

DAC-OSFP-400G-xM

400GBase OSFP112 Direct Attach Cable

Copper, Passive, 0.5m to 2m Lengths, Commercial Temperature

FEATURES

- Compliant with CMIS5.0
- OSFP MSA Ethernet Compliance with IEEE802.3ck
- Support 112G (PAM4) electrical data rates/channel
- Support I2C two-line string interface, easy to control
- Support for hot plugging
- Low crosstalk/Low power
- Maximum Link Length: up to 2m
- ROHS Compliant
- Commercial Operating Temperature Range: 0°C to 70°C

APPLICATIONS

- 400G Ethernet SWITCH/Router
- Data storage and communication industry data centre, cloud server
- NVIDIA ConnectX-7 series VPI network card

DESCRIPTION

DAC-OSFP-400G-xM 400G OSFP112 Passive Direct Attach Copper Twinax Cable is designed for use in 400G Ethernet. OSFP112 is the module and cage/connector system based on current OSFP, targeting 112Gbps per lane speed in a 4x lane OSFP system enabling the OSFP 400G interconnect ecosystem. This will greatly help legacy OSFP users upgrade the link bandwidth to 400G per port with lower cost and shorter transition time.

WIRING DIAGRAM

P1			P2	
GND	1		11	GND
TX2+	2	↔	12	RX2+
TX2-	3	↔	13	RX2-
GND	4		14	GND
TX4+	5	↔	15	RX4+
TX4-	6	↔	16	RX4-
GND	7		17	GND
GND	24		14	GND
RX3-	25	↔	15	TX3-
RX3+	26	↔	16	TX3+
GND	27		17	GND
RX1-	28	↔	18	TX1-
RX1+	29	↔	19	TX1+
GND	30		20	GND

P1			P2	
GND	31		1	GND
RX2+	32	↔	2	TX2+
RX2-	33	↔	3	TX2-
GND	34		4	GND
RX4+	35	↔	5	TX4+
RX4-	36	↔	6	TX4-
GND	37		7	GND
GND	34		24	GND
TX3-	35	↔	25	RX3-
TX3+	36	↔	26	RX3+
GND	37		27	GND
TX1-	38	↔	28	RX1-
TX1+	39	↔	29	RX1+
GND	40		30	GND

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 (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	10MHz≤f≤40GHz
Differential to common-mode (Input/Output) Return loss S_{CD11}/S_{CD22}		$22-10(f/26.56)$ $0.05 \leq f < 26.56$ $15-3(f/26.56)$ $26.56 \leq f \leq 40$ 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}		$Return_loss(f) \geq 1.8\text{dB}$ $0.05 \leq f \leq 40$ 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 TP _a to TP _b Excluding Test fixture) $Return_loss(f) \geq -19.75\text{dB}$ $0.05 \leq f \leq 26.56$ Where f is the frequency in GHz Insertion Loss (f) is the differential insertion loss at frequency f	50MHz≤f≤40GHz
Insertion Loss Deviation		$-0.176*f - 0.7 \leq \text{ILD} \leq 0.176*f + 0.7$	50MHz≤f≤26.56GHz

CONTINUED

Differential to common-mode Conversion Loss-Differential Insertion Loss ($S_{CD21}-S_{DD21}$)	$10 \quad 0.05 \leq f < 12.89$ $14-0.3108 \quad 12.89 \leq f < 40$ 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)	$\geq 35\text{dB @}26.5\text{GHz}$	$10\text{MHz} \leq f \leq 26.5\text{GHz}$
Intra Skew	10ps/m	$10\text{MHz} \leq f \leq 26.5\text{GHz}$
Low Level Contact Resistance	20milliohms Max. From initial.	EIA-364-23: Apply a maximum voltage of 20mV and a current of 100mA.
Insulation Resistance	10Mohm (Min.)	EIA364-21: AC 300V for 1 minute
Dielectric Withstanding Voltage	NO disruptive discharge.	EIA-364-20: Apply a voltage of 300 VDC for 1minute between adjacent terminals and between adjacent terminals and ground

ENVIRONMENTAL CHARACTERISTICS

ITEM	REQUIREMENT	TEST CONDITON
Operating Temperature Range	0°C to +70°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 ($\pm 90^\circ$ 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	125 N Min. No evidence of physical damage	No functional damage to module, connector, or cage with latching mechanism activated. Per OSFP_Specification_Rev5_0 5.0
Cable Retention in Plug	90N Min. No evidence of physical damage	Cable plug is 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.(55N)	Per OSFP_Specification_Rev5_0 5.0 Module to be inserted into connector and cage with latch mechanism engaged. (55N if the cage has riding heatsink)
Cable plug Extraction	30N Max. (45N)	Per OSFP_Specification_Rev5_0 5.0 Module to be removed from connector and cage with latching mechanism disengaged. (45N if the cage has riding heatsink)
Durability	50 cycles No evidence of physical damage	Per OSFP_Specification_Rev5_0 5.0, Number of cycles for an individual module, to be tested with cage, connector, and module, latches may be locked out during testing

MECHANICAL DIMENSIONS (UNITS: mm)

