



47 CFR PART 22 SUBPART H & 24 SUBPART E

TEST REPORT

Shamu PCIe Data Card

Model Name: Shamu_PCIe
Trade Name: /
Report No.: SH09100013R01
FCC ID: X2U-SHAMU-PCIE

prepared for

VIA Telecom, Inc.

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1. Test Result Certification

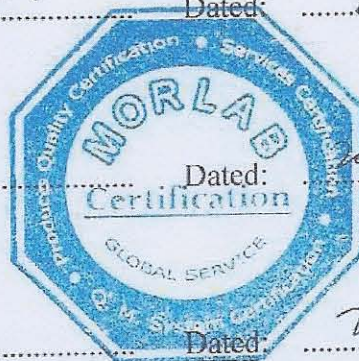
Equipment under Test: Shamu PCIe Data Card
Trade Name: /
Model Name: Shamu_PCIe
FCC ID: X2U-SHAMU-PCIE
Applicant: VIA Telecom, Inc.
3390 Carmel Mountain Road, San Diego, CA 92121-1002, USA
Manufacturer: VIA Telecom, Inc.
3390 Carmel Mountain Road, San Diego, CA 92121-1002, USA
Test Standards: 47 CFR Part 2
47 CFR Part 22 Subpart H
47 CFR Part 24 Subpart E
Test Result: PASS

*** We Hereby Certify That:**

The equipment under test was tested by Shenzhen Morlab Communications Technology Co., Ltd. The test data, data evaluation, test procedures and equipment configurations shown in this report were made in accordance with the requirement of related FCC rules.

The test results of this report only apply for the tested sample equipment identified above. The test report shall be invalid without all the signatures of the test engineer, the reviewer and the approver.

Tested by:	<u>Bao Yinquan</u>	Dated:	<u>2009/12/22</u>
	Bao Yinquan		2009/12/22
Reviewed by:	<u>Zhang Jun</u>	Dated:	<u>2009.12.22</u>
	Zhang Jun		2009/12/22
Approved by:	<u>Su Feng</u>	Dated:	<u>2009.12.22</u>
	Su Feng		2009/12/22





2. General Information

2.1 Equipment under Test (EUT) Description

EUT Type..... : Shamu PCIe Data Card
 Brand Name : /
 Model Name : Shamu PCIe
 Frequency Range : CDMA2000 Cellular:
 Tx: 824 MHz ~ 849 MHz; Rx: 869 MHz ~ 894 MHz
 CDMA2000 PCS:
 Tx: 1850 MHz ~1910 MHz;Rx: 1930 MHz ~ 1990 MHz
 Max ERP/EIRP Power..... : CDMA2000 Cellular:0.2306W for 1x RTT
 CDMA2000 PCS:0.1396W for 1x EVDO REV.A
 Modulation Type..... : QPSK
 Emission Designators : 1M28F9W
 Hardware Version..... : P2
 Software Version..... : 8.5.6
 Manufacturer..... : VIA Telecom, Inc.
 3390 Carmel Mountain Road, San Diego, CA 92121-1002, USA
 Factory : FUGANG ELECTRIC(KUNSHAN) CO., LTD.
 No. 2 ZhengWei Road, JinXi Town, KunShan, JianSu, China
 Ancillary Equipments..... : 1: Test Board
 Model Name: Lark_Test_P1
 Brand Name: N/A(made by VIA)
 2: Notebook PC
 Model Name: E12KT
 Brand Name: TWINHEAD
 3:Antenna(Used for ERP and RSE testing)
 Model Name: N/A(Test sample)
 Brand Name: N/A(Test sample)
 Gain: 0.8dBi (800MHz);3.0dBi(1900MHz)

NOTE:

1. The EUT is a CDMA2000 1x/EV-DO PCIe module operating in Cellular 800MHz band and PCS1900MHz band.
2. The test board is similar to a PCIe port,only power supply to the module,and the test board is connect to the note book from USB conector.The module also can insert to a stander PCIe port on the PC.
3. For more detailed features about the EUT, please see user manual.



2.2 Test Standards and Results

The objective of the report is to perform tests according to 47 CFR Part 2, Part 22 and Part 24 for FCC ID Certification:

No.	Identity	Document Title
1	47 CFR Part 2 (10-1-05 Edition)	Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
2	47 CFR Part 22 (10-1-05 Edition)	Public Mobile Services
3	47 CFR Part 24 (10-1-05 Edition)	Personal Communications Services
4	ANSI/TIA/EIA-603-C (2004)	Land Mobile FM or PM - Communications Equipment - Measurement and Performance Standards
5	ANSI C63.4-2003	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

Test detailed items and the results are as below:

No.	Rules	Test Type	Result	Date of Test
1	§2.106 §22.905 24.229	Frequencies	PASS	12.10
2	§2.1046	Conducted RF Output Power	PASS	12.08~12.10
3	§2.1049	Occupied Bandwidth	PASS	12.10
4	§2.1057 §22.917 §24.238	Band Edge	PASS	12.20
5	§2.1051 §2.1057 §22.917	Conducted Spurious Emission at Antenna Terminal	PASS	12.10
6	§22.913 §24.232	Transmitter Radiated Power (EIPR/ERP)	PASS	12.18
7	§2.1053 §2.1057 §22.917	Radiated Spurious Emission	PASS	12.21
8	§2.1055 §22.355	Frequency Stability	PASS	12.15

2.3 Facilities and Accreditations

2.3.1 Facilities

Shenzhen Electronic Product Quality Testing Center Morlab Laboratory is a testing organization accredited by China National Accreditation Board for Laboratories (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L1659.

All measurement facilities used to collect the measurement data are located at Electronic Testing Building, Shahe Road, Xili, Nanshan District, Shenzhen 518055 CHINA. The test site is constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22; the FCC registration number is 741109.

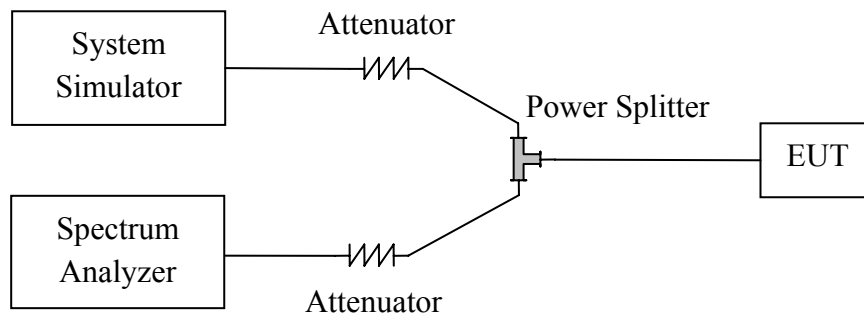
2.3.2 Test Environment Conditions

During the measurement, the environmental conditions were within the listed ranges:

Temperature:	20 - 25°C
Relative Humidity:	40 - 50%
Atmospheric Pressure:	96kPa

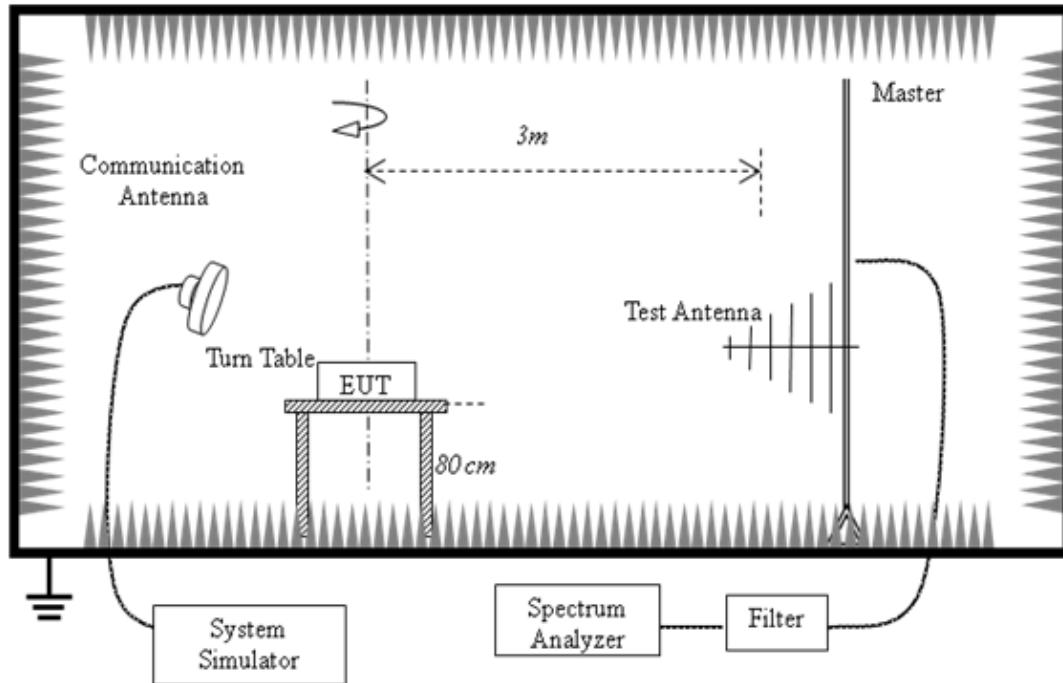
2.4 47 CFR Part 2, Part 22H ,Part 24E Requirements

2.4.1 Conducted Related Tests



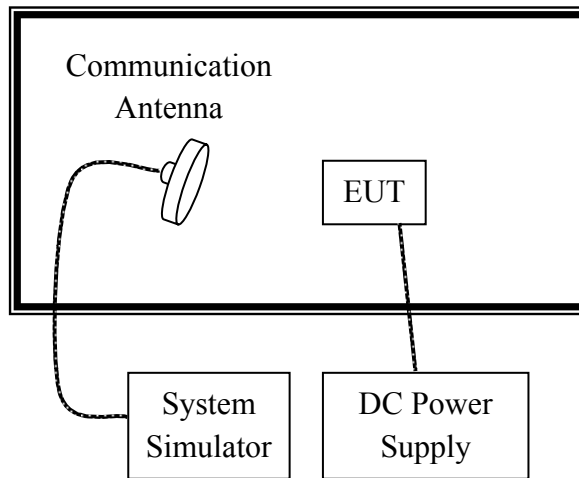
1. The EUT is coupled to the Spectrum Analyzer and the System Simulator with the suitable Attenuators through the Power Splitter; the path loss is calibrated to correct the reading.
2. The EUT is configured here as EUT + Test Board + PC.
3. The EUT is commanded via the System Simulator (SS) to operate at the maximum output power . A communication link is established between the EUT and the SS.
4. The Spectrum Analyzer is set to max-peak detector function and maximum hold mode.

2.4.2 Radiated Power and Spurious Emission Tests



1. The test is performed in a full-Anechoic Chamber; the air loss of the site and the factors of the test system are pre-calibrated using the substitution method.
2. The EUT is configured as EUT + Test Board + PC.
3. The EUT is placed on the vertical axis of a Turn Table 0.8 meters above the ground.
4. The Test Antenna is a bi-log one or a horn one, and the Test Antenna is at the same height as the EUT.
5. The EUT is commanded via the System Simulator (SS) to operate at the maximum output power. A communication link is established between the EUT and the SS.
6. The Spectrum Analyzer is set to max-peak detector function and maximum hold mode.

2.4.3 Frequency Stability Test



1. The test is performed in a Temperature Chamber.
2. The EUT is configured as MS + DC Power Supply.

2.4.4 Test Mode

During all testing, EUT is in link mode with base station emulator at maximum power level. The spurious emission measurements were carried out in semi-anechoic chamber with 3-meter test range, and EUT is rotated on three test planes to find out the worst emission.

Frequency range investigated for radiated emission is as follows:

1. 30 MHz to 10000 MHz for CDMA2000 Cellular
2. 30MHz to 20000 MHz for CDMA2000 PCS.

Test Modes		
Band	Radiated Test	Conducted Test
CDMA2000 Cellular	<ul style="list-style-type: none"> ■ 1xRTT Link Mode_CH1013 ■ 1xRTT Link Mode_CH384 ■ 1xRTT Link Mode_CH777 	<ul style="list-style-type: none"> ■ 1xRTT Link Mode ■ 1xEV-DO Rev. 0 Link Mode ■ 1xEV-DO Rev. A Link Mode
CDMA2000 PCS	<ul style="list-style-type: none"> ■ 1xEV-DO Rev. A Link Mode _CH25 ■ 1xEV-DO Rev. A Link Mode _CH600 ■ 1xEV-DO Rev. A Link Mode _CH1175 	<ul style="list-style-type: none"> ■ 1xRTT Link Mode ■ 1xEV-DO Rev. 0 Link Mode ■ 1xEV-DO Rev. A Link Mode

Note:

1. For CDMA2000 Cellular, the maximum RF output power mode is 1xRTT which was used for ERP and RSE testing.
2. For CDMA2000 PCS, the maximum RF output power mode is 1xEV-DO Rev. A which was used for EIRP and RSE testing.

2.5 Frequencies

2.5.1 Requirement

According to FCC §22.905, the frequencies blocks assignment for the Cellular Radio telephone Service are listed as below.

- (a) Channel Block A:
 - Mobile 824 - 835MHz, Base 869 - 880MHz;
 - Mobile 845 - 846.5MHz, Base 890 - 891.5MHz
- (b) Channel Block B:
 - Mobile 835 - 845 MHz, Base 880 - 890MHz;
 - Mobile 846.5 - 849 MHz, Base 891.5 - 894MHz

According to FCC section 24.229, the frequencies available in the Broadband PCS services are listed as below, in accordance with the frequency allocations table of FCC section 2.106.

- (a) The following frequency blocks are available for assignment on an MTA basis:
 - Block A: 1850 - 1865MHz paired with 1930 - 1945MHz;
 - Block B: 1870 - 1885MHz paired with 1950 - 1965MHz.
- (b) The following frequency blocks are available for assignment on a BTA basis:
 - Block C: 1895 - 1910 MHz paired with 1975 - 1990MHz;
 - Block D: 1865 - 1870 MHz paired with 1945 - 1950MHz;
 - Block E: 1885 - 1890 MHz paired with 1965 - 1970MHz;
 - Block F: 1890 - 1895 MHz paired with 1970 - 1975MHz.

