



FCC PART 24E AND PART 90  
TEST AND MEASUREMENT REPORT

For

**AnyDATA Corporation**

18902 Bardeen Ave., Irvine, CA 92612, USA

**FCC ID:P4M-APC500N**

<b>Report Type:</b> Original Report	<b>Product Type:</b> EV-DO Rev.A PCMCIA Modem
<b>Test Engineer:</b> Jack Liu	
<b>Report Number:</b> R0812092-2490	
<b>Report Date:</b> 2009-01-13	
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**Note:** This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. This report **must not** be used by the customer to claim product certification, approval, or endorsement by NVLAP\*, NIST, or any agency of the Federal Government.

\* This report may contain data that are not covered by the NVLAP accreditation and are marked with an asterisk "\*" ...

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**DOCUMENT REVISION HISTORY**

<b>Revision Number</b>	<b>Report Number</b>	<b>Description of Revision</b>	<b>Date of Revision</b>
0	R0812092-2490	Original	2009-01-13

## 1 GENERAL INFORMATION

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

The AnyDATA Corporation's Product model: APC-500N or the "EUT" as referred to in this report is a CDMA 1xEV-DO Rev. A modem. Model APC-500N operates in both 700 MHz band and CDMA 1900 MHz (Band Class 1). The EUT interface is PCMCIA Standard 8.0 with the input voltage of 3.3VDC.

#### 1.1.1 Antenna Specification

##### *Primary Antenna*

Antenna Type: FIPA

Frequency Range (RX):	792.5 ~ 806 MHz, 1930 ~ 1990 MHz
Frequency Range (TX):	762.5 ~ 776 MHz, 1850 ~ 1910 MHz
Radiation Pattern:	Omni Directional
Impedance:	50 ohms +/-10
Polarization:	Vertical
Peak Gain (700 MHz):	-4.39 dBi
(1900 MHz):	4.53 dBi

##### *Auxiliary Antenna (RX Diversity / GPS)*

Antenna Type: FIPA

Frequency Range (RX):	792.5 ~ 806 MHz, 1930 ~ 1990 MHz, 1574 ~ 1576 MHz
Frequency Range (TX):	762.5 ~ 776 MHz, 1850 ~ 1910 MHz
Radiation Pattern:	Omni Directional
Impedance:	50 ohms +/-10
Polarization:	Vertical
Peak Gain (700 MHz):	-5.28 dBi
(1900 MHz):	4.49 dBi
(GPS 1575 MHz):	-6.05 dBi

### 1.2 Mechanical Description

The AnyDATA Corporation product model: APC-500N or the "EUT" measures approximately 132mm (L) x 54mm (W) x 5mm (H), Antenna 13mm (H), and weighs approximately 55g.

\* The test data gathered are from typical production sample, serial number: 0708C3311211 / B2057, Sample ID: 1 / 72233 provided by the Manufacturer / BACL.

### 1.3 EUT Photo



*Additional Photos in Exhibit C*

### 1.4 Objective

This type approval report is prepared on behalf of *Company Name* in accordance with Part 2, Subpart J, Part 24 Subpart E and Part 90 Subpart R 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.

### 1.5 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 24 Subpart E—BROADBAND PCS

Part 90 Subpart R—Regulations Governing the Licensing and Use of Frequencies in the 763–775 and 793–805 MHz Bands

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 BA CL Corp.

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

## 1.8 Test Facility

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

The test sites at BA CL 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, BA CL 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

TXTest\_700.exe, software provided by AnyData Corporation to control the EUT.

### 2.3 Special Accessories

N/A

### 2.4 Equipment Modifications

N/A

### 2.5 Remote Support Equipment

N/A

### 2.6 Local Support Equipment

Manufacturers	Descriptions	Models	Serial Numbers
IBM	Laptop	T41/ type2374	99-KHVP2
IBM	AC Adapter	92P1016	11S92P1016Z1ZAC665TOMC

### 2.7 Power Supply and Line Filters

Manufacturers	Descriptions	Models	Serial Numbers
-	-	-	-

### 2.8 Interface Ports and Cabling

Cable Descriptions	Length (M)	From	To
-	-	-	-



### 3 SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Results
§ 2.1047	Modulation Characteristics	N/A
§ 2.1053 § 24.238 (a) § 90.543(f)	Field Strength of Spurious Radiation	Compliant
§2.1093	RF Exposure	Compliant *
§ 2.1046 § 24.232 §90.542(a)(6)	RF Output Power	Compliant
§ 2.1049 § 24.238	Out of Band Emissions, Occupied Bandwidth	Compliant
§ 2.1051, § 24.238(a)	Spurious Emissions at Antenna Terminals	Compliant
§ 2.1055 (a) § 2.1055 (d) § 24.235 § 90.539(e)	Frequency stability vs. temperature Frequency stability vs. voltage	Compliant
§24.238 § 90.543(f)	Band Edge	Compliant

Note: \* Please refer to SAR report R0812092-SAR

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## **4 §2.1047 - MODULATION CHARACTERISTIC**

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### **4.1 Applicable Standard**

According to FCC § 2.1047(d), Part 24E and Part 90R there is no specific requirement for digital modulation, therefore modulation characteristic is not presented.

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## **5 §1.1307(b) (1) & §2.1093 - RF EXPOSURE**

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### **5.1 Applicable Standard**

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

### **5.2 Test Result**

Please refer to SAR report R0812092-SAR.

## **6 §2.1053, §24.238 & §90.543(f) - RADIATED SPURIOUS EMISSIONS**

### **6.1 Applicable Standard**

Requirements: CFR 47, § 2.1053, § 24.238, §90.543(f)

#### **§ 24.238**

According to § 24.238 (a), 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.

#### **§90.543**

According to §90.543, the transmitters designed to operate in 769–775 MHz and 799–805 MHz frequency bands must meet the emission limitations in paragraphs (a) through (d) of this section. Transmitters operating in 763–768 MHz and 793–798 MHz bands must meet the emission limitations in (e) of this section.

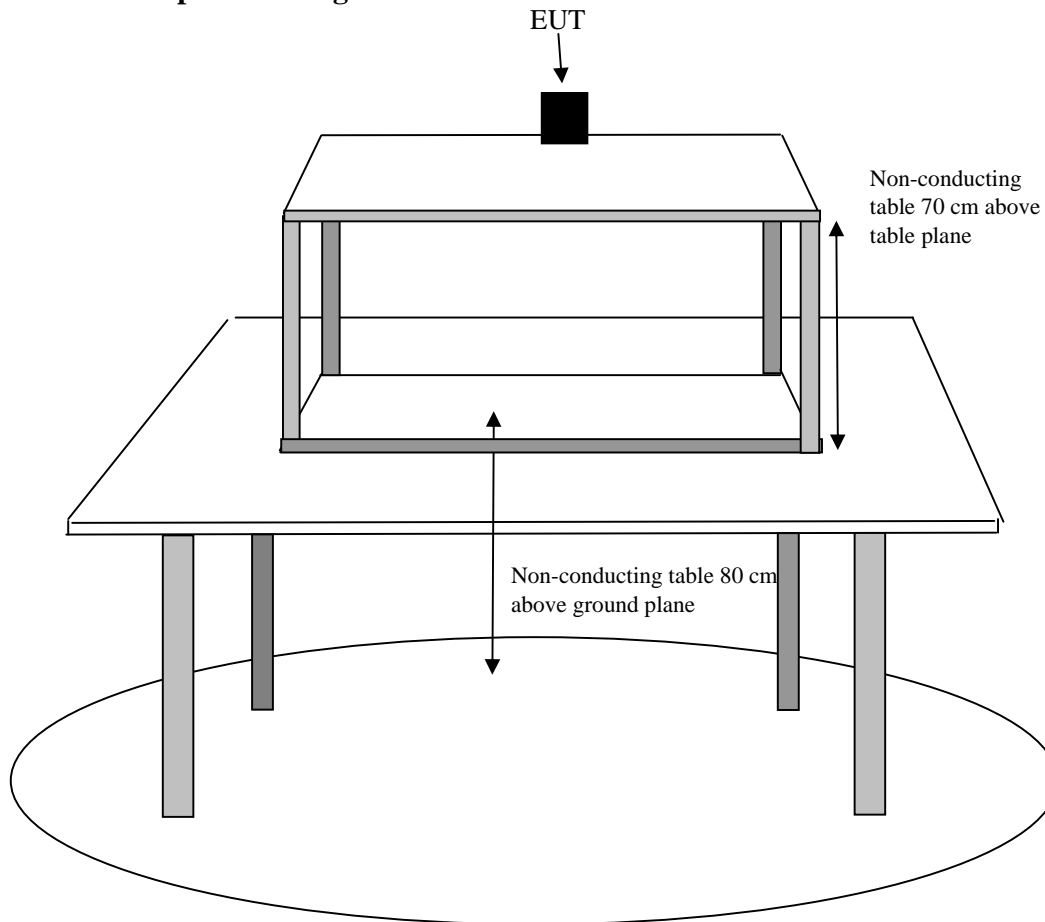
e) For operations in the 763–768 MHz and the 793–798 MHz bands, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

- (1) On all frequencies between 769–775 MHz and 799–805 MHz, by a factor not less than  $76 + 10 \log(P)$  dB in a 6.25 kHz band segment, for base and fixed stations.
- (2) On all frequencies between 769–775 MHz and 799–805 MHz, by a factor not less than  $65 + 10 \log(P)$  dB in a 6.25 kHz band segment, for mobile and portable stations.
- (3) Compliance with the provisions of paragraphs (e)(1) and (2) of this section is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment.

(f) For operations in the 763–775 MHz and 793–805 MHz bands, all emissions including harmonics in the band 1559–1610 MHz shall be limited to -70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

(g) When an emission outside of the authorized bandwidth causes harmful interference, the Commission may, at its discretion, require greater attenuation than specified in this section.

## 6.2 Test Setup Block Diagram



## 6.3 Test Equipment List and Details

Manufacturers	Descriptions	Models	Serial Number	Calibration Due Dates
Agilent	Spectrum Analyzer	E4440A	MY44303352	2009-04-28
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	2008-12-19

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

## 6.4 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.

*For Part 24 limit is as follows:*

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

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

*For Part 90 limit is as follows:*

For operations in the 763–775 MHz and 793–805 MHz bands, all emissions including harmonics in the band 1559–1610 MHz shall be limited to -70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth.

## 6.5 Environmental Conditions

<b>Temperature:</b>	22 °C ~ 24 °C
<b>Relative Humidity:</b>	40 % ~ 60 %
<b>ATM Pressure:</b>	101.1 kPa ~ 101.6 kPa

\* Testing performed by Jack Liu on 2008-12-09 to 2009-01-05.

