

### Q28-100GP4-BXD3327-10-I-MX-C

Mellanox® Compatible TAA 100GBase-BX PAM4 QSFP28 Transceiver Single Lambda (SMF, 1331nmTx/1271nmRx, 10km w/FEC, LC, DOM, -40 to 85C)

#### Features:

- Compliant with 100G Lambda MSA 100G-LR Specifications
- Compliant with SFF-8636
- Single 3.3V Power Supply
- Single-mode Fiber
- Bidi LC Connectors
- Industrial Temperature -40 to 85 Celsius
- Hot Pluggable
- Metal with Lower EMI
- Excellent ESD Protection
- RoHS Compliant and Lead Free



#### Applications:

- 100GBase Ethernet
- Datacenter

#### Product Description

This Mellanox® compatible QSFP28 transceiver provides 100GBase-BX throughput up to 10km w/host FEC over single-mode fiber (SMF) PAM4 using a wavelength of 1331nmTx/1271nmRx via an LC connector. This bidirectional unit must be used with another transceiver or network appliance of complementing wavelengths. It is capable of withstanding rugged environments and can operate at temperatures between -40 and 85C. 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. 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.")



## Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Maximum Supply Voltage	V <sub>cc</sub>	0		3.6	V	
Data Input Voltage		-0.3		3.6	V	
Control Input Voltage		-0.3		4	V	
Storage Temperature	T <sub>stg</sub>	-40		85	°C	
Operating Case Temperature	T <sub>c</sub>	0		70	°C	
Relative Humidity	RH	5		85	%	
Data Rate	BR		53.125		GBd	
Bit Error Rate	BER			2.4x10 <sup>-4</sup>		1
Supported Link Length on 9/125um SMF, 53.125 GBd	L		10		km	2

### Notes:

1. Tested with a PRBS31Q test pattern for 53.125 GBd operation.
2. Distances are based on FC-PI-6 Rev. 3.1 and IEEE 802.3 standards, with FEC.

## Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Power Supply Voltage	V <sub>cc</sub>	3.135	3.3	3.465	V	
Module Supply Current	I <sub>cc</sub>			1212	mA	
Power Dissipation	P <sub>DISS</sub>			4000	mW	
<b>Transmitter</b>						
Differential Data Input Swing	V <sub>IN</sub> , p-p	90	100	110	mVp-p	
Differential Input Impedance	Z <sub>IN</sub>	90	100	110	Ω	
<b>Receiver</b>						
Differential Data Output Swing	V <sub>OUT</sub> , p-p	300		900	mVp-p	
Differential Output Impedance	Z <sub>OUT</sub>	90	100	110	Ω	

## Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
<b>Transmitter</b>						
Center Wavelength	$\lambda_C$	1324.5	1331	1337.5	nm	
Extinction Ratio	ER	3.5			dB	
Launch Optical Power (Average)	Po	-1.4		4.5	dBm	1
Launch Optical Power (OMA)	Poma	0.7		4.7	dBm	
Transmitter and dispersion penalty eye closure for PAM4	TDECQ			3.4	dB	
RIN17.1OMA (max)	RIN			-136	dB/Hz	
Optical Return Loss Tolerance	ORLT			15.6	dB	
Pout @TX-Disable Asserted	Poff			-30	dBm	
<b>Receiver</b>						
Center Wavelength	$\lambda_C$	1264.5	1271	1277.5	nm	
Receiver Sensitivity (OMA)	RxSENS			-6.1	dBm	2
Receiver Overload (Pavg)	POL	4.5			dBm	
Receiver reflectance				-26	dB	
LOS De-Assert	LOSD			-12	dBm	
LOS Assert	LOSA	-18			dBm	
LOS Hysteresis		0.5			dB	

### Notes:

1. Class 1 Laser Safety per FDA/CDRH and EN (IEC) 60825 regulations.
2. Measured with PRBS31Q test pattern, 53.125GBd, BER<2.4×10<sup>-4</sup>.

