

# FSP 150-XG400 Series

Service demarcation and aggregation for 100Gbit/s edge networks

## Benefits

- **MEF 3.0 CE 100GbE UNI**  
Ultra-compact 100Gbit/s UNI demarcation solution for large enterprises
- **Compact design**  
100Gbit/s UNI demarcation in 1RU  
High port count, low footprint aggregation: 1RU or 2RU height and 227.4mm depth
- **Versatile deployment**  
Compact size and extended operating temperature range (-40°C to 65°C) enable deployment in street cabinets and harsh environments
- **High-density 10/100GbE service aggregation**  
Seamless transition from 1/10Gbit/s to 10/25/100Gbit/s with 100/400GbE trunk capacity
- **Timing distribution**  
Hardware-based timing support on all traffic interfaces enabling accurate frequency and phase distribution using Sync-E and 1588v2 PTP
- **Wide range of networking options for the converged edge**  
VLAN based forwarding, MAC learning and forwarding, IP routing and forwarding, IP/MPLS with BGP/MPLPS EVPN and L3VPN solutions
- **Carrier class**  
Standard Ethernet OAM and Y.1564 service activation testing for delivery of MEF 3.0 Carrier Ethernet services up to 100GbE

## Overview

**The demand for bandwidth in the metro space is constantly rising.** It's being fueled by the boom in cloud computing and the hunger for mobile broadband, both of which create the need for traffic aggregation. As a result, business and mobile network operators are rolling out 10Gbit/s services in their networks, driving the demand for 100/400Gbit/s demarcation and aggregation at the metro edge. Our FSP 150-XG400 Series is a family of carrier-class packet edge products that enable MEF 3.0 CE 100Gbit/s demarcation and high-scale 10/100Gbit/s service aggregation in a compact form factor.

Our FSP 150-XG400 Series is designed for high-density aggregation and demarcation of MEF 3.0 CE services and IP services. The products feature 1GbE, 10GbE, 25GbE, 40GbE, 100GbE, and 400GbE interfaces for high-speed connectivity to the metro core and support hardware-based time distribution on all traffic ports (Synchronous Ethernet and IEEE 1588). The XG400 Series provides standard Ethernet OAM and Y.1564 for service activation testing up to 100Gbit/s. It supports IP/MPLS capabilities, for the delivery of EVPN services and L3VPN services. It also features a wide range of traffic protection mechanisms including IEEE 802.1AX DRNI, ITU-T G.8032, ERPS and VRRP for high service availability. A common software stack assures consistent operation with any member of this series. What's more, the FSP 150-XG400 Series has been designed to work in locations with no temperature control.



# FSP 150–XG400 Series

## High-level technical specifications

### Switching capacity

- 4.8Tbit/s (2.4Tbit/s full duplex) switching capacity (XG490)
- 1.6Tbit/s (800Gbit/s full duplex) switching capacity (XG480)
- 600Gbit/s (300Gbit/s full duplex switching capacity (XG404 and XG418)

### Advanced Ethernet and IP OAM

- ITU-T, Y.1564 SAT and MEF-48/49 up to 100GbE
- IEEE 802.1ag CFM
- IEEE 802.3ah/ITU-T G.8021 PHY level monitoring
- ITU-T, Y.1731 AIS and PM
- MEF-35/36 SOAM PM
- TWAM light
- E-LMI

### Synchronization

- Synchronous Ethernet
- IEEE 1588-2008
- PTP telecom profiles for time/phase distribution (G.8275.1, G.8275.2)
- Telecom boundary clock and telecom transparent clock

### Advanced service capabilities

- HQoS with advanced policing and scheduling mechanisms
- NETCONF/YANG open control
- Egress hierarchical shaping and scheduling; ingress hierarchical policing MEF 10.3
- Counters per shaper

