Quidway® S9300 Terabit Routing Switches

HUAWEI TECHNOLOGIES CO., LTD.

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Product Overview

Quidway® S9300 switches (S9300 for short) are next-generation high-end terabit routing switches developed by Huawei designed for multiservice convergence. The S9300 is designed based on Huawei's intelligent multilayer switching technology to provide high-definition video services, large-capacity wireless networks, elastic cloud computing, IPv6-capable hardware, and integrated security in addition to stable, reliable, and secure high performance L2/L3 switching services. The S9300 is a highly extensible and reliable platform integrating switching and routing functions to facilitate end-to-end integrated networks, and is widely used in WANs, MANs, campus networks, and data centers to help enterprises build application-oriented networks.

Product Appearance

The S9300 offers three models: S9303, S9306, and S9312. Their switching capacity and port density can be expanded. Each model has a modular design with interchangeable modules and components, ensuring device extensibility to allow enterprises to maximize their return on investment (ROI). In addition, the S9300 uses various innovative energy saving technologies, greatly reducing energy consumption and noise without compromising performance and stability.

S9303

S9306

S9312

Product Features

Advanced Switching Architecture to Improve Network Expansibility

- Huawei's advanced switching architecture permits rapid bandwidth expansion. The highly expansible backplane enables the port rates to be upgraded to 40 Gbit/s and 100 Gbit/s, and is compatible with the currently used cards, helping enterprises maximize their ROI.
- Each S9300 supports 480 10GE ports. The high density of 10GE ports brings enterprise campus networks and data centers into an era of all-10GE core network.

Carrier-Level High Availability Design to Ensure Service Consistency

- Huawei's carrier-level high reliability design ensures that the S9300 is 99.999% reliable, which meets and exceeds carrier-level operation requirements. The S9300 provides redundant backup for key components, including MPUs/SRUs, power supply units, and fans, all of which are hot swappable. The S9300 also supports the in-service software upgrade (ISSU), which can minimize disruption of mission-critical data and services.
- Cluster requires multiple switching processes cross chassises and therefore reduces the switching efficiency. The S9300 implements the Cluster Switching System (CSS) function through switching fabrics to solve this problem. In this way, switching fabrics of the switches in a cluster are connected. This method saves line card slots and provides 256 Gbit/s bandwidth, which is the highest in the industry. In addition, inter-chassis link aggregation can be used to improve link usage and eliminate single-point faults.
- The S9300 can monitor network running status, rapidly locate device faults, and accurately calculate parameters such as the transmission delay and jitter using its well-designed maintenance and management mechanisms and performance management functions, such as 802.3ah, 802.1ag, and ITU-Y.1731.

S9300 CSS

Improved QoS Mechanism

- The S9300's QoS control mechanisms perform traffic classification based on Layer 2 to Layer 7 information. Additionally, with the advanced queue scheduling algorithm and congestion control algorithm, the S9300 performs accurate multi-level scheduling for data flows, satisfying QoS requirements for a variety of users at different levels.
- The S9300 supports Hierarchical QoS scheduling at the access side to satisfy service requirements of access users at different levels.

Full-Service Ethernet Switching Platform

- The S9300 supports distributed Layer 2/Layer 3 MPLS VPN functions, MPLS, VPLS, HVPLS, and VLL, meeting the

access requirements of enterprise VPNs.

- The S9300 supports Layer 2 and Layer 3 multicast protocols, implements multicast replication among VLANs at the line rate, provides independent multicast QoS queues, and gives priority to services requiring a low delay such as voice and video services.
- The software platform provides various routing protocols to meet enterprise network requirements, supports large routing tables for both SMB networks and large-scale multinational company networks, supports IPv6, and enables enterprise networks to be smoothly upgraded.

Virtualized Data Center Switching Platform

- The S9300 innovatively implements the CSS function through switching fabrics. Inter-chassis link aggregation can be implemented to improve usage of bandwidth resources in the data center. This technology hides physical links from data switching in the data center.
- The S9300 provides line cards with large caches specific to the service model of large distributed data centers. Each port of such a line card provides 200ms caching of data flows. This prevents packet loss caused by high burst traffic on the distributed computing network.
- The S9300 supports refined QoS guarantee and traffic management. It uses various queue scheduling algorithms and congestion control algorithms to control data traffic accurately and hierarchically. In this way, the S9300 can assign different priorities and queues to flows of different users and services according to their QoS requirements and provides different bandwidth, delay, and jitter for them.

