Lab Code: 200167-0

FCC PART 22H, 24E

TEST AND MEASUREMENT REPORT

For

Advanced RF Technologies, Inc.

3116 W Vanowen St.,

Burbank, CA 91505, USA

FCC ID: S2O-AXIOM
Model: AXIOM

Report Type:	**Product Type:**
Original Report	LTE, Cellular, PCS, AWS, Repeater

Test Engineer: Dennis Huang

Report Number: R1007282-2224

Report Date: 2010-11-01

Reviewed By: Victor Zhang
Test Engineer, Lead

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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	R1007282-2224	Original Report	2010-11-01

1 GENERAL INFORMATION

1.1 Product Description for Equipment under Test (EUT)

The *Advanced RF Technologies, Inc.* FCC ID: S2O-AXIOM, Model: AXIOM or the "EUT" as referred to in this report is a LTE, Cellular, PCS, and AWS Bi directional repeater. The LTE Band support three modulations: QPSK, 16QAM, 64QAM and the AWS band supports 1xEVDO.

Repeater Specification

Parameters		LTE 700 MHz	Cellular (MHz)	PCS (MHz)	AWS (MHz)
Frequency	Downlink	Lower Band: 728-740	860-894	1930-1990	2110-2155
		Upper Band: 746-757			
	Uplink	Lower Band: 698-710	824-849	1850-1910	1710-1755
		Upper Band:776-787			
Output Power		25 dBm		30 dBm	
AC Power		110-220V, 60Hz			
Power Consumption		130 Watt			

1.2 Mechanical Description

The EUT measures 310 mm **(L)** x 508 mm **(W)** x 483 mm **(H)**, and weighs approximately 58 kg.

The test data gathered are from production sample, serial number: P-AXM100100001-A provided by the manufacturer.

1.3 Objective

This type approval report is prepared on behalf of *Advanced RF Technologies, 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.

1.4 Related Submittal(s)/Grant(s)

FCC Part 27 report, BACL Report Number: R1007282-27

1.5 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 - Public Mobile Services
Part 24 Subpart E - PCS

Applicable Standards: TIA EIA 98-C, 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.

1.6 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 +2.0 dB for Conducted Emissions tests and +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.

1.7 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

NA, signal was sent through EUT using a signal generator, device was set to normal operating mode.

2.3 Equipment Modifications

No modifications were made to the EUT.

2.4 Local Support Equipment and Software List and Details

Manufacturer	Description	Model	Serial Number
Agilent	Vector Signal Generator	E4438C	MY42083251
Agilent	Signal Studio for 3GPP LTE	N7624B	-

2.5 Internal Configurations of EUT

Manufacturer	Description	Model	Serial Number
Advanced RF Technologies, Inc	Cellular PCB Board 1	ADRF-6410 REV1.2	A6410V1.2010040053
Advanced RF Technologies, Inc	Cellular PCB Board 2	VZW Modular CH 20091021 VER.0.9	-
Advanced RF Technologies, Inc	Cellular LED Board	-	091021
Advanced RF Technologies, Inc	Cellular PCB Board 3	Cell091223022 DSP-Cell Rev 1.1	-
Advanced RF Technologies	Cellular FWD PCB Board 4	Aeon-9030-Cell Ver 1.0 RVS	-
Advanced RF Technologies	Cellular RVS PCB Board 5	Aeon-9030-Cell Ver 1.0 FWS	-
Advanced RF Technologies, Inc	Cellular FWD Module PCB Board 6	EMP-07-001 FWD	-
Advanced RF Technologies, Inc	Cellular RVS Module PCB Board 7	EMP-07-001 RVS	-
Advanced RF Technologies, Inc	PCS PCB Board 1	ADRF-6410 REV1.2	A6410V1.2010040052
Advanced RF Technologies, Inc	PCS PCB Board 2	VZW Modular CH 20091021	-
Advanced RF Technologies, Inc	PCS LED Board	-	091021
Advanced RF Technologies, Inc	PCS PCB Board 3	PCS091029014	-
Advanced RF Technologies	PCS FWD PCB Board 4	Aeon-9030-PCS Ver 1.0 RVS	-
Advanced RF Technologies	PCS RVS PCB Board 5	Aeon-9030-PCS Ver 1.0 FWS	-
Advanced RF Technologies, Inc	PCS FWD Module PCB Board 6	EMP-05-002 REV 1.4 FWD	-
Advanced RF Technologies, Inc	PCS RVS Module PCB Board 7	EMP-05-002 REV 1.4 RVS	-
NEWTEC	Power Supply	-	-

2.6 Interface Ports and Cables

Cable Description	Length (m)	To	From
RF Cable	< 1	EUT	Spectrum Analyzer
RF Cable	< 1	EUT	Signal Generator

3 SUMMARY OF TEST RESULTS

FCC Rules	Description of Tests	Results
§2.1046 §22.913(a), §24.232	RF Output Power	Compliant
§2.1047	Modulation Characteristics	N/A[1]
§2.1049 §22.917, §24.238	Occupied Bandwidth / Out of Band Emissions	Compliant
§2.1053 §22.917, §24.238	Spurious Radiated Emissions	Compliant
§2.1051 §22.917, §24.238	Spurious Emissions at Antenna Terminals	Compliant
§22.917, §24.238	Band Edge	Compliant
§2.1055 §22.355, §24.235	Frequency Stability	N/A[2]
§2.1091	RF Exposure	Compliant

Note: [1]According to FCC §2.1047(d) and part 22H, 24E, there is no specific requirement for digital modulation and no oscillator circuit, therefore modulation characteristic is not presented.
[2] There is no oscillator circuit in the EUT, therefore there is no frequency stability measurement required.

4 FCC §2.1046, §22.913(a) & §24.232 – RF OUTPUT POWER

4.1 Applicable Standard

According to FCC §22.913 (a), the maximum effective radiated power (ERP) of base transmitters and cellular repeaters must not exceed 500 Watts.

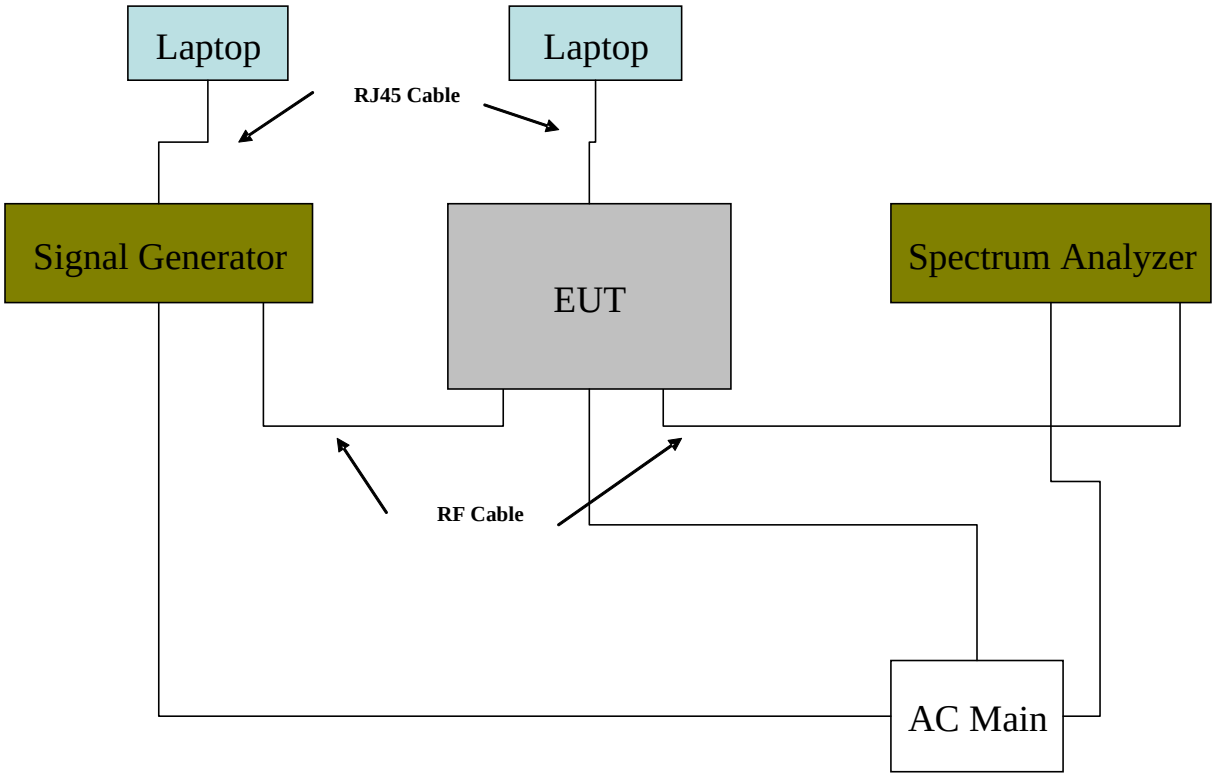
According to §24.232 , Mobile/portable stations are limited to 2 watts EIRP peak power and the equipment must employ means to limit the power to the minimum necessary for successful communications.

4.2 Test Procedure

Conducted:

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

4.3 Test Block Diagram



4.4 Test Environmental Conditions

Temperature:	21-24°C
Relative Humidity:	40-43 %
ATM Pressure:	101-103 kPa

The testing was performed by Dennis Huang from 2010-08-24 to 2010-08-26 at RF Site.

4.5 Test Equipment List and Details

Manufacturers	Descriptions	Models	Serial Numbers	Calibration Dates
Agilent	Spectrum Analyzer	E4440A	MY44303352	2010-05-09
Agilent	Signal Generator	E4438C	MY42083251	2009-12-08

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

4.6 Test Results

Maximum Output Power – Modulated Signal

Mode		Channel	Frequency (MHz)	Output Power (dBm)
1xEVDO	850 MHz Uplink	Low	824.8	25.05
		Middle	836.52	25.03
		High	848.2	25.01
	850 MHz Downlink	Low	869.8	24.64
		Middle	881.52	25.08
		High	893.2	24.81

Mode		Channel	Frequency (MHz)	Output Power (dBm)
1xEVDO	1900 MHz Uplink	Low	1850.8	30.02
		Mid	1880	30.02
		High	1909.2	29.28
	1900 MHz Downlink	Low	1930.8	29.92
		Mid	1960	30.06
		High	1989.2	30.15

5 FCC §2.1047 - MODULATION CHARACTERISTIC

5.1 Applicable Standard

According to FCC §2.1047(d), Part 22H and Part 24E, there is no specific requirement for digital modulation and no oscillator circuit, therefore modulation characteristic is not presented.

5.2 Test Result

N/A

6 FCC §2.1049, §22.917 & §24.238 - OCCUPIED BANDWIDTH

6.1 Applicable Standard

Requirements: FCC §2.1049, §22.917 and §24.238.

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 30 kHz (Cellular/PCS) and the 26 dB & 99% bandwidth was recorded.

6.3 Test Environmental Conditions

Temperature:	21-24°C
Relative Humidity:	40-43 %
ATM Pressure:	101-103 kPa

The testing was performed by Dennis Huang from 2010-08-24 to 2010-08-26 at RF Site.

6.4 Test Equipment List and Details

Manufacturers	Descriptions	Models	Serial Numbers	Calibration Dates
Agilent	Spectrum Analyzer	E4440A	MY44303352	2010-05-09
Agilent	Signal Generator	E4438C	MY42083251	2009-12-08

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

6.5 Test Results

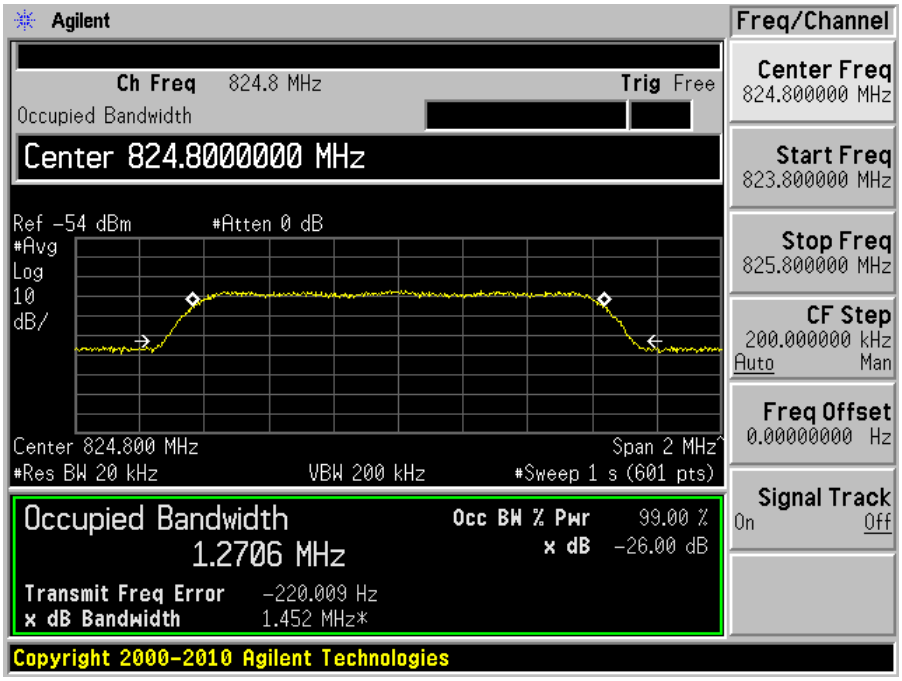
Mode		Channel	Frequency (MHz)	26 dB Emission Bandwidth (kHz)	99% Emission Bandwidth (kHz)
1xEVDO	850 MHz Uplink	Low	824.80	1.428	1.255
		Middle	836.52	1.435	1.266
		High	848.20	1.434	1.265
	850 MHz Downlink	Low	869.80	1.434	1.26
		Middle	881.52	1.438	1.263
		High	893.20	1.441	1.268
	1900 MHz Uplink	Low	1850.80	1.395	1.206
		Middle	1880.00	1.429	1.256
		High	1909.20	1.383	1.205
	1900 MHz Downlink	Low	1930.80	1.371	1.201
		Middle	1960.00	1.420	1.255
		High	1989.20	1.389	1.192

Please refer to the following plots.

