidth (MHz*km)	Transmission distance
QSFP112-400G-FR4-WDM1300	Four lanes: • 1271 • 1291 • 1311 • 1331	SMF	9/125	N/A	2 km (1.24 miles)

Table 16 Specifications for QSFP112 optical transceiver modules (LC) (2)

Model	Optical parameters (dBm)	
	Transmit power	Receive power
QSFP112-400G-FR4-WDM1300	–3.2 to +3.5	–7.3 to +4.4

QSFP112 fiber cables

Figure 16 QSFP112 fiber cable



Models and specifications

Table 17 Specifications for QSFP112 fiber cables

Model	Length	Data rate
QSFP112-400G-D-AOC-10m-SM	10 m (32.81 ft)	400 Gbps
QSFP112-400G-D-AOC-10m-MM	10 m (32.81 ft)	
QSFP112-400G-D-AOC-20m-SM	20 m (65.62 ft)	
QSFP112-400G-D-AOC-20m-MM	20 m (65.62 ft)	
QSFP112-400G-D-AOC-30m-SM	30 m (98.43 ft)	
QSFP112-400G-D-AOC-30m-MM	30 m (98.43 ft)	
QSFP112-400G-D-AOC-50m-SM	50 m (164.04 ft)	
QSFP112-400G-D-AOC-50m-MM	50 m (164.04 ft)	

NOTE:

A fiber cable that has **SM** in its model name is a single-mode fiber cable, and a fiber cable that has **MM** in its model name is a multimode fiber cable.

QSFP112 to 2QSFP112 fiber cables

Figure 17 QSFP112 to 2QSFP112 fiber cable



Models and specifications

Table 18 Specifications for QSFP112 to 2QSFP112 fiber cables

Model	Length	Data rate	Remarks
Q112-400G-2Q112-200G-AOC-10m-SM	10 m (32.81 ft)	400 Gbps	Used for connecting one 400G QSFP112 port to two 200G QSFP112 ports
Q112-400G-2Q112-200G-AOC-10m-MM	10 m (32.81 ft)		
Q112-400G-2Q112-200G-AOC-20m-SM	20 m (65.62 ft)		
Q112-400G-2Q112-200G-AOC-20m-MM	20 m (65.62 ft)		
Q112-400G-2Q112-200G-AOC-30m-SM	30 m (98.43 ft)		
Q112-400G-2Q112-200G-AOC-30m-MM	30 m (98.43 ft)		
Q112-400G-2Q112-200G-AOC-50m-SM	50 m (164.04 ft)		
Q112-400G-2Q112-200G-AOC-50m-MM	50 m (164.04 ft)		

NOTE:

A fiber cable that has **SM** in its model name is a single-mode fiber cable, and a fiber cable that has **MM** in its model name is a multimode fiber cable.

QSFP112 to OSFP-RHS fiber cables

Figure 18 QSFP112 to OSFP-RHS fiber cable



Models and specifications

Table 19 Specifications for QSFP112 to OSFP-RHS fiber cables

Model	Length	Data rate	Remarks
Q112-OSFP-RHS-400G-AOC-10m-SM	10 m (32.81 ft)	400 Gbps	Used for connecting one 400G QSFP112 port to one 400G OSFP-RHS port
Q112-OSFP-RHS-400G-AOC-10m-MM	10 m (32.81 ft)		
Q112-OSFP-RHS-400G-AOC-20m-SM	20 m (65.62 ft)		
Q112-OSFP-RHS-400G-AOC-20m-MM	20 m (65.62 ft)		
Q112-OSFP-RHS-400G-AOC-30m-SM	30 m (98.43 ft)		
Q112-OSFP-RHS-400G-AOC-30m-MM	30 m (98.43 ft)		
Q112-OSFP-RHS-400G-AOC-50m-SM	50 m (164.04 ft)		
Q112-OSFP-RHS-400G-AOC-50m-MM	50 m (164.04 ft)		

NOTE:

A fiber cable that has **SM** in its model name is a single-mode fiber cable, and a fiber cable that has **MM** in its model name is a multimode fiber cable.

QSFP112 copper cables

Figure 19 QSFP112 copper cable



Models and specifications

Table 20 Specifications for QSFP112 copper cables

Model	Length	Data rate
QSFP112-400G-D-DAC-2m	2 m (6.56 ft)	400 Gbps

QSFP-DD modules

QSFP-DD optical transceiver modules (MPO interface)

Figure 20 QSFP-DD optical transceiver module (MPO interface)



Models and specifications

QSFP-DD optical transceiver modules (MPO) provide a transmission rate of 400 Gbps.

Table 21 Specifications for QSFP-DD optical transceiver modules (MPO) (1)

Model	Central wavelength (nm)	Fiber mode	Fiber diameter (μm)	Fiber cores	Modal bandwidth (MHz*km)	Transmission distance
QSFPDD-400G-SR8-MM850	850	MMF	50/125	16	2000	70 m (229.66 ft)
					4700	100 m (328.08 ft)
QSFPDD-400G-SR4-MM850	850	MMF	50/125	8	4700	50 m (164.04 ft)
QSFPDD-400G-DR4-SM1310	1310	SMF	9/125	8	N/A	500 m (1640.42 ft)
QSFPDD-400G-eSR8-MM850	855	MMF	50/125	16	4700	200 m (656.17 ft)

NOTE:

When you use the QSFPDD-400G-eSR8-MM850 optical transceiver module, follow these guidelines:

- The Effective Modal Bandwidth (EMB) of the fiber cable must be greater than or equal to 6000 Hz*km.
- Make sure no more than two connectors are present in a link.
- Make sure the connectors used by Y-cables or optical distribution frames (ODFs) in a link are APC-polished and have a return loss greater than 30 dB.

Table 22 Specifications for QSFP-DD optical transceiver modules (MPO) (2)

Model	Connector	Optical parameters (dBm)	
		Transmit power	Receive power
QSFPDD-400G-SR8-MM850	MPO (APC polished, 16-fiber)	–6.5 to +4	–8.4 to +4
QSFPDD-400G-SR4-MM850	MPO (APC polished, 12-fiber)	–4.6 to +4.0	–6.4 to +4.0
QSFPDD-400G-DR4-SM1310	MPO (APC polished, 12-fiber)	–2.9 to +4.0	–5.9 to +4.0
QSFPDD-400G-eSR8-MM850	MPO (APC polished, 16-fiber)	–6.5 to +4	–8.4 to +4

QSFP-DD optical transceiver modules (LC interface)

Figure 21 QSFP-DD optical transceiver module (LC interface)



Models and specifications

QSFP-DD optical transceiver modules (LC interface) provide a transmission rate of 400 Gbps.

Table 23 Specifications for QSFP-DD optical transceiver modules (LC interface) (1)

Model	Central wavelength (nm)	Fiber mode	Fiber diameter (μm)	Modal bandwidth (MHz*km)	Transmission distance
QSFPDD-400G-FR4-WDM1300	Four lanes: • 1271 • 1291 • 1311 • 1331	SMF	9/125	N/A	2 km (1.24 miles)
QSFPDD-400G-LR4-WDM1300-DC	Four lanes: • 1271 • 1291 • 1311 • 1331	SMF	9/125	N/A	6 km (3.73 miles, complying with the IEEE802.3cu standard)
					10 km (6.21 miles, complying with the 100G Lambda MSA standard)

QSFPDD-400G-LR8-WDM1300	Eight lanes: • 1273.54 • 1277.89 • 1282.26 • 1286.66 • 1295.56 • 1300.05 • 1304.58 • 1309.14	SMF	9/125	N/A	10 km (6.21 miles)
QSFPDD-400G-ZR-A	191.3 THz (1567.13 nm) to 196.1 THz (1528.77 nm) (fully C-band tunable)	SMF	9/125	N/A	120 km (74.57 miles)
QSFPDD-400G-ZR-B	191.3 THz (1567.13 nm) to 196.1 THz (1528.77nm) (fully C-band tunable)	SMF	9/125	N/A	120 km (74.57 miles)

Table 24 Specifications for QSFP-DD optical transceiver modules (LC interface) (2)

Model	Optical parameters (dBm)	
	Transmit power	Receive power
QSFPDD-400G-FR4-WDM1300	–3.2 to +4.4	–7.2 to +4.4
QSFPDD-400G-LR4-WDM1300-DC	–2.7 to +5.1	–9.0 to +5.1
QSFPDD-400G-LR8-WDM1300	–2.8 to +5.3	–9.1 to +5.3
QSFPDD-400G-ZR-A	–10.0 to –6.0	–12.0 to 0
QSFPDD-400G-ZR-B	–10.0 to –6.0	–12.0 to 0

NOTE:

- The transmit power and receive power provided in Table 24 are average values of the four lanes.
- For a transmission distance of 120 km (74.57 miles), use the QSFPDD-400G-ZR-A or QSFPDD-400G-ZR-B optical transceiver module together with optical amplifiers.

QSFP-DD to QSFP56 copper cables

Figure 22 QSFP-DD to QSFP56 copper cable



Models and specifications

Table 25 Specifications for QSFP-DD to QSFP56 copper cables

Model	Length	Data rate	Remarks
QSFPDD-400G-2QSFP56-200G-DAC-3m	3 m (9.84 ft)	400 Gbps	Used for connecting one 400G QSFP-DD port to two 200G QSFP56 ports.
QSFPDD-400G-4QSFP56-100G-DAC-3m	3 m (9.84 ft)		Used for connecting one 400G QSFP-DD port to four 100G QSFP56 ports.

QSFP-DD to QSFP56 fiber cables

Figure 23 QSFP-DD to QSFP56 fiber cable



Models and specifications

Table 26 Specifications for QSFP-DD to QSFP56 fiber cables

Model	Length	Data rate	Remarks
QSFPDD-400G-2QSFP56-200G-AOC-5m	5 m (16.40 ft)	400 Gbps	Used for connecting one 400G QSFP-DD port to two 200G QSFP56 ports.
QSFPDD-400G-2QSFP56-200G-AOC-7m	7 m (22.97 ft)		
QSFPDD-400G-2QSFP56-200G-AOC-10m	10 m (32.81 ft)		
QSFPDD-400G-2QSFP56-200G-AOC-20m	20 m (65.62 ft)		
QSFPDD-400G-2QSFP56-200G-AOC-30m	30 m (98.43 ft)		
QSFPDD-400G-2QSFP56-200G-AOC-50m	50 m (164.04 ft)		
QSFPDD-400G-4QSFP56-100G-AOC-5m	5 m (16.40 ft)		Used for connecting one 400G QSFP-DD port to four 100G QSFP56 ports.
QSFPDD-400G-4QSFP56-100G-AOC-7m	7 m (22.97 ft)		
QSFPDD-400G-4QSFP56-100G-AOC-10m	10 m (32.81 ft)		
QSFPDD-400G-4QSFP56-100G-AOC-20m	20 m (65.62 ft)		

QSFP-DD fiber cables

Figure 24 QSFP-DD fiber cable



Models and specifications

Table 27 Specifications for QSFP-DD fiber cables

Model	Length	Data rate
QSFPDD-400G-D-AOC-5m	5 m (16.40 ft)	400 Gbps
QSFPDD-400G-D-AOC-7m	7 m (22.97 ft)	
QSFPDD-400G-D-AOC-10m	10 m (32.81 ft)	

QSFPDD-400G-D-AOC-20m	20 m (65.62 ft)	
QSFPDD-400G-D-AOC-30m	30 m (98.43 ft)	
QSFPDD-400G-D-AOC-50m	50 m (164.04 ft)	

QSFP-DD copper cables

Figure 25 QSFP-DD copper cable



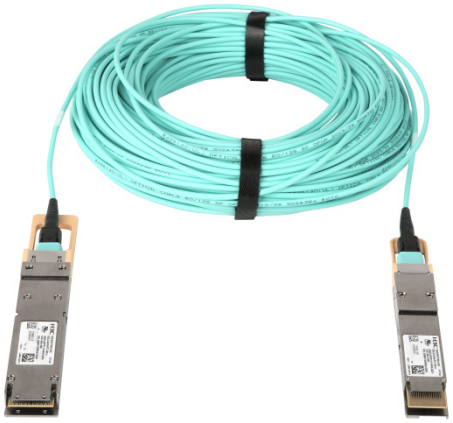
Models and specifications

Table 28 Specifications for QSFP-DD copper cables

Model	Length	Data rate
QSFPDD-400G-D-CAB-2M	2 m (6.56 ft)	400 Gbps
QSFPDD-400G-D-CAB-2.5m	2.5 m (8.20 ft)	
QSFPDD-400G-D-CAB-3m	3 m (9.84 ft)	

QSFPDD to OSFP-RHS fiber cables

Figure 26 QSFPDD to OSFP-RHS fiber cables



Models and specifications

Table 29 Specifications for QSFPDD to OSFP-RHS fiber cables

Model	Length	Data rate	Remarks
OSFP112-RHS-QDD-400G-AOC-5m-MM	5 m (16.40 ft)	400 Gbps	Used for connecting one 400G QSFP-DD port to one 400G OSFP-RHS port.
OSFP112-RHS-QDD-400G-AOC-7m-MM	7 m (22.97 ft)		
OSFP112-RHS-QDD-400G-AOC-10m-MM	10 m (32.81 ft)		
OSFP112-RHS-QDD-400G-AOC-20m	20 m (65.62 ft)		
OSFP112-RHS-QDD-400G-AOC-30m-MM	30 m (98.43 ft)		
OSFP112-RHS-QDD-400G-AOC-50m	50 m (164.04 ft)		
OSFP112-RHS-QDD-400G-AOC-20m-MM	20 m (65.62 ft)		
OSFP112-RHS-QDD-400G-AOC-50m-MM	50 m (164.04 ft)		

NOTE:

The OSFP112-RHS-QDD-400G-AOC-20m and OSFP112-RHS-QDD-400G-AOC-50m transceiver modules support single-mode optical fibers in Table 29. The other transceiver modules support multimode optical fibers.

OSFP-RHS modules

OSFP-RHS optical transceiver modules (MPO interface)

Figure 27 OSFP-RHS optical transceiver module (MPO interface)



Models and specifications

OSFP-RHS optical transceiver modules (MPO interface) provide a transmission rate of 400 Gbps and use an MPO connector.

Table 30 Specifications for OSFP-RHS optical transceiver modules (MPO interface) (1)

Model	Central wavelength (nm)	Fiber mode	Fiber diameter (μm)	Fiber cores	Modal bandwidth (MHz*km)	Transmission distance
UN-OSFP-RHS-400G-VR4-MM850	850	MMF	50/125	8	2000	30 m (98.43 ft)
					4700	50 m (164.04 ft)
UN-OSFP-RHS-400G-DR4-SM1310-1	1310	SMF	9/125	8	N/A	500 m (1640.42 ft)

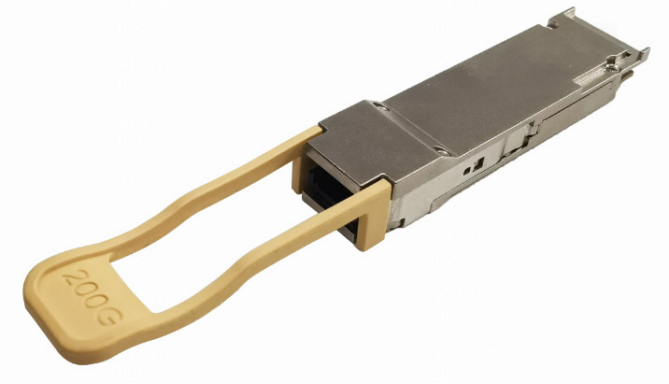
Table 31 Specifications for OSFP-RHS optical transceiver modules (MPO interface) (2)

Model	Connector	Optical parameters (dBm)	
		Transmit power	Receive power
UN-OSFP-RHS-400G-VR4-MM850	MPO (APC polished, 12-fiber)	–4.6 to +4	–6.4 to +4
UN-OSFP-RHS-400G-DR4-SM1310-1	MPO (APC polished, 12-fiber)	–2.9 to +4	–5.9 to +4

QSFP56 modules

QSFP56 optical transceiver modules (MPO interface)

Figure 28 QSFP56 optical transceiver module (MPO interface)



Models and specifications

QSFP56 optical transceiver modules (MPO interface) provide a transmission rate of 200 Gbps and use an MPO connector.

Table 32 Specifications for QSFP56 optical transceiver modules (MPO interface) (1)

Model	Central wavelength (nm)	Fiber mode	Fiber diameter (μm)	Fiber cores	Modal bandwidth (MHz*km)	Transmission distance
QSFP56-200G-SR4-MM850	850	MMF	50/125	8	2000	70 m (229.66 ft)
					4700	100 m (328.08 ft)
QSFP56-200G-SR4-MM850-APC	850	MMF	50/125	8	2000	70 m (229.66 ft)
					4700	100 m (328.08 ft)

Table 33 Specifications for QSFP56 optical transceiver modules (MPO interface) (2)

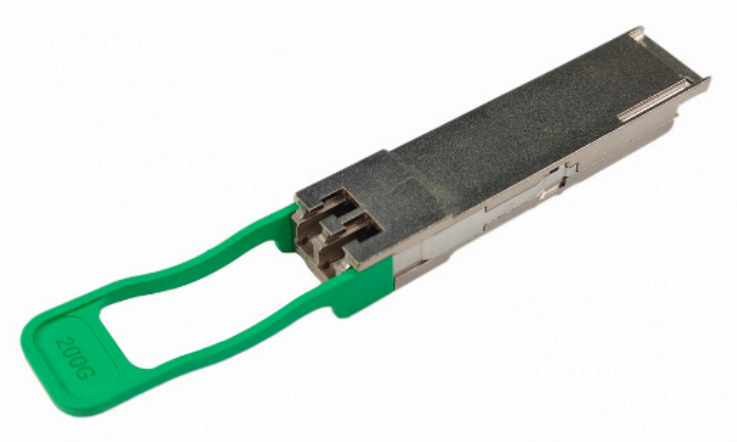
Model	Connector	Optical parameters (dBm)	
		Transmit power	Receive power
QSFP56-200G-SR4-MM850	MPO (PC polished, 12-fiber)	–6.5 to +4	–8.4 to +4
QSFP56-200G-SR4-MM850-APC	MPO (APC polished, 12-fiber)	–6.5 to +4	–8.4 to +4

NOTE:

The QSFP56-200G-SR4-MM850 transceiver module cannot be connected to the QSFP56-200G-SR4-MM850-APC transceiver module.

QSFP56 optical transceiver modules (LC interface)

Figure 29 QSFP56 optical transceiver module (LC interface)



Models and specifications

QSFP56 optical transceiver modules (LC interface) provide a transmission rate of 200 Gbps and use an LC connector.

