## Highlights

### Family of 10Gb/100Gb Switches with Advanced Enterprise Capabilities
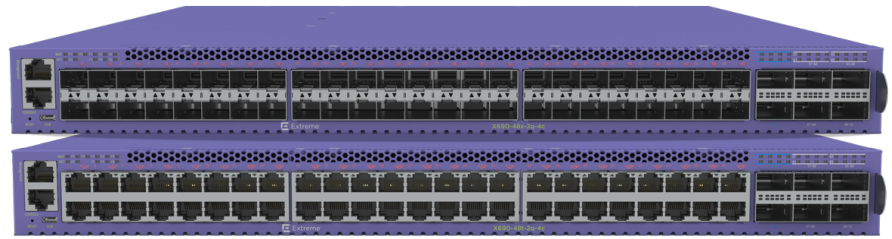
• Full featured ExtremeXOS® operating system with advanced features supporting switching, routing, SDN, and VXLAN

• Controlling aggregation switch for V300 and V400 edge devices with Extreme Extended Edge Switching

• High-density 10Gb aggregation and leaf applications

• Non-blocking 1.76 Tbps switching capacity per system

### Ease of Use — Flexible Management Options

• Enterprise Extreme Management Center application support

• Advanced command line interface

• Zero Touch Provisioning (ZTP+)

• Integrated web based management application

### Flexible System Configurations

• Wide range of port speeds from 1Gb, 10Gb, 25Gb, 40Gb, and 100Gb

• Fiber SFP+ and copper 10GBASE-T models

• Hot-swappable modular power and fans

• AC and DC power supply options

• Front to Back and Back to Front air flow options

• Redundancy option for high-availability



# ExtremeSwitching™ X690

High-performance 48-port 10Gb aggregation and leaf switch

## Product Overview

### High-Density, 10Gb Enterprise LAN and Aggregation Switching

The ExtremeSwitching X690 product family are high-density, purpose-built 10Gb/100Gb switches designed for high-performance enterprise and aggregation applications. The X690 can support a range of interface speeds, including 1Gb, 10Gb, 25Gb, 40Gb, 50Gb and 100Gb, all in a compact 1RU form factor. This enables the ExtremeSwitching X690 to be flexibly deployed in either Enterprise LAN or high-density top of rack applications.

The X690 can also serve as the controlling aggregation switch within Extreme's Extended Edge Switching solution.

Two models of the X690 are available:

### X690-48x-2q-4c

• 48 x 1Gb/10Gb SFP+ ports

• 2 x 10Gb/40Gb QSFP+ ports

• Up to 4 x 10Gb/25Gb/40Gb/50Gb/100Gb QSFP28 ports

### X690-48t-2q-4c

• 48 x 100Mb/1Gb/10Gb 10GBASE-T ports

• 2 x 10Gb/40Gb QSFP+ ports

• Up to 4 x 10Gb/25Gb/40Gb/50Gb/100Gb QSFP28 ports.

## Flexible Deployment Options

The X690 can handle a range of high bandwidth applications, including high-density 10Gb top of rack aggregation, as well as spine/leaf deployments as an edge leaf switch. With both copper and fiber high-density 10Gb port options, the X690 can flexibly accommodate a variety of data center needs. It can also flexibly support uplinks at 25Gb, 40Gb, 50Gb or even 100Gb rates. A range of SFP+ and QSFP+ optical transceivers are available to support 1Gb, 10Gb and 40Gb Ethernet, while QSFP28 optical transceivers can be used to support 25Gb, 50Gb and 100Gb Ethernet applications.

## ExtremeXOS Intelligent L2/L3 Switching

The ExtremeSwitching X690 family supports sophisticated, intelligent Layer 2 switching, as well as Layer 3 IPv4/IPv6 routing, including policy-based switching and routing. The X690 simplifies network operation with the ExtremeXOS modular operating system, which is used across a wide range of ExtremeSwitching networking products. The high availability ExtremeXOS operating system reduces operational overhead through the use of a single OS across the network.

## Extended Edge Switching

The X690 supports Extreme Extended Edge Switching, an innovative solution that simplifies the deployment and operation of edge switches. With this solution, the X690 can be meshed with economical V300 and V400 Series access devices to form a single logical switch. Advanced X690 services can then be seamlessly delivered to the V300 and V400 edge switches. The result is a simplified operational model that reduces costs.