## 6.6 Summary of Test Results

Worst case reading as follows:

CDMA 1900 MHz (FCC Part 24):

Mode: Transmitting		
Margin (dB)	Frequency (MHz)	Antenna Polarization (Horizontal/Vertical)
-20.93	3770	Vertical

CDMA 700 MHz (FCC Part 90):

Mode: Transmitting		
Margin (dB)	Frequency (MHz)	Antenna Polarization (Horizontal/Vertical)
-2.64	1591.00	Horizontal

## CDMA 1900 MHz (FCC Part 24):

Indicated		Azimuth (degree)	Test Antenna		Substituted				Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Frequency (MHz)	Amp. (dBuV)		Height (cm)	Polar (H/V)	Frequency (MHz)	Level dBm	Ant. Gain Cord. (dBi)	Cable Loss (dB)			
3770.00	54.10	27	112	V	3770	-42.69	10.6	1.84	-33.93	-13	-20.93
3770.00	49.58	294	250	H	3770	-50.15	10.6	1.84	-41.39	-13	-28.39
166.52	58.61	2	100	H	166.52	-55.25	0	0.30	-55.55	-13	-42.55
195.60	56.38	225	100	H	196.6	-58.32	0	0.32	-58.64	-13	-45.64
166.52	52.42	240	200	V	166.52	-59.61	0	0.30	-59.91	-13	-46.91
195.60	51.45	150	150	V	196.6	-61.35	0	0.32	-61.67	-13	-48.67
99.90	51.24	255	100	V	99.9	-63.51	0	0.27	-63.78	-13	-50.78
99.90	47.09	254	135	H	99.9	-71.14	0	0.27	-71.41	-13	-58.41

## CDMA 700 MHz (FCC Part 90):

Indicated		Azimuth (degree)	Test Antenna		Substituted				Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Frequency (MHz)	Amp. (dBuV)		Height (cm)	Polar (H/V)	Frequency (MHz)	Level (dBm)	Ant. Gain Cord. (dBi)	Cable Loss (dB)			
2386.5	50.2	293	100	V	2386.5	-53.69	9.6	1.33	-45.42	-40	-5.42
196.60	55.84	225	100	H	196.60	-58.86	0	0.32	-59.18	-50	-9.18
166.52	54.48	0	100	H	166.52	-59.38	0	0.30	-59.68	-50	-9.68
2386.5	46.68	187	127	H	2386.5	-58.83	9.6	1.33	-50.56	-40	-10.56
1591.00	46.58	67	100	H	1591.00	-60.84	9.2	1	-52.64	-40	-12.64
196.60	50.01	153	149	V	196.60	-62.79	0	0.32	-63.11	-50	-13.11
1591.00	46.89	55	100	V	1591.00	-61.44	9.2	1	-53.24	-40	-13.24
166.52	48.78	244	200	V	166.52	-63.25	0	0.30	-63.55	-50	-13.55
99.90	49.95	253	100	V	99.90	-64.80	0	0.27	-65.07	-50	-15.07
99.90	43.69	266	127	H	99.90	-74.54	0	0.27	-74.81	-50	-24.81

Limit: -70 dBW/MHz = -40 dBm/MHz  
-80dBW= -50dBm (for narrowband signal).

## 7 §2.1046, §24.232, & §90.542(a) (6) - RF OUTPUT POWER

### 7.1 Applicable Standard

According to FCC §2.1046 and §24.232 (a), in no case may the peak output power of a base station transmitter exceed 2 watt.

According to FCC §90.542(a) (6), Control stations and mobile stations transmitting in the 763–768 MHz band and the 793–798 MHz band are limited to 30 watts ERP.

### 7.2 Test Equipment List and Details

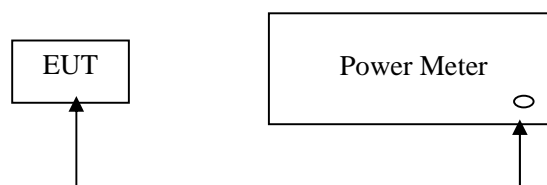
Manufacturers	Descriptions	Models	Serial Number	Calibration Due Dates
Agilent	Spectrum Analyzer	E4440A	MY44303352	2009-04-28
Agilent	EPM Series Power Meter	E4419B	MY41291511	2009-10-10
Agilent	E-Series AVG Power Sensor	E9301A	MY41497252	2009-10-10
Sunol Sciences	Antenna	JB1	A103105-3	2009-03-25
A.R.A	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	2008-12-19

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

### 7.3 Test Procedure

Conducted:

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



Radiated:

TIA-603-C §2.2.17



## 7.4 Environmental Conditions

<b>Temperature:</b>	22 °C ~ 24 °C
<b>Relative Humidity:</b>	40 % ~ 60 %
<b>ATM Pressure:</b>	101.1 kPa ~ 101.6 kPa

\* Testing performed by Jack Liu on 2008-12-09 to 2008-12-19.

## 7.5 Summary of Test Results

### Conducted Power

CDMA 700 MHz (FCC Part 90):

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (mW)	ERP Limit (dBm)
Low	794.25	22.79	190.11	44.77
Middle	795.50	23.04	201.37	44.77
High	796.75	23.06	202.30	44.77

CDMA 1900 MHz (FCC Part 24E):

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (mW)	EIRP Limit (dBm)
Low	1851.25	23.11	204.64	33.0
Middle	1885.00	23.05	201.84	33.0
High	1908.75	21.32	135.52	33.0

## Radiated Power ERP and EIRP

## CDMA 700 MHz (FCC Part 90):

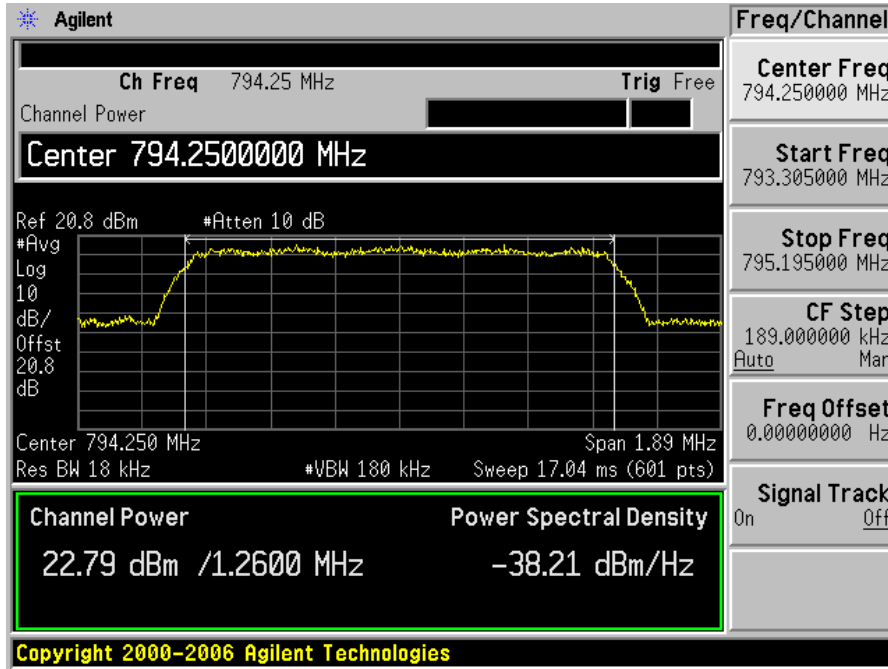
Indicated		Azimuth (degree)	Test Antenna		Substituted				Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Frequency (MHz)	Amp. (dBuV)		Height (cm)	Polar (H/V)	Frequency (MHz)	Level (dBm)	Antenna Gain Correction (dB)	Cable Loss (dB)			
794.25	95.82	46	191	H	794.25	19.94	0	0.55	19.39	44.77	-25.38
796.75	94.63	34	192	H	796.75	18.92	0	0.55	18.37	44.77	-26.40
795.50	94.30	53	192	H	795.50	18.48	0	0.55	17.93	44.77	-26.84
794.25	85.06	36	100	V	794.25	11.06	0	0.55	10.51	44.77	-34.26
796.75	84.51	34	100	V	796.75	11.01	0	0.55	10.46	44.77	-34.31
795.50	84.11	36	100	V	795.50	10.37	0	0.55	9.82	44.77	-34.95

## CDMA 1900 MHz (FCC Part 24E):

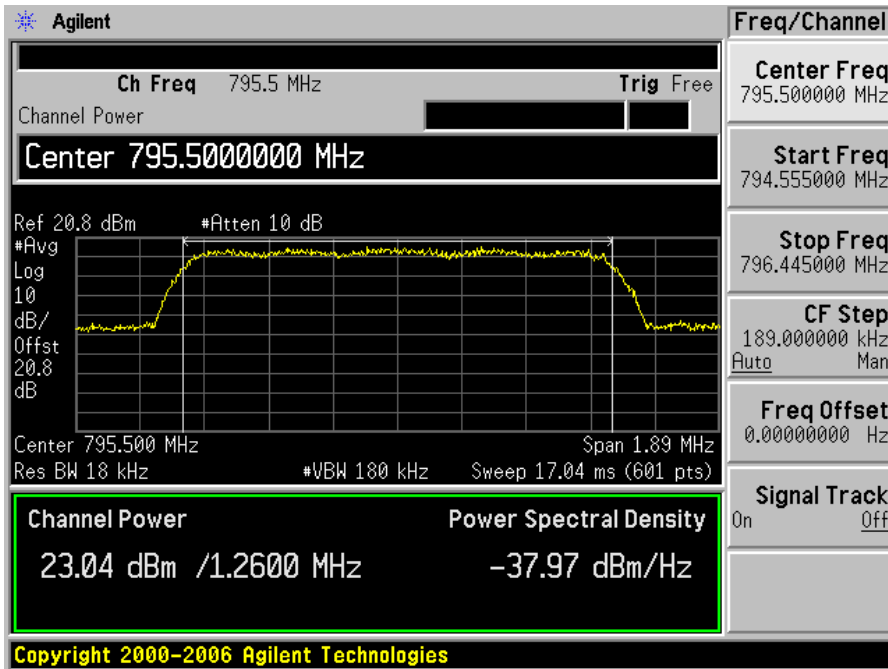
Indicated		Azimuth (degree)	Test Antenna		Substituted				Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Frequency (MHz)	Amp. (dBuV)		Height (cm)	Polar (H/V)	Frequency (MHz)	Level (dBm)	Antenna Gain Correction (dBi)	Cable Loss (dB)			
1908.75	86.85	294	160	H	1908.75	17.51	9.0	0.38	26.13	33	-6.87
1885	87.15	294	160	H	1880	16.5	9.0	0.38	25.12	33	-7.88
1851.25	84.99	294	160	H	1851.25	15.94	9.5	0.38	25.06	33	-7.94
1908.75	85.46	355	100	V	1908.75	16.22	9.0	0.38	24.84	33	-8.16
1851.25	83.67	355	100	V	1851.25	13.5	9.5	0.38	22.62	33	-10.38
1885	85.05	355	100	V	1880	13.82	9.0	0.38	22.44	33	-10.56

Conducted Power plots for CDMA 700 MHz:

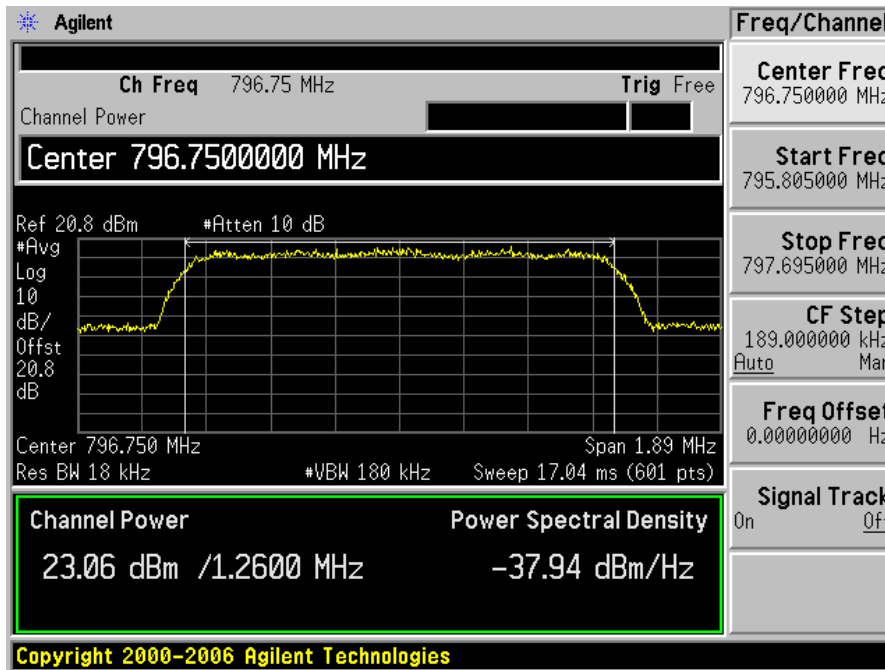
**Low Channel**



**Middle Channel**



### High Channel



## 8 §2.1049 & §24.238 - OCCUPIED BANDWIDTH

### 8.1 Applicable Standard

Requirements: CFR 47, Section 2.1049, and Section 24.238.

