

**DATASHEET 5.0****SO-SFP28-32GFC-LR10-Cxx****SFP28, 32Gbps FC/25GbE/10GbE, CWDM, DDM, 9.4dB, 10km, 1270nm-1330nm (4ch)****OVERVIEW**

The SO-SFP28-32GFC-LR10-Cxx is a CWDM SFP28 transceiver for 32G Fiber Channel (FC) services, also supporting 25Gbps and 10Gbps Ethernet. The transceiver can also be used for transport of single lane 25G Ethernet and 10GbE services. The optical performance provides a bridgeable distance of up to 10 km for 32G FC.

The transceiver has a Rate\_Select function compliant with SFF-8472 Rev12.2 where a switch between 32G FC, 25GbE and 10GbE is done. The transceiver is available in 4 CWDM wavelength versions, spanning from 1270nm to 1330nm in accordance with the G.694.2 standard.

As stipulated by the 32G FC and 25G Ethernet standards, Forward Error Correction (FEC) is required to be implemented by the host in order to ensure reliable system operation. The optical parameters below will provide a bit error ratio (BER) of  $1 \times 10^{-6}$  for 32G FC. FEC will provide the required quality for secure service.

This transceiver provides digital diagnostic functions via a 2-wire serial interface as defined by the SFF-8472 specification.

## TECHNICAL DATA

Parameter	Value
Technology	CWDM SFP28
Transmission media	SM (2x LC)
Typical reach	10km
Nominal wavelength	1271 – 1331nm (4ch)
Bit rate support	28.05Gbps / 25.78Gbps 10.31Gbps / 9.95Gbps
Protocol support	32G FC / 25GE 10GbE-WAN / 10GbE-LAN
Power budget	0–9.4dB for 32GFC
Dispersion penalty	Max 4.5dB
Power consumption	< 1.2W
Operating temperature	0°C to +70°C
Storage temperature	-40°C to +85°C

1). Average power.

2). @ BER  $1 \times 10^{-6}$ , PRBS  $2^{31}-1$ , back-to-back.

Parameter	Value
<b>Transmitter data:</b>	
Output power 32G FC	Min: -3.0dBm <sup>1)</sup> Max: +2.0dBm <sup>1)</sup>
Transmit wavelength	1271 – 1331nm (ITU G.694.2)
<b>Receiver data:</b>	
Minimum input power 32G FC	-12.4dBm <sup>1) 2)</sup>
Overload (max power)	+2.0dBm <sup>1) 2)</sup>
Wavelength range	1260nm – 1350nm
LOS Assert	Min -30dBm
LOS De-assert	Max -17dBm
LOS Hysteresis	Min 0.5dB
DDM	Yes
MSA compliance	SFF-8402, -8472

### Safety/regulatory compliance:

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

RoHS compliance

## RATE\_SELECT OPERATION

The SO-SFP28-32GFC-LR10-Cxx supports high data rates 25.78Gbps/28.05Gbps (25GbE /32GFC) and Low data rates 9.95Gbps/10.31Gbps(10GbE-LW/LR). Rate\_Select is compliant with SFF-8472 Rev12.2.

Logic OR of RS0 pin and bit 110.3 of A2H	Logic OR of RS1 pin and bit 118.3 of A2H	RX Data Rate	TX Data Rate
High	High	25.78 / 28.05Gbps (25GE/32G FC)	25.78 / 28.05Gbps (25GE/32G FC)
Low	Low	9.95 / 10.31Gbps (10GbE-LW/-LR)	9.95 / 10.31Gbps (10GbE-LW/-LR)

## ORDERING INFORMATION

Ordering code	Description
SO-SFP28-32GFC-LR10-C27	SFP28, 32G FC, 25G/10G Ethernet, CWDM, 10km, 9.4dB, LC, 1270nm
SO-SFP28-32GFC-LR10-C29	SFP28, 32G FC, 25G/10G Ethernet, CWDM, 10km, 9.4dB, LC, 12790nm
SO-SFP28-32GFC-LR10-C31	SFP28, 32G FC, 25G/10G Ethernet, CWDM, 10km, 9.4dB, LC, 1310nm
SO-SFP28-32GFC-LR10-C33	SFP28, 32G FC, 25G/10G Ethernet, CWDM, 10km, 9.4dB, LC, 1330nm

## 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.

\*\* Smaroptics makes no warranties or representations, expressed or implied, of any kind relative to the information or any portion thereof contained in this document or its adaptation or use, and assumes no responsibility or liability of any kind, including, but not limited to, indirect, special, consequential or incidental damages, for any errors or inaccuracies contained in the information or arising from the adaptation or use of the information or any portion thereof. The information in this document is subject to change without notice.