Approved Networks
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QSFP28-ZR4-BD95-I

100GBASE, QSFP28, ZR4, SMF TRANSCEIVER

TX: 1295, 1300, 1304, 1309nm, RX: 1273, 1277, 1282, 1286nm, 80km REACH, SIMPLEX LC CONNECTOR

Features

- Compatible with IEEE802.3ba 100GBASE-ER4
- Compliant with SFF-8665 QSFP28 MSA
- Compliant with IEEE 802.3bm CAUI-4 Interface
- 4CH LWDM MUX / DEMUX design
- Data Rate up to 25.78125Gbps per Lane
- Built in Tx CDR and Rx CDR
- Hot Pluggable QSFP28 footprint
- O-Band LWDM 1295.56~1309.14nm EML transmitter
- SOA + PIN receiver
- Simplex LC connector
- 2-wire interface for management and diagnostic monitor compliant with SFF-8636
- Single 3.3V power supply
- Operating Temperature -40~80°C
- Link distance 80km over SM fiber with FEC
- Maximum Power consumption 7W
- RoHS compliant

Applications

- 100GBASE-ZR4 Ethernet
- Infiniband QDR and DDR
- Data Centers Switch Interconnect
- Server and Storage Area Network Interconnect

Absolute Maximum Ratings				
Parameters	**Symbol**	**Min.**	**Max.**	**Unit**
Storage Temperature Range	Ts	°C	-40	85
Relative Humidity	RH	%	0	85
Power Supply Voltage	Vcc	V	-0.3	3.6

Recommended Operating Conditions					
Parameters	**Symbol**	**Min.**	**Typ.**	**Max.**	**Unit**
Case Operating Temperature	Top	-40	-	80	°C
Supply Voltage	Vcc	3.13	3.3	3.47	V
Supply Current	Icc			2100	mA
Electrical Data Rate, per Lane (NRZ)	DRele		25.78125		Gb/s
Optical Data Rate (PAM4)	DRopt		53.125		GBd
Data Rate Accuracy	ΔDR	-100		100	ppm
Bit Error Rate (Pre-FEC)	BERpre			2.4x10-4	
Bit Error Rate (Post-FEC)	BERpost			1x10-12	
Power Consumption (3.3V)	P			7	W
Transceiver Power-on Initialization Time				2000	ms
Control Input Voltage High	Vih	2.0		Vcc	V
Control Input Voltage Low	Vil	0		0.8	V
Fiber Link Distance (SMF)	D			80	km

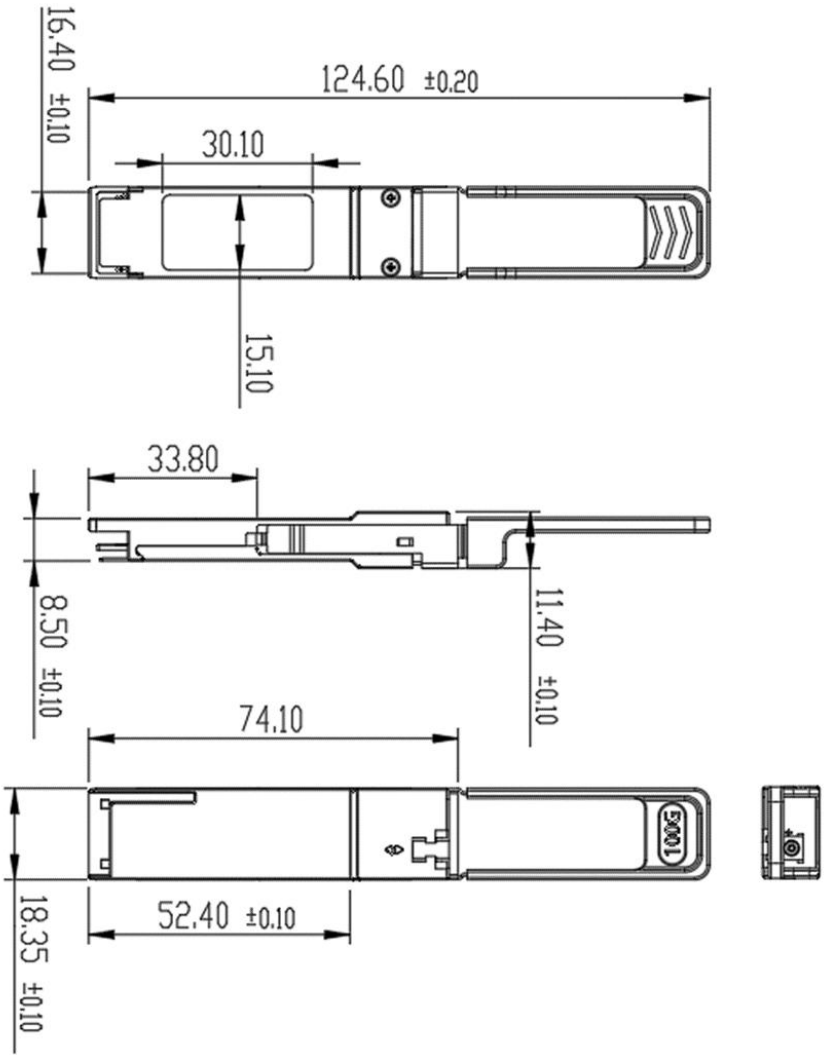
Electro-optical Characteristics						
Parameters	**Symbol**	**Min.**	**Typ.**	**Max.**	**Unit**	**Note**
Transmitter						
Operating Data Rate, per Lane	DR		25.78125		Gb/s	
Total Average Launch Power	TPavg	8		12	dBm	
Average Launch Power, per Lane	Pavg	2		6	dBm	
Optical Modulation Amplitude (OMA),						
per Lane	Poma	3		6.5	dBm	1
Difference in Launch Power between any two Lanes (OMA)	Ptx-diff			3.6	dB	
Transmitter Dispersion Penalty, per Lane	TDP			3	dB	
Launch Power in OMA minus Transmitter and Dispersion Penalty (TDP), per Lane	OMA-TDP	1.3			dB	
Optical Wavelength, each Lane	λL0	1294.53	1295.56	1296.59	nm	
	λL1	1299.02	1300.05	1301.09	nm	
	λL2	1303.54	1304.58	1305.63	nm	
	λL3	1308.09	1309.14	1310.09	nm	
Spectral Width (-20dB)	Δλ			1	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
Optical Extinction Ratio	ER	6			dB	
Optical Eye Mask { X1, X2, X3, Y1, Y2, Y3 }		{ 0.25, 0.4, 0.45, 0.25, 0.28, 0.4 }				2
Average Launch Power OFF, per Lane	Poff			-30	dBm	
Relative Intensity Noise (OMA)	RIN			-130	dB/Hz	
Optical Return Loss Tolerance	ORLT			20	dB	
Transmitter Reflectance	Rtx			-12	dB	
Input Differential Impedance	Zin	90	100	110	Ω	
Differential Data Input Voltage	Vin-pp	180		1000	mVpp	
Receiver						
Operating Data Rate, per Lane	DR		25.78125		Gb/s	
Damage Threshold, per Lane	Dth	6.5			dBm	3

