RF TEST REPORT

Test item	:	Cellular/PCS GSM/GPRS/EDGE(RX Only)/WCDMA/HSDPA Phone with Bluetooth, WLAN
Model No.	:	LG-E425g, LG-E425G, LGE425g, LGE425G, E425g, E425G LG-E431g, LG-E431G, LGE431g, LGE431G, E431g, E431G
Order No.	:	DEMC1301-00299
Date of receipt	:	2013-01-23
Test duration	:	2013-01-30 ~ 2013-02-06
Date of issue	:	2013-03-05
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, Gyeonggi-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	N/A	Technical Director
Hyun-Su, Son		Harvey, Sung

Test Report Version

Test Report No.	Date	Description
DRTFCC1303-0199	Mar. 05, 2013	Initial issue

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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	:	ZNFE425G
FCC Classification	:	Licensed Portable Transmitter Held to Ear (PCE)
EUT Type	:	Cellular/PCS GSM/GPRS/EDGE(RX Only)/WCDMA/HSDPA Phone with Bluetooth, WLAN
Model Name	:	LG-E425g
Add Model Name	:	LG-E425G, LGE425g, LGE425G, E425g, E425G LG-E431g, LG-E431G, LGE431g, LGE431G, E431g, E431G
Supplying power	:	Standard Battery - Type: Li-Ion Polymer Battery - M/N: BL-44JN - Rating: DC 3.7V &1540mAh / 5.7Wh
Antenna Information	:	Internal Antenna - Type: Built-In type
Tx Frequency	:	GSM850: 824.2 ~ 848.8 MHz GSM1900: 1850.2 ~ 1909.8 MHz WCDMA850: 826.4 ~ 846.6 MHz WCDMA1900: 1852.4 ~ 1907.6 MHz
Rx Frequency	:	GSM850: 869.2 ~ 893.8 MHz GSM1900: 1930.2 ~ 1989.8 MHz WCDMA850: 871.4 ~ 891.6 MHz WCDMA1900: 1932.4 ~ 1987.6 MHz
Max. RF Output Power	:	GSM850: 0.796W ERP(29.01dBm) GSM1900: 1.054W EIRP(30.23 dBm) WCDMA850: 0.095W ERP(19.78dBm) WCDMA1900: 0.226W EIRP(23.54dBm)
Emission Designator(s)	:	GSM850: 248KGXW GSM1900: 246KGXW WCDMA850: 4M19F9W WCDMA1900: 4M19F9W

2. INTRODUCTION

2.1. EUT DESCRIPTION

The Equipment Under Test(EUT) supports a GSM/GPRS of dual band(Cellular/PCS) and a WCDMA of dual band(Cellular/PCS) with Bluetooth, 2.4GHz WLAN.

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

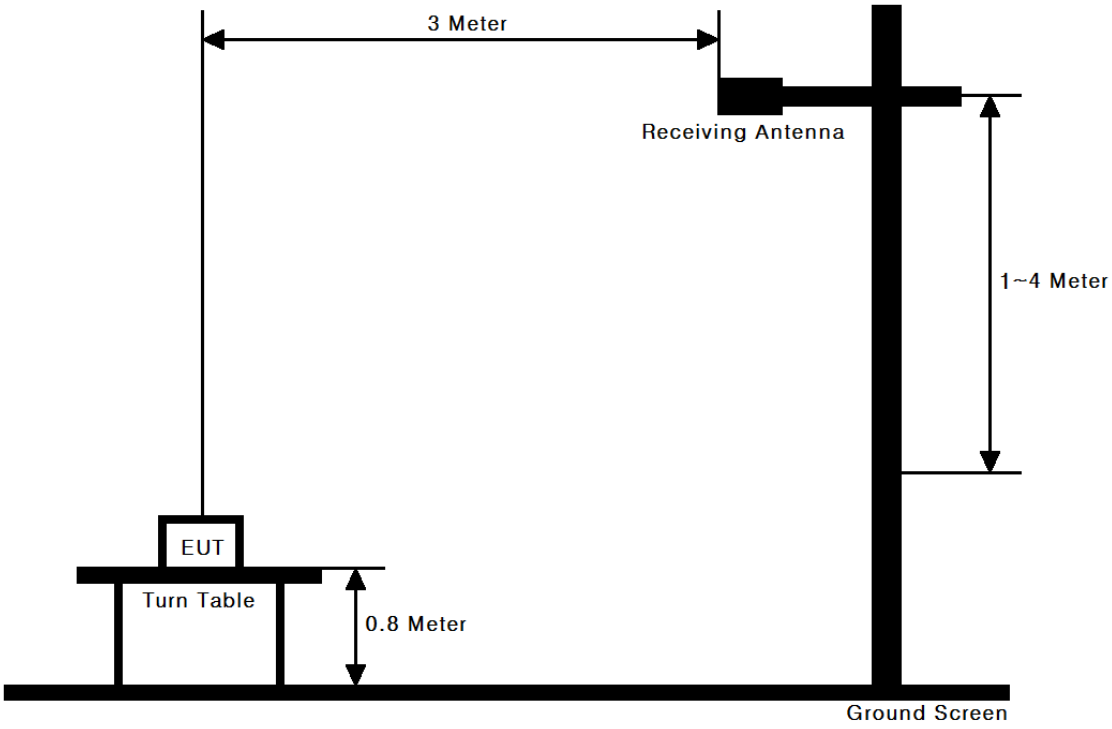
The 3&10M test site and conducted measurement facility used to collect the radiated data are located at the 683-3, Yubang-Dong, Yongin-Si, Gyunggi-Do, 449-080, South Korea. The site is constructed in conformance with the requirements.

- 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.

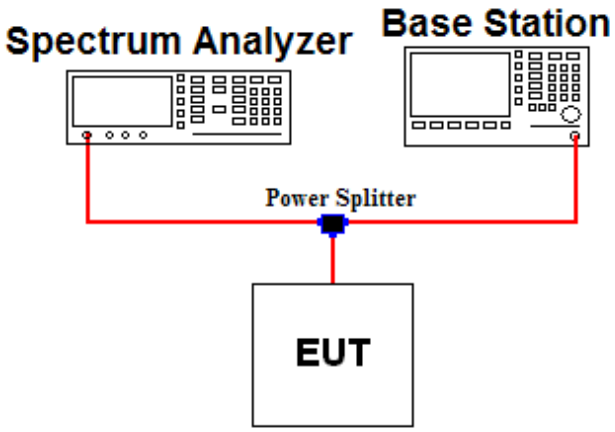
3.2 PEAK TO AVERAGE RATIO

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
826.4	6.81	1852.4	7.33
836.6	6.82	1880.0	7.35
846.6	6.83	1907.6	7.36
848.8	6.83	1909.8	7.36

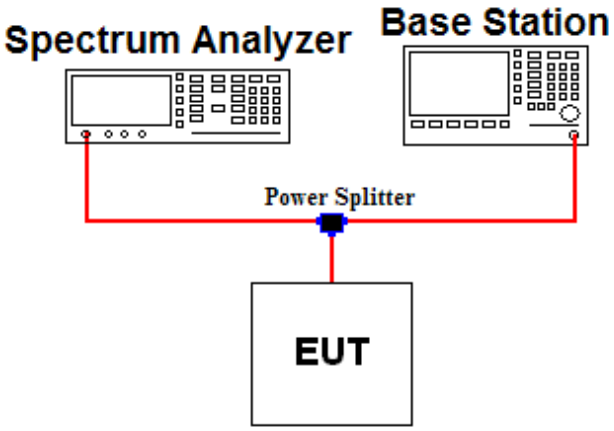
Note. 1: The offset values from EUT to Spectrum analyzer were measured and used for test.
Offset value = Cable A + Splitter + Cable B

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 least26 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)
823.0	6.81	1849.0	7.32	5000.0	8.39
824.0	6.81	1850.0	7.33	10000.0	8.92
849.0	6.84	1910.0	7.37	15000.0	9.29
850.0	6.84	1915.0	7.39	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.

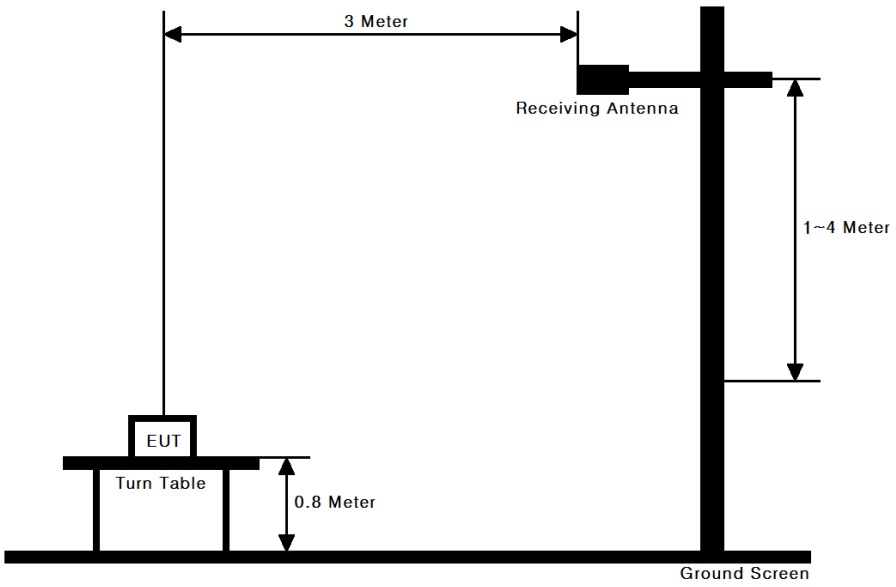
A display line was placed at -13dBm to show compliance. The high, lowest and a middle channel were tested for out of band measurements.

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 thetransmitter may be employed to measure the out of band Emissions.

3.5 RADIATED SPURIOUS EMISSIONS

Test Set-up



Test Procedure

This measurement was performedat 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.

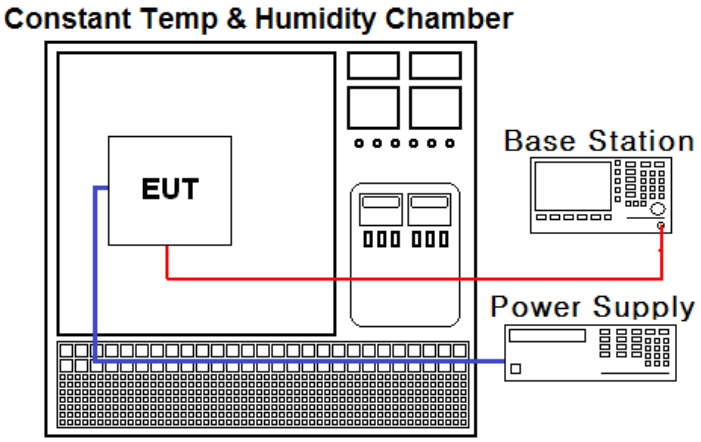
For radiated power measurements below 1GHz, a half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same spectrum analyzer reading.

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
Horn Antenna(18G)	ETS	3115	11/09/06	13/09/06	00021097
Multimeter	HP	34401A	12/03/05	13/03/05	3146A13475
			13/02/27	14/02/27	
DC Power Supply	HP	6622A	12/03/05	13/03/05	3448A03760
			13/02/27	14/02/27	
Horn Antenna(18G)	ETS	3115	12/02/20	14/02/20	6419
Power Splitter	Anritsu	K241B	12/09/17	13/09/17	020611
Constant Temp & Humidity Chamber	JISICO	KR-100/J-RHC2	12/09/17	13/09/17	30604493/021031
Dipole ANT(30~300MHz)	SCHWARZBECK	VHA 9103	12/03/12	14/03/12	2116
Dipole ANT(30~300MHz)	SCHWARZBECK	VHA 9103	12/03/22	14/03/22	2117
Dipole ANT(300MHz~1.0GHz)	SCHWARZBECK	UHA 9105	12/03/12	14/03/12	2261
Dipole ANT(300MHz~1.0GHz)	SCHWARZBECK	UHA 9105	12/03/22	14/03/22	2262
Attenuator(10dB)	WEINSCHEL	23-10-34	12/09/17	13/09/17	BP4386
Horn Antenna(18~40GHz)	A.H.Systems Inc.	SAS-574	11/03/25	13/03/25	154
Horn Antenna(18~40GHz)	A.H.Systems Inc.	SAS-574	11/03/25	13/03/25	155
Spectrum Analyzer (3Hz~26.5G)	Agilent Technologies	E4440A	12/09/18	13/09/18	MY45304199
Preamplifier	Agilent	8449B	12/03/05	13/03/05	3008A01590
			13/02/27	14/02/27	
Signal Generator	Rohde Schwarz	SMR20	12/03/05	13/03/05	101251
			13/02/27	14/02/27	
High-pass filter	Wainwright Instruments	WHKX2.1	12/09/17	13/09/17	1
8960 Series 10 Wireless Comms Test Set	Agilent Technologies, Inc	E5515C	12/03/05	13/03/05	GB43461134
			13/02/28	14/02/28	
Vector Signal Generator	Rohde Schwarz	SMJ100A	13/01/08	14/01/08	100148
3dB Attenuator(0-26.5GHz)	Aeroflex/Weinschel	56-3	12/09/17	13/09/17	Y2342
High-pass filter	Wainwright Instruments	WHKX1.0	12/09/17	13/09/17	9
Thermohygrometer	BODYCOM	BJ5478	12/06/20	13/06/20	120612-2
Amplifier	EMPOWER	BBS3Q7ELU	12/09/18	13/09/18	1020
AMPLIFIER	H.P	8447D	12/07/01	13/07/01	2648A04922
BICONICAL ANT.	SCHWARZBECK	VHA 9103	12/10/04	14/10/04	VHA91032789
LOG-PERIODIC ANT.	SCHWARZBECK	UHALP9108A	12/10/04	14/10/04	9108-A0590

5. SUMMARY OF TEST RESULTS

FCC Part Section(s)	RSS Section(s)	Parameter	Status Note 1
2.1046	RSS-132 (4.4) RSS-133 (4.1)	Conducted Output Power	C
22.913(a) 24.232(c)	RSS-132 (4.4) [SRSP-503(5.1.3)] RSS-133 (6.4) [SRSP-510(5.1.2)]	Effective Radiated Power Equivalent Isotropic Radiated Power	C
22.917(a) 24.238(a) 2.1049	RSS-Gen (4.6.1) RSS-133 (2.3)	Occupied Bandwidth	C
22.917(a) 24.238(a) 2.1051	RSS-132 (4.5.1) RSS-133 (6.5.1)	Band Edge Spurious and Harmonic Emissions at Antenna Terminal	C
24.232(d)	RSS-133 (6.4)	Peak to Average Ratio	C
22.917(a) 24.238(a) 2.1053	RSS-132 (4.5.1) RSS-133 (6.5.1)	Radiated Spurious and Harmonic Emissions	C
22.355 24.235 2.1055	RSS-132 (4.3) RSS-133 (6.3)	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 = **248KGXW**
GSM OBW = 247.9469kHz
(Measured at the 99.75% power bandwidth)
G = Phase Modulation
X = Cases not otherwise covered
W = Combination (Audio/Data)

GSM1900 Emission Designator

Emission Designator = **246KGXW**
GSM OBW = 246.4504 kHz
(Measured at the 99.75% power bandwidth)
G = Phase Modulation
X = Cases not otherwise covered
W = Combination (Audio/Data)

WCDMA850 Emission Designator

Emission Designator = **4M19F9W**
WCDMAOBW = 4.1944MHz
(Measured at the 99.75% power bandwidth)
F = Frequency Modulation
9 = Composite Digital Information
W = Combination (Audio/Data)

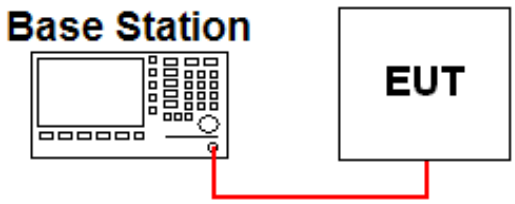
WCDMA1900 Emission Designator

Emission Designator = **4M19F9W**
WCDMA OBW = 4.1893MHz
(Measured at the 99.75% power bandwidth)
F = Frequency Modulation
9 = Composite 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	33.20	33.10	30.70	29.10	27.70	N/A	N/A	N/A	N/A
	190	33.20	33.20	30.70	29.20	27.70	N/A	N/A	N/A	N/A
	251	33.20	33.20	30.70	29.20	27.70	N/A	N/A	N/A	N/A
PCS	512	30.20	30.20	27.70	26.20	24.70	N/A	N/A	N/A	N/A
	661	30.20	30.20	27.70	26.20	24.70	N/A	N/A	N/A	N/A
	810	30.20	30.10	27.70	26.10	24.70	N/A	N/A	N/A	N/A

The output power was measured using the Agilent E5515C

▪ WCDMA

3GPP Release Version	Mode		Power (dBm)			MPR	B_c	β_d	B_c/β_d	Sub-Test
	Channel		4132	4183	4233					
99	WCDMA	RMC	23.18	23.19	23.17	-	-	-	-	-
		ARM	23.17	23.17	23.16					
5	HSDPA (Cellular)		23.14	23.15	23.14	0	2/15	15/15	2/15	1
5			23.11	23.14	23.12	0	12/15	15/15	12/15	2
5			22.64	22.65	22.63	0.5	15/15	8/15	15/8	3
5			22.60	22.63	22.61	0.5	15/15	4/15	15/4	4
-	Channel		9262	9400	9538	-	-	-	-	-
99	WCDMA	RMC	23.19	23.20	23.18	-	-	-	-	-
		ARM	23.17	23.18	23.17					
5	HSDPA (PCS)		23.17	23.16	23.15	0	2/15	15/15	2/15	1
5			23.14	23.14	23.11	0	12/15	15/15	12/15	2
5			22.66	22.64	22.64	0.5	15/15	8/15	15/8	3
5			22.62	22.59	22.61	0.5	15/15	4/15	15/4	4

The output power was measured using the Agilent E5515C

7.2 PEAKTOAVERAGE 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***	***247.9469***
	190	244.1721
	251	243.7570
GSM1900	512	245.8458
	661	***246.4504***
	810	245.3289
WCDMA850	***4132***	***4194.4***
	4183	4156.9
	4233	4186.5
WCDMA1900	***9262***	***4189.3***
	9400	4167.2
	9538	4166.0

- 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 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	-5.73	H	26.98	1.20	28.18	0.658	DC 3.7V	GSM
190	***X***	***-6.14***	***H***	***27.86***	***1.15***	***29.01***	***0.796***	***DC 3.7V***	***GSM***
251	X	-6.04	H	27.56	1.05	28.61	0.726	DC 3.7V	GSM

- WCDMA850 data

CH.	EUT Position (Axis)	TEST CONDITIONS							
		Reading Value (dBm)	Pol. (H/V)	LEVEL@ TX ANTENNA TERMINAL (dBm)	Antenna Gain (dBd)	ERP (dBm)	ERP (W)	Power Supply	Note.
4132	X	-14.78	H	18.16	1.19	19.35	0.086	DC 3.7V	WCDMA
4183	X	-15.84	H	18.42	1.15	19.57	0.091	DC 3.7V	WCDMA
4233	***X***	***-15.76***	***H***	***18.68***	***1.10***	***19.78***	***0.095***	***DC 3.7V***	***WCDMA***

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 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	Y	-10.23	V	21.57	8.59	30.16	1.038	DC 3.7V	GSM
661	***X***	***-7.54***	***H***	***21.55***	***8.68***	***30.23***	***1.054***	***DC 3.7V***	***GSM***
810	X	-8.41	H	19.94	8.77	28.71	0.743	DC 3.7V	GSM

- WCDMA1900 data

CH.	EUT Position (Axis)	TEST CONDITIONS							
		Reading Value (dBm)	Pol. (H/V)	LEVEL@ TX ANTENNA TERMINAL (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (W)	Power Supply	Note.
512	Y	-15.02	V	14.69	8.59	23.28	0.213	DC 3.7V	WCDMA
661	***Y***	***-15.24***	***V***	***14.86***	***8.68***	***23.54***	***0.226***	***DC 3.7V***	***WCDMA***
810	Y	-16.32	V	13.33	8.77	22.10	0.162	DC 3.7V	WCDMA

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 (0.658W)	1648.14	Y	V	-45.95	5.48	-40.47	68.65	41.18
	2472.74	Z	V	-51.97	6.89	-45.08	73.26	
	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	
190 (0.796W)	1673.04	Y	V	-46.72	5.53	-41.19	70.20	42.01
	2510.20	Z	V	-51.18	6.94	-44.24	73.25	
	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	
251 (0.726W)	1697.99	Y	V	-47.49	5.59	-41.90	70.51	41.61
	2546.01	Z	V	-50.12	7.00	-43.12	71.73	
	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	

- Limit Calculation= 43 + 10 $\log_{10}$(ERP [W]) [dBc]

- No other spurious and harmonic emissions were reportedgreater 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 (WCDMA850)

Channel (EIRP)	Freq. (MHz)	EUT Position (Axis)	POL (H/V)	LEVEL@ ANTENNA TERMINAL (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	CORRECT GENERATOR LEVEL (dBm)	Result (dBc)	Limit (dBc)
4132 (0.086W)	1651.13	Z	V	-52.54	5.49	-47.05	66.40	32.35
	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	
4183 (0.091W)	1675.62	Z	V	-53.43	5.54	-47.89	67.46	32.57
	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	
4233 (0.095W)	1692.62	Z	V	-52.76	5.57	-47.19	66.97	32.78
	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	

- Limit Calculation = 43 + 10 $\log_{10}$(ERP [W]) [dBc]

- No other spurious and harmonic emissions were reportedgreater 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.

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.

7.8.3 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 (1.038W)	3700.63	Y	V	-48.04	9.67	-38.37	68.53	43.16
	7400.96	Y	H	-39.89	11.53	-28.36	58.52	
	-	-	-	-	-	-	-	
661 (1.054W)	3759.36	Y	V	-48.07	9.68	-38.39	68.62	43.23
	7520.28	Y	H	-35.17	11.51	-23.66	53.89	
	-	-	-	-	-	-	-	
810 (0.743W)	3819.40	Y	V	-46.46	9.68	-36.78	65.49	41.71
	7639.23	Y	H	-37.18	11.48	-25.70	54.41	
	-	-	-	-	-	-	-	

- Limit Calculation = 43 + 10 $\log_{10}$(EIRP [W]) [dBc]
- No other spurious and harmonic emissions were reportedgreater 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.

7.8.4 RADIATED SPURIOUS EMISSIONS (WCDMA1900)

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 (0.213W)	3707.18	Y	V	-43.74	9.90	-33.84	57.12	36.28
	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	
661 (0.226W)	3761.84	Y	V	-45.49	9.90	-35.59	59.13	36.54
	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	
810 (0.162W)	3814.80	Y	V	-45.02	9.91	-35.11	57.21	35.10
	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	

- Limit Calculation = 43 + 10 $\log_{10}$(EIRP [W]) [dBc]
- No other spurious and harmonic emissions were reportedgreater 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.

