RG-CS86 Series

Multi-GE Switches

INNOVATION
Beyond Networks

Ruijie

01 Product Overview

RG-CS86 series switches are next-generation multi-GE switches developed by Ruijie. With an advanced hardware architecture and Ruijie modular operating system, the RG-CS86 delivers fast hardware processing and good operation experience.

The RG-CS86 offers flexible multi-GE access (1GE/2.5GE/5GE/10GE) and high-performance 10GE/40GE uplink ports, catering for demands of high-density access and high-performance aggregation.

The RG-CS86 delivers robust performance, sound end-to-end service quality, and rich security functions for the aggregation layer of large-scale networks, the core layer of small- and medium-scale networks, and campus data centers. This satisfies requirements on high speed, security, and intelligence for enterprise campus networks.

02 Product Appearance

RG-CS86-24MG4VS-UP

RG-CS86-12XMG4VS-UP

RG-CS86-24XMG4XS4VS-UPD

RG-CS86-48MG4VS2QXS-UPD

03
Product Features

Multi-GE Access

Recent years have witnessed the rapid evolution of the Ethernet interface standards from 10BASE-T and 100BASE-T to 1000BASE-T (IEEE 802.3ab) that is widely applied to devices covering PCs and APs. However, as the Wi-Fi 6 technology has been introduced, APs can delivers an uplink rate of 10 Gbps, posing an increasing challenge to GE network devices. The RG-CS86 provides 100M/1000M/2.5G/5GBASE-T and 100M/1000M/2.5G/5G/10GBASE-T Ethernet ports in auto-negotiation mode which can better adapt to Wi-Fi 6 APs.

High-Power PoE Power Supply

In the previous scenarios of PoE remote power supply, only PoE (IEEE 802.3af) and PoE+ (IEEE 802.3at) standards are available. If the power exceeds 30 W, PoE cannot be used for power supply. Instead, power cables must be deployed for mains power supply, and even EHV power deployment is required. This imposes tremendous challenges on deployment costs and period, maintenance, and security during the deployment. In compliance with the IEEE802.3bt standard, the RG-CS86 adopts high-power PoE power supply and achieves a maximum PoE output of 90 W through a single Ethernet port to significantly improve user experience.

IPv4/IPv6 Dual-Stack Multi-Layer Switching

The hardware of the RG-CS86 supports IPv4/IPv6 dual stacks and multilayer line-rate switching to differentiate and process IPv4 and IPv6 packets. The RG-CS86 also provides flexible IPv6 network communication solutions for users to perform network planning or maintain network status quo based on various IPv6 network demands. The RG-CS86 supports a wide range of IPv4 routing protocols, covering IPv4 static routing, RIP, OSPFv2, IS-ISv4, and BGP4. You can select appropriate routing protocols to flexibly build networks based on various network environments. Meanwhile, the RG-CS86 also supports abundant IPv6 routing protocols, including IPv6 static routing, RIPng, OSPFv3, IS-ISv6, and BGP4+. A routing protocol can be selected flexibly to upgrade the live network to an IPv6 network or establish a new IPv6 network.

Virtual Switching Unit

The RG-CS86 supports Virtual Switch Unit (VSU). VSU enables multiple physical devices to be connected through aggregate links and virtualized into one logical device. The devices use the same IP address, Telnet process, and CLI for management, and support automatic version check and automatic configuration. In this context, a network administrator only manages one logical device, improving working efficiency and experience.

Simplified management: The network administrator can manage multiple switches uniformly without connecting to each switch for separate configuration and management.

Simplified network topology: A VSU serves as a switch on a network and connects to peripheral devices through aggregate links. Therefore, no Layer 2 loop occurs and MSTP configuration is not required. Various control protocols can run on the VSU.

Fault recovery within milliseconds: A VSU connects to peripheral devices through aggregate links. If a fault occurs on one device or member link in the VSU, data and services can be switched to another member link within 30 ms.

High scalability: Devices can be added to or removed from a virtualized network, without affecting normal operation of other devices.

Sound Security Protection Policies

The RG-CS86 can effectively defend against virus spread and hacker attacks through multiple inherent mechanisms, such as DoS attack defense, IP scanning attack defense, validity check of ARP packets, and multiple hardware-based ACLs.

The hardware-based IPv6 ACL can easily control the access of IPv6 users at the network edge even if there are IPv6 users on an IPv4 network. The switch allows IPv4 and IPv6 users to coexist and can control

access permissions of IPv6 users, for example, restricting access to sensitive resources on the network.

The RG-CS86 provides a unique hardware CPU protection mechanism: CPU Protection Policy (CPP). The CPP enables the switch to classify data traffic sent to the CPU, process the traffic by queue priority, and apply the rate limit to traffic as required. The CPP fully protects the CPU from being occupied by unauthorized traffic, malicious attacks, and resource consumption, which ensures the security of the CPU and the switch.

The RG-CS86 and its ports can be flexibly bound to a user's IP address and MAC address, which strictly restricts the access of users connected to the ports or the switch.

DHCP snooping enables the RG-CS86 to receive DHCP Response messages only from trusted ports and prevent spoofing from unauthorized DHCP servers. With DHCP snooping, the switch dynamically monitors ARP packets, checks users' IP addresses, and discards unauthorized packets that do not match binding entries. This effectively prevents ARP spoofing and source IP address spoofing.

The switch also supports the device access control through source IP-based Telnet, which can prevent unauthorized users and hackers from maliciously attacking and controlling the switch, and enhance the network management security of the switch.

