



## FCC PART 22H TEST AND MEASUREMENT REPORT

For

**AnyDATA.NET Inc**

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**FCC ID: V6VADU-310C**

<b>Report Type:</b> Original Report	<b>Product Type:</b> CDMA 1x/EVDO USB Modem
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<b>Report Number:</b> <u>R0811194-22</u>	
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\* This report may contain data that are not covered by the NVLAP accreditation and are marked with an asterisk “\*” (Rev. 2)

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## 1 GENERAL INFORMATION

### 1.1 Product Description for Equipment under Test (EUT)

This measurement and test report has been compiled on behalf of *AnyDATA.NET Inc* and their product model: *ADU-310C, FCC ID: V6VADU-310C* which is a CDMA 1x/EVDO USB Modem. This EUT support CDMA2000 and 1xEV-DO (Revision 0).

Description	Specification
Frequency Band	824.04~848.97 MHz (TX) 869.04~893.97 MHz (RX)
Rated Power	0.3 Watt (24.8 dBm)
Number of Channel	832
CDMA Protocol	1xRTT / EVDO

### 1.2 EUT Photo



*Additional Photos in Exhibit C*

### 1.3 Mechanical Description

The EUT measures approximately 96mm (L) x 35mm (W) x 10.8 mm (H), and weighs approximately 34 g.

*\* The test data gathered are from typical production sample, serial number: B2034 Sample ID: 72205 provided by the BACL.*

## 1.4 Objective

This type approval report is prepared on behalf of *AnyDATA.NET Inc* in accordance with Part 2, Subpart J, Part 22 Subpart H, and Part 24 Subpart E of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC rules for RF output power, modulation characteristic, occupied bandwidth, spurious emissions at antenna terminal, field strength of spurious radiation, frequency stability, band edge, and conducted and radiated margin.

This measurement and test report only pertains to the CDMA 1xRTT and 1x/EV-DO 850MHz portion of the EUT.

## 1.5 Related Submittal(s)/Grant(s)

N/A

## 1.6 Test Methodology

All tests and measurements indicated in this document were performed in accordance with the Code of Federal Regulations Title 47 Part 2, Sub-part J as well as the following parts:

Part 22 Subpart H - Cellular Radiotelephone Service

Applicable Standards: TIA/EIA603-C, ANSI C63.4-2003.

All radiated and conducted emissions measurement was performed at Bay Area Compliance Laboratory, Corp. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

## 1.7 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in the field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the values ranging from  $\pm 2.0$  dB for Conducted Emissions tests and  $\pm 4.0$  dB for Radiated Emissions tests are the most accurate estimates pertaining to uncertainty of EMC measurements at BACL Corp.

Detailed instrumentation measurement uncertainties can be found in BACL Corp. report QAP-018.

## 1.8 Test Facility

The test site used by BACL Corp. to collect radiated and conducted emissions measurement data is located at its facility in Sunnyvale, California, USA.

The test sites at BACL have been fully described in reports submitted to the Federal Communication Commission (FCC) and Voluntary Control Council for Interference (VCCI). The details of these reports has been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on February 11 and December 10, 1997 and Article 8 of the VCCI regulations on December 25, 1997. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2003.

The Federal Communications Commission, Industry Canada, and Voluntary Control Council for Interference has the reports on file and is listed under FCC registration number: 90464, IC registration number: 3062A, and VCCI Registration Number: C-2463 and R-2698. The test site has been approved by the FCC, IC, and VCCI for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, BACL is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (Lab Code 200167-0). The current scope of accreditations can be found at <http://ts.nist.gov/ts/htdocs/210/214/scopes/2001670.htm>

## **2 SYSTEM TEST CONFIGURATION**

### **2.1 Justification**

The EUT was configured for testing according to TIA/EIA 603-C.

The final qualification test was performed with the EUT operating at normal mode.

### **2.2 EUT Exercise Software**

Agilent 8960 (HP E5155C) Wireless Communication test set was used to activate the EUT.

CDMA 2000

CDMA 1xEV-DO Rev 0

### **2.3 Special Accessories**

N/A

### **2.4 Equipment Modifications**

No modifications were made to the EUT

### **2.5 Remote Support Equipment**

N/A

### **2.6 Local Support Equipment**

Manufacturer	Description	Model	Serial Number
HP	Laptop	T41	99-KHVP2

### **2.7 Power Supply and Line Filters**

Manufacturer	Description	Model	Serial Number
AC/DC Adapter	USB version AC/DC Adapter	ZT-688	B1995

### **2.8 Interface Ports and Cabling**

Cable Description	From	To
USB cable	EUT	AC/DC Adapter

### 3 SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§ 2.1046 § 22.913	RF Output Power	Compliant
§ 2.1047	Modulation Characteristics	N/A*
§ 2.1049 § 22.917	Out of Band Emissions, Occupied Bandwidth	Compliant
§ 2.1051, § 22.917	Spurious Emissions at Antenna Terminals	Compliant
§ 2.1053 § 22.917 (a)	Field Strength of Spurious Radiation	Compliant
§ 22.917	Band Edge	Compliant
§ 2.1055 (a) § 2.1055 (d)	Frequency stability vs. temperature Frequency stability vs. voltage	Compliant
§2.1093	RF Exposure	N/A**

\* According to FCC § 2.1047(d), Part 22H, there is no specific requirement for digital modulation, therefore modulation characteristic is not presented.

\*\* Refer to SAR Report (R0811194-SAR).

## 4 §2.1046, §22.913(a) – RF OUTPUT POWER

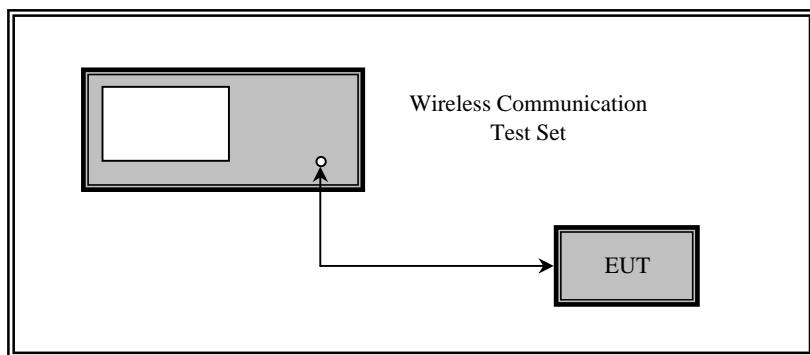
### 4.1 Applicable Standard

According to FCC §2.1046 and §22.913 (a), the ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 watts.

### 4.2 Test Procedure

Conducted:

The RF output of the transmitter was connected to the simulator and the spectrum analyzer through sufficient attenuation.



