

# 800G OSFP-2x400G OSFP Direct Attach Cable (DAC) Datasheet

## General Description

OSFP\_2XOSFP passive copper cable assembly feature sixteen differential copper pairs, providing eight data transmission channels at speeds up to 100Gbps(PAM4) per channel, and meets 2X400G Ethernet and InfiniBand Next Data Rate(NDR) requirements. Available in 26AWG and 30AWG wire gauges, this 2X400G copper cable assembly features low insertion loss and low crosstalk.

OSFP passive 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.

## Features and Benefits

- Compatible with IEEE 802.3ck
- Supports aggregate data rates of 2X400Gbps(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
- Temperature Range: 0~ 70 °C
- RoHs Compliant

## Product Applications

- 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

## Industry Standards

- 2x400G Ethernet(IEEE 802.3ck)
- InfiniBand NDR

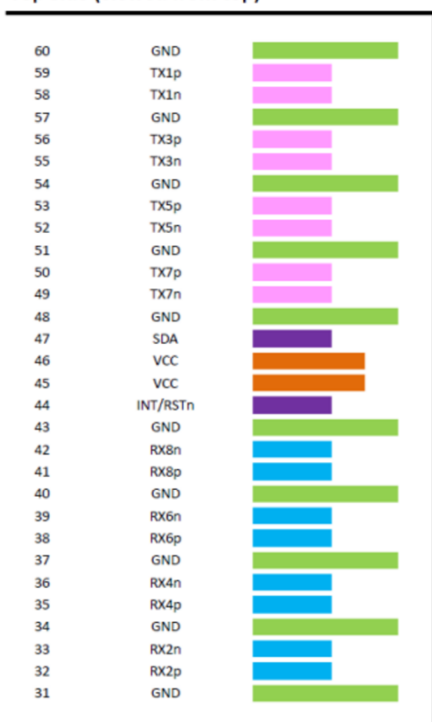
## Pin Descriptions

## OSFP Pin Function Definition

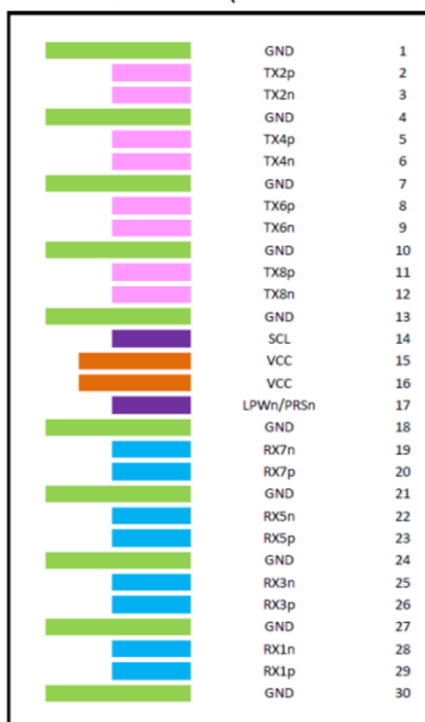
| Pin | Logic       | Symbol    | Description                         |
|-----|-------------|-----------|-------------------------------------|
| 1   |             | GND       | Ground                              |
| 2   | CML-I       | Tx2p      | Transmitter Non-Inverted Data Input |
| 3   | CML-I       | Tx2n      | Transmitter Inverted Data Input     |
| 4   |             | GND       | Ground                              |
| 5   | CML-I       | Tx4p      | Transmitter Non-Inverted Data Input |
| 6   | CML-I       | Tx4n      | Transmitter Inverted Data Input     |
| 7   |             | GND       | Ground                              |
| 8   | CML-I       | Tx6p      | Transmitter Non-Inverted Data Input |
| 9   | CML-I       | Tx6n      | Transmitter Inverted Data Input     |
| 10  |             | GND       | Ground                              |
| 11  | CML-I       | Tx6p      | Transmitter Non-Inverted Data Input |
| 12  | CML-I       | Tx6n      | Transmitter Inverted Data Input     |
| 13  |             | GND       | Ground                              |
| 14  | LVC MOS-I/O | SCL       | 2-wire serial interface clock       |
| 15  |             | VCC       | +3.3V Power supply                  |
| 16  |             | VCC       | +3.3V Power supply                  |
| 17  |             | LPWn/PRSn | Low-Power Mode / Module Present     |
| 18  |             | GND       | Ground                              |
| 19  | CML-O       | Rx7n      | Receiver Inverted Data Output       |
| 20  | CML-O       | Rx7p      | Receiver Non-Inverted Data Output   |
| 21  |             | GND       | Ground                              |
| 22  | CML-O       | Rx5n      | Receiver Inverted Data Output       |
| 23  | CML-O       | Rx5p      | Receiver Non-Inverted Data Output   |
| 24  |             | GND       | Ground                              |
| 25  | CML-O       | Rx3n      | Receiver Inverted Data Output       |
| 26  | CML-O       | Rx3p      | Receiver Non-Inverted Data Output   |
| 27  |             | GND       | Ground                              |
| 28  | CML-O       | Rx1n      | Receiver Inverted Data Output       |
| 29  | CML-O       | Rx1p      | Receiver Non-Inverted Data Output   |
| 30  |             | GND       | Ground                              |
| 31  |             | GND       | Ground                              |
| 32  | CML-O       | Rx2p      | Receiver Non-Inverted Data Output   |
| 33  | CML-O       | Rx2n      | Receiver Inverted Data Output       |
| 34  |             | GND       | Ground                              |
| 35  | CML-O       | Rx4p      | Receiver Non-Inverted Data Output   |
| 36  | CML-O       | Rx4n      | Receiver Inverted Data Output       |
| 37  |             | GND       | Ground                              |
| 38  | CML-O       | Rx6p      | Receiver Non-Inverted Data Output   |

