

SFP+ Transceivers – 10 Gbps

Description:

The OPTOKON transceivers are compliant with IEEE 802.3ae and the 10G MSA (Multi-Source Agreement). This upgrade, and reliability benefits by virtue of being hot-pluggable, also is designed for singlemode and multimode fiber with cost effective and high performance. The S10-D55, 1550 nm cooled EML laser based 10 Gigabit SFP+ transceiver is designed to transmit and receive optical data over single mode optical fiber for link length up to 80 km.



| | Unit | SR | LRM | LR02 | LR | LR20 | ER | ER60 | ZR |
|----------------------------------|------|-------------|------------|------------|----------|-----------|--------------------------|-------|------------|
| Average output power (min / max) | dBm | -6 / -1 | -6,5 / 0,5 | -8,2 / 0,5 | -6 / 0 | -6 / -0.5 | -1 / 4 | 0 / 5 | 0 / 5 |
| Receiver sensitivity | dBm | -10 | -10 | -14,4 | -14 | -14,4 | -16 | -20 | -23 |
| Overload | dBm | 0,5 | 1,5 | 0 | 0 | 0 | 0 | 0 | -7 |
| Maximum distance | km | 0,330 | 0,220 | 2 | 10 | 20 | 40 | 60 | 80 |
| Fiber type | - | MMF | MMF | SMF | SMF | SMF | SMF | SMF | SMF |
| Optical link budget | dBm | 8 | 3,5 | 6,2 | 8 | 8,4 | 15 | 15 | 23 |
| Wavelength / laser type | nm | 850 / VCSEL | 1310/FP | 1310/FP | 1310/DFB | 1310/DFB | 1310 / DFB 1550 / EML | DFB | 1550 / EML |

Table 1: Basic technical specifications according to distance.

Temperature:

OPTOKON is always trying to satisfy as much market demand as possible and with this in mind, almost all OPTOKON SFP transceivers are manufactured in the **C**ommercial, **E**xtended and **I**ndustrial temperature ranges to provide you all possibilities you need for your application.

| Code | Temperature |
|------|------------------|
| D | 0 °C to + 70 °C |
| E | -10°C to + 80 °C |
| I | -40°C to + 85 °C |

Table 2: Temperature specifications.

Safety and regulatory compliance

Electrostatic discharge (ESD) IEC/EN 61000-4-2
 Electromagnetic Interference (EMI) FCC Part 15 Class B EN 55022 Class B (CISPR 22A)
 Laser Eye Safety Class 1 laser product
 Component Recognition IEC/EN 60950, UL
 ROHS 2002/95/EC
 EMC EN 61000-3

Digital diagnostics:

All OPTOKON SFP transceivers are assembled with digital diagnostic feature as a standard.

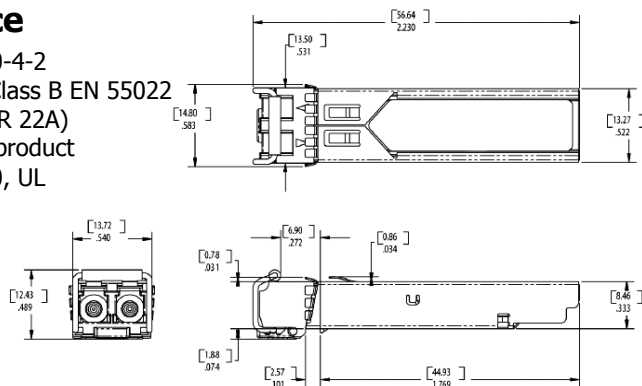


Figure 1: Transceiver dimensions schema.



Ordering codes for 10 Gbps SFP+ transceivers:

Standard series:

| Part number: | Speed [Gbps] | Distance dd [km] | Wavelength [nm] | Temperature [-] | Fiber type [-] | Connector [-] |
|----------------------|--------------|------------------|-----------------|-----------------|----------------|---------------|
| M10-V85-SP-SX-D-XX | 10 | 0,300 | 850 | D | MMF | LC |
| M10-F31-SP-LRM-D-XX | 10 | 0,220 | 1310 | D | MMF | LC |
| S10-F31-SP-LR02-D-XX | 10 | 2 | 1310 | D | SMF | LC |
| S10-D31-SP-LR-D-XX | 10 | 10 | 1310 | D | SMF | LC |
| S10-D31-SP-LR20-D-XX | 10 | 20 | 1310 | D | SMF | LC |
| S10-D31-SP-ER-D-XX | 10 | 40 | 1310 | D | SMF | LC |
| S10-D55-SP-ER-D-XX | 10 | 40 | 1550 | D | SMF | LC |
| S10-D55-SP-ZR-D-XX | 10 | 80 | 1550 | D | SMF | LC |

Bidirectional series:

| Part number: | Speed [Gbps] | Distance dd [km] | Wavelength [-] | Temperature [-] | Fiber type [-] | Connector [-] |
|-------------------------|--------------|------------------|----------------|-----------------|----------------|---------------|
| S10-W27/33-SP-LR-D-XX | 10 | 10 | 1270 | D | SMF | LC |
| S10-W33/27-SP-LR-D-XX | 10 | 10 | 1330 | D | SMF | LC |
| S10-W27/33-SP-ER-D-XX | 10 | 40 | 1270 | D | SMF | LC |
| S10-W33/27-SP-ER-D-XX | 10 | 40 | 1330 | D | SMF | LC |
| S10-W33/27-SP-ER60-D-XX | 10 | 60 | 1330 | D | SMF | LC |
| S10-W27/33-SP-ER60-D-XX | 10 | 60 | 1270 | D | SMF | LC |

