

FCC Test Report

FCC Part 24 / RSS 133

FOR

800/1900 CDMA Handset

Model #: 6275i

Nokia, Inc. 12278 Scripps Summit Drive San Diego, CA 92131 U.S.A

FCC ID: QMNRM-154 IC-ID: 661X-RM154

TEST REPORT #: EMC_NOKI1_006_07002_RM_154_FCC24 DATE: April 30th, 2007









FCC listed# 101450

IC recognized # 3925

CETECOM Inc.

411 Dixon Landing Road • Milpitas, CA 95035 • U.S.A.

Phone: +1 (408) 586 6200 • Fax: +1 (408) 586 6299 • E-mail: info@cetecomusa.com • http://www.cetecom.com CETECOM Inc. is a Delaware Corporation with Corporation number: 2113686

Board of Directors: Dr. Harald Ansorge, Dr. Klaus Matkey, Hans Peter May

4/30/2007

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1 Assessment

The following is in compliance with the applicable criteria specified in FCC rules Parts 2 and 24 of Title 47 of the Code of Federal Regulations and in compliance with the applicable criteria specified in Industry Canada rules RSS133.

Company	Description	Model #	
Nokia	800/1900 CDMA Handset	6275i	

This report is reviewed by:	
Peter Mu	
Project Engineer 4/30/2007	
This report is prepared by:	
Pete Krebill Project Engineer 4/30/2007	

The test results of this test report relate exclusively to the test item specified in Identification of the Equipment under Test. The CETECOM Inc. USA does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of the CETECOM Inc USA.

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2 Administrative Data

2.1 Identification of the Testing Laboratory Issuing the EMC Test Report

Company Name:	CETECOM Inc.
Department:	EMC
Address:	411 Dixon Landing Road Milpitas, CA 95035 U.S.A.
Telephone:	+1 (408) 586 6200
Fax:	+1 (408) 586 6299
Responsible Test Lab Manager:	Lothar Schmidt
Responsible Project Leader:	Pete Krebill
Date of test:	3/22/2007 to 4/11/2007

2.2 Identification of the Client

Applicant's Name:	Nokia, Inc.	
Street Address:	12278 Scripps Summit Drive	
City/Zip Code	San Diego, CA 92131	
Country	USA	
Contact Person:	Mary Washington-Mhlanga	
Phone No.	858-831-5000	
Fax:	858-831-6500	
e-mail:	Mary.Washington-Mhlanga@nokia.com	

2.3 Identification of the Manufacturer

Manufacturer's Name:	Same as applicant
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3 Equipment under Test (EUT)

3.1 Specification of the Equipment under Test

Marketing Name:	RM-154	
Description:	800/1900 CDMA Handset	
Model No:	6275i	
Hardware Revision :	6000	
Software Revision :	BL100_05w21_58_12.nbr	
ESN:	037/07660400 & 037/07660383	
FCC ID:	QMNRM-154	
IC ID:	661X-RM154	
Eraguanay Danga:	824.7 MHz – 848.31 MHz for CDMA Cellular	
Frequency Range:	1851.25 MHz – 1908.75 MHz for CDMA PCS	
Type(s) of Modulation:	CDMA	
Number of Channels:	832 – Cellular	
Number of Channels.	1200 - PCS	
Antenna Type:	Patch Antenna	

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4 Subject of Investigation

All testing was performed on the Nokia 6275i referred to as EUT hereafter. The EUT was maximized in the X,Y & Z positions, all data in this report shows the worst case between horizontal and vertical polarization for above 1GHz.

The objective of the measurements done by Cetecom Inc. was to measure the performance of the EUT as specified by requirements listed in FCC rules Parts 2 and 24 of Title 47 of the Code of Federal Regulations and Industry Canada rules RSS133. The maximization of portable equipment is conducted in accordance with ANSI C63.4.

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5 **Measurements**

5.1 **Environment:**

Test Report #:

Temperature: $20.1 \, ^{\circ}\text{C} - 23.5 \, ^{\circ}\text{C}$ Humidity: $45\% \, _{\odot} \, 55 \, \%$ 4/30/2007

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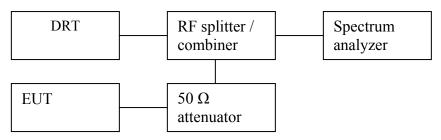
5.2 Occupied Bandwidth/Emission Bandwidth

5.2.1 FCC 2.1049 Measurements required: Occupied bandwidth

The occupied bandwidth, that is the frequency bandwidth such that below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured under the following conditions as applicable.

(h) Transmitters employing digital modulation techniques-when modulated by an input signal such that its amplitude and symbol rate represent the maximum rated conditions under which the equipment will be operated.

5.2.2 Occupied / emission bandwidth measurement procedure:



- 1. Connect the equipment as shown in the above diagram.
- 2. Adjust the settings of the Digital Radiocommunication Tester (DRT) to set the EUT to its maximum power at the required channel.
- 3. Set the spectrum analyzer to measure the 99% (-20 dB) occupied bandwidth. Record the value
- 4. Set the spectrum analyzer to measure the 99.75% (-26 dB) emission bandwidth. Record the value.
- 5. Measurements are to be performed with the EUT set to the low, middle and high channel of each frequency band.

5.2.3 Occupied / Emission bandwidth results 1900 MHz band:

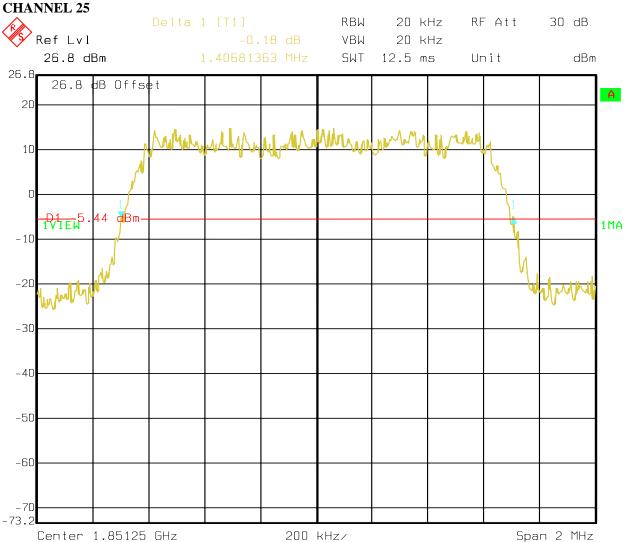
Frequency	Occupied B/W -20 dB (MHz)	Emission B/W -26 dB (MHz)
(MHz)		
1851.25	1.41	1.45
1880	1.39	1.42
1908.75	1.40	1.42

