1AB402160012-OPC

Alcatel-Lucent Nokia® 1AB402160012 Compatible TAA 100GBase-LR4 CFP Transceiver (SMF, 1310nm, 10km, LC, DOM)

Features

- CFP MSA 1.4 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:

- 100GBase Ethernet
- OTU4 Operation
- Access and Enterprise

Product Description

This Alcatel-Lucent Nokia® 1AB402160012 compatible CFP transceiver provides 100GBase-LR4 throughput up to 10km over single-mode fiber (SMF) using a wavelength of 1310nm 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. This transceiver is Trade Agreements Act (TAA) compliant. We stand behind the quality of our products and proudly offer a limited lifetime warranty.

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

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Storage Temperature	TS	-40	+85	℃
Power Supply Voltage	VCC	-0.5	3.6	V
Operating Case Temperature Range	Tc	-10	+75	℃
Relative Humidity	Rh	5	85	%

Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	
Power Supply Voltage	VCC	3.2	3.3	3.4	V	
Power Supply Current	Icc		4000		mA	
Transmitter						
Differential data input swing	Vin			1050	mVp-p	
Input differential impedance	Zin	80	100	120	Ω	
Receiver						
Differential data output swing	Vout, pp	360		770	mVp-p	
Output differential impedance	Zo	80	100	120	Ω	
Output Rise/Fall Time	t_r/t_f	24			ps	20%~80%

1.2V MDIO Interface Specifications

Parameter	Symbol	Min.	Typ.	Max	Unit	Notes
Input Voltage	V_{IH}	0.84		1.5	V	
	V_{IL}	-0.3		0.36	V	
Input Leak current	I_{IN}	-100		100	uA	
Output Voltage	V_{OH}	1.0		1.5	V	
	V_{OL}	-0.3		0.2	V	
Input Capacitance	C_I			10	pF	
Input MDC Clock	f_{MDC}	0.1		4	MHz	
MDC Clock Period	T_{MDC}	250		10000	ns	
MDIO Hold Time	Thold	10			ns	
MDIO Setup Time	Tsetup	10			ns	
GLB_ALM	Tglb_alm_ass			150	ms	
	Tglb_alm_dea			150	ms	

OTU4 4I1-9D1F Operation Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Transmitter						
Signaling Speed per Lane	BR_{AVE}		27.95		Gbps	
Lane_0 Center Wavelength	λ_{C0}	1294.53	1295.56	1296.59	nm	
Lane_1 Center Wavelength	λ_{C1}	1299.02	1300.05	1301.09	nm	
Lane_2 Center Wavelength	λ_{C2}	1303.54	1304.58	1305.63	nm	
Lane_3 Center Wavelength	λ_{C3}	1308.09	1309.14	1310.19	nm	
Total Average Output Power	P_{O1}	-		8.9	dBm	1, 2
Average Launch Power per Lane	P_{each1}	-2.5		2.9	dBm	2
Side Mode Suppression Ratio	SMSR	30			dB	
Optical Return Loss Tolerance				20	dB	
Extinction Ratio	ER_1	7			dB	2
Transmitter eye mask definition {X1, X2, X3, Y1, Y2, Y3}		G.959.1 Compliant				2
TX Disable Assert Time	t_off			100	us	
Receiver						
Signaling Speed per Lane	BR_{AVE}		27.95		Gbps	
Lane_0 Center Wavelength	λ_{C0}	1294.53	1295.56	1296.59	nm	
Lane_1 Center Wavelength	λ_{C1}	1299.02	1300.05	1301.09	nm	
Lane_2 Center Wavelength	λ_{C2}	1303.54	1304.58	1305.63	nm	
Lane_3 Center Wavelength	λ_{C3}	1308.09	1309.14	1310.19	nm	
Average Receive Power per Lane	R_{pow1}	-8.8		4	dBm	5
Equivalent Sensitivity per Lane	P_{min1}			-10.3	dBm	7
Receiver Overload per Lane	P_{max}	5.5			dBm	
Optical Return Loss	ORL			-26	dB	
LOS Assert	LOSA	-21			dBm	
LOS De-Assert	LOSD			-11	dBm	
LOS Hysteresis		0.5			dB	

