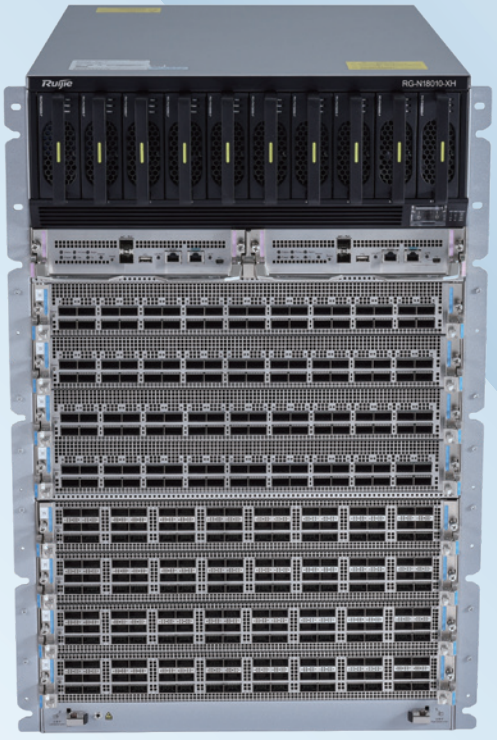


RG-N18000-XH Series
Next-Generation Core Switches

Scan QR Code
For More Enquiry

Product Pictures

RG-N18010-XH

M18000XH-36QC-CES

M18000XH-48CQ-CES

Product Overview

The RG-N18000-XH series switches are new-generation high-performance core switches launched by Ruijie Networks for data centers and Data Center Interconnect (DCI) scenarios.

Boasting the Clos direct orthogonal switching architecture, a single chassis provides up to 576 x 400GE ports or 768 x 40/100GE ports with support for line-rate forwarding, and supports long-term evolution to 800GE ports.

The RG-N18000-XH series, owing to the straight-through front-to-rear airflow design, has excellent heat dissipation capacity. Moreover, the adoption of innovative green technologies in the design also reduces the power consumption of the device by 25% when all slots are installed with 400GE line cards, making this series an ideal choice for ultra-large data center clusters.

The RG-N18000-XH series comes into two models: RG-N18018-XH and RG-N18010-XH.

Product Features

Cutting-Edge Backplane-free Design

The RG-N18000-XH series switches adopt the cutting-edge backplane-free design, in which the line cards are directly connected to switch fabric modules without engaging a backplane. Traffic is directly transmitted to the switch fabric modules for switching, thus minimizing the transmission loss and multiplying the service traffic transmission efficiency in the switch. This design also infinitely expands the performance and switching capacity of the switch, as well as significantly improves its upgradability. In the future, the device upgrade does not require chassis replacement, which provides a guarantee for future upgrade to 800 Gbps bandwidth.

Cell-based CLOS Architecture for Non-Blocking Switching

The RG-N18000-XH series switches adopt the novel CLOS multi-stage multi-plane architecture to separate the control plane from the forwarding plane. That is, the switch fabric modules and supervisor modules can be configured independently to ensure non-blocking switching at full line rate among ports in the cell-based architecture, delivering continuous bandwidth upgrade and service support capabilities.

High-Performance Core Switches for Data Centers

With the backplane-free design and rich network interface types, the RG-N18000-XH series switches can meet interface requirements in different scenarios. A single line card provides 36 x 400GE ports or 48 x 100GE ports, and supports long-term evolution to 800 GE ports.
With a height of 31 RU, RG-N18018-XH supports up to 576 x 400GE ports or 768 x 100GE ports with support for line-rate forwarding.
With a height of 16 RU, RG-N18010-XH supports up to 288 x 400GE ports or 384 x 100GE ports with support for line-rate forwarding.

Fast Deployment of an Overlay Network

Each RG-N18000-XH series switch provides up to 16M virtual extensible local area network (VXLAN) subnets, which meets requirements for building overlay networks. This solves the issues of VLAN insufficiency and scalability challenges of traditional data center networks.
By leveraging the RG-N18000-XH series switches, you can segment new subnets (overlay networks) without changing the physical topology, eliminating concerns about IP address and broadcast domain limitations on the physical network.

