EDQPY-4SPx

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

PRODUCT FEATURES

- Compliant SFF-8636、SFF-8402
- Compliant Sonet IEEE802.3bj
- 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

APPLICATIONS

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

DESCRIPTIONS

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 Infniband 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.

Ordering Information

Part No.	Description
EDQPY-4SPx	100G QSFP28 Copper Cable Assembly (DAC) 0~3M
EDQPY-4SPx-26	100G QSFP28 Copper Cable Assembly (DAC) 5M

1. where "x" denotes cable length in meters. Examples are as follows:
2. x = 1 for 1m,
3. 0~3M is the fiber diameter 30AWG
4. 5M is the fiber diameter 26AWG

5. Electrical Performance

6. 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}]		Return_loss(f)≥ Where	10MHz≤f ≤19GHz

<table>
<tr><td></td><td>f is the frequency in GHz
Return loss(f) is the return loss at frequency f</td><td></td></tr>
<tr><td>Differential to common-mode (Input/Output)Return loss S_{CD11}/S_{CD22}</td><td>Return_loss(f)≥

Where
f is the frequency in GHz
Return_loss(f) is the Differential to common-mode return loss at frequency f</td><td>10MHz≤f ≤19GHz</td></tr>
<tr><td>Common-mode to Common-mode (Input/Output)Return loss S_{CC11}/S_{CC22}</td><td>Return_loss(f)≥2dB 0.2≤f≤19
Where
f is the frequency in GHz
Return_loss(f) is the common-mode to common-mode return loss at frequency f</td><td>10MHz≤f ≤19GHz</td></tr>
<tr><td rowspan="7">Differential Insertion Loss (S_{DD21} Max.)</td><td colspan="7">(Differential InsertionLoss Max. For TPa to TPb Excluding Test fixture)</td><td>10MHz≤f ≤19GHz</td></tr>
<tr><td>F
AWG</td><td>1.25GHz</td><td>2.5GHz</td><td>5.0GHz</td><td>7.0GHz</td><td>10Ghz</td><td>12.89Ghz</td><td rowspan="5"></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>9.9 dB</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>
<tr><td colspan="8"></td></tr>
<tr><td>Differential to common-mode Conversion Loss-Differential Insertion Loss(S_{CD21}-S_{DD21})</td><td>Conversion _loss(f) – IL(f)≥
10 0.01≤f＜12.89
27-(29/22)f 12.89≤f＜15.7
6.3 15.7≤f≤19
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</td><td>10MHz≤f ≤19GHz</td></tr>
<tr><td>MDNEXT(multiple disturber near-end crosstalk)</td><td>≥35dB @12.89GHz</td><td>10MHz≤f ≤19GHz</td></tr>
<tr><td>[Intra Skew</td><td>15ps/m,</td><td>10MHz≤f ≤19GHz</td></tr>
</table>

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

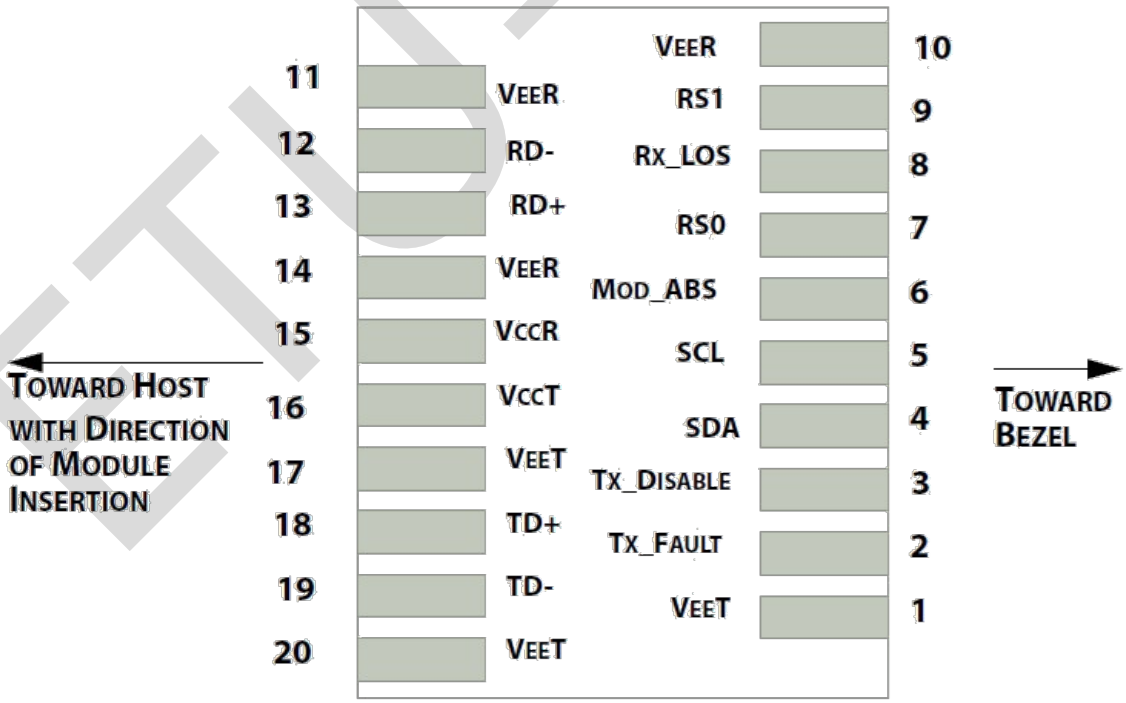
ITEM	REQUIREMENT	TEST CONDITON
Operating Temp. Range	-20°C to +75°C	Cable operating temperature range.
Storage Temp. Range (in packed condition)	-40°C to +80°C	Cable storage temperature range in packed condition.
Thermal Cycling Non-Powered	No evidence of physical damage	EIA-364-32D, Method A, -25 to 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℃ 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 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.(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)

