

NT-QSF40G-LR4

40GBASE-LR4 QSFP+ Transceiver, SMF, CWDM 1271~1331nm, 10km, LC

Features

- High Channel Capacity: 40 Gbps per transceiver
- Transmission data rate up to 10.3Gbps per channel
- Up to 10km links on single mode fiber
- 4 CWDM channels 1271, 1291, 1311 and 1331nm
- Compliant with QSFP+ MSA
- Compliant with IEEE 802.3ba 40GBASE-LR4
- Power dissipation < 3.5 W
- Supports Digital Diagnostics Monitoring
- Operating temperature range: 0 to 70°C
- RoHS Compliant and Lead-Free



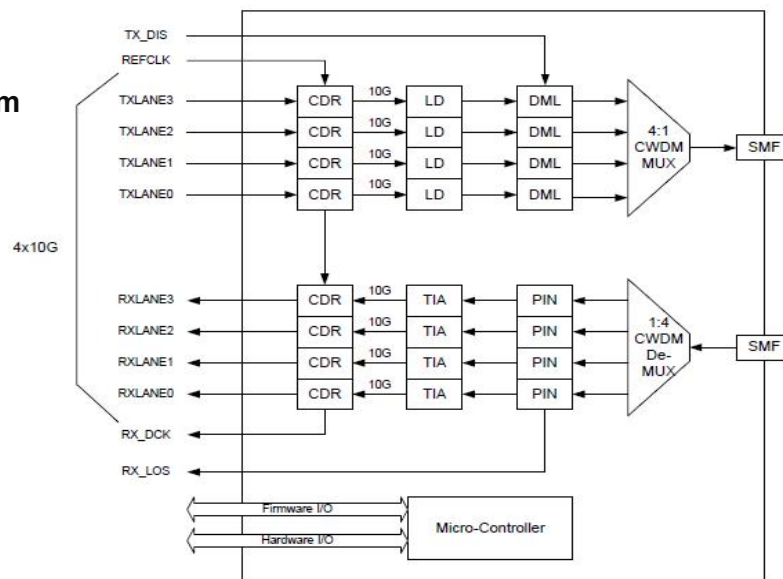
Applications

- 40GBASE-LR4 Ethernet
- Switch, router and HBAs
- Data Center Interconnect
- Infiniband QDR
- 40G Campus Link
- Proprietary Protocol Applications

Description

Netiks NT-QSF40G-LR4 is a high performance and cost-effective QSFP+ transceiver designed for 40GBase-LR4 Gigabit Ethernet applications. The 40GBase-LR4 QSFP+ transceiver complies with QSFP+ MSA and IEEE 802.3ba 40GBASE-LR4 specifications. The QSFP+ transceiver converts 4 inputs channel of 10.3125Gb/s electrical data to 4 CWDM optical signals, and multiplexes them into a single channel for 40Gb/s optical transmission. On the receiver side, the transceiver optically de-multiplexes a 40Gb/s input into 4 CWDM channels signals and converts them to 4 channel output electrical data. The center wavelengths of the 4 CWDM channels are 1271, 1291, 1311 and 1331 nm. The 40GBase-LR4 QSFP+ transceiver contains a duplex LC connector for the optical interface and a 38-pin connector for the electrical interface.

Transceiver functional diagram



Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit	Notes
Maximum Supply Voltage	V _{cc}	-0.5	4.5	V	
Storage Temperature	T _s	-40	85	°C	
Operating Humidity	RH	5	85	%	

Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Power Supply Voltage	V _{cc}	3.13	3.3	3.47	V	
Power Dissipation	P _m			3.5	W	
Case Operating Temperature	T _c	0		70	°C	
Data Rate			10.3	10.5	Gbps	Each channel
Bit Error Rate	BER			10 ⁻¹²		

