RF TEST REPORT

Test item	:	Cellular/PCS GSM/GPRS/EDGE Phone with Bluetooth, WLAN and NFC
Model No.	:	LG-E975, E975, LGE975
Order No.	:	DEMC1208-01448
Date of receipt	:	2012-08-10
Test duration	:	2012-09-05 ~ 2012-10-03
Date of issue	:	2012-10-04
Use of report	:	Original Grant

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

Test laboratory : Digital EMC Co., Ltd.
683-3, Yubang-Dong, Cheoin-Gu, Yongin-Si, Kyunggi-Do, 449-080, Korea

Test specification	:	§22(H), §24(E)
Test environment	:	See appended test report
Test result	:	☒ Pass ☐ Fail

Tested by:	Witnessed by:	Reviewed by:
Engineer J.J.LEE	N/A	Technical Director Harvey Sung

Test Report Version

Test Report No.	Date	Description
DRTFCC1209-0556(1)	Oct. 04, 2012	Final version for approval

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1. GENERAL INFORMATION

Applicant Name: **LG Electronics MobileComm U.S.A., Inc.**

Address: **1000 Sylvan Avenue, Englewood Cliffs NJ 07632**

FCC ID	:	ZNFE975
FCC Classification	:	Licensed Portable Transmitter Held to Ear (PCE)
EUT Type	:	Cellular/PCS GSM/GPRS/EDGE Phone with Bluetooth, WLAN and NFC
Model Name	:	LG-E975
Add Model Name	:	E975, LGE975
Supplying power	:	Standard Battery - Type: Li-Ion Battery - M/N: BL-T5 - Rating: DC 3.8V & 2100mAh 8.0Wh
Antenna Information	:	Internal Antenna - Type: Built-In type
Tx Frequency	:	GSM850: 824.2 ~ 848.8 MHz GSM1900: 1850.2 ~ 1909.8 MHz EDGE850: 824.2 ~ 848.8 MHz EDGE1900: 1850.2 ~ 1909.8 MHz
Rx Frequency	:	GSM850: 869.2 ~ 893.8 MHz GSM1900: 1930.2 ~ 1989.8 MHz EDGE850: 869.2 ~ 893.8 MHz EDGE1900: 1930.2 ~ 1989.8 MHz
Max. RF Output Power	:	GSM850: 0.565W ERP(27.52dBm) GSM1900: 0.931W EIRP(29.69dBm) EDGE850: 0.183W ERP(22.63dBm) EDGE1900: 0.411W EIRP(26.14dBm)
Emission Designator(s)	:	GSM850: 246KGXW GSM1900: 248KGXW EDGE850: 246KG7W EDGE1900: 247KG7W

2. INTRODUCTION

2.1. EUT DESCRIPTION

The Equipment Under Test(EUT) supports a dual band(Cellular/PCS) GSM/GPRS/EDGE, Bluetooth, 2.4GHz/5GHz WLAN and NFC.

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

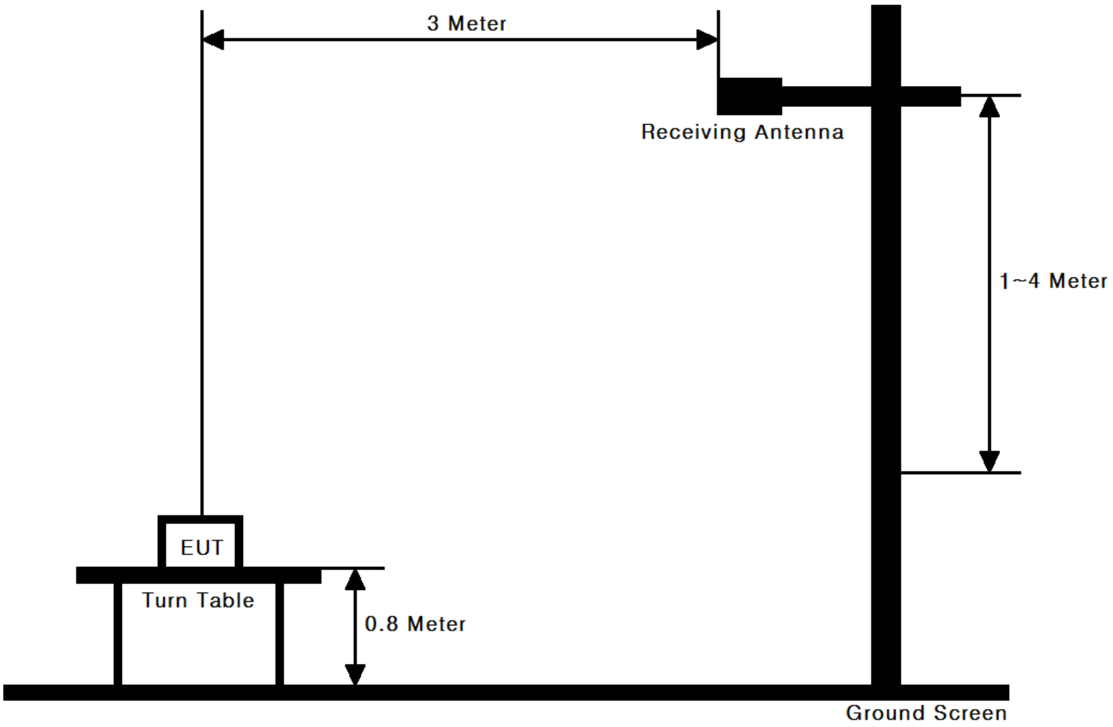
The 3&10M test site and conducted measurement facility used to collect the radiated data are located at the 683-3, Yubang-Dong, Yongin-Si, Gyunggi-Do, 449-080, South Korea. The site is constructed in conformance with the requirements.

- 3&10M test site registration Number: 678747

3. DESCRIPTION OF TESTS

3.1 ERP & EIRP
(Effective Radiated Power & Equivalent Isotropic Radiated Power)

Test Set-up



Test Procedure

These measurements were performed at 3&10m test site. The equipment under test is placed on a wooden turntable 0.8-meters above the ground plane and 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.

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.

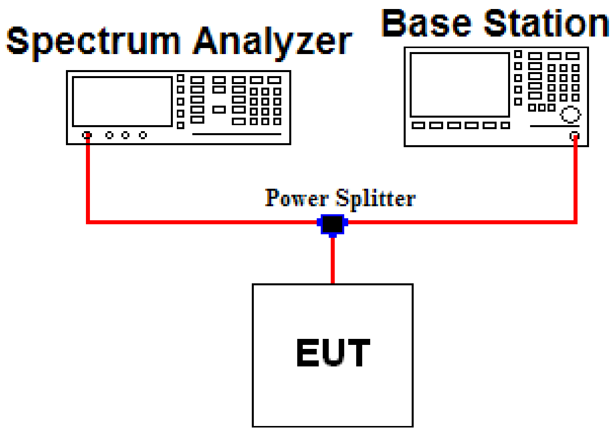
3.2 PEAK TO AVERAGE RATIO

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

For GSM signals, an average and a peak trace are used on a spectrum analyzer to determine the largest deviation between the average and the peak power of the EUT in a bandwidth greater than the emission bandwidth. Plots of the EUT's Peak- to- Average Ratio are shown herein.

3.3 OCCUPIED BANDWIDTH.

Test set-up



Offset value information

Frequency (MHz)	Offset Value (dB)	Frequency (MHz)	Offset Value (dB)
824.2	6.81	1850.2	7.33
836.6	6.82	1880.0	7.35
848.8	6.83	1909.8	7.36

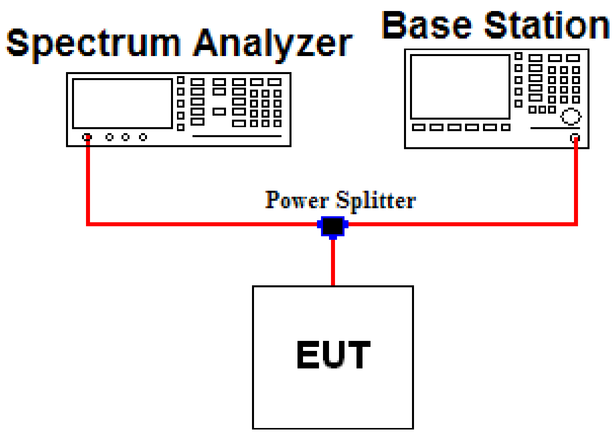
Note. 1: The offset values from EUT to Spectrum analyzer were measured and used for test.
Offset value = Cable A + Splitter + Cable B

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.

3.4 SPURIOUS AND HARMONIC EMISSIONS AT ANTENNA TERMINAL.

Test set-up



Offset value information

Frequency (MHz)	Offset Value (dB)	Frequency (MHz)	Offset Value (dB)	Frequency (MHz)	Offset Value (dB)
824.0	6.81	5000.0	8.39	-	-
849.0	6.84	10000.0	8.92	-	-
1850.0	7.33	15000.0	9.29	-	-
1910.0	7.37	20000.0	9.74	-	-

Note. 1: The offset value from EUT to Spectrum analyzer was measured and used for test.
Offset value = Cable A + Splitter + Cable B

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 spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10th harmonic. The Resolution BW of the analyzer is set to 1 % of the emission bandwidth to show compliance with -13dBm limit [43+10log(P)], in the 1 MHz bands immediately outside and adjacent to the edge of the frequency block.

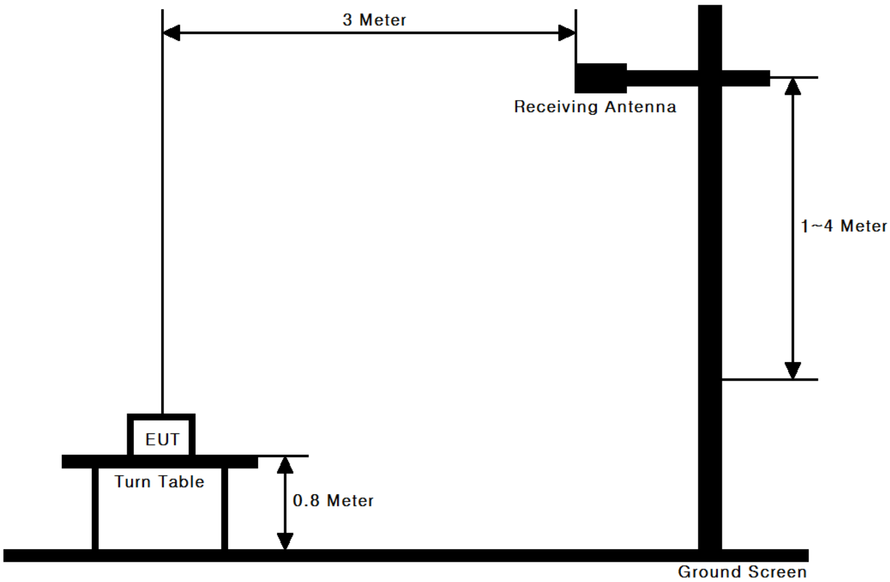
A display line was placed at -13dBm to show compliance. The high, lowest and a middle channel were tested for out of band measurements.

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.

3.5 RADIATED SPURIOUS EMISSIONS

Test Set-up



Test Procedure

This measurement was performed at 3meter test range. The equipment under test is placed on a wooden turntable 0.8-meters above the ground plane and 3-meters from the receive antenna.

The receive antenna height and turntable rotations were adjusted for the highest reading on the receive spectrum analyzer.

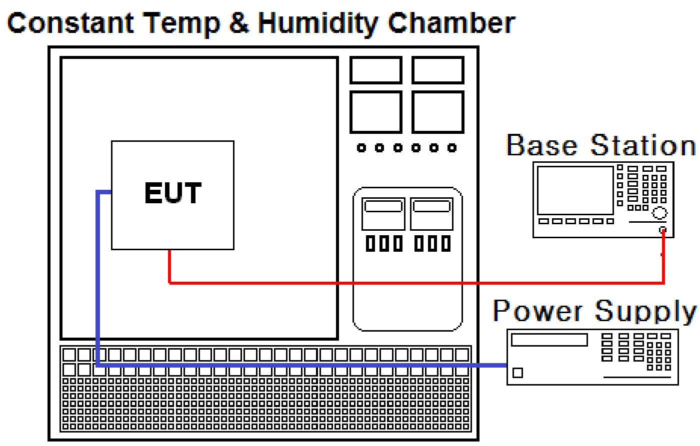
For radiated power measurements below 1GHz, a half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same spectrum analyzer reading.

For radiated power measurements above 1GHz, 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 spectrum analyzer reading. The difference between the gain of the horn and an isotropic antenna are taken into consideration.

This measurement was performed with the EUT oriented in 3 orthogonal axis.

3.6 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

Test Set-up



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 ± 0.000 25 %(± 2.5 ppm) of the center frequency.

Time Period and Procedure:

The carrier frequency of the transmitter is measured at room temperature.
(25°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

Type	Manufacturer	Model	Cal. Date (yy/mm/dd)	Next. Cal. Date (yy/mm/dd)	S/N
Spectrum Analyzer	Agilent	E4440A	11/09/30	12/09/30	MY45304199
			12/09/18	13/09/18	
Spectrum Analyzer	Agilent	N9020A	12/01/09	13/01/09	MY49100833
8960 Series 10 Wireless Comms. Test Set	Agilent	E5515C	12/03/05	13/03/05	GB43461134
Thermo hygrometer	BODYCOM	BJ5478	12/01/13	13/01/13	090205-2
TEMP & HUMIDITY Chamber	JISCO	KR-100/J-RHC2	11/09/30	12/09/30	30604493/021031
			12/09/17	13/09/17	
Signal Generator	Rohde Schwarz	SMR20	12/03/05	13/03/05	101251
Vector Signal Generator	Rohde Schwarz	SMJ100A	12/01/09	13/01/09	100148
Amplifier	EMPOWER	BBS3Q7ELU	11/09/30	12/09/30	1020
			12/09/18	13/09/18	
DC Power Supply	HP	6622A	12/03/05	13/03/05	3448A03760
Digital Multi-meter	H.P	34401A	12/03/05	13/03/05	3146A13475, US36122178
Attenuator (3dB)	WEINSCHEL	56-3	11/09/30	12/09/30	Y2342
			12/09/17	13/09/17	
Attenuator (10dB)	WEINSCHEL	23-10-34	11/09/30	12/09/30	BP4386
			12/09/17	13/09/17	
Power Splitter	Anritsu	K241B	11/09/30	12/09/30	020611
			12/09/17	13/09/17	
High-Pass Filter	Wainwright	WHKX1.0	11/09/30	12/09/30	9
			12/09/17	13/09/17	
High-Pass Filter	Wainwright	WHNX2.1	11/09/30	12/09/30	1
			12/09/17	13/09/17	
Amplifier (25dB)	Agilent	8447D	12/03/05	13/03/05	2944A10144
Amplifier (30dB)	Agilent	8449B	12/03/05	13/03/05	3008A01590
Dipole Antenna	Schwarzbeck	VHA9103	11/11/22	12/11/22	2116
Dipole Antenna	Schwarzbeck	VHA9103	11/11/22	12/11/22	2117
Dipole Antenna	Schwarzbeck	UHA9105	11/11/22	12/11/22	2261
Dipole Antenna	Schwarzbeck	UHA9105	11/11/22	12/11/22	2262
BICONICAL ANT.	Schwarzbeck	VHA 9103	10/12/21	12/12/21	91031946
LOG-PERIODIC ANT.	Schwarzbeck	UHALP9108A1	10/11/29	12/11/29	1098
HORN ANT	ETS	3115	11/09/06	13/09/06	21097
HORN ANT	ETS	3115	12/02/20	14/02/20	6419
HORN ANT	A.H.Systems	SAS-574	11/03/25	13/03/25	154
HORN ANT	A.H.Systems	SAS-574	11/03/25	13/03/25	155

5. SUMMARY OF TEST RESULTS

FCC Part Section(s)	Parameter	Status Note 1
2.1046	Conducted Output Power	C
22.913(a) 24.232(c)	Effective Radiated Power Equivalent Isotropic Radiated Power	C
22.917(a) 24.238(a) 2.1049	Occupied Bandwidth	C
22.917(a) 24.238(a) 2.1051	Band Edge Spurious and Harmonic Emissions at Antenna Terminal	C
24.232(d)	Peak to Average Ratio	C
22.917(a) 24.238(a) 2.1053	Radiated Spurious and Harmonic Emissions	C
22.355 24.235 2.1055	Frequency Stability	C

Note 1: **C**=Comply **NC**=Not Comply **NT**=Not Tested **NA**=Not Applicable

The sample was tested according to the following specification:
ANSI/TIA/EIA-603-C-2004

6. SAMPLE CALCULATION

A. Emission Designator

GSM850 Emission Designator

Emission Designator = **246KGXW**

GSM OBW = 245.7646 kHz

(Measured at the 99.75% power bandwidth)

G = Phase Modulation

X = Cases not otherwise covered

W = Combination (Audio/Data)

GSM1900 Emission Designator

Emission Designator = **248KGXW**

GSM OBW = 247.8430 kHz

(Measured at the 99.75% power bandwidth)

G = Phase Modulation

X = Cases not otherwise covered

W = Combination (Audio/Data)

EDGE850 Emission Designator

Emission Designator = **246KG7W**

GSM OBW = 246.0590 kHz

(Measured at the 99.75% power bandwidth)

G = Phase Modulation

7 = Two or more channels containing quantized or digital information

W = Combination (Audio/Data)

EDGE1900 Emission Designator

Emission Designator = **247KG7W**

GSM OBW = 246.6872 kHz

(Measured at the 99.75% power bandwidth)

G = Phase Modulation

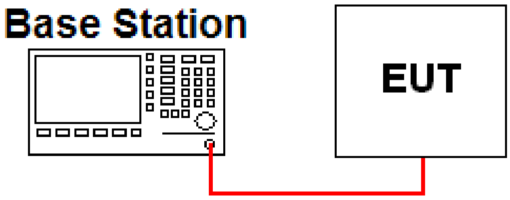
7 = Two or more channels containing quantized or digital information

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.



