PCTEST ENGINEERING LABORATORY, INC.
7185 Oakland Mills Road, Columbia, MD 21046 USA
Tel. 410.290.6652 / Fax 410.290.6654
http://www.pctestlab.com

MEASUREMENT REPORT
FCC Part 22 & 24 / IC RSS-132/RSS-133

Applicant Name:
NEC Corporation of America
Radio Communications Systems Division
6535 N. State Highway 161
Irving, TX 75039-2402 USA

Date of Testing:
08/19/2012-08/24/2012
Test Site/Location:
PCTEST Lab., Columbia, MD, USA
Test Report Serial No.:
0Y1208171167.A98

FCC ID:	**A98-HRG0037**
APPLICANT:	**NEC CORPORATION OF AMERICA**

Application Type:	Certification
Model(s):	KMP7N2AB1-1A
EUT Type:	Portable Handset
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
FCC Rule Part(s):	§2; §22(H), §24(E)
IC Specification(s):	RSS-132 Issue 2; RSS-133 Issue 5
Test Procedure(s):	ANSI/TIA-603-C-2004, KDB 971168
Test Device Serial No.:	*identical prototype* [IMEI: 004401201031032]

Mode	Tx Frequency (MHz)	Emission Designator	ERP/EIRP	
			Max. Power (W)	Max. Power (dBm)
GSM1900	1850.2 - 1909.8	240KGXW	1.438	31.58
WCDMA850	826.4 - 846.6	4M30F9W	0.172	22.35

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. Test results reported herein relate only to the item(s) tested.

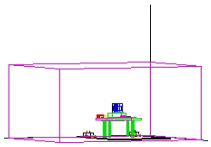
I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking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

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

Randy Ortanez
President

ACCREDITED
TESTING LABORATORY
CERTIFICATE #2041.01

TABLE OF CONTENTS



MEASUREMENT REPORT
FCC Part 22 & 24

§2.1033 General Information

APPLICANT:	NEC Corporation of America
APPLICANT ADDRESS:	Radio Communications Systems Division 6535 N. State Highway 161, Irving, TX 75039-2402 USA
TEST SITE:	PCTEST ENGINEERING LABORATORY, INC.
TEST SITE ADDRESS:	7185 Oakland Mills Road, Columbia, MD 21046 USA
FCC RULE PART(S):	§2; §22(H), §24(E)
IC SPECIFICATION(S):	RSS-132 Issue 2; RSS-133 Issue 5
BASE MODEL:	KMP7N2AB1-1A
FCC ID:	A98-HRG0037
FCC CLASSIFICATION:	PCS Licensed Transmitter Held to Ear (PCE)
MODE:	GSM/WCDMA
FREQUENCY TOLERANCE:	±0.00025 % (2.5 ppm)
Test Device Serial No.:	004401201031032 ☐ Production ☒ Pre-Production ☐ Engineering
DATE(S) OF TEST:	08/19/2012-08/24/2012
TEST REPORT IMEI:	0Y1208171167.A98

Test Facility / Accreditations

Measurements were performed at PCTEST Engineering Lab located in Columbia, MD 21046, U.S.A.

- PCTEST facility is an FCC registered (PCTEST Reg. No. 159966) test facility with the site description report on file and has met all the requirements specified in Section 2.948 of the FCC Rules and Industry Canada (2451B-1).
- PCTEST Lab is accredited to ISO 17025 by U.S. National Institute of Standards and Technology (NIST) under the National Voluntary Laboratory Accreditation Program (NVLAP Lab code: 100431-0) in EMC, FCC and Telecommunications.
- PCTEST Lab is accredited to ISO 17025-2005 by the American Association for Laboratory Accreditation (A2LA) in Specific Absorption Rate (SAR) testing, Hearing Aid Compatibility (HAC) testing, CTIA Test Plans, and wireless testing for FCC and Industry Canada Rules.

- PCTEST Lab is a recognized U.S. Conformity Assessment Body (CAB) in EMC and R&TTE (n.b. 0982) under the U.S.-EU Mutual Recognition Agreement (MRA).
- PCTEST TCB is a Telecommunication Certification Body (TCB) accredited to ISO/IEC Guide 65 by the American National Standards Institute (ANSI) in all scopes of FCC Rules and Industry Canada Standards (RSS).
- PCTEST facility is an IC registered (2451B-1) test laboratory with the site description on file at Industry Canada.
- PCTEST is a CTIA Authorized Test Laboratory (CATL) for AMPS, CDMA, and EvDO wireless devices and for Over-the-Air (OTA) Antenna Performance testing for AMPS, CDMA, GSM, GPRS, EGPRS, UMTS (W-CDMA), CDMA 1xEVDO, and CDMA 1xRTT.

1.0 INTRODUCTION

1.1 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 and the Industry Canada Certification and Engineering Bureau.

1.2 Testing Facility

The map below shows the location of the PCTEST LABORATORY, its proximity to the FCC Laboratory, the Columbia vicinity, the Baltimore-Washington Internt'l (BWI) airport, the city of Baltimore and the Washington, DC area. (*See Figure 1-1*).

These measurement tests were conducted at the PCTEST Engineering Laboratory, Inc. facility located at 7185 Oakland Mills Road, Columbia, MD 21046. The site coordinates are 39° 10'23" N latitude and 76° 49'50" W longitude. The facility is 0.4 miles North of the FCC laboratory, and the ambient signal and ambient signal strength are approximately equal to those of the FCC laboratory. The detailed description of the measurement facility was found to be in compliance with the requirements of § 2.948 according to ANSI C63.4-2003/2009 on February 15, 2012.

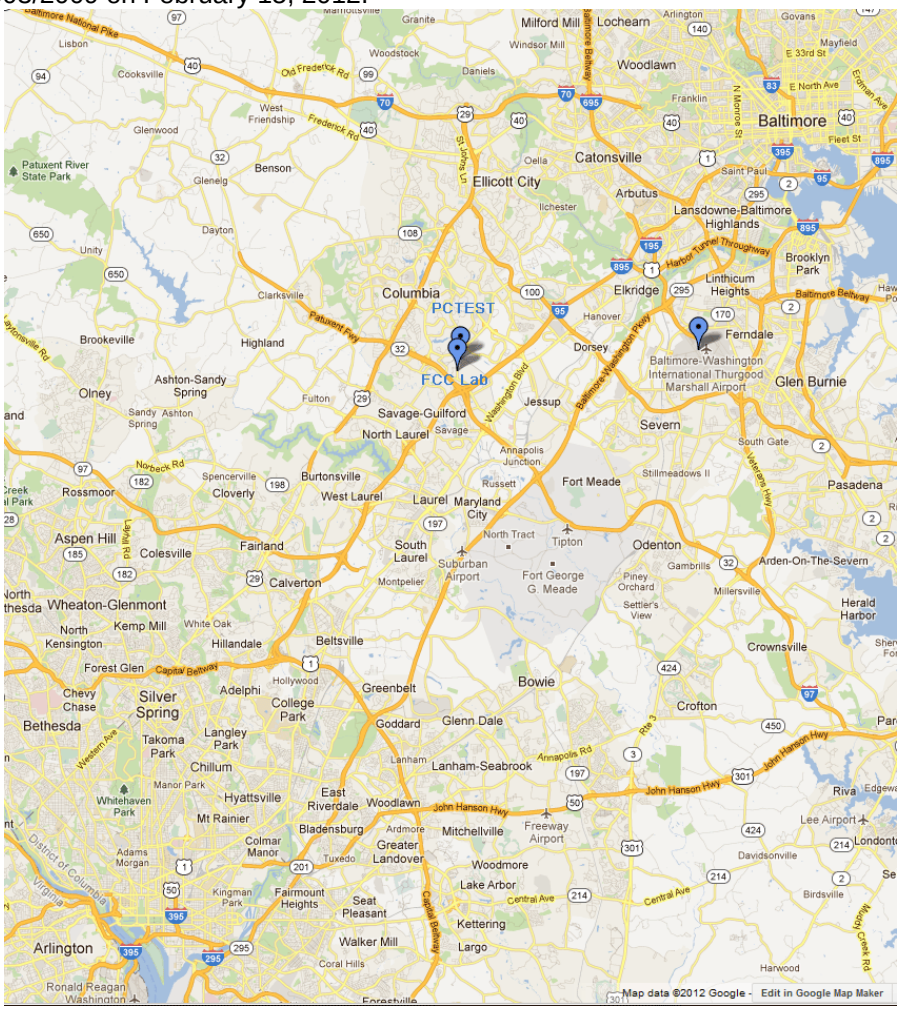


Figure 1-1. Map of the Greater Baltimore and Metropolitan Washington, D.C. area

2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **NEC Portable Handset FCC ID: A98-HRG0037**. The test data contained in this report pertains only to the emissions due to the EUT's licensed transmitter.

2.2 Device Capabilities

This device contains the following capabilities:

1900 GSM/GPRS, 850 WCDMA, Bluetooth (1x,EDR), NFC

2.3 Test Configuration

The NEC Portable Handset FCC ID: A98-HRG0037 was tested per the guidance of ANSI/TIA-603-C-2004 and KDB 971168. See Section 3.0 of this test report for a description of the radiated and antenna port conducted emissions tests.

2.4 EMI Suppression Device(s)/Modifications

No EMI suppression device(s) were added and no modifications were made during testing.

2.5 Labeling Requirements

Per 2.925

The FCC identifier shall be permanently affixed to the equipment and shall be readily visible to the purchaser at the time of purchase.

Per 15.19; Docket 95-19

In addition to this requirement, a device subject to certification shall be labeled as follows:

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

The label shall be permanently affixed at a conspicuous location on the device; instruction manual or pamphlet supplied to the user and be readily visible to the purchaser at the time of purchase. However, when the device is so small wherein placement of the label with specified statement is not practical, only the trade name and FCC ID must be displayed on the device per Section 15.19(b)(2).

Please see attachment for FCC ID label and label location.

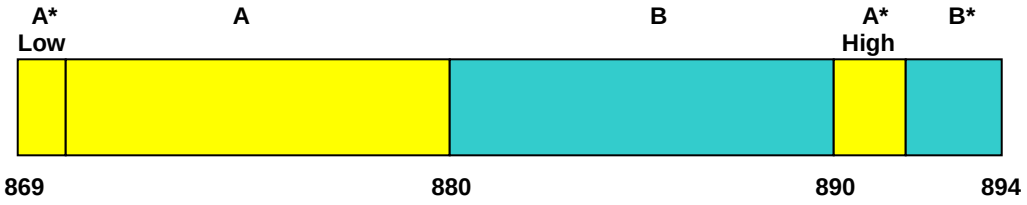
3.0 DESCRIPTION OF TESTS

3.1 Evaluation Procedure

The measurement procedures described in the "Land Mobile FM or PM – Communications Equipment – Measurements and Performance Standards" (ANSI/TIA-603-C-2004) and "Procedures for Compliance Measurement of the Fundamental Emission Power of Licensed Wideband (> 1 MHz) Digital Transmission Systems" were used in the measurement of the measurement of the **NEC Portable Handset FCC ID: A98-HRG0037.**

Deviation from Measurement Procedure……..None

3.2 Cellular - Base Frequency Blocks



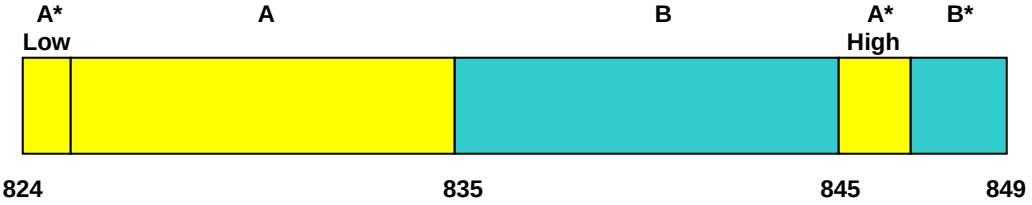
BLOCK 1: 869 – 880 MHz (A* Low + A)

BLOCK 2: 880 – 890 MHz (B)

BLOCK 3: 890 – 891.5 MHz (A* High)

BLOCK 4: 891.5 – 894 MHz (B*)

3.3 Cellular - Mobile Frequency Blocks



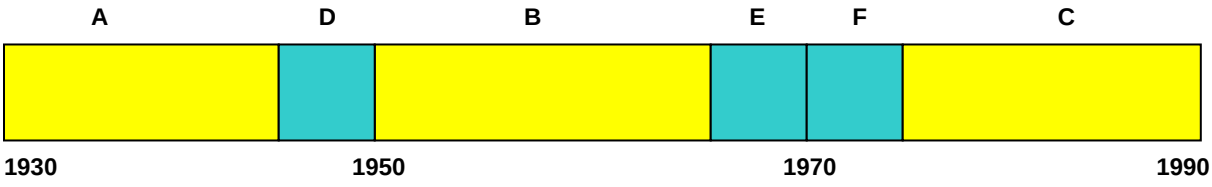
BLOCK 1: 824 – 835 MHz (A* Low + A)

BLOCK 2: 835 – 845 MHz (B)

BLOCK 3: 845 – 846.5 MHz (A* High)

BLOCK 4: 846.5 – 849 MHz (B*)

3.4 PCS - Base Frequency Blocks



BLOCK 1: 1930 – 1945 MHz (A)

BLOCK 2: 1945 – 1950 MHz (D)

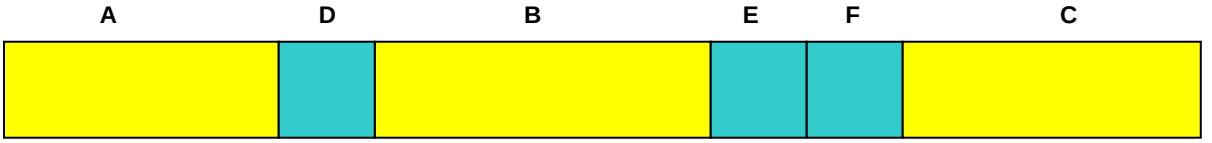
BLOCK 3: 1950 – 1965 MHz (B)

BLOCK 4: 1965 – 1970 MHz (E)

BLOCK 5: 1970 – 1975 MHz (F)

BLOCK 6: 1975 – 1990 MHz (C)

3.5 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)

3.6 Occupied Bandwidth

§2.1049, RSS-Gen (4.6.1)

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. The spectrum analyzers' "occupied bandwidth" measurement function was used to record the occupied bandwidth in accordance with KDB 971168.

