Validated SFPs and Cables for CSX8000 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) 8000 series appliance fiber interfaces, and it describes the test environment used for the remote switches.

Supported Ethernet Ports for CSX8000

You can install SFP, SFP+, SFP28, and QSFP28 transceivers in Ethernet ports enet-0/0 through enet-0/77 of CSX8300 switch and Ethernet ports enet-0/0 through enet-0/124 of CSX8500 switch. The Ethernet ports on the CSX8000 series appliances use different Ethernet controllers and hence support different SFPs.

The following table describes the Ethernet ports, controllers, and supported transceivers on the CSX8300 series appliances.

Ethernet Ports	Controller	Supported Transceivers
enet-0/0 through enet-0/47	Broadcom BCM56873	10-Gigabit/25-Gigabit Ethernet fiber ports
enet-0/48, enet-0/52, enet-0/56, enet-0/60, enet-0/64, enet-0/68, enet-0/72, enet-0/76	Broadcom BCM56873	100-Gigabit Ethernet fiber ports

The following table describes the Ethernet ports, controllers, and supported transceivers on the CSX8500 series appliance. Note that the Ethernet ports are in modules of four ports for each module, for example, enet-0/0, enet-0/4, and enet-0/8.

Ethernet Ports	Controller	Supported Transceivers
enet-0/0 through enet-0/124	Broadcom BCM56873	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 CSX8300 series appliances.

SFP/SFP+ Transceiver Type	Manufacturer	Part Number	enet-0/0 through enet-0/47	Transceiver Description
Short reach (SR)	Finisar	FTLX8574D3BCV-IT	Yes	Intel OEM, 1-Gigabit Ethernet-SX/10G-SR dual-rate
Long reach (LR)	Finisar	FTLX1471D3BCV-IT	Yes	Intel OEM, 1-Gigabit Ethernet -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 CSX8300 series appliances.

SFP Transceiver Type	Manufacturer	Part Number	enet-0/0 through enet-0/47	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

Supported 10-Gigabit Ethernet SFP+ Transceivers and Cables

The following table describes the 10-Gigabit Ethernet SFP+ transceiver modules supported on the CSX8300 series appliances.

SFP+ Transceiver Type	Manufacturer	Part Number	enet-0/0 through enet-0/47	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 CSX8300 series appliances.

SFP+ Cable Type	Manufacturer	Part Number	enet-0/0 through enet-0/47	Cable Description
AOC 5-m	FS	SFPP-AO05	Yes	5-m (16-ft) generic compatible 10-Gigabit Ethernet SFP+ AOC cable
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 CSX8300 series appliances.

SFP28 Transceiver Type	Manufacturer	Part Number	enet-0/0 through enet-0/47	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 CSX8300 series appliances.

SFP28 Cable Type	Manufacturer	Part Number	enet-0/0 through enet-0/47	Cable Description
AOC 5-m	FS	S28-AO05	Yes	5-m (16-ft) generic compatible 25-Gigabit Ethernet 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 CSX8300 series appliances. Note that the Ethernet ports are in modules of four ports for each module.

QSFP28 Transceiver Type	Manufacturer	Part Number	enet-0/48 through enet-0/76	Transceiver Description
Short reach (SR)	Finisar	FTLC9558REPM	Yes	100-m parallel MMF

QSFP28 Transceiver Type	Manufacturer	Part Number	enet-0/48 through enet-0/76	Transceiver Description
				100-Gigabit Ethernet Gen3 QSFP28 optical transceiver

The following table describes the 100-Gigabit Ethernet QSFP28 AOC and DAC cables supported on the CSX8300 series appliances. Note that the Ethernet ports are in modules of four ports for each module.

QSFP28 Cable Type	Manufacturer	Part Number	enet-0/48 through enet-0/76	Cable Description
AOC 5-m	FS	Q28-AO05	Yes	5-m (16-ft) 100-Gigabit Ethernet QSFP28 AOC cable
DAC 1-m	FS	Q28-PC01	Yes	1-m (3-ft) QSFP 100-Gigabit Ethernet CU1M-compatible 100-Gigabit Ethernet QSFP28 passive DAC twinax cable
DAC 5-m	FS	Q28-PC05	Yes	5-m (16-ft) 100-Gigabit Ethernet QSFP28 passive DAC twinax cable

The following table describes the 100-Gigabit Ethernet QSFP28 transceiver modules supported on the CSX8500 series appliances. Note that the Ethernet ports are in modules of four ports for each module.