Radiated (ERP and EIRP):

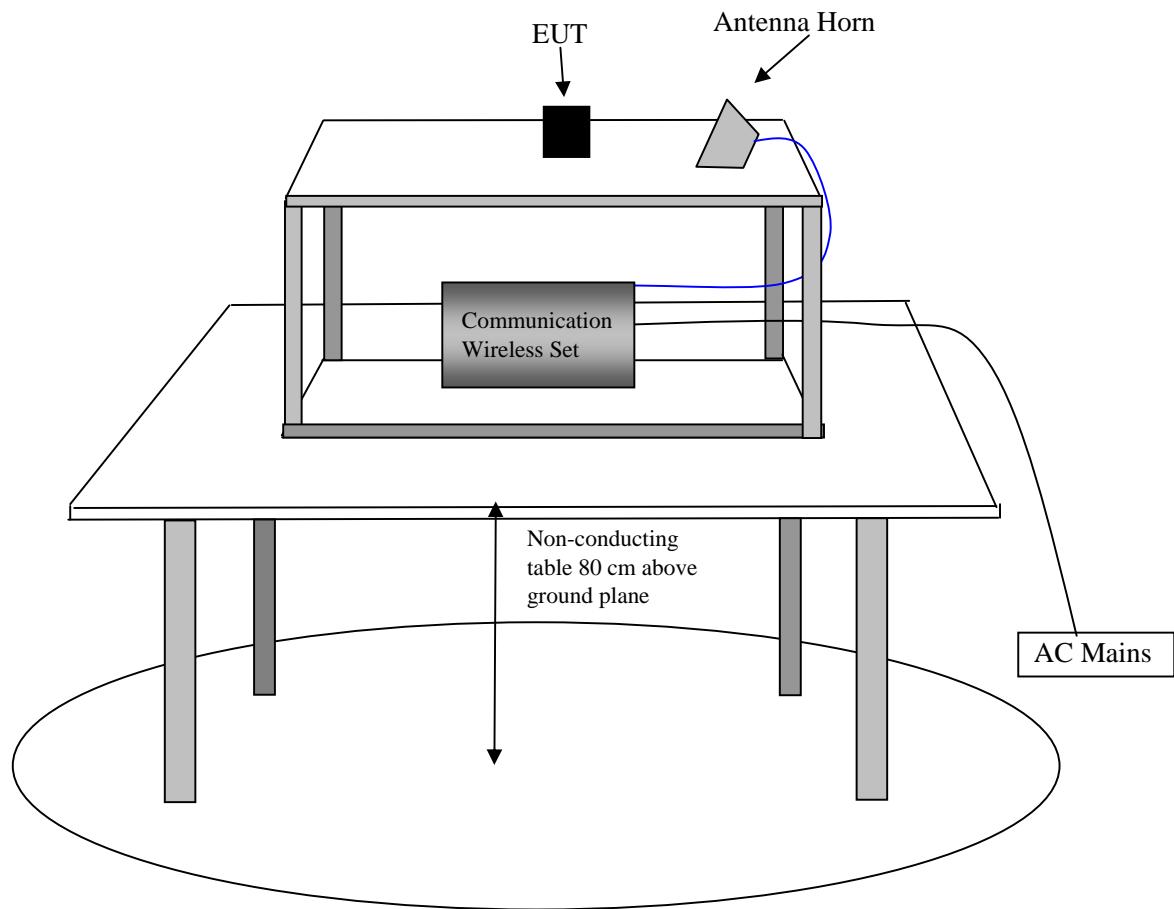
TIA-603-C §2.2.17

### 4.3 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Due Date
Agilent	Spectrum Analyzer	E4440A	US45303156	2009-05-31
Agilent	Analyzer, Communications	E5155C	GB44051221	2009-08-08
Sunol Sciences	Antenna	JB1	A103105-3	2009-03-25
A.R.A	Horn Antenna	DRG-118/A	1132	2009-07-28
A. H. Systems	Antenna, Horn, DRG	SAS-200/571	261	2009-07-01
HP	Pre-Amplifier	8449B	3008A01978	2009-10-21
HP	Pre-Amplifier	8447D	2944A06639	2009-12-19

\***Statement of Traceability:** BACL Corp. attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

### 4.4 Test setup Block Diagram for radiated emissions tests



## 4.5 Environmental Conditions

Temperature:	18 °C
Relative Humidity:	60 %
ATM Pressure:	101.4kPa

\* Testing performed by Jack Liu on 2009-03-04 in the RF test site.

### Conducted Power

CDMA2000 1xRTT	FED	REV	Low CH (824.7 MHz)	Middle CH (836.52 MHz)	High CH (848.31 MHz)	Part 22H Limit (dBm)
	RC1	RC1(S02)	25.22	25.03	25.15	38.45
	RC1	RC1(S055)	25.04	24.99	25.24	38.45
	RC2	RC2(S09)	25.30	25.29	25.48	38.45
	RC2	RC2(S055)	24.91	25.21	25.24	38.45
	RC3	RC3(S02)	25.14	25.70	25.82	38.45
	RC3	RC3(S055)	25.57	25.86	25.80	38.45
	RC4	RC3(S02)	25.34	25.47	25.62	38.45
	RC4	RC3(S055)	25.18	25.16	25.30	38.45
	RC5	RC4(S09)	25.01	24.83	25.45	38.45
	RC5	RC4(S055)	25.12	25.06	25.56	38.45

1xEV-DO Rev 0	Low CH (824.7 MHz)	Middle CH (836.52 MHz)	High CH (848.31 MHz)	Part 22H Limit (dBm)
	25.29	24.46	25.30	38.45

### Radiated Power (ERP)

Indicated		Azimuth (degree)	Test Antenna		Substituted			Absolute Level (dBm)	Part 22H Limit (dBm)	Margin (dB)	
Frequency (MHz)	S.A. Amp. (dBuV)		Height (m)	Polar (H/V)	Frequency (MHz)	S.G. Level (dBm)	Ant. Gain Correction (dBi)				
824.70	95.62	247	1.37	H	824.70	20.78	0	0.21	20.57	38.45	-17.88
824.70	95.39	192	1.42	V	824.70	21.16	0	0.21	20.95	38.45	-17.50
836.52	95.81	245	1.4	H	836.52	21.11	0	0.21	20.90	38.45	-17.55
836.52	95.77	187	1.41	V	836.52	21.30	0	0.21	21.09	38.45	-17.36
848.30	96.60	121	1.52	H	848.30	22.71	0	0.22	22.49	38.45	-15.96
848.30	96.00	206	1.43	V	848.30	22.28	0	0.22	22.06	38.45	-16.39

Note: Limit = 7 Watts = 38.45 dBm

## **5 §2.1047 - MODULATION CHARACTERISTIC**

### **5.1 Applicable Standard**

According to FCC § 2.1047(d), Part 22H, there is no specific requirement for digital modulation, therefore modulation characteristic is not presented.

## **6 §2.1049, §22.917, §22.905 - OCCUPIED BANDWIDTH**

### **6.1 Applicable Standard**

Requirements: CFR 47, Section 2.1049, Section 22.901, Section 22.917.

