QFX5130 LINE OF SWITCHES DATASHEET

Product overview

Juniper Networks QFX5130 line of Switches supports modern data center workloads that demand a top-of-rack switch with multiple speeds. The high-speed, high-density, cost optimized 1 U fixed platform is ideal for spine-and-leaf IP fabrics. Supporting 400GbE, 200GbE, 100GbE, 50GbE, 40GbE, 25GbE, and 10GbE connections and offering advanced L2/L3 features, and secure ZTP, the QFX5130 line enables network operators to build large, next-generation IP fabrics. The switches are based on a proven, Internet-scale software suite with best-in-class automation and management capabilities.

Product description

Juniper Networks® QFX5130 line of Switches is a high-radix, high-density, 1 U platform suitable for today's data centers. The four options are a perfect choice for leaf, border leaf, and spine roles within IP networks, as well as Ethernet VPN - Virtual Extensible LAN (EVPN-VXLAN) fabrics. For large public cloud providers—early adopters of high-performance servers to meet increasing workload growth—the QFX5130 line supports very large, dense, and fast 400GbE IP fabrics based on proven, Internet-scale technology. For enterprise data center customers seeking investment protection as they transition their server farms from 10GbE to 25GbE, the QFX5130 line switch provides a high radix-native 100GbE/400GbE EVPN-VXLAN option with reduced power and a smaller footprint.

Additional Remote Direct Memory Access over Converged Ethernet (RoCEv2) capabilities in the QFX5130 line make it suitable in IP storage deployments. Instead of relying on deep buffer switching, QoS mechanisms such as Priority-based Flow Control-DiffServ code point (PFC-DSCP) and Explicit Congestion Notification (ECN) help deliver high performance for storage workloads. Support for high-power 400G-ZR and 400G-ZR-M optics makes it suitable for edge and DCI use cases.

Product options

The QFX5130 line of Switches includes four compact 1 U platforms—QFX5130-32CD, QFX5130E-32CD, QFX5130-48C, and QFX5130-48CM. All provide high speeds, high densities, and a rich set of Junos® OS Evolved operating system features.

The Juniper Networks QFX5130-32CD and QFX5130E-32CD switches are next-generation, fixed-configuration spine-and-leaf switches featuring:

- 32 400G QSFP-DD ports in 1 U form factor
- Up to 25.6 Tbps (bidirectional)/5.3 bpps throughput

Using breakout cables, each of the 32 400GbE QSFP-DD ports can be broken into four 100/25/10GbE ports, increasing the total number of supported 100/25/10GbE ports per switch to 128.

The Juniper Networks QFX5130-48C and QFX5130-48CM (MACsec) Switch is a next-generation, high-density, and cost-efficient 100GbE and 400GbE optimized fixed system featuring:

- Native 48 SFP56-DD100GbE ports for server connectivity
- Native 8 QSFP-DD 400GbE uplink ports
- Up to 16 Tbps (bidirectional)/2.7 bpps throughput
- With MACsec enabled on QFX5130-48CM:
  - Up to 9.6 Tbps (bidirectional)/2.7 bpps MACsec encryption support
  - 32x 100G SFP56-DD and 4x 400G QSFP-DD MACsec port support

Using breakout cables, the total number of supported 100/25/10GbE ports per switch can be increased to 72.

Product highlights

Increased scale and buffer

The QFX5130-32CD switch provides enhanced scale with up to 1.24 million routes, 80,000 firewall filters, and 160,000 media access control (MAC) addresses. It supports high numbers of egress IPv4/IPv6 rules by programming matches in egress ternary content addressable memory (TCAM) along with ingress TCAM.

Increased port density

The QFX5130-48C and QFX5130-48CM support 100GbE ports with SFP56-DD form- factor, which helps to increase the number of ports that can be supported in a standard 1U box. This increase in port density is achieved with reduced power consumption and makes it an excellent choice for a top-of-rack device.

