

H3C Transceiver Modules User Guide

New H3C Technologies Co., Ltd.
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Preface

H3C Transceiver Modules User Guide describes the types, views, and specifications 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. |
| <i>Italic</i> | <i>Italic</i> 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 |
|---|---|---------------------|-------------|
| 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 | |
| QSFP56 module (transceiver) | QSFP56 optical transceiver module | LC | 200 Gbps |
| 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 optical cable | | |
| 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 optical 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+ optical cable | | |
| SFP28 module (transceiver) | SFP28 optical transceiver module | Dual LC | 25 Gbps |
| | SFP28 copper cable | N/A | |
| | SFP28 optical 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+ optical cable | | |

| Transceiver module and network cable type | | Interface connector | Data rate |
|---|---|---------------------|--------------------------------|
| 10-Gigabit small form-factor pluggable (XFP) module (transceiver) | XFP optical transceiver module | Dual LC | See Table 52 . |
| | 10G EPON OLT optical transceiver module | SC | See Table 54 . |
| 10-Gigabit CX4 cable (for interconnecting devices) | | N/A | 12 Gbps |
| 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 | |

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 QSFP-DD, QSFP56, QSFP28, CFP, CFP2, CXP, QSFP+, SFP28, SFP+, and SFP.

Data rate

Data rate is the number of bits transmitted per second. The unit of measure for data rate is Mbps (Megabits per second) or Gbps (Gigabits per second). Optical transceiver modules available for H3C devices mainly provide the following levels of data rates: 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) |
| 25GBASE-SR | 850 | OM3 | < 70 m (229.66 ft) |
| | | OM4 | < 100 m (328.08 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) | <ul style="list-style-type: none"> 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

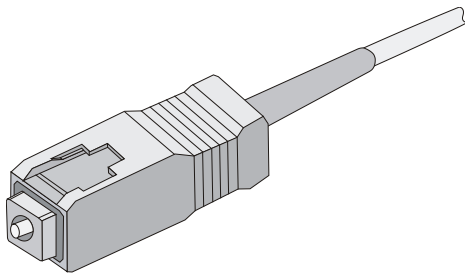
⚠ CAUTION:

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:

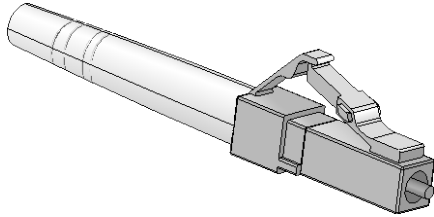
- Subscriber connector standard connector (SC).

Figure 1 SC connector



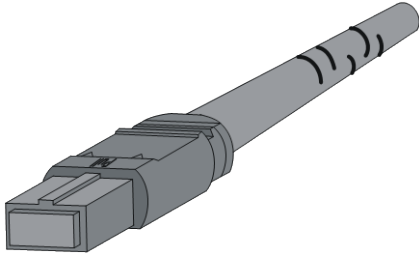
- Lucent connector or local connector (LC).

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.

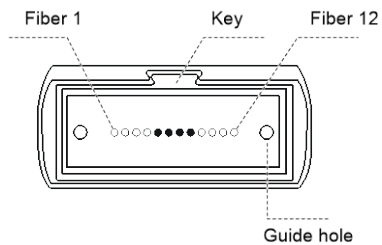
MPO connectors are classified as the following types based on the polish type:

- **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:

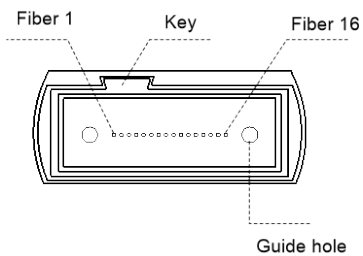
- 12-fiber MPO connector

Figure 4 End face of a 12-fiber connector



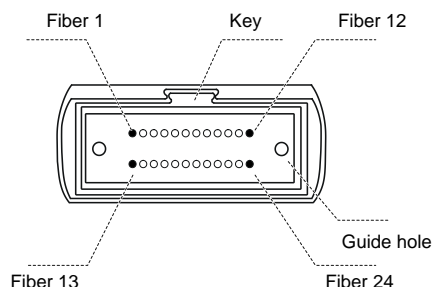
- 16-fiber MPO connector

Figure 5 End face of a 16-fiber connector



- 24-fiber MPO connector

Figure 6 End face of a 24-fiber connector



Optical parameters

△ 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

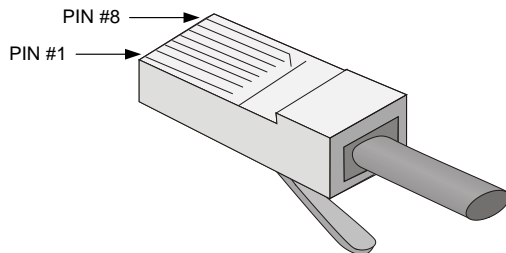


Table 5 RJ-45 GE connector pin assignment

| 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 |

QSFP-DD modules

QSFP-DD optical transceiver modules (MPO)

Figure 8 QSFP-DD optical transceiver module (MPO)



Models and specifications

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

Table 6 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) |

Table 7 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 |

QSFP-DD optical transceiver modules (dual LC)

Figure 9 QSFP-DD optical transceiver module (dual LC)



Models and specifications

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

Table 8 Specifications for QSFP-DD optical transceiver modules (dual LC) (1)

| Model | Central wavelength (nm) | Fiber mode | Fiber diameter (μm) | Modal bandwidth (MHz*km) | Transmission distance |
|--------------------------------|---|------------|---------------------|--------------------------|-----------------------|
| QSFPDD-400G-FR 4-WDM1300 | Four lanes: <ul style="list-style-type: none"> • 1271 • 1291 • 1311 • 1331 | SMF | 9/125 | N/A | 2 km (1.24 miles) |
| QSFPDD-400G-LR 4-WDM1300-DC | Four lanes: <ul style="list-style-type: none"> • 1271 • 1291 • 1311 • 1331 | SMF | 9/125 | N/A | 10 km (6.21 miles) |
| QSFPDD-400G-LR 8-WDM1300 | Four lanes: <ul style="list-style-type: none"> • 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) |

Table 9 Specifications for QSFP-DD optical transceiver modules (dual LC) (2)

| Model | Optical parameters (dBm) | |
|----------------------------|--------------------------|---------------|
| | Transmit power | Receive power |
| QSFPDD-400G-FR4-WDM1300 | -3.3 to +3.5 | -7.3 to +3.5 |
| QSFPDD-400G-LR4-WDM1300-DC | -2.7 to +5.1 | -6.8 to +5.1 |
| QSFPDD-400G-LR8-WDM1300 | -2.8 to +5.3 | -7.2 to +5.3 |

NOTE:

The transmit power and receive power provided in Table 9 are average values of the four lanes.

