

# QSFP28-100G-ZR4

## Optical SFP Module

100Gbps QSFP28 ZR4 Transceiver, SM, 80KM



### Features

- Support line rates from 103.125 Gbps to 111.81 Gbps
- 4 LAN-WDM lanes MUX/DEMUX design
- 4x25G electrical interface
- LC duplex receptacle
- Up to 80km reach for SMF
- Compliant with QSFP28 MSA
- Hot Pluggable QSFP28 form factor
- Digital Diagnostics Monitoring Interface
- Power dissipation < 6.5 W
- Compatible with RoHS
- Commercial operating case temperature: 0 to +70° C

### Application

- Ethernet 100GBASE-ZR4
- Infiniband QDR and DDR interconnects
- Client-side 100G Telecom connections
- Data Center

## Standard

- Compliant with IEEE 802.3bm
- Compliant with QSFP28 MSA
- Compliant with SFF-8436

## Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit
Power Supply Voltage	Vcc	0	3.6	V
Damage Threshold, each Lane	THd	6.5		dBm
Storage Temperature	Ts	-40	+85	°C
Operating Humidity	-	5	95	%

## Recommended Operating Conditions

Parameter	Symbol	Min	Typical	Max	Unit
Operating Case Temperature	Tc	0		70	°C
Power Supply Voltage	Vcc	3.135	3.3	3.465	V
Power Supply Current	Icc			1.8759	A
Data Rate,each Lane			25.78125		Gbps
Link Distance with SMF	D			80	km

## Optical and Electrical Characteristics

Optical Transmitter Characteristics						
Parameter	Symbol	Min	Typical	Max	Unit	Notes
Signaling Speed per Lane	Gb/s	25.78125 ± 100 ppm				
Transmit wavelengths	nm	1294.53	1295.56	1296.59		
		1299.02	1300.05	1301.09		
		1303.54	1304.58	1305.63		
		1308.09	1309.14	1310.19		
Side-Mode Suppression Ratio (SMSR)	dB	30				
Total Average Launch Power	dBm	8.0		12.5		
Average launch power, each lane	dBm	2.0		6.5		
Difference in launch power between any two lanes(Average and OMA)	dBm			3		
Average launch power of OFF transmitter, each lane	dBm			-30		
Extinction Ratio (ER)	dB	6				
RIN OMA	dB/Hz			-130		
Optical return loss tolerance	dB			20		
Transmitter reflectance	dB			-12		
Transmitter eye mask definition {X1, X2, X3, Y1, Y2, Y3}		{0.25, 0.4, 0.45, 0.25, 0.28, 0.4}				
Mask margin	%	5				
Optical Receiver Characteristics						
Parameter	Symbol	Min	Typical	Max	Unit	Notes
Signaling Speed per Lane	Gb/s	25.78125 ± 100 ppm				
Transmit wavelengths	nm	1294.53	1295.56	1296.59		
		1299.02	1300.05	1301.09		
		1303.54	1304.58	1305.63		
		1308.09	1309.14	1310.19		
Average receiver power, each lane	dBm	-28		-7		
Receiver power, each lane(OMA)	dBm			-7		
Receiver reflectance	dB			-26		
Receiver sensitivity Average, each lane	dBm			-28		
Receiver 3 dB electrical upper cutoff frequency, each lane	GHz			31		
Damage threshold, each lane	dBm	6.5				

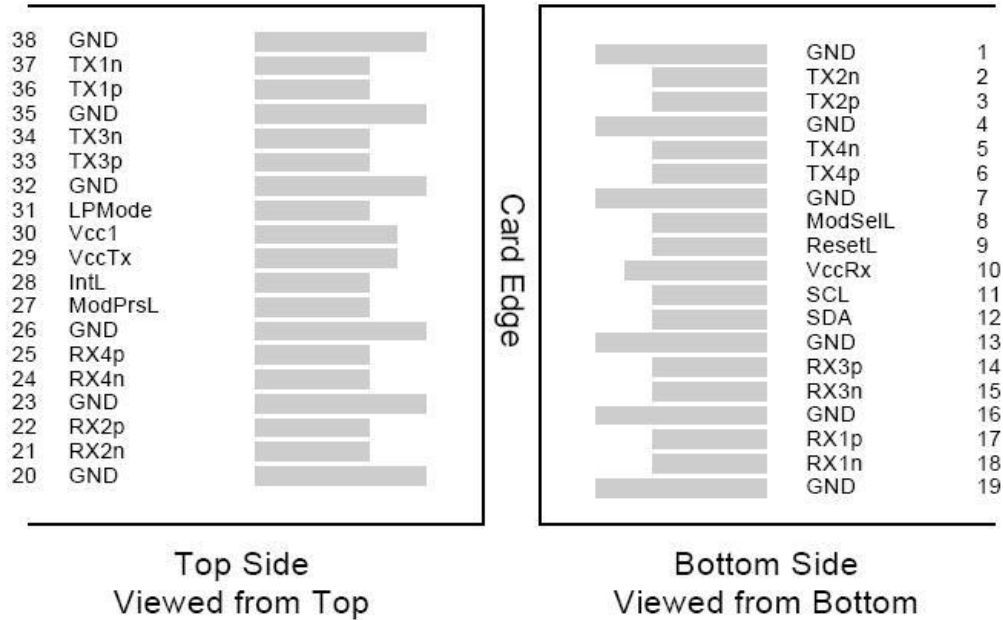
LOS Assert	dBm	-40				
LOS Deassert	dBm			-29		
LOS Hysteresis	dB	0.5				

