

RG-S6510 Series

Next-Generation Data Center and Cloud Computing Switch

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Product Overview

The RG-S6510 series switches are next-generation, high-performance, high-density 25G/100G switches launched by Ruijie Networks, designed for cloud data centers and high-end campus networks. They fully meet the design requirements of a Spine-Leaf Layer 3 network architecture.

Product Pictures



RG-S6510-48VS8CQ Isometric View



RG-S6510-32CQ Isometric View

Product Features

Setting Up a Non-Blocking Data Center Network with a Large Buffer

The whole series of switches designed for next-generation data centers and cloud computing are line-rate products. They are in line with the development trend of East-West traffic of data centers and apply to heavy-traffic next-generation data centers. They meet the Spine-Leaf network architecture design requirements.

The RG-S6510 series switches provide 48 × 25GE ports and 8 × 100GE ports or 32 × 100GE ports. All the ports can forward data at the line rate. The 100GE ports are backward compatible with 40GE ports.

To meet the requirements for non-blocking transmission of heavy-traffic data in data centers, the switch offers powerful buffer capacity and uses the advanced buffer scheduling mechanism, to maximize the buffer capacity of the switch.

Data Center Virtualization

The RG-S6510 series switches adopt the virtual switching unit (VSU) 2.0 technology to virtualize multiple physical devices into one logical device, which reduces network nodes and enhances network reliability. These physical switches can be operated and managed in a unified manner. The switch can implement fast link switching within 50 ms to 200 ms in the case of a link failure, thereby ensuring uninterrupted transmission of critical service traffic. The Multichassis Link Aggregation Group (M-LAG) feature implements dual-active uplinks for data through access servers and switches.

Data Center Overlay Networking

The RG-S6510 series switches support VXLAN to meet the data center overlay networking requirements. It resolves the challenges of limited VLAN capacity and scalability issues in conventional data center networks.

The basic network built by the RG-S6510 series switches can be divided into new subnets based on the overlay technology, without changing the physical topology or considering the restrictions on IP addresses and broadcast domains of physical networks.

Data Center Layer-2 Network Expansion

The VXLAN technology encapsulates Layer 2 packets into User Datagram Protocol (UDP) packets, which enables the establishment of a logical Layer 2 network on the Layer 3 network. The RG-S6510 series switches support the EVPN protocol to automatically discover and authenticate virtual tunnel endpoints (VTEPs), thereby reducing flooding on the VXLAN data plane and preventing VXLAN from relying on deployed underlying multicast services. This simplifies VXLAN deployment and improves the efficiency for building large Layer 2 networks, meeting the needs of large Layer 2 networks in data centers and Layer 2 interconnection requirements in dual-active data centers.

RDMA-based Lossless Ethernet

The switch implements low-latency forwarding of the lossless Ethernet based on the Remote Direct Memory Access (RDMA) and optimizes service forwarding performance. It significantly reduces the operation cost per bit of the entire network and enhances the competitive edge of products.

Hardware-based Traffic Visualization

The chip hardware enables the switch to visualize the end-to-end traffic of complex networks involving multiple paths and nodes. This enables centralized monitoring of the forwarding path and latency for each session, improving fault location efficiency by over ten times.

Carrier-Class High Reliability

The RG-S6510 series switches are equipped with built-in redundant power modules and modular fan assemblies. All power supply modules and fan modules can be hot-swapped without affecting service continuity on the switch. The switch provides fault detection and alarm functions for power modules and fan modules. It automatically adjusts the fan speed based on temperature changes, to better adapt to the environment in data centers. The switch also supports device-level and link-level reliability protection as well as overcurrent protection, overvoltage protection, and over temperature protection.

In addition, the switch integrates various link reliability mechanisms, such as Rapid Ethernet Uplink Protection Protocol (REUP), quick link switching, graceful restart (GR), and bidirectional forwarding detection (BFD). When multiple services and heavy traffic are carried over the network, these mechanisms can reduce the impact of exceptions on network services and enhance overall reliability.

