fX3 Dual-speed 8-port Module

SFP28 Test Module

25/10G

The VIAVI fX3 Ethernet multi-speed module combines VIAVI's industry-leading Layer 2–3 traffic generation and analysis with powerful network emulation and application layer protocols for emulating a wide range of device types, users and protocols. This module delivers the highest performance per dollar for Layer 2–3 testing. Reduced power consumption and dual-speed support results in lower CAPEX and OPEX. This is ideal for functional and performance testing of data center and service provider network infrastructure where extreme protocol performance is not required.

The fX3 Dual-speed module is designed with eight native SFP28 ports to utilize the latest transceivers and interconnects. The dual-speed SFP28 interfaces are combined with VIAVI's flexible FPGA logic to allow mode-switching of the fX3 packet generation and analysis engine to operate at 25 and 10G speeds. The fX3 module is available in several speed combinations to match your test needs and budget.

VIAVI's fX3 test module is the industry's first native SFP28 form- factor test modules for multispeed High Speed Ethernet (HSE) testing:

- Supporting both 25G and 10G port speeds to test next-generation server and storage solutions.
- 25G and 10G copper and fiber media support
- Designed for enterprise and data center switch and router testing

Applications

Service Provider Core and Edge Routers — Verify scale, reliability, and performance of Layer 2 and 3 services including IP data and video delivered via unicast routing, multicast routing, switching, Multicast VPN, EVPN and MPLS VPN technologies.

Data Center Top of Rack, NIC, Spine and Core Switches — Benchmark capacity of high-density and capacity fabrics using IETF RFC 2544, RFC 2889 and RFC 3918 methodologies with easy test setup using dynamically bound traffic and automated wizards.

Carrier Ethernet — Verify scale, reliability, performance of Ethernet services delivered via Ethernet OAM (CFM IEEE 802.1ag and Y.1731), MPLS-TP, VPLS, PWE3 Pseudowires, bridged Ethernet, packet transport protocols or combinations of these technologies.

Features and Benefits

- 25G/10G dual speed provides flexibility for validating multi-speed switches, NIC's and line cards.
- Enable and disable Clause 74 BASE-R FEC, Clause 91 RS-FEC, and Clause 108 RS-FEC
- Auto Negotiation and Link Training for 25G
- SFP28 connector form-factor supports the latest 25/10G based copper and optical media
- Low total cost of ownership compared to other test modules in its class:
  - Excellent price-performance ratio that delivers faster time-to market by combining leading-edge technical innovation with VIAVI's extensive testing experience
  - Intelligent power control to shut down unused test modules and allows faster boot time to bring capacity back on-line quickly
  - More total throughput than the competition for a given power footprint
  - Enhanced chassis software license value — Two to four times the device or end-user emulation per chassis with no increase in software costs
  - Topology emulation lowers CapEx by eliminating the need for multiple DUTs in multiprotocol tests
  - Intelligent results gets answers in a fraction of the test time required by competitive products
  - Faster boot and firmware upgrade times mean less downtime in continuous running 24x7 regression test beds
- VIAVI TestCenter's industry-leading Layer 2–3 feature set:
  - Stress ASIC and backplane designs with live traffic changes. The number of emulated devices, the traffic they emanate and the rate at which they send it can all be changed "on the fly" making for more realistic tests and faster troubleshooting
  - Best-in-industry for measuring ultra-low sub-microsecond latencies with 2.5 ns precision and resolution. Latency accuracy up to 10 times better than the competition
  - 19 different scheduling algorithms available for finding the right traffic to emulate the real world or tax the device's ability to handle any traffic pattern—from micro-bursts to carefully timed sequences of "killer" frames
- fX3 module supports VIAVI TestCenter's deep analysis system:
  - Port counts, rates, errors and protocol summaries provide a high-level view for quick drilldown to specific issues
  - Broadest set of per stream metrics with simultaneous control and data plane results allows most tests to be run in a single pass
  - Real-time traffic filters allow analysis down to specific fields. Multiple metrics can be simultaneously collected and instantly analyzed
  - Dynamic views feature multi-metric extraction, sorting and operation in real-time or post-test
  - Full packet capture enables timing, sequencing and content analysis for individual packets
  - Powerful filters ensure the capture buffer is filled with relevant data

Technical Specifications

fX3 Dual-speed 8-port Module

Maximum Support	Speed	Maximum Ports Per Slot	Maximum Ports Per Spt-N12u Chassis	Maximum Ports Per Spt-N4u Chassis
FX3-25GD-S8	25/10G	8/8	96/96	16/16