▪ GSM / GPRS / EDGE

Band	Channel	Test Result(dBm)								
		GSM	GPRS 1 TX Slot	GPRS 2 TX Slot	GPRS 3 TX Slot	GPRS 4 TX Slot	EDGE 1 TX Slot	EDGE 2 TX Slot	EDGE 3 TX Slot	EDGE 4 TX Slot
Cellular	128	33.00	33.00	31.50	29.40	27.30	27.60	25.50	23.60	21.50
	190	33.10	33.10	31.60	29.40	27.10	27.60	25.40	23.60	21.30
	251	33.10	33.10	31.60	29.30	27.20	27.60	25.40	23.60	21.40
PCS	512	29.80	29.70	28.30	28.30	26.40	26.40	24.40	22.30	22.30
	661	29.90	29.90	28.40	28.40	26.50	26.40	24.50	22.40	22.50
	810	30.20	30.00	28.60	28.60	26.60	26.50	24.60	22.50	22.60

The output power was measured using the Agilent E5515C

7.2 PEAK TO AVERAGE RATIO

- Plots of the EUT's Peak- to- Average Ratio are shown in Clause 8.1

7.3 OCCUPIED BANDWIDTH

Band	Channel	Test Result(KHz)
GSM850	128	***245.7646***
	190	242.5187
	251	245.5488
GSM1900	512	244.9254
	661	242.3716
	810	***247.8430***
EDGE850	128	242.1754
	190	244.3706
	251	***246.0590***
EDGE1900	512	243.4022
	661	***246.6872***
	810	243.8338

- Plots of the EUT's Occupied Bandwidth are shown in Clause 8.2

7.4 SPURIOUS AND HARMONIC EMISSIONS AT ANTENNA TERMINAL

- Plots of the EUT's Conducted Spurious Emissions are shown in Clause 8.3

7.5 BAND EDGE

- Plots of the EUT's Band Edge are shown in Clause 8.4

7.6 EFFECTIVE RADIATED POWER(GSM850)

- GSM850 data

CH.	EUT Position (Axis)	TEST CONDITIONS Power Step: 5							
		Reading Value (dBm)	Pol. (H/V)	LEVEL@ TX ANTENNA TERMINAL (dBm)	Antenna Gain (dBd)	ERP (dBm)	ERP (W)	Power Supply	Note.
128	X	-8.21	H	24.50	1.20	25.70	0.372	DC 3.8V	GSM
190	X	-7.77	H	26.23	1.15	27.38	0.547	DC 3.8V	GSM
251	***X***	***-7.13***	***H***	***26.47***	***1.05***	***27.52***	***0.565***	***DC 3.8V***	***GSM***
251	X	-12.02	H	21.58	1.05	22.63	0.183	DC 3.8V	EDGE

NOTES:

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

The EUT is placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation is 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 TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz.
A half-wave dipole is substituted in place of the EUT. This dipole antenna is driven by a signal generator and the level of the signal generator is 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 GSM mode. This EUT was tested with the fully charged battery. Also, we have done x, y, z planes in EUT and horizontal and vertical polarization of detecting antenna.
The worst case data is reported.

7.7 EQUIVALENT ISOTROPIC RADIATED POWER(GSM1900)

- GSM1900 data

CH.	EUT Position (Axis)	TEST CONDITIONS Power Step: 0							
		Reading Value (dBm)	Pol. (H/V)	LEVEL@ TX ANTENNA TERMINAL (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (W)	Power Supply	Note.
512	***X***	***-8.02***	***H***	***21.10***	***8.59***	***29.69***	***0.931***	***DC 3.8V***	***GSM***
661	X	-8.10	H	20.99	8.68	29.67	0.927	DC 3.8V	GSM
810	X	-7.59	H	20.76	8.77	29.53	0.897	DC 3.8V	GSM
512	X	-11.57	H	17.55	8.59	26.14	0.411	DC 3.8V	EDGE

NOTES:

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

The EUT is placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation is 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 TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz.
A half-wave dipole is substituted in place of the EUT. This dipole antenna is driven by a signal generator and the level of the signal generator is 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 GSM mode. This EUT was tested with the fully charged battery. Also, we have done x, y, z planes in EUT and horizontal and vertical polarization of detecting antenna.
The worst case data is reported.

7.8 RADIATED SPURIOUS EMISSIONS

7.8.1 RADIATED SPURIOUS EMISSIONS (GSM850)

Channel (ERP)	Freq. (MHz)	EUT Position (Axis)	POL (H/V)	LEVEL@ ANTENNA TERMINAL (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	CORRECT GENERATOR LEVEL (dBm)	Result (dBc)	Limit (dBc)
128 (0.372W)	1648.54	X	H	-51.63	5.48	-46.15	71.85	38.70
	2472.65	Z	V	-53.90	6.89	-47.01	72.71	
	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	
190 (0.547W)	1673.18	X	H	-49.08	5.53	-43.55	70.93	40.38
	2509.71	Z	V	-53.12	6.94	-46.18	73.56	
	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	
251 (0.565W)	1697.53	X	H	-46.52	5.59	-40.93	68.45	40.52
	2546.40	Z	V	-53.35	7.00	-46.35	73.87	
	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	

- Limit Calculation = 43 + 10 $\log_{10}$ (ERP [W]) [dBc]
- No other spurious and harmonic emissions were reported greater than listed emissions above table.

NOTES:

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

The EUT is placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation is 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 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 highest power is reported in GSM mode and using a Power Control Level of “0” in the PCS Band and “5” in the Cellular Band.
This EUT was tested with the fully charged battery. Also, we have done x, y, z planes in EUT and horizontal and vertical polarization of detecting antenna.
The worst case data is reported.

7.8.2 RADIATED SPURIOUS EMISSIONS (GSM1900)

Channel (EIRP)	Freq. (MHz)	EUT Position (Axis)	POL (H/V)	LEVEL@ ANTENNA TERMINAL (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	CORRECT GENERATOR LEVEL (dBm)	Result (dBc)	Limit (dBc)
512 (0.931W)	3700.35	X	V	-50.85	9.67	-41.18	70.87	42.69
	5550.45	X	V	-52.90	11.11	-41.79	71.48	
	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	
661 (0.927W)	3760.10	X	V	-53.78	9.68	-44.10	73.77	42.67
	5640.20	X	V	-53.00	11.16	-41.84	71.51	
	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	
810 (0.897W)	3819.78	X	V	-51.18	9.68	-41.50	71.03	42.53
	5729.46	X	V	-54.72	11.21	-43.51	73.04	
	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	

- Limit Calculation = 43 + 10 $\log_{10}$ (EIRP [W]) [dBc]
- No other spurious and harmonic emissions were reported greater than listed emissions above table.

NOTES:

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

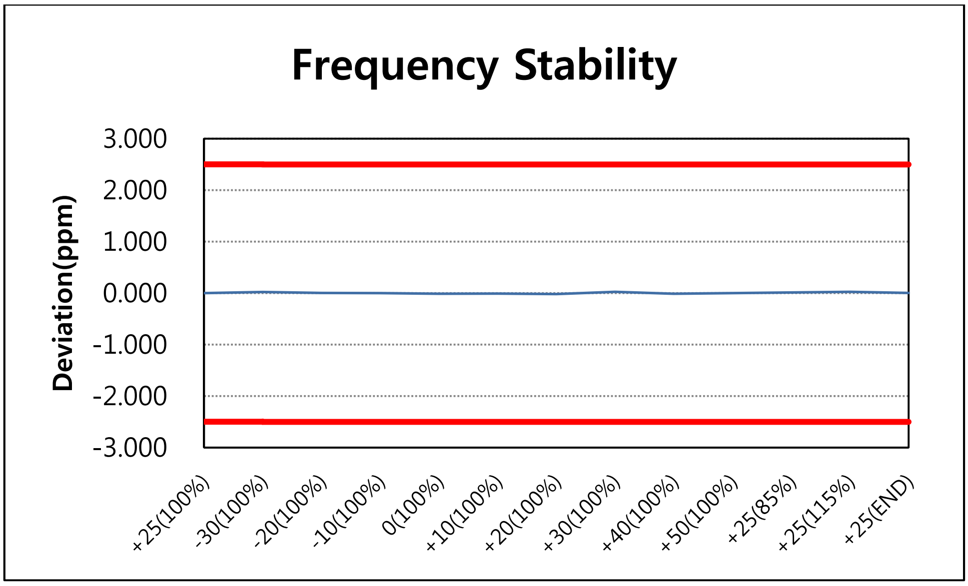
The EUT is placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation is adjusted for the highest reading on the receive spectrum analyzer.
A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This 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 highest power is reported in GSM mode and using a Power Control Level of “0” in the PCS Band and “5” in the Cellular Band.
This EUT was tested with the fully charged battery. Also, we have done x, y, z planes in EUT and horizontal and vertical polarization of detecting antenna.
The worst case data is reported.

7.9 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

7.9.1 FREQUENCY STABILITY (GSM850)

OPERATING FREQUENCY : 836,599,987 Hz
CHANNEL : 190(Mid)
REFERENCE VOLTAGE : 3.80 V DC
DEVIATION LIMIT : ± 0.00025 % or 2.5 ppm

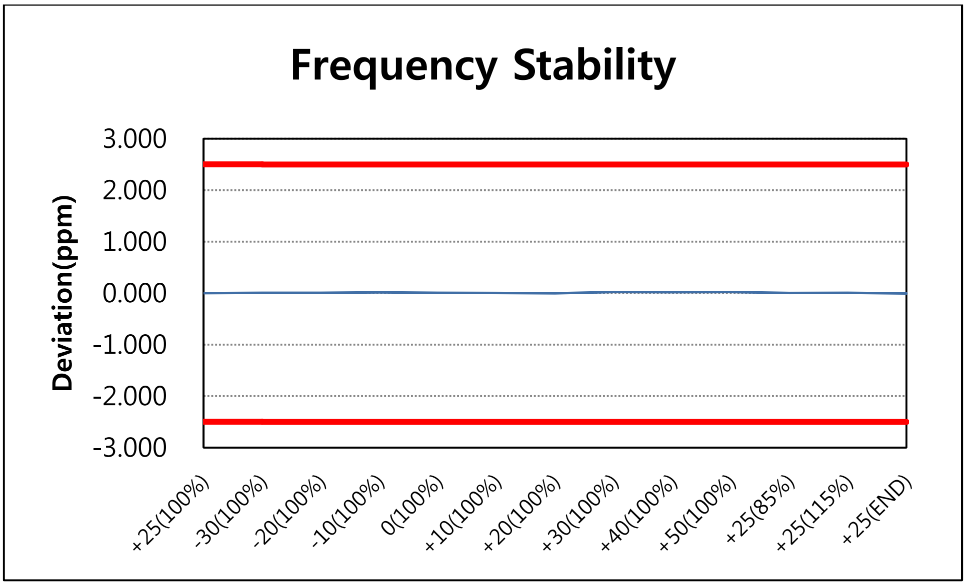
VOLTAGE (%)	POWER (V DC)	TEMP (℃)	FREQ (Hz)	Deviation	
				(ppm)	(%)
100%	3.80	+25(Ref)	836,599,987	0.000	0.00000000
100%		-30	836,600,006	0.023	0.00000227
100%		-20	836,599,991	0.005	0.00000048
100%		-10	836,599,987	0.000	0.00000000
100%		0	836,599,976	-0.013	-0.00000131
100%		+10	836,599,981	-0.007	-0.00000072
100%		+20	836,599,971	-0.019	-0.00000191
100%		+30	836,600,008	0.025	0.00000251
100%		+40	836,599,976	-0.013	-0.00000131
100%		+50	836,599,988	0.001	0.00000012
85%	3.23	+25	836,599,998	0.013	0.00000131
115%	4.37	+25	836,600,008	0.025	0.00000251
BATT.ENDPOINT	3.20	+25	836,599,991	0.005	0.00000048



7.9.2 FREQUENCY STABILITY (GSM1900)

OPERATING FREQUENCY : 1,879,999,978 Hz
CHANNEL : 661(Mid)
REFERENCE VOLTAGE : 3.80 V DC
DEVIATION LIMIT : ± 0.00025 % or 2.5 ppm

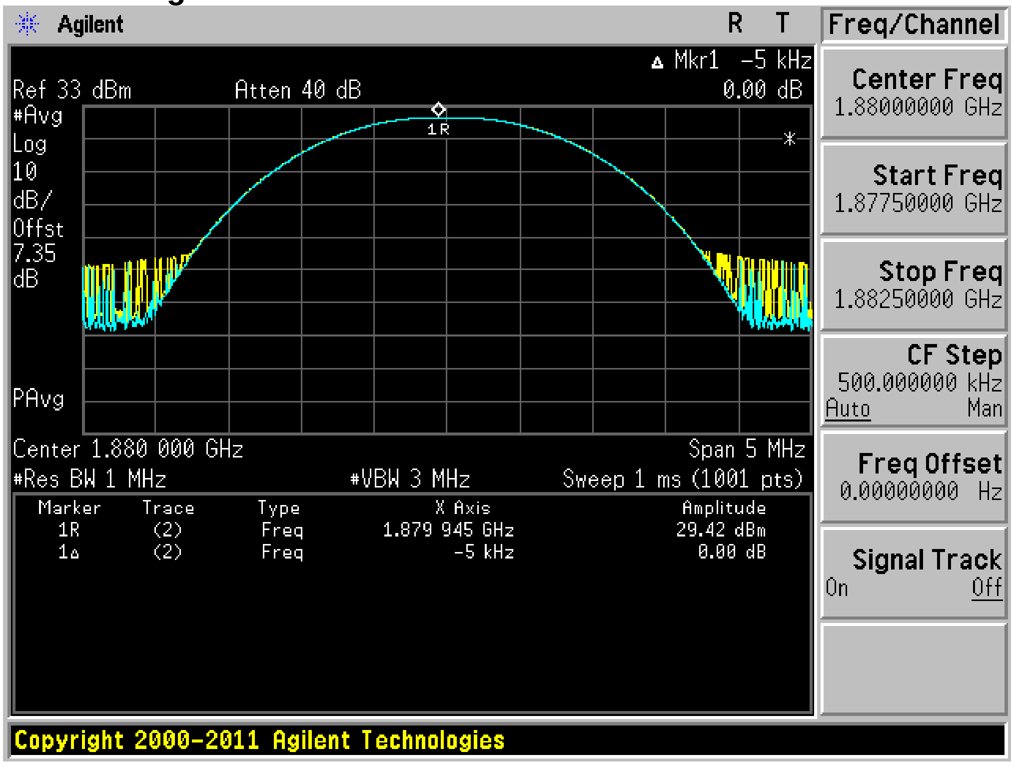
VOLTAGE (%)	POWER (V DC)	TEMP (℃)	FREQ (Hz)	Deviation (ppm)	Deviation (%)
100%	3.80	+25(Ref)	1,879,999,978	0.000	0.00000000
100%		-30	1,879,999,989	0.006	0.00000059
100%		-20	1,879,999,993	0.008	0.00000080
100%		-10	1,880,000,006	0.015	0.00000149
100%		0	1,879,999,990	0.006	0.00000064
100%		+10	1,879,999,987	0.005	0.00000048
100%		+20	1,879,999,976	-0.001	-0.00000011
100%		+30	1,880,000,018	0.021	0.00000213
100%		+40	1,880,000,014	0.019	0.00000191
100%		+50	1,880,000,018	0.021	0.00000213
85%	3.23	+25	1,879,999,986	0.004	0.00000043
115%	4.37	+25	1,879,999,990	0.006	0.00000064
BATT.ENDPOINT	3.20	+25	1,879,999,967	-0.006	-0.00000059



