

EMI Test Report

Tested in accordance with
Federal Communications Commission (FCC)
Personal Communications Services
CFR 47, Parts 2, 22 and 24
&
Industry Canada (IC) RSS-132, 133 and RSS-GEN




A division of Research In Motion Limited

REPORT NO.: RTS-2581-1007-55

PRODUCT MODEL NO.: RCU21CW
TYPE NAME: BlackBerry® smartphone
FCC ID: L6ARCU20CW
IC: 2503A-RCU20CW
EMISSION DESIGNATOR: 1M29F9W

DATE: August 04, 2010

	EMI Test Report for the BlackBerry® smartphone Model RCU21CW	
Test Report No. RTS-2581-1007-55	Dates of Test May 02 to June 08, 2010	FCC ID: L6ARCU20CW IC: 2503A-RCU20CW

Statement of Performance:

The BlackBerry® smartphone, model RCU21CW, part number CER-30951-001 Rev. 2, and accessories when configured and operated per RIM's operation instructions, performs within the requirements of the test standards.

Declaration:

We hereby certify that:

The test data reported herein is an accurate record of the performance of the sample(s) tested.

The test results are valid for the tested unit (s) only.

The test equipment used was suitable for the tests performed and within manufacturer's published specifications and operating parameters.

The test methods were consistent with the methods described in the relevant standards.

Documented by:



Jerry Ma
Regulatory Compliance Associate
Date: August 04, 2010

Reviewed By:



Michael Cino
Regulatory Compliance Associate
Date: August 04, 2010

Reviewed and Approved by:



Masud S. Attayi, P.Eng.
Manager, Regulatory Compliance
Date: August 12, 2010



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A. Scope

This report details the results of compliance tests which were performed in accordance to the requirements of:

- FCC CFR 47 Part 2, October, 2009
- FCC CFR 47 Part 22, Subpart H, Cellular Radiotelephone Services, October, 2009
- FCC CFR 47 Part 24 Subpart E, Broadband PCS, October, 2009
- Industry Canada, RSS-132 Issue 2, September 2005, Cellular Telephones Employing New Technologies Operating in the Bands 824-849 MHz and 869-894 MHz.
- Industry Canada, RSS-133 Issue 5, February 2009, 2 GHz Personal Communications Services.
- Industry Canada, RSS-GEN Issue 2, June 02007, General Requirements and Information for the Certification of Radiocommunication Equipment

B. Associated Documents

1. 9670_RCU21CW_HW_Declaration_CER-30951-001_Rev 2

C. Product Identification

Manufactured by Research In Motion Limited whose headquarters is located at:


295 Phillip Street
Waterloo, Ontario
Canada, N2L 3W8
Phone: 519 888 7465
Fax: 519 888 6906

The equipment under test (EUT) was tested at the following locations:

RIM Testing Services EMI test facilities
305 Phillip Street
Waterloo, Ontario
Canada, N2L 3W8
Phone: 519 888 7465
Fax: 519 888 6906

440 Phillip Street
Waterloo, Ontario
Canada, N2L 5R9
Phone: 519 888 7465
Fax: 519 888 6906

The testing was performed from May 02 to June 08, 2010.

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The sample BlackBerry® smartphones tested were:

SAMPLE	MODEL	CER NUMBER	PIN
1	RCU21CW	CER-30951-001 Rev 1	316F2B4D
2	RCU21CW	CER-30951-001 Rev 1	316F0C87
3	RCU21CW	CER-30951-001 Rev 1	3170EE31
4	RCU21CW	CER-30951-001 Rev 1	321D4551
5	RCU21CW	CER-30951-001 Rev 2	321D43E6

Conducted RF measurements were performed on BlackBerry® smartphone sample 1. Radiated Emission measurements were performed on BlackBerry® smartphones samples 3, 4 and 5.


Conducted Power measurements were performed on BlackBerry® smartphones sample 2.

To view the differences between Rev1 and Rev2, see document 9670_RCU21CW_HW_Declaration _ CER-30951-001_Rev 2.

The characteristics that may have been impacted by the changes between Rev 1 and Rev 2 were re-tested.

D. Support Equipment Used for the Testing of the EUT


No support equipment required; for list of equipment refer to section H, Compliance Test Equipment Used.

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Summary of Results

SPECIFICATION		TEST TYPE	RESULT	TEST DATA APPENDIX
FCC CFR 47	IC			
Part 2.1051 Part 22.917 Part 22.901(d)	RSS-GEN, 4.9	CDMA Cell Conducted Spurious Emissions	Pass	1
Part 2.1051 Part 24.238(a)	RSS-GEN, 4.9	CDMA PCS Conducted Spurious Emissions	Pass	1
Part 2.202 Part 22.917	RSS-GEN, 4.6	CDMA Cell Occupied Bandwidth and Channel Mask	Pass	1
Part 2.202 Part 24.238	RSS-GEN, 4.6	CDMA PCS Occupied Bandwidth and Channel Mask	Pass	1
Part 2.1046(a)	RSS-133, 6.4 RSS-132, 4.4	CDMA Conducted RF Output Power	Pass	2
Part 2.1055(a)(d) Part 22.917	RSS-132, 4.3	CDMA Cell Frequency Stability vs. Temperature and Voltage	Pass	3
Part 2.1055(a)(d) Part 24.235	RSS-GEN, 4.7	CDMA PCS Frequency Stability vs. Temperature and Voltage	Pass	3
Part 22, Subpart H	RSS-GEN, 4.9	CDMA Cell Radiated Spurious/Harmonic Emissions, ERP	Pass	4
Part 24, Subpart E	RSS-GEN, 4.9	CDMA PCS Radiated Spurious/Harmonic Emissions, EIRP	Pass	4

- 1) The EUT met the requirements of the Conducted Spurious Emissions in the Cellular band as per 47 CFR 22.917, CFR 22.901(d) and RSS-132. The EUT was measured in Loopback and 1xEVDO mode on the low, middle and high channels. The frequency range investigated was from 10 MHz to 10 GHz. See APPENDIX 1 for the test data.
- 2) The EUT met the requirements of the Conducted Spurious Emissions in the PCS band as per 47 CFR 2.1057, CFR 24.238 and RSS-133. The EUT was measured in Loopback and 1xEVDO mode on the low, middle and high channels. The frequency range investigated was from 10 MHz to 20 GHz. See APPENDIX 1 for the test data.

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- 3) The EUT met the requirements of the Occupied Bandwidth in the Cellular band as per 47 CFR 2.202, CFR 22.917 and RSS-132. The EUT was measured in Loopback and 1xEVDO mode on the low, middle and high channels. The worst case occupied bandwidth was 1.287 MHz on all three channels
See APPENDIX 1 for the test data.
- 4) The EUT met the requirements of the Occupied Bandwidth and channel mask in the PCS band as per 47 CFR 2.202, CFR 24.238 and RSS-133. The EUT was measured in Loopback and 1xEVDO mode on the low, middle and high channels. The worst case occupied bandwidth was 1.287 MHz on the high channel.
See APPENDIX 1 for the test data.
- 5) The EUT met the requirements of the Conducted RF Output Power for both the Cellular and PCS bands. The EUT was measured in Loopback and 1xEVDO mode on the low, middle and high channels. The worst case conducted output power for the cellular band was 24.9 dBm (0.31W) on the low channel. The worst case conducted output power for the PCS band was 23.9 dBm (0.25W) on the low and high channel.
See APPENDIX 2 for the test data.
- 6) The EUT met the requirements of the Frequency Stability vs. Temperature and Voltage for Cellular band as per 22.917 and RSS-132.
The maximum frequency error measured was less than 0.1 ppm.
The temperature range was from -30°C to +60°C in 10° temperature steps. The EUT was measured on low, middle and high channels at each temperature step. The EUT was measured at low (3.6 volts), nominal (3.7 volts) and high (4.2 volts) dc input voltage at each temperature step and channel at maximum output power.
See APPENDIX 3 for the test data.
- 7) The EUT met the requirements of the Frequency Stability vs. Temperature and Voltage requirements for the PCS band as per 24.235 and RSS-133. The maximum frequency error measured was less than 0.1 ppm.
The temperature range was from -30°C to +60°C in 10 degree temperature steps. The EUT was measured on low, middle and high channels at each temperature step. The EUT was measured at low (3.6 volts), nominal (3.7 volts) and high (4.2 volts) dc input voltage at each temperature step and channel at maximum output power. See APPENDIX 3 for the test data.

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- 8) The radiated spurious emissions/harmonics and ERP/EIRP were measured for both Cellular and PCS bands. The results are within the limits. The EUT was placed on a nonconductive styrofoam table, 100 cm high that was positioned on a remote controlled turntable. The test distance used between the EUT and the receiving antenna was three metres. Then the emissions were maximized by elevating the antenna in the range of 1 to 4 metres. The turntable was rotated to determine the azimuth of the peak emissions. The maximum emissions level was recorded. The following measurements were done in a semi-anechoic chamber (SAC) below 1 GHz and a fully-anechoic room (FAR) above 1 GHz. The SAC's FCC registration number is **778487** and the Industry Canada (IC) file number is **2503B-1**. The FAR's FCC registration number is **959115** and the IC file number is **2503C-1**. The BlackBerry® smartphone was measured on the low, middle and high channels.

The highest ERP measured in the Cellular band, Loopback Service mode, was 28.23 dBm (0.67 W) at 836.52 MHz (channel 384).

The highest ERP measured in the Cellular band, 1xEVDO mode, was 29.49 dBm (0.89 W) at 848.31 MHz (channel 777).


The highest EIRP measured in the PCS band, Loopback Service mode, was 25.77 dBm (0.38 W) at 1851.25 MHz (channel 25).

The highest EIRP measured in the PCS band, 1xEVDO mode, was 30.08 dBm (1.02 W) at 1851.25 MHz (channel 25)

The radiated carrier harmonics were measured up to the 10th harmonic for low, middle and high channels in the Cellular and PCS bands. Each band was measured in Loopback, Testdata, and 1xEVDO modes. Both the horizontal and vertical polarizations were measured.

All emissions in the cellular band were in the noise floor.

The worst case emission/harmonic level in the PCS band loopback service and test data mode was -26.67 dBm or test margin of 13.67 dB below the limit at 3817.176 MHz.

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Co-Location Measurements

The radiated emissions were measured up to 18 GHz for middle channels for simultaneous transmission in the following test configuration combinations:

Cellular/Bluetooth/802.11b and PCS/Bluetooth/802.11b.

Both the horizontal and vertical polarizations were measured. The emissions due to different simultaneous transmission did not increase the amplitude of any emissions nor did it produce any new inter-modulation products as a result of mixing.


Sample Calculation:

Field Strength (dBμV/M) is calculated as follows:

FS = Measured Level (dBμV) + A.F. (dB/m) + Cable Loss (dB) - Preamp (dB) + Filter Loss (dB)

Measurement Uncertainty ±4.0 dB

To view the test data see APPENDIX 4.

