Key Features

- Deployment flexibility with 800G (dual 400G), 400G, 100G, 50G, 40G, 25G, 10G or 1G modules.
- Hot swappable to maximize uptime and simplify serviceability
- Data rates from 1GbE to 25GbE supported using the SFP form factor, for the smallest, and lowest power solutions
- SFP+ Optical interoperability with 10GbE XFP, X2 and XENPAK pluggable form factors
- QSFP+ Universal transceiver for 40G operations over duplex multi-mode and single-mode fiber. Interoperable with IEEE 40GbE LR4 and LRL4 for easier migrations from 10G to 40G and to single mode fiber
- 100G QSFP pluggable transceivers and cables for high density 100G deployments. Optical interoperability with 100GbE CFP, CFP2 and CPAK
- Parallel QSFP transceivers for both multi-mode and single-mode enable flexible 4x25G and 4x10G options for gradual migration from 10G to 40G and 25G to 100G connectivity
- 100G SFP-DD and DSFP cables for cost effective NIC connectivity
- 200G QSFP optics, AOCs and cables for simple upgrade from 100G
- A Broad range of 400GE optics, AOCs and cables, in both OSFP and QSFP-DD form-factors
- 400G-ZR optics, with pluggable line-system for simple, cost effective DCI
- Flexibility of media and interface choice on a port-by-port basis
- Support for tunable 10G and 400G DWDM for DCI and long-haul optical fiber networks

Overview

Arista's Optical Modules and Cable portfolio offer a wide variety of high-density and low-power 800G (dual 400G), 400G, 200G, 100G, 50G, 40G, 25G, 10G, 1G, and 100M Ethernet connectivity options over fiber or copper.

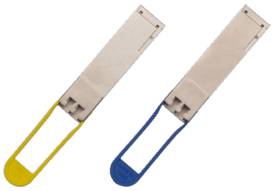
To accommodate an increasing spectrum of applications, Arista offers a wide choice of OSFP, QSFP-DD, QSFP, SFP, SFP-DD and DSFP transceivers and cables that comply with industry standards, offering a broad range of connectivity options. Each module is optimized for different media and reach (ranging from 0.5 meters to 80 kilometers).

All interface speeds, from 1G to 400GE have connectivity options that include Direct Attach copper Cables (DACs), Active Optical Cables (AOCs), multi-mode fiber and single-mode fiber transceivers.

800G OSFP
(Dual 400G-FR4, Dual 400G-XDR4)

400GBASE-DR4, SR8, 2FR4 OSFP

400GBASE-AOC



100GBASE-LRL4 and LR4 QSFP

100GBASE-CR4 Copper Cable

40GBASE-CR4 to 4x 10GBASE-CR Copper Cable

40GBASE-LRL4, UNIV, LR4 and XSR4 QSFP+

25GBASE-CR, AOC, SR and LR

10GBASE-SR and LR SFP+ 1000BASE-T SFP

10GBASE-CR Copper Cable

25 Gigabit Ethernet SFP Options

PHY Type	Reach
25GBASE-CR	Twin-ax copper cables with link lengths of 1m, 2m, 3m and 5m
25GBASE-AOC	Active Optical Cable with link lengths of 3m, 5m, 7m, 10m, 15m, 20m, 25m and 30m
25GBASE-SR	Up to 70m/100m over OM3/OM4 duplex multimode fiber
25GBASE-MR-SR	Dual rate (25G/10G), up to 70m/100m over OM3/OM4 MMF at 25G and 300m/400m over OM3/OM4 MMF at 10G. Interoperates with 10G-SR when operated at 10G.
25GBASE-MR-XSR [1]	Dual rate (25G/10G), extended reach, up to 200m/300m over OM3/OM4 MMF at 25G & 300m/400m over OM3/OM4 at 10G.
25GBASE-SR-E	Up to 30m/50m over duplex OM3/OM4 MMF without FEC (for low latency), or 70m/100m over OM3/OM4 MMF with FEC
25GBASE-LR	Up to 10km over duplex single-mode fiber
25GBASE-MR-LR [1]	Dual rate (25G/10G) up to 10km over duplex single-mode fiber
25GBASE-LR-E	Up to 2km over over duplex SMF without FEC (for low latency), or up to 10km over duplex SMF with FEC
25GBASE-ER [3]	Up to 40km over duplex single-mode fiber

