

Nemko Test Report:

10227978RUS1

Applicant:

Nokia Siemens Networks 6000 Connection Drive Irving, TX 75039 USA

Equipment Under Test: (E.U.T.)

FCC ID:

VBNFXCA-01

FXCA

In Accordance With:

CFR 47, Part 22, Subpart H and RSS 132, Issue 2 Cellular Base Stations

Tested By:

Nemko USA, Inc. 802 N. Kealy Lewisville, TX 75057-3136

TESTED BY:

APPROVED BY:

David Light, Senior Wireless Engineer

DATE: 21 August 2012

articl Michael (

DATE: 22 August 2012

Mike Cantwell

Number of Pages: 24

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Section 1. Summary of Test Results

Manufacturer: Nokia Siemens Networks

Model No.: FXCA

Serial No.: EA1148E2408

General: All measurements are traceable to national standards.

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with FCC Part 22, Subpart H and RSS 132, Issue 2.

	New Submission	\boxtimes	Production Unit
\triangleleft	Class II Permissive Change		Pre-Production Unit

Reason for Class II change: Adding CDMA modulation to previous filing.

THIS TEST REPORT RELATES ONLY TO THE ITEM(S) TESTED.

THE FOLLOWING DEVIATIONS FROM, ADDITIONS TO, OR EXCLUSIONS FROM THE TEST SPECIFICATIONS HAVE BEEN MADE. See "Summary of Test Data".

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Summary Of Test Data

NAME OF TEST	PART 22 PARA.	RSS 312 PARA.	SPEC.	RESULT
DE Deurse Outeut	NU.	NO.	4040 \\	Osmulias
RF Power Output	22.913(a)	4.4	1640 W	Complies
Occupied Bandwidth	22.917	4.5.1	Not defined	Complies
Spurious Emissions at Antenna	22.017	4.5.1	12 dDm	Complian
Terminals	22.917		-13 UDIII	Complies
Field Strength of Spurious	22.017	-	-13 dBm	NT
Emissions	22.917		E.R.P.	
Frequency Stability	22.355	4.3	1.5 ppm	NT
Reasiver Spurious Emissions		RSS-Gen	Para. 6.1	NT
Receiver Spurious Emissions	-	Issue 3	Table 1	INI

Footnotes:

The FXCA transceiver was tested to include CDMA modulation. Test marked NT were deemed unnecessary to show compliance to the Class II change requirements.

All previous testing to demonstrate full compliance to the requirements to FCC Part 22 and IC RSS-132 is included in Nemko test report 1026738RUS2 on file with the FCC and Industry Canada.

Section 2. General Equip	oment Specification
Supply Voltage Input:	-48 Vdc nominal
Frequency Band:	869 to 894 MHz
Type of Modulation and Designator:	CDMA 1M25F9W
Maximum No. of Carriers:	6
Output Impedance:	50 ohms
RF Output (Rated):	60 W +47.8 dBm
Band Selection:	Software Duplexer Fullband

System Description

The FXCA is an 850 MHz multistandard multicarrier radio module that consists of three individual transceivers designed to support GSM/EDGE, CDMA, WCDMA and LTE in dedicated or concurrent mode. Each module supports upto six GSM/EDGE carriers in GSM/EDGE dedicated mode, upto four WCDMA carriers in WCDMA dedicated mode and up to four 5 MHz LTE carriers in LTE dedicated mode with one radio branch. In concurrent mode, a combination of all three radio technologies is supported with a single radio branch. Each module is capable to serve three radio branches with multiradio multicarrier radios of up to 60 Watts output power per branch. The LTE modulation and concurrent mode operation were not tested under this effort.

Section 3. RF Power Output

NAME OF TEST: RF Power Output	PARA. NO.: 2.1046
	RSS 132 PARA. 4.4
TESTED BY: David Light	DATE: 21 August 2012

Test Results: Complies.

Measurement Data: Refer to table on next page.

Equipment Used: 1036-1082-1054-1597-1602

Measurement Uncertainty: +/- 1.7 dB

Temperature: 22 °C

Relative Humidity: 46 %

Test Data – RF Power Output

Modulation	Frequency	Measured Powe	Output er	Deviation from rated	
туре		(dBm)	(W)	(dB)	
CDMA	Low	47.74	59.4	0.04	
CDMA	Mid	47.89	61.5	0.11	
CDMA	High	47.76	59.7	0.02	

Supply voltage was varied +/- 15%. No fluctuation in output power resulted.

Section 4. Occupied Bandwidth

NAME OF TEST: Occupied Bandwidth	PARA. NO.: 2.1049
	RSS 132 PARA. 4.5.1
TESTED BY: David Light	DATE: 21 August 2012

Test Results:	Complies.
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Test Data:See attached plot(s).