Port Density	8-port SFP28
Media Support and FEC Options	Support varies by module speed mode • 25G: 802.3 by 25GBASE-CR, 25GBASE-CRS, 25GBASE-SR • 10G: 10GBASE-SR, 10G Copper DAC • Auto-Negotiation and Link Training for 25G • Clause 74 BASE-R FEC, Clause 91 RS-FEC, and Clause 108 RS-FEC • IEEE 25GBASE CR CL74, CL108, CR-S CL74, SR FEC CL108 • 25/50G Consortium 25GBase-R FEC CL74, 25/50G Consortium 25GBase RS-FEC CL91
Line Clocking And Packet Time Stamping (modules get their transmit line clocking and timestamping from the control modules on the SPT-N12U and SPT-N4U)	• Stratum-3 rated oscillator is the default time source • Frame time stamp resolution of 2.5 ns • GPS and CDMA-based external time sources are supported • IEEE 1588v2 and NTP packet-based external time sources are supported • TIA/EIA-95B-based external time sources are supported
Inter-module and Inter-chassis Time Synchronization	Ports in the same chassis are locked to the internal timing source. For separate systems: • Timing chain synchronization with ±20 ns accuracy • Synchronized via GPS or CDMA network • Using NTP or PTP packet-based approaches (requires supporting controller version)
User Reservation	• Per-port reservation
Transmit/Receive Streams Per Port	• TX/ 64K TX and RX/128K for all speeds
VFDs and Variable Fields	• 6 VFDs available for each 512 (25G/10G) stream templates • 8 m route insertion table entries 4m in 25G/10G mode
Scheduler Mode Support	• Port Based – traffic scheduling handled at the port level • Rate Based – key parameters determined at the port level with division among the individual stream blocks • Priority Based – scheduling determined at the stream block level using user-assigned priorities. Precise scheduling of CBR and bursty traffic for QoS testing • Manual Mode – manual control of stream sequence
Frame Length Range and Controls	• 100% line rate for frames of 64-16383 bytes controlled by fixed, increment, decrement, random and IMIX modes

Technical Specifications continued

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Statistics	• Nearly 50 transmit stats per port reported in real time. Includes L1-3 counters and rates and checksum and CRC errors • Over 40 real-time measurements per stream including advanced sequencing, latency, jitter and data integrity
Transmit Clock Adjustment	• ±100 PPM in 1 PPM increments for each 25/10G port or each SFP28 interface for 25G and 10G
Capture	• 512MB per 25G/10G port • Capture software includes sophisticated trigger and filtering controls
Histograms	Port-level histogram modes for latency, jitter, inter-arrival time, frame length, sequence run length and sequence difference check
Operating Temperature	15 C - 35 C, 20% - 80% RH (non-condensing)

VIAVI TestCenter Protocol Emulation

VIAVI TestCenter protocols available as separately licensed packages. Below is a sample list of supported protocols. Contact VIAVI for a full list of capabilities and packages.

Enterprise and Data Center Switch Protocol Support	• OpenFlow 1.3 / 1.0: OpenFlow switch and controller emulation testing • Routing, multicast and bridging: All major IPv4 and IPv6 unicast and multicast routing protocols, IGMPv1/v2/v3, MLDv1/v2, LACP, STP, RSTP and MSTP • Data center: VXLAN, EVPN, DCBX, FCoE, FIP, 802.1Qbb
Service Provider Protocol Support	• WAN SDN: PCE-P, BGP-LS (Link State), BGP Flow Spec and Segment Routing for ISIS, OSPF and BGP • NFV: Validate performance and scale for NFVI and VNFs including vSwitch, BGP v RouteReflector, vBNG, vCPE and vRouter • Routing and MPLS: All major IPv4 and IPv6 unicast and multicast routing protocols, RSVP-TE, LDP, VPLS-LDP, VPLS-BGP, BGP/MPLS-VPN, EVPN (RFC 7432), PBB EVPN, mVPN, NG MVPN, GTM, BFD, MPLS BFD, LSP Ping, TWAMP and PWE3 (RFC4447) • Access: ANCP, PPPoE, DHCP, L2TP, L2TPv3, IGMPv1/v2/v3, MLDv1/v2, DHCP-PD and PPPoEv6 • Carrier Ethernet and bridging: LACP, STP, RSTP, MSTP, 802.1ag CFM, Y.1731, PBB, PBB-TE, Link OAM • Mobile Backhaul: MPLS-TP, 1588v2 and Synchronous Ethernet

Ordering Information

Part Number	Description
FX3-25GD-S8	FX3 25/10G SFP28 8-Port
VIAVI Chassis	
SPT-N12U-110	N12U chassis and controller with 110 VAC power supplies
SPT-N12U-220	N12U chassis and controller with 220 VAC power supplies
SPT-N12U-220-LC	N12U-LC chassis and controller with 220 VAC power supplies
SPT-N4U-110	N4U chassis and controller with 110 VAC power supplies
SPT-N4U-220	N4U chassis and controller with 220 VAC power supplies

Contact Us: +1 844 GO VIAVI | (+1 844 468 4284). To reach the VIAVI office nearest you, visit viavisolutions.com/contact

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