ArubaOS-Switch and ArubaOS-CX Transceiver Guide

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Content

The transceivers listed in this document represent the currently available and End of Sale products at the time of this publication. Not all transceiver products are supported in every switch available from Aruba. Consult the overviews for the applicable switch product for a list of supported transceiver products. Overviews can be found at http://www.router-switch.com/hpe/price-hpe-switch/price-aruba-switches.html .

Types of transceiver modules and network cables

Table 1: Types of transceiver modules and network cables

Transceiver module type		Connector head
QSFP28 module (transceiver)	QSFP28 optical transceiver module	MPO 12-strand or LC 2-strand
	QSFP28 DAC (copper cable for interconnecting devices) 1 - 5m reaches	N/A
QSFP+ module (transceiver)	QSFP+ optical transceiver module	MPO 12-strand or LC 2-strand
	QSFP+ DAC (copper cable for interconnecting devices) 1 - 5m reaches	N/A
SFP+ module (transceiver)	SFP+ optical transceiver module	LC 2-strand or 1-strand (for BiDi)
	SFP+ DAC (copper cable for interconnecting devices)	N/A
Small form-factor pluggable (SFP) module (transceiver)	100-Megabit SFP optical transceiver module	LC 2-strand
	Gigabit SFP optical transceiver module	
	Gigabit SFP copper transceiver module	RJ-45

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 us.

For information about the transceiver modules and network cables available for each device model, see the

overview for the applicable switch product.

Data rate

Data rate is the number of bits transmitted per second. The unit of measure for data rate is Megabits per second (Mbps) or Gigabits per second (Gbps). Optical transceiver modules available for products provide the following levels of data rates:

◊ 100 Gbps

◊ 40 Gbps

◊ 10 Gbps

◊ 1000 Mbps (also known as Gigabit)

◊ 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 considered a short-range type. A distance of 10 km (6.21 miles) is considered a long-range type. Transmission distances provided by optical transceiver modules are limited by certain loss and dispersion suffered during the transmission of fiber signals over 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 occurs mainly because light waves of different wavelengths travel at different rates over the same medium. This causes different wave components of optical signals to reach the receiving end early or late as the transmission distance increases causing impulse broadening. Impulse broadening makes the signal values indistinguishable (data loss). Different wavelengths traveling down the same fiber are called modes, and this data loss is known as intermodal dispersion.

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

Central wavelength

Central wavelength (wl) represents the wave band used for optical signal transmission. The following central wavelengths are available for common optical transceiver modules representing three wavebands:

◊ 850 nm waveband: Used for short-reach transmission.

◊ 1310 nm waveband: Used for middle-reach and long-haul transmission.

◊ 1550 nm waveband: Used for middle-reach and long-haul 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 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. For more information, see Table 2. The modal bandwidth of a multimode fiber is determined by the expression 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. The modal bandwidth values shown above are for the fiber grades listed. There are multimode fibers that have different modal bandwidth characteristics and do not necessarily match the OM1 - OM4 grades.

Table 3: Multimode fiber specifications

Interface types	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	< 400m (1312.34 ft)
10GBASE-LRM	1310	OM1	< 220 m (721.78 ft)
		OM2	< 220 m (721.78 ft)
		OM3	< 220 m (721.78 ft)
		OM4	< 220 m (721.78 ft)
		SMF	<300m (987.25 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 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 the mark "SM".

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

Fiber diameter

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

For the HPE devices, the following fiber diameters are recommended:
◊ G.652 standard single-mode fiber: 9/125 µm

◊ G.655 non zero dispersion shifted single-mode fiber: 9/125 µm

◊ G.651 standard multimode fiber: 50/125 µm or 62.5/125 µm

Connector

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

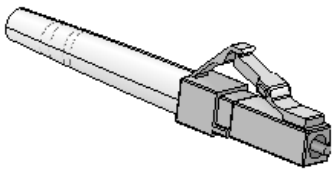
Connectors connect transceiver modules to the corresponding transmission media. The transceiver modules available for Aruba products use the following types of connectors:

Lucent connector or local connector (LC).

Single LC connectors (also known as Simplex) are typically used for 1G & 10G BiDi (Bidirectional) optics. Dual LC connectors (Duplex) are typically used in normal optical types.

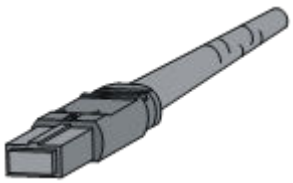
Note: 40G BiDi uses only Duplex fiber versus MPO (see below) for 40G SR4 applications.

Figure 1: LC connector (a simplex connector is shown)



Note: Multifiber Push On (MPO) connector.

Figure 2: MPO connector



The 40G QSFP+ MPO transceiver modules use only female MPO connectors, which have guide holes in the end face of the MPO connector (the transceiver has guide pins within the MPO receptacle).

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

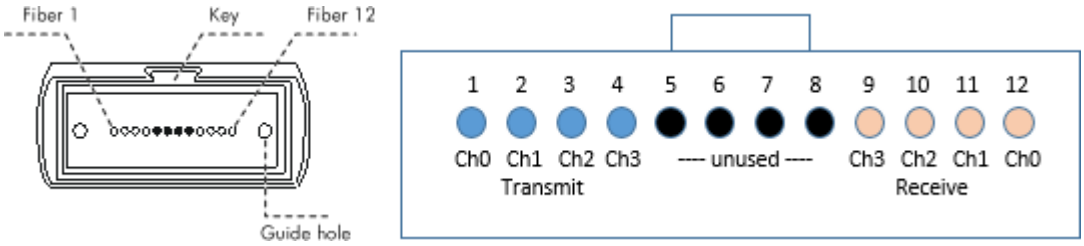
◊ Physical contact (PC): End face polished flat.

◊ Angle-polished contact (APC): End face polished with an angle, typically 8°.

MPO connectors are available with 12 fibers or 24 fibers:

12-fiber MPO connector (40G, SR4, eSR4, and 100G SR4 transceivers use 8 of the available 12 fibers. The four center fibers are unused.)

Figure 3: End face of a 12-fiber connector and channel assignment



MPO transceivers typically use four channels to communicate. These channels are assigned using the outer eight fibers (the center four are unused).

Transmit channels are one set of four fibers, and the receive channels are on the other set of four fibers. Because of this, the cables used and fiber cable connections from endpoint to endpoint effectively create a crossover connection.

Be aware that using two crossover cables in series cancels this effect and no connection will be established. An odd number of crossovers combined with straight-thru fiber connections will effect a crossover connection.

The channel layout indicates that the left four fibers are Transmit, and must reach the opposite transceiver Receive channels (and in proper channel order).

Optical parameters

This guide provides average transmit and receive power ranges for transceiver modules.

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.

Use of attenuators

Transceivers are designed to transmit light pulses at a power level that accounts for loss in the fiber optic cabling, and meets the receiver input thresholds of the link partner optical transceiver.

If you are using a fiber cable with less light loss than expected (for example, in a test environment and you do not have a 40km spool of SMF available), use attenuators to affect the transmit level to within the receive sensitivity of the other transceiver -- you will need to condition both fibers (sends in both directions). If you do not, you risk overdriving the Receive end and permanently damaging the transceiver. For example, a 40GER4 has a highest transmit level of 4.5dBm, but the Receive Sensitivity can be no higher than -4.5dBm. That means that there must be at least a 9dBm loss on the light level to be within the standards (4.5 - (4.5) = 9dBm required).

Copper transceiver modules

Copper transceiver modules transmit signals over Category-5 unshielded twisted pair (UTP). UTP transmission cover shorter distances than fiber transmission and can be used in small-sized networks only.

Copper transceivers are supported in 1G SFP and 10G SFP+ ports where listed in the Support Matrix tables.

Transmission distance

Through UTP cables, signals can be transmitted over a distance of 100 m (328.08 ft.) only. This behavior occurs because 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 signals as they travel over the cable. When signals are transmitted over a long distance, signal strength decreases significantly, causing the signal-to-noise ratio to drop below the accepted level. This decrease makes it impossible to distinguish between signals and noise, which results in data loss.

Patch panel and punch down blocks also affect attenuation; that is, they can be a source of issues resulting in shorter distances or data loss.

Connector

Registered Jack-45 (RJ-45) twisted-pair connectors are used as connectors for copper transceiver modules.

Figure 4: RJ-45 connector

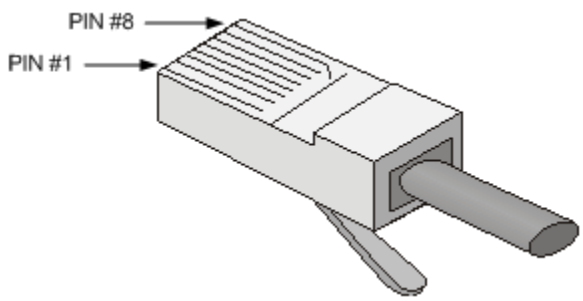


Table 5: RJ-45 GE connector pin assignment for Gigabit connections

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

Identification of 4x4 part numbers

A SKU# may be fulfilled by two or more vendor parts providing similar functionality. A 4x4 part number is of the form nnnn-nnnn and is on the transceiver or DAC label. For example, JL309A can have a 1990-4680 or 1990-4678 4x4 part number.

