

Arista 800G Transceivers and Cables: Q&A

What are the benefits of moving to 800G technology?

Arista's 800G platforms allow data centers and high-performance computing environments to address growing needs for higher bandwidth at lower cost and power per gigabit. Key benefits include:

- Increase switching bandwidth by a factor of 2 when compared to 400G/port systems. Migrating from a 32x 400G/port to a 32x 800G/port system doubles the bandwidth density from 12.8T / RU to 25.6T / RU.
- Easy aggregation of 400G links: All 800G/port systems can be configured as 2x 400G, and all Arista 800G optics allow 2 physically distinct 400GE links without the need for optical breakout cables.
- High density 400G and ultra-high density 100G: A 32 port 1RU 800G system enables 64 ports of 400GE, or 256 ports of 100GE in a single RU. Arista offers 800G optics that enable 2x 400GE and 8x 100GE connectivity that interoperate with existing 400G and 100G optics.

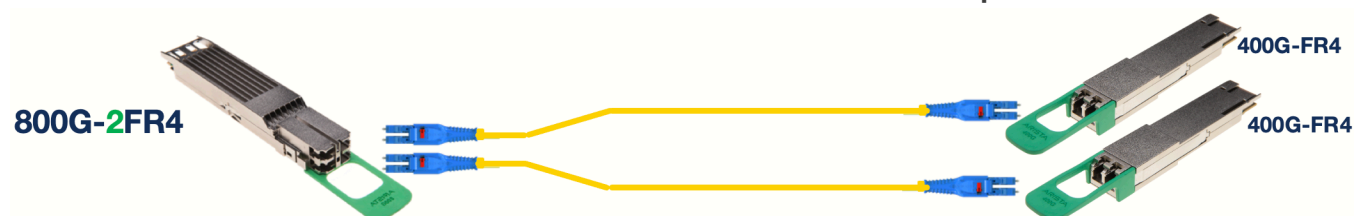
What 800G Transceivers and Cables are available from Arista?

Arista supports a range of 800G optical transceivers, Active Optical Cables (AOCs), Direct Attach Copper cables (DACs), and Active Electrical Cables (AECs) in both OSFP and QSFP-DD form factors. The tables below summarize the 800G connectivity options supported. Additional media types will be added over time.

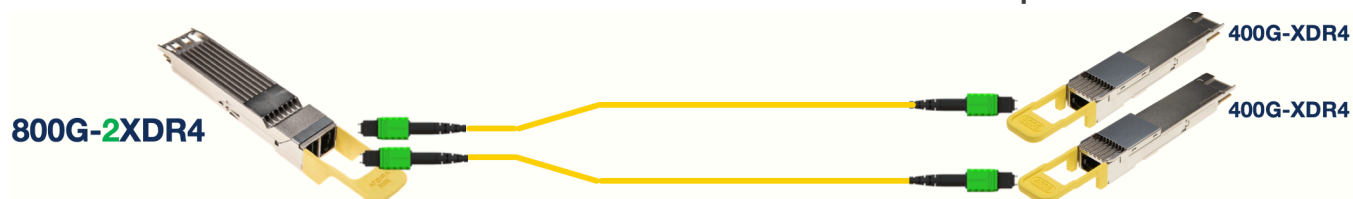
800G Optical Transceivers		
OSFP Part No.	QSFP-DD Part No.	Product Description
OSFP-800G-2FR4	QDD-800G-2FR4	2x 400GBASE-FR4 / 200GBASE-FR4 Dual-Rate Transceiver, dual LC connectors, up to 2km over dual duplex SMF. Interoperates with 2x 400G-FR4 OSFP / QSFP-DD, or 2x 200G-FR4 QSFPs.
OSFP-800G-2LR4	QDD-800G-2LR4	2x 400GBASE-LR4 / 200GBASE-LR4 Dual-Rate Transceiver, dual LC connectors, up to 10km over dual duplex SMF. Interoperates with 2x 400G-LR4 OSFP / QSFP-DD, or 2x 200G-LR4 QSFPs.
OSFP-800G-2XDR4	QDD-800G-2XDR4	2x 400GBASE-XDR4 Transceiver, Dual MPO-12 APC connector, 2km over parallel SMF. Interoperates with 2x 400G-XDR4 OSFP / QSFP-DD, and 8x 100G-FR QSFPs.
LPO-800G-2DR4	-	2x 400GBASE-DR4 Linear Pluggable OSFP Transceiver, Dual MPO-12, up to 500m over parallel SMF.
OSFP-800G-2PLR4	QDD-800G-2PLR4	2x 400GBASE-PLR4 Transceiver, Dual MPO-12 APC connector, 10km over parallel SMF. Interoperates with 2x 400G-PLR4 OSFP / QSFP-DD, and 8x 100G-LR QSFPs.
OSFP-800G-2VSR4	QDD-800G-2VSR4	2x 400GBASE-VSR4 Transceiver, Dual MPO-12 connector, up to 50m over parallel multi-mode OM4 fiber (MMF). Interoperates with 2x 400G-VSR4 OSFP / QSFP-DD

The diagrams below illustrate connectivity between 800G optics to 2x 400G optics, and breakout to 8x 100G links.