100GBASE-LR4 Operation Optical Characteristics

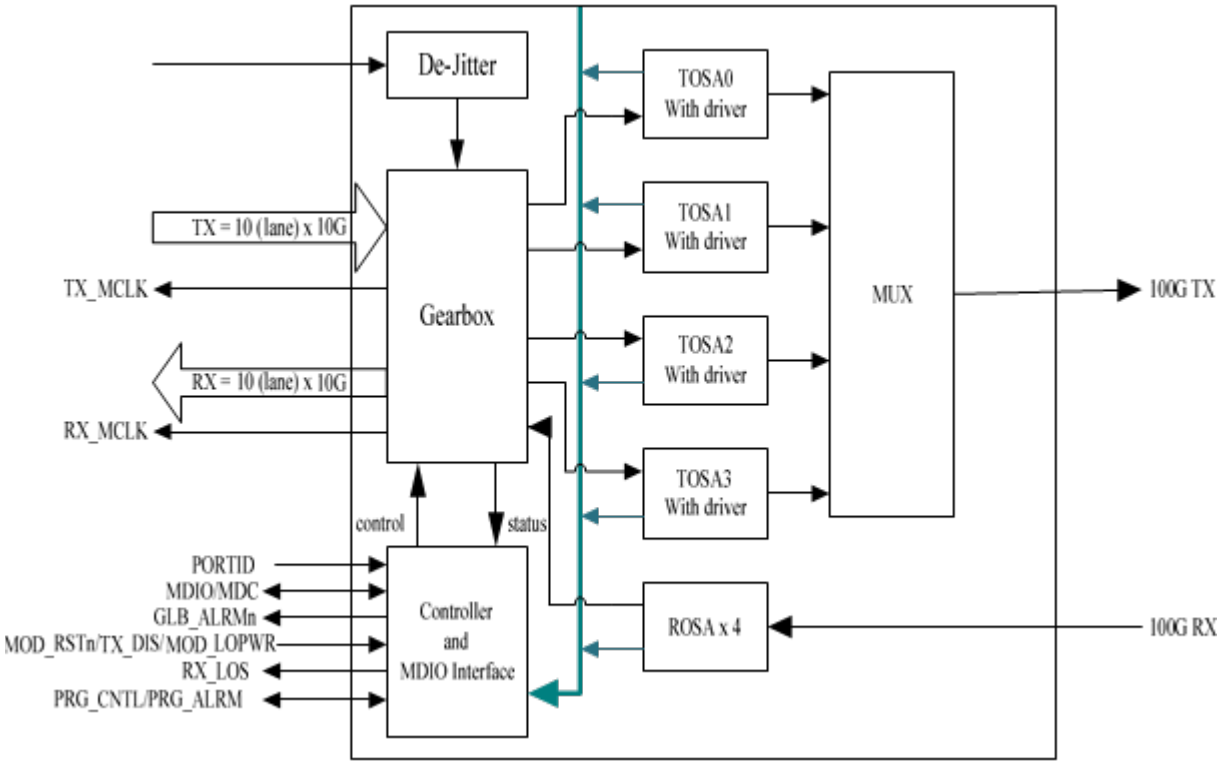
Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Transmitter						
Signaling Speed per Lane	BR_{AVE}		25.78		Gbps	
Lane_0 Center Wavelength	λ_{C0}	1294.53	1295.56	1296.59	nm	
Lane_1 Center Wavelength	λ_{C1}	1299.02	1300.05	1301.09	nm	
Lane_2 Center Wavelength	λ_{C2}	1303.54	1304.58	1305.63	nm	
Lane_3 Center Wavelength	λ_{C3}	1308.09	1309.14	1310.19	nm	
Total Average Output Power	P_{O2}	-		10.5	dBm	1, 4
Average Launch Power per Lane	P_{each2}	-4.3		4.5	dBm	4
Side Mode Suppression Ratio	SMSR	30			dB	
Optical Return Loss Tolerance				20	dB	
Extinction Ratio	ER_2	7			dB	4
Transmitter eye mask definition {X1, X2, X3, Y1, Y2, Y3}		IEEE802.3ba-2010 Compliant				4
TX Disable Assert Time	t_off			100	us	
Receiver						
Signaling Speed per Lane	BR_{AVE}		25.78		Gbps	
Lane_0 Center Wavelength	λ_{C0}	1294.53	1295.56	1296.59	nm	
Lane_1 Center Wavelength	λ_{C1}	1299.02	1300.05	1301.09	nm	
Lane_2 Center Wavelength	λ_{C2}	1303.54	1304.58	1305.63	nm	
Lane_3 Center Wavelength	λ_{C3}	1308.09	1309.14	1310.19	nm	
Average Receive Power per Lane	R_{pow2}	-10.6		4.5	dBm	6
Receive Sensitivity (OMA) per Lane	P_{min2}			-8.6	dBm	8
Stressed Sensitivity (OMA) per lane	SRS			-6.8	dBm	
Receiver Overload per Lane	P_{max}	5.5			dBm	
Optical Return Loss	ORL			-26	dB	
LOS Assert	LOSA	-21			dBm	
LOS De-Assert	LOSD			-11	dBm	
LOS Hysteresis		0.5			dB	

