100G QSFP28 PSM4 1310nm 2KM MPO SMF Fiber Optic Transceiver

Zion Code and Description

Zion Code	Zion Description
7211020	100G QSFP28 PSM4 1310nm 2KM MPO SMF Fiber Optic Transceiver

Applications

- 40G Ethernet Links; Infiniband DDR/EDR
- Data Center; Enterprise networking

Features

- Up to 26Gbps per channel bandwidth;
- Compliant with QSFP28 MSA
- 4 channels 1310nm DFP
- 4 channels PIN photo detector array
- Up to 2km reach over standard single mode fiber
- MPO connector
- Hot pluggable electrical interface
- Compliant to IEEE 802.3ba for 100GBASE-PSM4 links
- Single +3.3V power supply operating
- Commercial Temperature range 0°C to 70°C
- RoHS Compliant Part

Description

The 100G QSFP28 PSM4 2KM is a 4x25G hot-pluggable optical transceiver module. It is designed for 2km optical communication applications over single mode fiber using a wavelength of 1310nm via MPO connectors.
It is compliant with QSFP28 MSA, IEEE 802.3bm 100GBASE-PSM4.
It is designed with form factor, optical/electrical connection and digital diagnostic interface according to the QSFP28 Multi-Source Agreement (MSA). It has been designed to meet the harshest external operating conditions including temperature, humidity and EMI interference. With these features, this easy to install, hot swappable transceiver is suitable to be used in various applications, such as high-performance computing networks, enterprise core and distribution layer applications, data centers.

Main product parameters

Form Factor	QSFP28	Max Data Rate	100 Gbps
Wavelength	1310nm	Center Wavelength	1295,1325nm
Max Cable Distance	2KM	Connector type	MPO
Fiber cable Type	SMF	Vendor Name	Zion Communication
Transimitter Type	FP	Receiver Type	PIN
Transmit Power		Max Receiver sensitivity	
Overload Power		Extinction Ratio	
DDM	Supported	Operating Temp.	0°C to 70°C (32°F to 158°F)

Zion Communication's Hot 100G transceiver types

Zion Code	Zion Description
7211010	100G QSFP28 SR4 850nm 100M MPO MMF Fiber Optic Transceiver
7211020	100G QSFP28 PSM4 1310nm 2KM MPO SMF Fiber Optic Transceiver
7211030	100G QSFP28 LR4 CWDM 2KM LC SMF Fiber Optic Transceiver
7211050	100G QSFP28 LR4 LAN WDM 10KM LC SMF Fiber Optic Transceiver
7211060	100G QSFP28 ER4 LAN WDM 30KM/40KM LC SMF Fiber Optic Transceiver
7211070	100G QSFP28 ZR4 LAN WDM 80KM LC SMF Fiber Optic Transceiver

Detailed product specifications

1 Absolute Maximum Ratings

Parameter	Symbol	Min.	Typical	Max.	Unit
Supply Voltage	V_{CC}	-0.3		3.6	V
Input Voltage	Vin	-0.3		Vcc+0.3	V
Storage Temperature (°C)	T_S	-20		85	°C
Relative Humidity	RH	5		95	%

2 Recommended Operating Environment

Parameter	Symbol	Min.	Typical	Max.	Unit
Supply Voltage	$V_{CCT, R}$	3.13	3.3	3.47	V
Case operating Temperature	T_C	0		70	°C
Power Consumption			2	3.5	W
Data Rate, each Lane	DR		25.5		Gb/s
Data Speed Tolerance	ΔDR	-100		-100	ppm
Humidity	RH	5		85	%
Transmission Distance	D			2	km

