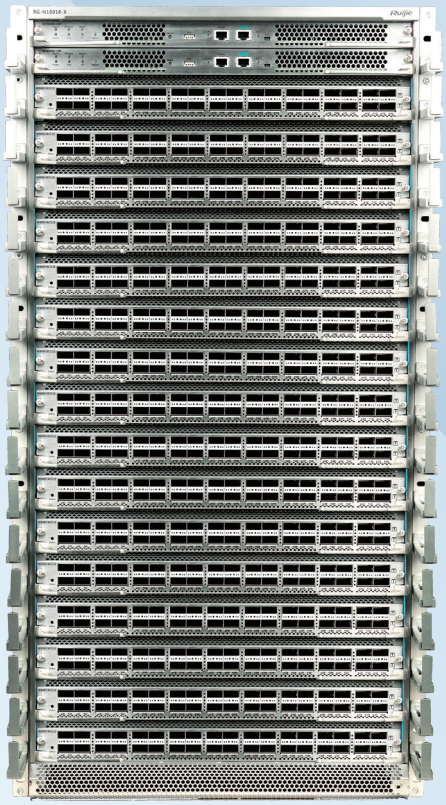
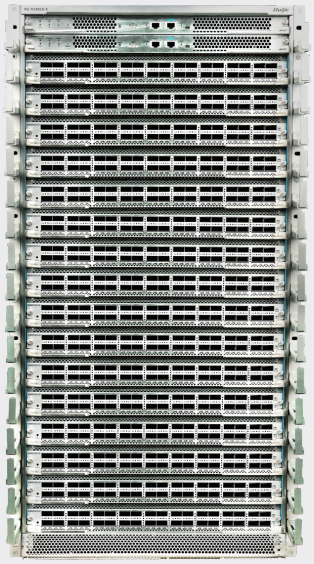


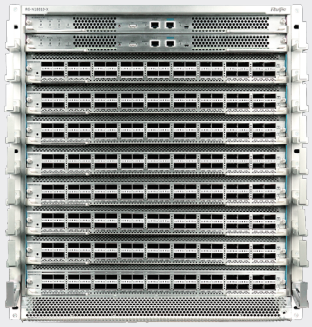
RG-N18000-X
Data Center Switch Datasheet

Scan QR Code
For More Enquiry

Product Pictures



RG-N18018-X



RG-N18010-X

RG-N18006-X

Product Overview

Ruijie Networks Newton 18000-X ("RG-N18000-X" for short) series switches are next-generation high-performance core switches released by Ruijie Networks for cloud architecture networks. The switches are the trailblazer of the midplane-free technology on the 100 Tbps switching platform. While providing efficient and stable switching services, the RG-N18000-X series switches support continuous smooth network upgrade in the next 10 years.

The RG-N18000-X series switches utilize the advanced hardware architecture design and are one of the core switches with top configurations in the industry. Adopting the advanced CLOS direct orthogonal switching architecture, a single chassis supports up to 384 × 400GE, 768 × 100GE, 576 × 40GE, and 2304 × 10GE ports with full line rate. The switches meet the design requirements of the spine-leaf three-tier network architecture.

The RG-N18000-X series switches adopt the straight-through front-to-rear ventilation design to meet the heat dissipation requirements of data centers. The front-to-rear ventilation brings higher heat dissipation efficiency, and achieves the same heat dissipation effect with lower fan speed and fewer fans while reducing the noise generated during the device running. In addition, the switches incorporate a variety of innovative green energy-saving technologies to substantially reduce the power consumption.

The portfolio of RG-N18000-X includes RG-N18006-X, RG-N18010-X, and RG-N18018-X, which can be deployed in Internet data centers and campus data centers based on service requirements.

Product Features

Cutting-Edge Midplane-free Design on the 100T Switching Platform

Among switches providing 100 Tbps switching capacity, RG-N18000-X series switches are the trailblazer of the midplane-free technology, which directly interconnects service line cards to switch fabric modules, without the midplane. In this way, inter-card traffic is directly transmitted to switch fabric modules for switching, which minimizes the transmission loss and doubles the service traffic transmission efficiency inside the switches. Moreover, this technology remarkably increases switches' performance and switching capacity, thereby substantially expanding the device capacity. Even if the switches are upgraded in the future, the chassis does not need to be replaced, bringing more than 10 years of service lifecycle to data center customers in the future.