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 rejects unauthorized network access and enables authorized network access by employing multi-element binding, port security, time-based ACL, and data stream-based rate limiting. The RG-CS86 can strictly control user access to enterprise networks and campus networks and restrict the communication of unauthorized users.

The RG-CS86 supports the Network Foundation Protection Policy (NFPP) to enhance its security. By isolating attack sources, the policy can protect the processor and channel bandwidth resources of the switch. This ensures normal packet forwarding and protocol status.

High Reliability

The RG-CS86 supports built-in redundant power modules and fan modules. The power and fan modules are hot swappable without affecting the normal operation of the switch. The switch also provides fault detection and alarms for power and fan modules. The fan speed can be automatically adjusted based on temperature changes to better adapt to various environments. The RG-CS86 adopts the front-to-rear airflow to enhance the cooling efficiency. By using overcurrent, overvoltage, and overheating protection technologies, the RG-CS86 achieves device-level and link-level reliability protection.

The RG-CS86 supports Spanning Tree Protocols (IEEE 802.1D, IEEE 802.1w, and IEEE 802.1s) to achieve fast convergence, improve the fault tolerance capability, and ensure stable network operation and link load balancing. The RG-CS86 effectively utilizes network channels to improve the usage of aggregate links.

The Virtual Router Redundancy Protocol (VRRP) effectively facilitates network stability for the switch.

With the Rapid Link Detection Protocol (RLDP), the RG-CS86 can quickly detect the link connectivity and unidirectional optical fiber links. Through port loop detection, the switch can prevent network failures caused by the loops that occurs in the scenario where an unauthorized port is connected to hubs.

When STP is disabled, the Rapid Ethernet Uplink Protection Protocol (REUP) can still provide basic link redundancy and millisecond-level fault recovery faster than STP.

The RG-CS86 supports Bidirectional Forwarding Detection (BFD) for upper-level protocols (such as routing protocols), rapidly detecting connectivity of the forwarding path between two routing devices. BFD greatly shortens the convergence time for the upper-level protocols upon link status changes.

Powerful Multi-Service Capability

The RG-CS86 supports the IPv4 and IPv6 multicast functions as well as multiple multicast protocols, including IGMP snooping, IGMP, Multicast Listener Discovery (MLD), Protocol Independent Multicast (PIM), PIM for IPv6, and Multicast Source Discovery

Protocol (MSDP). The switches provide multicast service support for IPv4 networks, IPv6 networks, and IPv4 and IPv6 coexistent networks.

The IGMP source port and source IP address check function supported by the RG-CS86 can effectively eliminate unauthorized multicast sources and enhance the network security.

Sound QoS Policies

The RG-CS86 is capable of classifying and controlling various flows including MAC flows, IP flows, and application flows, to implement fine-grained bandwidth control, forwarding priority, and other flow policies. Furthermore, the switch can provide services based on applications and QoS levels required by different applications.

The Differentiated Services (DiffServ) model supports IEEE 802.1p priorities, IP ToS values, traffic filtering based on Layer 2 to Layer 7 information, Strict Priority (SP), Weighted Round Robin (WRR), and other QoS policies.

Energy-Saving Design

The RG-CS86 adopts the next-generation hardware architecture, and advanced energy-efficient circuit design and components, to reduce energy consumption and noise. RG-CS86 series switches are equipped with variable-speed axial fan modules to intelligently control the fan speed based on the ambient temperature, which reduces the power consumption and noise while ensuring stable operation of the switch.

In the networking where PoE power supply is adopted, the RG-CS86 provides automatic and energy-saving modes.

Flexible Device Management Modes

Ruijie Cloud Make Your Business Easy

The RG-CS86 series switches support Ruijie cloud APP to management, can bring customers simplified O&M management and user experience:

Ease of networking: Only a mobile phone available for Internet access is required to complete the device deployment. The switches support plug and play.

Ease of O&M: The O&M is simple. The network can be managed at any time, and You can manage the network wherever you go. VLAN visualized on Ruijie Cloud, lower technical barriers from configuration to management.

Ease of monitoring: You can view the network health and device details (system status, traffic trend, connectivity, power supply status, etc.) at any time. Faults and user network experience are visible, alarms are pushed in time once they are generated, and logs are generated to facilitate event traceback.

The RG-CS86 series switches also support the Simple Network Management Protocol (SNMP), Remote Network Monitoring (RMON), Syslog, Sampled Flow (sFlow), log and configuration backup using USB flash drives for routine network diagnosis and maintenance. Administrators can also use CLI, web-based management, telnet, CPE WAN Management Protocol (CWMP(TR069) based zero configuration and other methods to manage and maintain devices conveniently.

