

Arista 1.6T Transceivers and Cables: Q&A

What are the benefits of moving to 1.6T technology?

Arista's 200G Lane 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:

- Delivers double the switching capacity of current 800G-per-port architectures while enabling a new generation of tightly coupled, rack-scale infrastructure.
- High-density link aggregation: 1.6T ports support dual 800GE operation, enabling direct connection of independent 800G links while reducing cabling complexity and infrastructure costs, and allowing reuse of existing fiber plant to support migration to 1.6T.

What 200G Lane Transceivers and Cables are available from Arista?

The tables below provide an overview of Arista's supported 200G PAM4 connectivity portfolio, including optical transceivers, Active Optical Cables (AOCs), Direct Attach Copper (DAC) cables, and Active Electrical Cables (AECs). These solutions are available in both OSFP IHS and OSFP RHS form factors. Additional connectivity options will be introduced as the portfolio continues to expand.

OSFP IHS/RHS SKU	Product Description
OSFP-1T6-2XDR4	2x 800GBASE-XDR4 OSFP IHS Transceiver, dual MPO-12 connectors, supports up to 2km over parallel SMF, for 200G SerDes Systems
OSFP-R-1T6-2XDR4	2x 800GBASE-XDR4 OSFP RHS Transceiver, dual MPO-12 connectors, supports up to 2km over parallel SMF, for 200G SerDes Systems
OSFP-1T6-2FR4	2x 800GBASE-FR4 OSFP IHS Transceiver, dual LC connectors, supports up to 2km over SMF, for 200G SerDes Systems
OSFP-R-1T6-2FR4	2x 800GBASE-FR4 OSFP RHS Transceiver, dual LC connectors, supports up to 2km over SMF, for 200G SerDes Systems
LRO-1T6-2XDR4	2x 800GBASE-XDR4 OSFP IHS LRO Transceiver, dual MPO-12 connectors, supports up to 2km over parallel SMF, for 200G SerDes Systems
LRO-R-1T6-2XDR4	2x 800GBASE-XDR4 OSFP RHS LRO Transceiver, dual MPO-12 connectors, supports up to 2km over parallel SMF, for 200G SerDes Systems
LRO-1T6-2FR4	2x 800GBASE-FR4 OSFP IHS LRO Transceiver, dual LC connectors, supports up to 2km over SMF, for 200G SerDes Systems
LRO-R-1T6-2FR4	2x 800GBASE-FR4 OSFP RHS LRO Transceiver, dual LC connectors, supports up to 2km over SMF, for 200G SerDes Systems
OSFP-800G-XDR4	800GBASE-XDR4 OSFP IHS Transceiver, MPO-12 connector, supports up to 2km over parallel SMF, for 200G SerDes Systems
OSFP-R-800G-XDR4	800GBASE-XDR4 OSFP RHS Transceiver, MPO-12 connector, supports up to 2km over parallel SMF, for 200G SerDes Systems
OSFP-800G-FR4	800GBASE-FR4 OSFP IHS Transceiver, supports up to 2km over duplex SMF, for 200G SerDes Systems
OSFP-R-800G-FR4	800GBASE-FR4 OSFP RHS Transceiver, supports up to 2km over duplex SMF, for 200G SerDes Systems
OSFP-800G-XDR4-G	800GBASE-XDR4 (200G Lane) OSFP IHS Transceiver, MPO-12 connector, supports up to 2km over parallel SMF, for 100G SerDes Systems
OSFP-800G-FR4-G	800GBASE-FR4 (200G Lane) OSFP IHS Transceiver, supports up to 2km over duplex SMF, for 100G SerDes Systems

1.6T AOC (Active Optical Cables)	
OSFP IHS/RHS SKU	Product Description
“Straight Through” AOCs	
A-O1T6-O1T6-xM	1.6T OSFP IHS to OSFP IHS Active Optical Cable, x=1,3,5,7,10,15,20,25,30,50 meter
A-O1T6-R1T6-xM	1.6T OSFP RHS to OSFP RHS Active Optical Cable, x=1,3,5,7,10,15,20,25,30,50 meter
A-R1T6-R1T6-xM	1.6T OSFP RHS to OSFP RHS Active Optical Cable, x=1,3,5,7,10,15,20,25,30,50 meter

