RF TEST REPORT

Test item	:	Mobile Phone
Model No.	:	KCMH01
Order No.	:	DEMC1303-00991
Date of receipt	:	2013-03-15
Test duration	:	2013-03-25 ~ 2013-04-05
Date of issue	:	2013-04-08
Use of report	:	Original Grant

Applicant : KYOCERA Corporation
2-1-1 Kagahara, Tsuzuki-ku, Yokohama-Shi, Kanagawa 224-8502, Japan

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

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

Tested by:	Witnessed by:	Reviewed by:
Engineer JaeJin Lee	N/A	Deputy General Manager WonJung, Lee

Test Report Version

Test Report No.	Date	Description
DRTFCC1303-0331	Apr. 08, 2013	Initial issue

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1. GENERAL INFORMATION

Applicant Name: **KYOCERA Corporation**

Address: **2-1-1 Kagahara, Tsuzuki-ku, Yokohama-Shi, Kanagawa 224-8502, Japan**

FCC ID	:	JOYKCMH01
FCC Classification	:	Licensed Portable Transmitter Held to Ear (PCE)
EUT Type	:	Mobile Phone
Model Name	:	KCMH01
Add Model Name	:	N/A
Supplying power	:	Standard Battery - Type: Li-Ion Polymer Battery - M/N: KYX03UAA - Rating: DC 3.7V & 770mAh / 2.9Wh
Antenna Information	:	Internal Antenna - Type: Built-In type
Tx Frequency	:	Cellular CDMA: 824.70 ~ 848.31 MHz
Rx Frequency	:	Cellular CDMA: 869.70 ~ 893.31 MHz
Max. RF Output Power	:	Cellular CDMA: 0.154W ERP(21.88dBm)
Emission Designator(s)	:	Cellular CDMA: 1M28F9W

2. INTRODUCTION

2.1. EUT DESCRIPTION

The Equipment Under Test(EUT) supports a cellular band of CDMA with Bluetooth.

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

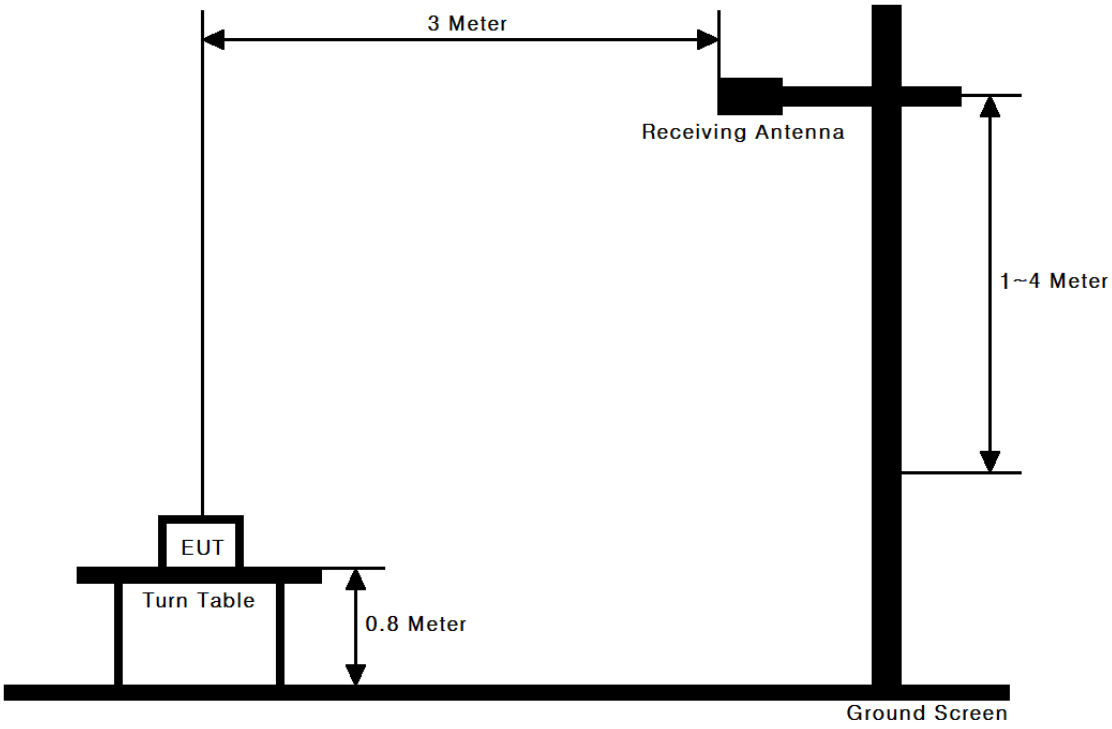
The 3&10M test site and conducted measurement facility used to collect the radiated data are located at the 683-3, Yubang-Dong, Yongin-Si, Gyunggi-Do, 449-080, South Korea. The site is constructed in conformance with the requirements.

- 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.

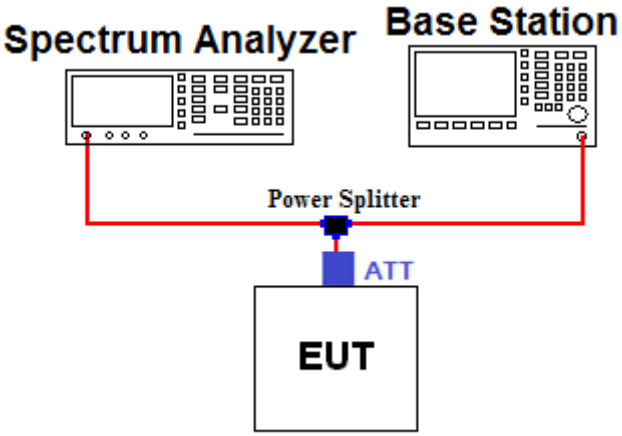
3.2 PEAK TO AVERAGE RATIO

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)
824.70	17.64	-	-
836.52	17.67	-	-
848.31	17.75	-	-

