EDQD400-x

400Gbps OSFP to QSFPDD Passive High Speed Cable

PRODUCT FEATURES

- Products Compliance with CMIS4.0, OSFP_MSA, QSFP DD MSA
- Ethernet-Compliance with IEEE802.3cd
- Support 56G (PAM4) electrical data rates/channel
- Support I2C two - line string interface, easy to control
- Support for hot plugging
- Low crosstalk/Low power
- Maximum Link Length: up to 3m
- ROHS Compliance

APPLICATIONS

- 400G Ethernet
- SWITCH/ Router
- Data storage and communication industry
- Data center, cloud server

Description

The 400G OSFP56 Passive Direct Attach Copper Twinax Cable is designed for use in 400GBASE Ethernet., OSFP56 is the module and cage/connector system based on current OSFP, targeting to support the 56Gb/s per lane speed in a 8x lane OSFP system and to enable the OSFP 400G interconnect ecosystem. This will greatly help the legacy OSFP users upgrade the link bandwidth to 400G per port with lower cost and shorter transition time.

QSFP-DD (quad small form-factor pluggable double density) doubles the density of QSFP interconnects with an eight-lane electrical interface capable of 28Gbps NRZ or 56Gbps PAM-4 to achieve 200 or 400Gbps aggregate per port. The QSFP-DD portfolio's backwards compatibility allows existing QSFP modules to be plugged into QSFP-DD ports, provide low loss, less skew and better NEXT. providing superior thermal and signal integrity performance.

Information

Part No.	Description
EDQD400-x	400Gbps OSFP To QSFPDD Passive High Speed Cable xM

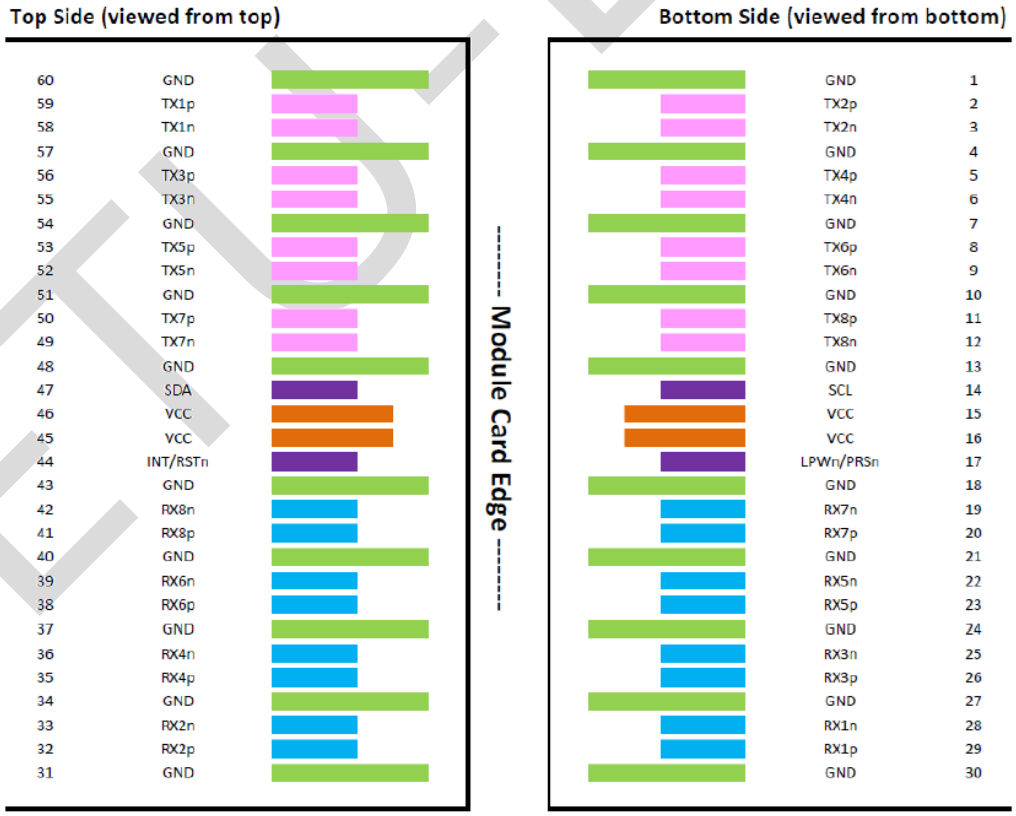
PN	Data Rate	Length	Wire Gauge	Temp.Range
EDQD400-0.5-30	400G	0.5M	30AWG	0-70°C
EDQD400-1-30	400G	1M	30AWG	0-70°C
EDQD400-1.5-30	400G	1.5M	30AWG	0-70°C
EDQD400-2-28	400G	2M	28AWG	0-70°C
EDQD400-3-27	400G	3M	27AWG	0-70°C

