QSFPP-40GBASE-LR4

Part number: 740-073093

Optics Overview

Juniper Networks offers a complete portfolio of modular and fixed-chassis routers and switches for both WAN and data center networks. These solutions span Juniper's MX-Series Universal Routing Platform and PTX-Series Packet Transport Routers to EX-Series Ethernet Switches and QFX-Series Data Center Switches among others. Depending on deployment scenarios, Juniper's platforms support different pluggable optic modules that can be selected based on speed, distance, form-factor, and wavelength among other relevant attributes.

Additional Resources

Hardware Compatibility Tool

HCT contains a regularly updated database of Juniper's transceivers, DACs, and AOCs along with information regarding compatibility with Juniper's platforms and interface modules.

https://apps.juniper.net/hct/home/

Product Description

40GE QSFP+ LR4 Pluggable Optics module

Overview

Part Number	740-073093
Old Part Number(s)	740-043308
Speed	40 Gigabit Ethernet
Breakout Capable	No
Transceiver Type	QSFP+
Product Type	Optical Transceiver
Connector	Duplex LC
Monitoring Available	Yes
Digital Optical Monitoring	—
Common Optic Equivalent	QSFPP-40G-LR4-C

Note:

- Monitoring Available - Can measure received optical power and display in CLI.
- Digital Optical Monitoring - Full support for SFF-8636.
- Common Optic - The common optics product line provides competitively priced single-SKU optics offerings for use across Juniper routing, switching, and security platforms.

Specifications

Standard: 40GBASE-LR4

Standards compliance (Ethernet/OTN Standard, for e.g. 100GBASE-LR4)	IEEE 802.3ba-2010
Transmitter wavelengths (range)	1264.5 nm through 1277.5 nm 1284.5 nm through 1297.5 nm 1304.5 nm through 1317.5 nm 1324.5 nm through 1337.5 nm
Transmitter output power, each lane (minimum)	–7 dBm
Transmitter output power, each lane (maximum)	2.3 dBm
Receiver input power, each lane (minimum)	–13.7 dBm
Receiver input power, each lane (maximum)	2.3 dBm
Cable type	SMF
Core size/cladding	9/125 µm
Distance	10 km
Maximum Power consumption (W)	3.5 W
Operating Temperature (range)	0° C to 70° C
Storage temperature	–40° C to 85° C

Supported Platforms

Platform	Introduced Release	Additional Information
Routing		
ACX710	Junos OS 20.2R1	
ACX5448-D	Junos OS 19.3R1	
ACX5448-M	Junos OS 19.3R1	
ACX5448	Junos OS 18.2R1	
ACX6360	Junos OS 18.4R1	
ACX7024	Junos OS Evolved 22.3R1	
ACX7100-32C	Junos OS Evolved 21.3R1	
ACX7100-48L	Junos OS Evolved 21.3R1	
ACX7509	Junos OS Evolved 21.4R1	
MX240	Junos OS 12.2R1	
MX480	Junos OS 12.2R1	
MX960	Junos OS 12.2R1	
MX2008	Junos OS 15.1F7	
MX2010	Junos OS 12.3R2	
MX2020	Junos OS 12.3R1	
MX10004	Junos OS 22.3R1	
MX10008	Junos OS 18.2R1	
MX10016	Junos OS 19.2R1	
PTX10001-36MR	Junos OS Evolved 20.2R1	
PTX1000	Junos OS 16.1X65-D30	
PTX3000	Junos OS 16.1R3	
PTX5000	Junos OS 17.1R1	
PTX10002-60C	Junos OS 18.2R1	
PTX10003	Junos OS Evolved 20.1R1	
PTX10004	Junos OS Evolved 21.1R1	

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Platform	Introduced Release	Additional Information
PTX10008	Junos OS Evolved 21.1R1 Junos OS 17.2R1	
PTX10016	Junos OS Evolved 21.1R1 Junos OS 17.4R1	
Security		
SRX5400	Junos OS 19.3R1	
SRX5600	Junos OS 19.3R1	
SRX5800	Junos OS 19.3R1	
Switching		
EX3400	Junos OS 21.4R1	
EX4300	Junos OS 13.2X51-D15	
EX4300 Multigigabit	Junos OS 18.2R1	
EX4400	Junos OS 22.1R1	
EX4400-48T	Junos OS 22.1R1	
EX4400-24T	Junos OS 22.1R1	
EX4400 Multigigabit	Junos OS 22.1R1	
EX4400-24X Breakout Supported	Junos OS 23.4R1	
EX4400-48F	Junos OS 22.1R1	
EX4600		
EX4650-48Y	Junos OS 22.1R1	
EX9204	Junos OS 16.1R1	
EX9208	Junos OS 16.1R1	
EX9214	Junos OS 16.1R1	
QFX5130-32CD	Junos OS Evolved 20.4R1	
QFX5120-48Y	Junos OS 22.1R1	
QFX5230-64CD		
QFX5700	Junos OS Evolved 21.2R1	