3 Electrical Characteristics (TOP = 0 to 70 °C, VCC = 3.13 to 3.47 Volts)

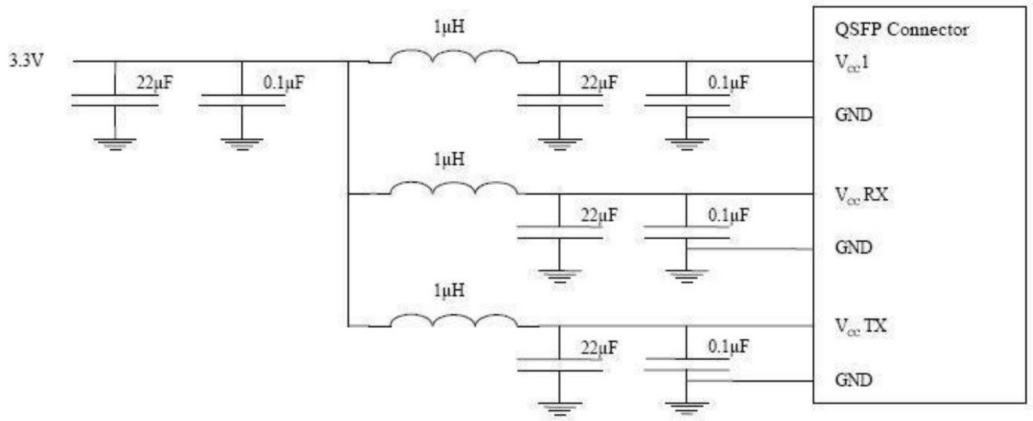
Parameter	**Symbol**	**Min.**	**Typical**	**Max.**	**Unit**	**Note**
Differential input impedance	Zin	90	100	110	ohm	
Differential Output impedance	Zout	90	100	110	ohm	
Differential input voltage amplitude	ΔVin	190		700	mVp-p	
Differential output voltage amplitude	ΔVout	300		850	mVp-p	
Input Logic Level High	VIH	2		VCC	V	
Input Logic Level Low	VIL	0		0.8	V	
Output Logic Level High	VOH	VCC-0.5		VCC	V	
Output Logic Level Low	VOL	0		0.4	V	