1xEVDO 850 MHz Band (Uplink)

Low Channel (824.8 MHz)

Input



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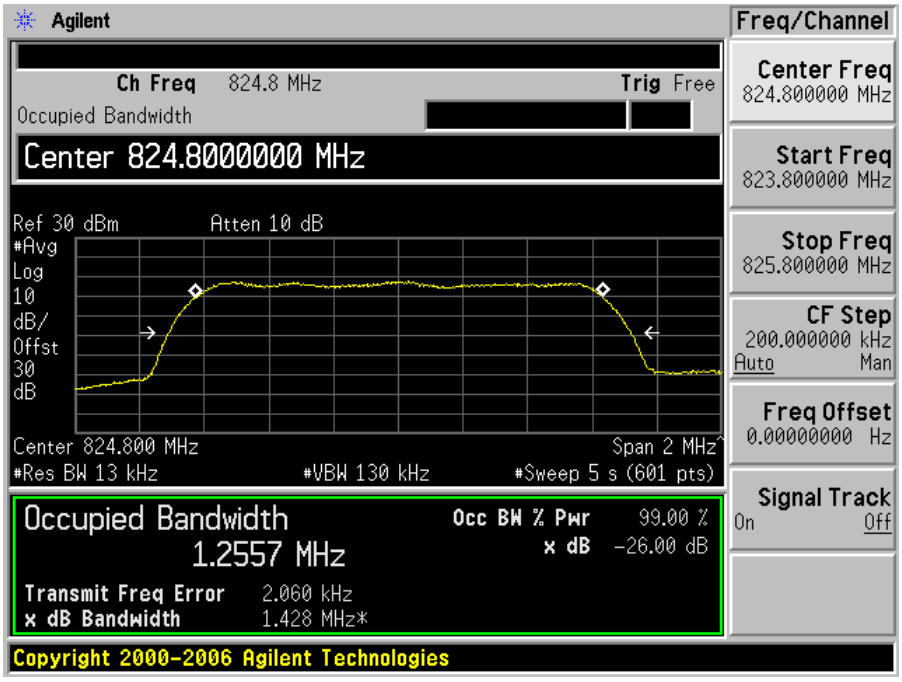
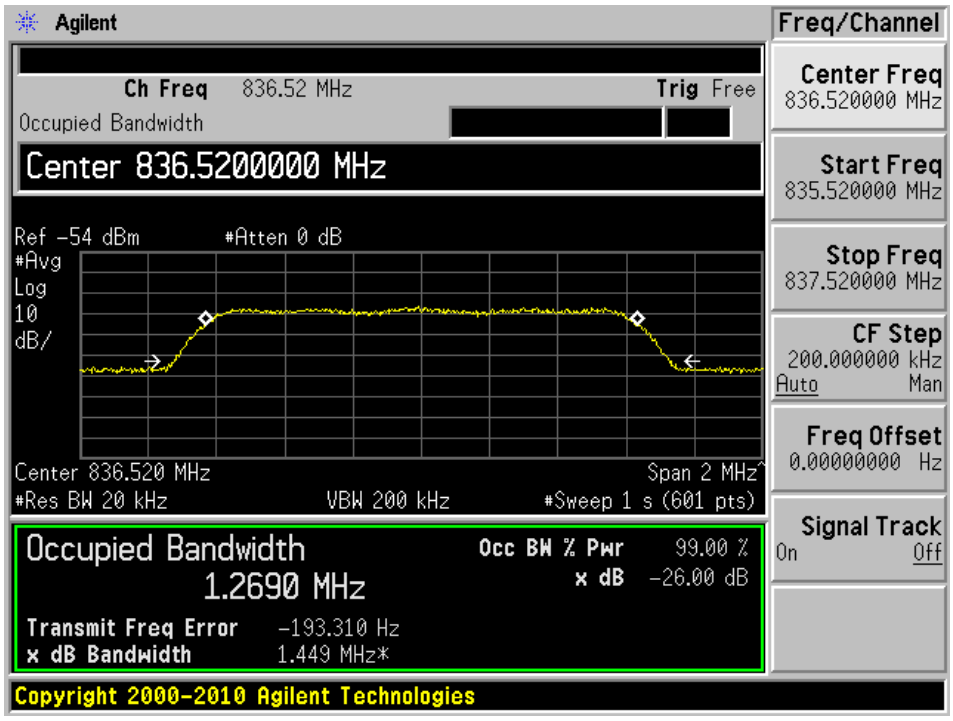


Middle Channel (836.52 MHz)

Input



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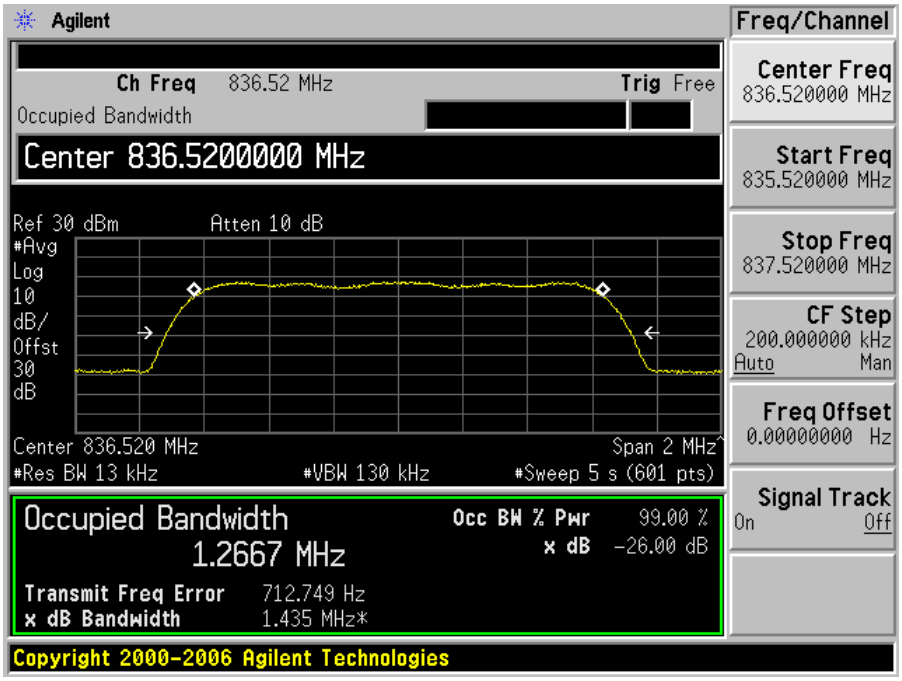
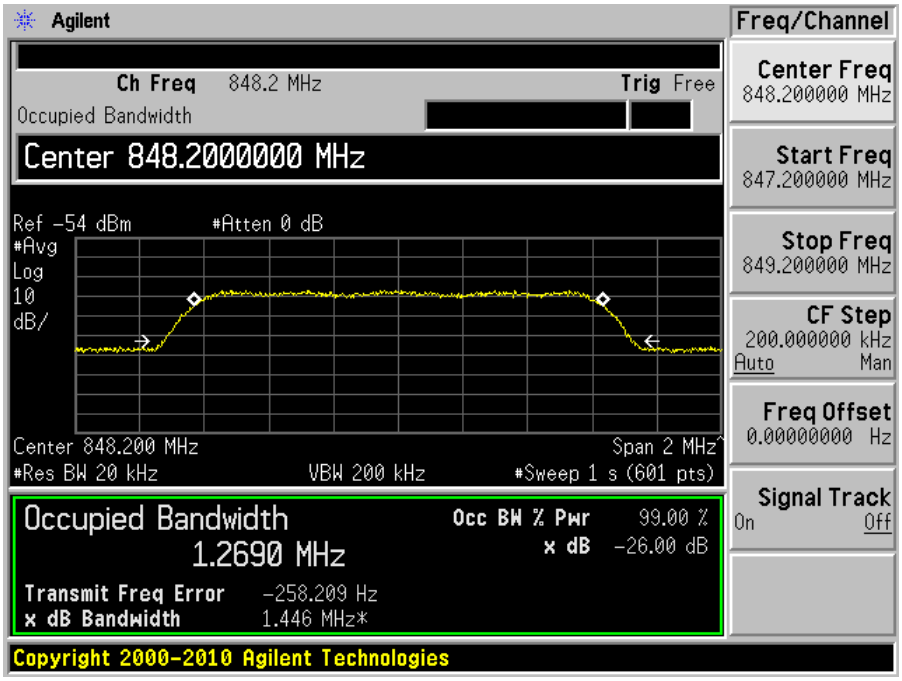


High Channel (848.2 MHz)

Input



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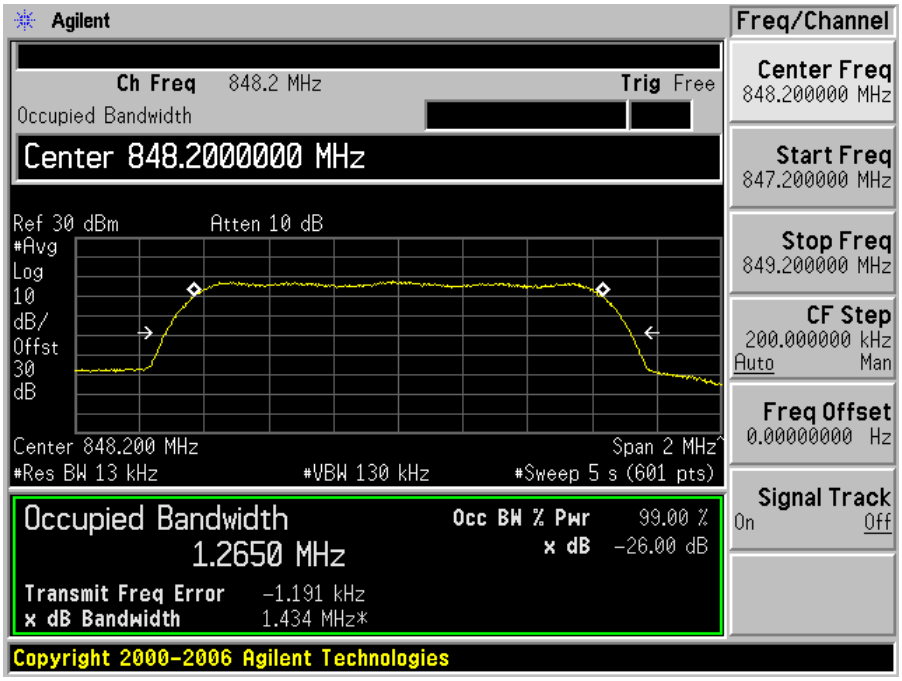
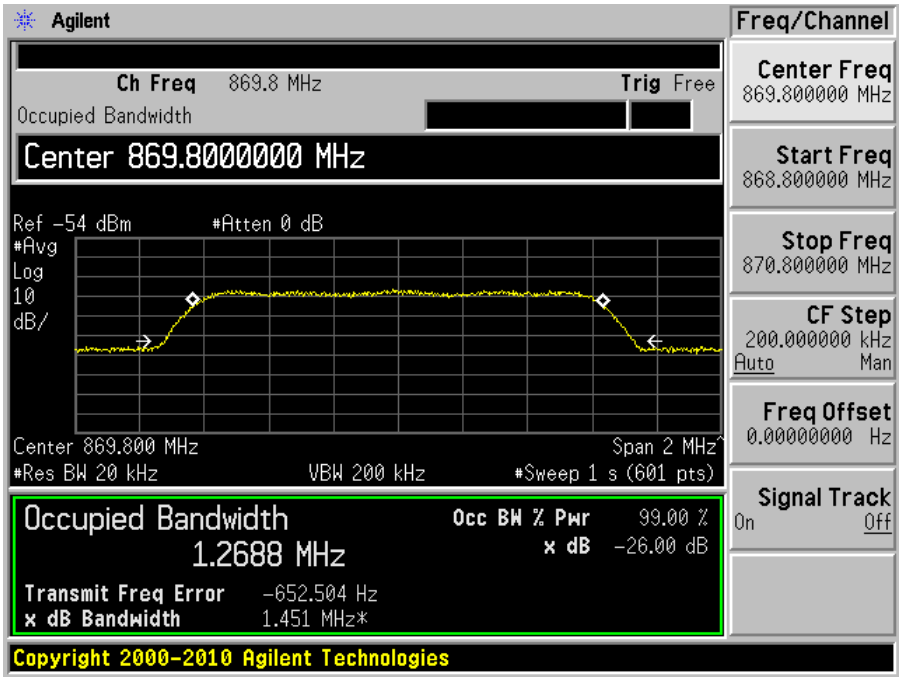


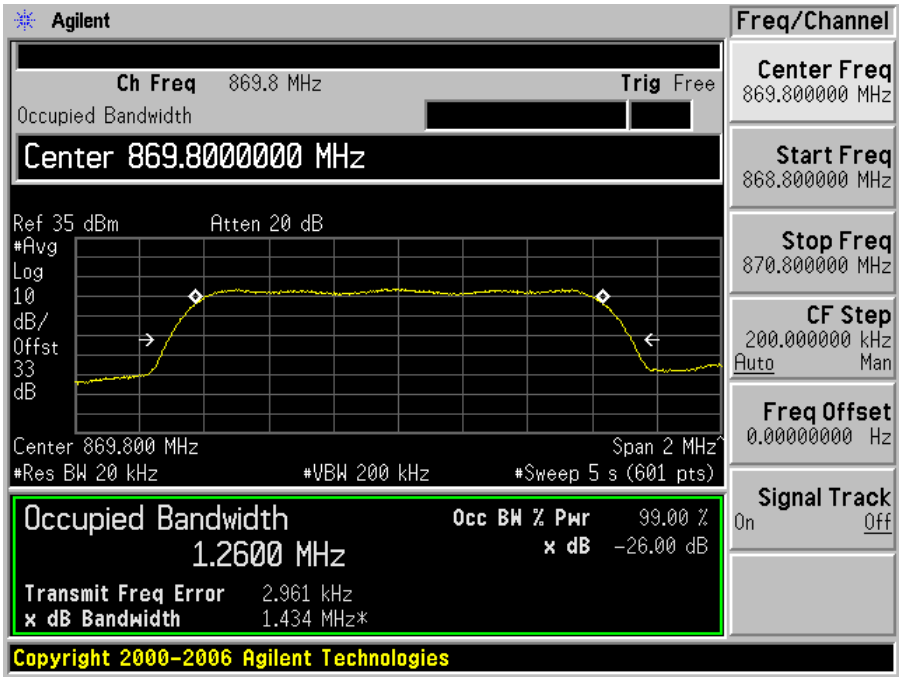
1xEVDO 850 MHz Band (Downlink)

Low Channel (869.8MHz)

Input

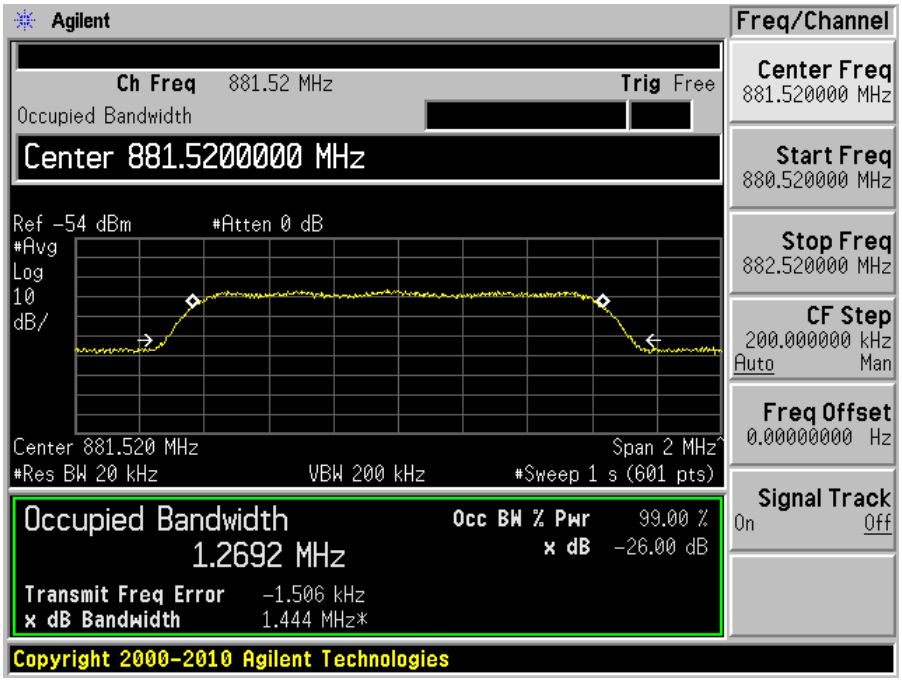


Output

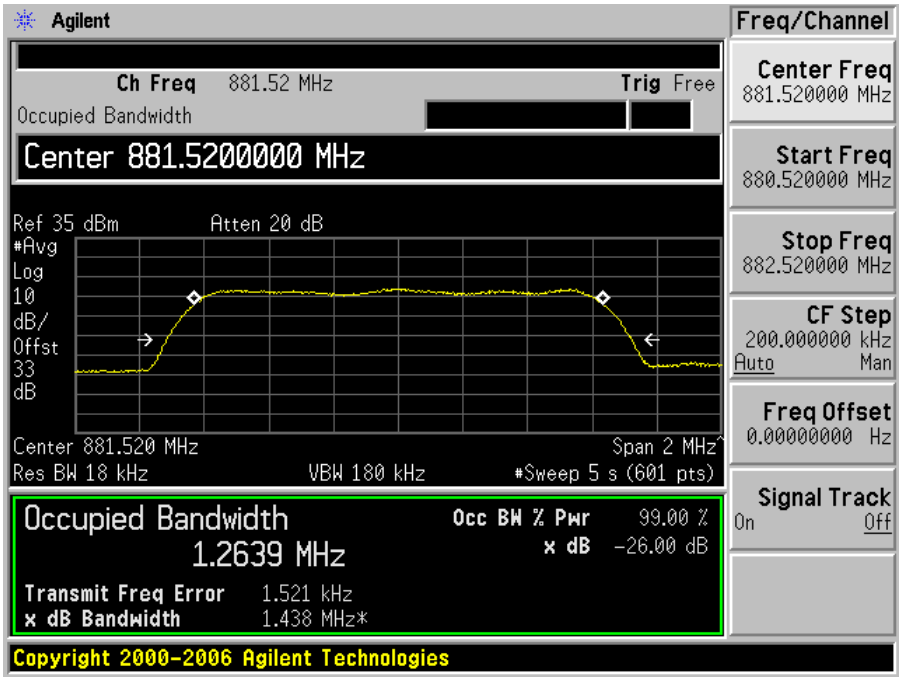


Middle Channel (881.52 MHz)