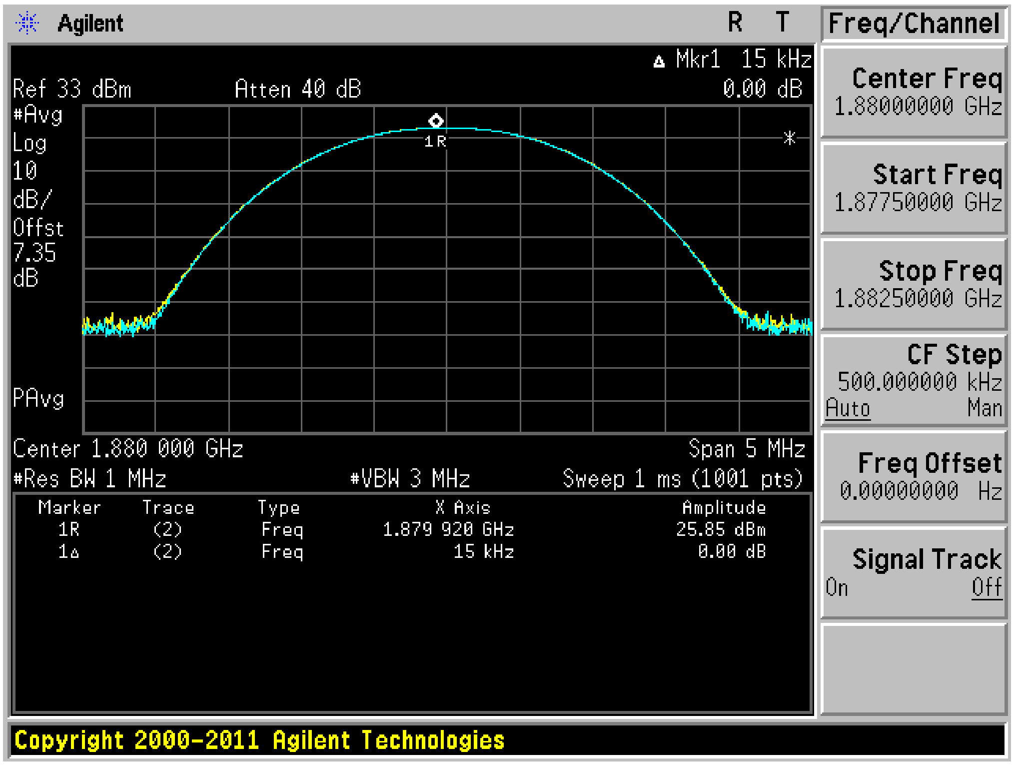
8. TEST PLOTS

8.1 Peak to Average Ratio

GSM1900 & Channel: 661

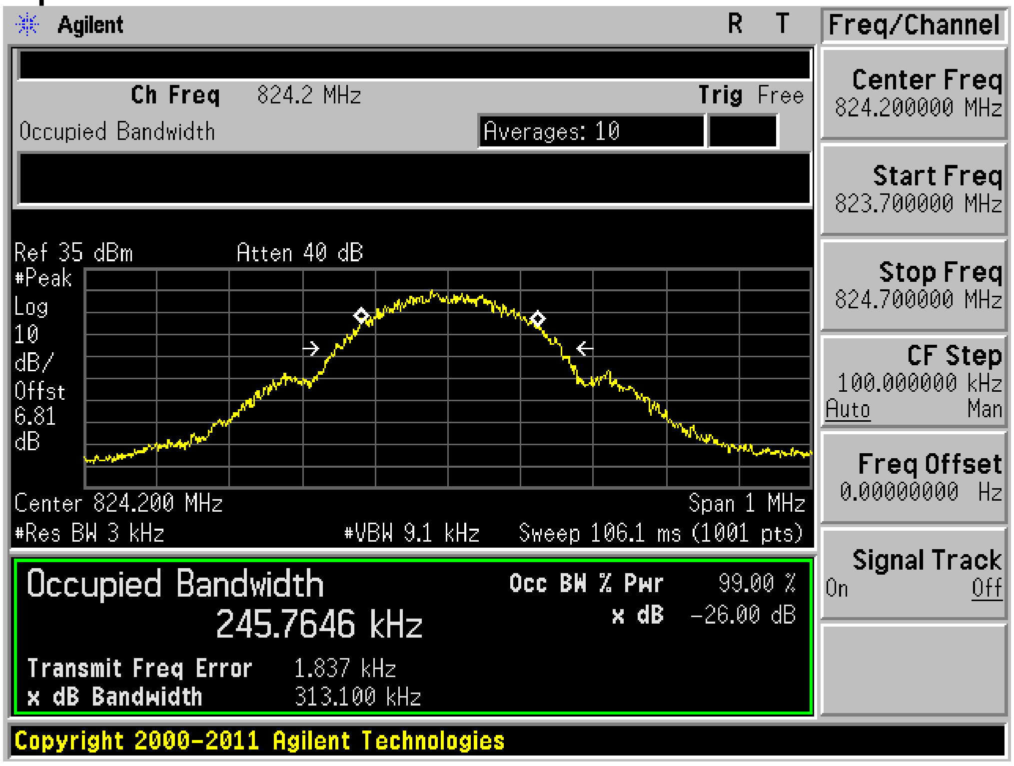


EDGE1900 & Channel: 661

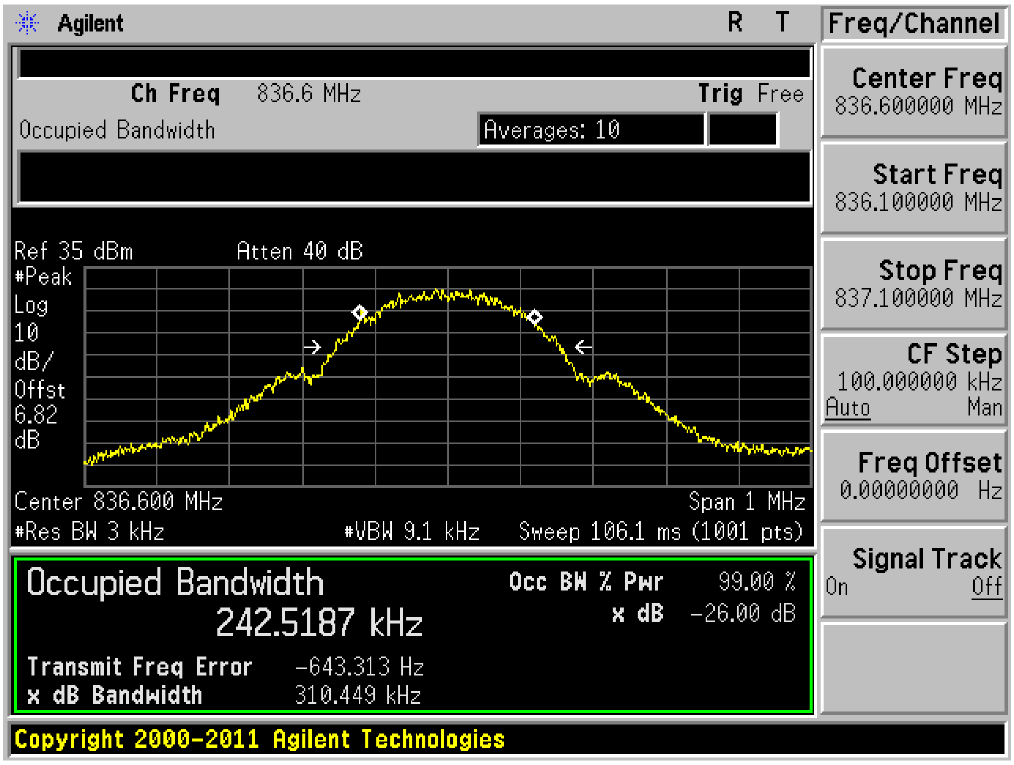


8.2 Occupied Bandwidth 99 % Bandwidth

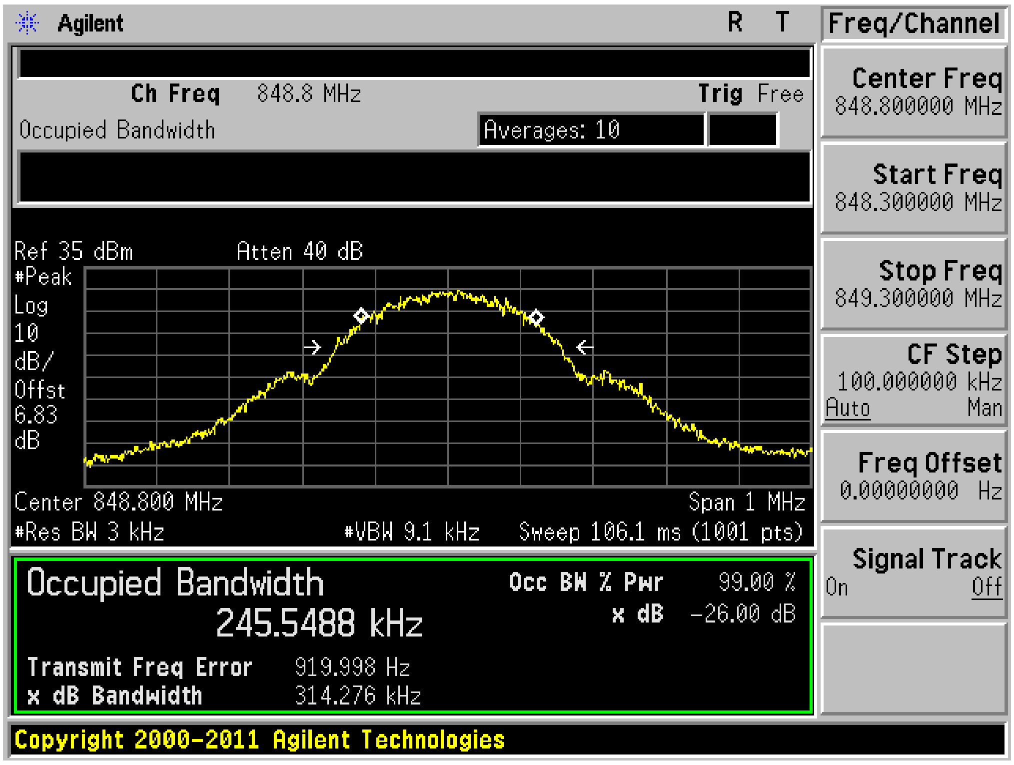
GSM850 & Channel: 128



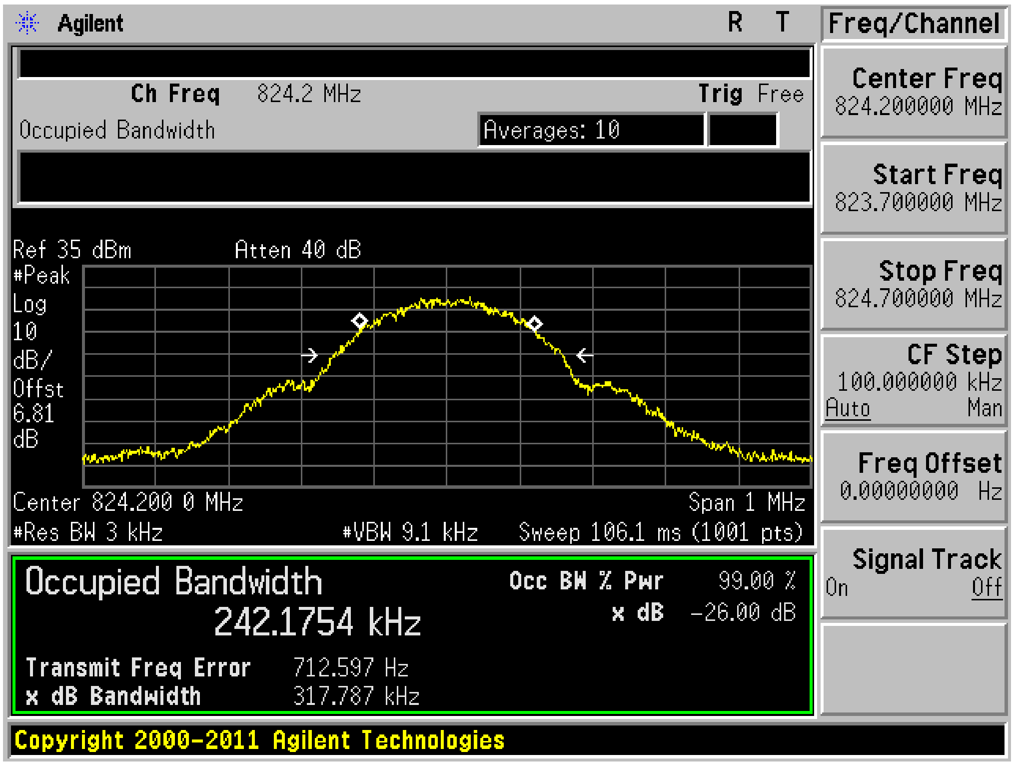
GSM850 & Channel: 190



