RG-S8600E

Cloud Network Core Switch Series Datasheet

Ruijie RG-S8600E Switch Series is industry leading in supporting cloud data center with a broad spectrum of specialized campus network features. The RG-S8600E Series achieves cloud network integration, virtualization, and flexible deployment to fulfill the evolving next-gen cloud architecture requirements.

Ruijie brings you an innovative "Network Cloud Mode" featuring a strong core (unified gateway, authentication, multiservice) for easy and simplified access. All service channels including those of the cloud data center and cloud campus network can move to the cloud, building a true channel connecting the services and end users. The feature achieves pooling, demand-based distribution and flexible expansion of all network resources.

The two models RG-S8610E, RG-S8607E and RG-S8605E with various port densities support up to 96 full line-rate interfaces at 40GE or 384 at 10GE. The series is suitable for a wide range of deployment settings such as data center, MAN, campus network and integrated network of data center and campus network.

HIGHLIGHTS

- High Performance for Large Campus Network
- Virtualization for Demand-based Allocation
- Variety of Line Cards to Choose, Wired Wireless Integration
- Superior Reliability

PRODUCT FEATURES

Scalable Performance for Future Development

The RG-S8600E Series supports high-density 40GE ports to meet the requirements in the coming decade.
The RG-S8600E Series supports up to 170K ARP entries, handling a large amount of online users with ease.
The Series is also market leading in supporting line-rate packet forwarding. The modules including the highest-density all support 64-byte packet forwarding at line rate. The switches thereby guarantee high-speed forwarding with zero packet loss in large-scale data center.
The switches offer ultra-low latency less than 1μs to support high-speed transmission.

Virtualization for Demand-based Allocation

World's Leading Cloud Network Core

CLOS Non-Blocking Architecture[1]
Ruijie RG-S8600E Series deploys the advanced CLOS multi-plane, multi-stage architecture, which achieves complete separation of the forwarding and control planes. With independent fabric engines and control engines, it ensures all ports are running at full line rate in a non-blocking manner. The solution continues to strengthen bandwidth upgrade and business supporting capacities.
Using an orthogonal design for service modules and fabric engines, the cross-board traffic is transmitted to the fabric engines through the orthogonal connector. Ruijie RG-S8600E

Note:
[1] The RG-S8605E and RG-S8607E do not support the CLOS Non-blocking Architecture.

Series achieves zero wiring for backplane with minimized transmission loss and signal degradation. It can also improve internal transmission efficiency of the switch.

Multilevel CLOS Architecture

Advanced CLOS Architecture
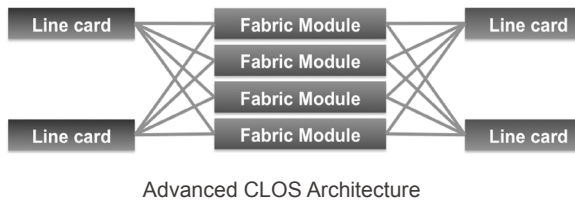
Virtual Switch Unit 3.0 (VSU)

The RG-S8600E Series supports the Virtual Switch Unit 3.0 (VSU). The technology can virtualize up to 4 physical devices into one logical unit, which largely minimizes the number of network nodes and reduce maintenance workload. Superior 50~200ms link failover ensures smooth and uninterrupted transmission of key services. The RG-S8600E Series supports cross-device link aggregation for easy double uplink to server/switch, effectively maximizing bandwidth investment return.
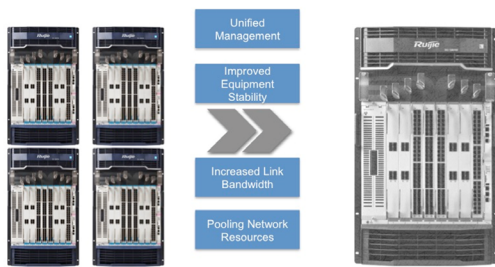

Benefits of 4-to-1 Virtualization

Virtual Switch Device (VSD)

