

QDD-LB-0DB-C

MSA and TAA 400GBase QSFP-DD Loopback Transceiver with 0dB Attenuation, -40 to 85C

Features:

- SFF-8024 Compliance
- Built-in surge current mitigation technology
- Industrial temperature: -40 to 85 Celsius
- +3.3V power supply
- Supports 8x10G/25G/56G PAM4 data rates
- 2-wire interface for integrated Digital Diagnostic Monitoring
- Compliant with IEEE 802.3ba, 802.3bj, and 802.3cd standards
- Enhanced heat dissipation technology for high power testing
- A multi-color LED indicator for high/low power modes
- Hot Pluggable



Applications:

- QSFP-DD port/system testing
- Ethernet IEEE 802.3 (Gigabit, 10 Gigabit and 25 Gigabit Ethernet)
- SONET, SDH, GBE, Fiber Channel Support

Product Description

This MSA compliant QSFP-DD loopback provides a simple solution to loopback testing on individual ports with the use of a cable assembly. It has 0dB of attenuation and is compatible with existing 400G QSFP-DD ports. All of our transceivers are built to comply with Multi-Source Agreement (MSA) standards and are uniquely serialized and tested for data-traffic and application to ensure 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	Vcc	2.97	3.3	+3.63	V	
Storage Temperature	Tstg	-40		+85	°C	
Operating Case Temperature	Tc	-40		+85	°C	
Storage Relative Humidity	RHs	0		95	%	
Operating Humidity	RHo	0		85	%	
Data Rate	BRate	0.1		400	Gbps	
Durability Cycles			2000	2250	Cycles	

High Speed Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Input/Output Impedance	Zd	90	100	110	Ohm	1
Return Loss	SDD11/22	IEEE 802.3bj CL92.10.3.			dB	2
Insertion Loss	SDD21	0.845		6.615	dB	3
Insertion Loss Deviation	ILD	-1		1		2
Skew Between Lanes	SKEW			200	ps	

Notes:

1. Differential impedance.
2. At Nyquist Frequency
3. Exclude the MCB insertion loss, at 13GHz.

Pin Descriptions

Pin	Logic	Symbol	Name/Description	Notes
1		GND	Module Ground (Logic and Power Return Path).	1
2	CML-I	Tx2-	Transmit Differential Pairs from Host to Module.	
3	CML-I	Tx2+	Transmit Differential Pairs from Host to Module.	
4		GND	Module Ground (Logic and Power Return Path).	1
5	CML-I	Tx4-	Transmit Differential Pairs from Host to Module.	
6	CML-I	Tx4+	Transmit Differential Pairs from Host to Module.	
7		GND	Module Ground (Logic and Power Return Path).	1
8	LVTTL-I	ModSelL	Module Select.	
9	LVTTL-I	ResetL	Module Reset.	
10		VccRx	+3.3V Receiver Power Supply.	2
11	LVC MOS-I/O	SCL	2-Wire Serial Interface Clock.	3
12	LVC MOS-I/O	SDA	2-Wire Serial Interface Data.	3
13		GND	Module Ground (Logic and Power Return Path).	1
14	CML-O	Rx3+	Receive Differential Pairs from Module to Host.	
15	CML-O	Rx3-	Receive Differential Pairs from Module to Host.	
16		GND	Module Ground (Logic and Power Return Path).	1
17	CML-O	Rx1+	Receive Differential Pairs from Module to Host.	
18	CML-O	Rx1-	Receive Differential Pairs from Module to Host.	
19		GND	Module Ground (Logic and Power Return Path).	1
20		GND	Module Ground (Logic and Power Return Path).	1
21	CML-O	Rx2-	Receive Differential Pairs from Module to Host.	
22	CML-O	Rx2+	Receive Differential Pairs from Module to Host.	
23		GND	Module Ground (Logic and Power Return Path).	1
24	CML-O	Rx4-	Receive Differential Pairs from Module to Host.	
25	CML-O	Rx4+	Receive Differential Pairs from Module to Host.	
26		GND	Module Ground (Logic and Power Return Path).	1
27	LVTTL-O	ModPrsL	Module Present.	4
28		IntL	Interrupt.	5
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 (Logic and Power Return Path).	1
33	CML-I	Tx3+	Transmit Differential Pairs from Host to Module.	
34	CML-I	Tx3-	Transmit Differential Pairs from Host to Module.	
35		GND	Module Ground (Logic and Power Return Path).	1

