## QSFP28-100GB-ZR4-I-C-C

Cisco® Compatible TAA 100GBase-ZR4 QSFP28 Transceiver (SMF, 1295nm to 1309nm, 80km, LC, DOM, -40 to 85C)

Features:

- QSFP28 MSA Compliant
- Supports 103.125Gbps Aggregate Bit Rate
- 4 LAN-WDM Lanes MUX/DEMUX Design
- 4x25G Electrical Interface
- EML Laser and PIN+SOA Receiver
- Single 3.3V Power Supply
- Maximum Power Consumption of 6.5W
- Duplex LC Connector
- Industrial Temperature: -40 to 85 Celsius
- Single-Mode Fiber
- Hot Pluggable
- RoHS Compliant and Lead-Free
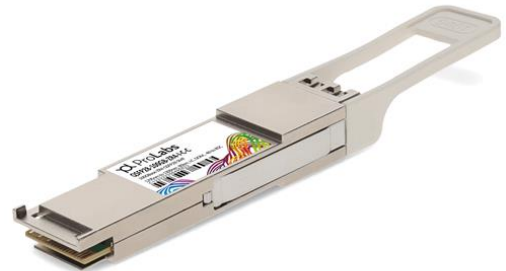
Applications:

- 100GBase Ethernet
- Access and Enterprise

Product Description

This Cisco® QSFP28 transceiver provides 100GBase-ZR4 throughput up to 80km over single-mode fiber (SMF) using a wavelength of 1295nm to 1309nm via an LC connector. It is guaranteed to be 100% compatible with the equivalent Cisco® transceiver. This easy to install, hot swappable transceiver has been programmed, uniquely serialized and data-traffic and application tested to ensure that it will initialize and perform identically. Digital optical monitoring (DOM) support is also present to allow access to real-time operating parameters. This transceiver is Trade Agreements Act (TAA) compliant. We stand behind the quality of our products and proudly offer a limited lifetime warranty.

ProLabs' transceivers are RoHS compliant and lead-free.

TAA refers to the Trade Agreements Act (19 U.S.C. & 2501-2581), which is intended to foster fair and open international trade. TAA requires that the U.S. Government may acquire only "U.S. – made or designated country end products."

Rev. 082923

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit	Notes
Maximum Supply Voltage	Vcc	0	3.6	V	
Storage Temperature	Tstg	-40	85	°C	
Operating Case Temperature	Tc	-40	85	°C	1
Operating Humidity	RH	0	85	%	

Notes:

1. Industrial temperature range.

Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Power Supply Voltage	Vcc	3.13	3.30	3.47	V	
Power Dissipation				6.5	W	
Transmitter						
Data Rate Per Lane			25.78125		Gbps	
Differential Voltage Pk-Pk	Vpp			900	mV	1
Common-Mode Voltage	Vcm	-350		2850	mV	
Transition Time	Tr/Tf	10			ps	2
Differential Termination Resistance Mismatch				10	%	
Eye Width	EW15	0.46			UI	
Eye Height	EH15	95			mV	
Receiver						
Data Rate Per Lane			25.78125		Gbps	
Differential Termination Resistance Mismatch				10	%	1
Differential Output Voltage Swing	VOUT,pp			900	mV	
Common-Mode Noise (RMS)	Vrms			17.5	mV	
Transition Time	Tr/Tf	12			ps	2
Eye Width	EW15	0.57			UI	
Eye Height	EH15	228			mV	

Notes:

1. At 1MHz.
2. 20-80%.

Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
9/125μm G.652 SMF	Lmax			80	km	
Transmitter						
Signaling Speed Per Lane			25.78125±100ppm		Gbps	
Optical Wavelength	L0	1294.53		1296.59	nm	
	L1	1299.02		1301.09	nm	
	L2	1303.54		1305.63	nm	
	L3	1308.09		1310.19	nm	
Side-Mode Suppression Ratio	SMSR	30			dB	
Total Average Launch Power		8		12.5	dBm	
Average Launch Power Per Lane		2		6.5	dBm	
Difference in Launch Power Between Any Two Lanes (Average and OMA)				3	dBm	
Average Launch Power of Off Transmitter Per Lane				-30	dBm	
Extinction Ratio	ER	6			dB	
RIN OMA				-130	dB/Hz	
Optical Return Loss Tolerance	ORLT			20	dB	
Transmitter Reflectance				-12	dB	
Transmitter Eye Mask Definition: (X1, X2, X3, Y1, Y2, Y3)		(0.25, 0.4, 0.45, 0.25, 0.28, 0.4)				1
Mask Margin		5			%	
Receiver						
Signaling Speed Per Lane			25.78125±100ppm		Gbps	
Receive Wavelengths	L0	1294.53		1296.59	nm	
	L1	1299.02		1301.09	nm	
	L2	1303.54		1305.63	nm	
	L3	1308.09		1310.19	nm	
Average Receiver Power Per Lane		-28		-7	dBm	
Receiver Power Per Lane (OMA)				-7	dBm	
Receiver Reflectance				-26	dB	
Receiver Sensitivity Average Per Lane				-28	dBm	1
Receiver 3dB Electrical Upper Cutoff Frequency Per Lane				31	GHz	
Damage Threshold Per Lane		6.5			dBm	
LOS De-Assert	LOSD			-29	dBm	
LOS Assert	LOSA	-40			dBm	
LOS Hysteresis	LOSH	0.5			dB	

