

# LQP100-ZR4

## QSFP28 100Gb/s ZR4 80km DDM

### PRODUCT FEATURES

- Supports 100GBASE 100GE;
- Lane bit rate 25.78 Gb/s 100GE
- Up to 80km transmission on SMF;
- LAN WDM EML laser and PIN receiver with SOA;
- Support Multi-Pin function with IntL/RxLOSL and LPMoDe/TxDIS;
- 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 6.5 W;
- Operating case temperature: 0 to +70 °C;
- Compliant to IEEE 802.3bm and ITU-T G.959;
- Compliant to SFF-8665 and SFF-8679;
- Complies with EU Directive 2015/863/EU;



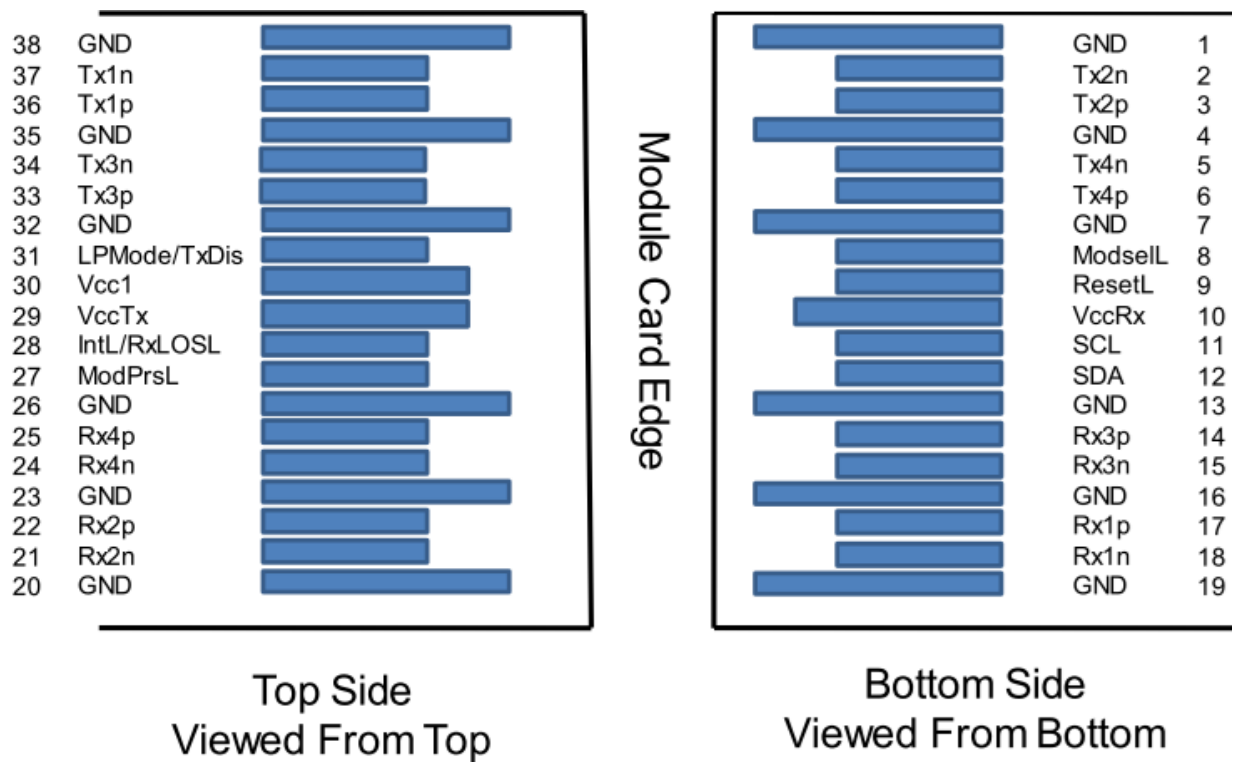
### APPLICATIONS

- 100GBASE-ZR4

## Ordering information

Part No.	Data Rate	Laser	Fiber Type	Distance	Optical Interface	Temp	DDMI
LQP100-ZR4	103.1Gbps	LWDM	SMF	80km	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



