

# SFP+ OVERVIEW

## OVERVIEW

The tables below list the SFP+ transceivers and cable assemblies currently provided in the Smartoptics portfolio and with the most characteristic parameters. Please refer to the respective datasheets for more technical information.

## GREY SFP+ TRANSCEIVERS

Part number	Protocols/Bit rate	Dist	Wavelengths	Fiber	Conn	Standard / MSA	Pwr budget	Datasheet
SO-SFP-10GE-T	10G/1G/100M Eth	30m-100m	-	CATx	RJ45	10G BASE-T 1000BASE-T 100BASE-TX	-	<a href="#">Datasheet</a>
SO-SFP-10GE-SR	0.6-11.3Gbps	300m	850nm	MM	2x LC	10GBASE-SW /-SR	5.1dB	<a href="#">Datasheet</a>
SO-SFP-10GE-SR-I	0.6-11.3Gbps	300m	850nm	MM	2x LC	10GBASE-SW /-SR, I-temp	5.1dB	<a href="#">Datasheet</a>
SO-SFP-10GE-LRM	0.6-11.3Gbps	220m	1310nm	MM	2x LC	10GBASE-LRM	3.5dB	<a href="#">Datasheet</a>
SO-SFP-10GE-LR	0.6-11.3Gbps	10km	1310nm	SM	2x LC	10GBASE-LR /-LW	6.2dB	<a href="#">Datasheet</a>
SO-SFP-10GE-LR-I	0.6-11.3Gbps	10km	1310nm	SM	2x LC	10GBASE-LR /-LW, I-temp	6.2dB	<a href="#">Datasheet</a>
SO-SFP-10GE-LR20	0.6-11.3Gbps	20km	1310nm	SM	2x LC	10GBASE-LR /-LW	11.4dB	<a href="#">Datasheet</a>
SO-SFP-10GE-LR20-I	0.6-11.3Gbps	20km	1310nm	SM	2x LC	10GBASE-LR /-LW, I-temp	11.4dB	<a href="#">Datasheet</a>
SO-SFP-10GE-LR40	0.6-11.3Gbps	40km	1310nm	SM	2x LC	10GBASE-ER /-EW	16dB	<a href="#">Datasheet</a>
SO-SFP-10GE-ER	0.6-11.3Gbps	40km	1550nm	SM	2x LC	10GBASE-ER /-EW	11.1dB	<a href="#">Datasheet</a>
SO-SFP-10GE-ER-I	0.6-11.3Gbps	40km	1550nm	SM	2x LC	10GBASE-ER /-EW, I-temp	11.1dB	<a href="#">Datasheet</a>
SO-SFP-10GE-ZR	0.6-11.3Gbps	80km	1550nm	SM	2x LC	10GBASE-ZR /-ZW	23dB	<a href="#">Datasheet</a>
SO-SFP-10GE-ZR-I	0.6-11.3Gbps	80km	1550nm	SM	2x LC	10GBASE-ZR /-ZW, I-temp	23dB	<a href="#">Datasheet</a>
SO-SFP-1G-10G-SR	1GbE 10GbE-LAN/-WAN	70m	850nm	MM	2x LC	10GBASE-SR /-SW, 1000BASE-SX	7.5dB	<a href="#">Datasheet</a>
SO-SFP-1G-10G-LR	1GbE 10GbE-LAN/-WAN	10km	1310nm	SM	2x LC	10GBASE-LR /-LW, 1000BASE-LX	11.5dB	<a href="#">Datasheet</a>

0.6 – 11.3Gbps covers the following protocols:

10GbE-LAN, 10GbE-WAN, 1GbE, OTU2e, OTU2, OTU1, STM64/OC192, STM16/OC48, STM4/OC12, 10G FC, 8G FC, 4G FC, 1G FC, CPRI Opt 1, 2, 3, 4, 5, 6, 7, 7A, 8, OBSAI 1x, 2x, 4, 8x

Dist: Typical distance, normally based on dispersion properties.

Pwr budget: Difference between average min Tx power and Rx sensitivity. Dispersion/path penalties not taken into account.

Standard/MSA: Lists relevant interface standards or MSA compliance. The transceiver may support additional protocols from rate perspective.

