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MEASUREMENT REPORT
FCC Part 22, 24, & 27 / IC RSS-132/RSS-133/RSS-139

Applicant Name:
LG Electronics MobileComm U.S.A
1000 Sylvan Avenue
Englewood Cliffs, NJ 07632
United States

Date of Testing:
09/07/2012-09/26/2012
Test Site/Location:
PCTEST Lab., Columbia, MD, USA
Test Report Serial No.:
0Y1209051309.ZNF

FCC ID:	**ZNFMS870**
APPLICANT:	**LG ELECTRONICS MOBILECOMM U.S.A**

Application Type:	Certification
Model(s):	MS870, LG-MS870, LGMS870, LG-LW870, LGLW870, LW870
EUT Type:	Portable Handset
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
FCC Rule Part(s):	§2; §22(H), §24(E), §27(C)
Test Procedure(s):	ANSI/TIA-603-C-2004, KDB 971168
Test Device Serial No.:	*identical prototype* [S/N: RF1]

Mode	Tx Frequency (MHz)	Emission Designator	ERP/EIRP	
			Maximum Power (Watts)	Maximum Power (dBm)
CDMA850	824.70 - 848.31	1M27F9W	0.185	22.67
CDMA1700	1711.25 - 1753.75	1M27F9W	0.140	21.45
CDMA1900	1851.25 - 1908.75	1M27F9W	0.320	25.06

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

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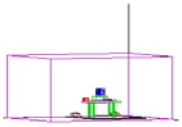
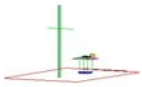


MEASUREMENT REPORT
FCC Part 22, 24, & 27



§2.1033 General Information

APPLICANT:	LG Electronics MobileComm U.S.A
APPLICANT ADDRESS:	1000 Sylvan Avenue Englewood Cliffs, NJ 07632
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), §27(C)(L)
IC SPECIFICATION(S):	RSS-132 Issue 2; RSS-133 Issue 5; RSS-139 Issue 2
BASE MODEL:	MS870
FCC ID:	ZNFMS870
FCC CLASSIFICATION:	PCS Licensed Transmitter Held to Ear (PCE)
MODE:	CDMA / EvDO
FREQUENCY TOLERANCE:	±0.00025 % (2.5 ppm)
Test Device Serial No.:	RF1 ☐ Production ☒ Pre-Production ☐ Engineering
DATE(S) OF TEST:	09/07/2012-09/26/2012
TEST REPORT S/N:	0Y1209051309.ZNF

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.

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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.

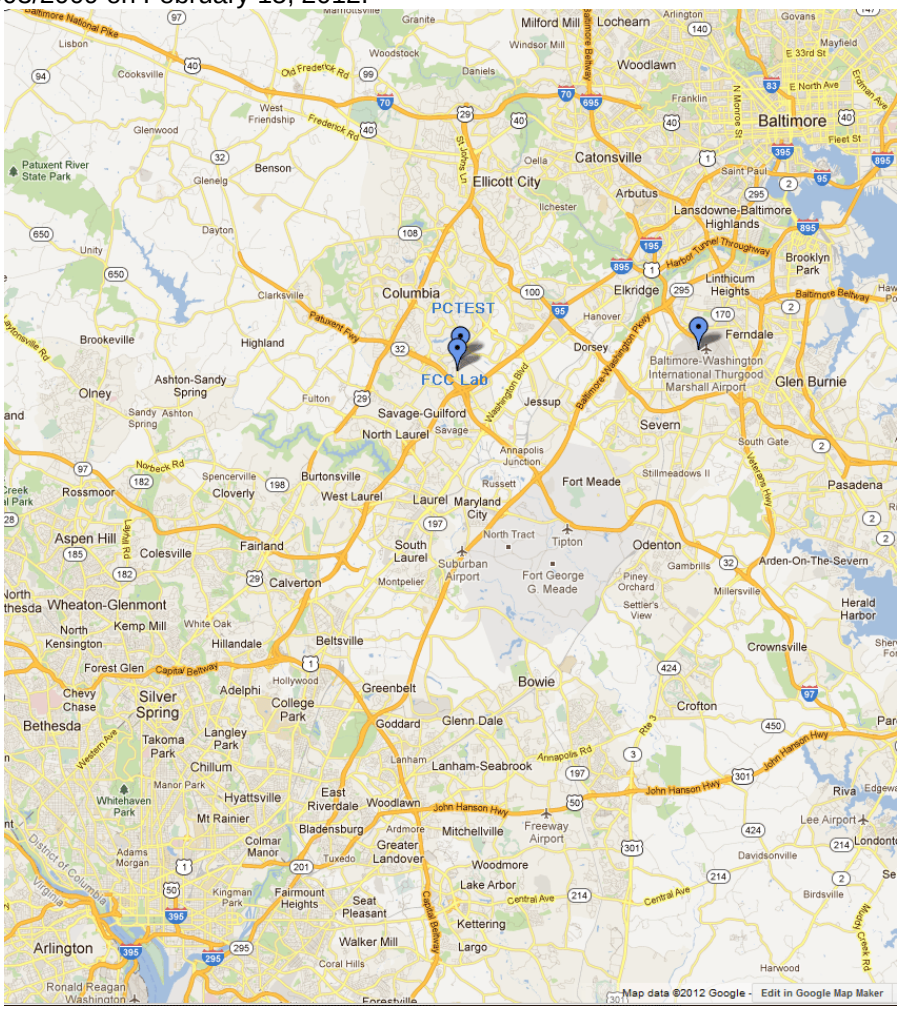

Figure 1-1. Map of the Greater Baltimore and Metropolitan Washington, D.C. area

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2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **LG Portable Handset FCC ID: ZNFMS870**. 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:

850/1700/1900 CDMA/EvDO Rev0/A (BC0, BC15, BC1), Band 2 (1.4, 3, 5, 10 Mhz), 4 (1.4, 3, 5, 10 Mhz), 25 (5, 10 Mhz) LTE, 802.11b/g/n WLAN, Bluetooth (1x,EDR)

2.3 Test Configuration

The LG Portable Handset FCC ID: ZNFMS870 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.

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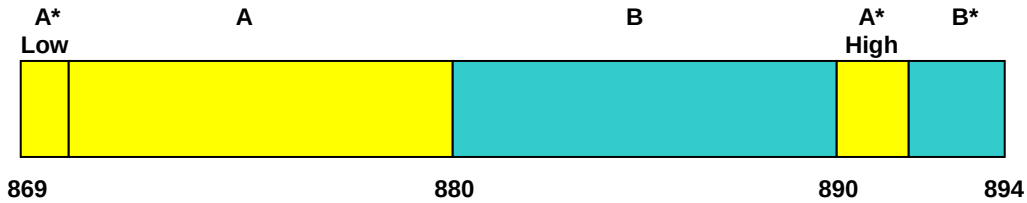
3.0 DESCRIPTION OF TESTS

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 **LG Portable Handset FCC ID: ZNFMS870.**

Deviation from Measurement Procedure……..None

3.2 Cellular - Base Frequency Blocks



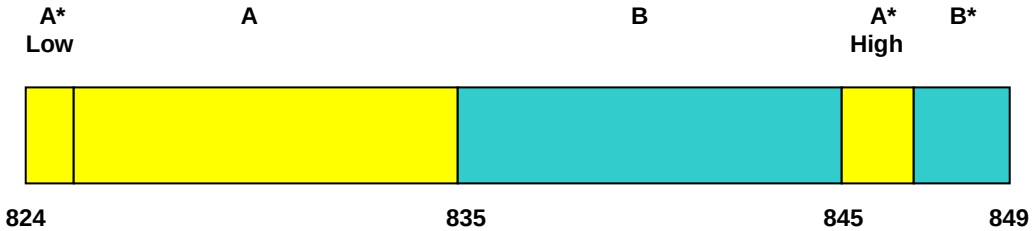
BLOCK 1: 869 – 880 MHz (A* Low + A)

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*)

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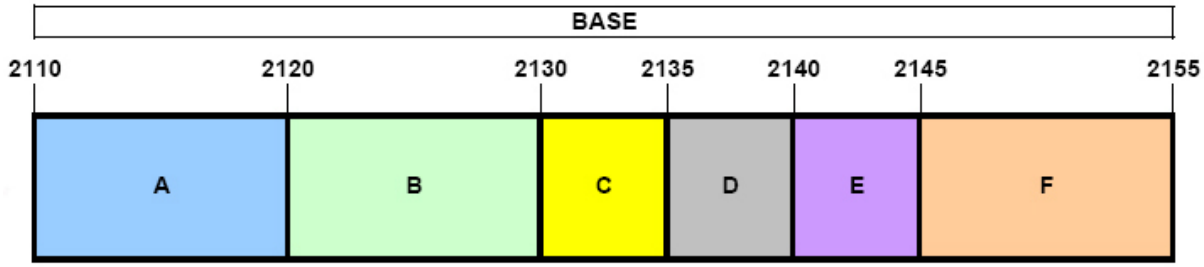
3.4 AWS - Base Frequency Blocks

§27.5(h)



BLOCK 1: 2110 – 2120 MHz (A)

BLOCK 2: 2120 – 2130 MHz (B)

BLOCK 3: 2130 – 2135 MHz (C)

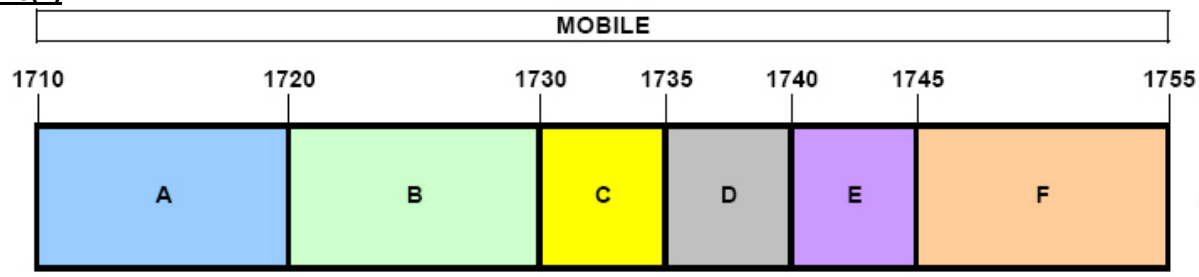
BLOCK 4: 2135 – 2140 MHz (D)

BLOCK 5: 2140 – 2145 MHz (E)

BLOCK 6: 2145 – 2155 MHz (E)

3.5 AWS - Mobile Frequency Blocks

§27.5(h)



BLOCK 1: 1710 – 1720 MHz (A)

BLOCK 2: 1720 – 1730 MHz (B)

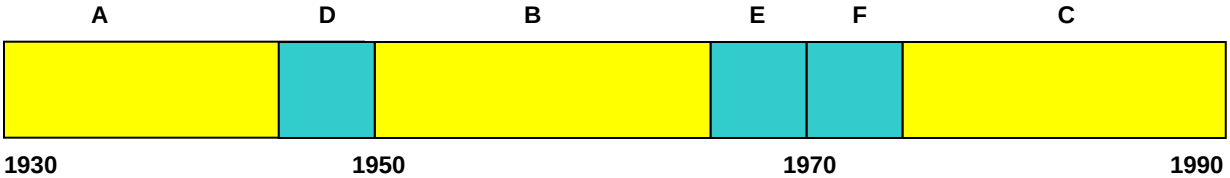
BLOCK 3: 1730 – 1735 MHz (C)

BLOCK 4: 1735 – 1740 MHz (D)

BLOCK 5: 1740 – 1745 MHz (E)

BLOCK 6: 1745 – 1755 MHz (F)

3.6 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)

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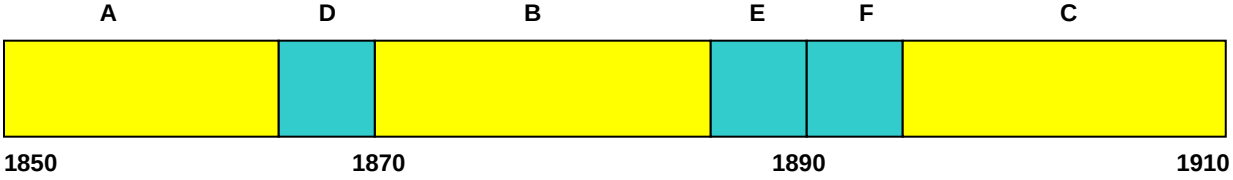
3.7 PCS - Mobile Frequency Blocks



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)

3.8 Occupied Bandwidth Emission Limits

§2.1049, 22.917(a)(b), 24.238(a)(b), §27.53(h)

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.

3.9 Spurious and Harmonic Emissions at Antenna Terminal

§2.1051, 22.917(a)(b), 24.238(a), §27.53(h)

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 10th 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 AWS and 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.

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3.10 Radiated Power and Radiated Spurious Emissions

§2.1053, 22.917(a), 22., 24.232(c), 24.238(a), §27.53(h)

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).

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3.11 Peak-Average Ratio
§24.232(d), §27.50(d)(5)

A peak to average ratio measurement is performed at the conducted port of the EUT. For CDMA signals, 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.

3.12 Frequency Stability / Temperature Variation
§2.1055, 22.355, 24.235, §27.54

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 sufficient stabilization period at each temperature shall be used prior to each frequency requirement.

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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
Agilent	N9030A	PXA Signal Analyzer	2/23/2012	Annual	2/23/2013	MY49432391
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	3160-09	18-26.5 GHz Standard Gain Horn	5/30/2012	Biennial	5/30/2014	135427
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	TS-PR26	18-26.5 GHz Pre-Amplifier	5/30/2012	Annual	5/30/2013	100040
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
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.

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5.0 SAMPLE CALCULATIONS

Emission Designator

Emission Designator = 1M25F9W

CDMA BW = 1.25 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: Channel 25 PCS Mode 2nd Harmonic (3702.50 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 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 25.50 dBm so this harmonic was 25.50 dBm – (-24.80) = 50.3 dBc.

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6.0 TEST RESULTS

6.1 Summary

Company Name: LG Electronics MobileComm U.S.A

FCC ID: ZNFMS870

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

Mode(s): CDMA / EvDO

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), 27.53(g)(1)	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), 27.53(g)	RSS-132 (4.5.1) RSS-133 (6.5.1) RSS-139 (6.5)	Band Edge / Conducted Spurious Emissions	< 43 + 10log$_{10}$ (P[Watts]) at Band Edge and for all out-of-band emissions		PASS	Section 7.0
24.232(d), 27.50(d)(5)	RSS-133 (6.4) RSS-139 (6.4)	Peak-Average Ratio	< 13 dB		PASS	Section 7.0
2.1046	RSS-132 (4.4) RSS-133 (4.1) RSS-139 (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), 27.50(d)(4)	RSS-133 (6.4) [SRSP-510 (5.1.2)] RSS-139 (6.4)	Equivalent Isotropic Radiated Power	< 2 Watts max. EIRP (PCS) < 1 Watt max. EIRP (AWS)		PASS	Section 6.3
2.1053, 22.917(a), 24.238(a), 27.53(g)	RSS-132 (4.5.1) RSS-133 (6.5.1) RSS-139 (6.5)	Undesirable Emissions	< 43 + 10log$_{10}$ (P[Watts]) for all out-of-band emissions		PASS	Sections 6.4, 6.5, 6.6
2.1055, 22.355, 24.235, 27.54	RSS-132 (4.3) RSS-133 (6.3) RSS-139 (6.3)	Frequency Stability	< 2.5 ppm (Part 22) Emission must remain in band (Part 24)		PASS	Sections 6.7, 6.8, 6.9

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.

