

# SO-QSFP-DD-2C-10 / -4

QSFP-DD 2x 100G Ethernet, 1295.56nm/1300.05nm/1304.58nm/1309.14nm, 10km, 7.3dB, Dual CS

## OVERVIEW

The SO-QSFP-DD-2C-10 is a QSFP-DD form-factor transceiver for 2x 100Gbps Ethernet applications. It is intended for use in data center interconnect between switches, routers, storage equipment etc. for optical distances up to 10km over a SingleMode (SM) fiber cable.

The transceiver has a dual CS connector interface which means that there are two singlemode fiber pairs connected to the transceiver, each transporting a 100Gbps signal. The SO-QSFP-DD-2C-10 is thus intended for 200G to 2x 100G breakout configurations using two 100G QSFP-28 transceivers on the 100G Ethernet side. The SO-QSFP28-LR4-10L has matching optical performance and is a recommended option for this.

The electrical interface consists of eight 25.78G NRZ signals (SFF-8679) that are converted to eight channels/lanes (four per fiber-pair) to transport the Ethernet signal.

Digital diagnostics functions are available via an I<sup>2</sup>C interface, as specified by the QSFP-DD MSA. The transceiver is provided in two versions, compliant with Common Management Interface Specification CMIS3.0 and CMIS4.0.

## TECHNICAL DATA

| Parameter             | Value  |
|-----------------------|--|
| Technology            | Grey QSFP-DD   |
| Transmission media    | SM (Dual CS)   |
| Typical reach         | 10km   |
| Nominal wavelengths   | 1295.56nm<br>1300.05nm<br>1304.58nm<br>1309.14nm       |
| Interface standards   | 100GBASE-LR4   |
| Bit rate support      | 2x 103.12Gbps <sup>1)</sup><br>25.78Gbps <sup>2)</sup> |
| Protocol support      | 2x 100GbE  |
| Power budget          | 0 – 7.3dB  |
| Power consumption     | < 8W   |
| Operating temperature | 0°C to +70°C   |
| Storage temperature   | -40°C to +85°C   |

<sup>1)</sup> Aggregated line rate 200GbE

<sup>2)</sup> Line rate per lane

<sup>3)</sup> Average power, per lane

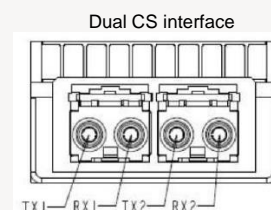
<sup>4)</sup> Specified at BER 1x10<sup>-12</sup>

### Safety/regulatory compliance:

TUV/UL/FDA (contact Smartoptics for latest certification information)

RoHS compliance

| Parameter                      | Value  |
|--------------------------------|--|
| <b>Transmitter data:</b>       |  |
| Output power, per lane         | Min: -0.7dBm <sup>3)</sup><br>Max: +4.5dBm <sup>3)</sup>                                 |
| Transmit wavelengths           | 1294.53 - 1296.59nm<br>1299.02 - 1301.09nm<br>1303.54 - 1305.63nm<br>1308.09 - 1310.19nm |
| <b>Receiver data:</b>          |  |
| Minimum input power, per lane  | -8.0dBm <sup>3) 4)</sup>   |
| Overload (max power), per lane | +4.5dBm <sup>3) 4)</sup>   |
| Wavelength range               | 1294.53 - 1296.59nm<br>1299.02 - 1301.09nm<br>1303.54 - 1305.63nm<br>1308.09 - 1310.19nm |
| DDM                            | Yes  |
| MSA compliance                 | QSFP-DD MSA<br>CMIS3.0 / CMIS4.0   |



## APPLICATION CODE LIST

| CMIS Application Code | Host format  | Electrical interface | Payload | FEC    | MSA                      |
|-----------------------|--------------|----------------------|---------|--------|--------------------------|
| 1                     | 2x100GBASE-R | 2x CAUI-4 (4x 25G)   | 200G    | No FEC | 100GBASE-LR4 (Clause 88) |

## ORDERING INFORMATION

| Ordering number    | Description                                      |
|--------------------|--|
| SO-QSFP-DD-2C-10   | QSFP-DD 2x100G Ethernet 10km 7.3dB CMIS3 Dual CS |
| SO-QSFP-DD-2C-10-4 | QSFP-DD 2x100G Ethernet 10km 7.3dB CMIS4 Dual CS |

## GENERAL DEFINITIONS

| Parameter                    | Description  |
|------------------------------|--|
| Technology                   | Grey; Transceiver type for non-WDM applications. Electrical or optical.<br>CWDM; Transceiver type for CWDM applications using G.694.2 channel grid.<br>DWDM; Transceiver type for DWDM applications using G.694.1 channel grid.<br>BiDi; Transceiver pair using two different wavelength channels operating on a single-fiber.<br>DAC: Direct Attach Cable. Electrical cable with attached connectors.<br>AOC: Active Optical Cable. Optical cable with attached connectors. |
| Transmission Media           | Type of fiber, e.g. Multimode (MM) or Singlemode (SM). Number of and connector type within brackets (e.g. 2x LC, 1x MPO).  |
| Typical reach                | Nominal distance performance based on typical fiber dispersion, fiber loss and power budget properties, i.e. w/o dispersion compensation and optical amplification. Actual distance is dependent on actual optical path loss and dispersion properties.  |
| Bit rate range               | Supported bit rate range in Gigabit or Megabit per second (Gbps or Mbps).  |
| Protocols                    | Protocols within supported bit rate range.   |
| Nominal wavelength           | Typical wavelength(s) from transmitter.  |
| Interface standards          | Referenced interface standards or MSA's, e.g. IEEE 802.3 standard for 10GbE services or 100G 4WDM-10 etc.  |
| Power budget                 | Min and max power budget between Transmitter and Receiver w/o optical path penalties.  |
| Dispersion tolerance/penalty | Maximum amount of tolerated dispersion and required reduction of power budget to maintain stipulated Bit Error Rate (BER) and at a given bit rate.   |
| Temperature range            | Max operating case temperature range.<br>Standard temperature range (C-temp): 0°C to +70°C (32°F to +158°F)<br>Extended temperature range (E-temp): typically -20°C to +75°C (-4°F to +167°F)<br>Industrial temperature range (I-temp): -40°C to +85°C (-40°F to +185°F)   |
| Power consumption            | Worst case power consumption. Will vary over temperature.  |
| Transmitter Output power     | Average output power. Provided in min and max values.  |
| Receiver minimum input power | Minimum average input power at specified BER, normally $1E^{-12}$ . Note that some protocols require FEC to achieve sufficient BER.  |
| Receiver max input power     | Maximum average input power giving a BER, normally $1E^{-12}$ .  |
| DDM                          | Digital Diagnostic Monitoring functionality as defined in e.g. SFF-8472 MSA.   |

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