



HCT CO., LTD.

Product Compliance Division

TEL : +82 31 639 8518 FAX : +82 31 639 8535

CERTIFICATE OF COMPLIANCE
FCC Certification

Applicant Name:
Vertex Wireless Co., Ltd

Address:
5F, Seohyeon Plaza, Seohyeon-Dong, 254-5, Bundang-Gu,
Seongnam-City, Gyeonggi-Do, Korea

Date of Issue:
May 11, 2009
Location:
HCT CO., LTD., San 136-1 Ami-ri, Bubal-eup, Icheon-si,
Kyungki-do, Korea
Test Report No.: HCT-RF09-0513
HCT FRN: 0005866421
IC Recognition No.: IC 5944A

FCC ID : XAVVVW240

APPLICANT : Vertex Wireless Co., Ltd

Model(s): VW240
EUT Type: CDMA 1xEVDO Rev.A Wireless Router
Tx Frequency: 824.70 — 848.31 MHz (CDMA)
1 851.25 — 1 908.75 MHz (PCS CDMA)
Rx Frequency: 869.70 — 893.31 MHz (CDMA)
1 931.25 — 1 988.75 MHz (PCS CDMA)
Max. RF Output Power: 0.327 W ERP CDMA EVDO (25.15 dBm) / 0.458 W EIRP PCS EVDO (26.61 dBm)
0.215 W ERP CDMA (23.32 dBm) / 0.394 W EIRP PCS CDMA (25.96 dBm)
Emission Designator(s): 1M27F9W (CDMA), 1M27F9W (CDMA EVDO)
1M27F9W (PCS CDMA), 1M27F9W (PCS CDMA EVDO)
FCC Classification: PCS Licensed Transmitter (PCB)
FCC Rule Part(s): §22, §24, §2

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

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


Report prepared by
: Jong Seok Lee
Test engineer of RF Part


Approved by
: Sang Jun Lee
Manager of RF Part

This report only responds to the tested sample and may not be reproduced, except in full, without written approval of the HCT Co., Ltd.

FCC CERTIFICATION REPORT				www.hct.co.kr
Test Report No. HCT-RF09-0513	Date of Issue: May 11, 2009	EUT Type: CDMA 1xEVDO Rev.A Wireless Router	FCC ID: XAVVVW240	Page 1 of 41

Table of Contents

1. GENERAL INFORMATION	3
2. INTRODUCTION.....	4
2.1. EUT DESCRIPTION.....	4
2.2. MEASURING INSTRUMENT CALIBRATION	4
2.3. TEST FACILITY	4
3. DESCRIPTION OF TESTS.....	5
3.1 Effective Radiated Power/Equivalent Isotropic Radiated Power.....	5
3.2 Peak- to- Average Ratio	6
3.3 Occupied bandwidth.....	7
3.4 Spurious and Harmonic Emissions at Antenna Terminal.	8
3.5 Radiated Spurious and Harmonic Emissions	9
3.6 Frequency stability / variation of ambient temperature.....	10
4. LIST OF TEST EQUIPMENT	11
5. SUMMARY OF TEST RESULTS	12
6. SAMPLE CALCULATION.....	13
7. TEST DATA	14
7.1 Conducted Output Power.....	14
7.2 Peak-to-Average Ratio	14
7.3 Occupied Bandwidth.....	15
7.4 Conducted Spurious Emissions.....	15
7.4.1 Band Edge	15
7.5 Effective Radiated Power Output(E.R.P)	16
7.6 Equivalent Isotropic Radiated Power(E.I.R.P).....	17
7.7 Radiated Spurious Emissions	18
7.7.1 Radiated Spurious Emissions(CDMA EVDO Mode)	18
7.7.2 Radiated Spurious Emissions(PCS CDMA EVDO Mode)	19
7.8 Frequency stability / variation of ambient temperature.....	20
7.8.1 FREQUENCY STABILITY (CDMA EVDO).....	20
7.8.2 FREQUENCY STABILITY (PCS CDMA EVDO).....	21
8. TEST PLOTS	22

FCC CERTIFICATION REPORT				www.hct.co.kr
Test Report No. HCT-RF09-0513	Test Dates: May 11, 2009	EUT Type: CDMA 1xEVDO Rev.A Wireless Router	FCC ID: XAVVW240	Page 2 of 41



MEASUREMENT REPORT

1. GENERAL INFORMATION

Applicant Name: Vertex Wireless Co., Ltd

Address: 5F, Seohyeon Plaza, Seohyeon-Dong, 254-5, Bundang-Gu, Seongnam-City, Gyeonggi-Do, Korea

Contact: TEL :+82-31-702-4901 / FAX : +82-31-702-4567

FCC ID: XAVVW240

Application Type: Certification

FCC Classification: PCS Licensed Transmitter (PCB)

FCC Rule Part(s): §22, §24, §2

EUT Type: CDMA 1xEVDO Rev.A Wireless Router

Model(s): VW240

Battery **Model Name:** NCM186501S200F211A1
Power Rating: 3.7 Vdc, 2000 mAh
Type: Lithium-Ion Battery

Tx Frequency: 824.70 — 848.31 MHz (CDMA)
1 851.25 — 1 908.75 MHz (PCS CDMA)

Rx Frequency: 869.70 — 893.31 MHz (CDMA)
1 931.25 — 1 988.75 MHz (PCS CDMA)

Max. RF Output Power: 0.327 W ERP CDMA EVDO (25.15 dBm) / 0.458 W EIRP PCS EVDO (26.61 dBm)
0.215 W ERP CDMA (23.32 dBm) / 0.394 W EIRP PCS CDMA (25.96 dBm)

Emission Designator(s): 1M27F9W (CDMA), 1M27F9W (CDMA EVDO),
1M27F9W (PCS CDMA), 1M27F9W (PCS EVDO),

Antenna Specification Manufacturer: G-TECHNOLOGY co., Ltd.
Antenna type: PCB Type Dual Dipole Antenna
Peak Gain: 1.63 dBi

Date(s) of Tests: April 28, 2009

FCC CERTIFICATION REPORT				www.hct.co.kr
Test Report No. HCT-RF09-0513	Test Dates: May 11, 2009	EUT Type: CDMA 1xEVDO Rev.A Wireless Router	FCC ID: XAVVW240	Page 3 of 41



2. INTRODUCTION

2.1. EUT DESCRIPTION

The VW240 Wireless Router consists of Cellular CDMA, PCS CDMA and 1xEVDO Rev.A.

2.2. MEASURING INSTRUMENT CALIBRATION

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

2.3. TEST FACILITY

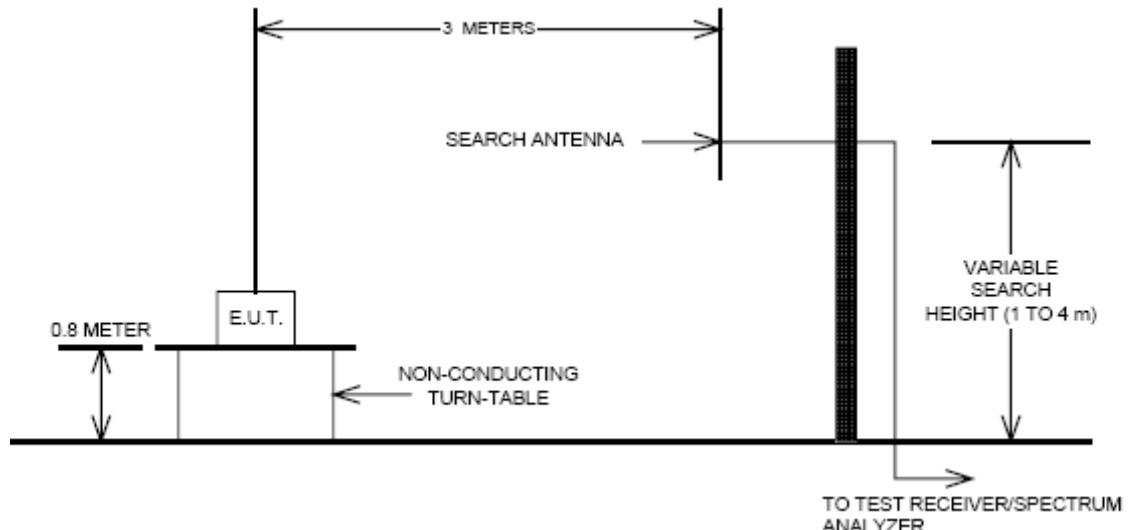
The open area test site and conducted measurement facility used to collect the radiated data are located at the 254-1, Maekok-Ri, Hobup-Myun, Ichon-Si, Kyoungki-Do, 467-701, KOREA. The site is constructed in conformance with the requirements of ANSI C63.4 and CISPR Publication 22. Detailed description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

FCC CERTIFICATION REPORT				www.hct.co.kr
Test Report No. HCT-RF09-0513	Test Dates: May 11, 2009	EUT Type: CDMA 1xEVDO Rev.A Wireless Router	FCC ID: XAVVW240	Page 4 of 41

3. DESCRIPTION OF TESTS

3.1 Effective Radiated Power/Equivalent Isotropic Radiated Power

Test Set-up



Test Procedure

Radiated emission measurements were performed at an open Site.

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

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

The maximum EIRP was calculated by adding the forward power to the calibrated source plus its appropriate gain value. These steps were carried out with the receiving antenna in both vertical and horizontal polarization. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic antenna are taken into consideration.

FCC CERTIFICATION REPORT				www.hct.co.kr
Test Report No. HCT-RF09-0513	Test Dates: May 11, 2009	EUT Type: CDMA 1xEVDO Rev.A Wireless Router	FCC ID: XAVVW240	Page 5 of 41



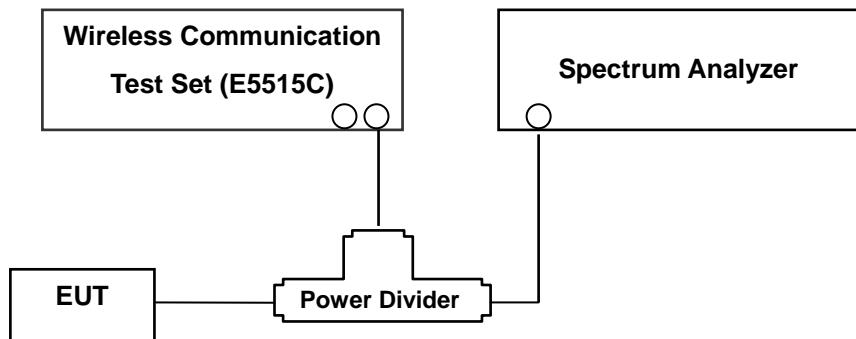
3.2 Peak- to- Average Ratio

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.

FCC CERTIFICATION REPORT				www.hct.co.kr
Test Report No. HCT-RF09-0513	Test Dates: May 11, 2009	EUT Type: CDMA 1xEVDO Rev.A Wireless Router	FCC ID: XAVVW240	Page 6 of 41

3.3 Occupied bandwidth.

Test set-up



(Configuration of conducted Emission measurement)

Test Procedure

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

FCC CERTIFICATION REPORT				www.hct.co.kr
Test Report No. HCT-RF09-0513	Test Dates: May 11, 2009	EUT Type: CDMA 1xEVDO Rev.A Wireless Router	FCC ID: XAVVW240	Page 7 of 41



3.4 Spurious and Harmonic Emissions at Antenna Terminal.

Test Procedure

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

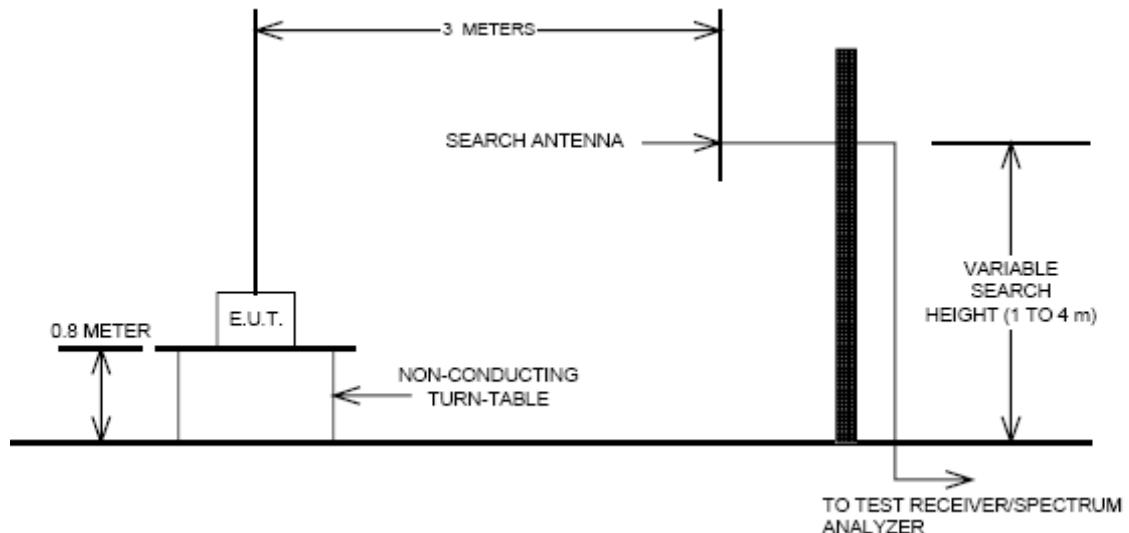
The EUT was setup to maximum output power at its lowest channel. The Resolution BW of the analyzer is set to 1 % of the emission bandwidth to show compliance with the – 13 dBm limit, in the 1 MHz bands immediately outside and adjacent to the edge of the frequency block. The 1 MHz RBW was used to scan from 30 MHz to 10 GHz. (PCS CDMA Mode: 30 MHz to 20 GHz). A display line was placed at – 13 dBm to show compliance. The high, lowest and a middle channel were tested for out of band measurements.

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

FCC CERTIFICATION REPORT				www.hct.co.kr
Test Report No. HCT-RF09-0513	Test Dates: May 11, 2009	EUT Type: CDMA 1xEVDO Rev.A Wireless Router	FCC ID: XAVVW240	Page 8 of 41

3.5 Radiated Spurious and Harmonic Emissions

Test Set-up



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

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

Test Procedure

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

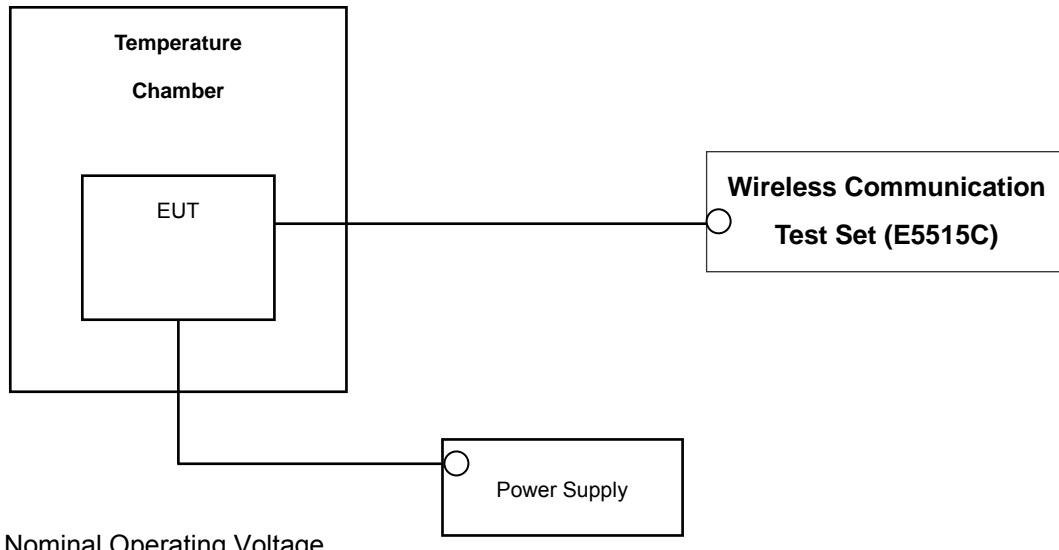
A wooden turntable was rotated 360° and the receiving antenna scanned from 1-4m in order to capture the maximum emission. A half wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the previously recorded signal was duplicated.

The maximum EIRP was calculated by adding the forward power to the calibrated source plus its appropriate gain value. These steps were carried out with the receiving antenna in both vertical and horizontal polarization. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic antenna are taken into consideration.

FCC CERTIFICATION REPORT				www.hct.co.kr
Test Report No.	Test Dates:	EUT Type:	FCC ID:	
HCT-RF09-0513	May 11, 2009	CDMA 1xEVDO Rev.A Wireless Router	XAVVW240	Page 9 of 41

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 $\pm 0.000\ 25\% (\pm 2.5\ ppm)$ of the center frequency.

Time Period and Procedure:

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

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

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

NOTE: 1. The EUT is tested down to the battery endpoint.

