

LQ-DAC14100-xMN

RoHS Compliant 100Gb/s QSFP28 to 4 SFP28 Copper Cable

Features

- Supporting 100 Gbps to 4 x 25 Gbps
- Support data rates : 25.78Gb/s (per channel)
- IEEE 802.3bj 100GEBASE-CR4 and P802.3by compliant
- Compatible to SFP28 MSA and QSFP28 MSA
- Compatible to SFF-8402, SFF-8432 and SFF8665
- Maximum aggregate data rate: 100 Gb/s (4 x 25Gb/s)
- High-Density QSFP28 38-PIN and 4x SFP28 20-PIN Connector
- Copper link length up to 5m
- Power Supply : +3.3V
- Low crosstalk
- I2C based two-wire serial interface for EEPROM signature which can be customized
- Operating Temperature: 0~ 70 °C
- ROHS Compliant connector

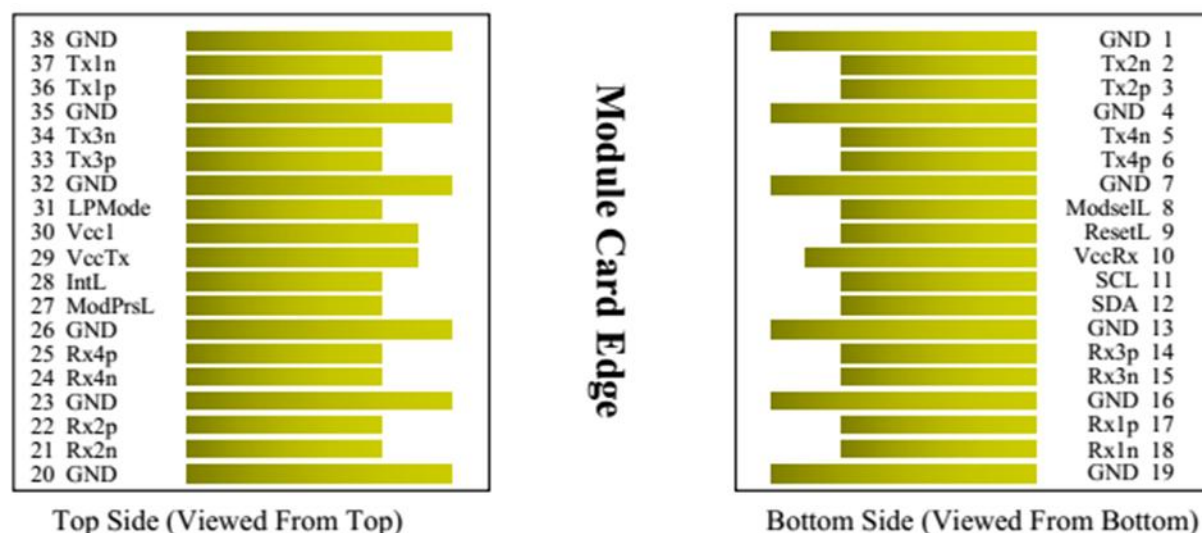
Applications

- 100G/25G Ethernet
- InfiniBand 4x SDR/DDR/QDR
- DATA Center & Clouds
- Fibre Channel over Ethernet
- SAS, Servers, Hubs, Switches, and Routers

General Description

Link-pp's 100G QSFP28 to 4x 25G SFP28 direct attach passive copper cable are suitable for very short distances and offer a highly cost-effective way to establish a 100-Gigabit link between QSFP28 and SFP28 equipment connections. These cables are used for 100GbE and Infiniband standards, to maximize performance. The Hybrid cables are designed to meet emerging data center and high performance computing application needs for a high density cabling interconnect system capable of delivering an aggregate data bandwidth of 100Gb/s. This interconnect system is fully compliant with existing industry standard specifications such as the QSFP MSA and IBTA (InfiniBand Trade Association). The Hybrid cables support the bandwidth transmission requirements as defined by IEEE 802.3ba (100 Gb/s) and Infiniband QDR (4x25 Gb/s per channel) specifications.

