

# QSFP-DD 800G 2xDR4, CMIS5.0

QSFP-DD, 800G Ethernet, 2x400G-DR4, PAM4 CMIS5.0, 1311nm 500m 3.1dB 2xMPO

## TD8002-S31C-SO

The TD8001-S31C-SO is an QSFP-DD800 form-factor transceiver for 800Gbps or 2x400G Ethernet applications. It is intended for use in data center interconnect between switches, routers, storage equipment etc. for optical distances up to 500m over single-mode fiber. The optical interface consists of two MPO-12 connectors, allowing aggregation of two 400G-DR4 or eight 100G-DR transceivers.

The electrical interface consists of eight 106.25G signals (800GAUI-8) that are converted to eight PAM4-modulated channels/lanes to transport the optical signal over 1311 wavelengths. The transceiver can also be set in 2x400GAUI-4 and 8x100GAUI-1 mode to enable 2x400G or 8x 100G break-out configurations. Digital diagnostics functions are available via an I<sup>2</sup>C interface, as specified by the CMIS revision 5.0.

The optical interface to the transceiver is two MPO-12 connectors (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  $2.4 \times 10^{-4}$ .

## TECHNICAL DATA

Parameter	Value
Technology	Grey, QSFP-DD800 800G
Transmission media	SM (2x MPO-12, APC)
Typical reach	500m
Nominal wavelengths	4x1311nm
Interface standards	2x 400GBASE-DR4 8x 100GBASE-DR
Electrical interfaces	800GAUI-8 2x 400GAUI-4 8x 100GAUI-1
Bit rate support	850Gbps <sup>1)</sup> 53.125Gbd <sup>2)</sup>
Protocol support	800GbE, 2x400GbE, 8x100GbE
Power budget	0 – 3.1dB
Power consumption	< 14W
Operating temperature	0°C to +70°C
Storage temperature	-40°C to +85°C

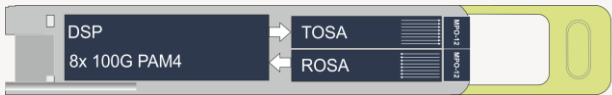
<sup>1)</sup> Aggregated line rate 800GbE

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

### Safety/regulatory compliance:

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

RoHS compliance



Parameter	Value
<b>Transmitter data:</b>	
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
<b>Receiver data:</b>	
Minimum input power, Average, per lane	-6.0dBm
Overload, Average, per lane	+4.0dBm
Minimum input power, OMA per lane	-3.9dBm
Wavelength range	1304.5 – 1317.5nm
LOS Assert	Min -16dBm
LOS De-assert	Max -10dBm
LOS Hysteresis	Min 0.5dB
DDM	Yes
MSA compliance	QSFP MSA, CMIS5.0



## APPLICATION CODE LIST

CMIS Application Code	Host format	Electrical interface	Payload	FEC	Media ID	MSA
1	2 x 400GBASE-R	2x 400GAUI-4-L C2M	2x 400G	RS-FEC	0x1C	400GBASE-DR4
2	2 x 400GBASE-R	2x 400GAUI-4-S C2M	2x 400G	RS-FEC	0x1C	400GBASE-DR4
3	800GBASE-R	1x 800GAUI-8 L C2M	800G	RS-FEC	0x56	800GBASE-DR8
4	800GBASE-R	1x 800GAUI-8 S C2M	800G	RS-FEC	0x56	800GBASE-DR8
5	4 x 200GBASE-R	4x 200GAUI-2-L C2M	4x 200G	RS-FEC	0xC0	200G-DR2* (Undefined)
6	4 x 200GBASE-R	4x 200GAUI-2-S C2M	4x 200G	RS-FEC	0xC0	200G-DR2* (Undefined)
7	8 x100GBASE-R	8 x 100GAUI-1-L C2M	8x 100G	RS-FEC	0x14	100GBASE-DR
8	8 x100GBASE-R	8 x 100GAUI-1-S C2M	8x 100G	RS-FEC	0x14	100GBASE-DR

\*) The media ID for the application code is missing in the MSA SFF-8024 and uses a Vendor specific/Custom code.

## ORDERING INFORMATION

Ordering number	Description
TD8002-S31C-SO	QSFP-DD 800G-2xDR4 Ethernet, PAM4 CMIS5.0, 8x 1311nm 500m 3.1dB 2xMPO12

## 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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