



Extreme Networks Optical Transceivers and Cables

Highlights

- Optical transceivers that provide high system reliability based on rigorous qualification and certification testing
- Hot-swappable flexibility in the field for greater ease and lower total cost of ownership
- Standards-based, including IEEE 802.3z, IEEE 802.3ah, IEEE 802.3u, IEEE 802.3ae, IEEE 802.3ak, IEEE 802.3ba, IEEE 802.3bm, and IEEE 802.3by compliant as required
- Compliant with Restrictions on Hazardous Substances (RoHS), meeting either RoHS 5 or RoHS 6 EU standards
- SFP28, SFP+ and SFP modules and cables compliant with SFF-8472, SFF-8432, SFF-8419
- QSFP+, QSFP28 modules complaint with SFF-8636, SFF-8679, SFF-8661

Highly Reliable, Extreme-Qualified Optics

This guide provides descriptions of the optical transceiver modules supported by Extreme Networks switches and routers, along with information about how to use them. The following types of optical transceiver modules are included:

- Extreme Networks 100Gb QSFP28 Modules
- Extreme Networks 100Gb CFP2 Modules
- Extreme Networks 40Gb QSFP+ Modules
- Extreme Networks 25Gb SFP28 Modules
- Extreme Networks 10Gb SFP+ Modules
- Extreme Networks 20Gb SFP-DD Modules
- Extreme Networks 1Gb SFP Modules
- Extreme Networks QSFP-to-SFP Adapter (QSA) and QSA28 Ethernet Adapter

Extreme Networks offers a complete set of high-performance, reliable, and cost-effective optical transceivers to help enterprises and service providers meet the challenges of diverse network topologies. To ensure maximum quality, Extreme selects and tests the most reliable, highest-performing optical transceivers on the market, and then warrants their availability, capacity, and performance in Extreme Networks products.

Extensive performance and reliability testing reflects an ongoing commitment to quality. Extreme Networks tests transceivers using the industry's most advanced tools and instruments to help ensure that they provide the right mix of functionality and performance when used in conjunction with Extreme products. The speed, capacity, reliability, and low cost of ownership that Extreme is known for is also provided in all optical components.

Make sure to use [Extreme's Optics Compatibility website](#) whenever researching or specifying transceivers for Extreme switches or other devices. It contains the most up-to-date information on Extreme-qualified transceivers.

By using Extreme-qualified components, organizations can be assured that their warranty and service requirements will be met and that their Extreme products will continually provide the uptime, performance, and reliability required by today's leading enterprises and service providers.

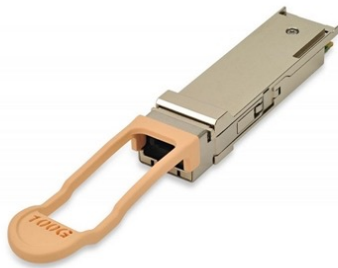
Optics Compatibility and Detailed Specifications

Extreme publishes up-to-date Optical transceiver and cable compatibility information via its Extreme Networks [Optics Compatibility website](#). This site defines compatibility among transceivers/cables and Extreme switches and routers, including minimum required software revisions, end-of-sale and replacement information, and other device-specific notes. In addition, the site includes detailed specification for each module.

Note: It is highly recommended to only use Extreme Networks-certified pluggable transceiver modules with Extreme Networks switches and routers.

Features and benefits:

- Hot-swappable input/output device that plugs into a 100 Gigabit Ethernet Extreme platform
- Interoperable with other IEEE-compliant 100GBASE interfaces where applicable
- Certified and tested on Extreme platforms for superior performance, quality, and reliability
- High-speed electrical interface compliant to IEEE 802.3bm.
- QSFP Form factor, 2-wire I2C communication interface and other low-speed electrical interface compliant to SFF 8436 and QSFP Multisource Agreement (MSA)



Extreme Networks 100Gb QSFP28 Modules

The Extreme 100GBASE Quad Small Form-Factor Pluggable (QSFP28) portfolio offers customers a wide variety of high-density and low-power 100 Gigabit Ethernet connectivity options for data center, high-performance computing networks, enterprise core and distribution layers, and service provider applications. These modules represent the latest generation of 100G transceiver modules solution based on a QSFP28 form factor.

100Gb Optics Types/Extreme SKUs

Standard/Type	Description	Extreme SKUs
100GBASE-SR4	100G SR4 QSFP28, MPO, 100m over OM4, Multimode Fiber	100G-SR4-QSFP100M 10401 AA1405005-E6
100GBASE-BDSR	100G SR BiDi, QSFP28, LC, 100m over OM4, Multimode Fiber	100G-SR4BD- QSFP100M
100GBASE-SWDM4	100G SWDM4 QSFP28, LC, 100m, Multimode Fiber	100G-SWDM4- QSFP100M
100GBASE-ESR4	100G ESR4 QSFP28, MPO, 300m over OM4, Multimode fiber	100G-ESR4- QSFP300M 100G-QSFP-ESR4
100GBASE-DR	100G DR QSFP28, LC, 500m, Single mode Fiber	100G-DR-QSFP500M
100GBASE-CWDM4	100G CWDM4 QSFP28, LC, 2KM, Single mode Fiber	100G-CWDM2- QSFP2KM
100GBASE-LR4-2	100G LR4 QSFP28, LC, 2KM, Single mode Fiber	100G-LR4-QSFP2KM
100GBASE-FR	100G FR QSFP28, LC, 2KM Single mode Fiber	100G-FR-QSFP2KM

100Gb Optics Types/Extreme SKUs (cont.)

