

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 Eth | 30m | - | CAT7 | RJ45 | 10G BASE-T | - | Datasheet |
| SO-SFP-10GE-SR | 0.6-11.3Gbps | 300m | 850nm | MM | 2x LC | 10GBASE-SW /-SR | 5.1dB | Datasheet |
| SO-SFP-10GE-SR-I | 0.6-11.3Gbps | 300m | 850nm | MM | 2x LC | 10GBASE-SW /-SR, I-temp | 5.1dB | Datasheet |
| SO-SFP-10GE-LRM | 0.6-11.3Gbps | 220m | 1310nm | MM | 2x LC | 10GBASE-LRM | 3.5dB | Datasheet |
| SO-SFP-10GE-LR | 0.6-11.3Gbps | 10km | 1310nm | SM | 2x LC | 10GBASE-LR /-LW | 6.2dB | Datasheet |
| SO-SFP-10GE-LR-I | 0.6-11.3Gbps | 10km | 1310nm | SM | 2x LC | 10GBASE-LR /-LW, I-temp | 6.2dB | Datasheet |
| SO-SFP-10GE-LR20 | 0.6-11.3Gbps | 20km | 1310nm | SM | 2x LC | 10GBASE-LR /-LW | 11.4dB | Datasheet |
| SO-SFP-10GE-LR20-I | 0.6-11.3Gbps | 20km | 1310nm | SM | 2x LC | 10GBASE-LR /-LW, I-temp | 11.4dB | Datasheet |
| SO-SFP-10GE-LR40 | 0.6-11.3Gbps | 40km | 1310nm | SM | 2x LC | 10GBASE-ER /-EW | 16dB | Datasheet |
| SO-SFP-10GE-ER | 0.6-11.3Gbps | 40km | 1550nm | SM | 2x LC | 10GBASE-ER /-EW | 11.1dB | Datasheet |
| SO-SFP-10GE-ER-I | 0.6-11.3Gbps | 40km | 1550nm | SM | 2x LC | 10GBASE-ER /-EW, I-temp | 11.1dB | Datasheet |
| SO-SFP-10GE-ZR | 0.6-11.3Gbps | 80km | 1550nm | SM | 2x LC | 10GBASE-ZR /-ZW | 23dB | Datasheet |
| SO-SFP-10GE-ZR-I | 0.6-11.3Gbps | 80km | 1550nm | SM | 2x LC | 10GBASE-ZR /-ZW, I-temp | 23dB | Datasheet |
| SO-SFP-10G-ZR100 | 0.6-11.3Gbps | 100km | 1550nm | SM | 2x LC | 10GBASE-ZR /-ZW | 26dB | Datasheet |
| SO-SFP-1G-10G-SR | 1GbE 10GbE-LAN/-WAN | 70m | 850nm | MM | 2x LC | 10GBASE-SR /-SW, 1000BASE-SX | 7.5dB | Datasheet |
| SO-SFP-1G-10G-LR | 1GbE 10GbE-LAN/-WAN | 10km | 1310nm | SM | 2x LC | 10GBASE-LR /-LW, 1000BASE-LX | 11.5dB | Datasheet |

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.

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 | Datasheet |
| SO-SFP-16GFC-LD | 16G/8G/4G FC | 10km | 1310nm | SM | 2x LC | FC-PI-5 | 6.9dB | Datasheet |
| SO-SFP-8GFC-SD | 8G/4G/2G/1G FC 0.614 – 8.5Gbps | 300m | 850nm | MM | 2x LC | - | 5.1dB | Datasheet |
| 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 | Datasheet |
| SO-SFP-16GFC-ER-Cxx | 16G/8G/4G FC | 40km | C47 - C55 (5ch) | SM | 2x LC | 1600-SM-LC-L | 13dB | Datasheet |
| SO-SFP-16GFC-ER-Dxxxx | 16G/8G/4G FC | 40km | D920 – D960 (41ch) | SM | 2x LC | 1600-SM-LC-L | 14dB | Datasheet |

Subject to change without notice.