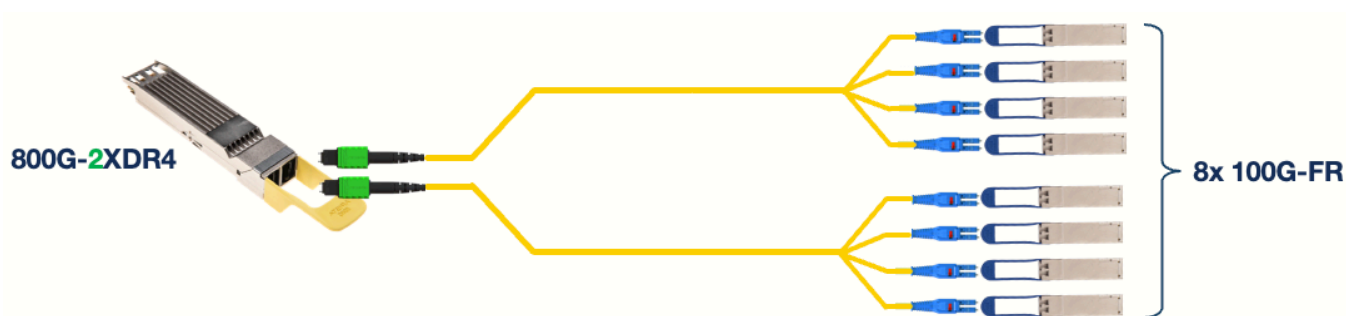
800G-2FR4 to 2x 400G-FR4: No breakout cables required



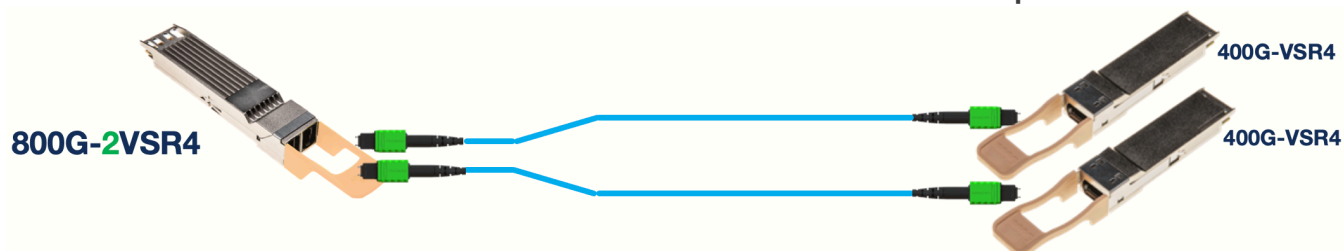
800G-2XDR4 to 2x 400G-XDR4: No breakout cables required



Breakout from 800G-2XDR4 to 8x 100G-FR links



800G-2VSR4 to 2x 400G-VSR4: No breakout cables required



800G AOC (Active Optical Cables)		
OSFP Part Number	QSFP-DD Part No.	Product Description
“Straight Through” AOCs		
A-O800-O800-xM	A-D800-D800-xM	800G AOC, x meter (OSFP to OSFP, or QSFP-DD to QSFP-DD) [x=1, 3, 5, 7, 10, 15, 20, 25, 30]
Breakout AOC Cables		
A-O800-2Q400-xM	A-D800-2Q400-xM	800G AOC, x meter (OSFP to 2x 400G QSFP-DD, or QSFP-DD to 2x 400G QSFP-DD) [x=1, 3, 5, 7, 10, 15, 20, 25, 30]

800G Passive Copper Cables (or Direct Attach Cables or ‘DACs’)		
OSFP Part Number	QSFP-DD Part No.	Product Description
“Straight Through” DACs		
C-O800-O800-xM	C-D800-D800-xM	800G Passive DAC, x meter (OSFP to OSFP, or QSFP-DD to QSFP-DD) [x=1, 2]
Breakout DACs		
C-O800-2Q400-xM	C-D800-2Q400-xM	800G Passive DAC, x meters (OSFP to 2x 400G QSFP-DD, or QSFP-DD to 2x 400G QSFP-DD) [x=1, 2]
C-O800-4Q200-xM	C-D800-4Q200-xM	800G Passive DAC, x meters (OSFP to 4x 200G QSFP56, or QSFP-DD to 4x 200G QSFP56) [x=1, 2]

800G ‘Straight Through’ Active Electrical Cables		
OSFP Part Number	QSFP-DD Part No.	Product Description
E-O800-O800-xM	E-D800-D800-xM	800G Active Electrical Cable, [x = 1, 2, 3 meter] (OSFP to OSFP, or QSFP-DD to QSFP-DD)

What form-factors are used for 800G optics and cables?

800G optics and cables use the same form-factors used by 400G optics, the OSFP and the QSFP-DD. Arista supports both form-factors, and Arista 800G platforms are offered in both OSFP and QSFP-DD variants.

- **The OSFP:** The OSFP stands for “Octal Small Form-factor Pluggable”. It is described as an “Octal” module because the electrical interface of an OSFP connector consists of 8 electrical lanes. When used for 800G, each electrical lane is modulated at 100Gb/s, for a total of bandwidth of 800Gb/s.
- **The QSFP-DD:** The QSFP-DD stands for “Quad Small Form-factor Pluggable (QSFP) – Double Density (DD)”. The QSFP-DD form factor is similar to the QSFP form factor, with an additional second row of electrical contacts to increase the number of high-speed electrical lanes from 4 (in a QSFP) to 8 (in a QSFP-DD). When used for 800G, each electrical lane of the QSFP-DD is modulated at 100Gb/s, for a total bandwidth of 800Gb/s.

Can OSFPs be plugged into a QSFP-DD port, or QSFP-DD's plugged into an OSFP port?

No. The OSFP and the QSFP-DD are two physically distinct form factors. For OSFP systems, OSFP optics and cables must be used, and for QSFP-DD systems, QSFP-DD optics and cables must be used.

Can an OSFP on one end of an 800G link interop with a QSFP-DD on the other end of a link?

Yes. The OSFP and QSFP-DD describe the physical form factor of the module. If the Ethernet media types are the same, the OSFP and QSFP-DD modules will interop with each other.