### 8.2 Test Equipment List and Details

Manufacturers	Descriptions	Models	Serial Number	Calibration Due Date
Agilent	Spectrum Analyzer	E4446A	US44300386	2009-05-19

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

### 8.3 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 and the -26 dB bandwidth was recorded.

### 8.4 Environmental Conditions

<b>Temperature:</b>	22 °C ~ 24 °C
<b>Relative Humidity:</b>	40 % ~ 60 %
<b>ATM Pressure:</b>	101.1 kPa ~ 101.6 kPa

\* Testing performed by Jack Liu on 2008-12-09 to 2009-0105.

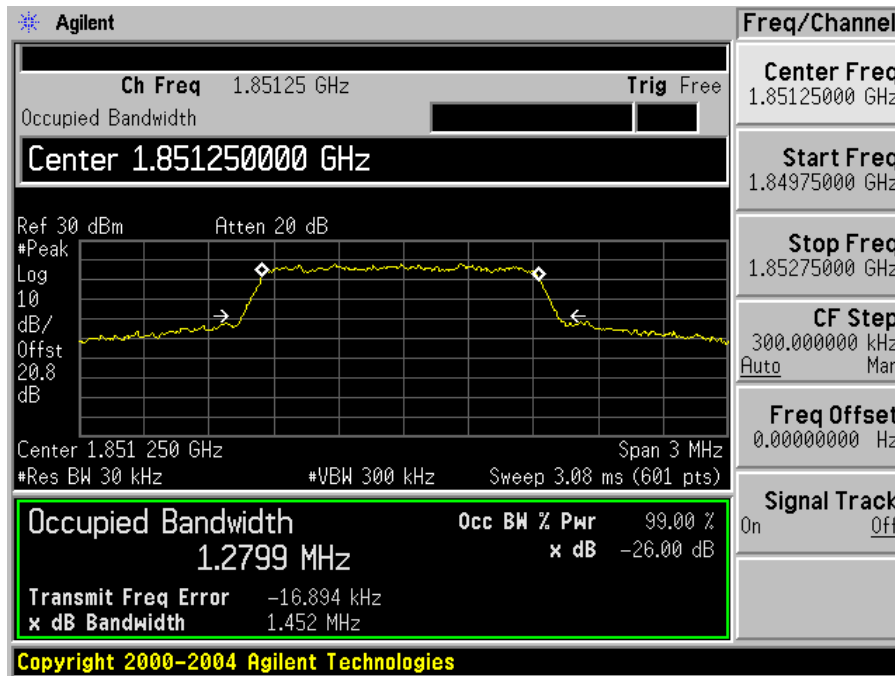
### 8.5 Summary of Test Results

CDMA 1900 MHz (FCC Part 24E):

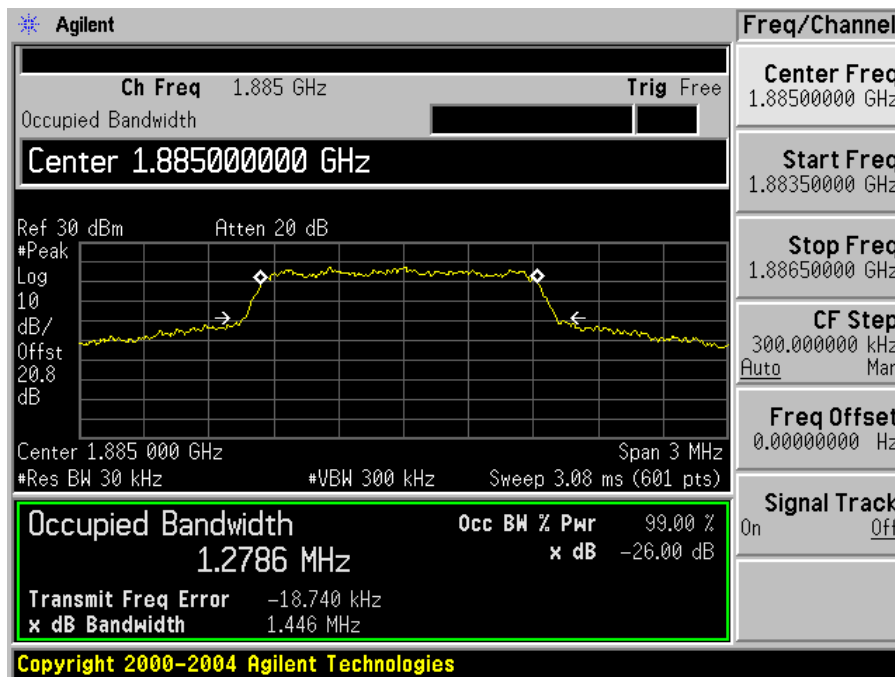
Channel	Frequency (MHz)	26 dB Occupied Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
Low	1851.25	1.452	1.2799
Middle	1885.00	1.446	1.2786
High	1908.75	1.470	1.2795

Plots of Occupied Bandwidth for CDMA 1900 MHz (FCC Part24E):

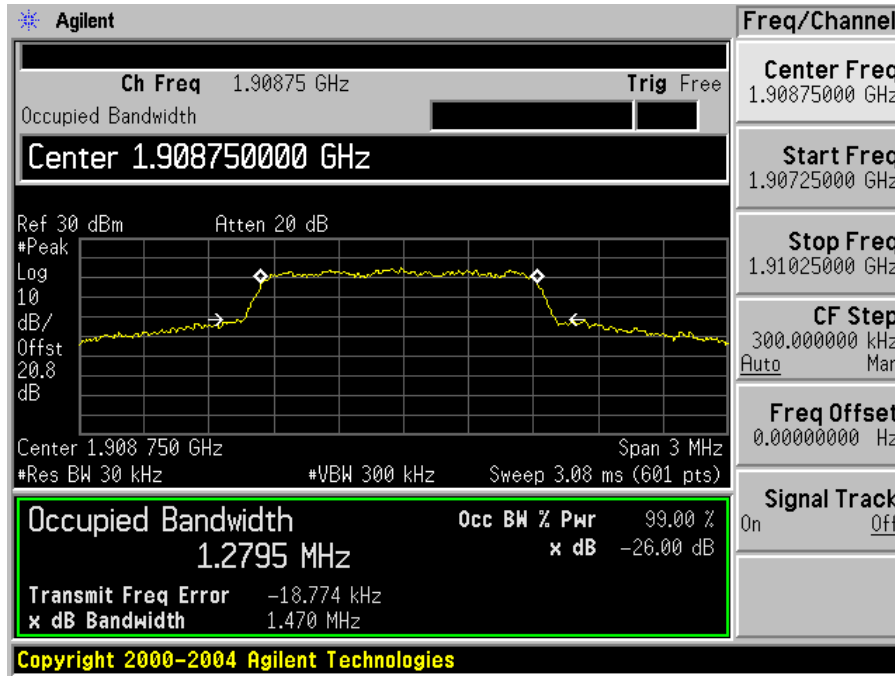
**Low Channel**



**Middle Channel**



### High Channel

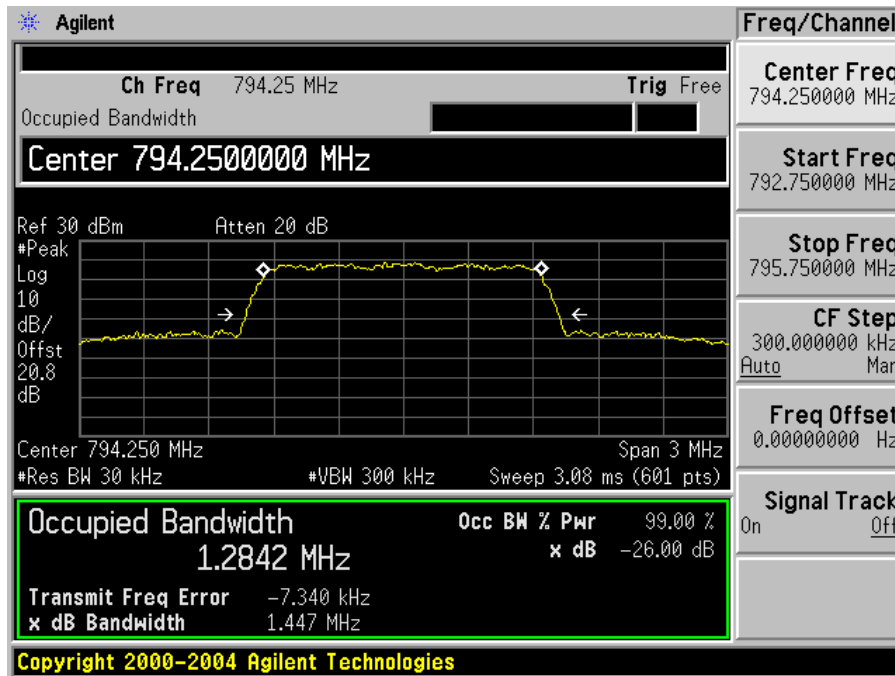


CDMA 700 MHz (FCC Part 90):

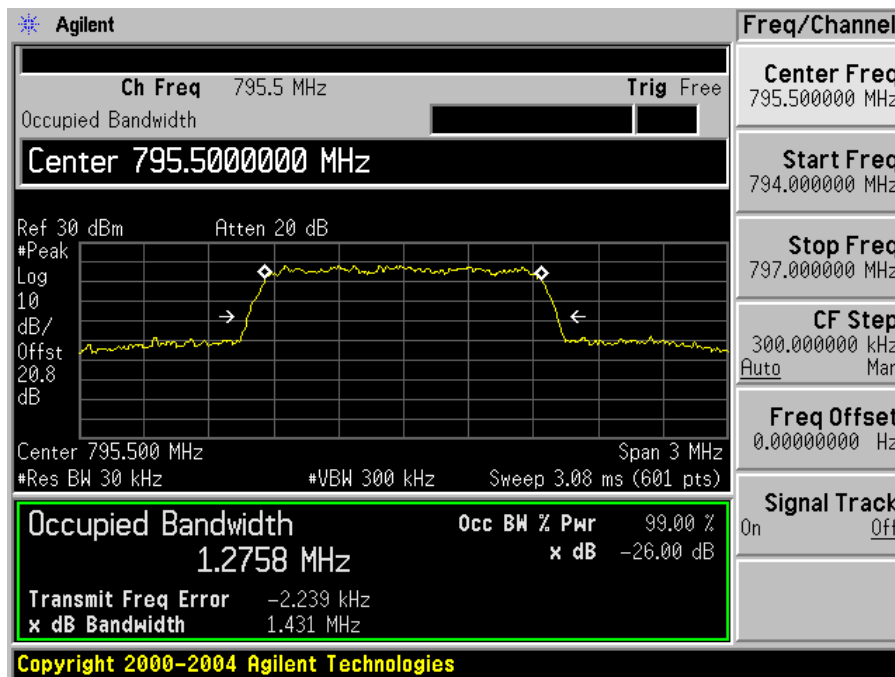
Channel	Frequency (MHz)	26 dB Occupied Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
Low	794.25	1.447	1.2842
Middle	795.5	1.431	1.2758
High	796.75	1.421	1.2748