## Pin Descriptions

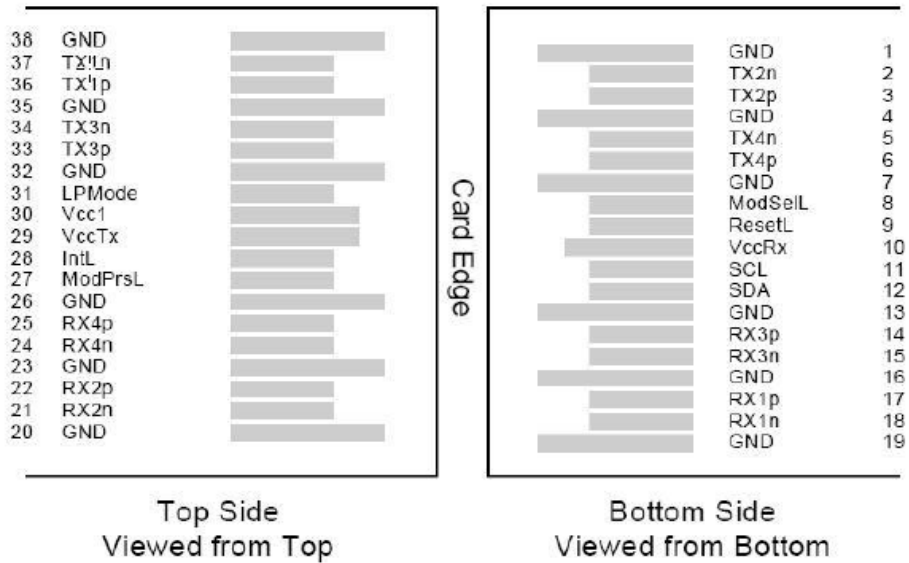
Pin	Logic	Symbol	Name/Descriptions	Notes
1		GND	Module Ground.	1
2	CML-I	Tx2-	Transmitter Inverted Data Input.	
3	CML-I	Tx2+	Transmitter Non-Inverted Data Output.	
4		GND	Module Ground.	1
5	CML-I	Tx4-	Transmitter Inverted Data Input.	
6	CML-I	Tx4+	Transmitter Non-Inverted Data Output.	
7		GND	Module Ground.	1
8	LVTLL-I	ModSelL	Module Select.	
9	LVTLL-I	ResetL	Module Reset.	
10		VccRx	+3.3V Receiver Power Supply.	2
11	LVCMOS-I/O	SCL	2-Wire Serial Interface Clock.	
12	LVCMOS-I/O	SDA	2-Wire Serial Interface Data.	
13		GND	Module Ground.	
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.	1
25	CML-O	Rx4+	Receiver Non-Inverted Data Output.	
26		GND	Module Ground.	1
27	LVTTL-O	ModPrsL	Module Present.	
28	LVTTL-O	IntL	Interrupt.	
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 Output.	
35		GND	Module Ground.	1

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

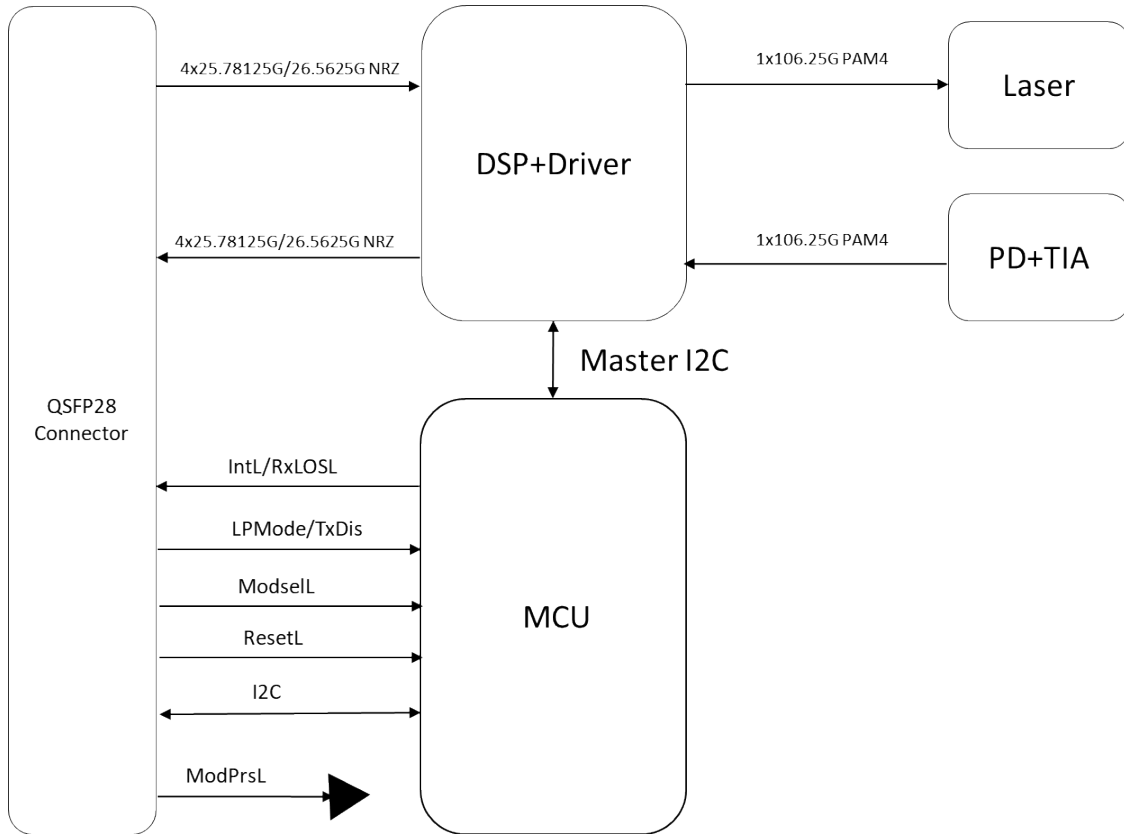
**Notes:**

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.
2. VccRx, Vcc1, and VccTx are the receiver and transmitter power supplies and shall be applied concurrently. Recommended host board power supply filtering is shown below. VccRx, Vcc1, and VccTx may be internally connected within the QSFP28 transceiver module in any combination. The connector pins are each rated for a maximum current of 1000mA.

**Electrical Pin-Out Details**



# Block Diagram





## About ProLabs

Our extensive experience comes as standard. For over 20 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 more than 100 optical switching and transport platforms.

## A 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 1.6T 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.

## The Trusted Partner

Customer service is our number one value. ProLabs has invested in people, labs and manufacturing capacity to ensure compatible products, and immediate answers to your questions. 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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