

## 100G QSFP28 BiDi 80km Transceiver

Model: NT-Q28-4LR4-80A-BIDI

Model: NT-Q28-4LR4-80B-BIDI

### Ordering information:

Part Number	Product Description
NT-Q28-4LR4-80A	Single-mode,100G,80Km,LC interface
NT-Q28-4LR4-80B	Single-mode,100G,80Km,LC interface

### Product Features:

- 4x25Gb/s LAN WDM Blue or Red Side TOSA, LAN WDM Red or Blue Side ROSA with SOA.
- Support 100GBASE-ZR4 for line rate of 103.125Gbps and OTU4 for line rate of 111.81Gbps.
- Compliant with IEEE 802.3-2012 Clause 88 standard IEEE 802.3bm CAUI-4 chip to module.
- Electrical standard ITU-T G.959.1-2012-02 standard.
- Simplex LC connector.
- Single +3.3V power supply operating.
- Temperature range 0°C to 70°C.
- RoHS Compliant Part.

### Applications

- 100GBASE-ZR4
- Data Center

### General Description:

NT-Q28-4LR4-80A and NT-Q28-4LR4-80B provides 100GBase-BX throughput up to 80km over single-mode fiber (SMF) using wavelengths of 1273.54, 1277.89, 1282.26, 1286.66nm- TX/1295.56, 1300.05, 1304.58, 1309.14nm-RX(1295.56, 1300.05, 1304.58, 1309.14nm TX/1273.54, 1277.89, 1282.26, 1286.66nm-RX) via an LC connector.

This bidirectional unit must be used with another transceiver or network appliance of complimenting wavelengths. Digital diagnostics functions are also available via the I2C interface, as specified by the QSFP28 MSA, to allow access to real-time operating parameters. With these features, this easy to install, hot swappable transceiver is suitable to be used in various applications, such as 100G Ethernet, data center, and storage area networks applications.

**Absolute Maximum Ratings:**

Parameter	Symbol	Min	Max	Unit	Notes
Storage Temperature	TS	-40		+85	
Supply Voltage	VCCT, R	-0.5		4	
Relative Humidity	RH	0		85	

**Recommended Operating Conditions:**

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Case operating Temperature	TC	0		+70	°C	
Supply Voltage	VCCT, R	+3.13	3.3	+3.47	V	
Supply Current	ICC		1200	1900	mA	
Power Dissipation	PD			6.5	W	

**Electrical Characteristics:**

Parameter	Symbol	Min	Typical	Max	Unit	note
Data Rate per Channel		-	25.78125			
			27.9525			
Power Consumption		-	4	6.5	W	
Supply Current	Icc		1.2	1.8	A	
Control I/O Voltage-High	VIH	2.0		Vcc	V	
Control I/O Voltage-Low	VIL	0		0.7	V	
Inter-Channel Skew	TSK			35	Ps	
RESETL Duration			10		Us	
RESETL De-assert time				100	ms	
Power On Time				100	ms	
<b>Transmitter</b>						
Single Ended Output Voltage Tolerance		0.3		Vcc	V	1
Common mode Voltage Tolerance		15			mV	
Transmit Input Diff Voltage	VI	150		1200	mV	
Transmit Input Diff Impedance	ZIN	85	100	115		
Data Dependent Input Jitter	DDJ		0.3		UI	
<b>Receiver</b>						
Single Ended Output Voltage Tolerance		0.3		4	V	
Rx Output Diff Voltage	Vo	370	600	950	mV	
Rx Output Rise and Fall Voltage	Tr/Tf			35	ps	1
Total Jitter	TJ		0.3		UI	

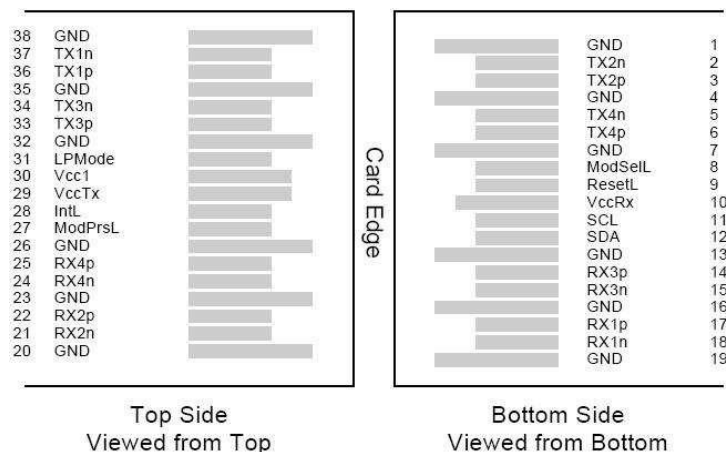
## Optical Characteristics:

Parameter	Symbol	Min	Typical	Max	Unit	Notes
<b>Transmitter</b>						
Purple Side Four Lane Wavelength Range	$\lambda_1$	1272.54	1273.54	1274.54	nm	
	$\lambda_2$	1276.89	1277.89	1278.89	nm	
	$\lambda_3$	1281.25	1282.26	1283.27	nm	
	$\lambda_4$	1285.65	1286.66	1287.68	nm	
Write Side Four Lane Wavelength Range	$\lambda_1$	1294.56	1295.56	1296.56	nm	
	$\lambda_2$	1299.05	1300.05	1301.05	nm	
	$\lambda_3$	1303.58	1304.58	1305.58	nm	
	$\lambda_4$	1308.14	1309.14	1310.14	nm	
Side-mode Suppression Ratio	SMSR	30	-	-	dB	
Total Average Launch Power	PT	8	-	12.5	dBm	
Average Launch Power, each Lane		+2	-	6.5	dBm	
Difference in Launch Power between any two Lanes (OMA)		-	-	3	dB	
Extinction Ratio	ER	6	-	-	dB	
Transmitter Eye Mask Definition {X1, X2, X3, Y1, Y2, Y3}		{0.25, 0.4, 0.45, 0.25, 0.28, 0.4}				1
Optical Return Loss Tolerance		-	-	20	dB	
Average Launch Power OFF Transmitter, each Lane	Poff			-30	dBm	
Relative Intensity Noise	Rin			-130	dB/HZ	
Optical return loss tolerance				20	dB	
Transmitter reflectance		-	-	12	dB	
<b>Receiver</b>						
Purple Side Four Lane Wavelength Range	$\lambda_1$	1272.54	1273.54	1274.54	nm	
	$\lambda_2$	1276.89	1277.89	1278.89	nm	
	$\lambda_3$	1281.25	1282.26	1283.27	nm	
	$\lambda_4$	1285.65	1286.66	1287.68	nm	
Write Side Four Lane Wavelength	$\lambda_1$	1294.56	1295.56	1296.56	nm	
	$\lambda_2$	1299.05	1300.05	1301.05	nm	
	$\lambda_3$	1303.58	1304.58	1305.58	nm	
Range	$\lambda_4$	1308.14	1309.14	nm		
Total Damage Threshold	THd			5.5	dBm	1
Receiver Sensitivity per Lane	R			-28	dBm	
Average Power at Receiver Input, eachLane	R	-28		0	dBm	1
LOS De-Assert	LOSD			-29	dBm	
LOS Assert	LOSA	-40			dBm	
LOS Hysteresis	LOSH	0.5			dB	

### Note

- Sensitivity is specified at BER@5E-5 with FE

### Pin Assignment and Description:



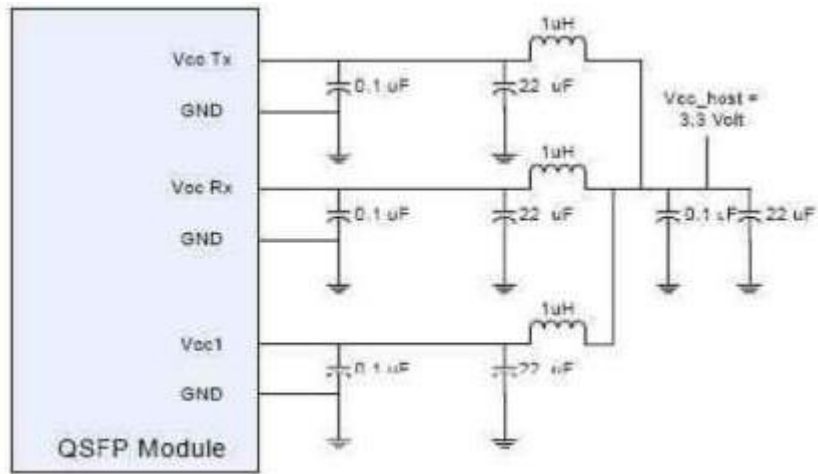
**Pin Assignment:**

PIN	Symbol	Description	Notes
1	GND	Ground	1
2	Tx2n	Transmitter Inverted Data Input	
3	Tx2p	Transmitter Non-Inverted Data output	
4	GND	Ground	1
5	Tx4n	Transmitter Inverted Data Input	
6	Tx4p	Transmitter Non-Inverted Data output	
7	GND	Ground	1
8	ModSelL	Module Select	
9	ResetL	Module Reset	
10	VccRx	+3.3V Power Supply Receiver	2
11	SCL	2-Wire Serial Interface Clock	
12	SDA	2-Wire Serial Interface Data	
13	GND	Ground	
14	Rx3p	Receiver Non-Inverted Data Output	
15	Rx3n	Receiver Inverted Data Output	
16	GND	Ground	1
17	Rx1p	Receiver Non-Inverted Data Output	
18	Rx1n	Receiver Inverted Data Output	
19	GND	Ground	1
20	GND	Ground	1
21	Rx2n	Receiver Inverted Data Output	
22	Rx2p	Receiver Non-Inverted Data Output	
23	GND	Ground	1
24	Rx4n	Receiver Inverted Data Output	1
25	Rx4p	Receiver Non-Inverted Data Output	
26	GND	Ground	1
27	ModPrsL	Module Present	
28	IntL	Interrupt	
29	VccTx	+3.3V Power Supply transmitter	2
30	Vcc1	+3.3V Power Supply	2
31	LPMODE	Low Power Mode	
32	GND	Ground	1
33	Tx3p	Transmitter Non-Inverted Data Input	
34	Tx3n	Transmitter Inverted Data Output	
35	GND	Ground	1
36	Tx1p	Transmitter Non-Inverted Data Input	
37	Tx1n	Transmitter Inverted Data Output	
38	GND	Ground	1

**Notes:**

1. GND is the symbol for signal and supply (power) common for QSFP28 modules. All are common within the QSFP28 module and all module voltages are referenced to this potential unless otherwise noted. Connect these directly to the host board signal common ground plane.
2. VccRx, Vcc1 and VccTx are the receiving and transmission power suppliers and shall be applied concurrently. Recommended host board power supply filtering is shown below. Vcc Rx, Vcc1 and Vcc Tx may be internally connected within the QSFP28 transceiver module in any combination. The connector pins are each rated for a maximum current of 500mA.

Recommended Circuit:



Mechanical Dimension:

