RF TEST REPORT

Test item	:	Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSDPA/HSUPA Phone with Bluetooth, WLAN and NFC
Model No.	:	LG-E972, E972, LGE972
Order No.	:	DEMC1209-01843
Date of receipt	:	2012-09-18
Test duration	:	2012-10-08 ~ 2012-10-12
Date of issue	:	2012-10-15
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

The test results presented in this test report are limited only to the sample supplied by applicant and the use of this test report is inhibited other than its purpose. This test report shall not be reproduced except in full, without the written approval of DIGITAL EMC CO., LTD.

Tested by:	Witnessed by:	Reviewed by:
Enginee H.S.SON	N/A	Technical Director Harvey Sung

Test Report Version

Test Report No.	Date	Description
DRTFCC1210-0624	Oct. 15, 2012	Final version for approval

Copyright © 2012, Digital EMC Co., Ltd.

Table of Contents

1. GENERAL INFORMATION 5
2. INTRODUCTION 6
2.1. EUT DESCRIPTION 6
2.2. MEASURING INSTRUMENT CALIBRATION 6
2.3. TEST FACILITY 6
3. DESCRIPTION OF TESTS 7
3.1 ERP & EIRP 7
3.2 PEAK TO AVERAGE RATIO 8
3.3 OCCUPIED BANDWIDTH. 9
3.4 SPURIOUS AND HARMONIC EMISSIONS AT ANTENNA TERMINAL. 10
3.5 RADIATED SPURIOUS EMISSIONS 11
3.6 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE 12
4. LIST OF TEST EQUIPMENT 13
5. SUMMARY OF TEST RESULTS 14
6. SAMPLE CALCULATION 15
7. TEST DATA 16
7.1 CONDUCTED OUTPUT POWER 16
7.2 PEAK TO AVERAGE RATIO 18
7.3 OCCUPIED BANDWIDTH 18
7.4 SPURIOUS AND HARMONIC EMISSIONS AT ANTENNA TERMINAL 18
7.5 BAND EDGE 18
7.6 EFFECTIVE RADIATED POWER 19
7.7 EQUIVALENT ISOTROPIC RADIATED POWER 20
7.8 RADIATED SPURIOUS EMISSIONS 21
7.8.1 RADIATED SPURIOUS EMISSIONS (GSM850) 21
7.8.2 RADIATED SPURIOUS EMISSIONS (WCDMA850) 22
7.8.3 RADIATED SPURIOUS EMISSIONS (HSUPA850) 23
7.8.4 RADIATED SPURIOUS EMISSIONS (GSM1900) 24
7.8.5 RADIATED SPURIOUS EMISSIONS (WCDMA1900) 25
7.8.6 RADIATED SPURIOUS EMISSIONS (HSUPA1900) 26
7.9 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE 27
7.9.1 FREQUENCY STABILITY (GSM850) 27
7.9.2 FREQUENCY STABILITY (WCDMA850) 28
7.9.3 FREQUENCY STABILITY (HSUPA850) 29
7.9.4 FREQUENCY STABILITY (GSM1900) 30
7.9.5 FREQUENCY STABILITY (WCDMA1900) 31

Copyright © 2012, Digital EMC Co., Ltd.

7.9.6 FREQUENCY STABILITY (HSUPA1900) 32
8. TEST PLOTS 33
8.1 Peak to Average Ratio 33
8.2 Occupied Bandwidth 99 % Bandwidth 35
8.3 Spurious Emissions at Antenna Terminal 51
8.4 Band Edge 78

Copyright © 2012, Digital EMC Co., Ltd.

1. GENERAL INFORMATION

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

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

FCC ID	:	ZNFE972
FCC Classification	:	Licensed Portable Transmitter Held to Ear (PCE)
EUT Type	:	Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSDPA/HSUPA Phone with Bluetooth, WLAN and NFC
Model Name	:	LG-E972
Add Model Name	:	E972, LGE972
Supplying power	:	Standard Battery - Type: Li-Ion Polymer 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 WCDMA850: 826.4 ~ 846.6 MHz WCDMA1900: 1852.4 ~ 1907.6 MHz HSUPA850: 826.4 ~ 846.6 MHz HSUPA1900: 1852.4 ~ 1907.6 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 WCDMA850: 871.4 ~ 891.6 MHz WCDMA1900: 1932.4 ~ 1987.6 MHz HSUPA850: 871.4 ~ 891.6 MHz HSUPA1900: 1932.4 ~ 1987.6 MHz
Max. RF Output Power	:	GSM850: 1.629W ERP(32.12dBm) GSM1900: 1.462W EIRP(31.65dBm) EDGE850: 0.452W ERP(26.55dBm) EDGE1900: 0.671W EIRP(28.27dBm) WCDMA850: 0.256W ERP(24.09dBm) WCDMA1900: 0.230W EIRP(23.61dBm) HSUPA850: 0.294W ERP(24.69dBm) HSUPA1900: 0.269W EIRP(24.29dBm)
Emission Designator(s)	:	GSM850: 247KGXW GSM1900: 246KGXW EDGE850: 250KG7W EDGE1900: 246KG7W WCDMA850: 4M17F9W WCDMA1900: 4M21F9W HSUPA850: 4M17F9W HSUPA1900: 4M20F9W

Copyright © 2012, Digital EMC Co., Ltd.

2. INTRODUCTION

2.1. EUT DESCRIPTION

The Equipment Under Test(EUT) supports a dual band(Cellular/PCS) with GSM/GPRS/EDGE and WCDMA/HSPA, 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.

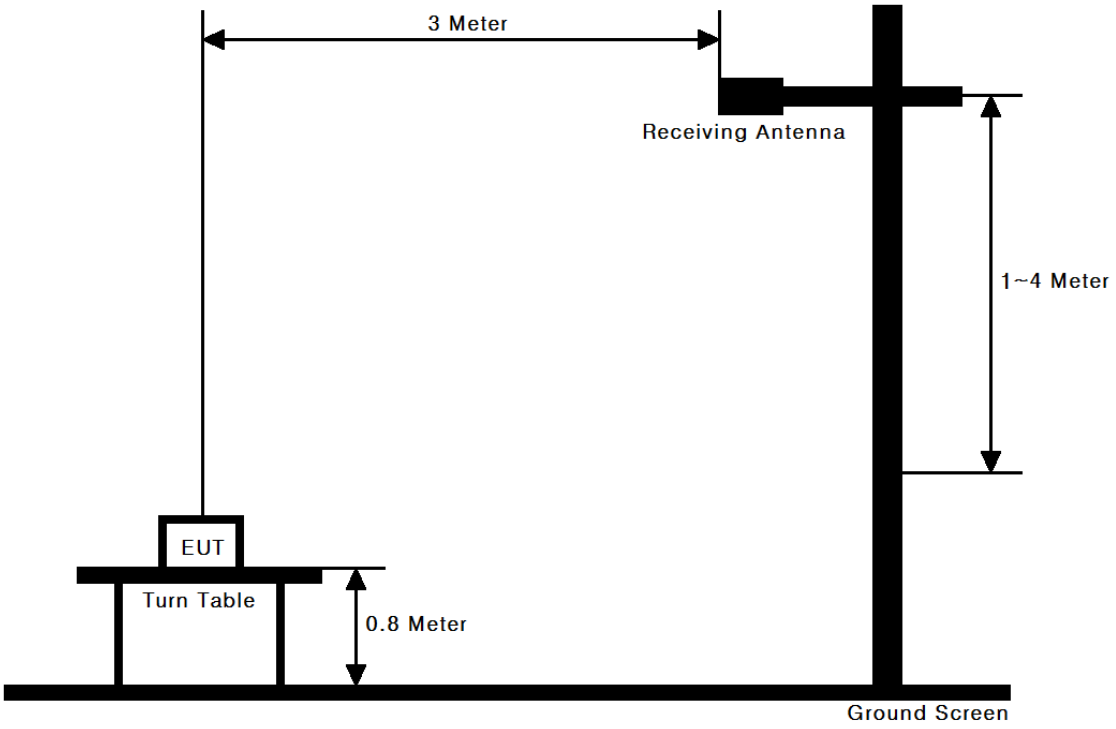
- 3&10M test site registration Number: 678747

Copyright ⓒ 2012, Digital EMC Co., Ltd.

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.

Copyright © 2012, Digital EMC Co., Ltd.

3.2 PEAK TO AVERAGE RATIO

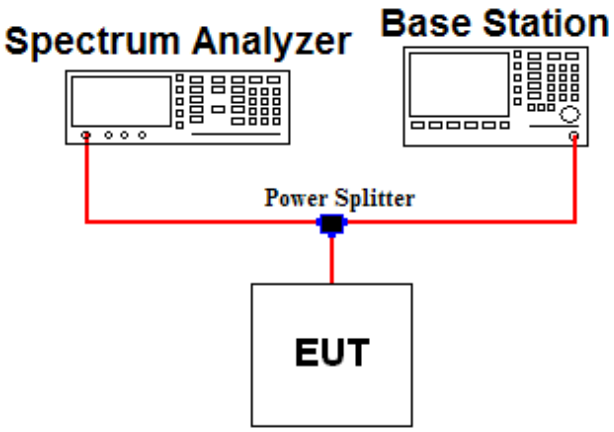
A peak to average ratio measurement is performed at the conducted port of the EUT. For CDMA and WCDMA signals, the spectrum analyzers Complementary Cumulative Distribution Function (CCDF) measurement profile is used to determine the largest deviation between the average and the peak power of the EUT 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.

Copyright © 2012, Digital EMC Co., Ltd.

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

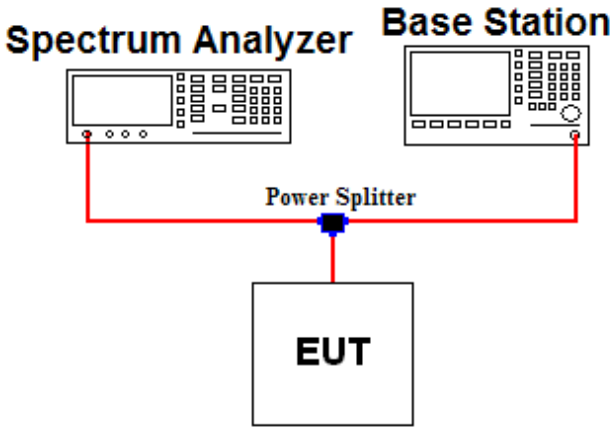
Test Procedure

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 least 26 dB below the transmitter power. Plots of the EUT's occupied bandwidth are shown herein.

Copyright © 2012, Digital EMC Co., Ltd.

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.

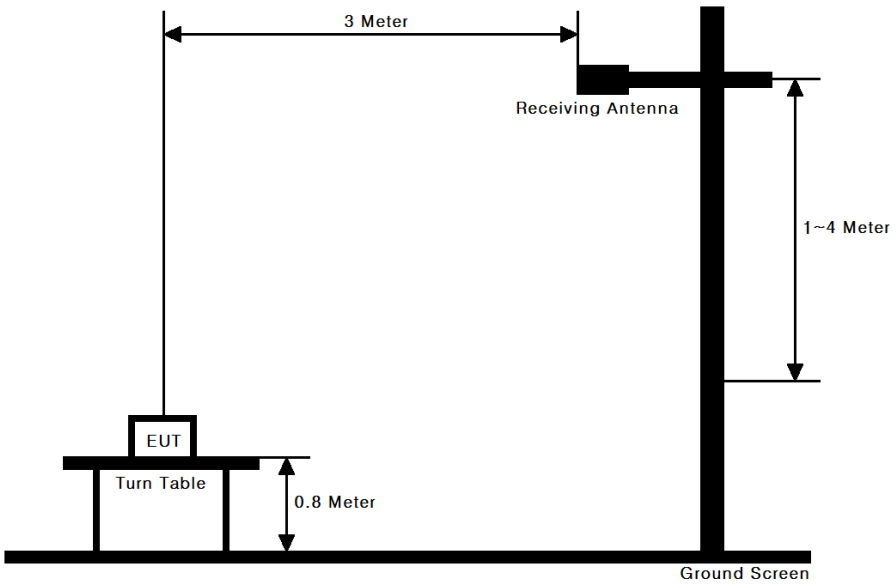
Band Edge Requirement

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

Copyright © 2012, Digital EMC Co., Ltd.

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.

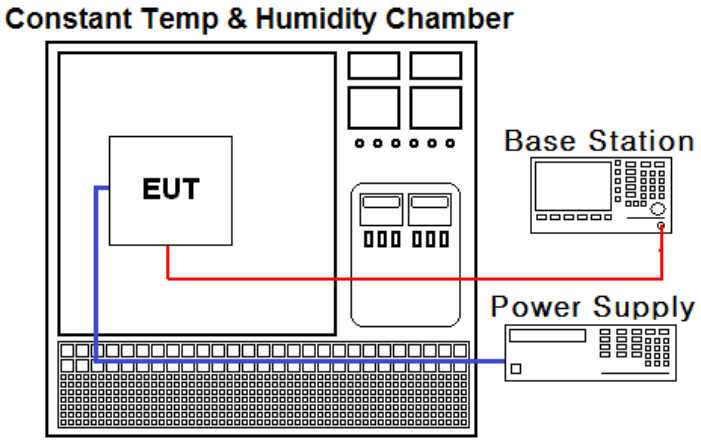
For radiated power measurements above 1GHz, a Horn antenna was substituted in place of the EUT. This Horn antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same spectrum analyzer reading. The difference between the gain of the horn and an isotropic antenna are taken into consideration.

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

Copyright © 2012, Digital EMC Co., Ltd.

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.

Copyright © 2012, Digital EMC Co., Ltd.

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	12/09/18	13/09/18	MY45304199
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	12/09/17	13/09/17	30604493/021031
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	12/09/18	13/09/18	1020
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	12/09/17	13/09/17	Y2342
Attenuator (10dB)	WEINSCHEL	23-10-34	12/09/17	13/09/17	BP4386
Power Splitter	Anritsu	K241B	12/09/17	13/09/17	020611
High-Pass Filter	Wainwright	WHKX1.0	12/09/17	13/09/17	9
High-Pass Filter	Wainwright	WHNX2.1	12/09/17	13/09/17	1
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

Copyright © 2012, Digital EMC Co., Ltd.

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

Copyright © 2012, Digital EMC Co., Ltd.

6. SAMPLE CALCULATION

A. Emission Designator

GSM850 Emission Designator

Emission Designator = **247KGXW**
GSM OBW = 247.1075kHz
(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 = 246.4504kHz
(Measured at the 99.75% power bandwidth)
G = Phase Modulation
X = Cases not otherwise covered
W = Combination (Audio/Data)

EDGE850 Emission Designator

Emission Designator = **250KG7W**
GSM OBW = 250.2182 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 = **246KG7W**
GSM OBW = 246.3845 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)

WCDMA850 Emission Designator

Emission Designator = **4M17F9W**
WCDMA OBW = 4.1732MHz
(Measured at the 99.75% power bandwidth)
F = Frequency Modulation
9 = Composite Digital Information
W = Combination (Audio/Data)

WCDMA1900 Emission Designator

Emission Designator = **4M21F9W**
WCDMA OBW = 4.2119MHz
(Measured at the 99.75% power bandwidth)
F = Frequency Modulation
9 = Composite Digital Information
W = Combination (Audio/Data)

HSUPA850 Emission Designator

Emission Designator = **4M17F9W**
HSUPA OBW = 4.1714MHz
(Measured at the 99.75% power bandwidth)
F = Frequency Modulation
9 = Composite Digital Information
W = Combination (Audio/Data)

HSUPA1900 Emission Designator

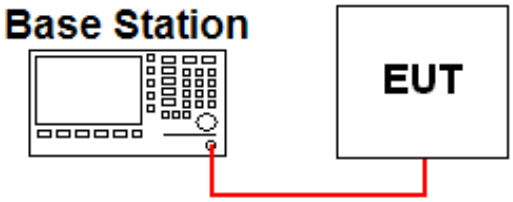
Emission Designator = **4M20F9W**
HSUPA OBW = 4.2026MHz
(Measured at the 99.75% power bandwidth)
F = Frequency Modulation
9 = Composite Digital Information
W = Combination (Audio/Data)

Copyright © 2012, Digital EMC Co., Ltd.

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	33.0	33.0	31.4	29.5	27.5	27.5	25.5	23.2	21.5
	190	33.0	33.0	31.3	29.5	27.5	27.3	25.3	23.2	21.3
	251	32.5	32.5	31.2	29.1	27.2	27.1	25.3	23.0	21.3
PCS	512	29.9	29.9	28.3	28.3	26.2	26.5	24.5	22.3	22.3
	661	30.0	30.0	28.4	28.4	26.3	26.4	24.5	22.2	22.2
	810	30.0	30.0	28.4	28.5	26.3	26.2	24.5	22.2	22.2

The output power was measured using the Agilent E5515C

Copyright © 2012, Digital EMC Co., Ltd.

▪ 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	23.00	23.00	22.95	-	-	-	-	-
		ARM	22.96	22.97	22.91					
5	HSDPA (Cellular)		22.95	22.95	22.88	0	2/15	15/15	2/15	1
5			22.93	22.94	22.85	0	12/15	15/15	12/15	2
5			22.41	22.39	22.34	0.5	15/15	8/15	15/8	3
5			22.40	22.40	22.31	0.5	15/15	4/15	15/4	4
-	Channel		9262	9400	9538	-	-	-	-	-
99	WCDMA	RMC	22.97	22.99	22.70	-	-	-	-	-
		ARM	22.95	22.96	22.64					
5	HSDPA (PCS)		22.92	22.94	22.61	0	2/15	15/15	2/15	1
5			22.89	22.90	22.57	0	12/15	15/15	12/15	2
5			22.34	22.35	22.18	0.5	15/15	8/15	15/8	3
5			22.31	22.32	22.18	0.5	15/15	4/15	15/4	4

The output power was measured using the Agilent E5515C

▪ HSUPA

3GPP Release Version	Mode	Power (dBm)			MPR	Bc	βd	Bc/βd	Sub-Test
	Channel	4132	4183	4233					
6	HSUPA (Cellular)	22.94	22.96	22.91	0	11/15	15/15	11/15	1
6		20.98	20.97	20.78	2	6/15	15/15	6/15	2
6		21.84	21.88	21.79	1	15/15	9/15	15/9	3
6		20.95	20.91	20.74	2	2/15	15/15	2/15	4
6		22.91	22.92	22.87	0	15/15	15/15	15/15	5
-	Channel	9262	9400	9538	-	-	-	-	-
6	HSUPA (PCS)	22.89	22.91	22.77	0	11/15	15/15	11/15	1
6		20.15	20.17	19.89	2	6/15	15/15	6/15	2
6		21.35	21.44	21.30	1	15/15	9/15	15/9	3
6		20.10	20.08	19.77	2	2/15	15/15	2/15	4
6		22.84	22.89	22.75	0	15/15	15/15	15/15	5

The power was measured E5515C

Copyright © 2012, Digital EMC Co., Ltd.

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	246.2653
	190	243.0083
	251	***247.1075***
GSM1900	512	243.8404
	661	***246.4504***
	810	242.3658
EDGE850	128	245.3780
	190	245.0367
	251	***250.2182***
EDGE1900	512	243.1765
	661	245.0484
	810	***246.3845***
WCDMA850	4132	4129.4
	4183	***4173.2***
	4233	4156.2
WCDMA1900	9262	4166.9
	9400	4207.4
	9538	***4211.9***
HSUPA850	4132	4143.7
	4183	4150.4
	4233	***4171.4***
HSUPA1900	9262	4178.8
	9400	4193.7
	9538	***4202.6***

- 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

Copyright © 2012, Digital EMC Co., Ltd.

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	Z	-3.60	H	29.11	1.20	30.31	1.074	DC 3.8V	GSM
190	***Z***	***-3.03***	***H***	***30.97***	***1.15***	***32.12***	***1.629***	***DC 3.8V***	***GSM***
251	Z	-2.62	H	30.98	1.05	32.03	1.596	DC 3.8V	GSM
190	Z	-8.60	H	25.40	1.15	26.55	0.452	DC 3.8V	EDGE

- 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	Z	-10.94	H	22.00	1.19	23.19	0.208	DC 3.8V	-
4183	***Z***	***-11.32***	***H***	***22.94***	***1.15***	***24.09***	***0.256***	***DC 3.8V***	***-***
4233	Z	-11.92	H	22.52	1.10	23.62	0.230	DC 3.8V	-

- HSUPA850 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	Z	-10.86	H	22.08	1.19	23.27	0.212	DC 3.8V	-
4183	Z	-11.91	H	22.35	1.15	23.50	0.224	DC 3.8V	-
4233	***Z***	***-10.85***	***H***	***23.59***	***1.10***	***24.69***	***0.294***	***DC 3.8V***	***-***

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.

Copyright © 2012, Digital EMC Co., Ltd.

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	***Z***	***-8.74***	***V***	***23.06***	***8.59***	***31.65***	***1.462***	***DC 3.8V***	***GSM***
661	Z	-8.33	V	22.84	8.68	31.52	1.419	DC 3.8V	GSM
810	Z	-9.03	V	21.99	8.77	30.76	1.191	DC 3.8V	GSM
512	Z	-12.12	V	19.68	8.59	28.27	0.671	DC 3.8V	EDGE

- 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.
9262	***Z***	***-14.69***	***V***	***15.02***	***8.59***	***23.61***	***0.230***	***DC 3.8V***	***-***
9400	Z	-15.84	V	14.26	8.68	22.94	0.197	DC 3.8V	-
9538	Z	-14.92	V	14.73	8.77	23.50	0.224	DC 3.8V	-

- HSUPA1900 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.
9262	Z	-15.02	V	14.69	8.59	23.28	0.213	DC 3.8V	-
9400	Z	-15.72	V	14.38	8.68	23.06	0.202	DC 3.8V	-
9538	***Z***	***-14.13***	***V***	***15.52***	***8.77***	***24.29***	***0.269***	***DC 3.8V***	***-***

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.

Copyright © 2012, Digital EMC Co., Ltd.

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 (1.074W)	1648.79	Z	V	-48.88	5.48	-43.40	73.71	43.31
	2472.60	Z	V	-58.19	6.89	-51.30	81.61	
	3297.03	Y	H	-53.33	7.68	-45.65	75.96	
	-	-	-	-	-	-	-	
190 (1.629W)	1673.19	Z	V	-46.05	5.53	-40.52	72.64	45.12
	2509.29	Z	V	-59.21	6.94	-52.27	84.39	
	3346.93	Y	H	-52.13	7.69	-44.44	76.56	
	-	-	-	-	-	-	-	
251 (1.596W)	1697.50	Z	V	-43.45	5.59	-37.86	69.89	45.03
	2546.61	Z	V	-52.38	7.00	-45.38	77.41	
	3395.64	Y	H	-50.40	7.70	-42.70	74.73	
	-	-	-	-	-	-	-	

- 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.

Copyright © 2012, Digital EMC Co., Ltd.

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)	(dBc)	Limit (dBc)
4132 (0.208W)	1653.12	Z	V	-56.80	5.49	-51.31	74.50	36.19
	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	
4183 (0.256W)	1673.72	Z	V	-54.12	5.54	-48.58	72.67	37.09
	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	
4233 (0.230W)	1694.26	Z	V	-52.92	5.58	-47.34	70.96	36.62
	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	

- 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.
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.

Copyright © 2012, Digital EMC Co., Ltd.

7.8.3 RADIATED SPURIOUS EMISSIONS (HSUPA850)

Channel (ERP)	Freq. (MHz)	EUT Position (Axis)	POL (H/V)	LEVEL@ ANTENNA TERMINAL (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	CORRECT GENERATOR LEVEL (dBm)	(dBc)	Limit (dBc)
4132 (0.212W)	1652.35	Z	V	-56.01	5.49	-50.52	73.79	36.27
	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	
4183 (0.224W)	1674.31	Z	V	-53.71	5.54	-48.17	71.67	36.50
	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	
4233 (0.294W)	1694.28	Z	V	-52.89	5.58	-47.31	72.00	37.69
	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	

- 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.
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.

Copyright © 2012, Digital EMC Co., Ltd.

7.8.4 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)	(dBc)	Limit (dBc)
512 (1.462W)	3700.06	Z	V	-48.07	9.67	-38.40	70.05	44.65
	9251.31	Z	H	-37.03	11.44	-25.59	57.24	
	-	-	-	-	-	-	-	
661 (1.419W)	3759.76	Z	V	-49.64	9.68	-39.96	71.48	44.52
	9400.30	Z	H	-37.45	11.61	-25.84	57.36	
	-	-	-	-	-	-	-	
810 (1.191W)	3819.76	Z	V	-47.12	9.68	-37.44	68.20	43.76
	9549.22	Z	H	-35.96	11.78	-24.18	54.94	
	-	-	-	-	-	-	-	

- 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.

Copyright © 2012, Digital EMC Co., Ltd.

7.8.5 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)	(dBc)	Limit (dBc)
9262 (0.230W)	3706.38	Y	H	-39.96	9.90	-30.06	53.67	36.61
	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	
9400 (0.197W)	3762.32	Y	H	-38.81	9.90	-28.91	51.85	35.94
	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	
9538 (0.224W)	3817.25	Y	H	-37.13	9.91	-27.22	50.72	36.50
	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	

- 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.
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.

Copyright © 2012, Digital EMC Co., Ltd.

7.8.6 RADIATED SPURIOUS EMISSIONS (HSUPA1900)

Channel (ERP)	Freq. (MHz)	EUT Position (Axis)	POL (H/V)	LEVEL@ ANTENNA TERMINAL (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	CORRECT GENERATOR LEVEL (dBm)	(dBc)	Limit (dBc)
9262 (0.213W)	3702.84	Y	H	-40.83	9.90	-30.93	54.21	36.28
	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	
9400 (0.202W)	3758.81	Y	H	-39.30	9.90	-29.40	52.46	36.06
	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	
9538 (0.269W)	3816.05	Y	H	-38.57	9.91	-28.66	52.95	37.29
	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	

- 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.
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.

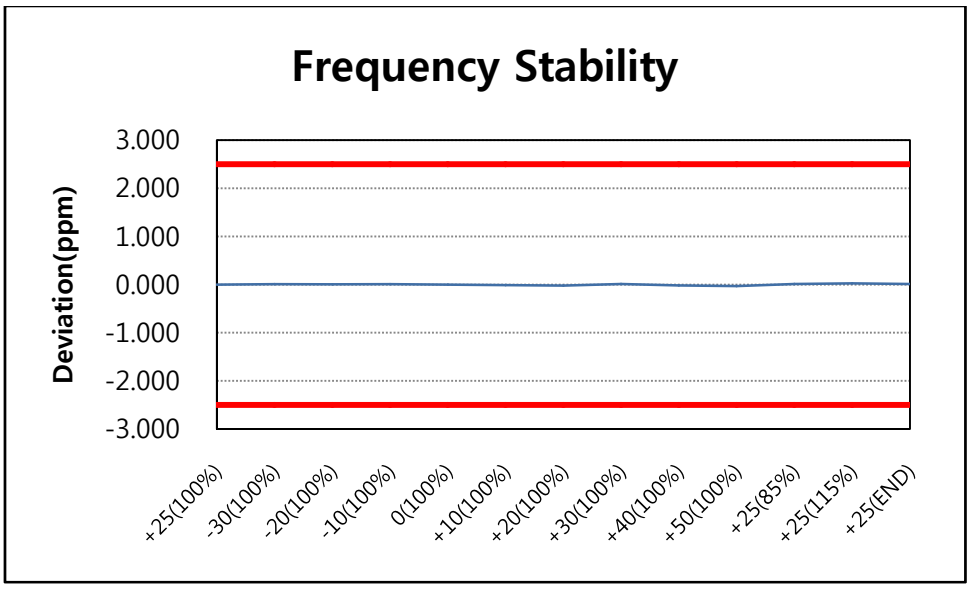
Copyright © 2012, Digital EMC Co., Ltd.

7.9 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

7.9.1 FREQUENCY STABILITY (GSM850)

OPERATING FREQUENCY : 836,599,967 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)	836,599,967	0.000	0.00000000
100%		-30	836,599,976	0.011	0.00000108
100%		-20	836,599,971	0.005	0.00000048
100%		-10	836,599,976	0.011	0.00000108
100%		0	836,599,968	0.001	0.00000012
100%		+10	836,599,957	-0.012	-0.00000120
100%		+20	836,599,949	-0.022	-0.00000215
100%		+30	836,599,978	0.013	0.00000131
100%		+40	836,599,954	-0.016	-0.00000155
100%		+50	836,599,943	-0.029	-0.00000287
85%	3.23	+25	836,599,977	0.012	0.00000120
115%	4.37	+25	836,599,990	0.027	0.00000275
BATT.ENDPOINT	3.20	+25	836,599,979	0.014	0.00000143

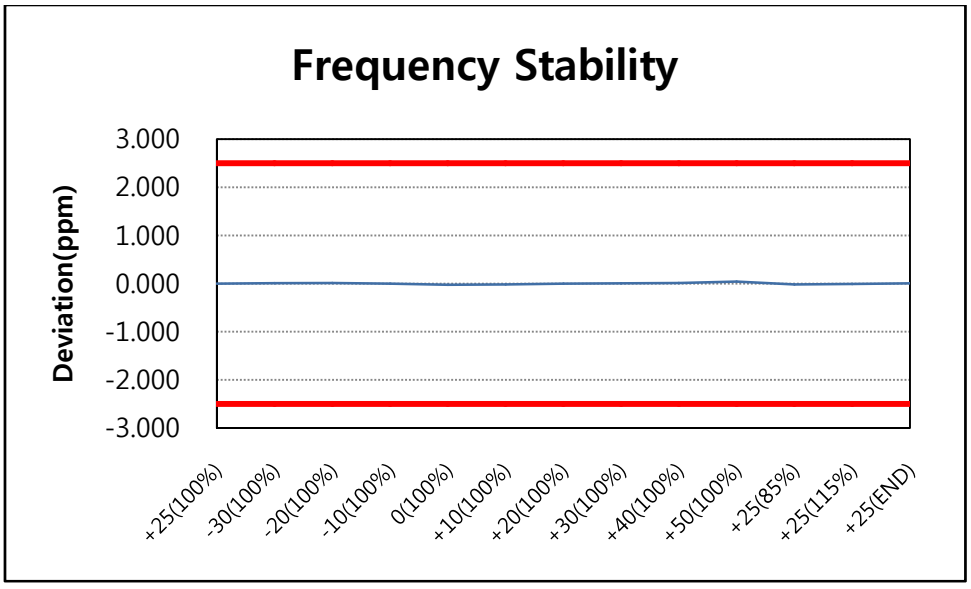


Copyright © 2012, Digital EMC Co., Ltd.

7.9.2 FREQUENCY STABILITY (WCDMA850)

OPERATING FREQUENCY : 836,599,980 Hz
CHANNEL : 4183(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)	836,599,980	0.000	0.00000000
100%		-30	836,599,989	0.011	0.00000108
100%		-20	836,599,992	0.014	0.00000143
100%		-10	836,599,981	0.001	0.00000012
100%		0	836,599,959	-0.025	-0.00000251
100%		+10	836,599,967	-0.016	-0.00000155
100%		+20	836,599,979	-0.001	-0.00000012
100%		+30	836,599,986	0.007	0.00000072
100%		+40	836,599,991	0.013	0.00000131
100%		+50	836,600,015	0.042	0.00000418
85%	3.23	+25	836,599,967	-0.016	-0.00000155
115%	4.37	+25	836,599,973	-0.008	-0.00000084
BATT.ENDPOINT	3.20	+25	836,599,984	0.005	0.00000048

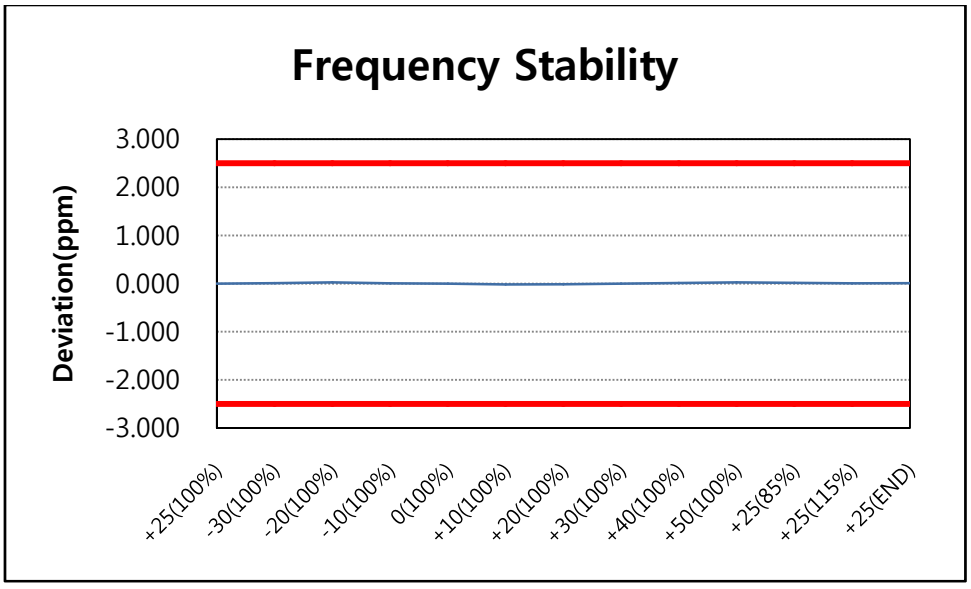


Copyright © 2012, Digital EMC Co., Ltd.

7.9.3 FREQUENCY STABILITY (HSUPA850)

OPERATING FREQUENCY : 836,599,972 Hz
CHANNEL : 4183(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)	836,599,972	0.000	0.00000000
100%		-30	836,599,981	0.011	0.00000108
100%		-20	836,599,994	0.026	0.00000263
100%		-10	836,599,978	0.007	0.00000072
100%		0	836,599,972	0.000	0.00000000
100%		+10	836,599,959	-0.016	-0.00000155
100%		+20	836,599,961	-0.013	-0.00000131
100%		+30	836,599,973	0.001	0.00000012
100%		+40	836,599,984	0.014	0.00000143
100%		+50	836,599,995	0.027	0.00000275
85%	3.23	+25	836,599,985	0.016	0.00000155
115%	4.37	+25	836,599,978	0.007	0.00000072
BATT.ENDPOINT	3.20	+25	836,599,981	0.011	0.00000108

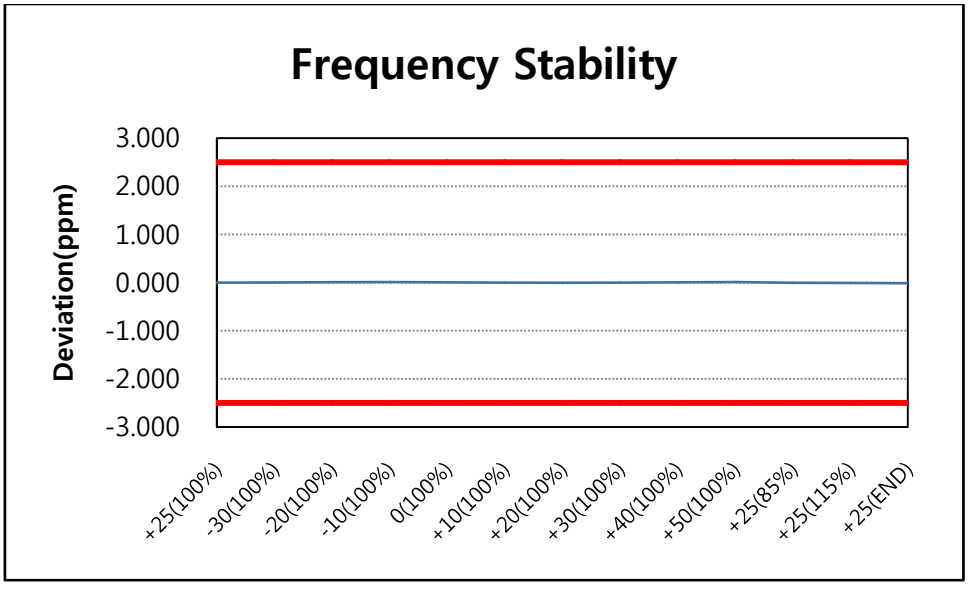


Copyright © 2012, Digital EMC Co., Ltd.

7.9.4 FREQUENCY STABILITY (GSM1900)

OPERATING FREQUENCY : 1,879,999,982 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)	(%)
100%	3.80	+25(Ref)	1,879,999,982	0.000	0.00000000
100%		-30	1,879,999,989	0.004	0.00000037
100%		-20	1,879,999,998	0.009	0.00000085
100%		-10	1,880,000,007	0.013	0.00000133
100%		0	1,879,999,996	0.007	0.00000074
100%		+10	1,879,999,979	-0.002	-0.00000016
100%		+20	1,879,999,973	-0.005	-0.00000048
100%		+30	1,879,999,984	0.001	0.00000011
100%		+40	1,879,999,992	0.005	0.00000053
100%		+50	1,880,000,009	0.014	0.00000144
85%	3.23	+25	1,879,999,978	-0.002	-0.00000021
115%	4.37	+25	1,879,999,966	-0.009	-0.00000085
BATT.ENDPOINT	3.20	+25	1,879,999,982	-0.013	-0.00000128

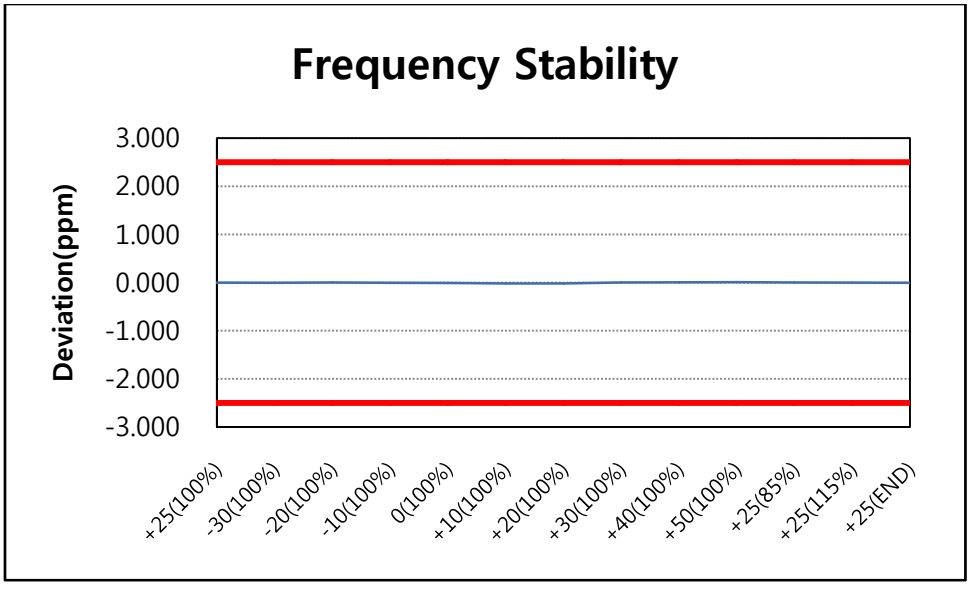


Copyright © 2012, Digital EMC Co., Ltd.

