TSQS-CW40G-02LC Optical Transceiver

QSFP+ 40G LR4 2km Transceiver, With Diagnostic Monitoring

Features

- Reach: 2 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-LR4-2km 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 2km reach.

Optical Transmitter Performance

Parameter		Symbol	Min	Typical	Max	Unit
Center Wavelength	Ch0	λ0	1264.5	-	1277.5	nm
	Ch1	λ1	1284.5	-	1297.5	nm

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	Ch2	λ2	1304.5	-	1317.5	nm
	Ch3	λ3	1324.5	-	1337.5	nm
Bit Rate per Channel		B	10.3125	-	-	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	-6.0	-	3.5	dBm
Optical Modulation Amplitude (OMA) - TDP, per lane (min)		-	-7.8	-	-	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	λ0	1264.5	1271	1277.5	nm
	Ch1	λ1	1284.5	1291	1297.5	nm
	Ch2	λ2	1304.5	1311	1317.5	nm
	Ch3	λ3	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^{-12}BER		OMAin	-	-	-10.5	dBm
Stressed Sensitivity (OMA)		OMAin,str	-		-8.5	dBm
Receiver Reflectance		ORL	-	-	-26	dB
Vertical eye closure penalty, each lane		VECP	-	-	1.9	dB

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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

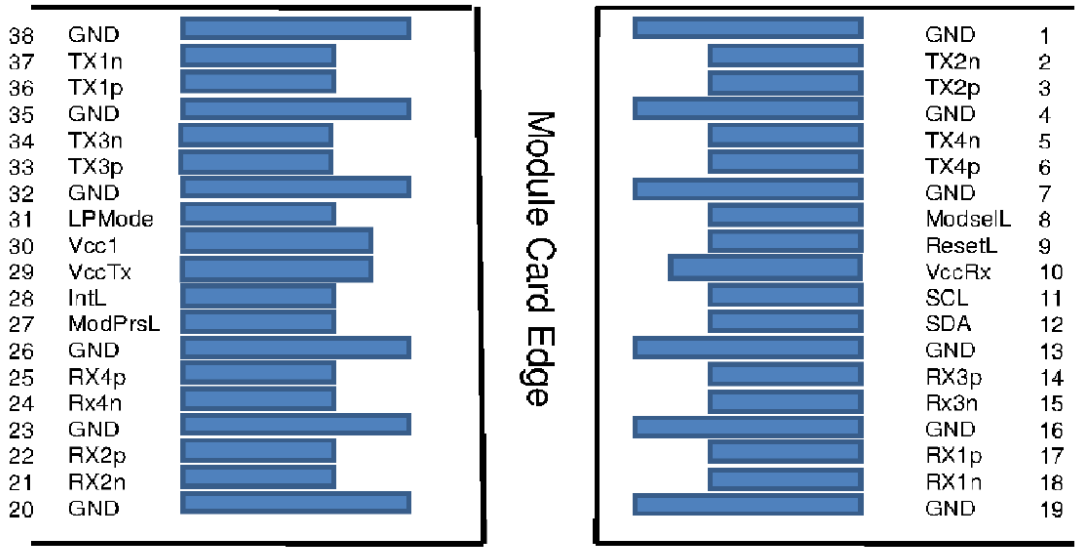
Parameter	Symbol	Min	Typical	Max	Unit
Power Supply Voltage	VCC	3.135	3.300	3.465	V
Operating Case Temperature	TC	0	25	70	°C

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

Bottom Side
Viewed From Bottom

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Ordering Information

Part Number	Product Description
TSQS-CW40G-02LC	QSFP+ 40G LR4 2km 0°C ~ +70°C

Important Notice

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