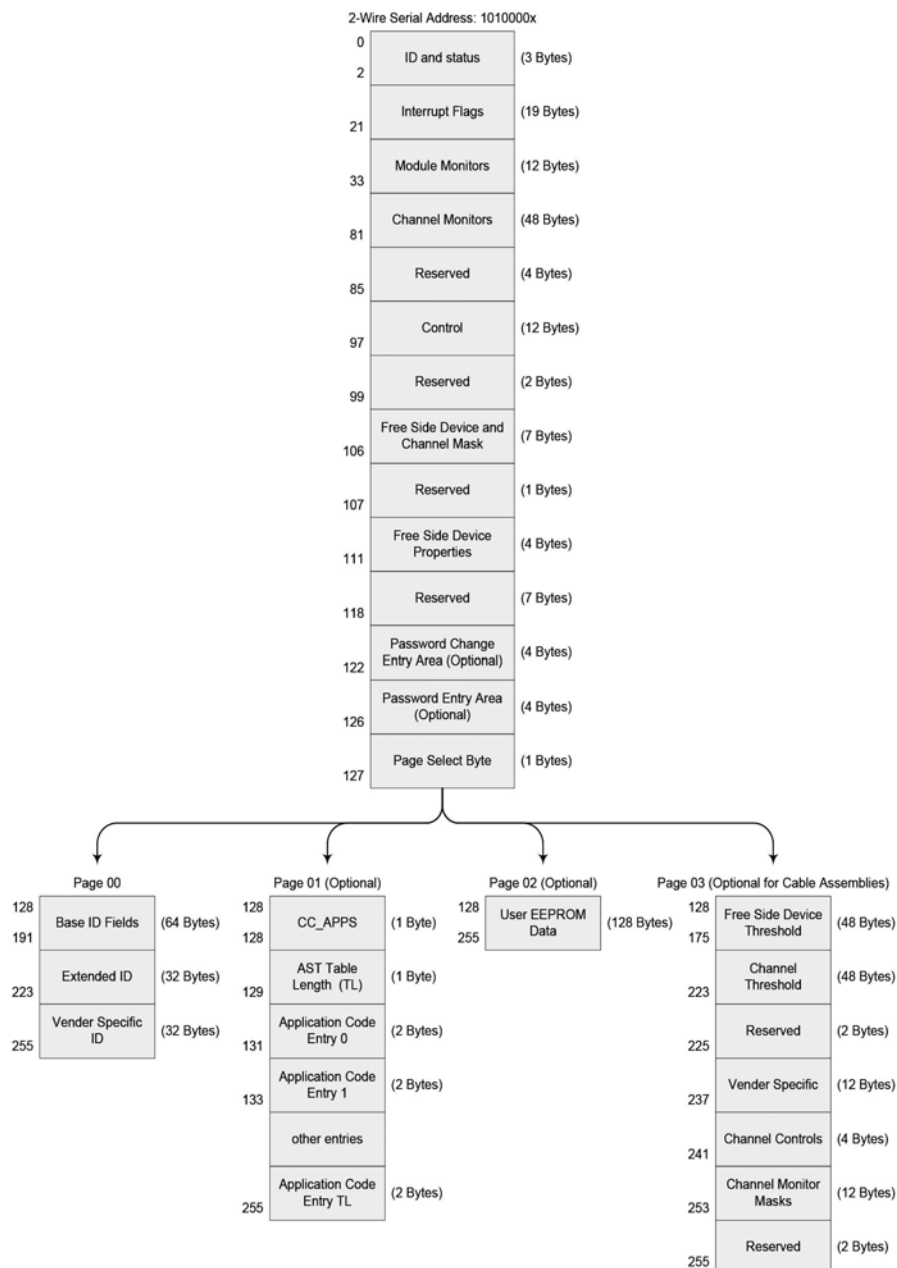
Optical and Electrical Characteristics

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Transmitter						
Centre Wavelength	L0	1264.5	1271	1277.5	nm	
	L1	1284.5	1291	1297.5	nm	
	L2	1304.5	1311	1317.5	nm	
	L3	1324.5	1331	1337.5	nm	
-20dB Spectral Width	Δλ			1	nm	
Side-mode Suppression Ratio	SMSR	30	-		dB	
Total Average Launch Power	P _T			8.3	dBm	
Average launch power, each lane	P _{out}	-7		2.0	dBm	
Optical Modulation Amplitude, each lane	P _{oma}	-4		3.5	dBm	
Extinction Ratio	ER	3.5			dB	
Average launch power of OFF transmitter, each lane	P _{off}			-30	dBm	
Relative Intensity Noise	R _{in}			-128	dB/Hz	12dB reflection
Transmitter Reflectance	R _T			-12	dB	
Data Input Swing Differential	V _{IN}	190		700	mV	
Input Differential Impedance	Z _{IN}	90	100	110	Ω	
Receiver						
Centre Wavelength	L0	1264.5	1271	1277.5	nm	
	L1	1284.5	1291	1297.5	nm	
	L2	1304.5	1311	1317.5	nm	
	L3	1324.5	1331	1337.5	nm	
Damage threshold	THd	3.3			dBm	