Standard/Type	Description	Extreme SKUs
100GBASE-PSM4	100G PSM4 QSFP28, MPO, 2Km, Single mode Fiber	10405
100GBASE-4WDM-10	100G 4WDM QSFP28, LC, 10Km, Single mode Fiber	100G-4WDM-QSFP10KM
100G-BASE-LR	100G LR QSFP28, LC, 10Km, Single mode Fiber	100G-LR-QSFP10KM
100GBASE-LR4	100G LR4 QSFP28, LC, 10Km, Single mode Fiber	100G-LR4-QSFP10KM 10403
100GBASE-4WDM-20	100G 4WDM QSFP28, LC, 20Km, Single mode Fiber	100G-4WDM-QSFP20KM
100GBASE-4WDM-40	100G 4WDM QSFP28, LC, 40Km, Single mode Fiber	100G-4WDM-QSFM40KM
100GBASE-ERLT	100G ER4 Lite QSFP28, LC, 40Km, Single mode fiber	100G-ER4LT-QSFP40KM
100G-DACP	100G QSFP28 Passive DAC Copper cables (0.5m, 1m, 3m, 5m)	100G-DACP-QSFPZ5M 100G-DACP-QSFP1M 100G-DACP-QSFP3M 100G-DACP-QSFP5M 10410, 10411, 10413, 10414 AA1405029-E6 AA1405031-E6 AA1405032-E6
100G-DACP Breakout	100G QSFP28 to 4xSFP28 Passive DAC Copper cables (0.5m, 1m, 3m, 5m)	100G-DACP-QSFP4SFP1M 100G-DACP-QSFP4SFP3M 100G-DACP-QSFP4SFP5M 10421, 10423, 10424
100G-AOC	100G Active Optics Cables (5m, 7m, 10m, 20m)	100G-AOC-QSFP10M-TA 10434, 10435, 10436, 10437 100G-QSFP-QSFP-AOC-1001
100G-AOC Breakout	100G QSFP28 to 4xSFP28 Active Optical Breakout cables (10m, 20m)	10443, 10444

100GBASE-SR4: The Extreme 100GBASE-SR4 Optics modules support link lengths of up to 70m (OM3) or 100m (OM4) over Multimode Fiber with MPO-12 connectors. They provide 100G optical links over 12-fiber parallel fiber terminated with MPO connectors.

100GBASE-BDSR: The Extreme 100GBASE-BDSR Optics modules support link lengths of up to 70m (OM3), 100m (OM4) or 150m (OM5) over Multimode Fiber with LC connectors. They provide 100G optical links over 2 Multimode fibers by transmitting and receiving 50Gb streams bidirectionally over each fiber at different wavelengths centered at 850nm and 900nm for TX and RX on each fiber.

100GBASE-SDWM4: The Extreme 100GBASE-SWDM4 Optics modules support link lengths of up to 75m (OM3), 100m(OM4), or 150m(OM5) over a pair of Multimode fibers with duplex LC connectors. The 100 Gigabit Ethernet signal is carried over four wavelengths. Multiplexing and demultiplexing of the four wavelengths are managed within the device. 100GBASE-SWDM4 requires the use of FEC.

100GBASE-ESR4: The Extreme 100GBASE-ESR4 Optics modules support link lengths of up to 170m (OM3) or 300m (OM4) over Multimode Fiber with MPO-12 connectors. They provide 100G optical links over 12-fiber parallel fiber terminated with MPO connectors.

100GBASE-DR: The Extreme 100GBASE-DR Optics modules support link lengths of up to 500m over a pair of Single mode fibers with duplex LC connectors. The 100 Gigabit Ethernet signal is carried over a single wavelength using PAM4 encoding. 100GBASE-DR is compatible as breakout with 400G-DR/400G-DR4 (500M) using fiber break-out cables. 100GBASE-DR requires the use of FEC.

100GBASE-CWDM4: The Extreme 100GBASE-CWDM4 Optics modules support link lengths of up to 2Km over a pair of Single mode fibers with duplex LC connectors. The 100 Gigabit Ethernet signal is carried over four wavelengths using CWDM wavelengths. Multiplexing and demultiplexing of the four wavelengths are managed within the device. 100GBASE-CWDM4 requires the use of FEC.

Note: 100GBASE-CWDM4 is compatible with 100GBASE-4WDM-10 modules up to 2Km using FEC.

100GBASE-LR4-2: The Extreme 100GBASE-LR4-2 Optics modules support link lengths of up to 2Km over a pair of Single mode fibers with duplex LC connectors. The 100 Gigabit Ethernet signal is carried over four wavelengths using LAN-WDM wavelengths. Multiplexing and demultiplexing of the four wavelengths are managed within the device. 100GBASE-LR4-2 does not require the use of FEC.

Note: 100G-LR4-QSFP10KM is compatible with 100GBASE-ER4 modules up to 10Km without using FEC.

100GBASE-FR: The Extreme 100GBASE-FR Optics modules support link lengths of up to 2Km over a pair of Single mode fibers with duplex LC connectors. The 100 Gigabit Ethernet signal is carried over a single wavelength using PAM4 encoding. 100GBASE-FR can also be used in applications meant for 100GBASE-DR and is compatible as breakout with 400G-DR/400G-DR4 (500M) and -DR4+(2KM) using fiber break-out cables. 100GBASE-FR requires the use of FEC.