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H. Compliance Test Equipment Used


<u>UNIT</u>	<u>MANUFACTURER</u>	<u>MODEL</u>	<u>SERIAL NUMBER</u>	<u>CAL DUE DATE (YY MM DD)</u>	<u>USE</u>
Preamplifier	Sonoma	310N/11909A	185831	10-11-14	Radiated Emissions
Preamplifier system	TDK RF Solutions	PA-02	080010	10-11-06	Radiated Emissions
Preamplifier	Rohde & Schwarz	TS-ANA4-SP	001	11-02-17	Radiated Emissions
Preamplifier	Rohde & Schwarz	TS-ANA-SP	001	11-02-19	Radiated Emissions
Hybrid Log Antenna	TDK	HLP-3003C	017301	11-02-02	Radiated Emissions
Horn Antenna	TDK	HRN-0118	030101	10-07-22	Radiated Emissions
Horn Antenna	TDK	HRN-0118	030201	11-03-12	Radiated Emissions
Horn Antenna	ETS-Lindgren	3117	47653	11-07-15	Radiated Emissions
Horn Antenna	CMT	LHA 0180	R52734-001	12-01-21	Radiated Emissions
Preamplifier	TDK	18-26	030002	10-11-06	Radiated Emissions
Dipole Antenna	Schwarzbeck	UHAP	1018	11-03-12	Radiated Emissions
Dipole Antenna	Schwarzbeck	UHAP	974	11-10-16	Radiated Emissions
EMC Analyzer	Agilent	E7405A	US40240226	10-10-01	Radiated Emissions
Universal Radio Communication Tester	Rohde & Schwarz	CMU 200	837493/073	10-11-30	Radiated Emissions
Universal Radio Communication Tester	Rohde & Schwarz	CMU 200	112394	10-11-30	Radiated Emissions
Universal Radio Communication Tester	Rohde & Schwarz	CMU 200	102204	10-11-25	RF Conducted Emissions
Universal Radio Communication Tester	Agilent	8960	MY47510358	11-03-06	Frequency Stability, RF Conducted Emissions
EMI Receiver	Rohde & Schwarz	ESIB-40	100255	10-11-30	Radiated Emissions
Spectrum Analyzer	HP	8563E	3745A08112	11-09-30	RF Conducted Emissions
DC Power Supply	HP	6632B	US37472178	10-06-23	RF Conducted Emissions
Environment Monitor	Control Company	1870	230355190	11-01-08	Radiated Emissions

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Compliance Test Equipment Used cont'd

<u>UNIT</u>	<u>MANUFACTURER</u>	<u>MODEL</u>	<u>SERIAL NUMBER</u>	<u>CAL DUE DATE</u> (YY MM DD)	<u>USE</u>
Temperature Probe	Control Company	1870	230355190	11-01-08	Frequency Stability
Environmental Chamber	ESPEC Corp.	SH-240S1	91007118	N/R	Frequency Stability
Signal Generator	Agilent	8648C	4037U03155	11-12-10	Frequency Stability
Signal Generator	Agilent	E8257D	MY45140527	10-10-09	Radiated Emissions
Power Meter	Agilent	N1911A	MY45100905	11-01-05	Frequency Stability
Environment Monitor	Control Company	1870	230355189	11-01-08	RF Conducted Emissions
Power Sensor	Agilent	N1921A	SG45240281	11-05-22	Frequency Stability

APPENDIX 1 - CONDUCTED RF EMISSIONS TEST DATA/PLOTS

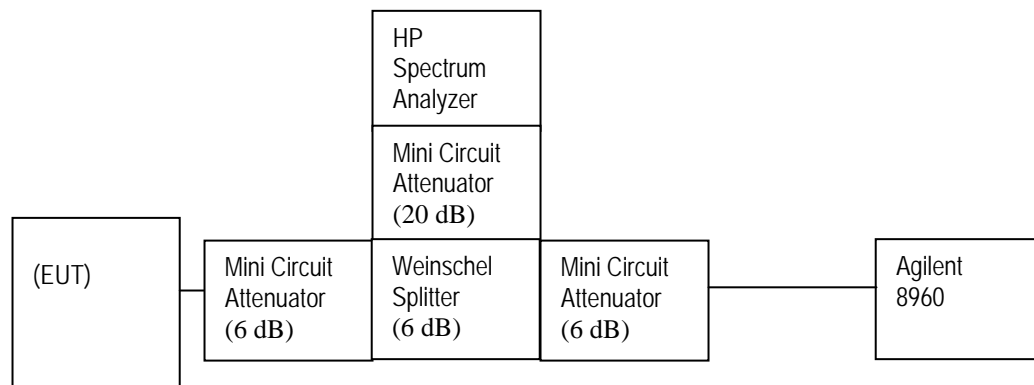
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Conducted RF Emission Test Data

This appendix contains measurement data pertaining to conducted spurious emissions, 99% power bandwidth and the channel mask.

The measurements were performed by Maurice Battler.


Test Setup Diagram



Date of Test: May 19, 2010

The environmental test conditions were:

Temperature	23 °C
Pressure	1011 mb
Relative Humidity	25 %

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Conducted RF Emission Test Data cont'd

The conducted spurious emissions – As per 47 CFR 2.1051, CFR 24.238(a), RSS-GEN, 4.9, CFR 22 Subpart H and RSS-132 were measured from 10 MHz to 20 GHz. The EUT emissions were in the NF.

See figures 1 to 12 for the plots of the conducted spurious emissions.

Test Data for Cellular and PCS selected Frequencies in Loopback mode

Cellular Frequency (MHz)	99% Occupied Bandwidth (MHz)
824.700	1.287
836.520	1.287
848.310	1.287

PCS Frequency (MHz)	99% Occupied Bandwidth (MHz)
1851.200	1.280
1880.000	1.273
1908.750	1.280


Measurement Plots for Cellular and PCS in Loopback mode

Refer to the following measurement plots for more detail.

See Figures 13 to 18 for the plots of the 99% Occupied Bandwidth.

See Figures 19 to 22 for plots of the channel mask results.

The RF power output was at maximum for all the recorded measurements shown below.

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Conducted Emission Test Results cont'd

Figure 1: Cellular, Spurious Conducted Emissions, Low channel

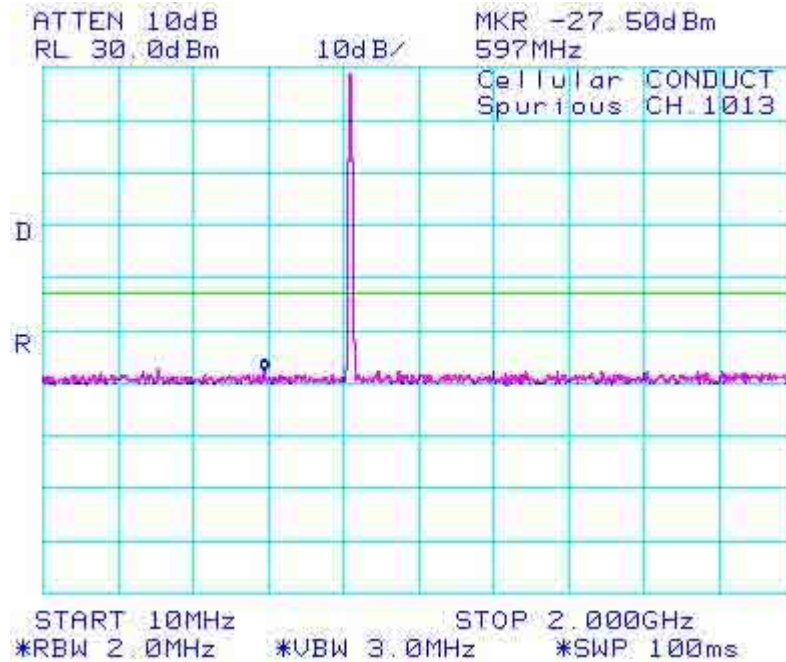
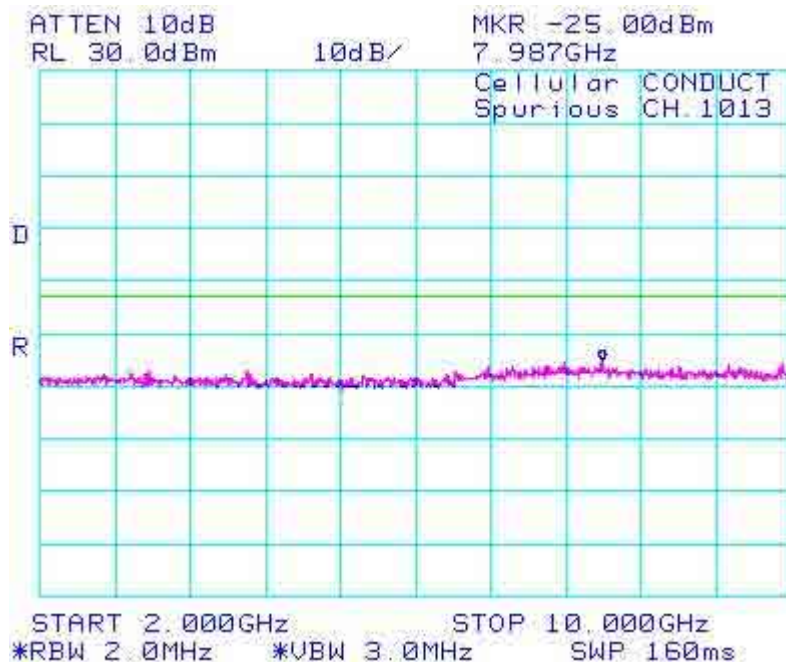



Figure 2: Cellular, Spurious Conducted Emissions, Low channel



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Conducted Emission Test Results cont'd

Figure 3: Cellular, Spurious Conducted Emissions, Middle Channel

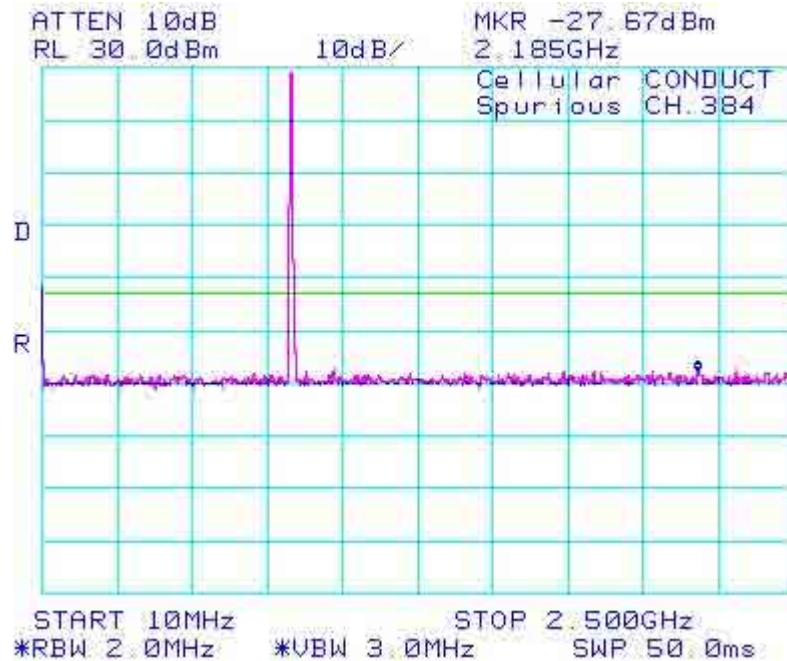
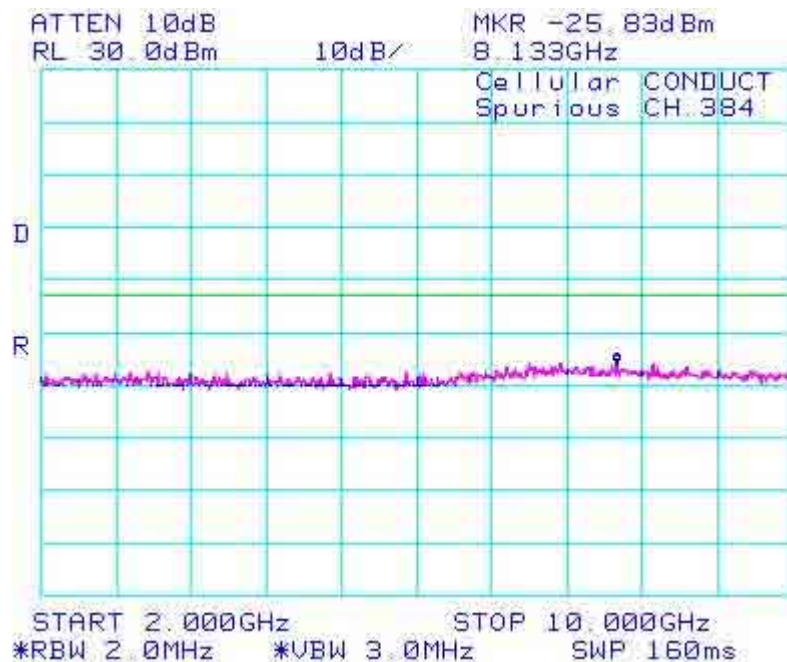



