Adtran

Data Sheet

FSP 150-XG300 Series

High-port count 10G multi-layer demarcation, aggregation and edge computing

Benefits

- **One device, multiple technologies**
  Common hardware architecture for MEF 3.0, IPv4 / IPv6 and MPLS service demarcation
- **Smooth scalability to 10GbE**
  1Gbit/s-to-10Gbit/s aggregation and 10Gbit/s demarcation in two product variants to better match capacity and footprint
- **Seamlessly introducing NFV**
  In-service upgrade with high-performance server for edge-hosting of virtual network functions
- **Advanced traffic management**
  Up to 2000 queues and up to five levels of hierar-chical QoS with sophisticated traffic management and policing schemes
- **Multiple network interface options**
  Fiber- and copper-based access networks with optional connection over 4G mobile networks
- **Hierarchical quality of service**
  Using high-scale per-flow shaping and policing based on MEF 10.3 for enhanced bandwidth optimization

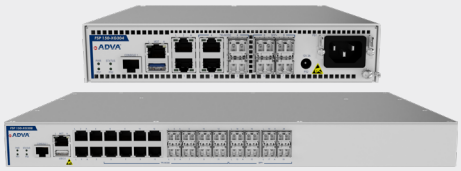
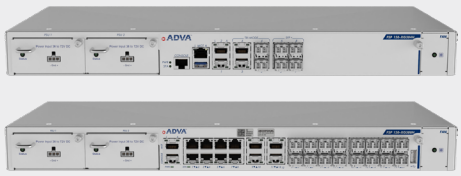
Overview

Bandwidth demand is growing by the day. Fueled by changing patterns in services such as mobility, cloud and video, metro network traffic is rapidly increasing. Communication service providers (CSPs) must quickly transition their infrastructure from 1Gbit/s to 10Gbit/s, and add intelligent demarcation and aggregation, as well as edge compute capabilities, without exceeding space and power consumption.

Today's networks need bandwidth for ever-increasing numbers of connected devices, business applications, cloud-based services, and enormous amounts of data. High-speed, high-bandwidth networking enables the aggregation, automation and analysis of this data. Offering higher bandwidth services impacts technology installed on the customer premises and creates the need for high-capacity, intelligent demarcation and aggregation capabilities to deliver SLA-based Carrier Ethernet and IP services. Our FSP 150-XG300 Series addresses this ongoing market demand to scale from 1GbE to 10GbE services and to offer price-competitive, high-performance 10GE customer access services. What's more, with an in-service upgradable server blade, this product range also offers seamless migration to NFV.

