MMA1L10-CR-80-C

Mellanox® MMA1L10-CR-80 Compatible TAA 100GBase-ZR4 QSFP28 Transceiver (SMF, 1295nm to 1309nm, 80km, LC, DOM)

Features:

- SFF-8665 Compliance
- Duplex LC Connector
- Single-mode Fiber
- Commercial Temperature 0 to 70 Celsius
- Hot Pluggable
- Metal with Lower EMI
- Excellent ESD Protection
- RoHS Compliant and Lead Free

Applications:

- 100GBase Ethernet
- Access and Enterprise

Product Description

This Mellanox® MMA1L10-CR-80 compatible 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 Mellanox® 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's 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. 111921

Regulatory Compliance

- ESD to the Electrical PINs: compatible with MIL-STD-883E Method 3015.4
- ESD to the LC Receptacle: compatible with IEC 61000-4-3
- EMI/EMC compatible with FCC Part 15 Subpart B Rules, EN55022:2010
- Laser Eye Safety compatible with FDA 21CFR, EN60950-1& EN (IEC) 60825-1,2
- RoHS compliant with EU RoHS 2.0 directive 2015/863/EU

Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit
Maximum Supply Voltage	Vcc	-0.5		3.6	V
Storage Temperature	TS	-40		+85	°C
Operating Case Temperature	Tc	0		70	°C
Operating Relative Humidity	RH	5		85	%

Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Power Supply Voltage	Vcc	3.135	3.3	3.465	V	
Power Dissipation	PD			5.5	W	
Transmitter						
Differential data input swing per lane				900	Mvp-p	
Input Impedance (Differential)	Zin			10	%	
Stressed Input Parameters						
Eye width		0.46			UI	
Applied pk-pk sinusoidal jitter		IEEE 802.3bm Table 88-13				
Eye height		95			mv	
DC common mode voltage		-350		2850	mv	
Receiver						
Differential output amplitude		200		900	Mvp-p	
Output Impedance (Differential)	Zout			10	%	
Eye width		0.57			UI	
Eye height differential		228			mv	
Vertical eye closure				5.5	db	

Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter						
Signaling Speed per Lane	BRave		25.78		Gbps	
Data Rate Variation		-100		+100	ppm	
Lane_0 Center Wavelength	λC0	1294.53	1295.56	1296.59	nm	
Lane_1 Center Wavelength	λC1	1299.02	1300.05	1301.09	nm	
Lane_2 Center Wavelength	λC2	1303.54	1304.58	1305.63	nm	
Lane_3 Center Wavelength	λC3	1308.09	1309.14	1310.19	nm	
Spectral width (-20dB)	Δλ			1	nm	
Total Average Output Power	Po			13	dBm	
Average Launch Power Per Lane	P_{each}	3		7	dBm	1
Optical Modulation Amplitude Per Lane	POMA	3.7		7.8	dBm	
Average Launch Power of OFF Transmitter Per Lane	Poff			-30	dBm	
Side-mode Suppression Ratio	SMSR	30			dB	
Transmitter Dispersion Penalty, each lane	TDP			1	dB	2
Difference in Launch Power Between Any Two Lanes				3.6	dB	
Optical Return Loss Tolerance				20	dB	
Transmitter Reflectance				-26		
Extinction Ratio	ER	6	8		dB	
Transmitter Eye Mask Definition {X1, X2, X3, Y1, Y2, Y3}	{0.25, 0.4, 0.45, 0.25, 0.28, 0.4}					
Receiver						
Signaling Speed per Lane	BR_{AVE}		25.78		Gbps	
Data Rate Variation		-100		+100	ppm	
Damage Threshold Per Lane (min)	Pdamage			5.5	dBm	3
Lane_0 Center Wavelength	λC0	1294.53	1295.56	1296.59	nm	
Lane_1 Center Wavelength	λC1	1299.02	1300.05	1301.09	nm	
Lane_2 Center Wavelength	λC2	1303.54	1304.58	1305.63	nm	
Lane_3 Center Wavelength	λC3	1308.09	1309.14	1310.19	nm	
Average Receive Power Per Lane	Rx_pow	-31		4.5	dBm	
Receiver Overload Per Lane	Psat	4.5			dBm	
Receive Sensitivity Average Per Lane	Rx_sens			-29	dBm	2
Stressed Sensitivity Per Lane	SRS			-25.1	GHz	2
Receiver Reflectance	ORL			-26	dBm	
LOS Assert	LOSA	-42			dBm	
LOS De-Assert	LOSD			-31.5	dBm	
LOS Hysteresis		0.5			dB	

Notes:

1. Average launch power, each lane (min) is informative and not the principal indicator of signal strength. A transmitter with launch power below this value cannot be compliant; however, a value above this does not ensure compliance.
2. Measured with conformance test signal for BER = 5E-5@25.78Gbps PRBS^{31}-1.
3. The receiver shall be able to tolerate, without damage, continuous exposure to an optical input signal having this average power level.

