

# 40GBASE-SR4 QSFP+ 850nm 150m MTP/MPO Transceiver for MMF

QSFP-SR4-40G



## Application

- 40GBASE-SR4 40G Ethernet
- Breakout to 4 x 10GBASE-SR Ethernet
- Proprietary interconnections

## Features

- Four-channel full-duplex transceiver module
- Hot Pluggable QSFP+ form factor
- Maximum link length of 100m on OM3 Multimode Fiber (MMF) and 150m on OM4 MMF
- Single 1x12 MPO receptacle
- Unretimed XLPP electrical interface
- Max power dissipation <1.5W
- Reliable VCSEL array technology
- Built-in digital diagnostic functions, including optical power monitoring
- Commercial operating case temperature range: 0° C to 70° C

## Description

QSFP+ transceiver modules are designed for use in 40 Gigabit per second links over multimode fiber. They are compliant with the QSFP + MSA and IEEE 802.3ba 40GBASE-SR4 and breakout to 4 10GBASE-SR. Digital diagnostics functions are available via an I2C interface, including Tx and Rx power monitoring. The optical transceiver is compliant per the RoHS Directive 2011/65/EU.

## Product Specifications

### I. General Product Characteristics

Parameter	Symbol	Min	Typ.	Max	Unit	Ref.
<b>Operating Case Temperature</b>	TOPR	0	-	70	°C	
<b>Power Supply Voltage</b>	Vcc	3.135	3.3	3.465	V	
<b>Power Supply Current</b>	Icc			475	mA	
<b>Maximum Power Dissipation</b>	PD	-	-	1.5	W	
<b>Data Rate per Lane</b>	DR	-	10.3125	-	Gb/s	
<b>Operating Distance (MMF OM3)</b>	-	0.5	-	100	m	
<b>Operating Distance (MMF OM4)</b>	-	0.5	-	150	m	

## II. Absolute Maximum Ratings

Parameter	Symbol	Min	Typ.	Max	Unit	Ref.
<b>Storage Temperature</b>	Ts	-40	-	+85	°C	
<b>Relative Humidity (non-condensing)</b>	RH	5	-	95	%	
<b>Supply Voltage</b>	Vcc	-0.5	-	3.6	V	
<b>Input Voltage</b>	Vin	-0.5	-	Vcc+0.5	V	

### III. Electrical Characteristics (TOP= 0 to 70 °C, VCC = 3.315 to 3.465 Volts)

Parameter	Symbol	Min	Typ.	Max	Unit	Ref.
<b>Supply Voltage</b>	Vcc	3.315		3.465	V	
<b>Supply Current</b>	Icc			450	mA	
<b>Input Differential Impedance</b>		90	100	110		
<b>Differential Data Input Swing</b>	VIN, P-P	300	-	1100	mVpp	
<b>Differential Data Output Swing</b>	Vout, P-P	300		850	mVpp	
<b>Input Logic Level High</b>		2		Vcc		
<b>Input Logic Level Low</b>		0		0.8		
<b>Output Logic Level High</b>		Vcc-0.5		Vcc		
<b>Output Logic Level Low</b>		0		0.4		

Parameter	Symbol	Min	Typ.	Max	Unit	Ref.
<b>Host 2-wire Vcc voltage</b>	Vcc_Host_2w	3.14	-	3.46	V	
<b>SCL and SDA Voltage</b>	V_OL	0	-	0.4	V	
<b>SCL and SDA Voltage</b>	V_OH	$V_{cc\_Host\_2w}-0.5$	-	$V_{cc\_Host\_2w}+0.3$	V	
<b>SCL and SDA Voltage</b>	V_IL	-0.3	-	$V_{ccT} \times 0.3$	V	
<b>SCL and SDA Voltage</b>	V_IH	$V_{ccT} \times 0.7$	-	$V_{ccT} + 0.5$	V	
<b>Input current on the SCL and SDA contacts</b>	li	-10	-	10	mA	

