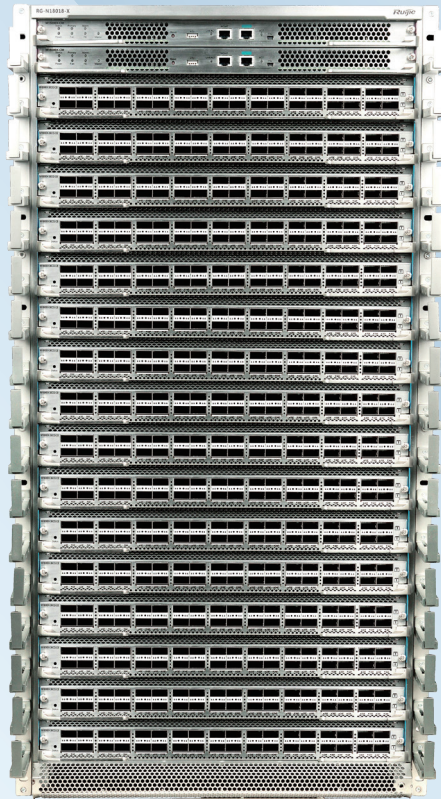




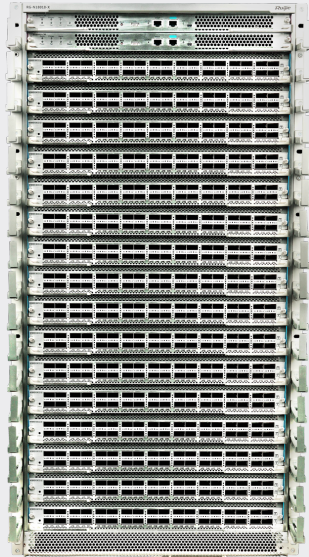
RG-N18000-X Series Data Center DCI Core Switch



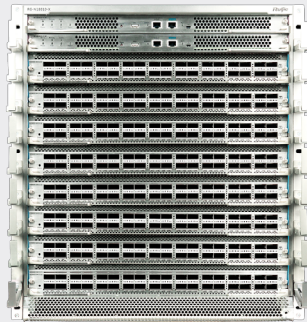
Scan QR Code
For More Enquiry

Ruijie

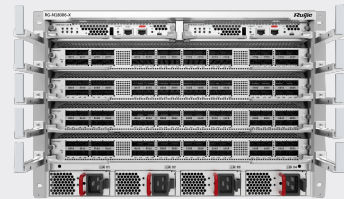
Product Pictures



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 $384 \times 400\text{GE}$, $768 \times 100\text{GE}$, $576 \times 40\text{GE}$, and $2304 \times 10\text{GE}$ 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 height of 7 RU, supports a maximum of 192 × 100GE, 144 × 40GE, and 576 × 10GE line-rate ports, implementing the high density of up to 100 Gbps with fewer slots.

The RG-N18000-X series switches, serving as the gateways of large Layer 2 networks, support more than 500,000 virtual machines (VMs). Equipped with the latest graphics double data rate 5 (GDDR5) synchronous dynamic random-access memory (SDRAM), these switches offer an impressive 24 GB buffer capacity per line 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 significantly 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 exceptional device virtualization capability and support ultra-large 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 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 critical service traffic, 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 16 million virtual extensible local area network (VXLAN) network segments, which meets requirements for overlay network building in data centers. It resolves the challenges of limited VLAN capacity and scalability issues in

conventional data center networks.
On a infrastructure 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 Layer 2 Network in a Data Center

The VXLAN technology encapsulates Layer 2 packets into User Datagram Protocol (UDP) packets and allows you to establish a logical Layer 2 network on an Layer 3 network. The Ethernet Virtual Private Network (EVPN) protocol enables the RG-N18000-X series switch to automatically discover and authenticate virtual tunnel endpoints (VTEPs). This reduces the number of packets that are flooded on the VXLAN data plane and minimizes dependence on multicast deployment at the underlying layer, and simplifies VXLAN deployment. As a result, it enhances the efficiency of building large Layer 2 networks, meeting the needs of large Layer 2 networks in data centers and Layer 2 interconnection requirements in 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. This design perfectly aligns with the airflow direction in data center racks, creating a high-speed, smooth airflow that passes through the front and rear panels. The airflow speed reaches up to 15 m/s, significantly improving cooling efficiency by allowing more cold air to enter the chassis. This helps lower device temperatures and prevents excessive power consumption. Additionally, the 30° inward-folded design of the front panel increases the open area by up to 106% compared to vertical openings, further enhancing the cooling performance.
The RG-N18000-X series switches use 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%. Moreover, the PHY chip-free design of 100GE line cards reduces the power consumption of a single module 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