1.6T Passive Copper Cables (or Direct Attach Cables or ‘DACs’)	
OSFP IHS/RHS SKU	Product Description
“Straight Through” DACs	
C-O1T6-O1T6-xM	1600GBASE-CR8 OSFP IHS to OSFP IHS Twinax Copper Cable, x=0.5, 1 meter
C-R1T6-R1T6-xM	1600GBASE-CR8 OSFP RHS to OSFP RHS Twinax Copper Cable, x=0.5, 1 meter
C-O1T6-R1T6-xM	1600GBASE-CR8 OSFP IHS to OSFP RHS Twinax Copper Cable, x=0.5, 1 meter

1.6T ‘Straight Through’ Active Electrical Cables	
OSFP IHS/RHS SKU	Product Description
E-O1T6-O1T6-xM	1600GBASE-CR8 OSFP IHS to OSFP IHS Active Electrical Cable, x=1,1.5,2,3,4,5 meter
E-R1T6-R1T6-xM	1600GBASE-CR8 OSFP RHS to OSFP RHS Active Electrical Cable, x=1,1.5,2,3,4,5 meter
E-O1T6-R1T6-xM	1600GBASE-CR8 OSFP IHS to OSFP RHS Active Electrical Cable, x=1,1.5,2,3,4,5 meter
“Breakout” AECs	
E-O1T6-2R800-xM	1600GBASE-CR8 OSFP IHS to 2x 800GBASE-CR8 OSFP RHS Active Electrical Cable, x=1,1.5,2,3,4,5 meter
E-R1T6-2O800-xM	1600GBASE-CR8 OSFP RHS to 2x 800GBASE-CR8 OSFP IHS Active Electrical Cable, x=1,1.5,2,3,4,5 meter
E-R1T6-2R800-xM	1600GBASE-CR8 OSFP RHS to 2x 800GBASE-CR8 OSFP RHS Active Electrical Cable, x=1,1.5,2,3,4,5 meter

What is the difference between IHS and RHS OSFP variants? Can they be used interchangeably? Can they interop?

IHS (Integrated Heat Sink) Optics (ex: OSFP-800G-2XDR4) include their own heat sink attached on top of the OSFP body. RHS (Riding Heat Sink) Optics have no heat sink of their own and are designed to sit directly on the heat sink that is built into the OSFP cage (typically liquid cooled switches).

IHS and RHS modules are not interchangeable. A cage designed for a riding heat sink must use RHS optics, while cages without a riding heat sink must use IHS optics. These mechanical differences do not impact Optical interoperability, and both types of modules interop without any issues.

Arista's RHS Optics are indicated with "-R" for easy identification.

Ex: OSFP-800G-2VSR4 & OSFP-1T6-2XDR4 are IHS variants. OSFP-R-1T6-2XDR4 and LRO-R-1T6-2FR4 are RHS variants.



Can 1T6-2XDR4, 1T6-2VSR4, 800G-XDR4 and 800G-XDR4-G support breakouts for interoperability with NIC?

Yes. 200G λ optics support 2x 800G, 4x 400G, 8x 200G breakout services. The NIC, deployed with QSFP112, QSFP-DD or OSFP optics operating with 200G λ , using fiber splitter cable to interoperate with 1.6T ports configured in breakout mode.

Can 200G λ transceivers interop with existing 100G, 200G, 400G and 800G transceivers?

No. 200G PAM4 optics cannot interop with existing transceivers that operate with 100G PAM4, 50G PAM4 or 25G NRZ channels.

What transceivers can be used for interoperability between 1.6T Optics and existing 400G/800G platforms?

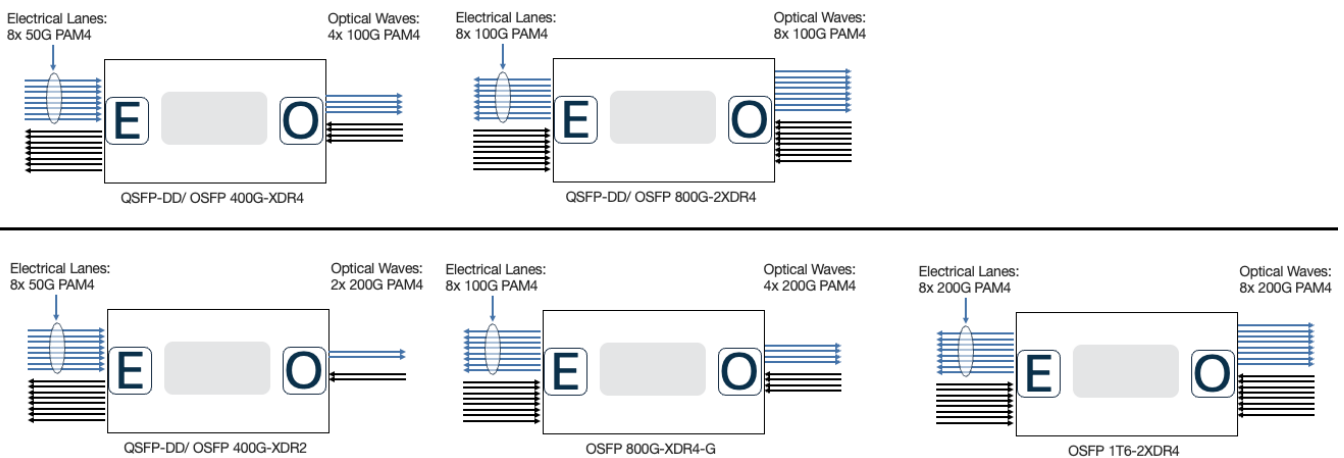
Arista's Optics portfolio includes the latest generation DSP based modules for 400G and 800G data rates that the electrical channels into 200G PAM4. These gearbox optics can support the interoperability between existing platforms and NICs with 1.6T Optics.