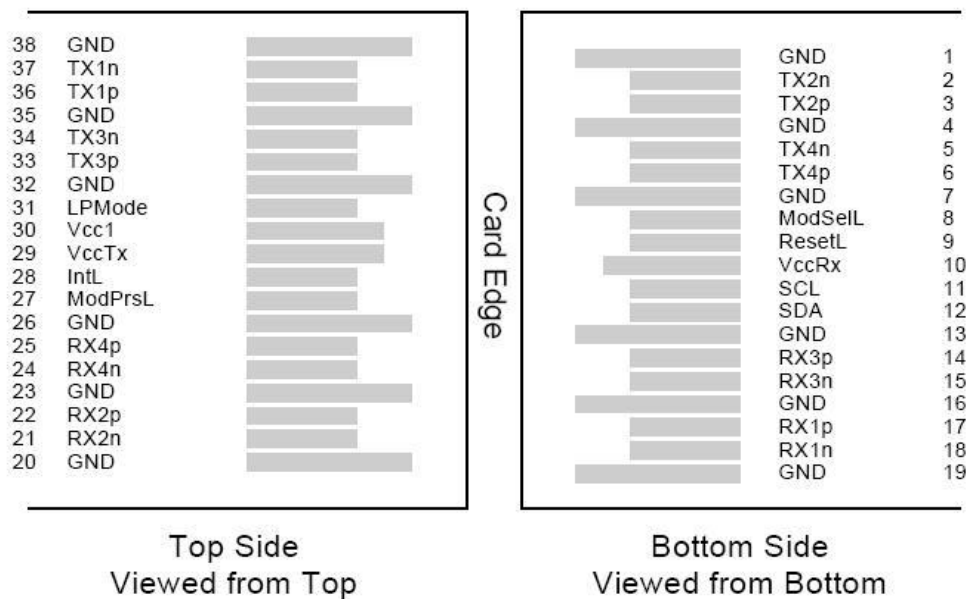
Average power at receiver input,each lane		-13.7		2.3	dBm	
Optical Modulation Amplitude(OMA),each lane				3.5	dBm	
Receiver sensitivity (OMA),each lane	SEN			-11.5	dBm	
Stressed Receiver Sensitivity (OMA), each Lane				-9.6	dBm	
LOS De-Assert	LOS _D			-15	dBm	
LOS Assert	LOS _A	-28			dBm	
LOS Hysteresis		0.5			dB	
Receive Electrical 3 dB upper Cutoff Frequency, each Lane	Fc			12.3	GHz	

Digital Diagnostic Memory Map

The transceivers provide serial ID memory contents and diagnostic information about the present operating conditions by the 2-wire serial interface (SCL, SDA). The digital diagnostic memory map specific data field defines as following.



