EDQD400-2QPx

400G QSFP-DD to 2*200G QSFP56 Direct Attach Cable - PAM4

PRODUCT FEATURES

- Compatible with IEEE 802.3bj and IEEE 802.3cd
- Supports aggregate data rates of 400Gbps(PAM4)
- Optimized construction to minimize insertion loss and cross talk
- Pull-to-release slide latch design
- 28AWG through 30AWG cable
- Straight and break out assembly configurations available
- Customized cable braid termination limits EMI radiation
- Customizable EEPROM mapping for cable signature
- RoHS omplia

APPLICATIONS

- Switches,servers and routers
- Data Center networks
- Storage area networks
- High performance computing
- Telecommunication and wireless infrastructure
- Medical diagnostics and networking
- Test and measurement equipment

INDUSTRY STANDARDS

- **400G Ethernet(IEEE 802.3cd)**
- **InfiniBand EDR**

DESCRIPTIONS

QSFP-DD_2XQSFP56 passive copper cable assembly feature eight differential copper pairs,providing four data transmission channels at speeds up to 56Gbps(PAM4) per channel,and meets 400G Ethernet and InfiniBand Enhanced Data Rate(EDR) requirements.Available in a broad rang of wire gages-from 28AWG through 30AWG-this 400G copper cable assembly features low insertion loss and low cross talk.

QSFP-DD_2XQSFP56 uses PAM4 signals for transmission, which doubles the rate. However, there are more stringent requirements for cable insertion loss. For detailed requirements, please see High Speed Characteristics.

Ordering Information

Part No.	Description
EDQD400-2QPx	400G QSFP-DD to 2*200G QSFP56 Direct Attach Cable - PAM4 0.5~1.5m 30AWG
EDQD400-2QPx-28	400G QSFP-DD to 2*200G QSFP56 Direct Attach Cable - PAM4 2~2.5m 28AWG

Notes:

1. where "x" denotes cable length in meters. Examples are as follows:
2. x = 0.5 for 0.5m, xx=1 for 1m

High Speed Characteristics

Parameter	Symbol	Min	Typical	Max	Unit	Note
Differential Impedance	TDR	90	100	110	Ω	
Insertion loss	SDD21	-16.06			dB	At 13.28 GHz
Differential Return Loss	SDD11 SDD22			See 1	dB	At 0.05 to 4.1 GHz
				See 2	dB	At 4.1 to 19 GHz
Common-mode to common-mode output return loss	SCC11 SCC22			-2	dB	At 0.2 to 19 GHz
Differential to common-mode return loss	SCD11 SCD22			See 3	dB	At 0.01 to 12.89 GHz
				See 4		At 12.89 to 19 GHz
Differential to common Mode	SCD21-IL			-10	dB	At 0.01 to 12.89 GHz

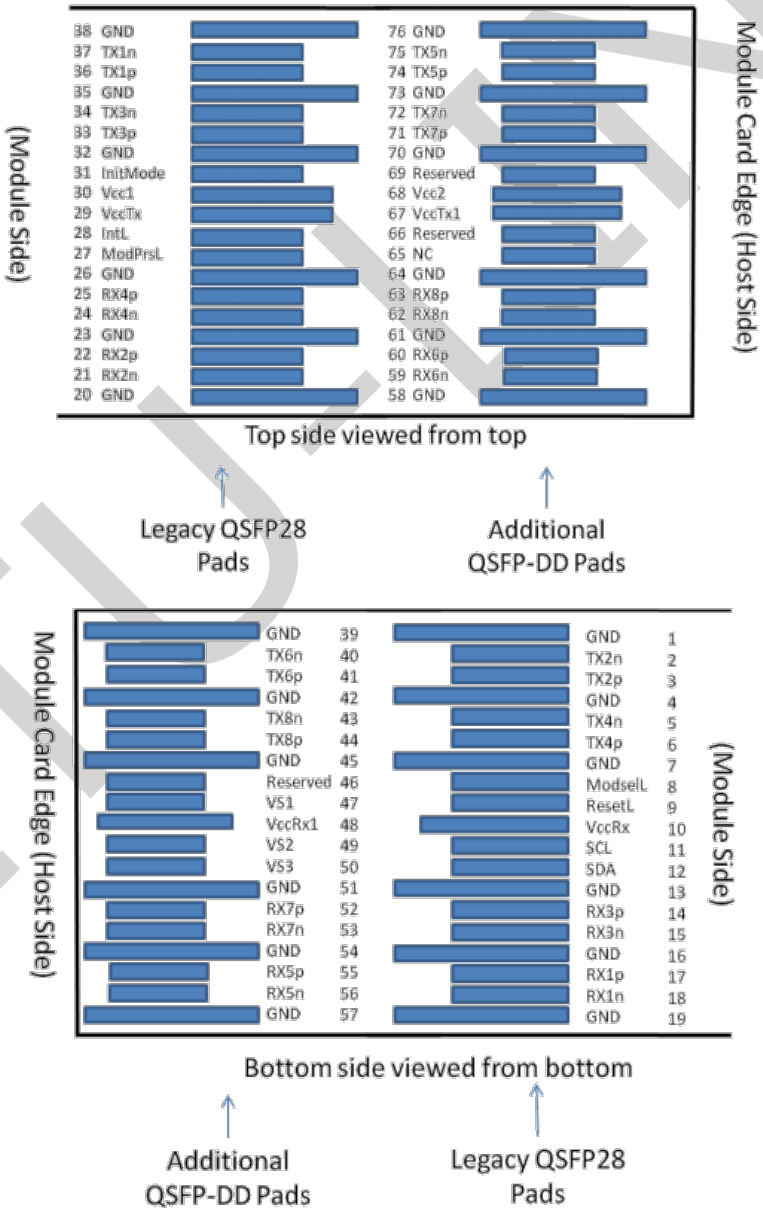
Conversion Loss				See 5		At 12.89 to 15.7 GHz
				-6.3		At 15.7 to 19 GHz