Pin Diagram



Pin Descriptions

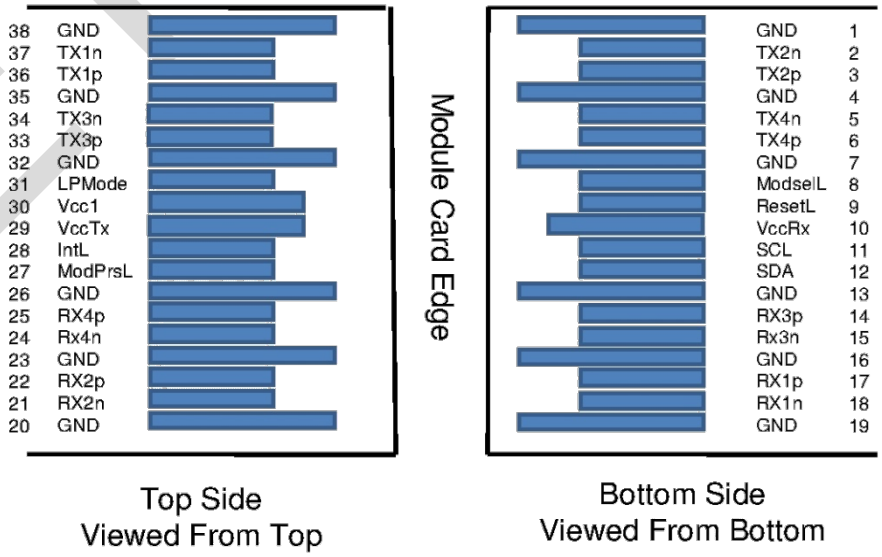
SFP28 Pin Function Definition

1		VeeT	Transmitter Ground	
2	LV-TTL-O	TX_Fault	N/A	1
3	LV-TTL-I	TX_DIS	Transmitter Disable	2
4	LV-TTL-I/O	SDA	Tow Wire Serial Data	
5	LV-TTL-I	SCL	Tow Wire Serial Clock	
6		MOD_DEF0	Module present, connect to VeeT	
7	LV-TTL-I	RS0	N/A	1
8	LV-TTL-O	LOS	LOS of Signal	2
9	LV-TTL-I	RS1	N/A	1
10		VeeR	Reciever Ground	
11		VeeR	Reciever Ground	
12	CML-O	RD-	Reciever Data Inverted	
13	CML-O	RD+	Reciever Data Non-Inverted	
14		VeeR	Reciever Ground	
15		VccR	Reciever Supply 3.3V	
16		VccT	Transmitter Supply 3.3V	
17		VeeT	Transmitter Ground	
18	CML-I	TD+	Transmitter Data Non-Inverted	
19	CML_I	TD-	Transmitter Data Inverted	
20		VeeT	Transmitter Ground	

Note:

1. Signals not supported in SFP+ Copper pulled-downto VeeT with 30K ohms resistor
2. Passive cable assemblies do not support LOS and TX_DIS

