



3AL81776AA-SKY

Alcatel-Lucent Nokia® 3AL81776AA Compatible 10GBase-DWDM 50GHz XFP Transceiver (SMF, Tunable, 80km, LC, DOM)

Product Description

This Alcatel-Lucent Nokia® 3AL81776AA compatible XFP transceiver provides 10GBase-DWDM throughput up to 80km over single-mode fiber (SMF) using a wavelength of 1530nm to 1560nm via an LC connector. It is guaranteed to be 100% compatible with the equivalent Alcatel-Lucent Nokia® transceiver. This easy to install, hot swappable transceiver has been programmed, uniquely serialized and data-traffic and application tested to ensure that it will initialize and perform identically. Digital optical monitoring (DOM) support is also present to allow access to real-time operating parameters. We stand behind the quality of our products and proudly offer a limited lifetime warranty.

Skylane's transceivers are RoHS compliant and lead-free.

Features:

- INF-8077i Compliance
- Duplex LC Connector
- Commercial Temperature 0 to 70 Celsius
- Single-mode Fiber
- Hot Pluggable
- Excellent ESD Protection
- Metal with Lower EMI
- RoHS Compliant and Lead Free



Applications:

- 10x Gigabit Ethernet over DWDM
- Access, Metro and Enterprise
- 8x/10x Fibre Channel

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.

Regulatory Compliance

- ESD to the Electrical PINs: compatible with MIL-STD-883E Method 3015.4
- ESD to the LC Receptacle: compatible with IEC 61000-4-3
- EMI/EMC compatible with FCC Part 15 Subpart B Rules, EN55022:2010
- Laser Eye Safety compatible with FDA 21CFR, EN60950-1& EN (IEC) 60825-1,2
- RoHS compliant with EU RoHS 2.0 directive 2015/863/EU

Tunable XFP Channel Number and Wavelength

Channel No.	Frequency (THz)	Center Wavelength	Channel No.	Frequency (THz)	Center Wavelength
1	191.35	1566.723	49	193.75	1547.316
2	191.40	1566.314	50	193.80	1546.917
3	191.45	1565.905	51	193.85	1546.518
4	191.50	1565.496	52	193.90	1546.119
5	191.55	1565.087	53	193.95	1545.720
6	191.60	1564.679	54	194.00	1545.322
7	191.65	1564.271	55	194.05	1544.924
8	191.70	1563.863	56	194.10	1544.526
9	191.75	1563.455	57	194.15	1544.128
10	191.80	1563.047	58	194.20	1543.730
11	191.85	1562.640	59	194.25	1543.333
12	191.90	1562.233	60	194.30	1542.936
13	191.95	1561.826	61	194.35	1542.539
14	192.00	1561.419	62	194.40	1542.142
15	192.05	1561.013	63	194.45	1541.746
16	192.10	1560.606	64	194.50	1541.349
17	192.15	1560.200	65	194.55	1540.953
18	192.20	1559.794	66	194.60	1540.557
19	192.25	1559.389	67	194.65	1540.162
20	192.30	1558.983	68	194.70	1539.766
21	192.35	1558.578	69	194.75	1539.371
22	192.40	1558.173	70	194.80	1538.976
23	192.45	1557.768	71	194.85	1538.581
24	192.50	1557.363	72	194.90	1538.186
25	192.55	1556.959	73	194.95	1537.792
26	192.60	1556.555	74	195.00	1537.397
27	192.65	1556.151	75	195.05	1537.003

28	192.70	1555.747	76	195.10	1536.609
29	192.75	1555.343	77	195.15	1536.216
30	192.80	1554.940	78	195.20	1535.822
31	192.85	1554.537	79	195.25	1535.429
32	192.90	1554.134	80	195.30	1535.036
33	192.95	1553.731	81	195.35	1534.643
34	193.00	1553.329	82	195.40	1534.250
35	193.05	1552.926	83	195.45	1533.858
36	193.10	1552.524	84	195.50	1533.465
37	193.15	1552.122	85	195.55	1533.073
38	193.20	1551.721	86	195.60	1532.681
39	193.25	1551.319	87	195.65	1532.290
40	193.30	1550.918	88	195.70	1531.898
41	193.35	1550.517	89	195.75	1531.507
42	193.40	1550.116	90	195.80	1531.116
43	193.45	1549.715	91	195.85	1530.725
44	193.50	1549.315	92	195.90	1530.334
45	193.55	1548.915	93	195.95	1529.944
46	193.60	1548.515	94	196.00	1529.553
47	193.65	1548.115	95	196.05	1529.163
48	193.70	1547.715	96	196.10	1528.773

Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Storage Temperature	Tstg	-40		85	°C	
Case Temperature		-5		70	°C	
ESD		500			V	High Speed i/o pins
		2000				All other pins
Receiver optical input power				+12	dBm	

Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
1.8V Supply	Vcc2	1.71	1.8	1.89	V	VPS not supported
3.3V Supply	Vcc3	3.15	3.3	3.45	V	
5.0V Supply	Vcc5	4.75	5.0	5.25	V	
Supply Current, 1.8V			160	200	mA	
Supply Current, 3.3V			310	400	mA	
Supply Current, 5.0V			100	200	mA	
Inrush current limit				100	mA/μs	
Total power consumption				2.5	W	Power Level 2 MSA classification

