QSFPTEK S7600 Series Routing Switch Owner's Manual

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Contents

Product Overview

The QSFPTEK S7600 Series Routing Switches (whose abbreviation is "S7600") are highperformance1GE/10GE/40GE/100GE switches designed based on ethernet switching chip CTC7132. S7600'sproductposition is to meet the requirements of next generation Enterprise, Data Center, MetroandHCI(Hyper Converged Infrastructure) networks.

S7600's QSFPTEKOS system software supports mainstream protocols and applications which can be conveniently deployed and managed

S7600 currently provide the following configurations:
S7600-24X2C: Standard 1U 19'' rack mountable; 24×10/100/1000 Base-T ports; 8x10GESFP+ports; Dualmodular AC power supply

S7600-24X2Q: Standard 1U 19'' rack mountable; 48×10/100/1000 Base-T ports; 4x10GESFP+ports; Dualmodular AC power supply.

S7600-32C: Standard 1U 19'' rack mountable; 24×10/100/1000 Base-T ports; 8x10GESFP+ports; Dualmodular AC power supply

S7600-48X8C: Standard 1U 19'' rack mountable; 48×10/100/1000 Base-T ports; 4x10GESFP+ports; Dualmodular AC power supply

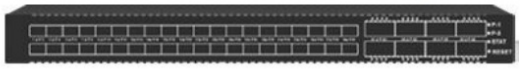
S7600-48Y8C: Standard 1U 19'' rack mountable; 48x1GE SFP ports; 4x10GE SFP+ ports; Dual modularACpower supply.


Front Panel of S7600-24X2C


Rear Panel of S760024X2C


Front Panel of S7600-24X2Q


Rear Panel of S7600-24X2Q


Front Panel of S7600-32C


Rear Panel of S7600-32C


Front Panel of S7600-48X8C


Rear Panel of S7600-48X8C


Front Panel of S7600-48Y8C


Rear Panel of E680-48X8C

Product Characteristic

Based on Carrier Grade High Performance Chip
S7600 series routing switches, which are designed based on Ethernet switching chip CTC7132. TheCTC7132 is Carrier Grade high-performance chip which help the S7600 to meet the requirement ofMetro/Enterprise/Data

Varied Port Types
Support 1G / 10G / 25G / 40G / 100G ports to meet different network requirements

System Design for Green and Energy Saving
Intelligent FAN adjustment and real-time power consumption monitoring technology are providedfor thecostof maintenance redundancy and help to build a green and energy saving data center.

Customized Profile for Different Deployment Scenarios
The Flexible Table Management (FTM) technology offers multiple table size configurationprofilesasoptimized choices for different network scenarios. Support up to 96K MAC address tables. Support upto56KIP routing tables.

IP routing tables. Intelligent Ethernet OAM: completed network fault managementand

performance guaranty
With the IEEE802.1ag and ITU-T Y.1731 end-to-end OAM, Ethernet service providers canmonitortheservices, survey the end-to end performance and ensure the service quality match the agreement. The fault management technique includes CCM, LTM and LBM. Performance targets includemeasureforlatency and jitter. S7600 Support remote management network monitoring network fault indication remote loopbackandMIBparameter retrieval according to the standard 802.3ah EFM

Data Center Features

S7600 support leading edge Data Center features: Priority Flow Control (PFC), explicit CongestionNotification (ECN) and Data Center TCP, etc. Support MLAG (Multi-Chassis Link Aggregation) to aggregate links across different devices. MLAGcanbuildan Active-Active system to improve the reliability of the network links from single board grade todevicegrade.MLAG use a peer link between to devices to aggregate two devices and make themas one devicelogically.Ports of two different devices join the aggregate ports together and all port can transmit the datatraffic. MLAGneed to management the device respectively, but the configurations are easier than stacking, reboot isNOTrequired after MLAG is configured. Forwarding and configuring are processing on local device, innormalcondition the traffic do NOT transmit trough the peer link, the bandwidth of peer link is not the bottleneckof thenetwork and the latency is low.

network and the latency is low. Support overlay technology (include NVGRE/VXLAN/GENEVE etc.). Overlay can make layer2 packetsacross the layer3 networks by using NVGRE/VXLAN/GENEVE header to encapsulate the entire Ethernet packets.Overlay resolves the problem of MAC table size limitation in traditional layer2 networks, resolves theproblemof VLAN id count limitation, and resolves the problem network dynamic adjustment which cannot achievebyVLAN/VPN. Use VXLAN for example, 24 bits VNI identifier can support at most 16777215 logicnetworks,layer2 networks built by VXLAN can keep the same IP/MAC etc. when move the virtue machine. MLAG and overlay features are also good candidates for switches in data center network. S7600 supports RPC-API for SDN(Software Defined Network). SDN is a new architecture of networkwhichcan substantially simplify the management and maintenance by separating the control plane anddataplaneofthe network.

