

QSFP-40G-DACxM

40G QSFP+ to QSFP+ DAC Passive Copper Cable (PCC), 0.5~7 meters

Features

- QSFP conforms to the Small Form Factor SFF-8436
- 4-Channel Full-Duplex Passive Copper Cable
- Operates 1G to 10.3125 Gbps data rate per channel(per channel)
- Maximum aggregate data rate: 40 Gb/s (4 x 10Gb/s)
- Available in lengths of 0.5m(1.6ft) to 7m (23ft)
- High-Density QSFP 38-PIN Connector
- Low power consumption: 0.02 W (typ.)
- I2C based two-wire serial interface for EEPROM signature
- Single 3.3V power supply
- 24AWG to 30AWG cable available
- Operating temperature range: 0 to 70°C
- RoHS Compliant and Lead-Free



Applications

- 40 Gigabit Ethernet links
- Fiber Channel over Ethernet
- Data storage and communication industry
- Switches, servers,routers and HBA
- Enterprise network
- SAN (Storage area networks)
- Data center cabling infrastructure
- High density connections between networking equipment

Description

Optcore's QSFP-40G-DACxM direct attach copper cable assembly (also known as DAC) is suitable for very short distances. It offers a highly cost-effective way to establish a 40 Gigabit link connectivity between devices using QSFP ports. The QSFP+ DAC cable is designed for 40Gb/s high-speed interconnecting networking applications such as high-performance computing (HPC), enterprise networking including top-of-rack switching, and network storage markets.

The 40G QSFP+ DAC fully complies with QSFP+ Multi-Source Agreement (MSA) standards SFF-8436 and IEEE 802.3ba 40GBASE-CR4. It is developed specifically as a cost-effective and lower-power alternative to QSFP+ optical transceivers and QSFP+ active optical fiber (QSFP+ AOC).

Ordering information

Part Number	Data Rate	Cable Length	Wire Gauge		
QSFP-40G-DAC05M	40Gbps	0.5 m	/	/	AWG30
QSFP-40G-DAC1M	40Gbps	1 m	/	/	AWG30

QSFP-40G-DAC2M	40Gbps	2 m	/	/	AWG30
QSFP-40G-DAC3M	40Gbps	3 m	/	/	AWG30
QSFP-40G-DAC4M	40Gbps	4 m	/	AWG26	/
QSFP-40G-DAC5M	40Gbps	5 m	/	AWG26	/
QSFP-40G-DAC6M	40Gbps	6 m	AWG24	/	/
QSFP-40G-DAC7M	40Gbps	7 m	AWG24	/	/

Notes:

1. Customized 40G QSFP DAC cables are available in various lengths.
2. The Wire Gauge is available in AWG24, AWG26, AWG28, and AWG30 for customized need.

Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit	Notes
Maximum Supply Voltage	V _{cc}	-0.5	4.0	V	
Storage Temperature	T _s	-40	85	°C	
Operating Humidity	RH	5	95	%	

Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Power Supply Voltage	V _{cc}	3.13	3.3	3.47	V	
Power Dissipation	PD			0.1	W	
Case Operating Temperature	T _c	0		70	°C	
Data Rate Per Lane				10.3125	Gbps	
Bit Error Rate	BER			10 ⁻¹²		

High Speed Characteristics

Parameter	Symbol	Min	Typical	Max	Unit	Note
Differential Impedance	TDR	90	100	110	Ω	
Insertion loss	SDD21	-17.04			dB	At 5.15625 GHz
Differential Return Loss	SDD11 SDD22			See 1	dB	At 0.05 to 4.1 GHz
				See 2	dB	At 4.1 to 11.1 GHz
Differential to common-mode return loss	SCD11 SCD22			-10	dB	At 0.2 to 11.1 GHz
Common-mode to common-mode output return loss	SCC11 SCC22	-3			dB	At 0.01 to 11.1 GHz

Notes:

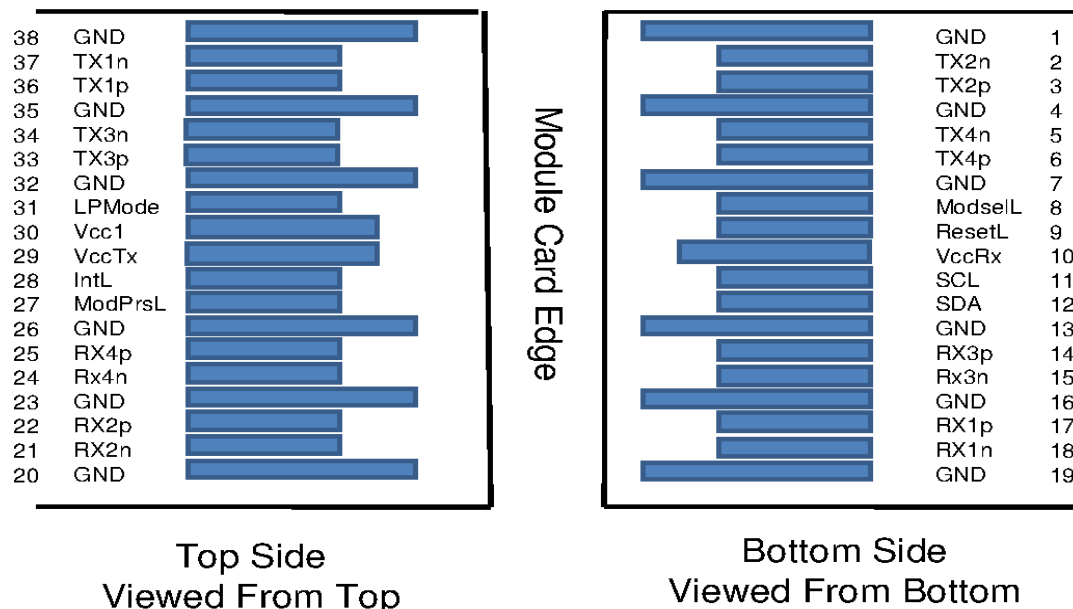
1. Reflection Coefficient given by equation $SDD11(dB) < -12 + 2 \times \sqrt{f}$, with f in GHz
2. Reflection Coefficient given by equation $SDD11(dB) < -6.3 + 13 \times \log_{10}(f/5.5)$, with f in GHz

Cable Specifications

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
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Cable Diameter	DIA		6.0		mm	AWG 24
			5.4		mm	AWG 26
			4.7		mm	AWG 28
			4.2		mm	AWG 30
Bend Radius		5x Cable Diameter			mm	
Cable Jacket Type		PVC				
Cable Impedance	Z	90	100	110	Ω	

Electrical Pad Layout



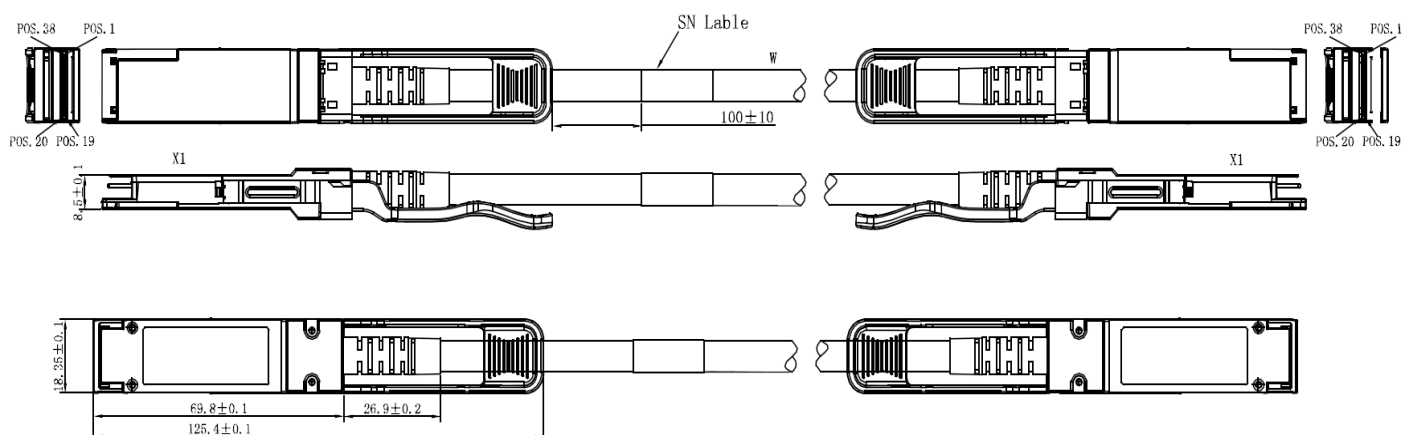
Pin Definitions

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
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

Mechanical Dimensions

The connector is compatible with the SFF-8436 specification.



Warnings

Process plug

The transceiver optics is supplied with a dust cover. This plug protects the transceiver optics during standard manufacturing processes by preventing contamination from air borne particles. It is recommended that the dust cover remain in the transceiver whenever an optical fiber connector is not inserted.

Handling Precautions

The transceiver optics is susceptible to damage as a result of electrostatic discharge (ESD). A static free environment is highly recommended. Follow guidelines according to proper ESD procedures.

Laser Safety

The transceiver optics is a Class 1 laser product per international standard IEC 60825-1. Radiation emitted by laser devices can be dangerous to human eyes. Avoid eye exposure to direct or indirect radiation.

Appendix A. Document Revision

Version No	Date	Description
DS/V180124/EN	2018-01-24	Preliminary datasheet
DS/V211103/EN	2021-11-03	Update image and order information
DS/V3.0/EN	2024-09-30	Update datasheet version, change part number

For more product information, visit us on the web at www.optcore.net



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