

LQP100-LR4-B1

QSFP28 100Gb/s LR4 10km DDM

PRODUCT FEATURES

- Supports 100GBASE-LR4(103.1Gb/s);
- Lane bit rate 25.78 Gb/s;
- Up to 10km transmission on SMF;
- LAN WDM laser and PIN receiver;
- High speed I/O electrical interface (CAUI-4);
- I2C interface with integrated Digital Diagnostic monitoring;
- QSFP28 MSA package with duplex LC connector;
- Single +3.3V power supply;
- Maximum power consumption 4 W;
- Operating case temperature: 0 to +70 °C;
- Compliant to IEEE 802.3bm;
- Compliant to SFF-8665 and SFF-8679;
- Complies with EU Directive 2015/863/EU;



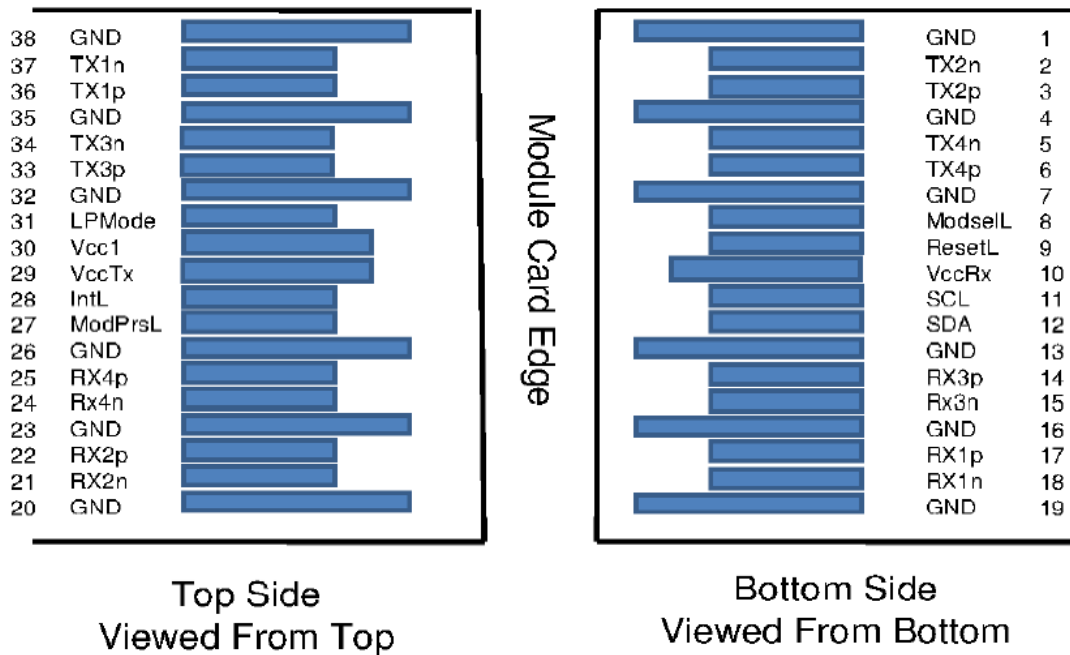
APPLICATIONS

- 100GBASE-LR4

Ordering information

Part No.	Data Rate	Laser	Fiber Type	Distance	Optical Interface	Temp	DDMI
LQP100-LR4-B1	103.1Gbps	LWDM	SMF	10km	LC	0~70C	Y

I. Pin Diagram



II. Pin Descriptions

PIN	Logic	Symbol	Description	Plug Seq.	Notes
1		GND	Ground	1	1
2	CML-I	Tx2n	Transmitter Inverted Data Input	3	
3	CML-I	Tx2p	Transmitter Non-Inverted Data output	3	
4		GND	Ground	1	1
5	CML-I	Tx4n	Transmitter Inverted Data Input	3	
6	CML-I	Tx4p	Transmitter Non-Inverted Data output	3	
7		GND	Ground	1	1