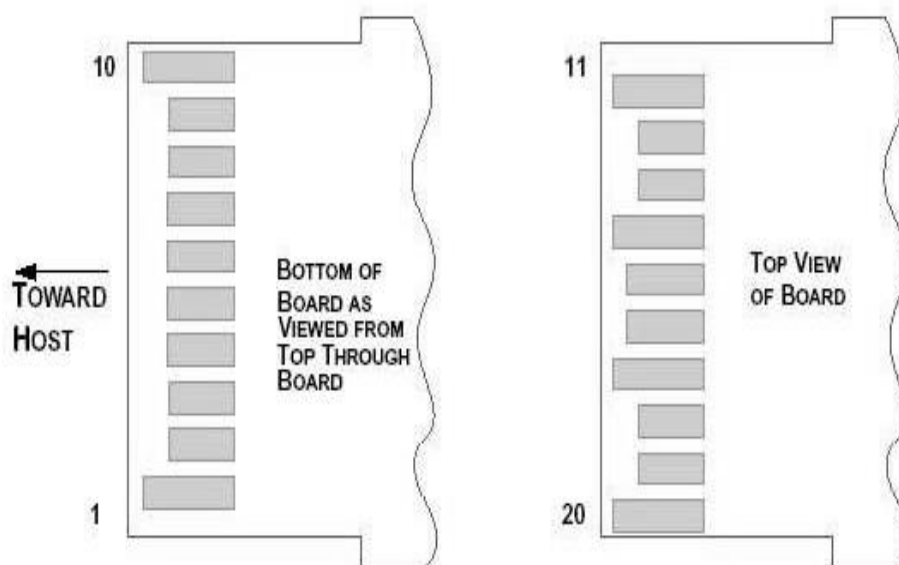
QSFP28 Pin Function Definition



Pin	Logic	Symbol	Name	Description
1		GND	Signal Ground	Ground
2	CML-I	Tx2n	Tx2n	Transmitter Inverted Date Input.AC coupled
3	CML-I	Tx2p	Tx2p	Transmitter Non_Inverted Date Input.AC coupled
4		GND	Signal Ground	Ground
5	CML-I	Tx4n	Tx4n	Transmitter Inverted Date Input.AC coupled
6	CML-I	Tx4p	Tx4p	Transmitter Non_Inverted Date Input.AC coupled
7		GND	Signal Ground	Ground
8	LVTTL-I	ModSelL	ModSelL	Module Select pin.Selected when held low by the host.

9	LVTTTL-I	ResetL	LPMode_Reset	Module Reset.A"low" pulse induces a reset on the module.
10		Vcc Rx	Vcc Rx	+3.3V Power Supply Receiver
11	LVC MOS-I/O	SCL	SCL	2-wire serial interface
12	LVC MOS-I/O	SDA	SDA	
13		GND	Signal Ground	Ground
14	CML-O	Rx3p	Rx3p	Receiver Non_Inverted Date Input.AC coupled
15	CML-O	Rx3n	Rx3n	Receiver Inverted Date Input.AC coupled
16		GND	Signal Ground	Ground
17	CML-O	Rx1p	Rx1p	Receiver Non_Inverted Date Input.AC coupled
18	CML-O	Rx1n	Rx1n	Receiver Inverted Date Input.AC coupled
19		GND	Signal Ground	Ground
20		GND	Signal Ground	Ground
21	CML-O	Rx2n	Rx2n	Receiver Inverted Date Input.AC coupled
22	CML-O	Rx2p	Rx2p	Receiver Non_Inverted Date Input.AC coupled
23		GND	Signal Ground	Ground
24	CML-O	Rx4n	Rx4n	Receiver Inverted Date Input.AC coupled
25	CML-O	Rx4p	Rx4p	Receiver Non_Inverted Date Input.AC coupled
26		GND	Signal Ground	Ground
27	LVTTTL-O	ModPrsL	ModPrsL	Module Present pin.Internally grounded inside the module.
28	LVTTTL-O	IntL	IntL	Interrupt by the QSFP module."Low"indicates an Alarm/Warning.
29		Vcc Tx	Vcc Tx	+3.3V Power Supply Transmitter
30		Vccl	Vccl	+3.3V Power Supply
31	LVTTTL-I	LPMode	LPMode	Low Power Mode
32		GND	Signal Ground	Ground
33	CML-I	Tx3p	Tx3p	Transmitter Non_Inverted Date Input.AC coupled
34	CML-I	Tx3n	Tx3n	Transmitter Inverted Date Input.AC coupled
35		GND	Signal Ground	Ground
36	CML-I	Tx1p	Tx1p	Transmitter Non_Inverted Date Input.AC coupled
37	CML-I	Tx1n	Tx1n	Transmitter Inverted Date Input.AC coupled
38		GND	Signal Ground	Ground
39			Chassis Ground	