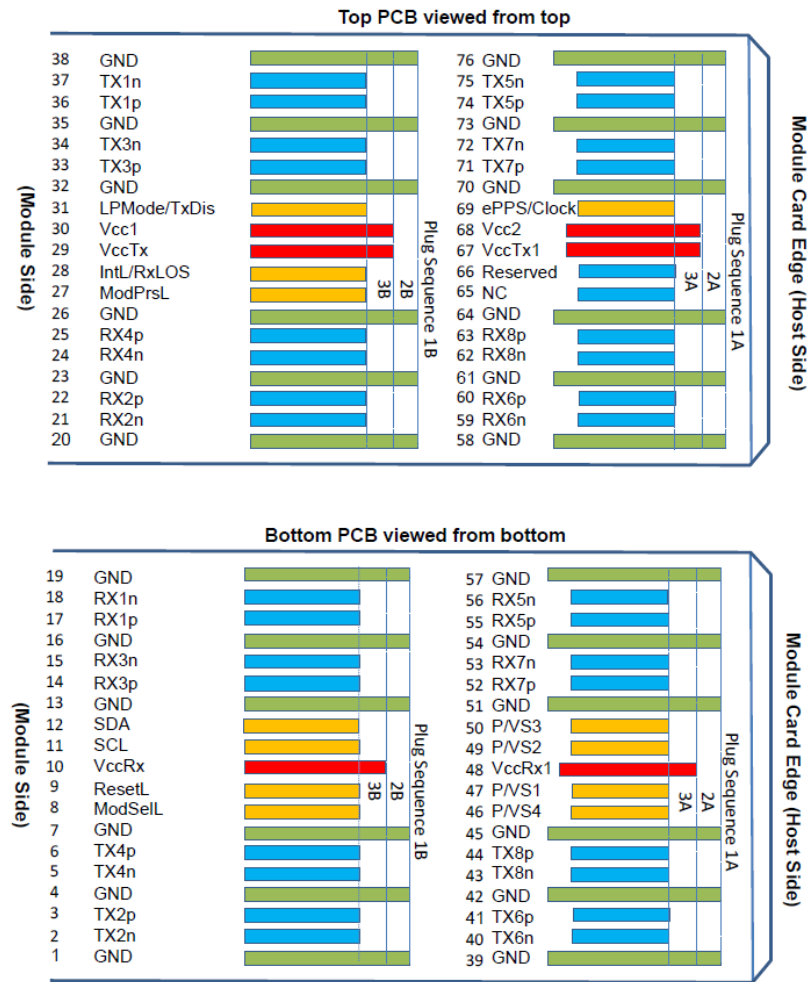
36	CML-I	Tx1+	Transmit Differential Pairs from Host to Module.	
37	CML-I	Tx1-	Transmit Differential Pairs from Host to Module.	
38		GND	Module Ground (Logic and Power Return Path).	1
39		GND	Module Ground (Logic and Power Return Path).	1
40	CML-I	Tx6-	Transmit Differential Pairs from Host to Module.	
41	CML-I	Tx6+	Transmit Differential Pairs from Host to Module.	
42		GND	Module Ground (Logic and Power Return Path).	1
43	CML-I	Tx8-	Transmit Differential Pairs from Host to Module.	
44	CML-I	Tx8+	Transmit Differential Pairs from Host to Module.	
45		GND	Module Ground (Logic and Power Return Path).	1
46		Reserved	For Future Use. Not Connected.	6
47	LVC MOS-O	VS1	Module Vendor-Specific 1.	6
48		VccRx1	+3.3V Receiver Power Supply.	2
49	LVC MOS-I	VS2	Module Vendor-Specific 2.	6
50	LVC MOS-I/O	VS3	Module Vendor-Specific 3.	6
51		GND	Module Ground (Logic and Power Return Path).	1
52	CML-O	Rx7+	Receive Differential Pairs from Module to Host.	
53	CML-O	Rx7-	Receive Differential Pairs from Module to Host.	
54		GND	Module Ground (Logic and Power Return Path).	1
55	CML-O	Rx5+	Receive Differential Pairs from Module to Host.	
56	CML-O	Rx5-	Receive Differential Pairs from Module to Host.	
57		GND	Module Ground (Logic and Power Return Path).	1
58		GND	Module Ground (Logic and Power Return Path).	1
59	CML-O	Rx6-	Receive Differential Pairs from Module to Host.	
60	CML-O	Rx6+	Receive Differential Pairs from Module to Host.	
61		GND	Module Ground (Logic and Power Return Path).	1
62	CML-O	Rx8-	Receive Differential Pairs from Module to Host.	
63	CML-O	Rx8+	Receive Differential Pairs from Module to Host.	
64		GND	Module Ground (Logic and Power Return Path).	1
65		NC	Not Connected.	6
66		Reserved	For Future Use. Not Connected.	6
67		VccTx1	+3.3V Transmitter Power Supply.	2
68		Vcc2	+3.3V Power Supply.	2
69	LVTTL-I	ePPS	Precision Time Protocol (PTP) Reference Clock Input.	
70		GND	Module Ground (Logic and Power Return Path).	1
71	CML-I	Tx7+	Transmit Differential Pairs from Host to Module.	
72	CML-I	Tx7-	Transmit Differential Pairs from Host to Module.	