100GBASE-PSM4: The Extreme 100GBASE-PSM4 Optics modules support link lengths of up to 2Km over Single mode fibers with MPO-12 connectors. They provide 100G optical links over 12-fiber parallel fiber terminated with MPO connectors. 100GBASE-PSM4 does not require the use of FEC.

100GBASE-4WDM-10: The Extreme 100GBASE-4WDM-10 Optics modules support link lengths of up to 10Km over a pair of Single mode fibers with duplex LC connectors. The 100 Gigabit Ethernet signal is carried over four wavelengths using CWDM wavelengths. Multiplexing and demultiplexing of the four wavelengths are managed within the device. 100GBASE-4WDM-10 requires the use of FEC.

Notes:

1. 100GBASE-4WDM-10 is compatible with 100GBASE-CWDM4 modules up to 2Km using FEC.

2. 100GBASE-4WDM-10 is not compatible with either 100GBASE-4WDM-20 or 100GBASE-4WDM-40.

100GBASE-LR: The Extreme 100GBASE-LR Optics modules support link lengths of up to 10Km over a pair of Single mode fibers with duplex LC connectors. The 100 Gigabit Ethernet signal is carried over a single wavelength using PAM4 encoding. 100GBASE-LR is compatible as breakout with 400G-LR4P (MPO) using fiber break-out cables. 100GBASE-LR requires the use of FEC.

100GBASE-LR4: The Extreme 100GBASE-LR4 Optics modules support link lengths of up to 10Km over a pair of Single mode fibers with duplex LC connectors. The 100 Gigabit Ethernet signal is carried over four wavelengths using LAN-WDM wavelengths. Multiplexing and demultiplexing of the four wavelengths are managed within the device. 100GBASE-LR4 does not require the use of FEC.

100GBASE-4WDM-20: The Extreme 100GBASE-4WDM-20 Optics modules support link lengths of up to 20Km over a pair of Single mode fibers with duplex LC connectors. The 100 Gigabit Ethernet signal is carried over four wavelengths using LAN-WDM wavelengths. Multiplexing and demultiplexing of the four wavelengths are managed within the device. 100GBASE-4WDM-20 requires the use of FEC.

Notes:

1. 100GBASE-4WDM-20 is compatible with 100G-ER4-QSFP40KM and 100GBASE-4WDM-40 up to 20Km using FEC.

2. 100GBASE-4WDM-20 is not compatible with either 100GBASE-4WDM-10 or 100GBASE-CWDM4.

100GBASE-4WDM-40: The Extreme 100GBASE-4WDM-40 Optics modules support link lengths of up to 40Km over a pair of Single mode fibers with duplex LC connectors. The 100 Gigabit Ethernet signal is carried over four wavelengths using LAN-WDM wavelengths. Multiplexing and demultiplexing of the four wavelengths are managed within the device. 100GBASE-4WDM-40 requires the use of FEC.

Notes:

1. 100GBASE-4WDM-40 is compatible with 100G-ER4-QSFP40KM up to 40Km using FEC, and with 100GBASE-4WDM-20 up to 20Km using FEC.

2. 100GBASE-4WDM-40 is not compatible with 100GBASE-4WDM-10 or 100GBASE-CWDM4.

Customers should ensure that 100GBASE-4WDM40 receivers are protected from excessive input optical power by adding additional optical attenuation if necessary. TX and RX power levels are described for each module in the Optics compatibility website.

100GBASE-ER4LT: The Extreme 100GBASE-ER4 Optics modules support link lengths of up to 40Km over a pair of Single mode fibers with duplex LC connectors. The 100 Gigabit Ethernet signal is carried over four wavelengths using LAN-WDM wavelengths. Multiplexing and demultiplexing of the four wavelengths are managed within the device. Full 40km reach requires the use of FEC on the host platform. Without FEC, the reach is 30km.

Notes:

1. 100G-ER4-QSFP40KM is compatible with 100GBASE-LR4 modules up to 10Km without using FEC.

2. 100G-ER4-QSFP40KM is compatible with 100G-4WDM-QSFP40KM up to 40KM using FEC, and with 100G-4WDM-QSFP20KM up to 20Km using FEC.

Customers should ensure that 100GBASE-ER4 receivers are protected from excessive input optical power by adding additional optical attenuation if necessary. TX and RX power levels are described for each module in the Optics compatibility website.

100G-DACP: Extreme QSFP28 to QSFP28 copper direct-attach 100G-DACP cables are suitable for very short links and offer a cost-effective way to establish a 100-Gigabit link between 100G ports of Extreme platforms. Extreme currently offers passive copper cables in lengths of 0.5, 1, 3 and 5 meters. 100GBASE-DACP requires the use of FEC.

100G-DACP Breakout: Extreme QSFP28 to 4xSFP28 copper direct-attach 100G-DACP break-out cables are suitable for very short links and offer a cost-effective way to establish a 100-Gigabit link between one 100G QSFP28 port and four 25G SFP28 ports of Extreme platforms. Extreme currently offers passive copper break-out cables in lengths of 1, 3 and 5 meters. 100GBASE-DACP Breakout requires the use of FEC.