Notes: Sensitivity is specified at BER@2E-5 with FEC.

Electrical Transmitter Characteristics						
Parameter	Symbol	Min	Typical	Max	Unit	Notes
Power Consumption				6.5	W	
Data Rate, each lane			25.78125		Gbps	
Differential Voltage pk-pk	Vpp			900	mV	At 1 MHz
Common Mode Voltage	Vcm	-350		2850	mV	
Transition time	Trise/Tfall	10			ps	20%~80%
Differential Termination Resistance Mismatch				10	%	
Eye width	EW15	0.46			UI	
Eye height	EH15	95			mV	
Electrical Receiver Characteristics						
Parameter	Symbol	Min	Typical	Max	Unit	Notes
Data Rate, each lane			25.78125		Gbps	
Differential Termination Resistance Mismatch				10	%	At 1 MHz
Differential output voltage swing	Vout, pp			900	mV	
Common Mode Noise, RMS	Vrms			17.5	mV	
Transition time	Trise/Tfall	12			ps	20%~80%
Eye width	EW15	0.57			UI	
Eye height	EH15	228			mV	

## Pin Definitions

### Pin Diagram

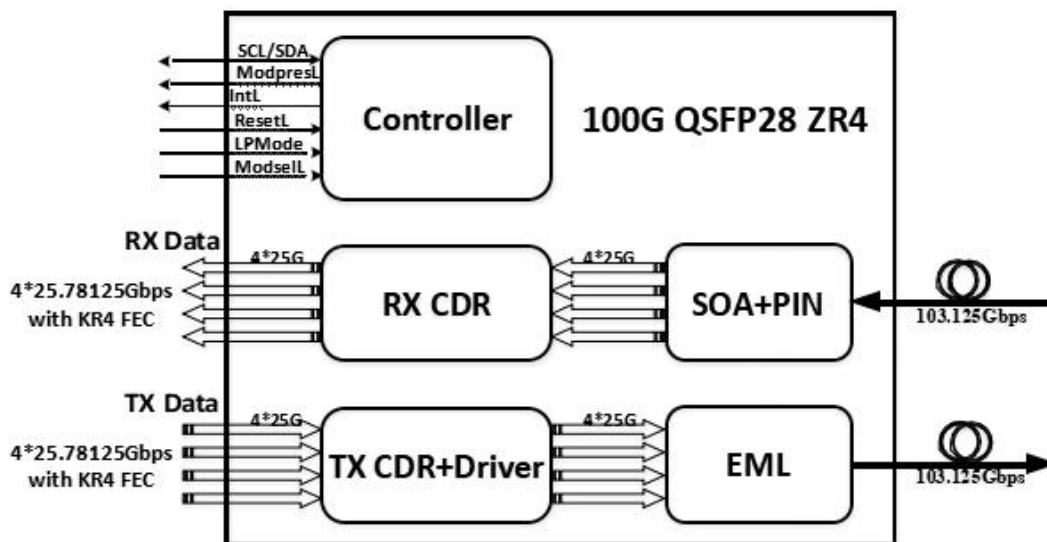


### QSFP MSA-compliant 38-pin connector

Pin	Symbol	Name/Description	Notes
1	GND	Transmitter Ground (Common with Receiver 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	ModSelL	Module Select	
9	ResetL	Module Reset	
10	Vcc Rx	+3.3 V Power supply receiver	2
11	SCL	2-wire serial interface clock	
12	SDA	2-wire serial interface data	
13	GND	Ground	
14	RX3P	Transmitter Inverted Data Input	
15	RX3N	Transmitter Non-Inverted Data Input	
16	GND	Ground	1
17	RX1P	Transmitter Inverted Data Input	