## SFP+ TRANSCEIVERS FOR FIBER CHANNEL

Part number	Protocols/Bit rate	Dist	Wavelengths	Fiber	Conn	Standard / MSA	Pwr budget	Datasheet
SO-SFP-16GFC-SD	16G/8G/4G FC	150m	850nm	MM	2x LC	-	4.2dB	<a href="#">Datasheet</a>
SO-SFP-16GFC-LD	16G/8G/4G FC	10km	1310nm	SM	2x LC	FC-PI-5	6.9dB	<a href="#">Datasheet</a>
SO-SFP-8GFC-SD	8G/4G/2G/1G FC 0.614 – 8.5Gbps	300m	850nm	MM	2x LC	-	5.1dB	<a href="#">Datasheet</a>
SO-SFP-8GFC-L10D	8G/4G/2G/1G FC 0.614 – 8.5Gbps	10km	1310nm	SM	2x LC	FC-PI-4 800-SM-LC-L FC-PI-4 400-SM-LC-L FC-PI-4 200-SM-LC-L FC-PI-4 100-SM-LC-L	6.8dB	<a href="#">Datasheet</a>
SO-SFP-16GFC-ER-Cxx	16G/8G/4G FC	40km	C47 - C55 (5ch)	SM	2x LC	1600-SM-LC-L	13dB	<a href="#">Datasheet</a>
SO-SFP-16GFC-ER-Dxxxx	16G/8G/4G FC	40km	D920 – D960 (41ch)	SM	2x LC	1600-SM-LC-L	14dB	<a href="#">Datasheet</a>

## CWDM SFP+ TRANSCEIVERS

Part number	Protocols/Bit rate	Dist	Wavelengths	Fiber	Conn	Standard / MSA	Pwr budget	Datasheet
SO-SFP-10GE-LR10-Cxx	0.6-11.3Gbps	10km	C27 – C61 (18ch)	SM	2x LC	10GBASE-LR /-LW	10dB	<a href="#">Datasheet</a>
SO-SFP-10GE-LR40-Cxx	0.6-11.3Gbps	40km	C27 – C45 (10ch)	SM	2x LC	10GBASE-ER /-EW	14dB	<a href="#">Datasheet</a>
SO-SFP-10GE-ER-Cxx	0.6-11.3Gbps	40km	C47 – C61 (8ch)	SM	2x LC	10GBASE-ER /-EW	15dB	<a href="#">Datasheet</a>
SO-SFP-10GE-ER-Cxx-E	0.6-11.3Gbps	40km	C47 – C61 (8ch)	SM	2x LC	10GBASE-ER /-EW, E-temp	14dB	<a href="#">Datasheet</a>
SO-SFP-10GE-ZR-Cxx	0.6-11.3Gbps	80km	C47 – C61 (8ch)	SM	2x LC	10GBASE-ZR /-ZW	23dB	<a href="#">Datasheet</a>
SO-SFP-10GE-ZR-Cxx-E	0.6-11.3Gbps	80km	C47 – C61 (8ch)	SM	2x LC	10GBASE-ZR /-ZW, E-temp	23dB	<a href="#">Datasheet</a>

0.6 – 11.3Gbps covers the following protocols:  
 10GbE-LAN, 10GbE-WAN, 1GbE, OTU2e, OTU2, OTU1, STM64/OC192, STM16/OC48, STM4/OC12, 10G FC, 8G FC, 4G FC, 1G FC, CPRI Opt 1, 2, 3, 4, 5, 6, 7, 7A, 8, OBSAI 1x, 2x, 4x, 8x

Dist: Typical distance, normally based on dispersion properties. Please note the higher intrinsic fiber attenuation in the lower CWDM band that could prevent a certain channel to bridge the distance.

Pwr budget: Difference between average min Tx power and Rx sensitivity. Dispersion/path penalties not taken into account.

Standard/MSA: Lists relevant interface standards or MSA compliance. The transceiver may support additional protocols from rate perspective.