Plots of Occupied Bandwidth for CDMA 700 MHz (FCC Part90):

**Low Channel**

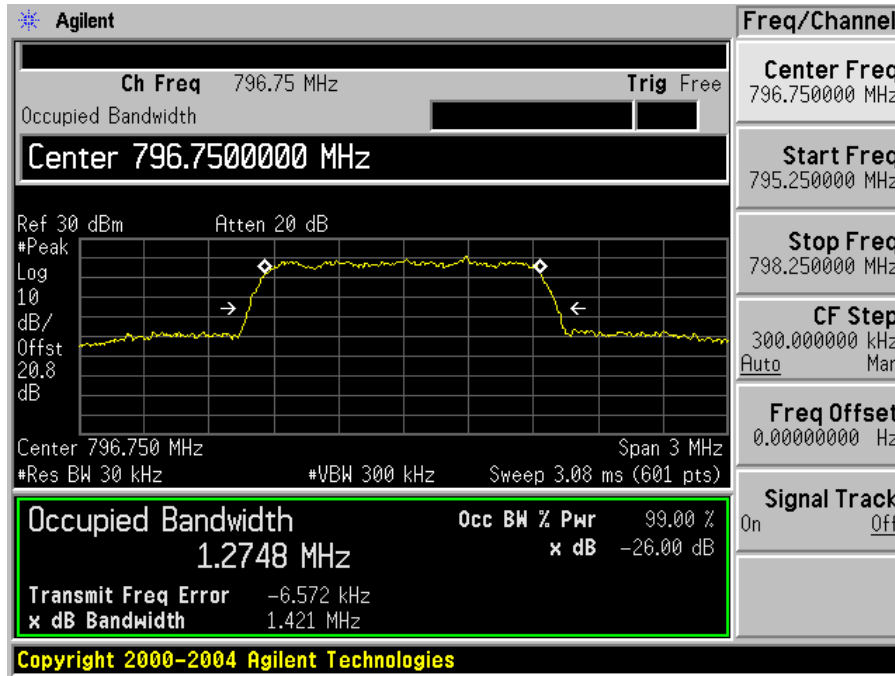


**Middle Channel**





### High Channel



## 9 §2.1051, §24.238(a) & §90.543 (f) - SPURIOUS EMISSIONS AT ANTENNA TERMINALS

### 9.1 Applicable Standard

Requirements: CFR 47, § 2.1051. & §24.238(a). Part 90.543 (f)

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

### 9.2 Test Equipment List and Details

Manufacturers	Descriptions	Models	Serial Number	Calibration Due Date
Agilent	Spectrum Analyzer	E4446A	US44300386	2009-05-19

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

### 9.3 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.

### 9.4 Environmental Conditions

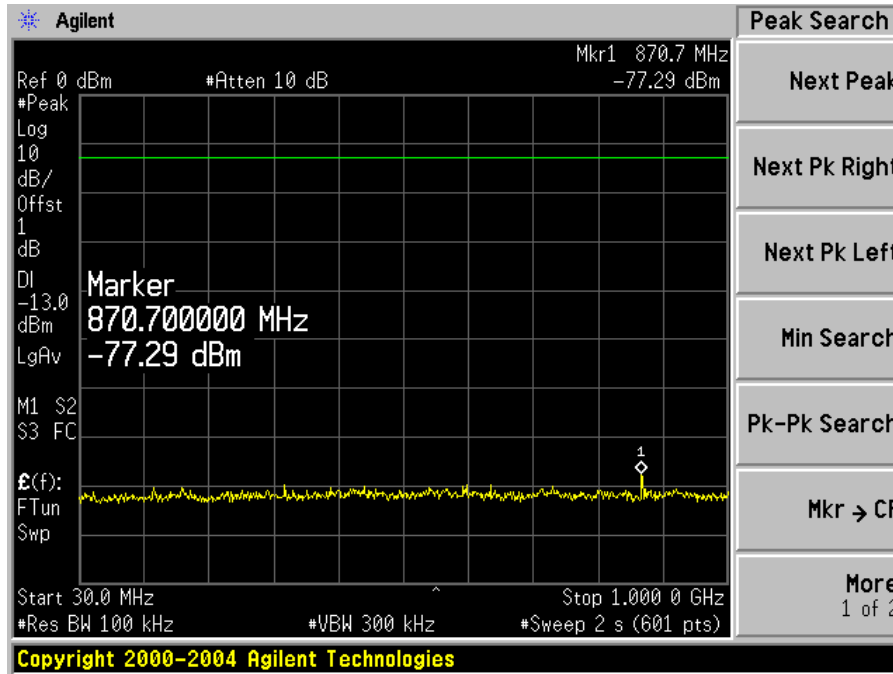
<b>Temperature:</b>	22 °C ~ 24 °C
<b>Relative Humidity:</b>	40 % ~ 60 %
<b>ATM Pressure:</b>	101.1 kPa ~ 101.6 kPa

\* *Testing performed by Jack Liu on 2008-12-09 to 2009-01-05.*

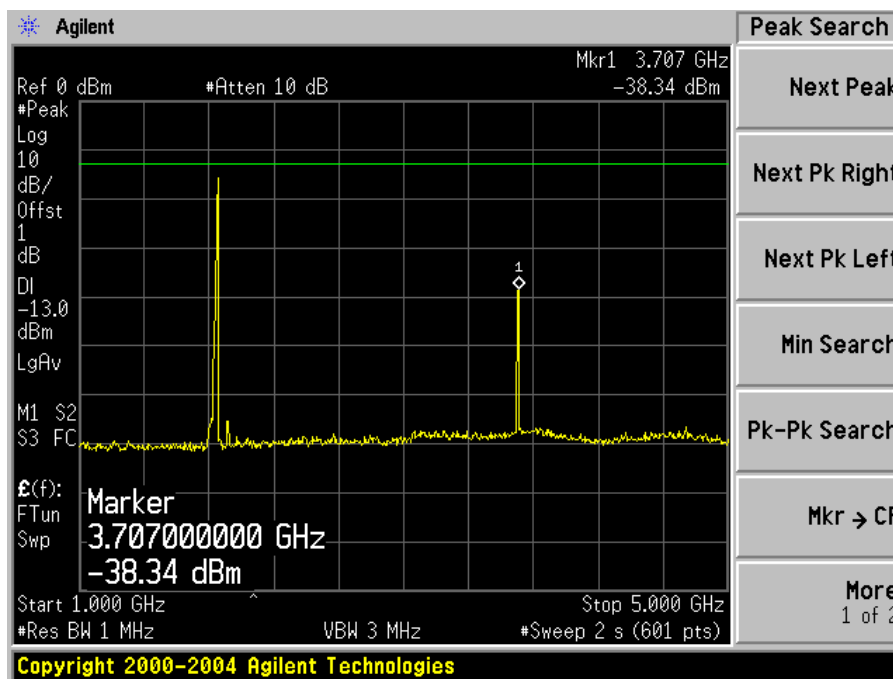
### 9.5 Test Results

Plots of Band Edge for CDMA 1900 MHz (FCC Part 24E):

