

# LQP100-LR4

## QSFP28 100Gbps LR4 10km DDM Transceiver

### PRODUCT FEATURES

- Supports 103.1Gbps aggregate bit rate
- 4x25Gbps electrical interface
- 4X25Gbps DFBLAN-WDM transmitter and PIN/TIA receiver
- Maximum link length of 10km on Single Mode Fiber
- Hot pluggable QSFP28 footprint
- Duplex LC receptacles
- Single 3.3V power supply
- Maximum power dissipation <4W
- RoHS-6 compliant and lead-free
- I<sup>2</sup>C management interface
- 0°C to +70°C case operating temperature



### APPLICATIONS

- 100GBASE-LR4 100G Ethernet

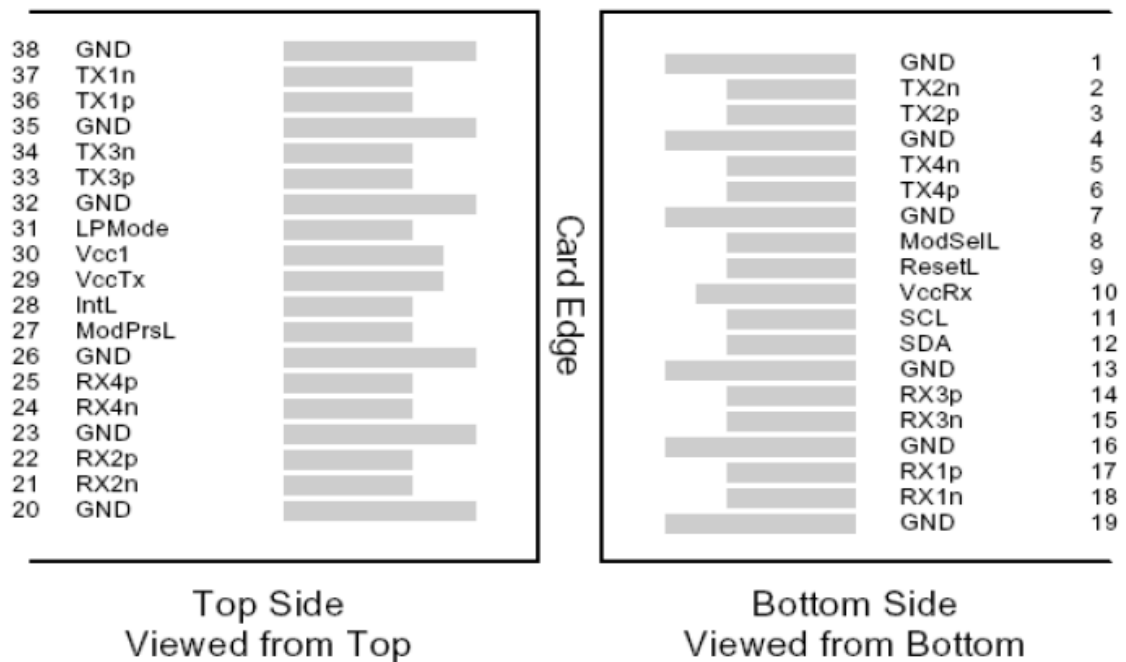
### COMPLIANCE

- QSFP28 MSA SFF-8665
- IEEE802.3ba 100GBASE-LR4
- ROHS

## Ordering Information

Package	Product part NO.	Description
QSFP28	LQP100-LR4	4X25Gbps, Single-mode fiber, 10Km, 0-70°C

## I. Pin Diagram



QSFP28 38pin connector (SFF 8679)

## II. Pin Descriptions

Pin	Symbol	Name/Description	Note
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	ModSe1L	Module Select	
9	ResetL	Module Reset	
10	Vcc Rx	+3.3V Power supply receiver	
11	SCL	2-wire serial interface clock	

Pin	Symbol	Name/Description	Note
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	VccTx	+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.

### III. Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark
Storage Temperature	T <sub>s</sub>	-40		85	°C	
Storage Ambient Relative Humidity	H <sub>A</sub>	0		85	%	
Case Operation Temperature	°C	0		70	°C	
Maximum Supply Voltage	V <sub>CC</sub>	-0.5		4.0	V	
Signal Input Voltage		-0.3		V <sub>CC</sub> +0.3	V	

Receiver Damage Threshold		+5.5			dBm	
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#### IV. Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark
<b>Transmitter</b>						
Total Average Output Power	$P_{OUT}$			10.5	dBm	
Average Output Power, each lane		-4.3		4.5	dBm	
Optical Modulation Amplitude (OMA), each lane		-1.3		4.5	dBm	
Extinction Ratio	ER	4			dB	
Center Wavelength	$\lambda_c$	1294.53 1299.02 1303.54 1308.09	1295.56 1300.05 1304.58 1309.14	1296.59 1301.09 1305.63 1310.19	nm	
Spectral Width				1	nm	
Transmitter OFF Output Power	$P_{Off}$			-30	dBm	
Transmitter eye mask definition {X1,X2,X3,Y1,Y2,Y3}		{0.25,0.4,0.45,0.25,0.28,0.4}				Hit ratio $5 \times 10^{-5}$
<b>Receiver</b>						
Input Optical Wavelength	$\lambda_{IN}$	1294.53 1299.02 1303.54 1308.09	1295.56 1300.05 1304.58 1309.14	1296.59 1301.09 1305.63 1310.19	nm	
Average receive power, each lane		-10.6		4.5		BER = 10–12
Receive power, each lane (OMA)		-8.6		4.5	dBm	BER = 10–12
Receiver Reflectance	Rfl			-26	dBm	
Loss of Signal Assert	$P_A$	-24		-13.6	dBm	
Loss of Signal De-assert	$P_D$			-11.6	dBm	
LOS Hysteresis	$P_D - P_A$	0.5		6	dB	

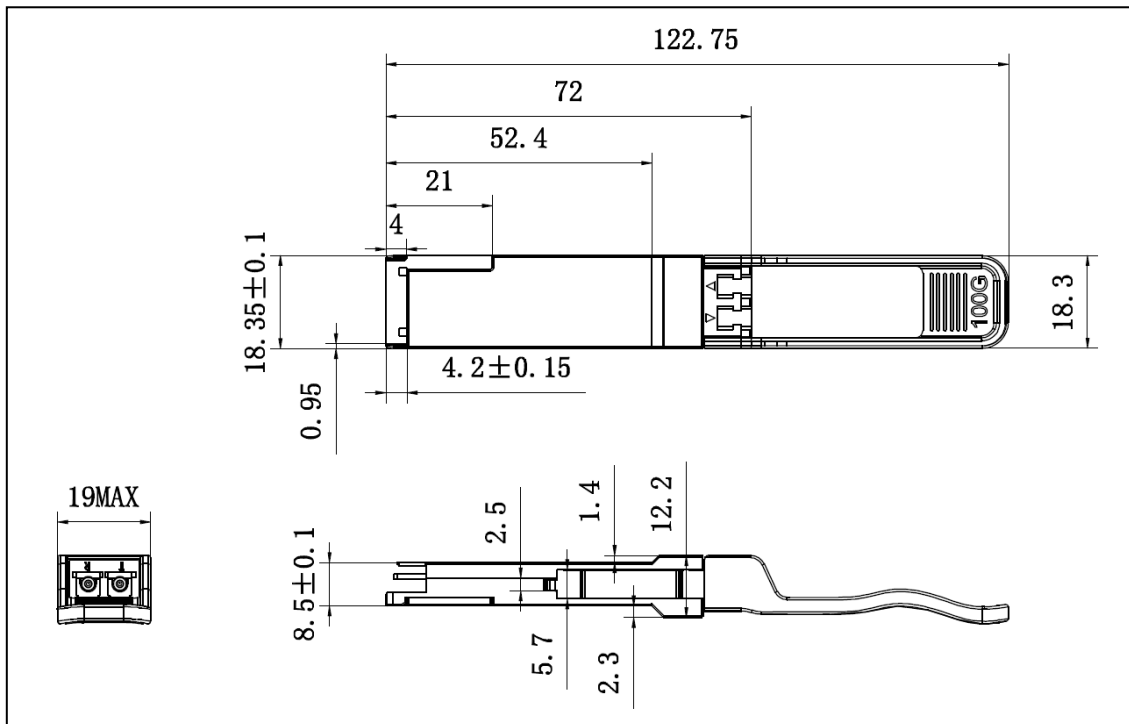
## V. Electrical Interface Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark
Supply Voltage	V <sub>cc</sub>	3.135		3.465	V	
Supply Current	I <sub>cc</sub>			1.15	A	
Module total power	P			4	W	
<b>Transmitter</b>						
Signaling rate per lane		25.78125±100ppm			Gbps	
Differential pk-pk input voltage	V <sub>in,pp,diff</sub>	350			mV	
Differential input Resistance	R <sub>tin</sub>		100		Ohm	
<b>Receiver</b>						
Signaling rate per lane		25.78125±100ppm			Gbps	
Differential data output swing	V <sub>out,pp</sub>		400		mVpp	
Eye width		0.57			UI	
Differential output Resistance			100		ohm	

## VI. Digital Diagnostic Functions

LQP100-LR4 transceivers support the I2C-based diagnostics interface specified by the SFF8636.

## VII. Mechanical Specifications(Unit: mm)





## Revision History

Version No.	Date	Description
1.0	June 24, 2019	Preliminary datasheet