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20 dB Bandwidth (PCS)

Date of Report:



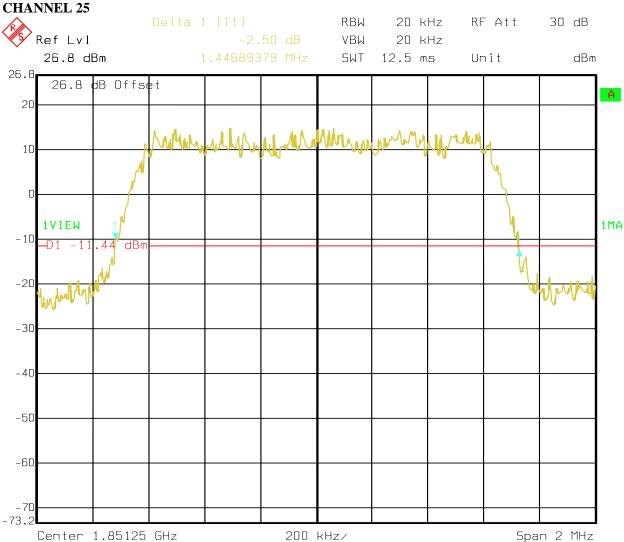
Date: 11.APR.2007 15:23:59

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26 dB Bandwidth (PCS)

Date of Report:



Date: 11.APR.2007 15:25:06

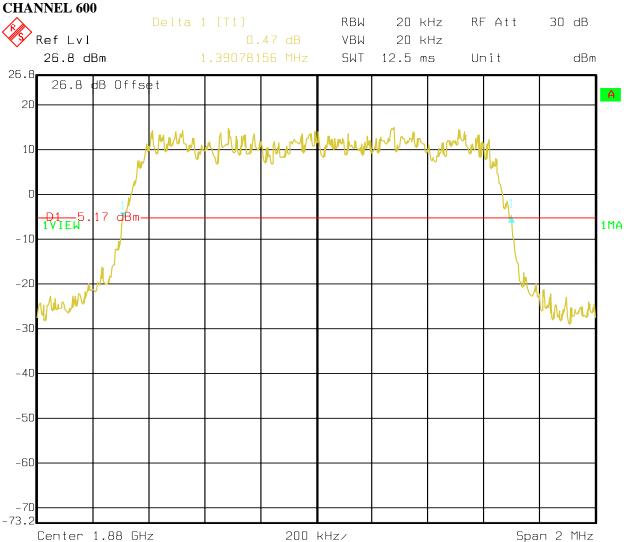
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20 dB Bandwidth (PCS)



Date: 11.APR.2007 15:22:25

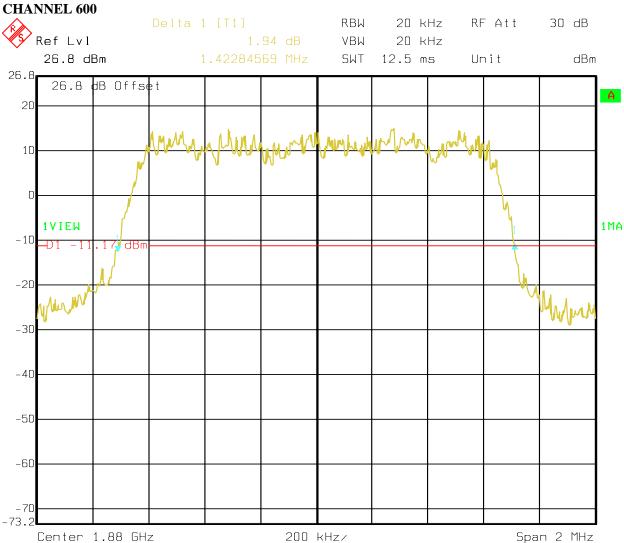
Test Report #:

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26 dB Bandwidth (PCS)



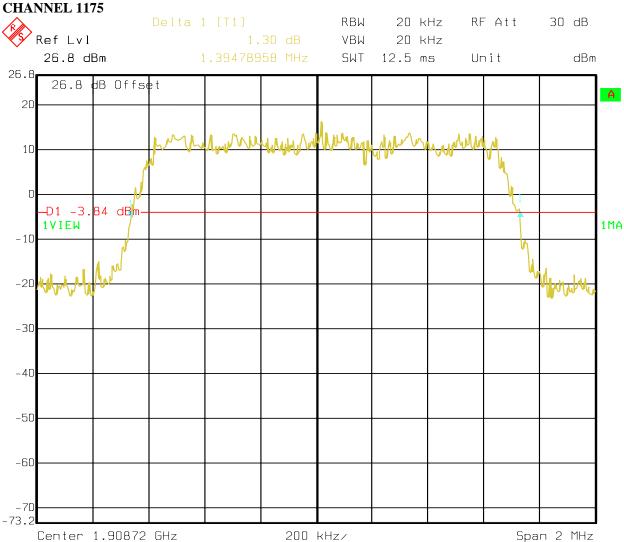
Date: 11.APR.2007 15:22:57

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20 dB Bandwidth (PCS)

Date of Report:



Date: 11.APR.2007 15:21:00

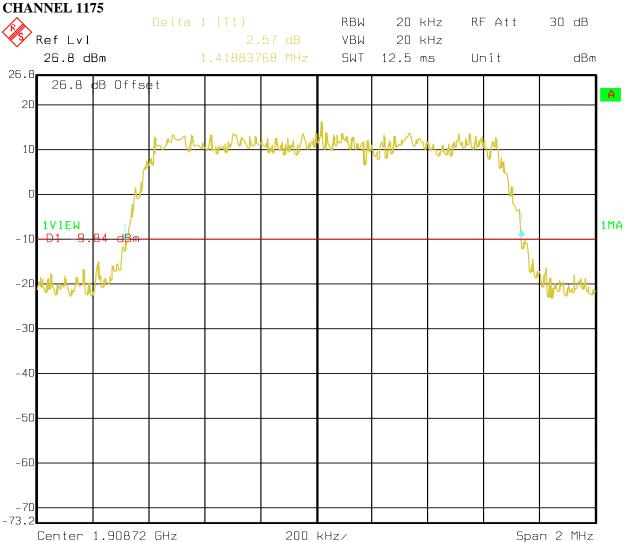
Test Report #:

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26 dB Bandwidth (PCS)



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5.3 Spurious Emissions Conducted

5.3.1 FCC 2.1051 Measurements required: Spurious emissions at antenna terminals.

The radio frequency voltage or power generated within the equipment and appearing on a spurious frequency shall be checked at the equipment output terminals when properly loaded with a suitable artificial antenna. Curves or equivalent data shall show the magnitude of each harmonic and other spurious emission that can be detected when the equipment is operated under the conditions specified in FCC 2.1049 as appropriate. The magnitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be specified.