SFP28 Pin Function Definition



Pin	Logic	Symbol	Description
1		VeeT	Module Transmitter Ground
2	LVTTL-O	TX_Fault	Module Transmitter Fault
3	LVTTL-I	TX_Disable	Transmitter disable; Turns off transmitter laser output
4	LVTTL-I/O	SDA	2-wire Serial Interface Data Line (Same as MOD-DEF2 in INF-8074i)
5	LVTTL-I/O	SCL	2-wire Serial Interface Clock (Same as MOD-DEF1 in INF-8074i)
6		Mod_ABS	Module Absent, connected to VeeT or VeeR in the module
7	LVTTL-I	RS0	Rate Select 0, optionally controls SFP+ module receiver
8	LVTTL-O	RX_LOS	Receiver Loss of Signal Indication (In FC designated as Rx_LOS and in Ethernet designated as Signal Detect)
9	LVTTL-I	RS1	Rate Select 1, optionally controls SFP+ module transmitter
10		VeeR	Module Receiver Ground
11		VeeR	Module Receiver Ground
12	CML-O	RD-	Receiver Inverted Data Output
13	CML-O	RD+	Receiver Non-Inverted Data Output
14		VeeR	Module Receiver Ground
15		VccR	Module Receiver 3.3 V Supply
16		VccT	Module Transmitter 3.3 V Supply

17		VeeT	Module Transmitter Ground
18	CML-I	TD+	Transmitter Non-Inverted Data Input
19	CML-I	TD-	Transmitter Inverted Data Input
20		SDA	Module Transmitter Ground

Absolute Maximum Ratings

These values represent the damage threshold of the module. Stress in excess of any of the individual Absolute Maximum Ratings can cause immediate catastrophic damage to the module even if all other parameters are within Recommended Operating Conditions.

Table.1 Absolute maximum ratings

Parameter	Symbol	Min	Max	Unit
Maximum Supply Voltage	Vcc	0	3.6	V
Storage Temperature	Ts	-40	85	°C
Relative Humidity	RH	5	95	%

Recommended Operating Conditions

Table.2 Recommended Operating Conditions

Parameter	Symbol	Min	Typical	Max	Unit
Operating Case Temperature	Standard Tc	0	25	70	°C
Storage Temperature	Ts	0		70	°C
Relative Humidity	RH	5		95	%
Data Rate			100		Gbps
Power Dissipation	PD			0.02	W

