

# SO-QSFP28-LR4-20L

QSFP28, 100G Ethernet eLR4, SM, 1296/1300/1305/1309nm, 20km, 8.1dB, LC

## OVERVIEW

The SO-QSFP28-LR4-20L is a QSFP28 form-factor transceiver for 100G Ethernet applications. It is intended for use in inter- and intra-connect applications within and between data centers between switches, routers, storage equipment etc. The optical performance supports optical distances up to 20km over a SingleMode (SM) fiber.

For Ethernet services, Forward Error Correction (FEC) is required to be implemented by the host in order to ensure reliable system operation. The FEC type shall be as defined in IEEE802.3bj, i.e. Reed Solomon RS(528,514). The optical parameters will provide a bit error ratio (BER) of  $5 \times 10^{-5}$ . FEC will render in the required BER of better than  $1 \times 10^{-12}$ .

SO-QSFP28-LR4-20L uses four optical channels/lanes @ 25.78 Gbps to transport the Ethernet signal. Digital diagnostics functions are available via an I2C interface, as specified by the QSFP28 MSA.

## TECHNICAL DATA

Parameter	Value
Technology	Grey QSFP28
Transmission media	SM (2x LC)
Typical reach	20km
Nominal wavelength	Lane 1: 1295.56nm Lane 2: 1300.05nm Lane 3: 1304.58nm Lane 4: 1309.14nm
Interface standards	100GBASE-LR4
Bit rate support	103.12Gbps <sup>1)</sup> 25.78 Gbps <sup>2)</sup>
Protocol support	100GbE
Power budget	0 – 8.1dB
Power consumption	< 3.5W
Operating temperature	0°C to +70°C
Storage temperature	-40°C to +85°C

Parameter	Value
<b>Transmitter data:</b>	
Output power, total	Max +10.5dBm <sup>3)</sup>
Output power, per lane	Min: -2.5dBm <sup>3)</sup> Max: +4.5dBm <sup>3)</sup>
Transmit wavelength	1294.53 – 1296.59nm 1299.02 – 1301.09nm 1303.54 – 1305.63nm 1308.09 – 1310.19nm
<b>Receiver data:</b>	
Minimum input power	-10.6dBm <sup>2) 3) 4)</sup>
Overload (max power)	+4.5dBm <sup>2) 3) 4)</sup>
Wavelength range	1294.53 – 1296.59nm 1299.02 – 1301.09nm 1303.54 – 1305.63nm 1308.09 – 1310.19nm
DDM	Yes
MSA compliance	QSFP28 MSA

<sup>1)</sup> Aggregated line rate 100GbE

<sup>2)</sup> Per lane

<sup>3)</sup> Average power

<sup>4)</sup> Specified at BER  $5 \times 10^{-5}$



### Safety/regulatory compliance:

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

RoHS compliance

## ORDERING INFORMATION

Ordering number	Description
SO-QSFP28-LR4-20L	QSFP28, 100G Ethernet eLR4, SM, 1296/1300/1305/1309nm, 20km, 8.1dB, 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. DAC: Direct Attach Cable (DAC). 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.
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 <sup>-12</sup> .
Receiver max input power:	Maximum average input power giving a BER, normally 1E <sup>-12</sup> .
DDM:	Digital Diagnostic Monitoring functionality as defined in SFF-8472 MSA.

Smartoptics makes no warranties or representations, expressed or implied, of any kind relative to the information or any portion thereof contained in this document or its adaptation or use, and assumes no responsibility or liability of any kind, including, but not limited to, indirect, special, consequential or incidental damages, for any errors or inaccuracies contained in the information or arising from the adaptation or use of the information or any portion thereof. The information in this document is subject to change without notice.