Data Sheet

40G QSFP+ eSR4 300m Transceiver

P/N: WST-QSFP+eSR4-C

Features:

- Four-channel full-duplex transceiver module
- Hot Pluggable QSFP+ form factor
- Maximum link length of 300m on OM3
- Compliant to QSFP+ Electrical MSA SFF-8436
- Multi rate of up to 10.3125Gbps
- +3.3V single power supply
- Operating case temp
- Commercial: 0°C to +70 °C
- RoHS compliant

Applications:

- 40GBASE-SR4 40G Ethernet
- Proprietary interconnections
- Infiniband QDR

Absolute Maximum Ratings

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Supply Voltage	Vcc_3	-0.5	-	+3.6	V	
Storage Temperature	T_s	-40	-	+85	°C	
Operating Humidity	RH	+5	-	+85	%	1
Receiver Damage Threshold per Lane	P_{IND}	+3.4	-	-	dBm	

Notes:

1. No-condensing.

Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Operating Case Temperature	T_C	0	-	+70	°C	
Power Supply Voltage	Vcc	3.14	3.3	3.47	V	
Power Dissipation	Pd	-	-	1.5	W	
Bit Rate	BR	1.25	10.3125	-	Gbps	Per lane

Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Units	Notes
Input Logic Level High	V_{IH}	2.0	-	V_{CC}+0.3	V	
Input Logic Level Low	V_{IL}	V_{EE}-0.3	-	0.8	V	
Output Logic Level High	V_{OH}	2.0	-	V_{CC}+0.3	V	
Output Logic Level Low	V_{OL}	V_{EE}-0.3	-	0.4	V	
Transmitter						
Differential Data Input Swing	$V_{in,P-P}$	200	-	1000	mV_{PP}	
Input Differential Impedance	Z_{IN}	90	100	110	Ω	
Receiver						
Differential Date Output Swing	V_{out}	200	-	1000	mV	
Output Differential Impedance	Z_D	90	100	110	Ω	

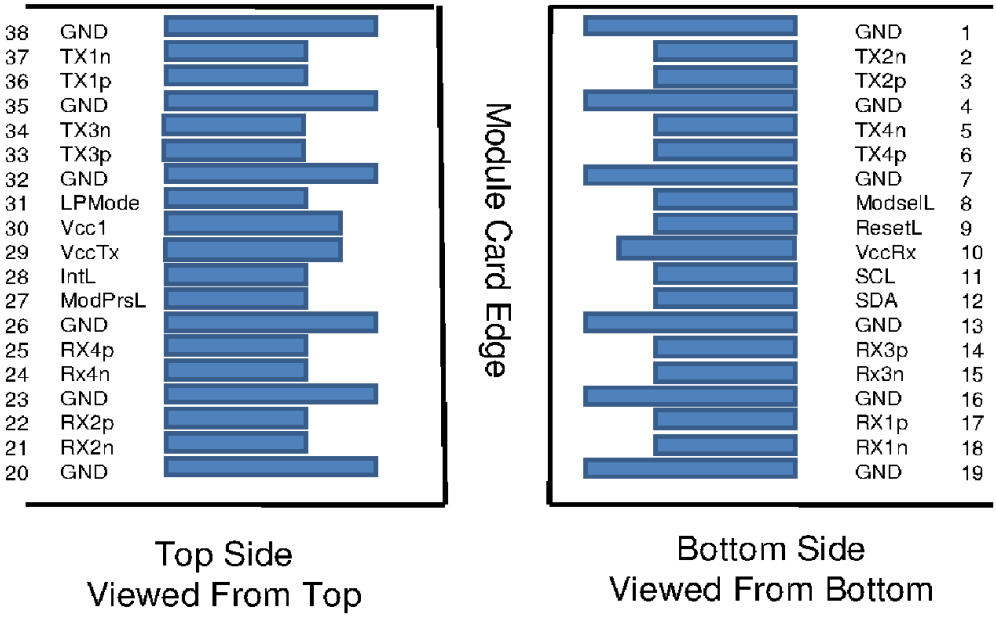
Optical Characteristics

Parameter	Symbol	Unit	Min	Typ	Max	Notes
Optical transmitter Characteristics						
Bit Rate	BR	Gbps	1.25	10.3125	-	Per lane
Center Wavelength Range	λc	nm	840	850	860	
RMS Spectral Width	Δλ	nm	-	-	0.6	
Average Launch power Tx_off	Poff	dBm	-	-	-30	
Launch Optical Power	P_0	dBm	-6.0	-	2.4	1
Extinction Ratio	ER	dB	3	-	-	
Optical Receiver Characteristics						
Bit Rate	BR	Gbps	1.25	10.3125	-	Per lane
Sensitivity@BER=E-12	BER	dBm	-	-	-11.1	
Overload Input Optical Power	P_{IN}	dBm	2.4	-	-	2
Center Wavelength Range	λc	nm	840	-	860	
LOS Assert	-	dBm	-30	-	-	
LOS De-Assert	-	dBm	-	-	-12	
LOS Hysteresis	-	dB	0.5	-	-	