Cell-based CLOS Architecture for Non-Blocking Switching

The RG-N18000-X series switches use the new CLOS multi-tier multi-plane switching architecture to implement thorough separation of the forwarding plane from the control plane. That is, switch fabric modules and supervisor modules can be configured independently. The cell-based switching architecture (asynchronous transfer mode) ensures full line rate switching without blocking between ports, providing capabilities of continuous bandwidth upgrade and service support.

Global High-Performance Core Switches for Data Centers

The RG-N18000-X series switches adopt the midplane-free design and provide abundant network port types to meet port requirements in different scenarios. A single line card can provide 48 × 100GE ports, 36 × 40GE ports, and 144 × 10GE ports.

RG-N18018-X, with a height of 21 RU, supports a maximum of 384 × 400GE, 768 × 100GE, 576 × 40GE, and 2304 × 10GE line-rate ports, with the port density 20% higher than that of counterparts in the industry.

RG-N18010-X, with a height of 12 RU, supports a maximum of 192 × 400GE, 384 × 100GE, 288 × 40GE, and 1152 × 10GE line-rate ports, with the port density 20% higher than that of counterparts in the industry.

RG-N18006-X, with a of 7 RU, supports a maximum of 144 × 100GE, 144 × 40GE, and 576 × 10GE line-rate ports, implementing the high density of up to 100 Gbps withfewer slots.

The RG-N18000-X series switches, serving as the gateways of large layer-2 networks, support more than 500,000 virtual machines (VMs). The switches use the latest graphics double data rate 5 (GDDR5) synchronous dynamic random-access memory (SDRAM) to provide the ultralarge buffer capacity of 24 GB per card. They also integrate the distributed buffer technology to increase the buffer capacity by 33% in comparison with similar products in the industry. The switches can buffer burst traffic of large-scale VMs in data centers more efficiently and greatly reduce the packet loss rate on the network, thereby improving the service processing performance of data centers.

On-demand Resource Allocation in Data Centers Based on Virtualization

The industry-leading virtual switching unit (VSU) 3.0 enables the switches to provide the best device virtualization capability and support ultralarge virtualized bandwidth and out-of-band management. VSU 3.0 can virtualize multiple physical devices into one logical device for unified O&M, which substantially reduces network nodes and lowers network O&M management personnel's workload. The RG-N18000-X series switches can implement fast switchover within 50 ms to 200 ms upon a link failure and ensure uninterrupted transmission of key services, thereby enhancing network reliability. The inter-device link aggregation feature implements dual active uplinks for access servers and switches and doubles the bandwidth of effective connections.

Fast Building of an Overlay Network in a Data Center

Each of the RG-N18000-X series switches can provide a maximum of 16M virtual extensible local area network (VXLAN) network segments, which meets requirements

for overlay network building in data centers. The switches solve the problems of insufficient VLANs and scale expansion on conventional data center networks.
On a basic network constructed using RG-N18000-X series switches, new subnets can be divided based on the overlay network without changing the physical topology, and the limitations of physical IP addresses and broadcast domain do not need to be considered.

Fast Expansion of an L2 Network in a Data Center

The VXLAN technology encapsulates L2 packets into User Datagram Protocol (UDP) packets and allows you to establish a logical L2 network on an L3 network. The RG-N18000-X series switches support the Ethernet virtual private network (EVPN) technology, which provides the VXLAN tunnel end point (VTEP) automatic discovery and authentication, reduces flooding on the VXLAN data plane, avoids the dependence of the VXLAN on underlying deployed multicast services, simplifies VXLAN deployment, and improves the efficiency of building large L2 networks. The switches better meet the L2 interconnection requirements of large L2 networks in data centers and dual-active data centers.

Technological Innovation, Energy Saving, and Consumption Reduction

The RG-N18000-X series switches adopt the midplane-free design, which achieves straight-through front-to-rear ventilation. The ventilation is perfectly in line with the airflow direction in data center equipment rooms, and high-speed unobstructed airflow that passes through the front and rear cards forms, with the air speed as high as 15 m/s, greatly improving the heat dissipation efficiency. More cool air can go into the chassis, which effectively reduces device temperature and avoids excessive power consumption. In addition, the 30° design between the front panel and port panel provides an opening rate of 106% in comparison with the vertical plane, effectively increasing the air intake.
The RG-N18000-X series switches employ the smart counter rotating fans, which combine two different fan blades to meet requirements for both the air volume and pressure. The different number of fan blades on both sides can stagger the vibration frequency from the noise frequency, to avoid resonance. Compared with the series connection of conventional axial fans (increasing air pressure only), the fans are advantageous in air volume and allow regulating the fan speed in different areas to reduce the power consumption of the devices.
The RG-N18000-X series switches use the efficient titanium-level power supply in the industry, making the power supply conversion efficiency up to 96%. Meanwhile, the 100G line card adopts the design of no PHY chip, reducing the power consumption of the card by more than 5.63%. The low-impedance copper bar design lowers the power distribution loss to less than 0.3%.