5.3.2 Limits:

5.3.2.1 FCC 24.238 Emission limitations for Broadband PCS equipment.

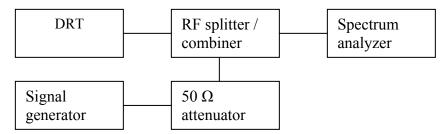
The rules in this section govern the spectral characteristics of emissions in the Broadband Personal Communications Service.

- (a) Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P) dB$.
- (b) Measurement procedure. 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. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 100 kHz of 1 percent of emission bandwidth, as specified). 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 emissions are attenuated at least 26 dB below the transmitter power.

5.3.3 Conducted out of band emissions measurement procedure:

Based on TIA-603C 2004

2.2.13 Unwanted Emissions: Conducted Spurious



- 1. Connect the equipment as shown in the above diagram.
- 2. Set the spectrum analyzer to measure peak hold with the required settings.

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3. Set the signal generator to a known output power and record the path loss in dB (**LOSS**) for frequencies up to the tenth harmonic of the EUT's carrier frequency. **LOSS** = Generator Output Power (dBm) – Analyzer reading (dBm).

4. Replace the signal generator with the EUT.

Test Report #:

- 5. Adjust the settings of the Digital Radiocommunication Tester (DRT) to set the EUT to its maximum power at the required channel.
- 6. Set the spectrum analyzer to measure peak hold with the required settings. Offset the spectrum analyzer reference level by the path loss measured above.
- 7. Measure and record all spurious emissions up to the tenth harmonic of the carrier frequency.
- 8. Measurements are to be performed with the EUT set to the low, middle and high channel of each frequency band.
- 9. If necessary steps 6 and 7 may be performed with the spectrum analyzer set to average detector or video averaging may be used.

(**note:** Step 3 above is performed prior to testing and **LOSS** is recorded by test software. Steps 2, 6, and 7 above are performed with test software.)

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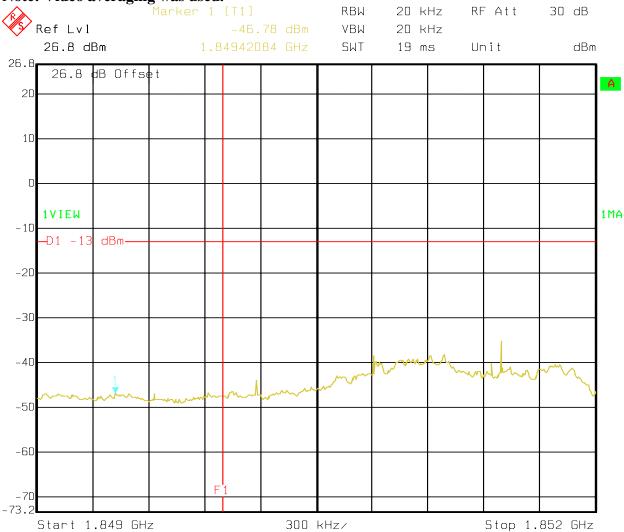


5.3.4 Band Edge Results PCS

Lower Band Edge CHANNEL 25

Date of Report:

Note: Video averaging was used.



Date: 11.APR.2007 15:30:05

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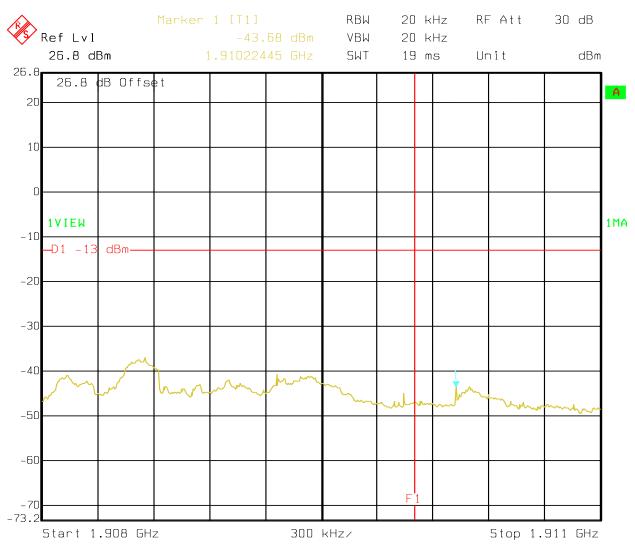
Date of Report: 4/30/2007

007



Higher Band Edge CHANNEL 1175

Note: Video averaging was used.





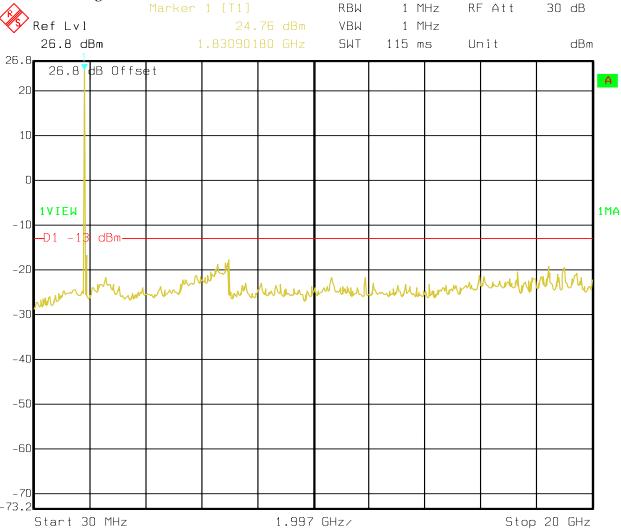
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5.3.5 Out of band results (PCS)

Conducted out of band emissions (PCS)

CHANNEL 25

Note: marked signal is the fundamental emission



Test Report #:

Date of Report:

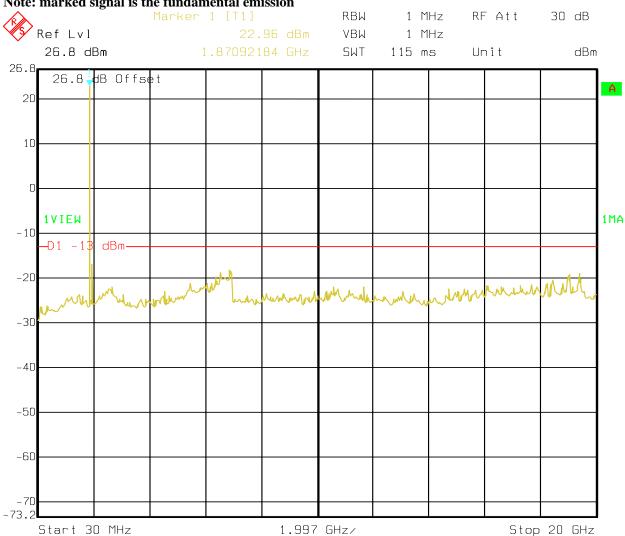
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Conducted out of band emissions (PCS) **CHANNEL 600**