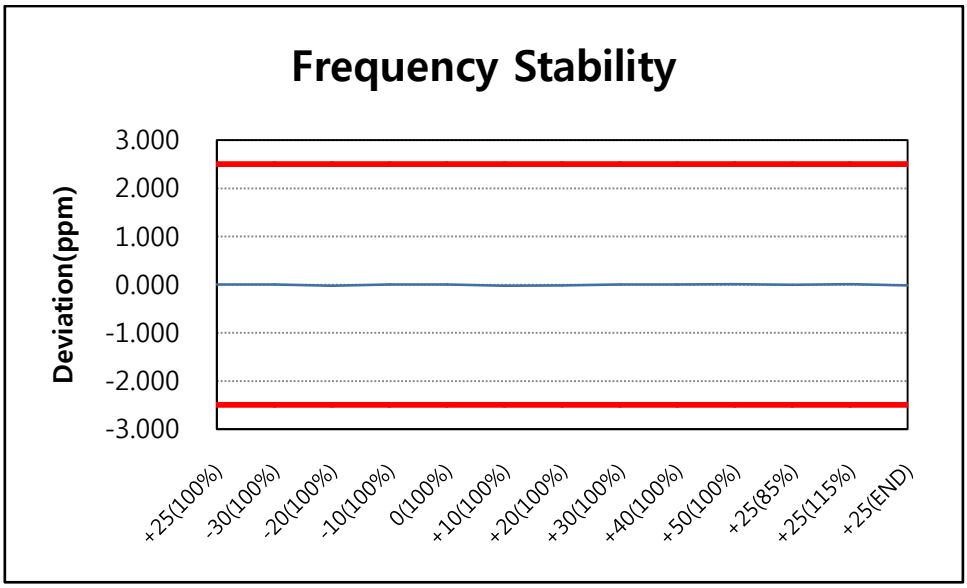
The worst case data is reported.

7.9 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

7.9.1 FREQUENCY STABILITY (GSM850)

OPERATING FREQUENCY : 836,600,022 Hz
CHANNEL : 190(Mid)
REFERENCE VOLTAGE : 3.700 V DC
DEVIATION LIMIT : ± 0.00025 % or 2.5 ppm

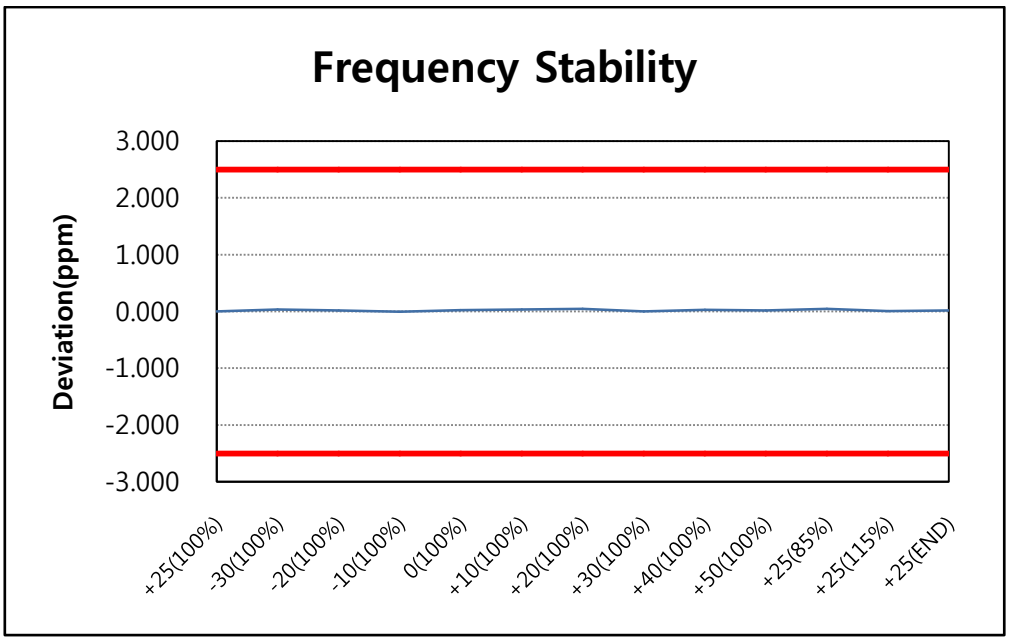
VOLTAGE (%)	POWER (V DC)	TEMP (℃)	FREQ (Hz)	Deviation	
				(ppm)	(%)
100%	3.700	+25(Ref)	836,600,022	0.000	0.00000000
100%		-30	836,600,026	0.005	0.00000048
100%		-20	836,600,004	-0.022	-0.00000215
100%		-10	836,600,027	0.006	0.00000060
100%		0	836,600,022	0.000	0.00000000
100%		+10	836,600,004	-0.022	-0.00000215
100%		+20	836,600,010	-0.014	-0.00000143
100%		+30	836,600,023	0.001	0.00000012
100%		+40	836,600,023	0.001	0.00000012
100%		+50	836,600,032	0.012	0.00000120
85%	3.145	+25	836,600,020	-0.002	-0.00000024
115%	4.255	+25	836,600,031	0.011	0.00000108
BATT.ENDPOINT	3.000	+25	836,600,005	-0.020	-0.00000203



7.9.2 FREQUENCY STABILITY (WCDMA850)

OPERATING FREQUENCY : 836,599,978 Hz
CHANNEL : 4183(Mid)
REFERENCE VOLTAGE : 3.700 V DC
DEVIATION LIMIT : ± 0.00025 % or 2.5 ppm

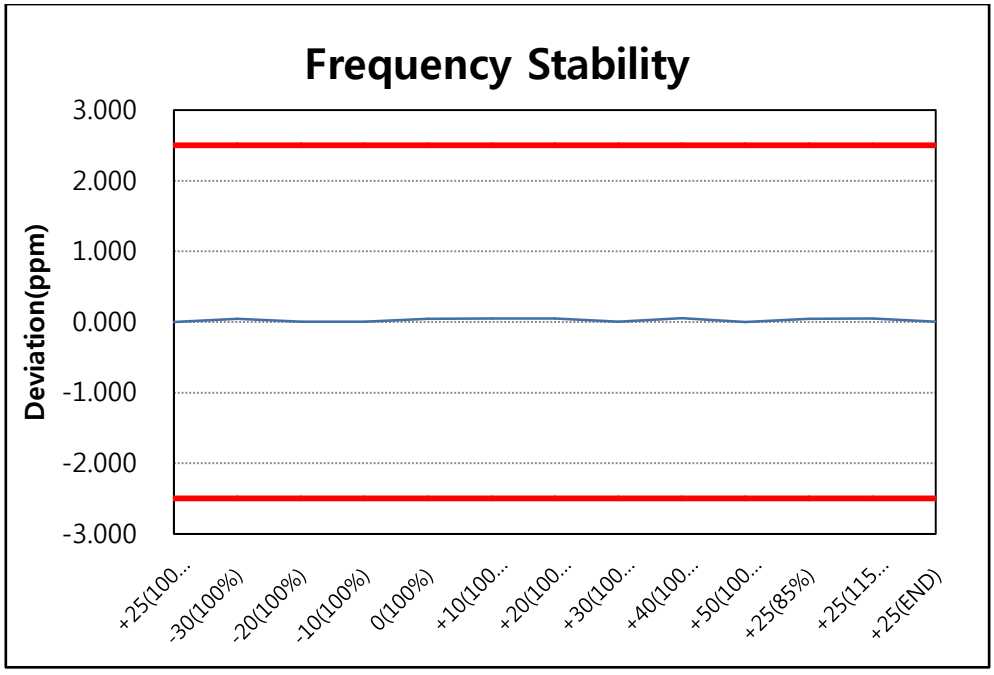
VOLTAGE (%)	POWER (V DC)	TEMP (℃)	FREQ (Hz)	Deviation	
				(ppm)	(%)
100%	3.700	+25(Ref)	836,599,978	0.000	0.00000000
100%		-30	836,600,009	0.037	0.00000371
100%		-20	836,599,995	0.020	0.00000203
100%		-10	836,599,977	-0.001	-0.00000012
100%		0	836,599,997	0.023	0.00000227
100%		+10	836,600,006	0.033	0.00000335
100%		+20	836,600,015	0.044	0.00000442
100%		+30	836,599,981	0.004	0.00000036
100%		+40	836,600,004	0.031	0.00000311
100%		+50	836,599,995	0.020	0.00000203
85%	3.145	+25	836,600,015	0.044	0.00000442
115%	4.255	+25	836,599,984	0.007	0.00000072
BATT.ENDPOINT	3.000	+25	836,599,995	0.020	0.00000203



7.9.3 FREQUENCY STABILITY (GSM1900)

OPERATING FREQUENCY : 1,880,000,026Hz
CHANNEL : 661(Mid)
REFERENCE VOLTAGE : 3.700 V DC
DEVIATION LIMIT : ± 0.00025 % or 2.5 ppm

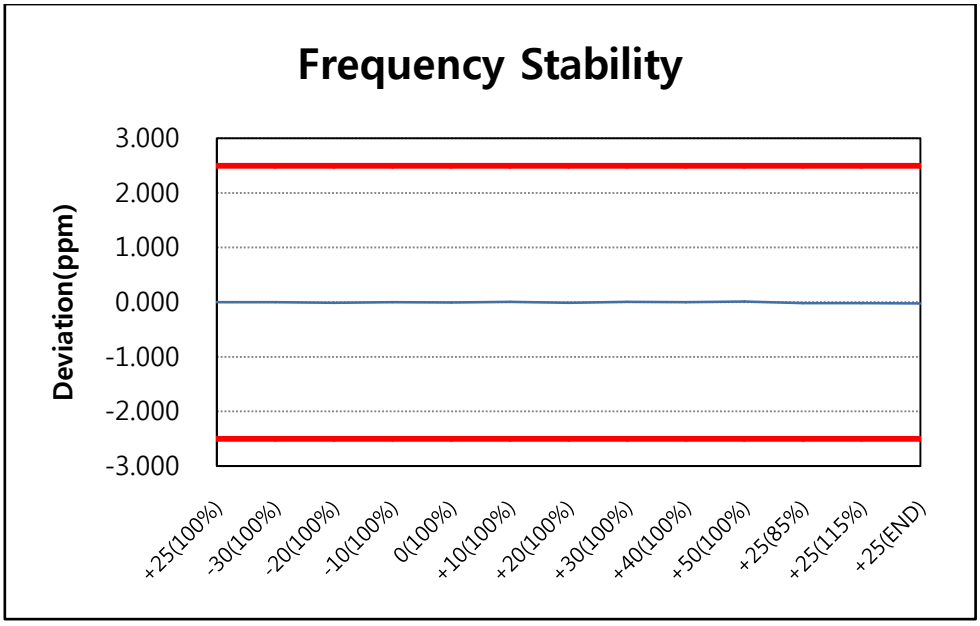
VOLTAGE (%)	POWER (V DC)	TEMP (℃)	FREQ (Hz)	Deviation	
				(ppm)	(%)
100%	3.700	+25(Ref)	1,880,000,026	0.000	0.00000000
100%		-30	1,880,000,029	0.002	0.00000016
100%		-20	1,879,999,994	-0.017	-0.00000170
100%		-10	1,880,000,032	0.003	0.00000032
100%		0	1,879,999,994	-0.017	-0.00000170
100%		+10	1,879,999,980	-0.024	-0.00000245
100%		+20	1,880,000,008	-0.010	-0.00000096
100%		+30	1,880,000,023	-0.002	-0.00000016
100%		+40	1,879,999,981	-0.024	-0.00000239
100%		+50	1,879,999,973	-0.028	-0.00000282
85%	3.145	+25	1,880,000,025	-0.001	-0.00000005
115%	4.255	+25	1,879,999,987	-0.021	-0.00000207
BATT.ENDPOINT	3.000	+25	1,880,000,016	-0.005	-0.00000053



7.9.4 FREQUENCY STABILITY (WCDMA1900)

OPERATING FREQUENCY : 1,880,000,013Hz
CHANNEL : 9400(Mid)
REFERENCE VOLTAGE : 3.700 V DC
DEVIATION LIMIT : ± 0.00025 % or 2.5 ppm

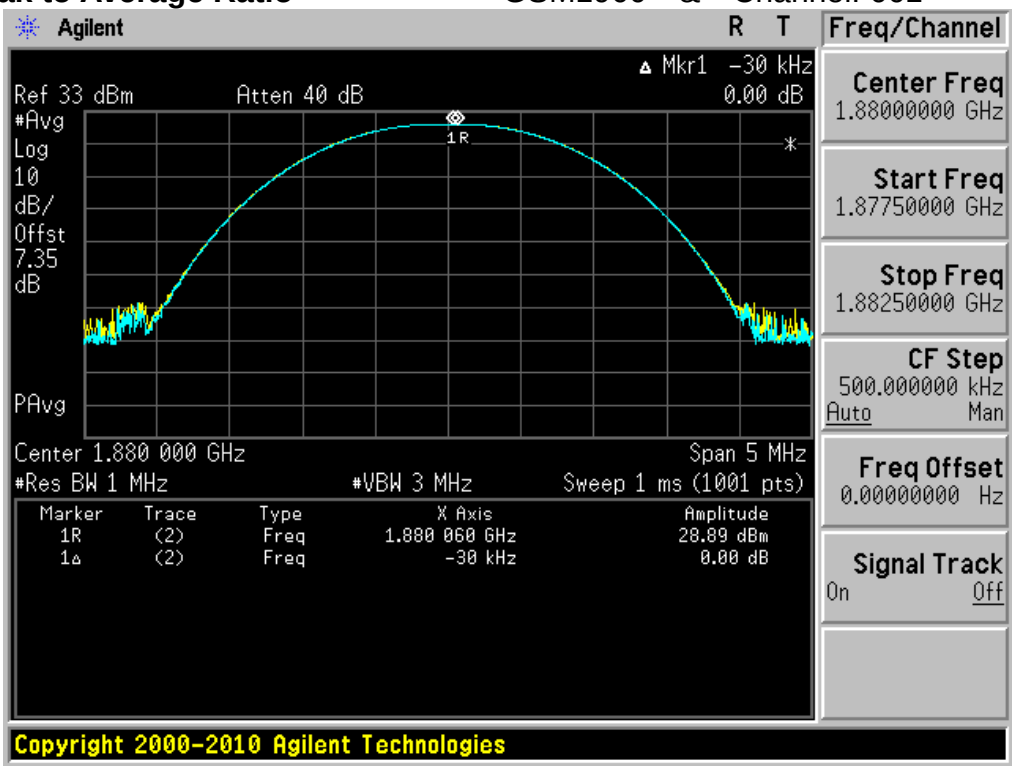
VOLTAGE (%)	POWER (V DC)	TEMP (℃)	FREQ (Hz)	Deviation	
				(ppm)	(%)
100%	3.700	+25(Ref)	1,880,000,013	0.000	0.00000000
100%		-30	1,880,000,014	0.001	0.00000005
100%		-20	1,879,999,990	-0.012	-0.00000122
100%		-10	1,880,000,014	0.001	0.00000005
100%		0	1,880,000,002	-0.006	-0.00000059
100%		+10	1,880,000,022	0.005	0.00000048
100%		+20	1,879,999,996	-0.009	-0.00000090
100%		+30	1,880,000,025	0.006	0.00000064
100%		+40	1,880,000,019	0.003	0.00000032
100%		+50	1,880,000,031	0.010	0.00000096
85%	3.145	+25	1,879,999,986	-0.014	-0.00000144
115%	4.255	+25	1,879,999,984	-0.015	-0.00000154
BATT.ENDPOINT	3.000	+25	1,879,999,975	-0.020	-0.00000202



