



**FCC 47 CFR PART 22 SUBPART H AND PART 24 SUBPART E**

**TEST REPORT**

**For**

**Computer**

**Trade Name: ADVANTECH**

**Model: TREK-550, TREK-550XXXXXXXXXXXX**

*Issued to*

**Advantech Co., Ltd.**

**No.1, Alley 20, Lane 26, Rueiguang Road, Neihu District, Taipei 114, Taiwan, R.O.C.**

**Issued by**

**Compliance Certification Services Inc.  
No.11, Wu-Gong 6th Rd., Wugu Industrial Park,  
New Taipei City 248, Taiwan (R.O.C.)  
http://www.ccsrf.com  
service@ccsrf.com**  
**Issued Date: October 23, 2012**



---

*Note: This report shall not be reproduced except in full, without the written approval of Compliance Certification Services Inc. This document may be altered or revised by Compliance Certification Services Inc. personnel only, and shall be noted in the revision section of the document.*



**Revision History**

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	September 5, 2011	Initial Issue	ALL	Sandy Lin
01	November 9, 2011	Re-test.	P.7, 9	Sandy Lin
01	November 9, 2011	Delete the average power.	P.15	Sandy Lin
02	October 23, 2012	Re-test Transmit power, ERP and EIRP test.	ALL	Gina Lo



## TABLE OF CONTENTS

<b>1. TEST RESULT CERTIFICATION.....</b>	<b>4</b>
<b>2. EUT DESCRIPTION .....</b>	<b>5</b>
<b>3. TEST METHODOLOGY .....</b>	<b>6</b>
3.1    EUT CONFIGURATION.....	6
3.2    EUT EXERCISE .....	6
3.3    GENERAL TEST PROCEDURES .....	6
3.4    DESCRIPTION OF TEST MODES .....	7
<b>4. INSTRUMENT CALIBRATION.....</b>	<b>8</b>
4.1    MEASURING INSTRUMENT CALIBRATION .....	8
4.2    MEASUREMENT EQUIPMENT USED .....	9
4.3    MEASUREMENT UNCERTAINTY .....	10
<b>5. FACILITIES AND ACCREDITATIONS .....</b>	<b>11</b>
5.1    FACILITIES .....	11
5.2    EQUIPMENT .....	11
5.3    TABLE OF ACCREDITATIONS AND LISTINGS .....	12
<b>6. SETUP OF EQUIPMENT UNDER TEST .....</b>	<b>13</b>
6.1    SETUP CONFIGURATION OF EUT .....	13
6.2    SUPPORT EQUIPMENT.....	13
<b>7. FCC PART 22 &amp; 24 REQUIREMENTS .....</b>	<b>14</b>
7.1    TRANSMIT POWER.....	14
7.2    ERP & EIRP MEASUREMENT .....	16
7.3    OCCUPIED BANDWIDTH MEASUREMENT .....	19
7.4    OUT OF BAND EMISSION AT ANTENNA TERMINALS .....	26
7.5    FIELD STRENGTH OF SPURIOUS RADIATION MEASUREMENT .....	38
7.6    FREQUENCY STABILITY V.S. TEMPERATURE MEASUREMENT .....	64
7.7    FREQUENCY STABILITY V.S. VOLTAGE MEASUREMENT .....	67
7.8    POWERLINE CONDUCTED EMISSIONS .....	70
<b>APPENDIX I PHOTOGRAPHS OF TEST SETUP.....</b>	<b>71</b>
<b>APPENDIX 1 - PHOTOGRAPHS OF EUT</b>	



## 1. TEST RESULT CERTIFICATION

**Applicant:** Advantech Co., Ltd.  
No.1, Alley 20, Lane 26, Rueiguang Road, Neihu District, Taipei 114,  
Taiwan, R.O.C.

**Equipment Under Test:** Computer

**Trade Name:** ADVANTECH

**Model:** TREK-550, TREK-550XXXXXXXXXXXX

**Date of Test:** May 17, 2011 ~ October 22, 2012

APPLICABLE STANDARDS	
STANDARD	TEST RESULT
FCC 47 CFR Part 22 Subpart H & Part 24 Subpart E	No non-compliance noted

### We hereby certify that:

The above equipment was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in TIA/EIA-603-C: 2004 and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rule FCC PART 22 Subpart H and PART 24 Subpart E.

The test results of this report relate only to the tested sample identified in this report.

*Approved by:*

---

Miller Lee  
Section Manager  
Compliance Certification Services Inc.

*Reviewed by:*

---

Gina Lo  
Section Manager  
Compliance Certification Services Inc.



## 2. EUT DESCRIPTION

<b>Product</b>	Computer
<b>Trade Name</b>	ADVANTECH
<b>Model Number</b>	TREK-550, TREK-550XXXXXXXXXXXX
<b>Model Discrepancy</b>	1. All the model numbers are identical just for marketing purpose only 2. The mean of "X ("X" can be 0-9 or A-Z or blank or any alphanumeric character)" on model number, they are identical just for marketing purpose only. 3. Client consigns only one sample to test (Model number: TREK-550). Therefore, the testing Lab. just guarantees the unit, which has been tested.
<b>Received Date</b>	May 12, 2010
<b>EUT Power Rating</b>	12-24VDC
<b>Frequency Range</b>	TX: 824.7 ~ 848.31 MHz / 1851.25 ~ 1908.75 MHz RX: 869.7 ~ 893.31 MHz / 1931.25 ~ 1988.75 MHz
<b>Transmit Power (ERP &amp; EIRP Power)</b>	CDMA2000 1xRTT 850 MHz: 22.04 dBm 1900 MHz: 21.98 dBm CDMA2000 1xEVDO 850 MHz: 27.23 dBm 1900 MHz: 27.15 dBm
<b>Cellular Phone Protocol</b>	CDMA2000 1xRTT CDMA2000 1xEVDO
<b>Type of Emission</b>	CDMA2000 1xRTT: 824.7 ~ 848.31 MHz: 1M27F9W--- 1851.25 ~ 1908.75 MHz: 1M27F9W--- CDMA2000 1xEVDO 824.7 ~ 848.31 MHz: 1M28F9W--- 1851.25 ~ 1908.75 MHz: 1M28F9W---
<b>Antenna Gain</b>	850 MHz: -2.5dBi 1900 MHz: 2.62dBi
<b>Antenna Type</b>	Dipole Antenna

**Remark:**

1. The sample selected for test was engineering sample that approximated to production product and was provided by manufacturer.
2. This submittal(s) (test report) is intended for FCC ID: **M82-TREK-550-CDMA** filing to comply with Part 22 and Part 24 of the FCC 47 CFR Rules.



### **3. TEST METHODOLOGY**

Both conducted and radiated testing were performed according to the procedures document on chapter 13 of ANSI C63.4: 2003, TIA/EIA-603-C: 2004 and FCC CFR 47, 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055 and 2.1057.

#### **3.1 EUT CONFIGURATION**

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

#### **3.2 EUT EXERCISE**

The EUT was operated in the engineering mode to fix the TX frequency that was for the purpose of the measurements.

#### **3.3 GENERAL TEST PROCEDURES**

##### **Conducted Emissions**

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.4. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-peak and average detector modes.

##### **Radiated Emissions**

The EUT is placed on a turn table, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 13.1.4.1 of ANSI C63.4.



### 3.4 DESCRIPTION OF TEST MODES

The EUT (model: TREK-550) had been tested under operating condition.

After verification, all tests were carried out with the worst case test modes as shown below except radiated spurious emission below 1GHz and power line conducted emissions below 30MHz, which worst case was in normal link mode only.

EUT staying in continuous transmitting mode was programmed.

Pre-scan was performed on RF conducted port to determine the worst-case scenario:

RC/TAP (REV)	SO/TAP (REV)	CDMA 850 / Cellular band			CDMA 1900 / PCS band		
		1013	384	777	25	600	1175
RC1	SO2	24.25	24.21	24.28	24.11	24.28	24.10
RC1	SO55	24.36	24.46	24.32	24.07	24.31	24.02
RC2	SO9	24.46	24.42	24.38	24.08	24.24	24.06
RC2	SO55	24.54	24.3	24.51	24.07	24.23	24.05
<b>RC3</b>	<b>SO55</b>	24.9	24.8	24.94	24.12	24.42	24.08
RC3	SO32	24.64	24.76	24.84	24.11	24.35	24.03
1xEvDO Rev.0	(FTAP) (dBm)	24.04	22.98	21.09	24.29	24.21	24.18
1xEvDO Rev.A	(FTAP) (dBm)	24.1	23.06	24.12	24.31	24.27	24.19

Based on the above results from the different modulations, CDMA2000 1xRTT RC3, SO55 (+F-SCH) and 1Xevdo, FTAP370 were determined to be the worst-case scenario for all tests.



## **4. INSTRUMENT CALIBRATION**

### **4.1 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.



## 4.2 MEASUREMENT EQUIPMENT USED

### Equipment Used for Emissions Measurement

**Remark:** Each piece of equipment is scheduled for calibration once a year and Loop Antenna is scheduled for calibration once three years.

Conducted Emissions Test Site				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	MY43360131	03/17/2012
Power Meter	Anritsu	ML2495A	1012009	04/27/2012
Power Sensor	Anritsu	MA2411A	0917072	04/27/2012
Temp. / Humidity Chamber	Terchy	MHG-150LF	930619	10/19/2012

Wugu 966 Chamber A				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	US42510252	11/03/2011
EMI Test Receiver	R&S	ESCI	100064	02/17/2012
Pre-Amplifier	Mini-Circuits	ZFL-1000LN	SF350700823	01/13/2012
Pre-Amplifier	MITEQ	AFS44-00102650-42-10P-44	1415367	11/20/2011
Bilog Antenna	Sunol Sciences	JB3	A030105	10/03/2012
Bilog Antenna	Sunol Sciences	JB3	A030205	10/03/2012
Horn Antenna	EMCO	3117	00055165	01/12/2012
Horn Antenna	EMCO	3117	00055167	12/06/2011
Horn Antenna	EMCO	3116	00026370	10/12/2012
Loop Antenna	EMCO	6502	8905/2356	06/10/2013
Turn Table	CCS	CC-T-1F	N/A	N.C.R
Antenna Tower	CCS	CC-A-1F	N/A	N.C.R
Controller	CCS	CC-C-1F	N/A	N.C.R
Site NSA	CCS	N/A	N/A	12/26/2011
Test S/W	EZ-EMC (CCS-3A1RE)			



### 4.3 MEASUREMENT UNCERTAINTY

PARAMETER	UNCERTAINTY
Powerline Conducted Emission	N/A
3M Semi Anechoic Chamber / 30M~200M	+/- 4.0138
3M Semi Anechoic Chamber / 200M~1000M	+/- 3.9483
3M Semi Anechoic Chamber / 1G~8G	+/- 2.5975
3M Semi Anechoic Chamber / 8G~18G	+/- 2.6112
3M Semi Anechoic Chamber / 18G~26G	+/- 2.7389
3M Semi Anechoic Chamber / 26G~40G	+/- 2.9683

*Remark: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.*



## 5. FACILITIES AND ACCREDITATIONS

### 5.1 FACILITIES

All measurement facilities used to collect the measurement data are located at

- No.199, Chunghsen Road, Hsintien City, Taipei Hsien, Taiwan, R.O.C.  
Tel: 886-2-2217-0894 / Fax: 886-2-2217-1029
- No.11, Wu-Gong 6th Rd., Wugu Industrial Park, New Taipei City 248, Taiwan (R.O.C.)  
Tel: 886-2-2299-9720 / Fax: 886-2-2298-4045
- No.81-1, Lane 210, Bade 2nd Rd., Lujhu Township, Taoyuan County 33841, TAIWAN, R.O.C.  
Tel: 886-3-324-0332 / Fax: 886-3-324-5235

*Remark: The conducted emissions test items was tested at Compliance Certification Services Inc. (Linkou Lab.)  
The test equipments were listed in page 9 and the test data, please refer page 71-72.*

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

### 5.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, biconical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, “Radio Interference Measuring Apparatus and Measurement Methods.”



### **5.3 TABLE OF ACCREDITATIONS AND LISTINGS**

<b>Country</b>	<b>Agency</b>	<b>Scope of Accreditation</b>	<b>Logo</b>
USA	FCC	3M Semi Anechoic Chamber (FCC MRA: TW1039) to perform FCC Part 15 measurements	 FCC MRA: TW1039
Taiwan	TAF	LP0002, RTTE01, FCC Method-47 CFR Part 15 Subpart C, D, E, RSS-210, RSS-310 IDA TS SRD, AS/NZS 4268, AS/NZS 4771, TS 12.1 & 12.2, ETSI EN 300 440-1, ETSI EN 300 440-2, ETSI EN 300 328, ETSI EN 300 220-1, ETSI EN 300 220-2, ETSI EN 301 893, ETSI EN 301 489-1/3/7/17 FCC OET Bulletin 65 + Supplement C, EN 50360, EN 50361, EN 50371, RSS 102, EN 50383, EN 50385, EN 50392, IEC 62209, CNS 14958-1, CNS 14959 FCC Method -47 CFR Part 15 Subpart B IEC / EN 61000-3-2, IEC / EN 61000-3-3, IEC / EN 61000-4-2/3/4/5/6/8/11	 Testing Laboratory 1309
Canada	Industry Canada	3M Semi Anechoic Chamber (IC 2324G-1 / IC 2324G-2) to perform	 IC 2324G-1 IC 2324G-2

*\* No part of this report may be used to claim or imply product endorsement by A2LA or any agency of the US Government.*



## 6. SETUP OF EQUIPMENT UNDER TEST

### 6.1 SETUP CONFIGURATION OF EUT

See test photographs attached in Appendix I for the actual connections between EUT and support equipment.

### 6.2 SUPPORT EQUIPMENT

No.	Device Type	Model	Series No.	FCC ID	Brand	Data Cable	Power Cord
1	LCD Monitor	2407WFPb	CN-0FC255-46633-675-24TKS	FCC DoC	DELL	D-SUB Cable: Shielded, 1.8m with two cores	Unshielded, 1.8m
2	Monitor	TREK-303H	N/A	N/A	ADVANTECH	D4 Cable: Shielded, 1.8m	Unshielded, 1.8m
3.	Modem	DM-1414	304012265	IFAXDM1414	ACEEX	Unshielded, 1.8m	Unshielded, 1.8m
4.	Modem	DM-1414	304012268	IFAXDM1414	ACEEX	Unshielded, 1.8m	Unshielded, 1.8m
5	Modem	DM-1414	304012261	IFAXDM1414	ACEEX	Unshielded, 1.8m	Unshielded, 1.8m
6	Modem	DM-1414	304012262	IFAXDM1414	ACEEX	Unshielded, 1.8m	Unshielded, 1.8m
7	Printer	STYLUS C60	DR3K039632	FCC DoC	EPSON	USB Cable: Shielded, 1.8m	Unshielded, 1.8m
8	USB Keyboard	6512-UV	21200201-1293999953	FCC DoC	ACER	USB Cable: Shielded, 1.8m	N/A
9	USB Mouse	MO19UCA	020509284	FCC DoC	HP	USB Cable: Shielded, 1.8m	N/A
10	Multimedia Headset	ClearChat	N/A	FCC DoC	Logitech	Unshielded, 1.8m	N/A
11	DVD Player	DVD-S53	VC7KA001763 R	FCC DoC	Panasonic	LAN Cable: Unshielded, 1.8m	Unshielded, 1.8m
12	DC Power Supply (Remote)	GPS-3303	0011606	FCC DoC	GW	N/A	Unshielded, 1.8m
13	Notebook PC (Remote)	COMPAQ NC 4010	CNU441F8LV	FCC DOC	HP	LAN Cable: Unshielded, 10m AC I/P: Unshielded, 1.8m DC O/P: Unshielded, 1.8m with a core	

#### **Remark:**

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.



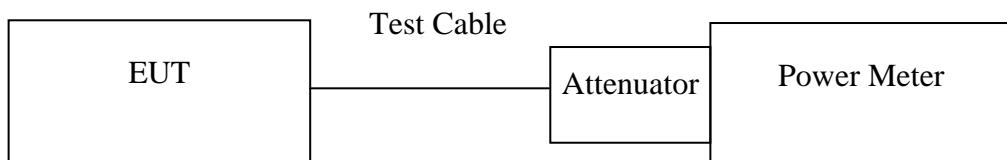
## 7. FCC PART 22 & 24 REQUIREMENTS

### 7.1 TRANSMIT POWER

#### LIMIT

According to FCC §2.1046.

#### Test Configuration



*Remark: Measurement setup for testing on Antenna connector*

#### TEST PROCEDURE

The transmitter output was connected to a calibrated attenuator, the other end of which was connected to a power meter. Transmitter output was read off the power meter in dBm. The power output at the transmitter antenna port was determined by adding the value of the attenuator to the power meter reading.

#### TEST RESULTS

*No non-compliance noted.*



## Test Data

### Peak Power

Test Mode	CH	Frequency (MHz)	Peak Power (dBm)
CDMA2000 1xRTT Cellular	1013	824.70	24.90
	384	836.52	24.80
	777	848.31	24.94
CDMA2000 1xEVDO Cellular	1013	824.70	24.10
	384	836.52	23.06
	777	848.31	24.12

Test Mode	CH	Frequency (MHz)	Peak Power (dBm)
CDMA2000 1xRTT PCS	25	1851.25	24.12
	600	1880.00	24.42
	1175	1908.75	24.08
CDMA2000 1xEVDO PCS	25	1851.25	24.31
	600	1880.00	24.27
	1175	1908.75	24.19

*Remark: The value of factor includes both the loss of cable and external attenuator*

## 7.2 ERP & EIRP MEASUREMENT

### LIMIT

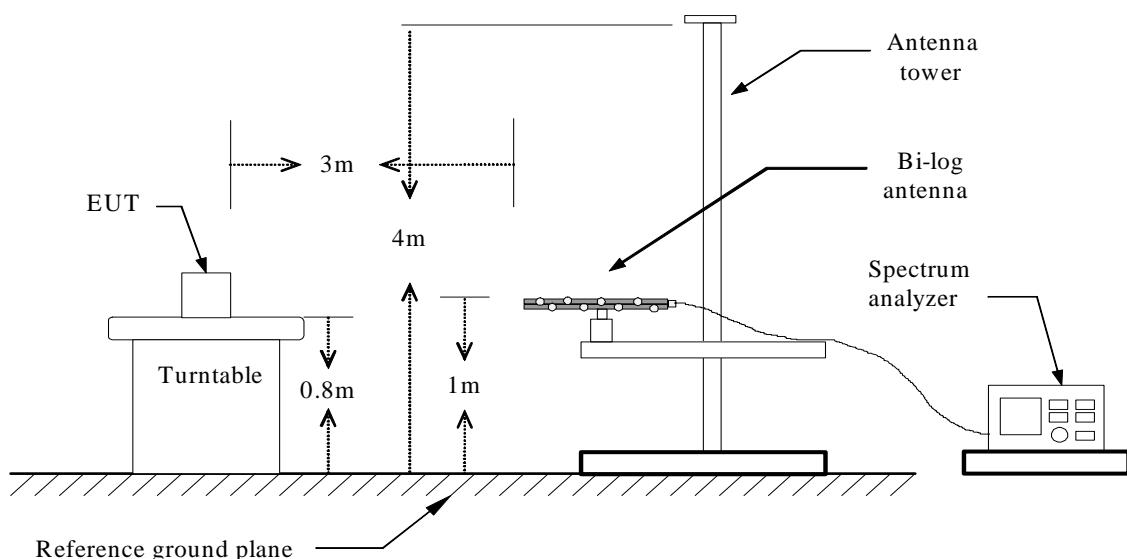
According to FCC §2.1046

FCC 22.913(b): The Effective Radiated Power (ERP) of mobile transmitters must not exceed 7 Watts.

