PCTEST ENGINEERING LABORATORY, INC.
6660-B Dobbin Road, Columbia, MD 21045 USA
Tel. 410.290.6652 / Fax 410.290.6554
http://www.pctestlab.com

CERTIFICATE OF COMPLIANCE
FCC Part 22 & 24 Certification

Applicant Name:
Samsung Electronics, Co. Ltd.
18600 Broadwick St.
Rancho Dominguez, CA 90220 USA

Date of Testing:
October 20-24, 2006
Test Site/Location:
PCTEST Lab., Columbia, MD, USA
Test Report Serial No.:
0610190921

FCC ID:	**A3LSGHA617**
APPLICANT:	**SAMSUNG ELECTRONICS, CO. LTD.**

Application Type:	Certification
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
FCC Rule Part(s):	§2; §22(H), §24(E)
EUT Type:	Dual-Band Dual-Mode GSM/EDGE/WCDMA Phone with Bluetooth
Model(s):	SGH-A617
Tx Frequency Range:	826.40 - 846.60MHz (Cell. WCDMA)/1852.4 - 1907.6MHz (PCS WCDMA)
Rx Frequency Range:	871.4 - 891.8MHz (Cell. WCDMA) / 1932.4 - 1995.6MHz (PCS WCDMA)
Max. RF Output Power:	0.23 W ERP Cell. WCDMA (23.62 dBm) /
	0.18 W EIRP PCS WCDMA (22.551 dBm)
Max. SAR Measurement:	0.693 W/kg Cell. WCDMA Head SAR; 0.046 W/kg Cell. WCDMA Body SAR
	0.625 W/kg PCS WCDMA Head SAR; 0.197 W/kg PCS WCDMA Body SAR
Emission Designator(s):	4M15F9W (WCDMA)
Test Device Serial No.:	*identical prototype* [S/N: FD-201-A]

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in §2.947.
I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.
Grant Conditions: Power output listed is ERP for Part 22 and EIRP for Part 24. SAR compliance for body-worn operating configuration is based on a separation distance of 1.5 between the back of the unit and the body of the user. End-users must be informed of the body-worn operating requirements for satisfying RF exposure compliance. Belt clips or holsters may not contain metallic components.
PCTEST certifies that no party to this application has been denied the FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C. 862.

Randy Ortanez
President

2041.01

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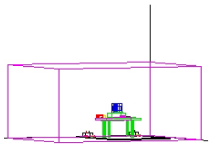


MEASUREMENT REPORT

FCC Part 22 & 24

A. §2.1033 General Information

APPLICANT:	Samsung Electronics, Co. Ltd.
APPLICANT ADDRESS:	18600 Broadwick St. Rancho Dominguez, CA 90220 USA
TEST SITE:	PCTEST ENGINEERING LABORATORY, INC.
TEST SITE ADDRESS:	6660-B Dobbin Road, Columbia, MD 21045 USA
FCC RULE PART(S):	§2; §22(H), §24(E)
MODEL NAME:	SGH-A617
FCC ID:	A3LSGHA617
FCC CLASSIFICATION:	PCS Licensed Transmitter Held to Ear (PCE)
EMISSION DESIGNATOR(S):	4M16F9W (WCDMA)
MODE:	WCDMA
FREQUENCY TOLERANCE:	±0.00025 % (2.5 ppm)
Test Device Serial No.:	FD-201-A ☐ Production ☒ Pre-Production ☐ Engineering
DATE(S) OF TEST:	October 20-24, 2006
TEST REPORT S/N:	0610190921

A.1 Test Facility / Accreditations

Measurements were performed at PCTEST Engineering Lab. located in Columbia, MD 21045, U.S.A.

- PCTEST facility is an FCC registered (PCTEST Reg. No. 90864) 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 (IC-2451).
- 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 (IC-2451) 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 Measurement Procedure

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

Deviation from Measurement Procedure……..None

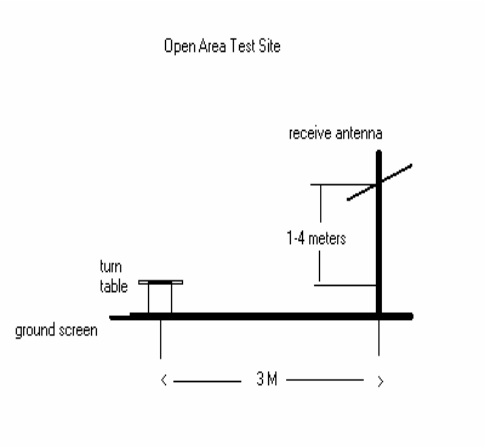


Figure 1-1. Diagram of 3-meter outdoor test range

1.2 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.

1.3 Testing Facility

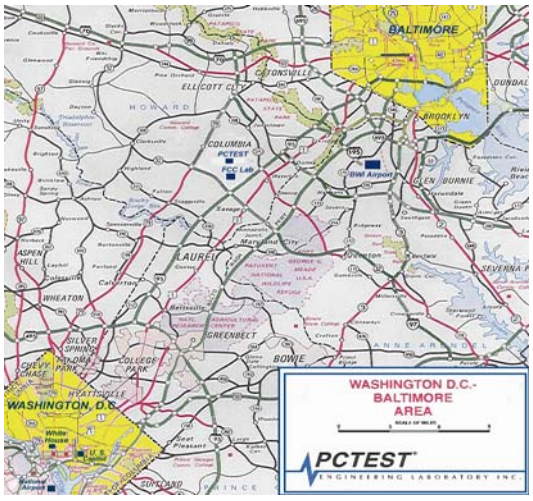


Figure 1-3. Map of the Greater Baltimore and Metropolitan Washington, D.C. area.

These measurement tests were conducted at PCTEST Engineering Laboratory, Inc. facility in New Concept Business Park, Guilford Industrial Park, Columbia, Maryland. The site address is 6660-B Dobbin Road, Columbia, MD 21045. The test site is one of the highest points in the Columbia area with an elevation of 390 feet above mean sea level. The site coordinates are 39° 11'15" N latitude and 76° 49'38" W longitude. The facility is 1.5 miles North of the FCC laboratory, and the ambient signal and ambient signal strength are approximately equal to those of the FCC laboratory. There are no FM or TV transmitters within 15 miles of the site. The detailed description of the measurement facility was found to be in compliance with the requirements of § 2.948 according to ANSI C63.4-2003 on January 27, 2006 and Industry Canada.

2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Samsung Electronics, Co. Ltd. Dual-Band Dual-Mode GSM/EDGE/WCDMA Phone with Bluetooth FCC ID: A3LSGHA617**. The EUT consisted of the following components(s):

Manufacturer / Description	FCC ID	Serial Number
Samsung Electronics, Co. Ltd. Dual-Band Dual-Mode GSM/EDGE/WCDMA Phone with Bluetooth	A3LSGHA617	FD-201-A

Table 2-1. EUT Equipment Description

2.2 EMI Suppression Device(s)/Modifications

EMI suppression device(s) added and/or modifications made during testing.

- None

3.0 DESCRIPTION OF TESTS

3.1 Occupied Bandwidth Emission Limits

§2.1049, 22.917(a), 24.238(a)

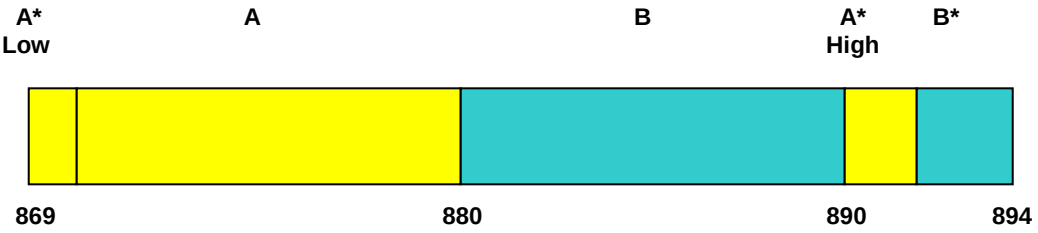
a. On any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least 43 + 10 log(P) dB.

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

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

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

3.2 Cellular - Base Frequency Blocks



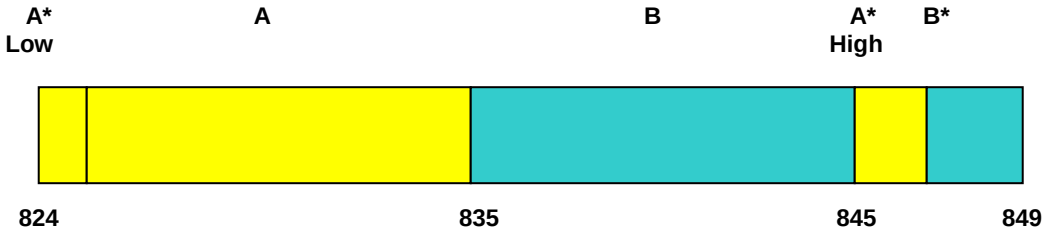
BLOCK 1: 869 – 880 MHz (A* Low + A)

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



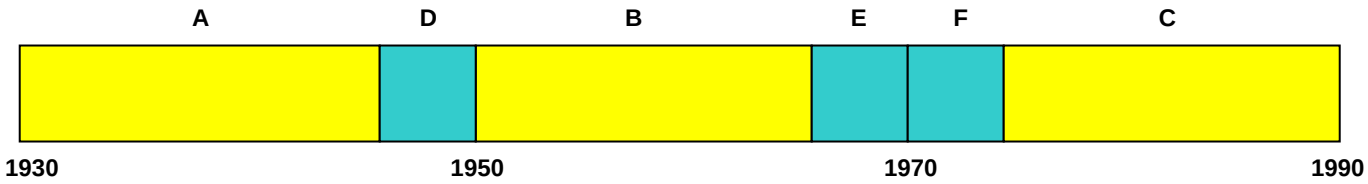
BLOCK 1: 824 – 835 MHz (A* Low + A)

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)

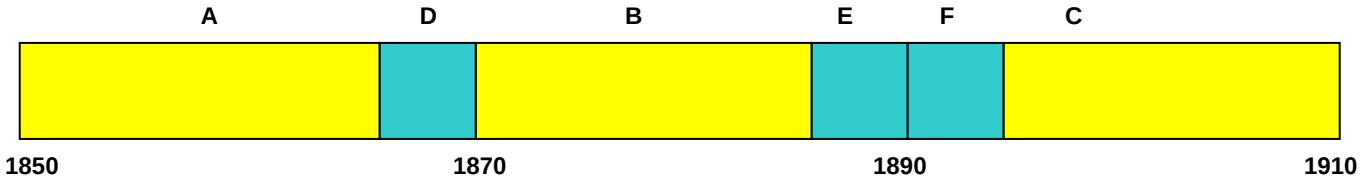
BLOCK 3: 1950 – 1965 MHz (B)

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 Frequencies

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

3.7 Radiated Spurious and Harmonic Emissions

§2.1051, 22.917(a), 24.238(a); RSS-132 (4.5.1.2), RSS-133 (6.5.1(i))

Radiation and harmonic emissions are measured outdoors at our 3-meter test range. The equipment under test is placed on a wooden turntable 3-meters from the receive antenna. The receive antenna height and turntable rotations were adjusted for the highest reading on the receive spectrum analyzer. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator with the level of the signal generator being adjusted to obtain the same receive spectrum analyzer reading. This level is recorded. For readings above 1 GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration. This device was tested under all configurations and the worst case is reported at 12.2 kbps AMR with TPC bits all set to "1".

3.8 Frequency Stability / Temperature Variation

§2.1055, 22.355, 24.235; RSS-132 (4.3), RSS-133 (6.7(a,b))

The frequency stability of the transmitter is measured by:

a.) **Temperature:** The temperature is varied from -30°C to +60°C using an environmental chamber.

b.) **Primary Supply Voltage:** The primary supply voltage is varied from 85% to 115% of the voltage normally at the input to the device or at the power supply terminals if cables are not normally supplied.

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

Time Period and Procedure:

1. The carrier frequency of the transmitter and the individual oscillators is measured at room temperature (22°C to 25°C to provide a reference).

2. The equipment is subjected to an overnight "soak" at -30°C without any power applied.

3. After the overnight "soak" at -30°C (usually 14-16 hours), the equipment is turned on in a "standby" condition for one minute before applying power to the transmitter. Measurement of the carrier frequency of the transmitter and the individual oscillators is made within a three minute interval after applying power to the transmitter.

4. Frequency measurements are made at 10°C interval up to room temperature. At least a period of one and one half-hour is provided to allow stabilization of the equipment at each temperature level.

5. Again the transmitter carrier frequency and the individual oscillators is measured at room temperature to begin measurement of the upper temperature levels.

6. Frequency measurements are at 10 intervals starting at -30°C up to +50°C allowing at least two hours at each temperature for stabilization. In all measurements the frequency is measured within three minutes after re-applying power to the transmitter.

7. The artificial load is mounted external to the temperature chamber.

NOTE: The EUT is tested down to the battery endpoint.

4.0 TEST EQUIPMENT CALIBRATION DATA

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

TYPE	MODEL	CAL. DUE DATE	CAL. INTERVAL	SERIAL No.
Microwave Spectrum Analyzer	Agilent E4448A (3Hz-50GHz)	09/22/07	Annual	US42510244
Spectrum Analyzer	HP 8566B (100Hz-22GHz)	12/22/06	Annual	3638A08713
PSG Analog Signal Generator	Agilent E8257D (250kHz-20GHz)	02/11/07	Annual	MY45470194
5 Watt Amplifier	5S1G4 (800MHz-4.2GHz)	N/A	N/A	22332
Wireless Communication Test Set	Agilent 8960 Series 10 E5515C	06/10/07	Annual	6B46110872
Universal Power Meter	Gigatronics 8651A (50MHz-18GHz)	07/28/07	Annual	1834052
Power Sensor	Gigatronics 80701A	04/11/07	Annual	1833460
Quasi-Peak Adapter	HP 85650A	12/22/06	Annual	2043A00301
Preamplifier	HP 8449B (1-26.5GHz)	12/22/06	Annual	3008A00985
Attenutation/Switch Driver	HP 11713A	12/22/06	Annual	N/A
Preselector	HP 85685A (20Hz-2GHz)	12/22/06	Annual	N/A
6dB Res BW Spec. Analyzer Display	OPT 462	12/22/06	Annual	3701A22204
Horn Antenna	EMCO Model 3115 (1-18GHz)	08/25/07	Bi-Annual	9704-5182
Horn Antenna	EMCO Model 3116 (18-40GHz)	08/25/07	Bi-Annual	9203-2178
EMCO Dipoles (2)	N/A	05/08/08	Bi-Annual	00023951
EMCO LISN (3)	3816/2, 3816/2, 3725/2	10/26/06	Annual	1077, 1079, 2099
10dB Attenuator	HP 8493B	N/A	N/A	N/A
Bi-Directional Coax Coupler	PE2208-6	N/A	Annual	N/A
Microwave Cables	MicroCoax (1.0-26.5GHz)	02/26/07	Annual	N/A
Temperature & Humidity Chamber	ESPEC SCP-220	06/08/07	Annual	017620

Table 4-1. Test Equipment

5.0 SAMPLE CALCULATIONS

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: Channel 9262 PCS Mode 2nd Harmonic (3704.80 MHz)

The receive analyzer reading at 3 meters with the EUT on the turntable was –81.0 dBm. The gain of the substituted antenna is 8.1 dBi. The signal generator connected to the substituted antenna terminals is adjusted to produce a reading of –81.0 dBm on the receive analyzer. The loss of the cable between the signal generator and the terminals of the substituted antenna is 2.0 dB at 3704.80 MHz. So 6.1 dB is added to the signal generator reading of –30.9 dBm yielding –24.80 dBm. The fundamental EIRP was 25.501 dBm so this harmonic was 25.501 dBm – (-24.80) = 50.3 dBc.