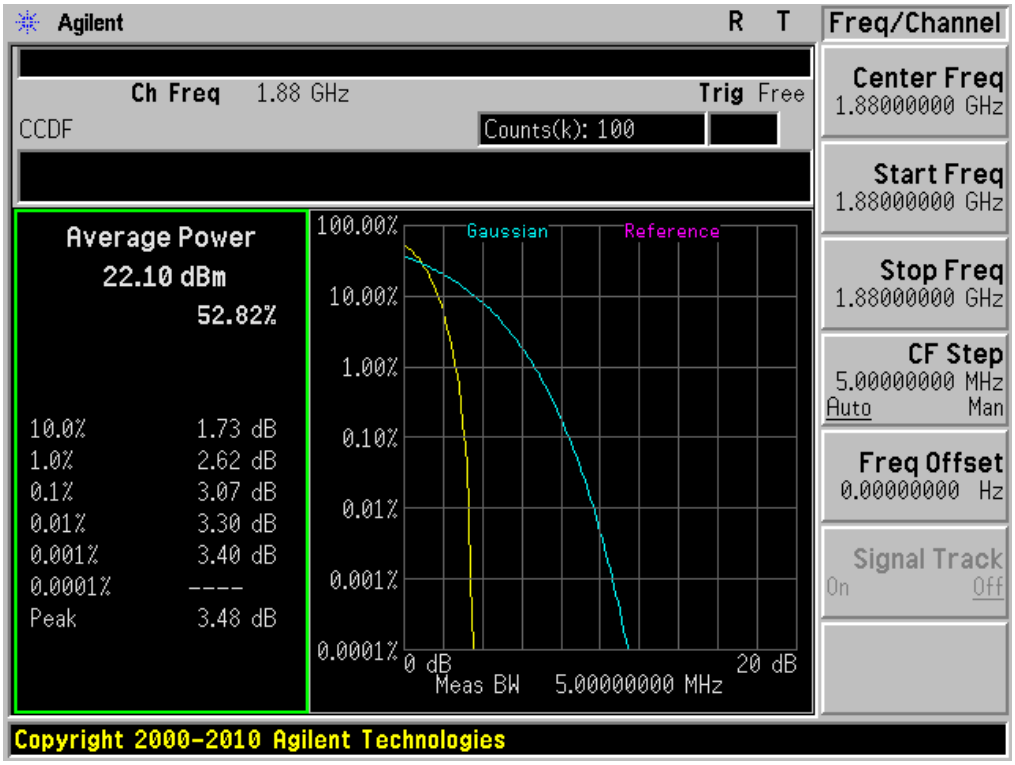
8. TEST PLOTS

8.1 Peak to Average Ratio

GSM1900 & Channel: 661

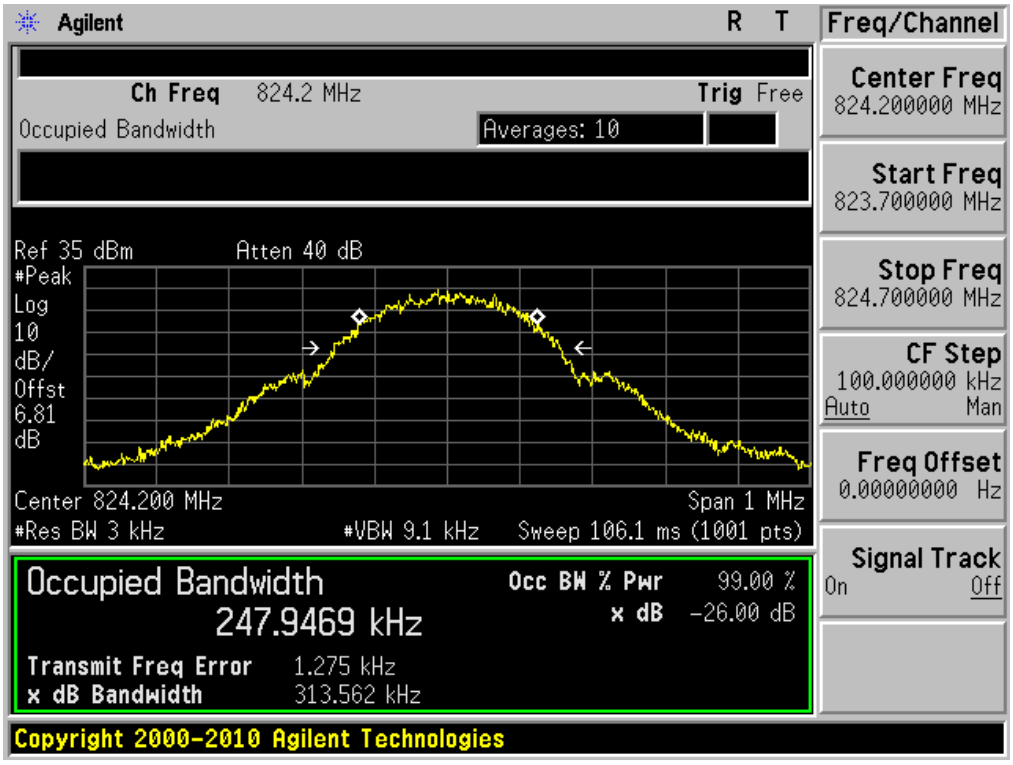


WCDMA1900 & Channel: 9400

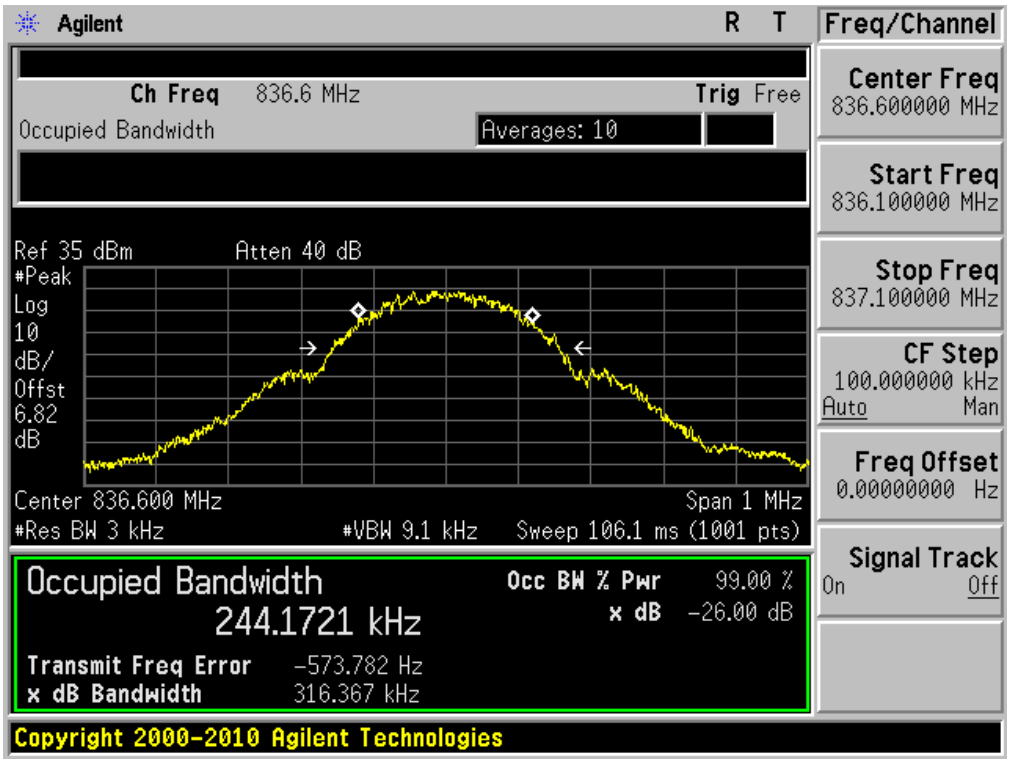


8.2 Occupied Bandwidth 99 % Bandwidth

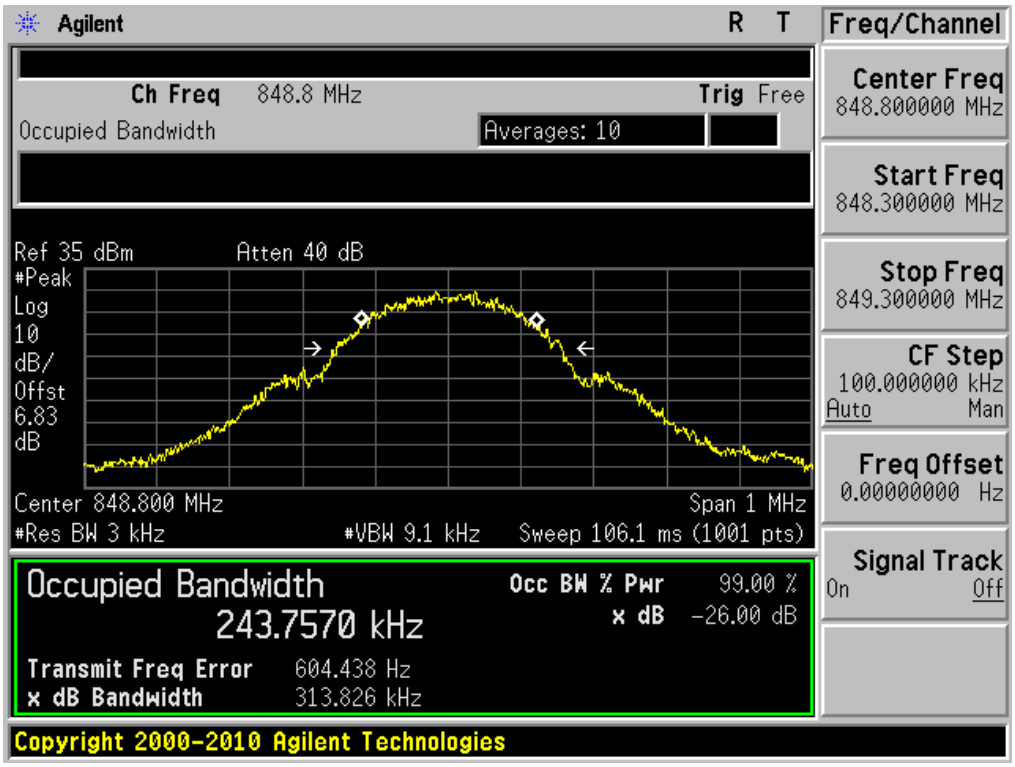
GSM850 & Channel: 128



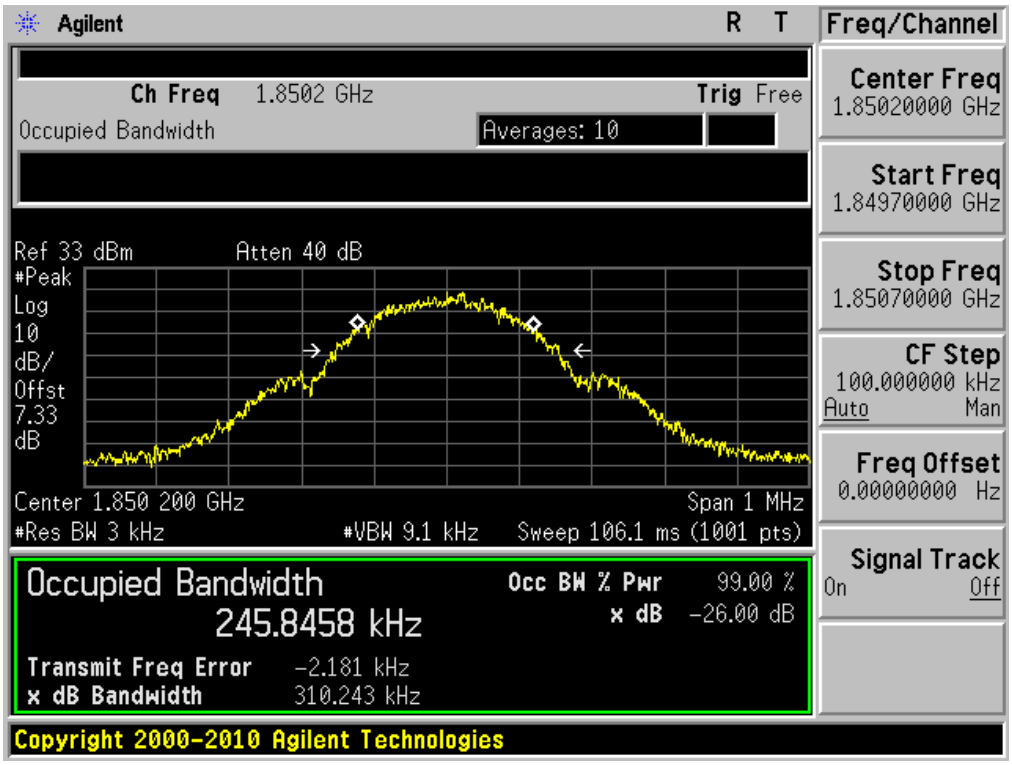
GSM850 & Channel: 190



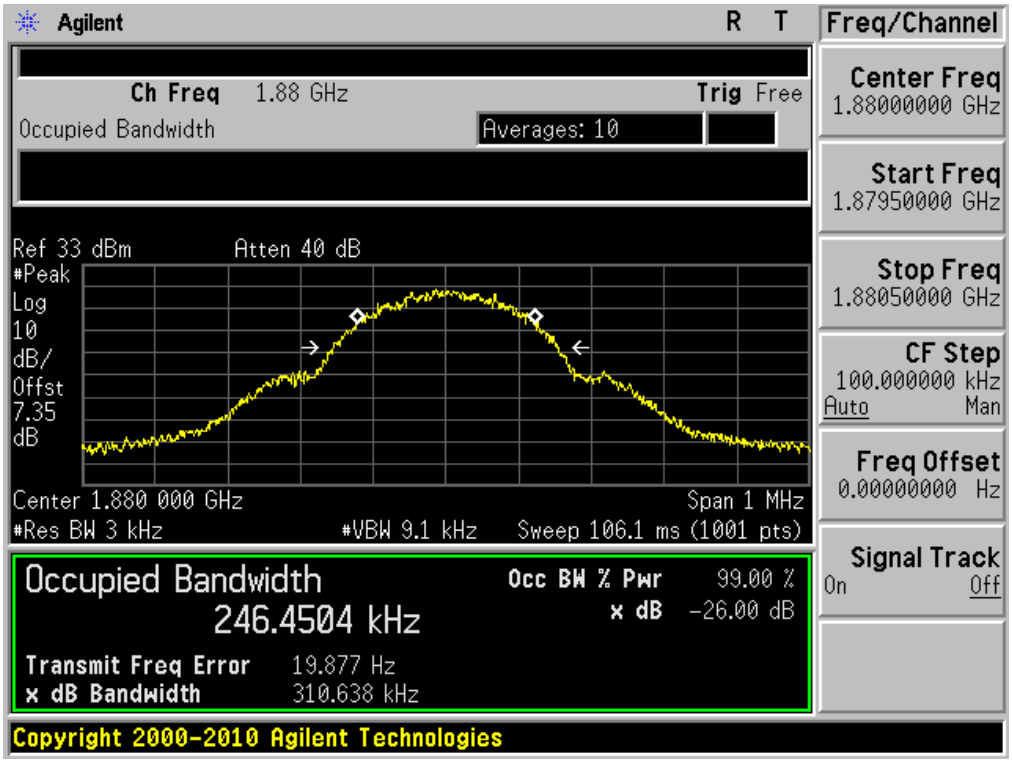
GSM850 & Channel: 251



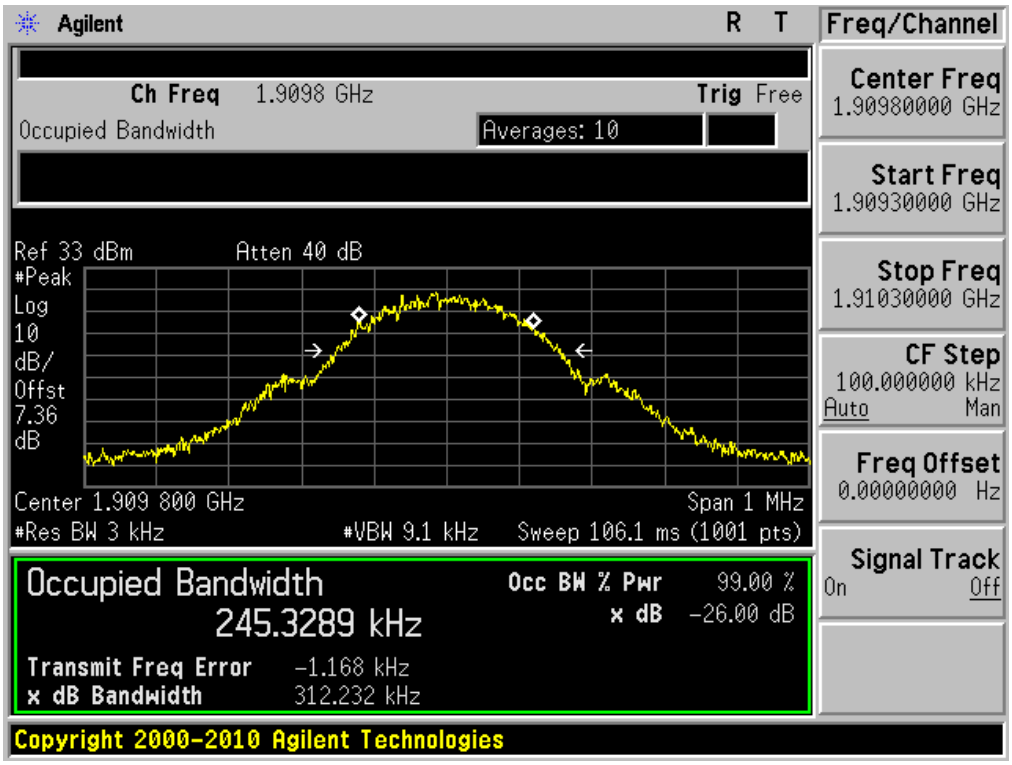
GSM 1900 & Channel: 512



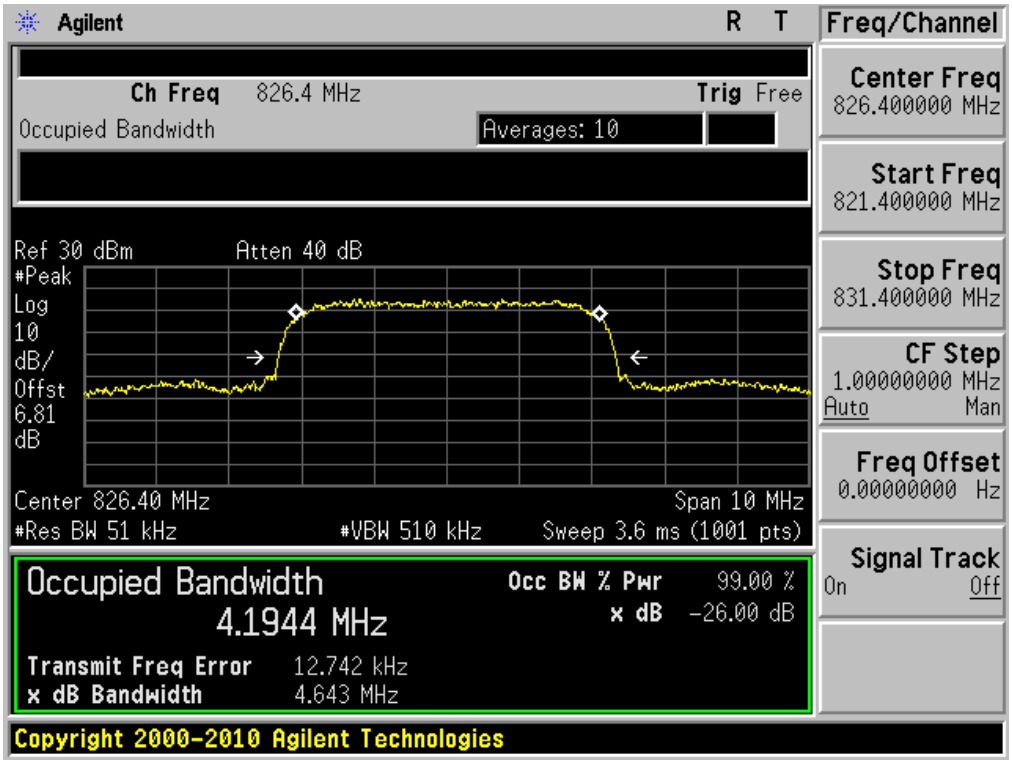
GSM 1900 & Channel: 661



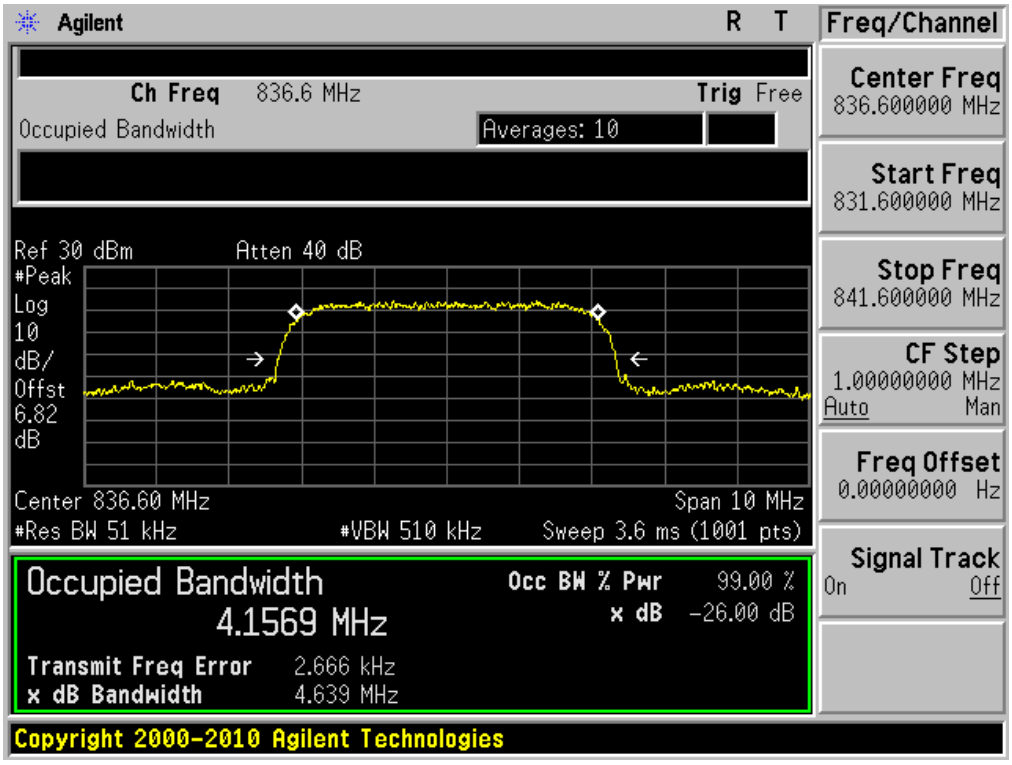
GSM 1900 & Channel: 810



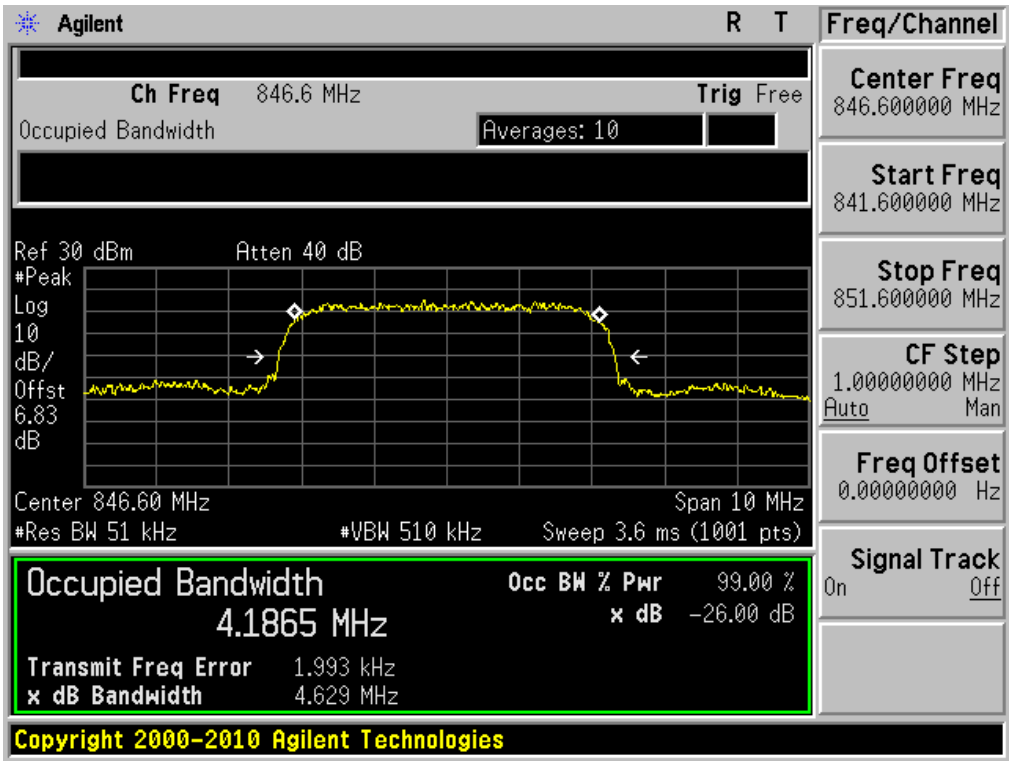
WCDMA850 & Channel: 4132



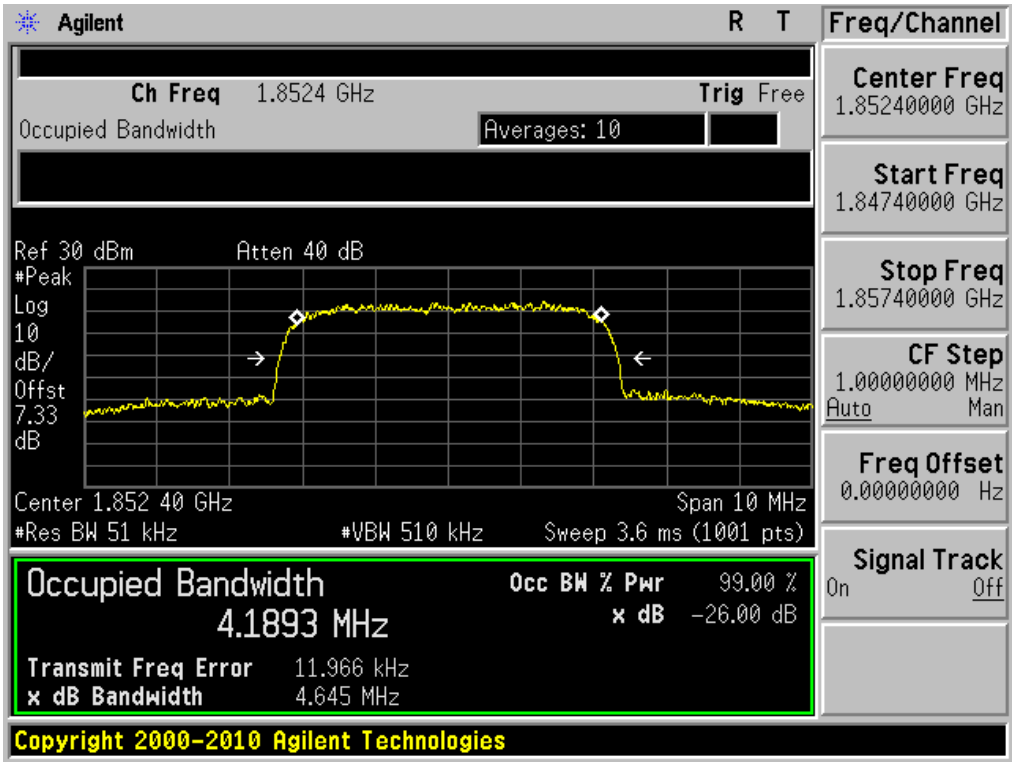
WCDMA850 & Channel: 4183