Input

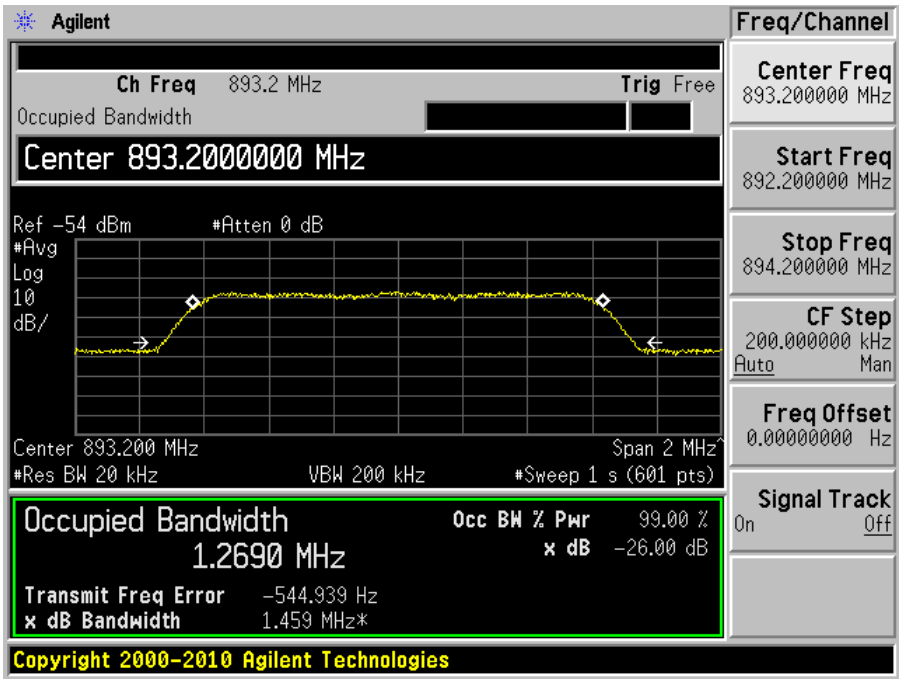


Output

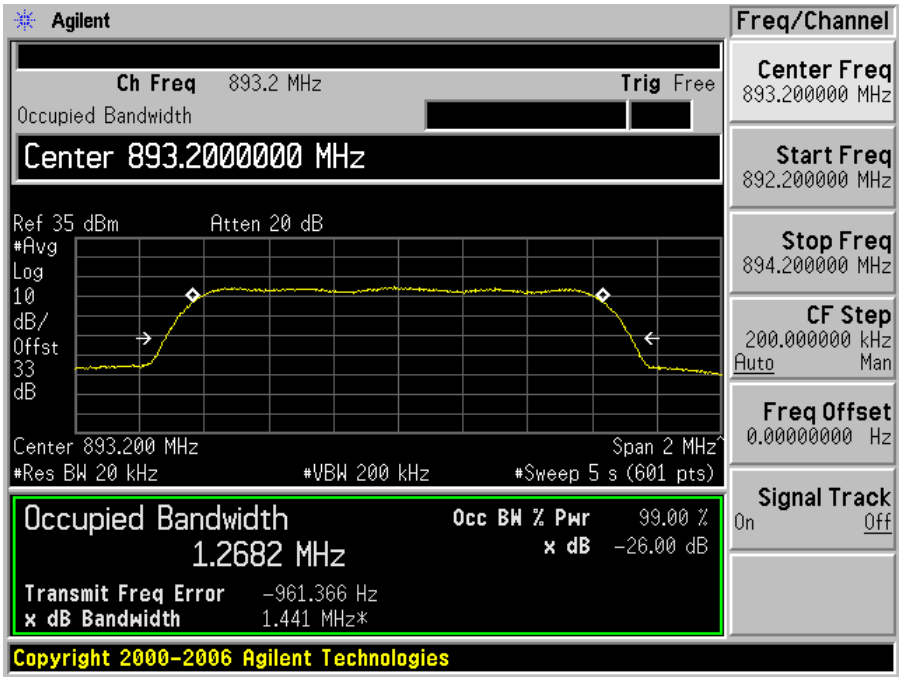


High Channel (893.2 MHz)

Input



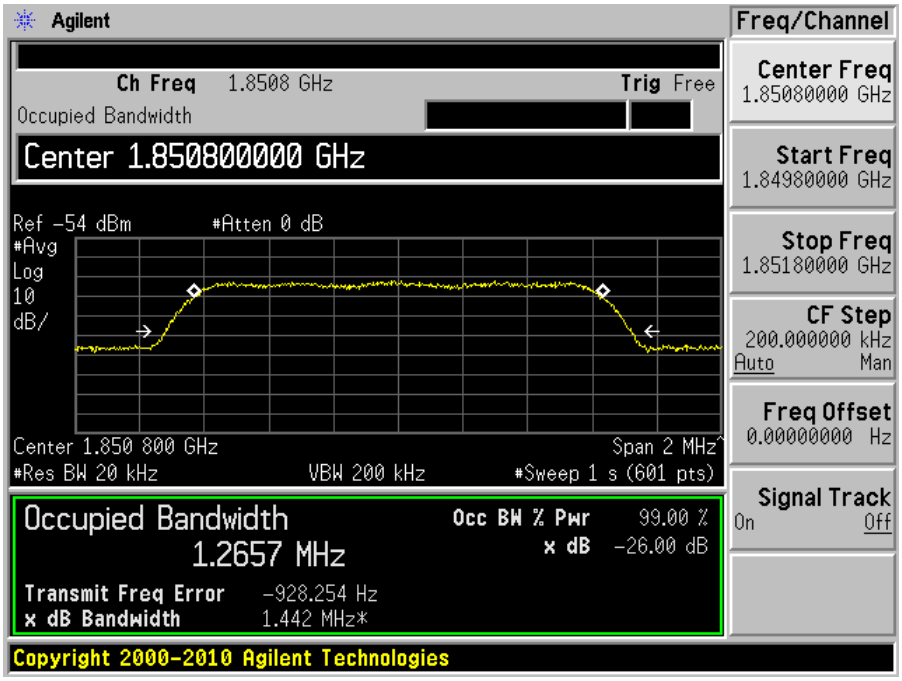
Output



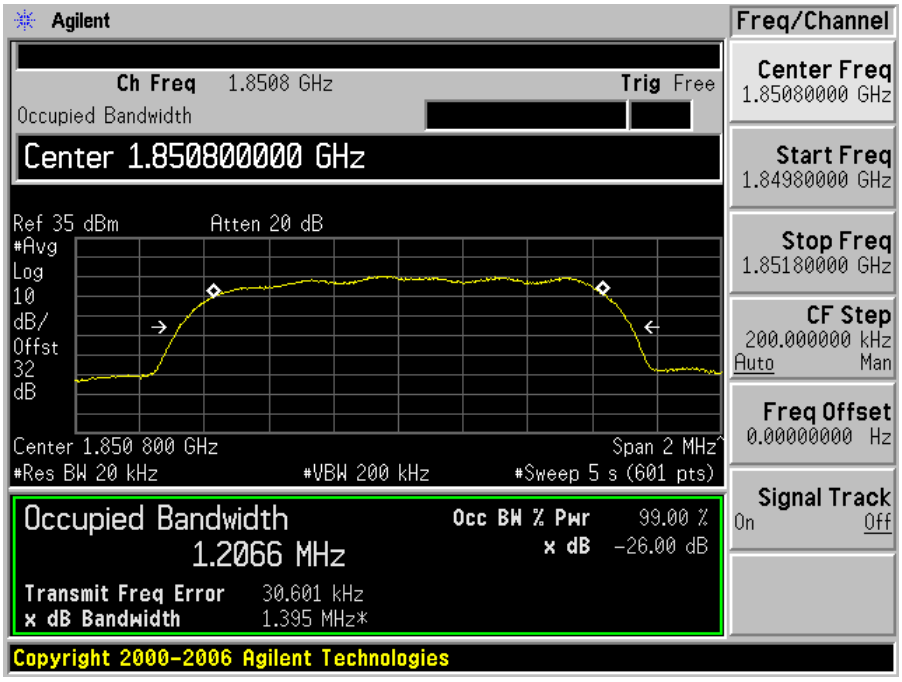
1xEVDO 1900 MHz Band (Uplink)

Low Channel (1850.8 MHz)

Input

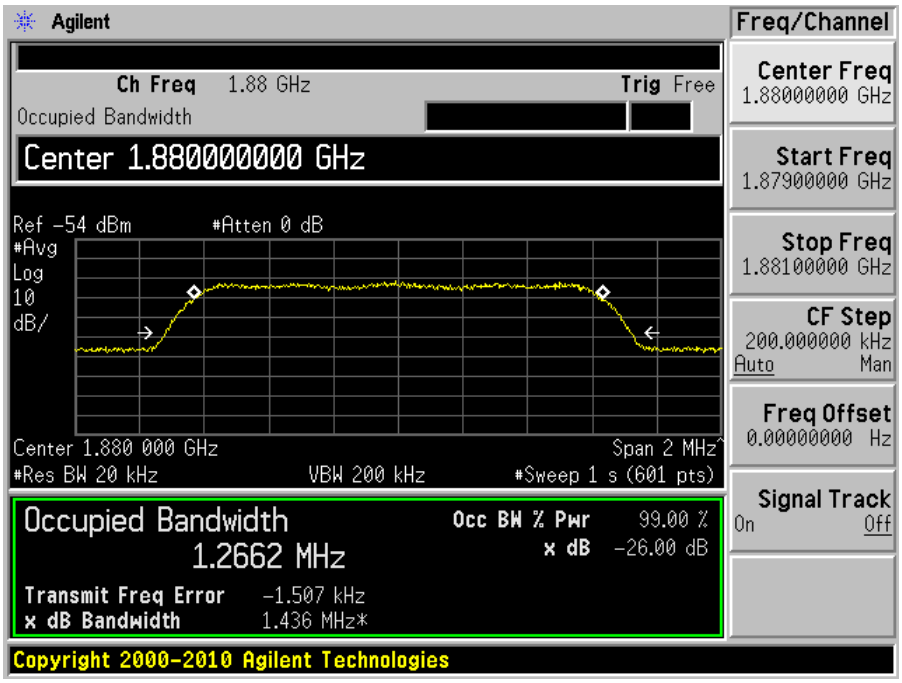


Output

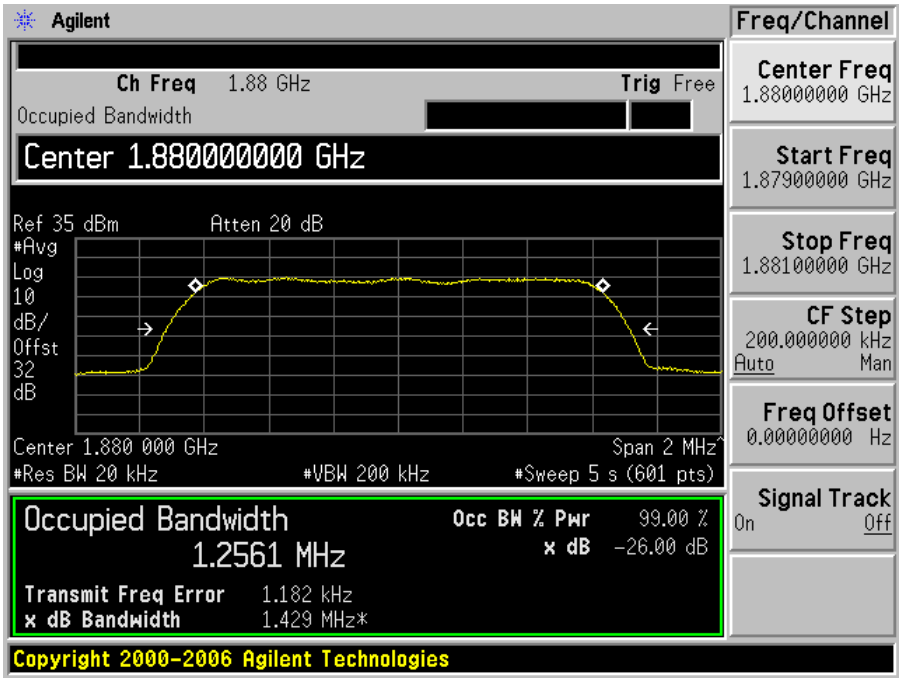


Middle Channel (1880 MHz)

Input

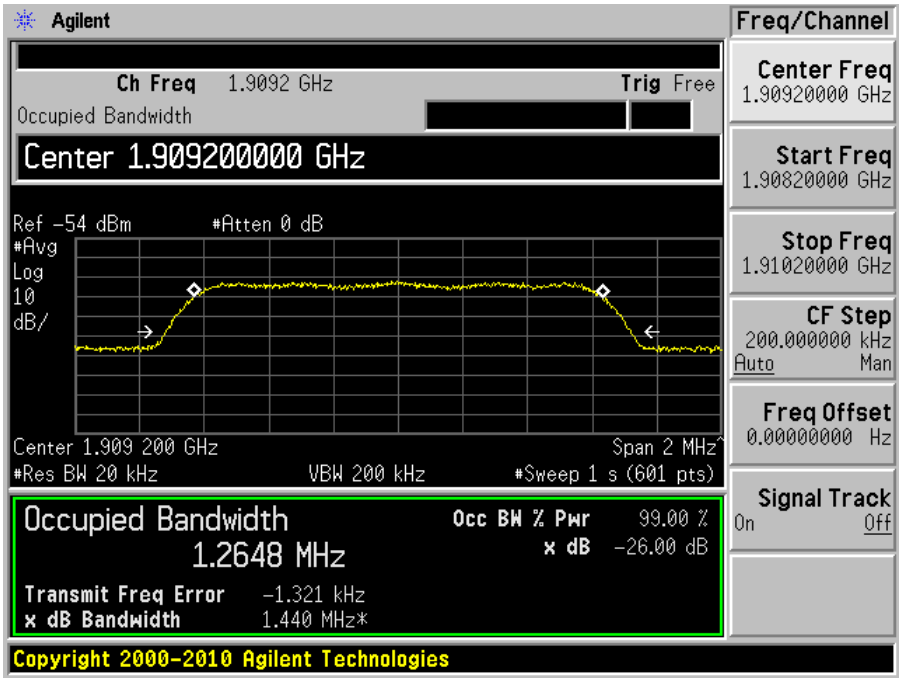


Output

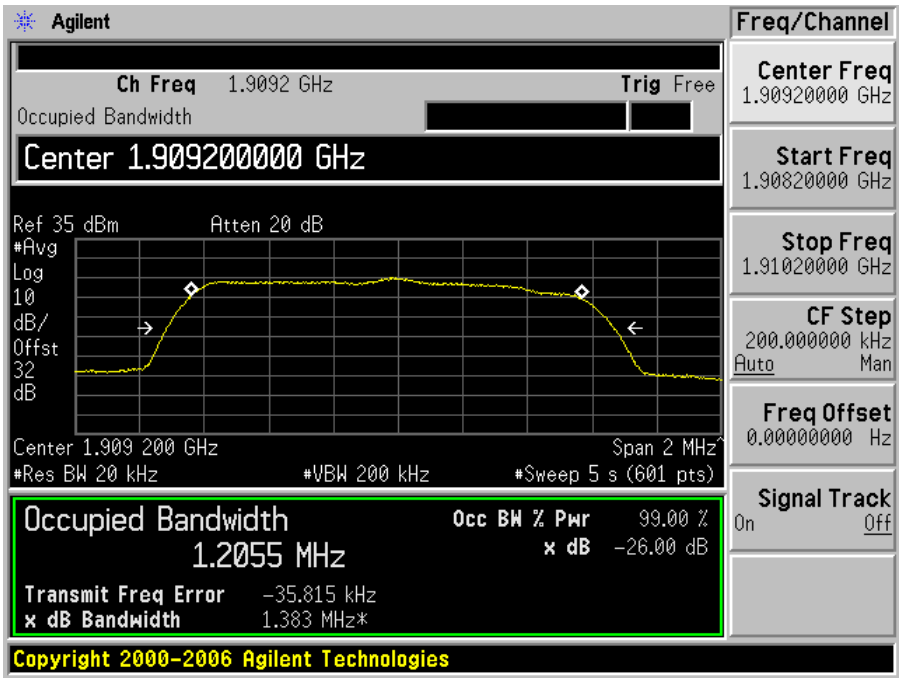


High Channel (1909.2 MHz)