High Reliability

S7600 are powered by Hot-swappable power modules which supports AC/DC 1+1 redundancy Fanssupport2+1 redundancy Support Real-time environment monitoring technology to detect the chipset temperature,status of fan and power, etc. Support LACP / ECMP / VRRP / VARP / STP/RSTP/MSTP / Smart Link / BFD / ERPS / G.8031/ G.8032/Load-Balancing, etc. to protect the network traffic all-around effectively. Patented technology “Sysmon” for CPU status monitoring can take action

Outstanding QoS Control

S7600 provides 10hardware queues per-port (8 unicast queues, 1 multicast queues, and1monitorqueue).Support multi-stage scheduling technology such as WDRR (Weighted Deficit Round Robin) / SP(StrictPriority) and TD (Tail Drop) / WRED (Weighted Random Early Detection) to prevent congestion. Supportflexible queue schedulingmechanism to do the shaping for queue or port traffic. Ingress and egress policer provide intelligent bandwidth monitoring, which support to adjust thegranularityaccording to the port speed. Both srTCM (Single Rate Three Color Marker) and trTCM(Two RateThreeColorMarker) can be supported

Triple-play Service Support with Bandwidth Guaranty for HighQuality

Application

S7600 offers high bandwidth for Triple-Play services such as IPTV, video monitoring. Thebuilt-inQoScapabilities and flexible queuing technologies guarantee high quality of services. Rich multicast protocol set (IGMP Snooping, IGMP v1/v2, PIM-SM) support up to 2K multicast groupsand4Klogical replications per group. With QSFPTEKOS software, IPTV service and multicast latency control arefullysupported.

Comprehensive Network Security Policy

S7600 supports subscriber-class / switch-class / network-class security control. IPv4 / IPv6 / MAC ACL can filter IPv4 / IPv6 / Non-IP packet respectively. Besides that, extendedIPv4/IPv6ACL which can match Layer2 / layer3 / layer4 information in one rule is available. The ACLs canapplytophysical ports / vlan / port group / vlan group. The members of port group or vlan group shareaset of ACLsand save the TCAM resource. ARP Inspection and IP Source Guard features prevent network from malicious ARP attack. Support CPUTraffic Protection, Storm Control and CPU load optimization features. Support centralized802.1x authentication feature to forbidden illegal user accessing network..

Convenient Management Features

Support varied management interfaces, include console port / in-band network ports / out-of-bandnetworkport / USB port. Support SNMP v1/v2/v3, Support CLI (Command Line Interface), web management, Telnetand FTP connection. Support OAM to make management more convenient, and support SSH2.0, SSL, etc.toensure security of management

Product Specifications

Items		S7600-48T4X	S7600-48S4X	S7600-24T8X
Size (H×W×D)		4.36 x 44.0 x 37.0cm (1.73 x 17.5 x 14.6 in.)		
Weight		5.1KG	6.25KG	6KG
RS-232Ports	Serial	1 RJ-45 port located at the left side of front panel		
Management Ports		1 RJ-45 out-of-band management port located at the left side of front panel		
USB Ports		1 Type-A USB port located at the left side of front panel		
10/100/1000MbBase-T Ports		48	–	24
1Gb SFP Ports		–	48	–
10GbEPorts	SFP+	4	4	8
25GbEPorts	SFP28	–	–	–
40GbEPorts	QSFP+	–	–	–
100GbEPorts	QSFP28	–	–	–
10/100/1000MbBase-T POE Ports		–	–	–
Latency		Min: 660ns		
CPU		SOC(Dual core/ARM A53)		
Memory		2 GB		
Flash		8 GB (eMMC)		
Packet Memory	Buffer	9 MB		
Power supply	AC	Operating Voltage: 100 ~ 240V; 50/60HzMaximum Voltage : 90 ~ 264V; 47~63Hz		