Notes:

1. Coupled into 50/125 MMF.
2. Measured with PRBS 2^{31}-1 test pattern @10.3125Gbps.BER=E-12

Pin Assignment



Pin out of Connector Block on Host Board

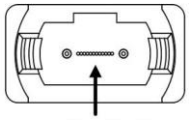
Pin	Symbol	Name/Description	Notes
1	GND	Ground	1
2	Tx2n	Transmitter Inverted Data Input	
3	Tx2p	Transmitter Non-Inverted Data Input	
4	GND	Ground	1
5	Tx4n	Transmitter Inverted Data Input	
6	Tx4p	Transmitter Non-Inverted Data Input	
7	GND	Ground	1
8	ModSelL	Module Select	
9	ResetL	Module Reset	
10	Vcc Rx	+3.3V Power Supply Receiver	
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	+3.3V Power supply transmitter	
30	Vcc1	+3.3V Power supply	
31	LPMode	Low Power Mode	
32	GND	Ground	1
33	Tx3p	Transmitter Non-Inverted Data Input	
34	Tx3n	Transmitter Inverted Data Input	
35	GND	Ground	1
36	Tx1p	Transmitter Non-Inverted Data Input	
37	Tx1n	Transmitter Inverted Data Input	
38	GND	Ground	1

Note:

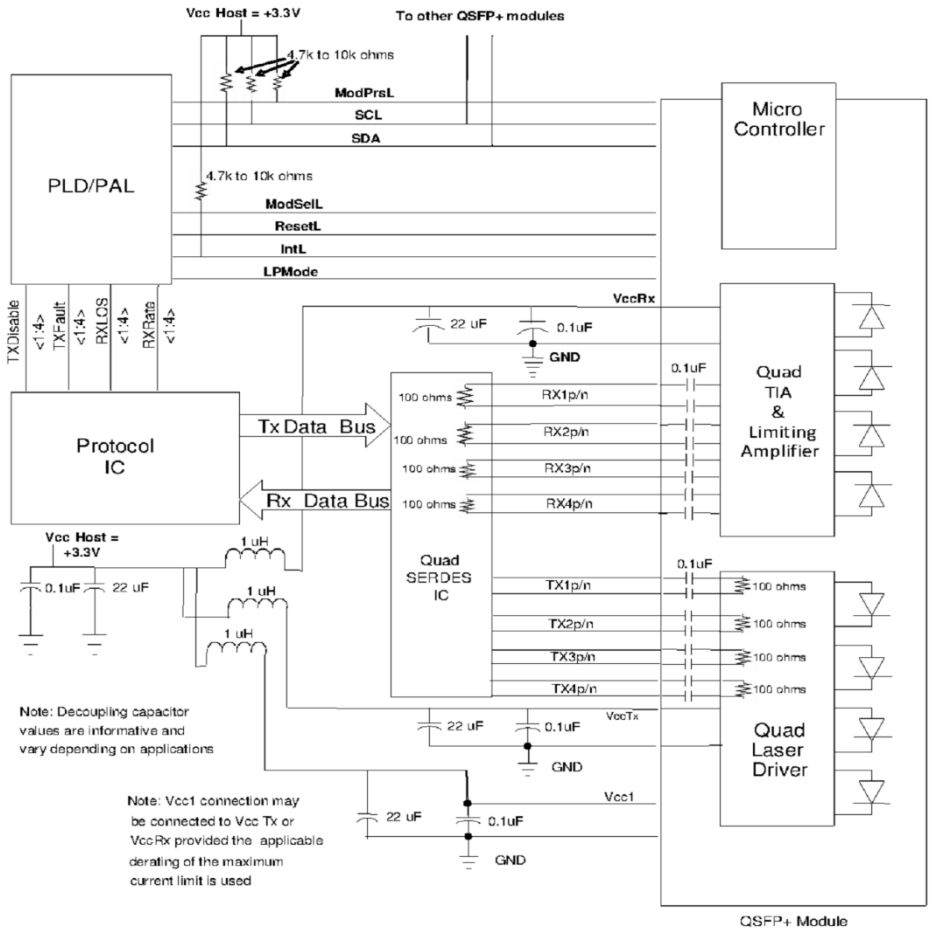
1. Circuit ground is internally isolated from chassis ground.