04
Specifications

Hardware Specifications

Port Specifications

Port Specifications	RG-CS86-24MG4VS-UP	RG-CS86-12XMG4VS-UP	RG-CS86-24XMG4XS4VS-UPD	RG-CS86-48MG4VS2QXS-UPD
Fixed service port	24 x 100/1000/2.5G/5GBASE-T ports, supporting PoE/PoE+/PoE++ 4 x 10GE/25GE SFP28 ports	12 x 100/1000/2.5G/5G/10GBASE-T ports, supporting PoE/PoE+/PoE++ 4 x 10GE/25GE SFP28 ports	24 x 100/1000/2.5G/5G/10GBASE-T ports, supporting PoE/PoE+/PoE++ 4 x 1GE/10GE SFP+ ports 4 x 10GE/25GE SFP28 ports	48 x 100/1000/2.5G/5GBASE-T ports • Ports 1 to 48 support • PoE/PoE+ Ports 1 to 24 support PoE++ 4 x 10GE/25GE SFP28 ports 2 x 40GE QSFP+ ports
Module slot	/	/	2 x power module slots 3 x fan module slots	
Power module	/	/	RG-PA600I-P-F RG-PA1000I-P-F	
Fan module	/	/	M2SFAN I-F (pre-installed 3)	
Fixed management port	1 x RJ45 console port 1 x RJ45 MGMT port			
USB	1 x USB port			

System Specifications

System Specifications	RG-CS86-24MG4VS-UP	RG-CS86-12XMG4VS-UP	RG-CS86-24XMG4XS4VS-UPD	RG-CS86-48MG4VS2QXS-UPD
Packet forwarding rate	327 Mpps	327 Mpps	565 Mpps	625 Mpps
Switching capacity	440 Gbps	440 Gbps	760 Gbps	840 Gbps
CPU	Dual-core CPU, with a clock speed up to 1.25 GHz			
BootROM	16 MB (storing boot software for 1+1 boot redundancy)			
Flash memory	1 GB (storing boot software for 1+1 boot redundancy)			
Memory	1 GB	1 GB	1 GB	2 GB
Switch buffer	4 MB			
MAC address table size	32,768			
ARP table size	16,000			
Number of IPv4 unicast routes	16,000			
Number of IPv4 multicast routes	4,000			

System Specifications	RG-CS86-24MG4VS-UP	RG-CS86-12XMG4VS-UP	RG-CS86-24XMG4XS4VS-UPD	RG-CS86-48MG4VS2QXS-UPD
Number of IPv6 unicast routes	16,000			
Number of IPv6 multicast routes	2,000			
Number of ACEs	Ingress: 2,500 Egress:1,000			
Number of VSU members	2			

Dimensions and Weight

Dimensions and Weight	RG-CS86-24MG4VS-UP	RG-CS86-12XMG4VS-UP	RG-CS86-24XMG4XS4VS-UPD	RG-CS86-48MG4VS2QXS-UPD
Unit dimensions (W x D x H)	442 mm x 220 mm x 43.6 mm (17.40 in. x 8.66 in. x 1.72 in.)			
Shipping dimensions (W x D x H)	568 mm x 366 mm x 226 mm (22.36 in. x 14.41 in. x 8.90 in.)		563 mm x 563 mm x 210mm (22.17 in. x 22.17 in. x 8.27 in.)	
Rack height	1 RU			
Unit weight	3.65 kg (8.82 lbs)		6.11 kg (13.47 lbs)	
Shipping weight	5.37 kg (11.84 lbs)		8.12 kg (17.90 lbs)	8.42 kg (18.56 lbs)

Power Supply and Consumption

Power Supply and Consumption	RG-CS86-24MG4VS-UP	RG-CS86-12XMG4VS-UP
Power supply	1 x fixed power supply	1 x fixed power supply
Power input	AC input • Rated input voltage: 100 V AC to 240 V AC, 50 Hz to 60 Hz • Maximum input voltage: 90 V AC to 264 V AC, 47 Hz to 63 Hz • Maximum input current: 6 A	
Maximum output power	Built-in power supply: 460 W	
Maximum power consumption	90 W (without PoE) 460 W (full PoE load)	
PoE port	Ports 1 to 24 support PoE/PoE+ and HPoE power supply (IEEE 802.3af/at and 802.3bt).	Ports 1 to 12 support PoE/PoE+ and HPoE power supply (IEEE 802.3af/at and 802.3bt).
PoE power cable pairs	Four pairs (1-2, 3-6, 4-5, and 7-8 pairs)	
PoE output power	Each PoE port provides up to 90 W of power The maximum power is 370 W	

Power Supply and Consumption	RG-CS86-24XMG4XS4VS-UPD	RG-CS86-48MG4VS2QXS-UPD
Power supply	2 x pluggable power modules	