### **6.2 Test Procedure**

The RF output of the transmitter was connected to the simulator and the spectrum analyzer through sufficient attenuation.

The resolution bandwidth of the spectrum analyzer was set at 3 kHz and the -26 dB bandwidth was recorded.

### **6.3 Test Equipment List and Details**

Manufacturer	Description	Model	Serial Number	Calibration Due Date
Agilent	Spectrum Analyzer	E4440A	US45303156	2009-05-31
Agilent	Analyzer, Communications	E5155C	GB44051221	2009-08-08

\* **Statement of Traceability:** BACL Corp. attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

### **6.4 Environmental Conditions**

Temperature:	18 °C
Relative Humidity:	60 %
ATM Pressure:	101.4kPa

\* Testing performed by Jack Liu on 2009-03-04 in the RF test site.

## 1xRTT

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	824.70	1.434	1.2698
Middle	836.52	1.423	1.2699
High	848.31	1.426	1.2722

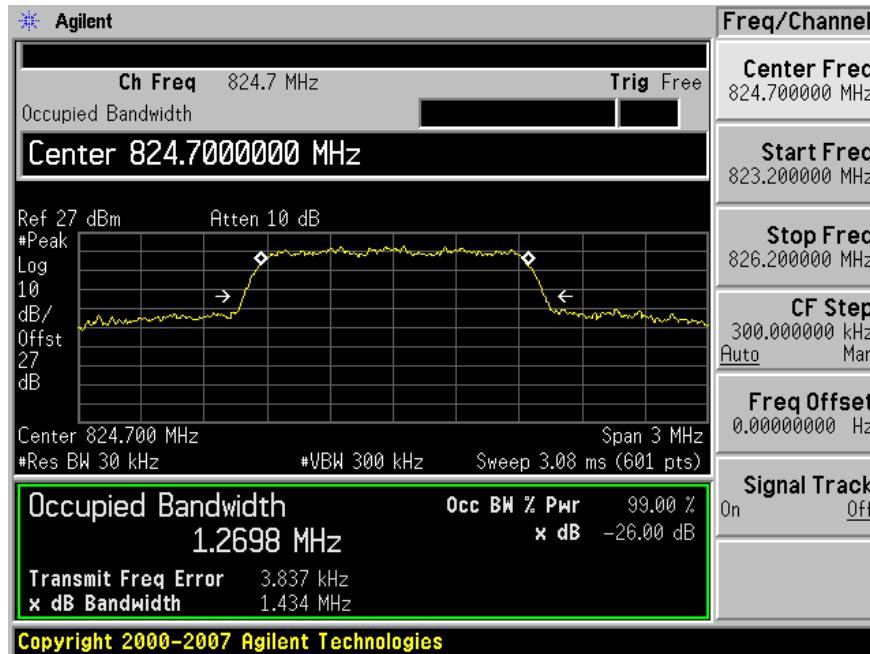
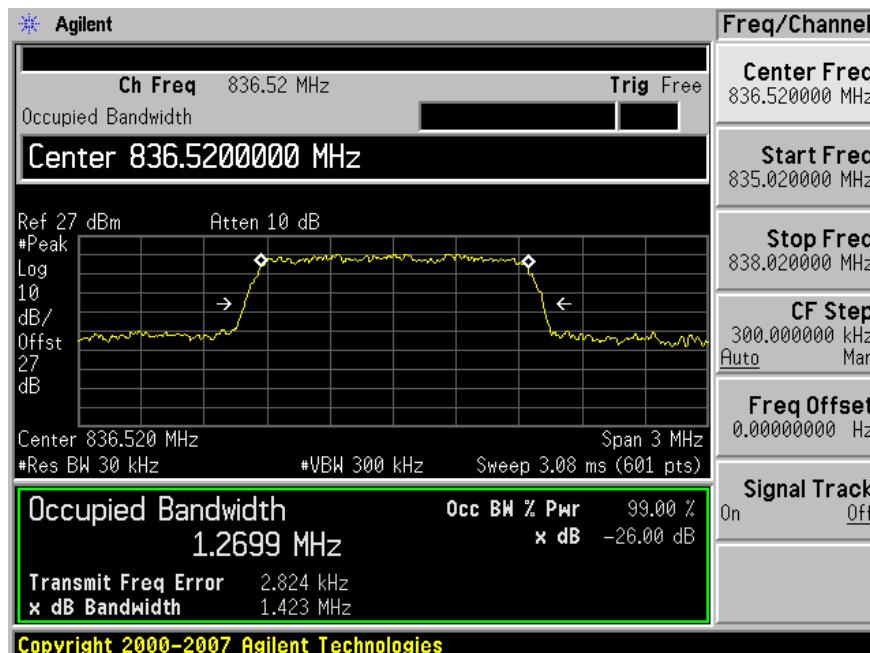
## 1xEV-DO Rev 0

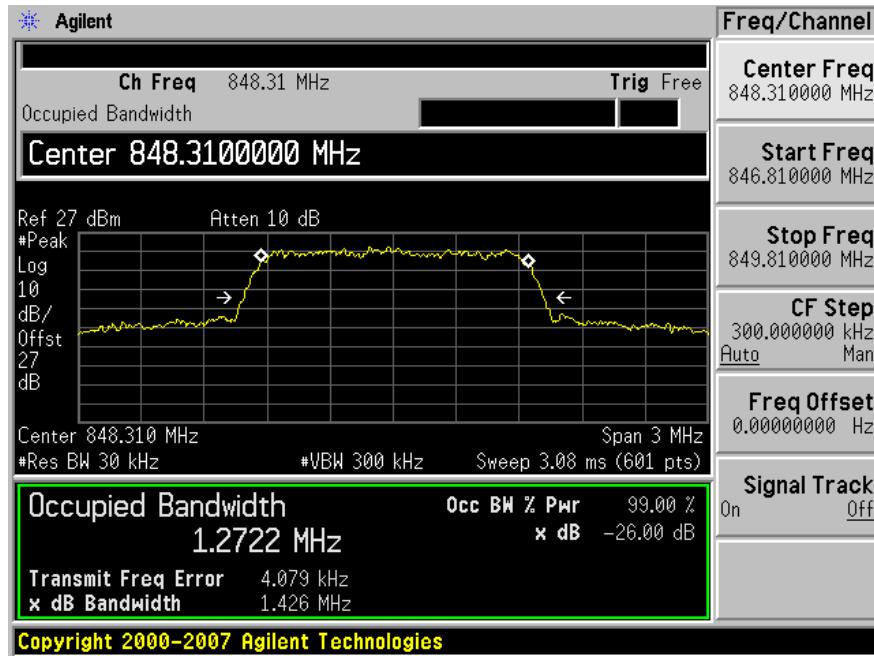
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	824.70	1.423	1.2699
Middle	836.52	1.435	1.2665
High	848.31	1.434	1.2683