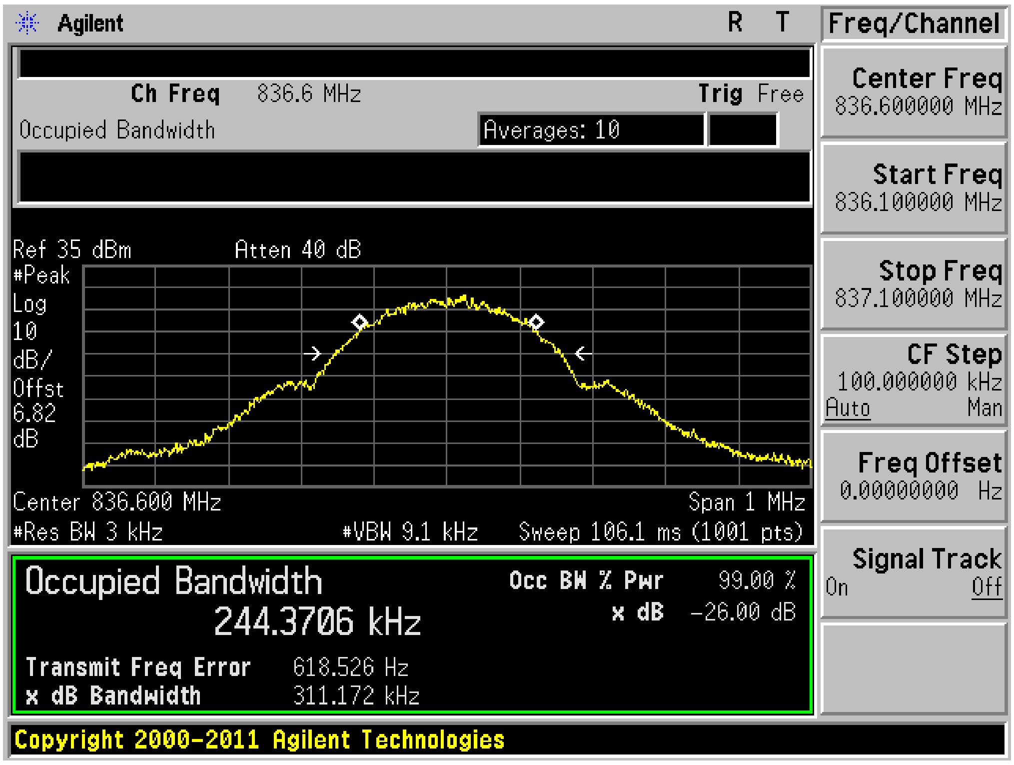
GSM850 & Channel: 251



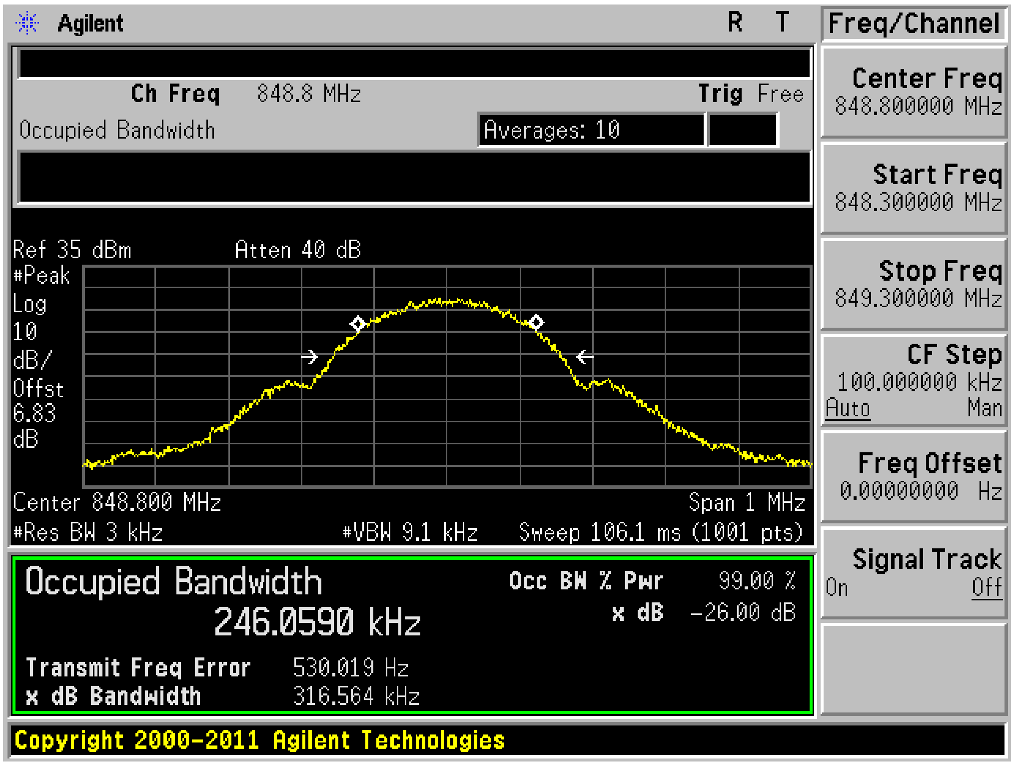
EDGE 850 & Channel: 128



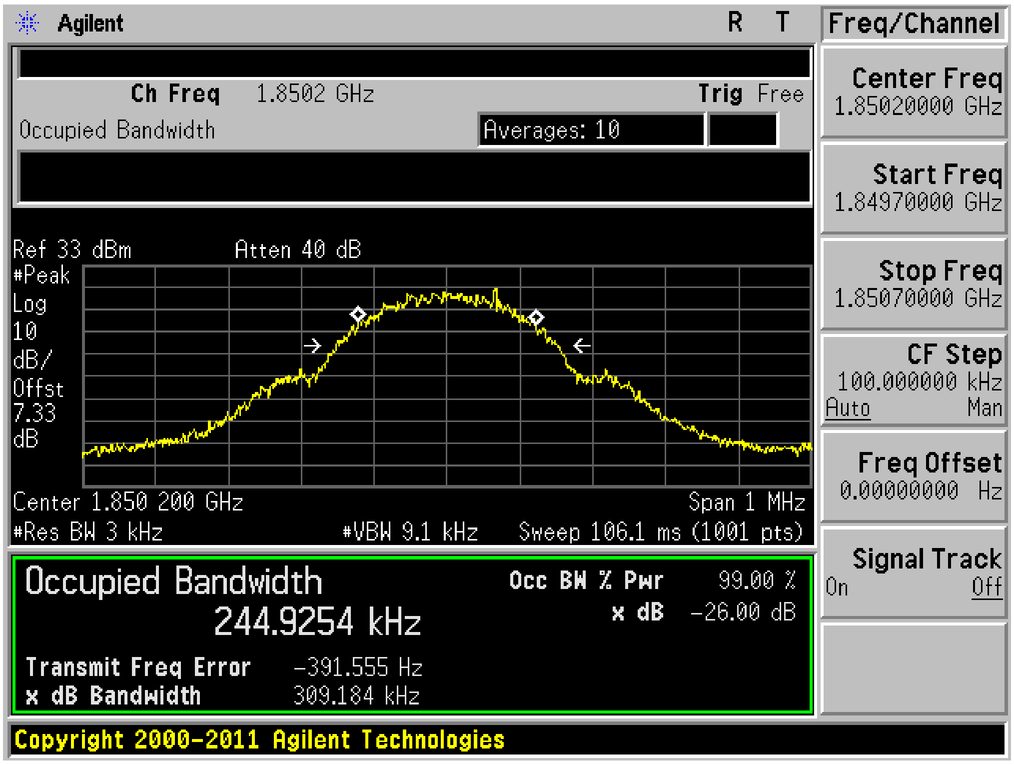
EDGE 850 & Channel: 190



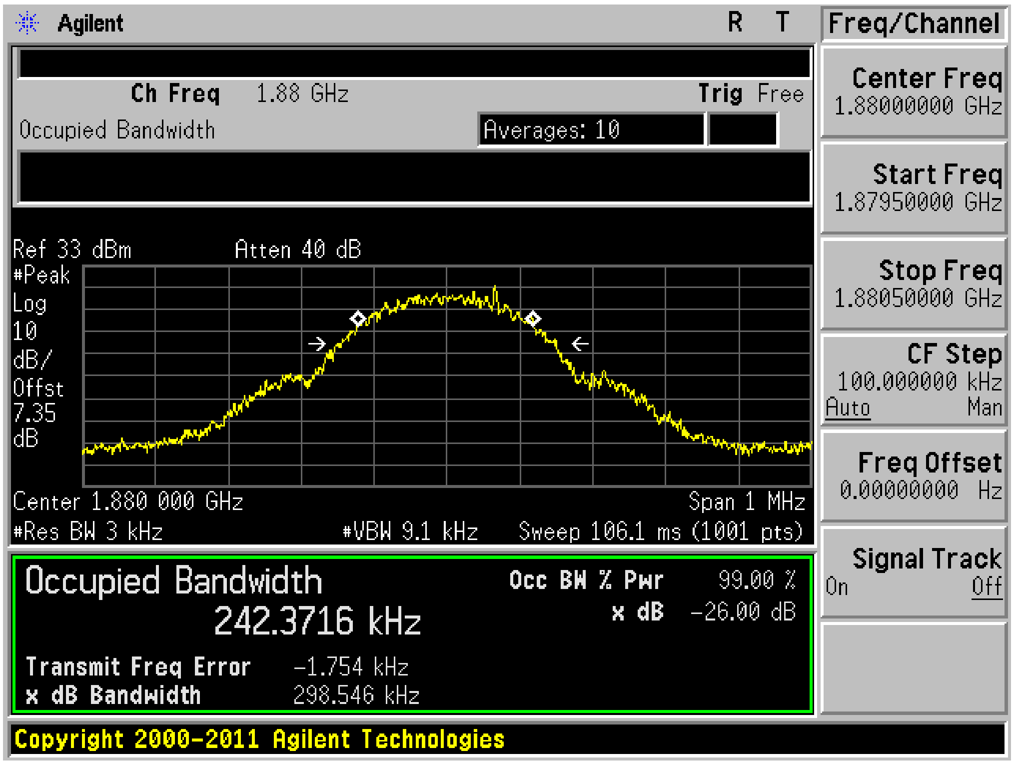
EDGE 850 & Channel: 251



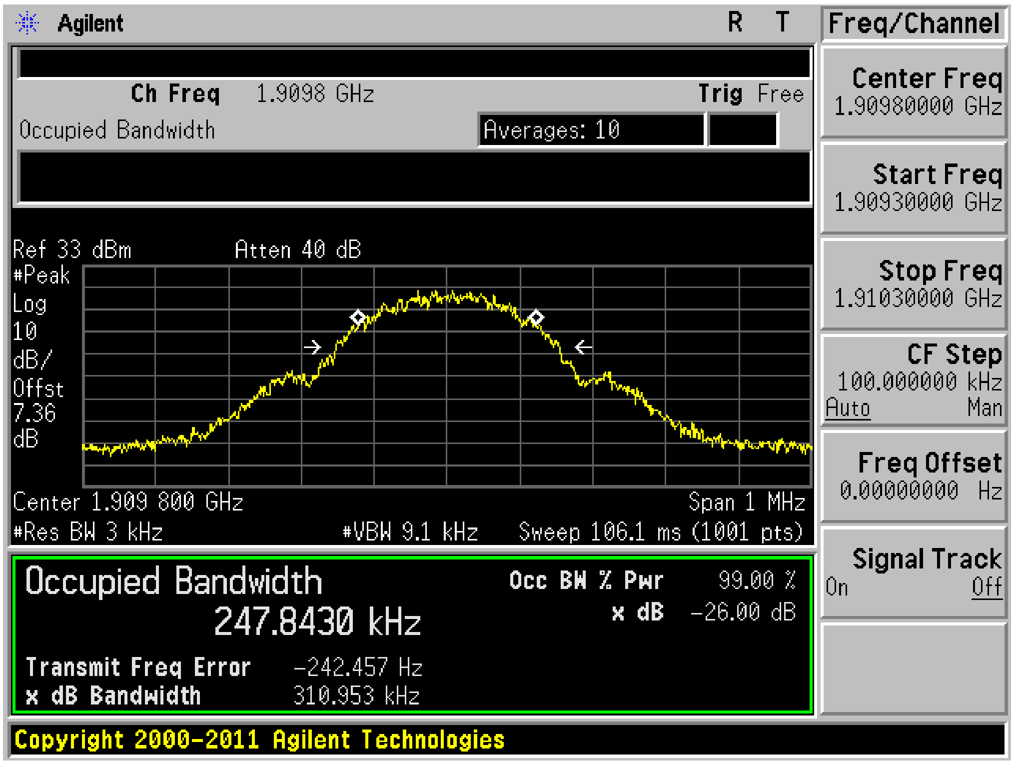
GSM 1900 & Channel: 512



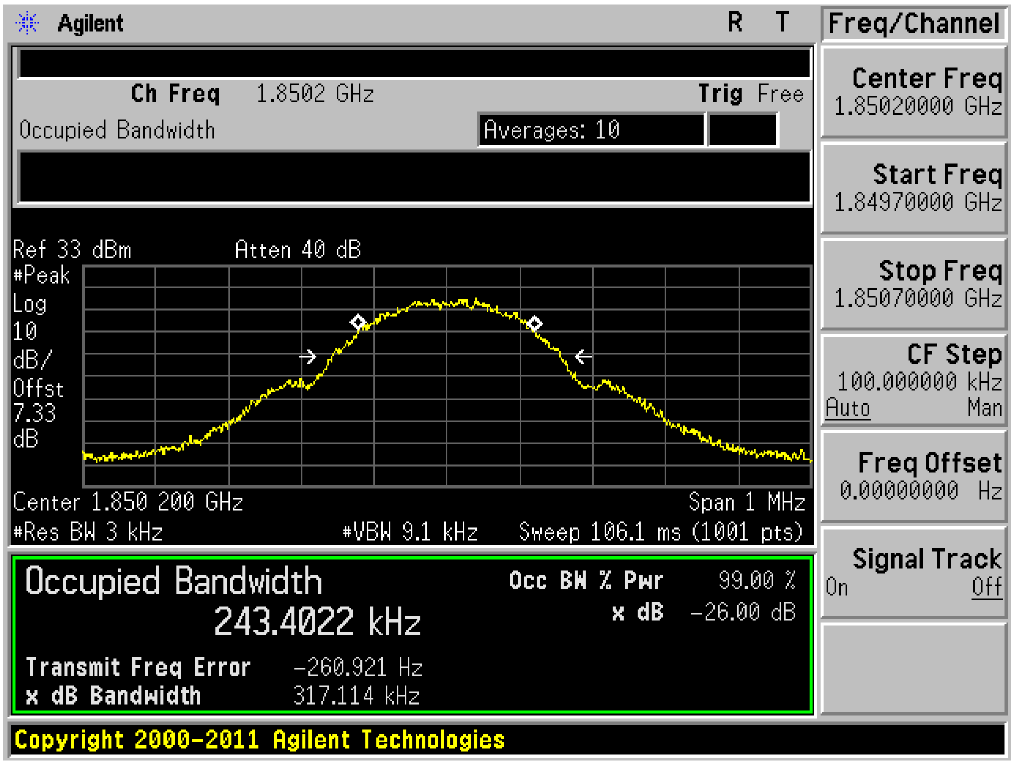
GSM 1900 & Channel: 661



