

100 Gb/s QSFP28 SR4 Transceiver

Features

- Hot Pluggable QSFP28 form factor
- MPO connector receptacle
- Four-channel full-duplex transceiver modules
- Transmission data rate up to 25.78Gb/s per channel
- Up to 70 m on OM3 Multimode Fiber(MMF) and 100 m on OM4 MMF
- Low power consumption < 2.2 W
- Operating case temperature 0 °C to 70 °C
- 3.3 V power supply voltage
- RoHS 6 compliant
- Built-in digital diagnostic function

Applications

- IEEE 802.3bm 100G BASE SR4
- Proprietary High Speed Interconnections
- Data center

Standards

- QSFP MSA
- SFF-8436 QSFP+
- SFF-8665
- SFF-8636
- Ethernet 100GBASE-SR4

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Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit	Note
Supply Voltage	V _{cc}	0	3.6	V	
Storage Temperature	T _s	-40	85	°C	
Relative Humidity	RH	5	85	%	

Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Operating Case Temperature	T _c	0		70	°C	Commercial
Power Supply Voltage	V _{cc}	3.13	3.3	3.47	V	
Power Supply Current	I _{cc}			0.65	A	

Transmitter Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Data Rate	DR		25.78125		Gb/s	
Center Wavelength	λ_c	840	850	860	nm	
RMS Spectral Width	λ_{RMS}			0.6	nm	
Average Launch Power each lane	P _{avg}	-8.4		+2.4	dBm	
Optical Modulation Amplitude (OMA) each lane	P _{OMA}	-6.4		3	dBm	
Difference in Launch Power between any two lanes	P _{tx,diff}			4	dB	
Extinction Ratio	ER	3			dB	
Average Launch Power off each lane	P _{off}			-30	dBm	
Transmitter Eye Mask margin {X1, X2, X3, Y1, Y2, Y3}		> 20% margin {0.3, 0.38, 0.45, 0.35, 0.41, 0.5}				Hit Ratio = 5x10 ⁻⁵
Input Differential Impedance	Z _{IN}		100		Ω	
Data Input Swing Differential	V _{INPP}	300		1000	mV	

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Receiver Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Data rate per Lane	BR		25.78125		Gb/s	
DamageThreshold	THd	3			dBm	
Average receiver power, each lane	-	-10.3		2.4	dBm	
Receiver Sensitivity in OMA, each Lane	SEN			-9	dBm	1
LOS De-Assert	LOSD			-10	dBm	
LOS Assert	LOSA	-30			dBm	
LOS Hysteresis	LOSH	0.5		6	dB	
Data Output Swing Differential	V _{OUTPP}	500		800	mV	
LOS Fault	-	2.0		V _{cc}	V	
LOS Normal	-	0		0.8	V	