Product specification

8	LVTLL-I	ModSelL	Module Select	3	
9	LVTLL-I	ResetL	Module Reset	3	
10		VccRx	+ 3.3V Power Supply Receiver	2	2
11	LVC MOS-I/O	SCL	2-Wire Serial Interface Clock	3	
12	LVC MOS-I/O	SDA	2-Wire Serial Interface Data	3	
13		GND	Ground	1	
14	CML-O	Rx3p	Receiver Non-Inverted Data Output	3	
15	CML-O	Rx3n	Receiver Inverted Data Output	3	
16		GND	Ground	1	1
17	CML-O	Rx1p	Receiver Non-Inverted Data Output	3	
18	CML-O	Rx1n	Receiver Inverted Data Output	3	
19		GND	Ground	1	1
20		GND	Ground	1	1
21	CML-O	Rx2n	Receiver Inverted Data Output	3	
22	CML-O	Rx2p	Receiver Non-Inverted Data Output	3	
23		GND	Ground	1	1
24	CML-O	Rx4n	Receiver Inverted Data Output	3	
25	CML-O	Rx4p	Receiver Non-Inverted Data Output	3	
26		GND	Ground	1	1
27	LVTTL-O	ModPrsL	Module Present	3	
28	LVTTL-O	IntL	Interrupt	3	
29		VccTx	+3.3 V Power Supply transmitter	2	2
30		Vcc1	+3.3 V Power Supply	2	2
31	LVTTL-I	LPMode	Low Power Mode	3	
32		GND	Ground	1	1
33	CML-I	Tx3p	Transmitter Non-Inverted Data Input	3	
34	CML-I	Tx3n	Transmitter Inverted Data Output	3	
35		GND	Ground	1	1
36	CML-I	Tx1p	Transmitter Non-Inverted Data Input	3	
37	CML-I	Tx1n	Transmitter Inverted Data Output	3	
38		GND	Ground	1	1

Note 1: GND is the symbol for signal and supply (power) common for the QSFP28 module. All are common within the QSFP28 module and all module voltages are referenced to this potential unless otherwise noted. Connect these directly to the host board signal-common ground plane.

Note 2: Vcc Rx, Vcc1 and Vcc Tx are the receiver and transmitter power supplies and shall be applied concurrently. Requirements defined for the host side of the Host Edge Card Connector are listed in MSA. The connector pins are each rated for a maximum current of 1000 mA.

III. Absolute Maximum Ratings

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Storage Temperature	T _S	-40	-	+85	°C	
Supply Voltage	V _{CC}	-0.5	-	+4.0	V	
Operating Relative Humidity	RH	5	-	+85	%	

IV. Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Operating Case Temperature	T _C	0	-	+70	°C	
Power Supply Voltage	V _{CC}	3.13	3.3	3.47	V	
Power Supply Current	I _{CC}	-	-	1.2	A	
Maximum Power Dissipation	P _D	-	-	4.0	W	
Aggregate Bit Rate	BR _{AVE}	-	103.125	-	Gb/s	
Lane Bit Rate	BR _{LANE}	-	25.78	-	Gb/s	
Transmission Distance	TD		-	10	km	Over SMF

V. Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Transmitter						
Center Wavelength Lane 0	λ ₀	1294.53	1295.56	1296.59	nm	
Center Wavelength Lane 1	λ ₁	1299.02	1300.05	1301.09	nm	
Center Wavelength Lane 2	λ ₂	1303.54	1304.58	1305.63	nm	
Center Wavelength Lane 3	λ ₃	1308.09	1309.14	1310.19	nm	
Total Launch Power, 100GE	P _{ALL}	-	-	10.5	dBm	1
Average Launch Power per Lane, 100GE	PTX_LANE	-4.3	-	4.5	dBm	1
OMA per Lane, 100GE	OMA	-1.3	-	4.5	dBm	1
OMA–TDP per Lane, 100GE	OMA_TDP	-2.3	-	-	dBm	
Difference in launch power between lanes	PTX_Delta_LANE	-	-	5	dB	
Average Output Power (Laser Turn off)	P _{OUT-OFF}	-	-	-30	dBm	
Side Mode Suppression Ratio	SMSR	30	-	-	dB	
Extinction Ratio, 100GE	ER	4	-	-	dB	
Transmitter and Dispersion Penalty	TDP	-	-	2.2	dB	2
Optical Return Loss Tolerance	ORLT	-	-	20	dB	



Product specification

Optical Eye Mask, 100GE	Compliant with IEEE 802.3ba					2
Receiver						
Center Wavelength Lane 0	λ_0	1294.53	1295.56	1296.59	nm	
Center Wavelength Lane 1	λ_1	1299.02	1300.05	1301.09	nm	
Center Wavelength Lane 2	λ_2	1303.54	1304.58	1305.63	nm	
Center Wavelength Lane 3	λ_3	1308.09	1309.14	1310.19	nm	
Average Rx Power per Lane, 100GE	PRx_LANE	-10.6		4.5	dBm	3
OMA Sensitivity per Lane, 100GE	POMA_LANE	-	-	-8.6	dBm	3
Damage threshold	PDamage	5.5	-	-	dBm	
Reflectance	Ref	-	-	-26	dB	
LOS Assert (OMA)	LosA	-26		-12	dBm	
LOS De-Assert (OMA)	LosDA			-10	dBm	
Hysteresis	Hys	0.5		4	dB	

Note:

1. The optical power is launched into SMF.
2. Measured with a PRBS 2³¹-1 test pattern @25.78125, Hit ratio≤5E-5.
3. Measured with a PRBS 2³¹-1 test pattern @25.78125 Gb/s, BER≤1E-12.

