

### QSFP28-100GB-SR4-40M-N-C

Alcatel-Lucent Nokia® Compatible TAA 100GBase-SR4 QSFP28 Transceiver (MMF, 850nm, 40m w/Reduced FEC, MPO, DOM)

#### Features:

- Compliant with IEEE Std 802.3bm, 100G BASE SR4 Ethernet
- Compliant with QSFP28 MSA
- Management interface specifications per SFF-8636
- Single MPO connector receptacle
- 4 channels 850nm VCSEL array
- 4 channels PIN photo detector array
- Up to 103.1Gb/s data rates
- Class 1 laser safety certified
- Commercial Temperature: 0 to 70 Celsius
- RoHS Compliant and Lead-Free



#### Applications:

- 100GBase Ethernet
- Access and Enterprise

#### Product Description

This Alcatel-Lucent Nokia® QSFP28 transceiver provides 100GBase-SR4 throughput up to 40m over OM4 multi-mode fiber (MMF) using a wavelength of 850nm via an MPO 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.

ProLabs' transceivers are RoHS compliant and lead-free.

TAA refers to the Trade Agreements Act (19 U.S.C. & 2501-2581), which is intended to foster fair and open international trade. TAA requires that the U.S. Government may acquire only "U.S. – made or designated country end products."



## Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Power Supply Voltage	V <sub>CC</sub>	-0.5		4	V	
Storage Temperature	T <sub>stg</sub>	-40		85	°C	
Case Operating Temperature	T <sub>c</sub>	0	25	70	°C	
Relative Humidity	RH	5		95	%	
Data Rate	BR		25.78125		Gbps	
Transmission Distance	TD			40	m	1
Transmission Distance	TD			100	m	2

### Notes:

1. On OM4 MMF without host FEC. Or up to 30m on OM3 MMF without host FEC.
2. On OM4 MMF with host Clause 91 (RS) FEC. Or up to 70m on OM3 MMF with host Clause 91 (RS) FEC.

## Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Power Supply Voltage	V <sub>CC</sub>	3.135	3.3	3.465	V	
Power Supply Current	I <sub>CC</sub>			750	mA	
Power Dissipation	P <sub>D</sub>			2.5	W	
Transmitter						
Input Differential Impedance	Z <sub>IN</sub>		100		Ω	
Differential Data Input Swing	V <sub>IN, P-P</sub>	180		900	mV <sub>P-P</sub>	
Receiver						
Output Differential Impedance	Z <sub>O</sub>		100		Ω	
Differential Data Output Swing	V <sub>OUT, P-P</sub>	300		850	mV <sub>P-P</sub>	1
Transition Time (20% to 80%)	T <sub>r</sub> ,T <sub>f</sub>	12			ps	

### Notes:

1. Internally AC coupled but requires an external 100Ω differential load termination.

## Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter						
Center Wavelength	$\lambda_C$	840	850	860	nm	
Optical Launch Power	Po	-4.5		+2.4	dBm	1
Transmit OMA per Lane	OMA	-4.5		+3	dBm	
Extinction Ratio	EX	2			dB	2
Spectral Width (RMS)	$\Delta\lambda$			0.6	nm	
TDEC per Lane	TDEC			4.3	dB	
Optical Return Loss Tolerance	ORLT			12	dB	
Eye Diagram	IEEE Std 802.3bm compatible					
Receiver						
Receiver Wavelength	$\lambda$	840	850	860	nm	
Average Receiver Sensitivity (Pavg)	S			-7	dBm	3
Receiver Overload (Pavg)	POL	2.4			dBm	
Damage Threshold	POL	3.4			dBm	
Optical Reflectance	ORL			-12	dB	
LOS De-Assert	LOSD			-11	dBm	
LOS Assert	LOSA	-30			dBm	
LOS Hysteresis		0.5		5	dB	

### Notes:

1. The optical power is launched into OM3 MMF.
2. Measured with a PRBS  $2^{31}-1$  test pattern @25.78125Gbps.
3. Measured with PRBS  $2^{31}-1$  test pattern, 25.78125Gb/s, BER<1E-12.

