



HCT CO., LTD.

Product Compliance Division

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CERTIFICATE OF COMPLIANCE

FCC Part 24 & 22 Certification

Applicant Name:

LG Electronics, Inc.

Date of Issue:

January 16, 2009

Test Site/Location:

HCT.CO., LTD., San 136-1 Ami-ri, Bubal-eup, Icheon-si,
Kyoungki-do, Korea

Test Report No.: HCT-RF09-0113

HCT FRN: 0005866421

FCC ID : BEJGM310F

APPLICANT : LG Electronics, Inc.

Application Type: Certification

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

FCC Rule Part(s): §22, §24, §2

EUT Type: Cellular/PCS GSM/EDGE/WCDMA Phone with Bluetooth

Model(s): GM310f

Additional Model(s): GM310

Tx Frequency:
824.20 - 848.80 MHz (GSM850)
826.40 - 846.60 MHz (WCDMA850)
1 850.20 - 1 909.80 MHz (GSM1900)

Rx Frequency:
869.20 - 893.80 MHz (GSM850)
871.40 - 891.60 (WCDMA850)
1 930.20 - 1 989.80 MHz (GSM1900)

Max. RF Output Power: 1.178 W ERP GSM850 (30.71 dBm) / 1.476 W EIRP GSM1900 (31.69 dBm)
0.344 W ERP EDGE850 (25.36 dBm) / 0.705 W EIRP EDGE1900 (28.48 dBm)
0.228 W ERP WCDMA850(23.57 dBm)

Emission Designator(s): 247KGXW (GSM850) 248KGXW (GSM1900)
243KG7W (GSM850EDGE) 248KG7W (GSM1900EDGE)
4M15F9W (WCDMA850)

The measurements shown in this report were made in accordance with the procedures specified in §2.947. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them.

HCT.CO., LTD. Certifies that no party to this application has been denied FCC benefits pursuant to section 5301 of the Anti-Drug Abuse Act of 1998, 21 U.S.C. 853(a)

Report prepared by

: Jong Seok Lee

Test engineer of RF Part

Approved by

: Sang Jun Lee

Manager of RF Part

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MEASUREMENT REPORT

1. GENERAL INFORMATION

Applicant Name: LG Electronics, Inc.

Address: 60-39, Kasan-Dong, Kumchon-Gu, Seoul 153-023, Korea

FCC ID: BEJGM310F

Application Type: Certification

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

FCC Rule Part(s): §22, §24, §2

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Model(s): GM310f
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Tx Frequency: 824.20 - 848.80 MHz (GSM850)
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1 850.20 - 1 909.80 MHz (GSM1900)

Rx Frequency: 869.20 - 893.80 MHz (GSM850)
871.40 - 891.60 (WCDMA850)
1 930.20 - 1 989.80 MHz (GSM1900)

Max. RF Output Power: 1.178 W ERP GSM850 (30.71 dBm) / 1.476 W EIRP GSM1900 (31.69 dBm)
0.344 W ERP EDGE850 (25.36 dBm) / 0.705 W EIRP EDGE1900 (28.48 dBm)
0.228 W ERP WCDMA850(23.57 dBm)

Emission Designator(s): 247KGXW (GSM850) 248KGXW (GSM1900)
243KG7W (GSM850EDGE) 248KG7W (GSM1900EDGE)
4M15F9W (WCDMA850)

Antenna Specification Manufacturer: E.M.W Antenna co., Ltd.
Antenna type: Internal Antenna
Peak Gain : 2.760 dBi

Date(s) of Tests: December 20, 2008 ~ January 06, 2009

Place of Tests: HCT.CO., LTD.
San 136-1 Ami-ri, Bubal-eup, Icheon-si,

Report Serial No HCT-RF09-0113

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2. INTRODUCTION

2.1. EUT DESCRIPTION

The LG Electronics, Inc. GM310f Cellular/PCS GSM/EDGE/WCDMA Phone with Bluetooth consists of GSM850, GSM1900, GPRS Class12, EDGE and WCDMA850, HSDPA.

2.2. MEASURING INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

2.3. TEST FACILITY

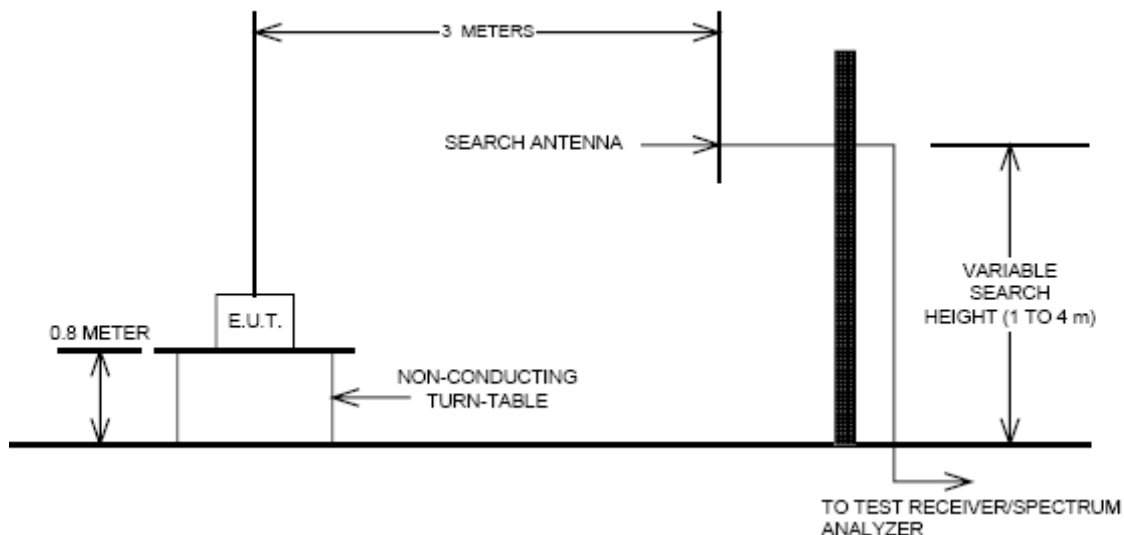
The open area test site and conducted measurement facility used to collect the radiated data are located at the 254-1, Maekok-Ri, Hobup-Myun, Ichon-Si, Kyongki-Do, 467-701, KOREA. The site is constructed in conformance with the requirements of ANSI C63.4 and CISPR Publication 22. Detailed description of test facility was submitted to the Commission and accepted dated July 6, 2006(Registration Number: 90661)

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3. DESCRIPTION OF TESTS

3.1 Effective Radiated Power/Equivalent Isotropic Radiated Power

Test Set-up



Test Procedure

Radiated emission measurements were performed at an open Site.

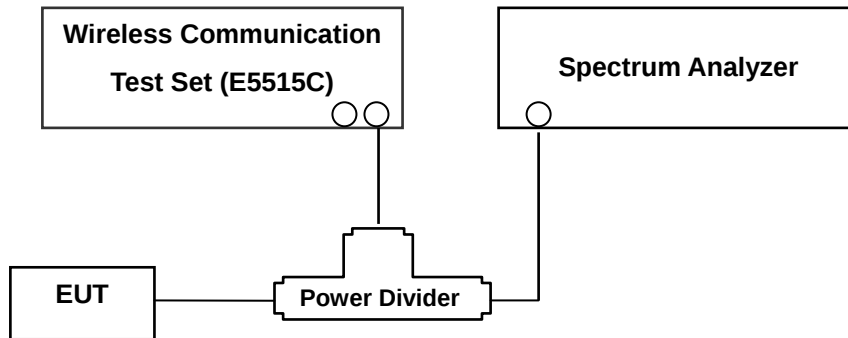
The equipment under test is placed on a wooden turntable 3-meters from the receive antenna.

A wooden turntable was rotated 360° and the receiving antenna scanned from 1-4m in order to capture the maximum emission. A half wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the previously recorded signal was duplicated.

The maximum EIRP was calculated by adding the forward power to the calibrated source plus its appropriate gain value. These steps were carried out with the receiving antenna in both vertical and horizontal polarization. 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.

3.2 Occupied bandwidth.

Test set-up



(Configuration of conducted Emission measurement)
Test Procedure

The EUT was setup to maximum output power at its lowest channel. The occupied bandwidth was measured using a spectrum analyzer. The measurements are repeated for the highest and a middle channel. The EUT's occupied bandwidth is measured as the width of the signal between two points, one below the carrier center frequency and one above the carrier frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power. Plots of the EUT's occupied bandwidth are shown herein.

3.3 Spurious and Harmonic Emissions at Antenna Terminal.

Test Procedure

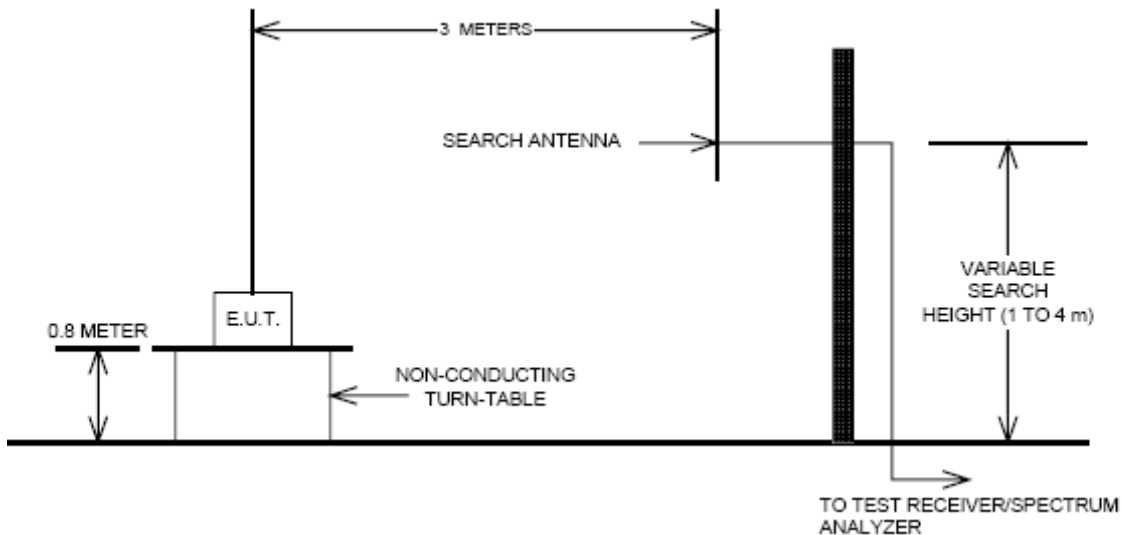
The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer.

The EUT was setup to maximum output power at its lowest channel. The Resolution BW of the analyzer is set to 1 % of the emission bandwidth to show compliance with the – 13 dBm limit, in the 1 MHz bands immediately outside and adjacent to the edge of the frequency block. The 1 MHz RBW was used to scan from 10 MHz to 10 GHz. (GSM1900 Mode: 10 MHz to 20 GHz). A display line was placed at – 13 dBm to show compliance. The high, lowest and a middle channel were tested for out of band measurements.

- Band Edge Requirement : In the 1MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 1 percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to measure the out of band Emissions. Limit, -13dBm.

3.4 Radiated Spurious and Harmonic Emissions

Test Set-up



The measurement facilities used for this test have been documented in previous filings with the commission pursuant to section § 2.948. The open field test site is situated in open field with ground screen whose site attenuation characteristics meet ANSI C63.4 –2003. A mast capable of lifting the receiving antenna from a height of one to four meters is used together with a rotatable wooden platform mounted at three from the antenna mast.

- 1) The unit mounted on a wooden table 1.5 m × 1.0 m × 0.80 m is 0.8 meter above test site ground level.
- 2) During the emission test, the turntable is rotated and the EUT is manipulated to find the configuration resulting in maximum emission under normal condition of installation and operation.
- 3) The antenna height and polarization are also varied from 1 to 4 meters until the maximum signal is found.
- 4) The spectrum shall be scanned up to the 10th harmonic of the fundamental frequency.

Test Procedure

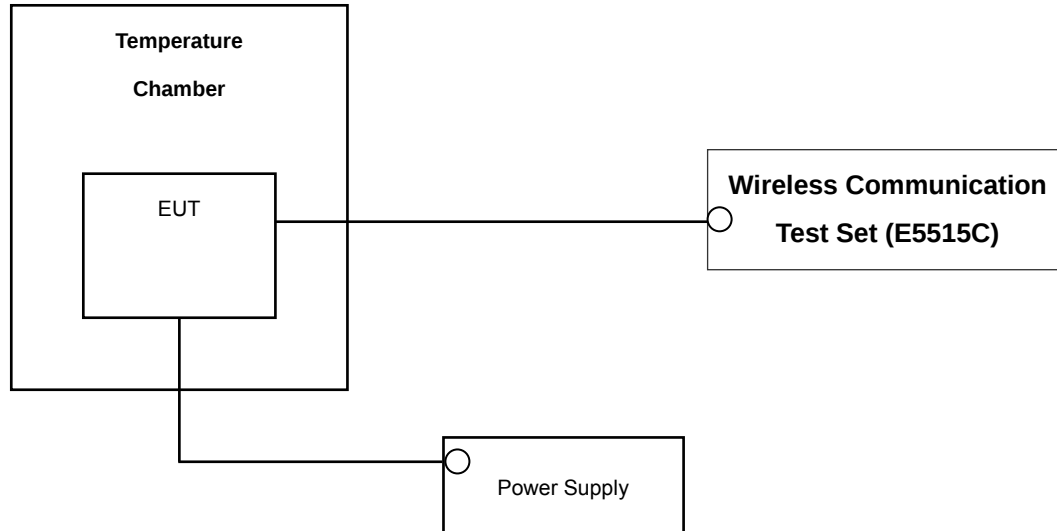
The equipment under test is placed on a wooden turntable 3-meters from the receive antenna.

A wooden turntable was rotated 360° and the receiving antenna scanned from 1-4m in order to capture the maximum emission. A half wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the previously recorded signal was duplicated.

The maximum EIRP was calculated by adding the forward power to the calibrated source plus its appropriate gain value. These steps were carried out with the receiving antenna in both vertical and horizontal polarization. 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.

3.5 Frequency stability / variation of ambient temperature

Test Set-up



* Nominal Operating Voltage

Test Procedure

The frequency stability of the transmitter is measured by:

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

b.) **Primary Supply Voltage:** The primary supply voltage is varied from battery end point 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 $\pm 0.00025\%$ (± 2.5 ppm) of the center frequency.

Time Period and Procedure:

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

1. 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 is made within one minute after applying power to the transmitter.

