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Technical Datasheet

DAC-SFP10G-xM

10GBase SFP+ Direct Attach Cable

Copper, Passive, 1m to 10m Lengths

FEATURES

- Compliant with MSA SFF-8431 / SFF-8432
- Compliant with IEEE 802.3ae
- Optimized NEXT & Return Loss
- Enhanced EMI / EMC performance
- Supports serial ID functionality through EEPROM
- Passive cable assembly supports distances up to 10 meters
- 30AWG to 24AWG cable sizes available
- RoHS compliant and Halogen-Free option available

APPLICATIONS

- 1-8G Fibre Channel and 1-10G Gigabit Ethernet
- Hub, Switches, Routers, Servers, Network Interface Card (NICs)
- Data centre cabling infrastructure
- Networking, Storage, Telecommunications

DESCRIPTION

SFP+ direct attach copper cable assembly is based on the 10G Ethernet IEEE802.3ae standard, fibre channel, and SFF-8431 standard. The passive SFP+ Cable is a low cost alternative for short reach applications in data centre cabling.

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WIRING DIAGRAM

Starting	End	Remark
X1. 12	X2. 19	Pair
X1. 13	X2. 18	
X1. 18	X2. 13	Pair
X1. 19	X2. 12	
X1:1, 2, 6 8, 10, 11, 14, 17, 20	X2:1, 2, 6 8, 10, 11, 14, 17, 20	Drain wire
X1:1, 4, 5 15, 16	X2:1, 4, 5 15, 16	EEPROM point at both ends

ELECTRICAL CHARACTERISTICS

<table>
<tr><th colspan="2">ITEM</th><th colspan="6">REQUIREMENT</th><th>TEST CONDITION</th></tr>
<tr><td rowspan="3">Differential Impedance</td><td>Cable Impedance</td><td colspan="6">105+5/-5Ω</td><td rowspan="3">Rise time of 35ps (20% - 80%)</td></tr>
<tr><td>Paddle Card Impedance</td><td colspan="6">100±10Ω</td></tr>
<tr><td>Cable Termination Impedance</td><td colspan="6">100±15Ω</td></tr>
<tr><td colspan="2">Differential (Input/Output) Return loss S_{DD11}/S_{DD22}</td><td colspan="6">Return loss(f)≥ $\begin{cases} 10 & 0.01 \leqslant f < 4.1 \\ 6.3\text{-}13\log_{10}(f/5.5) & 4.1 \leqslant f \leqslant 11.1 \end{cases}$
Where f is the frequency in GHz
Return loss(f) is the return loss at frequency f</td><td>0.01GHz≤f≤11.1GHz SFF-8431 Rev.4.1</td></tr>
<tr><td colspan="2" rowspan="7">Differential Insertion Loss (S_{DD21} Max.)</td><td colspan="5">(Differential Insertion Loss Max.)</td><td rowspan="7">0.01GHz≤f≤11.1GHz</td></tr>
<tr><td>F / AWG</td><td>600MHz</td><td>1.25GHz</td><td>2.5GHz</td><td>5.0GHz</td></tr>
<tr><td>30 (1m) Max</td><td>2.5dB</td><td>3.5dB</td><td>4.5dB</td><td>6.5dB</td></tr>
<tr><td>30 (2m) Max</td><td>3.8dB</td><td>5.3dB</td><td>6.8dB</td><td>9.8dB</td></tr>
<tr><td>30 (3m) Max</td><td>5.0dB</td><td>7.0dB</td><td>9.0dB</td><td>13.0dB</td></tr>
<tr><td>26 (5m) Max</td><td>5.5dB</td><td>7.0dB</td><td>10.5dB</td><td>15.0dB</td></tr>
<tr><td>24 (10m) Max</td><td>7.0dB</td><td>10.0dB</td><td>14.0dB</td><td>20.0dB</td></tr>
<tr><td colspan="2">MDNEXT (multiple disturber near-end crosstalk)</td><td colspan="6">≥26dB @5GHz</td><td>0.01GHz≤f≤11.1GHz</td></tr>
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Insertion Loss Deviation	-0.7-0.2*10-3f ≤ ILD ≤ 0.7+0.2*10-3f (f is the frequency in MHz)	0.01GHz≤f≤5.0GHz
Low Level Contact Resistance	70 Mohm Max. From initial.	EIA-364-23: Apply a maximum voltage of 20mV And a current of 100 mA.
Insulation Resistance	10 Mohm (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 1minute 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)	-20°C to +55°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℃ 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 CHARACHTERISTICS

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	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	18N Max. (SFP28)	Per SFF-8432 Rev 5.0
Cable plug Extraction	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: 250times/hour. 50times for module (CONNECTOR TO PCB)

MECHANICAL DIMENSIONS (UNITS: mm)