

## QSFP-DD

### EQDDP40X-32Q5CNxx

#### 400Gbps QSFP DD To 2x 200G QSFP56 Passive High Speed Cable

- Comply with SFF-8636&QSFP-DD MSA
- Complies with Ethernet IEEE802.3bj/IEEE 802.3cd
- Support serial ID function through EEPROM
- Support hot swap, low crosstalk, low power consumption
- Support the maximum distance of 3 meters
- Operating temperature range: 0°C to 70°C
- RoHS compliant
- Eight-lane electrical interface transmits up to 28Gbps NRZ or 56Gbps PAM4



## Applications

### Telecommunications equipment

- 200g/400g Ethernet
- Switches, routers, servers, hubs, data center cabling

## Description

QSFP-DD (Double Density) has eight-channel electrical interfaces, with data transmission rates up to 28Gbps NRZ or 56Gbps PAM4, and total data rates up to 200Gbps or 400Gbps. QSFP-DD connectors and cable assemblies comply with IEEE 802.3bj, InfiniBand EDR and SAS 3.0 specifications, so they are suitable for various next-generation technologies and applications.

QSFP56 passive cable assembly products, based on 4X50G or 4X56G structure, can well meet the application requirements of next-generation 200G switches, servers, routers and other products. QSFP56 cable assemblies are optimized to reduce crosstalk and insertion loss, and have good signal integrity, fully complying with the next-generation 200G Ethernet and InfiniBand HDR standards.

## Wiring Diagram

START			END	
GND	X1. 1	----	X2. 20	GND
TX2-	X1. 2	--->	X2. 21	RX2-
TX2+	X1. 3	--->	X2. 22	RX2+
GND	X1. 4	----	X2. 23	GND
TX4-	X1. 5	--->	X2. 24	RX4-
TX4+	X1. 6	--->	X2. 25	RX4+
GND	X1. 7	----	X2. 26	GND
MODSELL	X1. 8	----	X2. 27	MODPRSL
RESETL	X1. 9	----	X2. 28	INTL
VCCR1	X1. 10	----	X2. 29	VCCR1
SCL	X1. 11	----	X2. 30	VCC1
SDA	X1. 12	----	X2. 31	INITMODE
GND	X1. 13	----	X2. 32	GND
RX3+	X1. 14	<---	X2. 33	TX3+
RX3-	X1. 15	<---	X2. 34	TX3-
GND	X1. 16	----	X2. 35	GND
RX1+	X1. 17	<---	X2. 36	TX1+
RX1-	X1. 18	<---	X2. 37	TX1-
GND	X1. 19	----	X2. 38	GND
GND	X1. 20	----	X2. 1	GND
RX2-	X1. 21	<---	X2. 2	TX2-
RX2+	X1. 22	<---	X2. 3	TX2+
GND	X1. 23	----	X2. 4	GND
RX4-	X1. 24	<---	X2. 5	TX4-
RX4+	X1. 25	<---	X2. 6	TX4+
GND	X1. 26	----	X2. 7	GND
MODPRSL	X1. 27	----	X2. 8	MODSELL
INTL	X1. 28	----	X2. 9	RESETL
VCCR1	X1. 29	----	X2. 10	VCCR1
VCC1	X1. 30	----	X2. 11	SCL
INITMODE	X1. 31	----	X2. 12	SDA
GND	X1. 32	----	X2. 13	GND
TX3+	X1. 33	--->	X2. 14	RX3+
TX3-	X1. 34	--->	X2. 15	RX3-
GND	X1. 35	----	X2. 16	GND
TX1+	X1. 36	--->	X2. 17	RX1+
TX1-	X1. 37	--->	X2. 18	RX1-
GND	X1. 38	----	X2. 19	GND