Notes:

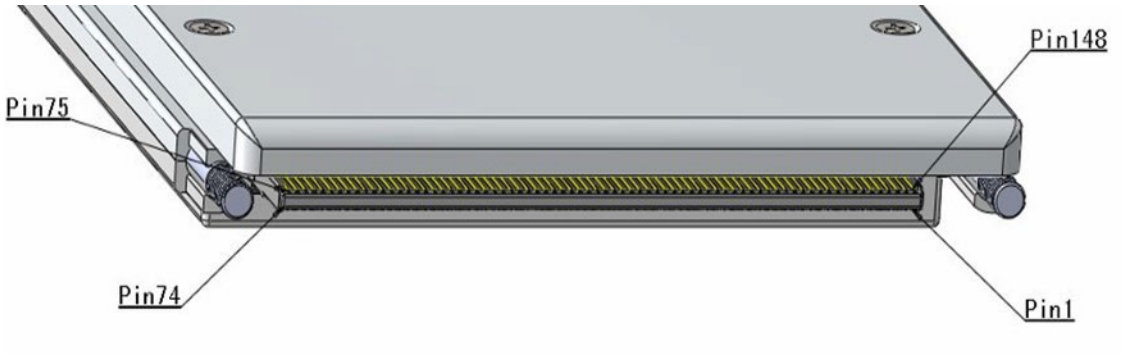
1. Output is coupled into a 9/125µm single-mode fiber.
2. Filtered, measured with a PRBS 2^{31}-1 test pattern @27.95Gbps
3. High speed I/O, internally AC coupled.
4. Filtered, measured with a PRBS 2^{31}-1 test pattern @25.78Gbps
5. CFP transceiver works in OTU4 4I1-9D1F mode.
6. CFP transceiver works in 100GBASE-LR4 mode.

7. Minimum average optical power measured at BER less than 1E-12, with a 2^{31}-1 PRBS@27.95Gbps.
8. Minimum OMA optical power measured at BER less than 1E-12, with a 2^{31}-1 PRBS@25.78Gbps.

Functional Description of Transceiver



Electrical Pad Layout



Pin Descriptions

Part A: Bottom Row Pin Function Definition

Pin	Name	Function	Notes
1	3.3V_GND	Ground	3.3V Module Supply Ground, Internally connected to Signal Ground
2	3.3V_GND	Ground	3.3V Module Supply Ground, Internally connected to Signal Ground
3	3.3V_GND	Ground	3.3V Module Supply Ground, Internally connected to Signal Ground
4	3.3V_GND	Ground	3.3V Module Supply Ground, Internally connected to Signal Ground
5	3.3V_GND	Ground	3.3V Module Supply Ground, Internally connected to Signal Ground
6	3.3V	3.3V Module Supply Voltage	3.3V ± 2.5%
7	3.3V	3.3V Module Supply Voltage	3.3V ± 2.5%
8	3.3V	3.3V Module Supply Voltage	3.3V ± 2.5%
9	3.3V	3.3V Module Supply Voltage	3.3V ± 2.5%
10	3.3V	3.3V Module Supply Voltage	3.3V ± 2.5%
11	3.3V	3.3V Module Supply Voltage	3.3V ± 2.5%
12	3.3V	3.3V Module Supply Voltage	3.3V ± 2.5%
13	3.3V	3.3V Module Supply Voltage	3.3V ± 2.5%
14	3.3V	3.3V Module Supply Voltage	3.3V ± 2.5%
15	3.3V	3.3V Module Supply Voltage	3.3V ± 2.5%
16	3.3V_GND	Ground	3.3V Module Supply Ground, Internally connected to Signal Ground
17	3.3V_GND	Ground	3.3V Module Supply Ground, Internally connected to Signal Ground
18	3.3V_GND	Ground	3.3V Module Supply Ground, Internally connected to Signal Ground
19	3.3V_GND	Ground	3.3V Module Supply Ground, Internally connected to Signal Ground
20	3.3V_GND	Ground	3.3V Module Supply Ground, Internally connected to Signal Ground
21	VND_IO_A	I/O	Module Vendor I/O, NC
22	VND_IO_B	I/O	Module Vendor I/O, NC
23	GND	Ground	Signal Ground
24	(TX_MCLKn)	Tx Monitor Clock O	Tx Monitor Clock Output
25	(TX_MCLKp)	Tx Monitor Clock O	Tx Monitor Clock Output
26	GND	Ground	Signal Ground
27	VND_IO_C	I/O	Module Vendor I/O, must not connect at host board
28	VND_IO_D	I/O	Module Vendor I/O, must not connect at host board
29	VND_IO_E	I/O	Module Vendor I/O, must not connect at host board
30	PRG_CNTL1	I	LVCOMS
31	PRG_CNTL2	I	LVCOMS
32	PRG_CNTL3	I	LVCOMS
33	PRG_ALRM1	O	LVCOMS
34	PRG_ALRM2	O	LVCOMS
35	PRG_ALRM3	O	LVCOMS
36	TX_DIS	Transmitter Disable I	"1" or NC = transmitter disabled, "0" = transmitter enabled
37	MOD_LOPW R	Module Low Power Mode I	"1" or NC: module in low power (safe) mode, "0": power-on enabled
38	MOD_ABS	Module Absent O	"1" or NC: module absent, "0": module present
39	MOD_RSTn	Module Reset I	"0" resets the module, "1" or NC = module enabled
40	RX_LOS	Loss of Signal O	"1": low optical signal, "0": normal condition