Items		S7600-48T4X	S7600-48S4X	S7600-24T8X	
	DC	Operating Voltage : -48 ~ -60V			NOT support
Airflow Option		Front-Rear			
Hot-swappable Fans		2 (1+1 redundant)			1 Fixed AC power supply
Typical Power Draw		42W	58W		41W
Max Power Draw		55W	70W		55W
MTBF(Hour)		204935	189901		204935
MTBF(Year)		23.39	21.68		23.39

S7600 Series System Specifications

Table 3-1 Series System Specifications

Description	Specification
Operating Temperature	0 to 45 ºC
Storage Temperature	-40 to 70 ºC
Relative Humidity	0 to 95% (non-condensing)

Table 3-2 Environment Specifications

Description	Specification
Safety Certifications	Ready to CE Marking
Electromagnetic Emissions Certifications	Ready to FCC Part 15 Class A Ready to CE
Warranty	Limited warranty

Table 3-3 Safety and Compliance

Description	Specification
Safety Certifications	Ready to CE Marking
Electromagnetic Emissions Certifications	Ready to FCC Part 15 Class A Ready to CE
Warranty	Limited warranty

S7600 Series Service Specifications

Table 3-4 Service specifications

Features		**S7600-48T4X**	**S7600-48S4X**	**S7600-24T8X**
Line speed forwarding	Switch capability	176 Gbps	176 Gbps	208 Gbps
	Throughput	132 Mpps	132 Mpps	155 Mpps
Forward mode		Support store-forward mode and cut-through mode		
Ethernet features		Support full duplex, half duplex, and auto-negotiation duplex Support auto-negotiation port speedSupport Jumbo Frame Support Flow Control Support Storm Control Support Port-block Support Port-isolateSupport L2 Protocol Tunneling		
VLAN features		Support 4094 VLANsSupport VLAN access mode: Access /Trunk Support Default VLANSupport VLAN ClassificationSupport basic QinQ, selective QinQ and VLAN Mapping Support VLAN statisticsSupport Private VLAN Support Guest VLANSupport Voice VLAN		
MAC Address Table		Support static MAC addressSupport dynamic MAC address learning and aging Support hardware learningSupport black hole MAC addressSupport MAC Flapping detect		
Link aggregation		Support Static Link aggregation Support LACPSupport Static load balancingSupport dynamic load balancing (DLB) Support Self-healingSupport port priority and active-standby mode		
Reliability features		Support STP/RSTP/MSTP protocolSupport STP Protocol Protection (BPDU Filter/Guard, Root Guard, Loop Guard, Anti TC-BPDU attack)Support Single ERPS ring / tangent ERPS rings / intersecting ERPS rings Support ERPS compatible with RRPPSupport G.8031 Support G.8032Support port Loopback Detect Support BFD Support VRRP Support MLAGSupport Ethernet OAM: EFM/CFM/Y.1731Support Software class process monitoring(Sysmon) Support Hardware Watch Dog		
ARP features		Support static ARPSupport dynamic ARP leaning and aging Support Gratuitous ARPSupport basic ARP-Proxy and local ARP-Proxy		
IPv6 forwarding		Support ICMPv6 Support NDP Support PMTUSupport IPv6 static routes Support RIPngSupport OSPFv3Support IPv6 over IPv4 Tunnel Support 6to4 TunnelSupport ISTAP Tunnel Support DHCPv6 Support IPv6 prefix listSupport VRRP v3		