3.7 Spurious and Harmonic Emissions at Antenna Terminal

§2.1051, 22.917(a)(b), 24.238(a)(b); RSS-132 (4.5.1), RSS-133 (6.5.1)

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10^{th} harmonic. 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. Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater for the PCS band, and 100 kHz or greater for the Cell band. 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.

3.8 Radiated Power and Radiated Spurious Emissions

§2.1053, 22.913(a)(2), 22.917(a), 24.232(c), 24.238(a); RSS-132 (4.5.1), RSS-133 (6.5.1)

The radiated test facilities consisted of an indoor 3 meter semi-anechoic chamber used for final measurements and exploratory measurements, when necessary. The measurement area is contained within the semi-anechoic chamber which is shielded from any ambient interference. For measurements above 1GHz absorbers are arranged on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections. For measurements below 1GHz, the absorbers are removed. An ETS Lindgren Model 2188 raised turntable is used for radiated measurement. It is a continuously rotatable, remote-controlled, metallic turntable and 2 meters (6.56 ft.) in diameter. The turn table is flush with the raised floor of the chamber in order to maintain its function as a ground plane. A 78cm high PVC support structure is placed on top of the turntable. A ¾" (~1.9cm) sheet of high density polyethylene is used as the table top and is placed on top of the PVC supports to bring the total height of the table to 80cm.

The equipment under test was transmitting while connected to its integral antenna and is placed on a wooden turntable 80cm above the ground plane and 3 meters from the receive antenna. The receive antenna height is adjusted between 1 and 4 meter height, the turntable is rotated through 360 degrees, and the EUT is manipulated through all orthogonal planes representative of its typical use to achieve the highest reading on the receive spectrum analyzer. Radiated power levels are also investigated with the receive antenna horizontally and vertically polarized. The maximized power level is recorded using the spectrum analyzer "Channel Power" function with the integration band set to the emissions' occupied bandwidth, a RMS detector, RBW = 100kHz, VBW = 300kHz, and a 1 second sweep time over a minimum of 10 sweeps, per the guidelines of KDB 971168.

Per the guidance of ANSI/TIA-603-C-2004, a half-wave dipole is then substituted in place of the EUT. For emissions above 1GHz, a horn antenna is substituted in place of the EUT. The substitute antenna is driven by a signal generator with the level of the signal generator being adjusted to obtain the same receive spectrum analyzer level previously recorded from the spurious emission from the EUT. The power of the emission is calculated using the following formula:

$$P_{d\ [dBm]} = P_{g\ [dBm]} - \text{cable loss}_{\ [dB]} + \text{antenna gain}_{\ [dBd/dBi]}$$

Where, P_d is the dipole equivalent power, P_g is the generator output into the substitution antenna, and the antenna gain is the gain of the substitute antenna used relative to either a half-wave dipole (dBd) or an isotropic source (dBi). The substitute level is equal to $P_{g\ [dBm]}$ – cable loss $_{[dB]}$.

The calculated P_d levels are then compared to the absolute spurious emission limit of -13dBm which is equivalent to the required minimum attenuation of 43 + $10\log_{10}$(Power $_{[Watts]}$) specified in 22.917(a) and 24.238(a).

3.9 Peak-Average Ratio

§24.232(d); RSS-133 (6.4)

A peak to average ratio measurement is performed at the conducted port of the EUT. The spectrum analyzers Complementary Cumulative Distribution Function (CCDF) measurement profile is used to determine the largest deviation between the average and the peak power of the EUT in a given bandwidth. The CCDF curve shows how much time the peak waveform spends at or above a given average power level. The percent of time the signal spends at or above the level defines the probability for that particular power level.

For GSM signals, the spectrum analyzer is set to use an internal "RF Burst" trigger that is synced with an incoming pulse and the measurement interval is set to 400μs to ensure that energy is only captured during a time in which the transmitter is operating at maximum power. For WCDMA, the trigger is set to "free run" in the CCDF measurement mode.

3.10 Frequency Stability / Temperature Variation

§2.1055, 22.355, 24.235; RSS-132 (4.3) / RSS-133 (6.3)

Frequency stability testing is performed in accordance with the guidelines of ANSI/TIA-603-C-2004. The frequency stability of the transmitter is measured by:

a.) **Temperature:** The temperature is varied from -30°C to +50°C in 10°C increments using an environmental chamber.

b.) **Primary Supply Voltage:** The primary supply voltage is varied from 85% to 115% of the nominal value for non hand-carried battery and AC powered equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.

Specification – For Part 22, the frequency stability of the transmitter shall be maintained within ±0.00025% (±2.5 ppm) of the center frequency. For Part 24, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

Time Period and Procedure:

1. The carrier frequency of the transmitter is measured at room temperature (20°C to provide a reference).

2. The equipment is turned on in a "standby" condition for fifteen minutes before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.

3. Frequency measurements are made at 10°C intervals ranging from -30°C to +50°C. A period of at least one half-hour is provided to allow stabilization of the equipment at each temperature level.

4.0 TEST EQUIPMENT CALIBRATION DATA

Test Equipment Calibration is traceable to the National Institute of Standards and Technology (NIST).

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
-	LTx1	Licensed Transmitter Cable Set	1/25/2012	Annual	1/25/2013	N/A
-	RE1	Radiated Emissions Cable Set (UHF/EHF)	7/10/2012	Annual	7/10/2013	N/A
-	RE2	Radiated Emissions Cable Set (VHF/UHF)	2/13/2012	Annual	2/13/2013	N/A
Agilent	8447D	Broadband Amplifier	5/8/2012	Annual	5/8/2013	1937A03348
Agilent	E8257D	(250kHz-20GHz) Signal Generator	4/5/2012	Annual	4/5/2013	MY45470194
Agilent	N9020A	MXA Signal Analyzer	10/10/2011	Annual	10/10/2012	US46470561
Anritsu	MA2411B	Power Sensor	3/5/2012	Annual	3/5/2013	846215
Anritsu	ML2495A	Power Meter	10/13/2011	Annual	10/13/2012	1039008
Espec	ESX-2CA	Environmental Chamber	4/4/2012	Annual	4/4/2013	17620
ETS Lindgren	3117	1-18 GHz DRG Horn (Medium)	7/22/2011	Biennial	7/22/2013	125518
ETS Lindgren	3164-08	Quad Ridge Horn Antenna	10/1/2010	Biennial	10/1/2012	128337
Mini-Circuits	VHF-1200+	High Pass Filter	1/15/2012	Annual	1/15/2013	30923
Mini-Circuits	VHF-3100+	High Pass Filter	1/15/2012	Annual	1/15/2013	30841
Rohde & Schwarz	CMU200	Base Station Simulator	N/A		N/A	836536/0005
Rohde & Schwarz	TS-PR18	1-18 GHz Pre-Amplifier	6/26/2012	Annual	6/26/2013	100071
Rohde & Schwarz	ESU26	EMI Test Receiver	12/15/2011	Annual	12/15/2012	100342
Schwarzbeck	UHA 9105	Dipole Antenna (400 - 1GHz) Rx	11/14/2011	Biennial	11/14/2013	9105-2404
Seekonk	NC-100	Torque Wrench (8" lb)	3/5/2012	Triennial	3/5/2015	N/A
Sunol	JB5	Bi-Log Antenna (30M - 5GHz)	1/26/2012	Biennial	1/26/2014	A051107

Table 4-1. Test Equipment

Note:

Equipment used for signaling with a calibration date of "N/A" shown in this list was only used for maintaining a link between the piece of equipment and the EUT. This equipment was not used to make direct calibrated measurements.

5.0 SAMPLE CALCULATIONS

GSM Emission Designator

Emission Designator = 250KGXW

GSM BW = 250 kHz
G = Phase Modulation
X = Cases not otherwise covered
W = Combination (Audio/Data)

WCDMA Emission Designator

Emission Designator = 4M16F9W

WCDMA BW = 4.16 MHz
F = Frequency Modulation
9 = Composite Digital Info
W = Combination (Audio/Data) (Measured at the 99.75% power bandwidth)

Spurious Radiated Emission - PCS Band

Example: GSM Channel 512 PCS Mode 2nd Harmonic (3700.40 MHz)

The receive spectrum 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 spectrum analyzer. The loss of the cable between the signal generator and the terminals of the substituted antenna is 2.0 dB at 3700.40 MHz. So 6.1 dB is added to the signal generator reading of –30.9 dBm yielding –24.80 dBm. The fundamental EIRP was 25.50 dBm so this harmonic was 25.50 dBm – (-24.80) = 50.3 dBc.

6.0 TEST RESULTS

6.1 Summary

Company Name: NEC Corporation of America

FCC ID: A98-HRG0037

FCC Classification: PCS Licensed Transmitter Held to Ear (PCE)

Mode(s): GSM/WCDMA

FCC Part Section(s)	RSS Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
TRANSMITTER MODE (TX)						
2.1049, 22.917(a), 24.238(a)	RSS-Gen (4.6.1) RSS-133 (2.3)	Occupied Bandwidth	N/A	CONDUCTED	PASS	Section 7.0
2.1051, 22.917(a), 24.238(a)	RSS-132 (4.5.1) RSS-133 (6.5.1)	Band Edge / Conducted Spurious Emissions	< 43 + $\log_{10}$ (P[Watts]) at Band Edge and for all out-of-band emissions		PASS	Section 7.0
24.232(d)	RSS-133 (6.4)	Peak-Average Ratio	< 13 dB		PASS	Section 7.0
2.1046	RSS-132 (4.4) RSS-133 (4.1)	Transmitter Conducted Output Power	N/A		PASS	RF Exposure Report
22.913(a)(2)	RSS-132 (4.4) [SRSP-503(5.1.3)]	Effective Radiated Power	< 7 Watts max. ERP	RADIATED	PASS	Section 6.2
24.232(c)	RSS-133 (6.4) [SRSP-510 (5.1.2)]	Equivalent Isotropic Radiated Power	< 2 Watts max. EIRP		PASS	Section 6.3
2.1053, 22.917(a), 24.238(a)	RSS-132 (4.5.1) RSS-133 (6.5.1)	Undesirable Emissions	< 43 + $\log_{10}$ (P[Watts]) for all out-of-band emissions		PASS	Sections 6.4, 6.5
2.1055, 22.355, 24.235	RSS-132 (4.3) RSS-133 (6.3)	Frequency Stability	< 2.5 ppm (Part 22) Emission must remain in band (Part 24)		PASS	Sections 6.6, 6.7

Table 6-1. Summary of Test Results

Notes:

1) All modes of operation and data rates were investigated. The test results shown in the following sections represent the worst case emissions.
2) The analyzer plots shown in Section 7.0 were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables, directional couplers, and attenuators used as part of the system to maintain a link between the call box and the EUT at all frequencies of interest.
3) All antenna port conducted emissions testing was performed on a test bench with the antenna port of the EUT connected to the spectrum analyzer through calibrated cables, attenuators, and couplers.
4) Conducted data included in this report is taken from the parent model FCC ID: A98-XGU3296 as it is electrically identical to FCC ID: A98-HRG0037.

6.2 Effective Radiated Power Output Data

§22.913(a)(2); RSS-132 (4.4) [SRSP-503(5.1.3)]

Frequency [MHz]	Mode	Battery Type	Substitute Level [dBm]	Antenna Gain [dBd]	Pol [H/V]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]
826.40	WCDMA850	Standard	17.220	4.68	H	21.90	0.155	38.45	-16.55
836.60	WCDMA850	Standard	14.940	4.79	H	19.73	0.094	38.45	-18.72
846.60	WCDMA850	Standard	17.420	4.93	H	22.35	0.172	38.45	-16.10

Table 6-2. Effective Radiated Power Output Data (WCDMA)

NOTES:

1. This device was tested under all configurations and the highest power is reported in WCDMA mode with HSDPA Inactive at 12.2 kbps RMC and TPC bits all set to "1" and in GSM mode using a Power Control Level of "0" in the PCS Band and "5" in the Cellular Band.

2. This unit was tested with its standard battery.

3. The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case test configuration was found in the clam shell open, horizontal polarization. The data reported in the table above was measured in this test setup.

