SPCxxB1010xD – SFP+ Dual Fibre CWDM

CWDM / 10dB / 10x Gigabit Ethernet

For your product safety, please read the following information carefully before any manipulation of the transceiver:

ESD
This transceiver is specified as ESD threshold 1kV for SFI pins and 2kV for all others electrical input pins, tested per MIL-STD-883G, Method 3015.4 /JESD22-A114-A (HBM). However, normal ESD precautions are still required during the handling of this module.

LASER SAFETY
This is a Class1 Laser Product according to IEC 60825-1:2007. This product complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated (June 24, 2007).

The optical ports of the module need to be terminated with an optical connector or with a dust plug in order to avoid contamination.

1. Overview

SPCxxB1010xD is a high-performance transceiver module for up to 10× Gigabit Ethernet data links over a single mode fibre pair. The power budget[1] is 10dB end of life (EOL). The transmitter is a CWDM DFB laser, the receiver is a PIN photodiode.

This transceiver module is compliant with the Small Form-factor Pluggable (SFP+) Multisource Agreement (MSA) and hot pluggable. Always contact Skylane Optics® commercial agents for compatibility with different equipment platforms.

2. Features

- SFP+ Multi-Source Agreement compliant (SFF-8431)
- Hot pluggable SFP+ footprint
- Serial ID functionality supported according to (SFF-8472)
- Dual LC connector
- CWDM DFB transmitter
- PIN receiver
- Power budget ≥10dB
- Operating temperature range -10°C to 75°C
- Power dissipation < 1W
- Digital Diagnostics monitoring (DDM)

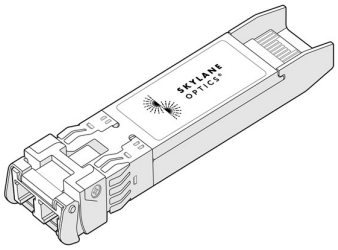

Figure 1. SFP+ Dual Fiber
(non-binding illustration)

3. Applications

- 10× Gigabit Ethernet
- 8× Fiber Channel
- 4× Fiber Channel
- 2× Fiber Channel
- CPRI 9.8304 & 10.1376Gbps

4. Optical Interface

P/N	Wavelength [nm]	Optical Output Power[2] [dBm]	Receiver Sensitivity[3] [dBm]	Dispersion Penalty [dB]	Receiver Overload[4] [dBm]	Power Budget[2] [dB]
SPCxxB1010xD	ITU CWDM	-4 to 1	≤ -14	NA	0.5	≥ 10

1. Only optical power budget is guaranteed, see section 9 for estimated transmission reach
2. EOL, over operating temperature range
3. Measured with 10.3125Gbps PRBS 2^{31}-1, BER≤10^{-12}
4. The optical input to the receiver should not exceed this value. Transmitters must never be directly connected to receivers (optical loop back) before ensuring that proper optical attenuation is used

5. Technical Parameters

5.1. Recommended Operating Conditions

Parameter	Min	Typ	Max	Unit	Notes
Storage temperature	-40		85	°C	
Operating Case Temperature	-10		75	°C	
Relative Humidity			95	%	Non condensing
Power Supply Voltage	3.13	3.3	3.45	V	
Power Supply Current			300	mA	

5.2. Transmitter Optical Specifications

Parameter	Min	Typ	Max	Unit	Notes
Average Output Power	-4		1	dBm	5
Centre Wavelength Range	1265		1618.5	nm	
Wavelength	λ_c-6	λ_c	λ_c+7.5	nm	6
Spectral Width (-20dB)			1	nm	
Extinction Ratio	3.5			dB	
Dispersion Penalty	NA	dB			

5. Output power coupled into a 9/125 µm single mode fibre
6. ITU-T G.694.2 CWDM. For available wavelengths, see section 10

5.3. Receiver Optical Specifications

Parameter	Min	Typ	Max	Unit	Notes
Receiver Sensitivity			-14	dBm	7
Receiver Overload	0.5			dBm	7
Receiver Operating Range	1260		1620	nm	

