Datasheet



RG-CS86 Series Full 10GE

Switches

INNOVATION
Beyond Networks

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01

Product Overview

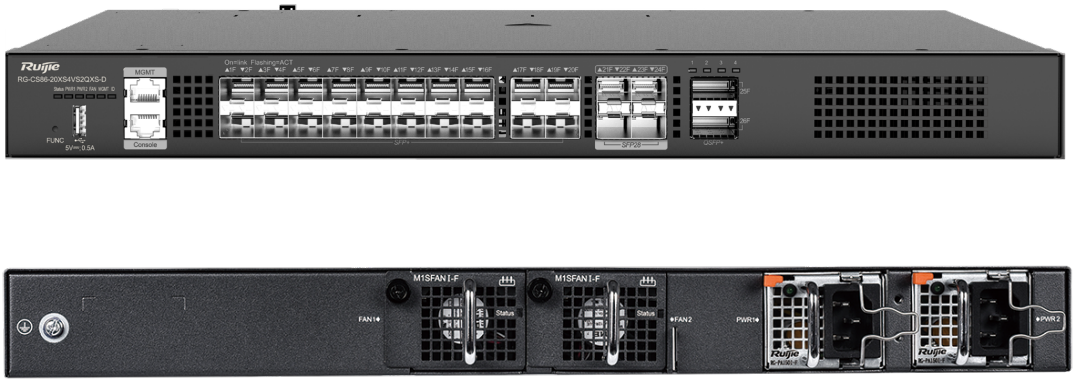
RG-CS86 series full 10GE switches are next-generation high-performance and strong-security 10G Ethernet switches newly released by Ruijie Networks. With the advanced hardware architecture and Ruijie latest modular OS, the RG-CS86 series full 10GE switches are capable of providing faster hardware processing and better operation experience.

RG-CS86 series full 10GE switches flexibly provide access services at multiple rates (1G/2.5G/10G) through 10GE optical ports. They can connect to uplink devices through high-performance 10G/40G ports and fully meet user requirements for high-density access and high-performance convergence.

RG-CS86 series full 10GE switches provides robust performance, sound end-to-end service quality, and rich security settings for the convergence layer of large-sized networks and the core layer of medium- and small-sized networks. They can meet requirements of enterprise networks for high speed, security, and intelligence.

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Product Appearance



RG-CS86-20XS4VS2QXS-D

03 Product Features

IPv4/IPv6 Dual-Stack Multi-Layer Switching

The hardware of the RG-CS86 series full 10GE switches supports line-rate IPv4/IPv6 dual-stack multi-layer switching, and differentiates and processes IPv4 and IPv6 protocol packets. Networks can be planned using the switches based on IPv6 network requirements, or flexible IPv6 network communication solutions can be drawn up, with the network status quo unchanged. The RG-CS86 series full 10GE switches support a wide range of IPv4 routing protocols, including static routing, Routing Information Protocol (RIP), Open Shortest Path First version 2 (OSPFv2), Intermediate System to Intermediate System version 4 (IS-ISv4), and Border Gateway Protocol version 4 (BGP4). Users can select appropriate routing protocols based on network environments, to flexibly build networks. The RG-CS86 series full 10GE switches also support abundant IPv6 routing protocols, including static routing, Routing Information Protocol next generation (RIPng), OSPFv3, IS-ISv6, and BGP4+. A routing protocol can be selected flexibly to either upgrade the existing network to an IPv6 network or build a new IPv6 network.

VSU

The RG-CS86 series full 10GE switches support the Virtual Switch Unit (VSU) technology, in which multiple physical devices are connected through aggregate links and virtualized into one logical device. The devices use the same IP address, Telnet process, and command line interface (CLI) for management, and support automatic version check and automatic configuration. Users need to manage only this logical device to enjoy the work efficiency and use experience brought by multiple devices.

Aggregate links can be 10G interfaces or dedicated stacking cards, which can maximize the return on investment for users.

Simplified management: Administrators can manage multiple switches in a unified manner, with no need to connect to each switch for 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 exists and the Multiple Spanning Tree Protocol (MSTP) does not need to be configured. Various control protocols run on the VSU.