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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]
824.70	CDMA850	Standard	15.13	4.66	H	19.79	0.095	38.45	-18.66
836.52	CDMA850	Standard	17.87	4.80	H	22.67	0.185	38.45	-15.78
848.31	CDMA850	Standard	16.96	4.95	H	21.91	0.155	38.45	-16.54

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

6.3 Equivalent Isotropic Radiated Power Output Data

§24.232(c), §27.50(d)(2); RSS-133 (6.4) [SRSP-510 (5.1.2)], RSS-139 (6.4)

Frequency [MHz]	Mode	Battery Type	Substitute Level [dBm]	Antenna Gain [dBi]	Pol [H/V]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1711.25	CDMA1700	Standard	12.65	8.47	H	21.12	0.129	30.00	-8.88
1732.50	CDMA1700	Standard	12.62	8.54	H	21.16	0.131	30.00	-8.84
1753.75	CDMA1700	Standard	12.85	8.60	H	21.45	0.140	30.00	-8.55

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

Frequency [MHz]	Mode	Battery Type	Substitute Level [dBm]	Antenna Gain [dBi]	Pol [H/V]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1851.25	CDMA1900	Standard	16.50	8.56	H	25.06	0.320	33.01	-7.95
1880.00	CDMA1900	Standard	16.12	8.55	H	24.67	0.293	33.01	-8.34
1908.75	CDMA1900	Standard	14.91	8.53	H	23.44	0.221	33.01	-9.57

Table 6-4. Equivalent Isotropic Radiated Power Output Data (PCS Band)

NOTES:

1. 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.

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 horizontal setup. The data reported in the table above was measured in this test setup.

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6.4 Cellular CDMA Radiated Measurements

§2.1053, 22.917(a); RSS-132 (4.5.1)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:	824.70	MHz		
CHANNEL:	1013			
MEASURED OUTPUT POWER:	19.79	dBm	=	0.095 W
MODULATION SIGNAL:	CDMA			
DISTANCE:	3	meters		
LIMIT:	43 + 10 log10 (W) =	32.79	dBc	

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
1649.40	-61.32	2.59	-58.74	H	78.5
2474.10	-60.24	2.89	-57.35	H	77.1
3298.80	-116.96	5.45	-111.50	H	131.3
4123.50	-116.49	7.05	-109.44	H	129.2
4948.20	-116.47	7.87	-108.61	H	128.4

Table 6-5. Radiated Spurious Data (Cellular CDMA Mode – Ch. 1013)

NOTES:

1. 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.

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 horizontal setup. The data reported in the table above was measured in this test setup.

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Cellular CDMA Radiated Measurements (Cont'd)

§2.1053, 22.917(a)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:	836.52	MHz		
CHANNEL:	384			
MEASURED OUTPUT POWER:	22.67	dBm	=	0.185 W
MODULATION SIGNAL:	CDMA			
DISTANCE:	3	meters		
LIMIT:	43 + 10 log10 (W) =	35.67	dBc	

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
1673.04	-60.15	2.34	-57.81	H	80.5
2509.56	-58.18	2.84	-55.34	H	78.0
3346.08	-117.28	5.64	-111.63	H	134.3
4182.60	-116.71	7.14	-109.57	H	132.2
5019.12	-116.44	7.97	-108.48	H	131.2

Table 6-6. Radiated Spurious Data (Cellular CDMA Mode – Ch. 384)

NOTES:

1. 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.

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 horizontal setup. The data reported in the table above was measured in this test setup.

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Cellular CDMA Radiated Measurements (Cont'd)

§2.1053, 22.917(a)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:	848.31	MHz		
CHANNEL:	777			
MEASURED OUTPUT POWER:	21.91	dBm	=	0.155 W
MODULATION SIGNAL:	CDMA			
DISTANCE:	3	meters		
LIMIT:	43 + 10 log10 (W) =	34.91	dBc	

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
1696.62	-56.27	2.09	-54.18	H	76.1
2544.93	-56.83	3.16	-53.67	H	75.6
3393.24	-117.59	5.83	-111.76	H	133.7
4241.55	-116.94	7.24	-109.70	H	131.6
5089.86	-116.25	8.02	-108.23	H	130.1

Table 6-7. Radiated Spurious Data (Cellular CDMA Mode – Ch. 777)

NOTES:

1. 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.

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 horizontal setup. The data reported in the table above was measured in this test setup.

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6.5 AWS CDMA Radiated Measurements
§2.1053, 27.53(g)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY: 1711.25 MHz
CHANNEL: 25
MEASURED OUTPUT POWER: 21.12 dBm = 0.129 W
MODULATION SIGNAL: CDMA
DISTANCE: 3 meters
LIMIT: 43 + 10 log10 (W) = 34.12 dBc

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
3422.50	-62.14	8.10	-54.03	H	75.2
5133.75	-66.25	10.21	-56.04	H	77.2
6845.00	-61.95	11.32	-50.63	H	71.7
8556.25	-65.96	13.02	-52.94	H	74.1
10267.50	-56.81	13.02	-43.79	H	64.9

Table 6-8. Radiated Spurious Data (AWS CDMA Mode – Ch. 25)

NOTES:

1. 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.

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 horizontal setup. The data reported in the table above was measured in this test setup.

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AWS CDMA Radiated Measurements (Cont'd)
§2.1053, 27.53(g)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:	1732.50	MHz		
CHANNEL:	450			
MEASURED OUTPUT POWER:	21.16	dBm	=	0.131 W
MODULATION SIGNAL:	CDMA			
DISTANCE:	3	meters		
LIMIT:	43 + 10 log10 (W) =	34.16	dBc	

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
3465.00	-62.83	8.26	-54.57	H	75.7
5197.50	-66.50	10.26	-56.25	H	77.4
6930.00	-62.70	11.42	-51.28	H	72.4
8662.50	-65.92	13.07	-52.85	H	74.0
10395.00	-54.76	13.12	-41.65	H	62.8

Table 6-9. Radiated Spurious Data (AWS CDMA Mode – Ch. 450)

NOTES:

1. 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.

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 horizontal setup. The data reported in the table above was measured in this test setup.

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AWS CDMA Radiated Measurements (Cont'd)
§2.1053, 27.53(g)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:	1753.75	MHz		
CHANNEL:	875			
MEASURED OUTPUT POWER:	21.45	dBm	=	0.140 W
MODULATION SIGNAL:	CDMA			
DISTANCE:	3	meters		
LIMIT:	43 + 10 log10 (W) =	34.45	dBc	

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
3507.50	-63.67	8.40	-55.27	H	76.7
5261.25	-65.24	10.31	-54.93	H	76.4
7015.00	-61.05	11.51	-49.54	H	71.0
8768.75	-65.62	13.11	-52.51	H	74.0
10522.50	-58.09	13.20	-44.89	H	66.3

Table 6-10. Radiated Spurious Data (AWS CDMA Mode – Ch. 875)

NOTES:

1. 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.

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 horizontal setup. The data reported in the table above was measured in this test setup.

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6.6 PCS CDMA Radiated Measurements
§2.1053, 24.238(a)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY: 1851.25 MHz
CHANNEL: 25
MEASURED OUTPUT POWER: 25.06 dBm = 0.320 W
MODULATION SIGNAL: CDMA
DISTANCE: 3 meters
LIMIT: 43 + 10 log10 (W) = 38.06 dBc

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
3702.50	-64.12	8.40	-55.72	H	80.8
5553.75	-66.35	10.62	-55.73	H	80.8
7405.00	-58.06	11.82	-46.23	H	71.3
9256.25	-63.36	13.30	-50.06	H	75.1
11107.50	-54.07	13.50	-40.57	H	65.6

Table 6-11. Radiated Spurious Data (PCS CDMA Mode – Ch. 25)

NOTES:

1. 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.

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 horizontal setup. The data reported in the table above was measured in this test setup.

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PCS CDMA Radiated Measurements (Cont'd)

§2.1053, 24.238(a)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:	1880.00	MHz		
CHANNEL:	600			
MEASURED OUTPUT POWER:	24.67	dBm	=	0.293 W
MODULATION SIGNAL:	CDMA			
DISTANCE:	3	meters		
LIMIT:	43 + 10 log10 (W) =	37.67	dBc	

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
3760.00	-65.34	8.42	-56.92	H	81.6
5640.00	-67.12	10.66	-56.46	H	81.1
7520.00	-57.25	11.92	-45.33	H	70.0
9400.00	-63.05	13.24	-49.81	H	74.5
11280.00	-59.25	13.49	-45.76	H	70.4

Table 6-12. Radiated Spurious Data (PCS CDMA Mode – Ch. 600)

NOTES:

1. 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.

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 horizontal setup. The data reported in the table above was measured in this test setup.

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PCS CDMA Radiated Measurements (Cont'd)

§2.1053, 24.238(a)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY: 1908.75 MHz
CHANNEL: 1175
MEASURED OUTPUT POWER: 23.44 dBm = 0.221 W
MODULATION SIGNAL: CDMA
DISTANCE: 3 meters
LIMIT: 43 + 10 log10 (W) = 36.44 dBc

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
3817.50	-64.43	8.57	-55.86	H	79.3
5726.25	-66.67	10.69	-55.98	H	79.4
7635.00	-55.35	12.06	-43.29	H	66.7
9543.75	-61.23	13.20	-48.03	H	71.5
11452.50	-60.29	13.42	-46.87	H	70.3

Table 6-13. Radiated Spurious Data (PCS CDMA Mode – Ch. 1175)

NOTES:

1. 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.

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 horizontal setup. The data reported in the table above was measured in this test setup.

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6.7 Cellular CDMA Frequency Stability Measurements

§2.1055, 22.355

OPERATING FREQUENCY: 836,520,000 Hz

CHANNEL: 384

REFERENCE VOLTAGE: 3.8 VDC

DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (ºC)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	836,519,984	-16	-0.000002
100 %		- 30	836,520,010	10	0.000001
100 %		- 20	836,519,988	-12	-0.000001
100 %		- 10	836,519,992	-8	-0.000001
100 %		0	836,519,980	-20	-0.000002
100 %		+ 10	836,520,009	9	0.000001
100 %		+ 20	836,520,014	14	0.000002
100 %		+ 30	836,520,006	6	0.000001
100 %		+ 40	836,519,992	-8	-0.000001
100 %		+ 50	836,520,019	19	0.000002
115 %	4.37	+ 20	836,519,998	-2	0.000000
BATT. ENDPOINT	3.50	+ 20	836,519,980	-20	-0.000002

Table 6-14. Frequency Stability Data (Cellular CDMA Mode – Ch. 384)

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Cellular CDMA Frequency Stability Measurements (Cont'd)

§2.1055, 22.355

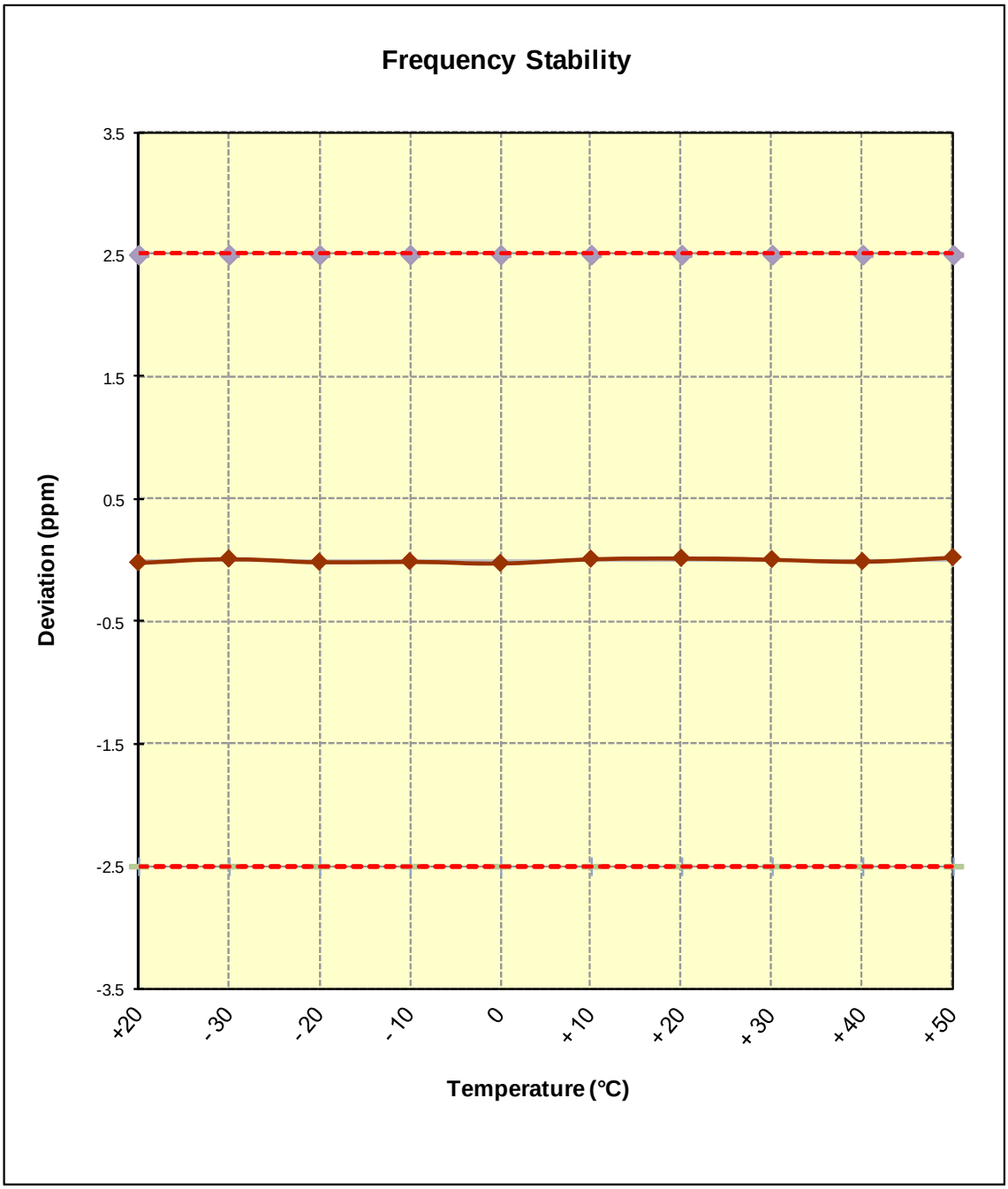

Figure 6-1. Frequency Stability Graph (Cellular CDMA Mode – Ch. 384)

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6.8 AWS CDMA Frequency Stability Measurements

§2.1055, 27.54

OPERATING FREQUENCY: 1,732,500,000 Hz

CHANNEL: 450

REFERENCE VOLTAGE: 3.8 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	1,732,500,011	11	0.000001
100 %		- 30	1,732,499,980	-20	-0.000001
100 %		- 20	1,732,499,991	-9	-0.000001
100 %		- 10	1,732,499,987	-13	-0.000001
100 %		0	1,732,500,000	0	0.000000
100 %		+ 10	1,732,499,985	-15	-0.000001
100 %		+ 20	1,732,499,982	-18	-0.000001
100 %		+ 30	1,732,500,015	15	0.000001
100 %		+ 40	1,732,500,005	5	0.000000
100 %		+ 50	1,732,499,983	-17	-0.000001
115 %	4.37	+ 20	1,732,500,013	13	0.000001
BATT. ENDPOINT	3.50	+ 20	1,732,499,995	-5	0.000000

Table 6-15. Frequency Stability Data (AWS CDMA Mode – Ch. 450)

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AWS CDMA Frequency Stability Measurements (Cont'd)
§2.1055, 27.54

