Hewlett Packard Enterprise

HPE Comware-Based Devices Transceiver Modules

User Guide (100G)

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Acknowledgments

Contents

Overview

This document describes 100-Gigabit transceiver modules and cables available for HPE Comware-based devices.

List of 100-Gigabit transceiver modules and network cables

Transceiver module type	Connector type
QSFP28 transceiver modules	
QSFP28 optical transceiver module	MPO/LC
QSFP28 copper cable	N/A
QSFP28 to SFP28 copper cables	
QSFP28 active optical cable	
CFP transceiver modules	
100-Gigabit CFP optical transceiver module	LC
CFP2 transceiver modules	
100-Gigabit CFP2 optical transceiver module	LC
CXP transceiver modules	
100-Gigabit CXP optical transceiver module	MPO
100-Gigabit CXP active optical cable	N/A

NOTE:

- HPE 100-Gigabit transceiver modules and cables are subject to change over time. For the most recent list of HPE 100-Gigabit transceiver modules and cables, contact HPE technical support or marketing staff.
- The available transceiver modules and cables vary by HPE devices. For the transceiver modules and cables available for a device, see the installation guide for the device. For the 100-Gigabit transceiver modules and cables for a switch in a data center, see "100-Gigabit Ethernet transceiver modules compatibility matrix".

About optical transceiver modules

Optical transceiver modules (also called fiber transceiver modules) transmit signals over optical fibers and are suitable for long distance transmission.

The following information explains the major specifications of a fiber transceiver module.

Data rate

Data rate is the number of bits transmitted per second. Data rate is typically measured in Gigabits per second (Gbps).

Transmission distance

The transmission distance of optical transceiver modules is divided into short and long-range types. Typically, a distance of 2 km (1.24 miles) or below is short-range type and a distance of 10 km (6.21 miles) is long-range type.

Transmission distances supported by optical transceiver modules are mainly limited by signal attenuation and dispersion suffered during the transmission of fiber signals over fibers.

- Signal attenuation occurs because of absorption, dispersion, and leakage over the media as light travels through optical fibers. This attenuation increases in direct ratio to transmission distance.
- Dispersion occurs because a fiber transmits light with different wavelengths at different speeds. Light with different wavelengths reaches the receiving end at different time. This results in spread and blurred pulses.

Central wavelength

Central wavelength represents the wave band used for optical signal transmission. The following central wavelengths (wave bands) are available for common optical transceiver modules: 850 nm, 1310 nm, and 1550 nm.

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

Fiber

Fiber types

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

- Multimode fibers

  Multimode fibers (MMFs) have thicker fiber cores than single-mode fibers and can transport light in multiple modes. However, the intermodal 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, as shown in Table 1. The modal bandwidth is a comprehensive index that reflects the optical characteristics of a multimode fiber. The modal bandwidth of a multimode fiber is equal to *the modulation frequency of the maximum modulation frequency pulse that can pass a fiber* × *the fiber length*.

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

  Table 1 Multimode fiber grades

Fiber grade	Fiber diameter (μm)	Modal bandwidth at 850 nm (MHz*km)
OM3	50/125	2000
OM4	50/125	4700

- 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 intermodal dispersion and are suitable for long-haul 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 an "SM" mark.

ITU defines single-mode fiber types in its G series standards. The most commonly used single-mode fibers are defined in ITU G.652 and G.655 standards. Table 2 describes features of the G.652 and G.655-compliant fibers.

Table 2 Features of G.652 and G.655-compliant fibers

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

Fiber diameter

Fiber diameter is expressed as core diameter/cladding diameter, in μm. For example, 9/125 μm represents a fiber core diameter of 9 μm and a fiber cladding diameter of 125 μm.

As a best practice, use the following fiber diameters for the HPE Comware-based devices:

- **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.

Connector

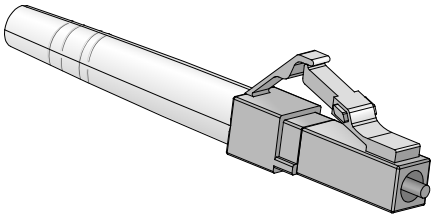
CAUTION:

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

Connectors connect transceiver modules to the transmission media. The following information describes the connectors used by the transceiver modules for the HPE Comware-based devices.

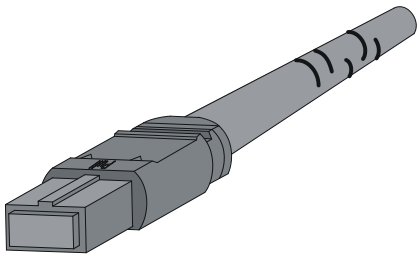
Lucent connector or local connector (LC)

Figure 1 LC connector



Multi-fiber Push On connector (MPO)

Figure 2 MPO connector



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

MPO connectors are classified into 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 (see Figure 3) or 24 fibers (see Figure 4).