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

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

4. LIST OF TEST EQUIPMENT

Manufacture	Model/ Equipment	Serial Number	Calibration Interval	Calibration Due
R&S	ESI40/ Spectrum Analyzer	831564/003	Annual	10/31/2009
Agilent	E4416A/ Power Meter	MY41291412	Annual	01/29/2009
Agilent	E9327A/ Power Sensor	MY4442009	Annual	07/28/2009
Agilent	8960 (E5515C)/ Base Station	US41070189	Annual	05/02/2009
MITEQ	AMF-60-0010 1800-35-20P / AMP	1200937	Annual	05/20/2009
Wainwright	WHK1.2/15G-10EF/H.P.F	2	Annual	06/28/2009
Wainwright	WHK3.3/18G-10EF/H.P.F	1	Annual	06/28/2009
Agilent	775D/ Dual Directional Coupler	12922	Annual	12/24/2009
Agilent	11636B/ Power Divider	11377	Annual	12/24/2009
Digital	EP-3010/ Power Supply	3110117	Annual	01/07/2010
Schwarzbeck	UHAP/ Dipole Antenna	557	Annual	04/20/2009
Schwarzbeck	UHAP/ Dipole Antenna	558	Annual	04/20/2009
Korea Engineering	KR-1005L / Chamber	KRAB07063-2CH	Annual	12/31/2009
Schwarzbeck	VULB9160/ TRILOG Antenna	3150	Biennial	04/20/2009
Schwarzbeck	VULB9160/ TRILOG Antenna	3125	Biennial	05/16/2009
Schwarzbeck	BBHA 9120D/ Horn Antenna	147	Biennial	03/26/2010
Schwarzbeck	BBHA 9120D/ Horn Antenna	1201	Biennial	05/02/2009
Agilent	E4440A/Spectrum Analyzer	US45303008	Annual	12/23/2009

5. SUMMARY OF TEST RESULTS

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result
2.1049, 22.917(a), 24.238(a)	Occupied Bandwidth	N/A	CONDUCTED	PASS
2.1051, 22.917(a), 24.238(a)	Band Edge / Spurious and Harmonic Emissions at Antenna Terminal.	$< 43 + \log_{10}(P[\text{Watts}])$ at Band Edge and for all out-of-band emissions		PASS
2.1046	Conducted Output Power	N/A		PASS
2.1055, 22.355, 24.235	Frequency stability / variation of ambient temperature	< 2.5 ppm		PASS
22.913(a)(2) 24.232(c)	Effective Radiated Power	< 7 Watts max. ERP	RADIATED	PASS
	Equivalent Isotropic Radiated Power	< 2 Watts max. EIRP		PASS
2.1053, 22.917(a), 24.238(a)	Radiated Spurious and Harmonic Emissions	$< 43 + \log_{10}(P[\text{Watts}])$ for all out-of band emissions		PASS



6. SAMPLE CALCULATION

A. ERP Sample Calculation

Mode	Ch./ Freq.		Measured	Substitute	Ant. Gain	C.L	Pol.	ERP	
	channel	Freq.(MHz)	Level(dBm)	LEVEL(dBm)				W	dBm
GSM850	128	824.20	-11.56	34.28	-8.32	1.17	H	0.30	24.79

$$\text{ERP} = \text{Substitute LEVEL(dBm)} + \text{Ant. Gain} - \text{CL(Cable Loss)}$$

- 1) The EUT mounted on a wooden tripod is 0.8 meter above test site ground level.
- 2) During the test , the turn table is rotated and the antenna height is also varied from 1 to 4 meters until the maximum signal is found.
- 3) Record the field strength meter's level.
- 4) Replace the EUT with dipole/Horn antenna that is connected to a calibrated signal generator.
- 5) Increase the signal generator output till the field strength meter's level is equal to the item (3).
- 6) The signal generator output level with Ant. Gain and cable loss are the rating of effective radiated power (ERP).

B. Emission Designator

GSM Emission Designator

Emission Designator = 249KGXW

GSM BW = 249 kHz

G = Phase Modulation

X = Cases not otherwise covered

W = Combination (Audio/Data)

WCDMA Emission Designator

Emission Designator = 4M17F9W

WCDMA BW = 4.17 MHz

F = Frequency Modulation

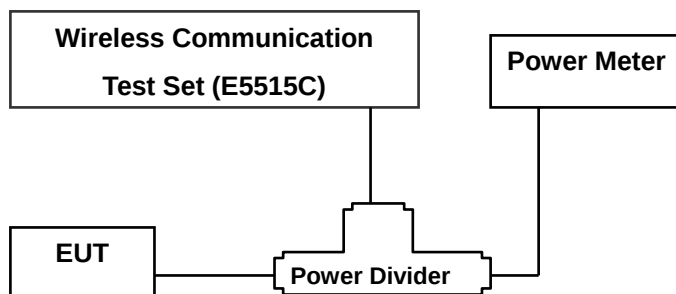
9 = Composite Digital Info

W = Combination (Audio/Data)

7. TEST DATA

7.1 Conducted Output Power

A base station simulator was used to establish communication with the EUT. The base station simulator parameters were set to produce the maximum power from the EUT. This device was tested under all configurations and the highest power is reported. Conducted Output Powers of EUT are reported below.



Test Result

Band	Channel	Voice	GPRS Data			
		GSM (dBm)	GPRS 1 TX Slot (dBm)	GPRS 2 TX Slot (dBm)	GPRS 3 TX Slot (dBm)	GPRS 4 TX Slot (dBm)
GSM 850	128	32.33	32.28	32.25	32.21	32.15
	190	32.34	32.26	32.21	32.18	32.15
	251	32.34	32.27	32.24	32.19	32.14
GSM 1900	512	29.53	29.38	29.32	29.26	29.24
	661	29.68	29.52	29.46	29.38	29.30
	810	29.84	29.62	29.53	29.44	29.38

(GSM Conducted Output Powers)

Band	Channel	EDGE Data			
		EDGE 1 TX Slot (dBm)	EDGE 2 TX Slot (dBm)	EDGE 3 TX Slot (dBm)	EDGE 4 TX Slot (dBm)
GSM 850	128	25.67	25.85	26.24	26.64
	190	25.73	26.00	26.32	26.64
	251	25.59	25.80	26.14	26.52
GSM 1900	512	24.73	24.84	25.14	25.33
	661	24.62	24.58	24.81	25.14
	810	24.82	24.88	25.00	25.22

(GSM EDGE Conducted Output Powers)

Band	Channel	HSDPA INACTIVE		HSDPA ACTIVE
		12.2kbps RMC (dBm)	12.2kbps AMR (dBm)	12.2kbps RMC (dBm)
WCDMA 850	4132	22.73	22.63	20.50
	4183	22.67	22.54	20.48
	4233	22.61	22.45	20.37

(WCDMA Conducted Output Powers)



7.2 Effective Radiated Power Output (GSM / WCDMA)

(GSM850 Mode)

Ch./ Freq.		Measured	Substitute	Ant. Gain	C.L	Pol.	ERP	
channel	Freq.(MHz)	Level(dBm)	LEVEL (dBm)	(dBd)			W	dBm
128	824.20	-10.72	35.12	-8.32	1.17	V	0.37	25.63
190	836.60	-8.99	37.50	-8.22	1.19	V	0.64	28.09
251	848.80	-7.09	40.03	-8.12	1.20	V	1.18	30.71
EDGE 251	848.80	-12.44	34.68	-8.12	1.20	V	0.34	25.36

(WCDMA850 Mode)

Ch./ Freq.		Measured	Substitute	Ant. Gain	C.L	Pol.	ERP	
channel	Freq.(MHz)	Level(dBm)	LEVEL (dBm)	(dBd)			W	dBm
4132	826.40	-14.66	31.29	-8.30	1.17	V	0.15	21.82
4183	836.60	-15.65	30.84	-8.22	1.19	V	0.14	21.43
4233	846.60	-14.10	32.91	-8.14	1.20	V	0.23	23.57

Note: Standard batteries are the only options for this phone

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

The highest power is 4TX Slot in GSM EDGE Mode.

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7.3 Equivalent Isotropic Radiated Power (E.I.R.P.) (GSM)

(GSM1900 Mode)

Ch./ Freq.		Measured Level(dBm)	Substitute LEVEL (dBm)	Ant. Gain (dBi)	C.L	Pol.	EIRP	
channel	Freq.(MHz)						W	dBm
512	1,850.20	-8.29	23.32	10.05	1.91	H	1.40	31.45
661	1,880.00	-8.23	23.59	10.05	1.95	H	1.48	31.69
810	1,909.80	-9.12	22.78	10.06	1.97	H	1.22	30.87
EDGE 661	1,880.00	-11.44	20.38	10.05	1.95	H	0.70	28.48

Note: Standard batteries are the only options for this phone

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

The highest power is 4TX Slot in GSM EDGE Mode.



7.4 Radiated Spurious Emissions(GSM850 Mode)

■ MEASURED OUTPUT POWER: 30.71 dBm = 1.178 W
■ MODULATION SIGNAL: GSM850
■ DISTANCE: 3 meters
■ LIMIT: - (43 + 10 log₁₀ (W)) = -43.71 dBc

Ch.	Freq.(MHz)	<u>Measured Level</u> [dBm]	Ant. Gain (dBd)	<u>Substitute</u> <u>Level</u> [dBm]	C.L	Pol.	ERP (dBm)	dBc
128 (824.2)	1,648.40	-34.97	7.09	-45.50	1.73	H	-40.14	-70.85
	2,472.60	-44.13	8.12	-51.24	2.28	H	-45.40	-76.11
	3,296.80	-36.59	9.72	-44.17	2.57	V	-37.02	-67.73
190 (836.6)	1,673.20	-36.72	7.23	-47.48	1.79	H	-42.04	-72.75
	2,509.80	-42.83	8.14	-49.96	2.33	H	-44.15	-74.86
	3,346.40	-35.97	9.99	-44.00	2.66	V	-36.67	-67.38
251 (848.8)	1,697.60	-39.64	7.41	-50.25	1.83	H	-44.67	-75.38
	2,546.40	-42.94	8.21	-50.22	2.34	H	-44.35	-75.06
	3,395.20	-36.83	9.91	-44.46	2.85	V	-37.40	-68.11

NOTES: Radiated Spurious Emission Measurements at 3 meters by Substitution Method
according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:



7.5 Radiated Spurious Emissions(GSM1900 Mode)

■ MEASURED OUTPUT POWER: 31.69 dBm =1.476 W
■ MODULATION SIGNAL: GSM1900
■ DISTANCE: 3 meters
■ LIMIT: - (43 + 10 log₁₀ (W)) = - 44.69 dBc

Ch.	Freq.(MHz)	<u>Measured Level</u> [dBm]	Ant. Gain (dBi)	<u>Substitute</u> <u>Level</u> [dBm]	C.L	Pol.	EIRP (dBm)	dBc
512 (1850.2)	3,700.40	-42.04	12.46	-48.31	2.73	H	-38.58	-70.27
	5,550.60	-51.57	12.70	-53.15	3.60	H	-44.05	-75.74
	7,400.80	-51.44	11.36	-42.56	3.88	H	-35.08	-66.77
661 (1880.0)	3,760.00	-40.52	12.47	-46.49	2.73	H	-36.75	-68.44
	5,640.00	-50.09	10.60	-49.59	3.60	H	-42.59	-74.28
	7,520.00	-51.44	11.33	-42.34	3.88	H	-34.89	-66.58
810 (1909.8)	3,819.60	-41.86	12.49	-47.74	2.73	H	-37.98	-69.67
	5,729.40	-49.23	12.80	-50.54	3.60	H	-41.34	-73.03
	7,639.20	-54.38	11.30	-45.05	3.88	H	-37.63	-69.32

NOTES: Radiated Spurious Emission Measurements at 3 meters by Substitution Method
according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:



7.6 Radiated Spurious Emissions(WCDMA850 Mode)

- MEASURED OUTPUT POWER: 23.57 dBm = 0.228 W
- MODULATION SIGNAL: WCDMA850
- DISTANCE: 3 meters
- LIMIT: - (43 + 10 log₁₀ (W)) = - 36.57 dBc

Ch.	Freq.(MHz)	<u>Measured Level</u> [dBm]	Ant. Gain (dBd)	<u>Substitute</u> <u>Level</u> [dBm]	C.L	Pol.	ERP (dBm)	dBc
4,132 (826.4)	1,652.80	-49.42	7.09	-59.98	1.73	V	-54.62	-78.19
	2,479.20	-45.56	8.12	-52.68	2.28	V	-46.84	-70.41
	3,305.60	-36.54	9.72	-44.10	2.57	V	-36.95	-60.52
4,183 (836.6)	1,673.20	-50.80	7.23	-61.56	1.79	V	-56.12	-79.69
	2,509.80	-50.32	8.14	-57.45	2.33	V	-51.64	-75.21
	3,346.40	-39.17	9.99	-47.20	2.66	V	-39.87	-63.44
4,233 (846.6)	1,693.20	-51.51	7.41	-62.17	1.83	V	-56.59	-80.16
	2,539.80	-47.00	8.21	-54.26	2.34	V	-48.39	-71.96
	3,386.40	-36.12	9.91	-43.77	2.85	V	-36.71	-60.28

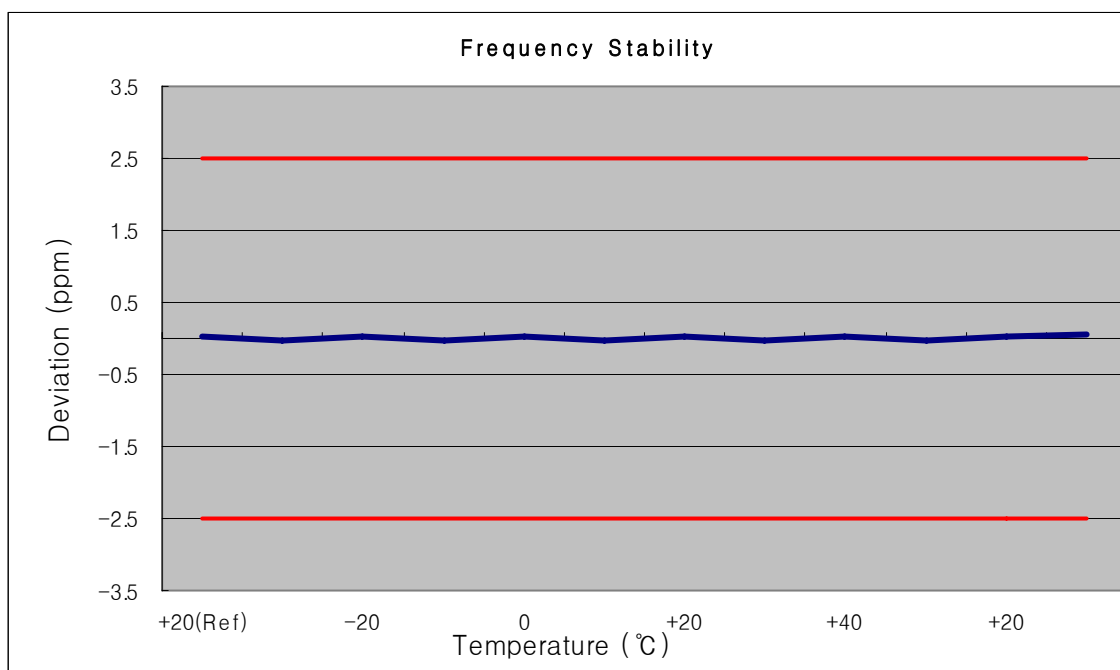
NOTES: Radiated Spurious Emission Measurements at 3 meters by Substitution Method
according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

7.7 Frequency stability / variation of ambient temperature

7.7.1 FREQUENCY STABILITY (GSM850)

OPERATING FREQUENCY: 836,600,000 Hz
 CHANNEL: 190
 REFERENCE VOLTAGE: 3.7 VDC
 DEVIATION LIM IT: ± 0.000 25 % or 2.5 ppm

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.700	+20(Ref)	836 600 020	20.25	0.000 002	0.024
100%		-30	836 599 971	-29.39	-0.000 004	-0.035
100%		-20	836 600 027	27.17	0.000 003	0.032
100%		-10	836 599 987	-12.81	-0.000 002	-0.015
100%		0	836 600 028	28.16	0.000 003	0.034
100%		+10	836 599 985	-14.73	-0.000 002	-0.018
100%		+20	836 600 020	20.10	0.000 002	0.024
100%		+30	836 599 982	-18.22	-0.000 002	-0.022
100%		+40	836 600 021	21.31	0.000 003	0.025
100%		+50	836 599 980	-20.32	-0.000 002	-0.024
115%	4.255	+20	836 600 021	20.71	0.000 002	0.025
Batt. Endpoint	3.400	+20	836 600 037	37.25	0.000 004	0.045