Fault recovery within milliseconds: A VSU connects to peripheral devices through aggregate links. If one device or member link in the VSU malfunctions, data and services can be switched to another member link within only 50–200 milliseconds.

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

Sound Security Protection Policies

The RG-CS86 series full 10GE switches effectively defend against and control the virus spread and hacker attacks by using multiple inherent mechanisms such as anti-DoS attack, anti-IP scanning, validity check of ARP packets on ports, and multiple hardware ACL policies.

The RG-CS86 series full 10GE switches support hardware-based IPv6 ACLs, which can easily control the access of IPv6 users at the network boundary even in the presence of IPv6 users on an IPv4 network. The switches allow the coexistence of IPv4 and IPv6 users and can control the access permissions of IPv6 users, for example, restricting the access to sensitive resources on the network.

The hardware CPU protection mechanism provided by the RG-CS86 series full 10GE switches is a special CPU protection policy, in which data traffic sent to the CPU is classified and processed by queue priority, and the bandwidth rate is limited as required. This mechanism fully protects the CPU against illegitimate traffic occupancy, malicious attacks, and resource consumption, thereby ensuring the CPU security and protecting the switches.

The hardware of the RG-CS86 series full 10GE switches flexibly binds a port or switch to a user's IP address and MAC address, to strictly restrict the access of users connected to a port or the switch.

DHCP snooping enables the RG-CS86 full 10G series switches to receive DHCP responses only from trusted

ports and prevent spoofing from unauthorized DHCP servers. With DHCP snooping, the switches dynamically monitor ARP packets, check users' IP addresses, and discard illegitimate packets whose addresses do not match bound entries, thereby effectively preventing ARP spoofing and source IP address spoofing.

The switches support the source IP-based Telnet device access control, which can prevent unauthorized users and hackers from maliciously attacking and controlling the devices, thereby enhancing the network management security of the devices.

Through the Secure Shell (SSH) and Simple Network Management Protocol version 3 (SNMPv3), the RG-CS86 full 10G series switches can encrypt management information in the Telnet and SNMP processes, to ensure information security of management devices and prevent hackers from attacking and controlling the devices.

RG-CS86 series full 10GE switches prevent unauthorized users from accessing networks by using multiple measures. Such measures include multi-element binding, port security, time-based ACL, and data flow-based bandwidth limit. These measures can help enterprise networks and campus networks control user access and restrict the communication of unauthorized users.

The Network Foundation Protection Policy (NFPP) supported by the RG-CS86 series full 10GE switches is a protection mechanism for enhancing the switch security. It isolates the attack sources to protect the processor and channel bandwidth resources of switches, thereby ensuring normal forwarding of packets and protocol status.

High Reliability

The RG-CS86 series full 10GE switches are equipped with built-in redundant power modules and modular fan assemblies, which can be hot-swapped and do not affect the normal operation of devices. In addition, the RG-CS86 series full 10GE switches support fault detection and alarm functions for the power and fan modules. The fan speed can be automatically adjusted to better adapt to the ambient environment. The RG-CS86 series full 10GE switches provide front-to-rear ventilation channels to improve the heat dissipation efficiency. The switches also provide device-level and link-level reliability protection as well as over-current protection, over-voltage protection, and overheating protection.

The Spanning Tree Protocols (STPs) (802.1d, 802.1w, and 802.1s) help the RG-CS86 series full 10GE switches achieve fast convergence, improve the fault tolerance capability, and ensure stable network operation and load balance of links. The switches utilize network channels appropriately to raise the utilization of redundant links.

The Virtual Router Redundancy Protocol (VRRP) helps the switches effectively ensure the network stability.

With the Rapid Link Detection Protocol (RLDP), the switches can quickly detect the link connectivity and unidirectional optical fiber links. The port loop detection function helps the switches prevent network failures caused by loops resulting from unauthorized port connection 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 series full 10GE switches support Bidirectional Forwarding Detection (BFD), which provides upper-level protocols (such as routing protocols) with a method of rapidly detecting connectivity of the forwarding path between two routers. BFD greatly shortens the convergence time for the upper-level protocols in the case of link status changes.