## DWDM SFP+ TRANSCEIVERS

Part number	Protocols/Bit rate	Dist	Wavelengths	Fiber	Conn	Standard / MSA	Pwr budget	Datasheet
SO-SFP-10GE-ER-Dxxxx	0.6-11.3Gbps	40km	D920-D960 (41ch)	SM	2x LC	10GBASE-ER /-EW	14dB	<a href="#">Datasheet</a>
SO-SFP-10GE-ER-Dxxxx-I	0.6-11.3Gbps	40km	D920-D960 (41ch)	SM	2x LC	10GBASE-ER /-EW, I-temp	14dB	<a href="#">Datasheet</a>
SO-SFP-10GE-ZR-Dxxxx	0.6-11.3Gbps	80km	D920-D960 (41ch)	SM	2x LC	10GBASE-ZR /-ZW	23dB	<a href="#">Datasheet</a>
SO-SFP-10GE-ZR-Dxxxx-I	0.6-11.3Gbps	80km	D920-D960 (41ch)	SM	2x LC	10GBASE-ZR /-ZW, I-temp	23dB	<a href="#">Datasheet</a>
SO-SFP-10GE-ER-50G-Dxxxx	0.6-11.3Gbps	40km	D9200 – D9595 (80ch)	SM	2x LC	10GBASE-ER /-EW	14dB	<a href="#">Datasheet</a>
SO-SFP-10GE-ZR-50G-Dxxxx	0.6-11.3Gbps	80km	D9200 – D9595 (80ch)	SM	2x LC	10GBASE-ZR /-ZW	23dB	<a href="#">Datasheet</a>
SO-TSFP-10G-ZR-DWDM-A	9.95-11.3Gbps	80km	D9135 – D9610 (96ch)	SM	2x LC	10GBASE-ZR /-ZW	23dB	<a href="#">Datasheet</a>
SO-TSFP-10G-ZR-DWDM-I	1.2-11.3Gbps	80km	D9135 – D9610 (96ch)	SM	2x LC	10GBASE-ZR /-ZW, I-temp	23dB	<a href="#">Datasheet</a>

0.6 – 11.3Gbps covers the following protocols:  
 10GbE-LAN, 10GbE-WAN, 1GbE, OTU2e, OTU2, OTU1, STM64/OC192, STM16/OC48, STM4/OC12, 10G FC, 8G FC, 4G FC, 1G FC, CPRI Opt 1, 2, 3, 4, 5, 6, 7, 7A, 8, OBSAI 1x, 2x, 4x, 8x

9.95-11.3Gbps covers the following protocols:  
 10GbE-LAN, 10GbE-WAN, OTU2e, OTU2, CPRI Opt 7A, 8

1.2 – 11.3Gbps covers the following protocols:  
 10GbE-LAN, 10GbE-WAN, 1GbE, OTU2e, OTU2, OTU1, STM64/OC192, STM16/OC48, 10G FC, 8G FC, 4G FC, CPRI Opt 2, 3, 4, 5, 6, 7, 7A, 8, OBSAI 4x, 8x

Dist: Typical distance, normally based on dispersion properties.

Pwr budget: Difference between average min Tx power and Rx sensitivity. Dispersion/path penalties not taken into account.

Standard/MSA: Lists corresponding interface standards or MSA compliances. For WDM-transceivers the standard reference is from distance and power budget perspective since the wavelength is not according to the standard. The transceiver may support additional protocols from rate perspective.