FCC CERTIFICATION REPORT				www.hct.co.kr
Test Report No. HCT-RF09-0513	Test Dates: May 11, 2009	EUT Type: CDMA 1xEVDO Rev.A Wireless Router	FCC ID: XAVVW240	Page 10 of 41



4. LIST OF TEST EQUIPMENT

Manufacture	Model/ Equipment	Serial Number	Calibration Interval	Calibration Due
R&S	ESI40/ EMI TEST Receiver	831564/003	Annual	10/31/2009
Agilent	E4416A/ Power Meter	GB41291412	Annual	01/21/2010
Agilent	E9327A/ Power Sensor	MY4442009	Annual	07/28/2009
Agilent	8960 (E5515C)/ Base Station	GB44400269	Annual	02/10/2010
MITEQ	AMF-60-0010 1800-35-20P / AMP	1200937	Annual	05/20/2009
Wainwright	WHK1.2/15G-10EF/H.P.F	2	Annual	06/28/2009
Wainwright	WHK3.3/18G-10EF/H.P.F	1	Annual	06/28/2009
Agilent	775D/ Dual Directional Coupler	12922	Annual	12/24/2009
Agilent	11636B/ Power Divider	11377	Annual	12/24/2009
Digital	EP-3010/ Power Supply	3110117	Annual	01/07/2010
Schwarzbeck	UHAP/ Dipole Antenna	585	Annual	02/13/2011
Schwarzbeck	UHAP/ Dipole Antenna	558	Annual	02/13/2011
Korea Engineering	KR-1005L / Chamber	KRAB07063-2CH	Annual	12/31/2009
Schwarzbeck	BBHA 9120D/ Horn Antenna	147	Biennial	03/26/2010
Agilent	E4440A/Spectrum Analyzer	US45303008	Annual	12/23/2009

FCC CERTIFICATION REPORT				www.hct.co.kr
Test Report No. HCT-RF09-0513	Test Dates: May 11, 2009	EUT Type: CDMA 1xEVDO Rev.A Wireless Router	FCC ID: XAVVW240	Page 11 of 41



5. SUMMARY OF TEST RESULTS

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result
2.1049, 22.917(a), 24.238(a),	Occupied Bandwidth	N/A	CONDUCTED	PASS
2.1051, 22.917(a), 24.238(a)	Band Edge / Spurious and Harmonic Emissions at Antenna Terminal.	< $43 + 10\log_{10}(P[\text{Watts}])$ at Band Edge and for all out-of-band emissions		PASS
2.1046	Conducted Output Power	N/A		PASS
24.232(d),	Peak- to- Average Ratio	< 13 dB		PASS
2.1055, 22.355, 24.235	Frequency stability / variation of ambient temperature	< 2.5 ppm		PASS
22.913(a)(2) 24.232(c),	Effective Radiated Power	< 7 Watts max. ERP	RADIATED	PASS
	Equivalent Isotropic Radiated Power	< 2 Watts max. EIRP		PASS
2.1053, 22.917(a), 24.238(a), 27.53(g)	Radiated Spurious and Harmonic Emissions	< $43 + 10\log_{10}(P[\text{Watts}])$ for all out-of band emissions		PASS

FCC CERTIFICATION REPORT				www.hct.co.kr
Test Report No. HCT-RF09-0513	Test Dates: May 11, 2009	EUT Type: CDMA 1xEVDO Rev.A Wireless Router	FCC ID: XAVVW240	Page 12 of 41



6. SAMPLE CALCULATION

A. ERP Sample Calculation

Mode	Ch./ Freq.		Measured Level(dBm)	Substitute LEVEL(dBm)	Ant. Gain	C.L	Pol.	ERP	
	channel	Freq.(MHz)						W	dBm
CDMA	384	836.52	-10.96	24.81	2.50	1.19	H	0.41	26.12

ERP = SubstituteLEVEL(dBm) + Ant. Gain – CL(Cable Loss)

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

B. Emission Designator

CDMA Emission Designator

Emission Designator = 1M27F9W

CDMA BW = 1.27 MHz (Measured at the 99% power bandwidth)

F = Frequency Modulation

9 = Composite Digital Info

W = Combination (Audio/Data)

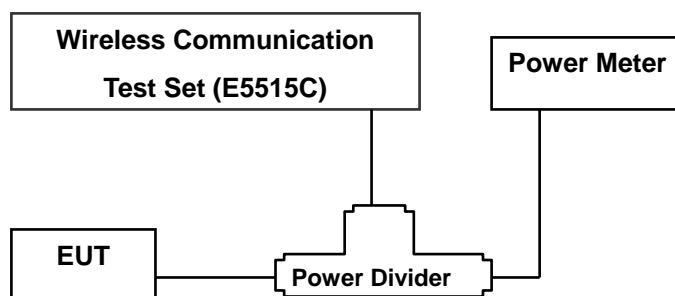
FCC CERTIFICATION REPORT					www.hct.co.kr
Test Report No.	Test Dates:	EUT Type:	FCC ID:	Page 13 of 41	
HCT-RF09-0513	May 11, 2009	CDMA 1xEVDO Rev.A Wireless Router	XAVVW240		

7. TEST DATA

Highest Power is 1xEVDO Rev.A mode.

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.



Band	Channel	SO2	SO2	SO55	SO55	TDSO SO32	1xEvD Rev.O	1xEvD Rev.O	1xEvDO Rev.1	1xEvDO Rev.1
		RC1/1 (dBm)	RC3/3 (dBm)	RC1/1 (dBm)	RC3/3 (dBm)	RC3/3 (dBm)	(FTAP)	(RTAP)	(FETAP)	(RETAP)
CDMA	1013	24.69	24.71	24.67	24.77	24.68	26.50	26.55	26.61	26.46
	384	23.95	24.04	23.94	24.11	23.94	25.97	25.95	25.93	25.72
	777	23.87	23.99	23.88	24.03	23.89	25.80	25.77	25.83	25.72
PCS	25	24.27	24.36	24.29	24.37	24.28	25.92	25.97	25.93	25.90
	600	24.19	24.16	24.18	24.18	24.20	25.27	25.46	25.40	25.37
	1175	24.34	24.38	24.28	24.40	24.25	25.50	25.62	25.57	25.50

(Maximum Conducted Output Powers)

7.2 Peak-to-Average Ratio

- Plots of the EUT's Peak- to- Average Ratio are shown Page 27.

Note : This device was tested under all R.C.s and S.O.s in CDMA and FETAP and RETAP in 1xEVDO and Worst case(Highest power) is reported with RC3/SO55 and 1xEVDO Rev.A FETAP, with 'All Up' power control bits.

FCC CERTIFICATION REPORT					www.hct.co.kr
Test Report No.	Test Dates:	EUT Type:	FCC ID:	Page	
HCT-RF09-0513	May 11, 2009	CDMA 1xEVDO Rev.A Wireless Router	XAVVW240	14 of 41	



7.3 Occupied Bandwidth

Band	Channel	Frequency(MHz)	Data (kHz)
CDMA EVDO	1013	824.70	1.2719
	384	836.52	1.2705
	777	848.31	1.2684
CDMA	1013	824.70	1.2683
PCS EVDO	25	1851.25	1.2706
	600	1880.00	1.2885
	1175	1908.75	1.2692
PCS	600	1880.00	1.2692

- Plots of the EUT's Occupied Bandwidth are shown Page 23 ~ 26.

Note : This device was tested under all R.C.s and S.O.s in CDMA and FETAP and RETAP in 1xEVDO and Worst case(Highest power) is reported with RC3/SO55 and 1xEVDO Rev.A FETAP, with 'All Up' power control bits.

7.4 Conducted Spurious Emissions

Band	Channel	Frequency of Maximum Harmonic (GHz)	Maximum Data (dBm)
GSM850	128	2.475	-34.08
	190	7.9750	-39.55
	251	7.1125	-39.51
GSM1900	512	3.702	-32.33
	661	13.307	-35.74
	810	14.320	-36.06

- Plots of the EUT's Conducted Spurious Emissions are shown Page 35 ~ 41.

Note : This device was tested under all R.C.s and S.O.s in CDMA and FETAP and RETAP in 1xEVDO and Worst case(Highest power) is reported with RC3/SO55 and 1xEVDO Rev.A FETAP, with 'All Up' power control bits.

7.4.1 Band Edge

- Plots of the EUT's Band Edge are shown Page 27 ~35.

Note : This device was tested under all R.C.s and S.O.s in CDMA and FETAP and RETAP in 1xEVDO and Worst case(Highest power) is reported with RC3/SO55 and 1xEVDO Rev.A FETAP, with 'All Up' power control bits.

FCC CERTIFICATION REPORT				www.hct.co.kr
Test Report No. HCT-RF09-0513	Test Dates: May 11, 2009	EUT Type: CDMA 1xEVDO Rev.A Wireless Router	FCC ID: XAVVW240	Page 15 of 41



7.5 Effective Radiated Power Output(E.R.P)

(CDMA EVDO Mode)

Mode	Ch./ Freq.		Measured Level(dBm)	Substitute LEVEL (dBm)	Ant. Gain	C.L	Pol.	ERP	
	channel	Freq.(MHz)						W	dBm
CDMA	777	848.31	-14.48	32.65	-8.13	1.20	V	0.21	23.32
EVDO	1013	824.70	-12.11	33.72	-8.31	1.17	H	0.27	24.24
	384	836.52	-12.40	34.09	-8.22	1.19	V	0.29	24.68
	777	848.31	-12.65	34.48	-8.13	1.20	V	0.33	25.15

Note: Standard batteries are the only options for this Router.

NOTES:

Effective Radiated Power Output Measurements by Substitution Method

according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For WCDMA signals, a peak detector is used, with RBW = VBW = 5MHz. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. The conducted power at the terminals of the dipole is measured. The ERP is recorded.

This device was tested under all configurations and the highest power is reported.

Note : This device was tested under all R.C.s and S.O.s in CDMA and FETAP and RETAP in 1xEVDO and Worst case(Highest power) is reported with RC3/SO55 and 1xEVDO Rev.A FETAP, with 'All Up' power control bits.

FCC CERTIFICATION REPORT					www.hct.co.kr
Test Report No.	Test Dates:	EUT Type:	FCC ID:	Page 16 of 41	
HCT-RF09-0513	May 11, 2009	CDMA 1xEVDO Rev.A Wireless Router	XAVVW240		



7.6 Equivalent Isotropic Radiated Power(E.I.R.P)

(PCS CDMA EVDO Mode)

Mode	Ch./ Freq.		Measured Level(dBm)	Substitute LEVEL (dBm)	Ant. Gain	C.L	Pol.	EIRP	
	channel	Freq.(MHz)						W	dBm
PCS CDMA	600	1,880.00	-13.96	17.86	10.05	1.95	H	0.39	25.96
EVDO	25	1,851.25	-14.43	17.18	10.05	1.91	H	0.34	25.31
	600	1,880.00	-13.31	18.51	10.05	1.95	H	0.46	26.61
	1175	1,908.75	-14.70	17.20	10.06	1.97	H	0.34	25.29

Note: Standard batteries are the only options for this Router.

NOTES:

Equivalent Isotropic Radiated Power Measurements by Substitution Method

according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For WCDMA signals, a peak detector is used, with RBW = VBW = 5MHz. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz. A Horn antenna was substituted in place of the EUT. This Horn antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. The conducted power at the terminals of the Horn antenna is measured. The difference between the gain of the horn and an isotropic antenna is taken into consideration and the EIRP is recorded.

This device was tested under all configurations and the highest power is reported.

Note : This device was tested under all R.C.s and S.O.s in CDMA and FETAP and RETAP in 1xEVDO and Worst case(Highest power) is reported with RC3/SO55 and 1xEVDO Rev.A FETAP, with 'All Up' power control bits.

FCC CERTIFICATION REPORT					www.hct.co.kr
Test Report No.	Test Dates:	EUT Type:	FCC ID:	Page 17 of 41	
HCT-RF09-0513	May 11, 2009	CDMA 1xEVDO Rev.A Wireless Router	XAVVW240		



7.7 Radiated Spurious Emissions

7.7.1 Radiated Spurious Emissions(CDMA EVDO Mode)

MEASURED OUTPUT POWER: 25.15 dBm = 0.327 W

MODULATION SIGNAL: CDMA EVDO

DISTANCE: 3 meters

LIMIT: - (43 + 10 log₁₀ (W)) = - 38.15 dBc

Ch.	Freq.(MHz)	Measured Level [dBm]	Ant. Gain	Substitute Level [dBm]	C.L	Pol.	ERP (dBm)	dBc
1013	1,649.40	-25.09	7.09	-35.62	1.73	H	-30.26	-53.65
	2,474.10	-35.02	8.12	-42.13	2.28	V	-36.29	-59.68
	3,298.80	-32.29	9.72	-39.87	2.57	H	-32.72	-56.11
384	1,673.04	-28.51	7.23	-39.27	1.79	H	-33.83	-57.22
	2,509.56	-40.24	8.14	-47.37	2.33	V	-41.56	-64.95
	3,346.08	-33.93	9.99	-41.96	2.66	H	-34.63	-58.02
777	1,696.62	-28.28	7.41	-38.89	1.83	H	-33.31	-56.70
	2,544.93	-40.64	8.21	-47.92	2.34	V	-42.05	-65.44
	3,393.24	-36.76	9.91	-44.39	2.85	H	-37.33	-60.72

NOTES:

1. Radiated Spurious Emission Measurements at 3 meters by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004;
2. The magnitude of spurious emissions attenuated more than 20dB below the limit above 5th Harmonic for all channel.
3. This device was tested under all R.C.s and S.O.s in CDMA and FETAP and RETAP in 1xEVDO and Worst case(Highest power) is reported with RC3/SO55 and 1xEVDO Rev.A FETAP, with 'All Up' power control bits.

FCC CERTIFICATION REPORT					www.hct.co.kr
Test Report No.	Test Dates:	EUT Type:	FCC ID:	Page 18 of 41	
HCT-RF09-0513	May 11, 2009	CDMA 1xEVDO Rev.A Wireless Router	XAVVW240		



7.7.2 Radiated Spurious Emissions(PCS CDMA EVDO Mode)

- MEASURED OUTPUT POWER: 26.61 dBm = 0.458 W
- MODULATION SIGNAL: PCS CDMA EVDO
- DISTANCE: 3 meters
- LIMIT: - (43 + 10 \log_{10} (W)) = - 39.61 dBc

Ch.	Freq.(MHz)	<u>Measured Level</u> <u>[dBm]</u>	Ant. Gain	<u>Substitute</u> <u>Level</u> <u>[dBm]</u>	C.L	Pol.	ERP (dBm)	dBc
25	3,702.50	-39.16	12.46	-45.43	2.73	V	-35.70	-61.66
	5,553.75	-47.19	12.70	-48.77	3.60	V	-39.67	-65.63
	7,405.00	-52.66	11.36	-43.78	3.88	V	-36.30	-62.26
600	3,760.00	-41.06	12.47	-47.03	2.73	V	-37.29	-63.25
	5,640.00	-47.11	12.75	-48.76	3.60	V	-39.61	-65.57
	7,520.00	-52.75	11.33	-43.65	3.88	V	-36.20	-62.16
1175	3,817.50	-43.64	12.49	-49.52	2.73	V	-39.76	-65.72
	5,726.25	-51.32	12.80	-52.63	3.60	V	-43.43	-69.39
	7,635.00	-54.01	11.30	-44.68	3.88	V	-37.26	-63.22

NOTES:

1. Radiated Spurious Emission Measurements at 3 meters by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:
2. The magnitude of spurious emissions attenuated more than 20dB below the limit above 5th Harmonic for all channel.
3. This device was tested under all R.C.s and S.O.s in CDMA and FETAP and RETAP in 1xEVDO and Worst case(Highest power) is reported with RC3/SO55 and 1xEVDO Rev.A FETAP, with 'All Up' power control bits.

FCC CERTIFICATION REPORT					www.hct.co.kr
Test Report No.	Test Dates:	EUT Type:	FCC ID:		
HCT-RF09-0513	May 11, 2009	CDMA 1xEVDO Rev.A Wireless Router	XAVVW240	Page 19 of 41	

7.8 Frequency stability / variation of ambient temperature

7.8.1 FREQUENCY STABILITY (CDMA EVDO)

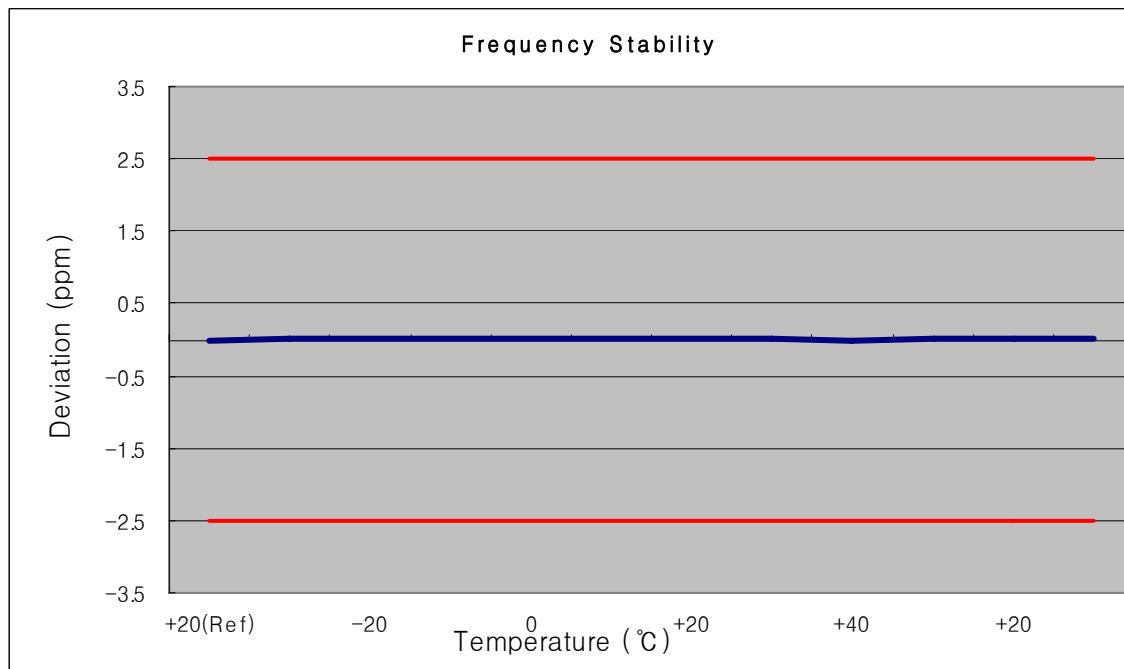
OPERATING FREQUENCY: 836,520,000 Hz

CHANNEL: 384

REFERENCE VOLTAGE: 3.7 VDC

DEVIATION LIM IT: ± 0.000 25 % or 2.5 ppm

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.700	+20(Ref)	836 519 993	-7.19	-0.000 001	-0.009
100%		-30	836 520 008	7.79	0.000 001	0.009
100%		-20	836 520 010	9.97	0.000 001	0.012
100%		-10	836 520 012	11.62	0.000 001	0.014
100%		0	836 520 008	7.93	0.000 001	0.009
100%		+10	836 520 006	5.90	0.000 001	0.007
100%		+20	836 520 002	1.58	0.000 000	0.002
100%		+30	836 520 005	4.72	0.000 001	0.006
100%		+40	836 519 999	-0.64	0.000 000	-0.001
100%		+50	836 520 009	9.49	0.000 001	0.011
115%	4.255	+20	836 520 004	4.30	0.000 001	0.005
Batt. Endpoint	3.400	+20	836 520 007	7.24	0.000 001	0.009



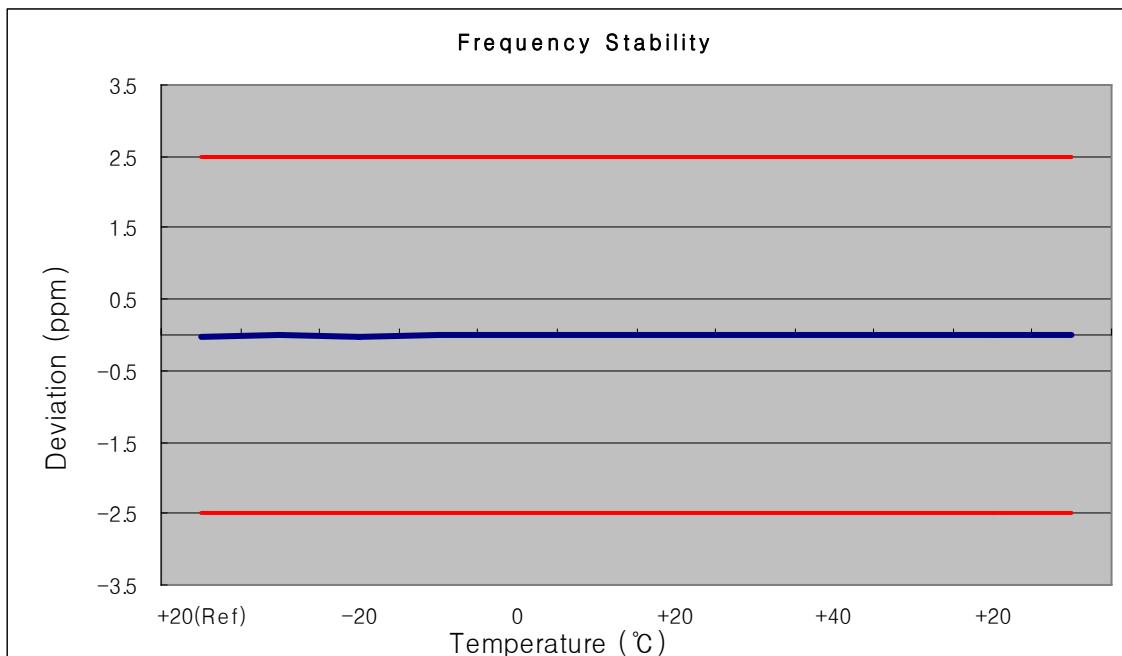
Note : This device was tested under all R.C.s and S.O.s in CDMA and FETAP and RETAP in 1xEVDO and Worst case(Highest power) is reported with RC3/SO55 and 1xEVDO Rev.A FETAP, with 'All Up' power control bits.