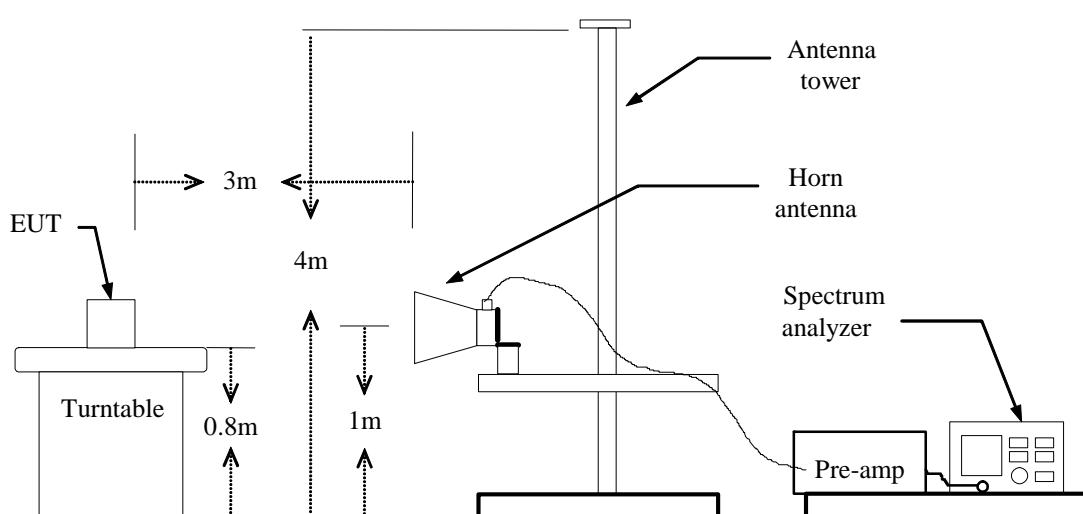
FCC 24.232(b): The equivalent Isotropic Radiated Power (EIRP) must not exceed 2 Watts.

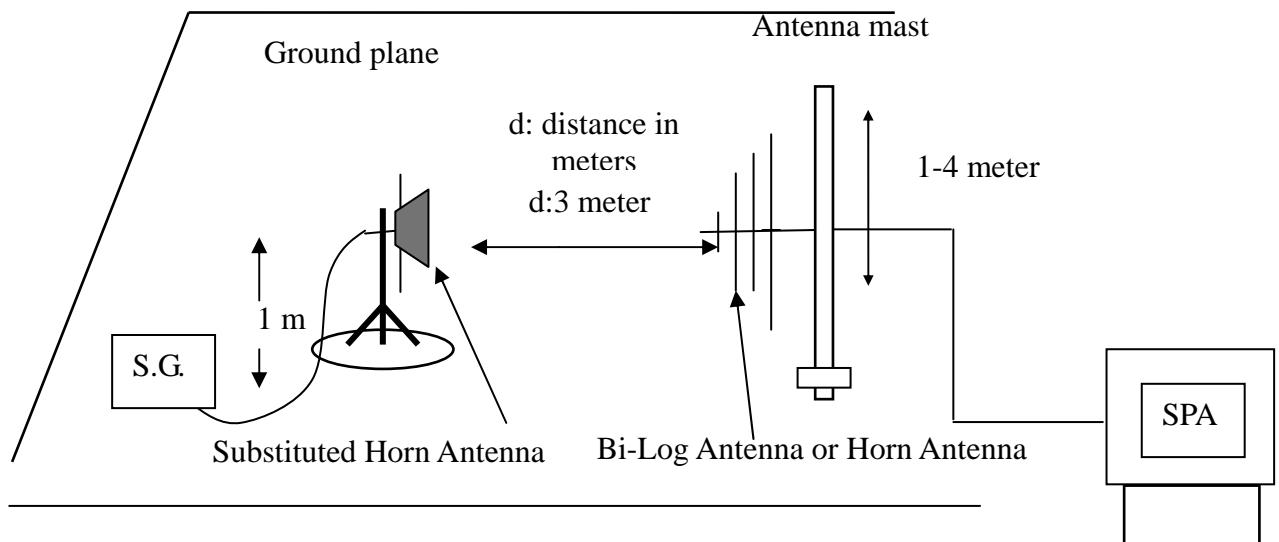
### TEST CONFIGURATION

#### Below 1 GHz



#### Above 1 GHz



**For Substituted Method Test Set-UP****TEST PROCEDURE**

The EUT was placed on a non-conductive turntable using a non-conductive support. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and EMI spectrum analyzer.

During the measurement of the EUT, the resolution bandwidth was set to 3MHz and the average bandwidth was set to 3MHz. The highest emission was recorded with the rotation of the turntable and the lowering of the test antenna. The reading was recorded and the field strength (E in dBuV/m) was calculated.

ERP in frequency band 824-849MHz, and EIRP in frequency band 1851.25 –1910MHz were measured using a substitution method. The EUT was replaced by half-wave dipole (824-849MHz) or horn antenna (1851.25-1910MHz) connected to a signal generator. The spectrum analyzer reading was recorded and ERP/EIRP was calculated as follows:

$$\text{ERP} = \text{S.G. output (dBm)} + \text{Antenna Gain (dBd)} - \text{Cable (dB)}$$

$$\text{EIRP} = \text{S.G. output (dBm)} + \text{Antenna Gain (dBi)} - \text{Cable (dB)}$$



## TEST RESULTS

No non-compliance noted.

### CDMA2000 1xRTT Cellular Test Data

Channel	Frequency (MHz)	Antenna Pol.	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)
1013	824.80	V	11.57	3.39	6.24	14.42	38.45	-24.03
	824.80	H	19.19	3.39	6.24	*22.04	38.45	-16.41
384	836.50	V	10.45	3.4	6.37	13.42	38.45	-25.03
	836.50	H	17.77	3.4	6.36	20.73	38.45	-17.72
777	848.40	V	11.71	3.4	6.4	14.71	38.45	-23.74
	848.30	H	18.57	3.4	6.4	21.57	38.45	-16.88

### CDMA2000 1xEVDO Cellular Test Data

Channel	Frequency (MHz)	Antenna Pol.	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)
1013	824.80	V	11.75	3.39	6.24	14.60	38.45	-23.85
	824.80	H	19.13	3.39	6.24	*21.98	38.45	-16.47
384	836.50	V	10.54	3.4	6.37	13.51	38.45	-24.94
	836.50	H	17.71	3.4	6.36	20.67	38.45	-17.78
777	848.40	V	11.55	3.4	6.4	14.55	38.45	-23.90
	848.30	H	18.65	3.4	6.4	21.65	38.45	-16.80

### CDMA2000 1xRTT PCS Test Data

Channel	Frequency (MHz)	Antenna Pol.	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)
25	1851.15	V	26.93	5.37	5.67	*27.23	33.00	-5.77
	1851.15	H	16.75	5.37	5.67	17.05	33.00	-15.95
600	1879.95	V	26.64	5.42	5.62	26.84	33.00	-6.16
	1879.95	H	16.88	5.42	5.62	17.08	33.00	-15.92
1175	1908.90	V	25.73	5.47	5.56	25.82	33.00	-7.18
	1908.90	H	16.34	5.47	5.56	16.43	33.00	-16.57

### CDMA2000 1xEVDO PCS Test Data

Channel	Frequency (MHz)	Antenna Pol.	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)
25	1851.15	V	26.85	5.37	5.67	*27.15	33.00	-5.85
	1851.15	H	16.62	5.37	5.67	16.92	33.00	-16.08
600	1879.95	V	26.37	5.42	5.62	26.57	33.00	-6.43
	1879.95	H	16.74	5.42	5.62	16.94	33.00	-16.06
1175	1908.90	V	25.74	5.47	5.56	25.83	33.00	-7.17
	1908.90	H	16.36	5.47	5.56	16.45	33.00	-16.55

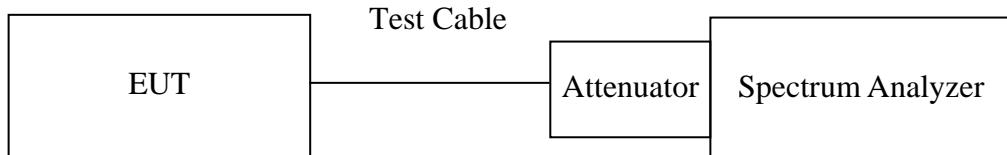


## 7.3 OCCUPIED BANDWIDTH MEASUREMENT

### LIMIT

According to §FCC 2.1049.

### Test Configuration



**Remark:** Measurement setup for testing on Antenna connector

### TEST PROCEDURE

The EUT's output RF connector was connected with a short cable to the spectrum analyzer, RBW was set to about 1% of emission BW, VBW is set to 3 times the RBW, -26dBc display line was placed on the screen (or 99% bandwidth), the occupied bandwidth is the delta frequency between the two points where the display line intersects the signal trace.

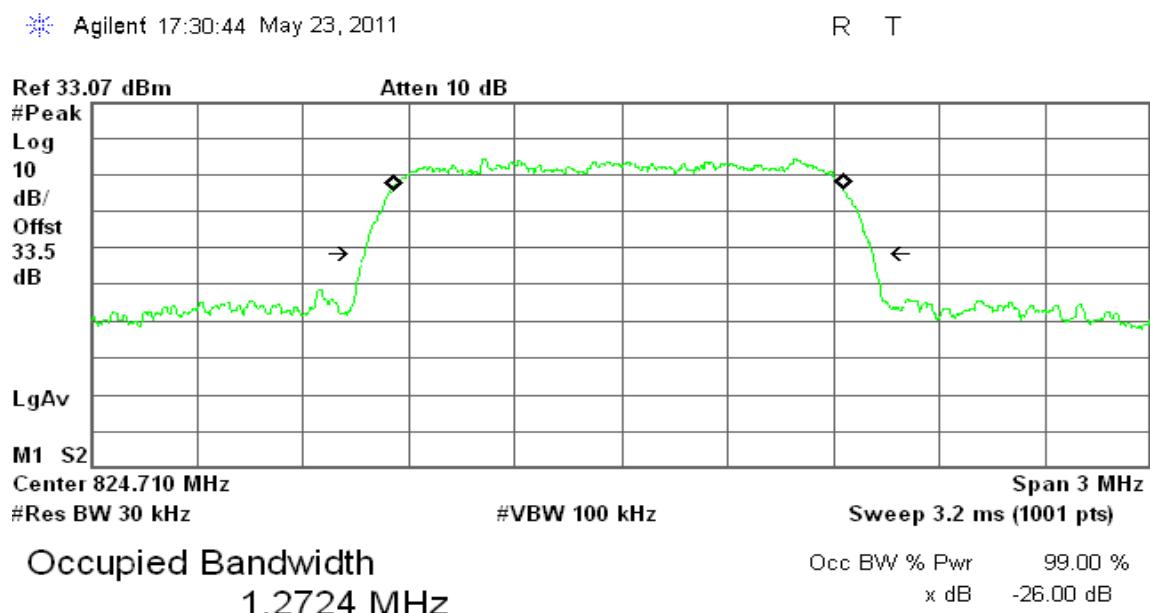
### TEST RESULTS

*No non-compliance noted.*

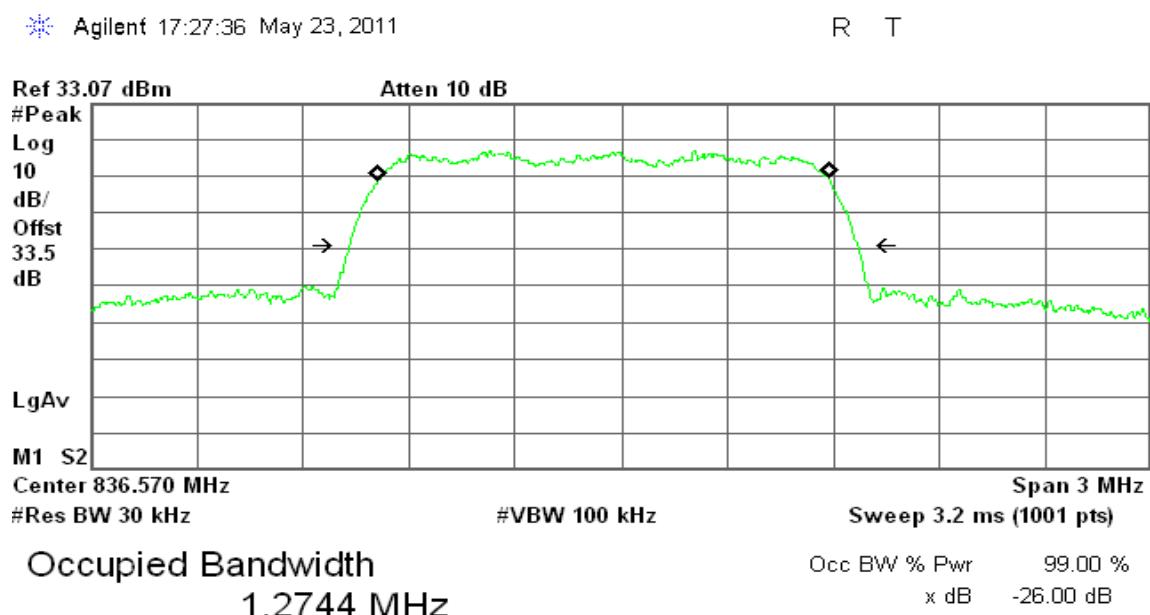
#### Test Data

Test Mode	CH	Frequency (MHz)	Bandwidth (MHz)
CDMA2000 1xRTT Cellular	1013	824.70	1.2724
	384	836.52	1.2744
	777	848.31	1.2711
CDMA2000 1xEVDO Cellular	1013	824.70	1.2770
	384	836.52	1.2714
	777	848.31	1.2808

Test Mode	CH	Frequency (MHz)	Bandwidth (MHz)
CDMA2000 1xRTT PCS	25	1851.25	1.2741
	600	1880.00	1.2775
	1175	1908.75	1.2789
CDMA2000 1xEVDO PCS	25	1851.25	1.2758
	600	1880.00	1.2811
	1175	1908.75	1.2748

**Test Plot****CDMA2000 1xRTT Cellular / CH Low**

Transmit Freq Error -8.198 kHz  
x dB Bandwidth 1.435 MHz

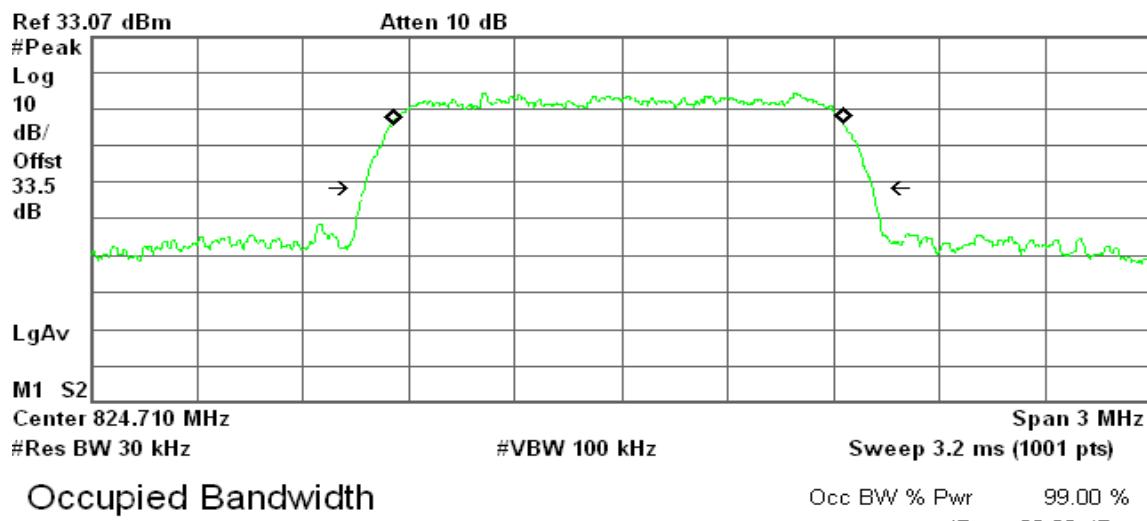
**CDMA2000 1xRTT Cellular / CH Mid**

Transmit Freq Error -49.967 kHz  
x dB Bandwidth 1.437 MHz

**CDMA2000 1xRTT Cellular / CH High**

Agilent 17:30:44 May 23, 2011

R T

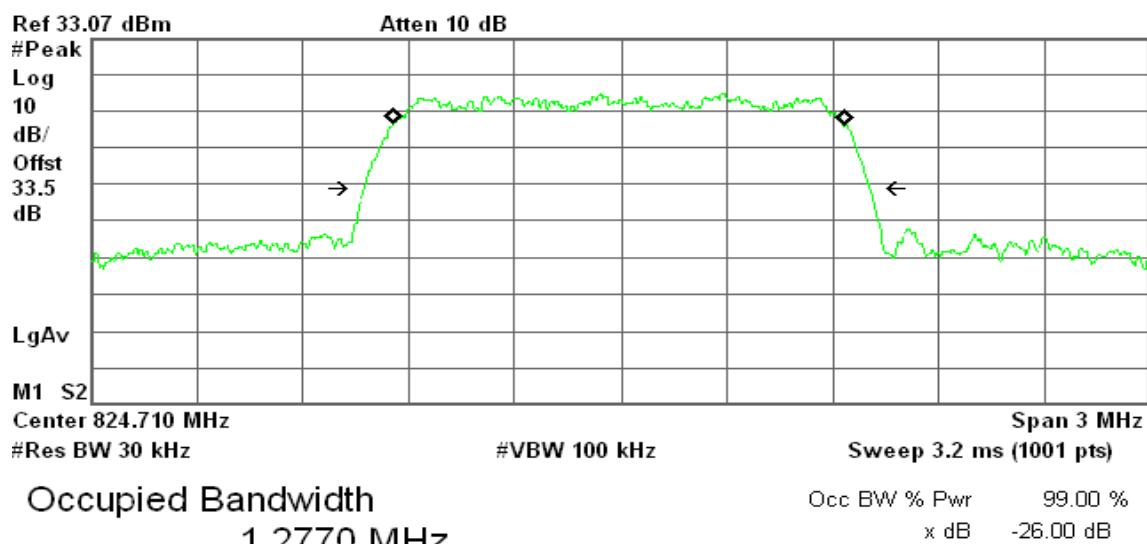


Transmit Freq Error      -8.198 kHz  
x dB Bandwidth      1.435 MHz

**CDMA2000 1xEVDO Cellular / CH Low**

Agilent 17:31:10 May 23, 2011

R T



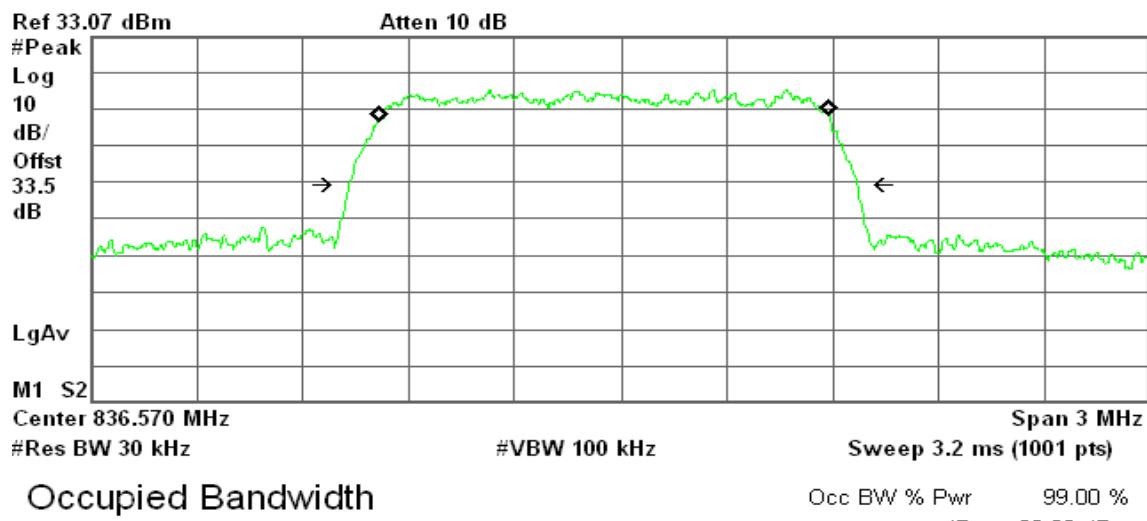
Transmit Freq Error      -4.414 kHz  
x dB Bandwidth      1.432 MHz