Pin Diagram



Pin Descriptions

PIN	Logic	Symbol	Name/Description	Note
1		GND	Ground	1
2	CML-I	Tx2n	Transmitter Inverted Data Input	
3	CML-I	Tx2p	Transmitter Non-Inverted Data output	
4		GND	Ground	1
5	CML-I	Tx4n	Transmitter Inverted Data Input	
6	CML-I	Tx4p	Transmitter Non-Inverted Data output	
7		GND	Ground	1
8	LVTLL-I	ModSelL	Module Select	
9	LVTLL-I	ResetL	Module Reset	
10		VccRx	+ 3.3V Power Supply Receiver	2
11	LVCMOS-I/O	SCL	2-Wire Serial Interface Clock	
12	LVCMOS-I/O	SDA	2-Wire Serial Interface Data	
13		GND	Ground	
14	CML-O	Rx3p	Receiver Non-Inverted Data Output	
15	CML-O	Rx3n	Receiver Inverted Data Output	
16		GND	Ground	1
17	CML-O	Rx1p	Receiver Non-Inverted Data Output	
18	CML-O	Rx1n	Receiver Inverted Data Output	
19		GND	Ground	1
20		GND	Ground	1
21	CML-O	Rx2n	Receiver Inverted Data Output	
22	CML-O	Rx2p	Receiver Non-Inverted Data Output	
23		GND	Ground	1
24	CML-O	Rx4n	Receiver Inverted Data Output	1
25	CML-O	Rx4p	Receiver Non-Inverted Data Output	
26		GND	Ground	1
27	LVTTL-O	ModPrsL	Module Present	
28	LVTTL-O	IntL	Interrupt	
29		VccTx	+3.3 V Power Supply transmitter	2
30		Vcc1	+3.3 V Power Supply	2
31	LVTTL-I	LPMode	Low Power Mode	
32		GND	Ground	1
33	CML-I	Tx3p	Transmitter Non-Inverted Data Input	
34	CML-I	Tx3n	Transmitter Inverted Data Output	
35		GND	Ground	1

36	CML-I	Tx1p	Transmitter Non-Inverted Data Input	
37	CML-I	Tx1n	Transmitter Inverted Data Output	
38		GND	Ground	1

Notes:

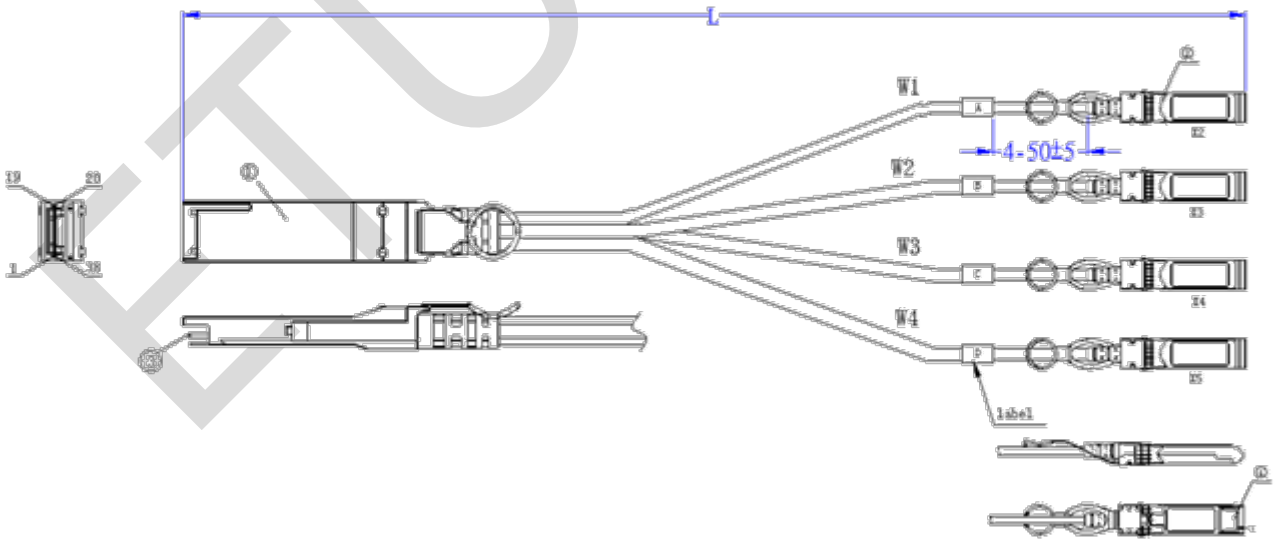
1. Module circuit ground is isolated from module chassis ground within the module. GND is the symbol for signal and supply (power) common for QSFP modules.
2. The connector pins are each rated for a maximum current of 500mA.

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+

Outline drawing



Revision History

Version No.	Date	Description
1.0	May 18, 2018	Preliminary datasheet
1.1	Aug 12,2024	Product upgrades

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