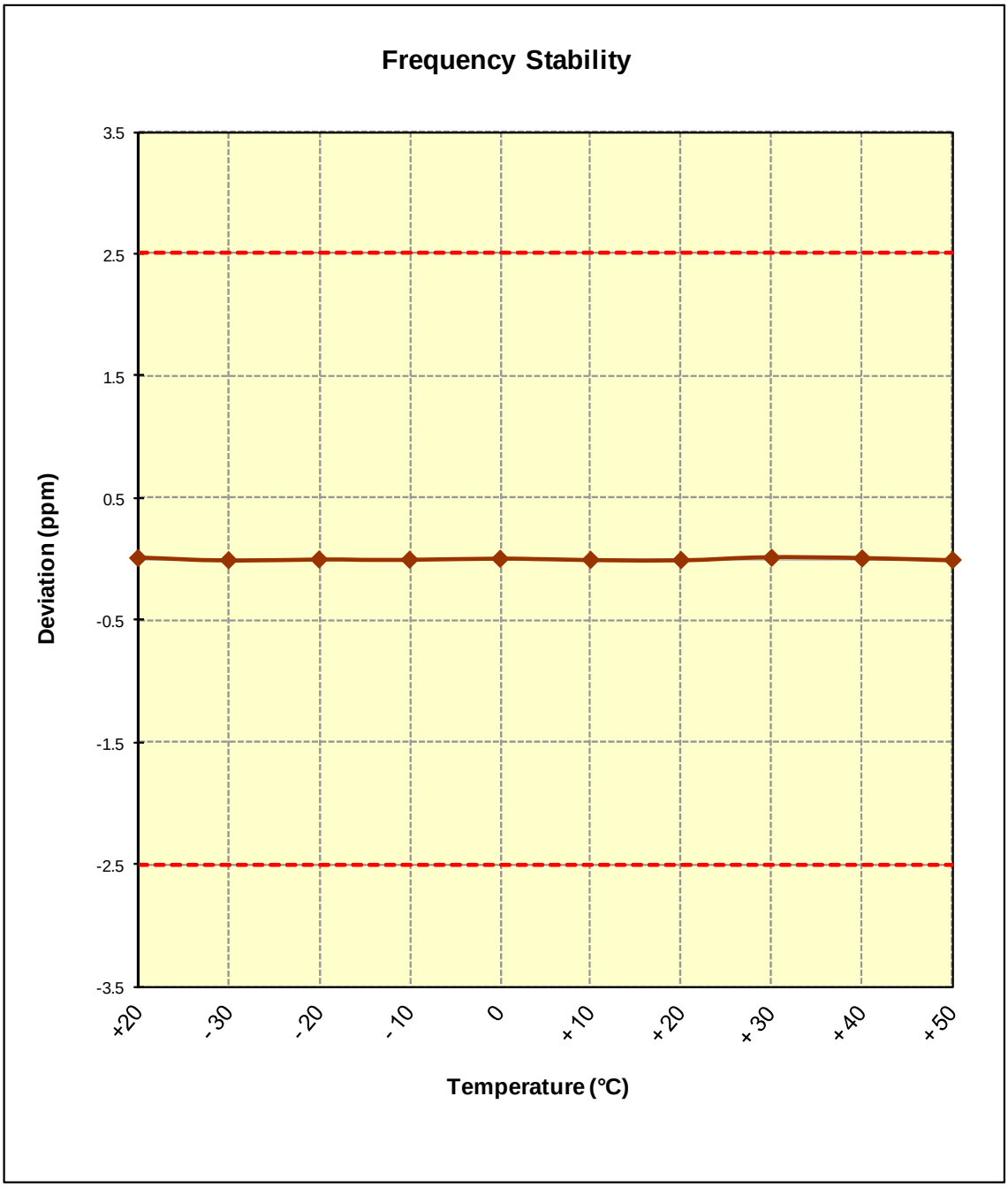

Figure 6-2. Frequency Stability Graph (AWS CDMA Mode – Ch. 450)

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6.9 PCS CDMA Frequency Stability Measurements

§2.1055, 24.235

OPERATING FREQUENCY: 1,880,000,000 Hz

CHANNEL: 600

REFERENCE VOLTAGE: 3.8 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (ºC)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	1,880,000,002	2	0.000000
100 %		- 30	1,880,000,010	10	0.000001
100 %		- 20	1,879,999,988	-12	-0.000001
100 %		- 10	1,880,000,006	6	0.000000
100 %		0	1,880,000,016	16	0.000001
100 %		+ 10	1,879,999,983	-17	-0.000001
100 %		+ 20	1,879,999,995	-5	0.000000
100 %		+ 30	1,880,000,018	18	0.000001
100 %		+ 40	1,879,999,994	-6	0.000000
100 %		+ 50	1,879,999,986	-14	-0.000001
115 %	4.37	+ 20	1,879,999,985	-15	-0.000001
BATT. ENDPOINT	3.50	+ 20	1,879,999,987	-13	-0.000001

Table 6-16. Frequency Stability Data (PCS CDMA Mode – Ch. 600)

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PCS CDMA Frequency Stability Measurements (Cont'd)

§2.1055, 24.235

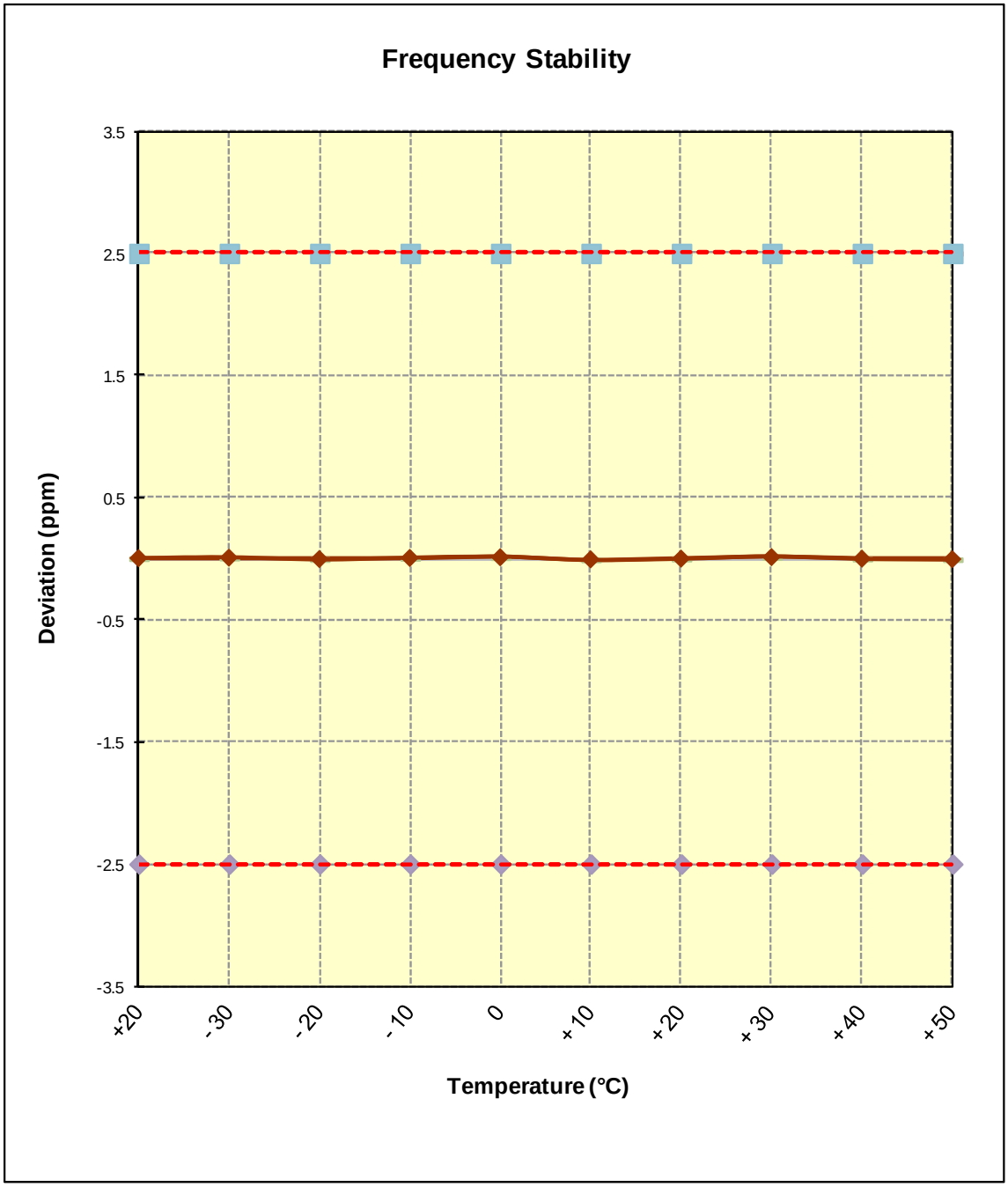

Figure 6-3. Frequency Stability Graph (PCS CDMA Mode – Ch. 600)

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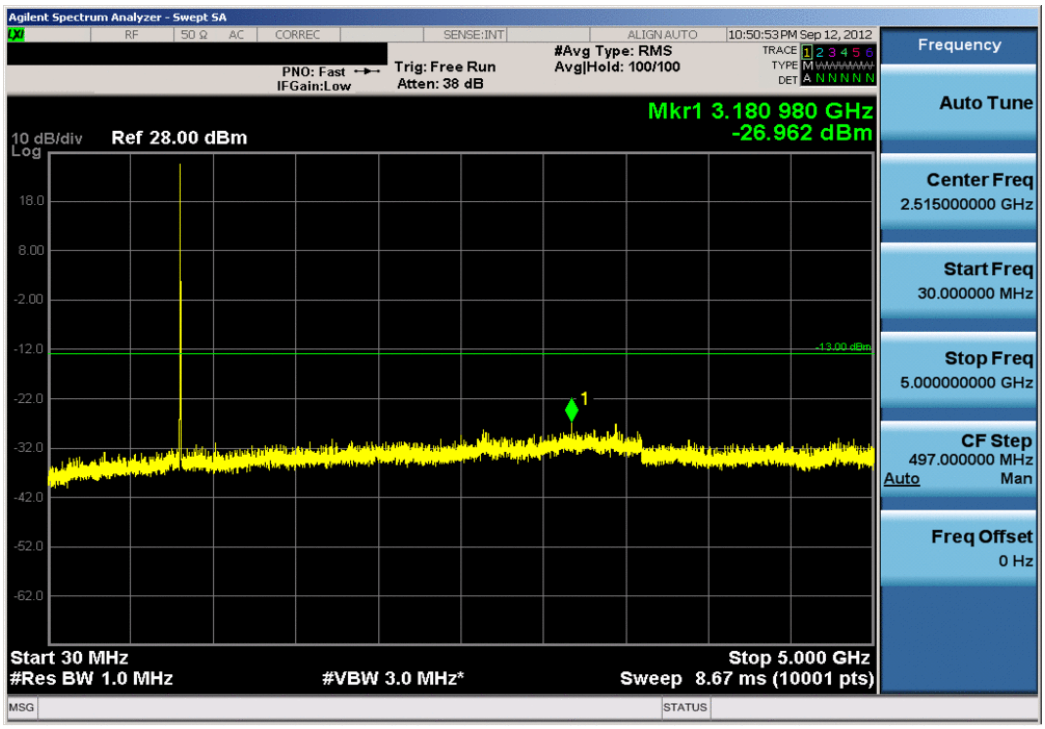
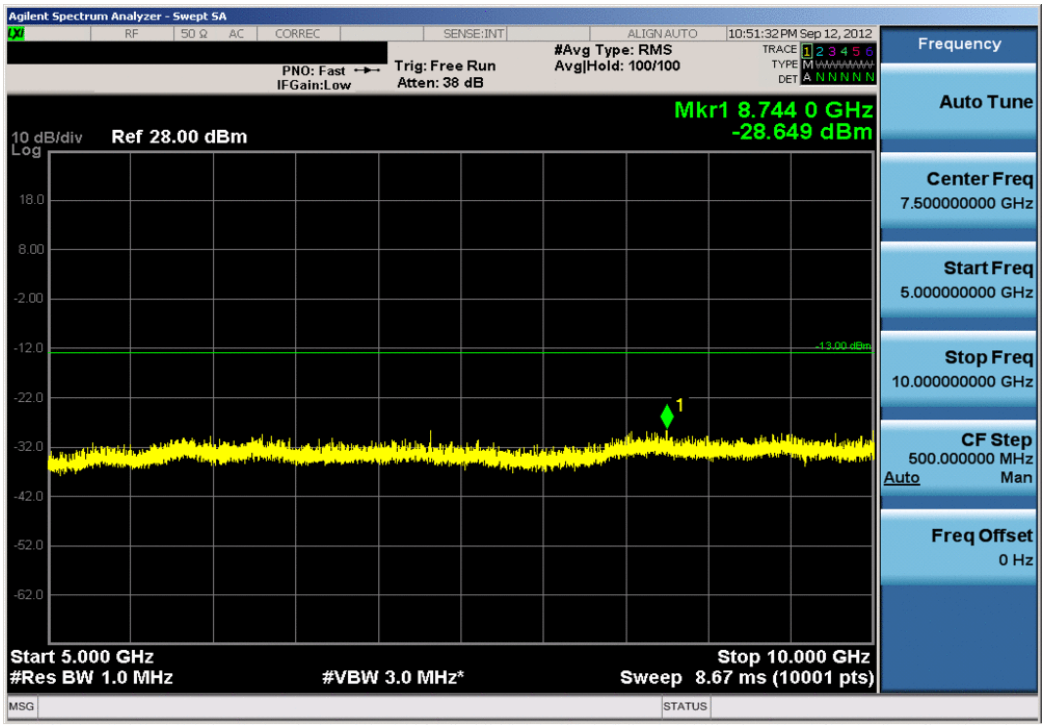
7.0 PLOT(S) OF EMISSIONS



Plot 7-1. Conducted Spurious Plot (Cellular CDMA Mode – Ch. 1013)



Plot 7-2. Conducted Spurious Plot (Cellular CDMA Mode – Ch. 1013)

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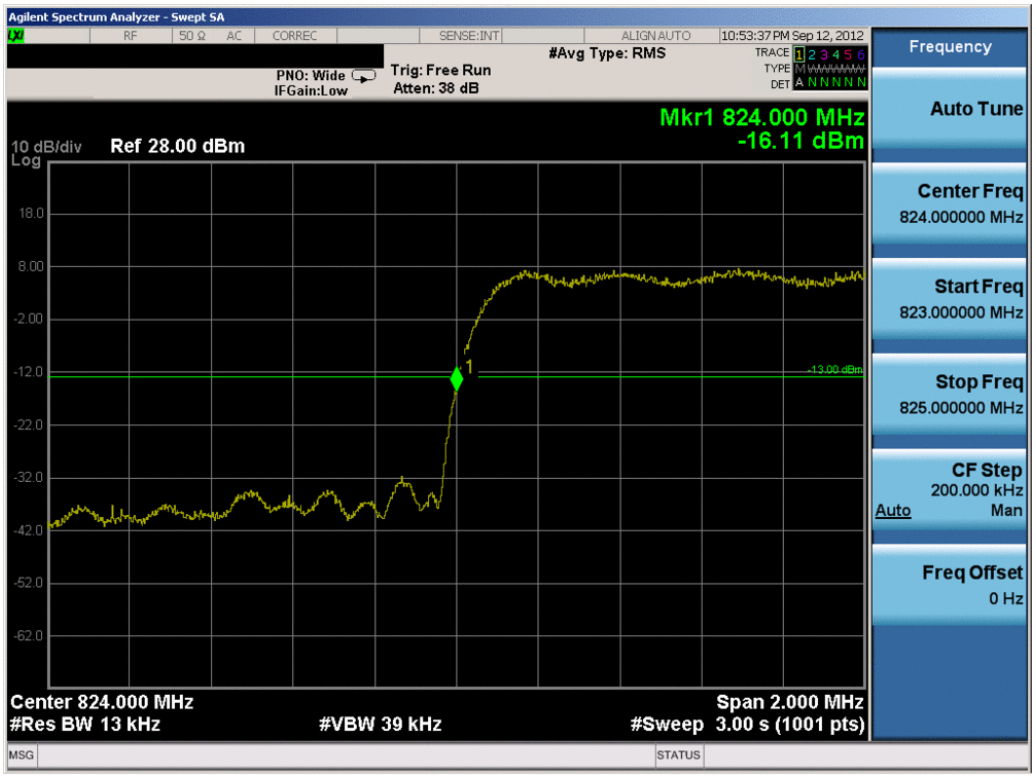

