

SO-TSFP-10G-ZR-DWDM-I

SFP+, 10G Multirate, DWDM, 50GHz Tunable, 23dB, 80km, D9135-D9610 (96ch), I-temp

OVERVIEW

The SO-TSFP-10G-ZR-DWDM-I is a high performance DWDM transceiver that is tunable to 96 channels in the 50GHz C-band grid as specified in ITU-T 694.1. The distance performance is in accordance with the industry ZR/ZW-standard, providing a bridgeable distance of up to 80km (without dispersion compensation) for 10GbE-LAN (10GBASE-ZR) and 10GbE-WAN (10GBASE-ZW) services.

The transceiver is temperature hardened and supports the Industrial temperature range (I-temp): -40°C to 85°C (-40°F to 185°F).

The mechanical characteristics are compliant with the SFP+ specification (SFF-8431 and SFF-8432). Wavelength and frequency tuning modes are supported in accordance with SFF-8690.

The transceiver supports data rates from 1.2 to 11.3 Gbps, covering a series of Ethernet, OTN, SDH/SONET and other protocols.

This transceiver provides digital diagnostic functions via a 2-wire serial interface as defined by the SFF-8472 specification. The transceiver module is compliant to RoHS-6/6.

TECHNICAL DATA

Technology	DWDM 50GHz SFP+												
Transmission media	SM (2x LC)												
Typical reach	80 km												
Bit rate range	1.2 - 11.3 Gbps												
Interface standards	10GBASE-ZR 10GBASE-ZW												
Protocols	<table border="0"> <tr> <td>Eth:</td> <td>10GbE-LAN 10GbE-WAN GbE</td> </tr> <tr> <td>OTN:</td> <td>OTU2e OUT2 OTU1</td> </tr> <tr> <td>SDH/SONET:</td> <td>STM-64/OC-192 STM-16/OC-48</td> </tr> <tr> <td>FC:</td> <td>10G FC 8G FC 4G FC</td> </tr> <tr> <td>CPRI:</td> <td>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)</td> </tr> <tr> <td>OBSAI:</td> <td>2x (1.536 Gbps) 4x (3.0720 Gbps) 8x (6.1440 Gbps)</td> </tr> </table>	Eth:	10GbE-LAN 10GbE-WAN GbE	OTN:	OTU2e OUT2 OTU1	SDH/SONET:	STM-64/OC-192 STM-16/OC-48	FC:	10G FC 8G FC 4G FC	CPRI:	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:	2x (1.536 Gbps) 4x (3.0720 Gbps) 8x (6.1440 Gbps)
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Power budget	10.0 - 23.0 dB ¹⁾⁺²⁾												
Dispersion tolerance	-300 to +1400 ps/nm ¹⁾												
Dispersion penalty	3 dB												
Temperature range	-45°C to +85°C												
Power consumption	< 2.3W												

Transmitter data	Output power:	Min: -1.0 dBm Max: +3.0 dBm
	Tx wavelength:	191.35 - 196.10 THz 50GHz steps (96ch)
	Tuning speed:	< 10s from any to any
Receiver data	Min input power:	-24.0 dBm ¹⁾⁺²⁾ -23.0 dBm ¹⁾⁺³⁾ -21.0 dBm ¹⁾⁺⁴⁾
	Max input power:	-7.0 dBm ¹⁾
	Wavelength range:	1525 – 1575 nm
DDM		Yes
MSA compliance		SFF-8431 SFF-8432 SFF-8690 SFF-8472

¹⁾ @ 10.3Gbps, 1E-12, OSNR >35dB

²⁾ @ back to back

³⁾ @ +1100 ps/nm

⁴⁾ @ -300 to +1400 ps/nm

Regulatory compliance

RoHS	RoHS 6
Environmental	MIL-STD-883, Method 3015.4 IEC61000-4-2:Edition1 (Air Discharge)

Storage temp.	-40°C to +85°C
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Note! See "Definitions" below.

Note: 10GBASE-ZR/ZW is an industry standard defined only at 1550 nm. The standard is referred to from bridgeable distance perspective for the other wavelengths within the DWDM band.

ORDERING INFORMATION

Part number	Description
SO-TSFP-10G-ZR-DWDM-I	SFP+, 10G Multirate, DWDM, 50GHz Tunable, 23dB, 80km, D9135-D9610 (96ch), 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. DAC: Direct Attach Cable. Electrical or 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 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.