IPv4/IPv6 Dual-Stack Protocols and Multilayer Switching

The hardware of the RG-S6510 series switches supports IPv4 and IPv6 protocol stacks and multilayer line-rate switching. The hardware differentiates and processes IPv4 and IPv6 packets. The switch also integrates multiple tunneling technologies such as manually configured tunnels, automatic tunnels, and Intra-Site Automatic Tunnel Addressing Protocol (ISATAP) tunnels. Users can flexibly work out IPv6 inter-network communication solutions by using this switch based on IPv6 network planning and network conditions.

The RG-S6510 series switches support various IPv4 routing protocols, including static routing, Routing Information Protocol (RIP), Open Shortest Path First (OSPF), Intermediate System to Intermediate System (IS-IS), and Border Gateway Protocol version 4 (BGP4). Users can select required routing protocols based on network environments, to flexibly build networks.

The RG-S6510 series switches also support abundant IPv6 routing protocols, including static routing, Routing Information Protocol next generation (RIPng), OSPFv3, and BGP4+. You can flexibly select an IPv6 routing protocol to upgrade the live network to an IPv6 network or establish a new IPv6 network.

Flexible & Comprehensive Security Policies

The RG-S6510 series switches can effectively defend against virus and hacker attacks through multiple built-in mechanisms, such as DoS attack defense, IP scanning attack defense, ARP packet validity check, and multiple hardware-based ACLs.

The hardware-based IPv6 ACL can easily control the access of IPv6 users at the network boundary even if there are IPv6 users on an IPv4 network. The switch supports the coexistence of IPv4 and IPv6 users and can control access permissions of IPv6 users, for example, restricting access to sensitive resources on the network.

The switch supports Telnet access control based on source IP addresses, which prevents unauthorized users and hackers from attacking and controlling the switch, thus enhancing network management security. Through the Secure Shell (SSH) and Simple Network Management Protocol version 3 (SNMPv3), the switch can encrypt management information in Telnet and SNMP processes. This ensures information security of management devices and prevents hackers from attacking and controlling the devices.

The switch denies unauthorized network access and enables authorized network access by employing multi-tuple binding, port security, time range-based ACL, and traffic-based rate limiting. The switch can strictly control user access to enterprise networks and campus networks and deny communication requirements of unauthorized users.

All-Round Management Performance

The switch supports various management ports, such as the console port, management port, and USB port, and supports the SNMP traffic analysis report to help users promptly optimize the network architecture and schedule resources.

Technical Specifications

Hardware Specifications

Item	RG-S6510-48VS8CQ	RG-S6510-32CQ
Dimensions (W x D x H)	442 mm x 387 mm x 44 mm (17.40 in. x 15.24 in. x 1.73 in.)	442 mm x 560 mm x 44 mm (17.40 in. x 22.05 in. x 1.73 in.)
Rack height	1 RU	1 RU
Unit weight	5.6 kg (12.35 lbs., empty chassis) 8.2 kg (18.08 lbs., a chassis with two power modules and four fan modules)	8.4 kg (18.52 lbs., empty chassis) 11.4 kg (25.13 lbs., a chassis with two power modules and five fan modules)
Switching capacity	4.0 Tbps	6.4 Tbps
Packet forwarding rate	2000 Mpps	2030 Mpps
Service port	48 x 10G/25G SFP28 ports 8 x 40G/100G QSFP28 ports	32 x 100G QSFP28 ports
Management port	1 x RJ45 console port 1 x RJ45 MGMT port	1 x RJ45 console port 1 x RJ45 MGMT port
USB port	1 x USB 2.0 port (Type A connector)	1 x USB 2.0 port (Type A connector)
Module slot	2 x power module slots 4 x fan module slots	2 x power module slots 5 x fan module slots
Power consumption	Maximum power consumption: 300 W Typical power consumption: 172 W Static power consumption: 98 W	Maximum power consumption: 450 W Typical power consumption: 270 W Static power consumption: 150 W
Power input	RG-PA550I-F (AC input): Rated input voltage: 100V AC to 240V AC, 50 Hz/60Hz Maximum input voltage: 90 V AC to140 V AC, 180 V to 264 V AC, 47 Hz to 63 Hz Rated input current: 7.2 A to3.5 A(100 V AC to 240 V AC) Power port type: C14 RG-PA550I-F (HVDC input): Rated input voltage: 240 V DC Maximum input voltage: 180 V DC to 310 V DC Rated current: 3.6 A Power port type: C14 RG-PA550I-R (AC input): Rated input voltage: 100 V AC to 240 V AC, 50 Hz/60 Hz Maximum input voltage: 90 V AC to140 V AC, 180 V AC to 264 V AC, 47 Hz to 63 Hz Rated input current: 7.2 A to 3.5 A(100 V AC to 240 V AC) Power port type: C14	RG-PA550I-F (AC input): Rated input voltage: 100 V AC to 240 V AC, 50 Hz/60 Hz Maximum input voltage: 90 V AC to 140 V AC, 180 V AC to 264 V AC, 47 Hz to 63 Hz Rated input current: 7.2 A to 3.5 A (100 V AC to 240 V AC) Power port type: C14 RG-PA550I-F (HVDC input): Rated input voltage: 240 V DC Maximum input voltage: 180 V DC to 310 V DC Rated current: 3.6 A Power port type: C14 RG-PD800I-F (DC input): Rated input voltage: –48 V DC Maximum input voltage: –36 V DC to –72 V DC Rated input current: 23 A Power port: three-pin power connector