Notes:

1. Reflection Coefficient given by equation SDD11(dB) < -16.5 + 2 × SQRT(f), with f in GHz
2. Reflection Coefficient given by equation SDD11(dB) < -10.66 + 14 × log10(f/5.5), with f in GHz
3. Reflection Coefficient given by equation SCD11(dB) < -22 + (20/25.78)*f, with f in GHz
4. Reflection Coefficient given by equation SCD11(dB) < -15 + (6/25.78)*f, with f in GHz
5. Reflection Coefficient given by equation SCD21(dB) < -27 + (29/22)*f, with f in GHz

Pin Diagram

QSFP-DD



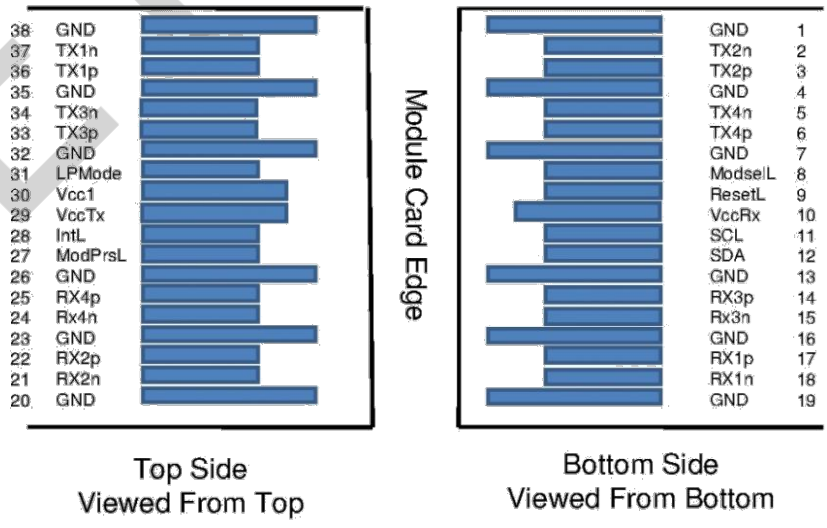
Pin Descriptions

QSFP-DD Pin Function Definition

Pin	Logic	Symbol	Description
1		GND	Ground
2	CML-I	Tx2n	Transmitter Inverted Data Input
3	CML-I	Tx2p	Transmitter Non-Inverted Data Input
4		GND	Ground
5	CML-I	Tx4n	Transmitter Inverted Data Input
6	CML-I	Tx4p	Transmitter Non-Inverted Data Input
7		GND	Ground
8	LVTTL-I	ModSelL	Module Select
9	LVTTL-I	ResetL	Module Reset
10		Vcc Rx	+3.3V Power Supply Receiver
11	LVCMOS-I/O	SCL	2-wire serial interface clock
12	LVCMOS-I/O	SDA	2-wire serial interface data
13		GND	Ground
14	CML-O	Rx3p	Receiver Non-Inverted Data Output
15	CML-O	Rx3n	Receiver Inverted Data Output
16		GND	Ground
17	CML-O	Rx1p	Receiver Non-Inverted Data Output
18	CML-O	Rx1n	Receiver Inverted Data Output
19		GND	Ground
20		GND	Ground
21	CML-O	Rx2n	Receiver Inverted Data Output
22	CML-O	Rx2p	Receiver Non-Inverted Data Output
23		GND	Ground
24	CML-O	Rx4n	Receiver Inverted Data Output
25	CML-O	Rx4p	Receiver Non-Inverted Data Output
26		GND	Ground
27	LVTTL-O	ModPrsL	Module Present
28	LVTTL-O	IntL	Interrupt
29		Vcc Tx	+3.3V Power supply transmitter
30		Vcc1	+3.3V Power supply
31	LVTTL-I	LPMode	Low Power Mode
32		GND	Ground
33	CML-I	Tx3p	Transmitter Non-Inverted Data Input
34	CML-I	Tx3n	Transmitter Inverted Data Input
35		GND	Ground
36	CML-I	Tx1p	Transmitter Non-Inverted Data Input
37	CML-I	Tx1n	Transmitter Inverted Data Input
38		GND	Ground
39		GND	Ground
40	CML-I	Tx6n	Transmitter Inverted Data Input
41	CML-I	Tx6p	Transmitter Non-Inverted Data Input