4x4 part numbers are referenced in the

◊ specification tables, to identify parts that support DOM (Digital Optical Monitoring) capabilities. (Some older vendor parts do not support DOM.)

◊ compatibility tables, where necessary, to identify supported combinations of switch or module with the identified transceiver, along with the minimum software version required.

In December 2017, Aruba introduced Revision D versions of 100M, 1G, and 10G products. Revision D products are structured to be specific alternative vendors as sources for the SKU#. Earlier Revision A, B, or C product may have alternative vendors that Aruba no longer actively ships, but remains as fully supported in earlier and current products.

Some switch products will specify Revision D transceivers for full support, while other products may support earlier (older) revision transceivers – and some with specific 4x4 part numbers.

Always refer to the Datasheet or QuickSpecs for the switch product to see the current list of supported transceivers. Refer to the compatibility tables within this document to cross-reference the Transceiver/DAC product against the switch product to identify the minimum software required for transceiver support.

To use CLI commands to display data for an installed transceiver, see the following examples.

```
8400X# show int 1/10/6 transceiver
------------------------------------------------------------
Port       Type         Product    Serial          Part
                        Number     Number          Number
------------------------------------------------------------

--- 1/10/6QSFP+SR4     JH231A     XX57nnnnnn      1990-
```

8400X# show int 1/10/6 dom

Port	Type	Channel#	Temperature (Celsius)	Voltage (Volts)	Tx Bias (mA)	Rx Power (mW/dBm)	Tx Power (mW/dBm)
1/10/6	QSFP+SR4	1	26.00	3.32	6.72	0.02, -16.99	0.58, -2.37
		2	26.00	3.32	6.79	0.02, -16.99	0.59, -2.29
		3	26.00	3.32	6.68	0.03, -15.23	0.59, -2.29
		4	26.00	3.32	6.82	0.03, -15.23	0.60, -2.22

```
Aruba-5406Rzl2#  show  interfaces  transceiver  f2


Transceiver in F2
   Interface          : 162
   Index Type         : QSFP+SR4
   Model              : JH231A
   Connector          : MPO
   Type               : 850nm
   Wavelength
   Transfer Distance  : 100m  (50um  OM3),  150m  (50um
   OM4) Diagnostic Support : DOM
   Serial Number      :
 XX57nnnnnn Status
   Temperature        :
   33.332C Voltage :
   3.3208V

            Tx Bias  Rx             Tx Power
  Channel#  (mA)     (mW/dbM)        (mW/dbM)
  --------- -------- --------------- ------------
  -- 1      6.904    0.5622,  -2.501  0.5822,  -
  2.349
  2         6.706    0.5922,  -2.275  0.5856,  -
  2.324
  3         6.894    0.6321,  -1.992  0.5813,  -
  2.356
  4         6.792    0.5111,  -2.915  0.5651,  -
  2.479
  Current
    Alarms:
    Channel 1 :
       Tx bias low alarm
       Rx    power    low
    warning Channel 2 :
       Tx bias low alarm
       Rx    power    low
  warning Current Errors:
    Channel 1 :
       Rx    Loss    of
    Signal Channel 2 :
       Rx    Loss    of
    Signal Channel 3 :
       Rx    Loss    of
    Signal Channel 4 :
       Rx Loss of Signal
```

QSFP28 optical transceiver modules that use MPO connectors

See Chapter 1, "Overview", for information regarding MPO connectors and cable requirements.

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 6: Specifications for QSFP28 optical transceiver modules that use MPO connectors (1)

Product name (SKU)	DOM - Digital Optical Monitoring (4x4 part #)	Central wl (nm)	Fiber mode	Fiber diameter (µm)	Modal bandwidth (MHz*km)	Transmission distance
Aruba 100G QSFP28 MPO SR4 100m 12-fiber MPO MMF Transceiver (JL309A)	YES (1990-4680, 1990-4678)	850	MMF	50/125	2000 (OM3)	70 m (229.66 ft)
					4700 (OM4)	100 m (328.08 ft)

Table 7: Specifications for QSFP28 optical transceiver modules that use MPO connectors (2)

Product name (SKU)Connector	Optical parameters (dBm)	Transmit power	Receive power
Aruba 100G QSFP28 MPO SR4 100m 12-fiber MPO MMF Transceiver (JL309A)	MPO (PC polished, 12-fiber)	-8.4 to +2.4	-10.3 to +2.4

Table 8: Compatibility for the QSFP28 optical transceiver modules that use MPO connectors

Product name (SKU)	Minimum software required	Comments
Aruba 8400X 6p 40G/100G QSFP28 Adv Module (JL366A)	10.00.0005	10.00.0005 provided support for 100G products. 10.00.0006 provides additional support for 40G on the JL366A.

QSFP28 optical transceiver modules that use LC connectors

Figure 6: QSFP28 optical transceiver module that use LC connectors

Models and specifications

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

Table 9: Specifications for QSFP28 optical transceiver modules that use LC connectors (1)

Product name (SKU)	DOM - Digital Optical Monitoring (4x4 part #)	Central wl (nm)	Fiber mode	Fiber diameter (µm)	Modal bandwidth (MHz*km)	Transmission distance
Aruba 100G QSFP28 LC LR4 10km SMF 2-strand Transceiver (JL310A)	YES	Four lanes:	SMF	9/125	N/A	10 km (6.21 miles)
	(1990-4681)	1294.53 ~ 1296.59				
		1299.02 ~				
		1301.09				
		1303.54 ~				
		1305.63				
		1308.09 ~				
		1310.19				

Table 10: Specifications for QSFP28 optical transceiver modules that use LC connectors (2)

Product name (SKU)	Connector	Optical parameters (dBm)	
		Transmit power	Receive power
Aruba 100G QSFP28 LC LR4 10km SMF 2-strand Transceiver (JL310A)	LC	-4.3 to +4.5 per lane	-10.6 to +4.5 per lane

Table 11: Compatibility for the QSFP28 optical transceiver modules that use LC connectors

Product name (SKU)	Minimum software required	Comments
Aruba 8400X 6p 40G/100G QSFP28 Adv Module (JL366A)	10.00.0005	10.00.0005 provides support for 100G products. 10.00.0006 provides additional support for 40G on the JL366A.

QSFP28 DAC (copper cables)

Figure 7: QSFP28 DAC (copper cable)

Models and specifications

Table 12: Specifications for QSFP28 copper cables

Product name (SKU)	Cable length	Data rate	Description
Aruba 100G QSFP28 to QSFP28 3m Direct Attach Copper Cable (JL307A)	3 m (9.8 ft)	100 Gbps	Used for interconnecting 100-Gigabit QSFP28 ports

Table 13: Compatibility for the QSFP28 copper cables

Product name (SKU)	Minimum software required	Comments
Aruba 8400X 6p 40G/100G QSFP28 Adv Module (JL366A)	All	

QSFP+ optical transceiver modules that use MPO connectors

Figure 8: QSFP+ optical transceiver module that uses MPO connectors

Models, specifications, and compatibility

QSFP+ optical transceiver modules provide a transmission rate of 40 Gbps and use MPO connectors. 40G SR4 and eSR4 are not supported for use over MMF OM1 or OM2 quality fiber.

Table 14: Specifications for QSFP+ optical transceiver modules that use MPO connectors (1)

Product name (SKU)	DOM - Digital Optical Monitoring (4x4 part #)	Central wl (nm)	Fiber mode	Fiber diameter (µm)	Modal bandwidth (MHz*km)	Transmission distance
HPE X142 40G QSFP+ MPO SR4 Transceiver (JH231A)	YES (1990-4554)	850	MMF	50/125	2000 (OM3) 4700 (OM4)	100 m (328.08 ft) 150 m (492.12 ft)
HPE X142 40G QSFP+ MPO eSR4 300M XCVR (JH233A)	YES (1990-4555)	850	MMF	50/125	2000 (OM3) 4700 (OM4)	300 m (984.25 ft) 400 m (1312.33 ft)

Table 15: Specifications for QSFP+ optical transceiver modules that use MPO connectors (2)

Product name (SKU)	Connector	Optical parameters (dBm)	
		Transmit power	Receive power
HPE X142 40G QSFP+ MPO SR4 Transceiver (JH231A)	MPO (PC polished, 12-fiber)	–7.6 to 0	–9.5 to +2.4
HPE X142 40G QSFP+ MPO eSR4 300M XCVR (JH233A)	MPO (PC polished, 12-fiber)	–7.6 to 0	–9.9 to +2.4

Table 16: Compatibility for the QSFP+ optical transceiver modules that use MPO connectors

Product name (SKU)	Minimum software required	Comments
Aruba 3810M/2930M 1QSFP+ 40GbE Module (JL078A)	All	
Aruba 3810M 2QSFP+ 40GbE Module (JL079A)	All	
20p PoE+ / 1p 40GbE QSFP+ v3 zl2 Module (J9992A)	KB.15.17	
2p 40GbE QSFP+ v3 zl2 Module (J9996A)	KB.15.17	
Aruba 8320 48p SFP/SFP+ & 6p 40G QSFP+ Switch (JL479A)	10.00.0006	
Aruba 8320 32p 40G QSFP+ Switch (JL579A)	10.00.0012	
Aruba 8400X 8p 40G QSFP+ Adv Module (JL365A)	All	
Aruba 8400X 6p 40G/100G QSFP28 Adv Module (JL366A)	10.00.0006	10.00.0005 provides support for 100G products. 10.00.0006 provides additional support for 40G on the JL366A.

