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CERTIFICATE OF TEST
FCC Part 24 Supplement

Applicant Name:
Nokia Inc.
12278 Scripps Summit Drive
San Diego, CA 92131-3697
United States

Date of Testing:
June 23, 2006
Test Site/Location:
PCTEST Lab, Columbia, MD, USA
Test Report Serial No.:
0606160521-R2

FCC ID: **QMNRH-71**

APPLICANT: **NOKIA INC.**

Application Type:	Certification
FCC Classification:	Licensed Transmitter Held to Ear (PCE)
FCC Rule Part(s):	§24(E)
EUT Type:	Tri-Mode Dual-Band Analog/ PCS Phone
Model(s):	2125, 2125I, 2126, 2126I, 2127I, 2128I
Tx Frequency Range:	1851.25 - 1908.75 MHz (PCS CDMA)
Rx Frequency Range:	1931.25 – 1988.75 MHz (PCS CDMA)
Max. RF Output Power:	0.430 W EIRP PCS CDMA (26.3 dBm)
Emission Designator(s):	1M25F9W
Test Device Serial No.:	*identical prototype* [S/N: 03308975745]
HW/SW Version:	*HWID 4001 / SW R210_03w24_49_12.nep*
Class II Permissive Change:	Please see change document.
Original Grant Date:	June 11, 2005

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in §2.947.

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

*NOTE: This revised test report (S/N: 0606160521-R2) supersedes and replaces the previously issued test report on the same subject EUT for the same type of testing as indicated. Please discard or destroy the previously issued report (S/N: 0606160521/ -R1) and dispose of it accordingly.

PCTEST certifies that no party to this application has been denied the FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C. 862.

Randy Ortanez
President

2041.01

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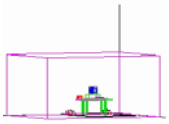
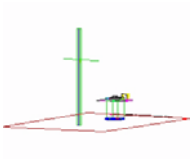
1.0 SCOPE



Measurement and determination of electromagnetic emissions (EME) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission.



§2.1033 General Information

Applicant Name:	Nokia Inc.
Address:	12278 Scripps Summit Drive San Diego, CA 92131-3697 United States

- FCC ID: QMNRH-71
- Quantity: Quantity production is planned
- Emission Designators: 1M25F9W (CDMA)
- Tx Freq. Range: 1851.25 - 1908.75 MHz (PCS CDMA)
- Rx Freq. Range: 1931.25 – 1988.75 MHz (PCS CDMA)
- Max. Power Rating: 0.430 W EIRP PCS CDMA (26.3 dBm)
- FCC Classification(s): PCS Licensed Portable Tx Held to Ear (PCE)
- Equipment (EUT) Type: Tri-Mode Dual-Band Analog/ PCS Phone
- Modulation(s): CDMA
- Frequency Tolerance: ±0.00025 % (2.5 ppm)
- FCC Rule Part(s): § 24(E)
- Dates of Tests: June 23, 2006
- Place of Tests: PCTEST Lab, Columbia, MD U.S.A.
- Test Report S/N: 0606160521-R2
- *Deviation from measurement procedure – None*

2.0 INTRODUCTION

2.1 Testing Facility

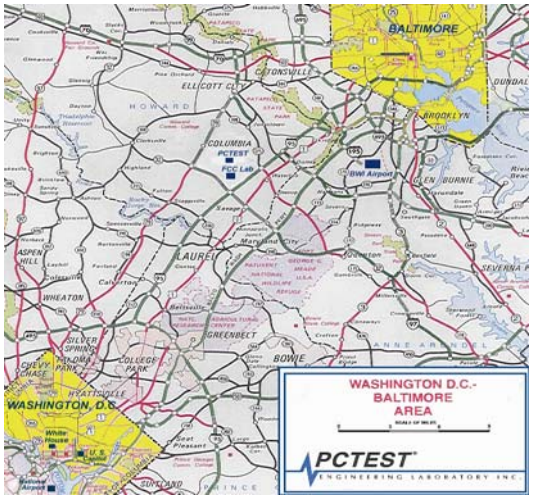


Figure 1. Map of the Greater Baltimore and Metropolitan Washington, D.C. area.