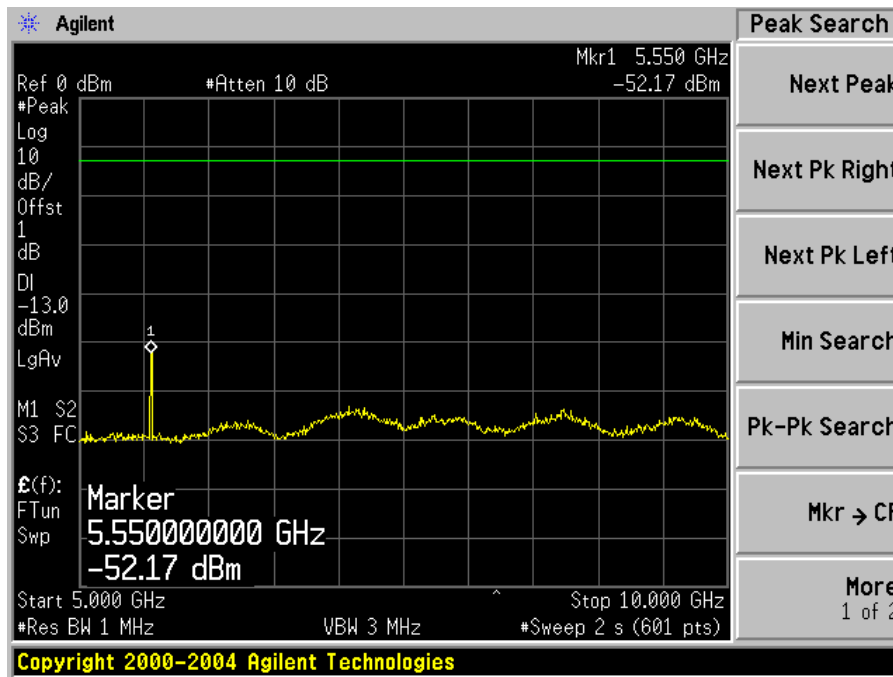
**Low Channel (f = 1851.25 MHz)**



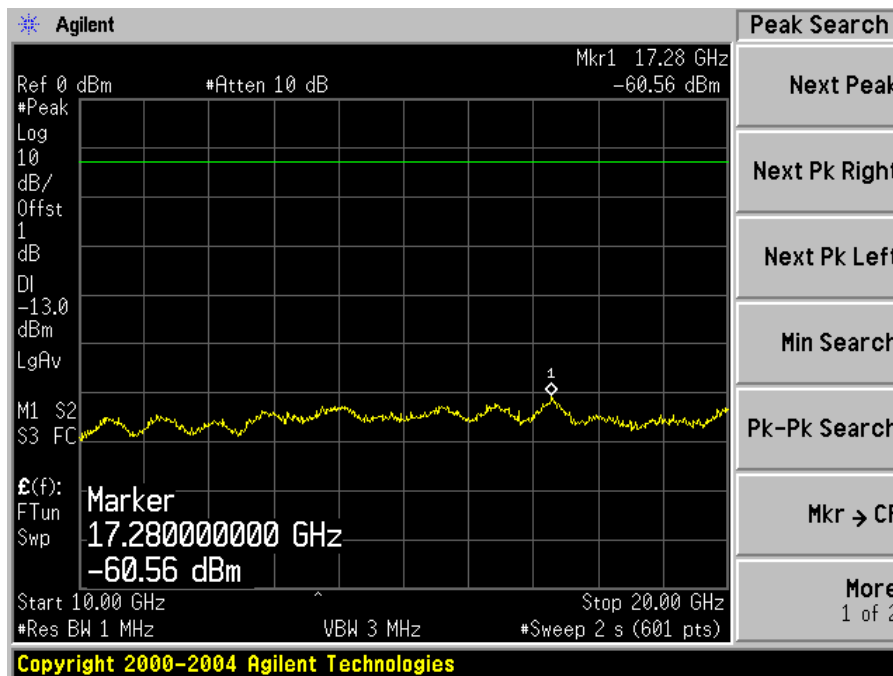
Plot 1a: 30MHz – 1GHz



Plot 2a: 1GHz – 5GHz

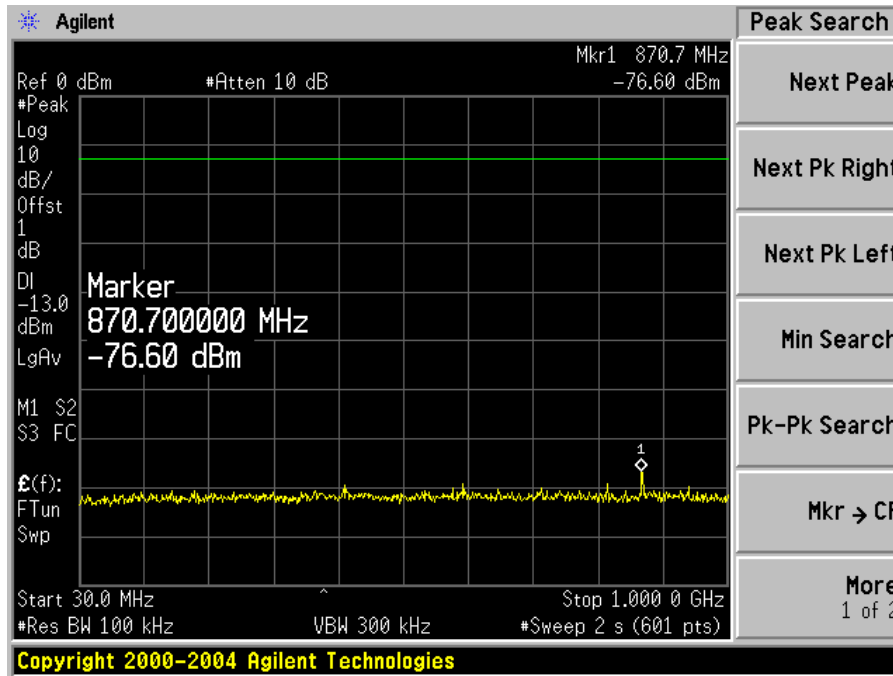


Plot 3a: 5GHz – 10GHz

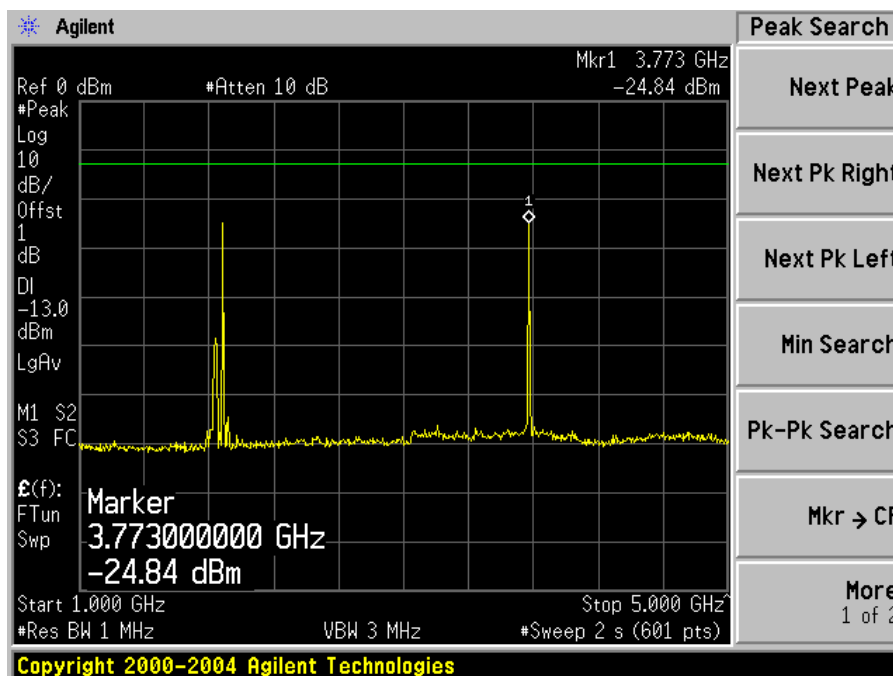


Plot 4a: 10GHz – 20GHz

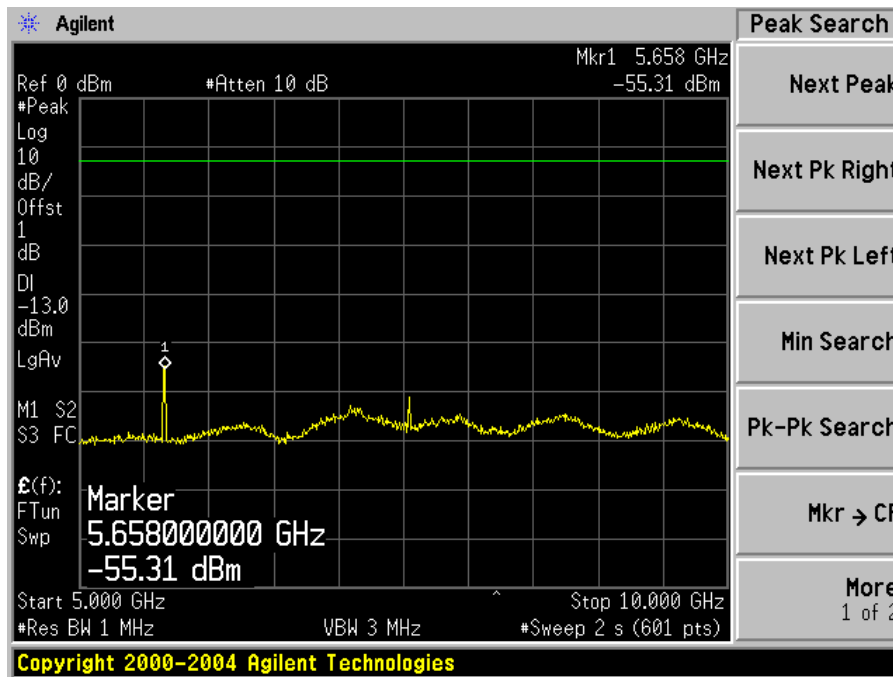
Middle Channel (f = 1885 MHz)