Power Supply and Consumption	RG-CS86-24XMG4XS4VS-UPD	RG-CS86-48MG4VS2QXS-UPD
Power module redundancy	1+1 power redundancy	
Power module hot swapping	Supported	
Power input	RG-PA600I-P-F (AC input): • Rated input voltage: 100 V AC to 240 V AC, 50 Hz to 60 Hz • Maximum input voltage: 90 V AC to 264 V AC, 47 Hz to 63 Hz • Maximum input current: 8 A RG-PA1000I-P-F (AC input 1): • Rated input voltage: 100 V AC to 130 V AC, 50 Hz to 60 Hz • Maximum input voltage: 90 V AC to 143 V AC, 47 Hz to 63 Hz • Maximum input current: 12 A RG-PA1000I-P-F (AC input 2): • Rated input voltage: 200 V AC to 240 V AC, 50 Hz to 60 Hz • Maximum input voltage: 180 V AC to 264 V AC, 47 Hz to 63 Hz • Maximum input current: 8 A	
Maximum output power	RG-PA600I-P-F: 600 W RG-PA1000I-P-F: • 100 V AC to 130 V AC: 930 W • 200 V AC to 240 V AC: 1000 W	
Maximum power consumption	150 W (without PoE) 1,800 W (full PoE load)	200 W (without PoE) 1,800 W (full PoE load)
PoE port	Ports 1 to 24 support PoE/PoE+ and HPoE power supply (IEEE 802.3af/at and 802.3bt).	Ports 1 to 24 support HPoE power supply (IEEE 802.3bt) Ports 1 to 48 support PoE/PoE+ power supply (IEEE 802.3af/at)
PoE power cable pairs	Four pairs (1-2, 3-6, 4-5, and 7-8 pairs)	
PoE output power	Each PoE port provides up to 90 W of power • 1 x RG-PA600I-P-F: 450 W • 1 x RG-PA1000I-P-F: 760 W (100 V AC to 130 V AC) • 1 x RG-PA1000I-P-F: 850 W (200 V AC to 240 V AC) • 2 x RG-PA600I-P-F: 930 W • 1 x RG-PA600I-P-F + 1 x RG-PA1000I-P-F: 1200 W (100 V AC to 130 V AC) • 1 x RG-PA600I-P-F + 1 x RG-PA1000I-P-F: 1290 W (200 V AC to 240 V AC) • 2 x RG-PA1000I-P-F: 1470 W (100 V AC to 130 V AC) • 2 x RG-PA1000I-P-F: 1650 W (200 V AC to 240 V AC)	Each port of ports 1 to 24 provides up to 90 W of power Each port of ports 25 to 48 provides up to 30 W of power • 1 x RG-PA600I-P-F: 400 W • 1 x RG-PA1000I-P-F: 710 W (100 V AC to 130 V AC) • 1 x RG-PA1000I-P-F: 800 W (200 V AC to 240 V AC) • 2 x RG-PA600I-P-F: 880 W • 1 x RG-PA600I-P-F + 1 x RG-PA1000I-P-F: 1150 W (100 V AC to 130 V AC) • 1 x RG-PA600I-P-F + 1 x RG-PA1000I-P-F: 1240 W (200 V AC to 240 V AC) • 2 x RG-PA1000I-P-F: 1420 W (100 V AC to 130 V AC) • 2 x RG-PA1000I-P-F: 1600 W (200 V AC to 240 V AC)

Note: The maximum number of powered devices supported by the switch is determined by the available power of the switch and the actual power consumption of each device.

Environment and Reliability

Environment and Reliability	RG-CS86-24MG4VS-UP	RG-CS86-12XMG4VS-UP	RG-CS86-24XMG4XS4VS-UPD	RG-CS86-48MG4VS2QXS-UPD
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)			
Humidity	Operating humidity: 10% to 90% RH (non-condensing) Storage humidity: 5% to 95% RH (non-condensing)			

Environment and Reliability	RG-CS86-24MG4VS-UP	RG-CS86-12XMG4VS-UP	RG-CS86-24XMG4XS4VS-UPD	RG-CS86-48MG4VS2QXS-UPD
Altitude	Operating altitude: 0 m to 5,000 m (0 ft. to 16,404.20 ft.) Storage altitude: 0 m to 5,000 m (0 ft. to 16,404.20 ft.)			
Mean time between failure (MTBF)	194,297 hours (about 22 years)	194,297 hours (about 22 years)	194,297 hours (about 22 years)	237,221 hours (about 27 years)
Fan	2 x fixed fan modules		3 x pluggable fan modules	
Fan redundancy	Not supported		2+1 redundancy	
Fan module hot swapping	/		Supported	
Heat dissipation	Fan cooling, front-to-right and left-to-right airflow		Fan cooling, front-to-rear and left-to-rear airflow	
Acoustic noise	27°C (80.6°F): 40 dB 45°C (113°F): 78 dB	27°C (80.6°F): 40 dB 45°C (113°F): 78 dB	27°C (80.6°F): 60 dB 45°C (113°F): 78 dB	27°C (80.6°F): 60 dB 45°C (113°F): 78 dB
Power module hot swapping	/	/	Supported	Supported
Fan module hot swapping	/	/	Supported	Supported
USB hot swapping	Supported	Supported	Supported	Supported
Cable hot swapping	Supported	Supported	Supported	Supported
Power supply monitoring	Monitoring of power supply model and status Power supply failure alarming			
Fan monitoring	Fan speed adjustment: 3 levels Fan failure alarming			
Temperature monitoring	Temperature alarming			
ESD	ESD contact discharge/air discharge: 6 kV/8 kV ESD immunity contact discharge/air discharge: 8 kV/15 kV			
Surge protection	MGMT port: 4 kV Service port: 4 kV Power port: common mode 6 kV, differential mode 6 kV			
Conformal coating	Conformal coating supported (key components only)			

Certifications and Regulatory Compliance

Certifications and Regulatory Compliance	RG-CS86-24MG4VS-UP	RG-CS86-12XMG4VS-UP	RG-CS86-24XMG4XS4VS-UPD	RG-CS86-48MG4VS2QXS-UPD
Safety regulation	IEC 62368-1			
EMC regulation	EN 300386, EN 55032 Class A, EN 55035, EN IEC 61000-3-2, EN 61000-3-3, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-11			