QSFP-DD copper cable

Figure 10 QSFP-DD copper cable



Models and specifications

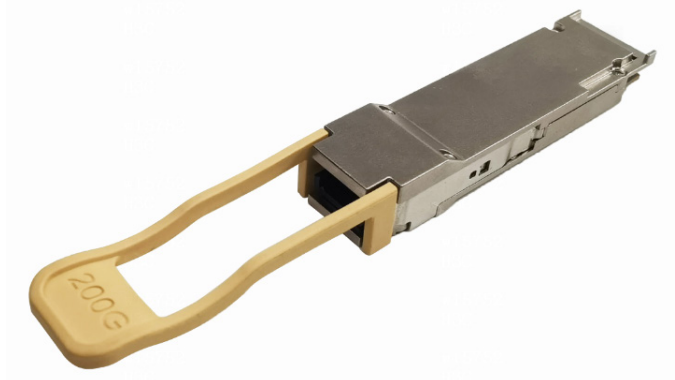
Table 10 Specifications for QSFP-DD copper cables

| Model | Length | Data rate |
|----------------------|---------------|-----------|
| QSFPDD-400G-D-CAB-2M | 2 m (6.56 ft) | 400 Gbps |

QSFP56 modules

QSFP56 optical transceiver modules (MPO)

Figure 11 QSFP56 optical transceiver module (MPO)



Models and specifications

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

Table 11 Specifications for QSFP56 optical transceiver modules (MPO) (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) |

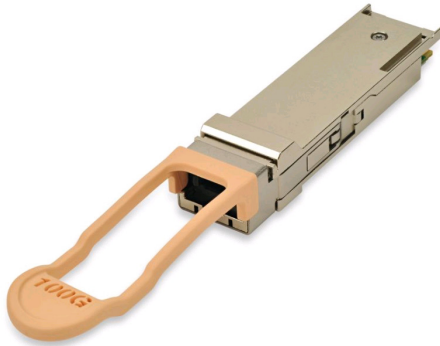
Table 12 Specifications for QSFP56 optical transceiver modules (MPO) (2)

| 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 |

QSFP28 modules

QSFP28 optical transceiver modules (MPO)

Figure 12 QSFP28 optical transceiver module (MPO)



Models and specifications

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

Table 13 Specifications for QSFP28 optical transceiver modules (MPO) (1)

| Model | Central wavelength (nm) | Fiber mode | Fiber diameter (μm) | Fiber cores | Modal bandwidth (MHz*km) | Transmission distance |
|----------------------------------|-------------------------|------------|---------------------|-------------|--------------------------|-----------------------|
| QSFP-100G-S R4-MM850 | 850 | MMF | 50/125 | 8 | 2000 | 70 m (229.66 ft) |
| | | | | | 4700 | 100 m (328.08 ft) |
| QSFP-100G-S R4-MM850-H | 850 | MMF | 50/125 | 8 | 2000 | 70 m (229.66 ft) |
| | | | | | 4700 | 100 m (328.08 ft) |
| QSFP-100G-S R4-MM850-B-C M | 850 | MMF | 50/125 | 8 | 2000 | 70 m (229.66 ft) |
| | | | | | 4700 | 100 m (328.08 ft) |
| QSFP-100G-S R4-MM850-CM | 850 | MMF | 50/125 | 8 | 2000 | 70 m (229.66 ft) |
| | | | | | 4700 | 100 m (328.08 ft) |
| QSFP-100G-S R4-MM850-A | 850 | MMF | 50/125 | 8 | 2000 | 70 m (229.66 ft) |
| | | | | | 4700 | 100 m (328.08 ft) |
| QSFP-100G-eS R4-MM850 | 850 | MMF | 50/125 | 8 | 4700 | 300 m (984.25 ft) |
| QSFP-100G-PS M4-SM1310 | 1310 | SMF | 9/125 | 8 | N/A | 0.5 km (0.31 miles) |

Table 14 Specifications for QSFP28 optical transceiver modules (MPO) (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-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 optical transceiver modules (dual LC)

Figure 13 QSFP28 optical transceiver module (dual LC)



Models and specifications

QSFP28 optical transceiver modules (dual LC) in [Table 15](#) and [Table 16](#) provide a transmission rate of 100 Gbps and 50 Gbps, respectively. The QSFP28 optical transceiver modules use a dual LC connector.

Table 15 Specifications for QSFP28 optical transceiver modules (dual LC) (1)

| Model | Central wavelength (nm) | Fiber mode | Fiber diameter (μm) | Modal bandwidth (MHz*km) | Transmission distance |
|-------------------------|---|------------|---------------------|--------------------------|-----------------------|
| QSFP-100G-ER4L-WD M1300 | Four lanes: <ul style="list-style-type: none"> • 1295.56 • 1300.05 • 1304.58 • 1309.14 | SMF | 9/125 | N/A | 40 km (24.86 miles) |
| QSFP-100G-ER4-WD M1300 | Four lanes: <ul style="list-style-type: none"> • 1295.56 • 1300.05 • 1304.58 • 1309.14 | SMF | 9/125 | N/A | 40 km (24.86 miles) |
| QSFP-100G-LR4-WD M1300 | Four lanes: <ul style="list-style-type: none"> • 1295.56 • 1300.05 • 1304.58 | SMF | 9/125 | N/A | 10 km (6.21 miles) |

