Leapmicro Advancing Connectivity

40G Q/4SFP+ Direct Attach Cable (DAC) Datasheet

Part Numbers

- QSFP-4SFP-1M
- QSFP-4SFP-2M
- QSFP-4SFP-3M

Product Description

For use with data center cabling, direct connection between networking equipment, and other short distance, high bandwidth applications, the QSFP+ breakout cable is a Cisco compatible QSFP-4SFP10G-CU[1M, 2M, 3M] passive direct attach breakout cable that connects a QSFP+ port to 4 x SFP+ ports. Designed as an alternative to more costly fiber optic cables, the passive direct attach cable supports 40 Gigabit Ethernet applications and is hot-pluggable, with connection through QSFP+ (Quad Small Form Factor Pluggable)

ports. These passive twinax cables are made for high speed, short length connections, and are fully compliant with MSA (Multi-Source Agreement) standards (SFF- 8436, SFF-8431, SFF-8432 and SFF-8472).

Features

- Compliant with MSA (Multi-Source Agreement) standards (SFF- 8436, SFF-8431, SFF-8432 and SFF-8472)
- Supports data rates up to 40Gbps
- 30AWG
- 1M, 2M, and 3M lengths available
- Copper cable assembly
- Operating temperature: 0 – 70°C
- Operates on +3.3V power supply

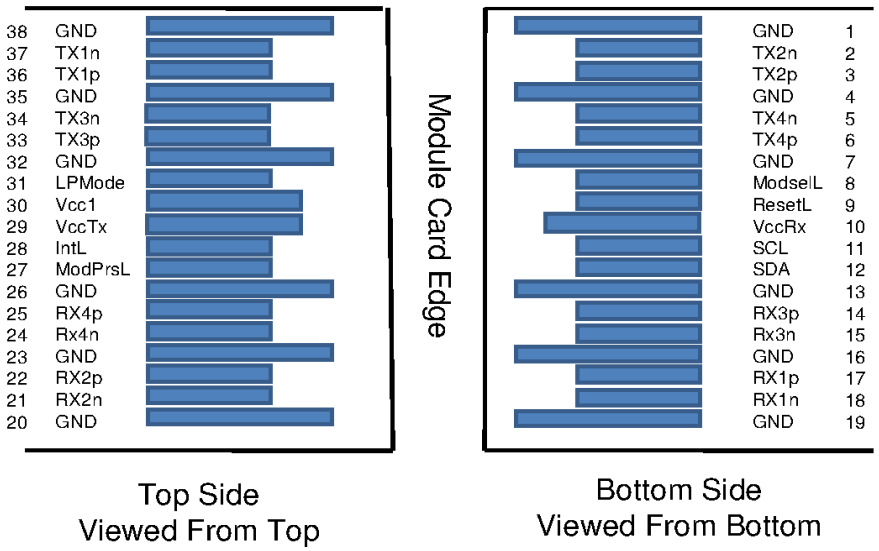
Benefits

- Cost effective option when compared to fiber optic cables
- Low latency
- Low power
- High bandwidth

QSFP+ Pin Definitions

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

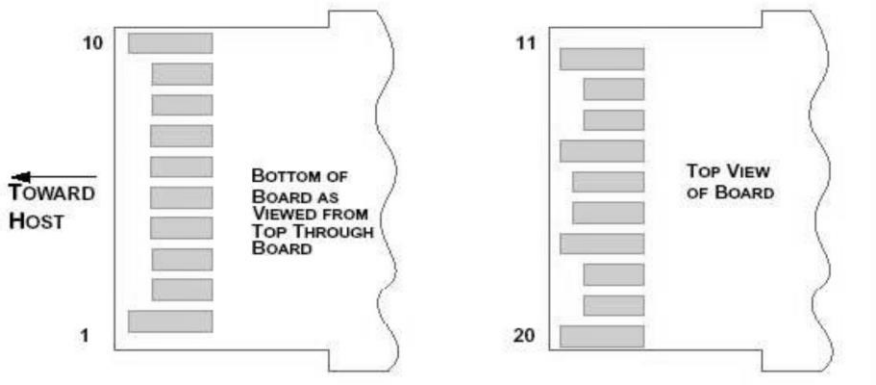
11	LVCMOS-I/O	SCL	2-wire serial interface clock
12	LVCMOS-I/O	SDA	2-wire serial interface data
13		GND	Ground
14	CML-O	Rx3p	Receiver Non-Inverted Data Output
15	CML-O	Rx3n	Receiver Inverted Data Output
16		GND	Ground
17	CML-O	Rx1p	Receiver Non-Inverted Data Output
18	CML-O	Rx1n	Receiver Inverted Data 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