## 6.5 Test Data & Plots

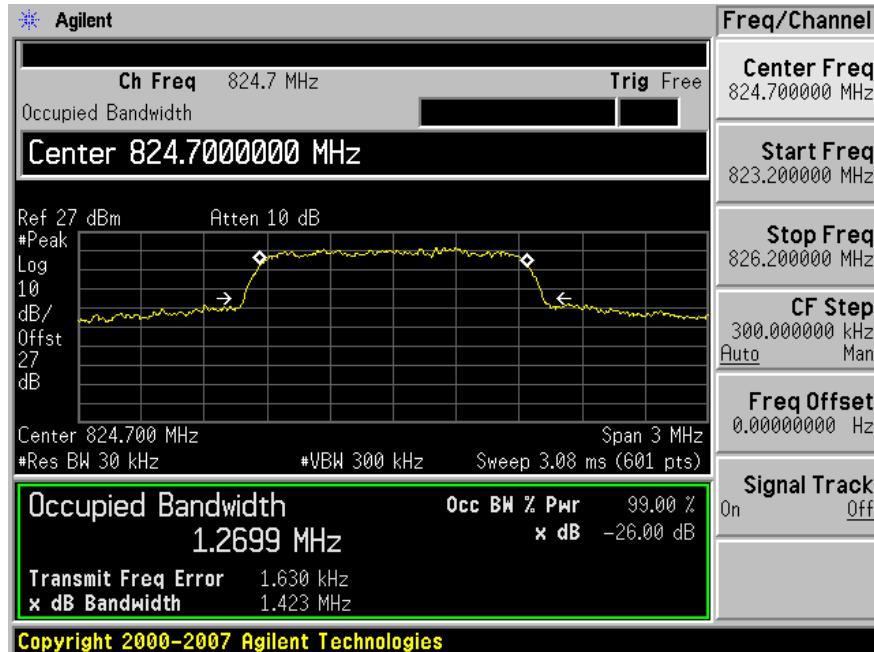
Please refer to the following plots.

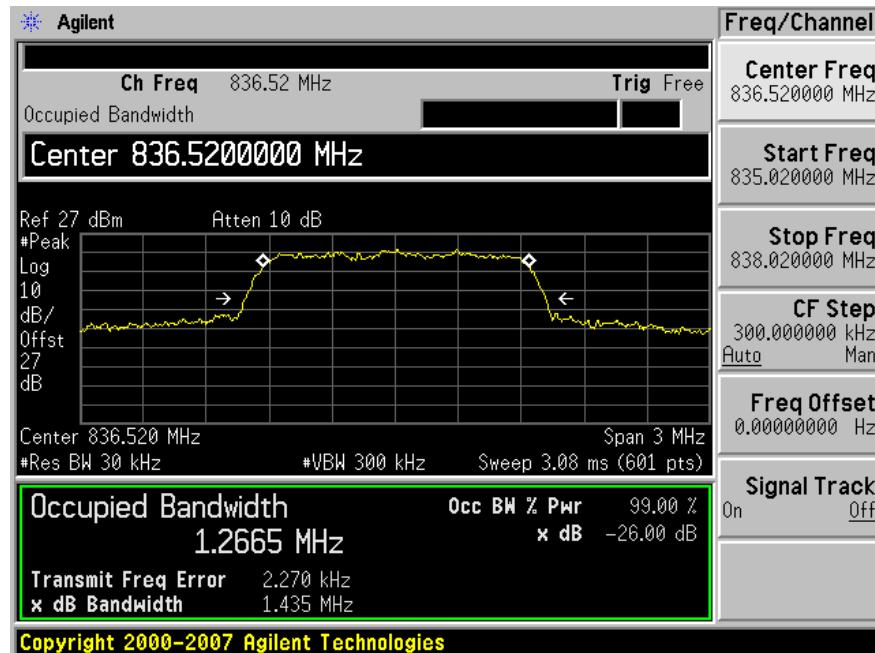
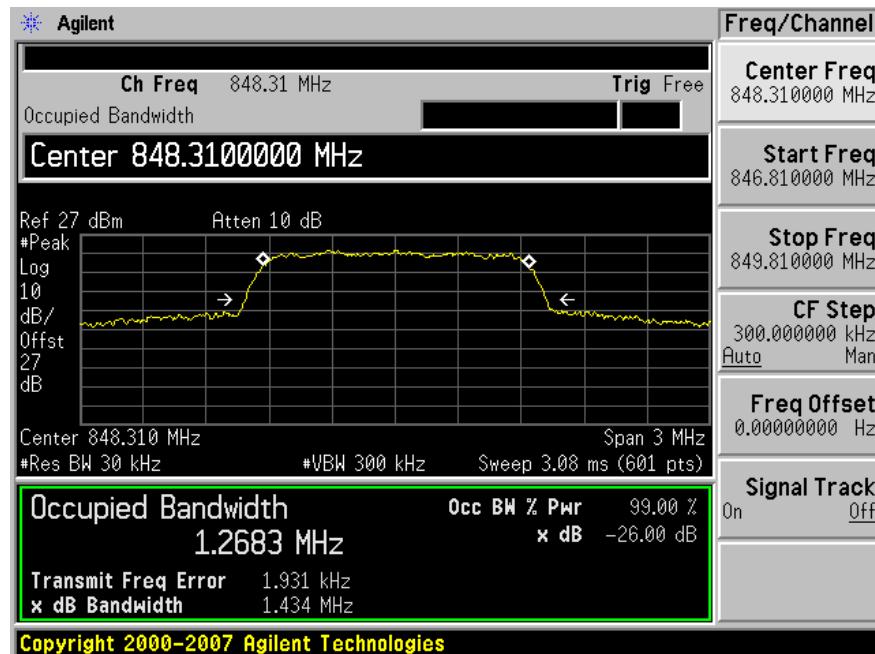
1xRTT

**Low Channel****Middle Channel**

**High Channel**

1xEV-DO Rev. 0

**Low Channel**

**Middle Channel****High Channel**

## **7 §2.1051, §22.917 - SPURIOUS EMISSIONS AT ANTENNA TERMINALS**

### **7.1 Applicable Standard**

Requirements: CFR 47, § 2.1051. § 22.917.

The spectrum was to be investigated to the tenth harmonics of the highest fundamental frequency as specified in § 2.1057.

### **7.2 Test Procedure**

The RF output of the transceiver was connected to a spectrum analyzer and simulator through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 100 kHz. Sufficient scans were taken to show any out of band emissions up to 10<sup>th</sup> harmonic.