Features and benefits

- **Power efficiency**: With its low-power 7 nm process, the QFX5130-32CD and QFX5130E-32CD bring improvements in speed, lower power consumption, and higher density on chip. The QFX5130-48C brings improvements in total power consumption and better power efficiency per port.
- **Shared packet buffer**: Today's cloud-native applications depend on buffer size to prevent congestion and packet drops. The QFX5130 line of switches has a shared packet buffer that is allocated dynamically to congested ports. Having the right amount of on buffer is critical to preventing congestion and packet drops.
- **Automation and programmability**: The QFX5130 line supports multiple network automation features for plug-and-play operations, including zero-touch provisioning (ZTP), Network Configuration Protocol (NETCONF), Juniper Extension Toolkit (JET), Junos telemetry interface, operations and event scripts, automation rollback, and Python scripting. The QFX5130 line revolutionizes performance for data center networks by providing a programmable software-defined pipeline. The QFX5130 line uses a compiler-driven switch data plane with full software program control to enable and serve a diverse set of use cases, including in-band telemetry, fine-grained filtering for traffic steering, traffic monitoring, and support for new protocol encapsulations.
- **Cloud-level scale and performance**: The QFX5130 line supports best-in-class, cloud-based, L2/L3 deployments with superior scale and performance and latency as low as 1000 ns (store and forward). The switches support up to 128 link aggregation groups, 4096 VLANs, and jumbo frames of 9216 bytes. Junos OS Evolved provides configurable options through a CLI, enabling each QFX5130 to be optimized for different deployment scenarios.
- **VXLAN overlays**: The QFX5130 line is capable of both L2 and L3 gateway services. Enterprises, cloud operators, and service providers can deploy overlay networks to provide L2 adjacencies for applications over L3 fabrics. The overlay networks use VXLAN in the data plane and EVPN for programming the overlays, which can operate without a controller or be orchestrated with an SDN controller.
- **IEEE 1588 PTP Boundary Clock with Hardware Timestamping**: IEEE 1588 PTP transparent/boundary clock is supported on QFX5130-32CD and QFX5130E-32CD, enabling accurate and precise sub-microsecond timing information in today's data center networks. In addition, the QFX5130-32CD and QFX5130E-32CD support hardware timestamping; timestamps in Precision Time Protocol (PTP) packets are captured and inserted by an onboard field-programmable gate array (FPGA) on the switch at the physical (PHY) level.
- **RoCEv2**: As a switch capable of transporting data as well as storage traffic over Ethernet, the QFX5130 line provides an IEEE data center bridging (DCB) converged network between servers with disaggregated flash storage arrays or an NVMe-enabled SAN. The QFX5130 line offers a full-featured DCB implementation that provides strong monitoring capabilities on the top-of-rack switch for SAN and LAN administration teams to maintain clear separation of management.
- **Junos OS Evolved features**: The QFX5130 line supports features such as L2/L3 unicast, EVPN-VXLAN, BGP add-path, RoCEv2 and congestion management, multicast, 128-way ECMP, dynamic load balancing capabilities, enhanced firewall capabilities, and monitoring.
- **Junos OS Evolved Architecture**: Junos OS Evolved is a native Linux operating system that incorporates a modular design of independent functional components and enables individual components to be upgraded independently while the system remains operational. Component failures are localized to the specific component involved and can be corrected by upgrading and restarting that specific component without bringing down the entire device. The switch's control and data plane processes can run in parallel, maximizing CPU utilization, providing support for containerization, and enabling application deployment using LXC or Docker.
- **Retained state**: State is the retained information or status pertaining to physical and logical entities. It includes both operational and configuration state, comprising committed configuration, interface state, routes, hardware state, and what is held in a central database called the distributed data store

(DDS). State information remains persistent, is shared across the system, and is supplied during restarts.

- **Feature support**: All key networking functions such as routing, bridging, management software, and management plane interfaces, as well as APIs such as CLI, NETCONF, JET, Junos telemetry interface, and the underlying data models, resemble those supported by the Junos operating system. This ensures compatibility and eases the transition to Junos Evolved.
- **Automation and Monitoring:** Apstra intent-based networking delivers full Day 0 through Day 2+ capabilities for IP/EVPN fabrics with closed-loop assurance in the data center for the QFX5130 line of switches. Apstra is the state-of-the art fabric management solution that empowers organizations to automate and manage their networks across virtually any data center design, vendor, and topology, making private data center as easy as cloud. Apstra provides full Day 2+ operations assurance with multiple built-in intent-based analytics probes to assure your network is running as designed, plus Apstra provides a simple UI workflow to create custom intent-based analytics to capture, enrich, and visualize data from the managed devices. Apstra also provides the capability to capture and analyze flow data to provide complete network visibility.

  Additionally, the Junos Evolved operating system supports a robust API set to support automation through Terraform, Ansible, ZTP, operations and event scripts, automatic rollback, and Python scripts. The QFX5130 line supports Junos telemetry interface, a modern telemetry streaming tool that provides performance monitoring in complex, dynamic data centers.

Junos Telemetry Interface

Streaming data to a performance management system lets network administrators measure trends in link and node utilization and troubleshoot issues such as network congestion in real time.