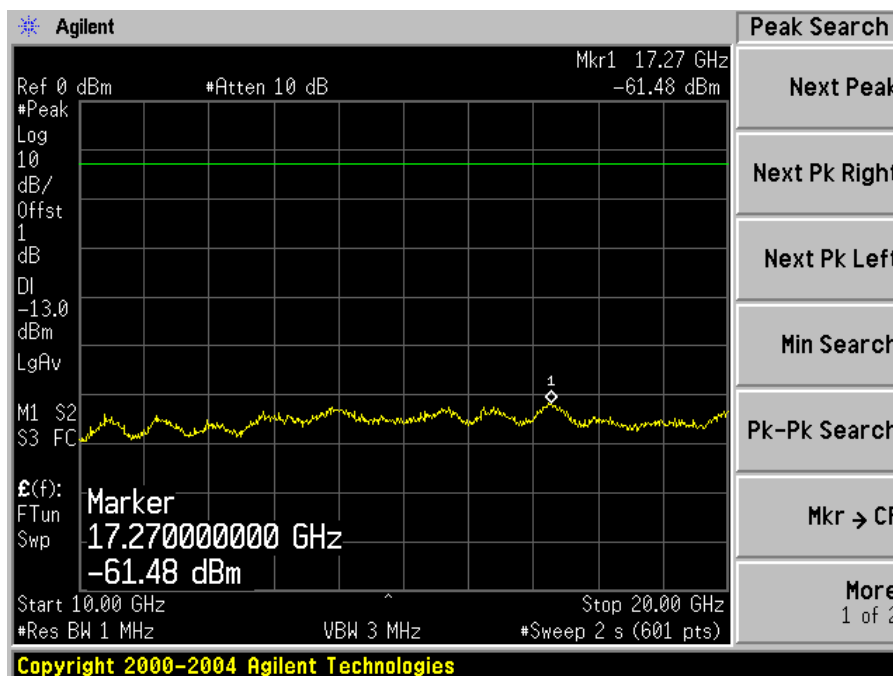
Plot 1b: 30MHz – 1GHz



Plot 2b: 1GHz – 5GHz

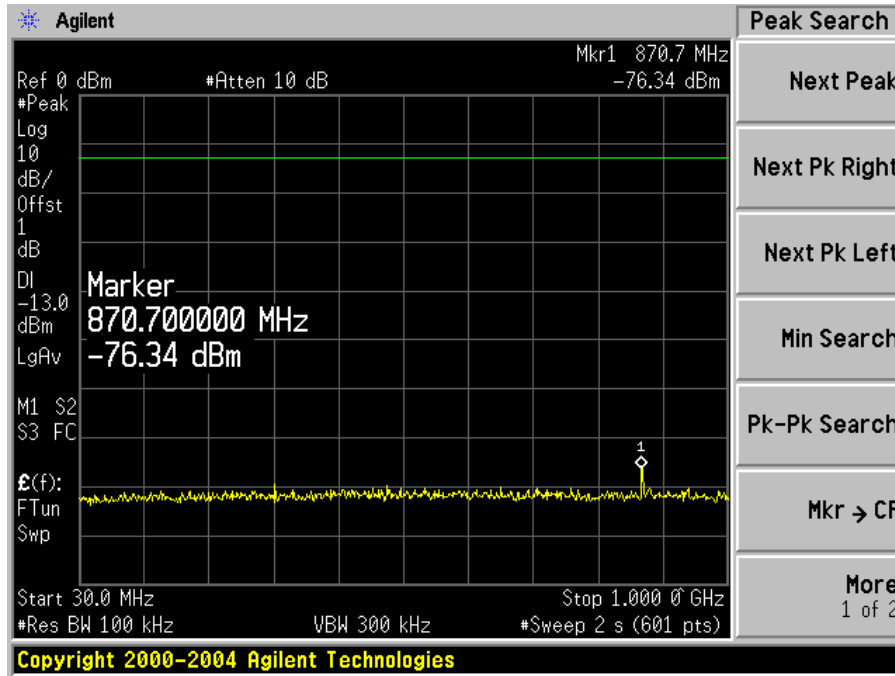


Plot 3b: 5GHz – 10GHz

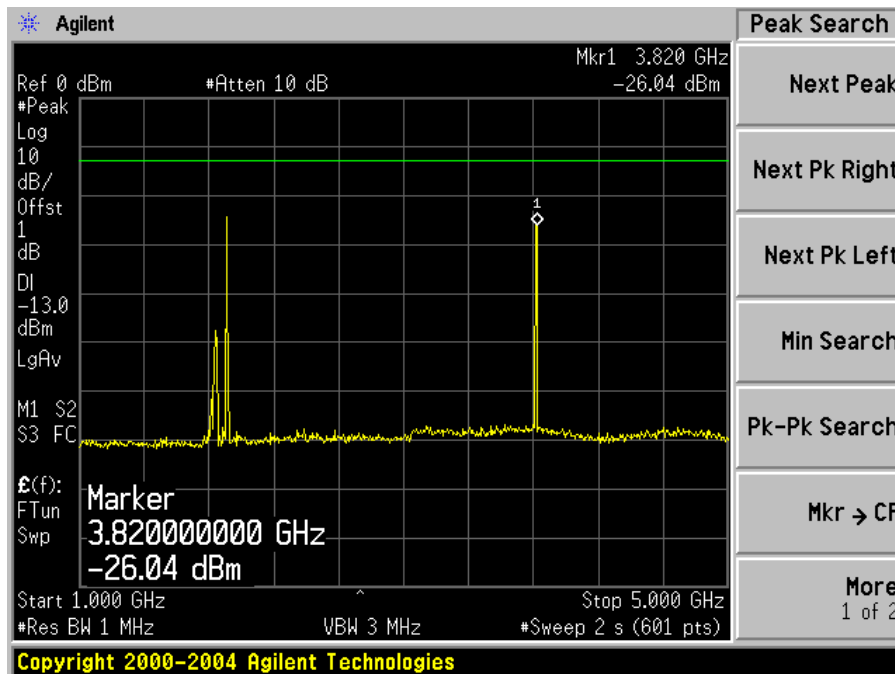


Plot 4b: 10GHz – 20GHz

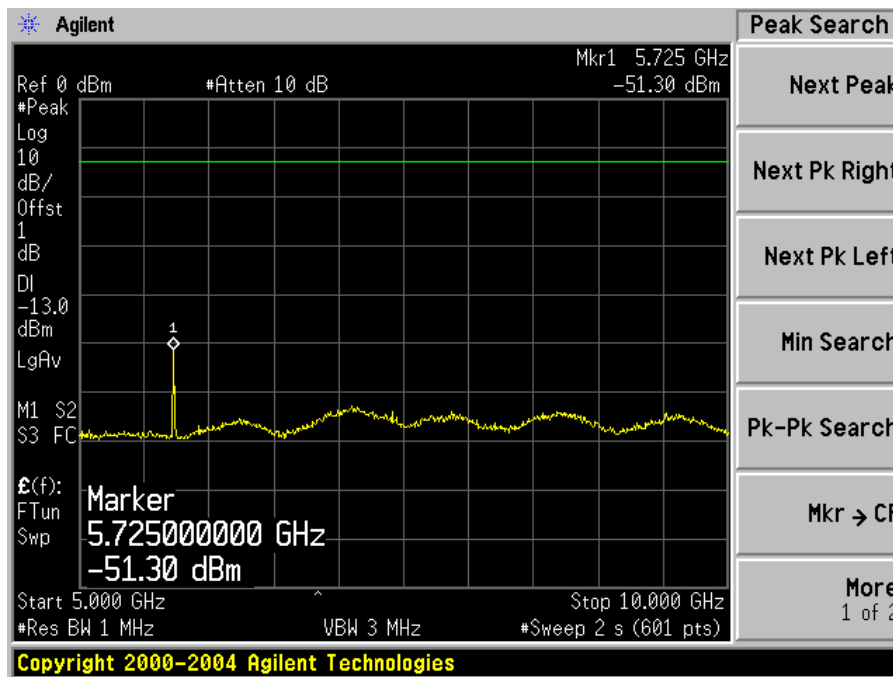
High Channel (f = 1908.75 MHz)



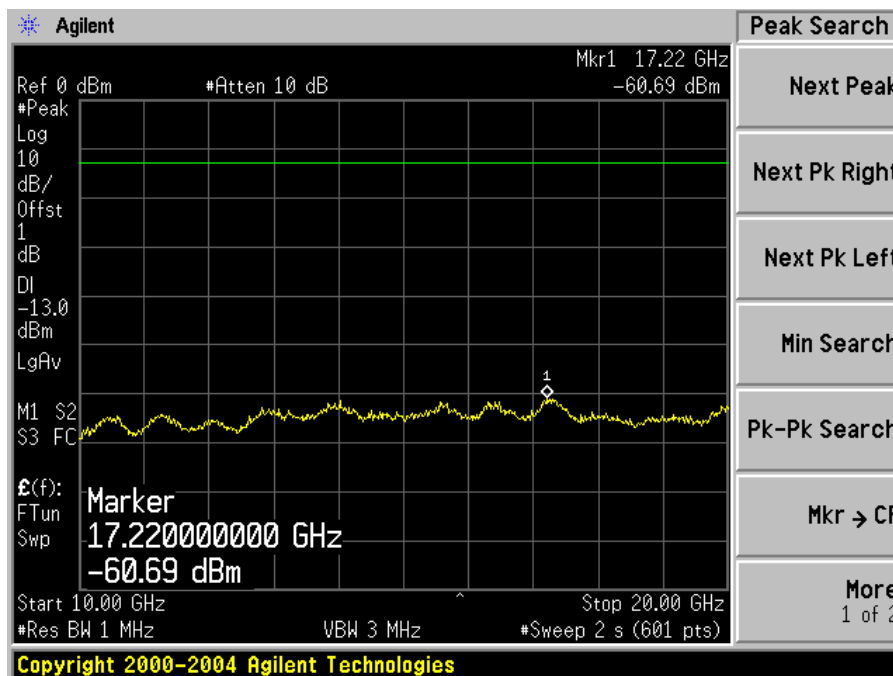
Plot 1c: 30MHz – 1GHz



Plot 2c: 1GHz – 5GHz



Plot 3c: 5GHz – 10GHz

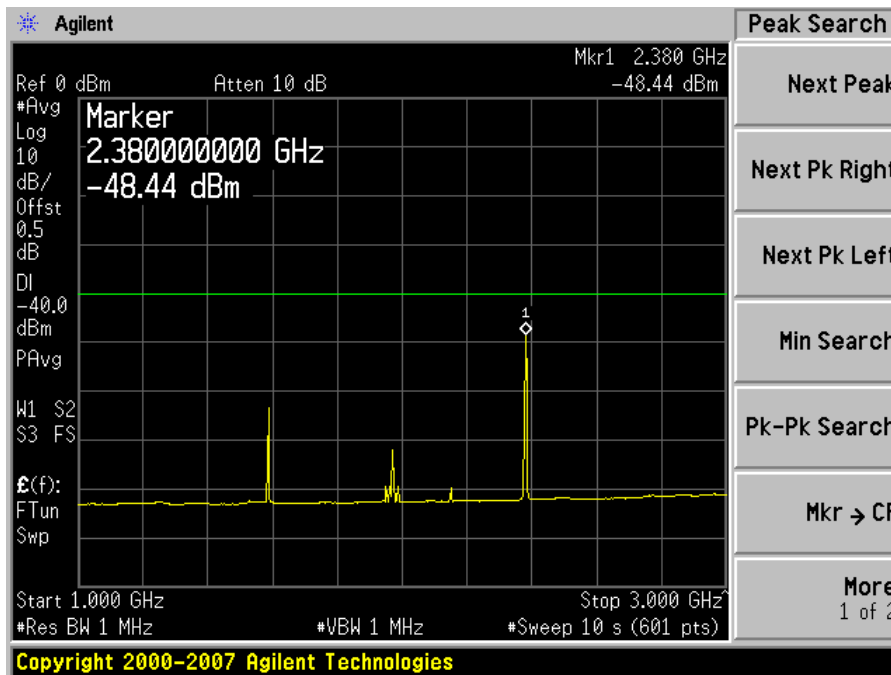
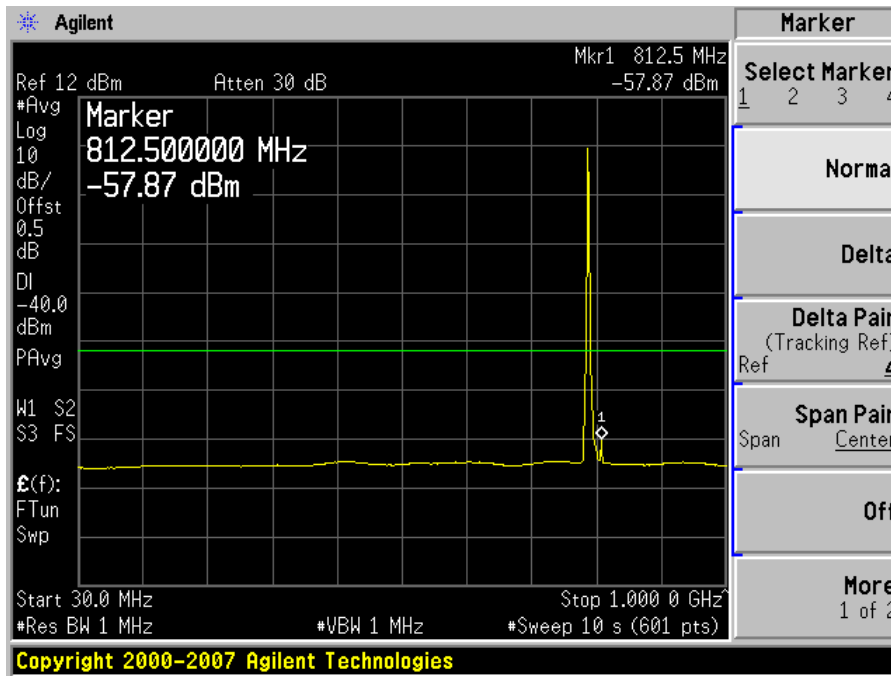