### CDMA2000 1xEVDO Cellular / CH Mid

Agilent 17:28:03 May 23, 2011

R T

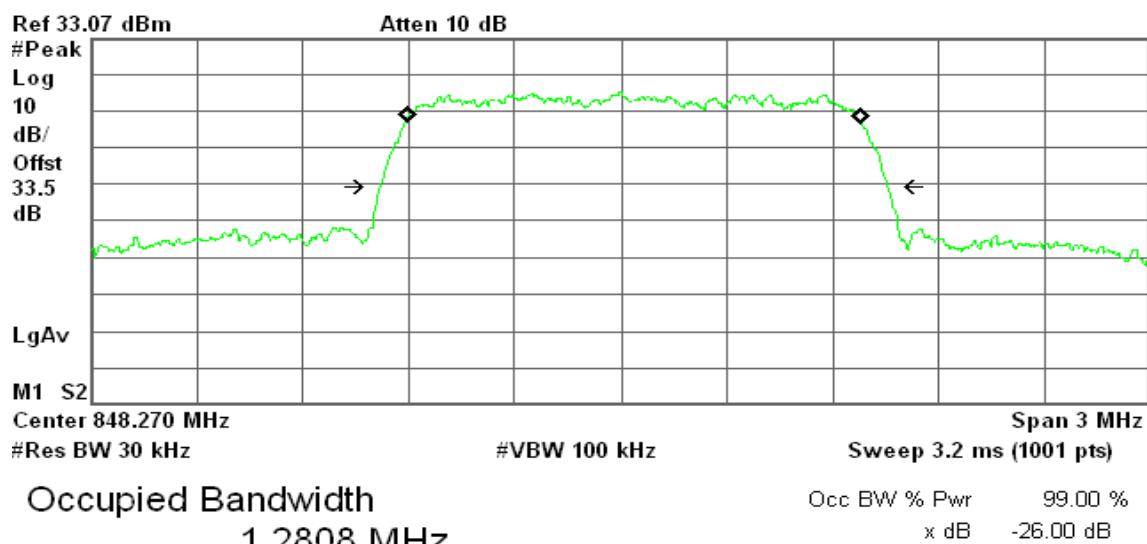


Transmit Freq Error      -47.109 kHz  
x dB Bandwidth      1.437 MHz

### CDMA2000 1xEVDO Cellular / CH High

Agilent 17:30:00 May 23, 2011

R T



Transmit Freq Error      37.452 kHz  
x dB Bandwidth      1.437 MHz

**CDMA2000 1xRTT PCS / CH Low**

Agilent 09:26:51 May 23, 2011

R T

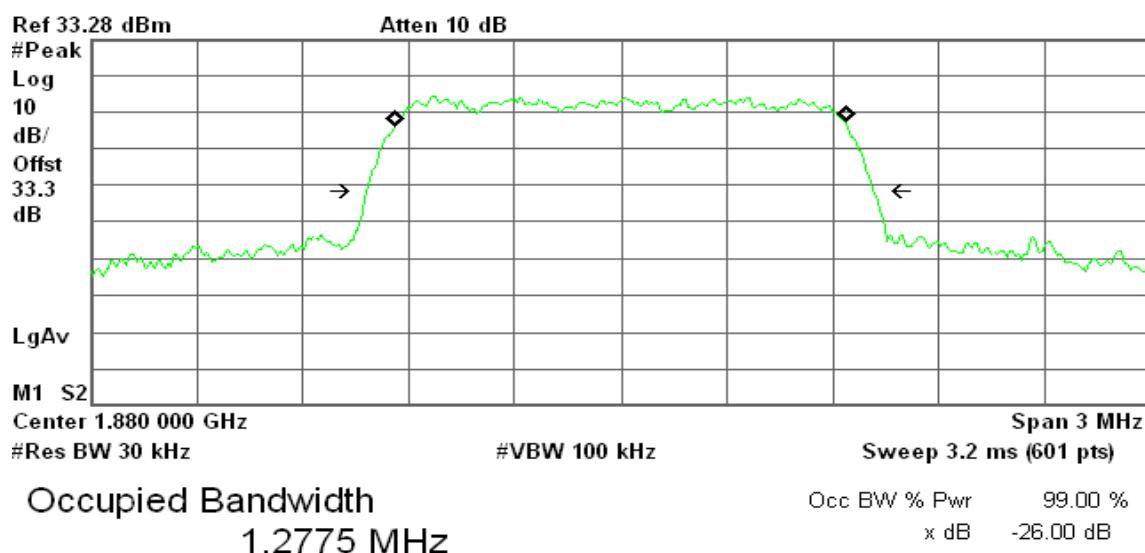


Transmit Freq Error      1.571 kHz  
x dB Bandwidth      1.431 MHz

**CDMA2000 1xRTT PCS / CH Mid**

Agilent 09:28:18 May 23, 2011

R T

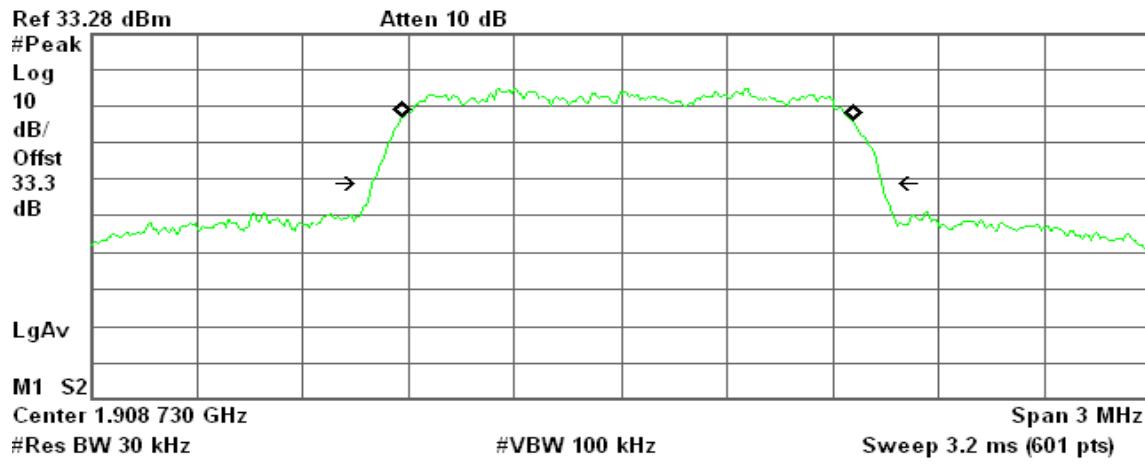


Transmit Freq Error      3.573 Hz  
x dB Bandwidth      1.439 MHz

**CDMA2000 1xRTT PCS / CH High**

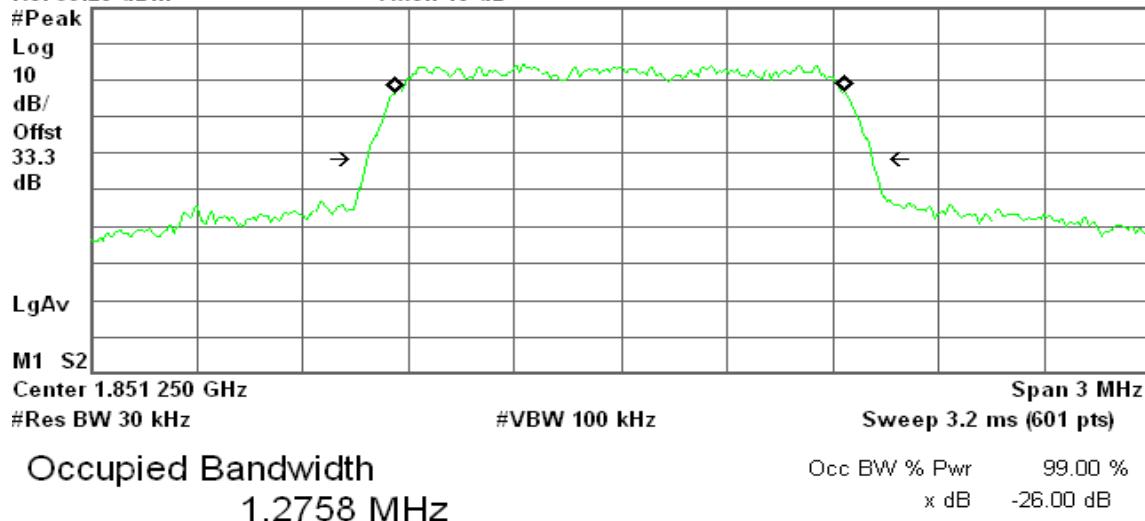
Agilent 09:28:47 May 23, 2011

R T

**CDMA2000 1xEVDO PCS / CH Low**

Agilent 09:27:26 May 23, 2011

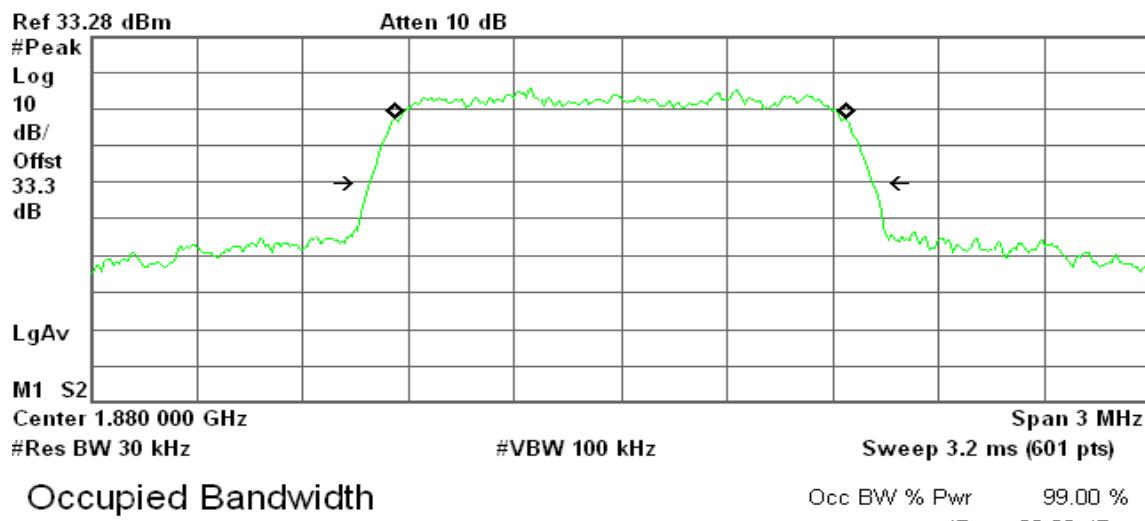
R T



**CDMA2000 1xEVDO PCS / CH Mid**

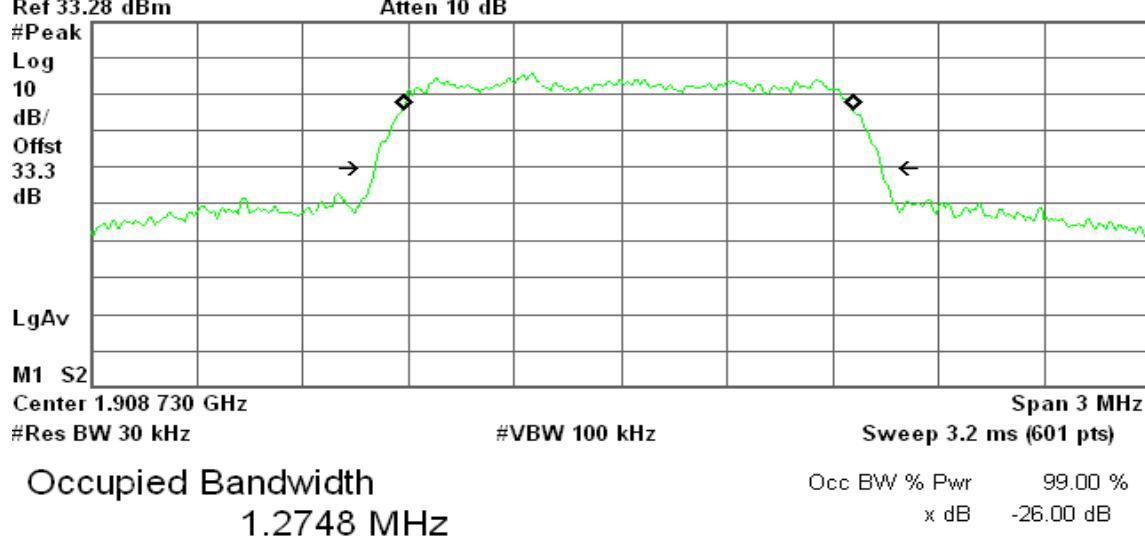
Agilent 09:27:50 May 23, 2011

R T

**CDMA2000 1xEVDO PCS / CH High**

Agilent 09:29:14 May 23, 2011

R T





## 7.4 OUT OF BAND EMISSION AT ANTENNA TERMINALS

### LIMIT

According to FCC §2.1051, FCC §22.917, FCC §24.238(a).

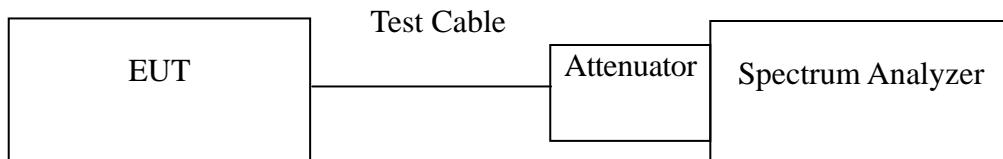
**Out of Band Emissions:** The mean power of emission must be attenuated below the mean power of the non-modulated carrier (P) on any frequency twice or more than twice the fundamental frequency by at least  $43 + 10 \log P$  dB.

**Mobile Emissions in Base Frequency Range:** The mean power of any emissions appearing in the base station frequency range from cellular mobile transmitters operated must be attenuated to a level not exceed -80 dBm at the transmit antenna connector.

**Band Edge Requirements:** In the 1MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 1% of the emission bandwidth of the fundamental emission of the transmitter may be employed to measure the Out of band Emission

### TEST CONFIGURATION

**Out of band emission at antenna terminals:**



### TEST PROCEDURE

The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 1MHz, sufficient scans were taken to show the out of band Emissions if any up to 10th harmonic.

For the out of band: Set the RBW, VBW = 1MHz, Start=30MHz, Stop= 10 th harmonic. Limit = -13dBm

Band Edge Requirements (824 MHz and 849 MHz /1850MHz and 1910MHz): In the 1 MHz 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.



## TEST RESULTS

*No non-compliance noted.*

### Test Data

<b>Mode</b>	<b>CH</b>	<b>Location</b>	<b>Description</b>
CDMA2000 1xRTT Cellular	1013	Figure 7-1	Conducted spurious emissions, 30MHz - 20GHz
	384	Figure 7-2	Conducted spurious emissions, 30MHz - 20GHz
	777	Figure 7-3	Conducted spurious emissions, 30MHz - 20GHz
CDMA2000 1xEVDO Cellular	1013	Figure 8-1	Conducted spurious emissions, 30MHz - 20GHz
	384	Figure 8-2	Conducted spurious emissions, 30MHz - 20GHz
	777	Figure 8-3	Conducted spurious emissions, 30MHz - 20GHz
CDMA2000 1xRTT PCS	25	Figure 9-1	Conducted spurious emissions, 30MHz - 20GHz
	600	Figure 9-2	Conducted spurious emissions, 30MHz - 20GHz
	1175	Figure 9-3.	Conducted spurious emissions, 30MHz - 20GHz
CDMA2000 1xEVDO PCS	25	Figure 10-1	Conducted spurious emissions, 30MHz - 20GHz
	600	Figure 10-2	Conducted spurious emissions, 30MHz - 20GHz
	1175	Figure 10-3.	Conducted spurious emissions, 30MHz - 20GHz
CDMA2000 1xRTT Cellular	1013	Figure 11-1	Band Edge emissions
	777	Figure 11-2	Band Edge emissions
CDMA2000 1xEVDO Cellular	1013	Figure 12-1	Band Edge emissions
	777	Figure 12-2	Band Edge emissions
CDMA2000 1xRTT PCS	25	Figure 13-1	Band Edge emissions
	1175	Figure 13-2	Band Edge emissions
CDMA2000 1xEVDO PCS	25	Figure 14-1	Band Edge emissions
	1175	Figure 14-2	Band Edge emissions