Figure 4: Cellular, Spurious Conducted Emissions, Middle Channel



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Conducted Emission Test Results cont'd

Figure 5: Cellular, Spurious Conducted Emissions, High Channel

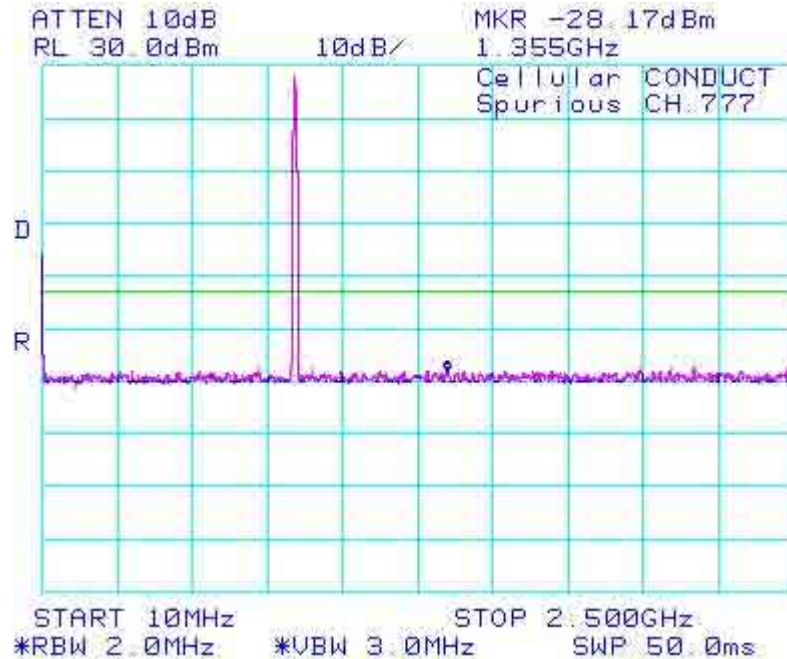
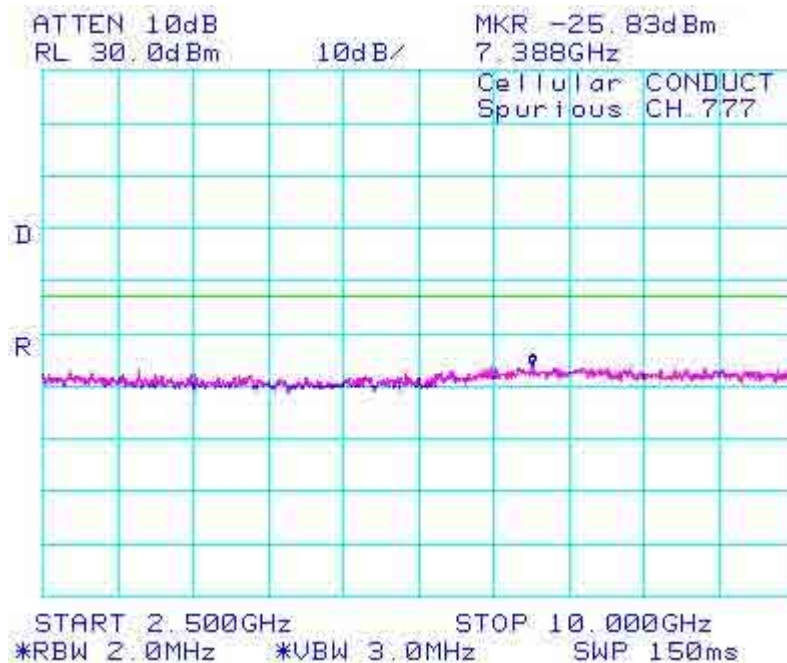



Figure 6: Cellular, Spurious Conducted Emissions, High Channel



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Conducted Emission Test Results cont'd

Figure 7: PCS, Spurious Conducted Emissions, Low Channel

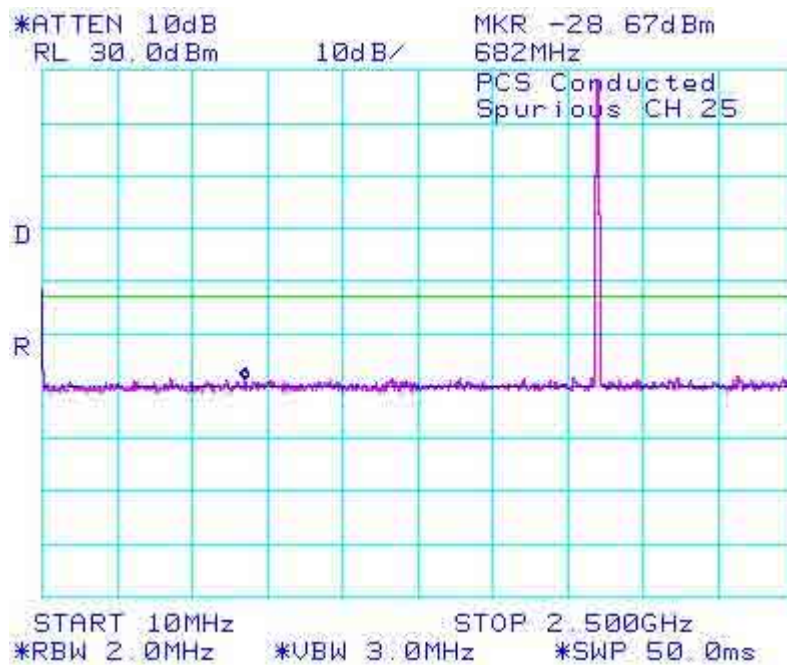
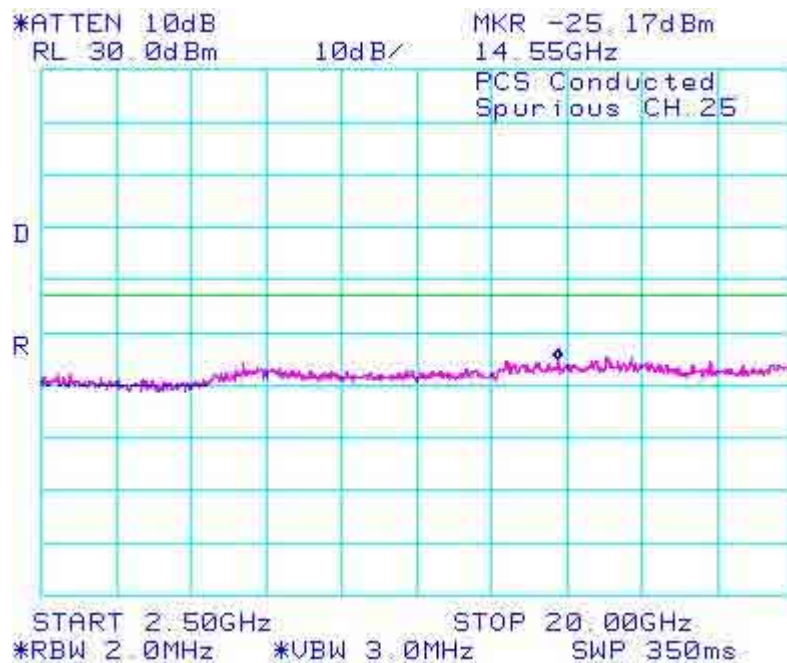



Figure 8: PCS, Spurious Conducted Emissions, Low Channel



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Conducted Emission Test Results cont'd

Figure 9: PCS, Spurious Conducted Emissions, Middle Channel

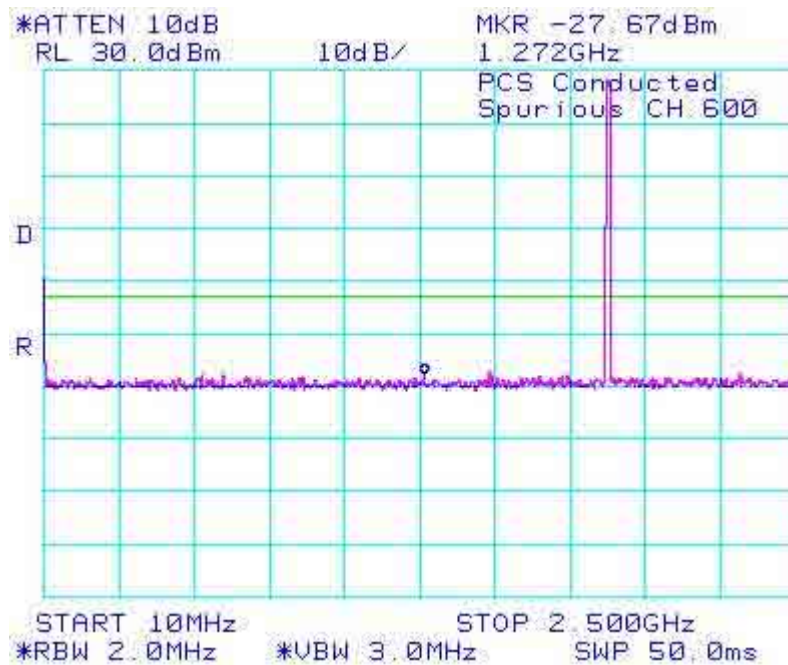
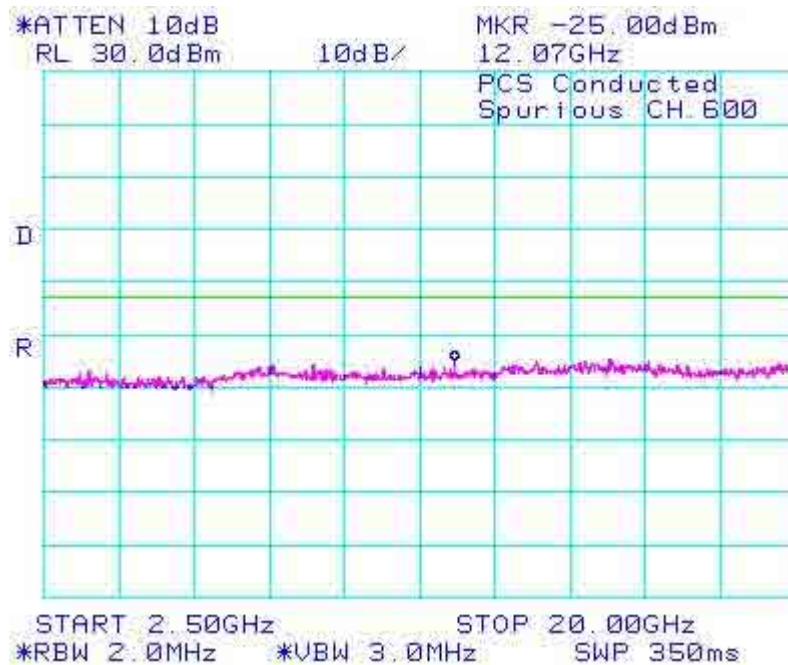



Figure 10: PCS, Spurious Conducted Emissions, Middle Channel



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Conducted Emission Test Results cont'd

