

**DATASHEET 5.2****SO-SFP-10GE-LRM****SFP+, 10G Multirate, 1310nm MM, DDM, 3.5dB, 220m****OVERVIEW**

The SO-SFP-10GE-LRM is a versatile 1310nm transceiver for MultiMode (MM) fiber supporting a wide range of traffic formats. The optical performance is in accordance with the IEEE 802.3ae LRM-standard, providing a bridgeable distance of up to 220m for 10GbE-LAN (10GBASE-LRM) services. The host system must have Electronic Dispersion Compensation (EDC) to fulfil the 10GBASE-LRM distance performance.

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	MM (2x LC)
Interface standards	10GBASE-LRM ¹⁾
Typical reach	220m ¹⁾
Nominal wavelengths	1310nm
Bit rate range	614Mbps – 11.3Gbps
Protocol support	10GbE-LAN, 10GbE-WAN, GbE STM-16/-4/-1, OC48/OC12/ OC3 OTU2e, OTU2, OTU1 10G FC, 8G FC, 4G FC, 2G FC, 1G FC CPRI Opt 1 (0.6144Gbps) CPRI Opt 2 (1.2288Gbps) CPRI Opt 3 (2.4576Gbps) CPRI Opt 5 (4.9152Gbps) CPRI Opt 6 (6.1440Gbps) CPRI Opt 7 (9.8304Gbps) CPRI Opt 7A (8.11008Gbps) CPRI Opt 8 (10.1376Gbps) OBSAI 0.768Gbps OBSAI 1.536Gbps OBSAI 3.0720Gbps OBSAI 6.1440Gbps
Power budget	0 – 3.5 dB
Power consumption	< 1 W
Operating temperature	0°C to +70°C
Storage temperature	-40°C to +85°C

Parameter	Value
Transmitter data:	
Output power	Min: -6.5dBm ³⁾ Max: +0.5dBm ³⁾
Transmit wavelength	1260 to 1355nm
Receiver data:	
Minimum input power	-10dBm ^{2) 3)}
Overload (max power)	+1.5dBm ^{2) 3)}
Wavelength range	1260nm – 1565nm
LOS Assert	Min -25dBm
LOS De-assert	Max -11dBm
DDM	Yes
MSA compliance	SFP 8431 SFF-8472

- 1). 10GBASE-LRM requires EDC to fulfil distance 220m over 50/125 MMF with a modal bandwidth of 2000MHz*km
- 2). Measured at 10.3Gbps using PRBS31 @ BER 1x10⁻¹²
- 3). Average power



Safety/regulatory compliance:

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

RoHS compliance

ORDERING INFORMATION

Ordering number	Description
SO-SFP-10GE-LRM	SFP+, 10G Multirate, 1310nm MM, DDM, 3.5dB, 220m

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 SFF-8472 MSA.

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