Multicast features	Support IGMP v1/v2/v3 Support IGMP agent Support IGMP SSM MappingSupport PIM-SM,PIM-SSM,PIM-DMSupport MLD v1/v2, MLD v1/v2 snoo ping Support MVR and MVR6Support PIM-SM v6
Metro features	Support LDP
	Support MPLS Forwarding Support VPWSSupport VPLS Support MPLS OAM Su pport MPLS StatsSupport L2VPN/L3VPN Support MPLS ACLSupport MPLS QoS
Data center features	Support VARP Support VXLAN Support GRE TunnelSupport NVGRE Tunnel Support GENEVE Tunnel Support DCBXSupport priority-based flow control (PFC) Support PFC Deadlock detectionSupport EVPN
QOS features	Support traffic classification based on COS/DSCP (simple classification) Support t raffic classification based on ACL (complex classification) Support queue scheduling based on traffic classificationSupport Remark the priority fields(COS/D SCP) of the packet Support flow redirectionSupport flow mirror Support traffic poli cing Support traffic shaping Support traffic statisticsSupport SP(Strict Priority) sch edulingSupport WDRR (Weighted Deficit Round Robin) scheduling Support SP + WDRR mixed schedulingSupport TD(Tail Drop)Support WRED (Weighted Rando m Early Detection) Support ECN tags based on TD and WRED
Security features	Support SSH Support Radius Support TACAS+ Support AAASupport port based d ot1x and MAC based dot1x authentication/access accounting/keep aliveSupport c onfigure dot1x Guest via command or Radius server
	Support access control list(ACL)Support traffic classification based on source and destination IP / source and destination MAC / source and destination layer for prot ocol number / VLAN IDSupport ACL matching User defined fields (UDF) Support ACL active based on Time-Range Support ARP inspectionSupport IP source guar dSupport port security to limit the MAC address learning on interface Support VLA N security to limit the MAC address learning on interfaceSupport CoPP (Control Pl ane Protect) black & white list and rate limit featuresSupport CPU Traffic Limit Sup port Prevent DDOS attackSupport ACL filtering Telnet/SSH loginSupport Link-Flap ping detection
Configuration and mainten ance	Support DHCP Server Support DHCP Relay Support DHCP Snooping Support D HCP Client Support DHCP Option82 Support RMONSupport sFlow Support IP SL ASupport IPFIX and MFP Support SGTSupport Latency/Buffer Monitor Support E FD (Elephant Flow Detection) Support NTPSupport port Errdisable state detection and recovery Support configure static DNS clientSupport LLDP Support port loop backSupport hardware loopback (internal/external) Support to configure system ti meSupport to configure time zone
Debugging features	Support to Debug based on modulesSupport CPU/memory usage display and alar mSupport Device temperature/PSU/FAN/status display and alarm

	Support user operation logsSupport Management of logs, alarms, and debugging information Support VCT (Virtual Cable Test)Support detailed diagnostic-information collection Support reboot information loggingSupport network diagnostics (ping/traceroute)Support mirror: support use port/VLAN/CPU as mirror source Support use port/port group/ VLAN / CPU as mirror destination Support ERSPANSupport to CPU/From CPU packets statistics Support L2 pingSupport UDLD(Unidirectional Link Detection)
Management features	Support in-band and out-of-band management ports Support privileged user priority and privileged commands Support User block featureSupport Network management based on SNMPv1/v2c/v3 Support Public and private MIBSupport Public and private TrapSupport Configuration and management based on WEB UI Support Configuration and management based on RPC-APISupport SmartConfig(Automatically configuration when system start) Support OVSDBSupport change the system specifications by choose different STM ProfilesSupport feature configuration based on License Support restore factory default configuration Support manual/schedule rebootSupport upgrade with the local image file/remote TFTP serverSupport online upgrade Uboot
File system	Support file system to manage the files and directories Support upload/download files via FTP/TFTPSupport transmit files via Xmodem