FSP 150-XG300 SERIES

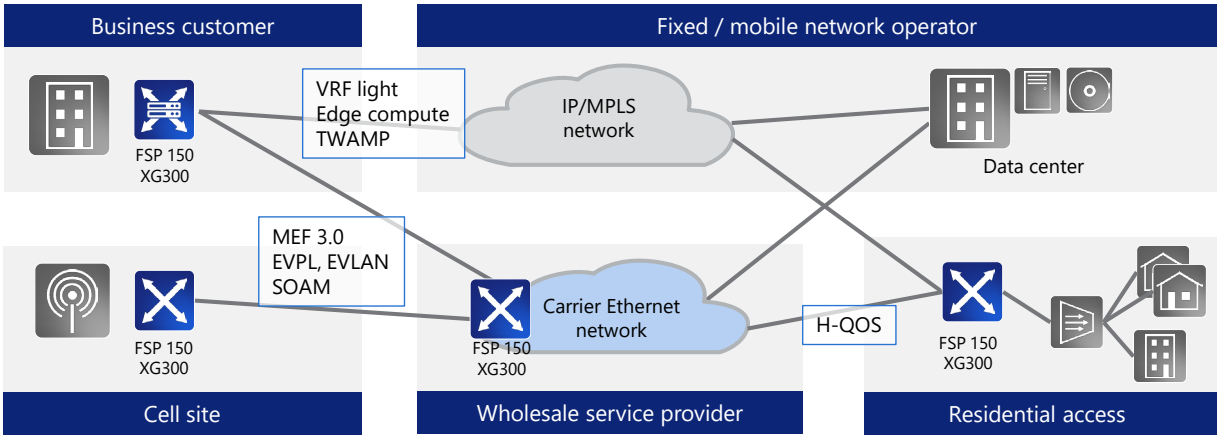
FSP 150-XG300 Series at a glance

	Product	Key application
	**FSP 150-XG304** **FSP 150-XG308**	Fixed configuration, multi-tenant 10Gbit/s demarcation device for business services, mobile backhaul and cloud access, featuring redundant power supply (AC or DC)
	**FSP 150-XG304H** **FSP 150-XG308H**	Fixed configuration, multi-tenant 10Gbit/s demarcation device for business services, mobile backhaul and cloud access, featuring front-loaded redundant PS (AC/DC) and FAN unit in a compact 1RU design for 300mm ETSI racks
	**FSP 150-XG304u** **modular series**	Modular multi-tenant 10Gbit/s demarcation device for business services, mobile backhaul and cloud access, featuring redundant power supply (AC or DC) Expansion slot for additional, flexible functionality: VDSL link, integrated LTE/5G modem for wireless backup and rapid deployment turn-up, X86 server module for VNF hosting
	**FSP 150-XG312**	1G/10G massive scale aggregation device for business services featuring front-loaded redundant PS (AC/DC) and FAN unit in a compact 2RU design for 300mm ETSI racks

Applications in your network

Multi-layer demarcation and aggregation in combination with edge computing

- Compact and cost-effective solution for CSPs to support increasing consumer demand and offer price-competitive and high-performance 10GbE (and sub-rates) access services
- Demarcation at cell sites and with mid-sized business customers as well as large multi-tenant enterprise sites
- Compact and efficient pre-aggregation solution for transport of up to 40 1Gbit/s services over 10Gbit/s metro networks
- Hosting of virtual network functions at the network edge
- Fast rollout in fiber- and copper-based access networks with optional connection over 4G mobile networks
- Full visibility of quality of service with comprehensive set of Ethernet and IP-SLA-based service OAM capabilities
- Optimized transport links with H-QoS



FSP 150-XG300 SERIES

Product specifications

Power consumption

	Ports and interfaces	Configuration options	Licensing options	Size	Typical power consump-tion(*)	Operating temperature
FSP 150-XG304 (OS-V8)	4 x 1/10GbE SFP+ ports, 2 x 1GbE combo ports, 2 x 1GbE copper ports	Variants: • Basic: 1GbE + 1GbE OAM • F: 10GbE + 10GbE OAM Power supply options (1+1): • AC or DC fixed power supply, and • AC to DC (12V) desktop power supply	10GbE ports, L3 routing protocols, MPLS	1RU, half width	20W or 25W for -F model variant	0°C to 50°C or -40°C to 65°C (***)
FSP 150-XG304H	4 x 1/10GbE SFP+ ports, 2 x 1GbE combo ports, 2 x 1GbE copper ports	Fixed OAM option: F: 10GbE + 10GbE OAM Power supply options (1+1): • AC Modular power supply • DC Modular power supply	10GbE ports, L3 routing protocols, MPLS	1RU, full width	29W	-40°C to 65°C
FSP 150-XG304u (OS-V8-M)	4 x 1/10GbE SFP+ ports, 2 x 1GbE combo ports, 2 x 1GbE copper ports, 1 x service slot	Variants: • Basic: 1GbE + 1GbE OAM • F: 10GbE + 10GbE OAM Power supply options (1+1): • AC modular power supply • DC modular power supply	10GbE ports, L3 routing protocols, MPLS	1RU, full width	29W(**)	0°C to 50°C or -40°C to 65°C (***)
FSP 150-XG308 (OS-V20)	8 x 1/10GbE SFP+ ports, 8 x 1GbE combo ports, 4 x 1GbE copper ports	Variants: • Basic: 1GbE + 1GbE OAM • F: 10GbE + 10GbE OAM Power supply options (1+1): • AC modular power supply • DC modular power supply	10GbE ports, L3 routing protocols, MPLS	1RU, full width	35W or 40W for -F model variant	0°C to 50°C
FSP 150-XG308H	8 x 1/10GbE SFP+ ports, 8 x 1GbE combo ports, 4 x 1GbE copper ports	Fixed OAM option: F: 10GbE + 10GbE OAM Power supply options (1+1): • AC Modular power supply • DC Modular power supply	10GbE ports, L3 routing protocols, MPLS	1RU, full width	40W	-40°C to 65°C
FSP 150-XG312	12x 1/10GbE SFP+ ports 40x 1GbE SFP ports	Power supply options (1+1): • AC Modular power supply • DC Modular power supply	L3 routing protocols, MPLS and L3 routing protocols	2RU, full width	70W- 160W depending on fan speed	-40C - +65C