These measurement tests were conducted at PCTEST Engineering Laboratory, Inc. facility in New Concept Business Park, Guilford Industrial Park, Columbia, Maryland. The site address is 6660-B Dobbin Road, Columbia, MD 21045. The test site is one of the highest points in the Columbia area with an elevation of 390 feet above mean sea level. The site coordinates are 39 11'15" N latitude and 76 49'38" W longitude. The facility is 1.5 miles North of the FCC laboratory, and the ambient signal and ambient signal strength are approximately equal to those of the FCC laboratory. There are no FM or TV transmitters within 15 miles of the site. The detailed description of the measurement facility was found to be in compliance with the requirements of § 2.948 according to ANSI C63.4 on October 19, 1992.

2.2 Measurement Procedure

The radiated spurious measurements were made outdoors at a 3-meter test range (see Figure2). The equipment under test is placed on a wooden turntable 3-meters from the receive antenna. The receive antenna height and turntable rotations were adjusted for the highest reading on the receive spectrum analyzer. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This level is recorded. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic antenna are taken into consideration.

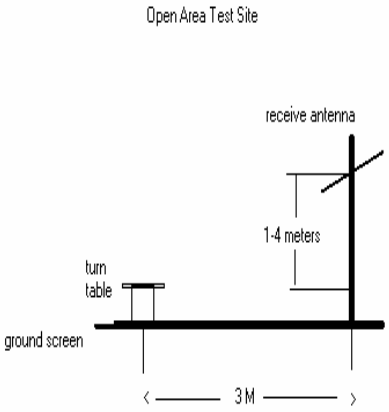


Figure 2. Diagram of 3-meter outdoor test range

3.0 INSERTS

Function of Active Devices (Confidential)

Block & Schematic Diagrams (Confidential)

Operating Instructions

Parts List & Tune-Up Procedure (Confidential)

Description of Freq. Stabilization Circuit (Confidential)

Description for Suppression of Spurious Radiation, for Limiting Modulation, and Harmonic Suppression Circuits (Confidential)

** These exhibits are not included.*

4.0 DESCRIPTION OF TESTS

4.1 Occupied Bandwidth Emission Limits

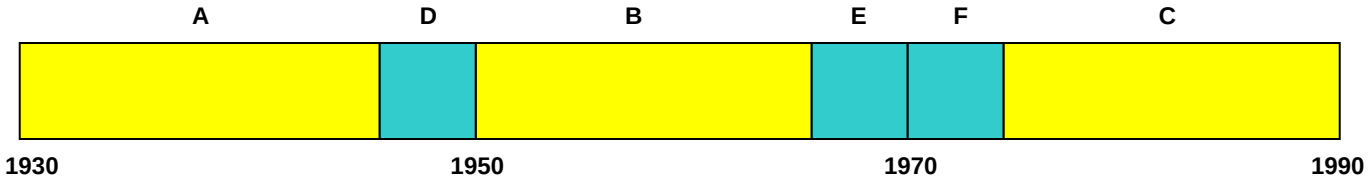
a. On any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least 43 + 10 log(P) dB.

b. Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emission are attenuated at least 26 dB below the transmitter power.

c. When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the licensee's frequency block edges, both upper and lower, as the design permits.

d. The measurement of emission power can be expressed in peak or average values, provided they are expressed in the same parameters as the transmitter power.

4.2 PCS - Base Frequency Blocks



BLOCK 1: 1930 – 1945 MHz (A)

BLOCK 2: 1945 – 1950 MHz (D)

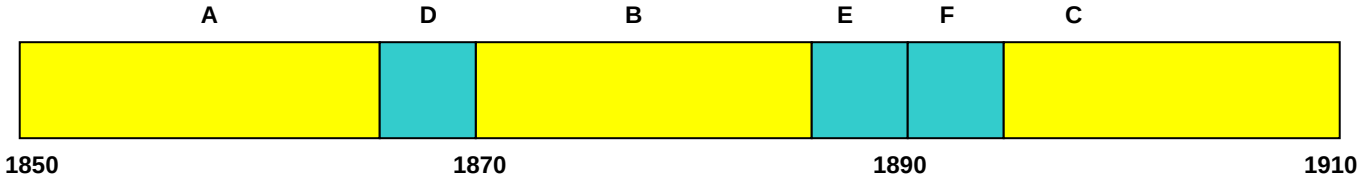
BLOCK 3: 1950 – 1965 MHz (B)

BLOCK 4: 1965 – 1970 MHz (E)

BLOCK 5: 1970 – 1975 MHz (F)

BLOCK 6: 1975 – 1990 MHz (C)