The RG-S8600E Series support VSD in which one device can be virtualized into multiple virtual units. Each virtual unit has a unique configuration management interface and independent hardware allocation (e.g. storage, TCAM and hardware forwarding table). All the features support restart with no impact on other virtual machines. Users can realize network resource allocation based on different needs. Resources of the core switch can hence be shared with other domains and users. With the enablement of both VSU3.0 and VSD, the switches satisfactorily deliver complete resource pooling.
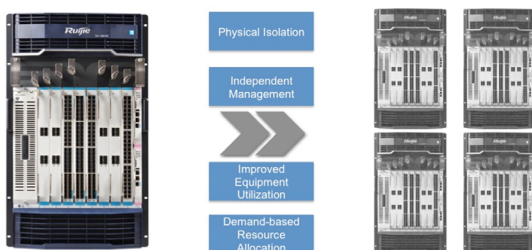
Advantages of VSD Technology

Layer 2 Generic Routing Encapsulation (L2-GRE)

With the international L2-GRE standard, the RG-S8600E switches break the geographical boundaries to achieve data center L2 communication. Data center resources at different locations can be centrally managed and allocated.

Superior Reliability

Redundant design of the RG-S8600E Series key components delivers excellent protection: control engine 1+1 redundancy, fan N+1 redundancy and power module come with N+1 and N+M redundancy for both chassis model S8605E, S8607E and S8610E. All redundant components are hot-swappable to enhance the reliability and availability of the device to the maximum extent. Hot patch is also supported to enable online upgrade of devices.
Support GR for OSPF/IS-IS/BGP and BFD for VRRP/OSPF/BGP4/ISIS/ISISv6/MPLS/static routing to enable the fast fault detection mechanism of different protocols. The feature minimizes the fault detection time to less than 50ms.

Multi-processing Modular Operating System

Since 1998, Ruijie has been investing on the R&D of modular operating system. The RG-S8600E software platform is designed based on the next-generation RGOS 11.X multi-processing modular operating system to integrate the service features such as loosely coupled firewall, wireless, IPFIX and authentication into a unified cloud network operating system. The RG-S8600E software platform also supports full virtualization and offers rich data center and campus network features. The key availability indicators such as multi-processing modules, process backup and hot patch have reached the industry-leading level.
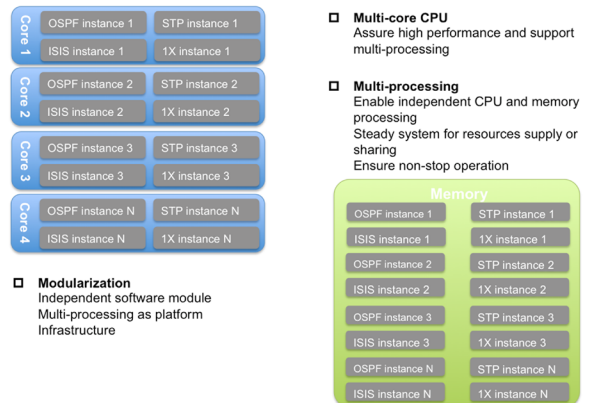
Architecture and Benefits of Multi-process Modular Operating System

Excellent Energy Efficiency

The RG-S8600E Series adopts 40nm chip technology, which is more energy efficient than the traditional 90nm and 65nm counterparts. Multi-core CPU supports dynamic power management with all fiber ports adopting non-PHY design to reduce power consumption. All Ethernet ports support the Energy-Efficient Ethernet (EEE) standard to save power under light load.
The internal system is designed for low voltage power supply with high-efficiency modular power to form a more efficient power supply system. The smart fan supports 256 speed modulations with precise temperature control, energy saving and noise control. The device can function at high temperature for a long period of time or in harsh environment. The RG-S8600E Series thereby helps clients to maximize savings on air conditioning.
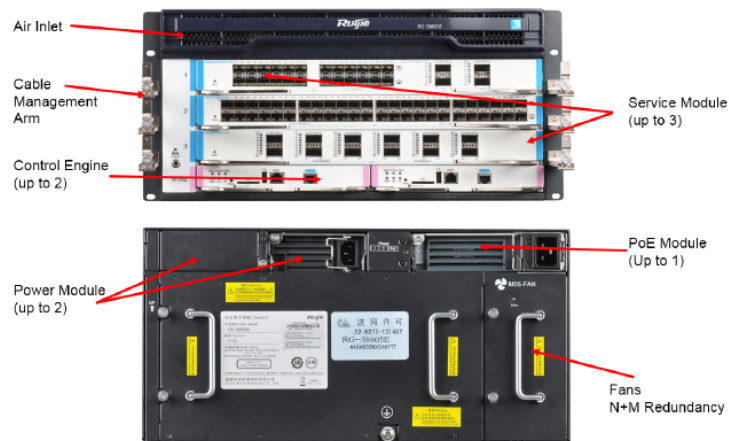
PLATFORM COMPONENTS