Table 34 Specifications for QSFP56 optical transceiver modules (LC interface) (1)

Model	Central wavelength (nm)	Fiber mode	Fiber diameter (μm)	Modal bandwidth (MHz*km)	Transmission distance
QSFP56-200G-FR4-WDM1300	Four lanes: • 1271 • 1291 • 1311 • 1331	SMF	9/125	N/A	2 km (1.24 miles)

Table 35 Specifications for QSFP56 optical transceiver modules (LC interface) (2)

Model	Optical parameters (dBm)	
	Transmit power	Receive power
QSFP56-200G-FR4-WDM1300	–4.2 to +4.7	–8.2 to +4.7

QSFP56 copper cables

Figure 30 QSFP56 copper cable



Models and specifications

Table 36 Specifications for QSFP56 copper cable

Model	Length	Data rate
QSFP56-200G-D-DAC-1M	1 m (3.28 ft)	200 Gbps
QSFP56-200G-D-DAC-2M	2 m (6.56 ft)	
QSFP56-200G-D-DAC-3M	3 m (9.84 ft)	

QSFP56 to 2QSFP56 copper cables

Figure 31 QSFP56 to 2QSFP56 copper cable



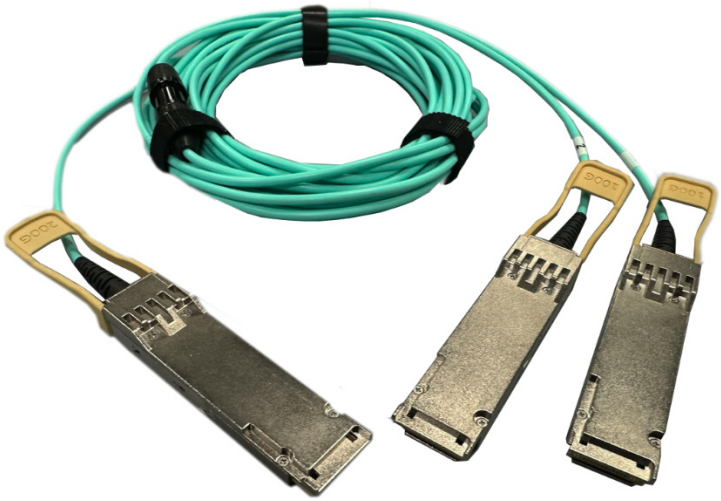
Models and specifications

Table 37 Specifications for QSFP56 to 2QSFP56 copper cables

Model	Length	Data rate	Remarks
QSFP56-200G-2QSFP56-100G-DAC-1m	1 m (3.28 ft)	200 Gbps	Used for connecting one 200G QSFP56 port to two 100G QSFP56 ports.
QSFP56-200G-2QSFP56-100G-DAC-2m	2 m (6.56 ft)		
QSFP56-200G-2QSFP56-100G-DAC-3m	3 m (9.84 ft)		

QSFP56 to 2QSFP56 fiber cables

Figure 32 QSFP56 to 2QSFP56 fiber cable



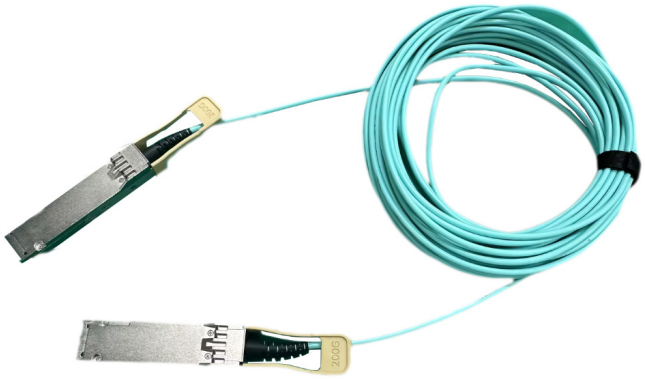
Models and specifications

Table 38 Specifications for QSFP56 to 2QSFP56 fiber cables

Model	Length	Data rate	Remarks
QSFP56-200G-2QSFP56-100G-AOC-5m	5 m (16.40 ft)	200 Gbps	Used for connecting one 200G QSFP56 port to two 100G QSFP56 ports.
QSFP56-200G-2QSFP56-100G-AOC-7m	7 m (22.97 ft)		
QSFP56-200G-2QSFP56-100G-AOC-10m	10 m (32.81 ft)		
QSFP56-200G-2QSFP56-100G-AOC-20m	20 m (65.62 ft)		
QSFP56-200G-2QSFP56-100G-AOC-30m	30 m (98.43 ft)		
QSFP56-200G-2QSFP56-100G-AOC-50m	50 m (164.04 ft)		

QSFP56 fiber cables

Figure 33 QSFP56 fiber cable



Models and specifications

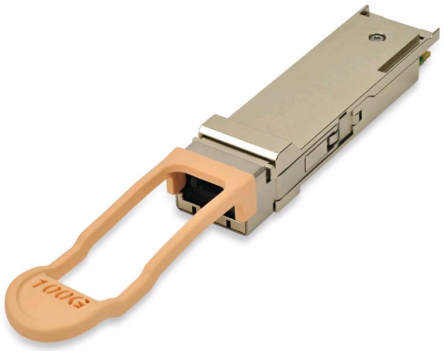
Table 39 Specifications for QSFP56 fiber cables

Model	Length	Data rate
QSFP56-200G-D-AOC-5M	5 m (16.40 ft)	200 Gbps
QSFP56-200G-D-AOC-7M	7 m (22.97 ft)	
QSFP56-200G-D-AOC-10M	10 m (32.81 ft)	
QSFP56-200G-D-AOC-20M	20 m (65.62 ft)	

QSFP28 modules

QSFP28 optical transceiver modules (MPO interface)

Figure 34 QSFP28 optical transceiver module (MPO interface)



Models and specifications

QSFP28 optical transceiver modules (MPO interface) provide a transmission rate of 100 Gbps and use an MPO connector.

Table 40 Specifications for QSFP28 optical transceiver modules (MPO interface) (1)

Model	Central wavelength (nm)	Fiber mode	Fiber diameter (μm)	Fiber cores	Modal bandwidth (MHz*km)	Transmission distance
QSFP-100G-SR4-MM850	850	MMF	50/125	8	2000	70 m (229.66 ft)
					4700	100 m (328.08 ft)
QSFP-100G-SR4-MM850-G	850	MMF	50/125	8	2000	70 m (229.66 ft)
					4700	100 m (328.08 ft)
QSFP-100G-SR4-MM850-H	850	MMF	50/125	8	2000	70 m (229.66 ft)
					4700	100 m (328.08 ft)
QSFP-100G-SR4-MM850-B-CM	850	MMF	50/125	8	2000	70 m (229.66 ft)
					4700	100 m (328.08 ft)
QSFP-100G-SR4-MM850-CM	850	MMF	50/125	8	2000	70 m (229.66 ft)
					4700	100 m (328.08 ft)
QSFP-100G-SR4-MM850-A	850	MMF	50/125	8	2000	70 m (229.66 ft)
					4700	100 m (328.08 ft)
QSFP-100G-eSR4-MM850	850	MMF	50/125	8	4700	300 m (984.25 ft)
QSFP-100G-PSM4-SM1310	1310	SMF	9/125	8	N/A	0.5 km (0.31 miles)

Table 41 Specifications for QSFP28 optical transceiver modules (MPO interface) (2)

Model	Connector	Optical parameters (dBm)	
		Transmit power	Receive power
QSFP-100G-SR4-MM850	MPO (PC polished, 12-fiber)	–8.4 to +2.4	–10.3 to +2.4
QSFP-100G-SR4-MM850-G	MPO (PC polished, 12-fiber)	–8.4 to +2.4	–10.3 to +2.4
QSFP-100G-SR4-MM850-H	MPO (PC polished, 12-fiber)	–8.4 to +2.4	–10.3 to +2.4
QSFP-100G-SR4-MM850-B-CM	MPO (PC polished, 12-fiber)	–2 to +2.4	–10.3 to +2.4
QSFP-100G-SR4-MM850-CM	MPO (PC polished, 12-fiber)	–8.4 to +2.4	–10.3 to +2.4
QSFP-100G-SR4-MM850-A	MPO (PC polished, 12-fiber)	–8.4 to +2.4	–10.3 to +2.4
QSFP-100G-eSR4-MM850	MPO (PC polished, 12-fiber)	–8.4 to +2.4	–10.3 to +2.4
QSFP-100G-PSM4-SM1310	MPO (APC polished, 12-fiber)	–9.4 to +2	–12.66 to +2

QSFP28 liquid-cooled transceiver modules (MPO interface)

Figure 35 QSFP28 liquid-cooled transceiver module (MPO interface)



Models and specifications

QSFP28 liquid-cooled transceiver modules (MPO interface) provide a transmission rate of 100 Gbps and use an MPO connector.

Table 42 Specifications for QSFP28 liquid-cooled transceiver modules (MPO interface) (1)

Model	Central wavelength (nm)	Fiber mode	Fiber diameter (μm)	Fiber cores	Modal bandwidth (MHz*km)	Transmission distance
QSFP-100G-SR4-MM850-Y5	850	MMF	50/125	8	2000	70 m (229.66 ft)
					4700	100 m (328.08 ft)

CAUTION:

The operating outer casing temperature range of liquid-cooled transceiver modules is 10°C to 60°C (50°F to 140°F).

Table 43 Specifications for QSFP28 liquid-cooled transceiver modules (MPO interface) (2)

Model	Connector	Optical parameters (dBm)	
		Transmit power	Receive power
QSFP-100G-SR4-MM850-Y5	MPO (PC polished, 12-fiber)	–8.4 to +2.4	–10.3 to +2.4

QSFP28 optical transceiver modules (LC interface)

Figure 36 QSFP28 optical transceiver module (LC interface)



Models and specifications

QSFP28 optical transceiver modules (LC interface) in Table 44 and Table 45 provide a transmission rate of 100 Gbps and 50 Gbps, respectively. The QSFP28 optical transceiver modules use an LC connector.

Table 44 Specifications for QSFP28 optical transceiver modules (LC interface) (1)

Model	Central wavelength (nm)	Fiber mode	Fiber diameter (μm)	Modal bandwidth (MHz*km)	Transmission distance
QSFP-100G-ER4L-WDM1300	Four lanes: • 1295.56 • 1300.05 • 1304.58 • 1309.14	SMF	9/125	N/A	40 km (24.86 miles)
QSFP-100G-ER4-WDM1300	Four lanes: • 1295.56 • 1300.05 • 1304.58 • 1309.14	SMF	9/125	N/A	40 km (24.86 miles)
QSFP-100G-LR4-WDM1300	Four lanes: • 1295.56 • 1300.05 • 1304.58 • 1309.14	SMF	9/125	N/A	10 km (6.21 miles)
QSFP-100G-LR4-WDM1300-G	Four lanes: • 1295.56 • 1300.05 • 1304.58 • 1309.14	SMF	9/125	N/A	10 km (6.21 miles)
QSFP-100G-LR4-WDM1300-A	Four lanes: • 1295.56 • 1300.05 • 1304.58 • 1309.14	SMF	9/125	N/A	10 km (6.21 miles)
QSFP-100G-LR4L-WDM1300	Four lanes: • 1271	SMF	9/125	N/A	2 km (1.24 miles)

	• 1291 • 1311 • 1331				
QSFP-100G-ZR4-WDM1300	Four lanes: • 1295.56 • 1300.05 • 1304.58 • 1309.14	SMF	9/125	N/A	80 km (49.71 miles)
QSFP-100G-CWDM4-SM1300-A	Four lanes: • 1271 • 1291 • 1311 • 1331	SMF	9/125	N/A	2 km (1.24 miles)
QSFP-100G-SWDM4-MM850	Four lanes: • 850 • 880 • 910 • 940	MMF	50/125	2000	75 m (246.06 ft)
				4700	100 m (328.08 ft)
QSFP-100G-BIDI-MM850	Two lanes: • 855 • 908	MMF	50/125	2000	70 m (229.66 ft)
				4700	100 m (328.08 ft)
QSFP-100G-BIDI-MM850-G2	Two lanes: • 855 • 908	MMF	50/125	2000	70 m (229.66 ft)
				4700	100 m (328.08 ft)
QSFP-100G-LR1-SM1310-DC	1310	SMF	9/125	N/A	10 km (6.21 miles)
QSFP-100G-DR1-SM1310	1310	SMF	9/125	N/A	500 m (1640.42 ft)
QSFP-100G-FR1-SM1310	1310	SMF	9/125	N/A	2 km (1.24 miles)
QSFP-100G-eBIDI-MM850	850	MMF	50/125	2000	70 m (229.66 ft)
				4700	150 m (492.13 ft)

Table 45 Specifications for QSFP28 optical transceiver modules (LC interface) (2)

Model	Central wavelength (nm)	Fiber mode	Fiber diameter (μm)	Modal bandwidth (MHz*km)	Transmission distance
QSFP-50G-LR-SM1311	1311	SMF	9/125	N/A	10 km (6.2 miles)
QSFP-50G-ER-SM1311	1311	SMF	9/125	N/A	40 km (24.86 miles)

Table 46 Specifications for QSFP28 optical transceiver modules (LC interface) (3)

Model	Optical parameters (dBm)	
	Transmit power (average)	Receive power (average)
QSFP-100G-ER4L-WDM1300	+0.5 to +4.5 per lane	–20.5 to –1.9 per lane

QSFP-100G-ER4-WDM1300	–2.9 to +2.9 per lane	–20.9 to –3.5 per lane
QSFP-100G-LR4-WDM1300	–4.3 to +4.5 per lane	–10.6 to +4.5 per lane
QSFP-100G-LR4-WDM1300-G	–4.3 to +4.5 per lane	–10.6 to +4.5 per lane
QSFP-100G-LR4-WDM1300-A	–4.3 to +4.5 per lane	–10.6 to +4.5 per lane
QSFP-100G-LR4L-WDM1300	–6.5 to +2.5 per lane	–11.5 to +2.5 per lane
QSFP-100G-ZR4-WDM1300	+2 to +6.5 per lane	–28 to –7 per lane
QSFP-100G-CWDM4-SM1300-A	–6.5 to +2.5 per lane	–11.5 to +2.5 per lane
QSFP-100G-SWDM4-MM850	–7.5 to +2.4 per lane	–9.5 to +2.4 per lane
QSFP-100G-BIDI-MM850	–6 to +4 per lane	–7.9 to +4 per lane
QSFP-100G-BIDI-MM850-G2	–6 to +4 per lane	–7.9 to +4 per lane
QSFP-50G-LR-SM1311	–4.5 to +4.2 per lane	–10.8 to +4.2 per lane
QSFP-50G-ER-SM1311	+0.4 to +6.6 per lane	–17.6 to –3.4 per lane
QSFP-100G-LR1-SM1310-DC	–1.9 to +4.8 per lane	–8.2 to +4.8 per lane
QSFP-100G-DR1-SM1310	–2.9 to +4.0 per lane	–5.9 to +4.0 per lane
QSFP-100G-FR1-SM1310	–3.1 to +4.0 per lane	–7.1 to +4.0 per lane
QSFP-100G-eBIDI-MM850	–6.2 to +4.0 per lane	–8.2 to +4.0 per lane

NOTE:

- The operating outer casing temperature of a QSFP-100G-BIDI-MM850 transceiver module is in the range of 10°C to 60°C (50°F to 140°F). The performance, signal transmitting and receiving capability, and link status of the transceiver module deteriorate when the outer casing temperature is out of this range.
- To use the QSFP-100G-ER4L-WDM1300 transceiver module to transmit data over a distance of 40 km (24.86 miles), you must enable FEC on the traffic transmitting and receiving ports. If FEC is not enabled on the peer ports, the transmission distance can only reach a maximum of 30 km (18.64 miles).

QSFP28 copper cable

Figure 37 QSFP28 copper cable



Models and specifications

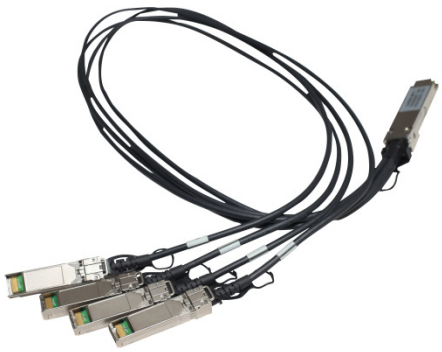
Table 47 Specifications for QSFP28 copper cables

Model	Length	Data rate
QSFP-100G-D-CAB-1M	1 m (3.28 ft)	100 Gbps
QSFP-100G-D-CAB-3M	3 m (9.84 ft)	
QSFP-100G-D-CAB-3M-CM	3 m (9.84 ft)	
QSFP-100G-D-CAB-5M	5 m (16.40 ft)	

QSFP28 to SFP28 copper cables

A QSFP28 to SFP28 copper cable has a QSFP28 module at one end and four SFP28 modules at the other end.

Figure 38 QSFP28 to SFP28 copper cable



Models and specifications

Table 48 Specifications for QSFP28 to SFP28 copper cables

Model	Length	Data rate	Remarks
QSFP-100G-4SFP-25G-CAB-1M	1 m (3.28 ft)	100 Gbps	Used for connecting one 100G QSFP28 port to four 25G SFP28 ports.
QSFP-100G-4SFP-25G-CAB-3M	3 m (9.84 ft)		
QSFP-100G-4SFP-25G-CAB-3M-CM	3 m (9.84 ft)		
QSFP-100G-4SFP-25G-CAB-5M	5 m (16.40 ft)		
QSFP-100G-4SFP-25G-CAB-5M-CM	5 m (16.40 ft)		

QSFP28 fiber cables

Figure 39 QSFP28 fiber cable



Models and specifications

Table 49 Specifications for QSFP28 fiber cables

Model	Length	Data rate
QSFP-100G-D-AOC-7M	7 m (22.97 ft)	100 Gbps
QSFP-100G-D-AOC-7M-H	7 m (22.97 ft)	
QSFP-100G-D-AOC-10M	10 m (32.81 ft)	
QSFP-100G-D-AOC-10M-H	10 m (32.81 ft)	
QSFP-100G-D-AOC-20M	20 m (65.62 ft)	
QSFP-100G-D-AOC-20M-H	20 m (65.62 ft)	
QSFP-100G-D-AOC-30M	30 m (98.43 ft)	
QSFP-100G-D-AOC-50M	50 m (164.04 ft)	

DSFP modules

DSFP fiber cables

Figure 40 DSFP fiber cable



Models and specifications

Table 50 Specifications for DSFP fiber cables

Model	Length	Transmission rate
DSFP-100G-D-AOC-5M	3 m (9.84 ft)	100 Gbps
DSFP-100G-D-AOC-7M	5 m (16.40 ft)	
DSFP-100G-D-AOC-10M	7 m (22.97 ft)	
DSFP-100G-D-AOC-20M	20 m (65.62 ft)	

CFP modules

100-Gigabit CFP optical transceiver modules

Figure 41 100-Gigabit/40-Gigabit CFP optical transceiver module



Models and specifications

100-Gigabit CFP optical transceiver modules provide a transmission rate of 100 Gbps and use LC connectors.