2.5.2 Procedure

1. Perform test system setup as section 2.4.1.
2. The resolution bandwidth (RBW) of the Spectrum Analyzer was set to at least 1% of the emission bandwidth of the fundamental emission of the transmitter, e.g. for GSM modulated signal (here used): $RBW=VBW=3kHz$, for CDMA modulated signal: $RBW=VBW=30kHz$.
3. The lowest and the highest channel were selected to perform tests respectively. Channel No.1013(lowest) and 777(highest) for cellular band; Channel No.25(lowest) and 1175(highest) for PCS band;
4. The MS operated at the maximum output power. Set the Spectrum Analyzer suitably to capture the waveform, search peak and mark, and then record the plot.

2.5.3 Test Results

CDMA2000 Cellular				
Test Mode	Channel	Frequency (MHz)	Result	Plots
CDMA 2000 1xRTT	1013 (Low)	824.70	PASS	1
	777 (High)	848.31	PASS	2
CDMA2000 PCS				
Test Mode	Channel	Frequency (MHz)	Result	Plots
CDMA 2000 1xEV-DO (Rev. A)	25(Low)	1851.25	PASS	3
	1175(High)	1908.75	PASS	4

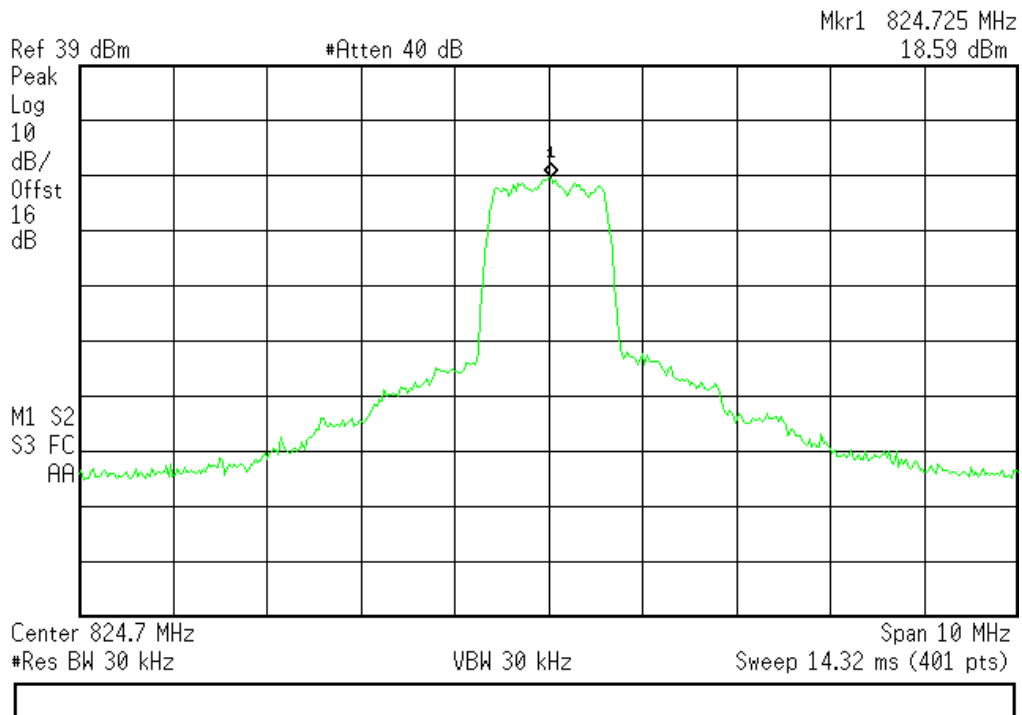
Note:

The frequencies of the lowest channel and the highest channel are as the following figures.

2.5.4 Test Plots

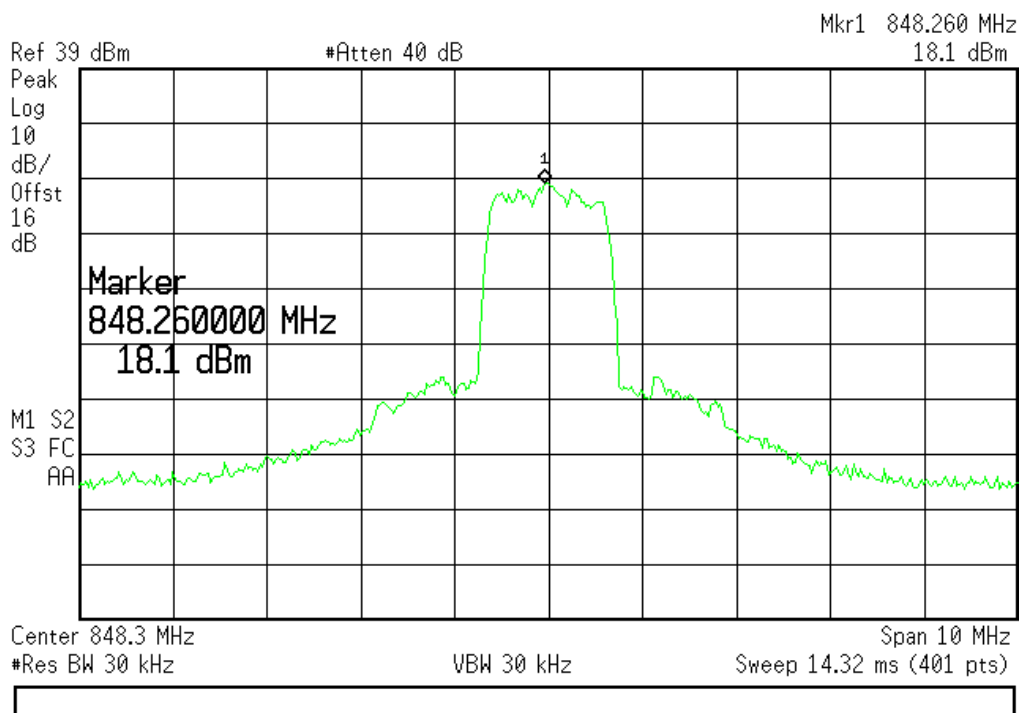
1. CDMA 1x RTT Channel 1013

Agilent 11:16:10 Dec 10, 2009



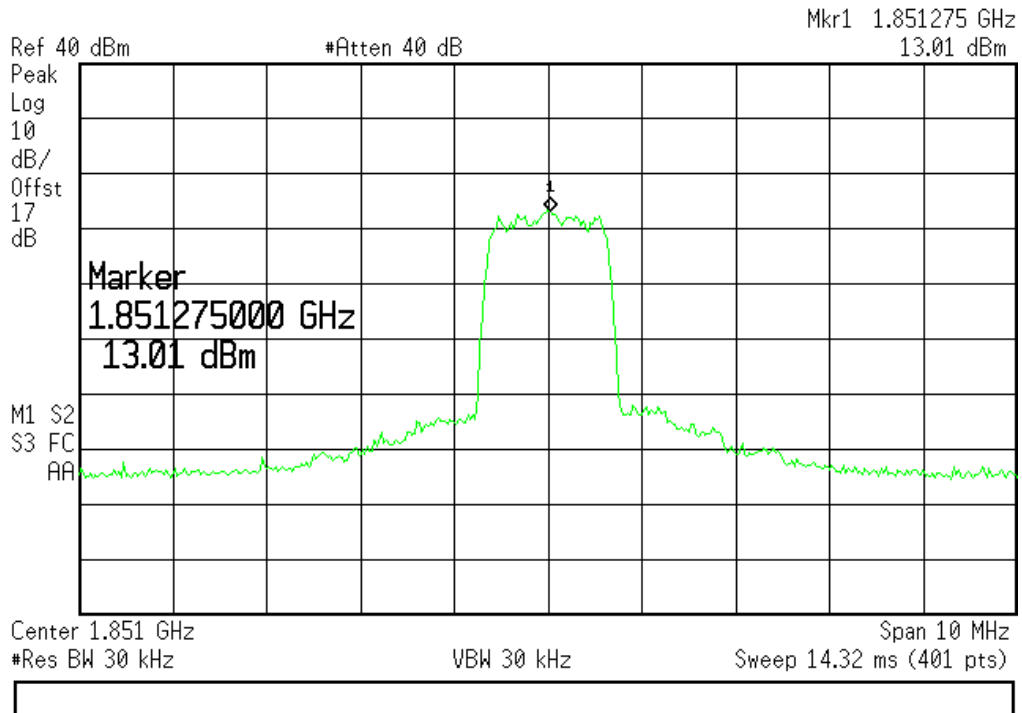
2. CDMA 1x RTT Channel 777

Agilent 11:25:33 Dec 10, 2009



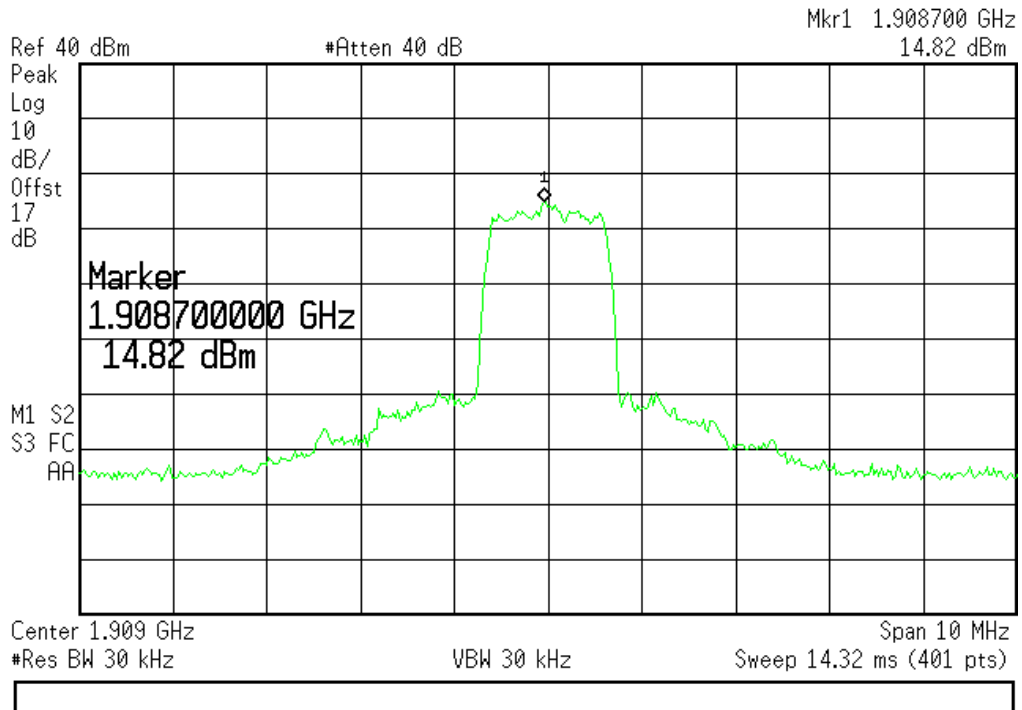
3. CDMA 1xEV-DO(Rev. A) Channel 25

Agilent 11:28:01 Dec 10, 2009



4. CDMA 1xEV-DO(Rev. A) Channel 1175

Agilent 11:29:20 Dec 10, 2009



2.6 Conducted RF Output Power

2.6.1 Requirement

According to FCC §2.1046 (a), for transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, power output shall be measured at the RF output terminals when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on the circuit elements specified in §2.1033 (c)(8). The electrical characteristics of the radio frequency load attached to the output terminals when this test is made shall be stated.

2.6.2 Test Procedure

1. Perform test system setup as section 2.4.1 (the radio frequency load attached to the EUT antenna terminal is 50Ω).
2. The resolution bandwidth of the Spectrum Analyzer is set to be comparable to the emission bandwidth of the transmitter, e.g. for GSM modulated signal (here used): RBW=VBW=1MHz, for CDMA modulated signal: RBW=VBW=3MHz.
3. The lowest and the highest channel were selected to perform tests respectively. Channel No.1013(lowest) 384(middle)and 777(highest) for cellular band; Channel No.25(lowest) 600 (middle)and 1175(highest) for PCS band.
4. Set the frequency range of the Spectrum Analyzer suitably to capture the waveform; search peak and mark it; finally record the peak and the plot.