6.3 Equivalent Isotropic Radiated Power Output Data

§24.232(c); RSS-133 (6.4) [SRSP-510 (5.1.2)]

Frequency [MHz]	Mode	Battery Type	Substitute Level [dBm]	Antenna Gain [dBi]	Pol [H/V]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1850.20	GSM1900	Standard	21.740	8.56	H	30.30	1.071	33.01	-2.71
1880.00	GSM1900	Standard	23.030	8.55	H	31.58	1.438	33.01	-1.43
1909.80	GSM1900	Standard	21.520	8.53	H	30.05	1.013	33.01	-2.96

Table 6-3. Equivalent Isotropic Radiated Power Output Data (GSM)

NOTES:

1. This device was tested under all configurations and the highest power is reported in WCDMA mode with HSDPA Inactive at 12.2 kbps RMC and TPC bits all set to "1" and in GSM mode using a Power Control Level of "0" in the PCS Band and "5" in the Cellular Band.

2. This unit was tested with its standard battery.

3. The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case test configuration was found in the clam shell open, horizontal polarization. The data reported in the table above was measured in this test setup.

6.4 Cellular WCDMA Radiated Measurements

§2.1053, 22.917(a); RSS-132 (4.5.1)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:	826.40	MHz		
CHANNEL:	4132			
MEASURED OUTPUT POWER:	21.90	dBm	=	0.155 W
MODULATION SIGNAL:	WCDMA			
DISTANCE:	3	meters		
LIMIT:	43 + 10 log10 (W) =	34.90	dBc	

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
1652.80	-48.58	2.55	-46.03	H	67.9
2479.20	-115.07	2.86	-112.21	H	134.1
3305.60	-117.00	5.48	-111.52	H	133.4
4132.00	-60.10	7.06	-53.03	H	74.9
4958.40	-67.55	7.88	-59.66	H	81.6

Table 6-4. Radiated Spurious Data (Cellular WCDMA Mode – Ch. 4132)

NOTES:

1. This device was tested under all configurations and the highest power is reported in WCDMA mode with HSDPA Inactive at 12.2 kbps RMC and TPC bits all set to "1" and in GSM mode using a Power Control Level of "0" in the PCS Band and "5" in the Cellular Band.

2. This unit was tested with its standard battery.

3. The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case test configuration was found in the clam shell open, horizontal polarization. The data reported in the table above was measured in this test setup.

Cellular WCDMA Radiated Measurements (Cont'd)

§2.1053, 22.917(a); RSS-132 (4.5.1)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:	836.60	MHz		
CHANNEL:	4183			
MEASURED OUTPUT POWER:	19.73	dBm	=	0.094 W
MODULATION SIGNAL:	WCDMA			
DISTANCE:	3	meters		
LIMIT:	43 + 10 log10 (W) =	32.73	dBc	

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
1673.20	-49.84	2.37	-47.47	H	67.2
2509.80	-114.80	2.80	-112.00	H	131.7
3346.40	-117.23	5.62	-111.62	H	131.3
4183.00	-61.25	7.13	-54.11	H	73.8
5019.60	-67.65	7.96	-59.69	H	79.4

Table 6-5. Radiated Spurious Data (Cellular WCDMA Mode – Ch. 4183)

NOTES:

1. This device was tested under all configurations and the highest power is reported in WCDMA mode with HSDPA Inactive at 12.2 kbps RMC and TPC bits all set to "1" and in GSM mode using a Power Control Level of "0" in the PCS Band and "5" in the Cellular Band.

2. This unit was tested with its standard battery.

3. The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case test configuration was found in the clam shell open, horizontal polarization. The data reported in the table above was measured in this test setup.

Cellular WCDMA Radiated Measurements (Cont'd)

§2.1053, 22.917(a); RSS-132 (4.5.1)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:	846.60	MHz		
CHANNEL:	4233			
MEASURED OUTPUT POWER:	22.35	dBm	=	0.172 W
MODULATION SIGNAL:	WCDMA			
DISTANCE:	3	meters		
LIMIT:	43 + 10 log10 (W) =	35.35	dBc	

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
1693.20	-44.65	2.13	-42.52	H	64.9
2539.80	-114.98	3.11	-111.87	H	134.2
3386.40	-117.54	5.80	-111.74	H	134.1
4233.00	-64.60	7.22	-57.37	H	79.7
5079.60	-116.28	8.01	-108.26	H	130.6

Table 6-6. Radiated Spurious Data (Cellular WCDMA Mode – Ch. 4233)

NOTES:

1. This device was tested under all configurations and the highest power is reported in WCDMA mode with HSDPA Inactive at 12.2 kbps RMC and TPC bits all set to "1" and in GSM mode using a Power Control Level of "0" in the PCS Band and "5" in the Cellular Band.

2. This unit was tested with its standard battery.

3. The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case test configuration was found in the clam shell open, horizontal polarization. The data reported in the table above was measured in this test setup.

6.5 PCS GSM Radiated Measurements

§2.1053, 24.238(a); RSS-133 (6.5.1)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:	1850.20	MHz		
CHANNEL:	512			
MEASURED OUTPUT POWER:	30.30	dBm	=	1.071 W
MODULATION SIGNAL:	GSM (GMSK)			
DISTANCE:	3	meters		
LIMIT:	43 + 10 log10 (W) =	43.30	dBc	

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
3700.40	-51.82	8.40	-43.42	H	73.7
5550.60	-49.27	10.62	-38.64	H	68.9
7400.80	-64.95	11.82	-53.13	H	83.4
9251.00	-65.11	13.30	-51.81	H	82.1
11101.20	-108.16	13.50	-94.66	H	125.0

Table 6-7. Radiated Spurious Data (PCS GSM Mode – Ch. 512)

NOTES:

1. This device was tested under all configurations and the highest power is reported in WCDMA mode with HSDPA Inactive at 12.2 kbps RMC and TPC bits all set to "1" and in GSM mode using a Power Control Level of "0" in the PCS Band and "5" in the Cellular Band.

2. This unit was tested with its standard battery.

3. The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case test configuration was found in the clam shell open, horizontal polarization. The data reported in the table above was measured in this test setup.

PCS GSM Radiated Measurements (Cont'd)

§2.1053, 24.238(a); RSS-133 (6.5.1)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:	1880.00	MHz		
CHANNEL:	661			
MEASURED OUTPUT POWER:	31.58	dBm	=	1.438 W
MODULATION SIGNAL:	GSM (GMSK)			
DISTANCE:	3	meters		
LIMIT:	43 + 10 log10 (W) =	44.58	dBc	

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
3760.00	-47.77	8.42	-39.35	H	70.9
5640.00	-55.42	10.66	-44.76	H	76.3
7520.00	-63.93	11.92	-52.01	H	83.6
9400.00	-114.70	13.24	-101.46	H	133.0
11280.00	-109.80	13.49	-96.31	H	127.9

Table 6-8. Radiated Spurious Data (PCS GSM Mode – Ch. 661)

NOTES:

1. This device was tested under all configurations and the highest power is reported in WCDMA mode with HSDPA Inactive at 12.2 kbps RMC and TPC bits all set to "1" and in GSM mode using a Power Control Level of "0" in the PCS Band and "5" in the Cellular Band.

2. This unit was tested with its standard battery.

3. The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case test configuration was found in the clam shell open, horizontal polarization. The data reported in the table above was measured in this test setup.

PCS GSM Radiated Measurements (Cont'd)

§2.1053, 24.238(a); RSS-133 (6.5.1)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:	1909.80	MHz		
CHANNEL:	810			
MEASURED OUTPUT POWER:	30.05	dBm	=	1.013 W
MODULATION SIGNAL:	GSM (GMSK)			
DISTANCE:	3	meters		
LIMIT:	43 + 10 log10 (W) =	43.05	dBc	

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
3819.60	-43.18	8.57	-34.61	H	64.7
5729.40	-54.80	10.69	-44.11	H	74.2
7639.20	-115.46	12.07	-103.39	H	133.4
9549.00	-114.16	13.20	-100.96	H	131.0
11458.80	-110.73	13.42	-97.31	H	127.4

Table 6-9. Radiated Spurious Data (PCS GSM Mode – Ch. 810)

NOTES:

1. This device was tested under all configurations and the highest power is reported in WCDMA mode with HSDPA Inactive at 12.2 kbps RMC and TPC bits all set to "1" and in GSM mode using a Power Control Level of "0" in the PCS Band and "5" in the Cellular Band.

2. This unit was tested with its standard battery.

3. The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case test configuration was found in the clam shell open, horizontal polarization. The data reported in the table above was measured in this test setup.

6.6 Cellular WCDMA Frequency Stability Measurements

§2.1055, 22.355; RSS-132 (4.3)

OPERATING FREQUENCY: 836,600,000 Hz

CHANNEL: 4183

REFERENCE VOLTAGE: 3.8 VDC

DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	836,600,016	16	0.000002
100 %		- 30	836,600,008	8	0.000001
100 %		- 20	836,600,010	10	0.000001
100 %		- 10	836,599,987	-13	-0.000002
100 %		0	836,599,999	-1	0.000000
100 %		+ 10	836,599,992	-8	-0.000001
100 %		+ 20	836,599,988	-12	-0.000001
100 %		+ 30	836,600,015	15	0.000002
100 %		+ 40	836,599,995	-5	-0.000001
100 %		+ 50	836,600,010	10	0.000001
115 %	4.37	+ 20	836,599,992	-8	-0.000001
BATT. ENDPOINT	3.50	+ 20	836,600,012	12	0.000001

Table 6-10. Frequency Stability Data (Cellular WCDMA Mode – Ch. 4183)

Cellular WCDMA Frequency Stability Measurements (Cont'd)

§2.1055, 22.355; RSS-132 (4.3)

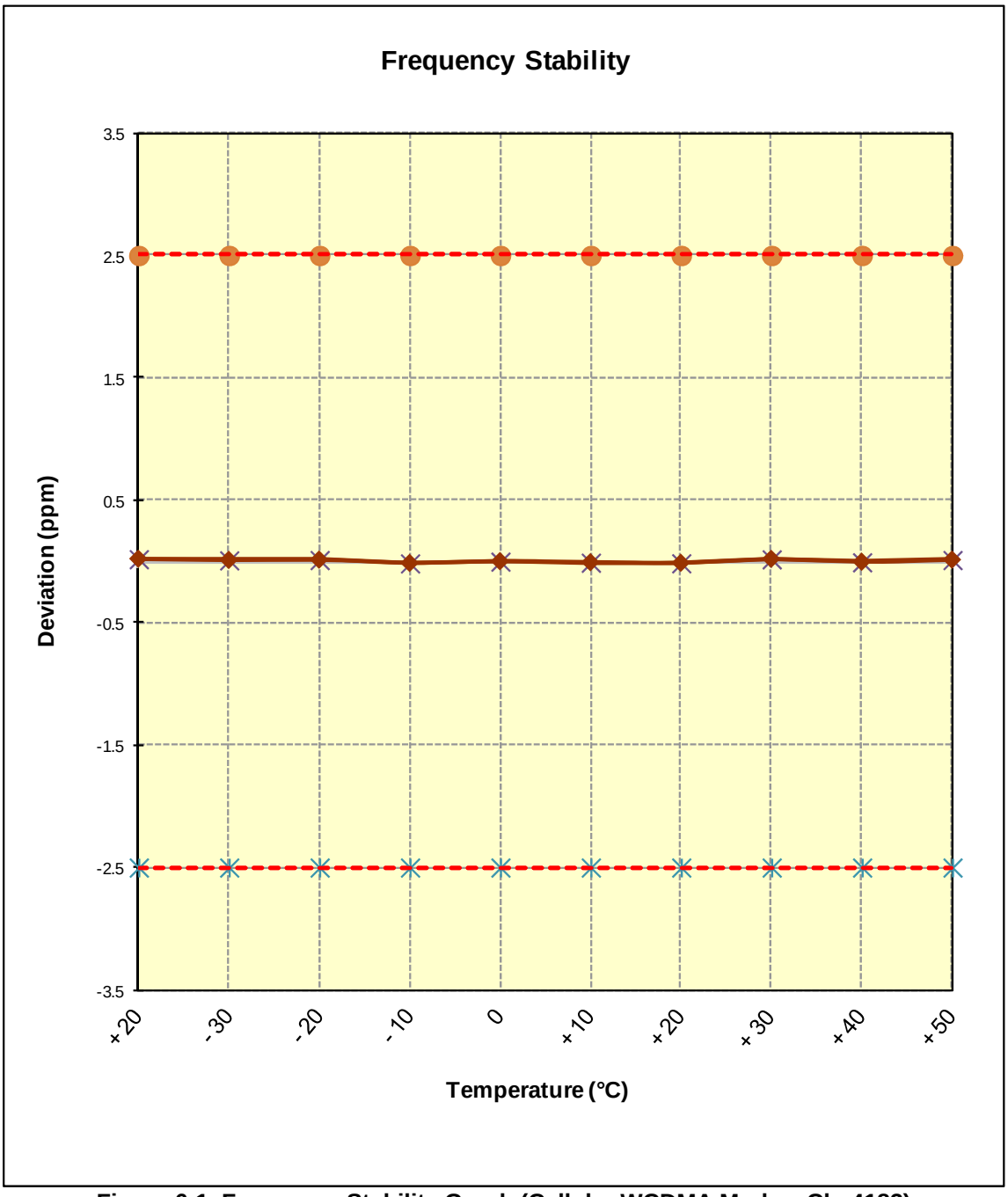


Figure 6-1. Frequency Stability Graph (Cellular WCDMA Mode – Ch. 4183)