QSFP+ optical transceiver modules that use LC connectors

Figure 9: QSFP+ optical transceiver module that uses LC connectors

Models, specifications, and compatibility

QSFP+ optical transceiver modules provide a transmission rate of 40 Gbps and use LC connectors.

Table 17: Specifications for QSFP+ transceiver modules that use LC connectors (1)

Product name (SKU)	DOM - Digital Optical Monitoring (4x4)	Central wl (nm)	Fiber mode	Fiber diameter (µm)	Modal bandwidth (MHz*km)	Transmission distance
Aruba 40G QSFP+ LC BiDi 150m MMF Transceiver (JL308A)	YES (1990-4679)	Dual 20Gb/s: • 850 • 900	MMF	50/125	2000 (OM3) 4700 (OM4)	100 m (328.08 ft) 150 m (492.12 ft) Not supported on OM1/OM2.
HPE X142 40G QSFP+ LC LR4 SM Transceiver (JH232A)	YES (1990-4556)	Four lanes: • 1271 • 1291 • 1311 • 1331	SMF	9/125	N/A	10 km (6.21 miles)
Aruba 40G QSFP+ LC ER4 40km SMF XCVR (Q9G82A)	YES (1990-4734)	Four lanes: • 1271 • 1291 • 1311 • 1331	SMF	9/125	N/A	40km (24.86 miles)

Table 18: Specifications for QSFP+ transceiver modules that use LC connectors (2)

Product name (SKU)	Optical parameters (dBm)	
	Transmit power	Receive power
Aruba 40G QSFP+ LC BiDi 150m MMF Transceiver (JL308A)	–4 to +5	–6 to +5
HPE X142 40G QSFP+ LC LR4 SM Transceiver (JH232A)	–7 to +2.3 per lane	–13.7 to +2.3 per lane
Aruba 40G QSFP+ LC ER4 40km SMF XCVR (Q9G82A)	-2.7 to 4.5 dBm	-21.2 to -4.5 dBm (Use attenuators to match power levels.)

Table 19: Compatibility for the QSFP+ optical transceiver modules that use LC connectors

Product name (SKU)	Minimum software required	Comments
Aruba 3810M/2930M 1QSFP+ 40GbE Module (JL078A)	For JH232A: all For JL308A: KB.16.04.0008 or WC.16.04.0008 Q9G82A not supported.	
Aruba 3810M 2QSFP+ 40GbE Module (JL079A)	For JH232A: all For JL308A: KB.16.04.0008 Q9G82A not supported.	The JL079A module is not supported in the 2930M series nor on the 3810M 16SFP+ 2-slot switch (JL075A).
20p PoE+ / 1p 40GbE QSFP+ v3 zl2 Module (J9992A)	For JH232A: KB.15.17 For JL308A: KB.16.04.0008 Q9G82A not supported.	
2p 40GbE QSFP+ v3 zl2 Module (J9996A)	For JH232A: KB.15.17 For JL308A: KB.16.04.0008 Q9G82A not supported.	
Aruba 8320 48p SFP/SFP+ & 6p 40G QSFP+ Switch (JL479A)	For JH232A: 10.00.0006 For JL308A: 10.00.0006 For Q9G82A: Future version	

Aruba 8320 32p 40G QSFP+ Switch (JL579A)	For JH232A: 10.00.0012 For JL308A: 10.00.0012 For Q9G82A: Future version	
Aruba 8400X 8p 40G QSFP+ Adv Module (JL365A)	For JH232A: all For JL308A: all For Q9G82A: Future version	
Aruba 8400X 6p 40G/100G QSFP28 Adv Module (JL366A)	For JH232A: 10.00.0006 For JL308A: 10.00.0006 For Q9G82A: Future version	10.00.0005 provides support for 100G products. 10.00.0006 provides additional support for 40G on the JL366A.

QSFP+ DAC (copper cables)

Figure 10: QSFP+ DAC copper cables

Direct Attach over Copper (DAC) cables have a minimum bend radius of typically 4x the diameter of the cable (approximately a 1" bend radius). Handle DAC cables carefully to ensure that you do not crimp or bend the cable beyond a 1" radius. Otherwise, you risk damaging the cable.

Models, specifications, and compatibility

Table 20: Specifications for QSFP+ copper cables

Product name (SKU)	Cable length	Data rate	Description
HPE X242 40G QSFP+ to QSFP+ 1m DAC Cable (JH234A)	1 m (3.28 ft)	40 Gbps	Used for interconnecting 40-
HPE X242 40G QSFP+ to QSFP+ 3m DAC Cable (JH235A)	3 m (9.84 ft)		

Product name (SKU)	Cable length	Data rate	Description
HPE X242 40G QSFP+ to QSFP+ 5m DAC Cable (JH236A)	5 m (16.40 ft)		Gigabit QSFP+ ports

Table 21: Compatibility for the QSFP+ copper cables

Product name (SKU)	Minimum software required	Comments
Aruba 3810M/2930M 1QSFP+ 40GbE Module (JL078A)	All	
Aruba 3810M 2QSFP+ 40GbE Module (JL079A)	All	The JL079A module is not supported in the 2930M series nor on the 3810M 16SFP+ 2-slot Switch (JL075A).
20p PoE+ / 1p 40GbE QSFP+ v3 zl2 Module (J9992A)	KB.15.17	
2p 40GbE QSFP+ v3 zl2 Module (J9996A)	KB.15.17	
Aruba 8320 48p 10G SFP/SFP+ and 6p 40G QSFP+ Switch (JL479A)	All	
Aruba 8320 32p 40G QSFP+ Switch (JL579A)	10.00.0012	
Aruba 8400X 8p 40G QSFP+ Adv Module (JL365A)	All	
Aruba 8400X 6p 40G/100G QSFP28 Adv Module (JL366A)	10.00.0006	

SFP+ optical transceiver modules

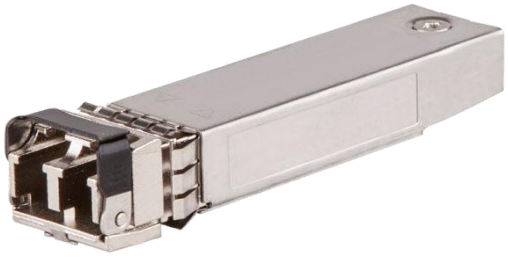
In December, 2017, Aruba introduced Revision D versions of 100M, 1G, and 10G transceivers. Revision D products are structured to be specific alternate vendors as sources for the SKU#. Earlier Revision A, B, or C product may have alternate vendors that we no longer actively ship, but remain as fully supported in earlier and current products.

Some switch products will be specifying Revision D transceivers for full support, while other products may support earlier (older) revision transceivers – and some with specific 4x4 part numbers.

Always refer to the Datasheet or Overviews for the Switch product to see the current list of supported

transceivers.

Figure 11: SFP+ optical transceiver modules



Note:

◊ Although a 10G SFP+ transceiver module is the same physical dimensions of a 1G SFP transceiver, a 10G transceiver will NOT operate in a 1G SFP port.

◊ Many, although not all, 10G SFP+ ports have support to use a 1G SFP transceiver (or even a 100Mbps FX SFP transceiver).

See the Overview for the Switch product and verify if the 1G or 100Mbps SFP transceiver is supported in the 10G SFP+ port.

Models, specifications, and compatibility

SFP+ optical transceiver modules provide a transmission rate of 10.31 Gbps and use LC connectors.

The specifications for Revision D transceiver products are the same as the specified Revision A, B, C SKUs.

