



Nemko Test Report: 5L0526RUS1

Applicant: Nokia, Inc.

Equipment Under Test: 6165i
(E.U.T.)

In Accordance With: **FCC Part 22, Subpart H**
Cellular Band Subscriber Services
and
FCC Part 24, Subpart E
Broadband PCS Subscriber Station

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

Authorized By: 
Tom Tidwell, Frontline Manager

Date: 21 October, 2005

NVLAP LAB CODE: 100426-0
Accreditation valid 1/1/05 to 12/31/05



Table of Contents

Section 1. Summary of Test Results3

Section 2. General Equipment Specification5

Section 3. Field Strength of Spurious7

Section 4. Test Equipment List13

ANNEX A - TEST METHODOLOGIES14

ANNEX B - TEST DIAGRAMS16

Section 1. Summary of Test Results

Manufacturer: Nokia, Inc.

Model No.: 6165i

Serial No.: 033/10858381

Type: RM-125

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 FCC Part 24, Subpart E.



New Submission



Production Unit



Class II Permissive Change



Pre-Production Unit

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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This report applies only to the items tested.

Summary Of Test Data**Part 22**

NAME OF TEST	PARA. NO.	RESULT
RF Power Output	22.913(a)(2)	Not tested
Audio Frequency Response	2.1047	Not tested
Audio Low Pass Filter Response	2.1047	Not tested
Modulation Limiting	2.1047	Not tested
Occupied Bandwidth	2.1049	Not tested
Spurious Emissions at Antenna Terminals	22.917(a)	Not tested
Field Strength of Spurious Emissions	22.917(a)	Complies
Frequency Stability	22.355	Not tested

Part 24

NAME OF TEST	PARA. NO.	RESULT
RF Power Output	24.232	Not tested
Occupied Bandwidth	24.238	Not tested
Spurious Emissions at Antenna Terminals	24.238(a)	Not tested
Field Strength of Spurious Emissions	24.238(a)	Complies
Frequency Stability	24.235	Not tested

Footnotes:

Tests not performed are being carried out by Nokia.

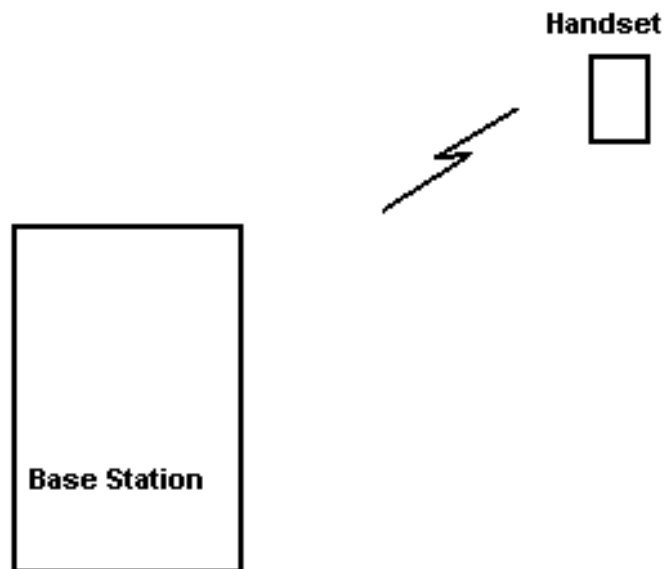
Section 2. General Equipment Specification

Frequency Bands:	824.04 to 848.97 MHz AMPS 824.70 to 847.31 CDMA 800 1851.25 to 1908.75 MHz PCS						
Type of Modulation and Designator:	<table><tr><td>CDMA (F9W)</td><td>AMPS (F8W)</td><td>NADC (DXW)</td></tr><tr><td>☒</td><td>☒</td><td>☐</td></tr></table>	CDMA (F9W)	AMPS (F8W)	NADC (DXW)	☒	☒	☐
CDMA (F9W)	AMPS (F8W)	NADC (DXW)					
☒	☒	☐					
Necessary Bandwidth:	40 kHz AMPS 1.25 MHz CDMA						
Emission designator(s):	40KF8W 1M25F9W						
Output Impedance:	50 ohms						

Operational Description

This handset is tri-mode device operating at 800 MHz AMPS, CDMA 800 and CDMA 1900 modes.

System Diagram



Section 3. Field Strength of Spurious

NAME OF TEST: Field Strength of Spurious(800 MHz band)	PARA. NO.: 22.917(a)
TESTED BY: David Light	DATE: 10 October 2005

Test Results: Complies.

800 MHz band: The worst-case emission is -24.7 dBm at 1673.04 MHz. This emission was detected with the phone operating in CDMA 800 mode at 836.52 MHz.

Test Data: See attached table.

Orientation of device under test: The device under test was tested on three orthogonal axis in order to determine worst-case orientation. The worst-case orientation was found to be in the upright position.