## Test Plot

### CDMA2000 1xRTT Cellular

Figure 7-1: Out of Band emission at antenna terminals – CDMA2000 1xRTT / CH Low

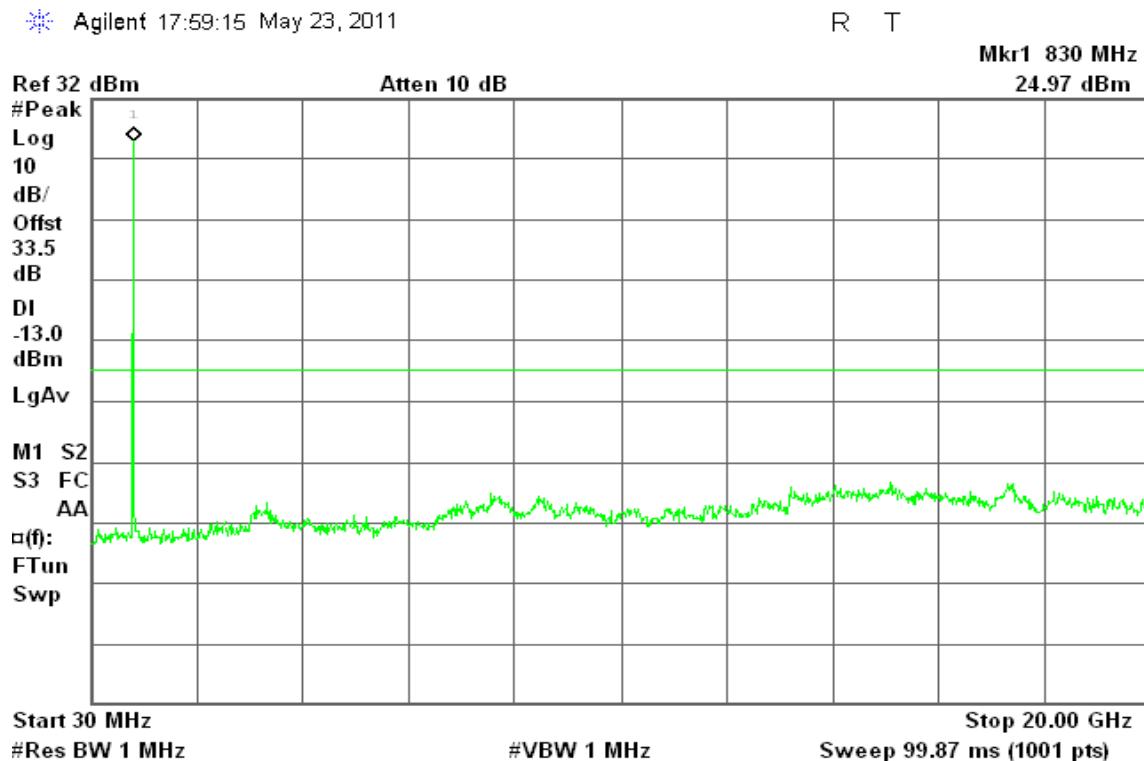


Figure 7-2: Out of Band emission at antenna terminals – CDMA2000 1xRTT / CH Mid

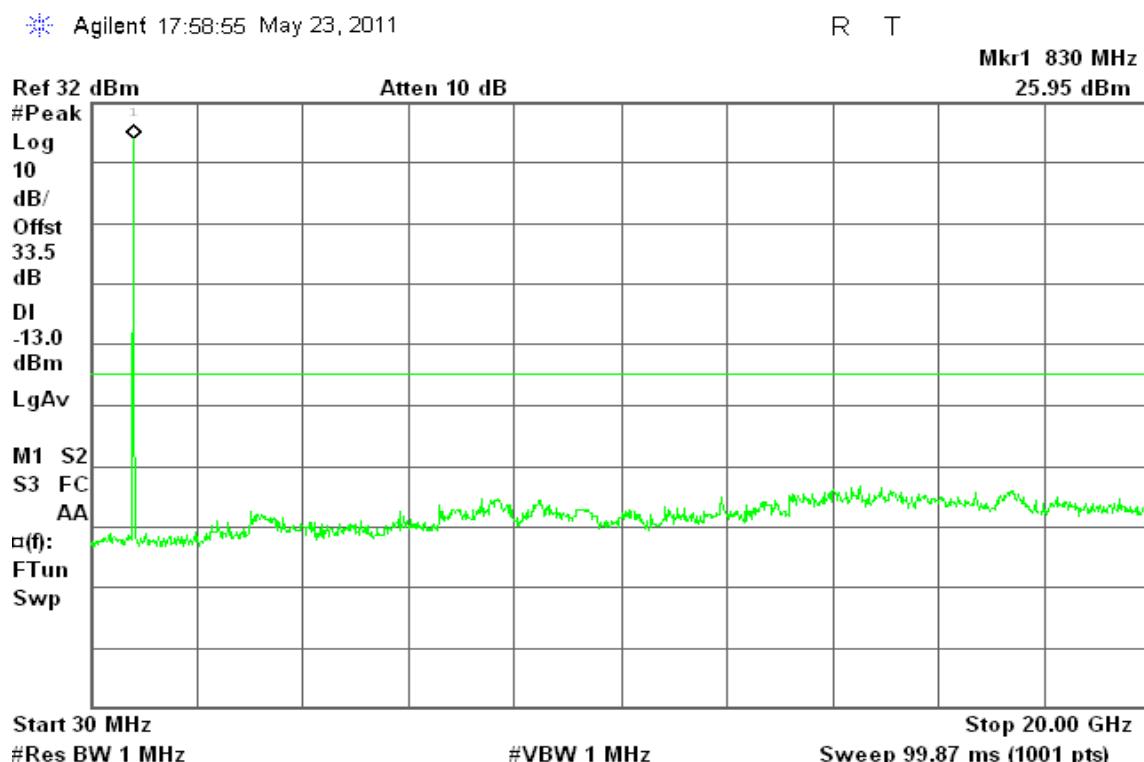
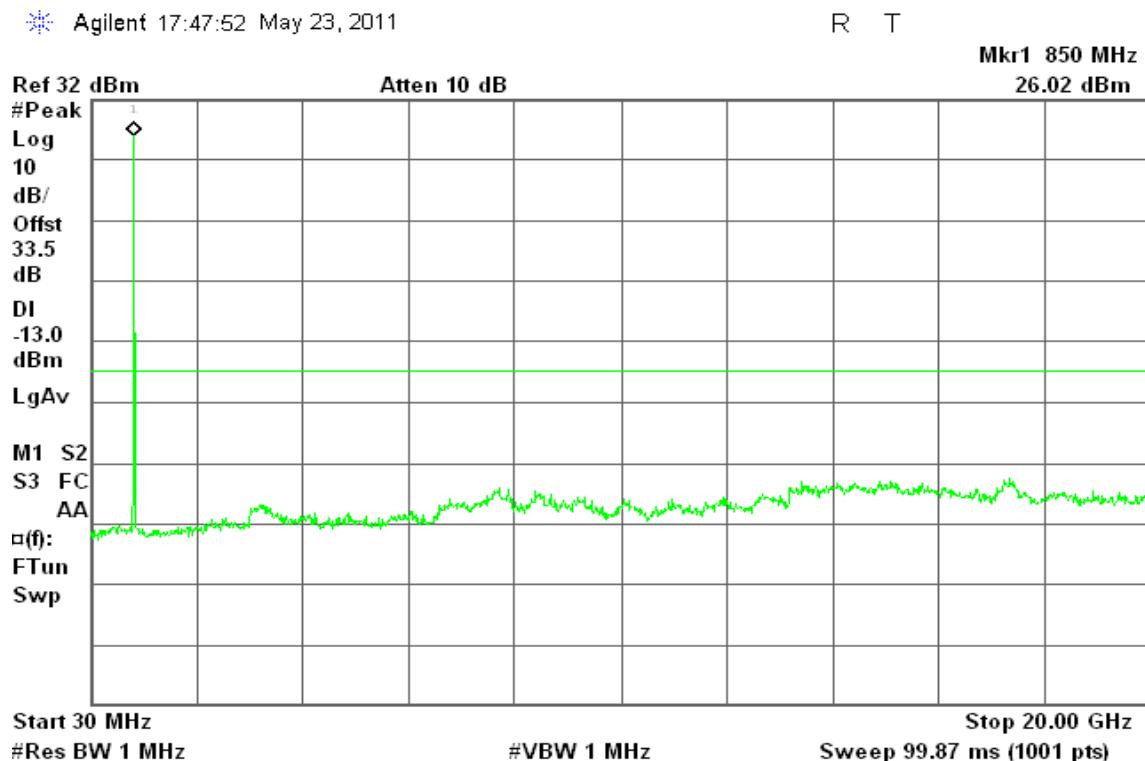




Figure 7-3: Out of Band emission at antenna terminals – CDMA2000 1xRTT / CH High



## 1XEVDO Cellular

Figure 8-1: Out of Band emission at antenna terminals – CDMA2000 1xEVDO / CH Low

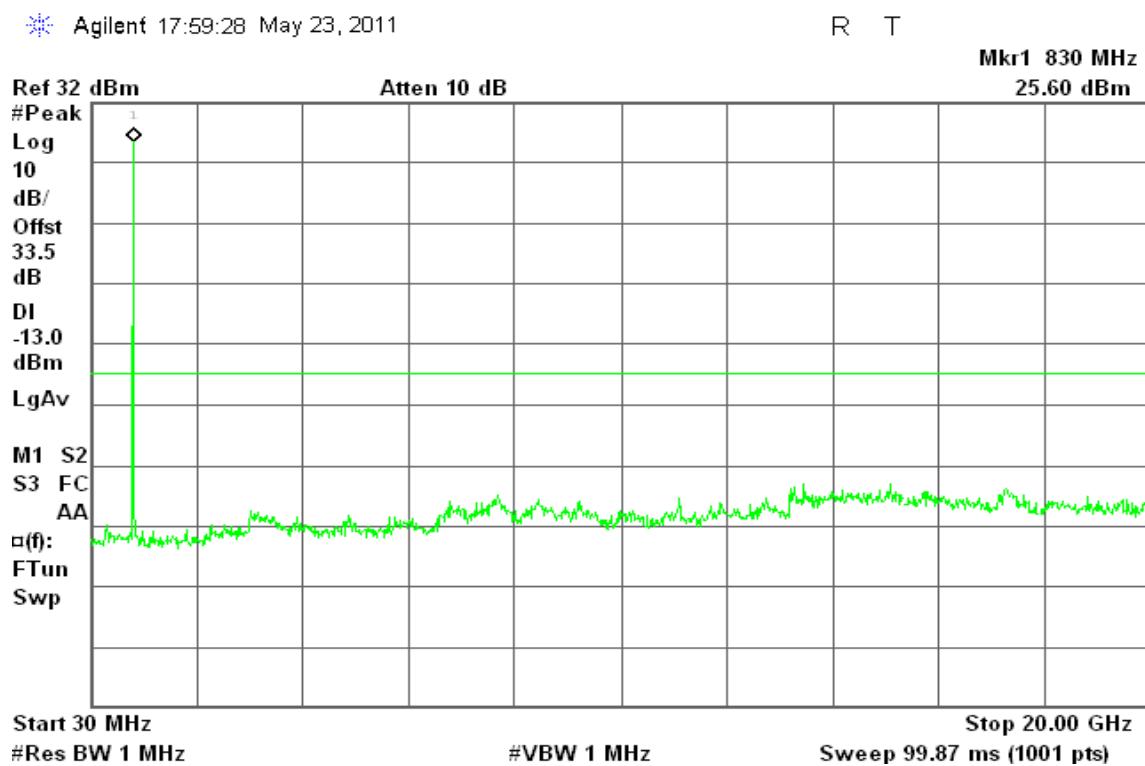




Figure 8-2: Out of Band emission at antenna terminals – CDMA2000 1xEVDO / CH Mid

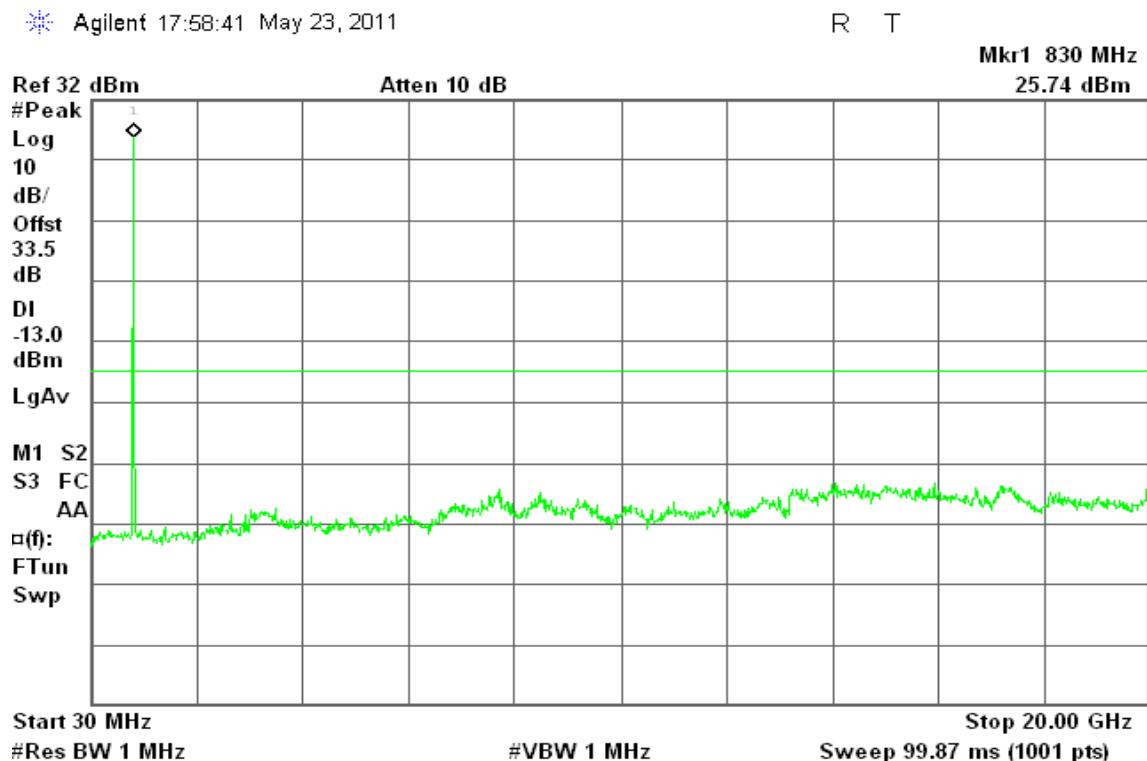
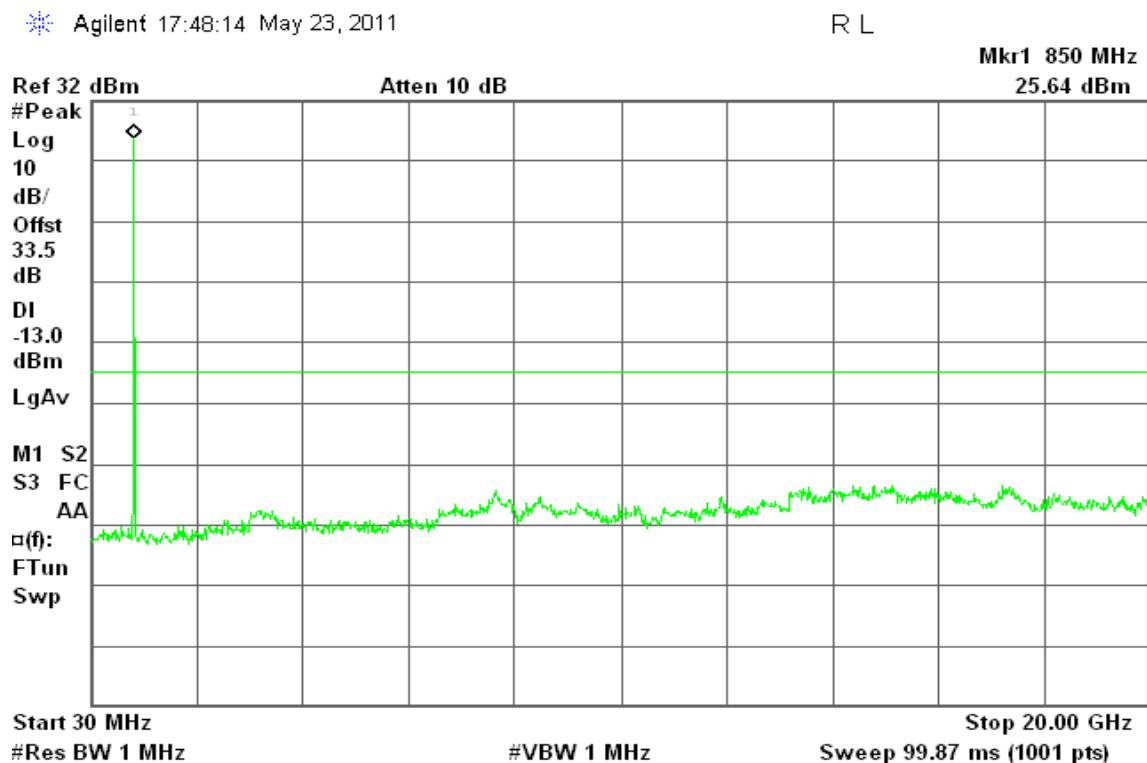


Figure 8-3: Out of Band emission at antenna terminals – CDMA2000 1xEVDO / CH High





