

**DATASHEET 5.1****SO-SFP-1G-10G-LR****SFP+, 1000Base-LX / 10GBase-LR, 1310nm, SM, DDM, 10km****OVERVIEW**

SO-SFP-1G-10G-LR is a versatile 1310nm SFP+ transceiver for SingleMode (SM) fiber with a rate select between GbE and 10GbE-LAN/WAN services. The optical performance is in accordance with the IEEE 802.3ae standard, providing a bridgeable distance of up to 10km for 10GbE-LAN (10GBASE-LR), 10GbE-WAN (10GBASE-LW) and 1000BASE-LX (GbE) services.

The transceiver has no minimum distance (i.e. no minimum attenuation) which is ideal for intra-office connections since extra attenuators need not be considered.

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

TECHNICAL DATA

Parameter	Value
Technology	Grey SFP+
Transmission media	SM (2x LC)
Typical reach	10km
Nominal wavelength	1310nm
Bit rate support	1.25Gbps / 9.953Gbps to 10.312Gbps
Interface standards	1000BASE-LX, 10GBASE-LR/-LW
Protocol support	GbE, 10GbE-LAN, 10GbE-WAN STM-64/OC192
Power budget	0 – 11.5dB at 1.25Gbps (GbE) 0 – 6.2dB at 10.3Gbps (10GbE-LAN)
Dispersion penalty	Max 3.2dB
Power consumption	< 1.0W
Operating temperature	0°C to +70°C
Storage temperature	-40°C to +85°C

- 1). At 1.25Gbps (GbE), PRBS 2⁷-1, BER ≤ 1x10⁻¹².
- 2). At 10.3Gbps (10GbE-LAN), PRBS 2³¹-1, BER ≤ 1x10⁻¹².
- 3). Average power

Safety/regulatory compliance:

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

RoHS compliance

ORDERING INFORMATION

Ordering code	Description
SO-SFP-1G-10G-LR	SFP+, 1/10GBase-LR, 1310nm, SM, DDM, 11.5dB@1.25Gbps, 6.2dB@10.3Gbps,10km

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.

Parameter	Value
Transmitter data:	
Output power	1.25Gbps Min: -9.5dBm ³⁾ Max: -3.0dBm ³⁾
	10.3Gbps Min: -8.2dBm ³⁾ Max: +0.5dBm ³⁾
Transmit wavelength	1270 – 1355nm
Receiver data:	
Minimum input power 1.25Gbps	-21.0dBm ³⁾
Minimum input power 10.3Gbps	-14.4dBm ³⁾
Overload (max power)	+0.5dBm ³⁾
Wavelength range	1260nm – 1565nm
LOS assert 1.25Gbps / 10.3Gbps	Min -35dBm / Min -28dBm
LOS de-assert 1.25Gbps / 10.3Gbps	Max -16dBm / Max -22dBm
DDM	Yes
MSA compliance	SFF-8431, -8432, -8472

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 SFF-8472 MSA.

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