2.6.3 Test Results

CDMA2000 Cellular					
Test Mode	Test Status	Channel	Frequency (MHz)	Conducted power(dBm)	Conducted power(watts)
CDMA 2000 1xRTT	FCH_RC1	1013 (Low)	824.70	22.75	0.1883
		384 (Mid)	836.52	23.64	0.2312
		777 (High)	848.31	24.62	0.2897
	FCH_RC3	1013 (Low)	824.70	23.45	0.2213
		384 (Mid)	836.52	23.18	0.2079
		777 (High)	848.31	24.67	0.2930
	FCH+SCH_RC3	1013 (Low)	824.70	22.45	0.1757
		384 (Mid)	836.52	23.64	0.2312
		777 (High)	848.31	24.66	0.2924
CDMA 2000 1xEV-DO (Rev. 0)	RTAP_9.6Kbps	1013 (Low)	824.70	22.96	0.1977
		384 (Mid)	836.52	23.57	0.2275
		777 (High)	848.31	24.32	0.2704
	RTAP_38.4Kbps	1013 (Low)	824.70	22.23	0.1671
		384 (Mid)	836.52	23.98	0.2500
		777 (High)	848.31	23.72	0.2355
	RTAP_153.6Kbps	1013 (Low)	824.70	23.25	0.2113
		384 (Mid)	836.52	23.88	0.2443
		777 (High)	848.31	24.33	0.2710
CDMA 2000 1xEV-DO (Rev. A)	RETAP_128Kbps	1013 (Low)	824.70	23.04	0.2013
		384 (Mid)	836.52	23.73	0.2360
		777 (High)	848.31	24.19	0.2624
	RETAP_2048Kbps	1013 (Low)	824.70	22.09	0.1618
		384 (Mid)	836.52	23.77	0.2382
		777 (High)	848.31	24.29	0.2685
	RETAP_12288Kbps	1013 (Low)	824.70	23.04	0.2013
		384 (Mid)	836.52	23.27	0.2123
		777 (High)	848.31	23.81	0.2404



CDMA2000 PCS					
Test Mode	Test Status	Channel	Frequency (MHz)	Conducted power(dBm)	Conducted power(watts)
CDMA 2000 1xRTT	FCH_RC1	25 (Low)	1851.25	23.41	0.2192
		600 (Mid)	1880.00	23.34	0.2157
		1175 (High)	1908.75	23.74	0.2365
	FCH_RC3	25 (Low)	1851.25	23.70	0.2344
		600 (Mid)	1880.00	23.53	0.2254
		1175 (High)	1908.75	23.89	0.2449
	FCH+SCH_RC3	25 (Low)	1851.25	23.55	0.2264
		600 (Mid)	1880.00	23.32	0.2147
		1175 (High)	1908.75	23.74	0.2365
CDMA 2000 1xEV-DO (Rev. 0)	RTAP_9.6Kbps	25 (Low)	1851.25	23.38	0.2177
		600 (Mid)	1880.00	23.49	0.2233
		1175 (High)	1908.75	23.54	0.2259
	RTAP_38.4Kbps	25 (Low)	1851.25	23.35	0.2162
		600 (Mid)	1880.00	23.46	0.2218
		1175 (High)	1908.75	23.84	0.2421
	RTAP_153.6Kbps	25 (Low)	1851.25	23.25	0.2113
		600 (Mid)	1880.00	23.36	0.2167
		1175 (High)	1908.75	23.93	0.2471
CDMA 2000 1xEV-DO (Rev. A)	RETAP_128Kbps	25 (Low)	1851.25	23.15	0.2065
		600 (Mid)	1880.00	23.81	0.2404
		1175 (High)	1908.75	23.56	0.2269
	RETAP_2048Kbps	25 (Low)	1851.25	23.71	0.2349
		600 (Mid)	1880.00	23.64	0.2312
		1175 (High)	1908.75	24.04	0.2535
	RETAP_12288Kbps	25 (Low)	1851.25	23.47	0.2223
		600 (Mid)	1880.00	23.56	0.2269
		1175 (High)	1908.75	23.23	0.2103

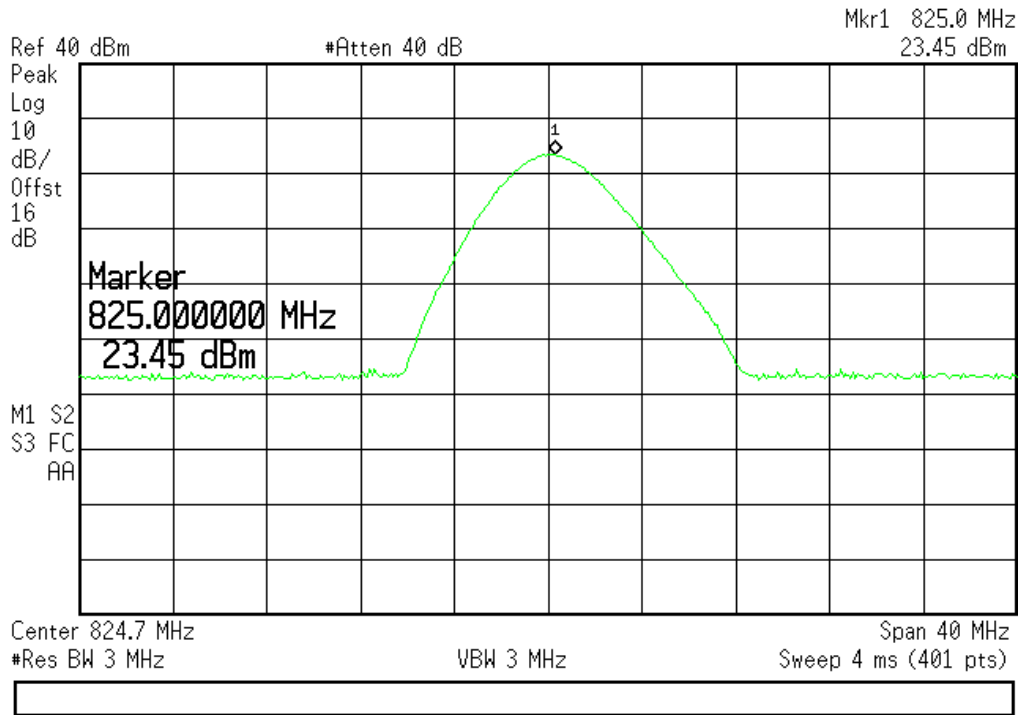
Note:

This report only show the worst results with plots of Cellular CDMA2000 1x RTT FCH_RC3 mode and PCS CDMA2000 1x EVDO Rev.A RETAP_2048kbps mode.

2.6.4 Test Plots

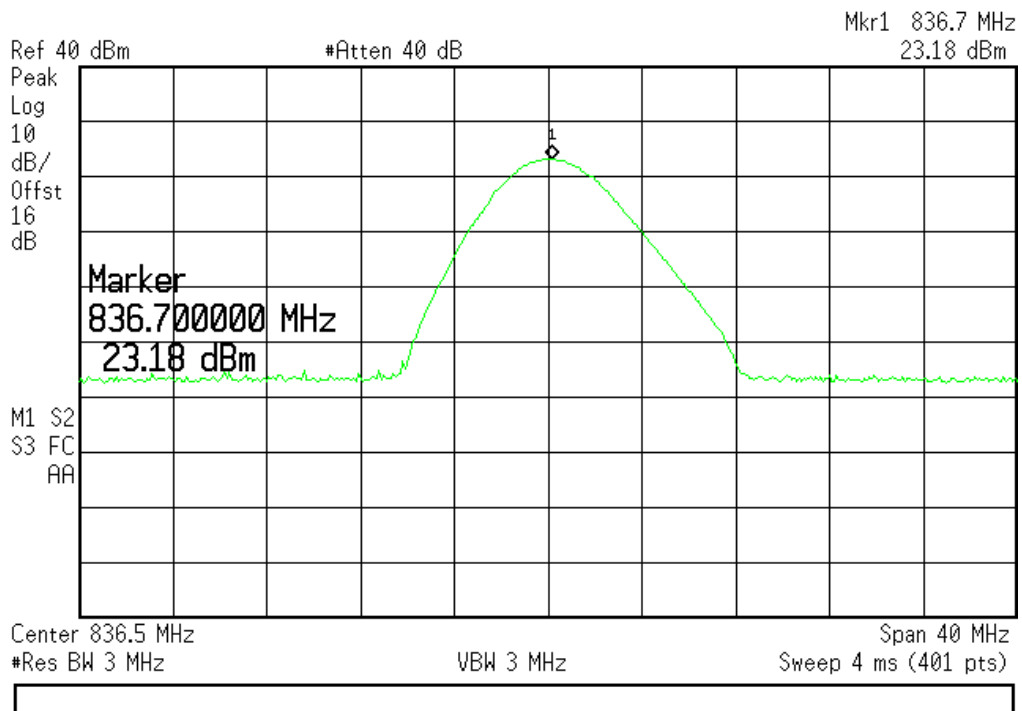
1 Cellular CDMA2000 1x RTT FCH_RC3 Channel 1013

Agilent 15:46:39 Dec 8, 2009



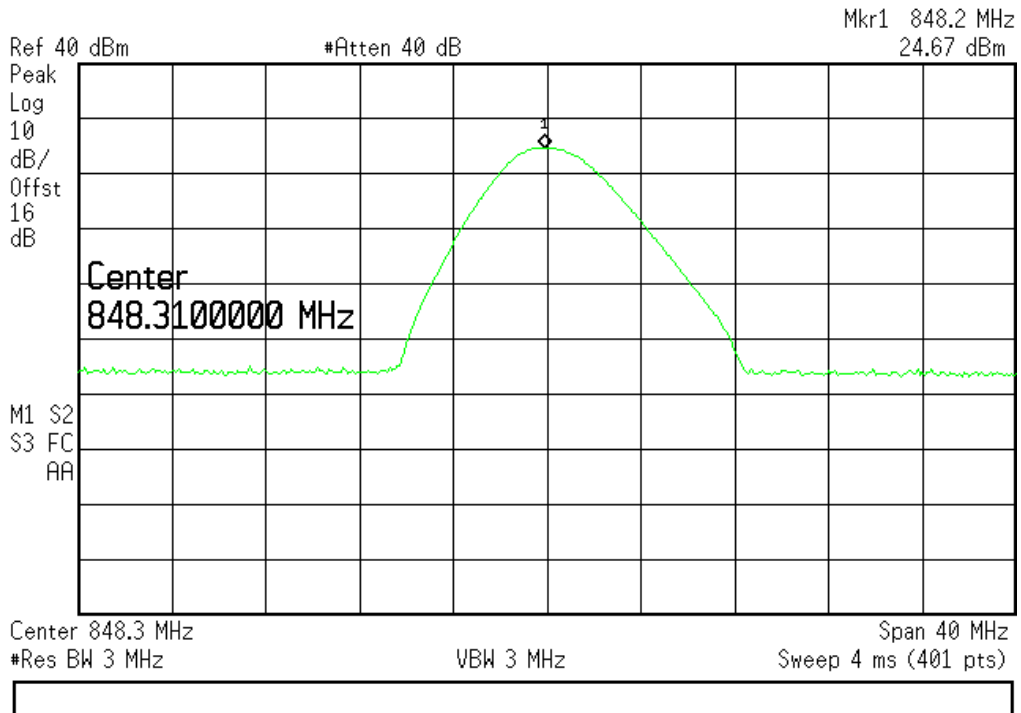
2 Cellular CDMA2000 1x RTT FCH_RC3 Channel 384

Agilent 15:27:23 Dec 8, 2009



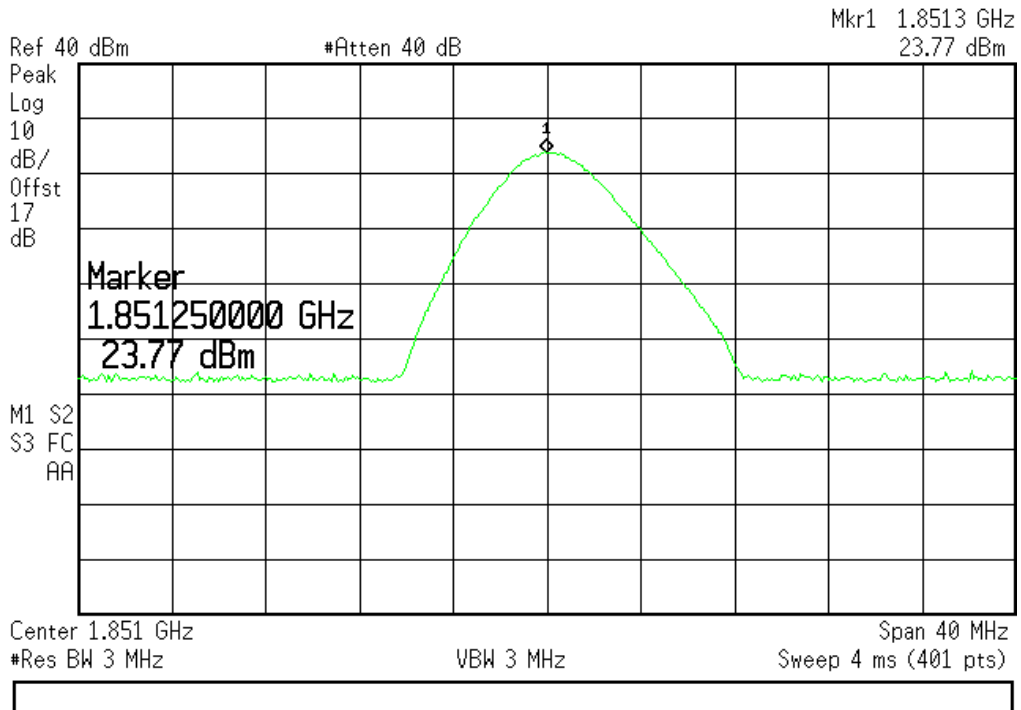
3 Cellular CDMA2000 1x RTT FCH_RC3 Channel 777

Agilent 15:22:19 Dec 8, 2009



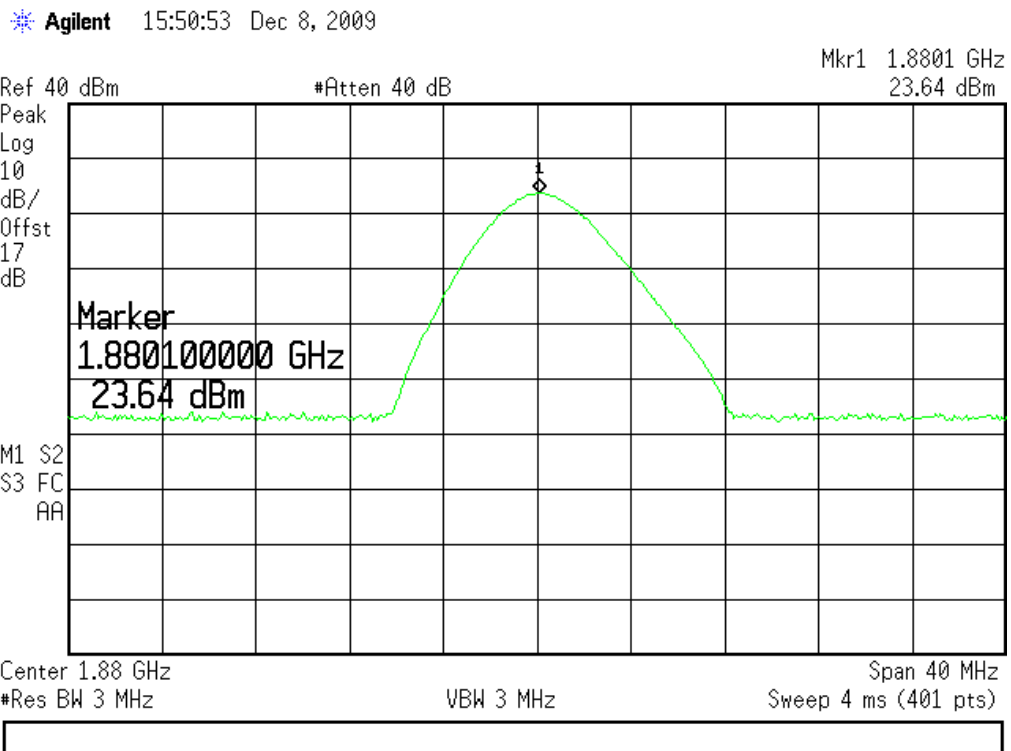
4 PCS CDMA2000 1x EVDO Rev.A RETAP_2048kbps Channel 25

