

DATASHEET 5.0

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
Nominal wavelength	1470 nm - 1610 nm (8ch)
Interface standards	10GBASE-ZR 10GBASE-ZW
Bit rate range	1.2 - 11.3 Gbps
Protocols 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
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

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)
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	Minimum input power:	-24.0 dBm ¹⁾⁺²⁾ -23.0 dBm ¹⁾⁺³⁾ -21.0 dBm ¹⁾⁺⁴⁾
	Overload (max power):	-7.0 dBm ¹⁾
	Wavelength range:	1525 – 1575 nm
DDM		Yes
MSA compliance		SFF-8431 SFF-8432 SFF-8690 SFF-8472

Regulator compliance

Environmental	MIL-STD-883, Method 3015.4 IEC61000-4-2:Edition1 (Air Discharge)
RoHS	RoHS 6
Storage temp.	-40°C to +85°C

¹⁾ @ 10.3Gbps, 1E-12, OSNR >35dB

²⁾ @ back to back

³⁾ @ +1100 ps/nm

⁴⁾ @ -300 to +1400 ps/nm

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.

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.