#### IV. Optical Characteristics (TOP = 0 to 70°C, VCC = 3.315 to 3.465 Volts)

##### Transmitter (per Lane)

Parameter	Symbol	Min	Typ.	Max	Unit	Ref.
<b>Mean Wavelength (Each Lane)</b>		840	850	860	nm	
<b>Data rate per lane</b>	DR		10.3125		Gbps	
<b>Spectral Width (RMS)</b>				0.65	nm	
<b>Optical Power (Each Lane)</b>	POUT	-7.6	-	2.4	dBm	
<b>OMA per lane</b>	Poma	-5.6		3	dBm	
<b>Peak power, each lane</b>	P_peak			4	dBm	
<b>Extinction Ratio</b>	ER	3	50		dB	
<b>TDP, each lane</b>	TDP			3.5	dB	
<b>Optical return loss tolerance</b>				12	dB	
<b>Average Launch Power Tx_ Off (Each Lane)</b>	Jt2					

## Receiver (per Lane)

Parameter	Symbol	Min	Typ.	Max	Unit	Ref.
<b>Wavelength (Each Lane)</b>		840	850	860	nm	
<b>Data rate per lane</b>	DR		10.3125		Gbps	
<b>Average power at receiver, each lane</b>	-	-0.95	-	2.4	dBm	
<b>Rx OMA per Lane</b>	OMA	-	-	3	dBm	
<b>Stressed Receiver Sensitivity OMA (Each Lane)</b>	SRS	-	-	-5.4	dBm	
<b>Peak Power (Each lane)</b>	-	-	-	4	dBm	
<b>Receiver Reflectance</b>	RXR	-	-	-12	dB	
<b>LOS Assert</b>	LOSA	-30	-	-	dBm	
<b>LOS De-Assert</b>	LOSD	-	-	-12	dBm	
<b>LOS Hysteresis</b>	-	0.5	-		dB	

### Notes:

Measured with a PRBS231-1 test pattern @10.3125Gbps, BER 10<sup>-12</sup>

## V. Pin Description

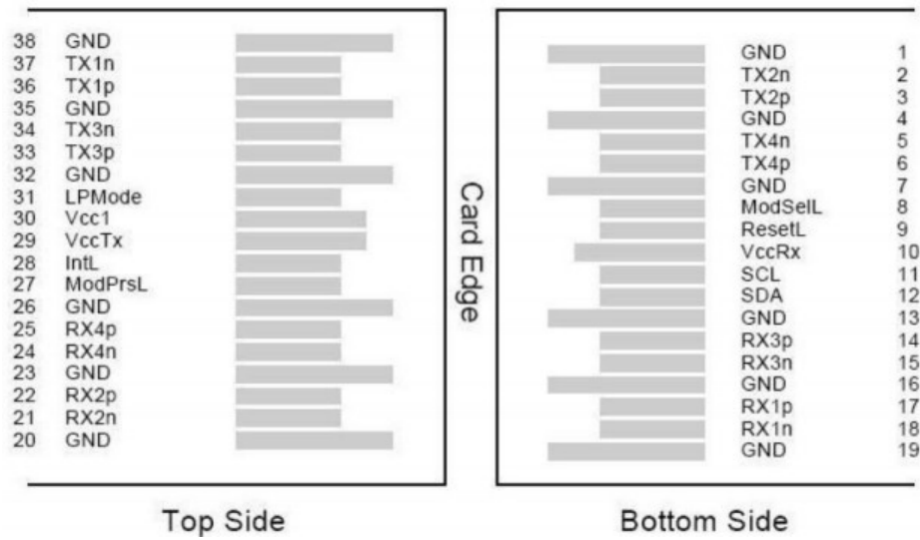


Figure1 QSFP+ Module Pad Layout

Pin	Symbol	Name/Description	Notes
1	GND	Ground	1
2	Tx2n	Transmitter Inverted Data Input	
3	Tx2p	Transmitter Non-Inverted Data Input	
4	GND	Ground	1
5	Tx4n	Transmitter Inverted Data Input	
6	Tx4p	Transmitter Non-Inverted Data Input	
7	GND	Ground	1
8	ModselL	Module Select	
9	ResetL	Module Reset	