1. May require attenuation when connecting to 10G-LR / SR optics. Refer to the relevant 10G-LR / SR optical specifications for requirements.
2. Supported on specific platforms. Refer to Arista's Transceiver and Cable Guide for supported platforms.
3. Proper optical attenuation is required for shorter links to protect the receiver from permanent damage.

25GBASE-CR

25 Gigabit Ethernet SFP25 Cable Specifications

PHY Type	Connector Type	Wavelength (nm)	Cable Type	Max Reach
25GBASE-CR	SFP (Both ends)	–	Twinax Copper	1m to 5m
25GBASE-CR	QSFP100 to 4 x SFP25	–	Twinax Copper	1m to 5m
25GBASE-AOC	SFP (Both ends)	850nm	MMF	3m to 30m

SFP-25G-MR-LR

SFP-25G-MR-XSR

25 Gigabit Ethernet SFP25 Optical Specifications

PHY Type	Conn Type	Wave-length (nm)	Cable Type	Core Size (um)	Modal Bandwidth (MHz*Km)	Tx power (dBm)	Rx power (dBm)	Max Reach
25GBASE-SR	LC	850	MMF	50.0	2000 (OM3) 4700 (OM4)	-8.4 to 2.4	-10.3 to 2.4	70m/100m
25GBASE-MR-SR						-8.4 to 2.4 @ 25G -7.3 to -0.5 @ 10G	-10.3 to 2.4 @ 25G -9.9 to 2.4 @10G	70m/100m @ 25G 300m/400m @ 10G
25GBASE-MR-XSR [1]						-6 to 2.4	-10.3 to 2.4	200m/300m @ 25G 300m/400m @ 10G
25GBASE-SR-E						-4.5 to 2.4	-5.9 to 2.4 w/o FEC, or -10.3 to 2.4 w FEC	30m / 50m w/o FEC, or 70m/100m w FEC
25GBASE-LR	LC	1310	SMF	G.652	–	-7 to 2.0	-13.3 to 2.0	10km
25GBASE-MR-LR [1]						-7 to 2.0	-13.3 to 2.0	10km
25GBASE-LR-E						-4 to 2.0	-7.2 to 2.0 w/o FEC, or -13.3 to 2.0 w FEC	2km w/o FEC, or 10km with FEC
25GBASE-ER [2]						-3 to 6	-21 to -4	40km

1. When connecting 25G-MR-XSR/LR optics to legacy fixed rate 10G optics, attenuation may be required to ensure the optical input power to the 10G optical module is within allowable limits.
2. Proper optical attenuation is required for shorter links to protect the receiver from permanent damage

