

TSQSQ-PCM-xxC

400G OSFP112 Direct Attach Cable

Description

The 400G QSFP112 Passive Direct Attach Copper Twinax Cable is designed for use in 400GBASE Ethernet. , QSFP112 is the module and cage/connector system based on current QSFP, targeting to support the 112Gb/s per lane speed in a 4x lane QSFP system and to enable the QSFP 400G interconnect ecosystem. This will greatly help the legacy QSFP users upgrade the link bandwidth to 400G per port with lower cost and shorter transition time.

Features

- Compliance with SFF-8636 and SFF8024
- Compliance with IEEE802.3ck& QSFP112_MSA
- Support I2C two - line string interface, easy to control
- Support for hot plugging
- Straight and break out assembly configurations available
- Customized cable braid termination limits EMI radiation
- Customizable EEPROM mapping for cable signature
- RoHS Compatible

Applications

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

Recommended Operation Condition

Parameters	Symbol	Min.	Max.	Unit
Operating Case Temperature	Topc	0	70	degC
Storage Temperature	Tst	-40	85	degC
Relative Humidity (non-condensation)	RS	35	60	%
Supply Voltage	Vcc3	3.135	3.465	V
Voltage on LVTTTL Input	Vilvttl	-0.3	Vcc3+0.2	V
Power Supply Current	Icc3	-	15	mA
Total Power Consumption	Pd	-	0.05	W

Notes:

Stress or conditions exceed the above range may cause permanent damage to the device.

This is a stress rating only and functional operation of the device at these or any other conditions above those listed in the operational sections of this specification is not applied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

Pin Definition

Pin	Logic	Symbol	Name/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	LVTTTL-I	ModSelL	Module Select
9	LVTTTL-I	ResetL	Module Reset
10	-	Vcc Rx	+3.3V Power supply receiver
11	LVC MOS-	SCL	2-wire serial interface clock
	I/O		
12	LVC MOS-	SDA	2-wire serial interface data
	I/O		
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	Transmitter Inverted DATA in. AC Coupled
19	-	GND	Ground
20	-	GND	Ground
21	CML-O	Rx2n	Receiver Inverted Data Output
22	CML-O	Rx2p	Receiver Non-Inverted Data Output

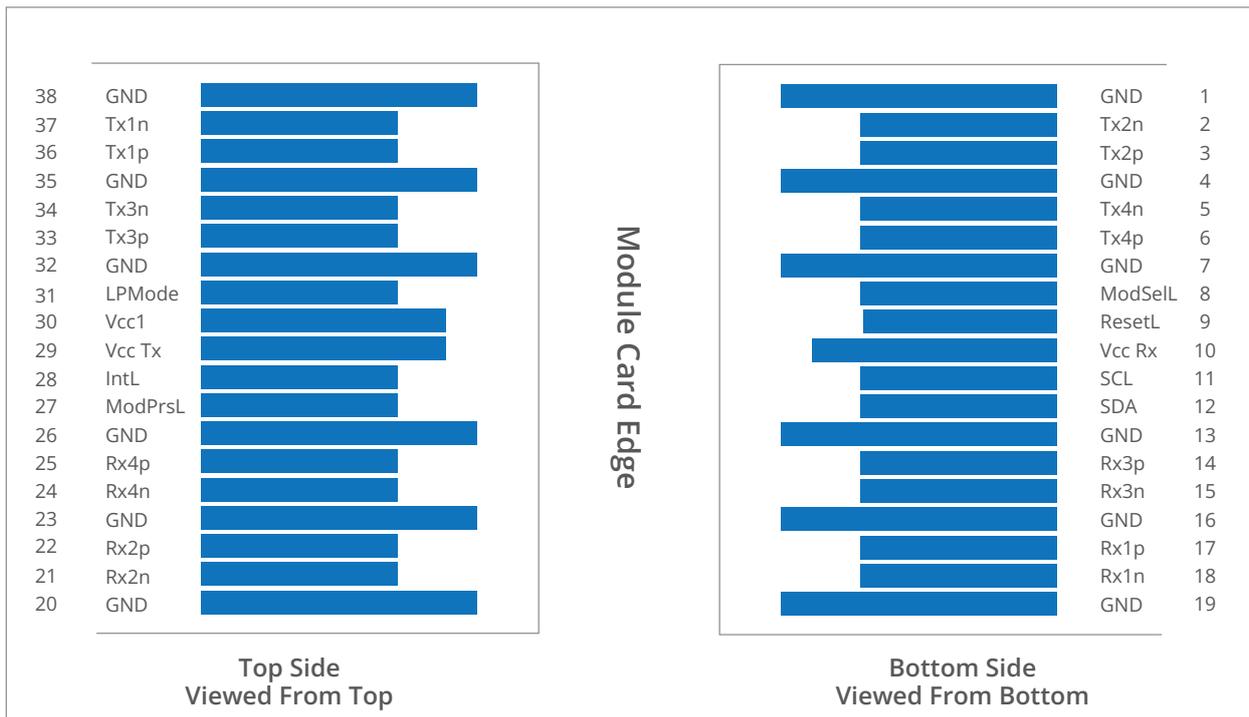
23	-	GND	Ground
24	CML-O	Rx4n	Receiver Inverted Data Output
25	CML-O	Rx4p	Receiver Non-Inverted Data Output
26	-	GND	Ground
27	LVTTTL-O	ModPrsL	Module Present
28	LVTTTL-O	IntL	Interrupt
29	-	Vcc Tx	+3.3V Power supply transmitter
30	-	Vcc1	+3.3V Power Supply
31	LVTTTL-I	LPMODE	Low Power Mode
32	-	GND	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