Input



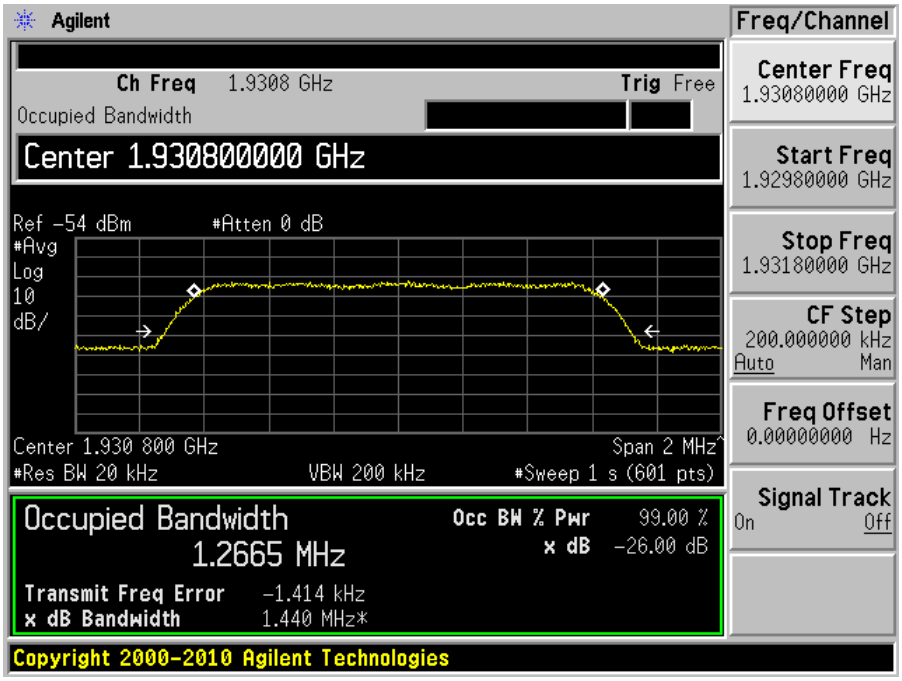
Output



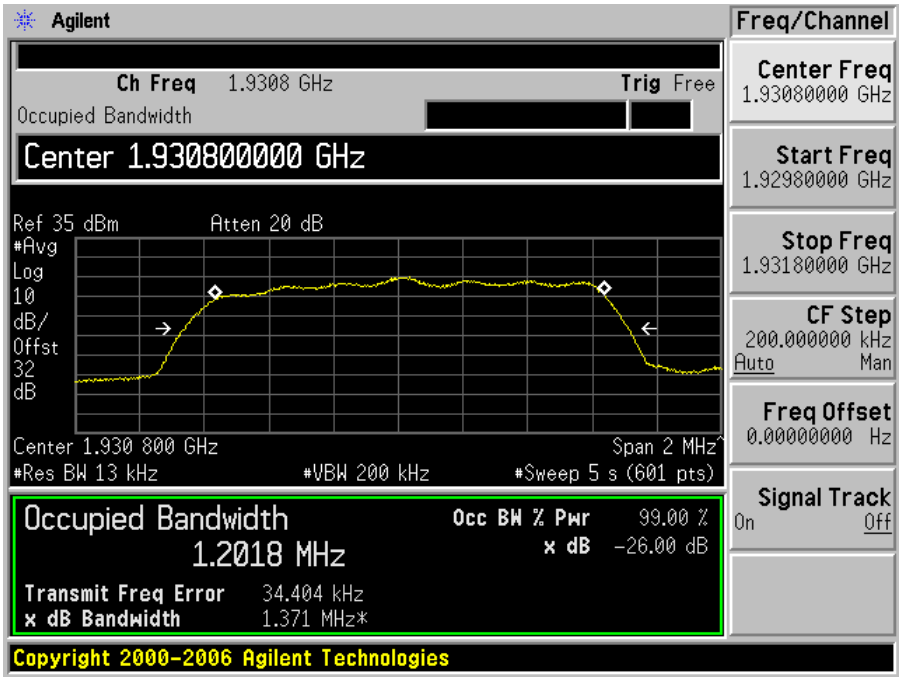
1xEVDO 1900 MHz Band (Downlink)

Low Channel (1930.8 MHz)

Input

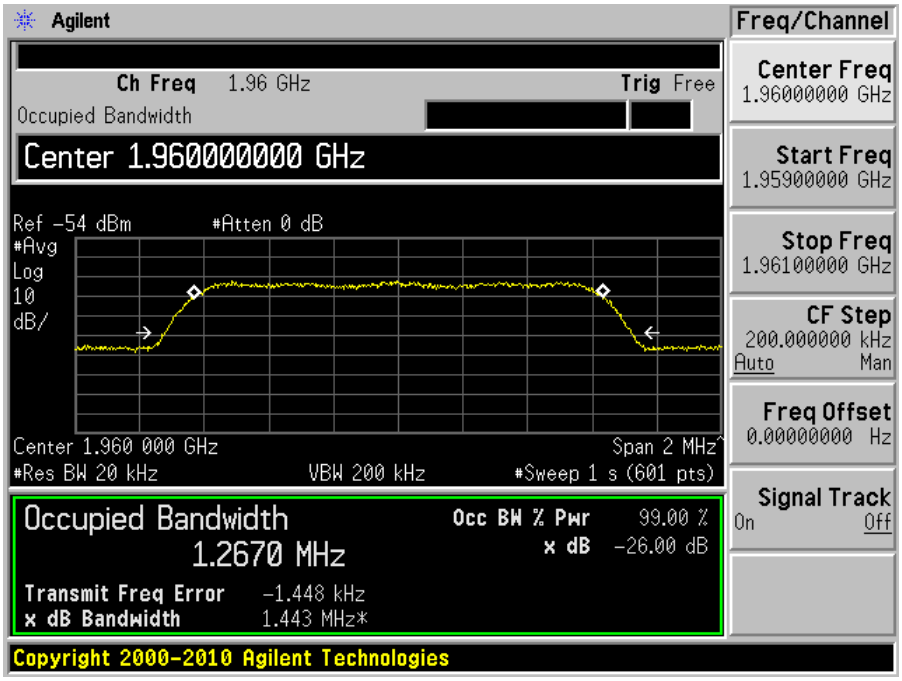


Output

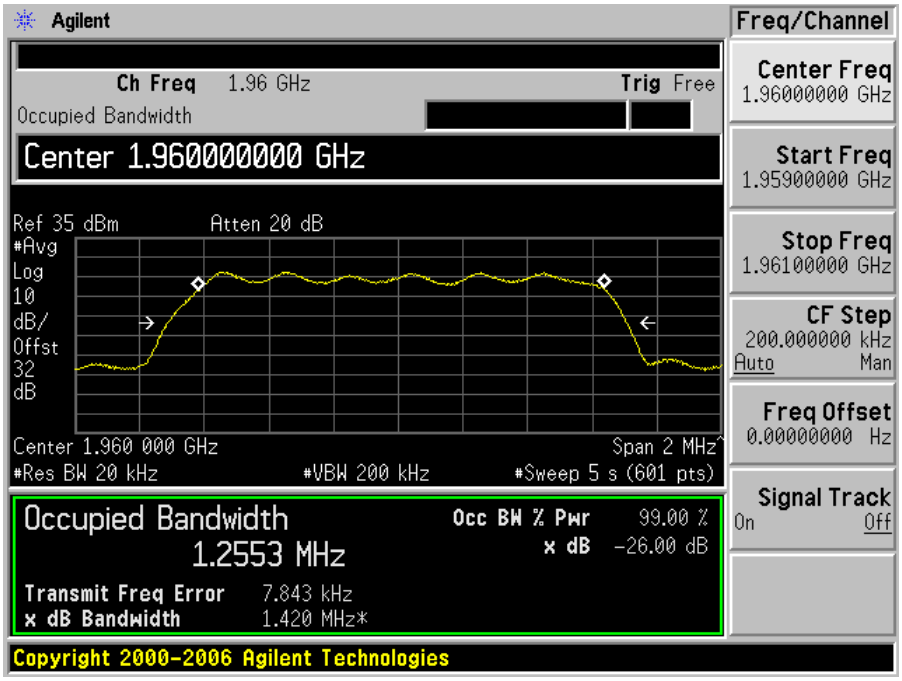


Middle Channel (1960 MHz)

Input

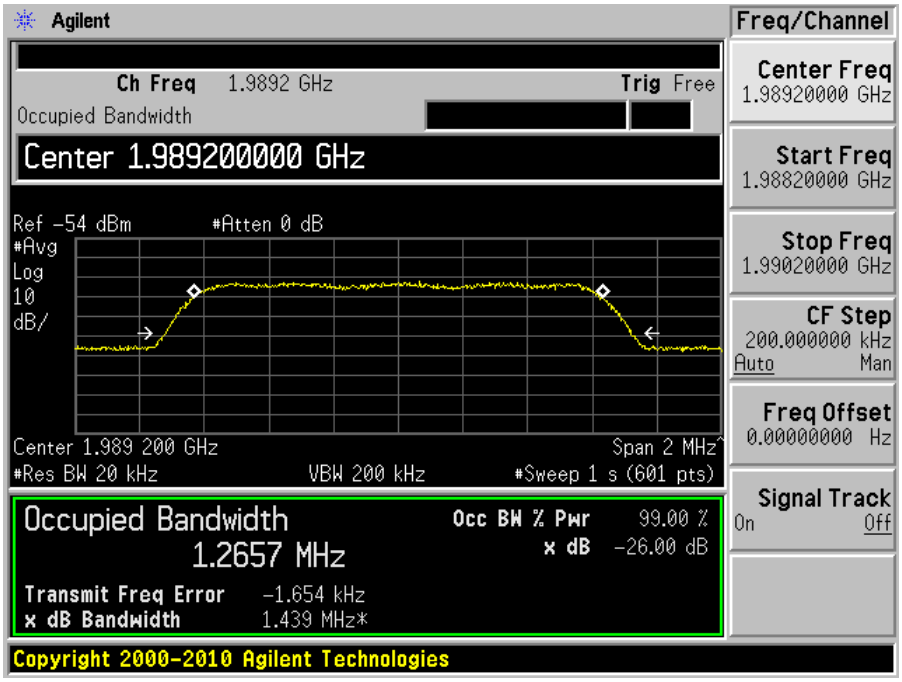


Output

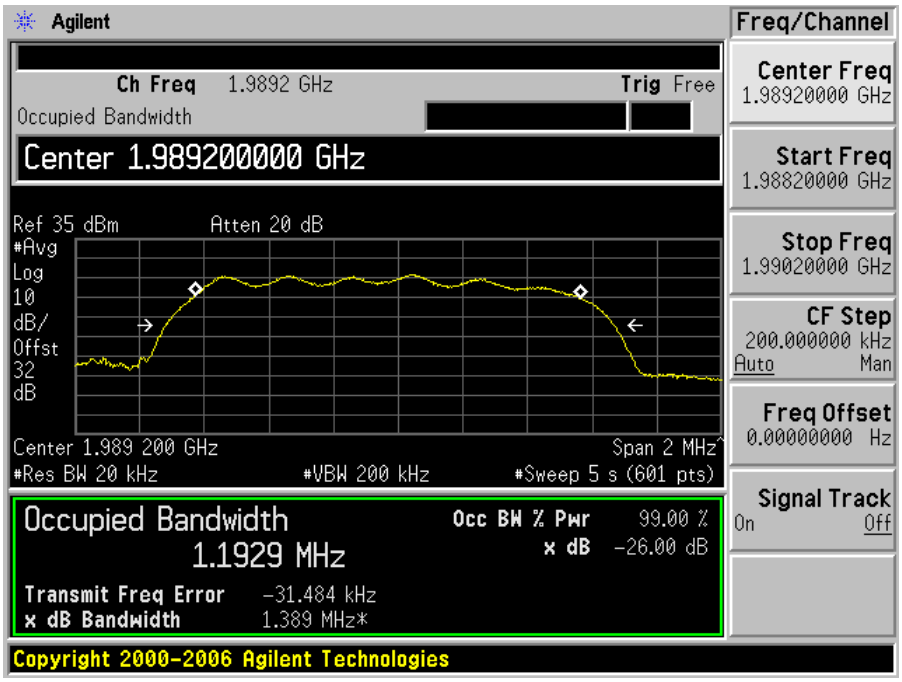


High Channel (1989.2 MHz)

Input



Output



7 FCC §2.1053, §22.917 & §24.238 - SPURIOUS RADIATED EMISSIONS

7.1 Applicable Standard

Requirements: FCC §2.1053, §22.917 and §24.238

7.2 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.

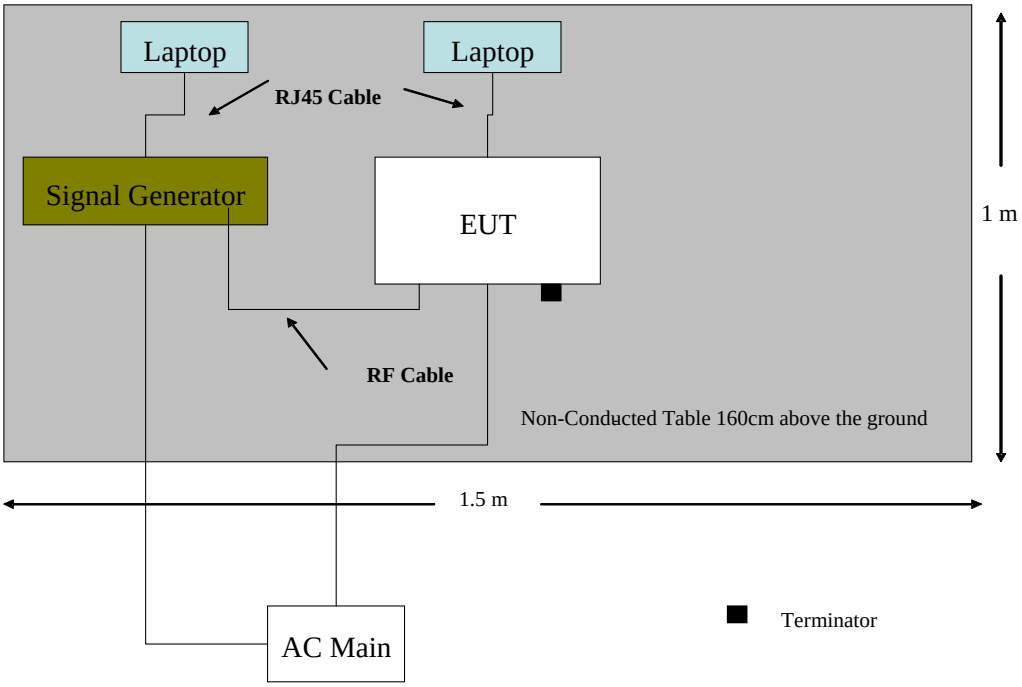
Spurious emissions in dB = 10 log (TX Power in Watts/0.001) – the absolute level
Spurious attenuation limit in dB = 43 + 10 Log10 (power out in Watts)

7.3 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date
Rohde & Schwarz	EMI Test Receiver	ESCI 1166.5950K03	100337	2010-03-24
Agilent	Spectrum Analyzer	E4440A	US45303156	2010-08-09
Sunol Science Corp	System Controller	SC99V	122303-1	N/R
Sunol Science Corp	Combination Antenna	JB3	A0020106-3	2010-06-16
Hewlett Packard	Pre amplifier	8447D	2944A06639	2010-06-18
A.R.A Inc	Horn antenna	DRG-1181A	1132	2009-10-27
Mini-Circuits	Pre Amplifier	ZVA-183-S	570400946	2010-05-0
Agilent	Signal Generator	E4438C	MY42083251	2009-12-08

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

7.4 Test Block Diagram



7.5 Test Environmental Conditions

Temperature:	21-24 °C
Relative Humidity:	42-44 %
ATM Pressure:	101-103 kPa

The testing was performed by Jerry Huang on 2010-08-28 in 5 Meter Chamber #3.

7.6 Summary of Test Results

Worst case reading as follows:

Mode: 1xEVDO 850 MHz Downlink			
Margin (dB)	**Frequency (MHz)**	**Polarization (Horizontal/Vertical)**	**Input Frequency**
Note [1]	-	Horizontal	881.52
Mode: 1xEVDO 850 MHz Uplink			
Margin (dB)	**Frequency (MHz)**	**Polarization (Horizontal/Vertical)**	**Input Frequency**
Note [1]	-	Vertical	836.52

Mode: 1xEVDO 1900 MHz Downlink			
Margin (dB)	**Frequency (MHz)**	**Polarization (Horizontal/Vertical)**	**Input Frequency**
Note [1]	-	Horizontal	1960
Mode: 1xEVDO 1900 MHz Uplink			
Margin (dB)	**Frequency (MHz)**	**Polarization (Horizontal/Vertical)**	**Input Frequency**
Note [1]	-	Vertical	1880

Note [1]: All harmonics were on the noise floor level and/or 20 dB below the limit.
All digital signals were tested on another standard.