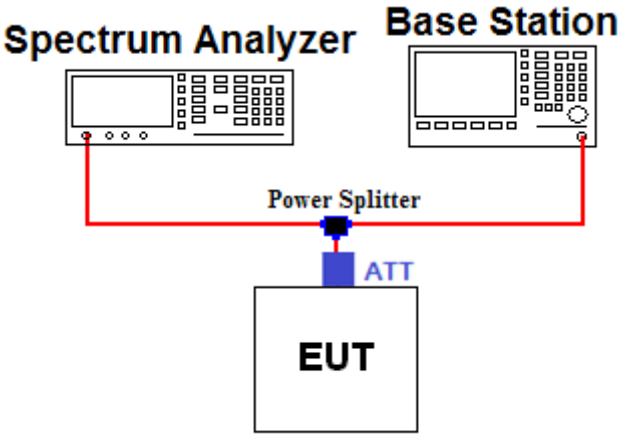
Note. 1: The offset values from EUT to Spectrum analyzer were measured and used for test.
Offset value = Cable A + ATT + Splitter + Cable B

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	17.61	849.0	17.77	5000.0	18.41
824.0	17.63	850.0	17.78	10000.0	20.75

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

Test Procedure

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

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

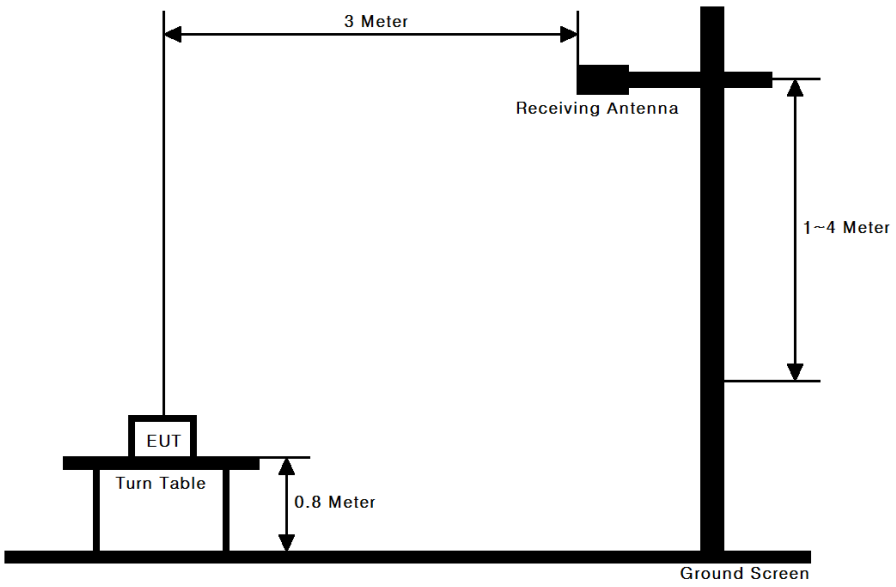
A display line was placed at -13dBm to show compliance. The high, lowest and a middle channel were tested for out of band measurements.

Band Edge Requirement

In the 1MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 1 percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to measure the out of band Emissions.

3.5 RADIATED SPURIOUS EMISSIONS

Test Set-up



Test Procedure

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

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

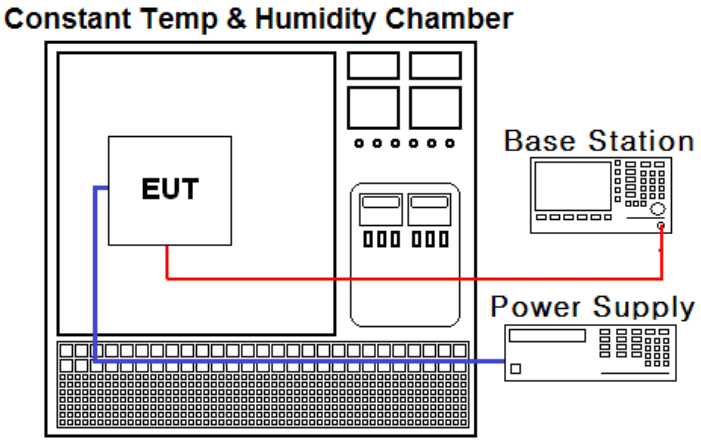
For radiated power measurements below 1GHz, a half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same spectrum analyzer reading.

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

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

3.6 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

Test Set-up



Test Procedure

The frequency stability of the transmitter is measured by:

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

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

Specification - the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within ± 0.000 25 %(± 2.5 ppm) of the center frequency.

Time Period and Procedure:

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

1. The equipment is turned on in a “standby” condition for one minute before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.

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

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

4. LIST OF TEST EQUIPMENT

Type	Manufacturer	Model	Cal.Date (yy/mm/dd)	Next.Cal.Date (yy/mm/dd)	S/N
Horn Antenna(18G)	ETS	3115	13/02/28	15/02/28	00021097
Horn Antenna(18G)	ETS	3115	12/02/20	14/02/20	6419
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
Multimeter	HP	34401A	13/02/27	14/02/27	3146A13475
DC Power Supply	HP	6622A	13/02/27	14/02/27	3448A03760
Constant Temp & Humidity Chamber	JISICO	KR-100/J-RHC2	12/09/17	13/09/17	30604493/021031
Preamplifier	Agilent	8449B	13/02/27	14/02/27	3008A01590
Spectrum Analyzer (3Hz~26.5G)	Agilent Technologies	E4440A	13/01/08	14/01/18	MY44303778
Vector Signal Generator	Rohde Schwarz	SMJ100A	13/01/08	14/01/08	100148
Signal Generator	Rohde Schwarz	SMR20	13/02/27	14/02/27	101251
Attenuator(3dB)	Aeroflex/Weinschel	56-3	12/09/17	13/09/17	Y2342
Attenuator(10dB)	Aeroflex/Weinschel	86-10-11	12/09/17	13/09/17	408
High-pass filter	Wainwright Instruments	WHKX1.0	12/09/17	13/09/17	9
Amplifier	EMPOWER	BBS3Q7ELU	12/09/18	13/09/18	1020
AMPLIFIER	H.P	8447D	12/07/01	13/07/01	2648A04922
Thermohygrometer	BODYCOM	BJ5478	12/06/20	13/06/20	120612-2
8960 Series 10 Wireless Comms Test Set	Agilent Technologies, Inc	E5515C	13/02/28	14/02/28	GB43461134
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	N/A Note2
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
Note 2: This test item was not performed because this device supports only cellular band.