6.0 TEST RESULTS

Summary

The intentional radiator has been tested in a simulated typical installation to demonstrate compliance with the relevant FCC performance and procedural standards. The radio was transmitting at full power on the specified channels. The channels tested are high, middle and low of the allocated bands. Final system data was gathered in a mode that tended to maximize emissions by varying the orientation of the EUT, orientation of power and I/O cabling, antenna search height, and antenna polarization. This device was tested under all configurations and the worst case is reported at 12.2 kbps AMR with TPC bits all set to "1".

Method/System: PCS Licensed Transmitter Held to Ear (PCE)

Mode(s): WCDMA

FCC Part Section(s)	RSS Section	Test Description	Test Limit	Test Condition	Test Result
TRANSMITTER MODE (TX)					
2.1049, 22.917(a), 24.238(a)	N/A	Occupied Bandwidth	N/A	CONDUCTED	N/A
22.917(a), 24.238(a)	RSS-132 (4.5.1.2) / RSS-133 (6.5.1(i))	Band Edge / Conducted Spurious Emissions	< 43 + $\log_{10}$ (P[Watts]) at Band Edge / for all out-of-band emissions		PASS
2.1046	N/A	Transmitter Conducted Output Power	N/A		N/A
22.913(a)(2)	RSS-132 (4.4) [SRSP-503(5.1.3)]	Effective Radiated Power	< 7 Watts max. ERP (<6.3 Watts max. ERP (IC))	RADIATED	PASS
24.232(c)	RSS-133 (6.4) [SRSP-510 (5.1.2)]	Equivalent Isotropic Radiated Power	< 2 Watts max. EIRP		PASS
2.1051, 22.917(a), 24.238(a)	RSS-132 (4.5.1.2) / RSS-133 (6.5.1(i))	Undesirable Emissions	< 43 + $\log_{10}$ (P[Watts]) for all out-of-band emissions		PASS
2.1055, 22.355, 24.235	RSS-132 (4.3) / RSS-133 (6.7(a,b))	Frequency Stability	< 2.5 ppm		PASS
RECEIVER MODE (RX)					
15.107	RSS-210 (7.4)	AC Conducted Emissions 150kHz – 30MHz	EN55022	Line Conducted	PASS
15.109	RSS-132 (4.6) / RSS-133 (6.7(a,b)) / RSS-210 (7.3)	General Field Strength Limits (Restricted Bands and Radiated Emissions Limits)	< FCC 15.209 limits or < RSS-210 table 3 limits	RADIATED (30MHz-1GHz) (1-25 GHz)	PASS
RF EXPOSURE (SAR)					
2.1093	RSS-102	SAR Test or MPE	1.6 W/kg (SAR Limit)	3 Channels	PASS

Table 6-1. Summary of Test Results

Conducted Output Power
§2.1046

Measurement Conditions for UMTS

The handset was placed into a simulated call using a base station simulator in a shielded chamber. Such test signals offer a consistent means for testing and are recommended for evaluating EMC measurements. All measurements were taken with a fully charged battery. The base station simulator configurations were set so as to achieve and maintain the EUT's maximum output power level. Power measurements were performed using the digital average power function of the base station simulator.

Output Power Verification

Maximum output power is verified on the High, Middle and Low channels according to the general descriptions in section 5.2 of 3GPP TS 34.121, using the appropriate RMC or AMR with TPC (transmit power control) set to all "1's". Results for all applicable physical channel configurations (DPCCH, DPDCH and spreading codes) should be tabulated in the test report. All configurations that are not supported by the DUT or cannot be measured due to technical or equipment limitations should be clearly identified.

	Channel	12.2 kbps RMC	12.2 kbps AMR
UMTS	4132	23.15	23.26
	4175	23.26	23.05
	4233	23.14	23.2
PCS	9262	23.05	23.14
	9400	23.1	23.28
	9538	23.17	23.2

Table 6-2. Conducted Power for SGH-A617

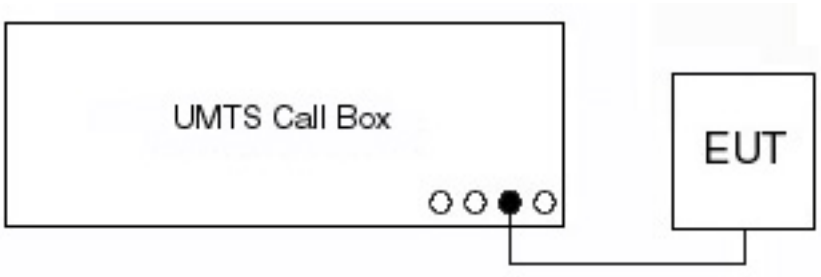


Figure 6-1. Conducted Power Measurement Setup

Effective Radiated Power Output Data

§22.913(a)(2); RSS-132 (4.4)

POWER: High (WCDMA850 Mode)

Freq. Tuned (MHz)	REF. LEVEL (dBm)	POL (H/V)	ERP (W)	ERP (dBm)	BATTERY
826.40	-17.650	V	0.230	23.623	Standard
836.40	-18.000	V	0.220	23.433	Standard
846.60	-18.000	V	0.228	23.583	Standard

Table 6-3. Effective Radiated Power Output Data

NOTES:

Effective Radiated Power Output Measurements by Substitution Method according to ANSI/ TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For WCDMA signals, a peak detector is used, with RBW = VBW = 5 MHz. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. The conducted power at the terminals of the dipole is measured. The ERP is recorded.

This device was tested under all configurations and the worst case is reported at 12.2 kbps AMR with TPC bits all set to "1".

Equivalent Isotropic Radiated Power Output Data

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

Radiated measurements at 3 meters

Supply Voltage: 3.7 VDC

Modulation: PCS WCDMA

FREQ. (MHz)	REF. LEVEL (dBm)	POL (H/V)	Azimuth (o angle)	EIRP (dBm)	EIRP (W)	Battery
1852.40	-20.800	V	10	22.281	0.169	Standard
1880.00	-20.700	V	10	22.551	0.180	Standard
1907.60	-21.000	V	10	22.421	0.175	Standard

Table 6-4. Equivalent Isotropic Radiated Power Output Data

NOTES:

Equivalent Isotropic Radiated Power Measurements by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For WCDMA signals, a peak detector is used, with RBW = VBW = 5 MHz. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz. A Horn antenna was substituted in place of the EUT. This Horn antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. The conducted power at the terminals of the Horn antenna is measured. The difference between the gain of the horn and an isotropic antenna is taken into consideration and the EIRP is recorded.

This device was tested under all configurations and the worst case is reported at 12.2 kbps AMR with TPC bits all set to "1".

Cellular WCDMA Radiated Measurements

§2.1051, 22.917(a); RSS-132 (4.5.1.2)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:	826.40	MHz		
CHANNEL:	4132 (Low)			
MEASURED OUTPUT POWER:	23.623	dBm	=	0.230 W
MODULATION SIGNAL:	GSM (Internal)			
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W) =	36.62	dBc	

FREQ. (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	CORRECT GENERATOR LEVEL (dBm)	POL (H/V)	(dBc)
1652.80	-53.18	6.10	-47.08	V	70.7
2479.20	-62.98	6.70	-56.28	V	79.9
3305.60	-89.58	6.80	-82.78	V	106.4
4132.00	-85.68	6.50	-79.18	V	102.8
4958.40	-84.38	7.00	-77.38	V	101.0

Table 6-5. Radiated Spurious Data (Cellular WCDMA Mode – Ch. 4132)

NOTES:

Radiated Spurious Emission Measurements by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For WCDMA signals, a peak detector is used, with RBW = VBW = 5 MHz. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This spurious level is recorded. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

This device was tested under all configurations and the worst case is reported at 12.2 kbps AMR with TPC bits all set to "1".

Cellular WCDMA Radiated Measurements (Cont'd)

§2.1051, 22.917(a); RSS-132 (4.5.1.2)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:	836.40	MHz		
CHANNEL:	4182 (Mid)			
MEASURED OUTPUT POWER:	23.623	dBm	=	0.230 W
MODULATION SIGNAL:	GSM (Internal)			
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W) =	36.62	dBc	

FREQ. (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	CORRECT GENERATOR LEVEL (dBm)	POL (H/V)	(dBc)
1672.80	-51.28	6.10	-45.18	V	68.8
2509.20	-64.78	6.70	-58.08	V	81.7
3345.60	-89.48	6.80	-82.68	V	106.3
4182.00	-85.78	6.50	-79.28	V	102.9
5018.40	-83.78	7.00	-76.78	V	100.4

Table 6-6. Radiated Spurious Data (Cellular WCDMA Mode – Ch. 4175)

NOTES:

Radiated Spurious Emission Measurements by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For WCDMA signals, a peak detector is used, with RBW = VBW = 5 MHz. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This spurious level is recorded. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

This device was tested under all configurations and the worst case is reported at 12.2 kbps AMR with TPC bits all set to "1".

Cellular WCDMA Radiated Measurements (Cont'd)

§2.1051, 22.917(a); RSS-132 (4.5.1.2)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:	846.60	MHz		
CHANNEL:	4233 (High)			
MEASURED OUTPUT POWER:	23.623	dBm	=	0.230 W
MODULATION SIGNAL:	GSM (Internal)			
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W) =	36.62	dBc	

FREQ. (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	CORRECT GENERATOR LEVEL (dBm)	POL (H/V)	(dBc)
1693.20	-52.38	6.10	-46.28	V	69.9
2539.80	-65.98	6.70	-59.28	V	82.9
3386.40	-89.08	6.80	-82.28	V	105.9
4233.00	-85.68	6.50	-79.18	V	102.8
5079.60	-83.98	7.00	-76.98	V	100.6

Table 6-7. Radiated Spurious Data (Cellular WCDMA Mode – Ch. 4233)

NOTES:

Radiated Spurious Emission Measurements by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For WCDMA signals, a peak detector is used, with RBW = VBW = 5 MHz. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This spurious level is recorded. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

This device was tested under all configurations and the worst case is reported at 12.2 kbps AMR with TPC bits all set to "1".

PCS WCDMA Radiated Measurements

§2.1051, 24.238(a); RSS-133 (6.5.1)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:	1852.40	MHz		
CHANNEL:	9262 (Low)			
MEASURED OUTPUT POWER:	22.551	dBm	=	0.180 W
MODULATION SIGNAL:	GSM (Internal)			
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W) =	35.55	dBc	

FREQ. (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	CORRECT GENERATOR LEVEL (dBm)	POL (H/V)	(dBc)
3704.80	-54.23	8.70	-45.53	V	68.1
5557.20	-52.73	9.70	-43.03	V	65.6
7409.60	-79.43	9.90	-69.53	V	92.1
9262.00	-77.43	11.40	-66.03	V	88.6
11114.40	-77.33	12.10	-65.23	V	87.8

Table 6-8. Radiated Spurious Data (PCS WCDMA Mode – Ch. 9262)

NOTES:

Radiated Spurious Emission Measurements by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For WCDMA signals, a peak detector is used, with RBW = VBW = 5 MHz. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This spurious level is recorded. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

This device was tested under all configurations and the worst case is reported at 12.2 kbps AMR with TPC bits all set to "1".

PCS WCDMA Radiated Measurements (Cont'd)

§2.1051, 24.238(a); RSS-133 (6.5.1)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:	1880.00	MHz		
CHANNEL:	9400 (Mid)			
MEASURED OUTPUT POWER:	22.551	dBm	=	0.180 W
MODULATION SIGNAL:	GSM (Internal)			
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W) =	35.55	dBc	

FREQ. (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	CORRECT GENERATOR LEVEL (dBm)	POL (H/V)	(dBc)
3760.00	-53.13	8.70	-44.43	V	67.0
5640.00	-54.73	9.70	-45.03	V	67.6
7520.00	-79.13	9.90	-69.23	V	91.8
9400.00	-77.23	11.40	-65.83	V	88.4
11280.00	-77.13	12.10	-65.03	V	87.6

Table 6-9. Radiated Spurious Data (PCS WCDMA Mode – Ch. 9400)

NOTES:

Radiated Spurious Emission Measurements by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For WCDMA signals, a peak detector is used, with RBW = VBW = 5 MHz. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This spurious level is recorded. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

This device was tested under all configurations and the worst case is reported at 12.2 kbps AMR with TPC bits all set to "1".

PCS WCDMA Radiated Measurements (Cont'd)

§2.1051, 24.238(a); RSS-133 (6.5.1)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:	1907.60	MHz		
CHANNEL:	9538 (High)			
MEASURED OUTPUT POWER:	22.551	dBm	=	0.180 W
MODULATION SIGNAL:	GSM (Internal)			
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W) =	35.55	dBc	

FREQ. (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	CORRECT GENERATOR LEVEL (dBm)	POL (H/V)	(dBc)
3815.20	-54.33	8.70	-45.63	V	68.2
5722.80	-53.63	9.70	-43.93	V	66.5
7630.40	-78.93	9.90	-69.03	V	91.6
9538.00	-76.93	11.40	-65.53	V	88.1
11445.60	-76.93	12.10	-64.83	V	87.4

Table 6-10. Radiated Spurious Data (PCS WCDMA Mode – Ch. 9538)

NOTES:

Radiated Spurious Emission Measurements by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For WCDMA signals, a peak detector is used, with RBW = VBW = 5 MHz. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This spurious level is recorded. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

This device was tested under all configurations and the worst case is reported at 12.2 kbps AMR with TPC bits all set to "1".

