3FE73402AC-OPC

Alcatel-Lucent Nokia® 3FE73402AC Compatible TAA 100GBase-4WDM-40 QSFP28 Transceiver (SMF, 1295nm to 1309nm, 40km, LC, DOM, -40 to 85C)

Features

- QSFP28 MSA compliant
- Supports 103Gbps
- Single 3.3V Power Supply and Power dissipation < 5W
- Up to 40km over SMF with FEC on host
- Operating case temperature: -40C to 85C
- Four 25Gbps Cooled DFB-based LAN-WDM lasers on transmitter side
- APD and TIA array on the receiver side
- 4x25G electrical interface
- Duplex LC receptacles
- I2C interface with integrated Digital Diagnostic Monitoring
- RoHS compliant

Applications:

- 100GBase Ethernet

Product Description

This Alcatel-Lucent Nokia® 3FE73402AC compatible QSFP28 transceiver provides 100GBase-4WDM-40 throughput up to 40km over single-mode fiber (SMF) using a wavelength of 1295nm to 1309nm via an LC connector. It is capable of withstanding rugged environments and can operate at temperatures between -40 and 85C. Our transceiver is built to meet or exceed OEM specifications and is guaranteed to be 100% compatible with Alcatel-Lucent Nokia®. It has been programmed, uniquely serialized, and tested for data-traffic and application to ensure that it will initialize and perform identically. All of our transceivers comply with Multi-Source Agreement (MSA) standards to provide seamless network integration. Additional product features include Digital Optical Monitoring (DOM) support which allows 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.

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Maximum Supply Voltage	Vcc	-0.5	3.6	V
Storage Temperature	TS	-40	85	°C
Operating Case Temperature	Tc	-40	85	°C
Operating Relative Humidity	RH	5	85	%

Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Power Supply Voltage	Vcc	3.135	3.3	3.465	V	
Power Dissipation	PD			5	W	
Transmitter						
Differential data input swing per lane				900	mv_{p-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	mv_{p-p}	
Output Impedance (Differential)	Zout			10	%	
Eye width		0.57			UI	
Eye height differential		228			mv	
Vertical eye closure				5.5	dB	

Optical Characteristics

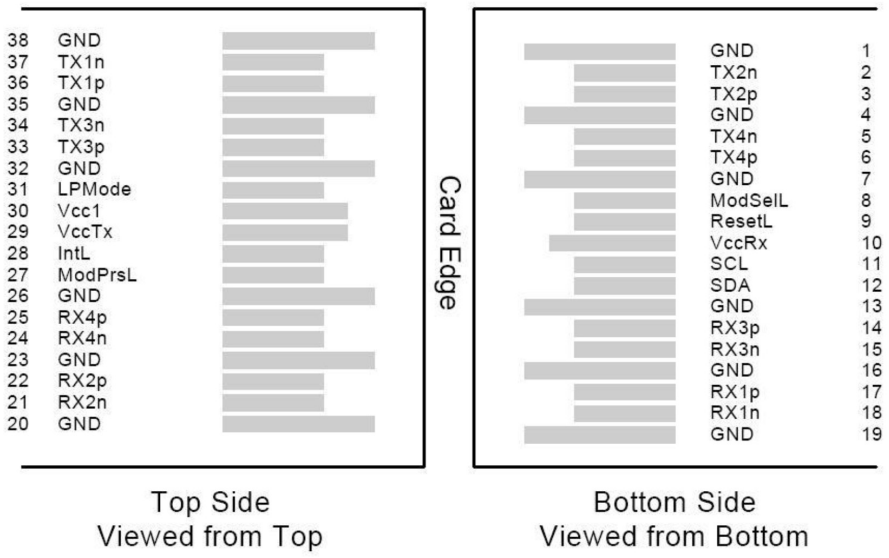
Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter						
Signaling Speed per Lane	BR_{AVE}		25.78		Gbps	
Data Rate Variation		-100		+100	ppm	
Lane_0 Center Wavelength	λ_{C0}	1294.53	1295.56	1296.59	nm	
Lane_1 Center Wavelength	λ_{C1}	1299.02	1300.05	1301.09	nm	
Lane_2 Center Wavelength	λ_{C2}	1303.54	1304.58	1305.63	nm	
Lane_3 Center Wavelength	λ_{C3}	1308.09	1309.14	1310.19	nm	
Total Average Launch Power	PT			12.5	dBm	
Average Launch Power per Lane	Peach	-2.5		6.5	dBm	1
Optical Modulation Amplitude (OMA) each Lane (max)	OMAmax			6.5	dBm	
Optical Modulation Amplitude (OMA), each lane (min)	OMAmin	0.5			dBm	2
Launch power in OMA minus TDP, each lane (min)	OMA-TDP	-0.5			dBm	
Average launch Power of OFF Transmitter per Lane				-30	dBm	
Side-mode suppression ratio	SMSRmin	30			dB	
Difference in Launch Power Between Any Two Lanes (OMA)				4	dB	
Optical Return Loss Tolerance		20			dB	
Transmitter Reflectance				-26	dB	3
Extinction Ratio	ER	4.5			dB	4
Transmitter Eye Mask Definition {X1, X2, X3, Y1, Y2, Y3}		{0.25, 0.4, 0.45, 0.25, 0.28, 0.4}				4
Receiver						
Signaling Speed per Lane	BR_{AVE}		25.78		Gbps	
Data Rate Variation		-100		+100	ppm	
Receiver Overload per Lane	Psat	-3			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	-20.5		-3.5	dBm	5
Damage threshold per lane (min)	Pdamage			-2.5	dBm	6
Receive Sensitivity in (OMA) per Lane	Rxsens			-18.5	dBm	7
Stressed Receiver Sensitivity (OMA) per Lane	RX_{SRS}			-16	dBm	8
Optical Return Loss	ORL			-26	dB	
LOS Assert	LOSA	-30			dBm	

