

# SO-QSFP-ER4

QSFP+, 40GBase, CWDM 1270-1330nm, SM, DDM, 18.5dB, 40km

## OVERVIEW

The SO-QSFP-ER4 is a QSFP+ (Quad Small Form-factor Pluggable Plus) transceiver for 40 Gbps applications such as inter- and intra-connect within and between data centers between switches, routers, storage equipment etc.

The SO-QSFP-ER4 converts 4x 10Gbps flows into four CWDM channels in the 1300nm band up to 40 km over a SingleMode (SM) fiber.

## TECHNICAL DATA

|                            |   |
|----------------------------|---|
| <b>Technology</b>          | Grey QSFP+  |
| <b>Transmission media</b>  | SM (2x LC)  |
| <b>Typical reach</b>       | 40 km   |
| <b>Nominal wavelength</b>  | Ch 1: 1271 nm<br>Ch 2: 1291 nm<br>Ch 3: 1311 nm<br>Ch 4: 1331 nm          |
| <b>Interface standards</b> | 40GBASE-ER4   |
| <b>Bit rate range</b>      | 41.25 / 43.018 Gbps <sup>1)</sup><br>10.3125 / 10.7546 Gbps <sup>2)</sup> |
| <b>Protocols</b>           | Eth: 40GbE<br>OTN: OTU3   |
| <b>Power budget</b>        | 9 – 18.5 dB   |
| <b>Temperature range</b>   | 0°C to +70°C  |
| <b>Power consumption</b>   | < 3.5W  |

- <sup>1)</sup> Aggregated line rate  
<sup>2)</sup> Per channel line rate  
<sup>3)</sup> Total power (all lanes)  
<sup>4)</sup> Ch 1  
<sup>5)</sup> Ch 2  
<sup>6)</sup> Ch 3  
<sup>7)</sup> Ch 4  
<sup>8)</sup> Per channel @ 10.3125 Gbps

|                         |                               |  |
|-------------------------|-------------------------------|--|
| <b>Transmitter data</b> | <b>Output power, tot:</b>     | Max: + 10.5 dBm <sup>3)</sup>  |
|                         | <b>Output power, per lane</b> | Min: - 2.7 dBm<br>Max: + 4.5dBm  |
|                         | <b>Tx wavelength (nm):</b>    | 1264.5 – 1277.5 <sup>4)</sup><br>1284.5 – 1297.5 <sup>5)</sup><br>1304.5 – 1317.5 <sup>6)</sup><br>1324.5 – 1337.5 <sup>7)</sup> |
| <b>Receiver data</b>    | <b>Minimum input power:</b>   | -21.2 dBm <sup>8)</sup>  |
|                         | <b>Overload (max power):</b>  | - 4.5 dBm <sup>8)</sup>  |
|                         | <b>Wavelength range:</b>      | 1264.5 – 1277.5 <sup>4)</sup><br>1284.5 – 1297.5 <sup>5)</sup><br>1304.5 – 1317.5 <sup>6)</sup><br>1324.5 – 1337.5 <sup>7)</sup> |
| <b>DDM</b>              | Yes                           |  |
| <b>MSA compliance</b>   | QSFP+ MSA<br>SFF-8436         |  |

### Regulatory compliance

|                  |   |
|------------------|---|
| <b>EMC CE</b>    | EN 55022:2010<br>EN 55024:2010  |
| <b>UL/Safety</b> | UL 60950-1  |
| <b>FCC</b>       | 47 CFR PART 15 OCT, 2013  |
| <b>RoHS</b>      | RoHS 6  |
| <b>TUV</b>       | EN 60950-1:2006+A11+A1+A12+A2<br>EN 60825-1:2014<br>EN 60825-2:2004+A1+A2 |

|                      |                |
|----------------------|----------------|
| <b>Storage temp.</b> | -40°C to +85°C |
|----------------------|----------------|

Note! See "Definitions" below.

## ORDERING INFORMATION

| Part number | Description   |
|-------------|---|
| SO-QSFP-ER4 | QSFP+, 40GBase, CWDM 1270-1330nm, SM, DDM, 18.5dB, 40km |

## DEFINITIONS

|                               |  |
|-------------------------------|--|
| 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. |
| Transmission Media:           | DAC: Direct Attach Cable (DAC). Electrical or optical cable with attached connectors.<br>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 dispersion and power budget properties, i.e. w/o dispersion compensation and optical amplification.  |
| 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 from transmitter.   |
| Interface standards:          | Referenced interface standards e.g. IEEE 802.3 standard for 10GbE services.  |
| Power budget:                 | Min and max power budget between Transmitter and Receiver. Excluding any dispersion penalty.   |
| Dispersion tolerance/penalty: | Maximum amount of tolerated dispersion and required reduction of power budget to maintain BER better than $1E^{-12}$ . Defined at a specific bit rate.   |
| Temperature range:            | Max operating case temperature range.<br>Standard temperature range: typically 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.  |
| Transmitter Output power:     | Average output power. Provided in min and max values.  |
| Receiver minimum input power: | Minimum average input power at specified BER, normally $1E^{-12}$ .  |
| Receiver max input power:     | Maximum average input power giving a BER, normally $1E^{-12}$ .  |
| DDM:                          | Digital Diagnostic Monitoring functionality as defined in SFF-8472 MSA.  |