Note: marked signal is the fundamental emission



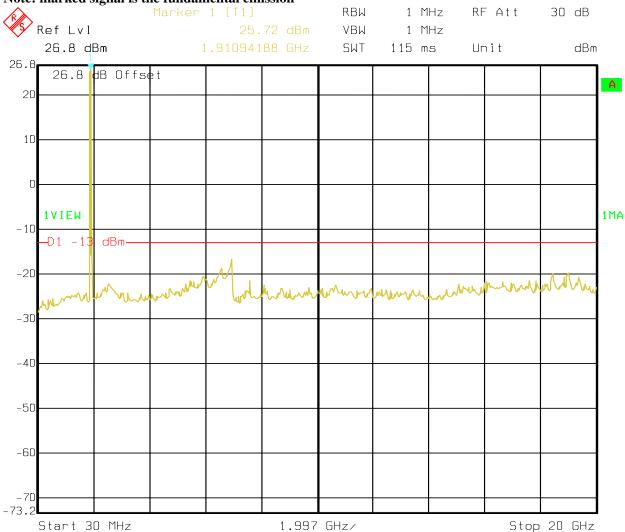
11.APR.2007 15:18:22 Date:

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Conducted out of band emissions (PCS) CHANNEL 1175

Note: marked signal is the fundamental emission



Date: 11.APR.2007 15:18:45

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5.4 Spurious Emissions Radiated

5.4.1 FCC 2.1053 Measurements required: Field strength of spurious radiation.

(a) Measurements shall be made to detect spurious emissions that may be radiated directly from the cabinet, control circuits, power leads or intermediate circuit elements under normal conditions of installation and operation. Curves or equivalent data shall be supplied showing the magnitude of each harmonic and other spurious emission.

5.4.2 Limits:

5.4.2.1 FCC 24.238 Emission limitations for Broadband PCS equipment.

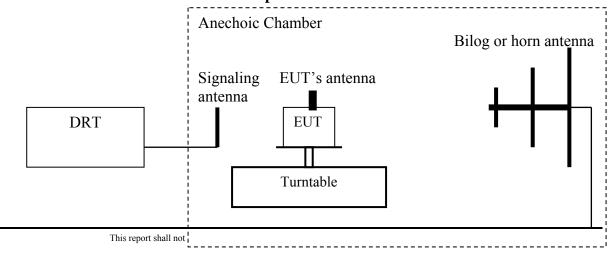
The rules in this section govern the spectral characteristics of emissions in the Broadband Personal Communications Service.

- (a) Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P) dB$.
- (b) Measurement procedure. 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. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 100 kHz of 1 percent of emission bandwidth, as specified). 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 emissions are attenuated at least 26 dB below the transmitter power.

5.4.3 Radiated out of band measurement procedure:

Based on TIA-603C 2004

2.2.12 Unwanted emissions: Radiated Spurious



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Spectrum Analyzer	
3	

- 1. Connect the equipment as shown in the above diagram with the EUT's antenna in a horizontal orientation.
- 2. Adjust the settings of the Digital Radiocommunication Tester (DRT) to set the EUT to its maximum power at the required channel.
- 3. Set the spectrum analyzer to measure peak hold with the required settings.
- 4. Place the measurement antenna in a horizontal orientation. Rotate the EUT 360°. Raise the measurement antenna up to 4 meters in 0.5 meters increments and rotate the EUT 360° at each height to maximize all emissions. Measure and record all spurious emissions (LVL) up to the tenth harmonic of the carrier frequency.
- 5. Replace the EUT with a horizontally polarized half wave dipole or known gain antenna. The center of the antenna should be at the same location as the center of the EUT's antenna.
- 6. Connect the antenna to a signal generator with known output power and record the path loss in dB (**LOSS**). **LOSS** = Generator Output Power (dBm) Analyzer reading (dBm).
- 7. Determine the level of spurious emissions using the following equation: **Spurious** (dBm) = **LVL** (dBm) + **LOSS** (dB):
- 8. Repeat steps 4, 5 and 6 with all antennas vertically polarized.
- 9. Determine the level of spurious emissions using the following equation: **Spurious** (dBm) = **LVL** (dBm) + **LOSS** (dB):
- 10. Measurements are to be performed with the EUT set to the low, middle and high channel of each frequency band.

(**note:** Steps 5 and 6 above are performed prior to testing and **LOSS** is recorded by test software. Steps 3, 4 and 7 above are performed with test software.)

Spectrum analyzer settings:

Res B/W: 1 MHz Video B/W: 1 MHz

Test Report #:

5.4.4 Radiated Spurious Emissions Results

Measurements were performed with the EUT in X, Y and Z orientations with the measurement antenna in both horizontal and vertical polarity. The plots below show the results of the worst case orientation and polarity.



Radiated Out of band results (PCS) 5.4.5

30MHz - 1GHz Vertical

CHANNEL 25 CETECOM Inc.

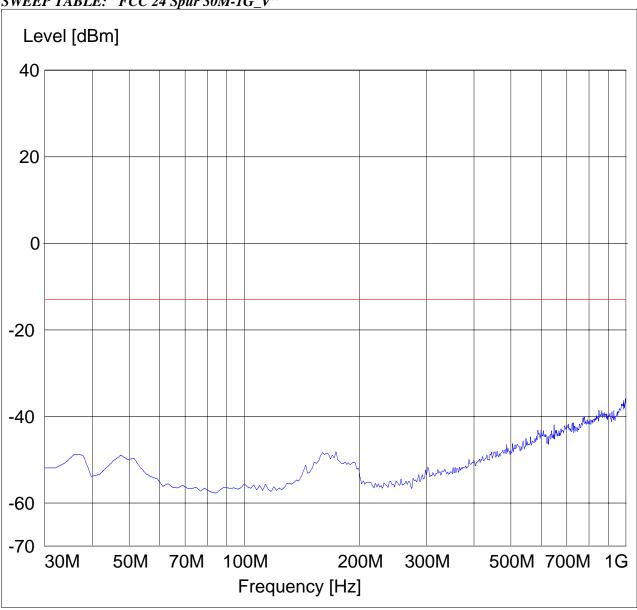
411 Dixon Landing Road, Milpitas CA 95035, USA

RM 154 EUT: Customer: Nokia

Test Mode: CDMA PCS Ch 25

ANT Orientation: V EUT Orientation: V Test Engineer: Pete K

SWEEP TABLE: "FCC 24 Spur 30M-1G_V"





30MHz - 1GHz Horizontal

CHANNEL 25 CETECOM Inc.