Table 22: Specifications for SFP+ optical transceiver modules (1)

Product Name (SKU)	**DOM - Digital Optical Monitoring (4x4 part #)**	**Central we (nm)**	**Fiber mode**	**Fiber diameter (µm)**	**Band width (MHz* km)**	**Transmis -ion distance**
HPE X132 10G SFP+ LC SR Transceiver (J9150A) Aruba 10G SFP+ LC SR 300m MMF XCVR (J9150D)	Yes (1990-4391, 1990-4175)	850	MMF	50/125	4700 (OM4)	400 m (1312.34 ft)
					2000 (OM3)	300 m (984.25 ft)
					500 (OM2)	82 m (269.03 ft)
					400	66 m (216.54 ft)
				62.5/125	200 (OM1)	33 m (108.27 ft)
					160	26 m (85.30 ft)

Product Name (SKU)	DOM - Digital Optical Monitoring (4x4 part #)	Central we (nm)	Fiber mode	Fiber diameter (µm)	Band width (MHz* km)	Transmis -ion distance
HPE X132 10G SFP+ LC LRM Transceiver (J9152A) Aruba 10G SFP+ LC LRM 220m MMF XCVR (J9152D)	Yes (1990-4485)	1310	MMF	50/125	1500	220 m (721.78 ft)
					500 (OM2)	220 m (721.78 ft)
					400	100 m (328.08 ft)
				62.5/125	200 (OM1)	220 m (721.78 ft)
					160	220 m (721.78 ft)
			SMF	9/125	N/A	300m (987.25 ft)
HPE X132 10G SFP+ LC LR Transceiver (J9151A) Aruba 10G SFP+ LC LR 10km SMF XCVR (J9151D)	Yes (1990-4657, 1990-4694)	1310	SMF	9/125	N/A	10 km (6.21 miles)
HPE X132 10G SFP+ LC ER Transceiver (J9153A) Aruba 10G SFP+ LC ER 40km SMF XCVR (J9153D)	Yes (1990-4365, 1990-4656)	1550	SMF	9/125	N/A	40 km (24.86 miles)

Note: A mode conditioning patch cord is required when you use OM1 or OM2 fiber types on a 10G LRM Transceiver (J9152A/J9152D). Never use mode conditioning patch cords for OM3 or OM4 fiber types. For more information about mode conditioning patch cords, see related parts in the IEEE 802.3 standard.

Table 23: Specifications for SFP+ optical transceiver modules (2)

Product name (SKU)	Optical parameters (dBm)	
	Transmit power	Receive power
HPE X132 10G SFP+ LC SR Transceiver (J9150A) Aruba 10G SFP+ LC SR 300m MMF XCVR (J9150D)	–7.3 to –1	–9.9 to +0.5
HPE X132 10G SFP+ LC LRM Transceiver (J9152A) Aruba 10G SFP+ LC LRM 220m MMF XCVR (J9152D)	–6.5 to +0.5	–6.5 to +1.5
HPE X132 10G SFP+ LC LR Transceiver (J9151A) Aruba 10G SFP+ LC LR 10km SMF XCVR (J9151D)	–8.2 to +0.5	–14.4 to +0.5
HPE X132 10G SFP+ LC ER Transceiver (J9153A) Aruba 10G SFP+ LC ER 40km SMF XCVR (J9153D)	–4.7 to +4	–15.8 to –1

Table 24: Compatibility for the SFP+ optical transceiver module

Product name	SKU	Minimum software required		Comments
		10G-SR, LR, LRM (J9150A/J9150D, J9151A/J9151D, J9152A/J9152D)	10G-ER (J9153A/ J9153D)	
1850 Switch Series	JL169A	J9150A/J9150D: All J9151A/J9151D: All J9152A/J9152D: All	J9153A/J9153D is not supported on the 1850 Switch Series.	Other models not listed do not have SFP +.
2530 Switch Series	J9853A J9854A J9855A J9856A	All	All	Other models not listed do not have SFP + ports
2540 Switch Series	JL354A JL355A JL356A JL357A	All (J9150A/J9150D and J9151A/J9151D only) J9152A/J9152D (LRM) is not supported in any 2540 model	All	J9152A/J9152D (LRM) is not supported in any 2540 model
2910al Switch Series	J9008A	All	W.15.07.0002	Other models not listed do not have SFP + ports

2920 Switch Series	J9726A J9727A J9728A J9729A J9836A	All		For use in an installed J9731A Aruba 2920 2-port 10GbE SFP+ Module
2930F Switch Series	JL253A JL254A JL255A JL256A JL258A JL263A JL264A JL558A JL559A	All (J9150A/J9150D and J9151A/J9151D only) J9152A/J9152D (LRM) is not supported in any 2930F model	All	Other models unlisted do not have SFP+ ports J9152A/J9152D (LRM) is not supported in any 2930F model
2930M Switch Series	JL319A JL320A JL321A JL322A JL323A JL324A	All J9152A/J9152D (LRM) is supported for use in the JL083A module for all 2930M models	All	For use in an installed JL083A Aruba 3810M/ 2930M 4SFP+ MACsec Module
3500yl Switch Series	J8692A J8693A J9310A J9311A	K.14.50 and later	K.15.02.0004 and later	For use in an installed J9312A 10GbE 2-port SFP+/2-port CX4 yl Module
3800 Switch Series	J9575A J9576A J9573A J9574A J9584A	All	All	Other models not listed do not have SFP + ports
3810M Switch Series	JL071A JL072A JL073A JL074A JL076A	All	All	For use in an installed JL083A Aruba 3810M/ 2930M 4SFP+ MACsec Module
	JL075A	All	All	For use in the JL075A SFP+ ports or in an

				installed JL083A Aruba 3810M/2930M 4SFP+ MACsec Module
5400zl Switch Series	J9309A	K.14.39	K.15.02.0004	
5400R Switch Series	J9538A J9548A J9536A	All	All	
	J9990A J9993A	KB.15.17	KB.15.17	
6120 Switch Series	516733-B21 (6120XG)	All	(not supported)	498358-B21 (6120G/XG) has 1GB SFP and 10G XFP or CX4 ports and does not support these SFP + transceivers
6200yl Switch Series	J8992A	K.14.50	K.15.02.0004	J8992A fixed SFP ports are 1GB and do not support these SFP + transceivers For use in an installed J9312A 10GbE 2-port SFP+/2-port CX4 yl Module
6600 Switch Series	J9264A J9265A	K.14.03	K.15.02.0004	
	J9452A	K.14.24	K.15.02.0004	
8200zl Switch Series	J9309A	K.14.39	K.15.02.0004	
	J9538A J9548A J9536A	K.15.02.0004	K.15.02.0004	

Aruba 8320 48p 10G SFP/SFP+ and 6p 40G QSFP+ Switch	JL479A	All (J9150A/J9150D and J9151A/J9151D only) J9152A/J9152D (LRM) is not supported in the 8320 switches	All	Only the following 4x4 part numbers are supported: • J9150A/J9150D: 1990-4391, 1990-4175 • J9151A/J9151D: 1990-4657, 1990-4727, 1990-4694 • J9153A/J9153D: 1990-4365, 1990-4656 J9152A/J9152D (10G LRM) is not supported in the 8320 Switches
Aruba 8400X 32p 10G SFP/SFP+ Msec Module	JL363A	All	All	Only the following 4x4 part numbers are supported: • J9150A/J9150D: 1990-4391, 1990-4175 • J9151A/J9151D: 1990-4657, 1990-4727, 1990-4694 • J9152A/J9152D: 1990-4485 • J9153A: 1990-4365, 1990-4656

Note: A mode conditioning patch cord is required when you use OM1 or OM2 fiber types on a10G LRM Transceiver. Never use mode conditioning patch cords for OM3 or OM4 fiber types. For more information about mode conditioning patch cords, see related parts in the IEEE 802.3 standard.

10G SFP+ copper transceiver modules

Figure 12: 10G SFP+ copper transceiver module

Models, specifications, and compatibility

Table 25: Specifications for SFP+ copper transceiver modules

Product name (SKU)	Transmission distance	Data rate	Cable type	Connector type
Aruba 10GBASE-T SFP+ RJ45 30m Cat6A XCVR (JL563A)	30 m (98.43 ft)	10G	Cat6A UTP/STP	RJ-45

Table 26: Compatibility for SFP+ copper transceiver modules

Product name	SKU	Minimum software required (JL563A)	Comments
Aruba 8320 48p 10G SFP/SFP+ and 6p 40G QSFP+ Switch	JL479A	Future version	The JL563A transceiver does NOT support 1G operation; only 10G.
Aruba 8400X 32p 10G SFP/SFP+ Msec Module	JL363A	Future version	

SFP+ DAC cables

Figure 13: SFP+ DAC cable

Note: Direct Attach over Copper (DAC) cables have a minimum bend radius of typically 4x the diameterof the cable

(approximately a 1" bend radius). Handle DAC cables carefully to ensure that you do not crimp or bend the cable beyond a 1" radius, otherwise, you risk damaging the cable.

Models, specifications, and compatibility

The specifications for Revision D transceiver products are the same as the specified Revision A, B, and C SKUs.