Order Number	Product Description
25 Gigabit Ethernet SFP Twinax Copper Cables	
CAB-S-S-25G-0.5M	25GBASE-CR SFP to SFP Twinax Copper Cable 0.5 meter
CAB-S-S-25G-1M	25GBASE-CR SFP to SFP Twinax Copper Cable 1 meter
CAB-S-S-25G-1.5M	25GBASE-CR SFP to SFP Twinax Copper Cable 1.5 meter
CAB-S-S-25G-2M	25GBASE-CR SFP to SFP Twinax Copper Cable 2 meter
CAB-S-S-25G-2.5M	25GBASE-CR SFP to SFP Twinax Copper Cable 2.5 meter
CAB-S-S-25G-3M	25GBASE-CR SFP to SFP Twinax Copper Cable 3 meter
CAB-S-S-25G-5M	25GBASE-CR SFP to SFP Twinax Copper Cable 5 meter
25 Gigabit Ethernet SFP Active Optical Cables	
AOC-S-S-25G-3M	SFP to SFP 25GbE Active Optical Cable 3 meter
AOC-S-S-25G-5M	SFP to SFP 25GbE Active Optical Cable 5 meter
AOC-S-S-25G-7M	SFP to SFP 25GbE Active Optical Cable 7 meter
AOC-S-S-25G-10M	SFP to SFP 25GbE Active Optical Cable 10 meter
AOC-S-S-25G-15M	SFP to SFP 25GbE Active Optical Cable 15 meter
AOC-S-S-25G-20M	SFP to SFP 25GbE Active Optical Cable 20 meter
AOC-S-S-25G-25M	SFP to SFP 25GbE Active Optical Cable 25 meter
AOC-S-S-25G-30M	SFP to SFP 25GbE Active Optical Cable 30 meter
25 Gigabit Ethernet SFP Optics	
SFP-25G-SR	25GBASE-SR SFP Transceiver, up to 70m over OM3 MMF or 100m over OM4 MMF
SFP-25G-MR-SR	10/25GBASE-MR-SR Dual rate SFP Transceiver, up to 70m/100m over OM3/OM4 MMF at 25G and 300m/400m over OM3/OM4 MMF at 10G. Interoperates with 10G-SR when operated at 10G.
SFP-25G-MR-XSR *	10/25GBASE-MR-XSR (Extended Reach) Dual rate SFP Transceiver, up to 200m/300m over OM3/OM4 MMF at 25G and 300m/400m over OM3/OM4 MMF at 10G
SFP-25G-SR-E	25GBASE-SR-Enhanced SFP E-Series Transceiver for low latency, Up to 30m/50m over OM3/OM4 MMF without FEC (for low latency), or Up to 50m/100m over OM3/OM4 MMF with FEC
SFP-25G-LR	25GBASE-LR SFP Transceiver, up to 10 km over duplex SMF
SFP-25G-MR-LR *	10/25GBASE-MR-LR Dual rate SFP Transceiver, up to 10 km over duplex SMF
SFP-25G-LR-E	25GBASE-LR-Enhanced SFP E-Series Transceiver for low latency, Up to 2km over SMF without FEC (for low latency), or Up to 10km over SMF with FEC
SFP-25G-ER	25GBASE-ER SFP Transceiver, up to 40 km over duplex SMF

* When connecting 25G-MR-XSR/LR optics to legacy fixed rate 10G optics, attenuation may be required to ensure the optical input power to the 10G optical module is within allowable limits. Refer to the relevant 10G-LR / SR optical specifications for requirements.

Standards Compliance & Certifications

EMC Emissions & Immunity	Subpart B, Part 15 FCC Class A, ICES-003 Issue 7 EN 55032:2015, BS EN 55032:2015, EN 55035:2017, EN 300 386 V2.1.1
Safety	EN 62368-1:2014 + A11:2017, IEC 62368-1:2014 21CFR-1040.10 LN#50, Laser Class 1 or 1M IEC 60825-1, Laser Class 1 or 1M EN 60825-1,
Certifications	CE South Korea KCC Australia RCM UKCA
European Union Directives	2014/35/EU Low Voltage Directive 2014/30/EU EMC Directive 2012/19/EU WEEE Directive 2011/65/EU RoHS 2015/863/EU Commission Delegated Directive

Warranty

Arista pluggables and cables include a one-year limited hardware warranty, which covers parts, repair, or replacement with a 10 business day turn-around after the unit is received.

Service and Support

Support services including next business day and 4-hour advance hardware replacement are available. For service depot locations, please see: http://www.arista.com/en/service

Headquarters

5453 Great America Parkway
Santa Clara, California 95054
408-547-5500

Support

support@arista.com
408-547-5502
866-476-0000

Sales

sales@arista.com
408-547-5501
866-497-0000

www.arista.com

ARISTA

Arista 25G Transceivers and Cables: Q&A

What 25G Transceivers and Cables are available from Arista?

Arista supports a range of 25G copper cables and optical transceivers compliant to IEEE standards and industry MSAs. Arista's 25G connectivity solutions include copper cables, Active Optical Cables (AOCs), and a range of optical transceivers in an SFP form factor for various fiber types and reach.