For more information visit smartoptics.com.

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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 | Datasheet |
| SO-SFP-10GE-LR40-Cxx | 0.6-11.3Gbps | 40km | C27 – C45 (10ch) | SM | 2x LC | 10GBASE-ER /-EW | 14dB | Datasheet |
| SO-SFP-10GE-ER-Cxx | 0.6-11.3Gbps | 40km | C47 – C61 (8ch) | SM | 2x LC | 10GBASE-ER /-EW | 15dB | Datasheet |
| SO-SFP-10GE-ER-Cxx-E | 0.6-11.3Gbps | 40km | C47 – C61 (8ch) | SM | 2x LC | 10GBASE-ER /-EW, E-temp | 14dB | Datasheet |
| SO-SFP-10GE-ZR-Cxx | 0.6-11.3Gbps | 80km | C47 – C61 (8ch) | SM | 2x LC | 10GBASE-ZR /-ZW | 23dB | Datasheet |
| SO-SFP-10GE-ZR-Cxx-E | 0.6-11.3Gbps | 80km | C47 – C61 (8ch) | SM | 2x LC | 10GBASE-ZR /-ZW, E-temp | 23dB | Datasheet |

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 | Datasheet |
| SO-SFP-10GE-ER-Dxxxx-I | 0.6-11.3Gbps | 40km | D920-D960 (41ch) | SM | 2x LC | 10GBASE-ER /-EW, I-temp | 14dB | Datasheet |
| SO-SFP-10GE-ZR-Dxxxx | 0.6-11.3Gbps | 80km | D920-D960 (41ch) | SM | 2x LC | 10GBASE-ZR /-ZW | 23dB | Datasheet |
| SO-SFP-10GE-ZR-Dxxxx-I | 0.6-11.3Gbps | 80km | D920-D960 (41ch) | SM | 2x LC | 10GBASE-ZR /-ZW, I-temp | 23dB | Datasheet |
| SO-SFP-10GE-ER-50G-Dxxxx | 0.6-11.3Gbps | 40km | D9200 – D9595 (80ch) | SM | 2x LC | 10GBASE-ER /-EW | 14dB | Datasheet |
| SO-SFP-10GE-ZR-50G-Dxxxx | 0.6-11.3Gbps | 80km | D9200 – D9595 (80ch) | SM | 2x LC | 10GBASE-ZR /-ZW | 23dB | Datasheet |
| SO-TSFP-10G-ZR-DWDM-A | 9.95-11.3Gbps | 80km | D9135 – D9610 (96ch) | SM | 2x LC | 10GBASE-ZR /-ZW | 23dB | Datasheet |
| SO-TSFP-10G-ZR-DWDM-I | 1.2-11.3Gbps | 80km | D9135 – D9610 (96ch) | SM | 2x LC | 10GBASE-ZR /-ZW, I-temp | 23dB | Datasheet |
| SO-TSFP10GER-AxI ¹⁾ | 1.0 - 11.3Gbps | 40km | 5x 9ch D9200-D9600 | SM | 2x LC | 10GBASE-ER, I-temp | 22dB | Datasheet |
| SO-TSFP10GER-DxI ²⁾ | 1.0 - 11.3Gbps | 40km | 5x 9ch D9200-D9600 | SM | 2x LC | 10GBASE-ER, I-temp | 22dB | Datasheet |

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.

¹⁾ Five transceivers covering 9 channels. Tunable within resp. band plus optional autonomous tuning.

²⁾ Five transceivers covering 9 channels. Tunable within resp. band.