## CDMA2000 1xRTT PCS

Figure 9-1: Out of Band emission at antenna terminals – CDMA2000 1xRTT / CH Low

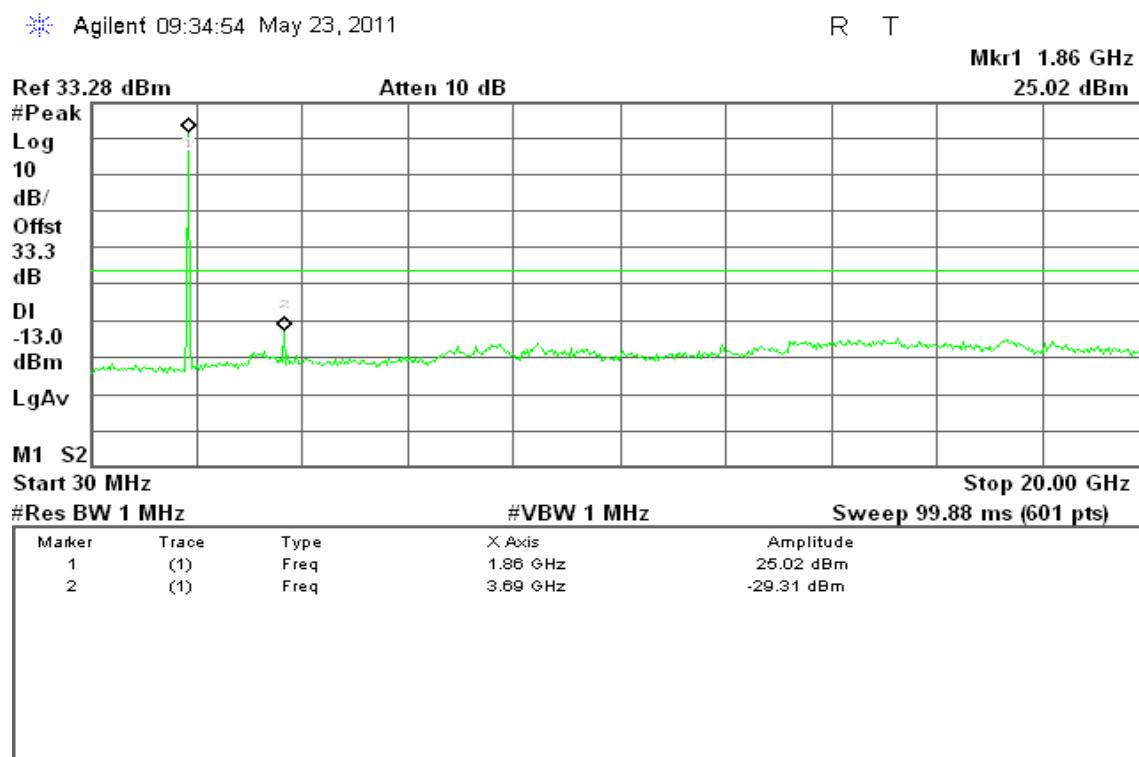


Figure 9-2: Out of Band emission at antenna terminals – CDMA2000 1xRTT / CH Mid

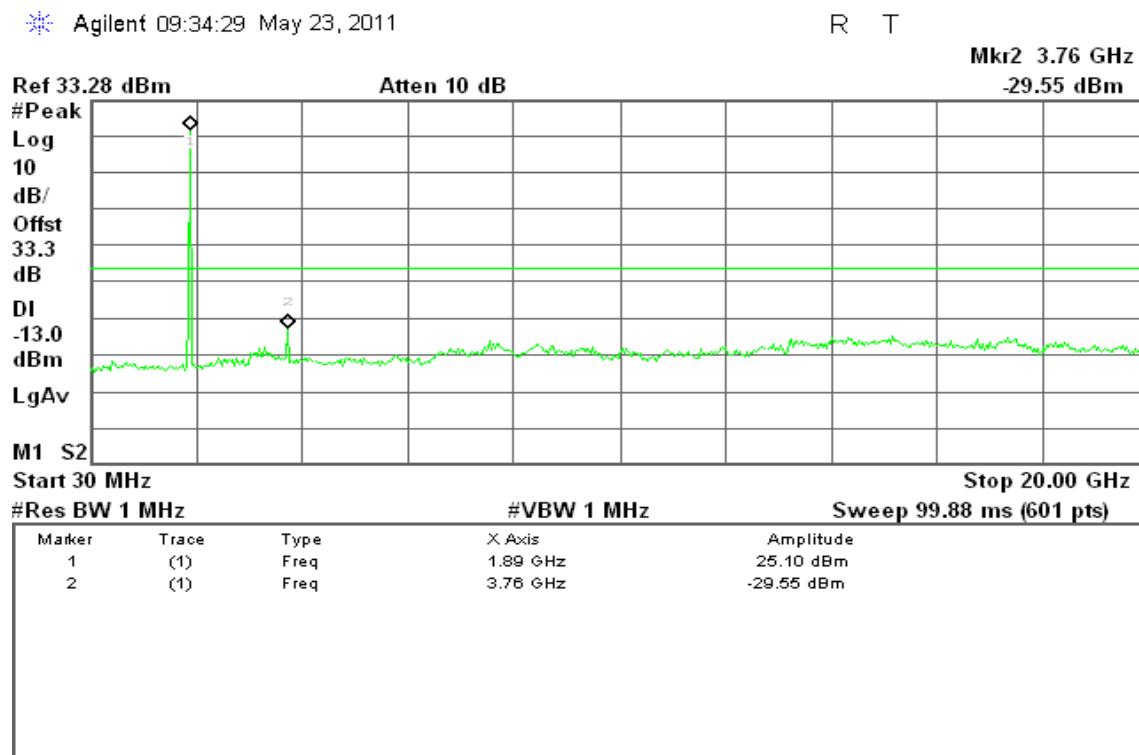
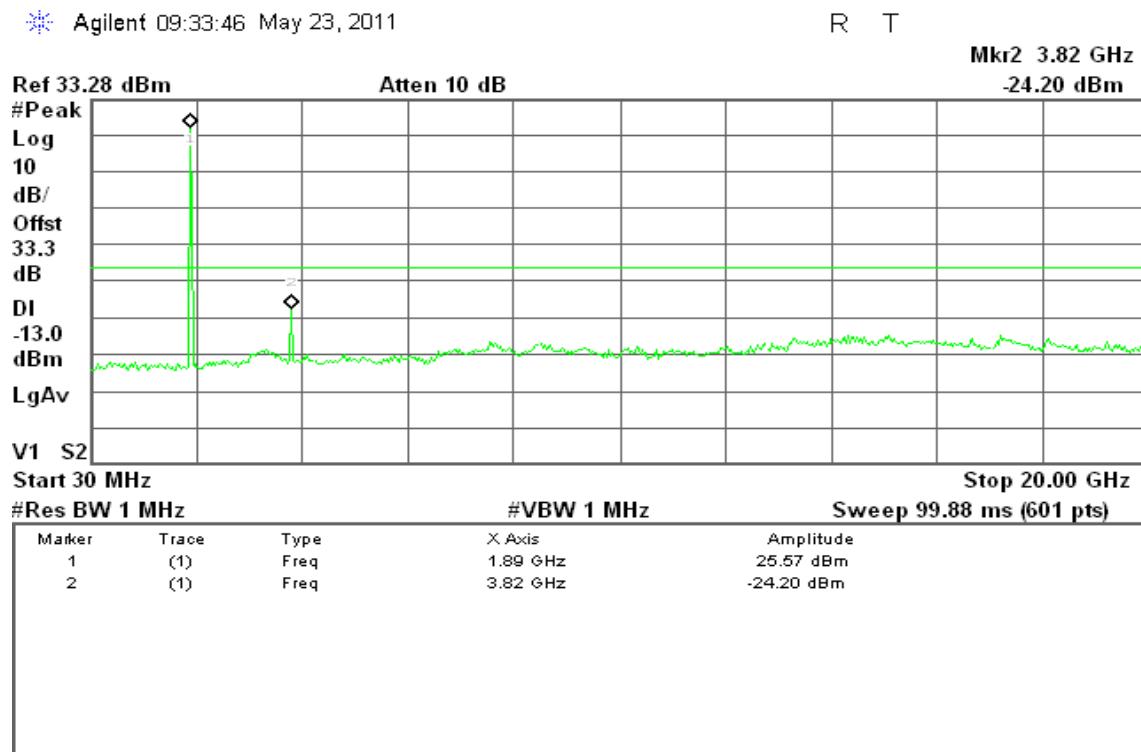




Figure 9-3: Out of Band emission at antenna terminals – CDMA2000 1xRTT / CH High



### CDMA2000 1xEVDO PCS

Figure 10-1: Out of Band emission at antenna terminals – CDMA2000 1xEVDO / CH Low

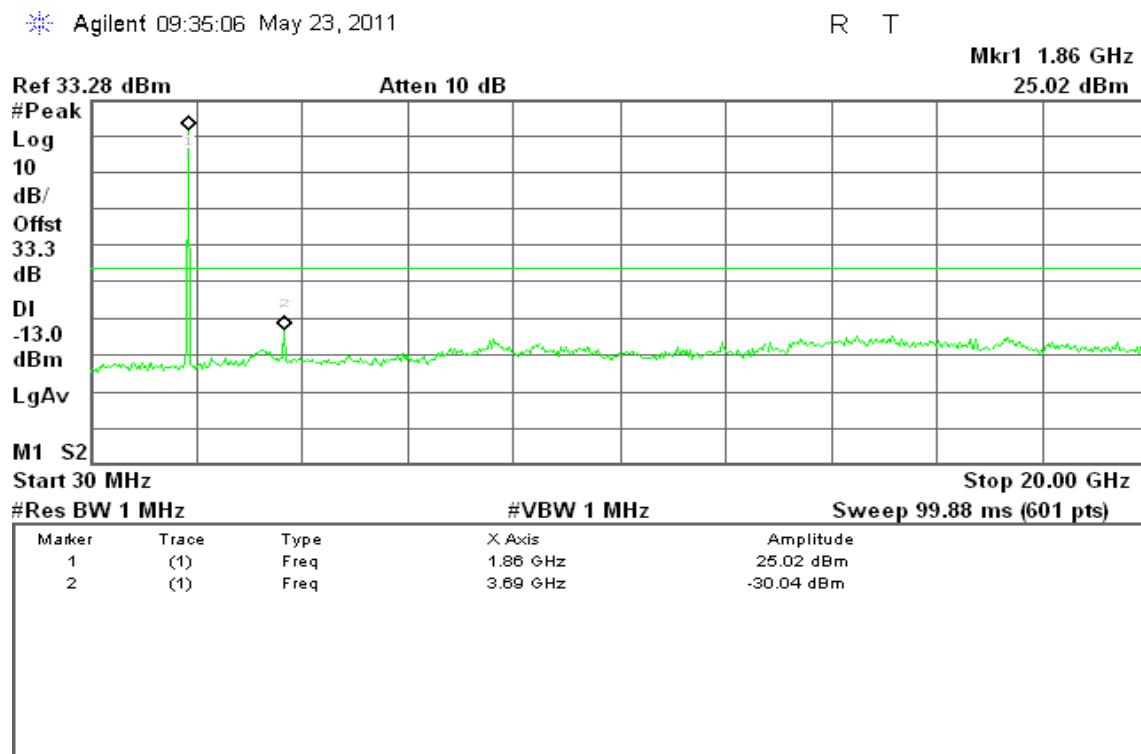




Figure 10-2: Out of Band emission at antenna terminals – CDMA2000 1xEVDO / CH Mid

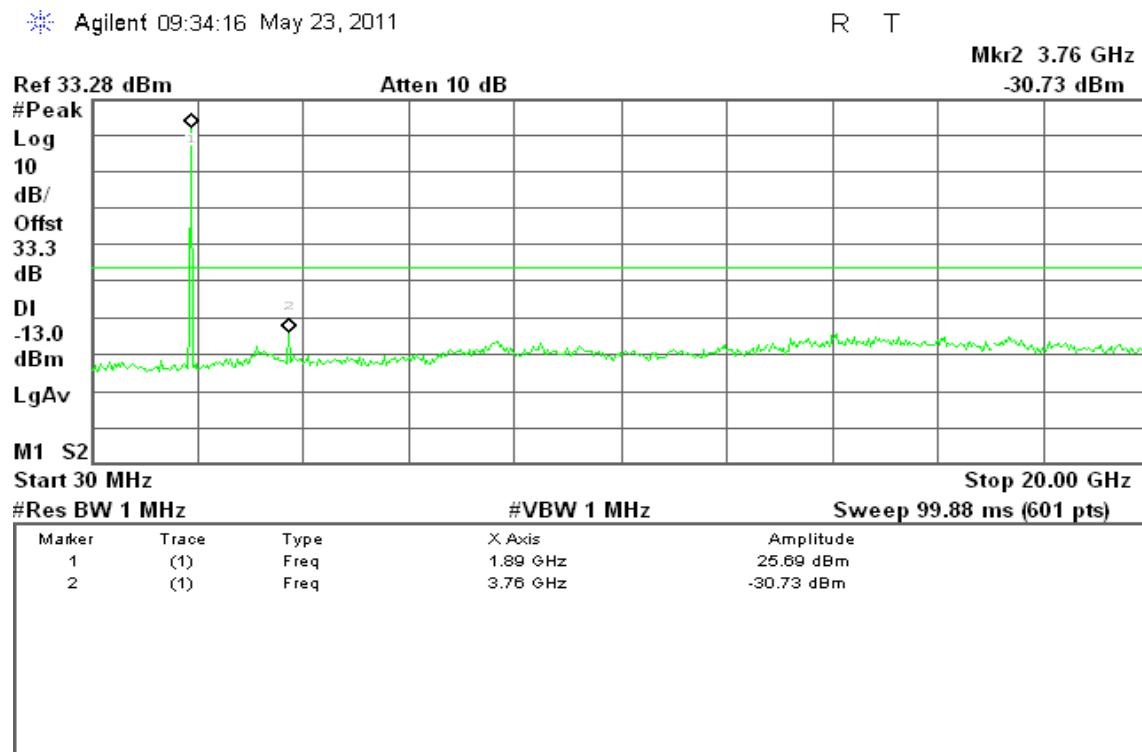
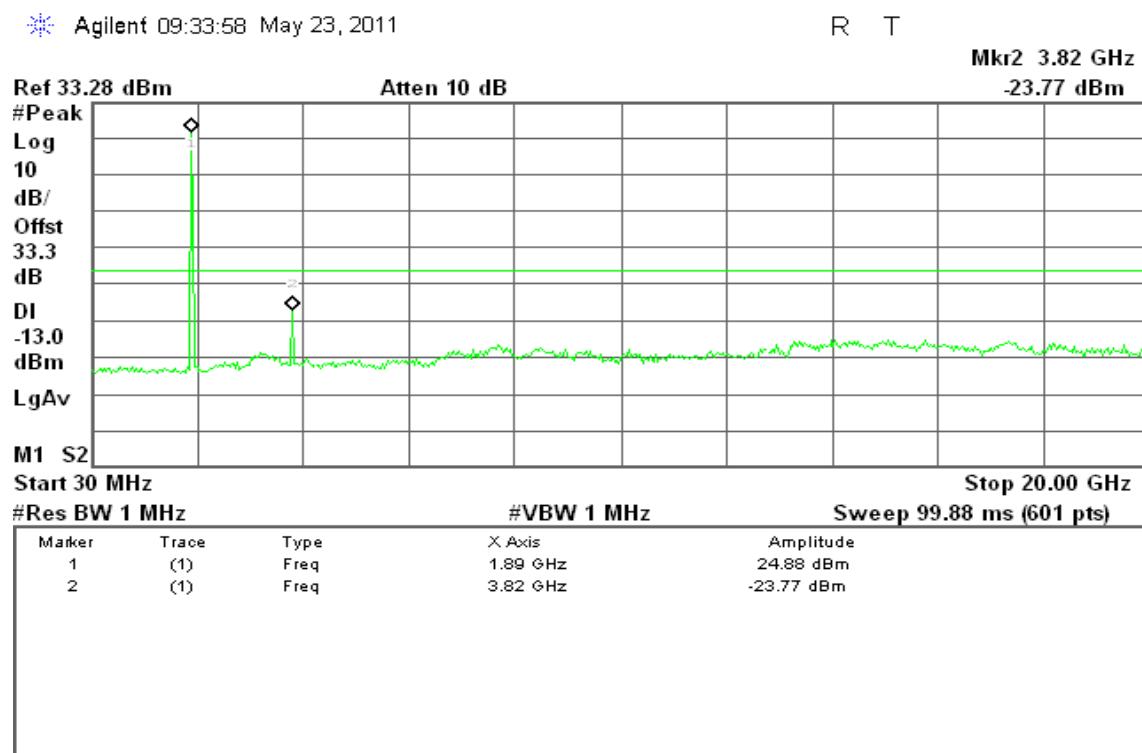


Figure 10-3: Out of Band emission at antenna terminals – CDMA2000 1xEVDO / CH High





## CDMA2000 1xRTT Cellular

Figure 11-1: Band Edge emissions – CDMA2000 1xRTT / CH Low

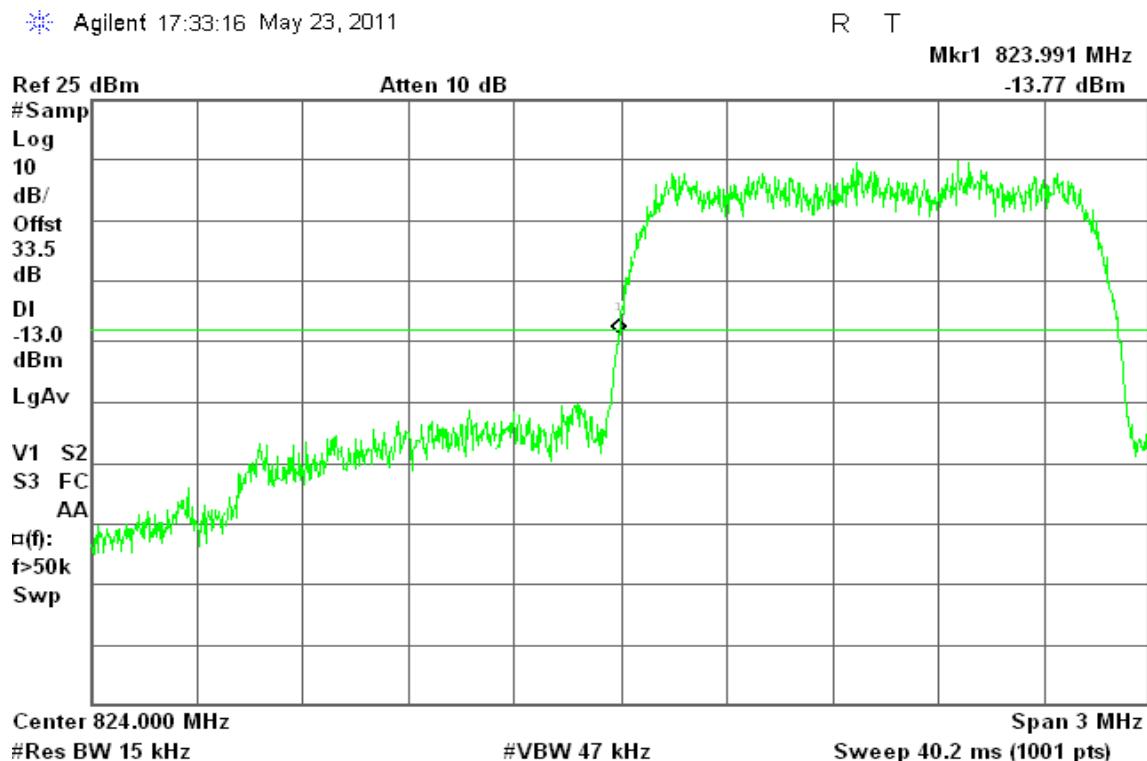
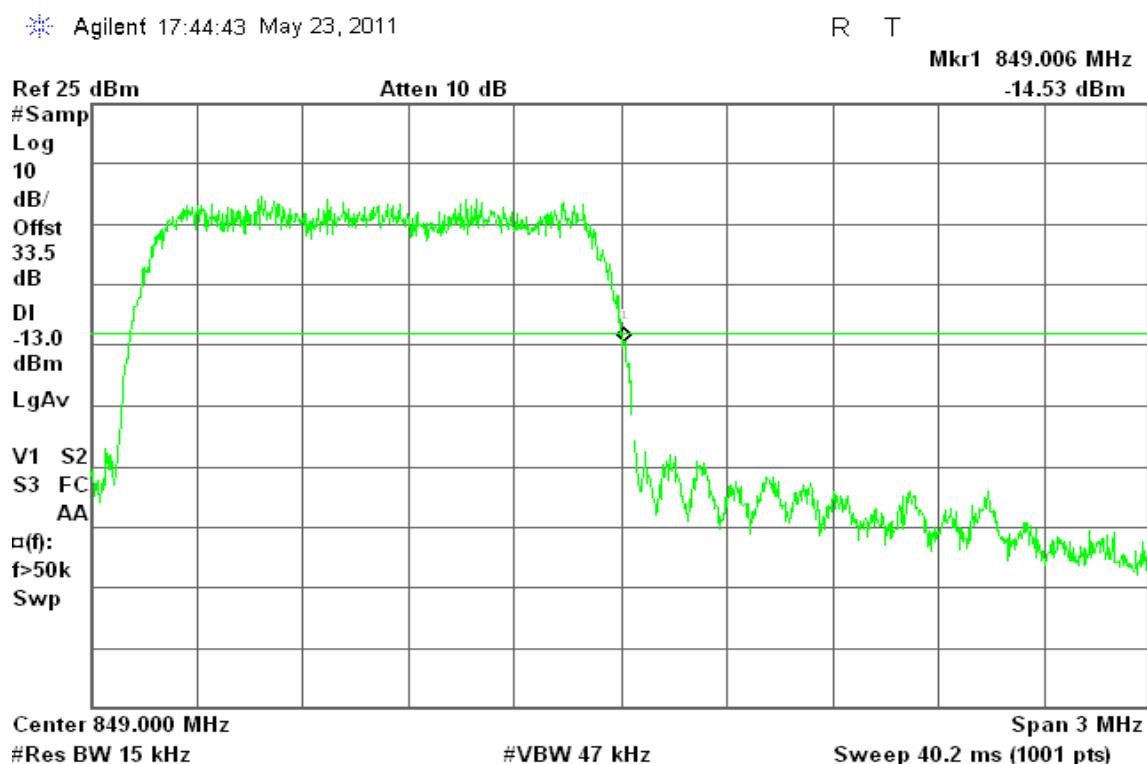


