

TITLE 400G QSFP112 Active Copper Cable PAM4	DOC No. RFD-20240124005-001	
	REVISION : 01	AUTHORIZED BY : Andy Yang
	DATE : 2023.01.24	CLASSIFICATION : CONFIDENTIAL

1. General Description

QSFP112 active copper cable assembly feature eight differential copper pairs, providing four data transmission channels at speeds up to 100Gbps(PAM4) per channel, and meets 400G Ethernet and InfiniBand Next Data Rate(NDR) requirements. Available in 26AWG and 30AWG wire gauges, this 400G copper cable assembly features low insertion loss and low crosstalk.

QSFP112 active copper cable uses PAM4 signals for transmission, which doubles the rate. However, there are more stringent requirements for cable insertion loss. For detailed requirements, please see High Speed Characteristics.

2. PRODUCT FEATURES

- Compatible with IEEE 802.3ck
- Supports aggregate data rates of 400Gbps(PAM4)
- Optimized construction to minimize insertion loss and crosstalk
- Pull-to-release slide latch design
- Straight and break out assembly configurations available
- Customized cable braid termination limits EMI radiation
- Customizable EEPROM mapping for cable signature
- 26AWG and 30AWG cable
- 3.3V Power supply
- Low power Consumes 0.15W per active channel
- EQ programmable
- Temperature Range: 0~ 70 °C
- RoHS Compliant

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3. PRODUCT DESCRIPTION

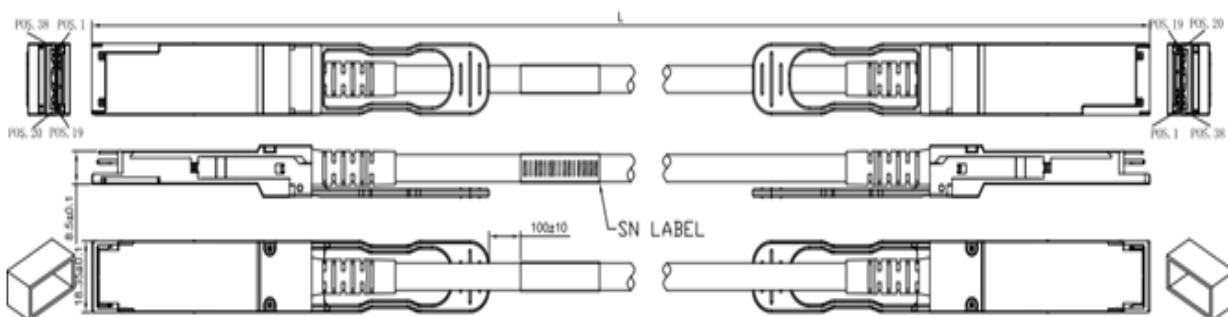
3.1 PRODUCT NAME

400G QSFP112 Active Copper Cable PAM4

Category	Data Rate	Temp.	Distance	AWG
QSFP112 to QSFP112	400G	C	1m	30
	400G	C	2m	30
	400G	C	3m	30
	400G	C	4m	30
	400G	C	5m	26

3.2 DIMENSIONS,MATERIALS,PLATINGS AND MARKING

The connector is compatible with the QSFP-DD specification.



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4. APPLICABLE DOCUMENTS AND SPECIFICATIONS

- Switches, servers and routers
- Data Center networks
- Storage area networks
- High performance computing
- Telecommunication and wireless infrastructure
- Medical diagnostics and networking
- Test and measurement equipment
- 400G Ethernet(IEEE 802.3ck)
- InfiniBand NDR

5. General Product Characteristics

QSFP112 DAC Specifications	
Number of Lanes	Tx4 Rx4
Channel Data Rate	106.25Gbps
Operating Temperature	0 to + 70°C
Storage Temperature	-40 to + 85°C
Supply Voltage	3.3 V nominal
Electrical Interface	38pins edge connector
Management Interface	Serial, I ² C

6. High Speed Characteristics

Parameter	Symbol	Min	Typical	Max	Unit	Note
Differential Impedance	TDR	90	100	110	Ω	
Insertion loss	SDD21	-19.75			dB	At 26.56 GHz