What are the key differences in modulation format and optical channel configuration between 1.6T, 800G, and 400G optics?

All 400G, 800G, and 1.6T modules and cables use 8 electrical lanes in each direction (8 transmit and 8 receive lanes). Each lane operates at 50G PAM4, 100G PAM4, or 200G PAM4, which provides a total aggregate bandwidth of 400 Gb/s, 800 Gb/s, or 1.6 Tb/s.

Existing 400G and 800G optics, for example QDD-400G-XDR4 and OSFP-800G-2XDR4, are based on 100G PAM4 Optical channels. They can interoperate with one another, but they are not interoperable with 1.6T optics that use 200G PAM4 optical channels. NextGen 400G and 800G optics with gearbox, for example QDD-400G-XDR2 and OSFP-800G-XDR4-G, operate with 200G PAM4 optical channels and they can interop with 1.6T optics.

The diagram below illustrates the basic data path architecture of 400G, 800G and 1.6T modules.



What is the reach, fiber type, connector, and optical modulation for each 1.6T transceiver type?

OSFP IHS & RHS SKUs	Reach	Fiber type	Optical connector	No. of Fiber pairs	Optical waves per fiber	Optical modulation
OSFP-1T6-2XDR4/ OSFP-R-1T6-2XDR4	2km	Parallel SMF	2x MPO-12 APC	8 (4 pairs per MPO-12 connector)	1	200G PAM4
OSFP-1T6-2FR4/ OSFP-R-1T6-2FR4	2km	Duplex SMF	2x LC Duplex	2 (1 pair per LC duplex connector)	4	200G PAM4
OSFP-1T6-2PLR4/ OSFP-R-1T6-2PLR4	10km	Parallel SMF	2x MPO-12 APC	8 (4 pairs per MPO-12 connector)	1	200G PAM4

What is the maximum power consumption of 1.6T OSFP transceivers?

The power consumption of Fully Retimed 1.6T client transceivers is up to 28W per port, depending on the operation of Inner FEC and VDM features. Refer to the transceiver data sheet for power consumption values of individual modules.

What are the Appels configurable with 200G/λ 1.6T and 800G optical transceivers?

Arista's 1.6T and 800G optical transceivers and cables operating at 200G/λ 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 OSFP port. The values in the "Lane" columns refer to the speed configuration of the 800G switch port.

OSFP/ OSFP-R 1T6-2XDR4 supported modes								
Logical port configuration								
Lane 1	Lane 2	Lane 3	Lane 4	Lane 5	Lane 6	Lane 7	Lane 8	Notes
800GBASE-DR4				800GBASE-DR4				1,3
1.6TBASE-DR8								1
400GBASE-DR2		400GBASE-DR2		400GBASE-DR2		400GBASE-DR2		1,3
200GBASE-DR1	200GBASE-DR1	200GBASE-DR1	200GBASE-DR1	200GBASE-DR1	200GBASE-DR1	200GBASE-DR1	200GBASE-DR1	1,3
800GBASE-DR4-2				800GBASE-DR4-2				2,3
1.6TBASE-DR8-2								2
400GBASE-DR2-2		400GBASE-DR2-2		400GBASE-DR2-2		400GBASE-DR2-2		2,3
200GBASE-DR1-2	200GBASE-DR1-2	200GBASE-DR1-2	200GBASE-DR1-2	200GBASE-DR1-2	200GBASE-DR1-2	200GBASE-DR1-2	200GBASE-DR1-2	2,3
Notes								
<ol style="list-style-type: none"> 1. These modes operate without Inner FEC. 2. These modes support Inner FEC. 3. This mode of operation supports breaking out the port configuration to 2x 800GE or 4x 400GE or 8x 200GE logical links. This enables breakout into physically separate 800G-4, 400G-2 or 200G-1 links that may interop with third-party transceivers. 								