| Model | Central wavelength (nm) | Fiber mode | Fiber diameter (μm) | Modal bandwidth (MHz*km) | Transmission distance |
|---------------------------------------|--|------------|---------------------|--------------------------|-----------------------|
| | <ul style="list-style-type: none"> 1309.14 | | | | |
| QSFP-100G-LR4-WD M1300-A | Four lanes: <ul style="list-style-type: none"> 1295.56 1300.05 1304.58 1309.14 | SMF | 9/125 | N/A | 10 km (6.21 miles) |
| QSFP-100G-LR4L-WD M1300 | Four lanes: <ul style="list-style-type: none"> 1271 1291 1311 1331 | SMF | 9/125 | N/A | 2 km (1.24 miles) |
| QSFP-100G-ZR4-WD M1300 | Four lanes: <ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> 1271 1291 1311 1331 | SMF | 9/125 | N/A | 2 km (1.24 miles) |
| QSFP-100G-SWDM4-MM850 | Four lanes: <ul style="list-style-type: none"> 850 880 910 940 | MMF | 50/125 | 2000 | 75 m (246.06 ft) |
| | | | | 4700 | 100 m (328.08 ft) |
| QSFP-100G-BIDI-MM850 (end of sale) | Four lanes: <ul style="list-style-type: none"> 855 908 | MMF | 50/125 | 2000 | 70 m (229.66 ft) |
| | | | | 4700 | 100 m (328.08 ft) |

Table 16 Specifications for QSFP28 optical transceiver modules (dual LC) (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 17 Specifications for QSFP28 optical transceiver modules (dual LC) (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 |

| Model | Optical parameters (dBm) | |
|--------------------------|--------------------------|-------------------------|
| | Transmit power (average) | Receive power (average) |
| 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-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-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 |

NOTE:

- The operating case 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 case 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 14 QSFP28 copper cable



Models and specifications

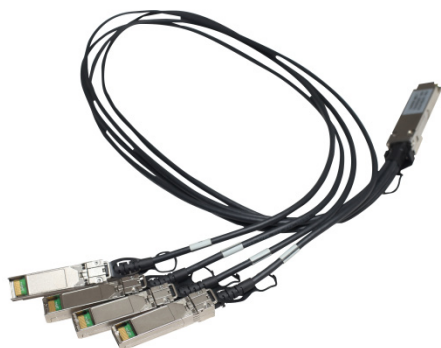
Table 18 Specifications for QSFP28 copper cables

| 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 15 QSFP28 to SFP28 copper cable



Models and specifications

Table 19 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 optical cables

Figure 16 QSFP28 optical cable



Models and specifications

Table 20 Specifications for QSFP28 optical cables

| Model | Length | Data rate |
|---------------------|-----------------|-----------|
| QSFP-100G-D-AOC-7M | 7 m (22.97 ft) | 100 Gbps |
| QSFP-100G-D-AOC-10M | 10 m (32.81 ft) | |
| QSFP-100G-D-AOC-20M | 20 m (65.62 ft) | |

CFP modules

100-Gigabit CFP optical transceiver modules

Figure 17 100-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 21 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: <ul style="list-style-type: none"> • 1295.56 • 1300.05 • 1304.58 • 1309.14 | SMF | 9/125 | 10 km (6.21 miles) |
| CFP-100G-LR4-WDM1300-A | Four lanes: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 1295.56 • 1300.05 • 1304.58 • 1309.14 | SMF | 9/125 | 40 km (24.86 miles) |

Table 22 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 17](#) 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 23 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: <ul style="list-style-type: none"> • 1271 • 1291 • 1311 • 1331 | SMF | 9/125 | 10 km (6.21 miles) |
| CFP-40G-ER4-WDM1300 (end of sale) | Four lanes: <ul style="list-style-type: none"> • 1271 • 1291 • 1311 • 1331 | SMF | 9/125 | 40 km (24.86 miles) |

Table 24 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)

Figure 18 CFP2 optical transceiver module (MPO)



Models and specifications

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

Table 25 Specifications for CFP2 optical transceiver modules (MPO) (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 26 Specifications for CFP2 optical transceiver modules (MPO) (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 (dual LC)

Figure 19 CFP2 optical transceiver module (dual LC)



Models and specifications

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

Table 27 Specifications for CFP2 optical transceiver modules (dual LC) (1)

| Model | Central wavelength (nm) | Fiber mode | Fiber diameter (μm) | Transmission distance |
|---|--|------------|---------------------|-----------------------|
| CFP2-100G-LR4-WDM1300 | Four lanes: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 1295.56 • 1300.05 • 1304.58 • 1309.14 | SMF | 9/125 | 10 km (6.21 miles) |
| CFP2-100G-ER4-WDM1300 | Four lanes: <ul style="list-style-type: none"> • 1295.56 • 1300.05 • 1304.58 • 1309.14 | SMF | 9/125 | 40 km (24.86 miles) |

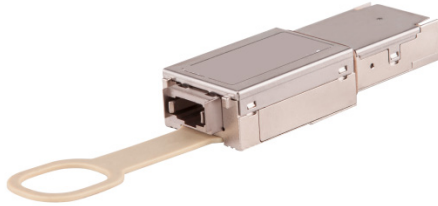
Table 28 Specifications for CFP2 optical transceiver modules (dual LC) (2)

| 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 20 CXP optical transceiver module



Models and specifications

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

Table 29 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-M M850 (end of sale) | 850 | MMF | 50/125 | 20 | 2000 | 100 m (328.08 ft) |
| CXP-100G-SR10-M M850-A (end of sale) | 850 | MMF | 50/125 | 20 | 2000 | 100 m (328.08 ft) |

Table 30 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 optical cables

Figure 21 CXP optical cable



Models and specifications

Table 31 Specifications for CXP optical 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)

Figure 22 QSFP+ optical transceiver module (MPO)



