

NXQ28-1314-S1D

QSFP28 100GBASE-LR4 1310nm 10km Singlemode

Features

- QSFP28 Form Factor
- 100 Gb/s bitrate
- Up to 10 km over Singlemode
- LC connector
- 1310 nm, DML laser, PIN photodiode
- Up to 3,5W power consumption
- +0/+70°C temperature range
- Built in digital diagnostic monitoring



Applications

- 100GBase Ethernet
- Access and Enterprise

Optical specifications



Optical budget : 6.3 dB

Transmitter & Receiver optical Specifications

Parameter	Min	Max	Unit
Tx Power	-4.3	4.5	dBm
Rx Sensitivity	-10.6	4.5	dBm

Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit
Maximum Supply Voltage	Vcc	-0.5		3.6	V
Storage Temperature	TS	-40		85	°C
Operating Case Temperature	Tc	0	25	70	°C
Operating Humidity	RH	5		85	%
Receiver Damage Threshold, per Lane	Rxdmg	5.5			dBm

Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Power Dissipation	PD			3.5	W	
Power Supply Voltage	Vcc	3.135	3.3	3.465	V	
Transmitter						
Differential data input swing per lane	Vin			900	Mvp-p	
Input Impedance (Differential)	Zin			10	%	
Stressed Input Parameters						
Eye width		0.46			UI	
Applied pk-pk sinusoidal jitter		IEEE 802.3bm Table 88-13				
Eye height		95			mv	
DC common mode voltage		-350		2850	mv	
Receiver						
Differential output amplitude		200		900	Mvp-p	
Output Impedance (Differential)	Zout			10	%	
Output Rise/Fall Time	tr/tf	12			ps	20%~80%
Eye width		0.57			UI	
Eye height differential		228			mv	
Vertical eye closure				5.5	db	

Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter						
Signaling Speed per Lane	Brave		25.78		Gbps	
Data Rate Variation		-100		+100		
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 Launch Power each Lane	P _{each}	-4.3		4.5	dBm	1
Optical Modulation Amplitude (OMA) each Lane	TxOMA	-1.3		4.5	dBm	
Difference in launch power between any two lanes (OMA)				5	dB	
Launch power in OMA minus TDP, each lane		-2.3			dBm	
Transmitter and dispersion penalty (TDP), each lane				2.2	dB	
Extinction Ratio	ER	4			dB	
Side-mode Suppression ratio	SMSR _{min}	30			dB	
Average launch power of OFF transmitter per lane				-30	dBm	
Relative Intensity Noise	RIN			-130	dB/hz	
Transmitter Reflectance				-12	dB	
Optical Return Loss Tolerance				20	dB	
Transmitter eye mask definitions: X1, X2, X3, Y1, Y2, Y3	0.25, 0.4, 0.45, 0.25, 0.28, 0.4					2
Receiver						
Signaling Speed per Lane	BRAVE		25.78		Gbps	
Data Rate Variation		-100		+100	ppm	
Damage threshold per lane	Rxdmg	5.5			dBm	
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	Rxpow	-10.6		4.5	dBm	3
Receive Power (OMA) per Lane	RxOMA			4.5	dBm	
Receive Sensitivity in OMA per Lane	Rxsens			-8.6	dBm	
Receiver 3 dB electrical upper cutoff frequency, per lane				31	GHz	
Stressed Receiver Sensitivity (OMA) per Lane	RXSRS			-6.8	dBm	4

Optical Return Loss	ORL			-26	dB	
LOS Assert	LOSA	-25			dBm	
LOS De-Assert	LOSD			-12	dBm	
LOS Hysteresis		0.5			dB	
Conditions of stressed receiver sensitivity test						
Vertical eye closure penalty	VECP		1.8		dB	5
Stressed eye J2 Jitter	J2		0.3		UI	5
Stressed eye J9 Jitter	J9		0.47		UI	5

Notes:

1. Average launch power, each lane (min) is informative and not the principal indicator of signal strength. A transmitter with launch power below this value cannot be compliant; however, a value above this does not ensure compliance.
2. Hit ratio 5×10^{-5} .
3. Average receive power, each lane (min) is informative and not the principal indicator of signal strength. A received power below this value cannot be compliant; however, a value above this does not ensure compliance.
4. Measured with conformance test signal at TP3 for BER = 10⁻¹².
5. Vertical eye closure penalty, stressed eye J2 Jitter, and stressed eye J9 Jitter are test conditions for measuring stressed receiver sensitivity. They are not characteristics of the receiver.