Can 400G OSFP / QSFP-DD modules be plugged into 800G OSFP/QSFP-DD ports?

Yes. Arista 400G modules will be detected and enabled upon insertion into Arista switches, provided that the physical form-factor is compatible (i.e. OSFPs cannot be plugged into QSFP-DD ports and vice versa).

Can 800G OSFP / QSFP-DD optical transceivers be plugged into 400G OSFP/QSFP-DD ports?

Only in some instances – if the following conditions apply:

- i) The 800G module must be capable of operation at ½ speed (with each electrical lane running at 50G PAM-4 instead of 100G PAM-4). The 800G-2XDR4 / 2PLR4 optics are not capable of dual-rate operation, so they cannot be used in 400G ports. Arista's 800G-2FR4/LR4 transceivers and DAC cables can operate at ½ speed.
- ii) **The 400G switch port must be capable of supporting the higher power draw of 800G modules.** 800G modules draw more power than 400G modules, so should only be used in 400G platforms capable of powering and cooling the 800G modules. This will limit the number of 400G platforms that can accept an 800G module, even if the module itself can operate at a lower data rate. Refer to the transceiver and cable datasheet for transceiver power consumption, and Arista 400G switch platform datasheets for details on specific systems.

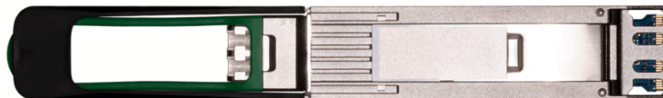
Can QSFP optical modules be used in OSFP ports?

Yes. An QSFP (40G or 100G) optical module can be inserted into an OSFP port by using a simple mechanical adapter. This adapter is available from Arista, with part number ADPT-O-Q-100G. The adapter, and the adapter with a QSFP plugged into it, are shown below.

OSFP to QSFP adapter (ADPT-O-Q-100G)



OSFP to QSFP adapter, with a 100G QSFP plugged in



When using a QSFP module in an OSFP port, the OSFP port must be configured for a data rate of 100G (or 40G), instead of 400G or 800G.

Can I plug a 100G QSFP module into a QSFP-DD port?

Yes. A QSFP (40G or 100G) module can also be inserted into a QSFP-DD port (without a mechanical adapter). When using a QSFP module in an QSFP-DD port, the QSFP-DD port must be configured for a data rate of 100G (or 40G), instead of 400G or 800G.

What are the pros and cons of using OSFPs or QSFP-DDs?

Arista supports both the OSFP and the QSFP-DD form factors – in other words, Arista will provide OSFP compatible hardware, and QSFP-DD compatible systems.

The QSFP-DD form factor is based on the QSFP form factor with an extra row of electrical pins added. It allows strict backwards compatibility with 40G and 100G QSFP modules. To dissipate the larger power of 400G modules, the QSFP-DD relies on an external heatsink that is part of the switch platform – i.e. when a QSFP-DD module is inserted into a QSFP-DD port, the platform must provide a heatsink that makes contact with the QSFP-DD module with sufficient pressure to guarantee a low thermal resistance interface.

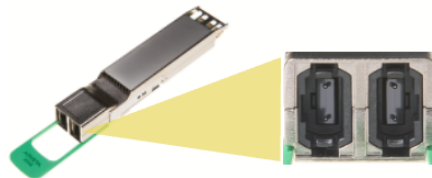
The OSFP form factor was designed from the ground up for optimal performance at 400G and 800G. It allows for backwards compatibility to 40G and 100G QSFP optics using the ADPT-O-Q-100G passive adapter. A key difference of the OSFP is that the heatsink is integrated into the module case itself. This has the advantage of ensuring the best possible thermal contact between the power dissipating components and the heatsink, enabling better thermal performance. The OSFP also has approximately 50% more surface area than the QSFP-DD, enhancing the ability of the module to dissipate heat. OSFP modules run between 5C – 15C cooler than QSFP-DD modules in equivalent systems. This allows support for a large range of optics, and operating optics at lower temperature improves reliability.

What do the suffixes “400G-XDR4 / PLR4, 400G-FR4 / LR4, 800G-2XDR4 / 2PLR4, 400G-VSR4/ 800G-2VSR4 and 800G-2FR4 / 2LR4” stand for?

The letters are reach specifications, and the number refers to the number of optical channels:

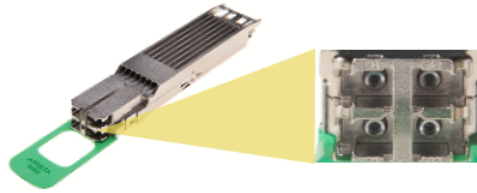
- i) **400G-XDR4 and 400G-PLR4:** “XDR” stands for “eXtended Reach DR”, and “PLR” stands for “Parallel Long Reach”. XDR4 / PLR4 optics have a reach of 2km / 10km using single-mode fiber, and the “4” indicates there are 4 optical channels. Each of the 4 optical channels are carried on separate fibers, resulting in a total of 4 pairs of fibers (4 fibers for Tx and 4 fibers for Rx). Each optical channel operates at 100Gb/s, enabling a total bandwidth of 400G. 400G-XDR4 / PLR4 interfaces use an MPO-12 connector to connect to 4 fiber pairs.
- ii) **800G-2XDR4 and 800G-2PLR4:** Refers to 2x “400G-XDR4” or 2x “400G-PLR4” interfaces, as described above. 800G-2XDR4 / 2PLR4 modules have 2x MPO-12 connectors, enabling 2 physically distinct 400G-XDR4/PLR4 links from each 800G transceiver without the need for optical breakout cables. The image below illustrates the dual MPO-12 connectors used in an OSFP-800G-XDR4.

