

SFP56 50G-LR

SFP56, 50G, 1311nm, SM, DDM, 6.9dB, 10km

TS5003-S31C-SO

The TS5003-S31C-SO is an SFP+ form-factor transceiver for 50Gbps Ethernet applications. Since the transmission rate can reach up to 56Gbps, the engineering and industry name is SFP56. It is intended for use in inter- and intra-connect applications within data centers between switches, routers, storage equipment etc. The optical performance is in accordance with the IEEE 50GBASE-LR standard, i.e. for optical distances up to 10km over a SingleMode (SM) fiber.

The TS5003-S31C-SO uses a single 1311nm channel @ 53.125 Gbps to transport a 50G Ethernet signal. Digital diagnostics functions are available via an I2C interface, as specified by the MSA.

As stipulated by the 50G Ethernet standards, Forward Error Correction (FEC) is required to be implemented by the host to ensure reliable system operation. The optical parameters below will provide a bit error ratio (BER) of 2.4×10^{-4} for 50G Ethernet. FEC will provide the required quality for secure service.

TECHNICAL DATA

Parameter	Value
Technology	Grey SFP56
Transmission media	SM (2x LC)
Typical reach	10km
Nominal wavelength	1x 1311nm
Interface standards	50GBASE-LR
Bit rate support	53.125 Gbps
Protocol support	50GbE
Power budget	0 – 6.9dB
Power consumption	< 1.8W
Operating temperature	0°C to +70°C
Storage temperature	-40°C to +85°C

¹⁾ Average receive power (min) is informative and not the principal indicator of signal strength. A received power below this value cannot be compliant; however, a value above this does not ensure compliance.

²⁾ at 53.125 Gbps (50GE) and BER 2.4×10^{-4}

Parameter	Value
Transmitter data:	
Output power, average	Min: -4.5dBm ¹⁾ Max: +4.2Bm
Output power, OMA	Min: -1.5dBm ¹⁾ Max: +4.0dBm ¹⁾
Transmit wavelength	1304.5 – 1317.5nm
Receiver data:	
Receiver sensitivity, OMA	-8.4dBm ²⁾
Minimum input power, Average	-10.8dBm
Overload, average (max power)	+4.2dBm ²⁾
Wavelength range	840 – 860nm
LOS Assert	Min -30dBm
LOS De-assert	Max -11dBm
LOS Hysteresis	Min 0.5dB

Safety/regulatory compliance:

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

RoHS compliance

ORDERING INFORMATION

Ordering number	Description
TS5003-S31C-SO	SFP56, 50G, 1310nm, SM, DDM, 6.9dB, 10km

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 $1E^{-12}$.
Optical Modulation Amplitude, OMA	Optical Modulation Amplitude is a parameter that, in certain standards, specifies the output power and as receiver sensitivity. To measure the OMA, a oscilloscope with a baud rate corresponding to the transceiver is required. Thus, this parameter cannot be measured using an ordinary optical power meter.
DDM	Digital Diagnostic Monitoring functionality as defined in e.g. SFF-8472 MSA.

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