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Differential Return Loss	SDD11 SDD22			See 1	dB	At 0.05 to 26.56GHz
				See 2	dB	At 26.56 to 40 GHz
Common-mode to common-mode output return loss	SCC11 SCC22			-2	dB	At 0.2 to 40GHz
Differential to common Mode Conversion Loss	SCD21- SDD21			-10	dB	At 0.05 to 12.89 GHz
				See3		At 12.89 to 40 GHz

Notes:

1. Reflection Coefficient given by equation $SDD11(dB) < 22 - 10(f/26.56)$, with f in GHz
2. Reflection Coefficient given by equation $SDD11(dB) < 15 - 3(f/26.5)$, with f in GHz
3. Reflection Coefficient given by equation $SCD21-CDD21(dB) < 14 - 0.3108*f$, with f in GHz

7. Pin-out Definition:

QSFP112 Pin Function Definition

Pin	Logic	Symbol	Description
1		GND	Ground
2	CML-I	Tx2n	Transmitter Inverted Data Input
3	CML-I	Tx2p	Transmitter Non-Inverted Data Input
4		GND	Ground
5	CML-I	Tx4n	Transmitter Inverted Data Input
6	CML-I	Tx4p	Transmitter Non-Inverted Data Input
7		GND	Ground
8	LVTTL-I	ModSelL	Module Select
9	LVTTL-I	ResetL	Module Reset
10		Vcc Rx	+3.3V Power Supply Receiver
11	LVC MOS- I/O	SCL	2-wire serial interface clock
12	LVC MOS- I/O	SDA	2-wire serial interface data

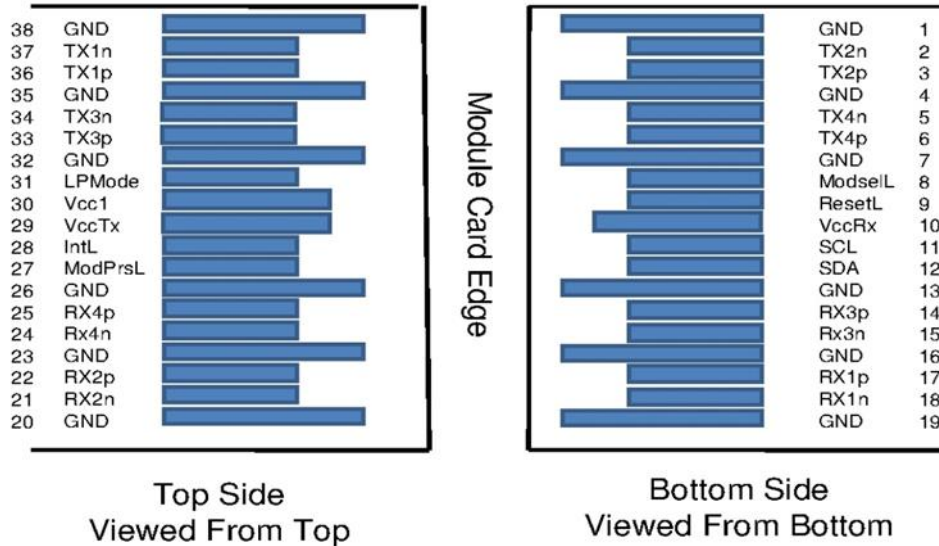
JESS-LINK PRODUCTS CO., LTD
PRODUCT SPECIFICATION

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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	Rx1p	Receiver Non-Inverted Data Output
18	CML-O	Rx1n	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	+3.3V Power supply transmitter
30		Vcc1	+3.3V Power supply
31	LVTTL-I	LPMODE	Low Power Mode
32		GND	Ground
33	CML-I	Tx3p	Transmitter Non-Inverted Data Input
34	CML-I	Tx3n	Transmitter Inverted Data Input
35		GND	Ground
36	CML-I	Tx1p	Transmitter Non-Inverted Data Input
37	CML-I	Tx1n	Transmitter Inverted Data Input
38		GND	Ground

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Regulatory Compliance

Feature	Test Method	Performance
Electrostatic Discharge (ESD) to the Electrical	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 from a 10V/m Field Swept from
RoHS Compliance	RoHS Directive 2011/65/EU and it's Amendment Directives (EU) 2015/863	RoHS (EU) 2015/863 compliant
REACH Compliance	REACH Regulation (EC) No 1907/2006	REACH (EC) No 1907/2006 compliant

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8.Modification History

Rev.	Comments	Date	Originator	Approval
01	Preliminary Draft	2024.01.24	Andy Yang	Mike Sun