Figure 3 End face of a 12-fiber connector

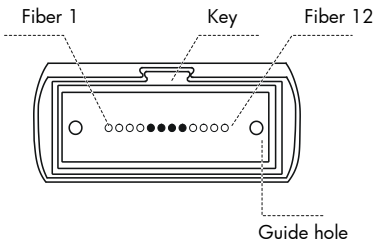
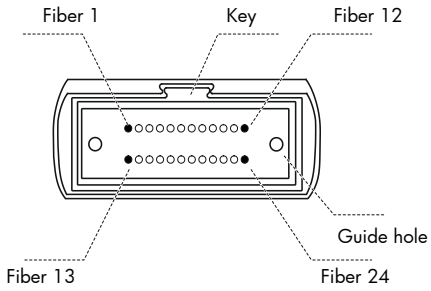


Figure 4 End face of a 24-fiber connector



Optical parameters

The following are the major optical parameters:

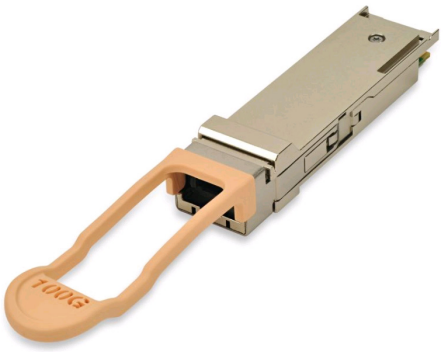
- **Transmit power**—Transmit power is the power at which the transmitter of an optical transceiver module transmits optical signals, in dBm.
- **Receive power**—Receive power is the power at which the receiver of a optical transceiver module receives optical signals, in dBm.

The transceiver module specifications in this guide provide the average transmit and receive power ranges.

QSFP28 transceiver modules

QSFP28 optical transceiver modules that use MPO connectors

Figure 5 QSFP28 optical transceiver module that use MPO connectors



Models and specifications

QSFP28 optical transceiver modules provide a transmission rate of 100 Gbps and use MPO connectors.

Table 3 Specifications for QSFP28 transceiver modules that use MPO connectors (1)

Product code	HPE description	Central wavelength (nm)	Fiber mode	Fiber diameter (μm)	Modal bandwidth (MHz*km)	Transmission distance
JL274A	HPE X150 100G QSFP28 MPO SR4 100m MM Transceiver	850	MMF	50/125	2000	70 m (229.66 ft)
					4700	100 m (328.08 ft)
JH420A	HPE X150 100G QSFP28 MPO PSM4 500m SM Transceiver	1295～1325	SMF	9/125	N/A	0.5 km (0.31 miles)

Table 4 Specifications for QSFP28 transceiver modules that use MPO connectors (2)

Product code	HPE description	Connector	Optical parameters (dBm)	
			Transmit power	Receive power
JL274A	HPE X150 100G QSFP28 MPO SR4 100m MM Transceiver	MPO (PC polished, 12-fiber)	–8.4 to +2.4	–10.3 to +2.4

Product code	HPE description	Connector	Optical parameters (dBm)	
			Transmit power	Receive power
JH420A	HPE X150 100G QSFP28 MPO PSM4 500m SM Transceiver	MPO (APC polished, 12-fiber)	–9.4 to +2	–12.66 to +2

QSFP28 optical transceiver modules that use LC connectors

Figure 6 QSFP28 optical transceiver module that uses LC connectors

Models and specifications

QSFP28 optical transceiver modules provide a transmission rate of 100 Gbps and use LC connectors.

Table 5 Specifications for QSFP28 transceiver modules that use LC connectors (1)

Product code	HPE description	Central wavelength (nm)	Fiber mode	Fiber diameter (μm)	Transmission distance
JL275A	HPE X150 100G QSFP28 LC LR4 10km SM Transceiver	Four lanes: • 1294.53～1296.59 • 1299.02～1301.09 • 1303.54～1305.63 • 1308.09～1310.19	SMF	9/125	10 km (6.21 miles)
JH673A	HPE X150 100G QSFP28 CWDM4 2km SM Transceiver	Four lanes: • 1264.5～1277.5 • 1284.5～1297.5 • 1304.5～1317.5 • 1324.5～1337.5	SMF	9/125	2 km (1.24 miles)

Table 6 Specifications for QSFP28 transceiver modules that use LC connectors (2)

Product code	HPE description	Optical parameters (dBm)	
		Transmit power	Receive power
JL275A	HPE X150 100G QSFP28 LC LR4 10km SM Transceiver	–4.3 to +4.5 per lane	–10.6 to +4.5 per lane
JH673A	HPE X150 100G QSFP28 CWDM4 2km SM Transceiver	–6.5 to +2.5 per lane	–11.5 to +2.5 per lane

QSFP28 copper cables

Figure 7 QSFP28 copper cable

Models and specifications

Table 7 Specifications for QSFP28 copper cables

Product code	HPE description	Cable length	Data rate	Remarks
JL271A	HPE X240 100G QSFP28 to QSFP28 1m Direct Attach Copper Cable	1 m (3.28 ft)	100 Gbps	Used for interconnecting 100-Gigabit QSFP28 ports.
JL272A	HPE X240 100G QSFP28 to QSFP28 3m Direct Attach Copper Cable	3 m (9.84 ft)		
JL273A	HPE X240 100G QSFP28 to QSFP28 5m Direct Attach Copper Cable	5 m (16.40 ft)		

QSFP28 to SFP28 copper cables

One end of a QSFP28 to SFP28 copper cable provides a 100-Gigabit QSFP28 module, and the other end provides four 25-Gigabit SFP28 modules.