## High-Performance 400Gb Stacking

The X690 supports SummitStack-V400 400Gbps high speed stacking using 2 100Gb ports, along with Extreme X590 and X87o Series switches. Up to eight (8) X590, X690 and X870 systems can be stacked using SummitStack-V400. Any of the supported 100Gb QSFP28 direct attach cables can be used for the stacking links.

## Comprehensive Network Management

Extreme Networks has developed tools that simplify and help in efficiently managing your network. The Extreme Management Center™ application provides centralized visibility and granular control of enterprise network resources end to end.

# Product Specifications

| Model | X690-48x-2q-4c | X690-48t-2q-4c |
|---|---|---|
| Ports | • 48 1Gb/10Gb SFP+ ports<br>• 2 10Gb/40Gb QSFP+ ports<br>• 4 10Gb/25Gb/40Gb/50Gb/100Gb QSFP28 ports<br>• 1 x Serial console port RJ-45<br>• 1 x 10/100/1000BASE-T out-of-band management port<br>• Micro-USB Type A storage port<br><br>**QSFP Port Configurations Support**<br><br>• 4 10Gb / 40Gb QSFP+ ports and 2 10Gb / 25Gb / 40Gb / 50Gb / 100Gb QSFP28 ports<br><br>  or<br><br>• 4 10Gb / 25Gb / 40Gb / 50Gb / 100Gb QSFP28 ports (two QSFP ports inactive) | • 48 100Mb/1Gb/10Gb 10GBASE-T ports<br>• 2 10Gb/40Gb QSFP+ ports<br>• 4 10Gb/25Gb/40Gb/50Gb/100Gb QSFP28 ports<br>• 1 x Serial console port RJ-45<br>• 1 x 10/100/1000BASE-T out-of-band management port<br>• Micro-USB Type A storage port<br><br>**QSFP Port Configurations Support**<br><br>• 4 10Gb / 40Gb QSFP+ ports and 2 10Gb / 25Gb / 40Gb / 50Gb / 100Gb QSFP28 ports<br><br>  or<br><br>• 4 10Gb / 25Gb / 40Gb / 50Gb / 100Gb QSFP28 ports (two QSFP ports inactive) |
| Power Supplies | • Modular 770W AC power supply (up to two PSUs)<br>• Modular 1100W DC power supply (up to two PSUs)<br>• Front-Back and Back-Front airflow options | • Modular 770W AC power supply (up to two PSUs)<br>• Modular 1100W DC power supply (up to two PSUs)<br>• Front-Back and Back-Front airflow options |
| Fan Modules | • 6 fan modules<br>• Front-Back and Back-Front airflow options | • 6 fan modules<br>• Front-Back and Back-Front airflow options |
| Dimensions | • 17.4in W / 19.2in D / 1.7in H (44.1cm / 48.8cm / 4.3cm) | • 17.4in W / 19.2in D / 1.7in H (44.1cm / 48.8cm / 4.3cm) |
| Performance | • 1.76Tbps Switching Capacity / 759Mpps Forwarding Rate Average Latency: 800 ns | • 1.76Tbps Switching Capacity / 759Mpps Forwarding Rate Average Latency: 2.3 µsec |
| CPU Memory | • 2.4GHz Quad core CPU<br>• 8GB DDR3 ECC memory<br>• 32GB SSD memory | • 2.4GHz Quad core CPU<br>• 8GB DDR3 ECC memory<br>• 32GB SSD memory |
| Packet Buffers | 12MB | 12MB |
| Operating Conditions | • 0° - 45°C operation<br>• 10% to 95% relative humidity, non-condensing<br>• 0 - 3000 meters altitude<br>• Shock (half sine): 98 m/s2 (10 G), 11 ms, 9 shocks<br>• Random vibration: 3 to 500 Hz at 1.5 G rms | • 0° - 45°C operation<br>• 10% to 95% relative humidity, non-condensing<br>• 0 - 3000 meters altitude<br>• Shock (half sine): 98 m/s2 (10 G), 11 ms, 9 shocks<br>• Random vibration: 3 to 500 Hz at 1.5 G rms |

# Scaling and Performance

- MAC Addresses: 272K
- IPv4 LPM Entries: 256K max w/ALPM
- IPv4 Hosts:
  - with min LPM IPv4 entries: 146K
  - with max LPM IPv4 entries: 3K
- IPv6 LPM (/64) Entries: 128K max w/ALPM
- IPv6 Hosts: 32K max
- IP Multicast Groups - 4K
- IP Multicast (s,v,g) entries - 130K max
- Flexible Universal Forwarding Tables (UFT)
- 4092 user-created VLAN/VMANs
- 9216 Byte Max Packet Size (Jumbo Frame)
- 8 queues per port
- 8k ingress rules
- 1K egress rules