Dual MPO-12 connectors on 800G-2XDR4 / 2PLR4 Transceivers



- iii) **400G-FR4 / LR4:** “FR” / “LR” refers to 2km / 10km reach using SMF, and “4” indicates there are 4 optical channels. All 4 optical channels from a 400G-FR4 / LR4 module are multiplexed onto one fiber in each direction (1 Tx fiber and 1 Rx fiber). Each optical channel operates at 100Gb/s, enabling 400G for each 400G-FR4/LR4 interface over a single fiber pair. 400G-FR4 / LR4 modules use a duplex LC optical connector.
- iv) **800G-2FR4 / 800G-2LR4:** Refers to 2x “400G-FR4” or 2x “400G-LR4” interfaces as described above. 800G-2FR4 / 2LR4 modules have 2 duplex LC connectors, enabling 2 physically distinct 400G-FR4/LR4 links from each 800G transceiver without the need for optical breakout cables. The image below illustrates the dual LC-duplex connector used on the OSFP-800G-2FR4 transceiver.

Dual duplex-LC connectors on 800G-2XDR4 / 2PLR4 Transceivers



- v) **400G-VSR4:** “VSR” refers to 50m reach using multimode fiber, and the “4” implies there are 4 optical channels. Each of the 4 optical channels are carried on separate fibers, resulting in a total of 4 pairs of fibers. Each optical channel operates at 100Gb/s. There are two IEEE defined standards for 100G/wave MMF optics: 400GBASE-SR4 (for 100m reach over parallel OM4 MMF), and 400GBASE-VR4 (for 50m reach over parallel OM4 MMF). Arista’s 400G-VSR4 transceivers are fully compliant with the 400GBASE-VR4 standard, and optically interoperable with both 400GBASE-SR4 and 400GBASE-VR4 transceivers over a reach of 50m.
- vi) **800G-2VSR4:** Refers to 2x “400G-VSR4” interfaces, as described above. 800G-2VSR4 modules have 2x MPO-12 APC MMF connectors, enabling 2 physically distinct 400G-VSR4 links from each 800G transceiver without the need for optical breakout cables.

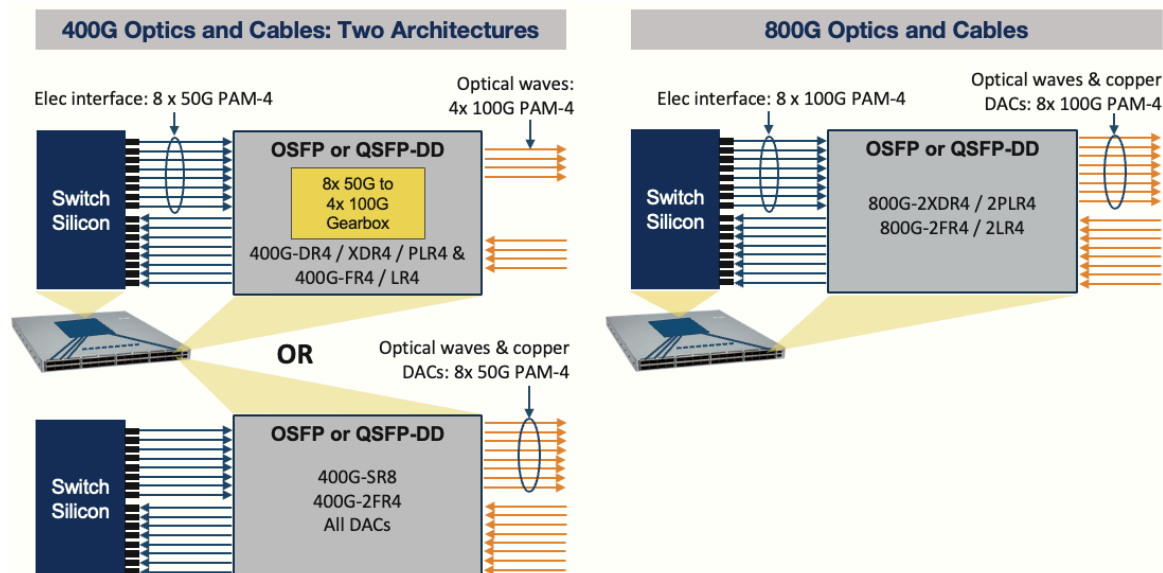
What are the speed and modulation formats used by 800G OSFP / QSFP-DD modules, and how does this compare to 400G OSFP / QSFP-DD modules?

All 800G modules and cables utilize 8x electrical lanes in each direction (8 transmit lanes and 8 receive lanes), with each lane running at a data rate of 100G PAM-4, enabling an aggregate bandwidth of 800Gb/s per module. The optical output of all 800G transceivers also consist of 8 optical waves modulated at 100G PAM-4 per lane.

All 400G modules and cables utilize 8x electrical lanes in each direction (8 transmit lanes and 8 receive lanes), with each lane running at a data rate of 50 PAM-4, enabling an aggregate bandwidth of 400Gb/s per module.

Some 400G optical transceivers (such as the 400G-FR4 and 400G-DR4) use an 8:4 gearbox to convert the 8x 50G PAM-4 electrical signals from the switch silicon to 4x 100G PAM-4 optical signals. Other 400G optical transceivers (such as 400G-SR8) do not use a gearbox, and simply perform electrical-to-optical conversion to enable an 8x 50G PAM-4 optical interface.

The basic data path architecture of 400G and 800G modules is illustrated in the diagram below.



What is the reach, fiber type, connector, and optical modulation for each 800G transceiver type?