42		GND	Ground
43	CML-I	Tx8n	Transmitter Inverted Data Input
44	CML-I	Tx8p	Transmitter Non-Inverted Data Input
45		GND	Ground
46		Reserved	
47		VS1	
48		VccRx1	+3.3V Power supply
49		VS2	
50		VS3	
51		GND	Ground
52	CML-O	Rx7p	Receiver Non-Inverted Data Output
53	CML-O	Rx7n	Receiver Inverted Data Output
54		GND	Ground
55	CML-O	Rx5p	Receiver Non-Inverted Data Output
56	CML-O	Rx5n	Receiver Inverted Data Output
57		GND	Ground
58		GND	Ground
59	CML-O	Rx6n	Receiver Inverted Data Output
60	CML-O	Rx6p	Receiver Non-Inverted Data Output
61		GND	Ground
62	CML-O	Rx8n	Receiver Inverted Data Output
63	CML-O	Rx8p	Receiver Non-Inverted Data Output
64		GND	Ground
65		NC	
66		Reserved	
67		VccTx1	+3.3V Power supply
68		VCC2	+3.3V Power supply
69		Reserved	
70		GND	Ground
71	CML-I	Tx7p	Transmitter Non-Inverted Data Input
72	CML-I	Tx7n	Transmitter Inverted Data Input
73		GND	Ground
74	CML-I	Tx5p	Transmitter Non-Inverted Data Input
75	CML-I	Tx5n	Transmitter Inverted Data Input
76		GND	Ground

QSFP56



Top Side
Viewed From Top

Bottom Side
Viewed From Bottom

QSFP56 Pin Function Definition

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1		GND	Ground
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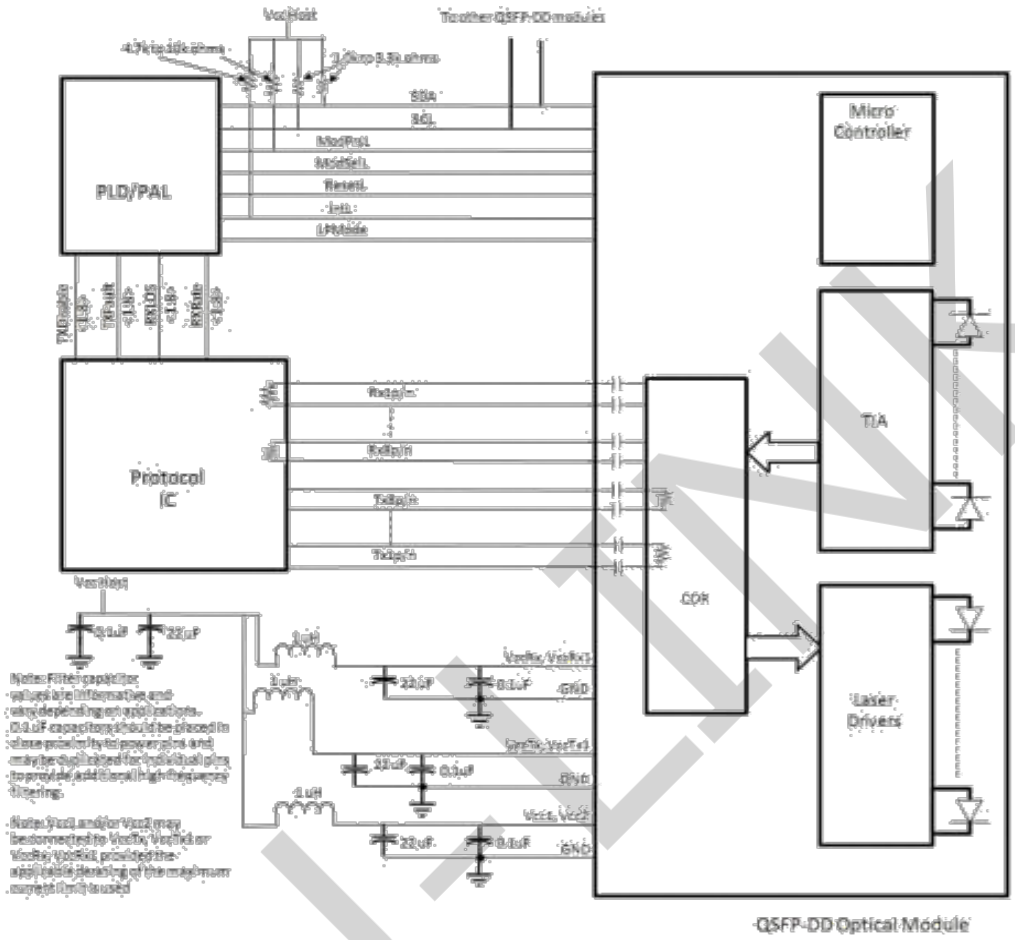
35		GND	Ground
36	CML-I	Tx1p	Transmitter Non-Inverted Data Input
37	CML-I	Tx1n	Transmitter Inverted Data Input
38		GND	Ground