4.3 PCS - Mobile Frequency Blocks



BLOCK 1: 1850 – 1865 MHz (A)

BLOCK 2: 1865 – 1870 MHz (D)

BLOCK 3: 1870 – 1885 MHz (B)

BLOCK 4: 1885 – 1890 MHz (E)

BLOCK 5: 1890 – 1895 MHz (F)

BLOCK 6: 1895 – 1910 MHz (C)

4.4 Frequencies

At the input terminals of the spectrum analyzer, an isolator (RF pad) and a high-pass filter are connected between the test transceiver (for conducted tests) or the receive antenna (for radiated tests) and the analyzer. The high-pass filter (signals below 1.6 GHz) is to limit the fundamental frequency from interfering with the measurement of low-level spurious and harmonic emissions and to ensure that the preamplifier is not saturated.

4.5 Radiated Spurious and Harmonic Emissions

Radiation and harmonic emissions are measured outdoors at our 3-meter test range. The equipment under test is placed on a wooden turntable 3-meters from the receive antenna. The receive antenna height and turntable rotations were adjusted for the highest reading on the receive spectrum analyzer. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator with the level of the signal generator being adjusted to obtain the same receive spectrum analyzer reading. This

level is recorded. For readings above 1 GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration. This device was tested under all R.C.s and S.O.s and the worst case is reported with RC3/SO55, with "All Up" power control bits.

5.0 CONDUCTED OUTPUT POWER

This device was tested under all R.C.s and S.O.s and the worst case is reported with RC3/SO55, with "All Up" power control bits.

5.1 SAR Measurement Conditions for CDMA2000

The following procedures were followed according to FCC "SAR Measurement Procedures for 3G Devices", May 2006.

5.2 Output Power Verification

See 3GPP2 C.S0011/TIA-98-E as recommended by "SAR Measurement Procedures for 3G Devices", May 2006.

1. If the mobile station (MS) supports Reverse TCH RC 1 and Forward TCH RC 1, set up a call using Fundamental Channel Test Mode 1 (RC=1/1) with 9600 bps data rate only.
2. Under RC1, C.S0011 Table 4.4.5.2-1, Table 5-1 parameters were applied.
3. If the MS supports the RC 3 Reverse FCH, RC3 Reverse SCH0 and demodulation of RC 3,4, or 5, set up a call using Supplemental Channel Test Mode 3 (RC 3/3) with 9600 bps Fundamental Channel and 9600 bps SCH0 data rate.
4. Under RC3, C.S0011 Table 4.4.5.2-2, Table 5-2 was applied.
5. FCHs were configured at full rate for maximum SAR with "All Up" power control bits.

Parameter	Units	Value
$\hat{I}_{or}$	dBm/1.23 MHz	-104
$\frac{\text{Pilot } E_c}{I_{or}}$	dB	-7
$\frac{\text{Traffic } E_c}{I_{or}}$	dB	-7.4

Table 5-1
Parameters for Max. Power for RC1

Parameter	Units	Value
$\hat{I}_{or}$	dBm/1.23 MHz	-86
$\frac{\text{Pilot } E_c}{I_{or}}$	dB	-7
$\frac{\text{Traffic } E_c}{I_{or}}$	dB	-7.4

Table 5-2
Parameters for Max. Power for RC3

Table 5-3
Maximum Power Output Table for 2125, 2125I, 2126, 2126I, 2127I, 2128I

Channel	SO2 RC 1/1	SO2 RC 3/3	SO55 RC 1/1	SO55 RC 3/3	TDSO SO32 RC 3/3
	dBm	dBm	dBm	dBm	dBm
25	23.51	23.52	23.51	23.53	23.46
600	23.24	23.31	23.26	23.43	23.24
1175	22.94	22.9	22.88	23.02	22.86

6.0 EQUIVALENT ISOTROPIC RADIATED POWER

6.1 Equivalent Isotropic Radiated Power Output Data

Radiated measurements at 3 meters

Supply Voltage: 3.7 VDC

Modulation: PCS CDMA

FREQ. (MHz)	REF. LEVEL (dBm)	POL (H/V)	Azimuth (o angle)	EIRP (dBm)	EIRP (W)	Battery
1851.25	-17.200	H	180	25.881	0.388	Standard
1880.00	-17.500	H	180	25.751	0.377	Standard
1908.75	-17.100	H	180	26.321	0.430	Standard

Note: Standard batteries are the only option for this phone

NOTES:

Equivalent Isotropic Radiated Power Measurements by Substitution Method according to ANSI/TIA/EIA-603-A-2001, Aug. 15, 2001:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz. A Horn antenna was substituted in place of the EUT. This Horn antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. The conducted power at the terminals of the Horn antenna is measured. The difference between the gain of the horn and an isotropic antenna is taken into consideration and the EIRP is recorded.