Figure 11: PCS, Spurious Conducted Emissions, High Channel

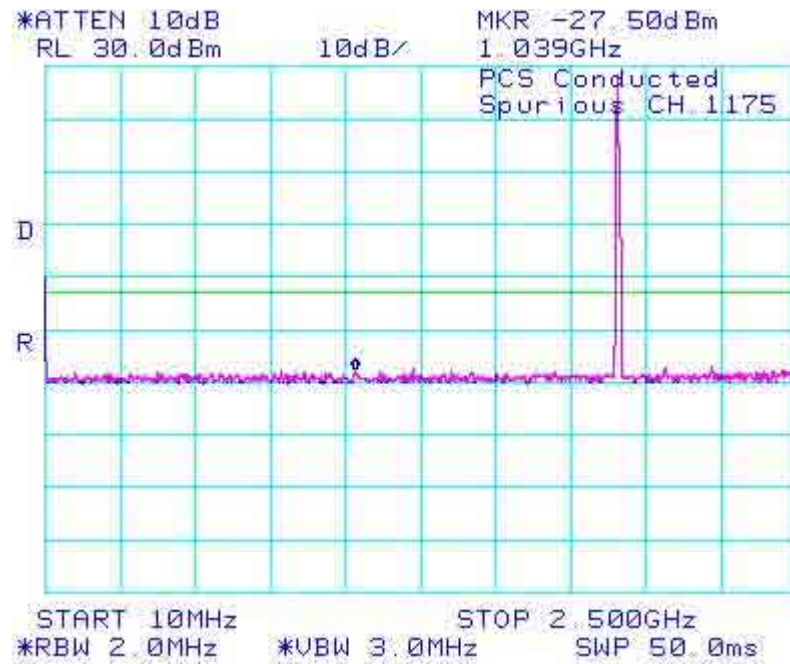
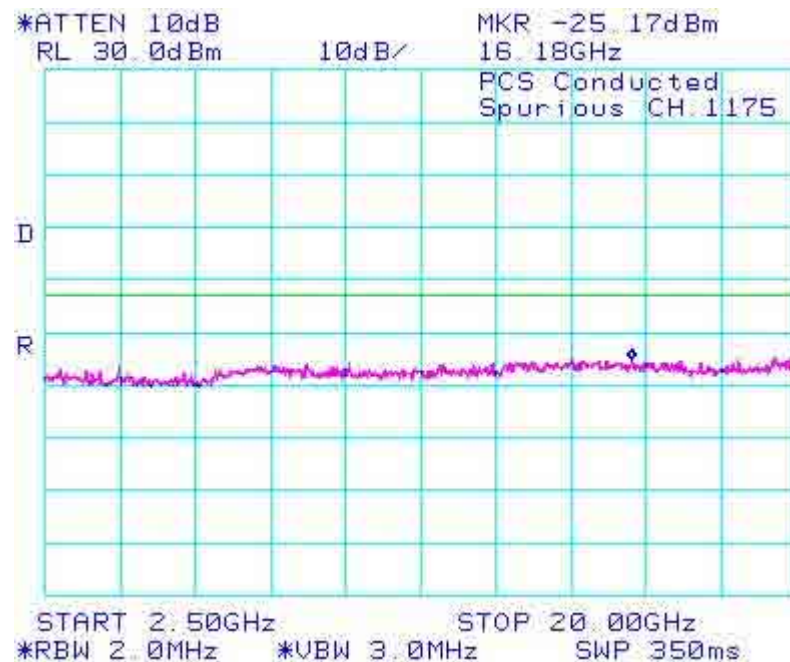



Figure 12: PCS, Spurious Conducted Emissions, High Channel



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Conducted Emission Test Results cont'd

Figure 13: Occupied Bandwidth, Cellular Low Channel

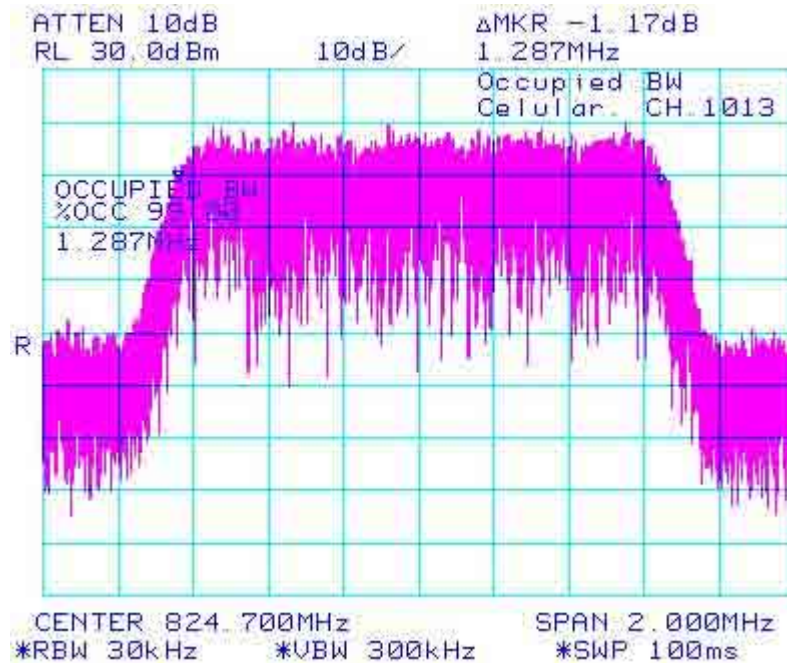
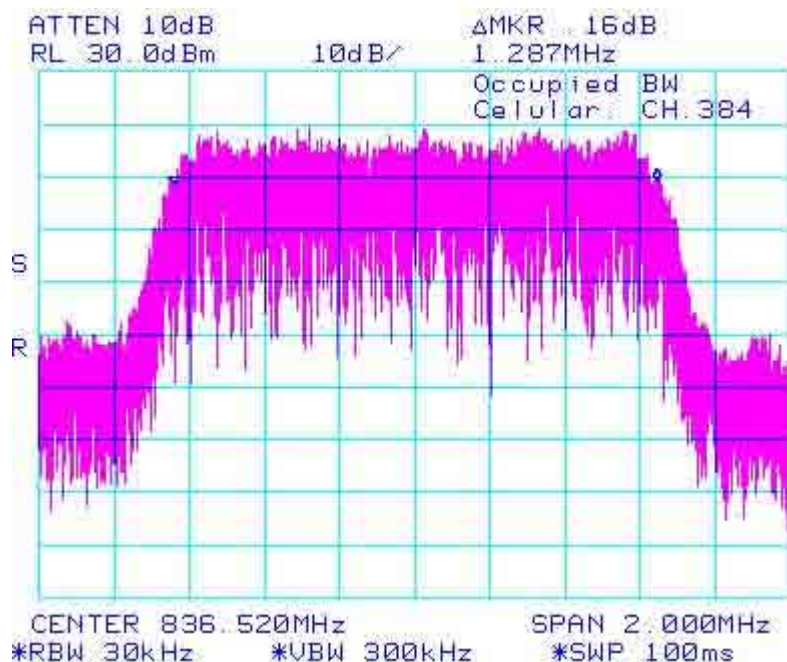



Figure 14: Occupied Bandwidth, Cellular Middle Channel



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Conducted Emission Test Results cont'd

Figure 15: Occupied Bandwidth, Cellular High Channel

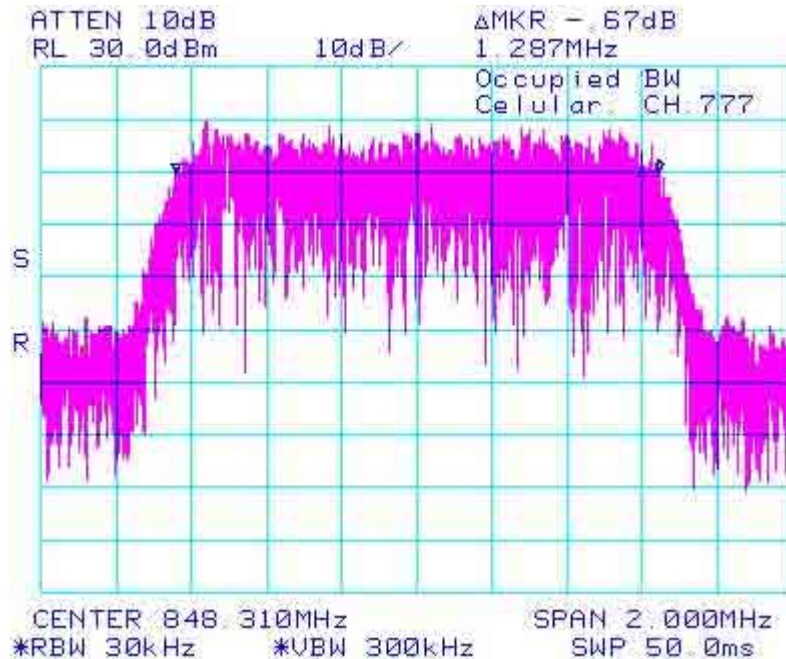
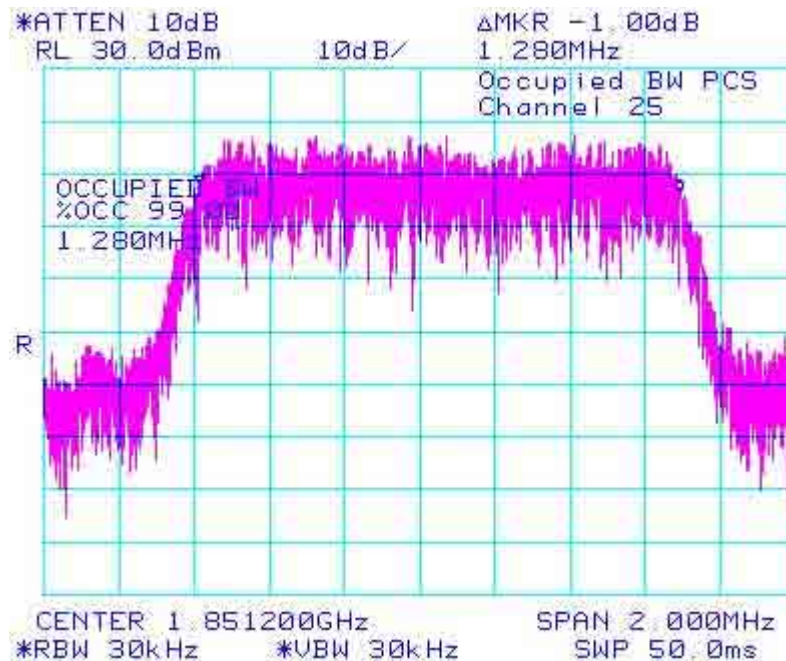



Figure 16: Occupied Bandwidth, PCS Low Channel



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Conducted Emission Test Results cont'd

Figure 17: Occupied Bandwidth, PCS Middle Channel

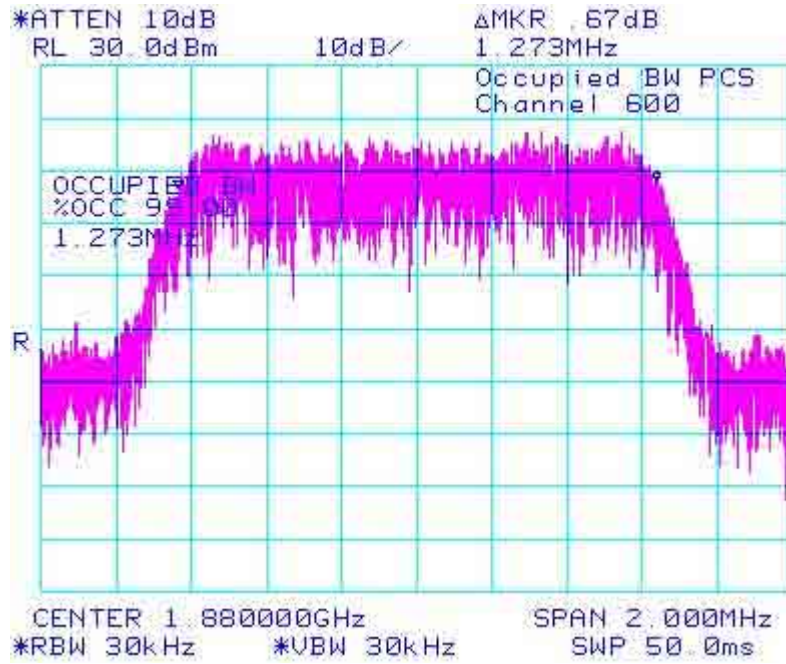
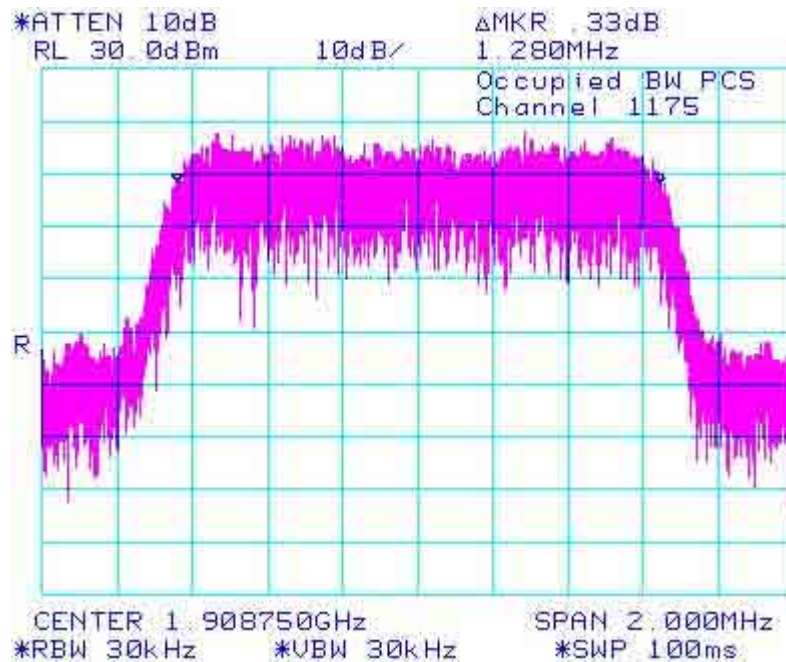