4 Optical Parameters(TOP = 0 to 70 °C, VCC = 3.0 to 3.6 Volts)

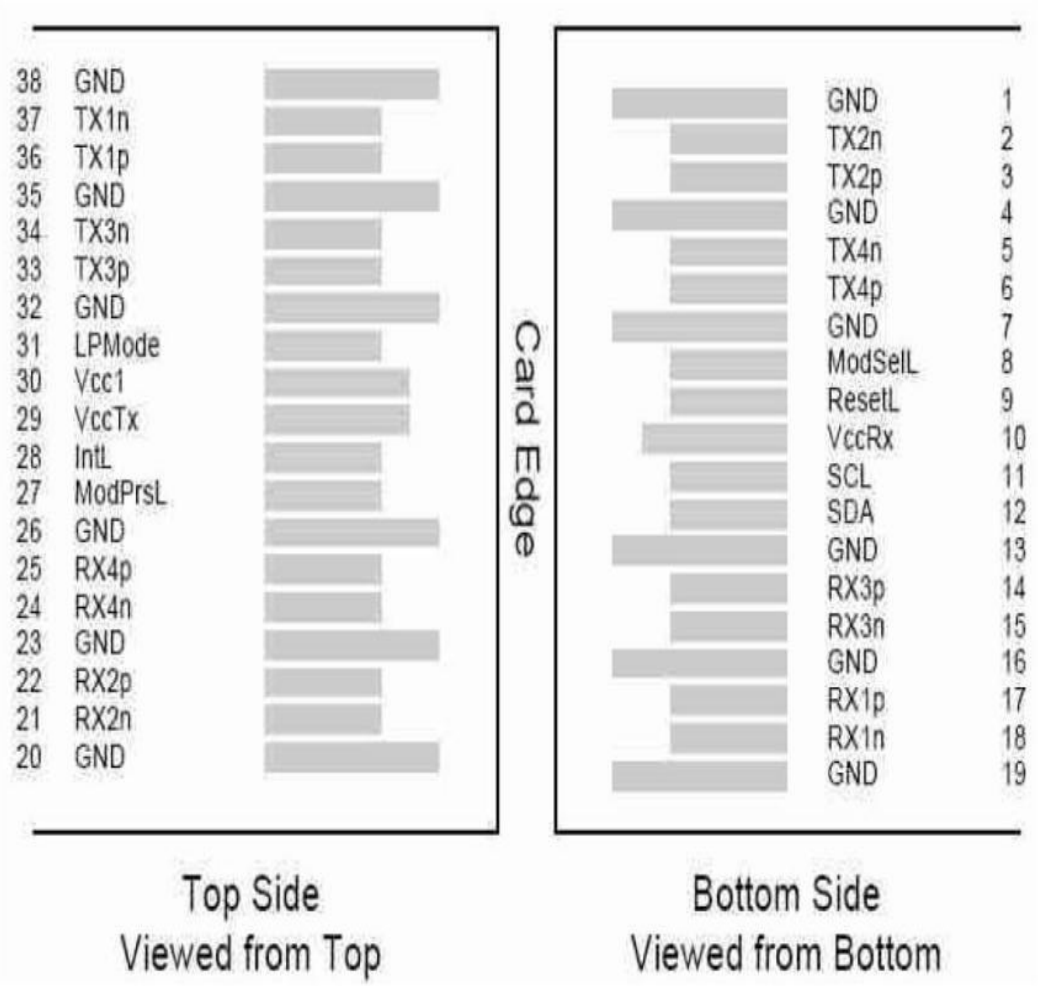
Parameter	Symbol	Min.	Typical	Max.	Unit	Ref.
Transmitter						
Center Wavelength	λC	1295	1310	1325	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
Average Launch Power, each Lane	PAVG	1		3.5	dBm	
Optical Modulation Amplitude (OMA)	POMA	2		4.5	dBm	1
Launch Power in OMA minus Transmitter and Dispersion		1			dBm	
TDP,each lane	TDP			3.2	dB	
Extinction Ratio	ER	3.5			dB	
Relative Intensity Noise	Rin			-128	dB/Hz	
Optical Return Loss Tolerance	TOL			12	dB	
Transmitter, each Lane	RT			-12	dB	
Average Launch Power OFF Transmitter, each Lane	Poff			-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 = 5x10-5
Receiver						
Center Wavelength	λC	1295	1310	1325	nm	
Damage Threshold	THd	4.5			dBm	2
Average Receive Power, each lane		-12		3.5	dBm	
Receiver Reflectance	RR			-12	dBm	
Receiver Sensitivity (OMA), each lane	SEN			-9	dB	3
Signal Loss Assert Threshold	LOSA		-18		dBm	
Signal Loss Deassert Threshold	LOSD		-15	-7.5	dBm	
LOS Hysteresis	LOSH	0.5		6	dB	

Note:
1. Even if the TDP<1dB,the OMA min must exceed the minimum value specified here.
2. The receiver shall be able to tolerate, without damage, continuous exposure to a modulated optical input signal having this power level on one lane. The receiver does not have to operate correctly at this input power.
3. Sensitivity is specified at 5x10^-5 BER at 25.78125Gb/s.

5 Recommended Power Supply Filter



6 Pin Assignment



7 Transceiver Block Diagram

Pin	Logic	Symbol	Max Unit Conditions	Ref.
1		GND	Ground	1
2	CML-I	Tx2n	Transmitter Inverted Data Input	
3	CML-I	Tx2p	Transmitter Non-Inverted Data output	
4		GND	Ground	1
5	CML-I	Tx4n	Transmitter Inverted Data Output	
6	CML-I	Tx4p	Transmitter Non-Inverted Data Output	
7		GND	Ground	1
8	LVTTL-I	ModSelL	Module Select	
9	LVTTL-I	ResetL	Module Reset	
10		VccRx	+3.3V Power Supply Receiver	2
11	LVCMOS-I/O	SCL	2-Wire Serial Interface Clock	
12	LVCMOS-I/O	SDA	2-Wire Serial Interface Data	
13		GND	Ground	1
14	CML-O	Rx3p	Receiver Inverted Data Output	
15	CML-O	Rx3n	Receiver Non-Inverted Data Output	
16		GND	Ground	1
17	CML-O	Rx1p	Receiver Inverted Data Output	
18	CML-O	Rx1n	Receiver Non-Inverted Data Output	
19		GND	Ground	1
20		GND	Ground	1
21	CML-O	Rx2n	Receiver Inverted Data Output	
22	CML-O	Rx2p	Receiver Non-Inverted Data Output	
23		GND	Ground	1
24	CML-O	Rx4n	Receiver Inverted Data Output	
25	CML-O	Rx4p	Receiver Non-Inverted Data Output	
26		GND	Ground	1
27	LVTTL-O	ModPrsL	Module Present	
28	LVTTL-O	IntL	Interrupt	
29		VccTx	+3.3V Power Supply Transmitter	2
30		Vcc1	+3.3V Power Supply	2
31	LVTTL-I	LPMode	Low Power Mode	
32		GND	Ground	1
33	CML-I	Tx3p	Transmitter Inverted Data Output	
34	CML-I	Tx3n	Transmitter Non-Inverted Data Output	
35		GND	Ground	1
36	CML-I	Tx1p	Transmitter Inverted Data Output	
37	CML-I	Tx1n	Transmitter Non-Inverted Data Output	
38		GND	Ground	1