### Layer 2 services and layer 3 services

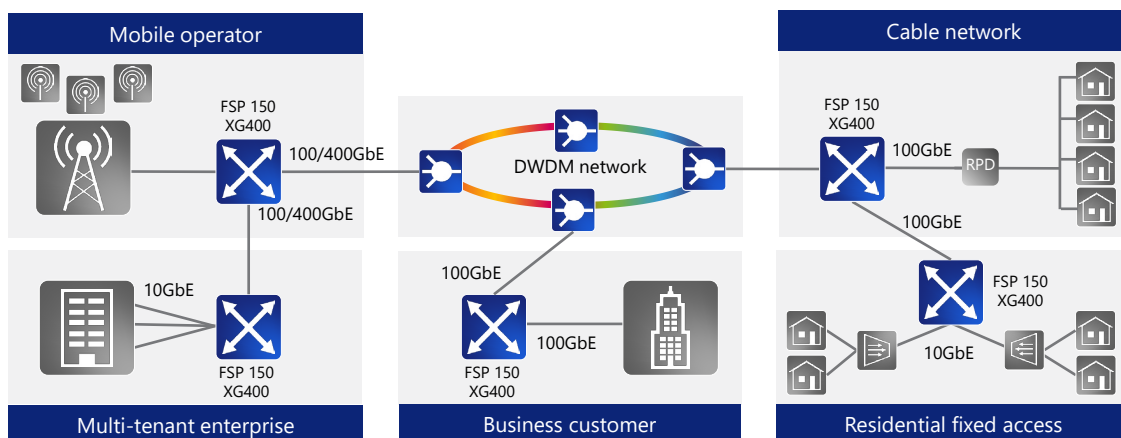
- MEF E-LINE, E-TREE, E-LAN, E-ACCESS services
- BGP/MPLS EVPN services
- BGP/MPLS IP VPN service
- VRF-lite

\*Note: Not all the features listed in this section may be applicable to each model. Please contact your sales representative for further information.

## Applications in your network

### Aggregation of high-bandwidth business and wholesale services



- Highly resilient, SLA-based 10, 25 and 100GbE MEF 3.0 CE service aggregation featuring ENNI and UNI
- Growing mobile backhaul and fronthaul networks to 10Gbit/s and 25Gbit/s at the base station
- Aggregating DSLAM traffic in metro networks for residential and multi-tenant applications








# FSP 150–XG400 Series

## Product specifications


### Switching capacity and traffic ports

FSP 150–XG404 variants		
		
Traffic ports:	4x QSFP+/QSFP28 25GbE, 40GbE and 100GbE data rates	2x QSFP+/QSFP28 + 2x CFP2 25GbE, 40GbE and 100GbE data rates
Switching capacity:	600Gbit/s (300Gbit/s full duplex) switching capacity	
Operating temperature	Part Numbers	
0°C to +65°C	1078901050-02	1078901051-02
–40°C to +65°C	1078901054-02	1078901055-02

FSP 150–XG418 variants		
		
Traffic ports:	8x 1/10G (SFP/SFP+) + 4x 10G (SFP+) + 4x 10/25G (SFP+/SFP28); 2x 40/100G (QSFP+/QSFP28)	8x 1/10G (SFP/SFP+) + 4x 10G (SFP+) + 4x 10/25G (SFP+/SFP28); 2x 100G (CFP2)
Switching capacity:	600Gbit/s (300Gbit/s full duplex) switching capacity	
Operating temperature	Part Numbers	
0°C to +65°C	1078901053-02	1078901052-02
–40°C to +65°C	1078901057-02	1078901056-02

FSP 150–XG480 variants			
			
Traffic ports:	40x 1/10G (SFP/SFP+) + 12x 10G (SFP+); 4x 100G (QSFP28)	40x 1/10G (SFP/SFP+) + 12x 10G (SFP+); 4x 100G (2 QSFP28, 2 CFP2)	40x 1/10G (SFP/SFP+) + 12x 10G (SFP+) + 8x 10G/25G (SFP+/SFP28); 2x 100G (QSFP28)
Switching capacity:	1.6Tbit/s (800Gbit/s full duplex) switching capacity		
Operating temperature	Part Numbers		
–40°C to +65°C	1078901001-02	1078901003-02	1078901002-02
	1078901010-02	1078901012-02	1078901011-02

# FSP 150–XG400 Series

FSP 150–XG490	
	
Traffic ports:	4x 1/10/25G (SFP/SFP+/SFP28) + 22x 40/100G (QSFP+/QSFP28) + 4x 100/400G (QSFP-DD)
Switching capacity:	4.8Tbit/s (2.4Tbit/s full duplex) switching capacity
Operating temperature	Part Numbers
0°C to +55°C	1078901060–01

## Services

- E-Line, E-LAN, E-Tree, E-Access
- BGP/MPLS EVPN
- BGP/MPLS IP VPN
- VRF-Lite

## Layer 2 features

- IEEE 802.1ad provider bridging (C-Tag and S-Tag)
- Acceptable client frame policy: tagged or untagged
- Port VLAN ID (pvid) and Priority VID
- MAC learning and switching with split-horizon
- MAC table limit per bridge domain
- Up to 500,000 MAC addresses with XG480 and 200,000 MAC addresses with XG404/418
- VLAN tag manipulation (push/pop and swap)
- CE-VLAN ID/EVC Map
- L2 control protocols disposition (MEF-45)
- Jumbo frame support
- IGMP snooping
- IEEE 802.1AX