QSFP 28 Transceiver Type	Manufacturer	Part Number	enet-0/0 through enet-0/124	Transceiver Description
Short reach (SR)	Finisar	FTLC9558REPM	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 CSX8500 series appliances. Note that the Ethernet ports are in modules of four ports for each module.

QSFP 28 Cable Type	Manufacturer	Part Number	enet-0/0 through enet-0/124	Cable Description
AOC 5-m	Finisar	Q28-AO05	Yes	5-m (16-ft) 100-Gigabit Ethernet QSFP28 AOC cable
DAC 5-m	Finisar	Q28-PC05	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 CSX8300 series appliances. Note that the Ethernet ports are in modules of four ports for each module.

Breakout Cable Type	Manufacturer	Part Number	enet-0/48 through enet-0/72	Cable Description
AOC 5-m QSFP+ to SFP+	FS	Q-4SAO05	Yes	5-m (16-ft) generic compatible 40-Gigabit Ethernet QSFP+ AOC cable to four 10-Gigabit Ethernet SFP+ AOC cables
AOC 5-m QSFP28 to SFP28	FS	Q-4S28AO05	Yes	5-m (16-ft) generic compatible 100-Gigabit Ethernet QSFP28 AOC cable to four 25-Gigabit Ethernet SFP28 AOC cables
DAC 2-m QSFP+ to SFP+	FS	Q-4SPC02	Yes	2-m (7-ft) generic compatible 40-Gigabit Ethernet QSFP+ DAC cable to four 10-Gigabit Ethernet SFP+ passive DAC cables
DAC 5-m QSFP+ to SFP+	FS	Q-4SPC05	Yes	5-m (16-ft) generic compatible 40-Gigabit Ethernet QSFP+ DAC cable to four 10-Gigabit

Breakout Cable Type	Manufacturer	Part Number	enet-0/48 through enet-0/72	Cable Description
				Ethernet SFP+ passive DAC cables
DAC 3-m QSFP28 to SFP28	FS	Q-4S28PC03	Yes	3-m (10-ft) generic compatible 100-Gigabit Ethernet QSFP28 DAC cable to four 25-Gigabit Ethernet SFP28 passive DAC cables
DAC 5-m QSFP28 to SFP28	FS	Q-4S28PC05	Yes	5-m (16-ft) generic compatible 100-Gigabit Ethernet QSFP28 DAC cable to four 25-Gigabit Ethernet SFP28 passive DAC cables
Four 10-Gigabit Ethernet optic	FS		Yes	40-Gigabit Ethernet QSFP+ SR4 optic cable on head end; four 10-Gigabit Ethernet SFP+ SR optic cables on tail end
Four 25-Gigabit Ethernet optic	Finisar		Yes	100-Gigabit Ethernet QSFP+ SR4 optic cable on head end; four 25-Gigabit Ethernet SFP+ SR optic cables on tail end

The following table describes the AOC and DAC breakout cables supported on the CSX8500 series appliances. Note that the Ethernet ports are in modules of four ports for each module.

Breakout Cable Type	Manufacturer	Part Number	enet-0/0 through enet-0/120	Cable Description
AOC 5-m QSFP+ to SFP+	Finisar	Q-4SAO05	Yes	5-m (16-ft) generic compatible 40-Gigabit Ethernet QSFP+ AOC cable to four 10-Gigabit Ethernet SFP+