Cellular WCDMA Frequency Stability

§2.1055, 22.355; RSS-132 (4.3)

OPERATING FREQUENCY: 835,000,009 Hz

CHANNEL: 4175

REFERENCE VOLTAGE: 3.7 VDC

DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (ºC)	FREQ. (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.70	+ 20 (Ref)	835,000,009	0.00	0.000000
100 %		- 30	835,000,042	-33.40	-0.000004
100 %		- 20	834,999,884	125.25	0.000015
100 %		- 10	834,999,767	242.15	0.000029
100 %		0	834,999,834	175.35	0.000021
100 %		+ 10	834,999,717	292.25	0.000035
100 %		+ 20	835,000,009	0.00	0.000000
100 %		+ 25	834,999,884	125.25	0.000015
100 %		+ 30	834,999,892	116.90	0.000014
100 %		+ 40	834,999,859	150.30	0.000018
100 %		+ 50	834,999,875	133.60	0.000016
100 %		+ 60	834,999,708	300.60	0.000036
85 %	3.30	+ 20	835,000,009	0.00	0.000000
115 %	4.26	+ 20	835,000,009	0.00	0.000000
BATT. ENDPOINT	3.21	+ 20	835,000,009	0.00	0.000000

Table 6-11. Frequency Stability Data (Cellular WCDMA Mode – Ch. 4175)

Note:

Standard batteries were used to perform this test.

Cellular WCDMA Frequency Stability (Cont'd)

§2.1055, 22.355; RSS-132 (4.3)

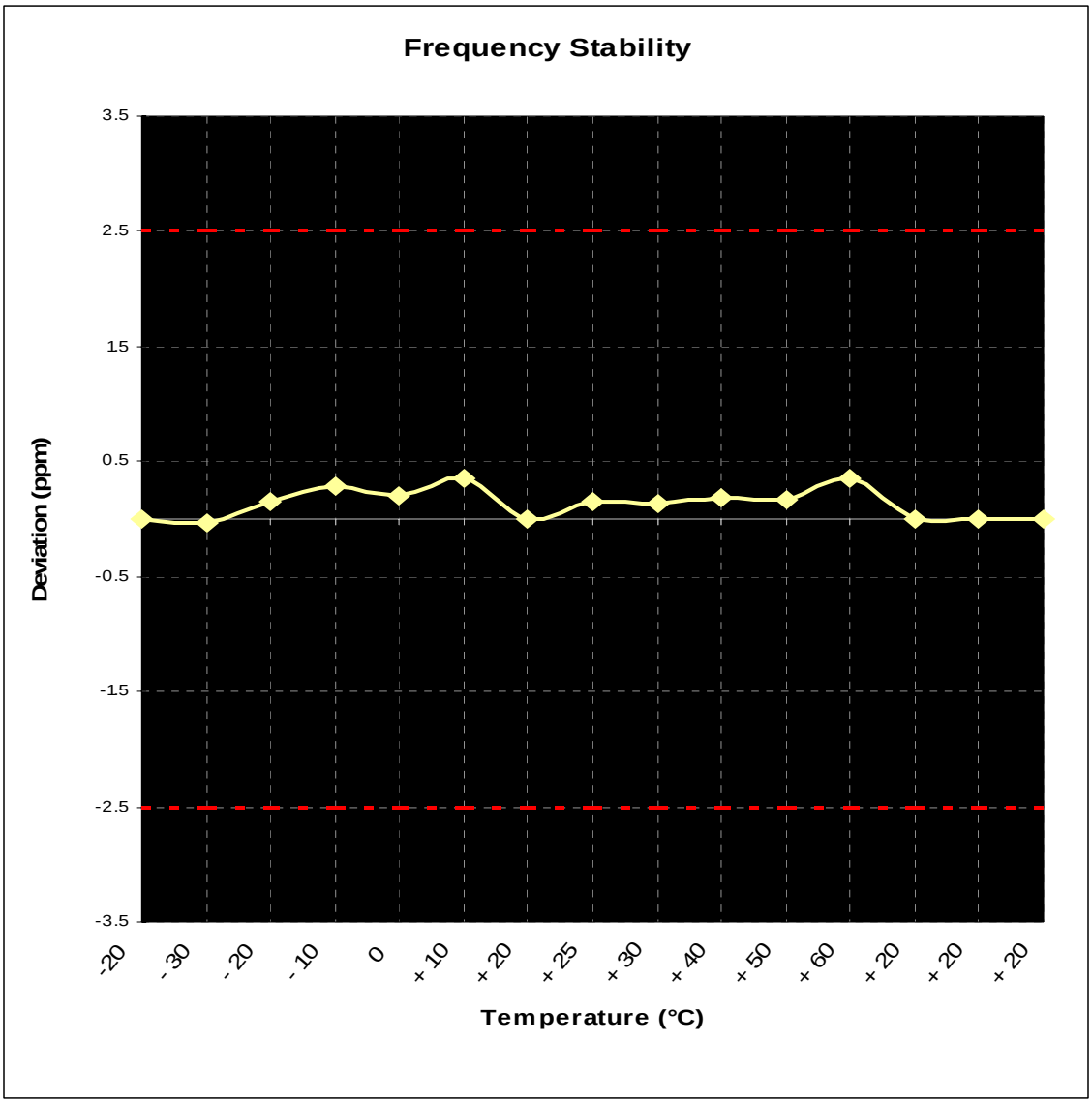


Figure 6-2. Frequency Stability Graph (Cellular WCDMA Mode – Ch. 4175)

Note:

Standard batteries were used to perform this test.

PCS WCDMA Frequency Stability

§2.1055, 24.235; RSS-133 (6.7(a,b))

OPERATING FREQUENCY: 1,880,000,004 Hz

CHANNEL: 9400

REFERENCE VOLTAGE: 3.7 VDC

DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (ºC)	FREQ. (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.70	+ 20 (Ref)	1,880,000,004	0.00	0.000000
100 %		- 30	1,879,999,703	300.80	0.000016
100 %		- 20	1,879,999,891	112.80	0.000006
100 %		- 10	1,879,999,496	507.60	0.000027
100 %		0	1,879,999,647	357.20	0.000019
100 %		+ 10	1,879,999,290	714.40	0.000038
100 %		+ 20	1,880,000,004	0.00	0.000000
100 %		+ 25	1,879,999,797	206.80	0.000011
100 %		+ 30	1,879,999,346	658.00	0.000035
100 %		+ 40	1,879,999,760	244.40	0.000013
100 %		+ 50	1,879,999,534	470.00	0.000025
100 %		+ 60	1,880,000,136	-131.60	-0.000007
85 %	3.30	+ 20	1,880,000,004	0.00	0.000000
115 %	4.26	+ 20	1,880,000,004	0.00	0.000000
BATT. ENDPOINT	3.20	+ 20	1,880,000,004	0.00	0.000000

Table 6-12. Frequency Stability Data (PCS WCDMA Mode – Ch. 9400)

Note:

Standard batteries were used to perform this test.

PCS WCDMA Frequency Stability (Cont'd)

§2.1055, 24.235; RSS-133 (6.7(a,b))

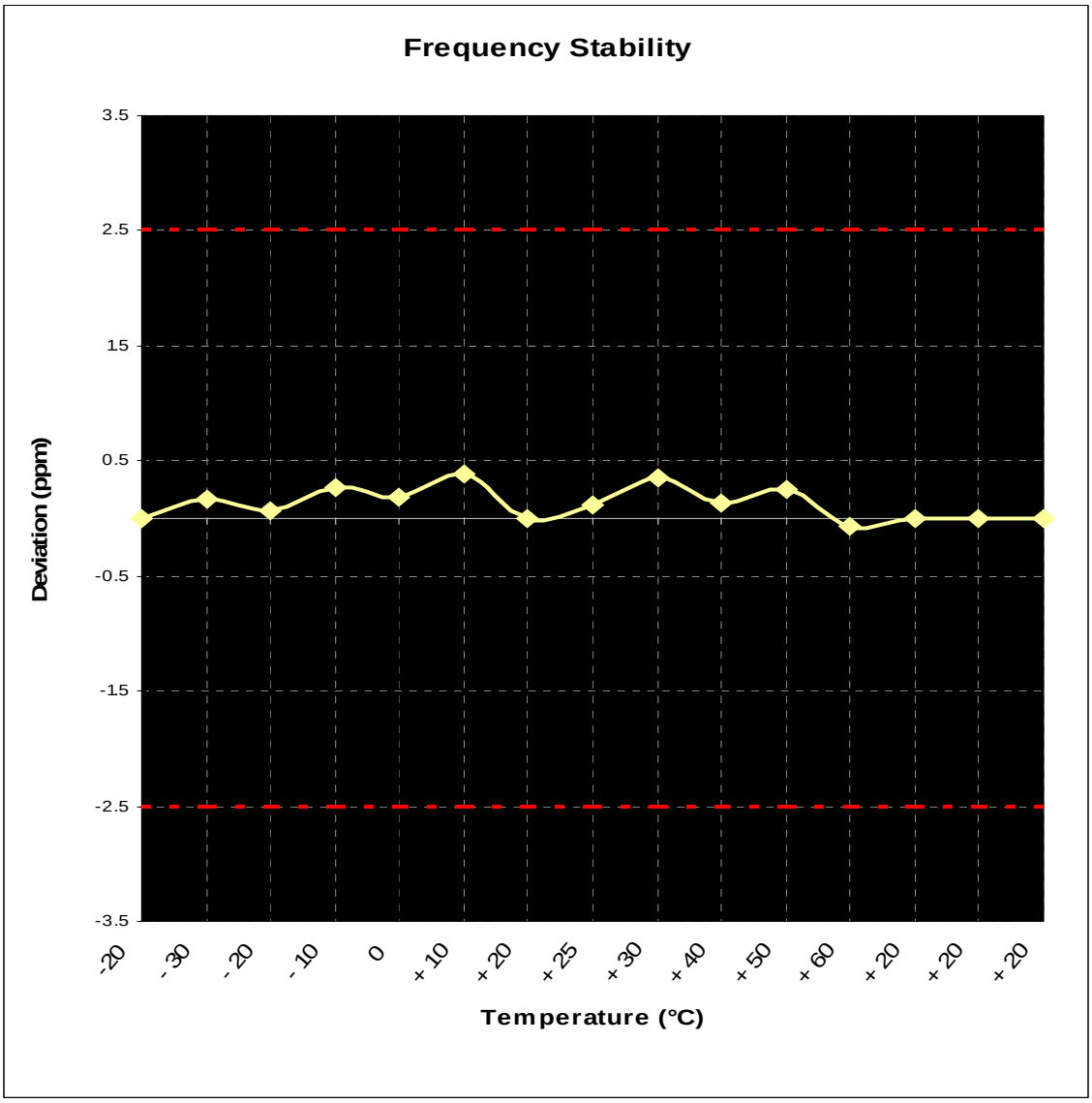


Figure 6-3. Frequency Stability Graph (PCS WCDMA Mode – Ch. 9400)

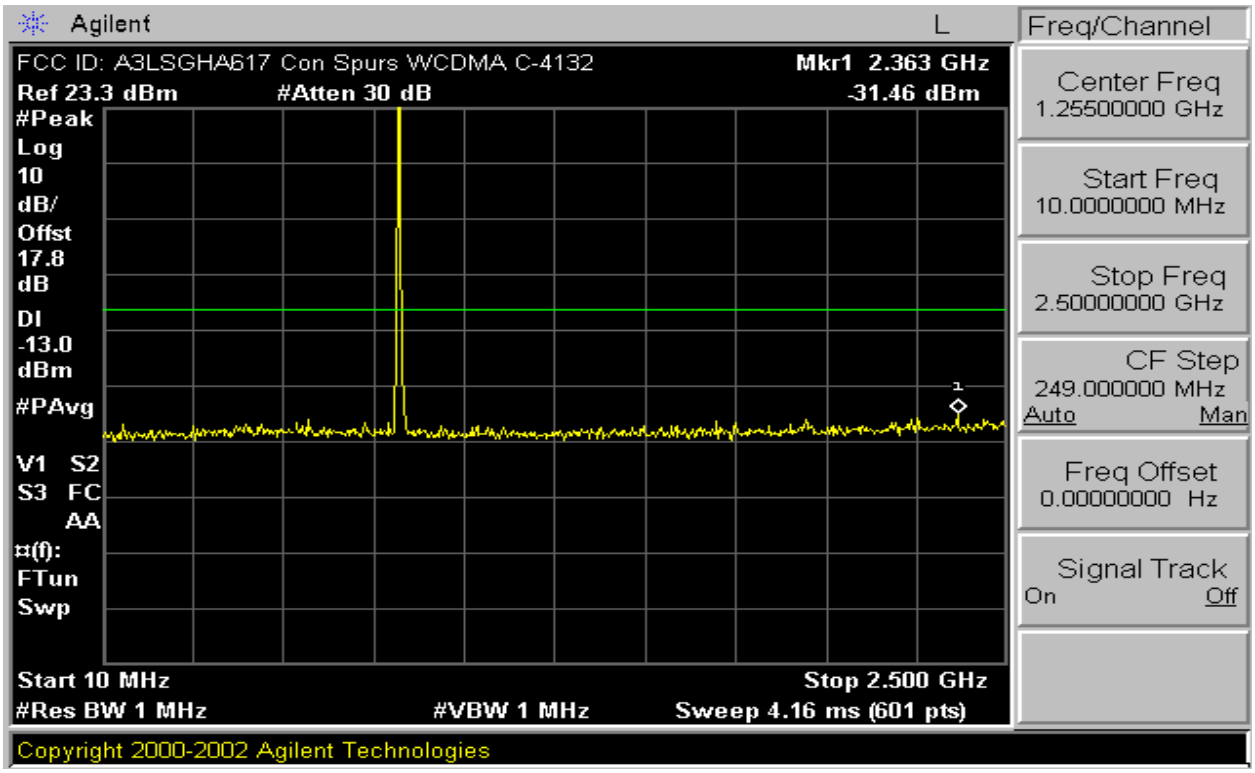
Note:

Standard batteries were used to perform this test.