Fast Expansion of a 2-Tier Layer Network

The VXLAN technology encapsulates Layer 2 packets into User Datagram Protocol (UDP) packets and establishes a logical Layer 2 network on top of a Layer 3 network. The RG-N18000-X series switches support Ethernet Virtual Private Network (EVPN), providing automatic discovery and authentication for VXLAN Tunnel End Points (VTEPs). This reduces flooding on the VXLAN data plane, eliminates the need for underlying multicast services, simplifies VXLAN deployment, and enhances the efficiency of large Layer 2 network construction. This addresses the Layer 2 interconnection requirements of large data center networks and dual-active data centers.

Segment Routing, Making Networks More Intelligent

SR-MPLS
The RG-N18000-XH series switches support Segment Routing MPLS (SR-MPLS), which makes path selection more flexible. The forwarding path can be specified at the ingress node, coping with path planning requirements of users.

SRv6
SRv6 is a future-oriented next-generation network protocol designed for seamless integration with IPv6 networks. It supports a vast number of addresses, accommodating the needs of numerous tenants. The SRv6 feature allows for the definition of forwarding paths based on segment lists, enabling flexible routing to meet user requirements for service path planning.

Data Center-Level HA Design

Redundancy design
The RG-N18000-XH series switches support N+1 switch

fabric module redundancy, 1+1 supervisor module redundancy, N+M power module redundancy, and 2+1 fan tray redundancy. All power modules and fan modules can be hot-swapped without affecting the normal operation of the device. Dual power inputs enhance the stability and reliability of the whole system. The switch provides fault detection and alarm feature for power modules and fans, realizing automatic adjustment of fan speed based on temperature change to better adapt to the environment in data centers. The device also supports device-level and link-level reliability protection as well as overcurrent protection, overvoltage protection, and overheating protection.

BFD

The RG-N18000-XH series switches support bidirectional forwarding detection (BFD) for Virtual Router Redundancy Protocol (VRRP), Border Gateway Protocol (BGP), Intermediate System to Intermediate System (IS-IS), Routing Information Protocol (RIP), Open Shortest Path First (OSPF), and static routing, and implement fast protection switching and fast convergence of protocols through linkage with protocols on the control plane.

MACSec for Hardware-Level Data Encryption

The RG-N18000-XH series switches support MACSec, which provides users with MAC-layer data encryption, data frame integrity check, and data source authenticity check to ensure security.

400GE ZR Optical Transceiver, Reducing Data Center Networking Costs

The RG-N18000-XH series switches support the interconnection of 400GB ZR modules, achieving a transmission distance of up to 80 km. This simplifies long-distance DCI and significantly reduces DCI costs.

Technological Innovation, Energy Saving and Consumption Reduction

The backplane-free design of the RG-N18000-XH series switches guarantees excellent heat dissipation through the direct air ducts of the switch. This heat dissipation design perfectly matches the direction of airflow in the data center server room, forming a high-speed and smooth airflow passing through the front and rear boards. This allows more cold air to enter the switches for heat dissipation, effectively reduces device temperature, and avoids excessive power consumption. In addition, the front panel adopts a high-density vent design, which increases the air inlet vent area at the bend. With the high porosity rate of up to 60% on the front panel, the air inlet amount is significantly improved. The fans support intelligent speed adjustment for different zones and temperature control, which can accurately control the temperature of components, improving the switch's reliability by 30%.

The RG-N18000-XH series switches adopt vapor chambers and phase-change thermal interface material (TIM) technologies, which reduce the temperature by over 15°C and improve the board reliability by 20% compared with traditional heat pipe radiators and TIM technologies.

The RG-N18000-XH series switches are equipped with platinum-level power modules whose power conversion efficiency is as high as 94%. Moreover, the PHY chip-free design of 400 GE line cards greatly reduces the power consumption of a single board. The low-impedance copper bar design lowers the power distribution loss to less than 0.3%.

Technical Specifications

Hardware Specifications

System

System	RG-N18018-XH	RG-N18010-XH
Switching Capacity	1,290 Tbps/3,870 Tbps	645 Tbps/1,935 Tbps
Packet Forwarding Rate	691,200 Mpps	345,600 Mpps

Slots

Slots	RG-N18018-XH	RG-N18010-XH
Module Slots	18 (2 for supervisor modules)	10 (2 for supervisor modules)
Switch Fabric Module Slots	8	8
Fan module	Three fan module slots	Three fan module slots
Power module	Twenty power module slots	Ten power module slots