Software Specifications

Software Specifications	RG-CS86-24MG4VS-UP	RG-CS86-48MG4VS2QXS-UPD	RG-CS86-24XMG4XS4VS-UPD	RG-CS86-12XMG4VS-UP
Ethernet switching	Jumbo frame (maximum length: 9216 bytes)			
	IEEE 802.1Q (supporting 4K VLANs)			
	Voice VLAN			
	Super VLAN, Private VLAN			
	MAC VLAN, Port based VLAN, Protocol based VLAN, IP-Subnet based VLAN			
	GVRP			
	Basic QinQ Flexible QinQ			
	STP, RSTP, and MSTP			
	ERPS (G.8032)			
	LLDP/LLDP-MED			
	LACP (IEEE 802.3ad)			
IP service	ARP			
	DHCP client, DHCP relay, and DHCP server			
	DHCP snooping			
	DNS			
	DHCPv6 client and DHCPv6 relay			
	DHCPv6 snooping			
	Neighbor Discovery (ND) and ND snooping			
IP Routing	Static routing			
	RIP and RIPng			
	OSPFv2, OSPFv3, IS-ISv4, ISv4, and IS-ISv6			
	BGP4 and BGP4+			
	IPv4 and IPv6 PBR			
	ECMP			
Multicast	IGMP v1/v2/v3, and IGMP proxy			
	IGMP v1/v2/v3 snooping			
	PIM-DM, PIM-SM, and PIM-SSM			
	MSDP			
	MLD v1/v2			

Software Specifications	RG-CS86-24MG4VS-UP	RG-CS86-48MG4VS2QXS-UPD	RG-CS86-24XMG4XS4VS-UPD	RG-CS86-12XMG4VS-UP
Multicast	MLD snooping v1/v2			
	PIM-SMv6 and PIM-SSM v6			
ACL and QoS	Standard IP ACLs Extended IP ACLs Extended MAC ACLs Time-based ACLs Expert-level ACLs ACL80 IPv6 ACL			
	Port traffic rate limiting			
	Congestion management: RR, SP, WRR, DRR, WFQ, SP+WRR, SP+DRR, and SP+WFQ			
	Congestion avoidance: tail drop, RED, and WRED			
	802.1p/DSCP/ToS traffic classification Eight priority queues per port			
Security	Multiple AAA modes			
	RADIUS and TACAS+			
	Port-based and MAC-based 802.1x authentication			
	Web authentication			
	HTTPS			
	SSHv1, SSHv2			
	Global IP-MAC binding			
	IP source guard			
	SAVI			
	CPP and NFPP			
	Strict and loose RPF uRPF ignoring default routes			
Reliability	REUP, RLDP, DLDP			
	IPv4 VRRP v2/v3 and IPv6 VRRP			
	BFD			
	GR for RIP, OSPF, BGP			
	1+1 power redundancy			
	Hot swapping of power and fan modules			
Device virtualization	Virtual Switching Unit (VSU)			
NMS and maintenance	SPAN, RSPAN, and ERSPAN			
	sFLOW			

Software Specifications	RG-CS86-24MG4VS-UP	RG-CS86-48MG4VS2QXS-UPD	RG-CS86-24XMG4XS4VS-UPD	RG-CS86-12XMG4VS-UP
NMS and maintenance	NTP and SNTP			
	FTP and TFTP			
	SNMP v1/v2/v3			
	RMON (1, 2, 3, 9)			
	NETCONF			
NMS and maintenance	CWMP (TR-069) standard protocol			
	gRPC			
	Cloud and SON			
PoE	IEEE 802.3af, 802.3at and 802.3bt Uninterruptible power supply upon hot start Port priority			

05
Protocol Compliance

RG-CS86 Series	
Organization	**Standards and Protocol**
IETF	RFC 1058 Routing Information Protocol (RIP) RFC 1157 A Simple Network Management Protocol (SNMP) RFC 1305 Network Time Protocol Version 3 (NTP) RFC 1349 Internet Protocol (IP) RFC 1350 TFTP Protocol (revision 2) RFC 1519 CIDR RFC 1583 OSPF Version 2 RFC 1591 Domain Name System Structure and Delegation RFC 1643 Ethernet Interface MIB RFC 1757 Remote Network Monitoring (RMON) RFC 1812 Requirements for IP Version 4 Router RFC 1901 Introduction to Community-based SNMPv2 RFC 1902-1907 SNMP v2 RFC 1918 Address Allocation for Private Internet RFC 1981 Path MTU Discovery for IP version 6 RFC 1997 BGP Communities Attribute RFC 2131 Dynamic Host Configuration Protocol (DHCP) RFC 2132 DHCP Options and BOOTP Vendor Extensions RFC 2236 IGMP RFC 2328 OSPF Version 2 RFC 2385 Protection of BGP Sessions via the TCP MD5 Signature Option RFC 2439 BGP Route Flap Damping RFC 2460 Internet Protocol, Version 6 Specification (IPv6) RFC 2461 Neighbor Discovery for IP Version 6 (IPv6) RFC 2462 IPv6 Stateless Address Auto configuration RFC 2463 Internet Control Message Protocol for IPv6 (ICMPv6) RFC 2545 Use of BGP 4 Multiprotocol Extensions for IPv6 Inter Domain Routing RFC 2571 SNMP Management Frameworks RFC 2711 IPv6 Router Alert Option

