

# NXQ4-1310-S1D

## QSFP+ 40GBASE-LR4 1310nm 10km Singlemode

### Features

- QSFP+ Form Factor
- 40 Gb/s bitrate
- Up to 10 km over Singlemode
- LC connector
- 1310 nm, DFB laser, PIN photodiode
- Up to 3,5W power consumption
- +0/+70°C temperature range
- Built in digital diagnostic monitoring



### Applications

- 40GBase Ethernet
- Access and Enterprise

### Optical specifications



**Optical budget : 8.5 dB**

### Transmitter & Receiver optical Specifications

Parameter	Min	Max	Unit
Tx Power	-3	2.3	dBm
Rx Sensitivity	-11.5	3.3	dBm

## Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit
Maximum Supply Voltage	V <sub>CC</sub>	-0.5		4.0	V
Storage Temperature	T <sub>stg</sub>	-40		+85	°C
Operating Case Temperature	T <sub>c</sub>	0	25	70	°C
Relative Humidity	RH	5		95	%
Data Rate Per Channel			10.3125		Gbps

## Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Module Supply Current	I <sub>CC</sub>			1100	mA	
Power Dissipation	P <sub>DISS</sub>			3500	mW	
Transmitter						
Input Differential Impedance	Z <sub>IN</sub>		100		Ω	
Differential Data Input Swing	V <sub>IN,pp</sub>	180		900	mVp-p	
Receiver						
Output Differential Impedance				900	Ω	
Differential Data Output Swing	Z <sub>OUT,pp</sub>	300		850	mVp-p	1
Data Output Rise/Fall Time	T <sub>r</sub> /T <sub>f</sub>	28			ps	2

### Notes:

1. Internally AC coupled but requires an external 100Ω differential load termination.
2. 20-80%.

## Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter						
Launch Optical Power Per lane	Po	-3		+2.3	dBm	1
Total Launch Optical Power	Po			+8	dBm	1
Center Wavelength	λ0	1264.5	1271	1277.5	nm	
	λ1	1284.5	1291	1297.5	nm	
	λ2	1304.5	1311	1317.5	nm	
	λ3	1324.5	1331	1337.5	nm	
Extinction Ratio	ER	3.5			dB	2
Spectral Width (-20dB)	Δλ			1	nm	
Side-Mode Suppression Ratio	SMSR	30			dB	
Transmitter and Dispersion Penalty	TDP			2.3	dB	
Optical Return Loss Tolerance	ORLT			12	dB	
Eye Diagram	IEEE Std 802.3ba Compatible					
Receiver						
Center Wavelength	λC	1260		1340	nm	
Receiver Sensitivity (OMA)	S			-11.5	dBm	3
Damage Threshold	POL	3.3			dBm	3
Optical Return Loss	ORL	26			dB	
LOS De-Assert	LOSD			-12	dBm	
LOS Assert	LOSA	-30			dB	
LOS Hysteresis		0.5			dB	

### Notes:

1. The optical power is launched into SMF.
2. Measured with a PRBS  $2^{31}-1$  test pattern @10.3125Gbps.
3. Measured with a PRBS  $2^{31}-1$  test pattern, @10.3125 Gbps, and BER  $<10^{-12}$ .