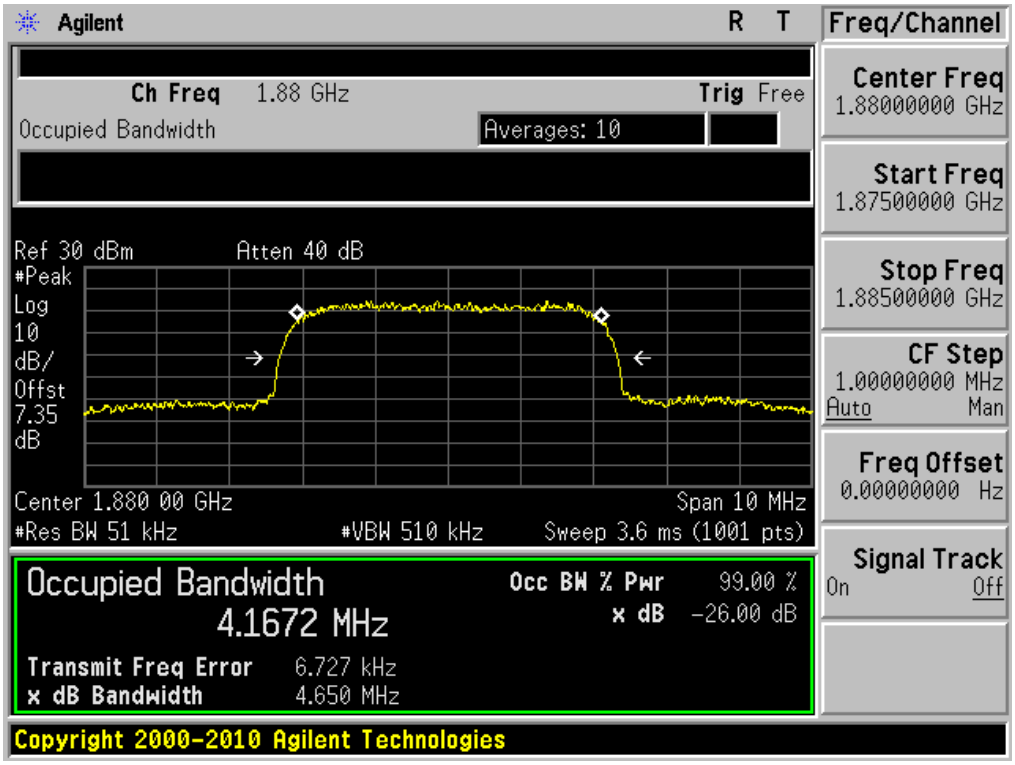
WCDMA850 & Channel: 4233



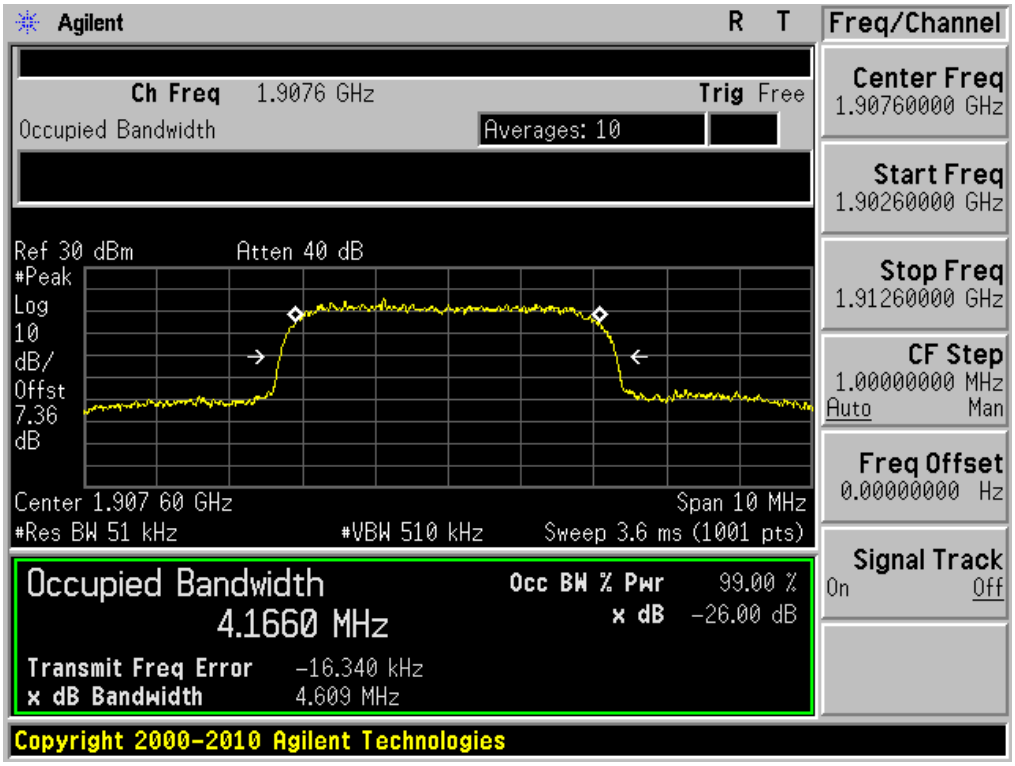
WCDMA1900 & Channel: 9262



WCDMA1900 & Channel: 9400

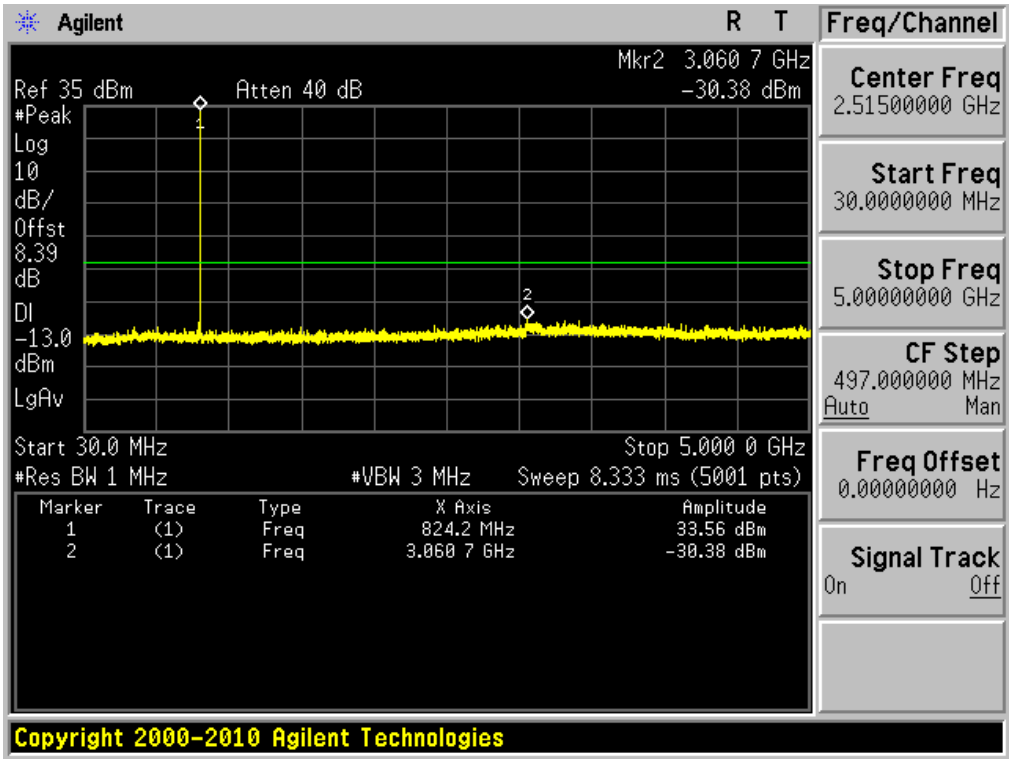


WCDMA1900 & Channel: 9538

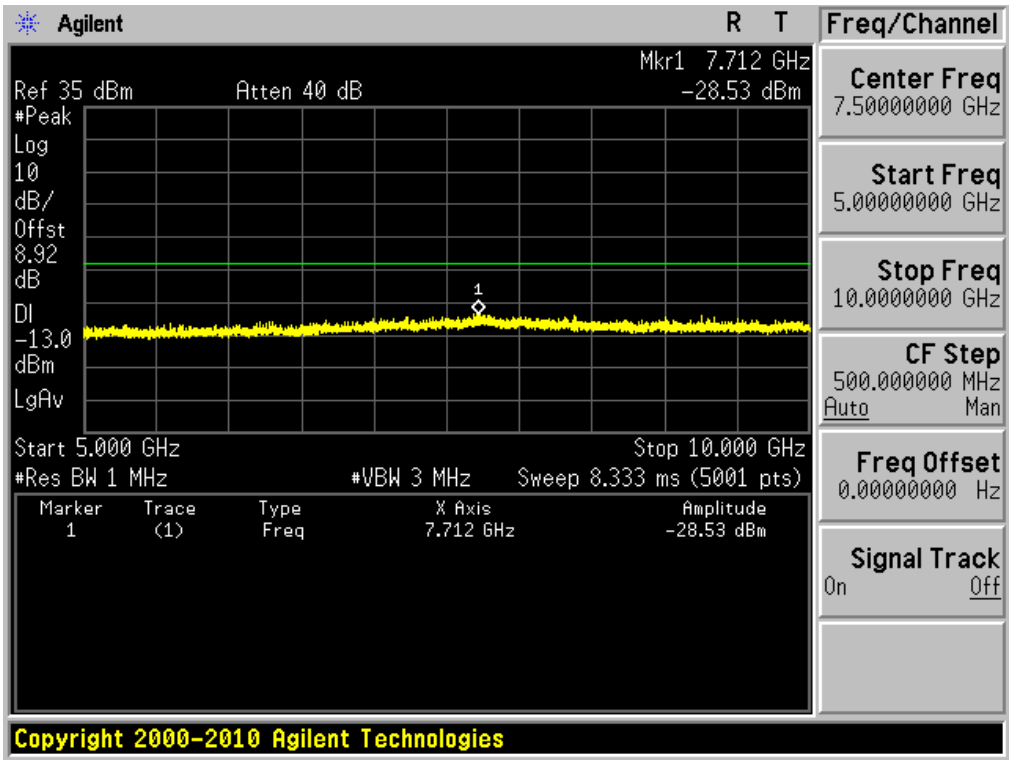


8.3 Spurious Emissions at Antenna Terminal

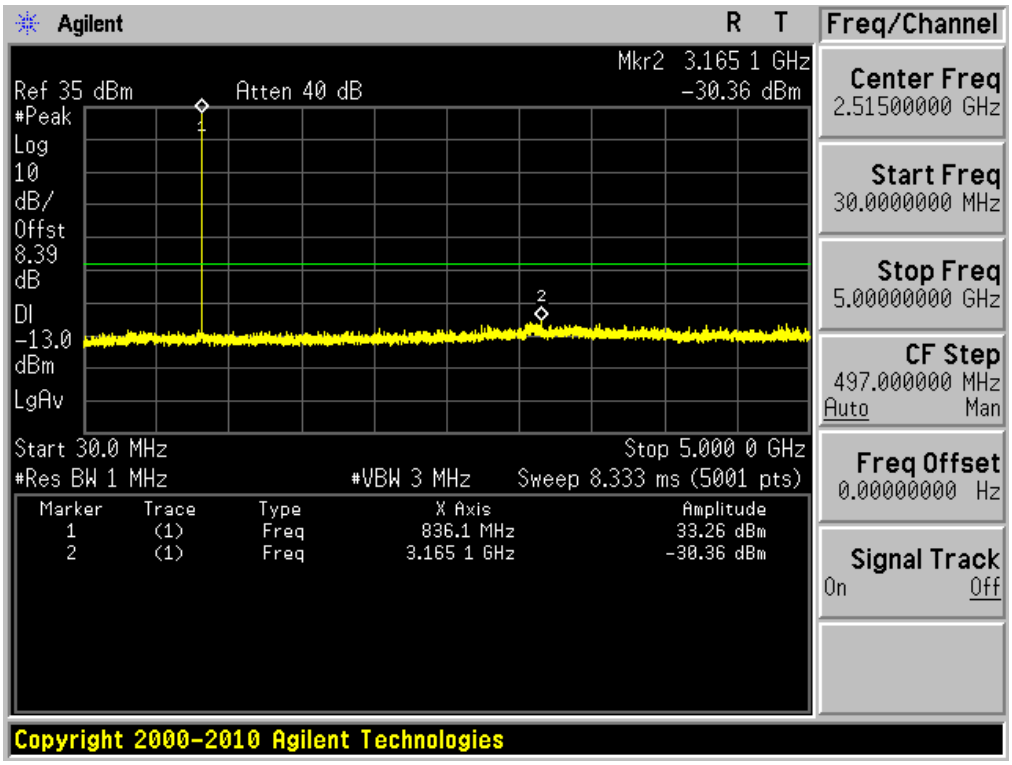
GSM850 & Channel: 128



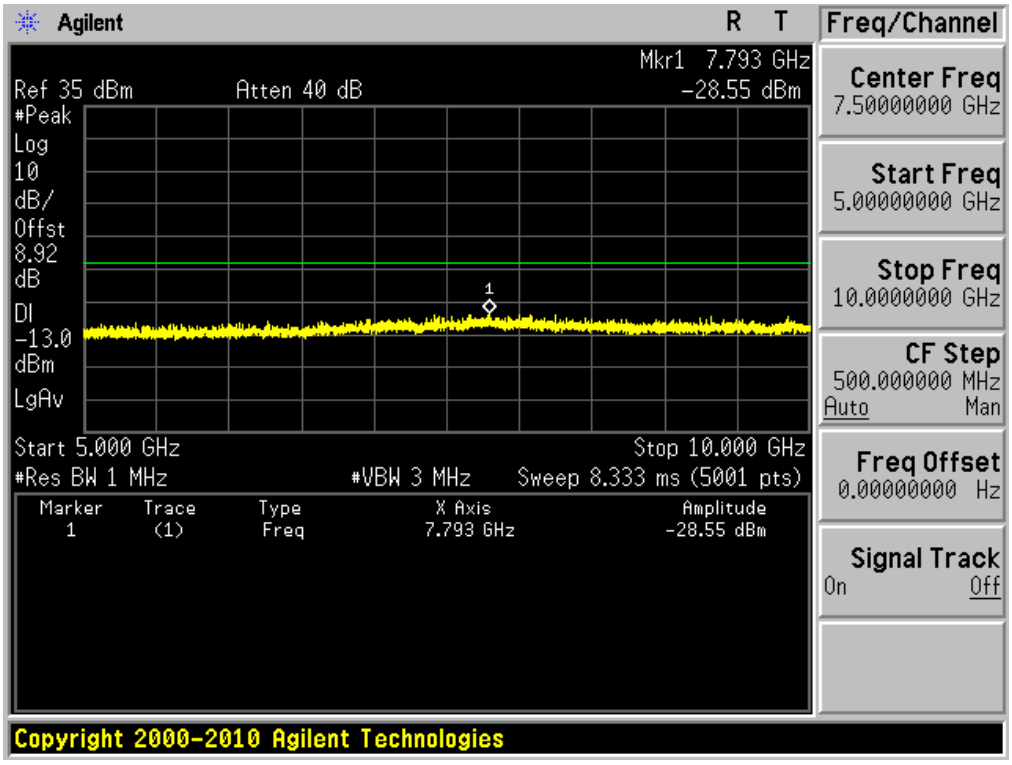
GSM850 & Channel: 128



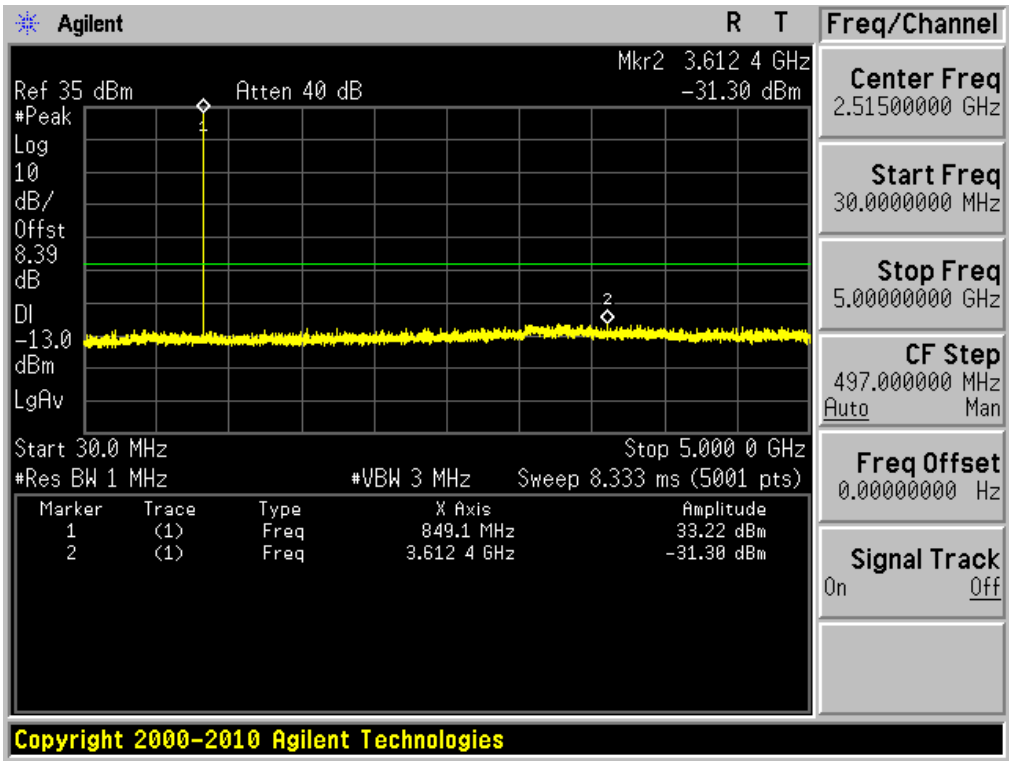
GSM850 & Channel: 190



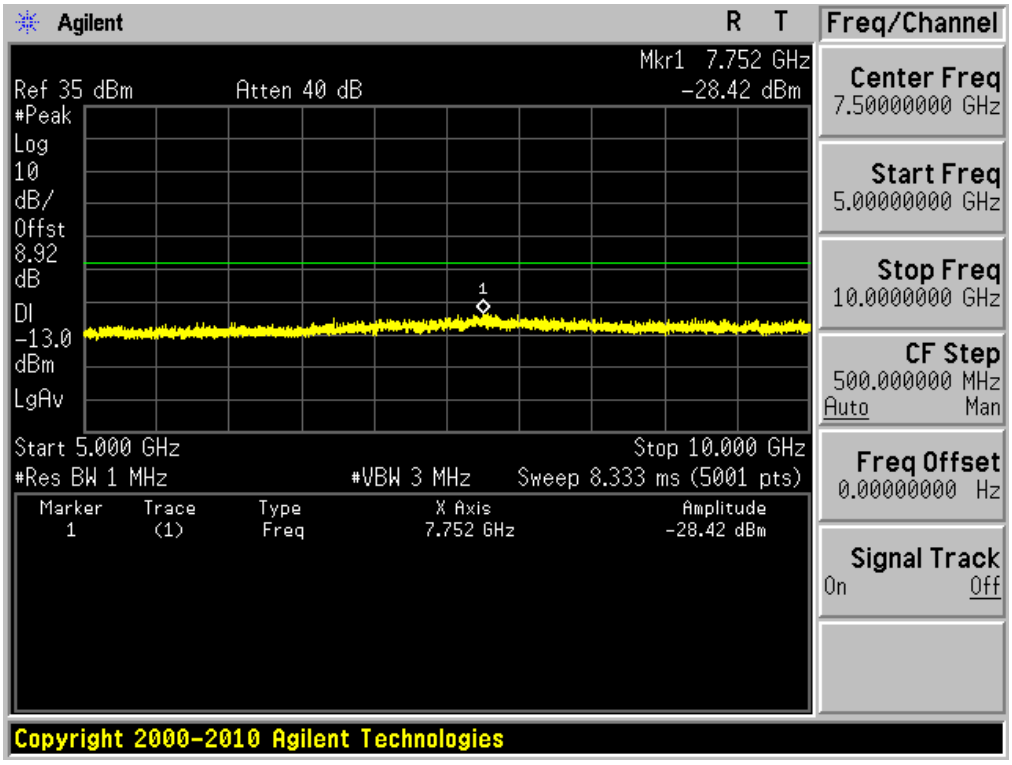
GSM850 & Channel: 190



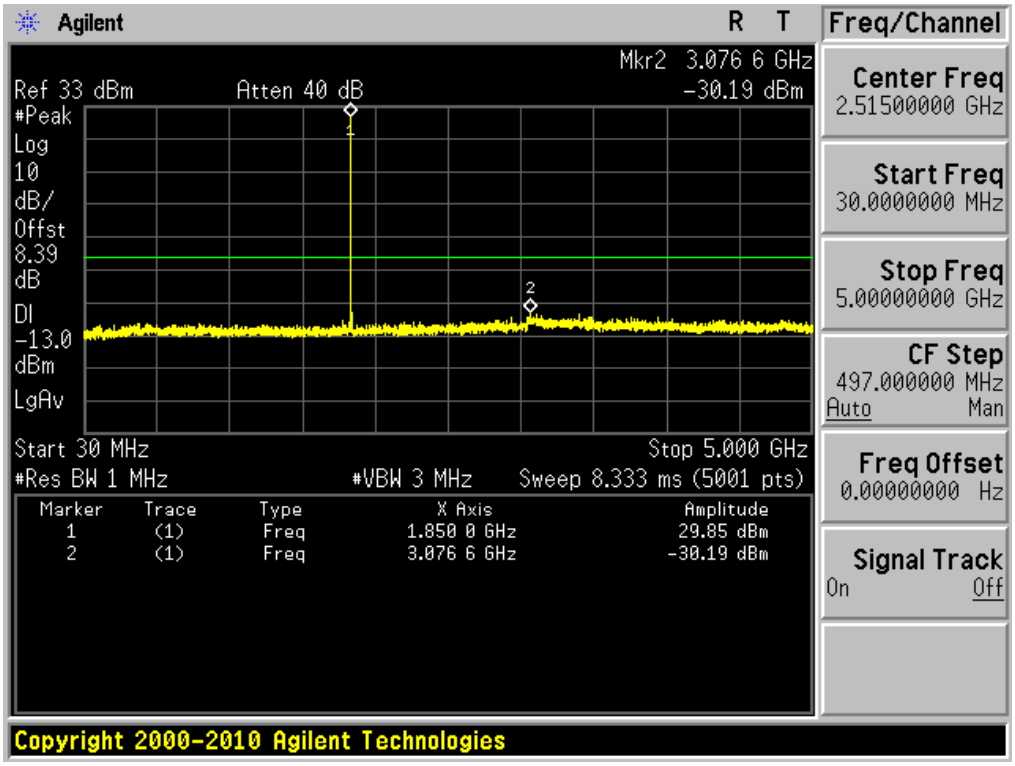
GSM850 & Channel: 251



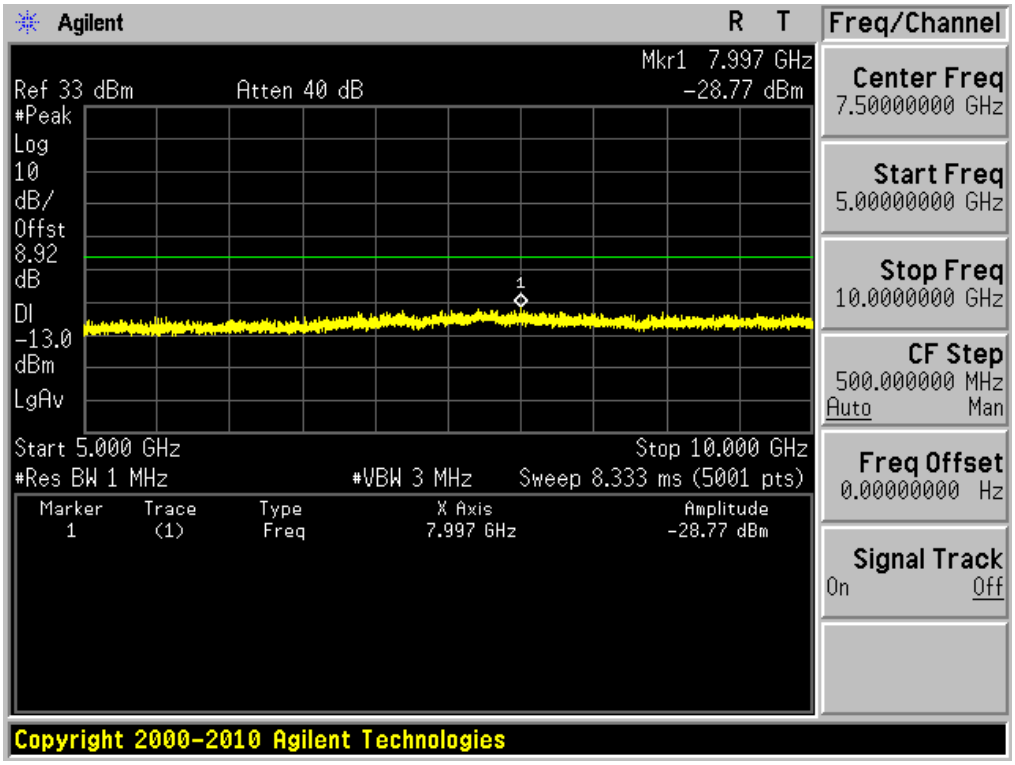
GSM850 & Channel: 251



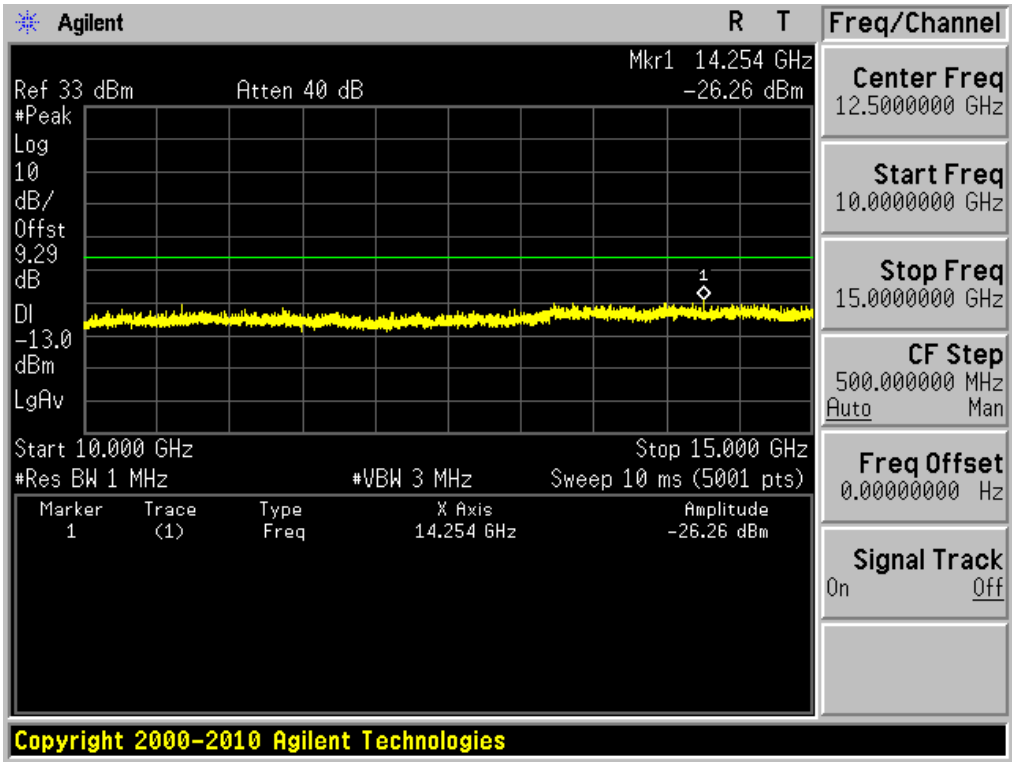
PCS1900 & Channel: 512