6.7 PCS GSM Frequency Stability Measurements

§2.1055, 24.235; RSS-133 (6.3)

OPERATING FREQUENCY: 1,880,000,000 Hz

CHANNEL: 661

REFERENCE VOLTAGE: 3.8 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	1,879,999,985	-15	-0.000001
100 %		- 30	1,880,000,007	7	0.000000
100 %		- 20	1,880,000,008	8	0.000000
100 %		- 10	1,880,000,012	12	0.000001
100 %		0	1,880,000,007	7	0.000000
100 %		+ 10	1,879,999,981	-19	-0.000001
100 %		+ 20	1,879,999,999	-1	0.000000
100 %		+ 30	1,879,999,998	-2	0.000000
100 %		+ 40	1,880,000,017	17	0.000001
100 %		+ 50	1,880,000,007	7	0.000000
115 %	4.37	+ 20	1,879,999,986	-14	-0.000001
BATT. ENDPOINT	3.50	+ 20	1,880,000,000	0	0.000000

Table 6-11. Frequency Stability Data (PCS GSM Mode – Ch. 661)

PCS GSM Frequency Stability Measurements (Cont'd)

§2.1055, 24.235; RSS-133 (6.3)

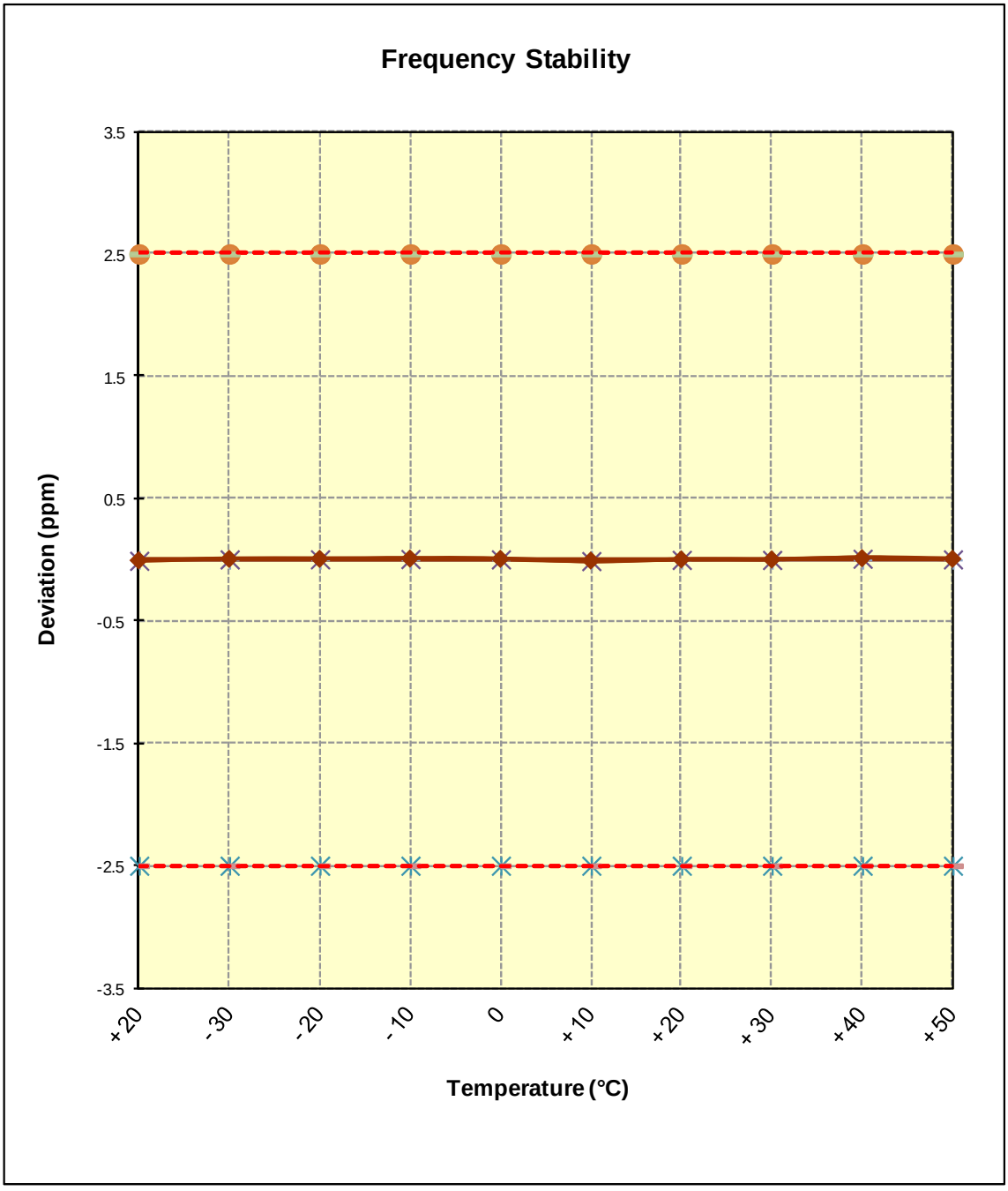
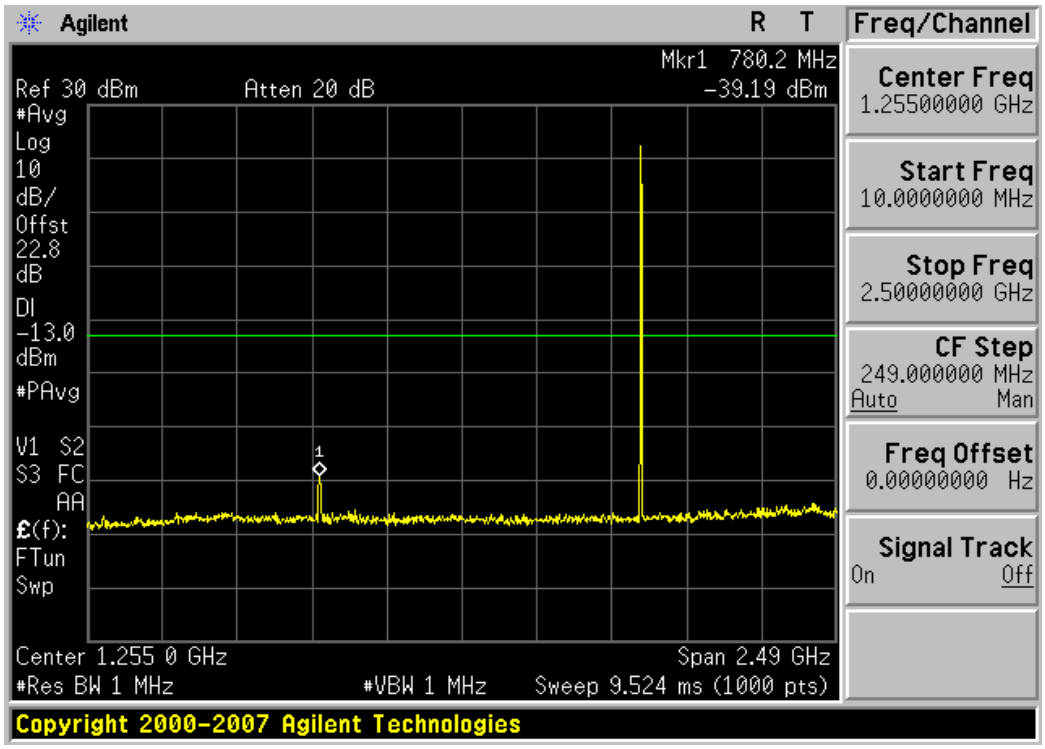
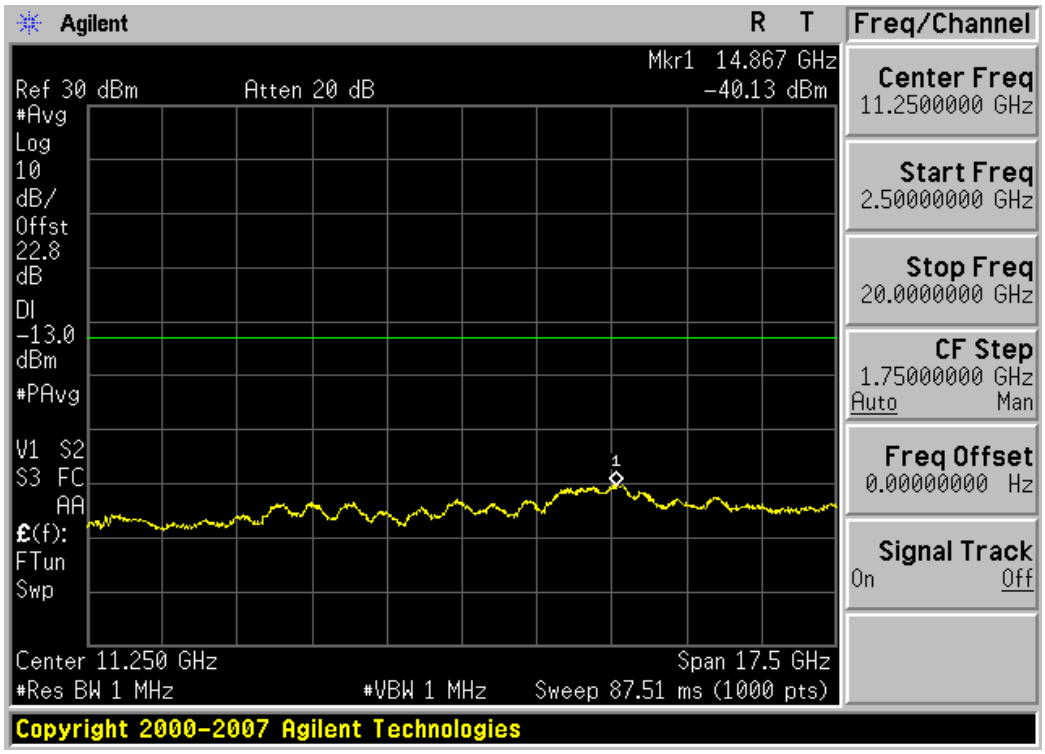


Figure 6-2. Frequency Stability Graph (PCS GSM Mode – Ch. 661)