Junos Telemetry Interface provides:

- Application visibility and performance management by provisioning sensors to collect and stream data and analyze the application and workload flow path through the network
- Capacity planning and optimization by proactively detecting hotspots and monitoring latency and microbursts
- Troubleshooting and root cause analysis via high-frequency monitoring and correlating overlay and underlay networks

Deployment options

Data center fabric deployments

The QFX5130 line can be deployed as a universal device in cloud data center to support 100GbE and 200GbE (with QFX5130-32CD and QFX5130E-32CD) server access and 400GbE spine-and-leaf configurations. This optimizes data center operations by using a single device across multiple network layers. The QFX5130 line can also be deployed in more advanced overlay architectures like an EVPN-VXLAN fabric. Depending on where tunnel terminations are desired, the QFX5130 line can be deployed in either Edge Routed Bridging (ERB) deign or the Bridged Overlay architecture. Juniper offers complete flexibility and a range of data center fabric designs that cater to data centers of different sizes and scalability in cloud operator, service provider, and enterprise environments.

- **Architecture 1: Edge Routed Bridging (ERB)** EVPN-VXLAN with distributed anycast IP gateway architecture supporting L2 and L3 for enterprises and 5G Telco-Cloud. This type of design offers a combination of L2 stretch between multiple leaf/top-of-rack switches and L2 active/active multihoming to the server with MAC-VRF EVI L2 virtualization support as well as L3 IP VRF virtualization at the leaf/top of rack through the Type-5 EVPN-VXLAN. This type of design in data centers can be used for optimized and redundant connections toservers/ compute nodes, Blade Center, IP storage nodes running ROCEv2, as well as other appliances.
- **Architecture 2: Bridged Overlay (BO)** EVPN-VXLAN design using MAC-VRF instances and different EVPN service-types (VLAN-aware, VLAN-bundle, VLAN-based). In this case an external to the fabric first hop IP gateway can be used, such as at the firewall or external, existing, data center gateway routers. In this design the data center fabric is offering L2 active/active multihoming using ESI-LAG and fabric wide-L2 stretch between the leaf top-of-rack nodes.
- **Architecture 3: Seamless DCI for ERB fabric design** DCI border-leaf design with seamless T2/T2 EVPN-VXLAN to EVPN-VXLAN tunnel stitching (RFC 9014) and T5/T5 EVPN-VXLAN tunnel stitching support. With this design the data center gets the benefit of geographical redundancy for the application deployed in the private cloud data center. The QFX5130 line is used in this design also as a border-leaf node.
- **Architecture 4: Collapsed spine design with ESI-LAG support and anycast IP** In this case a pair of QFX5130 switches is deployed with a back-to-back connect, without a spine layer. The L2 active/active multihoming using ESI-LAG is used for the server NIC high availability as well as anycast IP gateway.

Campus fabric deployments

The QFX5130-32CD can be deployed in campus core, distribution and access layer networks using 100GbE/400GbE ports to support technologies such as EVPN multihoming and campus fabrics. Juniper offers complete flexibility in choosing any of the following validated EVPN-VXLAN designs that cater to networks of different sizes, scale, and segmentation requirements:

- **EVPN multihoming (collapsed core or distribution)**: A collapsed core architecture combines the core and distribution layers into a single switch, turning the traditional three-tier hierarchal network into a two-tier network. EVPN Multihoming on a collapsed core eliminates the need for Spanning Tree Protocol (STP) across campus networks by providing link aggregation capabilities from the access layer to the core layer. This architecture is best suited for small to medium distributed enterprise networks and allows for consistent VLANs across the network. It uses ESI (Ethernet Segment Identifier) LAG (Link Aggregation) and is a standards-based protocol.
  - **Campus Fabric Core distribution**: When EVPN-VXLAN is configured across core and distribution layers, it becomes a campus Fabric Core Distribution architecture, which can be configured in two modes: centrally or edge routed bridging overlay. This architecture provides an opportunity for an administrator to move toward campus-fabric IP Clos without a fork-lift upgrade of all access switches in the existing network, while bringing in the advantages of moving to a campus fabric and providing an easy way to scale out the network.
  - **Campus Fabric IP Clos**: When EVPN-VXLAN is configured on all layers including access, it is called the campus fabric IP Clos architecture. This model is also referred to as “end-to-end,” given that VXLAN tunnels are terminated at the access layer. The availability of VXLAN at access provides policy enforcement and micro segmentation to the access layer (closest to the source) using standards-based Group Based Policy (GBP) to segment traffic even within a VLAN. GBP tags are assigned dynamically to clients as part of Radius transaction by Juniper Mist Cloud NAC. This topology works for small, medium, and large campus architectures that need macro and micro segmentation.

In all these EVPN-VXLAN deployment modes, the QFX5130 line can be used in the distribution or core. All three topologies are standards-based and interoperable with third-party vendors.