### **7.3 Test Equipment List and Details**

Manufacturer	Description	Model	Serial Number	Calibration Due Date
Agilent	Spectrum Analyzer	E4440A	US45303156	2009-05-31
Agilent	Analyzer, Communications	E5155C	GB44051221	2009-08-08

\* **Statement of Traceability:** BACL Corp. attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

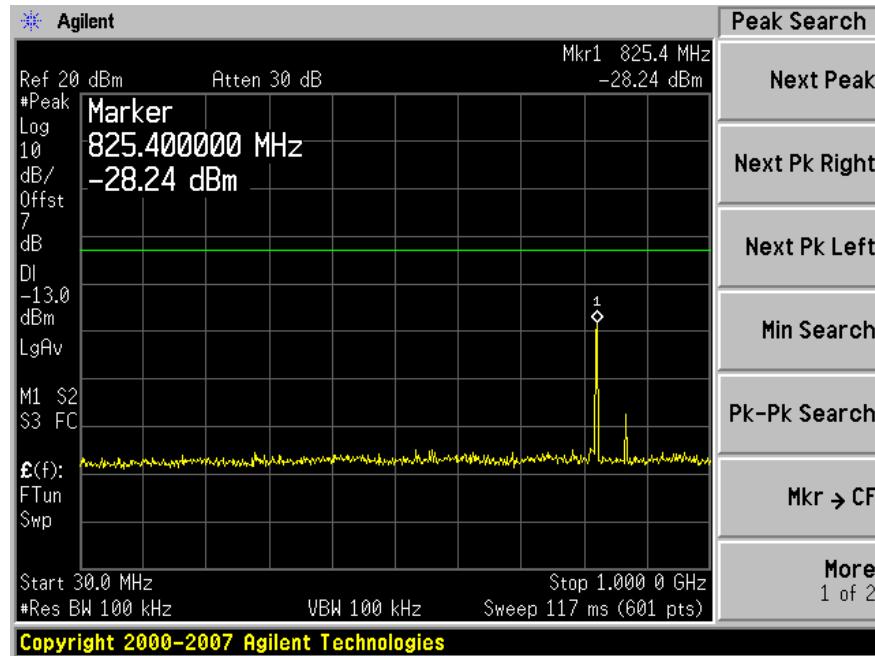
### **7.4 Environmental Conditions**

<b>Temperature:</b>	18 °C
<b>Relative Humidity:</b>	60 %
<b>ATM Pressure:</b>	101.4kPa

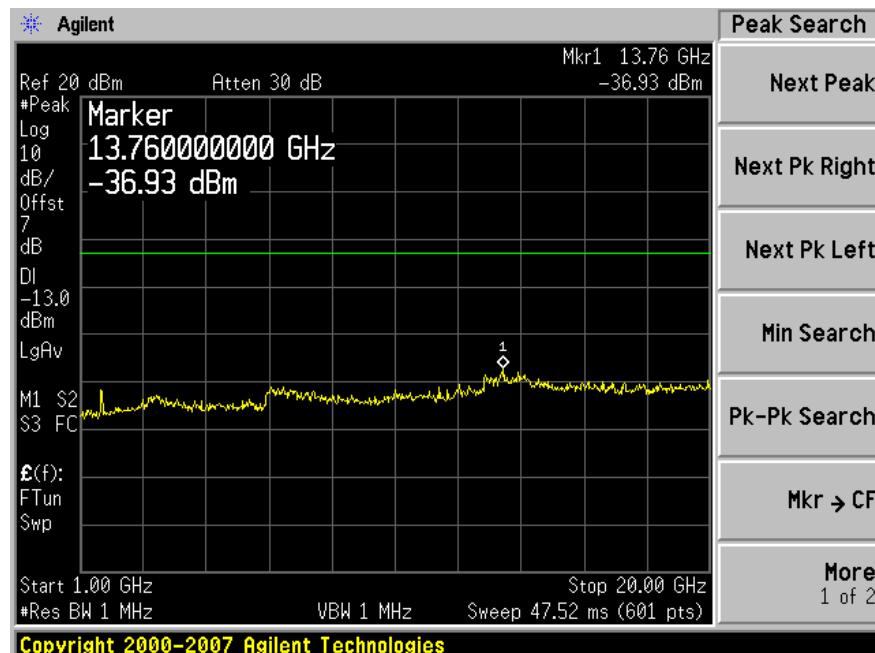
\* Testing performed by Jack Liu on 2008-03-04 in the RF test site.

