

DAC-QSFPDD-2QSFP28-xM

200GBase QSFP-DD to 2x 100GBase QSFP28 Direct Attach Cable

Copper, Passive, 1m to 3m Lengths

FEATURES

- Meets the SFF-8636 and QSFP-DD multi-source agreement standards
- Meet the IEEE 802.3bj & IEEE 802.3cd standards
- Supports I2C two-wire string interface, easy to control
- Support for hot plugging
- Low crosstalk
- Eight channel electrical interface with a data transmission rate of up to 25Gbps NRZ

APPLICATIONS

- Telecommunications equipment
- Servers
- Routers
- Switches
- Cellular infrastructure
- Multi-platform service systems
- Data networking equipment
- Storage

DESCRIPTION

QSFP-DD (Double Density) Interconnect System and Cable Assemblies feature an eight-lane electrical interface that transmits up to 25Gbps NRZ each reaching up to 200Gbps aggregate. QSFP-DD offers the same footprint as QSFP interconnects, ensuring backward compatibility. The double density feature is an extended paddle card with two rows of high-speed context. QSFP-DD meets IEEE 802.3bj, InfiniBand EDR, and SAS 3.0 specifications, allowing these connectors and cable assemblies to function across a variety of next-generation technologies and applications.

100G QSFP28 passive cable assembly products have a 4x 25G structure and meet the requirements of next generation 100G switches, servers, routers and other products. The QSFP28 cable assembly is optimised to reduce crosstalk and insertion loss with excellent signal integrity. It is fully compliant with the next generation 100G Ethernet and InfiniBand EDR standards.

WIRING DIAGRAM

START			END	
GND	X1. 1	----	X2. 20	GND
TX2-	X1. 2	---->	X2. 21	RX2-
TX2+	X1. 3	---->	X2. 22	RX2+
GND	X1. 4	----	X2. 23	GND
TX4-	X1. 5	---->	X2. 24	RX4-
TX4+	X1. 6	---->	X2. 25	RX4+
GND	X1. 7	----	X2. 26	GND
MODELL	X1. 8		X2. 27	MODPRSL
RESETL	X1. 9		X2. 28	INTL
VCCR1	X1. 10		X2. 29	VCCR1
SCL	X1. 11		X2. 30	VCC1
SDA	X1. 12		X2. 31	INITMODE
GND	X1. 13	----	X2. 32	GND
RX3+	X1. 14	<----	X2. 33	TX3+
RX3-	X1. 15	<----	X2. 34	TX3-
GND	X1. 16	----	X2. 35	GND
RX1+	X1. 17	<----	X2. 36	TX1+
RX1-	X1. 18	<----	X2. 37	TX1-
GND	X1. 19	----	X2. 38	GND
GND	X1. 20	----	X2. 1	GND
RX2-	X1. 21	<----	X2. 2	TX2-
RX2+	X1. 22	<----	X2. 3	TX2+
GND	X1. 23	----	X2. 4	GND
RX4-	X1. 24	<----	X2. 5	TX4-
RX4+	X1. 25	<----	X2. 6	TX4+
GND	X1. 26	----	X2. 7	GND
MODPRSL	X1. 27		X2. 8	MODELL
INTL	X1. 28		X2. 9	RESETL
VCCR1	X1. 29		X2. 10	VCCR1
VCC1	X1. 30		X2. 11	SCL
INITMODE	X1. 31		X2. 12	SDA
GND	X1. 32	----	X2. 13	GND
TX3+	X1. 33	---->	X2. 14	RX3+
TX3-	X1. 34	---->	X2. 15	RX3-
GND	X1. 35	----	X2. 16	GND
TX1+	X1. 36	---->	X2. 17	RX1+
TX1-	X1. 37	---->	X2. 18	RX1-
GND	X1. 38	----	X2. 19	GND