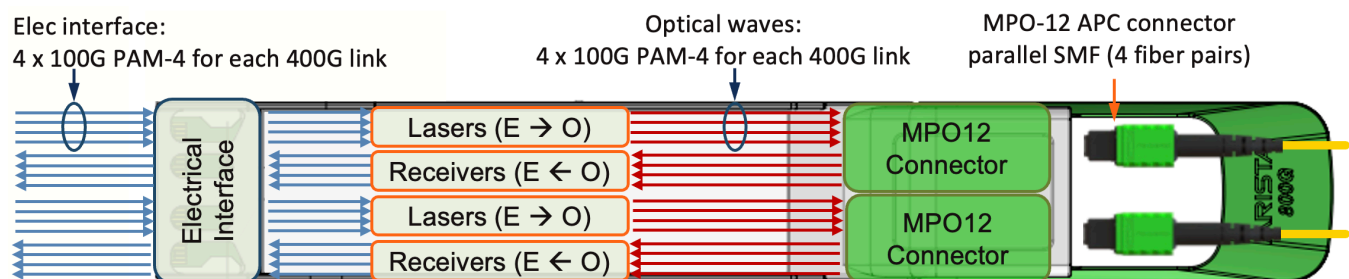
The table below summarizes the key parameters for the Arista's 800G optical transceivers

OSFP & QSFP-DD Part Numbers	Reach	Fiber type	Optical connector	No. of Fiber pairs	Optical waves per fiber	Optical modulation
OSFP-800G-2XDR4, QDD-800G-2XDR4	2km	Parallel SMF	2x MPO-12 APC	8 (4 pairs per MPO-12 connector)	1	100G PAM-4
LPO-800G-2DR4	500m	Parallel SMF	2x MPO-12 APC	8 (4 pairs per MPO-12 connector)	1	100G PAM-4
OSFP-800G-2PLR4, QDD-800G-2PLR4	10km	Parallel SMF	2x MPO-12 APC	8 (4 pairs per MPO-12 connector)	1	100G PAM-4
OSFP-800G-2FR4, QDD-800G-2FR4	2km	Duplex SMF	2x LC Duplex	2 (1 pair per LC duplex connector)	4	100G PAM-4
OSFP-800G-2LR4, QDD-800G-2LR4	10km	Duplex SMF	2x LC Duplex	2 (1 pair per LC duplex connector)	4	100G PAM-4
OSFP-800G-2VSR4, QDD-800G-2VSR4	50m	Parallel MMF	2x MPO-12 APC	8 (4 pairs per MPO-12 connector)	1	100G PAM-4

Note that all transceivers listed above use 8x optical channels, with each channel modulated at 100G PAM-4.

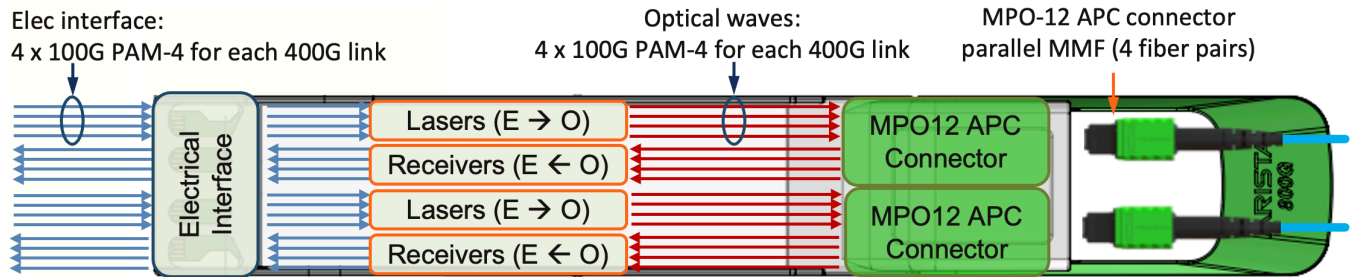
The 800G-2XDR4 / 2PLR4/ LPO-800G-2DR4 transceivers use a total of 8 fiber pairs (4 fiber pairs per 400G link), with a single 100G optical wave per fiber. The MPO-12 APC Single Mode Fiber (SMF) connectors used by 800G-2XDR4 / PLR4 transceivers are the same optical fiber and connector types used for 400G-DR4/XDR4/PLR4 and 100G-PSM4/PLRL4 transceivers. The diagram below illustrates the data path architecture of the 800G-2XDR4 / PLR4/ LPO-800G-2DR4 modules.

Data path block diagram of 800G-2XDR4 / 2PLR4, LPO-800G-2DR4 modules



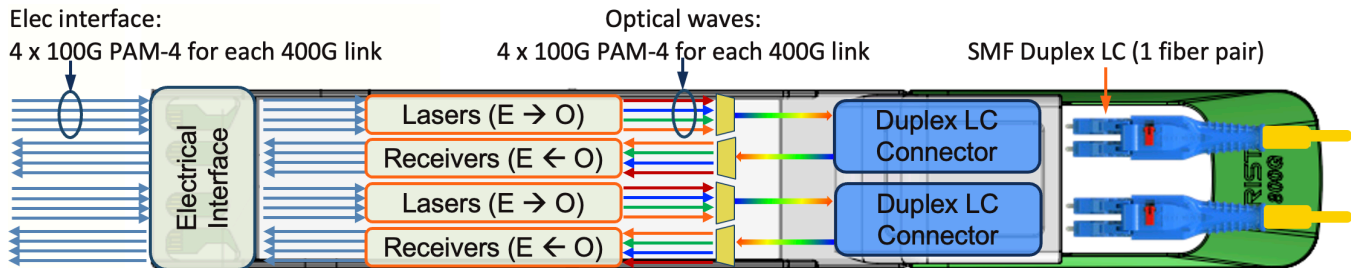
The OSFP-800G-2VSR4 / QDD-800G-2VSR4 (and OSFP-400G-VSR4 / QDD-400G-VSR4) transceivers use MPO-12 **APC** (Angled Physical Contact) Multimode fiber (**MMF**) optical connectors. The APC MMF connectors have an angled fiber end-face, which reduces optical back reflectance. This is **not compatible** with the MPO-12 UPC (Ultra Physical Contact) connectors more commonly used for 100G-SR4 and 40G-SR4 MMF optical links. The diagram below illustrates the data path architecture of the 800G-2VSR4 modules.