Item	RG-N18018-X	RG-N18010-X	RG-N18006-X
Dimensions (W x D x H)	442 mm x 961 mm x 934.5 mm (17.40 in. x 37.83 in. x 36.79 in.), without the cable management bracket; 442 mm x 1017 mm x 934.5 mm (17.40 in. x 40.04 in. x 36.79 in.), with the cable management bracket.	442 mm x 961 mm x 534 mm (17.40 in. x 37.83 in. x 21.02 in.), without the cable management bracket; 442 mm x 1017 mm x 534 mm (17.40 in. x 40.04 in. x 21.02 in.), with the cable management bracket.	442 mm x 893 mm x 308.4 mm (17.40 in. x 35.16 in. x 12.14 in.), without the cable management bracket; 442 mm x 956 mm x 308.4 mm (17.40 in. x 37.64 in. x 12.14 in.), with the cable management bracket.
Rack height	21 RU	12 RU	7 RU

Item	RG-N18018-X	RG-N18010-X	RG-N18006-X
Unit weight	12.88 kg (28.40 lbs., a chassis with three fan modules)	52 kg (114.640 lbs., a chassis with three fan modules)49 kg (108.03 lbs., a chassis with three fan modules)	49 kg (108.03 lbs., a chassis with three fan modules)
Switching capacity	307.2 Tbps	153.6 Tbps	28.8 Tbps
Packet forwarding rate	69,120 Mpps	34,560 Mpps	17,280 Mpps
Module slots	2 x supervisor module slots 16 x line card slots 6 x switch fabric module slots 16 x power module slots 3 x fan module slots	2 x supervisor module slots 8 x line card slots 6 x switch fabric module slots 8 x power module slots 3 x fan module slots	2 x supervisor module slots 4 x line card slots 6 x switch fabric module slots 4 x power module slots 3 x fan module slots
Power input	RG-PA2700I (AC input) Rated input voltage: 100 V AC to 240 V AC, 50 Hz/60 Hz Maximum input voltage: 90 V AC to 290 V AC, 47 Hz to 63 Hz Rated input current: 16 A Power port type: C20 RG-PA2700I (HVDC input): Rated input voltage: 240V DC Maximum input voltage: 192V~350V DC Rated input current: 16 A Power port type: C20 Note: When the switch is equipped with the high-voltage DC power supply, a PDU that supports high-voltage DC power supply must be used. To ensure safety, connect the external power supply to the power cord first and then to the PDU. The switch can only connect to a specific power system (UPS) but not to the DC power grid. The DC voltage tolerance range is from 188 V DC to 400 V DC. RG-PD2400I (DC input): Rated input voltage: -48 V DC to -60 V DC Maximum input voltage: -40 V DC to -72 V DC Rated input current: 60 A Power port type: Dedicated port	RG-PA2700I (AC input) Rated input voltage: 100 V AC to 240 V AC, 50 Hz/60 Hz Maximum input voltage: 90V AC to 290 V AC, 47 Hz to 63 Hz Rated input current: 16 A Power port type: C20 RG-PA2700I (HVDC input): Rated input voltage: 240V: 192~288V DC Maximum input voltage: 192V~350V DC Rated input current: 16 A Power port type: C20 Note: When the switch is equipped with the high-voltage DC power supply, a PDU that supports high-voltage DC power supply must be used. To ensure safety, connect the external power supply to the power cord first and then to the PDU. The switch can only connect to a specific power system (UPS) but not to the DC power grid. The DC voltage tolerance range is from 188 V DC to 400 V DC. RG-PD2400I (DC input): Rated input voltage: -48 V DC to -60 V DC Maximum input voltage: -40 V DC to -72 V DC Rated input current: 60 A Power port type: Dedicated port	RG-PA3000I-F (AC input) Rated input voltage: 100 V AC to 240 V AC, 50 Hz/60 Hz Maximum input voltage: 90 V AC to 290 V AC, 47 Hz to 63 Hz Rated input current: 16 A Power port type: C20 RG-PA3000I-F (HVDC input): Rated input voltage: 240V DC Maximum input voltage: 192V~350V DC Rated input current: 16 A Power port type: C20 Note: When the switch is equipped with the high-voltage DC power supply, a PDU that supports high-voltage DC power supply must be used. To ensure safety, connect the external power supply to the power cord first and then to the PDU. The switch can only connect to a specific power system (UPS) but not to the DC power grid. The DC voltage tolerance range is from 188 V DC to 400 V DC.