7. Measured with 10.3125Gbps PRBS 2^{31}-1, BER≤10^{-12}

6. Transceiver Electrical Pad Layout

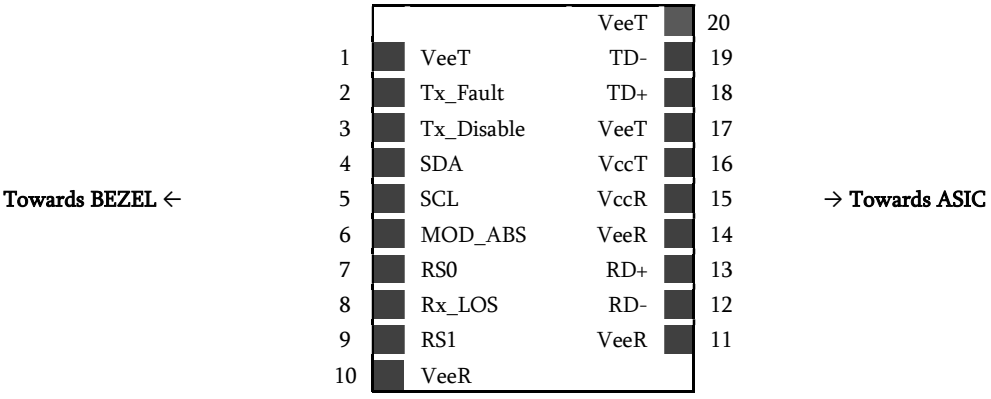

Figure 2. Transceiver Electrical Pad Layout

7. Module Electrical Pin Definition

SFP+ MSA (SFF-8431)

Pin Number	Name	Function
1	VeeT	Module Transmitter Ground
2	Tx_Fault	Module Transmitter Fault
3	Tx_ Disable	Transmitter Disable
4	SDA	2-Wire Serial Interface Data
5	SCL	2-Wire Serial Interface Clock
6	Mod_ABS	Module Absent
7	RS0	Not Used
8	Rx_LOS	Receiver Loss of Signal
9	RS1	Not Used
10	VeeR	Module Receiver Ground
11	VeeR	Module Receiver Ground
12	RD-	Receiver Inverted Data Output
13	RD+	Receiver Non-Inverted Data Output
14	VeeR	Module Receiver Ground
15	VccR	Module Receiver 3.3V Supply
16	VccT	Module Transmitter 3.3V Supply
17	VeeT	Module Transmitter Ground
18	TD+	Transmitter Non-Inverted Data Input
19	TD-	Transmitter Inverted Data Input
20	VeeT	Module Transmitter Ground

8. EEPROM

SFP+ MSA (SFF-8472)

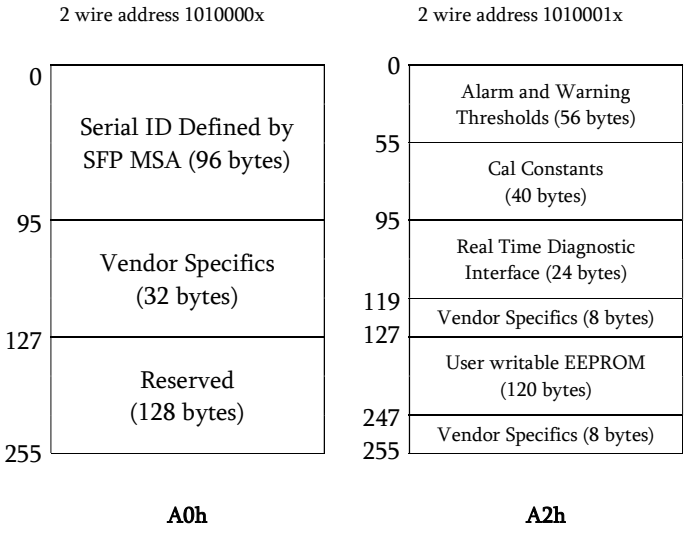

Figure 3. EEPROM of a SFP+

9. Transmission Reach

The actual transmission reach is depending on the CWDM channel used, due to the wavelength dependent dispersion in the fibre path. The table below shows the *estimated* transmission reach for CWDM channels 27 to 61.

NB: Distances are purely indicative and only valid for G.652 fibre. Only the optical power budget is guaranteed. Additional optical insertion loss from CWDM filters, splices, optical connectors etc. is not included.

CWDM Channel	Nominal Wavelength [nm]	Estimated Reach [km]
27	1270	10
29	1290	10
31	1310	10
33	1330	10
35	1350	10
37	1370	10
39	1390	10
41	1410	10
43	1430	10
45	1450	10
47	1470	10
49	1490	10
51	1510	10
53	1530	9
55	1550	8
57	1570	8
59	1590	7
61	1610	7