Equipment Used: 1036-1082-1054-1597-1602

Measurement Uncertainty: +/- 1.6 dB

- Temperature: 22 °C
- **Relative Humidity:** 35 %

Test Data - Occupied Bandwidth

Low Channel



Test Data - Occupied Bandwidth

Mid Channel



Test Data – Occupied Bandwidth

High Channel



Section 5. Spurious Emissions at Antenna Terminals

NAME OF TEST: Spurious Emissions @ Antenna Terminals	PARA. NO.: 2.1051 RSS 132 PARA 4.5.1
TESTED BY: David Light	DATE: 21 August 2012

Test Results: Complies.

Test Data:Refer to plots below

Equipment Used: 1036-1082-1054-1597-1602

Measurement Uncertainty: +/- 1.7 dB

Temperature:22 °C

Relative Humidity: 46 %

Test Data – Spurious Emissions

Low Band Edge

Three 20 watt CDMA Channels





Low Channel

Three channels @ 20 watts each







Mid channel











Date: 21.AUG.2012 07:11:00

Section 6. Test Equipment List

Asset Tag	Description	Manufacturer	Model	Serial #	Last Cal	Next Cal
1036	Spectrum	Rohde &	FSEK30	830844/006	23-Dec-2011	23-Dec-2013
	Analyzer	Schwartz				
1054	Directional	Narda	3020A	34366	Verify before	
	Coupler, Dual				use	
1082	Cable, 2m	Astrolab	32027-2-		Verify before	
			29094-72TC		use	
1597	Attenuator,	Pasternak	PE7000-10		Verify before	
	10db				use	
1602	Attenuator,	Pasternak	PE-7000-10		Verify before	
	10db				use	

ANNEX A - TEST DETAILS

Nemko USA, Inc.

EQUIPMENT: FXCA

NAME OF TEST: RF Power Output

PARA. NO.: 2.1046

Minimum Standard: Para. No. 22.913(a). The maximum effective radiated power (ERP) of base transmitters and cellular repeaters must not exceed 500 watts.

Method Of Measurement:

Detachable Antenna:

The peak power at antenna terminals is measured using an in-line peak power meter. Power output is measured with the maximum rated input level.

Integral Antenna:

The antenna substitution method is used to determine the equivalent radiated power at spurious frequencies. The spurious emissions are measured at a distance of 3 meters. The EUT is then replaced with a reference substitution antenna with a known gain referenced to a dipole. This antenna is fed with a signal at the spurious frequency. The level of the signal is adjusted to repeat the previously measured level. The resulting erp is the signal level fed to the reference antenna corrected for gain referenced to a dipole.

Nemko USA, Inc.

EQUIPMENT: FXCA

NAME OF TEST: Occupied Bandwidth

PARA. NO.: 2.1049

Minimum Standard: Not defined

Method Of Measurement:

<u>CDMA</u>

Spectrum analyzer settings: RBW=VBW=30 kHz Span: 5 MHz Sweep: Auto

<u>GSM / EDGE</u>

RBW=VBW= 3 kHz Span: 1 MHz Sweep: Auto

<u>TDMA</u>

RBW=VBW= 1 kHz Span: 1 MHz Sweep: Auto

<u>W-CDMA</u>

RBW=VBW= 50 kHz Span: 10 MHz Sweep: Auto

Nemko USA, Inc.

EQUIPMENT: FXCA

NAME OF TEST: Spurious Emission at Antenna Terminals

PARA. NO.: 2.1051

Minimum Standard:

Para. No. 22.917(e). The mean power of emissions must be attenuated below the mean power of the unmodulated carrier on any frequency twice or more than twice the fundamental emission by at least 43 + 10 log P. This is equivalent to -13 dBm absolute power.

Method Of Measurement:

Method Of Measurement:

Spectrum analyzer settings:

<u>CDMA</u>

RBW: 1 MHz (> 1 MHz from Band Edge) RBW: 30 kHz (< 1MHz from Band Edge) VBW: ≥ RBW Sweep: Auto Video Avg: 6 Sweeps

GSM / EDGE

RBW: 1 MHz (> 1 MHz from Band Edge) RBW: 3 kHz (< 1 MHz from Band Edge) VBW: \geq RBW Sweep: Auto Video Avg: Disabled

<u>TDMA</u>

RBW: 1 MHz (> 1 MHz from Band Edge) RBW: 3 kHz (< 1 MHz from Band Edge) VBW: ≥ RBW Sweep: Auto Video Avg: Disabled

W-CDMA

RBW: 1 MHz (> 1 MHz from Band Edge) RBW: 100 kHz (< 1MHz from Band Edge) VBW: \geq RBW Sweep: Auto Video Avg: 6 Sweeps

ANNEX B - TEST DIAGRAMS

Nemko USA, Inc.	Hand RSS 132, Issue 2	
	CELLU	JLAR BASE STATIONS
EQUIPMENT: FXCA	PROJECT NO.:	10227978RUS1

Para. No. 2.985 - R.F. Power Output



Para. No. 2.989 - Occupied Bandwidth



Para. No. 2.991 Spurious Emissions at Antenna Terminals