This device was tested under all R.C.s and S.O.s and the worst case is reported with RC3/SO55, with "All Up" power control bits.

7.0 RADIATED MEASUREMENTS

7.1 PCS CDMA Radiated Measurements

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY: 1851.25 MHz
CHANNEL: 0025 (Low)
MEASURED OUTPUT POWER: 26.321 dBm = 0.430 W
MODULATION SIGNAL: CDMA (Internal)
DISTANCE: 3 meters
LIMIT: 43 + 10 $\log_{10}$ (W) = 39.33 dBc

FREQ. (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	CORRECT GENERATOR LEVEL (dBm)	POL (H/V)	(dBc)
3702.50	-50.48	8.70	-41.78	H	68.1
5553.75	-61.08	9.70	-51.38	H	77.7
7405.00	-55.41	9.90	-45.51	H	71.8
9256.25	-71.03	11.40	-59.63	H	86.0
11107.50	-77.33	12.10	-65.23	H	91.6

NOTES:

Radiated Spurious Emission Measurements by Substitution Method according to ANSI/TIA/EIA-603-A-2001, Aug. 15, 2001:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This spurious level is recorded. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

This device was tested under all R.C.s and S.O.s and the worst case is reported with RC3/SO55, with "All Up" power control bits.

7.2 PCS CDMA Radiated Measurements (Cont'd)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:	1880.00	MHz		
CHANNEL:	0600 (Mid)			
MEASURED OUTPUT POWER:	26.321	dBm	=	0.430 W
MODULATION SIGNAL:	CDMA (Internal)			
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W) =	39.33	dBc	

FREQ. (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	CORRECT GENERATOR LEVEL (dBm)	POL (H/V)	(dBc)
3760.00	-46.83	8.70	-38.13	H	64.5
5640.00	-55.03	9.70	-45.33	H	71.7
7520.00	-54.98	9.90	-45.08	H	71.4
9400.00	-70.83	11.40	-59.43	H	85.8
11280.00	-77.13	12.10	-65.03	H	91.4

NOTES:

Radiated Spurious Emission Measurements by Substitution Method according to ANSI/TIA/EIA-603-A-2001, Aug. 15, 2001:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This spurious level is recorded. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

This device was tested under all R.C.s and S.O.s and the worst case is reported with RC3/SO55, with "All Up" power control bits.

7.3 PCS CDMA Radiated Measurements (Cont'd)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY: 1908.75 MHz
CHANNEL: 1175 (High)
MEASURED OUTPUT POWER: 26.321 dBm = 0.430 W
MODULATION SIGNAL: CDMA (Internal)
DISTANCE: 3 meters
LIMIT: 43 + 10 $\log_{10}$ (W) = 39.33 dBc

FREQ. (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	CORRECT GENERATOR LEVEL (dBm)	POL (H/V)	(dBc)
3817.50	-46.58	8.70	-37.88	H	64.2
5726.25	-60.93	9.70	-51.23	H	77.6
7635.00	-55.63	9.90	-45.73	H	72.1
9543.75	-70.93	11.40	-59.53	H	85.9
11452.50	-76.93	12.10	-64.83	H	91.2

NOTES:

Radiated Spurious Emission Measurements by Substitution Method according to ANSI/TIA/EIA-603-A-2001, Aug. 15, 2001:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This spurious level is recorded. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

This device was tested under all R.C.s and S.O.s and the worst case is reported with RC3/SO55, with "All Up" power control bits.