LOS De-Assert	LOSD			-21	dBm	
LOS Hysteresis		0.5			dB	
Conditions of Receiver Sensitivity Test						
Vertical Eye Closure Penalty per lane	2.5				dB	9
Stressed Eye J2 Jitter per lane	0.33				UI	9
Stressed Eye J4 Jitter per lane	0.48				UI	9
SRS eye mask definition {X1, X2, X3, Y1, Y2, Y3}	{0.39, 0.5, 0.5, 0.39, 0.39, 0.4}					9

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. Even if the TDP < 1.0dB, the OMA (min) must exceed this value.
3. Transmitter reflectance is defined looking into the transmitter.
4. Eye mask hit ratio is 5E-5.
5. 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.
6. The receiver shall be able to tolerate, without damage, continuous exposure to an optical signal having this average power level.
7. Receiver sensitivity (OMA), each lane (max) at 5E-5 BER is a normative specification.
8. Measured with conformance test signal at TP3 for BER = $5*10^{-5}$.
9. Vertical eye closure penalty, stressed eye J2 Jitter, stressed eye J4 Jitter, and SRS eye mask definition are test conditions for measuring stressed receiver sensitivity. They are not characteristics of the receiver.

Electrical Pin-out Details



Pin Descriptions

Pin	Logic	Symbol	Name/Descriptions	Plug Sequence	Ref.
1		GND	Ground	1	1
2	CML-I	Tx2n	Transmitter Inverted Data Input	3	
3	CML-I	Tx2p	Transmitter Non-Inverted Data Input	3	
4		GND	Ground	1	1
5	CML-I	Tx4n	Transmitter Inverted Data Input	3	
6	CML-I	Tx4p	Transmitter Non-Inverted Data output	3	
7		GND	Ground	1	1
8	LVTTL-I	ModSelL	Module Select	3	
9	LVTTL-I	ResetL	Module Reset	3	
10		VccRx	+3.3V Power Supply Receiver	2	2
11	LVCMOS- I/O	SCL	2-Wire Serial Interface Clock	3	
12	LVCMOS- I/O	SDA	2-Wire Serial Interface Data	3	
13		GND	Ground	1	1
14	CML-O	Rx3p	Receiver Non-Inverted Data Output	3	
15	CML-O	Rx3n	Receiver Inverted Data Output	3	
16		GND	Ground	1	1
17	CML-O	Rx1p	Receiver Non-Inverted Data Output	3	
18	CML-O	Rx1n	Receiver Inverted Data Output	3	
19		GND	Ground	1	1
20		GND	Ground	1	1
21	CML-O	Rx2n	Receiver Inverted Data Output	3	
22	CML-O	Rx2p	Receiver Non-Inverted Data Output	3	
23		GND	Ground	1	1
24	CML-O	Rx4n	Receiver Inverted Data Output	3	
25	CML-O	Rx4p	Receiver Non-Inverted Data Output	3	
26		GND	Ground	1	1
27	LVTTL-O	ModPrsL	Module Present	3	
28	LVTTL-O	IntL	Interrupt	3	
29		VccTx	+3.3V Power Supply Transmitter	2	2
30		Vccl	+3.3V Power Supply	2	2
31	LVTTL-I	LPMode	Low Power Mode	3	
32		GND	Ground	1	1
33	CML-I	Tx3p	Transmitter Non-Inverted Data Input	3	
34	CML-I	Tx3n	Transmitter Inverted Data Input	3	
35		GND	Ground	1	1

36	CML-I	Tx1p	Transmitter Non-Inverted Data Input	3	
37	CML-I	Tx1n	Transmitter Inverted Data Input	3	
38		GND	Ground	1	1

Notes:

1. GND is the symbol for signal and supply (power) common for the QSFP28 module. 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 receiver and transmitter power supplies and shall be applied concurrently. Vcc Rx Vcc1 and Vcc Tx may be internally connected within the QSFP28 Module in any combination. The connector pins are each rated for a maximum current of 1000mA.

Mechanical Specifications