- OnePolicy and Scaling
  - Up to 24,576 authenticated policy users per switch
  - Policy Profiles: 63
  - Unique Permit/Deny Rules per switch: 1976
    - Default OnePolicy Profile
      - MAC Rules: 512
      - IPv4 Rules: 512
      - IPv6 Rules: 512
      - L2 Rules: 440
- Data Center Bridging
  - DCBx Data Center Bridging Exchange Protocol
  - Priority Flow Control (PFC)
  - Enhanced Transmission Selection (ETS)
- VxLAN Tunneling End Point (VTEP)
- Configurable Store and Forward and Cut Through forwarding modesProduct Specifications

## Scaling and Performance (cont.)

- IEEE 802.3 Media Access Standards
  - IEEE 802.3ba / 802.3bm 40GBASE-X and 100GBASE-X
  - IEEE 802.3ae 10GBASE-X
  - IEEE 802.3 10GBASE-T (up to 100m using Cat6a cabling or better)

- 25Gb and 50Gb Ethernet implemented per 25G/50G Ethernet Consortium specification and IEEE 802.3 standard sFlow
- SummitStack-V400 400Gb stacking (full duplex)
  - Stacking with up to 8 X590/X690/X870 systems
  - 2 x 100Gb ports for stacking

## Power and Heat Dissipation

| Switch Model | Minimum Heat Dissipation (BTU/hr) (Idle, no ports linked) | Minimum Power Consumption (Watts) (Idle, no ports linked) | Maximum Heat Dissipation (BTU/hr) (Fans high, all ports 100% traffic) | Maximum Power Consumption (Watts) (Fans high, all ports 100% traffic) |
|---|---|---|---|---|
| X690-48x-2q-4c AC | 282 BTU/hr | 83 W | 1124 BTU/hr | 329 W |
| X690-48x-2q-4c DC | 311 BTU/hr | 91 W | 1178 BTU/hr | 345 W |
| X690-48t-2q-4c AC | 425 BTU/hr | 125 W | 1271 BTU/hr | 373 W |
| X690-48t-2q-4c DC | 421 BTU/hr | 123 W | 1315 BTU/hr | 385 W |
| | 1 PSU | | 2 PSU | |

## Power Supply Specifications

| | 770W AC PSU 10960/10961 | 1100W DC PSU 10962/10963 |
|---|---|---|
| Dimensions | 2.3 in W x 1.6 in H x 14.1 in D (5.9 cm x 4.1 cm x 35.9 cm) | 2.3 in W x 1.6 in H x 14.1 in D (5.9 cm x 4.1 cm x 35.9 cm) |
| Weight | 2.2 lb (1 Kg) | 2.2 lb (1 Kg) |
| Voltage Input Range | 100 - 240 VAC +/- 10% | -48 VDC -15% +20% |
| Line Frequency Range | 50 - 60 Hz +/- 5% | N/A |
| PSU Input Socket | IEC 320 C14 | Terminal Block |
| Power Cord Input Plug | IEC 320 C13 | N/A |
| Operating Conditions | 0º - 45ºC Operation | |

## Acoustic Specifications

| Switch Model | Bystander Sound Pressure | Declared Sound Power |
|---|---|---|
| X690-48x-2q-4c (Front-Back Airflow) | 55.4 dB(A) up to 30ºC 61.3 dB(A) up to 40ºC 76.8 dB(A) @ 45ºC (max) | 6.9 bels up to 30ºC 7.5 bels up to 40ºC 9.0 bels @ 45ºC (max) |
| X690-48x-2q-4c (Back-Front Airflow) | 56.9 dB(A) up to 30ºC 63.3 dB(A) up to 40ºC 77.4 dB(A) @ 45ºC (max) | 7.1 bels up to 30ºC 7.7 bels up to 40ºC 9.1 bels @ 45ºC (max) |
| X690-48t-2q-4c (Front-Back Airflow) | 58 dB(A) up to 25ºC 72.8 dB(A) up to 35ºC 76.3 dB(A) @ 45ºC (max) | 7.2 bels up to 25ºC 8.7 bels up to 35ºC 9.0 bels @ 45ºC (max) |
| X690-48t-2q-4c (Back-Front Airflow) | 59.1 dB(A) up to 25ºC 72.5 dB(A) up to 35ºC 77.5 dB(A) @ 45ºC (max) | 7.3 bels up to 25ºC 8.7 bels up to 35ºC 9.0 bels @ 45ºC (max) |