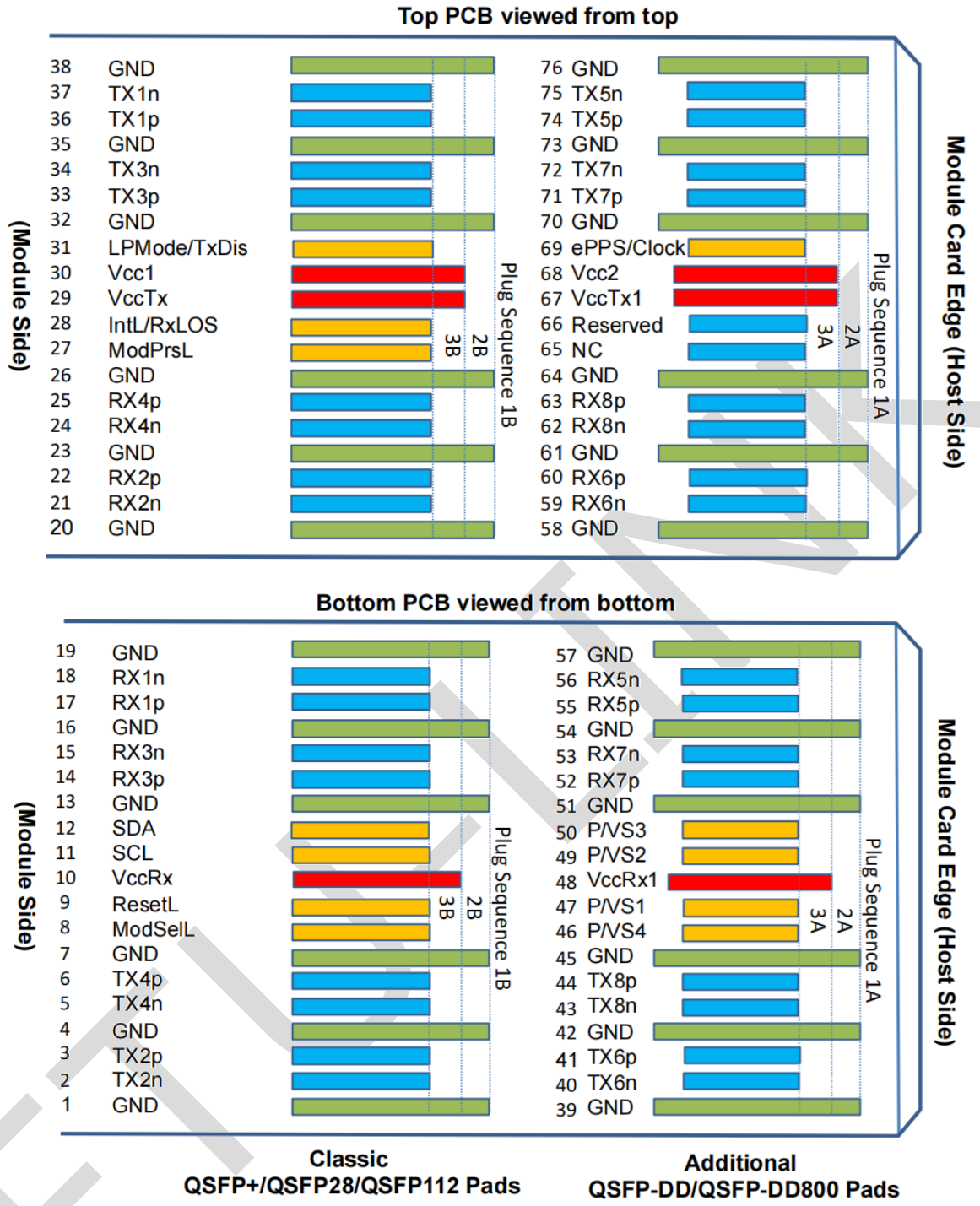
Wiring Diagram

P1				P2
GND	1	----	23	GND
TX2+	2	--->	22	RX2+
TX2-	3	--->	21	RX2-
GND	4	----	20	GND
TX4+	5	--->	25	RX4+
TX4-	6	--->	24	RX4-
GND	7	----	61	GND
TX6+	8	--->	60	RX6+
TX6-	9	--->	59	RX6-
GND	10	----	58	GND
TX8+	11	--->	61	RX8+
TX8-	12	--->	62	RX8-
GND	13	----	63	GND
GND	18	----	73	GND
RX7-	19	<---	72	TX7-
RX7+	20	<---	71	TX7+
GND	21	----	70	GND
RX5-	22	<---	75	TX5-
RX5+	23	<---	74	TX5+
GND	24	----	73	GND
RX3-	25	<---	34	TX3-
RX3+	26	<---	33	TX3+
GND	27	----	32	GND
RX1-	28	<---	37	TX1-
RX1+	29	<---	36	TX1+
GND	30	----	35	GND

P1				P2
GND	31	----	4	GND
RX2+	32	<---	3	TX2+
RX2-	33	<---	2	TX2-
GND	34	----	1	GND
RX4+	35	<---	6	TX4+
RX4-	36	<---	5	TX4-
GND	37	----	4	GND
RX6+	38	<---	41	TX6+
RX6-	39	<---	40	TX6-
GND	40	----	39	GND
RX8+	41	<---	44	TX8+
RX8-	42	<---	43	TX8-
GND	43	----	42	GND
GND	48	----	54	GND
TX7-	49	--->	53	RX7-
TX7+	50	--->	52	RX7+
GND	51	----	51	GND
TX5-	52	--->	56	RX5-
TX5+	53	--->	55	RX5+
GND	54	----	54	GND
TX3-	55	--->	15	RX3-
TX3+	56	--->	14	RX3+
GND	57	----	13	GND
TX1-	58	--->	18	RX1-
TX1+	59	--->	17	RX1+
GND	60	----	16	GND

PINOUT





Electrical Performance

Signal Integrity

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

Termination Impedance		