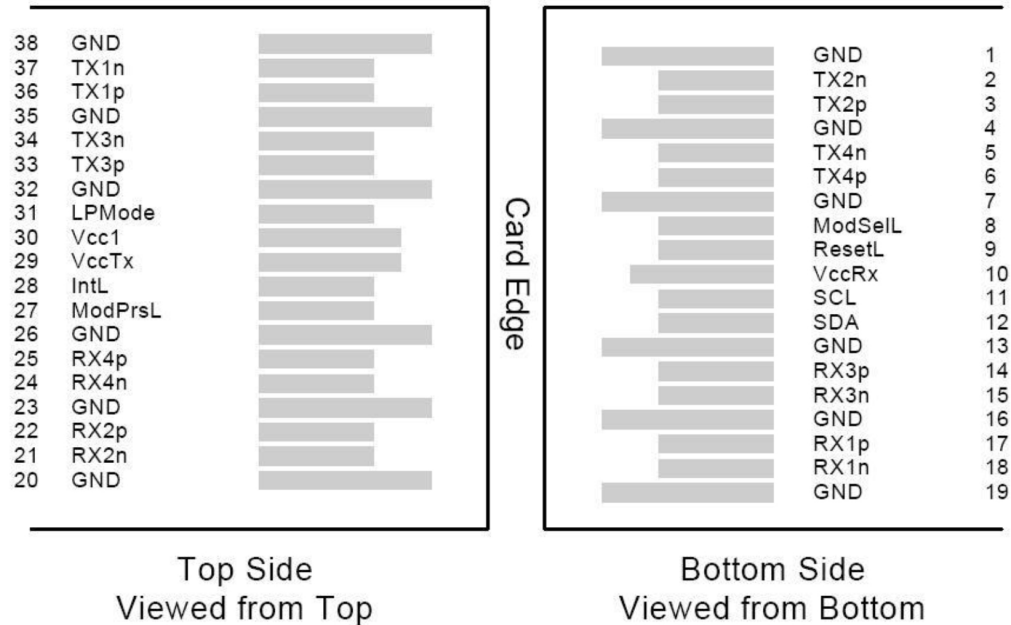
## Pin Descriptions

Pin	Logic	Symbol	Name/Descriptions	Ref.
1		GND	Transmitter Ground. (Common with Receiver Ground.)	1
2	CML-I	Tx2-	Transmitter Inverted Data Input.	
3	CML-I	Tx2+	Transmitter Non-Inverted Data Input.	
4		GND	Transmitter Ground. (Common with Receiver Ground.)	1
5	CML-I	Tx4-	Transmitter Inverted Data Input.	
6	CML-I	Tx4+	Transmitter Non-Inverted Data Input.	
7		GND	Transmitter Ground. (Common with Receiver Ground.)	1
8	LVTTL-I	MODSEL	Module Select.	2
9	LVTTL-I	ResetL	Module Reset.	2
10		VccRx	+3.3V Receiver Power Supply.	
11	LVC MOS-I	SCL	2-Wire Serial Interface Clock.	2
12	LVC MOS-I/O	SDA	2-Wire Serial Interface Data.	2
13		GND	Transmitter Ground. (Common with Receiver Ground.)	1
14	CML-O	Rx3+	Receiver Non-Inverted Data Output.	
15	CML-O	Rx3-	Receiver Inverted Data Output.	
16		GND	Transmitter Ground. (Common with Receiver Ground.)	1
17	CML-O	Rx1+	Receiver Non-Inverted Data Output	
18	CML-O	Rx1-	Receiver Inverted Data Output.	
19		GND	Transmitter Ground. (Common with Receiver Ground.)	1
20		GND	Transmitter Ground. (Common with Receiver Ground.)	1
21	CML-O	Rx2-	Receiver Inverted Data Output.	
22	CML-O	Rx2+	Receiver Non-Inverted Data Output.	
23		GND	Transmitter Ground. (Common with Receiver Ground.)	1
24	CML-O	Rx4-	Receiver Inverted Data Output.	
25	CML-O	Rx4+	Receiver Non-Inverted Data Output.	
26		GND	Transmitter Ground. (Common with Receiver Ground.)	1
27	LVTTL-O	ModPrsL	Module Present. Internally pulled down to GND.	
28	LVTTL-O	IntL	Interrupt output should be pulled up on the host board.	2
29		VccTx	+3.3V Transmitter Power Supply.	
30		Vcc1	+3.3V Power Supply.	
31	LVTTL-I	LPMODE	Low-Power Mode.	2
32		GND	Transmitter Ground. (Common with Receiver Ground.)	1
33	CML-I	Tx3+	Transmitter Non-Inverted Data Input.	
34	CML-I	Tx3-	Transmitter Inverted Data Input.	
35		GND	Transmitter Ground. (Common with Receiver Ground.)	1
36	CML-I	Tx1+	Transmitter Non-Inverted Data Input.	
37	CML-I	Tx1-	Transmitter Inverted Data Input.	
38		GND	Transmitter Ground. (Common with Receiver Ground.)	1