73		GND	Module Ground (Logic and Power Return Path).	1
74	CML-I	Tx5+	Transmit Differential Pairs from Host to Module.	
75	CML-I	Tx5-	Transmit Differential Pairs from Host to Module.	
76		GND	Module Ground (Logic and Power Return Path).	1

Notes:

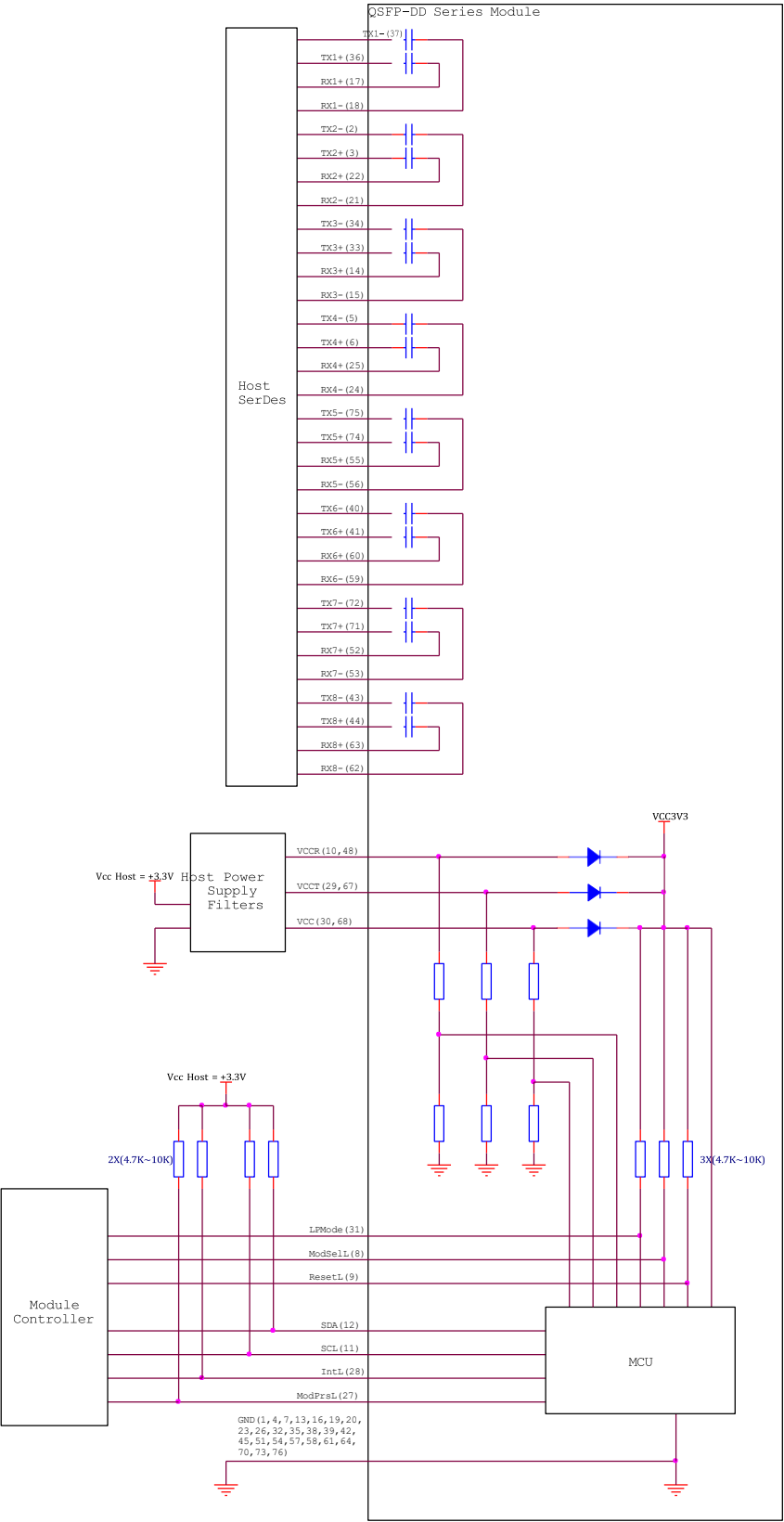
1. QSFP-DD uses common ground (GND) for all signals and supply (power). All are common with the QSFP-DD module, and all module voltages are referenced to this potential unless otherwise noted. Connect these directly to the host board signal common ground plane.
2. VccRx, VccRx1, Vcc1, Vcc2, VccTx, and VccTx1 shall be applied concurrently. VccRx, VccRx1, Vcc1, Vcc2, VccTx, and VccTx1 are internally connected within the module. The connector Vcc pins are each rated for a maximum current of 1.0A.
3. Open drain. Requires 1.0k to 3.3k pull-up resistor to 3.3V on the host.
4. Indication from module to host. Requires 4.7k to 10k pull-up resistor to 3.3V on the host.
5. Open collector. Interrupt request from module to host. Requires 4.7k pull-up resistor to 3.3V on the host.
6. Reserved and NC pins may be terminated with 50Ω to ground on the host. Vendor-Specific and Reserved pads shall have an impedance to the GND that is greater than 10kΩ and is less than 100pF.

