



MMA1B00-E100-SKY

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

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 can operate at temperatures between 0 and 70C. Our transceiver is built to meet or exceed OEM specifications and is guaranteed to be 100% compatible with Mellanox®. It has been programmed, uniquely serialized, and tested for data-traffic and application to ensure that it will initialize and perform identically. All of our transceivers comply with Multi-Source Agreement (MSA) standards to provide seamless network integration. Additional product features include Digital Optical Monitoring (DOM) support which allows access to real-time operating parameters. We stand behind the quality of our products and proudly offer a limited lifetime warranty.

Skylane's transceivers are RoHS compliant and lead-free.

Features:

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



Applications:

- 100GBase Ethernet
- Access and Enterprise
- Infiniband EDR

For your product safety, please read the following information carefully before any manipulation of the transceiver:



ESD

This transceiver is specified as ESD threshold 1kV for SFI pins and 2kV for all others electrical input pins, tested per MIL-STD-883G, Method 3015.4 / JESD22-A114-A (HBM). However, normal ESD precautions are still required during the handling of this module.



LASER SAFETY

This is a Class1 Laser Product according to IEC 60825-1:2007. This product complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated (June 24, 2007).

The optical ports of the module need to be terminated with an optical connector or with a dust plug in order to avoid contamination.

Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Supply Voltage	V _{CC}	-0.5		3.6	V	
Storage Temperature	T _s	-40		85	°C	
Case Operating Temperature	T _c	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°C, 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	I _{cc}			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)	RL _d (f)	9.5–0.37f, 0.01≤f<8			dB	
	RL _d (f)	4.75–7.4log10(f/14), 8 ≤f<19			dB	
Differential to common mode input return loss (min)	RL _{dc} (f)	22-20(f/25.78), 0.01≤f<12.89			dB	
	RL _{dc} (f)	15-6(f/25.78), 12.89≤f<19			dB	
Differential termination mismatch	T _m			10	%	
Eye width	E _w			0.46	UI	
Applied pk-pk sinusoidal jitter	P _{ppj}	Per IEEE 802.3bm				
Eye height	E _h		95		mV	
DC common mode voltage	DC _v	-350		2850	mV	
Receiver						
Signaling rate per lane	DRPL	25.78125 ± 100 ppm			Gb/s	
Differential data output swing	V _{out} (pp)	400		800	mV	
Eye width	E _w	0.57			UI	
Vertical eye closure	V _{ec}			5.5	dB	
Differential output return loss (min)	RL _d (f)	9.5–0.37f, 0.01≤f<8			dB	
	RL _d (f)	4.75–7.4log10(f/14), 8 ≤f<19			dB	
Common to differential mode conversion return loss (min)	RL _{dc} (f)	22-20(f/25.78), 0.01≤f<12.89			dB	
	RL _{dc} (f)	15-6(f/25.78), 12.89≤f<19			dB	
Differential termination mismatch	T _m			10	%	
Transition time, 20% to 80%	T _r /T _f	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	Pavg	-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	RIN			-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	Pmax	3.4			dBm	
Average Receive Power for Each Lane	Pin	-10.3		2.4	dBm	4
Stressed Receiver Sensitivity (OMA) per lane	Psens_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 1.5×10^{-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 5×10^{-5} hits/sample.

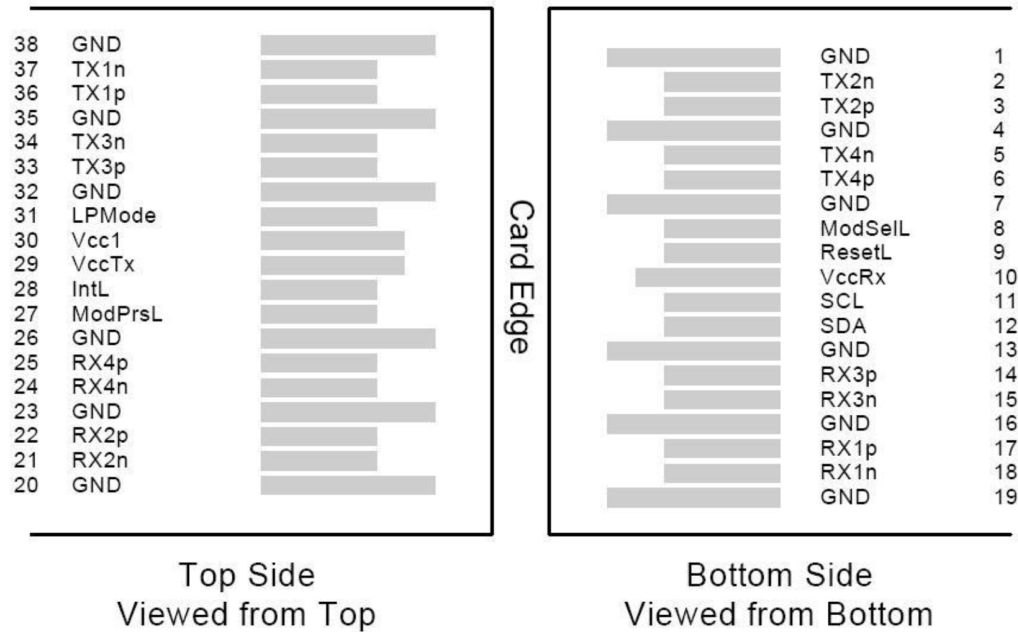
Pin Descriptions

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		VCCR _x	+3.3v Receiver Power Supply	
11	LVC MOS-I	SCL	2-wire Serial interface clock	2
12	LVC MOS-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		VCCT _x	+3.3v Transmitter Power Supply	
30		VCC1	+3.3v Power Supply	
31	LVTTL-I	LPM _{Mode}	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