Technical Specifications

Hardware Specifications

Hardware Specifications	RG-N18018-X	RG-N18010-X	RG-N18006-X
Module slots	18 (2 for supervisor modules)	10 (2 for supervisor modules)	6 (2 for supervisor modules)
Switch fabric module slots	6	6	6
Fan module	Three fan module slots	Three fan module slots	Three fan module slots
Power module	Sixteen power module slots	Eight power module slots	Four power module slots

Hardware Specifications	RG-N18018-X	RG-N18010-X	RG-N18006-X
Switching capacity	307.2 Tbps	153.6 Tbps	28.8 Tbps
Packet forwarding rate	69,120 Mpps	34,560 Mpps	17,280 Mpps
Large buffer	Ultralarge distributed buffer design and 200 ms buffer for each port to prevent packet loss in burst traffic		
Dimensions(W × D × H)	Without cable management brackets: 442 mm x 961 mm x 934.5 mm (17.40 in. x 37.83 in. x 36.79 in., 21 RU) With cable management brackets: 442 mm x 1017 mm x 934.5 mm (17.40 in. x 40.03 in. x 36.79 in., 21 RU)	Without cable management brackets: 442 mm x 961 mm x 534 mm (17.40 in. x 37.83 in. x 21.02 in., 12 RU) With cable management brackets: 442 mm x 1017 mm x 534 mm, (17.40 in. x 40.03 in. x 21.02 in., 12 RU)	Without cable management brackets: 442 mm x 893 mm x 308.4 mm (17.40 in. x 35.16 in. x 12.14 in.,7 RU) With cable management brackets: 442 mm x 956 mm x 308.4 mm (17.40 in. x 37.64 in. x 12.14 in.,7 RU)
Weight	120.88 kg (including the fan)	52 kg (including the fan)	49 kg (including the fan)
Power supply	RG-PA2700I: AC: 100 V AC to 240 V AC HVDC: 192 V DC to 350 V DC		RG-PA3000I-F: AC: 100 V AC to 240 VAC HVDC: 192 V DC to 350 V DC
Ventilation type	Front-to-rear ventilation		
MTBF	≥ 200,000 hours		
Operating temperature	0°C to 40°C (32°F to 104°F)		0°C to 45°C (32°F to 113°F)
Storage temperature	–40°C to +70°C (–40°F to +158°F)		
Operating humidity	10% to 90% RH (non-condensing)		
Storage humidity	5% to 95% RH (non-condensing)		
Working altitude	up to 5000 m (16404.19 ft.)		

Software Specifications

Software Specifications	RG-N18018-X	RG-N18010-X	RG-N18006-X
Device virtualization	Virtual Switching Unit 3.0		

Software Specifications	RG-N18018-X	RG-N18010-X	RG-N18006-X
Data center features	VXLAN bridge VXLAN gateway BGP-EVPN VXLAN VXLAN mapping IPv6 VXLAN over IPv4 M-LAG		
SDN	OpenFlow 1.3.		
Traffic analysis	sFLOW IPFIX NetFlow		
L2 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		
IPv6 features	Static routing, OSPFv3, BGP4+, IS-ISv6, and MLDv1/v2 VRRPv3 ECMP Policy-based routing Pingv6, Telnetv6, FTPv6, TFTPv6, DNSv6, ICMPv6		
Multicast	IGMP v1/v2/v3 IGMP Snooping IGMP Proxy MLDv1, MLDv2 Multicast static routing Fast leave		
ACL	Standard, extended, and expert-level ACLs Global ACLs Ingress/Egress ACLs IPv6 ACLs		
QoS	Mapping of IEEE 802.1p, DSCP, and ToS priorities Priority marking/remarking Multiple queue scheduling mechanisms, including SP, WRR, DRR, SP+WRR, and SP+DRR Congestion avoidance mechanisms such as RED and WRED Port-based rate limit		