Differential (Input/Output)Return loss S_{DD11}/S_{DD22}]	Return_loss(f)≥ Where f is the frequency in GHz Return loss(f) is the return loss at frequency f	10MHz≤f ≤26.5GHz
Differential to common-mode (Input/Output)Return loss S_{CD11}/S_{CD22}]	Return_loss(f)≥ Where f is the frequency in GHz Return_loss(f) is the Differential to common-mode return loss at frequency f	50MHz≤f ≤26.5GHz
Common-mode to Common-mode (Input/Output)Return loss S_{CC11}/S_{CC22}]	*Return_loss(f)*≥2dB 0.05≤f≤19 Where f is the frequency in GHz Return_loss(f) is the common-mode to common-mode return loss at frequency f	50MHz≤f ≤26.5GHz
Differential Insertion Loss (S_{DD21} Max.)	(Differential InsertionLoss Max. For TPa to TPb Excluding Test fixture) Insertion _loss(f)≥-17.16dB 0.05≤f≤13.28GHz Where f is the frequency in GHz Insertion Loss (f) Differential Insertion Loss at frequency f	50MHz≤f ≤26.5GHz
Insertion Loss Deviation	-0.176*f - 0.7 ≤ ILD ≤ 0.176* f + 0.7	50MHz≤f ≤ 26.56GHz
Differential to common-mode Conversion Loss-Differential Insertion Loss(S_{CD21}-S_{DD21})	Conversion _loss(f) – IL(f)≥ 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	50MHz≤f ≤26.5GHz
[MDNEXT(multiple disturber near-end crosstalk)	≥35dB @26.5GHz	10MHz≤f ≤26.5GHz
Intra Skew	10ps/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

