

## COL-QSFP-40G-LR4 Optical Transceiver

QSFP+ 40G LR4 10km Transceiver, With Diagnostic Monitoring

### Features

- ◆ Reach: 10 km via SMF
- ◆ Uncooled CWDM DFB lasers, directly modulated
- ◆ Using ITU G.694.2 wavelength grid at 1271, 1291, 1311, and 1331nm
- ◆ User controllable Transmit Input Equalization and Receiver Output Amplitude
- ◆ MSA-compliant performance monitoring via I2C interface
- ◆ Fiber connector: SMF LC duplex connector
- ◆ Compliant with QDR/DDR InfiniBand data rates
- ◆ Hot-pluggable electrical interface
- ◆ 0–70°C operating temp
- ◆ Power dissipation < 3.5W
- ◆ RoHS6 compliant (lead free)

### Applications

- ◆ 40G Ethernet
- ◆ InfiniBand QDR and DDR interconnects

### Description

The QSFP+ 40G-LR4-10km module is a highly integrated 4x10G transceiver focused on reach, bandwidth, density and cost for highport-count 40G systems, and client-side 40G interfaces. The 40G QSFP+ LR4 Lite transceiver is designed for applications based on the IEEE802.3ba 40GBASE-LR4 standard of up to 10km reach.

## OPTICAL TRANSMITTER PERFORMANCE

Parameter	Symbol	Min	Typical	Max	Unit	
Center Wavelength	Ch0	$\lambda_0$	1264.5		1277.5	nm
	Ch1	$\lambda_1$	1284.5		1297.5	nm
	Ch2	$\lambda_2$	1304.5		1317.5	nm
	Ch3	$\lambda_3$	1324.5		1337.5	nm
Bit Rate per Channel	B	10.3125		10.7546	Gb/s	
Total Average Launch Power	POUT			8.0	dBm	
Side Mode Suppression Ratio	SMSR	30	-	-	dB	
Average launch power, each lane		-6.8		2.0	dBm	
Optical Modulation Amplitude (each lane)	OMA	-3.8		3.5	dBm	
Optical Modulation Amplitude (OMA) - TDP, per lane (min)		-4.8			dBm	
Transmission & dispersion penalty, each lane	TDP			2.3	dB	
RIN12 OMA				-128	dB/Hz	
Transmitter Reflectance				-12	dB	
Extinction Ratio	ER	3.5			dB	
Transmitter eye mask definition {X1, X2, X3, Y1, Y2, Y3}		{0.25, 0.4, 0.45, 0.25, 0.28, 0.4}				
Average launch power of OFF transmitter, each lane				-30	dBm	
Optical return loss tolerance				20	dB	

## OPTICAL RECEIVER PERFORMANCE

Parameter	Symbol	Min	Typical	Max	Unit	
Center Wavelength	Ch0	$\lambda_0$	1264.5	1271	1277.5	nm
	Ch1	$\lambda_1$	1284.5	1291	1297.5	nm
	Ch2	$\lambda_2$	1304.5	1311	1317.5	nm
	Ch3	$\lambda_3$	1324.5	1331	1337.5	nm
Bit Rate per Channel	B	10.3125		10.7546	Gb/s	
Damage threshold, each lane		3.4			dBm	
Average receive power, each lane		-13.5		2.0	dbm	
Unstressed Sensitivity (OMA) at 10 x 10-12BER	OMAIN	-	-	-11.5	dBm	
Stressed Sensitivity (OMA)	OMAIN,STR	-		-9.9	dBm	
Receiver Reflectance	ORL			-26	dB	

Vertical eye closure penalty, each lane	VECP			1.6	dB
Receive electrical 3 dB upper cutoff frequency, per lane				12.3	GHZ
Stressed eye J2 Jitter, each lane	J2			0.42	UI
Stressed eye J9 Jitter, each lane	J9			0.65	UI
Eye mask coordinates #1 {X1, X2 Y1, Y2} Hit ratio = 5 x 10E-5	{ 0.29, 0.5 150, 425}				

## Recommended operating environment

Recommended Operating Environment specifies parameters for which the electrical and optical characteristics hold unless otherwise noted.