Product Characteristics

Table.3 Product Characteristics

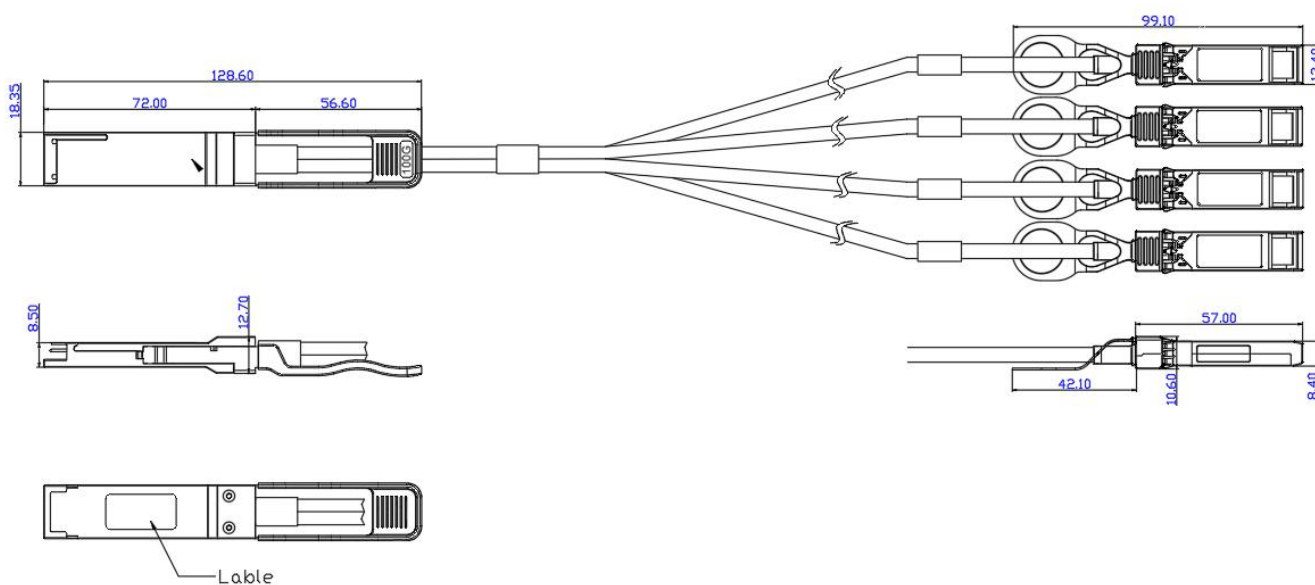
Parameter	Symbol	Min	Typical	Max	Unit	Note
Differential Impedance	Rin,p-p	90	100	110	Ω	
Insertion loss	SDD21			22.48	dB	At 12.8906 GHz
Differential Return Loss	SDD11 SDD22	12.45		See1	dB	At 0.05 to 4.1 GHz
		3.12		See2	dB	At 4.1 to 19 GHz

Common-mode to common-mode output return loss	SDD11 SDD22	2			dB	At 0.2 to 19 GHz
Differential to common-mode return loss	SDD11 SDD22	12		See3	dB	At 0.01 to 12.89 GHz
		10.58		See4		At 12.89 to 19 GHz
Differential to common-mode Conversion Loss	SCD21-IL			10	dB	At 0.01 to 12.89 GHz
				See5		At 12.89 to 15.7 GHz
				6.3		At 15.7 to 19 GHz
Channel Operating Margin	COM	3			dB	

Notes:

1. Reflection Coefficient given by equation $SDD11(dB) < 16.5 - 2 * \sqrt{f}$, with f in GHz
2. Reflection Coefficient given by equation $SDD11(dB) < 10.66 - 14 * \log_{10}(f/5.5)$, with f in GHz
3. Reflection Coefficient given by equation $SDD11(dB) < 22 - (20/25.78) * f$, with f in GHz
4. Reflection Coefficient given by equation $SDD11(dB) < 15 - (6/25.78) * f$, with f in GHz
5. Reflection Coefficient given by equation $SDD21(dB) < 27 - (29/22) * f$, with f in GHz

Mechanical Specifications



Length (m)	Cable AWG
1	30
2	30
3	30
5	24

Application Cautions

This transceiver is specified as ESD threshold 1kV for high speed pins and 2kV for all other electrical input pins, tested per MIL-STD-883, Method 3015.4 /JESD22-A114-A (HBM). However, normal ESD precautions are still required during the handling of this module. This transceiver is shipped in ESD protective packaging. It should be removed from the packaging and handled only in an ESD protected environment.

This is a Class 1 Laser Product according to IEC 60825-1:1993+A1:1997+A2:2001. This product complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated (July 26, 2001)

Ordering information

Part Number	Product Description
LQ-DAC14100-0M5N	QSFP28 to 4 SFP28 , up to 100 Gb/s, Copper Cable, 0~70℃, 0.5meter
LQ-DAC14100-1MN	QSFP28 to 4 SFP28 , up to 100 Gb/s, Copper Cable, 0~70℃, 1meter
LQ-DAC14100-2MN	QSFP28 to 4 SFP28 , up to 100 Gb/s, Copper Cable, 0~70℃, 2meter
LQ-DAC14100-3MN	QSFP28 to 4 SFP28, up to 100 Gb/s, Copper Cable, 0~70℃, 3meter
LQ-DAC14100-5MN	QSFP28 to 4 SFP28, up to 100 Gb/s, Copper Cable, 0~70℃, 5meter