The Ruijie RG-S8600E platform provides high forwarding performance, high-density 10GE/100GE ports to meet application requirements of integrated data center networks and campus networks. Below is a quick hardware overview of the RG-S8600E platform:

Specifications	RG-S8605E	RG-S8607E	RG-S8610E
Dimensions (W x D x H) (mm)	442 x 595 x 219.5 (5U)	442 x 595 x 352.8 (8U)	442 x 821 x 797.3 (18U)
Number of Control Engine Slots	2	2	2
Number of Service Module Slots	3	5	8
Number of Fabric Engine Slots	NA	NA	4
Number of 10GE Ports	24 (ED module, 10GE ports) 144 (DC module, 10GE ports)	40 (ED module, 10GE ports) 240 (DC module, 10GE ports)	64 (ED module, 10GE ports) 384 (DC module, 10GE ports)
Number of 40GE Ports	36	60	96

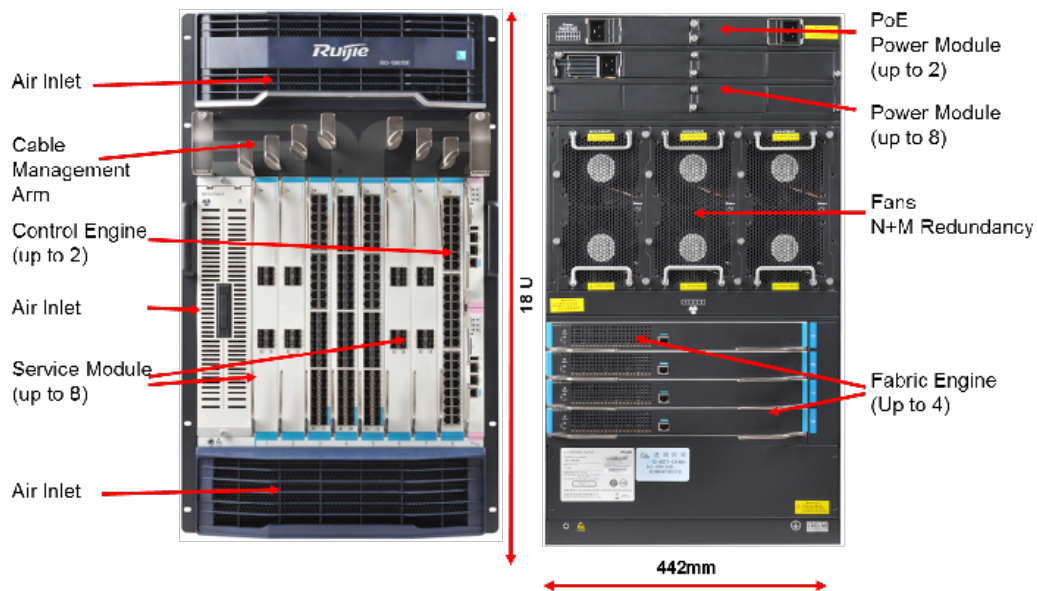## Ruijie RG-S8600E Platform Components

The Ruijie RG-S8600E platform is built using the components summarized in figure below followed by full details in latter sections.

Ruijie RG-S8605E Platform Components
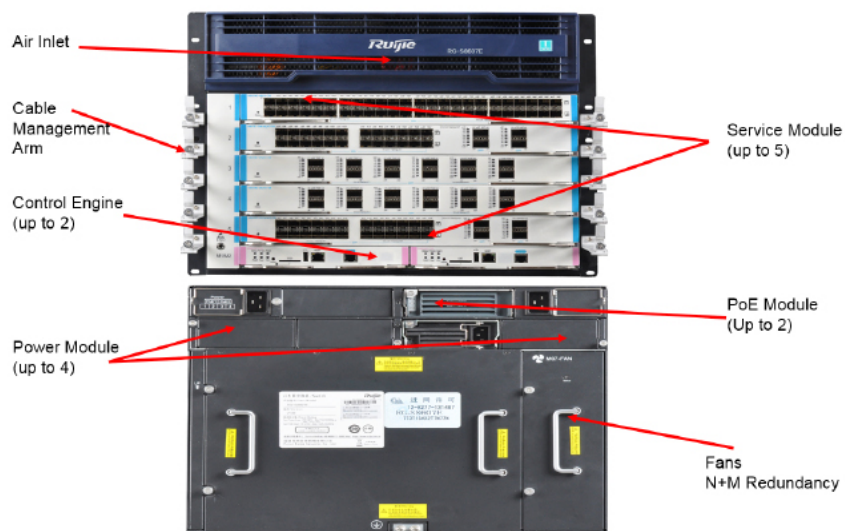
Ruijie RG-S8607E Platform Components