## Environmental Specifications

- EN/ETSI 300 019-2-1 v2.1.2 - Class 1.2 Storage
- EN/ETSI 300 019-2-2 v2.1.2 - Class 2.3 Transportation
- EN/ETSI 300 019-2-3 v2.1.2 - Class 3.1e Operational
- EN/ETSI 300 753 (1997-10) - Acoustic Noise ASTM D3580 Random Vibration Unpackaged 1.5 G

## Environmental Compliance

- EU RoHS – 2011/65/EU
- EU WEEE – 2012/19/EU
- China RoHS – SJ/T 11363-2006
- Taiwan RoHS – CNS 15663(2013.7)

## Packaging and Storage Specifications

- Temp: -40° C to 70° C (-40° F to 158° F)
- Humidity: 10% to 95% relative humidity, non-condensing
- Packaged Shock (half sine): 180 m/s2 (18 G), 6 ms, 600 shocks
- Packaged Vibration: 5 to 62 Hz at velocity 5 mm/s, 62 to 500 Hz at 0.2 G
- Packaged Random Vibration: 5 to 20 Hz at 1.0 ASD w/–3 dB/oct. from 20 to 200 Hz
- Packaged Drop Height: 14 drops minimum on sides and corners at 42 inches (<15 kg box)

## Regulatory and Safety

### North American ITE

- UL 60950-1 2nd edition A2:2014, Listed Device (U.S.)
- CSA 22.2 No. 60950-1 2nd edition 2014(Canada)
- Complies with FCC 21CFR 1040.10 (U.S. Laser Safety)
- CDRH Letter of Approval (US FDA Approval)

### European ITE EN

- 60950-1:2006+A11:2009+A1:2010+A12:2011+A2:2013 2nd Ed.
- EN 60825-1:2007 / IEC 60825-1:2007 Class 1 (Lasers Safety)
- 2014 / 35/ EU Low Voltage Directive

### International ITE

- CB Report & Certificate per IEC 60950-1 : 2005+A1:2009+A2:2013 + National Differences
- AS/NZS 60950-1 (Australia /New Zealand)

## EMI/EMC Standards

### North American EMC for ITE

- FCC CFR 47 part 15 Class A (USA)
- ICES-003 Class A (Canada)

### European EMC Standards

- EN 55032:2015 Class A
- EN 55024:2010
- EN 61000-3-2,2014 (Harmonics)
- EN 61000-3-3 2013 (Flicker)
- EN 300 386 v1.6.1 (EMC Telecommunications)
- 2014/30/EU EMC Directive

### International EMC Certifications

- CISPR 32:2015, Class A (International Emissions)
- AS/NZS CISPR32:2015
- CISPR 24:2010 Class A (International Immunity)
- IEC 61000-4-2:2008/EN 61000-4-2:2009 Electrostatic Discharge, 8kV Contact, 15 kV Air, Criteria A
- IEC 61000-4-3:2010/EN 61000-4-3:2006 +A1:2008 +A2:2010 Radiated Immunity 10V/m, Criteria A
- IEC 61000-4-4:2012. / EN 61000-4-4:2012 Transient Burst, 1 kV, Criteria A
- IEC 61000-4-5:2014 /EN 61000-4-5:2014 Surge, 2 kV L-L, 2 kV L-G, Level 3, Criteria A
- IEC 61000-4-6:2013/EN 61000-4-6:2014 Conducted Immunity, 0.15-80 MHz, 10V/m unmod. RMS, Criteria A
- IEC/EN 61000-4-11:2004 Power Dips & Interruptions, >30%, 25 periods, Criteria C

### Country Specific

- VCCI Class A (Japan Emissions)
- ACMA RCM (Australia Emissions)
- CCC Mark
- KCC Mark, EMC Approval (Korea)