41	GLB_ALRMn	Global Alarm O	“0": alarm condition in any MDIO Alarm register, "1": no alarm condition
42	PRTADR4	1.2V CMOS I	MDIO Physical Port address bit4
43	PRTADR3	1.2V CMOS I	MDIO Physical Port address bit3
44	PRTADR2	1.2V CMOS I	MDIO Physical Port address bit2
45	PRTADR1	1.2V CMOS I	MDIO Physical Port address bit1
46	PRTADR0	1.2V CMOS I	MDIO Physical Port address bit0
47	MDIO	1.2V CMOS I/O	Management Data I/O bi-directional data
48	MDC	1.2V CMOS I	Management Data Clock
49	GND	Ground	Signal Ground
50	VND_IO_F	I/O	Module Vendor I/O, Not Connected Internally
51	VND_IO_G	I/O	Module Vendor I/O, Not Connected Internally
52	GND	Ground	Signal Ground
53	VND_IO_H	I/O	Module Vendor I/O, Not Connected Internally
54	VND_IO_J	I/O	Module Vendor I/O, Not Connected Internally
55	3.3V_GND	Ground	3.3V Module Supply Ground, Internally connected to Signal Ground
56	3.3V_GND	Ground	3.3V Module Supply Ground, Internally connected to Signal Ground
57	3.3V_GND	Ground	3.3V Module Supply Ground, Internally connected to Signal Ground
58	3.3V_GND	Ground	3.3V Module Supply Ground, Internally connected to Signal Ground
59	3.3V_GND	Ground	3.3V Module Supply Ground, Internally connected to Signal Ground
60	3.3V	3.3V Module Supply Voltage	3.3V ± 2.5%
61	3.3V	3.3V Module Supply Voltage	3.3V ± 2.5%
62	3.3V	3.3V Module Supply Voltage	3.3V ± 2.5%
63	3.3V	3.3V Module Supply Voltage	3.3V ± 2.5%
64	3.3V	3.3V Module Supply Voltage	3.3V ± 2.5%
65	3.3V	3.3V Module Supply Voltage	3.3V ± 2.5%
66	3.3V	3.3V Module Supply Voltage	3.3V ± 2.5%
67	3.3V	3.3V Module Supply Voltage	3.3V ± 2.5%
68	3.3V	3.3V Module Supply Voltage	3.3V ± 2.5%
69	3.3V	3.3V Module Supply Voltage	3.3V ± 2.5%
70	3.3V_GND	Ground	3.3V Module Supply Ground, Internally connected to Signal Ground
71	3.3V_GND	Ground	3.3V Module Supply Ground, Internally connected to Signal Ground
72	3.3V_GND	Ground	3.3V Module Supply Ground, Internally connected to Signal Ground
73	3.3V_GND	Ground	3.3V Module Supply Ground, Internally connected to Signal Ground
74	3.3V_GND	Ground	3.3V Module Supply Ground, Internally connected to Signal Ground