Strong Multi-Service Support Capability

The RG-CS86 series full 10GE switches support 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 check function supported by the switches can effectively eliminate illegitimate multicast sources and enhance the network security.

Sound QoS Policies

The RG-CS86 series full 10GE switches are capable of classifying and controlling various flows, including MAC flows, IP flows, and application flows, to implement fine flow bandwidth control, forwarding

priority, and other flow policies. Furthermore, the switches can provide services based on applications and characteristics of the service quality required by different applications.

The DiffServ-centered QoS guarantee system supports 802.1p, IP ToS, Layer 2 to Layer 7 traffic filtering, SP, WRR, and other QoS policies, and implements the QoS logic for multiple services throughout the network.

Energy Efficiency

The RG-CS86 series full 10GE switches adopt the next-generation hardware architecture, and advanced energy-efficient circuit design and components to reduce energy consumption and noise. The RG-CS86 series full 10GE switches are equipped with variable-speed axial fans to intelligently control the fan speed based on the current ambient temperature, so as to reduce the power consumption and noise while ensuring stable operation of the devices.

Flexible Device Management Modes

Ruijie Cloud Makes Your Business Easy

The RG-CS86 series full 10GE switches support Ruijie Cloud APP to management, and 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 tracing.

The RG-CS86 series full 10GE 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/TR-069) based zero configuration and other methods to manage and maintain devices conveniently.

04 Specifications

Hardware Specifications

Port Specifications

Port Specifications	RG-CS86-20XS4VS2QXS-D
Fixed service port	20 x 1GE/2.5GE/10GE SFP+ ports 4 x 10GE/25GE SFP28 ports 2 x 40GE QSFP+ ports Note: One switch provides a maximum of 32 x 10GE ports.
Module slot	2 x power module slots 2 x fan power module slots
Power module	RG-PA150I-F / RG-PA150IB-F
Fan module	M1SFAN I-F (pre-installed 2)
Fixed management port	1 x RJ45 console port 1 x RJ45 MGMT port
USB	1 x USB port

System Specifications

System Specifications	RG-CS86-20XS4VS2QXS-D
Packet forwarding rate	570 Mpps
Switching capacity	760 Gbps
CPU	Single-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
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
Number of IPv6 unicast routes	16,000
Number of IPv6 multicast routes	2,000
Number of ACEs	In: 2,500 Out: 1,000
Number of VSU members	2

Dimensions and Weight

Dimensions and Weight	RG-CS86-20XS4VS2QXS-D
Unit dimensions (W x D x H)	440 mm x 330 mm x 43.6 mm (17.32 in. x 12.99 in. x 1.72 in.)
Shipping dimensions (W x D x H)	545 mm x 500 mm x 232 mm (21.46 in. x 19.69 in. x 9.13 in.)
Rack height	1 RU
Unit weight	4.6 kg (10.14 lbs) (empty chassis with 2 fan modules)
Shipping weight	6.40 kg (14.11 lbs) (empty chassis with 2 fan modules)

Power Supply and Consumption

Power Supply and Consumption	RG-CS86-20XS4VS2QXS-D
Power supply	2 x pluggable power modules
Power module redundancy	1+1 power redundancy
Power input	RG-PA150I-F / RG-PA150IB-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: 3 A
Maximum output power	RG-PA150I-F / RG-PA150IB-F: 150 W
Maximum power consumption	85 W

Environment and Reliability

Environment and Reliability	RG-CS86-20XS4VS2QXS-D
Temperature	Operating temperature: 0°C to 50°C (32°F to 122°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)
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)	200,000 hours (about 22 years)
Fan	2 x pluggable fan modules
Fan redundancy	1+1 redundancy
Heat dissipation	Fan cooling, front-to-rear airflow
Acoustic noise	≤ 78 dB
Power module hot swapping	Supported
USB hot swapping	Supported
Cable hot swapping	Supported
Power supply monitoring	Monitoring of power supply model and status Power supply failure alarming
Fan monitoring	Fan speed regulating and alarm function
Temperature monitoring	Temperature alarming
ESD	ESD Contact/Air Discharge: 6kV/8kV ESD Susceptibility Contact/Air Discharge: 8 kV/15kV
Surge protection	MGMT port: 4 kV Service port: 10 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-CS86-20XS4VS2QXS-D
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

