

DAC-QSFP56-200G-xM

200GBase QSFP56 Direct Attach Cable

Copper, Passive, 0.5m to 3m Lengths, Commercial Temperature

FEATURES

- Compliant with QSFP+ MSA and SFF-8636
- Complies with Ethernet IEEE802.3bj & IEEE802.3cd
- Support serial ID function through EEPROM
- Support hot swap, low crosstalk, low power consumption
- Support distances up to 3 meters
- Provide cable sizes from 30AWG to 26AWG
- Commercial Operating Temperature Range: 0°C to 70°C
- RoHS compliant

APPLICATIONS

- 40G / 100G / 200G Ethernet
- InfiniBand SDR, DDR, QDR, FDR, EDR, HDR
- Switches, routers, hubs, data centre

DESCRIPTION

200G QSFP56 passive cables are based on 4X25G/4X28G or 4x50G/4x56G PAM-4 structure. They meet the needs of next generation 2X100G switches, servers, routers and other product applications. The QSFP56 cable assembly uses an optimized design to reduce crosstalk and insertion loss, has excellent signal integrity, and fully complies with the next-generation Ethernet and InfiniBand standards.

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	105±5/-10Ω	Rise time of 25ps (20% - 80%).
	Paddle Card Impedance	100±10Ω	
	Cable Termination Impedance	100±15Ω	
Differential (Input/Output) Return loss S_{DD11}/S_{DD22}		$\text{Return_loss}(f) \geq \left\{ \begin{array}{ll} 16.5 - 2\sqrt{f} & 0.05 \leq f < 4.1 \\ 10.66 - 14 \log_{10}(f/5.5) & 4.1 \leq f \leq 19 \end{array} \right\}$ Where f is the frequency in GHz Return loss (f) is the return loss at frequency f	10MHz ≤ f ≤ 19GHz
Differential to common-mode (Input/Output) Return loss S_{CD11}/S_{CD22}		$\text{Return_loss}(f) \geq \left\{ \begin{array}{ll} 22 - (20/25.78)f & 0.01 \leq f < 12.89 \\ 15 - (6/25.78)f & 12.89 \leq f \leq 19 \end{array} \right\}$ Where f is the frequency in GHz Return_loss(f) is the Differential to common-mode return loss at frequency f	10MHz ≤ f ≤ 19GHz

Common-mode to Common-mode (Input/Output) Return loss S_{CC11}/S_{CC22}	$Return_loss(f) \geq 2\text{dB} \quad 0.2 \leq f \leq 19$ Where f is the frequency in GHz Return_loss(f) is the common-mode to common-mode return loss at frequency f							$10\text{MHz} \leq f \leq 19\text{GHz}$
Differential Insertion Loss (S_{DD21} Max.)	(Differential Insertion Loss Max. For TPa to TPb Excluding Test fixture)							$10\text{MHz} \leq f \leq 19\text{GHz}$
	F AWG	1.25GHz	2.5GHz	5.0GHz	7.0GHz	10GHz	12.89GHz	
	30n(1m) Max	4.5dB	5.4dB	6.3dB	7.5dB	8.5dB	10.5dB	
	30/28(3m) Max	7.5dB	9.5dB	12.2dB	14.8dB	18.0dB	21.5dB	
	26(3m) Max.	5.7dB	7.2dB	9.9 dB	11.9dB	14.1dB	16.5dB	
	26/25(5m) Max.	7.8dB	10.0dB	13.5dB	16.0dB	19.0dB	22.0dB	
Insertion Loss Deviation	$-0.176*f - 0.7 \leq \text{ILD} \leq 0.176*f + 0.7$							$50\text{MHz} \leq f \leq 19\text{GHz}$
Differential to common-mode Conversion Loss- Differential Insertion Loss ($S_{CD21}-S_{DD21}$)	$Conversion_loss(f) - IL(f) \geq$ $\left\{ \begin{array}{ll} 10 & 0.01 \leq f < 12.89 \\ 27 - (29/22)f & 12.89 \leq f < \end{array} \right\}$ 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							$10\text{MHz} \leq f \leq 19\text{GHz}$
MDNEXT(multiple disturber near-end crosstalk)	$\geq 26\text{dB} @ 12.89\text{GHz}$							$10\text{MHz} \leq f \leq 19\text{GHz}$
Intra Skew	15ps/m,							$10\text{MHz} \leq f \leq 19\text{GHz}$
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 (±90° 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 1ft 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	40N Max. (QSFP28)	Per SFF8661 Rev 2.1
Cable plug Extraction	30N Max. (QSFP28)	Place axial load on de-latch to de-latch plug. Per SFF8661 Rev 2.1
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)