Features

Layer 2
STP—IEEE 802.1D (802.1D-2004)
Rapid Spanning Tree Protocol (RSTP) (IEEE 802.1w); MSTP (IEEE 802.1s)
Bridge protocol data unit (BPDU) protect
Loop protect
Root protect
VLAN—IEEE 802.1Q VLAN trunking
Routed VLAN interface (RVI)
Static MAC address assignment for interface
Global MAC learning disable
Link Aggregation and Link Aggregation Control Protocol (LACP) (IEEE 802.3ad)
IEEE 802.1AB Link Layer Discovery Protocol (LLDP)
Link Aggregation
LAG load sharing algorithm—bridged or routed (unicast or multicast) traffic: - IP: Session Initiation Protocol (SIP), Dynamic Internet Protocol (DIP), TCP/UDP source port, TCP/UDP destination port - L2 and non-IP: MAC SA, MAC DA, Ether type, VLAN ID, source port
Layer 3 Features
Static routing
OSPF v2/v3
Filter-based forwarding
VRRP/VRRPv3
IPv6
Virtual routers
Loop-free alternate (LFA)
BGP
IS-IS
Dynamic Host Configuration Protocol (DHCP) v4/v6 relay(stateless)
VRF-aware DHCP
Security and Filters
Secure interface login and password
Secure boot
RADIUS
TACACS+
Ingress and egress filters: Allow and deny, port filters, VLAN filters, and routed filters, including management port filters and loopback filters for control plane protection.
Filter actions: Logging, system logging, reject, mirror to an interface, counters, assign forwarding class, permit, drop, police, mark
SSH v1, v2
Static ARP support
Storm control, port error disable, and auto recovery
Control plane denial-of-service (DoS) protection
Image rollback
Multicast
Internet Group Management Protocol (IGMP) v1/v2/v3
Multicast Listener Discovery (MLD) v2
IGMP proxy, querier
IGMP v1/v2/v3 snooping
Intersubnet multicast using IRB interface
MLD snooping
Protocol Independent Multicast PIM-SM, PIM-SSM, PIM-DM, PIM-Bidir
Multicast Source Discovery Protocol (MSDP)

Quality of Service (QoS)
L2 and L3 QoS: Classification, rewrite, queuing Rate limiting: - Ingress policing: 1 rate 2 color, 2 rate 3 color - Egress policing: Policer, policer mark down action - Egress shaping: Per queue, per port
10 hardware queues per port (8 unicast and 2 multicast)
Strict priority queuing (LLQ), shaped-deficit weighted round robin (SDWRR)
Layer 2 classification criteria: Interface, MAC address, Ether type, 802.1p, VLAN
Congestion avoidance capabilities: WRED, ECN
Trust IEEE 802.1p
Configurable shared buffer and buffer monitoring
Congestion Notification Profile
Priority-based flow control (PFC)—IEEE 802.1Qbb
EVPN-VXLAN
EVPN support with VXLAN transport
EVPN pure type-5 route support with symmetric inter-irb routing
All-active multihoming support for EVPN-VXLAN (ESI-LAG, EVPN-LAG)
Multiple EVI (EVPN instances) for multiple MAC-VRF for Mac advertisement
MAC-VRF (EVI) multiple EVPN service-type support: VLAN-based, VLAN-aware, VLAN-bundle
ARP/ND suppression for proxy-arp/nd
Ingress multicast Replication
IGMPv2 snooping support fabric wide: using EVPN route type-6
IGMPv2 snooping support for L2 multihoming scenarios: - EVPN route type-7 and type-8 - IP prefix advertisement using EVPN with VxLAN encapsulation - Symmetric inter-irb routing using RT2/MAC-IP (Integrated Routing and Bridging in Ethernet VPN (EVPN) - IP Prefix Advertisement in Ethernet VPN (EVPN-VxLAN)
DCI using seamless tunnel stitching EVPN-VxLAN to EVPN-VxLAN (Interconnect Solution for EVPN Overlay Networks
OISM - EVPN Optimized Inter-Subnet Multicast (OISM) Forwarding (draft-ietf-bess-evpn-irb-mcast)
Multicast Assisted Replication AR-leaf and AR-spine: Optimized Ingress Replication solution for EVPN (draft-ietf-bess-evpn-optimized-ir)
Network Virtualization Overlay Solution Using EVPN RFC 8365: MAC-VRF instances support with VLAN-based, VLAN-aware, VLAN-bundle service-types in EVPN-VxLAN fabric
Data Center Bridging (DCB)
Explicit congestion notification (ECN)
Priority-based flow control (PFC)—IEEE 802.1Qbb
High Availability
Bidirectional Forwarding Detection (BFD)
Visibility and Analytics
Switched Port Analyzer (SPAN)
Remote SPAN (RSPAN)
Encapsulated Remote SPAN (ERSPAN)
sFlow v5
Junos Telemetry Interface Management and Operations
Management and Operations
Role-based CLI management and access
CLI via console, telnet, or SSH
Extended ping and traceroute
Junos OS Evolved configuration rescue and rollback
SNMP v1/v2/v3
Junos OS Evolved XML management protocol
High frequency statistics collection