High-Performance IPv6 Service Support

- Both the hardware platform and software platform of the S9300 support IPv6. The S9300 has gained IPv6 Ready Phase 2 (Gold) designation.
- The S9300 supports IPv4/IPv6 dual stack, various tunneling technologies, IPv6 static routes, RIPng, OSPFv3, BGP+, IS-ISv6, and IPv6 multicast to meet the requirements of independent IP networks and IPv4/IPv6 integrated networks.

Highly-Integrated and Valued-Added Service Processing

- The S9300 load balancer supports multiple load balancing algorithms, including weighted round robin (WRR) algorithm, least connection algorithm, hash algorithm based on the IP address, and hash algorithm based on the URL in HTTP packets.
- The integrated traffic service analysis module supports NetStream V5, V8, and V9 formats, the aggregation traffic template, real-time traffic collection, dynamic report generation, traffic attribute analysis, and traffic exception report.

Excellent Security Design

- The S9300 has an integrated firewall card installed and also supports virtual firewalls and NAT multi-instance, allowing multiple VPN customers to share the same firewall. The application-layer packet filtering technology detects and filters application layer packets according to rules.

- The S9300 performs authentication, authorization, and accounting (AAA) on access users according to pre-defined policies. In addition, the S9300 supports 802.1x, portal, guest VLAN, and dynamic user access authentication. Therefore, it can work well with NAC produced by other mainstream manufacturers.
- The S9300 uses a two-level CPU protection mechanism and supports 1K hardware queues for CPU protection. It separates the data plane and the control plane and prevents DoS attacks, unauthorized access, and overload of the control plane. With these features, the S9300 provides industry-leading integrated security solutions.

Wireless and Passive Integrated Access

- The S9300 EPON OLT card provides symmetric upstream and downstream bandwidths of 1.25 Gbit/s, which meets customers' increasing bandwidth requirements. In addition, it provides different transmission distances, enabling the S9300 to be applicable to various access network environments.
- The S9300 wireless AC card supports radio frequency management. The S9300 allows APs to select their radio channels and power automatically. In an AP region, APs automatically adjust radio channels and power in the event of signal interference, enabling the receive signal strength indicator (RSSI) and signal-to-noise ratio (SNR) to be continuously updated. The system then can monitor the electromagnetic environment of every wireless user, improving network availability.
- The S9300 wireless AC card supports Layer 2 and Layer 3 roaming and allows STAs to rapidly switch to the radio of another AP. It supports 1+1 and N+1 backup between ACs and load balancing among ACs, improving network reliability.

Innovative Energy Saving Design

- The S9300 uses a rotating ventilation channel, improving heat dissipation efficiency. In addition, it uses a variable current chip to dynamically adjust the power according to traffic, reducing power consumption by 11%. Ports can hibernate, where they do not transmit traffic or consume power.
- The S9300 uses intelligent fan speed adjustment technology, where the fan module monitors and controls the temperature in each zone, adjusting the speed of each fan individually, extending the service life of each fan and reducing power consumption.
- The S9300 supports the smart PoE technology and uses different energy management configurations according to the Powered Device (PD) type, ensuring flexible energy management.
- The S9300 supports IEEE 802.3az Energy Efficient Ethernet, provides the low power idle mode for the line card PHY, and switches to a lower speed (power) PHY during low link utilization.

