QSFP28-100GB-ZR4-LP-C-C

Cisco® Compatible 100GBase-ZR4 QSFP28 Transceiver Low Power (SMF, 1295nm to 1309nm, 80km, LC, DOM)

Features:

- Supports 103Gbps
- QSFP28 MSA Compliant
- Single 3.3V power supply
- LAN WDM EML laser and SOA+PIN Receiver
- Maximum power consumption 5W
- Commercial Temperature 0 to 70 Celsius
- Class 1 Laser
- Duplex LC receptacle
- Hot Pluggable
- Two Wire Serial Interface Digital Diagnostic Monitoring
- RoHS Compliant and Lead Free

Applications:

- 100GBase Ethernet

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."

TAA COMPLIANT

Rev. 012524

Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Maximum Supply Voltage	Vcc	-0.5		3.6	V	
Data Input Voltage Differential	VIN			1	V	
Control Input Voltage	V_I	-0.3		Vcc+0.5	V	
Control Output Current	I_O	-20		20	mA	
Storage Temperature	Tstg	-40		+85	°C	
Operating Case Temperature	Tc	0		70	°C	
Relative Humidity (Non-Condensing)	RH	5		95	%	
Aggregate Bit Rate	ABR		103.125		Gbps	
Data Rate Per Lane	BR		25.78		Gbps	
Operating Distance		2		80,000	m	1

Notes:

1. 40km without FEC and 80km with FEC.

Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Power Supply Voltage	Vcc	3.135	3.3	3.465	V	
Maximum Power Dissipation	P_D			5	W	
Maximum Power Dissipation (Low-Power Mode)	P_{DLP}			1.5	W	
Instantaneous Peak Current at Hot Plug	Icc_IP			2000	mA	
Sustained Peak Current at Hot Plug	Icc_SP			1650	mA	
Control Input Voltage High	V_I	V_{CC}*0.7		V_{CC}+0.3	V	
Control Input Voltage Low	V_I	-0.3		V_{CC}*0.3	V	
2-Wire Serial Interface Clock Rate				400	kHz	
Module Power Supply Noise Tolerance 10Hz-10MHz (Peak-to-Peak)				66	mVp-p	
Rx Differential Data Output Load			100		Ω	
Transmitter (Module Input)						
Differential Data Output Amplitude	VOUT,pp			900	mVp-p	
Differential Termination Mismatch				10	%	
Output Rise/Fall Time (20-80%)	Tr/Tf	12			ps	
ModPrsL and IntL	VOL	0		0.4	V	I_{OL}=4mA
	VOH	Vcc-0.5		Vcc+0.3	V	I_{OL}=-4mA
Receiver (Module Output)						
Differential Data Input Amplitude	VIN,pp	95		900	mVp-p	
Differential Termination Mismatch				10	%	
LPMode, Reset, and ModSelL	VIL	-0.3		0.8	V	
	VIH	2		V_{CC}+0.3	V	

Notes:

1. High-Speed Signal: compliant to IEEE802.3 CAUI-4 C2M.
2. Low-Speed Signal: compliant to SFF-8679.

Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter						
Wavelength L0	λC0	1294.53	1295.56	1296.59	nm	
Wavelength L1	λC1	1299.02	1300.05	1301.09	nm	
Wavelength L2	λC2	1303.54	1304.58	1305.63	nm	
Wavelength L3	λC3	1308.09	1309.14	1310.19	nm	
Side-Mode Suppression Ratio	SMSR	30			dB	
Total Average Optical Launch Power	POUT			12.5	dBm	
Average Launch Power Tx Off (Per Lane)	Poff			-30	dBm	
Average Optical Launch Power (Per Lane)	POUTL	2		6.5	dBm	
Extinction Ratio	ER	6			dB	
Spectral Width	Δλ			1	nm	
Optical Modulation Amplitude (Per Lane)	OMA	2.5		7	dBm	
Transmitter and Dispersion Penalty (Per Lane)	TDP			2.2	dB	
Launch Power in OMA Minus TDP (Per Lane)	OMA-TDP	1.5			dBm	
Difference in Launch Power Between Any Two Lanes (OMA)	DT_OMA			4	dB	
Optical Return Loss Tolerance	ORLT			20	dB	
$RIN_{20}OMA$	RIN			-130	dB/Hz	
Transmitter Reflectance	RL			-26	dB	
Transmitter Eye Mask Definition	IEEE 802.3bs-2010 (0.25, 0.4, 0.45, 0.25, 0.28, 0.4)					
Receiver						
Wavelength L0	λC0	1294.53	1295.56	1296.59	nm	
Wavelength L1	λC1	1299.02	1300.05	1301.09	nm	
Wavelength L2	λC2	1303.54	1304.58	1305.63	nm	
Wavelength L3	λC3	1308.09	1309.14	1310.19	nm	
Receiver Sensitivity (OMA) Per Lane				-27.5	dBm	1
Stressed Receiver Sensitivity in OMA (Per Lane)				TBD	dBm	
Stressed Receiver Sensitivity Test Conditions						
Stressed Eye J2 Jitter (Per Lane)			0.33		UI	
Stressed Eye J9 Jitter (Per Lane)			0.48		UI	
Vertical Eye Closure Penalty			2		dB	
Damage Threshold for Receiver	THd	TBD			dBm	
Average Receive Power (Per Lane)		-28		-5	dBm	1
Receive Power in OMA (Per Lane) Overload	OMA			-4.5	dBm	
Receiver Reflectance	RL			-26	dB	