Dimensions and Weight

Dimensions and Weight	RG-N18018-XH	RG-N18010-XH
Dimensions (W x D x H)	Without cable management brackets: 442 mm x 1,052 mm x 1,345 mm (17.40 in. x 41.42 in. x 52.95 in., 31 RU) With cable management brackets: 442 mm x 1,091 mm x 1,345 mm (17.40 in. x 42.95 in. x 52.95 in., 31 RU)	Without cable management brackets: 442 mm x 896 mm x 708 mm (17.40 in. x 35.28 in. x 27.87 in., 16 RU) With cable management brackets: 442 mm x 935 mm x 708 mm (17.40 in. x 36.81 in. x 27.87 in., 16 RU)
Weight	186 kg (410.06 lbs., including the fan)	96.4 kg (212.53 lbs., including the fan)

Power Supply and Consumption

Power Supply and Consumption	RG-N18018-XH	RG-N18010-XH
Power Supply	RG-PAH3000I-F: • AC: 100 V AC to 176 V AC, power: 1,500 W • AC: 176 V AC to 240 V AC, power: 3,000 W • HVDC: 240 V DC to 380 V DC, power consumption: 3,000 W	
Airflow direction	Front-to-rear	
Maximum Power Consumption	38,900 W	18,760 W

Environment and Reliability

Environment and Reliability	RG-N18018-XH	RG-N18010-XH
MTBF	299,446 hours	312,683 hours
Operating Temperature	0°C to 40°C (32°F to 104°F)	
Storage Temperature	–40°C to +70°C (–40°F to +158°F)	
Operating Humidity	10% RH to 90% RH (non-condensing)	

Slots	RG-N18018-XH	RG-N18010-XH
Storage humidity	5% to 95% RH (non-condensing)	
Altitude	• Operating altitude for long-term working conditions: up to 5000 m (16404.20 ft.). At 1800 m (5905.51 ft.), the maximum operating temperature is 40°C (104°F). The maximum operating temperature decreases by 1°C (1.8°F) per 200 m (656.16 ft.) increase in altitude. • Operating altitude: up to 5,000 m (16404.20 ft.) • Storage altitude: up to 5,000 m (16404.20 ft.)	

Software Specifications

Software Specifications	RG-N18018-XH	RG-N18010-XH
Traffic Analysis	sFlow IPFIX	
Layer 2 Features	Jumbo frame IEEE 802.3ad (static link aggregation, LACP, cross-card link aggregation, cross-device link aggregation) IEEE 802.1Q STP, RSTP, MSTP GVRP QinQ LLDP Static MAC addresses, address filtering, and limit on the number of MAC addresses	
IPv4 Features	Static routing, RIP, OSPF, IS-IS, and BGP4 VRRP ECMP Policy-based routing Manual tunnel and GRE tunnel	
IPv6 Features	Static routing, OSPFv3, BGP4+, IS-ISv6, and MLDv1/v2 VRRPv3 ECMP Policy-based routing Path MTU Discovery Manual tunnel and GRE tunnel Pingv6, telnetv6, FTPv6, TFTPv6, DNSv6, ICMPv6	
Multicast	IGMP v1/v2/v3 IGMP snooping IGMP proxy PIM-DM, PIM-SM, PIM-SSM, and other multicast routing protocols MLDv1, MLDv2 Multicast static routing Fast leave	

Software Specifications	RG-N18018-XH	RG-N18010-XH
MPLS	MPLS L3VPN MPLS LDP #SR MPLS (Segment Routing) #SR-TE	
ACL	Standard, extended, and expert-level ACLs Global ACLs Ingress and egress ACLs IPv6 ACLs	
QoS	Mapping of IEEE 802.1p, DSCP, and ToS priorities Priority marking/remarking Multiple queue scheduling mechanisms, including SP(PQ), DRR, SP(PQ) + DRR, WFQ, SP(PQ) + WFR, Congestion avoidance mechanisms such as RED and WRED ACL Ingress and egress rate limiting, CAR #MPLS QoS	
Data center features	#SRv6 VXLAN bridge VXLAN gateway BGP-EVPN VXLAN VXLAN mapping IPv6 VXLAN over IPv4 MLAG	
SDN	OpenFlow 1.3.	
Reliability	Independent switch fabric modules and independent supervisor modules to implement thorough separation of the forwarding plane from the control plane 1+1 redundancy for supervisor modules N+1 redundancy for switch fabric modules N+M redundancy for power modules and fans Backplane-free design to avoid single point of failures Hot swapping of components Hot patch function and online installation of patches BPDU Guard/Loop Guard/Root Guard NSR DLDP FRR GR for OSPF/IS-IS/BGP BFD for VRRP/OSPF/BGP4/ISIS/ISISv6/static routing	
Device virtualization	Virtual Switching Unit 3.0	
Security	MACSec Network Foundation Protection Policy (NFPP) and CPU protection policy (CPP) to prevent protocol packet attacks Prevention against DDoS, ARP, and ICMP attacks DAI, port security, IP source guard, and port protection uRPF	