Product Specifications

Item	S9303	S9306	S9312
Backplane capacity	3Tbps	6Tbps	12Tbps
Switching capacity	720G/1.92T	2T/5.12T	2T/5.12T
Throughput	540Mpps/1440Mpps	1152Mpps/2880Mpps	1344Mpps/3360Mpps
LPU slots	3	6	12
VLAN	Supports access, trunk, and hybrid VLAN.		
	Supports the default VLAN.		
	Supports VLAN switching.		
	Supports QinQ and selective QinQ.		
	Supports dynamic VLAN allocation based on MAC		
MAC address	Supports dynamic learning and aging of MAC addresses.		
	Supports static, dynamic, and blackhole MAC address entries.		
	Filters packets based on source MAC addresses.		
	Restricts MAC address learning based on ports and VLANs.		
STP	Supports STP, RSTP, and MSTP.		
	Supports BPDU protection, root protection, and loop protection.		
	Supports BPDU tunnels.		
IP routing	Supports IPv4 routing protocols, such as RIP, OSPF, BGP, and IS-IS.		
	Supports IPv6 routing protocols, such as, RIPng, OSPFv3, ISISv6, and BGPv4.		
Multicast	Supports IGMP v1/v2/v3 and IGMP v1/v2/v3 snooping.		
	Supports PIM DM, PIM SM and PIM SSM		
	Supports MSDP and MBGP		
	Supports prompt leave of multicast members.		
	Supports multicast traffic control.		
	Supports the multicast querier.		
	Supports suppression on multicast packets.		
	Supports multicast CAC.		
	Supports multicast ACL.		
MPLS	Supports basic MPLS functions.		
	Supports MPLS OAM.		
	Supports MPLS TE.		
	Supports MPLS VPN/VLL/VPLS.		
Reliability	Supports LACP and Enhanced-Trunk.		
	Supports VRRP and BFD for VRRP.		
	Supports BFD for BGP, IS-IS, OSPF, and Static routing.		
	Supports NSF and GR for BGP, IS-IS, OSPF and LDP.		
	Supports TE FRR and IP FRR.		
	Supports Ethernet OAM (802.3ah and 802.1ag).		
	Supports ITU-Y.1731		
	Supports DLDP.		
	Supports ISSU.		
	Supports CSS.		

Item	S9303	S9306	S9312
QoS	Supports traffic classification based on the Layer-2 header, Layer-3 information, Layer-4 information, and 802.1p priority.		
	Supports the actions of ACL, CAR, re-mark, and schedule.		
	Supports the queue scheduling algorithms of PQ, WRR, DRR, PQ+WRR, and PQ+DRR.		
	Supports the congestion avoidance mechanisms such as WRED and tail drop.		
	Supports H-QoS.		
	Supports traffic shaping.		
EPON OLT	Supports IEEE 802.3ah.		
	Supports DBA.		
	Limit of ONU both downstream and upstream bandwidth.		
	Loopback test of ONU.		
Configuration and Maintenance	Supports Console, Telnet, and SSH terminals.		
	Supports the network management protocols, such as SNMPv1/v2/v3.		
	Supports file uploading and downloading through FTP and TFTP.		
	Supports BootROM upgrade and remote upgrade.		
	Supports hot patches.		
	Supports user operation logs.		
Security and Management	Supports RADIUS and HWTACACS authentication for login users.		
	Provides hierarchical protection for commands to prevent unauthorized users from accessing the equipment.		
	Defends against DoS attack, TCP SYN Flood attack, UDP Flood attack, broadcast storm, and heavy traffic attack.		
	Provides 1K CPU queues for CPU protection.		
	Supports the ping and tracert functions based on ICMP packets.		
	Supports RMON.		
Service Function	Supports Firewall.		
	Supports NAT.		
	Supports Netstream.		
	Supports IPSec.		
	Supports Load Balance.		
	Supports WLAN AC.		
Energy Management	Supports IEEE 802.3az Energy Efficient Ethernet.		
Chassis dimensions (width x depth x height) (mm)	442×476×175	442×476×442	442×476×664
Chassis weight (empty)	<15Kg	<30Kg	<45Kg
Working voltage	DC: –38.4V to –72V AC: 90V to 290V		
Chassis power supply capability (without POE power supply)	800W	1600W	1600W
Chassis POE power supply capability	2200W	8800W	8800W

Configuration Options

The S9300 is modular configuration. Product configuration includes basic configuration, software License, Line Processing Units (LPU), Service Processing Unit (SPU), daughter units, and other types of units (CSS Service Unit, Clock Pinch Card), transceiver and fiber connectors.

The product configuration must include the basic configuration for the first purchase. The basic S9300 configuration includes the assembly chassis, SRUs, and power modules. At least one SRU must be installed; to improve device reliability, you are advised to install two SRUs. At least one power module must be installed; to improve device reliability, you are advised to install two or four power modules for 1+1 or 2+2 redundancy backup, dependent upon the device power. DC power modules and AC power modules cannot be installed on the same S9300.