7.9.5 FREQUENCY STABILITY (WCDMA1900)

OPERATING FREQUENCY : 1,880,000,022 Hz
CHANNEL : 9400(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)	1,880,000,022	0.000	0.00000000
100%		-30	1,880,000,017	-0.003	-0.00000027
100%		-20	1,880,000,026	0.002	0.00000021
100%		-10	1,880,000,015	-0.004	-0.00000037
100%		0	1,880,000,007	-0.008	-0.00000080
100%		+10	1,879,999,987	-0.019	-0.00000186
100%		+20	1,879,999,993	-0.015	-0.00000154
100%		+30	1,880,000,029	0.004	0.00000037
100%		+40	1,880,000,033	0.006	0.00000059
100%		+50	1,880,000,037	0.008	0.00000080
85%	3.23	+25	1,880,000,028	0.003	0.00000032
115%	4.37	+25	1,880,000,022	0.000	0.00000000
BATT.ENDPOINT	3.20	+25	1,880,000,016	-0.003	-0.00000032

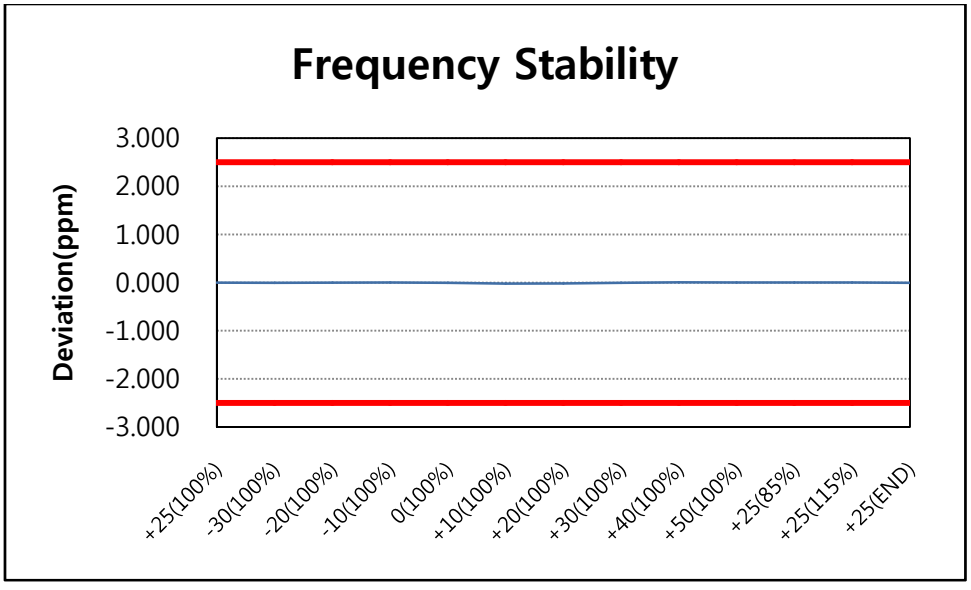


Copyright © 2012, Digital EMC Co., Ltd.

7.9.6 FREQUENCY STABILITY (HSUPA1900)

OPERATING FREQUENCY : 1,880,000,014 Hz
CHANNEL : 9400(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)	1,880,000,014	0.000	0.00000000
100%		-30	1,880,000,008	-0.003	-0.00000032
100%		-20	1,880,000,013	-0.001	-0.00000005
100%		-10	1,880,000,017	0.002	0.00000016
100%		0	1,880,000,004	-0.005	-0.00000053
100%		+10	1,879,999,975	-0.021	-0.00000207
100%		+20	1,879,999,982	-0.017	-0.00000170
100%		+30	1,880,000,010	-0.002	-0.00000021
100%		+40	1,880,000,026	0.006	0.00000064
100%		+50	1,880,000,021	0.004	0.00000037
85%	3.23	+25	1,880,000,022	0.004	0.00000043
115%	4.37	+25	1,880,000,017	0.002	0.00000016
BATT.ENDPOINT	3.20	+25	1,880,000,009	-0.003	-0.00000027

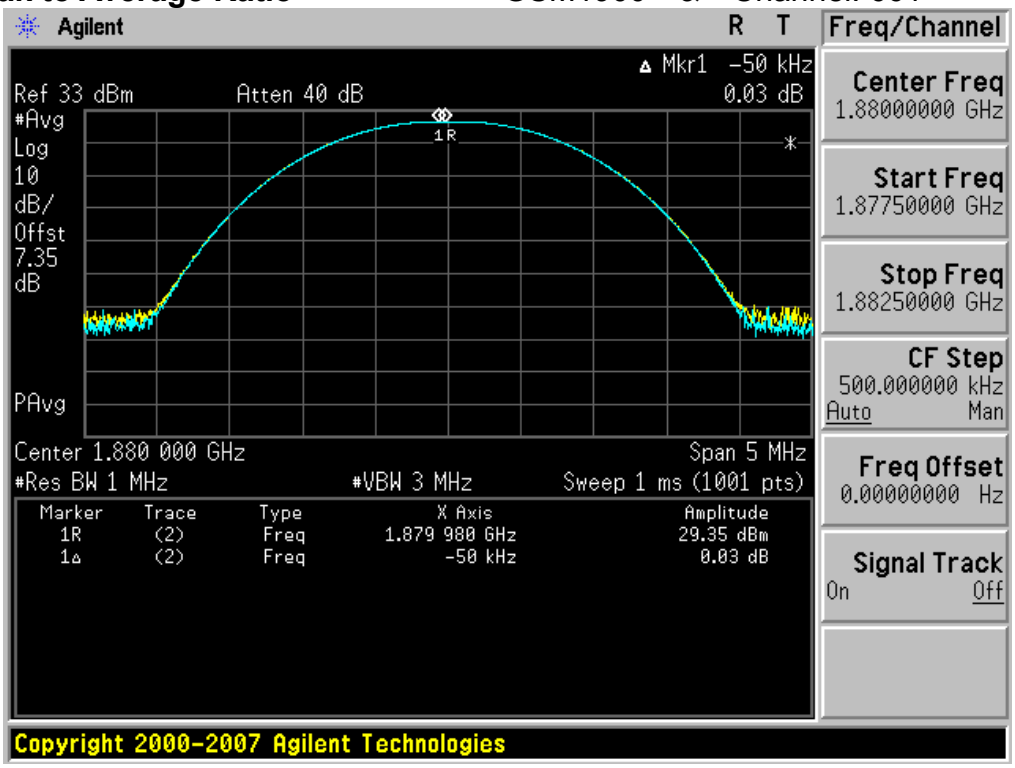


Copyright © 2012, Digital EMC Co., Ltd.

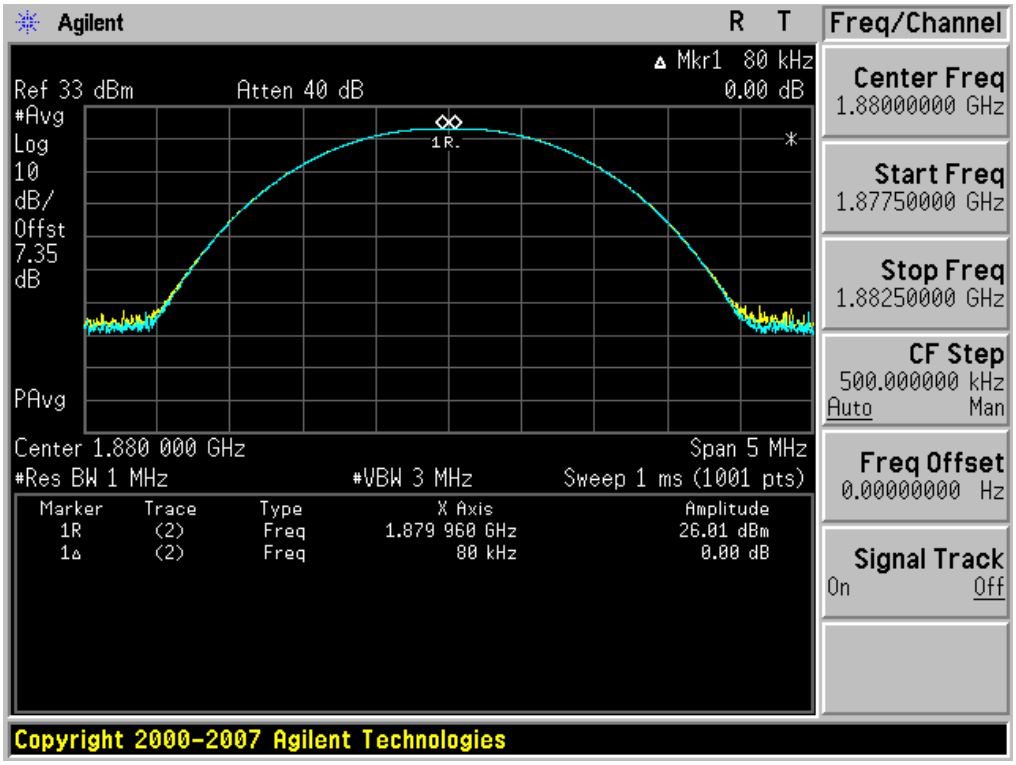
8. TEST PLOTS

8.1 Peak to Average Ratio

GSM1900 & Channel: 661

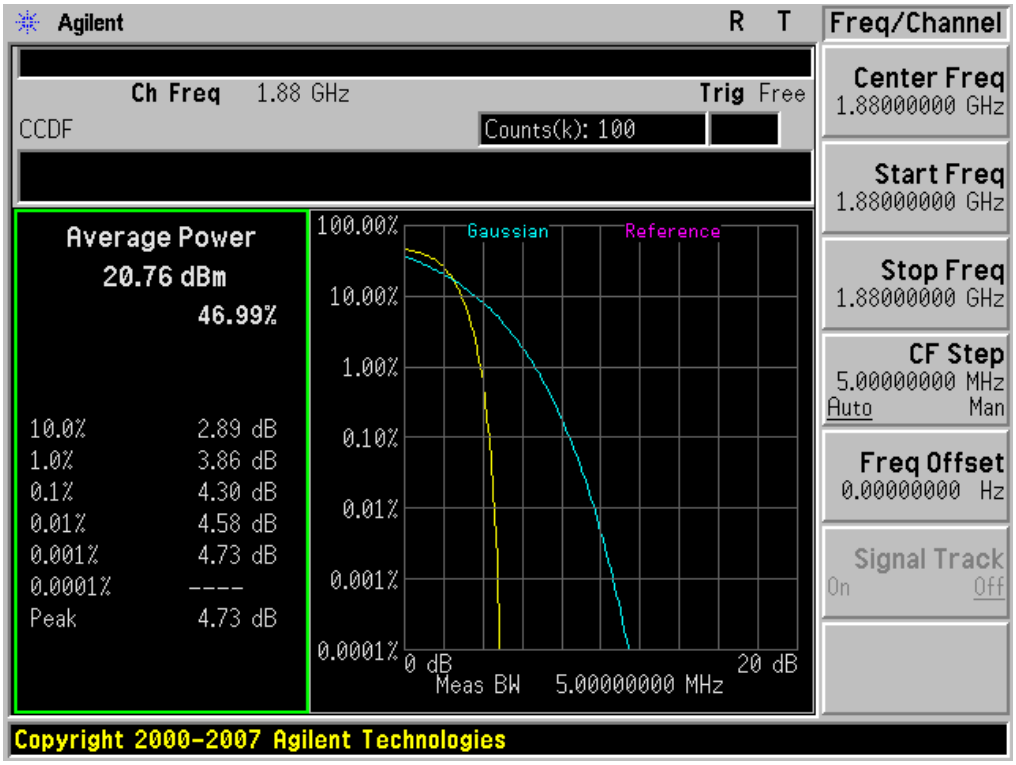


EDGE1900 & Channel: 661

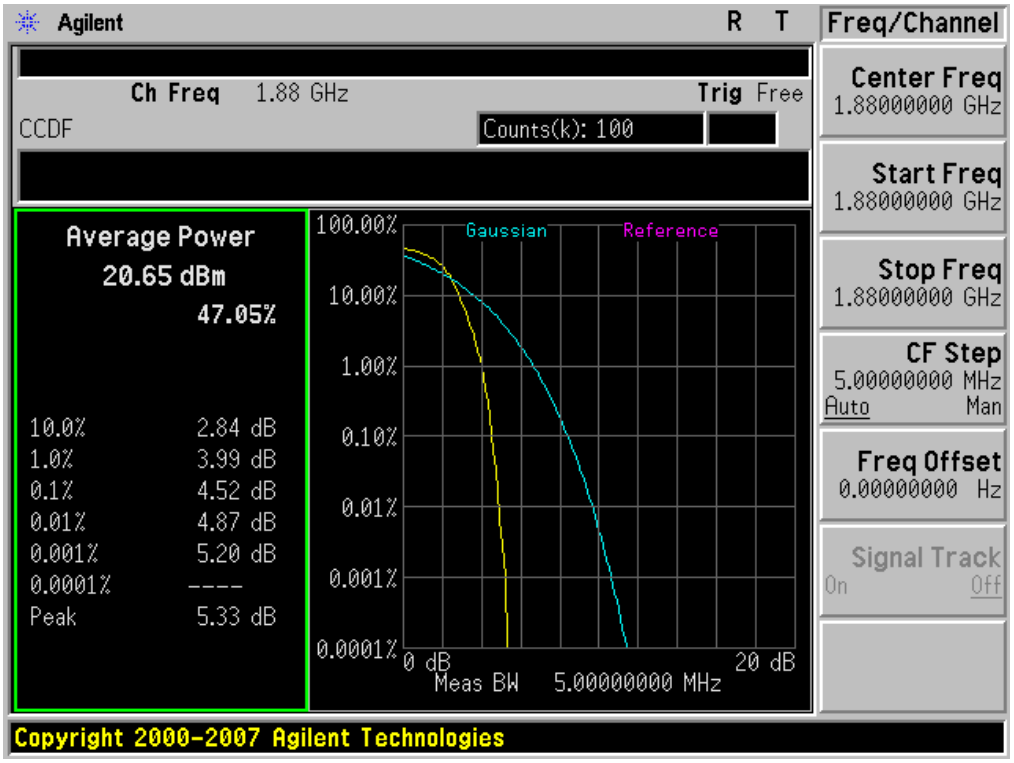


Copyright © 2012, Digital EMC Co., Ltd.

WCDMA1900 & Channel: 9400



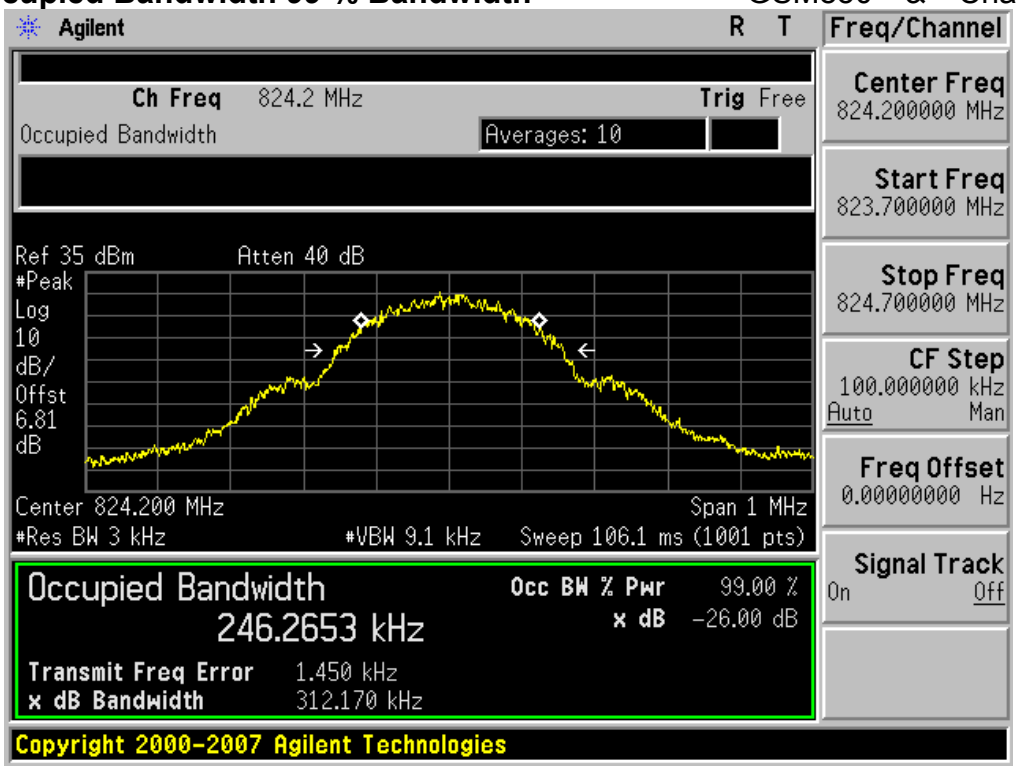
HSUPA1900 & Channel: 9400



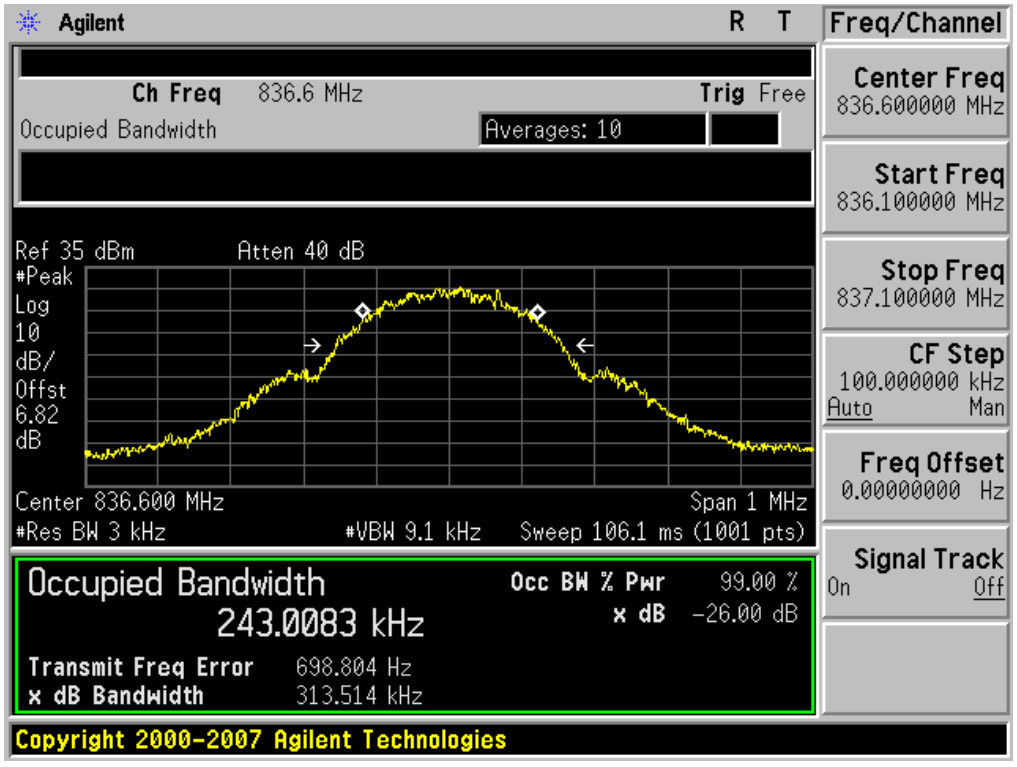
Copyright © 2012, Digital EMC Co., Ltd.

8.2 Occupied Bandwidth 99 % Bandwidth

GSM850 & Channel: 128

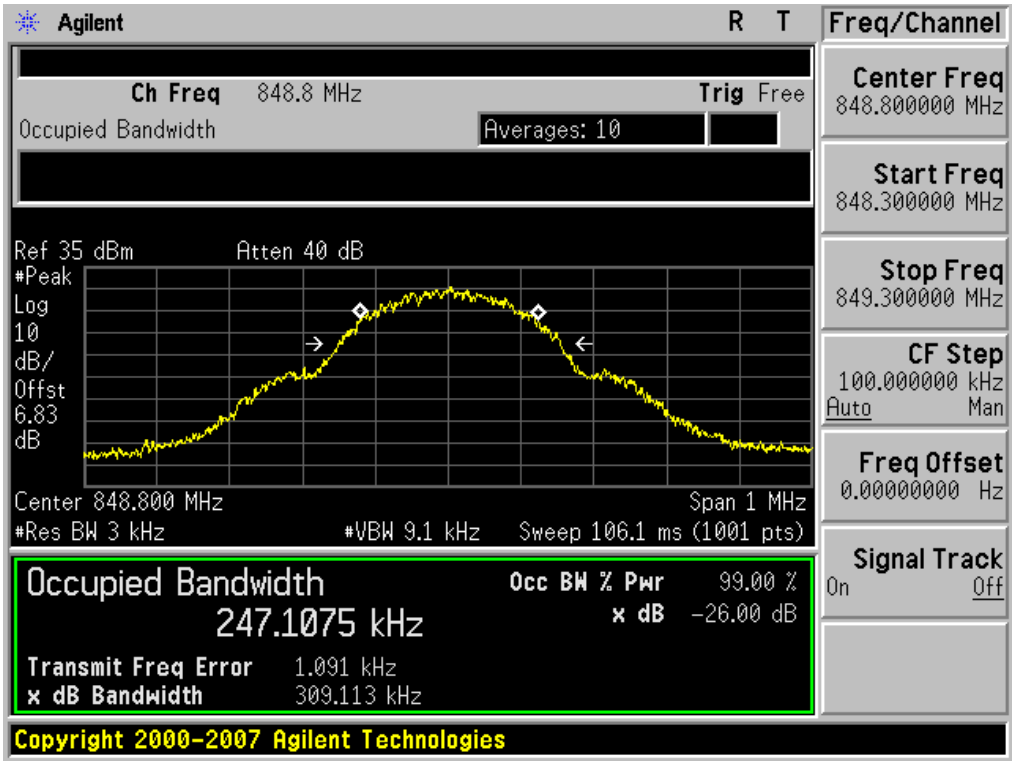


GSM850 & Channel: 190



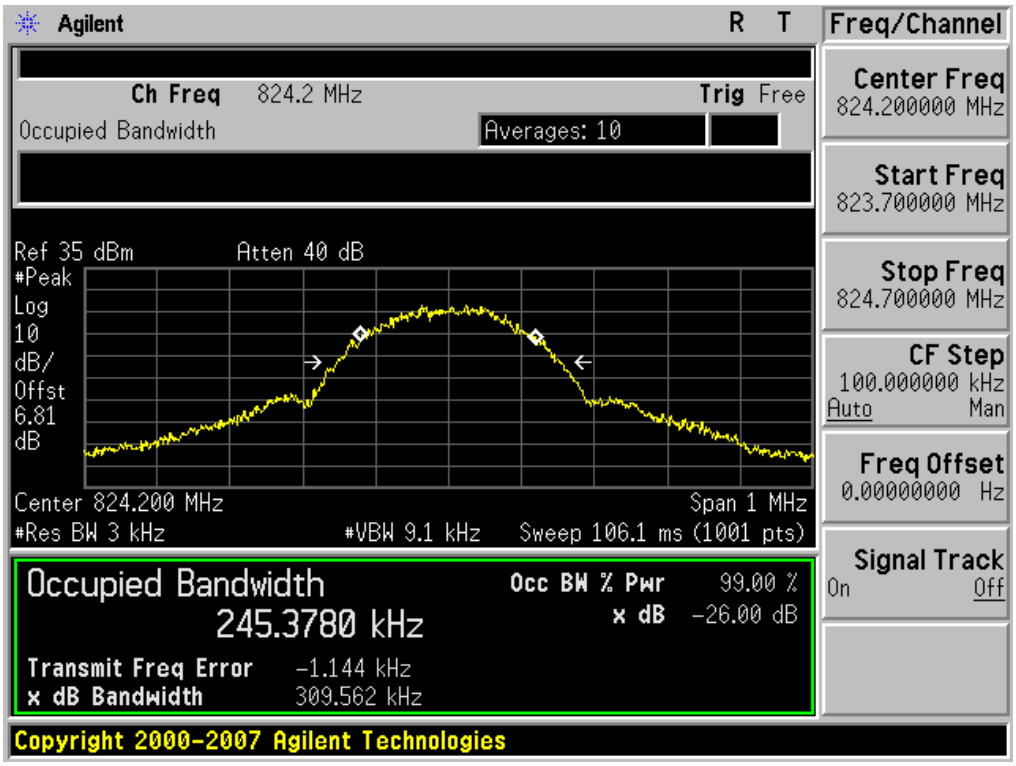
Copyright © 2012, Digital EMC Co., Ltd.

GSM850 & Channel: 251

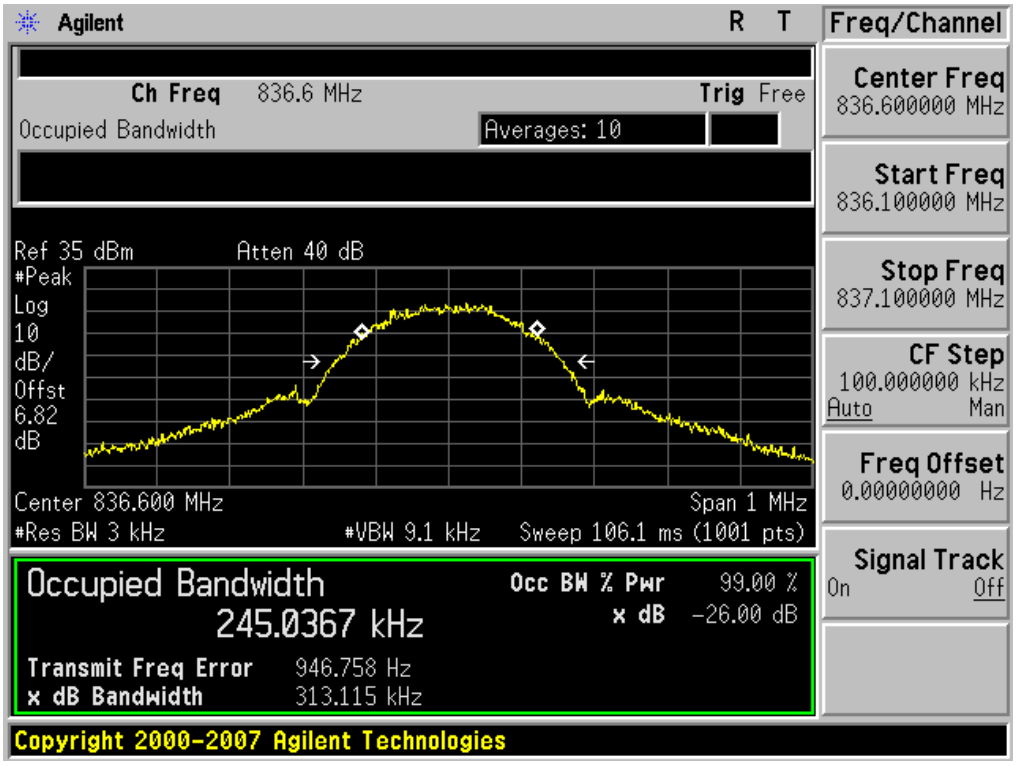


Copyright © 2012, Digital EMC Co., Ltd.

EDGE 850 & Channel: 128

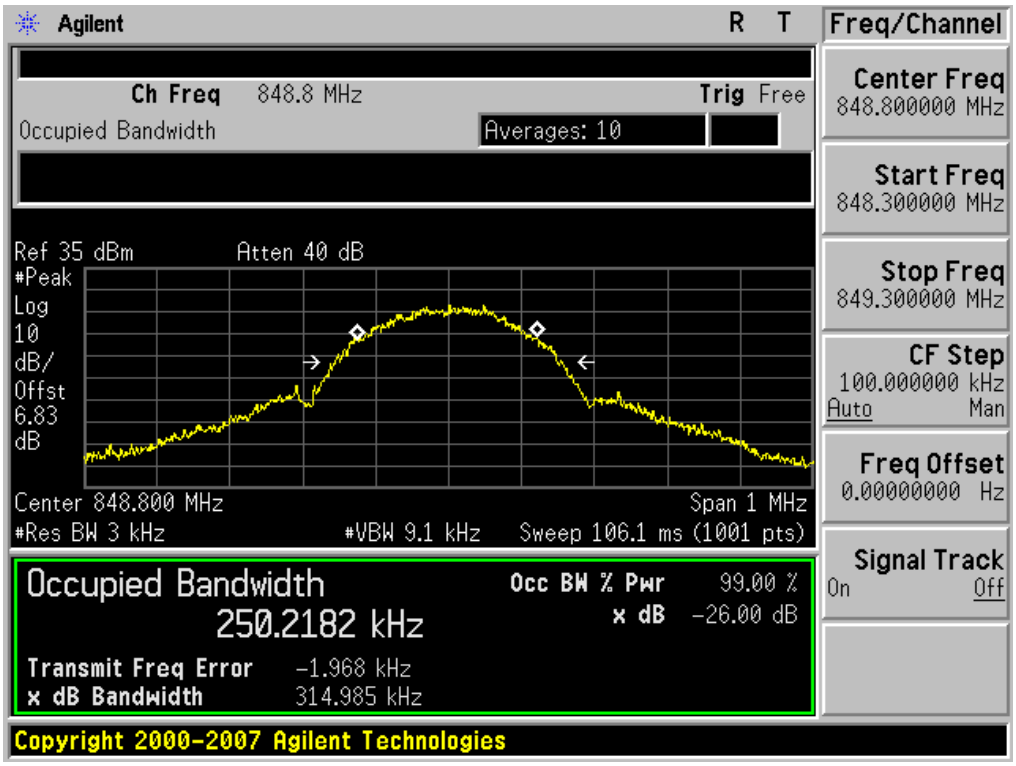


EDGE 850 & Channel: 190



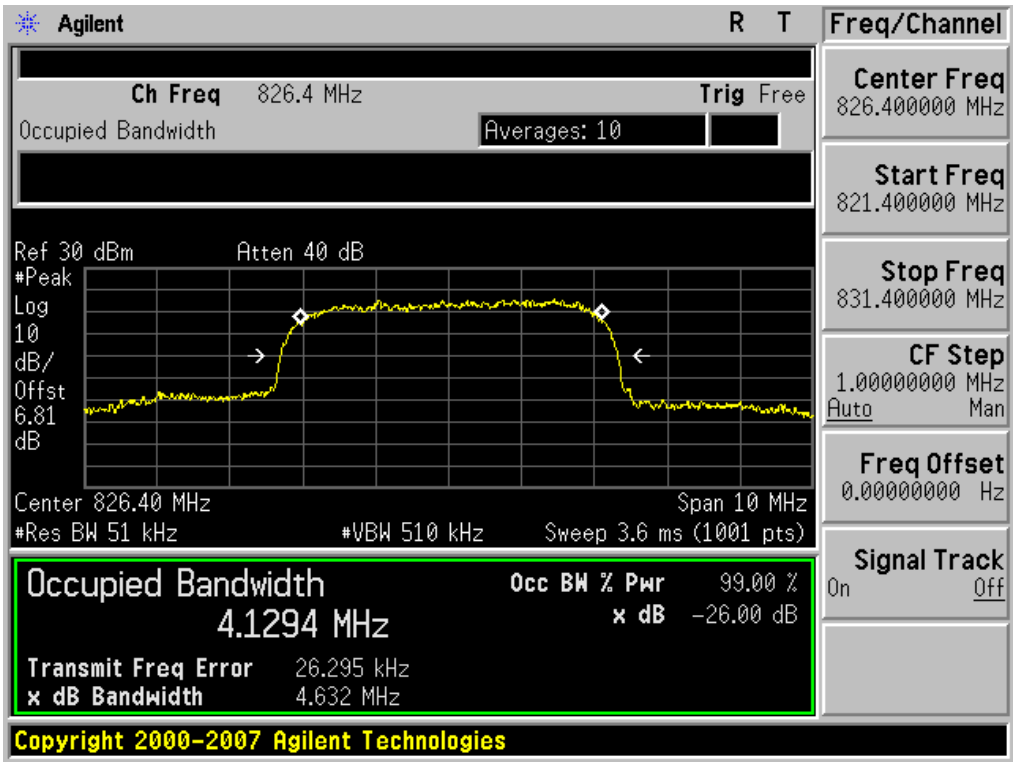
Copyright © 2012, Digital EMC Co., Ltd.

EDGE 850 & Channel: 251

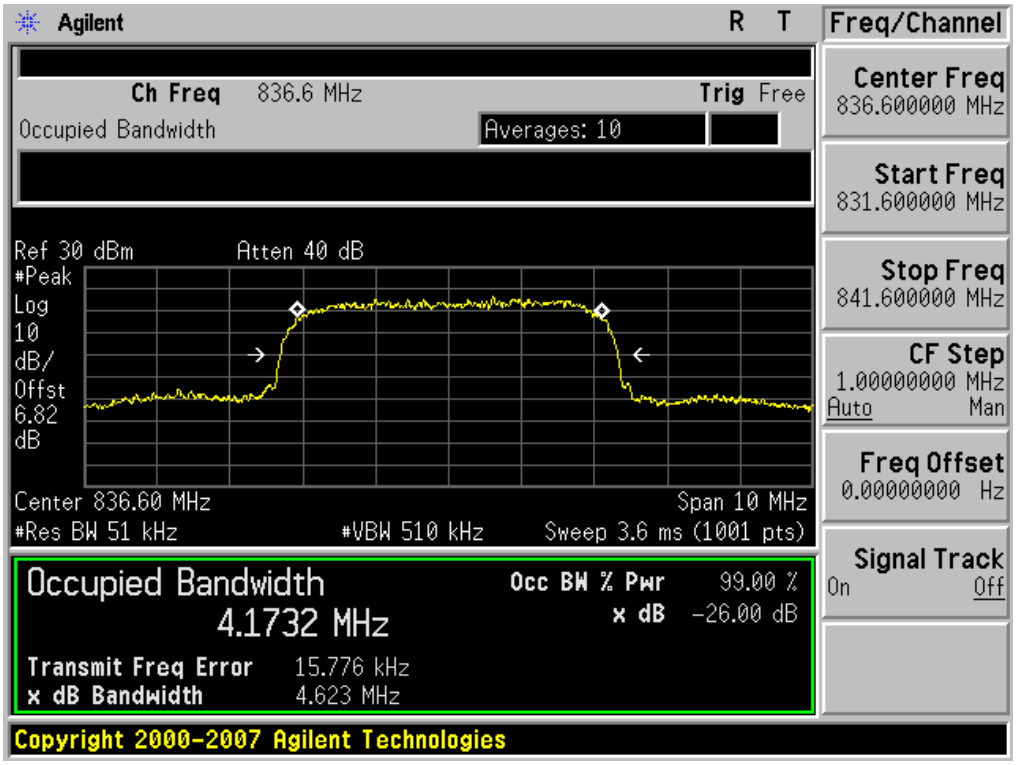


Copyright © 2012, Digital EMC Co., Ltd.

WCDMA850 & Channel: 4132

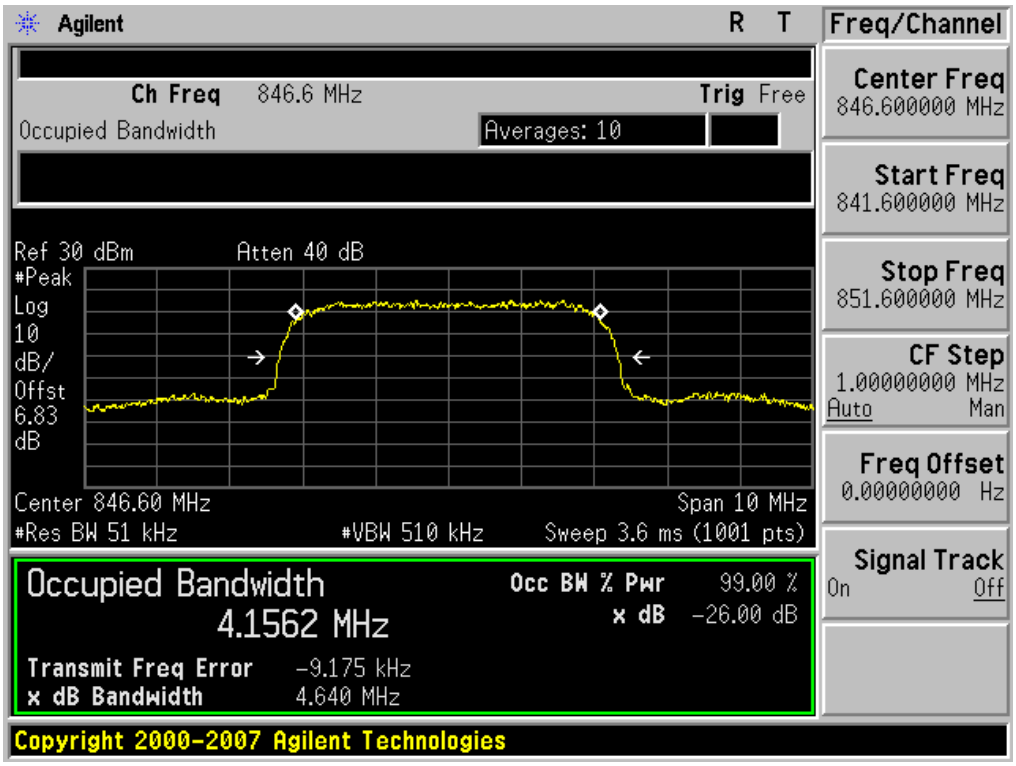


WCDMA850 & Channel: 4183



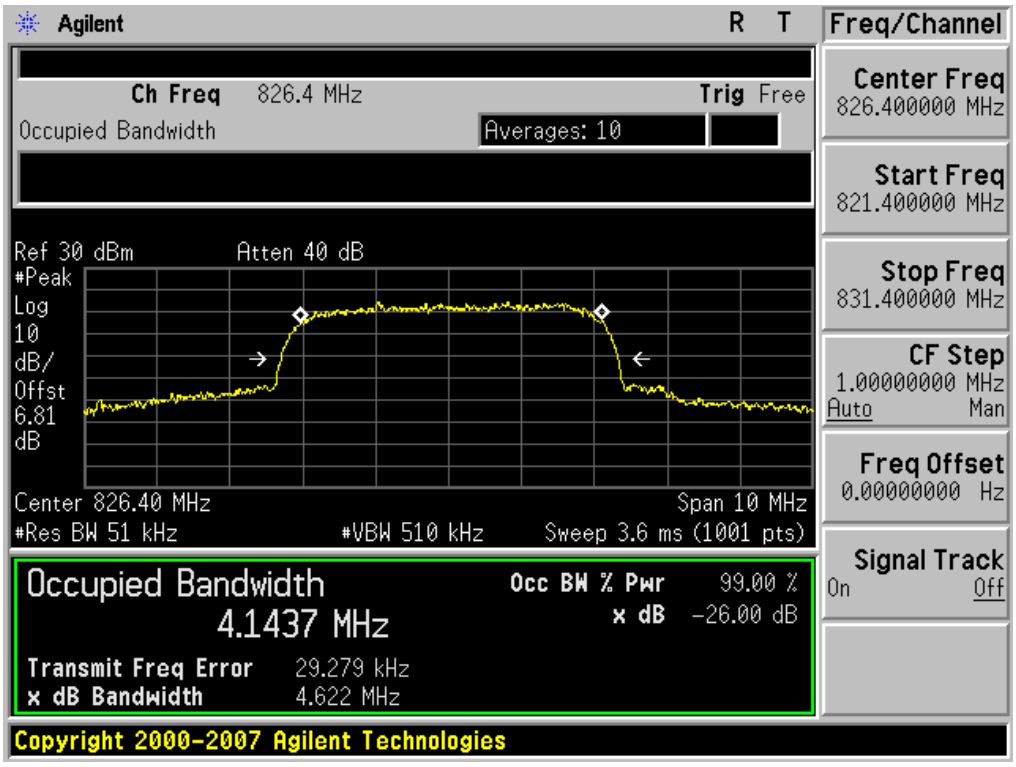
Copyright © 2012, Digital EMC Co., Ltd.

