OSFP RHS 400G DR4, CMIS5.0

OSFP112 RHS, 400G-DR4 Ethernet, 4x100G-DR, PAM4 CMIS5.0, 4x 1311nm 500m 3dB MPO12

TOS001-S31C-SO

The TOS001-S31-SO is a OSFP112 Riding Heatsink (RHS) form-factor transceiver for 400Gbps Ethernet and 400G NDR InfiniBand applications. It is intended for use in data center interconnect between switches, routers, storage equipment etc. for optical distances up to 500m over a SingleMode (SM) ribbon fiber cable.

The electrical interface consists of eight 106.25G signals (400GAUI-4) that are converted to eight PAM4-modulated channels/lanes to transport the optical signal. The transceiver can also be set in 4x100GAUI-1 mode to enable 400G to 4x 100G break-out configurations. Digital diagnostics functions are available via an I^2C interface, as specified by the OSFP MSA.

The optical interface to the transceiver is an MPO12 Angled Polished Connector (APC).

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 2.4×10^{-4}. FEC on the module is Bypassed.

TECHNICAL DATA

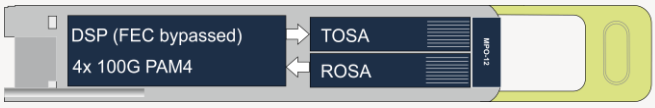
Parameter	Value
Technology	Grey, OSFP RHS
Transmission media	SM (1x MPO12)
Typical reach	500m
Nominal wavelengths	4x 1311nm
Interface standards	400GBASE-DR4
Electrical interfaces	400GAUI-4 or 4x100GAUI-1
Bit rate support	425Gbps [1]
	53.125Gbd [2]
Protocol support	400GbE
Power budget	0 – 3.6dB
Power consumption	< 9W
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

Parameter	Value
Transmitter data:	
Output power, Average, per lane	Min: -2.9dBm
	Max: +4.0dBm
Output power, OMA, per lane	Min: -0.8dBm
	Max: +4.2dBm
Transmit wavelength	1304.5 – 1317.5nm
Receiver data:	
Output power, Average, per lane	Min: -5.9dBm
	Max: +4.0dBm
Minimum input power, OMA per lane	-4.4dBm [3]
Overload (max power), OMA, per lane	+4.2dBm [3]
Wavelength range	1304.5 – 1317.5nm
LOS Assert	Min -15dBm
LOS De-assert	Max -10dBm
LOS Hysteresis	Min 0.5dB
DDM	Yes
MSA compliance	OSFP RHS MSA
	CMIS5.0

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



ORDERING INFORMATION

Ordering number	Description
TOS001-S31C-SO	OSFP112 RHS 400G-DR4 SM 500m MPO

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.