START			END	
GND	X1. 39	----	X3. 20	GND
TX6-	X1. 40	---->	X3. 21	RX2-
TX6+	X1. 41	---->	X3. 22	RX2+
GND	X1. 42	----	X3. 23	GND
TX8-	X1. 43	---->	X3. 24	RX4-
TX8+	X1. 44	---->	X3. 25	RX4+
GND	X1. 45	----	X3. 26	GND
RESERVED	X1. 46		X3. 27	MODPRSL
VS1	X1. 47		X3. 28	INTL
VCCR1	X1. 48		X3. 29	VCCR1
VS2	X1. 49		X3. 30	VCC1
VS3	X1. 50		X3. 31	INITMODE
GND	X1. 51	----	X3. 32	GND
RX7+	X1. 52	<----	X3. 33	TX3+
RX7-	X1. 53	<----	X3. 34	TX3-
GND	X1. 54	----	X3. 35	GND
RX5+	X1. 55	<----	X3. 36	TX1+
RX5-	X1. 56	<----	X3. 37	TX1-
GND	X1. 57	----	X3. 38	GND
GND	X1. 58	----	X3. 1	GND
RX6-	X1. 59	<----	X3. 2	TX2-
RX6+	X1. 60	<----	X3. 3	TX2+
GND	X1. 61	----	X3. 4	GND
RX8-	X1. 62	<----	X3. 5	TX4-
RX8+	X1. 63	<----	X3. 6	TX4+
GND	X1. 64	----	X3. 7	GND
NC	X1. 65		X3. 8	MODELL
RESERVED	X1. 66		X3. 9	RESETL
VCCR1	X1. 67		X3. 10	VCCR1
VCC2	X1. 68		X3. 11	SCL
RESERVED	X1. 69		X3. 12	SDA
GND	X1. 70	----	X3. 13	GND
TX7+	X1. 71	---->	X3. 14	RX3+
TX7-	X1. 72	---->	X3. 15	RX3-
GND	X1. 73	----	X3. 16	GND
TX5+	X1. 74	---->	X3. 17	RX1+
TX5-	X1. 75	---->	X3. 18	RX1-
GND	X1. 76	----	X3. 19	GND

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}		$16.5-2\sqrt{f}$ $0.05 \leq f < 4.1$ $10.66-14\log_{10}(f/5.5)$ $4.1 \leq f \leq 19$ Where f is the frequency in GHz Return loss (f) is the return loss at frequency f	$10\text{MHz} \leq f \leq 19\text{GHz}$
Differential to common-mode (Input/Output) Return loss S_{CD11}/S_{CD22}		$22-(20/25.78)f$ $0.01 \leq f < 12.89$ $15-(6/25.78)f$ $12.89 \leq f \leq 19$ Where f is the frequency in GHz Return_loss(f) is the Differential to common-mode return loss at frequency f	$10\text{MHz} \leq f \leq 19\text{GHz}$
Common-mode to Common-mode (Input/Output) Return loss S_{CC11}/S_{CC22}		$\text{Return_loss}(f) \geq 2\text{dB}$ $0.2 \leq f \leq 19$ Where f is the frequency in GHz Return_loss(f) is the common-mode to common-mode return loss at frequency f	$10\text{MHz} \leq f \leq 19\text{GHz}$

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Differential Insertion Loss (S_{DD21} Max.)	(Differential Insertion Loss Max. For TPa to TPb Excluding Test fixture)							10MHz ≤ f ≤ 19GHz
	F AWG	1.25GHz	2.5GHz	5.0GHz	7.0GHz	10GHz	12.89GHz	
	30(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	
Differential to common-mode Conversion Loss-Differential Insertion Loss (S_{CD21}-S_{DD21})	Conversion _loss(f) – IL(f) ≥ $\frac{10}{27-(29/22)f} \quad \begin{matrix} 0.01 \leq f < 12.89 \\ 12.89 \leq f < 15.7 \end{matrix}$ 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							10MHz ≤ f ≤ 19GHz
MDNEXT (multiple disturber near-end crosstalk)	≥ 26dB @ 12.89GHz							10MHz ≤ f ≤ 19GHz
Low Level Contact Resistance	70 milliohms 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 CHARACTERISTICS

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 90C, 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 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 a fixture 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. (QSFP56) 90N Max. (QSFP DD)	Per SFF8661 Rev 2.1 Per QSFP-DD Hardware Rev 5.0
Cable plug Extraction	30N Max. (QSFP56) 50N Max. (QSFP DD)	Place axial load on de-latch to de-latch plug. Per SFF8661 Rev 2.1. Measure without the aid of any cage kick-out springs. Place axial load on de-latch to de-latch plug. Per SFF-8432 Rev 5.0
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)

