Validated SFPs and Cables for CSX4000 Series Appliances

This article lists the small form-factor pluggable (SFP) transceivers, active optical connector (AOC) cables, and direct-attach copper (DAC) cables supported on the Cloud Services Switch (CSX) 4000 series appliance fiber interfaces, and it describes the test environment used for the remote switches.

Supported Ethernet Ports for CSX4000

You can install SFP, SFP+ SFP28, and QSFP28 transceivers in Ethernet ports enet-0/0 through enet-0/56. The Ethernet ports on the CSX4000 series appliances use different Ethernet controllers and hence support different SFPs.

The following table describes the Ethernet ports, controllers, and supported transceivers on the CSX4300 series appliance.

Ethernet Ports	Controller	Supported Transceivers
enet-0/0 through enet-0/47	Broadcom BCM54182	1-Gigabit Ethernet copper ports
enet-0/48 through enet-0/51	Broadcom BCM56371	10-Gigabit/25-Gigabit Ethernet Ethernet fiber ports
enet-0/52 through enet-0/56	Broadcom BCM56371	100-Gigabit Ethernet fiber ports

The following table describes the Ethernet ports, controllers, and supported transceivers on the CSX4500 series appliance.

Ethernet Ports	Controller	Supported Transceivers
enet-0/0 through enet-0/35	Broadcom BCM54998E	1-Gigabit Ethernet/2.5-Gigabit Ethernet copper ports
enet-0/36 through enet-0/47	Broadcom BCM84894	1-Gigabit Ethernet copper ports
enet-0/48 through enet-0/51	Broadcom BCM56370	10-Gigabit Ethernet/25-Gigabit Ethernet fiber ports
enet-0/52 through enet-0/56	Broadcom BCM56370	100-Gigabit Ethernet fiber ports

Supported Dual-Rate SFP/SFP+ Transceivers

The following table describes the dual-rate (1-Gigabit Ethernet/10-Gigabit Ethernet) SFP/SFP+ transceiver modules supported on the CSX4000 series appliances.

SFP/SFP+ Transceiver Type	Manufacturer	Part Number	enet-0/48 through enet-0/51	Transceiver Description
Short reach (SR)	Finisar	FTLX8574D3BCV-IT	Yes	Intel OEM, 1G-SX/10G-SR dual-rate
Long reach (LR)	Finisar	FTLX1471D3BCV-IT	Yes	Intel OEM, 1G-LX/10G-LR dual-rate

Supported 1-Gigabit Ethernet SFP Transceivers

The following table describes the 1-Gigabit Ethernet SFP transceiver modules supported on the CSX4300 series appliances.

SFP Transceiver Type	Manufacturer	Part Number	enet-0/48 through enet-0/51	Transceiver Description
Short wavelength (SX)	Finisar	FTLX8574D3BCV	Yes	1000BASE-SX, SFP transceiver
Long wavelength (LX)	Finisar	FTLX1475D3BCV	Yes	1000BASE-LX, SFP transceiver
Short wavelength (SX)	Finisar	FTLF1318P3BTL	Yes	1000BASE-SX, up to 500-m multimode datacom SFP+ optical transceiver
Long wavelength (LX)	Finisar	FTLF8519P3BNL	Yes	1000BASE-LX, up to 10-km multimode datacom SFP+ optical transceiver

The following table describes the 1-Gigabit Ethernet SFP transceiver modules supported on the CSX4500 series appliances.

SFP Transceiver Type	Manufacturer	Part Number	ent-0/48 through ent-0/51	Transceiver Description
Short wavelength (SX)	Finisar	FTLX8574D3BCV	Yes	1000BASE-SX SFP transceiver
Long wavelength (LX)	Finisar	FTLX1475D3BCV	Yes	1000BASE-LX SFP transceiver

Supported 10-Gigabit Ethernet SFP+ Transceivers and Cables

The following table describes the 10-Gigabit Ethernet SFP+ transceiver modules supported on the CSX4000 series appliances.

SFP+ Transceiver Type	Manufacturer	Part Number	enet-0/28 through enet-0/31	Transceiver Description
Short reach (SR)	Finisar	FTLX8574D3BCL	Yes	10GBASE-SR/SW, up to 300-m multimode datacom SFP+ optical transceiver
Long reach (LR)	Finisar	FTLX1475D3BCL	Yes	10GBASE-LR 1310-nm single-mode datacom SFP+ optical transceiver
Copper optic	FS	F1804000060	Yes	1000BASE-T SFP copper RJ-45 100-m transceiver module for Finisar switches

The following table describes the 10-Gigabit Ethernet SFP+ AOC and DAC cables supported on the CSX4000 series appliances.