## Pin Descriptions

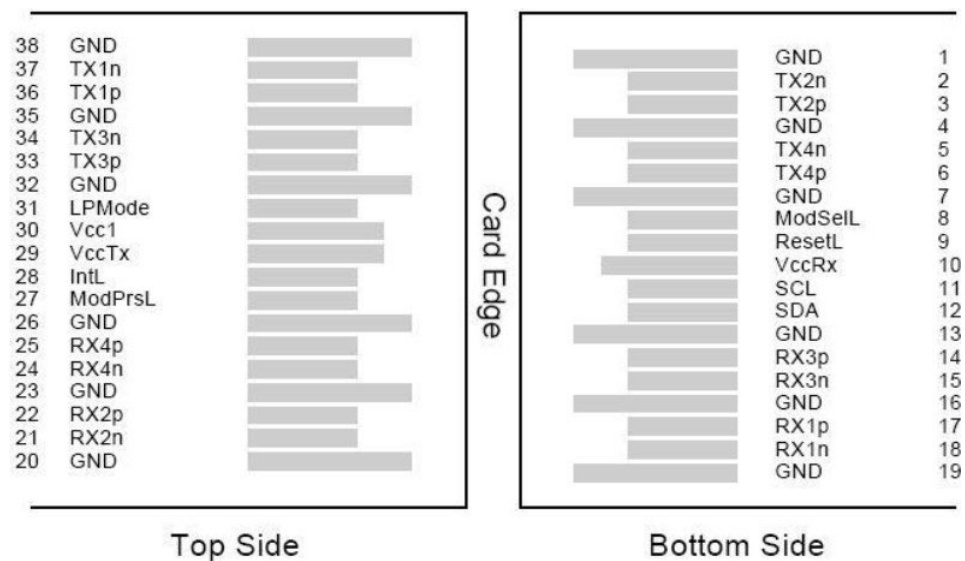
Pin	Symbol	Name/Description	Notes
1	GND	Transmitter Ground (Common with Receiver Ground).	1
2	Tx2-	Transmitter Inverted Data Input.	
3	Tx2+	Transmitter Non-Inverted Data Output.	
4	GND	Transmitter Ground (Common with Receiver Ground).	1
5	Tx4-	Transmitter Inverted Data Input.	
6	Tx4+	Transmitter Non-Inverted Data Output.	
7	GND	Transmitter Ground (Common with Receiver Ground).	1
8	ModSelL	Module Select.	2
9	ResetL	Module Reset.	2
10	VccRx	+3.3V Receiver Power Supply.	
11	SCL	2-Wire Serial Interface Clock.	2
12	SDA	2-Wire Serial Interface Data.	2
13	GND	Transmitter Ground (Common with Receiver Ground).	1
14	Rx3+	Receiver Non-Inverted Data Output.	
15	Rx3-	Receiver Inverted Data Output.	
16	GND	Transmitter Ground (Common with Receiver Ground).	1
17	Rx1+	Receiver Non-Inverted Data Output.	
18	Rx1-	Receiver Inverted Data Output.	
19	GND	Transmitter Ground (Common with Receiver Ground).	1
20	GND	Transmitter Ground (Common with Receiver Ground).	1
21	Rx2-	Receiver Inverted Data Output.	
22	Rx2+	Receiver Non-Inverted Data Output.	
23	GND	Transmitter Ground (Common with Receiver Ground).	1
24	Rx4-	Receiver Inverted Data Output.	1
25	Rx4+	Receiver Non-Inverted Data Output.	
26	GND	Transmitter Ground (Common with Receiver Ground).	1
27	ModPrsl	Module Present.	
28	IntL	Interrupt.	2
29	VccTx	+3.3V Transmitter Power Supply.	
30	Vcc1	+3.3V Power Supply.	
31	LPMODE	Low-Power Mode.	2
32	GND	Transmitter Ground (Common with Receiver Ground).	1
33	Tx3+	Transmitter Non-Inverted Data Input.	
34	Tx3-	Transmitter Inverted Data Output.	

<b>35</b>	GND	Transmitter Ground (Common with Receiver Ground).	<b>1</b>
<b>36</b>	Tx1+	Transmitter Non-Inverted Data Input.	
<b>37</b>	Tx1-	Transmitter Inverted Data Output.	
<b>38</b>	GND	Transmitter Ground (Common with Receiver Ground).	<b>1</b>