100G-AOC: Extreme QSFP28 to QSFP28 active optical fiber cables are suitable for short links and offer a cost-effective way to establish a 100-Gigabit link between 100G ports of Extreme platforms. Extreme currently offers active optical cables in lengths of 5, 7, 10 and 20 meters.

100G-AOC Breakout: Extreme QSFP28 to 4xSFP28 active optical fiber cables are suitable for short links and offer a cost-effective way to establish a 100-Gigabit link between one 100G port and four 25G SFP28 ports of Extreme platforms. Extreme currently offers active optical breakout cables in lengths of 10 and 20 meters.



Extreme Networks 100Gb CFP2 Modules

The Extreme 100GBASE CFP2 modules offer customers several options for legacy CFP2 deployments.

100Gb CFP2 Optics/Extreme SKUs

Standard/Type	Description	Extreme SKUs
100GBASE-SR10-CFP2	100G SR10 CFP2, MPO-12, 100m over OM4, Multimode Fiber	10331
100GBASE-LR4-CFP2	100G LR4 CFP2, LC, 10Km, Single mode Fiber	10330 100G-CFP2-LR4-10KM
100GBASE-ER4-CFP2	100G ER4 CFP2, LC, 40Km, Single mode fiber	100G-CFP2-ER4-40KM

100GBASE-SR10-CFP2: The Extreme 100GBASE-SR10-CFP2 Optics module supports link lengths of up to 100m (OM4) over Multimode Fiber with MPO-12 connectors. It provides 100G optical links over 12-fiber parallel fiber terminated with MPO connectors.

100GBASE-LR4-CFP2: The Extreme 100GBASE-LR4-CFP2 Optics modules support link lengths of up to 10Km over a pair of Single mode fibers with duplex LC connectors. The 100 Gigabit Ethernet signal is carried over four wavelengths using LAN-WDM wavelengths. Multiplexing and demultiplexing of the four wavelengths are managed within the device. 100GBASE-LR4-CFP2- does not require the use of FEC.

100GBASE-ER4-CFP2: The Extreme 100GBASE-ER4-CFP2 Optics module supports link lengths of up to 40Km over a pair of Single mode fibers with duplex LC connectors. The 100 Gigabit Ethernet signal is carried over four

wavelengths using LAN-WDM wavelengths. Multiplexing and demultiplexing of the four wavelengths are managed within the device. 100GBASE-LR4-CFP2 does not require the use of FEC.

Note: Customers should ensure that 100GBASE-ER4-CFP2 receivers are protected from excessive input optical power by adding additional optical attenuation if necessary. TX and RX power levels are described for each module in the Optics compatibility website.



Extreme Networks 40Gb QSFP+ Modules

The Extreme 40GBASE Quad Small Form-Factor Pluggable (QSFP+) portfolio offers customers a wide variety of high-density and low-power 40 Gigabit Ethernet connectivity options for data center, high-performance computing networks, enterprise core and distribution layers, and service provider applications. These modules represent the latest generation of 40G transceiver modules solution based on a QSFP+ form factor.

Features and benefits:

- Hot-swappable input/output devices that plug into a 40 Gigabit Ethernet Extreme platform
- Interoperable with other IEEE-compliant 40GBASE interfaces where applicable
- Certified and tested on Extreme platforms for superior performance, quality, and reliability
- High-speed electrical interface compliant to IEEE 802.3ba.
- QSFP Form factor, 2-wire I2C communication interface and other low-speed electrical interface compliant to SFF 8436 and QSFP Multisource Agreement (MSA)

40Gb QSFP+ Optics/Extreme SKUs

Standard/Type	Description	Extreme SKUs
40GBASE-SR4	40G SR4 QSFP+, MPO, 150m over OM4, Multimode Fiber	40G-SR4-QSFP150 AA1404005-E6 10319
40GBASE-BDSR	40G SR BiDi QSFP+, LC, 150m over OM4, Multimode Fiber	40G-BDSR-QSFP150M 10329
40GBASE-ESR4	40G ESR4 QSFP+, MPO, 400m over OM4, Multimode fiber	40G-ESR4-QSFP400M-NT AA1404006-E6
40GBASE-LM4	40G LM4 QSFP+, LC, 160m (OM4) Multimode, 1Km Single mode Fiber	40G-LM4-QSFP160KM 10334 40G-QSFP-LM4 AA1404002-E6
40GBASE-LR4	40G LR4 QSFP+, LC, 10Km, Single mode Fiber	40G-LR4-QSFP10KM 10320 AA1404001-E6 40GB-LR4-QSFP 40G-QSFP-LR4-1
40GBASE-PSM4	40G PSM4, QSFP+, MPO, 10Km, Single mode fiber	10326 40G-QSFP-LR4-INT
40GBASE-ER4	40G ER4, QSFP+, LC, 40Km, Single mode fiber	10335 AA1404003-E6 40G-QSFP-ER4-1

40Gb QSFP+ Optics/Extreme SKUs (cont.)