Plot 7-3. Band Edge Plot (Cellular CDMA Mode – Ch. 1013)

Plot 7-4. 4MHz Span Plot (Cellular CDMA Mode – Ch. 1013)

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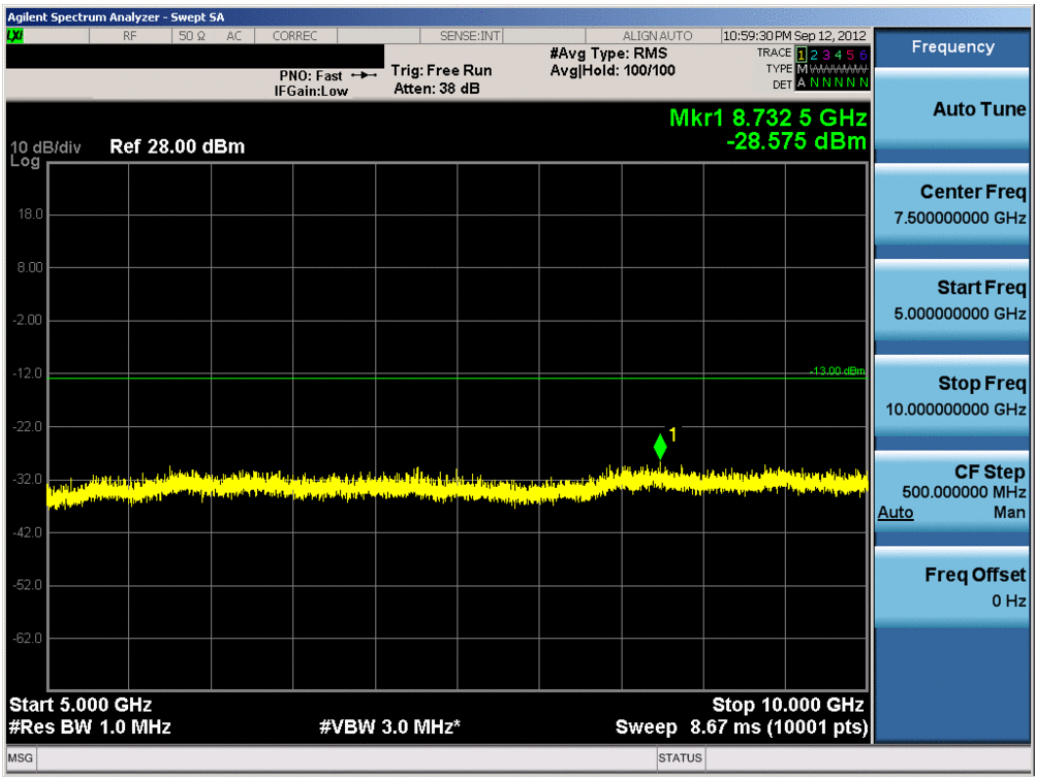
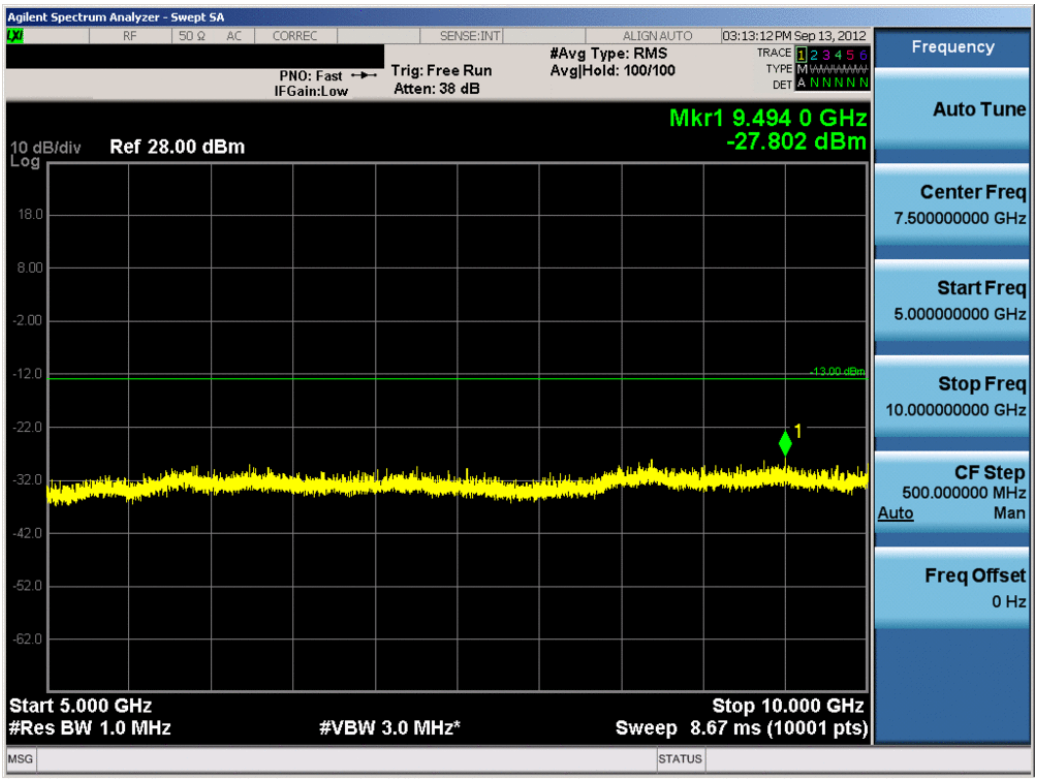


Plot 7-5. Conducted Spurious Plot (Cellular CDMA Mode – Ch. 384)



Plot 7-6. Conducted Spurious Plot (Cellular CDMA Mode – Ch. 384)

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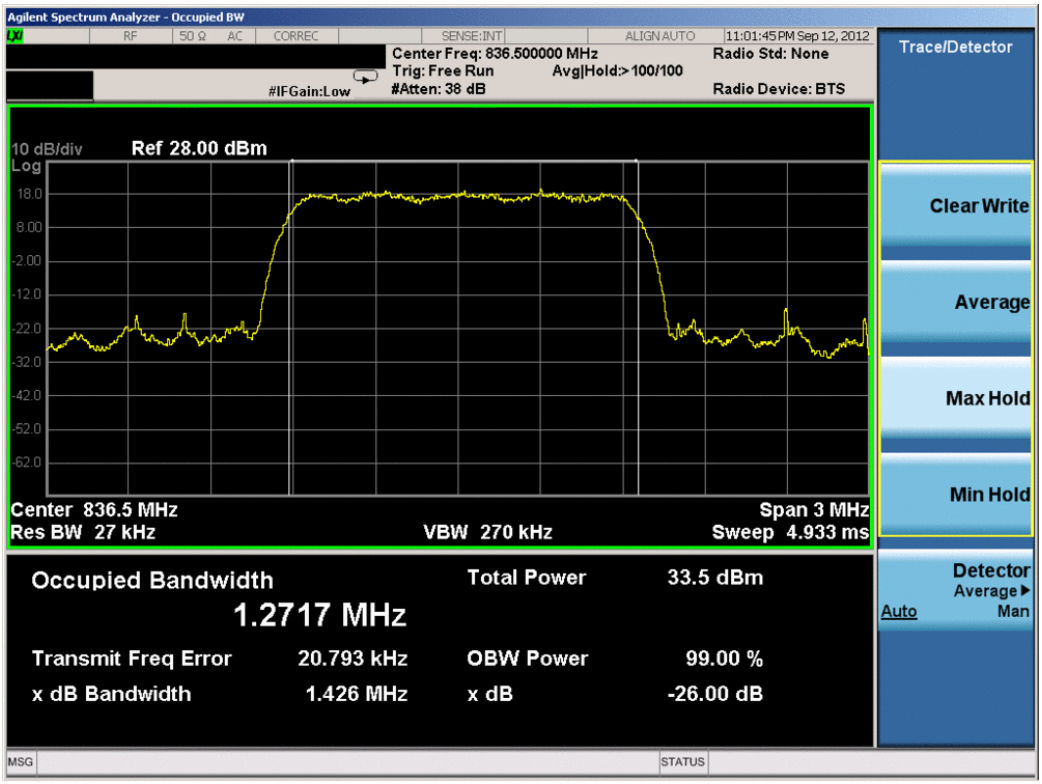
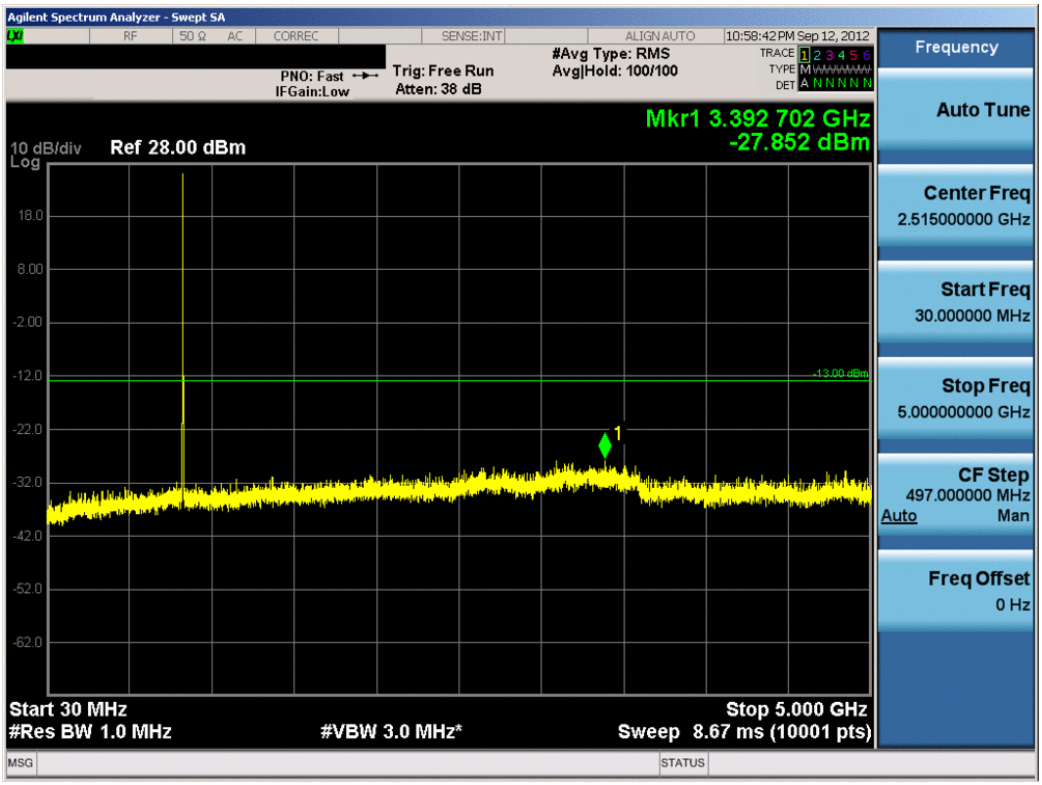


Plot 7-7. Occupied Bandwidth Plot (Cellular CDMA Mode – Ch. 384)



Plot 7-8. Conducted Spurious Plot (Cellular CDMA Mode – Ch. 777)

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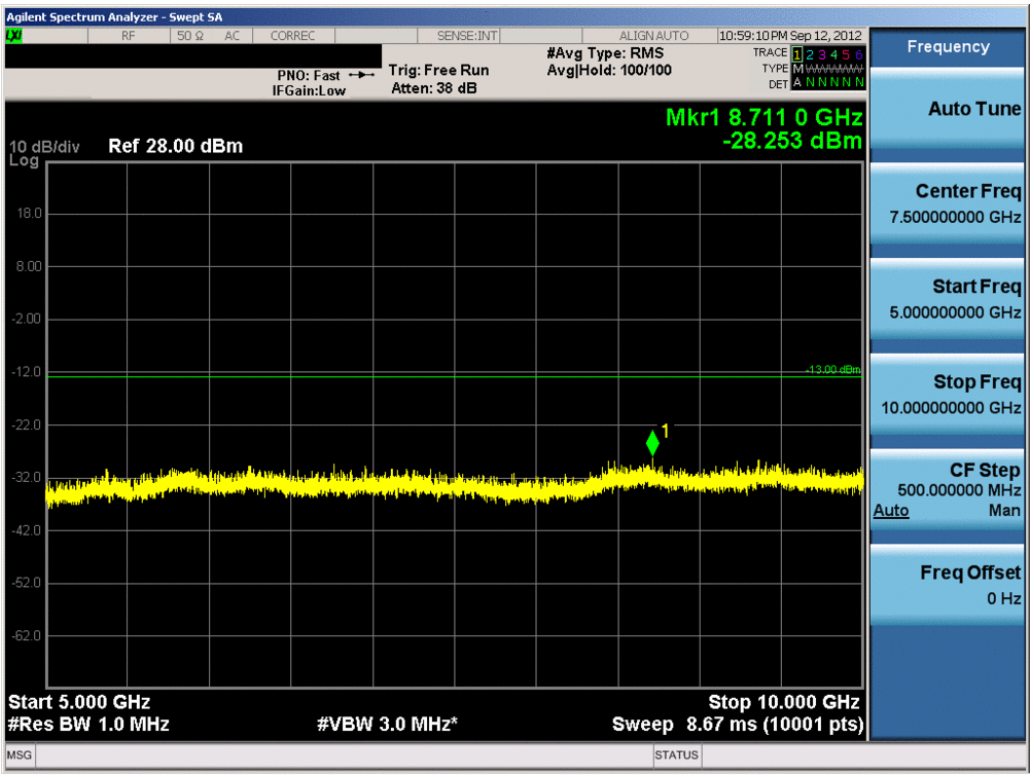
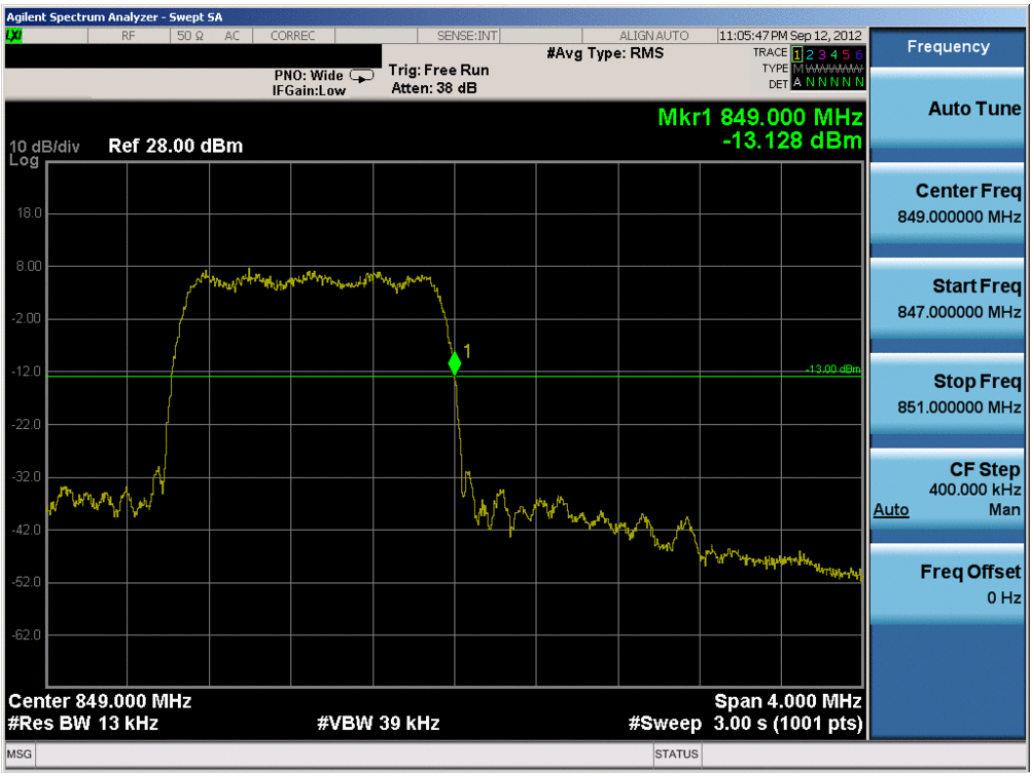