Product Number	Product Description
25G SFP Transceivers	
SFP-25G-SR	25GBASE-SR SFP transceiver up to 70m/100m over parallel OM3/OM4 multi-mode fiber (MMF)
SFP-25G-MR-SR	10/25GBASE-MR-SR Dual rate SFP Transceiver, up to 70m/100m over OM3/OM4 MMF at 25G and 300m/400m over OM3/OM4 MMF at 10G. **Interoperates with 10G-SR when operated at 10G**.
SFP-25G-MR-XSR	Dual rate 10/25GBASE-MR-XSR SFP optical transceiver up to 200m/300m of OM3/OM4 MMF at 25G, and up to 300m/400m of OM3/OM4 MMF at 10G.
SFP-25G-LR	25GBASE-LR SFP transceiver, up to 10km over single-mode fiber
SFP-25G-MR-LR	Dual rate 10/25GBASE-MR-LR SFP optical transceiver up to 10km over duplex Single-Mode Fiber (SMF)
25G SFP to SFP Active Optical Cables	
AOC-S-S-25G-xM	25GbE SFP to SFP Active Optical Cable, 3m – 30m
25G SFP to SFP Twinax Copper Cables	
CAB-S-S-25G-xM	25G SFP to SFP twinax copper cable, 1m, 2m, 3m, and 5m
100G QSFP to 25G SFP Twinax Copper breakout Cables	
CAB-Q-4S-100G-xM	100GBASE- QSFP to 4 x 25GbE SFP twinax copper cable, 1m, 2m, 3m, and 5m

What is the maximum supported distance for 25G Transceivers and Cables?

The maximum currently supported distance for 25G is 10km with SFP-25G-LR and SFP-25G-MR-LR. Additional optics may be released in the future to support longer distances.

What is the difference between SFP28 and 25G SFP?

They are the same. The "SFP" form factor was originally defined for speeds lower than 10G. When it was adopted for 10G, the name became SFP+ to denote the higher aggregate performance. The same SFP form factor was later adopted for 25G with the electrical interface operating at 25Gbps. The electrical interface is designed to accommodate up to 28Gbps, hence the engineering and industry name is SFP28. Arista refers to the 25G form factor as the 25G SFP to avoid any confusion.

Can 10G SFP+ and 1G SFP transceivers be plugged into Arista 25G SFP ports?

Yes, Arista 25G SFP ports allow the flexibility to run multiple speeds and support a full range of 10G SFP+ optical modules. The 10GBASE-T (copper) transceiver is supported in a limited range of products - refer to Arista's transceiver and cable guide for supported platforms. 1G SFP transceivers can also be used in 25G SFP platforms that support 1G. Please refer to product datasheets for more details on rate support for specific products.

Can 25G SFP transceivers and cables support 10/25G dual rate?

Arista offers three dual-rate 10G/25G SFPs for use with multi-mode fiber (MMF) and single-mode fiber (SMF):

- For MMF:
    1. The SFP-25G-MR-SR 10/25G Dual Rate Short Reach (or SR) optical transceiver, supporting 25G up to 100m with duplex OM4 MMF, and 10G up to 400m with duplex OMF MMF. When operated at 10G, the SFP-25G-MR-SR will optically interoperate with 10G-SR SFPs.
    2. The SFP-25G-MR-XSR 10/25G Dual rate "eXtended Short Reach" (or XSR) optical transceiver, supporting 25G up to 300m with duplex OM4 MMF and 10G up to 400m with duplex OM4 MMF. When operated at 10G, the SFP-25G-MR-XSR will optically interoperate with 10G-SR SFPs, but attenuation may be required to ensure the maximum input power of the 10G-SR is not exceeded.
- For SMF:
    3. The SFP-25G-MR-LR 10/25G Dual rate optical transceiver, supporting 10G or 25G over 10km of duplex SMF.

Are Arista 25G Transceivers interoperable with other 25G transceivers available in the industry?