WCDMA850 & Channel: 4233

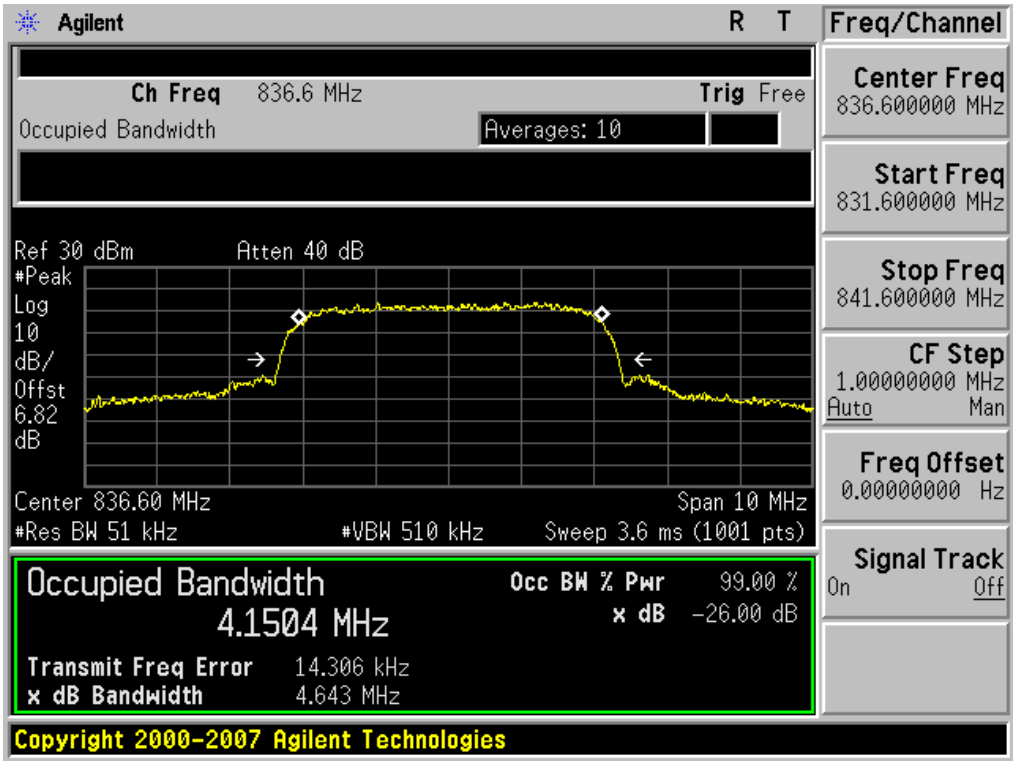


Copyright © 2012, Digital EMC Co., Ltd.

HSUPA850 & Channel: 4132

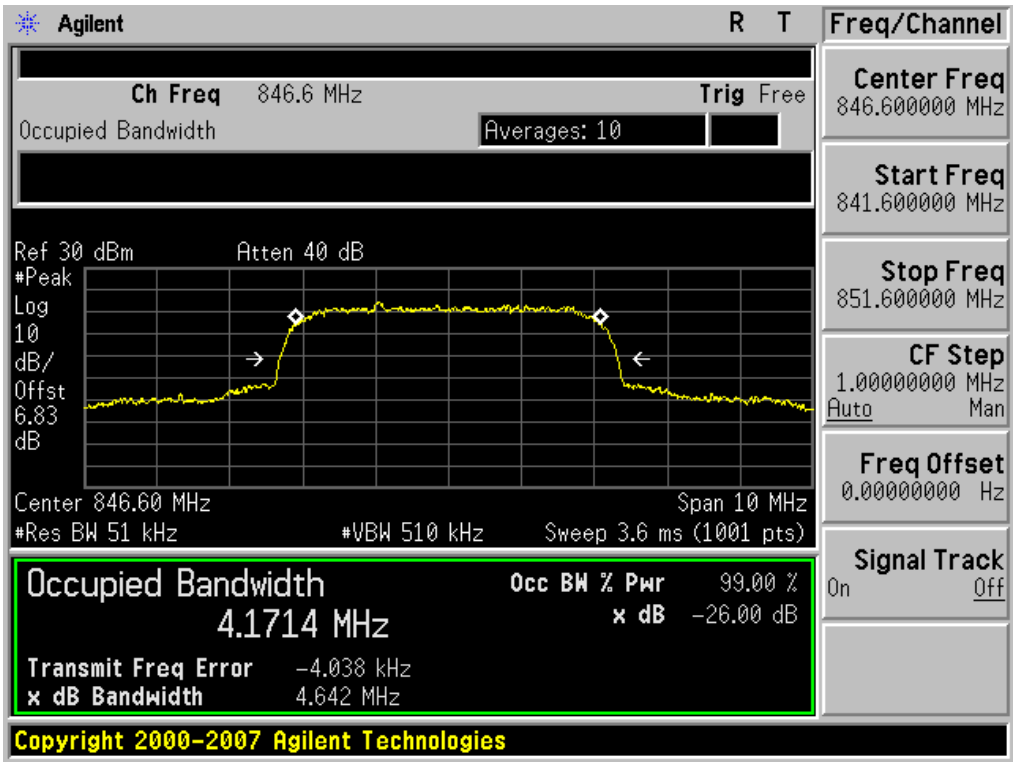


HSUPA850 & Channel: 4183



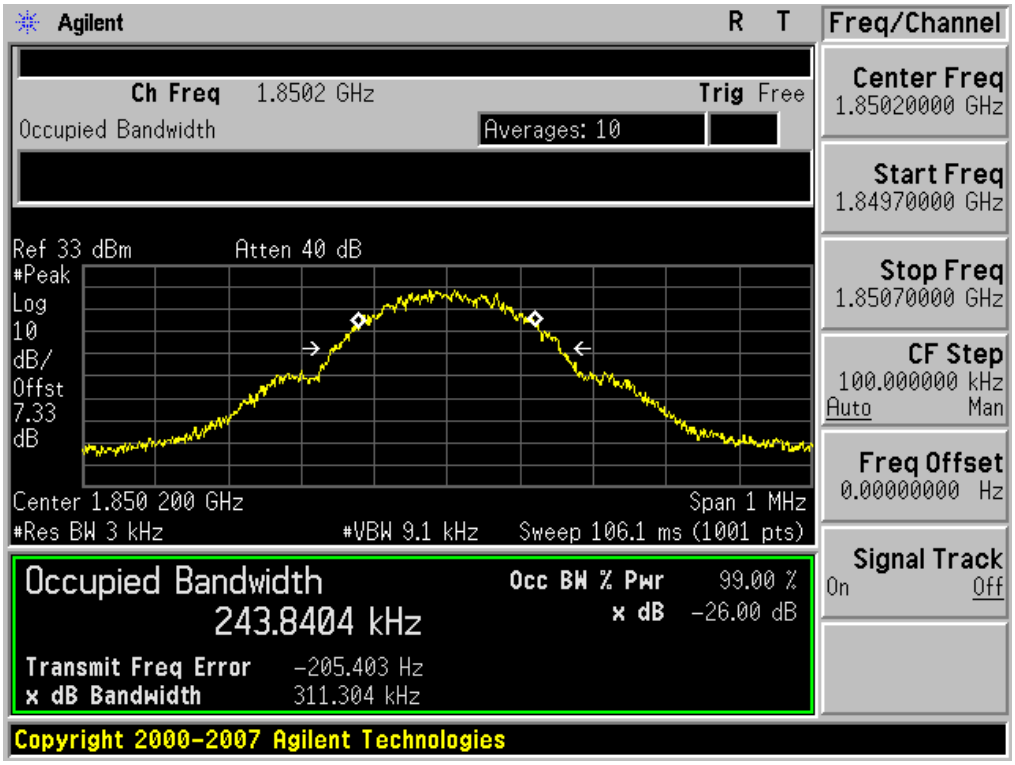
Copyright © 2012, Digital EMC Co., Ltd.

HSUPA850 & Channel: 4233

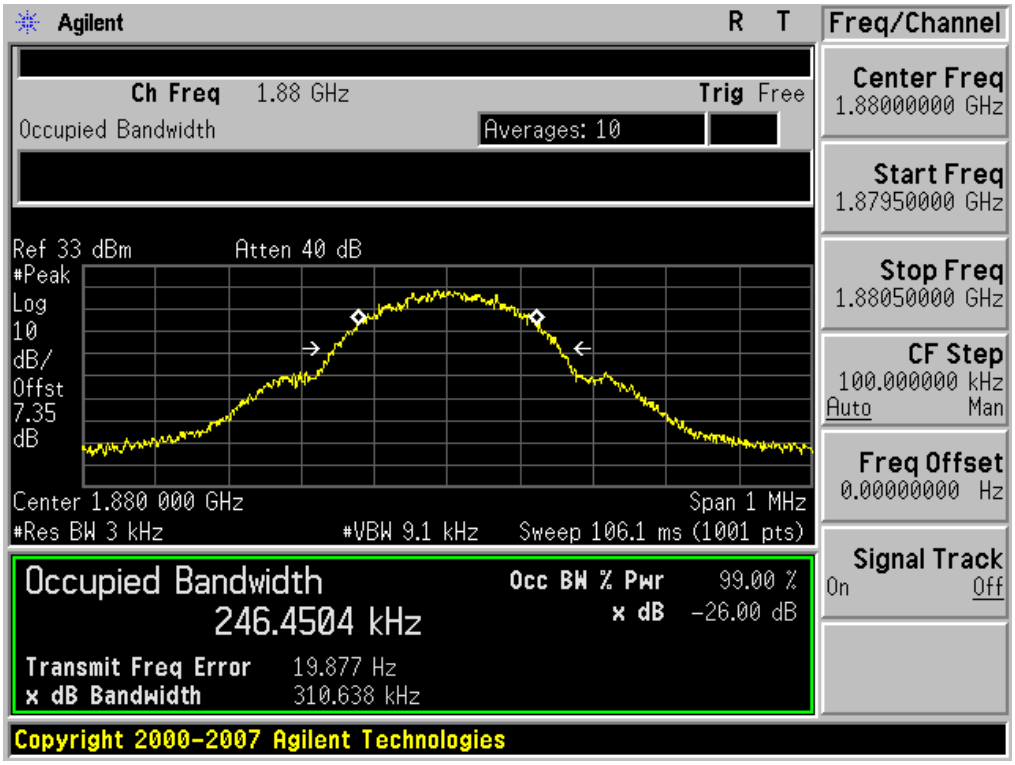


Copyright © 2012, Digital EMC Co., Ltd.

GSM 1900 & Channel: 512

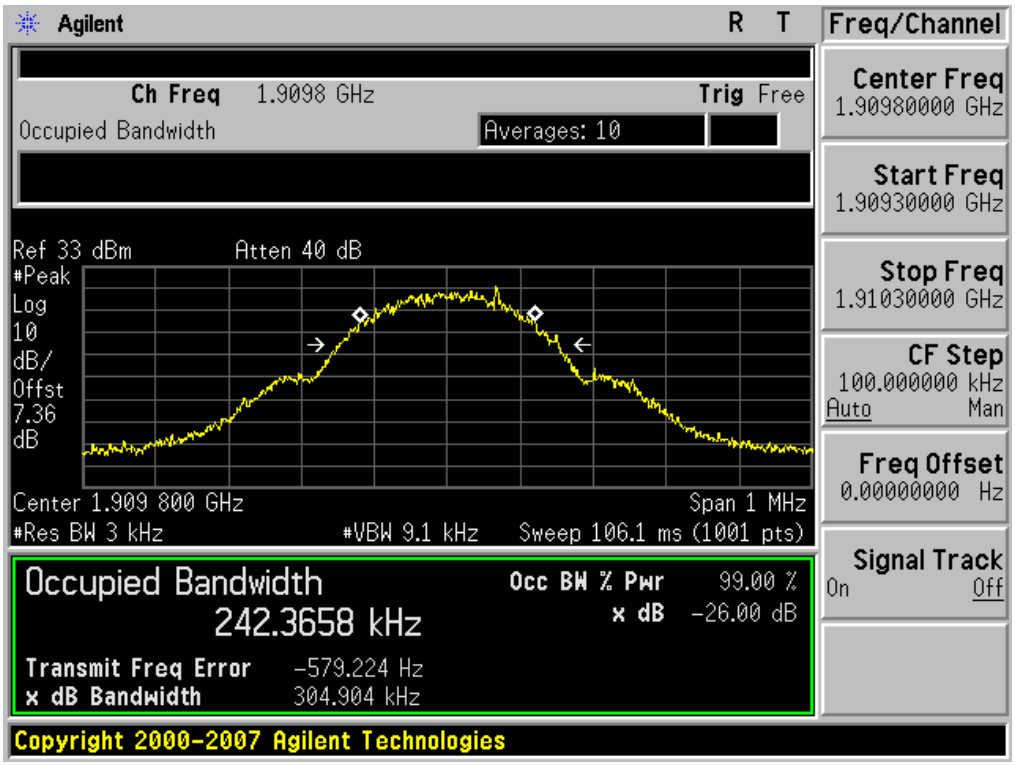


GSM 1900 & Channel: 661



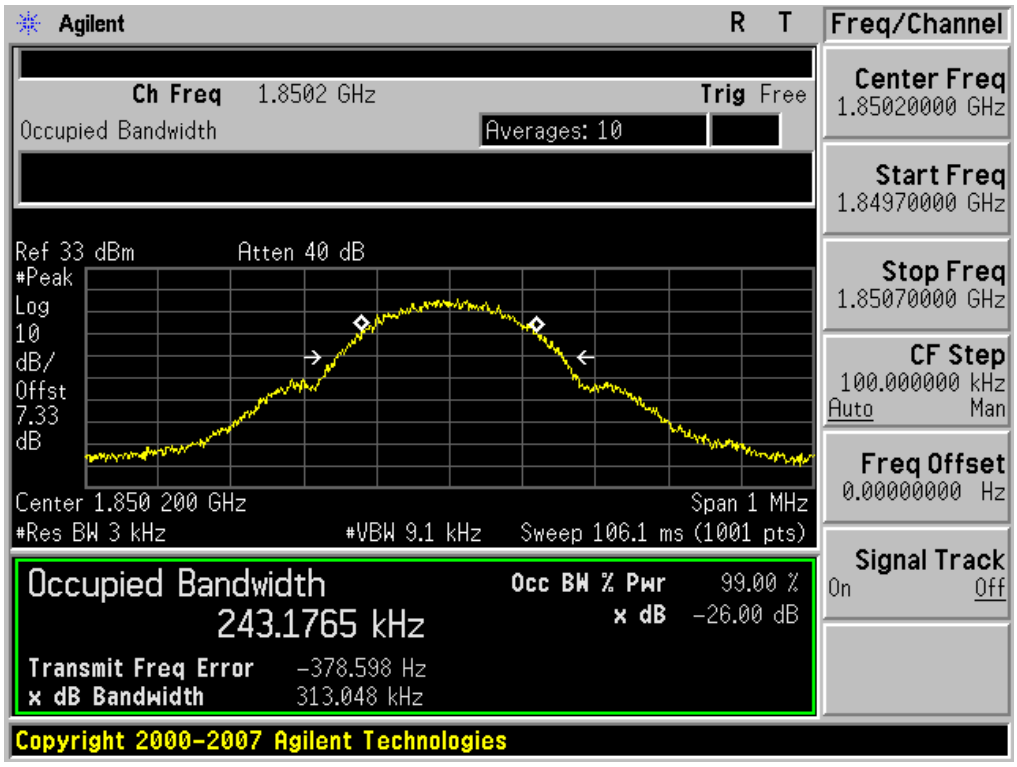
Copyright © 2012, Digital EMC Co., Ltd.

GSM 1900 & Channel: 810

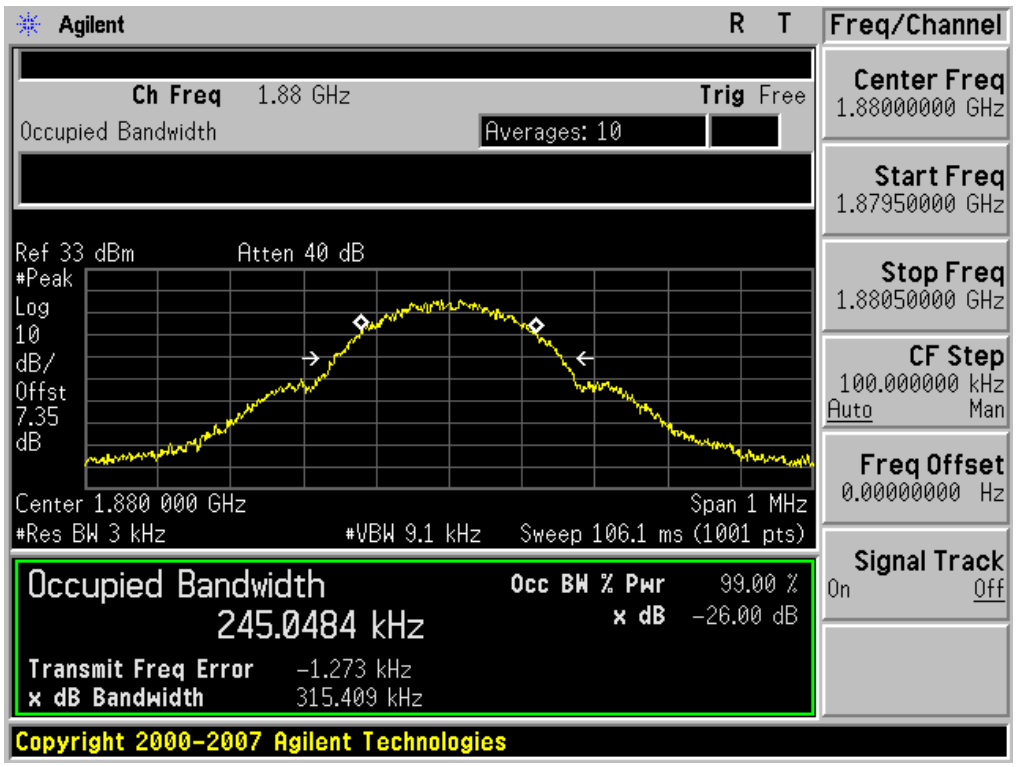


Copyright © 2012, Digital EMC Co., Ltd.

EDGE 1900 & Channel: 512

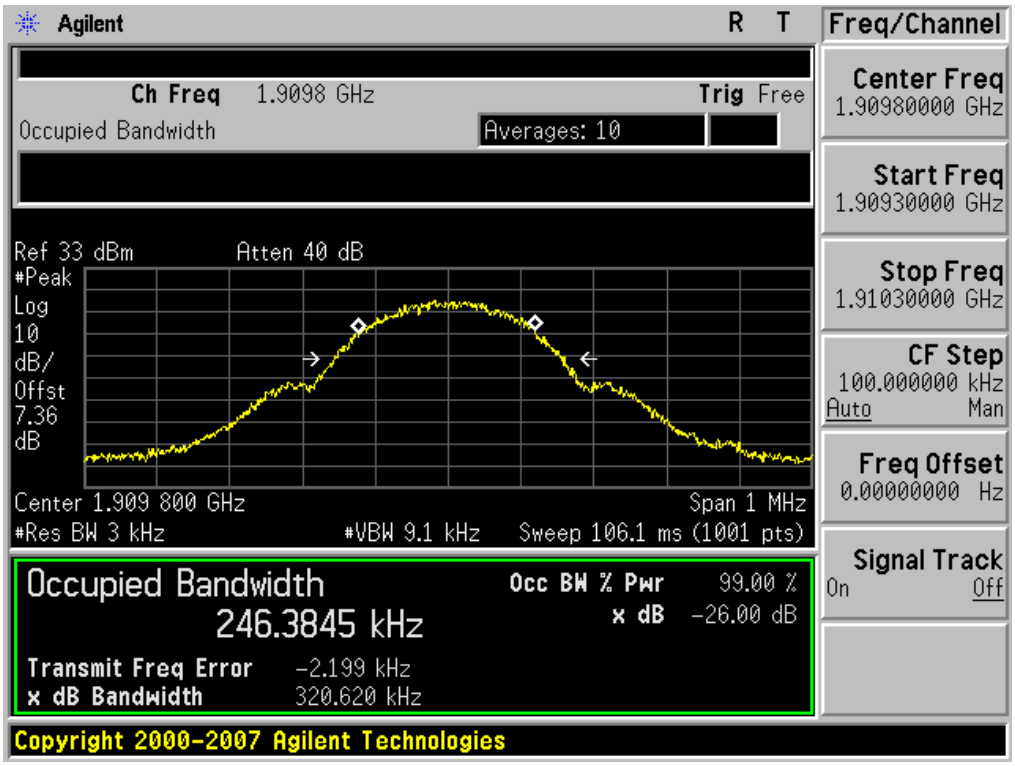


EDGE 1900 & Channel: 661



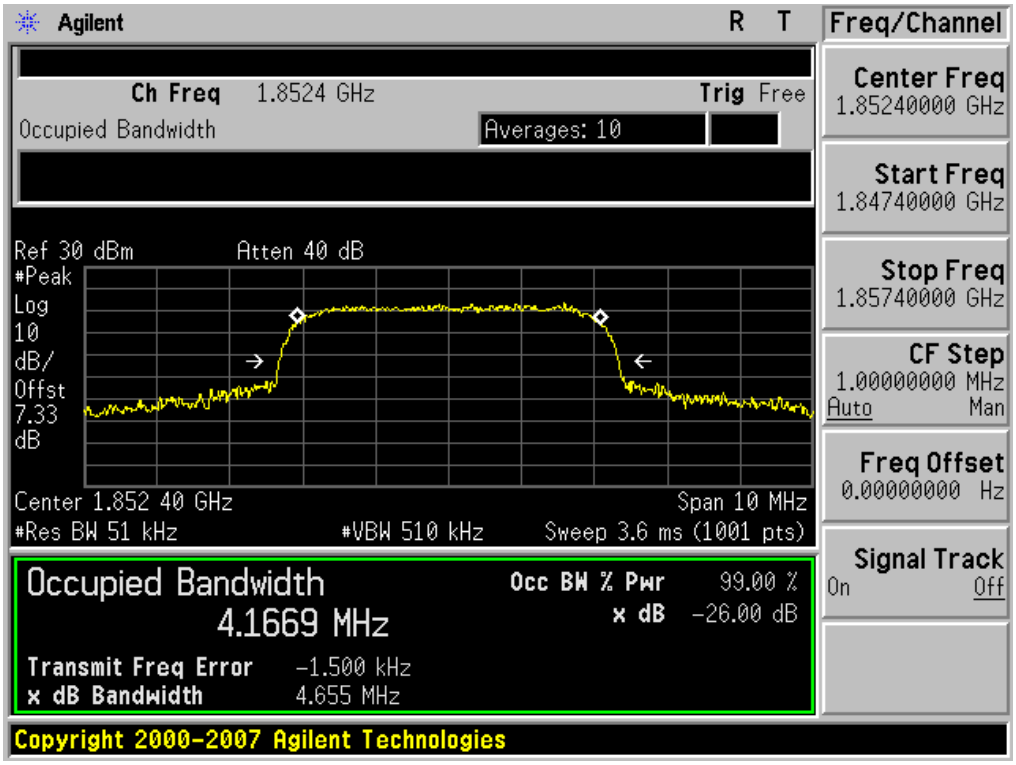
Copyright © 2012, Digital EMC Co., Ltd.

EDGE 1900 & Channel: 810

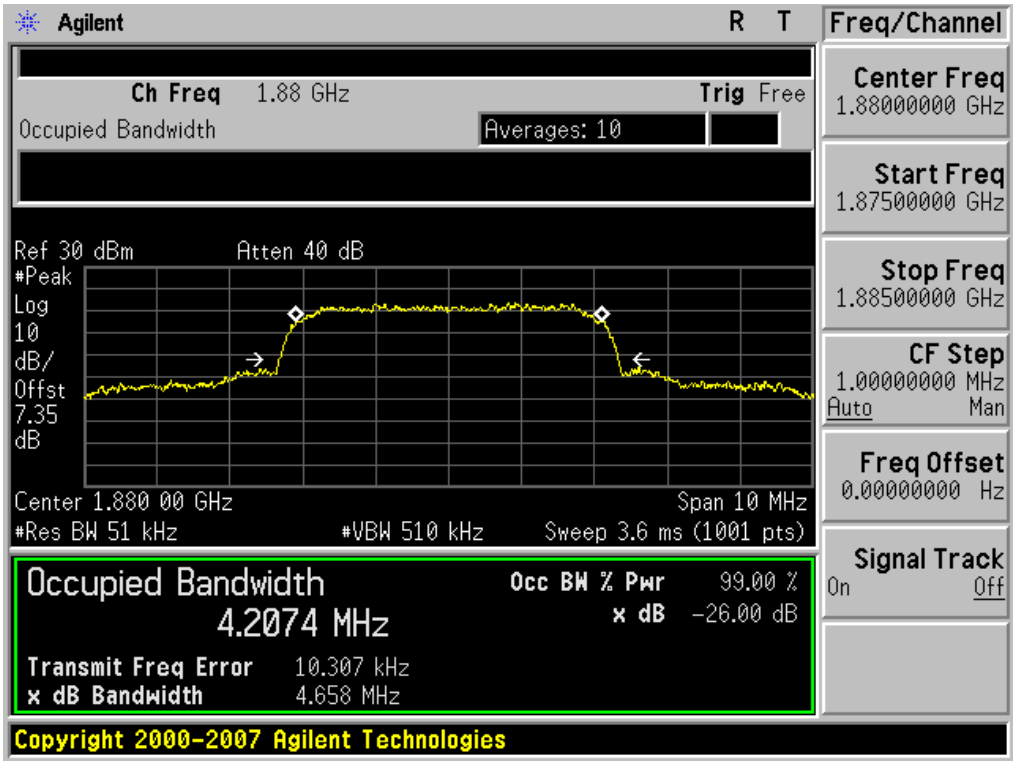


Copyright © 2012, Digital EMC Co., Ltd.

WCDMA1900 & Channel: 9262

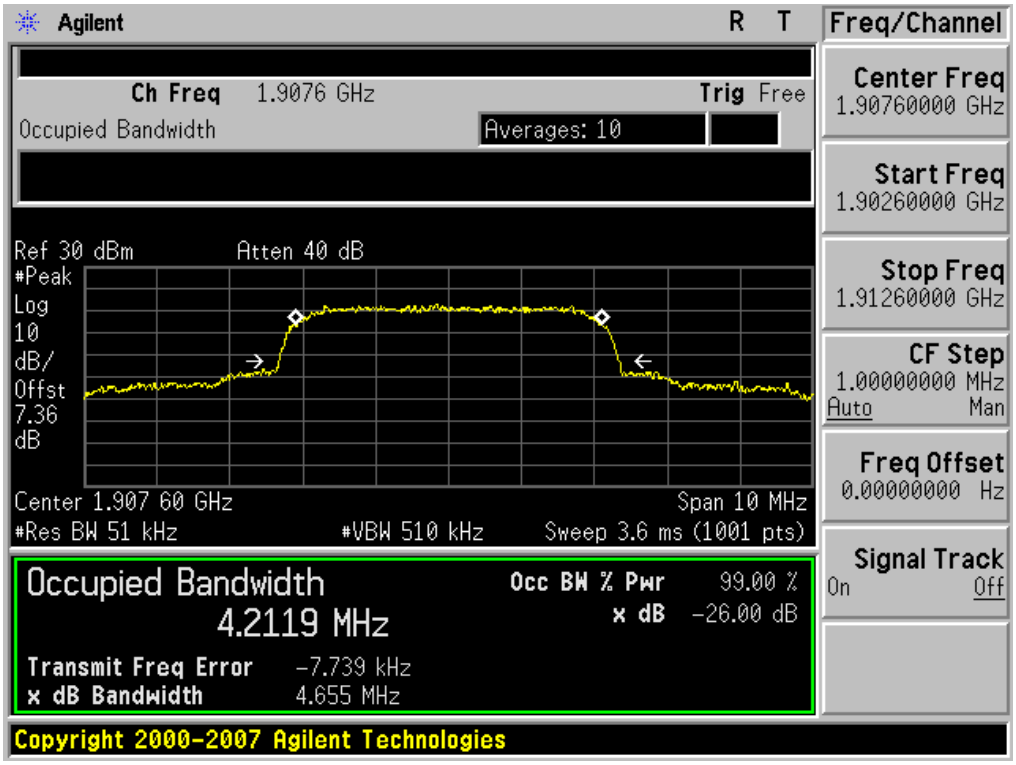


WCDMA1900 & Channel: 9400



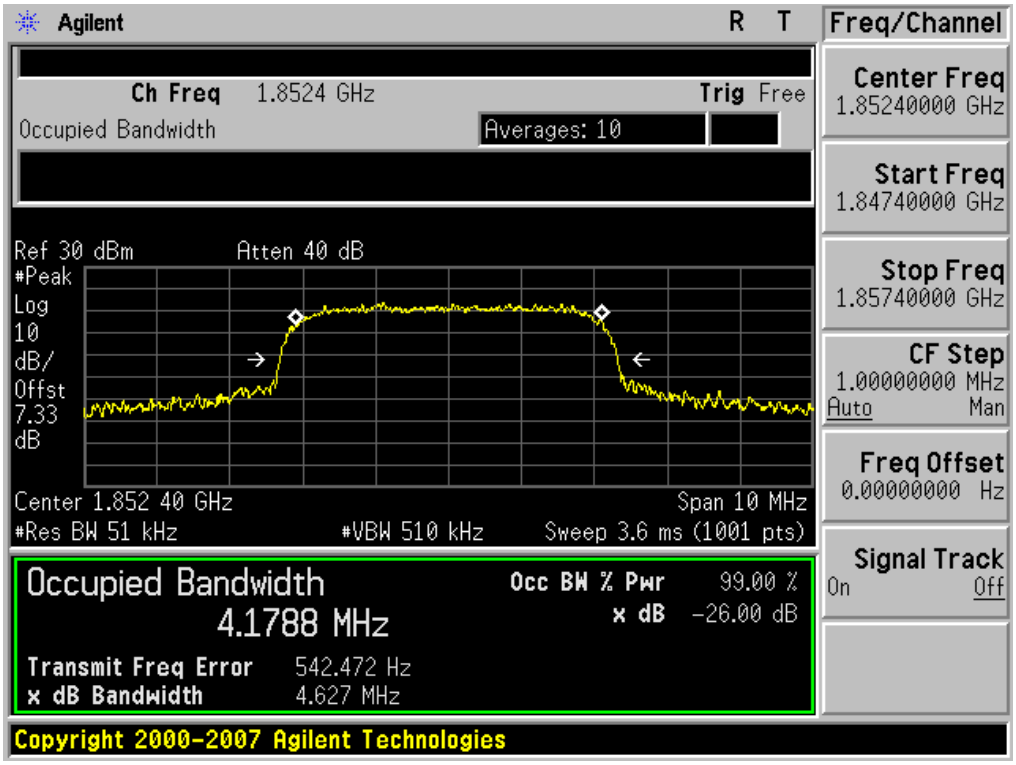
Copyright © 2012, Digital EMC Co., Ltd.

WCDMA1900 & Channel: 9538

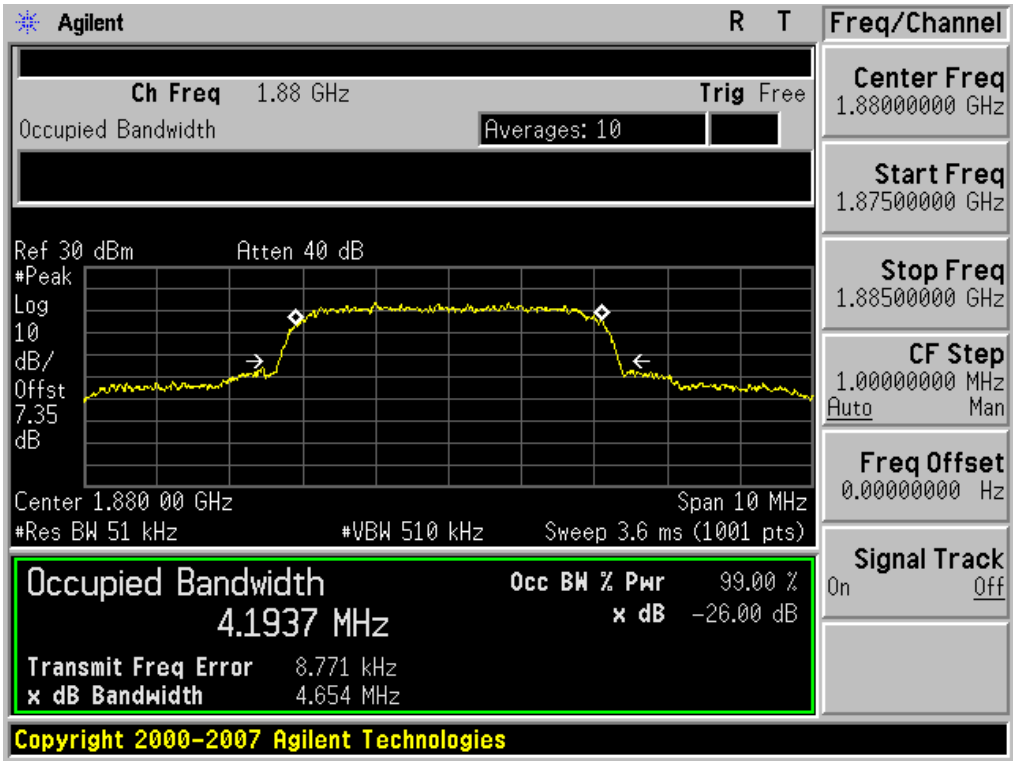


Copyright © 2012, Digital EMC Co., Ltd.

HSUPA1900 & Channel: 9262

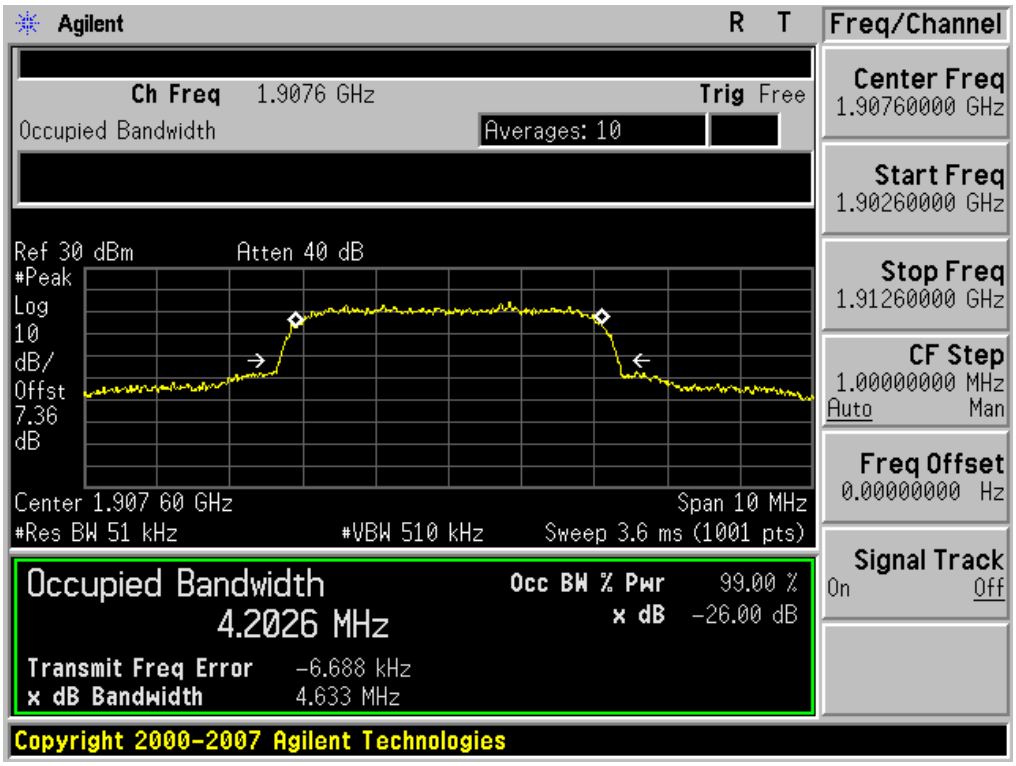


HSUPA1900 & Channel: 9400



Copyright © 2012, Digital EMC Co., Ltd.

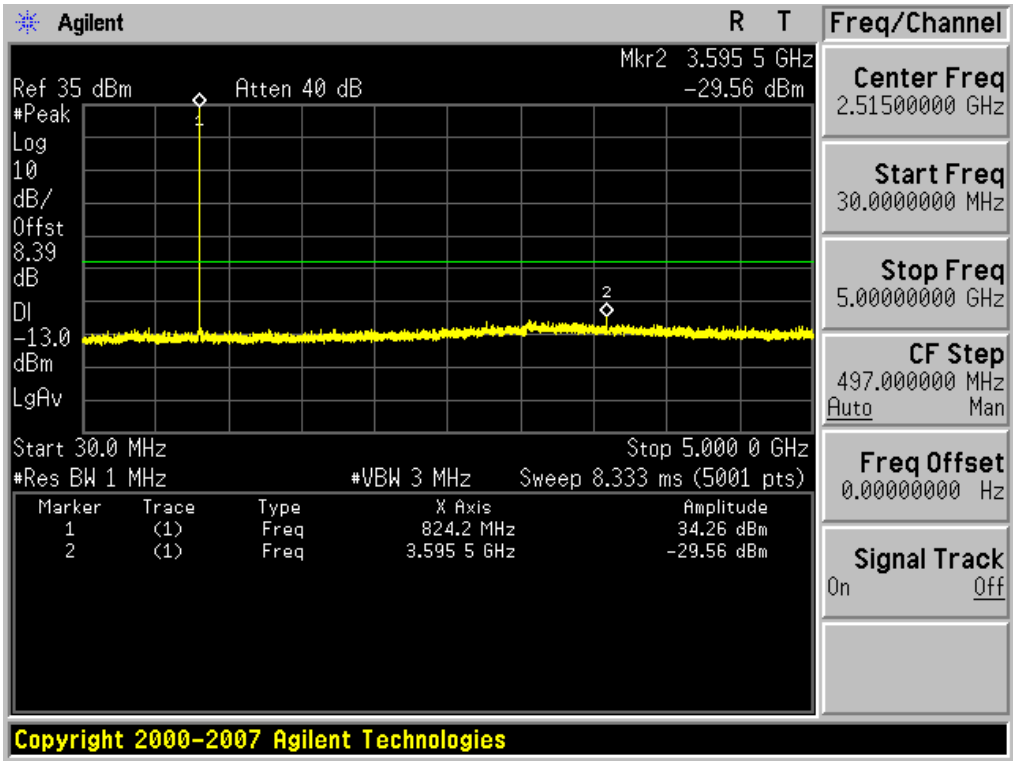
HSUPA1900 & Channel: 9538



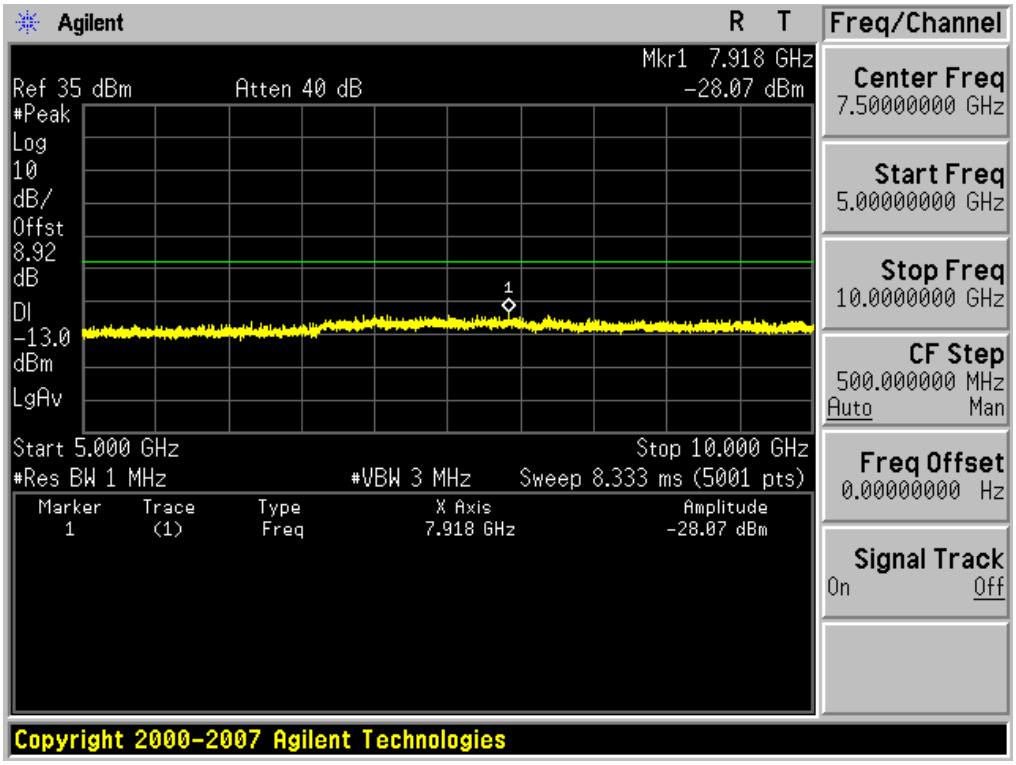
Copyright © 2012, Digital EMC Co., Ltd.