Software Specifications	RG-N18018-XH	RG-N18010-XH
Security	RADIUS and TACACS user login authentication, password security, hierarchical user management, and password protection Source IP address restriction Function of not sending unknown multicast packets to the CPU Suppression of unknown multicast, unknown broadcast, and unknown multicast packets SSHv2, providing encrypted security channels for user login Prevention against MAC address flapping Plaintext and MD5 ciphertext authentication for OSPF, RIPv2, and BGP4 packets	
Management	Console/AUX Modem/Telnet/SSH2.0 CLI configuration FTP, TFTP, Xmodem, and SFTP SNMP V1/V2c/V3 NETCONF RMON NTP clock Fault alarm and auto-recovery System operation logging Traffic analysis Zero-touch provisioning (ZTP) Reliable network service (RNS), which probes specific services provided by the peer device to monitor the service availability Telemetry Buffer status monitoring and traffic microburst identification Port mirroring, traffic mirroring, and ERSPAN Physical ports on all line cards support the routing mode and IP addresses can be configured independently. Monitoring of fan modules and power modules	

* indicates that the feature will be available in the future.
# indicates that the feature is supported by only CE cards.

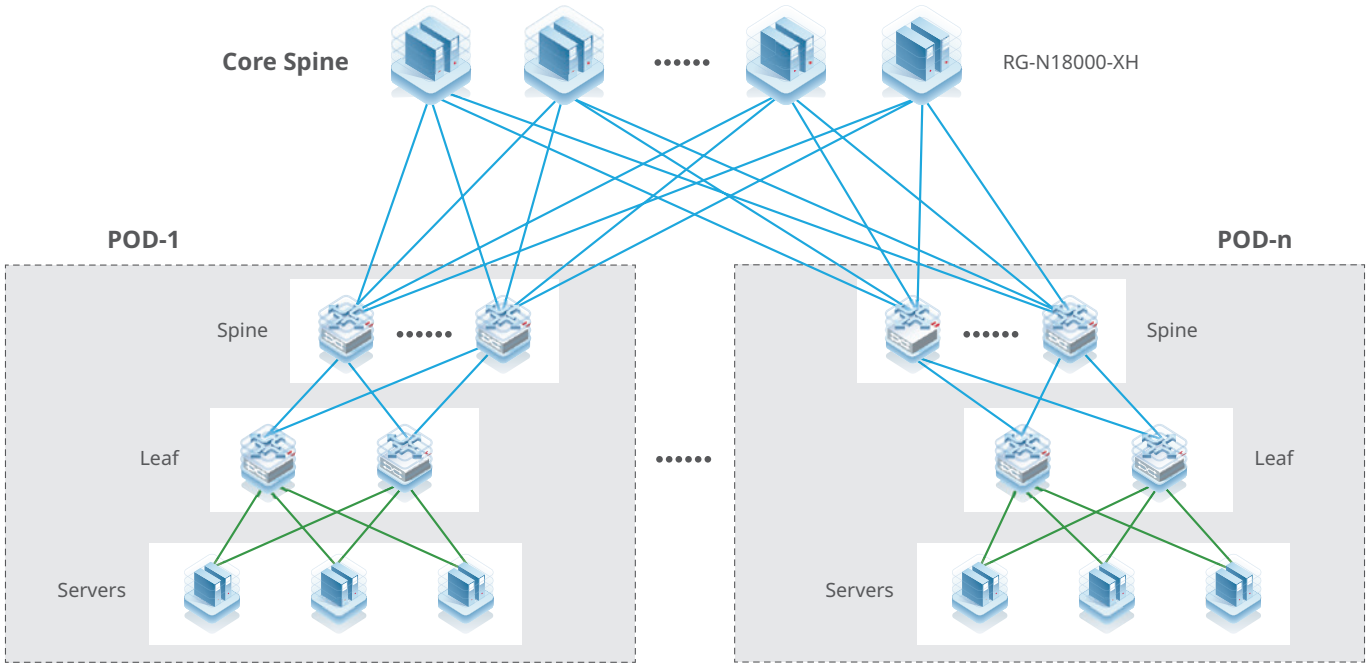
Safety and Regulatory Compliance

Specification	RG-N18010-XH
Safety	• IEC 62368-1 • EN IEC 62368-1 • GB 4943.1
Electromagnetic Compatibility (EMC)	• EN 55032 • EN 55035 • EN IEC 61000-3-2 • EN 61000-3-3 • EN 300 386 V2.2.1 • GB/T 9254.1
Environment	• 2011/65/EU EN 50581 • 2012/19/EU EN 50419 • (EC) No.1907/2006 • GB/T 26572