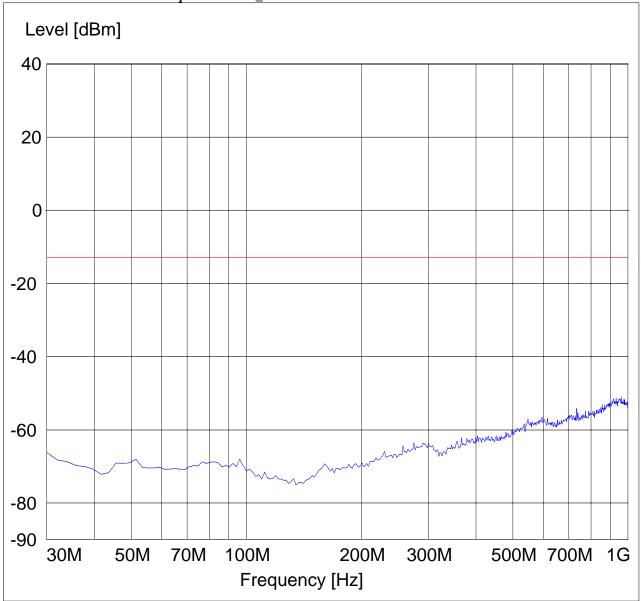
411 Dixon Landing Road, Milpitas CA 95035, USA

EUT: RM 154 Customer: Nokia

Test Mode: CDMA PCS Ch 25

ANT Orientation: H EUT Orientation: V Test Engineer: Pete K

SWEEP TABLE: "FCC 24 Spur 30M-1G_H"



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1GHz - 3GHz Vertical

CHANNEL 25

Note: marked signal is the fundamental emission

CETECOM Inc.

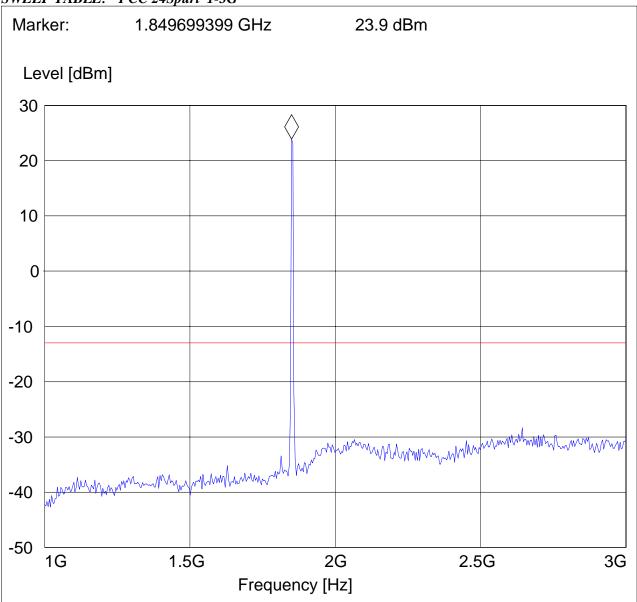
411 Dixon Landing Road, Milpitas CA 95035, USA

EUT: RM 154 Customer: Nokia

Test Mode: CDMA PCS Ch 25

ANT Orientation: V EUT Orientation: V Test Engineer: Pete K

SWEEP TABLE: "FCC 24Spuri 1-3G"





3GHz - 18GHz Vertical

CHANNEL 25 CETECOM Inc.

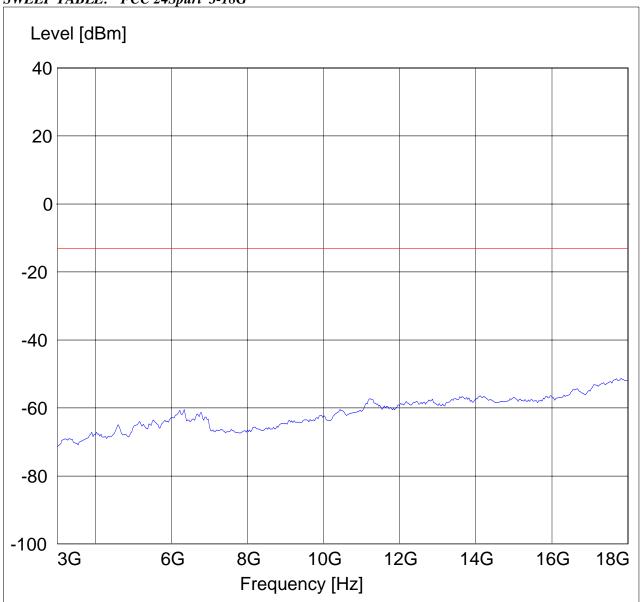
411 Dixon Landing Road, Milpitas CA 95035, USA

EUT: RM 154 Customer: Nokia

Test Mode: CDMA PCS Ch 25

ANT Orientation: V EUT Orientation: V Test Engineer: Pete K

SWEEP TABLE: "FCC 24Spuri 3-18G"





18GHz - 19.1GHz Vertical

CHANNEL 25 CETECOM Inc.

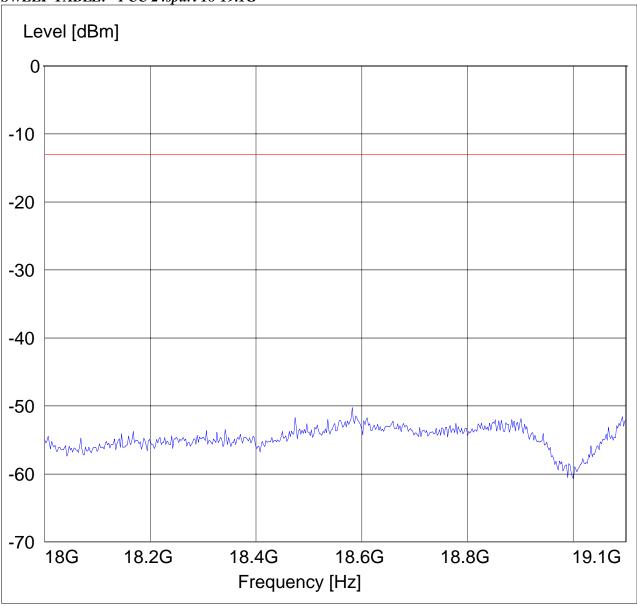
411 Dixon Landing Road, Milpitas CA 95035, USA

EUT: RM 154 Customer: Nokia

Test Mode: CDMA PCS Ch 25

ANT Orientation: V EUT Orientation: V Test Engineer: Pete K

SWEEP TABLE: "FCC 24spuri 18-19.1G"





30MHz - 1GHz Vertical

CHANNEL 600 CETECOM Inc.