Software Specifications	RG-N18018-X	RG-N18010-X	RG-N18006-X
Reliability	Independent switch fabric modules and independent supervisor engines 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 supply modules and fan modules Midplane-free design to avoid single point of failures Hot swapping of components Hot patching BPDU guard/Loop guard/Root guard ISSU NSR DLDP FRR Micro-segmentation security isolation GR for OSPF/IS-IS/BGP BFD for VRRP/OSPF/BGP4/ISIS/ISISv6/static routing		
Security	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 protected ports uRPF 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 ITU-T Y.1731 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 supply modules		

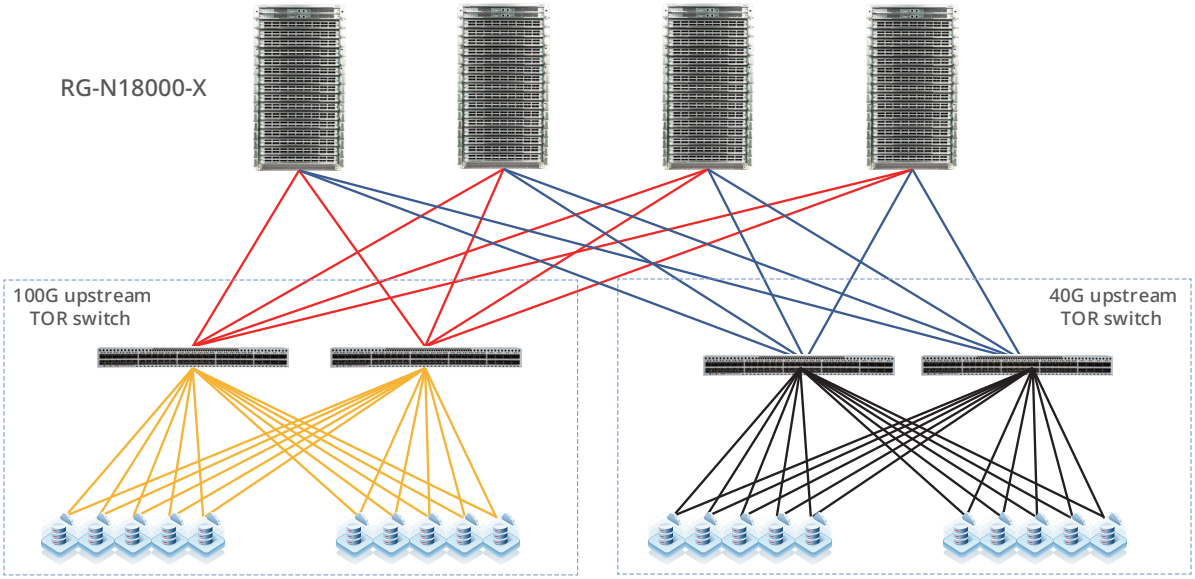
Safety and Regulatory Compliance

Specification	RG-N18018-X	RG-N18010-X	RG-N18006-X
Safety	• GB 4943.1	• GB 4943.1	• EN 62368-1 • IEC 62368-1 • NM EN 62368-1 • NM CEI 62368-1 • UL 62368-1 • CSA C22.2#62368-1 • GB 4943.1
Electromagnetic Compatibility (EMC)	• VCCI-CLSPR 32 • GB/T 9254.1	• VCCI-CLSPR 32 • GB/T 9254.1	• EN 55032 • EN IEC 61000-3-2 • NM EN CEI 61000-3-2 • EN 61000-3-3 • NM EN 61000-3-3 • EN 55035 • NM EN 55035 • ETSI EN 300 386 • FCC CFR Title 47, Part 15, Subpart B • ANSI C63.4-2014 • ICES-003 Issue 7 • GB/T 9254.1
Environment	• 2011/65/EU EN 50581 • 2012/19/EU EN 50419 • (EC) No.1907/2006 • GB/T 26572	• 2011/65/EU EN 50581 • 2012/19/EU EN 50419 • (EC) No.1907/2006 • GB/T 26572	• 2011/65/EU EN 50581 • 2012/19/EU EN 50419 • (EC) No.1907/2006 • GB/T 26572