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

6. SAMPLE CALCULATION

A. Emission Designator

Cellular CDMA Emission Designator

Emission Designator = **1M28F9W**

CDMA OBW = 1.2764 MHz

(Measured at the 99.75% power bandwidth)

F = Frequency Modulation

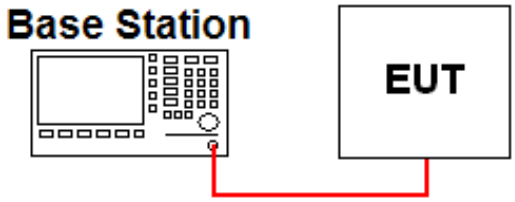
9 = Composite Digital Information

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.



▪ CDMA

Band	Channel	1X RRT				EvDo (Rev.0)		EvDo (Rev.A)	
		RC1	RC3	FCH+ SCH	FCH				
		SO55	SO55	TDSO SO32	TDSO SO32	FTAP	RTAP	FETAP	RETAP
Cellular	1013	21.44	21.48	21.38	21.41	N/A	N/A	N/A	N/A
	0384	21.43	21.45	21.35	21.38	N/A	N/A	N/A	N/A
	0777	21.31	21.37	21.25	21.26	N/A	N/A	N/A	N/A

The output power was measured using the Agilent E5515C

7.2 PEAKTOAVERAGE RATIO

- N/A

7.3 OCCUPIED BANDWIDTH

Band	Channel	Test Result(KHz)
Cellular CDMA	***1013***	***1276.40***
	384	1274.00
	777	1273.10

- 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

- Cellular CDMA data

CH.	EUT Position (Axis)	TEST CONDITIONSPower Step: 5							
		Reading Value (dBm)	Pol. (H/V)	LEVEL@ TX ANTENNA TERMINAL (dBm)	Antenna Gain (dBd)	ERP (dBm)	ERP (W)	Power Supply	Note.
1013	X	-12.92	H	19.81	1.20	21.01	0.126	DC 3.7V	CDMA
384	X	-14.79	H	19.21	1.15	20.36	0.109	DC 3.7V	CDMA
777	***Y***	***-15.34***	***V***	***20.83***	***1.05***	***21.88***	***0.154***	***DC 3.7V***	***CDMA***

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 RADIATED SPURIOUS EMISSIONS

7.7.1 RADIATED SPURIOUS EMISSIONS (Cellular CDMA)

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)
1013 (0.126W)	1649.54	Z	V	-66.63	5.89	-60.74	81.75	34.01
	3299.00	Y	V	-56.77	7.62	-49.15	70.16	
	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	
384 (0.109W)	1673.52	Z	V	-64.87	5.96	-58.91	79.27	33.36
	3346.48	Y	V	-55.86	7.60	-48.26	68.62	
	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	
777 (0.154W)	1696.70	Z	V	-66.65	6.02	-60.63	82.51	34.88
	3393.31	Y	V	-55.73	7.58	-48.15	70.03	
	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	

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

- No other spurious and harmonic emissions were reported greater than listed emissions above table.

NOTES:

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

The EUT is placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation is adjusted for the highest reading on the receive spectrum analyzer.

A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This spurious level is recorded. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

This device was tested under all configurations and the highest power is reported in GSM mode and using a Power Control Level of “0” in the PCS Band and “5” in the Cellular Band.

This EUT was tested with the fully charged battery. Also, we have done x, y, z planes in EUT and horizontal and vertical polarization of detecting antenna.

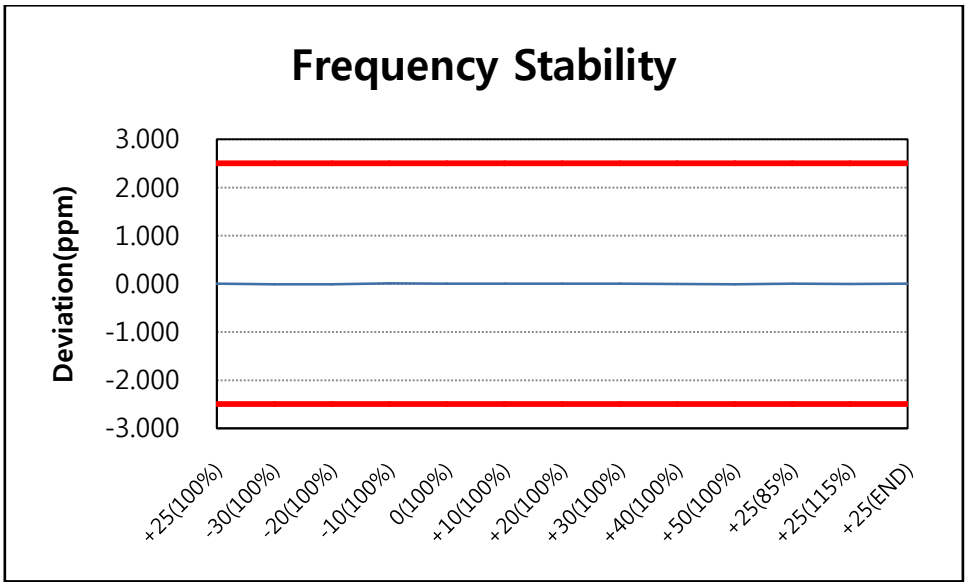
The worst case data is reported.

7.8 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

7.8.1 FREQUENCY STABILITY (Cellular CDMA)

OPERATING FREQUENCY : 836,520,002Hz
CHANNEL : 384(Mid)
REFERENCE VOLTAGE : 3.700 V DC
DEVIATION LIMIT : ± 0.00025 % or 2.5 ppm

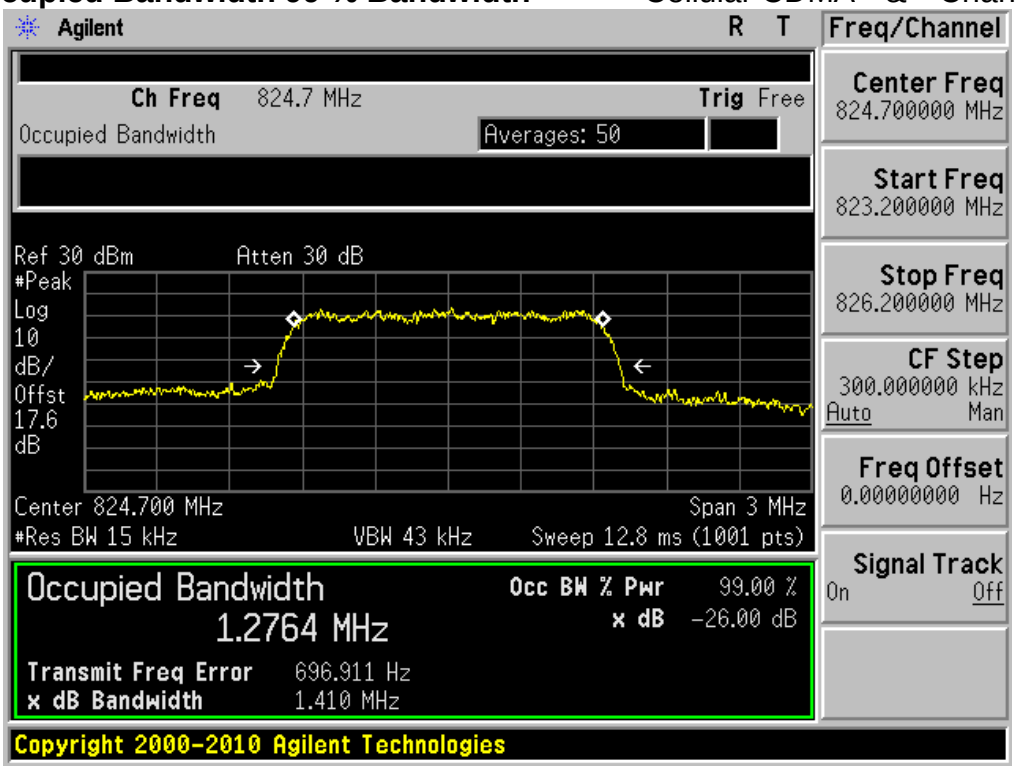
VOLTAGE (%)	POWER (V DC)	TEMP (℃)	FREQ (Hz)	Deviation	
				(ppm)	(%)
100%	3.700	+25(Ref)	836,520,002	0.000	0.00000000
100%		-30	836,519,996	-0.007	-0.00000072
100%		-20	836,519,996	-0.007	-0.00000072
100%		-10	836,520,008	0.007	0.00000072
100%		0	836,520,006	0.005	0.00000048
100%		+10	836,520,004	0.002	0.00000024
100%		+20	836,520,002	0.000	0.00000000
100%		+30	836,520,005	0.004	0.00000036
100%		+40	836,519,998	-0.005	-0.00000048
100%		+50	836,519,993	-0.011	-0.00000108
85%	3.145	+25	N/A	N/A	N/A
115%	4.255	+25	836,519,997	-0.006	-0.00000060
BATT.ENDPOINT	3.400	+25	836,520,004	0.002	0.00000024