Item	RG-S6510-48VS8CQ	RG-S6510-32CQ
Power input	RG-PA550I-R (HVDC input): Rated input voltage: 240 V DC Maximum input voltage: 180 V DC to 310 V DC Rated current: 3.6 A Power port type: C14 RG-PHD550I-F (AC input): Rated input voltage: 100 V AC to240 V AC, 50 Hz/60 Hz Maximum input voltage: 90 V AC to 264 V AC, 47 Hz to 63 Hz Rated input current: 10 A Power port type: C14 RG-PHD550I-F (HVDC input): Rated input voltage: 336 V DC Maximum input voltage: 160 V DC to 400 V DC Rated input current: 10 A Power port type: C14 RG-PD800I-F (DC input): Rated input voltage: –48 V DC Maximum input voltage: –36 V DC to –72 V DC Rated input current: 23 A Power port: three-pin power connector	
Temperature	Operating temperature: 0°C to 45°C (32°F to 113°F) Storage temperature: –40°C to +70°C (–40°F to +158°F) Note: At altitudes ranging from 1800 m (5905.51 ft.) to 5000 m (16,404.20 ft.), the maximum temperature decreases by 1°C (1.8°F) for every 200 m (656.17 ft.) increase in elevation.	Operating temperature: 0°C to 40°C (32°F to 104°F) Storage temperature: –40°C to +70°C (–40°F to +158°F) Note: At altitudes ranging from 3000 m (9842.52 ft.) to 5000 m (16,404.20 ft.), the maximum temperature decreases by 1°C (1.8°F) for every 200 m (656.17 ft.) increase in elevation.
Humidity	Operating humidity: 10% RH to 90% RH (non-condensing) Storage humidity: 5% RH to 95% RH (non-condensing)	Operating humidity: 10% RH to 90% RH (non-condensing) Storage humidity: 5% RH to 95% RH (non-condensing)
Altitude	Operating altitude: ≤ 5,000 m (16,404.20 ft.) Storage altitude: ≤ 5000 m (16,404.20 ft.)	Operating altitude: ≤ 5,000 m (16,404.20 ft.) Storage altitude: ≤ 5000 m (16,404.20 ft.)
Cooling	Air cooling, front-to-rear airflow (port-side intake): used with the RG-PA550I-F, RG-PD800I-F, and RG-PHD550I-F power modules Air cooling, rear-to-front airflow (port-side exhaust): used with the RG-PA550I-R power module	Air cooling, front-to-rear airflow (port-side intake)