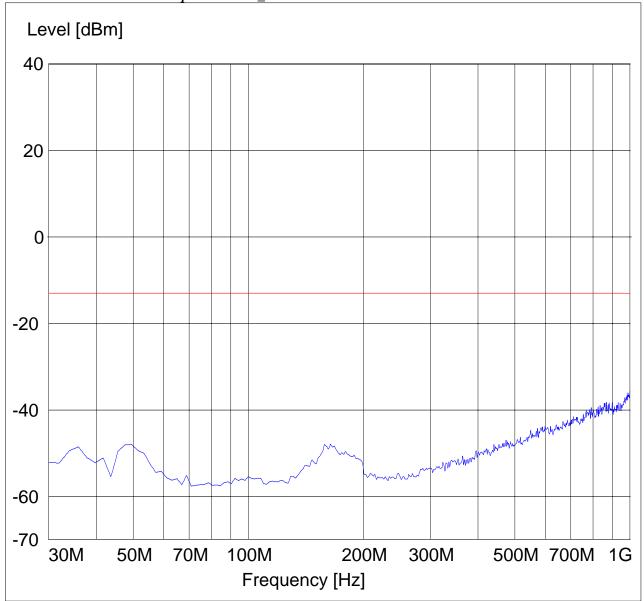
411 Dixon Landing Road, Milpitas CA 95035, USA

EUT: RM 154 Customer: Nokia

Test Mode: CDMA PCS Ch 600

ANT Orientation: V EUT Orientation: V Test Engineer: Pete K

SWEEP TABLE: "FCC 24 Spur 30M-1G_V"





30MHz - 1GHz Horizontal

CHANNEL 600 CETECOM Inc.

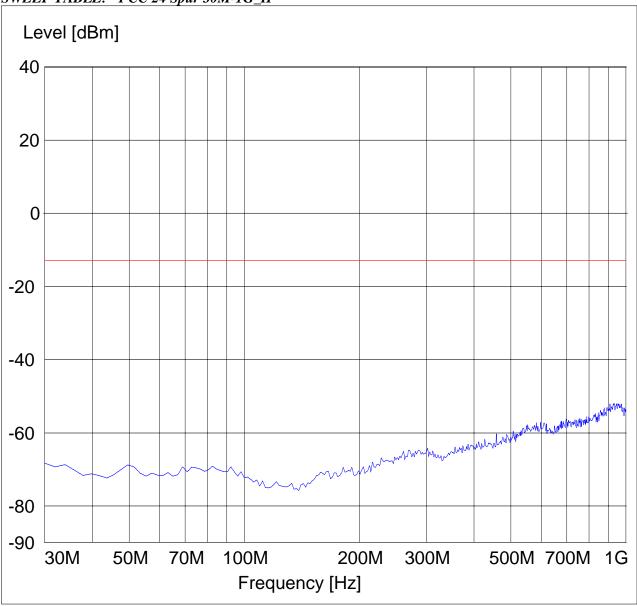
411 Dixon Landing Road, Milpitas CA 95035, USA

EUT: RM 154 Customer: Nokia

Test Mode: CDMA PCS Ch 600

ANT Orientation: H EUT Orientation: V Test Engineer: Pete K

SWEEP TABLE: "FCC 24 Spur 30M-1G_H"



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1GHz - 3GHz Vertical

CHANNEL 600

Note: marked signal is the fundamental emission

CETECOM Inc.

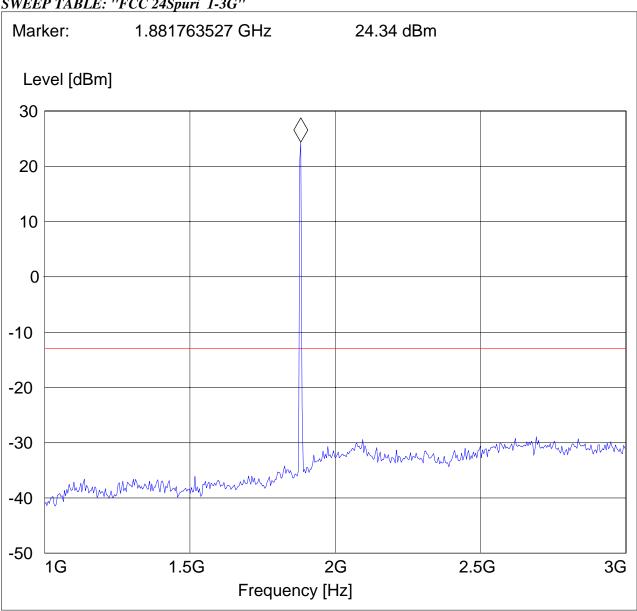
411 Dixon Landing Road, Milpitas CA 95035, USA

EUT: RM 154 Customer: Nokia

CDMA PCS Ch 600 Test Mode:

ANT Orientation: V EUT Orientation: V Test Engineer: Pete K

SWEEP TABLE: "FCC 24Spuri 1-3G"



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3GHz – 18GHz Vertical CHANNEL 600

CETECOM Inc.

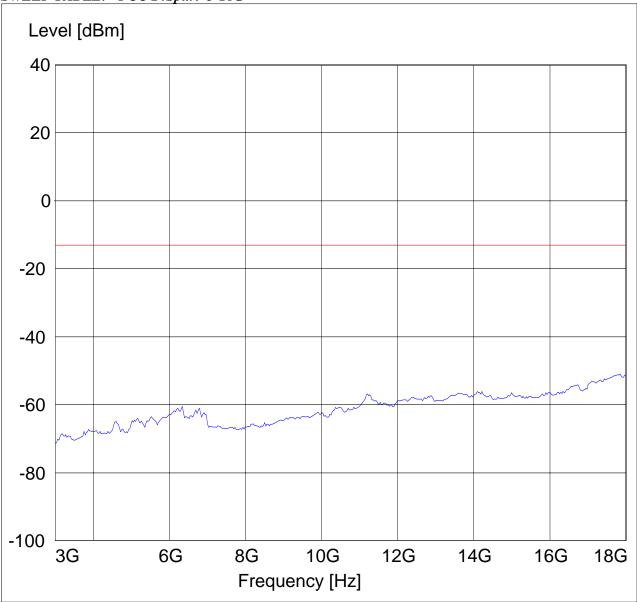
411 Dixon Landing Road, Milpitas CA 95035, USA

EUT: RM 154 Customer: Nokia

Test Mode: CDMA PCS Ch 600

ANT Orientation: V EUT Orientation: V Test Engineer: Pete K

SWEEP TABLE: "FCC 24Spuri 3-18G"





18GHz - 19.1GHz Vertical

CHANNEL 600 CETECOM Inc.