8.3 Spurious Emissions at Antenna Terminal

GSM850 & Channel: 128

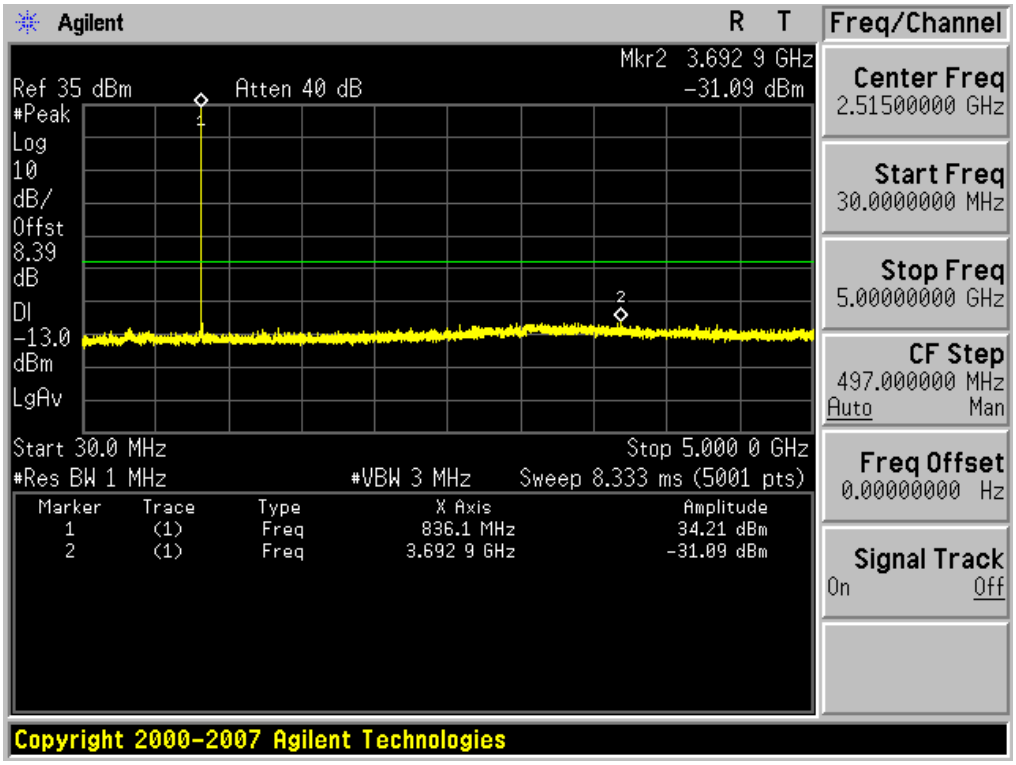


GSM850 & Channel: 128

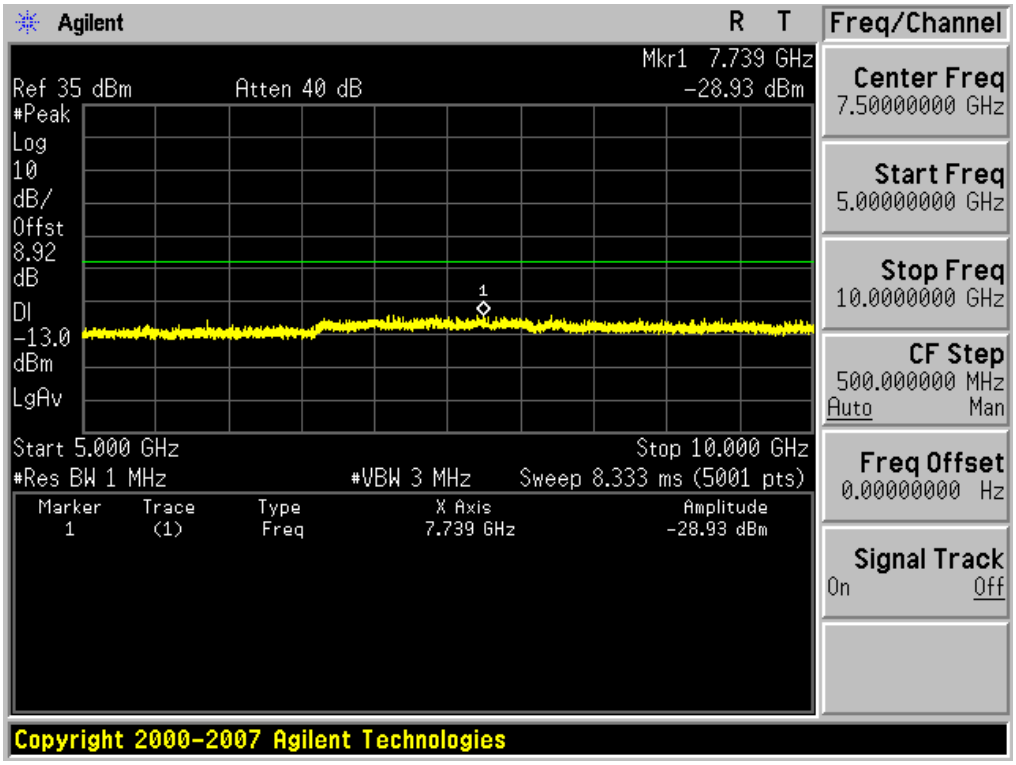


Copyright © 2012, Digital EMC Co., Ltd.

GSM850 & Channel: 190

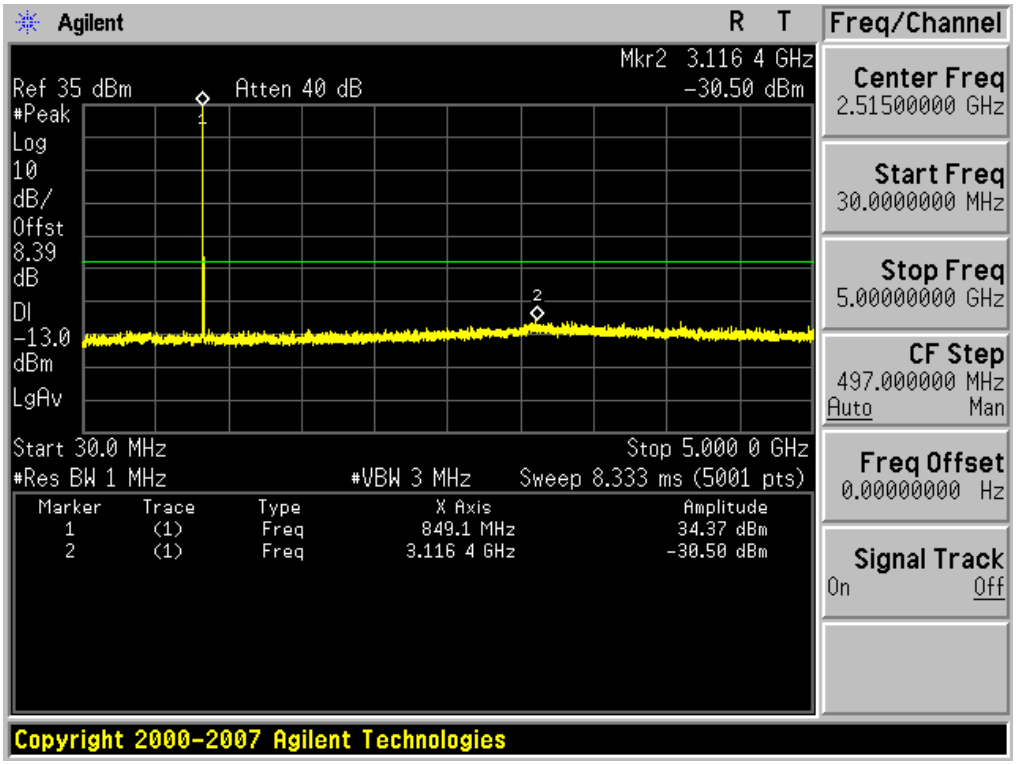


GSM850 & Channel: 190

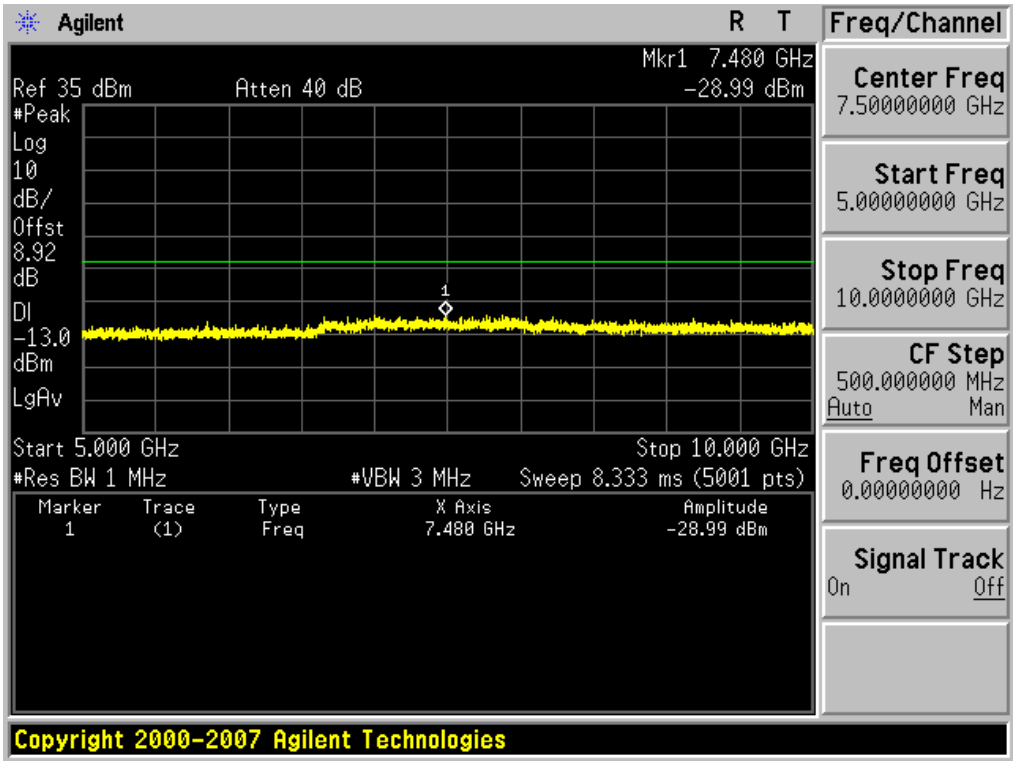


Copyright © 2012, Digital EMC Co., Ltd.

GSM850 & Channel: 251

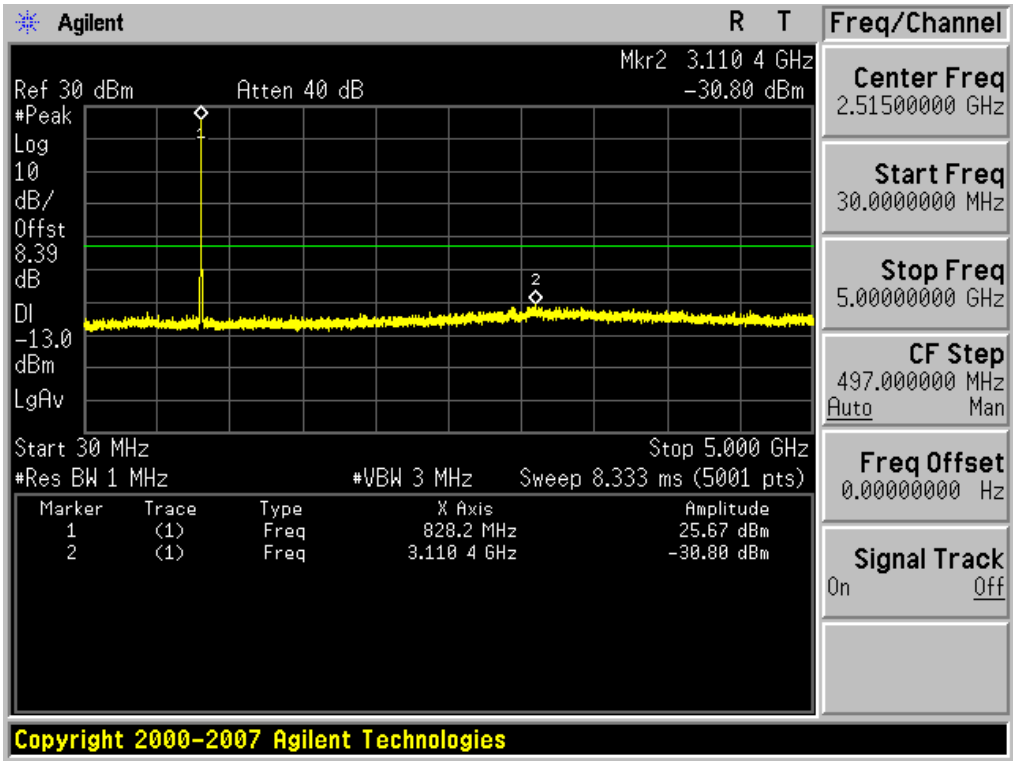


GSM850 & Channel: 251

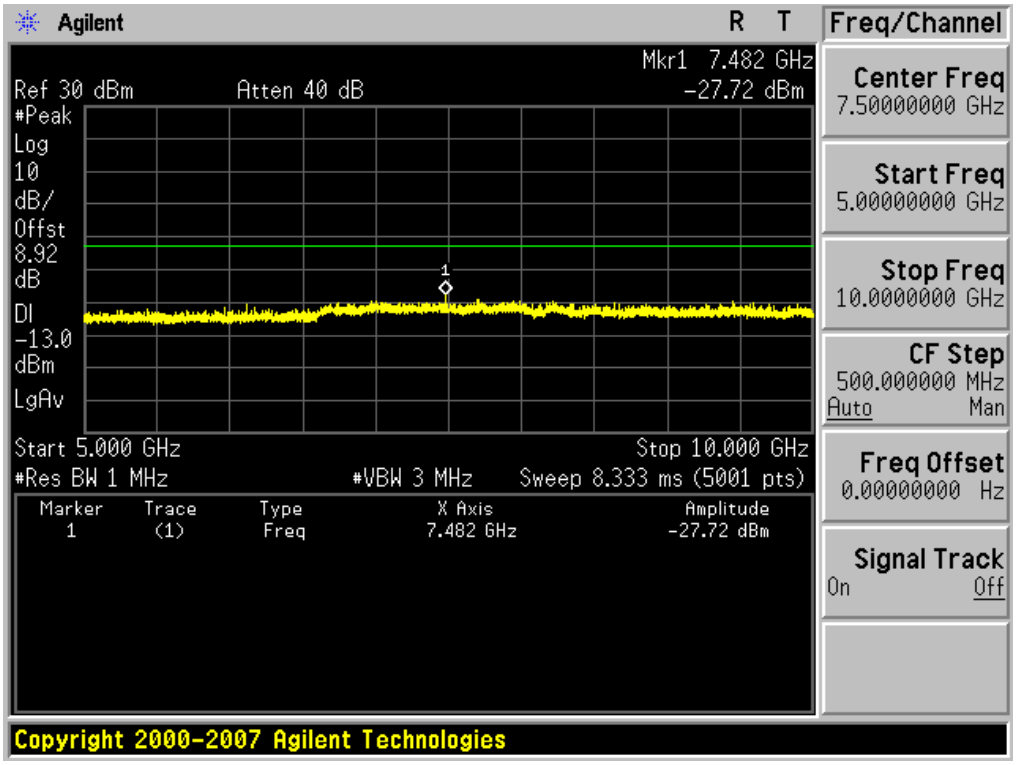


Copyright © 2012, Digital EMC Co., Ltd.

WCDMA850 & Channel: 4132

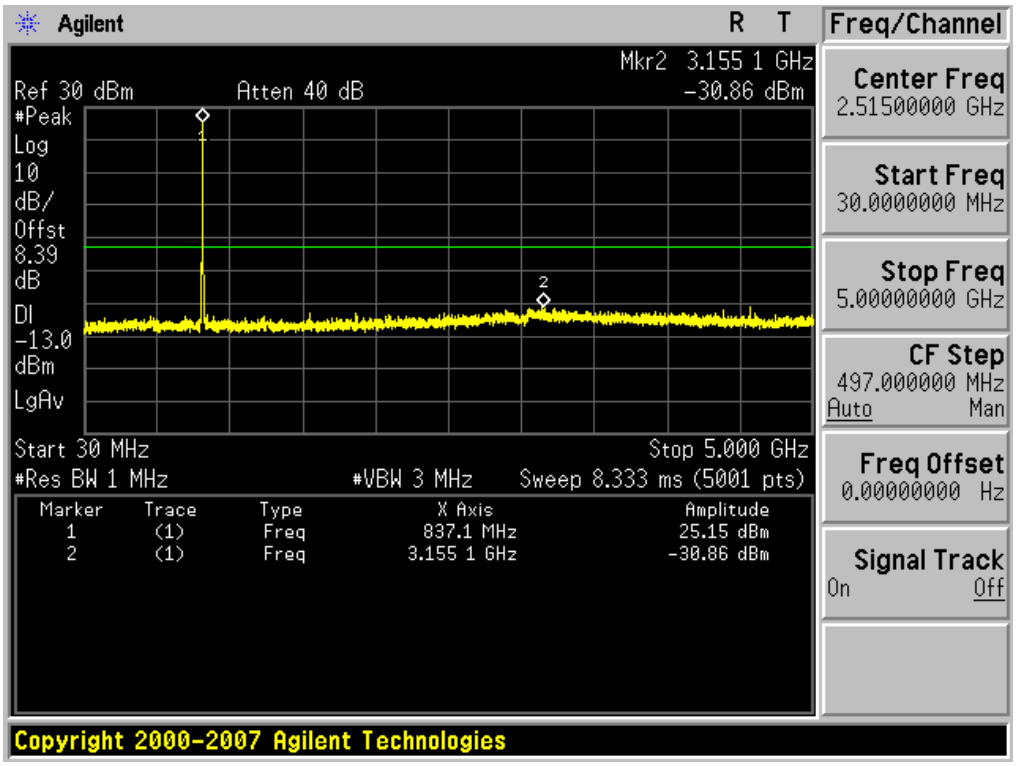


WCDMA850 & Channel: 4132

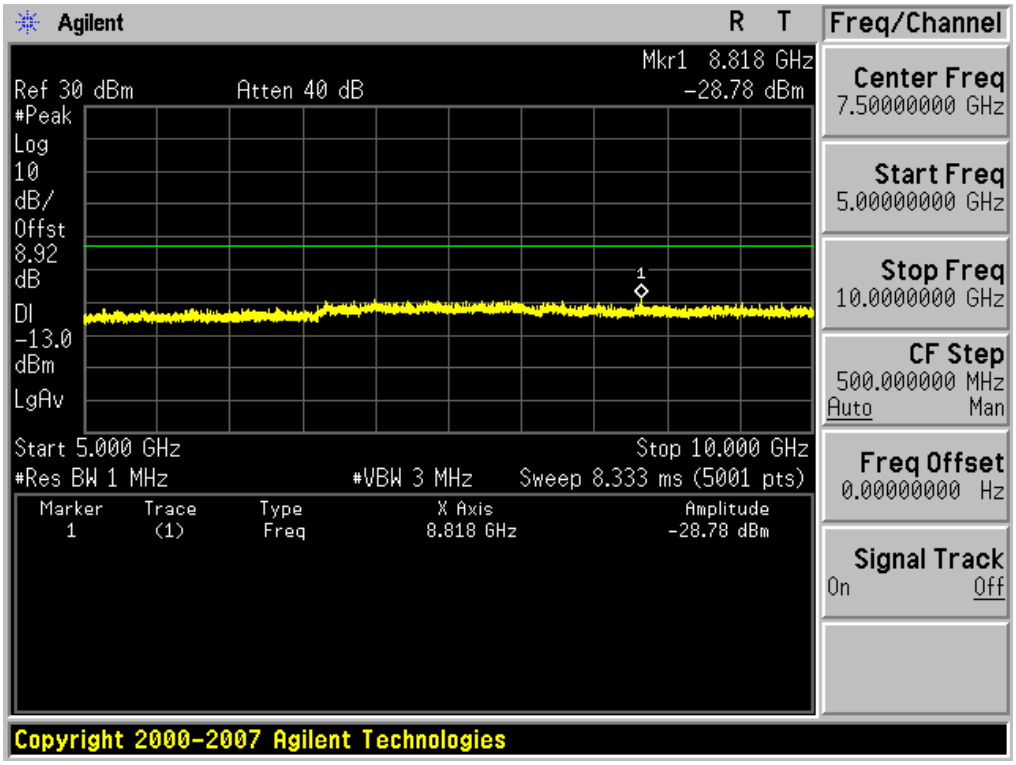


Copyright © 2012, Digital EMC Co., Ltd.

WCDMA850 & Channel: 4183

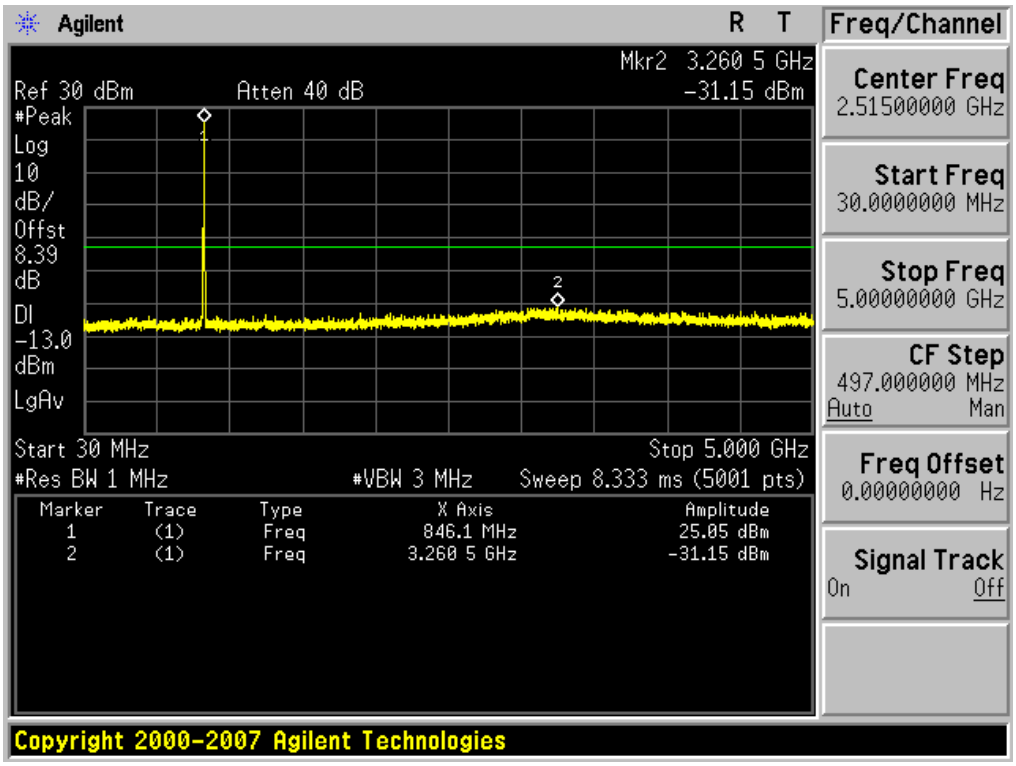


WCDMA850 & Channel: 4183

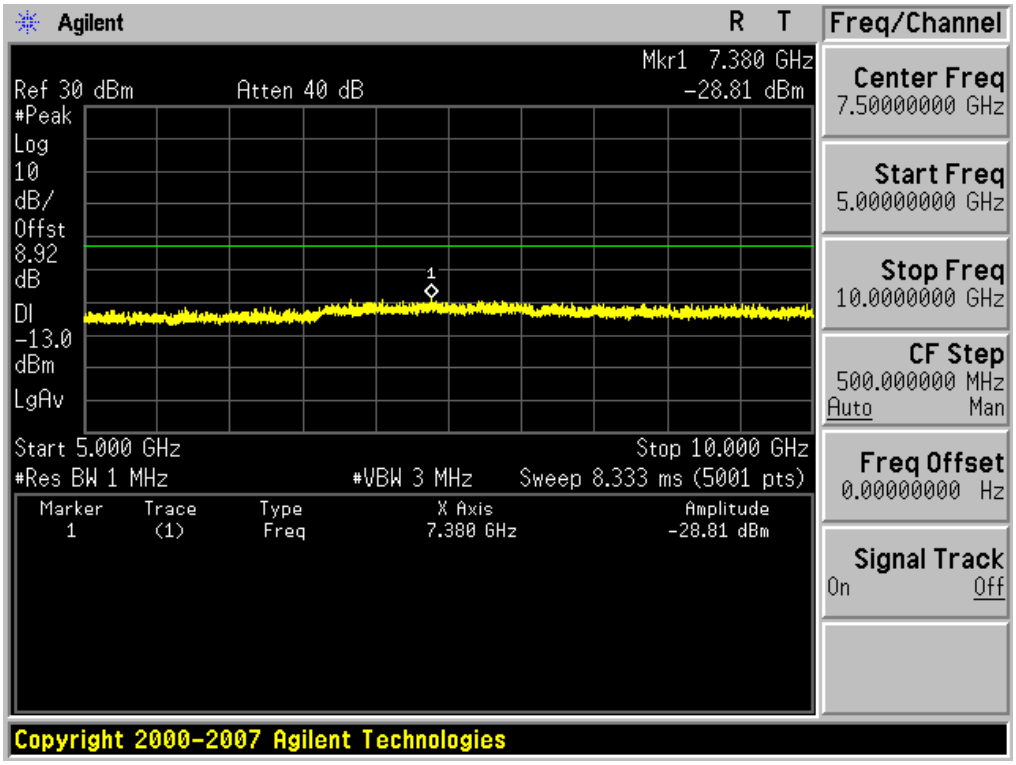


Copyright © 2012, Digital EMC Co., Ltd.

WCDMA850 & Channel: 4233

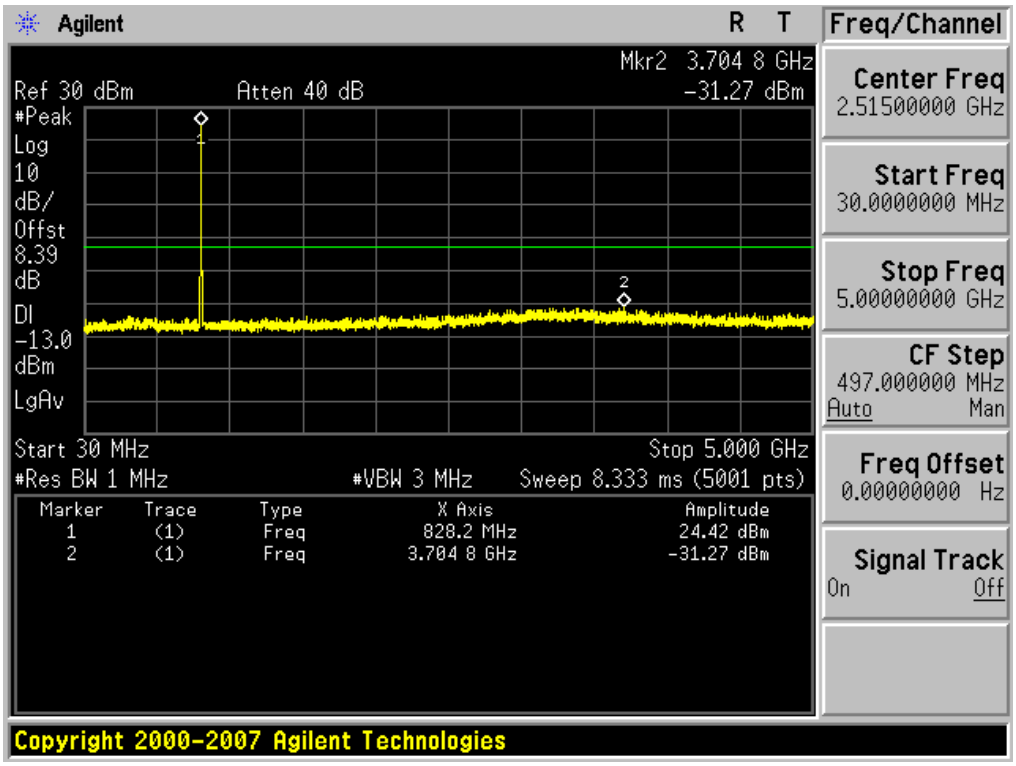


WCDMA850 & Channel: 4233

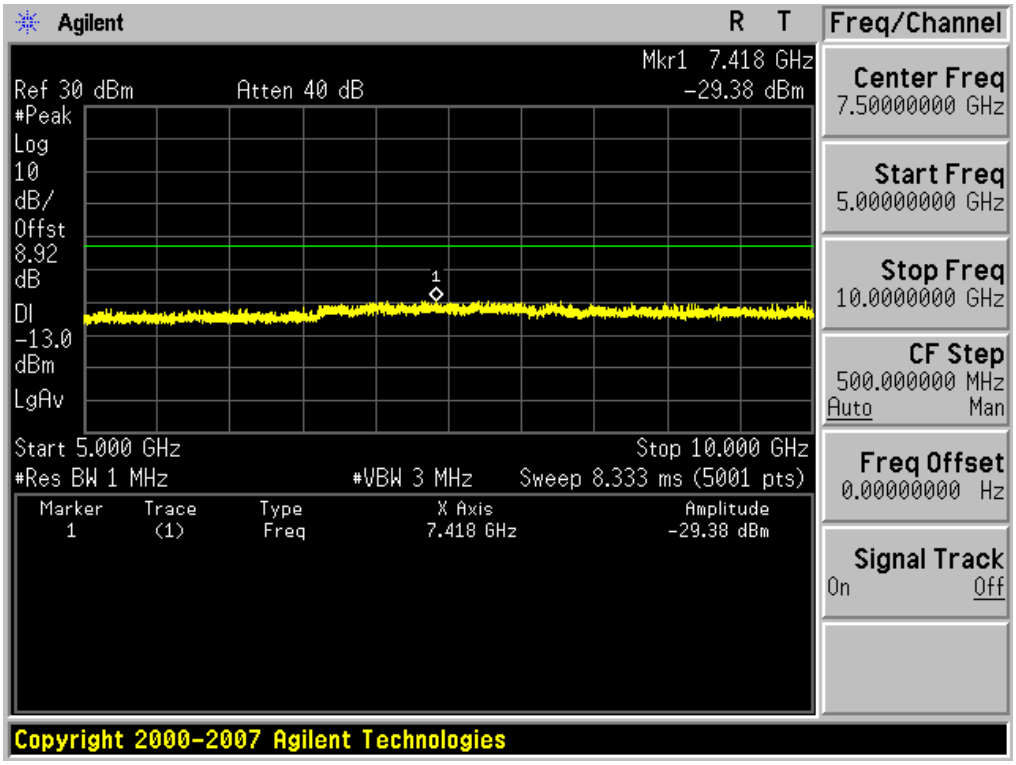


Copyright © 2012, Digital EMC Co., Ltd.

HSUPA850 & Channel: 4132

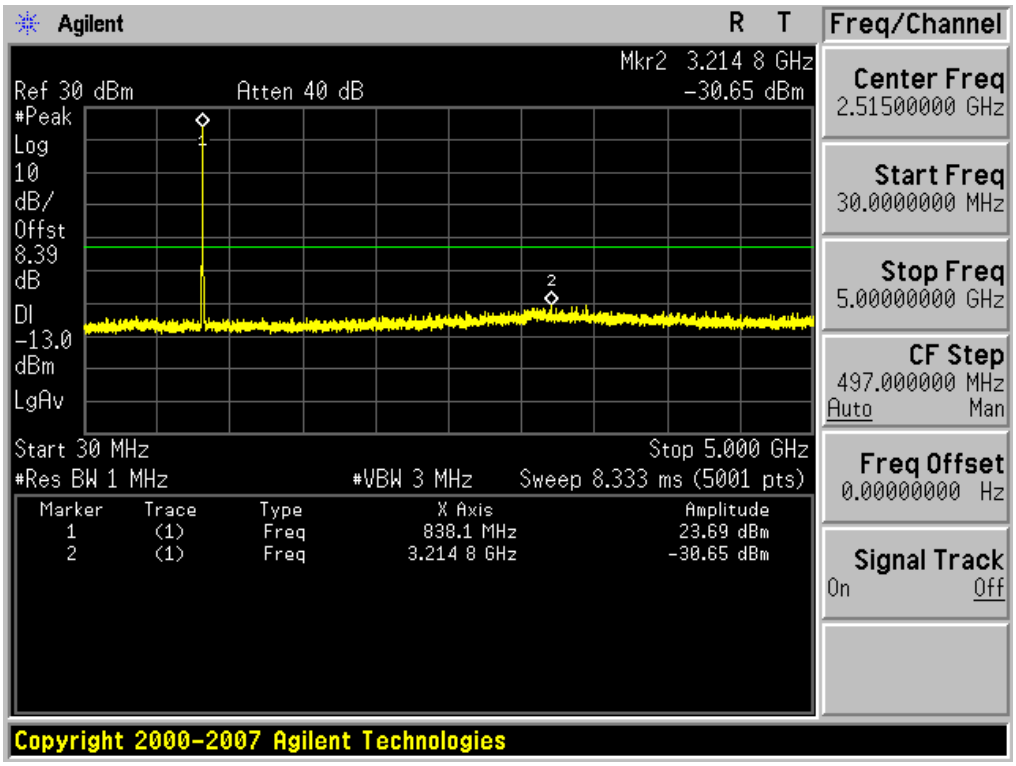


HSUPA850 & Channel: 4132

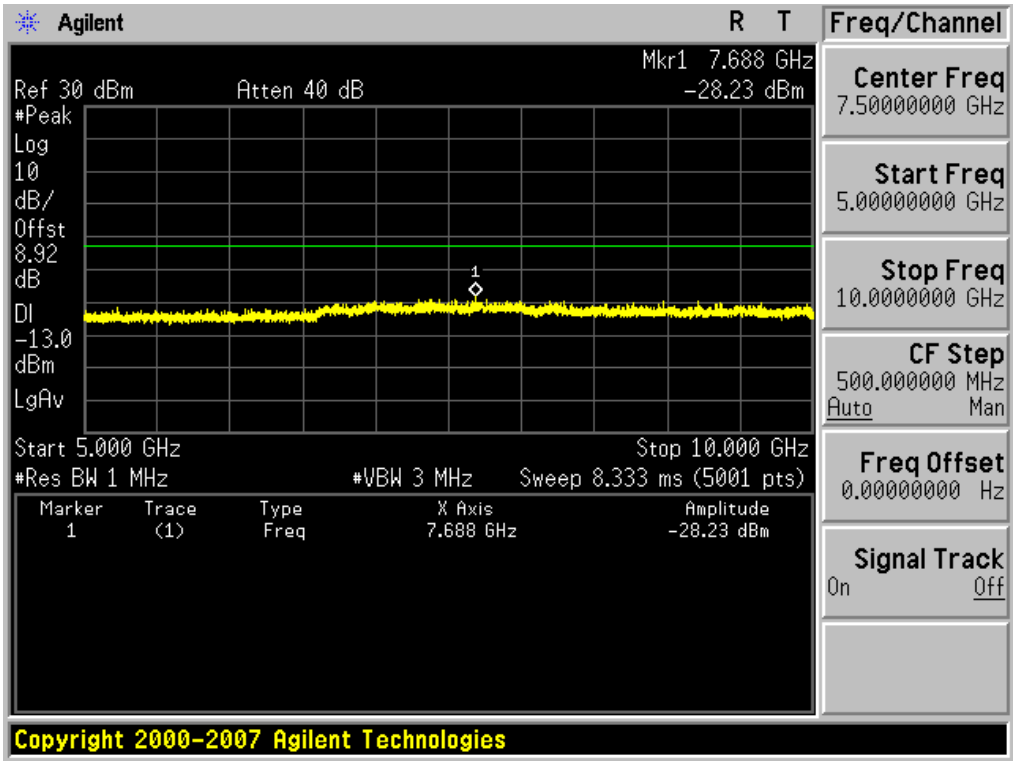


Copyright © 2012, Digital EMC Co., Ltd.