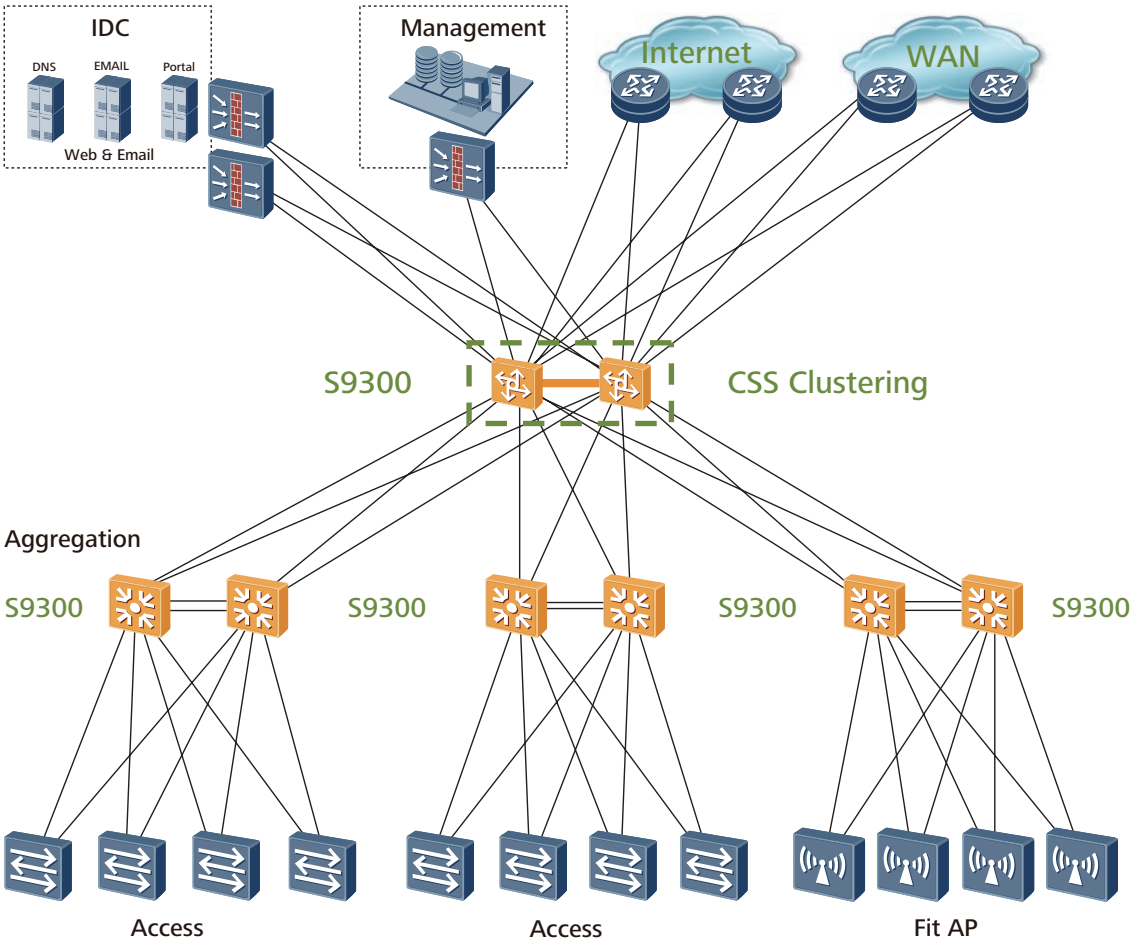
Software licenses, service cards, value-added service cards and daughter cards, and other cards can be customized to satisfy different service requirements. Use the following order information table to customize the S9300 to your specific need. Transceivers and optical fibers can be selected as required, also. For their specifications, see the bill of quotation.

To expand the capacity of cards and upgrade the software beyond basic configurations, select additional configurations from the order information table.