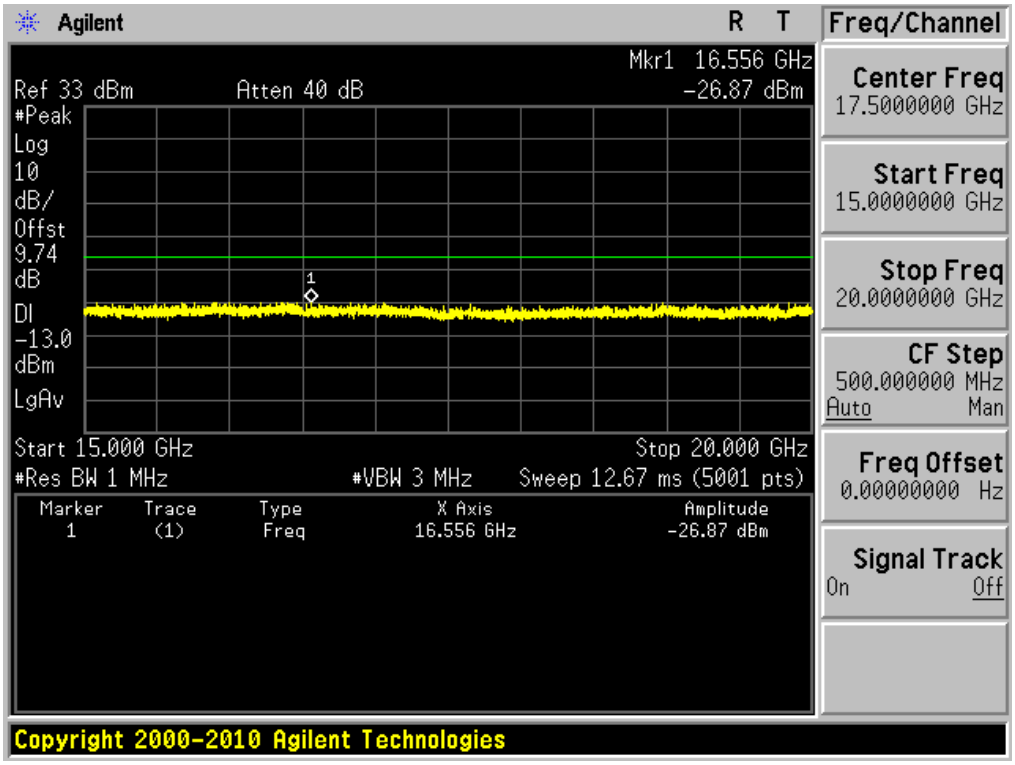
PCS1900 & Channel: 512



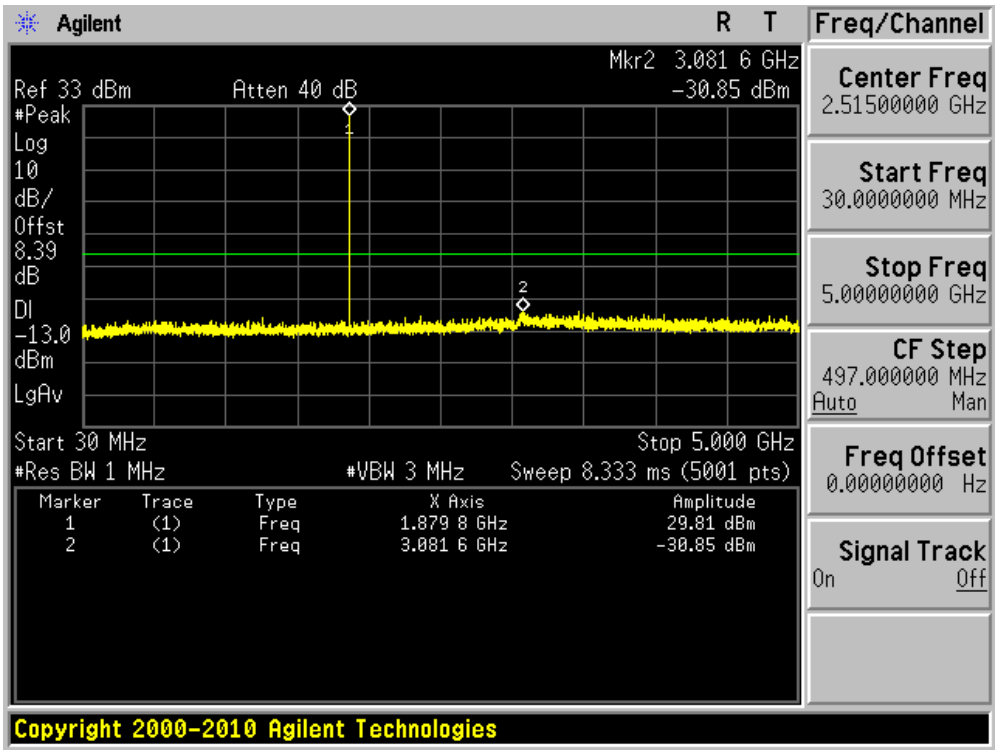
PCS1900 & Channel: 512



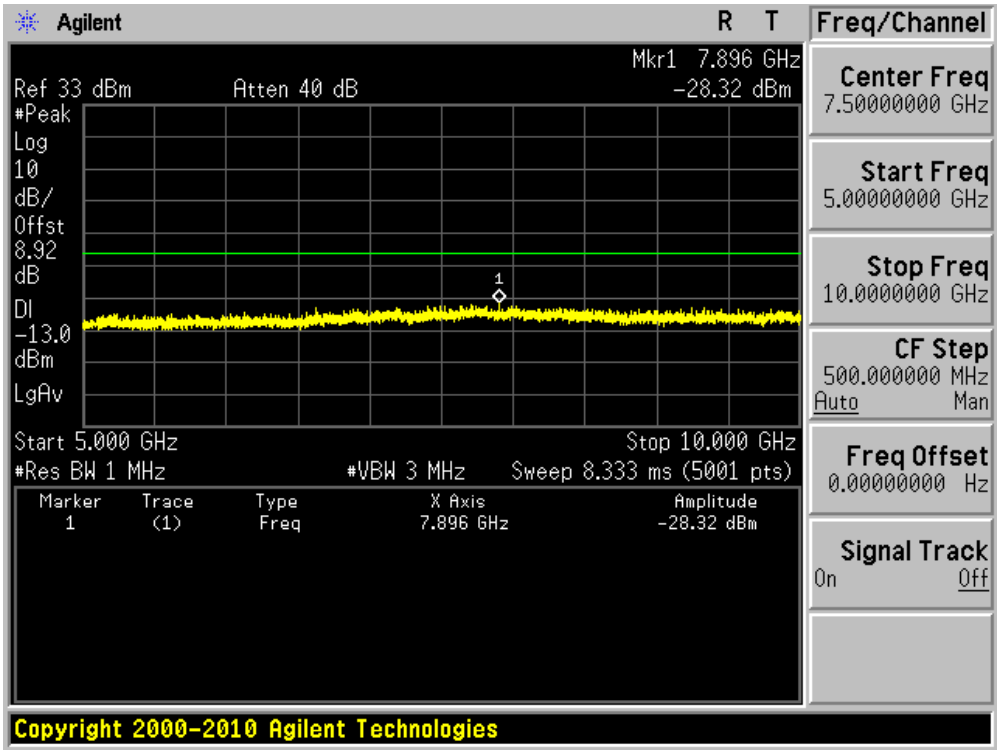
PCS1900 & Channel: 512



PCS1900 & Channel: 661



PCS1900 & Channel: 661



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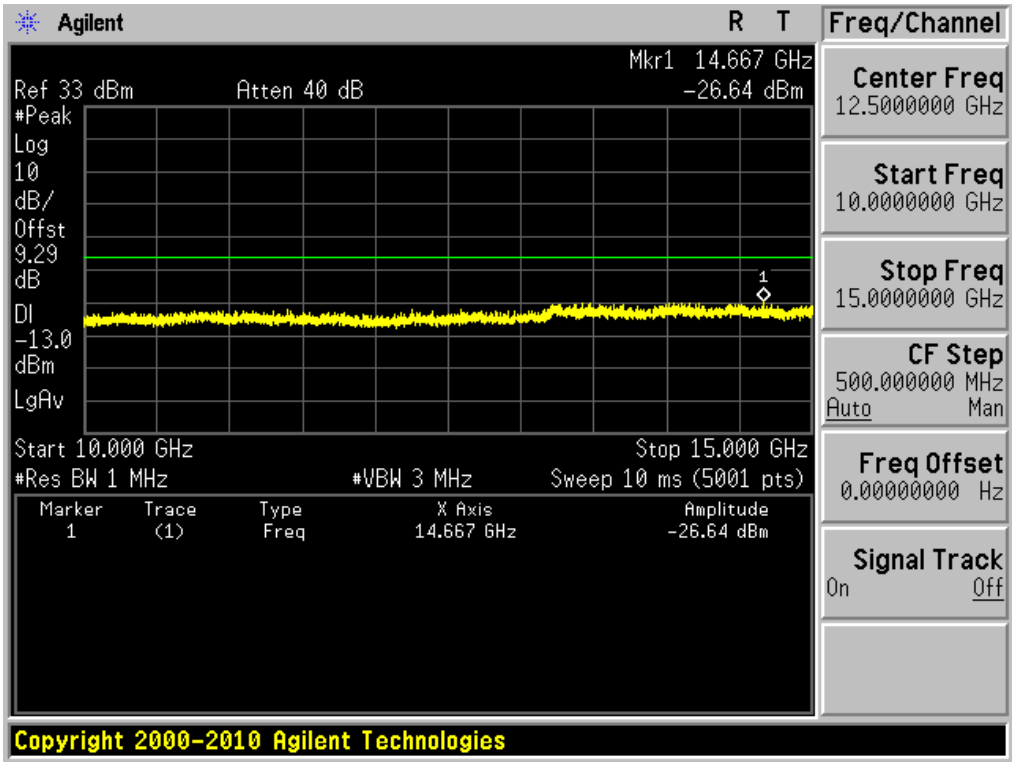

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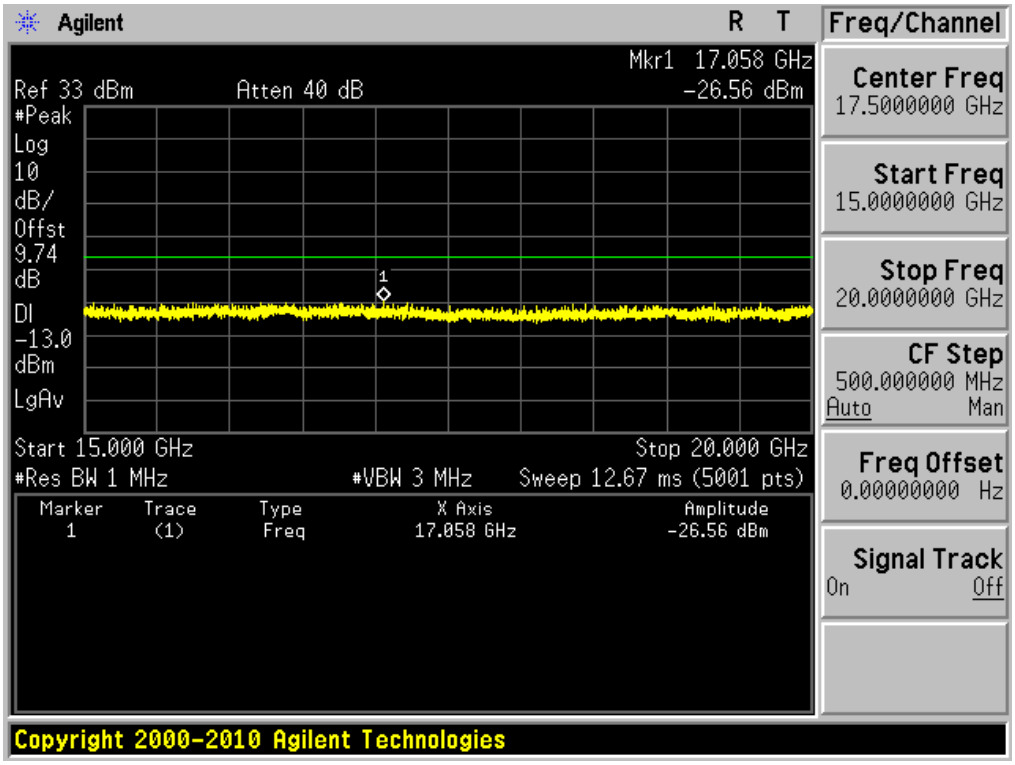

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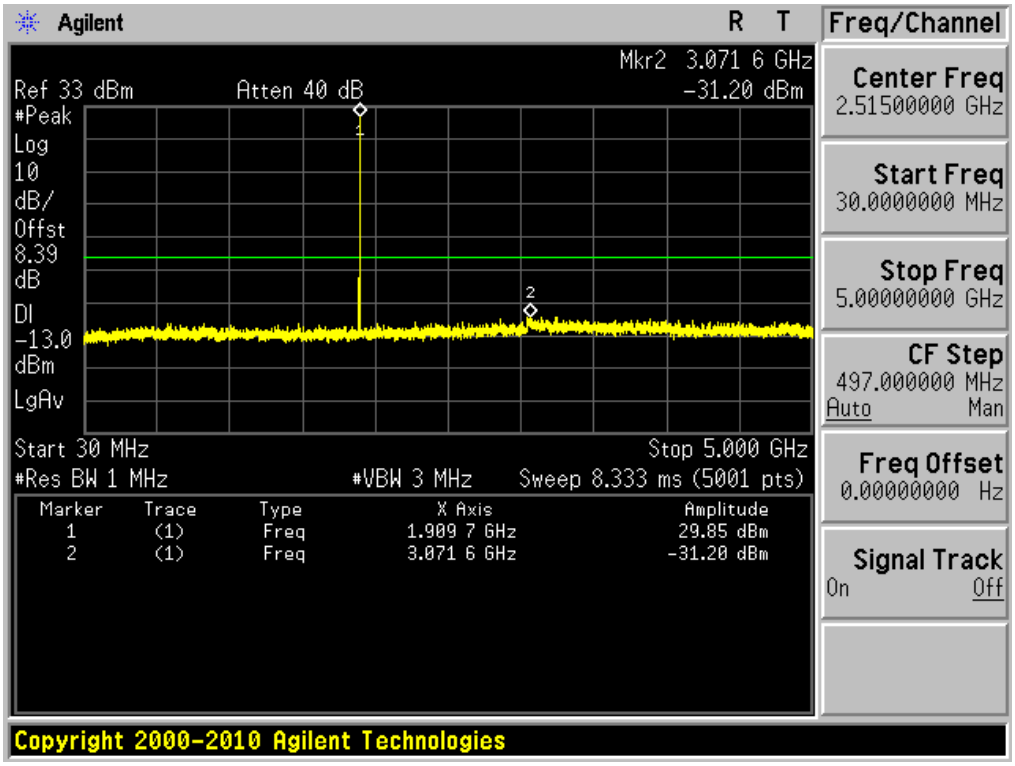

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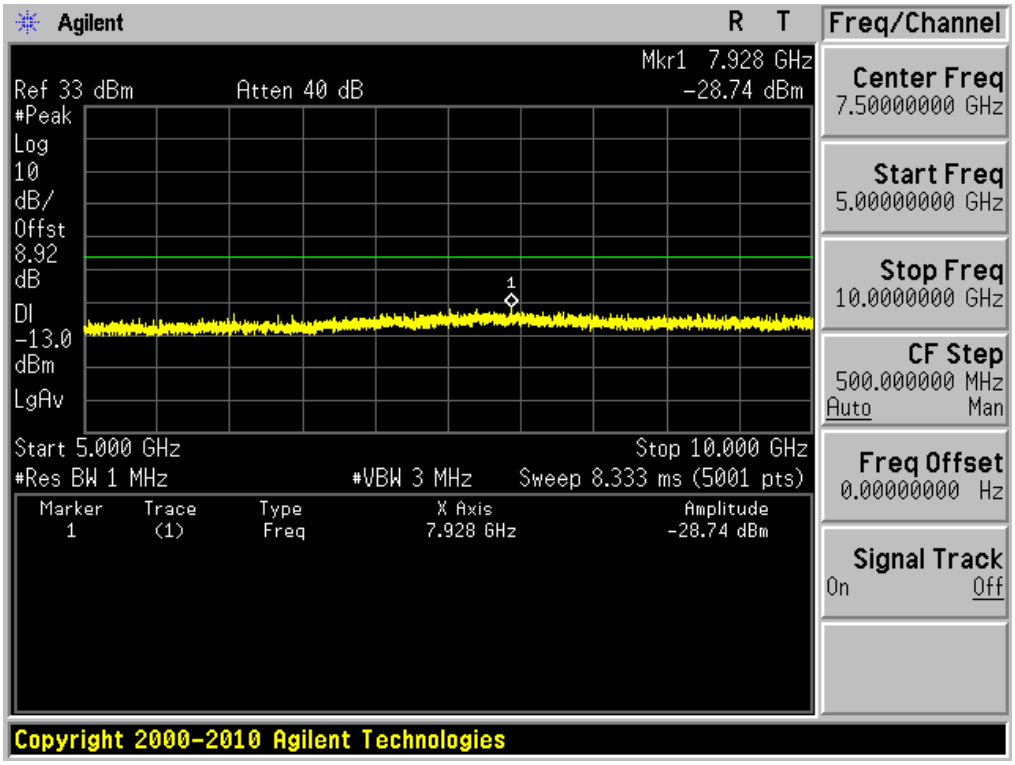

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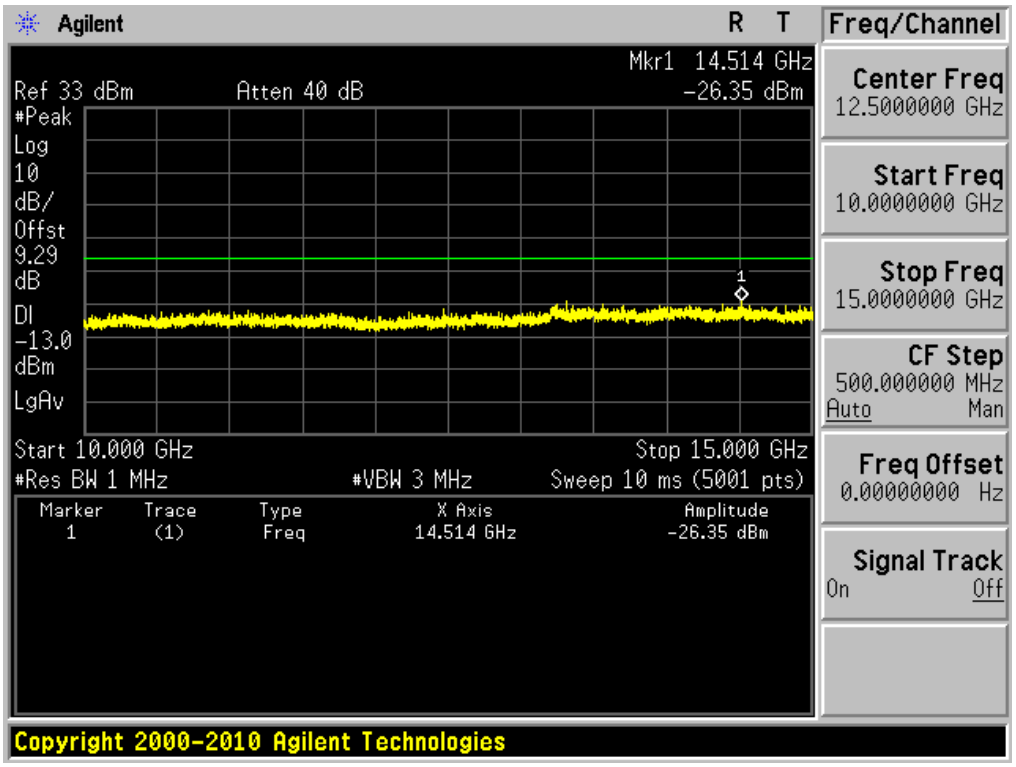
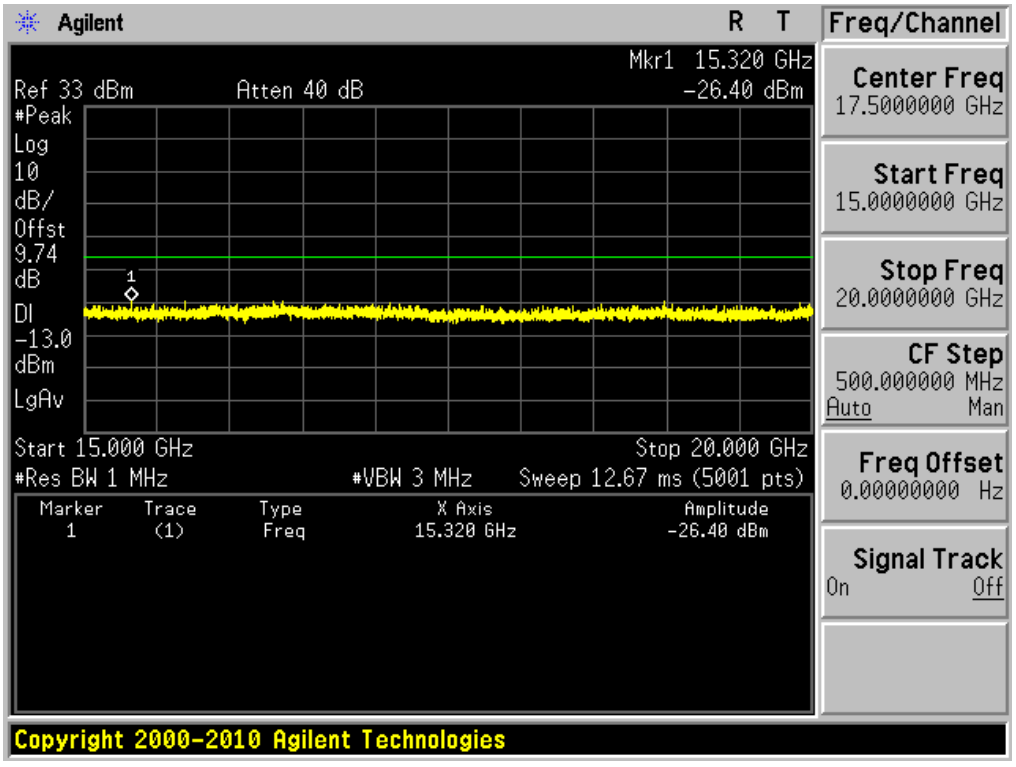
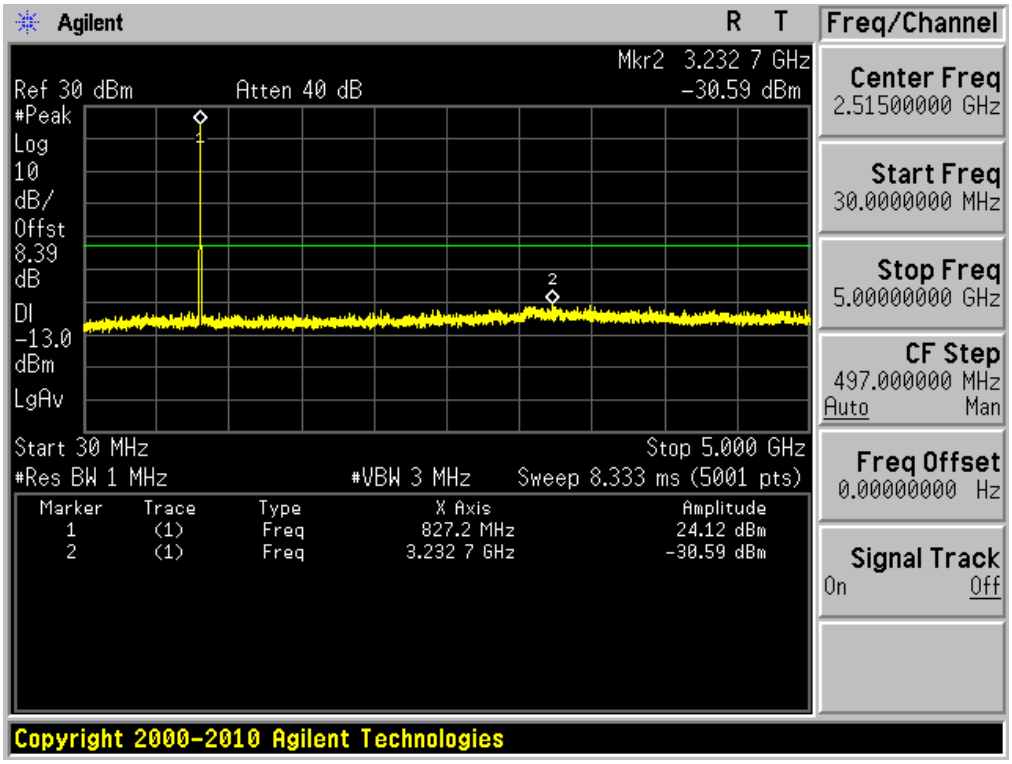


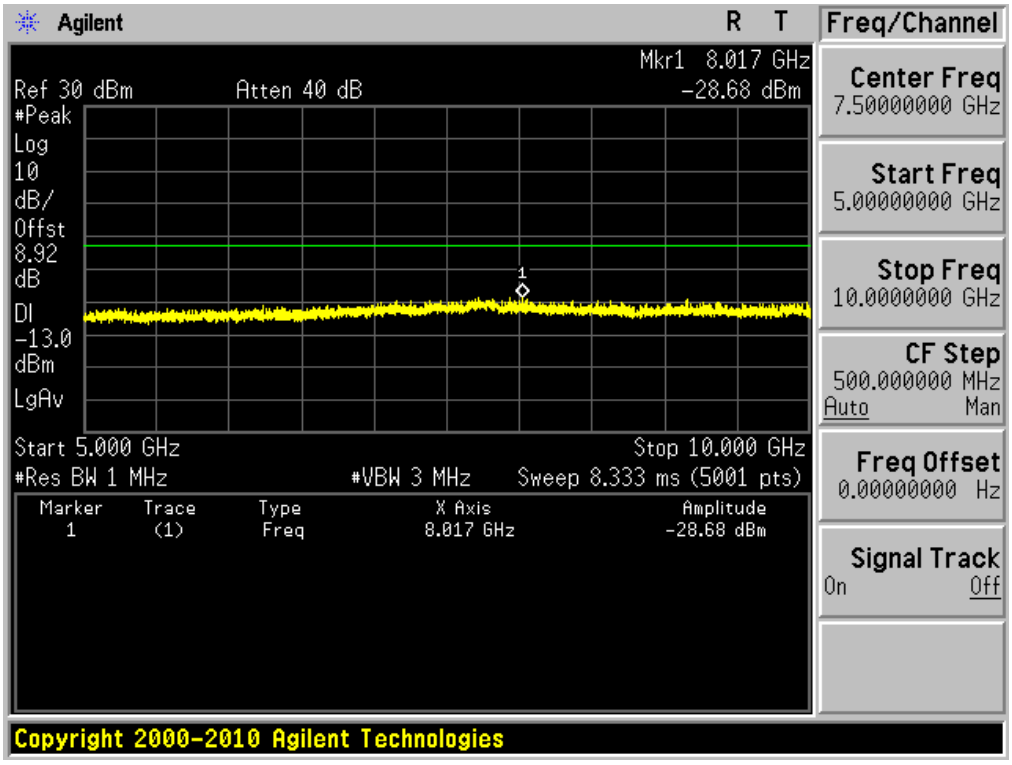
PCS1900 & Channel: 810



WCDMA850 & Channel: 4132



WCDMA850 & Channel: 4132



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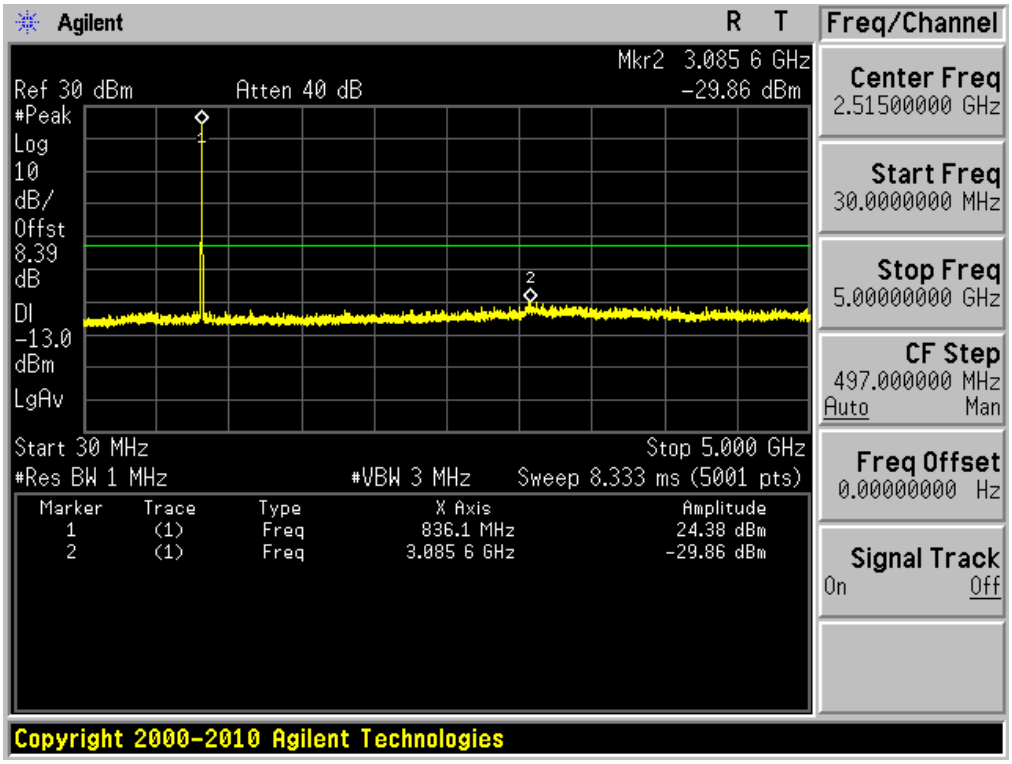

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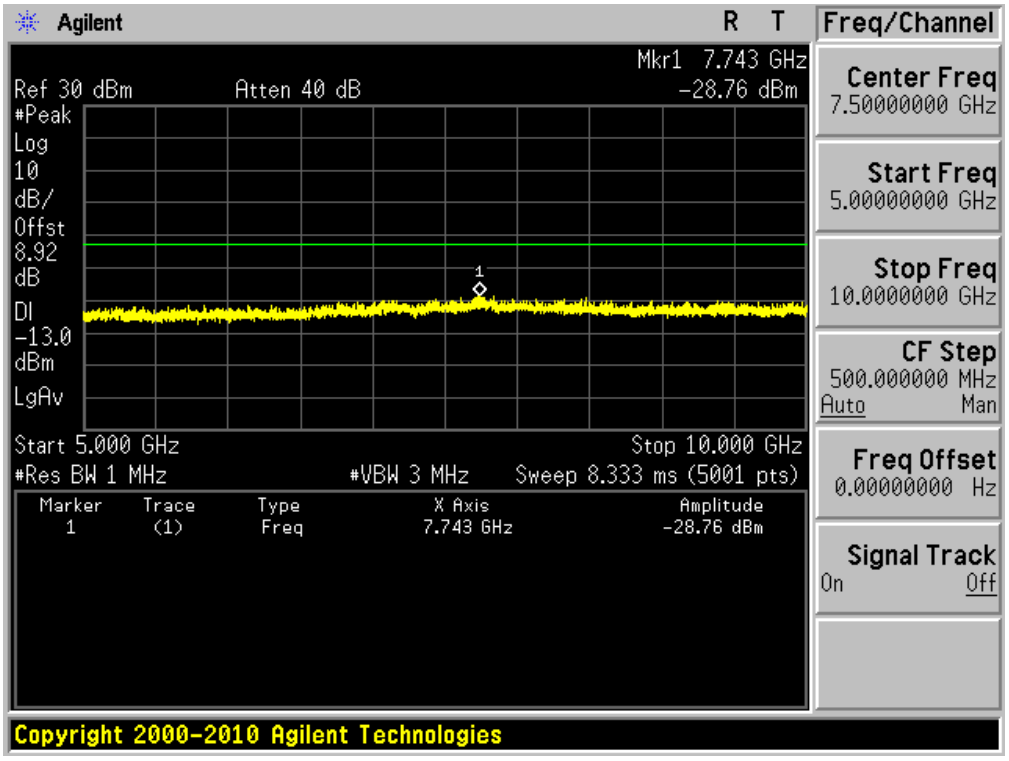

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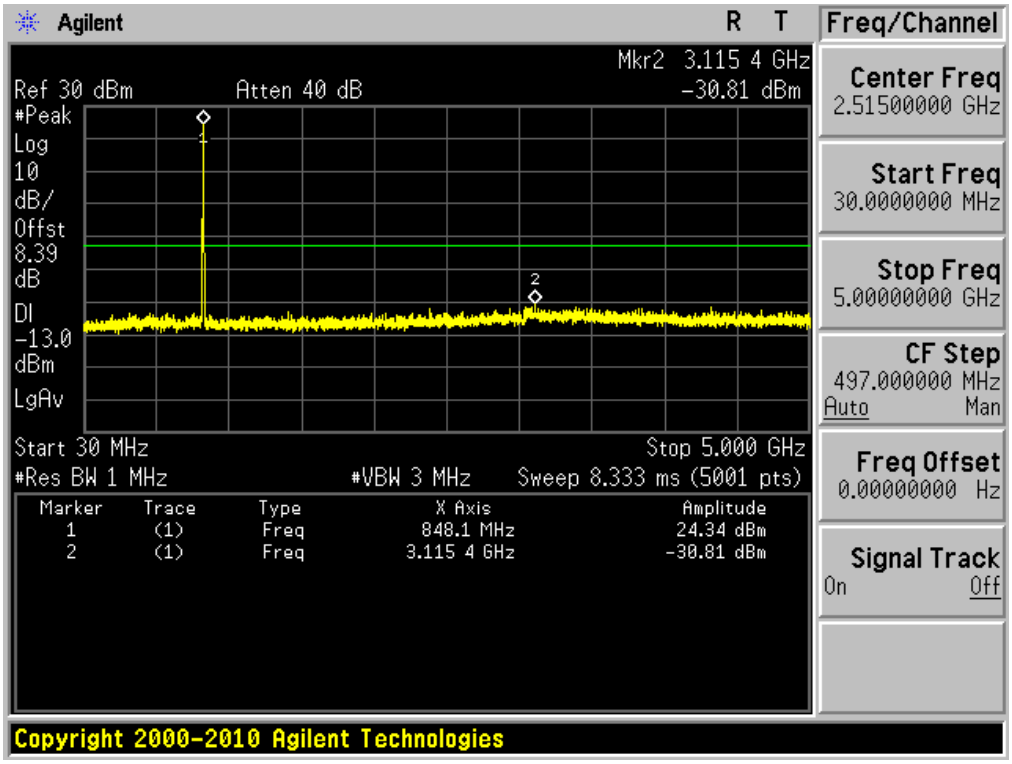

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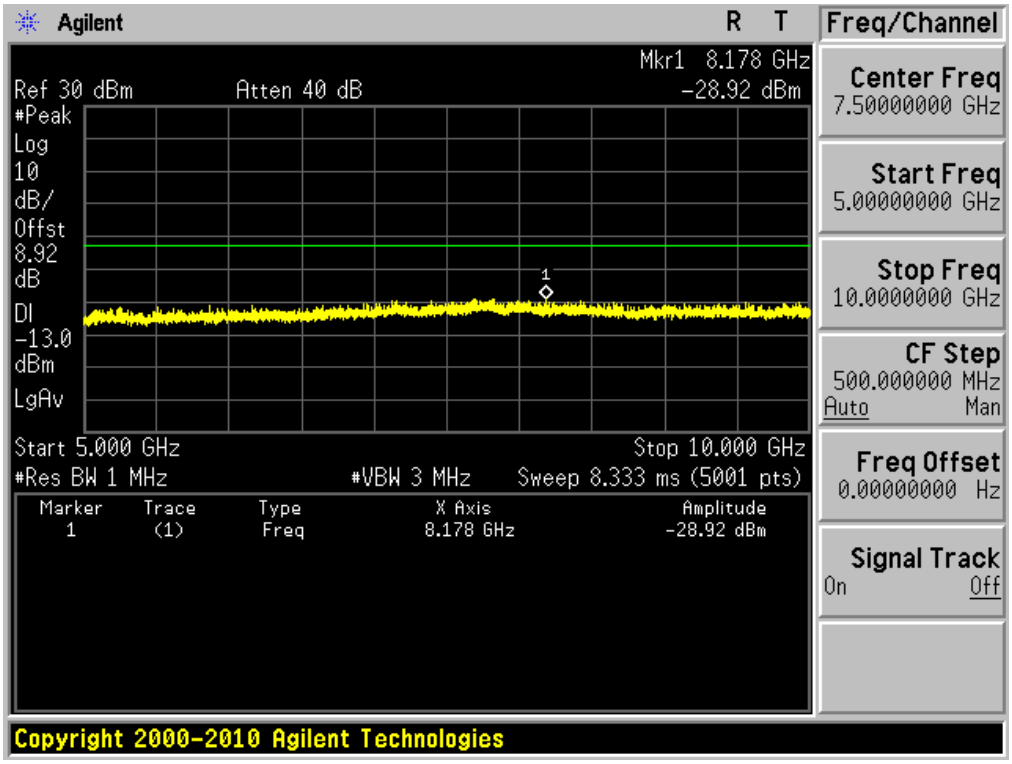
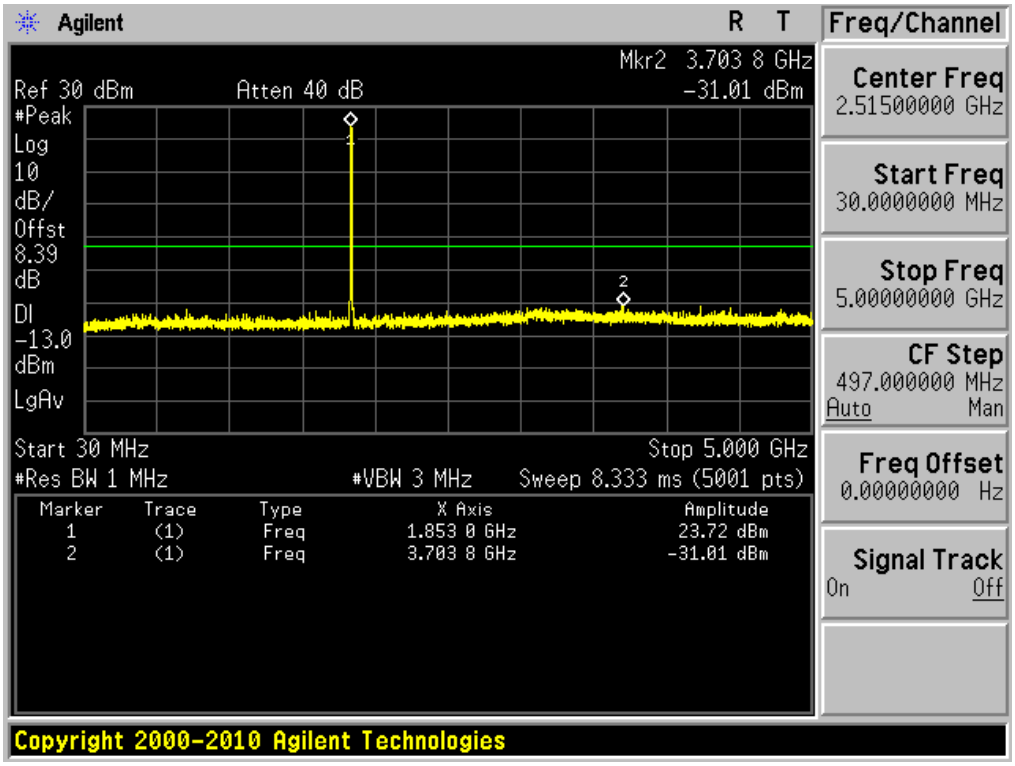


WCDMA1900 & Channel: 9262



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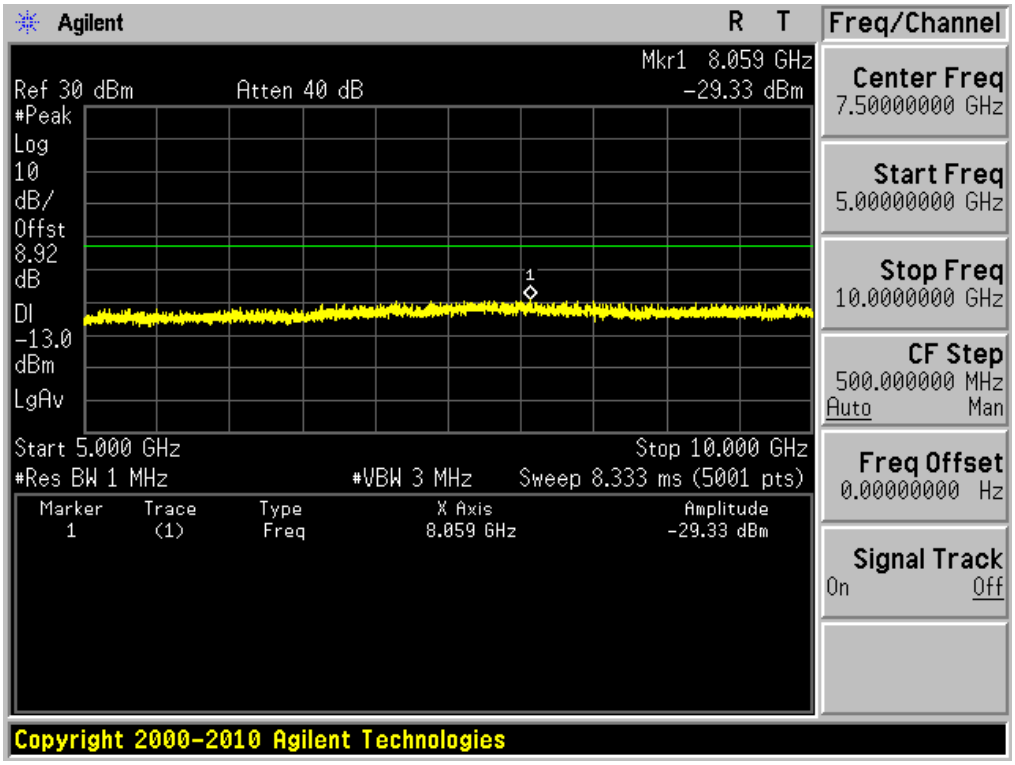

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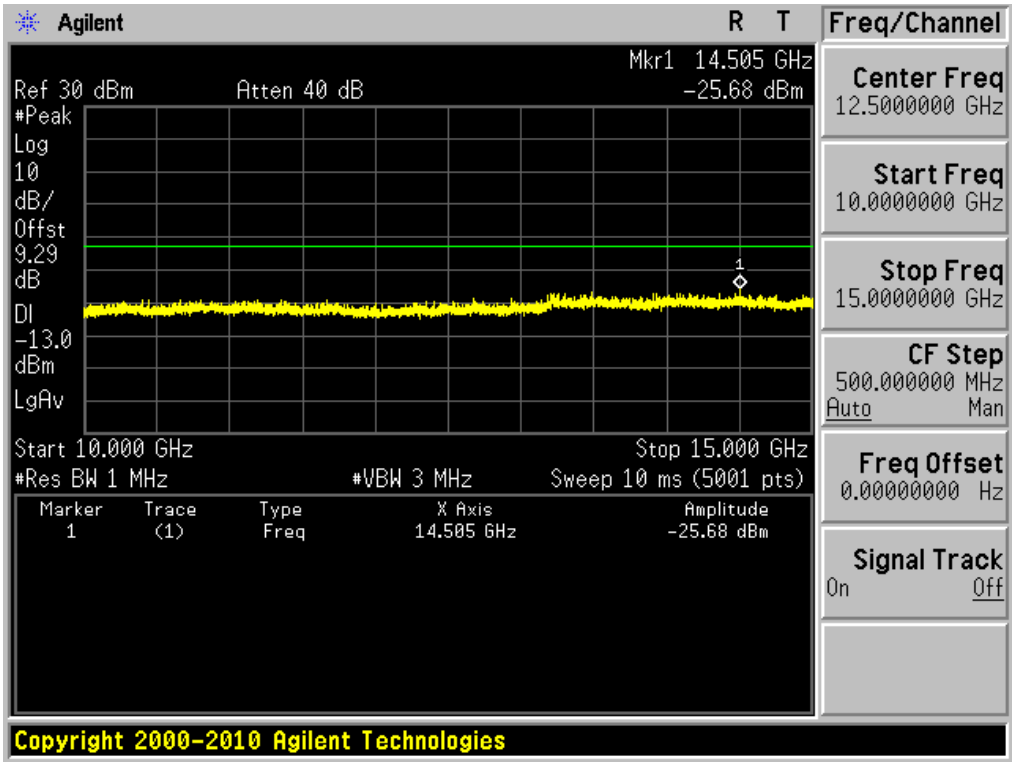