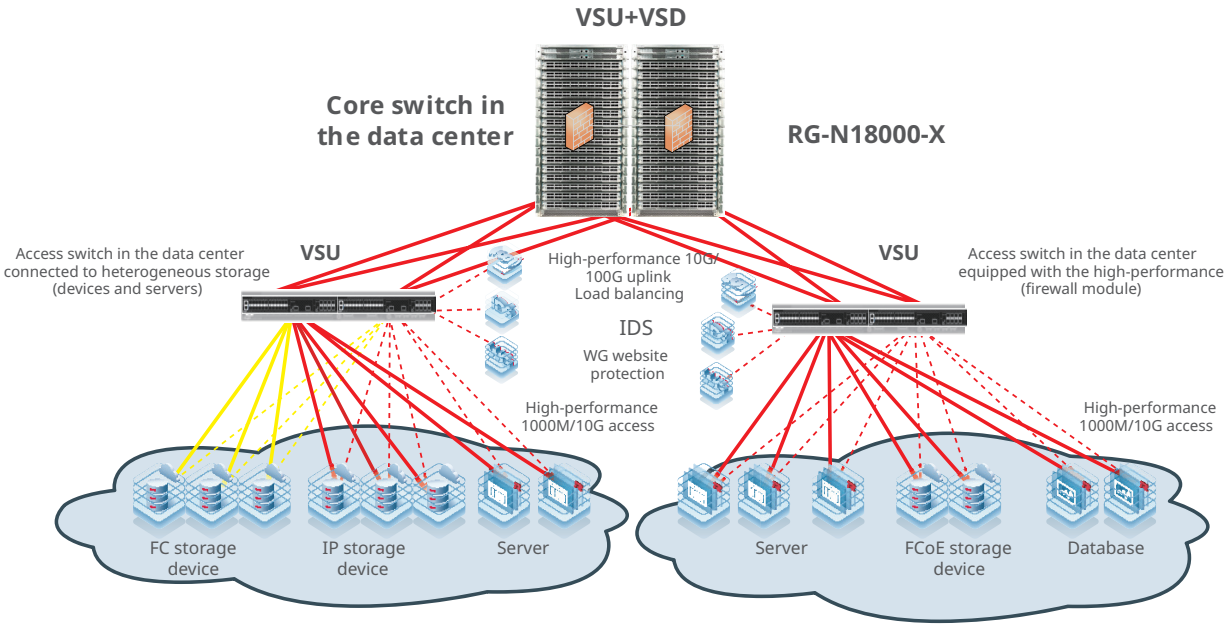
*For more country-specific regulatory information and approvals, contact your local sales agency.

Typical Applications

Serving as Core Devices in Large Data Center Networks (Spine-Leaf Architecture)



Serving as Core Devices in Conventional Data Center Networks



Configuration Guide

The configuration procedure for the RG-N18000-X series switches is as follows:

- Select the chassis and supervisor module.
- Select the power supply module
- Select the switch fabric module.
- Select the line card.
- Select the optical transceiver.

Ordering Information

Switch Chassis and Supervisor Engines

Model	Description
RG-N18018-X	18-slot chassis (without power module), equipped with fans
RG-N18010-X	10-slot chassis (without power module), equipped with fans
RG-N18006-X	6-slot chassis (without power module), equipped with fans
M18000X-CM	Supervisor module of RG-N18010-X and RG-N18018-X. It is used in combination with type-C switch fabric modules and CB cards.
M18000X-CM II	2nd-generation supervisor module of RG-N18010-X and RG-N18018-X. It is used in combination with type-C switch fabric modules and CB cards.
M18006X-CM II	2nd-generation supervisor module of RG-N18006-X. It is used in combination with type-C switch fabric modules and CB cards.
M18000X-CM X	Supervisor module of RG-N18010-X and RG-N18018-X. It is used in combination with type-E switch fabric modules and CE cards.

Power Modules

Model	Description
RG-PA2700I	Power module of RG-N18000-X series (available for redundancy, AC, 2700 W, 16 A)
RG-PA3000I-F	Power module of RG-N18000-X series (available for redundancy, AC, 3000 W, 16 A)

Switch Fabric Modules

Model	Description
M18018X-FE-C II	Type-C switch fabric module II of RG-N18018-X
M18018X-FE-C V	Type-C switch fabric module V of RG-N18018-X
M18010X-FE-C I	Type-C switch fabric module I of RG-N18010-X
M18010X-FE-C II	Type-C switch fabric module II of RG-N18010-X
M18006X-FE-C I	Type-C switch fabric module I of RG-N18006-X
M18010X-FE-E II	Type-E switch fabric module II of RG-N18010-X
M18018X-FE-E IV	Type-E switch fabric module IV of RG-N18018-X