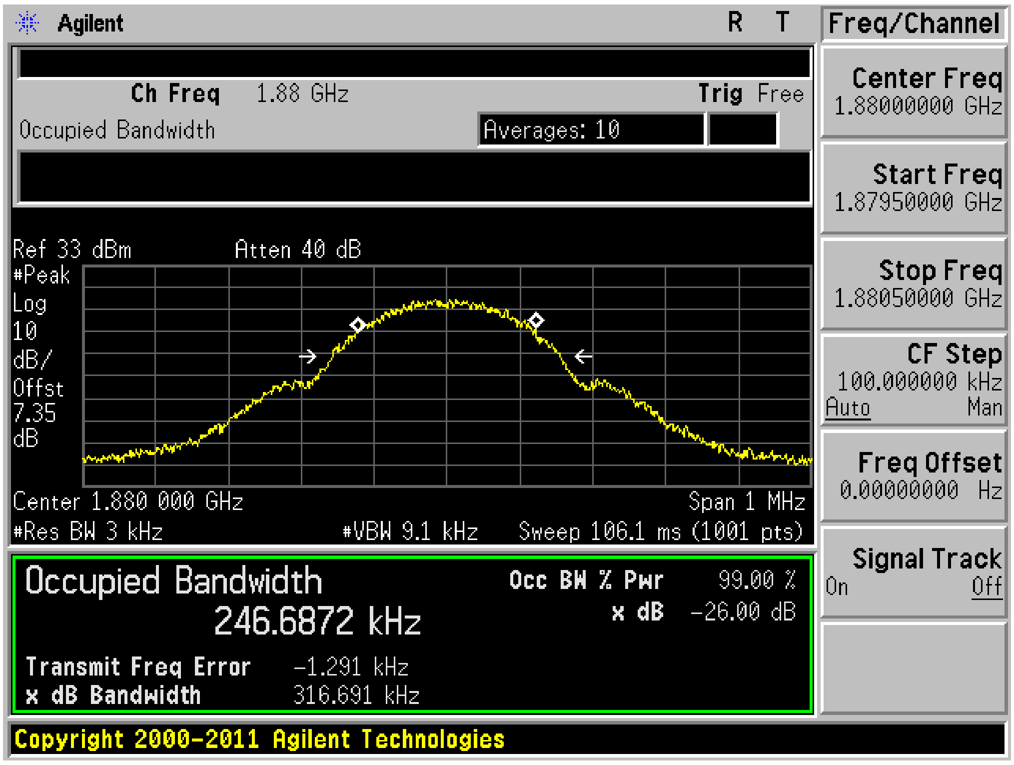
GSM 1900 & Channel: 810



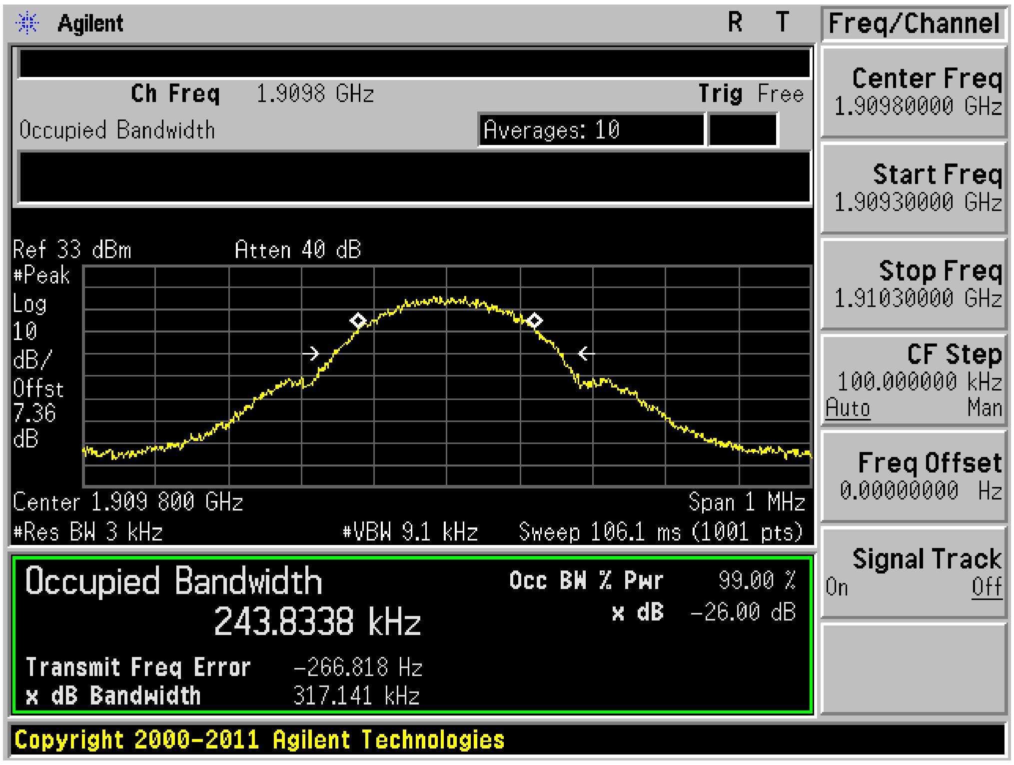
EDGE 1900 & Channel: 512



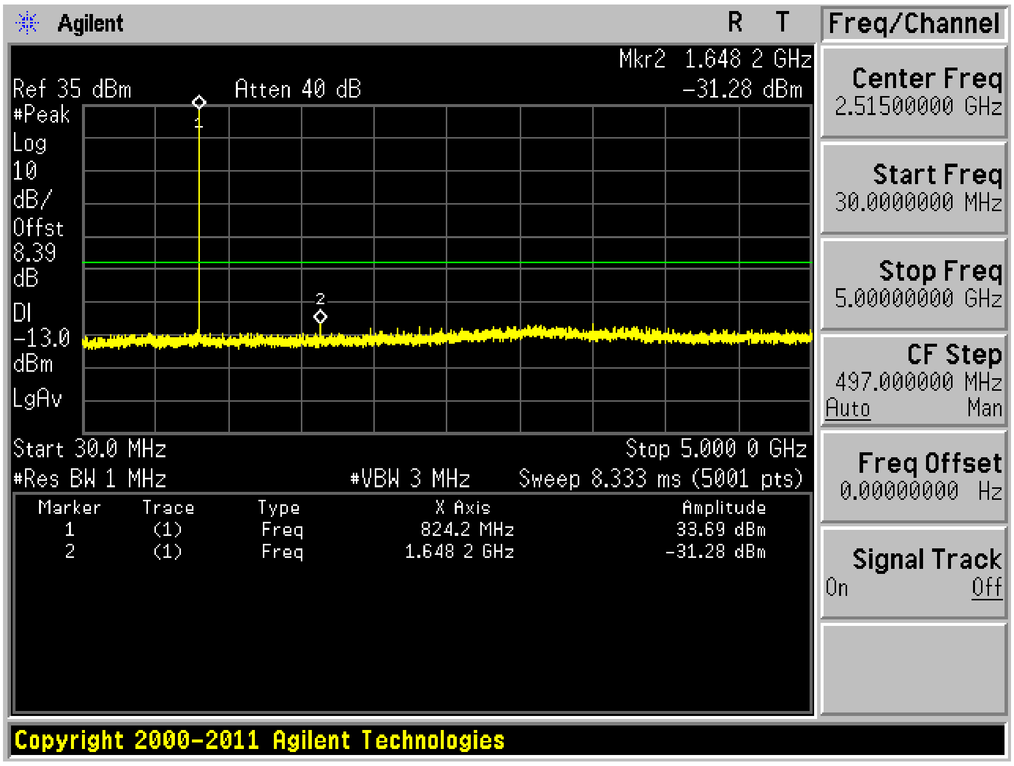
EDGE 1900 & Channel: 661



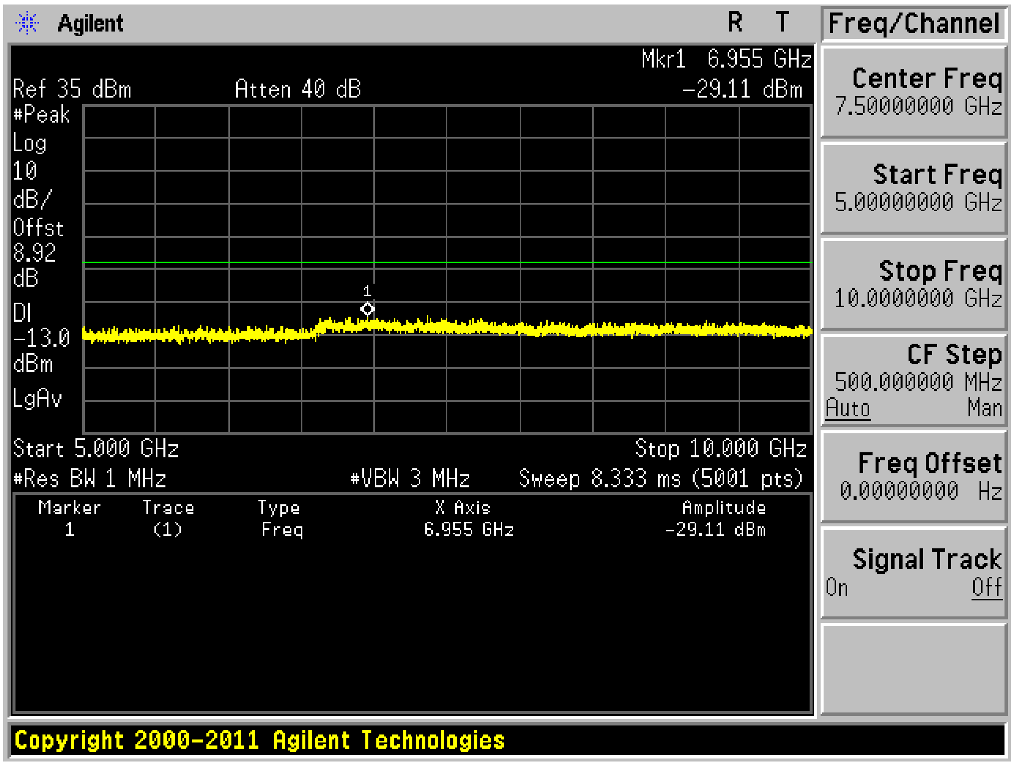
EDGE 1900 & Channel: 810



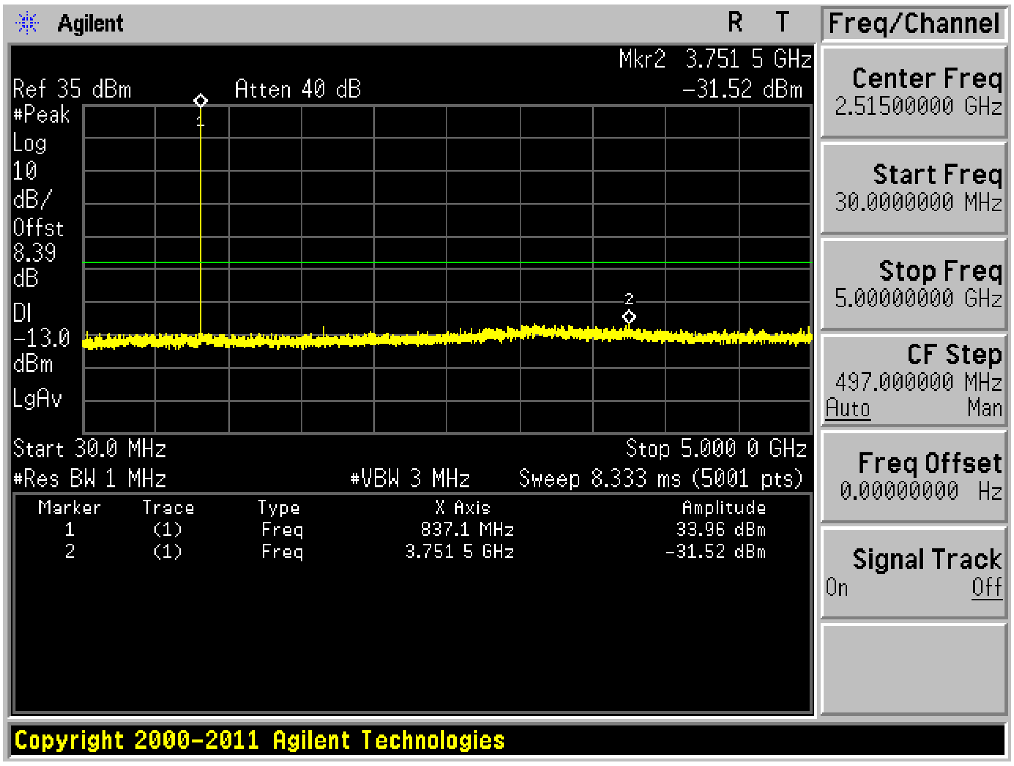
8.3 Spurious Emissions at Antenna Terminal GSM850 & Channel: 128



