

100Gbps QSFP28 To 4x 25G SFP28 Passive High Speed Cable

Product Description

100G QSFP28 passive copper direct-attach cables are suitable for very short distances and offer a highly cost-effective way to establish a 100-Gigabit link between QSFP28 ports of QSFP28 switches within racks and across adjacent racks. These cables are used for 100GbE and Infiniband standards, to maximize performance. 100G QSFP28 are designed to meet emerging data center and high performance computing application needs for a high density cabling interconnect system capable of delivering an aggregate data bandwidth of 40Gb/s. This interconnect system is fully compliant with existing industry standard specifications such as the QSFP MSA and IBTA (InfiniBand Trade Association). The 100G QSFP28 cables support the bandwidth transmission requirements as defined by IEEE 802.3ba (100Gb/s) and Infiniband QDR (4x125 Gb/s per channel) specifications.



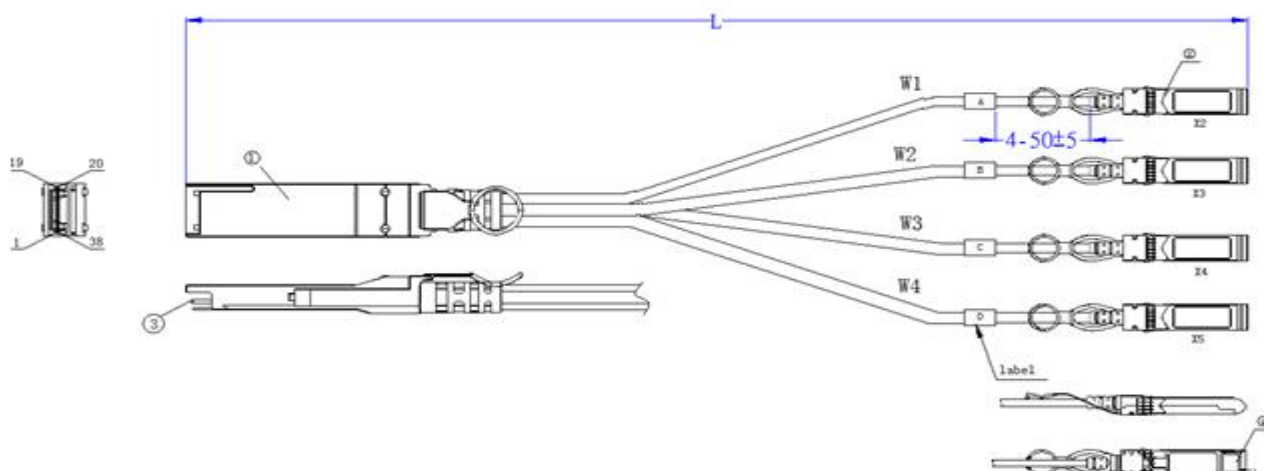
Features

- Compliant SFF-8636、SFF-8402
- Compliant Sonet IEEE802.3bj
- Operating case temperature: -40 to 85°C
- All-metal housing for superior EMI performance
- Precision process control for minimization of pair-to-pair skew
- AC coupling of PECL signals
- EEPROM for cable signature & system communications
- 30 AWG to 26 AWG cable sizes available
- RoHS compliant

Application

- 10G/40G /100G Sonet
- Infiniband SDR, DDR, QDR,FDR,EDR
- Switch
- Routers
- DATA Center & Clouds

Outline drawing



Wiring Diagram

wire	Starting signal	Starting	End	End signal
W1	RX1+	X1. 17	X2. 18	TX1+
	RX1-	X1. 18	X2. 19	TX1-
	GND	X1. 19	X2. 20	GND
	TX1+	X1. 36	X2. 13	RX1+
	TX1-	X1. 37	X2. 12	RX1-
	GND	X1. 38	X2. 14	GND
W2	GND	X1. 20	X3. 20	GND
	RX2-	X1. 21	X3. 19	TX2-
	RX2+	X1. 22	X3. 18	TX2+
	GND	X1. 1	X3. 14	GND
	TX2-	X1. 2	X3. 12	RX2-
	TX2+	X1. 3	X3. 13	RX2+
wire	Starting signal	Starting	End	End signal
W3	RX3+	X1. 14	X4. 18	TX3+
	RX3-	X1. 15	X4. 19	TX3-
	GND	X1. 16	X4. 20	GND
	TX3+	X1. 33	X4. 13	RX3+
	TX3-	X1. 34	X4. 12	RX3-
	GND	X1. 35	X4. 14	GND
W4	GND	X1. 23	X5. 20	GND
	RX4-	X1. 24	X5. 19	TX4-
	RX4+	X1. 25	X5. 18	TX4+
	GND	X1. 4	X5. 14	GND
	TX4-	X1. 5	X5. 12	RX4-
	TX4+	X1. 6	X5. 13	RX4+