Models and specifications

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

Table 32 Specifications for QSFP+ optical transceiver modules (MPO) (1)

| Model | Central wavelength (nm) | Fiber mode | Fiber diameter (μm) | Fiber cores | Modal bandwidth (MHz*km) | Transmission distance |
|---|-------------------------|------------|---------------------|-------------|--------------------------|-----------------------|
| QSFP-40G-SR4-MM8 50 | 850 | MMF | 50/125 | 8 | 2000 | 100 m (328.08 ft) |
| | | | | | 4700 | 150 m (492.13 ft) |
| QSFP-40G-SR4-MM8 50-H | 850 | MMF | 50/125 | 8 | 2000 | 100 m (328.08 ft) |
| | | | | | 4700 | 150 m (492.13 ft) |
| QSFP-40G-SR4-MM8 50-CM | 850 | MMF | 50/125 | 8 | 2000 | 100 m (328.08 ft) |
| | | | | | 4700 | 150 m (492.13 ft) |
| QSFP-40G-SR4-MM8 50-NDDM (end of sale) | 850 | MMF | 50/125 | 8 | 2000 | 100 m (328.08 ft) |
| | | | | | 4700 | 150 m (492.13 ft) |
| QSFP-40G-CSR4-MM 850 | 850 | MMF | 50/125 | 8 | 2000 | 300 m (984.25 ft) |
| | | | | | 4700 | 400 m (1312.33 ft) |
| QSFP-40G-CSR4-MM 850-H | 850 | MMF | 50/125 | 8 | 2000 | 300 m (984.25 ft) |
| | | | | | 4700 | 400 m (1312.33 ft) |
| QSFP-40G-CSR4-MM 850-NDDM (end of sale) | 850 | MMF | 50/125 | 8 | 2000 | 300 m (984.25 ft) |
| | | | | | 4700 | 400 m (1312.33 ft) |
| QSFP-40G-IR4-PSM1 310 (end of sale) | 1310 | SMF | 9/125 | 8 | N/A | 1.4 km (0.87 miles) |
| QSFP-40G-LR4-PSM1 310 | 1310 | SMF | 9/125 | 8 | N/A | 10 km (6.21 miles) |
| QSFP-40G-LR4-PSM1 310-A | 1310 | SMF | 9/125 | 8 | N/A | 10 km (6.21 miles) |

Table 33 Specifications for QSFP+ optical transceiver modules (MPO) (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-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 | 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-H | MPO (PC polished, 12-fiber) | -7.6 to +2.4 | -9.9 to +2.4 |
| QSFP-40G-CSR4-MM850-NDDM | 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 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 optical transceiver modules can be split into four channels. 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 (dual LC)

Figure 23 QSFP+ optical transceiver module (dual LC)



Models and specifications

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

Table 34 Specifications for QSFP+ transceiver modules (dual LC) (1)

| Model | Central wavelength (nm) | Fiber mode | Fiber diameter (µm) | Modal bandwidth (MHz*km) | Transmission distance |
|----------------------|-------------------------|------------|---------------------|--------------------------|-----------------------|
| QSFP-40G-LR4-WDM1300 | Four lanes: • 1271 | SMF | 9/125 | N/A | 10 km (6.21 miles) |

| Model | Central wavelength (nm) | Fiber mode | Fiber diameter (μm) | Modal bandwidth (MHz*km) | Transmission distance |
|-------------------------------------|--|------------|---------------------|--------------------------|-----------------------|
| | <ul style="list-style-type: none"> • 1291 • 1311 • 1331 | | | | |
| QSFP-40G-LR4L-WDM1300 | Four lanes: <ul style="list-style-type: none"> • 1271 • 1291 • 1311 • 1331 | SMF | 9/125 | N/A | 2 km (1.24 miles) |
| QSFP-40G-ER4-WDM1300 | Four lanes: <ul style="list-style-type: none"> • 1271 • 1291 • 1311 • 1331 | SMF | 9/125 | N/A | 40 km (24.86 miles) |
| QSFP-40G-LX4-WDM1300 | Four lanes: <ul style="list-style-type: none"> • 1271 • 1291 • 1311 • 1331 | MMF | 50/125 | 2000 | 150 m (492.13 ft) |
| | | | | 4700 | |
| QSFP-40G-BIDI-SR-MM850 | Two lanes: <ul style="list-style-type: none"> • 850 • 900 | MMF | 50/125 | 2000 | 100 m (328.08 ft) |
| | | | | 4700 | 150 m (492.13 ft) |
| QSFP-40G-BIDI-WDM1310 (end of sale) | Two lanes: <ul style="list-style-type: none"> • 1271 • 1291 • 1311 • 1331 | MMF | 50/125 | 2000 | 140 m (459.32 ft) |
| | | | | 4700 | 160 m (524.93 ft) |
| QSFP-40G-BIDI-WDM850 | Two lanes: <ul style="list-style-type: none"> • 850 • 880 • 910 • 940 | MMF | 50/125 | 2000 | 240 m (787.40 ft) |
| | | | | 4700 | 350 m (1148.29 ft) |

Table 35 Specifications for QSFP+ transceiver modules (dual LC) (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-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 case 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 case 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 optical distribution frames (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 24 QSFP+ copper cable



Models and specifications

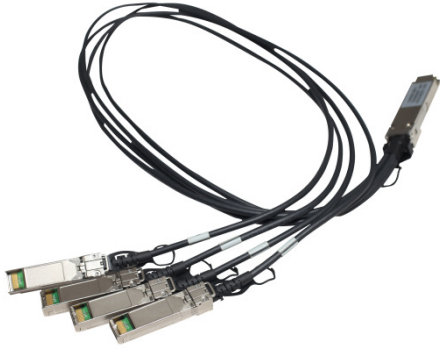
Table 36 Specifications for QSFP+ copper cables

| 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 25 QSFP+ to SFP+ copper cable



Models and specifications

Table 37 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+ optical cables

Figure 26 QSFP+ optical cable



Models and specifications

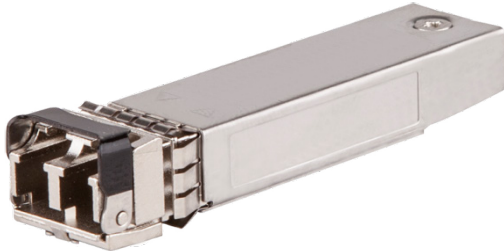
Table 38 Specifications for QSFP+ optical cables

| 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 27 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 39 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-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-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 40 Specifications for SFP28 transceiver modules (2)

| Model | Optical parameters (dBm) | |
|----------------------|--------------------------|---------------|
| | Transmit power | Receive power |
| SFP-25G-SR-MM850 | -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-I | -7 to +2 | -13.3 to +2 |

| Model | Optical parameters (dBm) | |
|-------------------|--------------------------|---------------|
| | Transmit power | Receive power |
| SFP-25G-CSR-MM850 | -6.4 to +2.4 | -10.3 to +2.4 |

NOTE:

Transceiver modules marked with an asterisk (*) are designed for industrial use and must operate with a case temperature in the range of -40°C to +85°C (-40°F to +185°F).