SFP+ Pin Definitions

Pin	Logic	Symbol	Description
1		VeeT	Module Transmitter Ground
2	LVTTL-O	Tx_Fault	Module Transmitter Fault
3	LVTTL-I	Tx_Disable	Transmitter disable; Turns off transmitter laser output
4	LVTTL-I/O	SDA	2-wire Serial Interface Data Line (Same as MOD-DEF2 in INF-8074i)
5	LVTTL-I/O	SCL	2-wire Serial Interface Clock (Same as MOD-DEF1 in INF-8074i)
6		Mod_ABS	Module Absent, connected to VeeT or VeeR in the module
7	LVTTL-I	RS0	Rate Select 0, optionally controls SFP+ module receiver
8	LVTTL-O	Rx_LOS	Receiver Loss of Signal Indication (In FC designated as Rx_LOS and in Ethernet designated as Signal Detect)
9	LVTTL-I	RS1	Rate Select 1, optionally controls SFP+ module transmitter
10		VeeR	Module Receiver Ground
11		VeeR	Module Receiver Ground
12	CML-O	RD-	Receiver Inverted Data Output
13	CML-O	RD+	Receiver Non-Inverted Data Output
14		VeeR	Module Receiver Ground
15		VccR	Module Receiver 3.3 V Supply
16		VccT	Module Transmitter 3.3 V Supply

17		VeeT	Module Transmitter Ground
18	CML-I	TD+	Transmitter Non-Inverted Data Input
19	CML-I	TD-	Transmitter Inverted Data Input
20		VeeT	Module Transmitter Ground



General Product Characteristics

Q/4SFP+ DAC Specifications	
Number of Lanes	4 - Tx & 4 - Rx
Maximum Data Rate	40Gbps
Operating Temperature	0 to + 70°C
Storage Temperature	-40 to + 85°C
Supply Voltage	3.3V nominal
Electrical Interface	38-pin edge connector (QSFP+) 20-pin edge connector (SFP+)
Management Interface	Serial, I^2C

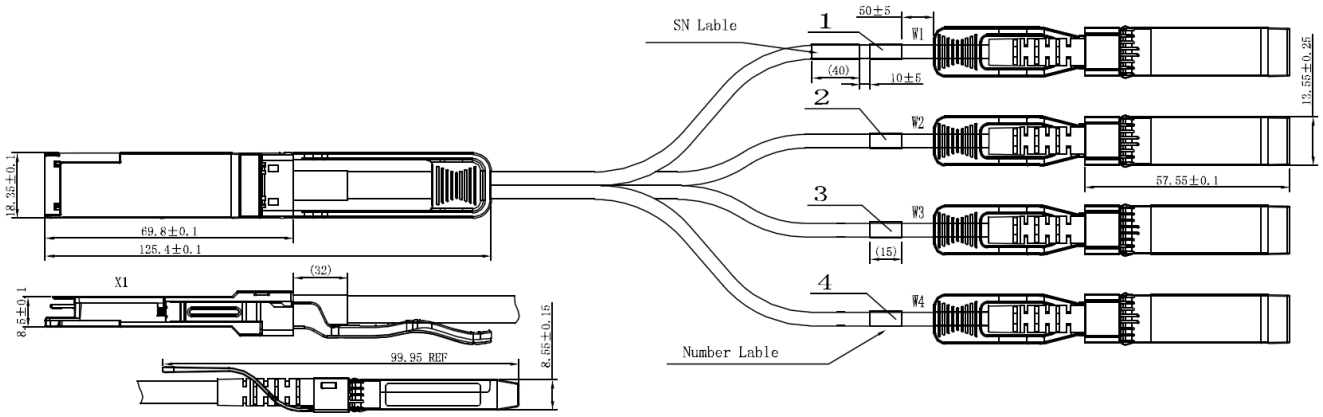
High Speed Characteristics

Parameter	Symbol	Min	Typ	Max	Units	Notes
Differential Impedance	Zd	90	100	110	Ω	
		<-12+2* SQRT (f) with f in GHz			dB	0.01~4.1GHz

Differential Input Return Loss	SDDXX	<-6.3+13* Log10/(f/5.5) with f in GHz			dB	4.1~11.1GHz
Common Mode Output Return Loss	SCCXX	< -7+1.6*f with f in GHz			dB	0.01~2.5GHz
				-3	dB	2.5~11.1GHz
Difference Waveform Distortion Penalty	dWDPc			6.75	dB	
VMA Loss	L			4.4	dB	
VMA Loss to Crosstalk Ratio	VCR	32.5			dB	

Mechanical Specifications

The connector is compatible with the SFF-8436 to SFF-8432 specification.



Length (m)	Cable AWG
1	30
2	30
3	30

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	Compliant with Standards
	CENELEC EN55022 Class B	
	CISPR22 ITE Class B	
RF Immunity(RFI)	IEC61000-4-3	Typically shows no Measurable Effect from a 10V/m Field Swept from 80 to 1000MHz
RoHS Compliance	RoHS Directive 2011/65/EU and it's Amendment Directives 6/6	RoHS 6/6 compliant

Packaging

Product is packaged in an anti-static bag