Supported Interface Modules

Flexible PIC Concentrators (FPCs)

Name	Description	Platforms and Introduced Releases
40 Gigabit Ethernet		
QFX5K-FPC-16C	16X100G linecard for QFX5700 chassis	QFX5700 Junos OS Evolved 21.2R1

I/O cards (IOCs)

Name	Description	Platforms and Introduced Releases	
40 Gigabit Ethernet			
SRX5K-IOC4-MRAT	SRX5K-IOC4-MRAT is a fixed-configuration interface card with a Packet Forwarding Engine that provides up to 480-Gbps (240-Gbps per PIC slot) line rate. This interface card provides scalability in bandwidth and services to the SRX5400, SRX5600, and SRX5800 Services Gateways. Note: SRX5K-IOC4-MRAT cards do not support plug-in Modular Interface Cards (MICs).</br>	SRX5400 Junos OS 19.3R1 SRX5800 Junos OS 19.3R1	SRX5600 Junos OS 19.3R1

Line Cards

Name	Description	Platforms and Introduced Releases	
40 Gigabit Ethernet			
ACX7509-FPC-16C	ACX7509 16X40GE/16X100GE LINE CARD	ACX7509 Junos OS Evolved 21.4R1	
EX9200-12QS	A line card with six 40-Gigabit Ethernet rate-selectable ports, each of which can house transceivers	EX9204 Junos OS 16.1R1 EX9214 Junos OS 16.1R1	EX9208 Junos OS 16.1R1
EX9200-6QS	A line card with six 40-Gigabit Ethernet ports and 24 10-Gigabit Ethernet ports	EX9204 EX9214	EX9208

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Name	Description	Platforms and Introduced Releases	
MX10K-LC2101	JNP10008/MX10008 24x100G/24x40G/96x10G Line Card	MX10004 Junos OS 22.3R1 MX10016 Junos OS 19.2R1	MX10008 Junos OS 18.2R1
MX10K-LC9600	The MX10K-LC9600 (Model number: JNP10K-LC9600) is a fixed-configuration 24-port line card, which provides a line rate throughput of 9.6 Tbps	MX10004 Junos OS 22.3R1	MX10008 Junos OS 21.4R1
PTX10K-LC1101	30x100G/30x40G Line Card	PTX10008 Junos OS 17.2R1	PTX10016 Junos OS 17.4R1
PTX10K-LC1102	36X40G/12X100G Line Card	PTX10008 Junos OS 17.2R1	PTX10016 Junos OS 17.4R1
PTX10K-LC1105	PTX10K 3Tbps MACse Line Card - 30x100G/30x40G	PTX10008 Junos OS 17.4R2	PTX10016 Junos OS 18.3R1
PTX10K-LC1202-36MR	36-port line card that has thirty-two QSFP28 ports capable of supporting 100-Gbps speed, and four QSFP56-DD ports capable of supporting 400-Gbps speed	PTX10004 Junos OS Evolved 21.1R1 PTX10016 Junos OS Evolved 21.1R1	PTX10008 Junos OS Evolved 21.1R1

Modular Interface Cards (MICs)

Name	Description	Platforms and Introduced Releases	
40 Gigabit Ethernet			
MIC-MACSEC-MRATE	8x100G/12x40G/48x10G MACSEC MIC for MX2K	MX2008 Junos OS 17.4R1 MX2020 Junos OS 17.4R1	MX2010 Junos OS 17.4R1
MIC-MRATE	MIC MRATE	MX2008 Junos OS 15.1F7 MX2020 Junos OS 16.1R1	MX2010 Junos OS 16.1R1

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Name	Description	Platforms and Introduced Releases	
MIC3-3D-2X40GE-QSFPP	40-Gigabit Ethernet MIC with QSFP+	MX240 Junos OS 12.2R1 MX960 Junos OS 12.2R1 MX2010 Junos OS 12.3R2	MX480 Junos OS 12.2R1 MX2008 Junos OS 15.1F7 MX2020 Junos OS 12.3R1

Modular Port Concentrators (MPCs)