Table 51 Specifications for 100-Gigabit CFP optical transceiver modules (1)

Model	Central wavelength (nm)	Fiber mode	Fiber diameter (μm)	Transmission distance
CFP-100G-LR4-WDM1300 (end of sale)	Four lanes: • 1295.56 • 1300.05 • 1304.58 • 1309.14	SMF	9/125	10 km (6.21 miles)
CFP-100G-LR4-WDM1300-A	Four lanes: • 1295.56 • 1300.05 • 1304.58 • 1309.14	SMF	9/125	10 km (6.21 miles)
CFP-100G-ER4-WDM1300 (end of sale)	Four lanes: • 1295.56 • 1300.05 • 1304.58 • 1309.14	SMF	9/125	40 km (24.86 miles)

Table 52 Specifications for 100-Gigabit CFP optical transceiver modules (2)

Model	Optical parameters (dBm)	
	Transmit power (average)	Receive power (average)
CFP-100G-LR4-WDM1300	–4.3 to +4.5	–10.6 to +4.5
CFP-100G-LR4-WDM1300-A	–4.3 to +4.5	–10.6 to +4.5
CFP-100G-ER4-WDM1300	–2.9 to +2.9	–20.9 to +4.5

40-Gigabit CFP optical transceiver modules

See Figure 41 for a view of the 40-Gigabit CFP optical transceiver module.

Models and specifications

40-Gigabit CFP optical transceiver modules provide a transmission rate of 40 Gbps and use a dual LC connector.

Table 53 Specifications for 40-Gigabit CFP optical transceiver modules (1)

Model	Central wavelength (nm)	Fiber mode	Fiber diameter (μm)	Transmission distance
CFP-40G-LR4-SM1310 (end of sale)	Four lanes: • 1271 • 1291 • 1311 • 1331	SMF	9/125	10 km (6.21 miles)
CFP-40G-ER4-WDM1300 (end of sale)	Four lanes: • 1271 • 1291 • 1311 • 1331	SMF	9/125	40 km (24.86 miles)

Table 54 Specifications for 40-Gigabit CFP optical transceiver modules (2)

Model	Optical parameters (dBm)	
	Transmit power (average)	Receive power (average)
CFP-40G-LR4-SM1310	–4 to +3	–11.5 to +3
CFP-40G-ER4-WDM1300	–2.7 to +4.5	–21 to –4.5

CFP2 modules

CFP2 optical transceiver modules (MPO interface)

Figure 42 CFP2 optical transceiver module (MPO interface)



Models and specifications

CFP2 optical transceiver modules (MPO interface) provide a transmission rate of 100 Gbps and use an MPO connector.

Table 55 Specifications for CFP2 optical transceiver modules (MPO interface) (1)

Model	Central wavelength (nm)	Fiber mode	Fiber diameter (μm)	Fiber cores	Modal bandwidth (MHz*km)	Transmission distance
CFP2-100G-SR 10-MM850	850	MMF	50/125	20	2000	100 m (328.08 ft)
					4700	150 m (492.13 ft)

Table 56 Specifications for CFP2 optical transceiver modules (MPO interface) (2)

Model	Connector	Optical parameters (dBm)	
		Transmit power	Receive power
CFP2-100G-SR10-MM850	MPO (PC polished, 24-fiber)	–7.6 to +2.4	–9.5 to +2.4

CFP2 optical transceiver modules (LC interface)

Figure 43 CFP2 optical transceiver module (LC interface)



Models and specifications

CFP2 optical transceiver modules (LC interface) provide a transmission rate of 100 Gbps and use an LC connector.

Table 57 Specifications for CFP2 optical transceiver modules (LC interface) (1)

Model	Central wavelength (nm)	Fiber mode	Fiber diameter (μm)	Transmission distance
CFP2-100G-LR4-WDM1300	Four lanes: • 1295.56 • 1300.05 • 1304.58 • 1309.14	SMF	9/125	10 km (6.21 miles)
CFP2-100G/112G-LR4-WDM1300 (end of sale)	Four lanes: • 1295.56 • 1300.05 • 1304.58 • 1309.14	SMF	9/125	10 km (6.21 miles)
CFP2-100G-ER4-WDM1300	Four lanes: • 1295.56 • 1300.05 • 1304.58 • 1309.14	SMF	9/125	40 km (24.86 miles)

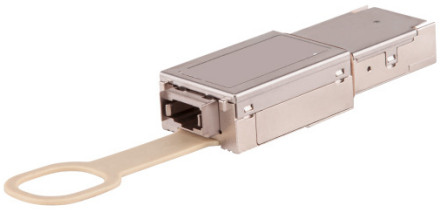
Table 58 Specifications for CFP2 optical transceiver modules (LC interface) (2)

Model	Optical parameters (dBm)	
	Transmit power (average)	Receive power (average)
CFP2-100G-LR4-WDM1300	–4.3 to +4.5	–10.6 to +4.5
CFP2-100G/112G-LR4-WDM1300	–4.3 to +4.5	–10.6 to +4.5
CFP2-100G-ER4-WDM1300	–2.7 to +2.9	–20.9 to +4.5

CXP modules

CXP optical transceiver modules

Figure 44 CXP optical transceiver module



Models and specifications

CXP optical transceiver modules provide a transmission rate of 100 Gbps and use an MPO connector.

Table 59 Specifications for CXP optical transceiver modules (1)

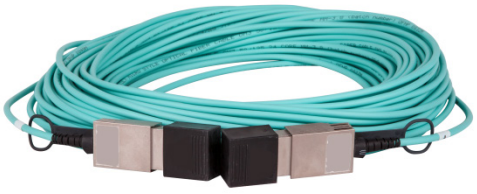
Model	Central wavelength (nm)	Fiber mode	Fiber diameter (μm)	Fiber cores	Modal bandwidth (MHz*km)	Transmission distance
CXP-100G-SR10-MM850 (end of sale)	850	MMF	50/125	20	2000	100 m (328.08 ft)
CXP-100G-SR10-MM850-A (end of sale)	850	MMF	50/125	20	2000	100 m (328.08 ft)

Table 60 Specifications for CXP optical transceiver modules (2)

Model	Connector	Optical parameters (dBm)	
		Transmit power	Receive power
CXP-100G-SR10-MM850	MPO (PC polished, 24-fiber)	–7.6 to +2.4	–9.5 to +2.4
CXP-100G-SR10-MM850-A	MPO (PC polished, 24-fiber)	–7.6 to +2.4	–9.5 to +2.4

CXP fiber cables

Figure 45 CXP fiber cable



Models and specifications

Table 61 Specifications for CXP fiber cables

Model	Length	Transmission rate
CXP-CXP-AOC-30M (end of sale)	30 m (98.43 ft)	100 Gbps
CXP-CXP-AOC-10M (end of sale)	10 m (32.81 ft)	

QSFP+ modules

QSFP+ optical transceiver modules (MPO interface)

Figure 46 QSFP+ optical transceiver module (MPO interface)



Models and specifications

QSFP+ optical transceiver modules (MPO interface) provide a transmission rate of 40 Gbps and use an MPO connector.

Table 62 Specifications for QSFP+ optical transceiver modules (MPO interface) (1)

Model	Central wavelength (nm)	Fiber mode	Fiber diameter (μm)	Fiber cores	Modal bandwidth (MHz*km)	Transmission distance
QSFP-40G-SR4-MM850	850	MMF	50/125	8	2000	100 m (328.08 ft)
					4700	150 m (492.13 ft)
QSFP-40G-SR4-MM850-G	850	MMF	50/125	8	2000	100 m (328.08 ft)
					4700	150 m (492.13 ft)
QSFP-40G-SR4-MM850-H	850	MMF	50/125	8	2000	100 m (328.08 ft)
					4700	150 m (492.13 ft)
QSFP-40G-SR4-MM850-CM	850	MMF	50/125	8	2000	100 m (328.08 ft)
					4700	150 m (492.13 ft)
QSFP-40G-SR4-MM850-NDDM (end of sale)	850	MMF	50/125	8	2000	100 m (328.08 ft)
					4700	150 m (492.13 ft)
QSFP-40G-CSR4-MM850	850	MMF	50/125	8	2000	300 m (984.25 ft)
					4700	400 m (1312.33 ft)
QSFP-40G-CSR4-MM850-G	850	MMF	50/125	8	2000	300 m (984.25 ft)
					4700	400 m (1312.33 ft)
QSFP-40G-CSR4-MM850-H	850	MMF	50/125	8	2000	300 m (984.25 ft)
					4700	400 m (1312.33 ft)
QSFP-40G-CSR4-MM	850	MMF	50/125	8	2000	300 m (984.25 ft)

850-NDDM (end of sale)					4700	400 m (1312.33 ft)
QSFP-40G-IR4-PSM1310 (end of sale)	1310	SMF	9/125	8	N/A	1.4 km (0.87 miles)
QSFP-40G-LR4-PSM1310	1310	SMF	9/125	8	N/A	10 km (6.21 miles)
QSFP-40G-LR4-PSM1310-A	1310	SMF	9/125	8	N/A	10 km (6.21 miles)

Table 63 Specifications for QSFP+ optical transceiver modules (MPO interface) (2)

Model	Connector	Optical parameters (dBm)	
		Transmit power	Receive power
QSFP-40G-SR4-MM850	MPO (PC polished, 12-fiber)	–7.6 to 0	–9.5 to +2.4
QSFP-40G-SR4-MM850-G	MPO (PC polished, 12-fiber)	–7.6 to 0	–9.5 to +2.4
QSFP-40G-SR4-MM850-H	MPO (PC polished, 12-fiber)	–7.6 to +2.4	–9.5 to +2.4
QSFP-40G-SR4-MM850-CM	MPO (PC polished, 12-fiber)	–7.6 to 0	–9.5 to +2.4
QSFP-40G-SR4-MM850-NDDM (end of sale)	MPO (PC polished, 12-fiber)	–7.6 to 0	–9.5 to +2.4
QSFP-40G-CSR4-MM850	MPO (PC polished, 12-fiber)	–7.6 to 0	–9.9 to +2.4
QSFP-40G-CSR4-MM850-G	MPO (PC polished, 12-fiber)	–7.6 to 0	–9.9 to +2.4
QSFP-40G-CSR4-MM850-H	MPO (PC polished, 12-fiber)	–7.6 to +2.4	–9.9 to +2.4
QSFP-40G-CSR4-MM850-NDDM (end of sale)	MPO (PC polished, 12-fiber)	–7.6 to 0	–9.9 to +2.4
QSFP-40G-IR4-PSM1310	MPO (APC polished, 12-fiber)	–6 to +0.5	–11.5 to +2.3
QSFP-40G-LR4-PSM1310	MPO (APC polished, 12-fiber)	–8.2 to +1.5	–12.6 to +1.5
QSFP-40G-LR4-PSM1310-A	MPO (APC polished, 12-fiber)	–8.2 to +1.5	–12.6 to +1.5

NOTE:

The 40G QSFP+ ports of the following optical transceiver modules can be split into four channels: QSFP-40G-SR4-MM850-G, QSFP-40G-CSR4-MM850-G, QSFP-40G-SR4-MM850, QSFP-40G-SR4-MM850-H, QSFP-40G-SR4-MM850-CM, QSFP-40G-SR4-MM850-NDDM, QSFP-40G-CSR4-MM850, QSFP-40G-CSR4-MM850-H, QSFP-40G-CSR4-MM850-NDDM, QSFP-40G-IR4-PSM1310, QSFP-40G-LR4-PSM1310, and QSFP-40G-LR4-PSM1310-A. You can connect a 40G QSFP+ port to four 10G SFP+ ports. The QSFP+ optical transceiver module and SFP+ optical transceiver modules to be connected must be the same in specifications, including central wavelength and fiber type.

QSFP+ optical transceiver modules (LC interface)

Figure 47 QSFP+ optical transceiver module (LC interface)



Models and specifications

QSFP+ optical transceiver modules (LC interface) provide a transmission rate of 40 Gbps and use a dual LC connector.

Table 64 Specifications for QSFP+ transceiver modules (LC interface) (1)

Model	Central wavelength (nm)	Fiber mode	Fiber diameter (μm)	Modal bandwidth (MHz*km)	Transmission distance
QSFP-40G-LR4-WDM1300	Four lanes: • 1271 • 1291 • 1311 • 1331	SMF	9/125	N/A	10 km (6.21 miles)
QSFP-40G-LR4-WDM1300-G	Four lanes: • 1271 • 1291 • 1311 • 1331	SMF	9/125	N/A	10 km (6.21 miles)
QSFP-40G-LR4L-WDM1300	Four lanes: • 1271 • 1291 • 1311 • 1331	SMF	9/125	N/A	2 km (1.24 miles)
QSFP-40G-ER4-WDM1300	Four lanes: • 1271 • 1291 • 1311 • 1331	SMF	9/125	N/A	40 km (24.86 miles)
QSFP-40G-LX4-WDM1300	Four lanes: • 1271 • 1291 • 1311 • 1331	MMF	50/125	2000	150 m (492.13 ft)
				4700	
QSFP-40G-BIDI-SR-MM850	Two lanes: • 850 • 900	MMF	50/125	2000	100 m (328.08 ft)
				4700	150 m (492.13 ft)
QSFP-40G-BIDI-WDM1	Four lanes:	MMF	50/125	2000	140 m

310 (end of sale)	• 1271 • 1291 • 1311 • 1331				(459.32 ft)
				4700	160 m (524.93 ft)
QSFP-40G-BIDI-WDM850	Four lanes: • 850 • 880 • 910 • 940	MMF	50/125	2000	240 m (787.40 ft)
				4700	350 m (1148.29 ft)

Table 65 Specifications for QSFP+ transceiver modules (LC interface) (2)

Model	Optical parameters (dBm)	
	Transmit power (average)	Receive power (average)
QSFP-40G-LR4-WDM1300	–7 to +2.3	–13.7 to +2.3
QSFP-40G-LR4-WDM1300-G	–7 to +2.3	–13.7 to +2.3
QSFP-40G-LR4L-WDM1300	–10 to +2.3	–11.5 to +2.3
QSFP-40G-ER4-WDM1300	–2.7 to +4.5	–21.2 to –4.5
QSFP-40G-LX4-WDM1300	–5 to +3.5	–10.5 to +3.5
QSFP-40G-BIDI-SR-MM850	–4 to +5	–6 to +5
QSFP-40G-BIDI-WDM1310	–7 to +4.3	–10 to +4.3
QSFP-40G-BIDI-WDM850	–7.6 to +3	–9 to +3

NOTE:

- The operating outer casing temperature of a QSFP-40G-BIDI-SR-MM850 transceiver module is in the range of 10°C to 70°C (50°F to 158°F). The performance, signal transmitting and receiving capability, and link status of the transceiver module deteriorate when the outer casing temperature is out of this range.
- The **`display transceiver diagnosis`** command displays the current values of the digital diagnosis parameters on transceiver modules. However, if you use this command for a port in which a QSFP-40G-BIDI-SR-MM850 transceiver module is installed, the transmit and receive power of the transceiver module will not be displayed.
- In the scenario where ODFs are used, the transmission line from a QSFP-40G-LX4-WDM1300 transceiver module can pass through only one ODF if the ODFs use MPO interfaces and can pass through two ODFs if the ODFs use LC interfaces.

QSFP+ copper cables

Figure 48 QSFP+ copper cable



Models and specifications

Table 66 Specifications for QSFP+ copper cables

Model	Length	Data rate	Type	Remarks
LSWM1QSTK0	1 m (3.28 ft)	40 Gbps	QSFP+ copper cable	Used for interconnecting 40-Gigabit QSFP+ ports
LSWM1QSTK1	3 m (9.84 ft)			
QSFP-40G-3M-CM	3 m (9.84 ft)			
LSWM1QSTK2	5 m (16.40 ft)			
QSFP-40G-5M-CM	5 m (16.40 ft)			

QSFP+ to SFP+ copper cables

One end of a QSFP+ to SFP+ copper cable provides a QSFP+ module, and the other end provides four SFP+ modules.

Figure 49 QSFP+ to SFP+ copper cable



Models and specifications

Table 67 Specifications for QSFP+ to SFP+ copper cables

Model	Length	Data rate	Cable type	Remarks
LSWM1QSTK3	1 m (3.28 ft)	40 Gbps	40G QSFP+ to 4 x 10G SFP+ copper cable	Used for connecting a 40-Gigabit QSFP+ port to four 10-Gigabit SFP+ ports
LSWM1QSTK4	3 m (9.84 ft)			
QSFP-40G-4SFP-10G-CAB-3M-CM	3 m (9.84 ft)			
LSWM1QSTK5	5 m (16.40 ft)			
QSFP-40G-4SFP-10G-CAB-5M-CM	5 m (16.40 ft)			

QSFP+ fiber cables

Figure 50 QSFP+ fiber cable



Models and specifications

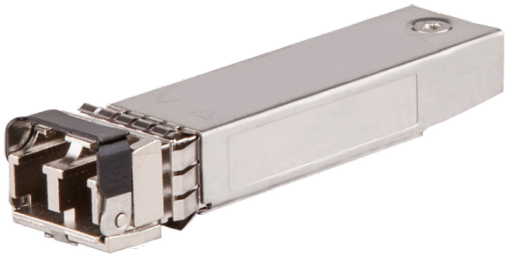
Table 68 Specifications for QSFP+ fiber cables

Model	Length	Data rate
QSFP-40G-D-AOC-3M	3 m (9.84 ft)	40 Gbps
QSFP-40G-D-AOC-7M	7 m (22.97 ft)	
QSFP-40G-D-AOC-7M-H	7 m (22.97 ft)	
QSFP-40G-D-AOC-7M-CM	7 m (22.97 ft)	
QSFP-40G-D-AOC-10M	10 m (32.81 ft)	
QSFP-40G-D-AOC-10M-H	10 m (32.81 ft)	
QSFP-40G-D-AOC-10M-CM	10 m (32.81 ft)	
QSFP-40G-D-AOC-20M	20 m (65.62 ft)	
QSFP-40G-D-AOC-20M-H	20 m (65.62 ft)	
QSFP-40G-D-AOC-20M-CM	20 m (65.62 ft)	

SFP28 modules

SFP28 optical transceiver modules

Figure 51 SFP28 optical transceiver module



Models and specifications

SFP28 optical transceiver modules provide a transmission rate of 25 Gbps and use a dual LC connector.