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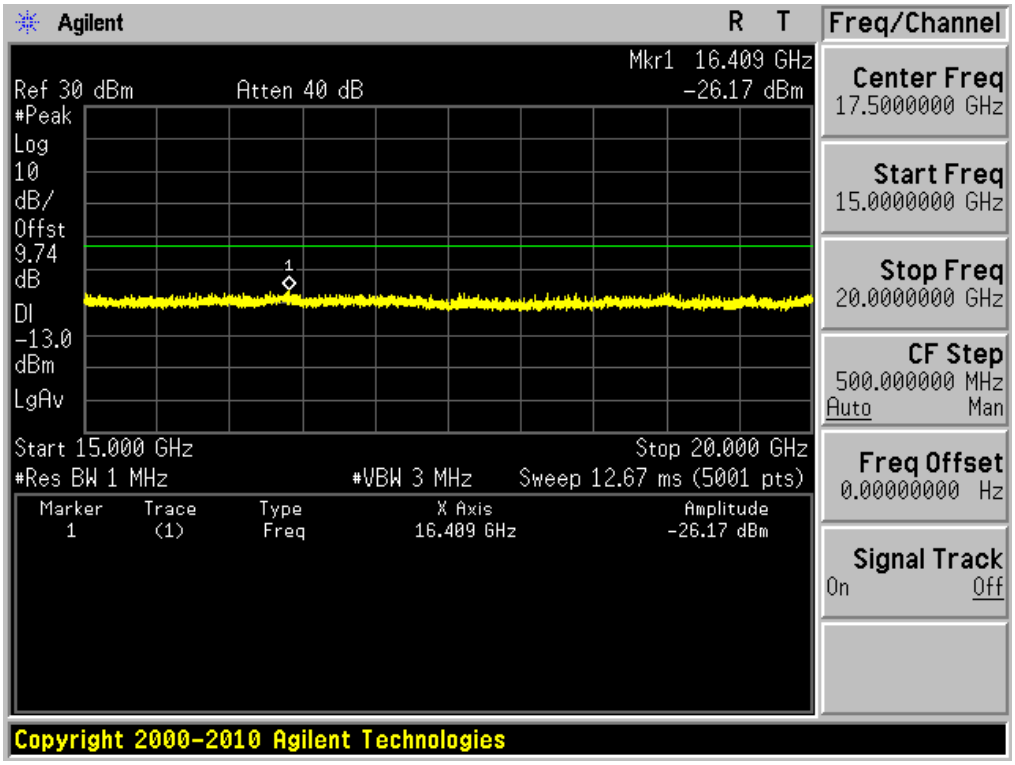

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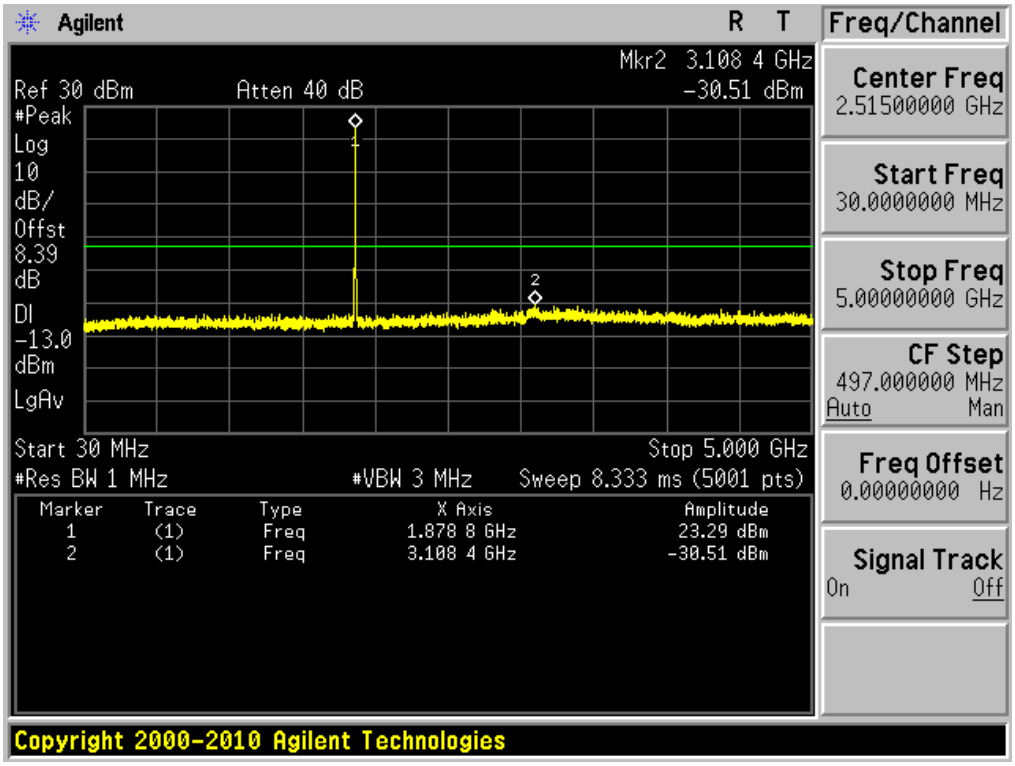

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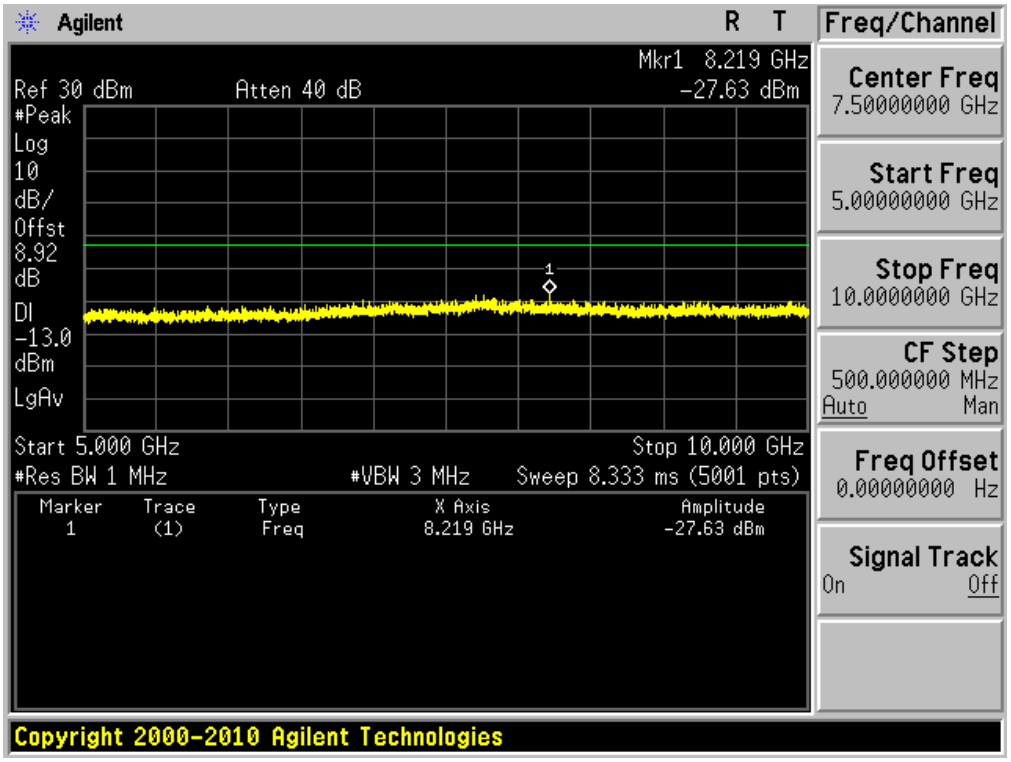

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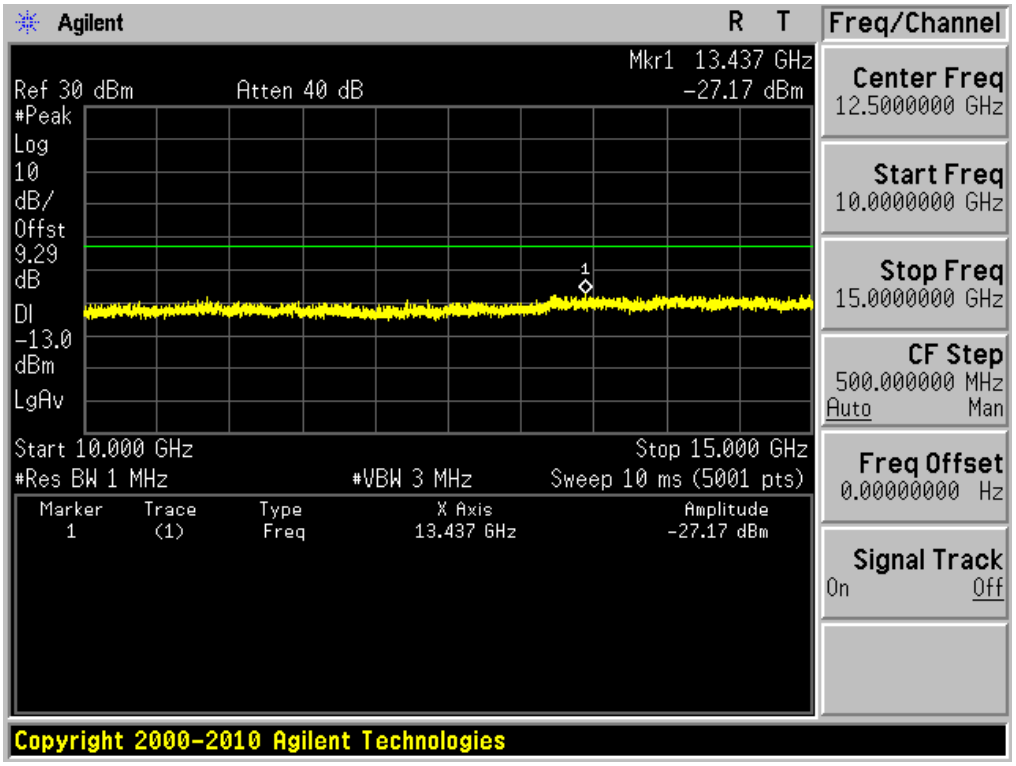

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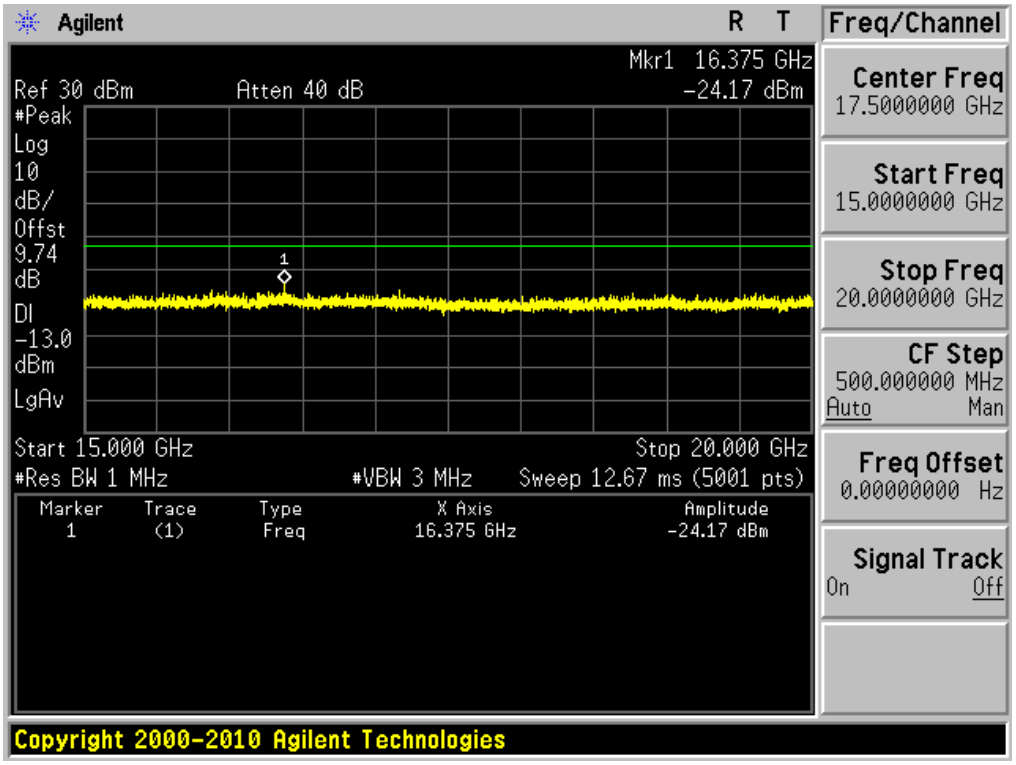

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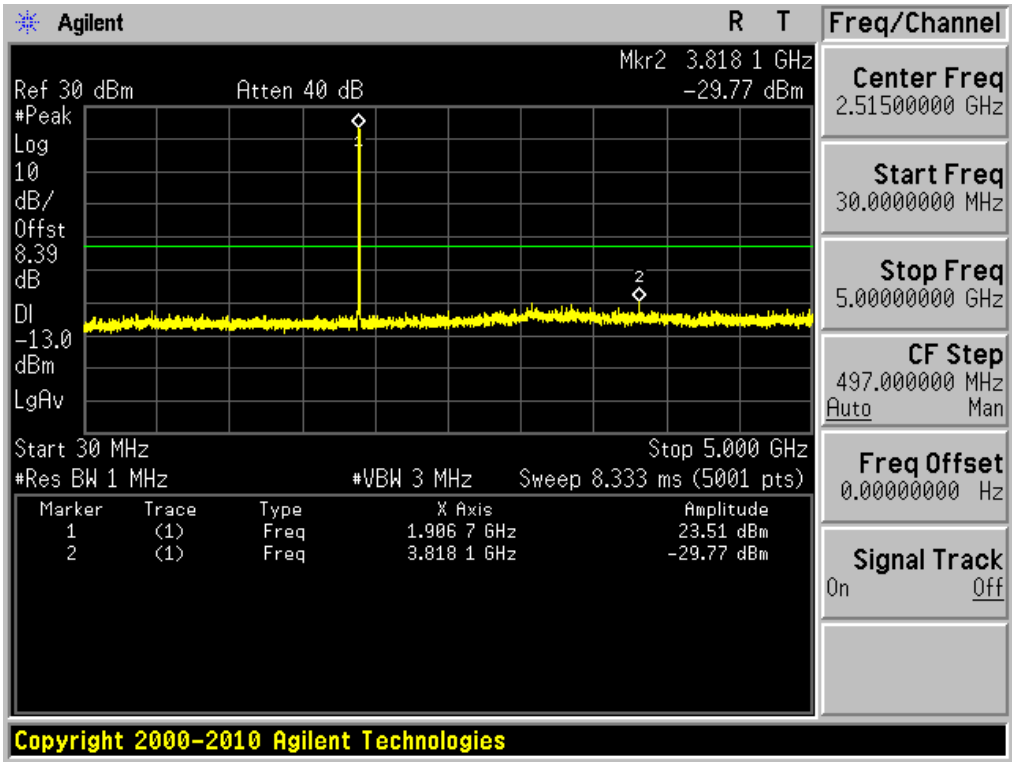

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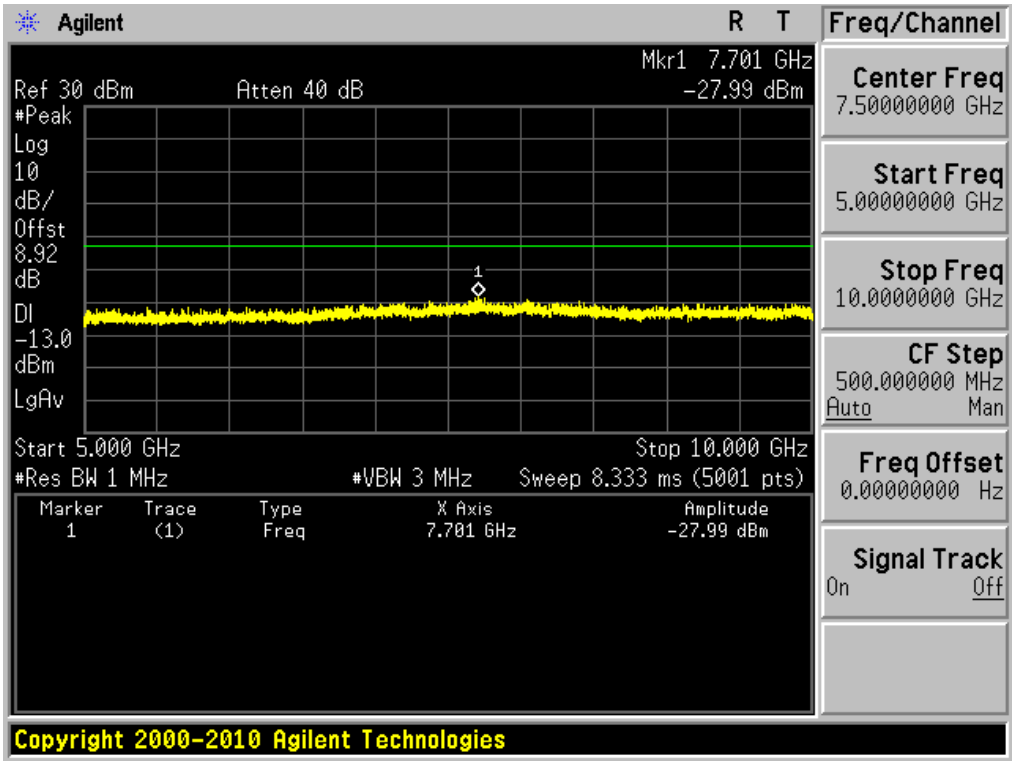

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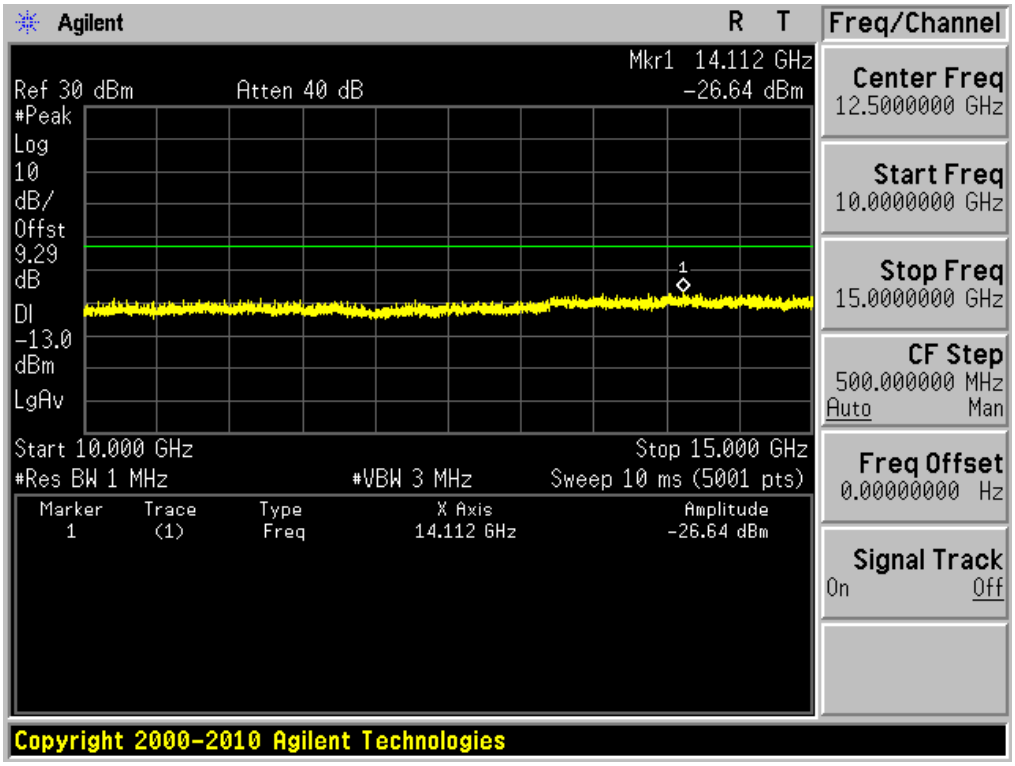

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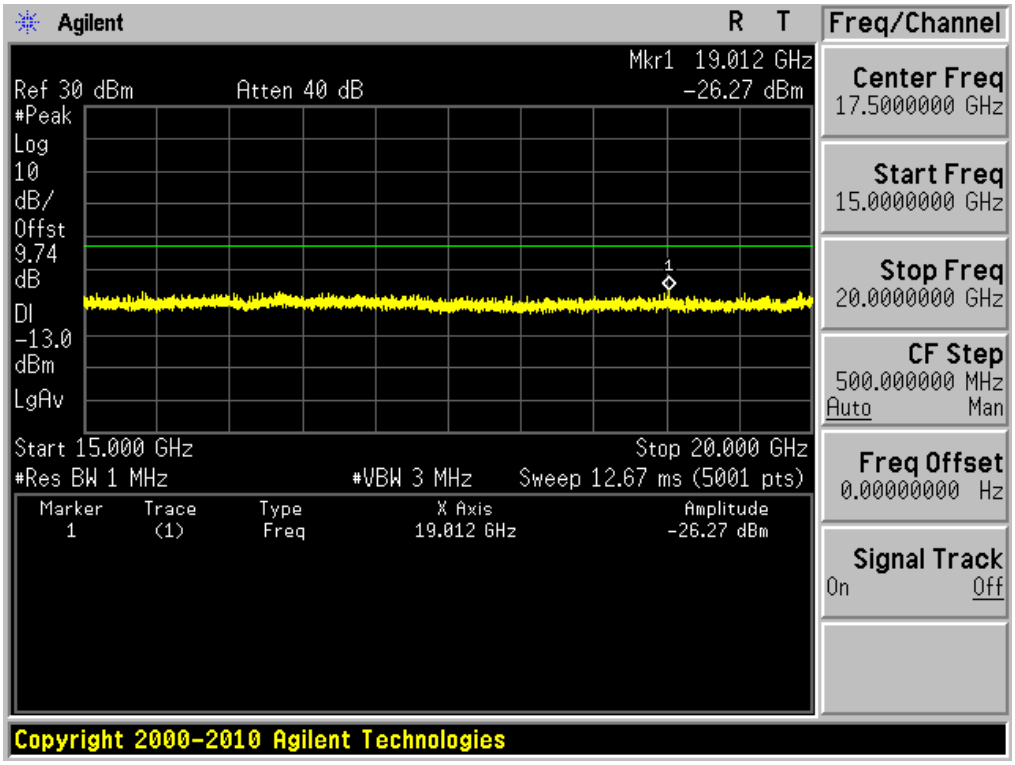
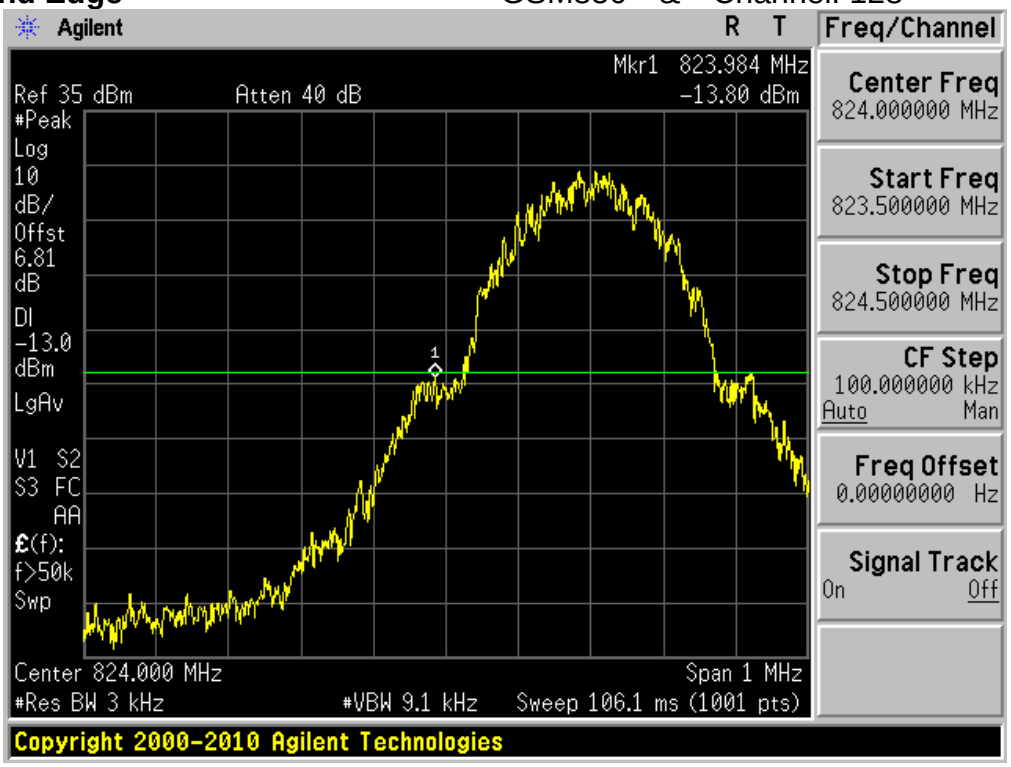
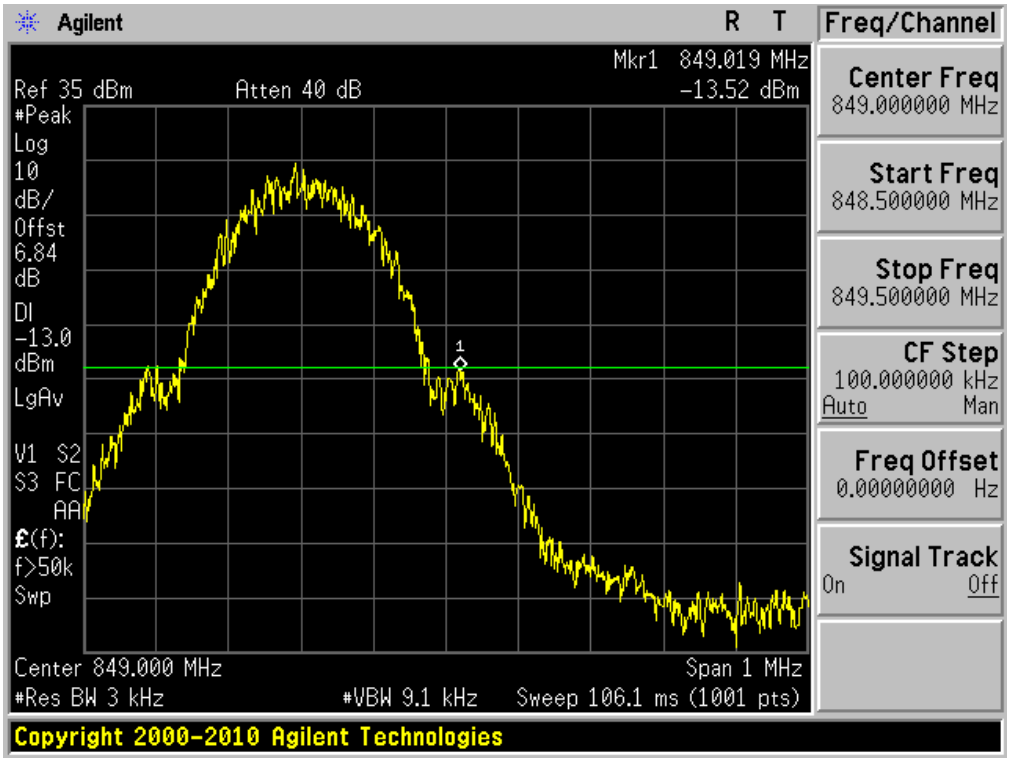