8.0 PLOT(S) OF EMISSIONS

(SEE ATTACHMENT A)

9.0 TEST EQUIPMENT

TYPE	MODEL	CAL DUE DATE	S/N
Signal Generator*	Rohde & Schwarz (0.1-1000MHz)	9/11/2006	894215/012
Ailtech/Eaton Receiver	NM 37/57A-SL (30-1000MHz)	4/12/2007	0792-03271
Ailtech/Eaton Receiver	NM 37/57A (30-1000MHz)	3/11/2007	0805-03334
Ailtech/Eaton Receiver	NM 17/27A (0.1-32MHz)	9/17/2006	0608-03241
Ailtech/Eaton Adapter	CCA-7 CISPR/ANSI QP Adapter	3/11/2007	0194-04082
Harmonic/Flicker	Test System HP 6841A (IEC 555-2/3)	2/11/2007	3531A00115/ PCT468
Harmonic/Flicker	Test System HP 6841A (IEC 555-2/3)	2/11/2007	3531A00115/ PCT468
Shielded Screen Room	RF Lindgren Model 26-2/2-0	N/A	6710 (PCT270)
Shielded Semi-Anechoic Chamber	Ray Proof Model S81	4/17/2007	R2437 (PCT278)
Quasi-Peak Adapter	HP 85650A	8/9/2006	2043A00301
Microwave Spectrum Analyzer	HP 8566B (100Hz-22GHz)	8/15/2006	3638A08713
Microwave Spectrum Analyzer	HP 8566B (100Hz-22GHz)	4/17/2007	2542A11898
Spectrum Analyzer/Tracking Gen.	HP 8591A (100Hz-1.8GHz)	9/12/2006	3144A02458
Signal Generator	HP 8648D (9kHz-4GHz)	5/1/2007	3613A00315
Spectrum Analyzer	HP 8594A	11/2/2006	3051A00187
Spectrum Analyzer (2)	HP 8591A	10/15/2006	3034A01395,
Audio Analyzer	HP 8903B		3011A09025
Modulation Analyzer	HP 8901A		2432A03467
Power Meter	HP 437B		3125U24437
Power Sensor	HP 8482H (30mW-3W)		2237A02084
Broadband Amplifier (2)	HP 8447D		1145A00470,
Broadband Amplifier	HP 8447F		2443A03784
Network Analyzer	HP 8753E (30kHz-3GHz)		JP38020182
Attenuator	HP 8495A (0-70dB) DC-4GHz		
Horn Antenna	EMCO Model 3115 (1-18GHz)		9704-5182
Horn Antenna	EMCO Model 3115 (1-18GHz)		9205-3874
Horn Antenna	EMCO Model 3116 (18-40GHz)		9203-2178
Biconical Antenna (4)	Eaton 94455/Eaton 94455-1/Singer 94455-1/Compliance		1295, 1332, 0355
Log-Spiral Antenna (3)	Ailtech/Eaton 93490-1		0608, 1103, 1104
Roberts Dipoles	Compliance Design (1 set)		
Ailtech Dipoles	DM-105A (1 set)		33448-111
EMCO LISN (6)	3816/2		1079
Microwave Preamplifier 40dB	Gain HP 83017A (0.5-26.5GHz)		3123A00181
Microwave Cables	MicroCoax (1.0-26.5GHz)		
Gigatronics Universal Power Meter	8657A		1835256
Gigatronics Power Sensor	80701A (0.05-18GHz)		1833460
Amplifier Research	5S1G4 (5W, 800MHz-4.2GHz)		22322
Microwave Survey Meter	Holaday Model 1501 (2.450GHz)		80931
Digital Thermometer	Extech Instruments 421305		426966
Bi-Directional Coax Coupler	Narda 3020A (50-1000MHz)		
Enviromental Chamber	Associated Systems Model 1025 (Temperature/Humidity)		PCT285

10.0 SAMPLE CALCULATIONS

Spurious Radiated Emission - PCS Band

Example: Channel 25 PCS Mode 2nd Harmonic (3702.50 MHz)

The receive analyzer reading at 3 meters with the EUT on the turntable was –81.0 dBm. The gain of the substituted antenna is 8.1 dBi. The signal generator connected to the substituted antenna terminals is adjusted to produce a reading of –81.0 dBm on the receive analyzer. The loss of the cable between the signal generator and the terminals of the substituted antenna is 2.0 dB at 3702.50 MHz. So 6.1 dB is added to the signal generator reading of –30.9 dBm yielding –24.80 dBm. The fundamental EIRP was 25.501 dBm so this harmonic was 25.501 dBm – (-24.80) = 50.3 dBc.

11.0 CONCLUSION

The data collected shows that the NOKIA Tri-Mode Dual-Band Analog/ PCS Phone FCC ID: QMNRH-71 complies with all the requirements of Part 24 of the FCC rules.