Automation and orchestration
ZTP
Python
Junos OS Evolved event, commit, and OP scripts
Juniper Apstra management, monitoring, and analytics for data center fabrics
Juniper Mist™ Wired Assurance for Campus

Software scale

Software	QFX5130-32CD	QFX5130E-32CD	QFX5130-48C and QFX5130-48CM
Operating System	Junos Evolved	Junos Evolved	Junos Evolved
MAC addresses per system	160,000	96,000	96,000
VLAN IDs	4,000	4,000	4,000
Number of link aggregation groups (LAGs)	128	128	72
Ingress routed ACL (RACL)	4*20k per Pipe	4*10k per Pipe	28,671 (for two pipes)
Ingress VLAN ACL (VACL)	20k	10k	14,335 (for two pipes)
Ingress port ACL (PACL)	4*20k per Pipe	4*10k per Pipe	28,671 (for two pipes)
Egress routed ACL (RACL)	4*1k per Pipe	4*1k per Pipe	2*1,000 per Pipe
Egress VLAN ACL (VACL)	2,000	2,000	2,000
Egress port ACL (PACL)	4*2k per Pipe	4*2k per Pipe	2*2,000 per pipe
IPv4/v6 unicast routes	1.2M/850K	732K/428K	700/360K
ARP entries	32,000	32,000	32,000
Jumbo frame	9,216 Bytes	9,216 Bytes	9,216 Bytes
Traffic mirroring destination ports per switch	4	4	4
Maximum number of mirroring sessions	4	4	4
Traffic mirroring destination vlans per switch	4	4	4
Shared Packet Buffer (MB)	132	132	82

QFX5130-32CD & QFX5130E-32CD

QFX5130-48C

QFX5130-48CM

Specifications

Hardware specifications

Table 2: QFX5130 Line System Capacity

Specification	QFX5130-32CD and QFX51320E-32CD	QFX5130-48C and QFX5130-48CM
System throughput	Up to 12.8/25.6 Tbps (uni/bidirectional)	Up to 8/16 Tbps (uni/bidirectional)
Forwarding capacity	5.3 billion packets per second	2.7 billion packets per second
Port density	32 ports of QSFP-DD 400GbE	48 ports of SFP56-DD and 8 port of QSFP-DD 400GbE
Max ports with breakout	64 x 200GbE + 2 x 10GbE or 128 x 100/50/25/10GbE + 2 x 10GbE or 32 x 40GbE + 2 x 10GbE	16 x 200GbE + 48 x 100/50/25/10GbE + 2 x 10 GbE or 72 x 100/50/25/10GbE + 2 x 10GbE or 74 x 10 GbE
Dimensions (W x H x D)	17.26 x 1.72 x 21.1 in. (43.8 x 4.3 x 53.59 cm)	17.28 x 1.72 x 20.5 inches
Rack units	1 U	1 U
Weight	24.5 lbs. (11.1 kg) with power supplies and fans installed	27 lbs. (12.24 kg) with power supplies and fans installed
Operating system	Junos OS Evolved	Junos OS Evolved
Switch chip	Broadcom Trident4	Broadcom Trident4
CPU	Intel Broadwell DE	Intel Ice Lake (4 core)
Memory	32GB (16GBx2) of DDR4	32GB (16GBx2) of DDR4
Storage	2x50GB	2x100GB
Power	Redundant (1+1) hot-pluggable 1600 W AC/DC power supplies	Redundant (1+1) hot-pluggable 1600 W AC/DC power supplies
Cooling	Ports-to-FRUs (AFO) and FRUs-to-ports (AFI) cooling 6 fan trays, redundancy (5+1) hot-pluggable fan modules	Ports-to-FRUs (AFO) and FRUs-to-ports (AFI) cooling 6 fan trays, redundancy (5+1) at rotor level, hot-pluggable fan modules
Total packet buffer	132 MB	82 MB
Warranty	Juniper standard one-year warranty	Juniper standard one-year warranty
AC Input	Voltage: 200 - 240Vac Current: 8A at 200 - 240Vac Frequency: 50-60Hz	Voltage: 100 - 127Vac / 200 - 240Vac Current: 12A at 100 - 127Vac, 9A at 200 - 240Vac Frequency: 50/60Hz
DC Input	Voltage: -48V - -60Vdc Current: 35Amax	Voltage: -48V - -60Vdc Current: 40Amax