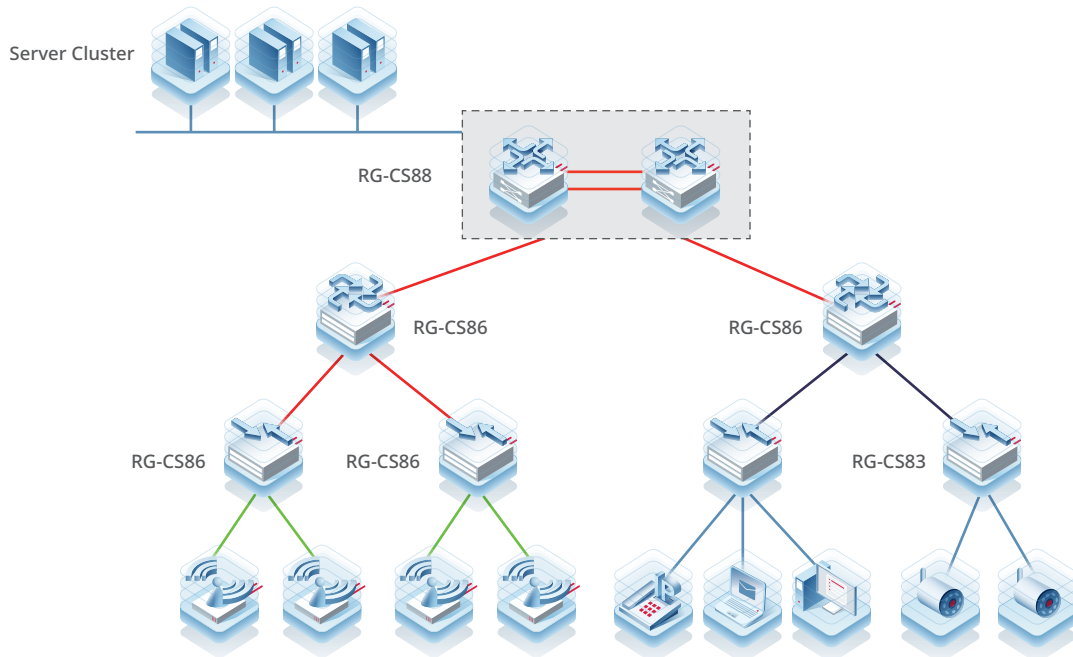| RG-CS86 Series	
Organization	**Standards and Protocol**
IETF	RFC 2787 Definitions of Managed Objects for the Virtual Router Redundancy Protocol RFC 2863 The Interfaces Group MIB RFC 2865 Remote Authentication Dial In User Service (RADIUS) RFC 2918 Route Refresh Capability for BGP 4 RFC 2925 Definitions of Managed Objects for Remote Ping, Traceroute, and Lookup Operations (Ping only) RFC 2934 Protocol Independent Multicast MIB for IPv4 RFC 3046 DHCP Option82 RFC 3065 Autonomous System Confederation for BGP RFC 3101 OSPF Not so stubby area option RFC 3137 OSPF Stub Router Advertisement sFlow RFC 3417 (SNMP Transport Mappings) RFC 3418 Management Information Base (MIB) for the Simple Network Management Protocol (SNMP) RFC 3509 Alternative Implementations of OSPF Area Border Routers RFC 3513 IP Version 6 Addressing Architecture RFC 3575 IANA Considerations for RADIUS RFC 3579 RADIUS Support For EAP RFC 3623 Graceful OSPF Restart RFC 3768 VRRP RFC 3810 Multicast Listener Discovery Version 2 (MLDv2) for IPv6 RFC 3973 PIM Dense Mode RFC 4022 MIB for TCP RFC 4213 Basic Transition Mechanisms for IPv6 Hosts and Routers RFC 4251 The Secure Shell (SSH) Protocol RFC 4252 SSHv6 Authentication RFC 4253 SSHv6 Transport Layer RFC 4254 SSHv6 Connection RFC 4271 A Border Gateway Protocol 4 (BGP 4) RFC 4273 Definitions of Managed Objects for BGP 4 RFC 4291 IP Version 6 Addressing Architecture RFC 4292 IP Forwarding Table MIB RFC 4293 Management Information Base for the Internet Protocol (IP) RFC 4360 BGP Extended Communities Attribute RFC 4419 Key Exchange for SSH RFC 4443 ICMPv6 RFC 4456 BGP Route Reflection: An Alternative to Full Mesh Internal BGP (IBGP) RFC 4486 Subcodes for BGP Cease Notification Message RFC 4552 Authentication/Confidentiality for OSPFv3 RFC 4601 PIM Sparse Mode RFC 4607 Source Specific Multicast for IP RFC 4724 Graceful Restart Mechanism for BGP RFC 4750 OSPFv2 MIB partial support no SetMIB RFC 4760 Multiprotocol Extensions for BGP 4 RFC 4861 IPv6 Neighbor Discovery RFC 4862 IPv6 Stateless Address Auto configuration RFC 4940 IANA Considerations for OSPF RFC 5065 Autonomous System Confederation for BGP RFC 5187 OSPFv3 Graceful Restart RFC 5340 OSPFv3 for IPv6 RFC 5424 Syslog Protocol RFC 5492 Capabilities Advertisement with BGP 4 RFC 5722 Handling of Overlapping IPv6 Fragments RFC 5798 VRRP RFC 5905 Network Time Protocol Version 4: Protocol and Algorithms Specification RFC 6020 YANG - A Data Modeling Language for the Network Configuration Protocol (NETCONF) RFC 6241 Network Configuration Protocol (NETCONF) RFC 6620 FCFS SAVI RFC 768 User Datagram Protocol (UDP) RFC 783 TFTP Protocol (revision 2) RFC 792 Internet Control Message Protocol (ICMP) RFC 793 Transmission Control Protocol (TCP) RFC 826 Ethernet Address Resolution Protocol (ARP) RFC 854 Telnet Protocol Specification RFC 959 File Transfer Protocol (FTP)