Breakout Cable Type	Manufacturer	Part Number	enet-0/0 through enet-0/120	Cable Description
				passive AOC cables
AOC 5-m QSFP28 to SFP28	Finisar	Q-4S28AO05	Yes	5-m (16-ft) generic compatible 100-Gigabit Ethernet QSFP28 AOC cable to four 25-Gigabit Ethernet SFP28 AOC cables
DAC 2-m QSFP+ to SFP+	Finisar	Q-4SPC02	Yes	2-m (7-ft) generic compatible 40-Gigabit Ethernet QSFP+ DAC cable to four 10-Gigabit Ethernet SFP+ passive DAC cables
DAC 5-m QSFP+ to SFP+	Finisar	Q-4SPC05	Yes	5-m (16-ft) generic compatible 40-Gigabit Ethernet QSFP+ DAC cable to four 10-Gigabit Ethernet SFP+ passive DAC cables
DAC 3-m QSFP28 to SFP28	Finisar	Q-4S28PC03	Yes	3-m (10-ft) generic compatible 100-Gigabit Ethernet QSFP28 DAC cable to four 25-Gigabit Ethernet SFP28 passive DAC cables
DAC 5-m QSFP28 to SFP28	Finisar	Q-4S28PC05	Yes	5-m (16-ft) generic compatible 100-Gigabit Ethernet QSFP28 DAC cable to four 25-Gigabit Ethernet SFP28 passive DAC cables
Four 10-Gigabit Ethernet optic	FS	FTLX8574D3BCL	Yes	40-Gigabit Ethernet QSFP+ SR4 optic cable on head end; four 10-Gigabit Ethernet SFP+ SR optic cables on tail

Breakout Cable Type	Manufacturer	Part Number	enet-0/0 through enet-0/120	Cable Description
				end
Four 25-Gigabit Ethernet optic	Finisar	FTLC9558REPM	Yes	100-Gigabit Ethernet QSFP+ SR4 optic cable on head end; four 25-Gigabit Ethernet SFP+ SR optic cables on tail end

LED Colors

The color of the LEDs on the CSX8300 and CSX 8500 series appliances depends on the speed of the media connected to the appliance.

For the CSX8300 series appliances, the colors are as follows:

- 1-Gigabit Ethernet—Amber (orange)
- 10-Gigabit Ethernet—Light green
- 25-Gigabit Ethernet—Dark green
- 100-Gigabit Ethernet—Dark green
- Four 10-Gigabit Ethernet breakout—Violet
- Four 25-Gigabit Ethernet breakout—Light green

For the CSX8500 series appliances, the colors are as follows:

- 100-Gigabit Ethernet—Dark blue
- Four 10-Gigabit Ethernet breakout—Dark 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 on CSX8300 appliances with BCM platform (CSG3000, CSX4000, and CSX8300 series appliances) as the peer switch.
  - To set the speed of a port group as 10-Gigabit Ethernet, issue the **set system platform npu port-group** *group-x* **speed 4x10g** CLI command.

- 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 the same SFP on the local and remote ends.
- 10-Gigabit Ethernet media
    - Test the 10-Gigabit Ethernet link connection on CSX8300 platforms with BCM platforms (CSG3000 series appliances, CSX4000 series and CSX8300 switches) as the peer switch.
    - To set the speed of a port group as 10-Gigabit Ethernet, issue the **set system platform npu port-group** *group-x* **speed 4x10g** CLI command.
    - Plug 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 CSX8300 series appliances. Note that the CAT6A cable from this port must be plugged in to a 10-Gigabit Ethernet copper port on the peer switch.
- 25-Gigabit Ethernet media
    - Test the 25-Gigabit Ethernet link connection on CSX8300 platforms with BCM platforms (CSG3000 series appliances , CSX4000 series and CSX8300 switches) as the peer switch.
    - Plug in the same SFP28 optics on the local and remote ends.
- 100-Gigabit Ethernet media
    - Test the 100-Gigabit Ethernet link connection on CSX8000 appliances with BCM platforms (CSG3000 , CSX4000, and CSX8000 series appliances) as the peer switch.
    - Test the 100-Gigabit Ethernet link connection with the CSX8300 and CSX8500 themselves as the peer switch and 100-Gigabit Ethernet port of the Spirent traffic generator.
    - Plug in the same QSFP28 optics 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 CSX8000 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 CSX8300 switch, issue the **set interfaces enet-0/48 breakout-mode 4x10g** CLI command.
        - To configure four 25-Gigabit Ethernet port breakout on a 100-Gigabit Ethernet interface of a CSX8300 switch, issue the **set interfaces enet-0/48 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-0/48 enable true** CLI command.
    - Breakout port configuration is not allowed on the last port of the CSX8300 (enet-0/76) and CSX8500 (enet-0/ 124) appliances.