Applications

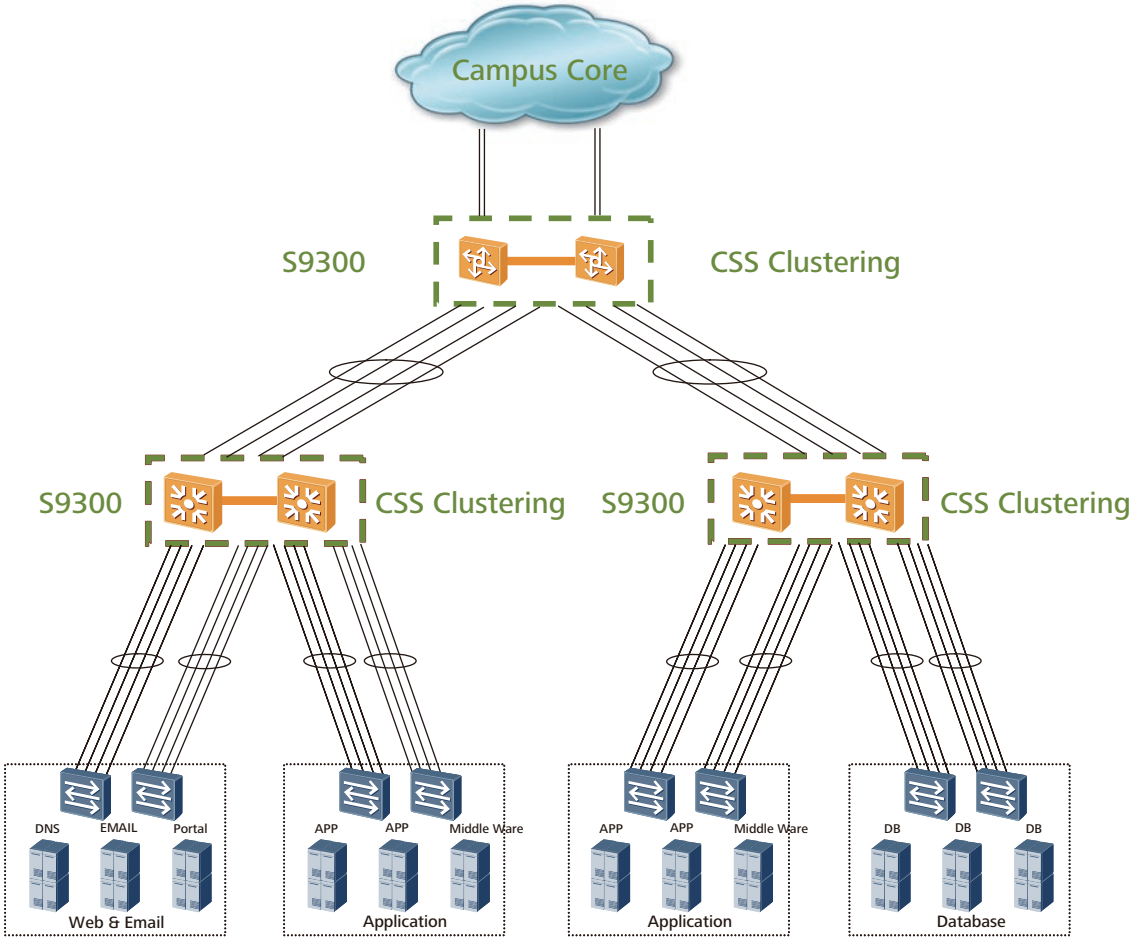
Application in Large-Scale Campus Networks

The S9300 can be used to build highly reliable, expansible, and manageable high performance enterprise campus networks. The S9300 supports distributed IPv4/IPv6/MPLS wire-speed switching and provides high-density 10G data throughput for core and convergence nodes on enterprise campus networks. The S9300 supports the wireless AC module and can integrate it with the campus core device, saving the network investment. The S9300 also supports hardware CPU queues to protect the enterprise core against DDoS attacks and security threats.



