PRODUCT SPECIFICATION

Part No.:	AC-XF-DG400-X	
Description:	400G QSFP-DD Direct Attach Cable ,DAC 1-3m	
Release Date	Rev.	Revision Change Description
2017/06/07	A0	New Release
2020/12/28	A1	Template Update

Features

- Hot Pluggable QSFP-DD Cable End
- Maximum Aggregate Data Rate: 400Gb/s (8 x 50G/Per Lane)
- Data rates : 56G-PAM4/ 25G-NRZ
- Compliant with IEEE802.3cd, IEEE802.3bj ,IEEE802.3by
- I/O Connector designed for high speed differential signal applications
- Low Power Consumption < 0.1W
- Wire AWG : 30 / 28 / 27
- Length = 1- 3 meters (400G)
- EEPROM signature can be customized
- RoHS compliant
- LSZH & PVC jacket material

Application

- Storage, Switch, & RAID Systems
- High-Performance Computing (HPC)
- Network Interface Cards (NIC's)
- Telecommunication equipment
- Data center and enterprise storage systems

Standard

- IEEE 802.3cm 400G BASE-SR8
- QSFP-DD MSA compliant
- Compliant to SFF-8636

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Performance Information

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Differential Impedance	TDR	90	100	110	Ω	
Insertion loss	SDD21	-17.16			dB	At 13.28 GHz
Differential Return Loss	SDD11			See 1	dB	At 0.05 to 4. 1 GHz
	SDD22			See 2	dB	At 4. 1 to 19 GHz
Common- mode to common-mode output return loss	SCC11 SCC22			-2	dB	At 0.2 to 19 GHz
Differential to common-modereturn loss	SCD11 SCD22			See 3	dB	At 0.01 to 12.89 GHz
				See 4		At 12.89 to 19 GHz
Differential to common ModeConversion Loss	SCD21-IL			-10	dB	At 0.01 to 12.89 GHz
				See 5		At 12.89 to 15.7 GHz
				-6.3		At 15.7 to 19 GHz

Notes:

1. Reflection Coefficient given by equation SDD11(dB) < -16.5 + 2 × SQRT(f), with f in GHz

2. Reflection Coefficient given by equation SDD11(dB) < -10.66 + 14 × log10(f/5.5), with f in GHz

3. Reflection Coefficient given by equation SCD11(dB) < -22 + (20/25.78)*f, with f in GHz

4. Reflection Coefficient given by equation SCD11(dB) < -15 + (6/25.78)*f, with f in GHz

Reflection Coefficient given by equation SCD21(dB) < -27 + (29/22)*f, with f in GHz