(*) Excluding optics, (**) Excluding modules: see below table for specific modules Power Consumption, (***) Extended temperature model variant -F model variant provides 10Gbit/s line-rate OAM capabilities

FSP 150-XG304u service slot modules

	FSP 150-XG304u LTE (EM-V-LTE)	FSP 150-XG304u 5G (EM-V-5G)	FSP 150-XG304u NFV (EM-V-NFV)
Description	1 x port LTE wireless backup module	1 x port 5G/LTE wireless backup module	NFV server module
Services	Turn-up over wireless, before having a fiber. Managed failover services (secondary backup path using LTE)	Turn-up over wireless, before fiber connectivity. Managed failover services (secondary backup path using 5G Sub-6 or LTE)	VNF handling network functions on virtual machines (VMs)
Dimensions (WxHxD)	155mm x 40.23mm x 236 mm	155mm x 40.23mm x 236 mm	155mm x 40.23mm x 236 mm
Weight	0.350kg	0.450kg	0.650kg
Regulatory and standards compliance	Qualcomm MDM9230 LTE (Cat 6) DC-HSPA+ (Cat 24) HSPA+ HSPA UMTS TD-SCDMA GNSS	5G NR Sub-6G, 4G LTE advanced Pro, 3G (HSPA+, UMTS) and GNSS	Ensemble Connector
CPU capacity	Celeron, Dual Core 2.2 GHz, 2GB DDR, 8GB Flash	X86 Denverton , Four Cores, 2.2 GHz, 8GB DDR4, 32GB Flash	XEON-D, 8/12/16 Cores, 1.3/1.5/1.6GHz, 16/32/64GB DDR, 256/512/1000GB SSD
Zero-touch configuration	For LTE and EoGRE	For LTE, 5G and EoGRE	Ensemble Connector
Encapsulation	EoGRE	EoGRE	Ensemble Connector
Power consumption	17.3W	28W	Depending on model; max. 55W
IP fragmentation	Yes	Yes	Ensemble Connector
Management	SNMP, NETCONF, remote and local CLI	SNMP, NETCONF, remote and local CLI	Ensemble Connector
Connectors	2 x SMA female 50Ohm connectors for primary and secondary antenna	4 x SMA female 50Ohm connectors for MAIN, MIMO1, MIMO2 and AUX antennas	3 x USB, 1 x RJ45 Ethernet and 1 x RJ45 RS-232

FSP 150-XG300 SERIES

MEF services

- E-LINE, E-TREE, E-LAN, E-ACCESS
- MEF 2.0 certified

Layer 1 functionality

- Virtual cable test – copper TDR
- SFP digital diagnostics
- Port mirroring
- Port protection
- Port reflection (LIN)
- Port speed and duplexity capabilities advertising