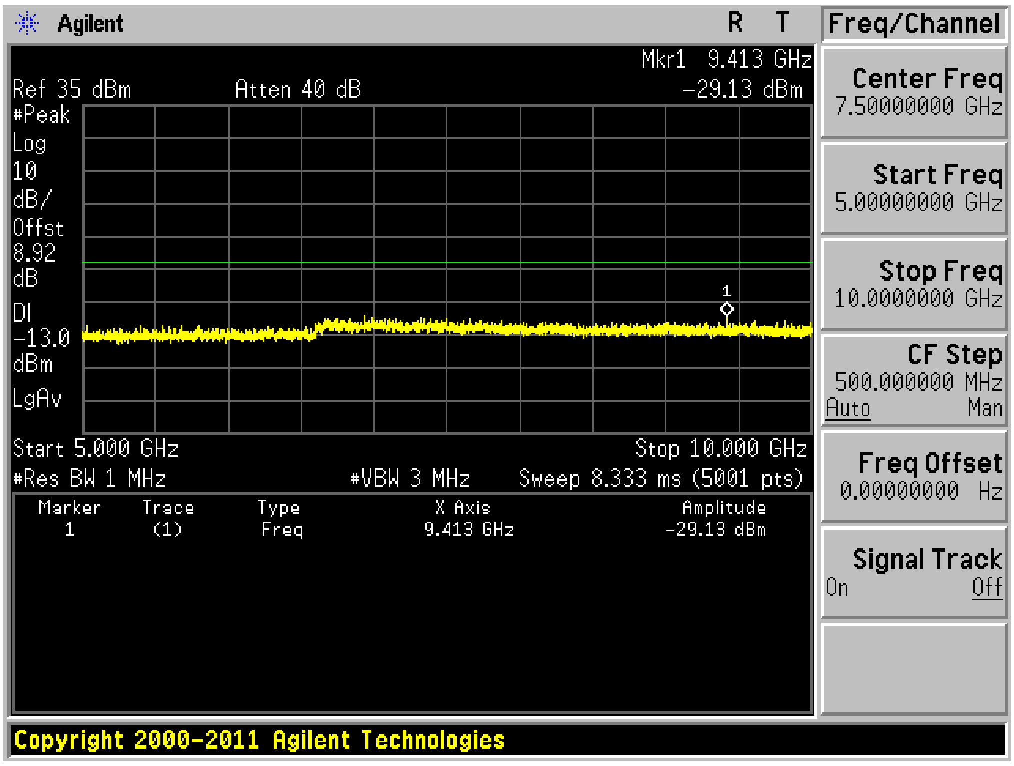
GSM850 & Channel: 128



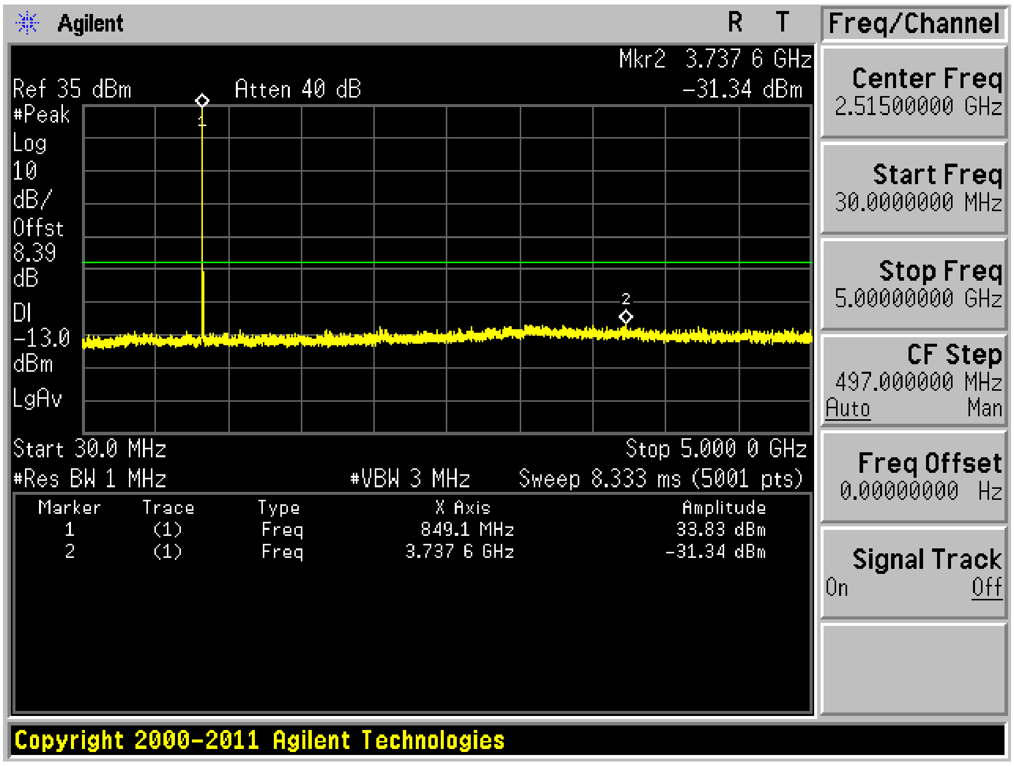
GSM850 & Channel: 190



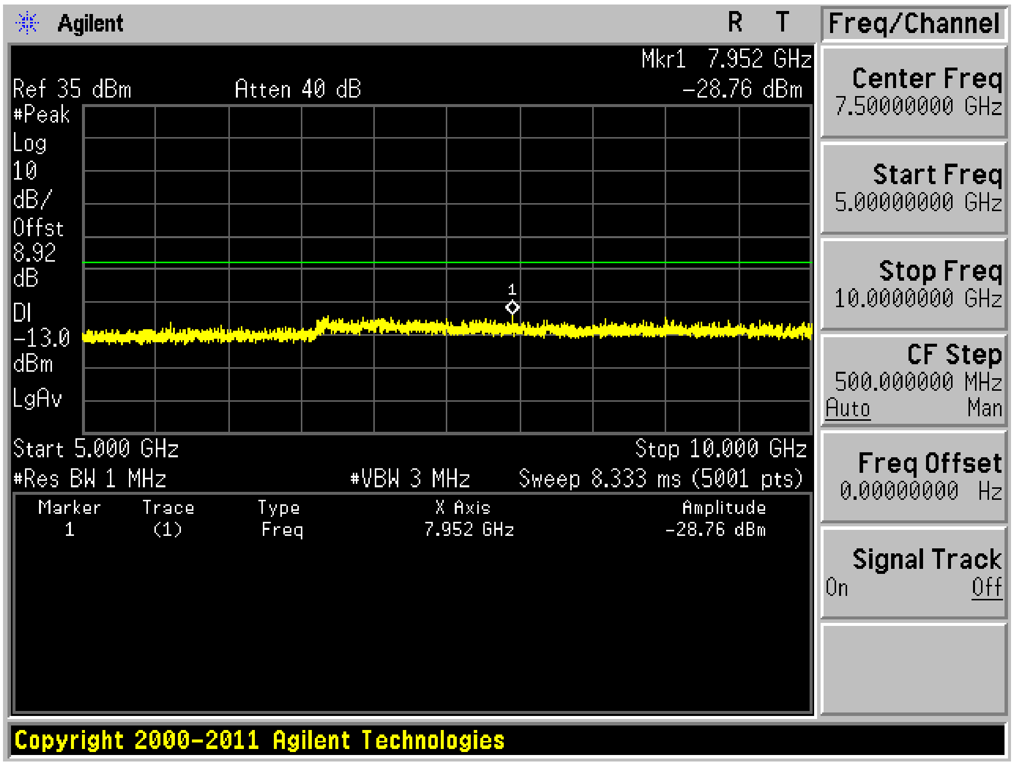
GSM850 & Channel: 190



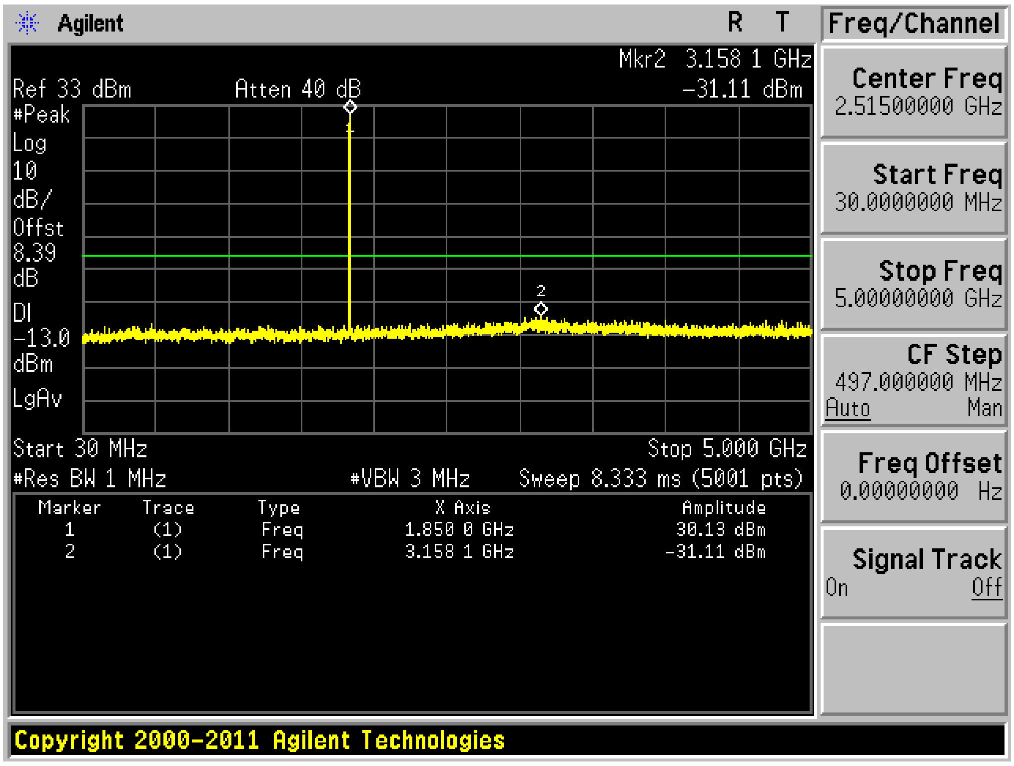
GSM850 & Channel: 251



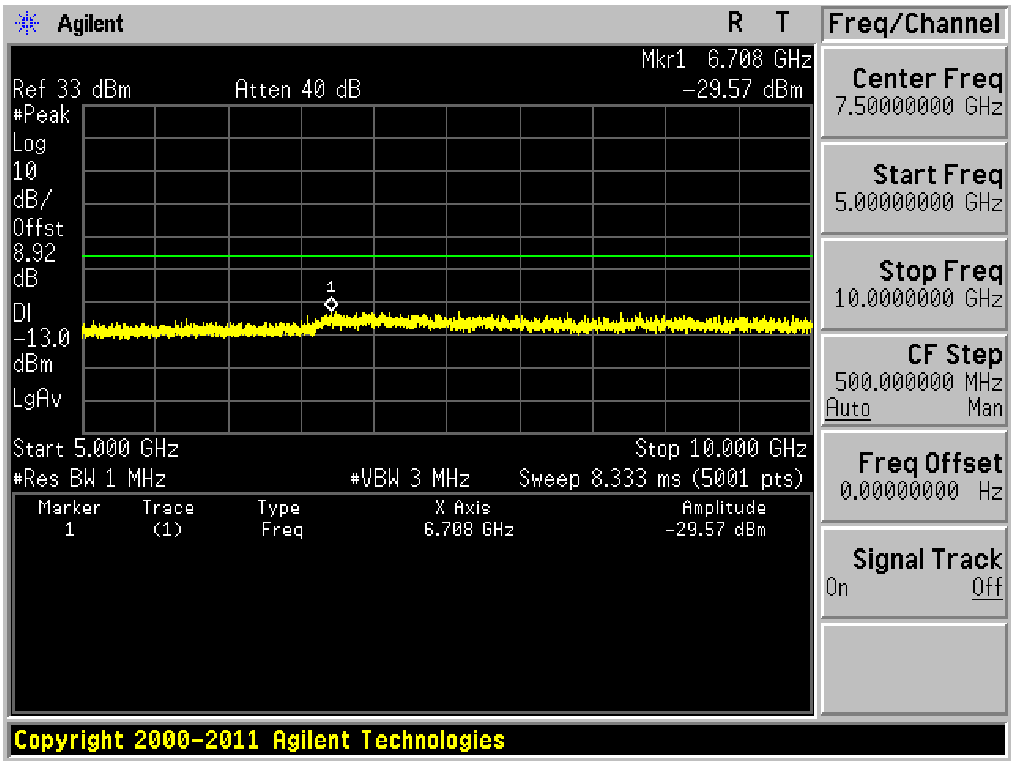
GSM850 & Channel: 251



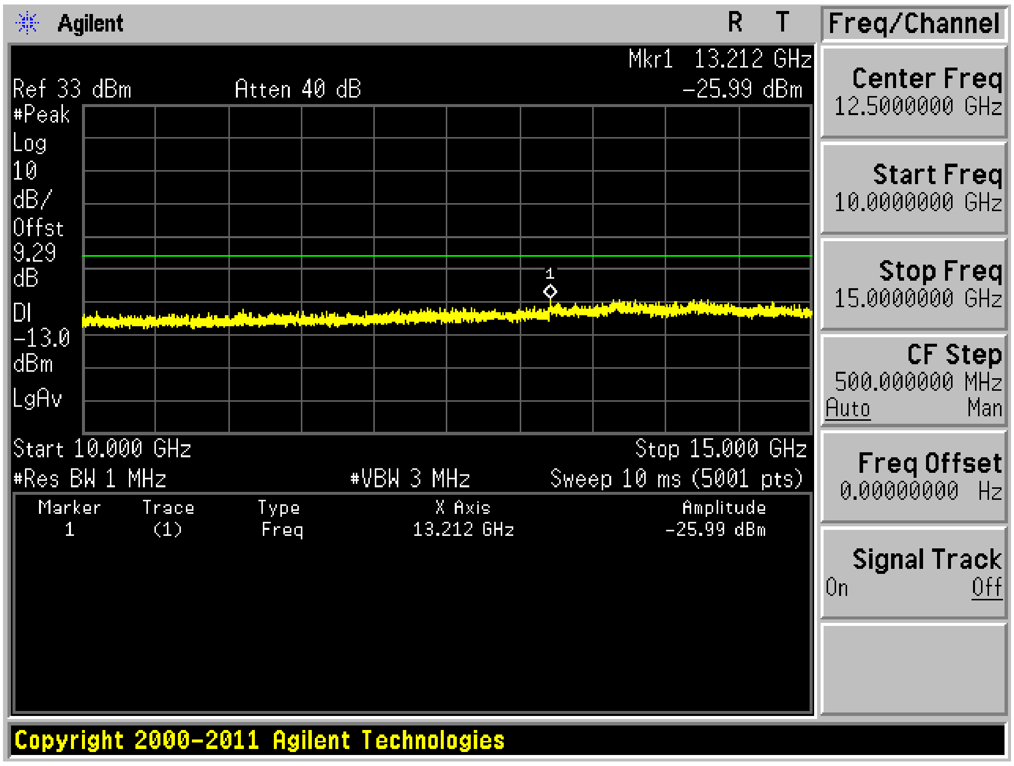
PCS1900 & Channel: 512



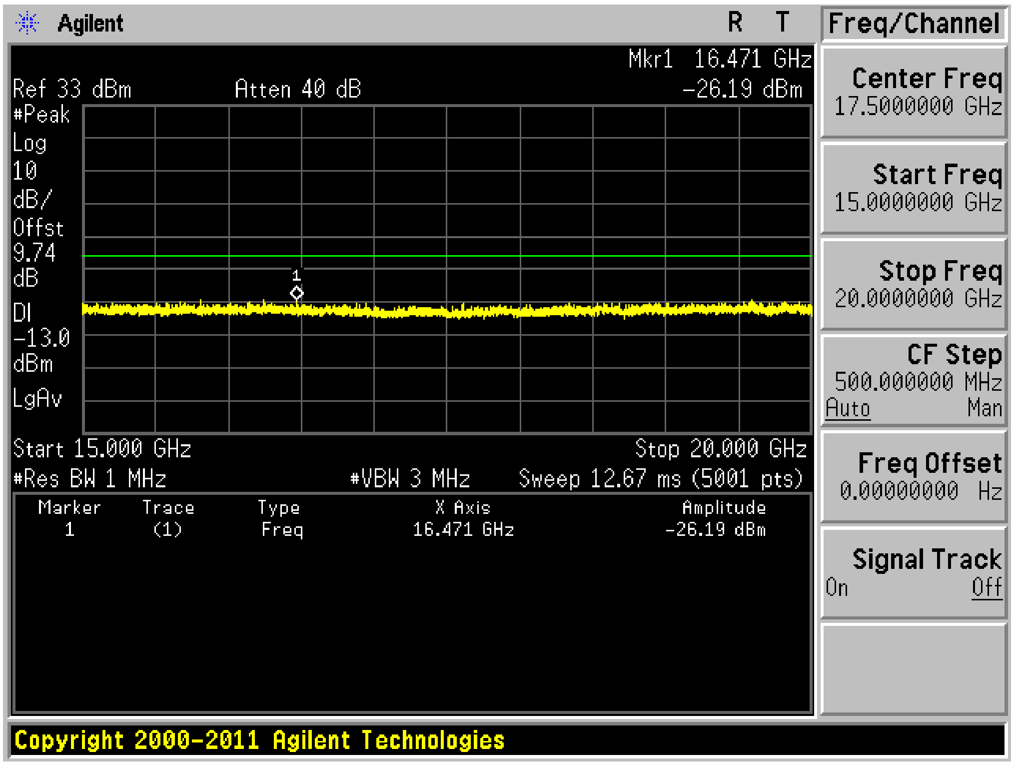
PCS1900 & Channel: 512



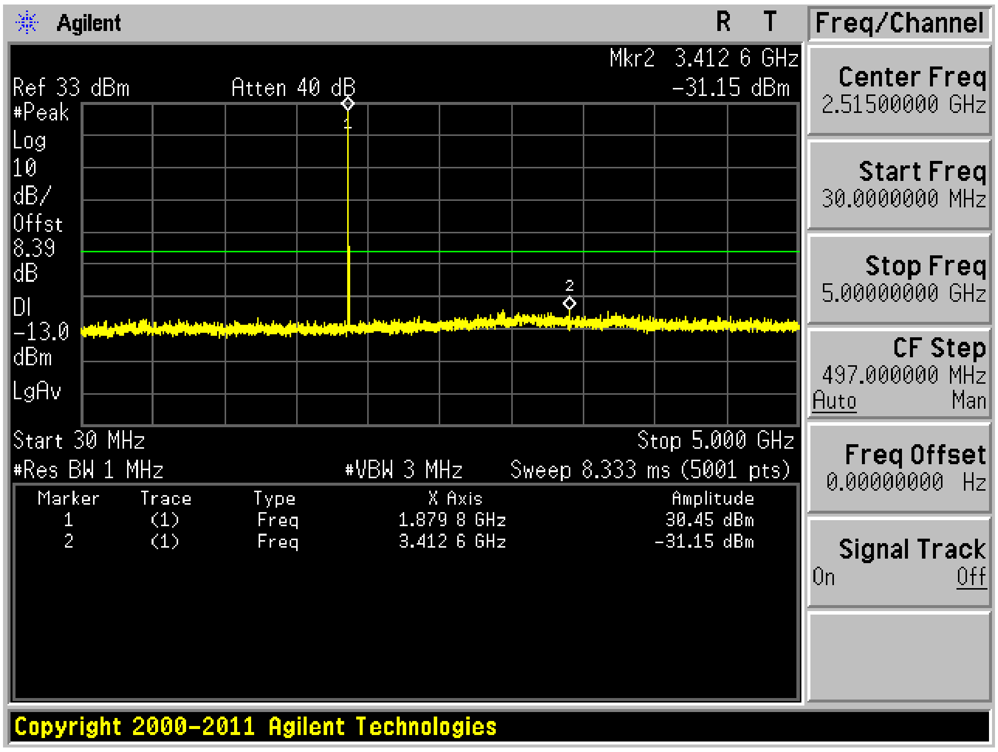
PCS1900 & Channel: 512



PCS1900 & Channel: 512



PCS1900 & Channel: 661



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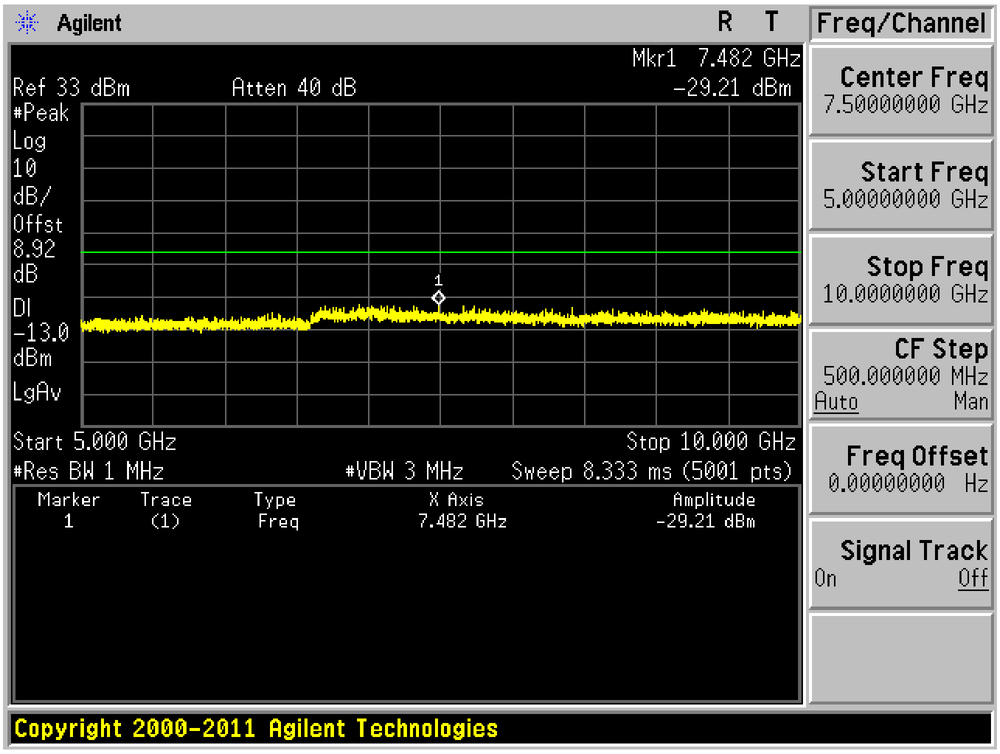