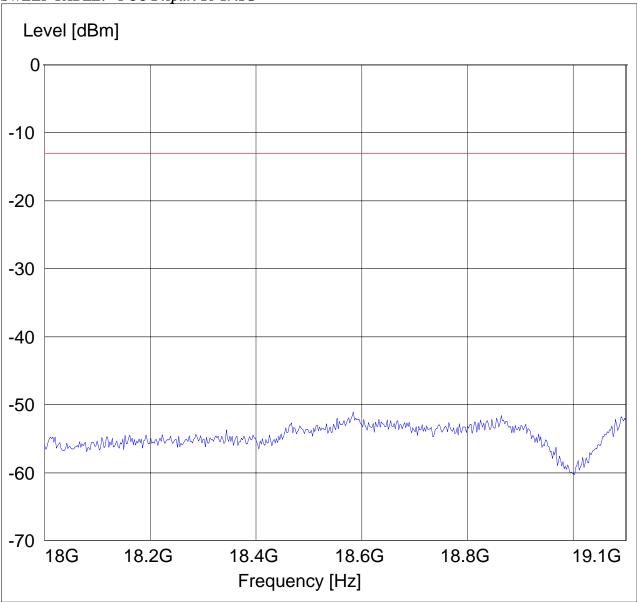
411 Dixon Landing Road, Milpitas CA 95035, USA

EUT: RM 154 Customer: Nokia

Test Mode: CDMA PCS Ch 600

ANT Orientation: V EUT Orientation: V Test Engineer: Pete K

SWEEP TABLE: "FCC 24spuri 18-19.1G"





30MHz - 1GHz Vertical CHANNEL 1175 CETECOM Inc.

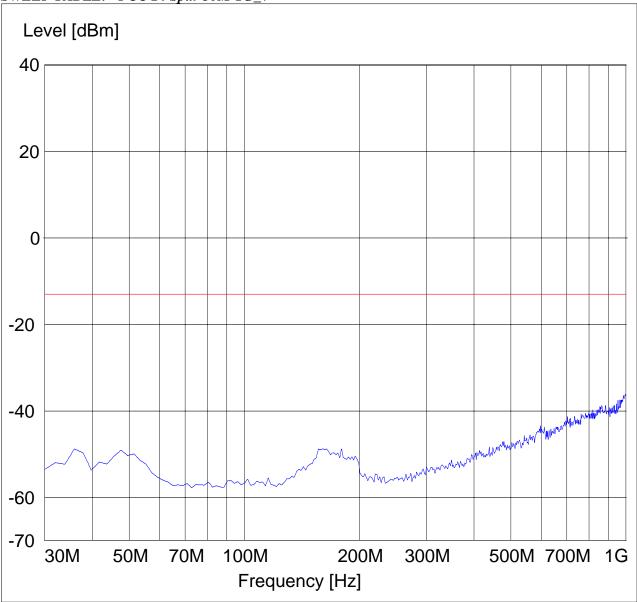
411 Dixon Landing Road, Milpitas CA 95035, USA

EUT: RM 154 Customer: Nokia

Test Mode: CDMA PCS Ch 1175

ANT Orientation: V EUT Orientation: V Test Engineer: Pete K

SWEEP TABLE: "FCC 24 Spur 30M-1G_V"





30MHz - 1GHz Horizontal

CHANNEL 1175

CETECOM Inc.

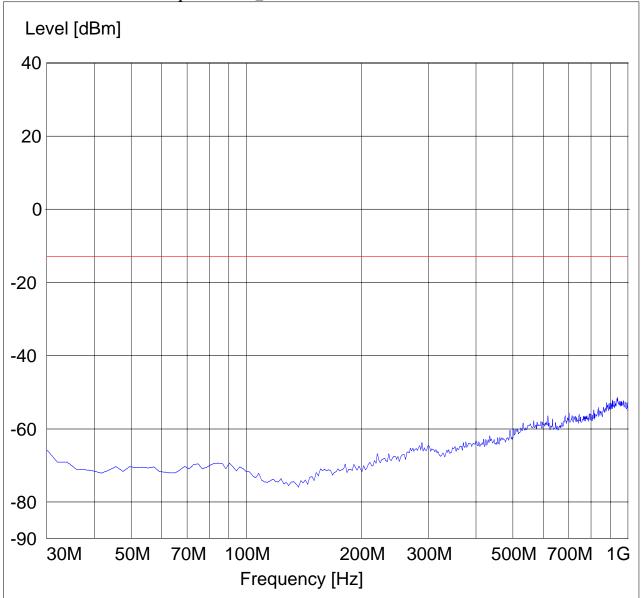
411 Dixon Landing Road, Milpitas CA 95035, USA

EUT: RM 154 Customer: Nokia

Test Mode: CDMA PCS Ch 1175

ANT Orientation: H EUT Orientation: V Test Engineer: Pete K

SWEEP TABLE: "FCC 24 Spur 30M-1G_H"



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1GHz - 3GHz Vertical **CHANNEL 1175**

Note: marked signal is the fundamental emission

CETECOM Inc.

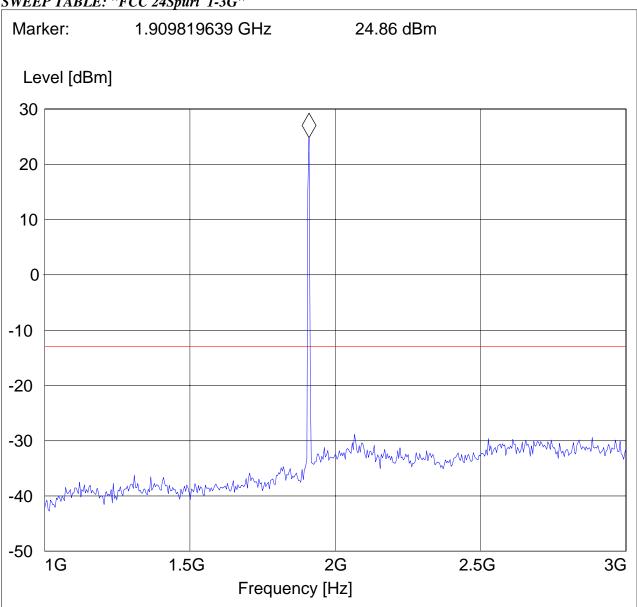
411 Dixon Landing Road, Milpitas CA 95035, USA

EUT: RM 154 Customer: Nokia

CDMA PCS Ch 1175 Test Mode:

ANT Orientation: V EUT Orientation: V Test Engineer: Pete K

SWEEP TABLE: "FCC 24Spuri 1-3G"





3GHz – 18GHz Vertical CHANNEL 1175 CETECOM Inc.