Figure 18: Occupied Bandwidth, PCS High Channel



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Conducted Emission Test Results cont'd

Figure 19a: Cellular Loopback, Low Channel Mask

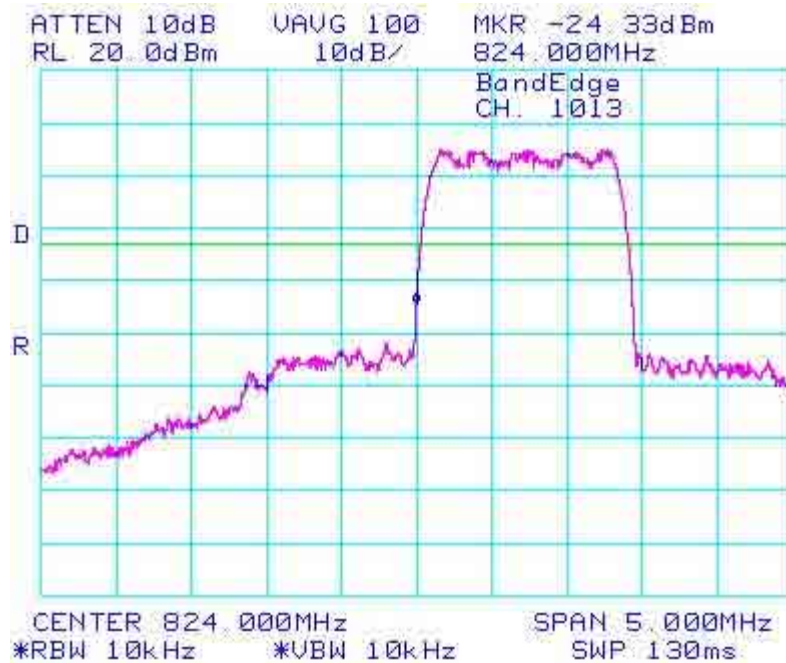
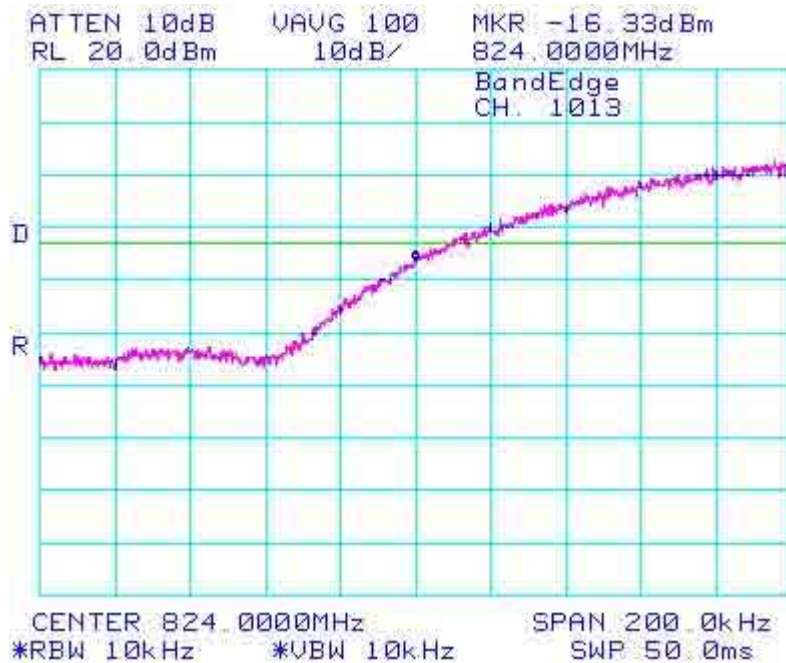



Figure 19b: Cellular Loopback, Low Channel Mask



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Conducted Emission Test Results cont'd

Figure 20a: Cellular Loopback, High Channel Mask

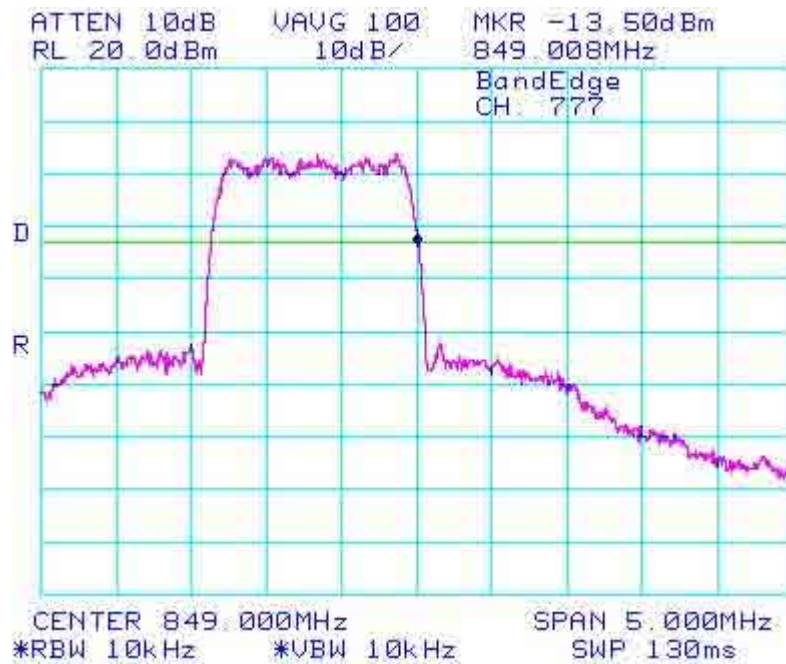
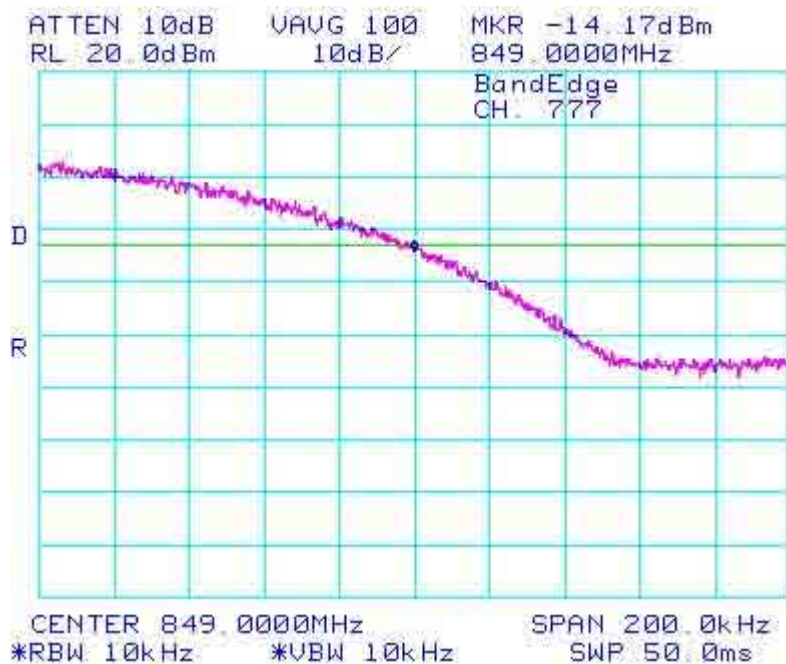



Figure 20b: Cellular Loopback, Low Channel Mask



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Conducted Emission Test Results cont'd

Figure 21: PCS, Low Channel Mask

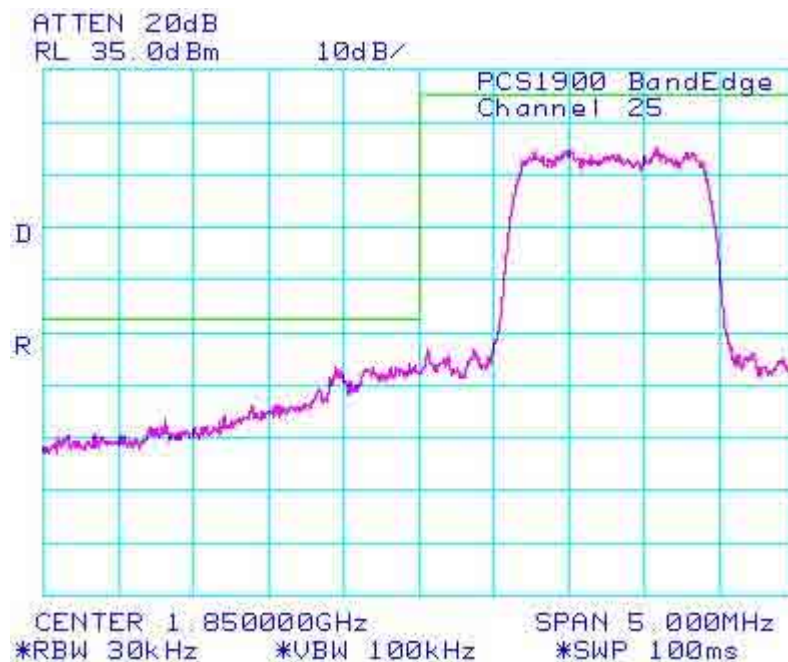
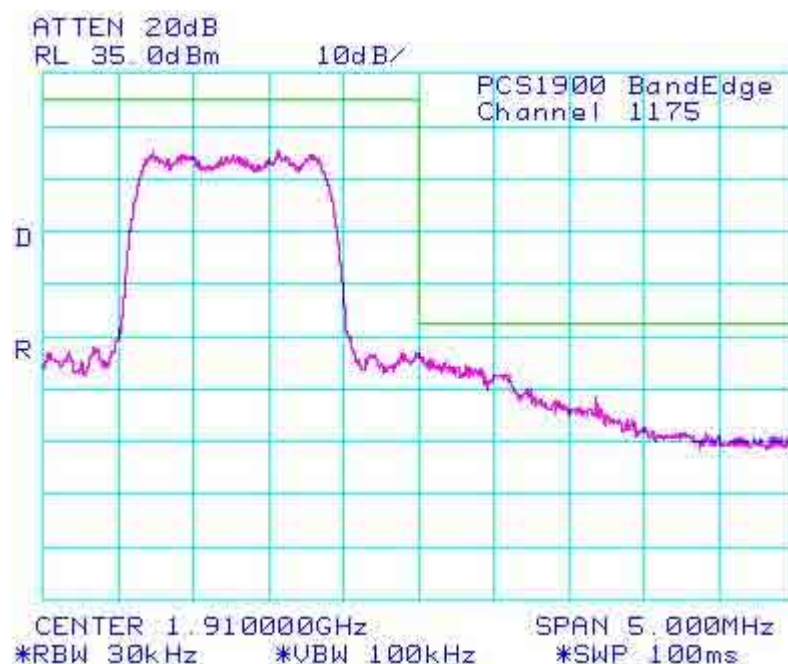



Figure 22: PCS, High Channel Mask



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Conducted RF Emission Test Data cont'd

The conducted spurious emissions – As per 47 CFR 2.1051, CFR 24.238(a), RSS-GEN, 4.9, CFR 22 Subpart H and RSS-132 were measured from 10 MHz to 20 GHz. The EUT emissions were in the NF.

