High density 400G Appliance

5G, cloud, and data centers have brought unprecedented internet experiences.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 X5-400G appliance 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 X5-400G appliance 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, supports 8/16 400G ports, and 400G/200G/100G
- Supports large-scale 2-3 layer traffic and routing switching protocol simulation
- Supports the performance test of routing, multicast, access, MPLS, VXLAN, segment routing(SR) and other protocols
- Supports the generation and transmission of RoCEv2 traffic, as well as ECN, DCQCN, and PFC functionalities
- Supports CCL(Collective Communication Library) traffic simulation.
- FPGA based 100% line speed traffic generation, statistics and capture
- Supports RFC2544, RFC2889, RFC3918 and other benchmark test suites

Models

Product name	Product description	Product classification
X5-400G-8QDD, X5-400G-16QDD	8/16 port 400G multi-rate appliance	X5 series appliance

Specifications

Hardware and electrical characteristics	
Port speed	400G PAM4/200G PAM4/100G PAM4/100G NRZ
Port density	8/16
User reservation	Reservation by port
Port speed switching	Switch speed by port
Weight(kg)	21.5 ~ 28.7
Module size(W x H x D)	444mm x 87mm x 730mm
Temperature	0 ° C to 35 ° C
Humidity	20% to 85%
Max power consumption(W)	3000W
Traffic	
Max streams per port	400G: Tx=16K; 200G: Tx=8K; 100G: Tx=8K
Frame length(byte)	64~16004 bytes
Frame length controls	Fixed, Increment, Decrement, Random, Auto, and IMIX
Dynamic fields	4 dynamic fields are available for each stream on 400G, 6 dynamic fields are available for each stream on 100G ; Support multiple dynamic controls such as Fixed, increment, Decrement, List, and Random.
Transmit mode	Continuous, Burst, and Time Burst modes based on port; Continuous and Burst modes based on flow
Bandwidth modification	Modify by port or flow
Latency and jitter	LIFO, FIFO, LILO, and FILO
Timestamp resolution	2.5 nanoseconds
Built-in protocol templates	Built in multiple message templates, such as VLAN, ICMP, PPPoE, GRE, DHCP, L2TP, IPv6, MPLS, GTP, GOOSE, VXLAN, OSPF, TCP, UDP, etc
Customized frame	Support user-defined frame, and the edited frame template can be saved; Supports the checksum check of custom fields
User defined data	Supports importing the 16K bytes customized payload and the first 256 bytes can be adjusted with jumping
Flow control	Full duplex flow control
Packet error generation	CRC error, Oversize frame
Statistics	
Statistical streams per port	400G: Tx=32K; 200G: Tx=16K; 100G: Tx=8K
Statistical pattern	Csv statistics, chart statistics, automatic saving of csv files
Statistics(Port)	Tx/Rx Frames, Tx/Rx Frame Rate, Rx Bandwidth, Error Frame Statistics, Filter Statistics, and Customized 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 customized 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)	400G: 256KB; 200G: 256KB; 100G: 256KB
Capture pattern	Capture of data and receive frames of the control plane; Capture of transmitted and received 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	
RoCEv2	PFC, ECN, DCQCN
Routing and MPLS	RIPv1v2, RIPng, OSPFv2, OSPFv3, ISISv4, ISISv6, BGP, BGP4+, LDP, MPLS L3VPN, VPLS, VLL, 6VPE, 6PE
Access	PPPoE Client/Server, DHCPv4 Client/Server, DHCPv6 Client/Server, DHCPv6 PD Client/Server, L2TPv2, 802.1x
Multicast	IGMPv1/v2/v3, MLDv1/v2, IGMP/MLD Querier, PIM-SM
Data center	VXLAN, OpenFlow, OVSDB, EVPN, LACP
CCL	Algorithms: Ring, Recursive Halving-Doubling, Double Binary Tree Communication Primitive: All-Reduce
Other	BFD, 802.1ag, 802.1ah, IPv6 automatic configuration
Test suite	RFC2544, RFC2889, RFC3918, Asymmetric Test, Smart Scripter
Software platform	
Client software	Renix
API	Tcl, Python3.x, GUIToTcl, GUIToPython
GUI language	English, Simplified Chinese
Hardware platform	
Chassis operating system	Linux CentOS7. x