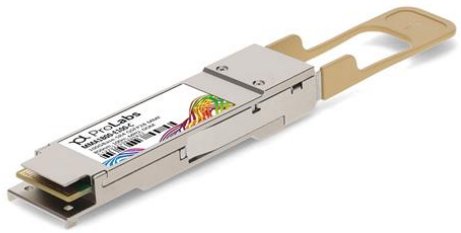
MMA1B00-E100-C

Mellanox® MMA1B00-E100 Compatible TAA 100GBase-SR4 QSFP28 Transceiver Infiniband EDR (MMF, 850nm, 100m, MPO, DOM)

Features:

- SFF-8665 Compliance
- MPO Connector
- Transmitter: 4x25Gb/s 850nm VCSEL
- Receiver: 4x25Gb/s PIN
- Commercial Temperature 0 to 70 Celsius
- Multi-mode Fiber
- Hot Pluggable
- Excellent ESD Protection
- Metal with Lower EMI
- RoHS Compliant and Lead Free



Applications:

- 100GBase Ethernet
- Infiniband EDR
- Access and Enterprise

Product Description

This Mellanox® MMA1B00-E100 compatible QSFP28 transceiver provides 100GBase-SR4 throughput up to 100m over OM4 multi-mode fiber (MMF) using a wavelength of 850nm via an MPO 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' 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. 022423

Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Supply Voltage	Vcc	-0.5		3.6	V	
Storage Temperature	Ts	-40		85	°C	
Case Operating Temperature	Tc	0		70	°C	
Relative Humidity	RH	0		85	%	
Rx Damage Threshold per Lane	P_{Rdmg}	3.4			dBm	
Data Rate	DR		103.125		Gb/s	
Bit Error Ratio (pre-FEC)	BER			$5x10^{-5}$		1
Transmission Distance	TD			70	m	2 OM3 MMF
Transmission Distance	TD			100	m	2 OM4 MMF

Notes:

1. Tested with a $2^{31} – 1$ PRBS.
2. Requires FEC on the host to support maximum distance, per 100GBASE-SR4.

Electrical Characteristics (Top=0~70℃, Vcc=3.14~3.47V)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Supply Voltage	V_{cc}	3.14	3.3	3.47	V	
Supply Current	Icc			1.06	A	
Power Dissipation	P_D			3.5	W	
Transmitter						
Signaling rate per lane	DRPL	25.78125 ± 100 ppm			Gb/s	
Differential input return loss (min)	RLd(f)	9.5–0.37f, 0.01≤f<8			dB	
	RLd(f)	4.75–7.4log10(f/14), 8 ≤f<19			dB	
Differential to common mode input return loss (min)	RLdc(f)	22-20(f/25.78), 0.01≤f<12.89			dB	
	RLdc(f)	15-6(f/25.78), 12.89≤f<19			dB	
Differential termination mismatch	Tm			10	%	
Eye width	Ew			0.46	UI	
Applied pk-pk sinusoidal jitter	Ppj	Per IEEE 802.3bm				
Eye height	Eh		95		mV	
DC common mode voltage	DCv	-350		2850	mV	
Receiver						
Signaling rate per lane	DRPL	25.78125 ± 100 ppm			Gb/s	
Differential data output swing	Vout（pp）	400		800	mV	
Eye width	Ew	0.57			UI	
Vertical eye closure	Vec			5.5	dB	
Differential output return loss (min)	RLd(f)	9.5–0.37f, 0.01≤f<8			dB	
	RLd(f)	4.75–7.4log10(f/14), 8 ≤f<19			dB	
Common to differential mode conversion return loss (min)	RLdc(f)	22-20(f/25.78), 0.01≤f<12.89			dB	
	RLdc(f)	15-6(f/25.78), 12.89≤f<19			dB	
Differential termination mismatch	Tm			10	%	
Transition time, 20% to 80%	Tr/Tf	12			ps	1

Notes:

1. 20%~80%

Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter						
Signaling rate, each lane	DRpl	25.78125 ±100 ppm			Gb/s	1
Center Wavelength	λ	840	850	860	nm	
RMS Spectral Width	RSW		0.6		nm	
Average launch power, each lane	P_{avg}	-8.4		2.4	dBm	2
Optical modulation amplitude, each lane (OMA)	OMA	-6.4		3	dBm	
Extinction ratio	ER	2			dB	
Average Launch Power of OFF Transmitter, per Lane	R_{IN}			-30	dBm	
Encircled Flux	FLX	>86% at 19 um <30% at 4.5 um			dBm	
Optical return loss tolerance				12	dB	
Transmitter eye mask {X1, X2, X3, Y1, Y2, Y3}		{0.3,0.38,0.45,0.35,0.41,0.5}				2
Receiver						
Receive Rate for Each Lane	DRpl	25.78125 ±100 ppm			Gb/s	3
Four Lane Wavelength Range	λ	840		860	nm	
Overload Input Optical Power	P_{max}	3.4			dBm	
Average Receive Power for Each Lane	P_{in}	-10.3		2.4	dBm	4
Stressed Receiver Sensitivity (OMA) per lane	P_{sens_srs}			-5.2	dBm	
Receiver Reflectance	REFLr			-12	dB	
Receiver Eye Mask Definition {X1, X2, X3, Y1, Y2,Y3}		{0.28,0.5,0.5,0.33,0.33,0.4}				5
Los De-Assert	Pd			-13	dBm	
Los Assert	Pa	-30			dBm	
Loss Hysteresis	Pd-Pa	0.5			dBm	

Notes:

1. Transmitter consists of 4 lasers operating at a maximum speed of 25.78125Gb/s ±100ppm each.
2. Hit Ratio 1.5 x 10^{-3} hits/sample.
3. Receiver consists of 4 photodetectors operating at a maximum speed of 25.78125Gb/s ±100ppm each.
4. Minimum value is informative only and not the principal indicator of signal strength.
5. Hit Ratio 5 x 10^{-5} hits/sample.

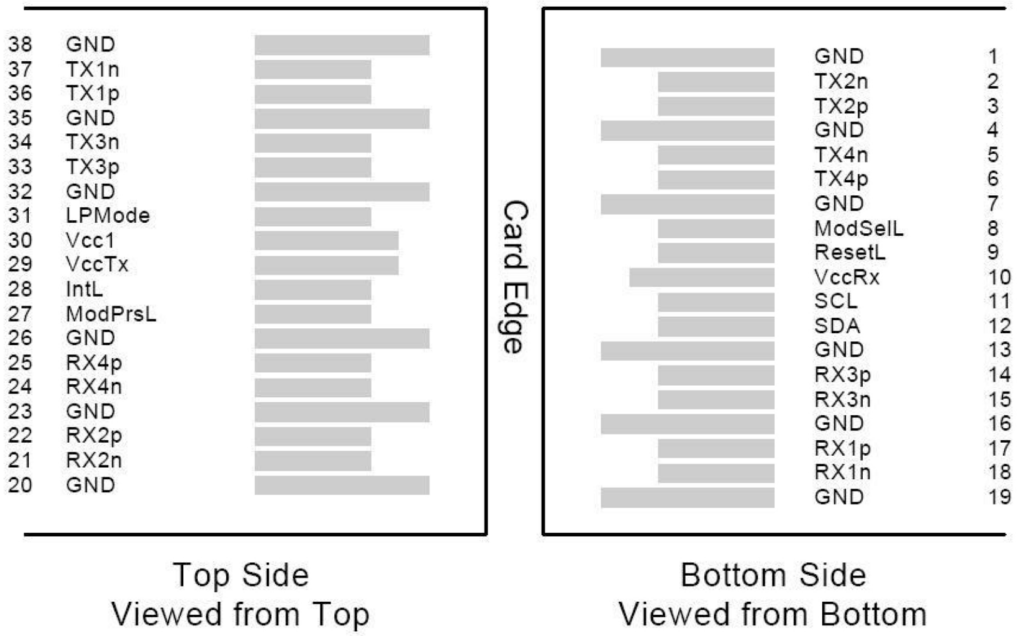
Pin Descriptions

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	2
9	LVTTL-I	ResetL	Module Reset	2
10		VCCRx	+3.3v Receiver Power Supply	
11	LVCMOS-I	SCL	2-wire Serial interface clock	2
12	LVCMOS-I/O	SDA	2-wire Serial interface data	2
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	2
29		VCCTx	+3.3v Transmitter Power Supply	
30		VCC1	+3.3v Power Supply	
31	LVTTL-I	LPMode	Low Power Mode	2
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

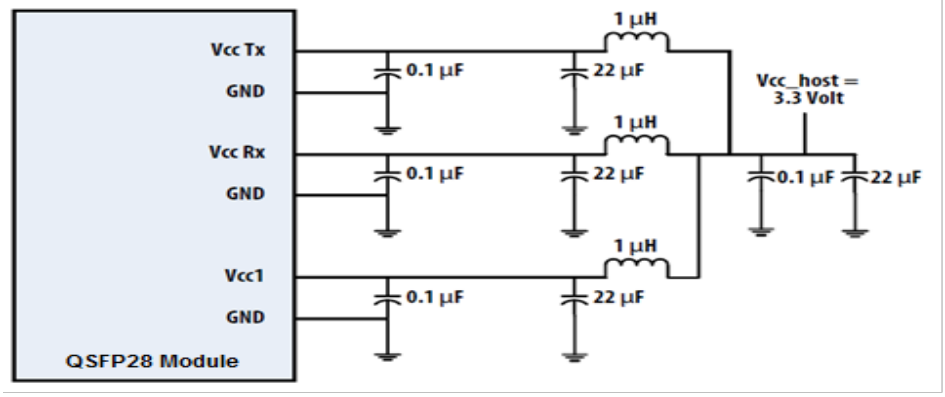
Notes:

1. Module circuit ground is isolated from module chassis ground with in the module.
2. Open collector; should be pulled up with 4.7k-10k ohms on host board to a voltage between 3.15V and 3.6V.