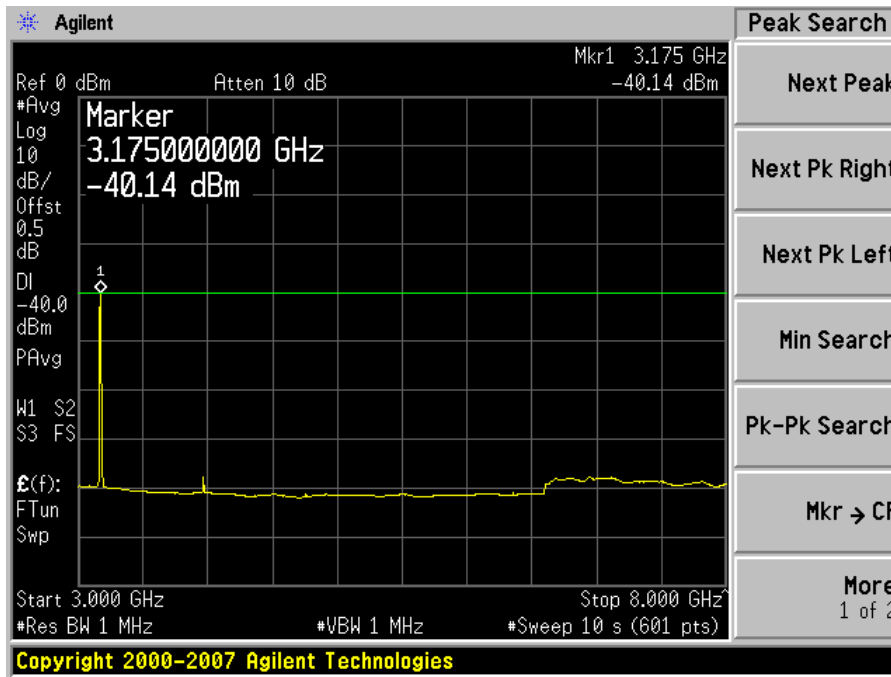
Plot 4c: 10GHz – 20GHz



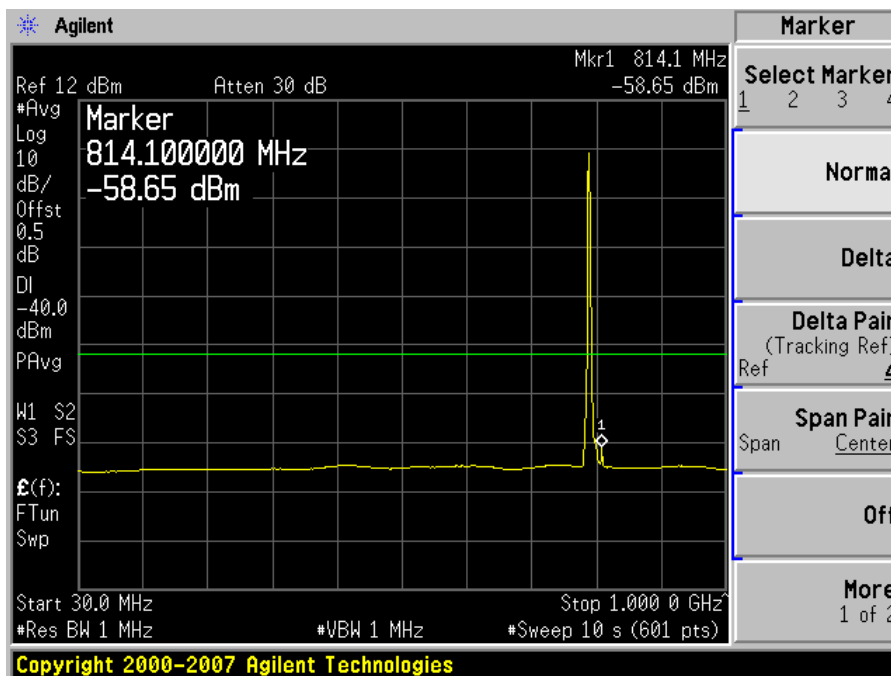
Plots of Band Edge for CDMA 700 MHz (FCC Part 90):

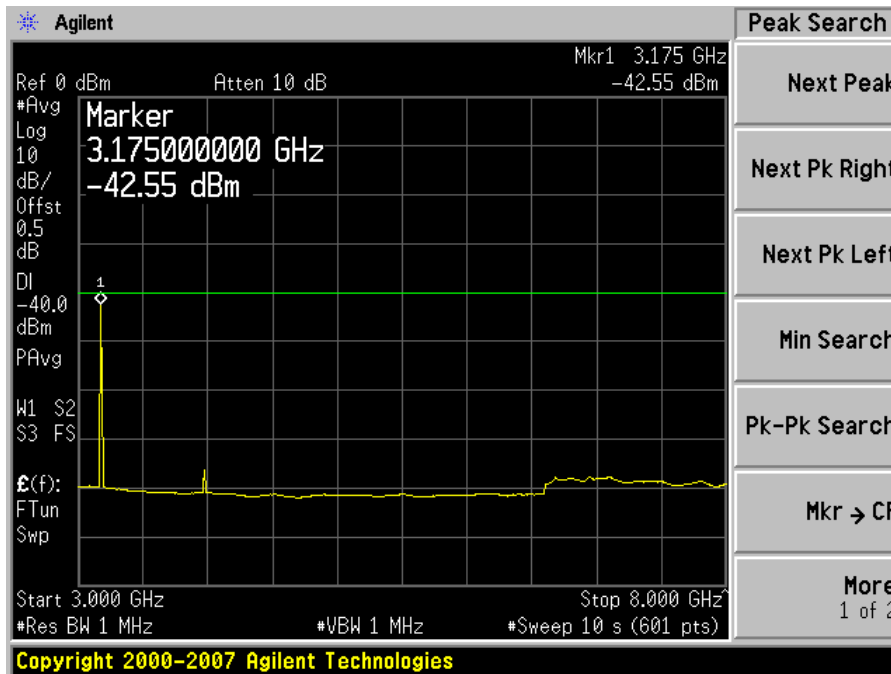
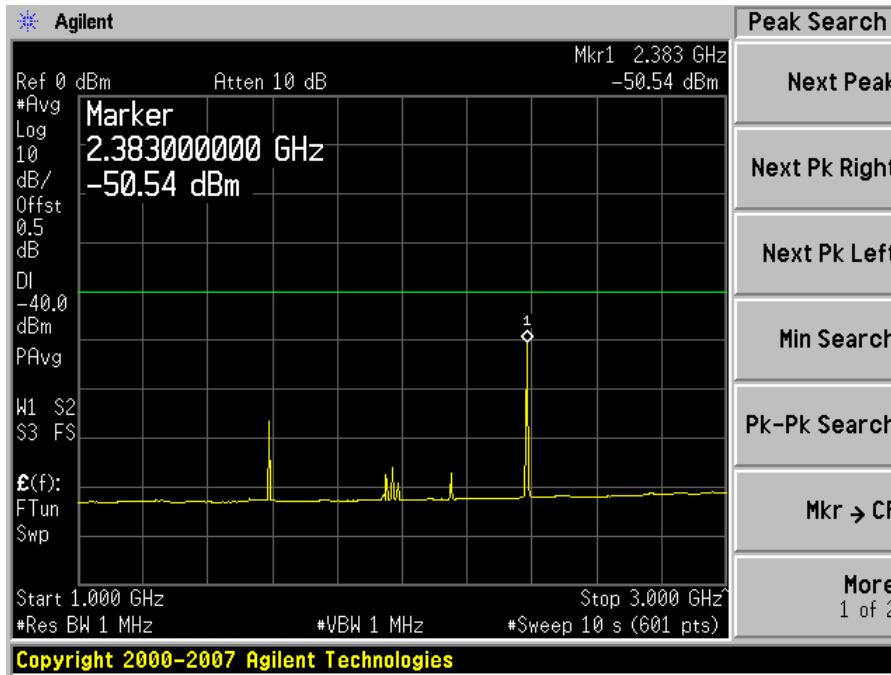
**Low Channel (f = 794.25 MHz)**



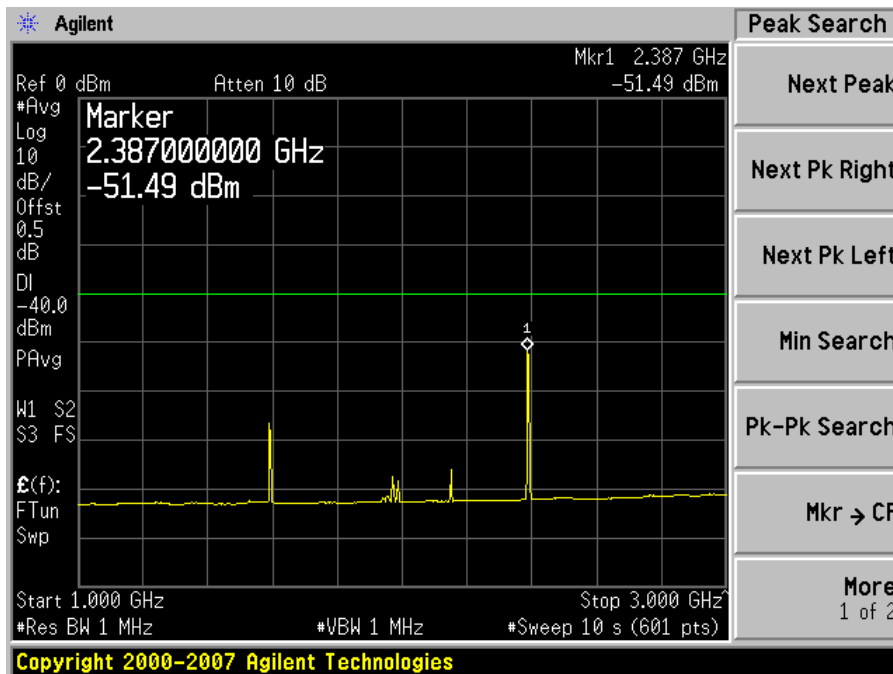
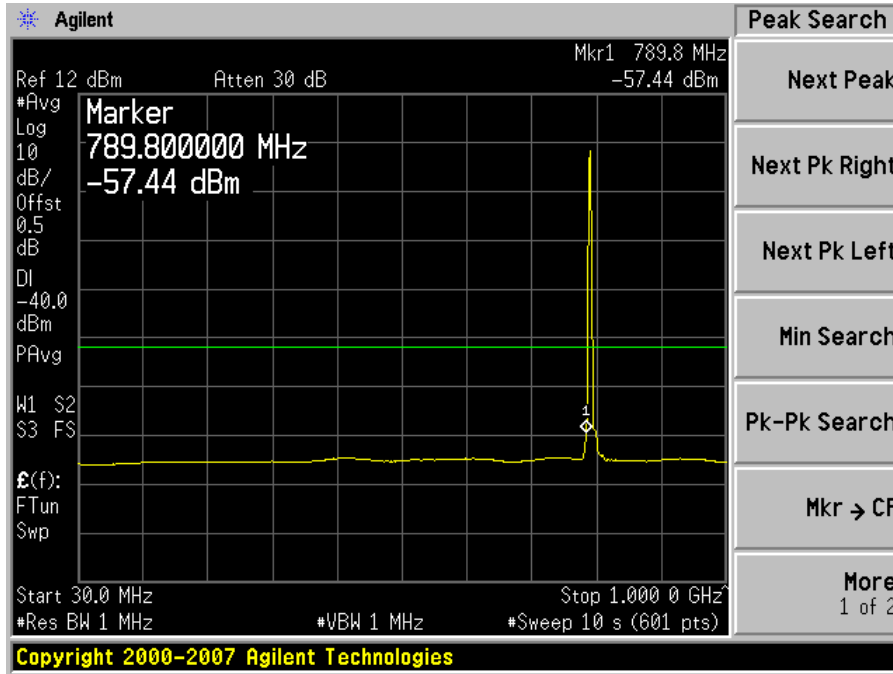


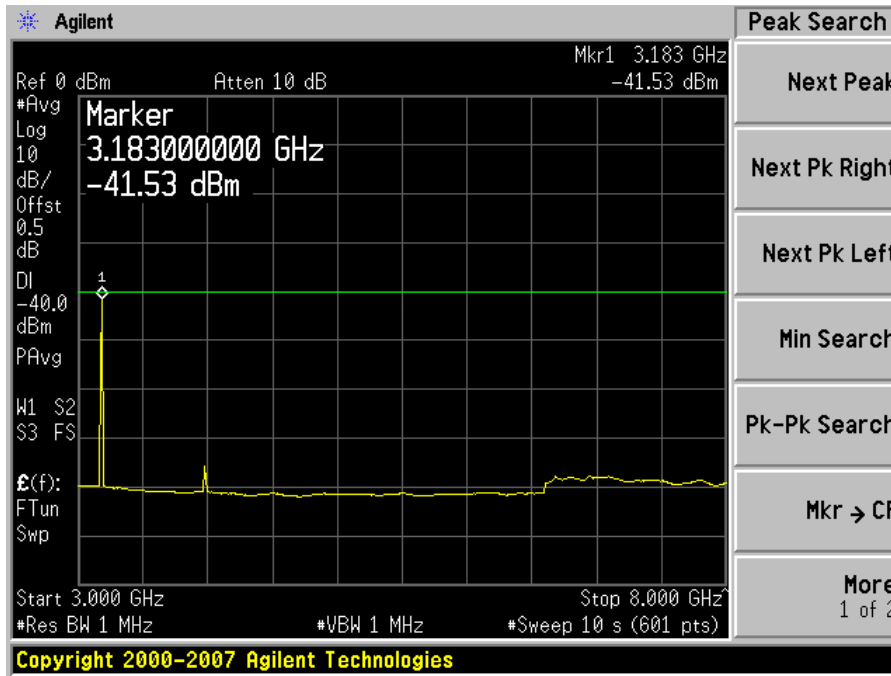
Middle Channel (f = 795.50 MHz)





High Channel (f = 796.75 MHz)





## **10 §2.1055 (a), §2.1055 (d), §24.235 & §90.539 - FREQUENCY STABILITY**

### **10.1 Applicable Standard**

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

According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stays within the authorized frequency block.

