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 100 km.

Table 1: Basic technical specifications: optical power budget according to distance

	Unit	SR	LRM	LR02	LR	LR20	ER	ER60	ZR	ZR+
Average output power (min / max)	dBm	-6 / -1	-6.5 / 0.5	-8.2 / 0.5	-6 / -0.5	-6 / -0.5	-1 / 4	0 / 5	0 / 5	1 / 5
Receiver sensitivity	dBm	-10	-10	-14.4	-14.4	-15	-16	-20	-23	-25
Overload	dBm	0.5	1.5	0	0	0,5	0	0	-7	-6
Maximum distance	km	0.330	0.220	2	10	20	40	60	80	100
Fiber type	-	MMF	MMF	SMF	SMF	SMF	SMF	SMF	SMF	SMF
Optical link budget	dB	8	3.5	6.2	8.4	9	15	15	23	26
Wavelength / laser type	nm	850 / VCSEL	1310/FP	1310/FP	1310/DFB	1310/DFB	1310/DFB 1550/EML	DFB	1550/ EML	1550/ EML

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.

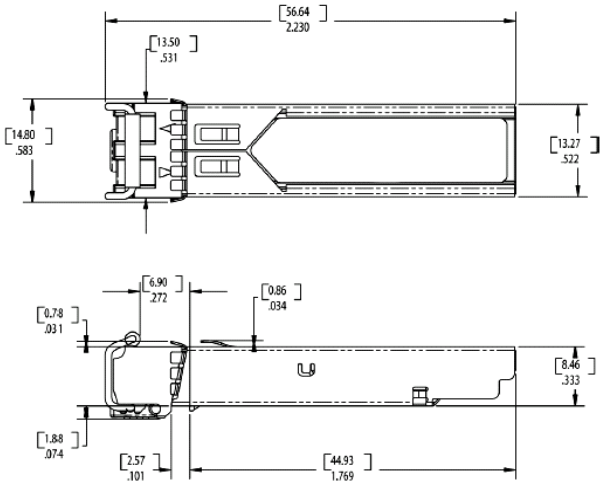

Figure 1: Transceiver dimensions schema.

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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-SR-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-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
S10-D55-SP-ZR+-D-XX	10	100	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-LR20-D-XX	10	20	1270	D	SMF	LC
S10-W33/27-SP-LR20-D-XX	10	20	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
S10-W49/55-SP-ZR-D-XX	10	80	1490	D	SMF	LC
S10-W55/49-SP-ZR-D-XX	10	80	1550	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[1]	10	20	CWDM –1270 ~ 1330	D	SMF	LC
S10-Cyy-SP-ER-D-XX	10	40	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

1) 20 km CWDM SFP has the same Tx specification like 10 km, receiver sensitivity is -16 dBm

CWDM laser code:

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

CWDM example code:

Part number:	Speed [Gbps]	Distance dd [km]	Wavelength [nm]	Temperature [-]	Fiber type [-]	Connector [-]
S10-C27-SP-LR-D-XX	10	10	1270	D	SMF	LC
S10-C33-SP-ER60-D-XX	10	60	1330	D	SMF	LC
S10-C59-SP-ZR-D-XX	10	80	1590	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

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

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DWDM laser code:

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

DWDM code examples:

Part number:	Speed [Gbps]	Distance dd [km]	Wavelength [nm]	Temperature [-]	Fiber type [-]	Connector [-]
S10-D63 86-SP-ER-D-XX	10	40	1563,86 (channel 17)	D	SMF	LC
S10-D59 79-SP-ER-D-XX	10	40	1559,79 (channel 22)	D	SMF	LC
S10-D58 98-SP-ER-D-XX	10	40	1558,98 (channel 23)	D	SMF	LC
S10-D54 94-SP-ZR-D-XX	10	80	1554,94 (channel 28)	D	SMF	LC
S10-D53 33-SP-ZR-D-XX	10	80	1553,33 (channel 30)	D	SMF	LC
S10-D28 77-SP-ZR-D-XX	10	80	1528,77 (channel 61)	D	SMF	LC

Temperature code examples:

To order SFP with **E**xtended or **I**ndustrial temperature, please replace the "**D**" mark with temperature mark in ordering number.

Distance & temperature codes

dd code [-]	Distance [km]
SR	0.300
LRM	0.220
LR02	2
LR	10
LR20	20
ER	40
ER60	60
ZR	80
ZR+	100

Table 5: Distance codes.

Code	Temperature
D	-5 °C to + 70 °C
E	-10 °C to + 80 °C
I	-40 °C to + 85 °C

Table 6: Temperature codes.

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