

# SO-SFP-10GE-BX60D-2733/-3327

SFP+, BiDi, 10G Multirate, 1270/1330nm, SM, DDM, 21dB, 60km

## OVERVIEW

The SO-SFP-10GE-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-10GE-BX60D-2733 and SO-SFP-10GE-BX60D-3327, operating at 1270nm and 1330nm 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 distance performance of the transceiver pair exceeds the IEEE 802.3ae ER/EW-standard (40km), providing a bridgeable distance of up to 60km for 10GbE-LAN and 10GbE-WAN services.

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).

This transceiver provides digital diagnostic functions via a 2-wire serial interface as defined by the SFF-8472 specification.

## TECHNICAL DATA

<b>Technology</b>	BiDi SFP+
<b>Transmission media</b>	SM (1x LC)
<b>Typical reach</b>	60 km
<b>Nominal wavelength</b>	1270 nm <sup>1)</sup> & 1330 nm <sup>2)</sup>
<b>Interface standards</b>	10GBASE-ER 10GBASE-EW
<b>Bit rate range</b>	0.6 - 11.3 Gbps
<b>Protocols</b>	Eth: 10GbE-LAN 10GbE-WAN GbE
	OTN: OTU2 OTU2e OTU1
	SDH/SONET: STM-64/OC-192 STM-16/OC-48 STM-4/OC-12
	FC: 10G FC 8G FC 4G FC 1G FC
	CPRI: Opt 1 (0.6144 Gbps) 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: 1x (0.768 Gbps) 2x (1.536 Gbps) 4x (3.0720 Gbps) 8x (6.1440 Gbps)
<b>Power budget</b>	12.0 - 21.0 dB
<b>Temperature range</b>	0°C to +70°C -40°C to +85°C (-I)
<b>Power consumption</b>	< 1.5W

<b>Transmitter data</b>	<b>Output power:</b>	Min: +1.0 dBm Max: +6.0 dBm
	<b>Tx wavelength:</b>	1260 - 1280 nm <sup>1)</sup> 1320 - 1340 nm <sup>2)</sup>
<b>Receiver data</b>	<b>Minimum input power:</b>	-20.0 dBm <sup>3)</sup>
	<b>Overload (max power):</b>	-6.0 dBm
	<b>Wavelength range:</b>	1320 - 1340 nm <sup>1)</sup> 1260 - 1280 nm <sup>2)</sup>
<b>DDM</b>		Yes
<b>MSA compliance</b>		SFF-8431 SFF 8472

<sup>1)</sup> SO-SFP-10GE-BX60D-2733

<sup>2)</sup> SO-SFP-10GE-BX60D-3327

<sup>3)</sup> @ 10.3Gbps

### Regulatory compliance

<b>EMC CE</b>	EN 55022:2010 EN 55024:2010
<b>UL/Safety</b>	UL 60950-1
<b>FCC</b>	47 CFR PART 15 OCT, 2013
<b>RoHS</b>	RoHS 6
<b>TUV</b>	EN 60950-1:2006+A11+A1+A12+A2 EN 60825-1:2014 EN 60825-2:2004+A1+A2

**Storage temp.** -40°C to +85°C

**Note! See "Definitions" below.**

Note: IEEE 802.3ae 10GBASE-ER/EW is defined only at 1550 nm. The standard is referred to from bridgeable distance perspective.

Subject to change without notice.

For more information visit [smaroptics.com](http://smaroptics.com).

smaroptics

## ORDERING INFORMATION

Part number	Description
SO-SFP-10GE-BX60D-2733	SFP+, BiDi, 10G Multirate 0.6-11.3Gbps, Tx/Rx=1270/1330nm, SM, 60km, 21dB, LC
SO-SFP-10GE-BX60D-3327	SFP+, BiDi, 10G Multirate 0.6-11.3Gbps, Tx/Rx=1330/1270nm, SM, 60km, 21dB, LC
SO-SFP-10GE-BX60D-2733-I	SFP+, BiDi, 10G Multirate 0.6-11.3Gbps, Tx/Rx=1270/1330nm, SM, 60km, 21dB, I-temp, LC
SO-SFP-10GE-BX60D-3327-I	SFP+, BiDi, 10G Multirate 0.6-11.3Gbps, Tx/Rx=1330/1270nm, SM, 60km, 21dB, I-temp, LC

## 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.