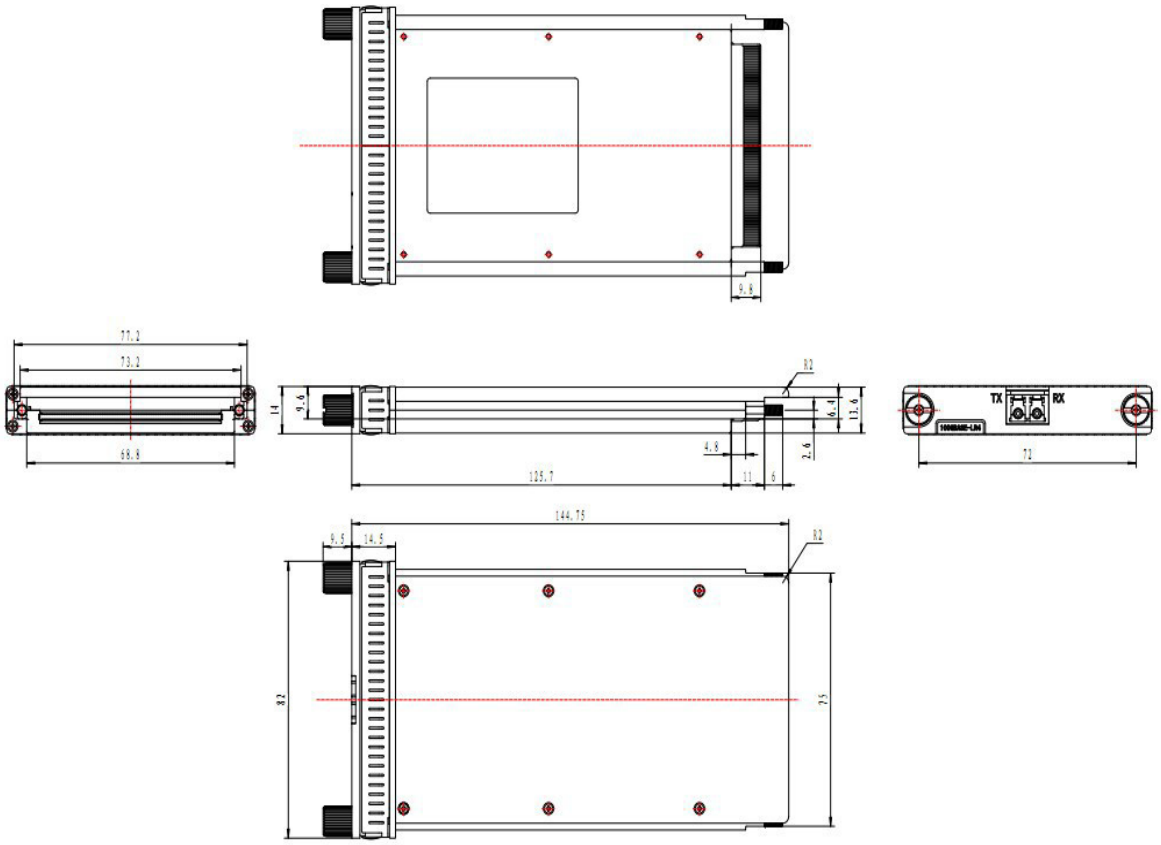
Part B: Top Row Pin Function Definition

Pin	Name	Function	Notes
148	GND	Ground	Signal Ground
147	REFCLKn	Reference Clock I	Reference Clock Input
146	REFCLKp	Ground	3.3V Module Supply Ground, Internally connected to Signal Ground
145	GND	Ground	Signal Ground
144	N.C.		Not Connected Internally
143	N.C.		Not Connected Internally
142	GND	Ground	Signal Ground
141	TX9n	Lane 9 Tx Input I	

