

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 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 two 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 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 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 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 two compact 1 U platforms—QFX5130-32CD and QFX5130-48C. Both provide high speeds, high densities, and a rich set of [Junos® OS Evolved operating system](#) features.

The Juniper Networks QFX5130-32CD Switch is a next-generation, fixed-configuration spine-and-leaf switch featuring:

- 32 400G QSFP-DD ports in 1 U form factor
- Up to 25.6 Tbps (bidirectional)/5.68 bpps throughput
- Enhanced scale up to 1.24 million routes, 80,000 firewall filters, and 160,000 media access control (MAC) addresses

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 Switch is a next-generation, high-density, and cost-efficient 100GbE and 400GbE optimized fixed system featuring:

- Native 48 SFP56DD 100GbE ports for server connectivity
- Native 8 QSFP-DD 400GbE uplink ports
- Up to 16 Tbps (bidirectional)/2.7 bpps throughput

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

Product Highlights for QFX5130-32CD

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.

132 MB Shared Packet Buffer

Today's cloud-native applications have critical dependency on buffer size to prevent congestion and packet drops. The QFX5130-32CD has a 132 MB shared packet buffer that is allocated dynamically to congested ports.

Power Efficiency

With its low-power 7 nm process, the QFX5130-32CD typically consumes 373 W, bringing improvements in speed, less power consumption, and higher density on chip.

Product Highlights for QFX5130-48C

Increased port density with less power usage

The QFX5130-48C supports 100GbE ports with SFP-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.

82 MB Shared Packet Buffer

Having the right amount of on buffer is critical to preventing congestion and packet drops. The QFX5130-48C has an 82 MB shared packet buffer that is allocated dynamically to congested ports.

Power Efficiency

The QFX5130-48C typically consumes 285 W, bringing improvements in total power consumption and better power efficiency per port.

Features and Benefits

- **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 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 QFX5130-32CD supports best-in-class cloud-scale L2/L3 deployments with a low latency of 630 ns and superior scale and performance. This includes L2 support for 160,000 MAC addresses and Address Resolution Protocol (ARP) learning, which scales up to 64,000 entries at 500 frames per second. It also includes L3 support for 1.24 million longest prefix match (LPM) routes and 160,000 host routes on IPv4. Additionally, the QFX5130-32CD supports 610,000 LPM routes and 80,000 host routes on IPv6, 128-way equal-cost multipath (ECMP) routes, and a filter that supports 80,000 ingress and 18,000 egress exact match filtering rules. The QFX5130-32CD supports 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 QFX5130-32CD to be optimized for different deployment scenarios.
- **VXLAN overlays:** The QFX5130 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, enabling accurate and precise sub-microsecond timing information in today's data center networks. In addition, the QFX5130-32CD supports 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 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) 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) design 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 to servers/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 QFX5130-32CD or QFX5130-48C 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 line 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	QFX5130-48C
Operating System	Junos Evolved	Junos Evolved
MAC addresses per system	160,000	96,000
VLAN IDs	4000	4000
Number of link aggregation groups (LAGs)	128	72
Ingress routed ACL (RACL)	6143	28,671
Ingress VLAN ACL (VACL)	6143	14,335
Ingress port ACL (PACL)	6143	28,671
Egress routed ACL (RACL)	1000	1000
Egress VLAN ACL (VACL)	2000	2000
Egress port ACL (PACL)	2000	2000
IPv4/v6 unicast routes	1.2M/850,000	700,000/360,000
ARP entries	32,000	32,000
Jumbo frame	9216Bytes	9216Bytes
Traffic mirroring destination ports per switch	4	4
Maximum number of mirroring sessions	4	4
Traffic mirroring destination vlans per switch	4	4