### Telecom Standards

- CE 2.0 Compliant

# Ordering Information

| Part Number | Product Name | Product Description |
|---|---|---|
| **ExtremeSwitching X690 Systems** | | |
| 17350 | X690-48x-2q-4c | X690-48x-2q-4c Base unit, 48 1Gb/10Gb SFP+ ports, 2 10Gb/40Gb QSFP+ ports, 4 10Gb/25Gb/40Gb/50Gb/100Gb QSFP28 ports, unpopulated, ExtremeXOS Advanced Edge License, 2 unpopulated power supply slots, 6 unpopulated fan module slots |
| 17360 | X690-48t-2q-4c | X690-48t-2q-4c Base unit, 48 1Gb/10Gb 10GBASE-T ports, 2 10Gb/40Gb QSFP+ ports, 4 10Gb/25Gb/40Gb/50Gb/100Gb QSFP28 ports, unpopulated, ExtremeXOS Advanced Edge License, 2 unpopulated power supply slots, 6 unpopulated fan module slots |
| 17115 | Fan Module FB | Fan module, Front to Back airflow |
| 17116 | Fan Module BF | Fan module, Back to Front airflow |
| 10960 | 770W AC PSU F-B | 770W AC power supply, Front-to-Back airflow |
| 10961 | 770W AC PSU B-F | 770W AC power supply, Back-to-Front airflow |
| 10962 | 1100W DC PSU F-B | 1100W DC power supply, Front-to-Back airflow |
| 10963 | 1100W DC PSU B-F | 1100W DC power supply, Back-to-Front airflow |
| 16777 | Four Piece Rack Mount Kit, Spare | Spare Four Piece Rack Mount compatible with X690 |
| 10965 | LRM/MACsec Adapter | LRM/MACsec Adapter, includes two host cables for host switch connection, and USB cable for optional power connection. Requires MACsec license on host switch |
| 10966 | 5-unit Rack Mount Kit | Optional rack mount bracket for LRM/MACsec Adapter. Holds five units in 1RU |
| Fan module and power supplies must be ordered separately. Air flow direction of the fan module and power supplies must be the same. AC and DC power supplies cannot be mixed in a system. Rack mount rails are included. | | |
| **Firmware Licenses** | | |
| 17131 | Core License | ExtremeXOS X670/X690 Series Core License |
| 17134 | OpenFlow Feature Pack | ExtremeXOS X670/X690 OpenFlow Feature Pack |
| 17133 | MPLS Feature Pack | ExtremeXOS X670/X690 MPLS Feature Pack |
| 17138 | MACsec Feature Pack | MACsec Feature Pack for X690 series switches. Enables MACsec when used with LRM/MACsec Adapter (10965) |
| **100Gb Optical Transceivers and Direct Attach Cables** | | |
| 10401 | 100Gb QSFP28 SR4 MMF | 100Gb, 100GBASE-SR4, 70m OM3 / 100m OM4 MMF, QSFP28, MPO (8 fiber) |
| 10332 | MPO to 4xLC OM4 MMF 5m | MPO to 4xLC OM4 MMF patch cord, 5m (for use with 10401 QSFP28 SR4 4x25Gb breakout) |
| 10403 | 100Gb QSFP28 LR4 10km | 100Gb, 100GBASE-LR4, 10km SMF, QSFP28, LC |
| 10404 | 100Gb QSFP28 CWDM4 | 100Gb, CWDM4, 2km SMF, QSFP28, LC |
| 10405 | 100Gb QSFP28 PSM4 | 100Gb, Parallel Single Mode PSM4, 2km SMF, QSFP28, MPO (8 fiber) |
| 10406 | 100Gb QSFP28 SWDM4 100m | 100Gb, QSFP28 SWDM 75m OM3 /100m OM4 MMF LC |
| 10327 | MPO to 4xLC Breakout Patch Cord, SM, 10m | MPO to 4xLC Breakout Patch Cord, SM, 10m (for use with 10405 100Gb QSFP28 PSM4 transceiver for 4x25Gb breakout) |
| 10434 | 100Gb, AOC QSFP28 5m | 100Gb, QSFP28-QSFP28 Active optical cable, 5m |
| 10435 | 100Gb, AOC QSFP28 7m | 100Gb, QSFP28-QSFP28 Active optical cable, 7m |
| 10436 | 100Gb, AOC QSFP28 10m | 100Gb, QSFP28-QSFP28 Active optical cable, 10m |
| 10437 | 100Gb, AOC QSFP28 20m | 100Gb, QSFP28-QSFP28 Active optical cable, 20m |
| 10441 | 100Gb AOC QSFP28 x 4 SFP28 5m | 100Gb, QSFP28- 4xSFP28 (4x25Gb) Active optical breakout cable, 5m |
| 10442 | 100Gb AOC QSFP28 x 4 SFP28 7m | 100Gb, QSFP28- 4xSFP28 (4x25Gb) Active optical breakout cable, 7m |
| 10443 | 100Gb AOC QSFP28 x 4 SFP28 10m | 100Gb, QSFP28- 4xSFP28 (4x25Gb) Active optical breakout cable, 10m |
| 10444 | 100Gb AOC QSFP28 x 4 SFP28 20m | 100Gb, QSFP28- 4xSFP28 (4x25Gb) Active optical breakout cable, 20m |
| 10410 | 100Gb, DAC QSFP28-QSFP28 0.5m | 100Gb, QSFP28-QSFP28 Direct attach passive copper cable, 0.5m |
| 10411 | 100Gb, DAC QSFP28-QSFP28 1m | 100Gb, QSFP28-QSFP28 Direct attach passive copper cable, 1m |
| 10412 | 100Gb, DAC QSFP28-QSFP28 2m | 100Gb, QSFP28-QSFP28 Direct attach passive copper cable, 2m |
| 10413 | 100Gb, DAC QSFP28-QSFP28 3m | 100Gb, QSFP28-QSFP28 Direct attach passive copper cable, 3m |
| 10414 | 100Gb, DAC QSFP28-QSFP28 5m | 100Gb, QSFP28-QSFP28 Direct attach passive copper cable, 5m |