LOS Assert	LOSA	-40			dBm	
LOS De-Assert	LOSD			-30	dBm	
LOS Hysteresis	LOSH	0.5			dB	

Notes:

1. Measured with conformance test signal at TP3 for the BER=$5x10^{-5}$.

Pin Descriptions

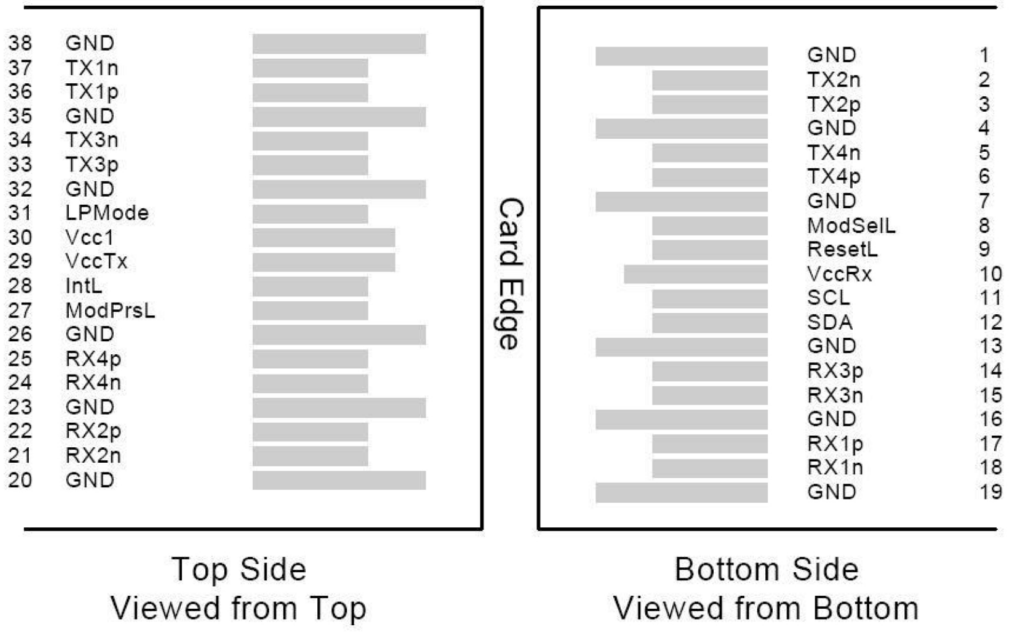
Pin	Logic	Symbol	Name/Descriptions	Ref.
1		GND	Module Ground.	1
2	CML-I	Tx2-	Transmitter Inverted Data Input.	
3	CML-I	Tx2+	Transmitter Non-Inverted Data Input.	
4		GND	Module Ground.	1
5	CML-I	Tx4-	Transmitter Inverted Data Input.	
6	CML-I	Tx4+	Transmitter Non-Inverted Data Input.	
7		GND	Module Ground.	1
8	LVTTL-I	MODSEIL	Module Select.	
9	LVTTL-I	ResetL	Module Reset.	
10		VccRx	+3.3v Receiver Power Supply.	2
11	LVCMOS-I	SCL	2-Wire Serial Interface Clock.	
12	LVCMOS-I/O	SDA	2-Wire Serial Interface Data.	
13		GND	Module Ground.	1
14	CML-O	Rx3+	Receiver Non-Inverted Data Output.	
15	CML-O	Rx3-	Receiver Inverted Data Output.	
16		GND	Module Ground.	1
17	CML-O	Rx1+	Receiver Non-Inverted Data Output.	
18	CML-O	Rx1-	Receiver Inverted Data Output.	
19		GND	Module Ground.	1
20		GND	Module Ground.	1
21	CML-O	Rx2-	Receiver Inverted Data Output.	
22	CML-O	Rx2+	Receiver Non-Inverted Data Output.	
23		GND	Module Ground.	1
24	CML-O	Rx4-	Receiver Inverted Data Output.	
25	CML-O	Rx4+	Receiver Non-Inverted Data Output.	
26		GND	Module Ground.	1
27	LVTTL-O	ModPrsL	Module Present. Internally pulled down to GND.	
28	LVTTL-O	IntL	Interrupt output. Should be pulled up on the host board.	
29		VccTx	+3.3v Transmitter Power Supply.	2
30		Vcc1	+3.3v Power Supply.	2