10. Ordering Information

Part Number	Description
SPC27B10100D	SFP+ CWDM Dual Fibre, **Tx 1270nm** (CWDM DFB), Rx (PIN), power budget 10dB, 10x Gigabit Ethernet, LC connector, 0°C to 70°C, DDM
SPC29B10100D	SFP+ CWDM Dual Fibre, **Tx 1290nm** (CWDM DFB), Rx (PIN), power budget 10dB, 10x Gigabit Ethernet, LC connector, 0°C to 70°C, DDM
SPC31B10100D	SFP+ CWDM Dual Fibre, **Tx 1310nm** (CWDM DFB), Rx (PIN), power budget 10dB, 10x Gigabit Ethernet, LC connector, 0°C to 70°C, DDM
SPC33B10100D	SFP+ CWDM Dual Fibre, **Tx 1330nm** (CWDM DFB), Rx (PIN), power budget 10dB, 10x Gigabit Ethernet, LC connector, 0°C to 70°C, DDM
SPC35B10100D	SFP+ CWDM Dual Fibre, **Tx 1350nm** (CWDM DFB), Rx (PIN), power budget 10dB, 10x Gigabit Ethernet, LC connector, 0°C to 70°C, DDM
SPC37B10100D	SFP+ CWDM Dual Fibre, **Tx 1370nm** (CWDM DFB), Rx (PIN), power budget 10dB, 10x Gigabit Ethernet, LC connector, 0°C to 70°C, DDM
SPC39B10100D	SFP+ CWDM Dual Fibre, **Tx 1390nm** (CWDM DFB), Rx (PIN), power budget 10dB, 10x Gigabit Ethernet, LC connector, 0°C to 70°C, DDM
SPC41B10100D	SFP+ CWDM Dual Fibre, **Tx 1410nm** (CWDM DFB), Rx (PIN), power budget 10dB, 10x Gigabit Ethernet, LC connector, 0°C to 70°C, DDM
SPC43B10100D	SFP+ CWDM Dual Fibre, **Tx 1430nm** (CWDM DFB), Rx (PIN), power budget 10dB, 10x Gigabit Ethernet, LC connector, 0°C to 70°C, DDM
SPC45B10100D	SFP+ CWDM Dual Fibre, **Tx 1450nm** (CWDM DFB), Rx (PIN), power budget 10dB, 10x Gigabit Ethernet, LC connector, 0°C to 70°C, DDM
SPC47B10100D	SFP+ CWDM Dual Fibre, **Tx 1470nm** (CWDM DFB), Rx (PIN), power budget 10dB, 10x Gigabit Ethernet, LC connector, 0°C to 70°C, DDM
SPC49B10100D	SFP+ CWDM Dual Fibre, **Tx 1490nm** (CWDM DFB), Rx (PIN), power budget 10dB, 10x Gigabit Ethernet, LC connector, 0°C to 70°C, DDM
SPC51B10100D	SFP+ CWDM Dual Fibre, **Tx 1510nm** (CWDM DFB), Rx (PIN), power budget 10dB, 10x Gigabit Ethernet, LC connector, 0°C to 70°C, DDM
SPC53B10100D	SFP+ CWDM Dual Fibre, **Tx 1530nm** (CWDM DFB), Rx (PIN), power budget 10dB, 10x Gigabit Ethernet, LC connector, 0°C to 70°C, DDM
SPC55B10100D	SFP+ CWDM Dual Fibre, **Tx 1550nm** (CWDM DFB), Rx (PIN), power budget 10dB, 10x Gigabit Ethernet, LC connector, 0°C to 70°C, DDM
SPC57B10100D	SFP+ CWDM Dual Fibre, **Tx 1570nm** (CWDM DFB), Rx (PIN), power budget 10dB, 10x Gigabit Ethernet, LC connector, 0°C to 70°C, DDM
SPC59B10100D	SFP+ CWDM Dual Fibre, **Tx 1590nm** (CWDM DFB), Rx (PIN), power budget 10dB, 10x Gigabit Ethernet, LC connector, 0°C to 70°C, DDM
SPC61B10100D	SFP+ CWDM Dual Fibre, **Tx 1610nm** (CWDM DFB), Rx (PIN), power budget 10dB, 10x Gigabit Ethernet, LC connector, 0°C to 70°C, DDM
SPC27B1010GD	SFP+ CWDM Dual Fibre, **Tx 1270nm** (CWDM DFB), Rx (PIN), power budget 10dB, 10x Gigabit Ethernet, LC connector, 0°C to 70°C, DDM, Specific Firmware
SPC29B1010GD	SFP+ CWDM Dual Fibre, **Tx 1290nm** (CWDM DFB), Rx (PIN), power budget 10dB, 10x Gigabit Ethernet, LC connector, 0°C to 70°C, DDM, Specific Firmware
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11. Document Revision Information

Revision	Description
A	Initial release
B	Specification updated to include 8x Fiber Channel compatibility
C	Update with CPRI rates compatibility
D	Ordering information tab updated with the "G" and "A" versions
E	"A" versions removed

Skylane Optics® supplies a broad range of optical transceivers. Our engineers work closely with our customers to find the best solutions for every application. We are committed to provide high quality products and services to our customers.

For questions on this product please contact:
support@skylaneoptics.com