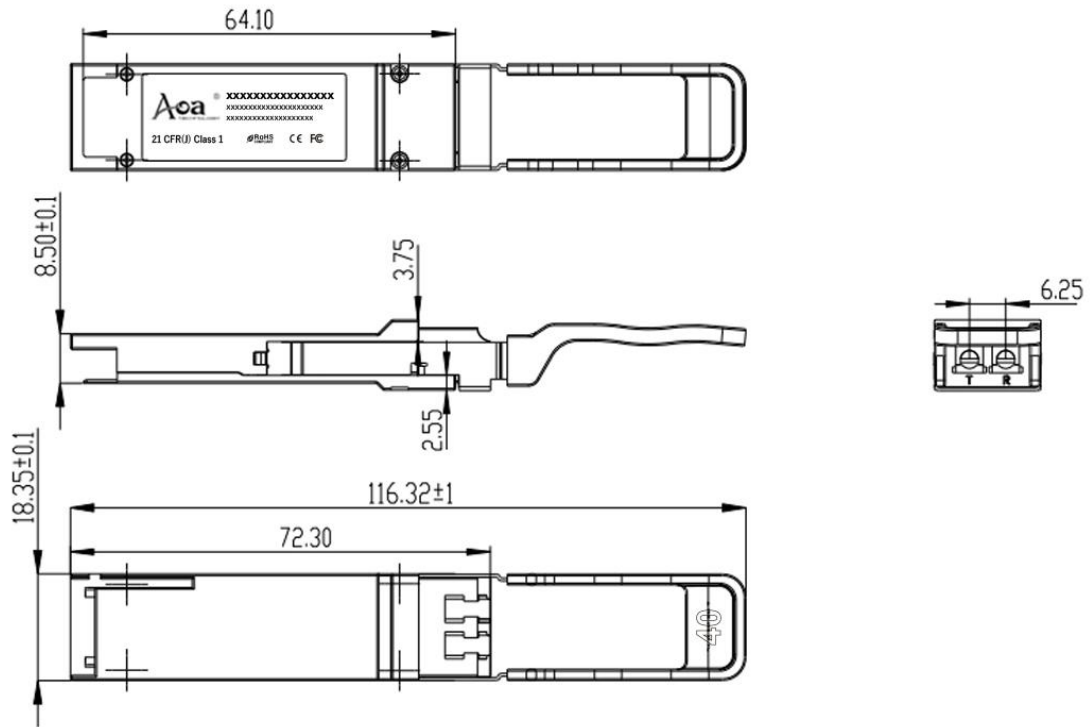
18	RX1N	Transmitter Non-Inverted Data Input	
19	GND	Ground	1
20	GND	Ground	1
21	RX2N	Transmitter Inverted Data Input	
22	RX2P	Transmitter Non-Inverted Data Input	
23	GND	Ground	1
24	RX4N	Transmitter Inverted Data Input	1
25	RX4P	Transmitter Non-Inverted Data Input	
26	GND	Ground	1
27	ModPrsL	Module Present	
28	IntL	Interrupt	
29	Vcc Tx	+3.3 V Power supply transmitter	2
30	Vcc1	+3.3 V Power Supply	2
31	LPMode	Low Power Mode	
32	GND	Ground	1
33	TX3P	Transmitter Inverted Data Input	
34	TX3N	Transmitter Non-Inverted Data Input	
35	GND	Ground	1
36	TX1P	Transmitter Inverted Data Input	
37	TX1N	Transmitter Non-Inverted Data Input	
38	GND	Ground	1

### QSFP Module PIN Definition



Transceiver Block Diagram

## Mechanical Dimensions



## Ordering information

Part. No	Specifications								
	Pack	Rate (Gbps)	Tx (nm)	Po (dBm)	RX	Sen (dBm)	Temp (°C)	Reach (km)	DDM
QSFP28-100G-ZR4	QSFP28	100G	EML LWDM	2.0~6.5	SOA+ PIN	<-28	0~70	80	Y



For further information, please visit our website <https://www.aoatech.com>

All rights are reserved by AOA Technology Co.,Ltd. AOA reserves the right to change, modify, transfer, or otherwise revise this publication without notice, and the most current version of the publication shall be applicable.