See figures 23 to 34 for the plots of the conducted spurious emissions.

Date of Test: May 19, 2010

The environmental test conditions were:

Temperature	24 °C
Pressure	1011 mb
Relative Humidity	24 %

Test Data for Cellular and PCS selected Frequencies in 1xEVDO mode

Cellular Frequency (MHz)	99% Occupied Bandwidth (MHz)
824.700	1.287
836.520	1.280
848.310	1.287

PCS Frequency (MHz)	99% Occupied Bandwidth (MHz)
1851.200	1.280
1880.000	1.280
1908.750	1.287


Measurement Plots for Cellular and PCS in 1xEVDO mode

Refer to the following measurement plots for more detail.

See Figures 35 to 40 for the plots of the 99% Occupied Bandwidth.

See Figures 41 to 44 for plots of the channel mask results.

The RF power output was at maximum for all the recorded measurements shown below.

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Conducted Emission Test Results cont'd

Figure 23: Cellular, Spurious Conducted Emissions, Low channel

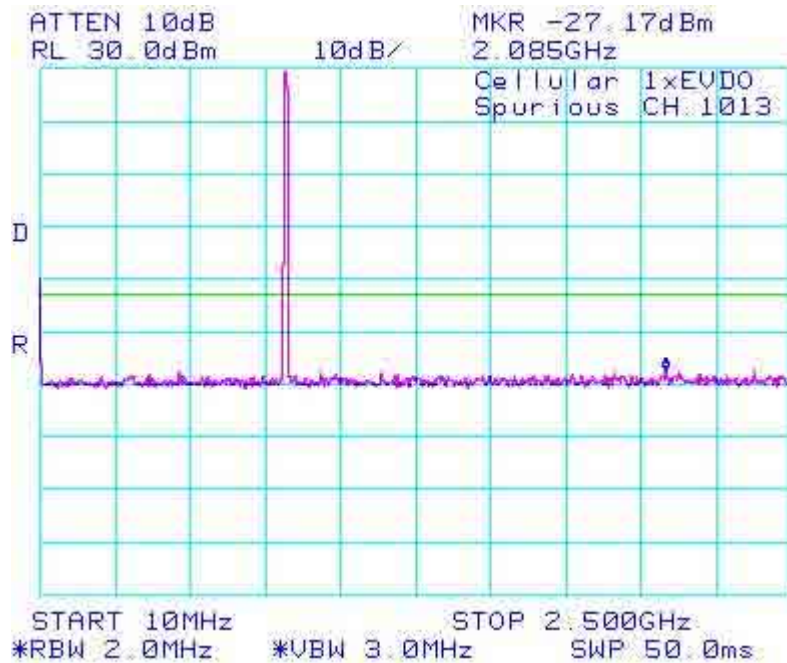
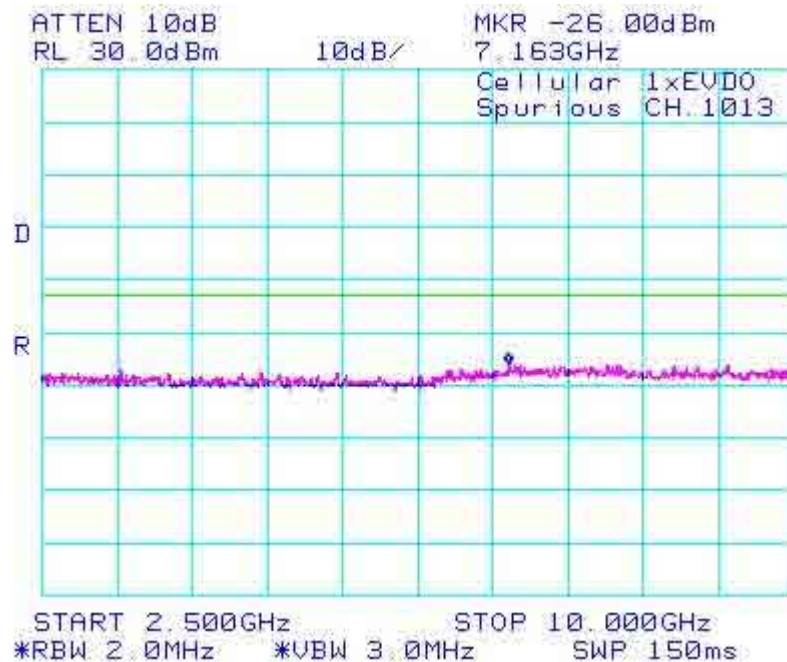



Figure 24: Cellular, Spurious Conducted Emissions, Low channel



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Conducted Emission Test Results cont'd

Figure 25: Cellular, Spurious Conducted Emissions, Middle Channel

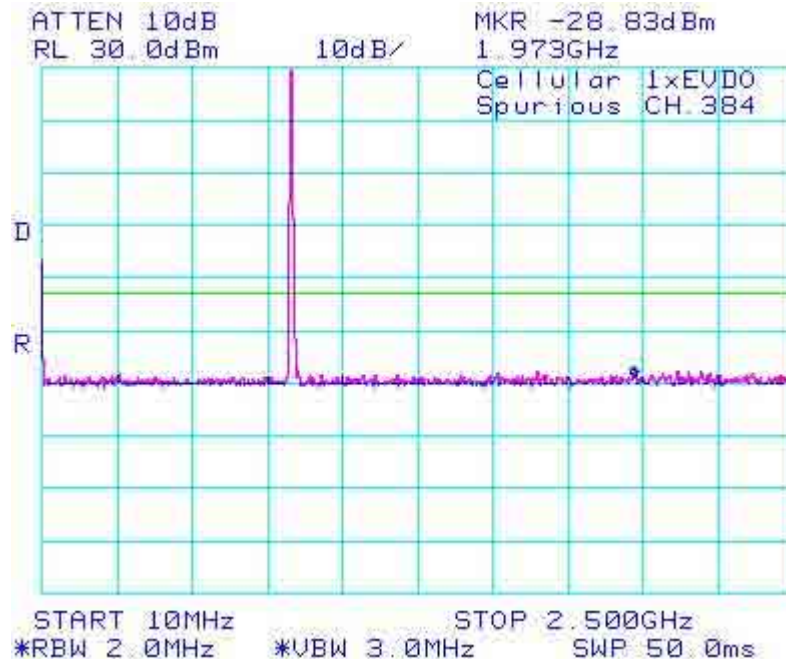
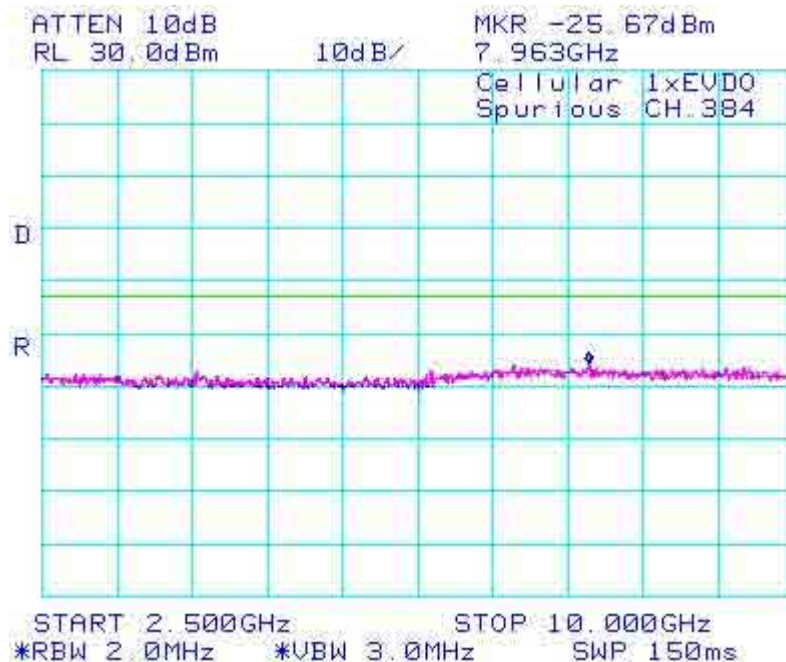



Figure 26: Cellular, Spurious Conducted Emissions, Middle Channel



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Conducted Emission Test Results cont'd

Figure 27: Cellular, Spurious Conducted Emissions, High Channel

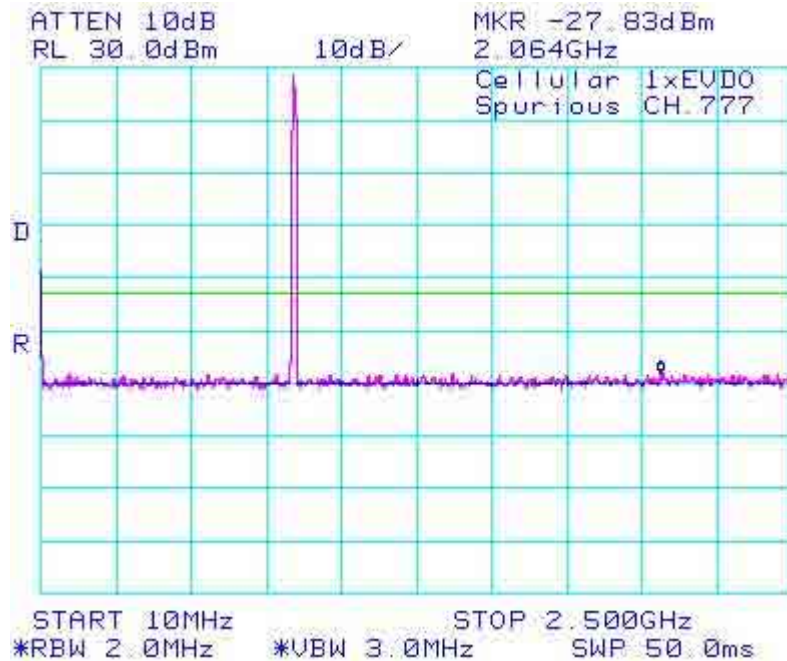
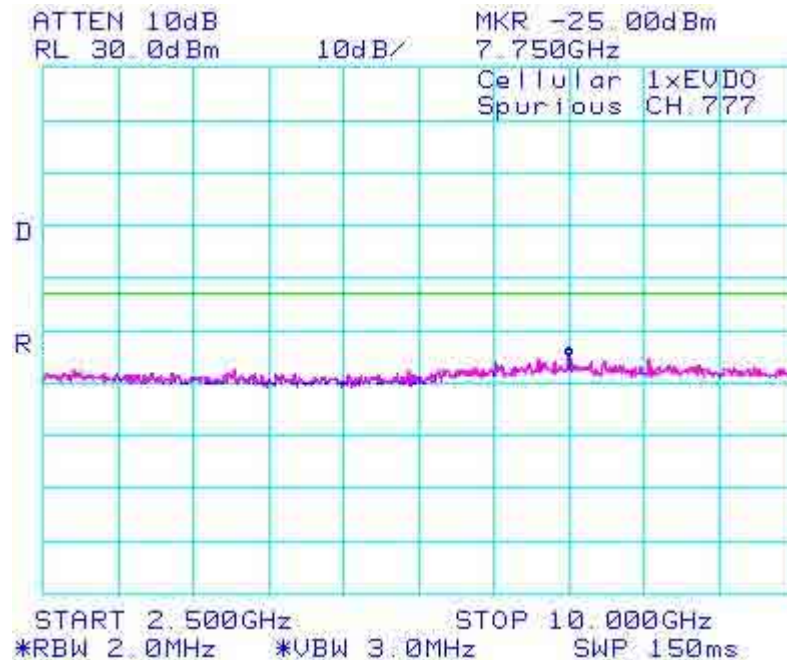



