X2-400G QSPF-DD Multi-Rate Test Module

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5G, cloud, and data centers have brought people unprecedented internet experiences. 5G is not only an upgrade of communication technology, but also a new era. The ultra-high bandwidth, massive connectivity, low latency and high reliability of 5G will become a strong foundation for building a digital society. Service providers and large-scale data centers are deploying multi-rate network infrastructure solutions to meet the growing market demands. Due to these multi-rate requirements, customers require higher density tester, and verifying next-generation routers and data center structures requires flexibility. The X2-400G series test module is launched by Xinertel for high-end routers, high-end switches, and data center switch to help operators, network equipment manufacturers, and enterprise users easily cope with the rapid testing business growth and future business development.

With the leading L2-3 traffic generation and analysis capabilities, Xinertel X2-400G multi-speed test module supports large-scale routing and switching protocols and traffic test, and benchmark tests(such as RFC2544/RFC2889/RFC3918),functional testing, performance testing, long-term stability and reliability testing for network equipment.

▌Key Features

- Native QSFP-DD 400G interface, support 400G/200G/100G/50G/40G/25G/10G
- Support large-scale simulation of L2-3 traffic and routing switching protocols
- Support performance testing of protocols such as routing, multicast, access, MPLS, VXLAN, and segmented routing (SR)
- Support FPGA based 100% line rate traffic generation, statistics, and packet capture
- Support the benchmark test suites such as RFC2544, RFC2889, and RFC3918
- Language for test software GUI: English and Chinese
- Language for test report: English and Chinese

Specifications

Hardware and Electrical Characteristics	
Port speed	PAM4 : 400G/200G/100G/50G　　　NRZ : 100G/50G/40G/25G/10G
Port density	2
Interface standards	PAM4 : · 400G : 400GAUI-8 (PAM4) ，400GBASE-LR8, 400GBASE-FR8 · 200G : 200GBASE-SR4, 200GBASE-LR4/FR4 · 50G : 50GBASE-CR , 50GBASE-LR , 50GBASE-SR · 400G FEC : 802.3-2018 CL119 RS-FEC NRZ : · 100G : 100GBASE-SR4, 100GBASE-LR4 · Clause 91 RS-FEC
Port occupation	By single port
Speed switching	By single port
Weight (kg)	8KG
Dimensions (W×H×D)	437mm (W) 45.32mm (H) 468.746mm (D)
Temperature	0° C to 35° C
Humidity	20% to 85%
Max power consumption (W)	450W (2 ports)
Traffic generation	
Max streams per port	32K
Frame length (Bytes)	400G/200G/100G/50G/40G : 64~16004 Bytes, 25G/10G : 60~16004 Bytes
Dynamic controls for Frame length	Fixed, Increment, Decrement, Random, Auto, and IMIX
Dynamic fields	Four dynamic fields are available for each stream ; Support multiple dynamic controls such as Fixed, increment, Decrement, List, and Random.
Sending mode	Continuous, Burst, and Time Burst modes based on port; Continuous and Burst modes based on stream
Rate modify	Modify by port or
Latency and jitter	LIFO, FIFO , LILO, and FILO
Timestamp resolution	2.5 nanoseconds
Built-in protocol templates	VLAN, ICMP, PPPoE, GRE、DHCP, L2TP, IPv6, MPLS, GTP, GOOSE, VXLAN, OSPF, TCP and UDP, etc.
Customized frame	Support customizing the frame, and the edited frame template can be saved; Customized field can be checked with checksum.
Customized payload	Support importing the 32K bytes customized payload and the first 256 bytes can be adjusted
Packet error generation	CRC error, Undersize frame,Jumbo frame
Flow control	Full duplex flow control, half duplex back pressure
Statistics	
Statistical streams per port	32K
Statistical pattern	Csv statistics, chart statistics, automatic saving of csv files
Statistics(Port)	Tx/Rx Frames, Tx/Rx Frame Rate, Receive Bandwidth, Error Frame Statistics, Filter Statistics, and Custom Statistics, FCS Error Statistics, TCP/UDP Checksum Errors, Pause Frame Statistics, etc.
Statistics(Flow)	Tx/Rx Frames, Tx/Rx Flow rate, Rx Bandwidth, Error frame statistics, Real-time packet loss statistics, out of order statistics, delay jitter and custom statistics, etc.
Statistics operation	Support sorting of statistical results, performing mathematical operations such as addition, subtraction, multiplication, and division, and customizing the number of statistical entries for each page, etc.
Capture	
Capture buffer (Byte)	1M
Capture pattern	Capture of data and receive frames of the control plane; Capture of sending and receiving frames of the control plane; Capture based on filter templates; Capture filtered error packets; Capture buffer overwriting; Support specifying the number of downloaded capture packets.
Protocol Emulation	
Routing and MPLS	RIPv1v2, RIPng, OSPFv2, OSPFv3, ISISv4, ISISv6, BGP, BGP4+, LDP, MPLS L3VPN, VPLS, VLL, 6VPE and 6PE
Access	PPPoE Client/Server, DHCPv4 Client/Server, DHCPv6 Client/Server, DHCPv6 PD Client/Server, L2TPv2 and 802.1x
Multicast	IGMPv1/v2/v3, MLDv1/v2, IGMP/MLD Querier and PIM-SM
Data center	VXLAN, OpenFlow, OVSDB, EVPN and LACP
Other	BFD, 802.1ag, 802.3ah and IPv6 Auto-configuration
Benchmark test	RFC2544, RFC2889, RFC3918, asymmetric testing, and intelligent scripting
Stateful L4-7 protocol	HTTP、Raw TCP
Software Platform	
Client software	RENIX
API	TCL, Python3.x, GUIToTCL and GUIToPython
GUI language	English and Chinese
Hardware Platform	
Chassis	DarYu 3000, DarYu 12000
Chassis operating system	Linux CentOS 7.1