Figure 8 QSFP28 to SFP28 copper cable

Models and specifications

Table 8 Specifications for QSFP28 to SFP28 copper cables

Product code	HPE description	Cable length	Data rate	Remarks
JL282A	HPE X240 QSFP28 4xSFP28 1m Direct Attach Copper Cable	1 m (3.28 ft)	100 Gbps	Used for connecting a 100-Gigabit QSFP28 port to four 25-Gigabit SFP28 ports.
JL283A	HPE X240 QSFP28 4xSFP28 3m Direct Attach Copper Cable	3 m (9.84 ft)		
JL284A	HPE X240 QSFP28 4xSFP28 5m Direct Attach Copper Cable	5 m (16.40 ft)		

QSFP28 active optical cables

Figure 9 QSFP28 active optical cable

Models and specifications

Table 9 Specifications for QSFP28 active optical cables

Product code	HPE description	Cable length	Data rate	Remarks
JL276A	HPE X2A0 100G QSFP28 to QSFP28 7m Active Optical Cable	7 m (22.97 ft)	100 Gbps	Used for interconnecting 100-Gigabit QSFP28 ports.
JL277A	HPE X2A0 100G QSFP28 to QSFP28 10m Active Optical Cable	10 m (32.81 ft)		
JL278A	HPE X2A0 100G QSFP28 to QSFP28 20m Active Optical Cable	20 m (65.62 ft)		

CFP transceiver modules

Figure 10 CFP transceiver module

Models and specifications

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

Table 10 Specifications for CFP transceiver modules (1)

Product code	HPE description	Central wavelength (nm)	Fiber mode	Fiber diameter (μm)	Transmission distance
JG829A (end of sale)	HPE X150 100G CFP LC LR4 10km SM Transceiver	Four lanes: • 1295.56 • 1300.05 • 1304.58 • 1309.14	SMF	9/125	10 km (6.21 miles)
JG829B	HPE X150 100G CFP LC LR4 10km SM Transceiver	Four lanes: • 1295.56 • 1300.05 • 1304.58 • 1309.14	SMF	9/125	10 km (6.21 miles)

Table 11 Specifications for CFP transceiver modules (2)

Product code	HPE description	Optical parameters (dBm)	
		Transmit power	Receive power
JG829A (end of sale)	HPE X150 100G CFP LC LR4 10km SM Transceiver	–4.3 to +4.5 per lane	–10.6 to +4.5 per lane
JG829B	HPE X150 100G CFP LC LR4 10km SM Transceiver	–4.3 to +4.5 per lane	–10.6 to +4.5 per lane

CFP2 transceiver modules

Figure 11 CFP2 transceiver module

Models and specifications

CFP2 transceiver modules use LC connectors.

Table 12 Specifications for CFP2 transceiver modules (1)

Product code	HPE description	Central wavelength (nm)	Data rate	Fiber mode	Fiber diameter (µm)	Transmission distance
JH289A	HPE X150 100G CFP2 LC LR4 10km SM Transceiver	Four lanes: • 1295.56 • 1300.05 • 1304.58 • 1309.14	100 Gbps	SMF	9/125	10 km (6.21 miles)

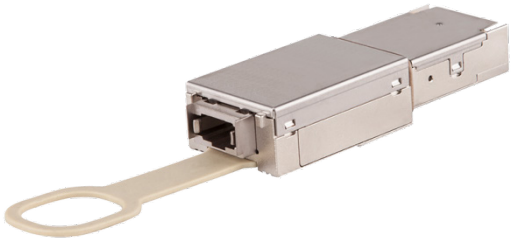
Table 13 Specifications for CFP2 transceiver modules (2)

Product code	HPE description	Optical parameters (dBm)	
		Transmit power	Receive power
JH289A	HPE X150 100G CFP2 LC LR4 10km SM Transceiver	–4.3 to +4.5 per lane	–10.6 to +4.5 per lane

CXP transceiver modules

CXP optical transceiver modules

Figure 12 CXP optical transceiver module



Models and specifications

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

Table 14 Specifications for CXP optical transceiver modules (1)

Product code	HPE description	Central wavelength (nm)	Fiber mode	Fiber diameter (µm)	Modal bandwidth (MHz*km)	Transmission distance
JG881A	HPE X150 100G CXP MPO SR 100m Multimode Transceiver	850	MMF	50/125	2000	100 m (328.08 ft)

Table 15 Specifications for CXP optical transceiver modules (2)

Product code	HPE description	Connector	Optical parameters (dBm)	
			Transmit power	Receive power
JG881A	HPE X150 100G CXP MPO SR 100m Multimode Transceiver	MPO (PC polished, 24-fiber)	–7.6 to +2.4	–9.5 to +2.4

CXP active optical cables

Figure 13 CXP active optical cable

Models and specifications

Table 16 Specifications for CXP active optical cables

Product code	HPE description	Cable length	Data rate
JG883A	HPE X2A0 100G CXP to CXP 30m Active Optical Cable	30 m (98.43 ft)	100 Gbps
JG882A	HPE X2A0 100G CXP to CXP 10m Active Optical Cable	10 m (32.81 ft)	100 Gbps

100-Gigabit Ethernet transceiver modules compatibility matrix

100-Gigabit Ethernet transceiver modules

Before you install, configure, or upgrade a device with HPE 100-Gigabit Ethernet transceiver modules, always see the device's release notes for latest information. This compatibility matrix does not replace or supersede the release notes.