FCC CERTIFICATION REPORT				www.hct.co.kr
Test Report No. HCT-RF09-0513	Test Dates: May 11, 2009	EUT Type: CDMA 1xEVDO Rev.A Wireless Router	FCC ID: XAVVW240	Page 20 of 41

7.8.2 FREQUENCY STABILITY (PCS CDMA EVDO)

OPERATING FREQUENCY: 1880,000,000 Hz
 CHANNEL: 600
 REFERENCE VOLTAGE: 3.7 VDC
 DEVIATION LIM IT: ± 0.000 25 % or 2.5 ppm

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.700	+20(Ref)	1879 999 947	-53.07	-0.000 003	-0.028
100%		-30	1879 999 979	-20.99	-0.000 001	-0.011
100%		-20	1879 999 973	-27.02	-0.000 001	-0.014
100%		-10	1879 999 983	-17.12	-0.000 001	-0.009
100%		0	1879 999 994	-5.96	0.000 000	-0.003
100%		+10	1879 999 986	-14.40	-0.000 001	-0.008
100%		+20	1879 999 999	-0.85	0.000 000	0.000
100%		+30	1879 999 989	-10.66	-0.000 001	-0.006
100%		+40	1880 000 002	2.39	0.000 000	0.001
100%		+50	1879 999 988	-12.25	-0.000 001	-0.007
115%	4.255	+20	1880 000 001	1.23	0.000 000	0.001
Batt. Endpoint	3.400	+20	1879 999 993	-6.51	0.000 000	-0.003



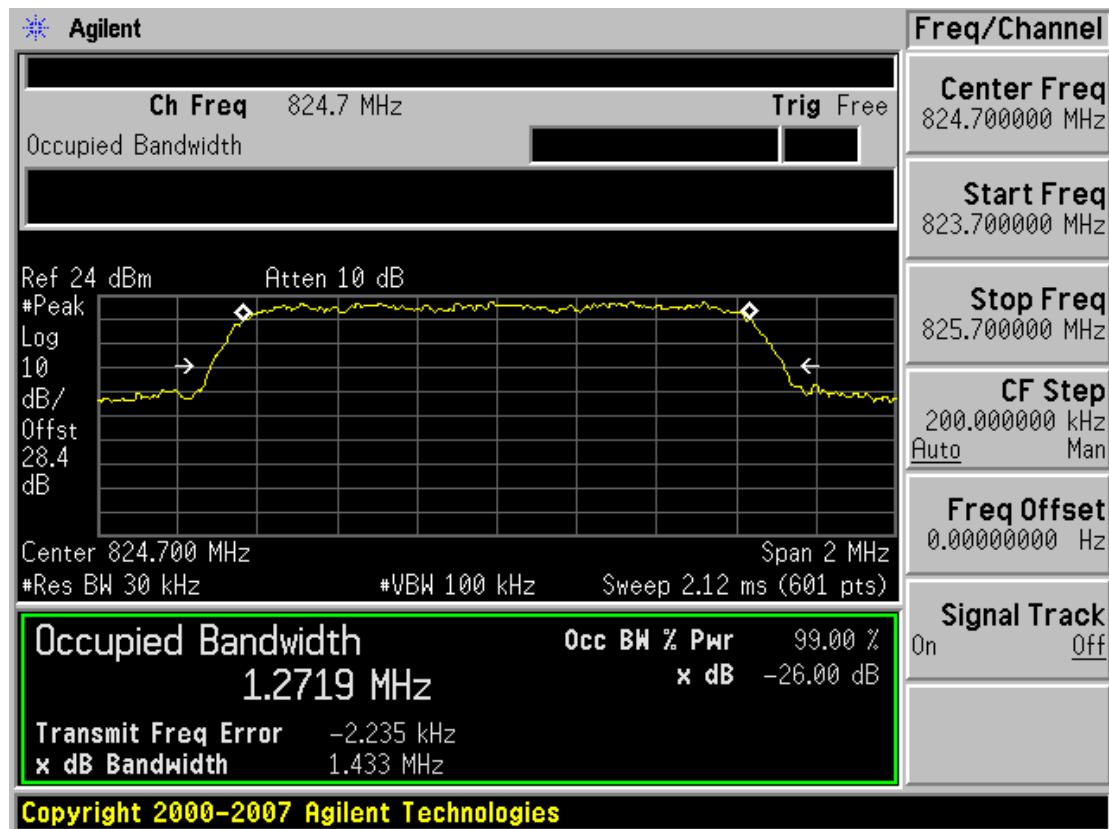
FCC CERTIFICATION REPORT				www.hct.co.kr
Test Report No. HCT-RF09-0513	Test Dates: May 11, 2009	EUT Type: CDMA 1xEVDO Rev.A Wireless Router	FCC ID: XAVVW240	Page 21 of 41



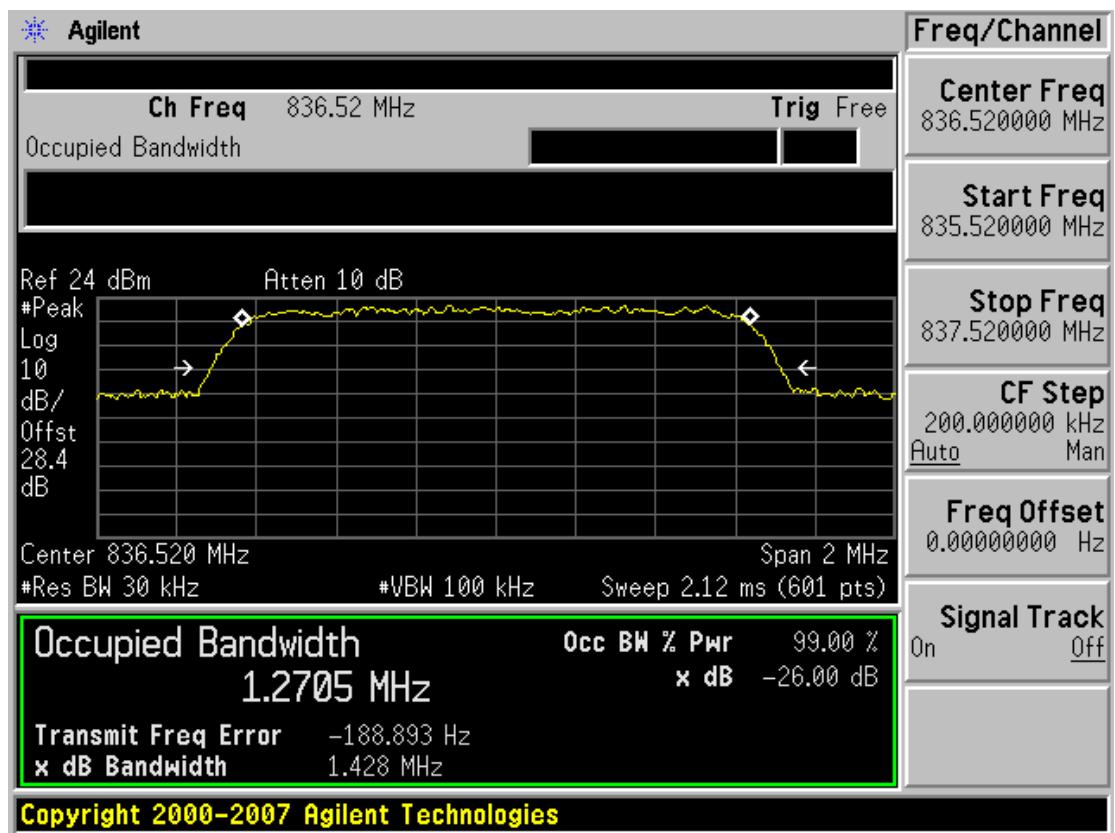
8. TEST PLOTS

FCC CERTIFICATION REPORT				www.hct.co.kr
Test Report No. HCT-RF09-0513	Test Dates: May 11, 2009	EUT Type: CDMA 1xEVDO Rev.A Wireless Router	FCC ID: XAVVW240	Page 22 of 41

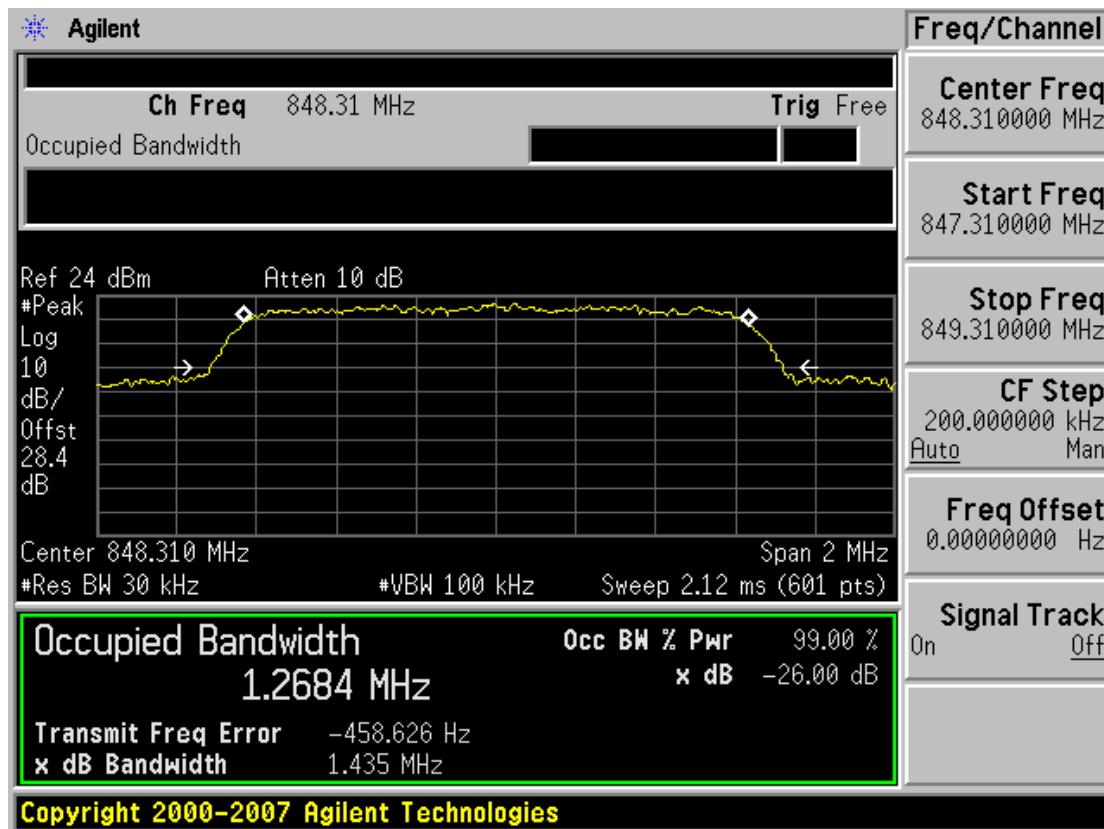
■ CDMA EVDO MODE (1013 CH.) Occupied Bandwidth



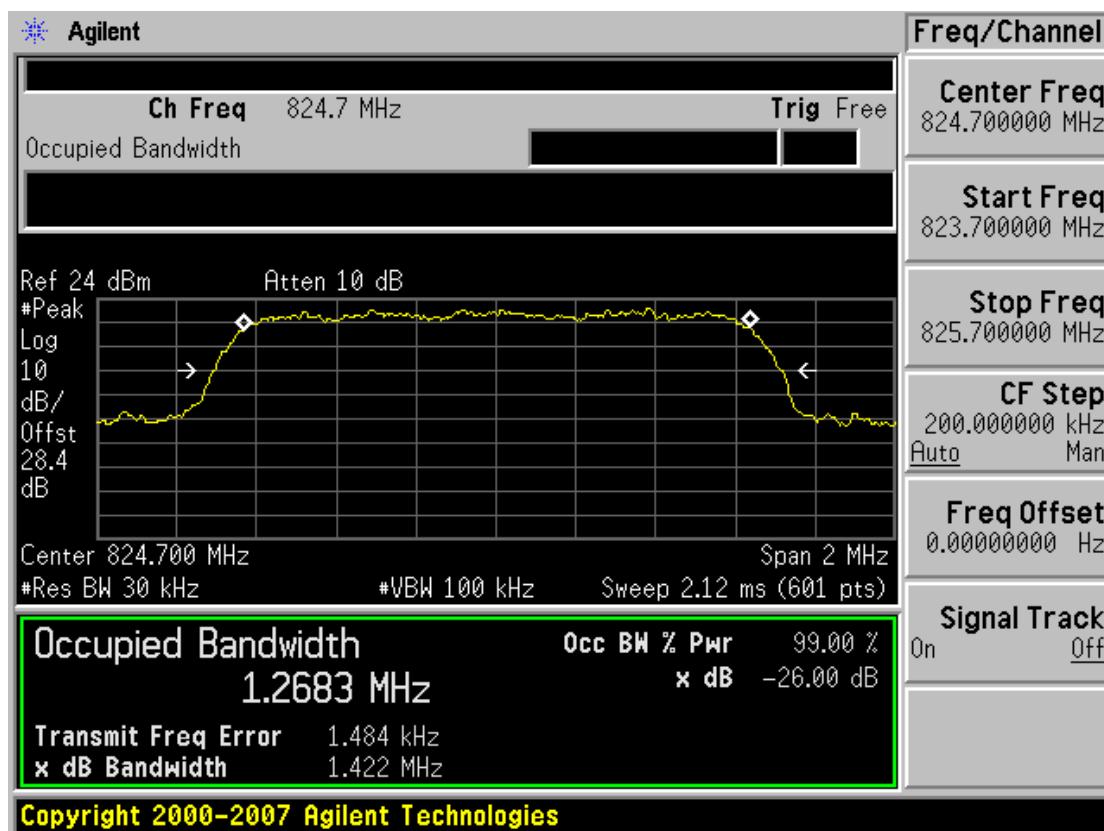
■ CDMA EVDO MODE (384 CH.) Occupied Bandwidth



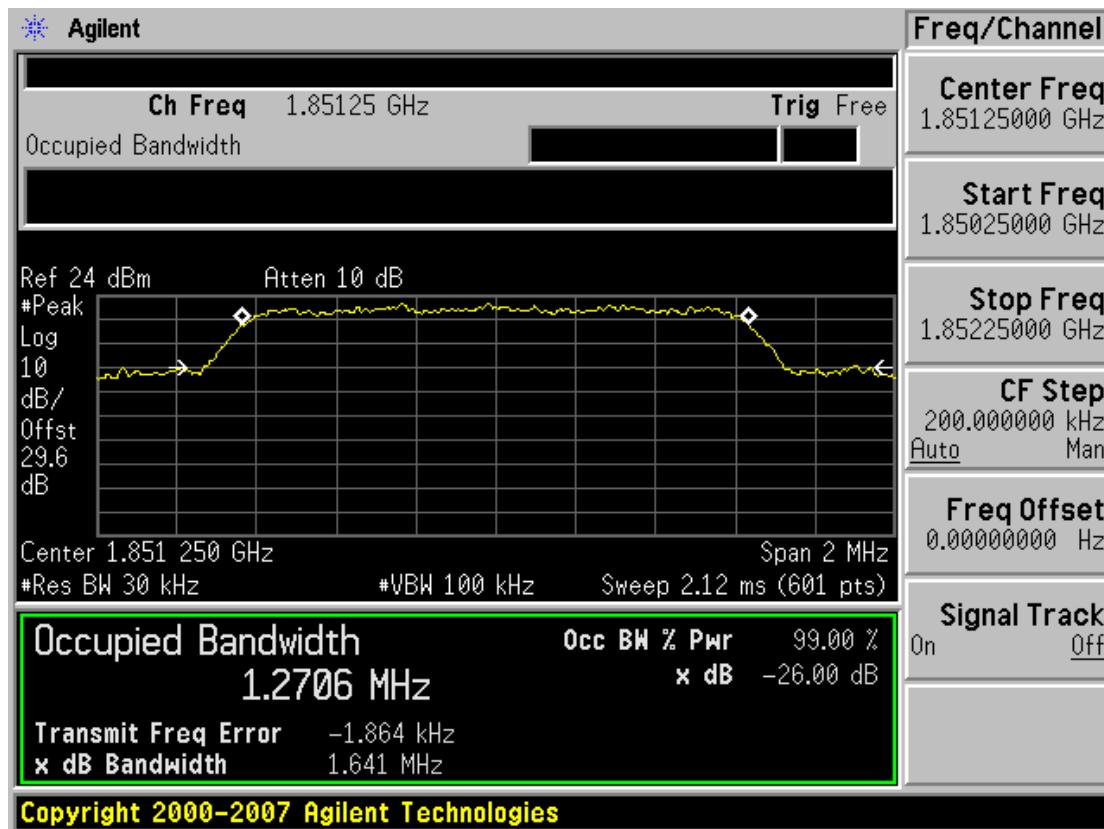
■ CDMA EVDO MODE (777 CH.) Occupied Bandwidth