Name	Description	Platforms and Introduced Releases	
40 Gigabit Ethernet			
MPC10E-10C	MPC10E-10C-MRATE/MPC10E-10C-P-BASE, 10 x QSFP28/QSFP56-DD multirate port line card	MX240 Junos OS 19.2R1 MX960 Junos OS 19.2R1	MX480 Junos OS 19.2R1
MPC10E-15C	MPC10E-15C-MRATE/MPC10E-15C-P-BASE, 15 x QSFP28/QSFP56-DD multirate port line card	MX240 Junos OS 19.1R1 MX960 Junos OS 19.1R1	MX480 Junos OS 19.1R1
MPC5E-40G10G	6x40GE + 24x10GE MPC5E	MX240 Junos OS 13.3R2 MX960 Junos OS 13.3R2 MX2010 Junos OS 13.3R2	MX480 Junos OS 13.3R2 MX2008 Junos OS 15.1F7 MX2020 Junos OS 13.3R2
MPC5EQ-40G10G	6x40GE + 24x10GE MPC5EQ	MX240 Junos OS 13.3R2 MX960 Junos OS 13.3R2 MX2010 Junos OS 13.3R2	MX480 Junos OS 13.3R2 MX2008 Junos OS 15.1F7 MX2020 Junos OS 13.3R2

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Name	Description	Platforms and Introduced Releases	
MPC7E-MRATE	MPC7E (Multi-Rate)	MX240 Junos OS 16.1R1	MX480 Junos OS 16.1R1
		MX960 Junos OS 16.1R1	MX2008 Junos OS 15.1F7
		MX2010 Junos OS 16.1R1	MX2020 Junos OS 16.1R1

Physical Interface Cards (PICs)

Name	Description	Platforms and Introduced Releases	
40 Gigabit Ethernet			
P2-10G-40G-QSFPP	10-Gigabit Ethernet/40-Gigabit Ethernet LAN/WAN OTN PIC with QSFP+ (PTX Series)	PTX3000 Junos OS 16.1R3	PTX5000 Junos OS 17.1R1
P3-10-U-QSFP28	10-Port 10-Gigabit Ethernet, 40-Gigabit Ethernet, 100-Gigabit Ethernet PIC with QSFP28 (PTX Series)	PTX3000 Junos OS 16.1R3	PTX5000 Junos OS 17.1R1
P3-15-U-QSFP28	15 Port 10-Gigabit, 40-Gigabit Ethernet, 100-Gigabit Ethernet PIC with QSFP28 (PTX Series)	PTX5000 Junos OS 17.1R1	
P3-24-U-QSFP28	24 Port 10-Gigabit Ethernet, 40-Gigabit Ethernet PIC with QSFP+ (PTX Series)	PTX3000 Junos OS 16.1R3	PTX5000 Junos OS 17.1R1

Uplink Modules

Name	Description	Platforms and Introduced Releases
40 Gigabit Ethernet		
EX-UM-2QSFP	EX4300, 2-Port 40G QSFP+ Uplink Module	EX4300 Junos OS 13.2X51-D15

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Name	Description	Platforms and Introduced Releases	
EX4400-EM-1C	1x100GbE QSFP28 extension module for EX4400 series of switches	EX4400 Junos OS 23.1R1 EX4400-24T Junos OS 23.1R1 EX4400-24X Junos OS 23.4R1 Breakout Supported	EX4400-48T Junos OS 23.1R1 EX4400 Multigigabit Junos OS 23.1R1 EX4400-48F Junos OS 23.1R1

Why buy optics from Juniper?

There is value in choosing Juniper over 3rd party optics

✓ Full testing, validation, and JTAC support for Juniper optics

- Power, Electrical, and Management interfaces tested at the system level.
- Extended temperature and functional testing in DVT chamber using fully loaded systems.
- Full software integration into JUNOS/EVO for seamless part recognition, functionality, and telemetry.
- Latest qualification status and optics specifications published on Hardware Compatibility Tool.

✓ Single-source provider for 1G to 400G on a variety of optical technologies

- Juniper's optics portfolio is maintained and constantly refreshed based on vendor availability.
- Automatic supply chain diversity and supply continuity - multiple optics suppliers fulfilled through Juniper.

✓ Rigorous evaluation of optical vendors

- Juniper ensures uniformity across all vendors by standardizing P-Specs for management, specs, and logs.
- Vendors are scored based on engineering and supply-chain analysis.
- Factory audits and critical component evaluation (Ex. Who is supplying the laser?).

Aren't 3rd party optics the same?

Optics may be a commodity, but some things are too good to be true

× Juniper does not Provide JTAC support for 3rd party optics

- JTAC will only assist with host-related issues unrelated to the use of 3rd party optics.

× Not all optics are the same - standards compliance does not guarantee quality or performance

- Third-party providers lack system-level knowledge and testing.
- No guarantee of vendor reliability or accountability.

× Newer technologies (ex. Coherent 400G ZR/ZR+) are complex and not simply plug-and-play

- Significant software integration necessary to enable full functionality, management, and telemetry.
- Use of unqualified 3rd party high-power optics can damage the host equipment.

× Third-party providers simply can't scale

- Incomplete solution offerings and fast turnaround times only for limited quantities.
