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QSFP+/40G-LR4

40Gbps QSFP+ LR4 Transceiver

1 Features

- 1.1 Duplex LC connector
- 1.2 Hot-pluggable QSFP+ form factor
- 1.3 Operating data rate up to 11.3Gbps per Lane
- 1.4 Up to 10km transmission
- 1.5 Maximum 3.5W operation power
- 1.6 Compliant with IEEE 802.3ba
- 1.7 Compliant with SFF 8436
- 1.8 Digital Diagnostic Monitoring (DDM)
- 1.9 Complies with RoHS directive (2002/95/EC)

2 Applications

40GBASE-LR4 40G Ethernet

3 General

This product is a high performance 40Gbps transceiver module designed for optical communication applications. It converts 4 channels of 10Gb/s electrical input data to 4 CWDM optical signals, and multiplexes them into a single channel for 40Gb/s optical transmission. On the receiver side, the module optically de-multiplexes a 40Gb/s input into 4 CWDM channels signals, and converts them to 4 channel output electrical data.

4 Performance Specifications

4.1 Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Storage Temperature	T _{st}	-40	+85	°C
Operating relative humidity (Non- condensing)	RH	5	90	%
Input Voltage	-	GND	V _{cc}	V
Power Supply Voltage	V _{cc}	0	3.6	V



4.2 Recommended Operating Environment

Parameter	Symbol	Min.	Typ.	Max.	Unit
Power Supply Voltage	V _{cc}	+3.14	+3.3	+3.46	V
Power Supply Current	I _{cc}	-	-	1130	mA
Data rate per lane		-	10.3125	11.3	Gbps
Operating relative humidity (Non- condensing)	RH	5		85	%
Case Temperature (Operating)	T _C	0	-	70	°C
		-40		85	°C
I2C clock frequency	-	-	100	400	KHz
Power consumption Max	-	-	-	3.5	W



4.3 Transmitter Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Signal Speed per Lane	Sp	-	10.3125	-	Gbps	Each of 4 lanes
Center Wavelength (Lane 0)	λ_0	1264.5	1271	1277.5	nm	-
Center Wavelength (Lane 1)	λ_1	1284.5	1291	1297.5	nm	-
Center Wavelength (Lane 2)	λ_2	1304.5	1311	1317.5	nm	-
Center Wavelength (Lane 3)	λ_3	1324.5	1331	1337.5	nm	-
Spectral Width (-20dB)	$\Delta\lambda$	-	-	1	nm	-
Side Mode Suppression Ratio (SMSR)	SMSR	30	-	-	dB	-
Total Output Optical Power	Pot	-	-	8.3	dBm	-
Average Optical Output Power (each lane)	Po	-7	-	2.3	dBm	-
Optical Modulation Amplitude (OMA)	OMA	-4	-	3.5	dBm	-
Extinction Ratio	Er	3.5	-	-	dB	-
Differential Input Impedance	-	80	100	120	Ω	-
Differential Data Input Swing	VINPP	120	-	1000	mV	-

4.4 Receiver Characteristics

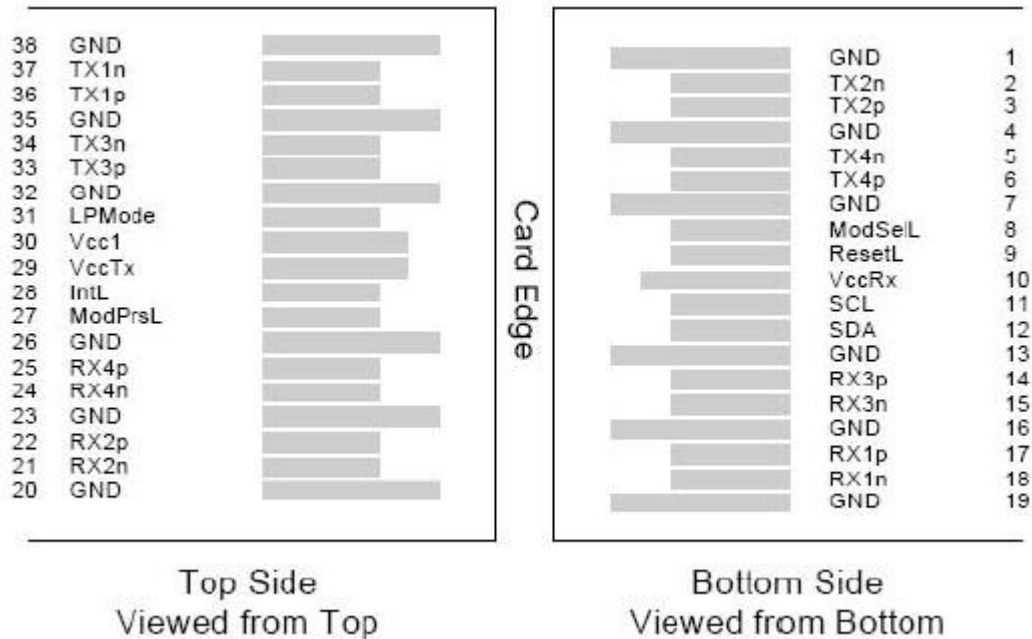
Parameter	Symbol	Min.	Typ.	Max.	Unit
Wavelength of Operation (Lane 0–3)	λ	1264.5	1271–1331	1337.5	nm
Optical Input Power (each lane)	Pin	-13.7	-	2.3	dBm
Damage Threshold	Pmax	-	-	3.3	dBm
Receiver Sensitivity (OMA, each lane)	Rxsen	-11.5	-	-	dBm
Differential Data Output Swing	VOUTPP	350	-	800	mV



Compatible with SFF-8436 (QSFP+).