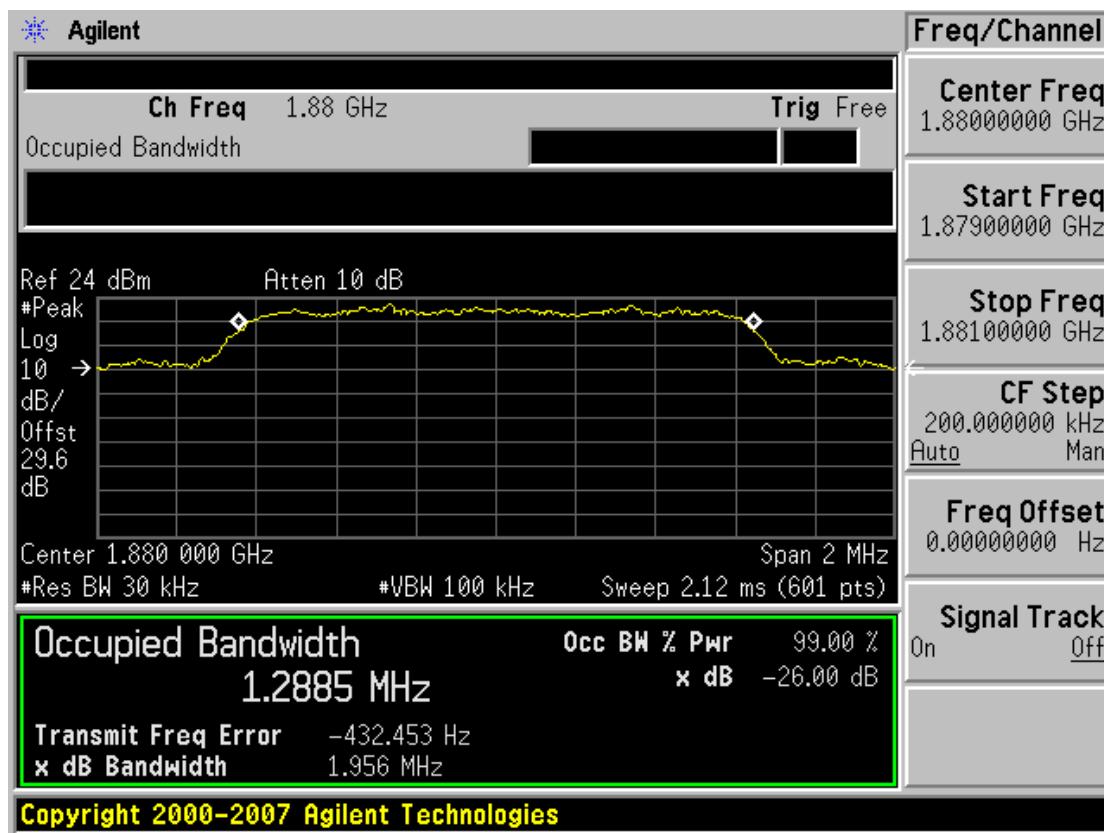
■ CDMA MODE (1013 CH.) Occupied Bandwidth



■ PCS CDMA EVDO MODE (25 CH.) Occupied Bandwidth



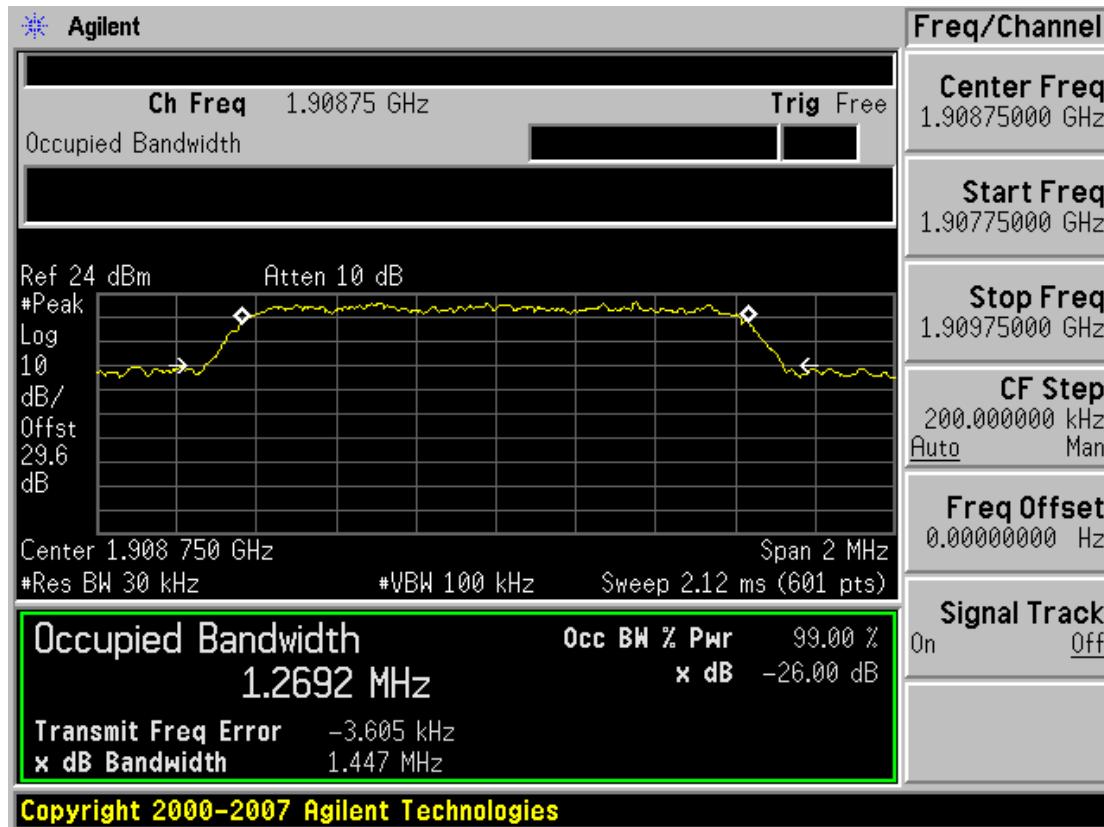
■ PCS CDMA EVDO MODE (600 CH.) Occupied Bandwidth



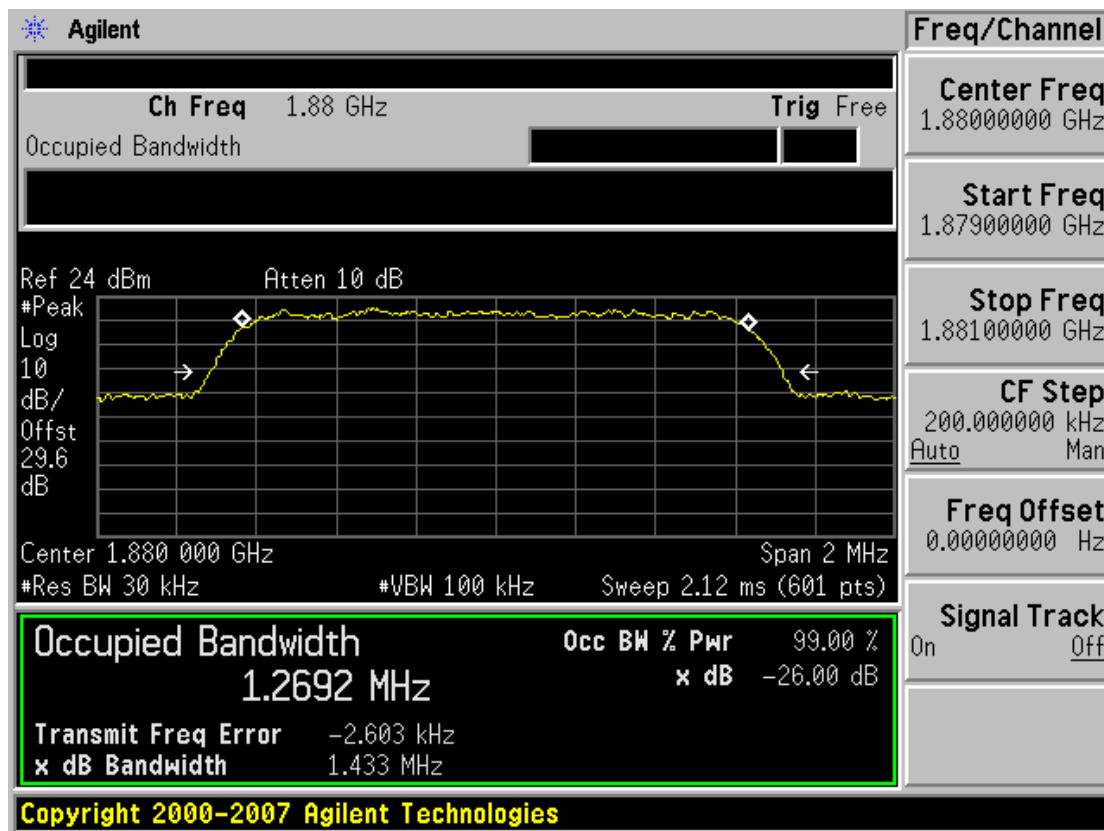
FCC CERTIFICATION REPORT

Test Report No. HCT-RF09-0513	Test Dates: May 11, 2009	EUT Type: CDMA 1xEVDO Rev.A Wireless Router	FCC ID: XAVVVW240	www.hct.co.kr
				Page 25 of 41

■ PCS CDMA EVDO MODE (1175 CH.) Occupied Bandwidth



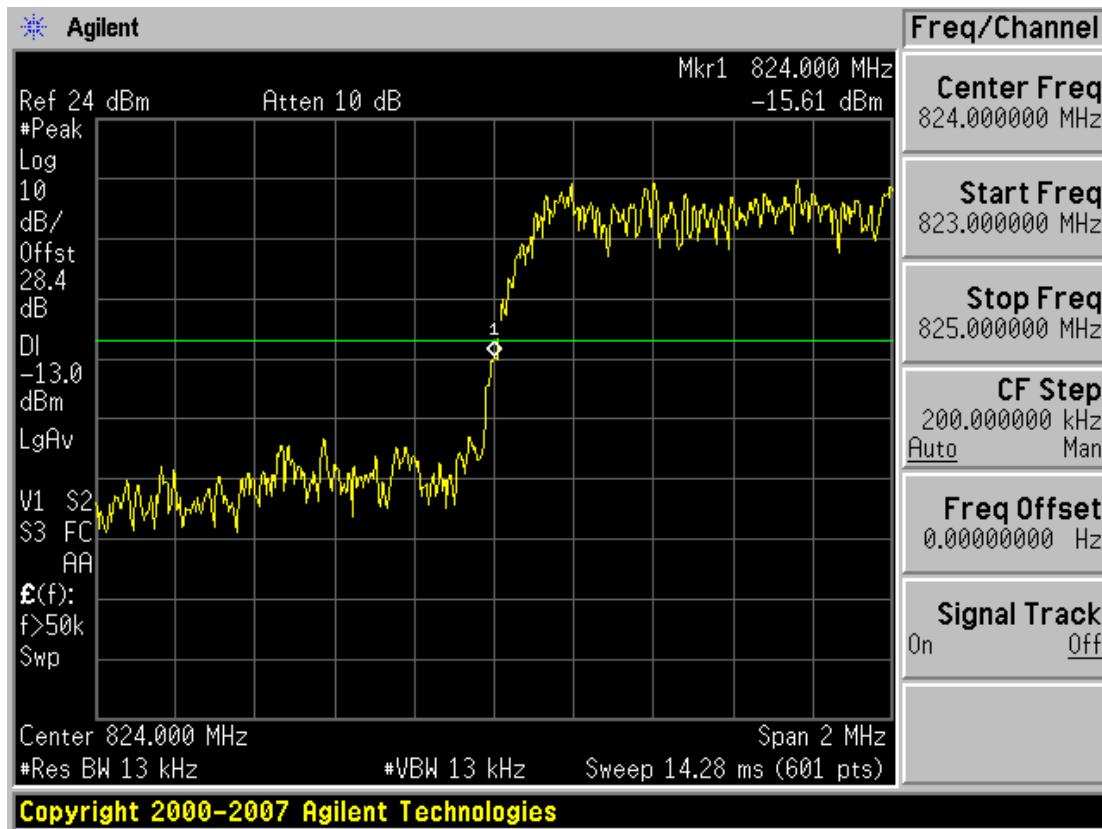
■ PCS CDMA MODE (600 CH.) Occupied Bandwidth



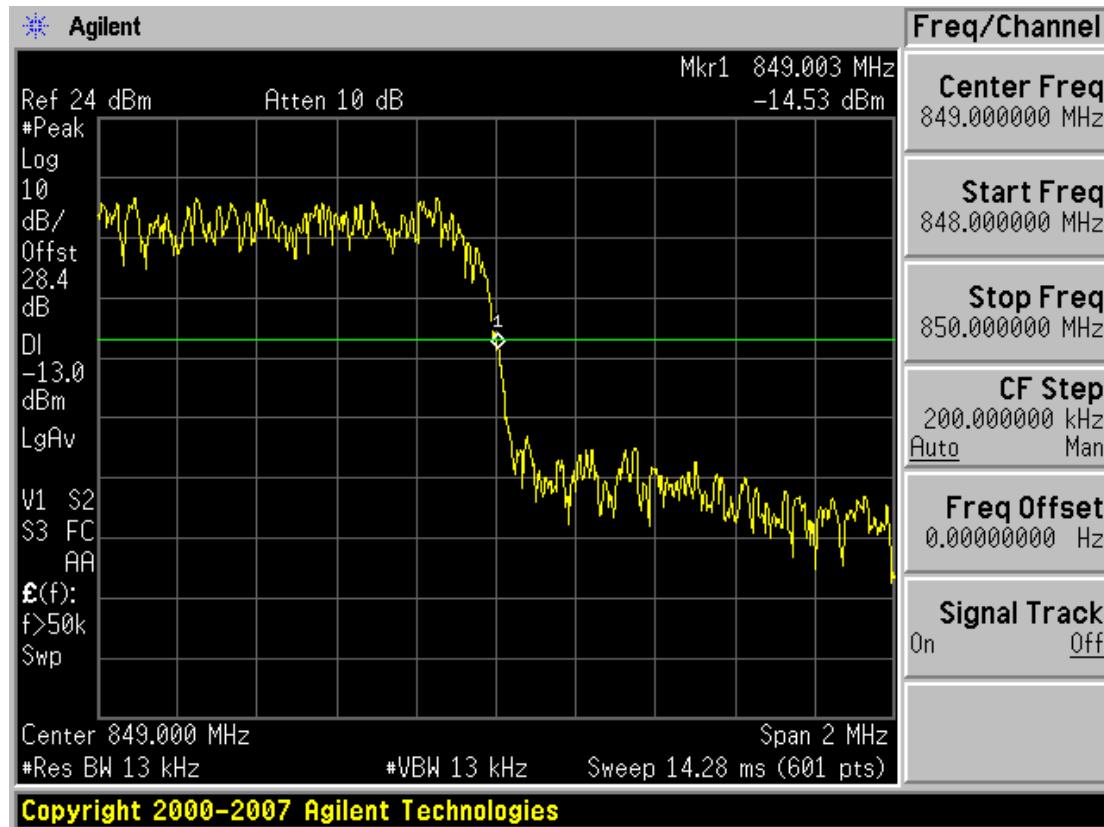
■ PCS CDMA MODE (600 CH.) Peak-to-Average Ratio