Software Specifications

Item	RG-S6510-48VS8CQ	RG-S6510-32CQ
Layer 2 Protocols	IEEE802.3ad (Link Aggregation Control Protocol), IEEE802.1p, IEEE802.1Q, IEEE802.1D (STP), IEEE802.1w (RSTP), IEEE802.1s (MSTP), IGMP Snooping, MLD Snooping, Jumbo Frame (9 KB), IEEE802.1ad (QinQ and Selective QinQ), GVRP	
Layer 3 Protocols (IPv4)	BGP4, OSPFv2, RIPv1, RIPv2, MBGP, LPM Routing, Policy-based Routing (PBR), Route-policy, Equal-Cost Multi-Path Routing (ECMP), WCMP, VRRP, IGMP v1/v2/v3, DVMRP, PIM-SSM/SM/DM, MSDP, Any-RP	
IPv6 Basic Protocols	Neighbor Discovery, ICMPv6, Path MTU Discovery, DNSv6, DHCPv6, ICMPv6, ICMPv6 redirection, ACLv6, TCP/UDP for IPv6, SNMP v6, Ping/Traceroute v6, IPv6 RADIUS, Telnet/SSH v6, FTP/TFTP v6, NTP v6, IPv6 MIB support for SNMP, VRRP for IPv6, IPv6 QoS	
IPv6 Features	Static routing, ECMP, PBR, OSPFv3, RIPng, BGP4+, MLDv1/v2, PIM-SMv6, manual tunnel, automatic tunnel, IPv4 over IPv6 tunnel, and ISATAP tunnel	
Data Center Features	VXLAN routing and VXLAN bridging IPv6 VXLAN over IPv4 and EVPN VXLAN PFC, ECN, and RDMA M-LAG OpenFlow 1.3	
Visualization	gRPC sFLOW sampling INT	
QoS	Mapping of IEEE 802.1p, DSCP, and ToS priorities ACL-based traffic classification Priority marking/remarking Multiple queue scheduling mechanisms, including SP, WRR, DRR, SP+WRR, and SP+DRR Congestion avoidance mechanisms such as WRED and tail discarding	
Virtualization	Virtual Switching Unit	
Buffer Management	Buffer status monitoring and management, and identification of burst traffic	
HA Design	GR for RIP/OSPF/BGP, BFD, DLDP, REUP dual-link fast switching, RLDP unidirectional link detection, 1+1 power redundancy and fan redundancy, and hot swapping for all cards and power supply modules	
Security Features	Network Foundation Protection Policy (NFPP), CPP, DDoS attack defense, illegitimate data packet detection, data encryption, source IP spoofing prevention, IP scanning prevention, RADIUS/TACACS, IPv4/v6 packet filtering by basic ACL, extended ACL or VLAN-based ACL, plaintext-based and MD5 ciphertext-based authentication for OSPF, RIPv2, and BGPv4 packets, telnet login and password mechanisms for restricted IP addresses, uRPF, broadcast packet suppression, DHCP Snooping, ARP spoofing prevention, ARP check, and hierarchical user management	
Management Mode	SNMP v1/v2c/v3, Netconf, telnet, console, MGMT, RMON, SSHv1/v2, FTP/TFTP, NTP clock, Syslog, SPAN/RSPAN/ERSPAN, Telemetry, ZTP, Python, fan and power alarm, and temperature alarm	
Other Protocols	DHCP Client, DHCP Relay, DHCP Server, DNS Client, UDP relay, ARP Proxy, and Syslog	

Ordering Guide

The configuration procedure for the RG-S6510 series switches is as follows:

- Select the switch based on the port types and quantity required by the service.
- Select the fan and power supply modules based on the switch model.
- Select optical transceivers based on port requirements.

Ordering Information

Chassis

Product Model	Description
RG-S6510-48VS8CQ	48 × 25GE ports and 8 × 100GE ports. Two power supply module slots and four fan module slots. The power module model is RG-PA550I-F, and the fan model is M6510-FAN-F.
RG-S6510-32CQ	Provides 32 × 100G ports. Two power supply module slots and five fan module slots. The power module model is RG-PA550I-F, and the fan model is M1HFAN I-F.