Item	RG-N18018-X	RG-N18010-X	RG-N18006-X
Temperature	Operating temperature: 0°C to 40°C (32°F to 104°F) Storage temperature: -40°C to +70°C (-40°F to +158°F) Note: At altitudes ranging from 3,000 m (9,842.52 ft.) to 5,000 m (16,404.20 ft.), the maximum temperature decreases by 6°C (10.8°F) for every 1,000 m (3280.84 ft.) increase in elevation.		Operating temperature: 0°C to 45°C (32°F to 113°F) Storage temperature: -40°C to +70°C (-40°F to +158°F) Note: At altitudes ranging from 3,000 m (9,842.52 ft.) to 5,000 m (16,404.20 ft.), the maximum temperature decreases by 1°C (1.8°F) for every 200 m (656.17 ft.) increase in elevation.
Humidity	Operating humidity: 10% to 90% RH (non-condensing) Storage humidity: 5% to 95% RH (non-condensing)		
Altitude	Operating altitude: ≤ 3,000 m (9,842.52 ft.) Storage altitude: ≤ 5000 m (16,404.20 ft.)		
Cooling	Air cooling, front-to-rear airflow (port-side air intake)		

Software Specifications

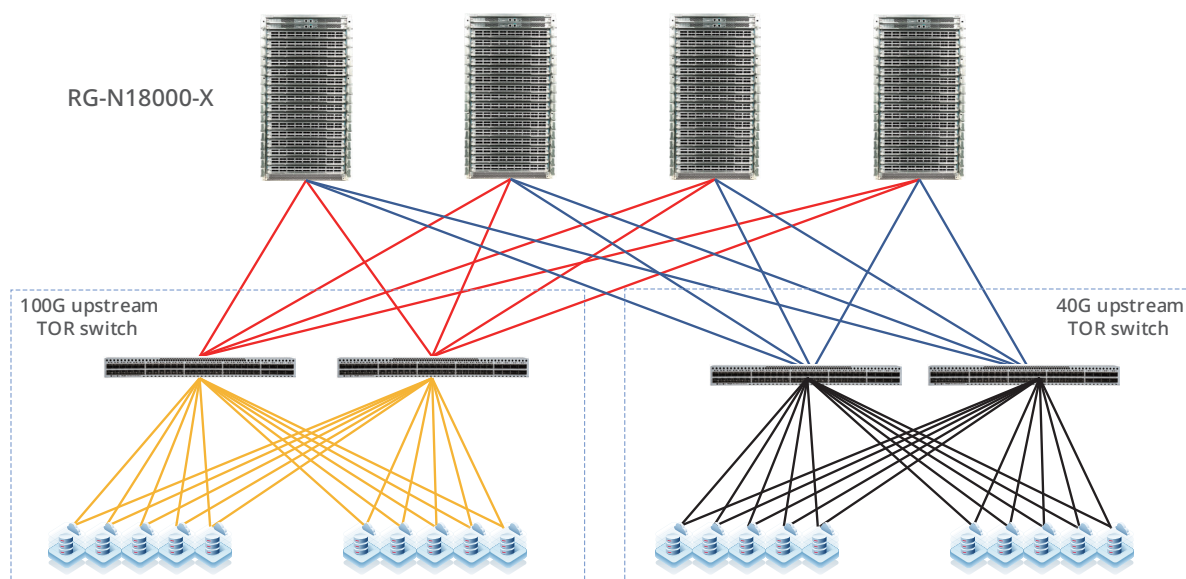
Item	RG-N18018-X	RG-N18010-X	RG-N18006-X
Device virtualization	Virtual Switching Unit 3.0		
Data center features	VXLAN bridge VXLAN gateway BGP-EVPN VXLAN VXLAN mapping IPv6 VXLAN over IPv4 M-LAG		
SDN	OpenFlow 1.3.		
Traffic analysis	sFLOW IPFIX NetFlow		
Layer 2 features	Jumbo frame IEEE 802.3ad (static link aggregation, LACP, cross-module link aggregation, M-LAG) IEEE 802.1Q STP, RSTP, MSTP GVRP QinQ LLDP Static MAC addresses, address filtering, and limit on the number of MAC addresses		