## BiDi SFP+ TRANSCEIVERS

Part number	Protocols	Dist	Wavelengths	Fiber	Conn	Standard / MSA	Pwr budget	Datasheet
SO-SFP-10GE-BX10D-2733	0.6-11.3Gbps	10km	Tx/Rx C27/C33	SM	1x LC	10GBASE-LR /-LW	9dB	<a href="#">Datasheet</a>
SO-SFP-10GE-BX10D-3327	0.6-11.3Gbps	10km	Tx/Rx=C33/C27	SM	1x LC	10GBASE-LR /-LW	9dB	<a href="#">Datasheet</a>
SO-SFP-10GE-BX10D-2733-I	0.6-11.3Gbps	10km	Tx/Rx C27/C33	SM	1x LC	10GBASE-LR /-LW, I-temp	9dB	<a href="#">Datasheet</a>
SO-SFP-10GE-BX10D-3327-I	0.6-11.3Gbps	10km	Tx/Rx=C33/C27	SM	1x LC	10GBASE-LR /-LW, I-temp	9dB	<a href="#">Datasheet</a>
SO-SFP-10GE-BX20D-2733	0.6-11.3Gbps	20km	Tx/Rx C27/C33	SM	1x LC	10GBASE-LR /-LW	12dB	<a href="#">Datasheet</a>
SO-SFP-10GE-BX20D-3327	0.6-11.3Gbps	20km	Tx/Rx=C33/C27	SM	1x LC	10GBASE-LR /-LW	12dB	<a href="#">Datasheet</a>
SO-SFP-10GE-BX20D-2733-I	0.6-11.3Gbps	20km	Tx/Rx C27/C33	SM	1x LC	10GBASE-LR /-LW, I-temp	12dB	<a href="#">Datasheet</a>
SO-SFP-10GE-BX20D-3327-I	0.6-11.3Gbps	20km	Tx/Rx=C33/C27	SM	1x LC	10GBASE-LR /-LW, I-temp	12dB	<a href="#">Datasheet</a>
SO-SFP-10GE-BX40D-2733	0.6-11.3Gbps	40km	Tx/Rx C27/C33	SM	1x LC	10GBASE-ER /-EW	16dB	<a href="#">Datasheet</a>
SO-SFP-10GE-BX40D-3327	0.6-11.3Gbps	40km	Tx/Rx=C33/C27	SM	1x LC	10GBASE-ER /-EW	16dB	<a href="#">Datasheet</a>
SO-SFP-10GE-BX40D-2733-I	0.6-11.3Gbps	40km	Tx/Rx C27/C33	SM	1x LC	10GBASE-ER /-EW, I-temp	16dB	<a href="#">Datasheet</a>
SO-SFP-10GE-BX40D-3327-I	0.6-11.3Gbps	40km	Tx/Rx=C33/C27	SM	1x LC	10GBASE-ER /-EW, I-temp	16dB	<a href="#">Datasheet</a>
SO-SFP-10GE-BX60D-2733	0.6-11.3Gbps	60km	Tx/Rx C27/C33	SM	1x LC	10GBASE-ER /-EW	21dB	<a href="#">Datasheet</a>
SO-SFP-10GE-BX60D-3327	0.6-11.3Gbps	60km	Tx/Rx=C33/C27	SM	1x LC	10GBASE-ER /-EW	21dB	<a href="#">Datasheet</a>
SO-SFP-10GE-BX60D-2733-I	0.6-11.3Gbps	60km	Tx/Rx C27/C33	SM	1x LC	10GBASE-ER /-EW, I-temp	21dB	<a href="#">Datasheet</a>
SO-SFP-10GE-BX60D-3327-I	0.6-11.3Gbps	60km	Tx/Rx=C33/C27	SM	1x LC	10GBASE-ER /-EW, I-temp	21dB	<a href="#">Datasheet</a>
SO-SFP-10GE-BX80D-4955	9.8-11.3Gbps	80km	Tx/Rx=C49/C55	SM	1x LC	10GBASE-ZR /-ZW	22dB	<a href="#">Datasheet</a>
SO-SFP-10GE-BX80D-5549	9.8-11.3Gbps	80km	Tx/Rx=C55/C49	SM	1x LC	10GBASE-ZR /-ZW	22dB	<a href="#">Datasheet</a>

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## SFP+ CABLE ASSEMBLIES

Part number	Protocols	Lengths	Type	Connectors	Datasheet
SO-SFP-10GE-CUxM	1Gbps - 10Gbps	0.5m – 7m	Passive DAC	SFP+ ↔ SFP+	<a href="#">Datasheet</a>
SO-SFP-10GE-ACUxM	1Gbps - 10Gbps	1m – 10m	Active DAC	SFP+ ↔ SFP+	<a href="#">Datasheet</a>
SO-SFP-10GE-AOCxM	4Gbps - 10Gbps	1m – 100m	Active AOC	SFP+ ↔ SFP+	<a href="#">Datasheet</a>

DAC: Direct Attach Cable. Coax cable with attached SFP+ transceivers at both ends.  
 AOC: Active Optical Cable. Fiber cable with attached SFP+ transceivers at both ends.