Notes:
1. Sensitivity is specified at BER@5E^{-5} with FEC.

Pin Descriptions

Pin	Symbol	Name/Description	Notes
1	GND	Module Ground.	1
2	Tx2-	Transmitter Inverted Data Input.	
3	Tx2+	Transmitter Non-Inverted Data Input.	
4	GND	Module Ground.	1
5	Tx4-	Transmitter Inverted Data Input.	
6	Tx4+	Transmitter Non-Inverted Data Input.	
7	GND	Module Ground.	1
8	ModSelL	Module Select.	
9	ResetL	Module Reset.	
10	VccRx	+3.3V Receiver Power Supply.	
11	SCL	2-Wire Serial Interface Clock.	
12	SDA	2-Wire Serial Interface Data.	
13	GND	Module Ground.	1
14	Rx3+	Receiver Non-Inverted Data Output.	
15	Rx3-	Receiver Inverted Data Output.	
16	GND	Module Ground.	1
17	Rx1+	Receiver Non-Inverted Data Output.	
18	Rx1-	Receiver Inverted Data Output.	
19	GND	Module Ground.	1
20	GND	Module Ground.	1
21	Rx2-	Receiver Inverted Data Output.	
22	Rx2+	Receiver Non-Inverted Data Output.	
23	GND	Module Ground.	1
24	Rx4-	Receiver Non-Inverted Data Output.	
25	Rx4+	Receiver Inverted Data Output.	
26	GND	Module Ground.	1
27	ModPrsL	Module Present.	
28	IntL	Interrupt.	
29	VccTx	+3.3V Transmitter Power Supply.	
30	Vcc1	+3.3V Power Supply.	
31	LPMode	Low-Power Mode.	
32	GND	Module Ground.	1
33	Tx3+	Transmitter Non-Inverted Data Input.	
34	Tx3-	Transmitter Inverted Data Input.	
35	GND	Module Ground.	1

36	Tx1+	Transmitter Non-Inverted Data Input.	
37	Tx1-	Transmitter Inverted Data Input.	
38	GND	Module Ground.	1

Notes:

1. Circuit ground is internally isolated from the chassis ground.

Electrical Pad Layout

Top Side	Bottom Side
38 GND	GND 1
37 TX1n	TX2n 2
36 TX1p	TX2p 3
35 GND	GND 4
34 TX3n	TX4n 5
33 TX3p	TX4p 6
32 GND	GND 7
31 LPMode	ModSelL 8
30 Vcc1	ResetL 9
29 VccTx	VccRx 10
28 IntL	SCL 11
27 ModPrsL	SDA 12
26 GND	GND 13
25 RX4p	RX3p 14
24 RX4n	RX3n 15
23 GND	GND 16
22 RX2p	RX1p 17
21 RX2n	RX1n 18
20 GND	GND 19