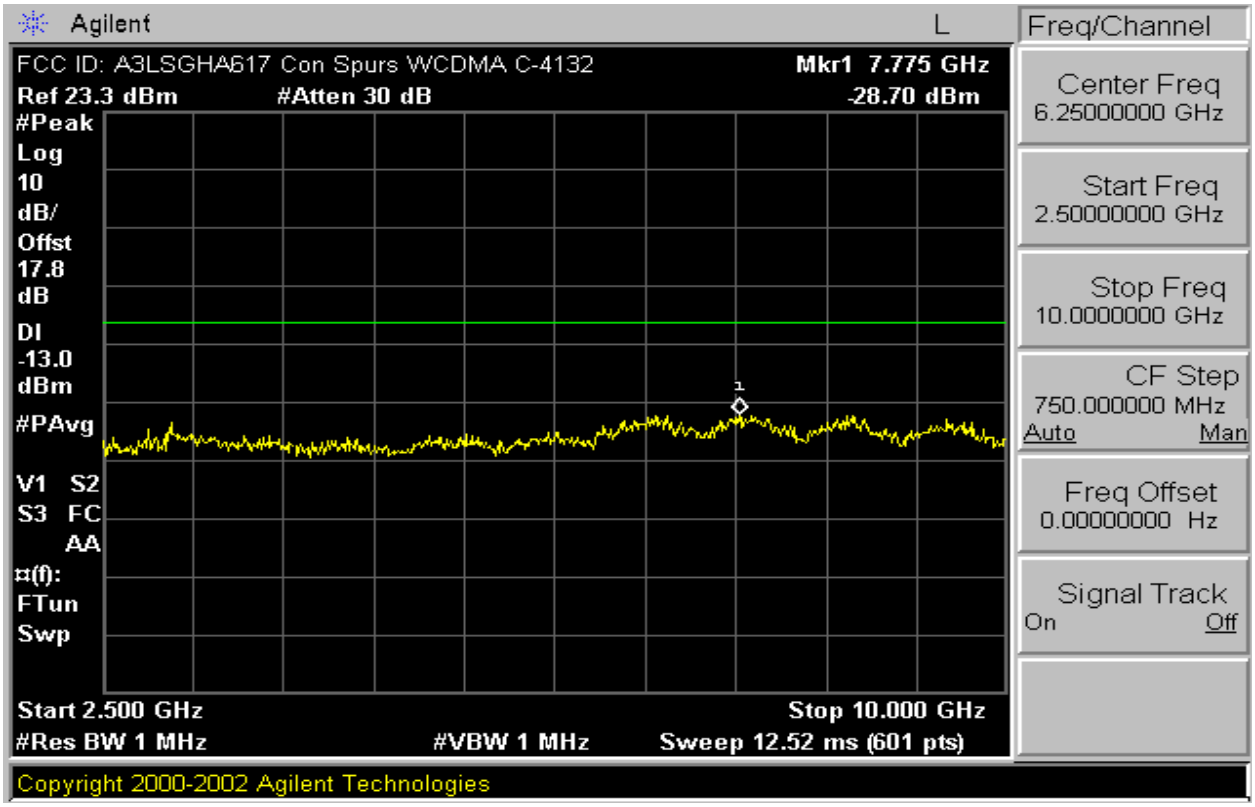
7.0 CONCLUSION

The data collected shows that the Samsung Electronics, Co. Ltd. Dual-Band Dual-Mode GSM/EDGE/WCDMA Phone with Bluetooth FCC ID: A3LSGHA617 complies with all the requirements of Parts 2, 22, and 24 of the FCC rules.

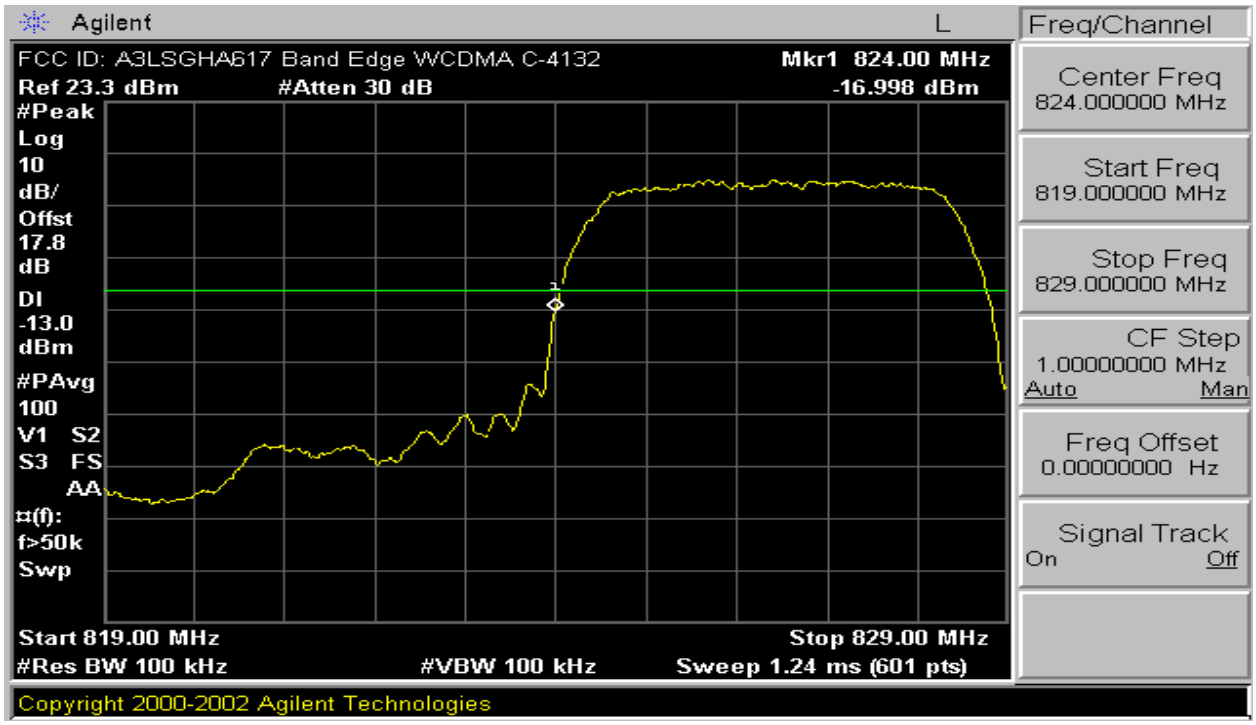
EXHIBIT A – PLOT(S) OF EMISSIONS



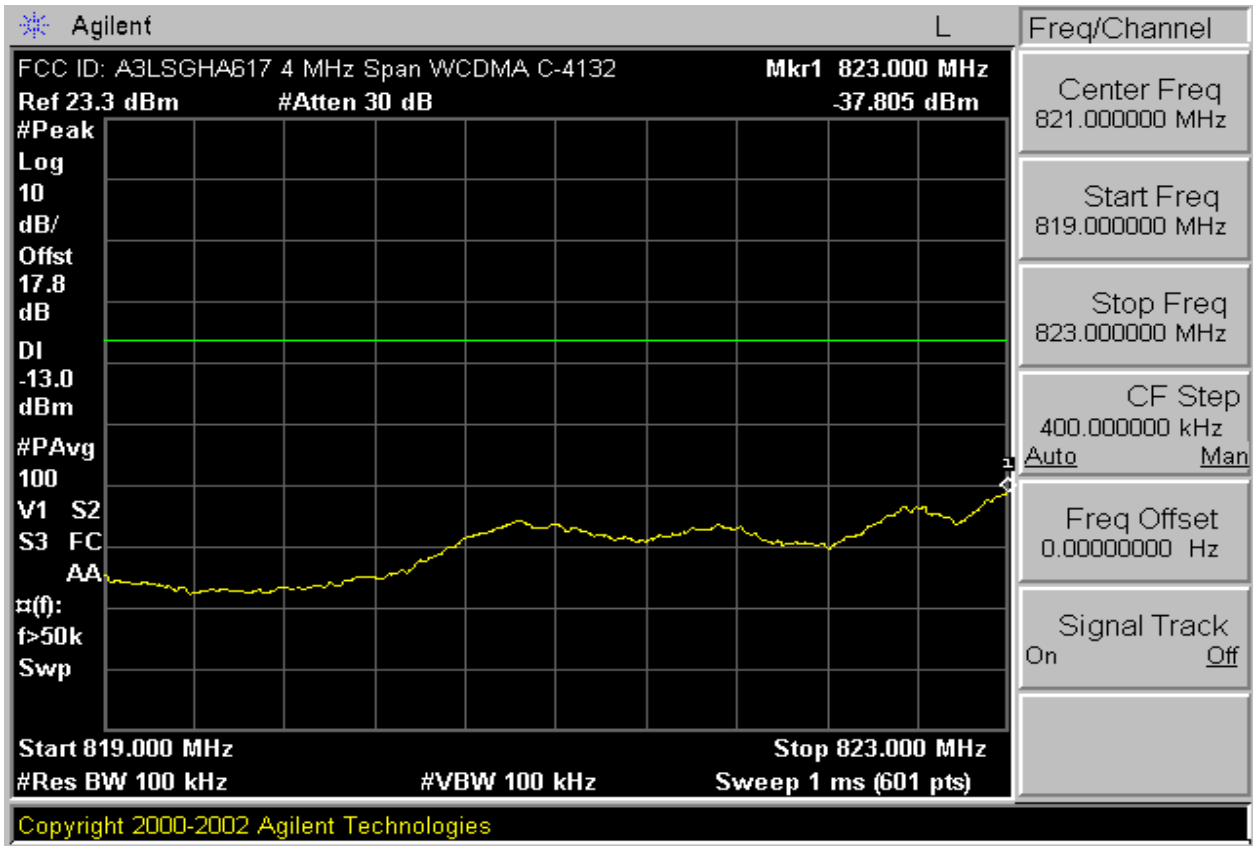
Plot A-1. Conducted Spurious Plot (Cellular WCDMA Mode – Ch. 4132)



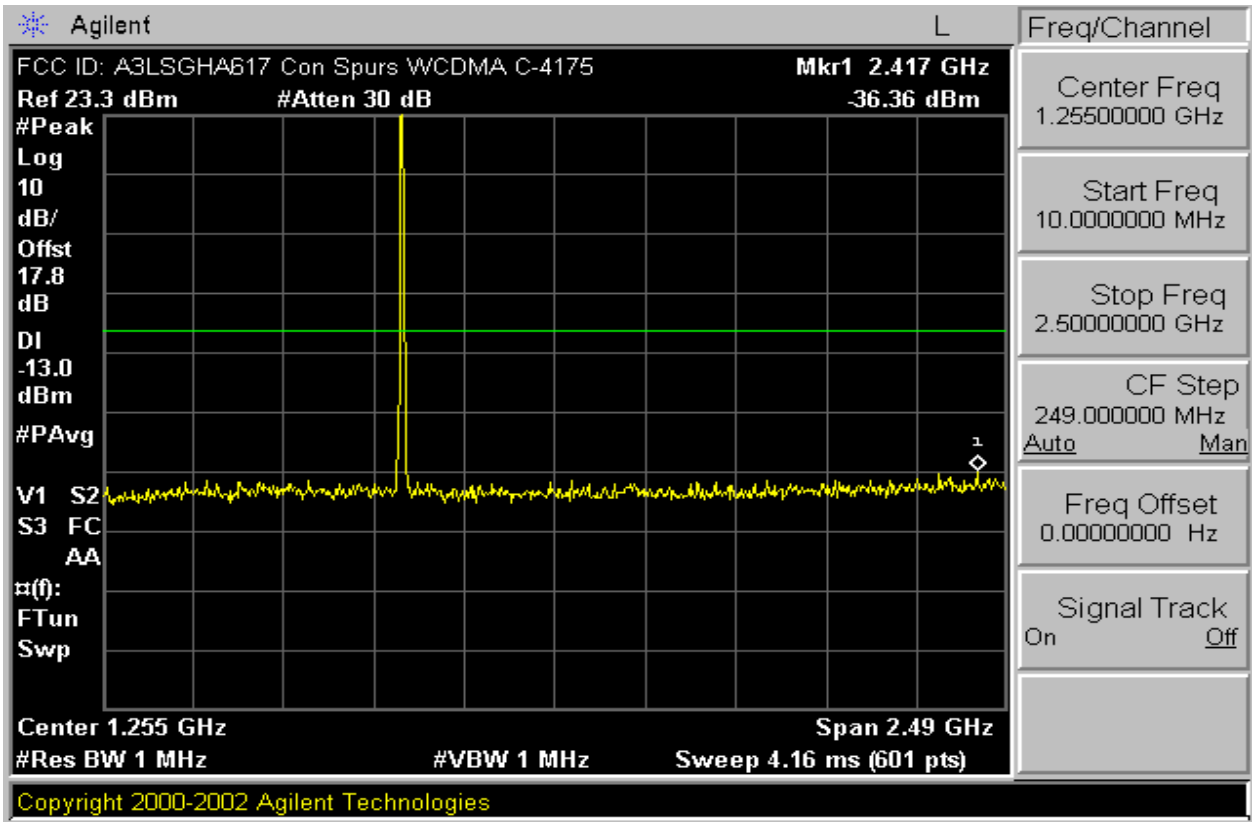
Plot A-2. Conducted Spurious Plot (Cellular WCDMA Mode – Ch. 4132)