Figure 28: Cellular, Spurious Conducted Emissions, High Channel



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Conducted Emission Test Results cont'd

Figure 29: PCS, Spurious Conducted Emissions, Low Channel

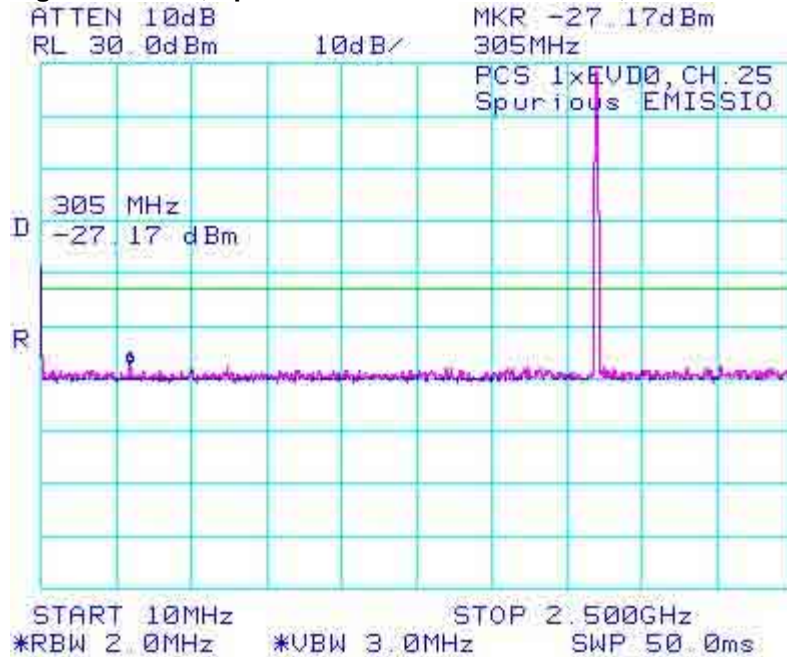



Figure 30: PCS, Spurious Conducted Emissions, Low Channel



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Conducted Emission Test Results cont'd

Figure 31: PCS, Spurious Conducted Emissions, Middle Channel

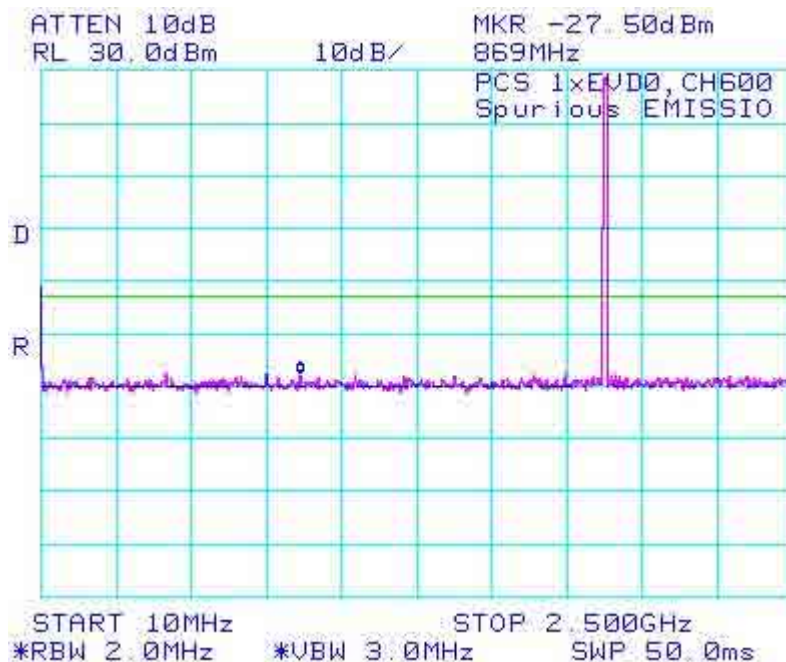
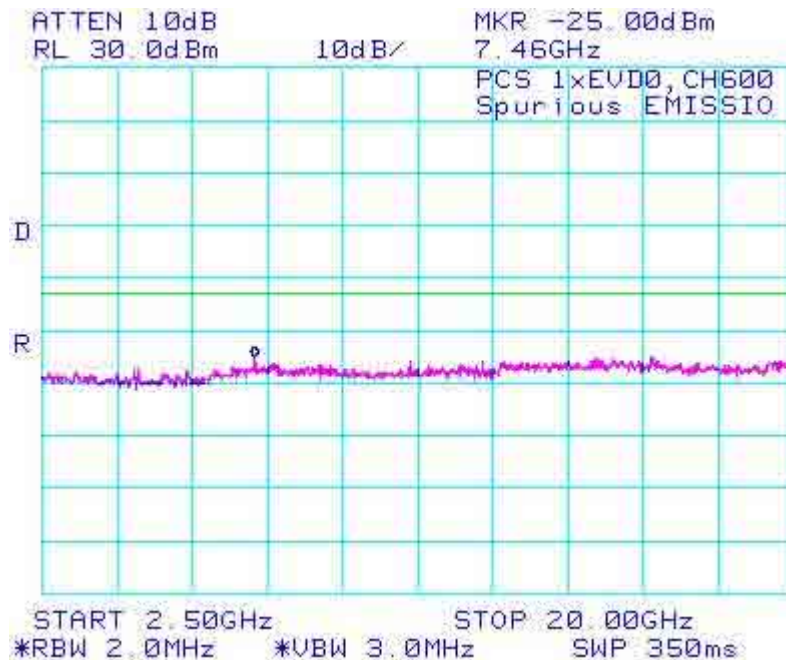



Figure 32: PCS, Spurious Conducted Emissions, Middle Channel



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Conducted Emission Test Results cont'd

Figure 33: PCS, Spurious Conducted Emissions, High Channel

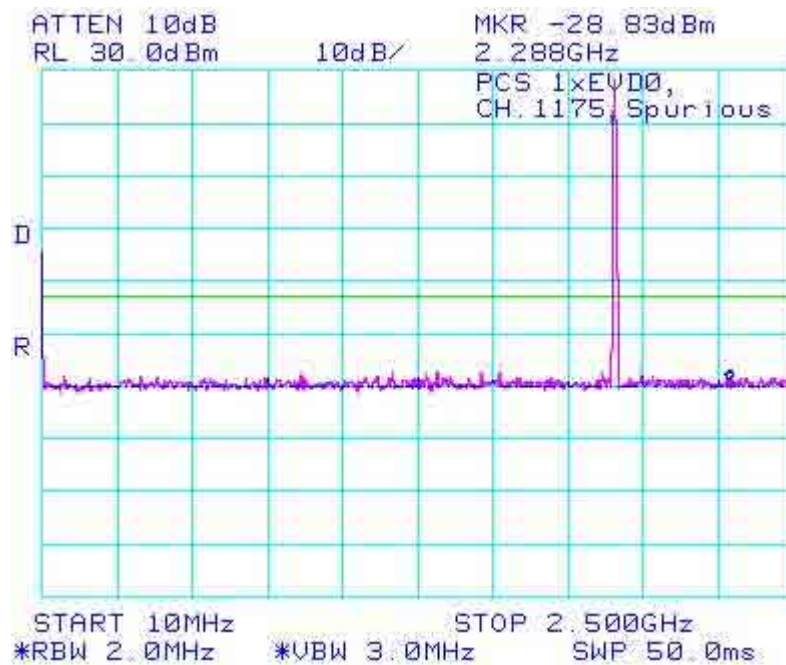
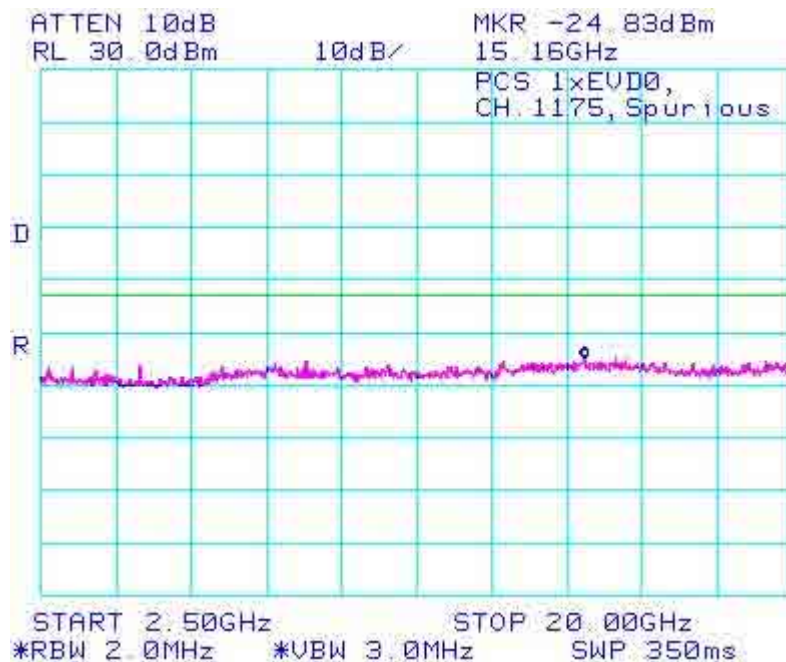



Figure 34: PCS, Spurious Conducted Emissions, High Channel



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Conducted Emission Test Results cont'd

Figure 35: Occupied Bandwidth, Cellular Low Channel

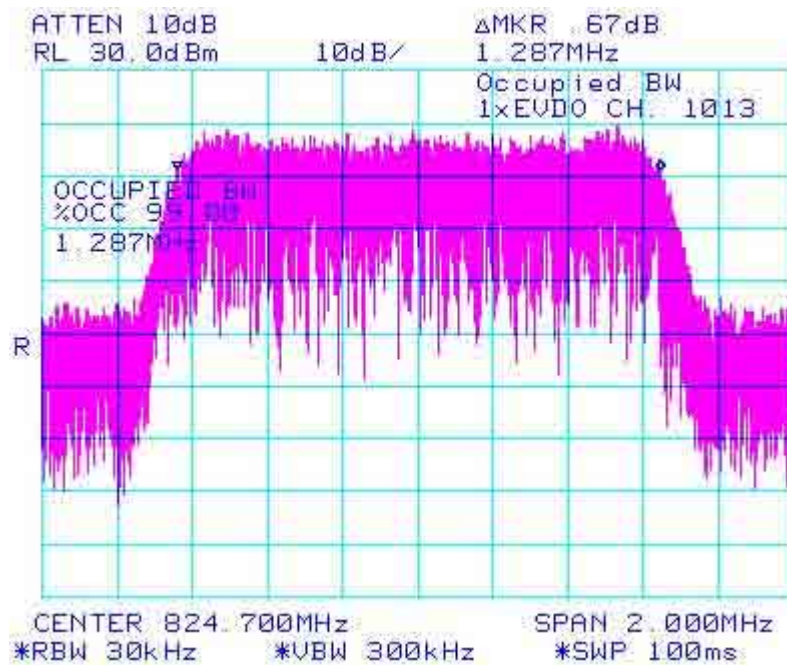
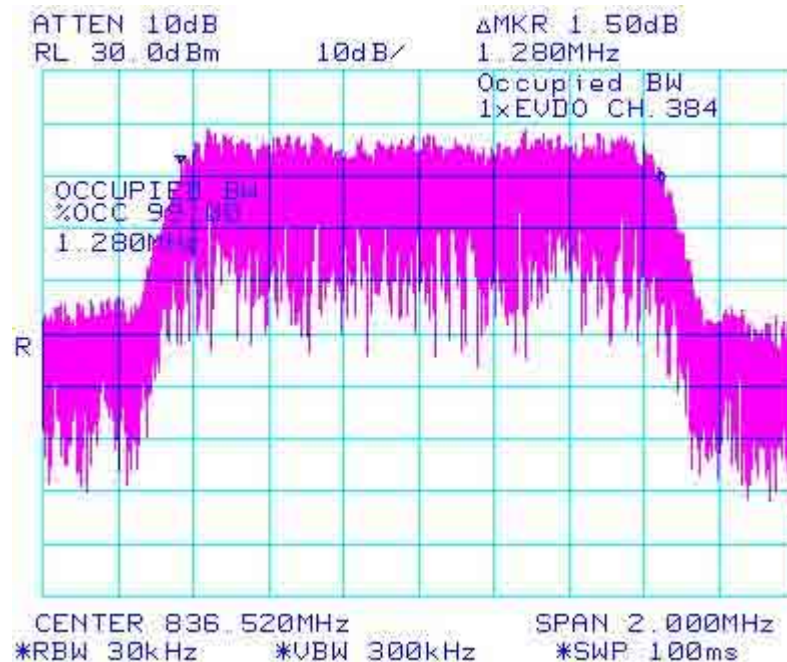