Ruijie RG-S8610E Platform Components

Ruijie RG-S8600E Platform Line Cards

The Ruijie S8600E platform supports a variety of line cards, all of which can be configured in any combination as shown in the table below.

Line Cards	Description
Commercial Line Cards (ED)	• Designed for Campus Network • Support for Large-Scale MAC (up to 512K) and ARP Table (up to 170K) • Support distributed IPv4, IPv6, MPLS and IPIFX • Support Next-Gen Data Center features such as VSD, VSU
Data Center Line Cards (DC)	• Designed for Data Center Network • Support for Large MAC (up to 288K) and ARP Table (up to 75K) for 40G/100G Ethernet • Support Ultra-Low Latency (i.e. <1µs) • Support distributed IPv4, IPv6, MPLS and IPIFX • Support Next-Gen Data Center features such as VSD, VSU

TECHNICAL SPECIFICATIONS

Model	RG-S8605E	RG-S8607E	RG-S8610E
Module Slots	5 (2 for control engines)	7 (2 for control engines)	10 (2 for control engines)
Fabric Engine Slots	N/A	N/A	4
Switching Capacity	22.25Tbps/88.62Tbps	37.09Tbps/147.7Tbps	59.35Tbps/236.33Tbps
Packet Forwarding Rate	720Mpps	900Mpps	3840Mpps
Number of 10GE Ports	24 (ED module, 10GE ports) 144 (DC module, 10GE ports)	40 (ED module, 10GE ports) 240 (DC module, 10GE ports)	64 (ED module,10GE ports) 384 (DC module,10GE ports)
Number of 40GE Ports	36	60	96
PoE	Support	Support	Support
ARP Table	170K(ED module) 75K(DC module)	170K(ED module) 75K(DC module)	170K(ED module) 75K(DC module)

Model	RG-S8605E	RG-S8607E	RG-S8610E
MAC Address	512K(ED module) 288K(DC module)	512K(ED module) 288K(DC module)	512K(ED module) 288K(DC module)
Routing Table Size (IPv4/IPv6)	12K/6K(ED module) 12K/6K(DC module)	12K/6K(ED module) 12K/6K(DC module)	12K/6K(ED module) 12K/6K(DC module)
Multicast Entries (IPv4/IPv6)	16K/8K(ED module) 16K/8K(DC module)	16K/8K(ED module) 16K/8K(DC module)	16K/8K(ED module) 16K/8K(DC module)
ACL Entries	7K(ED module) 8K(DC module)	7K(ED module) 8K(DC module)	7K(ED module) 8K(DC module)
VLAN	4K	4K	4K
MST	64	64	64
Maximum Aggregation Port (AP)	256	256	256
Virtual Routing and Forwarding (VRF) Instances	2K(ED module) 2K(DC module)	2K(ED module) 2K(DC module)	2K(ED module) 2K(DC module)
Device Virtualization	VSU3.0 (Virtual Switch Unit) Virtualized Bandwidth up to 2.56Tbps VSD (Virtual Switch Device)		
Network Virtualization	L2GRE (ED/DC module support)		
SDN	OpenFlow 1.0		
L2 Features	Jumbo Frame 802.1Q STP, RSTP, MSTP GVRP QinQ, flexible QinQ LLDP		
VLAN	Up to 4K 802.1q VLANs Super VLAN Protocol VLAN Private VLAN QinQ		
IPv4 Features	Static routing, RIP, OSPF, IS-IS, BGP4 VRRP Equal-cost routing Policy-based routing GRE Tunnel		
IPv6 Features	Static routing OSPFv3, BGP4+, IS-ISv6, MLDv1/v2 VRRPv3 Equal-cost routing Policy-based routing Manual tunnel, Auto tunnel, ISATAP tunnel, GRE tunnel		
Multicast	IGMP v1, v2, v3 IGMP Snooping IGMP Proxy Multicast routing protocols (PIM-DM, PIM-SM, PIM-SSM) MLD Multicast static routing		