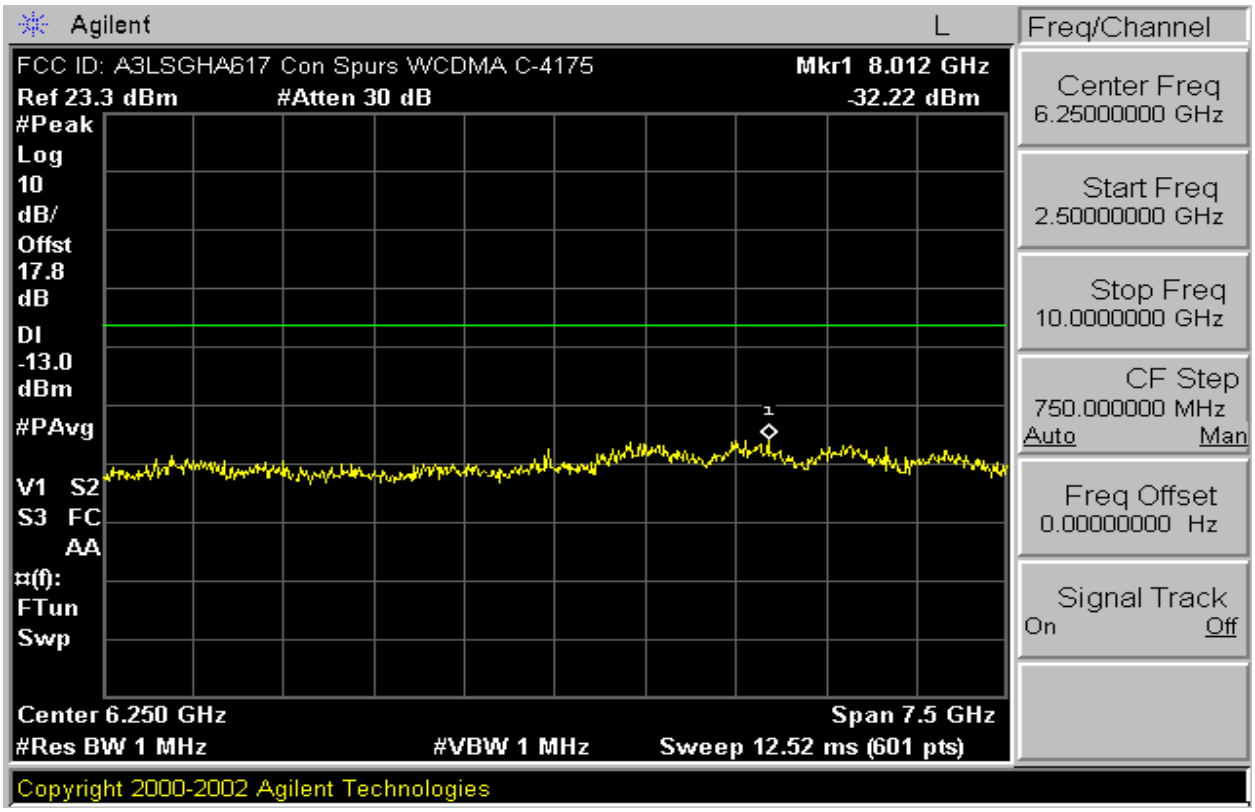
Plot A-3. Band Edge Plot (Cellular WCDMA Mode – Ch. 4132)



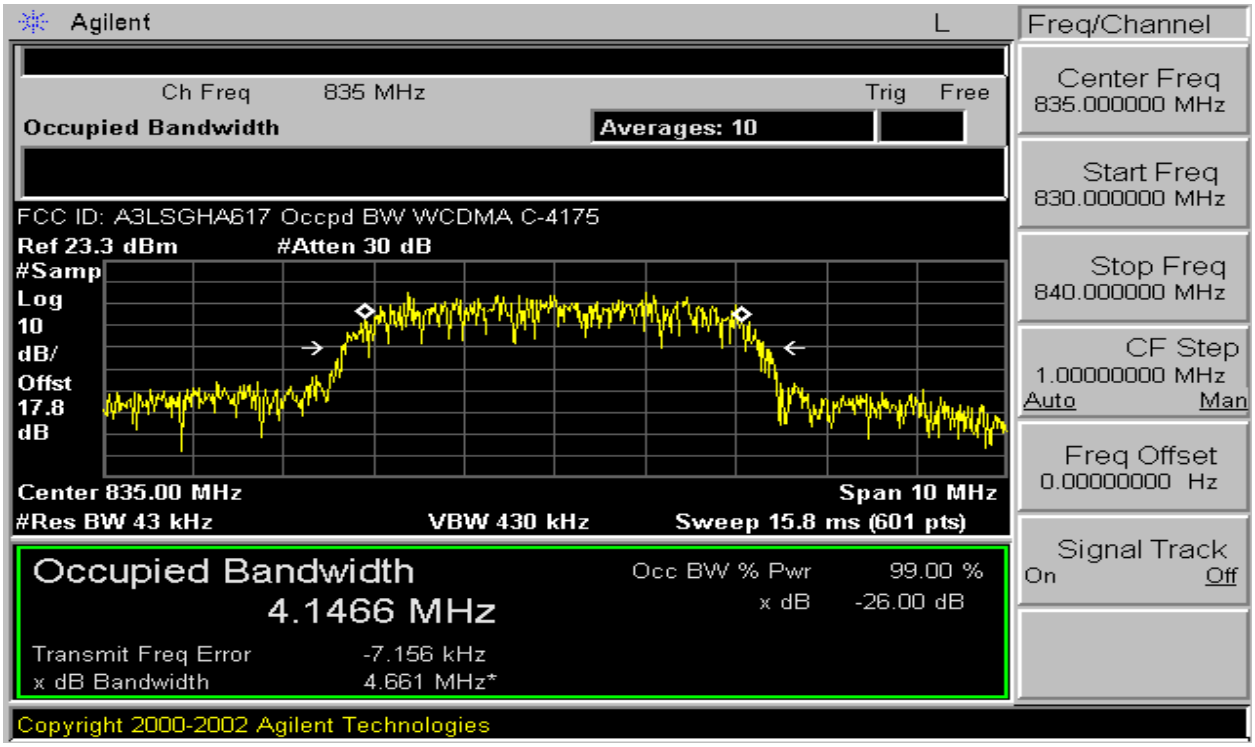
Plot A-4. 4MHz Span Plot (Cellular WCDMA Mode – Ch. 4132)



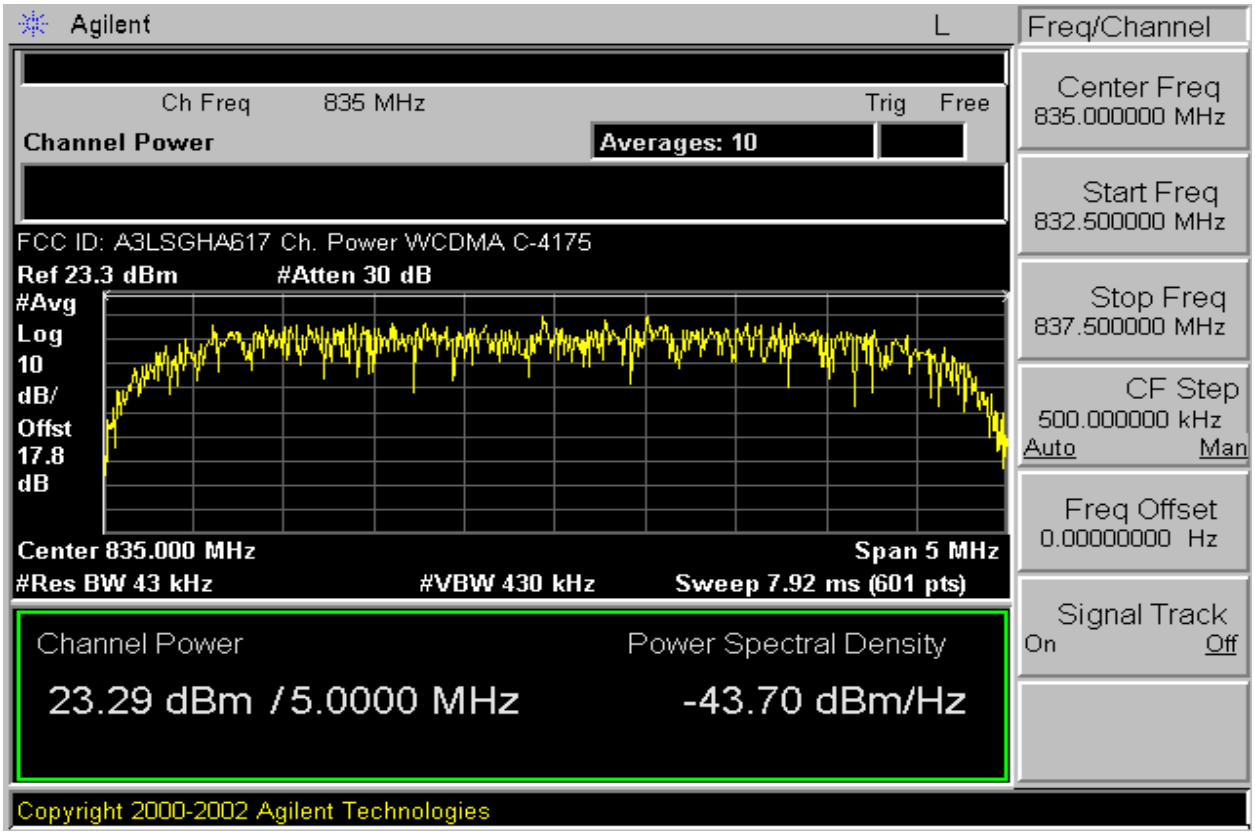
Plot A-5. Conducted Spurious Plot (Cellular WCDMA Mode – Ch. 4175)



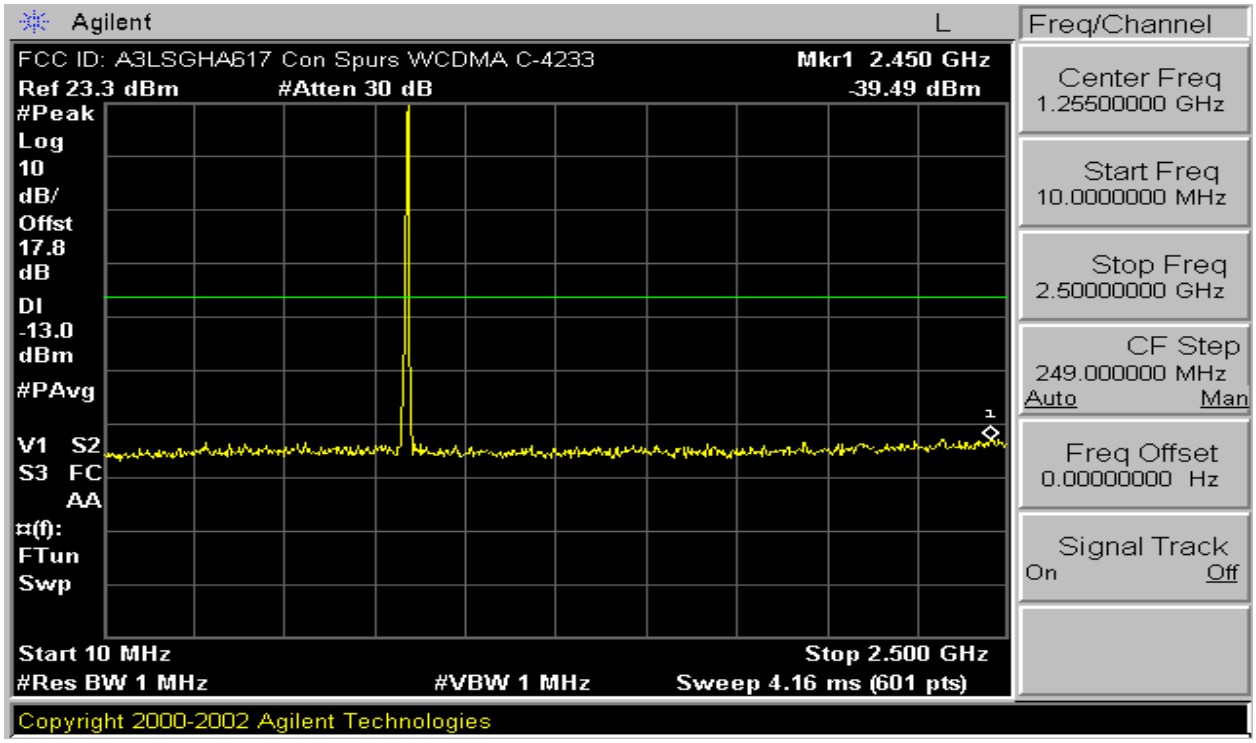
Plot A-6. Conducted Spurious Plot (Cellular WCDMA Mode – Ch. 4175)



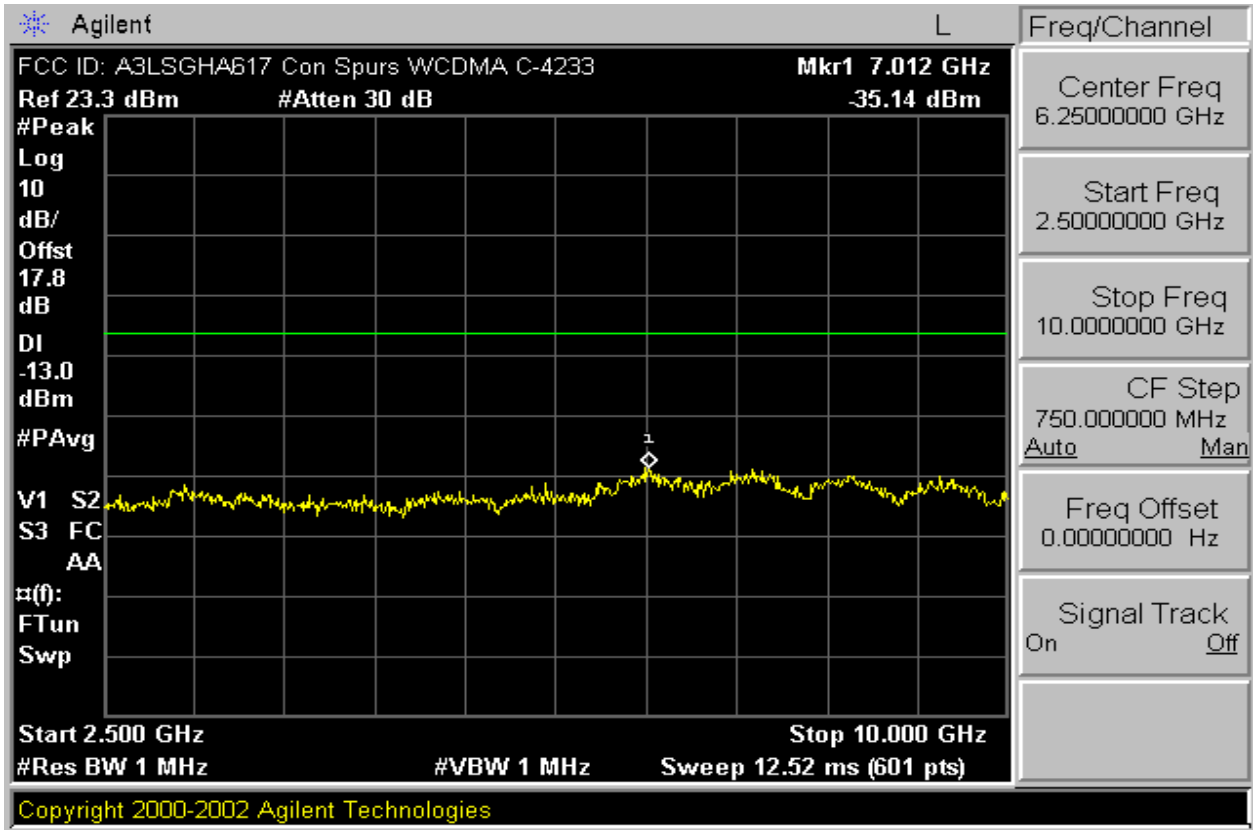
Plot A-7. Occupied Bandwidth Plot (Cellular WCDMA Mode – Ch. 4175)