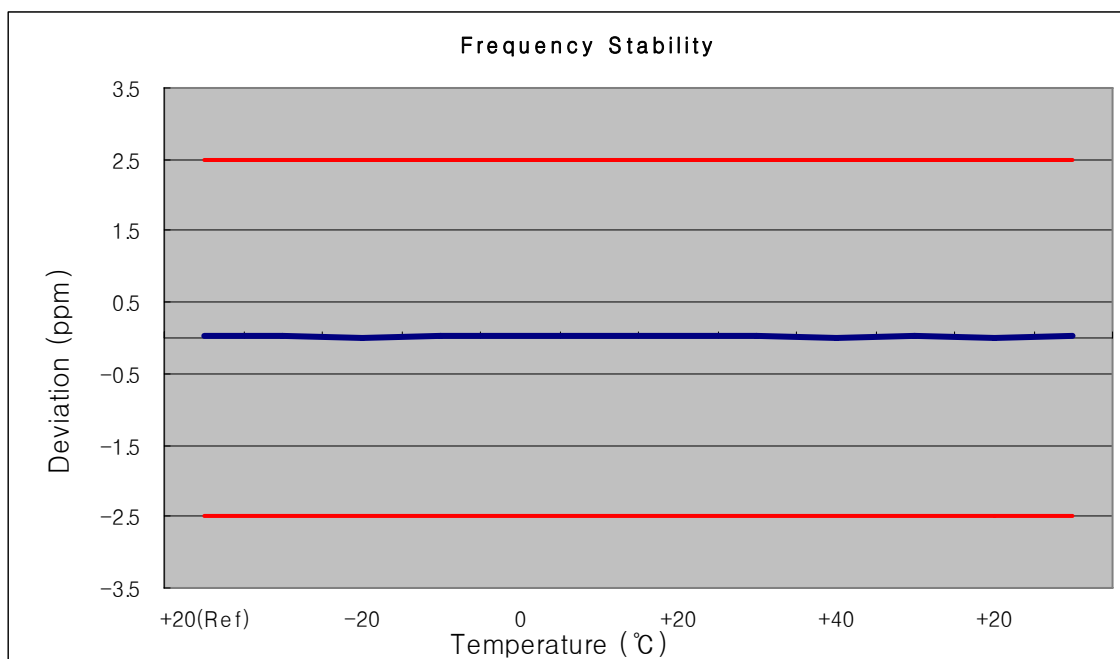




7.7.2 FREQUENCY STABILITY (GSM1900)

OPERATING FREQUENCY: 1880,000,000 Hz
 CHANNEL: 661
 REFERENCE VOLTAGE: 3.7 VDC
 DEVIATION LIM IT: ± 0.000 25 % or 2.5 ppm

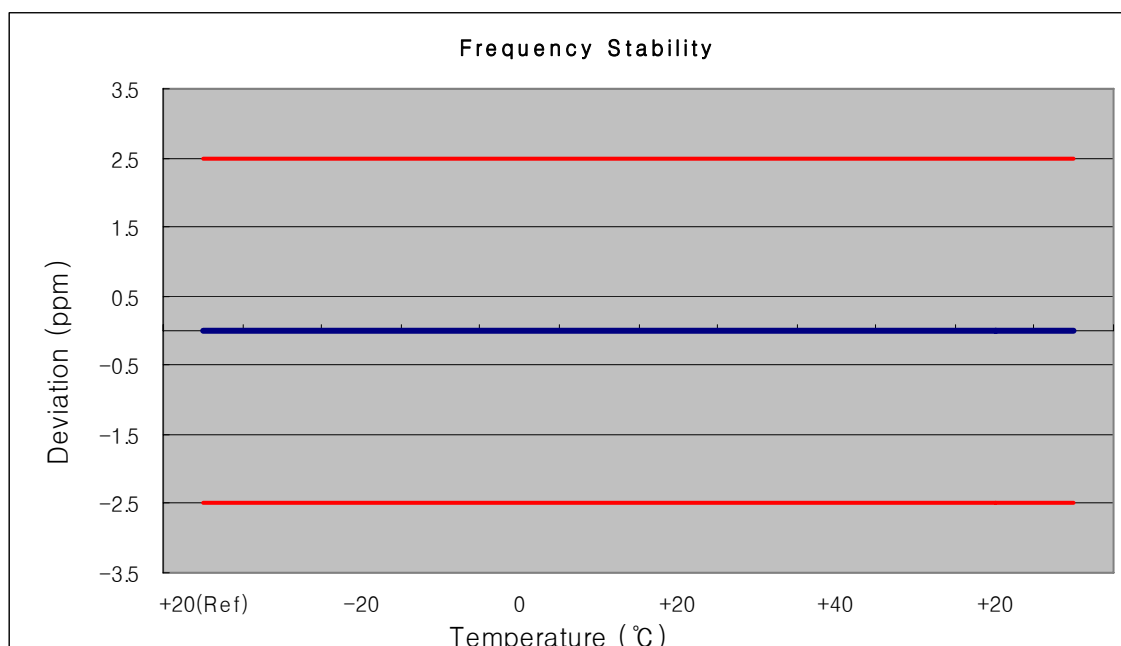
Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.700	+20(Ref)	1880 000 076	76.25	0.000 004	0.041
100%		-30	1880 000 045	44.52	0.000 002	0.024
100%		-20	1880 000 009	8.81	0.000 000	0.005
100%		-10	1880 000 057	57.47	0.000 003	0.031
100%		0	1880 000 043	42.76	0.000 002	0.023
100%		+10	1880 000 040	40.39	0.000 002	0.021
100%		+20	1880 000 067	67.21	0.000 004	0.036
100%		+30	1880 000 042	41.88	0.000 002	0.022
100%		+40	1880 000 006	5.50	0.000 000	0.003
100%		+50	1880 000 054	53.78	0.000 003	0.029
115%	4.255	+20	1880 000 020	19.93	0.000 001	0.011
Batt. Endpoint	3.400	+20	1880 000 056	56.48	0.000 003	0.030



7.7.3 FREQUENCY STABILITY (WCDMA850)

OPERATING FREQUENCY: 836,600,000 Hz
 CHANNEL: 4183
 REFERENCE VOLTAGE: 3.7 VDC
 DEVIATION LIMIT: ± 0.000 25 % or 2.5 ppm

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.700	+20(Ref)	836 599 996	-4.09	-0.000 005	-0.005
100%		-30	836 600 007	6.70	0.000 008	0.008
100%		-20	836 599 996	-3.54	-0.000 004	-0.004
100%		-10	836 599 996	-4.25	-0.000 005	-0.005
100%		0	836 600 008	7.96	0.000 010	0.010
100%		+10	836 599 997	-3.03	-0.000 004	-0.004
100%		+20	836 600 005	4.89	0.000 006	0.006
100%		+30	836 599 994	-6.06	-0.000 007	-0.007
100%		+40	836 600 007	6.96	0.000 008	0.008
100%		+50	836 599 996	-3.79	-0.000 005	-0.005
115%	4.255	+20	836 600 007	7.32	0.000 009	0.009
Batt. Endpoint	3.400	+20	836 599 996	-4.12	-0.000 005	-0.005

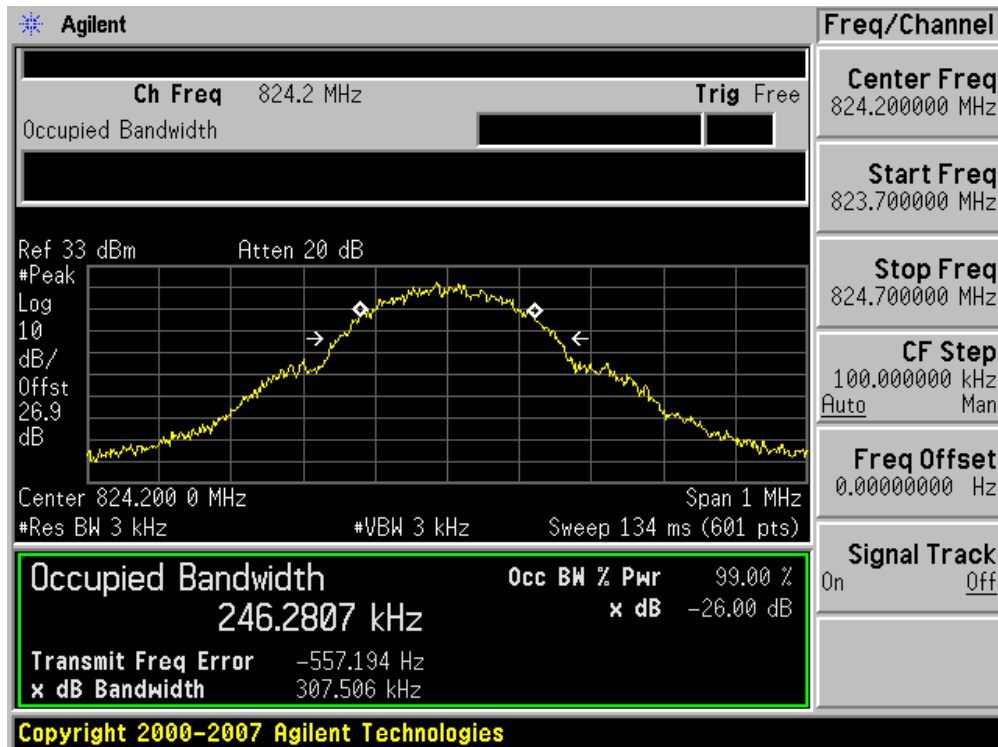




8. TEST PLOTS

FCC CERTIFICATION REPORT				www.hct.co.kr
Test Report No. HCT-RF09-0113	Date of Issue: January 16, 2009	EUT Type: Cellular/PCS GSM/EDGE/WCDMA Phone with Bluetooth	FCC ID: BEJGM310F	Page 22 of 42

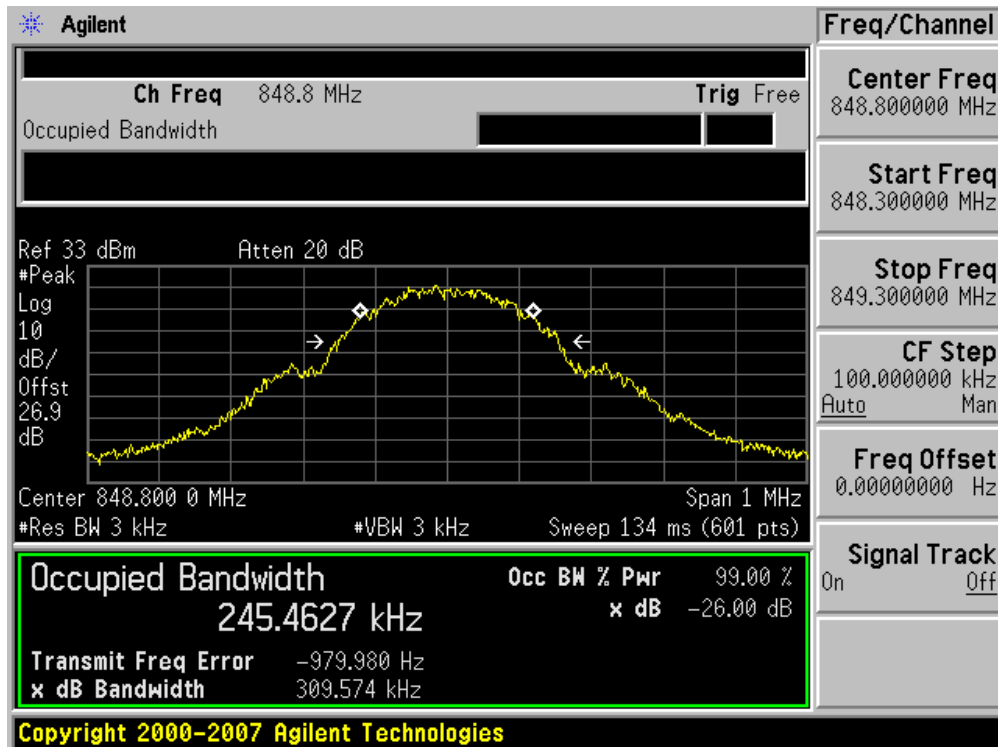
■ GSM850 MODE (128 CH.) Occupied Bandwidth



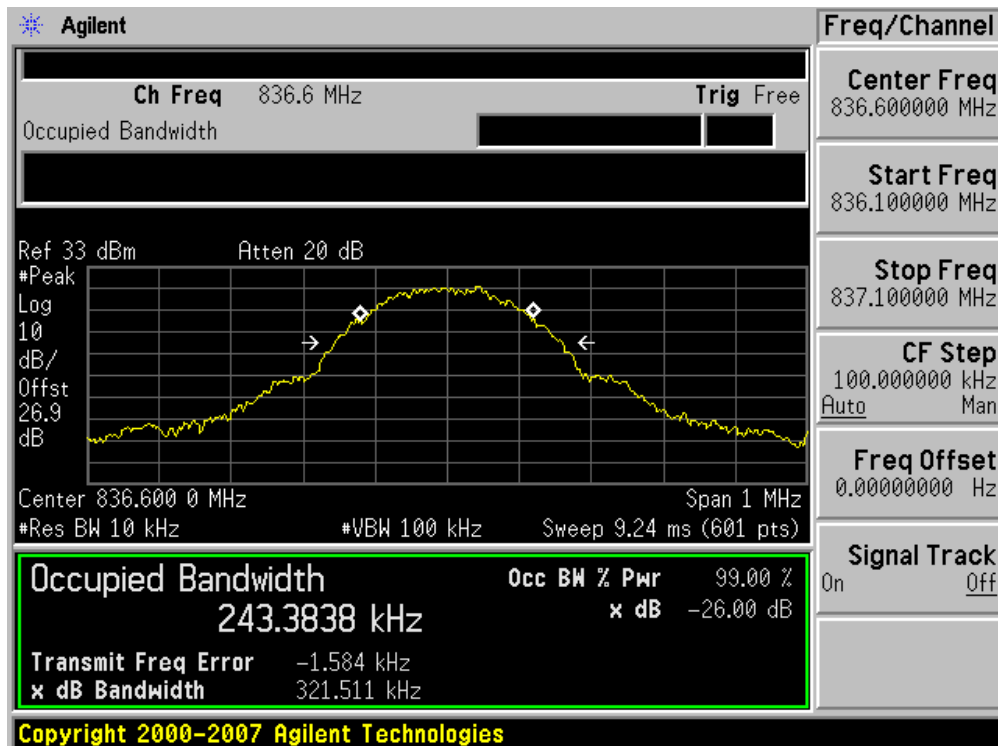
■ GSM850 MODE (190 CH.) Occupied Bandwidth



