

### QSFP-40GB-PSM4-BXD-40-PRO

MSA and TAA Compliant 40GBase-BX QSFP+ Transceiver (SMF, 1330nmTx/1270nmRx, 40km, DOM, 0 to 70C, MPO)

#### Features

- Compliant with IEEE802.3cp 10GBASE-BR40-D
- Compliant with SFF-8636
- Compliant with QSFP+ MSA
- 8-degree, angled MPO12 single-mode fiber connector
- Commercial Temperature 0 to 70 Celsius
- Single-mode fiber
- Excellent ESD Protection
- Hot Pluggable
- RoHS compliant and lead-free
- Metal with lower EMI



#### Applications:

- 40GBase-BX Ethernet
- Access, Metro and Enterprise

#### Product Description

This MSA Compliant QSFP+ transceiver provides 40GBase-BX throughput up to 40km over single-mode fiber (SMF) using a wavelength of 1330nmTx/1270nmRx via an MPO connector. It is built to MSA standards and is uniquely serialized and data-traffic and application tested to ensure that they will integrate into your network seamlessly. 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.

Proline'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.



## Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Supply Voltage	Vcc	3.135		3.465	V	
Storage Temperature	Tstg	-40		85	°C	
Case Operating Temperature	Tc	0		70	°C	
Aggregated Data Rate Per Transceiver	DR		41.24		Gbps	1
Bit Rate (NRZ)	DR		10.3125		Gbps	2
Supported Link Length	Lmax1			40	km	3

### Notes:

1. All channels.
2. Per optical transceiver block.
3. Single-mode fiber per G.652.
4. Distances up to 40km are conditional to the loss budget of the link. Not to exceed 18dB (including fiber loss, connector, TDP, and so forth), as per IEEE 802.3 CP specifications.

## Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Supply Voltage	Vcc	3.15		3.465	V	
Symbol Rate Per Lane	BR		10.3125		Gbps	±100ppm
Input Voltage - Low	VIL	-0.3		0.8	V	
Input Voltage - High	VIH	2		3.	V	
Output Voltage - Low	VOL	-0.3		0.8	V	
Output Voltage - High	VOH	2		3.	V	
Differential Data Input Per Lane	VIN,pp	70		900	mV	
Differential Data Output Per Lane	VOUT,pp	100		900	mV	1

### Notes

1. Internally AC coupled but requires an external 100Ω differential load termination.

## Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
<b>Transmitter</b>						
Launch Optical Power	Pavg	-3		+3	dBm	Per Lane
	Pavg			-30	dBm	1
Lane Center Tx WL for Each of the Four Channels	$\lambda$	1320	1330	1340	nm	2
Extinction Ratio	ER	5.5			dB	
OMA-TDP	OMA-TDP	-1			dBm	
Transmitter Dispersion Penalty	TDP			2.6	dB	
Side-Mode Suppression Ratio	SMSR	30			dB	
Optical Return Loss Tolerance	ORLT			21	dB	
Transmitter Reflectance				-12	dB	
Eye Mask Margin		10			%	
Eye Mask: (X1, X2, X3, Y1, Y2, Y3)	Mask	(0.25, 0.4, 0.45, 0.25, 0.28, 0.4)				3
<b>Receiver</b>						
Lane Center Rx WL for Each of the Four Channels	$\lambda$	1260	1270	1280	nm	2
Unstressed Receiver Sensitivity (OMA)	RX-OMA	+2.5		-19	dBm	Per Lane
Stressed Receiver Sensitivity (OMA)	RX-Stress OMA			16.8	dBm	Per Lane
Average Receiver Power Per Lane	RXsense	-21.2		-7	dBm	
Damage Threshold	THd	-3			dBm	4
Reflectance				-26	dB	Per Lane
LOS De-Assert	LOSD			-22	dBm	
LOS Assert	LOSA	-35			dBm	5
LOS Hysteresis		0.5		4	dB	

### Note:

1. Per lane in "off" mode.
2. Built-in optical BiDi demux for Tx/Rx for each channel.
3. Hit ratio of  $1 \times 10^{-12}$ , per IEEE.
4. Continuous exposure without damage.
5. Rx\_LOS is asserted if any of the network optical lanes have LOS.