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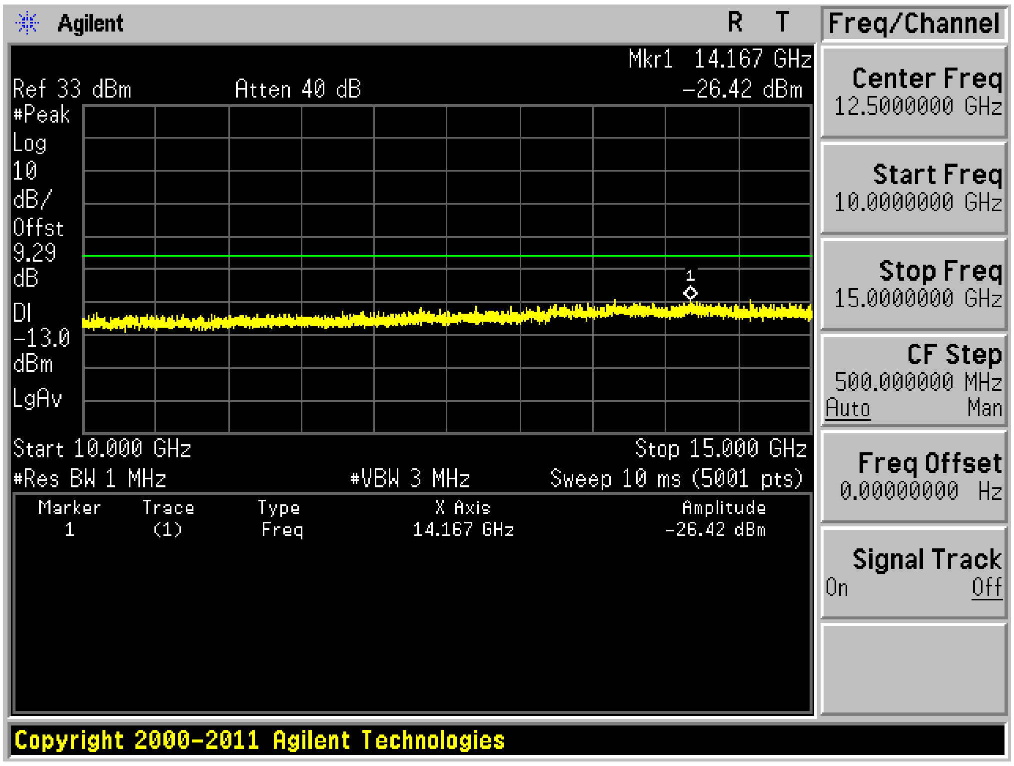

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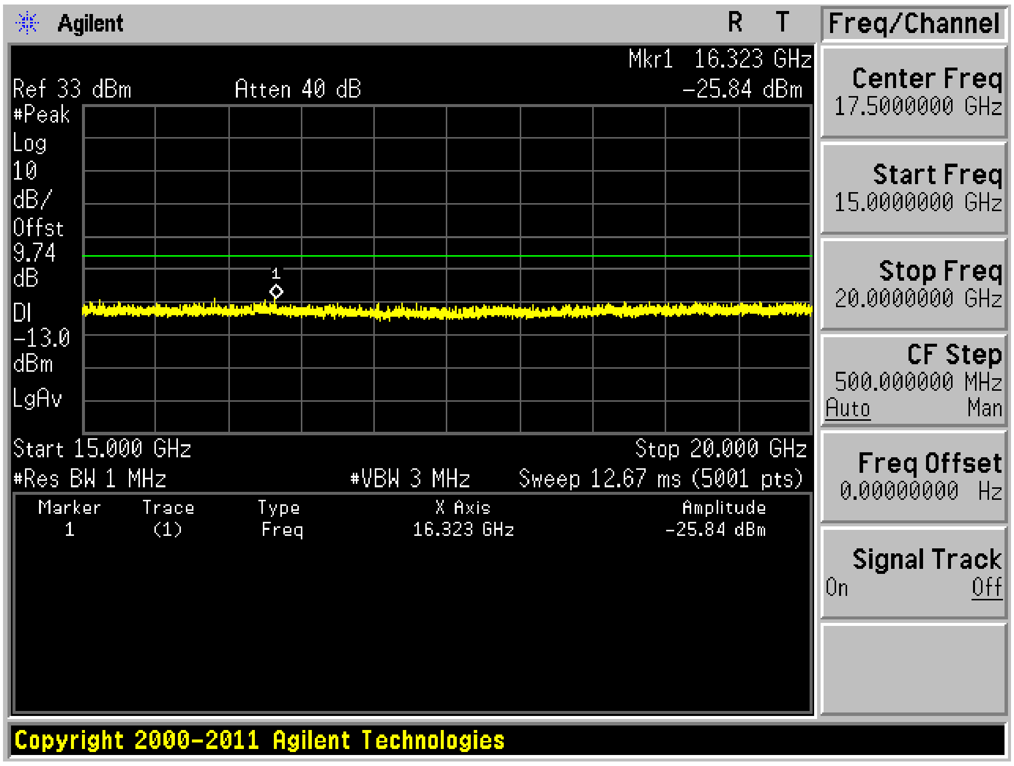
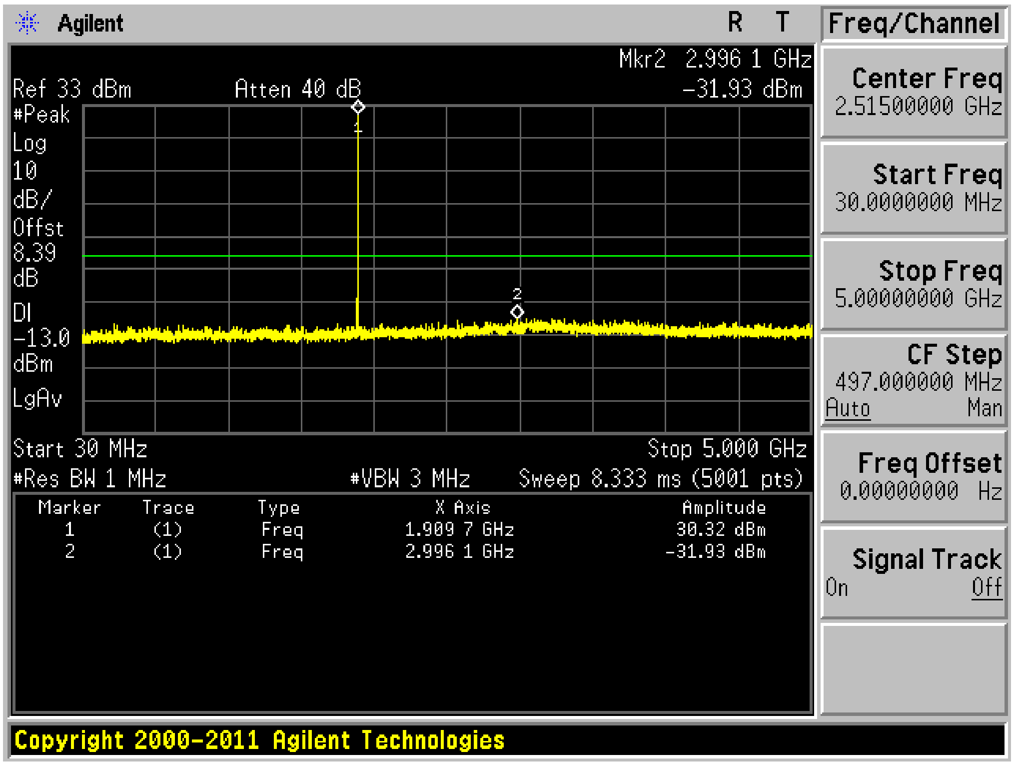
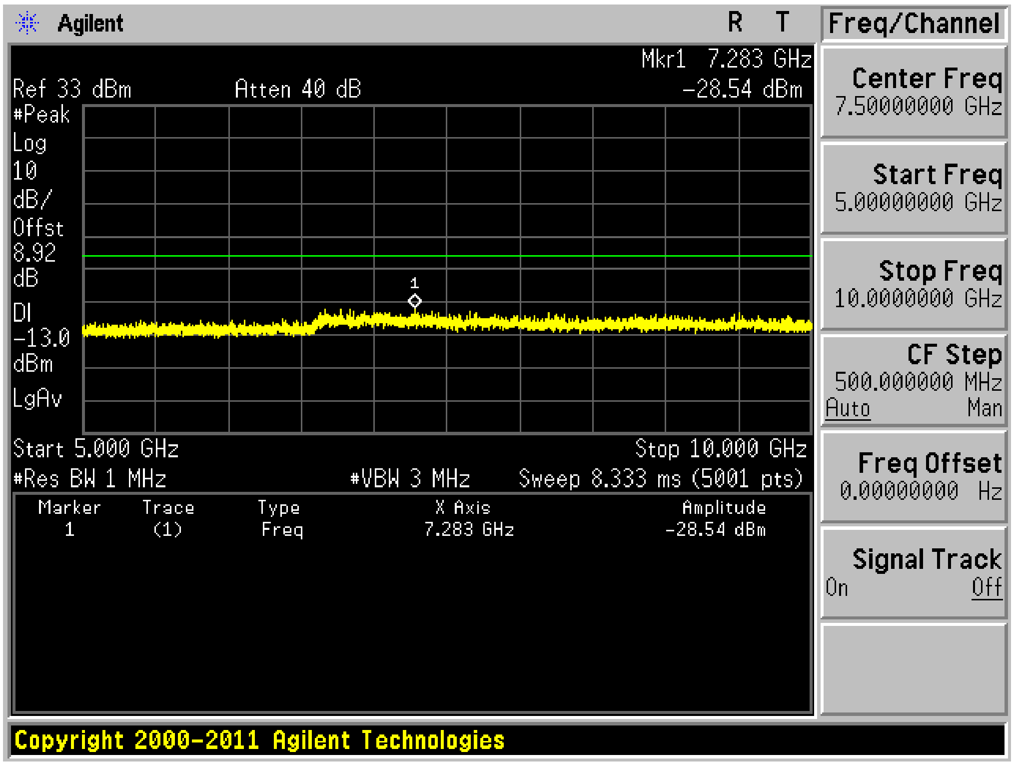