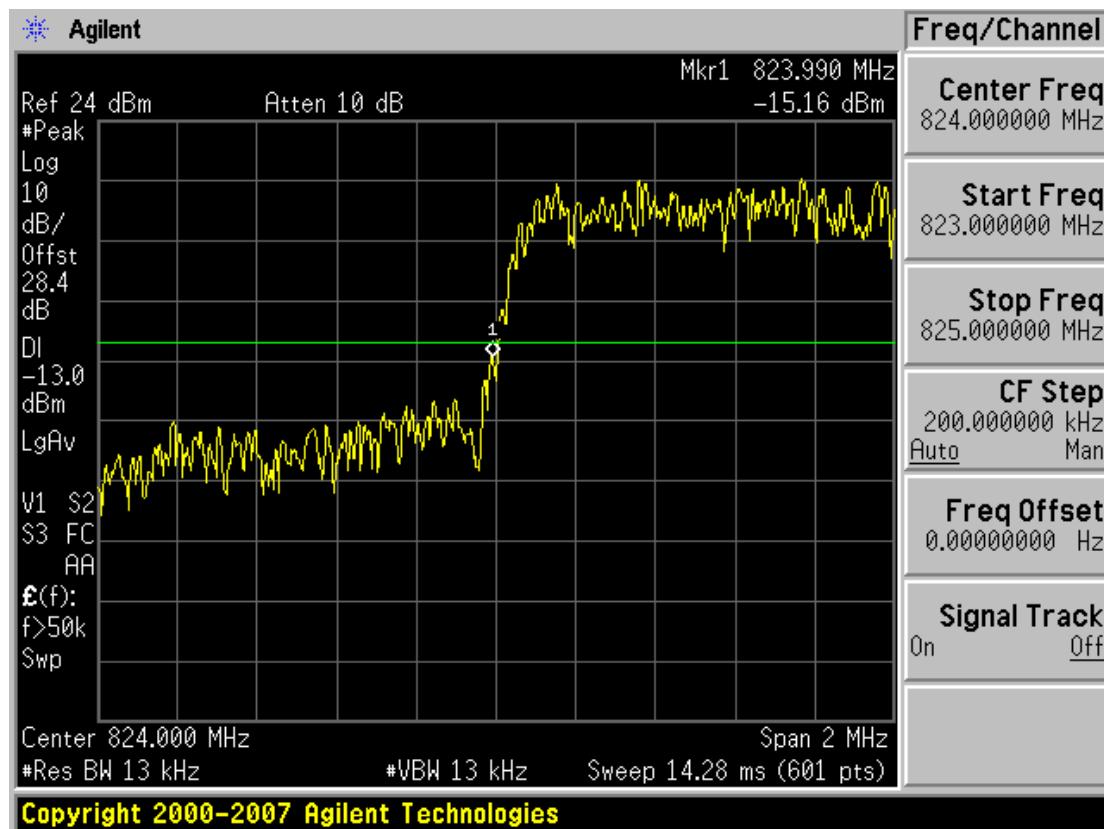
■ CDMA MODE (1013 CH.) Block Edge



■ CDMA MODE (777 CH.) Block Edge



■ CDMA EVDO MODE (1013 CH.) Block Edge

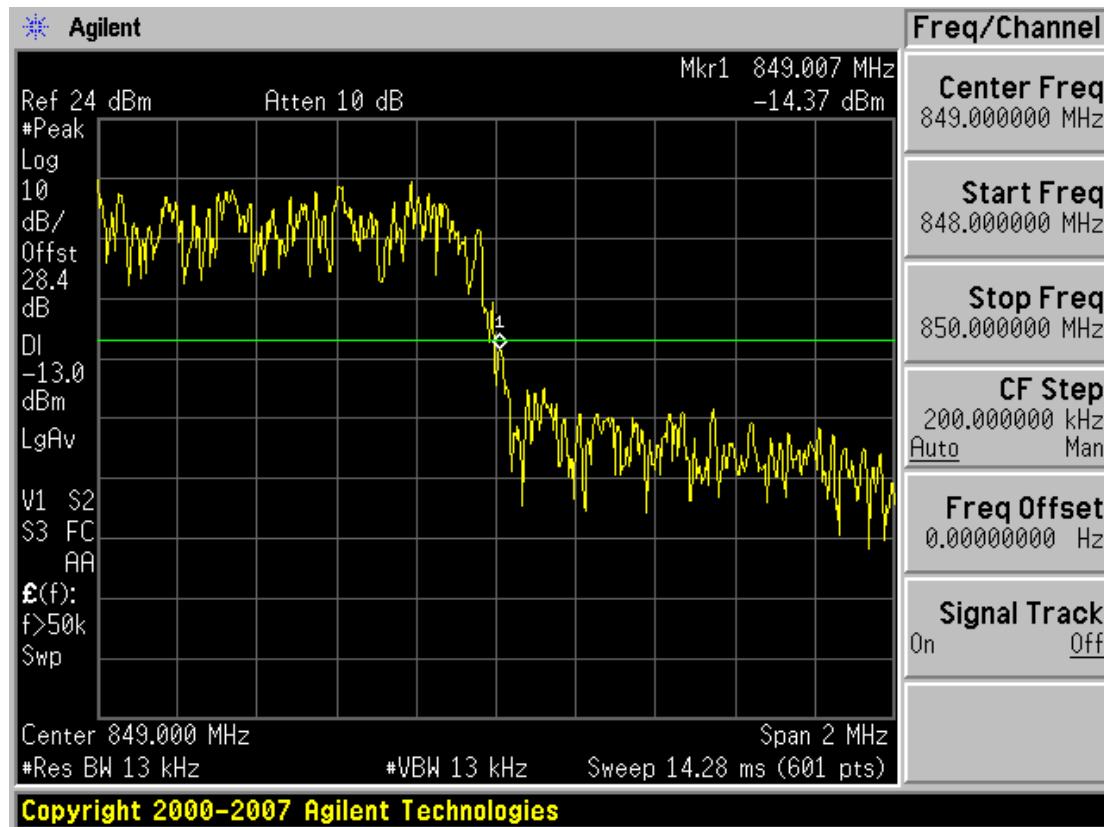


FCC CERTIFICATION REPORT

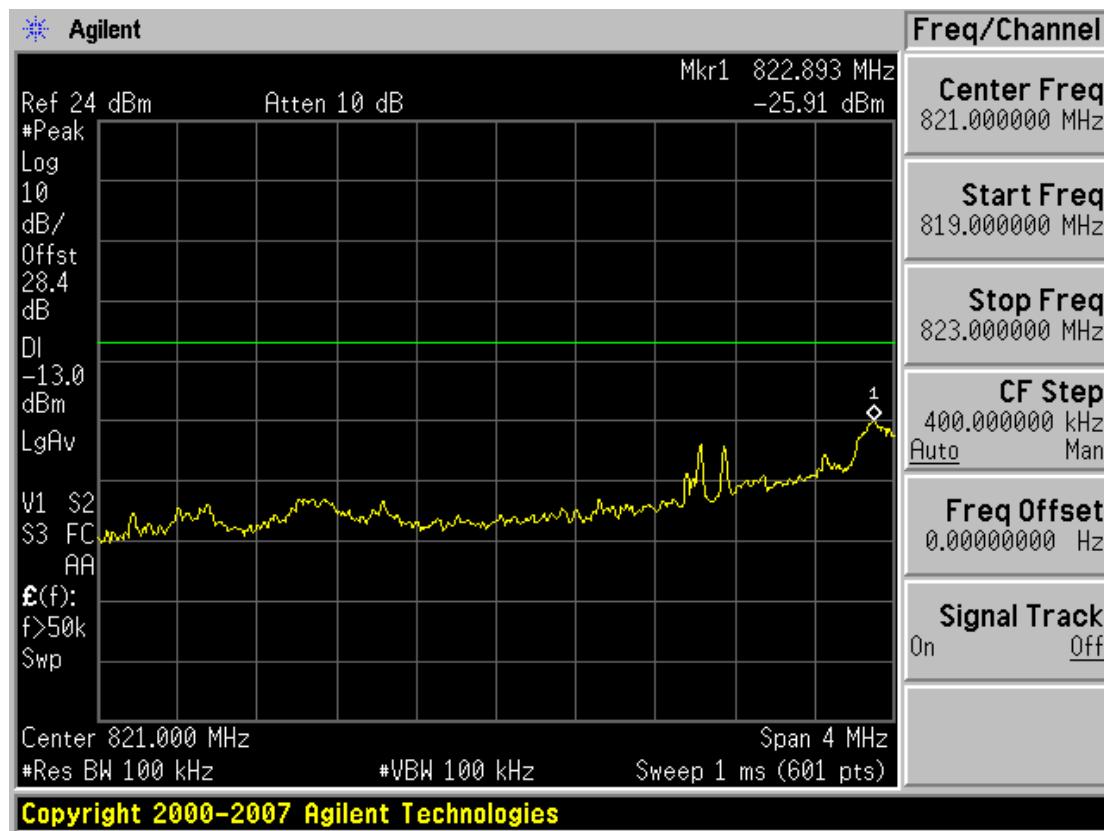
www.hct.co.kr

Test Report No. HCT-RF09-0513	Test Dates: May 11, 2009	EUT Type: CDMA 1xEVDO Rev.A Wireless Router	FCC ID: XAVVV240	Page 28 of 41
----------------------------------	-----------------------------	--	---------------------	---------------

■ CDMA EVDO MODE (777 CH.) Block Edge



■ CDMA MODE (1013 CH.) 4 MHz Span

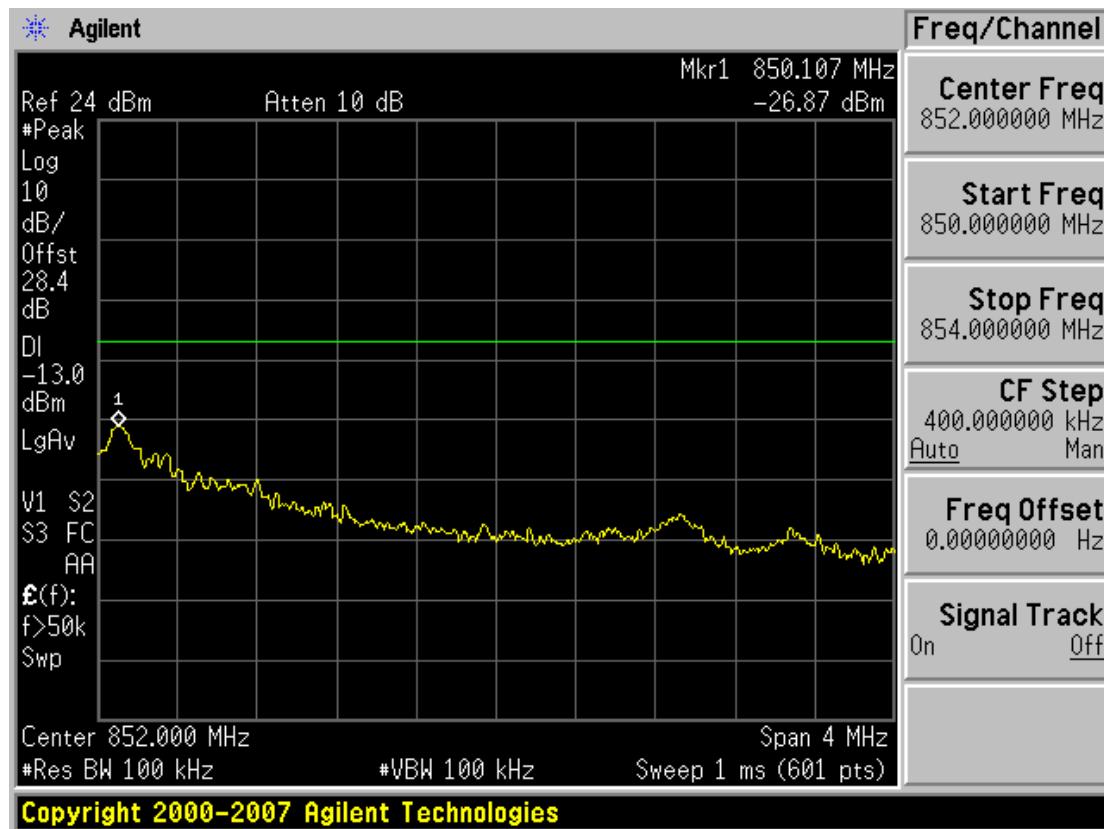


FCC CERTIFICATION REPORT

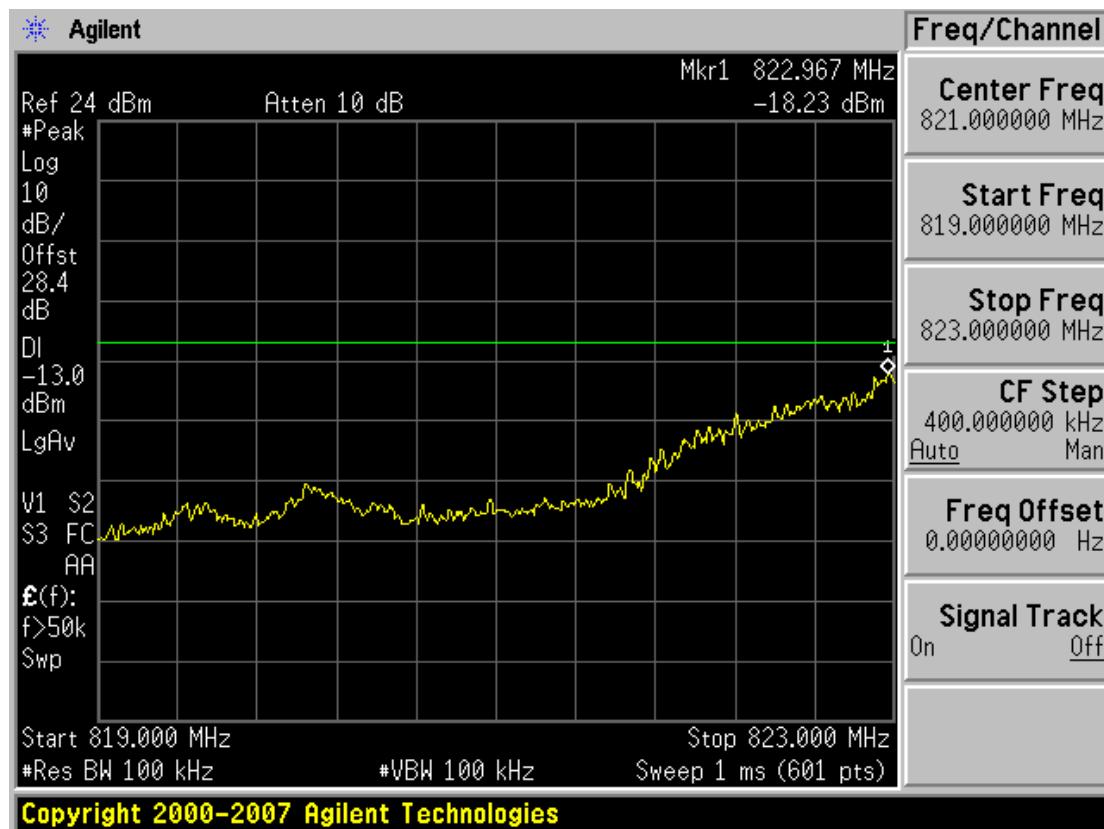
www.hct.co.kr

Test Report No. HCT-RF09-0513	Test Dates: May 11, 2009	EUT Type: CDMA 1xEVDO Rev.A Wireless Router	FCC ID: XAVVV240	Page 29 of 41
----------------------------------	-----------------------------	--	---------------------	---------------