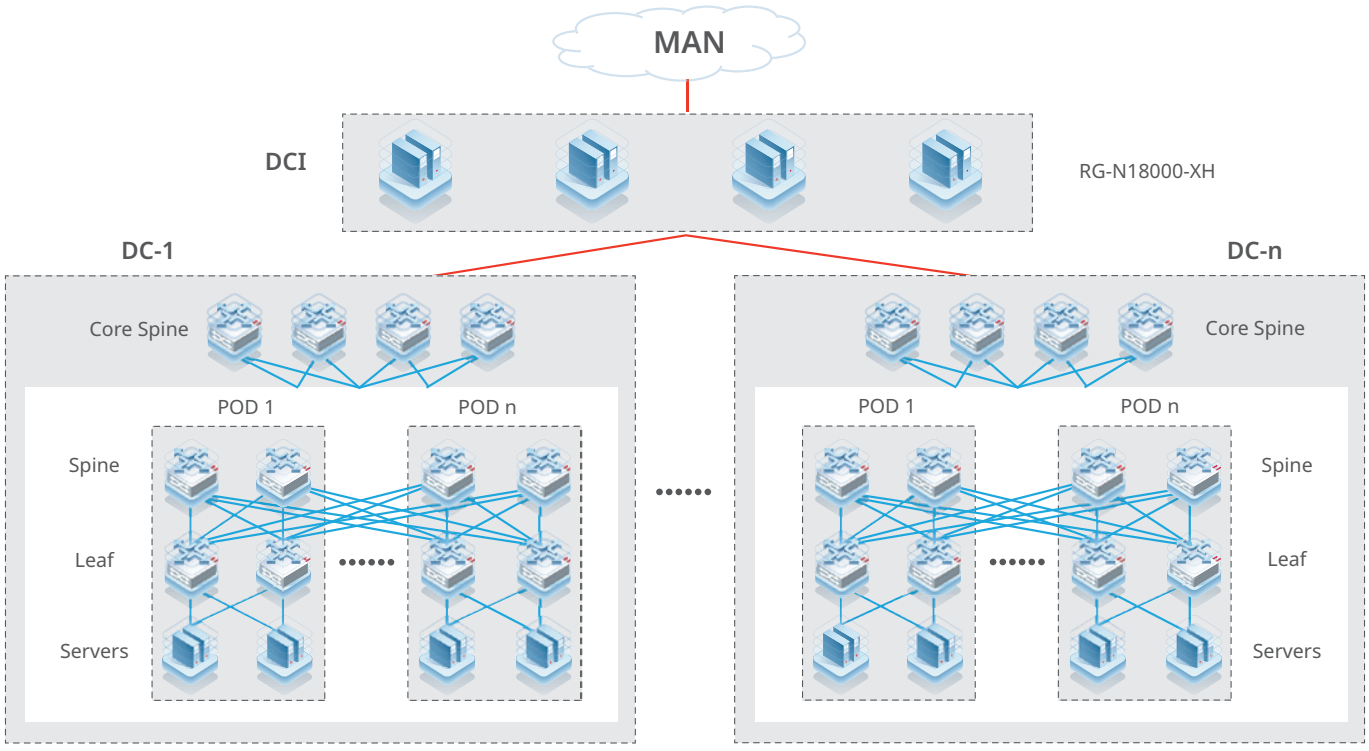
*For more country-specific regulatory information and approvals, contact your local sales agency.

Typical Applications

Serving as Core Devices in Large Data Center Networks



Ultra-Large DCI



Ordering Guide

Take the following steps to order an RG-N18000-XH series switch:

- Select the switch and supervisor module.
- Select the line cards and switch fabric modules based on the service requirements. If redundancy is required, you are advised to install all switch fabric modules for N+1 bandwidth redundancy.
- Select the power modules based on the power requirements of the entire device. (N+1 redundancy is recommended at a minimal level.)