Table 17 100 Gigabit Ethernet transceiver modules

Product code	Transceiver module	Description
QSFP28		
JL274A	HPE X150 100G QSFP28 MPO SR4 100m MM Transceiver	LSXM2QSFP28B,100G QSFP28 Optical Transceiver,(850nm,100m,SR4,MPO)
JL275A	HPE X150 100G QSFP28 LC LR4 10km SM Transceiver	LSXM2QSFP28F,100G QSFP28 Optical Transceiver Module,(1310nm,10km,LR4,WDM,LC)
JL271A	HPE X240 100G QSFP28 to QSFP28 1m Direct Attach Copper Cable	LSXM2QSFP28,100G QSFP28 to 100G QSFP28 Direct Attach Copper Cable,1m
JL272A	HPE X240 100G QSFP28 to QSFP28 3m Direct Attach Copper Cable	LSXM2QSFP28A,100G QSFP28 to 100G QSFP28 Direct Attach Copper Cable,3m
JL273A	HPE X240 100G QSFP28 to QSFP28 5m Direct Attach Copper Cable	LSXM2QSFP28G,100G QSFP28 to 100G QSFP28 Passive Cable,5m
JL282A	HPE X240 QSFP28 4xSFP28 1m Direct Attach Copper Cable	LSXM2QSFP28H,QSFP28 to 4xSFP28 1m Passive Cable,1m
JL283A	HPE X240 QSFP28 4xSFP28 3m Direct Attach Copper Cable	LSXM2QSFP28J,QSFP28 to 4xSFP28 3m Passive Cable,3m
JL276A	HPE X2A0 100G QSFP28 to QSFP28 7m Active Optical Cable	LSXM2QSFP28C,100G QSFP28 to 100G QSFP28 AOC,7m
JL277A	HPE X2A0 100G QSFP28 to QSFP28 10m Active Optical Cable	LSXM2QSFP28D,100G QSFP28 to 100G QSFP28 AOC,10m
JL278A	HPE X2A0 100G QSFP28 to QSFP28 20m Active Optical Cable	LSXM2QSFP28E,100G QSFP28 to 100G QSFP28 AOC,20m
JH420A	HPE X150 100G QSFP28 MPO PSM4 500m SM Transceiver	LSXM2QSFP28L,100G QSFP28 Optical Transceiver Module,(1310nm,500m,PSM4,MPO/APC)
JH673A	HPE X150 100G QSFP28 CWDM4 2km SM Transceiver	LSWM2QSFP28A,100G QSFP28 Optical Transceiver Module,(1310nm,2km,LR4L,CWDM4,LC)

Data center switching minimum software release requirements

HPE FlexFabric 12900E switch series minimum software version requirements

Switch or module	Transceiver module (Product code)	Minimum software release	
		DDM support	Release version
HPE FlexFabric 12900E 48-port 1/10GbE SFP+ 2-port 100GbE QSFP28 HB Module (JH360A)	HPE X150 100G QSFP28 MPO SR4 100m MM Xcvr (JL274A)	YES	E2603
	HPE X150 100G QSFP28 LC LR4 10km SM Xcvr (JL275A)	YES	E2603
	HPE X240 100G QSFP28 to QSFP28 1m Direct Attach Copper Cable (JL271A)	NO	E2603
	HPE X240 100G QSFP28 to QSFP28 3m Direct Attach Copper Cable (JL272A)	NO	E2603
	HPE X240 100G QSFP28 to QSFP28 5m Direct Attach Copper Cable (JL273A)	NO	E2606
	HPE X2A0 100G QSFP28 to QSFP28 7m Active Optical Cable (JL276A)	NO	E2606
	HPE X2A0 100G QSFP28 to QSFP28 10m Active Optical Cable (JL277A)	NO	E2606
	HPE X2A0 100G QSFP28 to QSFP28 20m Active Optical Cable (JL278A)	NO	E2606
	HPE X150 100G QSFP28 MPO PSM4 500m SM Transceiver (JH420A)	YES	E2609
	HPE X150 100G QSFP28 CWDM4 2km SM Xcvr (JH673A)	Yes	R2609
HPE FlexFabric 12900E 36-port 100GbE QSFP28 HB Module (JH357A)	HPE X150 100G QSFP28 MPO SR4 100m MM Transceiver (JL274A)	YES	E2603
	HPE X150 100G QSFP28 LC LR4 10km SM Xcvr (JL275A)	YES	E2603
	HPE X240 100G QSFP28 to QSFP28 1m Direct Attach Copper Cable (JL271A)	NO	E2603
	HPE X240 100G QSFP28 to QSFP28 3m Direct Attach Copper Cable (JL272A)	NO	E2603
	HPE X240 100G QSFP28 to QSFP28 5m Direct Attach Copper Cable (JL273A)	NO	E2606
	HPE X2A0 100G QSFP28 to QSFP28 7m Active Optical Cable (JL276A)	NO	E2606
	HPE X2A0 100G QSFP28 to QSFP28 10m Active Optical Cable (JL277A)	NO	E2606