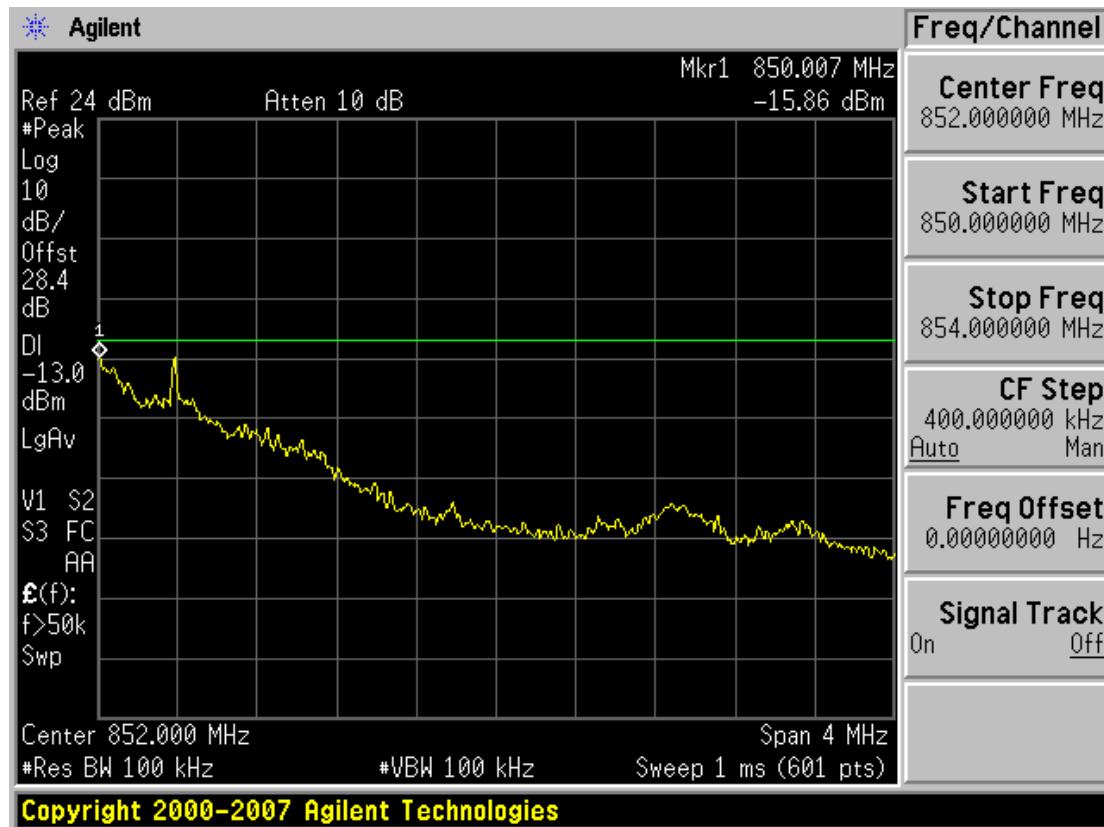
■ CDMA MODE (777 CH.) 4 MHz Span



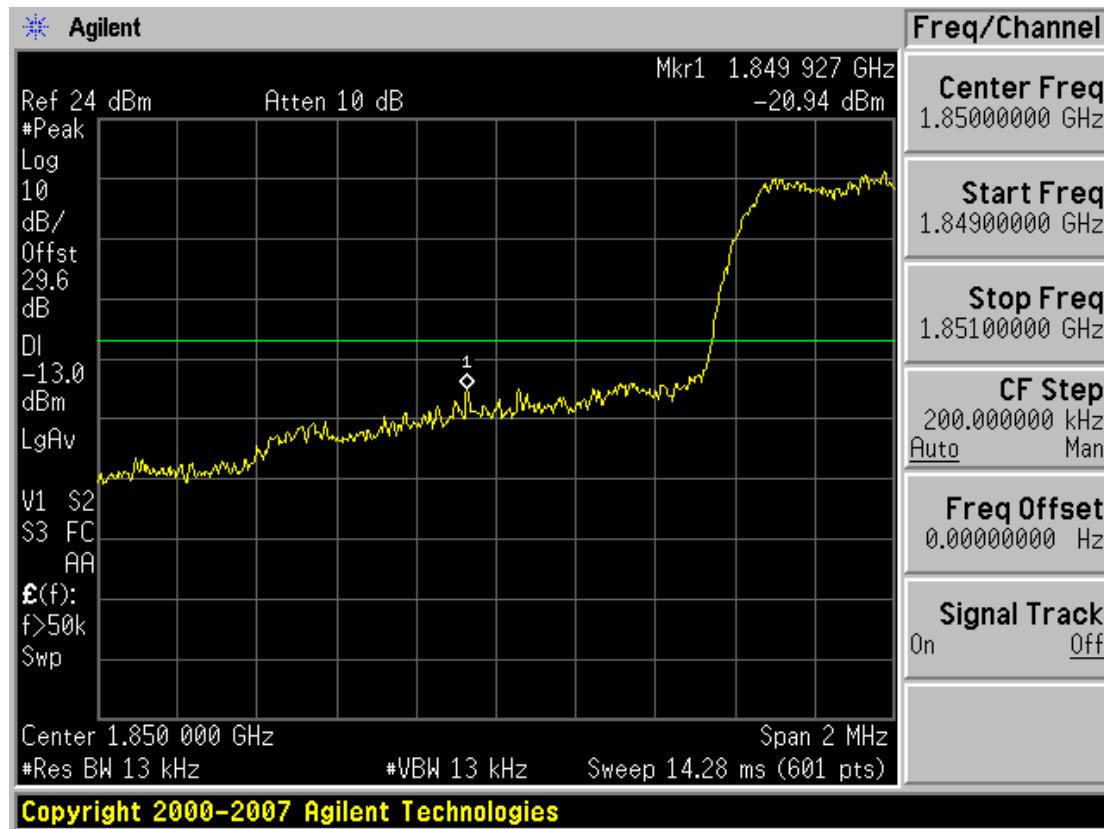
■ CDMA EVDO MODE (1013 CH.) 4 MHz Span



■ CDMA EVDO MODE (777 CH.) 4 MHz Span



■ PCS CDMA MODE (25 CH.) Block Edge

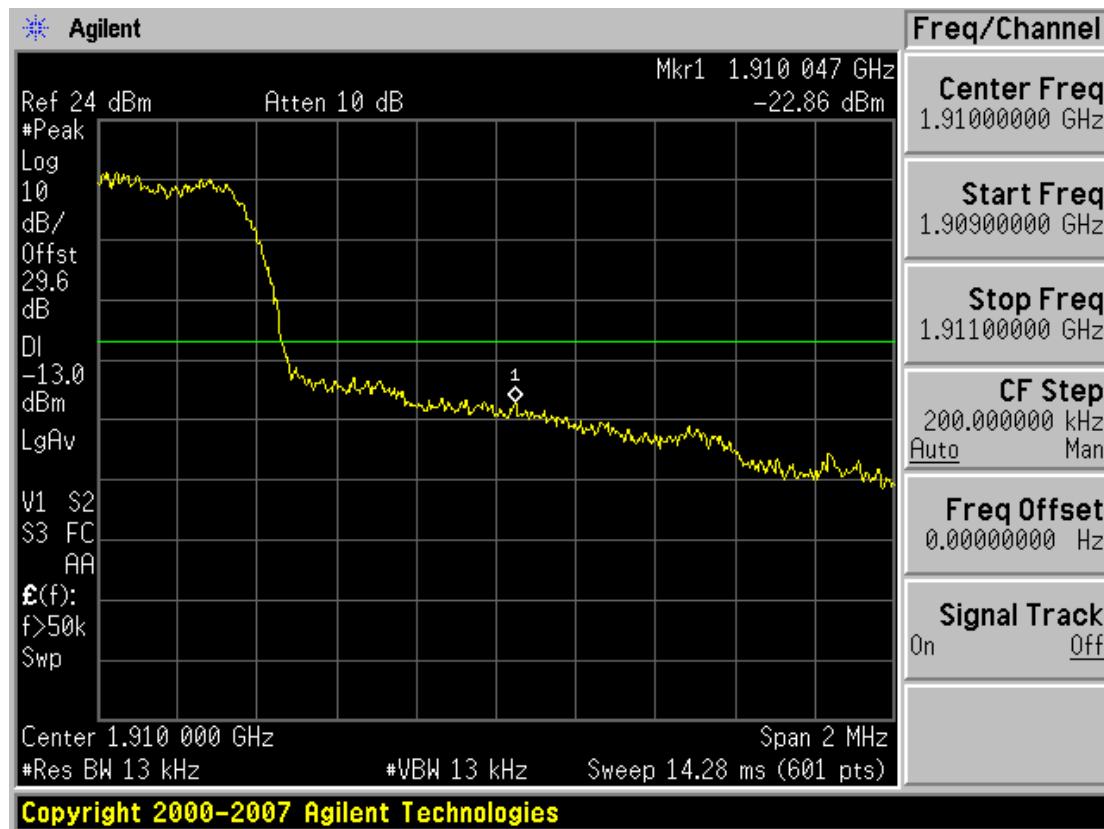


FCC CERTIFICATION REPORT

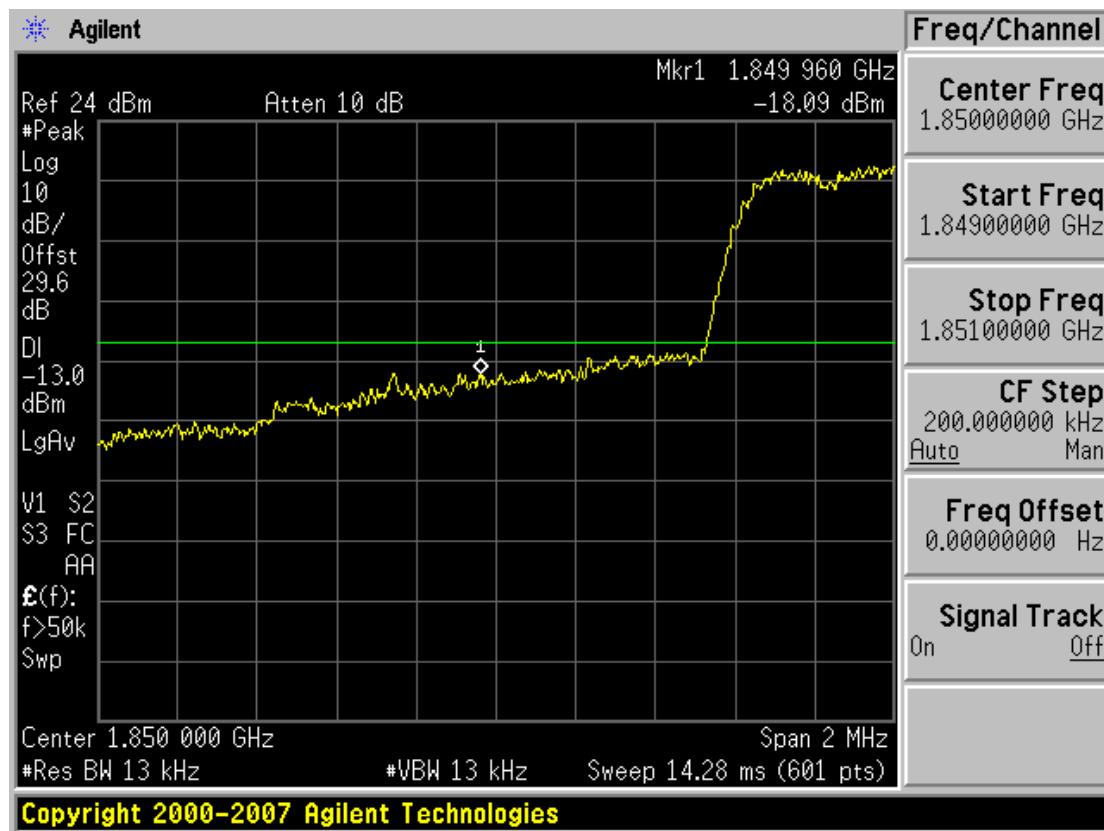
www.hct.co.kr

Test Report No. HCT-RF09-0513	Test Dates: May 11, 2009	EUT Type: CDMA 1xEVDO Rev.A Wireless Router	FCC ID: XAVVVW240	Page 31 of 41
----------------------------------	-----------------------------	--	----------------------	---------------

■ PCS CDMA MODE (1175 CH.) Block Edge

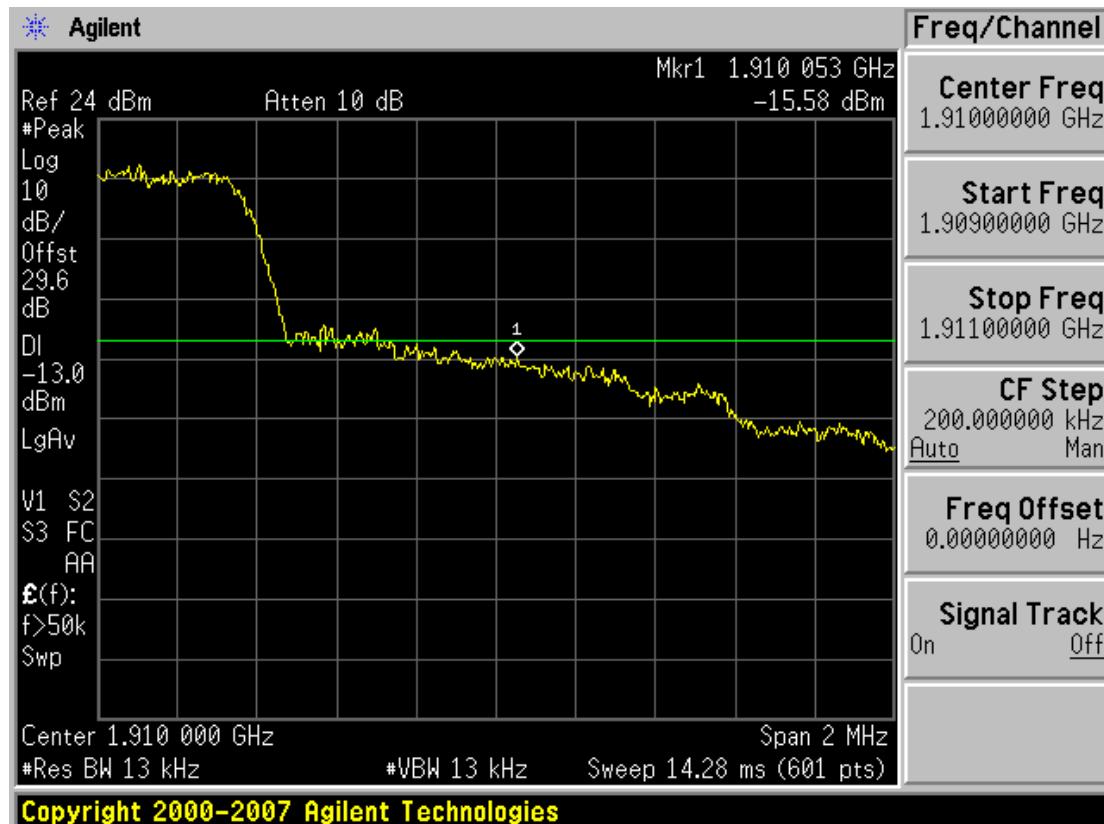


■ PCS CDMA EVDO MODE (25 CH.) Block Edge



Test Report No. HCT-RF09-0513	Test Dates: May 11, 2009	EUT Type: CDMA 1xEVDO Rev.A Wireless Router	FCC ID: XAVVW240	Page 32 of 41
----------------------------------	-----------------------------	--	---------------------	---------------

■ PCS CDMA EVDO MODE (1175 CH.) Block Edge



■ PCS CDMA MODE (25 CH.) 4 MHz Span



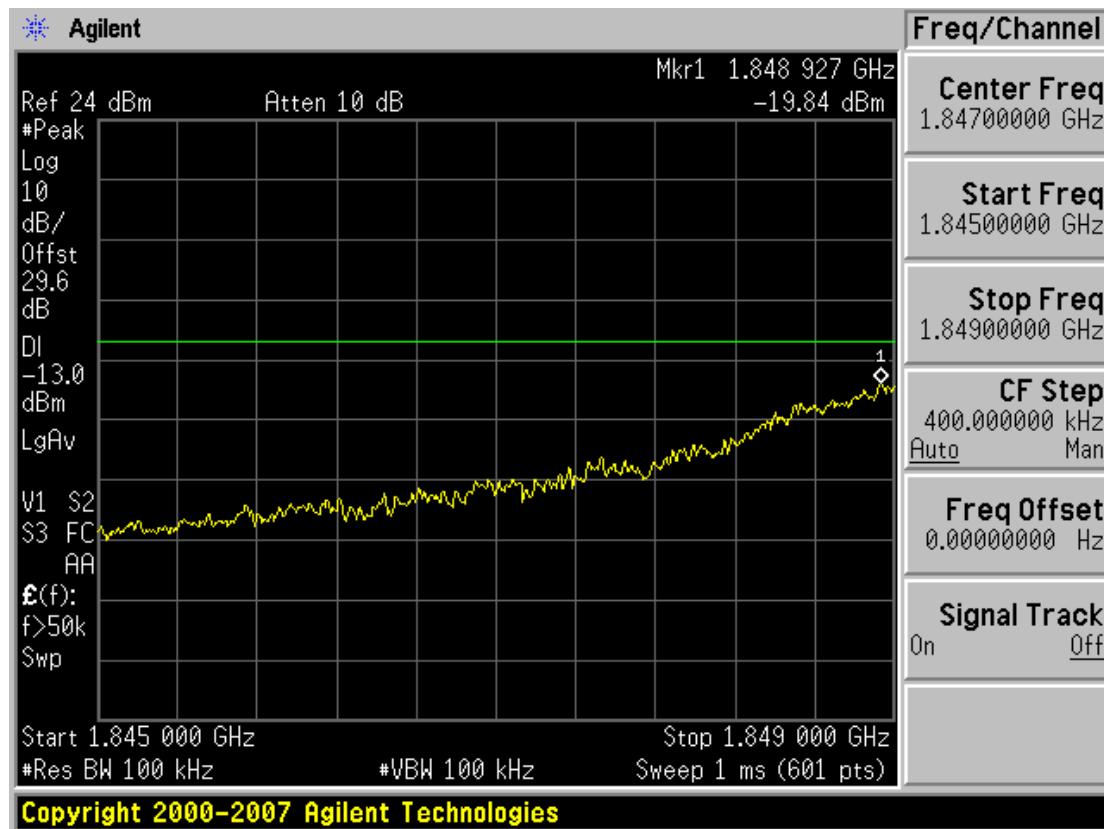
FCC CERTIFICATION REPORT

Test Report No. HCT-RF09-0513	Test Dates: May 11, 2009	EUT Type: CDMA 1xEVDO Rev.A Wireless Router	FCC ID: XAVVV240	www.hct.co.kr
				Page 33 of 41

■ PCS CDMA MODE (1175 CH.) 4 MHz Span



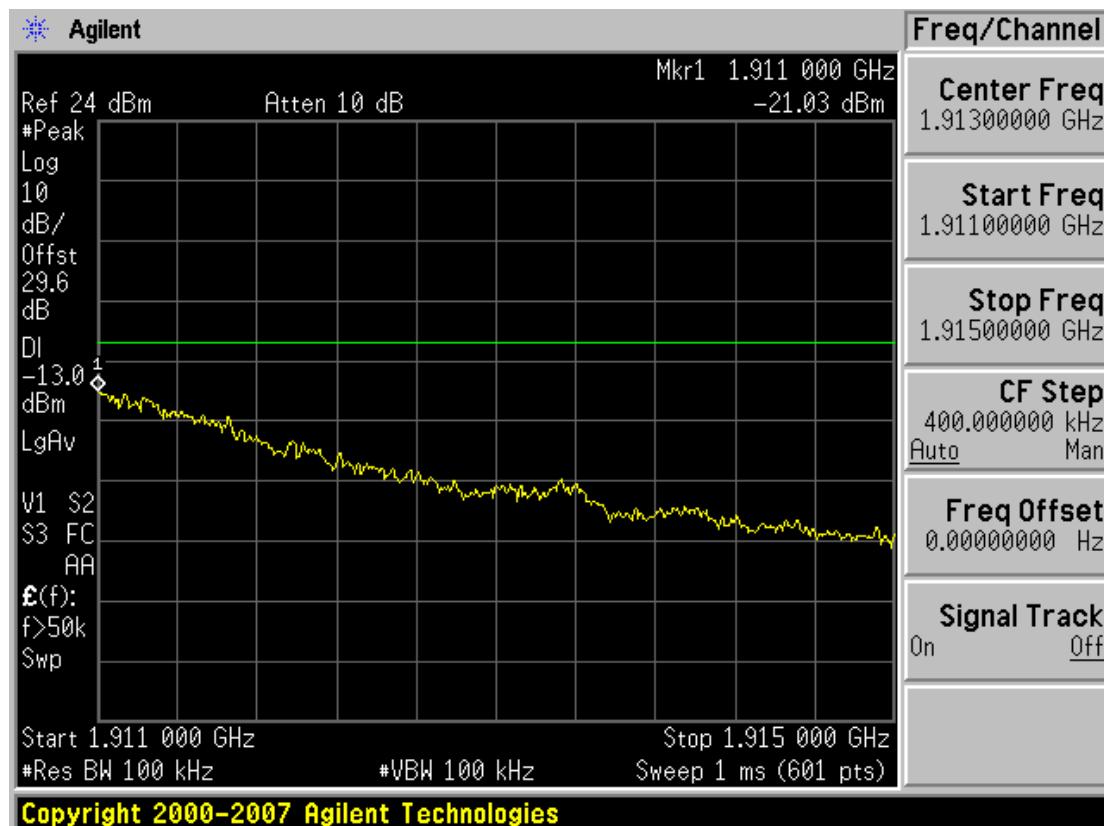
■ PCS CDMA EVDO MODE (25 CH.) 4 MHz Span