Ordering Information

Chassis and Supervisor Modules

Model	Description
RG-N18018-XH	RG-N18018-XH chassis, excluding power modules, with all fans
RG-N18010-XH	RG-N18010-XH chassis, excluding power modules, with all fans
M18000XH-CM	M18000XH-CM supervisor module

Power Modules

Model	Description
RG-PAH3000I-F	3000 W AC power module (AC and 240 V to 380 V HVDC)

Switch Fabric Modules

Model	Description
M18018XH-FE-E IV	Type-E switch fabric module II for RG-N18010-XH, used together with CE cards
M18010XH-FE-E II	Type-E switch fabric module II for RG-N18010-XH, used together with CE cards

Line Cards

Model	Description
M18000XH-36QC-CES	Line card with 36 x 400GE QSFP-DD ports, used together with Type-E switch fabric modules
M18000XH-48CQ-CES	Line card with 48 x 400GE QSFP28 ports, used together with Type-E switch fabric modules

400GBASE Series Optical Transceivers

Model	Description
400G-QDD-DR4-SM1310	400G DR4 transceiver, QSFP-DD form factor, MPO-12 APC, 1310 nm, 500 m (1,640.42 ft.) over SMF
400G-QDD-FR4-SM1310	400G FR4 transceiver, QSFP-DD form factor, Duplex LC, 1310 nm, 2 km (6,561.68 ft.) over SMF
400G-QDD-ZR-SM1550	400G ZR transceiver, QSFP-DD form factor, Duplex LC, 1550 nm, 80 km (262,467.19 ft.) over SMF
400G-QDD-ZR+-SM1550	400G ZR+ transceiver, QSFP-DD form factor, Duplex LC, tunable wavelength, P2P distance of up to 120 km (393,700.79 ft.) over SMF
400G-QDD-SR8-MM850	400G SR8 module, QSFP-DD form factor, MPO-16 APC, 850 nm, 100 m (328.08 ft.) over MMF

100GBASE Series Optical Transceivers

Model	Description
100G-QSFP-LR4-SM1310	100G LR4 transceiver, QSFP28 form factor, Duplex LC, 1310 nm, 10 km (32,808.40 ft.) over SMF
100G-QSFP-iLR4-SM1310	100G iLR4 transceiver, QSFP28 form factor, Duplex LC, 1310 nm, 2 km (6,561.68 ft.) over SMF
100G-QSFP-ER4-SM1310	100G ER4 transceiver, QSFP28 form factor, Duplex LC, 1310 nm, 40 km (131,233.59 ft.) over SMF
100G-QSFP-SR-MM850	100G SR transceiver, QSFP28 form factor, MPO, 850 nm, 100 m (328.08 ft.) over MMF
100G-AOC-5M	100G AOC cable, QSFP28 form factor, 5 m (16.40 ft.)
100G-AOC-10M	100G AOC cable, QSFP28 form factor, 10 m (32.81 ft.)

40GBASE Series Optical Transceivers

Model	Description
40G-QSFP-LX4-SM1310	40G LX4 transceiver, QSFP+ form factor, Duplex LC connector, 150 m (492.13 ft.) over OM3/OM4 MMF, or 2 km (6,561.68 ft.) over SMF
40G-QSFP-LR4-SM1310	40G LR4 transceiver, QSFP+ form factor, Duplex LC, 10 km (32,808.40 ft.) over SMF
40G-QSFP-iLR4-SM1310	40G iLR4 transceiver, QSFP+ form factor, Duplex LC, 2 km (6,561.68 ft.) over SMF
40G-QSFP-LSR-MM850	40G LSR transceiver, QSFP+ form factor, MPO, 400 m (1,312.34 ft.) over MMF
40G-QSFP-SR-MM850	40G SR transceiver, QSFP+ form factor, MPO, 150 m (492.13 ft.) over MMF

Model	Description
40G-AOC-30M	40G AOC cable, QSFP+ form factor, 30 m (98.43 ft.)
40G-AOC-5M	40G AOC cable, QSFP+ form factor, 5 m (16.40 ft.)

25GBASE Series Optical Transceivers

Model	Description
VG-SFP-AOC5M	25G AOC cable, SFP28 form factor, 5 m (16.40 ft.)
VG-SFP-SR-SM850	25G SR transceiver, SFP28 form factor, LC, 850 nm, 100 m (328.08 ft.) over MMF
VG-SFP-LR-SM1310	25G LR4 transceiver, QSFP28 form factor, LC, 1310 nm, 10 km (32,808.40 ft.) over SMF

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.

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