

# SO-SFP-10GE-LR20 & -LR20-I

SFP+, 10G Multirate, 1310nm, SM, DDM, 11.4dB, 20km

## OVERVIEW

The SO-SFP-10GE-LR is a versatile 1310nm transceiver supporting a wide range of traffic formats. The optical performance exceeds the IEEE 802.3ae LR/LW-standard (10km), providing a bridgeable distance of up to 20km for 10GbE-LAN (10GBASE-LR) and 10GbE-WAN (10GBASE-LW) services.

This transceiver provides digital diagnostic functions via a 2-wire serial interface as defined by the SFF-8472 specification. The transceiver is available in two temperature range options, one being the Industrial temperature range (I-temp): -40°C to 85°C (-40°F to 185°F).

## TECHNICAL DATA

<b>Technology</b>	Grey SFP+
<b>Transmission media</b>	SM (2x LC)
<b>Typical reach</b>	20 km
<b>Nominal wavelength</b>	1310 nm
<b>Interface standards</b>	10GBASE-LR 10GBASE-LW
<b>Bit rate range</b>	0.614 - 11.3 Gbps
<b>Protocols</b>	Eth: 10GbE-LAN 10GbE-WAN GbE
	OTN: OTU2e OTU2 OTU1
	SDH/SONET: STM-64/OC-192 STM-16/OC-48 STM-4/OC-12
	FC: 10G FC 8G FC 4G FC 1G FC
	CPRI: Opt 1 (0.6144 Gbps) Opt 2 (1.2288 Gbps) Opt 3 (2.4576 Gbps) Opt 4 (3.0720 Gbps) Opt 5 (4.9152 Gbps) Opt 6 (6.1440 Gbps) Opt 7 (9.8304 Gbps) Opt 7A (8.11008 Gbps) Opt 8 (10.1376 Gbps)
	OBSAI: 1x (0.768 Gbps) 2x (1.536 Gbps) 4x (3.0720 Gbps) 8x (6.1440 Gbps)
<b>Power budget</b>	0.5 - 11.4 dB
<b>Temperature range</b>	0°C to +70°C (LR20) -40°C to +85°C (LR20-I)
<b>Power consumption</b>	< 1.0W

<b>Transmitter data</b>	Output power:	Min: -3.0 dBm Max: +1.0 dBm
	Tx wavelength:	Min: 1270 nm Max: 1355 nm
<b>Receiver data</b>	Minimum input power:	-14.4 dBm <sup>1)</sup>
	Overload (max power):	+0.5 dBm
	Wavelength range:	1260 - 1565 nm
<b>DDM</b>		Yes
<b>MSA compliance</b>		SFF-8431 SFF-8472

<sup>1)</sup> @ 10.3Gbps

### Regulatory compliance

<b>EMC CE</b>	EN 55022:2010 EN 55024:2010
<b>UL/Safety</b>	UL 60950-1
<b>FCC</b>	47 CFR PART 15 OCT, 2013
<b>RoHS</b>	RoHS 6
<b>TUV</b>	EN 60950-1:2006+A11+A1+A12+A2 EN 60825-1:2014 EN 60825-2:2004+A1+A2

<b>Storage temp.</b>	-40°C to +85°C
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**Note! See "Definitions" below.**

## ORDERING INFORMATION

Part number	Description
SO-SFP-10GE-LR20	SFP+, 10G Multirate, 1310nm, SM, DDM, 11.4dB, 20km
SO-SFP-10GE-LR20-I	SFP+, 10G Multirate, 1310nm, SM, DDM, 11.4dB, 20km, I-temp

## DEFINITIONS

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.
Transmission Media:	DAC: Direct Attach Cable. Electrical or optical cable with attached connectors. 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 dispersion and power budget properties, i.e. w/o dispersion compensation and optical amplification.
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 from transmitter.
Interface standards:	Referenced interface standards e.g. IEEE 802.3 standard for 10GbE services.
Power budget:	Min and max power budget between Transmitter and Receiver. Excluding any dispersion penalty.
Dispersion tolerance/penalty:	Maximum amount of tolerated dispersion and required reduction of power budget to maintain BER better than $1E^{-12}$ . Defined at a specific bit rate.
Temperature range:	Max operating case temperature range. Standard temperature range: Typically 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.
Transmitter Output power:	Average output power. Provided in min and max values.
Receiver minimum input power:	Minimum average input power at specified BER, normally $1E^{-12}$ .
Receiver max input power:	Maximum average input power at specified BER, normally $1E^{-12}$ .
DDM:	Digital Diagnostic Monitoring functionality as defined in SFF-8472 MSA.