INDEPENDENT DATA SOLUTIONS

smartoptics

DATASHEET 5.3

SO-QSFP-DD-4C-LR4 / -LR4-4

QSFP-DD 400G Ethernet-LR4, 4x100G PAM4,1271nm/1291nm/1311nm/1331nm, 10km, 6.3dB, LC

OVERVIEW

The SO-QSFP-DD-4C-LR4 is a QSFP-DD form-factor transceiver for 400Gbps Ethernet applications. It is intended for use in data center interconnect between switches, routers, storage equipment etc. for optical distances up to 10km over a SingleMode (SM) fiber cable.

The electrical interface consists of eight 53.125G signals (400GAUI-8) that are converted to eight PAM4-modulated channels/lanes to transport the Ethernet signal. Digital diagnostics functions are available via an I2C interface, as specified by the QSFP-DD MSA. 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 x 10-4.

The optical interface to the transceiver is 2x LC connectors.

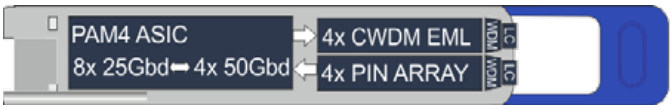
The transceiver is provided in two versions, compliant with Common Management Interface Specification CMIS3.0 and CMIS4.0.

TECHNICAL DATA

Parameter	Value
Technology	Grey QSFP-DD
Transmission media	SM (2x LC)
Typical reach	10km
Nominal wavelengths	1271 nm
	1291 nm
	1311 nm
	1331 nm
Interface standards	400GBASE-LR4
Bit rate support	425 Gbps [1]
	53.125 Gbd [2]
Protocol support	400GbE
Power budget	0 – 6.3 dB
Power consumption	< 10 W
Operating temperature	0°C to +70°C
Storage temperature	-40°C to +85°C

[1] Aggregated line rate 400GbE
[2] Line baud rate per lane
[3] Average power, per lane
[4] Specified at BER 2.4x10-4

Parameter	Value
Transmitter data:	
Output power, per lane	Min: -2.8 dBm [3]
	Max: +4.0 dBm [3]
Transmit wavelength	1264.5 - 1277.5 nm
	1284.5 - 1297.5 nm
	1304.5 - 1317.5 nm
	1324.5 - 1337.5 nm
Receiver data:	
Minimum input power	-9.1 dBm [3] [4]
Overload (max power)	+4.0 dBm [3] [4]
Wavelength range	1264.5 - 1277.5 nm
	1284.5 - 1297.5 nm
	1304.5 - 1317.5 nm
	1324.5 - 1337.5 nm
DDM	Yes
MSA compliance	QSFP-DD MSA
	CMIS3.0 / CMIS4.0
Safety / regulatory compliance	
TUV/UL/FDA (contact Smartoptics for latest certification information) RoHS compliance	



ORDERING INFORMATION

Ordering number	Description
SO-QSFP-DD-4C-LR4	QSFP-DD 400G-LR4 Ethernet, 4x100G-LR, PAM4 CMIS3.0, 1271nm/1291nm/1311nm/1331nm 10km 6.3dB LC
SO-QSFP-DD-4C-LR4-4	QSFP-DD 400G-LR4 Ethernet, 4x100G-LR, PAM4 CMIS4.0, 1271nm/1291nm/1311nm/1331nm 10km 6.3dB 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 $^{-12}$.
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.