SO-SFP-1000BASE-BX60D-35 & -53

SFP BiDi, 1.063/1.25Gbps, 1310/1550nm, SM, DDM, 24/22dB, 60km, C-temp & I-temp

OVERVIEW

The SO-SFP-1000BASE-BX60D is a bi-directional transceiver solution operating directly on a single-fiber without the need for a separate optical filter. This is achieved by having two transceivers that inject different wavelengths into the same single-fiber. The solution thus consists of two transceivers; SO-SFP-1000BASE-BX60D-35 and SO-SFP-1000BASE-BX60D-53, operating at 1310nm and 1550nm respectively. Using a single-fiber solution provides a cost-efficient solution for interconnect and it simplifies the patching since no separate transmit/receive direction has to be taken into account.

The transceiver pair supports 1G Fiberchannel (1G FC) and 1G Ethernet (GbE) services, having an optical performance that provides a bridgeable distance of up to 60km.

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

TECHNICAL DATA

Parameter	Value
Technology	BiDi SFP
Transmission media	SM (1x LC)
Typical reach	60km
Nominal wavelength Tx/Rx	1310nm/1550nm & 1550nm/1310nm
Bit rate support	1.063Gbps / 1.25Gbps
Protocol support	GbE
	1G FC
Power budget	8 – 24dB [1] / 6 – 22dB [2]
Dispersion penalty	Max 1dB [2]
Power consumption	< 1.0W
Operating temperature	0°C to +70°C
	-40°C to +85°C (-I)
Storage temperature	-40°C to +85°C
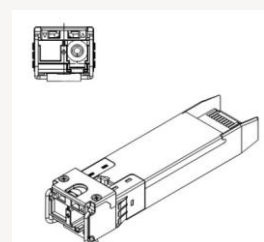
Parameter		Value
Transmitter data:		
Output power	-BX60D-35	Min: 0dBm [3]
		Max: +5.0dBm [3]
	-BX60D-53	Min: -2.0dBm [3]
		Max: +3.0dBm [3]
Transmit wavelength	-BX60D-35	1290 – 1330nm
	-BX60D-53	1480 – 1580nm
Receiver data:		
Minimum input power	-BX60D-35	-24.0dBm [3] [4]
	-BX60D-53	-24.0dBm [3] [4]
Overload (max power)		-3.0dBm [3] [4]
Wavelength range	-BX60D-35	1480 – 1580nm
	-BX60D-53	1290 – 1330nm
LOS Assert		Min -35dBm
LOS De-assert		Max -25dBm
LOS Hysteresis		Min 0.5dB
DDM		Yes
MSA compliance		SFF-8431, -8432, -8472

[1] SO-SFP-1000Base-BX60D-35 (1310nm direction).

[2] SO-SFP-1000Base-BX60D-53 (1550nm direction).

[3] Average power.

[4] @ 1.25Gbps, BER $\leq$ 1x10^{-12}, PRBS 2^7-1, back-to-back.

Safety/regulatory compliance:

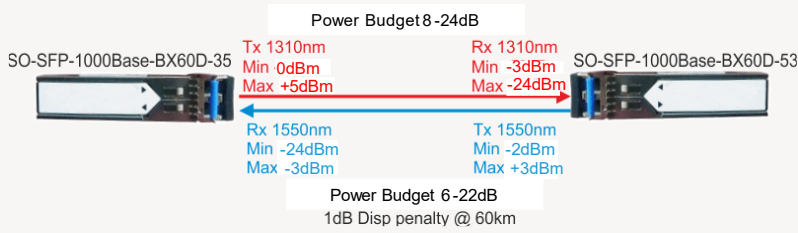TUV/UL/FDA (contact Smartoptics for latest certification information)

RoHS compliance

POWER BUDGET INFORMATION

Power Budget 8 -24dB

SO-SFP-1000Base-BX60D-35

Tx 1310nm
Min 0dBm
Max +5dBm

Rx 1310nm
Min -3dBm
Max -24dBm

SO-SFP-1000Base-BX60D-53

Rx 1550nm
Min -24dBm
Max -3dBm

Tx 1550nm
Min -2dBm
Max +3dBm

Power Budget 6 -22dB
1dB Disp penalty @ 60km

Note that the power budget differs in 1310nm vs 1550nm direction. This has to be taken into account for links with high attenuation.
Note also that the fiber attenuation is ~0.4dB/km in the 1310nm region and ~0.25dB/km in the 1550nm region.

ORDERING INFORMATION

Ordering code	Description
SO-SFP-1000Base-BX60D-35	SFP, BiDi, 1G Ethernet, 1G FC, TX/RX=1310/1550nm, SM, 60km, 24dB, LC
SO-SFP-1000Base-BX60D-33	SFP, BiDi, 1G Ethernet, 1G FC, TX/RX=1550/1310nm, SM, 60km, 22dB, LC
SO-SFP-1000Base-BX60D-35-I	SFP, BiDi, 1G Ethernet, 1G FC, TX/RX=1310/1550nm, SM, 60km, 24dB, I-temp, LC
SO-SFP-1000Base-BX60D-53-I	SFP, BiDi, 1G Ethernet, 1G FC, TX/RX=1550/1310nm, SM, 60km, 22dB, I-temp, LC

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 $1E^{-12}$.
DDM	Digital Diagnostic Monitoring functionality as defined in e.g. SFF-8472 MSA.