

**DATASHEET 5.1****SO-SFP-10GE-LR & -LR-I****SFP+, 10G Multirate, 1310nm, SM, DDM, 6.2dB, 10km****OVERVIEW**

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

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

| Parameter             | Value   |
|-----------------------|---|
| Technology            | Grey SFP+   |
| Transmission media    | SM (2x LC)  |
| Typical reach         | 10km  |
| Nominal wavelength    | 1310nm  |
| Bit rate support      | 0.6Gbps to 11.3Gbps   |
| Interface standards   | 10GBASE-LR, 10GBASE-LW  |
| Protocol support      | GbE, 10GbE-LAN, 10GbE-WAN<br>OTU1, OTU2, OTU2e<br>STM-64/OC192<br>STM-16/OC48, STM-4/OC12<br>1G, 2G, 4G, 8G, 10G FC<br>CPRI Opt, 1, 2, 3, 4, 5, 6, 7, 7A, 8<br>OBSAI 1x, 2x, 4x, 8x |
| Power budget          | 0 – 6.2dB   |
| Dispersion penalty    | Max 3.2dB   |
| Power consumption     | < 1W  |
| Operating temperature | -0°C to +70°C (-LR)<br>-40°C to +85°C (-LR-I)   |
| Storage temperature   | -40°C to +85°C  |

| Parameter                | Value  |
|--------------------------|--|
| <b>Transmitter data:</b> |  |
| Output power             | Min: -8.2dBm <sup>1)</sup><br>Max: +0.5dBm <sup>1)</sup> |
| Transmit wavelength      | 1270nm – 1355nm  |
| <b>Receiver data:</b>    |  |
| Minimum input power      | -14.4dBm <sup>1)2)</sup>                                 |
| Overload (max power)     | +0.5dBm <sup>1)</sup>                                    |
| Wavelength range         | 1260nm – 1565nm  |
| LOS assert               | Min -28dBm   |
| LOS de-assert            | Max -16dBm   |
| DDM                      | Yes  |
| MSA compliance           | SFF-8431, -8432, -8472                                   |

1). Average power.

2). @ 10.3Gbps, BER 1x10<sup>-12</sup>, PRBS 2<sup>31</sup>-1, back-to-back.

### Safety/regulatory compliance:

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

RoHS compliance

## ORDERING INFORMATION

| Ordering code    | Description   |
|------------------|---|
| SO-SFP-10GE-LR   | SFP+, 10G Multirate, 1310nm, SM, DDM, 6.2dB, 10km         |
| SO-SFP-10GE-LR-I | SFP+, 10G Multirate, 1310nm, SM, DDM, 6.2dB, 10km, I-temp |

## GENERAL DEFINITIONS

| Parameter          | Description  |
|--------------------|--|
| Technology         | Grey; Transceiver type for non-WDM applications. Electrical or optical.<br>CWDM; Transceiver type for CWDM applications using G.694.2 channel grid.<br>DWDM; Transceiver type for DWDM applications using G.694.1 channel grid.<br>BiDi; Transceiver pair using two different wavelength channels operating on a single-fiber.<br>DAC: Direct Attach Cable. Electrical cable with attached connectors.<br>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.<br>Standard temperature range (C-temp): 0°C to +70°C (32°F to +158°F)<br>Extended temperature range (E-temp): typically -20°C to +75°C (-4°F to +167°F)<br>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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