Plot 7-9. Conducted Spurious Plot (Cellular CDMA Mode – Ch. 777)



Plot 7-10. Band Edge Plot (Cellular CDMA Mode – Ch. 777)

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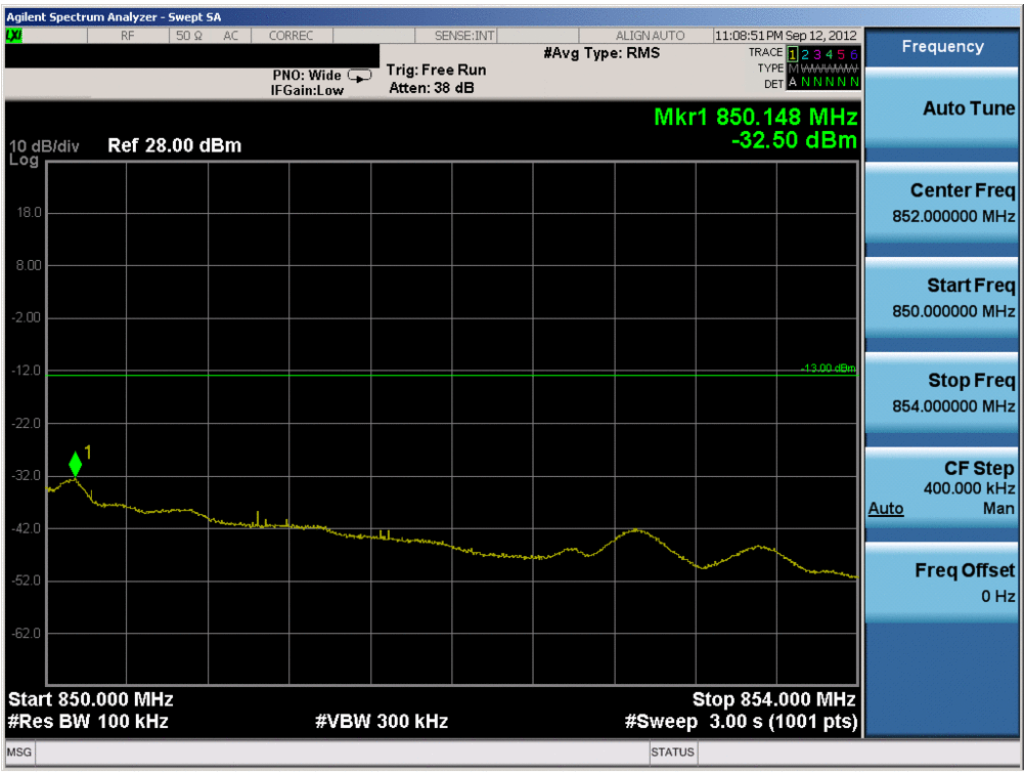
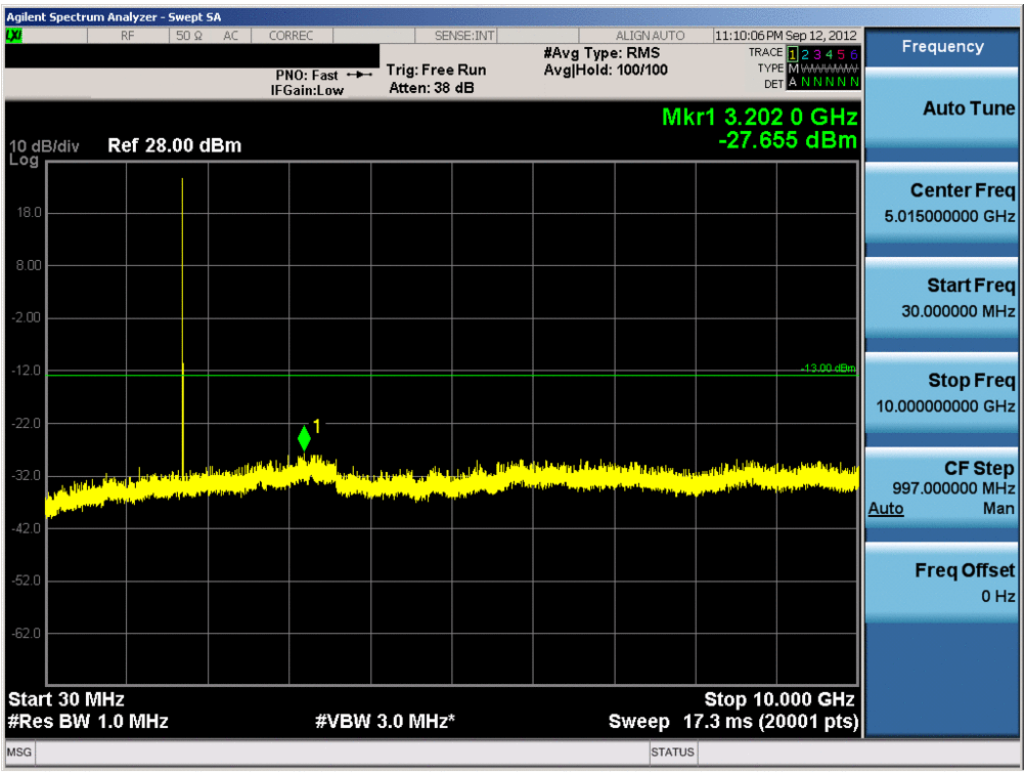


Plot 7-11. 4MHz Span Plot (Cellular CDMA Mode – Ch. 777)



Plot 7-12. Conducted Spurious Plot (AWS CDMA Mode – Ch. 25)

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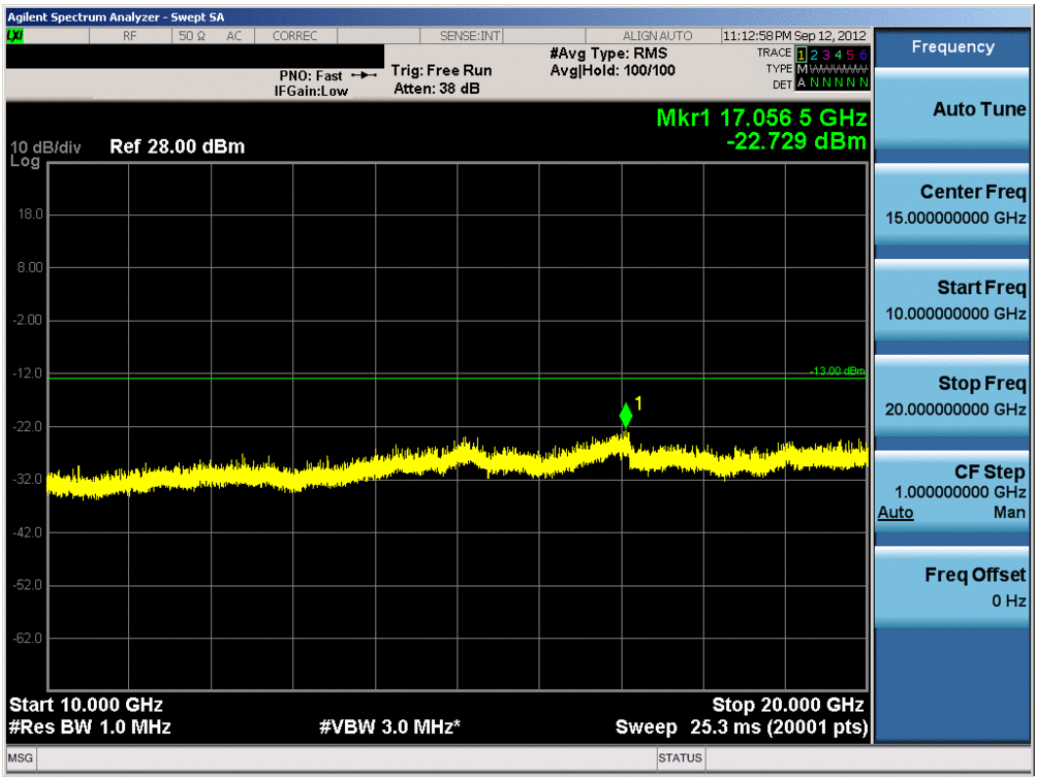
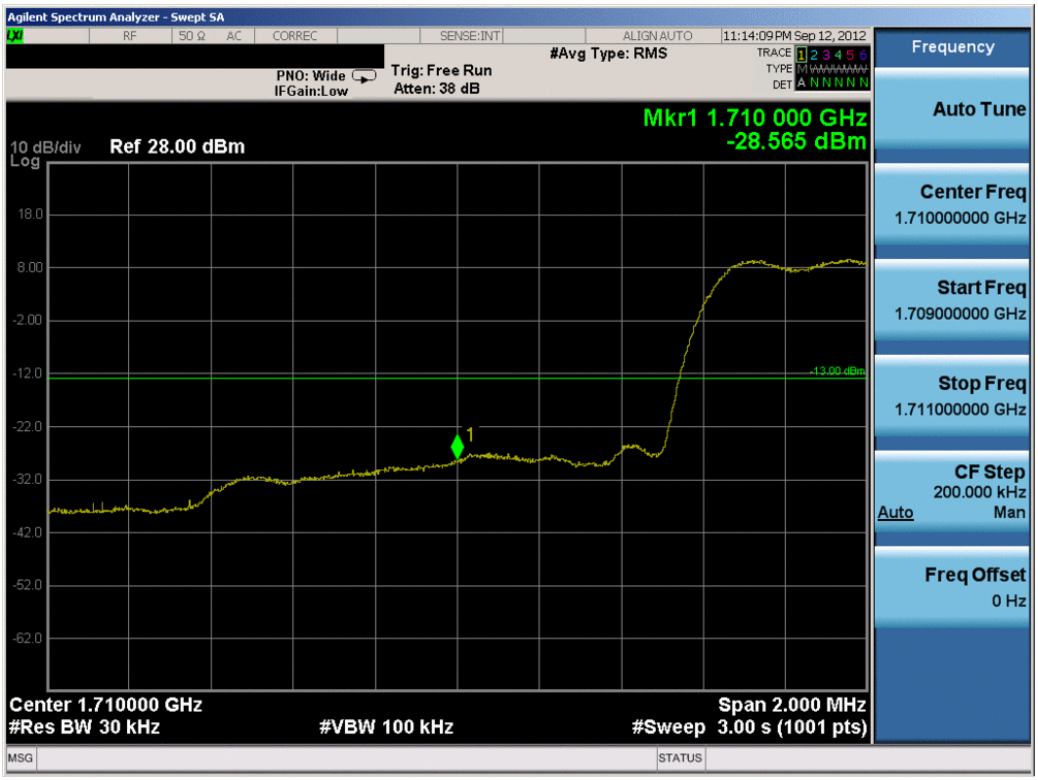


Plot 7-13. Conducted Spurious Plot (AWS CDMA Mode – Ch. 25)



Plot 7-14. Band Edge Plot (AWS CDMA Mode – Ch. 25)

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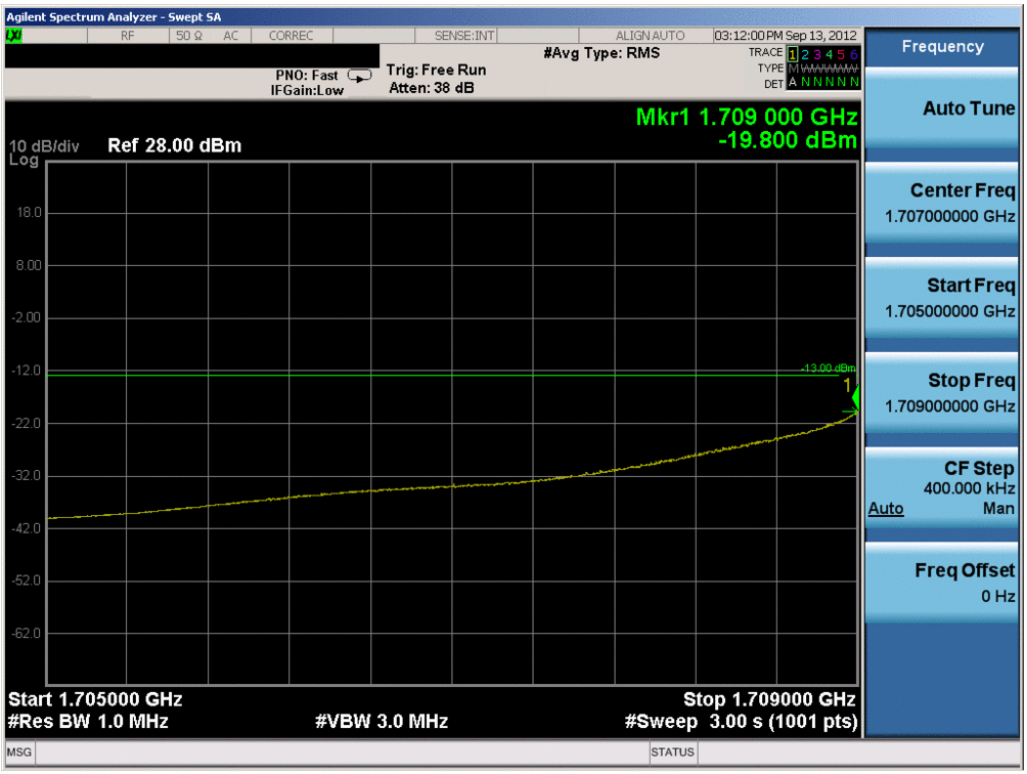
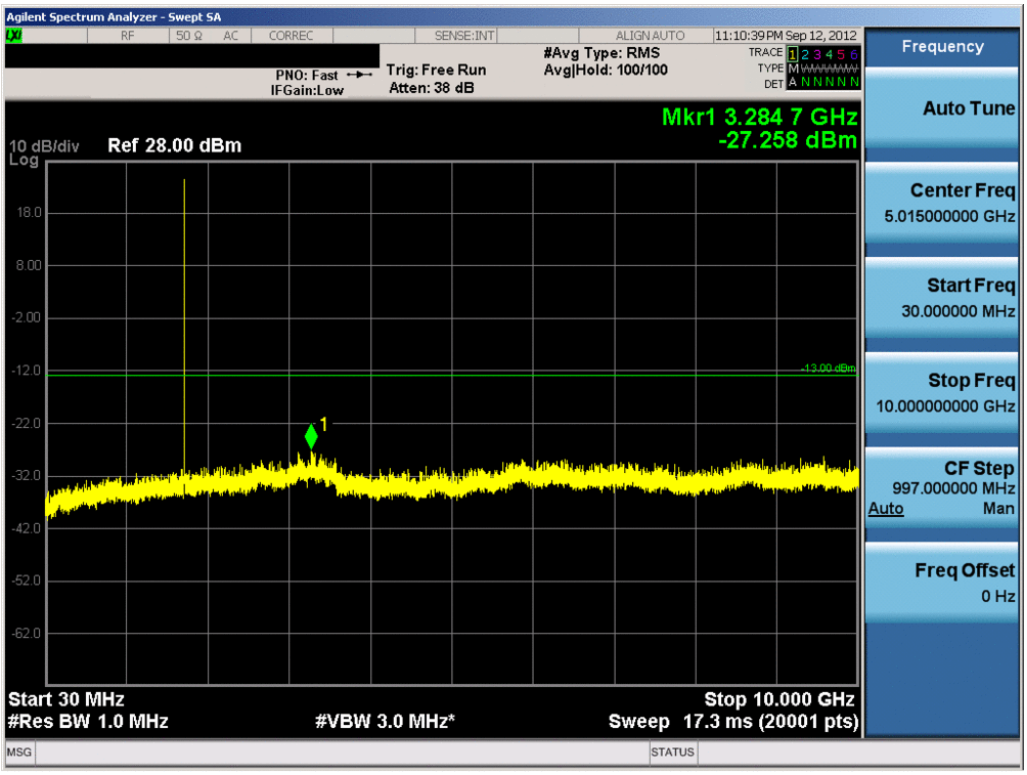