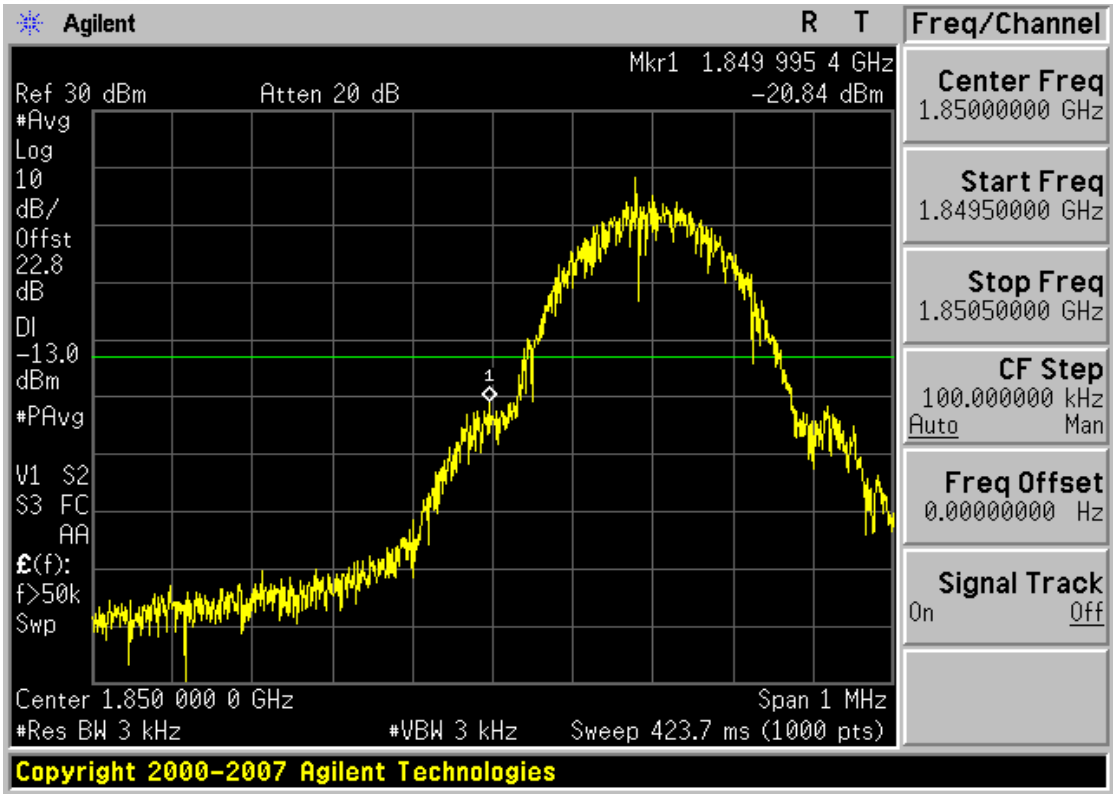
7.0 PLOTS OF EMISSIONS



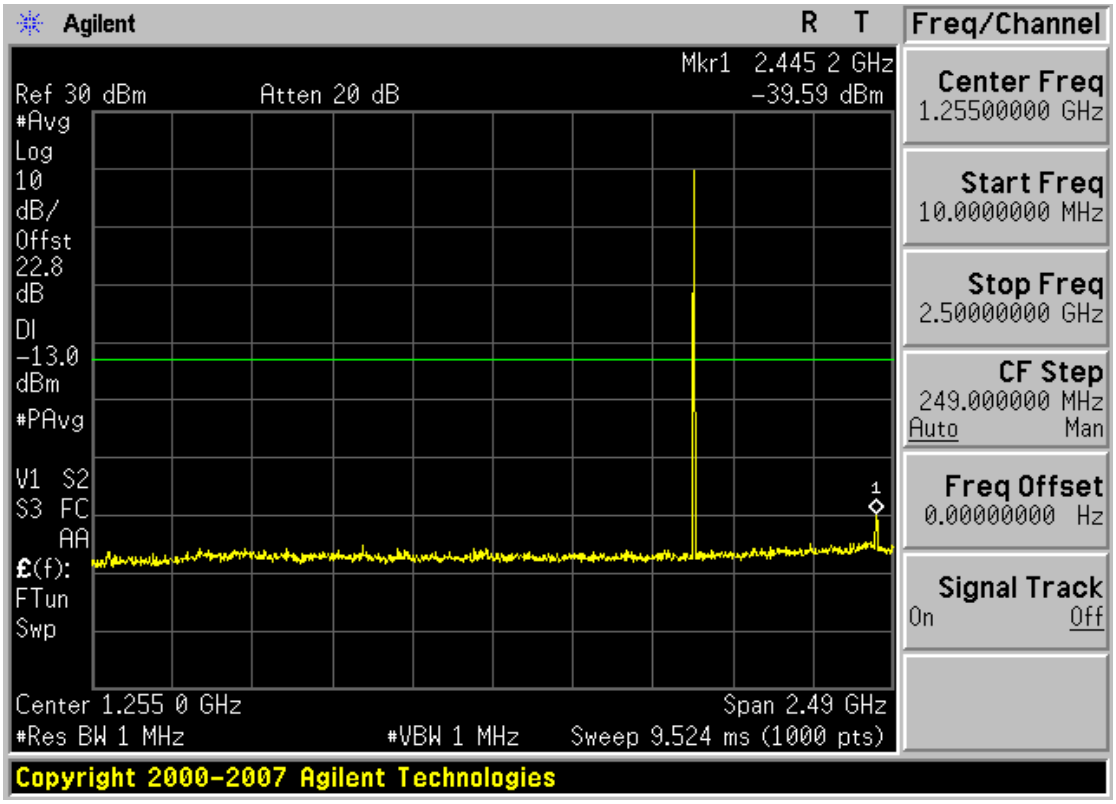
Plot 7-1. Conducted Spurious Plot (PCS GSM Mode – Ch. 512)



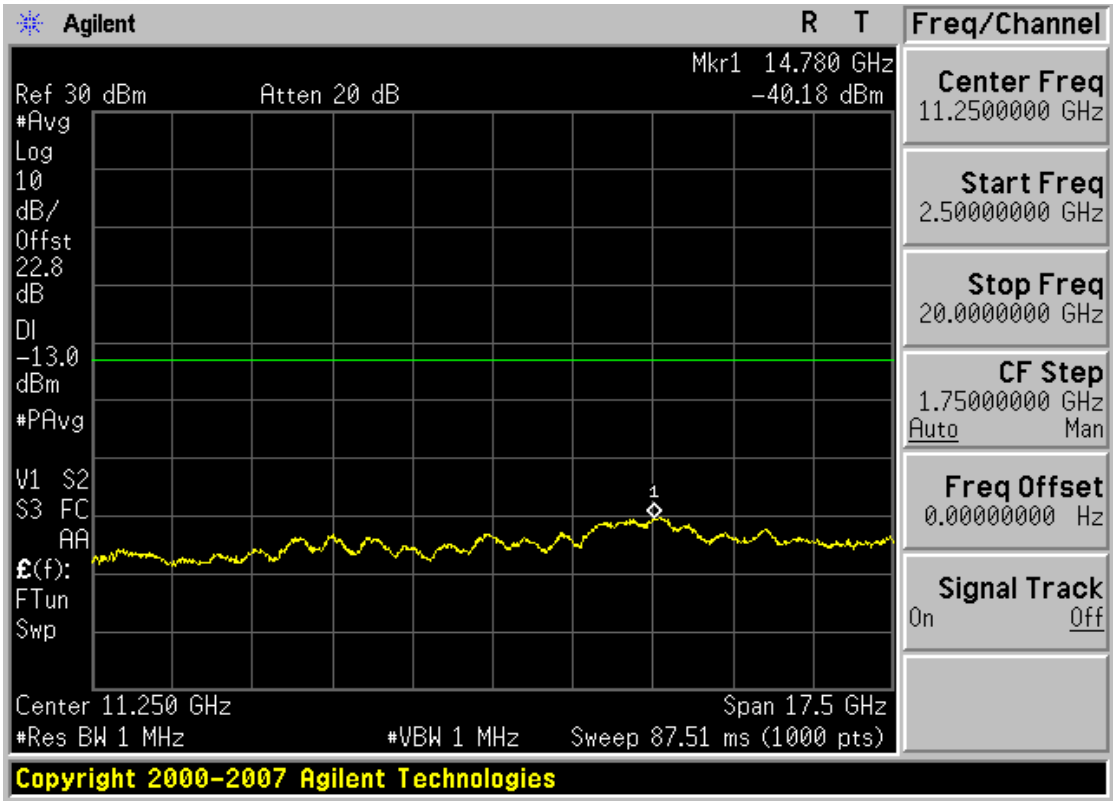
Plot 7-2. Conducted Spurious Plot (PCS GSM Mode – Ch. 512)



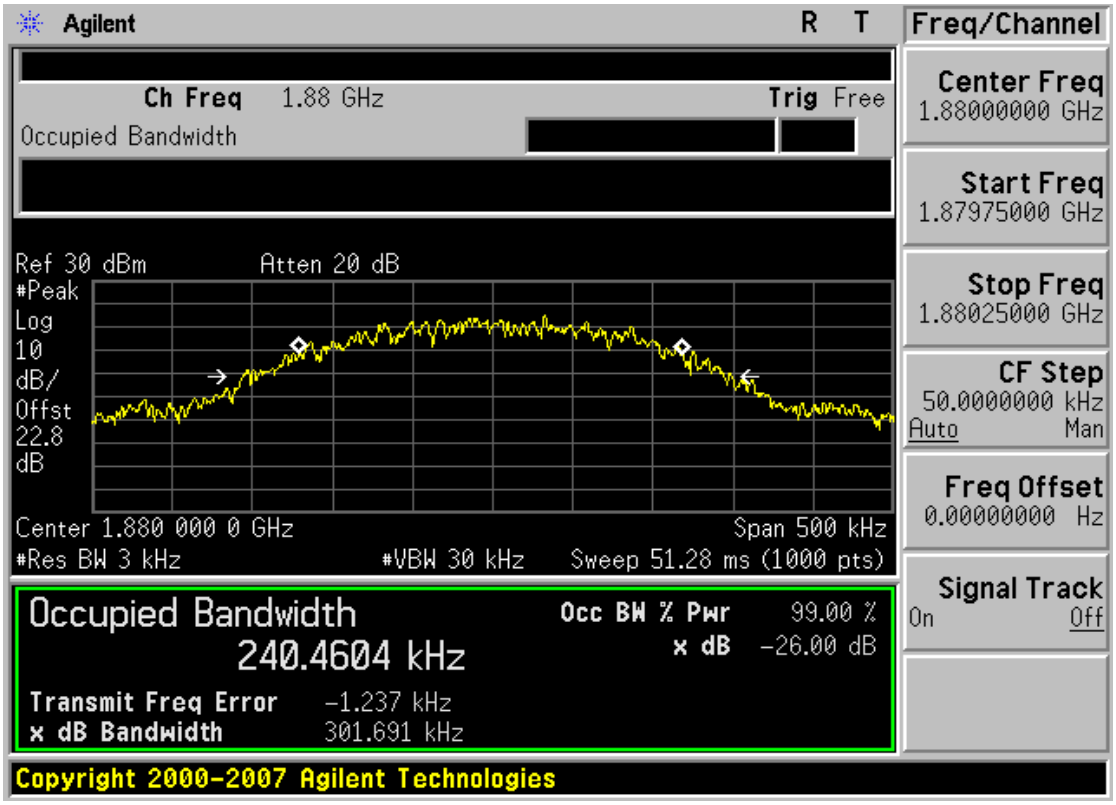
Plot 7-3. Band Edge Plot (PCS GSM Mode – Ch. 512)



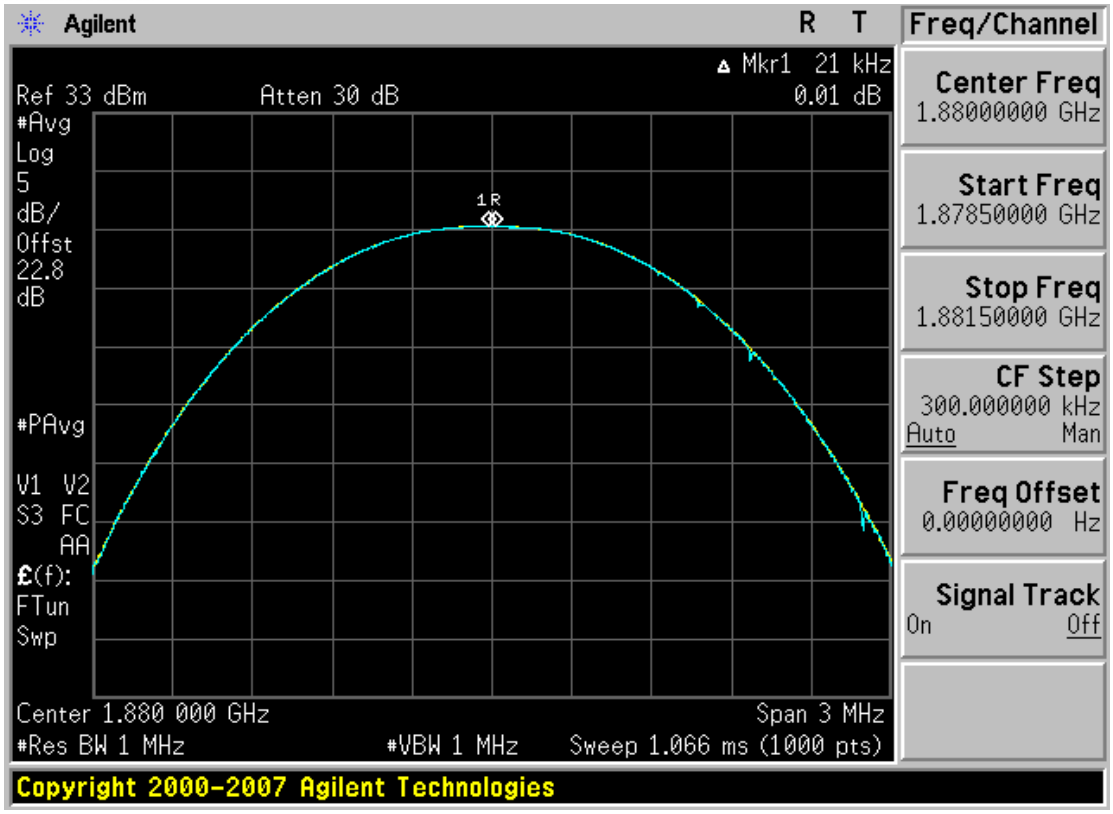
Plot 7-4. Conducted Spurious Plot (PCS GSM Mode – Ch. 661)



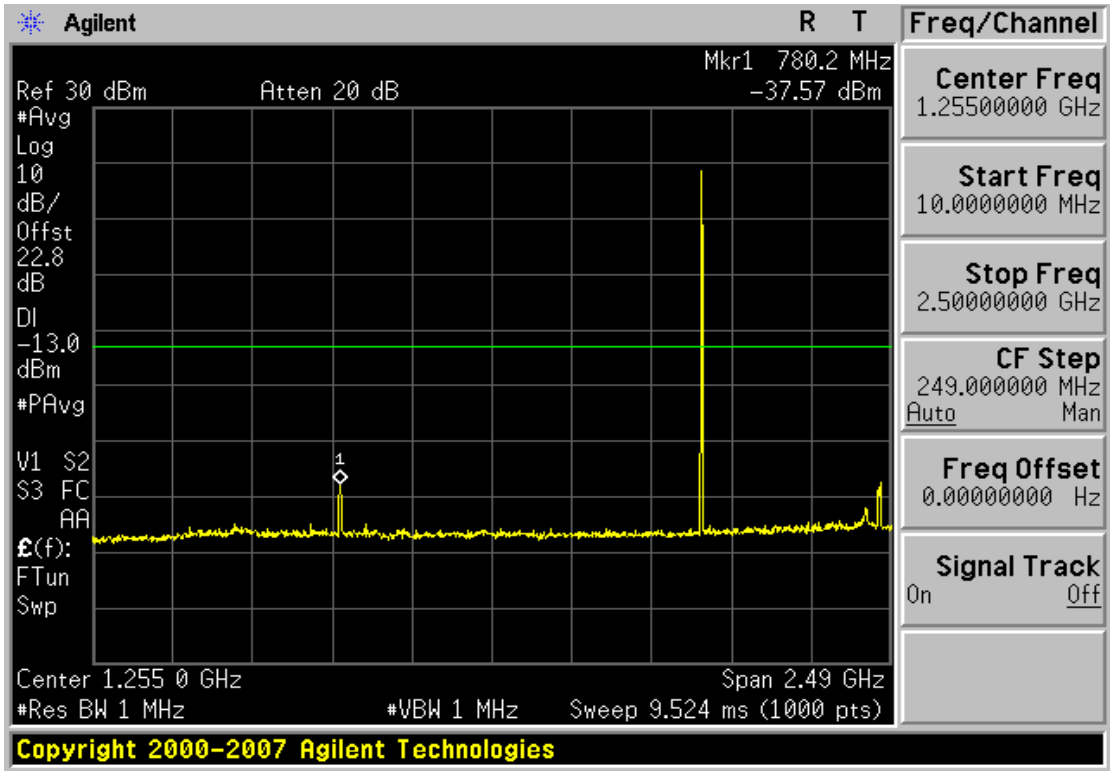
Plot 7-5. Conducted Spurious Plot (PCS GSM Mode – Ch. 661)