# Ordering Information (cont.)

| Part Number | Product Name | Product Description |
|---|---|---|
| **100Gb Optical Transceivers and Direct Attach Cables (cont'd)** | | |
| 10421 | 100Gb, DAC QSFP28–4xSFP28 1m | 100Gb, QSFP28–4 x SFP28 (4x25Gb) Direct attach passive copper breakout, 1m |
| 10423 | 100Gb, DAC QSFP28–4xSFP28 3m | 100Gb, QSFP28–4 x SFP28 (4x25Gb) Direct attach passive copper breakout, 3m |
| 10424* | 100Gb, DAC QSFP28–4xSFP28 5m | 100Gb, QSFP28–4 x SFP28 (4x25Gb) Direct attach passive copper breakout, 5m |
| **40Gb Optical Transceivers and Direct Attach Cables** | | |
| 10426 | 100Gb, DAC QSFP28-2xQSFP28 1m | 100Gb, QSFP28-2 x QSFP28 (2x50Gb) Direct attach passive copper breakout, 1m |
| 10428 | 100Gb, DAC QSFP28-2xQSFP28 3m | 100Gb, QSFP28-2 x QSFP28 (2x50Gb) Direct attach passive copper breakout, 3m |
| 10319 | QSFP+ SR4 module | 40Gb QSFP+ SR4 optical module, MPO connector (8 fiber), 100m MMF OM3, 140m MMF OM4 |
| 40GB-ESR4-QSFP | QSFP+ ESR4 | 40GB QSFP+ Extended Reach SR4, MMF, 300m OM3, 400m OM4 MMF |
| 9380014-5M | MPO to 4xLC OM3 MMF | MPO to 4xLC OM3 MMF patch cord, 5m (for use with parallel MMF 4x10Gb breakout) |
| 10332 | MPO to 4xLC OM4 MMF 5m | MPO to 4xLC OM4 MMF patch cord, 5m (for use with parallel MMF 4x10Gb breakout) |
| 10320 | QSFP+ LR4 | 40Gb QSFP+ LR4 optical module, LC, 10km SMF |
| 10326 | QSFP+ PSM Optical Module | 40Gb QSFP+ Parallel Single Mode (PSM) LR4, MPO connector (8 fiber), SMF, 10km |
| 10327 | MPO to 4xLC Breakout Patch Cord, SM, 10m | MPO to 4xLC Breakout Patch Cord, SM, 10m (for use with 10326 40Gb QSFP+ PSM transceiver for 4x10Gb breakout) |
| 10329 | 40Gb Bidi MMF QSFP+ | 40Gb Bidirectional MMF, 100m OM3, QSFP+, duplex LC |
| 10334 | 40Gb LM4 QSFP+ | 40Gb QSFP+ LM4, 140m OM3 MMF, 1km SMF, QSFP+, LC |
| 10335 | 40Gb ER4 QSFP+ | 40Gb QSFP+ ER4, 40km SMF, QSFP+, LC |
| 10311 | QSFP+ passive copper cable, 0.5M | 40 Gigabit Ethernet QSFP+ passive copper cable assembly, 0.5m length |
| 10312 | QSFP+ passive copper cable, 1.0M | 40 Gigabit Ethernet QSFP+ passive copper cable assembly, 1m length |
| 10313 | QSFP+ passive copper cable, 3.0M | 40 Gigabit Ethernet QSFP+ passive copper cable assembly, 3m length |