Table 27: Specifications for SFP+ DAC cables

Product name (SKU)	Cable length	Data rate	Type
HPE X242 10G SFP+ to SFP+ 1m DAC Cable (J9281B) Aruba 10G SFP+ to SFP+ 1m DAC Cable (J9281D)	1 m (3.28 ft)	10.31 Gbps	SFP+ cable
HPE X242 10G SFP+ to SFP+ 3m DAC Cable (J9283B) Aruba 10G SFP+ to SFP+ 3m DAC Cable (J9283D)	3 m (9.84 ft)		
HPE X242 10G SFP+ to SFP+ 7m DAC Cable (J9285B) Aruba 10G SFP+ to SFP+ 7m DAC Cable (J9285D)	7 m (22.97 ft)		

Table 28: Compatibility for the SFP+ copper cables

Product name	SKU	Minimum software required (J9281B/J9281D, J9283B/J9283D, J9285B/J9285D)	Comments
1850 Switch Series	JL169A	All	Other models not listed do not have SFP +.
2530 Switch Series	J9853A J9854A J9855A J9856A	All	Other models not listed do not have SFP + ports
2540 Switch Series	JL354A JL355A JL356A JL357A	All	J9285B (7m) not supported.
2910al Switch Series	J9145A J9146A J9147A	W.14.28	For use in the J9008A 2-port 10GbE SFP+ al module.

Product name	SKU	Minimum software required (J9281B/J9281D, J9283B/J9283D, J9285B/J9285D)	Comments
	J9148A		
2920 Switch Series	J9726A J9727A J9728A J9729A J9836A	All	The SFP ports on the models listed do not support these 10G SFP+ cables. For use in an installed J9731A Aruba 2920 2-port 10GbE SFP+ .
2930F Switch Series	JL253A JL254A JL255A JL256A JL258A JL263A JL264A JL558A JL559A	All J9285B/J9285D (7m DAC) not supported.	Other models not listed do not have 10G SFP+ ports. J9285B/J9285D (7m DAC) not supported.
2930M Switch Series	JL319A JL320A JL321A JL322A JL323A JL324A	All	For use in an installed JL083A Aruba 3810M/2930M 4SFP+ MACsec Module J9285B/9285D (7m DAC) is supported in all 2930M models
3500yl Switch Series	J8692A J8693A J9310A J9311A	K.14.50	For use in an installed J9312A 10GbE 2-port SFP +/2-port CX4 yl Module
3800 Switch Series	J9575A J9576A J9573A	All	Other models not listed do not have SFP+ ports.

Product name	SKU	Minimum software required (J9281B/J9281D, J9283B/J9283D, J9285B/J9285D)	Comments
	J9574A J9584A		
3810M Switch Series	JL071A JL072A JL073A JL074A JL076A	All	For use in an installed JL083A Aruba 3810M/2930M 4SFP+ MACsec Module.
	JL075A	All	For use in the JL075A SFP+ ports or used in an installed JL083A Aruba 3810M/2930M 4SFP+ MACsec Module.
5400zl Switch Series	J9309A	K.14.39	
	J9538A J9548A J9536A	K.15.02.0004	
5400R Switch Series	J9538A J9548A J9536A	All	
	J9990A J9993A	KB.15.17	
6120 Switch Series	516733- B21	All	
6200yl Switch Series	J8992A	K.14.50	J8992A fixed SFP ports are 1GB and do not support these SFP+ copper cables. For use in an installed J9312A 10GbE 2-port SFP

Product name	SKU	Minimum software required (J9281B/J9281D, J9283B/J9283D, J9285B/J9285D)	Comments
			+/2-port CX4 yl Module.
6600 Switch Series	J9264A J9265A J9452A	K.14.32	
8200zl Switch Series	J9309A	K.14.39	
	J9538A J9548A J9536A	K.15.02.0004	
Aruba 8320 48p 10G SFP/SFP+ and 6p 40G QSFP+ Switch	JL479A	All (J9281B/J9281D & J9283B/	Only the following 4x4 part
Aruba 8400X 32p 10G SFP/SFP+ Msec Module	JL363A	All	Only the following 4x4 part numbers are supported: • J9281B/J9281D: 8121-1151, 8121-1300 • J9283B/9281D: 8121-1152, 8121-1298 • J9285B/J9285D: 8121-1154, 8121-1305

Gigabit SFP optical transceiver modules

In December 2017, Aruba introduced Revision D versions of 100M, 1G, and 10G transceivers. Revision D products are structured to be specific alternative vendors as sources for the SKU#. Earlier Revision A, B, or C product may have alternative vendors that we no longer actively ship, but remain as fully supported in earlier and current products.

Some switch products will be specifying Revision D transceivers for full support, while other products may support earlier (older) revision transceivers – and some with specific 4x4 part numbers (see Chapter 1, "Overview" for information regarding 4x4 part numbers).

Always refer to the Datasheet or Overviews for the Switch product to see the current list of supported transceivers.

Figure 14: Gigabit or 100-Megabit SFP optical transceiver module

Note:

• Although a 10G SFP+ transceiver module has the same physical dimensions of a 1G SFP transceiver, a 10G transceiver will NOT operate in a 1G SFP port.

• Many, although not all, 10G SFP+ ports have support to use a 1G SFP transceiver (or even a 100Mbps FX SFP transceiver). See the Overviews for the Switch product and verify if the 1G or 100Mbps SFP transceiver is supported in the 10G SFP+ port.

Models, specifications, and compatibility

2.5-Gigabit SFP optical transceiver modules use LC connectors.

The specifications for Revision D transceiver products are the same as the specified Revision A, B, and C SKUs.

Table 29: Specifications for Gigabit SFP optical transceiver modules (1)

Product name (SKU)	DOM - Digital Optical Monitoring (4x4 part #)	Central wl (nm)	Fiber mode	Fiber diameter (µm)	Modal bandwidth (MHz*km)	Transmission distance
HPE X121 1G SFP LC SX Transceiver (J4858C) Aruba 1G SFP LC SX 500m MMF XCVR (J4858D)	Yes (1990-4395 & 1990-4415)	850	MMF	50/125	500 (OM2) 400	550 m (1804.46 ft) 500 m (1640.42 ft)
				62.5/125	200 (OM1) 160	275 m (902.23 ft) 220 m (721.78 ft)
HPE X121 1G SFP LC LX Transceiver (J4859C) Aruba 1G SFP LC LX 10km SMF XCVR (J4859D)	Yes (1990-4116, 1990-4414, & 1990-4608)	1310	SMF	9/125	N/A	10 km (6.21 miles)
			MMF	50/125	500 (OM2) or 400	550 m (1804.46 ft)
			MMF	62.5/125	500 (OM2)	550 m (1804.46 ft)

Product name (SKU)	DOM - Digital Optical Monitoring (4x4 part #)	Central wl (nm)	Fiber mode	Fiber diameter (µm)	Modal bandwidth (MHz*km)	Transmission distance
HPE X121 1G SFP LC LH Transceiver (J4860C) Aruba 1G SFP LC LH 70km SMF XCVR (J4860D)	Yes (1990-4363)	1550	SMF	9/125	N/A	70 km (43.49 miles)

Table 30: Specifications for Gigabit SFP optical transceiver modules (2)

Product name (SKU)	Optical parameters (dBm) Transmit power	Optical parameters (dBm) Receive power
HPE X121 1G SFP LC SX Transceiver (J4858C) Aruba 1G SFP LC SX 500m MMF XCVR (J4858D)	–9.5 to 0	–17 to –3
HPE X121 1G SFP LC LX Transceiver (J4859C) Aruba 1G SFP LC LX 10km SMF XCVR (J4859D)	–9.5 to –3	–20 to –3
HPE X121 1G SFP LC LH Transceiver (J4860C) Aruba 1G SFP LC LH 70km SMF XCVR (J4860D)	0 to +5	–22 to –3

Table 31: Compatibility for Gigabit SFP optical transceiver modules

Product name	SKU	Minimum software required (J4858C/J4858D, J4859C/J4859D, J4860C/J4860D)	Comments
1400 Switch Series	J9078A	All	
1410 Switch Series	J9561A	All	
1700 Switch Series	J9080A	VB.01.09	
1800 Switch Series	J9028A/B	PB.02.09	
1810 Switch Series	J9450A J9660A	All	Gig-LH in J9450A only
	J9801A J9803A J9834A	All	Gig-LH not supported

Product name	SKU	Minimum software required (J4858C/J4858D, J4859C/J4859D, J4860C/J4860D)	Comments
1820 Switch Series	J9980A J9981A J9983A J9984A	J4858C/J4858D: All J4859C/J4859D: All	J4860C/J4860D is not supported on the 1820 series.
1850 Switch Series	JL169A	J4858C/JL4857D: All J4859C/J4859D: All	J4860C/J4860D is not supported on the 1850 series. Other 1850 models do not have SFP ports.
1920S	JL381A JL382A JL384A JL385A JL386A	J4858C/J4858D: All J4859C/J4859D: All J4860C/J4860D: Not supported	Models JL380A and JL383A do not include SFP ports.
2510 Switch Series	J9019A/B J9020A J9279A J9280A	All	
2520 Switch Series	J9137A J9138A J9298A J9299A	All	
2530 Switch Series	J9772A J9773A J9774A J9775A J9776A	All	