Figure 11-2: Band Edge emissions – CDMA2000 1xRTT / CH High





## CDMA2000 1xEVDO Cellular

Figure 12-1: Band Edge emissions – CDMA2000 1xEVDO / CH Low

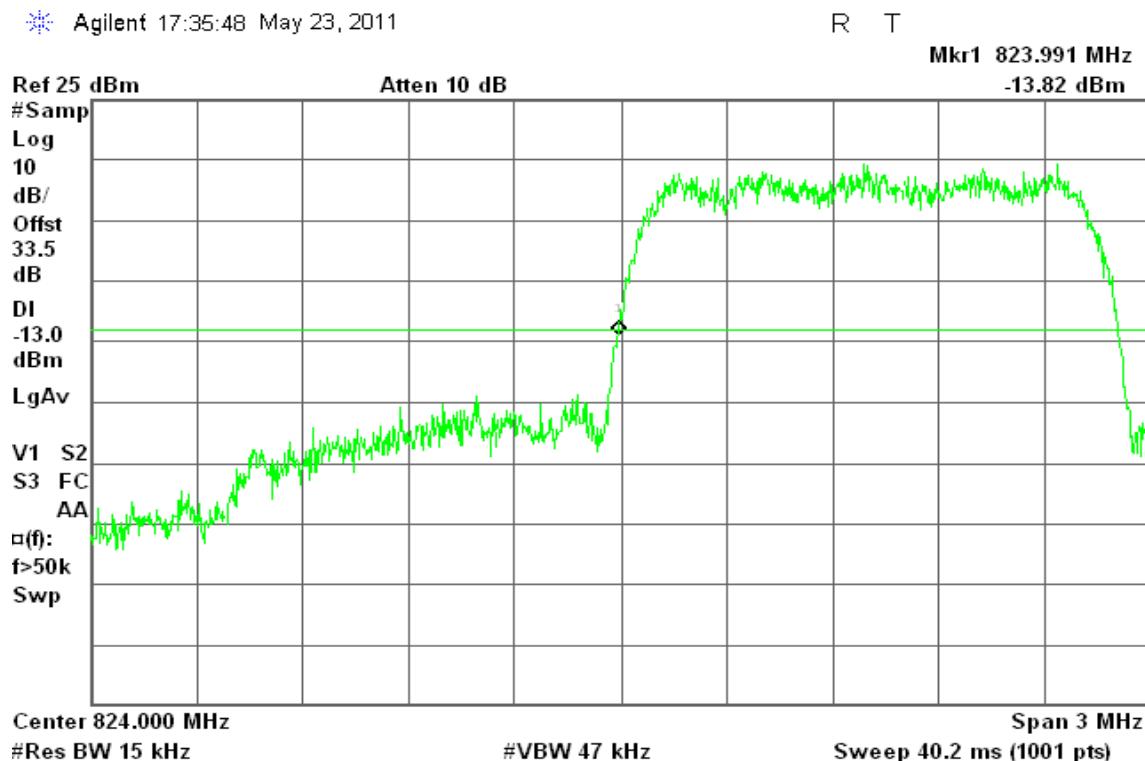
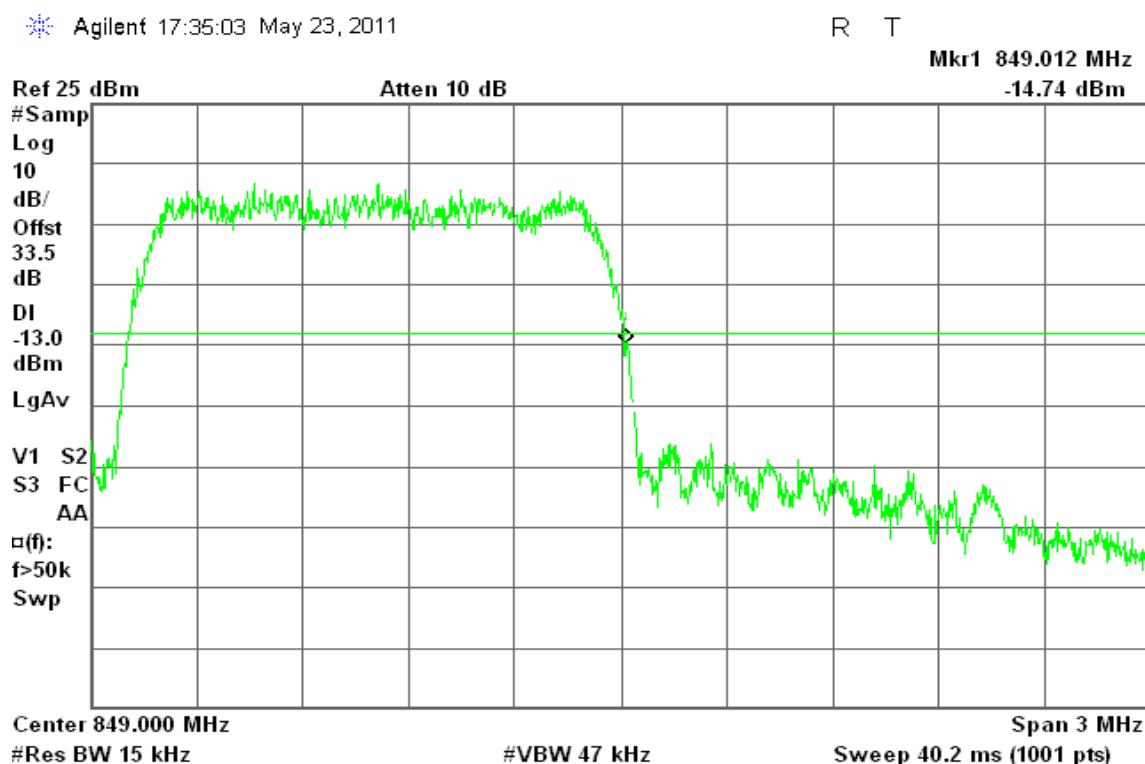


Figure 12-2: Band Edge emissions – CDMA2000 1xEVDO / CH High





## CDMA2000 1xRTT PCS

Figure 13-1: Band Edge emissions – CDMA2000 1xRTT / CH Low

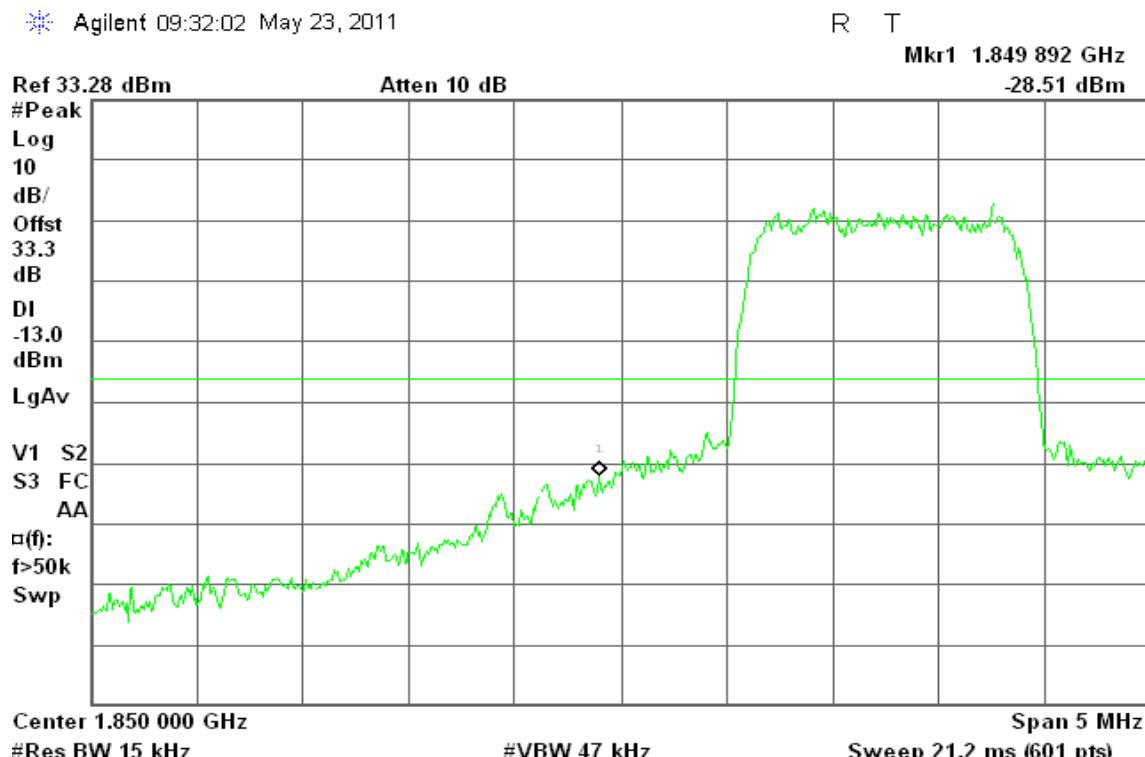
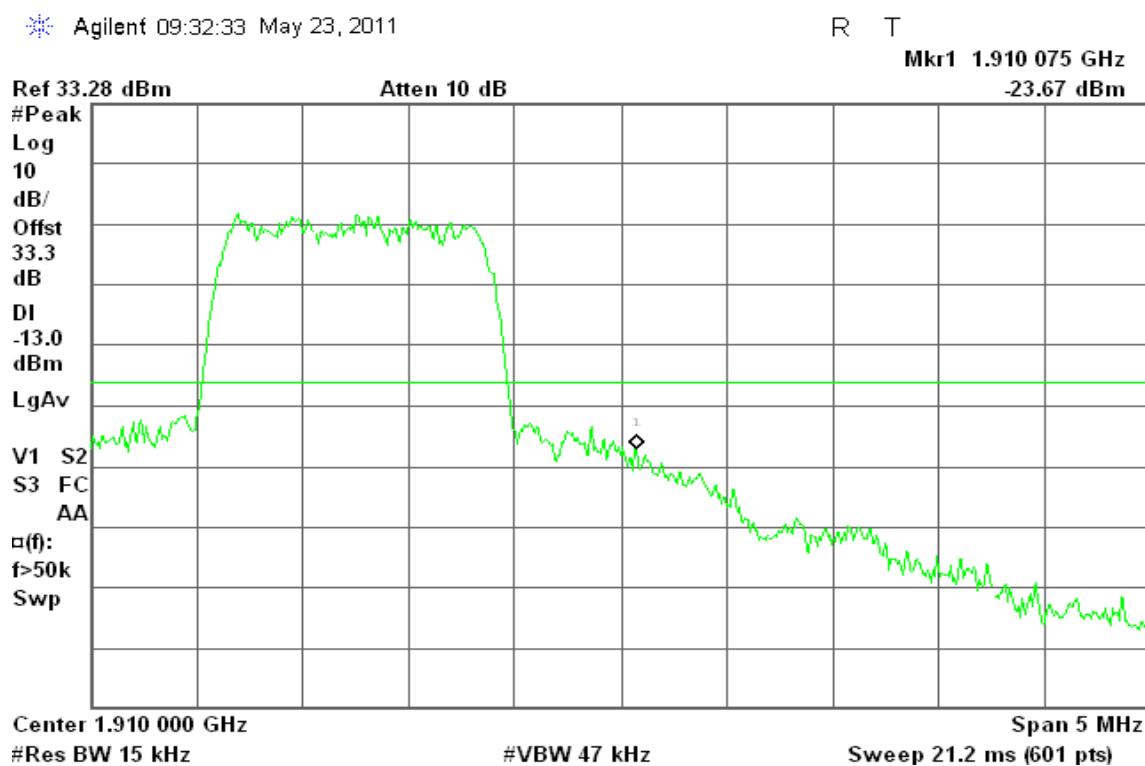


Figure 13-2: Band Edge emissions – CDMA2000 1xRTT / CH High





## CDMA2000 1xEVDO PCS

Figure 14-1: Band Edge emissions – CDMA2000 1xEVDO / CH Low

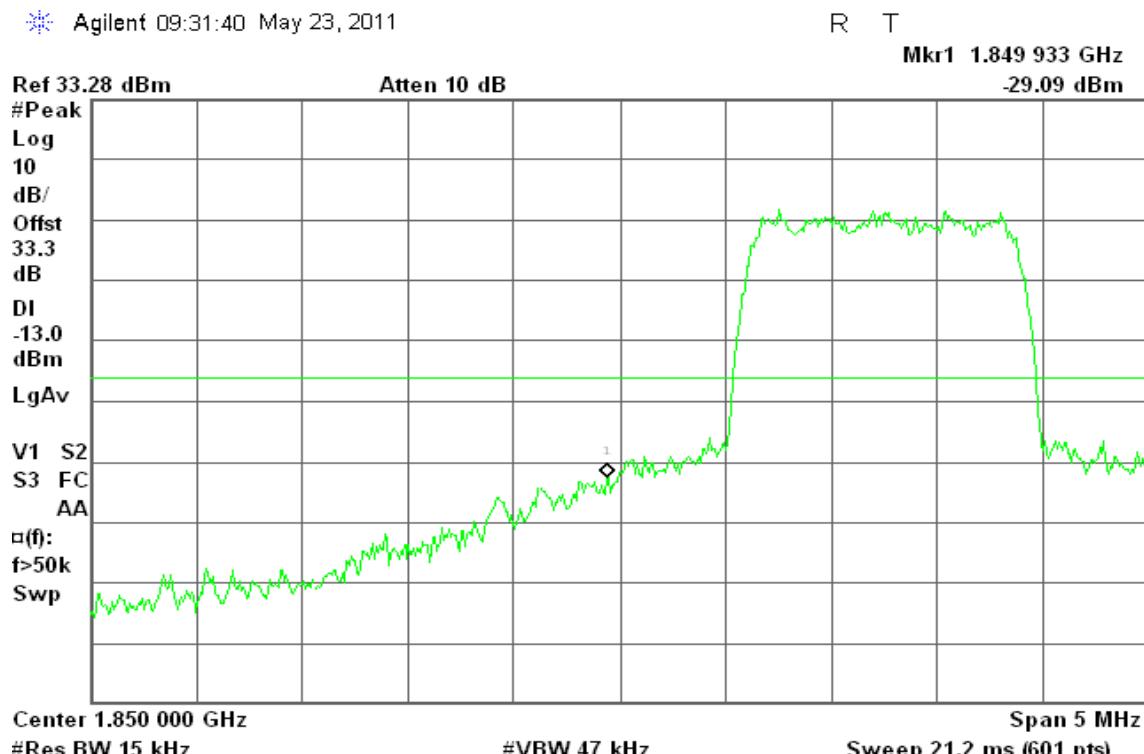
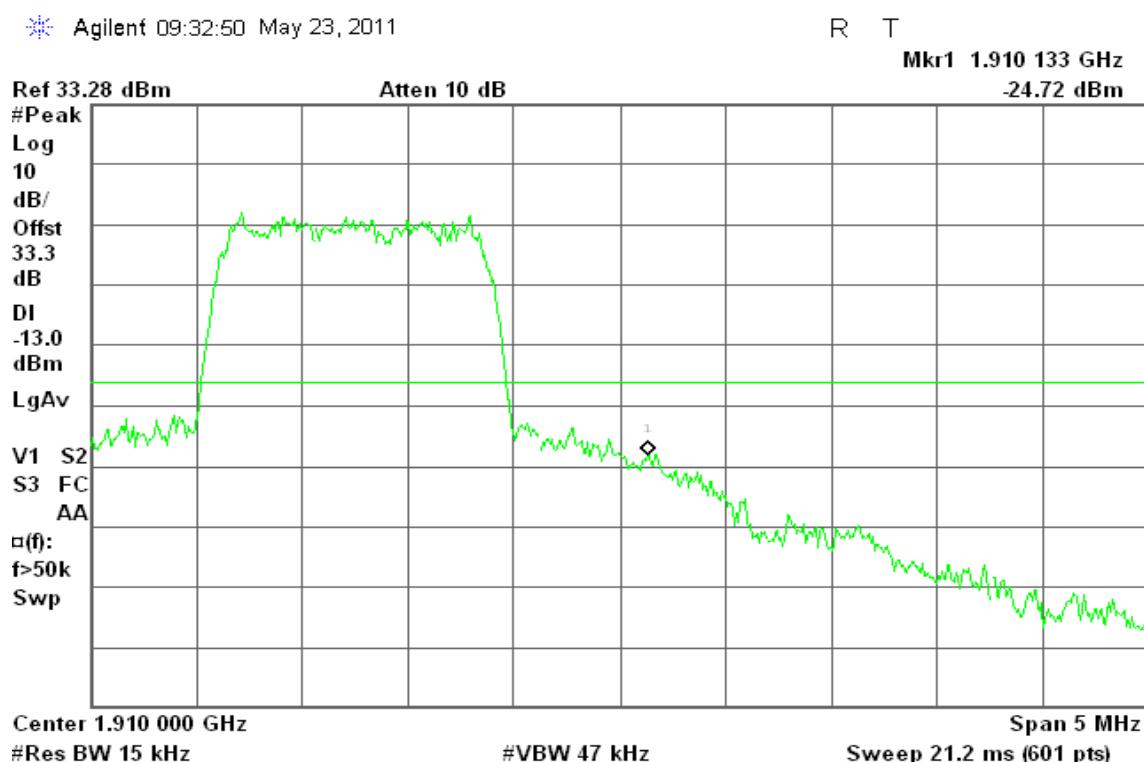