Model	RG-S8605E	RG-S8607E	RG-S8610E
MPLS	MPLS forwarding MPLS VPN/VPLS VPWS (ED/EF/DB/DC module support)		
ACL	Standard, Extended, Expert ACL ACL 80 IPv6 ACL		
QoS	802.1p Queue scheduling mechanisms (SP, WRR, DRR, SP+WRR, SP+DRR) RED/WRED Input/output port-based speed limit		
Reliability	Independent fabric engine and control engine design which allows separation of forwarding and control planes Control engine supports 1+1 redundancy Fabric engine supports N+1 redundancy Power supply and fan support N+M redundancy Passive backplane design to avoid single point of failure Hot-swappable components Support hot patch and online patch upgrade GR for OSPF/IS-IS/BGP BFD for VRRP/OSPF/BGP4/ISIS/ISISv6/MPLS/static routing		
Security	NFPP (Network Foundation Protection Policy) CPP (CPU Protection) DAI, Port Security, IP Source Guard 802.1x Portal authentication, RADIUS and TACACS+ user login authentication uRPF Account privileges and password security policy Unknown multicasts are not delivered to CPU and support unknown unicasts suppression Support SSHv2 to provide a secure and encrypted channel for user login		
Manageability	Console/AUX Modem/Telnet/SSH2.0 command line configuration FTP, TFTP, Xmodem, SFTP file upload/download management SNMP V1/V2c/V3 RMON NTP clock Fault alarm and self-recovery System log IPFIX flow analysis		
Dimensions (W x D x H) (mm)	442 x 595 x 219.5 (5U)	442 x 595 x 352.8 (8U)	442 x 821 x 797.3 (18U)
Power Supply	RG-PA1600I: 90-180V~1200W; 180-264V~ 1600W RG-PA600I: 90-180V~ 600W; 180-264V~ 600W RG-PD1600I: -40.5VDC-75VDC ~1400W RG-PD600I: -40.5VDC-75VDC ~600W RG-PA1600I-P: 90-180V~1200W; 180-264V~ 1600W		
MTBF	213K hours	229K hours	259K hours

| Model	RG-S8605E	RG-S8607E	RG-S8610E
Temperature	Operating temperature: 0°C to 50°C Storage temperature: -40°C to 70°C		
Humidity	Operating humidity: 10% to 90% RH (non-condensing) Storage humidity: 5% to 95% RH (non-condensing)		
Operating Altitude	-500 to 5000m		
Safety	IEC 60950-1, EN 60950-1		
Emissions	EN 300 386, EN 55022/55032, EN 61000-3-2, EN 61000-3-3, EN 55024, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN 61000-4-11		

Weight and Typical Power

Below table lists maximum power consumption of the RG-S8600E switch platform.

| Component	Weight	Maximum Power
Main Chassis		
Ruijie RG-S8605E chassis with fan	20.2 kg	288W
Ruijie RG-S8607E chassis with fan	30.2 kg	432W
Ruijie RG-S8610E chassis with fan	78.66 kg	730W
Control Engine		
M8600E-CM	1.68 kg	40W
Power Supply		
RG-PA600I – 600W	1.64 kg	N/A
RG-PD600I – 600W	1.3 kg	
RG-PA1600I – 1600W	2.04 kg	
RG-PD1600I – 1400W	1.6 kg	
RG-PA1600I-PL – 1600W	1.6 kg	
Line Card & Service Module		
M8600E-44SFP4XS-ED	3.76 kg	135W
M8600E-48GT-ED	3.7 kg	95W
M8600E-24GT20SFP4XS-ED	3.76 kg	100W
M8600E-08XS-ED	3.42 kg	85W
M8600E-48GT-P-ED	4.04 kg	815W
M8600E-48XS-DC	4.25 kg	212W
M8600E-12QXS-DC	3.92 kg	200W
M8600E-24XS4QXS-DC	4.0 kg	188W
RG-S8600E-WS-ED	4.58 kg	190W