SFP28 copper cables

Figure 28 SFP28 copper cable



Models and specifications

Table 41 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-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-ACC-7M | 7 m (22.97 ft) | |
| SFP-25G-D-ACC-10M | 10 m (32.81 ft) | |

SFP28 optical cables

Figure 29 SFP28 optical cable



Models and specifications

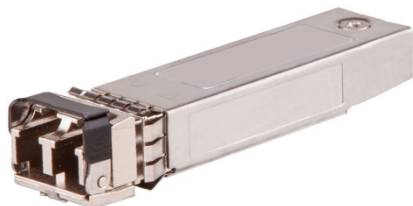
Table 42 Specifications for SFP28 optical cables

| 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 (dual LC)

Figure 30 SFP+ optical transceiver module (dual LC)



Models and specifications

SFP+ optical transceiver modules (dual LC) use a dual LC connector.

Table 43 Specifications for SFP+ optical transceiver modules (dual LC) (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-S | 850 | MMF | 50/125 | 4700 | 400 m (1312.34 ft) | 10.31 Gbps |
| | | | | 2000 | 300 m (984.25 ft) | |

| Model | Central wavelength (nm) | Fiber mode | Fiber diameter (µm) | Modal bandwidth (MHz*km) | Transmission distance | Data rate |
|------------------------------------|-------------------------|------------|---------------------|--------------------------|-----------------------|------------|
| | | | 62.5/125 | 500 | 82 m (269.03 ft) | |
| | | | | 400 | 66 m (216.54 ft) | |
| | | | | 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-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 220-MM1310 (end of sale) | 1310 | MMF | 50/125 | 1500 | 220 m (721.78 ft) | 10.31 Gbps |
| | | | | 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-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 | - | 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-LH 40-SM1550 | 1550 | SMF | 9/125 | N/A | 40 km (24.86 miles) | 10.31 Gbps |
| SFP-XG-LH 40-SM1550-D | 1550 | SMF | 9/125 | N/A | 40 km (24.86 miles) | 10.31 Gbps |
| SFP-XG-LH 80-SM1550 | 1550 | SMF | 9/125 | N/A | 80 km (49.71 miles) | 10.31 Gbps |
| SFP-XG-LH | 1550 | SMF | 9/125 | N/A | 80 km (49.71) | 10.31 Gbps |

| Model | Central wavelength (nm) | Fiber mode | Fiber diameter (μm) | Modal bandwidth (MHz*km) | Transmission distance | Data rate |
|-----------------------|-------------------------|------------|---------------------|--------------------------|-----------------------|------------|
| 80-SM1550-D | | | | | miles) | |
| SFP-FC-8G-SW-MM850 | 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 |

| Model | Central wavelength (nm) | Fiber mode | Fiber diameter (μm) | Modal bandwidth (MHz*km) | Transmission distance | Data rate |
|---------------------------------|-------------------------|------------|---------------------|--------------------------|-----------------------|-------------|
| SFP-FC-16 G-SW-MM8 50 | 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-16 G-SW-MM8 50-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-16 G-LW-SM13 10 | 1310 | SMF | 9/125 | N/A | 10 km (6.21 miles) | 4.25 Gbps |
| | | | | | | 8.5 Gbps |
| | | | | | | 14.025 Gbps |
| SFP-FC-16 G-LW-SM13 10-CM | 1310 | SMF | 9/125 | N/A | 10 km (6.21 miles) | 4.25 Gbps |
| | | | | | | 8.5 Gbps |
| | | | | | | 14.025 Gbps |

| Model | Central wavelength (nm) | Fiber mode | Fiber diameter (μm) | Modal bandwidth (MHz*km) | Transmission distance | Data rate |
|--|-------------------------|------------|---------------------|--------------------------|-----------------------|--------------------|
| SFP-FC-32 G-SW-MM8 50 | 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-32 G-SW-MM8 50-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-LH 80-Tunable (end of sale) | 1547.75 | SMF | 9/125 | N/A | 80 km (49.71 miles) | 9.95 to 11.3 Gbps |
| *SFP-XG-C PRI-IR-SM1 310 | 1310 | SMF | 9/125 | N/A | 1.4 km (0.87 miles) | 4.91 to 10.31 Gbps |
| *SFP-XG-C PRI-LR-SM 1310 | 1310 | SMF | 9/125 | N/A | 10 km (6.21 miles) | 4.91 to 10.31 Gbps |

| Model | Central wavelength (nm) | Fiber mode | Fiber diameter (µm) | Modal bandwidth (MHz*km) | Transmission distance | Data rate |
|---------------------------------|---|-------------------|----------------------------|---------------------------------|------------------------------|------------------|
| SFP-XG-LX -SM1270-BI DI | Transmitting end (TX): 1270 Receiving end (RX): 1330 | SMF | 9/125 | N/A | 10 km (6.21 miles) | 10.31Gbps |
| SFP-XG-LX -SM1270-BI DI-S | Transmitting end (TX): 1270 Receiving end (RX): 1330 | SMF | 9/125 | N/A | 10 km (6.21 miles) | 10.31Gbps |
| SFP-XG-LX -SM1330-BI DI | Transmitting end (TX): 1330 Receiving end (RX): 1270 | SMF | 9/125 | N/A | 10 km (6.21 miles) | 10.31Gbps |
| SFP-XG-LX -SM1330-BI DI-S | Transmitting end (TX): 1330 Receiving end (RX): 1270 | SMF | 9/125 | N/A | 10 km (6.21 miles) | 10.31Gbps |
| SFP-XG-LH 40-SM1270- BIDI | Transmitting end (TX): 1270 Receiving end (RX): 1330 | SMF | 9/125 | N/A | 40 km (24.86 miles) | 10.31Gbps |
| SFP-XG-LH 40-SM1330- BIDI | Transmitting end (TX): 1330 Receiving end (RX): 1270 | SMF | 9/125 | N/A | 40 km (24.86 miles) | 10.31Gbps |
| SFP-XG-LH 80-SM1490- BIDI | Transmitting end (TX): 1490 Receiving end (RX): 1550 | SMF | 9/125 | N/A | 80 km (49.71 miles) | 10.31Gbps |
| SFP-XG-LH 80-SM1550- BIDI | Transmitting end (TX): 1550 Receiving end (RX): 1490 | SMF | 9/125 | N/A | 80 km (49.71 miles) | 10.31Gbps |