Standard/Type	Description	Extreme SKUs
40G-DACP	40G QSFP+ Passive DAC Copper cables (0.5m, 1m, 3m, 5m)	40G-DACP-QSFPZ5M 40G-DACP-QSFP1M 40G-DACP-QSFP3M 40G-DACP-QSFP5M 10311 10312 10313 10323 AA1404037-E6 AA1404029-E6 AA1404030-E6 AA1404032-E6
40G-DACP Breakout	40G QSFP+ to 4xSFP+ Passive DAC Copper cables (1m, 2m, 3m, 5m)	40G-DACP-QSFP4SFP1M 40G-DACP-QSFP4SFP2M 40G-DACP-QSFP4SFP3M 40G-DACP-QSFP4SFP5M 10202 10203 10321 10322 AA1404035-E6
40G-DACA	40G QSFP+ Active DAC Copper cables (1m, 3m, 5m)	40G-DACA-QSFP4SFP1M 40G-DACA-QSFP4SFP3M, 40G-DACA-QSFP4SFP5M
40G-DACA Breakout	40G QSFP+ to 4xSFP+ Active DAC Copper cables (1m, 3m, 5m)	40G-DACA-QSFP4SFP1M 40G-DACA-QSFP4SFP3M 40G-DACA-QSFP4SFP5M 40G-QSFP-4SFP-C-0301
40G-AOC	40G Active Optics Cables (3m, 5m, 10m, 20m, 100m)	40G-AOC-QSFP3M 40G-AOC-QSFP5M 40G-AOC-QSFP10M 40G-AOC-QSFP20M 40G-AOC-QSFP100 10336
40G-AOC Breakout	40G QSFP+ to 4xSFP+ Active Optical breakout cables (10m)	40G-AOC-QSFP4SFP10M AA1404041-E6 40G-QSFP-4SFP-AOC-1001

40GBASE-SR4: The Extreme 40GBASE-SR4 Optics modules support link lengths of up to 100m (OM3) or 150m (OM4) over Multimode Fiber with MPO-12 connectors. They provide 40G optical links over 12-fiber parallel fiber terminated with MPO connectors.

Note: 40G-SR4-QSFP150M and AA1404005-E6 are compatible with 10GBASE-SR, allowing for break-out to 10GBASE-SR transceivers.

40GBASE-BDSR: The Extreme 40GBASE-BDSR Optics modules support link lengths of up to 100m (OM3), 150m (OM4) or 200m (OM5) over Multimode Fiber with LC connectors. They provide 40G optical links over 2 Multimode fibers by transmitting and receiving 20Gb streams bidirectionally over each fiber at different wavelengths centered at 850nm and 900nm for TX and RX on each fiber.

40GBASE-ESR4: The Extreme 40GBASE-ESR4 Optics modules support link lengths of up to 300m (OM3) or 400m (OM4) over Multimode Fiber with MPO-12 connectors. They provide 40G optical links over 12-fiber parallel fiber terminated with MPO connectors.

Note: 40G-ESR4-QSFP400M-NT is compatible with 10GBASE-SR, allowing break-out to four 10GBASE-SR connections.

40GBASE-LM4: The Extreme 40GBASE-LM4 Optics modules support link lengths of up to 140m (OM3) or 160m (OM3) over Multimode Fiber with MPO-12 connectors, or up to 1Km over Single mode fiber with duplex LC connectors. The 40 Gigabit Ethernet signal is carried over four wavelengths. Multiplexing and demultiplexing of the four wavelengths are managed within the device.

40GBASE-LR4: The Extreme 40GBASE-LR4 Optics modules support link lengths of up to 10Km over a pair of Single mode fibers with duplex LC connectors. The 40 Gigabit Ethernet signal is carried over four wavelengths. Multiplexing and demultiplexing of the four wavelengths are managed within the device.

40GBASE-PSM4: The Extreme 40GBASE-PSM4 Optics modules support link lengths of up to 10Km over Single mode fibers with MPO-12 connectors. They provide 40G optical links over 12-fiber parallel fiber terminated with MPO connectors. 40GBASE-PSM4 does not require the use of FEC.

Note: 10326 and 40G-QSFP-LR4-INT are compatible with 10GBASE-LR, allowing for break-out to 10GBASE-LR transceivers.

40GBASE-ER4: The Extreme 40GBASE-ER4 Optics modules support link lengths of up to 40Km over a pair of Single mode fibers with duplex LC connectors. The 40 Gigabit Ethernet signal is carried over four wavelengths. Multiplexing and demultiplexing of the four wavelengths are managed within the device.

Note: Customers should ensure that 40GBASE-ER4 receivers are protected from excessive input optical power by adding additional optical attenuation if necessary. TX and RX power levels are described for each module in the Optics compatibility website.

40G-DACP: Extreme QSFP+ to QSFP+ copper direct-attach 40G cables are suitable for very short links and offer a cost-effective way to establish a 40-Gigabit link between 40G ports of Extreme platforms. Extreme currently offers 40G passive copper cables in lengths of 0.5, 1, 3 and 5 meters.

40G-DACP Breakout: Extreme QSFP+ to 4xSFP+ copper direct-attach 40G break-out cables are suitable for very short links and offer a cost-effective way to establish a 40G-Gigabit link between one 40G QSFP+ port and four 10G SFP+ ports of Extreme platforms. Extreme currently offers 40G passive copper break-out cables in lengths of 1, 2, 3 and 5 meters.

40G-AOC: Extreme QSFP+ to QSFP+ active optical fiber cables are suitable for short to medium links and offer a cost-effective way to establish a 40-Gigabit link between 40G ports of Extreme platforms. Active optical cables are much thinner than copper cables and no Electro Magnetic Interference (EMI) issues, which is critical in high-density systems. Extreme currently offers active optical cables in lengths of 3, 5, 10, 20 and 100 meters.