HSUPA850 & Channel: 4183

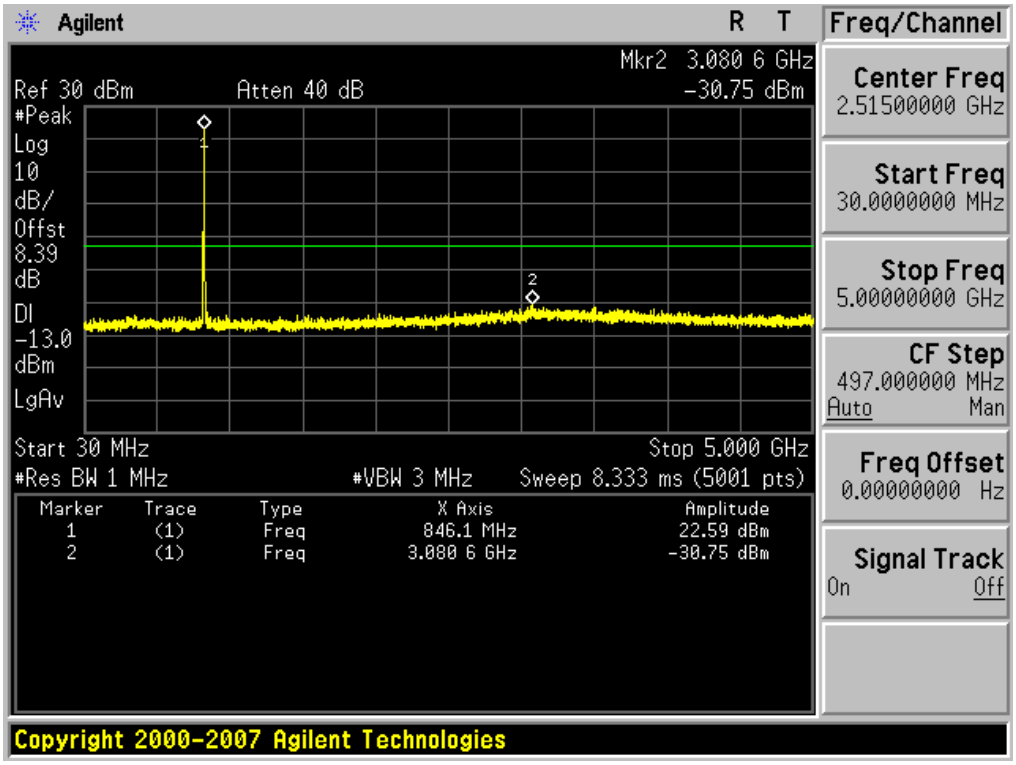


HSUPA850 & Channel: 4183

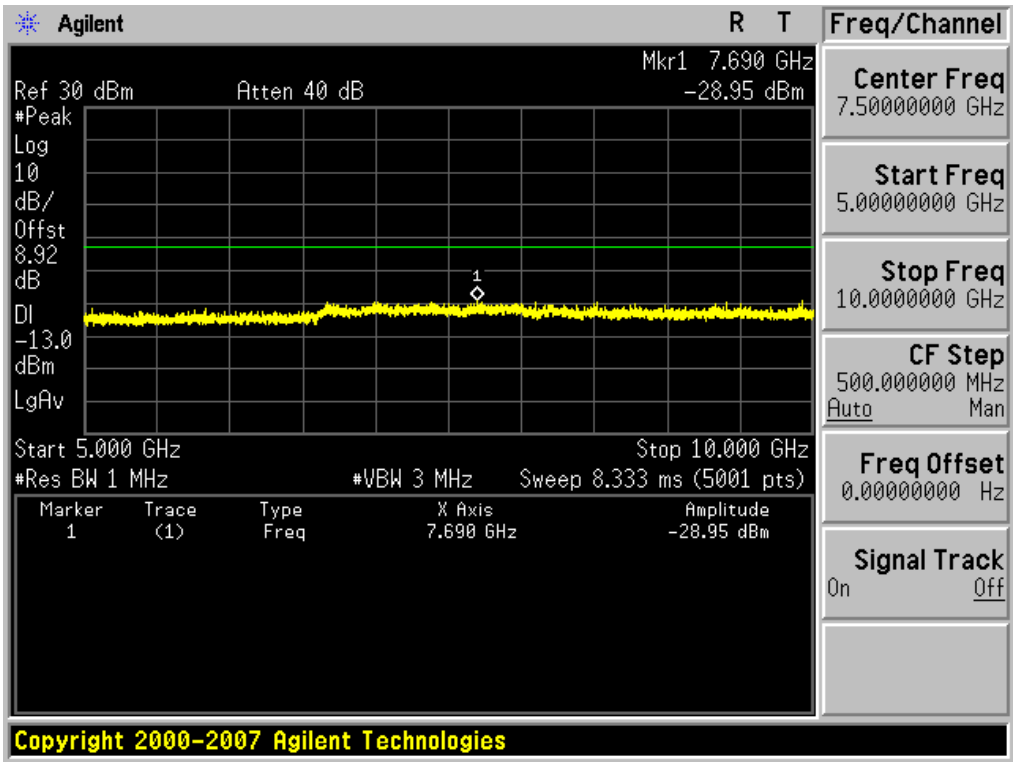


Copyright © 2012, Digital EMC Co., Ltd.

HSUPA850 & Channel: 4233

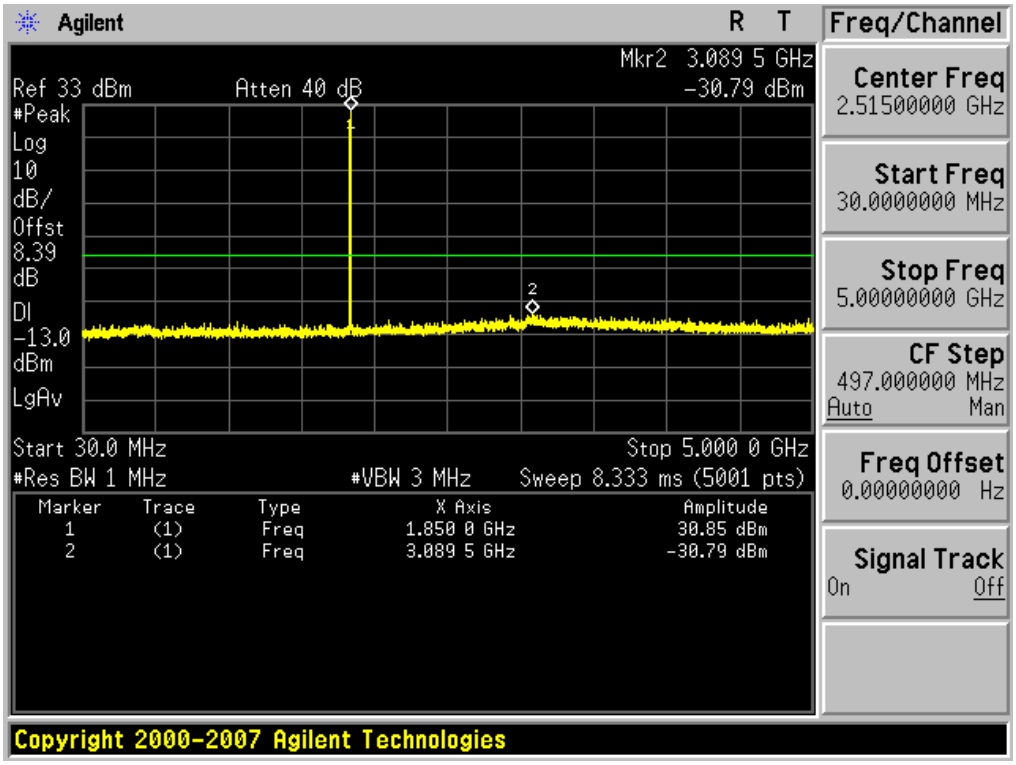


HSUPA850 & Channel: 4233

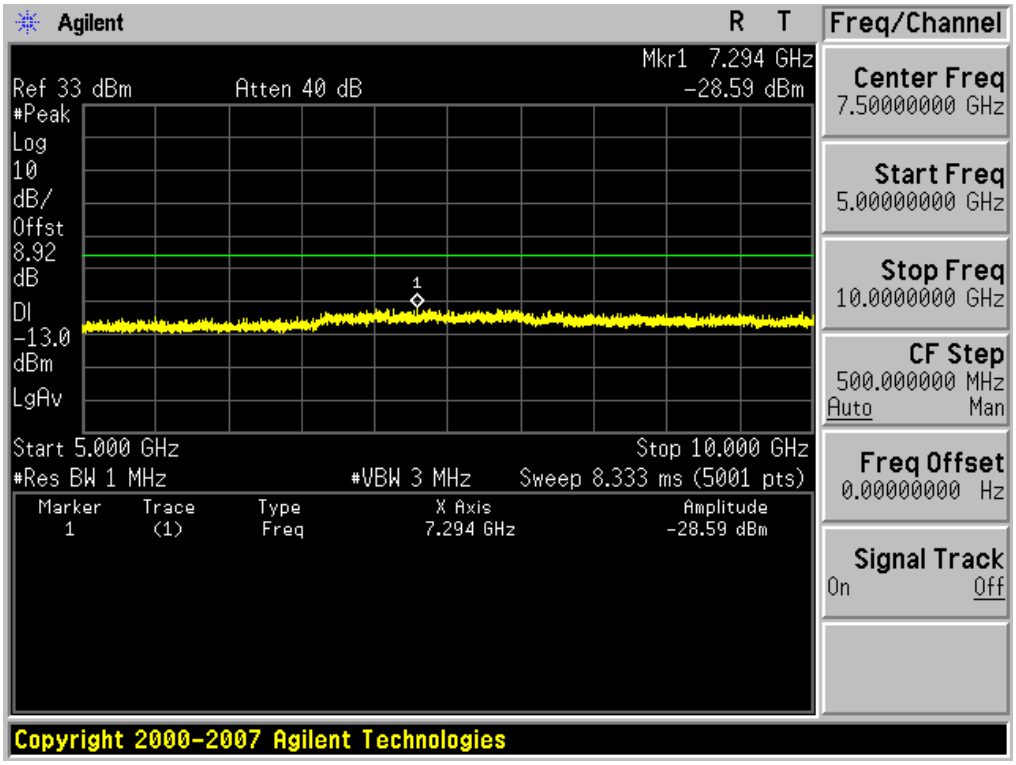


Copyright © 2012, Digital EMC Co., Ltd.

PCS1900 & Channel: 512

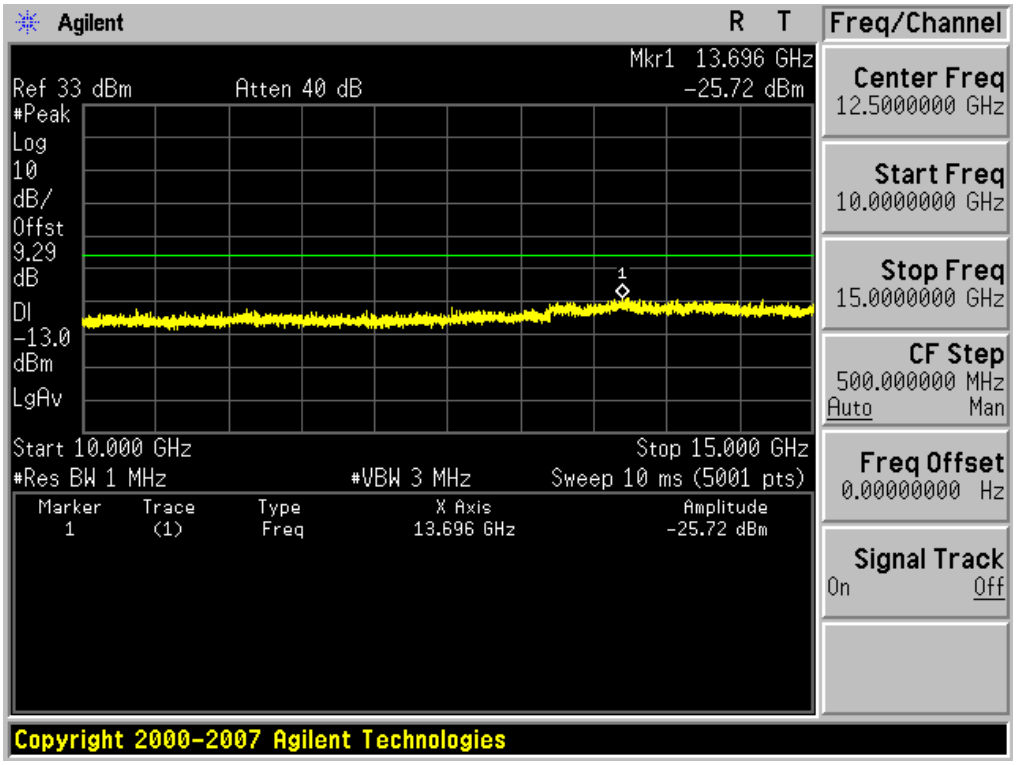


PCS1900 & Channel: 512

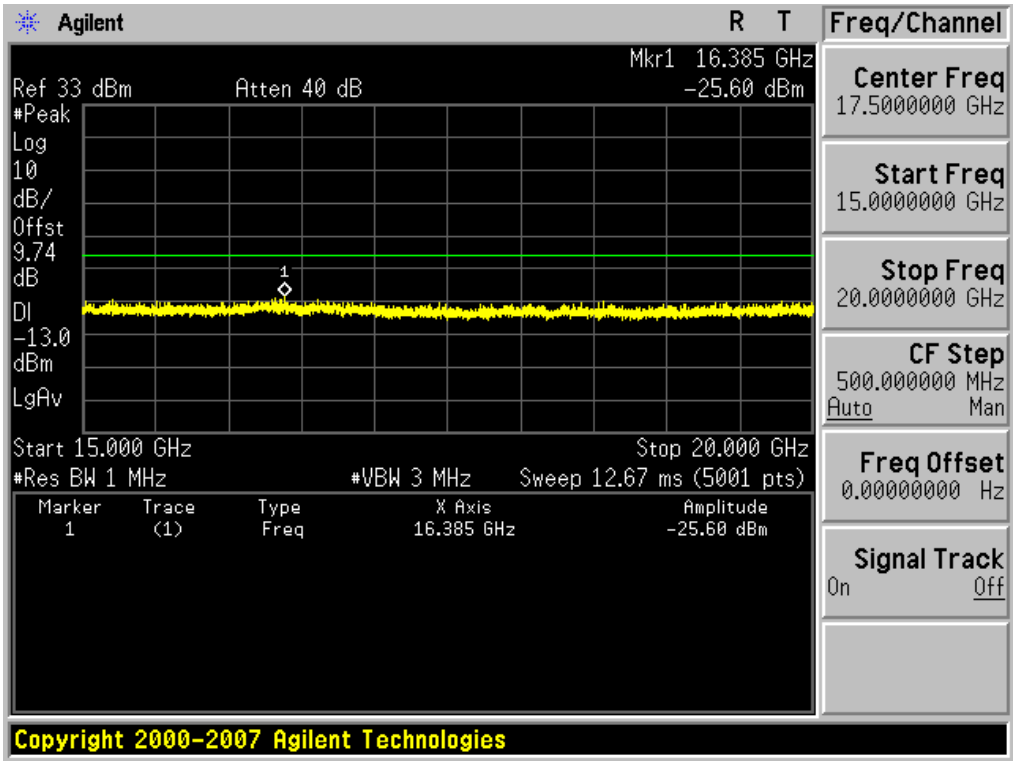


Copyright © 2012, Digital EMC Co., Ltd.

PCS1900 & Channel: 512

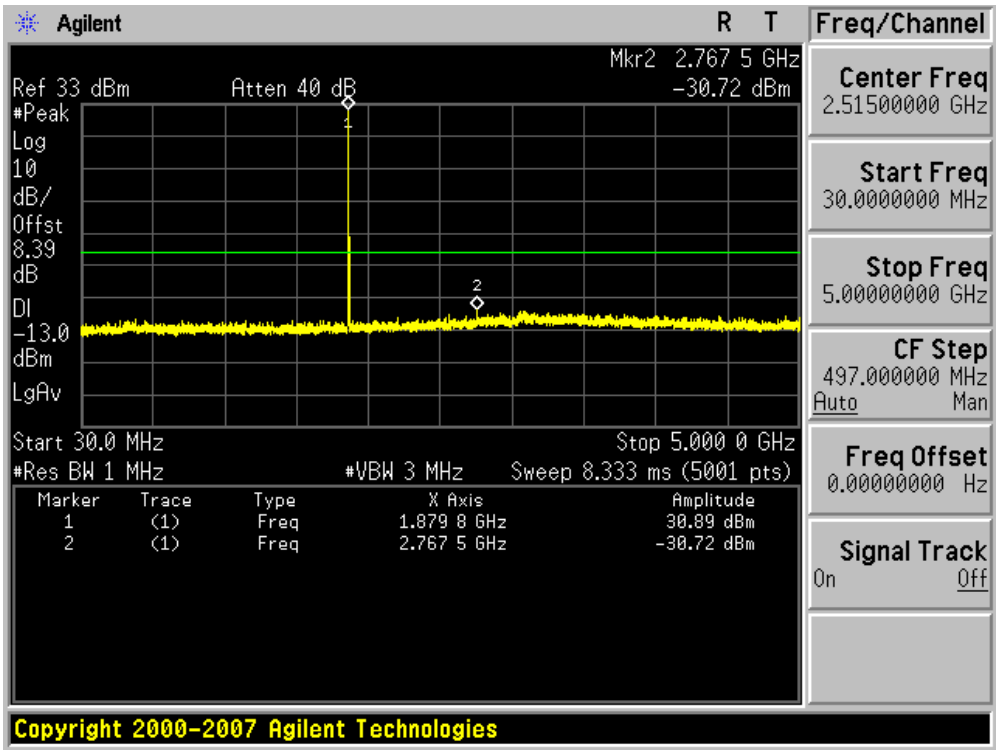


PCS1900 & Channel: 512

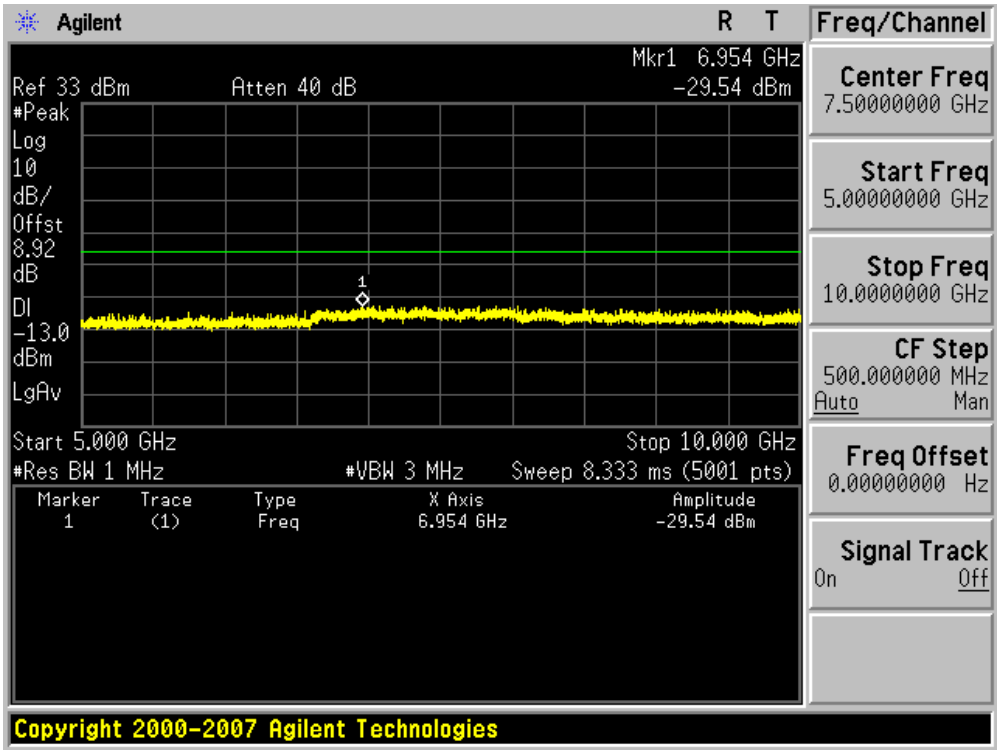


Copyright © 2012, Digital EMC Co., Ltd.

PCS1900 & Channel: 661

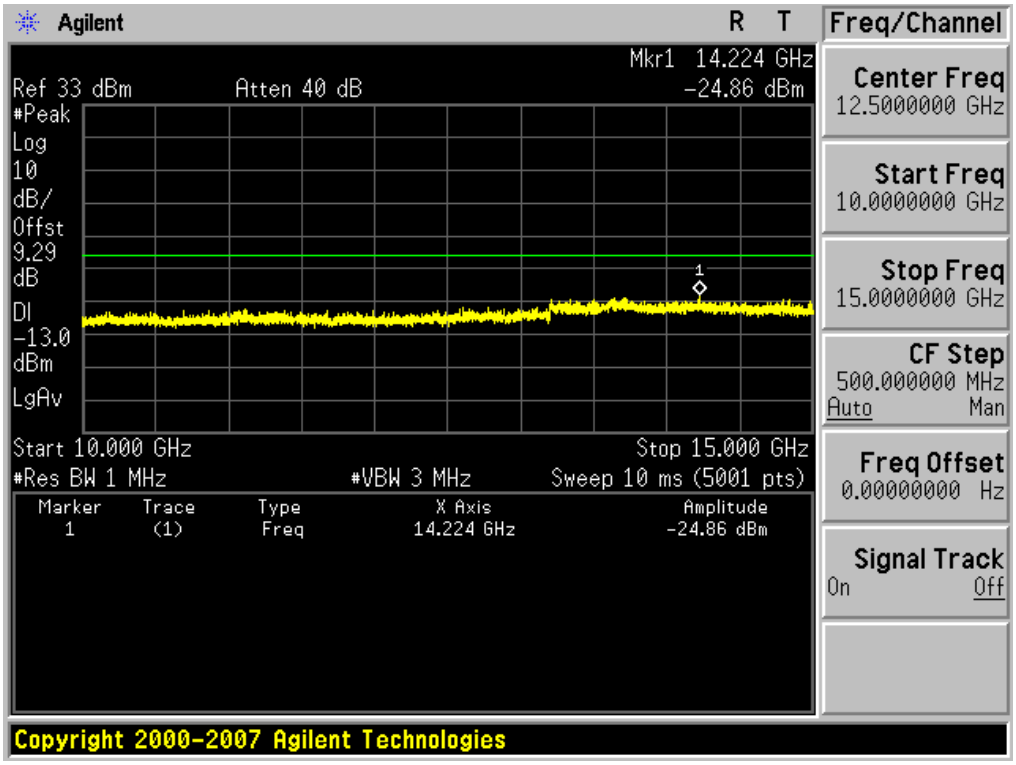


PCS1900 & Channel: 661

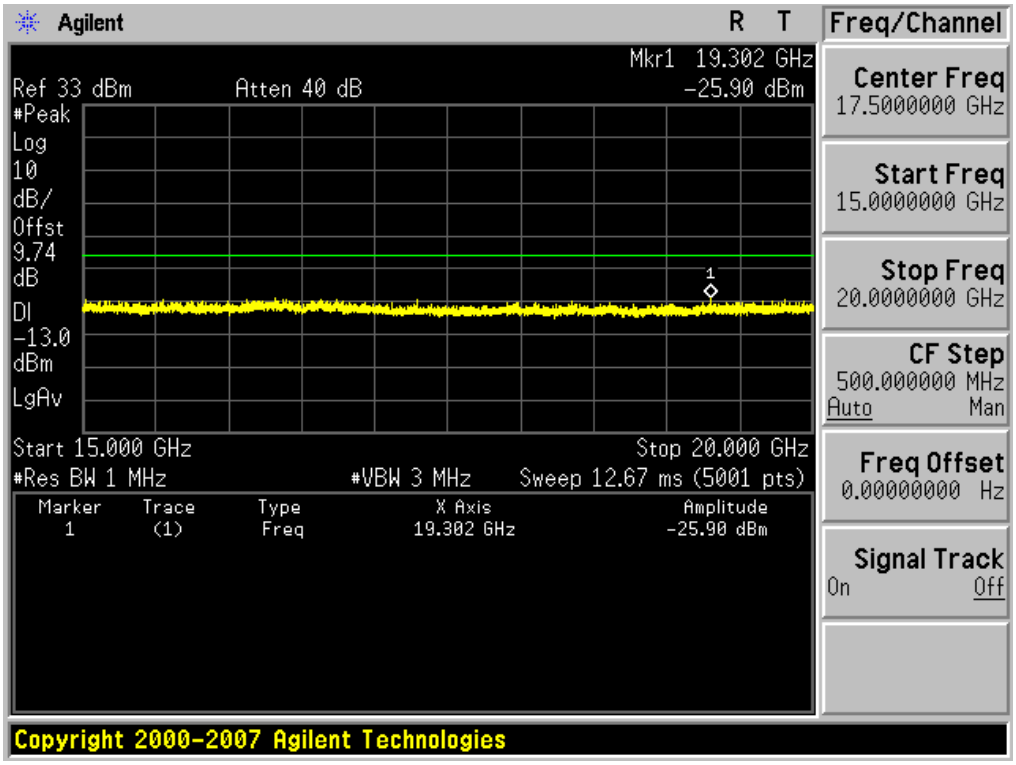


Copyright © 2012, Digital EMC Co., Ltd.

PCS1900 & Channel: 661

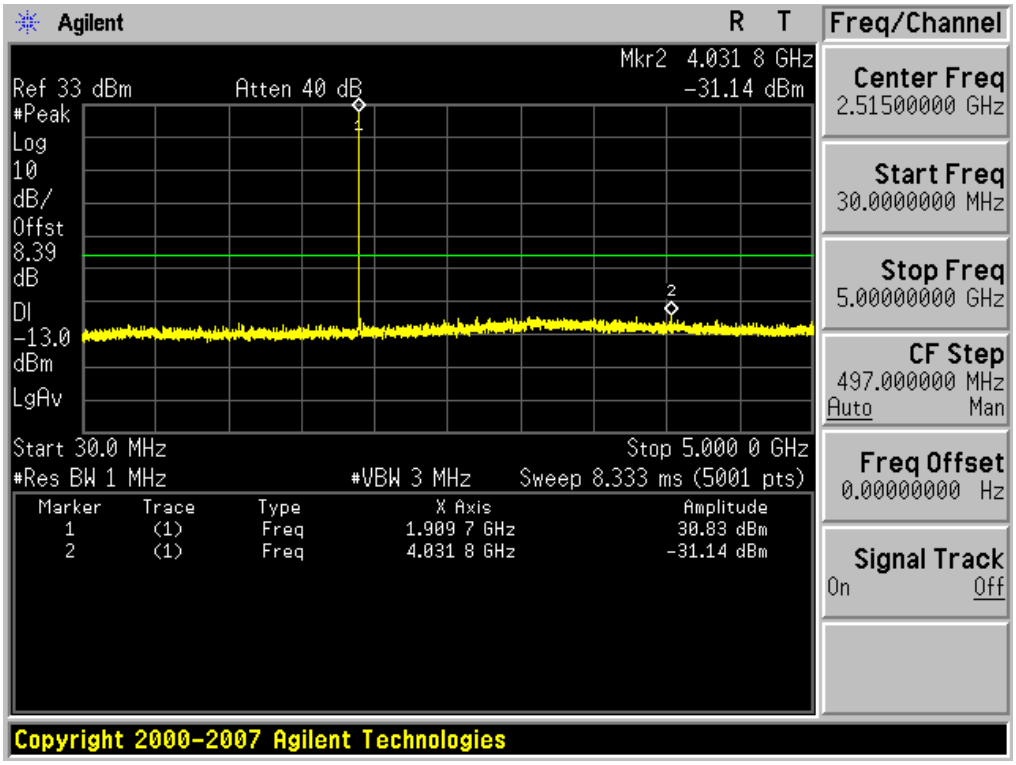


PCS1900 & Channel: 661

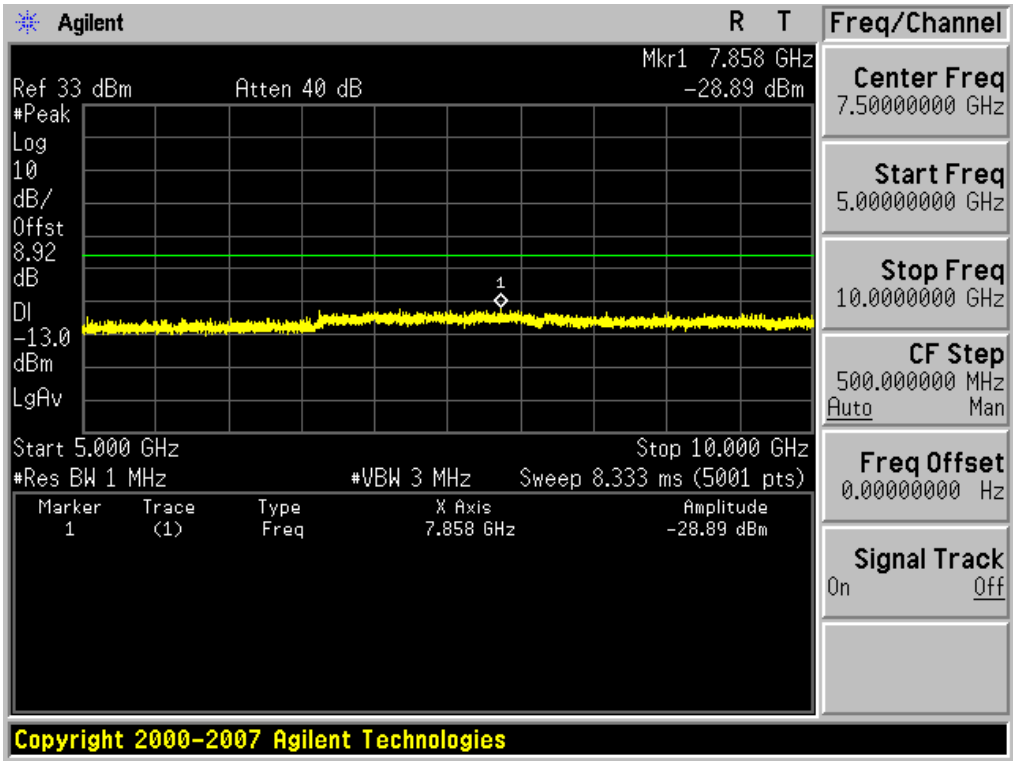


Copyright © 2012, Digital EMC Co., Ltd.

PCS1900 & Channel: 810

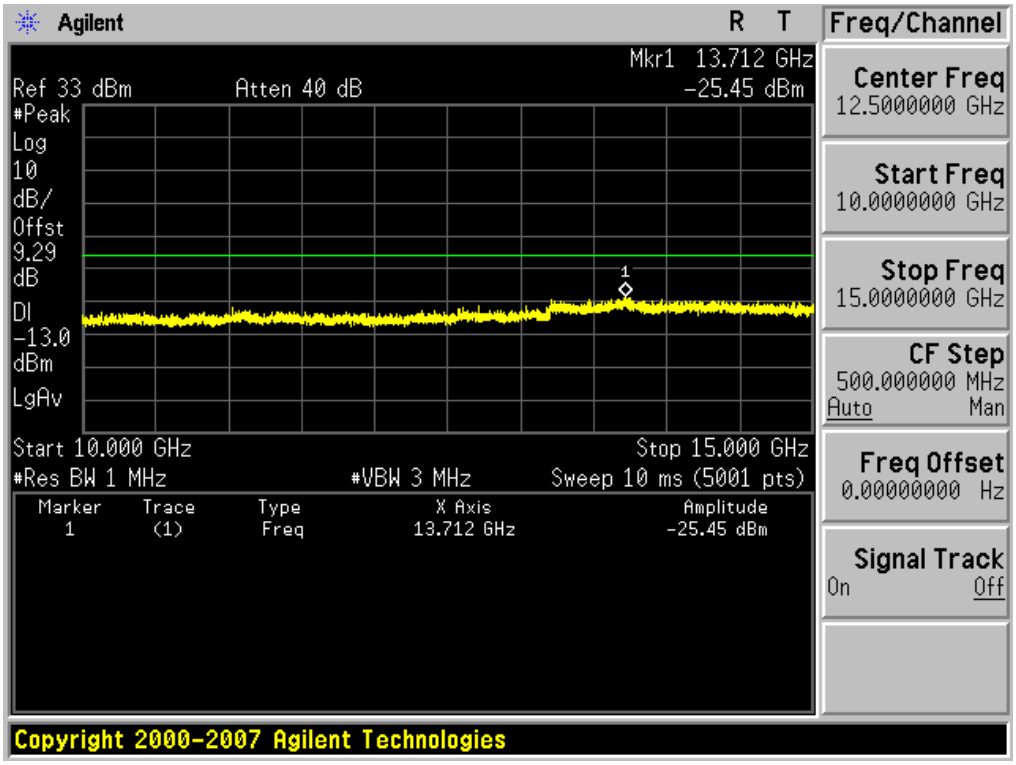


PCS1900 & Channel: 810

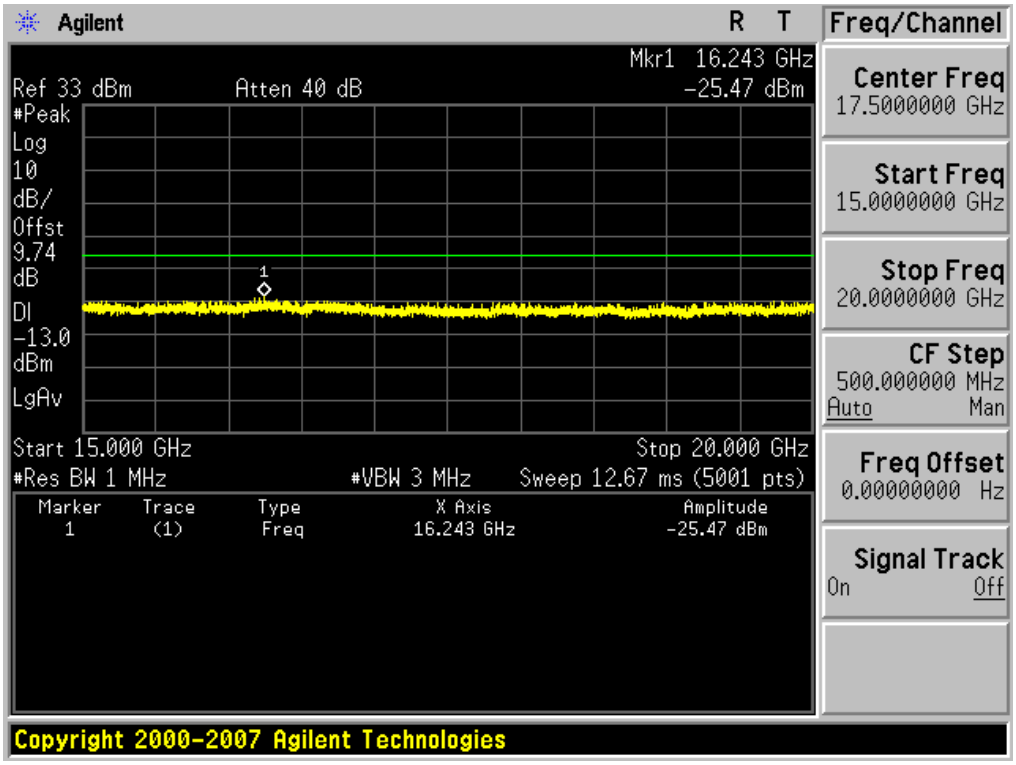


Copyright © 2012, Digital EMC Co., Ltd.

PCS1900 & Channel: 810

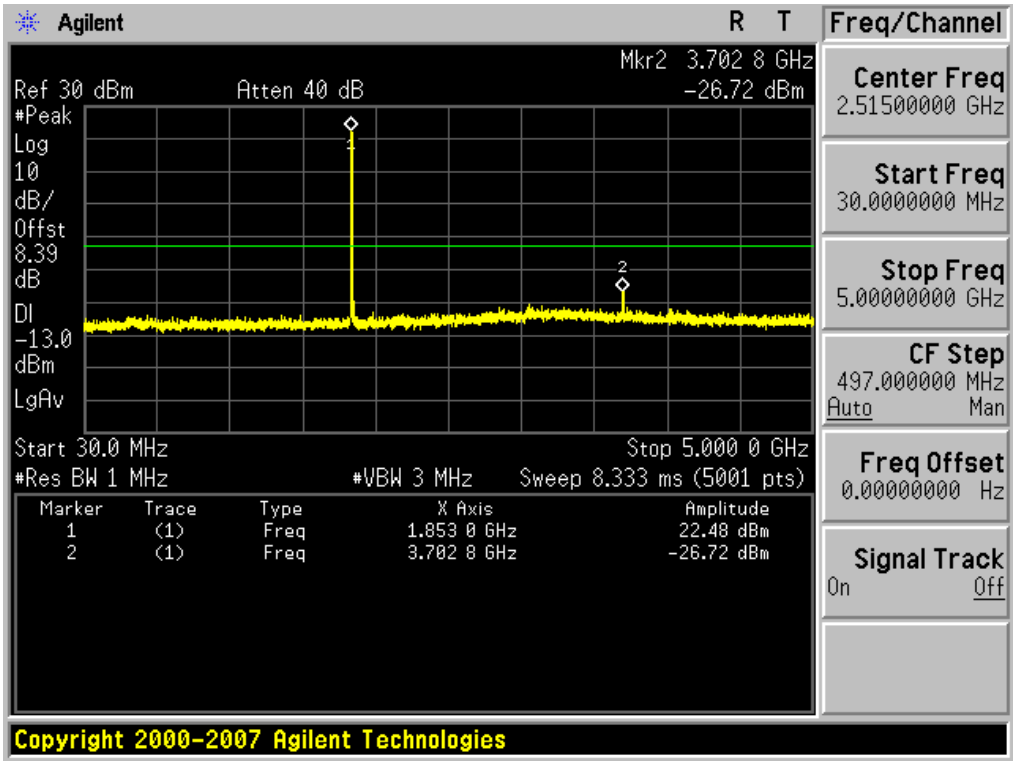


PCS1900 & Channel: 810

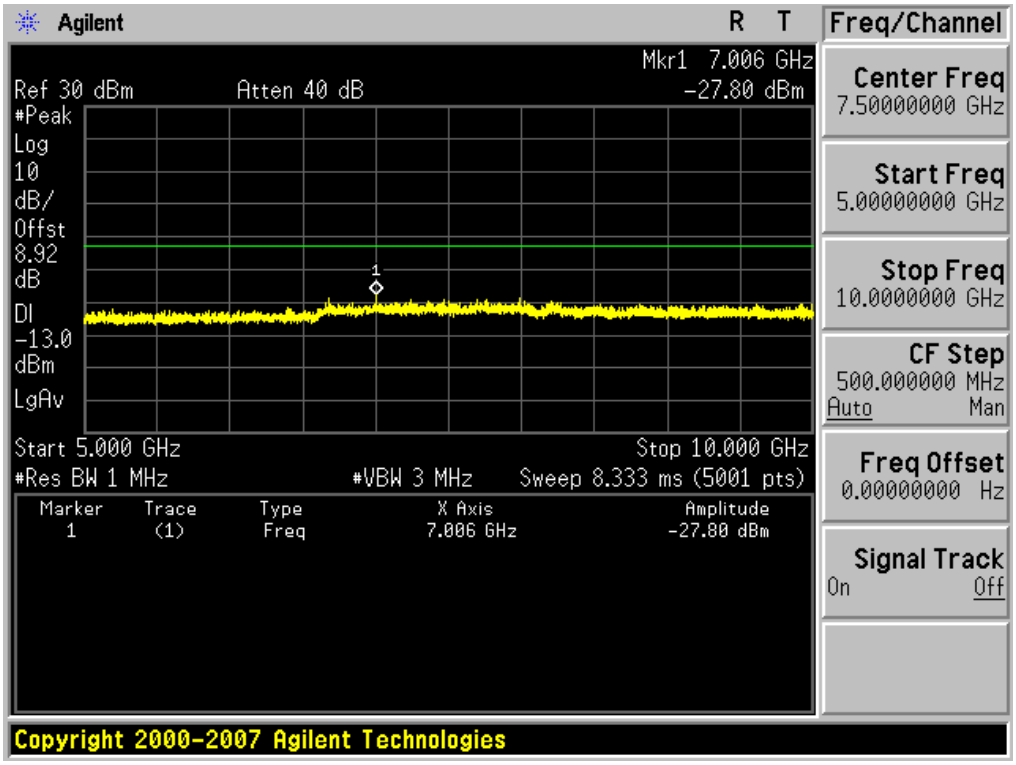


Copyright © 2012, Digital EMC Co., Ltd.