SFP+ Cable Type	Manufacturer	Part Number	enet-0/48 through enet-0/51	Cable Description
AOC 5-m	FS	SFPP-AO05	Yes	5-m (16-ft) generic compatible 10-Gigabit Ethernet SFP+ AOC cable

SFP+ Cable Type	Manufacturer	Part Number	enet-0/48 through enet-0/51	Cable Description
DAC 1-m	FS	SFPP-PC01	Yes	1-m generic compatible 10-Gigabit Ethernet SFP+ passive DAC twinax cable
DAC 5-m	FS	SFPP-PC05	Yes	5-m (16-ft) generic compatible 10-Gigabit Ethernet SFP+ passive DAC twinax cable

Supported 25-Gigabit Ethernet SFP28 Transceivers and Cables

The following table describes the 25-Gigabit Ethernet SFP28 transceiver modules supported on the CSX4000 series appliances.

SFP28 Transceiver Type	Manufacturer	Part Number	enet-0/48 through enet-0/51	Transceiver Description
Short reach (SR)	Finisar	FTLF8536P4BCL	Yes	25-Gigabit Ethernet SFP28 SR (850-nm) fiber-optic transmitter
Long reach (LR)	FS	SFP28-25GLR-31	Yes	25-Gigabit Ethernet SFP28 LR optical transceiver

The following table describes the 25-Gigabit Ethernet SFP28 AOC and DAC cables supported on the CSX4000 series appliances.

SFP28 Cable Type	Manufacturer	Part Number	enet-0/48 through enet-0/51	Cable Description
AOC 5-m	FS	S28-AO05	Yes	5-m (16-ft) generic compatible 25-Gigabit Ethernet

SFP28 Cable Type	Manufacturer	Part Number	enet-0/48 through enet-0/51	Cable Description
				SFP28 AOC cable
DAC 3-m	FS	S28-PC03	Yes	3-m (10-ft) SFP-H25G-CU3M compatible 25-Gigabit Ethernet SFP28 passive DAC twinax cable

Supported 100-Gigabit Ethernet QSFP28 Transceivers and Cables

The following table describes the 100-Gigabit Ethernet QSFP28 transceiver modules supported on the CSX4000 series appliances.

QSFP28 Transceiver Type	Manufacturer	Part Number	enet-0/52	enet-0/56	Transceiver Description
Short reach (SR4)	Finisar	FTLC9558REPM	Yes	Yes	100-m parallel MMF 100-Gigabit Ethernet Gen3 QSFP28 optical transceiver

The following table describes the 100-Gigabit Ethernet QSFP28 AOC and DAC cables supported on the CSX4300 series appliances.

QSFP28 Cable Type	Manufacturer	Part Number	enet-0/52	enet-0/56	Cable Description
AOC 5-m	FS	Q28-AO05	Yes	Yes	5-m (16-ft) 100-Gigabit Ethernet QSFP28 AOC cable
DAC 1-m	FS	Q28-PC01	Yes	Yes	1-m (3-ft) QSFP-100G-CU1M

QSFP28 Cable Type	Manufacturer	Part Number	enet-0/52	enet-0/56	Cable Description
					compatible 100-Gigabit Ethernet QSFP28 passive DAC twinax cable
DAC 5-m	FS	Q28-PC05	Yes	Yes	5-m (16-ft) 100-Gigabit Ethernet QSFP28 passive DAC twinax cable

The following table describes the 100-Gigabit Ethernet QSFP28 DAC and AOC cables supported on the CSX4500 series appliances.

QSPF 28 Cable Type	Manufacturer	Part Number	enet-0/52	enet-0/56	Cable Description
AOC 5-m	Finisar	Q28-AO05	Yes	Yes	5-m (16-ft) 100-Gigabit Ethernet QSFP28 AOC cable
DAC 5-m	Finisar	Q28-PC05	Yes	Yes	5-m (16-ft) 100-Gigabit Ethernet QSFP28 passive DAC twinax cable

Supported AOC and DAC Breakout Cables

The following table describes the AOC and DAC breakout cables supported on the CSX4000 series appliances.

