

S9300 Series Terabit Routing Switches





S9300 Series Terabit Routing Switches

Product Overview

The S9300 series switches (S9300 for short) are next-generation high-end terabit routing switches, developed by Huawei and designed for multiservice convergence. The S9300 design is 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 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. It is widely used in WANs, MANs, campus networks, and data centers to help enterprises build application-oriented networks.

Product Appearance

The S9300 is available in three models: S9303, S9306, and S9312. The switching capacity and port density of all three models is expandable. Each model offers a modular design with interchangeable components and modules, ensuring device extensibility and allowing enterprises to maximize their return on investment (ROI). In addition, the S9300 uses various innovative energy-saving technologies, sharply reducing energy consumption and noise without compromising performance and stability



S9312



S9306



S9303

Product Features

Advanced Switching Architecture to Improve Network Expansibility

- Huawei's advanced switching architecture permits rapid bandwidth expansion. The highly expandable backplane enables ports to be upgraded to a rate of 40 Gbit/s or 100 Gbit/s, and is compatible with the currently used cards, helping enterprises maximize their ROI.
- Each S9300 supports 576 10GE ports. The high density of 10GE ports brings enterprise campus networks and data centers into the era of the all-10GE core network.

Reliable Design to Ensure Consistent Service

- Huawei's highly reliable 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 the disruption of critical data and services.
- A cluster requires multiple switching processes across chassis, which reduces the switching efficiency. The S9300 implements the Cluster Switching System (CSS) function, solving this problem by switching fabrics. In this way, the 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 rate 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 the network running status, rapidly locate device faults, and accurately calculate parameters, such as the transmission delay and jitter. To accomplish these tasks, the S9300 uses its well-designed maintenance and management mechanisms and performance management functions, such as 802.3ah, 802.1ag, and ITU-Y.1731.



S9300 CSS

Enhanced QoS Mechanism

- The S9300's QoS control mechanisms perform traffic classification based on information from Layers 2 through 7. 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 to satisfy service requirements of access users at different levels.

Full-Service Ethernet Switching Platform

- The S9300 supports distributed Layer 2 and Layer 3 MPLS VPN functions, including 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 minimal 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 by switching fabrics. Inter-chassis link aggregation can be implemented to improve the 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 for large distributed data centers. Each port of such a line card provides 200ms caching of data flows. This prevents packet loss caused by sudden bursts of traffic on the distributed computing network.
- The S9300 supports refined QoS and traffic management. It uses various queue scheduling algorithms and congestion control algorithms to control data traffic accurately and hierarchically. In this manner, the S9300 can assign different priorities and queues to different user flows and services according to their QoS requirements, providing them with different bandwidth, delay, and jitter.

High-Performance IPv6 Service Support

- Both the hardware platform and software platform of the S9300 support IPv6. The S9300 has earned the IPv6 Ready Phase 2 (Gold) designation.
- The S9300 supports IPv4/IPv6 dual stack, various tunneling technologies, IPv6 static routes, RIPng, OSPFv3, BGP4+, 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 the 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, along with an aggregation traffic template, real-time traffic collection, dynamic report generation, traffic attribute analysis, and traffic exception report.

Excellent Security Design

- The S9300 comes equipped with an integrated firewall card. It 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 preset 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 wireless AC card supports radio frequency management. The S9300 allows APs to automatically select their radio channels and power. 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 can then 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 when 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 and extending the service life of each fan, 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	3 Tbps	6 Tbps	12 Tbps
Switching capacity	768 G/1.92 T	2 T/5.12 T	2 T/5.12 T
Throughput	576 Mpps/1440 Mpps	1152 Mpps/ 2880Mpps	1344 Mpps/3360 Mpps
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(IEEE 802.1d), RSTP(IEEE 802.1w), and MSTP(IEEE 802.1s).		
	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 BGP4+.		
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.		