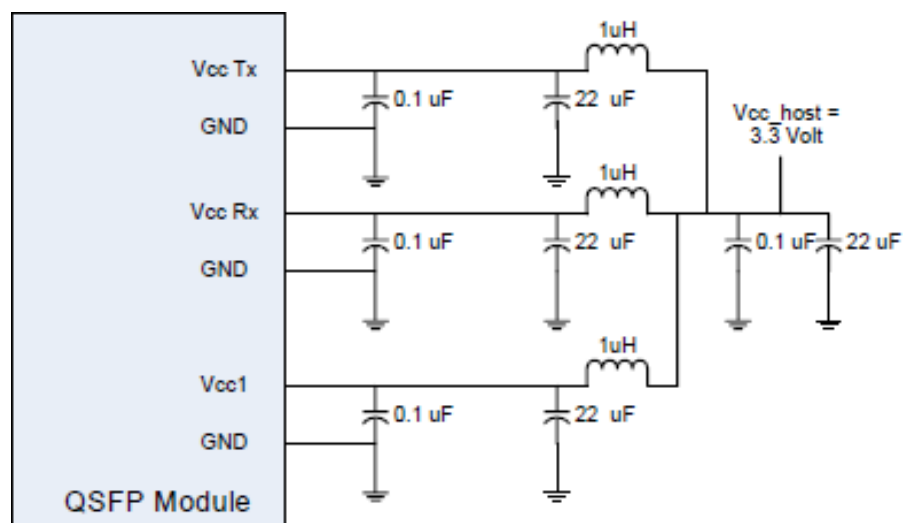
### Notes:

1. The module signal grounds are isolated from the module case.
2. This is open collector/drain output that on the host board requires a 4.7K $\Omega$  to 10K $\Omega$  pull-up resistor to VccHost.