Card Edge

Top Side
Viewed from Top
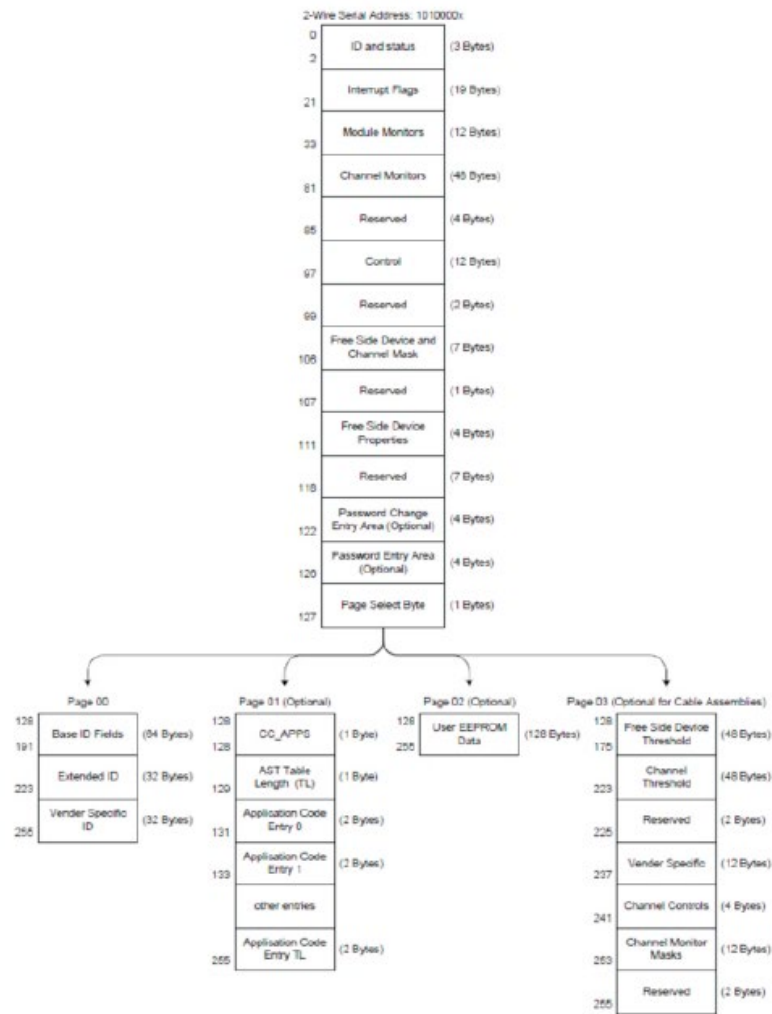
Bottom Side
Viewed from Bottom
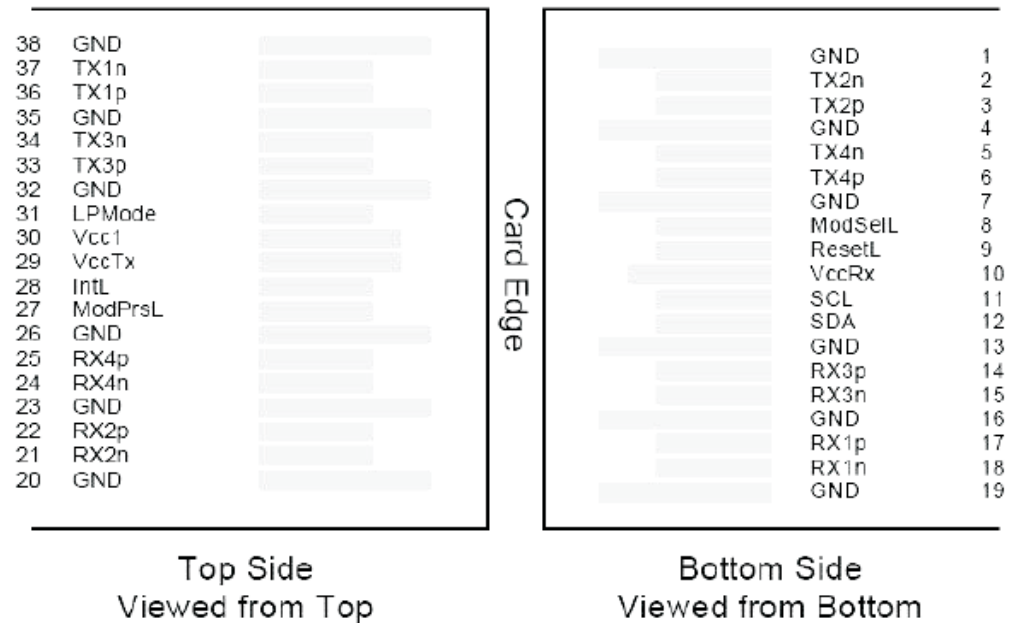
Pin-Out of Connector Block on the Host Board

Transceiver Block Diagram
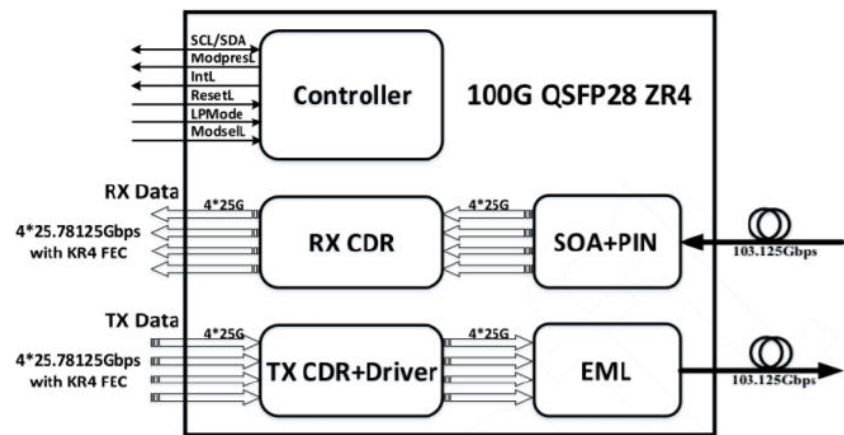
EEPROM Information