START			END	
GND	X1. 39	----	X3. 20	GND
TX6-	X1. 40	--->	X3. 21	RX2-
TX6+	X1. 41	--->	X3. 22	RX2+
GND	X1. 42	----	X3. 23	GND
TX8-	X1. 43	--->	X3. 24	RX4-
TX8+	X1. 44	--->	X3. 25	RX4+
GND	X1. 45	----	X3. 26	GND
RESERVED	X1. 46	----	X3. 27	MODPRSL
VS1	X1. 47	----	X3. 28	INTL
VCCR1	X1. 48	----	X3. 29	VCCR1
VS2	X1. 49	----	X3. 30	VCC1
VS3	X1. 50	----	X3. 31	INITMODE
GND	X1. 51	----	X3. 32	GND
RX7+	X1. 52	<---	X3. 33	TX3+
RX7-	X1. 53	<---	X3. 34	TX3-
GND	X1. 54	----	X3. 35	GND
RX5+	X1. 55	<---	X3. 36	TX1+
RX5-	X1. 56	<---	X3. 37	TX1-
GND	X1. 57	----	X3. 38	GND
GND	X1. 58	----	X3. 1	GND
RX6-	X1. 59	<---	X3. 2	TX2-
RX6+	X1. 60	<---	X3. 3	TX2+
GND	X1. 61	----	X3. 4	GND
RX8-	X1. 62	<---	X3. 5	TX4-
RX8+	X1. 63	<---	X3. 6	TX4+
GND	X1. 64	----	X3. 7	GND
NC	X1. 65	----	X3. 8	MODSELL
RESERVED	X1. 66	----	X3. 9	RESETL
VCCR1	X1. 67	----	X3. 10	VCCR1
VCC2	X1. 68	----	X3. 11	SCL
RESERVED	X1. 69	----	X3. 12	SDA
GND	X1. 70	----	X3. 13	GND
TX7+	X1. 71	--->	X3. 14	RX3+
TX7-	X1. 72	--->	X3. 15	RX3-
GND	X1. 73	----	X3. 16	GND
TX5+	X1. 74	--->	X3. 17	RX1+
TX5-	X1. 75	--->	X3. 18	RX1-
GND	X1. 76	----	X3. 19	GND

## 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	

<p>[Differential (Input/Output)Return loss <math>S_{DD11}/S_{DD22}</math>]</p>	<p>Return_loss(f)≥ <math>16.5-2\sqrt{f}</math> <math>0.05\leq f &lt; 4.1</math>  <math>10.66-14\log_{10}(f/ 5.5)</math> <math>4.1\leq f\leq 19</math></p> <p>Where  f is the frequency in GHz</p>	<p>10MHz≤f ≤19GHz</p>						
<p>Return loss(f) is the return loss at frequency f</p>								
<p>[Differential to common-mode (Input/Output)Return loss <math>S_{CD11}/S_{CD22}</math>]</p>	<p>Return_loss(f)≥ <math>22-(20/25.78)f</math> <math>0.01\leq f &lt; 12.89</math>  <math>15-(6/25.78)f</math> <math>12.89\leq f\leq 19</math></p> <p>Where  f is the frequency in GHz  Return_loss(f) is the Differential to common-mode return loss at frequency f</p>	<p>10MHz≤f ≤19GHz</p>						
<p>[Common-mode to Common-mode (Input/Output)Return loss <math>S_{CC11}/S_{CC22}</math>]</p>	<p>Return_loss(f)≥2dB <math>0.2\leq f\leq 19</math></p> <p>Where  f is the frequency in GHz  Return_loss(f) is the common-mode to common-mode return loss at frequency f</p>	<p>10MHz≤f ≤19GHz</p>						
<p>[Differential Insertion Loss (<math>S_{DD21}</math> Max.)]</p>	<p>(Differential InsertionLoss Max. For TPa to TPb Excluding Test fixture )</p>							<p>10MHz≤f ≤19GHz</p>
	<p>F AWG</p>	<p>1.25GHz</p>	<p>2.5GHz</p>	<p>5.0GHz</p>	<p>7.0GHz</p>	<p>10Ghz</p>	<p>12.89Ghz</p>	
	<p>30(1m) Max.</p>	<p>4.5dB</p>	<p>5.4dB</p>	<p>6.3dB</p>	<p>7.5dB</p>	<p>8.5dB</p>	<p>10.5dB</p>	
	<p>30/28(3m) Max.</p>	<p>7.5dB</p>	<p>9.5dB</p>	<p>12.2dB</p>	<p>14.8dB</p>	<p>18.0dB</p>	<p>21.5dB</p>	
	<p>26(3m) Max.</p>	<p>5.7dB</p>	<p>7.2dB</p>	<p>9.9 dB</p>	<p>11.9dB</p>	<p>14.1dB</p>	<p>16.5dB</p>	
	<p>26/25(5m) Max.</p>	<p>7.8dB</p>	<p>10.0dB</p>	<p>13.5dB</p>	<p>16.0dB</p>	<p>19.0dB</p>	<p>22.0dB</p>	

Differential to common-mode Conversion Loss-Differential Insertion Loss( $S_{CD21}-S_{DD21}$ )	$10 \leq f < 12.89$ $27-(29/22)f \leq f < 12.89$	$0.01 \leq f < 12.89$	
	<p>Where</p> <p><math>f</math> is the frequency in GHz</p> <p>Conversion_loss(<math>f</math>) is the cable assembly differential to common-mode conversion loss</p> <p>IL(<math>f</math>) is the cable assembly insertion loss</p>	10MHz ≤ f ≤ 19GHz	
[MDNEXT(multiple disturber near-end crosstalk)]	≥26dB @12.89GHz		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.