Switch or module	Transceiver module (Product code)	Minimum software release	
		DDM support	Release version
	HPE X2A0 100G QSFP28 to QSFP28 20m Active Optical Cable (JL278A)	NO	E2606
	HPE X150 100G QSFP28 MPO PSM4 500m SM Transceiver (JH420A)	YES	E2606
	HPE X150 100G QSFP28 CWDM4 2km SM Xcvr (JH673A)	Yes	R2609
HPE FlexFabric 12900E 18-port 100G QSFP28/18-port 40G QSFP+ HB Module (JH422A)	HPE X150 100G QSFP28 MPO SR4 100m MM Xcvr (JL274A)	YES	E2606
	HPE X150 100G QSFP28 LC LR4 10km SM Xcvr (JL275A)	YES	E2606
	HPE X240 100G QSFP28 to QSFP28 1m Direct Attach Copper Cable (JL271A)	NO	E2606
	HPE X240 100G QSFP28 to QSFP28 3m Direct Attach Copper Cable (JL272A)	NO	E2606
	HPE X240 100G QSFP28 to QSFP28 5m Direct Attach Copper Cable (JL273A)	NO	E2606
	HPE X2A0 100G QSFP28 to QSFP28 7m Active Optical Cable (JL276A)	NO	E2606
	HPE X2A0 100G QSFP28 to QSFP28 10m Active Optical Cable (JL277A)	NO	E2606
	HPE X2A0 100G QSFP28 to QSFP28 20m Active Optical Cable (JL278A)	NO	E2606
	HPE X150 100G QSFP28 MPO PSM4 500m SM Xcvr (JH420A)	YES	E2606
	HPE X150 100G QSFP28 CWDM4 2km SM Xcvr (JH673A)	Yes	R2609
HPE FlexFabric 12900E 6-port 100G QSFP28/6-port 40G QSFP+ HB Module (JH436A)	HPE X150 100G QSFP28 MPO SR4 100m MM Xcvr (JL274A)	YES	E2606
	HPE X150 100G QSFP28 LC LR4 10km SM Xcvr (JL275A)	YES	E2606
	HPE X240 100G QSFP28 to QSFP28 1m Direct Attach Copper Cable (JL271A)	NO	E2603
	HPE X240 100G QSFP28 to QSFP28 3m Direct Attach Copper Cable (JL272A)	NO	E2603
	HPE X240 100G QSFP28 to QSFP28 5m Direct Attach Copper Cable (JL273A)	NO	E2606
	HPE X2A0 100G QSFP28 to QSFP28 7m Active Optical Cable (JL276A)	NO	E2606
	HPE X2A0 100G QSFP28 to QSFP28 10m Active Optical Cable (JL277A)	NO	E2606
	HPE X2A0 100G QSFP28 to QSFP28 20m Active Optical Cable (JL278A)	NO	E2606
	HPE X150 100G QSFP28 MPO PSM4 500m SM Xcvr (JH420A)	YES	E2609

Switch or module	Transceiver module (Product code)	Minimum software release	
		DDM support	Release version
	HPE X150 100G QSFP28 CWDM4 2km SM Xcvr (JH673A)	Yes	R2609
HPE FlexFabric 12900E 18-port 100G QSFP28/18-port 40G QSFP+ HF Module (JH425A)	HPE X150 100G QSFP28 MPO SR4 100m MM Xcvr (JL274A)	YES	E2608
	HPE X150 100G QSFP28 LC LR4 10km SM Xcvr (JL275A)	YES	E2608
	HPE X240 100G QSFP28 to QSFP28 1m Direct Attach Copper Cable (JL271A)	NO	E2608
	HPE X240 100G QSFP28 to QSFP28 3m Direct Attach Copper Cable (JL272A)	NO	E2608
	HPE X240 100G QSFP28 to QSFP28 5m Direct Attach Copper Cable (JL273A)	NO	E2608
	HPE X2A0 100G QSFP28 to QSFP28 7m Active Optical Cable (JL276A)	NO	E2606
	HPE X2A0 100G QSFP28 to QSFP28 10m Active Optical Cable (JL277A)	NO	E2606
	HPE X2A0 100G QSFP28 to QSFP28 20m Active Optical Cable (JL278A)	NO	E2606
	HPE X150 100G QSFP28 MPO PSM4 500m SM Xcvr (JH420A)	YES	E2608
	HPE X150 100G QSFP28 CWDM4 2km SM Xcvr (JH673A)	Yes	R2609

HPE FlexFabric 5950 switch series minimum software version requirements

Switch or module	Transceiver module (Product code)	Minimum software release	
		DDM support	Release version
HPE FlexFabric 5950 32QSFP28 Switch (JH321A)	HPE X150 100G QSFP28 MPO SR4 100m MM Xcvr (JL274A)	YES	R6123
	HPE X150 100G QSFP28 LC LR4 10km SM Xcvr (JL275A)	YES	R6123
	HPE X240 100G QSFP28 to QSFP28 1m Direct Attach Copper Cable (JL271A)	NO	R6123
	HPE X240 100G QSFP28 to QSFP28 3m Direct Attach Copper Cable (JL272A)	NO	R6123
	HPE X240 100G QSFP28 to QSFP28 5m Direct Attach Copper Cable (JL273A)	NO	R6123
	HPE X240 QSFP28 4xSFP28 1m Direct Attach Copper Cable (JL282A)	NO	R6123