TYPICAL APPLICATIONS

Large Campus Network Core/ Aggregation
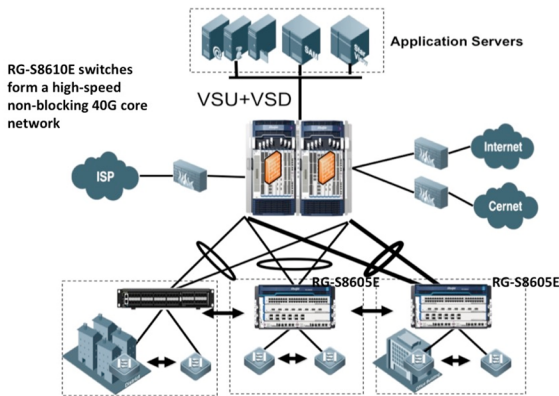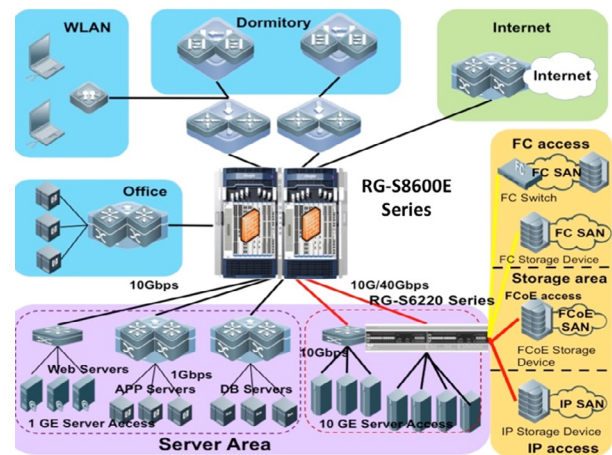

Medium/ Small-Scaled Network Core
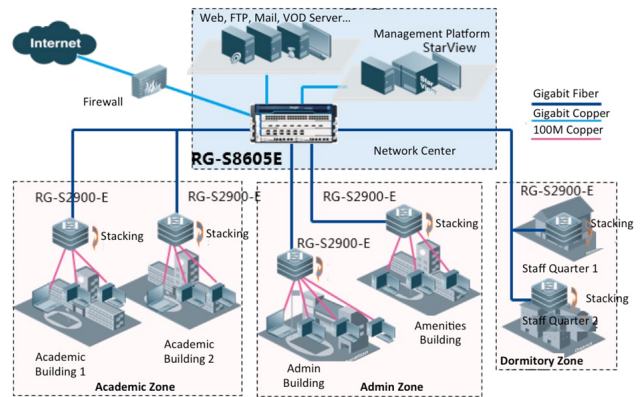
Data Center Network Core
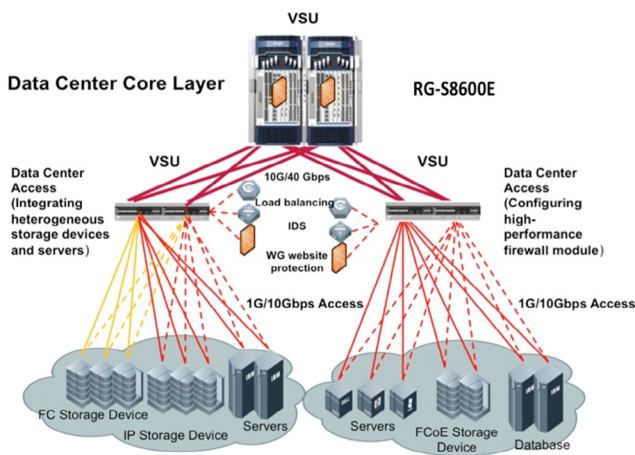
Campus Network & Data Center Network Core

ORDERING INFORMATION

1. Main Chassis & Engine Management

Select the main chassis and control engine according to specific product model.

Model	Description
RG-S8600E Series Main Chassis & Control Engine	
RG-S8610E-ISeries	10-slot Chassis with fan (without power supply)
RG-S8607E-ISeries	7-Slot Chassis with Fan (Without Power Supply)
RG-S8605E-ISeries	5-Slot Chassis with Fan (Without Power Supply)
M8600E-CM	S8600E Control Engine

2. Power Supply

Select at least 1 power module according to the power supply requirement of the device.