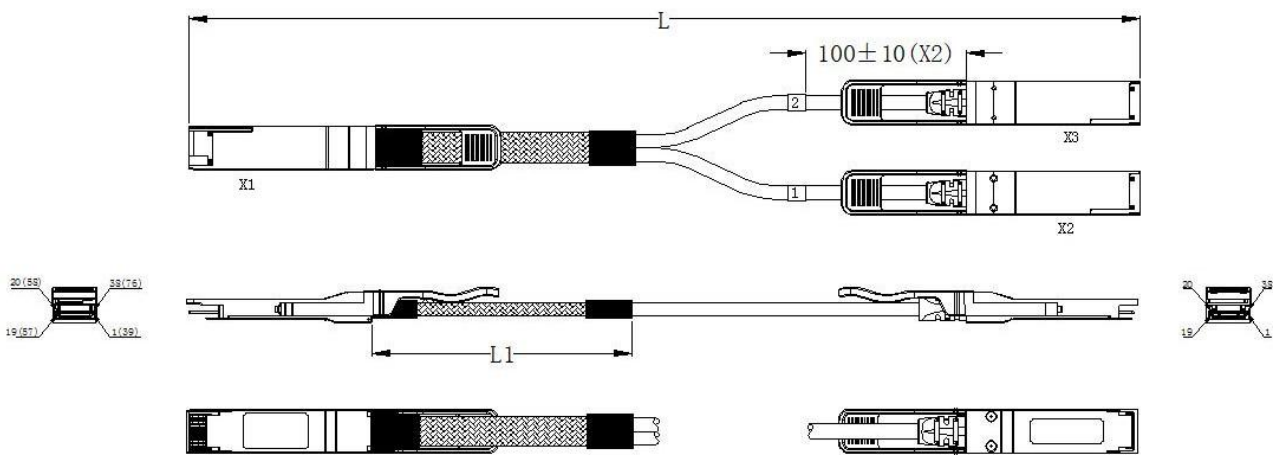
[Storage Temp. Range (in packed condition)]	-40°C to +80°C	Cable storage temperature range in packed condition.
[Thermal Cycling Non-Powered]	No evidence of physical damage	EIA-364-32D, Method A, -25 to 90C, 100 cycles, 15 min. dwells
Salt Spraying]	48 hours salt spraying after shell corrosive area less 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.
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.(QSFP56) 90N Max.(QSFP DD)	Per SFF8661 Rev 2.1 Per QSFP-DD Hardware Rev 5.0
Cable plug Extraction	30N Max. (QSFP56) 50N Max.(QSFP DD)	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)

## Outline drawing



M.P/N	C.P/N	L(mm)	L1	AWG
EQDDP40X-32Q5CN0	TBD	500±15	100±10	30
EQDDP40X-32Q5CN1	TBD	1000±25	200±10	30
EQDDP40X-32Q5CN1.5	TBD	1500±30		30
EQDDP40X-32Q5CNxx2	TBD	2000±35		28
EQDDP40X-32Q5CN2.5	TBD	2500±35		27
EQDDP40X-32Q5CN3	TBD	3000±45		27

## Compatibility Test

In order to ensure the product compatibility, our products will be tested on the switch before shipment. Our modules can be compatible with many mainstream brand switches, such as Cisco, Juniper, Extreme, Brocade, IBM, H3C, HP, Huawei, D-Link, Mikrotik, ZTE, TP-Link...

Our test equipment: VOLKTEK MEN-4110, HP 2530-8G, CRS226-24G-25+RM, Catalyst 2960G Series, Catalyst 3850 XS 10G SFP+, Catalyst 3750-E Series, HUAWEI S5700Series, H3C S3100V2 Series, Juniper-EX4200, etc.



**Cisco Catalyst 3850**



**HUAWEI S5700**



**H3C S3100V2**



**HP J9264AR**



**Juniper EX 4200**



**Alcatel 6850E-U24X**



**Mikrotik CR5226-24G-25+RM**



**Cisco Catalyst 2960G**



**Volktek MEN-4110**

## Product Production Process

# Quality Assurance

Continuous introduction of new equipment, produced by strict standards, strict quality inspection, to guarantee the high quality standard of each product.



**Standardized  
Production Line**



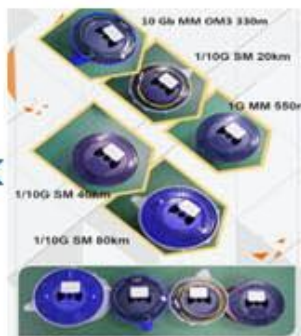
**Professional  
Welding**



**Assembling**



**Aging Testing**



**Distance Testing**



**Cleaning end face**



**Product Initial Test**



**Switch Testing**



**Product Final Test**



## Packaging



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