Optical interface arrangement



Fiber Number: 12 11 10 9 ..... 4 3 2 1
Transmit Channels: 1 2 3 4
Receive Channels: 4 3 2 1

Recommended Host - Transceiver Interface Block Diagram



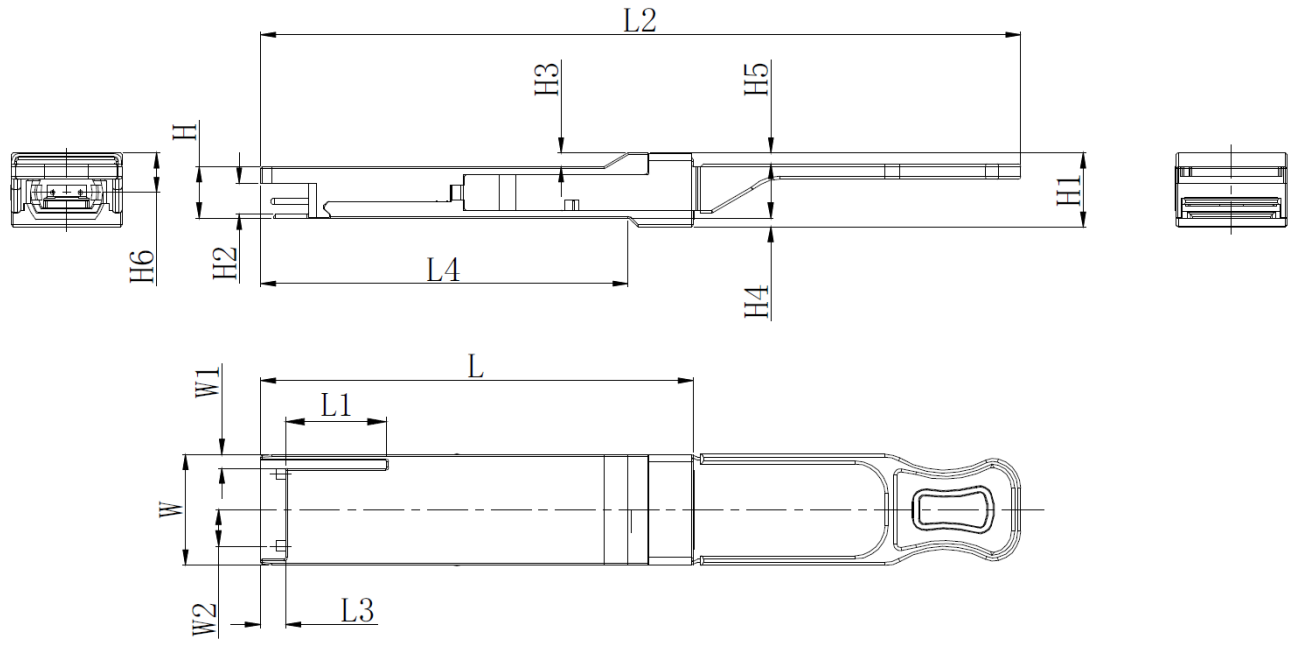
Recommended Typical Application Circuit

Memory map

2-Wire Serial Address 1010000x
Lower Page 00h
0 Identifier
1- 2 Status
3- 21 Interrupt Flags
22- 33 Free Side Device Monitors
34- 81 Channel Monitors
82- 85 Reserved
86- 98 Control
99 Reserved
100-104 Hardware Interrupt Pin Masks
105-106 Vendor Specific
107 Reserved
108-110 Free Side Device Properties
111-112 Assigned for use by PCI Express
113 Free Side Device Properties
114-118 Reserved
119-122 Password Change Entry Area (Optional)
123-126 Password Entry Area (Optional)
127 Page Select Byte

Upper Page 00h	Optional Page 01h	Optional Page 02h	Optional Page 03h
128 Identifier	128 CC_APPS	128-255 User EEPROM Data	128-175 Free Side Device Thresholds
129-191 Base ID Fields	129 AST Table Length (TL)		
	130-131 Application Code Entry 0		
	132-133 Application Code Entry 1		
	134-253 other entries		176-223 Channel Thresholds
192-223 Extended ID			224 Tx EQ & Rx Emphasis Magnitude ID
224-255 Vendor Specific ID			225 RX output amplitude indicators
			226-241 Channel Controls
			242-251 Channel Monitor Masks
	254-255 Application Code Entry TL		252-255 Reserved

Mechanical Drawing



	L	L1	L2	L3	L4	W	W1	W2	H	H1	H2	H3	H4	H5	H6
Max	72.2	-	128	4.35	61.4	18.45	-	6.2	8.6	12.4	5.35	2.5	1.6	2.0	-
Type	72.0	-	-	4.20	61.2	18.35	-	-	8.5	12.2	5.2	2.3	1.5	1.8	6.55
Min	68.8	16.5	124	4.05	61.0	18.25	2.2	5.8	8.4	12.0	5.05	2.1	1.3	1.6	-

Unit: mm

Ordering Information

Part No	Specification									
	Package	Data rate per Lane	Laser	Optical Power	Detector	Max. Receive Sensitivity (OMA)	Temp	Reach	Other	Application code
WST-QSFP+eSR4-C	QSFP+	10.3125 Gbps each Channel	850nm	-6.0~ +2.4 each Channel	PIN	-11.1 dBm each Channel	0~70°C	300m FOR OM3	DDM RoHS	40G Ethernet

Modification History

Revision	Date	Description	Originator	Review	Approved
V1.0	26-Aug-2020	New Issue	Elma Yueh	Wayne Liao	Wayne Liao

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