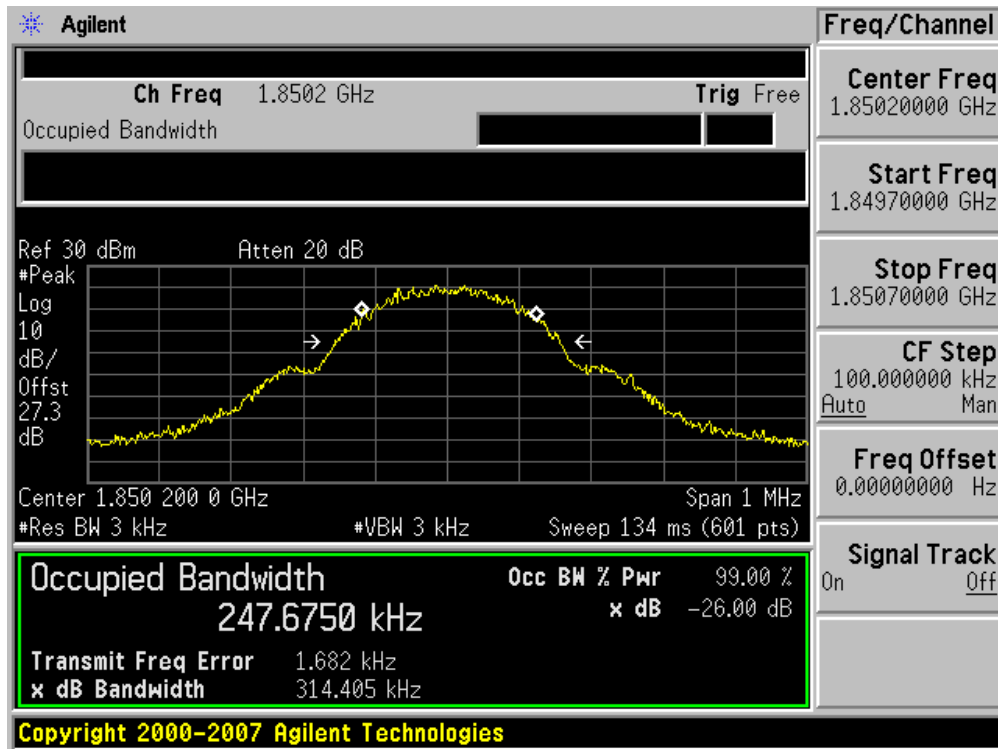
■ GSM850 MODE (251 CH.) Occupied Bandwidth



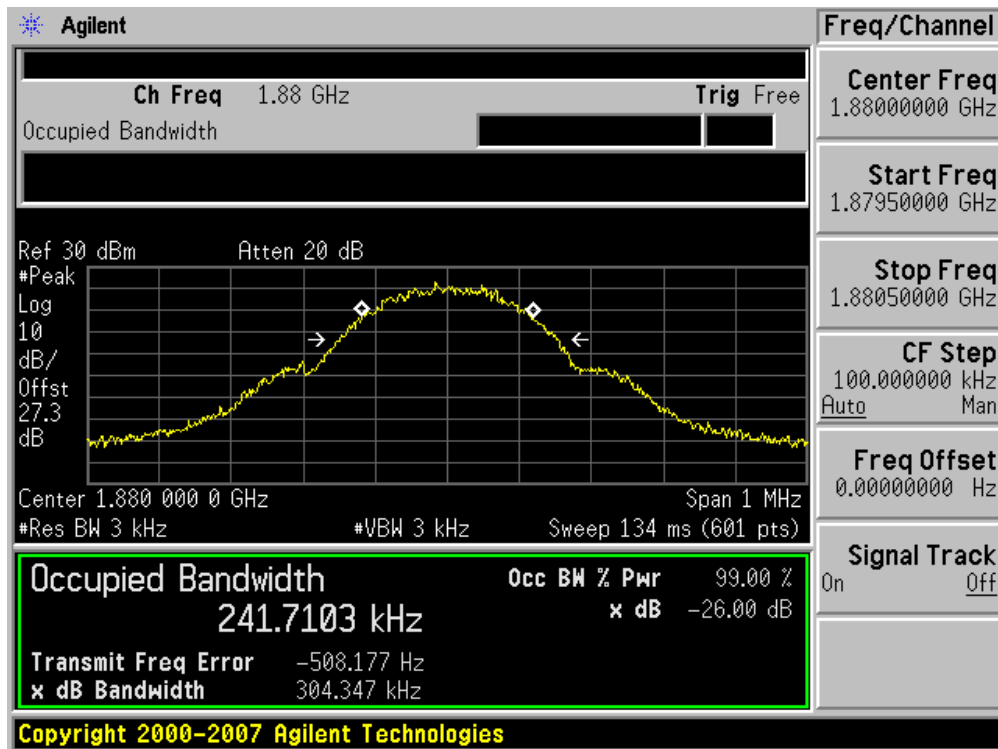
■ GSM850 EDGE (190 CH.) Occupied Bandwidth



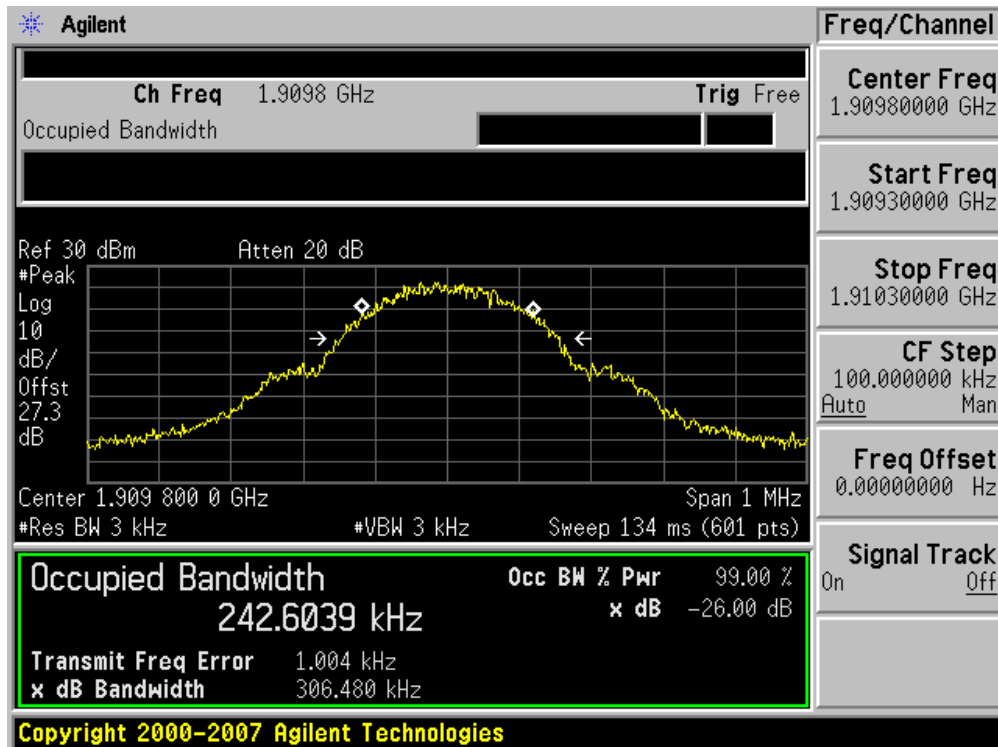
■ GSM1900 MODE (512 CH.) Occupied Bandwidth



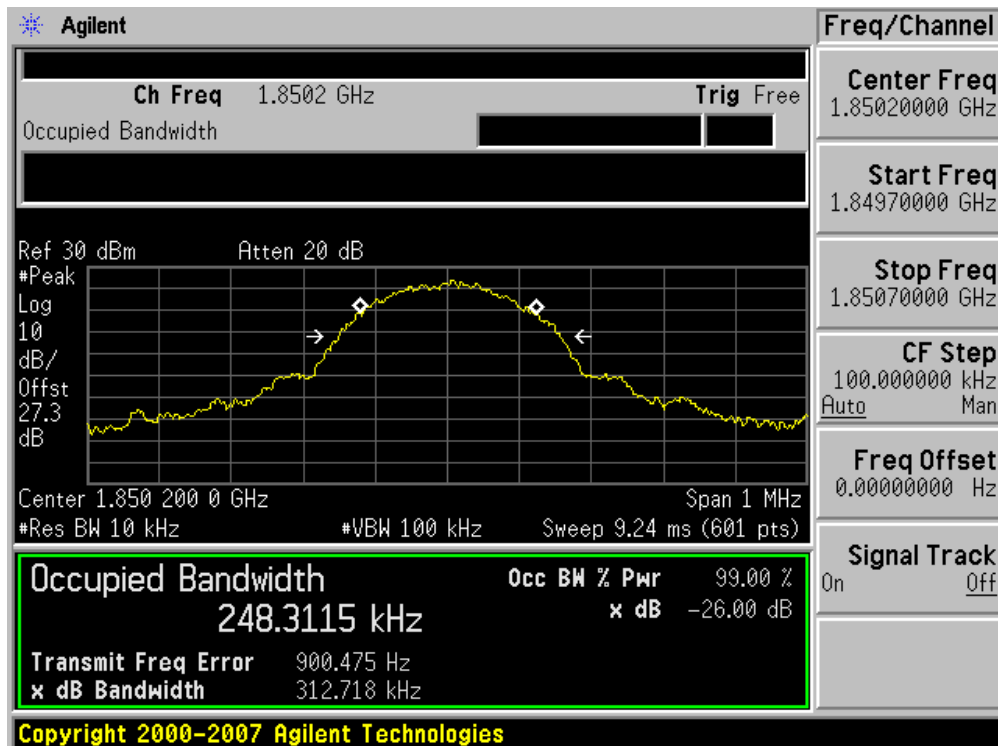
■ GSM1900 MODE (661 CH.) Occupied Bandwidth



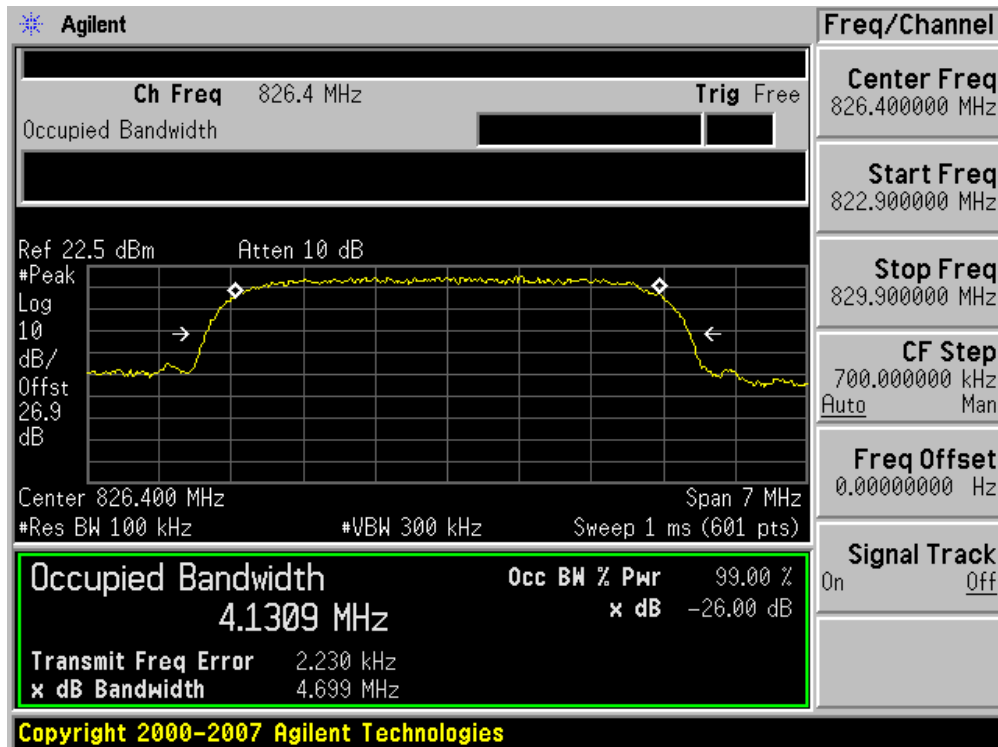
■ GSM1900 MODE (810 CH.) Occupied Bandwidth



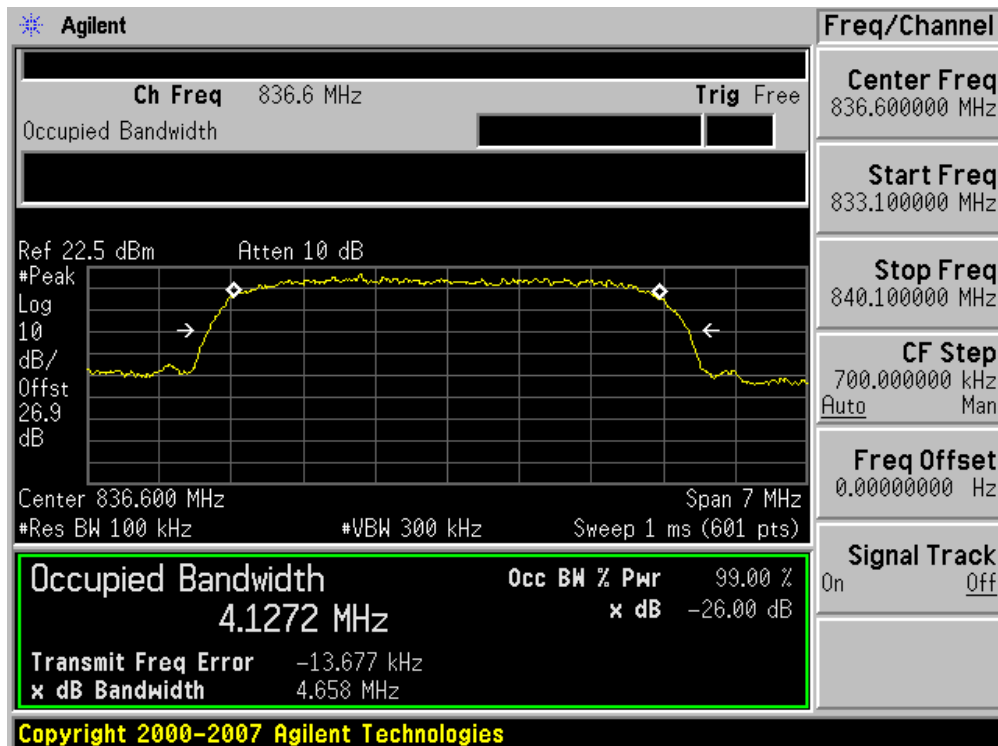
■ GSM1900 EDGE (512 CH.) Occupied Bandwidth



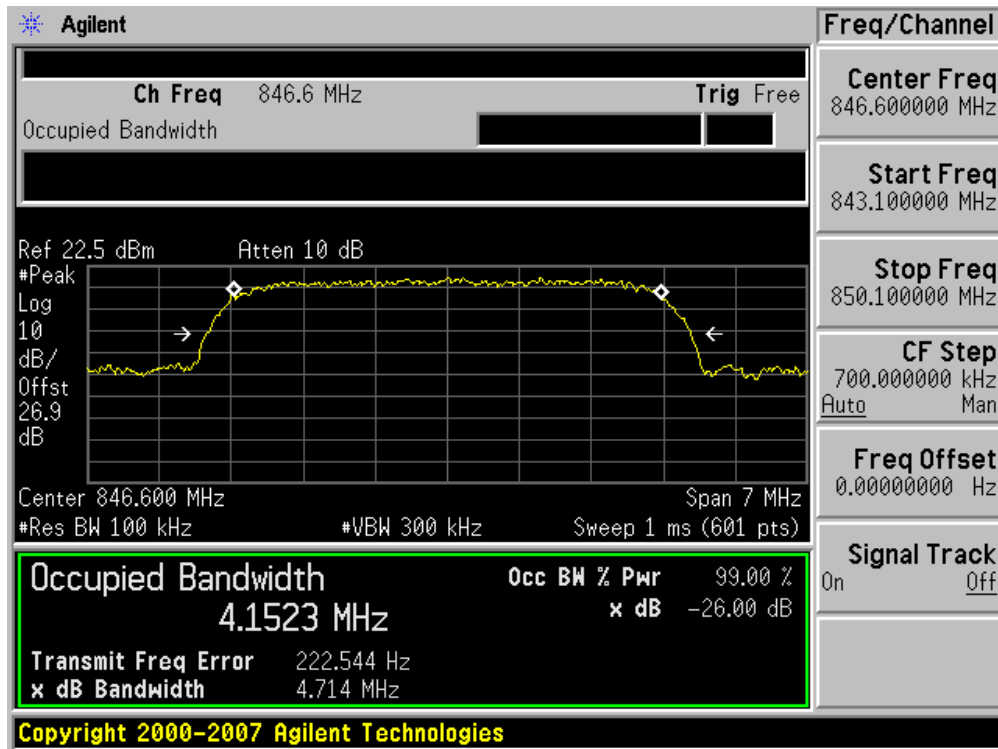
■ WCDMA850 MODE (4132 CH.) Occupied Bandwidth