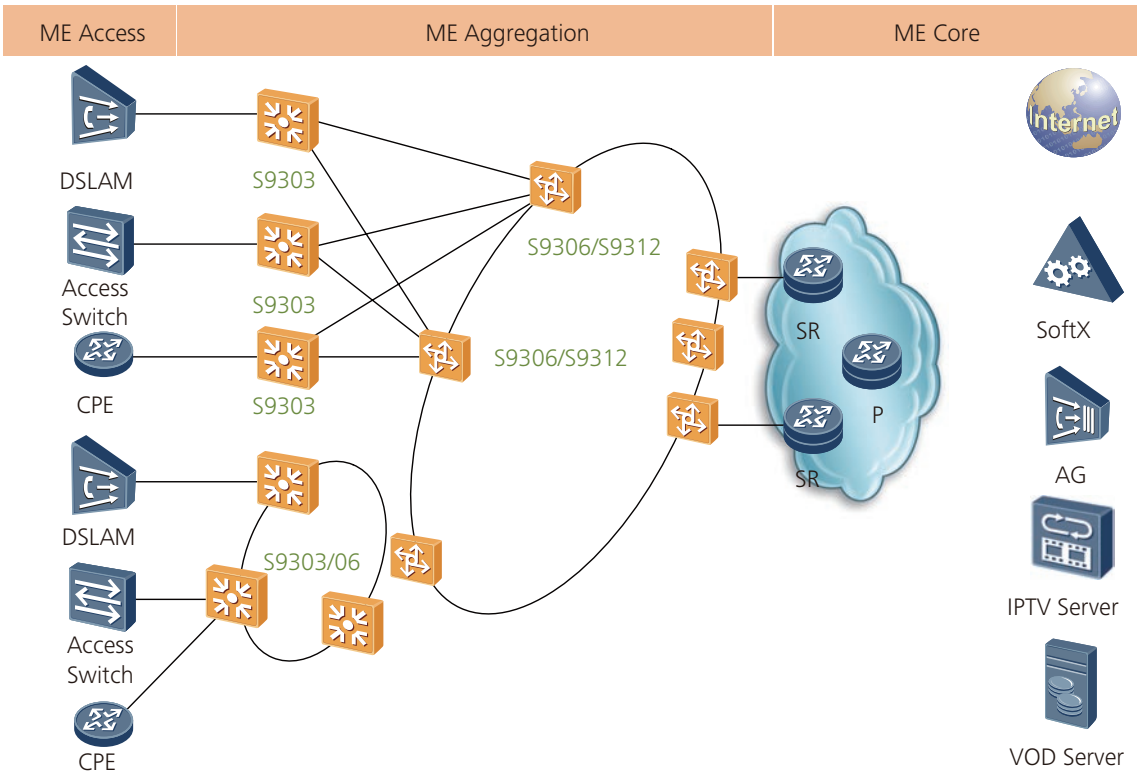
Applications in Large-Scale Data Centers

The S9300 functions as a high-density 10G core and convergence node in large-scale data centers, helping enterprises build highly reliable, non-blocking, and virtualized data center networks. The S9300 deploys various technologies to ensure uninterrupted services, including ISSU upgrades, IP FRR, hardware-level BFD, NSF, VRRP, and E-Trunk. Using the CSS and integrated load balancing solutions, the S9300 improves the network efficiency and reduces network maintenance costs.



Applications in Carriers' MANs

By converging DSLAM, LAN, and enterprise access services, the S9300 provides large-capacity switching and high-density 10G interfaces. At the convergence layer, the interface rate can be smoothly upgraded from 10GE to 40GE/100GE, meeting the increasing bandwidth requirements of the ISP network. The S9300 supports features such as the RRPP, Ethernet OAM, VRRP, and MPLS Layer 2/Layer 3 VPN. It satisfies the requirements for IPTV, high speed Internet (HSI), and enterprise leased lines and provides carrier-class reliability, security, and manageability.



Order Information

Basic Configuration	
LE0BN66EDC	DC Assembly Rack(600X600X2200mm)
LE0BN66EAC	AC Assembly Rack(600X600X2200mm)
LE0KS9303	S9303 Assembly Chassis
LE0KS9306	S9306 Assembly Chassis
LE0KS9312	S9312 Assembly Chassis
LE0BS9306P1	S9306 POE Assembly Chassis
LE0BS9312P1	S9312 POE Assembly Chassis
LE0M00FBXB00	Wide Voltage Fan Box
LE0MACPJBX01	APD32-2-4 Distribution Box