RG-CS86-20XS4VS2QXS-D	
Feature	**Description**
Ethernet Switching	Jumbo frame (maximum length: 9,216 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
	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 VRF
	IPv4 and IPv6 PBR
	Equal and Weighted Cost Multi-Path (ECMP)

RG-CS86-20XS4VS2QXS-D	
Feature	**Description**
Multicast	IGMP v1/v2/v3, and IGMP proxy
	IGMP v1/v2/v3 snooping
	PIM-DM, PIM-SM, and PIM-SSM
	MSDP
	MLD v1/v2
	MLD snooping v1/v2
	PIM-SMv6 and PIM-SSM v6
	IGMP filtering, IGMP immediate leave
ACL and QoS	Standard IP ACLs Extended IP ACLs Extended MAC ACLs Time-based ACLs Expert-level ACLs ACL80 IPv6 ACL
	ACL redirection
	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 TACACS+
	Port-based and MAC-based 802.1x authentication
	Web authentication
	HTTPS
	SSHv1, SSHv2
	Global IP-MAC binding
	Port isolation and port security
	IP source guard
	SAVI
	CPP and NFPP
	Strict and loose RPF

RG-CS86-20XS4VS2QXS-D	
Feature	**Description**
Reliability	REUP, RLDP, DLDP
	IPv4 VRRP v2/v3 and IPv6 VRRP
	BFD
	Hot swapping of power modules and cables
	3-level fan speed adjustment Fan fault alarm
Device virtualization	VSU
NMS and maintenance	SPAN, RSPAN, and ERSPAN
	sFlow
	NTP and SNTP
	FTP and TFTP
	SNMP v1/v2/v3
	RMON (1, 2, 3, 9)
	Telnet
	NETCONF
	CWMP (TR-069) standard protocol
	gRPC
	Cloud and SON

05

Typical Applications

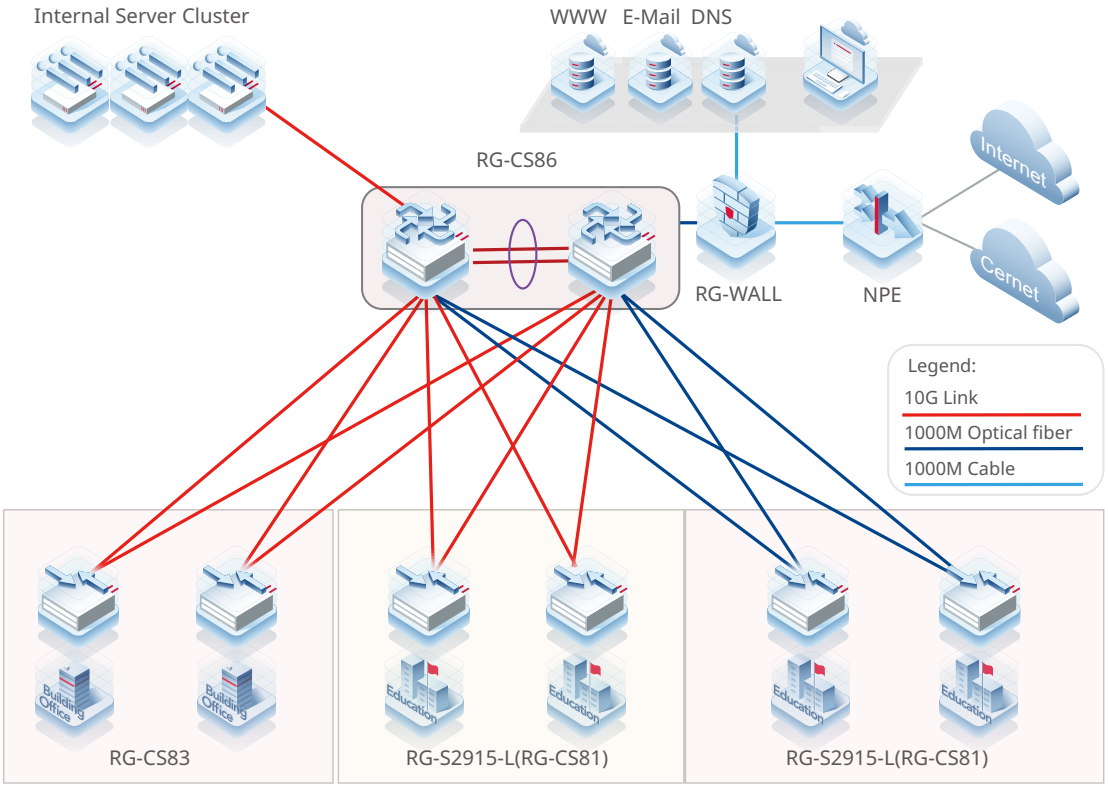
- The RG-CS86 series full 10GE switches can serve as convergence devices on large-sized networks or core devices on medium- and small-sized networks, and provide full-10G Layer 3 access services on large-sized enterprise networks or campus networks.
- The abundant security management mechanisms provide robust network security defense, high-security access control, and effective network access control.
- Sound management policies can be configured to help manage bandwidth so as to guarantee the bandwidth required by voice, multicast audio and video services, video on demand, and other key services.