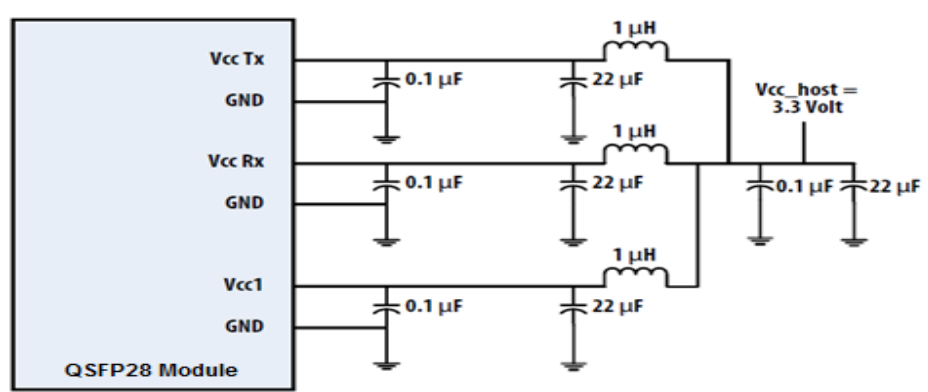
Notes:

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.

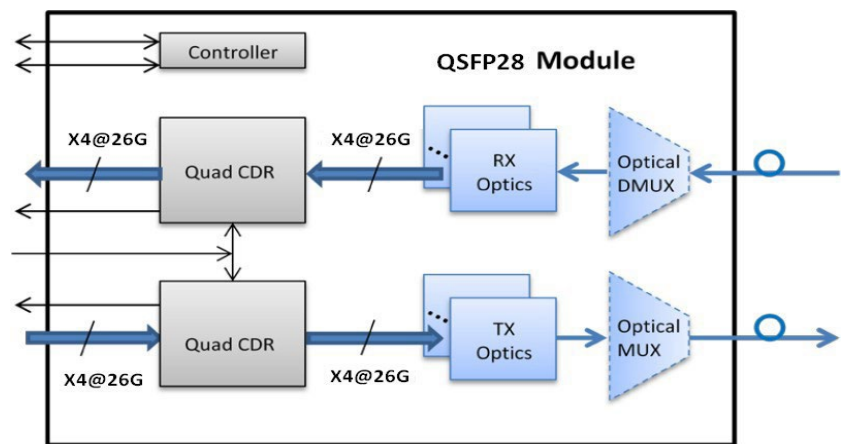
Electrical Pin-out Details



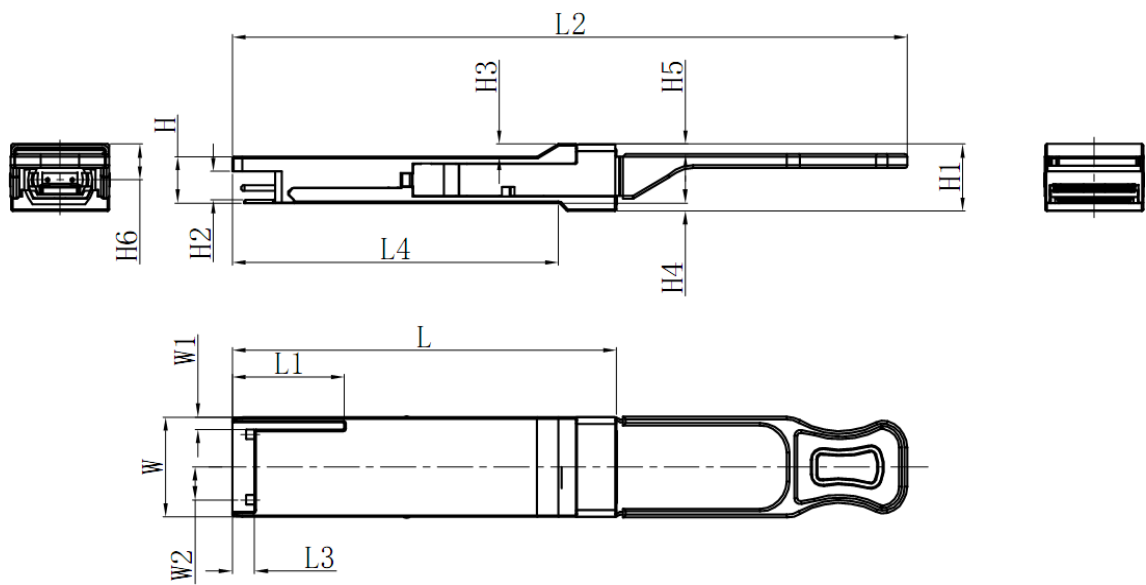
Recommended Power Supply Filter



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 Skylane Optics

Skylane is a leading provider of transceivers for optical communication.

We offer an extensive portfolio for the enterprise, access, datacenter and metropolitan fiber optical market as well as for smart home applications and home networks.

We cover the European, South American and North American market with a strong partner network and have offices in Belgium, Brazil, Sweden and USA.

Our offerings are characterized by high quality and performance. In combination with our strong technical support, we enable our customers to build cost optimized network solutions.

We offer an extensive range of high-quality products including transceivers (Optical and copper), Active Optical Cable (AOC), Direct Attach Cable (DAC), Mux/Demux, Coding Box.