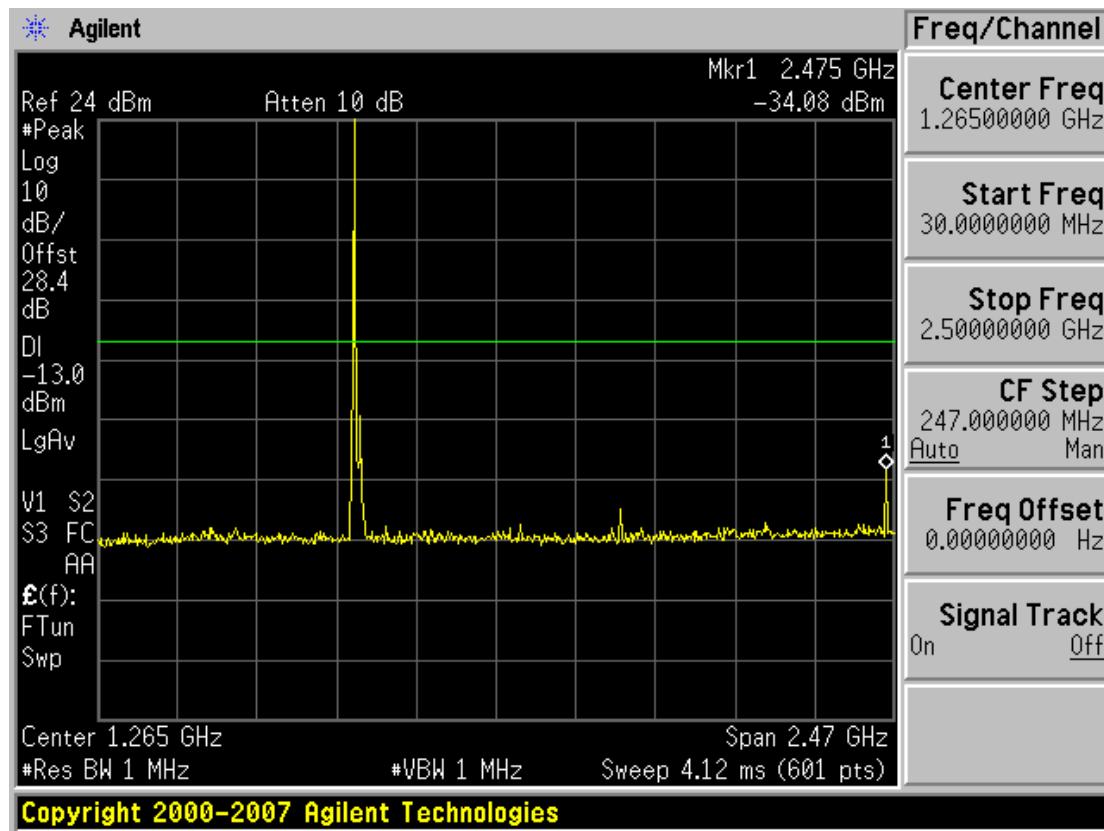
FCC CERTIFICATION REPORT

Test Report No. HCT-RF09-0513	Test Dates: May 11, 2009	EUT Type: CDMA 1xEVDO Rev.A Wireless Router	FCC ID: XAVVV240	www.hct.co.kr
				Page 34 of 41

■ PCS CDMA EVDO MODE (1175 CH.) 4 MHz Span



■ CDMA EVDO MODE (1013 CH.) Conducted Spurious Emissions - 1

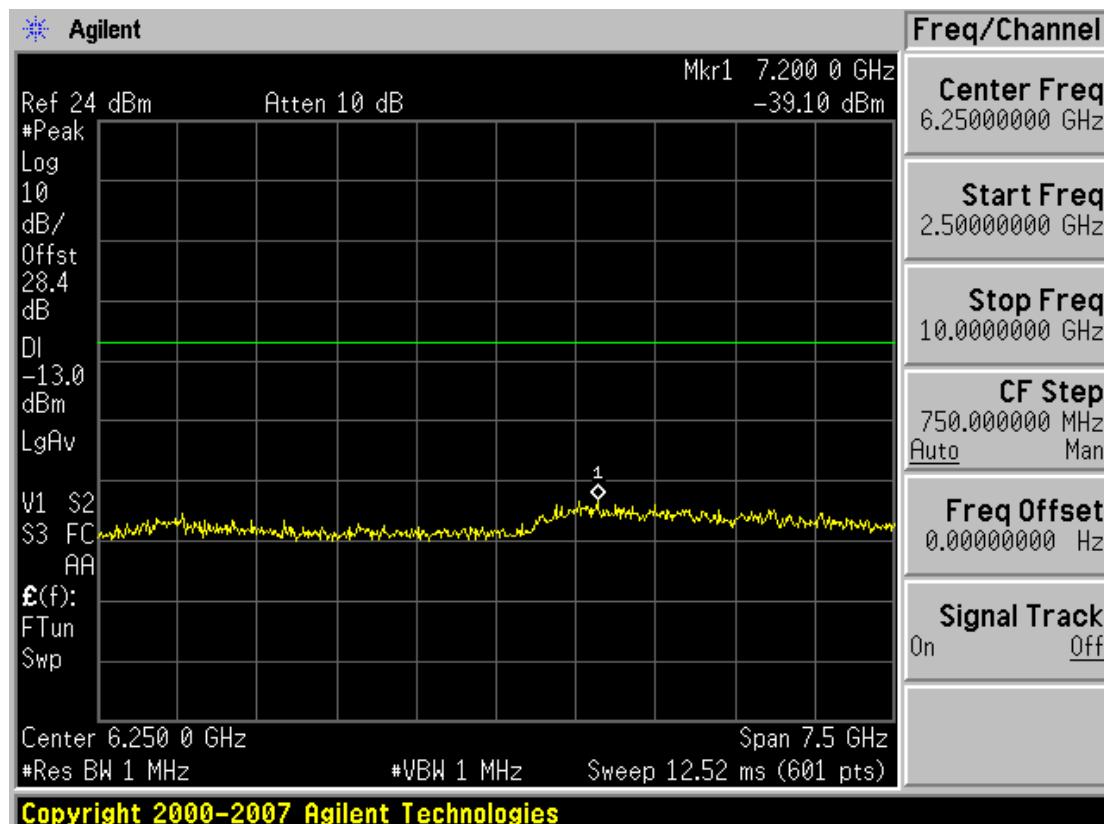


FCC CERTIFICATION REPORT

www.hct.co.kr

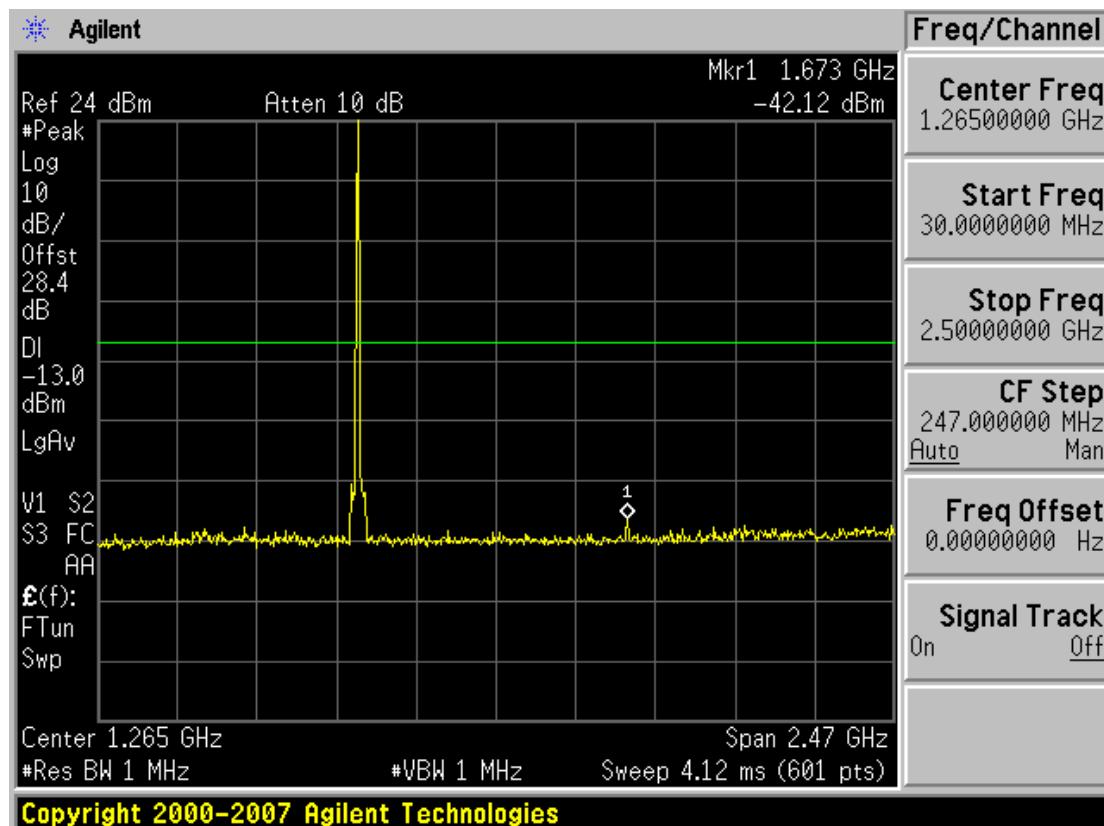
Test Report No. HCT-RF09-0513	Test Dates: May 11, 2009	EUT Type: CDMA 1xEVDO Rev.A Wireless Router	FCC ID: XAVVVW240	Page 35 of 41
----------------------------------	-----------------------------	--	----------------------	---------------

■ CDMA EVDO MODE (1013 CH.) Conducted Spurious Emissions - 2



Copyright 2000-2007 Agilent Technologies

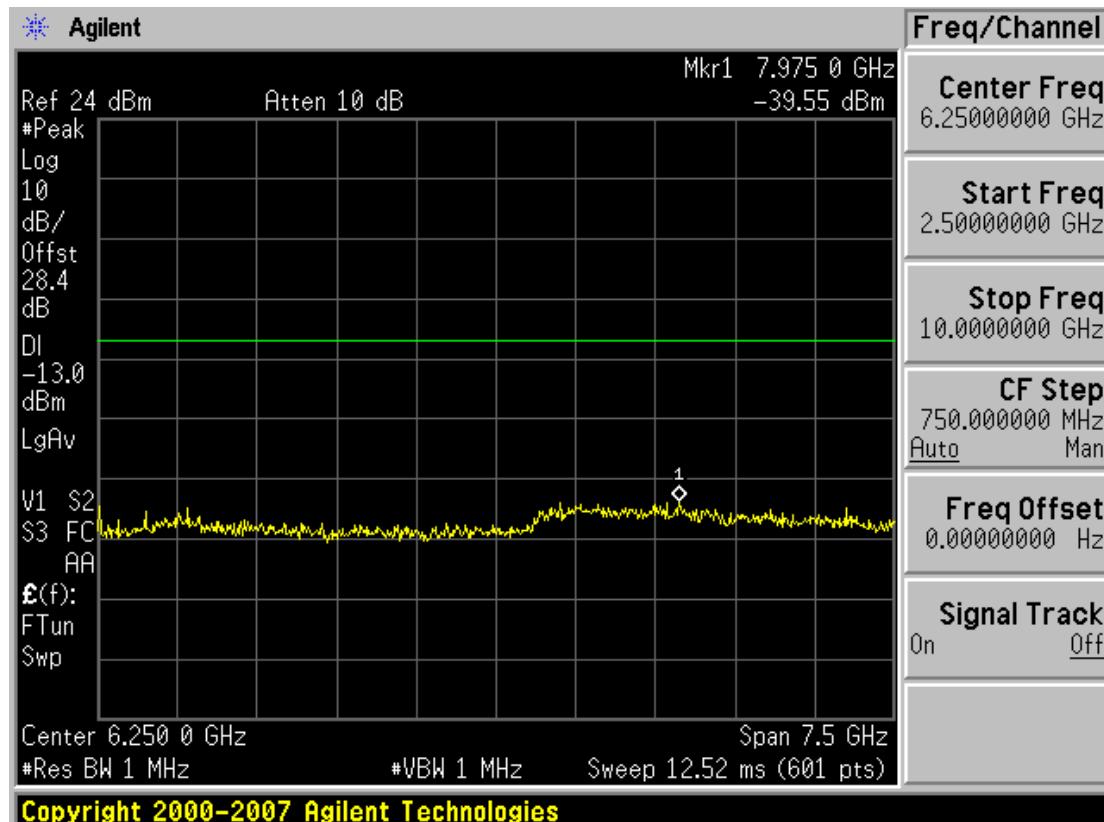
■ CDMA EVDO MODE (384 CH.) Conducted Spurious Emissions - 1



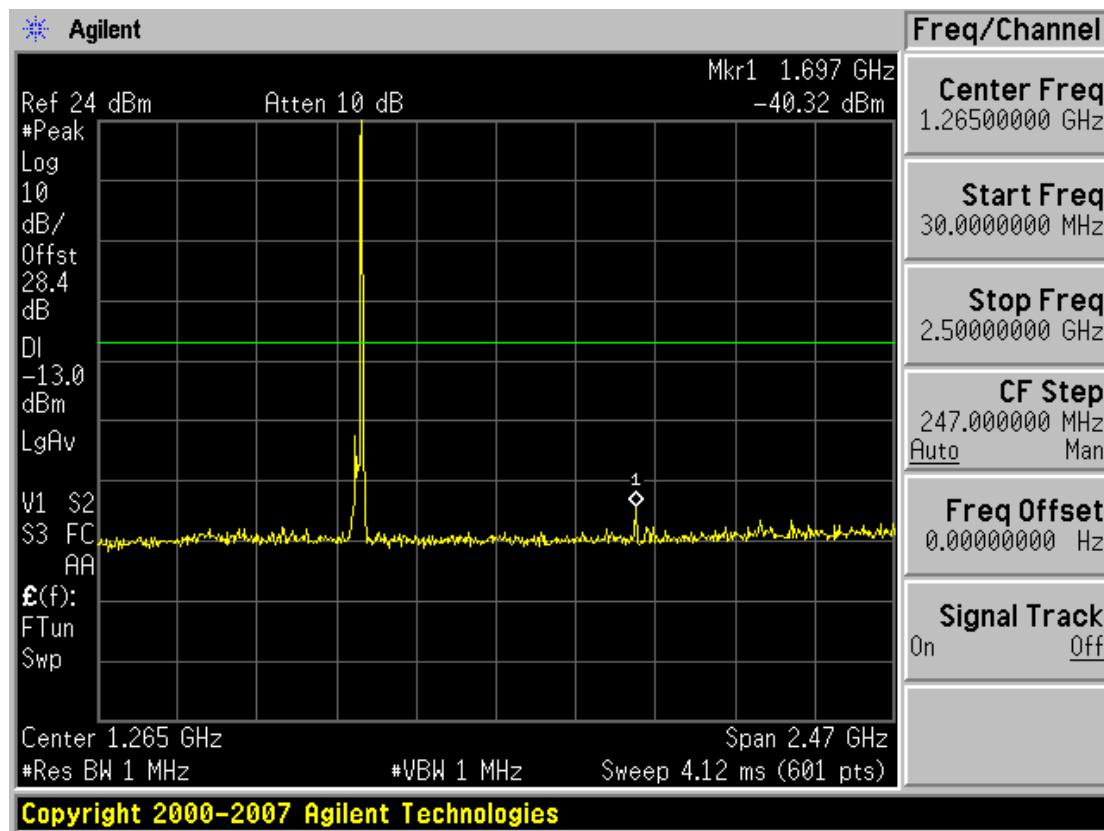
Copyright 2000-2007 Agilent Technologies

FCC CERTIFICATION REPORT				www.hct.co.kr
Test Report No. HCT-RF09-0513	Test Dates: May 11, 2009	EUT Type: CDMA 1xEVDO Rev.A Wireless Router	FCC ID: XAVVV240	Page 36 of 41

■ CDMA EVDO MODE (384 CH.) Conducted Spurious Emissions - 2

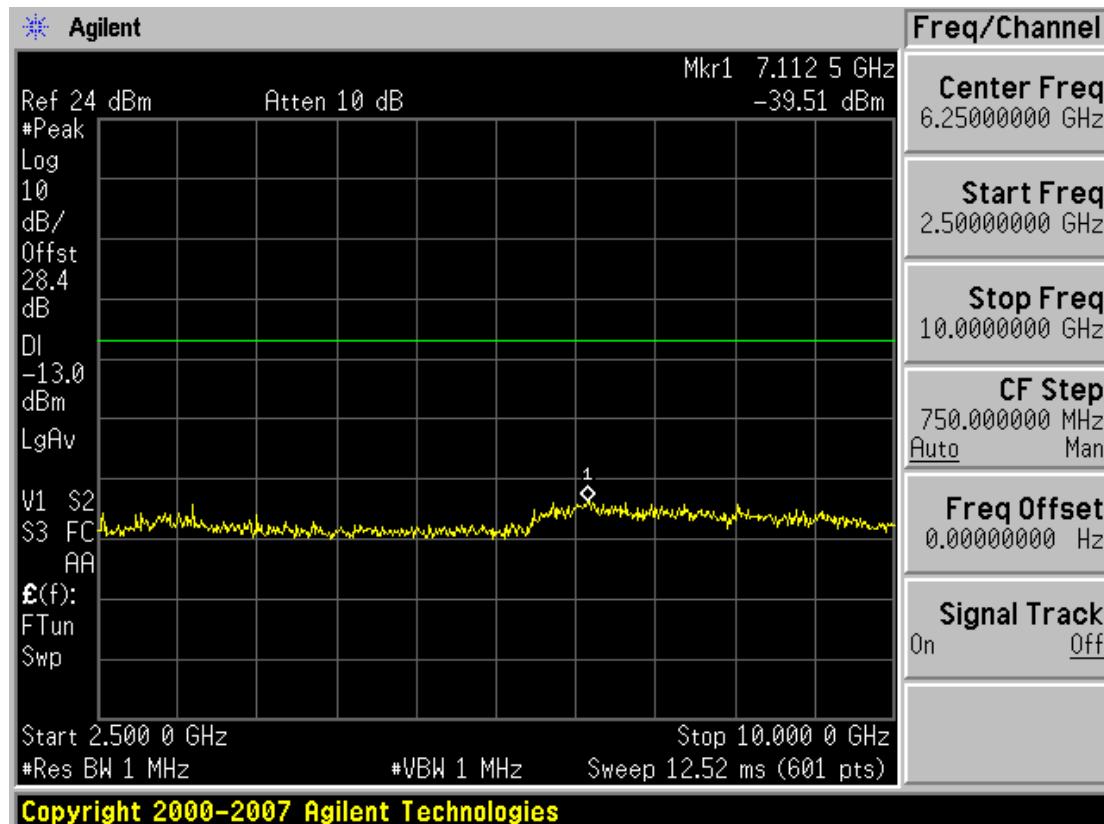


■ CDMA EVDO MODE (777 CH.) Conducted Spurious Emissions - 1

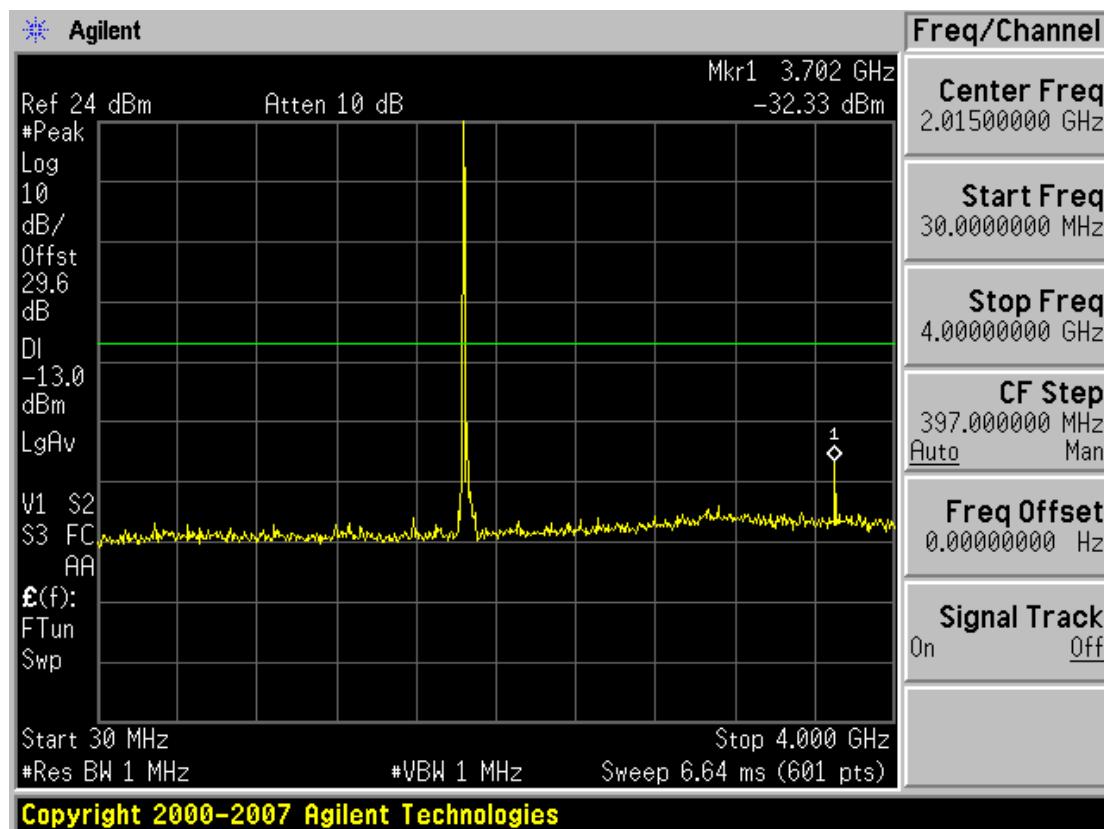


Test Report No. HCT-RF09-0513	Test Dates: May 11, 2009	EUT Type: CDMA 1xEVDO Rev.A Wireless Router	FCC ID: XAVVV240	Page 37 of 41
----------------------------------	-----------------------------	--	---------------------	---------------

