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Technical Datasheet

DAC-QSFP-1SFP-xM

40GBase QSFP+ to 1x10GBase SFP+ Direct Attach Cable

Copper, Passive, 1m to 10m Lengths, Commercial Temperature

FEATURES

- SFF-8431 and SFF-8436 compliant with Ethernet IEEE802.3ba
- Supports I2C 2-wire serial interface for easy control
- Supports hot plugging
- Low crosstalk and low power consumption

APPLICATIONS

- 10G/40G Ethernet
- InfiniBand SDR, DDR, QDR
- Switches Routers
- Data Centres
- Cloud Servers

DESCRIPTION

DAC-QSFP-1SFP-xM 40G QSFP+ Passive Cable Assembly is based on the 4X10G architecture and is suited to 40G switch, server, router and other applications. It is optimized to reduce crosstalk and insertion loss, provide excellent signal integrity, and is fully compliant with next generation 40G Ethernet and InfiniBand QDR standards. SFP+ form factor equivalents support the 10G Ethernet standard, provide 10Gb/s error-free transmission, and can be used in high-density 10G Ethernet switches and network interfaces to facilitate server connectivity in data centers. QSFP+ to 1x10G SFP+ supports interconnection of two interface devices at 10Gbps per channel.

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WIRING DIAGRAM

Wire	Starting Signal	Starting	End	End Signal
W1	GND	X1.19	X2.20	GND
	RX1-	X1.18	X2.19	TX1-
	RX1+	X1,17	X2.18	TX1+
	GND	X1.35	X2.14	GND
	TX1-	X1.37	X2.12	RX1-
	TX1+	X1.36	X2.13	RX1+

ELECTRICAL CHARACTERISTICS

ITEM		REQUIREMENT					TEST CONDITION
Differential Impedance	**Cable Impedance**	100±5Ω					Rise time of 35ps (20% - 80%).
	Paddle Card Impedance	100±10Ω					
	Cable Termination Impedance	100±15Ω					
Differential (Input/Output) Return loss S_{DD11}/S_{DD22}		Return_loss(f)≥ $\begin{cases} 10 & 0.01 \le f < 4.1 \\ 6.3-13\log_{10}(f/5.5) & 4.1 \le f \le 11.1 \end{cases}$ Where f is the frequency in GHz Return loss (f) is the return loss at frequency f					0.01GHz≤f≤ 11.1GHz SFF-8431 Rev.4.1
Differential Insertion Loss (S_{DD21} Max.)		(Differential InsertionLoss Max. For TPa to TPb Excluding Test fixture)					10MHz≤ f ≤5GHz
		F AWG	0.6GHz	1.25GHz	2.5GHz	5.0GHz	10MHz≤ f ≤5GHz
		30 (1m) Max.	4.5dB	5.4dB	6.3dB	7.5dB	
		30/28 (3m) Max.	7.5dB	9.5dB	12.2dB	14.8dB	
		26 (3m) Max.	5.7dB	7.2dB	9.9 dB	11.9dB	
		26/25 (5m) Max.	7.8dB	10.0dB	13.5dB	16.0dB	
MDNEXT (multiple disturber near-end crosstalk)		≥26dB					10MHz≤ f ≤5GHz
Insertion Loss Deviation		-0.7-0.2*10-3f ≤ ILD ≤ 0.7+0.2*10-3f (f is the frequency in MHz)					10MHz≤ f ≤5GHz
Low Level Contact Resistance		70milliohms 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 1minute
Dielectric Withstanding Voltage		DC 500V 1 minute disruptive discharge.					EIA-364-20 Apply a voltage of 500 VDC for 1 minute 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)	-25°C to +85°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 90º 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. (QSFP+) 18N Max. (SFP+)	Per SFF8432 Rev 5.0.
Cable plug Extraction	30N Max. (QSFP28) 12.5N Max. (SFP28)	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: 250 times/hour. 50 times for QSFP28/SFP28 module (CONNECTOR TO PCB)

MECHANICAL DIMENSIONS (UNITS: mm)