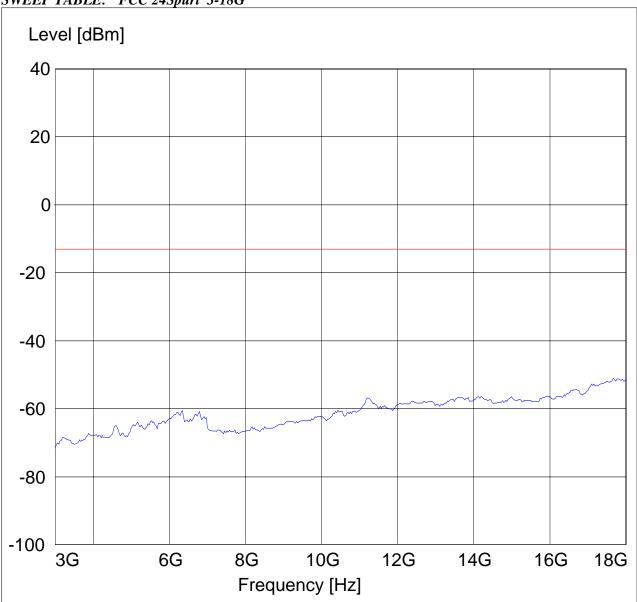
411 Dixon Landing Road, Milpitas CA 95035, USA

EUT: RM 154 Customer: Nokia

Test Mode: CDMA PCS Ch 1175

ANT Orientation: V EUT Orientation: V Test Engineer: Pete K

SWEEP TABLE: "FCC 24Spuri 3-18G"





18GHz - 19.1GHz Vertical

CHANNEL 1175

Test Report #:

CETECOM Inc.

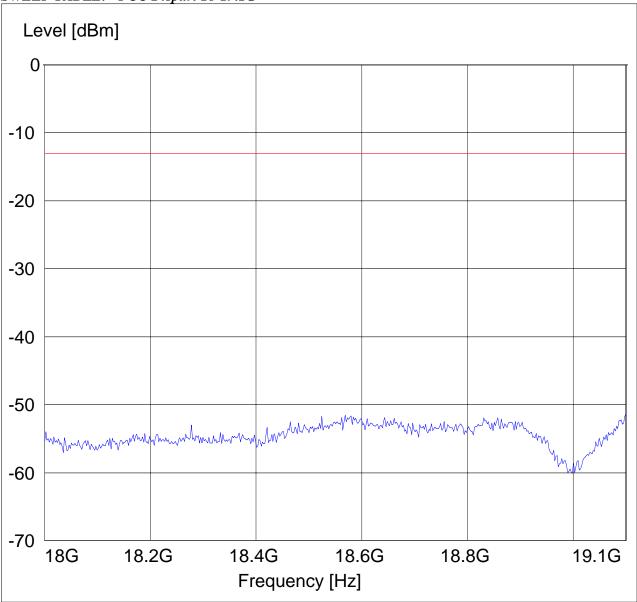
411 Dixon Landing Road, Milpitas CA 95035, USA

EUT: RM 154 Customer: Nokia

Test Mode: CDMA PCS Ch 1175

ANT Orientation: V EUT Orientation: V Test Engineer: Pete K

SWEEP TABLE: "FCC 24spuri 18-19.1G"



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6 TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS

No	Instrument/Ancillary	Type	Manufacturer	Serial No.	Cal Due	Interval
01	Spectrum Analyzer	ESIB 40	Rohde & Schwarz	100107	May 2007	1 year
02	Spectrum Analyzer	FSEM 30	Rohde & Schwarz	100017	August 2007	1 year
03	Signal Generator	SMY02	Rohde & Schwarz	836878/011	May 2007	1 year
04	Power-Meter	NRVD	Rohde & Schwarz	0857.8008.02	May 2007	1 year
05	Biconilog Antenna	3141	EMCO	0005-1186	June 2007	1 year
06	Horn Antenna (1- 18GHz)	SAS- 200/571	AH Systems	325	June 2007	1 year
07	Horn Antenna (18-26.5GHz)	3160-09	EMCO	1240	June 2007	1 year
08	Power Splitter	11667B	Hewlett Packard	645348	n/a	n/a
09	Climatic Chamber	VT4004	Voltsch	G1115	May 2007	1 year
10	High Pass Filter	5HC2700	Trilithic Inc.	9926013	n/a	n/a
11	High Pass Filter	4HC1600	Trilithic Inc.	9922307	n/a	n/a
12	Pre-Amplifier	JS4- 00102600	Miteq	00616	May 2007	1 year
13	Power Sensor	URV5-Z2	Rohde & Schwarz	DE30807	May 2007	1 year
14	Digital Radio Comm. Tester	CMD-55	Rohde & Schwarz	847958/008	May 2007	1 year
15	Universal Radio Comm. Tester	CMU 200	Rohde & Schwarz	832221/06	May 2007	1 year
16	LISN	ESH3-Z5	Rohde & Schwarz	836679/003	May 2007	1 year
17	Loop Antenna	6512	EMCO	00049838	July 2007	2 years

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7 References

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PART 2--FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS October 1, 2001.

FCC Report and order 02-229 September 24, 2002.

Title 47—Telecommunication, CHAPTER I--FEDERAL COMMUNICATIONS COMMISSION,

PART 24 PERSONAL COMMUNICATIONS SERVICES October 1, 1998.

ANSI / TIA-603-C-2004 Land Mobile FM or PM Communications Equipment Measurement and Performance Standard November 7, 2002.

Test Report #:

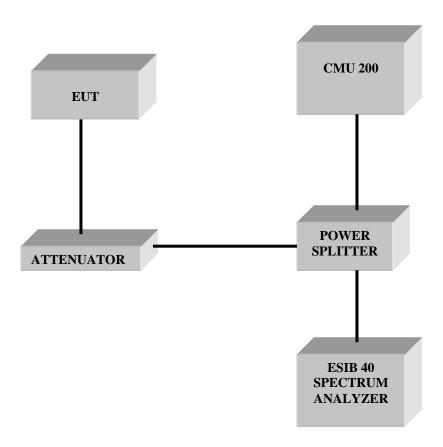
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8 BLOCK DIAGRAMS Conducted Testing



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Radiated Testing

ANECHOIC CHAMBER