Item	RG-N18018-X	RG-N18010-X	RG-N18006-X
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		
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 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		

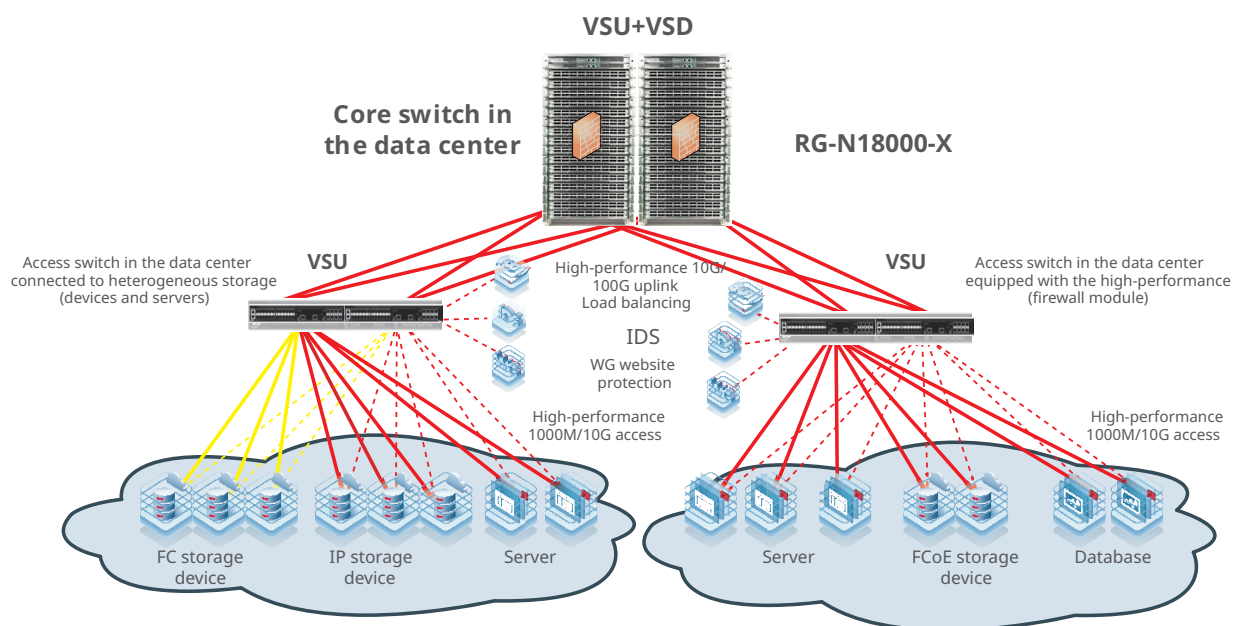
Item	RG-N18018-X	RG-N18010-X	RG-N18006-X
Security	RADIUS and TACACS user login authentication, password security, hierarchical user management, and password protection Source IP address restriction Function of not sending unknown multicast packets to the CPU Suppression of unknown multicast, unknown broadcast, and unknown multicast packets SSHv2, providing encrypted security channels for user login 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 modules		

Typical Applications

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



Serving as Core Devices in Conventional Data Center Networks



Ordering Guide

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

- Select the chassis and supervisor module.
- Select the power 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 II	2-nd 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)
RG-PD2400I	DC power module of RG-N18018-X and RG-N18010-X series (available for redundancy, DC, 2400 W, 60 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
M18006X-FE-E I	Type-E 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

40G Optical Transceivers

Model	Description
40G-QSFP-SR-MM850	40G SR optical transceiver, QSFP+ form factor, MPO, 150 m (492.13 ft.) over multimode fiber (MMF)
40G-QSFP-LR4-SM1310	40G LR4 optical transceiver, QSFP+ form factor, Duplex LC, 10 km (32,808.40 ft.) over single-mode fiber (SMF)
40G-QSFP-LSR-MM850	40G SR optical transceiver, QSFP+ form factor, MPO, 400 m (1,312.34 ft.) over MMF
40G-QSFP-iLR4-SM1310	40G iLR4 optical transceiver, QSFP+ form factor, Duplex LC, 2 km (6,561.68 ft.) over SMF
40G-QSFP-LX4-SM1310	40G LX4 optical transceiver, QSFP+ form factor, Duplex LC, 150 m (492.13 ft.) over OM3/OM4 MMF, or 2 km (6,561.68 ft.) over SMF
40G-AOC-30M	40G QSFP+ active optical cable (AOC), 30 m (98.43 ft.)
40G-AOC-5M	40G QSFP+ AOC, 5 m (16.40 ft.)