6 Pin Definitions

6.1 Pin Diagram



6.2 Pin Descriptions

Pin#	Logic	Name	Function	Notes
1		GND	Ground	
2	CML-I	Tx2n	Transmitter Inverted Data Input	
3	CML-I	Tx2p	Transmitter Non-Inverted Data output	
4		GND	Ground	
5	CML-I	Tx4n	Transmitter Inverted Data Input	
6	CML-I	Tx4p	Transmitter Non-Inverted Data output	
7		GND	Ground	
8	LVTLL-I	ModSelL	Module Select	
9	LVTLL-I	ResetL	Module Reset	
10		VccRx	+3.3V Power Supply Receiver	

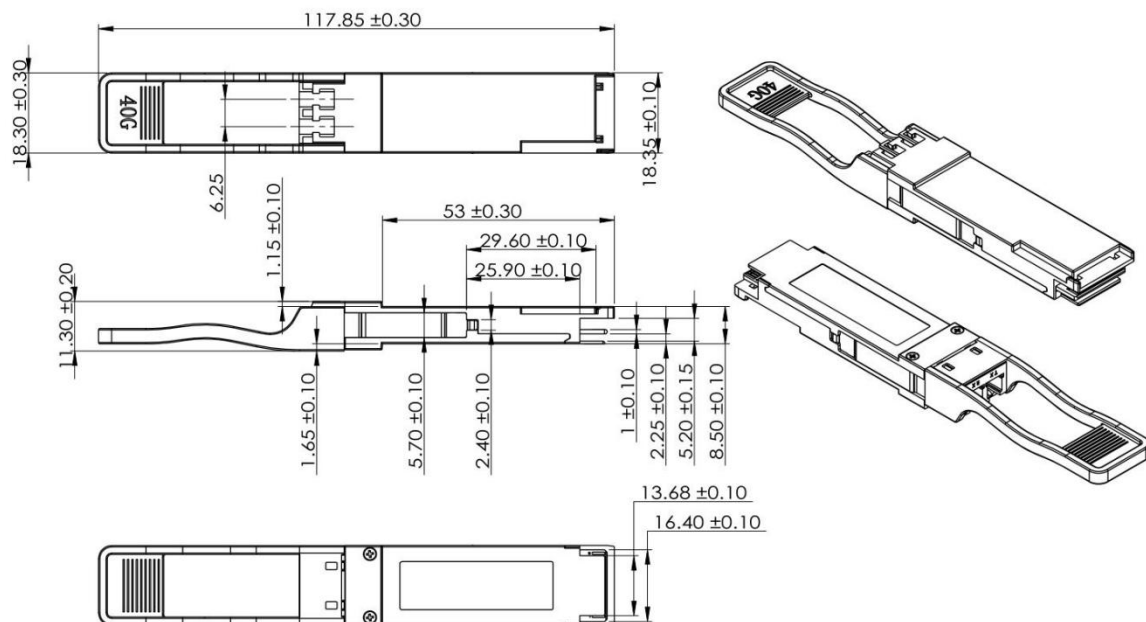


Pin#	Logic	Name	Function	Notes
11		SCL	2-Wire Serial Interface Clock	
12		SDA	2-Wire Serial Interface Data	
13		GND	Ground	
14	CML-O	Rx3p	Receiver Non-Inverted Data Output	
15	CML-O	Rx3n	Receiver Inverted Data Output	
16		GND	Ground	
17	CML-O	Rx1p	Receiver Non-Inverted Data Output	
18	CML-O	Rx1n	Receiver Inverted Data Output	
19		GND	Ground	
20		GND	Ground	
21	CML-O	Rx2n	Receiver Inverted Data Output	
22	CML-O	Rx2p	Receiver Non-Inverted Data Output	
23		GND	Ground	
24	CML-O	Rx4n	Receiver Inverted Data Output	
25	CML-O	Rx4p	Receiver Non-Inverted Data Output	
26		GND	Ground	
27	LVTTL-O	ModPrsL	Module Present	
28	LVTTL-O	IntL	Interrupt	
29		VccTx	+3.3 V Power Supply transmitter	
30		Vcc1	+3.3 V Power Supply	



Pin#	Logic	Name	Function	Notes
31	LVTTL-I	LPMODE	Low Power Mode	
32		GND	Ground	
33	CML-I	Tx3p	Transmitter Non-Inverted Data Input	
34	CML-I	Tx3n	Transmitter Inverted Data Output	
35		GND	Ground	
36	CML-I	Tx1p	Transmitter Non-Inverted Data Input	
37	CML-I	Tx1n	Transmitter Inverted Data Output	
38		GND	Ground	

7 Outline Dimensions



8 Ordering Information

Part Number	Operating Case Temperature	RoHS Compliant
QSFP+/40G-LR4	0 ~ 70 °C	RoHS-6



9 Document History

Version		Change Description	Changed by	Date
VER A		Initial Release	Wang	01/15/2018