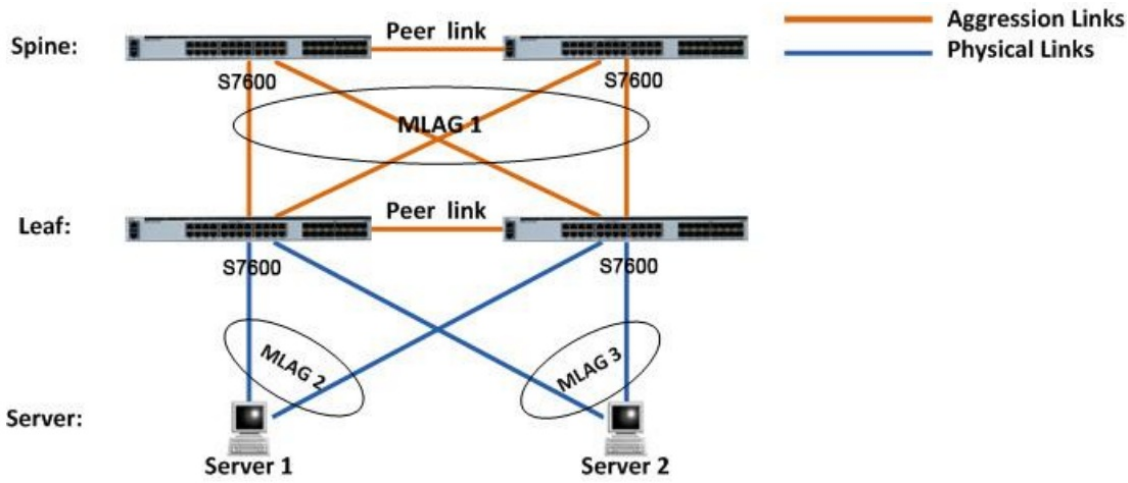
S7600 Series

Manufacturer Part Number	Manufact u rer Name	Safety	EMC	Certifications
	Wuhan	EN 62368-1:	EN 55032: 2015	CCC
S7600-48S4X	QSFPTEK	2020+A11:202	EN 55024: 2010	CE-LVD
	Communic	0	EN 61000-3-2:2014	CE-EMC
	ations Co.,L td.	EN62479:2010	EN 61000-3-3:201 3	FCCFCC ICES
	Wuhan	EN 62368-1: 2020+A11:2020E N62479:2011	EN 55032: 2015	ETL
	QSFPTEK		EN 55024: 2010	
S7600-48T4X	Communic		EN 61000-3-2:2014	
	ations Co.,		EN 61000-3-3:	
	Ltd.		2014	
	Wuhan	EN 62368-1: 2020+A11:2020E N62479:2011	EN 55032: 2015	CCC
	QSFPTEK	EN 62368-1: 2020+A11:202 0	EN 55024: 2010	CE-LVD
S7600-24T8X	Communic	EN62479:2010	EN 61000-3-2:2014	CE-EMC
S7600-48T4X	ations Co.,	EN 62368-1: 2020+A11:202 0 EN62479:2011	EN 61000-3-3:	FCC
S7600-24T8X	Ltd.	EN 62368-1: 2020+A11:202 0 EN62479:2011	2014	FCC ICES

Applications

HCI Hyper-Converged Infrastructure

S7600 with 1GE + 10GE/40GE/100GE ports are suitable for HCI Hyper-Converged Infrastructure networks. Using 1GE ports for management network and using 10G/40GE/100G ports for data traffic network. The following features of S7600 are available for this case: VLAN, LACP, STP/RSTP/MSTP, MLAG, etc.



Enterprise Data Center

S7600 series provide 1GE/10GE/40GE/100GE ports for Access or Aggregation switches. The following figure shows a deployment example using the S7600 Series for Data Center Accessnetworktopology as TOR access devices The following features of S7600 are available for this case: VLAN, LACP,RSTP&MSTP, MLAG, DCB Features (PFC/QCN/ETS, Data Center TCP), OSPF, QoS,Overlay(NVGRE/VXLAN/GENEVE), etc.

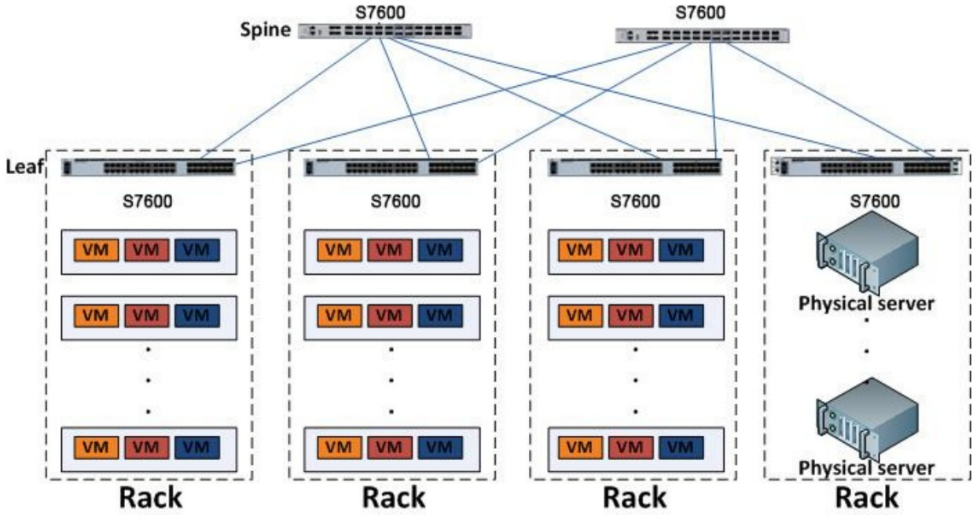


Figure 5-2 Data Center Servers Access Network with S7600 Series

Metro L2 Ring Network

Ring network topology allows service provider to establish robust network and operate multiple services. The following figure shows the deployment example using the S7600 Series for Metro L2 ring networktopologyas Aggregation or Access devices. The following features of S7600 are available for this case: QinQ/ ERPS/G.8032 / EFM / CFM / LACP / Smart-link, etc.