Data path block diagram of 800G-2VSR4 modules



The 800G-2FR4/2LR4 transceivers use 2 separate fiber pairs (1 fiber pair per 400G-FR4/LR4 link), with 4 different optical wavelengths multiplexed into each fiber. The diagram below illustrates the data path architecture of the 800G-2FR4 / 2LR4 modules.

Data path block diagram of 800G-2FR4 / LR4 modules

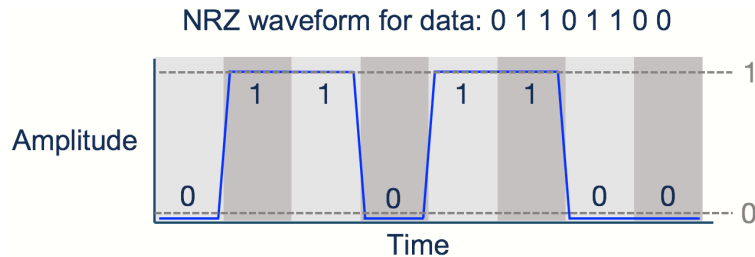


What is the maximum power consumption of 400G OSFP and QSFP-DD transceivers?

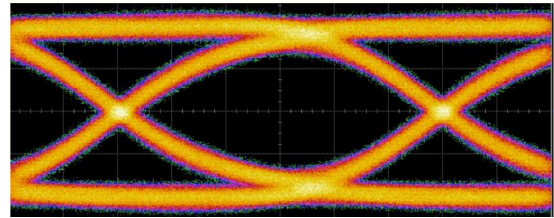
The power consumption of 800G client transceivers range from 16W to 18W per port. Refer to the transceiver data sheet for power consumption values of individual modules.

What does it mean when an electrical or optical channel is PAM-4 or NRZ?

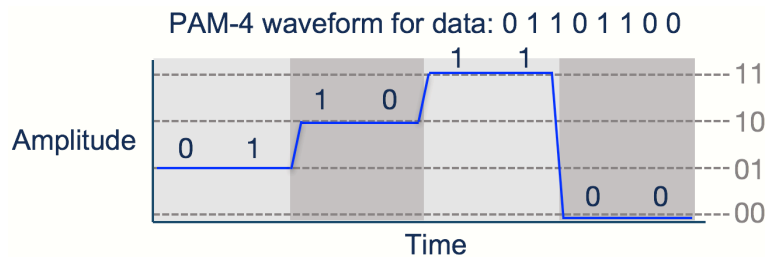
NRZ stands for “Non Return to Zero” modulation, and describes an electrical or optical data channel where there are only two allowed amplitude levels (or symbols), with one amplitude level representing a digital ‘1’ and the other level representing a digital ‘0’. This is the predominant modulation scheme for transmitting data up to 25Gb/s, and is the simplest way to transmit digital data. The diagram below shows an example of an NRZ waveform, along with an ‘eye diagram’ for NRZ data. An eye diagram is simply a way of viewing a modulation scheme with each symbol superimposed on each other.



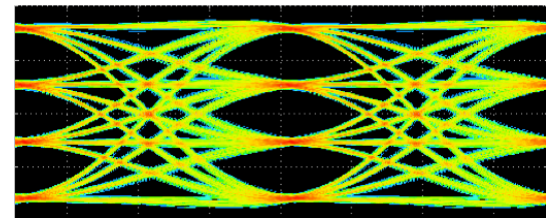
Eye diagram for NRZ data



PAM-4 stands for Pulse Amplitude Modulation – 4, where ‘4’ refers to the number of different amplitude levels (or symbols) of the electrical or optical signal carrying the digital data. In this case, each amplitude level (or symbol) represents two bits of digital data. This enables a PAM-4 waveform to transmit twice as many bits as a NRZ waveform at the same symbol (or “Baud”) rate. The diagram below shows an example of a PAM-4 waveform, along with an eye diagram for PAM-4 data.



Eye diagram for PAM-4 data



When a signal is referred to as “25Gb/s NRZ” or “25G NRZ”, it means the signal is carrying information at 25 Gbit / second with NRZ modulation. When a signal is referred to as “50G PAM-4”, or “100G PAM-4” it means the signal is carrying data at a rate of 50 Gbit / second, or 100 Gbit / second, respectively, using PAM-4 modulation.

What do the terms 100G-2, 100G-4, 200G-4, 400G-8, 400G-4 and 800G-8 mean?

These terms describe the bandwidth of an ethernet link, and the number of lanes used to achieve this bandwidth.

Every front panel port in an ethernet switch consists of one or more electrical lanes that transmit and receive ethernet data. For 10G SFP, 25G SFP or 50G SFP ports, a single electrical lane is used (in each direction) and modulated at 10G, 25G or 50G. For higher data rates, multiple lanes are required.

For example, a 100G QSFP port uses 4 lanes, with each lane running at 25Gb/s, or a '100G-4' interface. The number before the letter 'G' indicates the bandwidth of the ethernet link, and the number after the '-' indicates the number of data lanes required to achieve this bandwidth.