Table 69 Specifications for SFP28 transceiver modules (1)

Model	Central wavelength (nm)	Fiber mode	Fiber diameter (μm)	Modal bandwidth (MHz*km)	Transmission distance
SFP-25G-SR-MM850	850	MMF	50/125	2000	70 m (229.66 ft)
				4700	100 m (328.08 ft)
SFP-25G-SR-MM850-G	850	MMF	50/125	2000	70 m (229.66 ft)
				4700	100 m (328.08 ft)
SFP-25G-SR-MM850-H	850	MMF	50/125	2000	70 m (229.66 ft)
				4700	100 m (328.08 ft)
SFP-25G-LR-SM1310	1310	SMF	9/125	N/A	10 km (6.21 miles)
*SFP-25G-LR-SM1310-I	1310	SMF	9/125	N/A	10 km (6.21 miles)
SFP-25G-LR-SM1310-G	1310	SMF	9/125	N/A	10 km (6.21 miles)
SFP-25G-CSR-MM850	850	MMF	50/125	2000	200 m (656.17 ft)
				> 3500	300 m (984.25 ft)
				> 5500	400 m (1312.34 ft)

Table 70 Specifications for SFP28 transceiver modules (2)

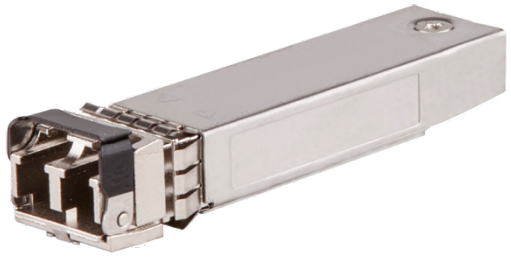
Model	Optical parameters (dBm)	
	Transmit power	Receiving power
SFP-25G-SR-MM850	–8.4 to +2.4	–10.3 to +2.4
SFP-25G-SR-MM850-G	–8.4 to +2.4	–10.3 to +2.4
SFP-25G-SR-MM850-H	–8.4 to +2.4	–10.3 to +2.4
SFP-25G-LR-SM1310	–7 to +2	–13.3 to +2
SFP-25G-LR-SM1310-G	–7 to +2	–13.3 to +2
*SFP-25G-LR-SM1310-I	–7 to +2	–13.3 to +2
SFP-25G-CSR-MM850	–6.4 to +2.4	–10.3 to +2.4

NOTE:

The transceiver module marked with * in Table 69 and Table 70 operates at the industrial outer casing temperature range.

SFP28 dual rate optical transceiver modules

Figure 52 SFP28 dual rate optical transceiver module



Models and specifications

SFP28 dual rate optical transceiver modules provide a transmission rate of 25 Gbps or 10 Gbp and use an LC connector.

NOTE:

- The use of the SFP28 dual rate optical transceiver module is limited. For more information, contact the product manager.
- When a device is connected to a 10G SR optical transceiver module, an RX power high alarm might occur on the 10G SR optical transceiver module.

Table 71 Specifications for SFP28 dual rate optical transceiver modules (1)

Model	Transmission speed	Central wavelength (nm)	Fiber mode	Fiber diameter (μm)	Modal bandwidth (MHz*km)	Transmission distance
SFP-25G-SR-	25Gbps/10Gbps	850	MMF	50/125	2000	70 m (229.66 ft)

MM850-DR					4700	100 m (328.08 ft)

Table 72 Specifications for SFP28 dual rate optical transceiver modules (2)

Model	Optical parameters (dBm)	
	Transmit power	Receiving power
SFP-25G-SR-MM850-DR	–8.4 to +2.4	–10.3 to +2.4

SFP28 copper cables

Figure 53 SFP28 copper cable



Models and specifications

Table 73 Specifications for SFP28 copper cables

Model	Length	Data rate
SFP-25G-D-CAB-1M	1 m (3.28 ft)	25 Gbps
SFP-25G-D-CAB-1M-A	1 m (3.28 ft)	
SFP-25G-D-CAB-2M-A	2 m (6.56 ft)	
SFP-25G-D-CAB-3M	3 m (9.84 ft)	
SFP-25G-D-CAB-3M-CM	3 m (9.84 ft)	
SFP-25G-D-CAB-3M-A	3 m (9.84 ft)	
SFP-25G-D-CAB-3M-Y	3 m (9.84 ft)	
SFP-25G-D-CAB-4M-A	4 m (13.12 ft)	
SFP-25G-D-CAB-5M	5 m (16.40 ft)	
SFP-25G-D-CAB-5M-A	5 m (16.40 ft)	
SFP-25G-D-CAB-5M-Y	5 m (16.40 ft)	
SFP-25G-D-ACC-7M	7 m (22.97 ft)	
SFP-25G-D-ACC-10M	10 m (32.81 ft)	

CAUTION:

The SFP-25G-D-CAB-3M-Y and SFP-25G-D-CAB-5M-Y are liquid-cooled copper cables. The transceiver module operating casing temperature range is 10°C to 60°C (50°F to 140°F).

SFP28 fiber cables

Figure 54 SFP28 fiber cable



Models and specifications

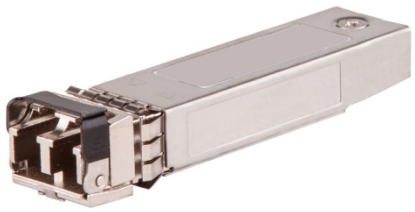
Table 74 Specifications for SFP28 fiber cables

Model	Length	Data rate
SFP-25G-D-AOC-3M	3 m (9.84 ft)	25 Gbps
SFP-25G-D-AOC-5M	5 m (16.40 ft)	
SFP-25G-D-AOC-5M-H	5 m (16.40 ft)	
SFP-25G-D-AOC-5M-DG	5 m (16.40 ft)	
SFP-25G-D-AOC-5M-DT (end of sale)	5 m (16.40 ft)	
SFP-25G-D-AOC-7M	7 m (22.97 ft)	
SFP-25G-D-AOC-7M-H	7 m (22.97 ft)	
SFP-25G-D-AOC-7M-DG	7 m (22.97 ft)	
SFP-25G-D-AOC-7M-DT (end of sale)	7 m (22.97 ft)	
SFP-25G-D-AOC-10M	10 m (32.81 ft)	
SFP-25G-D-AOC-10M-H	10 m (32.81 ft)	
SFP-25G-D-AOC-10M-DG	10 m (32.81 ft)	
SFP-25G-D-AOC-10M-DT (end of sale)	10 m (32.81 ft)	
SFP-25G-D-AOC-20M	20 m (65.62 ft)	
SFP-25G-D-AOC-20M-H	20 m (65.62 ft)	
SFP-25G-D-AOC-20M-DG	20 m (65.62 ft)	
SFP-25G-D-AOC-20M-DT (end of sale)	20 m (65.62 ft)	

SFP+ modules

SFP+ optical transceiver modules (LC interface)

Figure 55 SFP+ optical transceiver module (LC interface)



Models and specifications

SFP+ optical transceiver modules (LC interface) use an LC connector.

Table 75 Specifications for SFP+ optical transceiver modules (LC interface) (1)

Model	Central wavelength (nm)	Fiber mode	Fiber diameter (μm)	Modal bandwidth (MHz*km)	Transmission distance	Data rate
SFP-XG-SX-MM850-A	850	MMF	50/125	4700	400 m (1312.34 ft)	10.31 Gbps
				2000	300 m (984.25 ft)	
				500	82 m (269.03 ft)	
				400	66 m (216.54 ft)	
			62.5/125	200	33 m (108.27 ft)	
				160	26 m (85.30 ft)	
SFP-XG-SX-MM850-B (end of sale)	850	MMF	50/125	4700	400 m (1312.34 ft)	10.31 Gbps
				2000	100 m (328.08 ft)	
				500	25 m (82.02 ft)	
				400	20 m (65.62 ft)	
			62.5/125	200	10 m (32.81 ft)	
				160	8 m (26.25 ft)	
SFP-XG-SX-MM850-D	850	MMF	50/125	4700	400 m (1312.34 ft)	10.31 Gbps
				2000	300 m (984.25 ft)	
				500	82 m (269.03 ft)	
				400	66 m (216.54 ft)	
			62.5/125	200	33 m (108.27 ft)	
				160	26 m (85.30 ft)	
SFP-XG-SX-MM850-UL	850	MMF	50/125	4700	400 m (1312.34 ft)	10.31 Gbps
				2000	300 m (984.25 ft)	

				500	82 m (269.03 ft)	
				400	66 m (216.54 ft)	
			62.5/125	200	33 m (108.27 ft)	
				160	26 m (85.30 ft)	
SFP-XG-SX-MM850-H	850	MMF	50/125	4700	400 m (1312.34 ft)	10.31 Gbps
				2000	300 m (984.25 ft)	
				500	82 m (269.03 ft)	
				400	66 m (216.54 ft)	
			62.5/125	200	33 m (108.27 ft)	
				160	26 m (85.30 ft)	
SFP-XG-SX-MM850-S	850	MMF	50/125	4700	400 m (1312.34 ft)	10.31 Gbps
				2000	300 m (984.25 ft)	
				500	82 m (269.03 ft)	
				400	66 m (216.54 ft)	
			62.5/125	200	33 m (108.27 ft)	
				160	26 m (85.30 ft)	
SFP-XG-SX-MM850-E	850	MMF	50/125	4700	400 m (1312.34 ft)	10.31 Gbps
				2000	300 m (984.25 ft)	
				500	82 m (269.03 ft)	
				400	66 m (216.54 ft)	
			62.5/125	200	33 m (108.27 ft)	
				160	26 m (85.30 ft)	
*SFP-XG-SX-MM850-I	850	MMF	50/125	4700	400 m (1312.34 ft)	10.31 Gbps
				2000	300 m (984.25 ft)	
				500	82 m (269.03 ft)	
				400	66 m (216.54 ft)	
			62.5/125	200	33 m (108.27 ft)	
				160	26 m (85.30 ft)	
SFP-XG-SX-MM850-G	850	MMF	50/125	2000	300 m (984.25 ft)	10.31 Gbps
SFP-XG-SX-MM850-L	850	MMF	50/125	N/A	300 m (984.25 ft)	10.31 Gbps
SFP-XG-SX-MM850-F1 (end of sale)	850	MMF	50/125	4700	400 m (1312.34 ft)	10.31 Gbps
				2000	300 m (984.25 ft)	
				500	82 m (269.03 ft)	
				400	66 m (216.54 ft)	
			62.5/125	200	33 m (108.27 ft)	
				160	26 m (85.30 ft)	
SFP-XG-LX	1310	MMF	50/125	1500	220 m (721.78 ft)	10.31 Gbps

220-MM1310 (end of sale)				500	220 m (721.78 ft)	
				400	100 m (328.08 ft)	
			62.5/125	200	220 m (721.78 ft)	
				160	220 m (721.78 ft)	
SFP-XG-LX-SM1310	1310	SMF	9/125	N/A	10 km (6.21 miles)	10.31 Gbps
SFP-XG-LX-SM1310-G	1310	SMF	9/125	N/A	10 km (6.21 miles)	10.31 Gbps
SFP-XG-LX-SM1310-H	1310	SMF	9/125	N/A	10 km (6.21 miles)	10.31 Gbps
SFP-XG-LX-SM1310-D	1310	SMF	9/125	N/A	10 km (6.21 miles)	10.31 Gbps
SFP-XG-LX-SM1310-S	1310	SMF	9/125	N/A	10 km (6.21 miles)	10.31 Gbps
SFP-XG-LX-SM1310-CM	1310	SMF	9/125	N/A	10 km (6.21 miles)	10.31 Gbps
SFP-XG-LX-SM1310-E	1310	SMF	9/125	N/A	10 km (6.21 miles)	10.31 Gbps
*SFP-XG-LX-SM1310-I	1310	SMF	9/125	N/A	10 km (6.21 miles)	10.31 Gbps
SFP-XG-LX-SM1310-L	1310	SMF	9/125	N/A	10 km (6.21 miles)	10.31 Gbps
SFP-XG-LH40-SM1550	1550	SMF	9/125	N/A	40 km (24.86 miles)	10.31 Gbps
*SFP-XG-LH40-SM1550-I	1550	SMF	9/125	N/A	40 km (24.86 miles)	10.31 Gbps
SFP-XG-LH40-SM1550-D	1550	SMF	9/125	N/A	40 km (24.86 miles)	10.31 Gbps
SFP-XG-LH80-SM1550	1550	SMF	9/125	N/A	80 km (49.71 miles)	10.31 Gbps
SFP-XG-LH80-SM1550-D	1550	SMF	9/125	N/A	80 km (49.71 miles)	10.31 Gbps
SFP-FC-8G	850	MMF	62.5/125	200	150 m (492.13 ft)	2.125 Gbps

					70 m (229.66 ft)	4.25 Gbps
					21 m (68.90 ft)	8.5 Gbps
			50/125	500	300 m (984.25 ft)	2.125 Gbps
					150 m (492.13 ft)	4.25 Gbps
					50 m (164.04 ft)	8.5 Gbps
				2000	500 m (1640.42 ft)	2.125 Gbps
					380 m (1246.72 ft)	4.25 Gbps
					150 m (492.13 ft)	8.5 Gbps
				4700	N/A	2.125 Gbps
					400 m (1312.34 ft)	4.25 Gbps
					190 m (623.36 ft)	8.5 Gbps
SFP-FC-8G-SW-MM850-CM	850	MMF	62.5/125	200	150 m (492.13 ft)	2.125 Gbps
					70 m (229.66 ft)	4.25 Gbps
					21 m (68.90 ft)	8.5 Gbps
			50/125	500	300 m (984.25 ft)	2.125 Gbps
					150 m (492.13 ft)	4.25 Gbps
					50 m (164.04 ft)	8.5 Gbps
				2000	500 m (1640.42 ft)	2.125 Gbps
					380 m (1246.72 ft)	4.25 Gbps
					150 m (492.13 ft)	8.5 Gbps
				4700	N/A	2.125 Gbps
					400 m (1312.34 ft)	4.25 Gbps
					190 m (623.36 ft)	8.5 Gbps
SFP-FC-8G-LW-SM1310	1310	SMF	9/125	N/A	10 km (6.21 miles)	2.125 Gbps
						4.25 Gbps
						8.5 Gbps
SFP-FC-16G-SW-MM850	850	MMF	62.5/125	200	70 m (229.66 ft)	4.25 Gbps
					21 m (68.90 ft)	8.5 Gbps
					15 m (49.21 ft)	14.025 Gbps
			50/125	500	150 m (492.13 ft)	4.25 Gbps
					50 m (164.04 ft)	8.5 Gbps
					35 m (114.83 ft)	14.025 Gbps
				2000	380 m (1246.72 ft)	4.25 Gbps
					150 m (492.13 ft)	8.5 Gbps
					100 m (328.08 ft)	14.025 Gbps
				4700	400 m (1312.33 ft)	4.25 Gbps

					190 m (623.36 ft)	8.5 Gbps
					125 m (410.11 ft)	14.025 Gbps
SFP-FC-16G-SW-MM850-CM	850	MMF	62.5/125	200	70 m (229.66 ft)	4.25 Gbps
					21 m (68.90 ft)	8.5 Gbps
					15 m (49.21 ft)	14.025 Gbps
			50/125	500	150 m (492.13 ft)	4.25 Gbps
					50 m (164.04 ft)	8.5 Gbps
					35 m (114.83 ft)	14.025 Gbps
				2000	380 m (1246.72 ft)	4.25 Gbps
					150 m (492.13 ft)	8.5 Gbps
					100 m (328.08 ft)	14.025 Gbps
				4700	400 m (1312.33 ft)	4.25 Gbps
					190 m (623.36 ft)	8.5 Gbps
					125 m (410.11 ft)	14.025 Gbps
SFP-FC-16G-LW-SM1310	1310	SMF	9/125	N/A	10 km (6.21 miles)	4.25 Gbps
						8.5 Gbps
						14.025 Gbps
SFP-FC-16G-LW-SM1310-CM	1310	SMF	9/125	N/A	10 km (6.21 miles)	4.25 Gbps
						8.5 Gbps
						14.025 Gbps
SFP-FC-32G-SW-MM850	850	MMF	62.5/125	200	21 m (68.90 ft)	8.5 Gbps
					15 m (49.21 ft)	14.025 Gbps
					N/A	28.05 Gbps
			50/125	500	50 m (164.04 ft)	8.5 Gbps
					35 m (114.83 ft)	14.025 Gbps
					20 m (65.62 ft)	28.05 Gbps
				2000	150 m (492.13 ft)	8.5 Gbps
					100 m (328.08 ft)	14.025 Gbps
					70 m (229.66 ft)	28.05 Gbps
				4700	190 m (623.36 ft)	8.5 Gbps
					125 m (410.11 ft)	14.025 Gbps

					100 m (328.08 ft)	28.05 Gbps
SFP-FC-32G-SW-MM850-CM	850	MMF	62.5/125	200	21 m (68.90 ft)	8.5 Gbps
					15 m (49.21 ft)	14.025 Gbps
					N/A	28.05 Gbps
			50/125	500	50 m (164.04 ft)	8.5 Gbps
					35 m (114.83 ft)	14.025 Gbps
					20 m (65.62 ft)	28.05 Gbps
				2000	150 m (492.13 ft)	8.5 Gbps
					100 m (328.08 ft)	14.025 Gbps
					70 m (229.66 ft)	28.05 Gbps
				4700	190 m (623.36 ft)	8.5 Gbps
					125 m (410.11 ft)	14.025 Gbps
					100 m (328.08 ft)	28.05 Gbps
SFP-XG-LH80-Tunable (end of sale)	1547.75	SMF	9/125	N/A	80 km (49.71 miles)	9.95 to 11.3 Gbps
*SFP-XG-CPRI-IR-SM1310	1310	SMF	9/125	N/A	1.4 km (0.87 miles)	4.91 to 10.31 Gbps
*SFP-XG-CPRI-LR-SM1310	1310	SMF	9/125	N/A	10 km (6.21 miles)	4.91 to 10.31 Gbps
SFP-XG-LX-SM1270-BIDI	Tx: 1270 Rx: 1330	SMF	9/125	N/A	10 km (6.21 miles)	10.31Gbps
SFP-XG-LX-SM1270-BIDI-S	Tx: 1270 Rx: 1330	SMF	9/125	N/A	10 km (6.21 miles)	10.31Gbps
SFP-XG-LX-SM1330-BIDI	Tx: 1330 Rx: 1270	SMF	9/125	N/A	10 km (6.21 miles)	10.31Gbps
SFP-XG-LX-SM1330-BIDI-S	Tx: 1330 Rx: 1270	SMF	9/125	N/A	10 km (6.21 miles)	10.31Gbps
SFP-XG-LH40-SM1270-BIDI	Tx: 1270 Rx: 1330	SMF	9/125	N/A	40 km (24.86 miles)	10.31Gbps
SFP-XG-LH40-SM1330-BIDI	Tx: 1330 Rx: 1270	SMF	9/125	N/A	40 km (24.86 miles)	10.31Gbps
SFP-XG-LH80-SM1490-BIDI	Tx: 1490 Rx: 1550	SMF	9/125	N/A	80 km (49.71 miles)	10.31Gbps
SFP-XG-LH	Tx: 1550	SMF	9/125	N/A	80 km (49.71	10.31Gbps

80-SM1550-BIDI	Rx: 1490				miles)	
SFP-XG-LX-SM1271-A1-V2	1271	SMF	9/125	N/A	10 km (6.21 miles)	10 Gbps
SFP-XG-LX-SM1291-A2-V2	1291	SMF	9/125	N/A	10 km (6.21 miles)	10 Gbps
SFP-XG-LX-SM1311-A3-V2	1311	SMF	9/125	N/A	10 km (6.21 miles)	10 Gbps
SFP-XG-LX-SM1491-A4-V2	1491	SMF	9/125	N/A	10 km (6.21 miles)	10 Gbps
SFP-XG-LX-SM1511-A5-V2	1511	SMF	9/125	N/A	10 km (6.21 miles)	10 Gbps
SFP-XG-LX-SM1531-A6-V2	1531	SMF	9/125	N/A	10 km (6.21 miles)	10 Gbps
SFP-XG-LX-SM1551-A7-V2	1551	SMF	9/125	N/A	10 km (6.21 miles)	10 Gbps
SFP-XG-LX-SM1571-A8-V2	1571	SMF	9/125	N/A	10 km (6.21 miles)	10 Gbps
SFP-XG-LX-SM1331-C1-V2	1331	SMF	9/125	N/A	10 km (6.21 miles)	10 Gbps
SFP-XG-LX-SM1351-C2-V2	1351	SMF	9/125	N/A	10 km (6.21 miles)	10 Gbps
SFP-XG-LX-SM1371-C3-V2	1371	SMF	9/125	N/A	10 km (6.21 miles)	10 Gbps
SFP-XG-LX-SM1391-C4-V2	1391	SMF	9/125	N/A	10 km (6.21 miles)	10 Gbps
SFP-XG-LX-SM1411-C5-V2	1411	SMF	9/125	N/A	10 km (6.21 miles)	10 Gbps
SFP-XG-LX-SM1431-C6-V2	1431	SMF	9/125	N/A	10 km (6.21 miles)	10 Gbps
SFP-XG-LX-SM1451-C7-V2	1451	SMF	9/125	N/A	10 km (6.21 miles)	10 Gbps
SFP-XG-LX-SM1471-C8-V2	1471	SMF	9/125	N/A	10 km (6.21 miles)	10 Gbps

NOTE:

- BIDI optical transceiver modules use different central wavelengths in transmit and receive directions, in order to implement bidirectional transmission of optical signals over the same fiber.
- You must use the SFP-XG-LX-SM1270-BIDI and SFP-XG-LX-SM1330-BIDI transceiver modules in pairs.