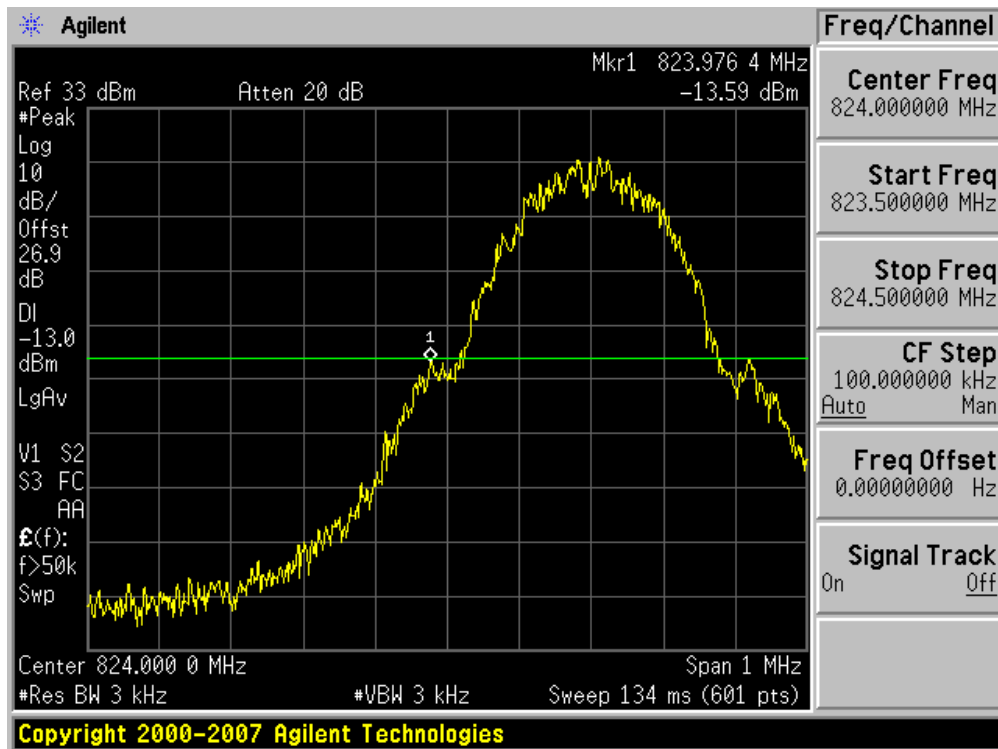
■ WCDMA850 MODE (4183 CH.) Occupied Bandwidth



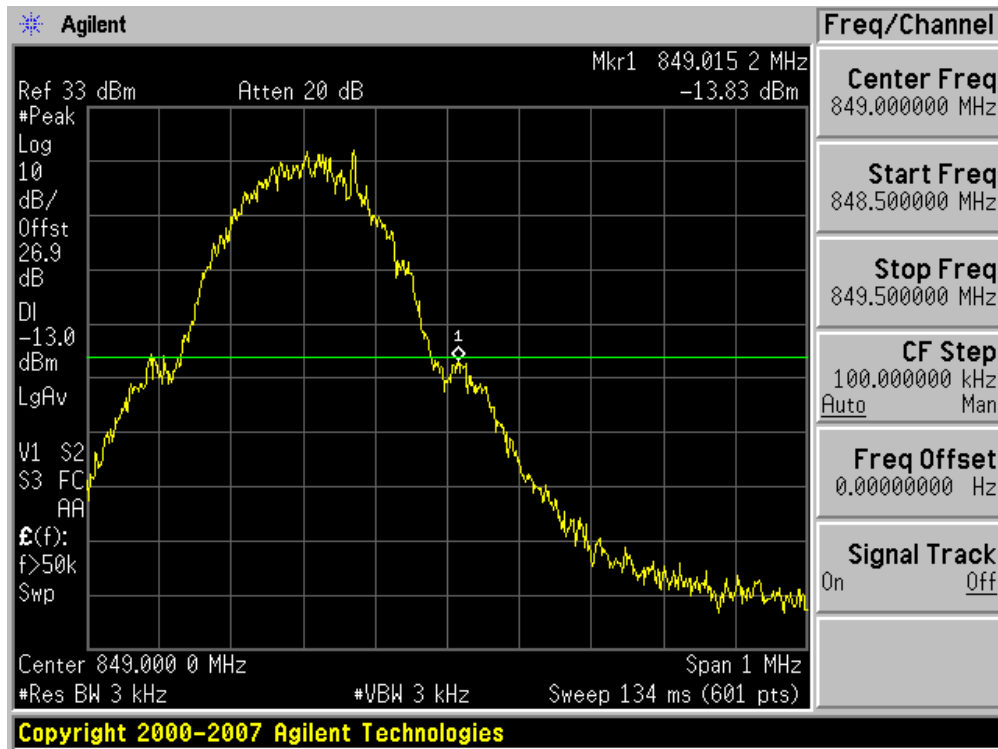
■ WCDMA850MODE (4233 CH.) Occupied Bandwidth