Monitoring Board	
LE0DCMUA0000	Centralized Monitoring Board
Main Control Unit	
LE0MMCUA	Quidway S9303 Main Control Unit A
LE0DMCUA	Quidway S9303 Main Control Unit A,Clock
LE0MSRUA	Quidway S9306/S9312 Main Control Unit A
LE0DSRUA	Quidway S9306/S9312 Main Control Unit A,Clock
LE0D00SRUB00	Quidway S9306/S9312 Main Control Unit B,Clock
SRU Service Card	
LE0MFSUA	Enhanced Flexible Service Unit
LE0D0VSTSA00	Cluster Switching System Service Unit
10/100BASE-T Interface Card	
LE0MF48TA	48-Port 10/100BASE-T Interface Card(EA,RJ45)
LE0DF48TFA00	48-Port 10/100BASE-T Interface Card(FA,RJ45)
LE0MF48TC	48-Port 10/100BASE-T Interface Card(EC,RJ45)
100BASE-X Interface Card	
LE0MF48SA	48-Port 100BASE-X Interface Card(EA,SFP)
LE0MF48SC	48-Port 100BASE-X Interface Card(EC,SFP)
10/100/1000BASE-T Interface Card	
LE0DT24XEA00	24-Port 10/100/1000BASE-T and 2-Port 10GBASE-X Interface Card (EA,RJ45/XFP)
LE0DG24TFA00	24-Port 10/100/1000BASE-T Interface Card(FA,RJ45)
LE0MG48TA	48-Port 10/100/1000BASE-T Interface Card(EA,RJ45)
LE0DG48TFA00	48-Port 10/100/1000BASE-T Interface Card(FA,RJ45)
LE0DG48TBC00	48-Port 10/100/1000BASE-T Interface Card(BC,RJ45)*
LE0MG48TC	48-Port 10/100/1000BASE-T Interface Card(EC,RJ45)
LE0MG48TD	48-Port 10/100/1000BASE-T Interface Card(ED,RJ45)
100/1000BASE-X Interface Card	
LE0MG24SA	24-Port 100/1000BASE-X Interface Card(SA,SFP)
LE0MG24SC	24-Port 100/1000BASE-X Interface Card(EC,SFP)
LE0MG24SD	24-Port 100/1000BASE-X Interface Card(ED,SFP)
LE0MG24CA	24-Port 100/1000BASE-X and 8-Port 10/100/1000BASE-T Combo Interface Card(SA,SFP/RJ45)
LE0DS24XEA00	24-Port 100/1000BASE-X and 2-Port 10GBASE-X Interface Card(EA,SFP/XFP)
LE0D024XC00	24-Port 100/1000BASE-X and 2-Port 10GBASE-X Interface Card(EC,SFP/XFP)
LE0MG48SA	48-Port 100/1000BASE-X Interface Card(EA,SFP)
LE0DG48SFA00	48-Port 100/1000BASE-X Interface Card(FA,SFP)
LE0DG48SBC00	48-Port 100/1000BASE-X Interface Card(BC,SFP)*
LE0MG48SC	48-Port 100/1000BASE-X Interface Card(EC,SFP)
LE0MG48SD	48-Port 100/1000BASE-X Interface Card(ED,SFP)

100/1000BASE-X and 10/100/1000BASE-T Interface Card	
LE0DG48CEAT0	36-Port 10/100/1000BASE-T and 12-Port 100/1000BASE-X Interface Card(EA,RJ45/SFP)
10GBASE-X Interface Card	
LE0MX2UXA	2-Port 10GBASE-X Interface Card(EA,XFP)
LE0MX2UXC	2-Port 10GBASE-X Interface Card(EC,XFP)
LE0MX4UXA	4-Port 10GBASE-X Interface Card(EA,XFP)
LE0MX4UXC	4-Port 10GBASE-X Interface Card(EC,XFP)
LE0DX4UXED00	4-Port 10GBASE-X Interface Card(ED,XFP)
LE0DX12XSA00	12-Port 10GBASE-X Interface Card(SA,SFP+)
LE0DX40SFC00	40-Port 10GBASE-X Interface Card(FC,SFP+)
POE Interface Card	
LE0DG48VEA00	48-Port 10/100/1000BASE-T POE Interface Card(EA,RJ45,POE)
EPON Interface Card	
LE0D0E12GA00	12-Port 1000BASE-PX EPON Interface and 12-Port 100/1000BASE-X Interface Card (SFP)
Service Processing Unit	
LE0D0VAMPA00	Value-added Service Unit**
Optical Transceiver	
FE-SFP Optical Transceiver	
SFP-FE-SX-MM1310	Optical Transceiver,SFP,100M/155M,Multi-mode Module(1310nm,2km,LC)
eSFP-FE-LX-SM1310	Optical Transceiver,eSFP,100M/155M,Single-mode Module(1310nm,15km,LC)
S-SFP-FE-LH40-SM1310	Optical Transceiver,eSFP,FE,Single-mode Module(1310nm,40km,LC)
S-SFP-FE-LH80-SM1550	Optical Transceiver,eSFP,FE,Single-mode Module(1550nm,80km,LC)
GE-SFP Optical Transceiver	
SFP-1000BaseT	Electrical Transceiver,SFP,GE,Electrical Interface Module(100m,RJ45)
eSFP-GE-SX-MM850	Optical Transceiver,eSFP,GE,Multi-mode Module(850nm,0.5km,LC)
SFP-GE-LX-SM1310	Optical Transceiver,eSFP,GE,Single-mode Module(1310nm,10km,LC)
S-SFP-GE-LH40-SM1310	Optical Transceiver,eSFP,GE,Single-mode Module(1310nm,40km,LC)
S-SFP-GE-LH40-SM1550	Optical Transceiver,eSFP,GE,Single-mode Module(1550nm,40km,LC)
S-SFP-GE-LH80-SM1550	Optical Transceiver,eSFP,GE,Single-mode Module(1550nm,80km,LC)
eSFP-GE-ZX100-SM1550	Optical Transceiver,eSFP,GE,Single-mode Module(1550nm,100km,LC)
10GE-XFP Optical Transceiver	
XFP-SX-MM850	Optical Transceiver,XFP,10G,Multi-mode Module(850nm,0.3km,LC)
XFP-STM64-LX-SM1310	Optical Transceiver,XFP,10G,Single-mode Module(1310nm,10km,LC)
XFP-STM64-LH40-SM1550	Optical Transceiver,XFP,10G,Single-mode Module(1550nm,40km,LC)
XFP-STM64-SM1550-80km	Optical Transceiver,XFP,10G Single-mode Module(1550nm,80km,LC)
10GE-SFP+ Optical Transceiver	
OMXD30000	Optical Transceiver,SFP+,10G,Multi-mode Module(850nm,0.3km,LC)
OSX010000	Optical Transceiver,SFP+,10G,Single-mode Module(1310nm,10km,LC)
OSX040N01	Optical Transceiver,SFP+,10G,Single-mode Module(1550nm,40km,LC)
OSXD22N00	Optical Transceiver,SFP+,10G,Single-mode Module(1310nm,0.22km,LC,LRM)