Product name	SKU	Minimum software required (J4858C/J4858D, J4859C/J4859D, J4860C/J4860D)	Comments
	J9777A J9778A J9779A J9780A J9781A J9782A J9783A J9853A J9854A J9855A J9856A		
2540 Switch Series	JL354A JL355A JL356A JL357A	All	
2600 Switch Series	J4899A/B/C J4900A/B/C J8164A J8165A J8762A	H.08.98	
2610 Switch Series	J9085A J9086A J9087A J9088A J9089A	All	
2615-8-PoE Switch	J9565A	All	

Product name	SKU	Minimum software required (J4858C/J4858D, J4859C/J4859D, J4860C/J4860D)	Comments
2620 Switch Series	J9623A J9624A J9625A J9626A J9627A	All	
2800 Switch Series	J4903A J4904A	i.08.103	
2810 Switch Series	J9021A J9022A	All	
2900 Switch Series	J9049A J9050A	T.13.45	
2910al Switch Series	J9145A J9146A J9147A J9148A	All	For use in the SFP ports on the models listed, and in the J9008A 2-port 10GbE SFP+ al module.
2915-8G-PoE Switch	J9562A	All	
2920 Series Switches	J9726A J9727A J9728A J9729A J9836A	All	For use in the SFP ports on the models listed. Also for use in the dual- speed SFP+ ports of the J9731A 2-Port

Product name	SKU	Minimum software required (J4858C/J4858D, J4859C/J4859D, J4860C/J4860D)	Comments
			10GbE SFP+ Module.
2930F Series Switches	JL253A JL254A JL255A JL256A JL258A JL259A JL260A JL261A JL262A JL263A JL264A JL557A JL558A JL559A	All	
2930M Switch Series	JL319A JL320A JL321A JL322A JL323A JL324A	All	For use in SFP ports on switch and an installed JL083A Aruba 3810M/ 2930M 4SFP+ MACsec Module.

Product name	SKU	Minimum software required (J4858C/J4858D, J4859C/J4859D, J4860C/J4860D)	Comments
3400cl Switch Series	J4905A J4906A	All	
3500 Series Switches	J9470A J9471A J9472A J9473A	K.14.31	
3500yl Switch Series	J8692A J8693A	All	For use in the SFP ports on the models listed, and in an installed J9312A 10GbE 2-port SFP+/2- port CX4 yl Model
	J9310A J9311A	K.14.50	
3800 Switch Series	J9573A J9574A J9575A J9576A J9584A	All	
3810M Switch Series	JL071A JL072A JL073A JL074A JL076A JL075A	All	For use in the JL075A 3810M switch. Also for use in any 3810M switch with a JL083A Aruba 3810M/2930M 4SFP+ MACsec Module

Product name	SKU	Minimum software required (J4858C/J4858D, J4859C/J4859D, J4860C/J4860D)	Comments
			installed.
4200gl Switch Series	J4893A J4908A	G.07.103	
4200vl Switch Series	J8776A J9033A	All	
5300xl Switch Series	J4878A/B J4907A	E.10.36	
5400zl Switch Series	J8705A J8706A	All	
	J9308A	K.14.34	
	J9537A J9549A J9535A J9637A J9538A J9548A J9536A	K.15.02.0004	

Product name	SKU	Minimum software required (J4858C/J4858D, J4859C/J4859D, J4860C/J4860D)	Comments
5400R Switch Series	J9537A J9549A J9535A J9637A J9538A J9548A J9536A	All	
	J9988A J9989A J9990A J9993A	KB.15.17	
6108 Switch	J4902A	H.07.88	
6120 Switch Series	498358-B21 516733-B21	SX, LX: all versions LH: not supported	
6200yl-24G-mGBIC Switch	J8992A	All	
6600 Switch Series	J9263A J9264A	K.14.03	

Product name	SKU	Minimum software required (J4858C/J4858D, J4859C/J4859D, J4860C/J4860D)	Comments
	J9451A	K.14.24	
8100fl Switch	J8735A	All	
8200zl Switch Series	J8705A J8706A	All	
	J9308A	K.14.34	
	J9537A J9549A J9535A J9637A J9538A J9548A J9536A	K.15.02.0004	
Aruba 8320 48p 10G SFP/SFP+ and 6p 40G QSFP + Switch	JL479A	All	Only the following 4x4 part numbers are supported: • J4858C/J4858D: 1990-4395, 1990-4415 • J4859C/J4859D: 1990-4116, 1990-4414 • J4860C/J4860D: 1990-4363

Product name	SKU	Minimum software required (J4858C/J4858D, J4859C/J4859D, J4860C/J4860D)	Comments
Aruba 8400X 32p 10G SFP/SFP+ Msec Module	-	All	Only the following 4x4 part numbers are supported: • J4858C/J4858D: 1990-4395, 1990-4415 • J4859C/J4859D: 1990-4116, 1990-4414 • J4860C/J4860D: 1990-4363
9300m Switch Series	J4885A J4894A	All	
9408sl Switch	J8684A	All	

100-Megabit SFP optical transceiver modules

Figure 15: Gigabit or 100-Megabit SFP optical transceiver module

Models, specifications, and compatibility

100 Megabit SFP optical transceiver modules use LC connectors.

The specifications for Revision D transceiver products are the same as the specified Revision A, B, and C SKUs.

Table 32: Specifications for 100-Megabit SFP optical transceiver modules (1)

Product name (SKU)	DOM - Digital Optical Monitoring (4x4 part #)	Central wl (nm)	Fiber mode	Fiber diameter (µm)	Transmission distance
HPE X111 100M SFP LC FX Transceiver (J9054C) Aruba 100M SFP LC FX 2km MMF XCVR (J9054D)	Yes (1990-4483, 1990-4360)	1310	MMF	50/125 62.5/125	2 km (1.24 miles)

Table 33: Specifications for 100–Megabit SFP optical transceiver modules (2)

Product name (SKU)	Optical parameters (dBm)	
	Transmit power	Receive power
HPE X111 100M SFP LC FX Transceiver (J9054C) Aruba 100M SFP LC FX 2km MMF XCVR (J9054D)	–19 to –14	–30 to –14

Table 34: Compatibility for the 100-Megabit SFP optical transceiver module

Product name	SKU	Minimum software required	Comments
1410G Switch Series	J9559A J9560A J9561A	J9559A, J9560A: Not supported (no SFP ports) J9561A: All	For use in the SFP ports of the J9561A 1410-24G Switch
1810G Series Switches	J9449A J9450A J9660A	For J9449A: Not supported. For J9450A, J9660A: All	For use in the SFP ports of the J9450A 1810G-24 Switch and J9660A V1810-48G Switch. (The J9449A 1810G-8 Switch does not have SFP ports.)
1810G v2 Switch Series	J9801A J9803A	All	For use in the SFP ports of the J9801A 1810-24 v2 and J9803A 1810-24G v2 Switches
PS1810 Switch	J9834A	All	For use in the SFP ports of the J9834A PS1810-24G

Product name	SKU	Minimum software required	Comments
			Switch
1820G Switch Series	J9980A J9981A J9983A J9984A	All	The J9054B 100-FX SFP-LC transceiver is not supported in the 1820G switches The J9054C part number 1990-4483 is not supported in these products. (Only the J9054C/J9054D part number 1990-4360 is supported.)
2510-24 Switch	J9019A/B	Q.10.04	
2510-48 Switch	J9020A	All	
2510G Switch Series	J9279A J9280A	All	
2520 Switch Series	J9137A J9138A	All	
2520G Switch Series	J9298A J9299A	J9054B: All J9054C: J.14.32	
2530 Switch Series	J9772A J9773A	For J9853A, J9854A, J9855A, and J9856A: Not supported	For use in the SFP ports of the 2530 Series Switches. (The J9853A, J9854A, J9855A, and J9856A models have 1G/10G SFP+ ports that do not support these 100Mbps transceiver modules.)
	J9774A J9775A J9776A J9777A J9778A J9779A J9780A J9781A J9782A J9783A	For all other switches: All	

