SFP-DD 100G-LR

SFP-DD, 100G Ethernet LR, SM, 1x 1311nm, PAM4, 10km, 6.8dB, LC

TSD003-S31C-SO

The TSD003-S31C-SO is a SFP-DD 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.

TSD003-S31C-SO uses a single 1311nm channel/lane @ 50Gbaud using PAM4 modulation to transport the Ethernet signal. The electrical interface is 2x 53.125Gbps PAM4- modulated channels compliant with 100GAUI-2. Digital diagnostics functions (DDM) are available via an I2C interface, as specified by the QSFP28 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(544,514). The optical parameters will provide a bit error ratio (BER) of 2.4 x 10-4.

TECHNICAL DATA

Parameter	Value
Technology	Grey SFP-DD
Transmission media	SM (2x LC)
Typical reach	10km
Nominal wavelength	1x 1311nm
Interface standards	100G-LR - 100G Lambda MSA
Bit rate support	103.12Gbps [1]
	53.125Gbd [2]
Protocol support	100GbE
Power budget	0 – 6.8dB
Power consumption	< 3.5W
Operating temperature	0°C to +70°C
Storage temperature	-40°C to +85°C

Parameter	Value
Transmitter data:	
Output power, average	Min: -1.4dBm [3]
	Max: +4.5dBm [3]
Output power, OMA	Min: 0.7dBm
	Max: +4.7dBm
Transmit wavelength	1304.5 – 1317.5nm
Receiver data:	
Minimum input power, average	-7.7dBm [3]
Minimum input power, OMA	-6.1dBm [3] [4]
Overload (max power)	+4.0dBm [3] [4]
Wavelength range	1304.5 – 1317.5nm
LOS Assert	Min -15dBm
LOS De-assert	Max -12dBm
LOS Hysteresis	Min 0.5dB
DDM	Yes
MSA compliance	SFP-DD MSA
	SFP-DD MIS

[1] Aggregated line rate 100GbE

[2] Line baud rate

[3] Average launch power (min) is informative and not the principal indicator of signal strength. A transmitter with launch power below this value cannot be compliant; however, a value above this does not ensure compliance.

[4] Specified at BER $2.4x10^{-4}$

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

ORDERING INFORMATION

Ordering number	Description
TSD003-S31C-SO	SFP-DD, 100G Ethernet LR, SM, 1x 1311nm, PAM4, 10km, 6.8dB, 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 $1E^{-12}$.
Optical modulation Amplitude, OMA	Optical Modulation Amplitude is a parameter that, in certain standards, specifies the output power and receiver sensitivity. To measure the OMA, a oscilloscope with a baud rate corresponding to the transceiver is required. Thus, this parameter cannot be measured using an ordinary optical power meter.
DDM	Digital Diagnostic Monitoring functionality as defined in e.g. SFF-8472 MSA.