High Speed Characteristics

Item	Requirement	Test Condition
Differential Impedance	Cable Impedance	100±5Ω
	Paddle Card Impedance	100±10Ω
	Cable Termination Impedance	100±10Ω
Differential (Input/Output)Return loss S_{DD11}/S_{DD22}	Return_loss(f)≥ $\left\{ \begin{array}{ll} 16.5-2\sqrt{f} & 0.05\leq f < 4.1 \\ 10.66-14\log_{10}(f/5.5) & 4.1\leq f\leq 40 \end{array} \right\}$	10MHz≤f≤40GHz
	Where f is the frequency in GHz Return_loss(f) is the return loss at frequency f	
Differential to common-mode (Input/Output)Return loss S_{CD11}/S_{CD22}	Return_loss(f)≥ $\left\{ \begin{array}{ll} 22-10(f/26.56) & 0.05\leq f < 26.56 \\ 15-3(f/26.56) & 26.56\leq f\leq 40 \end{array} \right\}$	50MHz≤f≤40GHz
	Where f is the frequency in GHz Return_loss(f) is the Differential to common-mode return loss at frequency f	
Common-mode to Common-mode (Input/Output)Return loss S_{CC11}/S_{CC22}	Return_loss(f)≥1.8dB 0.05≤f≤40	50MHz≤f≤40GHz
	Where f is the frequency in GHz Return_loss(f) is the Differential to common-mode return loss at frequency f	

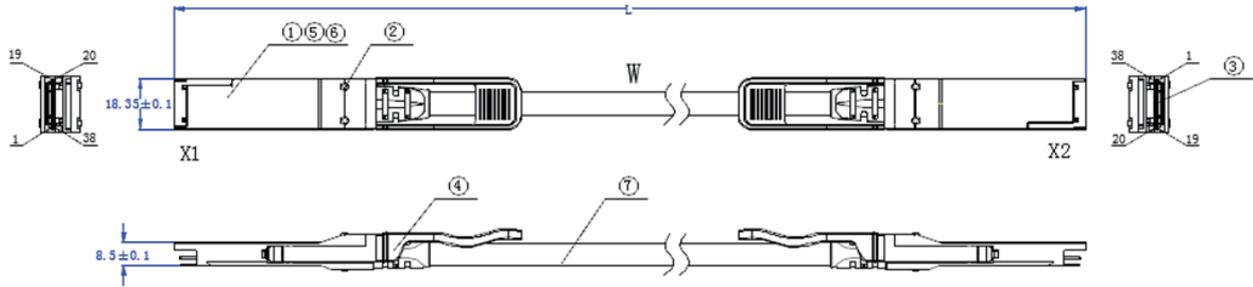
Differential Insertion Loss (S_{DD21} Max.)	(Differential InsertionLoss Max. For TPa to TPb Excluding Test fixture)	50MHz≤f≤40GHz
	Insertion_loss(f)≥-19.75dB 0.05≤f≤26.56 Where f is the frequency in GHz Insertion Loss (f) Differential Insertion Loss at frequency f	
Insertion Loss Deviation	-0.176*f - 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)≥ $\begin{cases} 10 & 0.05 \leq f < 12.89 \\ 14-0.3108f & 12.89 \leq f < 40 \end{cases}$ 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 ≤40GHz
MDNEXT(multiple disturber near-end crosstalk)	≥35dB @26.5GHz	10MHz≤f ≤26.5GHz
Intra Skew	10ps/m,	10MHz≤f ≤26.5GHz

Pin Descriptions



Mechanical Specifications

The connector is compatible with the SFF-8436 specification.



Ordering Information

400G QSFPDD Copper Cable Assemblies, Passive.

P/N	Length	Data Rate	AWG	Length Tolerance
TSQSQ-PCM-01C	1 m	400G	28/30	+3.5/-3.5 cm
TSQSQ-PCM-02C	2 m	400G	26/28	+3.5/-3.5 cm