WCDMA1900 & Channel: 9262

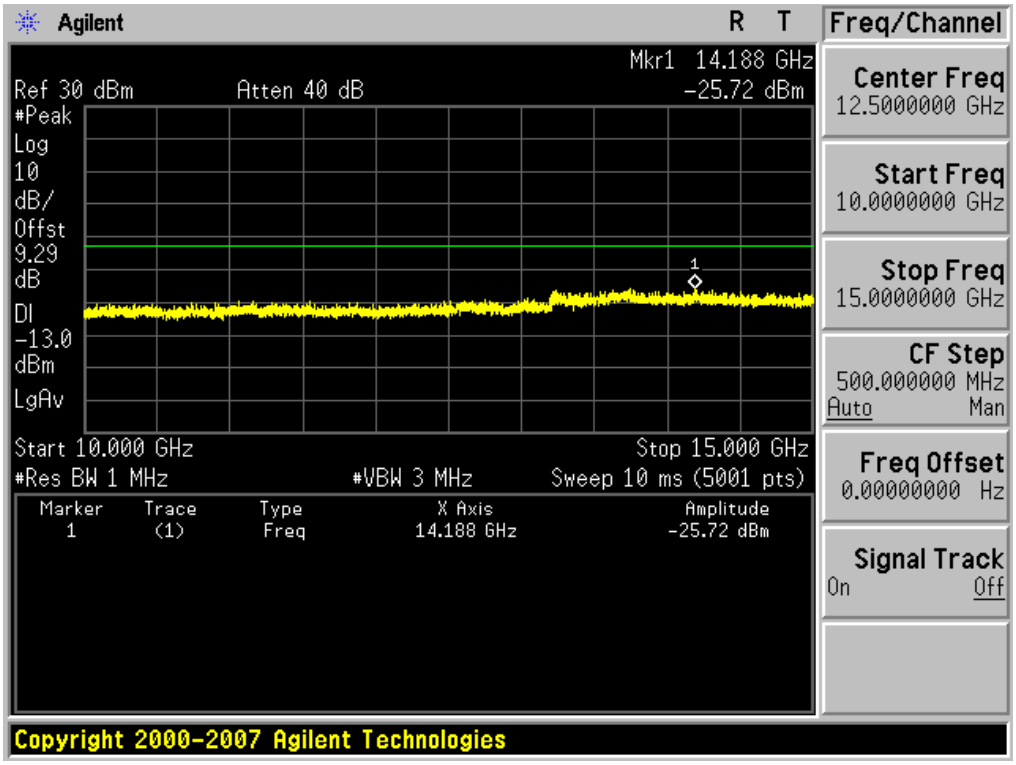


WCDMA1900 & Channel: 9262

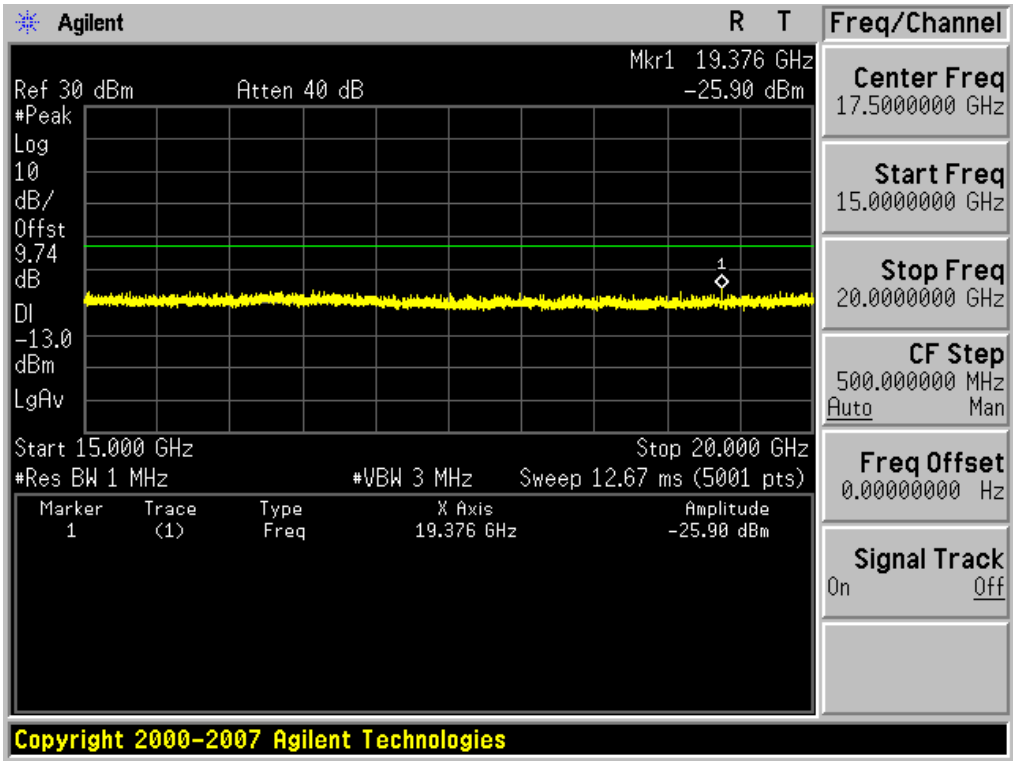


Copyright © 2012, Digital EMC Co., Ltd.

WCDMA1900 & Channel: 9262

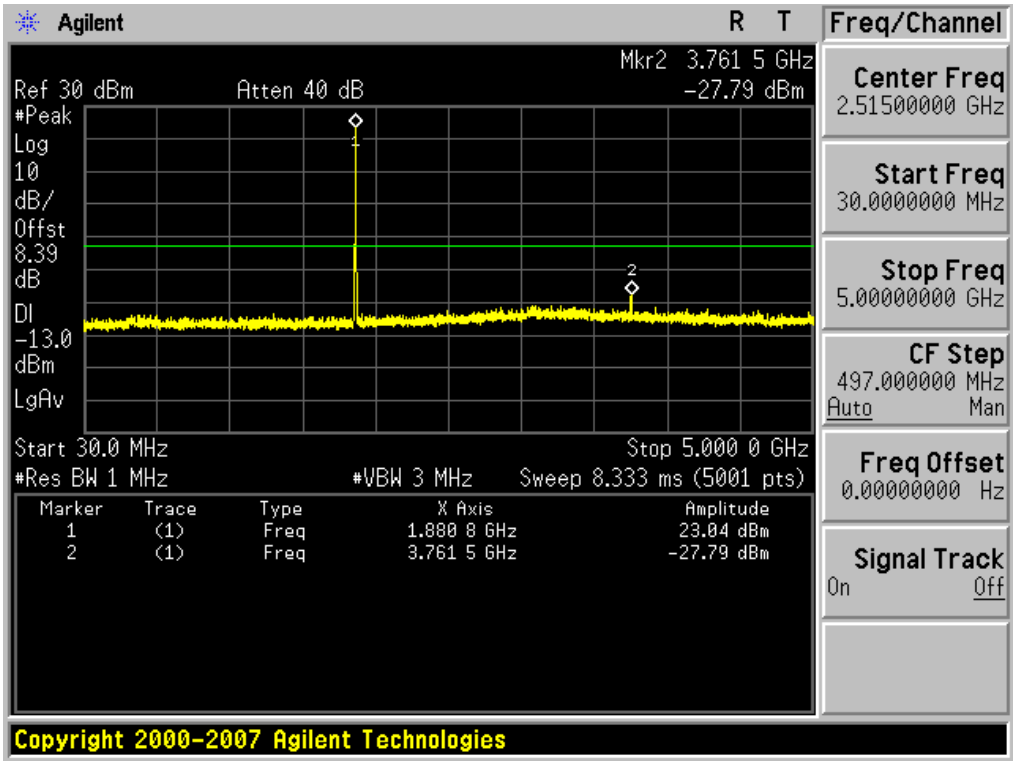


WCDMA1900 & Channel: 9262

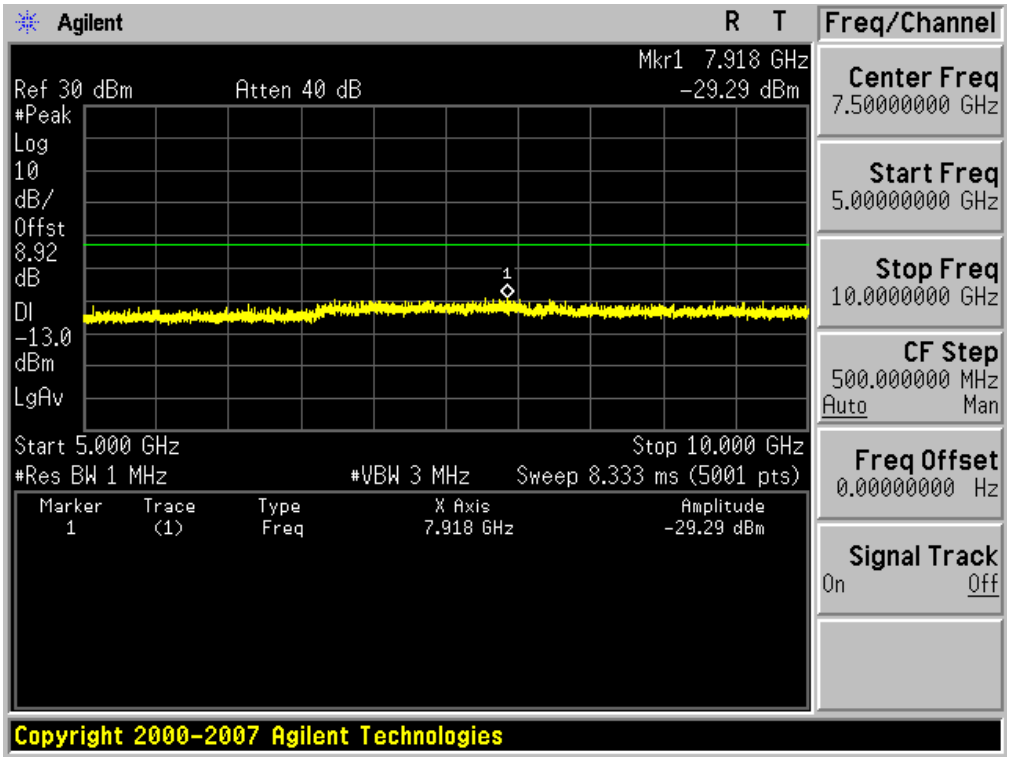


Copyright © 2012, Digital EMC Co., Ltd.

WCDMA1900 & Channel: 9400

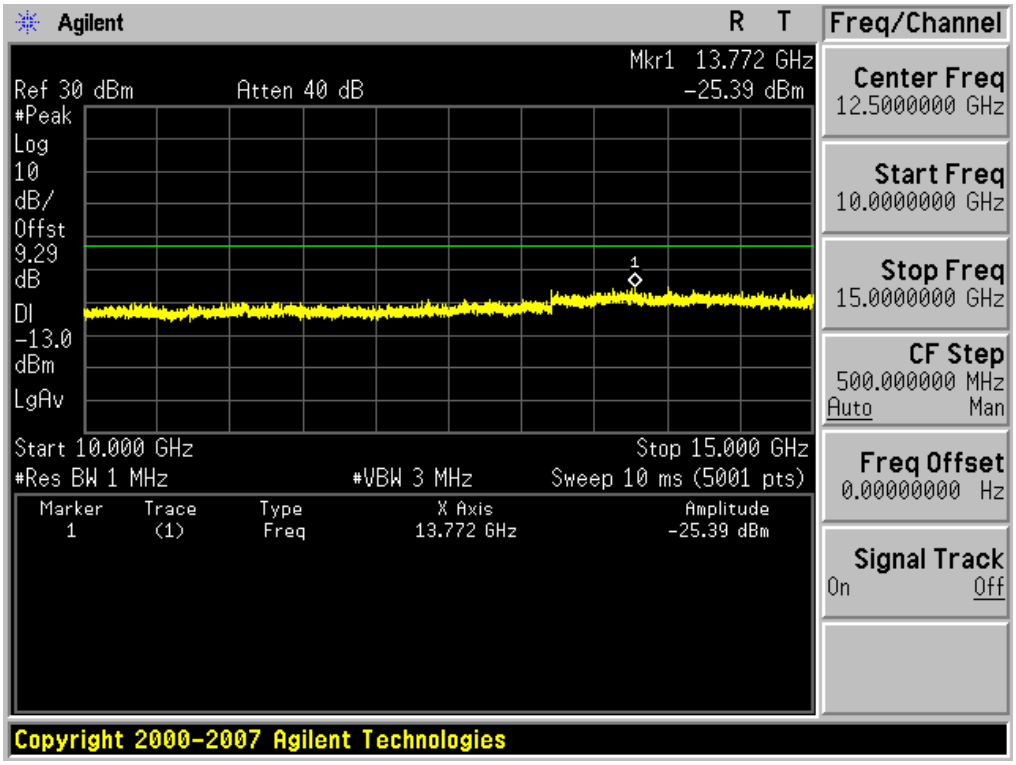


WCDMA1900 & Channel: 9400

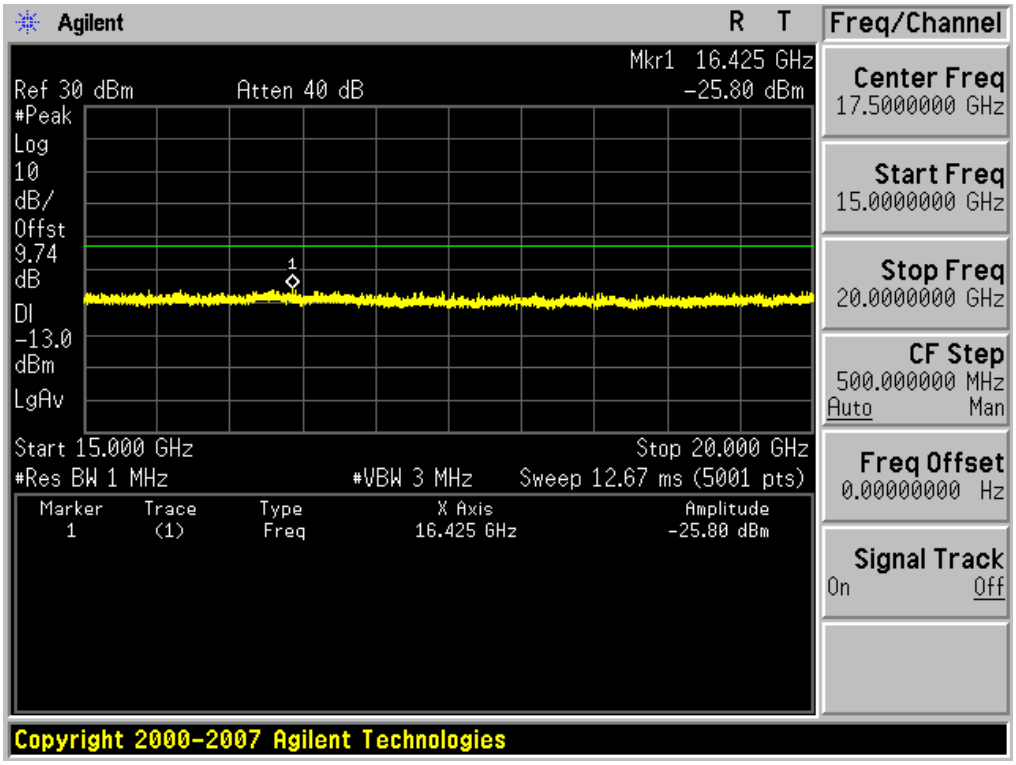


Copyright © 2012, Digital EMC Co., Ltd.

WCDMA1900 & Channel: 9400

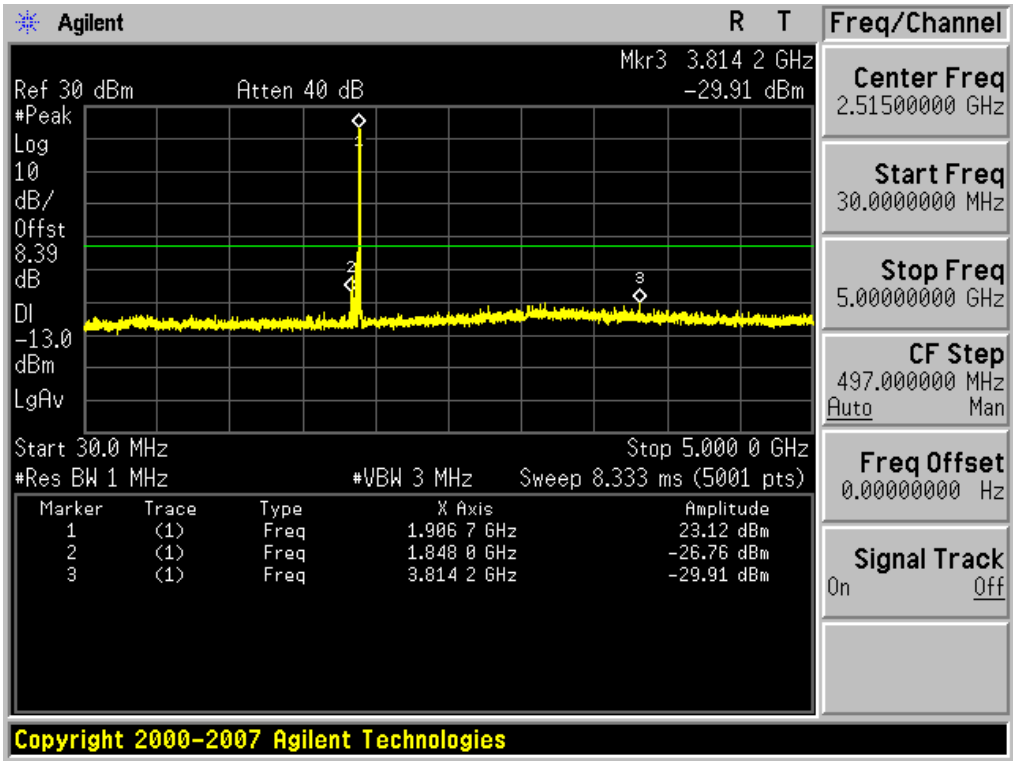


WCDMA1900 & Channel: 9400

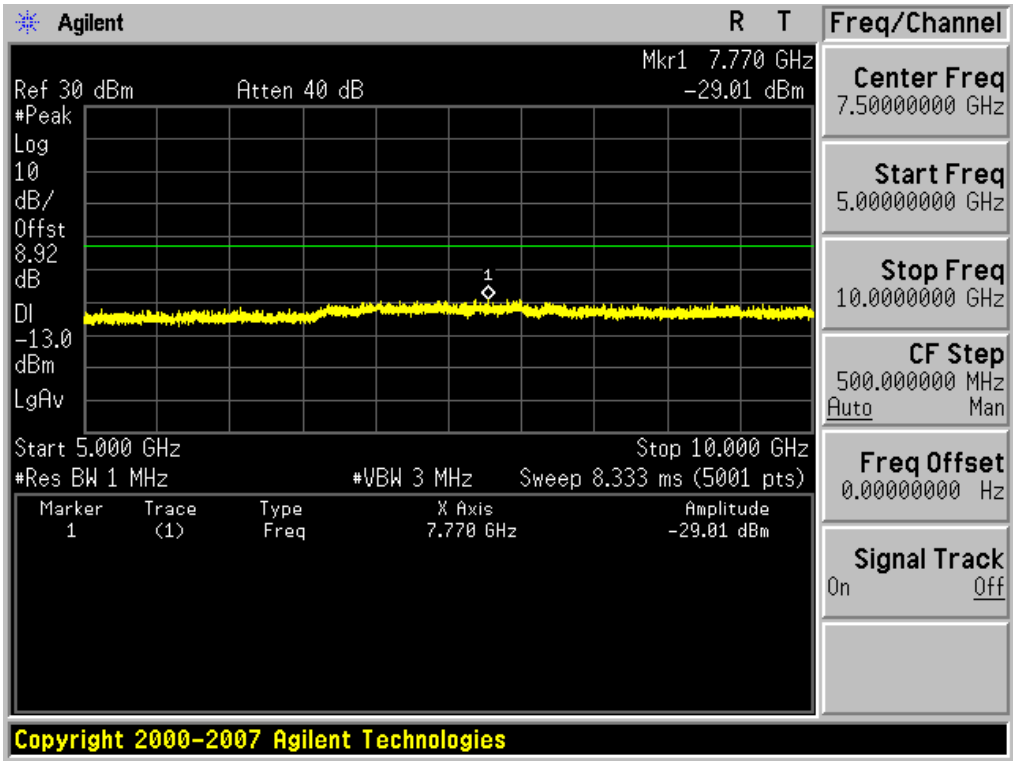


Copyright © 2012, Digital EMC Co., Ltd.

WCDMA1900 & Channel: 9538

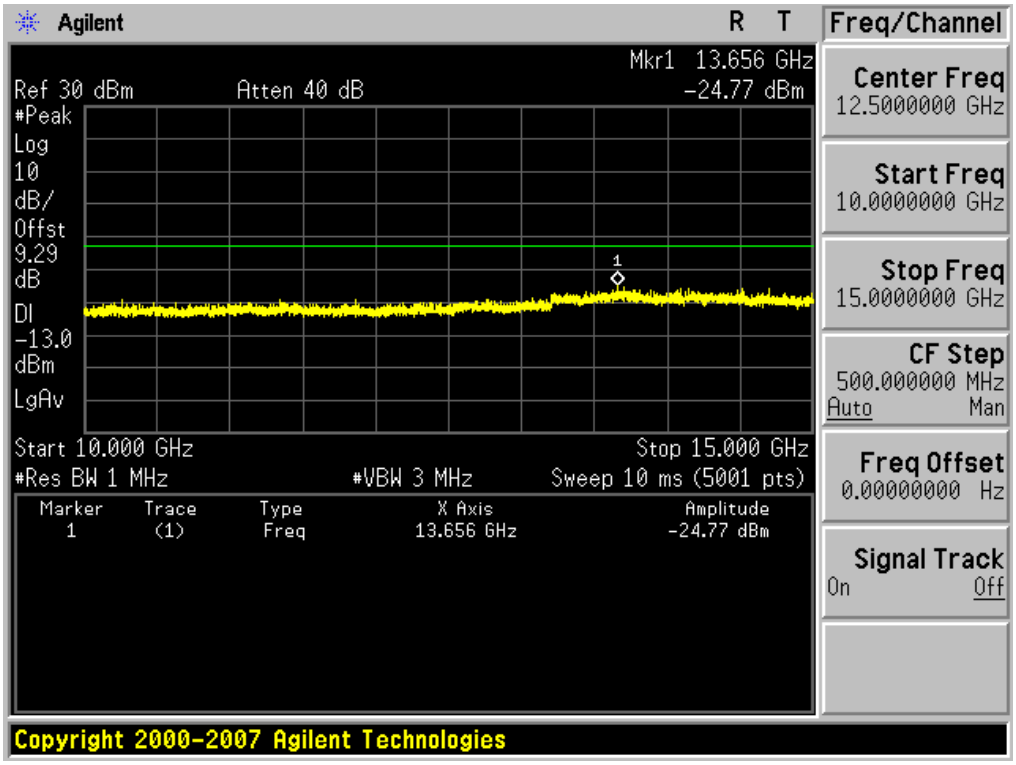


WCDMA1900 & Channel: 9538

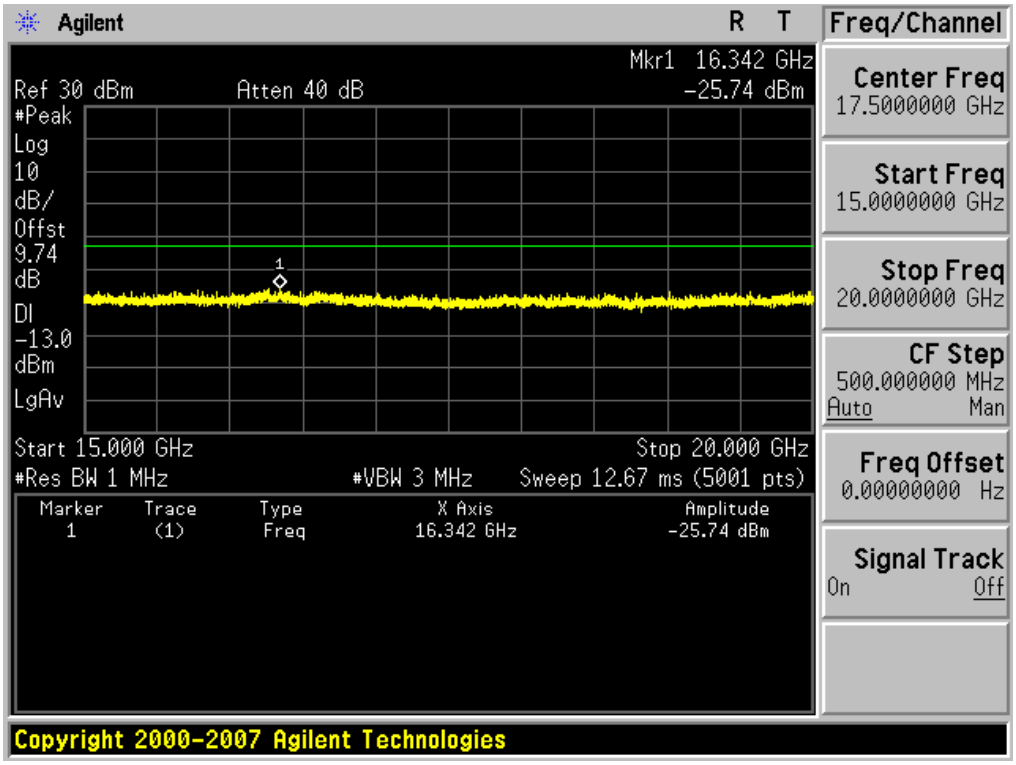


Copyright © 2012, Digital EMC Co., Ltd.

WCDMA1900 & Channel: 9538

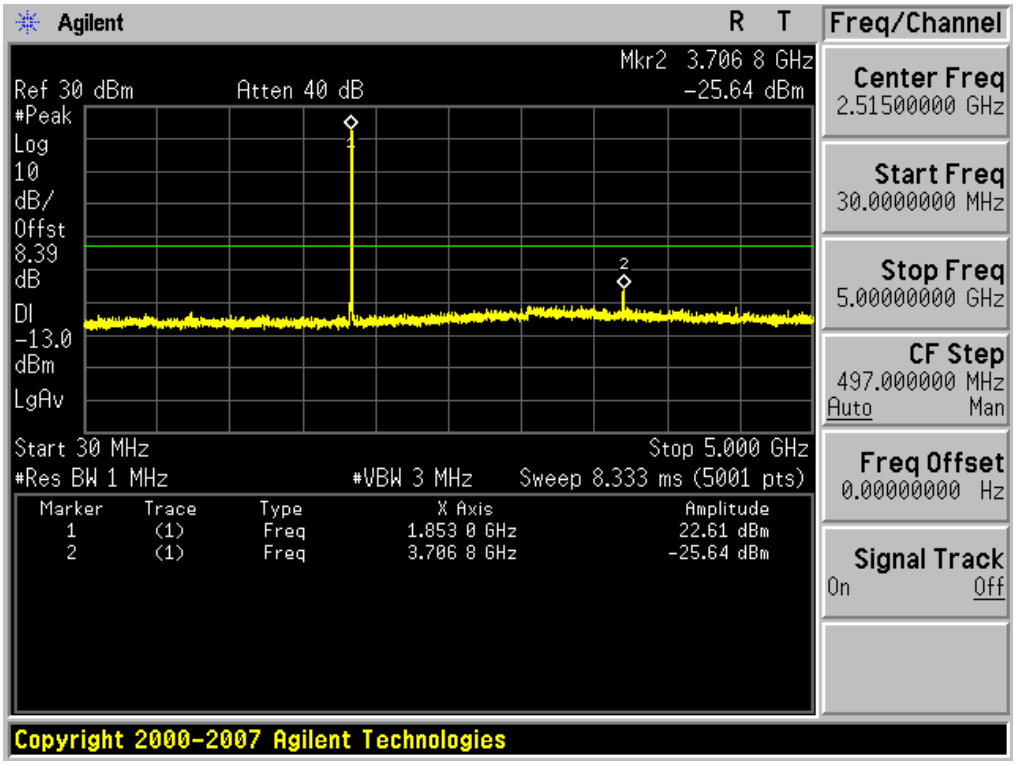


WCDMA1900 & Channel: 9538

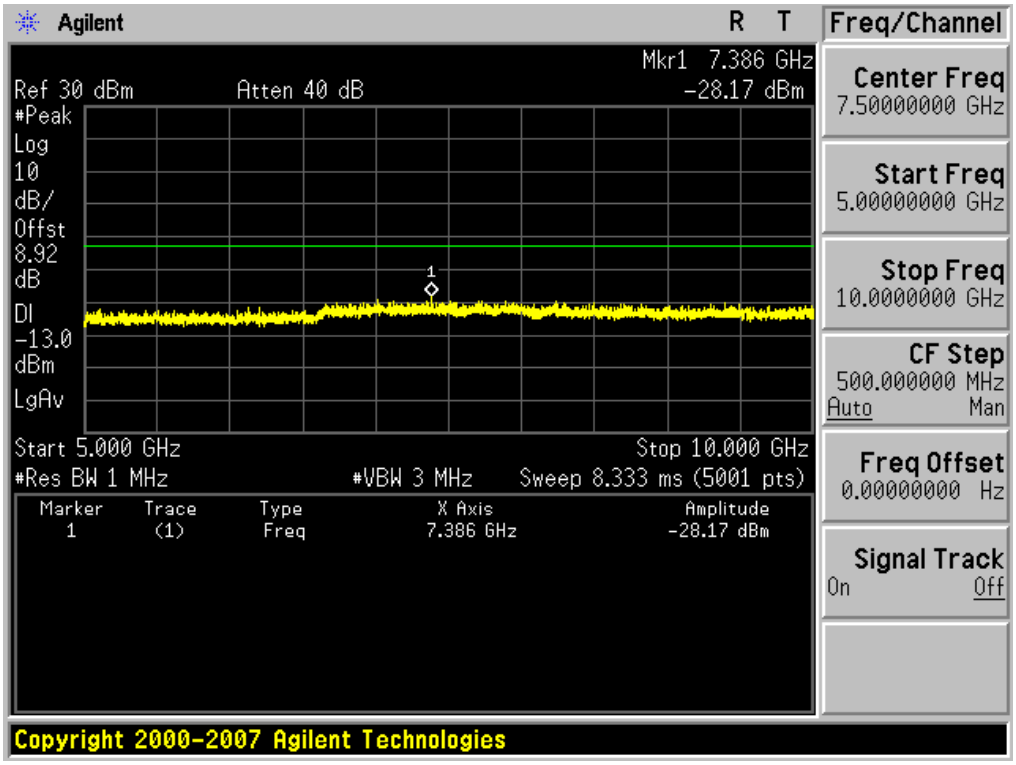


Copyright © 2012, Digital EMC Co., Ltd.

HSUPA1900 & Channel: 9262

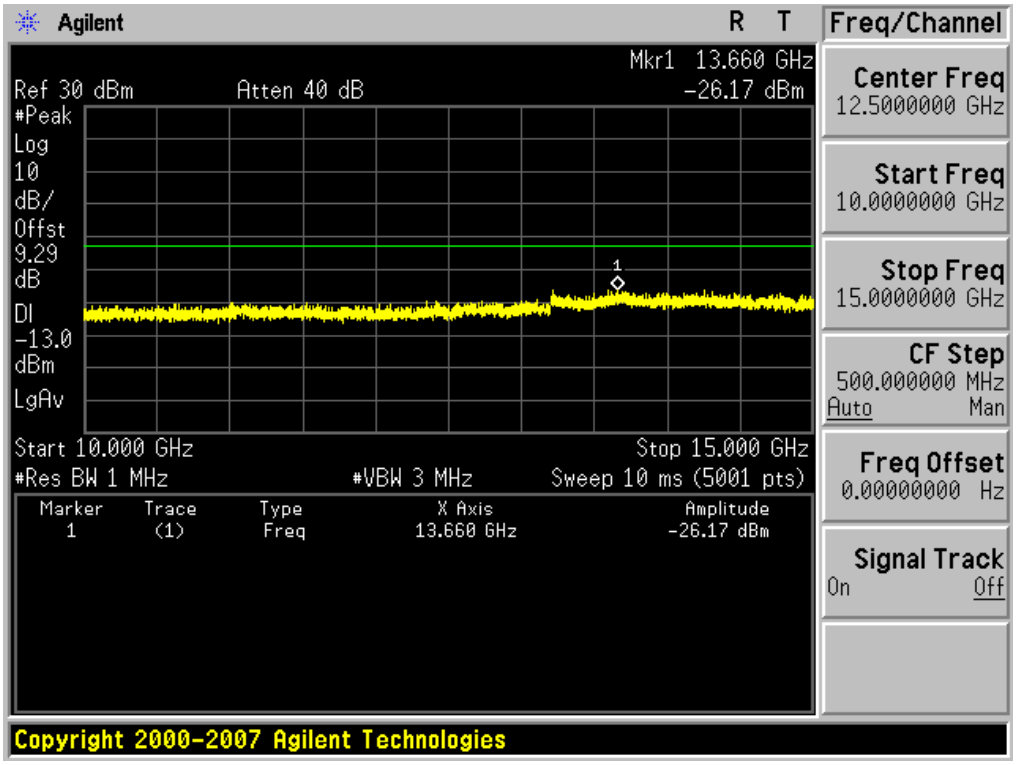


HSUPA 1900 & Channel: 9262

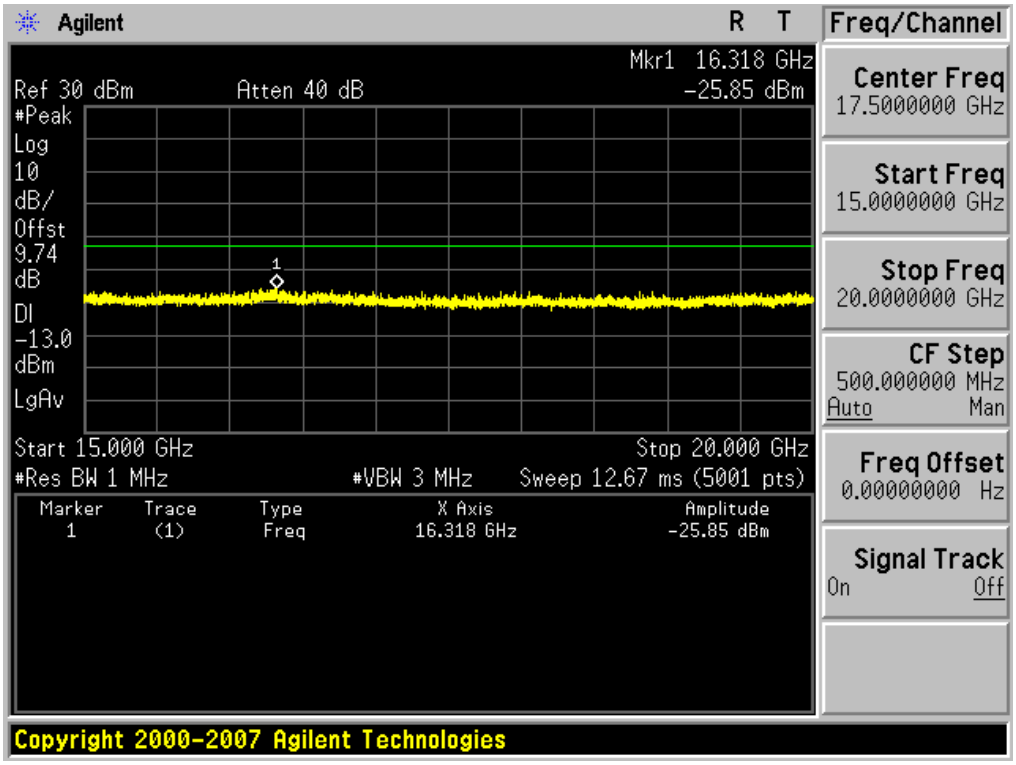


Copyright © 2012, Digital EMC Co., Ltd.

HSUPA1900 & Channel: 9262

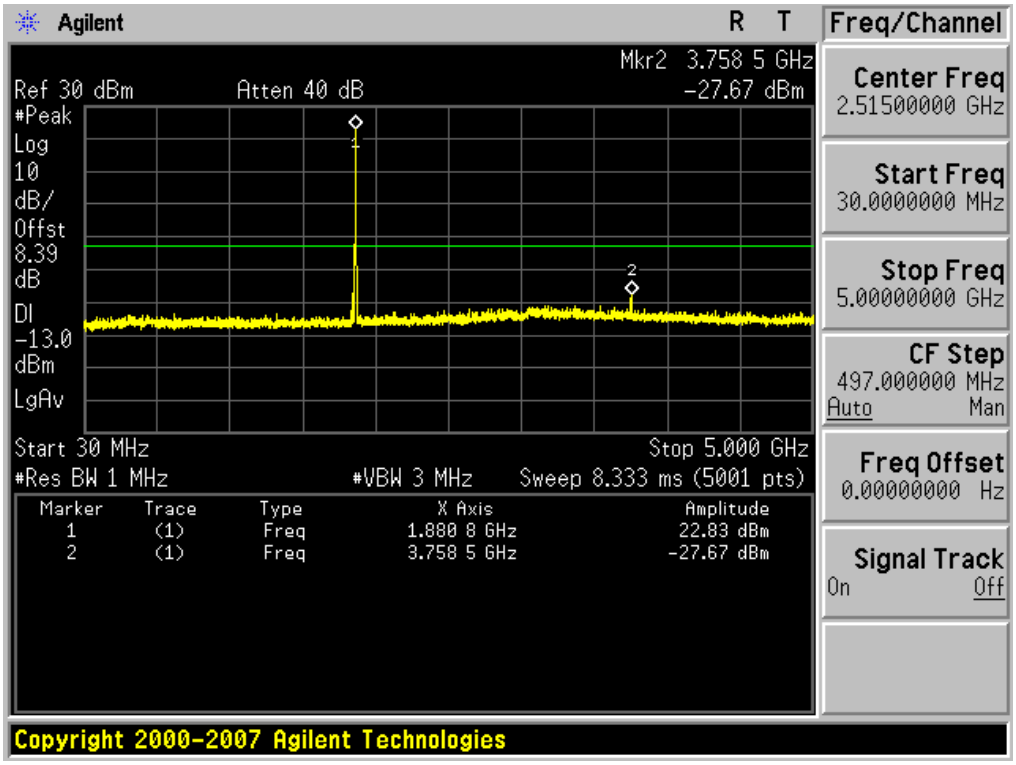


HSUPA1900 & Channel: 9262

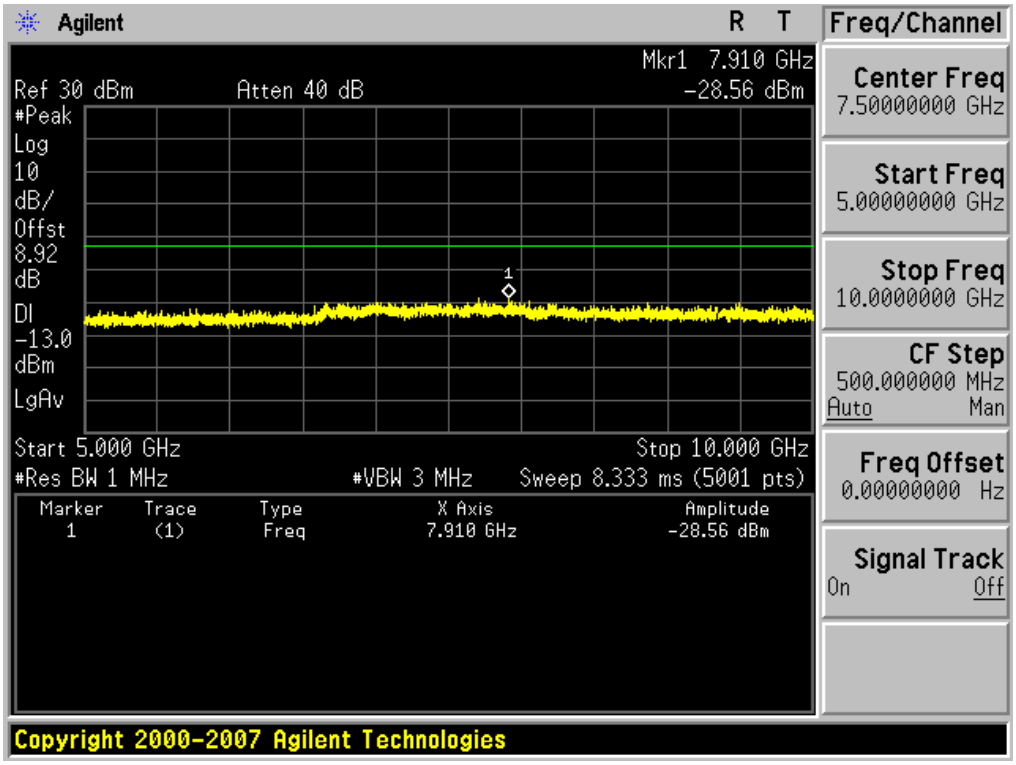


Copyright © 2012, Digital EMC Co., Ltd.