L2 and L2.5 functionality

- Bandwidth (Gbit/s) / forwarding rate (Mpps); non-blocking architecture
- MEF services and certifications
- All ports can serve as UNI/NNI
- Jumbo frames (up to 16,000 bytes) on all ports (per port/EVC)
- Configurable Ethertype values
- TLS, Q-in-Q, (802.1Q/802.1ad) - selective VLAN based on ACL + tag range rules
- VLAN translation based on inner/outer VLAN / 802.1p
- Tag swap over multi-point EVC
- Uni-directional link detection protocol (UDLD)
- Link layer discovery protocol (LLDP)
- <50ms protection (1:1 link and device protection), LACP 1+1 (802.3ad)
- MSTP (802.1s)
- ELPS - G.8031/Y.1342
- ERPS - G.8032/Y.1344 v2
- Protection and fault recovery based on service OAM messages/alarms
- Tunnel/filter of L2 protocols
- H-VPLS services: H-VPLS spoke MTU-s, MAC withdrawal
- Up to 64K MAC addresses
- Learning table limit per VLAN/port
- Link aggregation (EtherChannel)

L3 functionality

- Protocols: OSPFv2, OSPFv3, BGP4/BGP4+, IS-IS
- VRRP, and IP tracking for VRRP
- Longest prefix match (LPM) / next-hop (NH) tables
- Static configuration
- IPv6 routing
- BFD (bidirectional forwarding detection)
- VRF-Lite (requires the purchasing of L3 license)
- DHCP (client, server, relay, snooping)

Traffic management

- Hierarchical QoS (H-QoS)
- CIR/EIR bandwidth granularity (64Kbps steps)
- 802.1p and DSCP QoS queues no. (per port)
- Classification by physical port, MAC, Ethertype, protocol, VLAN, IP/TCP/UDP, 802.1p (VPT), DiffServ (IPv4 and IPv6 TC)
- Marking/remarking profiles between layers (802.1p, IP ToS / DSCP Bits)
- Scheduling strict priority and 2 levels SDWRR
- Color awareness UNI per EVC/CoS
- Egress shaping (per port/queue)
- In-service circuit parameters changes (on-the-fly ACLs)
- Per flow SLA metrics (traffic conditioner per service/total services)
- Statistics of L2 control protocols (STP, LACP, 802.3ah)
- L1 shaping

Operation, administration and maintenance (OAM)

- Link OAM -802.3ah EFM (discovery, config, fault, loopback and dying gasp)
- Service OAM 802.1ag CFM - MEP and MIP
- Service OAM ITU-T Y.1731 PM (latency, jitter) - microsecond accuracy
- Multi-point service OAM
- Service availability measurement (Y.1563, MEF 10.2)
- Service resiliency (MEF 10.2.1)
- MEF SOAM PM - MEF 35 (latency, jitter and synthetic loss per service - SLM) - microsecond accuracy
- Automatic scheduling for PM tests to increase utilization
- IP SLA - hardware-based measurement for IP VPN (L3) networks - microsecond accuracy
- L2 loopback with MAC swapping (per port/EVC)
- L2 loopbacks per L2, L3, L4 headers (source/destination swap)
- RFC 2544 test head throughput measurement, loss ratio (up to wire-speed GbE)
- Automated action scheduler for operation of any OAM
- ITU-T Y.1564 service activation testing
- Dying gasp message for power failure alarm (EFM-OAM and SNMP trap option)

Security

- UNI flood limit - DoS protection (broadcast, multicast and unicast rate control)
- Learning table limit - MAC control per EVC
- Wire-speed ACLs
- Restricted and controllable configuration access
- Optional console disable mode
- DHCP option 82
- Separate control and data plane
- 802.1x port based authentication
- Link flap guard
- Link flap damping

Management

- Out-of-band management
- IPv6 management
- Command line interface (CLI) via Serial, TELNET, or SSH V1 and 2
- Simple network management protocol (SNMPv1, v2, and v3)
- Remote monitoring (RMON) - Ethernet statistics (Group 1), history (Group 2), alarm (Group 3), and event (Group 9)
- RADIUS AAA for management
- TACACS+ AAA for management
- Upload/download/append configuration files with FTP and SCP
- Time of day + calendar + time zone
- Internal syslog + remote syslog + encrypted syslog
- Support MRV provisioning and network management platform