EQUIPMENT: 6165i

Test Report No.: 5L0526RUS1

Test Data - Radiated Emissions

Field Strength of Spurious Emissions										
Page <u>1</u> of <u>1</u>								Complete <u>X</u>		
Job No.: 5L0526		Date: 10/10/2005						Preliminary _____		
Specification: Part 22		Temperature(°C): <u>20</u>								
Tested By: David Light		Relative Humidity(%) <u>45</u>								
E.U.T.: Tri-mode handset										
Configuration: AMPS										
Sample No: 1										
Location: AC 3		RBW: 1 MHz		Measurement						
Detector Type: Peak		VBW: 1 MHz		Distance: <u>3</u> m						
Test Equipment Used										
Antenna: 993		Directional Coupler: _____								
Pre-Amp: 1016		Cable #1: 1484								
Filter: 1481		Cable #2: 1485								
Receiver: 1464		Cable #3: _____								
Attenuator #1: _____		Cable #4: _____								
Attenuator #2: _____		Mixer: _____								
Additional equipment used: 760 791 1311 HP8924 (Nokia)										
Measurement Uncertainty: +/-1.7 dB										
Frequency (MHz)	Meter Reading (dBm)	Correction Factor (dB)		Pre-Amp Gain (dB)	Substitution Antenna Gain (dBd)		ERP (dBm)	ERP (mW)	Polarity	Comments
										Tx at 836.52 MHz
1673.04	-63.0	31.1		0	6.2		-25.7	0.0027	V	
2509.56	-58.8	36.9		32.8	7.1		-47.6	0.0000	V	
5019.12	-61.8	42.0		32.6	8.5		-43.9	0.0000	V	
1673.04	-71.0	33.5		0	4.0		-33.5	0.0004	H	
2509.56	-59.3	33.6		32.8	4.9		-53.6	0.0000	H	
										Tx at 824.04 MHz
2472.12	-64.0	36.8		32.8	4.9		-55.1	0.0000	H	
1648.08	-61.6	31.1		0	4.0		-26.5	0.0022	V	
2472.12	-59.3	34.9		32.8	4.9		-52.3	0.0000	V	
										Tx at 848.97 MHz
1697.94	-64.9	31.1		0	4.0		-29.8	0.0010	V	
Notes: Spectrum searched from 30 MHz to 9 GHz. All emissions are reported.										

EQUIPMENT: 6165i

Test Report No.: 5L0526RUS1

Test Data - Radiated Emissions

Field Strength of Spurious Emissions										
Page <u>1</u> of <u>1</u>								Complete <u>X</u>		
Job No.: 5L0526		Date: 10/10/2005						Preliminary _____		
Specification: Part 22		Temperature(°C): <u>20</u>								
Tested By: David Light		Relative Humidity(%) <u>45</u>								
E.U.T.: Tri-mode handset										
Configuration: CDMA 800										
Sample No: 1										
Location: AC 3		RBW: 1 MHz		Measurement						
Detector Type: Peak		VBW: 1 MHz		Distance: <u>3</u> m						
Test Equipment Used										
Antenna: 993		Directional Coupler: _____								
Pre-Amp: 983		Cable #1: 1484								
Filter: 1481		Cable #2: 1485								
Receiver: 1464		Cable #3: _____								
Attenuator #1: _____		Cable #4: _____								
Attenuator #2: _____		Mixer: _____								
Additional equipment used: 760 791 1311 HP8924 (Nokia)										
Measurement Uncertainty: +/-1.7 dB										
Frequency (MHz)	Meter Reading (dBm)	Correction Factor (dB)		Pre-Amp Gain (dB)	Substitution Antenna Gain (dBd)		ERP (dBm)	ERP (mW)	Polarity	Comments
										Tx at 836.52 MHz
1673.04	-62.0	31.1		0	6.2		-24.7	0.0034	V	
2509.56	-59.0	36.9		32.8	7.1		-47.8	0.0000	V	
5019.12	-59.5	42.0		32.6	8.5		-41.6	0.0001	V	
										Tx at 824.70 MHz
1649.4	-64.0	31.1		0	4.0		-28.9	0.0013	V	Noise floor
2474.1	-58.5	34.9		32.8	4.9		-51.5	0.0000	V	
										Tx at 848.31 MHz
1696.62	-64.9	31.1		0	4.0		-29.8	0.0010	V	Noise floor
2544.62	-60.5	36.9		32.8	4.9		-51.5	0.0000	V	
4240.71	-62.0	45.8		32.3	5.7		-42.8	0.0001	V	
5088.81	-55.0	42.0		32.6	6.2		-39.4	0.0001	V	
5088.81	-62.0	38.1		32.6	6.2		-50.3	0.0000	H	
Notes: Spectrum searched from 30 MHz to 9 GHz. All emissions are reported.										

*EQUIPMENT: 6165i***Test Report No.: 5L0526RUS1**

NAME OF TEST: Field Strength of Spurious Emissions (PCS 1900 Band)	PARA. NO.: 24.238(a)
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TESTED BY: David Light

DATE: 14 October 2005

Test Results: Complies.