Plot 7-15. 4MHz Span Plot (AWS CDMA Mode – Ch. 25)



Plot 7-16. Conducted Spurious Plot (AWS CDMA Mode – Ch. 450)

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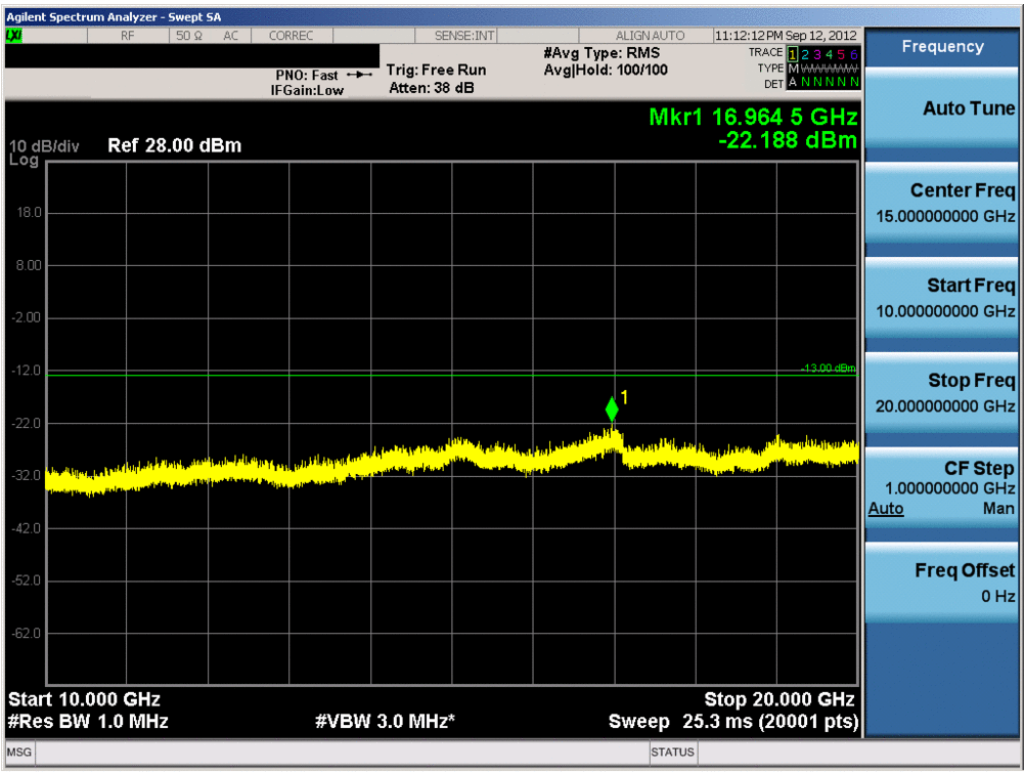

Plot 7-17. Conducted Spurious Plot (AWS CDMA Mode – Ch. 450)

Plot 7-18. Occupied Bandwidth Plot (AWS CDMA Mode – Ch. 450)

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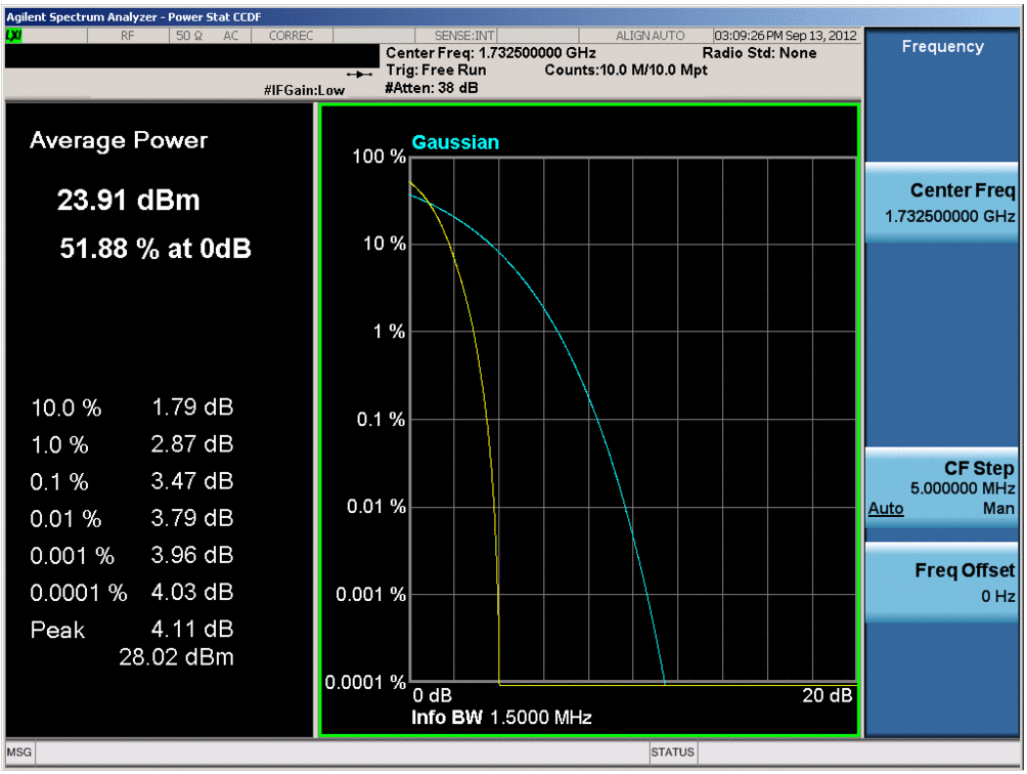
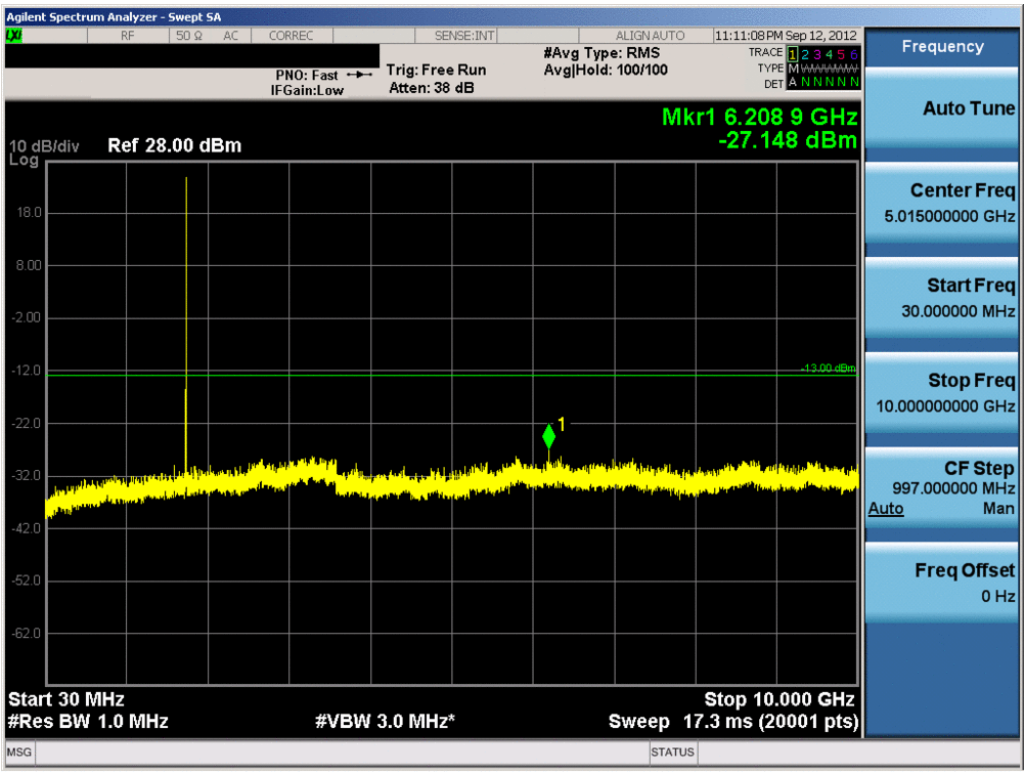


Plot 7-19. Peak-Average Ratio Plot (AWS CDMA Mode – Ch. 450)



Plot 7-20. Conducted Spurious Plot (AWS CDMA Mode – Ch. 875)

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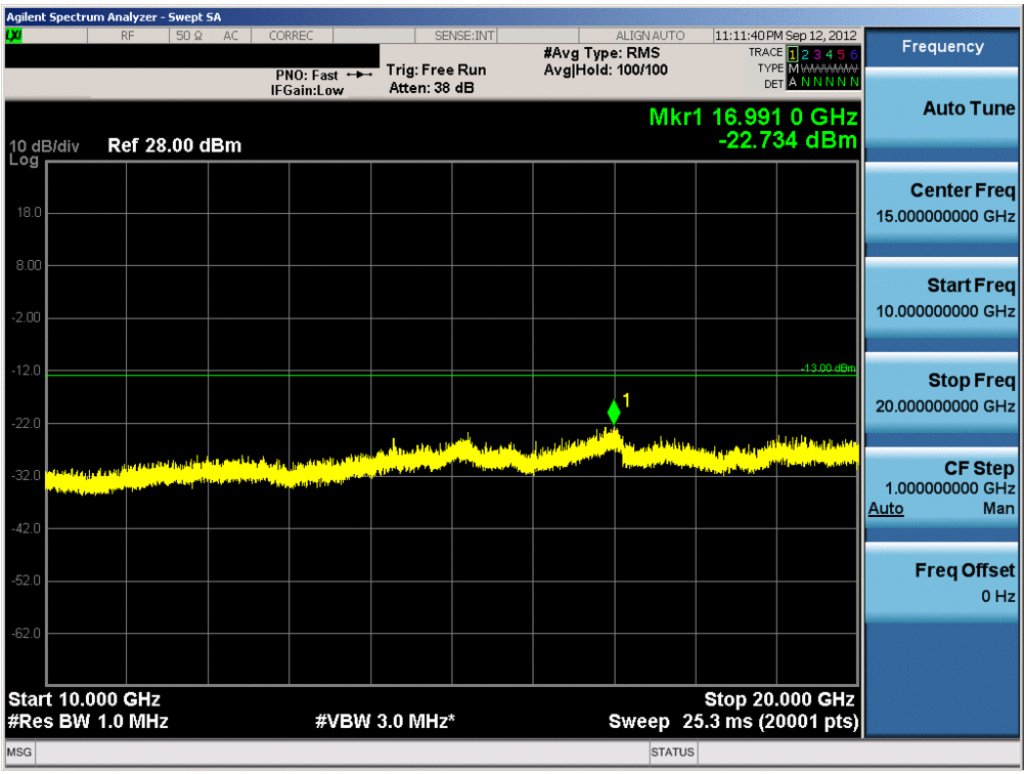
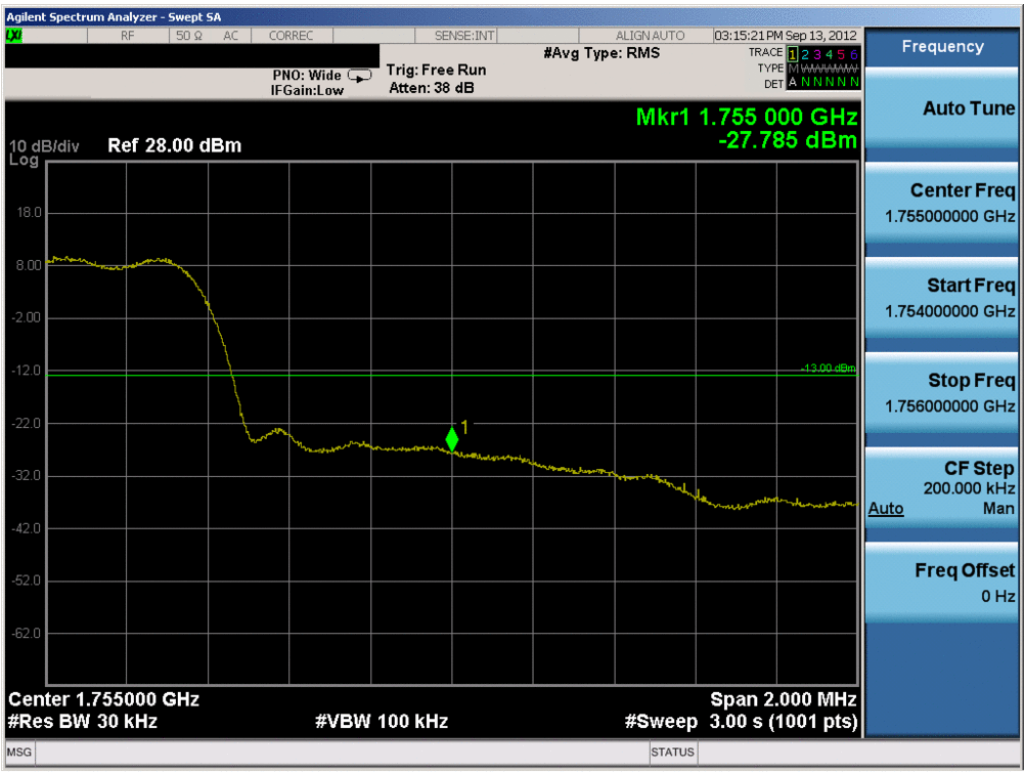


Plot 7-21. Conducted Spurious Plot (AWS CDMA Mode – Ch. 875)



Plot 7-22. Band Edge Plot (AWS CDMA Mode – Ch. 875)

