56Gbps QSFP Passive Direct Attach Copper Twinax Cable Specification

1 Description

56G QSFP+ passive cable assembly products, based on the 4X14G structure, this product can well meet the needs of 56G switches, servers, routers and other product applications.

The 56G QSFP+ cable assembly uses an optimized design to reduce crosstalk and insertion loss, has excellent signal integrity, and fully complies with Ethernet and InfiniBand FDR standards.

2 Features

- Compliant with QSFP + MSA and SFF-8436
- Support serial ID function through EEPROM
- Support hot swap, low crosstalk, low power consumption
- Support distances up to 5 meters
- Provide cable sizes from 30AWG to 26AWG
- Operating temperature range: 0◦C to 70◦C
- RoHS compliant

3 Applications :

10G/40G /14G/56G Ethernet
Infiniband SDR, DDR, QDR, FDR,
Switch Router Data Center, Cloud Server

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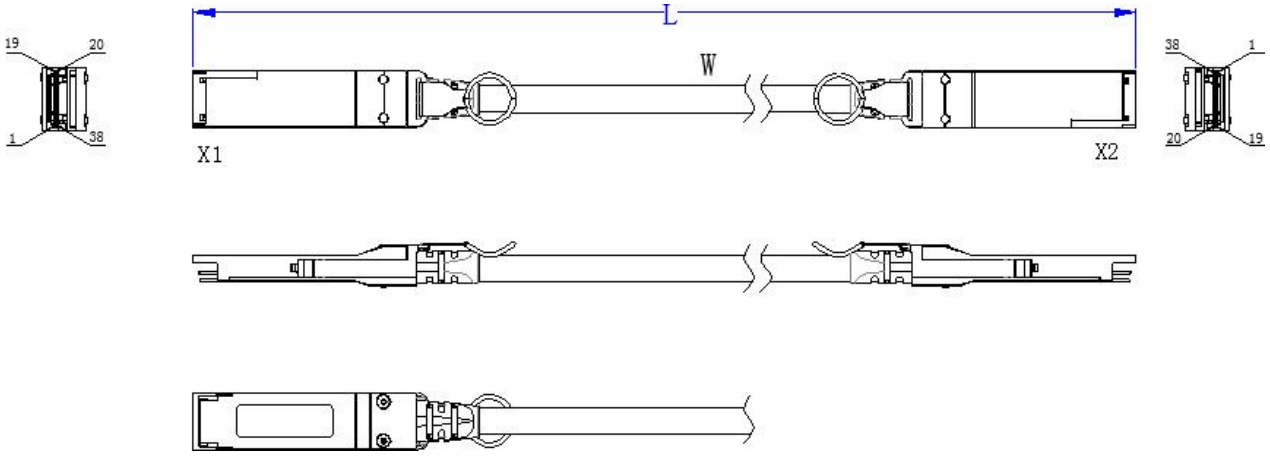
4 Outline drawing



5 Wiring Diagram：

X1	X2	REMARKS
18(RX1-)	37(TX1-)	pair
17(RX1+)	36(TX1+)	
15(RX3-)	34(TX3-)	pair
14(RX3+)	33(TX3+)	
6 (TX4+)	25(RX4+)	pair
5 (TX4-)	24(RX4-)	
3 (TX2+)	22(RX2+)	pair
2 (TX2-)	21(RX2-)	
1, 4, 7, 13, 16, 19, 20, 23, 26, 32, 35, 38	1, 4, 7, 13, 16, 19, 20 23, 26, 32, 35, 38	GND

X1	X2	REMARKS
37(TX1-)	18(RX1-)	pair
36(TX1+)	17(RX1+)	
34(TX3-)	15(RX3-)	pair
33(TX3+)	14(RX3+)	
25(RX4+)	6 (TX4+)	pair
24(RX4-)	5 (TX4-)	
22(RX2+)	3 (TX2+)	pair
21(RX2-)	2 (TX2-)	
8, 9, 10, 11, 12, 27, 28, 29, 30, 31	8, 9, 10, 11, 12, 27, 28, 29, 30, 31	EEPROM point at both ends

6 Electrical Performance：

6.1 （Signal Integrity）

ITEM）		（REQUIREMENT）	（TEST CONDITION）
（Differential Impedance）	Cable Impedance	105+5/-10Ω	Rise time of 30ps (20 % - 80 %).
	Paddle Card Impedance	100±10Ω	
	Cable Termination Impedance	100±15Ω	
[Differential (Input/Output)Return loss S_{DD11}/S_{DD22}]		Return_loss(f)≥ $\begin{cases} 12-1.71\sqrt{f} & 0.05\leq f < 5.6 \\ 6.7-13\log_{10}(f/7) & 5.6\leq f\leq 15 \end{cases}$ Where f is the frequency in GHz Return loss(f) is the return loss at frequency f	50MHz≤f ≤15GHz
[common to Differential -mode (Input/Output)Return loss S_{DC11}/S_{DC22}]		Return_loss(f)≥16-(2/3)f 0.05≤f < 15 Where f is the frequency in GHz Return_loss(f) is the Differential to common-mode return loss at frequency f	10MHz≤f ≤15GHz
[Common-mode to Common-mode (Input/Output)Return loss S_{CC11}/S_{CC22}]		*Return_loss(f)*≥2dB 0.2≤f≤14.1 Where f is the frequency in GHz Return_loss(f) is the common-mode to common-mode return loss at frequency f	200MHz≤f ≤14.1GHz
[Differential Insertion Loss (S_{DD21} Max.)]		15.00dB max @7.03125GHz	10MHz≤f ≤14GHz
[MDNEXT(multiple disturber near-end crosstalk)]		≥26dB @7.03125GHz	10MHz≤f ≤14GHz
[Intra Skew]		15ps/m,	

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6.2 （Other Electrical Performance）

（ITEM）	（REQUIREMENT）	（TEST CONDITON）
[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]	NO disruptive discharge.	EIA-364-20:Apply a voltage of 300 VDC for 1minute between adjacent terminals And between adjacent terminals and ground.

7 （Environment Performance）

（ITEM）	（REQUIREMENT）	（TEST CONDITON）
[Operating Temp. Range]	-20°C to +75°C	Cable operating temperature range.
Storage Temp. 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.
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.

8 （Mechanical and 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.
Twist	No evidence of physical damage	Twist cable 180° (±90° from nominal position) for 100 cycles at 30 cycles per minute with a 0.5kg load applied to the cable jacket. Clamp position: 300mm
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 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 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 SFF8436 Per SFF-8432
Cable plug Extraction	30N Max. (QSFP+) 12.5N Max. (SFP+)	Place axial load on de-latch to de-latch plug.Per SFF8436 Measure without the aid of any cage kick-out springs. Place axial load on de-latch to de-latch plug. Per SFF-8432
Durability	50 cycles,No evidence of physical damage	EIA-364-09, perform plug &unplug cycles:Plug and receptacle mate rate: 250times/hour. 50times for QSFP+/SFP+ module (CONNECTOR TO PCB)