Electrical Pad Layout



Pin-Out of Connector Block on the Host Board

Typical Application Circuit



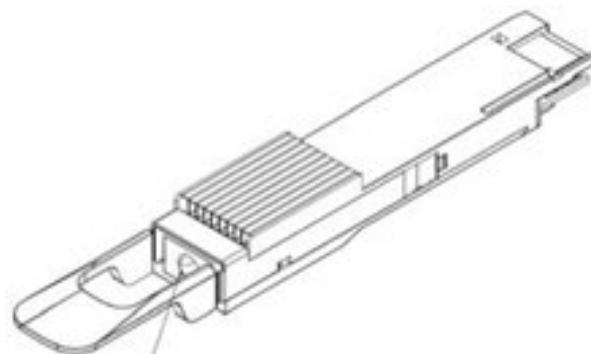
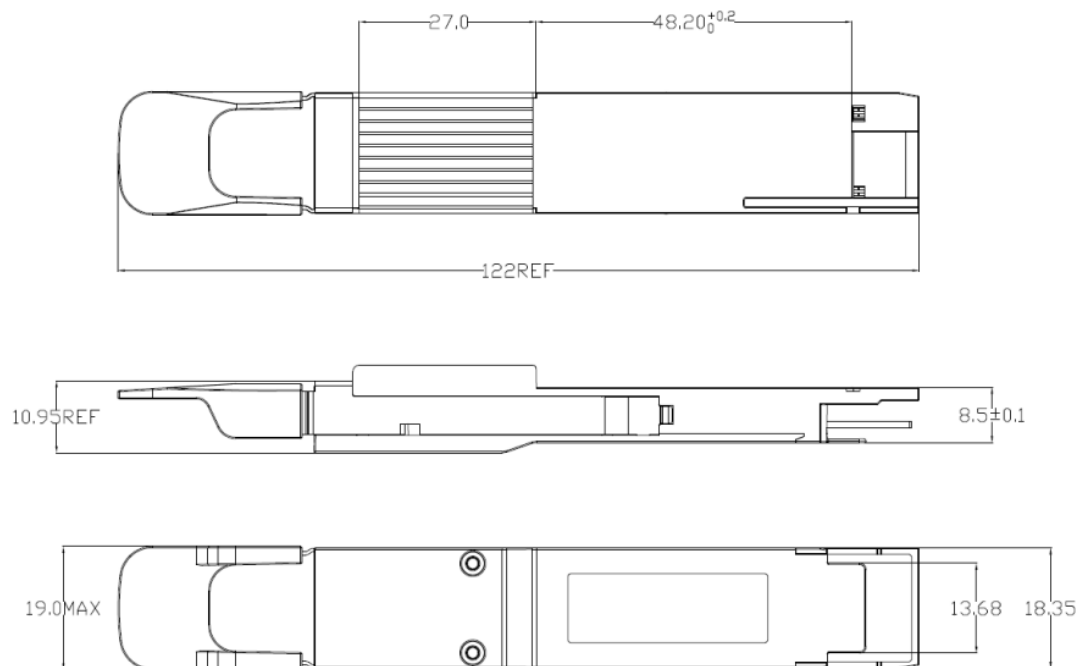
Status LED

A multi-color LED must be viewed from the front of the module in order to signify high/low power modes, as well as interrupts:

- Solid green: low-power mode
- Solid red: high-power mode
- Blinking green: low-power mode with any of the interrupt flag is set
- Blinking red: high-power mode with any of the interrupt flag is set

Mechanical Specifications

Dimensions are in millimeters. (Unit: mm)



LED:
Solid green: low-power mode
Solid red: high-power mode
Blinking green: low-power mode with any of the interrupt flag is set
Blinking red: high-power mode with any of the interrupt flag is set

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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