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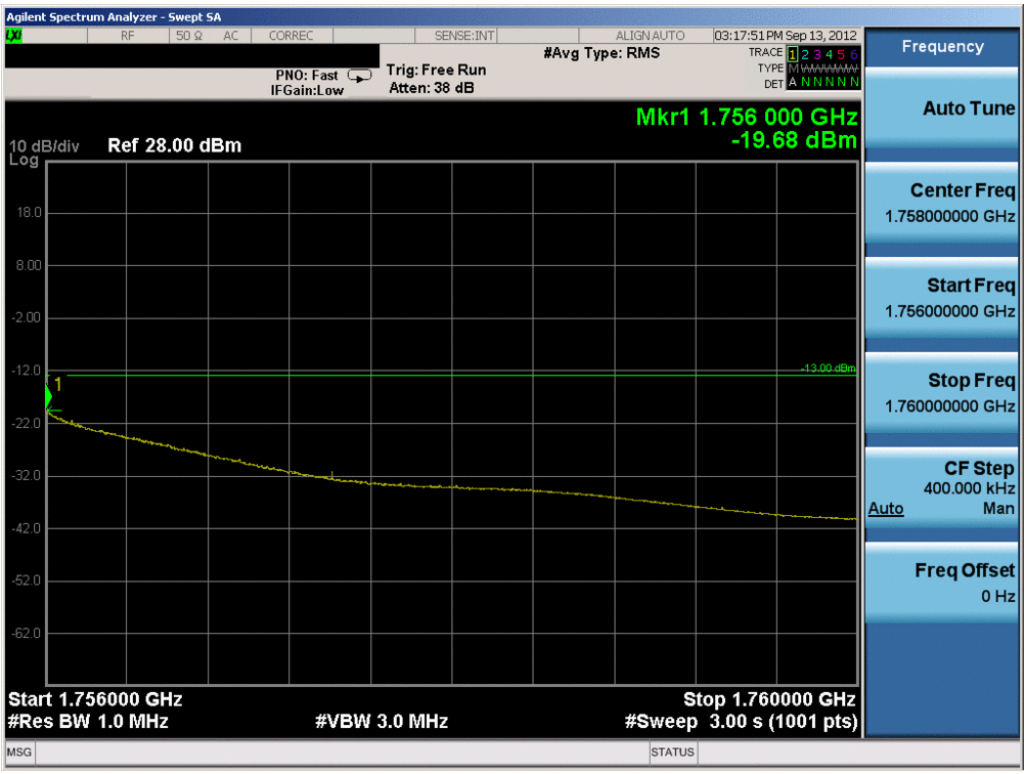
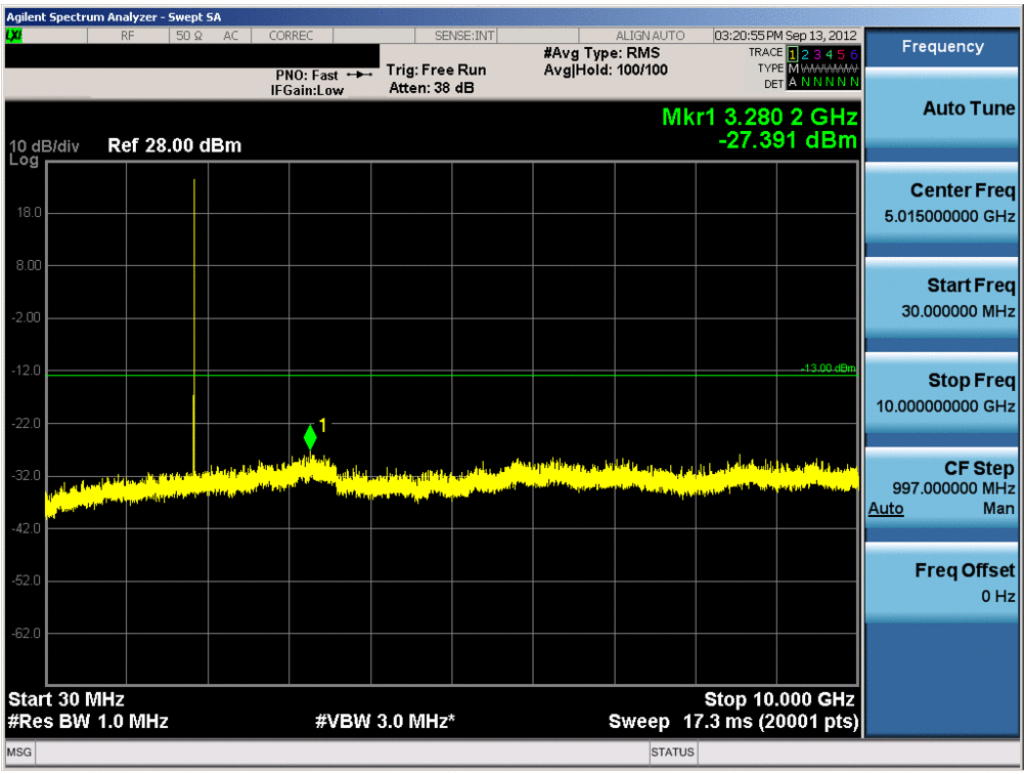


Plot 7-23. 4MHz Span Plot (AWS CDMA Mode – Ch. 875)



Plot 7-24. Conducted Spurious Plot (PCS CDMA Mode – Ch. 25)

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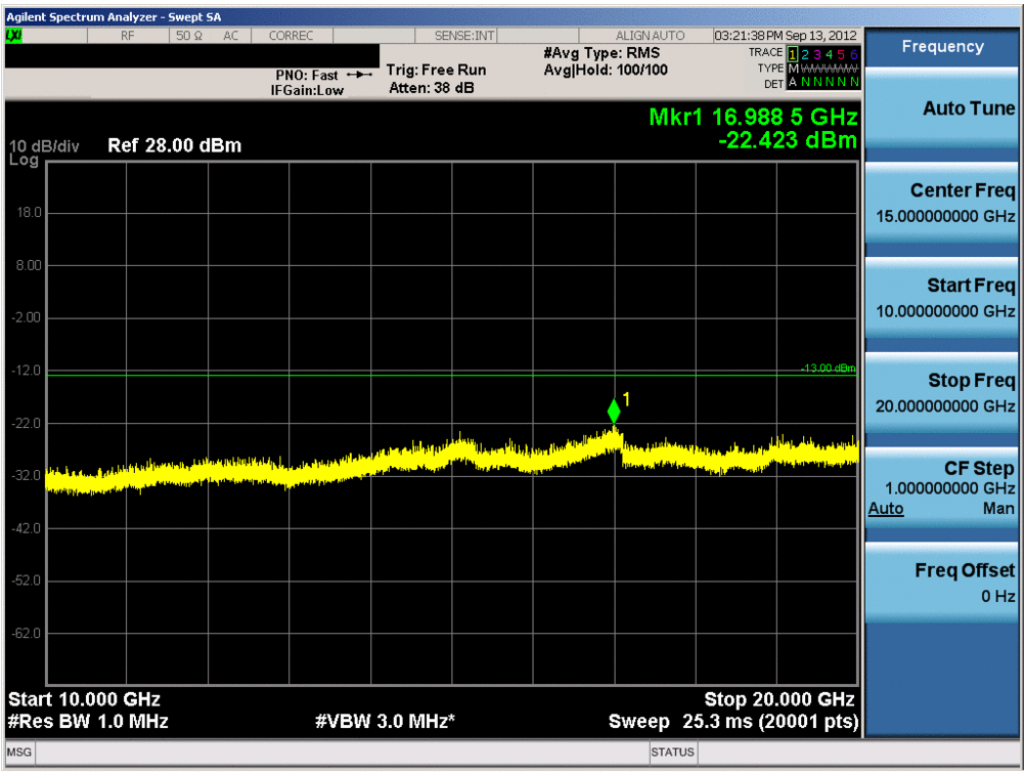

Plot 7-25. Conducted Spurious Plot (PCS CDMA Mode – Ch. 25)

Plot 7-26. Band Edge Plot (PCS CDMA Mode – Ch. 25)

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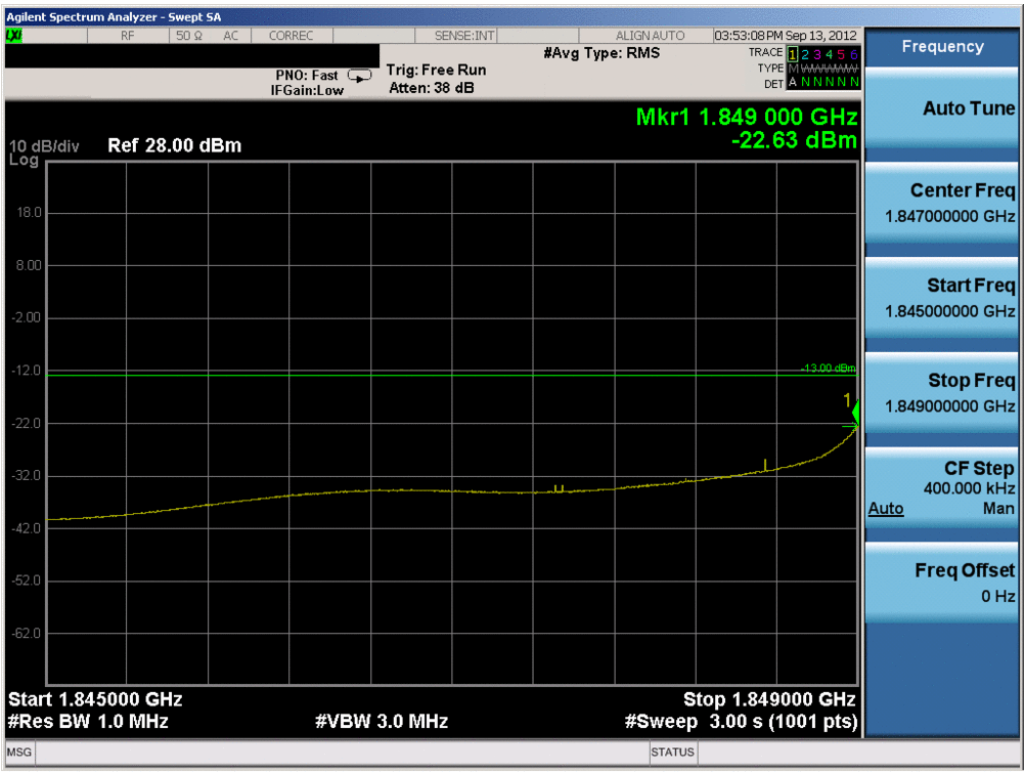
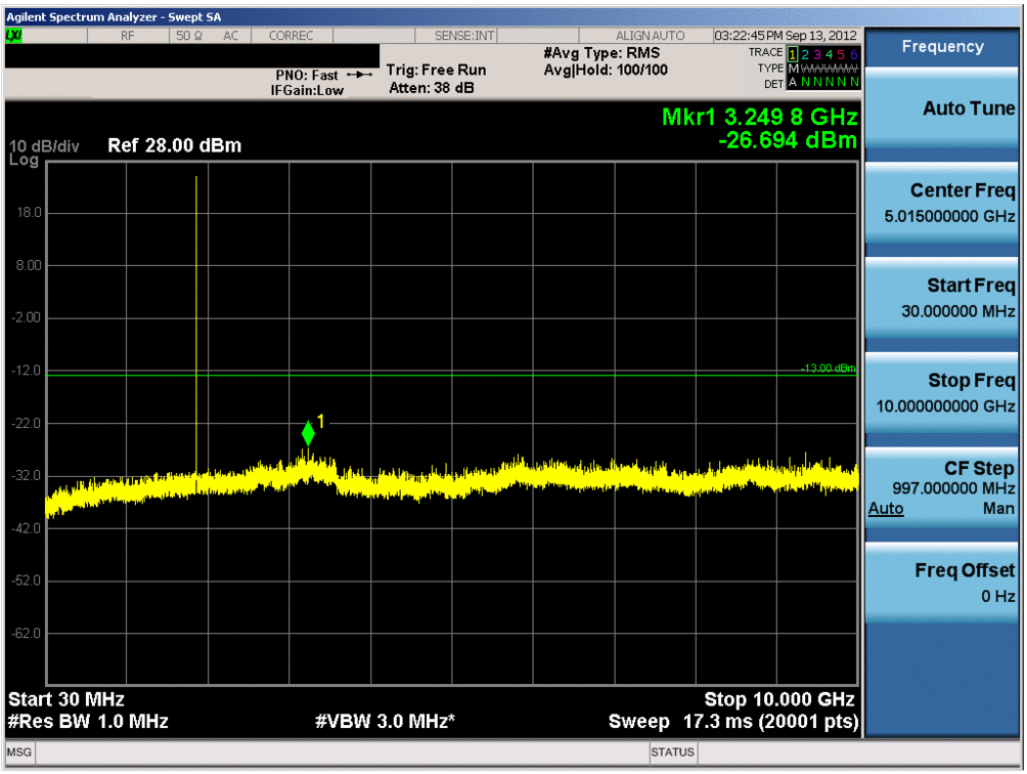


Plot 7-27. 4MHz Span Plot (PCS CDMA Mode – Ch. 25)



Plot 7-28. Conducted Spurious Plot (PCS CDMA Mode – Ch. 600)

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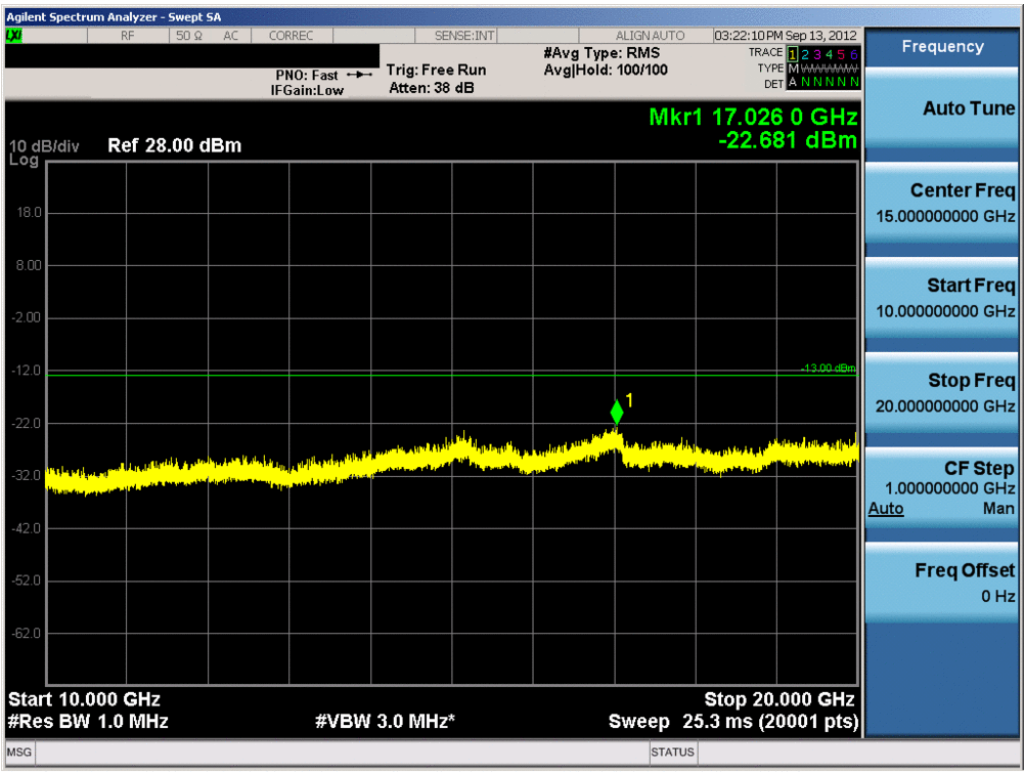
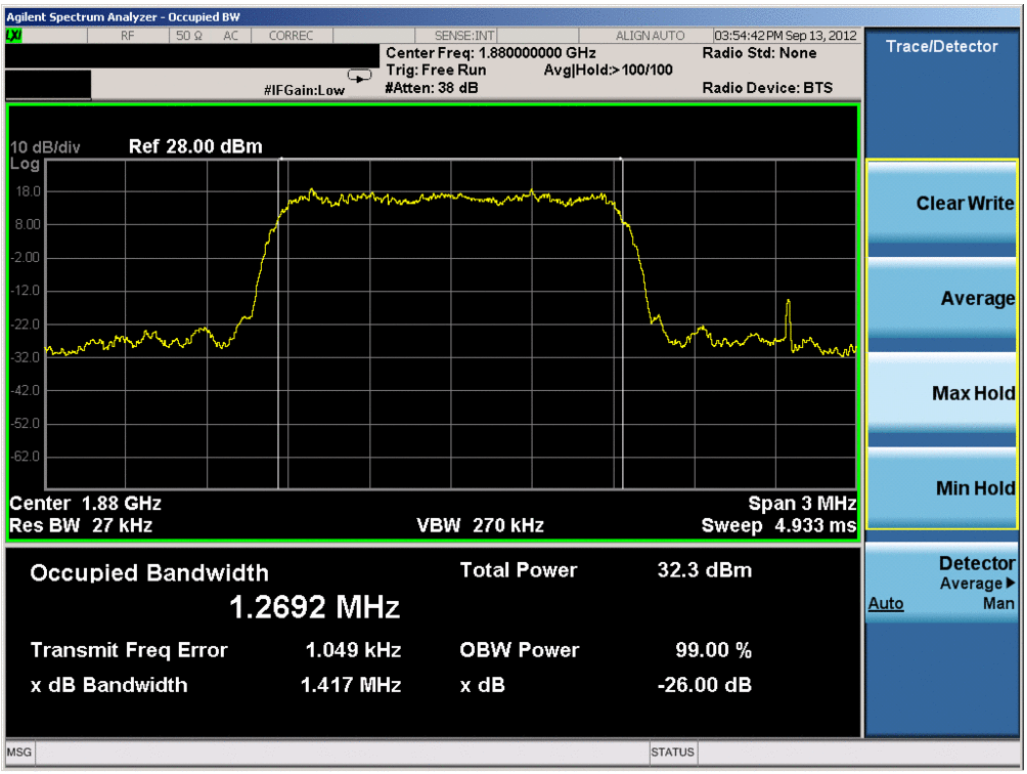