Figure 14-2: Band Edge emissions – CDMA2000 1xEVDO / CH High



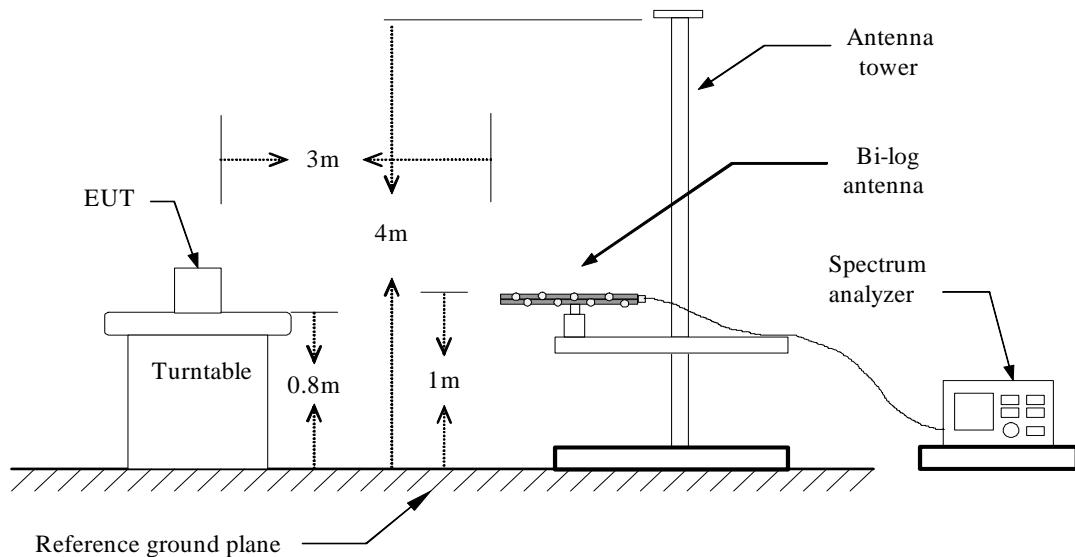
## 7.5 FIELD STRENGTH OF SPURIOUS RADIATION MEASUREMENT

### LIMIT

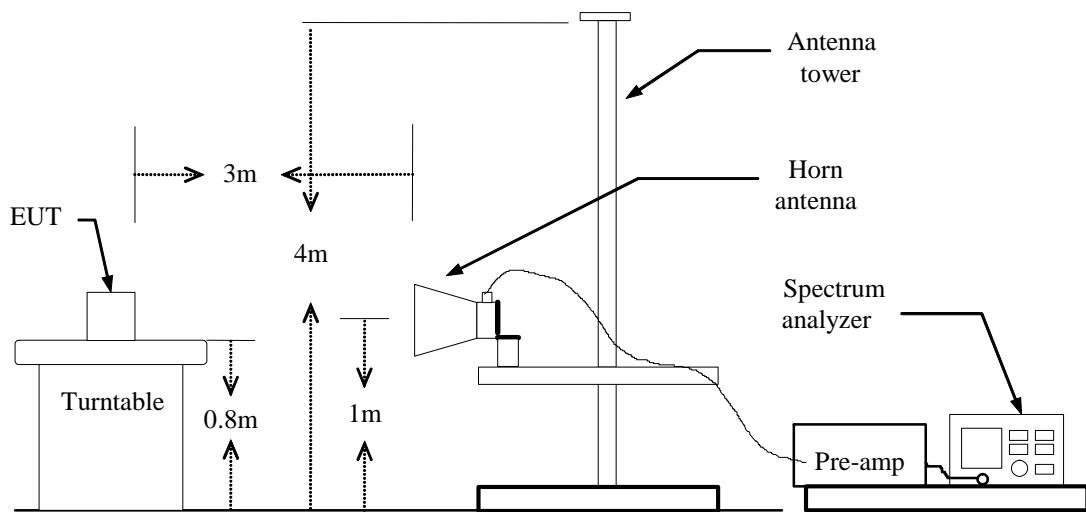
According to FCC §2.1053

### Test Configuration

#### Below 1 GHz

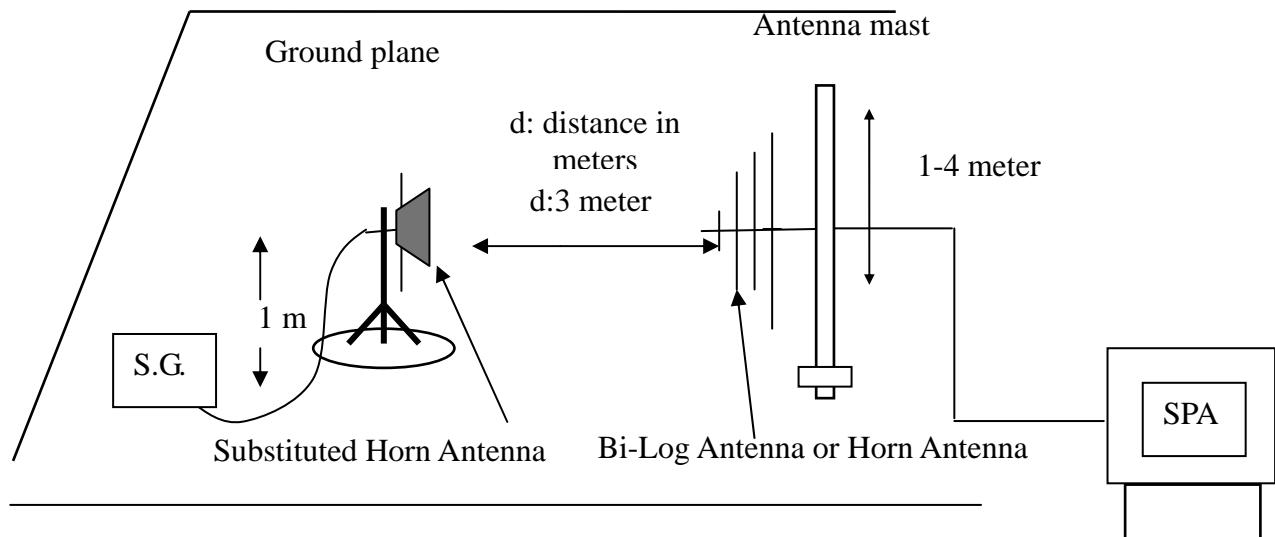


#### Above 1 GHz





## Substituted Method Test Set-up



## TEST PROCEDURE

The EUT was placed on a non-conductive, the measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.

The frequency range up to tenth harmonic was investigated for each of three fundamental frequency (low, middle and high channels). Once spurious emission were identified, the power of the emission was determined using the substitution method.

The spurious emissions attenuation was calculated as the difference between radiated power at the fundamental frequency and the spurious emissions frequency.

$$\text{ERP} = \text{S.G. output (dBm)} + \text{Antenna Gain (dBi)} - \text{Cable (dB)}$$

$$\text{EIRP} = \text{S.G. output (dBm)} + \text{Antenna Gain (dBi)} - \text{Cable (dB)}$$

## TEST RESULTS

*Refer to the attached tabular data sheets.*



### Radiated Spurious Emission Measurement Result

#### Below 1GHz

**Operation Mode:** CDMA2000 / 850 / TX / CH 1013

**Test Date:** May 17, 2011

**Temperature:** 26°C

**Tested by:** David Lee

**Humidity:** 50 % RH

**Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
168.2250	-66.85	1.55	2.32	-66.08	-13.00	-53.08	V
194.9000	-74.11	1.63	3.47	-72.27	-13.00	-59.27	V
265.2250	-75.92	1.95	5.34	-72.53	-13.00	-59.53	V
418.0000	-77.84	2.46	5.83	-74.47	-13.00	-61.47	V
485.9000	-76.07	2.65	5.66	-73.06	-13.00	-60.06	V
534.4000	-68.1	2.76	6.13	-64.73	-13.00	-51.73	V
624.1250	-72.52	2.96	6.15	-69.33	-13.00	-56.33	V
129.4250	-61.18	1.34	-1.47	-63.99	-13.00	-50.99	H
165.8000	-62.16	1.53	2.05	-61.64	-13.00	-48.64	H
194.9000	-66.69	1.63	3.47	-64.85	-13.00	-51.85	H
534.4000	-56.21	2.76	6.13	-52.84	-13.00	-39.84	H
481.0500	-66.79	2.64	5.52	-63.91	-13.00	-50.91	H
323.4250	-69.48	2.18	5.7	-65.96	-13.00	-52.96	H

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.

**Operation Mode:** CDMA2000 / 850 / TX / CH 384**Test Date:** May 17, 2011**Temperature:** 25°C**Tested by:** David Lee**Humidity:** 50 % RH**Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
168.2250	-67.67	1.55	2.32	-66.90	-13.00	-53.90	V
177.9250	-73.8	1.6	3.36	-72.04	-13.00	-59.04	V
267.6500	-77.38	1.96	5.22	-74.12	-13.00	-61.12	V
534.4000	-68.53	2.76	6.13	-65.16	-13.00	-52.16	V
565.9250	-74.52	2.86	6.05	-71.33	-13.00	-58.33	V
624.1250	-72.65	2.96	6.15	-69.46	-13.00	-56.46	V
129.4250	-67.45	1.34	-1.47	-70.26	-13.00	-57.26	V
<hr/>							
534.4000	-58.83	2.76	6.13	-55.46	-13.00	-42.46	H
481.0500	-69.14	2.64	5.52	-66.26	-13.00	-53.26	H
323.4250	-71.8	2.18	5.7	-68.28	-13.00	-55.28	H
168.2250	-64.99	1.55	2.32	-64.22	-13.00	-51.22	H
129.4250	-63.48	1.34	-1.47	-66.29	-13.00	-53.29	H
194.9000	-70.95	1.63	3.47	-69.11	-13.00	-56.11	H

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.

**Operation Mode:** CDMA2000 / 850 / TX / CH 777**Test Date:** May 17, 2011**Temperature:** 26°C**Tested by:** David Lee**Humidity:** 50 % RH**Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
165.8000	-68.13	1.53	2.05	-67.61	-13.00	-54.61	V
194.9000	-74.4	1.63	3.47	-72.56	-13.00	-59.56	V
143.9750	-68.22	1.41	0.13	-69.50	-13.00	-56.50	V
517.4250	-76.97	2.7	6.07	-73.60	-13.00	-60.60	V
534.4000	-69.8	2.76	6.13	-66.43	-13.00	-53.43	V
624.1250	-73.88	2.96	6.15	-70.69	-13.00	-57.69	V
168.2250	-68.14	1.55	2.32	-67.37	-13.00	-54.37	H
226.4250	-78.06	1.78	5.37	-74.47	-13.00	-61.47	H
323.4250	-74.4	2.18	5.7	-70.88	-13.00	-57.88	H
481.0500	-70.39	2.64	5.52	-67.51	-13.00	-54.51	H
534.4000	-60.89	2.76	6.13	-57.52	-13.00	-44.52	H
624.1250	-72.28	2.96	6.15	-69.09	-13.00	-56.09	H

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.

**Operation Mode:** CDMA2000 / 1900 / TX / CH 25**Temperature:** 26°C**Humidity:** 50 % RH**Test Date:** May 17, 2011**Tested by:** David Lee**Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
345.2500	-70.18	2.2	5.8	-66.58	-13.00	-53.58	V
413.1500	-62.89	2.45	5.88	-59.46	-13.00	-46.46	V
624.1250	-66.99	2.96	6.15	-63.80	-13.00	-50.80	V
677.4750	-67.06	3.08	6.45	-63.69	-13.00	-50.69	V
796.3000	-62.46	3.33	6.41	-59.38	-13.00	-46.38	V
922.4000	-63.68	3.58	6.55	-60.71	-13.00	-47.71	V
413.1500	-67.88	2.45	5.88	-64.45	-13.00	-51.45	H
481.0500	-72.7	2.64	5.52	-69.82	-13.00	-56.82	H
624.1250	-64.97	2.96	6.15	-61.78	-13.00	-48.78	H
721.1250	-69.36	3.17	6.5	-66.03	-13.00	-53.03	H
801.1500	-60.36	3.33	6.55	-57.14	-13.00	-44.14	H
961.2000	-62.88	3.67	6.38	-60.17	-13.00	-47.17	H

**Remark:**

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*

**Operation Mode:** CDMA2000 / 1900 / TX / CH 600**Test Date:** May 17, 2011**Temperature:** 26°C**Tested by:** David Lee**Humidity:** 50 % RH**Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
345.2500	-70.53	2.2	5.8	-66.93	-13.00	-53.93	V
413.1500	-63.3	2.45	5.88	-59.87	-13.00	-46.87	V
624.1250	-66.99	2.96	6.15	-63.80	-13.00	-50.80	V
677.4750	-66.49	3.08	6.45	-63.12	-13.00	-50.12	V
796.3000	-58.67	3.33	6.41	-55.59	-13.00	-42.59	V
910.2750	-62.62	3.57	6.6	-59.59	-13.00	-46.59	V
415.5750	-68.04	2.45	5.85	-64.64	-13.00	-51.64	H
481.0500	-71.68	2.64	5.52	-68.80	-13.00	-55.80	H
624.1250	-64.61	2.96	6.15	-61.42	-13.00	-48.42	H
677.4750	-69.11	3.08	6.45	-65.74	-13.00	-52.74	H
798.7250	-61.23	3.33	6.48	-58.08	-13.00	-45.08	H
961.2000	-62.56	3.67	6.38	-59.85	-13.00	-46.85	H

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.

**Operation Mode:** CDMA2000 / 1900 / TX / CH 1175**Test Date:** May 17, 2011**Temperature:** 26°C**Tested by:** David Lee**Humidity:** 50 % RH**Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
413.1500	-62.84	2.45	5.88	-59.41	-13.00	-46.41	V
534.4000	-71.73	2.76	6.13	-68.36	-13.00	-55.36	V
624.1250	-67.27	2.96	6.15	-64.08	-13.00	-51.08	V
677.4750	-67.56	3.08	6.45	-64.19	-13.00	-51.19	V
801.1500	-57.76	3.33	6.55	-54.54	-13.00	-41.54	V
917.5500	-62.38	3.58	6.6	-59.36	-13.00	-46.36	V
323.4250	-74.38	2.18	5.7	-70.86	-13.00	-57.86	H
413.1500	-68.33	2.45	5.88	-64.90	-13.00	-51.90	H
481.0500	-71.96	2.64	5.52	-69.08	-13.00	-56.08	H
624.1250	-64.36	2.96	6.15	-61.17	-13.00	-48.17	H
796.3000	-61.81	3.33	6.41	-58.73	-13.00	-45.73	H
961.2000	-62.37	3.67	6.38	-59.66	-13.00	-46.66	H

**Remark:**

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*

**Operation Mode:** EVDO / 850 / TX / CH 1013**Test Date:** May 17, 2011**Temperature:** 26°C**Tested by:** David Lee**Humidity:** 50 % RH**Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
165.8000	-66.52	1.53	2.05	-66.00	-13.00	-53.00	V
146.4000	-67.81	1.41	0.35	-68.87	-13.00	-55.87	V
194.9000	-73.15	1.63	3.47	-71.31	-13.00	-58.31	V
534.4000	-66.41	2.76	6.13	-63.04	-13.00	-50.04	V
580.4750	-74.6	2.89	6.01	-71.48	-13.00	-58.48	V
624.1250	-73.22	2.96	6.15	-70.03	-13.00	-57.03	V
129.4250	-62.43	1.34	-1.47	-65.24	-13.00	-52.24	H
165.8000	-63.44	1.53	2.05	-62.92	-13.00	-49.92	H
194.9000	-69.47	1.63	3.47	-67.63	-13.00	-54.63	H
534.4000	-58.35	2.76	6.13	-54.98	-13.00	-41.98	H
481.0500	-68.2	2.64	5.52	-65.32	-13.00	-52.32	H
323.4250	-71.14	2.18	5.7	-67.62	-13.00	-54.62	H
624.1250	-69.94	2.96	6.15	-66.75	-13.00	-53.75	H

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.

**Operation Mode:** EVDO / 850 / TX / CH 384**Test Date:** May 17, 2011**Temperature:** 26°C**Tested by:** David Lee**Humidity:** 50 % RH**Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
534.4000	-68.03	2.76	6.13	-64.66	-13.00	-51.66	V
624.1250	-74.34	2.96	6.15	-71.15	-13.00	-58.15	V
168.2250	-68.31	1.55	2.32	-67.54	-13.00	-54.54	V
146.4000	-69.39	1.41	0.35	-70.45	-13.00	-57.45	V
194.9000	-73.45	1.63	3.47	-71.61	-13.00	-58.61	V
323.4250	-79.43	2.18	5.7	-75.91	-13.00	-62.91	V
534.4000	-59.22	2.76	6.13	-55.85	-13.00	-42.85	H
481.0500	-69.35	2.64	5.52	-66.47	-13.00	-53.47	H
359.8000	-73.98	2.27	5.7	-70.55	-13.00	-57.55	H
323.4250	-72.02	2.18	5.7	-68.50	-13.00	-55.50	H
160.9500	-66.1	1.49	1.5	-66.09	-13.00	-53.09	H
129.4250	-65.54	1.34	-1.47	-68.35	-13.00	-55.35	H

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.

**Operation Mode:** EVDO / 850 / TX / CH 777**Test Date:** May 17, 2011**Temperature:** 26°C**Tested by:** David Lee**Humidity:** 50 % RH**Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
168.2250	-68.9	1.55	2.32	-68.13	-13.00	-55.13	V
194.9000	-74.15	1.63	3.47	-72.31	-13.00	-59.31	V
534.4000	-69.05	2.76	6.13	-65.68	-13.00	-52.68	V
565.9250	-75.6	2.86	6.05	-72.41	-13.00	-59.41	V
624.1250	-74.11	2.96	6.15	-70.92	-13.00	-57.92	V
483.4750	-75.73	2.65	5.59	-72.79	-13.00	-59.79	V
534.4000	-60.47	2.76	6.13	-57.10	-13.00	-44.10	H
624.1250	-71.43	2.96	6.15	-68.24	-13.00	-55.24	H
481.0500	-70.82	2.64	5.52	-67.94	-13.00	-54.94	H
359.8000	-75.97	2.27	5.7	-72.54	-13.00	-59.54	H
323.4250	-74.64	2.18	5.7	-71.12	-13.00	-58.12	H
168.2250	-66.97	1.55	2.32	-66.20	-13.00	-53.20	H
129.4250	-65.53	1.34	-1.47	-68.34	-13.00	-55.34	H

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.

**Operation Mode:** EVDO / 1900 / TX / CH 25**Test Date:** May 17, 2011**Temperature:** 26°C**Tested by:** David Lee**Humidity:** 50 % RH**Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
345.2500	-70.04	2.2	5.8	-66.44	-13.00	-53.44	V
413.1500	-64.98	2.45	5.88	-61.55	-13.00	-48.55	V
624.1250	-67.17	2.96	6.15	-63.98	-13.00	-50.98	V
675.0500	-67.03	3.08	6.4	-63.71	-13.00	-50.71	V
801.1500	-59.57	3.33	6.55	-56.35	-13.00	-43.35	V
927.2500	-62.46	3.6	6.46	-59.60	-13.00	-46.60	V
413.1500	-61.6	2.45	5.88	-58.17	-13.00	-45.17	H
481.0500	-65.71	2.64	5.52	-62.83	-13.00	-49.83	H
624.1250	-60.27	2.96	6.15	-57.08	-13.00	-44.08	H
677.4750	-65.25	3.08	6.45	-61.88	-13.00	-48.88	H
798.7250	-58.05	3.33	6.48	-54.90	-13.00	-41.90	H
961.2000	-59.42	3.67	6.38	-56.71	-13.00	-43.71	H

**Remark:**

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*

**Operation Mode:** EVDO / 1900 / TX / CH 600**Test Date:** May 17, 2011**Temperature:** 26°C**Tested by:** David Lee**Humidity:** 50 % RH**Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
345.2500	-70.23	2.2	5.8	-66.63	-13.00	-53.63	V
410.7250	-62.51	2.45	5.9	-59.06	-13.00	-46.06	V
624.1250	-66.33	2.96	6.15	-63.14	-13.00	-50.14	V
675.0500	-66.75	3.08	6.4	-63.43	-13.00	-50.43	V
801.1500	-58.33	3.33	6.55	-55.11	-13.00	-42.11	V
922.4000	-63.52	3.58	6.55	-60.55	-13.00	-47.55	V
170.6500	-68.55	1.57	2.59	-67.53	-13.00	-54.53	H
345.2500	-68.83	2.2	5.8	-65.23	-13.00	-52.23	H
413.1500	-61.86	2.45	5.88	-58.43	-13.00	-45.43	H
624.1250	-60.74	2.96	6.15	-57.55	-13.00	-44.55	H
801.1500	-61.59	3.33	6.55	-58.37	-13.00	-45.37	H
961.2000	-59.63	3.67	6.38	-56.92	-13.00	-43.92	H

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.