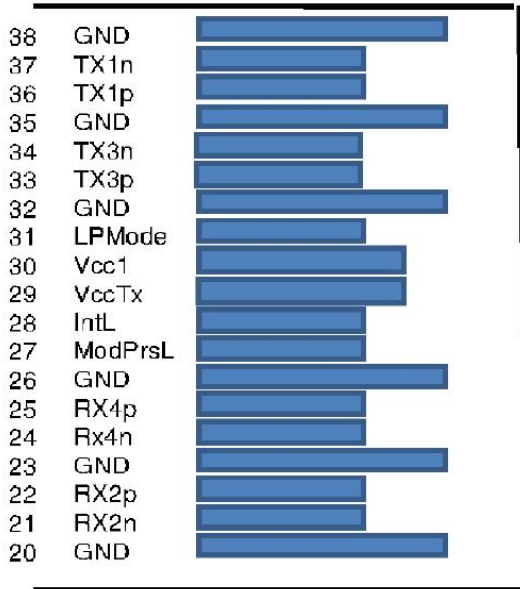
Parameter	Symbol	Min	Typical	Max	Unit
Power Supply Voltage	V <sub>CC</sub>	3.135	3.300	3.465	V
Operating Case Temperature	T <sub>C</sub>	0	25	70	°C

## Pin definition

Pin	Symbol	Name/Description
1	GND	Ground
2	Tx2n	Transmitter Inverted Data Input
3	Tx2p	Transmitter Non-Inverted Data Input
4	GND	Ground
5	Tx4n	Transmitter Inverted Data Input
6	Tx4p	Transmitter Non-Inverted Data Input
7	GND	Ground
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
14	Rx3p	Receiver Non-Inverted Data Output
15	Rx3n	Receiver Inverted Data Output
16	GND	Ground
17	Rx1p	Receiver Non-Inverted Data Output
18	Rx1n	Receiver Inverted Data Output
19	GND	Ground
20	GND	Ground
21	Rx2n	Receiver Inverted Data Output
22	Rx2p	Receiver Non-Inverted Data Output
23	GND	Ground

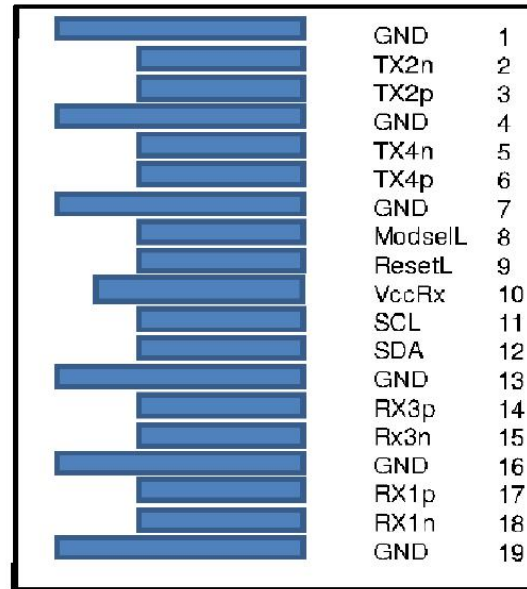
24	Rx4n	Receiver Inverted Data Output
25	Rx4p	Receiver Non-Inverted Data Output
26	GND	Ground
27	ModPrsL	Module Present
28	IntL	Interrupt
29	Vcc Tx	+3.3 V Power supply transmitter
30	Vcc1	+3.3 V Power Supply
31	LPMODE	Low Power Mode
32	GND	Ground
33	Tx3p	Transmitter Non-Inverted Data Input
34	Tx3n	Transmitter Inverted Data Input
35	GND	Ground
36	Tx1p	Transmitter Non-Inverted Data Input
37	Tx1n	Transmitter Inverted Data Input
38	GND	Ground

## Pin Descriptions



Top Side  
Viewed From Top

Module Card Edge



Bottom Side  
Viewed From Bottom

## Ordering information

Part Number	Product Description
<b>COL-QSFP-40G-LR4</b>	QSFP+ 40G LR4 10km 0°C ~ +70°C

## Important Notice

Performance figures, data and any illustrative material provided in this data sheet are typical and must be

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