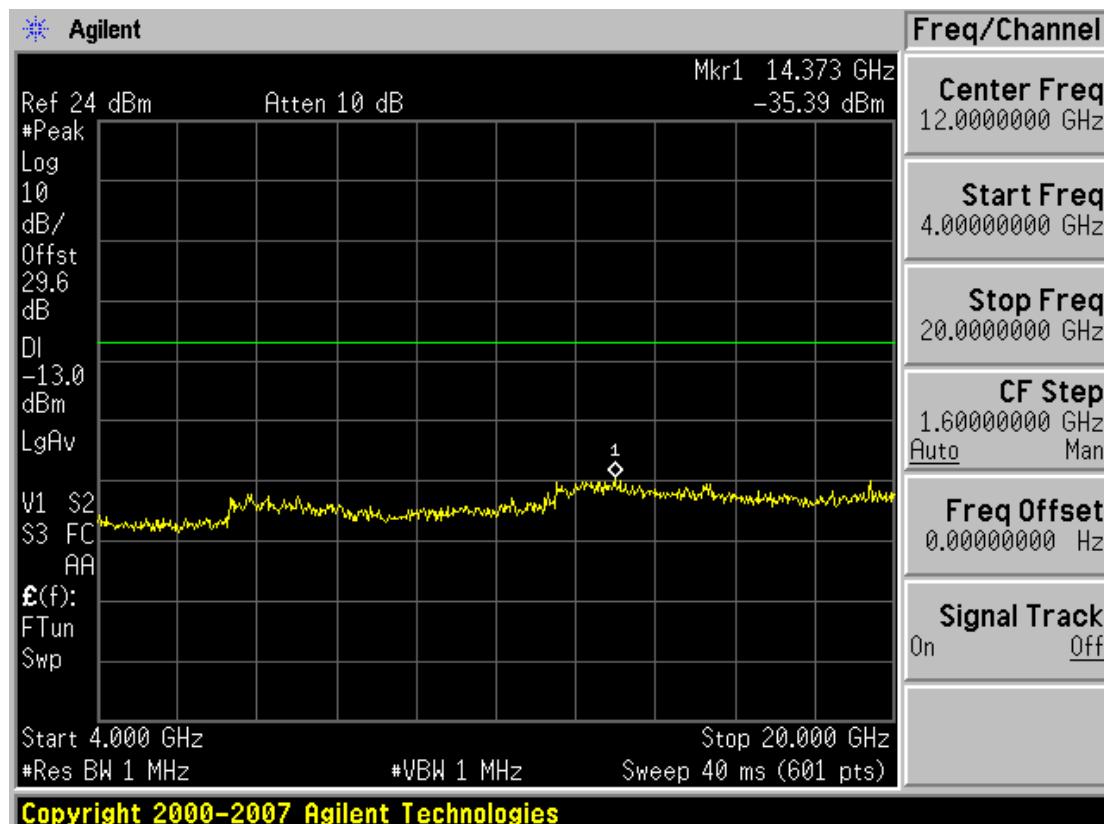
■ CDMA EVDO MODE (777 CH.) Conducted Spurious Emissions - 2



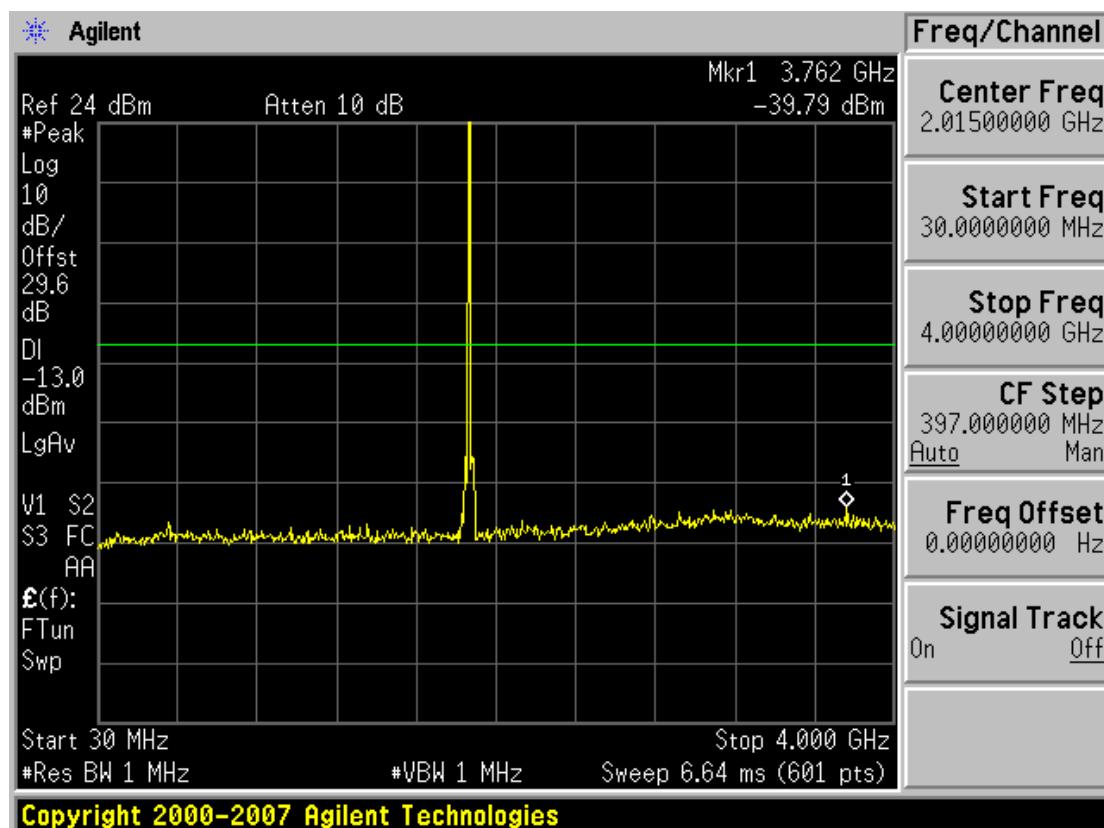
■ PCS CDMA EVDO MODE (25 CH.) Conducted Spurious Emissions - 1



■ PCS CDMA EVDO MODE (25 CH.) Conducted Spurious Emissions - 2

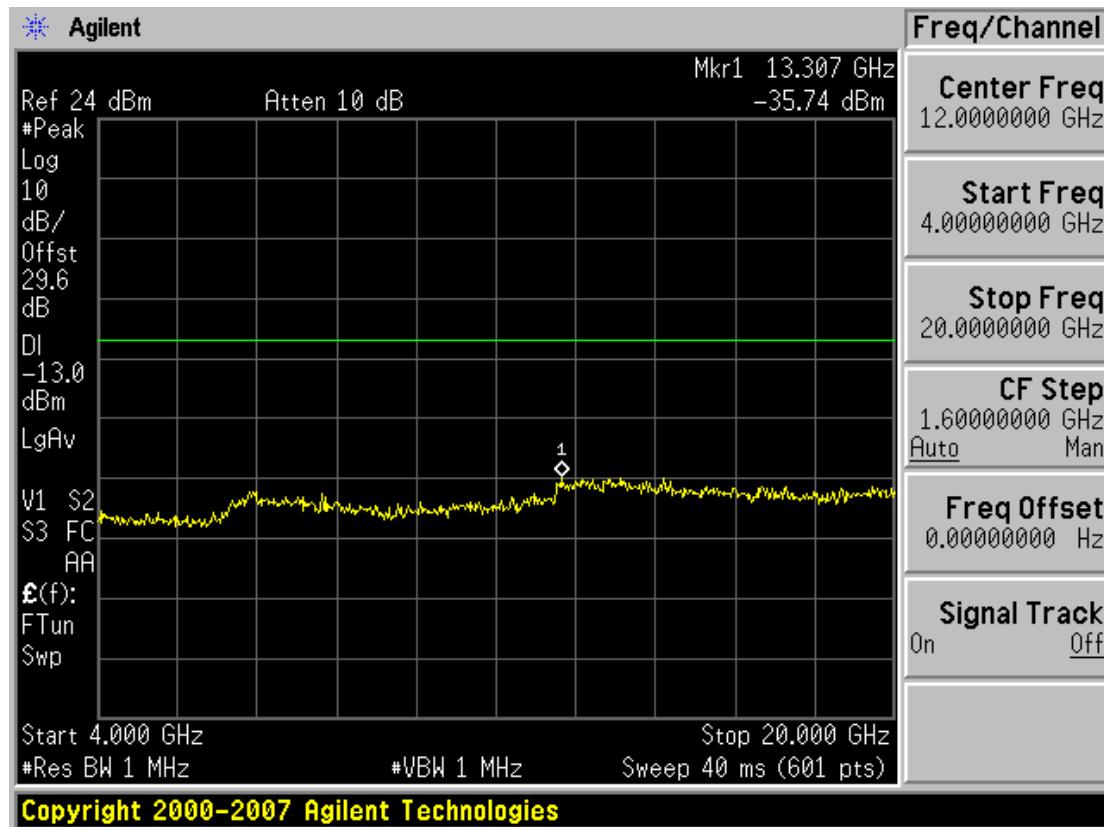


■ PCS CDMA EVDO MODE (600 CH.) Conducted Spurious Emissions - 1

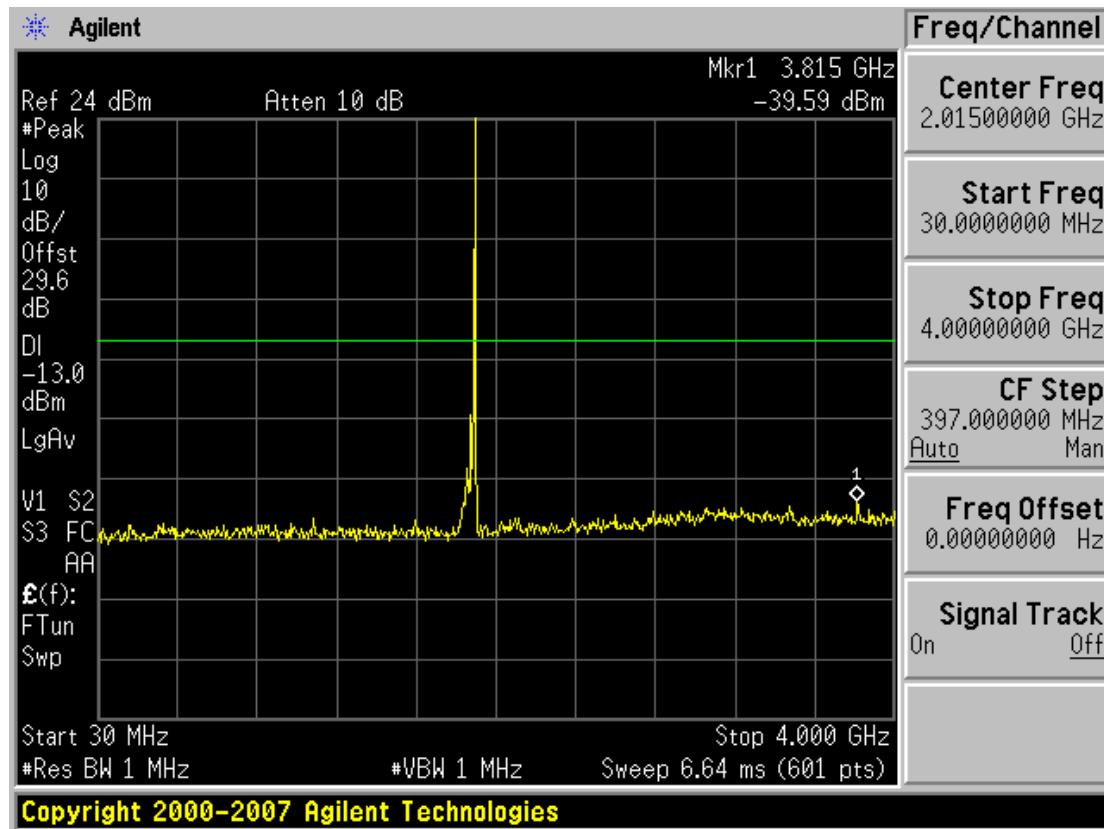


FCC CERTIFICATION REPORT				www.hct.co.kr
Test Report No. HCT-RF09-0513	Test Dates: May 11, 2009	EUT Type: CDMA 1xEVDO Rev.A Wireless Router	FCC ID: XAVVV240	Page 39 of 41

■ PCS CDMA EVDO MODE (600 CH.) Conducted Spurious Emissions - 2

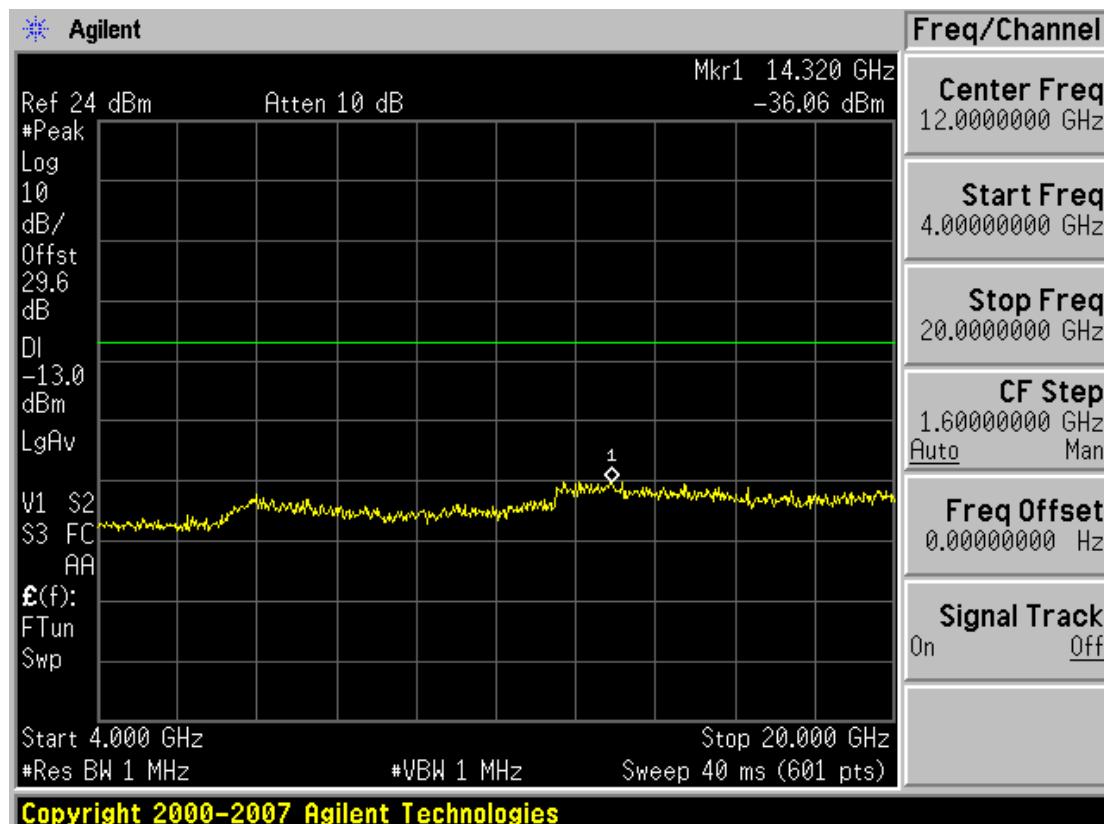


■ PCS CDMA EVDO MODE (1175 CH.) Conducted Spurious Emissions - 1



Test Report No. HCT-RF09-0513	Test Dates: May 11, 2009	EUT Type: CDMA 1xEVDO Rev.A Wireless Router	FCC ID: XAVVV240	Page 40 of 41
----------------------------------	-----------------------------	--	---------------------	---------------

■ PCS CDMA EVDO MODE (1175 CH.) Conducted Spurious Emissions - 2



FCC CERTIFICATION REPORT

Test Report No. HCT-RF09-0513	Test Dates: May 11, 2009	EUT Type: CDMA 1xEVDO Rev.A Wireless Router	FCC ID: XAVVW240	www.hct.co.kr
				Page 41 of 41