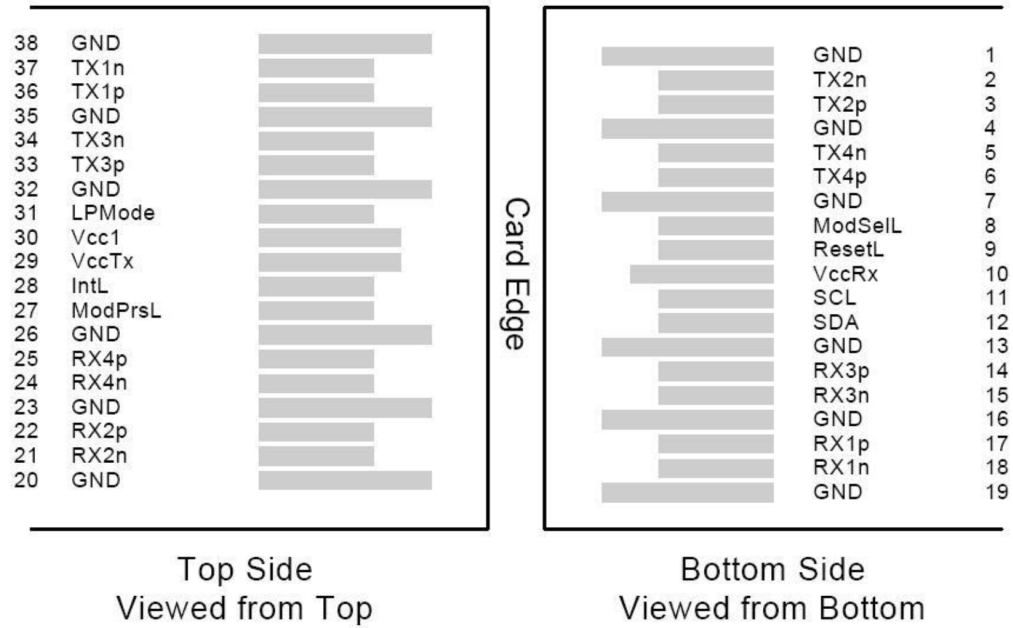
Pin Descriptions

Pin	Logic	Symbol	Name/Descriptions	Ref.
1		GND	Module Ground	1
2	CML-I	Tx2-	Transmitter inverted data input	
3	CML-I	Tx2+	Transmitter non-inverted data input	
4		GND	Module Ground	1
5	CML-I	Tx4-	Transmitter inverted data input	
6	CML-I	Tx4+	Transmitter non-inverted data input	
7		GND	Module Ground	1
8	LVTTTL-I	MODSEIL	Module Select	2
9	LVTTTL-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	Module Ground	1
14	CML-O	RX3+	Receiver non-inverted data output	
15	CML-O	RX3-	Receiver inverted data output	
16		GND	Module Ground	1
17	CML-O	RX1+	Receiver non-inverted data output	
18	CML-O	RX1-	Receiver inverted data output	
19		GND	Module Ground	1
20		GND	Module Ground	1
21	CML-O	RX2-	Receiver inverted data output	
22	CML-O	RX2+	Receiver non-inverted data output	
23		GND	Module Ground	1
24	CML-O	RX4-	Receiver inverted data output	
25	CML-O	RX4+	Receiver non-inverted data output	
26		GND	Module Ground	1
27	LVTTTL-O	ModPrsL	Module Present, internal pulled down to GND	
28	LVTTTL-O	IntL	Interrupt output, should be pulled up on host board	2
29		VCCTx	+3.3v Transmitter Power Supply	
30		VCC1	+3.3v Power Supply	
31	LVTTTL-I	LPMode	Low Power Mode	2
32		GND	Module Ground	1
33	CML-I	Tx3+	Transmitter non-inverted data input	
34	CML-I	Tx3-	Transmitter inverted data input	
35		GND	Module Ground	1
36	CML-I	Tx1+	Transmitter non-inverted data input	
37	CML-I	Tx1-	Transmitter inverted data input	
38		GND	Module Ground	1

Notes:

- 1. Module circuit ground is isolated from module chassis ground with in the module.
- 2. Open collector; should be pulled up with 4.7k-10k ohms on host board to a voltage between 3.15V and 3.6V.

Electrical Pin-out Details



Mechanical Specifications