Note: 1. Measured with a PRBS 2³¹-1 test pattern, @25.78125 Gb/s, BER@5E-5

Pin-out Drawing

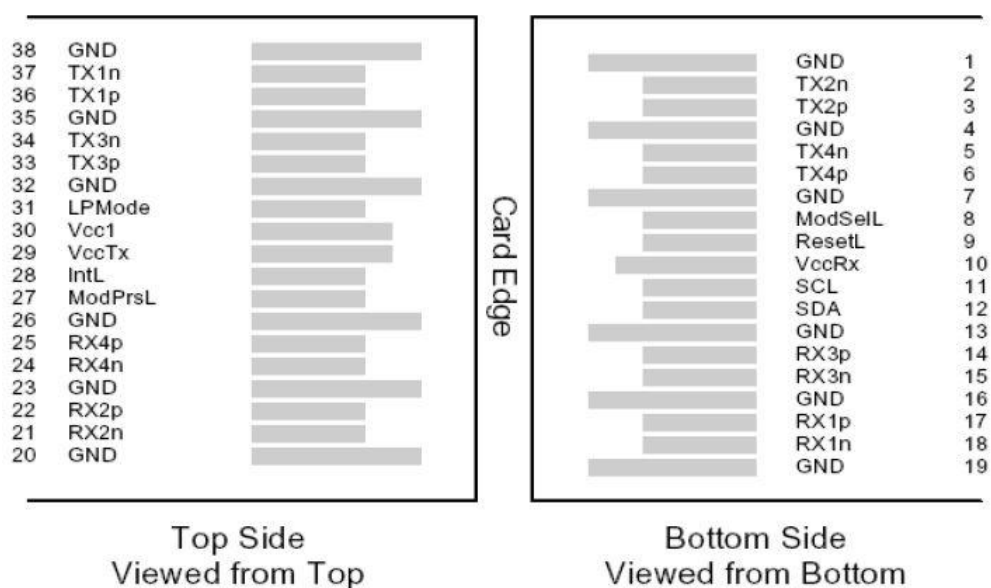


Figure 1. Pin-out Drawing

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Pin Description

Pin	Logic	Symbol	Description	Note
1		GND	Ground	
2	CML-I	Tx2n	Transmitter Inverted Data Input	
3	CML-I	Tx2p	Transmitter Non-Inverted Data Output	
4		GND	Ground	
5	CML-I	Tx4n	Transmitter Inverted Data Input	
6	CML-I	Tx4p	Transmitter Non-Inverted Data Output	
7		GND	Ground	
8	LVTL-I	ModSelL	Module Select	
9	LVTL-I	ResetL	Module Reset	
10		VccRx	+3.3 V Power Supply Receiver	
11	LVC MOS-I/O	SCL	2-Wire Serial Interface Clock	
12	LVC MOS-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	
17	CML-O	Rx1p	Receiver Non-Inverted Data Output	
18	CML-O	Rx1n	Receiver Inverted Data Output	
19		GND	Ground	
20		GND	Ground	
21	CML-O	Rx2n	Receiver Inverted Data Output	
22	CML-O	Rx2p	Receiver Non-Inverted Data Output	
23		GND	Ground	
24	CML-O	Rx4n	Receiver Inverted Data Output	
25	CML-O	Rx4p	Receiver Non-Inverted Data Output	
26		GND	Ground	
27	LV TTL-O	ModPrsL	Module Present	
28	LV TTL-O	IntL	Interrupt Output	
29		VccTx	+3.3 V Power Supply transmitter	
30		Vcc1	+3.3 V Power Supply	
31	LV TTL-I	LPMode	Low Power Mode	
32		GND	Ground	
33	CML-I	Tx3p	Transmitter Non-Inverted Data Input	
34	CML-I	Tx3n	Transmitter Inverted Data Output	
35		GND	Ground	

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

Package Outline

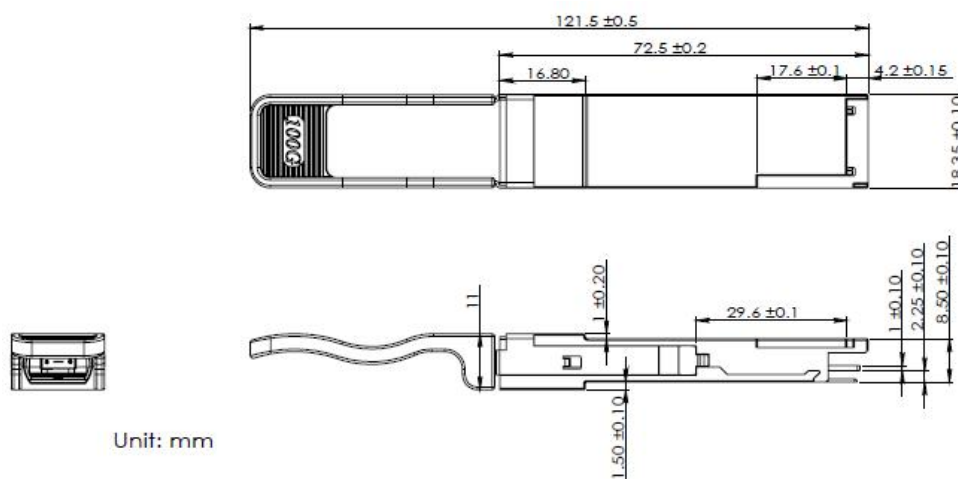
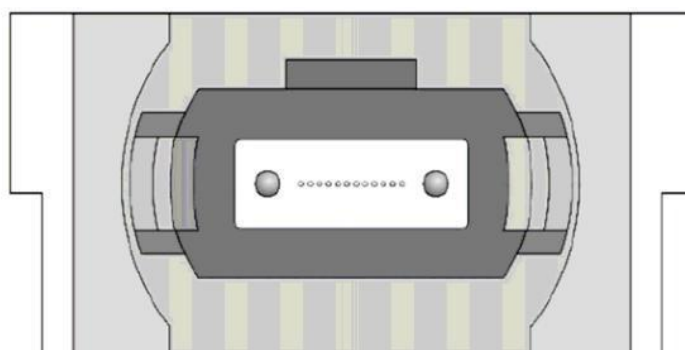


Figure 2. Package Outline

Optical Interface Lanes and Assignment

The optical interface port is a male MPO connector. The four fiber positions on the left as shown in Figure 2, with the key up, are used for the optical transmit signals (Channel 1 through 4). The fiber positions on the right are used for the optical receive signals (Channel 4 through 1). The central four fibers are physically present.



Transmit Channels: 1 2 3 4
 Unused positions: x x x x
 Receive Channels: 4 3 2 1

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Figure 3. Optical Receptacle and Channel Orientation

Digital Diagnostic Monitoring Interface

Parameter	Symbol	Accuracy	Calibration	Note
Temperature	DMI_Temp	$\pm 3\text{ }^{\circ}\text{C}$	Internal	Over operating temp
Voltage	DMI_VCC	$\pm 0.1\text{ V}$	Internal	Full operating range
Bias Current	DMI_BIAS	$\pm 10\%$	Internal	Per channel
TX Power	DMI_TX	$\pm 3\text{ dB}$	Internal	Per channel
RX Power	DMI_RX	$\pm 3\text{ dB}$	Internal	Per channel