

QSFP-40GBASE-ER4

Part number: 740-059185

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

QSFP+ 40GBase-ER4 40 Gigabit Optics, SMF for 40Km transmission

Note: Attenuators should be used when the module is in the optical loopback mode so as not to exceed the max Rx power and Rx damage thresholds.

Overview

Part Number	740-059185
Speed	40 Gigabit Ethernet
Breakout Capable	No
Transceiver Type	QSFP+
Product Type	Optical Transceiver
Connector	Duplex LC
Monitoring Available	—
Digital Optical Monitoring	—

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-ER4

Diagnostic support	Yes
Signaling rate, each lane	10.3125 GBd +/- 100 ppm
Transmitter wavelengths (range)	Lane 0-1264.5 nm to 1277.5 nm Lane 1-1284.5 nm to 1297.5 nm Lane 2-1304.5 nm to 1317.5 nm Lane 3-1324.5 nm to 1337.5 nm
Transmitter output power, each lane (minimum)	-2.7 dBm
Transmitter output power, each lane (maximum)	4.5 dBm
Receiver input power, each lane (minimum)	-21.2 dBm
Receiver input power, each lane (maximum)	-4.5 dBm
Optical receiver damage input power threshold	+3.8dBm(min each lane)
Cable type	SMF
Core size/cladding	9/125 μ m
Distance	40 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 23.1R1	
ACX7100-32C	Junos OS Evolved 21.2R1	
ACX7100-48L	Junos OS Evolved 21.1R1	
ACX7509	Junos OS Evolved 21.4R1	
MX204	Junos OS 19.1R1	
MX240	Junos OS 15.1R4	
MX304	Junos OS 22.2R1	
MX480	Junos OS 15.1R4	
MX960	Junos OS 15.1R4	
MX2008	Junos OS 15.1F7	
MX2010	Junos OS 15.1R4	
MX2020	Junos OS 15.1R4	
MX10003	Junos OS 19.1R1	
MX10004	Junos OS 22.3R1	
MX10008	Junos OS 18.2R1	
MX10016	Junos OS 19.2R1	
PTX10001-36MR	Junos OS Evolved 20.2R1	
PTX10002-60C	Junos OS 18.2R1	
PTX10003	Junos OS Evolved 19.1R1	
Security		

Platform	Introduced Release	Additional Information
SRX5400	Junos OS 19.3R1	
SRX5600	Junos OS 19.3R1	
SRX5800	Junos OS 19.3R1	
Switching		
EX4400	Junos OS 23.2R1	
EX4400-48T	Junos OS 23.2R1	
EX4400-24T	Junos OS 23.2R1	
EX4400-24X Breakout Supported	Junos OS 23.4R1	
EX4650-48Y	Junos OS 18.3R1	
QFX5120-48Y	Junos OS 18.3R1	

Supported Interface Modules

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	SRX5600 Junos OS 19.3R1
		SRX5800 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

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
MX304-LMIC16	The MX304-LMIC16-BASE is a 16-port line card that supports maximum data throughput of 1.6 TB ingress and 1.6 TB egress	MX304 Junos OS 22.2R1	

Modular Interface Cards (MICs)

Name	Description	Platforms and Introduced Releases	
40 Gigabit Ethernet			
JNP-MIC1	12x100G/12x40G/48x10G Universal MIC	MX10003 Junos OS 19.1R1	
JNP-MIC1-MACSEC	12x100G/12x40G/48x10G Universal MACSEC MIC	MX10003 Junos OS 19.1R1	
MIC3-3D-2X40GE-QSFP	40-Gigabit Ethernet MIC with QSFP+	MX240 Junos OS 15.1R4 MX960 Junos OS 15.1R4 MX2010 Junos OS 15.1R4	MX480 Junos OS 15.1R4 MX2008 Junos OS 15.1F7 MX2020 Junos OS 15.1R4

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

Name	Description	Platforms and Introduced Releases	
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 15.1R4 MX960 Junos OS 15.1R4 MX2010 Junos OS 15.1R4	MX480 Junos OS 15.1R4 MX2008 Junos OS 15.1F7 MX2020 Junos OS 15.1R4
MPC5EQ-40G10G	6x40GE + 24x10GE MPC5EQ	MX240 Junos OS 15.1R4 MX960 Junos OS 15.1R4 MX2010 Junos OS 15.1R4	MX480 Junos OS 15.1R4 MX2008 Junos OS 15.1F7 MX2020 Junos OS 15.1R4
MPC7E-MRATE	MPC7E (Multi-Rate)	MX240 Junos OS 16.2R2 MX960 Junos OS 16.2R2 MX2010 Junos OS 16.2R2	MX480 Junos OS 16.2R2 MX2008 Junos OS 16.2R2 MX2020 Junos OS 16.2R2

Uplink Modules

Name	Description	Platforms and Introduced Releases	
40 Gigabit Ethernet			
EX4400-EM-1C	1x100GbE QSFP28 extension module for EX4400 series of switches	EX4400-24X Junos OS 23.4R1 Breakout Supported	

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.

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