Agilent 15:53:41 Dec 8, 2009

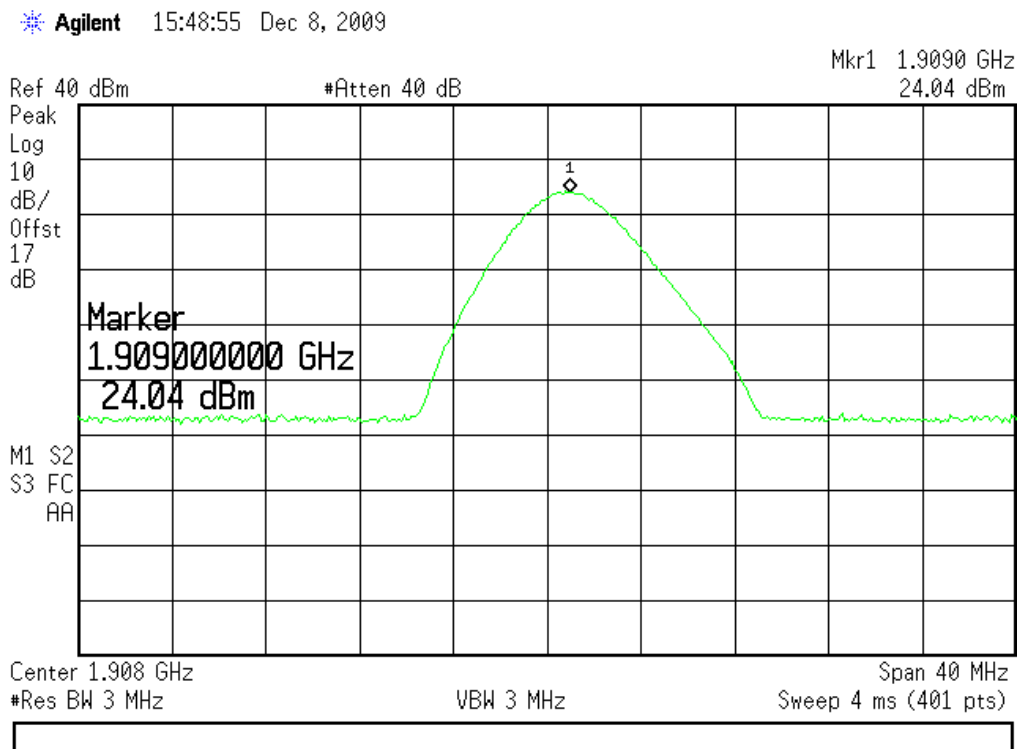




5 PCS CDMA2000 1x EVDO Rev.A RETAP_2048kbps Channel 600



6 PCS CDMA2000 1x EVDO Rev.A RETAP_2048kbps Channel 1175



2.7 Occupied Bandwidth

2.7.1 Occupied Bandwidth Definition

According to FCC §2.1049, the occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission.

Occupied bandwidth is also known as the 99% emission bandwidth. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26dB below the transmitter power.

2.7.2 Test Procedure

- 1 Perform test system setup as section 2.4.1 (the radio frequency load attached to the EUT antenna terminal is 50Ω).
- 2 The resolution bandwidth of the Spectrum Analyzer is set to be comparable to the emission bandwidth of the transmitter, for CDMA modulated signal: $RBW=VBW=30KHz$.
- 3 The lowest and the highest channel were selected to perform tests respectively. Channel No.1013(lowest) 384(middle)and 777(highest) for cellular band;. Channel No.25(lowest) 600 (middle)and 1175(highest) for PCS band.
- 4 Set the frequency range of the Spectrum Analyzer suitably to capture the waveform; search peak and mark it; finally record the peak and the plot.

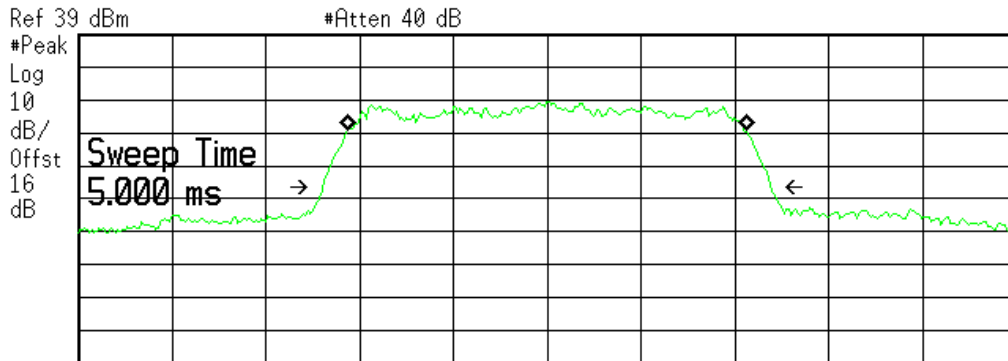
2.7.3 Test Result

CDMA2000 Cellular				
Test Mode	Channel	Measured Bandwidth (MHz)	Result	Plots
CDMA 2000 1xRTT	1013 (Low)	1.2735	Pass	1
	384 (Mid)	1.2789	Pass	2
	777 (High)	1.2683	Pass	3
CDMA2000 PCS				
Test Mode	Channel	Measured Bandwidth (MHz)	Result	Plots
CDMA 2000 1xEV-DO (Rev. A)	25 (Low)	1.2763	Pass	4
	600 (Mid)	1.2661	Pass	5
	1175 (High)	1.2773	Pass	6

2.7.4 Test plots

1 Cellular CDMA2000 1x RTT FCH_RC3 Channel 1013

Agilent 11:35:07 Dec 10, 2009



Ref 39 dBm #Atten 40 dB
 Center 824.7 MHz Span 3 MHz
 #Res BW 30 kHz #VBW 30 kHz Sweep 5 ms (401 pts)

Occupied Bandwidth
 1.2735 MHz

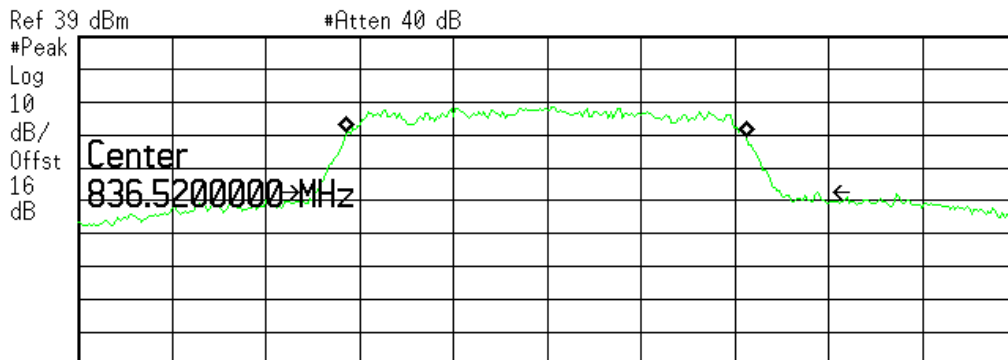
Occ BW % Pwr 99.00 %
 x dB -26.00 dB

Transmit Freq Error -635.575 Hz
 x dB Bandwidth 1.435 MHz



2 Cellular CDMA2000 1x RTT FCH_RC3 Channel 384

Agilent 11:37:05 Dec 10, 2009

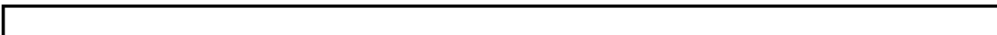


Ref 39 dBm #Atten 40 dB
 Center 836.5 MHz Span 3 MHz
 #Res BW 30 kHz #VBW 30 kHz Sweep 5 ms (401 pts)

Occupied Bandwidth
 1.2789 MHz

Occ BW % Pwr 99.00 %
 x dB -26.00 dB

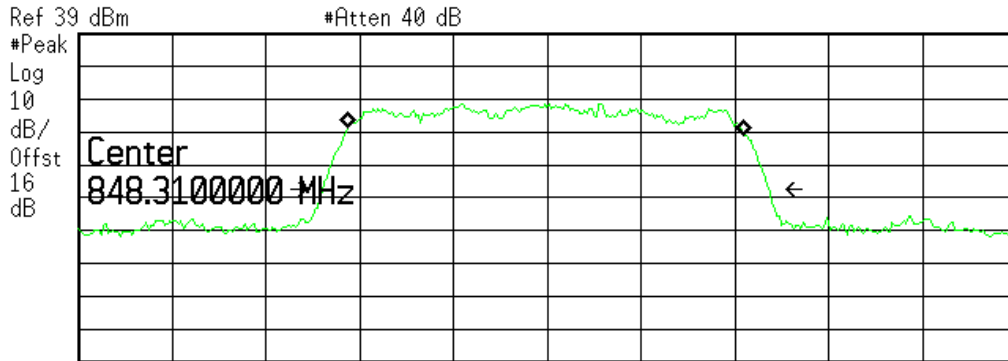
Transmit Freq Error -2.397 kHz
 x dB Bandwidth 1.606 MHz





3 Cellular CDMA2000 1x RTT FCH_RC3 Channel 777

Agilent 11:38:07 Dec 10, 2009



Center 848.3 MHz Span 3 MHz
 #Res BW 30 kHz #VBW 30 kHz Sweep 5 ms (401 pts)

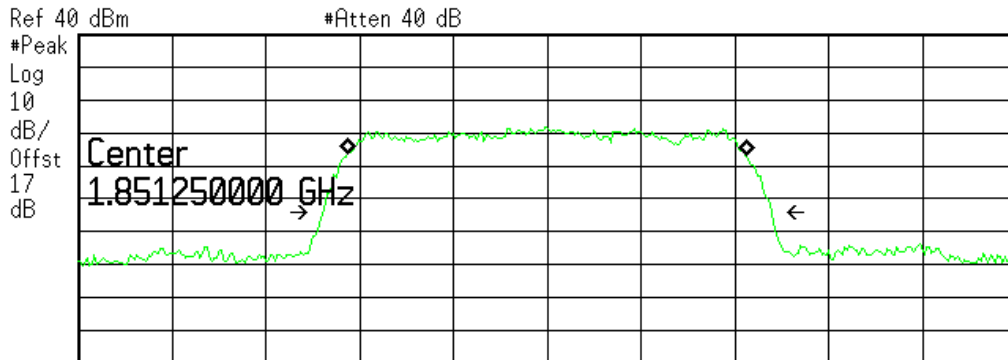
Occupied Bandwidth
 1.2683 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -4.864 kHz
x dB Bandwidth 1.429 MHz

4 PCS CDMA2000 1x EVDO Rev.A RETAP_2048kbps Channel 25

Agilent 12:18:27 Dec 10, 2009



Center 1.851 GHz Span 3 MHz
 #Res BW 30 kHz #VBW 30 kHz Sweep 5 ms (401 pts)

Occupied Bandwidth
 1.2763 MHz

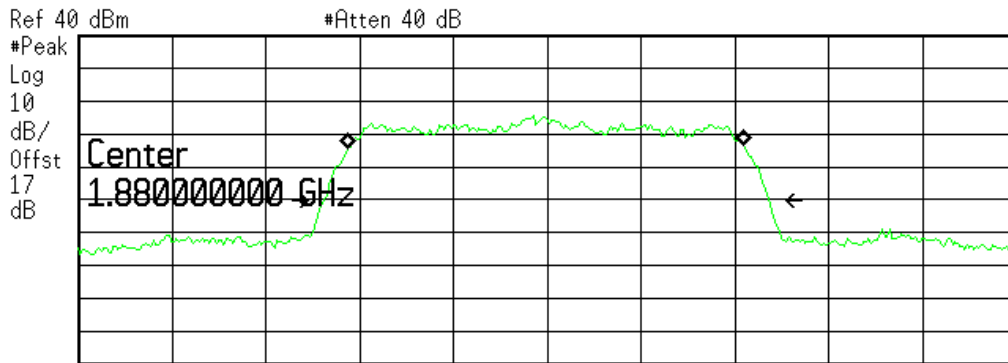
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -3.054 kHz
x dB Bandwidth 1.438 MHz



5 PCS CDMA2000 1x EVDO Rev.A RETAP_2048kbps Channel 600

Agilent 12:19:27 Dec 10, 2009



Center 1.88 GHz #Res BW 30 kHz #VBW 30 kHz Span 3 MHz Sweep 5 ms (401 pts)

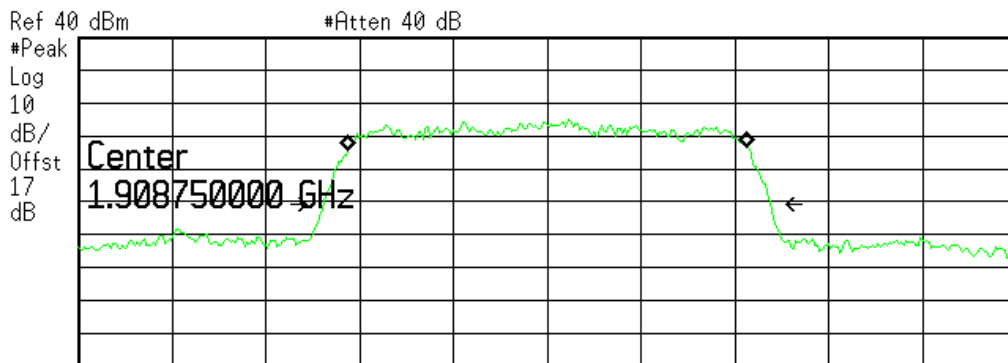
Occupied Bandwidth
1.2661 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -1.123 kHz
x dB Bandwidth 1.427 MHz

6 PCS CDMA2000 1x EVDO Rev.A RETAP_2048kbps Channel 1175

Agilent 12:20:14 Dec 10, 2009



Center 1.909 GHz #Res BW 30 kHz #VBW 30 kHz Span 3 MHz Sweep 5 ms (401 pts)

Occupied Bandwidth
1.2773 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error 1.271 kHz
x dB Bandwidth 1.431 MHz

2.8 Band-edge

2.8.1 Requirement

According to FCC section 22.717(b) and FCC section 24.235(b), in the 1MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth (26dB emission bandwidth) of the fundamental emission of the transmitter may be employed.