Product name	SKU	Minimum software required	Comments
	J9853A J9854A J9855A J9856A		
2540 Switch Series	JL354A JL355A JL356A JL357A	All	
2610 Switch Series	J9085A J9086A J9087A J9088A J9089A	All	
2615-8-PoE Switch	J9565A	J9054B: All J9054C: A.14.07	
2620 Switch Series	J9623A J9624A J9625A J9626A J9627A	All	
2800 Switch Series	J4903A J4904A	J9054B/C 1990-3613 and J9054C 1990-4112: i.10.30 J9054C 1990-4483: Not supported	J9054C part number 1990-4483 is not supported
2810 Switch Series	J9021A J9022A	N.10.07	
2900 Switch Series	J9049A J9050A	T.12.01	
2910al Switch Series	J9145A J9146A J9147A J9148A	All	
2915-8G-PoE Switch	J9562A	J9054B: All J9054C/J9054D: A.14.07	

Product name	SKU	Minimum software required	Comments
2920 Series Switches	J9726A J9727A J9728A J9729A J9836A	All	Use in the SFP ports of the 2920 Series Switches100-FX is not supported in the SFP+ ports of the J9731A 2-Port 10GbE SFP+ Module
2930F Switch Series	JL253A JL254A JL255A JL256A JL258A JL263A JL264A JL259A JL260A JL261A JL262A JL557A JL558A JL559A	J9054B: is not supported in the 2930F Series Switches For J9054C/9054D: All	The 2930F Switch Series models with 1G/10G SFP+ ports added support for this J9054C100FX transceiver module. The J9054C is supported in models with 1G SFP ports.
2930M Switch Series	JL319A JL320A JL321A JL322A JL323A JL324A	J9054B is not supported in the 2930M Series Switches. For J9054C/J9054D: All	For use in SFP ports on switch and an installed JL083A Aruba 3810M/2930M 4SFP+ MACsec Module.
3500 Series Switches	J9470A J9471A J9472A J9473A	J9054B/C 1990-3613: K.14.31 J9054C 1990-4112 and 1990-4483: K.15.08.0007	

Product name	SKU	Minimum software required	Comments
3500yl Switch Series	J8692A J8693A J9310A J9311A	For J8692A, J8693A: K.12.01 (for J9054B/C 1990-3613); K.15.08.0007 (for J9054C 1990-4112 and 1990-4483, and J9054D 1990-4483 and 1990-4360) For J9310A, J9311A: K.14.50 (for J9054B/C 1990-3613); K.15.08.0007 (for J9054C 1990-4112 and 1990-4483, and J9054D 1990-4483 and 1990-4360)	
3800 Switch Series	J9573A J9574A J9575A J9576A J9584A	For J9573A, J9574A, J9575A, J9576A: Not supported. For J9584A: All	Not supported for use in the following 3800 models: J9573A, J9574A, J9575A, and J9576A. The SFP+ ports do not support 100M operation. Supported in the J8584A 3800-24SFP-2SFP+ Switch
3810M Switch Series	JL071A JL072A JL073A JL074A JL076A	All	For use in an installed JL083A Aruba 3810M/2930M 4SFP+ MACsec Module.
	JL075A	All	For use in the JL075A SFP+ ports. Also used in an installed JL083A Aruba 3810M/2930M 4SFP+ MACsec Module.
4100gl Switch Series	J4865A J4887A	n/a	100-FX is not supported

Product name	SKU	Minimum software required	Comments
4200vl Switch Series	J8770A J8771A J8772A/B J8773A	L.10.24	Supported: J9033A Switch vl 20- Port Gig-T + 4-Port SFP Module Not supported: J8776A Switch vl 4-Port Mini-GBIC Module
5300xl Switch Series J4819A J4850A	J4819A J4850A	n/a	100-FX is not supported
5400zl Switch Series	J8697A J8698A J9642A J9643A	For J8705A and J8706A modules: K. 12.01 (for J9054B/C 1990-3613); K. 15.08.0007 (for J9054C 1990-4112 and 1990-4483) For the J9308A module: K.14.34 (for J9054B/C 1990-3613); K.15.08.0007 (for J9054C 1990-4112 and 1990-4483) For J9537A, J9549A, J9535A, and J9637A modules: K.15.02.0004 (for J9054B/C 1990-3613); K.15.08.0007 (for J9054C 1990-4112 and 1990-4483)	For use in: J8705A Switch zl 20-Port 10/100/1000 + 4-Port Mini-GBIC Module J8706A Switch zl 24-Port Mini- GBIC Module J9308A 20-Port 10/100/1000 PoE+ and 4-Port SFP zl Module J9537A 24-Port SFP v2 zl Module J9549A 20- Port Gig-T / 4 Port SFP v2 zl Module J9535A 20-Port Gig-T PoE+ / 4-Port SFP v2 zl Module J9637A 12-Port Gig- T PoE+ / 12-Port SFP v2 zl Module
5400R Switch Series	J9821A J9822A J9823A J9824A J9825A	For J9535A, J9537A, J9549A, and J9637A modules: All For the J9988A, J9989A, J9990A, and J9993A modules: KB.15.17 and later	For use in: J9537A 24-Port SFP v2 zl Module J9549A 20-Port Gig-T / 4-Port SFP v2 zl Module J9535A 20-Port Gig-T PoE+ / 4-Port SFP v2 zl Module

Product name	SKU	Minimum software required	Comments
	J9826A J9868A		J9637A 12-Port Gig-T PoE+ / 12-Port SFP v2 zl Module J9988A 24p 1GbE SFP v3 zl2 Module J9989A 12p PoE+ / 12p 1GbE SFP v3 zl2 Module J9990A 20p PoE+ / 4p SFP+ v3 zl2 Module J9993A 8p 1G/10GbE SFP+ v3 zl2 Module
6108 Switch	J4902A	n/a	100-FX is not supported
6120 Blade Switch Series	498358-B21 516733-B21	n/a	100-FX is not supported
6200yl-24G-mGBIC Switch	J8992A	K.12.01 (for J9054B/C 1990-3613); K.15.08.0007 (for J9054C 1990-4112 and 1990-4483)	For use in all 24 ports of the J8992A Switch 6200yl-24G- mGBIC
6600 Switch Series	J9263A J9264A J9265A J9451A J9452A	For J9263A, J9264A: K.14.03 (for J9054B/C 1990-3613); K.15.08.0007 (for J9054C 1990-4112 and 1990-4483) For J9451A: K.14.24 (for J9054B/C 1990-3613); K.15.08.0007 (for J9054C 1990-4112 and 1990-4483)	For use in the SFP ports of the J9263A 6600-24G Switch, the J9264A 6600-24G-4XG Switch, and the J9451A 6600-48G Switch (The J9265A 6600-24XG Switch and J9452A 6600- 48G-4XG Switch do not have SFP ports)
8100fl Switch Series	J8727A J8728A	n/a	100-FX is not supported

Product name	SKU	Minimum software required	Comments
8200zl Switch Series	J8715A/B J9475A J9640A J9641A	For J8705A and J8706A modules: All (for J9054B/C 1990-3613); K. 15.08.0007 (for J9054C 1990-4112 and 1990-4483) For the J9308A module: K.14.34 (for J9054B/C 1990-3613); K.15.08.0007 (for J9054C 1990-4112 and 1990-4483) For J9537A, J9549A, J9535A, and J9637A modules: K.15.02.0004 (for J9054B/C 1990-3613); K.15.08.0007 (for J9054C 1990-4112 and 1990-4483)	For use in: J8705A Switch zl 20-Port 10/100/1000 + 4-Port Mini-GBIC Module J8706A Switch zl 24-Port Mini- GBIC Module J9308A 20-Port 10/100/1000 PoE+ and 4-Port SFP zl Module J9537A 24-Port SFP v2 zl Module J9549A 20- Port Gig-T / 4-Port SFP v2 zl Module J9535A 20-Port Gig-T PoE+ / 4-Port SFP v2 zl Module J9637A 12-Port Gig- T PoE+ / 12-Port SFP v2 zl Module
8320 Series	All	n/a	100Mbps Transceivers are NOT supported in the 8320 series.
8400 Series	All	n/a	100Mbps Transceivers are NOT supported in the 8400 series.
9300m Switch Series	J4138A J4139A J4874A	n/a	100-FX is not supported.
9408sl Switch	J8680A	n/a	100-FX is not supported

Gigabit BIDI optical transceiver modules

Figure 16**: Gigabit BIDI optical transceiver module**

Models, specifications, and compatibility

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

• BIDI optical transceiver modules use different central wavelengths in transmit and receive directions to implement bidirectional transmission of fiber signals over the same fiber.

• You must use the HPE X122 1G SFP LC BX 10-D Transceiver (J9142B) and HPE X122 1G SFP LC BX 10-U Transceiver (J9143B) in pairs: a J9142B (-D = downlink) at one end of the connection and a J9143B (-U = uplink) at the other.

• The J9142B/J9143B were End of Sale in April 2016 and are no longer available. Contact your Aruba Sales team for alternative solutions. The information presented here is for compatibility use.