Breakout Cable Type	Manufacturer	Part Number	enet-0/52	enet-0/56	Breakout Cabl
AOC 5-m QSFP+ to SFP+	FS	Q-4SAO05	Yes	Yes	5-m (16-ft) gen to four 10-Giga

Breakout Cable Type	Manufacturer	Part Number	enet-0/52	enet-0/56	Breakout Cabl
AOC 5-m QSFP28 to SFP28	FS	Q-4S28AO05	Yes	Yes	5-m (16-ft) gen cable to four 25
DAC 2-m QSFP+ to SFP+	FS	Q-4SPC02	Yes	Yes	2-m (7-ft) gene four 10-Gigabit
DAC 5-m QSFP+ to SFP+	FS	Q-4SPC05	Yes	Yes	5-m (16-ft) gen to four 10-Giga
DAC 3-m QSFP28 to SFP28	FS	Q-4S28PC03	Yes	Yes	3-m (10-ft) gen cable to four 25
DAC 5-m QSFP28 to SFP28	FS	Q-4S28PC05	Yes	Yes	5-m (16-ft) gen cable to four 25
Four 10-Gigabit Ethernet optic	FS	FTLX8574D3BCL	Yes	Yes	40-Gigabit Ethe 10-Gigabit Ethe
Four 25-Gigabit Ethernet optic	Finisar	FTLC9558REPM	Yes	Yes	100-Gigabit Eth 25-Gigabit Ethe

LED Colors

The color of the LEDs on the CSX4300 and CSX4500 series appliances depend on the speed of the media connected to the appliance.

For the CSX4000 series appliances, the colors are as follows:

- 1-Gigabit Ethernet—White
- 10-Gigabit Ethernet—Light green
- 25-Gigabit Ethernet—White
- 100-Gigabit Ethernet—White
- Four 10-Gigabit Ethernet breakout—Light green
- Four 25-Gigabit Ethernet breakout—White

Test Environment

The following test environments were used for the remote devices:

- 1-Gigabit Ethernet media

- ◦ Test the 1-Gigabit Ethernet link connection of CSX4300 and CSX4500 switches with the peer switch as BCM platforms (CSG3000, CSX4000, and CSX8300 series appliances)

- ◦ To set the speed of a port as 1-Gigabit Ethernet, issue the **set interfaces** *port-number* **ether-options link-speed 1g** CLI command.

- ◦ Plug in the same SFP on the local and remote ends.

- ◦ 1-Gigabit Ethernet copper SFP optic is not supported on the 25-Gigabit Ethernet fiber ports of CSX4000 series appliances.

- 10-Gigabit Ethernet/25-Gigabit Ethernet media

  - ◦ Test the 10-Gigabit Ethernet link as a connection of CSX4300 and CSX4500 switches with the peer switch as BCM
platforms (CSG3000, CSX4000, and CSX8300 series appliances)

  - ◦ To validate 10-Gigabit Ethernet ports on 25-Gigabit Ethernet ports, issuing the **set interfaces** *port-number* **ether-options link-speed 10g** CLI command to set the speed of the fiber port as 10-Gigabit Ethernet.

  - ◦ Validate the 10-Gigabit Ethernet copper optic across the RJ45 ports on the peer switch.

  - ◦ Plug in the same SFP+ on the local and remote ends.

  - ◦ 10-Gigabit Ethernet copper SFP optic is supported on the 25-Gigabit Ethernet fiber ports of CSX4000 series appliances. Note that the CAT6A cable from this port must be plugged to a 10-Gigabit Ethernet copper port on the peer switch.

- 100-Gigabit Ethernet media

  - ◦ Test the 100-Gigabit Ethernet link connection of CSX4300 and CSX4500 switches with the peer switch as BCM platforms (CSG3000, CSX4000, and CSX8000 series appliances) and 100-Gigabit Ethernet port of the Spirent traffic generator.

  - ◦ Plug the same QSFP28 on the local and remote ends.

  - ◦ 100-Gigabit Ethernet DAC cable comes up between the BCM switch and the Spirent only after enabling *"Autoneg On"* on the Spirent.

- Breakout port media

  - ◦ On the CSX4000 series appliance, issue the **set interfaces** *port-number* **breakout-mode 4x10g** CLI command to configure all the breakout ports on the device under test (DUT). For example:

    - ▪ To configure four 10-Gigabit Ethernet port breakout on a 100-Gigabit Ethernet interface of a CSX4000 series appliance, issue the **set interfaces enet-0/52 breakout-mode 4x10g** CLI command.

    - ▪ To configure four 25-Gigabit Ethernet port breakout on a 100-Gigabit Ethernet interface of a CSX4000 series appliance, issue the **set interfaces enet-0/52 breakout-mode 4x25g** CLI command.

  - ◦ Enable all the breakout ports on the DUT and on the peer switch in which the tail ends are inserted. For example, issue the **set interfaces enet-0/52 enable true** CLI command.