## Product specification

5	CML-I	Tx4n	Transmitter Inverted Data Input	3	
6	CML-I	Tx4p	Transmitter Non-Inverted Data output	3	
7		GND	Ground	1	1
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/Rx_LOS	Interrupt/Rx_LOS	3	
29		VccTx	+3.3 V Power Supply transmitter	2	2
30		Vcc1	+3.3 V Power Supply	2	2
31	LVTTL-I	LPMo de/TxDI S	Low Power Mode/Tx_Disable	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 <sub>S</sub>	-40	-	+85	°C	
Supply Voltage	V <sub>CC</sub>	-0.5	-	+4.0	V	
Operating Relative Humidity	RH	-	-	+85	%	

### IV. Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Operating Case Temperature	T <sub>C</sub>	0	-	+70	°C	
Power Supply Voltage	V <sub>CC</sub>	3.13	3.3	3.47	V	
Power Supply Current	I <sub>CC</sub>	-	-	1.95	A	
Maximum Power Dissipation	P <sub>D</sub>	-	-	6.5	W	
Aggregate Bit Rate	BR <sub>AVE</sub>	-	103.125	-	Gb/s	
Lane Bit Rate	BR <sub>LANE</sub>	-	25.78	-	Gb/s	
Transmission Distance	TD	-	-	80	km	Over SMF

### V. Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
<b>Transmitter</b>						
Center Wavelength Lane 0	λ <sub>0</sub>	1294.53	1295.56	1296.59	nm	
Center Wavelength Lane 1	λ <sub>1</sub>	1299.02	1300.05	1301.09	nm	
Center Wavelength Lane 2	λ <sub>2</sub>	1303.54	1304.58	1305.63	nm	
Center Wavelength Lane 3	λ <sub>3</sub>	1308.09	1309.14	1310.19	nm	
Total Launch Power, 100GE	P <sub>ALL</sub>	7	-	12.5	dBm	1
Average Launch Power per Lane, 100GE	P <sub>TX_LANE</sub>	1	-	6.5	dBm	1
Optical Modulation Amplitude (OMA), per Lane	P <sub>TX_OMA_lane</sub>	2	-	6.5	dBm	1
Difference in launch power	P <sub>TX_Delta</sub>	-	-	3	dB	

between lanes	_LANE					
Average Output Power (Laser Turn off)	P0UT-OFF	-	-	-30	dBm	
Side Mode Suppression Ratio	SMSR	30	-	-	dB	
Extinction Ratio, 100GE	ER	6	-	-	dB	
Optical Eye Mask	{0.25,0.4, 0.45, 0.25, 0.28, 0.4}				%	2
<b>Receiver</b>						
Center Wavelength Lane 0	$\lambda_0$	1294.53	1295.56	1296.59	nm	
Center Wavelength Lane 1	$\lambda_1$	1299.02	1300.05	1301.09	nm	
Center Wavelength Lane 2	$\lambda_2$	1303.54	1304.58	1305.63	nm	
Center Wavelength Lane 3	$\lambda_3$	1308.09	1309.14	1310.19	nm	
Damage threshold	Pdamage	5.5	-	-	dBm	
Average Rx Power per Lane, 100GE	PRx _LANE	-29	-	4.5	dBm	3
Los Assert	LosA	-40	-	-	dBm	
Los De-assert	LosDA	-	-	-29	dBm	
Los Hysteresis	LosH	0.5	-	5	dB	

**Note:**

1. The optical power is launched into SMF.
2. Measured with a PRBS 2<sup>31</sup>-1 test pattern @25.78125, Hit ratio≤5E-5.
3. Measured with a PRBS 2<sup>31</sup>-1 test pattern @25.78125 Gb/s, BER≤5E-5.