Electrical Performance

Signal Integrity:

ITEM		REQUIREMENT	TEST CONDITION
Differential Impedance	Cable Impedance	105+5/-10Ω	Rise time of 25ps (20 % - 80 %).
	Paddle Card Impedance	100±10Ω	
	Cable Termination Impedance	100±15Ω	

Differential (Input/Output)Return loss S_{DD11}/S_{DD22}	<div>Return_loss(f)≥<div><div>$16.5-2\sqrt{f}$$0.05\leq f < 4.1$</div><div>$10.66-14\log_{10}(f/ 5.5)$$4.1\leq f\leq 19$</div></div></div> <div>Where f is the frequency in GHz Return loss(f) is the return loss at frequency f</div>	10MHz≤f ≤19GHz																																			
Differential to common-mode (Input/Output)Return loss S_{CD11}/S_{CD22}	<div>Return_loss(f)≥<div><div>$22-(20/25.78)f$$0.01\leq f < 12.89$</div><div>$15-(6/25.78)f$$12.89\leq f\leq 19$</div></div></div> <div>Where f is the frequency in GHz Return_loss(f) is the Differential to common-mode return loss at frequency f</div>	10MHz≤f ≤19GHz																																			
Common-mode to Common-mode (Input/Output)Return loss S_{CC11}/S_{CC22}	<div>$Return_loss(f)\geq 2\text{dB}$$0.2\leq f\leq 19$</div> <div>Where f is the frequency in GHz Return_loss(f) is the common-mode to common-mode return loss at frequency f</div>	10MHz≤f ≤19GHz																																			
Differential Insertion Loss (S_{DD21} Max.)	<div>(Differential Insertion Loss Max. For TPa to TPb Excluding Test fixture)</div> <table><tr><td>F AWG</td><td>1.25G Hz</td><td>2.5G Hz</td><td>5.0G Hz</td><td>7.0G Hz</td><td>10Gh z</td><td>12.89G hz</td></tr><tr><td>30(1m)Max.</td><td>4.5dB</td><td>5.4dB</td><td>6.3dB</td><td>7.5dB</td><td>8.5dB</td><td>10.5dB</td></tr><tr><td>30/28(3m)Max.</td><td>7.5dB</td><td>9.5dB</td><td>12.2dB</td><td>14.8dB</td><td>18.0dB</td><td>21.5dB</td></tr><tr><td>26(3m)Max.</td><td>5.7dB</td><td>7.2dB</td><td>9.9dB</td><td>11.9dB</td><td>14.1dB</td><td>16.5dB</td></tr><tr><td>26/25(5m)Max.</td><td>7.8dB</td><td>10.0dB</td><td>13.5dB</td><td>16.0dB</td><td>19.0dB</td><td>22.0dB</td></tr></table>	F AWG	1.25G Hz	2.5G Hz	5.0G Hz	7.0G Hz	10Gh z	12.89G hz	30(1m)Max.	4.5dB	5.4dB	6.3dB	7.5dB	8.5dB	10.5dB	30/28(3m)Max.	7.5dB	9.5dB	12.2dB	14.8dB	18.0dB	21.5dB	26(3m)Max.	5.7dB	7.2dB	9.9dB	11.9dB	14.1dB	16.5dB	26/25(5m)Max.	7.8dB	10.0dB	13.5dB	16.0dB	19.0dB	22.0dB	10MHz≤f ≤19GHz
F AWG	1.25G Hz	2.5G Hz	5.0G Hz	7.0G Hz	10Gh z	12.89G hz																															
30(1m)Max.	4.5dB	5.4dB	6.3dB	7.5dB	8.5dB	10.5dB																															
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Differential to common-mode Conversion Loss-Differential Insertion Loss($S_{CD21}-S_{DD21}$)	<div>Conversion_loss(f) – IL(f)≥<div><div>$10$$0.01\leq f < 12.89$</div><div>$27-(29/22)f$$12.89\leq f < 15.7$</div><div>$6.3$$15.7\leq f\leq 19$</div></div></div> <div>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</div>	10MHz≤f ≤19GHz																																			
MDNEXT(multiple disturber near-end crosstalk)	≥35dB @12.89GHz	10MHz≤f ≤19GHz																																			
Intra Skew	15ps/m,	10MHz≤f ≤19GHz																																			

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.

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°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 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 90° 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.(QSFP28) 18N Max.(SFP28)	Per SFF8661 Rev 2.1 Per SFF-8432 Rev 5.0
Cable plug Extraction	30N Max. (QSFP28) 12.5N Max. (SFP28)	Place axial load on de-latch to de-latch plug.Per SFF8661 Rev 2.1 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 QSFP28/SFP28 module (CONNECTOR TO PCB)