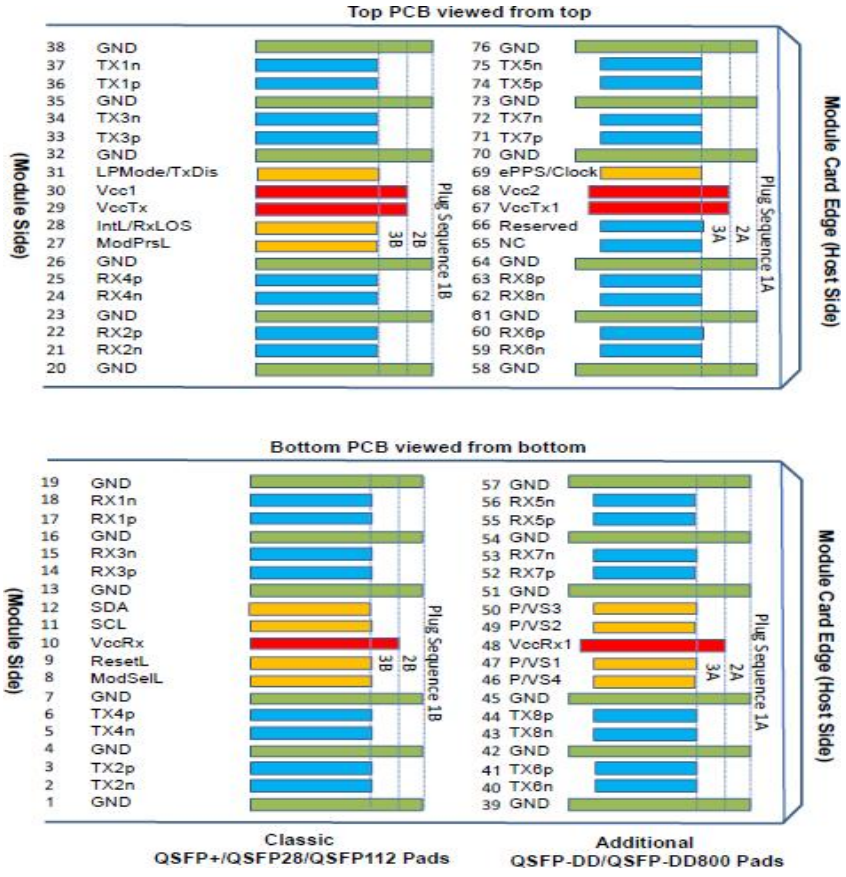
Specification

Parameter	Symbol	Min.	Max.	Unit
Storage Temperature	T_S	-20	85	°C
Case Operating Temperature	Tc	0	70	°C
Humidity (non-condensing)	Rh	5	95	%

Recommended Operating Conditions					
Parameter	**Symbol**	**Min.**	**Typical**	**Max.**	**Unit**
Operating Case Temperature	Tc	0		+70	°C
Baud Rate per Lane (PAM4)	fd		26.5625		GBaud/s
Humidity	Rh			85	%

Pin Assignment

QSFP-DD Pin Function Definition



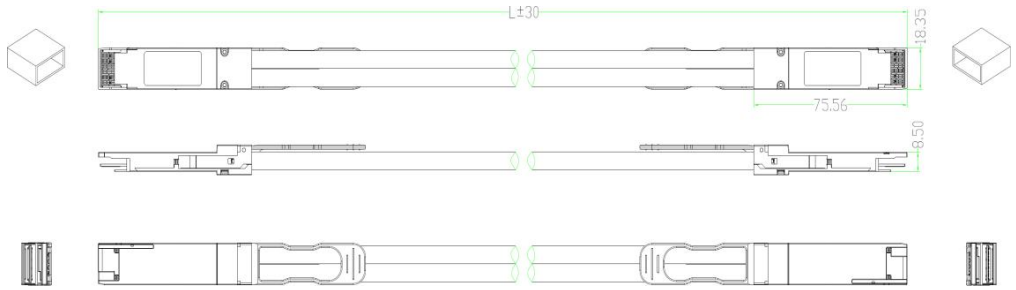
Pin	Logic	Symbol	Description
1		GND	Ground
2	CML- I	Tx2 n	Transmitter Inverted Data Input
3	CML- I	Tx2 p	Transmitter Non- Inverted Data Input
4		GND	Ground
5	CML- I	Tx4 n	Transmitter Inverted Data Input

6	CML- I	Tx4 p	Transmitter Non- Inverted Data Input
7		GND	Ground
8	LVTTL- I	ModSelL	Module Select
9	LVTTL- I	ResetL	Module Reset
10		Vcc Rx	+3. 3 V Power Supply Receiver
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
17	CML- O	Rx 1p	Receiver Non- Inverted Data Output
18	CML- O	Rx 1n	Receiver Inverted Data Output
19		GND	Ground
20		GND	Ground
21	CML- O	Rx2n	Receiver Inverted Data Output
22	CML- O	Rx2p	Receiver Non- Inverted Data Output
23		GND	Ground
24	CML- O	Rx4n	Receiver Inverted Data Output
25	CML- O	Rx4p	Receiver Non- Inverted Data Output
26		GND	Ground
27	LVTTL- O	ModPrsL	Module Present
28	LVTTL- O	IntL	Interrupt
29		Vcc Tx	+3. 3 V Power supply transmitter
30		Vcc1	+3.3V Power supply
31	LVTTL- I	LPMode	Low Power Mode
32		GND	Ground
33	CML- I	Tx3 p	Transmitter Non- Inverted Data Input
34	CML- I	Tx3 n	Transmitter Inverted Data Input
35		GND	Ground
36	CML- I	Tx 1p	Transmitter Non- Inverted Data Input
37	CML- I	Tx 1n	Transmitter Inverted Data Input
38		GND	Ground
39		GND	Ground
40	CML- I	Tx6 n	Transmitter Inverted Data Input