## 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
<b>Transmitter (Module Input)</b>						
Differential Data Input Amplitude	VIN,P-P	85	-	900	mVpp	
Differential Termination Mismatch		-	-	10	%	
Differential input return loss(min)	RLd(f)	Compliance with IEEE802.3ba Equation (83A–5)			dB	
Differential to common mode input return loss (min)	RLdc(f)	Compliance with IEEE802.3ba Equation (83A–6)			dB	
LPMODE, Reset and ModSelL, V in low	VIL	-0.3	-	0.8	V	
LPMODE, Reset and ModSelL, V in high	VIH	2.0	-	VCC+0.3	V	
<b>Receiver (Module Output)</b>						



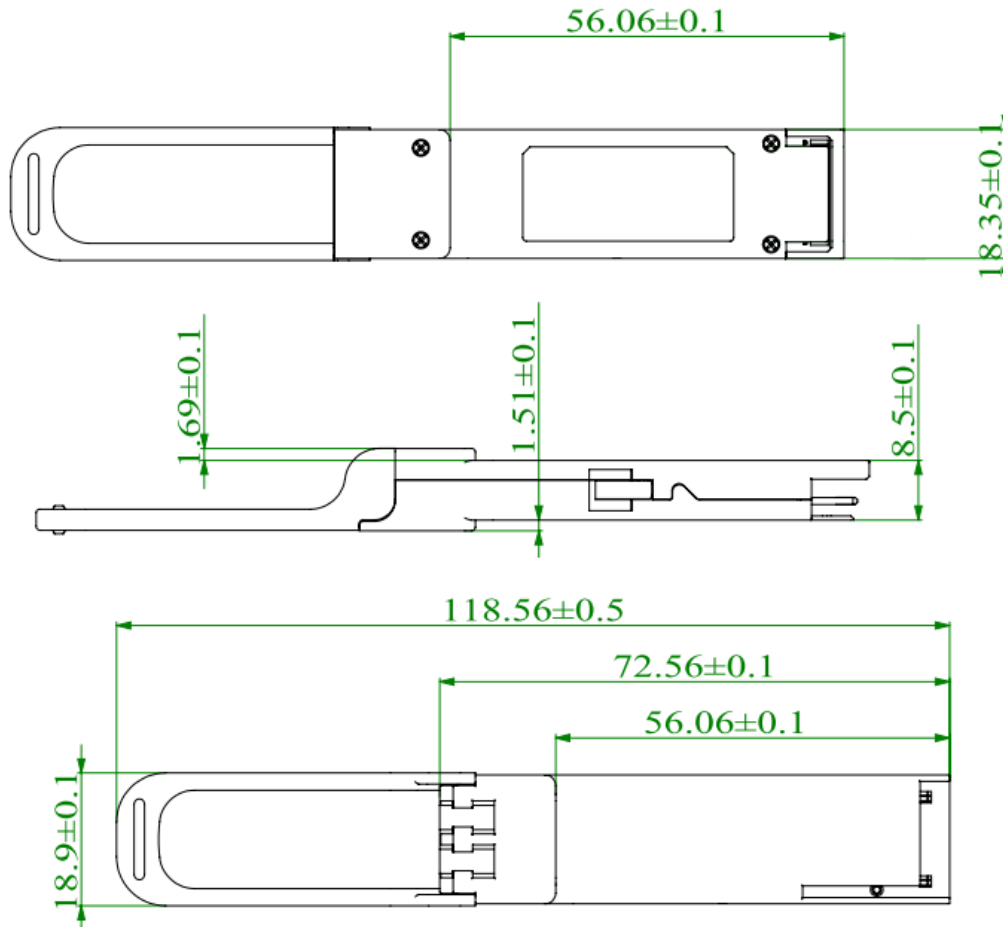
## Product specification

Differential Data Output Amplitude	VOUT,P -P	200	-	900	mVpp	
Differential Termination Mismatch (1MHZ)		-	-	10	%	
Transition time, 20% to 80%	Tr Tf	12	-	-	ps	
Differential output return loss (min)	RLd(f)	Compliance with IEEE802.3ba Equation (83A-7)			dB	
Common to differential mode conversion return loss (min)	RLdc(f)	Compliance with IEEE802.3ba Equation (83A-8)			dB	
ModPrsL and IntL, V out low	VOL	0	-	0.4	V	
ModPrsL and IntL, V out high	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 <sub>CC</sub>	0.1	V	Internal
Tx Bias Current Per Lane	0 to 100	10%	mA	Internal
Tx Output Power Per Lane	1.0 to 6.5	±3	dBm	Internal
Rx Power (Each Lane)	-28 to 4.5	±3	dBm	Internal

### VIII. Mechanical Specifications(Unit: mm)



## LQP100-ZR4

### 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:** Taclink 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 class1 product acc. IEC 60825-1.

### Revision History

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