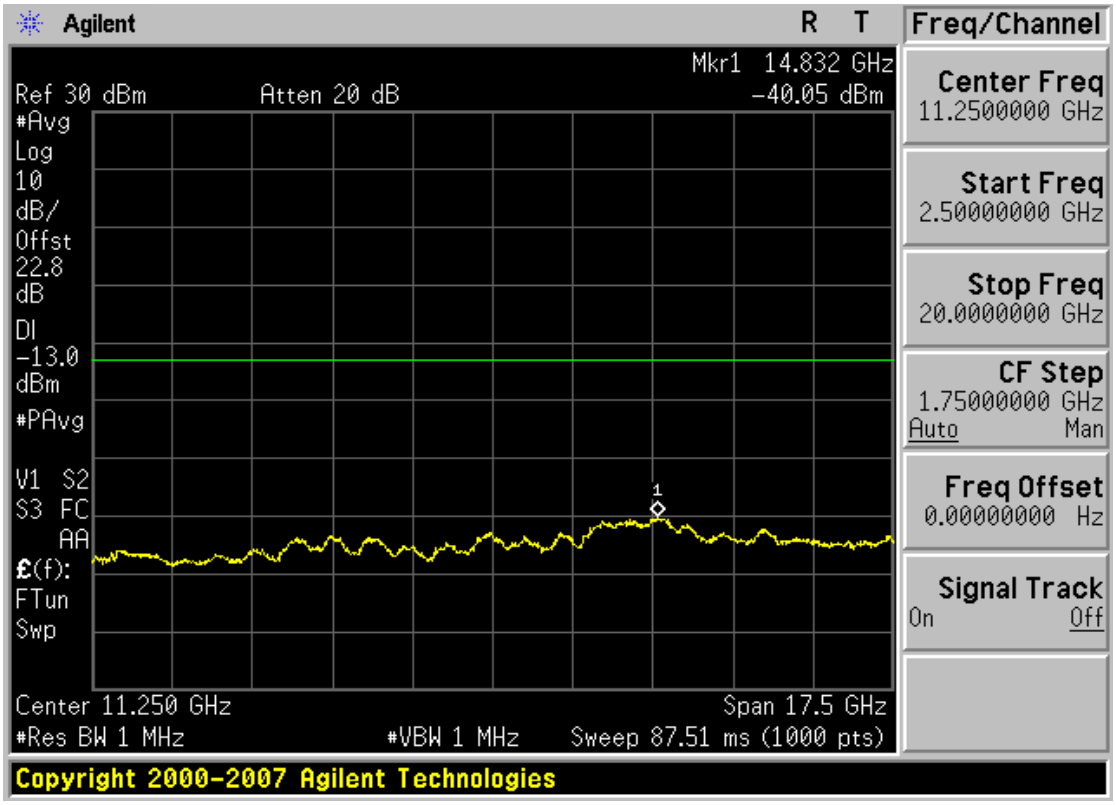
Plot 7-6. Occupied Bandwidth Plot (PCS GSM Mode – Ch. 661)



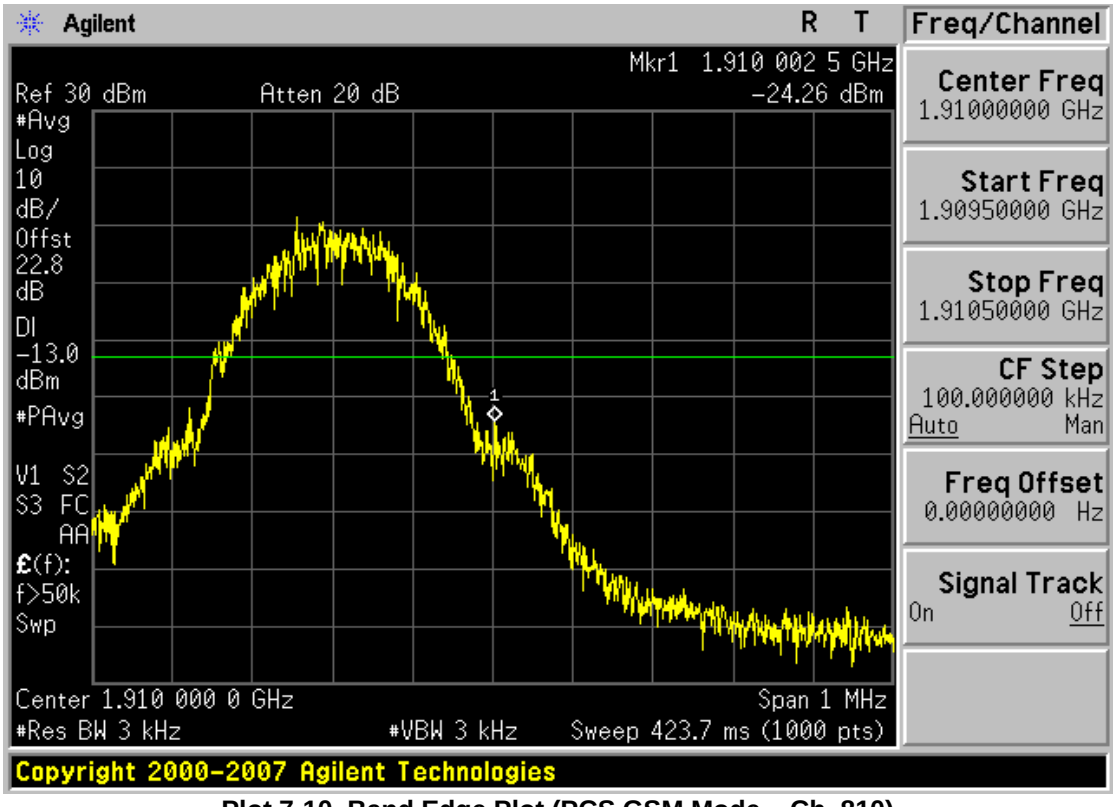
Plot 7-7. Peak-Average Ratio Plot (PCS GSM Mode – Ch. 661)



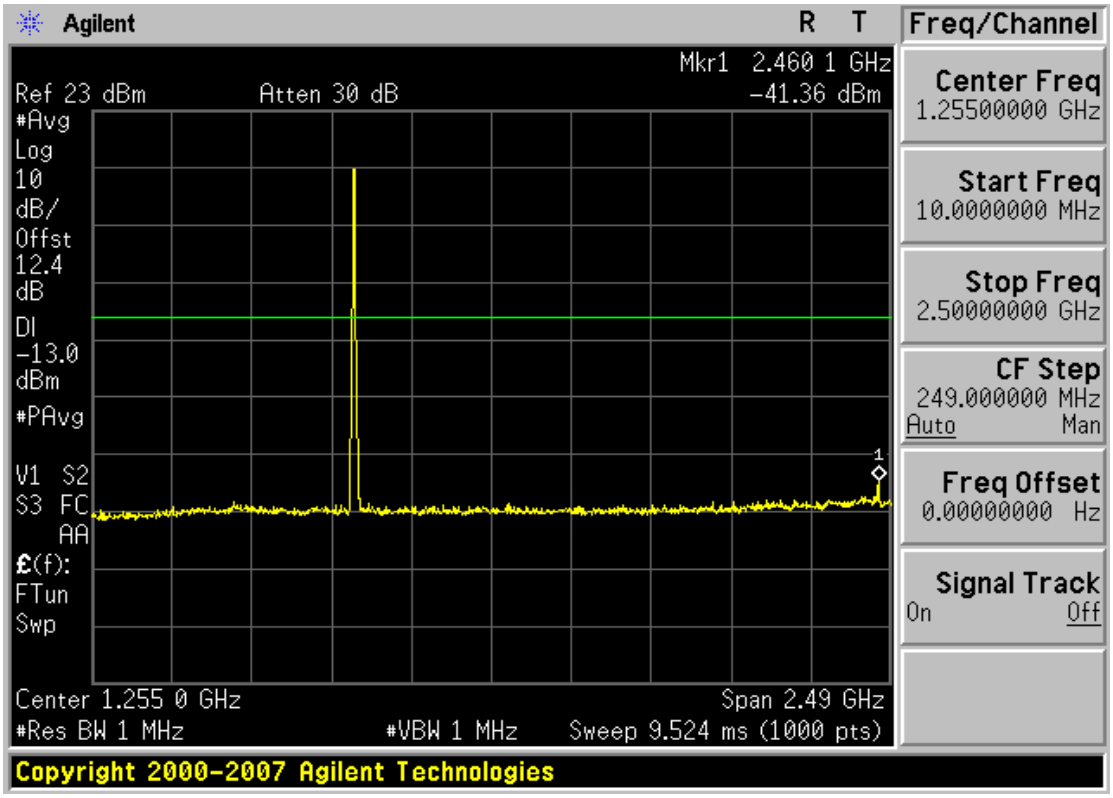
Plot 7-8. Conducted Spurious Plot (PCS GSM Mode – Ch. 810)



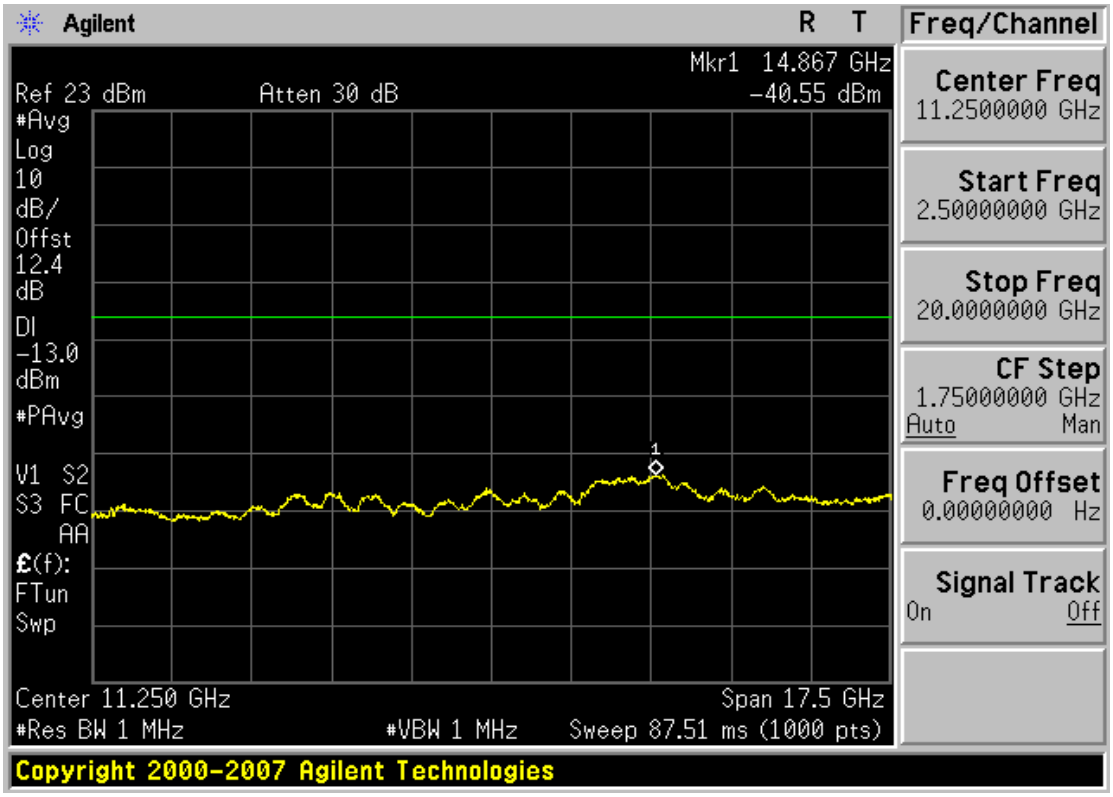
Plot 7-9. Conducted Spurious Plot (PCS GSM Mode – Ch. 810)