Please refer to the plots featured hereinafter

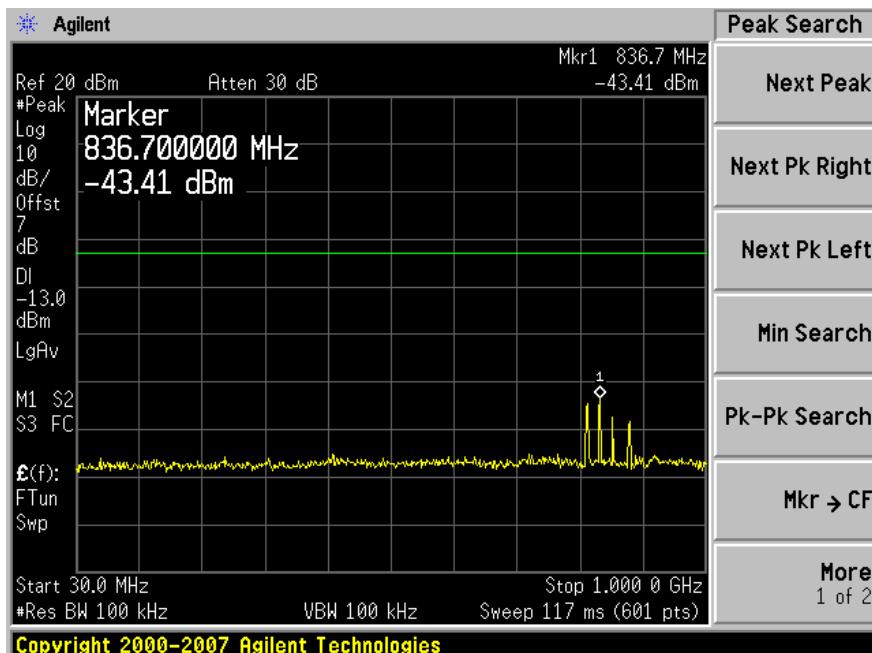
1xRTT

**Low Channel (f = 824.7 MHz)**

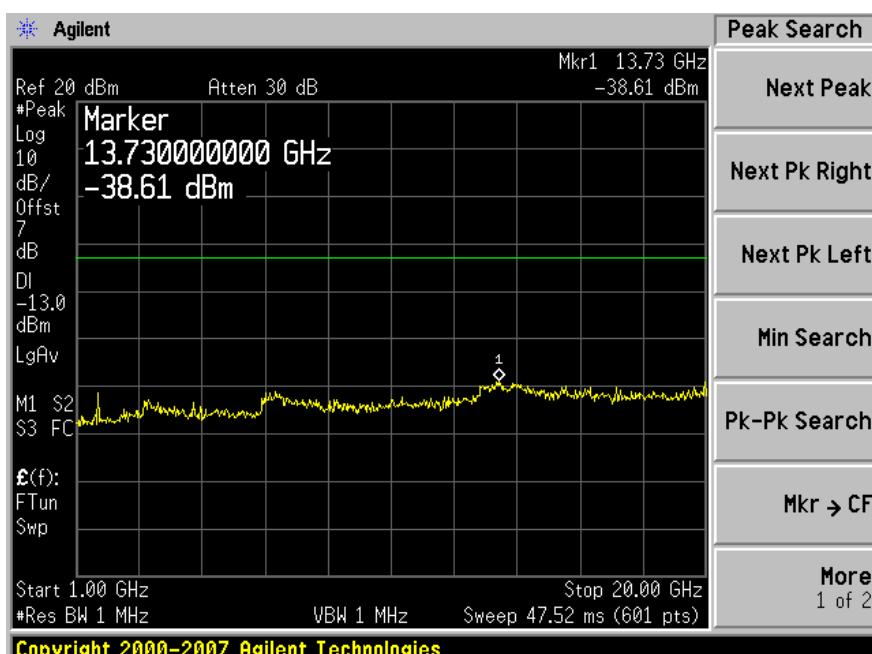
Plot 1a: 30MHz – 1GHz



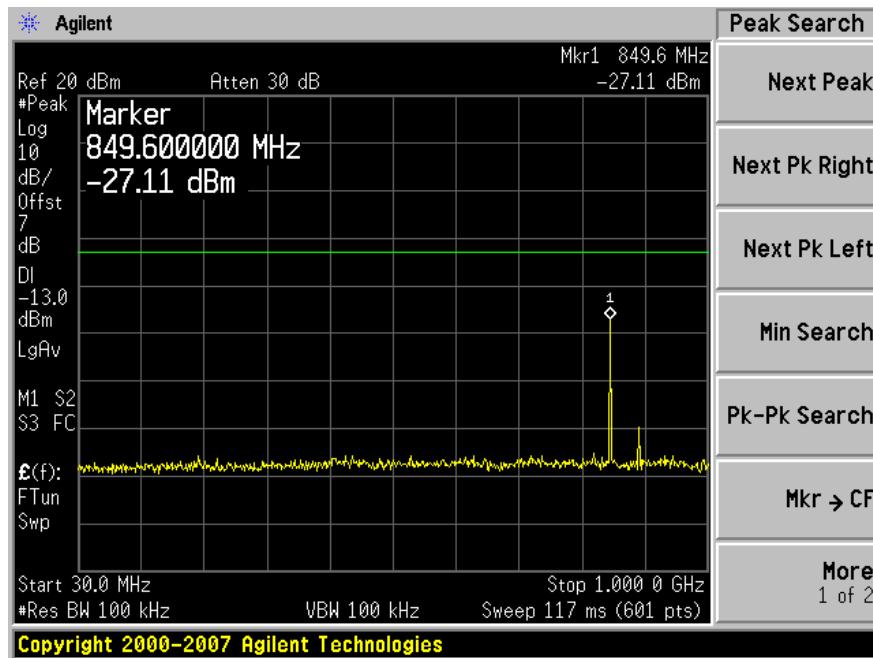
Plot 2a: 1GHz – 20GHz

**Middle Channel (f = 836.52 MHz)**

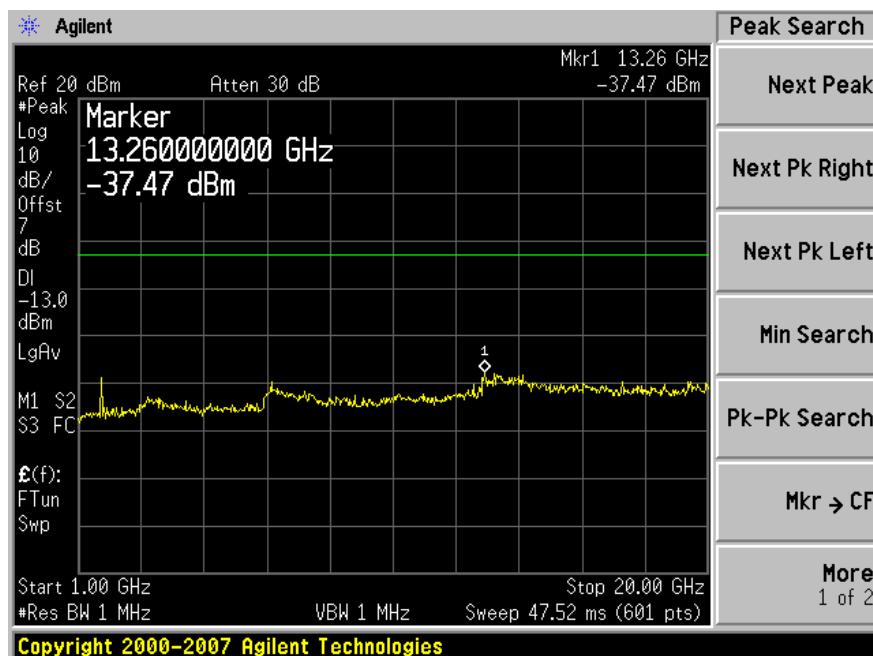
Plot 1b: 30MHz – 1GHz



Plot 2b: 1GHz – 20GHz

**High Channel (f = 848.31 MHz)**

Plot 1c: 30MHz – 1GHz



Plot 2c: 1GHz – 20GHz

## **8 §2.1053 - RADIATED SPURIOUS EMISSIONS**

### **8.1 Applicable Standard**

Requirements: CFR 47, § 2.1053, § 22.917.

### **8.2 Test Procedure**

The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load which was also placed on the turntable.

The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.

The frequency range up to tenth harmonic of the fundamental frequency was investigated.

Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

Spurious emissions in dB =  $10 \log (\text{TX Power in Watts}/0.001)$  – the absolute level

Spurious attenuation limit in dB =  $43 + 10 \log_{10} (\text{power out in Watts})$

### **8.3 Test Equipment List and Details**

Manufacturer	Description	Model	Serial Number	Calibration Due Date
Agilent	Spectrum Analyzer	E4440A	US45303156	2009-05-31
Agilent	Analyzer, Communications	E5155C	GB44051221	2009-08-08
Sunol Sciences	Antenna	JB1	A103105-3	2009-03-25
A.R.A	Horn Antenna	DRG-118/A	1132	2009-07-28
A. H. Systems	Antenna, Horn, DRG	SAS-200/571	261	2009-07-01
HP	Pre-Amplifier	8449B	3008A01978	2009-10-21
HP	Pre-Amplifier	8447D	2944A06639	2009-12-19

**\* Statement of Traceability:** BACL Corp. attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

## 8.4 Environmental Conditions

<b>Temperature:</b>	13 °C
<b>Relative Humidity:</b>	55 %
<b>ATM Pressure:</b>	101.5kPa

\* Testing performed by Greeman Chen on 2009-01-12 in the RF test site.