41	CML-I	Tx6p	Transmitter Non- Inverted Data Input
42		GND	Ground
43	CML-I	Tx8n	Transmitter Inverted Data Input
44	CML-I	Tx8p	Transmitter Non- Inverted Data Input
45		GND	Ground
46		Reserved	
47		VS1	
48		VccRx 1	+3.3V Power supply
49		VS2	
50		VS3	
51		GND	Ground
52	CML-O	Rx7p	Receiver Non-Inverted Data Output
53	CML-O	Rx7n	Receiver Inverted Data Output
54		GND	Ground
55	CML-O	Rx5p	Receiver Non-Inverted Data Output
56	CML-O	Rx5n	Receiver Inverted Data Output
57		GND	Ground
58		GND	Ground
59	CML-O	Rx6n	Receiver Inverted Data Output
60	CML-O	Rx6p	Receiver Non-Inverted Data Output
61		GND	Ground
62	CML-O	Rx8n	Receiver Inverted Data Output
63	CML-O	Rx8p	Receiver Non-Inverted Data Output
64		GND	Ground
65		NC	
66		Reserved	
67		VccTx 1	+3.3V Power supply
68		VCC2	+3.3V Power supply
69		Reserved	
70		GND	Ground
71	CML-I	Tx7p	Transmitter Non- Inverted Data Input
72	CML-I	Tx7n	Transmitter Inverted Data Input
73		GND	Ground
74	CML-I	Tx5p	Transmitter Non- Inverted Data Input
75	CML-I	Tx5n	Transmitter Inverted Data Input
76		GND	Ground

Mechanical Specifications

The connector is compatible with the QSFP- DD specification.



Length (m)	CableAWG
1	30
1.5	30
2	28
2.5	28
3	27

Regulatory Compliance

Feature	Test Method	Performance
Electrostatic Discharge (ESD) to the Electrical Pins	MIL-STD-883C Method 3015.7	Class 1(>2000 Volts)
Electromagnetic Interference(EMI)	FCC Class B	Compliant with Standards
	CENELEC EN55022 Class B	
	CISPR22 ITE Class B	
RF Immunity(RFI)	IEC61000-4-3	Typically Show no Measurable Effect froma 10V/m Field Swept from 80 to 1000MHz
RoHS Compliance	RoHS Directive 2011/65/EU and it's Amendment Directives(EU)2015/863	RoHS (EU) 2015/863 compliant

References

1. QSFP-DD Hardware Specification for QSFP DOUBLE DENSITY 8X PLUGGABLETRANSCEIVER Rev 5.0

2. SFF-8665: “QSFP+ 28Gb/s 4X Pluggable Transceiver Solution (QSFP28)”, Rev 1.9,June 29, 2015 and associated SFF documents referenced therein:

i. SFF-8661

ii. SFF-8679

iii. SFF-8662

iv. SFF-8663

v. SFF-8672

3. Directive 2011/65/EU of the European Council Parliament and of the Council, “on therestriction of the use of certain hazardous substances in electrical and electronic equipment” as well as Commission Delegated Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU. Certain products may use one or more exemptions as allowed by the Directive.

4. Common Management Interface Specification (CMIS) Rev 4.0.

5. IEEE P802.3bs, 400GAUI-8 Interface

Ordering information

Part Number	Bit Rate (Gbps)	Distance	AWG	Temp
AC-XF-DG400-01	400Gbps	1m	30AWG	0℃~+70℃
AC-XF-DG400-02	400Gbps	2m	28AWG	0℃~+70℃
AC-XF-DG400-03	400Gbps	3m	27AWG	0℃~+70℃