Plot 7-29. Conducted Spurious Plot (PCS CDMA Mode – Ch. 600)



Plot 7-30. Occupied Bandwidth Plot (PCS CDMA Mode – Ch. 600)

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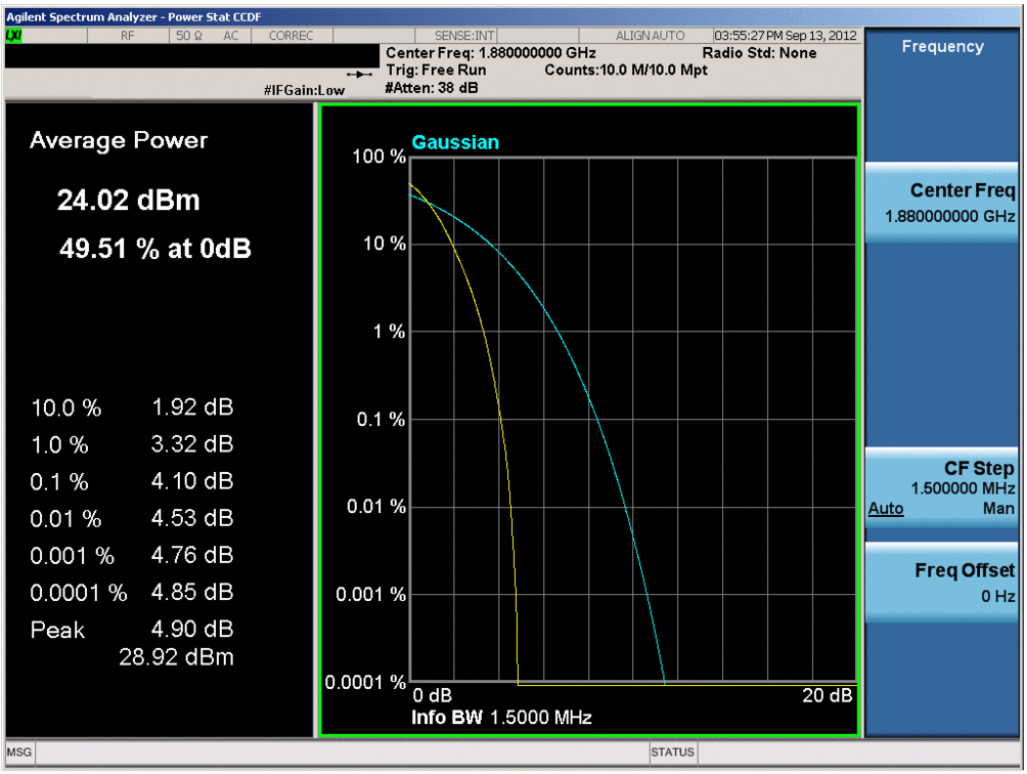
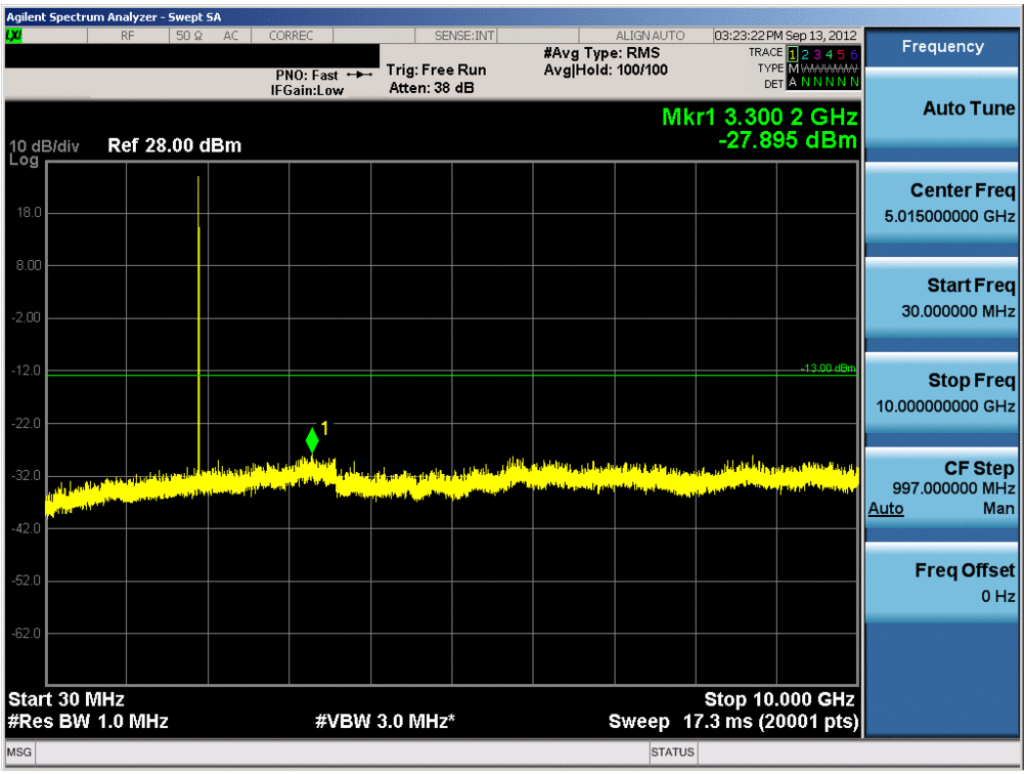


Plot 7-31. Peak-Average Ratio Plot (PCS CDMA Mode – Ch. 600)



Plot 7-32. Conducted Spurious Plot (PCS CDMA Mode – Ch. 1175)

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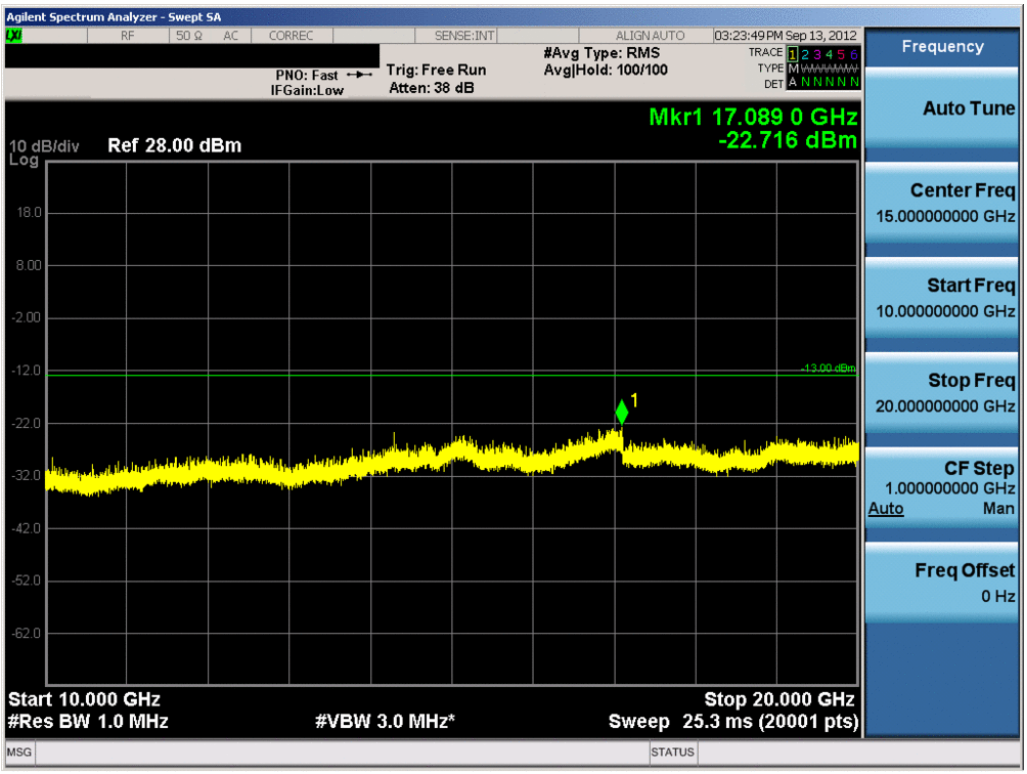
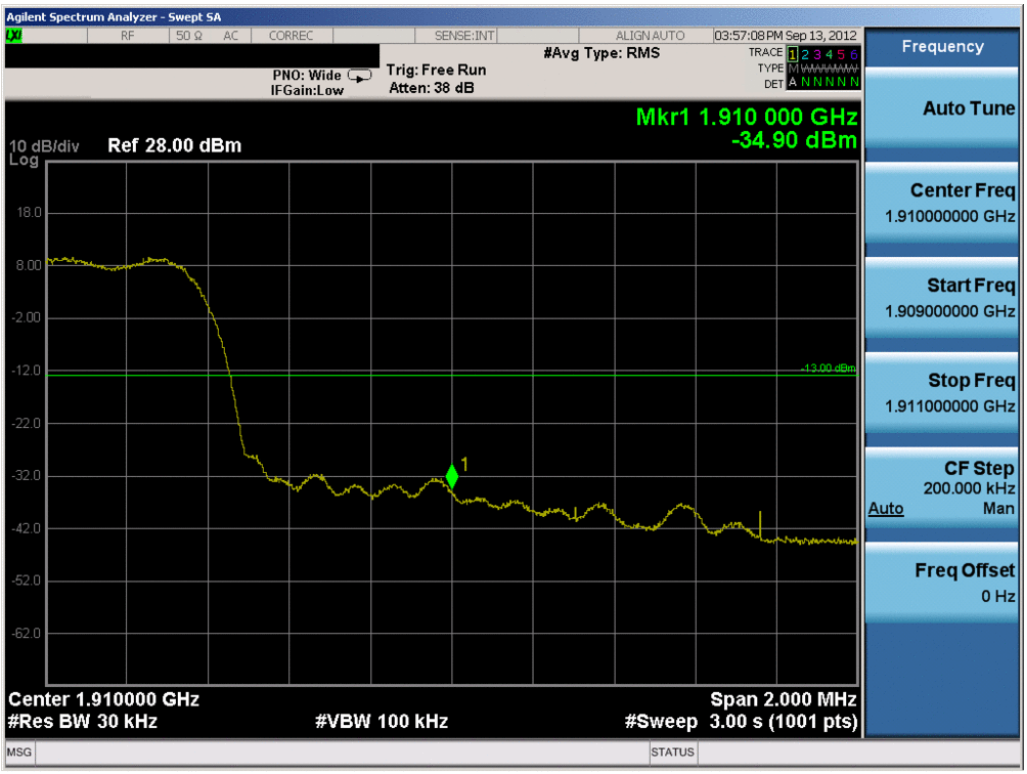


Plot 7-33. Conducted Spurious Plot (PCS CDMA Mode – Ch. 1175)



Plot 7-34. Band Edge Plot (PCS CDMA Mode – Ch. 1175)

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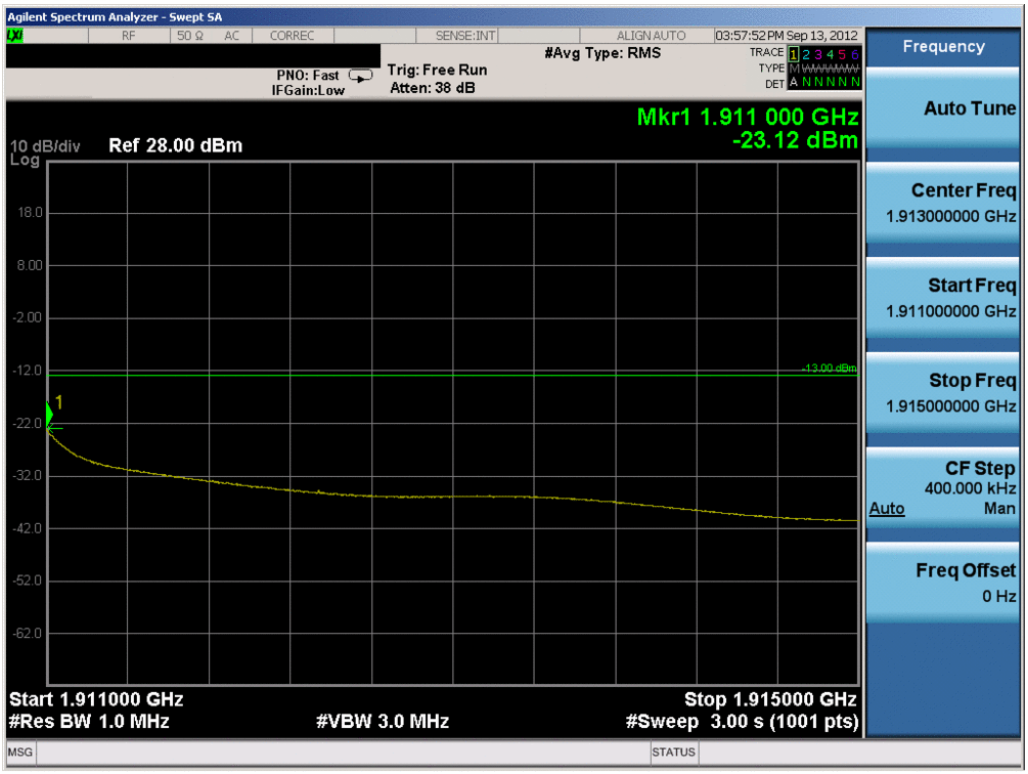

Plot 7-35. 4MHz Span Plot (PCS CDMA Mode – Ch. 1175)

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8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **LG Portable Handset FCC ID: ZNFMS870** complies with all the requirements of Parts 2, 22, 24, and 27 of the FCC rules and RSS-132, RSS-133, and RSS-139 of the Industry Canada rules.

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