Worst case reading as follows:

Mode: Transmitting		
Margin (dB)	Frequency (MHz)	Antenna Polarization (Horizontal/Vertical)
-21.27	2509.56	Vertical

## Test Data

30 MHz -10 GHz Radiated Emission at 3-meter (Middle Channel:836.52 MHz)

Indicated	Azimuth (degree)	Test Antenna			Substituted			Absolute Level (dBm)	Part 22H Limit (dBm)	Margin (dB)	
		Height (m)	Polar (H/V)	Frequency (MHz)	S.G. Level (dBm)	Antenna Gain (dBi)	Cable Loss (dB)				
2509.56	56.28	272	140	V	2509.56	-43.23	9.4	0.44	-34.27	-13	-21.27
3346.08	52.45	94	140	V	3346.08	-44.44	9.8	0.52	-35.16	-13	-22.16
2509.56	53.77	170	140	H	2509.56	-47.49	9.4	0.44	-38.53	-13	-25.53
3346.08	48.06	214	179	H	3346.08	-52.49	9.8	0.52	-43.21	-13	-30.21
1600.00	53.80	54	156	H	1600.00	-52.52	9.2	0.35	-43.67	-13	-30.67
1600.00	55.03	54	157	V	1600.00	-52.93	9.2	0.35	-44.08	-13	-31.08
1673.04	45.48	133	169	H	1673.04	-61.02	9.3	0.36	-52.08	-13	-39.08
531.50	53.92	154	200	V	531.50	-53.63	0.0	0.15	-53.78	-13	-40.78
1673.04	45.07	130	170	V	1673.04	-63.32	9.3	0.36	-54.38	-13	-41.38
531.50	57.06	88	124	H	531.50	-54.28	0.0	0.15	-54.43	-13	-41.43
398.70	52.33	80	200	V	398.70	-58.31	0.0	0.13	-58.44	-13	-45.44
398.70	53.00	180	200	H	398.70	-59.62	0.0	0.13	-59.75	-13	-46.75

## 9 §22.917 – BAND EDGE

### 9.1 Applicable Standard

According to § 22.917, the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB.

### 9.2 Test Procedure

The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.

The center of the spectrum analyzer was set to block edge frequency, RBW set to 10 kHz.

### 9.3 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Due Date
Agilent	Spectrum Analyzer	E4440A	US45303156	2009-05-31
Agilent	Analyzer, Communications	E5155C	GB44051221	2009-08-08

\* **Statement of Traceability:** BACL Corp. attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

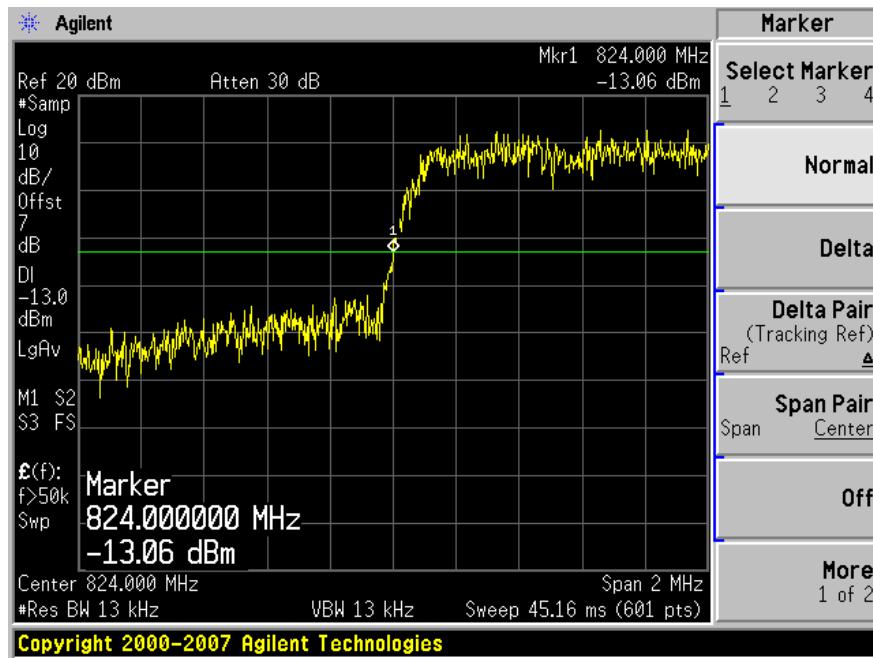
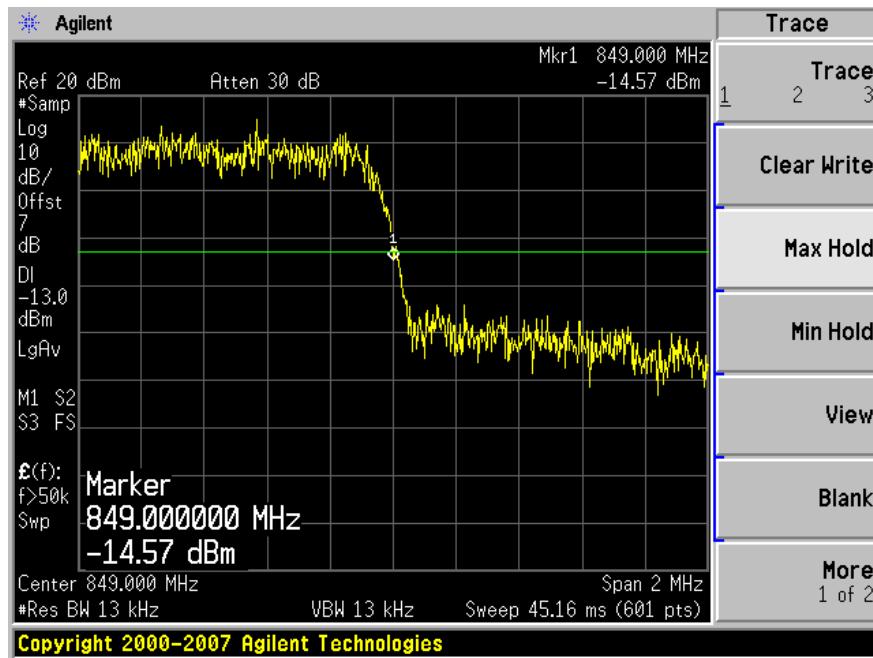
### 9.4 Environmental Conditions