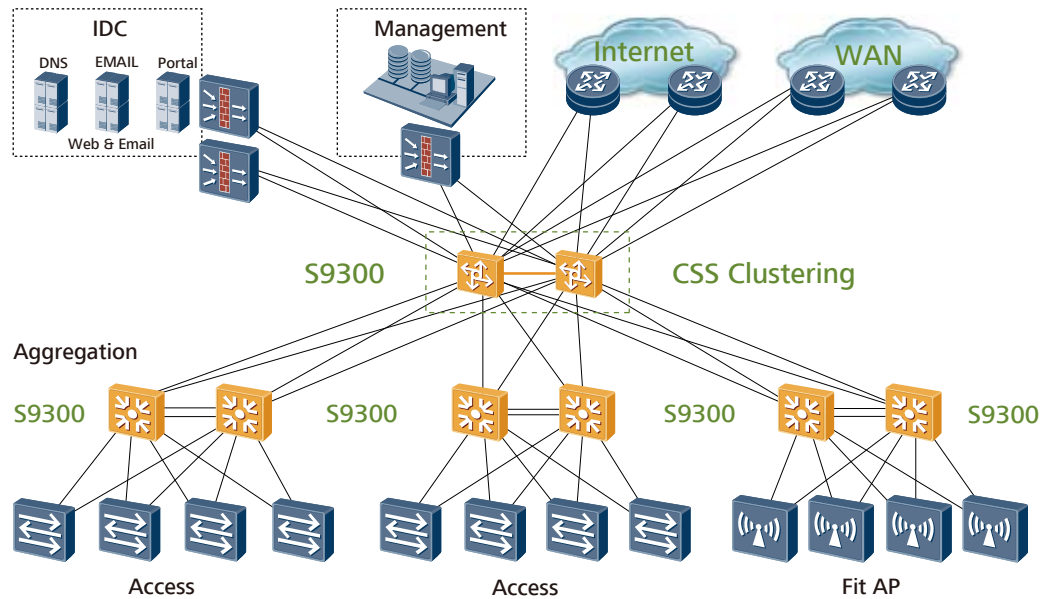
Item	S9303	S9306	S9312
MPLS	Supports basic MPLS functions.		
	Supports MPLS OAM.		
	Supports MPLS TE.		
	Supports MPLS VPN/VLL/VPLS.		
Reliability	Supports LACP and Enhanced-Trunk.		
	Supports VRRP and BFD for VRRP.		
	Supports BFD for BGP, IS-IS, OSPF, and Static routing.		
	Supports NSF and GR for 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.		
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 congestion avoidance mechanisms, such as WRED and tail drop.		
	Supports H-QoS.		
	Supports traffic shaping.		
Configuration and maintenance	Supports Console, Telnet, and SSH terminals.		
	Supports network management protocols, such as SNMPv1/v2/v3.		
	Supports file uploading and downloading through FTP and TFTP.		
	Supports BootROM upgrades and remote upgrades.		
	Supports hot patches.		
	Supports user operation logs.		

Item	S9303	S9306	S9312
Security and management	Supports 802.1x authentication and portal authentication.		
	Supports NAC.		
	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 tracer 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

Applications

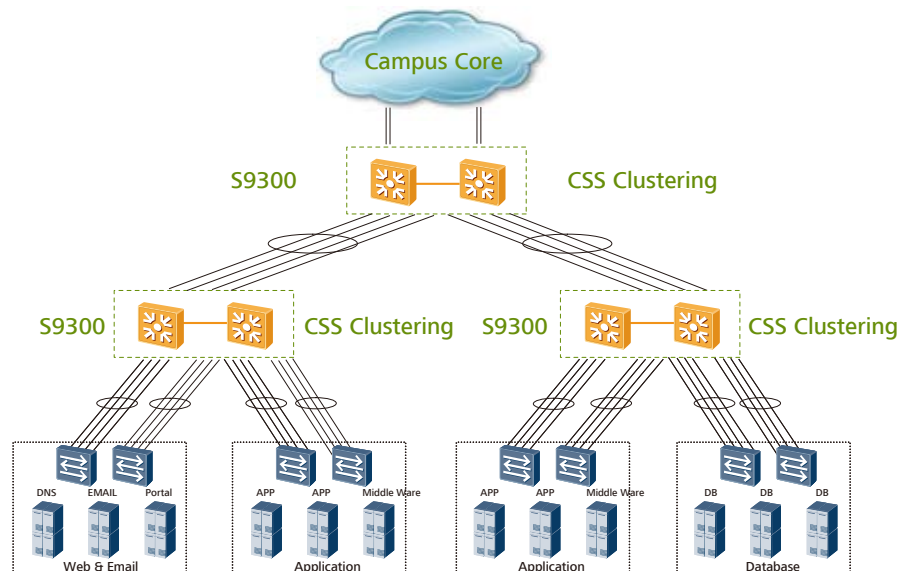
1 Large-Scale Campus Networks

The S9300 can be used to build highly reliable, expandable, 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 on network investments. The S9300 also supports hardware CPU queues to protect the enterprise core against DDoS attacks and security threats.