Environmental ranges

Table 3: QFX5130 Line Operating Parameters

Parameter	Specification	
	QFX5130-32CD/QFX5130E-32CD	QFX5130-48C/48CM
Operating temperature	0° to 40°C for AFO system, 0° to 30°C for AFI system	0° to 40°C for AFO system, 0° to 40°C for AFI system
Storage temperature	-40° to 70°C	
Operating altitude	AFO: 6000 ft at 40C AFI: Sea level at 30C	AFO: 6000 ft at 40C AFI*: 6000 ft* at 40C
Relative humidity operating	5 to 90% noncondensing	
Relative humidity nonoperating	5 to 90% noncondensing	
Seismic	Zone 4 earthquake rating	

*With 400GZR/ZR-M optics, AFI system can support only 40C, sea-level

Table 4. Power consumption

Parameter	QFX5130-32CD & QFX5130E-32CD	QFX5130-48C & QFX5130-48CM
Maximum power draw	220-240 V: 839 W (AC), 871 W (DC)	220-240 V: 609 W (AC), 587 W (DC)
Typical power draw	220-240 V: 323 W (AC), 341 W (DC)	220-240 V: 219 W (AC), 238 W (DC)

Note: Max power consumption measured at 40°C ambient temperature with SR optics at 100% load with IMIX traffic.
Typical power consumption measured at 25°C ambient temperature with DACs at 50% load with IMIX traffic, excluding transceivers.
Power consumption is subject to operating condition and unit-to-unit variations.

Table 5. QFX5130-32CD and QFX5130E-32CD Approvals

Safety Approvals
UL 60950-1:2007 R5.19 Information Technology Equipment—Safety
CAN/CSA-C22.2 No. 60950-1-07+A1:2011+A2:2014 Information Technology Equipment—Safety
IEC 62368-1:2014 Audio/Video, Information and Communication Technology Equipment—Safety (All country deviations)
IEC 62368-1:2018 Audio/Video, Information and Communication Technology Equipment—Safety (All country deviations)
UL 62368-1:2019 R10.21 Audio/Video, Information and Communication Technology Equipment—Safety
CSA C22.2 No. 62368-1:19, Audio/Video, Information and Communication Technology Equipment—Safety
IEC/EN 60825-1 Safety of Laser Products—Part 1: Equipment Classification and Requirements
Security
TAA
Electromagnetic Capability (EMC)
47 CFR Part 15, (FCC) Class A
ICES-003 Class A
EN 55022/EN 55032, Class A
CISPR 22/CISPR 32, Class A
EN 55024

CISPR 24
EN 300 386
VCCI Class A
AS/NZS CISPR 32, Class A
KN32/KN35
BSMI CNS 13438, Class A
EN 61000-3-2
EN 61000-3-3
Telco
Common Language Equipment Identifier (CLEI) code
Environmental Compliance
Restriction of Hazardous Substances (ROHS)
Waste Electronics and Electrical Equipment (WEEE)

Table 6. QFX5130-48C and QFX5130-48CM Approvals

Safety Approvals
UL 60950-1:2007 R5.19 Information Technology Equipment—Safety
CAN/CSA-C22.2 No. 60950-1-07+A1:2011+A2:2014 Information Technology Equipment—Safety
IEC 62368-1:2014 Audio/Video, Information and Communication Technology Equipment—Safety (All country deviations)
IEC 62368-1:2018 Audio/Video, Information and Communication Technology Equipment—Safety (All country deviations)
UL 62368-1:2019 R10.21 Audio/Video, Information and Communication Technology Equipment—Safety
CSA C22.2 No. 62368-1:19, Audio/Video, Information and Communication Technology Equipment—Safety
IEC/EN 60825-1 Safety of Laser Products—Part 1: Equipment Classification and Requirements
Security
TAA
Electromagnetic Capability (EMC)
FCC 47 CFR Part 15
ICES-003 / ICES-GEN
BS EN 55032
BS EN 55035
EN 300 386 V1.6.1
EN 300 386 V2.2.1
BS EN 300 386
EN 55032
CISPR 32
EN 55035
CISPR 35
IEC/EN 61000 Series
IEC/EN 61000-3-2
IEC/EN 61000-3-3
AS/NZS CISPR 32
VCCI-CISPR 32
BSMI CNS 15936
KS C 9835 (Old KN 35)
KS C 9832 (Old KN 32)

