40G QSFP+ LR4 Optical Transceiver

Product Features

- Compliant with IEEE802.3ba 40GBASE-LR4 Standard
- Compliant with QDR/DDR Infiniband data rates
- Compliant with QSFP+ MSA SFF-8436
- Duplex LC Connector Interface
- Up to 11.2Gb/s data rate per wavelength
- Up to 10km transmission on single mode fiber (SMF)
- 4 CWDM lanes MUX/DEMUX design
- Single +3.3V power supply
- Maximum power dissipation: 3.5W
- Operating case temperature: 0 to 70℃
- RoHS compliant

Applications

- 40GBASE-LR4 Ethernet Links
- Infiniband QDR and DDR interconnects
- Client-side 40G Telecom connections

Absolute Maximum Ratings

Parameter	Unit	Min.	Typical	Max.	Notes
Storage Temperature	°C	-40		85	
Operating Relative Humidity	%	0		85	
Power Supply not Damaged Voltage	V	-0.3		3.6	
Receiver Damage Threshold, each Lane	dBm	3.4			

Recommended Operating Conditions

Parameter	Unit	Min.	Typical	Max.	Notes
Operating Case Temperature	°C	0		70	
Power Supply Working Voltage	V	3.135	3.3	3.465	
Supply Current	A			1.13	
Power Consumption	W			3.5	
Data Rate, each Lane	Gbps		10.3125		

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Optical Characteristics

All performance is defined over the Recommended Operating Environment unless otherwise specified.

Parameter	Unit	Min.	Typical	Max.	Note
Wavelength Assignment	nm	1264.5	1271	1277.5	
	nm	1284.5	1291	1297.5	
	nm	1304.5	1311	1317.5	
	nm	1324.5	1331	1337.5	
Transmitter					
Signaling Speed per Lane	Gbps		10.3125		
Side Mode Suppression Ratio, each lane	dB	30			
Total Average Launch Power(max)	dBm			8.3	
Average Launch Power, each lane	dBm	-7		2.3	
Optical Modulation Amplitude (OMA), each Lane	dBm	-4		3.5	1
Extinction Ratio	dB	3.5			
TDP, each Lane	dB	2.6			
Average Launch power Tx_off	dBm			-30	
Relative Intensity Noise(RIN)	dB/Hz			-128	
Optical Return Loss Tolerance	dB			20	
Transmitter Reflectance	dB			-12	
Receiver					
Signaling Speed per Lane	Gbps		10.3125		
Total Average Receive Power	dBm			8.3	
Average Receive Power per Lane	dBm	-13.7		2.3	
Receiver Reflectance	dB			-26	
Receiver Sensitivity (OMA), each Lane	dBm			-11.5	
Stressed Receiver Sensitivity (OMA), each Lane	dBm			-9.6	
Difference in Receive Power between any Two Lanes (OMA)	dB			7.5	
LOS Assert	dBm	-28			
LOS De-Assert	dBm			-15	
LOS Hysteresis	dB	0.5			

Electrical Specifications

Parameter	Unit	Min.	Typical	Max.	Notes
LVTTL Output High	V	2.0		V_{CC}+0.3	
LVTTL Output Low	V	0		0.4	
LVTTL Input High	V	2.0		V_{CC}+0.3	
LVTTL Input Low	V	V_{EE}-0.3		0.8	
Transmitter					
Differential Input Voltage Swing	mVp-p	190	-	700	

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Data Differential Impedance	Ω	90	100	110	
Receiver					
Single-ended Data Output Swing	mVp-p	300	-	850	
Data Differential Impedance	Ω	90	100	110	

PIN Function Definitions

PIN #	Logic	Symbol	Description	Notes
1		GND	Ground	1
2	CML-I	Tx2n	Transmitter Inverted Data Input	
3	CML-I	Tx2p	Transmitter Non-Inverted Data output	
4		GND	Ground	1
5	CML-I	Tx4n	Transmitter Inverted Data Input	
6	CML-I	Tx4p	Transmitter Non-Inverted Data output	
7		GND	Ground	1
8	LVTLL-I	ModSelL	Module Select	
9	LVTLL-I	ResetL	Module Reset	
10		VccRx	+3.3V Power Supply Receiver	2
11	LVCMOS-I/O	SCL	2-Wire Serial Interface Clock	
12	LVCMOS-I/O	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	1
17	CML-O	Rx1p	Receiver Non-Inverted Data Output	
18	CML-O	Rx1n	Receiver Inverted Data Output	
19		GND	Ground	1
20		GND	Ground	1
21	CML-O	Rx2n	Receiver Inverted Data Output	
22	CML-O	Rx2p	Receiver Non-Inverted Data Output	
23		GND	Ground	1
24	CML-O	Rx4n	Receiver Inverted Data Output	1
25	CML-O	Rx4p	Receiver Non-Inverted Data Output	
26		GND	Ground	1
27	LVTTL-O	ModPrsL	Module Present	
28	LVTTL-O	IntL	Interrupt	
29		VccTx	+3.3 V Power Supply transmitter	2
30		Vcc1	+3.3 V Power Supply	2
31	LVTTL-I	LPMode	Low Power Mode	
32		GND	Ground	1
33	CML-I	Tx3p	Transmitter Non-Inverted Data Input	