**Operation Mode:** EVDO / 1900 / TX / CH 1175**Test Date:** May 17, 2011**Temperature:** 26°C**Tested by:** David Lee**Humidity:** 50 % RH**Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
345.2500	-69.93	2.2	5.8	-66.33	-13.00	-53.33	V
413.1500	-62.45	2.45	5.88	-59.02	-13.00	-46.02	V
624.1250	-66.64	2.96	6.15	-63.45	-13.00	-50.45	V
675.0500	-67.1	3.08	6.4	-63.78	-13.00	-50.78	V
798.7250	-63.47	3.33	6.48	-60.32	-13.00	-47.32	V
917.5500	-63	3.58	6.6	-59.98	-13.00	-46.98	V
<hr/>							
345.2500	-70.18	2.2	5.8	-66.58	-13.00	-53.58	H
413.1500	-62.23	2.45	5.88	-58.80	-13.00	-45.80	H
481.0500	-66.38	2.64	5.52	-63.50	-13.00	-50.50	H
624.1250	-60.56	2.96	6.15	-57.37	-13.00	-44.37	H
796.3000	-59.08	3.33	6.41	-56.00	-13.00	-43.00	H
961.2000	-59.63	3.67	6.38	-56.92	-13.00	-43.92	H

**Remark:**

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*

**Above 1GHz****Operation Mode:** CDMA2000 / 850 / TX / CH 1013**Test Date:** May 17, 2011**Temperature:** 26°C**Tested by:** David Lee**Humidity:** 50 % RH**Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
1647.500	-43.12	5.04	6.03	-42.13	-13.00	-29.13	V
1507.500	-51.41	4.87	6.29	-49.99	-13.00	-36.99	V
2487.500	-40.05	6.33	6.08	-40.30	-13.00	-27.30	V
1857.500	-46.69	5.38	5.66	-46.41	-13.00	-33.41	V
2137.500	-48.82	5.84	5.59	-49.07	-13.00	-36.07	V
3730.000	-52.63	8.22	9.13	-51.72	-13.00	-38.72	V
1647.500	-48.62	5.04	6.03	-47.63	-13.00	-34.63	H
1875.000	-53.17	5.41	5.63	-52.95	-13.00	-39.95	H
2137.500	-48.28	5.84	5.59	-48.53	-13.00	-35.53	H
2487.500	-47.15	6.33	6.08	-47.40	-13.00	-34.40	H
N/A							

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.

**Operation Mode:** CDMA2000 / 850 / TX / CH 384**Test Date:** May 17, 2011**Temperature:** 26°C**Tested by:** David Lee**Humidity:** 50 % RH**Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
1682.500	-45.21	5.09	5.97	-44.33	-13.00	-31.33	V
2522.500	-40.86	6.38	6.16	-41.08	-13.00	-28.08	V
4185.000	-46.14	8.49	9.55	-45.08	-13.00	-32.08	V
2137.500	-47.17	5.84	5.59	-47.42	-13.00	-34.42	V
1875.000	-48.55	5.41	5.63	-48.33	-13.00	-35.33	V
N/A							
1682.500	-50.5	5.09	5.97	-49.62	-13.00	-36.62	H
1875.000	-53.63	5.41	5.63	-53.41	-13.00	-40.41	H
2137.500	-48.14	5.84	5.59	-48.39	-13.00	-35.39	H
2522.500	-48.21	6.38	6.16	-48.43	-13.00	-35.43	H
N/A							

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.

**Operation Mode:** CDMA2000 / 850 / TX / CH 777**Test Date:** May 17, 2011**Temperature:** 26°C**Tested by:** David Lee**Humidity:** 50 % RH**Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
1700.000	-45.6	5.11	5.94	-44.77	-13.00	-31.77	V
1875.000	-51.73	5.41	5.63	-51.51	-13.00	-38.51	V
2137.500	-49.36	5.84	5.59	-49.61	-13.00	-36.61	V
2557.500	-44.63	6.43	6.25	-44.81	-13.00	-31.81	V
4255.000	-44.4	8.55	9.6	-43.35	-13.00	-30.35	V
N/A							
2137.500	-48.89	5.84	5.59	-49.14	-13.00	-36.14	H
1875.000	-55.65	5.41	5.63	-55.43	-13.00	-42.43	H
1700.000	-57.13	5.11	5.94	-56.30	-13.00	-43.30	H
1455.000	-58.88	4.76	5.98	-57.66	-13.00	-44.66	H
N/A							

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.



**Operation Mode:** CDMA2000 / 1900 / TX / CH 25

**Temperature:** 26°C

**Humidity:** 50 % RH

**Test Date:** May 17, 2011

**Tested by:** David Lee

**Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
3730.000	-53.16	8.22	9.13	-52.25	-13.00	-39.25	V
N/A							
3887.500	-52.29	8.37	9.29	-51.37	-13.00	-38.37	H
N/A							

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.



**Operation Mode:** CDMA2000 / 1900 / TX / CH 600

**Test Date:** May 17, 2011

**Temperature:** 26°C

**Tested by:** David Lee

**Humidity:** 50 % RH

**Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
3765.000	-48.44	8.24	9.16	-47.52	-13.00	-34.52	V
5637.500	-51.17	10.18	10.83	-50.52	-13.00	-37.52	V
N/A							
3765.000	-53.08	8.24	9.16	-52.16	-13.00	-39.16	H
N/A							

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.



**Operation Mode:** CDMA2000 / 1900 / TX / CH 1175

**Test Date:** May 17, 2011

**Temperature:** 26°C

**Tested by:** David Lee

**Humidity:** 50 % RH

**Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
3730.000	-54.65	8.22	9.13	-53.74	-13.00	-40.74	V
N/A							
4605.000	-53.53	9.13	9.97	-52.69	-13.00	-39.69	H
N/A							

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.

**Operation Mode:** EVDO / 850 / TX / CH 1013**Test Date:** May 17, 2011**Temperature:** 26°C**Tested by:** David Lee**Humidity:** 50 % RH**Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
1647.500	-43.63	5.04	6.03	-42.64	-13.00	-29.64	V
1490.000	-50.72	4.84	6.23	-49.33	-13.00	-36.33	V
1875.000	-49.66	5.41	5.63	-49.44	-13.00	-36.44	V
2137.500	-48.5	5.84	5.59	-48.75	-13.00	-35.75	V
2487.500	-51.78	6.33	6.08	-52.03	-13.00	-39.03	V
N/A							
1647.500	-49.84	5.04	6.03	-48.85	-13.00	-35.85	H
1875.000	-53.17	5.41	5.63	-52.95	-13.00	-39.95	H
2137.500	-49.42	5.84	5.59	-49.67	-13.00	-36.67	H
N/A							

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.

**Operation Mode:** EVDO / 850 / TX / CH 384**Test Date:** May 17, 2011**Temperature:** 26°C**Tested by:** David Lee**Humidity:** 50 % RH**Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
1682.500	-45.94	5.09	5.97	-45.06	-13.00	-32.06	V
1875.000	-50.02	5.41	5.63	-49.80	-13.00	-36.80	V
2137.500	-49.2	5.84	5.59	-49.45	-13.00	-36.45	V
2522.500	-49.55	6.38	6.16	-49.77	-13.00	-36.77	V
4185.000	-51.49	8.49	9.55	-50.43	-13.00	-37.43	V
1507.500	-56.76	4.87	6.29	-55.34	-13.00	-42.34	V
1682.500	-50.8	5.09	5.97	-49.92	-13.00	-36.92	H
2137.500	-48.68	5.84	5.59	-48.93	-13.00	-35.93	H
1857.500	-54.55	5.38	5.66	-54.27	-13.00	-41.27	H
1455.000	-58.11	4.76	5.98	-56.89	-13.00	-43.89	H
N/A							

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.

**Operation Mode:** EVDO / 850 / TX / CH 777**Test Date:** May 17, 2011**Temperature:** 26°C**Tested by:** David Lee**Humidity:** 50 % RH**Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
1700.000	-41.52	5.11	5.94	-40.69	-13.00	-27.69	V
1875.000	-47.77	5.41	5.63	-47.55	-13.00	-34.55	V
2137.500	-47.96	5.84	5.59	-48.21	-13.00	-35.21	V
2557.500	-35.23	6.43	6.25	-35.41	-13.00	-22.41	V
4255.000	-39.71	8.55	9.6	-38.66	-13.00	-25.66	V
1437.500	-54.77	4.72	5.85	-53.64	-13.00	-40.64	V
1700.000	-48.13	5.11	5.94	-47.30	-13.00	-34.30	H
2137.500	-48.85	5.84	5.59	-49.10	-13.00	-36.10	H
2557.500	-44.28	6.43	6.25	-44.46	-13.00	-31.46	H
4255.000	-50.09	8.55	9.6	-49.04	-13.00	-36.04	H
1875.000	-54.8	5.41	5.63	-54.58	-13.00	-41.58	H
N/A							

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.



**Operation Mode:** EVDO / 1900 / TX / CH 25

**Temperature:** 26°C

**Humidity:** 50 % RH

**Test Date:** May 17, 2011

**Tested by:** David Lee

**Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
3730.000	-54.11	8.22	9.13	-53.20	-13.00	-40.20	V
N/A							
3485.000	-56.29	7.83	8.86	-55.26	-13.00	-42.26	H
N/A							

**Remark:**

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*



**Operation Mode:** EVDO / 1900 / TX / CH 600

**Test Date:** May 17, 2011

**Temperature:** 26°C

**Tested by:** David Lee

**Humidity:** 50 % RH

**Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
3765.000	-49.21	8.24	9.16	-48.29	-13.00	-35.29	V
5655.000	-51.89	10.17	10.83	-51.23	-13.00	-38.23	V
N/A							
3765.000	-54.22	8.24	9.16	-53.30	-13.00	-40.30	H
N/A							

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.



**Operation Mode:** EVDO / 1900 / TX / CH 1175

**Test Date:** May 17, 2011

**Temperature:** 26°C

**Tested by:** David Lee

**Humidity:** 50 % RH

**Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
3730.000	-52.91	8.22	9.13	-52.00	-13.00	-39.00	V
N/A							
3835.000	-54.58	8.31	9.23	-53.66	-13.00	-40.66	H
N/A							

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.



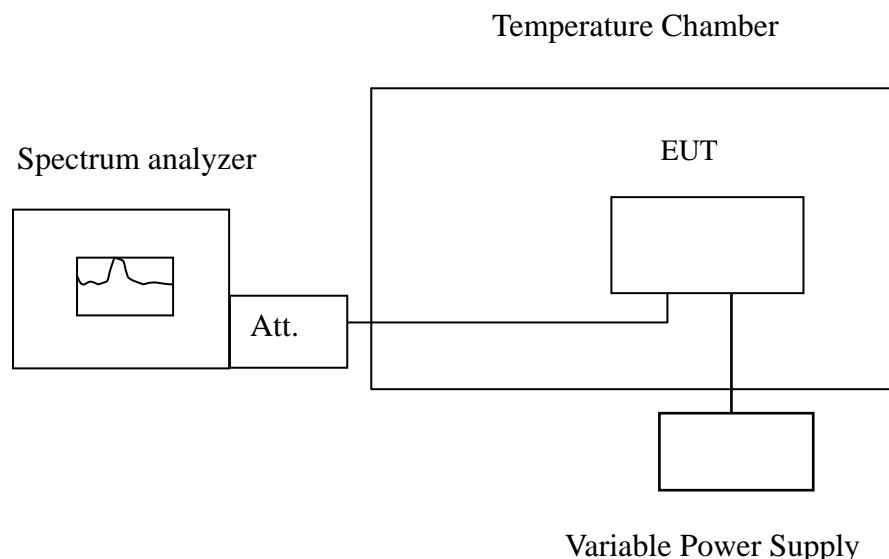
## 7.6 FREQUENCY STABILITY V.S. TEMPERATURE MEASUREMENT

### LIMIT

According to FCC §2.1055, FCC §24.235.

Frequency Tolerance: 2.5 ppm

### Test Configuration



*Remark: Measurement setup for testing on Antenna connector*



## **TEST PROCEDURE**

The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 20°C operating frequency as reference frequency. Turn EUT off and set the chamber temperature to -30°C. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10°C increased per stage until the highest temperature of +50°C reached.

## **TEST RESULTS**

*No non-compliance noted.*

<b>Reference Frequency: CDMA2000 Mid Channel 836.52MHz @ 20°C</b>				
<b>Limit: +/- 2.5 ppm = 2091 Hz</b>				
<b>Power Supply Vdc</b>	<b>Environment Temperature (°C)</b>	<b>Frequency (Hz)</b>	<b>Delta (Hz)</b>	<b>Limit (Hz)</b>
12	50	836520004	10	2091
	40	836519999	5	
	30	836519998	4	
	20	836519994	0	
	10	836519989	-5	
	0	836519985	-9	
	-10	836519997	3	
	-20	836520008	14	
	-30	836519997	3	

<b>Reference Frequency: CDMA2000 Mid Channel 1880MHz @ 20°C</b>				
<b>Limit: +/- 2.5 ppm = 4700 Hz</b>				
<b>Power Supply Vdc</b>	<b>Environment Temperature (°C)</b>	<b>Frequency (Hz)</b>	<b>Delta</b>	<b>Limit (Hz)</b>
12	50	1879999997	-8	4700
	40	1879999996	-9	
	30	1879999979	-26	
	20	1880000005	0	
	10	1879999982	-23	
	0	1879999973	-32	
	-10	1879999994	-11	
	-20	1879999990	-15	
	-30	1879999995	-10	



<b>Reference Frequency: EVDO Mid Channel 836.52MHz @ 20°C</b>				
<b>Limit: +/- 2.5 ppm = 2091 Hz</b>				
<b>Power Supply Vdc</b>	<b>Environment Temperature (°C)</b>	<b>Frequency (Hz)</b>	<b>Delta (Hz)</b>	<b>Limit (Hz)</b>
12	50	836519999	1	2091
	40	836519995	-3	
	30	836519997	-1	
	20	836519998	0	
	10	836519982	-16	
	0	836519986	-12	
	-10	836519998	0	
	-20	836519976	-22	
	-30	836519984	-14	

<b>Reference Frequency: EVDO Mid Channel 1880MHz @ 20°C</b>				
<b>Limit: +/- 2.5 ppm = 4700 Hz</b>				
<b>Power Supply Vdc</b>	<b>Environment Temperature (°C)</b>	<b>Frequency (Hz)</b>	<b>Delta (Hz)</b>	<b>Limit (Hz)</b>
12	50	1880000005	1	4700
	40	1880000001	-3	
	30	1880000003	-1	
	20	1880000004	0	
	10	1879999994	-10	
	0	1879999992	-12	
	-10	1879999991	-13	
	-20	1879999989	-15	
	-30	1879999996	-8	



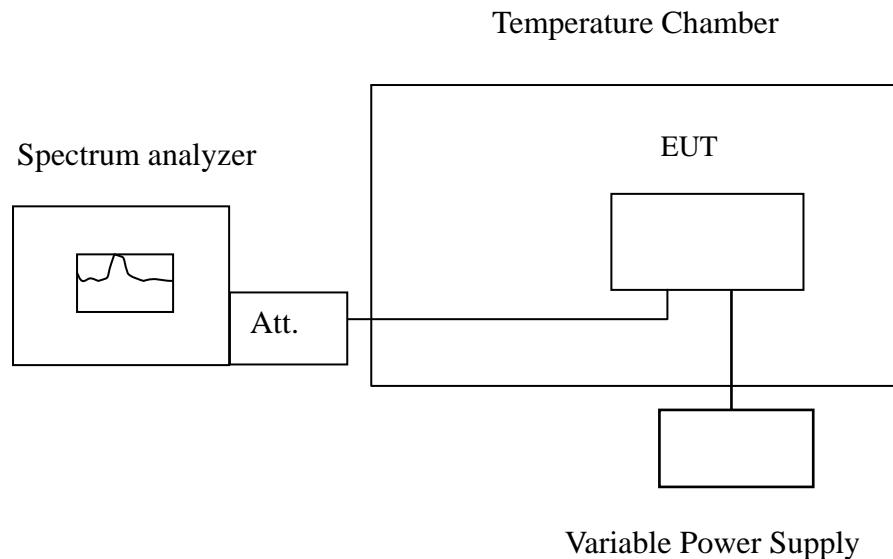
## 7.7 FREQUENCY STABILITY V.S. VOLTAGE MEASUREMENT

### LIMIT

According to FCC §2.1055, FCC §24.235,

Frequency Tolerance: 2.5 ppm.

### Test Configuration



**Remark:** Measurement setup for testing on Antenna connector.



## **TEST PROCEDURE**

Set chamber temperature to 20°C. Use a variable AC power supply / DC power source to power the EUT and set the voltage to rated voltage. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency.

Reduce the input voltage to specify extreme voltage variation ( $\pm 15\%$ ) and endpoint, record the maximum frequency change.

## **TEST RESULTS**

*No non-compliance noted.*

<b>Reference Frequency: CDMA2000 Mid Channel 836.52MHz @ 20°C</b>				
<b>Limit: +/- 2.5 ppm = 2091 Hz</b>				
<b>Power Supply Vdc</b>	<b>Environment Temperature (°C)</b>	<b>Frequency (Hz)</b>	<b>Delta (Hz)</b>	<b>Limit (Hz)</b>
13.8	20	836520001	-22	2091
12		836520023	0	
10.2		836520002	-21	
5.8END		836519913	-110	

<b>Reference Frequency: CDMA2000 Mid Channel 1880MHz @ 20°C</b>				
<b>Limit: <math>\pm 2.5</math> ppm = 4700 Hz</b>				
<b>Power Supply Vdc</b>	<b>Environment Temperature (°C)</b>	<b>Frequency (Hz)</b>	<b>Delta (Hz)</b>	<b>Limit (Hz)</b>
13.8	20	1880000003	-2	4700
12		1880000005	0	
10.2		1880000011	6	
5.8END		1880000073	68	



<b>Reference Frequency: EVDO Mid Channel 836.52MHz @ 20°C</b>				
<b>Limit: +/- 2.5 ppm = 2091 Hz</b>				
<b>Power Supply Vdc</b>	<b>Environment Temperature (°C)</b>	<b>Frequency (Hz)</b>	<b>Delta (Hz)</b>	<b>Limit (Hz)</b>
13.8	20	836520003	2	2091
12		836520001	0	
10.2		836520006	5	
5.8END		836520084	83	

<b>Reference Frequency: EVDO Mid Channel 1880MHz @ 20°C</b>				
<b>Limit: ± 2.5 ppm = 4700 Hz</b>				
<b>Power Supply Vdc</b>	<b>Environment Temperature (°C)</b>	<b>Frequency (Hz)</b>	<b>Delta (Hz)</b>	<b>Limit (Hz)</b>
13.8	20	1879999995	-9	4700
12		1880000004	0	
10.2		1880000006	2	
5.8END		1880000087	83	



## 7.8 POWERLINE CONDUCTED EMISSIONS

### LIMIT

For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed 250 microvolts (The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range is listed as follows:

Frequency Range (MHz)	Limits (dB $\mu$ V)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line (LINE and NEUTRAL) and ground at the power terminals.

### Test Configuration

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

### TEST PROCEDURE

1. The EUT was placed on a table, which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.

### TEST RESULTS

*Not applicable, because EUT does not connect to AC Main Source direct.*