Table 76 Specifications for SFP+ optical transceiver modules (LC interface) (2)

Model	Optical parameters (dBm)	
	Transmit power	Receive power
SFP-XG-SX-MM850-A	–7.3 to –1	–9.9 to +0.5
SFP-XG-SX-MM850-B	–7.3 to –1	–9.9 to +0.5
SFP-XG-SX-MM850-D	–7.3 to –1	–9.9 to +0.5
SFP-XG-SX-MM850-UL	–7.3 to –1	–9.9 to +0.5
SFP-XG-SX-MM850-H	–7.3 to –1	–9.9 to +0.5
SFP-XG-SX-MM850-S	–7.3 to –1	–9.9 to +0.5
SFP-XG-SX-MM850-E	–7.3 to –1	–9.9 to +0.5
*SFP-XG-SX-MM850-I	–7.3 to –1	–9.9 to +0.5
SFP-XG-SX-MM850-G	–7.3 to –1	–9.9 to –1
SFP-XG-SX-MM850-L	–7.3 to –1	–11.1 to –1
SFP-XG-SX-MM850-F1	–7.3 to –1	–9.9 to +0.5
SFP-XG-LX220-MM1310	–6.5 to +0.5	–6.5 to +1.5
SFP-XG-LX-SM1310	–8.2 to +0.5	–14.4 to +0.5
SFP-XG-LX-SM1310-H	–8.2 to +0.5	–14.4 to +0.5
SFP-XG-LX-SM1310-G	–8.2 to +0.5	–14.4 to +0.5
SFP-XG-LX-SM1310-D	–8.2 to +0.5	–14.4 to +0.5
SFP-XG-LX-SM1310-S	–8.2 to +0.5	–14.4 to +0.5
SFP-XG-LX-SM1310-CM	–8.2 to +0.5	–14.4 to +0.5
SFP-XG-LX-SM1310-E	–8.2 to +0.5	–14.4 to +0.5
*SFP-XG-LX-SM1310-I	–8.2 to +0.5	–14.4 to +0.5
SFP-XG-LX-SM1310-L	–8.2 to +0.5	–14.4 to +0.5
SFP-XG-LH40-SM1550	–4.7 to +4	–15.8 to –1
*SFP-XG-LH40-SM1550-I	–4.7 to +4	–15.8 to –1
SFP-XG-LH40-SM1550-D	–4.7 to +4	–15.8 to –1
SFP-XG-LH80-SM1550	0 to +4	–24 to –7
SFP-XG-LH80-SM1550-D	0 to +4	–24 to –7
SFP-FC-8G-SW-MM850	–10 to 0 (2.125 Gbps)	–13.1 to 0 (2.125 Gbps)
	–9 to 0 (4.25 Gbps)	–12.1 to 0 (4.25 Gbps)
	–8.2 to 0 (8.5 Gbps)	–11.2 to 0 (8.5 Gbps)
SFP-FC-8G-LW-SM1310	–9.5 to –3 (2.125 Gbps)	–18.2 to –3 (2.125 Gbps)
	–8.4 to –1 (4.25 Gbps)	–15.4 to –1 (4.25 Gbps)

	–8.4 to +0.5 (8.5 Gbps)	–13.8 to +0.5 (8.5 Gbps)
SFP-FC-16G-SW-MM850	–9 to 0 (4.25 Gbps)	–12.1 to 0 (4.25 Gbps)
	–8.2 to 0 (8.5 Gbps)	–11.2 to 0 (8.5 Gbps)
	–7.8 to 0 (14.025 Gbps)	–10.5 to 0 (14.025 Gbps)
SFP-FC-16G-SW-MM850-CM	–9 to 0 (4.25 Gbps)	–12.1 to 0 (4.25 Gbps)
	–8.2 to 0 (8.5 Gbps)	–11.2 to 0 (8.5 Gbps)
	–7.8 to 0 (14.025 Gbps)	–10.5 to 0 (14.025 Gbps)
SFP-FC-16G-LW-SM1310	–8.4 to –1 (4.25 Gbps)	–15.4 to –1 (4.25 Gbps)
	–8.4 to +0.5 (8.5 Gbps)	–13.8 to +0.5 (8.5 Gbps)
	–5 to +2 (14.025 Gbps)	–12 to +2 (14.025 Gbps)
SFP-FC-16G-LW-SM1310-CM	–8.4 to –1 (4.25 Gbps)	–15.4 to –1 (4.25 Gbps)
	–8.4 to +0.5 (8.5 Gbps)	–13.8 to +0.5 (8.5 Gbps)
	–5 to +2 (14.025 Gbps)	–12 to +2 (14.025 Gbps)
SFP-FC-32G-SW-MM850	–8.2 to 0 (8.5 Gbps)	–11.2 to 0 (8.5 Gbps)
	–7.8 to 0 (14.025 Gbps)	–10.5 to 0 (14.025 Gbps)
	–6.2 to +2 (28.05 Gbps)	–10.2 to +2 (28.05 Gbps)
SFP-XG-LH80-Tunable	–1 to +3	–24 to –7
*SFP-XG-CPRI-IR-SM1310	–8.2 to +0.5	–14.4 to +0.5
*SFP-XG-CPRI-LR-SM1310	–8.2 to +0.5	–14.4 to +0.5
SFP-XG-LX-SM1270-BIDI	–8.2 to –0.5	–14.4 to +0.5
SFP-XG-LX-SM1270-BIDI-S	–8.2 to –0.5	–14.4 to +0.5
SFP-XG-LX-SM1330-BIDI	–8.2 to –0.5	–14.4 to +0.5
SFP-XG-LX-SM1330-BIDI-S	–8.2 to –0.5	–14.4 to +0.5
SFP-XG-LH40-SM1270-BIDI	0 to +5	–15 to +0.5
SFP-XG-LH40-SM1330-BIDI	0 to +5	–15 to +0.5
SFP-XG-LH80-SM1490-BIDI	0 to +4	–23 to –6
SFP-XG-LH80-SM1550-BIDI	–1 to +3	–23 to –6
SFP-XG-LX-SM1271-A1-V2	–1 to +6	–16 to +2
SFP-XG-LX-SM1291-A2-V2	–1 to +6	–16 to +2
SFP-XG-LX-SM1311-A3-V2	–1 to +6	–16 to +2
SFP-XG-LX-SM1491-A4-V2	–1 to +6	–16 to +2
SFP-XG-LX-SM1511-A5-V2	–1 to +6	–16 to +2
SFP-XG-LX-SM1531-A6-V2	–1 to +6	–16 to +2
SFP-XG-LX-SM1551-A7-V2	–1 to +6	–16 to +2
SFP-XG-LX-SM1571-A8-V2	–1 to +6	–16 to +2
SFP-XG-LX-SM1331-C1-V2	–1 to +6	–16 to +2
SFP-XG-LX-SM1351-C2-V2	–1 to +6	–16 to +2
SFP-XG-LX-SM1371-C3-V2	–1 to +6	–16 to +2

SFP-XG-LX-SM1391-C4-V2	–1 to +6	–16 to +2
SFP-XG-LX-SM1411-C5-V2	–1 to +6	–16 to +2
SFP-XG-LX-SM1431-C6-V2	–1 to +6	–16 to +2
SFP-XG-LX-SM1451-C7-V2	–1 to +6	–16 to +2
SFP-XG-LX-SM1471-C8-V2	–1 to +6	–16 to +2

NOTE:

- A mode conditioning patch cord is required when you use OM1 or OM2 fiber types on an SFP-XG-LX220-MM1310. No mode conditioning patch cords are required for OM3 fiber types. For more information about mode conditioning patch cords, see the IEEE 802.3 standard.
- The SFP-XG-LH80-Tunable module supports wavelength adjustment. Cold-starting of the module takes a longer time (usually not exceeding 90 seconds) than other SFP+ modules.
- The transceiver modules marked with * in Table 75 and Table 76 operate at the industrial outer casing temperature range.

SFP+ EPON ONU optical transceiver modules (SC interface)

Figure 56 SFP+ EPON ONU optical transceiver module (SC interface)



Models and specifications

Table 77 Specifications for SFP+ EPON ONU optical transceiver modules (SC interface) (1)

Model	Central wavelength (nm)	Fiber mode	Fiber diameter (μm)	Transmission distance
SFP-XG-PR30-U-SM1270	• Tx: 1270 • Rx: 1577.5	SMF	9/125	20 km (12.43 miles)
SFP-XG-PRX30-U-SM1310 (end of sale)	• Tx: 1310 • Rx: 1577.5	SMF	9/125	20 km (12.43 miles)

Table 78 Specifications for SFP+ EPON ONU optical transceiver modules (SC interface) (2)

Model	Data rate (Gbps)		Optical parameters (dBm)	
	Tx	Rx	Transmit power	Receive power
SFP-XG-PR30-U-SM1270	10.3125	10.3125	+4 to +9	–10 to –28.5
SFP-XG-PRX30-U-SM1310 (end of sale)	1.25	10.3125	+0.62 to +5.62	–10 to –28.5

SFP+ GPON OLT optical transceiver modules (SC interface)

Figure 57 SFP+ GPON OLT optical transceiver module (SC interface)



Models and specifications

Table 79 Specifications for SFP+ GPON OLT optical transceiver modules (SC interface) (1)

Model	Central wavelength (nm)	Fiber mode	Fiber diameter (μm)	Transmission distance
SFP-GPON-B+-D-SM1490-A	• Tx: 1490 • Rx: 1310	SMF	9/125	20 km (12.43 miles)
SFP-GPO	• Tx: 1490 • Rx: 1310	SMF	9/125	20 km (12.43 miles)

N-C+-D-SM1490-A				
SFP-GPON-C++-D-SM1490-A	• Tx: 1490 • Rx: 1310	SMF	9/125	20 km (12.43 miles)

Table 80 Specifications for SFP+ GPON OLT optical transceiver modules (SC interface) (2)

Model	Data rate (Gbps)		Optical parameters (dBm)	
	Tx	Rx	Tx power	Rx power
SFP-GPON-B+-D-SM1490-A	2.488	1.244	+1.5 to +5	–28 to –8
SFP-GPON-C+-D-SM1490-A	2.488	1.244	+3 to +7	–32 to –12
SFP-GPON-C++-D-SM1490-A	2.488	1.244	+4.5 to +8	–33 to –12

SFP+ EPON OLT optical transceiver modules (SC interface)

Figure 58 SFP+ EPON OLT optical transceiver module (SC interface)



Models and specifications

Table 81 Specifications for SFP+ EPON OLT optical transceiver modules (SC interface) (1)

Model	Central wavelength (nm)	Fiber mode	Fiber diameter (μm)	Transmission distance

SFP-XG-PR30-D-SM1577-A (end of sale)	• **Tx/Rx rate**—10.3125 Gbps
	  ○ Tx: 1577.5
	  ○ Rx: 1270
	• **Tx/Rx rate**—1.25 Gbps
	  ○ Tx: 1490
	  ○ Rx: 1310
		SMF	9/125	20 km (12.43 miles)

SFP-XG-PR30-D-SM1577-C	• **Tx/Rx rate**—10.3125 Gbps
	  ○ Tx: 1577.5
	  ○ Rx: 1270
	• **Tx/Rx rate**—1.25 Gbps
	  ○ Tx: 1490
	  ○ Rx: 1310
		SMF	9/125	20 km (12.43 miles)

SFP-XG-PR40-D-SM1577-A (end of sale)	• **Tx/Rx rate**—10.3125 Gbps
	  ○ Tx: 1577.5
	  ○ Rx: 1270
	• **Tx/Rx rate**—1.25 Gbps
	  ○ Tx: 1490
	  ○ Rx: 1310
		SMF	9/125	20 km (12.43 miles)

SFP-XG-PR40-D-SM1577-C	• **Tx/Rx rate**—10.3125 Gbps
	  ○ Tx: 1577.5
	  ○ Rx: 1270
	• **Tx/Rx rate**—1.25 Gbps
	  ○ Tx: 1490
	  ○ Rx: 1310
		SMF	9/125	20 km (12.43 miles)

Table 82 Specifications for SFP+ EPON OLT optical transceiver modules (SC interface) (2)

Model	Data rate (Gbps)		Optical parameters (dBm)	
	Tx	Rx	Tx power	Rx power
SFP-XG-PR30-D-SM1577-A	10.3125	10.3125	+2 to +5	–6 to –28
	1.25	1.25	+3 to +7	–9.38 to –29.78
SFP-XG-PR30-D-SM1577-C	10.3125	10.3125	+2 to +5	–6 to –28
	1.25	1.25	+3 to +7	–9.38 to –29.78
SFP-XG-PR40-D-SM1577-A	10.3125	10.3125	+5 to +9	–9 to –29
	1.25	1.25	+4 to +10	–12 to –32
SFP-XG-PR40-D-SM1577-C	10.3125	10.3125	+5 to +9	–9 to –29
	1.25	1.25	+4 to +10	–12 to –31

NOTE:

The optical power budget is 29 dB for the SFP-XG-PR30-D-SM1577-A and SFP-XG-PR30-D-SM1577-C transceiver modules and 33 dB for the SFP-XG-PR40-D-SM1577-A and SFP-XG-PR40-D-SM1577-C transceiver modules.

SFP+ EPON ONU optical transceiver modules (SC interface)

Figure 59 SFP+ EPON ONU optical transceiver module (SC interface)



Models and specifications

An SFP+ EPON ONU optical transceiver module uses an SC connector.

Table 83 Specifications for SFP+ EPON ONU optical transceiver modules (SC interface) (1)

Model	Central wavelength (nm)	Fiber mode	Fiber diameter (μm)	Transmission distance
SFP-XG-PR30-U-SM1270-A	• Tx: 1270 • Rx: 1577	SMF	9/125	20 km (12.43 miles)

Table 84 Specifications for SFP+ EPON ONU optical transceiver modules (SC interface) (2)

Model	Data rate (Gbps)		Optical parameters (dBm)	
	Tx	Rx	Transmit power	Receive power
SFP-XG-PR30-U-SM1270-A	10.3	10.3	+4 to +9	–10 to –28.5

SFP+ XGPON ONU optical transceiver modules (SC interface)

Figure 60 SFP+ XGPON ONU optical transceiver module (SC interface)



Models and specifications

An SFP+ XGPON ONU optical transceiver module uses an SC connector.

Table 85 Specifications for SFP+ XGPON ONU optical transceiver modules (SC interface) (1)

Model	Central wavelength (nm)	Fiber mode	Fiber diameter (μm)	Transmission distance
SFP-XGPON-N/E-U-SM1270	• Tx: 1270 • Rx: 1577	SMF	9/125	20 km (12.43 miles)

Table 86 Specifications for SFP+ XGPON ONU optical transceiver modules (SC interface) (2)

Model	Data rate (Gbps)		Optical parameters (dBm)	
	Tx	Rx	Transmit power	Receive power
SFP-XGPON-N/E-U-SM1270	2.488	9.95	+2 to +7	–8 to –28

SFP+ XGSPON OLT optical transceiver modules (SC interface)

Figure 61 SFP+ XGSPON OLT optical transceiver module (SC interface)



Models and specifications

An SFP+ XGSPON OLT optical transceiver module uses an SC connector.

Table 87 Specifications for SFP+ XGSPON OLT optical transceiver modules (SC interface) (1)

Model	Central wavelength (nm)	Fiber mode	Fiber diameter (μm)	Transmission distance
SFP-XGSPON-N2-D-SM1577	• Tx: 1270 • Rx: 1577	SMF	9/125	20 km (12.43 miles)
SFP-XGSPON-E1-D-SM1577	• Tx: 1577 • Rx: 1270	SMF	9/125	20 km (12.43 miles)

SFP-XGSPON&GPON-C+-D-SM1577	• **Tx/Rx rate**—9.953 Gbps
	  ○ Tx: 1577
	  ○ Rx: 1270
	• Data rate of 9.953 Gbps at the Tx and 2.488 Gbps at the Rx
	  ○ Tx: 1490
	  ○ Rx: 1310
	• Data rate of 2.488 Gbps at the Tx and 1.244 Gbps at the Rx
	  ○ Tx: 1490
	  ○ Rx: 1310
		MMF	50/125	20 km (12.43 miles)

Table 88 Specifications for SFP+ XGSPON OLT optical transceiver modules (SC interface) (2)

Model	Data rate (Gbps)		Optical parameters (dBm)	
	Tx	Rx	Tx power	Rx power
SFP-XGSPON-N2-D-SM1577	9.953	• 9.953 • 2.488	+4 to +7	–7 to –28

SFP-XGSPON-E1-D-SM1577	9.953	• 9.953 • 2.488	+6 to +9	–9 to –30
SFP-XGSPON&GPON-C+-D-SM1577	9.953	• 9.953 • 2.488	+5 to +8	–29 to –8 (XGSPON)
				–30.5 to –10 (XGPON)
	2.488	1.244	+3 to +7	–32 to –12 (GPON)

SFP+ XGSPON ONU optical transceiver modules (SC interface)

Figure 62 SFP+ XGSPON ONU optical transceiver modules (SC interface)



Models and specifications

An SFP+ XGSPON ONU optical transceiver module uses an SC connector.