Scenario 1

The RG-CS86 series full 10GE switches serve as convergence switches on large-sized campus networks. They provide 10G bandwidth for access devices and high-performance 40G bandwidth links from the convergence layer to the core layer, to cope with increasing information amount of access users.

Scenario 2

The RG-CS86 series full 10GE switches serve as 10G core switches on small- and medium-sized enterprise networks. The VSU technology helps simplify the network architecture and substantially improves the reliability and efficiency of the network system.



06 Ordering Information

Switch and Power Module

Model	Description
RG-CS86-20XS4VS2QXS-D	20 x 1GE/2.5GE/10GE SFP+ ports, 4 x 10GE/25GE SFP28 ports, 2 x 40GE QSFP+ ports, supporting up to 32 x 10GE ports 2 x slots for power supply modules, requiring at least one RG-PA150IB-F power module 2 x slots for fan modules, 2 x pre-installed fans (Purchase at least one RG-PA150IB-F module.)
RG-PA150I-F	150 W AC power module
RG-PA150IB-F	150 W AC power module

Note:

- 20 x 1GE/2.5GE/10GE SFP+ ports support 1GE SFP transceivers, 2.5GE SFP transceivers and 10GE SFP+ transceivers.
- 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.
- 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.

2.5GE

Model	Description
2.5G-SFP-LX03-SM1310-BIDI-I	2.5GBASE-LX, SFP transceiver, TX1310/RX1550, BiDi LC, 3 km over SMF
2.5G-SFP-LX03-SM1550-BIDI-I	2.5GBASE-LX, SFP transceiver, TX1550/RX1310, BiDi LC, 3 km over SMF

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
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(M)	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-LR4-SM1310	40GBASE-LR4, QSFP+ transceiver, 1310 nm, Duplex LC, 10 km over SMF
40G-AOC-5M	40GBASE, QSFP+ active optical cable (AOC), 5 m, including one cable and two optical transceivers
40G-AOC-10M	40GBASE, QSFP+ active optical cable (AOC), 10 m, including one cable and two optical transceivers

07 Package Contents

Package Contents

Item	RG-CS86-20XS4VS2QXS-D
Chassis	1
Fan module	2 (M1SFAN I-F)
Power supply filler panel	1
Grounding wire	1
Rubber pad	4
M4*8FMO countersunk head screw	8 (two redundant spares)
L-shaped fixed frame	1
Warranty Manual & RoHS Hazardous Substance Table	1
Introduction to Fixed Frame Installation	1
Ruijie Networks Convergence Product Management Software	1 (pre-installed)
Shipping dimensions (W x D x H)	545 mm x 500 mm x 232 mm (21.46 in. x 19.69 in. x 9.13 in.)
Shipping weight	6.40 kg (14.11 lbs)

08

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.

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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.ruijie.com/
- Online support: https://www.ruijie.com/support
- Hotline support: https://www.ruijie.com/support/hotline
- Email support: EBGITSC@ruijie.com.cn

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