|    |            |          |                                           |
|----|------------|----------|-------------------------------------------|
| 39 | CML-O      | Rx6n     | Receiver Inverted Data Output             |
| 40 |            | GND      | Ground                                    |
| 41 | CML-O      | Rx8p     | Receiver Non-Inverted Data Output         |
| 42 | CML-O      | Rx8n     | Receiver Inverted Data Output             |
| 43 |            | GND      | Ground                                    |
| 44 |            | INT/RSTn | Module Interrupt / Module Reset           |
| 45 |            | VCC      | +3.3V Power supply                        |
| 46 |            | VCC      | +3.3V Power supply                        |
| 47 | LVCMOS-I/O | SDA      | 2-wire serial interface data              |
| 48 |            |          |                                           |
| 49 | CML-I      | Tx7n     | Transmitter Inverted Data                 |
| 50 | CML-I      | Tx7p     | Input Transmitter Non-Inverted Data Input |
| 51 |            | GND      | Ground                                    |
| 52 | CML-I      | Tx5n     | Transmitter Inverted Data                 |
| 53 | CML-I      | Tx5p     | Input Transmitter Non-Inverted Data Input |
| 54 |            | GND      | Ground                                    |
| 55 | CML-I      | Tx3n     | Transmitter Inverted Data                 |
| 56 | CML-I      | Tx3p     | Input Transmitter Non-Inverted Data Input |
| 57 |            | GND      | Ground                                    |
| 58 | CML-I      | Tx1n     | Transmitter Inverted Data                 |
| 59 | CML-I      | Tx1p     | Input Transmitter Non-Inverted Data Input |
| 60 |            | GND      | Ground                                    |

Top Side (viewed from top)



Bottom Side (viewed from bottom)



Module Card Edge

## General Product Characteristics

| OSFP_2XOSFP DAC Specifications |                                                |
|--------------------------------|------------------------------------------------|
| Number of Lanes                | Tx8 & Rx8(800G OSFP)<br>Tx4 & Rx4(2X400G OSFP) |
| 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           | 60pins edge connector                          |
| Management Interface           | Serial, I <sup>2</sup> C                       |

## High Speed Characteristics

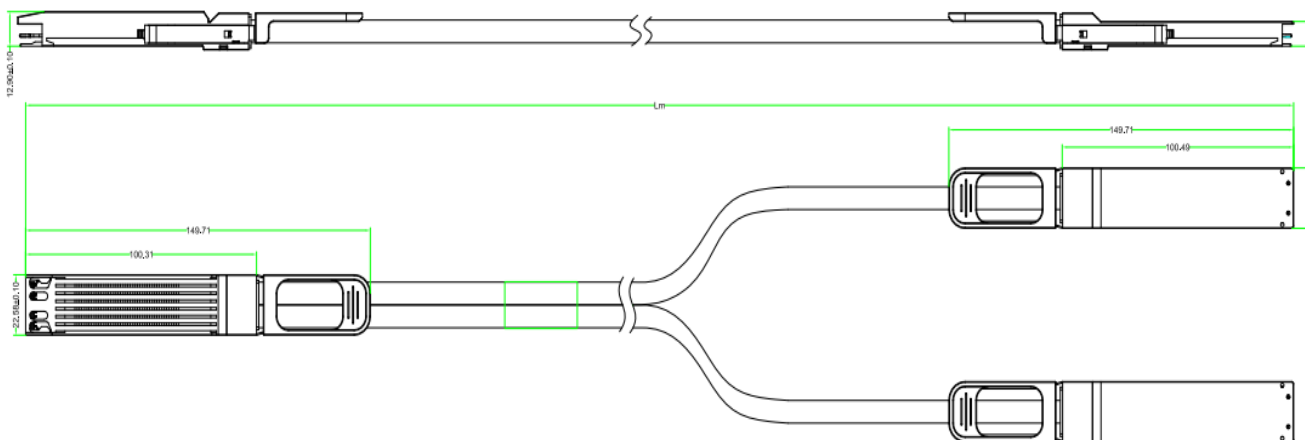
| Parameter                                     | Symbol          | Min    | Typical | Max   | Unit | Note                 |
|-----------------------------------------------|-----------------|--------|---------|-------|------|----------------------|
| Differential Impedance                        | TDR             | 90     | 100     | 110   | Ω    |                      |
| Insertion loss                                | SDD21           | -19.75 |         |       | dB   | At 26.56 GHz         |
| Differential Return Loss                      | SDD11<br>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<br>SCC22  |        |         | -2    | dB   | At 0.2 to 40GHz      |
| Differential to common Mode Conversion Loss   | SCD21-<br>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

## Mechanical Specifications

The connector is compatible with the SFF8024 specification.



| Length (m) | Cable AWG |
|------------|-----------|
| 1          | 30        |
| 1.5        | 30        |
| 2          | 26        |
| 2.5        | 26        |
| 3          | 26        |

## Regulatory Compliance

| Feature                                              | Test Method                                                            | Performance                                                                     |
|------------------------------------------------------|------------------------------------------------------------------------|---------------------------------------------------------------------------------|
| Electrostatic Discharge (ESD) to the Electrical Pins | 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 80 to 1000MHz |
| RoHS Compliance                                      | RoHS Directive 2011/65/EU and it's Amendment Directives (EU ) 2015/863 | RoHS (EU) 2015/863 compliant                                                    |



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|------------------|---------------------------------------|--------------------------------------|
| REACH Compliance | REACH Regulation (EC) No<br>1907/2006 | REACH (EC) No<br>1907/2006 compliant |
|------------------|---------------------------------------|--------------------------------------|

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