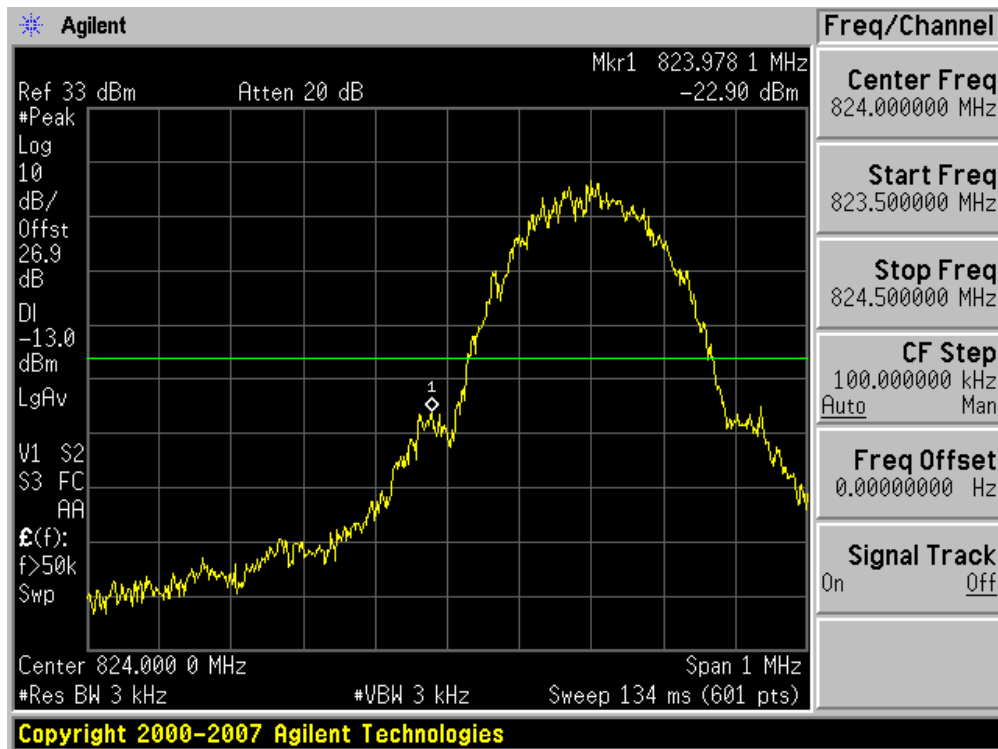
■ GSM850 MODE (128 CH.) Block Edge



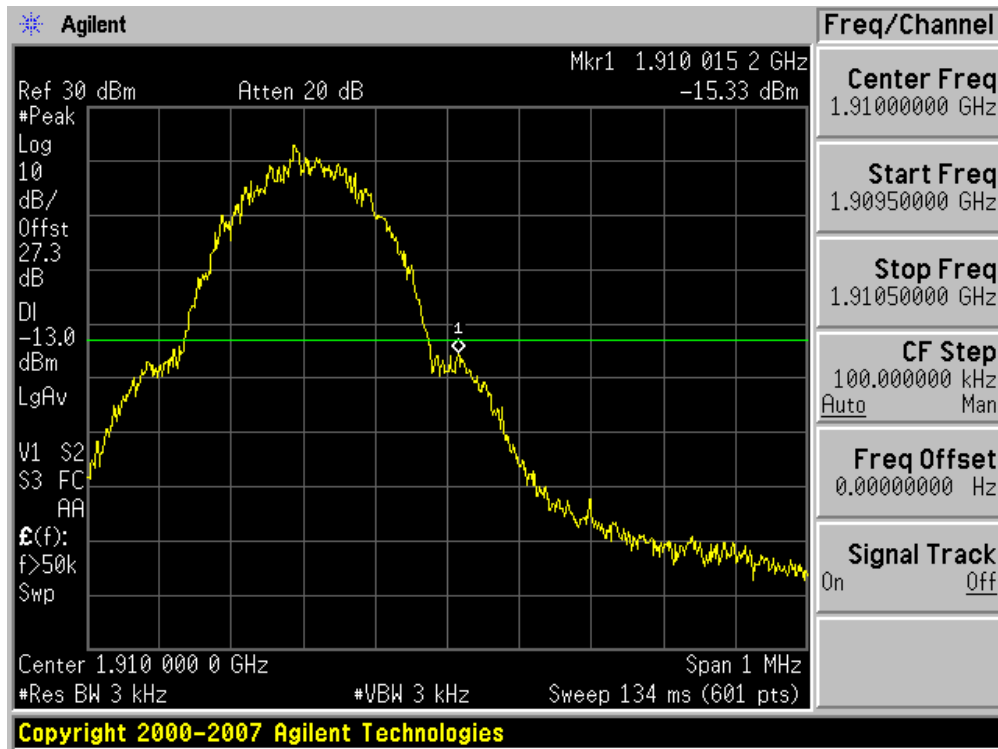
■ GSM850 MODE (251 CH.) Block Edge



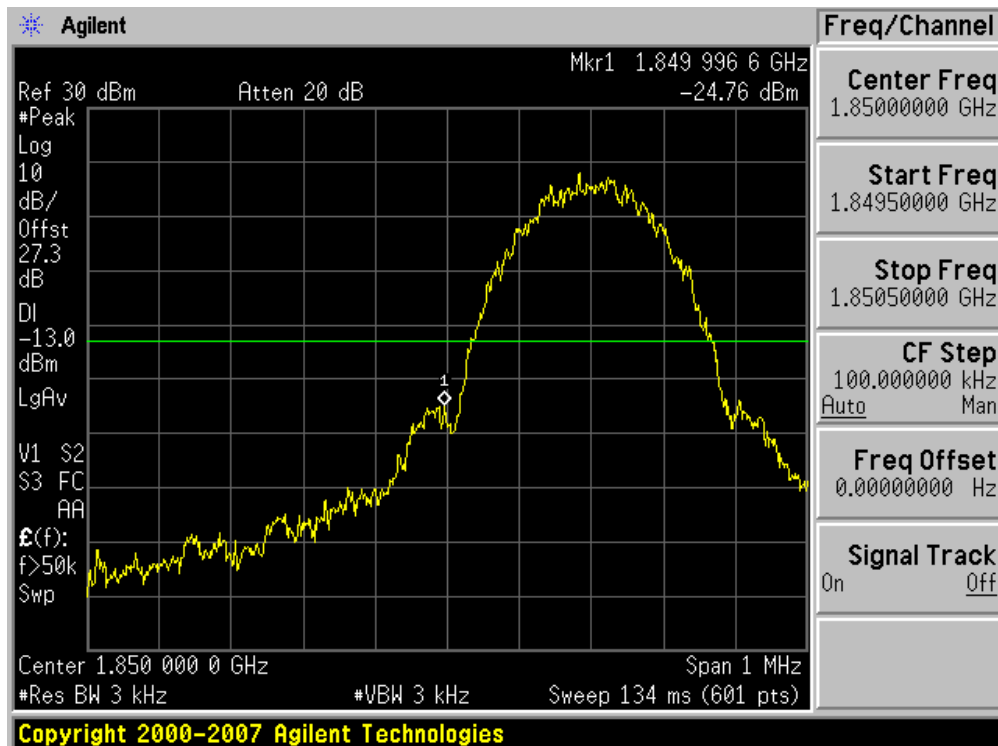
■ EDGE MODE (128 CH.) Block Edge



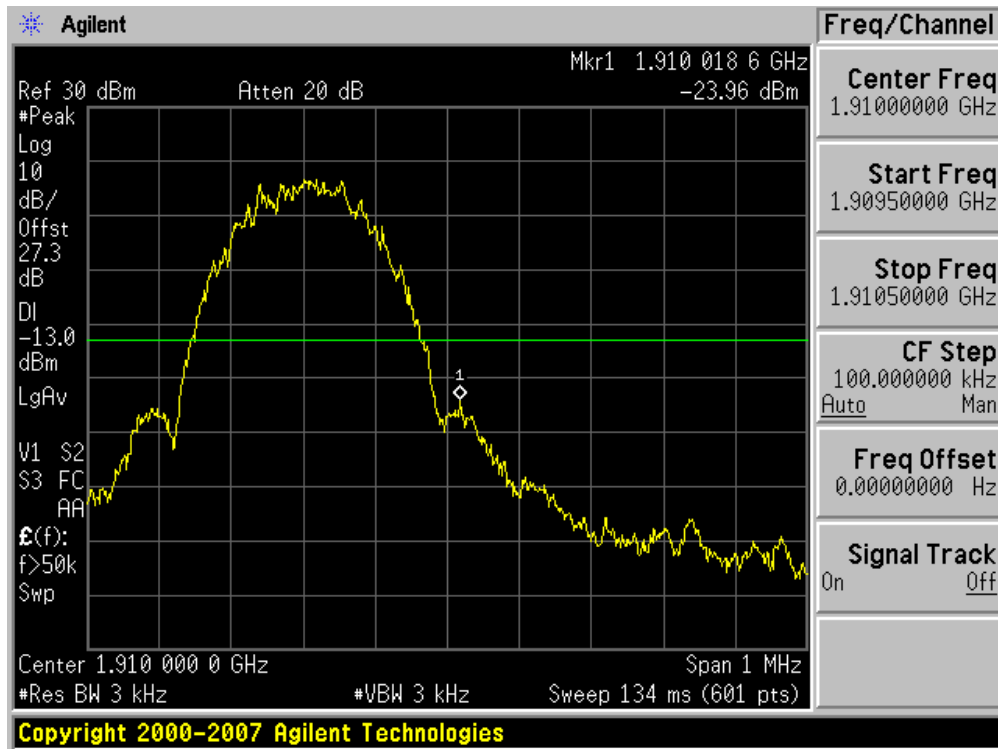
■ GSM1900 MODE (810 CH.) Block Edge



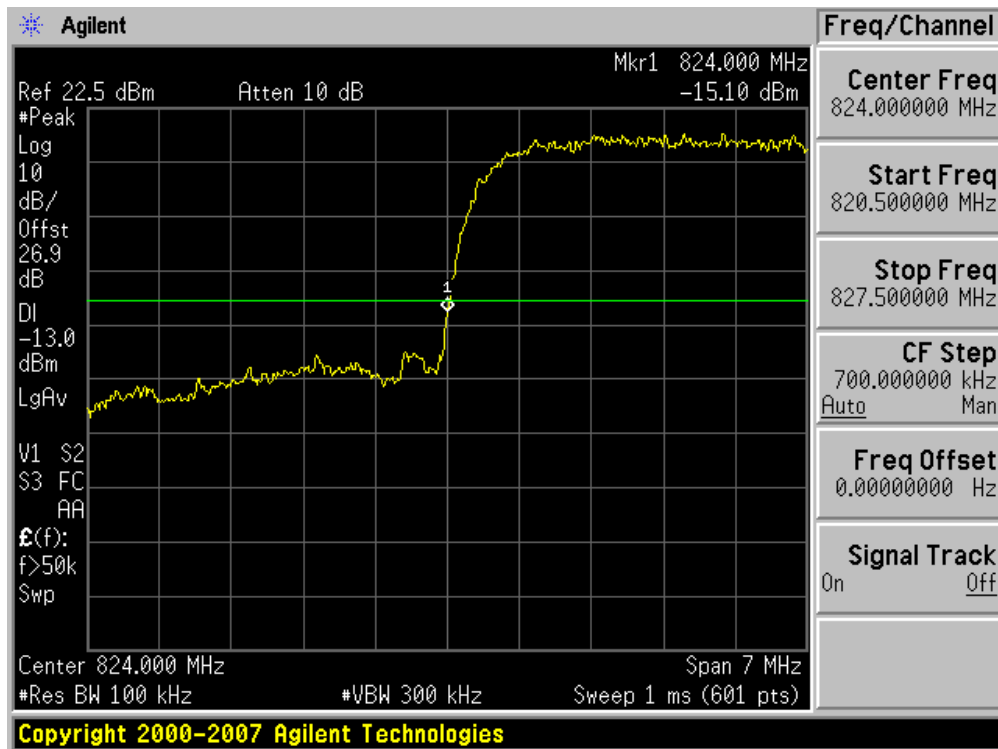
■ EDGE MODE (512 CH.) Block Edge



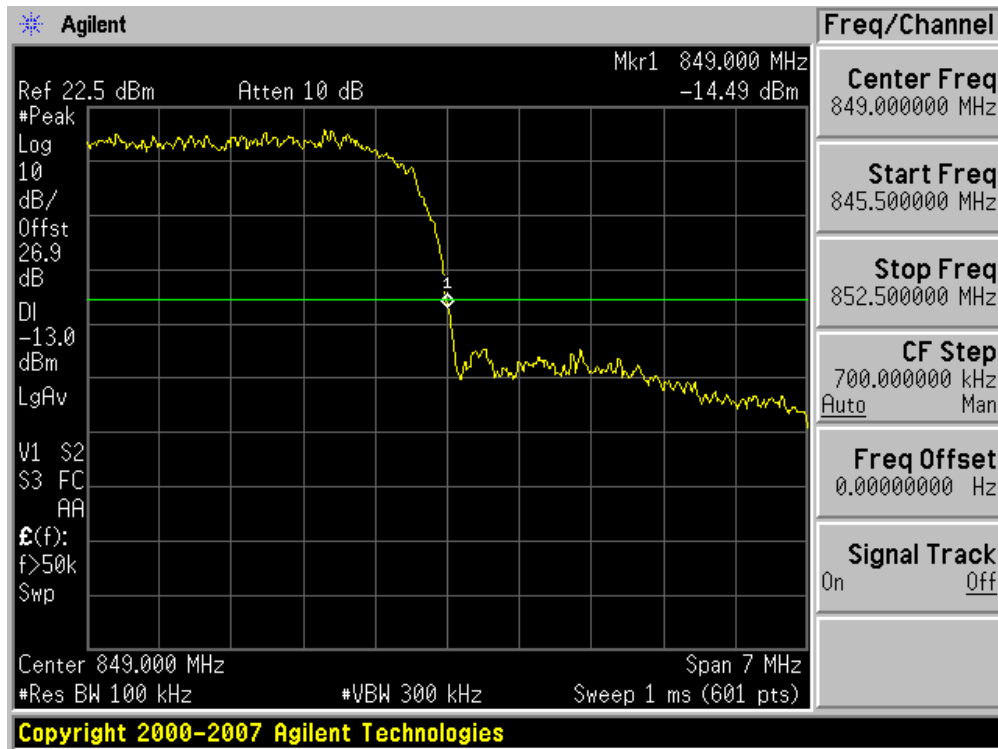
■ EDGE MODE (810 CH.) Block Edge



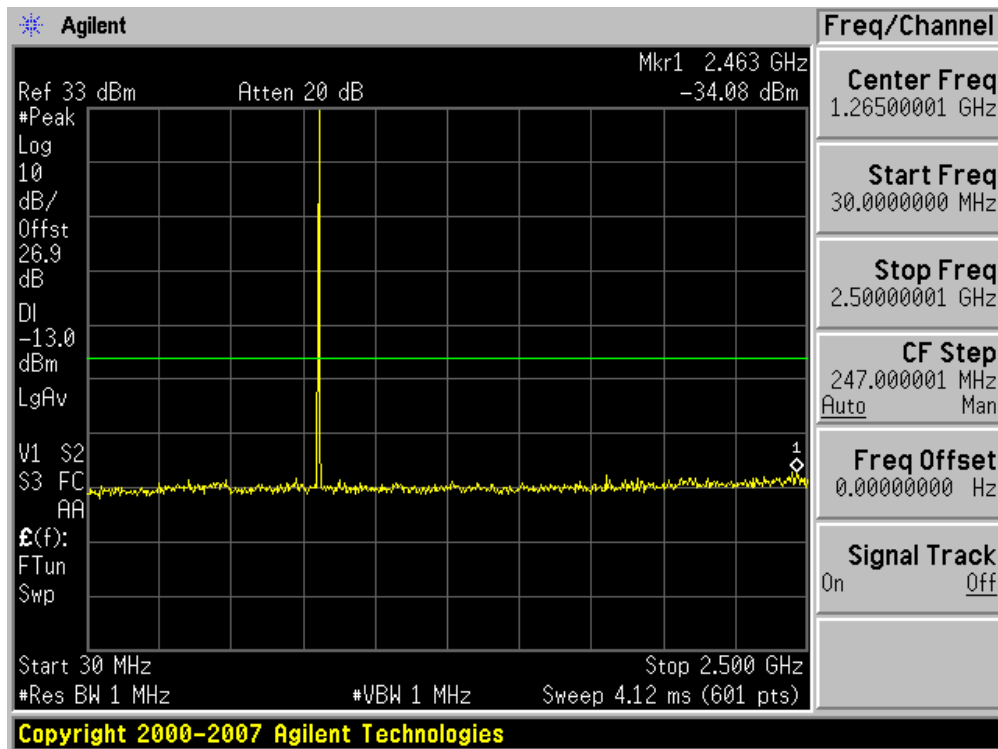
■ WCDMA850 MODE (4132 CH.) Block Edge



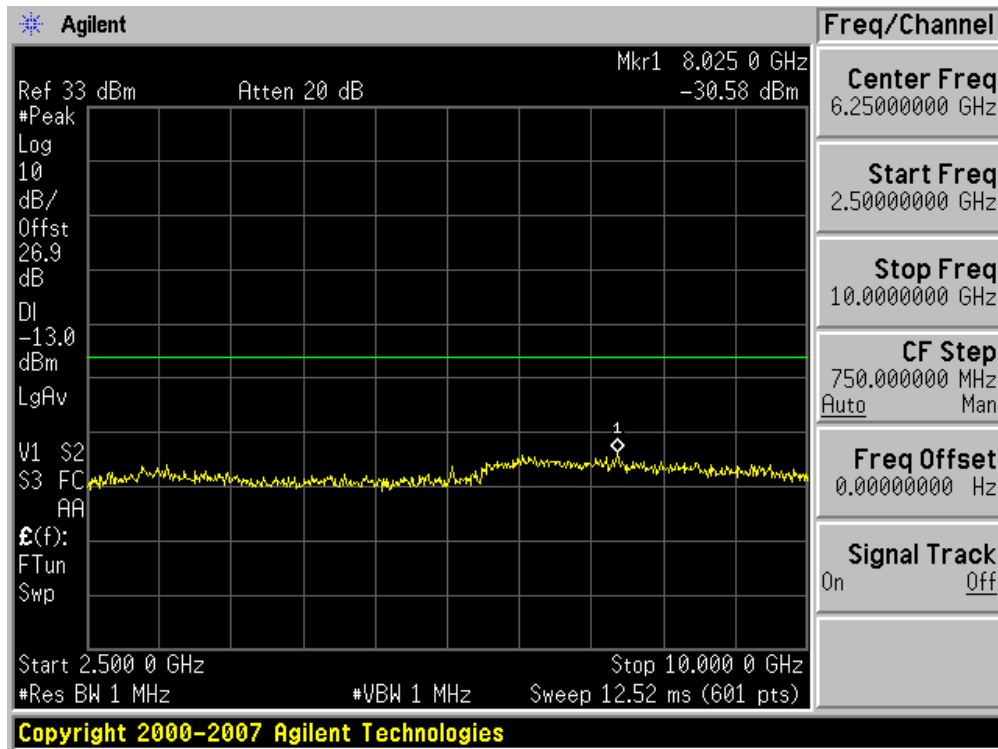
■ WCDMA850MODE (4233 CH.) Block Edge



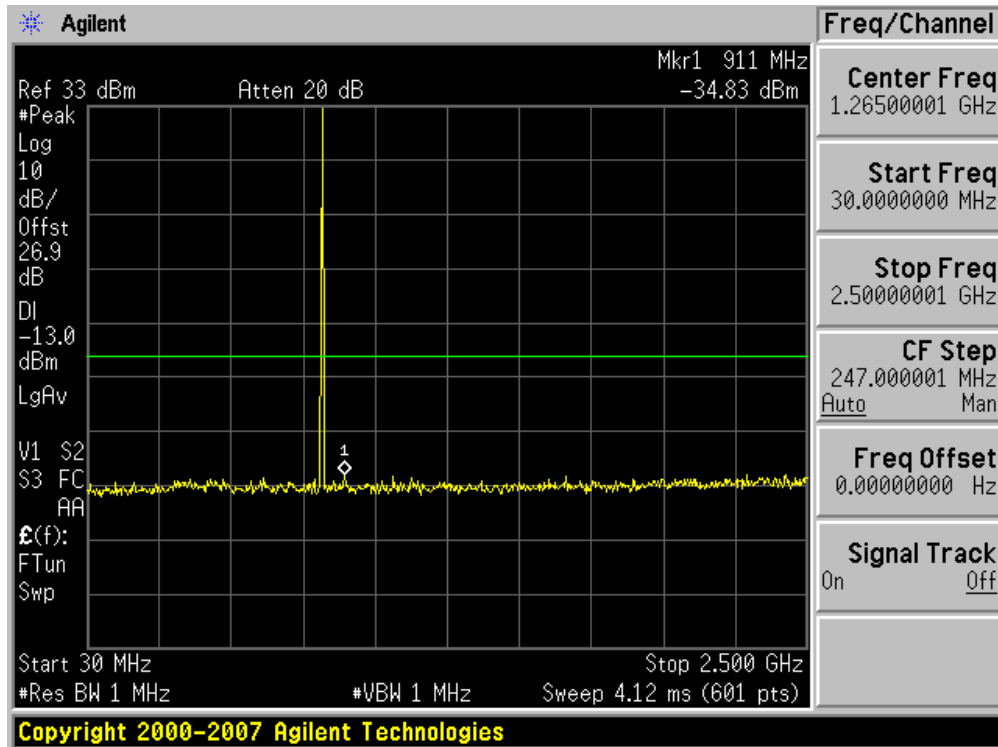
■ GSM850 MODE (128 CH.) Conducted Spurious Emissions1



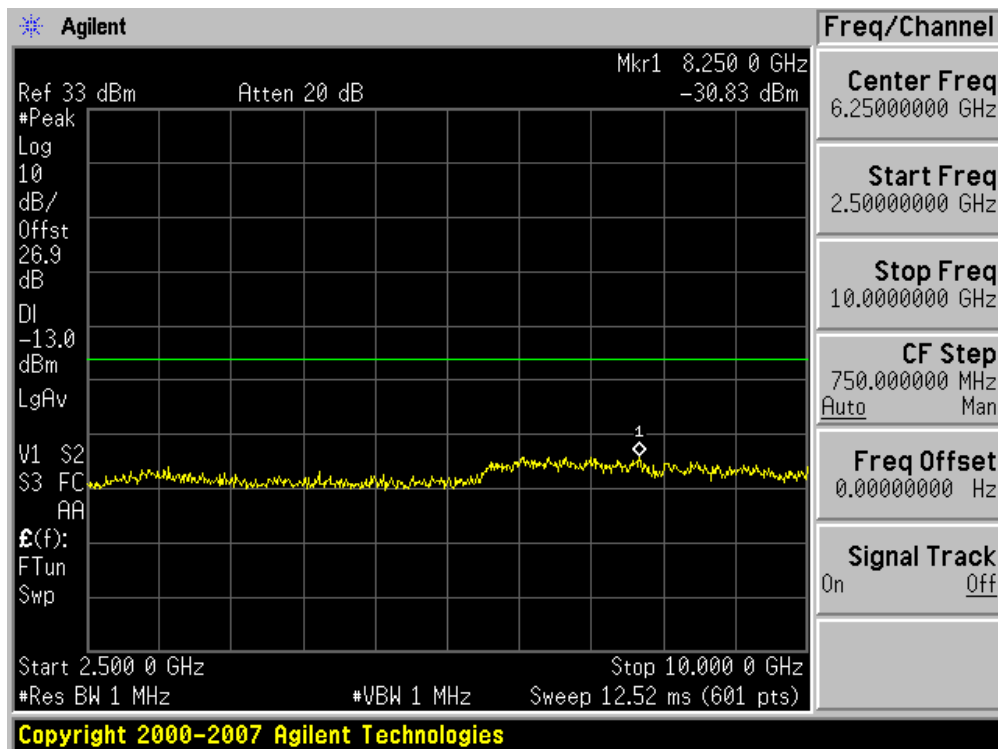
■ GSM850 MODE (128 CH.) Conducted Spurious Emissions2