2 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, 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 network efficiency and reduces network maintenance costs.



Product List

The S9300 is a 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), along with 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, install two SRUs. At least one power module must be installed; to improve device reliability, install two or four power modules for 1+1 or 2+2 redundancy backup, depending on the power of the device. DC power modules and AC power modules cannot be installed on the same S9300. Software licenses, service cards, value-added service cards, daughter cards, and other cards can be customized to satisfy different service requirements. Use the following order information table to customize the S9300. Transceivers and optical fibers can also be selected.

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

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	S9303 Main Control Unit A
LE0DMCUA	S9303 Main Control Unit A, Clock
LE0MSRUA	S9306/S9312 Main Control Unit A
LE0DSRUA	S9306/S9312 Main Control Unit A, Clock
LE0D00SRUB00	S9306/S9312 Main Control Unit B, Clock
SRU Service Card	
LE0MFSUA	Enhanced Flexible Service Unit
LE0DOVSTSA00	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)
LE0DG24CEAS0	24-Port 100/1000BASE-X and 8-Port 10/100/1000BASE-T Combo Interface Card (EA, SFP/RJ45, 1588)
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+)
LE0DX16SFC00	16-Port 10GBASE-X Interface Card(FC, 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)
Service Processing Unit	
LE0DOVAMPA00	Value-added Service Unit**
Optical Transceiver	
FE-SFP Optical Transceiver	
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)
Power	
LE0MPSD16	DC Power Module
LE0MPSA08	800W AC Power Module
W0PSA2200	2200W AC Power Module
LE0MDCPDBX00	Front-access-maintained Cabinet Power Distribution Box
LE0MACPJBX00	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	S9300 Basic SW, V100R002
LE0SMS139300	S9300 Basic SW, V100R003
LS0SMS169300	S9300 Basic SW, V100R006
LE0SMS219300	S9300 Basic SW, V200R001

LE0STO129300	S9300 SW Upgrade, V100R001 to V100R002
LE0STO139300	S9300 SW Upgrade, V100R002 to V100R003
LS0STO169300	S9300 SW Upgrade, V100R003 to V100R006
LE0SMPLS9300	MPLS Function License
LE0SNQAF9300	NQA Function License
LE0SIPV69300	IPv6 Function License
LE1SWLAN64AP	WLAN Access Controller AP Resource License-64AP
LE0SWLAN9300	WLAN Access Controller AP Resource License-128AP
Document	
LE0I000DOC00	S9300 Terabit Routing Switch Product Documentation
Installation Material	
E000FMT00	Subassembly for Fiber Winding Box

*: offers 200 ms caching capability.



** : supports firewall/NAT , IPSec, wireless AC, load balancing, and NetStream.

For more information, visit <http://enterprise.huawei.com> or contact the Huawei local sales office.

Copyright © Huawei Technologies Co., Ltd. 2012. All rights reserved.

No part of this document may be reproduced or transmitted in any form or by any means without prior written consent of Huawei Technologies Co., Ltd.

Trademark Notice

 , HUAWEI, and  are trademarks or registered trademarks of Huawei Technologies Co., Ltd. Other trademarks, product, service and company names mentioned are the property of their respective owners.

General Disclaimer

The information in this document may contain predictive statements including, without limitation, statements regarding the future financial and operating results, future product portfolio, new technology, etc. There are a number of factors that could cause actual results and developments to differ materially from those expressed or implied in the predictive statements. Therefore, such information is provided for reference purpose only and constitutes neither an offer nor an acceptance. Huawei may change the information at any time without notice.

HUAWEI TECHNOLOGIES CO.,LTD.
Huawei Industrial Base
Bantian Longgang
Shenzhen 518129,P.R.China
Tel: +86 755 28780808

www.huawei.com