7.7 Test Results

1xEVDO 850 MHz Band, Downlink

Input frequency = 881.52 MHz

Indicated		Azimuth (degree)	Test Antenna		Substituted					Limit (dBm)	Margin (dB)
Frequency (MHz)	S.A. Amp. (dBuV)		Height (m)	Polarity (H/V)	Frequency (MHz)	Level (dBm)	Ant. Cord. (dB)	Cable Loss (dB)	Absolute Level (dBm)		
1763.04	-	-	-	H	1763.04	-	-	-	-	-13.00	Note [1]
1763.04	-	-	-	V	1763.04	-	-	-	-	-13.00	Note [1]

1xEVDO 850 MHz Band, Uplink

Input frequency = 836.52 MHz

Indicated		Azimuth (degree)	Test Antenna		Substituted					Limit (dBm)	Margin (dB)
Frequency (MHz)	S.A. Amp. (dBuV)		Height (m)	Polarity (H/V)	Frequency (MHz)	Level (dBm)	Ant. Cord. (dB)	Cable Loss (dB)	Absolute Level (dBm)		
1673.04	-	-	-	H	1673.04	-	-	-	-	-13.00	Note [1]
1673.04	-	-	-	V	1673.04	-	-	-	-	-13.00	Note [1]

1xEVDO 1900 MHz Band, Downlink

Input frequency = 1960 MHz

Indicated		Azimuth (degree)	Test Antenna		Substituted					Limit (dBm)	Margin (dB)
Frequency (MHz)	S.A. Amp. (dBuV)		Height (m)	Polarity (H/V)	Frequency (MHz)	Level (dBm)	Ant. Cord. (dB)	Cable Loss (dB)	Absolute Level (dBm)		
3920.00	-	-	-	H	3920.00	-	-	-	-	-13.00	Note [1]
3920.00	-	-	-	V	3920.00	-	-	-	-	-13.00	Note [1]

CDMA 1900 MHz Band, Uplink

Input frequency = 1880 MHz

Indicated		Azimuth (degree)	Test Antenna		Substituted					Limit (dBm)	Margin (dB)
Frequency (MHz)	S.A. Amp. (dBuV)		Height (m)	Polarity (H/V)	Frequency (MHz)	Level (dBm)	Ant. Cord. (dB)	Cable Loss (dB)	Absolute Level (dBm)		
3760.00	-	-	-	H	3760.00	-	-	-	-	-13.00	Note [1]
3760.00	-	-	-	V	3760.00	-	-	-	-	-13.00	Note [1]

Note [1]: All harmonics were on the noise floor level and/or 20 dB below the limit.
All digital signals were tested on another standard.

8 FCC §2.1051, §22.917 & §24.238- SPURIOUS EMISSIONS AT ANTENNA TERMINALS

8.1 Applicable Standard

Requirements: FCC §2.1051, §22.917 and §24.238.

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

8.2 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^{th} harmonic.

8.3 Test Environmental Conditions

Temperature:	21-24°C
Relative Humidity:	40-43 %
ATM Pressure:	101-103 kPa

The testing was performed by Dennis Huang from 2010-08-24 to 2010-08-26 at RF Site.

8.4 Test Equipment List and Details

Manufacturers	Descriptions	Models	Serial Numbers	Calibration Dates
Agilent	Spectrum Analyzer	E4440A	MY44303352	2010-05-09
Agilent	Signal Generator	E4438C	MY42083251	2009-12-08

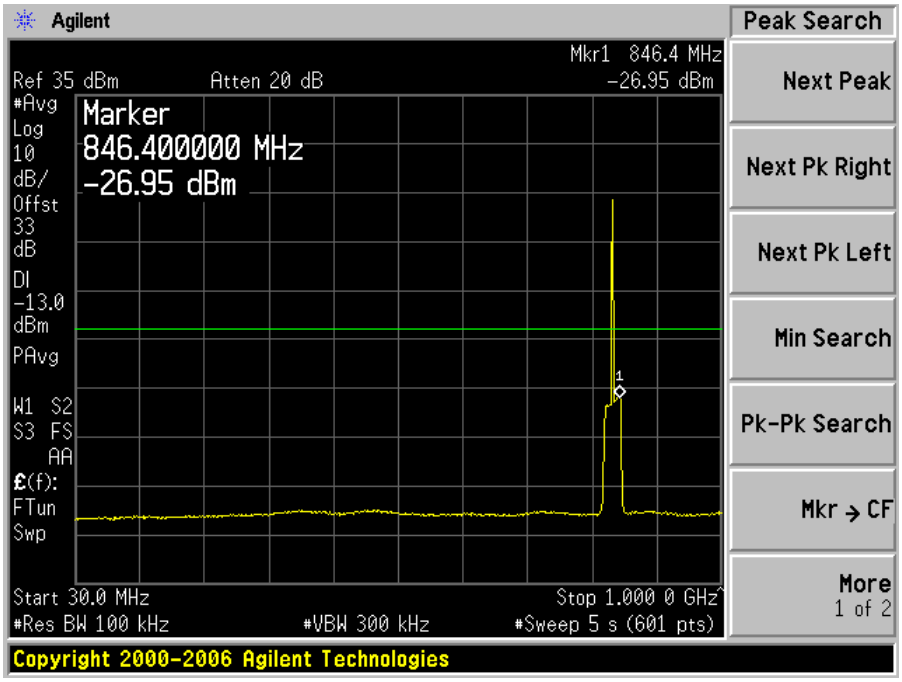
Statement of Traceability: BACL Corp. attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

8.5 Test Results

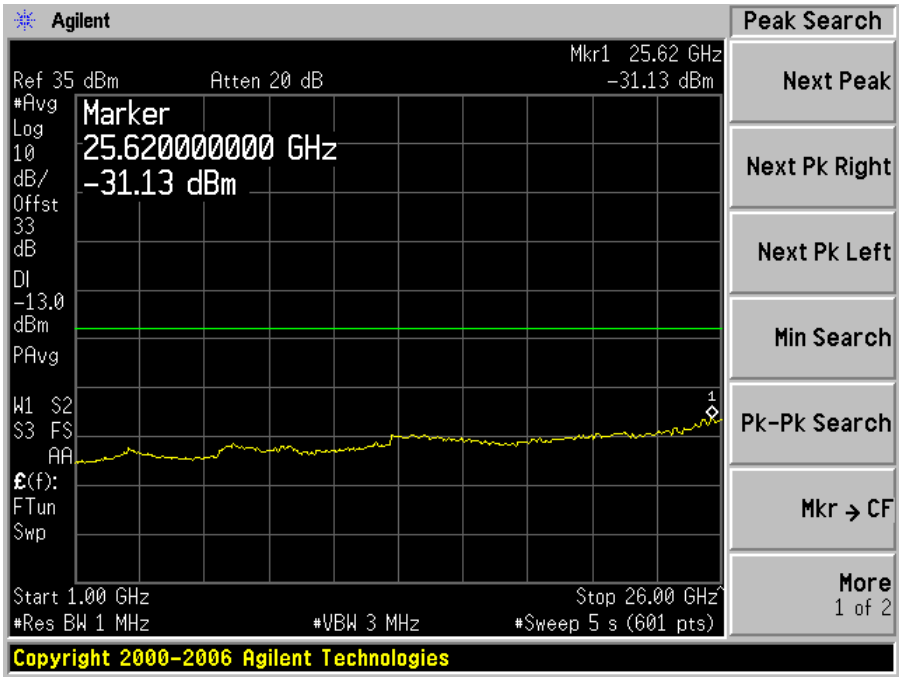
Please refer to the hereinafter plots.

1xEVDO 850 MHz Band, Uplink:

Middle Channel (836.52 MHz)



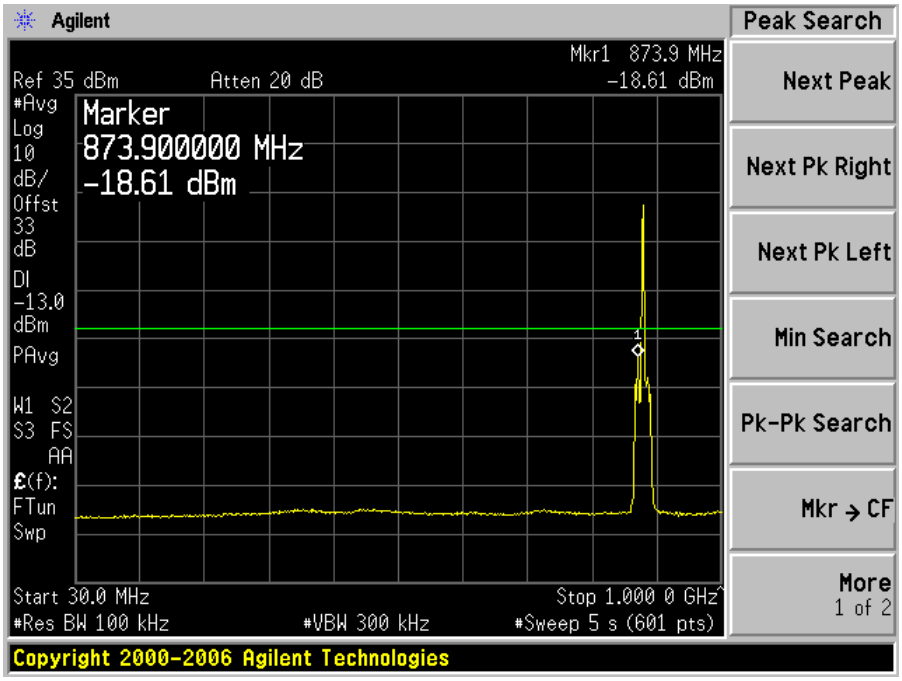
30 MHz to 1 GHz



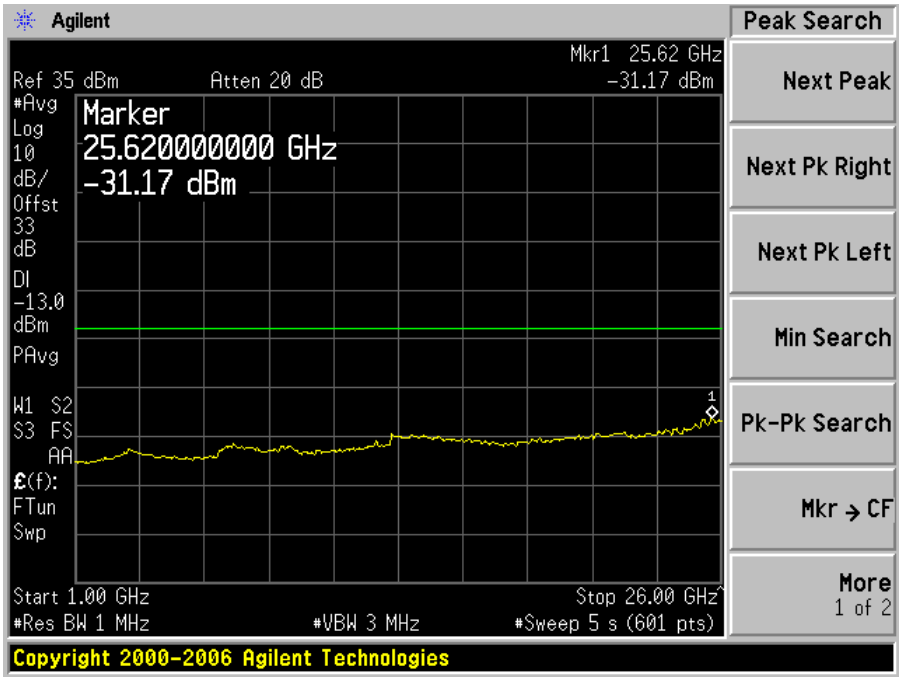
1 GHz to 26GHz

1xEVDO 850 MHz Band, Downlink:

Middle Channel (881.52 MHz)



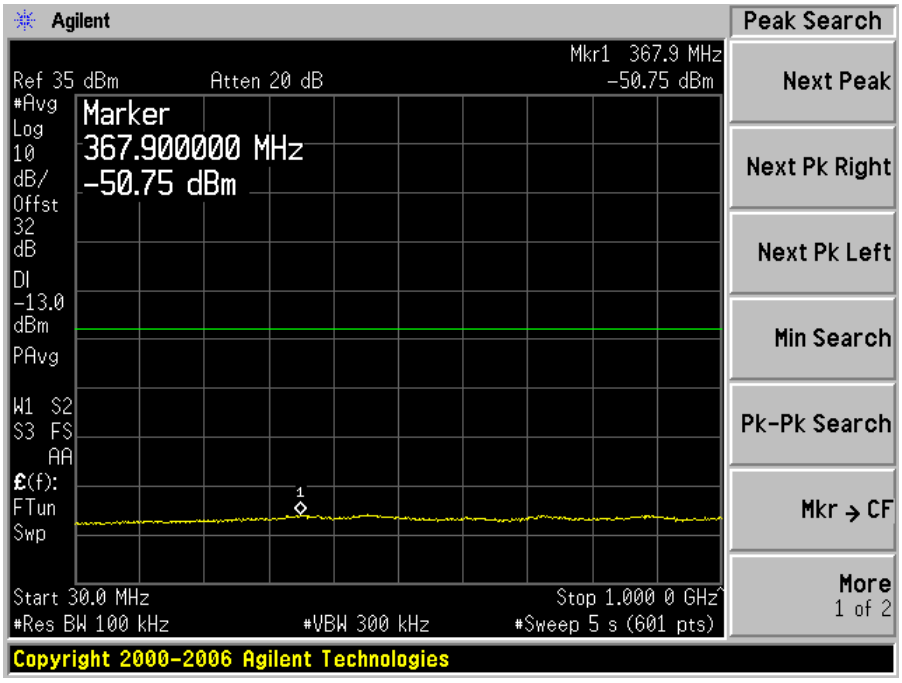
30 MHz to 1 GHz



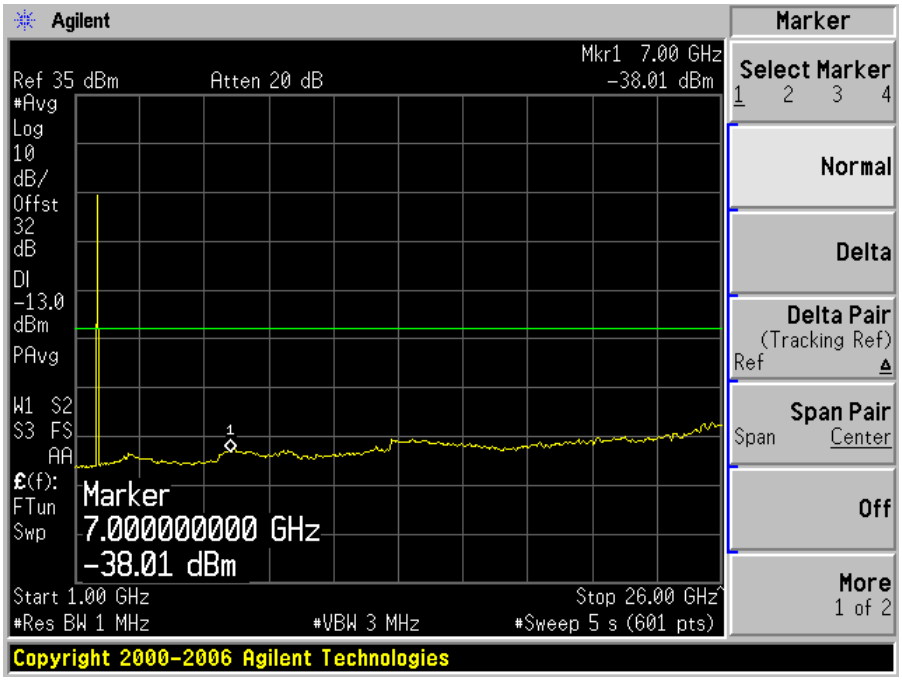
1 GHz to 26 GHz

1xEVDO 1900 MHz Band Uplink:

Middle Channel (1880 MHz)