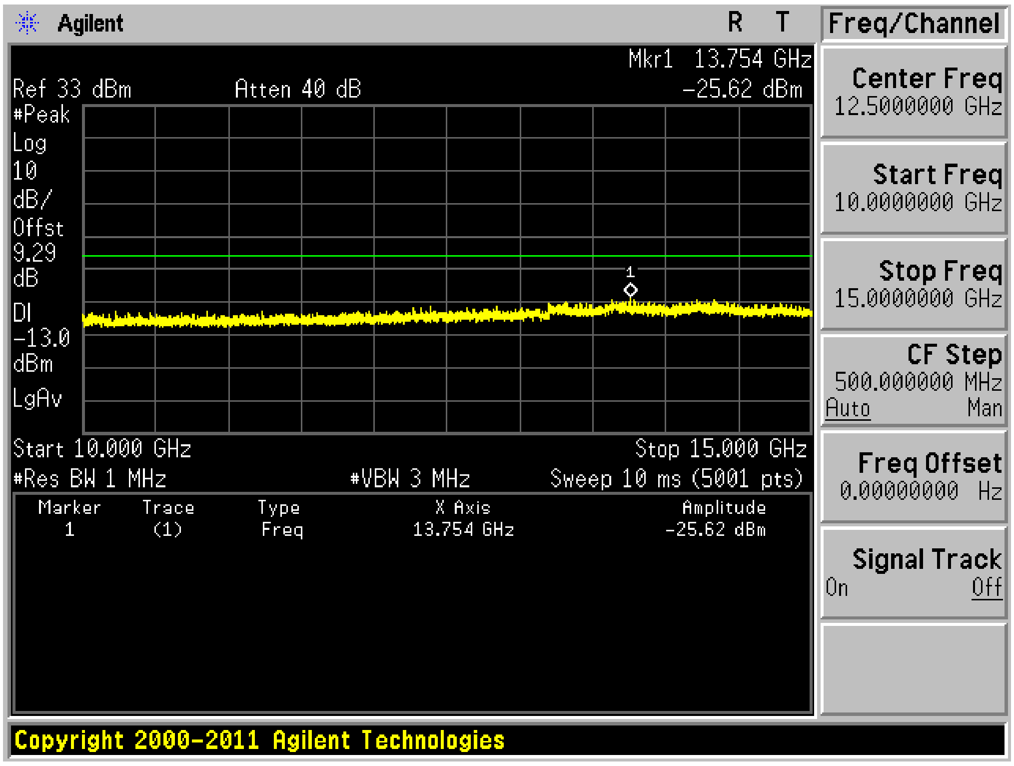
PCS1900 & Channel: 810



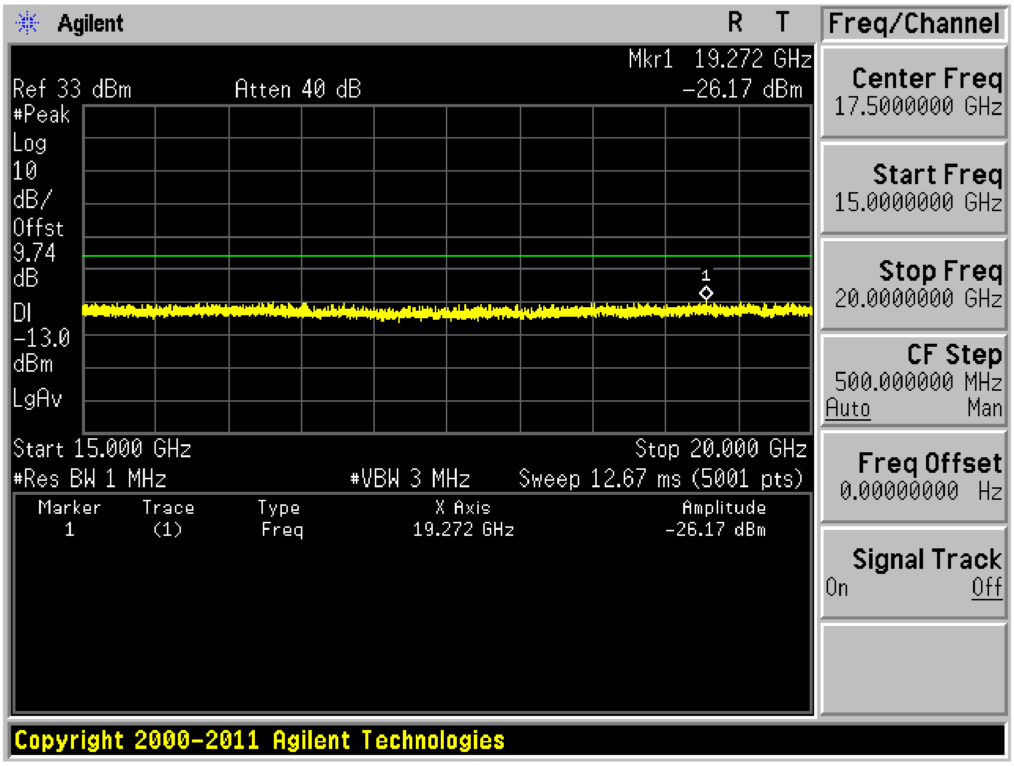
PCS1900 & Channel: 810



PCS1900 & Channel: 810

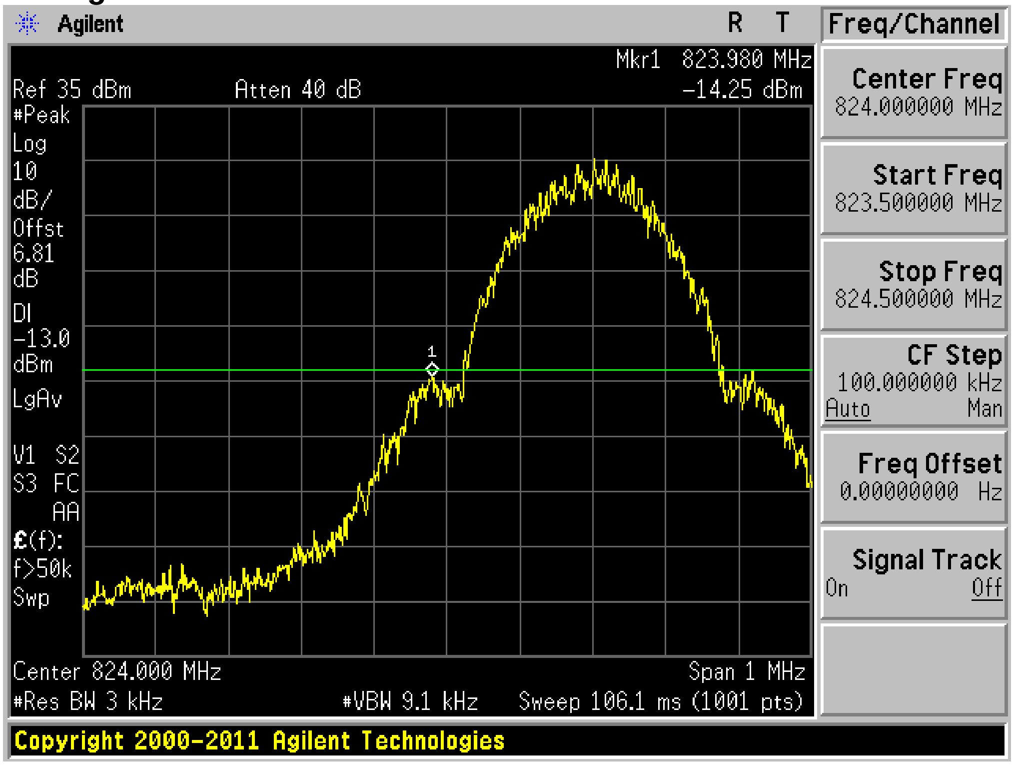


PCS1900 & Channel: 810

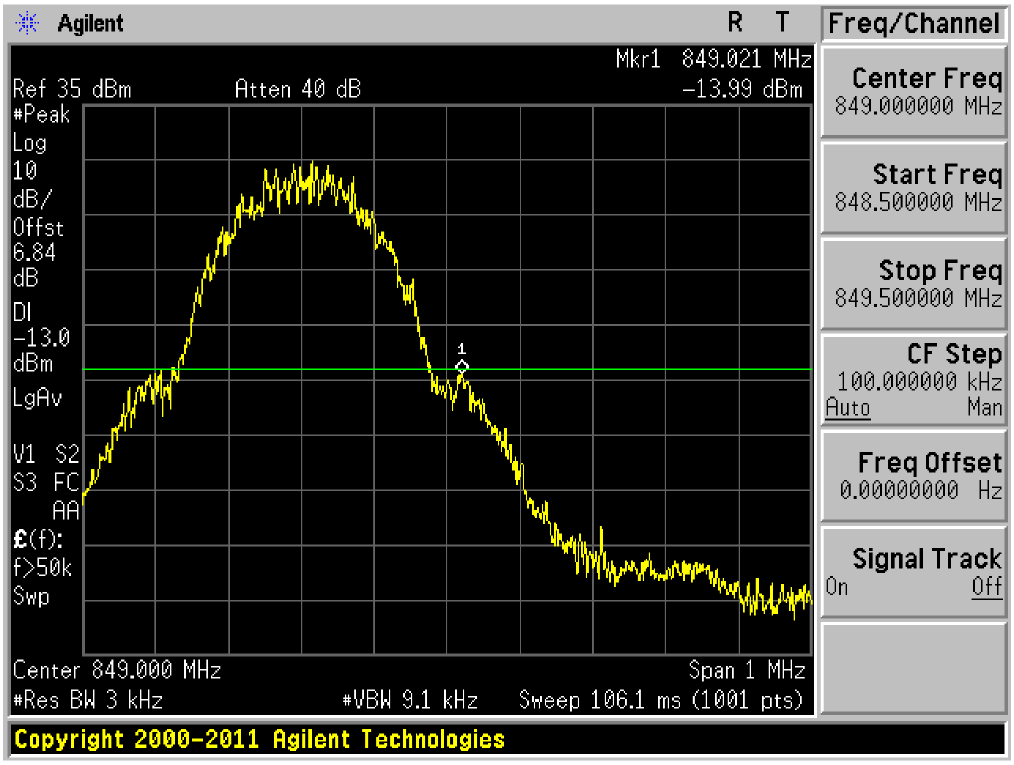


8.4 Band Edge

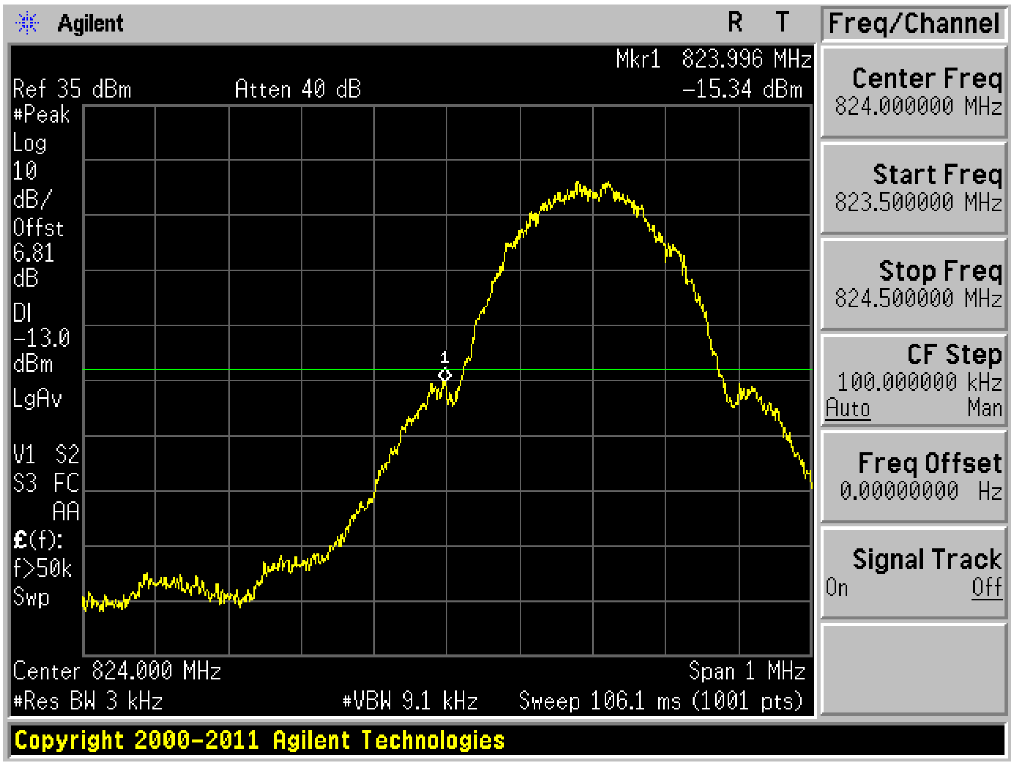
GSM850 & Channel: 128



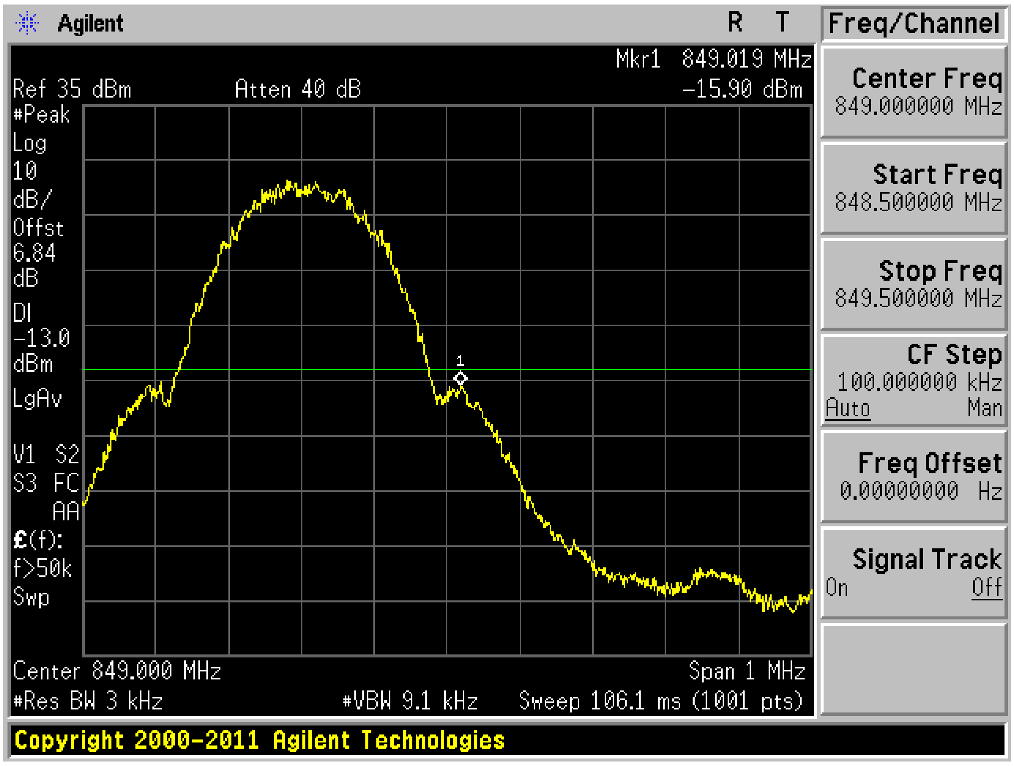
GSM850 & Channel: 251



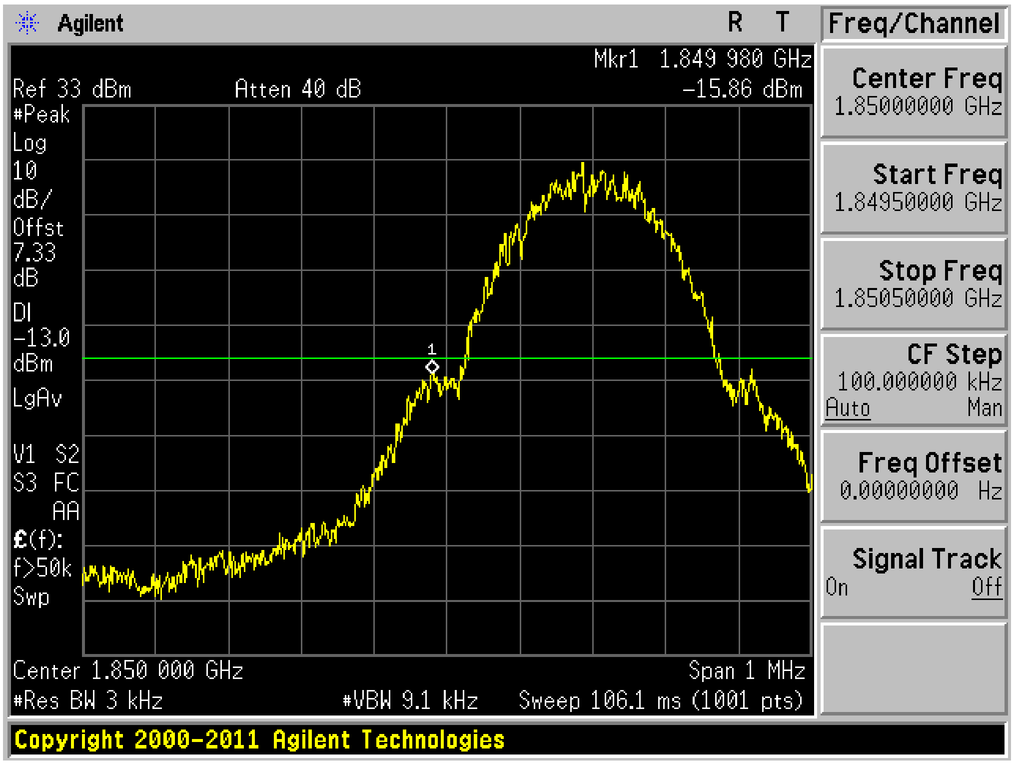
EDGE 850 & Channel: 128



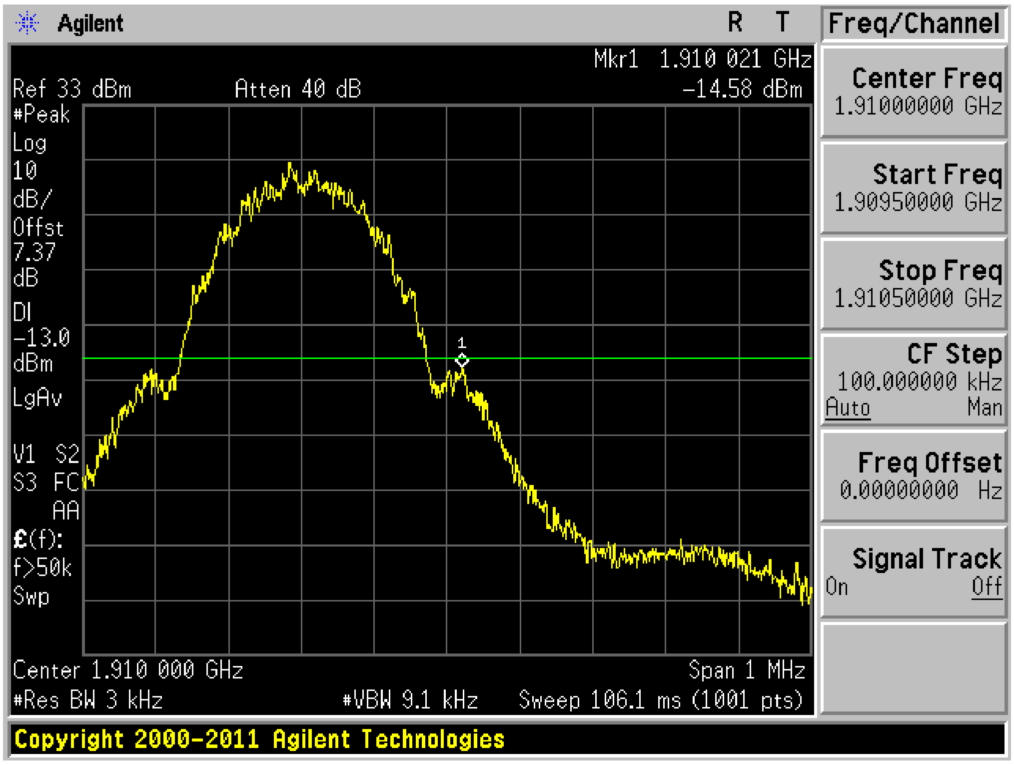
EDGE 850 & Channel: 251



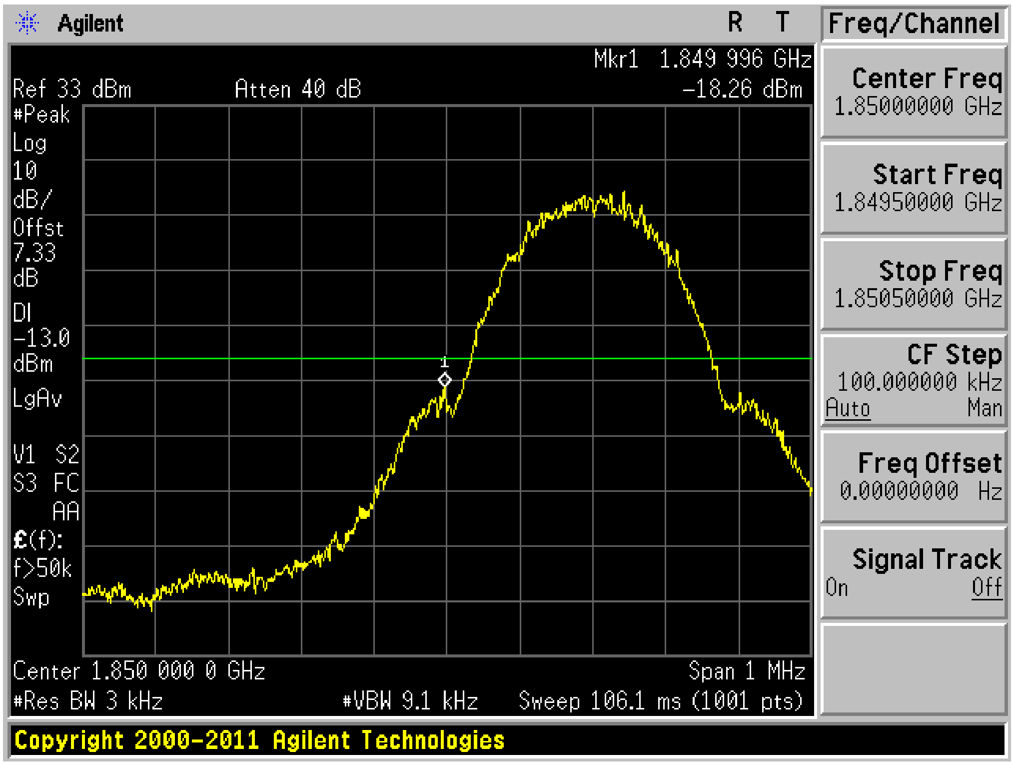
PCS1900 & Channel: 512



PCS1900 & Channel: 810



EDGE 1900 & Channel: 512



EDGE 1900 & Channel: 810