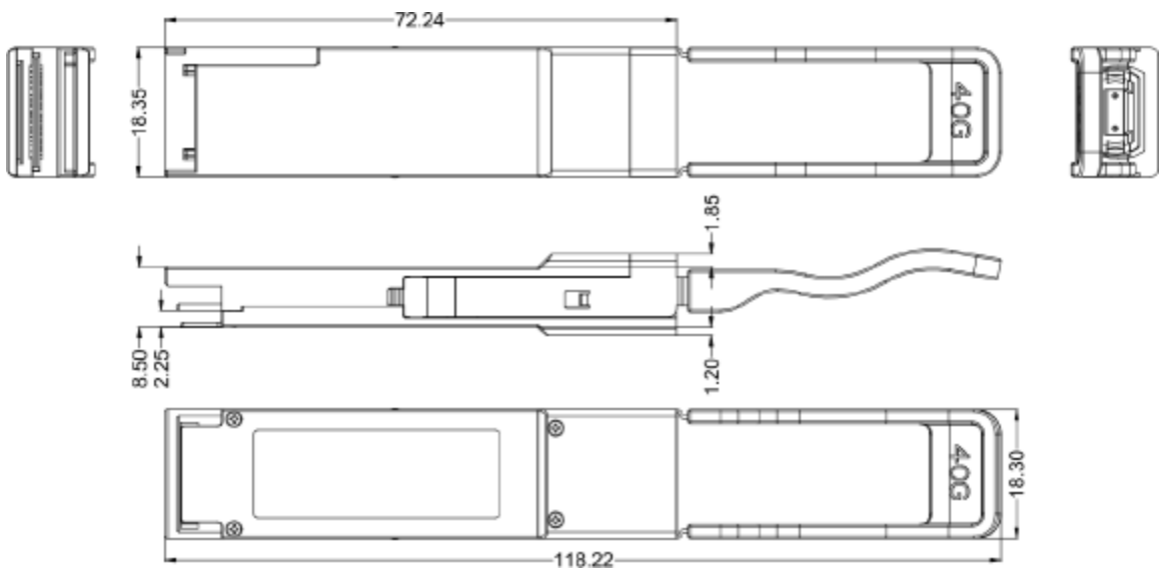
10	Vcc Rx	+3.3 V Power supply receiver	
11	SCL	2-wire serial interface clock	
12	SDA	2-wire serial interface data	
13	GND	Ground	1
14	Rx3p	Receiver Non-Inverted Data Output	
15	Rx3n	Receiver Inverted Data Output	
16	GND	Ground	1
17	Rx1p	Receiver Non-Inverted Data Output	
18	Rx1n	Receiver Inverted Data Output	
19	GND	Ground	1
20	GND	Ground	1
21	Rx2n	Receiver Inverted Data Output	
22	Rx2p	Receiver Non-Inverted Data Output	
23	GND	Ground	1
24	Rx4n	Receiver Inverted Data Output	
25	Rx4p	Receiver Non-Inverted Data Output	
26	GND	Ground	1
27	ModPrsL	Module Present	
28	IntL	Interrupt	
29	Vcc Tx	+3.3 V Power supply transmitter	2
30	Vcc1	+3.3 V Power Supply	2
31	LPMoDe	Low Power Mode	
32	GND	Ground	1

33	Tx3p	Transmitter Non-Inverted Data Input	
34	Tx3n	Transmitter Inverted Data Input	
35	GND	Ground	1
36	Tx1p	Transmitter Non-Inverted Data Input	
37	Tx1n	Transmitter Inverted Data Input	
38	GND	Ground	1

**Note:**

1. GND is the symbol for signal and supply (power) common for the QSFP+ module. All are common within the QSFP+ module and all module voltages are referenced to this potential unless otherwise noted. Connect these directly to the host board signal-common ground plane.
2. Vcc Rx, Vcc1 and Vcc Tx are the receiver and transmitter power supplies and shall be applied concurrently. Vcc Rx, Vcc1 and Vcc Tx may be internally connected within the QSFP+ transceiver module in any combination. The connector pins are each rated for a maximum current of 500 mA.