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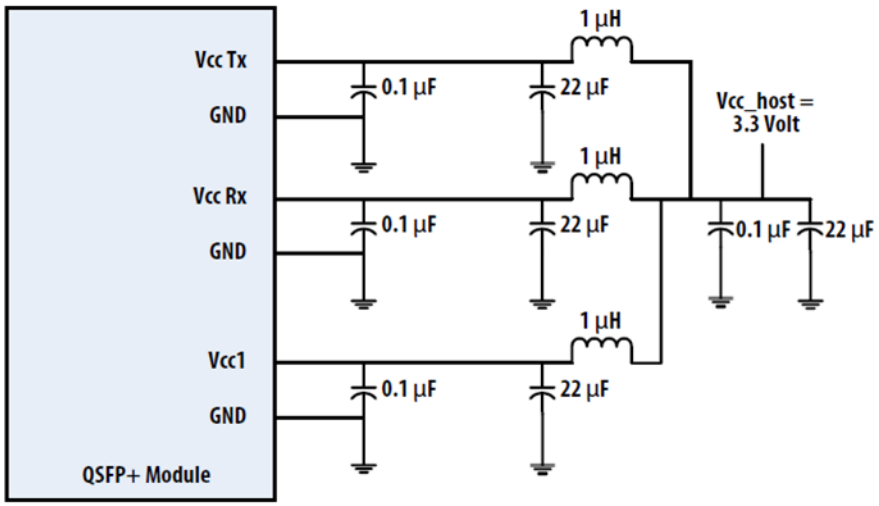
34	CML-I	Tx3n	Transmitter Inverted Data Output	
35		GND	Ground	1
36	CML-I	Tx1p	Transmitter Non-Inverted Data Input	
37	CML-I	Tx1n	Transmitter Inverted Data Output	
38		GND	Ground	1

Note:

1. GND is the symbol for signal and supply (power) common for QSFP+ modules. 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. VccRx, Vcc1 and VccTx are the receiving and transmission power suppliers and shall be applied concurrently. Recommended host board power supply filtering is shown in Figure 3 below. 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 500mA.