KS C 9610
BS EN 61000 Series
Energy Efficiency Requirements
AT&T TEER (ATIS-06000015.03.2013)
ECR 3.0.1
ETSI ES 203 136 (2013-05)
Verizon TEEER (VZ.TPR.9205 Issue 6)
ETSI
ETSI EN 300 019: Environmental Conditions & Environmental Tests for Telecommunications Equipment
ETSI EN 300 019-2-1 — Storage
ETSI EN 300 019-2-2 — Transportation
ETSI EN 300 019-2-3 noncondensing — Stationary use at weather-protected locations
ETS 300753 — Acoustic noise emitted by telecommunications equipment
Environmental Compliance
Restriction of Hazardous Substances (RoHS)
Toxic Substances Control Act (TSCA)
Persistent Organic Pollutants (POPs)
Recycled Material Waste Electronics and Electrical Equipment (WEEE)
California Prop 65
Registration, Evaluation, Authorization and Restriction of Chemicals (REACH)
Telco
Common Language Equipment Identifier (CLEI) code

Ordering information

QFX5130-32CD and QFX5130E-32CD ordering information

Product number	Description
QFX5130-32CD-AFI	QFX5130 (hardware with base software), 32 QSFP-DD/QSFP+/QSFP28 ports, redundant fans, 2 AC power supplies, back-to front airflow
QFX5130-32CD-AFO	QFX5130 (hardware only; software services sold separately), 32 QSFP-DD/QSFP+/QSFP28 ports, redundant fans, 2 AC power supplies, front-to-back airflow
QFX5130-32CD-D-AFI	QFX5130 (hardware only; software services sold separately), 32 QSFP-DD/QSFP+/QSFP28 ports, redundant fans, 2 DC power supplies, back-to-front airflow
QFX5130-32CD-D-AFO	QFX5130 (hardware only; software services sold separately), 32 QSFP-DD/QSFP+/QSFP28 ports, redundant fans, 2 DC power supplies, front-to-back airflow
QFX5130E-32CD-AFI	32X 400G 1U AC ports- AFI - AIR IN (AFI) back-to-front (air enters through the back of the switch)
QFX5130E-32CD-AFO	32X 400G 1U AC ports- AFO - AIR OUT (AFO) front-to-back (air exhausts through the back of the switch)
QFX5130E-32CD-D-AI	32X 400G 1U DC ports- AFI - AIR IN (AFI) back-to-front (air enters through the back of the switch)
QFX5130E-32CD-D-AO	32X 400G 1U DC ports- AFO - AIR OUT (AFO) front-to-back (air exhausts through the back of the switch)
QFX5130-32CD-CHAS	Chassis Spare for QFX5130-32CD without FAN & Power module
QFX5130E-32CD-CHAS	Chassis Spare for QFX5130E-32CD without FAN & Power module
JPSU-1600W-1UACAFI	QFX5220-32CD 1600W 1U AC PSU AFI

Product number	Description
JPSU-1600W-1UACAFO	QFX5220-32CD 1600W 1U AC PSU AFO
JPSU-1600W-1UDCAFI	QFX5220-32CD 1600W 1U DC PSU AFI
JPSU-1600W-1UDCAFO	QFX5220-32CD 1600W 1U DC PSU AFO
QFX5220-32CD-4PRMK	4-Post Rack Mount Kit for QFX5130-32CD
QFX5K-4PST-RMK-E	Enhanced 4PST RMK (Toolless Kit) for QFX5130-32CD & QFX5130E-32CD
QFX5220-32CD-FANAI	Airflow in (AFI) back-to-front airflow fans for QFX5130-32CD
QFX5220-32CD-FANAO	Airflow out (AFO) front-to-back airflow fans for QFX5130-32CD
Software	
S-QFX5K-C3-A1-X (X=3,5)	Base L3 Software Subscription (X Years; X=3,5) License for QFX5130-32CD and QFX5130E-32CD
S-QFX5K-C3-A2-X (X=3,5)	Advanced Software Subscription (X Years; X=3,5) License for QFX5130-32CD and QFX5130E-32CD
QFX5K-C3-P1-X (X=3,5)	Premium Software Subscription (X Years; X=3,5) License for QFX5130-32CD and QFX5130E-32CD