PCS 1900 Band: The worst-case emission is -29.3 dBm at 3702.5 MHz. This emission was detected with the phone operating in PCS 1900 mode at 1851.25 MHz.

Measurement Data: Refer to attached data

Orientation of device under test: The device under test was tested on three orthogonal axis in order to determine worst-case orientation. The worst-case orientation was found to be in the upright position.

EQUIPMENT: 6165i

Test Report No.: 5L0526RUS1

Test Data - Radiated Emissions

Field Strength of Spurious Emissions										
Page <u>1</u> of <u>1</u>						Complete <u>X</u>				
Job No.: 5L0526		Date: 10/14/2005				Preliminary _____				
Specification: Part 24		Temperature(°C): <u>22</u>								
Tested By: David Light		Relative Humidity(%) <u>50</u>								
E.U.T.: Tri-mode handset										
Configuration: Tx CDMA 1900										
Sample No: 1										
Location: AC 3		RBW: 1 MHz				Measurement				
Detector Type: Peak		VBW: 1 MHz				Distance: 3 m				
Test Equipment Used										
Antenna: 993		Directional Coupler: _____								
Pre-Amp: 1016		Cable #1: 1484								
Filter: 1482		Cable #2: 1485								
Receiver: 1036		Cable #3: _____								
Attenuator #1: _____		Cable #4: _____								
Attenuator #2: _____		Mixer: _____								
Additional equipment used: HP8924 (Nokia) 791 1311 760 HP89235B (Nokia)										
Measurement Uncertainty: +/-1.7 dB										
Frequency (MHz)	Meter Reading (dBm)	Correction Factor (dB)		Pre-Amp Gain (dB)	Substitution Antenna Gain (dBi)		EIRP (dBm)	EIRP (mW)	Polarity	Comments
										Tx at 1880 MHz
5640	-52.0	36.6		31.9	10.6		-36.7	0.0002	H	
7520	-63.0	40.4		32.6	11.2		-44.0	0.0000	H	
5640	-51.0	40.4		31.9	10.6		-31.9	0.0006	V	
										Tx at 1908.75 MHz
3817.5	-81.0	42.5		0	10.2		-28.4	0.0015	V	Noise floor
5726.25	-52.0	40.4		31.9	10.6		-32.9	0.0005	V	
5726.25	-55.7	36.6		31.9	10.6		-40.4	0.0001	H	
7635	-61.0	40.4		32.6	11.2		-42.0	0.0001	H	
										Tx at 1851.25
3702.5	-82.0	33.9		0	10.2		-37.9	0.0002	H	
5553.75	-58.2	36.6		31.9	10.6		-42.9	0.0001	H	
3702.5	-82.0	42.5		0	10.2		-29.3	0.0012	V	
5553.75	-51.0	40.4		31.9	10.6		-31.9	0.0006	V	
Notes: _____										

Photographs of Test Setup



Section 4. Test Equipment List

Nemko ID	Description	Manufacturer Model Number	Serial Number	Calibration Date	Calibration Due
760	Antenna biconical	Electro Metrics MFC-25	477	08/04/05	08/04/06
791	PREAMP, 25dB	ICC LNA25	398	11/12/04	11/12/05
1016	Pre-Amp	HEWLETT PACKARD 8449A	2749A00159	11/12/04	11/12/05
1484	Cable 2.0-18.0 Ghz	Storm PR90-010-072	N/A	CBU	N/A
1485	Cable 2.0-18.0 Ghz	Storm PR90-010-216	N/A	CBU	N/A
993	Horn antenna	A.H. Systems SAS-200/571	XXX	08/01/05	08/02/07
1036	SPECTRUM ANALYZER	ROHDE & SCHWARZ FSEK30	830844/006	03/22/04	03/23/06
1311	ANTENNA, LOG PERIODIC	EMCO 3146	1753	08/02/05	08/02/06
	CDMA Mobile Station Test Set	HP 8924C	US38283285	07/05/05	07/05/07
	PCS Interface	HP 83236B	3711J04715	07/05/05	07/05/07

ANNEX A - TEST METHODOLOGIES

NAME OF TEST: Field Strength of Spurious Radiation**PARA. NO.: 2.1053**

Minimum Standard: Para. No.24.238(a). On any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power by at least $43 + 10 \log (P)$ dB.
This level equates to -13 dBm absolute power.

Test Method: TIA/EIA-603-1992, Section 2.2.12

The antenna substitution method was used to determine the equivalent radiated power at spurious frequencies. The spurious emissions were measured at a distance of 3 meters. The EUT was then replaced with a reference substitution antenna with a known gain referenced to a dipole. This antenna was fed with a signal at the spurious frequency. The level of the signal was adjusted to repeat the previously measured level. The resulting eirp is the signal level fed to the reference antenna corrected for gain referenced to an isotropic radiator. ERP is the uncorrected value.

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ANNEX B - TEST DIAGRAMS

Para. No. 2.993 - Field Strength of Spurious Radiation