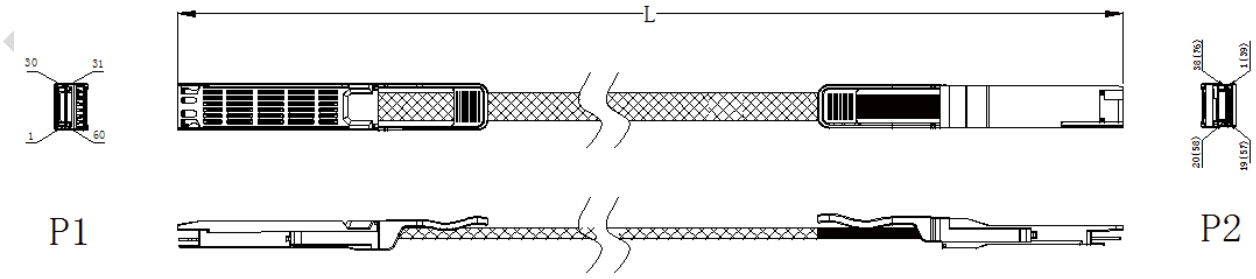
ITEM	REQUIREMENT	TEST CONDITON
Operating Temp. Range	0°C to +70°C	Cable operating temperature range.
Storage Temp. Range (in packed condition)	-40°C to +80°C	Cable storage temperature range in packed condition.
Thermal Cycling Non-Powered	No evidence of physical damage	EIA-364-32D, Method A, -25 to 90C, 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.
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	125 N Min.（OSFP） No evidence of physical damage 90N Min.（QSFP DD）	No functional damage to module, connector, or cage with latching mechanism activated. Per OSFP _Specification_Rev5_0 5.0 Pull on cable jacket approximately 1 ft behind

	No evidence of physical damage	cable plug. No functional damage to cable plug below 90N. Per QSFP-DD Hardware Rev 5.1
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,3 times in 6 directions, 100g, 6ms. per EIA-364-27B, TC-G
Cable Plug Insertion	OSFPmodule :40N Max.(55N) QSFP-DDmodule:90N Max	Per OSFP _Specification_Rev5_0 5.0 Module to be inserted into connector and cage with latch mechanism engaged. (55N if the cage has riding heatsink) Per QSFP-DD Hardware Rev 5.1
Cable plug Extraction	OSFPmodule :30N Max. (45N) QSFP-DDmodule:50N Max.	Module to be removed from connector and cage with latching mechanism disengaged. (45N if the cage has riding heatsink) Per OSFP _Specification_Rev5_0 5.0 Place axial load on de-latch to de-latch plug, Measure without the aid of any cage kick-out springs. Place axial load on de-latch to de-latch plug. Per QSFP-DD Hardware Rev 5.1
Durability	Module:50 cycles, No evidence of physical damage	Number of cycles for an individual module, to be tested with cage, connector, and module; latches may be locked out during testing Per OSFP _Specification_Rev5_0 5.0, perform plug &unplug cycles:Plug and receptacle mate rate: 250times/hour. 50times for QSFP-DD module (CONNECTOR TO PCB) Per EIA-364-09,

Outline drawing



Revision History

Version No.	Date	Description
1.0	Apr 25, 2022	Preliminary datasheet
2.0	September 28,2024	Product upgrades

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