BIDI-SFP Optical Transceiver	
SFP-FE-LX-SM1310-BIDI	Optical Transceiver,eSFP,FE,BIDI Single-mode Module(TX1310/RX1550,15km,LC)
SFP-FE-LX-SM1550-BIDI	Optical Transceiver,eSFP,FE,BIDI Single-mode Module(TX1550/RX1310,15km,LC)
SFP-GE-LX-SM1310-BIDI	Optical Transceiver,eSFP,GE,BIDI Single-mode Module(TX1310/RX1490,10km,LC)
SFP-GE-LX-SM1490-BIDI	Optical Transceiver,eSFP,GE,BIDI Single-mode Module(TX1490/RX1310,10km,LC)
EPON Optical Transceiver	
OSG020B00	Optical Transceiver,SFP,GE,BIDI Single-mode EPON Module(TX1490/RX1310,20km,SC)
Power	
LE0MPSD16	DC Power Module
LE0MPSA08	800W AC Power Module
W0PSA2200	2200W AC Power Module
LE0MDCPDBX00	Front-access-maintained Cabinet Power Distribution Box
LE0MACPJBX00	INtess ICD,IN6W18L10A,Intelligent Value Added Special Service Power Junction Box,8-Channel Output,Each With Rated Current Of 10A
Cable & Converter	
LE0CQP10QP00	QSFP High Speed Cable,10m
Software	
LE0SMS129300	Quidway S9300 Basic SW,V100R002
LE0SMS139300	Quidway S9300 Basic SW,V100R003
LS0SMS169300	Quidway S9300 Basic SW,V100R006
LE0STO129300	Quidway S9300 SW Upgrade,V100R001 to V100R002
LE0STO139300	Quidway S9300 SW Upgrade,V100R002 to V100R003
LS0STO169300	Quidway S9300 SW Upgrade,V100R003 to V100R006
LE0SMPLS9300	MPLS Function License
LE0SNQAF9300	NQA Function License
LE0SIPV69300	IPV6 Function License
LE0SWLAN9300	WLAN Access Controller AP Resource License-128AP
Document	
LE0I000DOC00	Quidway S9300 Terabit Routing Switch Product Documentation
Installation Material	
E000FMT00	Subassembly for Fiber Winding Box

*: has 200 ms caching capability.
**: supports firewall, IPSec, wireless AC, load balancing, and NetStream.

For more information, visit www.huawei.com or contact the local sales office of Huawei.

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