

DAC-QSFP112-400G-xM

400GBase QSFP112 Direct Attach Cable

Copper, Passive, 0.5m to 2m Lengths

FEATURES

- Compliance with SFF-8636 SFF8024
- Compliance with IEEE802.3ck & QSFP112 MSA
- Support I2C two line string interface, easy to control
- Support for hot plugging
- Low crosstalk
- Low power
- Maximum Link Length: up to 2m

APPLICATIONS

- 400G Ethernet
- Switch, Router, Data Centre, Cloud Server
- NIC adapter card

DESCRIPTION

The 400G QSFP112 Passive Direct Attach Copper Twinax Cable is designed for use in 400GBASE Ethernet. QSFP112 is the module and cage/connector system based on current QSFP, targeting 112Gbps per lane in a 4x lane QSFP system. This will greatly help the legacy QSFP users upgrade the link bandwidth to 400G per port with lower cost and shorter transition time.

WIRING DIAGRAM

X1	X2	REMARKS	X1	X2	REMARKS
18(RX1-)	37(TX1-)	pair	37(TX1-)	18(RX1-)	pair
17(RX1+)	36(TX1+)		36(TX1+)	17(RX1+)	
15(RX3-)	34(TX3-)	pair	34(TX3-)	15(RX3-)	pair
14(RX3+)	33(TX3+)		33(TX3+)	14(RX3+)	
6 (TX4+)	25(RX4+)	pair	25(RX4+)	6 (TX4+)	pair
5 (TX4-)	24(RX4-)		24(RX4-)	5 (TX4-)	
3 (TX2+)	22(RX2+)	pair	22(RX2+)	3 (TX2+)	pair
2 (TX2-)	21(RX2-)		21(RX2-)	2 (TX2-)	
1, 4, 7, 13, 16, 19, 20, 23, 26, 32, 35, 38	1, 4, 7, 13, 16, 19, 20, 23, 26, 32, 35, 38	GND	8, 9, 10, 11, 12, 27, 28, 29, 30, 31	8, 9, 10, 11, 12, 27, 28, 29, 30, 31	EEPROM point at both ends

ELECTRICAL CHARACTERISTICS

ITEM		REQUIREMENT	TEST CONDITION
Differential Impedance	Cable Impedance	100±5Ω	Rise time of 25ps (20 % - 80 %).
	Paddle Card Impedance	100±10Ω	
	Cable Termination Impedance	100±10Ω	
Differential to common-mode (Input/Output) Return loss S_{CD11}/S_{CD22}		$\text{Return_loss}(f) \geq \begin{cases} 22-10(f/26.56) & 0.05 \leq f < 26.56 \\ 15-3(f/26.56) & 26.56 \leq f \leq 40 \end{cases}$ Where f is the frequency in GHz Return_loss(f) is the Differential to common-mode return loss at frequency f	50MHz≤f ≤40GHz
Common-mode to Common-mode (Input/Output) Return loss S_{CC11}/S_{CC22}		$\text{Return_loss}(f) \geq 1.8\text{dB} \quad 0.05 \leq f \leq 40$ Where f is the frequency in GHz Return_loss(f) is the common-mode to common-mode return loss at frequency f	50MHz≤f ≤40GHz
Differential Insertion Loss (S_{DD21} Max.)		(Differential InsertionLoss Max. For TPa to TPb Excluding Test fixture) $\text{Insertion_loss}(f) \geq -19.75\text{dB} \quad 0.05 \leq f \leq 26.56$ Where f is the frequency in GHz Insertion Loss (f) Differential Insertion Loss at frequency f	50MHz≤f ≤40GHz
Differential to common-mode Conversion Loss-Differential Insertion Loss ($S_{CD21}-S_{DD21}$)		$\text{Conversion_loss}(f) - \text{IL}(f) \geq \begin{cases} 10 & 0.05 \leq f < 12.89 \\ 14-0.3108f & 12.89 \leq f < 40 \end{cases}$ Where f is the frequency in GHz Conversion_loss(f) is the cable assembly differential to common-mode conversion loss IL(f) is the cable assembly insertion loss	50MHz≤f ≤40GHz

Intra Skew	10ps/m,	10MHz≤f ≤19GHz
Low Level Contact Resistance	70Mohms Max. From initial.	EIA-364-23: Apply a maximum voltage of 20mV and a current of 100 mA.
Insulation Resistance	10Mohm (Min.)	EIA364-21:AC 300V 1 minute
Dielectric Withstanding Voltage	NO disruptive discharge.	EIA-364-20: Apply a voltage of 300 VDC for 1 minute between adjacent terminals and between adjacent terminals and ground.

ENVIRONMENTAL PERFORMANCE

ITEM	REQUIREMENT	TEST CONDITON
Operating Temperature Range	-20°C to +75°C	Cable operating temperature range.
Storage Temperature Range (in packed condition)	-40°C to +80°C	Cable storage temperature range in packed condition.
Thermal Cycling Non-Powered	No evidence of physical damage	EIA-364-32D, Method A, -25 to 90°C, 100 cycles, 15 min. dwells
Salt Spraying	48 hours salt spraying after shell corrosive area less than 5%	EIA-364-26
Mixed Flowing Gas	Pass electrical tests per 3.1 after stressing. (For connector only)	EIA-364-35 Class II, 14 days.
Temperature Life	No evidence of physical damage	EIA-364-17C w/ RH, Damp heat 90°C at 85% RH for 500 hours then return to ambient
Cable Cold Bend	4H, No evidence of physical damage	Condition: -20°C±2°C, mandrel diameter is 6 times the cable diameter.

MECHANICAL & PHYSICAL CHARACTERISTICS

ITEM	REQUIREMENT	TEST CONDITON
Vibration	Pass electrical tests per 3.1 after stressing.	Clamp & vibrate per EIA-364-28E, TC-VII, test condition letter – D, 15 minutes in X, Y & Z axis.
Cable Flex	No evidence of physical damage	Flex cable 180° for 20 cycles ($\pm 90^\circ$ from nominal position) at 12 cycles per minute with a 1.0kg load applied to the cable jacket. Flex in the boot area 90° in each direction from vertical. Per EIA-364-41C
Cable Plug Retention in Cage	90N Min. No evidence of physical damage	Force to be applied axially with no damage to cage. Per SFF 8661 Rev 2.1 Pull on cable jacket approximately 1 ft behind cable plug. No functional damage to cable plug below 90N. Per SFF-8432 Rev 5.0
Cable Retention in Plug	90N Min. No evidence of physical damage	Cable plug is fixtured with the bulk cable hanging vertically. A 90N axial load is applied (gradually) to the cable jacket and held for 1 minute. Per EIA-364-38B
Mechanical Shock	Pass electrical tests Per 3.1 after stressing.	Clamp and shock per EIA-364-27B, TC-G, 3 times in 6 directions, 100g, 6ms.
Cable Plug Insertion	60N Max. (QSFP112)	Per EIA-364-13 Test with connector, cage and module. (Latch disengaged, without heatsink)
Cable plug Extraction	30N Max. (QSFP112)	Per EIA-364-13 Test with connector, cage and module. (Latch disengaged, without heatsink)
Durability	50 cycles, No evidence of physical damage	EIA-364-09, perform plug & unplug cycles: Plug and receptacle mate rate: 250times/hour. 50times for QSFP28/SFP28 module (CONNECTOR TO PCB)

MECHANICAL DIMENSIONS (UNITS: mm)