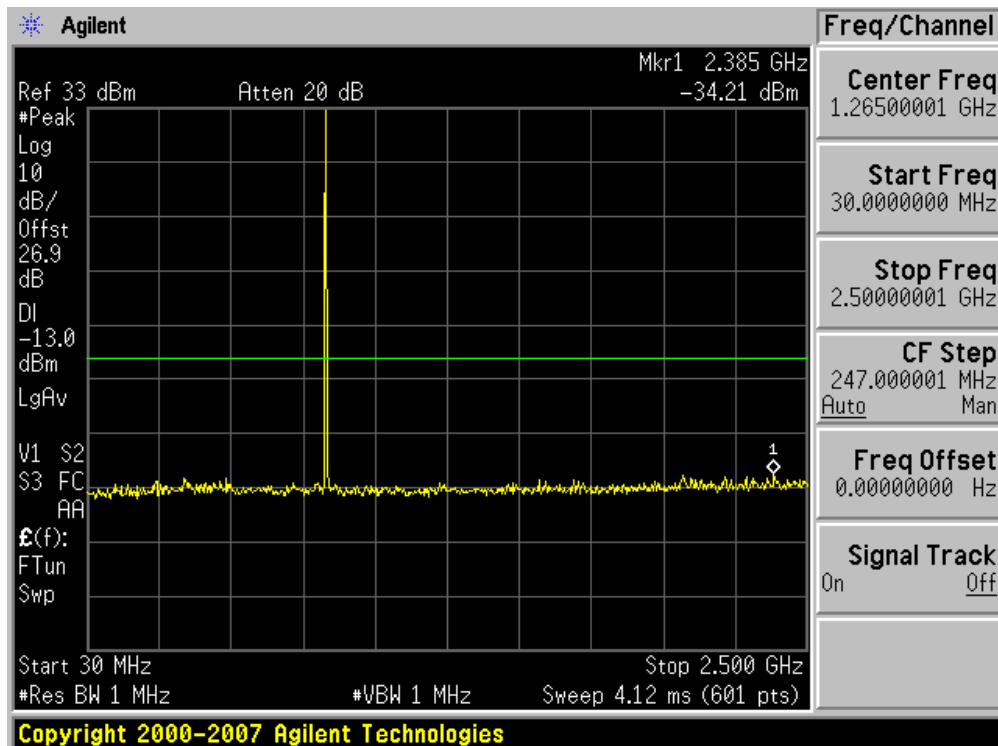
■ GSM850 MODE (190 CH.) Conducted Spurious Emissions1



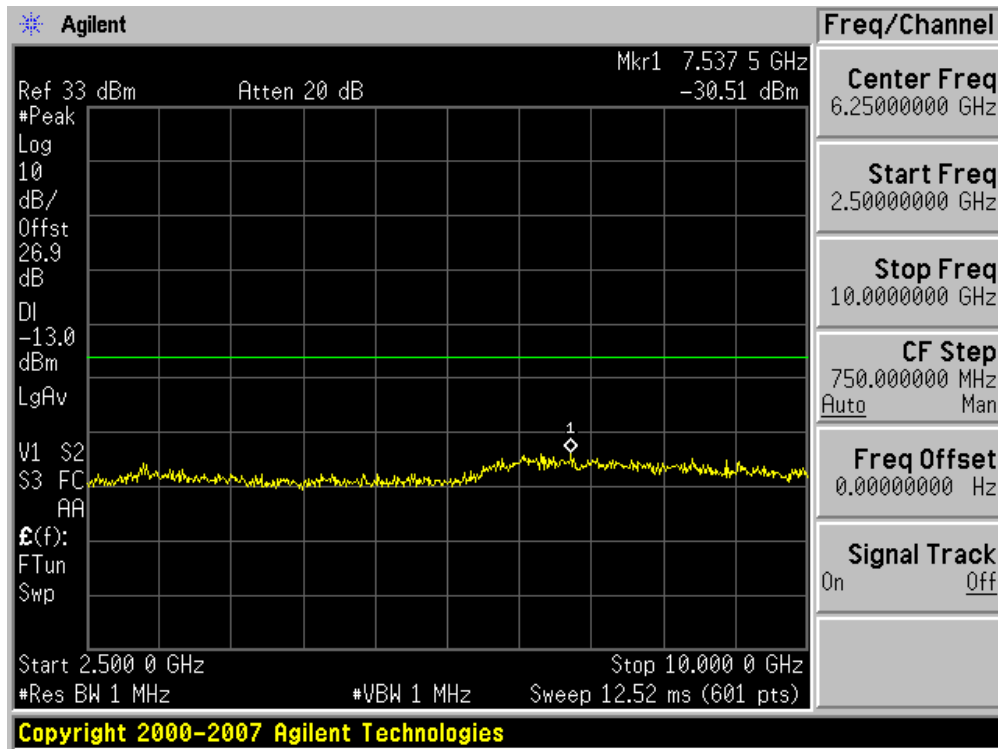
■ GSM850 MODE (190 CH.) Conducted Spurious Emissions2



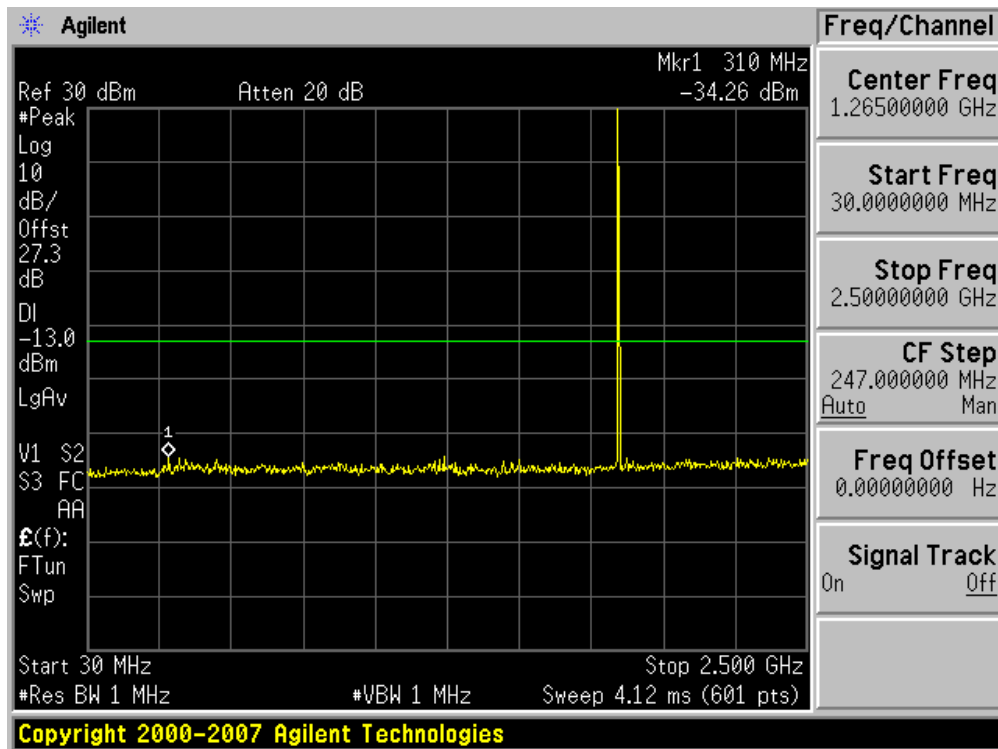
■ GSM850 MODE (251 CH.) Conducted Spurious Emissions1



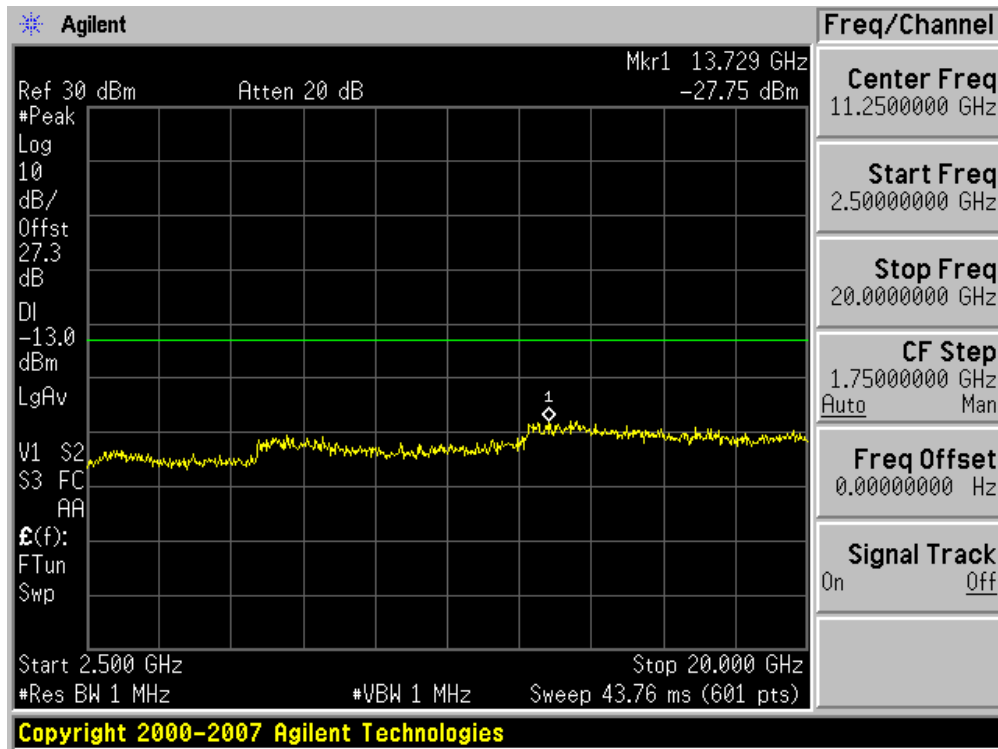
■ GSM850 MODE (251 CH.) Conducted Spurious Emissions2



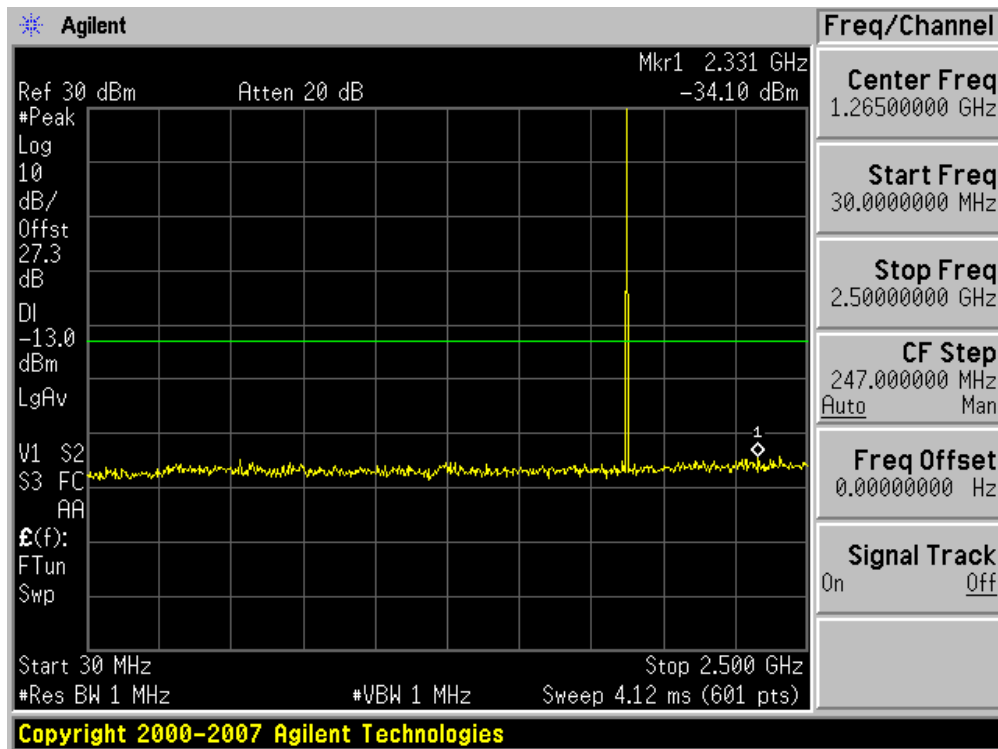
■ GSM1900 MODE (512 CH.) Conducted Spurious Emissions1



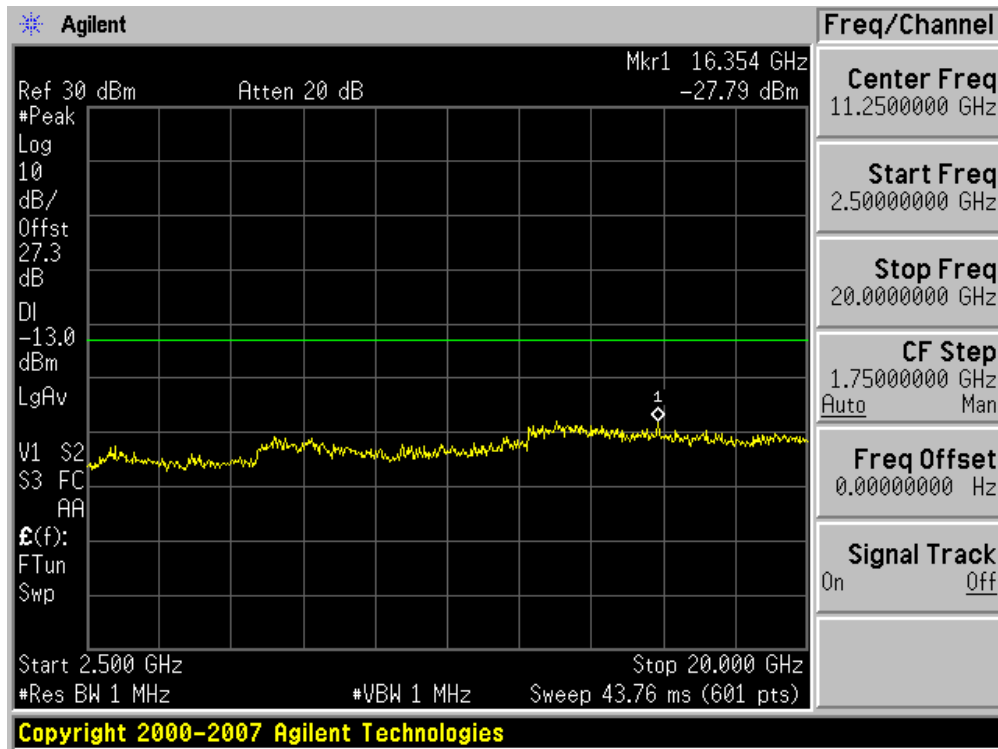
■ GSM1900 MODE (512 CH.) Conducted Spurious Emissions2



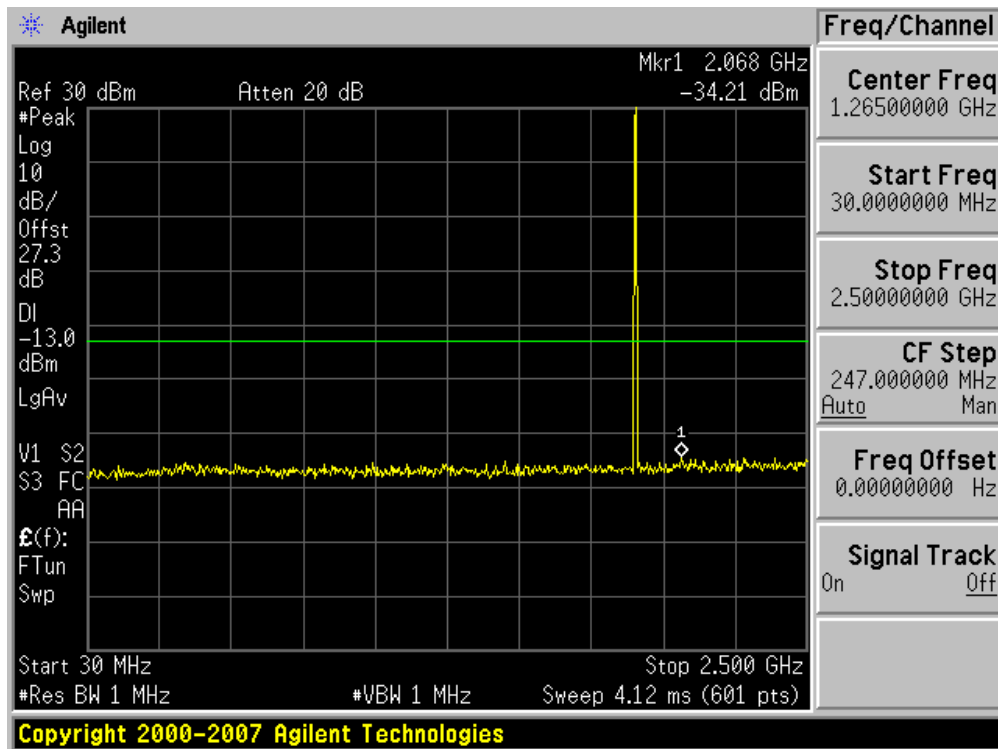
■ GSM1900 MODE (661 CH.) Conducted Spurious Emissions1