Line Cards

Model	Description
M18000X-36QXS-CB	CB card, providing 36 × 40GE optical ports (QSFP+)
M18000X-36CQ-CB	CB card, providing 36 × 100GE optical ports (QSFP28)
M18000X-18CQ-CB	CB card, providing 18 × 100GE optical ports (QSFP28)
M18000X-18QXS18CQ-CB	CB card, providing 18 × 40GE optical ports (QSFP+) and 18 × 100G Ethernet optical ports (QSFP28)
M18000X-48XS2CQ-CB	CB card, providing 48 × 10GE optical ports (SFP+) and 2 × 100G Ethernet optical ports (QSFP28)
M18000X-48CQ-CE	CE card, providing 48 × 100GE optical ports (QSFP28), used in combination with type-E switch fabric modules
M18000X-48DC-CE	CE card, providing 48 × 200GE optical ports (QSFP56), used in combination with type-E switch fabric modules

100GBASE Series Optical Modules

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

40GBASE Series Optical Modules

Model	Description
40G-QSFP-SR-MM850	40G SR module, QSFP+ form factor, MPO, 150 m (492.13 ft.) over MMF
40G-QSFP-LR4-SM1310	40G LR4 module, QSFP+ form factor, Duplex LC, 10 km (32,808.40 ft.) over SMF
40G-QSFP-LSR-MM850	40G LSR module, QSFP+ form factor, MPO, 400 m (1,312.34 ft.) over MMF
40G-QSFP-iLR4-SM1310	40G iLR4 module, QSFP+ form factor, Duplex LC, 2 km (6,561.68 ft.) over SMF
40G-QSFP-LX4-SM1310	40G LX4 module, 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-AOC-30M	40G QSFP+ AOC cable, 30 m (98.43 ft.)
40G-AOC-5M	40G QSFP+ AOC cable, 5 m (16.40 ft.)

10GBASE Series Optical Modules

Model	Description
XG-LR-SM1310	10G LR module, SFP+ form factor, Duplex LC, 10 km ((32,808.40 ft.) over SMF
XG-SFP-ER-SM1550	10G ER module, SFP+ form factor, Duplex LC, 40 km (131,233.60 ft.) over SMF
XG-SFP-LR-SM1310	10G LR module, SFP+ form factor, Duplex LC, 10 km ((32,808.40 ft.) over SMF
XG-SFP-SR-MM850	10G SR module, SFP+ form factor, Duplex LC, 300 m (984.25 ft.) over MMF
XG-SFP-ZR-SM1550	10G ZR module, SFP+ form factor, Duplex LC, 80 km (262,467.19 ft.) over SMF
XG-SR-MM850	10G SR module, SFP+ form factor, Duplex LC, 300 m (984.25 ft.) over MMF
XG-SFP-AOC5M	10G SFP+ AOC cable, 5 m (16.40 ft.)
XG-SFP-AOC3M	10G SFP+ AOC cable, 3 m (9.84 ft.)
XG-SFP-AOC1M	10G SFP+ AOC cable, 1 m (3.28 ft.)

1000BASE Series Optical Modules

Model	Description
GE-SFP-LH40-SM1310-BIDI	1G LH module, SFP form factor, BIDI LC, 40 km (131,233.60 ft.) over SMF
GE-SFP-LX20-SM1310-BIDI	1G LX module, SFP form factor, BIDI LC, 20 km (65,616.80 ft.) over SMF
GE-SFP-LX20-SM1550-BIDI	1G LX module, SFP form factor, BIDI LC, 20 km (65,616.80 ft.) over SMF
MINI-GBIC-LH40-SM1310	1G LH module, SFP form factor, Duplex LC, 40 km (131,233.60 ft.) over SMF
MINI-GBIC-LX-SM1310	1G LX module, SFP form factor, Duplex LC, 10 km (32,808.40 ft.) over SMF
MINI-GBIC-SX-MM850	1G SR module, SFP form factor, Duplex LC, 550 m (1,804.46 ft.) over MMF
MINI-GBIC-ZX80-SM1550	1G ZX module, SFP form factor, Duplex LC, 80 km (262,467.19 ft.) over SMF

1000BASE Series Electrical Modules

Model	Description
Mini-GBIC-GT(F)	1G SFP copper module, SFP form factor, RJ45, 100 m (328.08 ft.) over Cat 5e/6/6a
Mini-GBIC-GT	1G SFP copper module, SFP form factor, RJ45, 100 m (328.08 ft.) over Cat 5e/6/6a

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

Ruijie Networks Co., Ltd.

For more information, visit www.ruijienetworks.com or call 86-400-620-8818.