Recommended Interface Circuit

QSFP-DD



QSFP-DD Optical Module

QSFP56

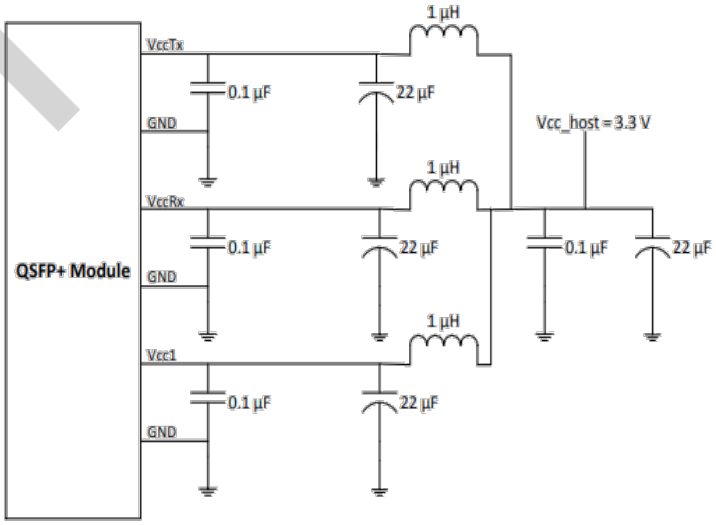
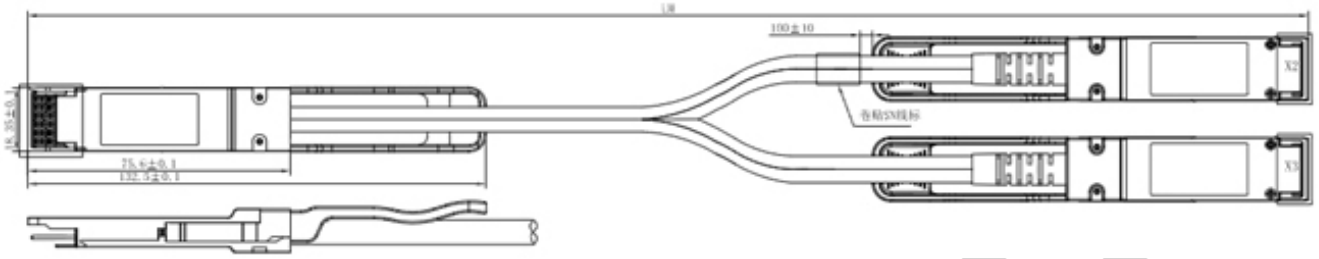


FIGURE 5-4 RECOMMENDED HOST BOARD POWER SUPPLY FILTERING

Mechanical Diagram

The connector is compatible with the QSFP-DD and SFF-8436 specification.



Length (m)	Cable AWG
1.5	30
2.5	28

Regulatory Compliance

Feature	Test Method	Performance
Electrostatic Discharge (ESD) to the Electrical Pins	MIL-STD-883C Method 3015.7	Class 1(>2000 Volts)
Electromagnetic Interference(EMI)	FCC Class B CENELEC EN55022 Class B CISPR22 ITE Class B	Compliant with Standards
RF Immunity(RFI)	IEC61000-4-3	Typically Show no Measurable Effect from a 10V/m Field Swept from 80 to 1000MHz
RoHS Compliance	RoHS Directive 2011/65/EU and its Amendment Directives （EU） 2015/863	RoHS （EU）2015/863 compliant
REACH Compliance	REACH Regulation (EC) No 1907/2006	REACH (EC) No 1907/2006 compliant

Revision History

Version No.	Date	Description
1.0	Sep 25, 2023	Preliminary datasheet
2.0	September 28,2024	Product upgrades

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