Yes, as long as the non-Arista 25G transceivers meet the associated industry standard specifications, Arista 25G transceivers are fully interoperable.

What 10G/25G/40G/100G Arista transceivers interoperate with Arista's 25G transceivers?

The tables below summarize the interoperability of Arista's 25G SFP transceivers over different media types and data rates

Interoperability of Arista's 25G SFP transceivers over MMF @ 25Gb/s				
	SFP-25G-SR	SFP-25G-XSR @25G	QSFP-100G-SR4 (optical breakout)	QSFP-100G-XSR4 (optical breakout)
SFP-25G-SR	70m (OM3) 100m (OM4)	70m (OM3) 100m (OM4)	70m (OM3) 100m (OM4)	70m (OM3) 100m (OM4)
SFP-25G-MR-SR @ 25G	70m (OM3) 100m (OM4)	70m (OM3) 100m (OM4)	70m (OM3) 100m (OM4)	70m (OM3) 100m (OM4)
SFP-25G-MR-XSR @ 25G	70m (OM3) 100m (OM4)	200m (OM3) 300m (OM4)	70m (OM3) 100m (OM4)	150m (OM3) 300m (OM4

Interoperability of Arista's dual rate 25G-MR-XSR SFP transceiver over MMF @ 10Gb/s					
	SFP-10G-SRL	SFP-10G-SR	SFP-25G-MR-XSR @ 10G	QSFP-40G-SR4 (optical breakout)	QSFP-40G-XSR4 (optical breakout)
SFP-25G-MR-SR @ 10G	100m (OM3) 150m (OM4)	300m (OM3) 400m (OM4)	300m (OM3) 400m (OM4)	100m (OM3) 150m (OM4)	300m (OM3) 400m (OM4)
SFP-25G-MR-XSR @ 10G	100m (OM3) * 150m (OM4) *	300m (OM3) * 400m (OM4) *	300m (OM3) 400m (OM4)	100m (OM3) 150m (OM4)	300m (OM3) 400m (OM4)
Note: When using the SFP-25G-XSR to interoperate with 10G SFP transceivers, attenuation may be required for short links to ensure the 10G SFP receiver is not overloaded. Refer to the transceiver datasheet for detailed optical specifications.					

Interoperability of Arista's 25G SFP transceivers over SMF @ 25Gb/s			
	SFP-25G-LR	SFP-25G-MR-LR @25G	QSFP-100G-PSM4 (optical breakout)
SFP-25G-LR	10km	10km	500m
SFP-25G-MR-LR @ 25G	10km	10km	500m

Interoperability of Arista's 25G-MR-LR SFP transceiver over SMF @ 10Gb/s					
	SFP-10G-LRL*	SFP-10G-LR*	SFP-25G-MR-LR @ 10G	QSFP-40G-PLRL4* (optical breakout)	QSFP-40G-PLR4* (optical breakout)
SFP-25G-MR-LR @ 10G	1km	10km	10km	1km	10km
* Note: When using the SFP-25G-XSR to interoperate with 10G SFP and 40G transceivers, attenuation may be required for short links to ensure the receiver is not overloaded. Refer to the transceiver datasheet for detailed optical specifications.					

What is the maximum power consumption of 25G SFP transceivers?

The table below summarizes the power consumption of Arista 25G SFP transceivers.

Product Number	Max Power Consumption
AOC-S-S-25G-xM	1.0W
SFP-25G-SR	1.5W

SFP-25G-LR	1.5W
SFP-25G-MR-SR	1.5W
SFP-25G-MR-XSR	1.5W
SFP-25G-MR-LR	1.5W

What will happen if I plug in 25G SFP transceivers that consume greater than 2W?

Arista cannot guarantee the performance of SFP transceivers that draw greater than 2W due to electrical and thermal limits.

Fiber and Copper Cables

What cable type is needed for 25G Transceivers?

The table below details the connector type of each 100G Transceiver and the cable type to be used.