The table below summarizes the terminology used to describe common ethernet speeds, the number of lanes required to achieve this bandwidth, and some applications of these interface types:

Ethernet link	Link bandwidth	No. of lanes	Modulation of each lane	Common applications
10G	10Gb/s	1	10G NRZ	All 10G SFP+ ports
25G	25Gb/s	1	25G NRZ	All 25G SFP ports
50G	50Gb/s	1	50G PAM-4	All 50G SFP ports
50G-2	50Gb/s	2	25G NRZ	QSFP100 and QSFP200 ports on an Arista switch can often be configured to operate as 2x 50G-2 Ethernet links. 50G-2 QSFP interfaces are sometimes found in 50G NICs. Only 2 lanes (out of the 4 lanes available on a QSFP connector) are used. The Arista CAB-Q-2Q-100G-xM passive breakout cables can be used to breakout a 100G-4 QSFP port to 2x 50G-2 QSFP ports.
100G-4	100Gb/s	4	25G NRZ	All 100G QSFP ports. All Arista 200G QSFP ports can also be configured to operate at 100G-4.
100G-2	100Gb/s	2	50G PAM-4	400G OSFP or QSFP-DD ports can be configured to operate as 4x 100G-2 Ethernet links, and a QSFP200 port on an Arista switch can be configured to operate as 2x 100G-2 Ethernet links.
100G-1	100Gb/s	1	100G PAM-4	All 800G OSFP and QSFP-DD modules can be configured to operate as 8x 100G-1 Ethernet links. The electrical and optical interface of all 800G modules use 8 lanes at 100G PAM-4.
200G-4	200Gb/s	4	50G PAM-4	All 200G QSFP ports. A 400G OSFP or QSFP-DD port on an Arista switch can often be configured to operate as 2x 200G-4 Ethernet links. The Arista CAB-O-2Q-400G-xM and CAB-D-2Q-400G-xM passive breakout cables can be used to breakout a 400G OSFP or QSFP-DD port, respectively, to 2x 200G-4 QSFP ports.
200G-2	200Gb/s	2	100G PAM-4	800G ports on an Arista switch can often be configured to operate as 4x 200G-2 Ethernet links.
400G-8	400Gb/s	8	50G PAM-4	All 400G OSFP and QSFP-DD ports.
400G-4	400Gb/s	4	100G PAM-4	All 800G ports on an Arista switch can be configured to operate as 2x400G-4 Ethernet links.
800G-8	800Gb/s	8	100G PAM-4	Initial Arista 800G / port systems support 2x 400GE per 800G port. Future systems will support native 800GE as defined by the Ethernet Technology Consortium in 800GBASE-ETC-R and the IEEE in 802.3df (in progress).

What are the complete set of ethernet speeds that each 800G optical transceiver supports?

Each of Arista's 800G optical transceivers and cables can support several different operating modes, summarized in the tables below. The column labels "Lane 1", Lane "2", ... "Lane 8" represent the 8 lane electrical interface at the 800G OSFP or QSFP-DD port. The values in the "Lane" columns refer to the speed configuration of the 800G switch port, while the text in parenthesis indicates the corresponding optical standard.

QDD/OSFP 800G-2XDR4, 800G-2PLR4, LPO-800G-2DR4 supported modes								
Logical port configuration								
Lane 1	Lane 2	Lane 3	Lane 4	Lane 5	Lane 6	Lane 7	Lane 8	Notes
400G-4 (400G-XDR4 / PLR4)				400G-4 (400G-XDR4 / PLR4)				1
800G-8 (800G-XDR8 / PLR8)								2
200G-2		200G-2		200G-2		200G-2		3
100G-1 (100G-FR / LR)	100G-1 (100G-FR / LR)	100G-1 (100G-FR / LR)	100G-1 (100G-FR / LR)	100G-1 (100G-FR / LR)	100G-1 (100G-FR / LR)	100G-1 (100G-FR / LR)	100G-1 (100G-FR / LR)	4
Notes <ol style="list-style-type: none">Dual 400G mode is the default configuration of an 800G-2XDR4 / 2PLR4 module. Commonly used to aggregate 2x 400G-XDR4 / PLR4 links into a single 800G port.Used for point-to-point 800GE links – supported only in platforms that support a single 800GE MAC per port.This mode of operation supports breaking out an 800G port configuration to 4x 200GE logical links. This enables breakout into 4 physically separate 200G-2 links that may interop with third-party transceivers.8x 100G mode is commonly used to aggregate 8x 100G-FR / 800G-LR optics into a single 800G port.								

QDD/OSFP 800G-2FR4, 800G-2LR4 supported modes								
Logical port configuration								
Lane 1	Lane 2	Lane 3	Lane 4	Lane 5	Lane 6	Lane 7	Lane 8	Notes
400G-4 (400G-FR4 / LR4)				400G-4 (400G-FR4 / LR4)				1
800G-8								2
200G-2		200G-2		200G-2		200G-2		3
100G-1	100G-1	100G-1	100G-1	100G-1	100G-1	100G-1	100G-1	4
200G-4 (200G-FR4 / LR4)				200G-4 (200G-FR4 / LR4)				5
Notes 1. Dual 400G mode is the default configuration of an 800G-2FR4 / 2LR4 module. Commonly used to aggregate 2x 400G-FR4 / LR4 links into a single 800G port. 2. Used for point-to-point 800GE links – supported only in platforms that support a single 800GE MAC per port. 3. This mode of operation is less common. May be used if the 800G port is required to be configured as 4x 200GE logical links. Because the 800G-FR4 / LR4 has only two physical duplex LC optical connectors (with a total of 2 pairs of fiber), it does not support optical breakout into 4 physically separate 200GE ports								

4. This mode of operation is less common. May be used if the 800G port is required to be configured as 8x 100GE logical links. Because the 800G-FR4 / LR4 has only two physical duplex LC optical connectors (with a total of 2 pairs of fiber), it does not support optical breakout into 8 physically separate 100GE ports
5. When the module is run at ½ speed, each fiber pair can be used to interop with 2x 200G-FR4 or 2x 200G-LR4 links.