Table 89 Specifications for SFP+ XGSPON ONU optical transceiver modules (SC interface) (1)

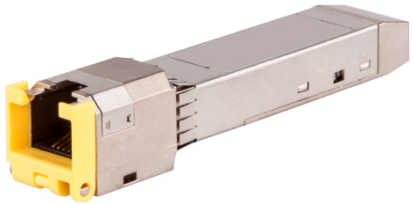
Model	Central wavelength (nm)	Fiber mode	Fiber diameter (μm)	Transmission distance
SFP-XGSPON-N/E-U-SM1270	• Tx: 1270 • Rx: 1577	SMF	9/125	20 km (12.43 miles)
SFP-XGSPON-STICK-N2-SM1270-I	• Tx: 1270 • Rx: 1577	SMF	9/125	20 km (12.43 miles)

Table 90 Specifications for SFP+ XGSPON ONU optical transceiver modules (SC interface) (2)

Model	Data rate (Gbps)		Optical parameters (dBm)	
	Tx	Rx	Transmit power	Receive power
SFP-XGSPON-N/E-U-SM1270	9.95	9.95	+4 to +9	–9 to –28
SFP-XGSPON-STICK-N2-SM1270-I	9.95	9.95	+4 to +9	–9 to –28

SFP+ copper transceiver modules

Figure 63 SFP+ copper transceiver module



Models and specifications

Table 91 SFP+ copper transceiver module specifications

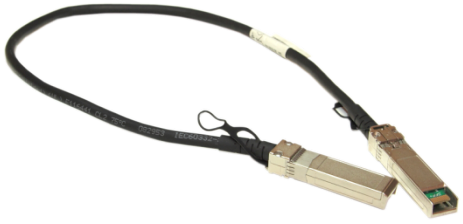
Model	Transmission distance	Data rate	Cable type	Connector type
SFP-10GE-T	30 m (98.43 ft)	10 Gbps	Category 6a STP or Category 7 STP	RJ-45
	100 m (328.08 ft)	1000/100 Mbps	Category 5e UTP/STP	

NOTE:

Support for data rate autonegotiation of depends on the device model.

SFP+ copper cables

Figure 64 SFP+ copper cable



Models and specifications

Table 92 Specifications for SFP+ copper cables

Model	Length	Data rate
LSWM1STK	0.65 m (2.13 ft)	10.31 Gbps
LSWM2STK	1.2 m (3.94 ft)	
LSWM3STK	3 m (9.84 ft)	
SFP-XG-CAB-3M-CM	3 m (9.84 ft)	
LSTM1STK	5 m (16.40 ft)	
LSTM1STK-S	5 m (16.40 ft)	
SFP-XG-CAB-5M-CM	5 m (16.40 ft)	
LSTM2STK	7 m (22.97 ft)	

SFP+ fiber cables

Figure 65 SFP+ fiber cable



Models and specifications

Table 93 Specifications for SFP+ fiber cables

Model	Length	Data rate
SFP-XG-D-AOC-7M	7 m (22.97 ft)	10.31 Gbps
SFP-XG-D-AOC-7M-H	7 m (22.97 ft)	
SFP-XG-D-AOC-10M	10 m (32.81 ft)	
SFP-XG-D-AOC-10M-H	10 m (32.81 ft)	
SFP-XG-D-AOC-20M	20 m (65.62 ft)	
SFP-XG-D-AOC-20M-H	20 m (65.62 ft)	

XFP modules

XFP optical transceiver modules (LC interface)

Figure 66 XFP optical transceiver module (LC interface)



Models and specifications

Table 94 Specifications for XFP optical transceiver modules (LC interface) (1)

Model	Central wavelength (nm)	Data rate (Gbps)	Fiber mode	Fiber diameter (μm)	Modal bandwidth (MHz*km)	Transmission distance
XFP-SX-MM850	850	9.95 to 10.31	MMF	50/125	4700	400 m (1312.34 ft)
					2000	300 m (984.25 ft)
					500	82 m (269.03 ft)
					400	66 m (216.54 ft)
				62.5/125	200	33 m (108.27 ft)
					160	26 m (85.30 ft)
XFP-SX-MM850-D	850	9.95 to 10.31	MMF	50/125	4700	400 m (1312.34 ft)
					2000	300 m (984.25 ft)
					500	82 m (269.03 ft)
					400	66 m (216.54 ft)
				62.5/125	200	33 m (108.27 ft)
					160	26 m (85.30 ft)
XFP-LX-SM1310	1310	9.95 to 10.31	SMF	9/125	N/A	10 km (6.21 miles)
XFP-LX-SM1310-D	1310	9.95 to 10.31	SMF	9/125	N/A	10 km (6.21 miles)
XFP-POS-LH10-SM1310	1310	9.95 to 11.3	SMF	9/125	N/A	10 km (6.21 miles)
XFP-LH40-SM1550 (end of sale)	1550	9.95 to 10.7	SMF	9/125	N/A	40 km (24.86 miles)
XFP-LH40-SM15	1550	9.95 to	SMF	9/125	N/A	40 km (24.86

50-D		10.7				miles)
XFP-LH40-SM1550-F1	1550	9.95 to 10.7	SMF	9/125	N/A	40 km (24.86 miles)
XFP-LH80-SM1550	1550	9.95 to 10.31	SMF	9/125	N/A	80 km (49.71 miles)
XFP-LH80-SM1550-D	1550	9.95 to 10.31	SMF	9/125	N/A	80 km (49.71 miles)
XFP-LX-SM1530.33 (end of sale)	1530.33	9.95 to 10.31	SMF	9/125	N/A	80 km (49.71 miles)
XFP-LX-SM1531.12 (end of sale)	1531.12	9.95 to 10.31	SMF	9/125	N/A	80 km (49.71 miles)
XFP-LX-SM1531.90 (end of sale)	1531.90	9.95 to 10.31	SMF	9/125	N/A	80 km (49.71 miles)
XFP-LX-SM1532.68 (end of sale)	1532.68	9.95 to 10.31	SMF	9/125	N/A	80 km (49.71 miles)
XFP-LX-SM1534.25 (end of sale)	1534.25	9.95 to 10.31	SMF	9/125	N/A	80 km (49.71 miles)
XFP-LX-SM1535.04 (end of sale)	1535.04	9.95 to 10.31	SMF	9/125	N/A	80 km (49.71 miles)
XFP-LX-SM1535.82 (end of sale)	1535.82	9.95 to 10.31	SMF	9/125	N/A	80 km (49.71 miles)
XFP-LX-SM1536.61 (end of sale)	1536.61	9.95 to 10.31	SMF	9/125	N/A	80 km (49.71 miles)
XFP-LX-SM1538.19 (end of sale)	1538.19	9.95 to 10.31	SMF	9/125	N/A	80 km (49.71 miles)
XFP-LX-SM1538.98 (end of sale)	1538.98	9.95 to 10.31	SMF	9/125	N/A	80 km (49.71 miles)
XFP-LX-SM1539.77 (end of sale)	1539.77	9.95 to 10.31	SMF	9/125	N/A	80 km (49.71 miles)
XFP-LX-SM1540.56 (end of sale)	1540.56	9.95 to 10.31	SMF	9/125	N/A	80 km (49.71 miles)
XFP-LX-SM1542.14 (end of sale)	1542.14	9.95 to 10.31	SMF	9/125	N/A	80 km (49.71 miles)
XFP-LX-SM1542.94 (end of sale)	1542.94	9.95 to 10.31	SMF	9/125	N/A	80 km (49.71 miles)
XFP-LX-SM1543.73 (end of sale)	1543.73	9.95 to 10.31	SMF	9/125	N/A	80 km (49.71 miles)
XFP-LX-SM1544.53 (end of sale)	1544.53	9.95 to 10.31	SMF	9/125	N/A	80 km (49.71 miles)
XFP-LX-SM1546.12 (end of sale)	1546.12	9.95 to 10.31	SMF	9/125	N/A	80 km (49.71 miles)
XFP-LX-SM1546.92 (end of sale)	1546.92	9.95 to 10.31	SMF	9/125	N/A	80 km (49.71 miles)
XFP-LX-SM1547.72 (end of sale)	1547.72	9.95 to 10.31	SMF	9/125	N/A	80 km (49.71 miles)
XFP-LX-SM1548.51 (end of sale)	1548.51	9.95 to 10.31	SMF	9/125	N/A	80 km (49.71 miles)
XFP-LX-SM1550	1550.12	9.95 to	SMF	9/125	N/A	80 km (49.71

.12 (end of sale)		10.31				miles)
XFP-LX-SM1550 .92 (end of sale)	1550.92	9.95 to 10.31	SMF	9/125	N/A	80 km (49.71 miles)
XFP-LX-SM1551 .72 (end of sale)	1551.72	9.95 to 10.31	SMF	9/125	N/A	80 km (49.71 miles)
XFP-LX-SM1552 .52 (end of sale)	1552.52	9.95 to 10.31	SMF	9/125	N/A	80 km (49.71 miles)
XFP-LX-SM1554 .13 (end of sale)	1554.13	9.95 to 10.31	SMF	9/125	N/A	80 km (49.71 miles)
XFP-LX-SM1554 .94 (end of sale)	1554.94	9.95 to 10.31	SMF	9/125	N/A	80 km (49.71 miles)
XFP-LX-SM1555 .75 (end of sale)	1555.75	9.95 to 10.31	SMF	9/125	N/A	80 km (49.71 miles)
XFP-LX-SM1556 .55 (end of sale)	1556.55	9.95 to 10.31	SMF	9/125	N/A	80 km (49.71 miles)
XFP-LX-SM1558 .17 (end of sale)	1558.17	9.95 to 10.31	SMF	9/125	N/A	80 km (49.71 miles)
XFP-LX-SM1558 .98 (end of sale)	1558.98	9.95 to 10.31	SMF	9/125	N/A	80 km (49.71 miles)
XFP-LX-SM1559 .79 (end of sale)	1559.79	9.95 to 10.31	SMF	9/125	N/A	80 km (49.71 miles)
XFP-LX-SM1560 .61 (end of sale)	1560.61	9.95 to 10.31	SMF	9/125	N/A	80 km (49.71 miles)

Table 95 Specifications for XFP optical transceiver modules (LC interface) (2)

Model	Optical parameters (dBm)	
	Transmit power	Receive power
XFP-SX-MM850	–7.3 to –1.08	–9.9 to –1
XFP-SX-MM850-D	–7.3 to –1.08	–9.9 to –1
XFP-LX-SM1310	–8.2 to +0.5	–14.4 to +0.5
XFP-LX-SM1310-D	–8.2 to +0.5	–14.4 to +0.5
XFP-POS-LH10-SM1310	–6 to –1	–10.3 to +0.5
XFP-LH40-SM1550	–1 to +2	–14 to –1
XFP-LH40-SM1550-D	–1 to +2	–14 to –1
XFP-LH40-SM1550-F1	–1 to +2	–14.1 to –1
XFP-LH80-SM1550	0 to +4	–24 to –7
XFP-LH80-SM1550-D	0 to +4	–24 to –7
XFP-LX-SM1530.33	–1 to +3	–24 to –7
XFP-LX-SM1531.12	–1 to +3	–24 to –7
XFP-LX-SM1531.90	–1 to +3	–24 to –7
XFP-LX-SM1532.68	–1 to +3	–24 to –7
XFP-LX-SM1534.25	–1 to +3	–24 to –7
XFP-LX-SM1535.04	–1 to +3	–24 to –7

XFP-LX-SM1535.82	–1 to +3	–24 to –7
XFP-LX-SM1536.61	–1 to +3	–24 to –7
XFP-LX-SM1538.19	–1 to +3	–24 to –7
XFP-LX-SM1538.98	–1 to +3	–24 to –7
XFP-LX-SM1539.77	–1 to +3	–24 to –7
XFP-LX-SM1540.56	–1 to +3	–24 to –7
XFP-LX-SM1542.14	–1 to +3	–24 to –7
XFP-LX-SM1542.94	–1 to +3	–24 to –7
XFP-LX-SM1543.73	–1 to +3	–24 to –7
XFP-LX-SM1544.53	–1 to +3	–24 to –7
XFP-LX-SM1546.12	–1 to +3	–24 to –7
XFP-LX-SM1546.92	–1 to +3	–24 to –7
XFP-LX-SM1547.72	–1 to +3	–24 to –7
XFP-LX-SM1548.51	–1 to +3	–24 to –7
XFP-LX-SM1550.12	–1 to +3	–24 to –7
XFP-LX-SM1550.92	–1 to +3	–24 to –7
XFP-LX-SM1551.72	–1 to +3	–24 to –7
XFP-LX-SM1552.52	–1 to +3	–24 to –7
XFP-LX-SM1554.13	–1 to +3	–24 to –7
XFP-LX-SM1554.94	–1 to +3	–24 to –7
XFP-LX-SM1555.75	–1 to +3	–24 to –7
XFP-LX-SM1556.55	–1 to +3	–24 to –7
XFP-LX-SM1558.17	–1 to +3	–24 to –7
XFP-LX-SM1558.98	–1 to +3	–24 to –7
XFP-LX-SM1559.79	–1 to +3	–24 to –7
XFP-LX-SM1560.61	–1 to +3	–24 to –7

10G EPON OLT XFP optical transceiver modules (SC interface)

Figure 67 10G EPON OLT XFP optical transceiver module (SC interface)



Models and specifications

Table 96 Specifications for 10G EPON OLT XFP optical transceiver modules (SC interface) (1)

Model	Central wavelength (nm)	Fiber mode	Fiber diameter (μm)	Transmission distance

XFP-PR30-D-SM1577	• Data rate of 10.3125 Gbps at both the Tx and Rx
	  ○ Tx: 1577.5
	  ○ Rx: 1270
	• Data rate of 1.25 Gbps at both the Tx and Rx
	  ○ Tx: 1490
	  ○ Rx: 1310
		SMF	9/125	20 km (12.43 miles)

XFP-PRX30-D-SM1577	• Data rate of 10.3125 Gbps at the Tx and 1.25 Gbps at the Rx
	  ○ Tx: 1577.5
	  ○ Rx: 1310
	• Data rate of 1.25 Gbps at both the Tx and Rx
	  ○ Tx: 1490
	  ○ Rx: 1310
		SMF	9/125	20 km (12.43 miles)

Table 97 Specifications for 10G EPON OLT XFP optical transceiver modules (SC interface) (2)

Model	Data rate (Gbps)		Optical parameters (dBm)	
	Tx	Rx	Transmit power	Receive power
XFP-PR30-D-SM1577	10.3125	10.3125	+2 to +5	–6 to –28
	1.25	1.25	+3 to +7	–9.38 to –29.8
XFP-PRX30-D-SM1577	10.3125	1.25	+2 to +5	–9.38 to –29.8
	1.25		+3 to +7	

NOTE:

To accurately measure the optical power of 10G EPON OLT or ONU ports, use an optical power meter specially designed for 10G EPON, for example VIAVI OLP-87 used by H3C,

CX4 cables

Figure 68 CX4 cable



Models and specifications

Table 98 Specifications for CX4 cables

Model	Length	Data rate	Type
LSPM2STKA	0.5 m (1.64 ft)	12 Gbps	CX4 cable
LSPM2STKB	1 m (3.28 ft)		
LSPM2STKC	3 m (9.84 ft)		

SFP modules

2.5-Gigabit SFP optical transceiver modules

Figure 69 2.5-Gigabit/Gigabit/622-Megabit/100-Megabit SFP optical transceiver module



Models and specifications

2.5-Gigabit SFP optical transceiver modules use an LC connector.

Table 99 Specifications for 2.5-Gigabit SFP optical transceiver modules (1)

Model	Central wavelength (nm)	Fiber mode	Fiber diameter (μm)	Transmission distance
SFP-2.5G-LX-SM1310	1310	SMF	9/125	2 km (1.24 miles)
*SFP-2.5G-LX10-SM1310-DR-I	1310	SMF	9/125	10 km (6.21 miles)
SFP-2.5G-LX10-SM1310-DR	1310	SMF	9/125	10 km (6.21 miles)
SFP-2.5G-LX10-SM1310-DR-L	1310	SMF	9/125	10 km (6.21 miles)
SFP-2.5G-LH15-SM1310	1310	SMF	9/125	15 km (9.32 miles)
SFP-2.5G-LH40-SM1310 (end of sale)	1310	SMF	9/125	40 km (24.86 miles)
SFP-2.5G-LH80-SM1550 (end of sale)	1550	SMF	9/125	80 km (49.71 miles)

Table 100 Specifications for 2.5-Gigabit SFP optical transceiver modules (2)

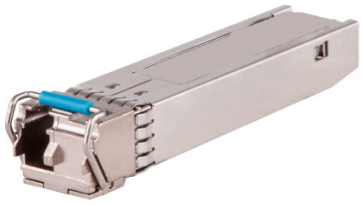
Model	Optical parameters (dBm)	
	Transmit power	Receive power
SFP-2.5G-LX-SM1310	–10 to –3	–18 to –3
*SFP-2.5G-LX10-SM1310-DR-I	–5 to –0.5	–14.4 to –0.5
SFP-2.5G-LX10-SM1310-DR	–5 to 0	–18 to +0.5
SFP-2.5G-LX10-SM1310-DR-L	–5 to 0	–18 to +0.5
SFP-2.5G-LH15-SM1310	–5 to 0	–18 to 0
SFP-2.5G-LH40-SM1310	–2 to +3	–27 to –9
SFP-2.5G-LH80-SM1550	–20 to –14	–31 to –12

NOTE:

The transceiver module marked with * in Table 99 and Table 100 operates at the industrial outer casing temperature range.

2.5-Gigabit BIDI optical transceiver modules (LC interface)

Figure 70 2.5-Gigabit BIDI optical transceiver module



Models and specifications

2.5-Gigabit BIDI optical transceiver modules provide a transmission rate of 2.5 Gbps and use an LC connector.