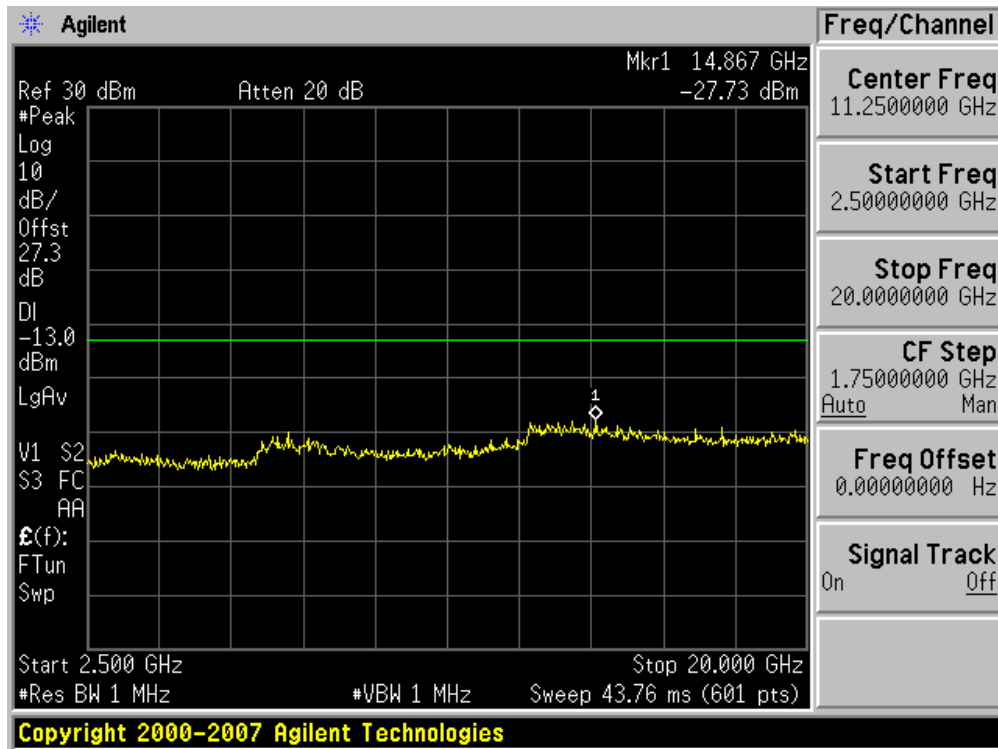
■ GSM1900 MODE (661 CH.) Conducted Spurious Emissions2



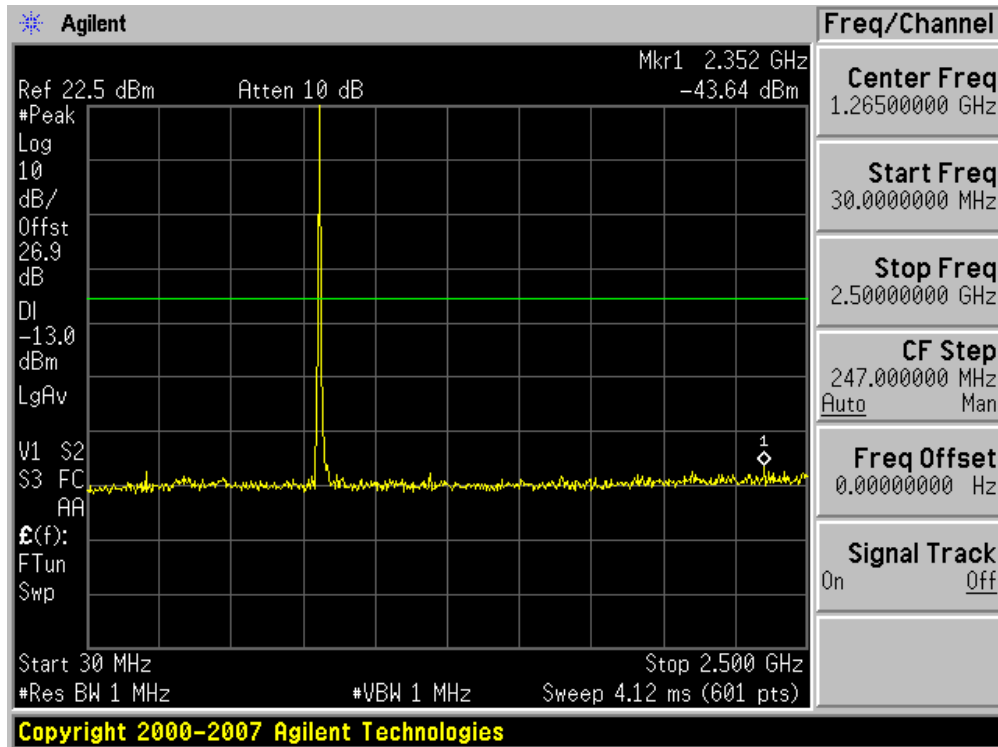
■ GSM1900 MODE (810 CH.) Conducted Spurious Emissions1



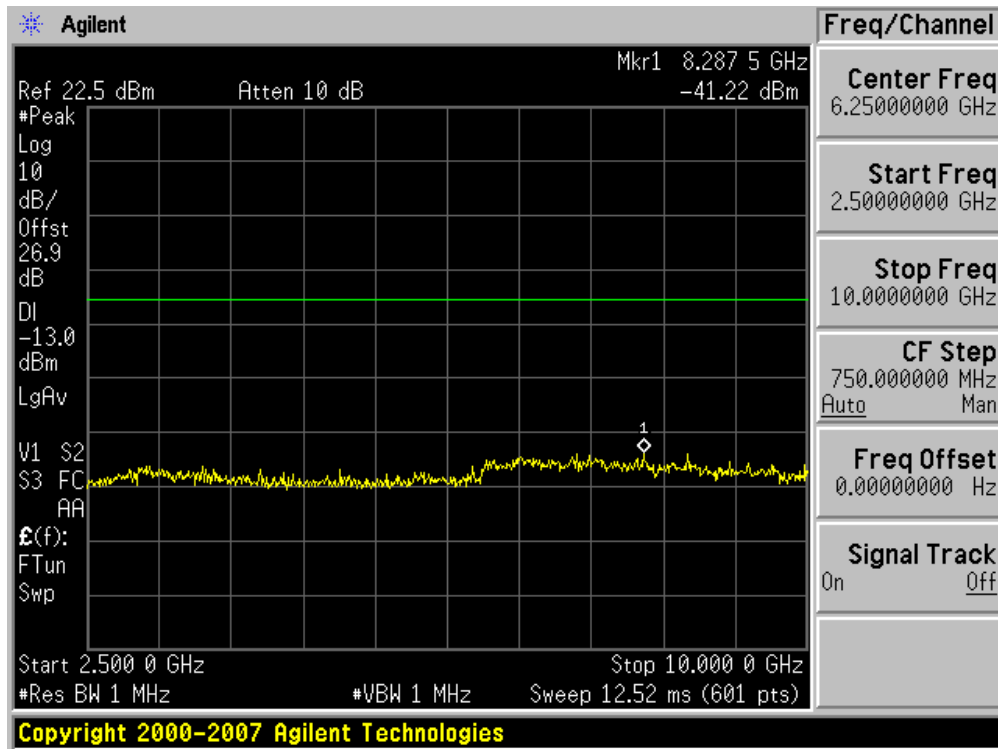
■ GSM1900 MODE (810 CH.) Conducted Spurious Emissions2



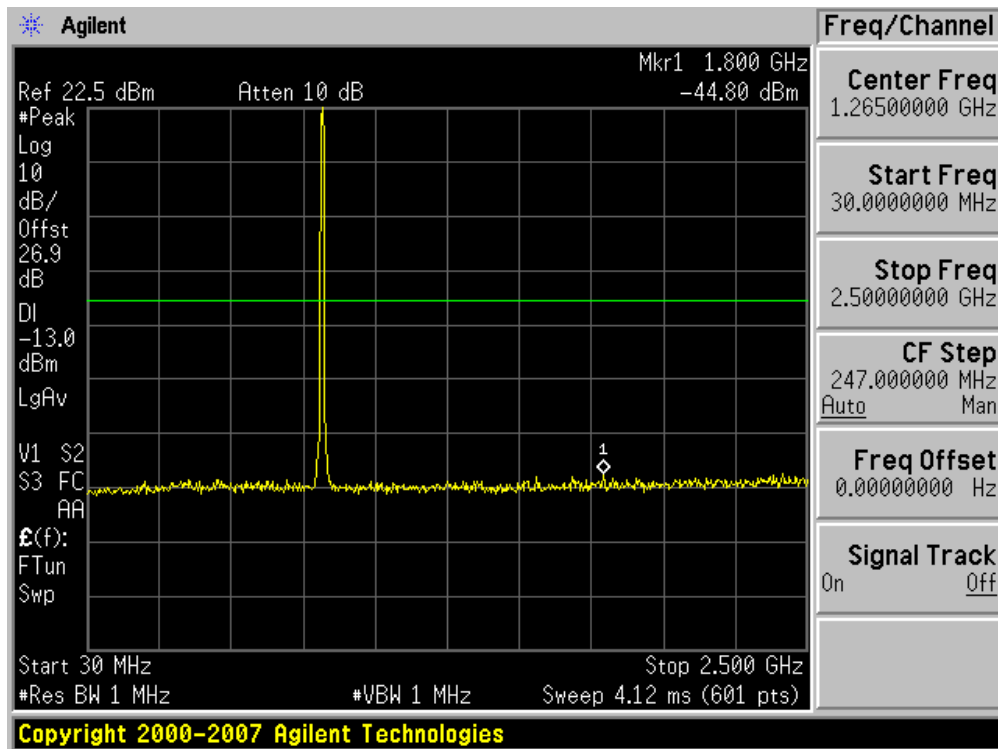
■ WCDMA850 MODE (4132 CH.) Conducted Spurious Emissions1



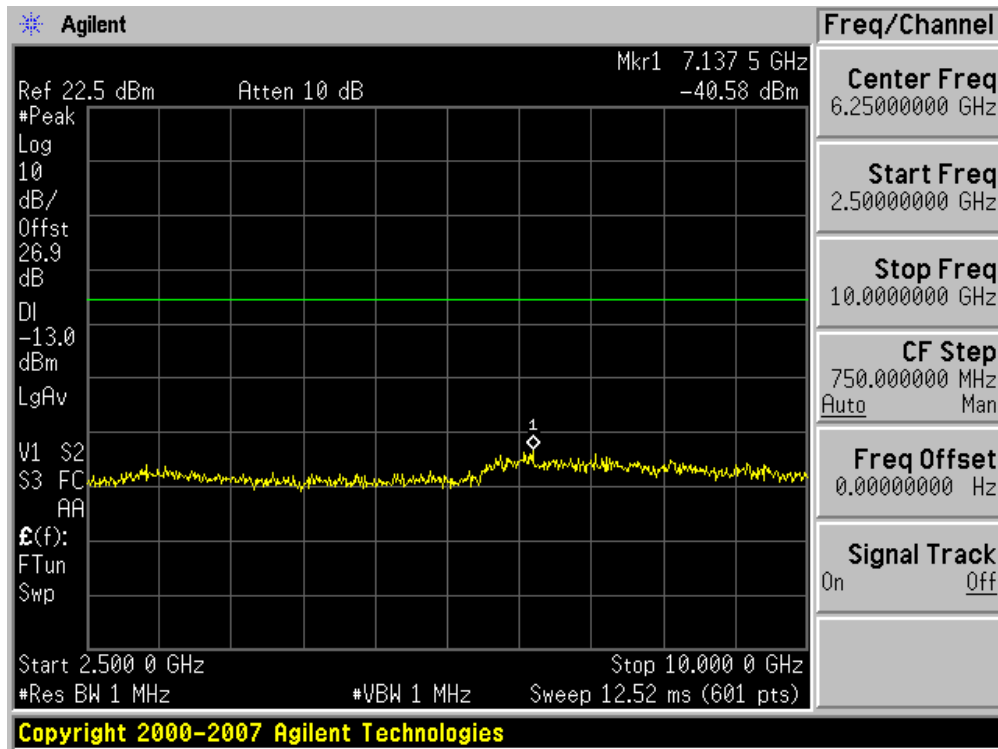
■ WCDMA850 MODE (4132 CH.) Conducted Spurious Emissions2



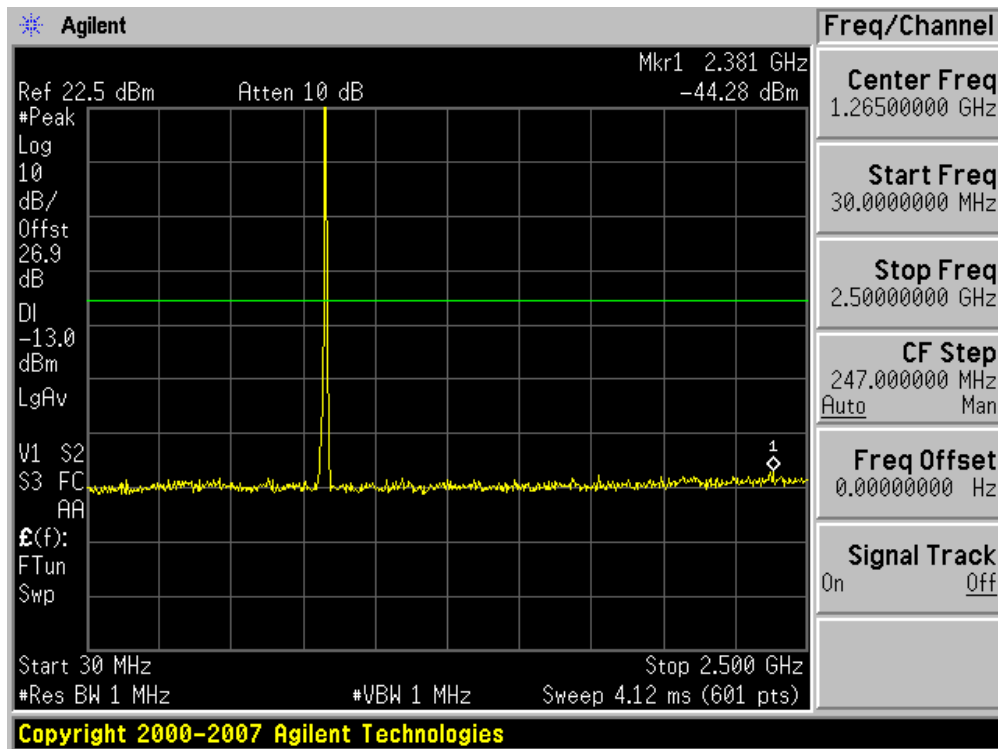
■ WCDMA850 MODE (4183 CH.) Conducted Spurious Emissions1



■ WCDMA850 MODE (4183 CH.) Conducted Spurious Emissions2



■ WCDMA850MODE (4233 CH.) Conducted Spurious Emissions1



■ WCDMA850MODE (4233 CH.) Conducted Spurious Emissions2