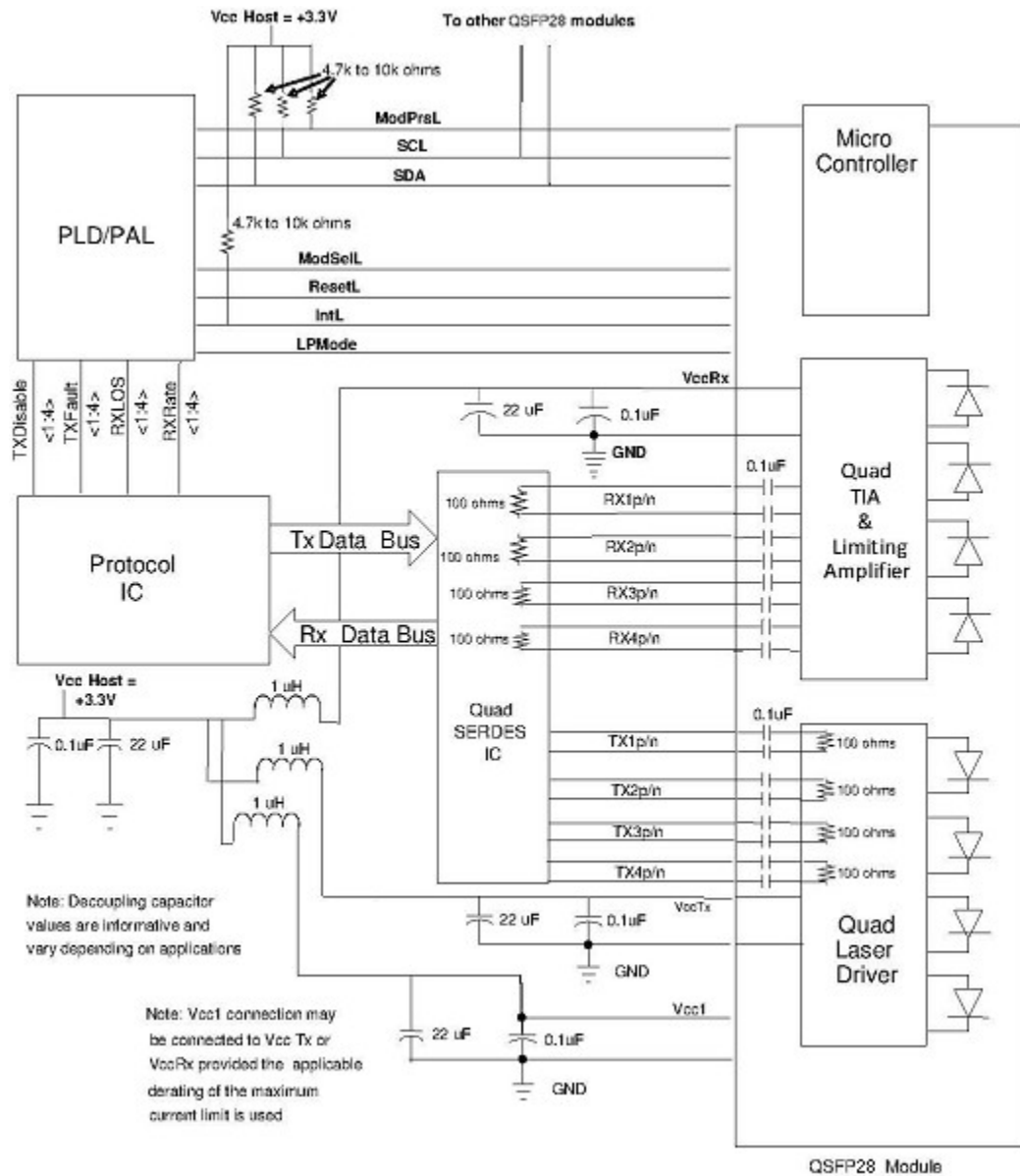
### Electrical Pin-Out Details



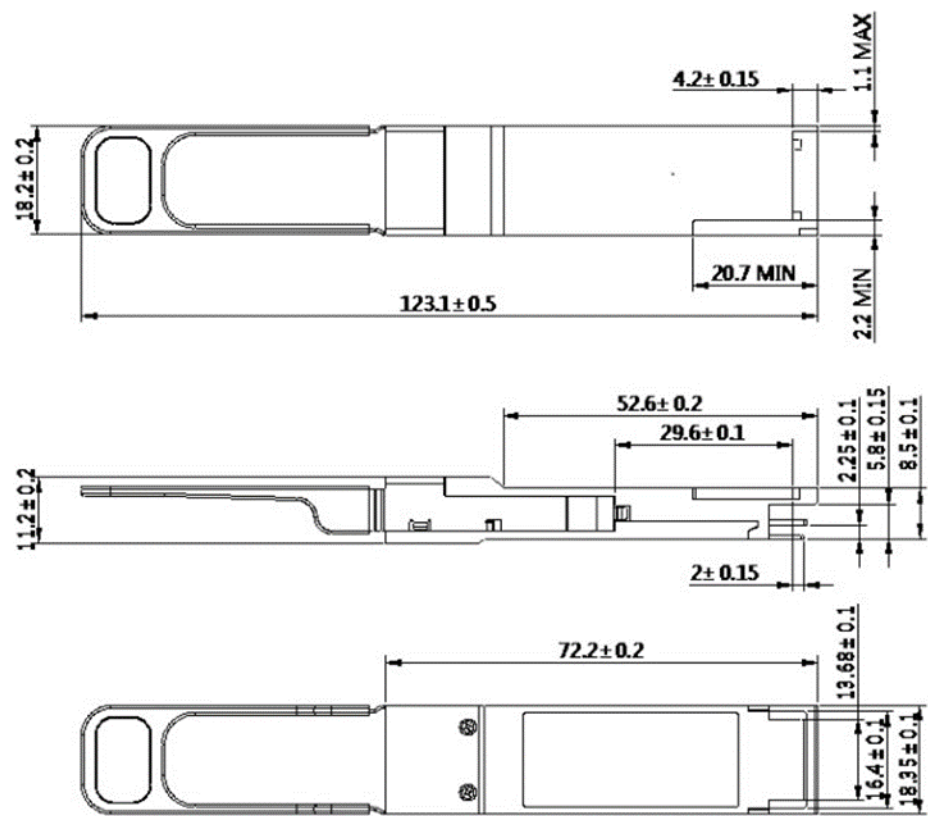
### Recommended Host Board Power Supply Filter Network



## Transceiver Interface Block Diagram



Mechanical Specifications



## About ProLabs

Our experience comes as standard; for over 15 years ProLabs has delivered optical connectivity solutions that give our customers freedom and choice through our ability to provide seamless interoperability. At the heart of our company is the ability to provide state-of-the-art optical transport and connectivity solutions that are compatible with over 90 optical switching and transport platforms.

## Complete Portfolio of Network Solutions

ProLabs is focused on innovations in optical transport and connectivity. The combination of our knowledge of optics and networking equipment enables ProLabs to be your single source for optical transport and connectivity solutions from 100Mb to 400G while providing innovative solutions that increase network efficiency. We provide the optical connectivity expertise that is compatible with and enhances your switching and transport equipment.

## Trusted Partner

Customer service is our number one value. ProLabs has invested in people, labs and manufacturing capacity to ensure that you get immediate answers to your questions and compatible product when needed. With Engineering and Manufacturing offices in the U.K. and U.S. augmented by field offices throughout the U.S., U.K. and Asia, ProLabs is able to be our customers best advocate 24 hours a day.



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