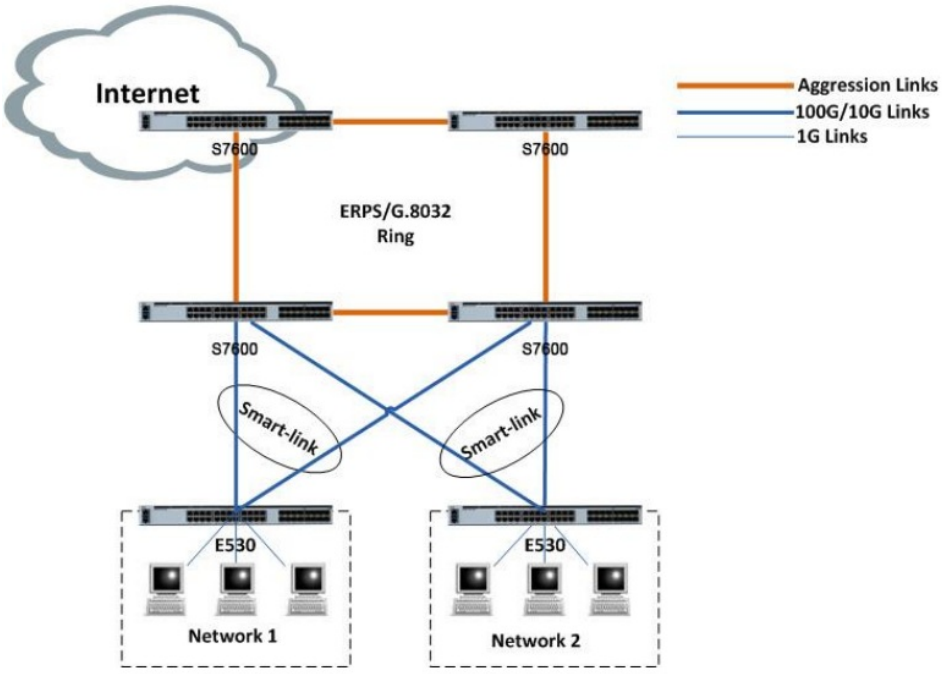


Figure 5-3 Metro L2 Ring Network topology with S7600 Series

Ordering Information

Table6-1 S7600 Series product

Product Number	Description
S7600-48T4X	Standard 1U 19’’ rack mountable
	48×10/100/1000 Base-T ports 4x10GE SFP+ portsDual modular AC power supplyFront-Rear Airflow, fixed FAN
S7600-48S4X	Standard 1U 19’’ rack mountable 48x1GE SFP ports4x10GE SFP+ portsDual modular AC power supply Front-Rear Airflow, fixed FAN
S7600-24T8X	Standard 1U 19’’ rack mountable 24×10/100/1000 Base-T ports 8x10GE SFP+ portsDual modular AC power supplyFront-Rear Airflow, fixed FAN

Extended Optics and Cables

Table6-2 Supported Optics and cables

Port type	Optics and cables	Note
Ethernet management port	RJ-45 connectors Cat-5 UTP cabling	–
Console port	RJ-45-to-DB9 cable	for PC connections
10/100/1000BASE-T Ports	RJ-45 connectors Cat-5 UTP cabling	–
1GE SFP	LC fiber connectorsSingle-mode or Multimode fiber	–
25GE SFP28	LC fiber connectorsSingle-mode or Multimode fiber	–
10GE SFP+	LC fiber connectors Single-mode or Multimode	–
Port type	Optics and cables	Note
	fiber	
40GE QSFP+	LC fiber connectorsSingle-mode or Multimode fiber	–
100GE QSFP28	LC fiber connectorsSingle-mode or Multimode fiber	–

Documents / Resources

	QSFPTEK S7600 Series Routing Switch [pdf] Owner's Manual S7600 Series Routing Switch, S7600 Series, Routing Switch, Switch

References

- QSFPTEK - Compatible Optical Transceivers Factory Outlet