Electro-optical Characteristics						
Parameters	**Symbol**	**Min.**	**Typ.**	**Max.**	**Unit**	**Note**
Average Receive Power, per Lane	Prx-avg	-30		-7	dBm	
Receiver Power (OMA), per Lane	Prx-oma			-7	dBm	
Receiver Sensitivity (OMA), per Lane	SENoma			-28	dBm	4
Stressed Receiver Sensitivity (OMA),						
per Lane	SRSoma			-25.5	dBm	4
Damage Threshold, per Lane	Dth	6.5			dBm	
Optical Wavelength, each Lane	λL0	1272.55	1273.55	1274.54	nm	
	λL1	1276.89	1277.89	1278.89	nm	
	λL2	1281.25	1282.26	1283.27	nm	
	λL3	1285.65	1286.66	1287.68	nm	
Receiver Reflectance	Rrx			-26	dB	
LOS De-Assert	LOSD			-29	dBm	
LOS Assert	LOSA	-40			dBm	
LOS Hysteresis	LOSHY	0.5			dB	
Receiver Electrical 3dB upper Cutoff Frequency, each Lane	Fcut			31	GHz	
Output Differential Impedance	Zout	90	100	110	Ω	
Differential Data Output Voltage	Vout-pp	350		900	mVpp	
Conditions of Stress Receiver Sensitivity Test (Note 5)						
Vertical Eye Closure Penalty, per Lane	VECP		1.5		dB	
Stressed Eye J2 Jitter, per Lane	J2		0.3		UI	
Stressed Eye J9 Jitter, per Lane	J9		0.47		UI	

Notes:

1. Transmitter wavelength and launch power need to meet the OMA minus TDP specs to guarantee link performance.
2. Hit ratio $5x10^{-5}$ hits per sample.
3. 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.
4. Measured with conformance test signal at receiver input @25.78125Gbps, ER=8.2dB, BER= $5x10^{-5}$ with PRBS 2^{31}-1 test pattern.
5. Vertical eye closure penalty and stressed eye jitter are test conditions for measuring stressed receiver sensitivity. They are not characteristics of the receiver.

Mechanical Diagram



Note:
External physical characteristics are subject to variation. This may include, but is not limited to, external case designs, pull tab colors and/or shapes, removal latch styles or colors, and label sizes and placement. These variations do not affect the function or characteristics of the transceivers.

Ordering Information

OEM	Part Number	OEM	Part Number
MSA	AN-Q28-ZR4-BD95-I		

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