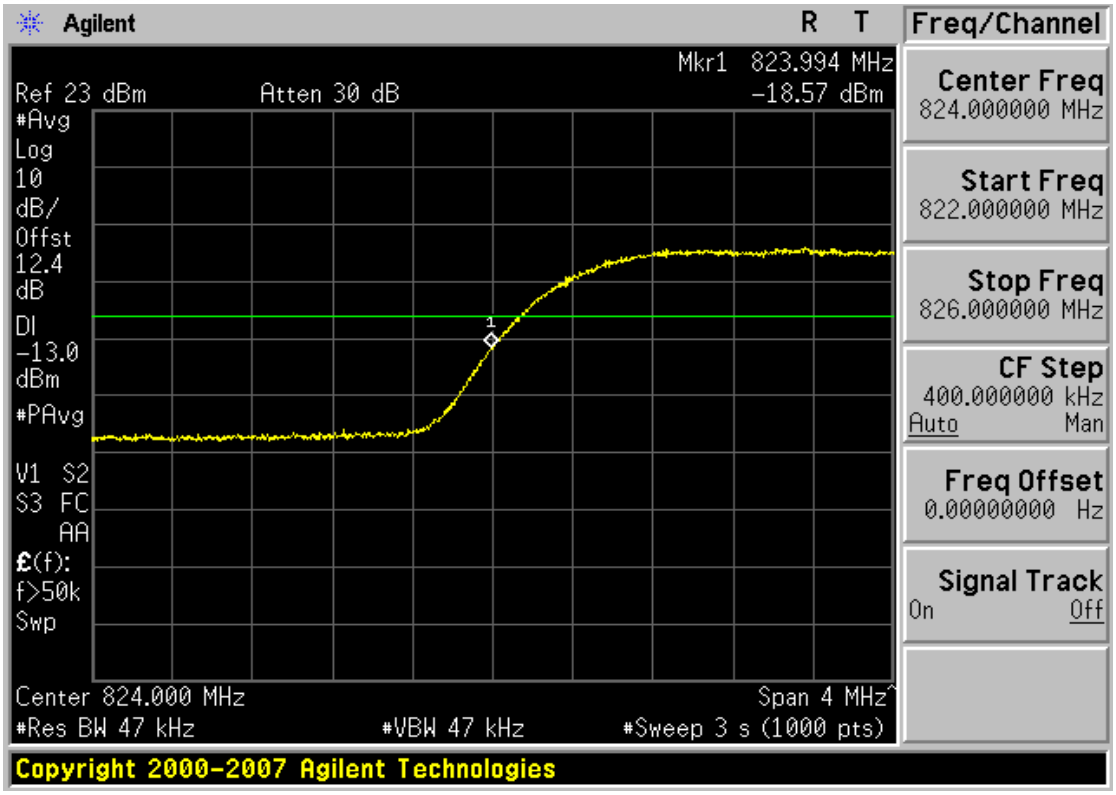
Plot 7-10. Band Edge Plot (PCS GSM Mode – Ch. 810)



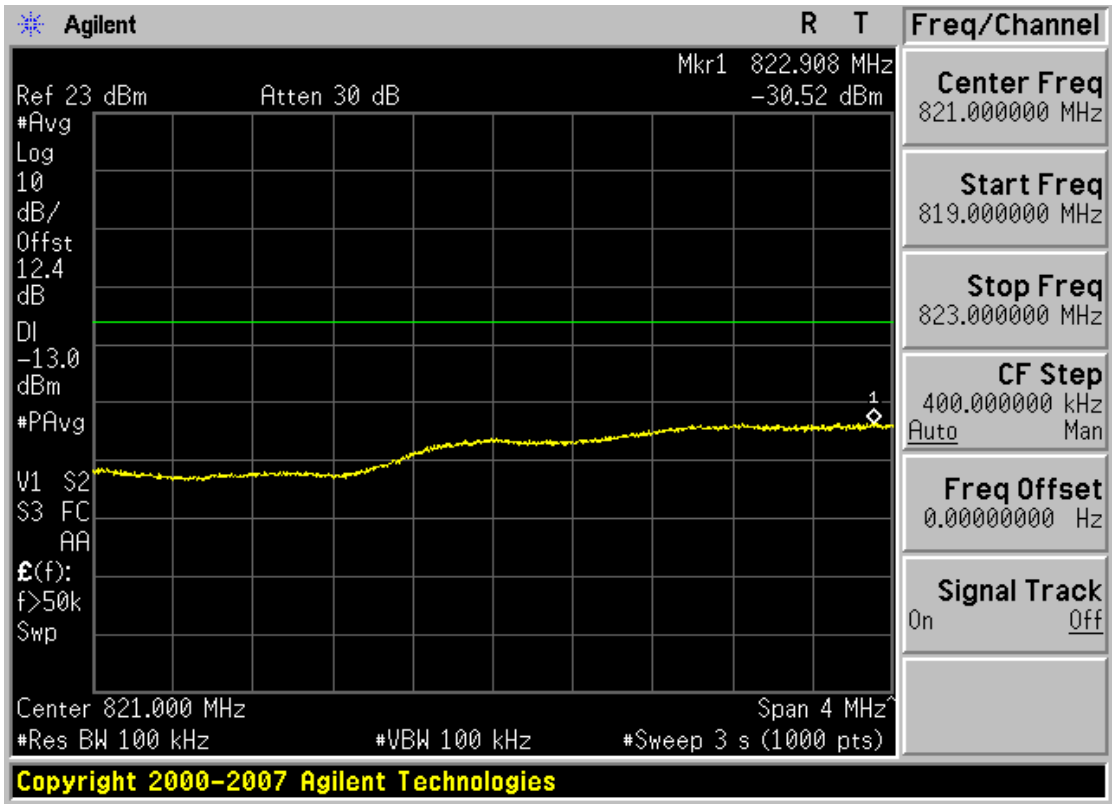
Plot 7-11. Conducted Spurious Plot (Cellular WCDMA Mode – Ch. 4132)



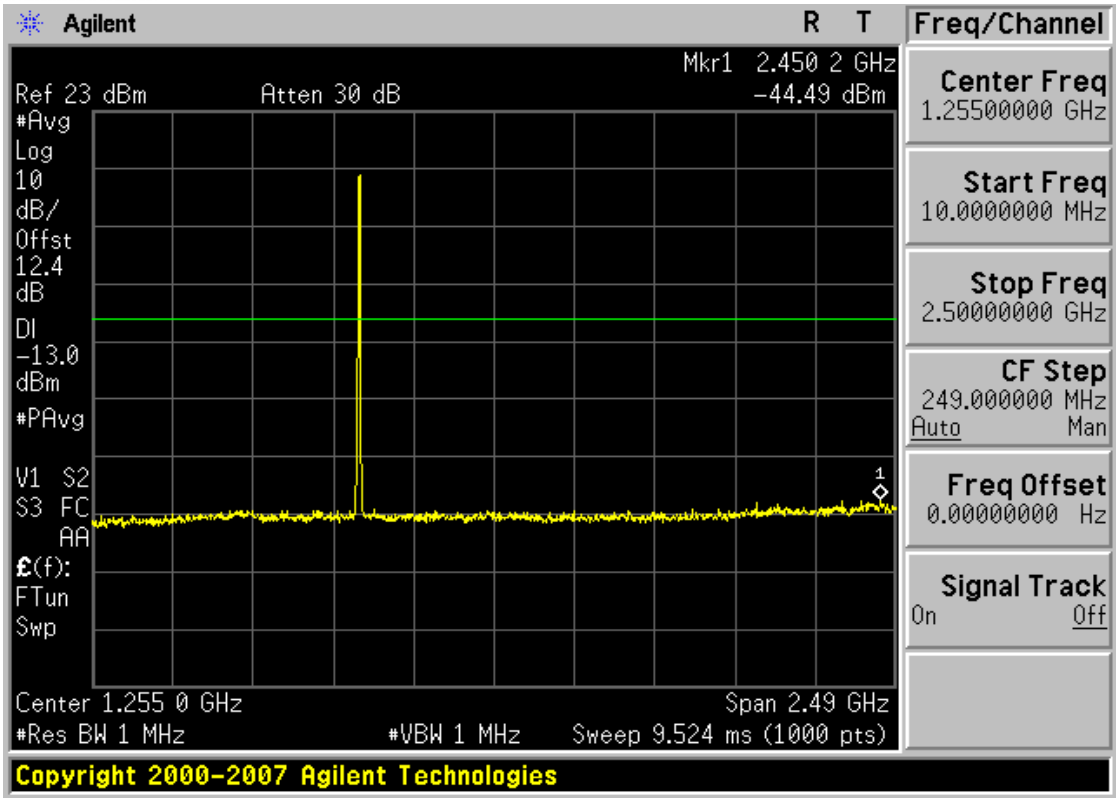
Plot 7-12. Conducted Spurious Plot (Cellular WCDMA Mode – Ch. 4132)



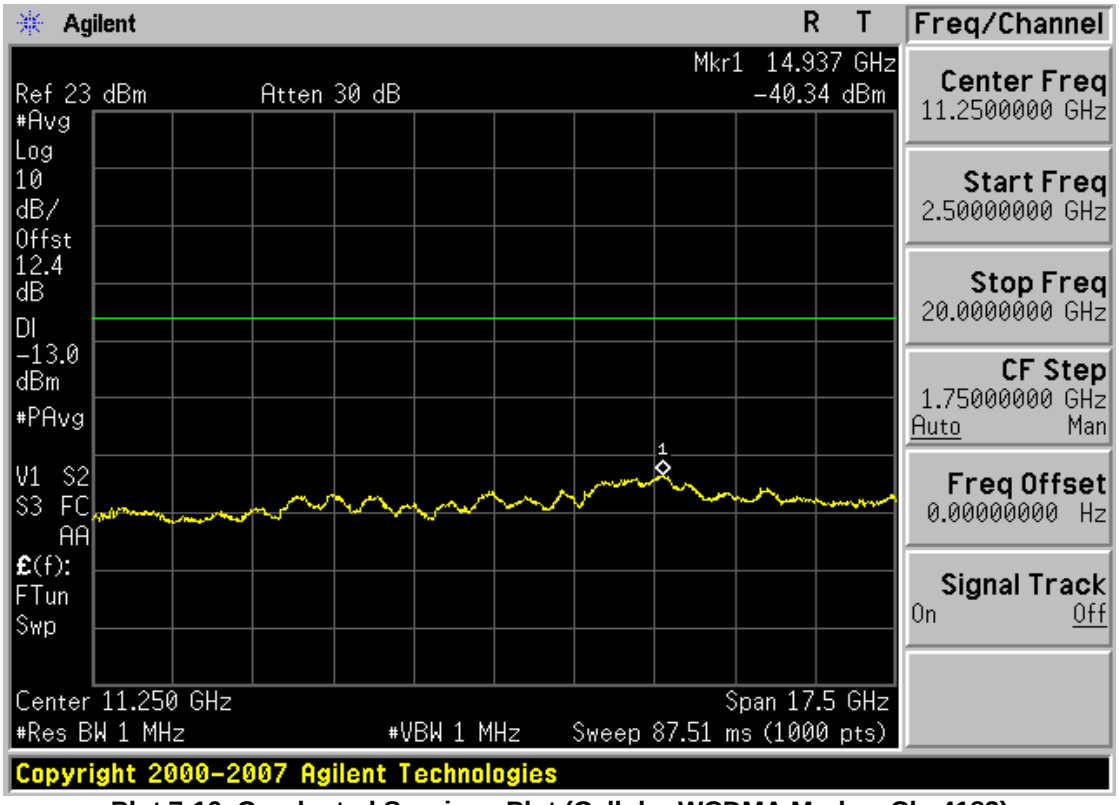
Plot 7-13. Band Edge Plot (Cellular WCDMA Mode – Ch. 4132)



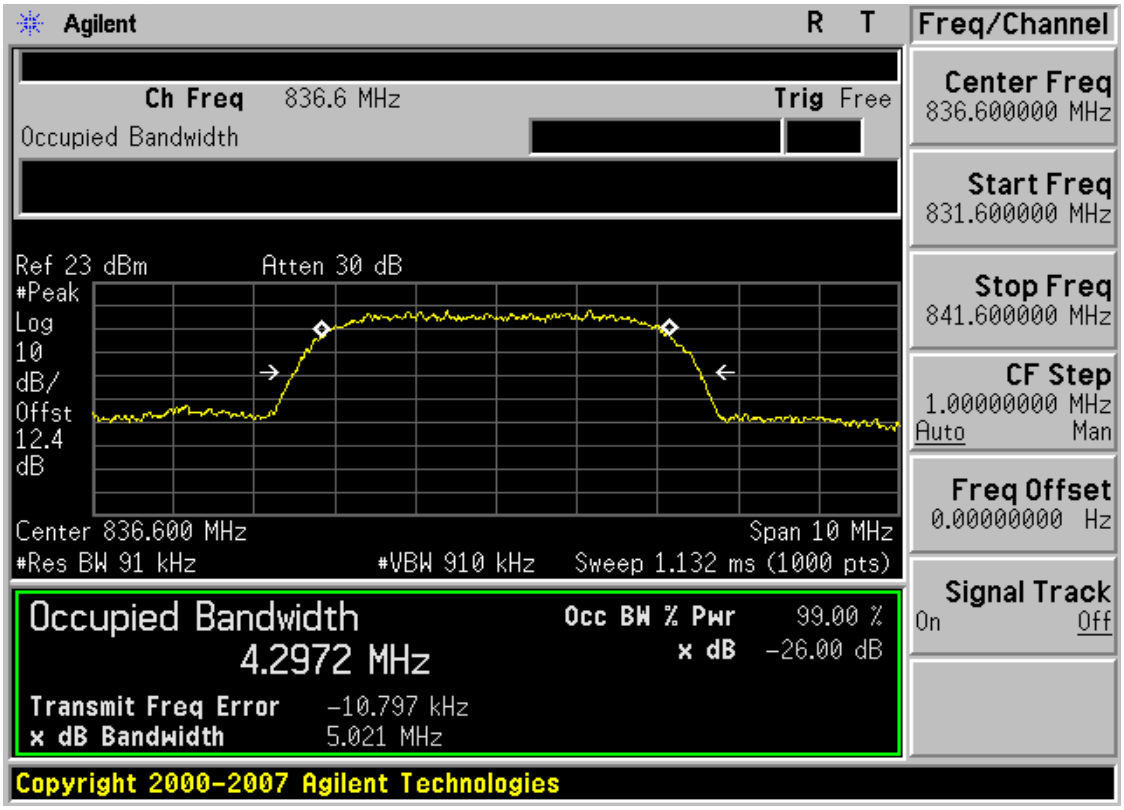
Plot 7-14. 4MHz Span Plot (Cellular WCDMA Mode – Ch. 4132)