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 | Datasheet |
| SO-SFP-10GE-BX10D-3327 | 0.6-11.3Gbps | 10km | Tx/Rx=C33/C27 | SM | 1x LC | 10GBASE-LR /-LW | 9dB | Datasheet |
| SO-SFP-10GE-BX10D-2733-I | 0.6-11.3Gbps | 10km | Tx/Rx C27/C33 | SM | 1x LC | 10GBASE-LR /-LW, I-temp | 9dB | Datasheet |
| SO-SFP-10GE-BX10D-3327-I | 0.6-11.3Gbps | 10km | Tx/Rx=C33/C27 | SM | 1x LC | 10GBASE-LR /-LW, I-temp | 9dB | Datasheet |
| SO-SFP-10GE-BX20D-2733 | 0.6-11.3Gbps | 20km | Tx/Rx C27/C33 | SM | 1x LC | 10GBASE-LR /-LW | 12dB | Datasheet |
| SO-SFP-10GE-BX20D-3327 | 0.6-11.3Gbps | 20km | Tx/Rx=C33/C27 | SM | 1x LC | 10GBASE-LR /-LW | 12dB | Datasheet |
| SO-SFP-10GE-BX20D-2733-I | 0.6-11.3Gbps | 20km | Tx/Rx C27/C33 | SM | 1x LC | 10GBASE-LR /-LW, I-temp | 12dB | Datasheet |
| SO-SFP-10GE-BX20D-3327-I | 0.6-11.3Gbps | 20km | Tx/Rx=C33/C27 | SM | 1x LC | 10GBASE-LR /-LW, I-temp | 12dB | Datasheet |
| SO-SFP-10GE-BX40D-2733 | 0.6-11.3Gbps | 40km | Tx/Rx C27/C33 | SM | 1x LC | 10GBASE-ER /-EW | 16dB | Datasheet |
| SO-SFP-10GE-BX40D-3327 | 0.6-11.3Gbps | 40km | Tx/Rx=C33/C27 | SM | 1x LC | 10GBASE-ER /-EW | 16dB | Datasheet |
| SO-SFP-10GE-BX40D-2733-I | 0.6-11.3Gbps | 40km | Tx/Rx C27/C33 | SM | 1x LC | 10GBASE-ER /-EW, I-temp | 16dB | Datasheet |
| SO-SFP-10GE-BX40D-3327-I | 0.6-11.3Gbps | 40km | Tx/Rx=C33/C27 | SM | 1x LC | 10GBASE-ER /-EW, I-temp | 16dB | Datasheet |
| SO-SFP-10GE-BX60D-2733 | 0.6-11.3Gbps | 60km | Tx/Rx C27/C33 | SM | 1x LC | 10GBASE-ER /-EW | 21dB | Datasheet |
| SO-SFP-10GE-BX60D-3327 | 0.6-11.3Gbps | 60km | Tx/Rx=C33/C27 | SM | 1x LC | 10GBASE-ER /-EW | 21dB | Datasheet |
| SO-SFP-10GE-BX60D-2733-I | 0.6-11.3Gbps | 60km | Tx/Rx C27/C33 | SM | 1x LC | 10GBASE-ER /-EW, I-temp | 21dB | Datasheet |
| SO-SFP-10GE-BX60D-3327-I | 0.6-11.3Gbps | 60km | Tx/Rx=C33/C27 | SM | 1x LC | 10GBASE-ER /-EW, I-temp | 21dB | Datasheet |
| SO-SFP-10GE-BX80D-4955 | 9.8-11.3Gbps | 80km | Tx/Rx=C49/C55 | SM | 1x LC | 10GBASE-ZR /-ZW | 22dB | Datasheet |
| SO-SFP-10GE-BX80D-5549 | 9.8-11.3Gbps | 80km | Tx/Rx=C55/C49 | SM | 1x LC | 10GBASE-ZR /-ZW | 22dB | Datasheet |

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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.

SFP+ CABLE ASSEMBLIES

| Part number | Protocols | Lengths | Type | Connectors | Datasheet |
|-------------------|----------------|-----------|-------------|-------------|---------------------------|
| SO-SFP-10GE-CuXM | 1Gbps - 10Gbps | 0.5m – 7m | Passive DAC | SFP+ ↔ SFP+ | Datasheet |
| SO-SFP-10GE-AOCxM | 4Gbps - 10Gbps | 1m – 100m | Active AOC | SFP+ ↔ SFP+ | Datasheet |

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.