Additional protocols and features

- Internet control message protocol (ICMP)
- Linux shell
- Domain name server (DNS) client
- Network time protocol (NTP)
- Mobile backhaul (MBH)
- CLI/Linux shell commands scheduler
- Cross connect mode
- Bootstrap protocol (BOOTP)
- sFlow (previously RFC3176)

Dimensions and power

- Dimensions (H x D x W):
  - FSP 150-XG312: 88.1mm x 214mm x 443mm / 3.47in x 8.42in x 17.44in (full rack width)
  - FSP 150-XG304H, FSP 150-XG308H: 44mm x 215.2mm x 443mm / 1.73in x 8.47in x 17.44in (short depth, full rack width)
  - FSP 150-XG308, FSP 150-XG304u: 44.2mm x 325mm x 438.66mm / 1.74in x 12.79in x 17.27in (full rack width)
  - FSP 150-XG304: 43.65mm x 200mm x 217.60mm x / 1.72in x 7.87in x 8.57in (half rack width)
- Operating temperature:
  - FSP 150-XG304, FSP 150-XG304u and FSP 150-XG308: 0°C to 50°C / 32°F to 122°F
  - FSP 150-XG304, FSP 150-XG304u, FSP 150-XG304H, FSP 150-XG308H and FSP 150-XG312 with extended temperature: -40°C to 65°C / -40°F to 149°F
- Storage temperature: -40°C to 70°C / -40°F to 158°F
- Humidity: 85%, non-condensing
- Power supply:
  - AC input voltage: 90 to 240VAC, 50 – 60Hz
  - DC input voltage: 18 to 60V DC for FSP 150-XG304 and 40 to 60V DC for FSP 150-XG304u, FSP 150-XG308, FSP 150-XG304H, FSP 150-XG308H and FSP 150 XG312
- Power consumption: see table page 3

Weight

Net weight:

- FSP 150-XG304: 1.2kg
- FSP 150-XG304u: 5.5kg with 2 x AC PSU, fan
- FSP 150-XG308: 6.4kg with 2 x AC PSU, fan
- FSP 150-XG312: 7.4kg with 2 x AC PSU, fan
- FSP 150-XG304H, FSP 150-XG308H: 6.3kg with 2 x AC PSU, fan

Regulatory and standards compliance

Safety Agency Approvals

- UL 60950-1:2007 R10.14
- CAN/CSA-C22.2 NO. 60950-1-07+A1:2011+A2:2014
- EN 60950-1:2006+A11:2009+A1:2010+A12:2011+AC: 2011+A2:2013; EN62368-1

FSP 150-XG300 SERIES

Electromagnetic Emission

- FCC Part 15, Subpart B(class A) radiated emissions
- EN 55011/CISPR11 radiated emissions
- EN 55022/CISPR22 radiated emissions
- EN 55011/CISPR11 conducted emissions
- EN 55022/CISPR22 conducted emissions
- EN/IEC 61000-3-2 harmonic emissions
- EN/IEC 61000-3-3 voltage fluctuations
- EN 55032: 2012 + AC:2013

Immunity

- EN55024 Information technology equipment Immunity
- EN/IEC 61000-4-2 ESD
- EN/IEC 61000-4-3 radiated immunity
- EN/IEC 61000-4-4 electrical fast transient/burst immunity test
- EN/IEC 61000-4-5 conductive surges
- EN/IEC 61000-4-6 conductive disturbances
- EN/IEC 61000-4-8 immunity to magnetic fields
- EN/IEC 61000-4-11 voltage dips and short interruptions

Environmental

- EU 2002/95/EC RoHS2 directive
- REACH SVHC
- EU 2002/96/ECWEEE directive