Table 101 Specifications for 2.5-Gigabit BIDI optical transceiver modules (1)

Model	Central wavelength (nm)	Fiber mode	Fiber diameter (μm)	Transmission distance
SFP-2.5G-LX03-SM1310-BIDI	• Tx: 1310 • Rx: 1490	SMF	9/125	3 km (1.86 miles)
SFP-2.5G-LX03-SM1490-BIDI	• Tx: 1490 • Rx: 1310	SMF	9/125	3 km (1.86 miles)

Table 102 Specifications for 2.5-Gigabit BIDI optical transceiver modules (2)

Model	Optical parameters (dBm)	
	Transmit power	Receive power
SFP-2.5G-LX03-SM1310-BIDI	–10 to –3	–18 to –3
SFP-2.5G-LX03-SM1490-BIDI	–10 to –3	–18 to –3

NOTE:

- BIDI optical transceiver modules use different central wavelengths in transmit and receive directions, in order to implement bidirectional transmission of optical signals over the same fiber.
- You must use the SFP-2.5G-LX03-SM1310-BIDI and SFP-2.5G-LX03-SM1490-BIDI transceiver modules in pairs.

SFP GPON ONU optical transceiver modules (SC interface)

Figure 71 SFP GPON ONU optical transceiver module



Models and specifications

Gigabit GPON ONU optical transceiver modules provide a transmission rate of 1250 Mbps and use an SC connector.

Table 103 Specifications for SFP GPON ONU optical transceiver modules (1)

Model	Central wavelength (nm)	Fiber mode	Fiber diameter (μm)	Transmission distance
*SFP-GPON-ONU-STICK-BP-SM1310-I	• Tx: 1310 • Rx: 1490	SMF	9/125	20 km (12.43 miles)
SFP-GPON-B+-U-SM1310	• Tx: 1310 • Rx: 1490	SMF	9/125	20 km (12.43 miles)

Table 104 Specifications for SFP GPON ONU optical transceiver modules (2)

Model	Transmission rate (Gbps)		Optical parameters (dBm)	
	Tx	Rx	Transmit power	Receive power
*SFP-GPON-ONU-STICK-BP-SM1310-I	1.25	2.5	+0.5 to +5	–27 to –8
SFP-GPON-B+-U-SM1310	1.25	2.5	+0.5 to +5	–8 to –27

IMPORTANT:

- The SFP-GPON-ONU-STICK-BP-SM1310-I is a Class B+ GPON ONU optical transceiver module. As a best practice, use it in pair with a Class B+ GPON OLT transceiver module.
- The optical power budget for the SFP-GPON-ONU-STICK-BP-SM1310-I transceiver module is 28 dB.
- The transceiver module marked with * in Table 103 and Table 104 operates at the industrial outer casing temperature range.

SFP GPON OLT optical transceiver modules (SC interface)

Figure 72 SFP GPON OLT optical transceiver module



Models and specifications

Gigabit GPON OLT optical transceiver modules provide a transmission rate of 1250 Mbps and use an SC connector.

Table 105 Specifications for SFP GPON OLT optical transceiver modules (1)

Model	Central wavelength (nm)	Fiber mode	Fiber diameter (μm)	Transmission distance
SFP-GPON-ONU-STICK-BP-SM1310-I	Tx: 1490 Rx: 1310	SMF	9/125	20 km (12.43 miles)
SFP-GPON-C+-D-SM1490	Tx: 1490 Rx: 1310	SMF	9/125	20 km (12.43 miles)
SFP-GPON-C++-D-SM1490	Tx: 1490 Rx: 1310	SMF	9/125	20 km (12.43 miles)

SFP-XGSPON&GPON-C+-D-SM1577	• **Tx/Rx rate**—9.953 Gbps
	  ○ Tx: 1577
	  ○ Rx: 1270
	• Data rate of 9.953 Gbps at the Tx and 2.488 Gbps at the Rx
	  ○ Tx: 1490
	  ○ Rx: 1310
	• Data rate of 2.488 Gbps at the Tx and 1.244 Gbps at the Rx
	  ○ Tx: 1490
	  ○ Rx: 1310
		MMF	50/125	20 km (12.43 miles)

Table 106 Specifications for SFP GPON OLT optical transceiver modules (2)

Model	Transmission rate (Gbps)		Optical parameters (dBm)	
	Tx	Rx	Transmit power	Receive power
SFP-GPON-B+-D-SM1490	2.5	1.25	+1.5 to +5	–8 to –28
SFP-GPON-C+-D-SM1490	2.5	1.25	+3 to +7	–12 to –30
SFP-GPON-C++-D-SM1490	2.5	1.25	+6 to +10	–12 to –33
SFP-XGSPON&GPON-C+-D-SM1577	9.953	• 9.953 • 2.488	+5 to +8	–29 to –8 (XGSPON)
				–30.5 to –10 (XGPON)
	2.488	1.244	+3 to +7	–32 to –12 (GPON)

IMPORTANT:

- The SFP-GPON-B+-D-SM1490 is a Class B+ GPON OLT optical transceiver module. As a best practice, use it in pair with a Class B+ GPON ONU transceiver module.
- The SFP-GPON-C+-D-SM1490 is a Class C+ GPON OLT optical transceiver module.
- The SFP-GPON-C++-D-SM1490 is a Class C++ GPON OLT optical transceiver module.
- The optical power budget for an SFP-GPON-B+-D-SM1490 transceiver is 28 dB.
- The optical power budget for an SFP-GPON-C+-D-SM1490 transceiver is 32 dB.
- The optical power budget for an SFP-GPON-C++-D-SM1490 transceiver is 33 dB.

Gigabit SFP optical transceiver modules

See Figure 69 for a view of the Gigabit SFP optical transceiver module.

Models and specifications

Gigabit SFP optical transceiver modules provide a transmission rate of 1250 Mbps and use a dual LC connector.

Table 107 Specifications for Gigabit SFP optical transceiver modules (1)

Model	Central wavelength (nm)	Fiber mode	Fiber diameter (μm)	Modal bandwidth at 850 nm (MHz*km)	Transmission distance
SFP-GE-SX-MM850-A	850	MMF	50/125	500	550 m (1804.46 ft)
				400	500 m (1640.42 ft)
			62.5/125	200	275 m (902.23 ft)
				160	220 m (721.78 ft)
SFP-GE-SX-MM850-CM	850	MMF	50/125	500	550 m (1804.46 ft)

				400	500 m (1640.42 ft)
			62.5/125	200	275 m (902.23 ft)
				160	220 m (721.78 ft)
SFP-GE-SX-MM850-D	850	MMF	50/125	500	550 m (1804.46 ft)
				400	500 m (1640.42 ft)
			62.5/125	200	275 m (902.23 ft)
				160	220 m (721.78 ft)
SFP-GE-SX-MM850-S	850	MMF	50/125	500	550 m (1804.46 ft)
				400	500 m (1640.42 ft)
			62.5/125	200	275 m (902.23 ft)
				160	220 m (721.78 ft)
*SFP-GE-SX-MM850-I	850	MMF	50/125	500	550 m (1804.46 ft)
				400	500 m (1640.42 ft)
			62.5/125	200	275 m (902.23 ft)
				160	220 m (721.78 ft)
SFP-GE-SX-MM850-G	850	MMF	50/125	500	550 m (1804.46 ft)
SFP-GE-SX-MM850-L	850	MMF	50/125	N/A	550 m (1804.46 ft)
SFP-GE-LX-SM1310-L	1310	SMF	9/125	N/A	10 km (6.21 miles)
SFP-GE-LX-SM1310-A	1310	SMF	9/125	N/A	10 km (6.21 miles)
		MMF	50/125	500 or 400	550 m (1804.46 ft)
			62.5/125	500	550 m (1804.46 ft)
SFP-GE-LX-SM1310-C	1310	SMF	9/125	N/A	10 km (6.21 miles)
SFP-GE-LX-SM1310-D	1310	SMF	9/125	N/A	10 km (6.21 miles)
SFP-GE-LX-SM1310-G	1310	SMF	9/125	N/A	10 km (6.21 miles)
SFP-GE-LX-SM1310-S	1310	SMF	9/125	N/A	10 km (6.21 miles)
*SFP-GE-LX10-SM1310	1310	SMF	9/125	N/A	10 km (6.21 miles)
SFP-GE/FE-LX10-SM1310	1310	SMF	9/125	N/A	10 km (6.21 miles)
*SFP-GE-LH20-SM1310-I	1310	SMF	9/125	N/A	20 km (12.43 miles)
*SFP-GE-LH20-SM1310-BIDI-I	Tx: 1310 Rx: 1490	SMF	9/125	N/A	20 km (12.43 miles)
*SFP-GE-LH20-SM1490-BIDI-I	Tx: 1490 Rx: 1310	SMF	9/125	N/A	20 km (12.43 miles)
*SFP-GE-LH40-SM1310-I	1310	SMF	9/125	N/A	40 km (24.86 miles)
SFP-GE-LH40-SM1310	1310	SMF	9/125	N/A	40 km (24.86 miles)
SFP-GE-LH40-SM1310-D	1310	SMF	9/125	N/A	40 km (24.86 miles)

SFP-GE-LH40-SM1310-S	1310	SMF	9/125	N/A	40 km (24.86 miles)
SFP-GE-LH40-SM1550	1550	SMF	9/125	N/A	40 km (24.86 miles)
SFP-GE-LH40-SM1550-S	1550	SMF	9/125	N/A	40 km (24.86 miles)
SFP-GE-LH80-SM1550	1550	SMF	9/125	N/A	80 km (49.71 miles)
SFP-GE-LH80-SM1550-D	1550	SMF	9/125	N/A	80 km (49.71 miles)
*SFP-GE-LH80-SM1550-I	1550	SMF	9/125	N/A	80 km (49.71 miles)
SFP-GE-LH100-SM1550	1550	SMF	9/125	N/A	100 km (62.14 miles)

Table 108 Specifications for Gigabit SFP optical transceiver modules (2)

Model	Optical parameters (dBm)	
	Transmit power	Receive power
SFP-GE-SX-MM850-A	–9.5 to 0	–17 to –3
SFP-GE-SX-MM850-CM	-9.5 to 0	-17 to –3
SFP-GE-SX-MM850-D	–9.5 to 0	–17 to –3
SFP-GE-SX-MM850-S	–9.5 to 0	–17 to –3
*SFP-GE-SX-MM850-I	–9.5 to 0	–17 to –3
SFP-GE-SX-MM850-G	–9.5 to 0	–17 to 0
SFP-GE-SX-MM850-L	–9.5 to 0	–17 to +0.5
SFP-GE-LX-SM1310-L	–9 to –3	–20 to +0.5
SFP-GE-LX-SM1310-A	–9.5 to –3	–20 to –3
SFP-GE-LX-SM1310-C	–9.5 to –3	–20 to –3
SFP-GE-LX-SM1310-D	–9.5 to –3	–20 to –3
SFP-GE-LX-SM1310-G	–9.5 to –3	–20 to –3
SFP-GE-LX-SM1310-S	–9.5 to –3	–20 to –3
*SFP-GE-LX10-SM1310	–11 to –3	–19 to –3
SFP-GE/FE-LX10-SM1310	–9.5 to –3	–22 to –3
*SFP-GE-LH20-SM1310-I	–8 to –3	–23 to –3
*SFP-GE-LH20-SM1310-BIDI-I	–9 to –3	–23 to –3
*SFP-GE-LH20-SM1490-BIDI-I	–9 to –3	–23 to –3
*SFP-GE-LH40-SM1310-I	–5 to 0	–23 to –3
SFP-GE-LH40-SM1310	–5 to +5	–22 to –3
SFP-GE-LH40-SM1310-D	–5 to +5	–22 to –3

SFP-GE-LH40-SM1310-S	–5 to +5	–22 to –3
SFP-GE-LH40-SM1550	–4 to +1	–21 to –3
SFP-GE-LH40-SM1550-S	–4 to +1	–21 to –3
SFP-GE-LH80-SM1550	–4 to +5	–22 to –3
SFP-GE-LH80-SM1550-D	–4 to +5	–22 to –3
*SFP-GE-LH80-SM1550-I	0 to +5	–24 to –3
SFP-GE-LH100-SM1550	0 to +5	–30 to –9

NOTE:

- The transmission distance of the SFP-GE-LH80-SM1550 and SFP-GE-LH80-SM1550-D transceiver modules might be displayed as 70 km (43.50 miles) on H3C devices with old software versions. Devices with upgraded software versions can correctly display the distance. The actual transmission distance is 80 km (49.71 miles).
- The transceiver modules marked with * in Table 107 and Table 108 operate at the industrial outer casing temperature range.

622-Megabit SFP optical transceiver modules

See Figure 69 for a view of the 622-Megabit SFP optical transceiver module.

Models and specifications

622-Megabit SFP optical transceiver modules use a dual LC connector.

Table 109 Specifications for 622-Megabit SFP optical transceiver modules (1)

Model	Central wavelength (nm)	Fiber mode	Fiber diameter (μm)	Transmission distance
SFP-622M-LX-SM1310	1310	SMF	9/125	15 km (9.32 miles)
SFP-622M-LH40-SM1310	1310	SMF	9/125	40 km (24.86 miles)
SFP-622M-LH80-SM1550	1550	SMF	9/125	80 km (49.71 miles)

Table 110 Specifications for 622-Megabit SFP optical transceiver modules (2)

Model	Optical parameters (dBm)	
	Transmit power	Receive power
SFP-622M-LX-SM1310	–15 to –8	–28 to –8
SFP-622M-LH40-SM1310	–3 to +2	–28 to –8
SFP-622M-LH80-SM1550	–3 to +2	–28 to –8

100-Megabit SFP optical transceiver modules

See Figure 69 for a view of the 100-Megabit SFP optical transceiver module.

Models and specifications

100-Megabit SFP optical transceiver modules provide a maximum transmission rate of 155 Mbps and use a dual LC connector.

Table 111 Specifications for 100-Megabit SFP optical transceiver modules (1)

Model	Central wavelength (nm)	Fiber mode	Fiber diameter (μm)	Transmission distance
SFP-FE-SX-MM1310-A	1310	MMF	50/125	2 km (1.24 miles)
			62.5/125	
*SFP-FE-SX-MM1310-I	1310	MMF	50/125	2 km (1.24 miles)
			62.5/125	
SFP-FE-SX-MM1310-GE (end of sale)	1310	MMF	50/125	2 km (1.24 miles)
			62.5/125	
SFP-GE/FE-LX10-SM1310	1310	SMF	9/125	10 km (6.21 miles)
SFP-FE-LX-SM1310-A	1310	SMF	9/125	15 km (9.32 miles)
SFP-FE-LX-SM1310-D	1310	SMF	9/125	15 km (9.32 miles)
*SFP-FE-BX15-U-SM1310	1310	SMF	9/125	15 km (9.32 miles)
SFP-FE-LH40-SM1310	1310	SMF	9/125	40 km (24.86 miles)
SFP-FE-LH40-SM1310-I	1310	SMF	9/125	40 km (24.86 miles)
SFP-FE-LH80-SM1550	1550	SMF	9/125	80 km (49.71 miles)
*SFP-FE-LH80-SM1550-I	1550	SMF	9/125	80 km (49.71 miles)

Table 112 Specifications for 100-Megabit SFP optical transceiver modules (2)

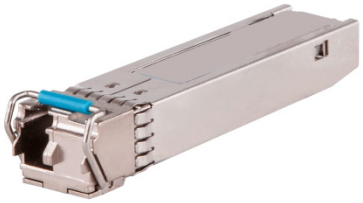
Model	Optical parameters (dBm)	
	Transmit power	Receive power
SFP-FE-SX-MM1310-A	–19 to –14	–30 to –14
*SFP-FE-SX-MM1310-I	–19 to –14	–30 to –14
SFP-FE-SX-MM1310-GE	–20 to –14	–31.5 to –8
SFP-GE/FE-LX10-SM1310	–15 to –8	–28 to –8
SFP-FE-LX-SM1310-A	–15 to –8	–28 to –7
SFP-FE-LX-SM1310-D	–15 to –8	–28 to –7
*SFP-FE-BX15-U-SM1310	–15 to –8	–28 to –8
SFP-FE-LH40-SM1310	–5 to 0	–34 to –9
*SFP-FE-LH40-SM1310-I	–5 to 0	–34 to –9
SFP-FE-LH80-SM1550	–5 to 0	–34 to –10
*SFP-FE-LH80-SM1550-I	–5 to 0	–33 to –10

NOTE:

The transceiver modules marked with * in Table 111 and Table 112 operate at the industrial outer casing temperature range.

Gigabit BIDI optical transceiver modules

Figure 73 Gigabit/100-Megabit BIDI optical transceiver module



Models and specifications

Gigabit BIDI optical transceiver modules provide a transmission rate of 1250 Mbps and use a dual LC connector.

Table 113 Specifications for Gigabit BIDI optical transceiver modules (1)

Model	Central wavelength (nm)	Fiber mode	Fiber diameter (μm)	Transmission distance
SFP-GE-LX-SM1310-BIDI	• Tx: 1310 • Rx: 1490	SMF	9/125	10 km (6.21 miles)
SFP-GE-LX-SM1310-BIDI-S	• Tx: 1310 • Rx: 1490	SMF	9/125	10 km (6.21 miles)
*SFP-GE-LX-SM1310-BIDI-I	• Tx: 1310 • Rx: 1490	SMF	9/125	10 km (6.21 miles)
SFP-GE-LX-SM1490-BIDI	• Tx: 1490 • Rx: 1310	SMF	9/125	10 km (6.21 miles)
SFP-GE-LX-SM1490-BIDI-S	• Tx: 1490 • Rx: 1310	SMF	9/125	10 km (6.21 miles)
*SFP-GE-LX-SM1490-BIDI-I	• Tx: 1490 • Rx: 1310	SMF	9/125	10 km (6.21 miles)
SFP-GE-LH20-SM1310-BIDI	• Tx: 1310 • Rx: 1550	SMF	9/125	20 km (12.43 miles)
SFP-GE-LH20-SM1550-BIDI	• Tx: 1550 • Rx: 1310	SMF	9/125	20 km (12.43 miles)
SFP-GE-LH40-SM1310-BIDI	• Tx: 1310 • Rx: 1550	SMF	9/125	40 km (24.86 miles)
*SFP-GE-LH40-SM1310-BIDI-I	• Tx: 1310 • Rx: 1490	SMF	9/125	40 km (24.86 miles)
*SFP-GE-LH40-SM1490-BIDI-I	• Tx: 1490 • Rx: 1310	SMF	9/125	40 km (24.86 miles)
SFP-GE-LH40-SM1550-BIDI	• Tx: 1550 • Rx: 1310	SMF	9/125	40 km (24.86 miles)
SFP-GE-LH70-SM1490-BIDI	• Tx: 1490 • Rx: 1550	SMF	9/125	70 km (43.50 miles)

SFP-GE-LH70-SM1550-BIDI	• Tx: 1550 • Rx: 1490	SMF	9/125	70 km (43.50 miles)

Table 114 Specifications for Gigabit BIDI optical transceiver modules (2)

Model	Optical parameters (dBm)	
	Transmit power	Receive power
SFP-GE-LX-SM1310-BIDI	–9 to –3	–18.7 to –3
SFP-GE-LX-SM1310-BIDI-S		
SFP-GE-LX-SM1490-BIDI		
SFP-GE-LX-SM1490-BIDI-S		
*SFP-GE-LX-SM1310-BIDI-I	–9 to –3	–20 to –3
*SFP-GE-LX-SM1490-BIDI-I		
SFP-GE-LH20-SM1310-BIDI	–9 to –3	–24 to +0.5
SFP-GE-LH20-SM1550-BIDI		
SFP-GE-LH40-SM1310-BIDI	–5 to 0	–23 to –3
SFP-GE-LH40-SM1550-BIDI		
*SFP-GE-LH40-SM1310-BIDI-I	–5 to +2	–24 to –1
*SFP-GE-LH40-SM1490-BIDI-I		
SFP-GE-LH70-SM1490-BIDI	–3 to +5	–23 to –3
SFP-GE-LH70-SM1550-BIDI		

NOTE:

- BIDI optical transceiver modules use different central wavelengths in transmit and receive directions, in order to implement bidirectional transmission of optical signals over the same fiber.
- You must use the SFP-GE-LX-SM1310-BIDI and SFP-GE-LX-SM1490-BIDI transceiver modules in pairs.
- The transceiver modules marked with * in Table 113 and Table 114 operate at the industrial outer casing temperature range.