According to §90.539(e), The frequency stability of mobile, portable and control transmitters operating in the wideband segment must be 1.25 parts per million or better when AFC is locked to a base station, and 5 parts per million or better when AFC is not locked.

### **10.2 Test Equipment List and Details**

<b>Manufacturers</b>	<b>Descriptions</b>	<b>Models</b>	<b>Serial Number</b>	<b>Calibration Due Dates</b>
Agilent	Spectrum Analyzer	E4440A	MY44303352	2009-04-28
ESPEC	Temp/ Humidity chamber	ESL-4CA	018010	2009-01-02

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

### **10.3 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.

### **10.4 Environmental Conditions**

<b>Temperature:</b>	22 °C ~ 24 °C
<b>Relative Humidity:</b>	40 % ~ 60 %
<b>ATM Pressure:</b>	101.1 kPa ~ 101.6 kPa

\* Testing performed by Jack Liu on 2008-12-09 to 2009-01-05.

## 10.5 Summary of Test Results

### CDMA 1900 MHz (FCC Part24E):

Frequency Stability versus Temperature  
(The EUT is Power by fixed 3.3V from Laptop PCMCIA Interface)

Reference Frequency:1885 MHz				
Environment		Frequency Measure with Time Elapsed		
Temperature (°C)	Power Supplied (Vdc)	Measured Frequency (Hz)	Frequency Error (Hz)	Error (ppm)
50	3.3	1885267000	-267000	-0.00014
40	3.3	1885167000	-167000	-0.00009
30	3.3	1885175000	-175000	-0.00009
20	3.3	1884642000	358000	0.00019
10	3.3	1884733000	267000	0.00014
0	3.3	1885217000	-217000	-0.00012
-10	3.3	1885333000	-333000	-0.00018
-20	3.3	1885233000	-233000	-0.00012
-30	3.3	1884667000	333000	0.00018

Frequency Stability versus Voltage  
(The EUT is Power by fixed 3.3V from Laptop PCMCIA Interface)

Reference Frequency:1885 MHz				
Environment		Frequency Measure with Time Elapsed		
Temperature (°C)	Power Supplied (Vdc)	Measured Frequency (Hz)	Frequency Error (Hz)	Error (ppm)
25	3.3	1884679100	320900	0.00017

**CDMA 700 MHz (FCC Part 90):****CDMA 1900 MHz (FCC Part24E):**

Frequency Stability versus Temperature  
(The EUT is Power by fixed 3.3V from Laptop PCMCIA Interface)

<b>Reference Frequency:795.5 MHz, Limit:1.25 ppm</b>				
<b>Environment</b>		<b>Frequency Measure with Time Elapsed</b>		
<b>Temperature (°C)</b>	<b>Power Supplied (Vdc)</b>	<b>Measured Frequency (Hz)</b>	<b>Frequency Error (Hz)</b>	<b>Error (ppm)</b>
50	3.3	795883000	-383000	-0.00048
40	3.3	795150000	350000	0.00044
30	3.3	795650000	-150000	-0.00019
20	3.3	795175000	325000	0.000409
10	3.3	795225000	275000	0.000346
0	3.3	795183000	317000	0.000398
-10	3.3	795775000	-275000	-0.00035
-20	3.3	795633000	-133000	-0.00017
-30	3.3	795658000	-158000	-0.0002

Frequency Stability versus Voltage  
(The EUT is Power by fixed 3.3V from Laptop PCMCIA Interface)

<b>Reference Frequency: 795.5 MHz, Limit:1.25 ppm</b>				
<b>Environment</b>		<b>Frequency Measure with Time Elapsed</b>		
<b>Temperature (°C)</b>	<b>Power Supplied (Vdc)</b>	<b>Measured Frequency (Hz)</b>	<b>Frequency Error (Hz)</b>	<b>Error (ppm)</b>
25	3.3	795176000	324000	0.000407



## 11 §24.238 & §90.543(f) - BAND EDGE

### 11.1 Applicable Standard

According to §24.238, 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 §90.543, the transmitters designed to operate in 769–775 MHz and 799–805 MHz frequency bands must meet the emission limitations in paragraphs (a) through (d) of this section. Transmitters operating in 763–768 MHz and 793–798 MHz bands must meet the emission limitations in (e) of this section.

e) For operations in the 763–768 MHz and the 793–798 MHz bands, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

- (1) On all frequencies between 769–775 MHz and 799–805 MHz, by a factor not less than  $76 + 10 \log(P)$  dB in a 6.25 kHz band segment, for base and fixed stations.
- (2) On all frequencies between 769–775 MHz and 799–805 MHz, by a factor not less than  $65 + 10 \log(P)$  dB in a 6.25 kHz band segment, for mobile and portable stations.
- (3) Compliance with the provisions of paragraphs (e)(1) and (2) of this section is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment.

(f) For operations in the 763–775 MHz and 793–805 MHz bands, all emissions including harmonics in the band 1559–1610 MHz shall be limited to -70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

(g) When an emission outside of the authorized bandwidth causes harmful interference, the Commission may, at its discretion, require greater attenuation than specified in this section.

### 11.2 Test Equipment List and Details

Manufacturers	Descriptions	Models	Serial Number	Calibration Due Dates
Agilent	Spectrum Analyzer	E4446A	US44300386	2009-5-19

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

### 11.3 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 30 kHz.

### 11.4 Environmental Conditions

<b>Temperature:</b>	22 °C ~ 24 °C
<b>Relative Humidity:</b>	40 % ~ 60 %
<b>ATM Pressure:</b>	101.1 kPa ~ 101.6 kPa

\* Testing performed by Jack Liu on 2008-12-09 to 2009-1-5.

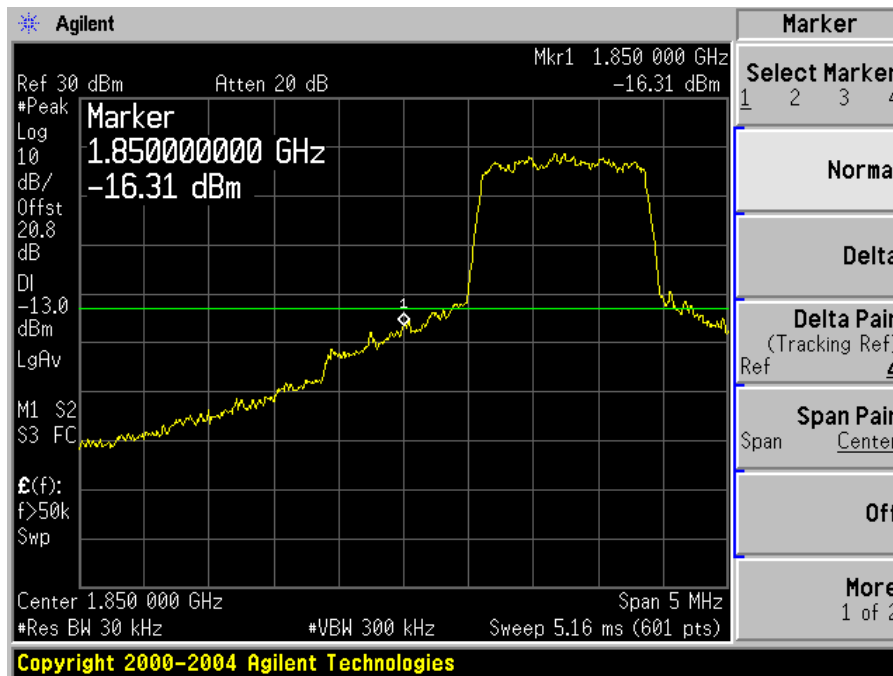
### 11.5 Summary of Test Results

#### CDMA 1900 MHz (FCC Part 24E):

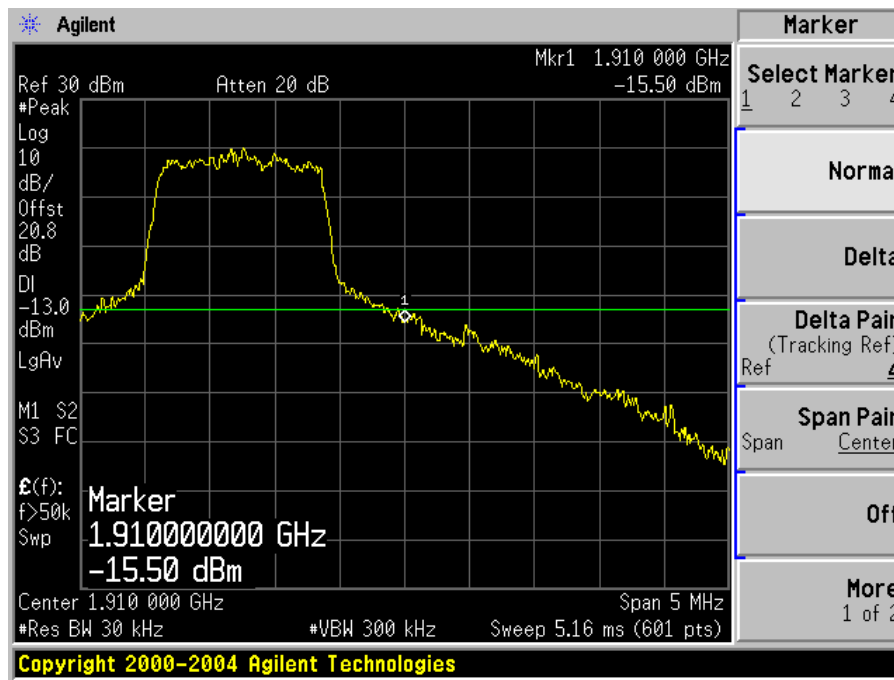
Conducted Measurement

Channel	Frequency (MHz)	Absolute Level (dBm)	Limit (dBm)
Low	1850	-16.31	-13
High	1910	-15.50	-13

#### Lowest Channel



Highest Channel



CDMA 700 MHz (FCC Part 90):

Radiated Measurement

Indicated		Azimuth (degree)	Test Antenna		Substituted			Absolute Level		Limit (dBW/MHz)	Margin (dB)	
Frequency (MHz)	Frequency (MHz)		Height (cm)	Polar (H/V)	Frequency (MHz)	Level dBm	Antenna Gain Correction (dBi)	Cable Loss (dB)	(dBm)			(dBW/MHz)
793	34.80	79	100	H	793	-42.28	0	0.55	-42.83	-72.83	-70	-2.83
793	27.35	11	200	V	793	-45.40	0	0.55	-45.95	-75.95	-70	-5.95
805	20.45	185	100	V	805	-51.73	0	0.55	-52.28	-82.58	-70	-12.28
805	21.99	75	200	H	805	-54.67	0	0.55	-55.22	-85.22	-70	-15.22