VI. Electrical Characteristics

High-Speed Signal: Compliant to CAUI-4 (IEEE 802.3bm)

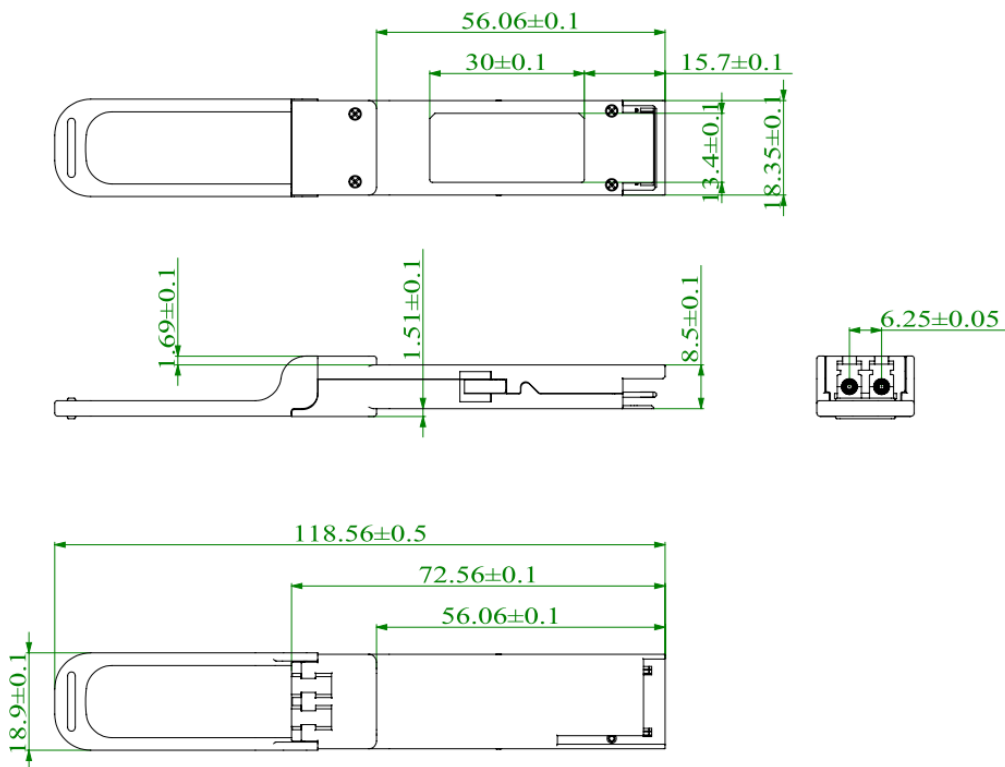
Low-Speed Signal: Compliant to SFF-8679.

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Transmitter (Module Input)						
Differential Data Input Amplitude	VIN,P-P	85	-	900	mVpp	
Differential Termination Mismatch		-	-	10	%	
LPMode, Reset and ModSelL / Tx dis	VIL	-0.3	-	0.8	V	
LPMode, Reset and ModSelL / Tx dis	VIH	2.0	-	VCC+0.3	V	
Receiver (Module Output)						
Differential Data Output Amplitude	VOUT,P-P	200	-	900	mVpp	
Differential Termination Mismatch (1MHZ)		-	-	10	%	
Output Rise/Fall Time, 20%~80%	TR	12	-	-	ps	
ModPrsL and IntL / Rx los	VOL	0	-	0.4	V	
ModPrsL and IntL / Rx los	VOH	VCC-0.5	-	VCC+0.3	V	

VII. Digital Diagnostics

Parameter	Range	Accuracy	Unit	Calibration
Temperature	0 to 70	±3	°C	Internal
Voltage	0 to V _{cc}	0.1	V	Internal
Tx Bias Current Per Lane	0 to 100	10%	mA	Internal
Tx Output Power Per Lane	-4.5 to 5	±3	dBm	Internal
Rx Power (Each Lane)	-15 to 5	±3	dBm	Internal

VIII. Mechanical Specifications(Unit: mm)



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Warnings

Handling Precautions: This device is susceptible to damage as a result of electrostatic discharge (ESD). A static free environment is highly recommended. Follow guidelines according to proper ESD procedures.

Laser Safety: The WXTR# family Transceiver uses a semiconductor laser system and is a laser class1 product acc. FDA, complies with 21CFR1040. 10 and 1040.11. Also this product is a laser class 1 product acc.IEC 60825-1.



Revision History

Version No.	Date	Description
1.0	June 24, 2020	Preliminary datasheet