RG-CS86 Series	
Organization	**Standards and Protocol**
IEEE	IEEE 802.2 Logical Link Control IEEE 802.1AB 2005 IEEE 802.1ab Link Layer Discovery Protocol IEEE 802.1ad Provider Bridges IEEE 802.1AX 2008 Link Aggregation IEEE 802.1ax/IEEE802.3ad Link Aggregation IEEE 802.1D MAC Bridges IEEE 802.1D Media Access Control (MAC) Bridges IEEE 802.1D Spanning Tree Protocol IEEE 802.1p Priority IEEE 802.1p Traffic Class Expediting and Dynamic Multicast Filtering IEEE 802.1Q Virtual Bridged Local Area Networks IEEE 802.1Q VLANs IEEE 802.1s Multiple Spanning Tree Protocol IEEE 802.1s Multiple Spanning Trees IEEE 802.1w Rapid Reconfiguration of Spanning Tree IEEE 802.1w Rapid Spanning Tree Protocol IEEE 802.1x Port based network access control protocol IEEE Std 802.3 CSMA/CD IEEE Std 802.3ab 1000BASE-T specification IEEE 802.3ad Link Aggregation Control Protocol (LACP) IEEE Std 802.3ae 10GE WEN/LAN Standard IEEE Std 802.3x Full Duplex and flow control IEEE Std 802.3z Gigabit Ethernet Standard

06
Typical Applications

- RG-CS86 series switches can be deployed at the access layer of a large-scale enterprise campus network to serve as PSE for high-power APs.

- RG-CS86 series switches provide abundant security management mechanisms to achieve robust network security defense, high-security access control, and effective network access control.

- RG-CS86 series switches adopt sound management policies for bandwidth management to guarantee the bandwidth required by voice, multicast audio and video services, video on demand, and other key services.

Scenario

RG-CS86 series switches can be deployed at the access or aggregation layer of a small- and medium-scale campus network. The 2.5GE/5GE/10GE Ethernet ports of the RG-CS86 can serve as member ports of a high-speed aggregate interface to achieve the link bandwidth of 10 Gbps or 25 Gbps at the aggregation layer and that of the 40 Gbps or 100 Gbps at the core layer. This meets the increasing needs for high-performance bandwidth.

07
Ordering Guide

Follow the steps to order a RG-CS86 multi-GE switch:

- Select a model of RG-CS86 series switches. The device is fully equipped with fan modules that do not need to be purchased separately.

- Select power modules based on switch models. At least one power module is required.

- Select optical transceivers based on optical interfaces of the switch.

Models marked with asterisks (*) in the ordering information are available later.

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Ordering Information

Switches and Power Modules

Model	Description
RG-CS86-24MG4VS-UP	24 x 100/1000/2.5G/5GBASE-T ports, supporting PoE/PoE+/PoE++ 4 x 10GE/25GE SFP28 ports fixed AC power supply and fan
RG-CS86-12XMG4VS-UP	12 x 100/1000/2.5G/5G/10GBASE-T ports, supporting PoE/PoE+/PoE++ 4 x 10GE/25GE SFP28 ports fixed AC power supply and fan

Model	Description
RG-CS86-24XMG4XS4VS-UPD	24 x 100/1000/2.5G/5G/10GBASE-T ports, supporting PoE/PoE+/PoE++ 4 x 1GE/10GE SFP+ ports 4 x 10GE/25GE SFP28 ports 2 modular power supply slots (at least one RG-PA600I-P-F or RG-PA1000I-P-F power module needed,no power module in default),3 modular fan slots (3 fan modules are equipped by default)
RG-CS86-48MG4VS2QXS-UPD	48 x 100/1000/2.5G/5GBASE-T ports, supporting PoE/PoE+/PoE++(25-48 ports only support PoE/PoE+) 4 x 10GE/25GE SFP28 + 2 x 40GE QSFP+ ports 2 modular power supply slots (at least one RG-PA600I-P-F/ RG-PA1000I-P-F power module needed,no power module in default),3 modular fan slots (3 fan modules are equipped by default)
RG-PA600I-P-F	600 W AC power module
RG-PA1000I-P-F	1000 W AC power module

Note:

- 4 x 10GE/25GE SFP28 ports support 10GE SFP+ transceivers and 25GE SFP28 transceivers. All 10GE/25GE SFP28 ports must work at the same rate, either 25G or 10G.

- 4 x 1GE/10GE SFP+ ports support 1GE SFP transceivers and 10GE SFP+ transceivers.

- 2 x 40GE QSFP+ ports support 40GE QSFP+ transceivers. The port can work in 4 x 10GE mode.

Optical Transceivers and Cables

1GE

Model	Description
Mini-GBIC-GT	1000BASE-X to 1000BASE-T, copper SFP transceiver, RJ45, 100 m over Cat 5e/6/6a The port needs to be configured with auto-negotiation
MINI-GBIC-SX-MM850	1000BASE-SX, SFP transceiver, 850 nm, Duplex LC, 500 m over MMF
MINI-GBIC-LX-SM1310	1000BASE-LX, SFP transceiver, 1310 nm, Duplex LC, 10 km over SMF
MINI-GBIC-LH40-SM1310	1000BASE-LH, SFP transceiver, 1310 nm, Duplex LC, 40 km over SMF
MINI-GBIC-ZX80-SM1550	1000BASE-ZX, SFP transceiver, 1550 nm, Duplex LC, 80 km over SMF
GE-SFP-LX20-SM1310-BIDI	1000BASE-LX, SFP transceiver, Tx1310/Rx1550, BiDi LC, 20 km over SMF
GE-SFP-LX20-SM1550-BIDI	1000BASE-LX, SFP transceiver, Tx1550/Rx1310, BiDi LC, 20 km over SMF
GE-SFP-LH40-SM1310-BIDI	1000BASE-LH, SFP transceiver, Tx1310/Rx1550, BiDi LC, 40 km over SMF
GE-SFP-LH40-SM1550-BIDI	1000BASE-LH, SFP transceiver, Tx1550/Rx1310, BiDi LC, 40 km over SMF

Note: BiDi transceivers must be used in pairs. If one end uses GE-SFP-LX20-SM1310-BIDI, the other end must use GE-SFP-LX20-SM1550-BIDI.