2.8.2 Test Description

See section 2.4.1 of this report.

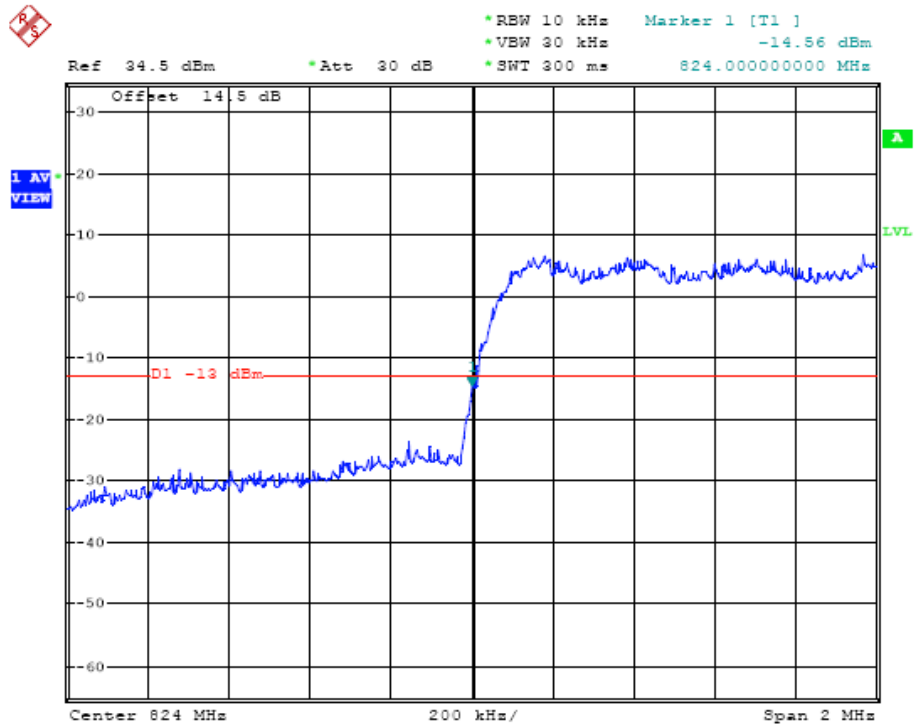
2.8.3 Test Result

The lowest and highest channels are tested to verify the band edge emissions.

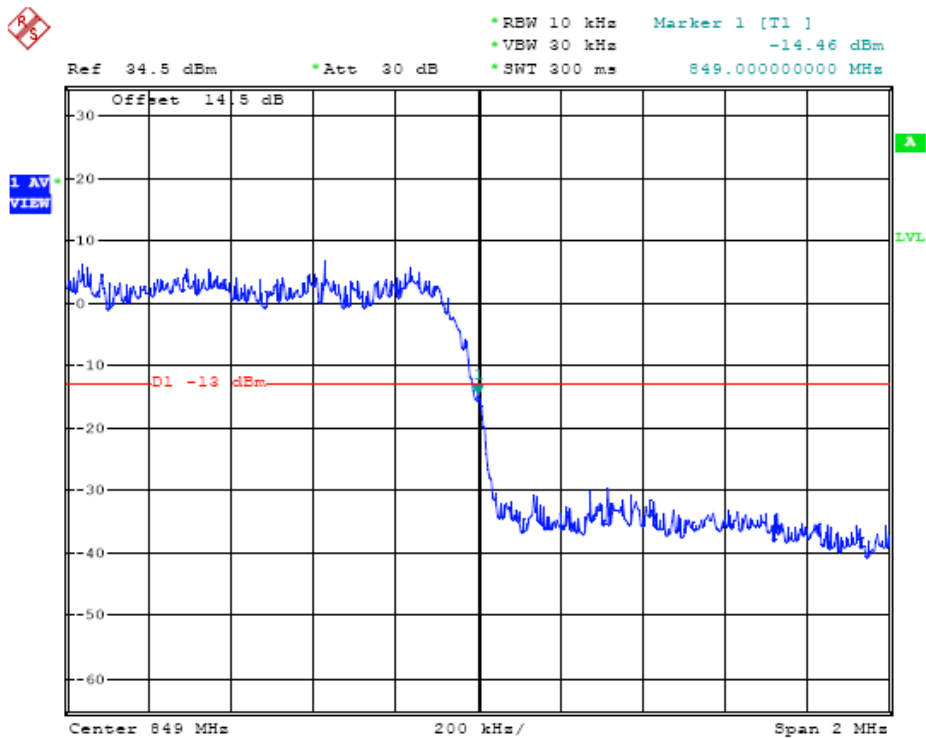
CDMA2000 Cellular					
Test Mode	Channel	Frequency(MHz)	Measured Max. Band Edge Emission (dBm)	Result	Plots
CDMA 2000 1xRTT	1013 (Low)	824.70	-14.56	Pass	1
	777 (High)	848.31	-14.46	Pass	2
CDMA2000 PCS					
Test Mode	Channel	Frequency(MHz)	Measured Max. Band Edge Emission (dBm)	Result	Plots
CDMA 2000 1xEV-DO (Rev. A)	25(Low)	1851.25	-34.41	Pass	3
	1175(High)	1908.75	-27.38	Pass	4

2.8.4 Test plots

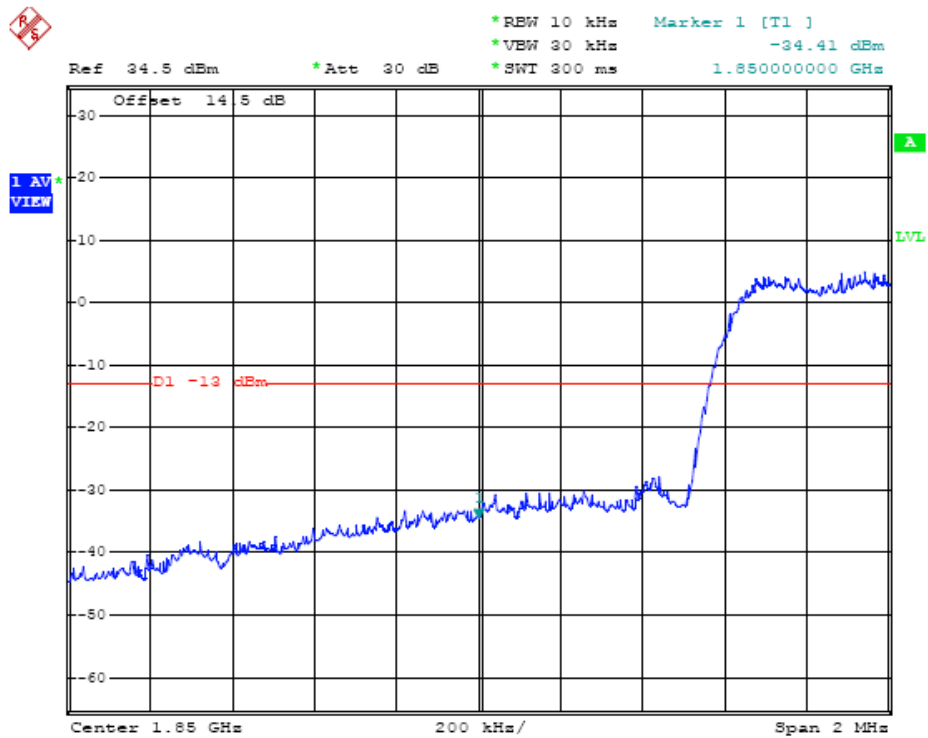
1 CDMA 1x RTT Channel 1013



2 CDMA 1x RTT Channel 777



3 CDMA 1xEV-DO(Rev. A) Channel 25



4 CDMA 1xEV-DO(Rev. A) Channel 1175



2.9 Conducted Spurious Emission

2.9.1 Requirement

According to FCC §22.917(a) and §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. This calculated to be -13dBm.

According to FCC §22.917 (b) and §24.238(b), in the 1MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. Thus the 26dB emission bandwidth is measurement for showing compliance at the band-edge.

2.9.2 Test Procedure

1. Perform test system setup as section 2.4.1.
2. Make a limit line whose value is -13dBm on the Spectrum Analyzer.
3. The lowest and the highest channel were selected to perform tests respectively. Channel No.1013(lowest) 384(middle)and 777(highest) for cellular band; Channel No.25(lowest) 600 (middle)and 1175(highest) for PCS band.
4. Set the RBW of the Spectrum Analyzer to 1MHz, and the measuring frequency range from 9kHz to 10th harmonic of the fundamental frequency (here used 26.5GHz); mark the fundamental frequency and the harmonics thereof; finally record the harmonics and the plot. Note, the measuring frequency range can be divided into several parts to perform tests.
5. In the 1MHz bands immediately outside and adjacent to the frequency black, the RBW of the Spectrum Analyzer was set to at least one percent of the emission bandwidth of the fundamental emission of the transmitter, e.g. for GSM modulated signal (here used): RBW=3kHz, for CDMA modulated signal: RBW=1MHz.
6. Set the frequency range of the Spectrum Analyzer suitably to capture the waveform; search peak and mark it; finally record the peak and the plot.

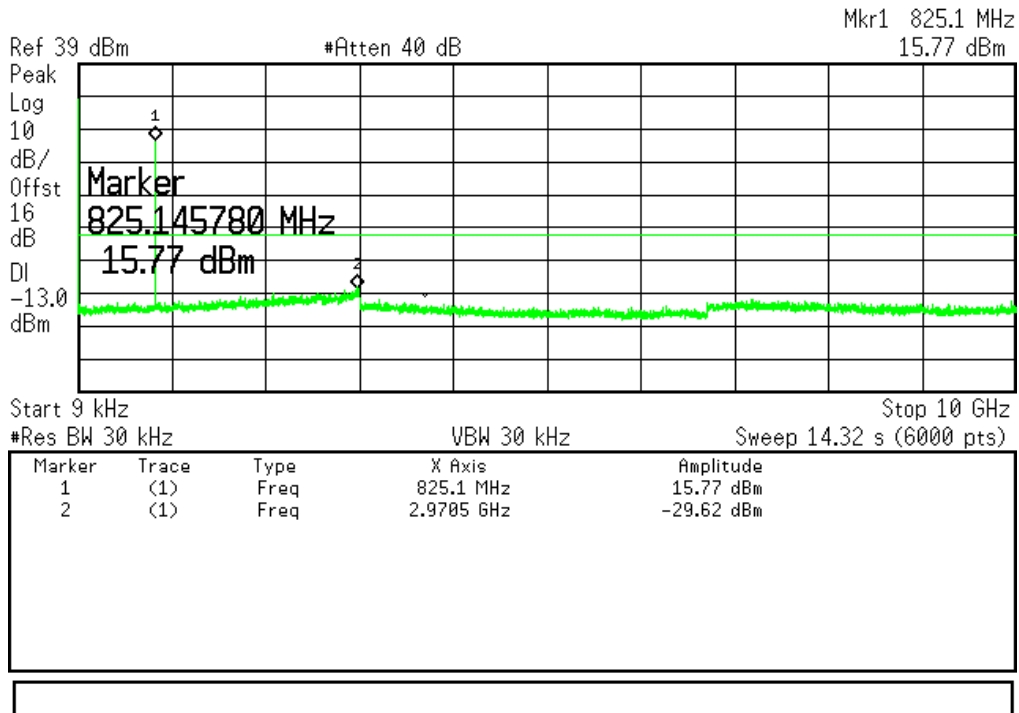
2.9.3 Test Results

CDMA2000 Cellular				
Test Mode	Channel	Measured Max. Spurious Emission (dBm)	Result	Plots
CDMA 2000 1xRTT	1013 (Low)	-29.62	Pass	1
	384 (Mid)	-29.67	Pass	2
	777 (High)	-28.54	Pass	3
CDMA2000 PCS				
Test Mode	Channel	Measured Max. Spurious Emission (dBm)	Result	Plots
CDMA 2000 1xEV-DO (Rev. A)	25(Low)	-26.87	Pass	4
	600 (Mid)	-29.19	Pass	5
	1175(High)	-24.64	Pass	6

2.9.4 Test Plots

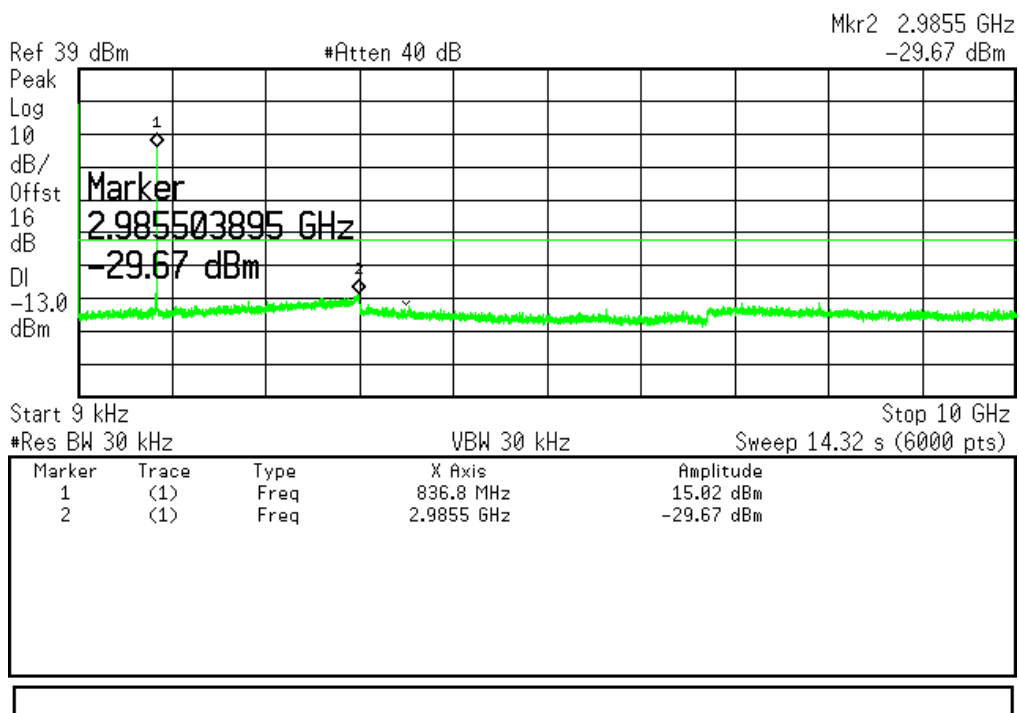
1 Cellular CDMA2000 1x RTT FCH_RC3 Channel 1013