Temperature:	18 °C
Relative Humidity:	60 %
ATM Pressure:	101.4kPa

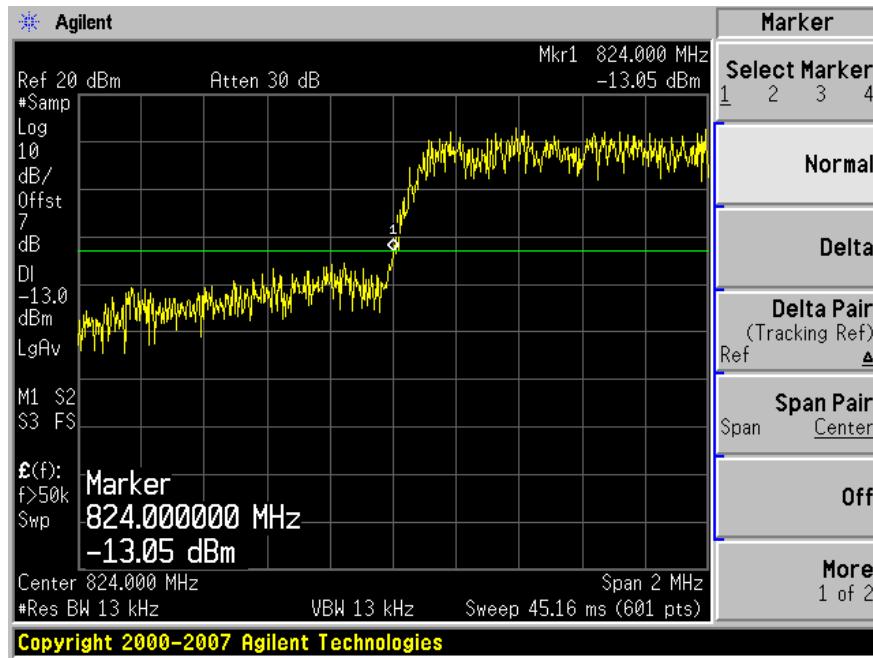
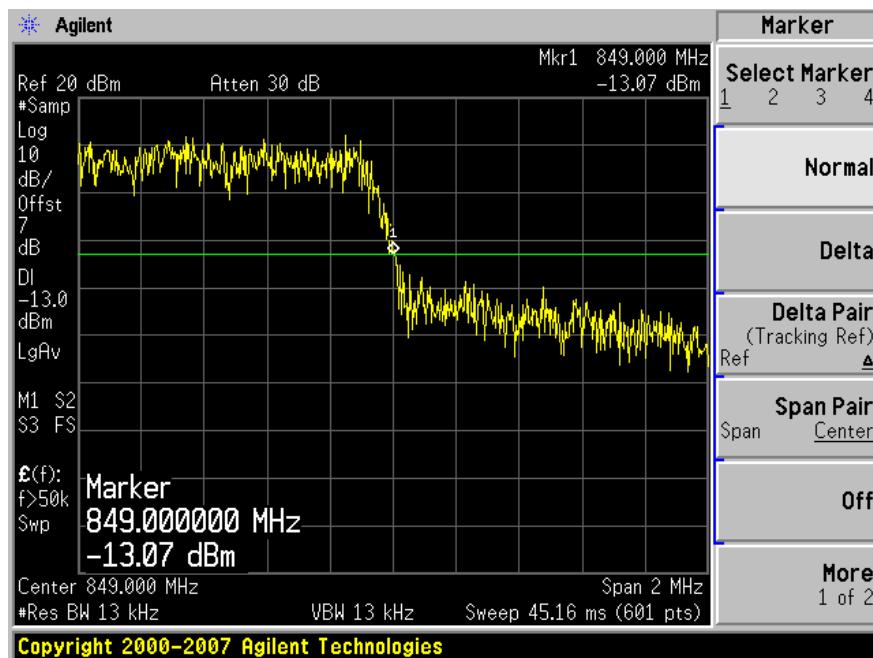
\* Testing performed by Jack Liu on 2009-03-04 in RF test site.

Please refer to the following plots.

1xRTT

**Lowest Channel****Highest Channel**

1xEV-DO Rev. 0

**Lowest Channel****Highest Channel**

## **10 §2.1055 (a), §2.1055 (d), §22.355 - FREQUENCY STABILITY**

### **10.1 Applicable Standard**

Requirements: FCC § 2.1055 (a), § 2.1055 (d) & following:

According to §22.355, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table C-1 of this section.

Frequency Tolerance for Transmitters in the Public Mobile Services

Frequency Range (MHz)	Base, fixed (ppm)	Mobile ≤ 3 watts (ppm)	Mobile ≤ 3 watts (ppm)
25 to 50	20.0	20.0	50.0
50 to 450	5.0	5.0	50.0
450 to 512	2.5	5.0	5.0
821 to 896	1.5	2.5	2.5
928 to 929.	5.0	N/A	N/A
929 to 960.	1.5	N/A	N/A
2110 to 2220	10.0	N/A	N/A

### **10.2 Test Procedure**

Frequency Stability vs. Temperature: The equipment under test was connected to an external DC power supply and the RF output was connected to communication test set via feed-through attenuators. The EUT was placed inside the temperature chamber. The DC leads and RF output cable exited the chamber through an opening made for the purpose.

After the temperature stabilized for approximately 20 minutes, the frequency output was recorded from the communication test set.

Frequency Stability vs. Voltage: An external variable DC power supply was connected to the battery terminals of the equipment under test. The voltage was set to 115% of the nominal value and was then decreased until the transmitter light no longer illuminated; i.e., the battery end point. The output frequency was recorded for each battery voltage.

### **10.3 Test Equipment List and Details**

Manufacturer	Description	Model	Serial Number	Calibration Due Date
Tenney	Temperature oven	Versa Tenn	12.431-8	N/A
Agilent	Spectrum Analyzer	E4440A	US45303156	2009-05-31
Agilent	Analyzer, Communications	E5155C	GB44051221	2009-08-08

**\* Statement of Traceability:** BACL Corp. attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

## 10.4 Environmental Conditions

Temperature:	13 °C
Relative Humidity:	55 %
ATM Pressure:	101.5kPa

\* Testing performed by Greeman Chen on 2009-01-12 in the RF test site.

### 1) Frequency Stability versus Temperature:

Reference Frequency: 836.52 MHz, Limit: 2.5ppm				
Test Environment		Frequency Measure with Time Elapsed		
Temperature (°C)	Power Supplied (Vdc)	Measured Frequency (Hz)	Frequency Error (Hz)	Frequency Error (ppm)
50	5	836.5199797	-20.26	0.024219385
40	5	836.5199815	-18.51	0.022127385
30	5	836.519983	-16.99	0.020310333
20	5	836.519984	-15.98	0.019102950
10	5	836.5199843	-15.70	0.018768230
0	5	836.5199841	-15.91	0.019019270
-10	5	836.5199823	-17.71	0.021171042
-20	5	836.5199807	-19.33	0.023107636
-30	5	836.5199787	-21.30	0.025462631

### 2) Frequency Stability versus Voltage:

Not Tested. (USB device, power is fixed form the Laptop or Desktop)

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## **11 §1.1307(b) (1) & §2.1093 - RF EXPOSURE**

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### **11.1 Applicable Standard**

According to §1.1310 and §2.1093 SAR Evaluation is required.

### **11.2 Test Result**

Compliant: Refer to SAR Report (R0811194-SAR)