40G-AOC Breakout: Extreme QSFP+ to 4xSFP+ active optical fiber breakout cables are suitable for short to medium links and offer a cost-effective way to establish a 40G-Gigabit link between one 40G QSFP+ port and four 10G SFP+ ports of Extreme platforms. Active optical cables are much thinner than copper cables and no Electro Magnetic Interference (EMI) issues, which is critical in high-density systems. Extreme currently offers active optical breakout cables in lengths of 10 meters.



Extreme Networks 25Gb SFP28 Optics Modules

Extreme Networks SFP28 Modules offer customers multiple options for 25Gb connectivity.

25Gb SFP28 Optics/Extreme SKUs

Standard/Type	Description	Extreme SKUs
25GBASE-SR	25G SR SFP28, LC, 100m over OM4, Multimode Fiber	25G-SR-SFP100M 10501
25GBASE-SR (Lite FEC)	25G SR SFP28, LC, 100m over OM4, Multimode Fiber	10502
25GBASE-ESR	25G ESR SFP28, LC, 300m over OM4, Multimode fiber	10503
25GBASE-LR	25G LR SFP28, LC, 10Km, Single mode Fiber	25G-LR-SFP10KM 10504
25GBASE-ER	25G ER SFP28, LC, 40Km, Single mode Fiber	25G-ER-SFP40KM
25G-DACP	25G SFP28 Passive DAC Copper cables (0.5m, 1m, 3m, 5m)	25G-ER-SFP40KM
25G-AOC	25G SFP28 Active Optical Cables (10m, 20m)	25G-DACP-SFPZ5M 25G-DACP-SFP1M 25G-DACP-SFP3M 25G-DACP-SFP5M 10520, 10521, 10522, 10530, 10531

25GBASE-SR: The Extreme 25GBASE-SR Optics modules support link lengths of up to 70m (OM3) or 100m (OM4) over Multimode Fiber with duplex LC connectors. 25GBASE-SR requires the use of FEC.

25GBASE-SR (Lite FEC): The Extreme 25GBASE-SR Optics module supports link lengths of up to 70m (OM3) or 100m (OM4) over Multimode Fiber with duplex LC connectors using FEC. In addition, the 25GBASE-SR (Lite FEC) module supports link lengths of 30m (OM3) or 40m (OM4) without the use of FEC.

25GBASE-ESR: The Extreme 25GBASE-ESR Optics modules support link lengths of up to 200m (OM3) or 300m (OM4) over Multimode Fiber with duplex LC connectors. 25GBASE-ESR requires the use of FEC.

25GBASE-LR: The Extreme 25GBASE-LR Optics modules support link lengths of up to 10Km over a pair of Single mode fibers with duplex LC connectors. 25GBASE-LR requires the use of FEC.

25GBASE-ER: The Extreme 25GBASE-ER Optics modules support link lengths of up to 40Km over a pair of Single mode fibers with duplex LC connectors. 25GBASE-ER requires the use of FEC.

Note: Customers should ensure that 25GBASE-ER receivers are protected from excessive input optical power by adding additional optical attenuation if necessary. TX and RX power levels are described for each module in the Optics compatibility website.

25G-DACP: Extreme SFP28 to SFP28 copper direct-attach cables are suitable for very short links and offer a cost-effective way to establish a 25-Gigabit link between 25G ports of Extreme platforms. Extreme currently offers 25G passive copper cables in lengths of 0.5, 1, 3 and 5 meters. 25G-DACP 0.5m, 1m and 2m do not require FEC; 3m and 5m cables require the use of FEC.

25G-AOC: Extreme SFP28 to SFP28 active optical cables are suitable for short links and offer a cost-effective way to establish a 25-Gigabit link between 25G ports of Extreme platforms. Extreme currently offers 25G active optical cables in lengths of 10 and 20 meters. 25G-AOC requires the use of FEC.



Extreme Networks 20Gb SFP-DD Optics Modules

Extreme Networks SFP-DD Modules offer customers multiple options for 20Gb connectivity.

20Gb SFP-DD Cables/Extreme SKUs

Standard/Type	Description	Extreme SKUs
20G SFP-DD DAC	20G SFP-DD to SFP-DD DAC (0.5m, 1m, 3m, 5m)	20G-DACP-SFP-DDZ5M 20G-DACP-SFP-DD1M 20G-DACP-SFP-DD3M 20G-DACP-SFP-DD5M
20G SFP-DD/SFP+ DAC Breakout	20G SFP-DD to 2xSFP+ DAC (1m, 3m, 5m)	20G-DACP-SFP-DD2SFP1M 20G-DACP-SFP-DD2SFP3M 20G-DACP-SFP-DD2SFP5M
20G SFP-DD/QSFP+ DAC Breakout	20G SFP-DD to QSFP+ DAC (1m, 3m, 5m)	20G-DACP-QSFP1SFP-DD1M 20G-DACP-QSFP1SFP-DD3M 20G-DACP-QSFP1SFP-DD5M

20G SFP-DD DAC: Extreme SFP-DD to SFP-DD copper direct-attach cables are suitable for very short links and offer a cost-effective way to establish a 20-Gigabit link between SFP-DD ports of Extreme's 5420 platform. The SFP-DD ports support 2xSFP+ data links in a single SFP-DD connector. Extreme currently offers 20G SFP-DD-SFP-DD passive copper cables in lengths of 0.5, 1, 3 and 5 meters.