8.4 Band Edge

GSM850 & Channel: 128



GSM850 & Channel: 251



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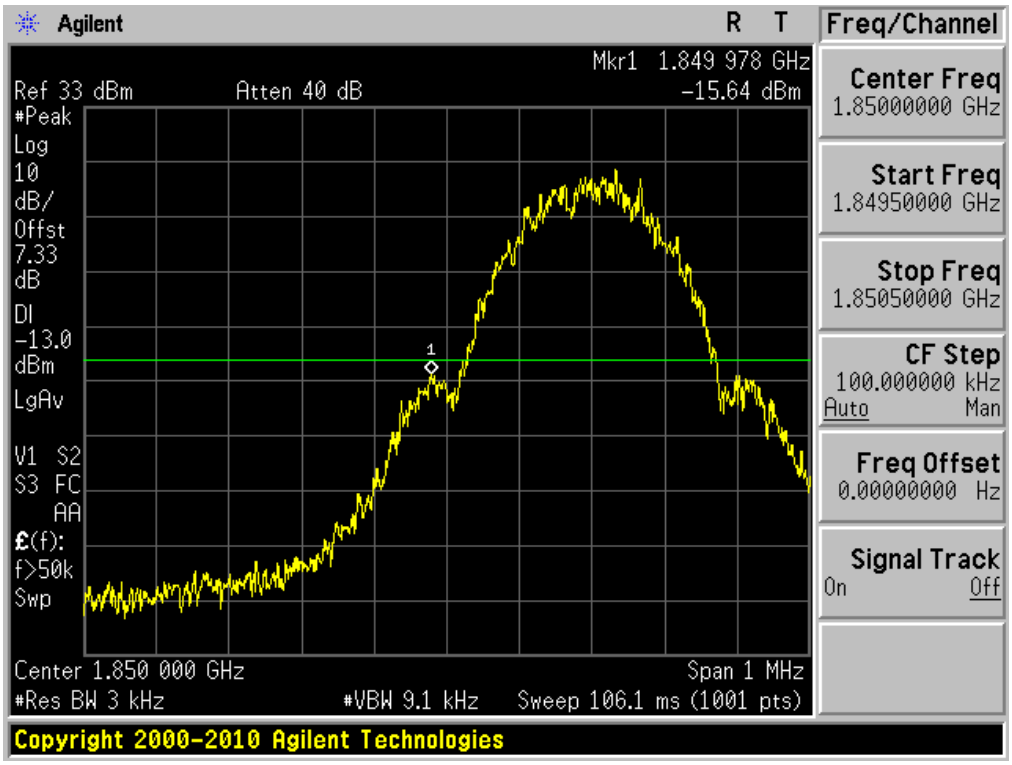
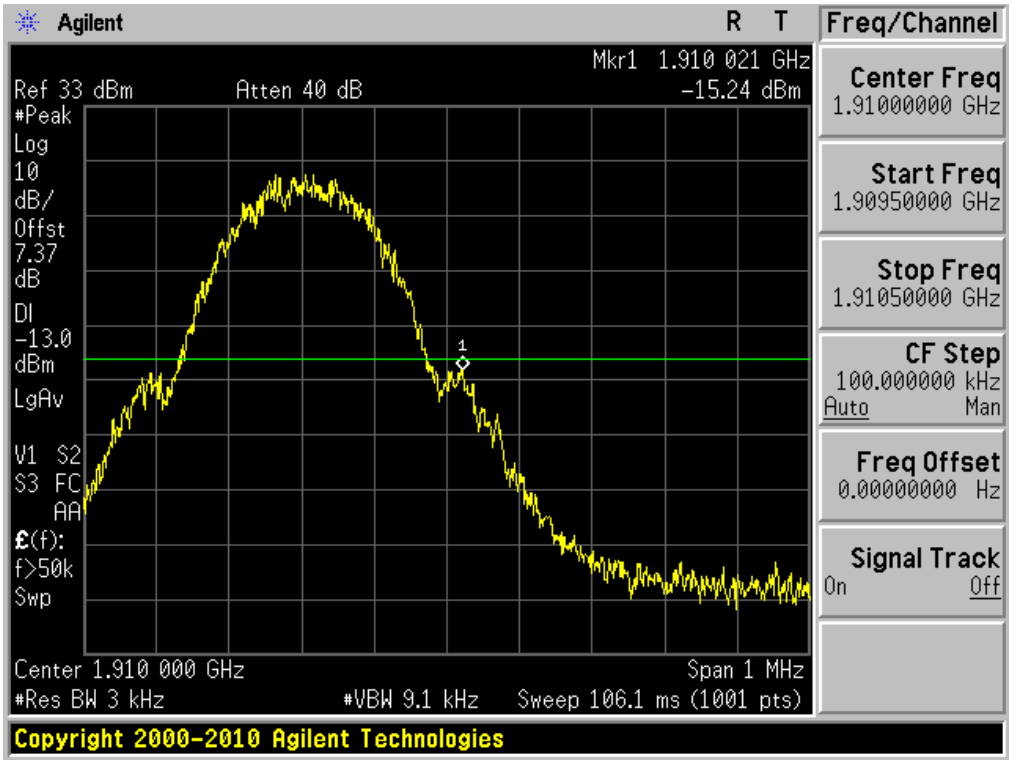


PCS1900 & Channel: 810



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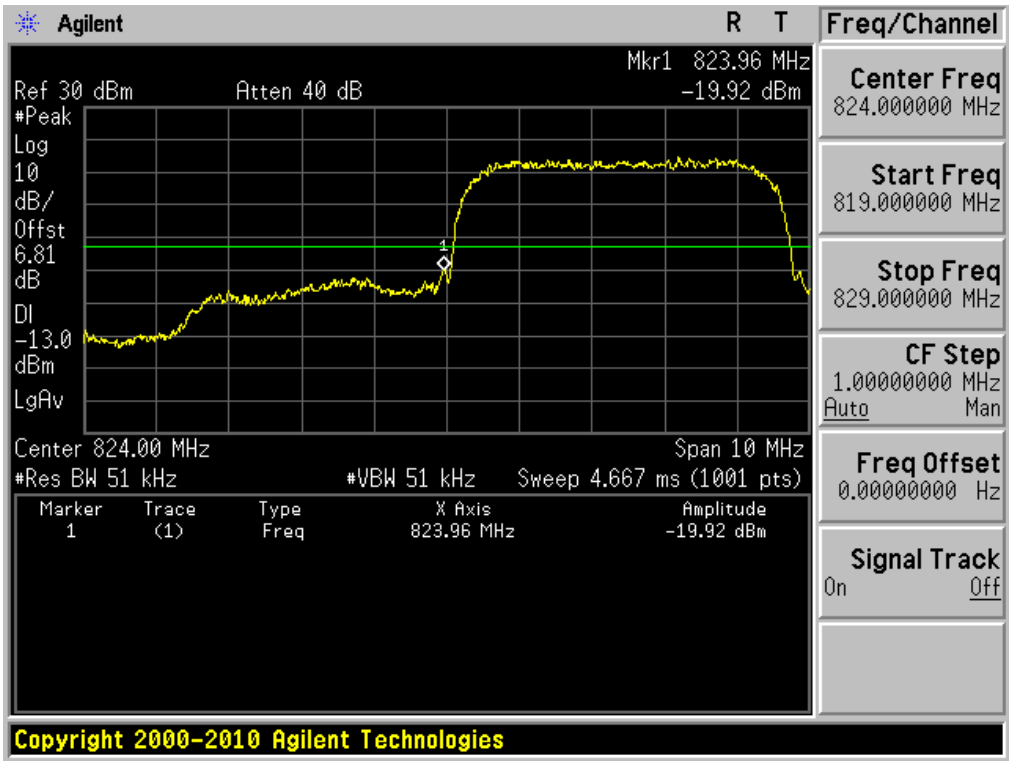
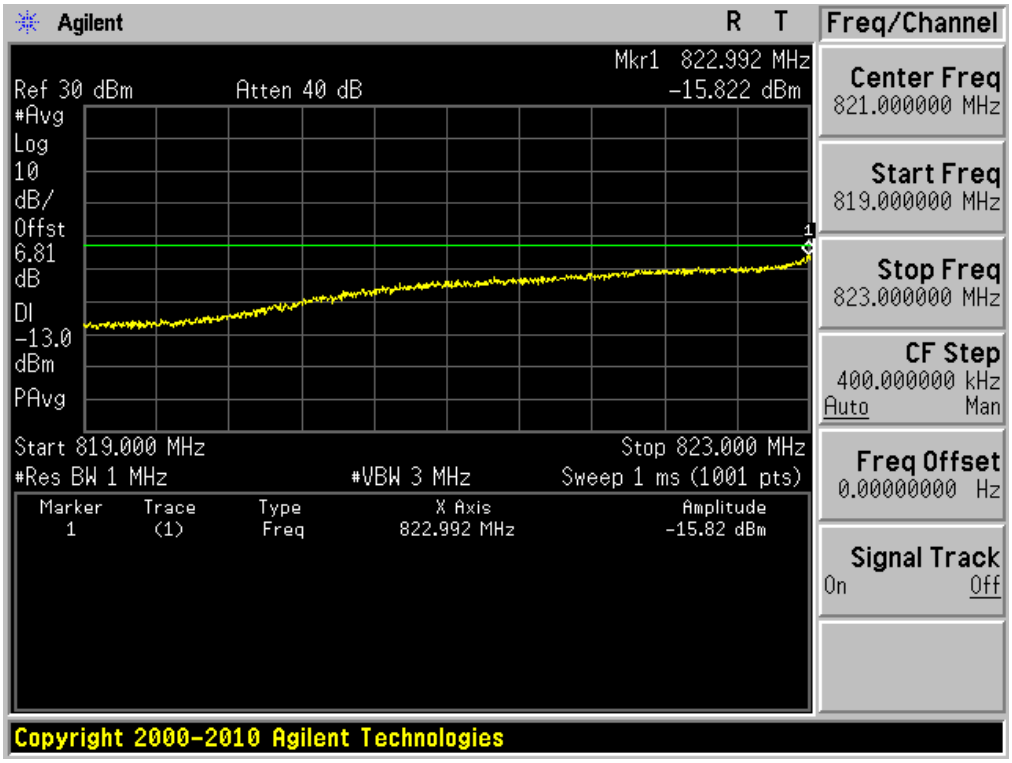
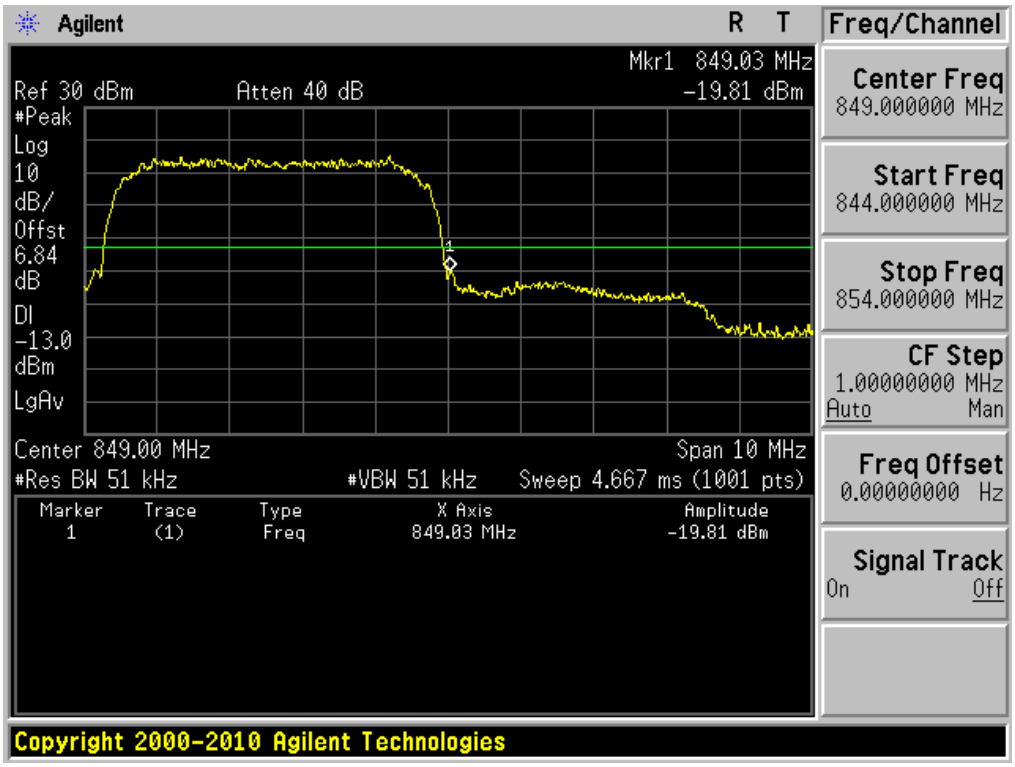
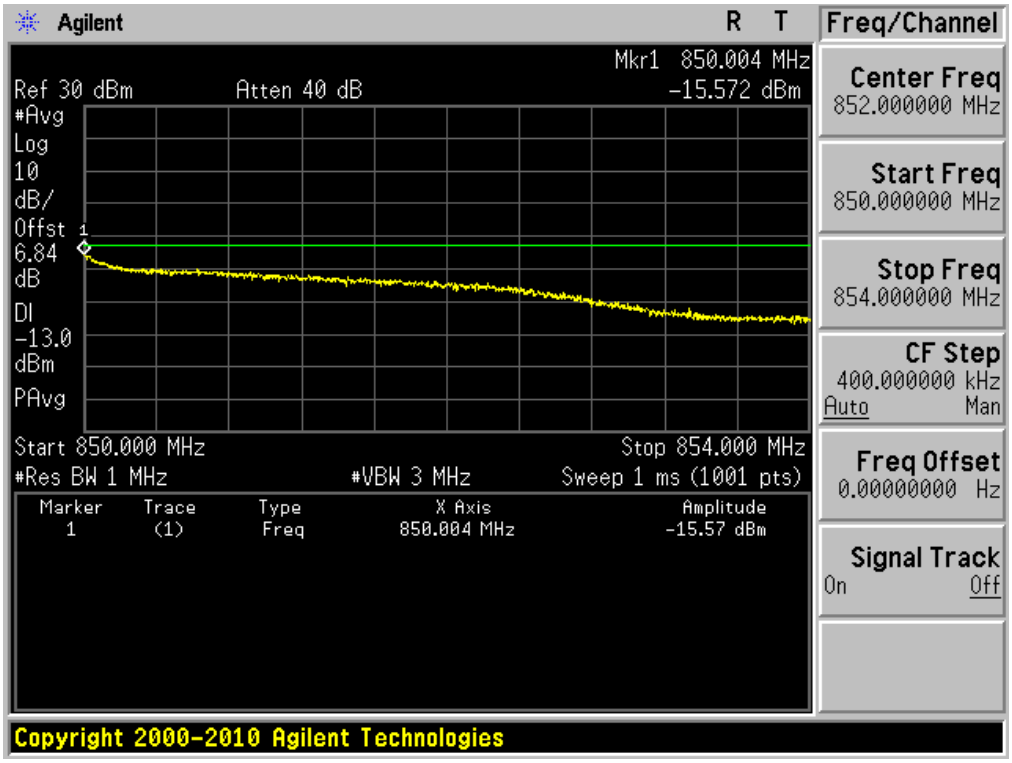




WCDMA850 & Channel: 4233





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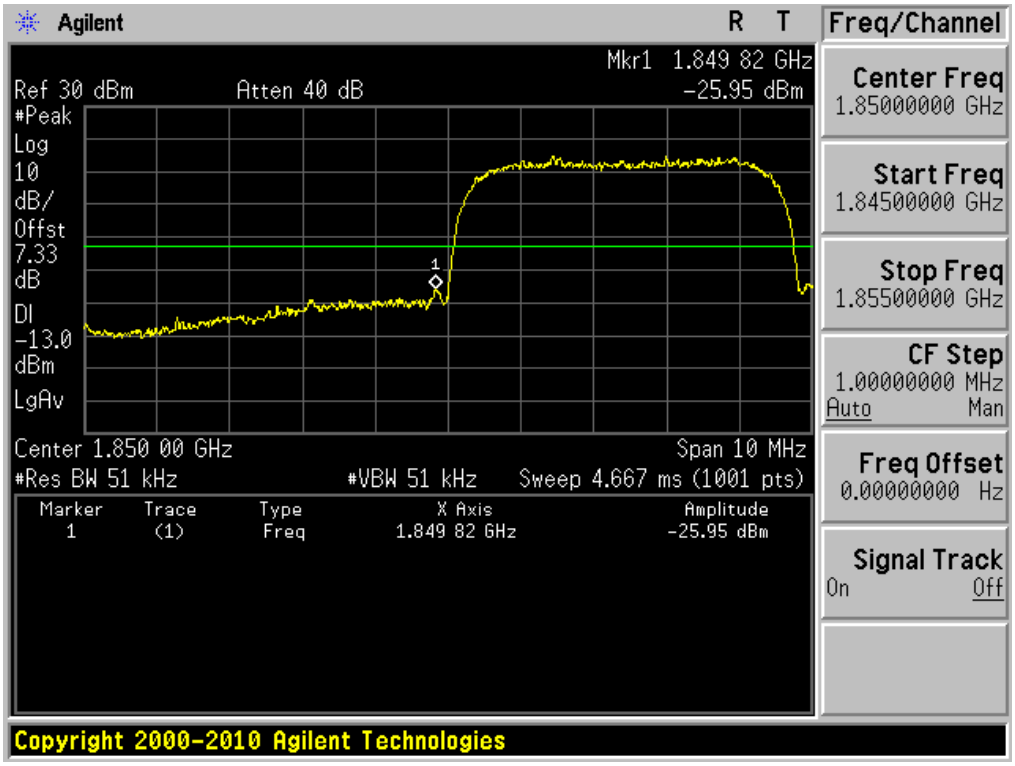

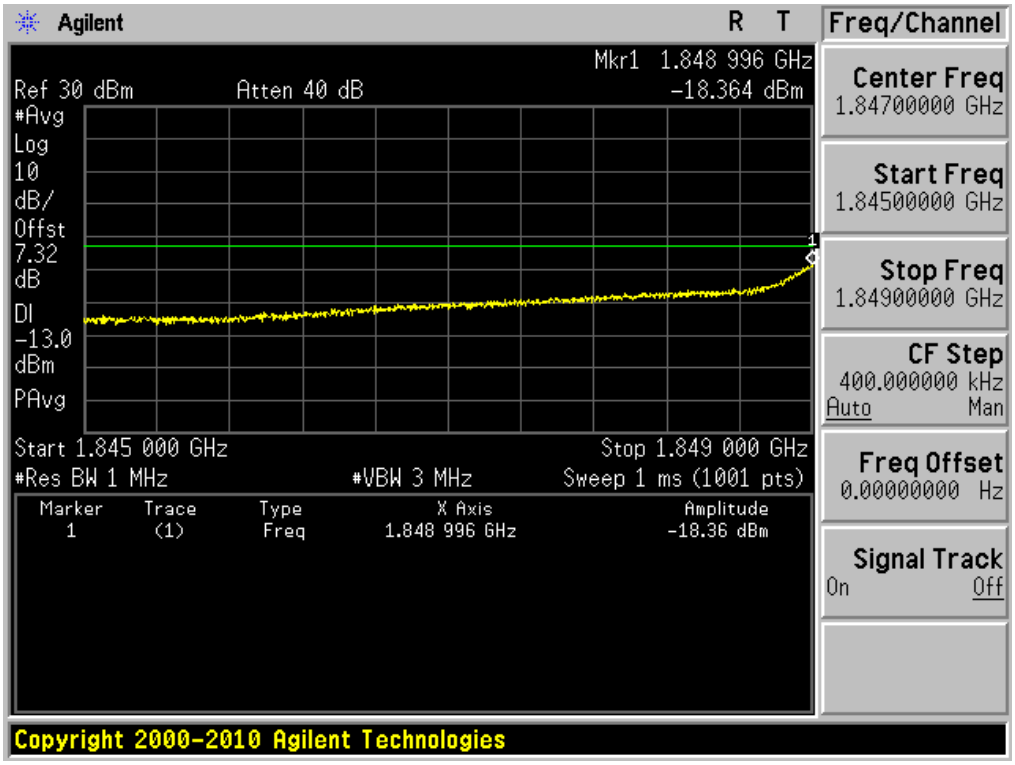

WCDMA1900 & Channel: 9538