QFX5130-48C and QFX5130-48CM ordering information

Product number	Description
Hardware	
QFX5130-48C-AFO	QFX5130 (hardware with base software), 1 U, 48 SFP56-DD ports and 8 QSFP-DD ports, redundant fans, 2 AC power supplies, front-to-back airflow
QFX5130-48C-AFI	QFX5130 (hardware with base software), 1 U, 48 SFP56-DD ports and 8 QSFP-DD ports, redundant fans, 2 AC power supplies, back-to-front airflow
QFX5130-48C-D-AFO	QFX5130 (hardware with base software), 1 U, 48 SFP56-DD ports and 8 QSFP-DD ports, redundant fans, 2 DC power supplies, front-to-back airflow
QFX5130-48C-D-AFI	QFX5130 (hardware with base software), 1 U, 48 SFP56-DD ports and 8 QSFP-DD ports, 2 DC power supplies, back-to-front airflow
QFX5130-48C-CHAS	QFX5130 (hardware with base software), 1 U, 48 SFP56-DD ports and 8 QSFP-DD ports without PSU and Fans
JPSU-1600W-1UACAFI	QFX5220-32CD 1600W 1U AC PSU AFI
JPSU-1600W-1UACAFO	QFX5220-32CD 1600W 1U AC PSU AFO
JPSU-1600W-1UDCAFI	QFX5220-32CD 1600W 1U DC PSU AFI
JPSU-1600W-1UDCAFO	QFX5220-32CD 1600W 1U DC PSU AFO
QFX5130-48C-FANAI	AFI Fan Module for QFX5130-48C
QFX5130-48C-FANAO	AFO Fan Module for QFX5130-48C
QFX5130-1RU-4PRMK	4-Post Toolless Rack Mount Kit for QFX5130-48C
QFX5130-1RU-4PRMK	4-Post Toolless Rack Mount Kit for QFX5130-48C
QFX5130-48CM-AFO	QFX5130 (hardware with base software), 1U, 48 SFP56-DD ports and 8 QSFP-DD ports, redundant fans, 2 AC power supplies, front-to-back airflow, MACsec capable
QFX5130-48CM-AFI	QFX5130 (hardware with base software), 1U, 48 SFP56-DD ports and 8 QSFP-DD ports, redundant fans, 2 AC power supplies, back-to-front airflow, MACsec capable
QFX5130-48CM-D-AFO	QFX5130 (hardware with base software), 1U, 48 SFP56-DD ports and 8 QSFP-DD ports, redundant fans, 2 DC power supplies, front-to-back airflow, MACsec capable
QFX5130-48CM-D-AFI	QFX5130 (hardware with base software), 1U, 48 SFP56-DD ports and 8 QSFP-DD ports, redundant fans, 2 DC power supplies, back-to-front airflow, MACsec capable
QFX5130-48CM-CHAS	QFX5130 (hardware with base software), 1U, 48 SFP56-DD ports and 8 QSFP-DD ports without PSU and Fans, Spare, MACsec capable
JNP-GL-2H6-1032-ST	GROUNDING LUGS FOR QFX5130
QFX5130-1RU-4PRMK	TOOLLESS RMK FOR QFX513048C/CM

Product number	Description
Software	
S-QFX5K-C3-A1-X	Base L3 Software Subscription (X=Term Lengths (1,3,5,P): 1-year, 3-year, 5-year, Perpetual) License for QFX5130-48C and QFX5130-48CM
S-QFX5K-C3-A2-X	Advanced Software Subscription (X=Term Lengths (1,3,5,P): 1-year, 3-year, 5-year, Perpetual) License for QFX5130-48C and QFX5130-48CM
S-QFX5K-C3-P1-X	Premium Software Subscription (X=Term Lengths (1,3,5,P): 1-year, 3-year, 5-year, Perpetual) License for QFX5130-48C and QFX5130-48CM
S-QFX5KC3-MACSEC-X	MACsec Software feature (X years-3,5,P) license for QFX5130-48CM

Optics and transceivers

Listed below are optics and transceivers that are only supported on ports 53 and 55 of the QFX5130-48C and QFX5130-48CM.

For up-to-date information of optics supported on the entire line of QFX5130 switches, visit the Hardware Compatibility Tool at https://apps.juniper.net/hct/product/. The QFX5130 line supports varying port speeds at 400GbE, 200GbE, 100GbE, 50GbE, 40GbE, 25GbE, and 10GbE with different transceiver options of direct attach copper cables, active optical cables, and breakout cables (DACBO and AOCBO).

Part Number	Description	SKU
400GBASE-ZR	QSFP-DD, up to 80km without amplifier, 120km w/ amplifier, SMF, duplex LC	QDD-400G-ZR
400GBASE-ZR+	QSFP-DD, up to 300km, SMF, duplex LC	QDD-400G-ZR-M

Note: Information is provided on an as-is basis and may change in the future.

Useful links:

Feature Explorer

Hardware Compatibility tool

Recommended Releases

About Juniper Networks

Juniper Networks believes that connectivity is not the same as experiencing a great connection. Juniper's AI-Native Networking Platform is built from the ground up to leverage AI to deliver exceptional, highly secure, and sustainable user experiences from the edge to the data center and cloud. Find additional information at www.juniper.net or connect with Juniper on X (formerly Twitter), LinkedIn and Facebook.

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