| 10323 | QSFP+ passive copper cable, 5.0M | 40 Gigabit Ethernet QSFP+ passive copper cable assembly, 5m length |
| 10336 | 3m QSFP+ Active Optical Cable | 40 Gigabit QSFP+ active optical cable, 3m |
| 10337 | 5m QSFP+ Active Optical Cable | 40 Gigabit QSFP+ active optical cable, 5m |
| 10315 | 10m QSFP+ Active Optical Cable | 40 Gigabit Ethernet QSFP+ active optical cable assembly, 10m length |
| 10316 | 20m QSFP+ Active Optical Cable | 40 Gigabit Ethernet QSFP+ active optical cable assembly, 20m length |
| 10318 | 100m QSFP+ Active Optical Cable | 40 Gigabit Ethernet QSFP+ active optical cable assembly, 100m length |
| 10202 | QSFP+ - 4xSFP+ fan-out cbl, 1m | QSFP+ to 4 x SFP+ fan-out copper cable, 1m |
| 10203 | QSFP+ - 4xSFP+ fan-out cbl, 2m | QSFP+ to 4 x SFP+ fan-out copper cable, 2m |
| 10321 | QSFP+ - 4xSFP+ fan-out cbl, 3m | QSFP+ to 4 x SFP+ fan-out copper cable, 3m |
| QSFP-SFPP-ADPT | QSFP+ to SFP+ Adapter | QSFP+ to SFP+ adapter, supports a single SFP+ 10Gb Ethernet transceiver in a QSFP+ port (optical transceivers only, 10303 LRM and 10338 10GBASE-T not supported) |
| **10Gb Transceivers and Direct Attach Cables** | | |
| 10301 | SR SFP+ module | 10GBASE-SR SFP+, 850nm, LC, 300m OM3 MMF, 400m OM4 MMF |
| 10302 | LR SFP+ module | 10GBASE-LR SFP+, 1310nm, LC, 10km SMF |
| 10309 | 10GBASE-ER SFP+ | 10GBASE-ER SFP+, 1550nm, LC connector, transmission length of up to 40km on SMF |
| 10310 | 10GBASE-ZR SFP+ | 10Gb, 10GBASE-ZR, SMF, 1550nm, up to 80Km, LC SFP+ |
| 10325 | 10Gb SFP+ DWDM Tunable | 10Gb DWDM Tunable, 80km SMF, LC SFP+ |
| 10GB-BX10-U | 10 GB, SINGLE FIBER SM, -U 10 KM | 10Gb, Single Fiber SM, Bidirectional, 1270nm Tx / 1330nm RX, 10Km, Simplex LC SFP+ (must be paired with 10GB-BX10-D) |
| 10GB-BX10-D | 10 GB, SINGLE FIBER SM, -D 10 KM | 10Gb, Single Fiber SM, Bidirectional, 1330nm Tx / 1270nm RX, 10Km, Simplex LC SFP+ (must be paired with 10GB-BX10-U) |
| 10GB-BX40-U | 10 GB, SINGLE FIBER SM, -U 40 KM | 10Gb, Single Fiber SM, Bidirectional, 1330nm Tx / 1330nm RX, 40Km, Simplex LC SFP+ (must be paired with 10GB-BX40-D) |
| 10GB-BX40-D | 10 GB, SINGLE FIBER SM, -D 40 KM | 10Gb, Single Fiber SM, Bidirectional, 1270nm Tx / 1270nm RX, 40Km, Simplex LC SFP+ (must be paired with 10GB-BX40-U) |