Product Number	Termination/Connector Type	Fiber Type to be used
SFP-25G-SR and SFP-25G-MR-SR / XSR	Duplex LC	Multi-mode Fiber OM3 or OM4
SFP-25G-LR and SFP-25G-MR-LR	Duplex LC	Single-mode Fiber
AOC-S-S-25G-xM	N/A	Pre-terminated
CAB-S-S-25G-xM	N/A	Pre-terminated
CAB-Q-4S-100G-1M	N/A	Pre-terminated

Where can customers buy splitter cables for 100G to 4x25G connectivity?

A large number of cabling suppliers provide MPO-LC MMF and SMF breakout cables. Example part numbers are below. More information is available at the Transceivers and Cables page on arista.com

Product Description	Corning P/N	Leviton P/N	Wave2Wave P/N
OM4 MPO12 to 4 LC - Direct connect for 1x QSFP+ SR4 to 4 SFP+ SR, 5m	HE67908QPH-KB005M	FH-FH008MR1624K	51PU-8080P-5M
OM4 MPO12 to 4 LC - Direct connect for 1x QSFP+ SR4 to 4 SFP+ SR, 3m	HE67908QPH-KB003M	FH-FH008MR1024K	51PU-8080P-3M
SM MPO12 to 4 LC - Direct connect for 1x QSFP+ PLRL4 to 4 SFP+ LR, 5m	HE87808GPH-KB005M	FH-AH008MR1624K	51PU-3084P-5M
SM MPO12 to 4 LC - Direct connect for 1x QSFP+ PLRL4 to 4 SFP+ LR, 3m	HE87808GPH-KB003M	FH-AH008MR1024K	51PU-3084P-3M

Can customers use third party 25G SFP to SFP and QSFP breakout cables?

Arista does not restrict the use of third party passive copper cables. These cables need to comply with the associated IEEE specifications, to allow them to be correctly identified and recognized by the Arista switch. Interfaces with cables not recognized correctly will be disabled.

What is the Forward Error Correction (FEC) requirement for Arista 25G Copper Cables?

The IEEE 802.3by spec has 3 different 25G cable types (CA-N, CA-S, CA-L), which are aligned to 3 different loss classification categories and have a minimum FEC requirement.

CA-N	12.98dB loss	the highest grade, and no FEC is required
CA-S	16.48dB loss	the middle grade, and BASE-R or RS FEC is required
CA-L	22.48dB loss	the lowest grade, and RS FEC is required

The table below summarizes the loss specification of Arista 25G copper cables

Arista 25G SFP and 100G-4x25G Copper Cables		
	25G SFP to SFP Cables	100G QSFP-4SFP Cables
Loss Characteristics spec	1, 2, 3 meters: CA-N 5 meter cable: CA-L	1, 2 meter cables: CA-N 3 meter cable: CA-S 5 meter cable: CA-L

How do you change 25G SFP ports to support 10G SFP+ transceivers?

```
Configure the desired speed as 10G:
(config)# interface Et1
(config-if-Et1)# speed forced 10000full
```

How do you change 100G QSFP ports from 100GbE mode to 4x25G mode?

```
Configure the desired speed as 25G:
(config)# interface Et1/1-4
(config-if-Et1/1-4)# speed forced 25gfull
```

Can I configure a 100G port to a mix of 10G and 25G speeds?

No, a 100G-port can either be configured as 4x25G or 4x10G. Mix and match 10G/25G is not supported with a single 100G port.

How do you change 25G SFP ports back to the default mode?

```
Configure the port to default mode:
(config)# interface Et1
(config-if-Et1)# no speed
```

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
Optics and Cables Datasheet	Detailed specifications and ordering information
Transceiver and Cable Guide	Arista EOS support, physical attributes, laser safety and fiber cleaning instructions
FAQ Documents	100G and 40G Frequently asked questions
Whitepapers	Whitepapers on 25G Ethernet, the 40G UNIV transceiver, and more, on the transceivers and cables pages on the arista website here
Partner Documents	Fiber cabling reference guides from Cabling companies like Corning and Leviton on the arista website here