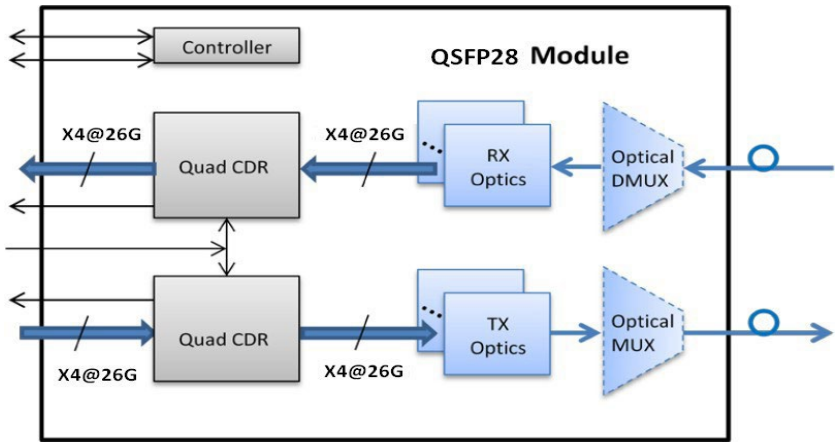
Electrical Pin-out Details



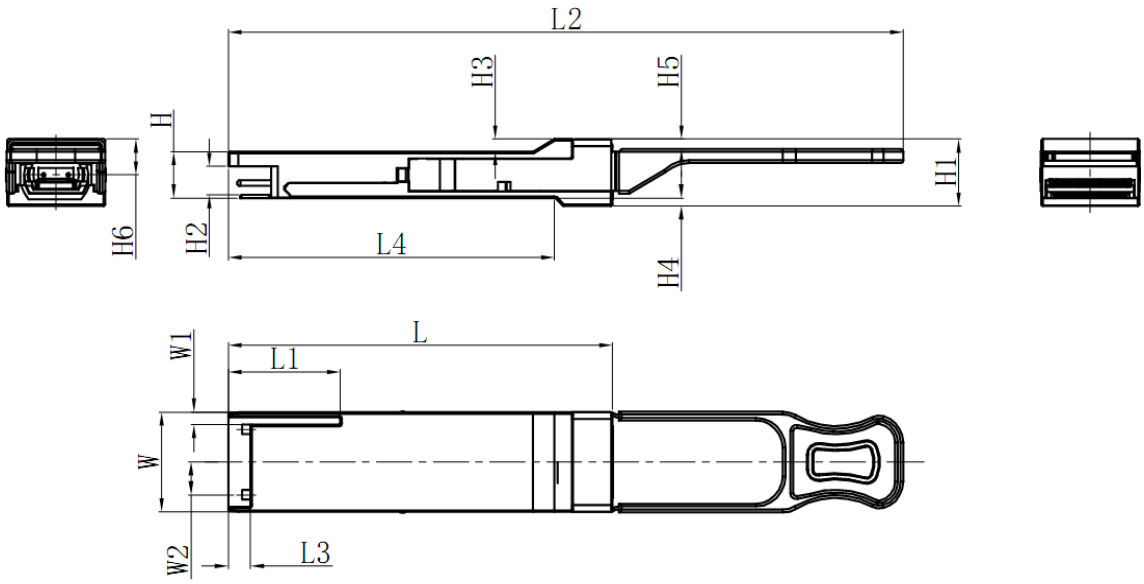
Recommended Power Supply Filter



Functional Diagram



Mechanical Specifications



Unit: mm

	L	L1	L2	L3	L4	W	W1	W2	H	H1	H2	H3	H4	H5	H6
Max	72.2	-	128	4.35	61.4	18.45	-	6.2	8.6	12.4	5.35	2.5	1.6	2.0	-
Type	72.0	-	-	4.20	61.2	18.35	-	-	8.5	12.2	5.2	2.3	1.5	1.8	6.55
Min	68.8	16.5	124	4.05	61.0	18.25	2.2	5.8	8.4	12.0	5.05	2.1	1.3	1.6	-

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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