Agilent 12:43:15 Dec 10, 2009



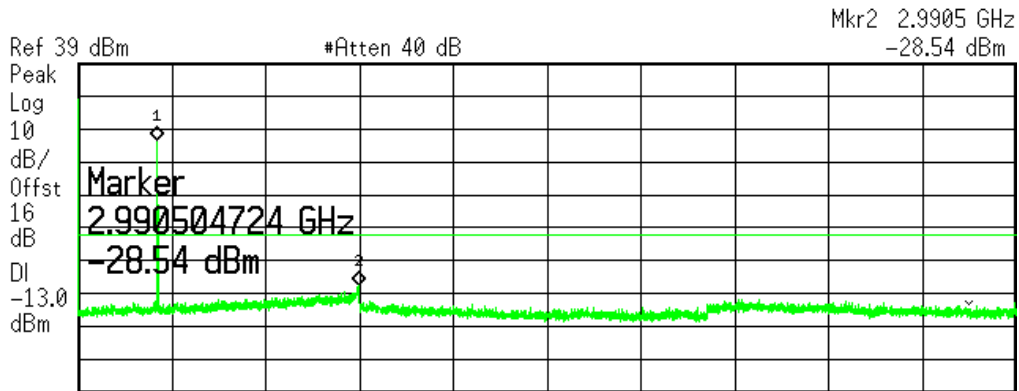
2 Cellular CDMA2000 1x RTT FCH_RC3 Channel 384

Agilent 12:44:35 Dec 10, 2009



3 Cellular CDMA2000 1x RTT FCH_RC3 Channel 777

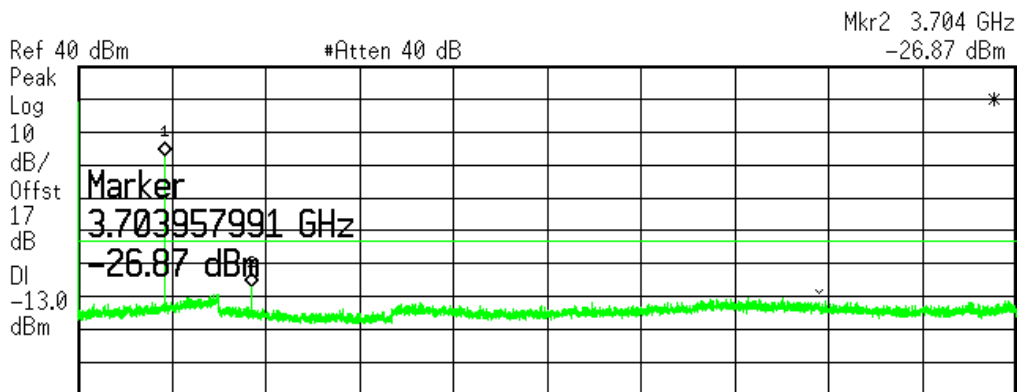
Agilent 12:45:34 Dec 10, 2009



Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	848.5 MHz	15.56 dBm
2	(1)	Freq	2.9905 GHz	-28.54 dBm

4 PCS CDMA2000 1x EVDO Rev.A RETAP_2048kbps Channel 25

Agilent 12:49:37 Dec 10, 2009

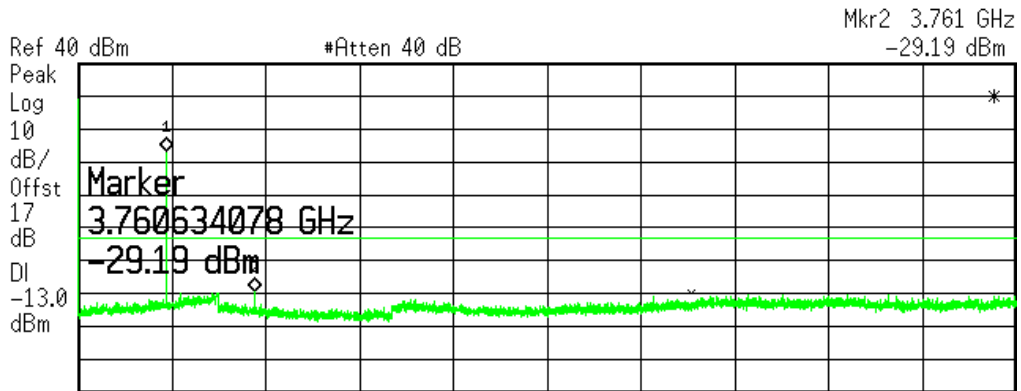


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	1.850 GHz	12.9 dBm
2	(1)	Freq	3.704 GHz	-26.87 dBm



5 PCS CDMA2000 1x EVDO Rev.A RETAP_2048kbps Channel 600

Agilent 12:50:18 Dec 10, 2009

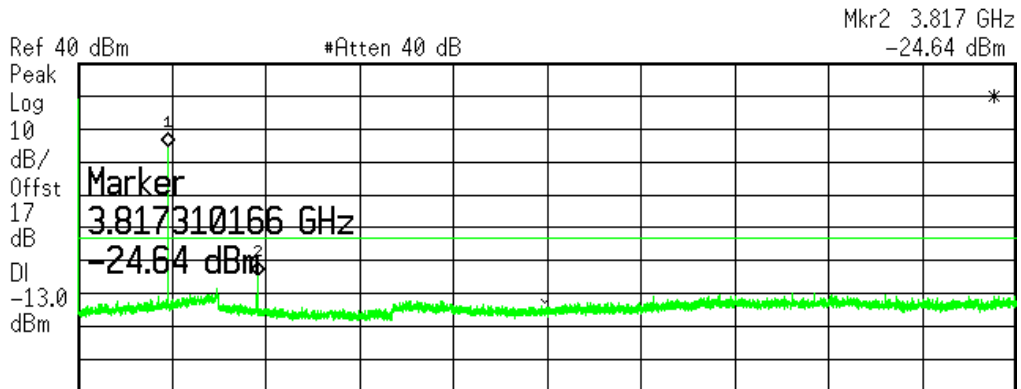


Start 9 kHz #Res BW 30 kHz VBW 30 kHz Sweep 28.63 s (6000 pts) Stop 20 GHz

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	1.880 GHz	13.14 dBm
2	(1)	Freq	3.761 GHz	-29.19 dBm

6 PCS CDMA2000 1x EVDO Rev.A RETAP_2048kbps Channel 1175

Agilent 12:50:57 Dec 10, 2009



Start 9 kHz #Res BW 30 kHz VBW 30 kHz Sweep 28.63 s (6000 pts) Stop 20 GHz

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	1.910 GHz	14.42 dBm
2	(1)	Freq	3.817 GHz	-24.64 dBm

2.10 Transmitter Radiated Power (EIRP/ERP)

2.10.1 Requirement

According to FCC §22.913, the ERP of Cellular mobile transmitters must not exceed 7 Watts (38.5dBm).

2.10.2 Test Procedure

1. Perform test system setup as section 2.4.2.
2. The resolution bandwidth of the Spectrum Analyzer is set to be comparable to the emission bandwidth of the transmitter, e.g. for GSM modulated signal (here used): RBW=VBW=1MHz, for CDMA modulated signal: RBW=VBW=3MHz.
3. The lowest and the highest channel were selected to perform tests respectively. Channel No.1013(lowest) 384(middle)and 777(highest) for cellular band; Channel No.25(lowest) 600 (middle)and 1175(highest) for PCS band.
4. Employ the bi-log Test Antenna as the test system receiving antenna; set the polarization of the Test Antenna to be the same as that of the EUT transmitting antenna.
5. Set the frequency range of the Spectrum Analyzer suitably to capture the waveform; actuate the Turn Table to turn from 0 degrees to 360 degrees to find the maximum reading via the Spectrum Analyzer, mark the peak; finally record the peak and the plot.
6. Set the frequency range of the Spectrum Analyzer suitably to capture the waveform; search peak and mark it; finally record the peak and the plot.

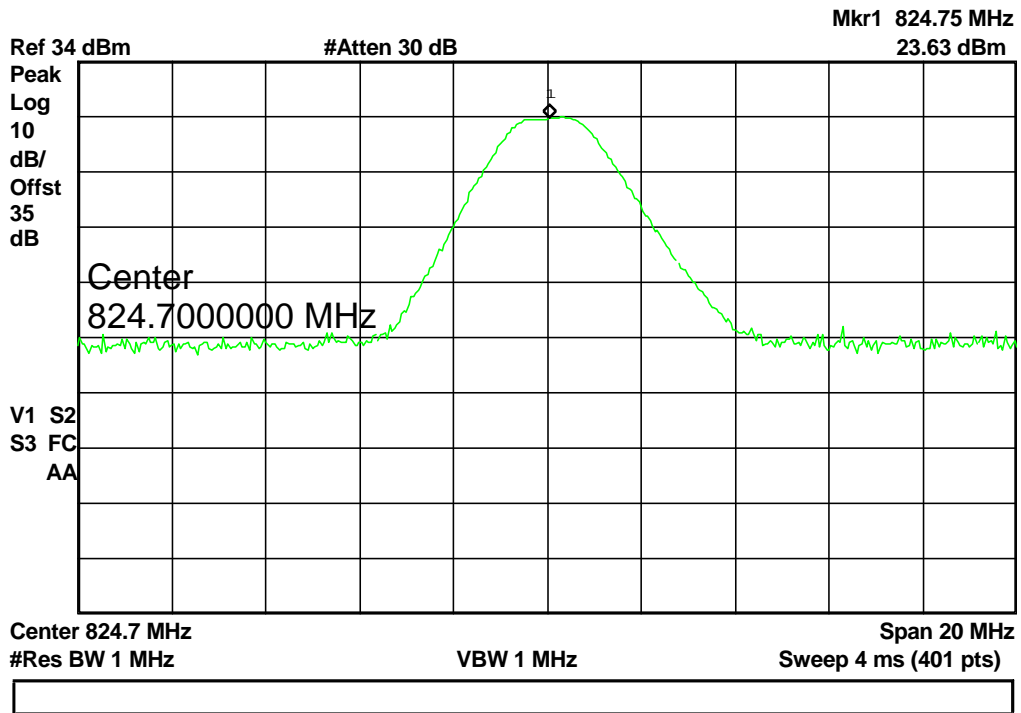
2.10.3 Test Result

CDMA2000 Cellular					
Test Mode	Channel	Measured ERP		Result	Plots
		dBm	Watts		
CDMA 2000 1xRTT	1013 (Low)	23.63	0.2306	Pass	1
	384 (Mid)	23.26	0.2118	Pass	2
	777 (High)	23.43	0.2202	Pass	3
CDMA2000 PCS					
Test Mode	Channel	Measured ERP		Result	Plots
		dBm	Watts		
CDMA 2000 1xEV-DO (Rev. A)	25(Low)	21.45	0.1396	Pass	4
	600 (Mid)	21.33	0.1358	Pass	5
	1175(High)	21.28	0.1342	Pass	6

2.10.4 Test plots

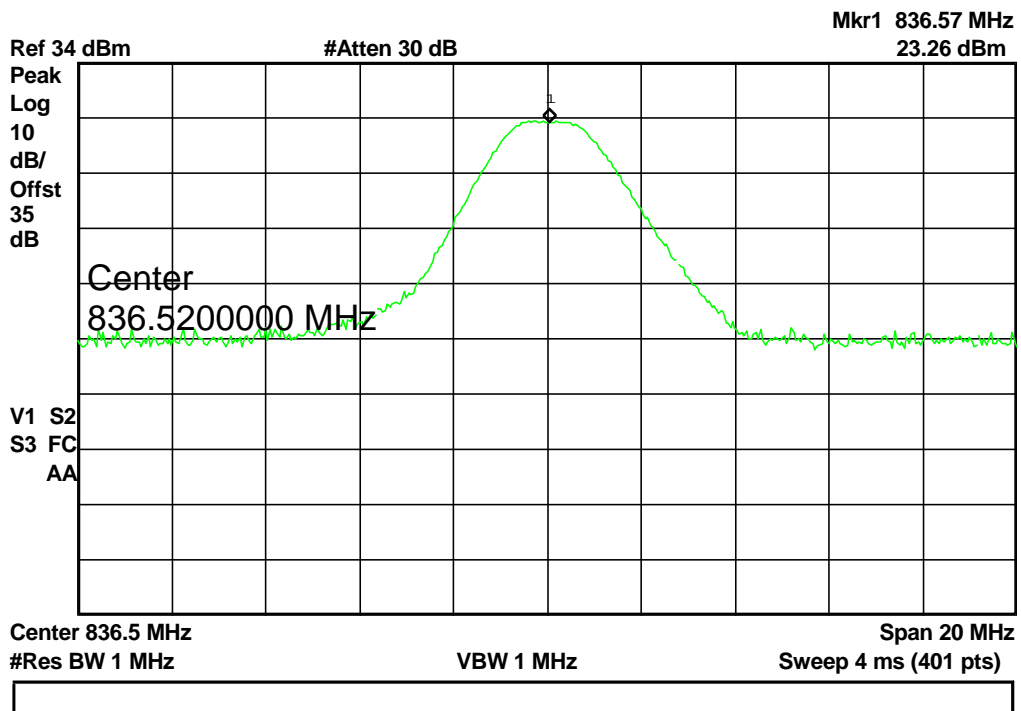
1 Cellular CDMA2000 1x RTT FCH_RC3 Channel 1013