20G SFP-DD/SFP+ DAC Breakout: Extreme SFP-DD to 2xSFP+ copper direct-attach breakout cables are suitable for very short links and offer a cost-effective way to establish two 10-Gigabit links between an SFP-DD port of Extreme's 5420 platform and 2 10-Gigabit SFP+ ports. Extreme currently offers 20G SFP-DD-2xSFP+ passive copper cables in lengths of 1, 3 and 5 meters.

20G SFP-DD/QSFP+ DAC Breakout: Extreme SFP-DD to QSFP+ copper direct-attach breakout cables are suitable for very short links and offer a cost-effective way to establish a 20-Gigabit link between an SFP-DD port of Extreme's 5420 platform and 2 channels of a QSFP+ port. The SFP-DD connection is wired to channels 1 and 2 of the QSFP+ connector. Extreme currently offers 20G SFP-DD-QSFP+ passive copper cables in lengths of 1, 3 and 5 meters.



Extreme Networks 10Gb SFP+ Optics Modules

Extreme Networks offers a wide variety of 10Gb SFP+ modules for connectivity at 10Gb data rates.

10Gb SFP+ Optics/Extreme SKUs

Standard/Type	Description	Extreme SKUs
10GBASE-T	10GBASE-T SFP+, RJ45, 30m over Cat6 copper	10338 AA1403043-E6
10GBASE-USR	10G USR SFP+, LC, 100m over OM3, Multimode fiber	10G-USR-SFP100M 10G-SFPP-USR-E
10GBASE-SR	10G SR SFP+, LC, 400m over OM4, Multimode Fiber	10301 10G-SR-SFP300M-ET 10G-SFP-SR 10GB-SR-SFPP 10G-SFP-SR-SA AA1403015-E6HT
10GBASE-LRM	10G LRM SFP, LC, 220m over OM4, Multimode Fiber	10303 AA1403017-E6
10GBASE-LR	10G LR SFP+, LC, 10Km, Single mode Fiber	10302 10G-LR-SFP10KM-ET AA1403011-E6 AA1403011-E6HT
10GBASE-BiDi-10	10G SR BiDi SFP+, LC, 10Km over Single mode fiber	10GB-BX10-D 10GB-BX10-U AA1403169-E6 AA1403170-E6
10GBASE-ER	10G ER SFP+, LC, 40Km, Single mode fiber	10G-ER-SFP40KM-ET 10309 AA1403013-E6
10GBASE-BiDi-40	10G SR BiDi SFP+, LC, 40Km over Single mode fiber	10GB-BX40-D, 10GB-BX40-U
10GBASE-ZR	10G ZR SFP+, LC, 80KM, Single mode fiber	10310, AA1403165-E6, 10GB-ZR-SFPP, AA1403016-E6,
10G-DACP	10G SFP+ Passive DAC Copper cables (0.5m, 1m, 3m, 5m, 10m)	10G-DACP-QSFPZ5M, 10304, 10305, 10306, 10307
10G-DACA	10G SFP+ Active DAC Copper cables (1m, 3m, 5m)	10G-DACA-SFP1M 10G-DACA-SFP3M 10G-DACA-SFP5M 10G-SFP-TWX-0101 10G-SFP-TWX-0501 AA1403018-E6 AA1403019-E6 AA1403020-E6 AA1403022-E6
10G-AOC	10G Active Optics Cables (7m, 10m)	10G-AOC-SFP7M 10G-AOC-SFP10M 10G-SFP-AOC-1001

10GBASE-T: The Extreme 10GBASE-T modules support link lengths of up to 30m over Cat6a copper cable with RJ-45 connectors.

Note: 10GBASE-T requires 2.5W power, hence requires alternate port population configuration to ensure proper heat dissipation.

10GBASE-USR: The Extreme 10GBASE-USR Optics modules support link lengths of up to 100m (OM3) over Multimode Fiber with duplex LC connectors.

10GBASE-SR: The Extreme 10GBASE-SR Optics modules support link lengths of up to 300m (OM3) or 400m (OM4) over Multimode Fiber with duplex LC connectors.

Note: Part number 10G-SR-SFP300M-ET8PK provides an 8-pack of part number 10G-SR-SFP300M-ET.

10GBASE-LRM: The Extreme 10GBASE-LRM Optics modules support link lengths of up to 220m (OM3) over Multimode Fiber with duplex LC connectors. 10GBase-LRM modules use linear-mode amplifiers.

10GBASE-LR: The Extreme 10GBASE-LR Optics modules support link lengths of up to 10Km over a pair of Single mode fibers with duplex LC connectors.

Note: Part number 10G-LR-SFP10KM-ET8PK provides an 8-pack of part number 10G-LR-SFP10KM-ET.

10GBASE-BiDi-10: The Extreme 10GBASE-BiDi-10 Optics modules support link lengths of up to 10Km over a single fiber with LC connector. They provide 10G optical links over one Single mode fiber by transmitting and receiving bidirectionally at different wavelengths over the same fiber, using one module which transmits at 1270nm paired with a second module which transmits at 1330nm.

10GBASE-ER: The Extreme 10GBASE-ER Optics modules support link lengths of up to 40Km over a pair of Single mode fibers with duplex LC connectors

Note: Customers should ensure that 10GBASE-ER receivers are protected from excessive input optical power by adding additional optical attenuation if necessary. TX and RX power levels are described for each module in the Optics compatibility website.