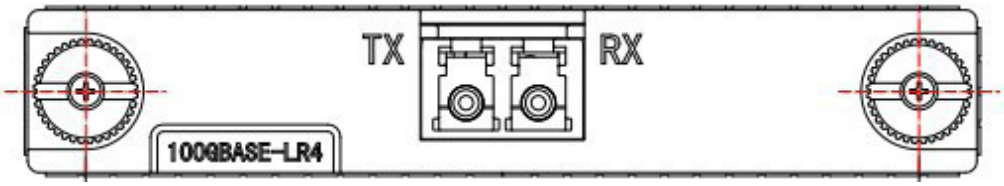
140	TX9p	Lane 9 Tx Input I	
139	GND	Ground	Signal Ground
138	TX8n	Lane 8 Tx Input I	3.3V ± 2.5%
137	TX8p	Lane 8 Tx Input I	3.3V ± 2.5%
136	GND	Ground	Signal Ground
135	TX7n	Lane 7 Tx Input I	3.3V ± 2.5%
134	TX7p	Lane 7 Tx Input I	3.3V ± 2.5%
133	GND	Ground	Signal Ground
132	TX6n	Lane 6 Tx Input I	
131	TX6p	Lane 6 Tx Input I	
130	GND	Ground	Signal Ground
129	TX5n	Lane 5 Tx Input I	
128	TX5p	Lane 5 Tx Input I	
127	GND	Ground	Signal Ground
126	TX4n	Lane 4 Tx Input I	
125	TX4p	Lane 4 Tx Input I	
124	GND	Ground	Signal Ground
123	TX3n	Lane 3 Tx Input I	
122	TX3p	Lane 3 Tx Input I	
121	GND	Ground	Signal Ground
120	TX2n	Lane 2 Tx Input I	
119	TX2p	Lane 2 Tx Input I	
118	GND	Ground	Signal Ground
117	TX1n	Lane 1 Tx Input I	
116	TX1p	Lane 1 Tx Input I	
115	GND	Ground	Signal Ground
114	TX0n	Lane 0 Tx Input I	
113	TX0p	Lane 0 Tx Input I	
112	GND	Ground	Signal Ground
111	GND	Ground	Signal Ground
110	N.C.		Not Connected Internally
109	N.C.		Not Connected Internally
108	GND	Ground	Signal Ground
107	RX9n	Lane 9 Rx Output O	
106	RX9p	Lane 9 Rx Output O	
105	GND	Ground	Signal Ground
104	RX8n	Lane 8 Rx Output O	
103	RX8p	Lane 8 Rx Output O	
102	GND	Ground	Signal Ground
101	RX7n	Lane 7 Rx Output O	
100	RX7p	Lane 7 Rx Output O	
99	GND	Ground	Signal Ground
98	RX6n	Lane 6 Rx Output O	
97	RX6p	Lane 6 Rx Output O	
96	GND	Ground	Signal Ground
95	RX5n	Lane 5 Rx Output O	
94	RX5p	Lane 5 Rx Output O	

93	GND	Ground	Signal Ground
92	RX4n	Lane 4 Rx Output O	
91	RX4p	Lane 4 Rx Output O	
90	GND	Ground	Signal Ground
89	RX3n	Lane 3 Rx Output O	
88	RX3p	Lane 3 Rx Output O	
87	GND	Ground	Signal Ground
86	RX2n	Lane 2 Rx Output O	
85	RX2p	Lane 2 Rx Output O	
84	GND	Ground	Signal Ground
83	RX1n	Lane 1 Rx Output O	
82	RX1p	Lane 1 Rx Output O	
81	GND	Ground	Signal Ground
80	RX0n	Lane 0 Rx Output O	
79	RX0p	Lane 0 Rx Output O	
78	GND	Ground	Signal Ground
77	RX_MCLKn	Rx Monitor Clock O	Rx Monitor Clock Output
76	RX_MCLKp	Rx Monitor Clock O	Rx Monitor Clock Output
75	GND	Ground	Signal Ground

Mechanical Specifications



Laser Emission



OptioConnect
Innovation for the Future of High-Speed Networking

Who We Are
OptioConnect is reshaping the landscape of communication and high-speed networking through intelligent technology. With a core focus on cutting edge technology, we deliver smarter fiber optic solutions for enterprise networks, data centers, and next-gen telecom infrastructures.

What We Do
At OptioConnect, we fuse advanced engineering with intelligent automation to drive the future of networking. Our AI-integrated solutions are designed to optimize performance and streamline operations with:

- Superior Performance
- Network and traffic optimization
- Intelligent energy management
- Seamless OEM compatibility
- Scalable cost-efficiency

Smarter Networks by Design
Innovation isn't just a goal—it's our process. We embed AI and machine learning across our R&D and product lines, enabling adaptive performance, automated tuning, and faster deployment cycles. The result? Networks that don't just work—they learn, evolve, and outperform.

Our Team
Our engineers, data scientists, and network architects bring decades of experience and a future-focused mindset. We provide hands-on support with intelligent insights that turn complex challenges into simple solutions.

Our Mission
To deliver AI-enhanced connectivity that reduces cost, increases speed, and maximizes efficiency—empowering our partners to operate at the forefront of a rapidly evolving digital world.

Let's Connect
Discover how OptioConnect's intelligent infrastructure solutions can power your network's next leap forward.
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