100G Optical Transceivers

Model	Description
100G-QSFP-SR-MM850	100G SR optical transceiver, QSFP28 form factor, MPO, 850 nm, 100 m (328.08 ft.) over MMF
100G-QSFP-LR4-SM1310	100G LR4 optical transceiver, QSFP28 form factor, Duplex LC, 1310 nm, 10 km (32,808.40 ft.) over SMF
100G-QSFP-iLR4-SM1310	100G iLR4 optical transceiver, QSFP28 form factor, Duplex LC, 1310 nm, 2 km (6,561.68 ft.) over SMF
100G-QSFP-ER4-SM1310	100G ER4 optical transceiver, QSFP28 form factor, Duplex LC, 1310 nm, 40 km (131,233.60 ft.) over SMF
100G-AOC-10M	100G AOC, QSFP28 form factor, 10 m (32.81 ft.)
100G-AOC-5M	100G AOC, QSFP28 form factor, 5 m (16.40 ft.)

1000M Optical Transceivers

Model	Description
GE-SFP-LH40-SM1310-BIDI	1G LH optical transceiver, SFP form factor, BIDI LC, 40 km (131,233.60 ft.) over SMF
GE-SFP-LX20-SM1310-BIDI	1G LX optical transceiver, SFP form factor, BIDI LC, 20 km (65,616.80 ft.) over SMF

Model	Description
GE-SFP-LX20-SM1550-BIDI	1G LX optical transceiver, SFP form factor, BIDI LC, 20 km (65,616.80 ft.) over SMF
MINI-GBIC-LH40-SM1310	1G LH optical transceiver, SFP form factor, Duplex LC, 40 km (131,233.60 ft.) over SMF
MINI-GBIC-LX-SM1310	1G LX optical transceiver, SFP form factor, Duplex LC, 10 km (32,808.40 ft.) over SMF
MINI-GBIC-SX-MM850	1G SR optical transceiver, SFP form factor, Duplex LC, 550 m (1,804.46 ft.) over MMF
MINI-GBIC-ZX80-SM1550	1G ZX optical transceiver, SFP form factor, Duplex LC, 80 km (262,467.20 ft.) over SMF

1000M Copper Transceivers

Model	Description
Mini-GBIC-GT	1G copper transceiver, SFP form factor, RJ45, 100 m (328.08 ft.) over Cat5e/6/6a cables

10GE Optical Transceivers

Model	Description
XG-LR-SM1310	10G LR optical transceiver, SFP+ form factor, Duplex LC, 10 km (32,808.40 ft.) over SMF
XG-SFP-ER-SM1550	10G ER optical transceiver, SFP+ form factor, Duplex LC, 40 km (131,233.60 ft.) over SMF
XG-SFP-LR-SM1310	10G LR optical transceiver, SFP+ form factor, Duplex LC, 10 km (32,808.40 ft.) over SMF
XG-SFP-SR-MM850	10G SR optical transceiver, SFP+ form factor, Duplex LC, 300 m (984.25 ft.) over MMF
XG-SFP-ZR-SM1550	10G ZR optical transceiver, SFP+ form factor, Duplex LC, 80 km (262,467.20 ft.) over SMF
XG-SR-MM850	10G SR optical transceiver, SFP+ form factor, Duplex LC, 300 m (984.25 ft.) over MMF
XG-SFP-AOC5M	10G SFP+ AOC, 5 m (16.40 ft.)
XG-SFP-AOC3M	10G SFP+ AOC, 3 m (9.84 ft.)
XG-SFP-AOC1M	10G SFP+ AOC, 1 m (3.28 ft.)

| 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-Summary/>

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.ruijie.com/>
- Online support: <https://www.ruijie.com/support>
- Hotline support: <https://www.ruijie.com/support/hotline>
- Email support: service_rj@ruijie.com



Ruijie Networks Co., Ltd.

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