10GBASE-BiDi-40: The Extreme 10GBASE-BiDi-40 Optics modules support link lengths of up to 40Km over a single fiber with LC connector. They provide 10G optical links over one Single mode fiber by transmitting and receiving bidirectionally at different wavelengths over the same fiber, using one module which transmits at 1270nm paired with a second module which transmits at 1330nm.

Note: Customers should ensure that 10GBASE-BiDi-40 receivers are protected from excessive input optical power by adding additional optical attenuation if necessary. TX and RX power levels are described for each module in the Optics compatibility website.

10GBASE-ZR: The Extreme 10GBASE-ZR Optics modules support link lengths of up to 80Km over a pair of Single mode fibers with duplex LC connectors

Note: Customers should ensure that 10GBASE-ZR receivers are protected from excessive input optical power by adding additional optical attenuation if necessary. TX and RX power levels are described for each module in the Optics compatibility website.

10G-DACP: Extreme SFP+ to SFP+ passive copper direct-attach cables are suitable for very short links and offer a cost-effective way to establish a 10-Gigabit link between 10G ports of Extreme platforms. Extreme currently offers 10G passive copper cables in lengths of 0.5, 1, 3, 5, and 10 meters.

10G-DACA: Extreme SFP+ to SFP+ active copper direct-attach cables are suitable for short links and offer a cost-effective way to establish a 10-Gigabit link between 10G ports of Extreme platforms. Extreme currently offers 10G active copper cables in lengths of 1, 3, 5, 7 and 10 meters.

10G-AOC: Extreme SFP+ to SFP+ active optical fiber cables are suitable for short to medium links and offer a cost-effective way to establish a 10-Gigabit link between Extreme platforms. Active optical cables are much thinner than copper cables and no Electro Magnetic Interference (EMI) issues, which is critical in high-density systems. Extreme currently offers 10G active optical cables in lengths of 7 and 10 meters.



Extreme Networks 1Gb SFP Optics Modules

Extreme Networks offers a wide variety of 1000Base SFP modules for connectivity at 1Gb data rates.

1000Base SFP Optics/Extreme SKUs

Standard/Type	Description	Extreme SKUs
1000BASE-T	1GBASE-T SFP, RJ45, 100m over Cat6 copper	10065 10070H 1G-SFP-000190 MGBIC-Q2
1000BASE-SX	1G SX SFP, LC, 550m over OM3, Multimode Fiber	10051H AA1419048-E6 1G-SFP-SX-OM MGBIC-LC01 I-MGBIC-GSX
1000BASE-FX	1G FX SFP, LC, 2Km, Single mode Fiber	MGBIC-LC03 I-MGBIC-LC03
1000BASE-BiDi-10	1G SR BiDi SFP, LC, 10Km over Single mode fiber	10056H 10057H AA1419069-E6 AA1419070-E6
1000BASE-LX	1G LX SFP, LC, 10Km, Single mode Fiber	10060 10060H 10052H AA1419049-E6
1000BASE-BiDi-40	1G SR BiDi SFP+, LC, 40Km over Single mode fiber	MGBIC-BX40-D MGBIC-BX40-U
1000BASE-ELX	1G ZR SFP+, LC, 80KM, Single mode fiber	10053H

1000BASE-T: The Extreme 1000BASE-T modules support link lengths of up to 100m over Cat6a copper cable with RJ-45 connectors.

1000BASE-SX: The Extreme 1000BASE-SX Optics modules support link lengths of up to 550m (OM3) over Multimode Fiber with duplex LC connectors.

Note: Part number 10071H provides a 10-pack of part number 10051H.

1000BASE-FX: The Extreme 1000BASE-FX Optics modules support link lengths of up to 2Km or over Single mode Fiber with duplex LC connectors.

1000BASE-BIDI-10: The Extreme 1000BASE-BIDI-10 Optics modules support link lengths of up to 10Km over one Single mode fiber with LC connectors. They provide 1G optical links over one Single mode fiber by transmitting and receiving bidirectionally at different wavelengths over the same fiber, using one module which transmits at 1310nm paired with a second module which transmits at 1490nm.

1000BASE-LX: The Extreme 1000BASE-LX Optics modules support link lengths of up to 10Km over a pair of Single mode fibers with duplex LC connectors.

Note: Part number 10072H provides a 10-pack of part number 10052H.

100GBASE-BIDI-40: The Extreme 100GBASE-BIDI-40 Optics modules support link lengths of up to 40Km over one Single mode fiber with LC connectors. They provide 1G optical links over one Single mode fiber by transmitting and receiving bidirectionally at different wavelengths over the same fiber, using one module which transmits at 1310nm paired with a second module which transmits at 1490nm.

Note: Customers should ensure that 10GBASE-BiDi-40 receivers are protected from excessive input optical power by adding additional optical attenuation if necessary. TX and RX power levels are described for each module in the Optics compatibility website.

100GBASE-ELX: The Extreme 100GBASE-ELX Optics modules support link lengths of up to 70Km over a pair of Single mode fibers with duplex LC connectors.

Note: Customers should ensure that 100GBASE-ELX receivers are protected from excessive input optical power by adding additional optical attenuation if necessary. TX and RX power levels are described for each module in the Optics compatibility website.

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