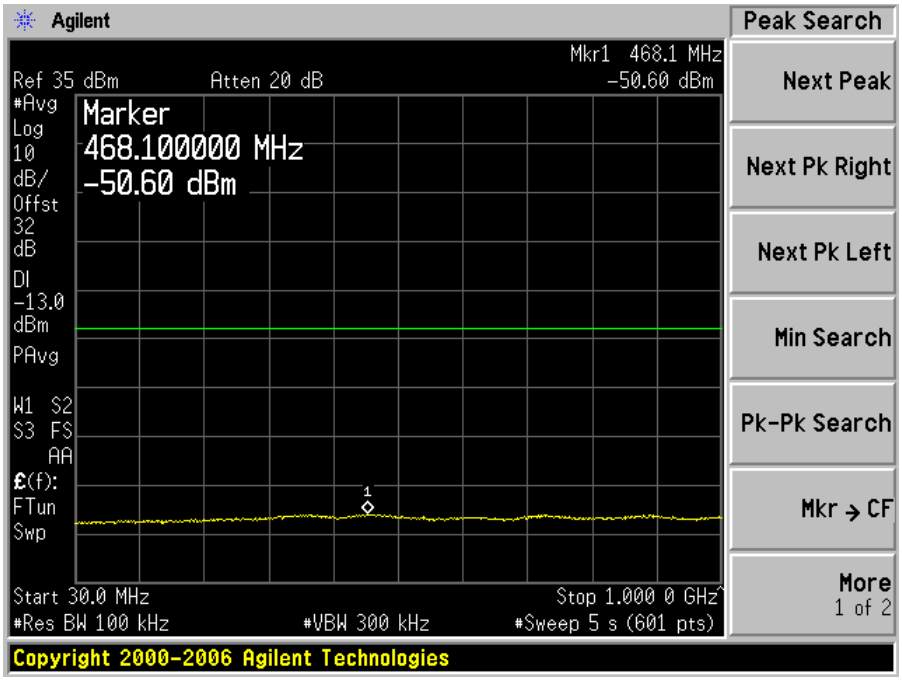
30 MHz to 1 GHz



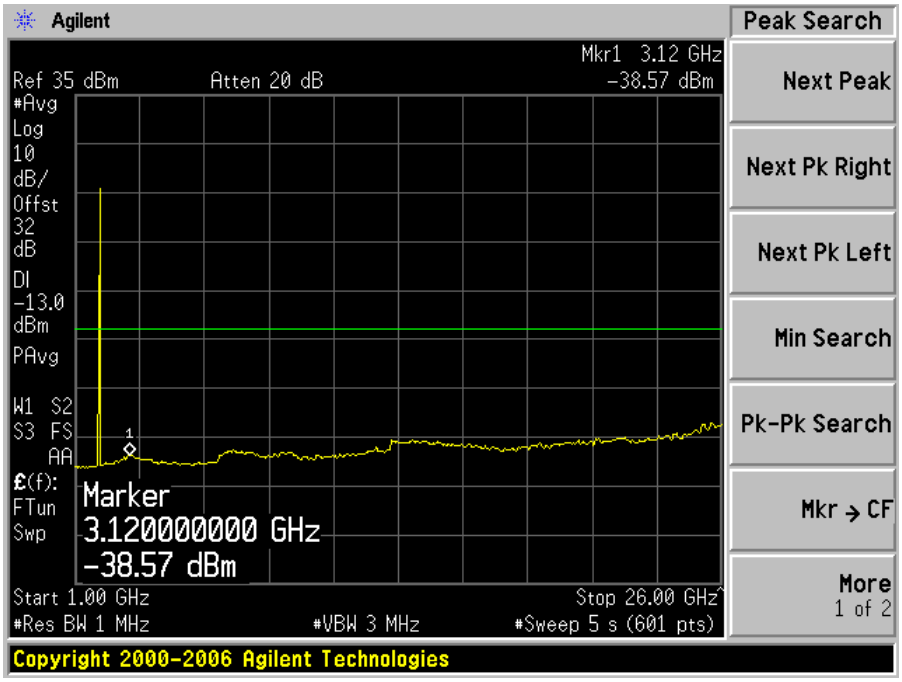
1 GHz to 26 GHz

1xEVDO 1900 MHz Band, Downlink:

Middle Channel (1960 MHz)



30 MHz to 1 GHz

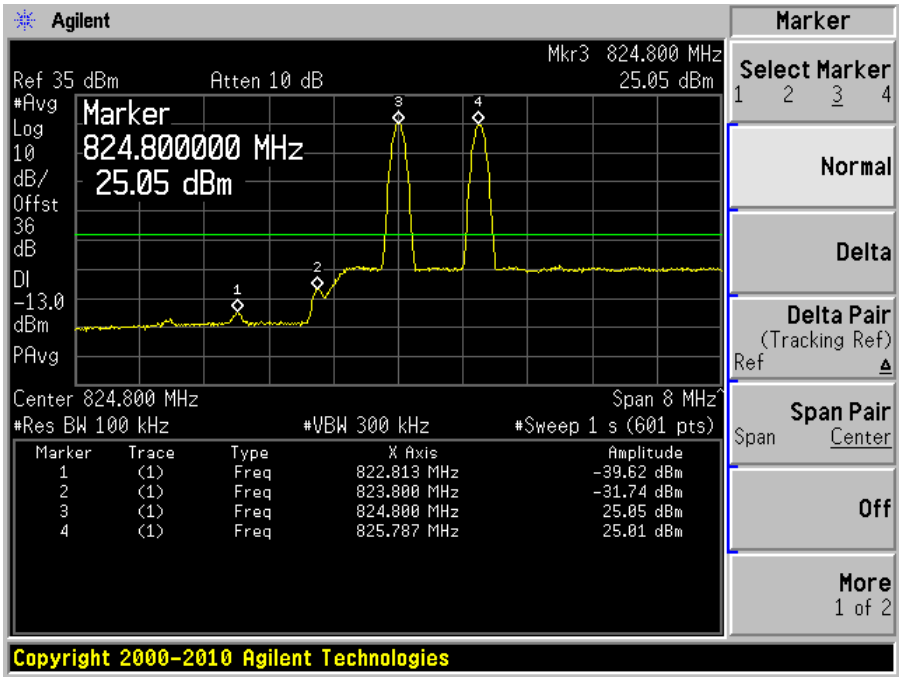


1 GHz to 26 GHz

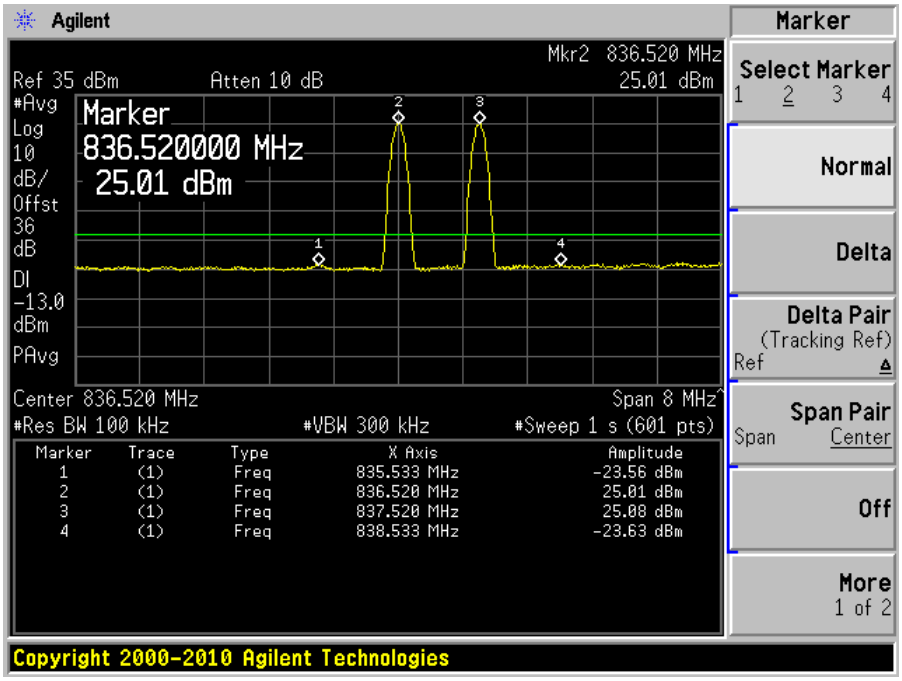
Inter-modulation:

1xEVDO 850 MHz Band, Uplink:

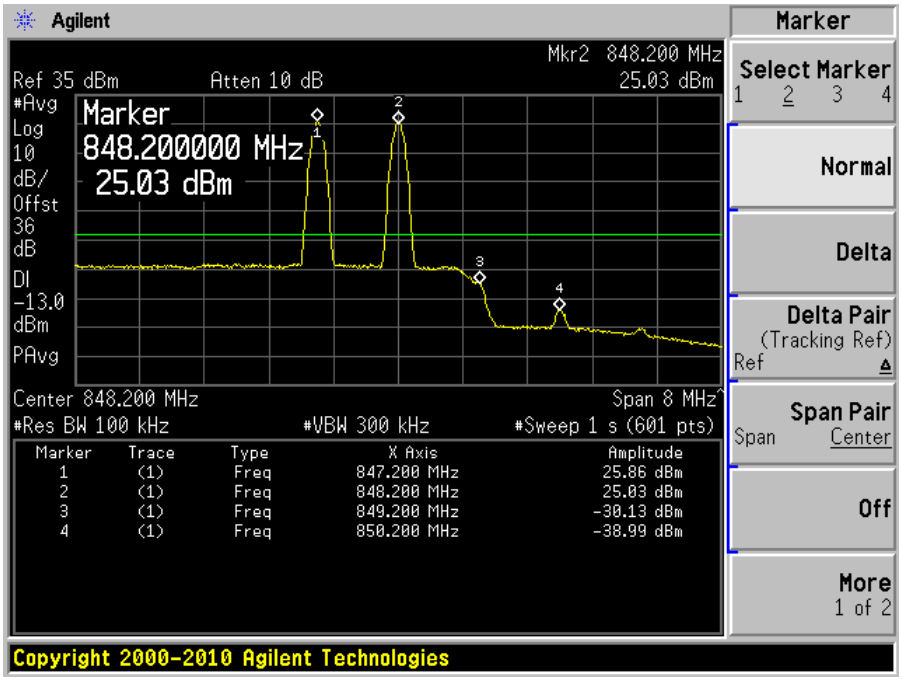
Lowest Channel



Middle Channel

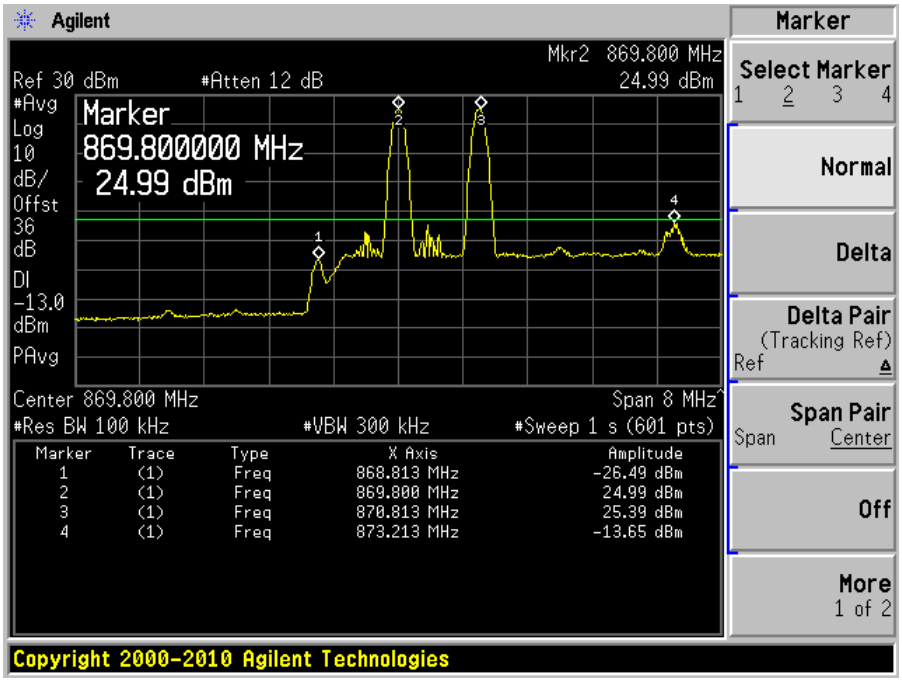


High Channel

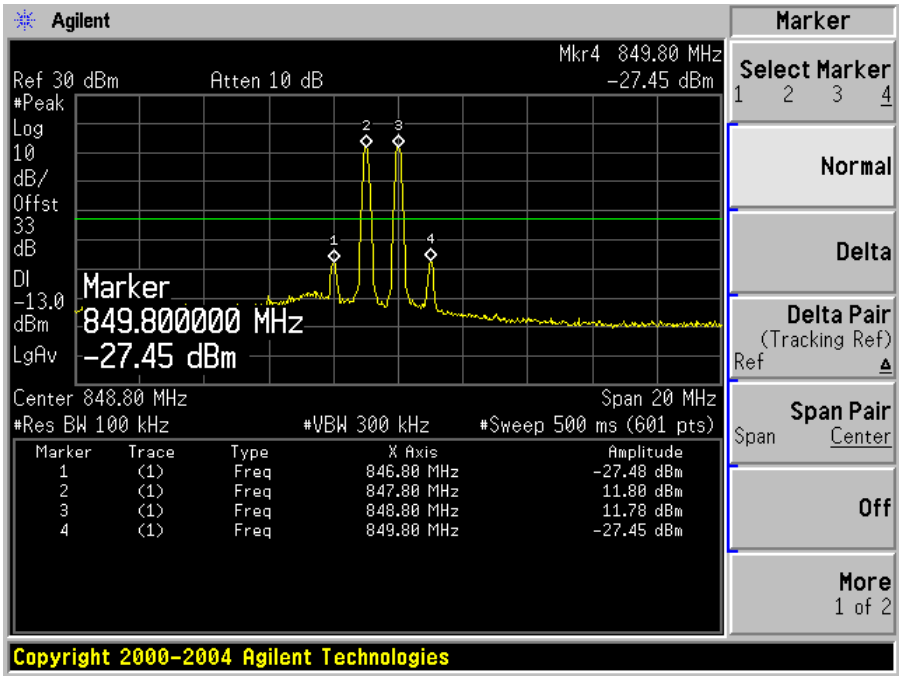


1xEVDO 850 MHz Band, Downlink:

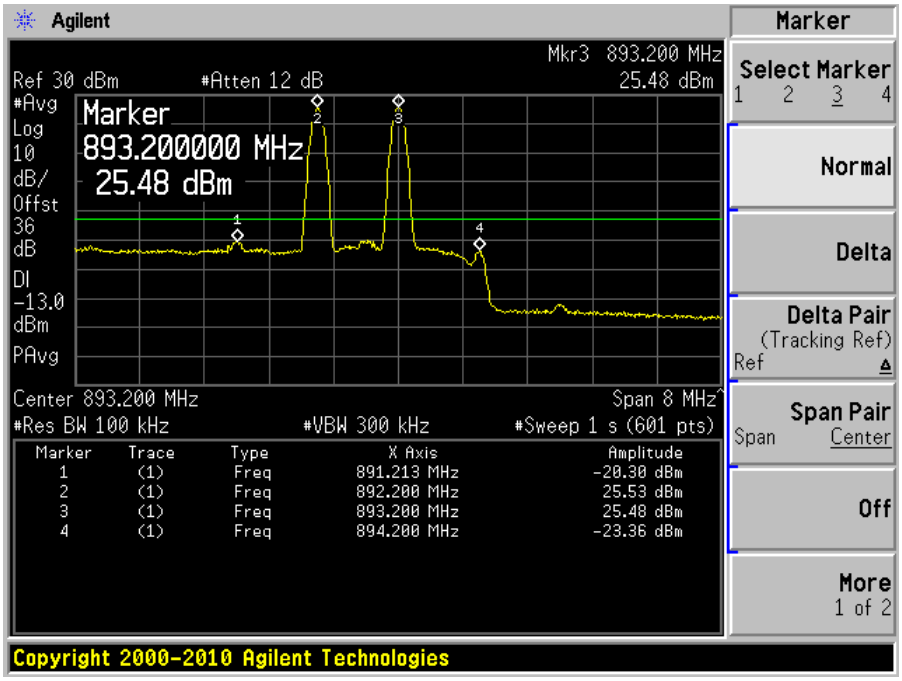
Lowest Channel



Middle Channel

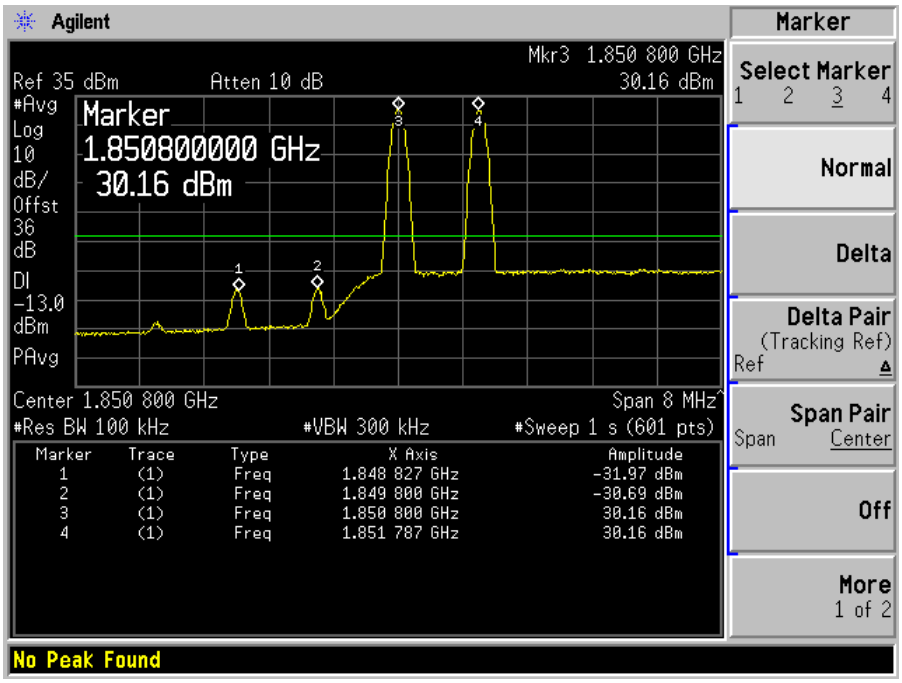


Highest Channel

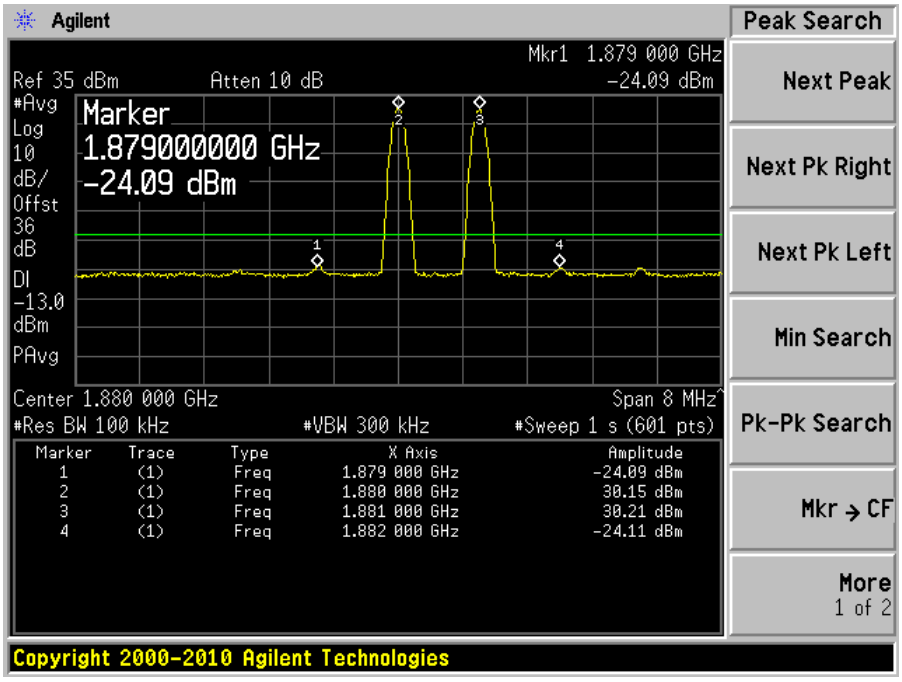


1xEVDO 1900 MHz Band, Unlink:

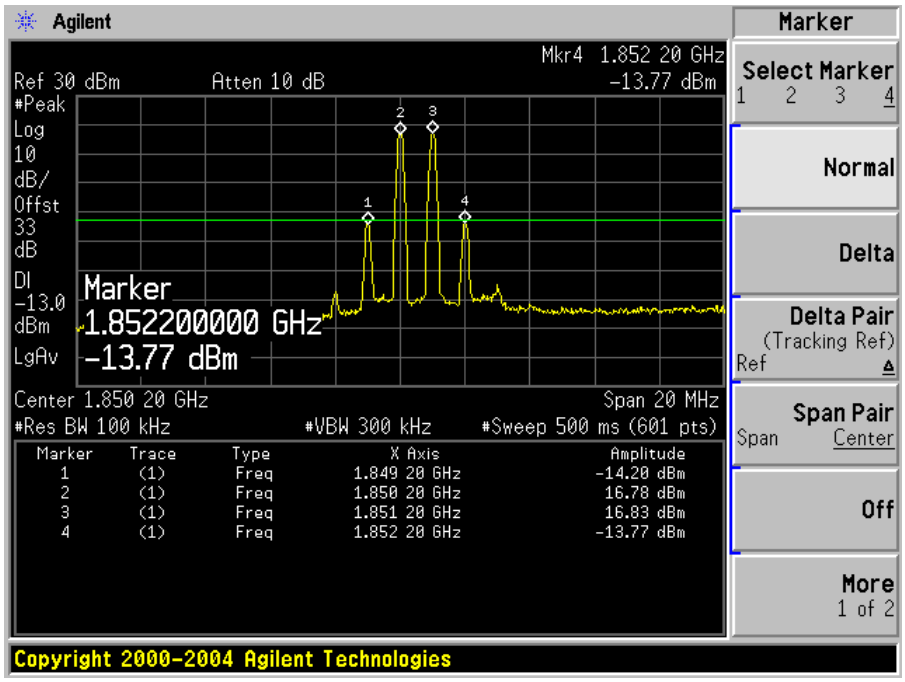
Lowest Channel



Middle Channel

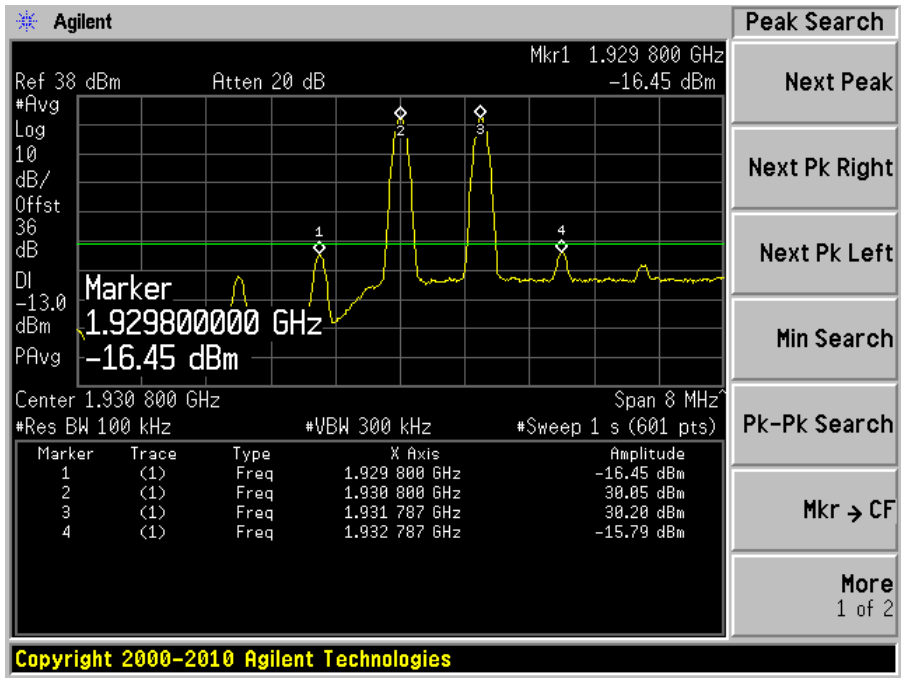


Highest Channel

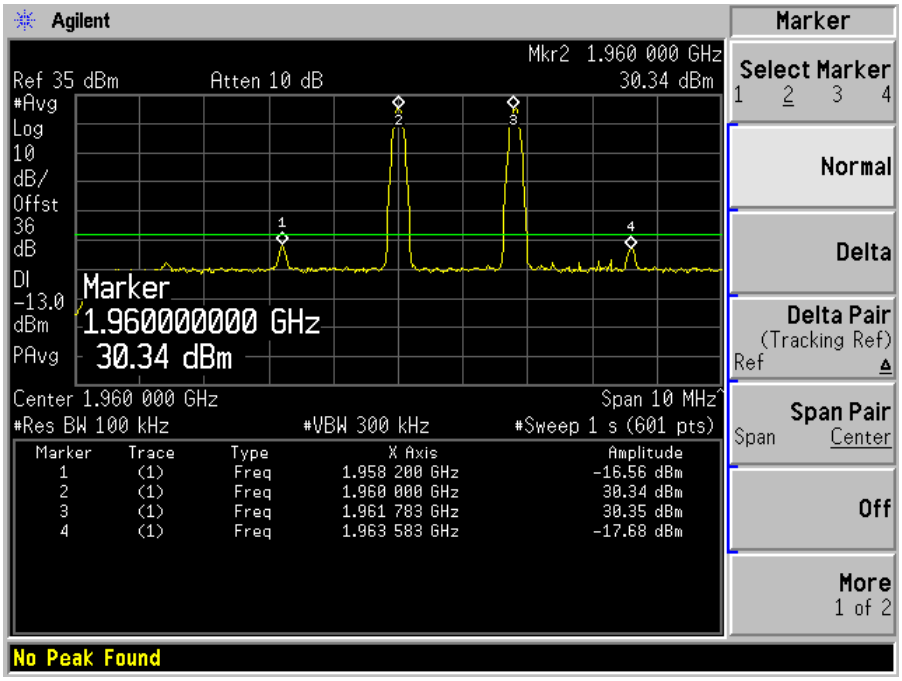


1xEVDO 1900 MHz Band, Downlink:

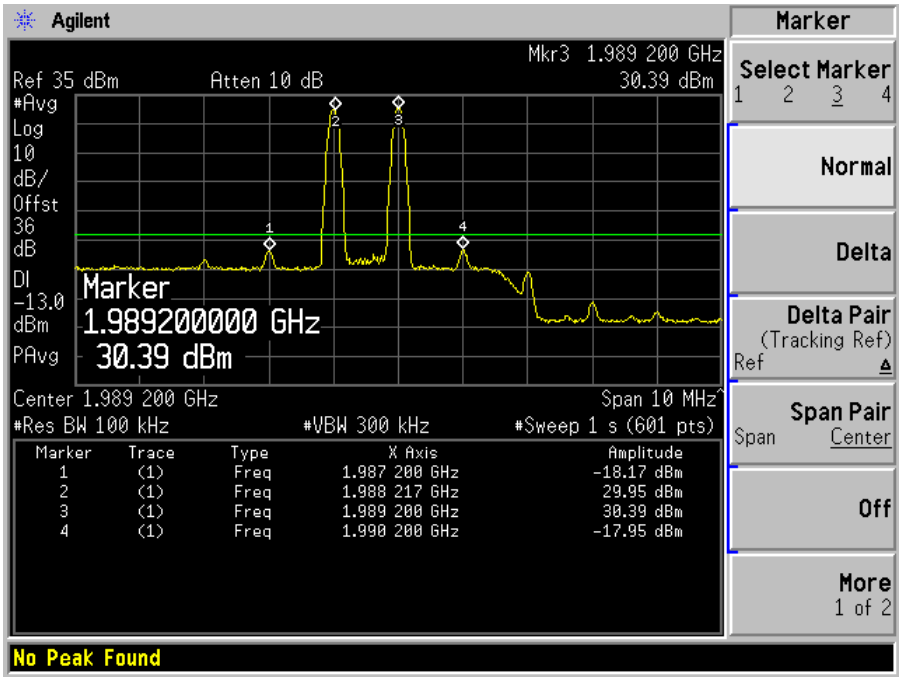
Lowest Channel



Middle Channel



Highest Channel



9 FCC §22.917 & §24.238– BAND EDGE

9.1 Applicable Standard

According to FCC §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.

According to FCC §24.238, the power of any emission 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.

9.3 Test Environmental Conditions

Temperature:	21-24°C
Relative Humidity:	40-43 %
ATM Pressure:	101-103 kPa

The testing was performed by Dennis Huang from 2010-08-24 to 2010-08-26 at RF Site.

9.4 Test Equipment List and Details

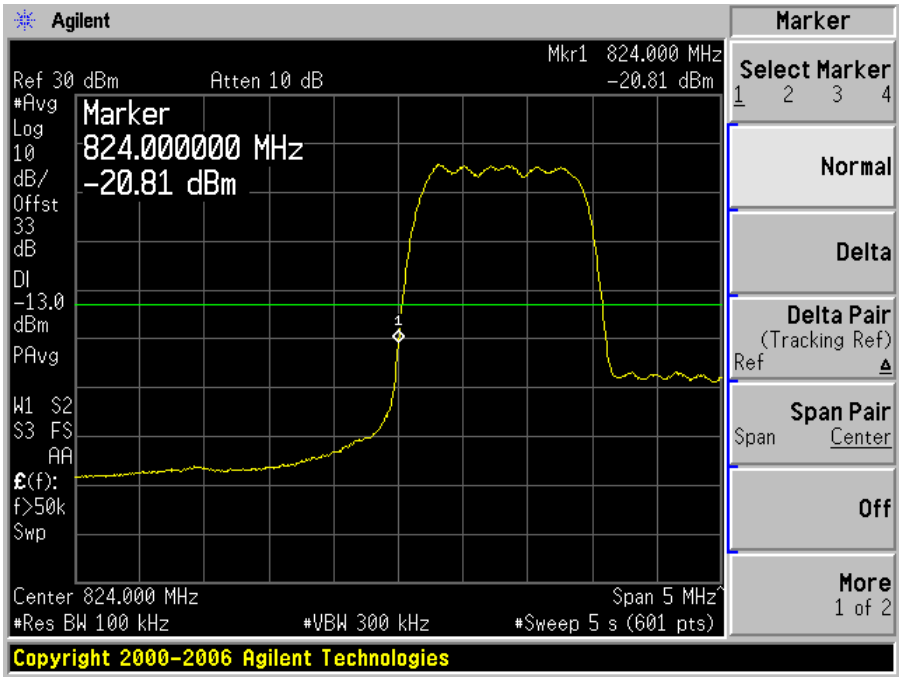
Manufacturer	Description	Model	Serial Number	Calibration Date
Agilent	Spectrum Analyzer	E4440A	MY44303352	2010-05-09
Agilent	Signal Generator	E4438C	MY42083251	2009-12-08

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

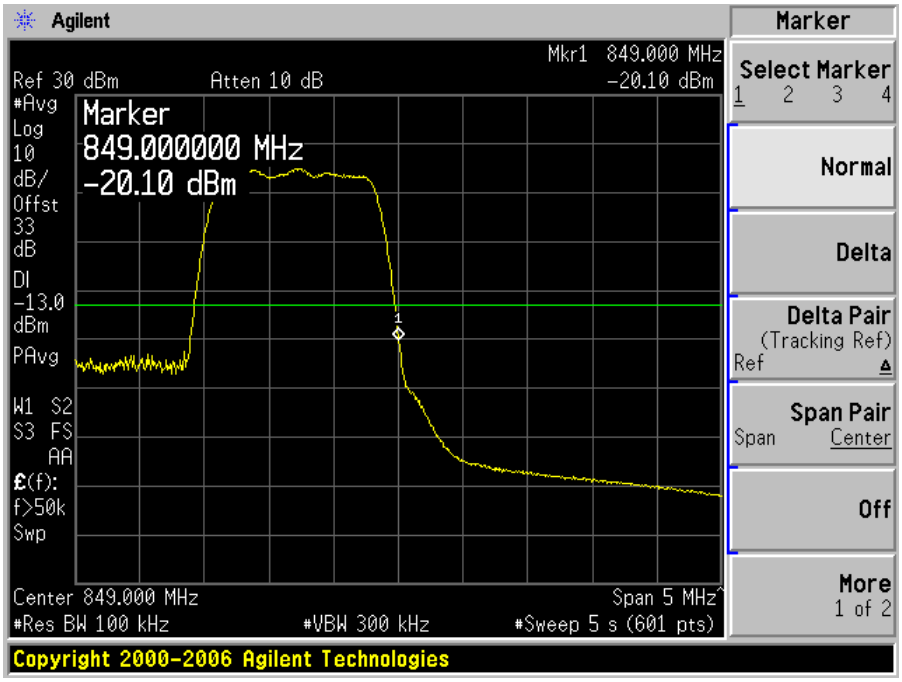
9.5 Test Results

Please refer to the following plots.