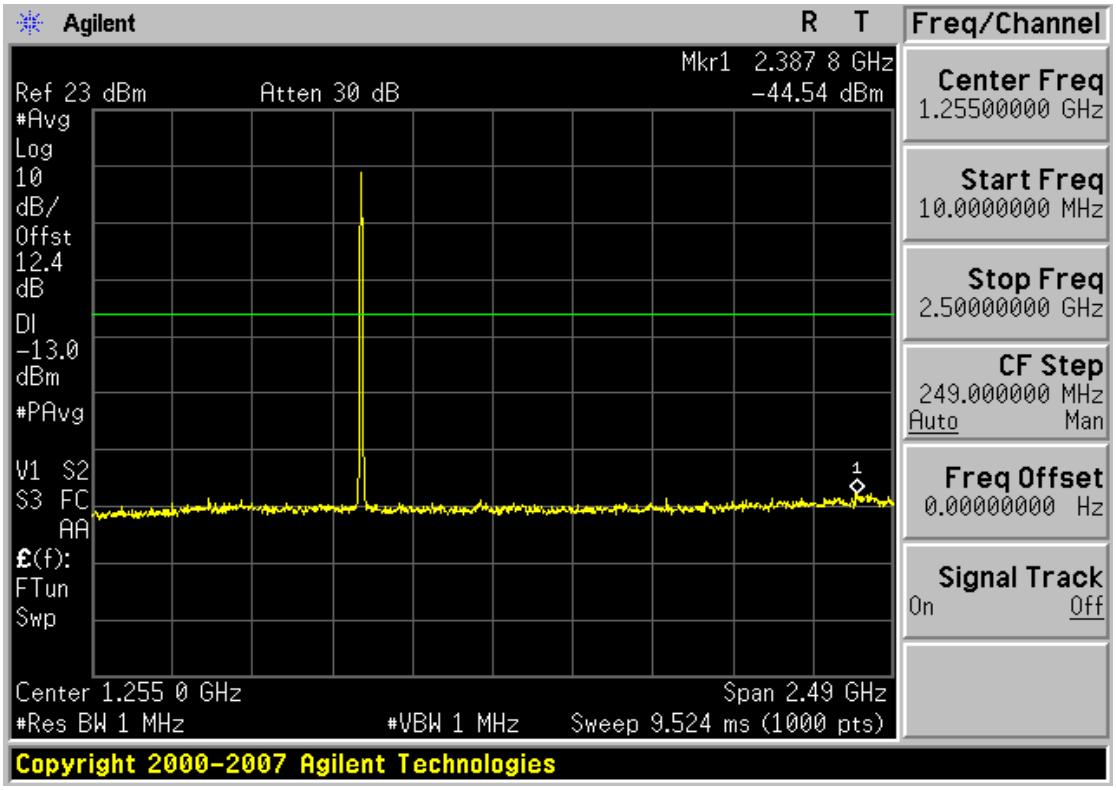
Plot 7-15. Conducted Spurious Plot (Cellular WCDMA Mode – Ch. 4183)



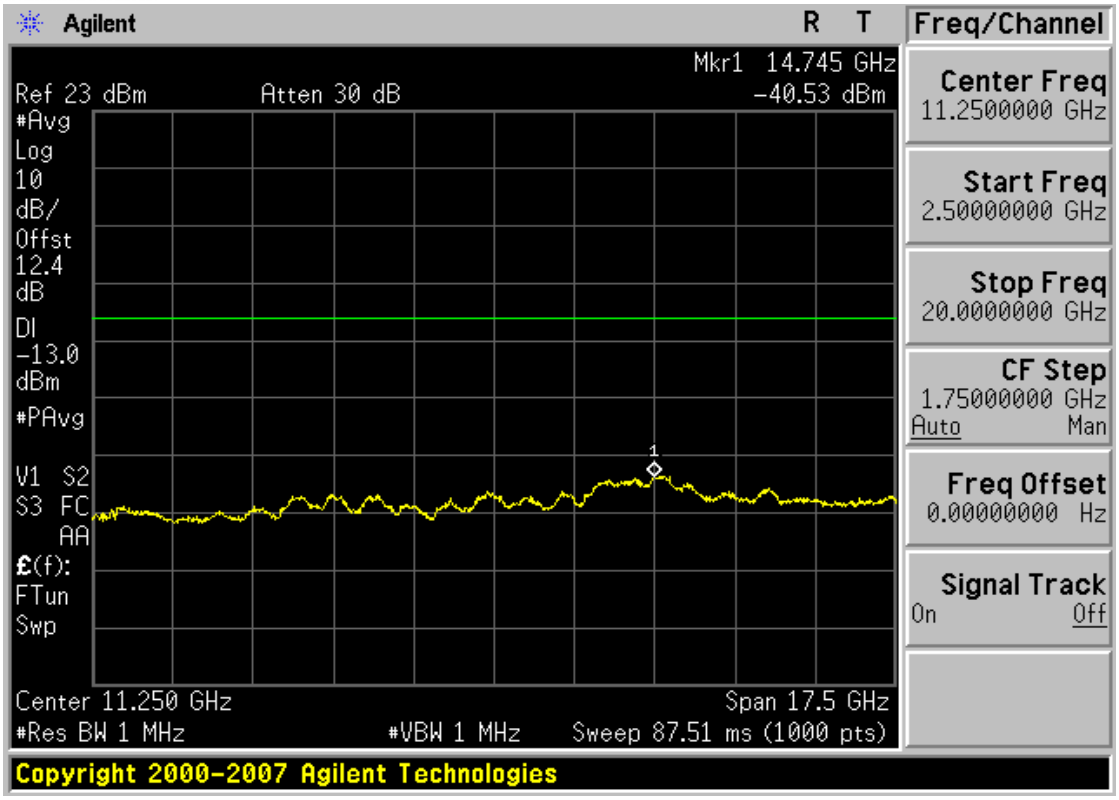
Plot 7-16. Conducted Spurious Plot (Cellular WCDMA Mode – Ch. 4183)



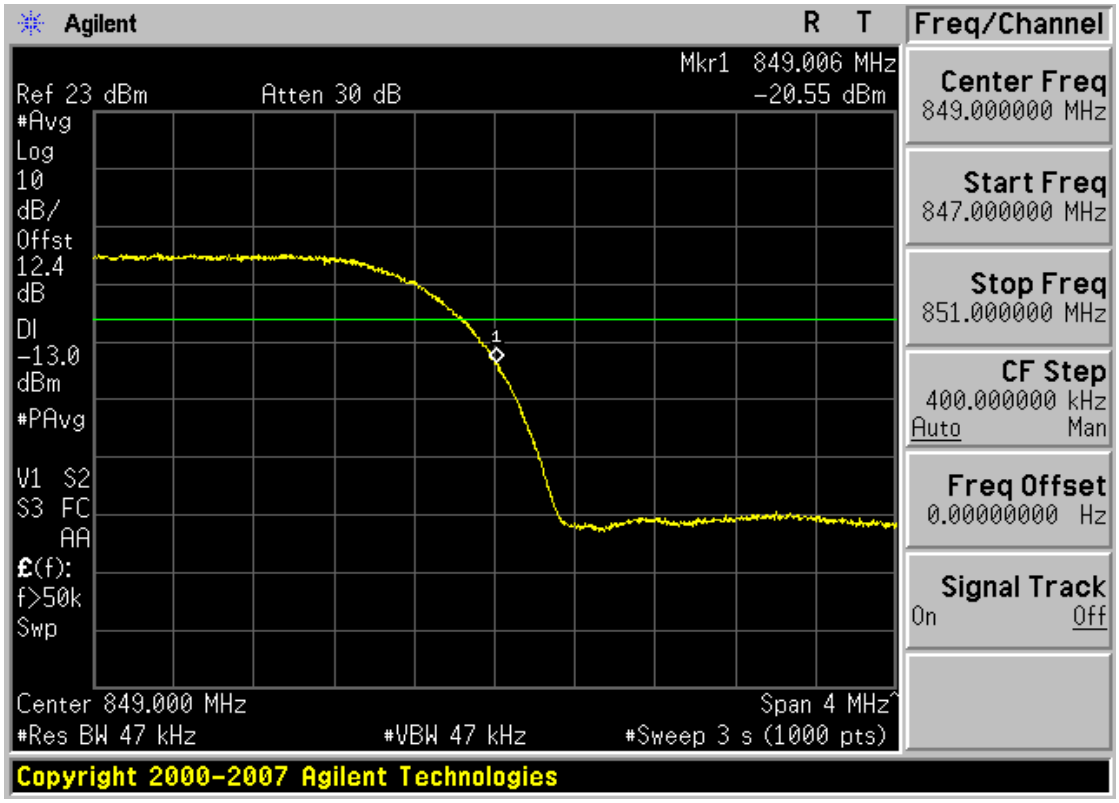
Plot 7-17. Occupied Bandwidth Plot (Cellular WCDMA Mode – Ch. 4183)



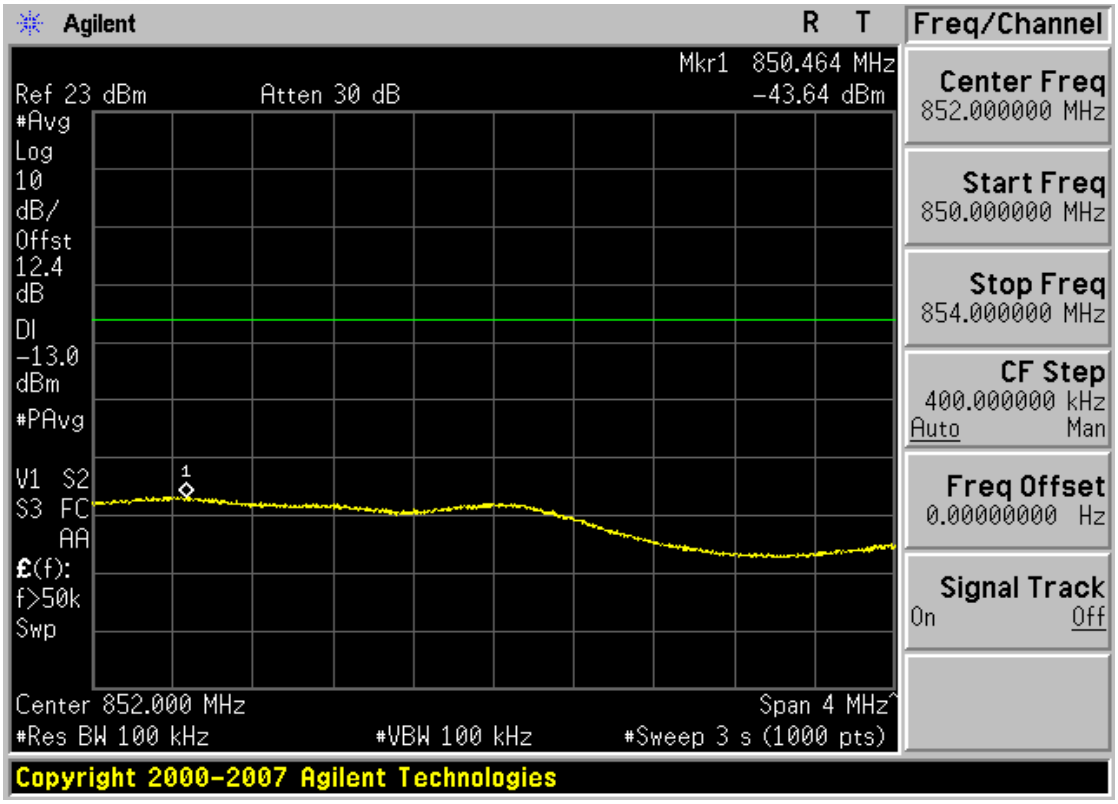
Plot 7-18. Conducted Spurious Plot (Cellular WCDMA Mode – Ch. 4233)



Plot 7-19. Conducted Spurious Plot (Cellular WCDMA Mode – Ch. 4233)



Plot 7-20. Band Edge Plot (Cellular WCDMA Mode – Ch. 4233)



Plot 7-21. 4MHz Span Plot (Cellular WCDMA Mode – Ch. 4233)

8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **NEC Portable Handset FCC ID: A98-HRG0037** complies with all the requirements of Parts 2, 22, and 24 of the FCC rules and RSS-132 and RSS-133 of the Industry Canada rules.