Fan and Power Supply Modules

Product Model	Description
RG-PA550I-F	550 W power supply module (AC and 240 V HVDC)
RG-PA550I-R	550 W power supply module (port-side exhaust, supporting AC and 240 V HVDC), applicable only to RG-S6510-48VS8CQ
RG-PHD550I-F	550 W power supply module (336 V HVDC), applicable only to RG-S6510-48VS8CQ
RG-PD800I-F	800 W AC power module (48 V LVDC)
M6510-FAN-F	Fan module of RG-S6510-48VS8CQ, supporting 3+1 redundancy, hot swapping, and front-to-rear ventilation design.
M1HFAN I-F	Fan module of RG-S6510-32CQ, supporting 4+1 redundancy, hot swapping, and front-to-rear ventilation design.

25GE Optical Transceivers

Product Model	Description
VG-SFP-AOC5M	25G AOC, SFP28 form factor, 5 m (16.40 ft.)
VG-SFP-LR-SM1310	25G LR optical transceiver, SFP28 form factor, LC, 1310 nm, 10 km (32,808.40 ft.) over single-mode fiber (SMF)
VG-SFP-SR-MM850	25G SR optical transceiver, SFP28 form factor, LC, 850 nm, 100 m (328.08 ft.) over multimode fiber (MMF)

40G Optical Transceivers

Product Model	Description
40G-QSFP-SR-MM850	40G SR optical transceiver, QSFP+ form factor, MPO, 150 m (492.13 ft.) over MMF
40G-QSFP-LR4-SM1310	40G LR4 optical transceiver, QSFP+, Duplex LC, 10 km (32,808.40 ft.) over SMF
40G-QSFP-LSR-MM850	40G SR optical transceiver, QSFP+ form factor, MPO, 400 m (1312.34 ft.) over MMF

Product Model	Description
40G-QSFP-iLR4-SM1310	40G iLR4 optical transceiver, QSFP+, Duplex LC, 2 km (6,561.68 ft.) over SMF
40G-QSFP-LX4-SM1310	40G LX4 optical transceiver, QSFP+, Duplex LC, 150 m (492.13 ft.) over OM3/OM4 MMF, 2 km (6,561.68 ft.) over SMF
40G-AOC-30M	40G QSFP+ AOC, 30 m (98.43 ft.)
40G-AOC-5M	40G QSFP+ AOC, 5 m (16.40 ft.)

100G Optical Transceivers

Product Model	Description
100G-QSFP-SR-MM850	100G SR optical transceiver, QSFP28 form factor, MPO, 850 nm, 100 m (328.08 ft.) over MMF
100G-QSFP-LR4-SM1310	100G LR4 optical transceiver, QSFP28 form factor, Duplex LC, 1310 nm, 10 km (32,808.40 ft.) over SMF
100G-QSFP-iLR4-SM1310	100G iLR4 optical transceiver, QSFP28 form factor, Duplex LC, 1310 nm, 2 km (6,561.68 ft.) over SMF
100G-QSFP-ER4-SM1310	100GE ER4 optical transceiver, QSFP28 form factor, Duplex LC, 1310 nm, 40 km (131,233.60 ft.) over SMF
100G-AOC-10M	100G AOC, QSFP28 form factor, 10 m (32.81 ft.)
100G-AOC-5M	100G AOC, QSFP28 form factor, 5 m (16.40 ft.)

For more information about optical transceiver compatibility, refer to *Ruijie RG-S6510 Series Data Center Switches Optical Transceiver Compatibility Matrix.*

Warranty

For more information about warranty terms and period, contact your local sales agency:

- Warranty terms: https://www.ruijie.com/support/servicepolicy
- Warranty period: https://www.ruijie.com/support/servicepolicy/Service-Support-Summany/

Note: The warranty terms are subject to the terms of different countries and distributors.

More Information

For more information about Ruijie Networks, visit the official Ruijie website or contact your local sales agency:

- Ruijie Networks official website: https://www.ruijie.com/
- Online support: https://www.ruijie.com/support
- Hotline support: https://www.ruijie.com/support/hotline
- Email support: service_rj@ruijie.com

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