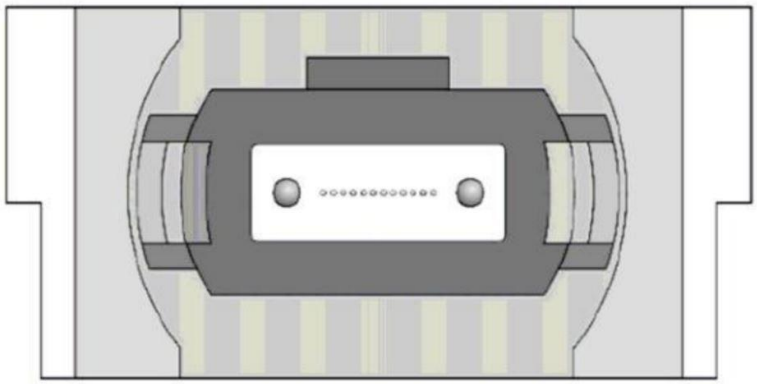
Note:

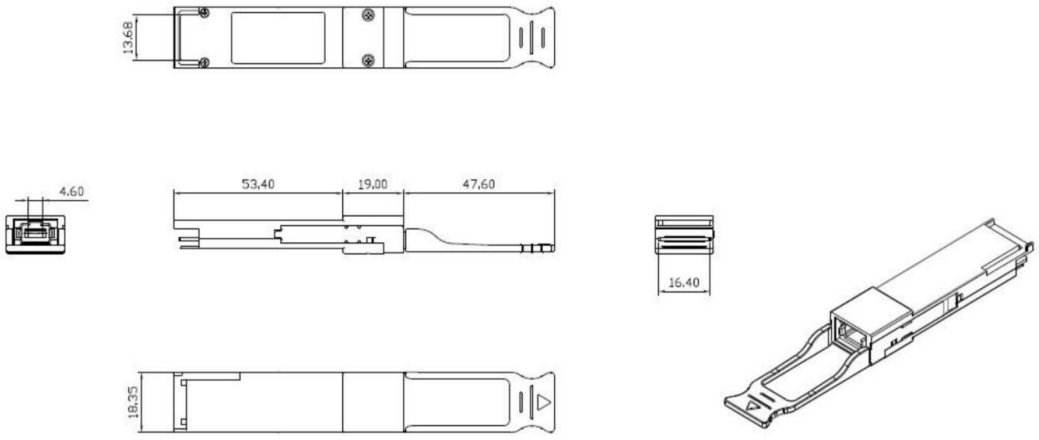
1.GND is the symbol for single and supply(power) common for QSFP modules, All are common within the QSFP module and all module voltages are referenced to this potential otherwise noted. Connect these directly to the host board signal common ground plane. Laser output disabled on TDIS >2.0V or open, enabled on TDIS <0.8V.

2.VccRx, Vcc1 and VccTx are the receiver and transmitter power suppliers and shall be applied concurrently. Recommended host board power supply filtering is shown below. VccRx, Vcc1 and VccTx may be internally connected within the QSFP transceiver module in any combination. The connector pins are each rated for maximum current of 500mA.

8 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 through4).
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

9 Diagram Mechnical Drawing