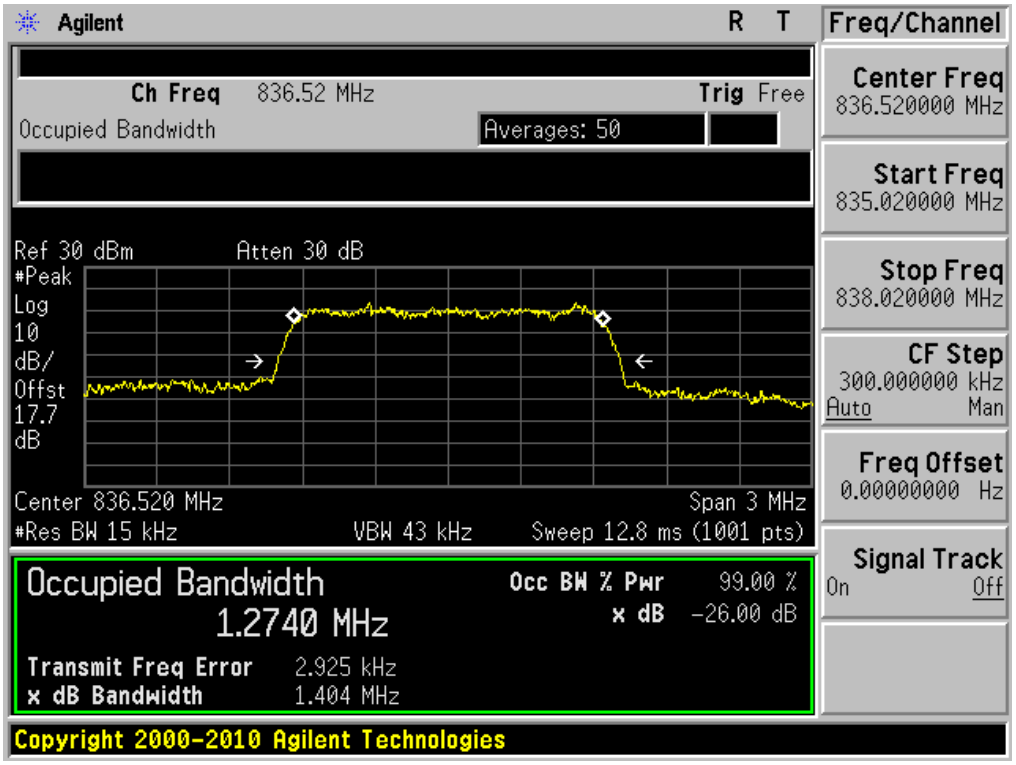
8. TEST PLOTS

8.2 Occupied Bandwidth 99 % Bandwidth

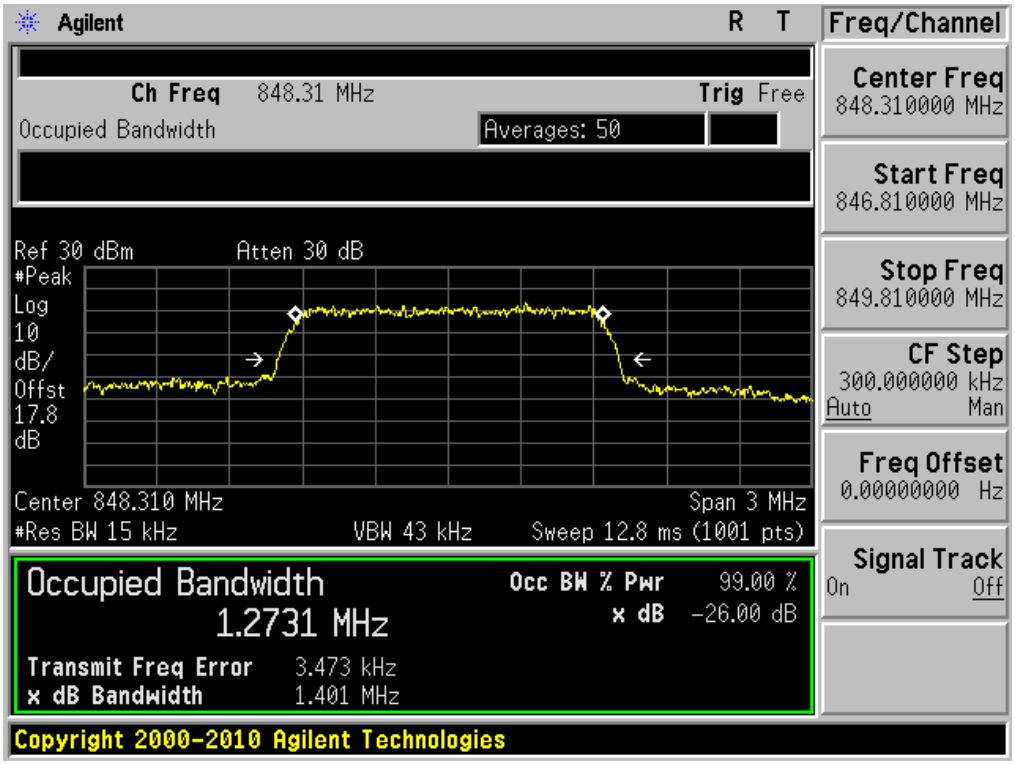
Cellular CDMA & Channel: 1013



Cellular CDMA & Channel: 384

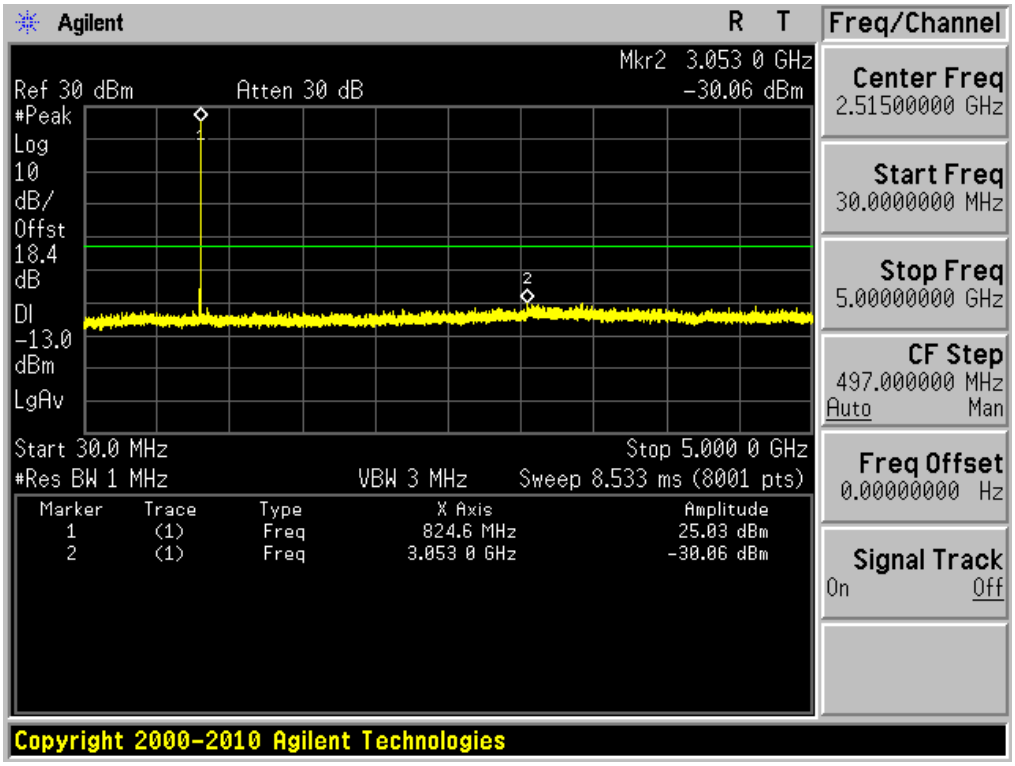