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 44 Specifications for SFP+ optical transceiver modules (dual LC) (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-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-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-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-LH40-SM1550 | -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) |

| Model | Optical parameters (dBm) | |
|-------------------------|--------------------------|--------------------------|
| | Transmit power | Receive power |
| | | -5 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 |

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.
- Transceiver modules marked with an asterisk (*) are designed for industrial use and must operate with a case temperature in the range of -40°C to +85°C (-40°F to +185°F).

SFP+ optical transceiver modules (SC)

Figure 31 SFP+ optical transceiver module (SC)



Models and specifications

Table 45 Specifications for SFP+ optical transceiver modules (SC) (1)

| Model | Central wavelength (nm) | Fiber mode | Fiber diameter (μm) | Transmission distance |
|-----------------------|---|------------|---------------------|-----------------------|
| SFP-XG-PR30-U-SM1270 | <ul style="list-style-type: none"> Transmitting end (TX): 1270 Receiving end (RX): 1577.5 | SMF | 9/125 | 20 km (12.43 miles) |
| SFP-XG-PRX30-U-SM1310 | <ul style="list-style-type: none"> Transmitting end (TX): 1310 Receiving end (RX): 1577.5 | SMF | 9/125 | 20 km (12.43 miles) |

Table 46 Specifications for SFP+ optical transceiver modules (SC) (2)

| Model | Data rate (Gbps) | | Optical parameters (dBm) | |
|-----------------------|-----------------------|--------------------|--------------------------|---------------|
| | Transmitting end (TX) | Receiving end (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 | 1.25 | 10.3125 | +0.62 to +5.62 | -10 to -28.5 |

10G EPON OLT SFP+ optical transceiver modules (SC)

A 10G EPON OLT SFP+ optical transceiver module uses an SC connector.

Figure 32 10G EPON OLT SFP+ optical transceiver module (SC)



Models and specifications

Table 47 Specifications for 10G EPON OLT SFP+ optical transceiver modules (SC) (1)

| Model | Central wavelength (nm) | Fiber mode | Fiber diameter (μm) | Transmission distance |
|--------------------------------------|--|------------|---------------------|-----------------------|
| SFP-XG-PR30-D-SM1577-A (end of sale) | <ul style="list-style-type: none"> Tx/Rx rate—10.3125 Gbps <ul style="list-style-type: none"> Tx: 1577.5 Rx: 1270 | SMF | 9/125 | 20 km (12.43 miles) |

| Model | Central wavelength (nm) | Fiber mode | Fiber diameter (μm) | Transmission distance |
|--------------------------------------|---|------------|---------------------|-----------------------|
| | <ul style="list-style-type: none"> • Tx/Rx rate—1.25 Gbps <ul style="list-style-type: none"> ○ Tx: 1490 ○ Rx: 1310 | | | |
| SFP-XG-PR30-D-SM1577-C | <ul style="list-style-type: none"> • Tx/Rx rate—10.3125 Gbps <ul style="list-style-type: none"> ○ Tx: 1577.5 ○ Rx: 1270 • Tx/Rx rate—1.25 Gbps <ul style="list-style-type: none"> ○ Tx: 1490 ○ Rx: 1310 | SMF | 9/125 | 20 km (12.43 miles) |
| SFP-XG-PR40-D-SM1577-A (end of sale) | <ul style="list-style-type: none"> • Tx/Rx rate—10.3125 Gbps <ul style="list-style-type: none"> ○ Tx: 1577.5 ○ Rx: 1270 • Tx/Rx rate—1.25 Gbps <ul style="list-style-type: none"> ○ Tx: 1490 ○ Rx: 1310 | SMF | 9/125 | 20 km (12.43 miles) |
| SFP-XG-PR40-D-SM1577-C | <ul style="list-style-type: none"> • Tx/Rx rate—10.3125 Gbps <ul style="list-style-type: none"> ○ Tx: 1577.5 ○ Rx: 1270 • Tx/Rx rate—1.25 Gbps <ul style="list-style-type: none"> ○ Tx: 1490 ○ Rx: 1310 | SMF | 9/125 | 20 km (12.43 miles) |

Table 48 Specifications for 10G EPON OLT SFP+ optical transceiver modules (SC) (2)

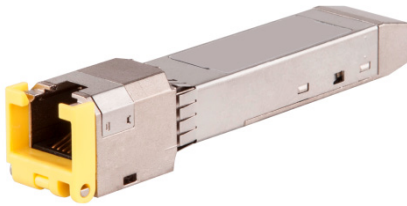
| Model | Data rate (Gbps) | | Optical parameters (dBm) | |
|------------------------|------------------|---------|--------------------------|-----------------|
| | Tx | Rx | Tx power | Rx power |
| SFP-XG-PR30-D-SM1577-A | 10.3125 | 10.3125 | +2 to +5 | -6 to -28 |
| | 1.25 | 1.25 | +3 to +7 | -9.38 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 dBm for the SFP-XG-PR30-D-SM1577-A and SFP-XG-PR30-D-SM1577-C transceiver modules and 33 dBm for the SFP-XG-PR40-D-SM1577-A and SFP-XG-PR40-D-SM1577-C transceiver modules.