Switch or module	Transceiver module (Product code)	Minimum software release	
		DDM support	Release version
	HPE X240 QSFP28 4xSFP28 3m Direct Attach Copper Cable (JL283A)	NO	R6123
	HPE X2A0 100G QSFP28 to QSFP28 7m Active Optical Cable (JL276A)	NO	R6123
	HPE X2A0 100G QSFP28 to QSFP28 10m Active Optical Cable (JL277A)	NO	R6123
	HPE X2A0 100G QSFP28 to QSFP28 20m Active Optical Cable (JL278A)	NO	R6123
	HPE X150 100G QSFP28 MPO PSM4 500m SM Xcvr (JH420A)	Yes	R6125
	HPE X150 100G QSFP28 CWDM4 2km SM Xcvr (JH673A)	Yes	R6125
HPE FlexFabric 5950 32QSFP28 TAA-compliant Switch (JH322A)	HPE X150 100G QSFP28 MPO SR4 100m MM Xcvr (JL274A)	YES	R6123
	HPE X150 100G QSFP28 LC LR4 10km SM Xcvr (JL275A)	YES	R6123
	HPE X240 100G QSFP28 to QSFP28 1m Direct Attach Copper Cable (JL271A)	NO	R6123
	HPE X240 100G QSFP28 to QSFP28 3m Direct Attach Copper Cable (JL272A)	NO	R6123
	HPE X240 100G QSFP28 to QSFP28 5m Direct Attach Copper Cable (JL273A)	NO	R6123
	HPE X240 QSFP28 4xSFP28 1m Direct Attach Copper Cable (JL282A)	NO	R6123
	HPE X240 QSFP28 4xSFP28 3m Direct Attach Copper Cable (JL283A)	NO	R6123
	HPE X2A0 100G QSFP28 to QSFP28 7m Active Optical Cable (JL276A)	NO	R6123
	HPE X2A0 100G QSFP28 to QSFP28 10m Active Optical Cable (JL277A)	NO	R6123
	HPE X2A0 100G QSFP28 to QSFP28 20m Active Optical Cable (JL278A)	NO	R6123
	HPE X150 100G QSFP28 MPO PSM4 500m SM Xcvr (JH420A)	Yes	R6125
	HPE X150 100G QSFP28 CWDM4 2km SM Xcvr (JH673A)	Yes	R6125
HPE FlexFabric 5950 48SFP28 8QSFP28 Switch (JH402A)	HPE X150 100G QSFP28 MPO SR4 100m MM Xcvr (JL274A)	YES	R6123
	HPE X150 100G QSFP28 LC LR4 10km SM Xcvr (JL275A)	YES	R6123
	HPE X240 100G QSFP28 to QSFP28 1m Direct Attach Copper Cable (JL271A)	NO	R6123
	HPE X240 100G QSFP28 to QSFP28 3m Direct Attach Copper Cable (JL272A)	NO	R6123

Switch or module	Transceiver module (Product code)	Minimum software release	
		DDM support	Release version
	HPE X240 100G QSFP28 to QSFP28 5m Direct Attach Copper Cable (JL273A)	NO	R6123
	HPE X240 QSFP28 4xSFP28 1m Direct Attach Copper Cable (JL282A)	NO	R6123
	HPE X240 QSFP28 4xSFP28 3m Direct Attach Copper Cable (JL283A)	NO	R6123
	HPE X2A0 100G QSFP28 to QSFP28 7m Active Optical Cable (JL276A)	NO	R6123
	HPE X2A0 100G QSFP28 to QSFP28 10m Active Optical Cable (JL277A)	NO	R6123
	HPE X2A0 100G QSFP28 to QSFP28 20m Active Optical Cable (JL278A)	NO	R6123
	HPE X150 100G QSFP28 MPO PSM4 500m SM Xcvr (JH420A)	Yes	R6125
	HPE X150 100G QSFP28 CWDM4 2km SM Xcvr (JH673A)	Yes	R6125
HPE 5950 8-port QSFP28 Module (JH406A)	HPE X150 100G QSFP28 MPO SR4 100m MM Xcvr (JL274A)	YES	R6123
	HPE X150 100G QSFP28 LC LR4 10km SM Xcvr (JL275A)	YES	R6123
	HPE X240 100G QSFP28 to QSFP28 1m Direct Attach Copper Cable (JL271A)	NO	R6123
	HPE X240 100G QSFP28 to QSFP28 3m Direct Attach Copper Cable (JL272A)	NO	R6123
	HPE X240 100G QSFP28 to QSFP28 5m Direct Attach Copper Cable (JL273A)	NO	R6123
	HPE X240 QSFP28 4xSFP28 1m Direct Attach Copper Cable (JL282A)	NO	R6123
	HPE X240 QSFP28 4xSFP28 3m Direct Attach Copper Cable (JL283A)	NO	R6123
	HPE X2A0 100G QSFP28 to QSFP28 7m Active Optical Cable (JL276A)	NO	R6123
	HPE X2A0 100G QSFP28 to QSFP28 10m Active Optical Cable (JL277A)	NO	R6123
	HPE X2A0 100G QSFP28 to QSFP28 20m Active Optical Cable (JL278A)	NO	R6123
	HPE X150 100G QSFP28 MPO PSM4 500m SM Xcvr (JH420A)	Yes	R6125
	HPE X150 100G QSFP28 CWDM4 2km SM Xcvr (JH673A)	Yes	R6125
HPE FlexFabric 5950 24-port SFP28 and 2-port QSFP28 Module (JH450A)	HPE X150 100G QSFP28 MPO SR4 100m MM Xcvr (JL274A)	YES	R6123
	HPE X150 100G QSFP28 LC LR4 10km SM Xcvr (JL275A)	YES	R6123