System Performance

Parameter	Min	Max	OSNR	BER	Conditions
Noise Loaded	-400ps/nm	1500ps/nm	19dB	1E-04	10.709Gb/s, -10 to -20dBm, 0.25nm filter, optimised RxDTV
Unamplified Links	0ps/nm	1600ps/nm	>35dB	1E-12	10.709Gb/s, -22dBm, 0.25nm filter, optimised RxDTV

Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Transmitter						
Data Rate		9.95		11.35	Gb/s	NRZ
Frequency range		191.35		196.10	THz	50GHz grid, 96 channels
Frequency accuracy		-2.5		+2.5	GHz	EOL
Optical transmit power	P _o		+0.5		dBm	SOL, 25°C
Optical transmit power	P _o	-1		+3.0	dBm	EOL
Shuttered output power			-45	-40	dBm	
Optical power stability	ΔP _{out}	-1.0		+1.0	dB	All channels, SOL
Side mode suppression	SMSR	35			dB	±2.5nm, modulated
Spectral width	Δλ		0.3	0.5	nm	-20dB, modulated
Extinction ratio	ER	9.5			dB	Filtered, 10.709Gb/s
Eye diagram compliance	GR-253, ITU-T G.691					
Mask margin		10			%	
OSNR		50	55		dB	0.1nm RBW
SBS threshold		18			dBm	50km SMF
Tuning speed				50	ms	
Laser enable (turn on) time				50	ms	To >90% power
Laser disable (turn off) time				10	μs	To <10% power
Module initialization time				20	s	
Receiver						
Data rate		9.95		11.35	Gb/s	NRZ
Input operating wavelength	λ	1525		1575	nm	
Receiver Sensitivity			-26		dBm	10.709 Gb/s, IE-12,
Maximum input power (overload)	P _{in} MAX	-5			dBm	OSNR>35dB, optimized RxDTV
LOS assert	PA	-33		-28.5	dBm	
LOS de-assert	PD	-32.5		-26.5	dBm	
LOS Hysteresis	PD - PA	0.5		4	dB	
LOS assert time	T _A			100	μs	
LOS de-assert time	T _D			100	μs	

Pin Descriptions

Pin	Logic	Symbol	Name/Descriptions	Notes
1		GND	Module Ground	1
2		VEE5	Optional -5.2V Power Supply	
3	LVTTL-I	Mod-Desel	Module De-select, when held low allows the module to respond to 2-wire serial interface commands	
4	LVTTL-O	Interrupt	Interrupt; Indicates presence of an important condition which can be read over the serial 2-wire interface	2
5	LVTTL-I	TX_DIS	Transmitter Disable; Turns off transmitter laser output	
6		VCC5	+5V Power Supply	
7		GND	Module Ground	1
8		VCC3	+3.3V Power Supply	
9		VCC3	+3.3V Power Supply	
10	LVTTL-I/O	SCL	2-wire Serial interface clock	2
11	LVTTL-I/O	SDA	2-wire Serial interface data line	2
12	LVTTL-O	Mod_Abs	Indicates Module is not present. Grounded in the Module	2
13	LVTTL-O	Mod_NR	Module Not Ready; Indicating Module Operational Fault	2
14	LVTTL-O	RX_LOS	Receiver Loss Of Signal Indicator	2
15		GND	Module Ground	1
16		GND	Module Ground	1
17	CML-O	RD-	Receiver Inverted Data Output	
18	CML-O	RD+	Receiver Non-Inverted Data Output	
19		GND	Module Ground	1
20		VCC2	+1.8V Power Supply	3
21	LVTTL-I	P_Down/RST	Power down; When high, requires the module to limit power consumption to 1.5W or below. 2-Wire serial interface must be functional in the low power mode.	
			Reset; The falling edge initiates a complete reset of the module including the 2-wire serial interface, equivalent to a power cycle	
22		VCC2	+1.8V Power Supply	3
23		GND	Module Ground	1
24	PECL-I	RefCLK+	Not required	
25	PECL-I	RefCLK-	Not required	
26		GND	Module Ground	1
27		GND	Module Ground	1
28	CML-I	TD-	Transmitter Inverted Data Input	
29	CML-I	TD+	Transmitter Non-Inverted Data Input	
30		GND	Module Ground	1

Notes:

1. Module ground pins (GND) are isolated from the module case and chassis ground within the module.
2. Shall be pulled up with 4.7K-10kOhms to a voltage between 3.15V and 3.45V on the host board.
3. Variable Power Supply (VPS) function is not supported.



Recommended Pattern Layout



Power Supply Noise Tolerance



Figure 2 Power Noise Requirement

Mechanical Specifications



About Skylane Optics

Skylane is a leading provider of transceivers for optical communication.

We offer an extensive portfolio for the enterprise, access, datacenter and metropolitan fiber optical market as well as for smart home applications and home networks.

We cover the European, South American and North American market with a strong partner network and have offices in Belgium, Brazil, Sweden and USA.

Our offerings are characterized by high quality and performance. In combination with our strong technical support, we enable our customers to build cost optimized network solutions.

We offer an extensive range of high-quality products including transceivers (Optical and copper), Active Optical Cable (AOC), Direct Attach Cable (DAC), Mux/Demux, Coding Box.

