

**DATASHEET 5.1****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

Parameter	Value
Technology	Grey QSFP+
Transmission media	SM (2x LC)
Typical reach	40km
Nominal wavelength	Lane 1: 1271nm Lane 2: 1291nm Lane 3: 1311nm Lane 4: 1331nm
Interface standards	40GBASE-ER4
Bit rate support	41.25 / 43.018Gbps ¹⁾ 10.3125 / 10.7546Gbps ²⁾
Protocol support	40GbE / OTU3
Power budget	9 – 18.5dB
Optical path penalty	2.6dB
Power consumption	< 3.5W
Operating temperature	0°C to +70°C
Storage temperature	-40°C to +85°C

1). Aggregated line rate

2). Per lane

3). Average power

4). At BER less than 10^{-12} , with a $2^{31}-1$ PRBS

Safety/regulatory compliance:

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

RoHS compliance

ORDERING INFORMATION

Ordering number	Description
SO-QSFP-ER4	QSFP+, 40G Ethernet ER4, SM, 1271/1291/1311/1331nm, 40km, 18.5dB, LC

GENERAL DEFINITIONS

Parameter	Description
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 (DAC). Electrical or optical cable with attached connectors.

Parameter	Value
Transmitter data:	
Output power, total	Max +10.5dBm ³⁾
Output power, per lane	Min: -2.7dBm ³⁾ Max: +4.5dBm ³⁾
Transmit wavelength	1264.5 – 1277.5nm 1284.5 – 1297.5nm 1304.5 – 1317.5nm 1324.5 – 1337.5nm
Receiver data:	
Minimum input power	-21.2dBm ²⁾³⁾⁴⁾
Overload (max power)	-4.5dBm ²⁾³⁾⁴⁾
Wavelength range	1264.5 – 1277.5nm 1284.5 – 1297.5nm 1304.5 – 1317.5nm 1324.5 – 1337.5nm
LOS Assert	Min -34dBm
LOS De-Assert	Max -24dBm
LOS Hysteresis	Min 0.5dB
DDM	Yes
MSA compliance	QSFP+ MSA, SFF-8436

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.
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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