

## Q-4S-DAC-PxM

40G QSFP+ to 4x10G SFP+ DAC Passive Copper Breakout Cable, 0.5~7 meters

### Features

- Connector A: 1x QSFP 40Gbps Rated Connector (QSFP+ MSA SFF-8436 Compliant)
- Connector B: 4x SFP+ 10Gbps Rated Connector (SFP+ MSA SFF-8431 Compliant)
- Economically Links up a QSFP port with an upstream 10GbE-SFP+ Switch
- Compliant with IEEE 802.3ba 40GBASE-CR4 standard
- Up to 10.3125 Gbps transfer rate per SFP+ channel (40 Gbps aggregate)
- Bridge the gap between your 10G and 40G capable switches/host adapters
- High-Density QSFP 38-PIN and 4x SFP 20-PIN Connector
- Reduced power budget and lower port cost compared to transceiver and AOC
- RoHS Compliant and Lead-Free
- 24AWG to 30AWG cable available
- Operating temperature range: 0 to 70°C
- RoHS Compliant and Lead-Free

### Applications

- 10/40 Gigabit Ethernet links
- 40G Ethernet transmission (40GBASE-CR4)
- InfiniBand 4x SDR, DDR, QDR
- 10G/40G Ethernet Switches, Routers, and HBAs
- Data center interconnect
- Networked storage systems
- High density connections between networking equipment



### Description

Optcore's Q-4S-DAC-PxM QSFP+ to 4xSFP+ breakout direct attach copper cable assembly (also known as Fan-out DAC) is suitable for very short distances, which offers a highly cost-effective way to establish a interconnect between the devices using QSFP+ ports and SFP+ ports. The QSFP+ to 4x SFP+ DAC breakout 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. It fully complies with QSFP+ Multi-Source Agreement (MSA) standards SFF-8436 and SFP+ MSA SFF-8431. The QSFP+ to 4x SFP+ cables connect the 40GbE systems to 10G switches and adapter cards.

### Ordering information

| Part Number   | Data Rate | Cable Length | Wire Gauge |   |       |
|---------------|-----------|--------------|------------|---|-------|
| Q-4S-DAC-P05M | 40Gbps    | 0.5 m        | /          | / | AWG30 |
| Q-4S-DAC-P1M  | 40Gbps    | 1 m          | /          | / | AWG30 |
| Q-4S-DAC-P2M  | 40Gbps    | 2 m          | /          | / | AWG30 |
| Q-4S-DAC-P3M  | 40Gbps    | 3 m          | /          | / | AWG30 |

|              |        |     |   |       |   |
|--------------|--------|-----|---|-------|---|
| Q-4S-DAC-P4M | 40Gbps | 4 m | / | AWG26 | / |
| Q-4S-DAC-P5M | 40Gbps | 5 m | / | AWG26 | / |
| Q-4S-DAC-P6M | 40Gbps | 6 m | / | AWG24 | / |
| Q-4S-DAC-P7M | 40Gbps | 7 m | / | AWG24 | / |

#### Notes:

1. Customized 40G QSFP+ to 4 x SFP+ breakout copper 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 <sub>cc</sub> | -0.5 | 4.0 | V    |       |
| Storage Temperature    | T <sub>s</sub>  | -40  | 85  | °C   |       |
| Operating Humidity     | RH              | 5    | 95  | %    |       |

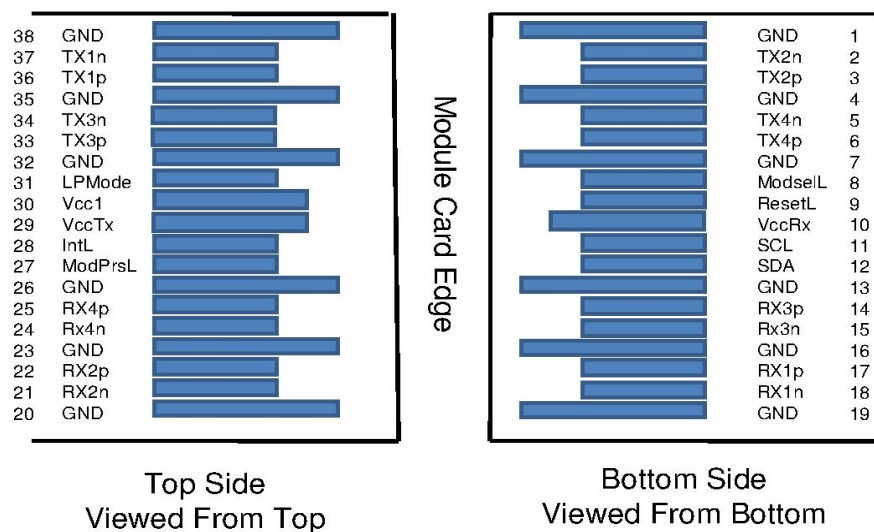
#### Recommended Operating Conditions

| Parameter                  | Symbol          | Min. | Typ. | Max.              | Unit | Notes |
|----------------------------|-----------------|------|------|-------------------|------|-------|
| Power Supply Voltage       | V <sub>cc</sub> | 3.13 | 3.3  | 3.47              | V    |       |
| Power Dissipation          | PD              |      |      | 0.1               | W    |       |
| Case Operating Temperature | T <sub>c</sub>  | 0    |      | 70                | °C   |       |
| Data Rate Per Lane         |                 |      |      | 10.3              | Gbps |       |
| Bit Error Rate             | BER             |      |      | 10 <sup>-12</sup> |      |       |

#### Cable Specifications

| Parameter         | Symbol | Min.              | Typ. | Max. | Unit | Notes  |
|-------------------|--------|-------------------|------|------|------|--------|
| 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

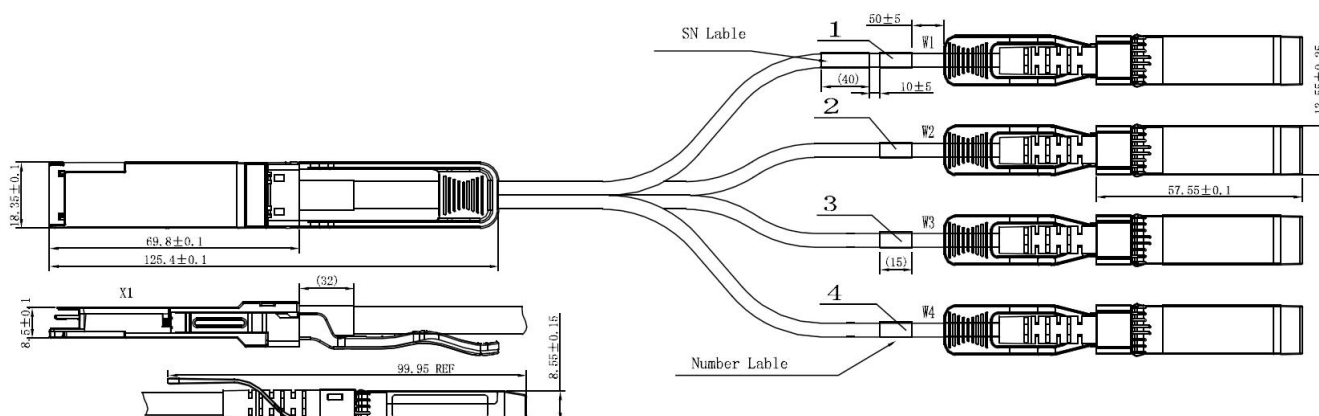


## Pin Definitions

| 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  | 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      | 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



## ⚠ 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.

For more product information, visit us on the web at [www.optcore.net](http://www.optcore.net)



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