

# SO-QSFP-LR4

QSFP+, 40G Ethernet LR4, OTU3, SM, 1271/1291/1311/1331nm, 10km, 6.7dB, LC

## OVERVIEW

The SO-QSFP-LR4 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-LR4 converts 4x 10 Gbps flows into four CWDM channels in the 1300nm band up to 10 km over a SingleMode (SM) fiber.

The transceiver provides digital diagnostic functions via a 2-wire serial interface as defined by the SFF-8472 specification.

## TECHNICAL DATA

Parameter	Value
Technology	Grey QSFP+
Transmission media	SM (2x LC)
Typical reach	10km
Nominal wavelength	Lane 1: 1271nm Lane 2: 1291nm Lane 3: 1311nm Lane 4: 1331nm
Interface standards	40GBASE-LR4
Bit rate support	41.25 / 43.018Gbps <sup>1)</sup> 10.3125 / 10.7546Gbps <sup>2)</sup>
Protocol support	40GbE / OTU3
Power budget	0 – 6.7dB
Power consumption	< 3.5W
Operating temperature	0°C to +70°C
Storage temperature	-40°C to +85°C

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

<sup>2)</sup> Per lane

<sup>3)</sup> Average power

<sup>4)</sup> At 10.3125Gbps, BER less than  $10^{-12}$ , with a  $2^{31}-1$  PRBS

Parameter	Value
<b>Transmitter data:</b>	
Output power, total	Max +8.3dBm <sup>3)</sup>
Output power, per lane	Min: -7.0dBm <sup>3)</sup> Max: +2.3dBm <sup>3)</sup>
Transmit wavelength	1264.5 – 1277.5nm 1284.5 – 1297.5nm 1304.5 – 1317.5nm 1324.5 – 1337.5nm
<b>Receiver data:</b>	
Minimum input power	-13.7dBm <sup>2) 3) 4)</sup>
Overload (max power)	+2.3dBm <sup>2) 3) 4)</sup>
Wavelength range	1264.5 – 1277.5nm 1284.5 – 1297.5nm 1304.5 – 1317.5nm 1324.5 – 1337.5nm
LOS Assert	Min -24dBm
LOS De-Assert	Max -11.5dBm
LOS Hysteresis	Min 0.5dB
DDM	Yes
MSA compliance	QSFP+ MSA, SFF-8436

### Safety/regulatory compliance:

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

RoHS compliance

## ORDERING INFORMATION

Ordering number	Description
SO-QSFP-LR4	QSFP+, 40G Ethernet LR4, OTU3, SM, 1271/1291/1311/1331nm, 10km, 6.7dB, LC

## GENERAL 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.
Transmission Media:	DAC: Direct Attach Cable (DAC). Electrical or optical cable with attached connectors. 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.
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. Commercial temperature range (C-temp): 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. 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 $1E^{-12}$ .
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.

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