# Ordering Information (cont.)

| Part Number | Product Name | Product Description |
|---|---|---|
| **10Gb Transceivers and Direct Attach Cables (cont.)** | | |
| 10338** | 10Gb SFP+ 10GBASE-T | 10Gb SFP+, 10GBASE-T RJ45, 30m with Cat6a |
| 10GB-F10-SFPP | 10 GB, ACTIVE OPTICAL DAC, 10 M | 10Gb, Active optical direct attach cable with 2 integrated SFP+ transceivers, 10m |
| 10GB-F20-SFPP | 10 GB, ACTIVE OPTICAL DAC, 20 M | 10Gb, Active optical direct attach cable with 2 integrated SFP+ transceivers, 20m |
| 10304 | 10GBASE-CR SFP+ 1m | 10GBASE-CR SFP+ pre-terminated twin-ax copper cable with link lengths of 1m |
| 10305 | 10GBASE-CR SFP+ 3m | 10GBASE-CR SFP+ pre-terminated twin-ax copper cable with link lengths of 3m |
| 10306 | 10GBASE-CR SFP+ 5m | 10GBASE-CR SFP+ pre-terminated twin-ax copper cable with link lengths of 5m |
| 10307*** | 10GBASE-CR SFP+ 10m | 10GBASE-CR SFP+ pre-terminated twin-ax copper cable with link lengths of 10m |
| **1Gb Transceivers** | | |
| 10051H | 1000BASE-SX SFP, Hi | 1000BASE-SX SFP, MMF 220 & 550 meters, LC connector, Industrial Temp |
| 10052H | 1000BASE-LX SFP, Hi | 1000BASE-LX SFP, MMF 220 & 550 meters, SMF 10km, LC connector, Industrial Temp |
| 10053H | 1000BASE-ZX SFP, Hi | 1000BASE-ZX SFP, SMF 70km, LC connector, Industrial Temp |
| 10056H | 1000BASE-BX-D BiDi SFP, Hi | 1000BASE-BX-D SFP SMF single fiber, 1490-nm TX/1310-nm RX wavelength, 10Km, simplex LC Industrial Temp |
| 10057H | 1000BASE-BX-U BiDi SFP, Hi | 1000BASE-BX-U SFP SMF single fiber, 1310-nm TX/1490-nm RX wavelength, 10Km, simplex LC Industrial Temp |
| MGBIC-BX40-U | 1000BASE-BX-U BiDi SFP 40Km | 1000BASE-BX-U SFP, single fiber, 1310-nm TX/1490-nm RX wavelength, 40Km Industrial Temp |
| MGBIC-BX40-D | 1000BASE-BX-D BiDi SFP 40Km | 1000BASE-BX-D SFP, single fiber, 1490-nm TX/1310-nm RX wavelength, 40Km Industrial Temp |
| MGBIC-BX120-U | 1000BASE-BX-U BiDi SFP 120Km | 1000BASE-BX-U SFP, single fiber, 1490-nm TX/1590-nm RX wavelength, 120Km Industrial Temp |
| MGBIC-BX120-D | 1000BASE-BX-D BiDi SFP 120Km | 1000BASE-BX-U SFP, single fiber, 1590-nm TX/1490-nm RX wavelength, 120Km Industrial Temp |
| I-MGBIC-LC03 | 1000BASE-LX MMF SFP | 1000BASE-LX SFP MMF, 1310nm, 2km with 62.5 micron OM1 MMF, 1km on 50 micron OM2 MMF, LC |
| MGBIC-02 | 1000BASE-T, RJ45 SFP | 1000BASE-T SFP, RJ45, 100m Cat5e |
| MGBIC-02 | 1000BASE-T, RJ45 SFP | 1000BASE-T SFP, RJ45, 100m Cat5e |

*10424 100Gb DAC passive copper DAC breakout cable can also be used for 40Gb to 4 x 10Gb speed breakout.*

*** 10338 supported in X690-48x-2q-4c model with configuration of every other SFP+ port in system, up to a maximum of half the 10Gb SFP+ ports configured with 10GBASE-T transceivers. An adjacent SFP+ port should remain unused for every 10GBASE-T SFP+ installed.*

**** 10307 supported only in ports 1-8 of X690-48x-2q-4c model.*

## Warranty

One year hardware warranty. For warranty details, visit:
http://www.extremenetworks.com/go/warranty

## Transceiver/Optics

For the latest and most up-to-date list of the optics/transceivers supported on this platform, refer to our Extreme Optics Compatibility Tool at
https://optics.extremenetworks.com

## Power Cords

In support of the Extreme Networks Green Initiatives, power cords can be ordered separately but need to be specified at time of ordering. Please refer to www.extremenetworks.com/product/powercords for details on power cord availability for this product.