Plot A-8. Channel Power Plot (Cellular WCDMA Mode – Ch. 4175)

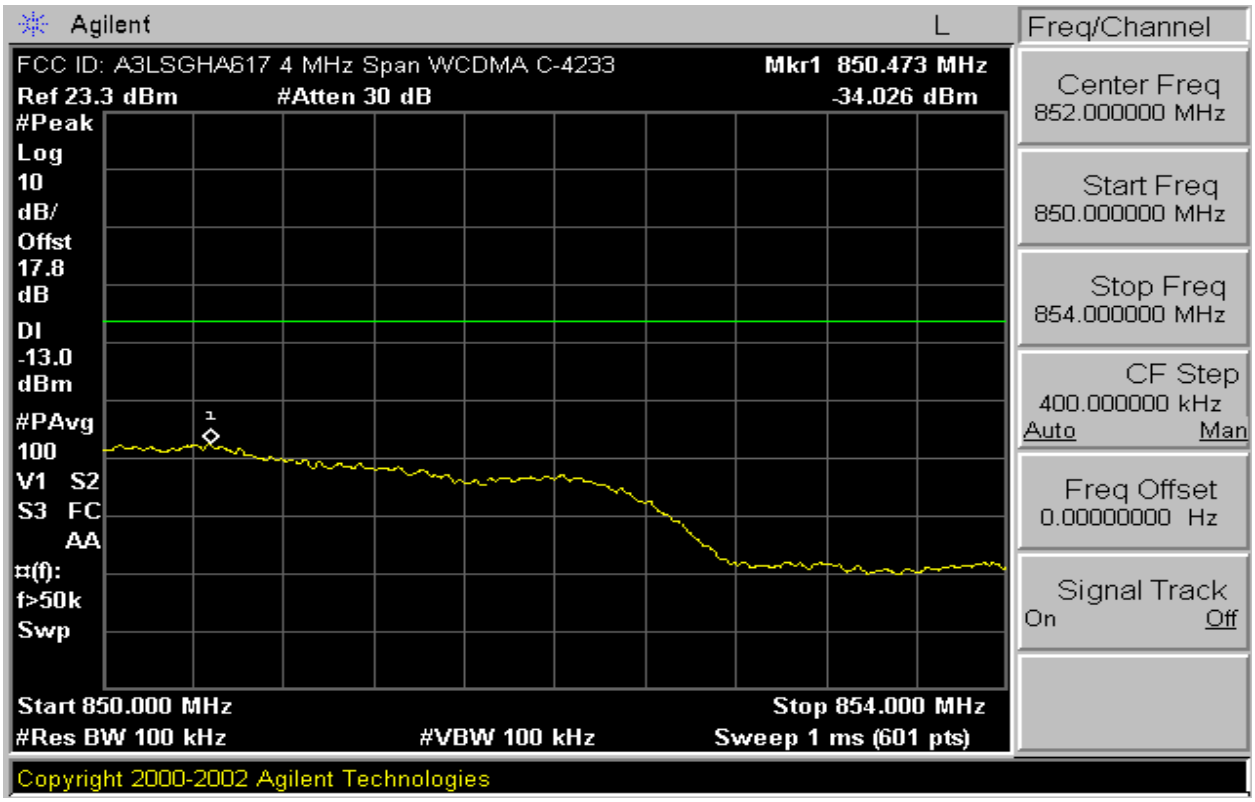


Plot A-9. Conducted Spurious Plot (Cellular WCDMA Mode – Ch. 4233)

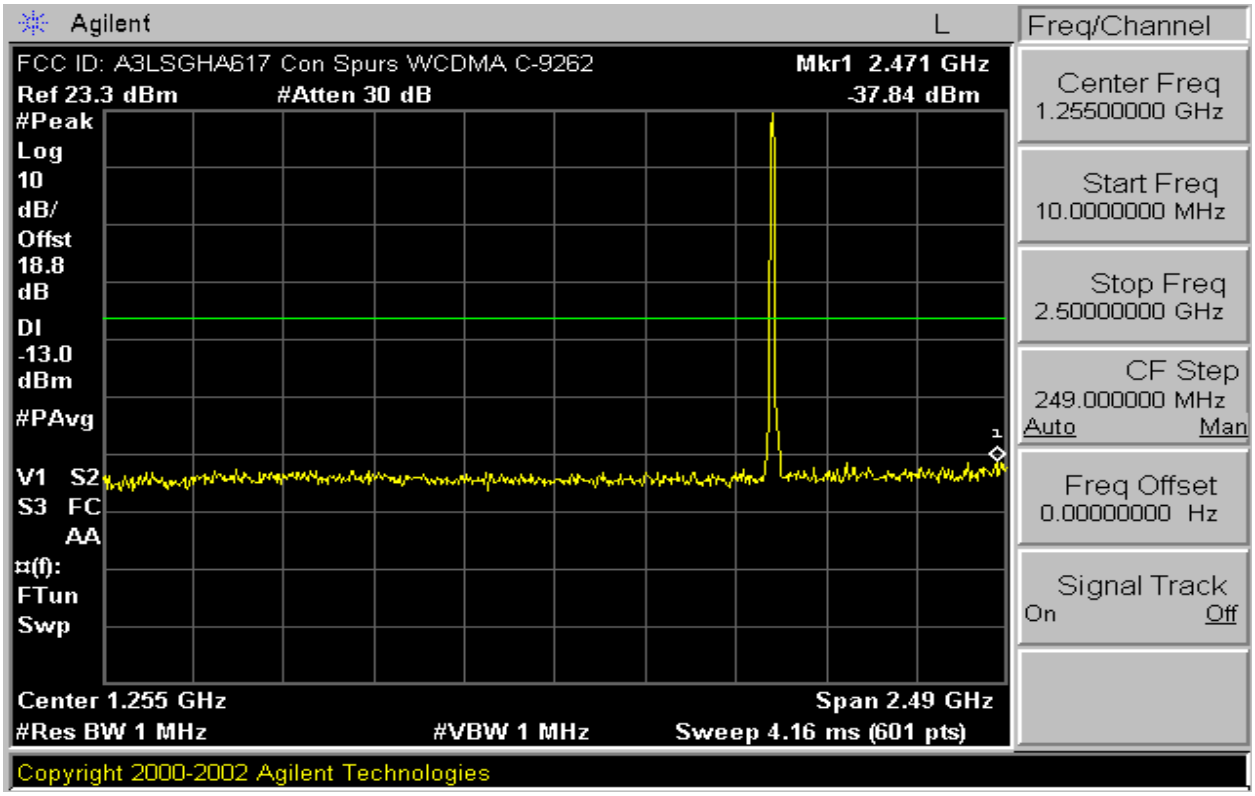


Plot A-10. Conducted Spurious Plot (Cellular WCDMA Mode – Ch. 4233)

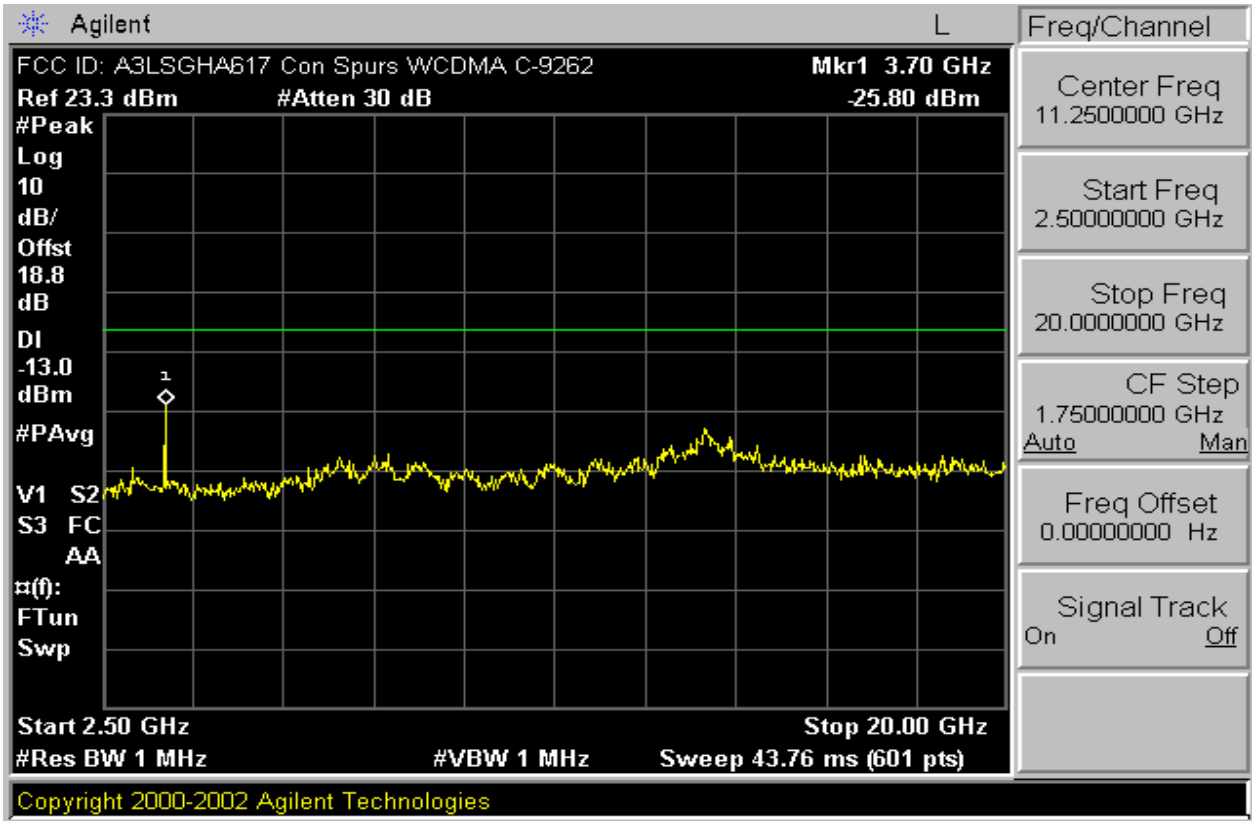
Plot A-11. Band Edge Plot (Cellular WCDMA Mode – Ch. 4233)



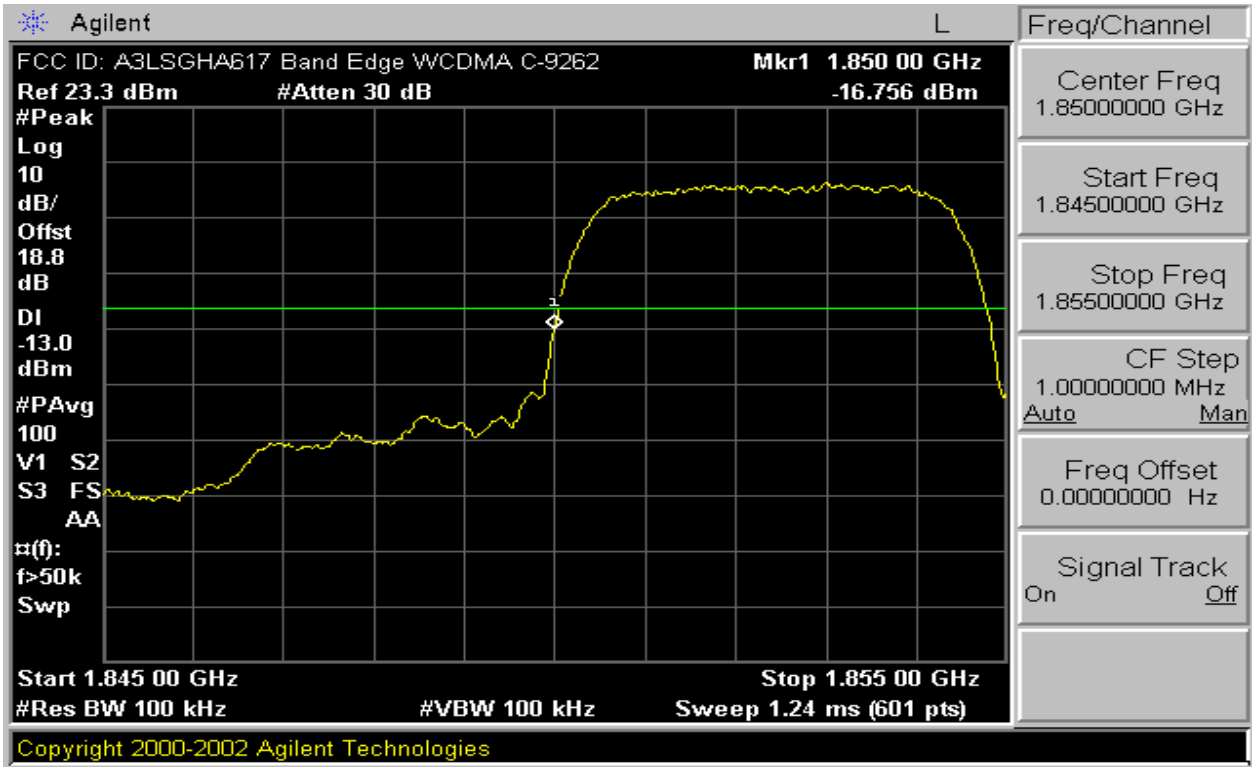
Plot A-12. 4MHz Span Plot (Cellular WCDMA Mode – Ch. 4233)