Cellular CDMA & Channel: 777

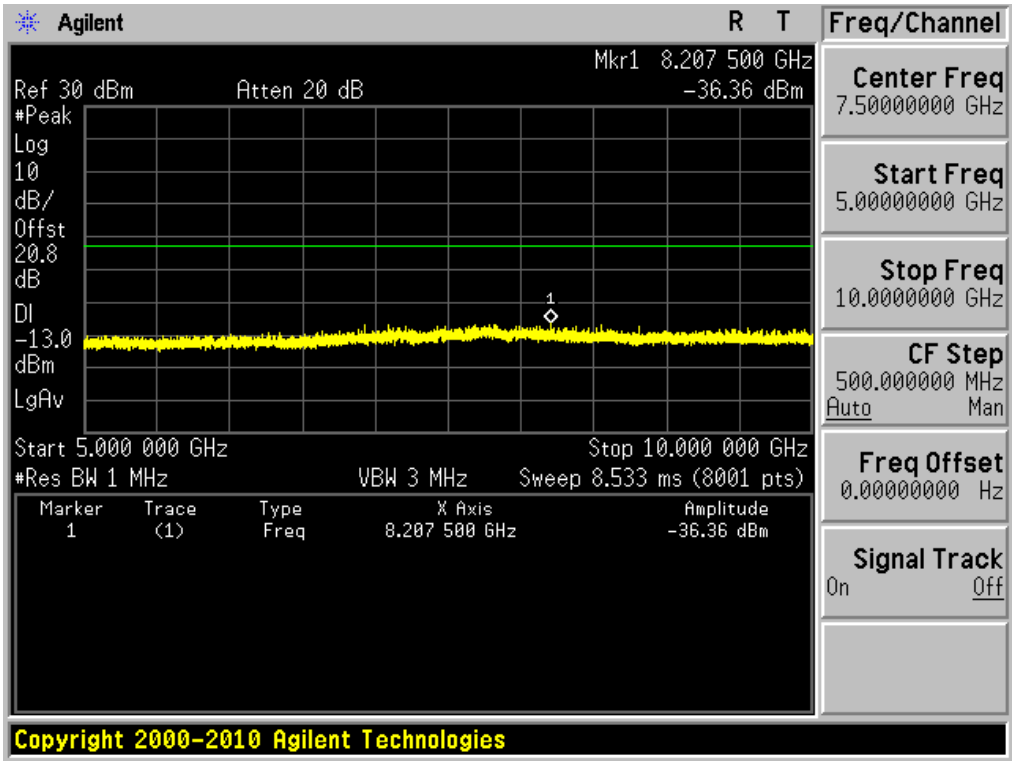


8.3 Spurious Emissions at Antenna Terminal

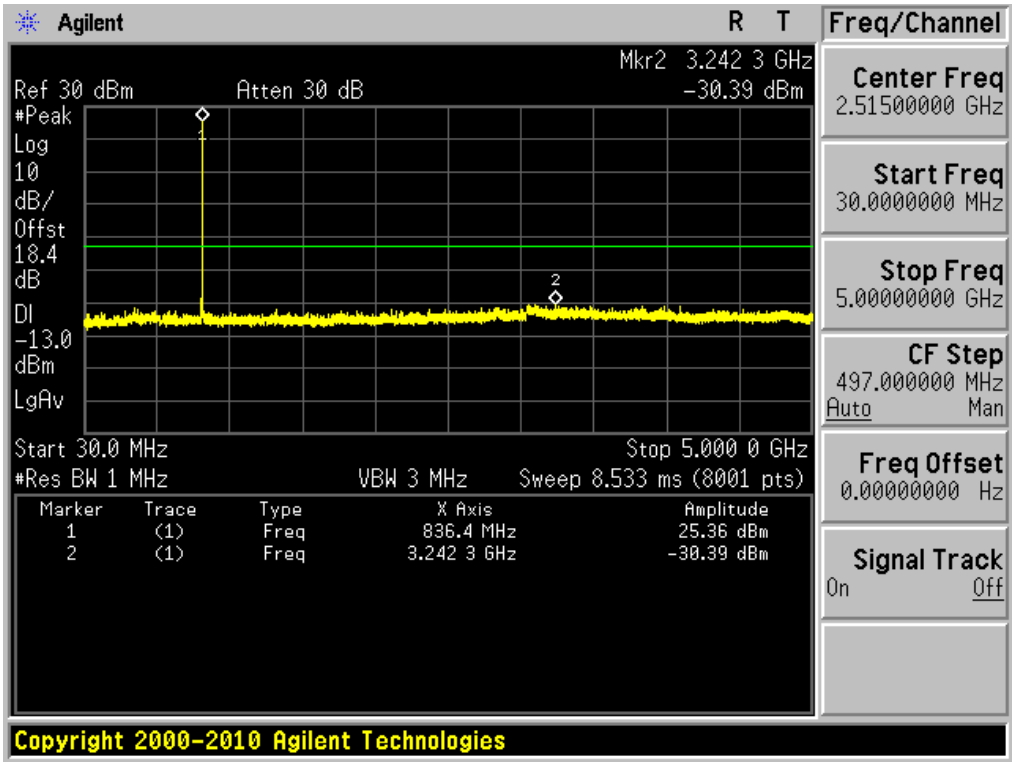
Cellular CDMA & Channel: 1013



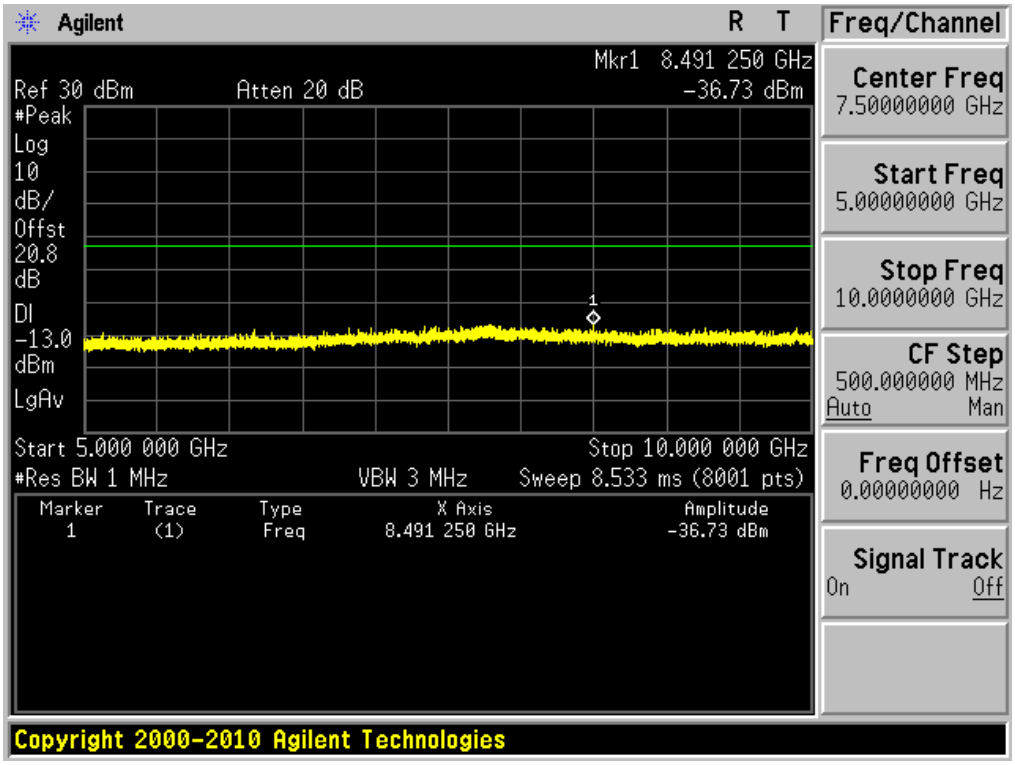