QFX5130-32CD



QFX5130-48C

Specifications

Hardware Specifications

Table 2: QFX5130 Line System Capacity

Specification	QFX5130-48C	QFX5130-32CD
System throughput	Up to 16 Tbps (bidirectional)/8 Tbps (unidirectional)	Up to 25.6 Tbps (bidirectional)/12.8 Tbps (unidirectional)
Forwarding capacity	2.7 billion packets per second	5.68 billion packets per second
Port density	48 ports of SFP56-DD and 8 port of QSFP-DD 400GbE	32 ports of QSFP-DD 400GbE
Max ports with breakout	16 x 200GbE + 48 x 100/50/25GbE + 2 x 10 GbE or 72 x 100/50/25GbE + 2 x 10 GbE or 74 x 10 GbE	64 x 200GbE + 2 x 10GbE or 128 x 100/50/25/10GbE + 2 x 10GbE or 32 x 40GbE + 2 x 10GbE
Dimensions (W x H x D)	17.28 x 1.72 x 20.5 inches	17.26 x 1.72 x 21.1 in. (43.8 x 4.3 x 53.59 cm)
Rack units	1 U	1 U
Weight	27 lbs. (12.24 kg) with power supplies and fans installed	24.5 lbs. (11.1 kg) with power supplies and fans installed
Operating system	Junos OS Evolved	Junos OS Evolved
CPU	Intel Ice Lake (4 core)	Intel Broadwell DE
Memory	32GB (16GBx2) of DDR4	32GB (16GBx2) of DDR4
Storage	2x100GB	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) hot-pluggable fan modules
Total packet buffer	82 MB	132 MB
Warranty	Juniper standard one-year warranty	Juniper standard one-year warranty

Environmental Ranges

Table 3: QFX5130 Line Operating Parameters

Parameter	Specification
Operating temperature	0° to 40°C @6000 ft for AFO system, 0° to 40°C @sea level for AFI systems.
Storage temperature	-40° to 70°C
Operating altitude	AFO: 6000 ft AFI: Sea level
Relative humidity operating	5 to 90% noncondensing
Relative humidity nonoperating	5 to 90% noncondensing
Seismic	Zone 4 earthquake rating

Table 4. Power consumption

Parameter	QFX5130-32CD	QFX5130-48C
Maximum power draw	220-240 V: 839 W	220-240 V: 554 W
Typical power draw	220-240 V: 373 W	220-240 V: 285 W

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. Power consumption is subject to operating condition and unit-to-unit variations.

Table 5. QFX5130-32CD Approvals

Safety Approvals
CAN/CSA-C22.2 No. 60950-1 Information Technology Equipment—Safety
UL 60950-1 Information Technology Equipment—Safety
EN 60950-1 Information Technology Equipment—Safety
IEC 60950-1 Information Technology Equipment—Safety (All country deviations)
EN 60825-1 Safety of Laser Products—Part 1: Equipment
Classification
Security
FIPS/CC*
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
ETSI
ETSI EN 300 019: Environmental Conditions & Environmental Tests for Telecommunications Equipment
ETSI EN 300 019-2-1 (2000)—Storage
ETSI EN 300 019-2-2 (1999)—Transportation
ETSI EN 300 019-2-3 (2003)—Stationary Use at Weather-protected locations
ETS 300753 (1997)—Acoustic noise emitted by telecommunications equipment
Telco
Common Language Equipment Identifier (CLEI) code
Environmental Compliance
Restriction of Hazardous Substances (ROHS)
Recycled material
Waste Electronics and Electrical Equipment (WEEE)

*Reserved for future release

Table 6. QFX5130-48C 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
NEBS
DC NEBS GR 3160 standard
GR-1089-Core Issue 7: EMC and Electrical Safety for Network Telecommunications Equipment
Security
TAA*
FIPS/CC*
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 (2000)—Storage
ETSI EN 300 019-2-2 (1999)—Transportation

ETSI EN 300 019-2-3 (2003)—Stationary use at weather-protected locations
 ETS 300753 (1997)—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