EEPROM memory map-specific data field description is as below:

Digital Diagnostic Monitoring Interface

Parameter	Related Bytes (A0[00] Memory)	Accuracy	Notes
Temperature	22 to 23	±3ºC	1, 2
Voltage	26 to 27	<3%	2
Bias Current	42 to 49	<10%	2
Tx Power	50 to 57	<3dB	2
Rx Power	34 to 41	<3dB	2

Notes:

1. Actual temperature test point is fixed on the module case around the laser.
2. Full operating temperature range.
3. Five transceiver parameter values are monitored. The table above defines the Monitory parameter's accuracy.

Mechanical Specifications
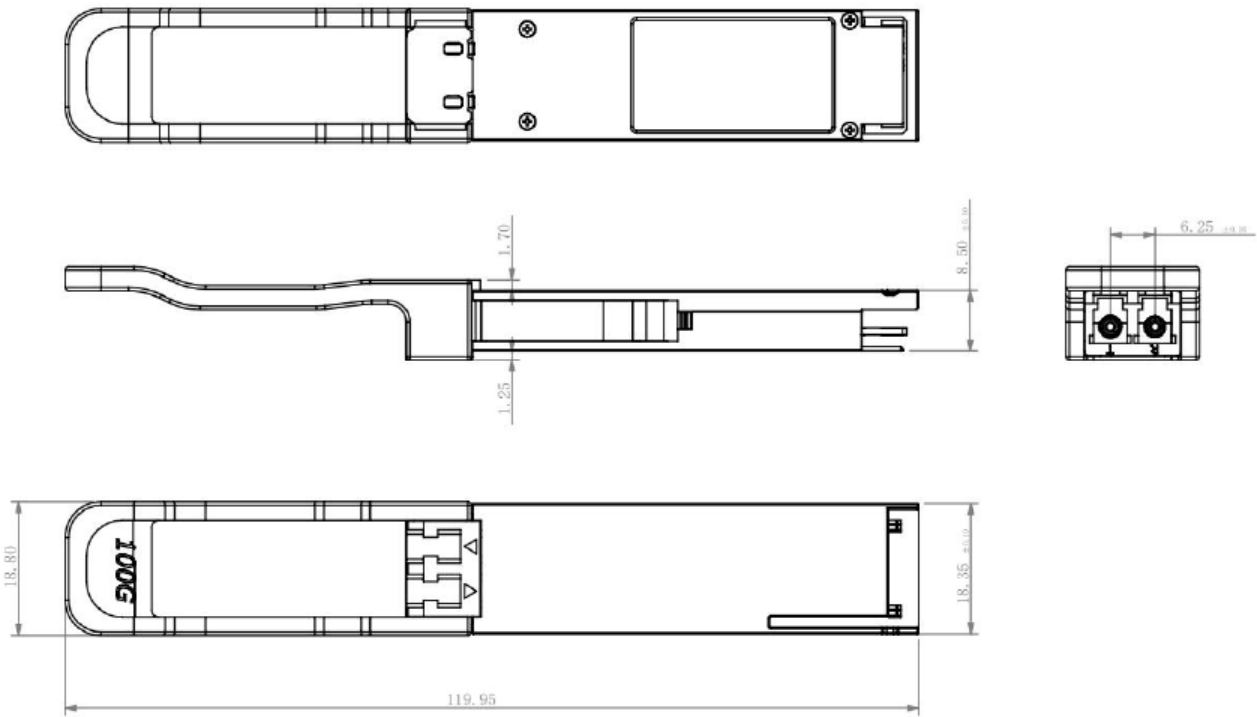
About ProLabs

Our experience comes as standard; for over 15 years ProLabs has delivered optical connectivity solutions that give our customers freedom and choice through our ability to provide seamless interoperability. At the heart of our company is the ability to provide state-of-the-art optical transport and connectivity solutions that are compatible with over 90 optical switching and transport platforms.

Complete Portfolio of Network Solutions

ProLabs is focused on innovations in optical transport and connectivity. The combination of our knowledge of optics and networking equipment enables ProLabs to be your single source for optical transport and connectivity solutions from 100Mb to 400G while providing innovative solutions that increase network efficiency. We provide the optical connectivity expertise that is compatible with and enhances your switching and transport equipment.

Trusted Partner

Customer service is our number one value. ProLabs has invested in people, labs and manufacturing capacity to ensure that you get immediate answers to your questions and compatible product when needed. With Engineering and Manufacturing offices in the U.K. and U.S. augmented by field offices throughout the U.S., U.K. and Asia, ProLabs is able to be our customers best advocate 24 hours a day.

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