QDD/ OSFP 800G-2VSR4, 800G-VSR8 supported modes								
Logical port configuration								
Lane 1	Lane 2	Lane 3	Lane 4	Lane 5	Lane 6	Lane 7	Lane 8	Notes
400G-4 (400G-VSR4)				400G-4 (400G-VSR4)				1
800G-8 (800G-VSR8)								2
200G-2 (200G-VSR2)		200G-2 (200G-VSR2)		200G-2 (200G-VSR2)		200G-2 (200G-VSR2)		3
100G-1	100G-1	100G-1	100G-1	100G-1	100G-1	100G-1	100G-1	4
Notes <ol style="list-style-type: none">Dual 400G mode is the default configuration of an 800G-2VSR4 module. Commonly used to aggregate 2x 400G-VSR4 links into a single 800G port.Used for point-to-point 800GE links – supported only in platforms that support a single 800GE MAC per port.This mode of operation supports breaking out an 800G port configuration to 4x 200GE logical links. This enables breakout into 4 physically separate 200G-2 links that may interop with third-party transceivers.While the 800G-2VSR4 modules can be configured in 8x 100G-1 mode, note that 100G-SR transceivers are not widely available on the market (at the time of writing).								

What are the CLI commands to configure an 800G port for different speeds & logical interfaces?

For 2x 400G-4 operation:

```
switch(config)#interface Ethernet1/1,1/5
switch(config-if-Et1/1,1/5)#speed 400g-4
```

For 4x 200G-2 operation:

```
switch(config)#interface Ethernet1/1,1/3,1/5,1/7
switch(config-if-Et1/1,1/3,1/5,1/7)#speed 200g-2
```

For 8x 100G-1 operation:

```
switch(config)#interface Ethernet1/1-8
switch(config-if-Et1/1-8)#speed 100g-1
```

For 2x 200G-4 operation (800G port operated at ½ speed):

```
switch(config)#interface Ethernet1/1,1/5
switch(config-if-Et1/1,1/5)#speed 200g-4
```

What does “APC” or PC/UPC mean when it comes to optical connectors? Which optical connectors use APC, and which use UPC?

PC and UPC refers to “Physical Contact” or “Ultra Physical Contact” fibers. APC refers to “Angled Physical Contact” fibers.

These terms refer to geometry of the end face of the optical fiber that is used. In PC/UPC fiber connectors, the end face of the fiber is “flat”. With APC connectors, the end face of the fiber is polished at an angle to reduce back reflections.

The following table summarizes what type of fiber termination should be used with Arista optics.

Optics type (SMF or MMF)	Parallel or duplex fiber	Optical connector	Required fiber end polish	Comments
SMF and MMF	Duplex	Duplex LC	PC / UPC	Duplex LC connectors are widely used, and all Arista optics with duplex LC use PC / UPC fiber connectors
SMF	Parallel	MPO-12	APC	All Arista optics with SMF MPO-12 connectors use APC fiber connectors.
MMF	Parallel	MPO-12	UPC	All 40G, 100G and 200G Arista optics with MMF MPO-12 connectors use UPC fiber connectors.
MMF	Parallel	MPO-12	APC	400G-VSR4 and 800G-2VSR4 optics from Arista required MPO-12 APC connectors. These are not compatible with the MPO-12 UPC connectors used for 40G/100G-200G-SR4 transceivers.
MMF	Parallel	MPO-16	APC	The MPO-16 connector is used in the 400G-SR8 and 400G-SR8-C modules. It requires an APC connector.

What industry standards are associated with each of the 800G Transceivers and Cables?

The table below summarizes the Arista 400G transceivers and cables and the associated industry standards.

Arista Products	Associated Industry Standard
C-O800-O800-xM and C-D800-D800-xM	800G-ETC-CR8, as defined by the Ethernet Technology Consortium, based on IEEE802.3ck
OSFP-800G-2XDR4, and QDD-800G-2XDR4	Optical specs identical to the 100G-FR, as defined in the 100G Lambda MSA
OSFP-800G-2PLR4, and QDD-800G-2PLR4	Optical specs identical to the 100G-LR, as defined in the 100G Lambda MSA.
OSFP-800G-2FR4, and QDD-800G-2FR4	400G-FR4/LR4, as defined in the 100G Lambda MSA and IEEE 802.3. http://100glambda.com/
OSFP-800G-2VSR4, and QDD-800G-2VSR4	800G-SR4, as defined by the Ethernet Technology Consortium, based on IEEE802.3ck
All OSFP transceivers	The OSFP MSA: https://osfpmsa.org/
All QSFP-DD transceivers	The QSFP-DD MSA: http://www.qsfp-dd.com/

What additional resources are available on Transceivers and Cables?

Below is a list of additional resources available on the transceivers and cables page of www.arista.com.

Document	Description
Arista Transceivers and Cables Datasheet	Detailed specifications and ordering information
Transceiver and Cable Guide	Arista EOS support, physical attributes, laser safety and fiber cleaning instructions
400G Transceivers and Cables: Q&A	400G Optics and cables FAQ
200G Transceivers and Cables: Q&A	200G Optics and cables FAQ
100G Transceivers and Cables: Q&A	100G Optics and cables FAQ
Corning 400G Cabling Guide Leviton 100G/400G Cabling Guide Siemon Cabling Guide for 100G and 400G Fiber Optics	Partner documents: Fiber cabling reference guides and loss budget guidelines from Cabling companies like Corning and Leviton