100-Megabit BIDI optical transceiver modules

See Figure 73 for a view of the 100-Megabit BIDI optical transceiver module.

Models and specifications

100-Megabit BIDI optical transceiver modules provide a transmission rate of 155 Mbps and use a dual LC connector.

Table 115 Specifications for 100-Megabit BIDI optical transceiver modules (1)

Model	Central wavelength (nm)	Fiber mode	Fiber diameter (μm)	Transmission distance
SFP-FE-LX-SM1310-BIDI	• Tx: 1310	SMF	9/125	15 km (9.32

	• Rx: 1550			miles)
SFP-FE-LX-SM1550-BIDI	• Tx: 1550 • Rx: 1310	SMF	9/125	15 km (9.32 miles)

Table 116 Specifications for 100-Megabit BIDI optical transceiver modules (2)

Model	Optical parameters (dBm)	
	Transmit power	Receive power
SFP-FE-LX-SM1310-BIDI	–15 to –8	–31 to –3
SFP-FE-LX-SM1550-BIDI		

NOTE:

- BIDI optical transceiver modules use different central wavelengths in transmit and receive directions, in order to implement bidirectional transmission of optical signals over the same fiber.
- You must use the SFP-FE-LX-SM1310-BIDI and SFP-FE-LX-SM1550-BIDI transceiver modules in pairs.

BIDI GEPON OLT optical transceiver modules (SC interface)

Figure 74 BIDI GEPON OLT optical transceiver module



Models and specifications

BIDI GEPON OLT optical transceiver modules provide a transmission rate of 1250 Mbps and use an SC connector.

Table 117 Specifications for BIDI GEPON OLT optical transceiver modules (1)

External model	Central wavelength (nm)	Fiber mode	Fiber diameter (μm)	Transmission distance
SFP-GE-PX10-D-SM1490-A (end of sale)	• Tx: 1490 • Rx: 1310	SMF	9/125	10 km (6.21 miles)
SFP-GE-PX20-D-SM1490-A (end of sale)	• Tx: 1490 • Rx: 1310	SMF	9/125	20 km (12.43 miles)
SFP-GE-PX20-D-SM1490-M	• Tx: 1490 • Rx: 1310	SMF	9/125	20 km (12.43 miles)

Table 118 Specifications for BIDI GEPON OLT optical transceiver modules (2)

External model	Connector index (dBm)		
	Output fiber power	Receiving sensitivity	Fiber saturation
SFP-GE-PX10-D-SM1490-A	–3 to +2	≤ –24	≤ –3
SFP-GE-PX20-D-SM1490-A	+2 to +7	≤ –30	≤ –10
SFP-GE-PX20-D-SM1490-M	+2 to +7	≤ –28	≤ –6

NOTE:

- BIDI GEPON OLT optical transceiver module is a kind of Gigabit SFP module specially used for EPON OLT end devices. The fiber signals transmitted through SFP-GE-PX10-D-SM1490-A module can be used for only the ONU devices with a transmission distance of 10 km (6.2 miles).
- When testing the fiber power of EPON OLT and ONU ports, please use the fiber power meter dedicated for EPON (the fiber power meter model used in H3C is JDSU OLP-57) to ensure the correctness of the test result.

Gigabit CWDM optical transceiver modules (LC interface)

Figure 75 Gigabit CWDM optical transceiver module



Models and specifications

Gigabit CWDM optical transceiver modules provide a transmission rate of 1250 Mbps and use a dual LC connector.

Table 119 Specifications for Gigabit CWDM optical transceiver modules (1)

Model	Central wavelength (nm)	Fiber mode	Fiber diameter (μm)	Transmission distance
SFP-GE-LH70-SM1470-CW (end of sale)	1470	SMF	9/125	70 km (43.50 miles)
SFP-GE-LH70-SM1490-CW (end of sale)	1490	SMF	9/125	70 km (43.50 miles)

SFP-GE-LH70-SM1510-CW (end of sale)	1510	SMF	9/125	70 km (43.50 miles)
SFP-GE-LH70-SM1530-CW (end of sale)	1530	SMF	9/125	70 km (43.50 miles)
SFP-GE-LH70-SM1550-CW (end of sale)	1550	SMF	9/125	70 km (43.50 miles)
SFP-GE-LH70-SM1570-CW (end of sale)	1570	SMF	9/125	70 km (43.50 miles)
SFP-GE-LH70-SM1590-CW (end of sale)	1590	SMF	9/125	70 km (43.50 miles)
SFP-GE-LH70-SM1610-CW (end of sale)	1610	SMF	9/125	70 km (43.50 miles)

Table 120 Specifications for Gigabit CWDM optical transceiver modules (2)

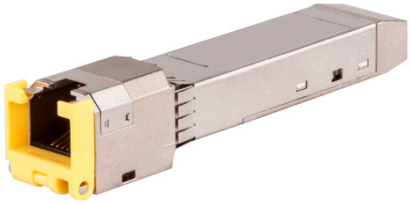
Model	Optical parameters (dBm)	
	Transmit power	Receive power
SFP-GE-LH70-SM1470-CW	0 to +5	–23 to –3
SFP-GE-LH70-SM1490-CW		
SFP-GE-LH70-SM1510-CW		
SFP-GE-LH70-SM1530-CW		
SFP-GE-LH70-SM1550-CW		
SFP-GE-LH70-SM1570-CW		
SFP-GE-LH70-SM1590-CW		
SFP-GE-LH70-SM1610-CW		

NOTE:

- Gigabit CWDM optical transceiver modules adopt the CWDM technology that uses wavelength division multiplexers to multiplex optical signals with different wavelengths for transmission over a single optical fiber, thereby saving optical fiber resources. The receiving end uses a wavelength division demultiplexer to demultiplex the multiplexed optical signals.
- The most recent software version of H3C networking devices might display the transmission distance of the Gigabit CWDM optical transceiver module as 80 km (49.71 miles). The CWDM optical transceiver module can transmit data over 80 km (49.71 miles) when the fiber link meets the budget.

Gigabit SFP copper transceiver modules

Figure 76 Gigabit SFP copper transceiver module



Models and specifications

Table 121 Specifications for Gigabit SFP copper transceiver modules

Model	Transmission distance	Data rate	Connector type
SFP-GE-T	100 m (328.08 ft)	1250 Mbps	RJ-45
SFP-GE-T-CM	100 m (328.08 ft)	1250 Mbps	RJ-45
SFP-GE-T-D	100 m (328.08 ft)	1250 Mbps	RJ-45
SFP-GE-T-I	100 m (328.08 ft)	1250 Mbps	RJ-45

IMPORTANT:

As a best practice, use shielded twisted pair (STP) cables for Gigabit SFP copper transceiver modules for better transmission performance.

Gigabit SFP copper cables

Figure 77 Gigabit SFP copper cable



Models and specifications

Table 122 Specifications for Gigabit SFP copper cables

Model	Transmission distance	Data rate	Cable type
SFP-STACK-Kit	1.5 m (4.92 ft)	1250 Mbps	UTP/STP
SFP-STACK-Kit-S	1.5 m (4.92 ft)	1250 Mbps	UTP/STP

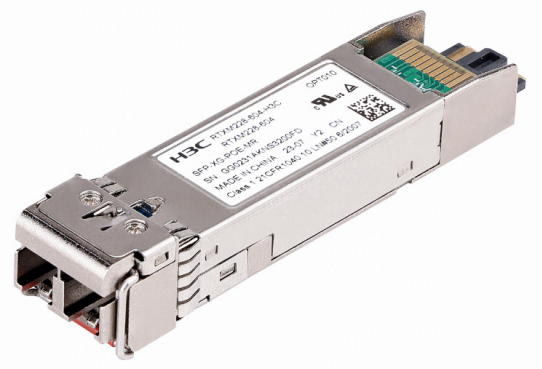
Hybrid copper-fiber transceiver modules

The hybrid copper-fiber transceiver module must be used in conjunction with the hybrid copper-fiber pigtail and hybrid copper-fiber cable for data transmission and power supply/reception.

The hybrid copper-fiber cable jumper can connect device over a short distance for data transmission and power supply/reception.

SFP+ hybrid copper-fiber transceiver modules (PELC interface)

Figure 78 SFP+ hybrid copper-fiber transceiver module (PELC interface)



Models and specifications

SFP+ hybrid copper-fiber transceiver modules are multi-rate transceiver modules that use PELC connectors and provide a transmission rate of 10 Gbps, 5 Gbps, 2.5 Gbps, or 1 Gbps.

Table 123 Specifications for SFP+ hybrid copper-fiber transceiver modules (1)

Model	Central wavelength (nm)	Fiber mode	Fiber diameter (μm)	Transmission distance
*SFP-XG-POE-MR	1310	SMF	9/125	1.4 km (0.87 miles)

Table 124 Specifications for SFP+ hybrid copper-fiber transceiver modules (2)

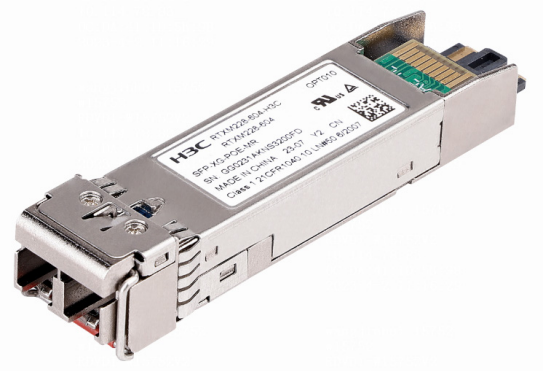
Model	Optical parameters (dBm)	
	Transmit power	Receive power
*SFP-XG-POE-MR	–8.2 to +0.5	–12.6 to +0.5

NOTE:

The transceiver module marked with * in Table 123 and Table 124 operates at the industrial outer casing temperature range.

SFP hybrid copper-fiber transceiver modules (PELC interface)

Figure 79 SFP hybrid copper-fiber transceiver module (PELC interface)



Models and specifications

SFP hybrid copper-fiber transceiver modules provide a transmission rate of 1250 Mbps and use PELC connectors.

Table 125 Specifications for SFP hybrid copper-fiber transceiver modules (1)

Model	Central wavelength (nm)	Fiber mode	Fiber diameter (μm)	Transmission distance
*SFP-GE-POE	1310	SMF	9/125	10 km (6.21 miles)

Table 126 Specifications for SFP hybrid copper-fiber transceiver modules (2)

Model	Optical parameters (dBm)	
	Transmit power	Receive power
*SFP-GE-POE	–9 to –1	–18.7 to –3

NOTE:

The transceiver module marked with * in Table 125 and Table 126 operates at the industrial outer casing temperature range.

Hybrid copper-fiber cable jumpers

Figure 80 Hybrid copper-fiber cable jumpers



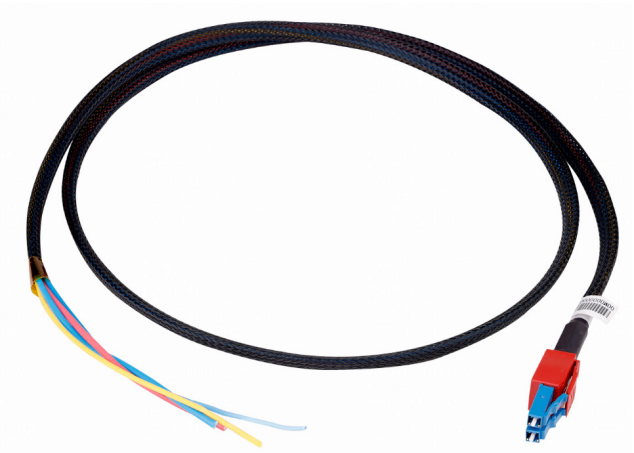
Models and specifications

Table 127 Specifications for hybrid copper-fiber cable jumpers

Model	Length
PoE-PELC-PELC-0.3	0.3 m (0.98 ft)
PoE-PELC-PELC-1.5	1.5 m (4.92 ft)
PoE-PELC-PELC-3.0	3.0 m (9.84 ft)

Hybrid copper-fiber cable pigtail

Figure 81 Hybrid copper-fiber cable pigtail



Models and specifications

Table 128 Specifications for the hybrid copper-fiber cable pigtail

Model	Length
PoE-PELC-ODF-0.4m	0.4 m (1.31 ft)
PoE-PELC-ODF-1.2m	1.2 m (3.94 ft)

iOptic 3.0 dedicated transceiver modules

The iOptic 3.0 dedicated transceiver module must be used in conjunction with the combined copper-fiber pigtail and hybrid copper-fiber cable for data transmission and power supply/reception.

SFP28 iOptic 3.0 dedicated transceiver modules (LC interface)

Figure 82 SFP28 iOptic 3.0 dedicated transceiver modules



Models and specifications

SFP28 iOptic 3.0 dedicated transceiver modules use PoDLC connectors and provide a transmission rate of 25 Gbps.

Table 129 Specifications for SFP28 iOptic 3.0 dedicated transceiver modules (1)

Model	Central wavelength (nm)	Fiber mode	Fiber diameter (μm)	Modal bandwidth (MHz*km)	Transmission distance
SFP-25G-LR-SM1310-F	1310	SMF	9/125	-	10 km (6.21 miles)

Table 130 Specifications for SFP28 iOptic 3.0 dedicated transceiver modules (2)

Model	Optical parameters (dBm)	
	Transmit power	Receive power
SFP-25G-LR-SM1310-F	–7 to +2	–13.3 to +2

SFP+ iOptic 3.0 dedicated transceiver modules (LC interface)

Figure 83 SFP+ iOptic 3.0 dedicated transceiver module



Models and specifications

SFP+ iOptic 3.0 dedicated transceiver modules provide a transmission rate of 10 Gbps and use PoDLC connectors.

Table 131 Specifications for SFP+ iOptic 3.0 dedicated transceiver modules (1)

Model	Central wavelength (nm)	Fiber mode	Fiber diameter (μm)	Modal bandwidth (MHz*km)	Transmission distance
SFP-XG-LX-SM 1310-F	1310	SMF	9/125	-	10 km (6.21 miles)

Table 132 Specifications for SFP+ iOptic 3.0 dedicated transceiver modules (2)

Model	Optical parameters (dBm)	
	Transmit power	Receive power
SFP-XG-LX-SM1310-F	–8.2 to +0.5	–14.4 to +0.5

2.5G SFP iOptic 3.0 dedicated transceiver modules (LC interface)

Figure 84 2.5G SFP iOptic 3.0 dedicated transceiver module



Models and specifications

The 2.5G SFP iOptic 3.0 dedicated transceiver module is a multi-rate transceiver module, providing transmission rates of 2.5 Gbps and 1 Gbps. These transceiver modules use PoDLC connectors

Table 133 Specifications for 2.5G SFP iOptic 3.0 dedicated transceiver modules (1)

Model	Central wavelength (nm)	Fiber mode	Fiber diameter (μm)	Modal bandwidth (MHz*km)	Transmission distance
*SFP-2.5G-LX10-SM1310-DR-I-F	1310	SMF	9/125	-	10 km (6.21 miles)

Table 134 Specifications for SFP iOptic 3.0 dedicated transceiver modules (2)

Model	Optical parameters (dBm)	
	Transmit power	Receive power
*SFP-2.5G-LX10-SM1310-DR-I-F	–5 to –0.5	–14.4 to +0.5

NOTE:

The transceiver module marked with * in Table 133 and Table 134 operates at the industrial outer casing temperature range.

SFP iOptic 3.0 dedicated transceiver modules (LC interface)

Figure 85 SFP iOptic 3.0 dedicated transceiver module



Models and specifications

The SFP iOptic 3.0 dedicated transceiver modules provide a transmission rate of 1250 Mbps and use PoDLC connectors.

Table 135 Specifications for SFP iOptic 3.0 dedicated transceiver modules (1)

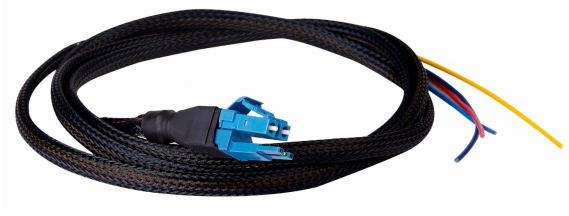
Model	Central wavelength (nm)	Fiber mode	Fiber diameter (μm)	Modal bandwidth (MHz*km)	Transmission distance
SFP-GE-LX-SM 1310-F	1310	SMF	9/125	-	10 km (6.21 miles)

Table 136 Specifications for SFP iOptic 3.0 dedicated transceiver modules (2)

Model	Optical parameters (dBm)	
	Transmit power	Receive power
SFP-GE-LX-SM1310-F	–9.5 to –3.0	–20 to –3

Combined copper-fiber pigtail

Figure 86 Combined copper-fiber pigtail



Models and specifications

Table 137 Specifications for the combined copper-fiber pigtail

Model	Cable length	Transmission rate	Cable type
PoE-PoDLCA-ODF-1.5m	1.5 m (4.92 ft)	N/A	Combined copper-fiber pigtail

CSFP modules

CSFP optical transceiver modules (LC interface)

Figure 87 CSFP optical transceiver module



Models and specifications

CSFP optical transceiver modules (LC interface) provide a transmission rate of 1.25 Gbps or 125 Mbps and use an LC connector.

Table 138 Specifications for CSFP optical transceiver modules (1)

Model	Central wavelength (nm)	Fiber mode	Fiber diameter (μm)	Modal bandwidth (MHz*km)	Transmission distance
CSFP-GE-BX10-SM1490-BIDI-DR	• Tx: 1490 • Rx: 1310	SMF	9/125	N/A	10 km (6.21 miles)

Table 139 Specifications for CSFP optical transceiver modules (2)

Model	Optical parameters (dBm)	
	Transmit power	Receive power
CSFP-GE-BX10-SM1490-BIDI-DR	–9 to –3	–19.5 to –3