Agilent 17:25:28 Dec 18, 2009



2 Cellular CDMA2000 1x RTT FCH_RC3 Channel 384

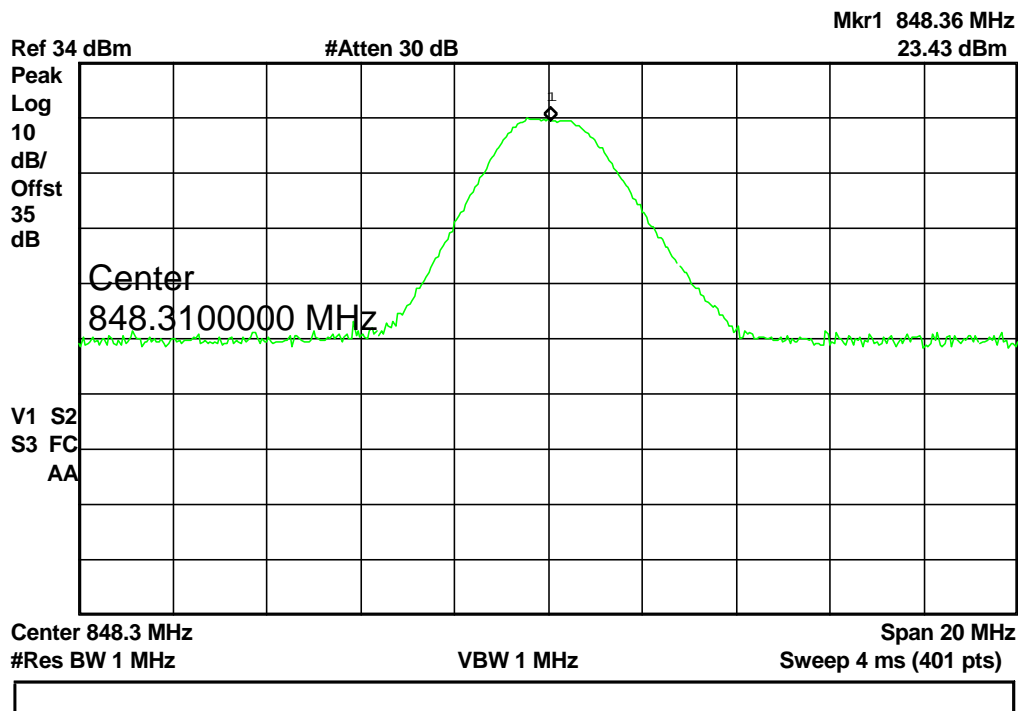
Agilent 17:24:58 Dec 18, 2009





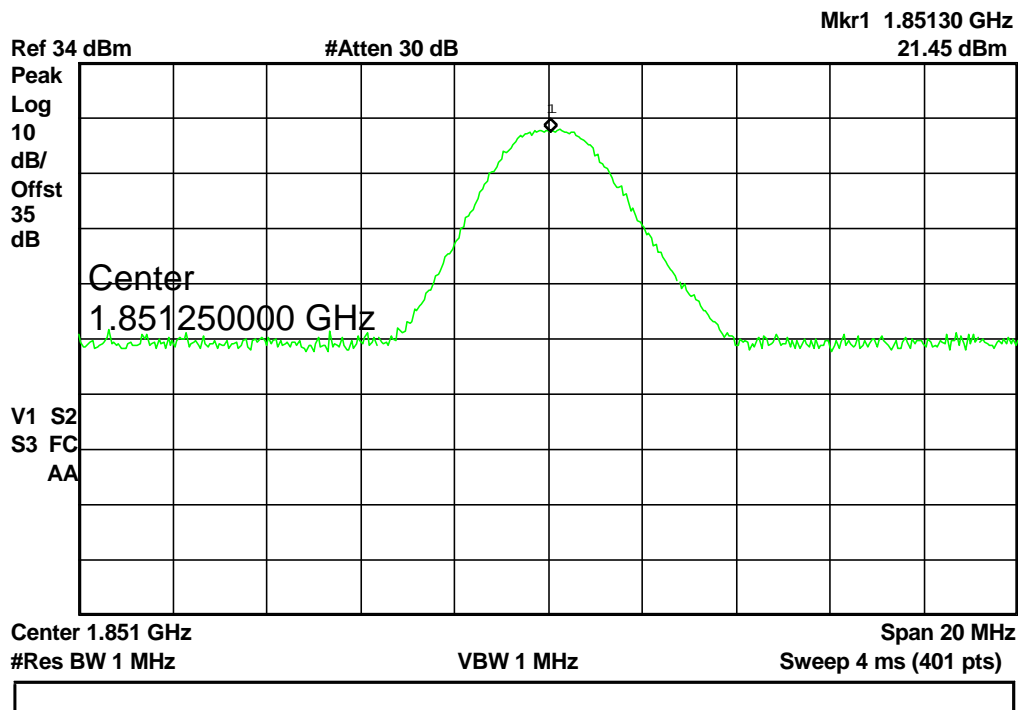
3 Cellular CDMA2000 1x RTT FCH_RC3 Channel 777

Agilent 17:24:28 Dec 18, 2009



4 PCS CDMA2000 1x EVDO Rev.A RETAP_2048kbps Channel 25

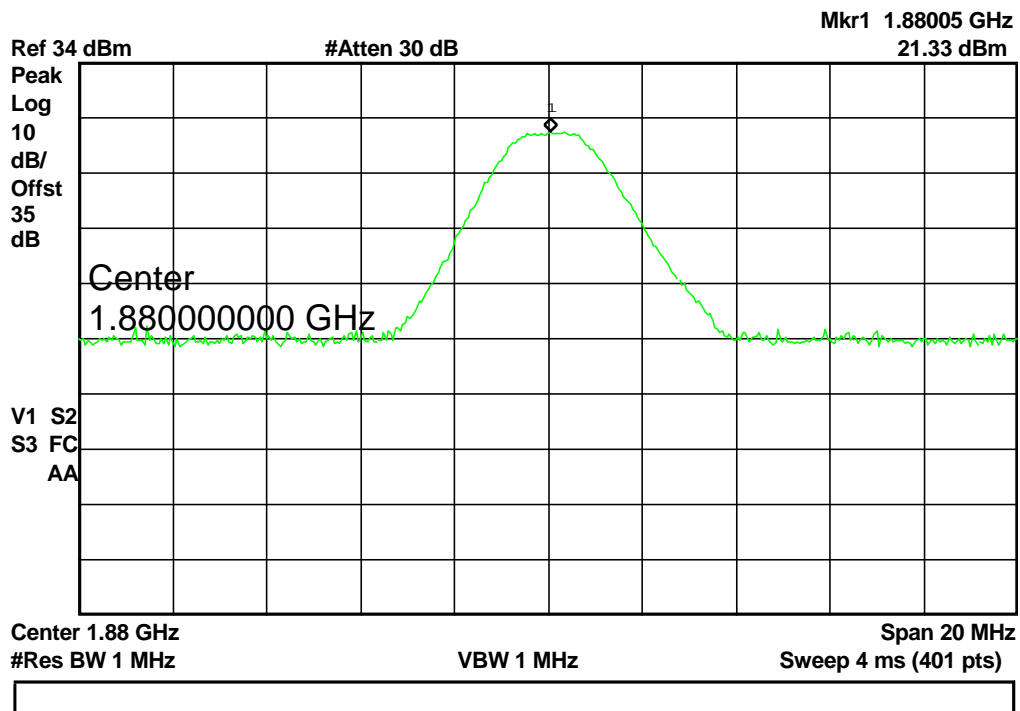
Agilent 17:23:49 Dec 18, 2009





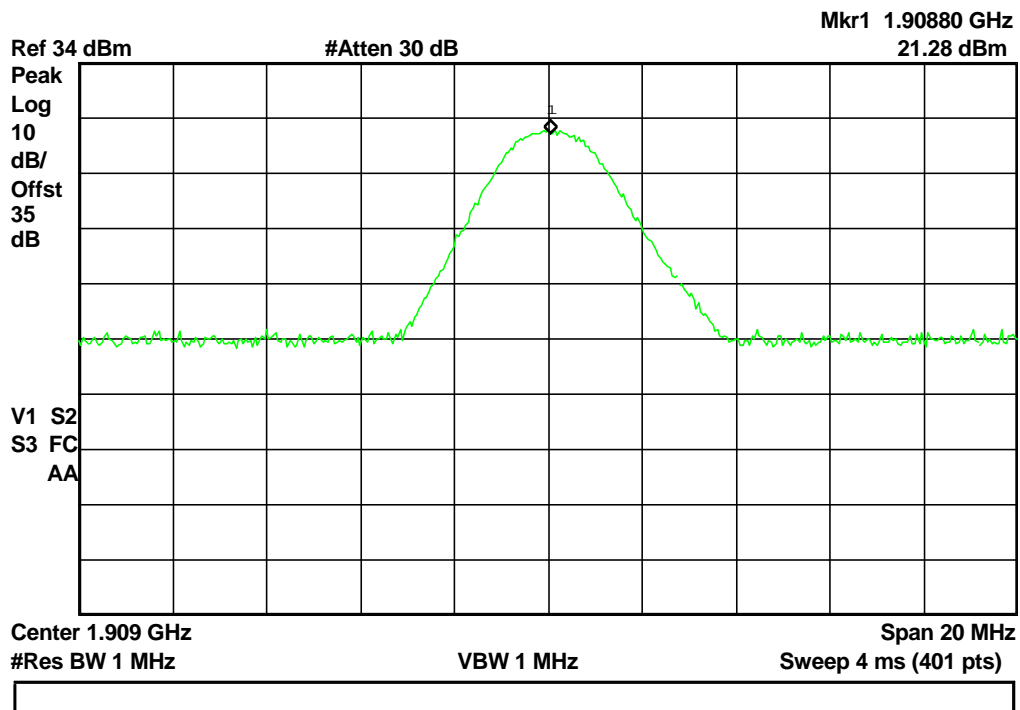
5 PCS CDMA2000 1x EVDO Rev.A RETAP_2048kbps Channel 600

Agilent 17:23:18 Dec 18, 2009



6 PCS CDMA2000 1x EVDO Rev.A RETAP_2048kbps Channel 1175

Agilent 17:22:39 Dec 18, 2009



2.11 Radiated Spurious Emission

2.11.1 Requirement

According to FCC §22.917(a), §24.238(a) and ANSI / TIA / EIA-603-C-2004, 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. This calculated to be -13dBm.

2.11.2 Test Procedure

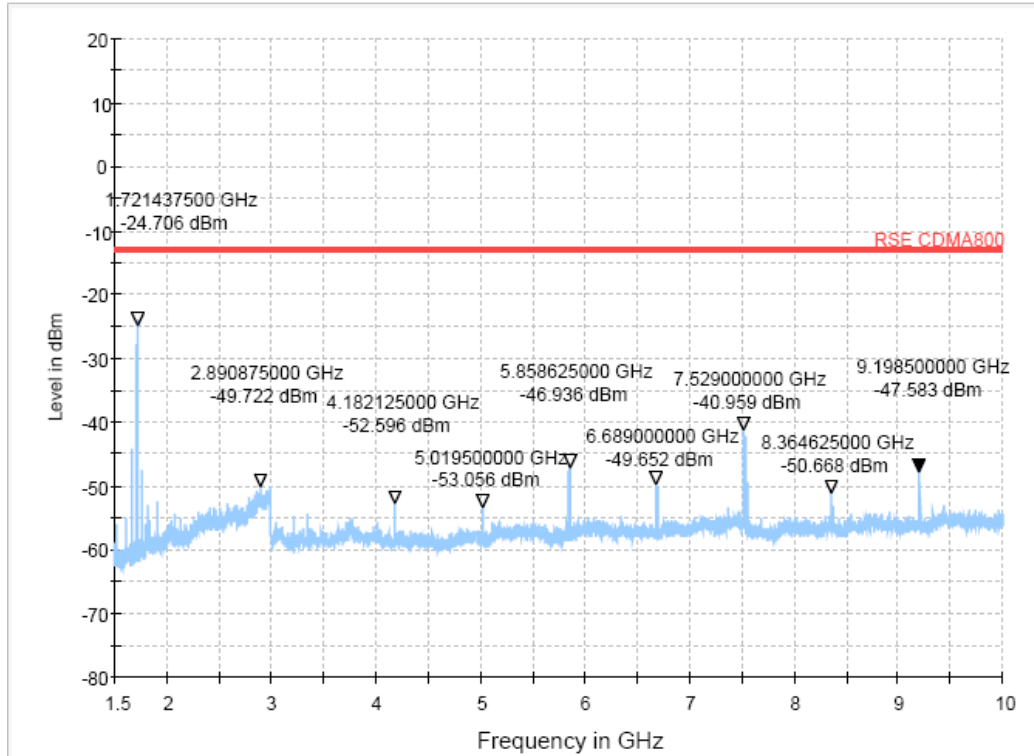
1. Perform test system setup as section 2.4.2
2. Make a limit line whose value is -13dBm on the Spectrum Analyzer, and set the RBW of the Spectrum Analyzer to 1MHz.
3. The two worst case channel were selected to perform tests respectively.
4. Employ the bi-log Test Antenna as the test system receiving antenna and set the frequency range of the Spectrum Analyzer from 30MHz to 3GHz.
5. The measurement is performed with the Test Antenna at both horizontal and vertical polarization respectively. Set the polarization of the Test Antenna to be horizontal.
6. Actuate the Turn Table to turn from 0 degrees to 360 degrees to find the maximum reading via the Spectrum Analyzer, mark the fundamental frequency and the harmonics thereof, after then record the harmonics and the plot.
7. Set the polarization of the Test Antenna to be vertical, then repeat step 6.
8. Employ the horn Test Antenna as the test system receiving antenna and set the frequency range of the Spectrum Analyzer from 3GHz to 10th harmonic of the fundamental frequency, then repeat step 5 to 7.
9. Set the frequency range of the Spectrum Analyzer suitably to capture the waveform; search peak and mark it; finally record the peak and the plot.

