QSFP28 100G-ZR4, 100KM

QSFP28, 100G Eth ZR4+, SM 1296/1300/1305/1309nm, 100km, 32.5dB, LC

TQ2036-SL4C-SO

The TQ2036-SL4C-SO is a QSFP28 form-factor transceiver for 100 Gbps Ethernet applications. It is intended for use in interconnect applications between data centers between switches, routers, storage equipment etc.

TQ2036-SL4C-SO has an optical performance enabling distances of up to 100km over a SingleMode (SM) G.652 fiber-pair cable. Forward Error Correction (FEC) is required to be implemented by the host 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 5×10^{-5}. FEC will render in the required BER of better than 1×10^{-12}.

TQ2036-SL4C-SO uses four LANWDM channels/lanes @ 25.78 Gbps to transport the Ethernet signal. 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	100km
Nominal wavelengths	1295.56nm
	1300.05nm
	1304.58nm
	1309.14nm
Interface standards	100GBASE-ZR4, 100km
Bit rate support	103.12Gbps [1]
	25.78Gbps [2]
Protocol support	100GbE
Power budget	2.0 – 32.5dB
Dispersion penalty	1.0dB
Power consumption	Max < 6.0W [5]
Operating temperature	0°C to +70°C
Storage temperature	-40°C to +85°C

[1] Aggregated line rate 100GbE

[2] Line rate per 25.78Gbps lane

[3] Average power

[4] Per 25.78Gbps lane. Measured with PRBS31 (2^{31}-1) @ BER 5E-5

[5] Max is worst case at high temp limit

Safety/regulatory compliance:
TUV/UL/FDA (contact Smartoptics for latest certification information)
RoHS compliance

Parameter	Value
Transmitter data:	
Output power, total	Max: +12.5dBm
Output power, per lane	Min: +3.0dBm [3]
	Max: +6.5dBm [3]
Transmit wavelengths	1294.53 - 1296.59nm
	1299.02 - 1301.09nm
	1303.54 - 1305.63nm
	1308.09 - 1310.19nm
Receiver data:	
Minimum input power, per lane	-29.5dBm [3] [4]
Overload (max power), per lane	+4.5dBm [3] [4]
Damage threshold, per lane	+5.5dBm [3]
Wavelength range	1294.53 - 1296.59nm
	1299.02 - 1301.09nm
	1303.54 - 1305.63nm
	1308.09 - 1310.19nm
LOS Assert	Min -35.0dBm
LOS De-assert	Max -28.0dBm
LOS Hysteresis	Min 0.5dB
DDM	Yes
MSA compliance	QSFP28 MSA, SFF-8636



ORDERING INFORMATION

Ordering number	Description
TQ2036-SL4C-SO	QSFP28, 100G Eth ZR4+, SM 1296/1300/1305/1309nm, 100km, 32.5dB, 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. Electrical cable with attached connectors. AOC: Active Optical Cable. 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 typical fiber dispersion, fiber loss and power budget properties, i.e. w/o dispersion compensation and optical amplification. Actual distance is dependent on actual optical path loss and dispersion properties.
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(s) from transmitter.
Interface standards	Referenced interface standards or MSA's, e.g. IEEE 802.3 standard for 10GbE services or 100G 4WDM-10 etc.
Power budget	Min and max power budget between Transmitter and Receiver w/o optical path penalties.
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. Standard 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 $1E^{-12}$. Note that some protocols require FEC to achieve sufficient BER.
Receiver max input power	Maximum average input power giving a BER, normally $1E^{-12}$.
DDM	Digital Diagnostic Monitoring functionality as defined in e.g. SFF-8472 MSA.

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