HSUPA1900 & Channel: 9400

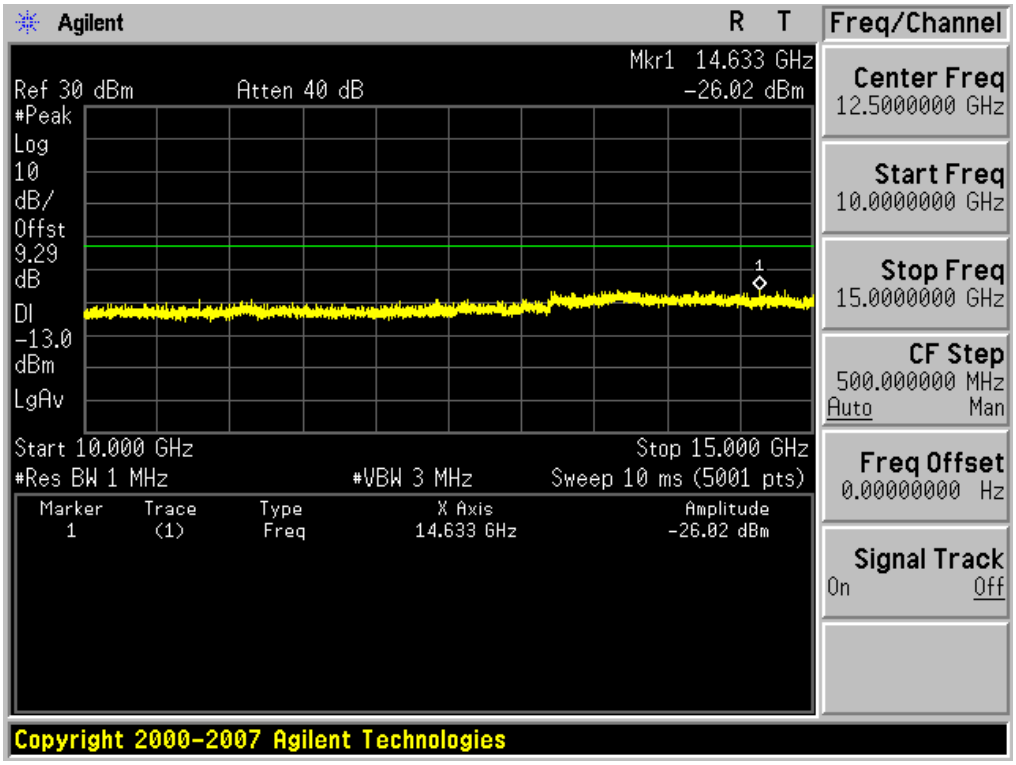


HSUPA1900 & Channel: 9400

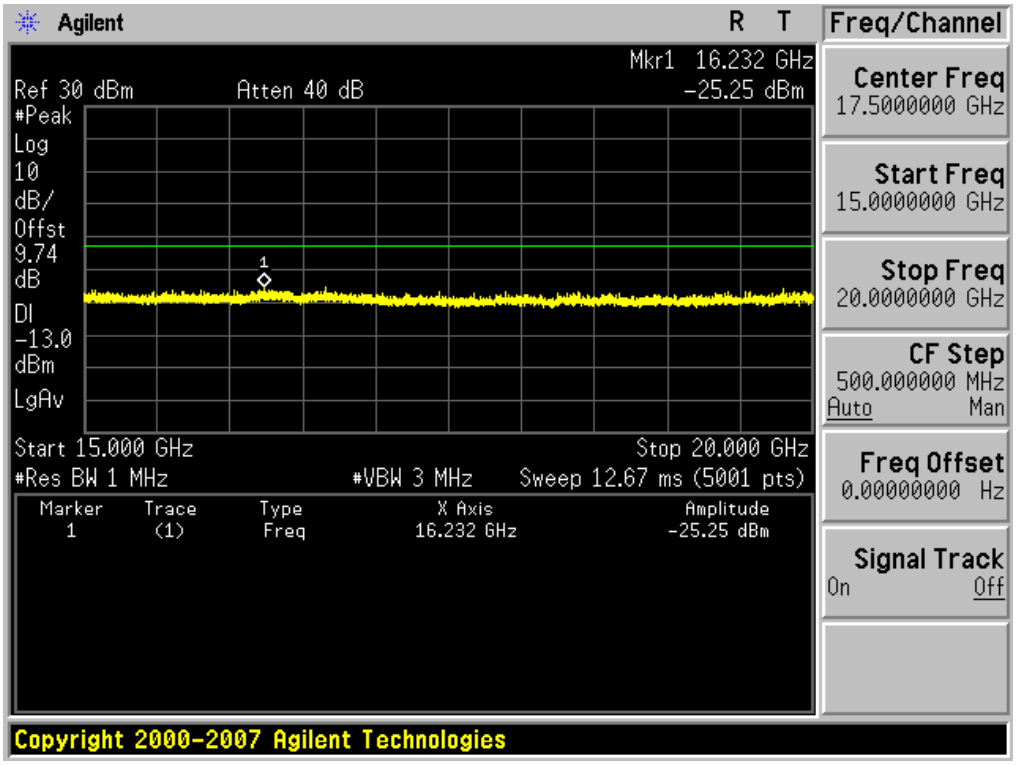


Copyright © 2012, Digital EMC Co., Ltd.

HSUPA1900 & Channel: 9400

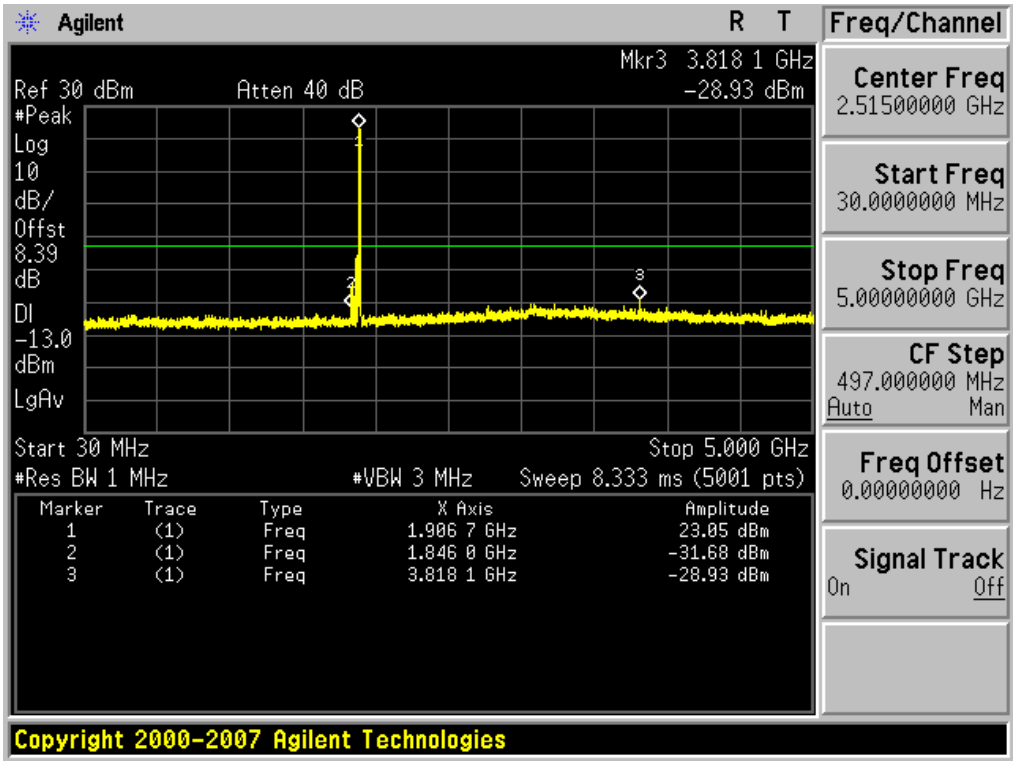


HSUPA1900 & Channel: 9400

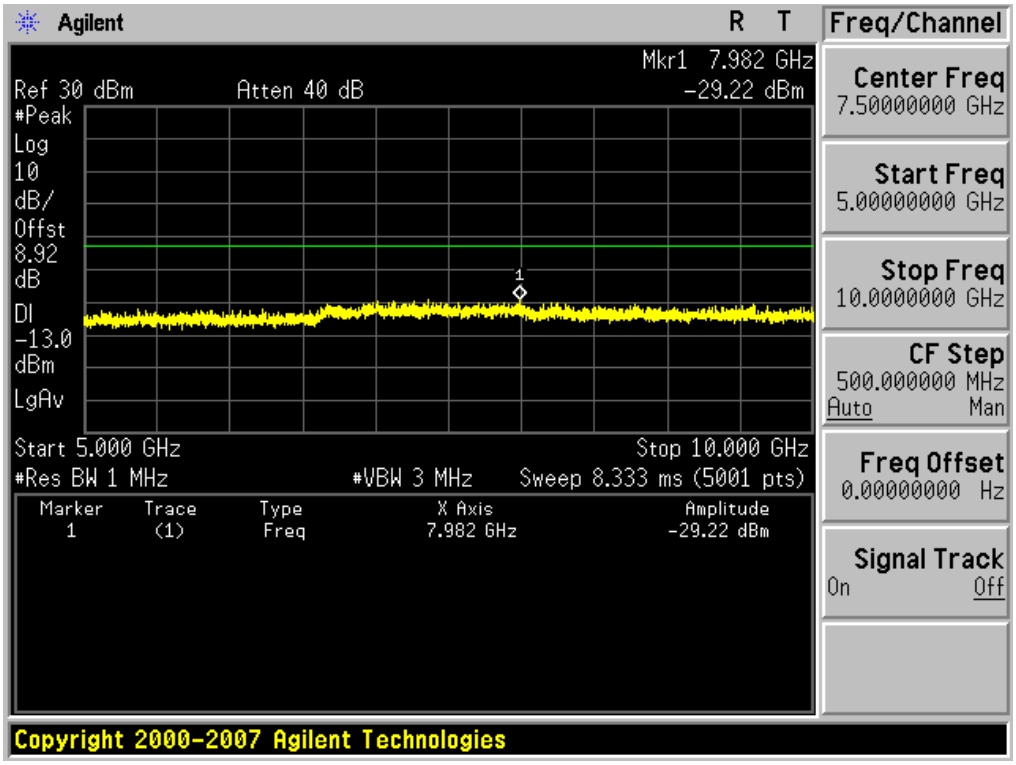


Copyright © 2012, Digital EMC Co., Ltd.

HSUPA1900 & Channel: 9538

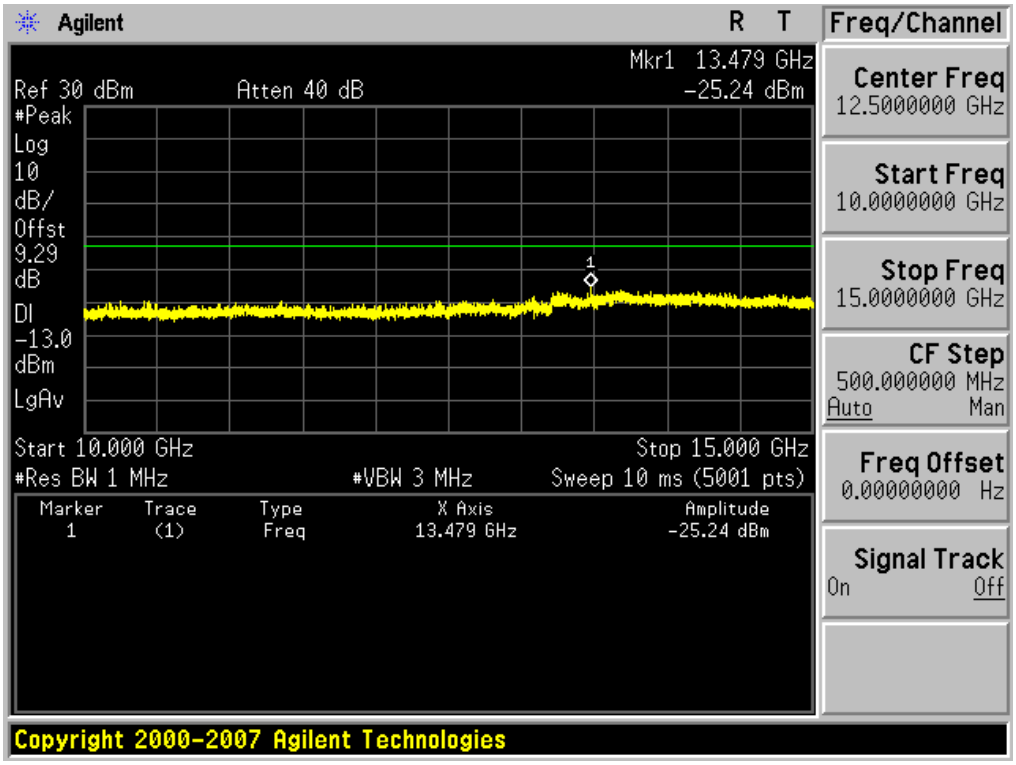


HSUPA1900 & Channel: 9538

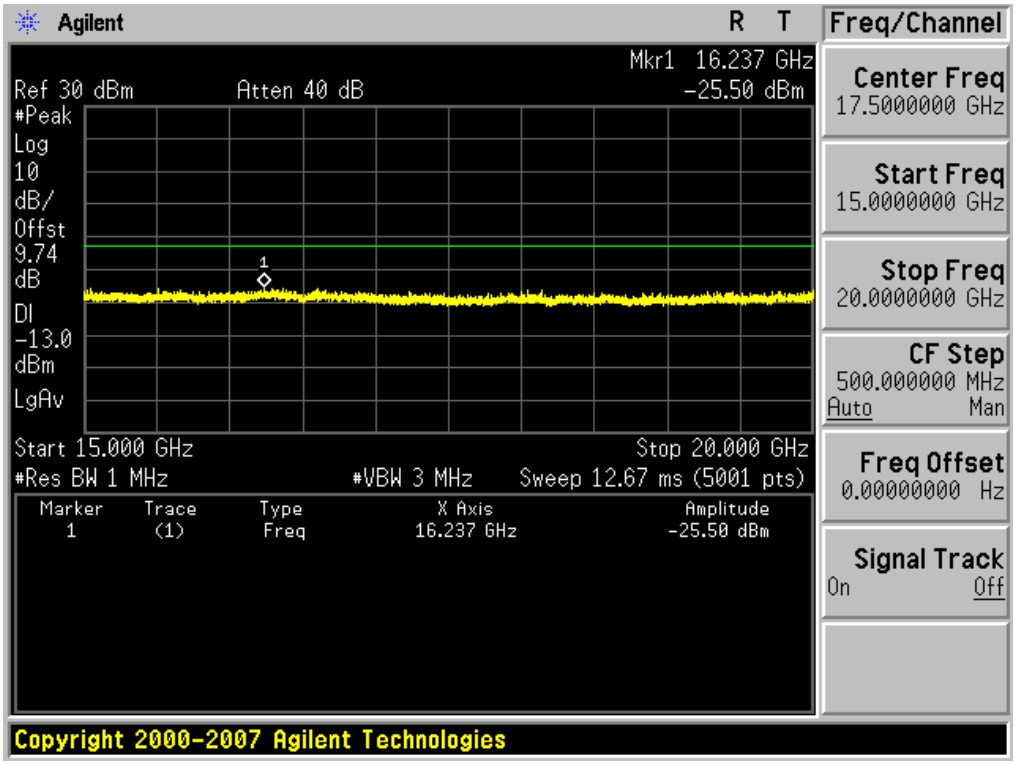


Copyright © 2012, Digital EMC Co., Ltd.

HSUPA1900 & Channel: 9538



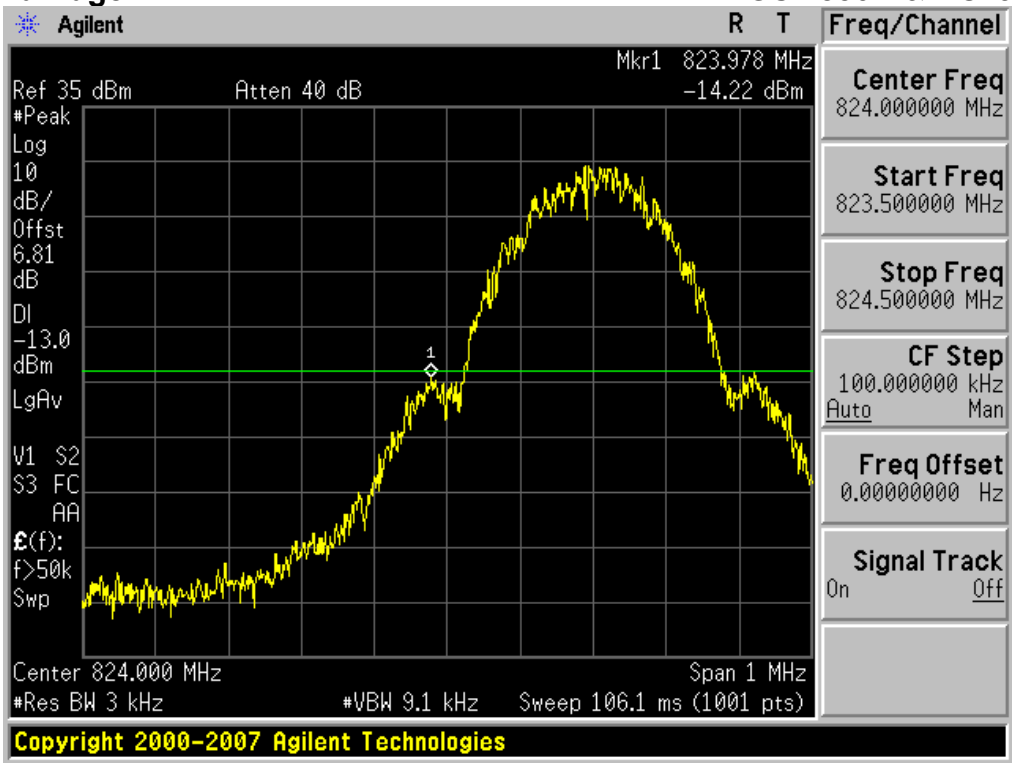
HSUPA1900 & Channel: 9538



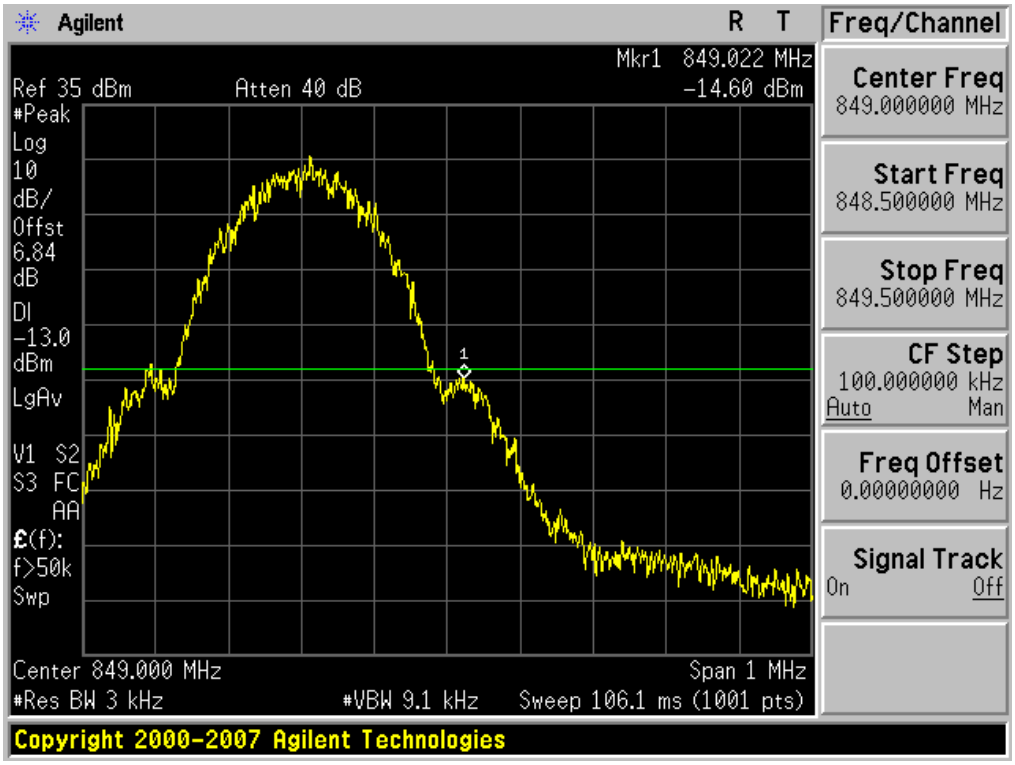
Copyright © 2012, Digital EMC Co., Ltd.

8.4 Band Edge

GSM850 & Channel: 128

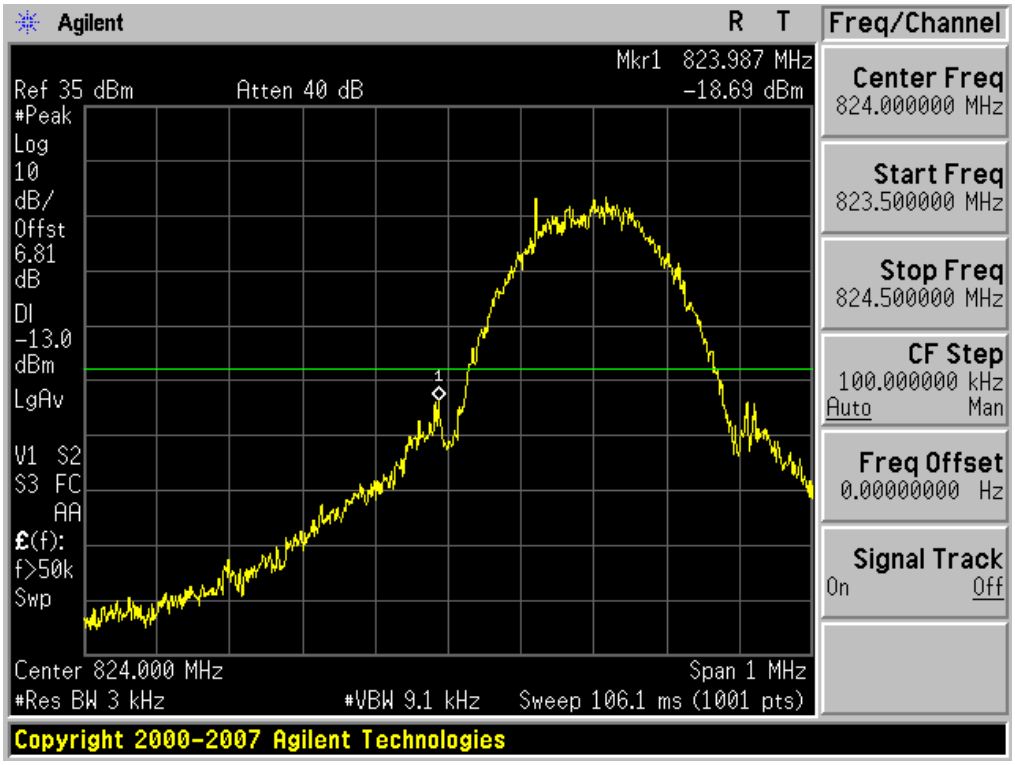


GSM850 & Channel: 251

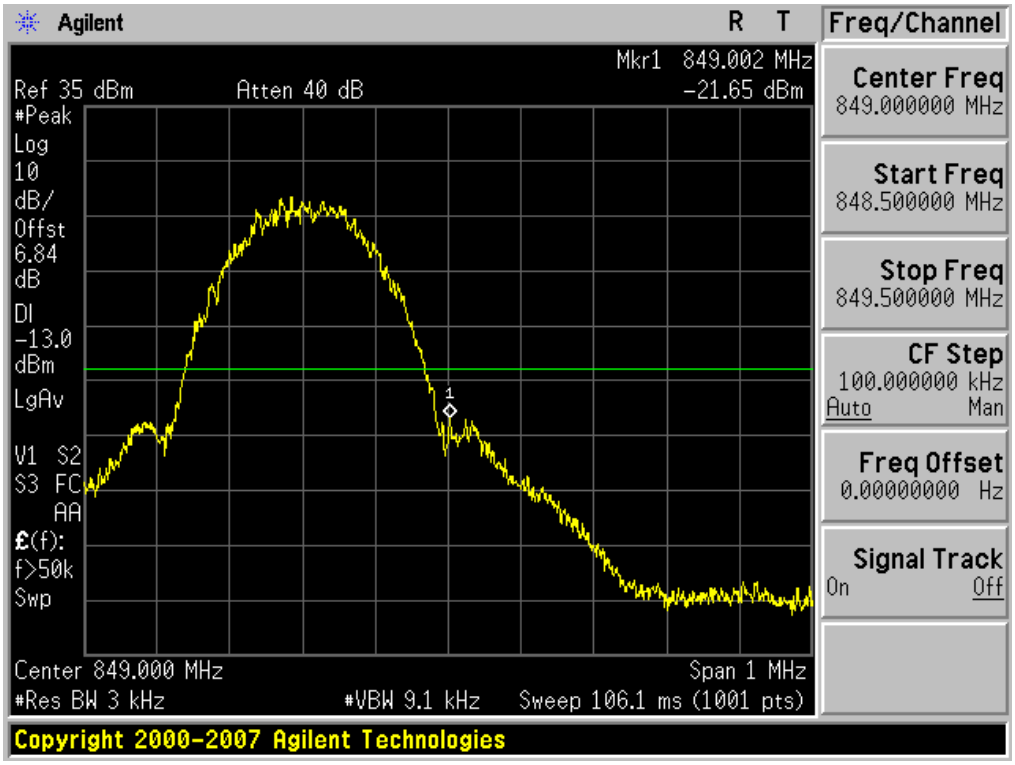


Copyright © 2012, Digital EMC Co., Ltd.

EDGE 850 & Channel: 128

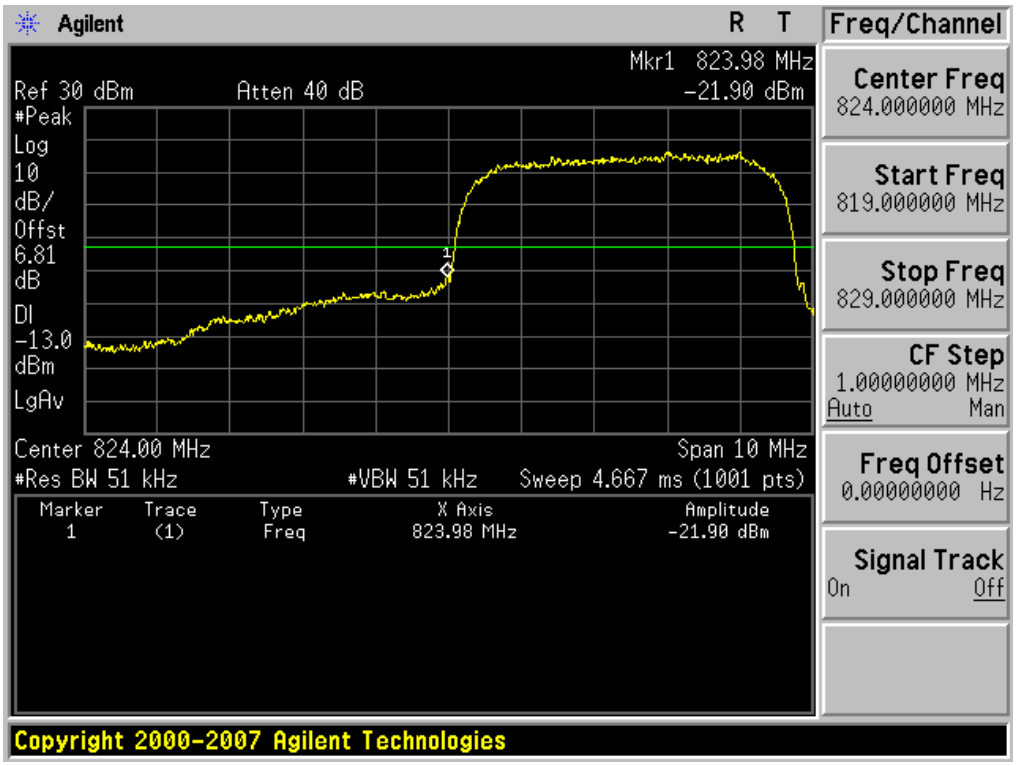


EDGE 850 & Channel: 251

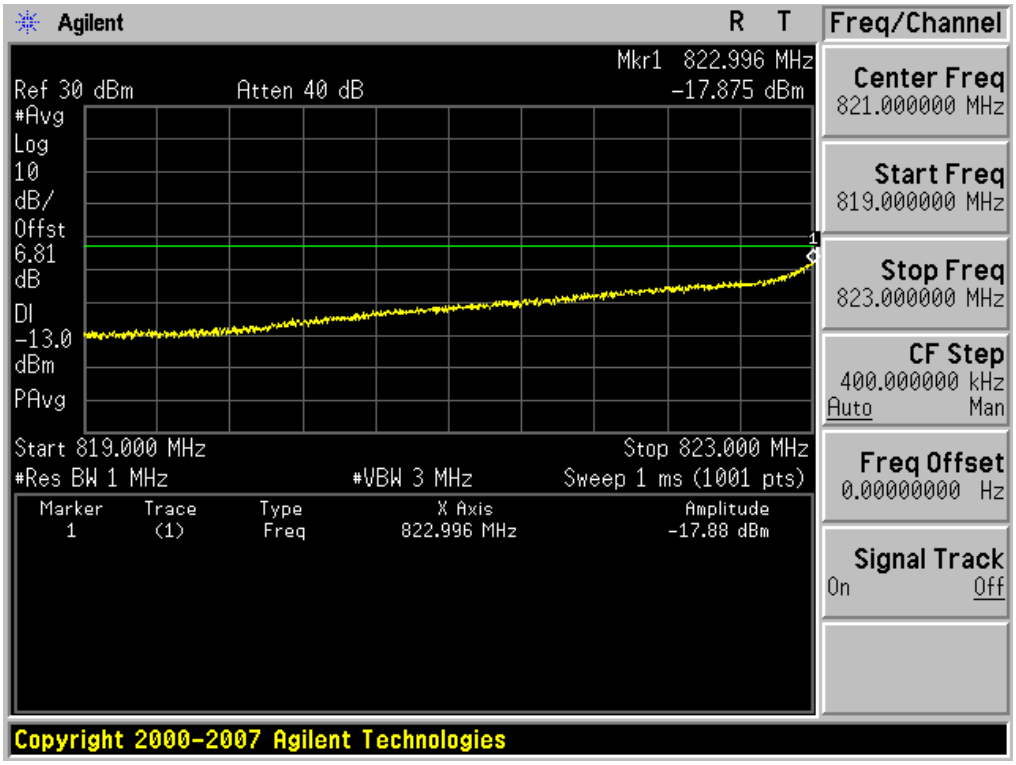


Copyright © 2012, Digital EMC Co., Ltd.

WCDMA850 & Channel: 4132

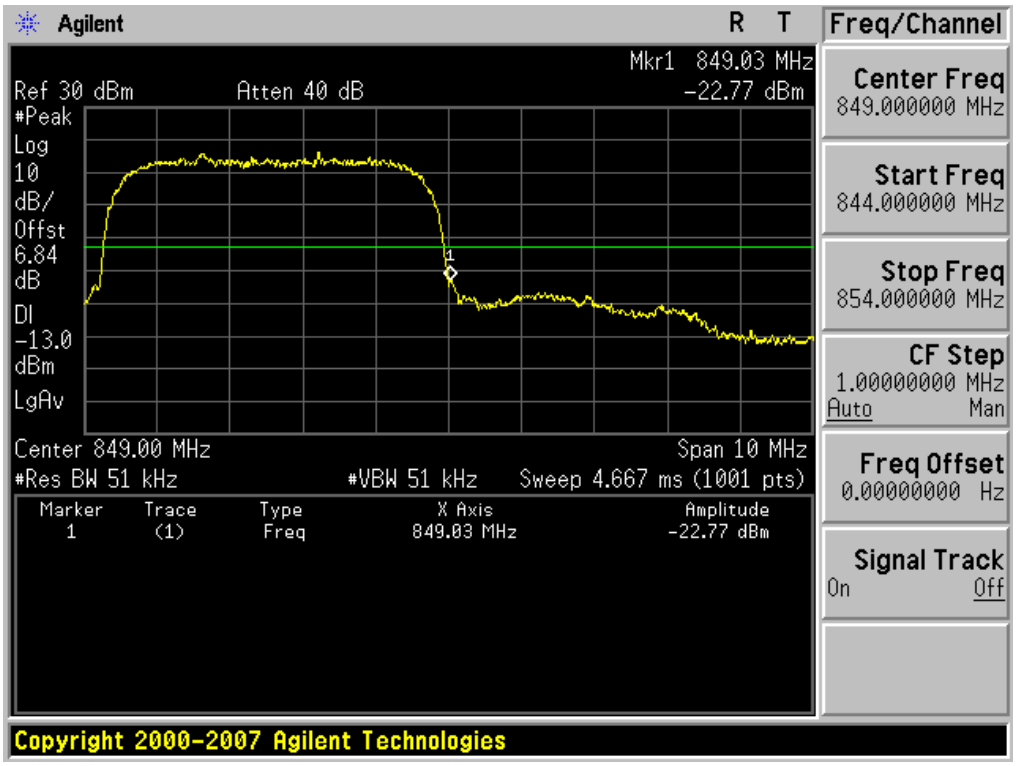


WCDMA850 & Channel: 4132

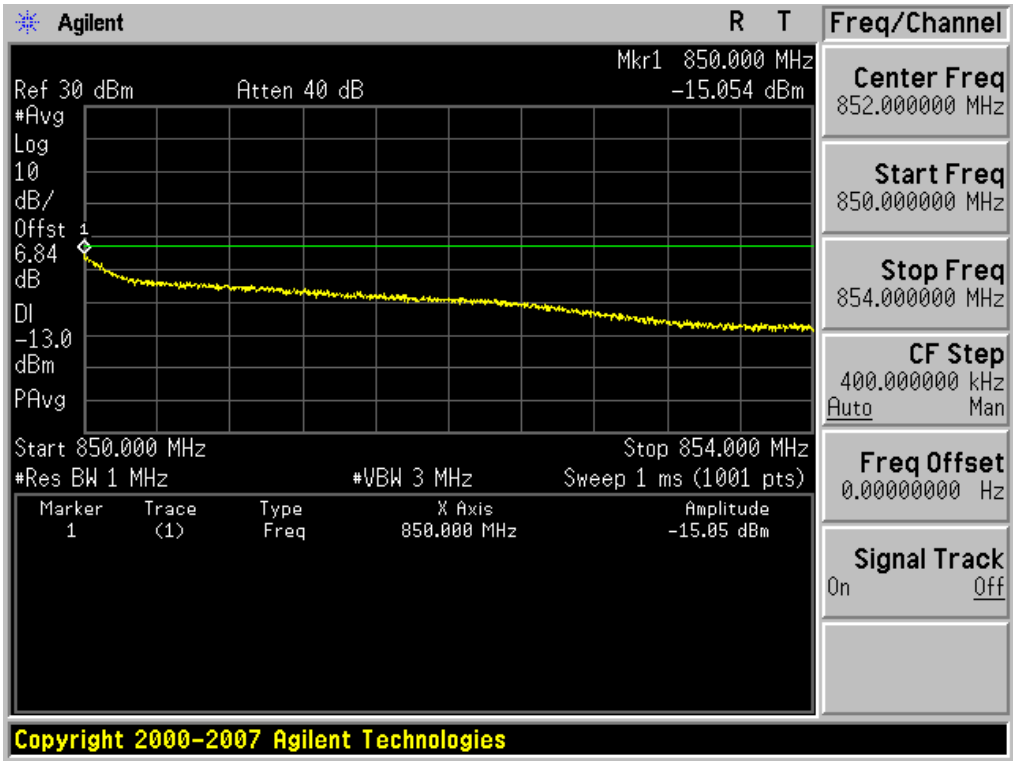


Copyright © 2012, Digital EMC Co., Ltd.