1xEVDO 850 MHz Band Uplink Band Edge

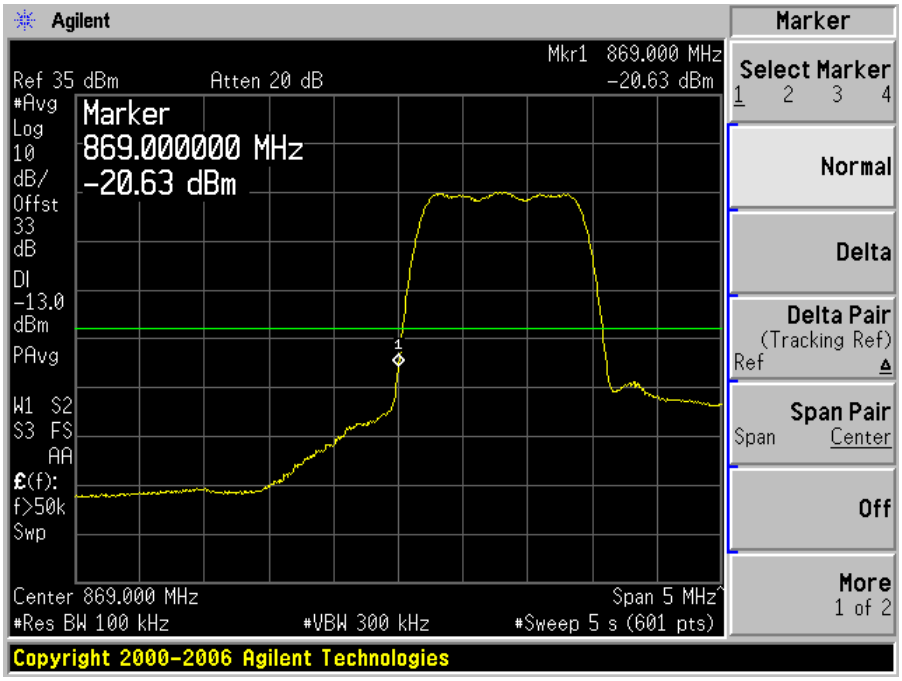


Low Channel

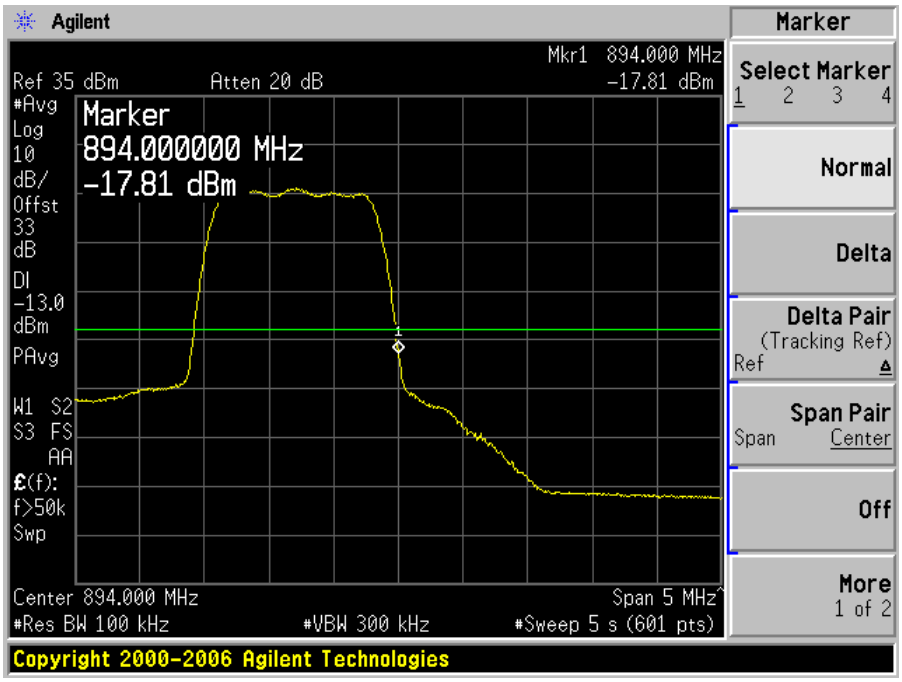


High Channel

1xEVDO 850 MHz Band Downlink Band Edge

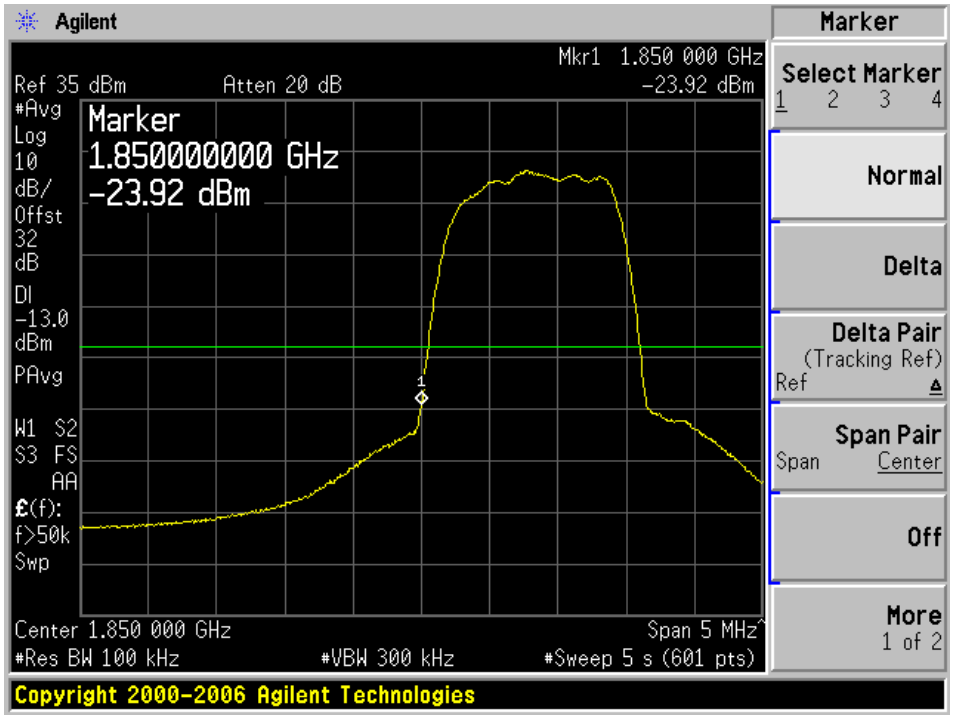


Low Channel

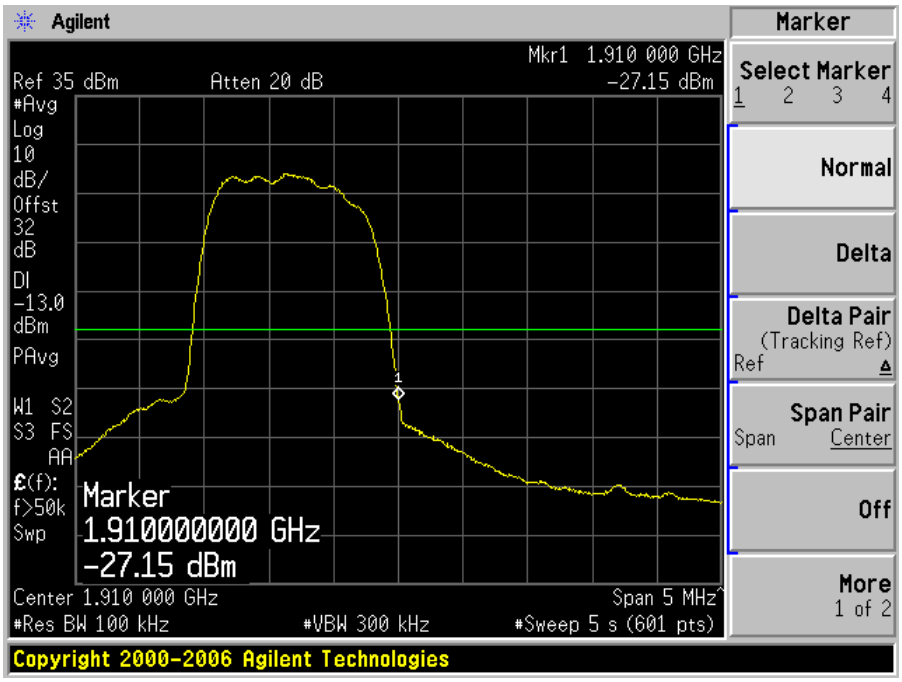


High Channel

1xEVDO 1900 MHz Band Uplink Band Edge

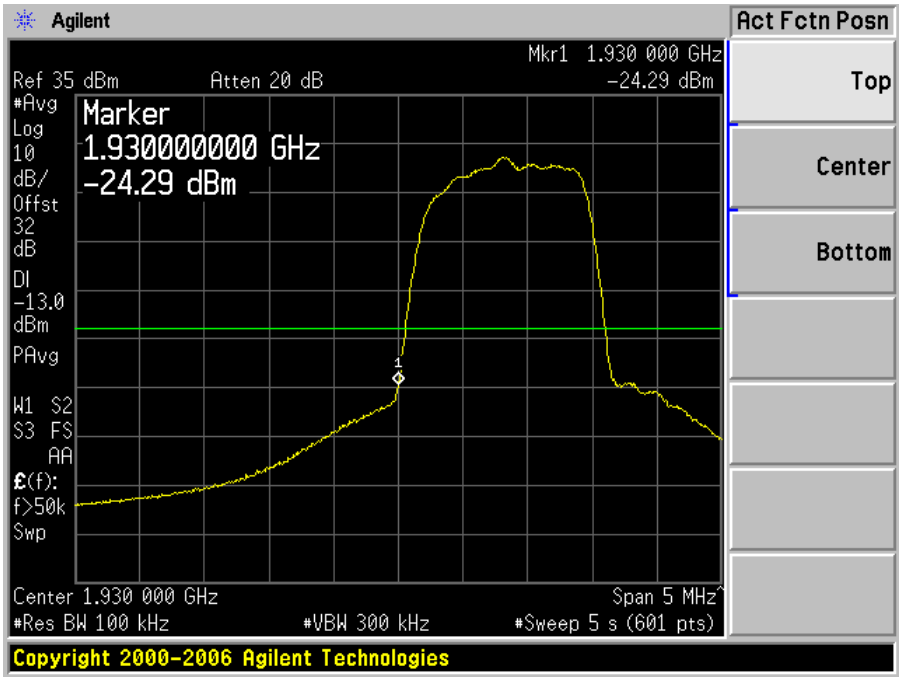


Low Channel

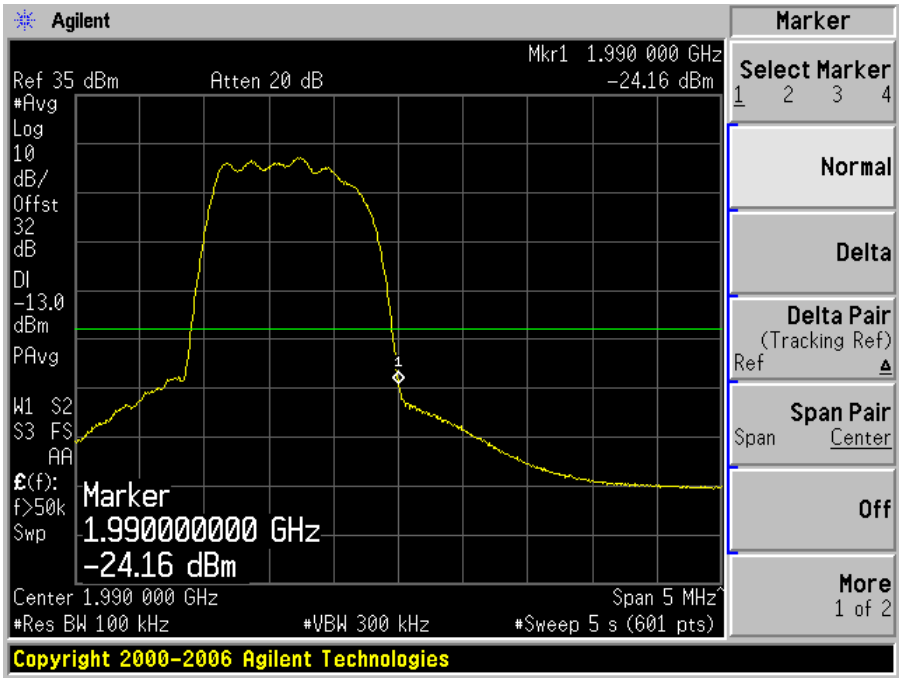


High Channel

1xEVDO 1900 MHz Band Downlink Band Edge



Low Channel



High Channel

10 FCC §2.1055, §22.355 & §24.235– FREQUENCY STABILITY

This EUT is an amplifier, not a transmitter. There is no oscillator circuit in the EUT, therefore there is no frequency stability measurement required.

10.1 Test Result

N/A

11 FCC §1.1307(b)(1) & §2.1091 - RF EXPOSURE

11.1 Applicable Standard

According to §1.1310 and §2.1091 (Mobile Devices) RF exposure is calculated.

Limits for General Population/Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)	Averaging Time (minute)
Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*($180/f^2$)	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	f/1500	30
1500-100,000	/	/	1.0	30

Note: f = frequency in MHz
* = Plane-wave equivalent power density

11.2 MPE Prediction

Predication of MPE limit at a given distance, Equation from OET Bulletin 65, Edition 97-01

$$S = PG/4\pi R^2$$

Where: S = power density
P = power input to antenna
G = power gain of the antenna in the direction of interest relative to an isotropic radiator
R = distance to the center of radiation of the antenna

850 MHz Cellular Band Uplink:

Maximum peak output power at antenna input terminal (dBm):	25.05
Maximum peak output power at antenna input terminal (mW):	319.88
Prediction distance (cm):	50
Prediction frequency (MHz):	824.8
Antenna Gain, typical (dBi):	2
Maximum Antenna Gain (numeric):	1.58
Power density at predication frequency and distance (mW/cm^2):	0.016
MPE limit for uncontrolled exposure at predication frequency (mW/cm^2):	0.549

850 MHz Cellular Band Downlink:

Maximum peak output power at antenna input terminal (dBm):	25.08
Maximum peak output power at antenna input terminal (mW):	322.11
Prediction distance (cm):	50
Prediction frequency (MHz):	881.52
Antenna Gain, typical (dBi):	12
Maximum Antenna Gain (numeric):	15.85
Power density at predication frequency and distance (mW/cm^2):	0.163
MPE limit for uncontrolled exposure at predication frequency (mW/cm^2):	0.588

PCS 1900 MHz Band Uplink:

Maximum peak output power at antenna input terminal (dBm):	30.02
Maximum peak output power at antenna input terminal (mW):	1004.6
Prediction distance (cm):	50
Prediction frequency (MHz):	1880
Antenna Gain, typical (dBi):	2
Maximum Antenna Gain (numeric):	1.58
Power density at predication frequency and distance (mW/cm^2):	0.051
MPE limit for uncontrolled exposure at predication frequency (mW/cm^2):	1.0

PCS 1900 MHz Band Downlink:

Maximum peak output power at antenna input terminal (dBm):	30.17
Maximum peak output power at antenna input terminal (mW):	1039.92
Prediction distance (cm):	50
Prediction frequency (MHz):	1960
Antenna Gain, typical (dBi):	12
Maximum Antenna Gain (numeric):	15.85
Power density at predication frequency and distance (mW/cm^2):	0.525
MPE limit for uncontrolled exposure at predication frequency (mW/cm^2):	1.0

Test Result

For Uplink, the highest power density level at 50 cm is 0.051 mW/cm^2, which is below the uncontrolled exposure limit of 1.0 mW/cm^2 at 1880 MHz.
For Downlink, the highest power density level at 50 cm is 0.525 mW/cm^2, which is below the uncontrolled exposure limit of 1.0mW/cm^2 at 1960 MHz.