10GE

Model	Description
XG-SFP-SR-MM850	10GBASE-SR, SFP+ transceiver, 850nm, Duplex LC, 300 m over MMF
XG-SFP-LR-SM1310	10GBASE-LR, SFP+ transceiver, 1310nm, Duplex LC, 10 km over SMF
XG-SFP-ER-SM1550	10GBASE-ER, SFP+ transceiver, 1550nm, Duplex LC, 40 km over SMF

Model	Description
XG-SFP-AOC1M	10GBASE, SFP+ active optical cable (AOC), 1 m, including one cable and two optical transceivers
XG-SFP-AOC3M	10GBASE, SFP+ active optical cable (AOC), 3 m, including one cable and two optical transceivers
XG-SFP-AOC5M	10GBASE, SFP+ active optical cable (AOC), 5 m, including one cable and two optical transceivers

25GE

Model	Description
VG-SFP-SR-MM850	25GBASE-SR, SFP28 transceiver, 850 nm, Duplex LC, 100 m over OM4 MMF, 70 m over OM3 MMF
VG-SFP-LR-SM1310	25GBASE-LR, SFP28 transceiver, 1310 nm, Duplex LC, 10 km over SMF
VG-SFP-AOC7M	25GBASE, SFP28 active optical cable (AOC), 7 m, including one cable and two optical transceivers

40GE

Model	Description
40G-QSFP-SR-MM850	40GBASE-SR, QSFP+ transceiver, 850 nm, MPO 1 x 12, 150 m over OM4 MMF, 100 m over OM3 MMF
40G-QSFP-LSR-MM850	40GBASE-LSR, QSFP+ transceiver, 850 nm, MPO 1 x 12, 400 m over OM4 MMF, 300 m over OM3 MMF
40G-QSFP-LR4-SM1310	40GBASE-LR4, QSFP+ transceiver, 1310 nm, Duplex LC, 10 km over SMF
40G-QSFP-iLR4-SM1310	40GBASE-iLR4, QSFP+ transceiver, 1310 nm, Duplex LC, 2 km over SMF
40G-QSFP-LX4-SM1310	40GBASE-LX4, QSFP+ transceiver, 1310 nm, Duplex LC, 150 m over OM3/OM4 MMF, 2 km over SMF
40G-AOC-5M	40GBASE, QSFP+ active optical cable (AOC), 5 m, including one cable and two optical transceivers
40G-AOC-30M	40GBASE, QSFP+ active optical cable (AOC), 30 m, including one cable and two optical transceivers

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Package Contents

Item	RG-CS86-24MG4VS-UP	RG-CS86-12XMG4VS-UP	RG-CS86-24XMG4XS4VS-UPD	RG-CS86-48MG4VS2QXS-UPD
Chassis	1	1	1	1
Power cord	1	1	/	/
Grounding wire	1	1	1	1
Nylon buckle	1	1	/	/
Mounting bracket	2	2	6 (Includes a front Mounting bracket and a rear Mounting bracket and a slide rail)	6 (Includes a front Mounting bracket and a rear Mounting bracket and a slide rail)
Rubber pad	4	4	4	4

Item	RG-CS86-24MG4VS-UP	RG-CS86-12XMG4VS-UP	RG-CS86-24XMG4XS4VS-UPD	RG-CS86-48MG4VS2QXS-UPD
Cross recessed countersunk head screw, M4x8, GB819-85	8	8	14	14
M6*16 screw	4	4	4	4
M6 cage nut	4	4	4	4
Switches User Manual (L-Shape Rail Version)	/	/	1	1
Mounting Bracket Installation Guide	1	1	/	/
Warranty Manual and Network Product Hazardous Substance Statement	1	1	1	1
Ruijie Networks Access Product Management Software	1 (pre-installed)	1 (pre-installed)	1 (pre-installed)	1 (pre-installed)
Shipping dimensions (W x D x H)	568 mm x 366 mm x 226 mm (22.36 in. x 14.41 in. x 8.90 in.)		563 mm x 563 mm x 210mm (22.17 in. x 22.17 in. x 8.27 in.)	
Shipping weight	5.37 kg (11.84 lbs)		8.12 kg (17.90 lbs)	8.42 kg (18.56 lbs)

You can retrieve product supporting documents at https://www.ruijienetworks.com/products.

Click **Support > Technical Documents**, and download the documents you need.

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Warranty

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

• Warranty terms: https://www.ruijienetworks.com/support/servicepolicy

• Warranty period: https://www.ruijienetworks.com/support/servicepolicy/Service-Support-Summany/

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

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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.ruijienetworks.com/

• Online support: https://www.ruijienetworks.com/support

• Hotline support: https://www.ruijienetworks.com/support/hotline

• Email support: service_rj@ruijienetworks.com

Ruijie Networks Co., Ltd
Website: https://www.ruijienetworks.com