Cellular CDMA & Channel: 1013



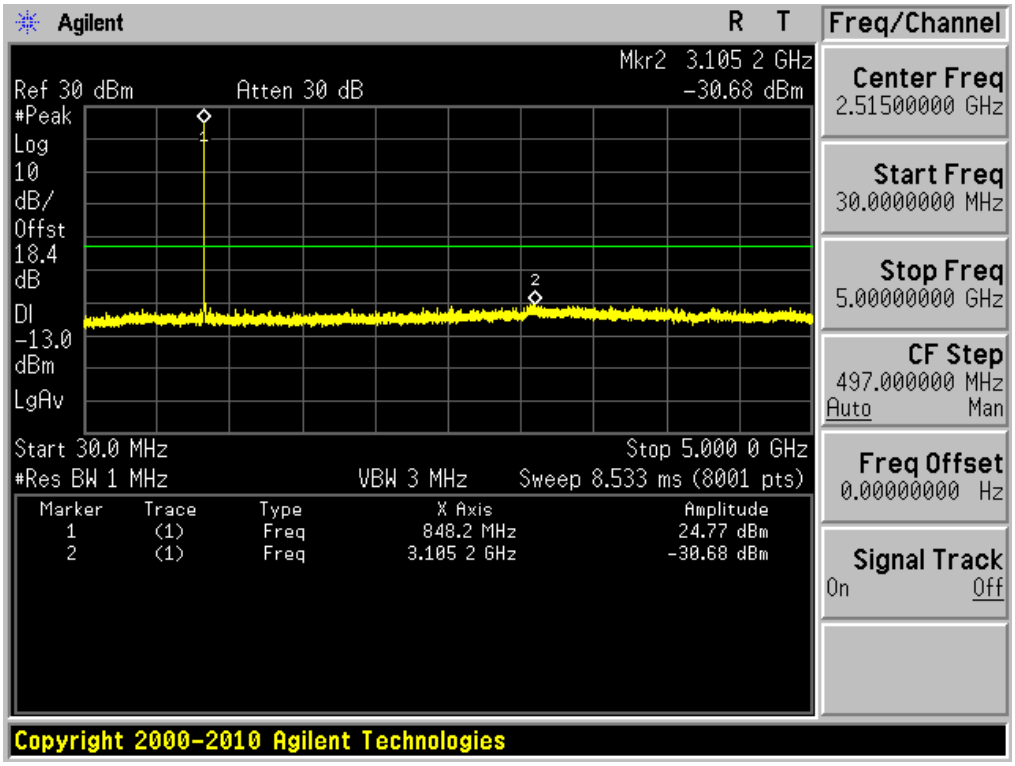
Cellular CDMA & Channel: 384



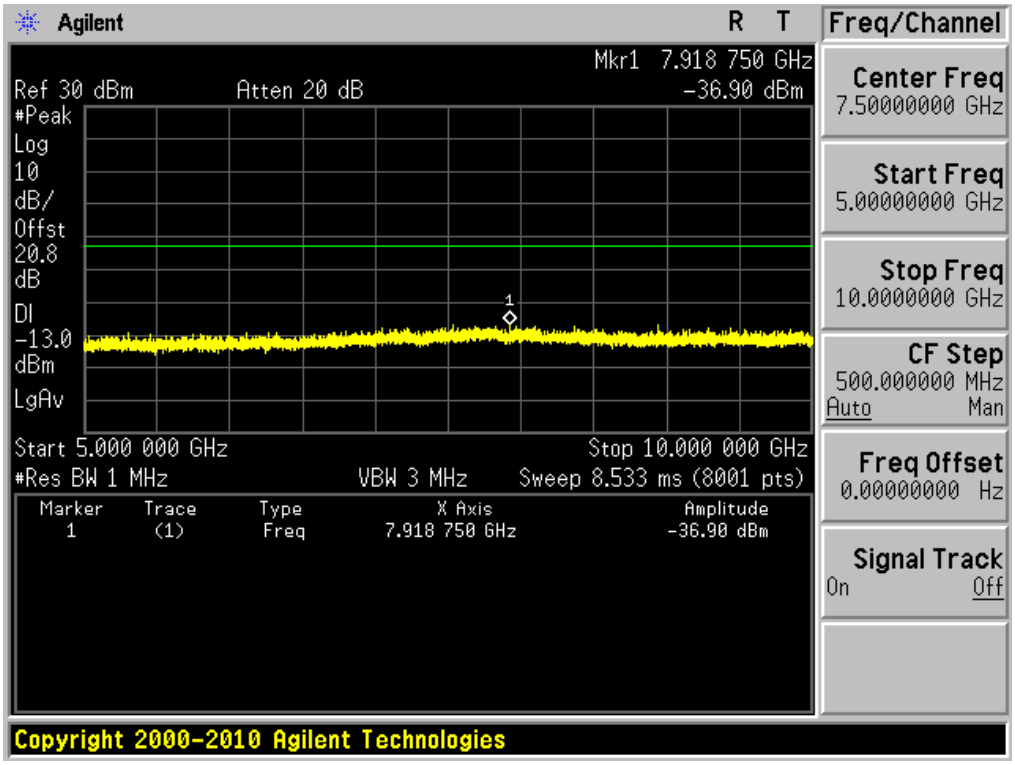
Cellular CDMA & Channel: 384



Cellular CDMA & Channel: 777

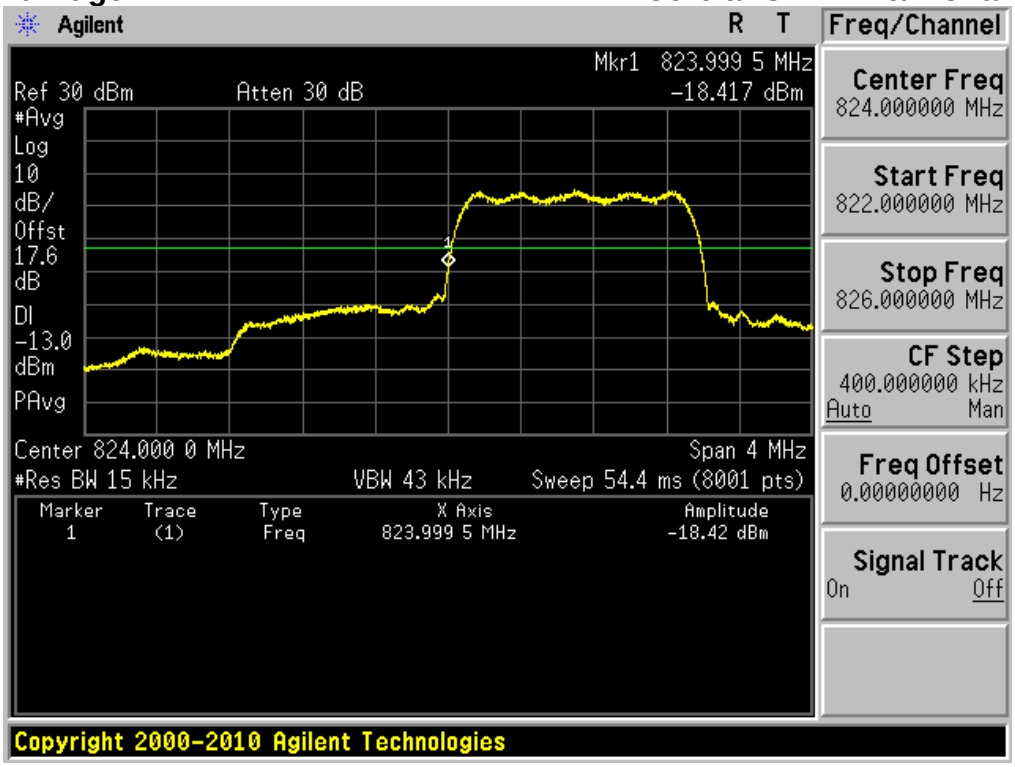