CWDM series:

| Part number: | Speed [Gbps] | Distance dd [km] | Wavelength [-] | Temperature [-] | Fiber type [-] | Connector [-] |
|----------------------|--------------|------------------|--|-----------------|----------------|---------------|
| S10-Cyy-SP-LR-D-XX | 10 | 10 | CWDM -1270 ~ 1610 | D | SMF | LC |
| S10-Cyy-SP-LR20-D-XX | 10 | 20 | CWDM -1270 ~ 1610 | D | SMF | LC |
| S10-Cyy-SP-ER-D-XX | 10 | 40 | CWDM -1270 ~ 1330 CWDM -1470 ~ 1610 | D | SMF | LC |
| S10-Cyy-SP-ER60-D-XX | 10 | 60 | CWDM -1270 ~ 1330 | D | SMF | LC |
| S10-Cyy-SP-ZR-D-XX | 10 | 80 | CWDM -1470 ~ 1610 | D | SMF | LC |

DWDM series:

| Part number ¹⁾ : | Speed [Gbps] | Distance dd [km] | Wavelength [-] | Temperature [-] | Fiber type [-] | Connector [-] |
|-----------------------------|--------------|------------------|----------------|-----------------|----------------|---------------|
| S10-Dxx xx-SP-ER-D-XX | 10 | 40 | DWDM | D | SMF | LC |
| S10-Dxx xx-SP-ZR-D-XX | 10 | 80 | DWDM | D | SMF | LC |

1) xx xx means last 4 digits of DWDM wavelength. **Example:** For channel C17 of DWDM use 63 86 in ordering code

CWDM & DWDM laser code:

| yy/zz [-] | Wavelength [nm] | Clasp Color [-] | yy/zz [-] | Wavelength [nm] | Clasp Color [-] |
|-----------|-----------------|-----------------|-----------|-----------------|-----------------|
| 27 | 1270 | Gray | 45 | 1450 | Brown |
| 29 | 1290 | Gray | 47 | 1470 | Gray |
| 31 | 1310 | Gray | 49 | 1490 | Purple |
| 33 | 1330 | Purple | 51 | 1510 | Blue |
| 35 | 1350 | Blue | 53 | 1530 | Green |
| 37 | 1370 | Green | 55 | 1550 | Yellow |
| 39 | 1390 | Yellow | 57 | 1570 | Orange |
| 41 | 1410 | Orange | 59 | 1590 | Red |
| 43 | 1430 | Red | 61 | 1610 | Brown |

Table 3: CWDM ordering code.

Distance & temperature codes

| dd code | Distance | Code | Temperature |
|---------|----------|------|-------------------|
| [-] | [km] | D | -5 °C to + 70 °C |
| SR | 0.300 | E | -10 °C to + 80 °C |
| LRM | 0.220 | I | -40 °C to + 85 °C |
| LR | 10 | | |
| LR20 | 20 | | |
| ER | 40 | | |
| ER60 | 60 | | |
| ZR | 80 | | |

Table 5: Distance codes.

Table 6: Temperature codes.

| yy [-] | Frequency [THz] | Wavelength [nm] | yy [-] | Frequency [THz] | Wavelength [nm] |
|--------|-----------------|-----------------|--------|-----------------|-----------------|
| C17 | 191,7 | 1563,86 | C40 | 194,0 | 1545,32 |
| C18 | 191,8 | 1563,05 | C41 | 194,1 | 1544,53 |
| C19 | 191,9 | 1562,23 | C42 | 194,2 | 1543,73 |
| C20 | 192,0 | 1561,42 | C43 | 194,3 | 1542,94 |
| C21 | 192,1 | 1560,61 | C44 | 194,4 | 1542,14 |
| C22 | 192,2 | 1559,79 | C45 | 194,5 | 1541,35 |
| C23 | 192,3 | 1558,98 | C46 | 194,6 | 1540,56 |
| C24 | 192,4 | 1558,17 | C47 | 194,7 | 1539,77 |
| C25 | 192,5 | 1557,36 | C48 | 194,8 | 1538,98 |
| C26 | 192,6 | 1556,55 | C49 | 194,9 | 1538,19 |
| C27 | 192,7 | 1555,75 | C50 | 195,0 | 1537,40 |
| C28 | 192,8 | 1554,94 | C51 | 195,1 | 1536,61 |
| C29 | 192,9 | 1554,13 | C52 | 195,2 | 1535,82 |
| C30 | 193,0 | 1553,33 | C53 | 195,3 | 1535,04 |
| C31 | 193,1 | 1552,52 | C54 | 195,4 | 1534,25 |
| C32 | 193,2 | 1551,72 | C55 | 195,5 | 1533,47 |
| C33 | 193,3 | 1550,92 | C56 | 195,6 | 1532,68 |
| C34 | 193,4 | 1550,12 | C57 | 195,7 | 1531,90 |
| C35 | 193,5 | 1549,32 | C58 | 195,8 | 1531,12 |
| C36 | 193,6 | 1548,51 | C59 | 195,9 | 1530,33 |
| C37 | 193,7 | 1547,72 | C60 | 196,0 | 1529,55 |
| C38 | 193,8 | 1546,92 | C61 | 196,1 | 1528,77 |
| C39 | 193,9 | 1546,12 | | | |

Table 4: DWDM ordering code.