Recommended Power Supply Filter



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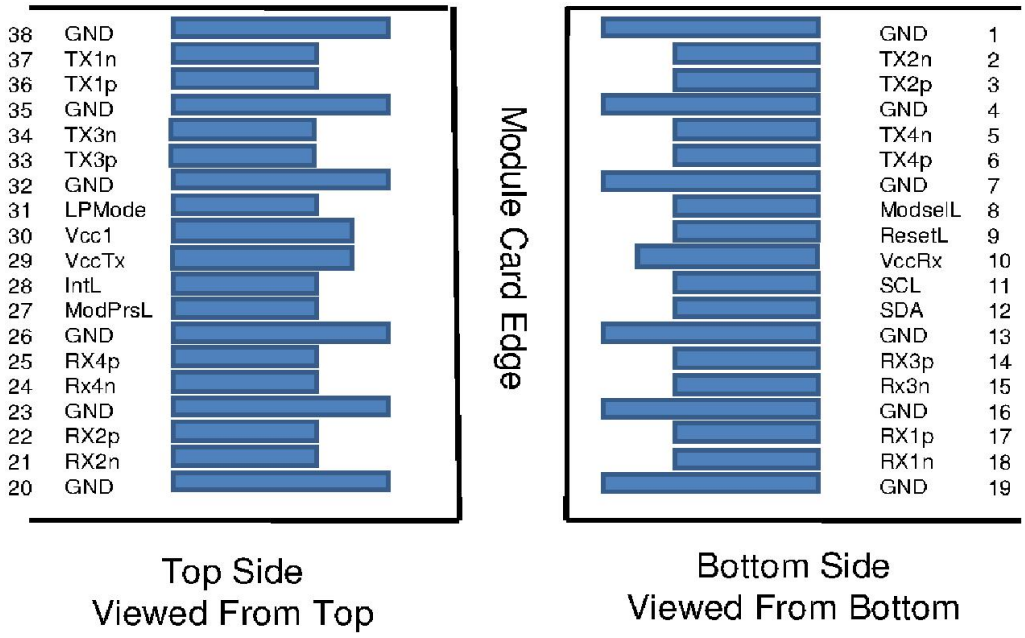
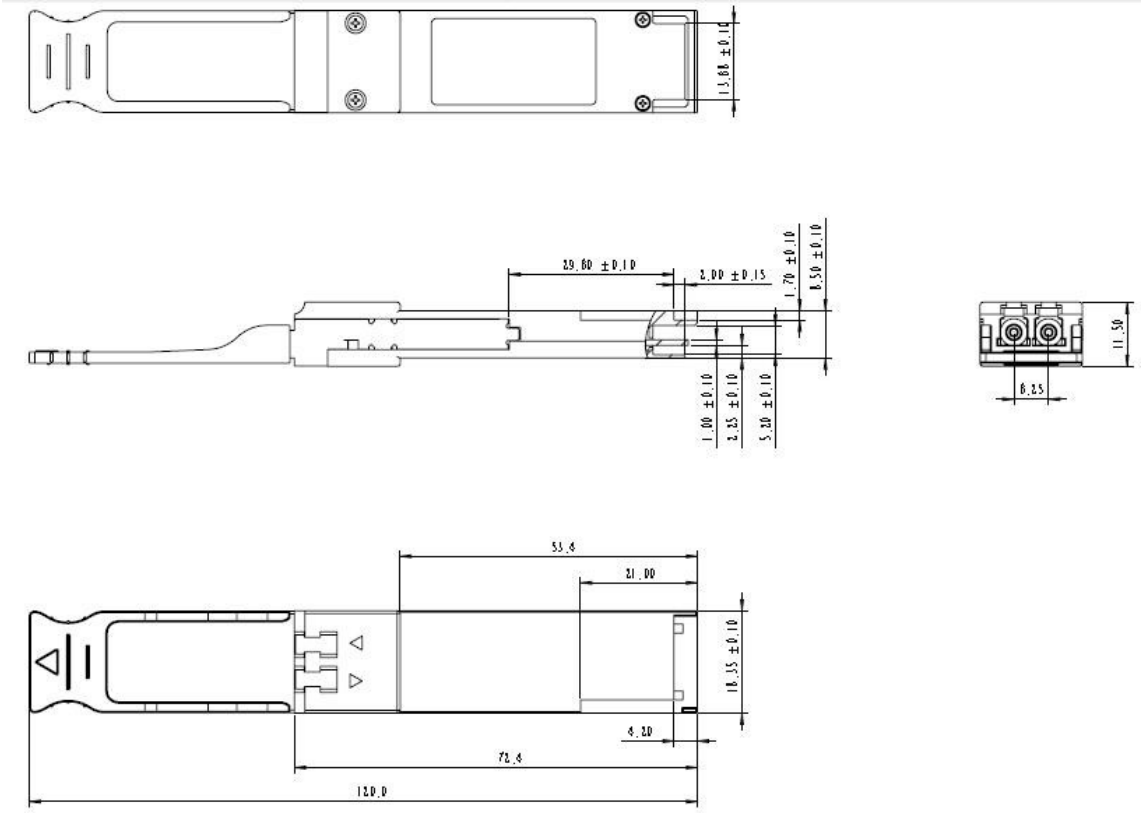
Electrical Pad Layout



Mechanical Specifications



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ESD

This transceiver is specified as ESD threshold 1kV for high speed data pins and 2kV for all other electrical input pins, tested per MIL-STD-883, Method 3015.4 /JESD22-A114-A (HBM). However, normal ESD precautions are still required during the handling of this module. This transceiver is shipped in ESD protective packaging. It should be removed from the packaging and handled only in an ESD protected environment.

Laser Safety

This is a Class 1 Laser Product according to IEC 60825-1:2007. This product complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated (June 24, 2007).

Ordering Information

Ordering P/Ns	Description
D1CCkk-QLCA	10km, CWDM 1271/1291/1311/1331nm, 4*10G NRZ electrical interface, 4*10G NRZ at LC/UPC optical interface, QSFP+, commercial temperature

Contact Us

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