2.11.3 Test Result and plots

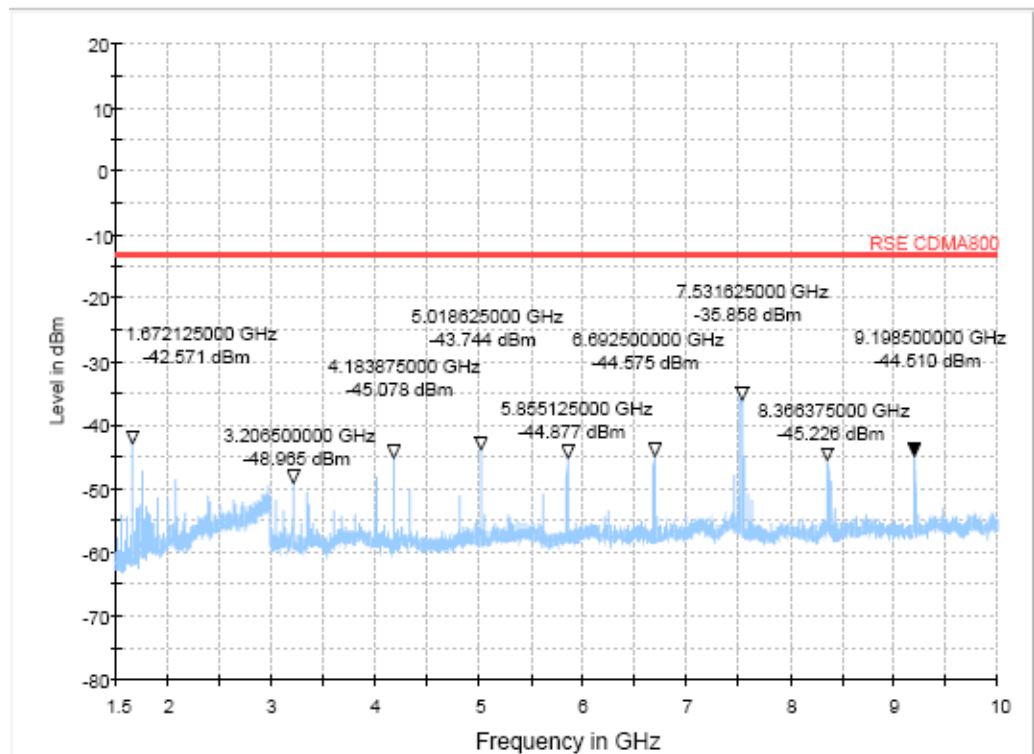
CDMA2000 Cellular						
Test Mode	Frequency (GHz)	Max Spurious Emission (dBm)		Limit (dBm)	Result	Plots
		Horizontal	Vertical			
CDMA 2000 1xRTT	1.7214	-24.706	-42.571	-13	Pass	1&2
	2.8908	-49.722	-49.225	-13	Pass	1&2
	4.1821	-52.596	-45.078	-13	Pass	1&2
	5.8586	-46.93	-44.877	-13	Pass	1&2
	6.6890	-49.652	-44.575	-13	Pass	1&2
	7.5290	-40.959	-35.858	-13	Pass	1&2
	8.3646	-50.668	-45.226	-13	Pass	1&2
	9.1985	-47.583	-44.510	-13	Pass	1&2
CDMA2000 PCS						
Test Mode	Frequency (GHz)	Max Spurious Emission (dBm)		Limit (dBm)	Result	Plots
		Horizontal	Vertical			
CDMA 2000 1xEV-DO (Rev. A)	3.7593	-23.599	-16.290	-13	Pass	3&4
	5.6400	-40.099	-37.443	-13	Pass	3&4
	7.5187	-49.501	-45.400	-13	Pass	3&4
	9.4012	-45.979	-40.723	-13	Pass	3&4
	11.2818	-44.020	-36.555	-13	Pass	3&4
	13.1606	-37.093	-30.857	-13	Pass	3&4
	15.0412	-45.002	-41.545	-13	Pass	3&4

2.11.4 Test plots

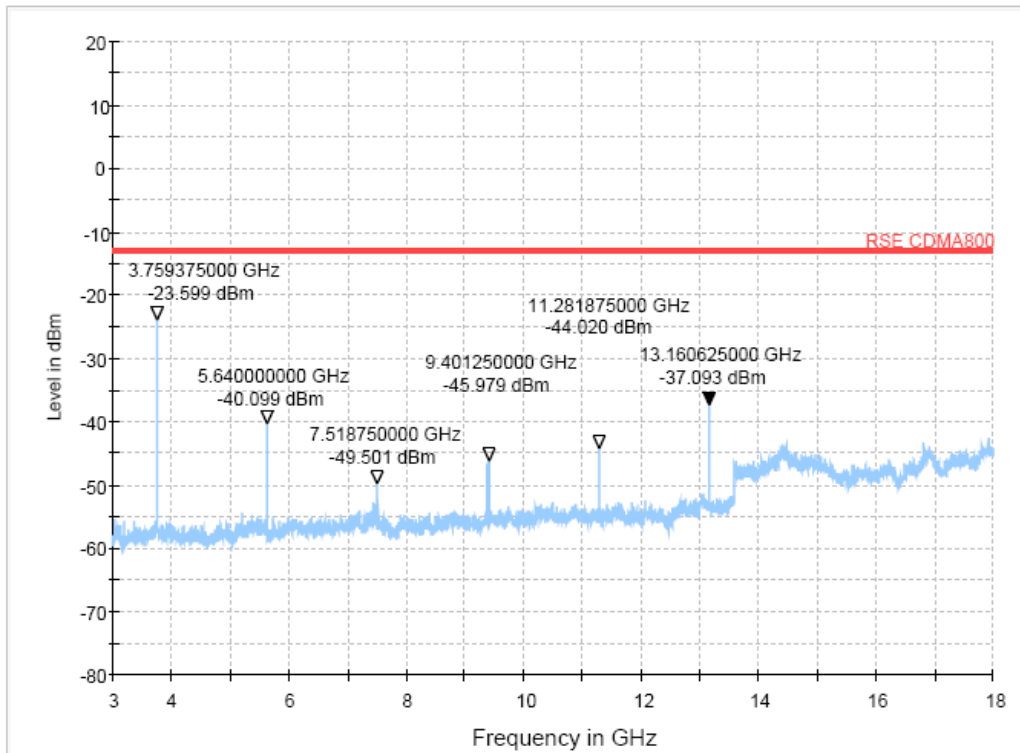
1 Cellular CDMA2000 1x RTT(Horizontal)



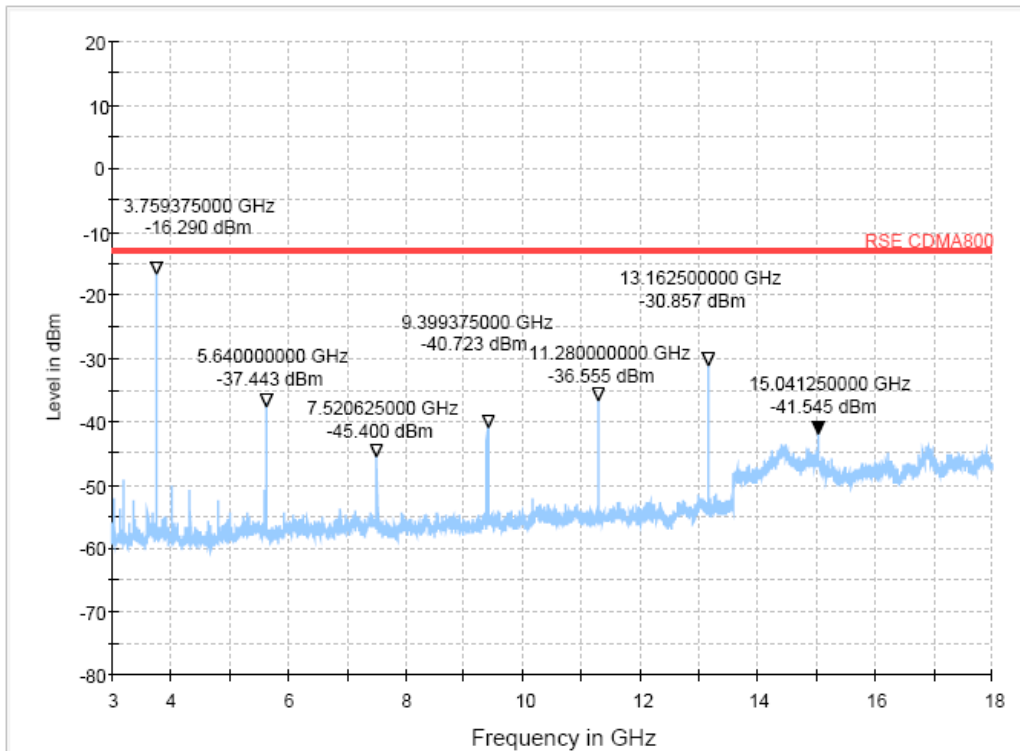
2 Cellular CDMA2000 1x RTT(Vertical)



3 PCS CDMA2000 1x EVDO Rev.A(Horizontal)



4 PCS CDMA2000 1x EVDO Rev.A(Vertical)



2.12 Frequency Stability

2.12.1 Frequency Stability Requirement

According to FCC §22.355, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

According to FCC §2.1055, the test conditions are:

- (a) Temperature:
The temperature is varied from -30°C to $+50^{\circ}\text{C}$ at intervals of not more than 10°C .
- (b) Primary Supply Voltage:
For hand carried battery powered equipment, the primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacture. The supply voltage shall be measured at the input to the cable normally provided with the equipment, or at the power supply terminals if cables are not normally provided.

2.12.2 Test Procedure

1. Perform test system setup as section 2.4.3.
2. Set the voltage of the DC Power Supply to normal supply voltage (here used 3.3V) and the temperature of the Temperature Chamber to vary from -30°C to $+50^{\circ}\text{C}$ at intervals of 10°C .
3. At each temperature level, the EUT is powered off and kept in the Temperature Chamber for two hours. After sufficient stabilization, turn on the EUT, command it via the System Simulator (SS) to operate at the maximum output power i.e. A communication link is established between the EUT and the SS.
4. The frequency deviation is measured (directly read from the SS, which can report the parameter) within three minutes.
5. Set the frequency range of the Spectrum Analyzer suitably to capture the waveform; search peak and mark it; finally record the peak and the plot.
6. Adjust the temperature of the Temperature Chamber as specified in step 2, then repeat step 3 to 7.
7. Set the voltage of the DC Power Supply to high extreme supply voltage (here used 3.6V) and the temperature of the Temperature Chamber to normal (here used $+25^{\circ}\text{C}$), then repeat step 3 to 8.
8. Set the voltage of the DC Power Supply to low extreme supply voltage (here used 3.0V) and the temperature of the Temperature Chamber to normal (here used $+25^{\circ}\text{C}$), then repeat step 3 to 8.



2.12.3 Test results

Band & Channel	Mode	Voltage (Volt)	Temperature (°C)	Dev. Freq. (Hz)	Deviation (ppm)	Limit (ppm)	Result
CDMA2000 Cellular CH384	1xEV-DO Rev. 0 38.4Kbps	3.3	-30	+2	0.00	2.5	PASS
			-20	+3	0.00		
			-10	+1	0.00		
			0	-2	0.00		
			+10	-4	0.00		
			+20	+2	0.00		
			+30	+1	0.00		
			+40	0	0.00		
			+50	+3	0.00		
		3.6	+25	+3	0.00		
3.0	+25	-2	0.00				
CDMA2000 PCS CH600	1xRTT FCH_RC3	3.3	-30	+5	0.00	2.5	PASS
			-20	+7	0.00		
			-10	+3	0.00		
			0	-2	0.00		
			+10	-5	0.00		
			+20	+2	0.00		
			+30	-3	0.00		
			+40	-8	0.00		
			+50	-4	0.00		
		3.6	+25	+3	0.00		
3.0	+25	-2	0.00				

3. Test Equipments

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
System Simulator	Rohde&Schwarz	CMU200	105571	2009.11	1year
System Simulator	Anritsu	MT8820A	BE07218	2009.10	1year
System Simulator	Agilent	E5515C	GB46040102	2009.10	1year
Spectrum Analyzer	Agilent	E4407B	MY44210631	2009.09	1year
Spectrum Analyzer	Rohde&Schwarz	FSP30	101020	2009.10	1year
<i>EMI Test Receiver</i>	Rohde&Schwarz	<i>ESCI3</i>	<i>100666</i>	2009.10	1year
<i>Bi-Log Antenna</i>	Rohde&Schwarz	<i>HL562</i>	<i>100385</i>	2009.10	1year
<i>Horn Antenna</i>	Rohde&Schwarz	<i>HF906</i>	<i>100565</i>	2009.10	1year
Power Splitter	Weinschel	1506A	NW521	(n.a.)	(n.a.)
Power Splitter	HP	11667B	00164	(n.a.)	(n.a.)
Attenuator 1	Resnet	20dB	(n.a.)	(n.a.)	(n.a.)
Attenuator 2	Resnet	3dB	(n.a.)	(n.a.)	(n.a.)
<i>Anechoic Chamber</i>	<i>ETS</i>	<i>9m*6m*6m</i>	<i>(n.a.)</i>	<i>(n.a.)</i>	<i>(n.a.)</i>
<i>Turn Table</i>	<i>ETS·LINDGREN</i>	<i>2188</i>	<i>(n.a.)</i>	<i>(n.a.)</i>	<i>(n.a.)</i>
<i>Antenna Tower</i>	<i>ETS·LINDGREN</i>	<i>2175</i>	<i>(n.a.)</i>	<i>(n.a.)</i>	<i>(n.a.)</i>
<i>Personal Computer</i>	<i>Lenovo</i>	<i>(n.a.)</i>	<i>(n.a.)</i>	<i>(n.a.)</i>	<i>(n.a.)</i>
<i>EMC Software</i>	Rohde&Schwarz	<i>EMC32</i>	<i>(n.a.)</i>	<i>(n.a.)</i>	<i>(n.a.)</i>

NOTE:

- Equipments listed above have been calibrated and are in the period of validation.

** END OF REPORT **