

# SO-QSFP-DD-4C-LR4 / -LR4-4

QSFP-DD 400G Ethernet-LR4, 4x100G PAM4, 1271nm/1291nm/1311nm/1331nm, 10km, 6.3dB, LC

## OVERVIEW

The SO-QSFP-DD-4C-LR4 is a QSFP-DD form-factor transceiver for 400Gbps 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 electrical interface consists of eight 53.125G signals (400GAUI-8) that are converted to eight PAM4-modulated channels/lanes 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 optical interface to the transceiver is 2x LC connectors.

The transceiver is provided in two versions, compliant with Common Management Interface Specification CMIS3.0 and CMIS4.0.

## TECHNICAL DATA

<b>Technology</b>	Grey QSFP-DD
<b>Transmission media</b>	SM (2x LC)
<b>Typical reach</b>	10 km
<b>Nominal wavelength</b>	1271 nm 1291 nm 1311 nm 1331 nm
<b>Bit rate range</b>	425 Gbps <sup>1)</sup> 53.125 Gbd <sup>2)</sup>
<b>Protocols</b> Eth:	400GbE
<b>Interface standard / MSA</b>	400G-LR4
<b>Power budget</b>	0 - 6.3 dB
<b>Temperature range</b>	0°C to +70°C
<b>Power consumption</b>	< 10 W

<b>Transmitter data</b>	Output power, total:	Max 10 dBm
	Output power, per lane:	Min: -2.8 dBm <sup>3)</sup> Max: +4.0 dBm <sup>3)</sup>
	Tx wavelength (nm):	1264.5 - 1277.5 nm 1284.5 - 1297.5 nm 1304.5 - 1317.5 nm 1324.5 - 1337.5 nm
<b>Receiver data</b>	Minimum input power:	-9.1 dBm <sup>3)</sup>
	Overload (max power):	+4.0 dBm <sup>3)</sup>
	Wavelength range:	1264.5 - 1277.5 nm 1284.5 - 1297.5 nm 1304.5 - 1317.5 nm 1324.5 - 1337.5 nm
<b>DDM</b>		Yes
<b>MSA compliance</b>		QSFP-DD MSA

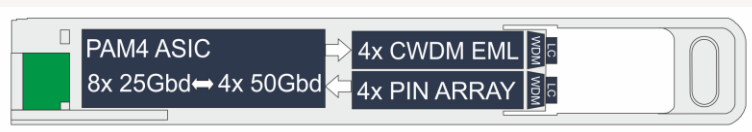
- <sup>1)</sup> Aggregated line rate (400GbE)
- <sup>2)</sup> Lane baud rate
- <sup>3)</sup> Per lane

### Regulatory compliance

<b>Safety</b>	EN 60950-1:2006+A11+A1+A12+A2 EN 60825-1:2014 EN 60825-2:2004+A1+A2 UL 60950-1
<b>RoHS</b>	EU Directive 2011/65/EU

<b>Storage temp.</b>	-40°C to +85°C
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Note! See "Definitions" below.



## ORDERING INFORMATION

Part number	Description
SO-QSFP-DD-4C-LR4	QSFP-DD 400G-LR4 Ethernet, 4x100G-LR, PAM4 CMIS3.0, 1271nm/1291nm/1311nm/1331nm 10km 6.3dB LC
SO-QSFP-DD-4C-LR4-4	QSFP-DD 400G-LR4 Ethernet, 4x100G-LR, PAM4 CMIS4.0, 1271nm/1291nm/1311nm/1331nm 10km 6.3dB LC

## DEFINITIONS

Technology:	Grey; Transceiver type for non-WDM applications. Electrical or optical. CWDM; Transceiver type for CWDM applications using G.694.2 channel grid. DWDM; Transceiver type for DWDM applications using G.694.1 channel grid. BiDi; Transceiver pair using two different wavelength channels operating on a single-fiber. DAC: Direct Attach Cable. Electrical or 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 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. Standard temperature range: Typically 0°C to +70°C (32°F to +158°F) Extended temperature range (E-temp): Typically -20°C to +75°C (-4°F to +167°F) 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 at specified BER, normally $1E^{-12}$ .
DDM:	Digital Diagnostic Monitoring functionality as defined in SFF-8472 MSA.