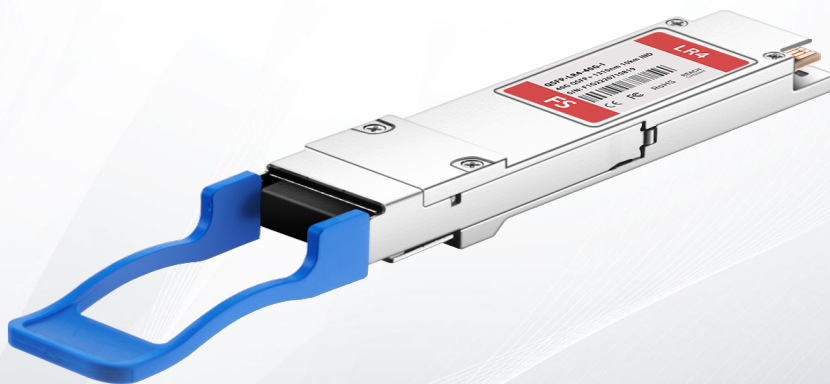


40GBASE-LR4 QSFP+ 1310nm 10km LC SMF Industrial Transceiver

QSFP-LR4-40G-I



Application

- 40GBASE-LR4 40G InfiniBnad

Features

- Hot-pluggable QSFP+ form factor
- 41.25 Gbit/s Single Rate Capability
- Power dissipation < 2.5W
- RoHS compliant
- Maximum link length of 10km on Single Mode Fiber (SMF)
- Operating case temperature:-40~+ 85°C
- Uncooled CWDM (1271nm,1291nm, 1311nm,1331nm) DFB LD
- Single 3.3V power supply
- Duplex LC receptacles
- Built-in digital diagnostic functions

Description

QSFP+ transceiver modules are designed for use in 40 Gigabit Ethernet links over single mode fiber. They are compliant with SFF-8436 QSFP+ MSA and IEEE 802.3ba 40GBASE-LR4 standards. Digital diagnostics functions are available via an I2C interface, as specified by the QSFP+ MSA. The transceiver is compliant per the RoHS Directive 2011/65/EU.

Product Specifications

I. General Product Characteristics

Parameter	Symbol	Min	Typ.	Max	Unit	Ref.
Operating Case Temperature	TOP	-40	-	85	°C	
Maximum Supply Voltage	Vcc	-0.3	-	3.6	V	
Power Consumption			1.7	2.5	W	
Data Speed Tolerance	ΔDR	-100		100	ppm	
Data Rate Per Lane	DR		10.3125		Gb/s	
Link Distance with SMF	D	0		10	km	

II. Absolute Maximum Ratings

Parameter	Symbol	Min	Typ.	Max	Unit	Ref.
Maximum Supply Voltage	Vcc	-0.3		3.6	V	
Storage Temperature	T _s	-40		85	° C	
Case Operating Temperature	Top	-40		85	° C	
Relative Humidity	RH	15		85	%	
Supply Voltage	Vcc	3.135		3.465	V	

III. Electrical Characteristics

Parameter	Symbol	Min	Typ.	Max	Unit	Ref.
Differential Input Impedance	Zin		100		Ohm	
Differential Output Impedance	Zout		100		Ohm	
Differential Input Voltage Amplitude	Vin	120		1200	mVp-p	
Differential Output Voltage Amplitude	Vout	400		800	mVp-p	
Bit Error Rate	BR			1E-12		
Disable transmitter voltage	VDIS	Vcc-1.3		Vcc	V	
Enable transmitter voltage	VEN	VEE		VEE +0.8	V	
Transition time, 20% to 80%	Tr/Tf	28			ps	
Signaling rate per lane			10.3125		Gb/s	

Notes:

1. Maximum total power value is specified across the full temperature and voltage range.

IV. Optical Characteristics

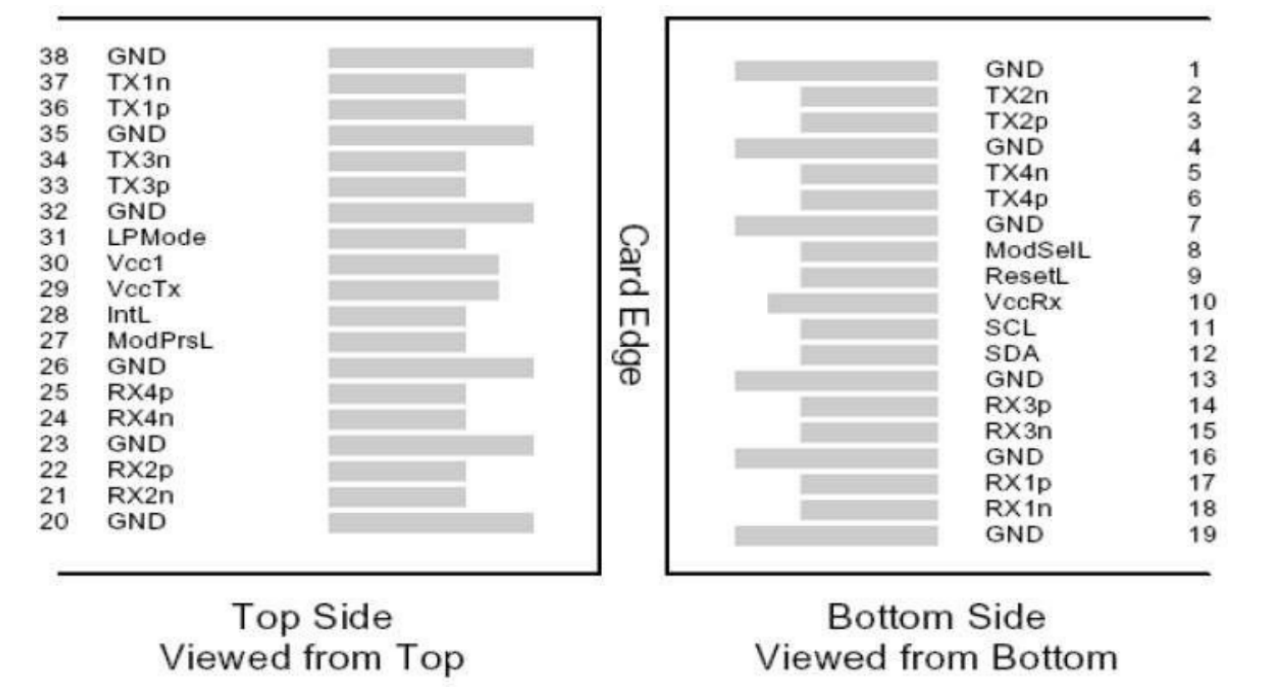
Parameter	Symbol	Min	Typ.	Max	Unit	Ref.
Transmitter						
Signaling Rate Per Lane			10.3125±100 ppm		Gb/s	
Side-mode Suppression Ratio	SMSR	30			dB	
Average Launch Power, Each Lane	PAVG	-7		2.3	dBm	1
Optical Modulation Amplitude (OMA)	POMA	-4		3.5	dBm	2
Difference in Launch Power Between Any Two lanes	Diff_P			6.5	dB	
Launch Power in OMA Minus Transmitterand TDP, Each Lane	P-TDP	-4.8			dB	
Total Average Launch Power	Pout			8.3	dBm	
Extinction Ratio	ER	3.5			dB	
Optical Return Loss Tolerance	RL			20	dB	
Average Launch Power of OFF Transmitter, Per Lane				-30	dBm	
Relative Intensity Noise	Rin			-128	dB/Hz	
Transmitter Eye Mask Definition {X1, X2,X3, Y1, Y2, Y3}			{0.25, 0.4, 0.45, 0.25, 0.28, 0.4}		dB	
Transmitte Reflectance	RT			-12	dB	

Parameter	Symbol	Min	Typ.	Max	Unit	Ref.
Receiver						
Average Receive Power Per Lane	RXP	-13.7		2.3	dBm	
Receiver Reflectance	Rfl			-26	dB	
Damage Threshold	DT	3.3			dBm	
Difference in Receive Power Between Any Two Lanes (OMA)	Diff_RxP			7.5	dB	
Receiver Sensitivity (OMA) Per Lane	RxSens			-11.5	dBm	
Signal Loss Assert Threshold	LOSA	-28			dBm	
Signal Loss Deassert Threshold	LOSD			-15	dBm	
Receive Power (OMA) Per Lane	RxOMA			3.5	dBm	
Stressed Receiver Sensitivity(OMA), Each Lane				-9.6	dBm	
LOS Hysteresis	LOSH	1			dB	

Notes:

- 1.Transmitter wavelength, RMS spectral width and power need to meet the OMA minus TDP specs to guarantee link performance.
- 2.The eye diagram is tested with 1000 waveform.

V. Pin Description



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	2
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 Output	
35	GND	Ground	1
36	Tx1p	Transmitter Non-Inverted Data Input	
37	Tx1n	Transmitter Inverted Data Input	
38	GND	Ground	1

Notes:

- 1. Circuit ground is internally isolated from chassis ground.
- 2. IntL is an open collector/drain output, which should be pulled up with a 4.7k – 10k Ohms resistor on the host board. The INTL pin is deasserted"High" after completion of reset, when byte 2 bit 0 (Data Not Ready) is read with a value of '0' and the flag field is read (see SFF-8436).

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.

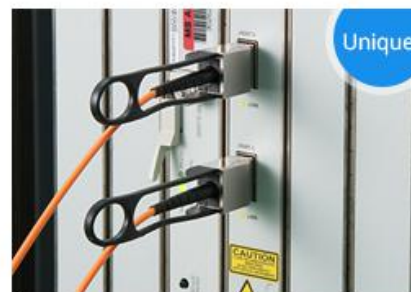
The original switches could be found nowhere but at FS.COM test center, eg: Juniper MX960 & EX 4300 series, Cisco Nexus 9396PX & Cisco ASR 9000 Series, HP 5900 Series & HP 5406R ZL2 V3(J9996A), Arista 7050S-64, Brocade ICX7750-26Q & ICX6610-48, Avaya VSP 7000 MDA 2, etc.



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



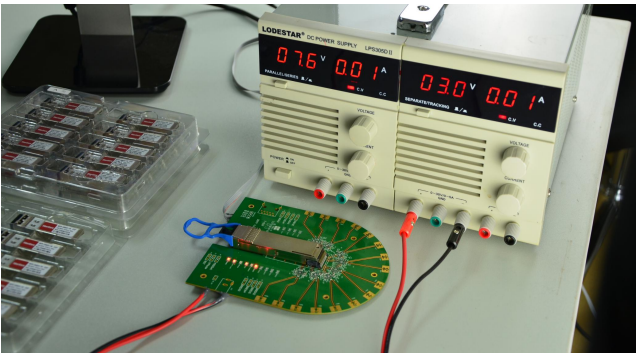
HP 5406R ZL2 V3(J9996A)



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 2km 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:

1. 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.