31	LVTTL-I	LPMode	Low-Power Mode.	
32		GND	Module Ground.	1
33	CML-I	Tx3+	Transmitter Non-Inverted Data Input.	
34	CML-I	Tx3-	Transmitter Inverted Data Input.	
35		GND	Module Ground.	1
36	CML-I	Tx1+	Transmitter Non-Inverted Data Input.	
37	CML-I	Tx1-	Transmitter Inverted Data Input.	
38		GND	Module Ground.	1

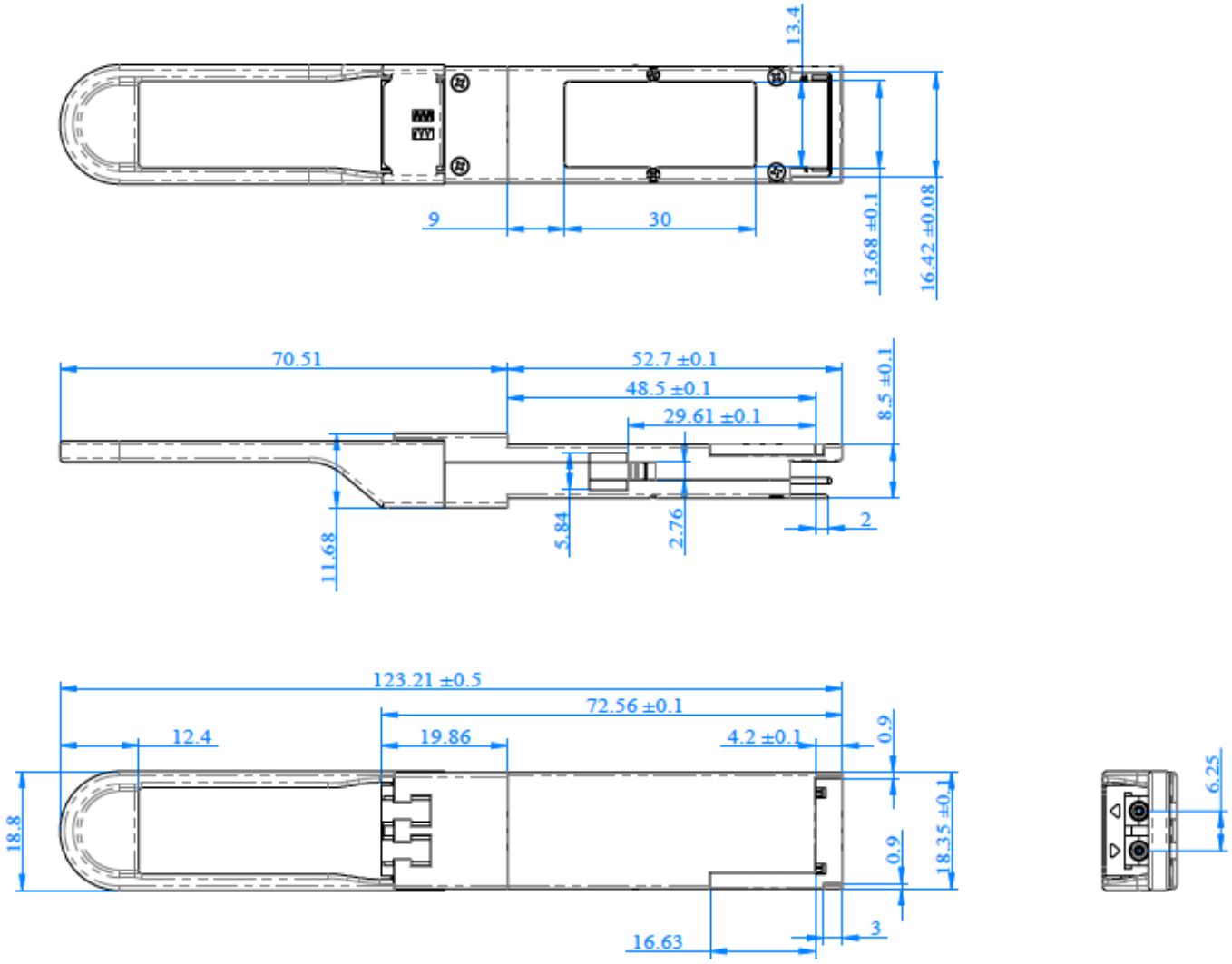
Notes:

1. GND is the symbol for signal and supply (power) common for the QSFP28 module. All are common within the QSFP28 module and all module voltages are referenced to this potential unless otherwise noted. Connect these directly to the host board signal-common ground plane. Open collector. Should be pulled up with 4.7kΩ-10kΩ on the host board to a voltage between 3.15V and 3.6V.
2. VccRx, Vcc1, and VccTx are the receiver and transmitter power supplies and shall be applied concurrently. VccRx, Vcc1, and VccTx may be internally connected within the QSFP28 module in any combination. The connector pins are each rated for a maximum current of 1000mA.

Electrical Pin-Out Details



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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