Switch or module	Transceiver module (Product code)	Minimum software release	
		DDM support	Release version
	HPE X240 100G QSFP28 to QSFP28 1m Direct Attach Copper Cable (JL271A)	NO	R6123
	HPE X240 100G QSFP28 to QSFP28 3m Direct Attach Copper Cable (JL272A)	NO	R6123
	HPE X240 100G QSFP28 to QSFP28 5m Direct Attach Copper Cable (JL273A)	NO	R6123
	HPE X240 QSFP28 4xSFP28 1m Direct Attach Copper Cable (JL282A)	NO	R6123
	HPE X240 QSFP28 4xSFP28 3m Direct Attach Copper Cable (JL283A)	NO	R6123
	HPE X2A0 100G QSFP28 to QSFP28 7m Active Optical Cable (JL276A)	NO	R6123
	HPE X2A0 100G QSFP28 to QSFP28 10m Active Optical Cable (JL277A)	NO	R6123
	HPE X2A0 100G QSFP28 to QSFP28 20m Active Optical Cable (JL278A)	NO	R6123
	HPE X150 100G QSFP28 MPO PSM4 500m SM Xcvr (JH420A)	Yes	R6125
	HPE X150 100G QSFP28 CWDM4 2km SM Xcvr (JH673A)	Yes	R6125

HPE FlexFabric 5940 switch series minimum software version requirements

Switch or module	Transceiver module (Product code)	Minimum software release	
		DDM support	Release version
HPE FlexFabric 5940 48XGT 6QSFP28 Switch (JH391A)	HPE X150 100G QSFP28 MPO SR4 100m MM Xcvr (JL274A)	Yes	R2509P02
	HPE X150 100G QSFP28 LC LR4 10km SM Xcvr (JL275A)	Yes	R2509P02
	HPE X240 100G QSFP28 to QSFP28 1m Direct Attach Copper Cable (JL271A)	NO	R2509P02
	HPE X240 100G QSFP28 to QSFP28 3m Direct Attach Copper Cable (JL272A)	NO	R2509P02
	HPE X240 100G QSFP28 to QSFP28 5m Direct Attach Copper Cable (JL273A)	NO	R2509P02
	HPE X150 100G QSFP28 MPO PSM4 500m SM Xcvr (JH420A)	Yes	F2604
	HPE X150 100G QSFP28 CWDM4 2km SM Xcvr (JH673A)	Yes	F2604

Switch or module	Transceiver module (Product code)	Minimum software release	
		DDM support	Release version
HPE FlexFabric 5940 48XGT 6QSFP28 TAA-compliant Switch (JH393A)	HPE X150 100G QSFP28 MPO SR4 100m MM Xcvr (JL274A)	Yes	R2509P02
	HPE X150 100G QSFP28 LC LR4 10km SM Xcvr (JL275A)	Yes	R2509P02
	HPE X240 100G QSFP28 to QSFP28 1m Direct Attach Copper Cable (JL271A)	NO	R2509P02
	HPE X240 100G QSFP28 to QSFP28 3m Direct Attach Copper Cable (JL272A)	NO	R2509P02
	HPE X240 100G QSFP28 to QSFP28 5m Direct Attach Copper Cable (JL273A)	NO	R2509P02
	HPE X150 100G QSFP28 MPO PSM4 500m SM Xcvr (JH420A)	Yes	F2604
	HPE X150 100G QSFP28 CWDM4 2km SM Xcvr (JH673A)	Yes	F2604
HPE FlexFabric 5940 48SFP+ 6QSFP28 Switch (JH390A)	HPE X150 100G QSFP28 MPO SR4 100m MM Xcvr (JL274A)	Yes	R2509P02
	HPE X150 100G QSFP28 LC LR4 10km SM Xcvr (JL275A)	Yes	R2509P02
	HPE X240 100G QSFP28 to QSFP28 1m Direct Attach Copper Cable (JL271A)	NO	R2509P02
	HPE X240 100G QSFP28 to QSFP28 3m Direct Attach Copper Cable (JL272A)	NO	R2509P02
	HPE X240 100G QSFP28 to QSFP28 5m Direct Attach Copper Cable (JL273A)	NO	R2509P02
	HPE X150 100G QSFP28 MPO PSM4 500m SM Xcvr (JH420A)	Yes	F2604
	HPE X150 100G QSFP28 CWDM4 2km SM Xcvr (JH673A)	Yes	F2604
HPE FlexFabric 5940 48SFP+ 6QSFP28 TAA-compliant Switch (JH392A)	HPE X150 100G QSFP28 MPO SR4 100m MM Xcvr (JL274A)	Yes	R2509P02
	HPE X150 100G QSFP28 LC LR4 10km SM Xcvr (JL275A)	Yes	R2509P02
	HPE X240 100G QSFP28 to QSFP28 1m Direct Attach Copper Cable (JL271A)	NO	R2509P02
	HPE X240 100G QSFP28 to QSFP28 3m Direct Attach Copper Cable (JL272A)	NO	R2509P02
	HPE X240 100G QSFP28 to QSFP28 5m Direct Attach Copper Cable (JL273A)	NO	R2509P02
	HPE X150 100G QSFP28 MPO PSM4 500m SM Xcvr (JH420A)	Yes	F2604
	HPE X150 100G QSFP28 CWDM4 2km SM Xcvr (JH673A)	Yes	F2604
HPE 5940 2-port QSFP+ and 2-port	HPE X150 100G QSFP28 MPO SR4 100m MM Xcvr (JL274A)	Yes	R2509P02