Table 35: Specifications for Gigabit BIDI optical transceiver modules (1)

Product name (SKU)	DOM - Digital Optical Monitoring (4x4 part #)	Central wavelength (nm) Transmit end (TX)	Central wavelength (nm) Receive end (RX)	Fiber mode	Fiber diameter (µm)	Transmission distance
HPE X122 1G SFP LC BX-D Transceiver (J9142B)	No	1490	1310	SMF	9/125	10 km (6.21 miles)
HPE X122 1G SFP LC BX-U Transceiver (J9143B)	No	1310	1490			

Table 36: Specifications for Gigabit BIDI transceiver modules (2)

Product name (SKU)	Optical parameters (dBm) Transmit power	Optical parameters (dBm) Receive power
HPE X122 1G SFP LC BX-D Transceiver (J9142B) HPE X122 1G SFP LC BX-U Transceiver (J9143B)	–9 to –3	–18.7 to –3

Table 37: Compatibility for Gigabit BIDI transceiver modules

Product name	SKU	Minimum software required (J9142B, J9143B)	Comments
1400 Switch Series	J9078A	All	
1410 Switch Series	J9561A	All	
1700 Switch Series	J9080A	VB.02.00	

Product name	SKU	Minimum software required (J9142B, J9143B)	Comments
1800 Switch Series	J9028A/B	PB.03.00	
2510-24 Switch	J9019A/B	Q.11.16	
2510-48 Switch	J9020A	U.11.10	
2510G–24 Switch	J9279A	Y.11.03	
2510G–48 Switch	J9280A	Y.11.03	
2520 Switch Series	J9137A J9138A J9298A J9299A	All	
2530 Switch Series	J9772A J9773A J9774A J9775A J9776A J9777A J9778A J9779A J9780A J9781A J9782A J9783A J9853A J9854A J9855A J9856A	All	
2540 Switch Series	JL354A JL355A JL356A JL357A	All	

Product name	SKU	Minimum software required (J9142B, J9143B)	Comments
2600 Switch Series	J4899A/B /C 4900A/B/ C J8164A J8165A J8762A	H.10.72	
2610 Switch Series	J9085A J9086A J9087A J9088A J9089A	R.11.22	
2615-8-PoE Switch	J9565A	All	
2620 Switch Series	J9623A J9624A J9625A J9626A J9627A	All	
2800 Switch Series	J4903A J4904A	i.10.69	
2810 Switch Series	J9021A J9022A	N.11.14	
2900 Switch Series	J9049A J9050A	T.13.45	
2910al Switch Series	J9145A J9146A J9147A J9148A	All	
2915-8G-PoE Switch	J9562A	All	

Product name	SKU	Minimum software required (J9142B, J9143B)	Comments
2920 Series Switches	J9726A J9727A J9728A J9729A J9836A	All	
2930F Series Switches	JL253A JL254A JL255A JL256A JL258A JL259A JL260A JL261A JL262A JL263A JL264A		As of April 2016, the J9142B and J9143B 1G BX transceivers have been End of Sale. Contact your Aruba representative for alternative solutions.
2930M Switch Series	JL319A JL320A JL321A JL322A JL323A JL324A	See comments	As of April 2016, the J9142B and J9143B 1G BX transceivers have been End of Sale. Contact your Aruba representative for alternative solutions.
3500 Series Switches	J9470A J9471A J9472A J9473A	K.14.31	
3500yl Switch Series	J8692A J8693A	K.14.31	

Product name	SKU	Minimum software required (J9142B, J9143B)	Comments
	J9310A J9311A	K.14.50	
3800 Switch Series	J9573A J9574A J9575A J9576A J9584A	All	
3810M Switch Series	JL071A JL072A JL073A JL074A JL076A	All	For use in the JL075A 3810M switch or in any 3810M switch with a JL083A Aruba 3810M/2930M 4SFP+ MACsec Module installed.
	JL075A	All	
4200vl Switch Series	J8776A J9033A	L.11.16	
5300xl Switch Series	J4878A/B J4907A	E.11.08	
5400zl Switch Series	J8705A J8706A	K.13.45	
	J9308A	K.14.34	
	J9537A J9549A J9535A J9637A J9538A J9548A J9536A	K.15.02.0004	

Product name	SKU	Minimum software required (J9142B, J9143B)	Comments
5400R Switch Series	J9537A J9549A J9535A J9637A J9538A J9548A J9536A	All	
	J9988A J9989A J9990A J9993A	KB.15.17	
6200yl-24G-mGBIC Switch	J8992A	K.13.45	
6600 Switch Series	J9263A J9264A	K.14.03	
	J9451A	K.14.24	
8200zl Switch Series	J8705A J8706A	K.13.45	
	J9308A	K.14.34	
	J9537A J9549A J9535A J9637A J9538A J9548A J9536A	K.15.02.0004	
8320 Series	JL479A, JL579A	n/a	1G BX Transceivers are NOT supported in the 8320 series.
8400 Series	All	n/a	1G BX Transceivers are NOT supported in the 8400 series.

Gigabit SFP copper transceiver modules

Figure 17: Gigabit SFP copper transceiver module

Models, specifications, and compatibility

Table 38: Specifications for SFP copper transceiver modules

Product name (SKU)	Transmission distance	Data rate	Cable type	Connector type
HPE X121 1G SFP RJ45 T Transceiver (J8177C)	100 m (328.08 ft)	1G 100Mbps[1]	Cat5e UTP/STP	RJ-45
Aruba 1G SFP RJ45 T 100m Cat5e XCVR (J8177D)				

[1] For certain products. See next table.

Table 39: Compatibility for SFP copper transceiver modules

The specifications for Revision D transceiver products are the same as the specified Revision A, B, and C SKUs.

Product name	SKU	Minimum software required (J8177C/ J8177D)	Comments
1810 Series Switches	J9660A J9801A J9803A J9834A	All	
1820 Switch Series	J9980A J9981A J9983A J9984A	All	
1920S Switch Series	JL381A JL382A	Not supported	The JL380A and JL383A switches do not include

Product name	SKU	Minimum software required (J8177C/ J8177D)	Comments
	JL384A JL385A JL386A		SFP ports.
2510 Switch	J9020A	All	
2530 Switch Series	J9782A J9781A J9776A J9775A J9779A J9778A J9773A J9772A J9856A J9855A J9854A J9853A	All	
2540 Switch Series	JL354A JL355A JL356A JL357A	All	
2610 Switch Series	J9085A J9086A J9087A J9088A J9089A	All	

Product name	SKU	Minimum software required (J8177C/ J8177D)	Comments
2620 Switch Series	J9623A J9624A J9625A J9626A J9627A	All	
2920 Series Switches	J9731A	All	
2930F Series Switches	JL253A, JL254A JL255A JL256A JL258A JL263A JL264A JL259A JL260A JL261A JL262A JL557A JL558A JL559A	All	J8177C/J8177D support operation at 100Mbps in this Switch Series
2930M Switch Series	JL319A JL320A JL321A JL322A JL323A JL324A	All	J8177C is not supported for use in the Dual-Personality ports of the 2930M Series Switches. For use in an installed JL083A Aruba 3810M/2930M 4SFP+ MACsec Module. J8177C/J8177D support operation at 100Mbps in this Switch Series

Product name	SKU	Minimum software required (J8177C/ J8177D)	Comments
3800 Switch Series	J9573A J9574A J9575A J9576A J9584A	All	
3810M Switch Series	JL071A JL072A JL073A JL074A JL076A JL075A	All	For use in the JL075A 3810M switch. Also used in any 3810M switch with a JL083A Aruba 3810M/2930M 4SFP+ MACsec Module installed. J8177C/J8177D support operation at 100Mbps in this Switch Series
4100gl Switch Series	J4893A J4908A	G.07.69	
4200vl Switch Series	J8776A J9033A	All	
5300xl Switch Series	J4878A/B	E.09.22	
5400zl Switch Series	J8705A J8706A	All	
	J9308A	K.14.34	
	J9537A J9549A J9535A J9637A	K.15.02.0004	
5400R Switch Series	J9537A J9549A J9535A J9637A	All	J8177C/J8177D support operation at 100Mbps in this Switch Series

Product name	SKU	Minimum software required (J8177C/ J8177D)	Comments
	J9988A J9989A J9990A J9993A	KB.15.17	J8177C/J8177D support operation at 100Mbps in this Switch Series
6120 Blade Switch Series	498358-B21 516733-B21	All	
6200yl-24G-mGBIC Switch	J8992A	All	
8100fl Switch Series	J8735A	CY.01.02.0050	
8200zl Switch Series	J8705A J8706A	All	
	J9308A	K.14.34	
	J9537A J9549A J9535A J9637A	K.15.02.0004	
Aruba 8320 48p 10G SFP/SFP+ and 6p 40G QSFP+ Switch	JL479A	All	100Mbps operation is NOT supported in this series. Only the 1G Copper 4x4 numbers 1990-3816 and 1990-4606 are supported for use in the 8400 Series.
Aruba 8400X 32p 10G SFP/SFP+ Msec Module	JL363A	All	

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