WCDMA850 & Channel: 4233

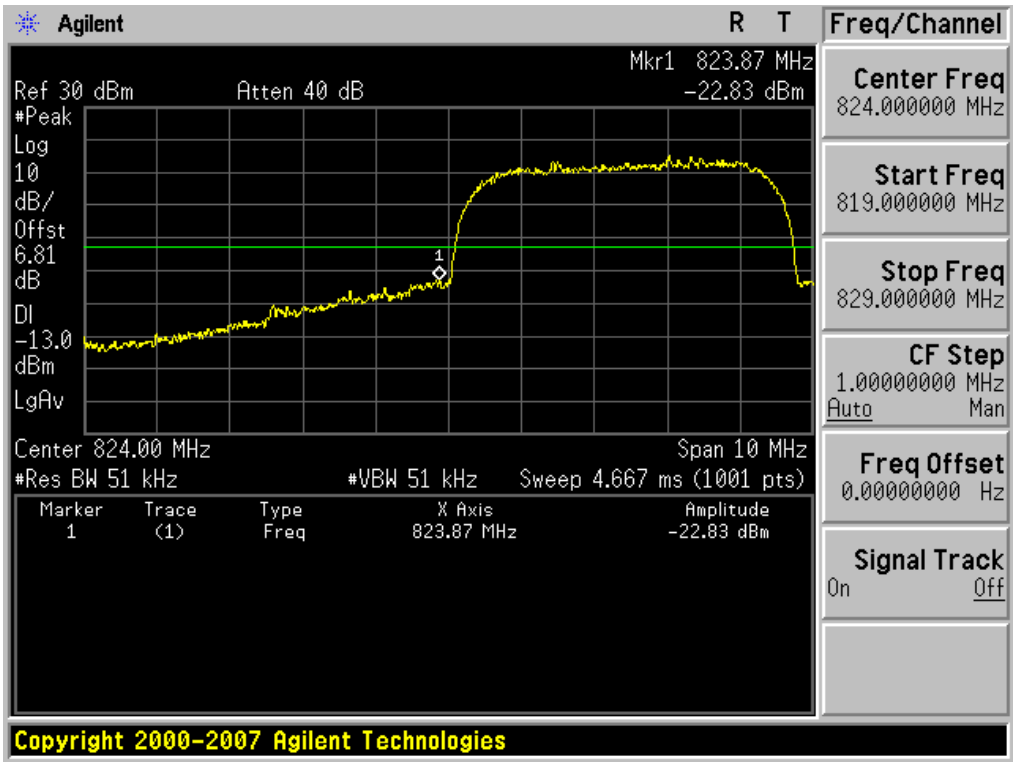


WCDMA850 & Channel: 4233

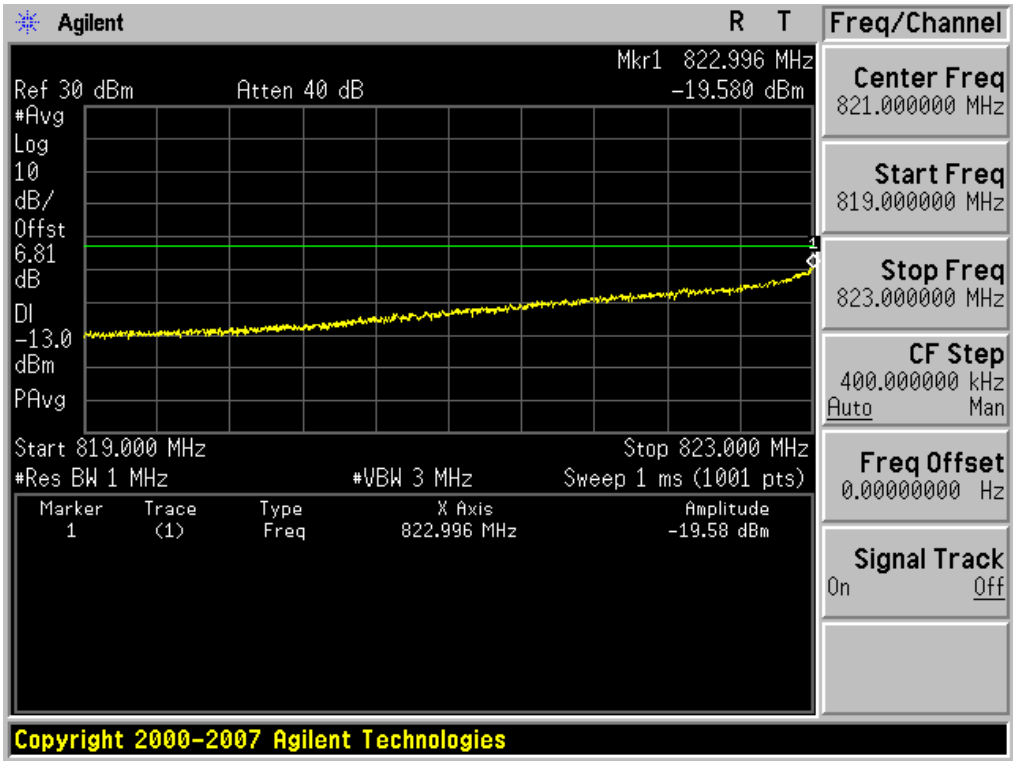


Copyright © 2012, Digital EMC Co., Ltd.

HSUPA850 & Channel: 4132

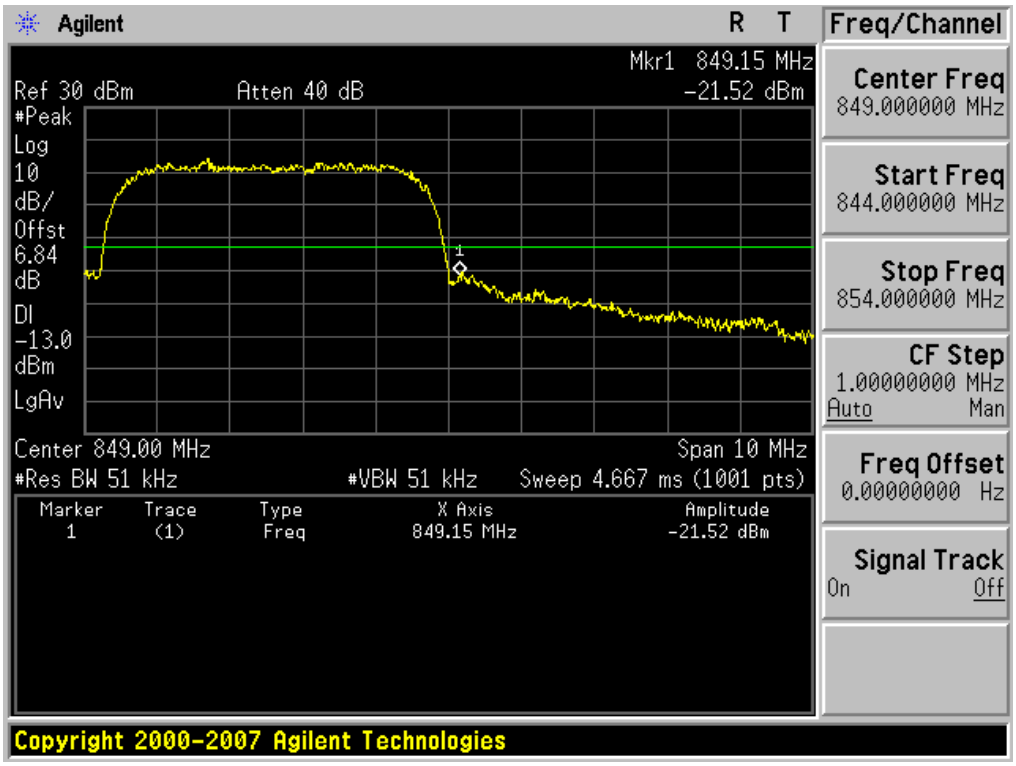


HSUPA850 & Channel: 4132

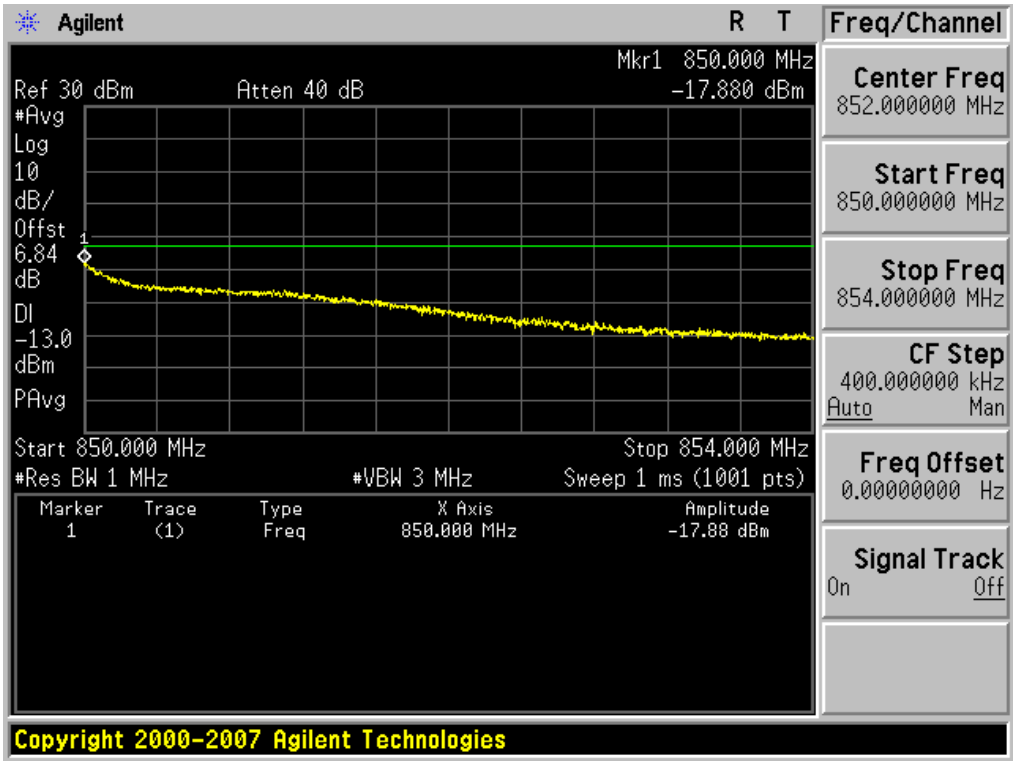


Copyright © 2012, Digital EMC Co., Ltd.

HSUPA850 & Channel: 4233

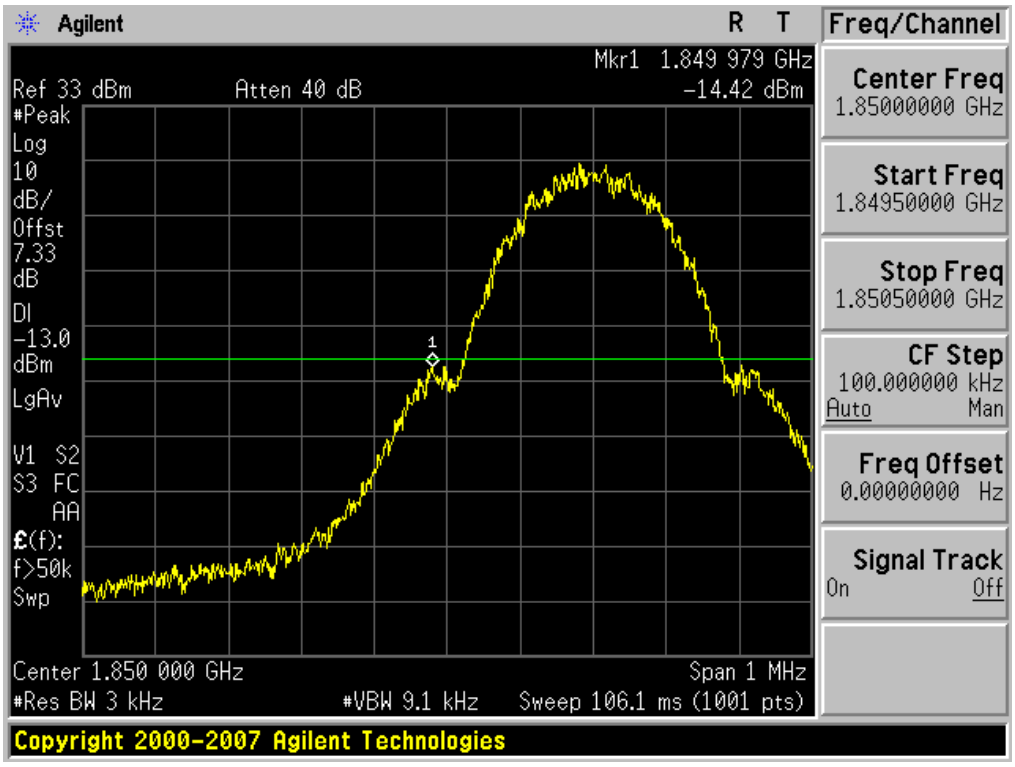


HSUPA850 & Channel: 4233

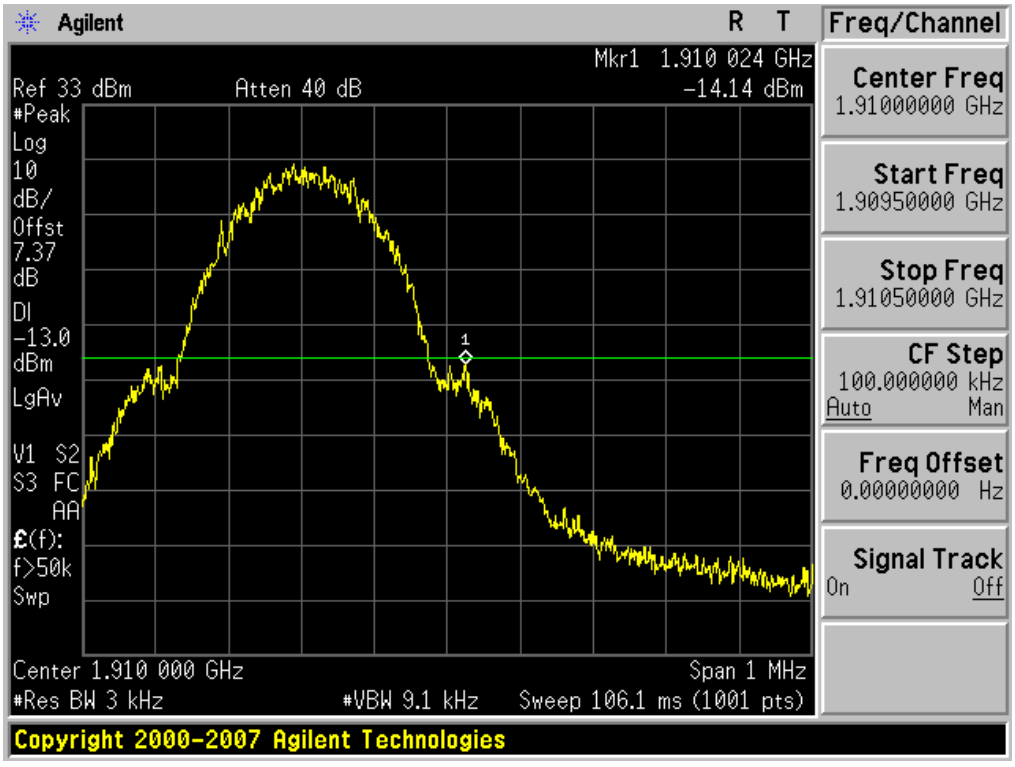


Copyright © 2012, Digital EMC Co., Ltd.

PCS1900 & Channel: 512

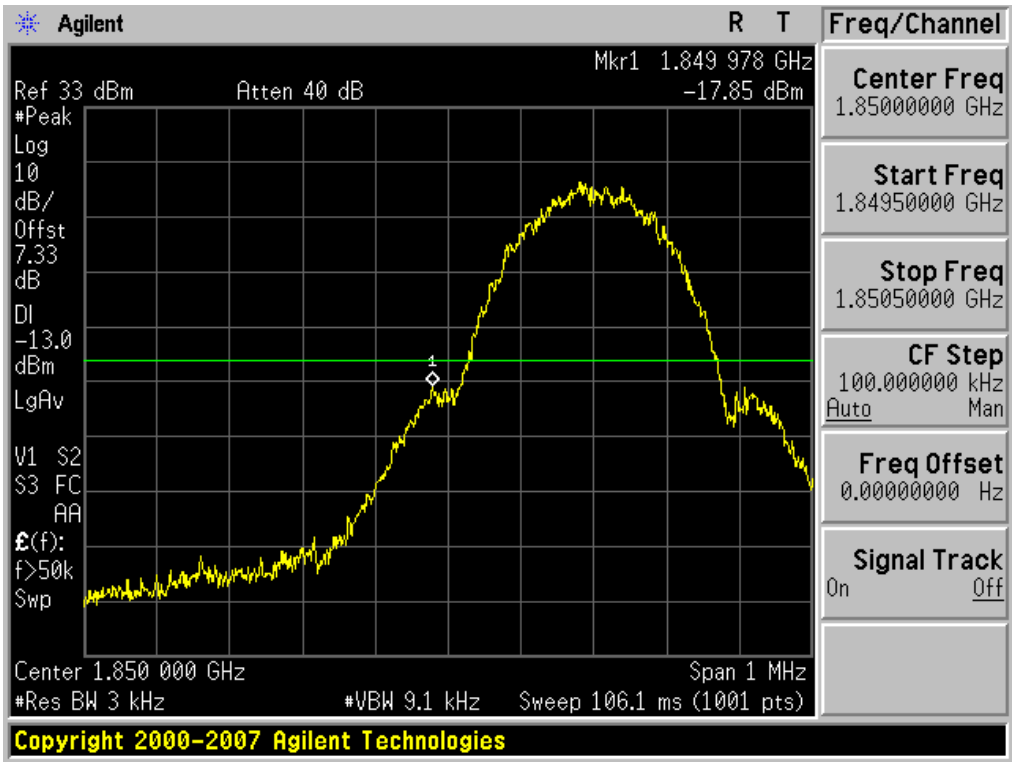


PCS1900 & Channel: 810

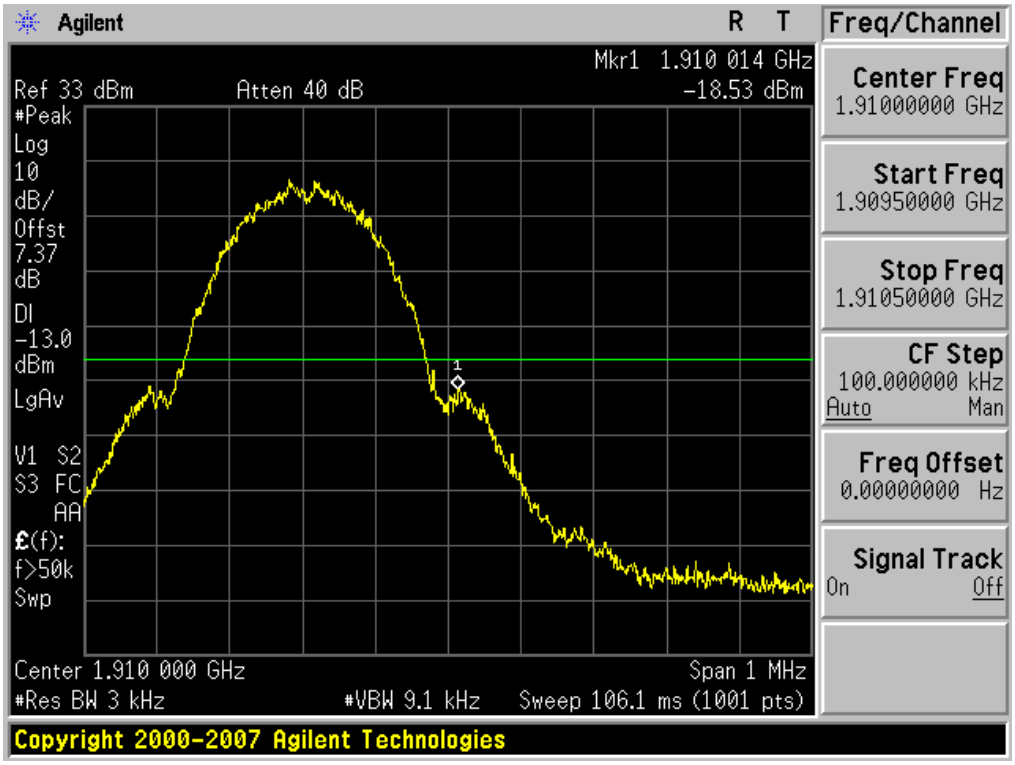


Copyright © 2012, Digital EMC Co., Ltd.

EDGE 1900 & Channel: 512

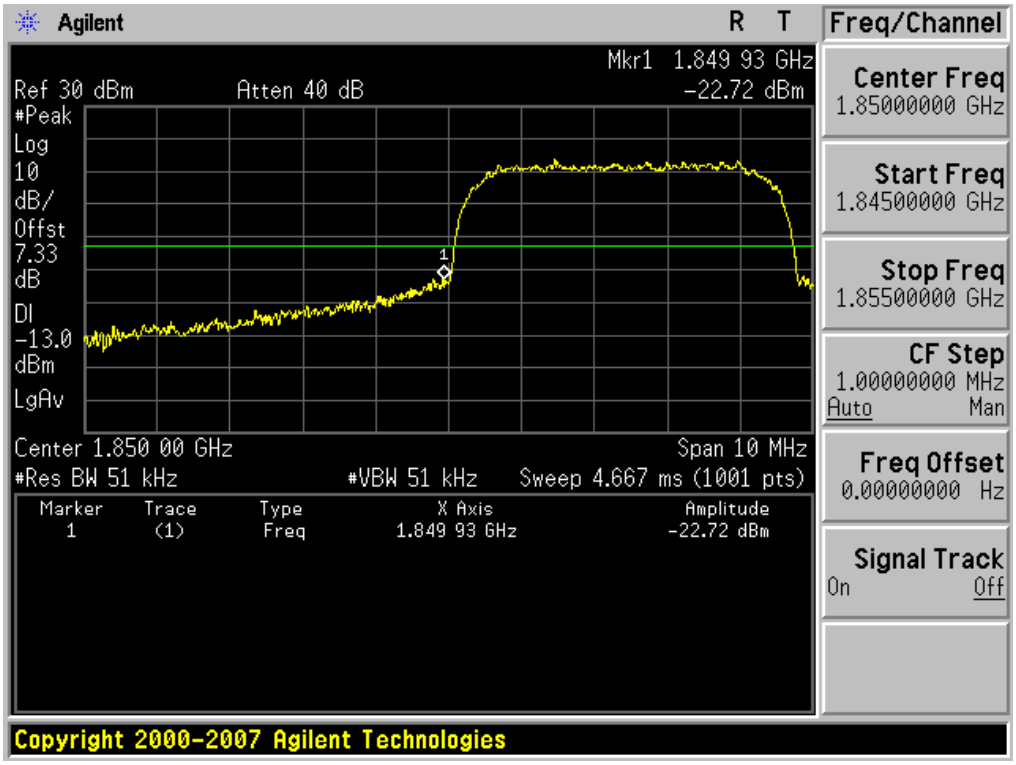


EDGE 1900 & Channel: 810

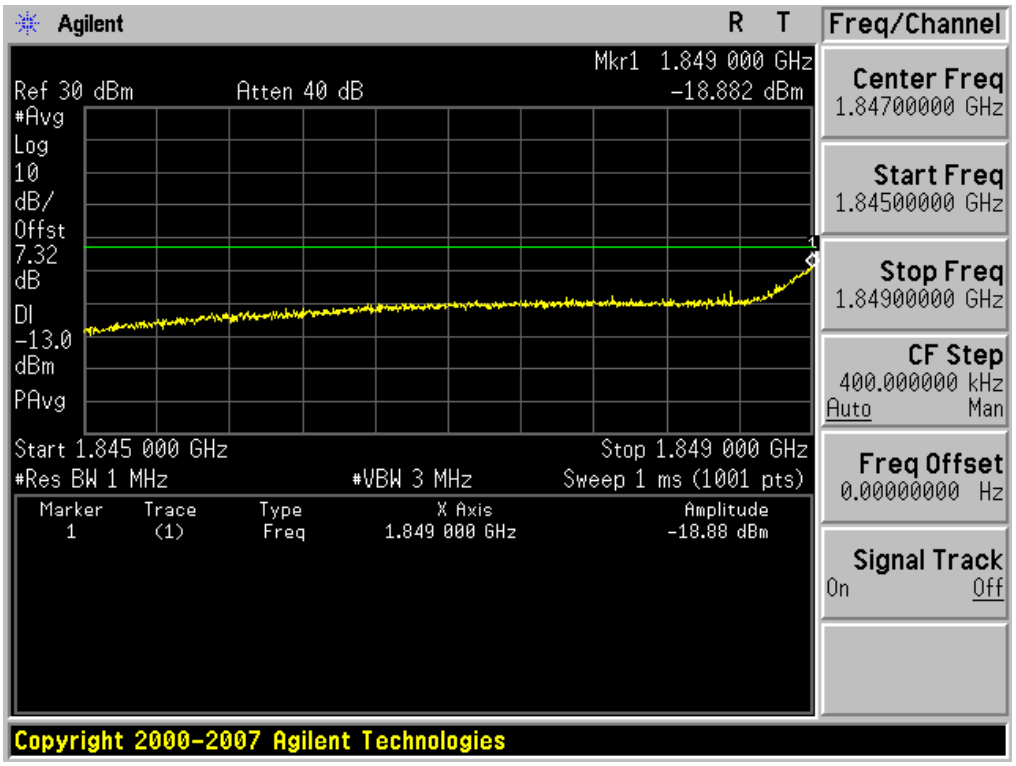


Copyright © 2012, Digital EMC Co., Ltd.

WCDMA1900 & Channel: 9262

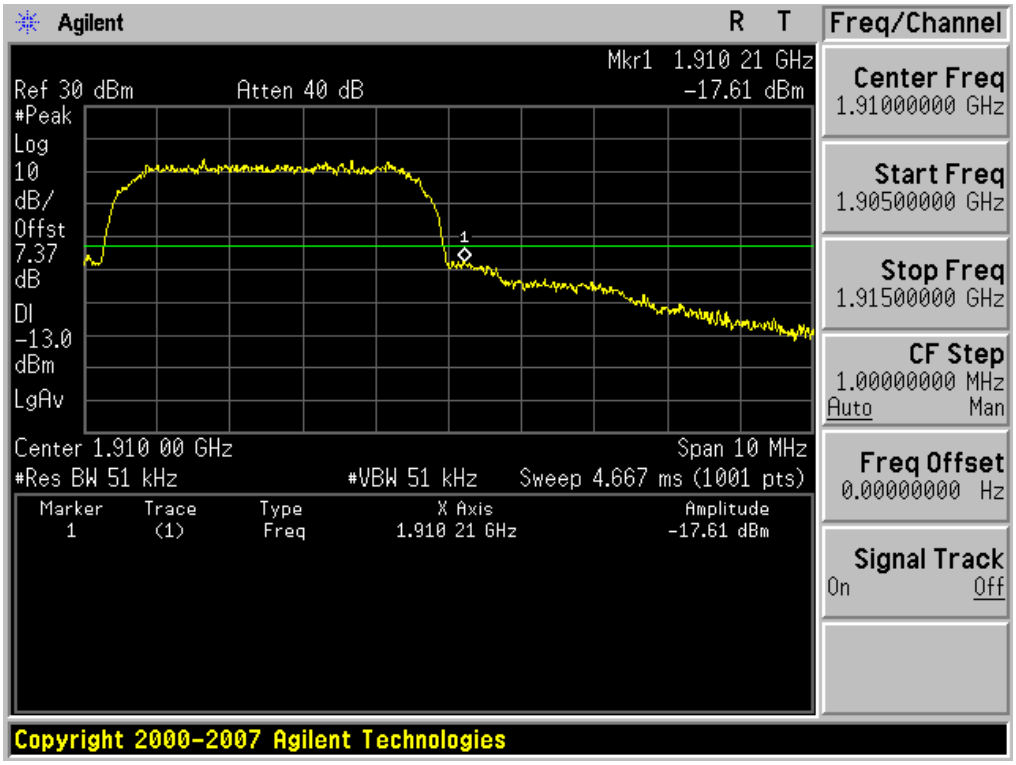


WCDMA1900 & Channel: 9262

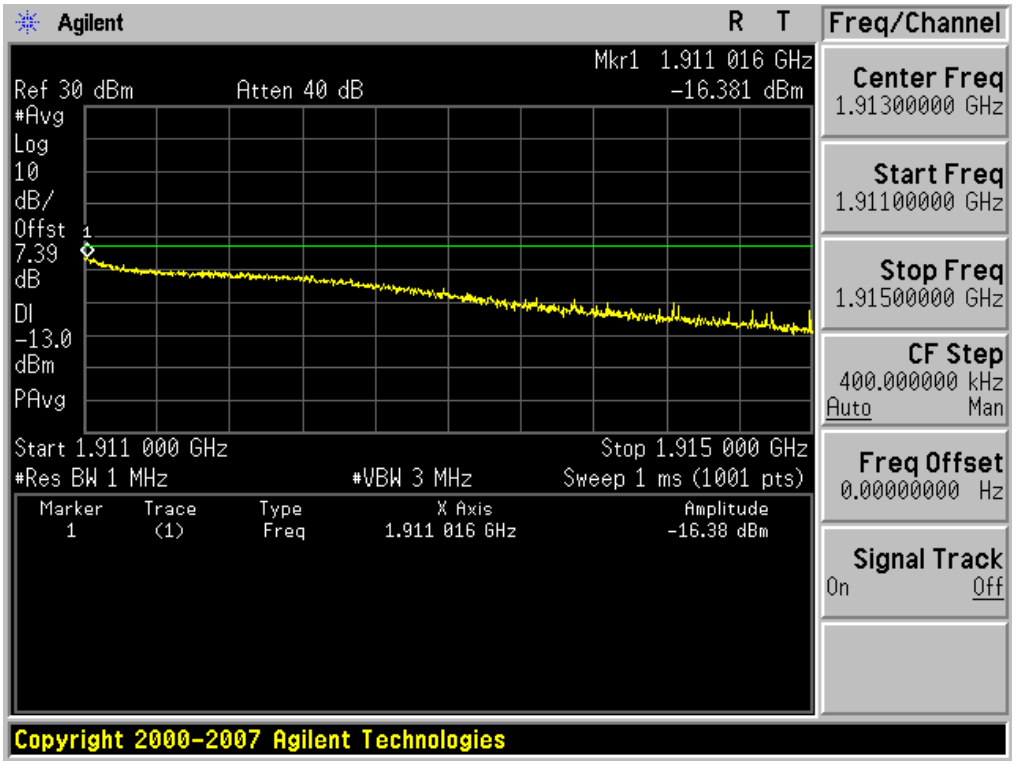


Copyright © 2012, Digital EMC Co., Ltd.

WCDMA1900 & Channel: 9538

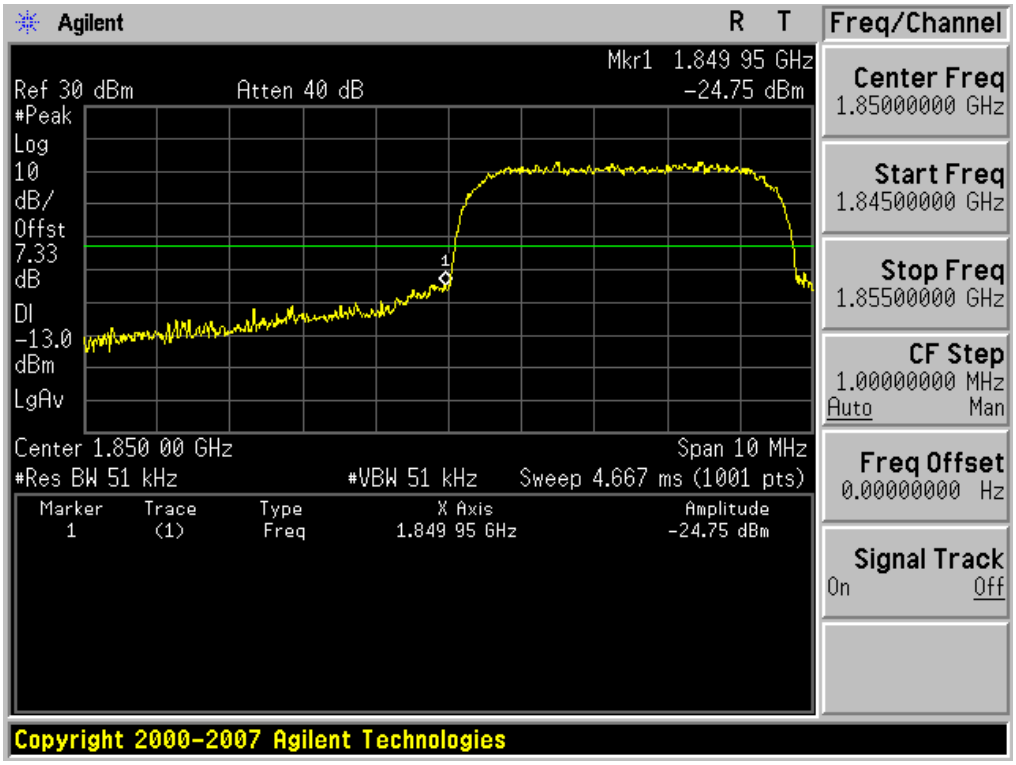


WCDMA1900 & Channel: 9538

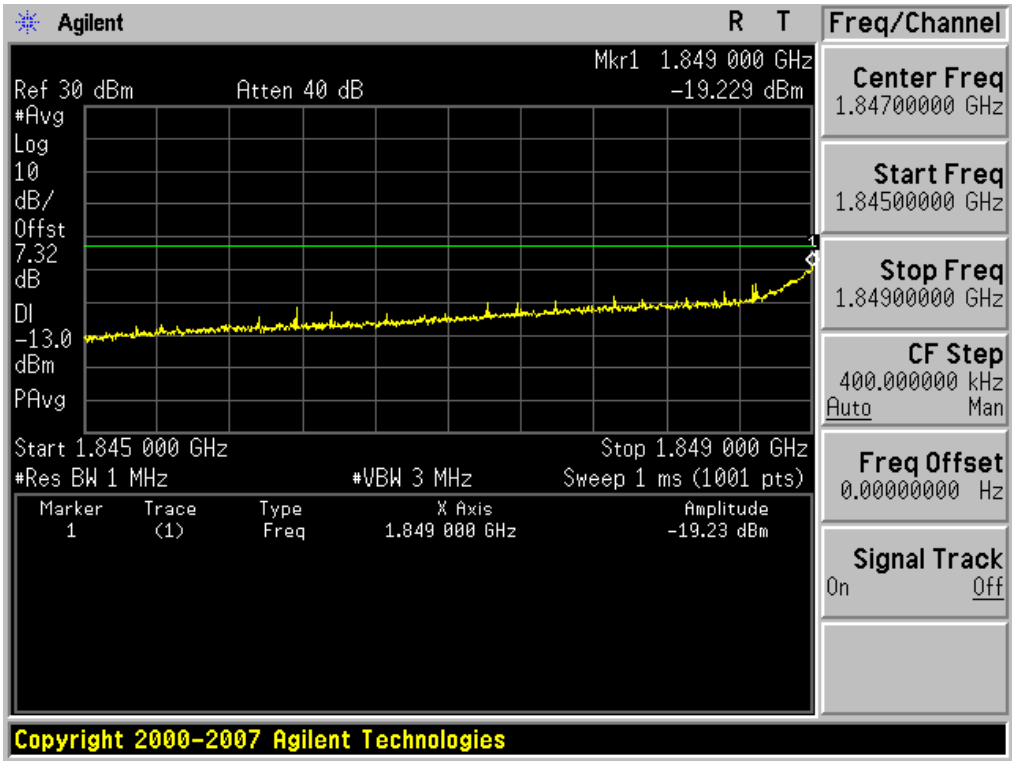


Copyright © 2012, Digital EMC Co., Ltd.

HSUPA1900 & Channel: 9262

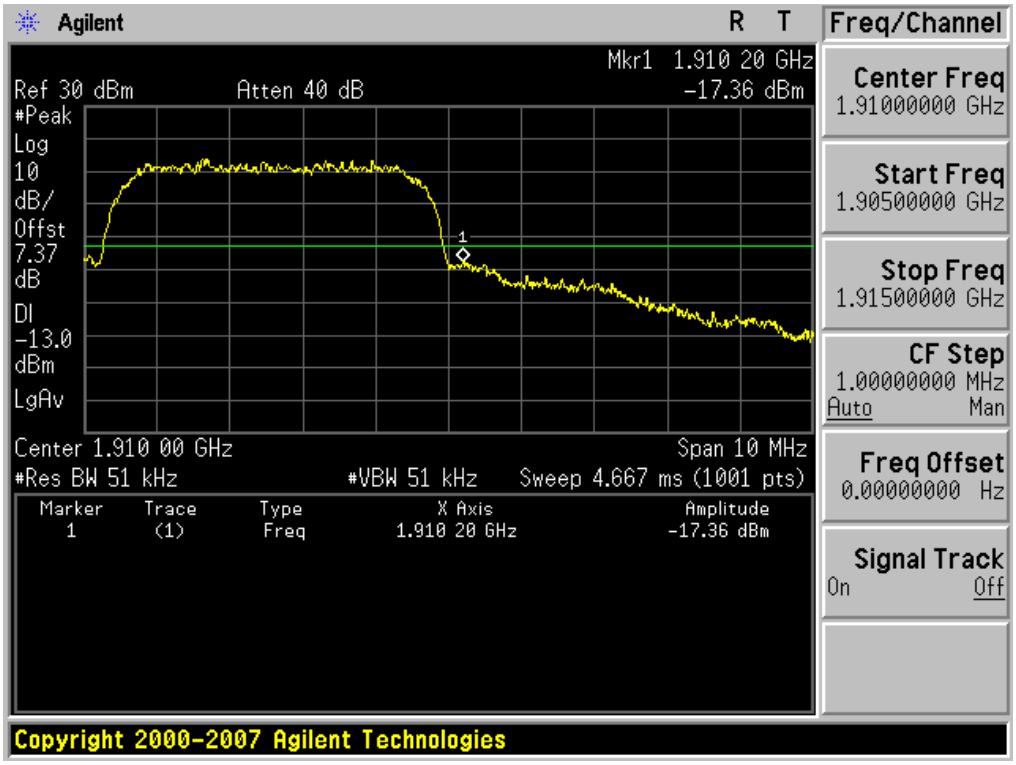


HSUPA1900 & Channel: 9262

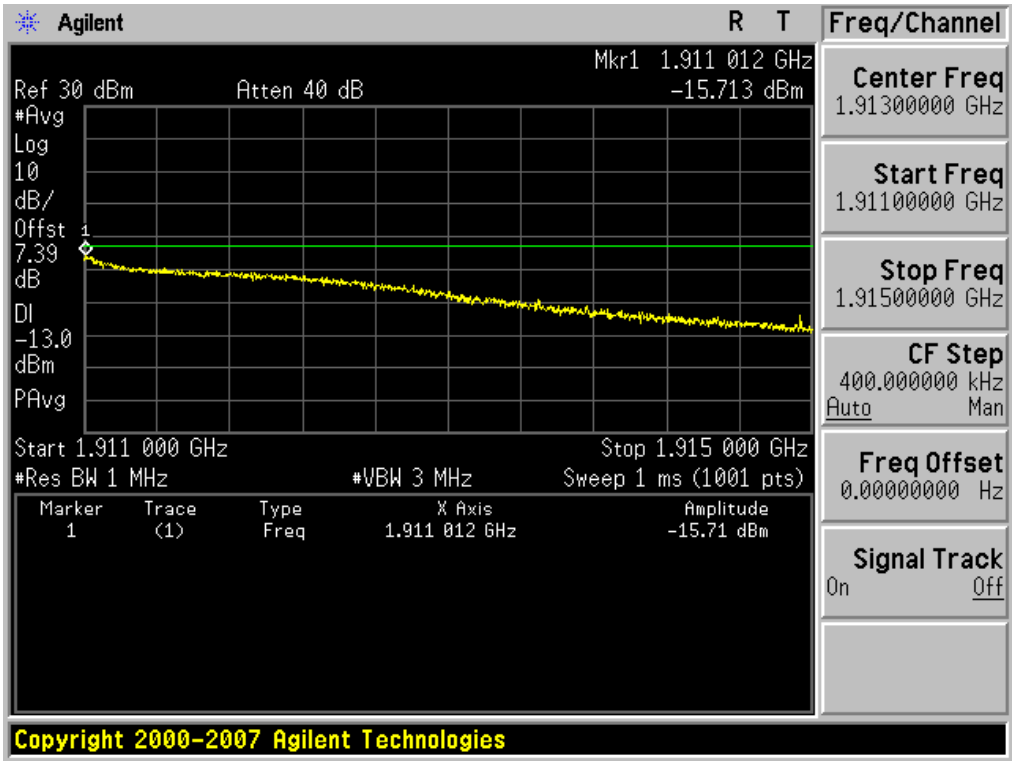


Copyright © 2012, Digital EMC Co., Ltd.

HSUPA1900 & Channel: 9538



HSUPA1900 & Channel: 9538



Copyright © 2012, Digital EMC Co., Ltd.