Cellular CDMA & Channel: 777

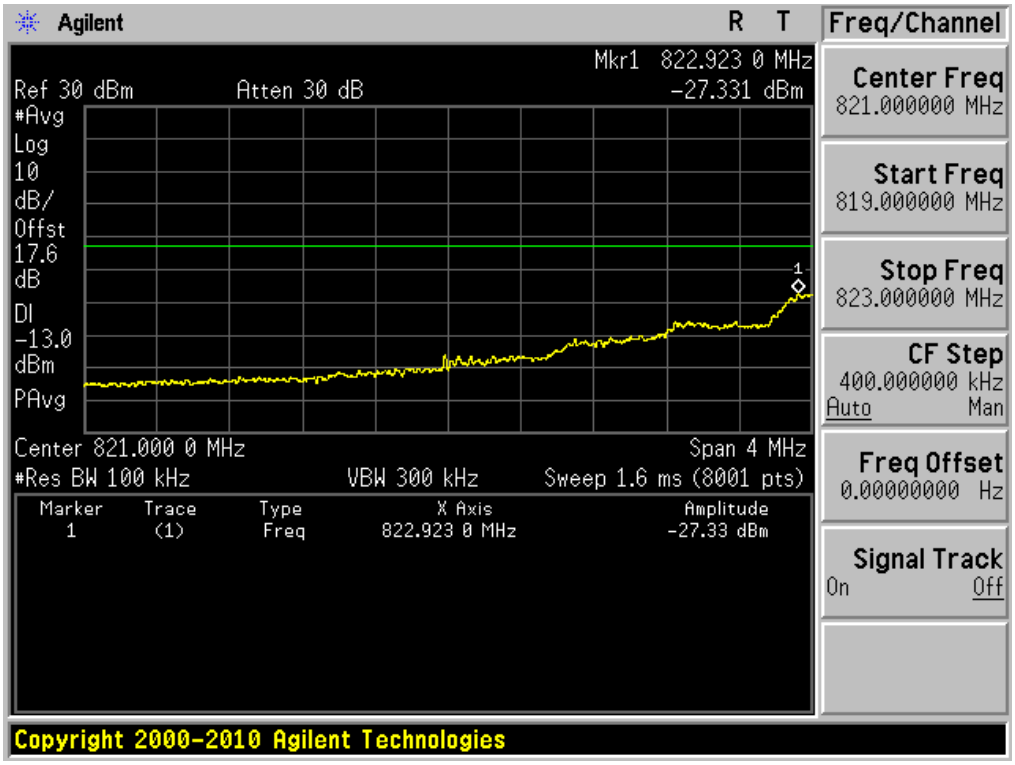


8.4 Band Edge

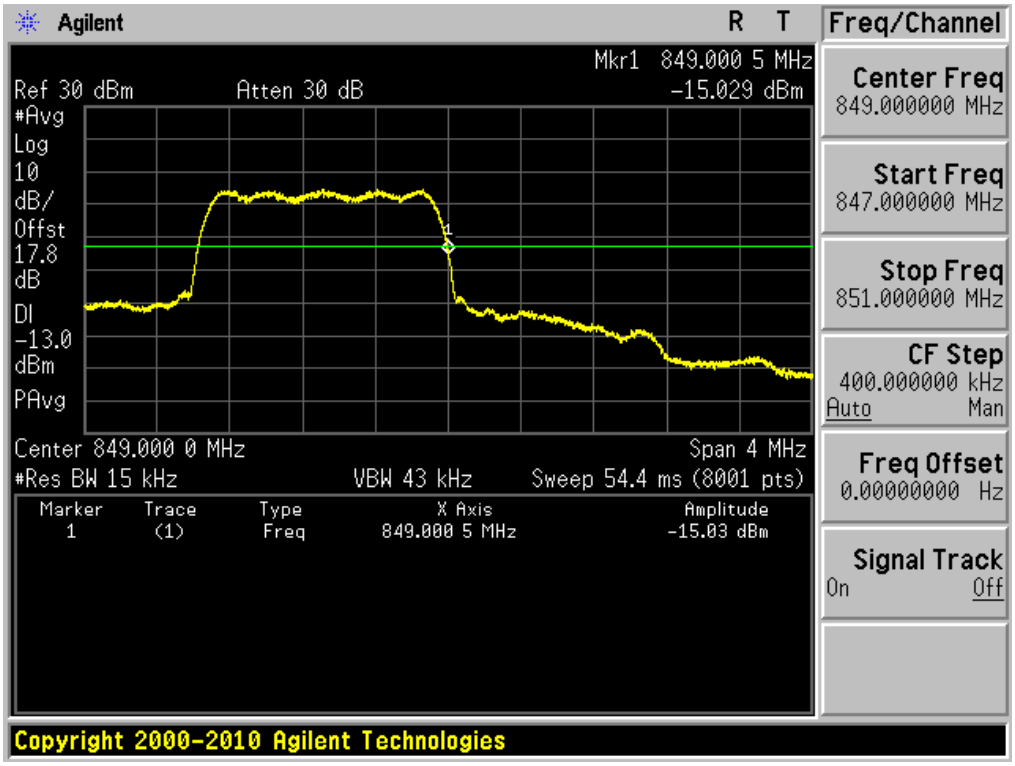
Cellular CDMA & Channel: 1013



Cellular CDMA & Channel: 1013



Cellular CDMA & Channel: 777



Cellular CDMA & Channel: 777