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Technical Datasheet

DAC-QSFP-DD-800G-xM

800GBase QSFP-DD Direct Attach Cable

Copper, Passive, 0.5m to 1.5m Lengths, Commercial Temperature

FEATURES

- Compliant with IEEE 802.3CK
- Compliant with QSFP-DD MSA
- RoHS compliant
- Commercial Operating Temperature Range: 0°C to +70°C

APPLICATIONS

- Servers
- Switches
- Routers
- Data Centres
- High Performance Computing (HPC)

DESCRIPTION

QSFP-DD112 (quad small form-factor pluggable double density) doubles the density of QSFP interconnects with an eight-lane electrical interface capable of 56 Gbps NRZ or 112 Gbps PAM-4 to achieve 400 or 800 Gbps aggregate per port. The QSFP-DD112 form factor's backwards compatibility allows existing QSFP112 modules to be plugged into QSFP-DD112 ports, provide low loss, less skew and better NEXT, providing superior thermal performance and signal integrity.

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WIRING DIAGRAM

P1			P2	
GND	1	----	20	GND
TX2-	2	--->	21	RX2-
TX2+	3	--->	22	RX2+
GND	4	----	23	GND
TX4-	5	--->	24	RX4-
TX4+	6	--->	25	RX4+
GND	7	----	26	GND
MODSELL	8		27	MODPRSL
RESETL	9		28	INTL
VCCRX	10		29	VCCTX
SCL	11		30	VCC1
SDA	12		31	INITMODE
GND	13	----	32	GND
RX3+	14	<---	33	TX3+
RX3-	15	<---	34	TX3-
GND	16	----	35	GND
RX1+	17	<---	36	TX1+
RX1-	18	<---	37	TX1-
GND	19	----	38	GND
GND	20	----	1	GND
RX2-	21	<---	2	TX2-
RX2+	22	<---	3	TX2+
GND	23	----	4	GND
RX4-	24	<---	5	TX4-
RX4+	25	<---	6	TX4+
GND	26	----	7	GND
MODPRSL	27		8	MODSELL
INTL	28		9	RESETL
VCCTX	29		10	VCCRX
VCC1	30		11	SCL
INITMODE	31		12	SDA
GND	32	----	13	GND
TX3+	33	--->	14	RX3+
TX3-	34	--->	15	RX3-
GND	35	----	16	GND
TX1+	36	--->	17	RX1+
TX1-	37	--->	18	RX1-
GND	38	----	19	GND

P1			P2	
GND	39	----	58	GND
TX6-	40	--->	59	RX6-
TX6+	41	--->	60	RX6+
GND	42	----	61	GND
TX8-	43	--->	62	RX8-
TX8+	44	--->	63	RX8+
GND	45	----	64	GND
RESERVED	46		65	NC
VS1	47		66	RESERVED
VCCRX1	48		67	VCCTX1
VS2	49		68	VCC2
VS3	50		69	RESERVED
GND	51	----	70	GND
RX7+	52	<---	71	TX7+
RX7-	53	<---	72	TX7-
GND	54	----	73	GND
RX5+	55	<---	74	TX5+
RX5-	56	<---	75	TX5-
GND	57	----	76	GND
GND	58	----	39	GND
RX6-	59	<---	40	TX6-
RX6+	60	<---	41	TX6+
GND	61	----	42	GND
RX8-	62	<---	43	TX8-
RX8+	63	<---	44	TX8+
GND	64	----	45	GND
NC	65		46	RESERVED
RESERVED	66		47	VS1
VCCTX1	67		48	VCCRX1
VCC2	68		49	VS2
RESERVED	69		50	VS3
GND	70	----	51	GND
TX7+	71	--->	52	RX7+
TX7-	72	--->	53	RX7-
GND	73	----	54	GND
TX5+	74	--->	55	RX5+
TX5-	75	--->	56	RX5-
GND	76	----	57	GND

ENVIRONMENTAL PERFORMANCE – SIGNAL INTEGRITY

Parameter		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 (Input/Output) Return loss S_{DD11}/S_{DD22}		Return_loss(f)≥ $\begin{cases} 16.5-2\sqrt{f} & 0.05 \leqslant f < 4.1 \\ 10.66-14\log_{10}(f/5.5) & 4.1 \leqslant f \leqslant 40 \end{cases}$ Where f is the frequency in GHz Return loss(f) is the return loss at frequency f	10MHz≤f ≤40 GHz

CONTINUED

Differential to common-mode (Input/Output) Return loss S_{CD11}/S_{CD22}	Return_loss(f)≥ $\begin{cases} 22-10(f/26.56) & 0.05 \le f < 26.56 \\ 15-3(f/26.56) & 26.56 \le f \le 40 \end{cases}$ 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}	*Return_loss(f)*≥1.8dB 0.05≤f≤*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 Insertion Loss Max. For TPa to TPb Excluding Test fixture) Insertion _loss(f)≥-19.75dB 0.05≤f≤26.56 Where f is the frequency in GHz Insertion Loss (f) Differential Insertion Loss at frequency f	50MHz≤f ≤40GHz
Insertion Loss Deviation	-0.176*f - 0.7 ⩽ ILD ⩽ 0.176* f + 0.7	50MHz⩽f ⩽26.56GHz
Differential to common-mode Conversion Loss-Differential Insertion Loss (SCD21-SDD21)	Conversion _loss(f) – IL(f)≥ $\begin{cases} 10 & 0.05 \leqslant f < 12.89 \\ 14-0.3108f & 12.89 \leqslant f < 40 \end{cases}$ 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
MDNEXT (multiple disturber near-end crosstalk)	≥35dB @26.5GHz	10MHz≤f ≤26.5GHz
Intra Skew	10ps/m	10MHz≤f ≤26.5GHz

OTHER ELECTRICAL PERFORMANCE

Parameter	Requirement	Test Condition
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	10mOhms (Min.)	EIA364-21:AC 300V 1minute
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

Parameter	Requirement	Test Condition
Operating Temp. Range	0°C to +70°C	Cable operating temperature range.
Storage Temp. Range (in packed condition)	-20°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.
Temp. Life	No evidence of physical damage	EIA-364-17C w/ RH, Damp heat 90℃ at 85% RH for 500 hours then return to ambient
Cable Cold Bend	4H, No evidence of physical damage	Condition: -20℃±2℃, mandrel diameter is 6 times the cable diameter.

MECHANICAL & PHYSICAL CHARACTERISTICS

Parameter	Requirement	Test Condition
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 90º in each direction from vertical. Per EIA-364-41C
Cable Plug Retention in Cage	125N Min. No evidence of physical damage	Force to be applied axially with no damage to cage. Per QSFP-DD Hardware Rev 5.1 Pull on cable jacket approximately 1 ft behind cable plug. No functional damage to cable plug below 90N. Per QSFP-DD Hardware Rev 5.1
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	QSFP-DD module: 90N Max.	Per QSFP-DD Hardware Rev 5.1
Cable plug Extraction	QSFP-DD module: 50N Max.	Place axial load on de-latch to de-latch plug, Measure without the aid of any cage kick-out springs. Place axial load on de-latch to de-latch plug. Per QSFP-DD Hardware Rev 5.1
Durability	50 cycles No evidence of physical damage	EIA-364-09, perform plug & unplug cycles: Plug and receptacle mate rate: 250 times/hour. 50 times for QSFP-DD112 module (CONNECTOR TO PCB)

MECHANICAL DIMENSIONS (UNITS: mm)