

# SO-QSFP28-100G-FR

QSFP28, 100G Ethernet FR, SM, 1x 1311nm, PAM4, 2km, 4dB, LC

## OVERVIEW

The SO-QSFP28-100G-FR is a QSFP28 form-factor transceiver for 100 Gbps Ethernet applications. It is intended for use in intra- and interconnect applications within and between data centers between switches, routers, storage equipment etc.

SO-QSFP28-100G-FR has an optical performance enabling distances of up to 2km over a SingleMode (SM) fiber-pair cable. 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  $2.4 \times 10^{-4}$ . FEC will render in the required BER of better than  $1 \times 10^{-12}$ .

SO-QSFP28-100G-FR uses a single 1311nm channel/lane @ 50Gbaud using PAM4 modulation to transport the Ethernet signal. The electrical interface is 4x 25.78Gbps and compliant with OIF CEI-28G-VSR. Digital diagnostics functions (DDM) 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	2 km
Nominal wavelength	1311 nm
Interface standards	100GBASE-FR
Bit rate support	103.12 Gbps <sup>1)</sup> 53.125 Gbd <sup>2)</sup>
Protocol support	100GbE
Power budget	0 – 4.0 dB
Power consumption	< 4W
Operating temperature	0°C to +70°C
Storage temperature	-40°C to +85°C

Parameter	Value
<b>Transmitter data:</b>	
Output power	Min: -2.4 dBm <sup>3)</sup> Max: +4.0 dBm <sup>3)</sup>
Transmit wavelength	1304.5 – 1317.5 nm
<b>Receiver data:</b>	
Minimum input power	-6.4 dBm <sup>3) 4)</sup>
Overload (max power)	+4.5 dBm <sup>3) 4)</sup>
Wavelength range	1304.5 – 1317.5 nm
DDM	Yes
MSA compliance	QSFP28 MSA SFF-8636

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

<sup>2)</sup> Line baud rate

<sup>3)</sup> Average power

<sup>4)</sup> Specified at BER  $2.4 \times 10^{-5}$

### Safety/regulatory compliance:

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

RoHS compliance



## ORDERING INFORMATION

Ordering number	Description
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## 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.

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