OSFP/ OSFP-R 1T6-2FR4 supported modes								
Logical port configuration								
Lane 1	Lane 2	Lane 3	Lane 4	Lane 5	Lane 6	Lane 7	Lane 8	Notes
800GBASE-FR4-500				800GBASE-FR4-500				1,3
1.6TBASE-FR8-500								1
400GBASE-FR2-500		400GBASE-FR2-500		400GBASE-FR2-500		400GBASE-FR2-500		1,4
200GBASE-FR1-500	200GBASE-FR1-500	200GBASE-FR1-500	200GBASE-FR1-500	200GBASE-FR1-500	200GBASE-FR1-500	200GBASE-FR1-500	200GBASE-FR1-500	1,4
800GBASE-FR4				800GBASE-FR4				2,3
1.6TBASE-FR8								2
400GBASE-FR2		400GBASE-FR2		400GBASE-FR2		400GBASE-FR2		2,4
200GBASE-FR1	200GBASE-FR1	200GBASE-FR1	200GBASE-FR1	200GBASE-FR1	200GBASE-FR1	200GBASE-FR1	200GBASE-FR1	2,4
Notes								
<ol style="list-style-type: none"> 1. These modes operate without Inner FEC. 2. These modes support Inner FEC. 3. Dual 800G mode is commonly used for aggregation of two 800G-FR4 links into a single 1.6T port. 								

4. Supports logical links of 400G and 200G. It is not possible to have physical breakouts into 4x 400G or 8x 200G.

OSFP/OSFP-R 800G-XDR4/ OSFP-800G-XDR4-G supported modes

Logical port configuration								
Lane 1	Lane 2	Lane 3	Lane 4	Lane 5	Lane 6	Lane 7	Lane 8	Notes
800GBASE-DR4								1
400GBASE-DR2				400GBASE-DR2				1
200GBASE-DR1		200GBASE-DR1		200GBASE-DR1		200GBASE-DR1		1
800GBASE-DR4-2								2
400GBASE-DR2-2				400GBASE-DR2-2				2
200GBASE-DR1-2		200GBASE-DR1-2		200GBASE-DR1-2		200GBASE-DR1-2		2

Notes

1. These modes operate without Inner FEC.
2. These modes support Inner FEC.
3. 800GBASE-DR4 and 800GBASE-DR4-2 are used for point-to-point 800GE links – supported only in platforms that support a single 800GE MAC per port.
4. 400GBASE-DR2, 400GBASE-DR2-2, 200GBASE-DR1 and 200GBASE-DR1-2 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.

OSFP/OSFP-R 800G-FR4/ OSFP-800G-FR4-G supported modes

Logical port configuration								
Lane 1	Lane 2	Lane 3	Lane 4	Lane 5	Lane 6	Lane 7	Lane 8	Notes
800GBASE-FR4-500								1
400GBASE-FR2-500				400GBASE-FR2-500				1,3
200GBASE-FR1-500		200GBASE-FR1-500		200GBASE-FR1-500		200GBASE-FR1-500		1,3
800GBASE-FR4								2
400GBASE-FR2				400GBASE-FR2				2,3
200GBASE-FR1		200GBASE-FR1		200GBASE-FR1		200GBASE-FR1		2,3

Notes

1. These modes operate without Inner FEC.
2. These modes support Inner FEC.
3. Physical breakouts are not possible with these modes.

What industry standards are associated with each of the 200G/λ Transceivers and Cables?

The table below summarizes the Arista 200G/λ transceivers and cables and the associated industry standards.

Arista Products	Associated Industry Standard
OSFP-1T6-2XDR4, and OSFP-R-1T6-2XDR4	IEEE 802.3dj
OSFP-1T6-2FR4, and OSFP-1T6-2FR4,	IEEE 802.3dj
OSFP-800G-XDR4, and OSFP-800G-XDR4-G	IEEE 802.3dj
OSFP-800G-FR4, and OSFP-800G-FR4-G	IEEE 802.3dj
All OSFP transceivers	The OSFP MSA: https://osfpmsa.org/

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
Corning Cabling Guide Leviton Cabling Guide Siemon Cabling Guide	Partner documents: Fiber cabling reference guides and loss budget guidelines from Cabling companies like Corning and Leviton