## IP/MPLS Routing and Forwarding

- Wire-speed IPv4/IPv6 forwarding
- Multicast
- DHCP Relay Agent
- Static routes
- OSPFv2/v3
- IS-IS
- BGP
- ECMP IPv4/IPv6 <sup>(F)</sup>
- VRRP
- MPLS with static and dynamic LSPs
- LDP
- RSVP-TE <sup>(F)</sup>
- MPLS-FRR <sup>(F)</sup>

## Ethernet OAM

- IEEE 802.3ah Link OAM
- IEEE 802.1ag connectivity fault management (CFM)
- ITU-T Y.1731 SLM/SLR and DMM/DMR
- ITU-T Y.1564 service activation testing (MEF-48/49)
- Port level and VLAN level loopback
- Link loss forwarding
- Dying gasp
- Traffic mirroring

\*Note: Dying Gasp generation is not supported on XG490 models

## Performance monitoring

- RFC 2819 RMON Etherstats on a per-port and per-service basis
- 15-min and 1-day performance data bins
- Threshold-setting and threshold-crossing alerts
- Physical parameters monitoring for optics
- Temperature monitoring and thermal alarms
- ITU-T Y.1731 dual-ended synthetic frame loss and delay measurement
- MEF-35/36 SOAM PM
- TWAMP sender/reflector

## Management features

- Local LAN ports (RJ45)
- Console port
- USB Type A interface
- eSATA
- In-band management over management VLAN
- IPv4 and IPv6 protocol stacks, including dual-stack operation
- Telnet, SSHv2, https, SNMP (v1/v2c, v3)
- Netconf/YANG
- Netconf Zero Touch <sup>(F)</sup>
- Database backup and restore
- System software download via FTP, https, SFTP or SCP (dual flash banks)

# FSP 150–XG400 Series

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- Remote authentication via TACACS+/RADIUS
- Access control lists
- OSPF
- Network time protocol (NTP)
- Link layer discovery protocol (LLDP)
- Time of day + time zone
- Alarm log, audit log and security log (local and remote via syslog protocol)
- DHCP client

## Traffic protection

- IEEE 802.1AX Link Aggregation with DRNI
- ITU-T G.8031 Ethernet linear protection switching<sup>(F)</sup>
- ITU-T G.8032 Ethernet ring protection

## Traffic management

- Port level broadcast/multicast rate limiting on receive
- Large flows policing (XG404 and XG418)
- Class of service identifier: 802.1P, IP-TOS/DSCP
- MEF-10.3 hierarchical metering with token-share envelopes
- Strict priority (SP) and weighted round robin scheduling mechanisms
- Congestion-avoidance mechanism WRED
- COS level shaping per-port and per flow point
- Hierarchical shaping per flow point
- Port level rate limiting on transmit
- L2–L4 ACLs

## Synchronization

- ITU-T G.8261 / G.8262 / G.8264 Synchronous Ethernet on all traffic interfaces
- Synchronization status messages (ESMC)
- IEEE 1588–2008
- PTP Telecom Profiles (G.8275.1, G.8275.2)
- Telecom boundary clock, telecom transparent clock
- BITS-IN/OUT
- Combined 1PPS and ToD interface
- Stratum 3E OCXO

## Size and weight

- Dimensions (including mounting brackets)
  - Chassis variant without rear DC inlet (W x D x H):
    - 443mm x 420mm x 44mm (XG490)
    - 482.6mm x 216mm x 88.1mm (XG480)
    - 445.4mm x 216mm x 44.05mm (XG404/XG418)
  - Chassis variant with rear DC inlet (W x D x H):
    - 482.6mm x 256.5mm x 88.1mm (XG480)
- Weight:
  - Chassis variant without rear DC inlet: 10Kg
  - Chassis variant without rear DC inlet: 10.4Kg

## Environment

- Storage temperature: -40°C to +70°C
- Humidity: 5 to 85%, non-condensing
- Redundant fans and dual hot-swappable AC and/ or DC power supplies
- Typical power consumption
  - 290W (XG404)
  - 340W (XG418)
  - 630W (XG480)
  - 750W (XG490)

## Compliance

- Safety: EN 62368-1, UL/CSA 62368-1, IEC 62368-1, emissions: AS/NZS CISPR 22: Class A, ICES-003, Issue Class A, EN 55022: Class A, VCCI Class A, FCC CFR 47 Part 15, Subpart B Class A
- Immunity: EN 300 386, EN55024, EN 61000-3-2, EN 61000 3-3, EN 61000-4-2, EN 61000-4-3, EN 61000-4-5, EN 61000 4-6, EN61000-4-8, EN61000-4-11
- EU RoHS compliant

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