## Pin Descriptions

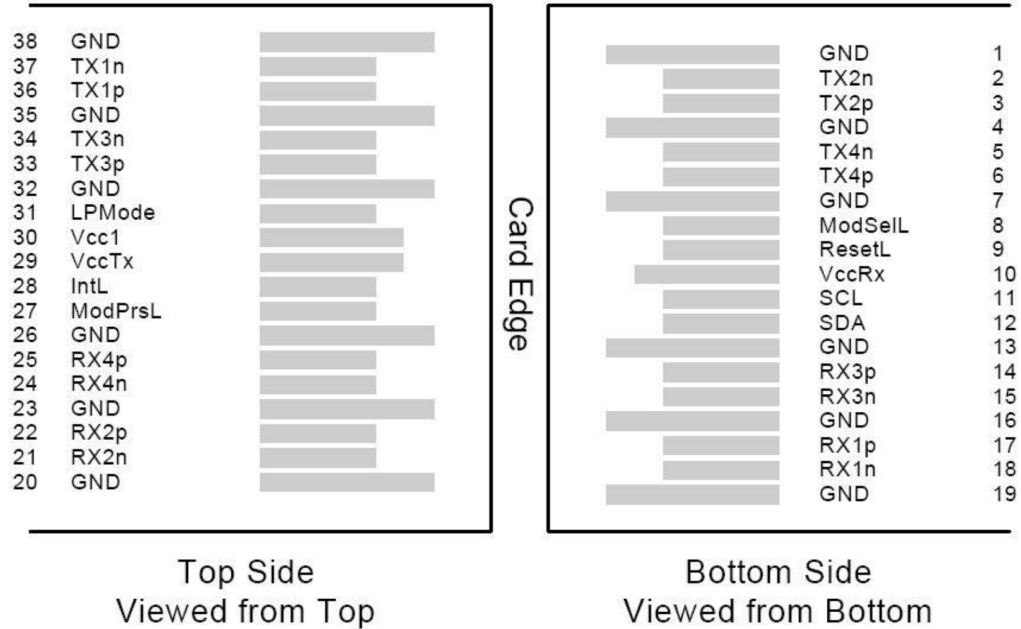
Pin	Logic	Symbol	Name/Description	Note
1		GND	Module Ground.	1
2	CML-I	Tx2-	Transmitter Inverted Data Input.	
3	CML-I	Tx2+	Transmitter Non-Inverted Data Input.	
4		GND	Module Ground.	1
5	CML-I	Tx4-	Transmitter Inverted Data Input.	
6	CML-I	Tx4+	Transmitter Non-Inverted Data Input.	
7		GND	Module Ground.	1
8	LVTTTL-I	ModSelL	Module Select.	2
9	LVTTTL-I	ResetL	Module Reset.	2
10		VccRx	+3.3V Receiver Power Supply.	
11	LVCNOS-I	SCL	2-Wire Serial Interface Clock.	2
12	LVCNOS-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.	1
25	CML-O	Rx4+	Receiver Non-Inverted Data Output.	
26		GND	Module Ground.	1
27	LVTTTL-O	ModPrsL	Module Present. Internally pulled down to the GND.	
28	LVTTTL-O	IntL	Interrupt Output. Should be pulled up on the host board.	2
29		VccTx	+3.3V Transmitter Power Supply.	
30		Vcc1	+3.3V Power Supply.	
31	LVTTTL-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:

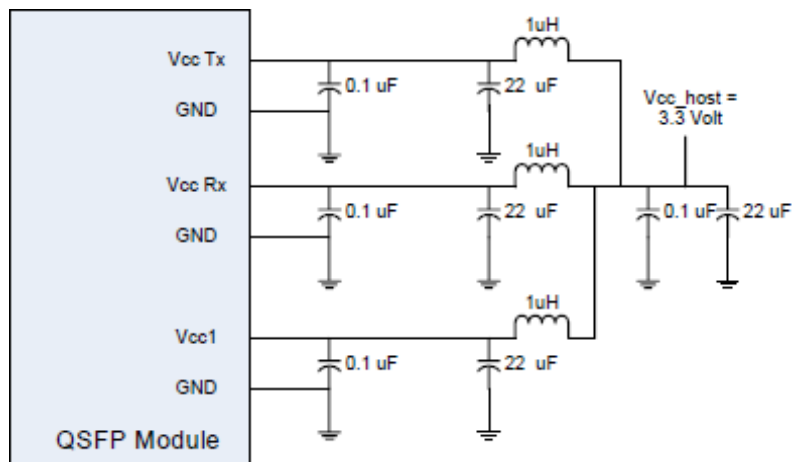
1. The module signal grounds are isolated from the module case.