Pin Descriptions



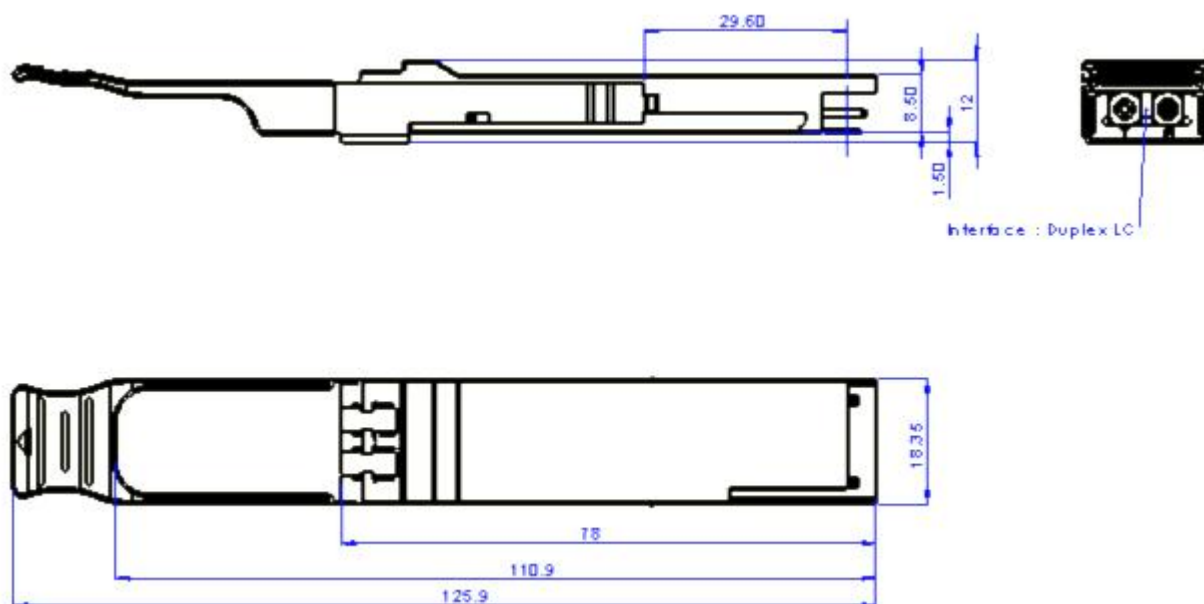
PIN	Logic	Symbol	Name/Description	Note
1		GND	Ground	1
2	CML-I	Tx2n	Transmitter Inverted Data Input	
3	CML-I	Tx2p	Transmitter Non-Inverted Data output	
4		GND	Ground	1
5	CML-I	Tx4n	Transmitter Inverted Data Input	
6	CML-I	Tx4p	Transmitter Non-Inverted Data output	
7		GND	Ground	1
8	LVTLL-I	ModSelL	Module Select	
9	LVTLL-I	ResetL	Module Reset	
10		VccRx	+ 3.3V Power Supply Receiver	2
11	LVC MOS-I/O	SCL	2-Wire Serial Interface Clock	
12	LVC MOS-I/O	SDA	2-Wire Serial Interface Data	
13		GND	Ground	
14	CML-O	Rx3p	Receiver Non-Inverted Data Output	
15	CML-O	Rx3n	Receiver Inverted Data Output	
16		GND	Ground	1
17	CML-O	Rx1p	Receiver Non-Inverted Data Output	
18	CML-O	Rx1n	Receiver Inverted Data Output	
19		GND	Ground	1
20		GND	Ground	1
21	CML-O	Rx2n	Receiver Inverted Data Output	
22	CML-O	Rx2p	Receiver Non-Inverted Data Output	
23		GND	Ground	1
24	CML-O	Rx4n	Receiver Inverted Data Output	1

25	CML-O	Rx4p	Receiver Non-Inverted Data Output	
26		GND	Ground	1
27	LVTTL-O	ModPrsL	Module Present	
28	LVTTL-O	IntL	Interrupt	
29		VccTx	+3.3 V Power Supply transmitter	2
30		Vcc1	+3.3 V Power Supply	2
31	LVTTL-I	LPMode	Low Power Mode	
32		GND	Ground	1
33	CML-I	Tx3p	Transmitter Non-Inverted Data Input	
34	CML-I	Tx3n	Transmitter Inverted Data Output	
35		GND	Ground	1
36	CML-I	Tx1p	Transmitter Non-Inverted Data Input	
37	CML-I	Tx1n	Transmitter Inverted Data Output	
38		GND	Ground	1

Notes:

1. GND is the symbol for signal and supply (power) common for QSFP modules. All are common within the QSFP transceiver and all transceiver 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 receiver and transmitter 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 QSFP transceiver module in any combination. The connector pins are each rated for a maximum current of 500mA.

Mechanical Dimensions



Ordering information

Part number	Description
NT-QSF40G-LR4	40GBASE-LR4 QSFP+ Transceiver, SMF, CWDM 1271~1331nm, 10km, LC, DDM, 0°C~+70°C

Warnings

Process plug

The transceiver optics is supplied with a dust cover. This plug protects the transceiver optics during standard manufacturing processes by preventing contamination from air borne particles. It is recommended that the dust cover remain in the transceiver whenever an optical fiber connector is not inserted.

Handling Precautions

The transceiver optics is susceptible to damage as a result of electrostatic discharge (ESD). A static free environment is highly recommended. Follow guidelines according to proper ESD procedures.

Laser Safety

The transceiver optics is a Class 1 laser product per international standard IEC 60825-1. Radiation emitted by laser devices can be dangerous to human eyes. Avoid eye exposure to direct or indirect radiation.

Standards

Netiks optical transceivers comply with the requirements set out in the Council Directive relating to Electromagnetic Compatibility Directive on (2014/30/EU). For the evaluation regarding the EMC, the following standards were applied:

EN 55032 (2012+AC: 2013)

EN 61000-3-2 (2014)

EN 61000-3-3 (2013)

EN 55024 (2010)

For more product information, visit us on the web at www.netiks.rs



Copyright © 2021 Netiks. All rights reserved. NT-QSFP and Netiks logo are registered trademarks of Netiks Co., Ltd. All other brands, product names, or trademarks mentioned are the property of their respective owners. Specifications and product availability are subject to change without notice. Netiks assumes no responsibility for inaccuracies contained herein.