SFP+ copper transceiver modules

Figure 33 SFP+ copper transceiver module



Models and specifications

Table 49 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 depends on the device model.

SFP+ copper cables

Figure 34 SFP+ copper cable



Models and specifications

Table 50 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) | |

| Model | Length | Data rate |
|------------------|----------------|-----------|
| LSTM1STK-S | 5 m (16.40 ft) | |
| SFP-XG-CAB-5M-CM | 5 m (16.40 ft) | |
| LSTM2STK | 7 m (22.97 ft) | |

SFP+ optical cables

Figure 35 SFP+ optical cable



Models and specifications

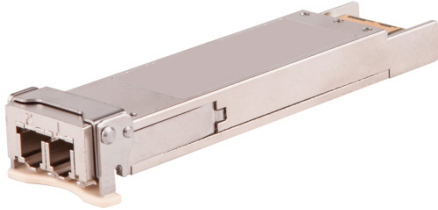
Table 51 Specifications for SFP+ optical cables

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

XFP modules

XFP optical transceiver modules (dual LC)

Figure 36 XFP optical transceiver module (dual LC)



Models and specifications

Table 52 Specifications for XFP optical transceiver modules (dual LC) (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) |
| | | | | 62.5/125 | 400 | 66 m (216.54 ft) |
| | | | | | 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) |
| | | | | 62.5/125 | 400 | 66 m (216.54 ft) |
| | | | | | 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-SM15 50 (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) |

| Model | Central wavelength (nm) | Data rate (Gbps) | Fiber mode | Fiber diameter (µm) | Modal bandwidth (MHz*km) | Transmission distance |
|--------------------------------|--------------------------------|-------------------------|-------------------|----------------------------|---------------------------------|------------------------------|
| 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) |

| Model | Central wavelength (nm) | Data rate (Gbps) | Fiber mode | Fiber diameter (μm) | Modal bandwidth (MHz*km) | Transmission distance |
|--------------------------------|-------------------------|------------------|------------|---------------------|--------------------------|-----------------------|
| 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-SM1550.12 (end of sale) | 1550.12 | 9.95 to 10.31 | SMF | 9/125 | N/A | 80 km (49.71 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 53 Specifications for XFP optical transceiver modules (dual LC) (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 |

| Model | Optical parameters (dBm) | |
|------------------|--------------------------|---------------|
| | Transmit power | Receive power |
| 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)

Figure 37 10G EPON OLT XFP optical transceiver module (SC)



Models and specifications

Table 54 Specifications for 10G EPON OLT XFP optical transceiver modules (SC) (1)

| Model | Central wavelength (nm) | Fiber mode | Fiber diameter (μm) | Transmission distance |
|--------------------|--|------------|---------------------|-----------------------|
| XFP-PR30-D-SM1577 | <ul style="list-style-type: none"> Data rate of 10.3125 Gbps at both the transmitting end (TX) and receiving end (RX) <ul style="list-style-type: none"> TX: 1577.5 RX: 1270 Data rate of 1.25 Gbps at both the TX and RX <ul style="list-style-type: none"> TX: 1490 RX: 1310 | SMF | 9/125 | 20 km (12.43 miles) |
| XFP-PRX30-D-SM1577 | <ul style="list-style-type: none"> Data rate of 10.3125 Gbps at the TX and 1.25 Gbps at the RX <ul style="list-style-type: none"> TX: 1577.5 RX: 1310 Data rate of 1.25 Gbps at both the TX and RX <ul style="list-style-type: none"> TX: 1490 RX: 1310 | SMF | 9/125 | 20 km (12.43 miles) |

Table 55 Specifications for 10G EPON OLT XFP optical transceiver modules (SC) (2)

| Model | Data rate (Gbps) | | Optical parameters (dBm) | |
|--------------------|-----------------------|--------------------|--------------------------|----------------|
| | Transmitting end (TX) | Receiving end (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 38 CX4 cable



Models and specifications

Table 56 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 39 2.5-Gigabit/Gigabit/622-Megabit/100-Megabit SFP optical transceiver module



Models and specifications

2.5-Gigabit SFP optical transceiver modules use a dual LC connector.

Table 57 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-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 58 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-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 |

⚠ IMPORTANT:

Transceiver modules marked with an asterisk (*) are designed for industrial use and must operate with a case temperature in the range of -40°C to +85°C (-40°F to +185°F).

SFP GPON ONU optical transceiver modules (SC)

Figure 40 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 59 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) |

Table 60 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 |

⚠ IMPORTANT:

- Transceiver modules marked with an asterisk (*) are designed for industrial use and must operate with a case temperature in the range of -40°C to $+85^{\circ}\text{C}$ (-40°F to $+185^{\circ}\text{F}$).
- 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 dBm.

SFP GPON OLT optical transceiver modules (SC)

Figure 41 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 61 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) |

Table 62 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 |

! 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 dBm.
- The optical power budget for an SFP-GPON-C+-D-SM1490 transceiver is 32 dBm.
- The optical power budget for an SFP-GPON-C++-D-SM1490 transceiver is 33 dBm.

Gigabit SFP optical transceiver modules

See [Figure 39](#) 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 63 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-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-S | 1310 | SMF | 9/125 | N/A | 10 km (6.21 miles) |

| Model | Central wavelength (nm) | Fiber mode | Fiber diameter (μm) | Modal bandwidth at 850 nm (MHz*km) | Transmission distance |
|-----------------------|-------------------------|------------|---------------------|------------------------------------|-----------------------|
| *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-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-LH100-SM1550 | 1550 | SMF | 9/125 | N/A | 100 km (62.14 miles) |

Table 64 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-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-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-LH40-SM1310-I | -5 to 0 | -23 to -3 |

| Model | Optical parameters (dBm) | |
|----------------------|--------------------------|---------------|
| | Transmit power | Receive power |
| 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-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).
- Transceiver modules marked with an asterisk (*) are designed for industrial use and must operate with a case temperature in the range of -40°C to +85°C (-40°F to +185°F).

622-Megabit SFP optical transceiver modules

See [Figure 39](#) 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 65 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 66 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 39](#) 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 67 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-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-LH80-SM1550 | 1550 | SMF | 9/125 | 80 km (49.71 miles) |

Table 68 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-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-LH80-SM1550 | -5 to 0 | -34 to -10 |

NOTE:

Transceiver modules marked with an asterisk (*) are designed for industrial use and must operate with a case temperature in the range of -40°C to +85°C (-40°F to +185°F).

Gigabit BIDI optical transceiver modules

Figure 42 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 69 Specifications for Gigabit BIDI optical transceiver modules (1)

| Model | Central wavelength (nm) | Fiber mode | Fiber diameter (μm) | Transmission distance |
|--------------------------|---|------------|---------------------|-----------------------|
| SFP-GE-LX-SM1310-BIDI | <ul style="list-style-type: none"> Transmitting end (TX): 1310 Receiving end (RX): 1490 | SMF | 9/125 | 10 km (6.21 miles) |
| SFP-GE-LX-SM1310-BIDI-S | <ul style="list-style-type: none"> Transmitting end (TX): 1310 Receiving end (RX): 1490 | SMF | 9/125 | 10 km (6.21 miles) |
| *SFP-GE-LX-SM1310-BIDI-I | <ul style="list-style-type: none"> Transmitting end (TX): 1310 Receiving end (RX): 1490 | SMF | 9/125 | 10 km (6.21 miles) |
| SFP-GE-LX-SM1490-BIDI | <ul style="list-style-type: none"> Transmitting end (TX): 1490 Receiving end (RX): 1310 | SMF | 9/125 | 10 km (6.21 miles) |
| SFP-GE-LX-SM1490-BIDI-S | <ul style="list-style-type: none"> Transmitting end (TX): 1490 Receiving end (RX): 1310 | SMF | 9/125 | 10 km (6.21 miles) |
| *SFP-GE-LX-SM1490-BIDI-I | <ul style="list-style-type: none"> Transmitting end (TX): 1490 Receiving end (RX): 1310 | SMF | 9/125 | 10 km (6.21 miles) |
| SFP-GE-LH40-SM1310-BIDI | <ul style="list-style-type: none"> Transmitting end (TX): 1310 Receiving end (RX): 1550 | SMF | 9/125 | 40 km (24.86 miles) |
| SFP-GE-LH40-SM1550-BIDI | <ul style="list-style-type: none"> Transmitting end (TX): 1550 Receiving end (RX): 1310 | SMF | 9/125 | 40 km (24.86 miles) |
| SFP-GE-LH70-SM1490-BIDI | <ul style="list-style-type: none"> Transmitting end (TX): 1490 Receiving end (RX): 1550 | SMF | 9/125 | 70 km (43.50 miles) |
| SFP-GE-LH70-SM1550-BIDI | <ul style="list-style-type: none"> Transmitting end (TX): 1550 Receiving end (RX): 1490 | SMF | 9/125 | 70 km (43.50 miles) |

Table 70 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 | | |

| Model | Optical parameters (dBm) | |
|--------------------------|--------------------------|---------------|
| | Transmit power | Receive power |
| 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-LH40-SM1310-BIDI | -5 to 0 | -23 to -3 |
| SFP-GE-LH40-SM1550-BIDI | | |
| 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.
- Transceiver modules marked with an asterisk (*) are designed for industrial use and must operate with a case temperature in the range of -40°C to +85°C (-40°F to +185°F).

100-Megabit BIDI optical transceiver modules

See [Figure 42](#) 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 71 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 | <ul style="list-style-type: none"> • Transmitting end (TX): 1310 • Receiving end (RX): 1550 | SMF | 9/125 | 15 km (9.32 miles) |
| SFP-FE-LX-SM1550-BIDI | <ul style="list-style-type: none"> • Transmitting end (TX): 1550 • Receiving end (RX): 1310 | SMF | 9/125 | 15 km (9.32 miles) |

Table 72 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 GEAPON OLT optical transceiver modules (SC)

Figure 43 BIDI GEAPON OLT optical transceiver module



Models and specifications

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

Table 73 Specifications for BIDI GEAPON 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) | <ul style="list-style-type: none"> • Transmitting end (TX): 1490 • Receiving end (RX): 1310 | SMF | 9/125 | 10 km (6.21 miles) |
| SFP-GE-PX20-D-SM1490-A (end of sale) | <ul style="list-style-type: none"> • Transmitting end (TX): 1490 • Receiving end (RX): 1310 | SMF | 9/125 | 20 km (12.43 miles) |
| SFP-GE-PX20-D-SM1490-M | <ul style="list-style-type: none"> • Transmitting end (TX): 1490 • Receiving end (RX): 1310 | SMF | 9/125 | 20 km (12.43 miles) |

Table 74 Specifications for BIDI GEAPON 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 GEAPON 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)

Figure 44 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 75 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) |

| Model | Central wavelength (nm) | Fiber mode | Fiber diameter (μm) | Transmission distance |
|--|-------------------------|------------|---------------------|-----------------------|
| SFP-GE-LH70-SM1610-CW (end of sale) | 1610 | SMF | 9/125 | 70 km (43.50 miles) |

Table 76 Specifications for Gigabit CWDM optical transceiver modules (2)

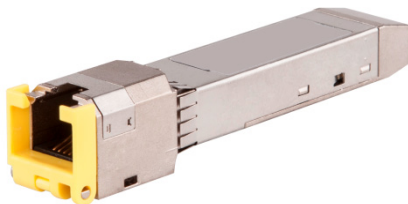
| Model | Optical parameters (dBm) | |
|-----------------------|--------------------------|---------------|
| | Transmit power | Receive power |
| SFP-GE-LH70-SM1470-CW | 0 to +5 | -23 to -3 |
| SFP-GE-LH70-SM1490-CW | | |
| SFP-GE-LH70-SM1510-CW | | |
| SFP-GE-LH70-SM1530-CW | | |
| SFP-GE-LH70-SM1550-CW | | |
| 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 45 Gigabit SFP copper transceiver module



Models and specifications

Table 77 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 |

| Model | Transmission distance | Data rate | Connector type |
|-------------|-----------------------|-----------|----------------|
| 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 |

! **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 46 Gigabit SFP copper cable



Models and specifications

Table 78 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 |