**VI. Mechanical Specifications**



## Test Center

FS.COM transceivers are tested to ensure connectivity and compatibility in our test center before shipped out. FS.COM test center is supported by a variety of mainstream original brand switches and groups of professional staff, helping our customers make the most efficient use of our products in their systems, network designs and deployments.

The original switches could be found nowhere but at FS.COM test center, eg: Juniper MX960 & EX 4300 series, Cisco Nexus 9396PX & Cisco ASR 9000 Series, HP 5900 Series & HP 5406R ZL2 V3(J9996A), Arista 7050S-64, Brocade ICX7750-26Q & ICX6610-48, Avaya VSP 7000 MDA 2, etc.



Cisco ASR 9000 Series(A9K-MPA-1X40GE)



ARISTA 7050S-64(DCS-7050S-64)



Juniper MX960



Brocade ICX 7750-26Q



Extreme Networks X670V VIM-40G4X



Mellanox M3601Q



Dell N4032F



HP 5406R ZL2 V3(J9996A)



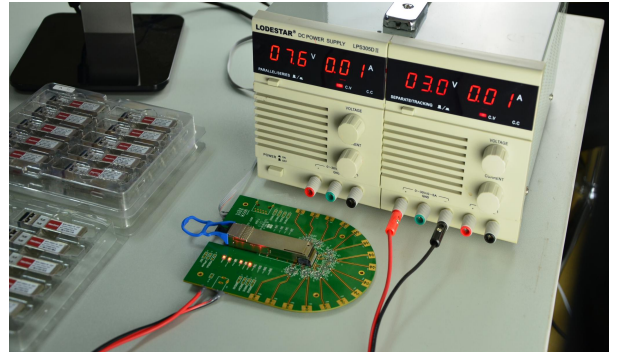
AVAYA 7024XLS(7002QQ-MDA)

## Test Assured Program

FS.COM truly understands the value of compatibility and interoperability to each optics. Every module FS.COM provides must run through programming and an extensive series of platform diagnostic tests to prove its performance and compatibility. In our test center, we care of every detail from staff to facilities—professionally trained staff, advanced test facilities and comprehensive original-brand switches, to ensure our customers to receive the optics with superior quality.



Our smart data system allows effective product management and quality control according to the unique serial number, properly tracking the order, shipment and every part.



Our in-house coding facility programs all of our parts to standard OEM specs for compatibility on all major vendors and systems such as Cisco, Juniper, Brocade, HP, Dell, Arista and so on.



With a comprehensive line of original-brand switches, we can recreate an environment and test each optics in practical application to ensure quality and distance.



The last test assured step to ensure our products to be shipped with perfect package.

## Order Information

Part Number	Description
QSFP-SR4-40G	40GBASE-SR4 QSFP+ 850nm 150m MTP/MPO Transceiver for MMF
QSFP-CSR4-40G	40GBASE-CSR4 QSFP+ 850nm 400m MTP/MPO Transceiver for MMF
QSFP-PIR4-40G	40GBASE-PLRL4 QSFP+ 1310nm 1.4km MTP/MPO Transceiver for SMF
QSFP-LX4-40G	40GBASE-UNIV QSFP+ 1310nm 2km LC Transceiver for SMF&MMF
QSFP-IR4-40G	40GBASE-LR4L QSFP+ 1310nm 2km LC Transceiver for SMF
QSFP-LR4-40G	40GBASE-LR4 and OTU3 QSFP+ 1310nm 10km LC Transceiver for SMF
QSFP-PLR4-40G	40GBASE-PLR4 QSFP+ 1310nm 10km MTP/MPO Transceiver for SMF
QSFP-ER4-40G	40GBASE-ER4 and OTU3 QSFP+ 1310nm 40km LC Transceiver for SMF
QSFP-BD-40G	40GBASE-SR Bi-Directional QSFP LC Duplex Transceiver for MMF

### Notes:

40G QSFP+ transceiver module is individually tested on corresponding equipment such as Cisco, Arista, Juniper, Dell, Brocade and other brands, and passes the monitoring of FS.COM intelligent quality control system.



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