Model	Description
RG-PA600I	S8600E Power Module (support redundancy, AC, 600W)
RG-PD600I	S8600E Power Module (support redundancy, DC, 600W)
RG-PA1600I	S8600E Power Module (support redundancy, AC, 1600W)
RG-PD1600I	S8600E Power Module (support redundancy, DC, 1400W)
RG-PA1600I-PL	S8600E PoE power module (support redundancy, AC, 1600W)
RG-PA3000I-PL	S8600E PoE power module (support redundancy, AC, 3000W)

3. Line Card & Service Module

Select the host line cards according to your real application.

Model	Description
Commercial Line Card	
M8600E-44SFP4XS-ED	44 Gigabit Ethernet fiber ports (SFP, LC), 4-port 10GE Ethernet optical line card (SFP+, LC)
M8600E-48GT-ED	48-port Gigabit Ethernet electrical line card (RJ45)
M8600E-24GT20SFP4XS-ED	24-port Gigabit Ethernet electrical line card (RJ45), 20 Gigabit Ethernet fiber ports (SFP, LC), 4 10GE Ethernet fiber ports (SFP+, LC)
M8600E-08XS-ED	8 10GE fiber ports (SFP+, LC)
M8600E-48GT-P-ED	48-port Gigabit Ethernet line card (RJ45), support PoE and PoE+
M8600E-48XS-DC	48 10GE fiber ports (SFP+, LC)
M8600E-12QXS-DC	12 40GE fiber ports (QSFP+, MPO)
M8600E-24XS4QXS-DC	24 10GE fiber ports (SFP+, LC) + 4-port 40GE Ethernet optical line card (QSFP+, MPO)
RG-M8600E-WS-ED	WS Series Wireless Controller Module for RG-S8600E Switch Series, 2 1G/10GBASE-X SFP+ ports, 128 APs License by default, maximum 2560 APs or 4000 Wall APs License

4. Transceiver and Cable

Model	Description
Mini-GBIC-SX-MM850	1000BASE-SX mini GBIC Transceiver (850nm)
Mini-GBIC-LX-SM1310	1000BASE-LX mini GBIC Transceiver (1310nm)
Mini-GBIC-GT	1000BASE-GT mini GBIC Transceiver
Mini-GBIC-LH40-SM1310	1000BASE-LH mini GBIC Transceiver (1310nm, 40km)
Mini-GBIC-ZX50-SM1550	1000BASE-ZX mini GBIC Transceiver (1550nm, 50km)
Mini-GBIC-ZX80-SM1550	1000BASE-ZX mini GBIC Transceiver (1550nm, 80km)
Mini-GBIC-ZX100-SM1550	1000BASE-ZX mini GBIC Transceiver (1550nm, 100km)
XG-SFP-AOC1M	10GBASE SFP+ Optical Stack Cable (included both side transceivers) , 1 Meter
XG-SFP-AOC3M	10GBASE SFP+ Optical Stack Cable (included both side transceivers), 3 Meter
XG-SFP-AOC5M	10GBASE SFP+ Optical Stack Cable (included both side transceivers), 5 Meter
XG-SFP-AOC10M	10GBASE SFP+ Optical Stack Cable (included both side transceivers), 10 Meter
XG-SFP-SR-MM850	10GBASE-SR, SFP+ Transceiver (300m)
XG-SFP-LR-SM1310	10GBASE-LR, SFP+ Transceiver (10km)
XG-SFP-ER-SM1550	10GBASE-ER, SFP+ Transceiver (40km)
XG-SFP-ZR-SM1550	10GBASE-ZR, SFP+ Transceiver (80km)
40G-AOC-5M	40G QSFP+ Optical Stack Cable (included both side transceivers), 5 Meters
40G-QSFP-SR-MM850	40GBASE-SR, QSFP+ Transceiver, MM (850nm, 100m with OM3 fiber, 150m with OM4 fiber, MPO)
40G-QSFP-LSR-MM850	40GBASE-SR, QSFP+ Transceiver, MM (850nm, 100m with OM3 fiber, 300m with OM4 fiber, MPO)
40G-QSFP-LR4-SM1310	40G LR Single-mode Fiber Module, QSFP+ Transceiver, LC (1310nm)
CON-DB9/RJ45-2M	Ruijie Console Cable RJ45-to-DB9 (2m)