Pin Descriptions

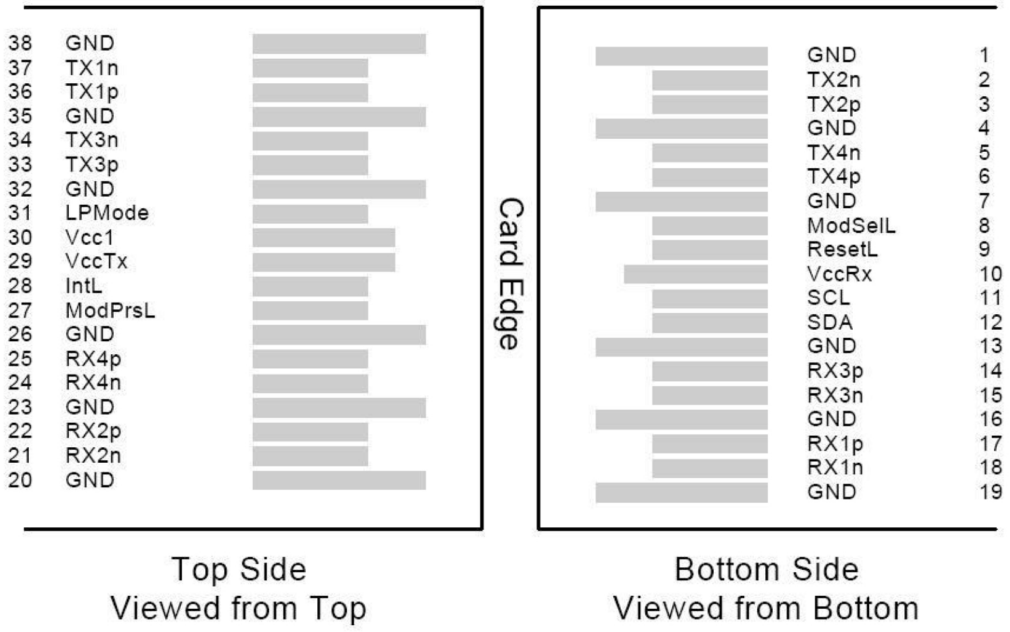
Pin	Logic	Symbol	Name/Descriptions	Ref.
1		GND	Module Ground	1
2	CML-I	Tx2-	Transmitter inverted data input	
3	CML-I	Tx2+	Transmitter non-inverted data input	
4		GND	Module Ground	1
5	CML-I	Tx4-	Transmitter inverted data input	
6	CML-I	Tx4+	Transmitter non-inverted data input	
7		GND	Module Ground	1
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, internal pulled down to GND	
28	LVTTL-O	IntL	Interrupt output, should be pulled up on 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

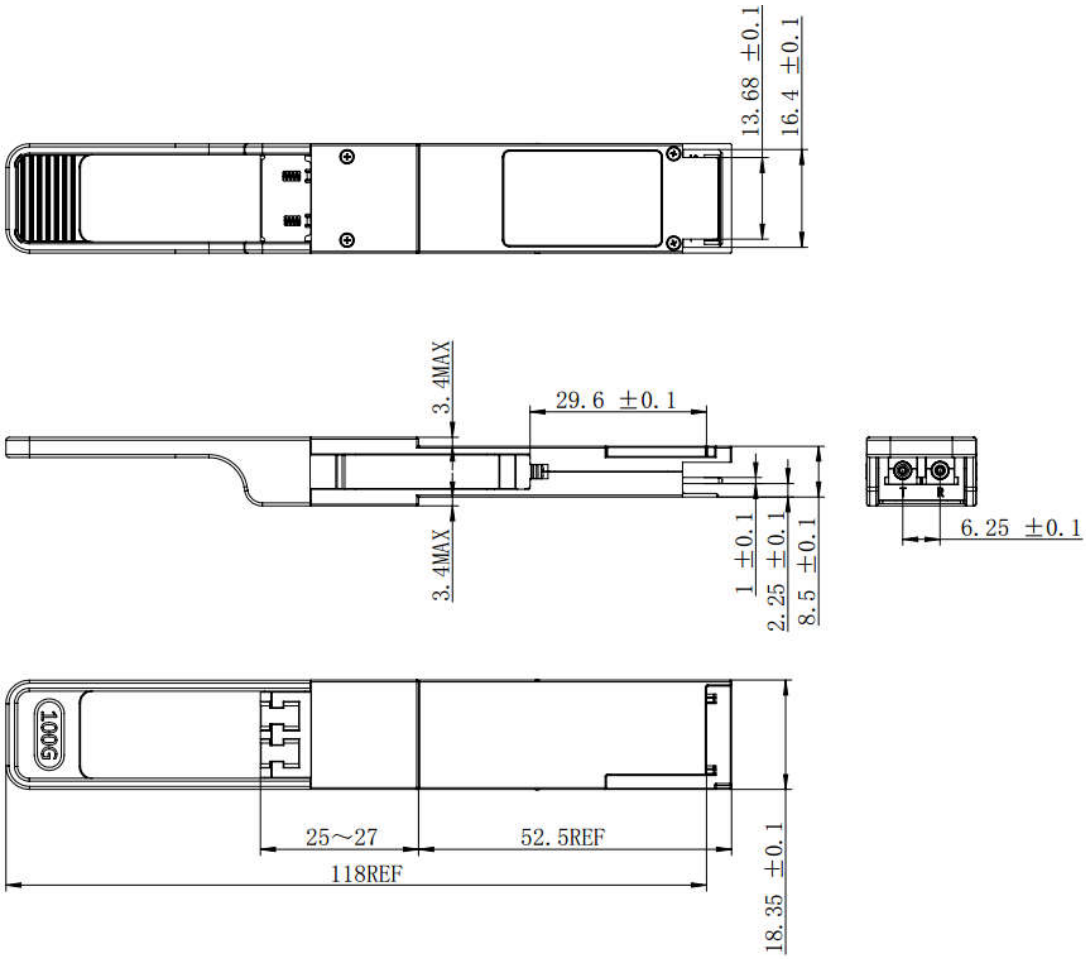
Notes:

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 4.7k-10k ohms on host board to a voltage between 3.15V and 3.6V.
2. Vcc Rx, Vcc1 and Vcc Tx are the receiver and transmitter power supplies and shall be applied concurrently. Vcc Rx Vcc1 and Vcc Tx 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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