Switch or module	Transceiver module (Product code)	Minimum software release	
		DDM support	Release version
QSFP28 Module (JH409A)	HPE X150 100G QSFP28 LC LR4 10km SM Xcvr (JL275A)	Yes	R2509P02
	HPE X240 100G QSFP28 to QSFP28 1m Direct Attach Copper Cable (JL271A)	NO	R2509P02
	HPE X240 100G QSFP28 to QSFP28 3m Direct Attach Copper Cable (JL272A)	NO	R2509P02
	HPE X240 100G QSFP28 to QSFP28 5m Direct Attach Copper Cable (JL273A)	NO	R2509P02
	HPE X150 100G QSFP28 MPO PSM4 500m SM Xcvr (JH420A)	Yes	F2604
	HPE X150 100G QSFP28 CWDM4 2km SM Xcvr (JH673A)	Yes	F2604

NOTE:

HPE 5940 2-port QSFP+ and 2-port QSFP28 Module (JH409A) can be installed only on HPE FlexFabric 5940 2-slot Switch (JH397A) or HPE FlexFabric 5940 4-slot Switch (JH398A).

Document conventions and icons

Conventions

This section describes the conventions used in the documentation.

Port numbering in examples

The port numbers in this document are for illustration only and might be unavailable on your device.

Command conventions

Convention	Description
Boldface	**Bold** text represents commands and keywords that you enter literally as shown.
Italic	*Italic* text represents arguments that you replace with actual values.
[ ]	Square brackets enclose syntax choices (keywords or arguments) that are optional.
{ x | y | ... }	Braces enclose a set of required syntax choices separated by vertical bars, from which you select one.
[x | y | ...]	Square brackets enclose a set of optional syntax choices separated by vertical bars, from which you select one or none.
{ x | y | ... } *	Asterisk marked braces enclose a set of required syntax choices separated by vertical bars, from which you select at least 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 appears; 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 card, such as a firewall, load balancing, NetStream, SSL VPN, IPS, or ACG card.

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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.

Support and other resources

Accessing Hewlett Packard Enterprise Support

- For live assistance, go to the Contact Hewlett Packard Enterprise Worldwide website:

  www.hpe.com/assistance
- To access documentation and support services, go to the Hewlett Packard Enterprise Support Center website:

  www.hpe.com/support/hpesc

Information to collect

- Technical support registration number (if applicable)
- Product name, model or version, and serial number
- Operating system name and version
- Firmware version
- Error messages
- Product-specific reports and logs
- Add-on products or components
- Third-party products or components

Accessing updates

- Some software products provide a mechanism for accessing software updates through the product interface. Review your product documentation to identify the recommended software update method.
- To download product updates, go to either of the following:
  - Hewlett Packard Enterprise Support Center **Get connected with updates** page:

    www.hpe.com/support/e-updates
  - Software Depot website:

    www.hpe.com/support/softwaredepot
- To view and update your entitlements, and to link your contracts, Care Packs, and warranties with your profile, go to the Hewlett Packard Enterprise Support Center **More Information on Access to Support Materials** page:

  www.hpe.com/support/AccessToSupportMaterials

IMPORTANT:

Access to some updates might require product entitlement when accessed through the Hewlett Packard Enterprise Support Center. You must have an HP Passport set up with relevant entitlements.

Websites

Website	Link
Networking websites	
Hewlett Packard Enterprise Information Library for Networking	www.hpe.com/networking/resourcefinder
Hewlett Packard Enterprise Networking website	www.hpe.com/info/networking
Hewlett Packard Enterprise My Networking website	www.hpe.com/networking/support
Hewlett Packard Enterprise My Networking Portal	www.hpe.com/networking/mynetworking
Hewlett Packard Enterprise Networking Warranty	www.hpe.com/networking/warranty
General websites	
Hewlett Packard Enterprise Information Library	www.hpe.com/info/enterprise/docs
Hewlett Packard Enterprise Support Center	www.hpe.com/support/hpesc
Hewlett Packard Enterprise Support Services Central	ssc.hpe.com/portal/site/ssc/
Contact Hewlett Packard Enterprise Worldwide	www.hpe.com/assistance
Subscription Service/Support Alerts	www.hpe.com/support/e-updates
Software Depot	www.hpe.com/support/softwaredepot
Customer Self Repair (not applicable to all devices)	www.hpe.com/support/selfrepair
Insight Remote Support (not applicable to all devices)	www.hpe.com/info/insightremotesupport/docs

Customer self repair

Hewlett Packard Enterprise customer self repair (CSR) programs allow you to repair your product. If a CSR part needs to be replaced, it will be shipped directly to you so that you can install it at your convenience. Some parts do not qualify for CSR. Your Hewlett Packard Enterprise authorized service provider will determine whether a repair can be accomplished by CSR.

For more information about CSR, contact your local service provider or go to the CSR website:

www.hpe.com/support/selfrepair

Remote support

Remote support is available with supported devices as part of your warranty, Care Pack Service, or contractual support agreement. It provides intelligent event diagnosis, and automatic, secure submission of hardware event notifications to Hewlett Packard Enterprise, which will initiate a fast and accurate resolution based on your product's service level. Hewlett Packard Enterprise strongly recommends that you register your device for remote support.

For more information and device support details, go to the following website:

www.hpe.com/info/insightremotesupport/docs

Documentation feedback

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Index