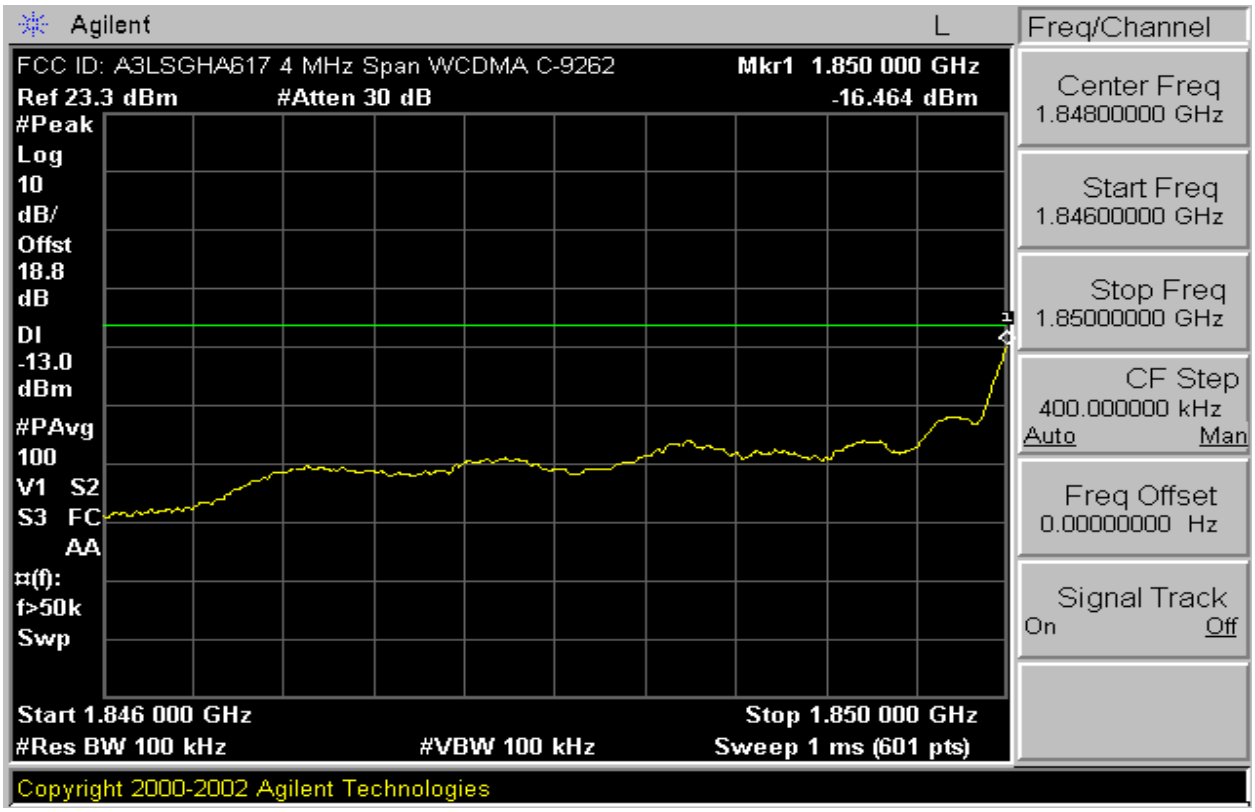
Plot A-13. Conducted Spurious Plot (PCS WCDMA Mode – Ch. 9262)



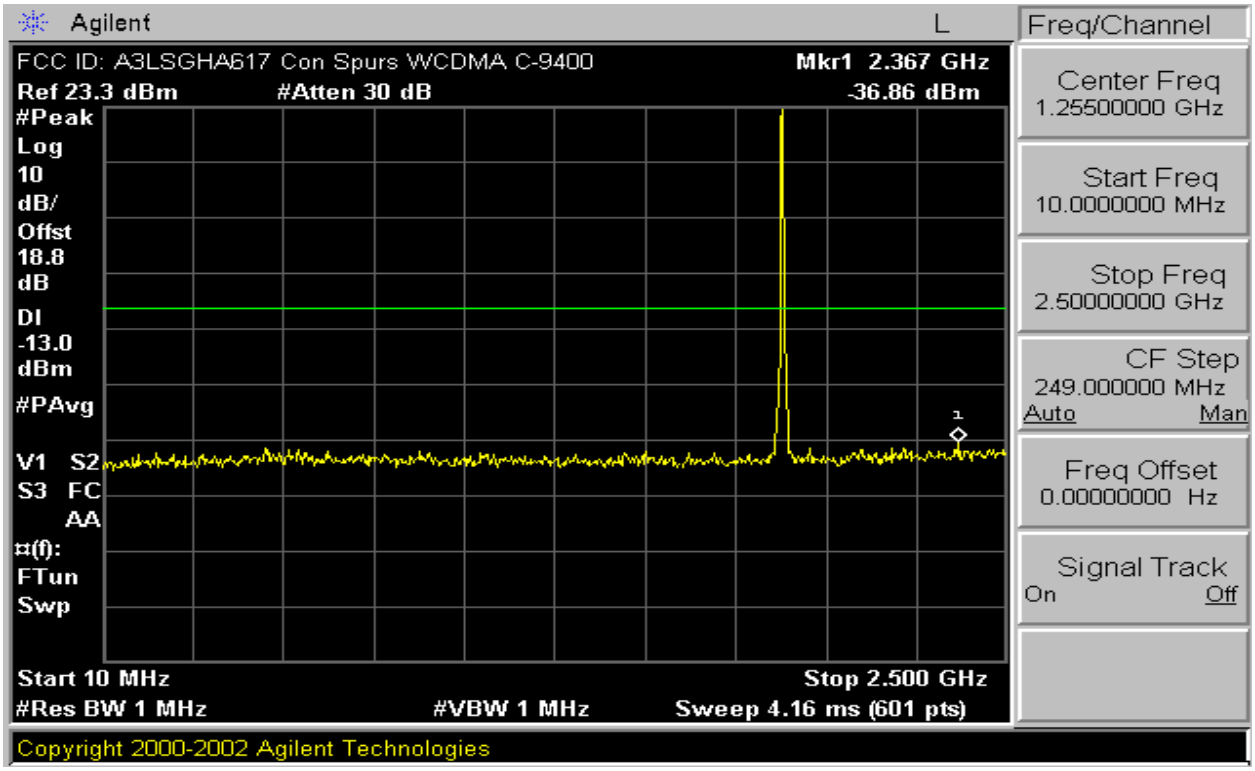
Plot A-14. Conducted Spurious Plot (PCS WCDMA Mode – Ch. 9262)



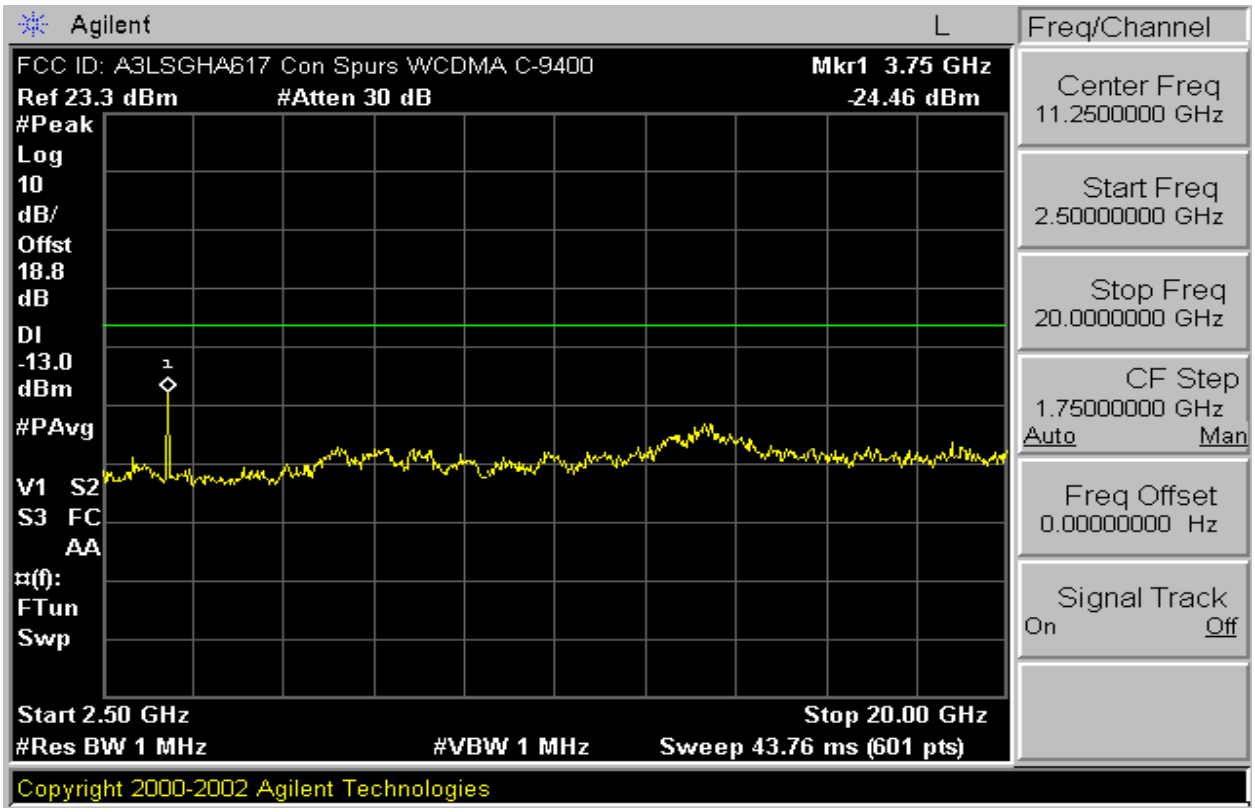
Plot A-15. Band Edge Plot (PCS WCDMA Mode – Ch. 9262)



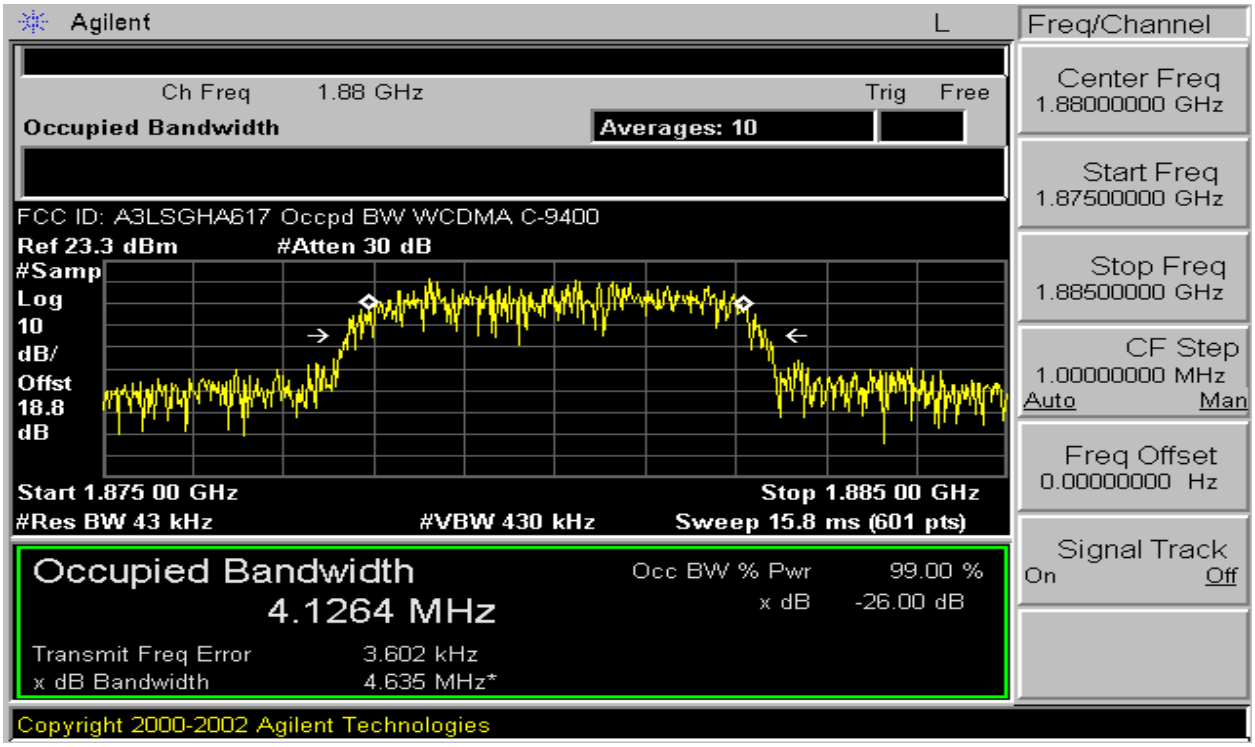
Plot A-16. 4MHz Span Plot (PCS WCDMA Mode – Ch. 9262)



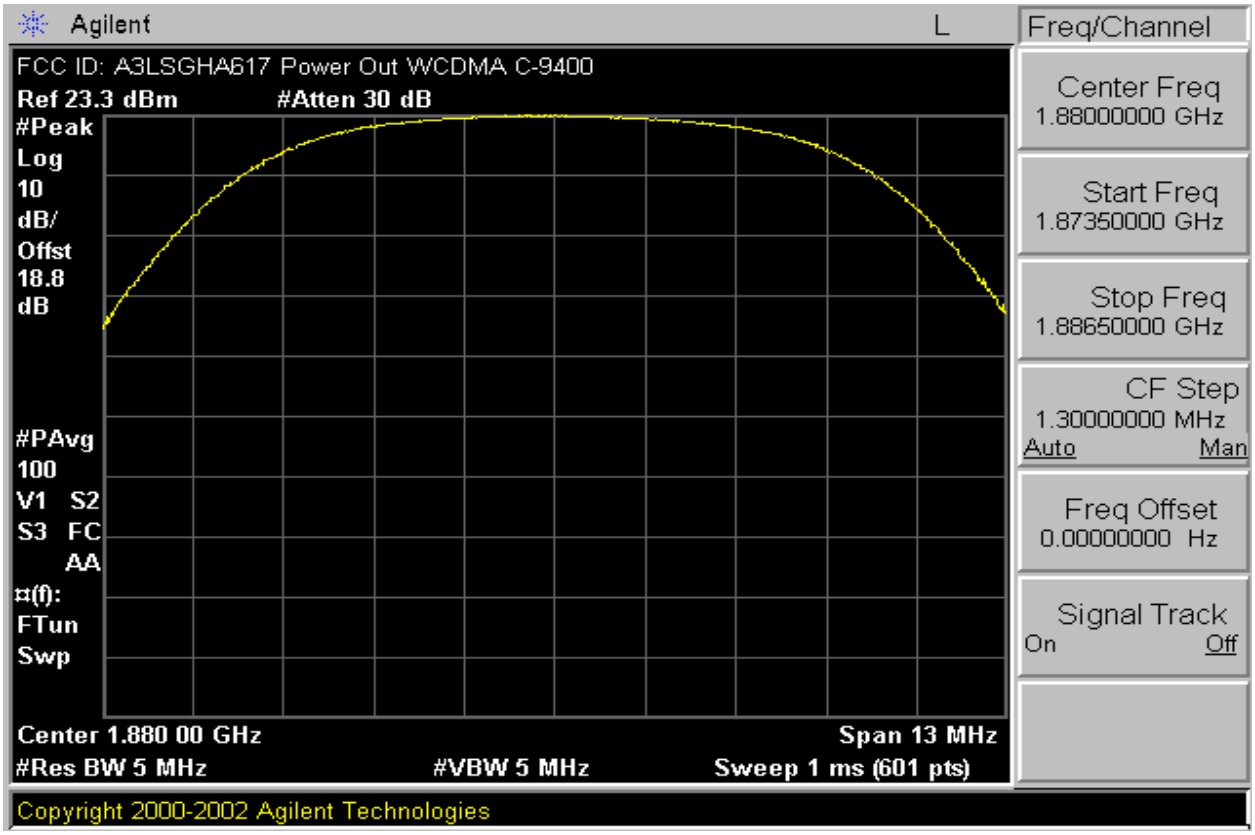
Plot A-17. Conducted Spurious Plot (PCS WCDMA Mode – Ch. 9400)