- This is an open collector/drain output that, on the host board, requires a 4.7kΩ-10kΩ pull-up resistor to the Host\_Vcc.

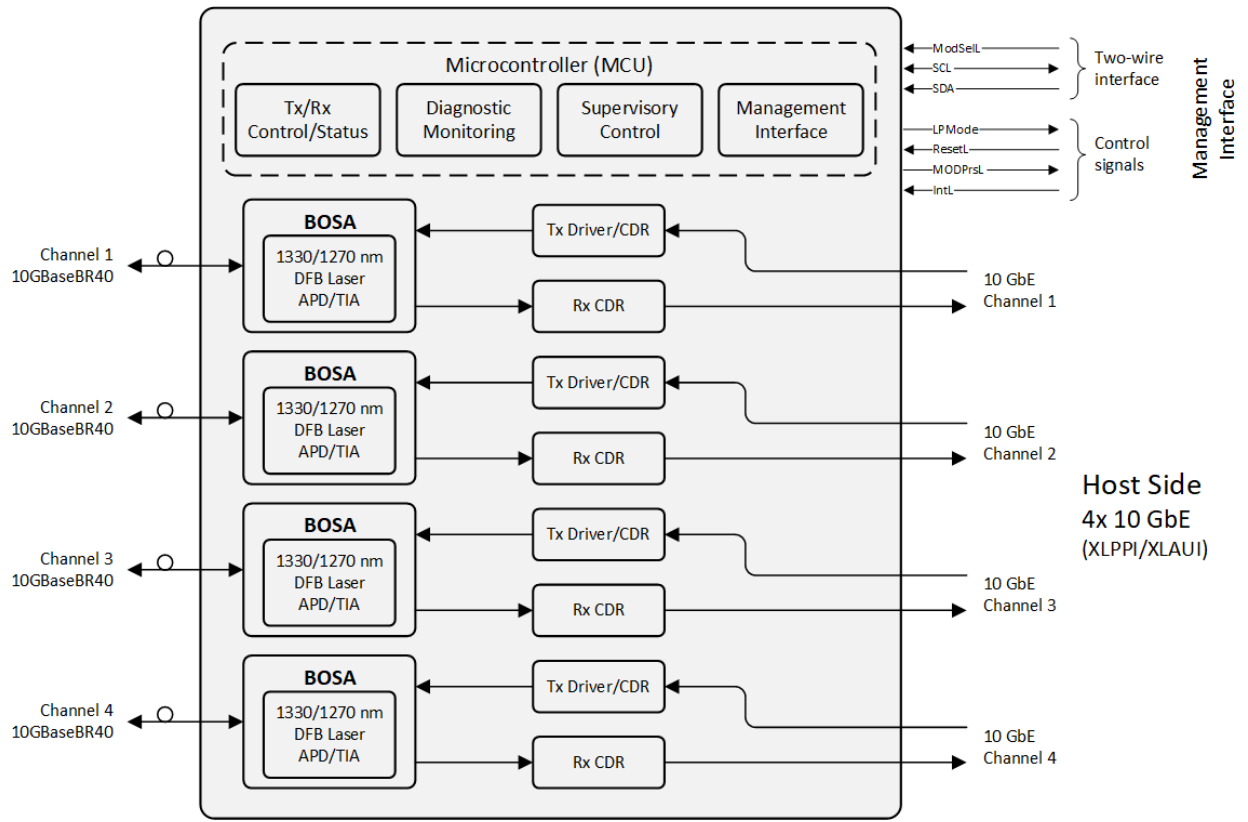
### Electrical Pin-Out Details



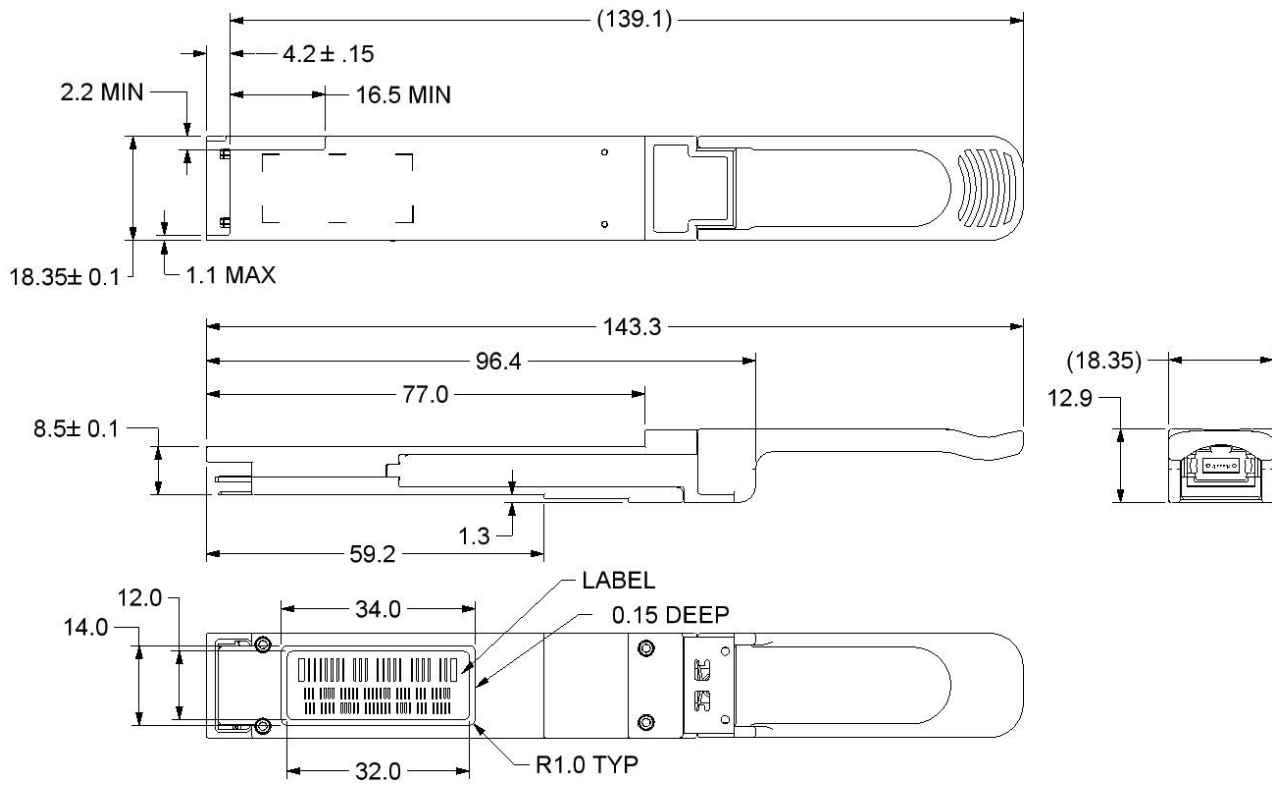
### Power Supply Filtering



# Transceiver Block Diagram

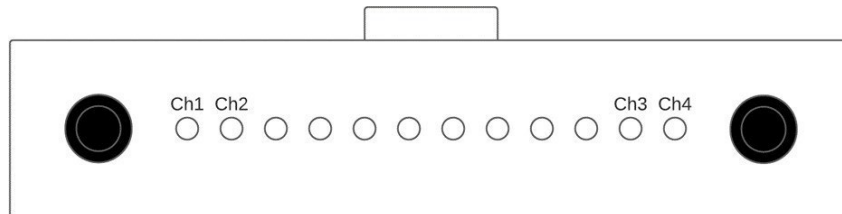


**Mechanical Specifications**



Dimensions are in mm.

**MPO12 Connector – Front View**



Fibers 1, 2, 11, and 12 are used.

**About Us:**

Proline Options is one of North America's leading providers of transceivers and high speed cabling. With a reputation for quality, tested products that cover the connectivity spectrum, Proline Options has a solution for you regardless of the specification.

At Proline Options, every product is tested in its intended application - never batch or spec tested only. We run bandwidth, distance and IOS network tests. We have documented an impressive 0.03% failure rate over the last 10 years. To continue this rate of success we invest millions annually in our own on-site testing lab.



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