*Reserved for future release

Ordering Information

QFX5130-32CD 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
JPSU-1600W-1UACAFI	QFX5130-32CD-AFI 1 U AC power supply unit
JPSU-1600W-1UACAFO	QFX5130-32CD-AFO 1 U AC power supply unit
JPSU-1600W-1UDCAFI	QFX5130-32CD-D-AFI 1 U DC power supply unit
JPSU-1600W-1UDCAFO	QFX5130-32CD-D-AFO 1 U DC power supply unit
QFX5220-32CD-4PRMK	4-Post Rack Mount Kit for QFX5130-32CD
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
S-QFX5K-C3-A2-X (X=3,5)	Advanced Software Subscription (X Years; X=3,5) License for QFX5130-32CD
QFX5K-C3-P1-X (X=3,5)	Premium Software Subscription (X Years; X=3,5) License for QFX5130-32CD

QFX5130-48C ordering information

Product number	Description
Hardware	
QQFX5130-48C-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

Product number	Description
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-1UACAFO	QFX5130-48C-AFO 1 U AC power supply unit
JPSU-1600W-1UDCAFO	QFX5130-48C-D-AFO 1 U DC power supply unit
JPSU-1600W-1UACAFI	QFX5130-48C-AFI 1 U AC power supply unit
JPSU-1600W-1UDCAFI	QFX5130-48C-D-AFI 1 U DC power supply unit
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
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
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
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

Optics and Transceivers

Part Number	Description	SKU
40GBASE-CR8	QSFP-DD to QSFP-DD, passive copper, 1/2.5m	QDD-400G-DAC-xM
40GBASE-AOC	QSFP-DD to QSFP-DD, active optical cable, 1/3/5/7/10/15/20/30m	QDD-400G-AOC-xM
40GBASE-SR4.2	QSFP-DD, up to 70m with OM3 and 100m with OM4 MMF, MPO-12	QDD-400G-SR4P2
40GBASE-DR4	QSFP-DD, up to 500m, SMF, MPO-12	QDD-400G-DR4
40GBASE-FR4	QSFP-DD, up to 2km, SMF, duplex LC	QDD-400G-FR4
40GBASE-LR4	QSFP-DD, up to 10km, SMF, duplex LC	QDD-400G-LR4-10
40GBASE-ZR	QSFP-DD, up to 80km without amplifier, 120km w/amplifier, SMF, duplex LC	QDD-400G-ZR
40GBASE-ZR+	QSFP-DD, up to 300km, SMF, duplex LC	QDD-400G-ZR-M
100GBASE		
100GBASE-CR4	QSFP28 to QSFP28, passive copper, 1/3/5m	JNP-100G-DAC-xM
100GBASE-AOC	QSFP28 to QSFP28, active optical cable, 1/3/5/7/10/15/20/30m	JNP-100G-AOC-xM
100GBASE-SR4	QSFP, up to 70m w/ OM3 and 100m with OM4 MMF, MPO-12	QSFP-100G-SR4-C
100G SR1.2	QSFP, up to 70m with OM3 and 100m with OM4 MMF, LC	QSFP-100G-SR1P2
100GBASE-DR	QSFP, up to 500m, SMF, LC	QSFP-100G-DR
100GBASE-CWDM4	QSFP, up to 2km, SMF, LC	QSFP-100G-CWDM-C
100GBASE-LR4	QSFP, up to 10km, SMF, LC	QSFP-100G-LR4-C
100GBASE-LR	Up to 10km, SMF, LC	QSFP-100G-LR
100G ZR4	Up to 60km, SMF, LC	QSFP-100G-ZR4
QSFP-100G-FR		
40G		
40G-CR4	QSFP+ to QSFP+, passive copper, 1/3/5m	QFX-QSFP-DAC-xM

40GBASE-SR4	QSFP, up to 100m w/ OM3 and 150m with OM4 MMF, MPO-12	QFX-QSFP-40G-SR4
40G ESR4	QSFP, up to 300m w/ OM3 and 150m with OM4 MMF, MPO-12	QSFP-4X10GE-SR
40G LX4	QSFP, up to 100m with OM3 and 150m with OM4 MMF, 2km SMF, LC	JNP-QSFP-40G-LX4
40GBASE-LR4	QSFP, up to 10km, SMF, LC	QSFP-40G-LR4-C