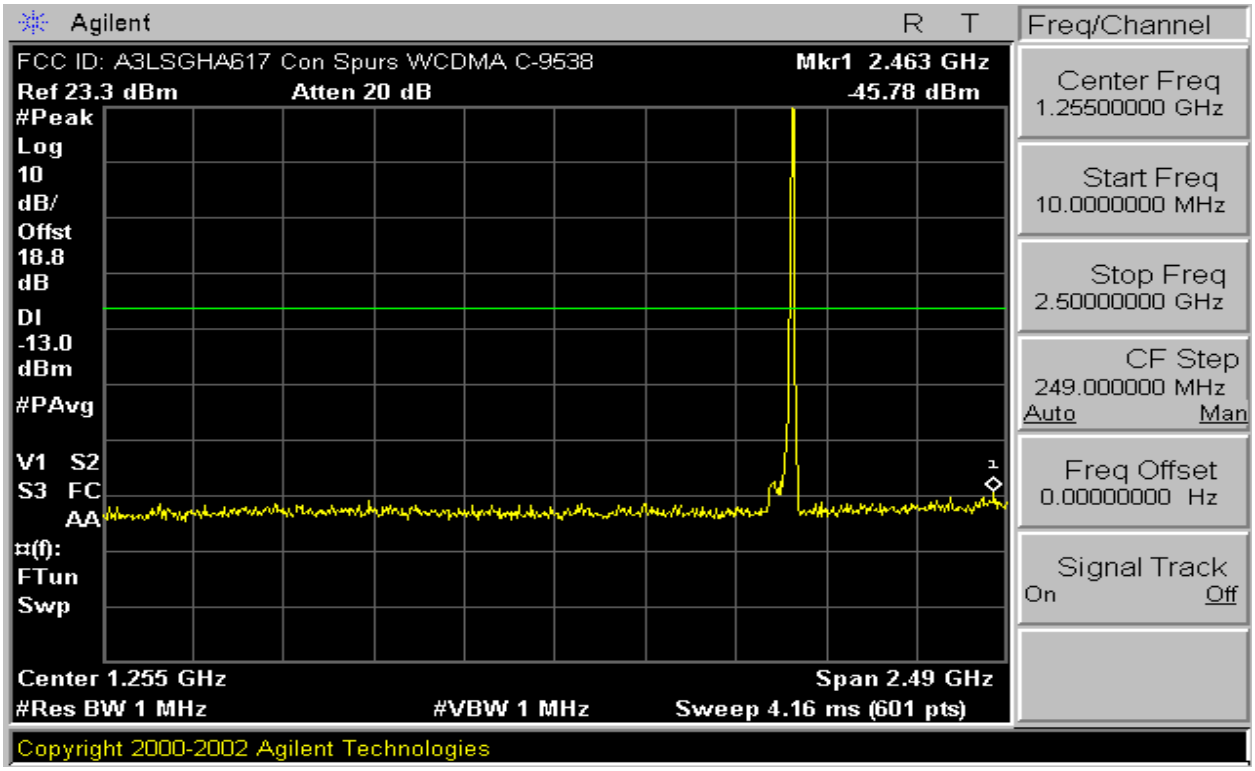
Plot A-18. Conducted Spurious Plot (PCS WCDMA Mode – Ch. 9400)



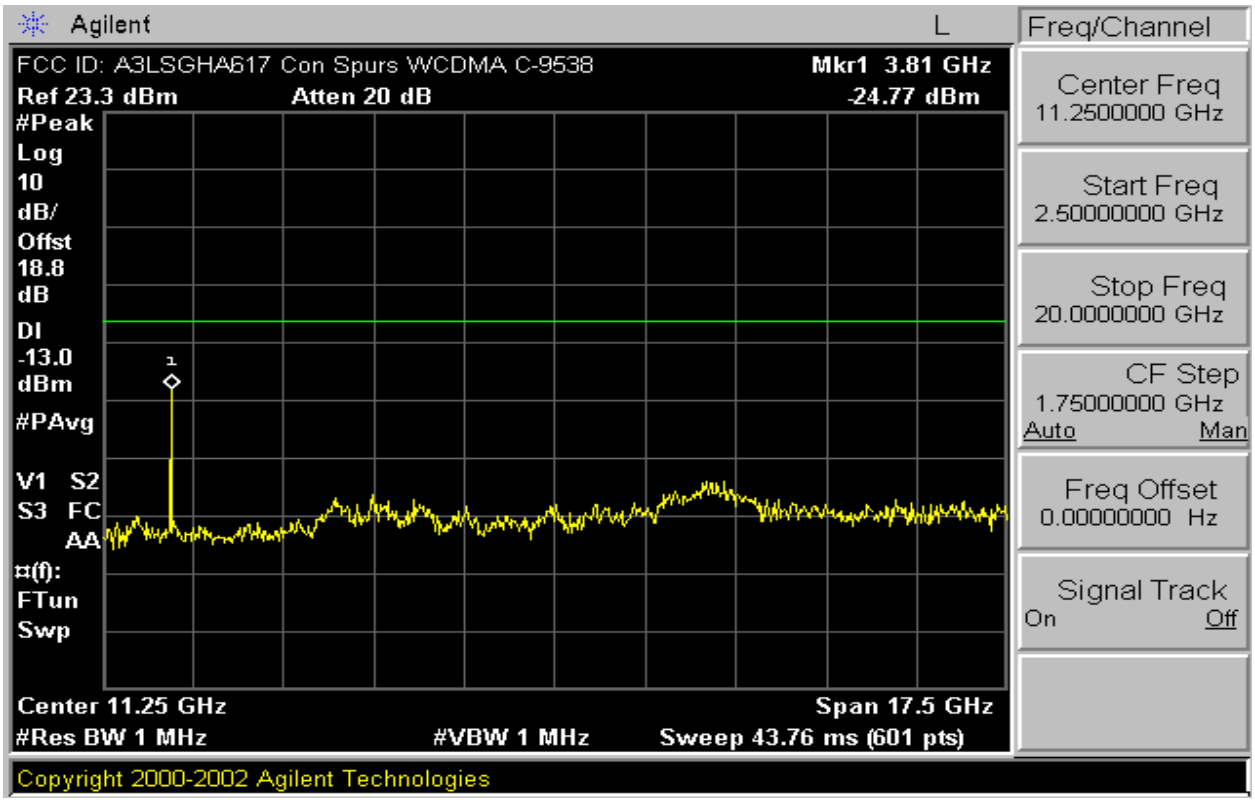
Plot A-19. Occupied Bandwidth Plot (PCS WCDMA Mode – Ch. 9400)



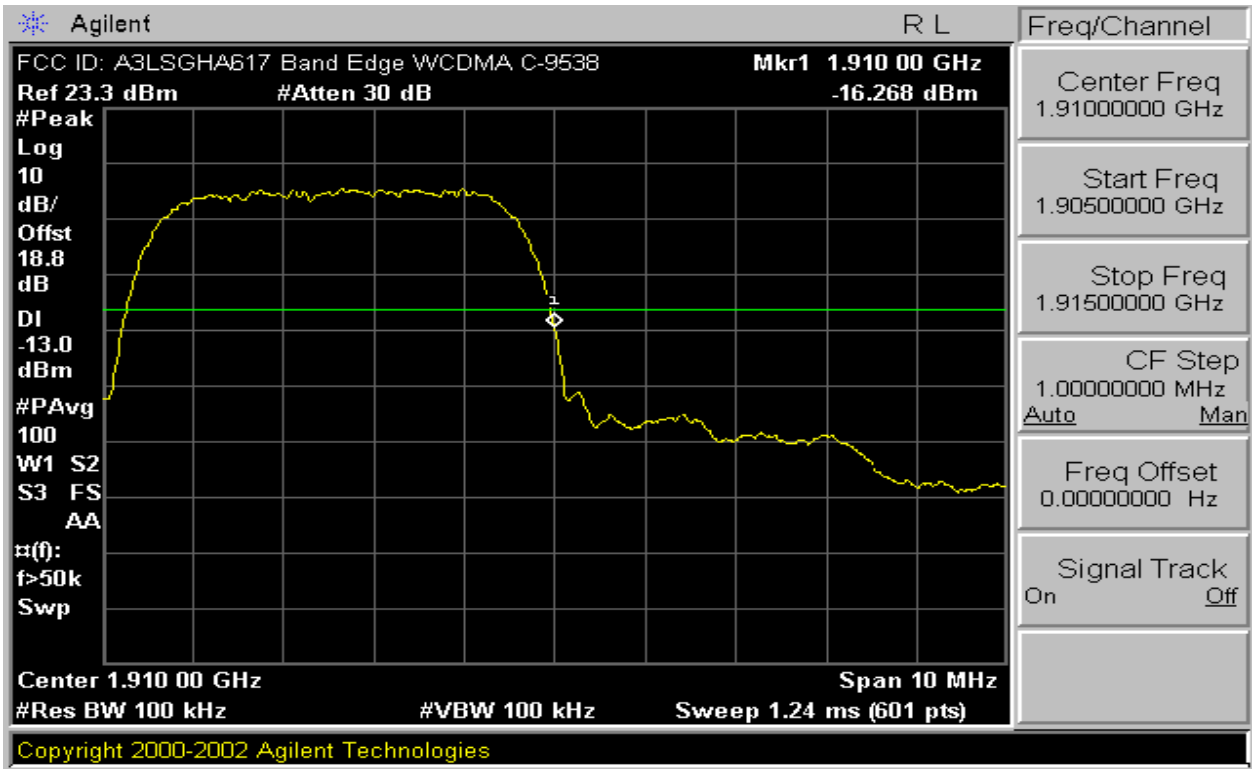
Plot A-20. Channel Power Plot (PCS WCDMA Mode – Ch. 9400)



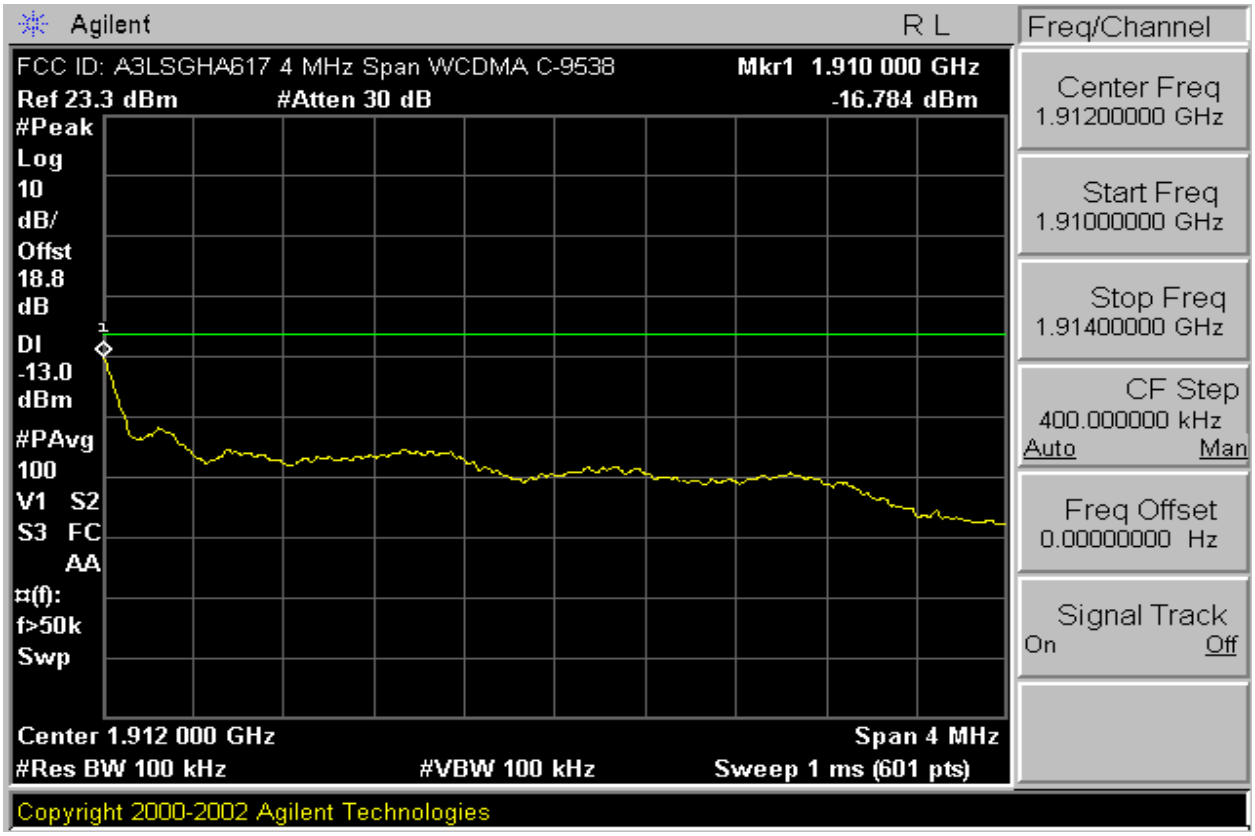
Plot A-21. Conducted Spurious Plot (PCS WCDMA Mode – Ch. 9538)



Plot A-22. Conducted Spurious Plot (PCS WCDMA Mode – Ch. 9538)



Plot A-23. Band Edge Plot (PCS WCDMA Mode – Ch. 9538)



Plot A-24. 4MHz Span Plot (PCS WCDMA Mode – Ch. 9538)

EXHIBIT B – TEST SETUP PHOTOGRAPHS

EXHIBIT C – INTERNAL/EXTERNAL PHOTOGRAPHS