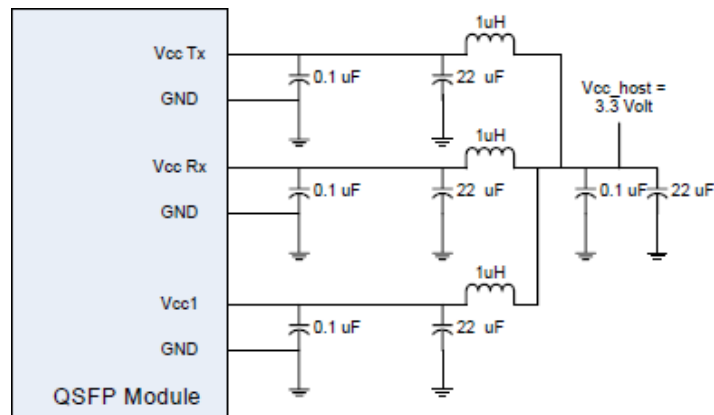
**Notes:**

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

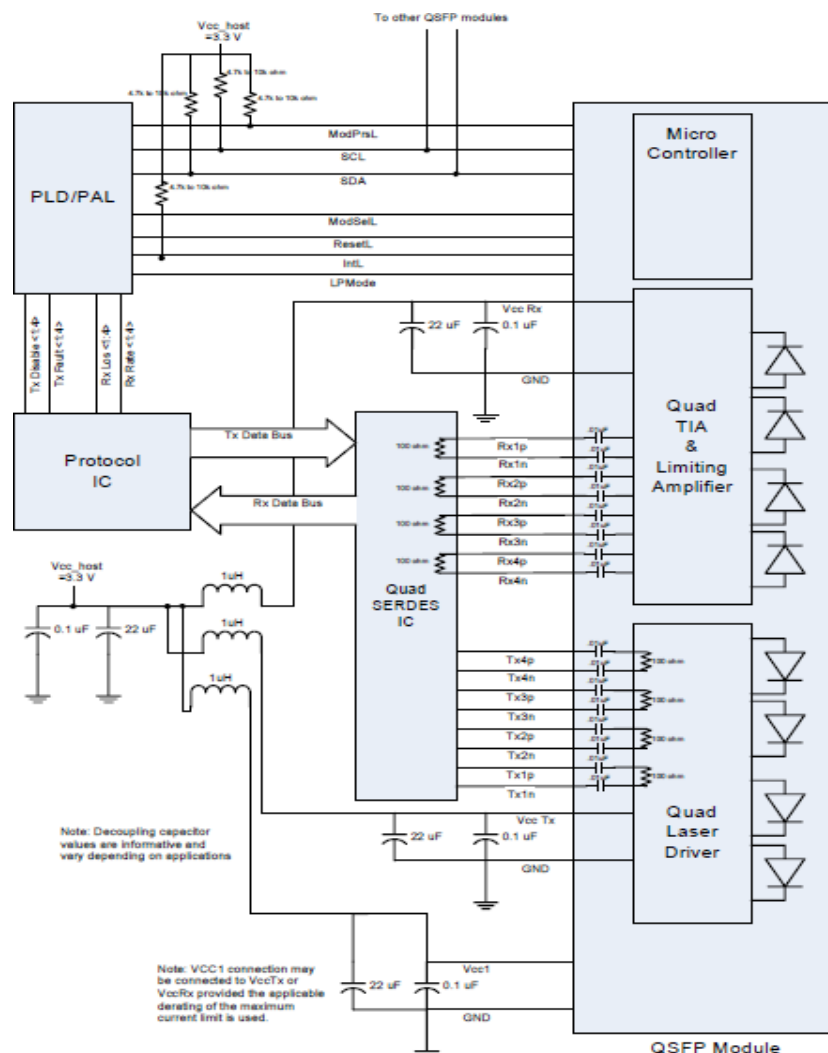
**Electrical Pin-Out Details**



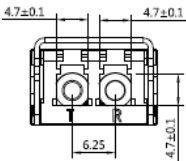
## Recommended Host Board Power Supply Filter Network



### Recommended Application Interface Block Diagram



Mechanical Specifications



Unit : mm