Part Number	Description	SKU
200GBASE-CR4	QSFP56-DD to 2xQSFP56, passive copper, 1/2/2.5m	QDD-2X200G-xM
100GBASE		
100GBASE-CR4	QSFP28-DD to 2xQSFP28, passive copper, 1/2/3m	QDD-2X100G-xM
100GBASE-CR2	QSFP56-DD to 4xQSFP56, passive copper, 1/2/2.5m	QDD-4X100G-xM
100G SR1.2	QSFP-DD, 4x100G, up to 70m with OM3 and 100m with OM4 MMF, MPO-12	QDD-400G-SR4P2
100GBASE-DR	QSFP-DD, 4x100G, up to 500m, SMF, MPO-12	QDD-400G-DR4
100GBASE-FR	QSFP-DD, 4x100G, up to 2km, SMF, MPO-12	QDD-4X100G-FR
100GBASE-LR	QSFP-DD, 4x100G, up to 10km, SMF, MPO-12	QDD-4X100G-LR

50G CR2	QSFP to 2xQSFP, passive copper, 1/2/3/5m	JNP-100G-2X50G-xM
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25GBASE-CR	QSFP28 to 4xSFP28, passive copper, 1/3/5m	JNP-100G-4X25G-xM
25GBASE-SR	QSFP, 4x25G, up to 70m w/ OM3 and 100m with OM4 MMF, MPO-12	QSFP-100G-SR4-C

10GBASE-CR	QSFP+ to 4xSFP+, passive copper, 1/3m	QFX-QSFP-DACBO-xM
10GBASE-SR	QSFP, 4x10G, up to 300m with OM3 and 150m with OM4 MMF, MPO-12	QSFP-4X10GE-SR
10GBASE-LR	QSFP, 4x10G, up to 10km, SMF, MPO-12	JNP-QSFP-4X10GE-LR

Part Number	Description	SKU
10G USR	SFP, up to 30m with OM2 and 100m with OM3 MMF, LC	SFPP-10G-USR-C
10GBASE-SR	SFP, up to 300m with OM3 and 400m with OM4 MMF, LC	SFPP-10G-SR-C
10GBASE-LR	SFP, up to 10km, SMF, LC	SFPP-10G-LRT2-C
10GBASE-ER	SFP, up to 40km, SMF, LC	SFPP-10G-ER-C

Part Number	Description	SKU
100GBASE-SDD-AOC	SFP56-DD (SDD) to SFP56-DD (SDD), active optical cable, 1/3/5/7/10/15/20/30m	SDD-100G-AOC-xM
100GBASE-SDD-DAC	SFP56-DD (SDD) to SFP56-DD (SDD), passive optical cable, 1/2/3m	SDD-100G-DAC-xM
50GBASE-SDD-DACBO	SFP56-DD (SDD) to 2xSFP56, passive copper breakout, 1/2/3m	SDD-2X50G-xM
100G SDD DR Optics	SFP56-DD (SDD) 100G DR transceiver	SDD-100G-DR
100G SDD FR Optics	SFP56-DD (SDD) 100G FR transceiver	SDD-100G-FR1
100G SDD LR Optics	SFP56-DD (SDD) 100G LR transceiver	SDD-100G-LR1

Part Number	Description	SKU
100G SDD SR1.2 Optics	SFP56-DD (SDD) 100G SR BiDi transceiver	SDD-100G-SR1P2
100G SDD ER Optics	SFP56-DD (SDD) 100G ER transceiver	SDD-100G-ER1-40
SDD-QSFP-AOC (Server connectivity)	SFP56-DD (SDD) to SFP56, active optical cable, 1/3/5/7/10/15/20/30m	SDD-Q56-AOC-xM*

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

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At Juniper Networks, we are dedicated to dramatically simplifying network operations and driving superior experiences for end users. Our solutions deliver industry-leading insight, automation, security and AI to drive real business results. We believe that powering connections will bring us closer together while empowering us all to solve the world's greatest challenges of well-being, sustainability and equality.

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