Figure 36: Occupied Bandwidth, Cellular Middle Channel



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Conducted Emission Test Results cont'd

Figure 37: Occupied Bandwidth, Cellular High Channel

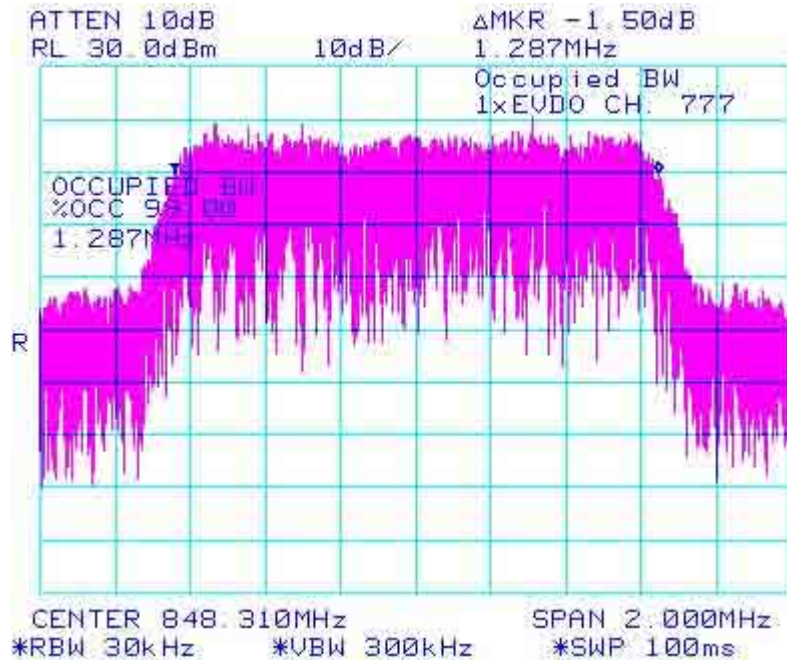
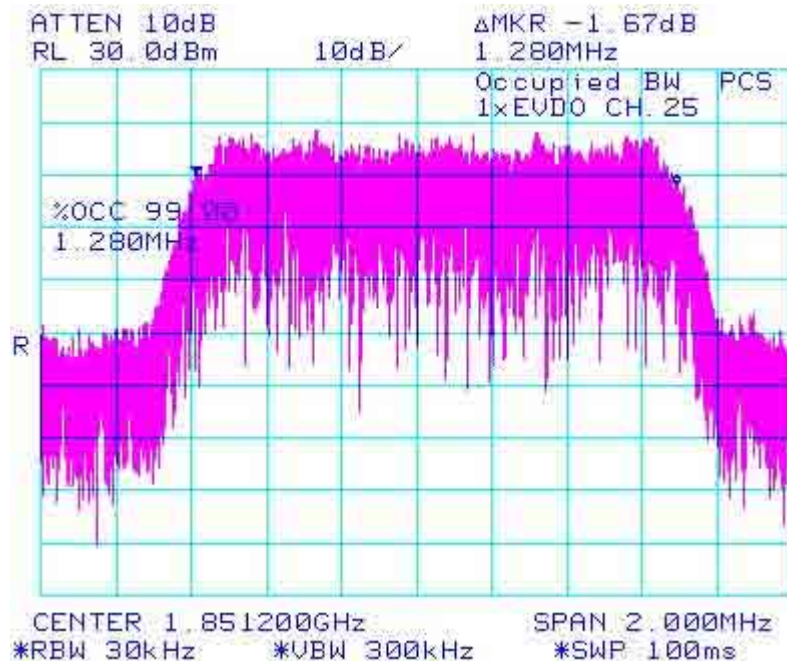



Figure 38: Occupied Bandwidth, PCS Low Channel



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Conducted Emission Test Results cont'd

Figure 39: Occupied Bandwidth, PCS Middle Channel

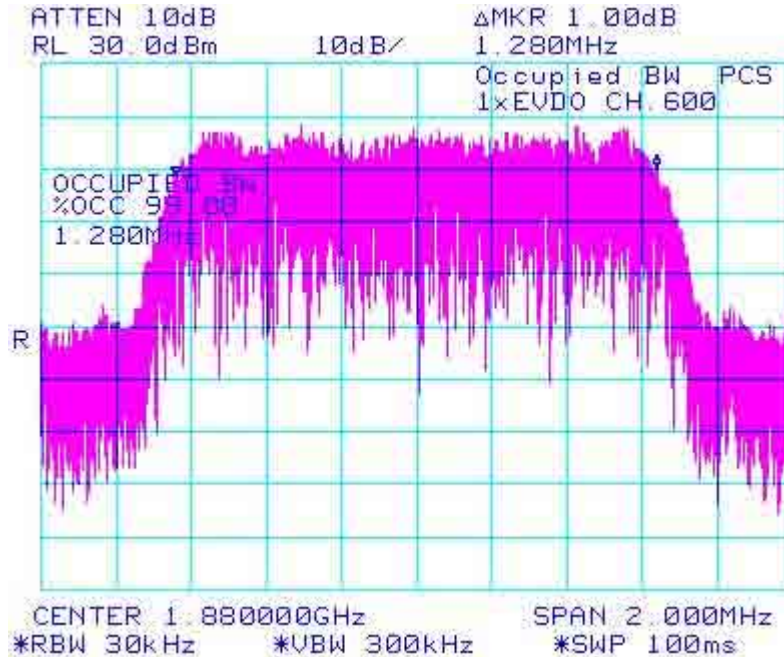
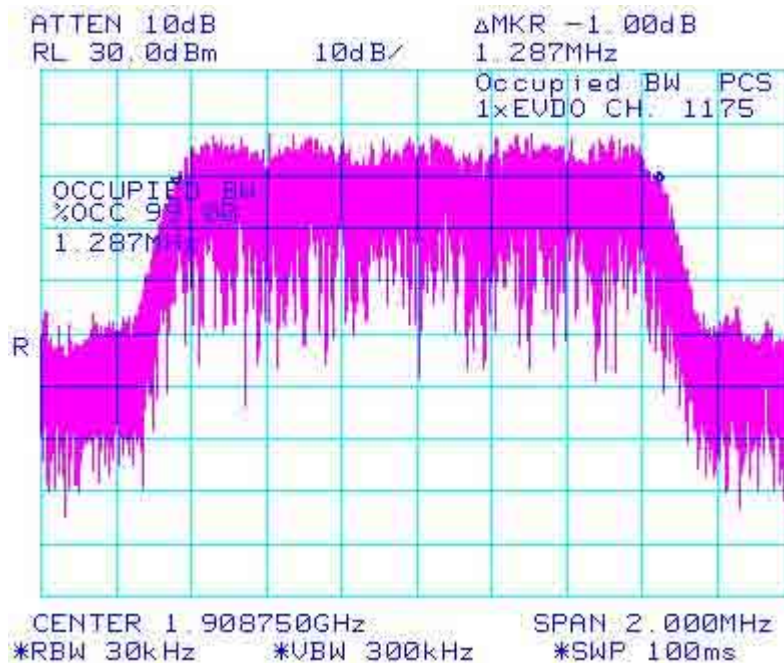



Figure 40: Occupied Bandwidth, PCS High Channel



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Conducted Emission Test Results cont'd

Figure 41a: Cellular 1xEVDO, Low Channel Mask

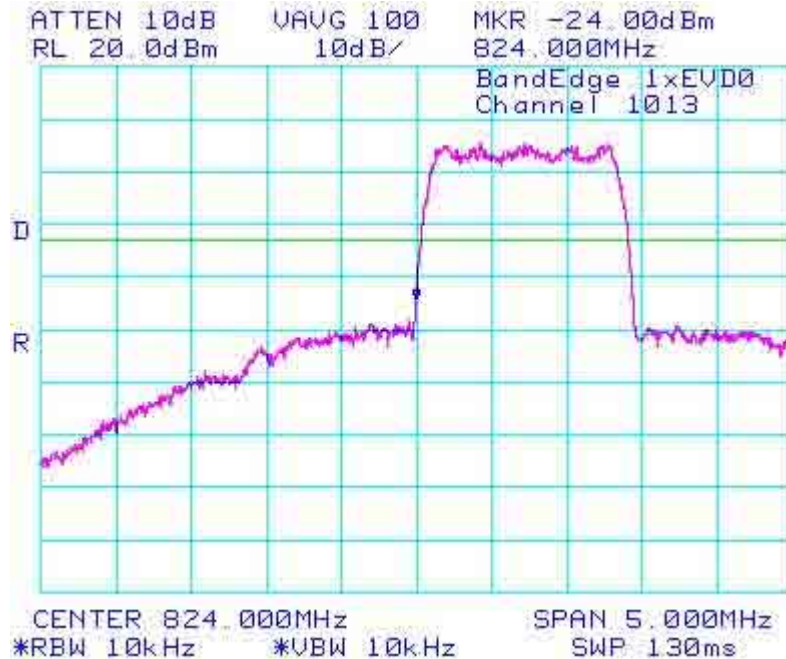
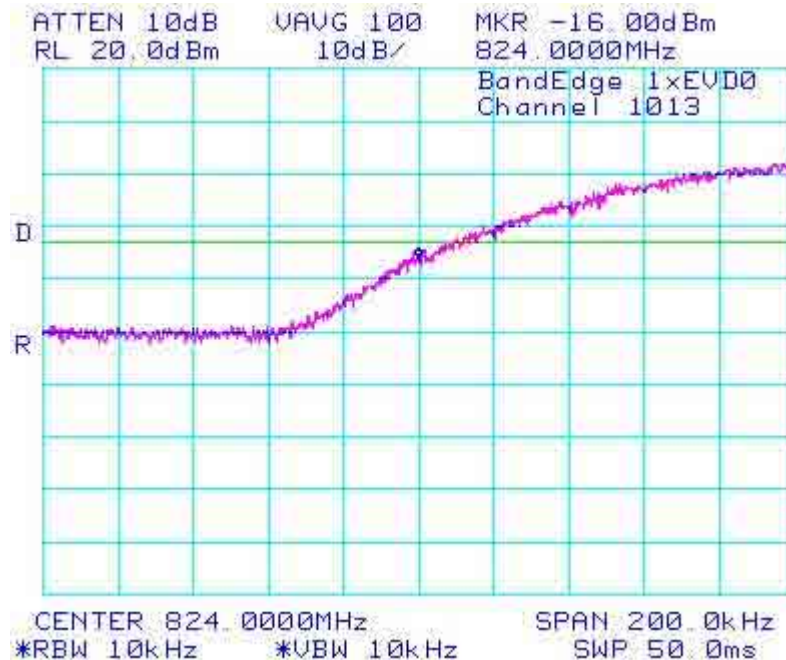



Figure 41b: Cellular 1xEVDO, Low Channel Mask



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Conducted Emission Test Results cont'd

Figure 42a: Cellular 1xEVDO, High Channel Mask

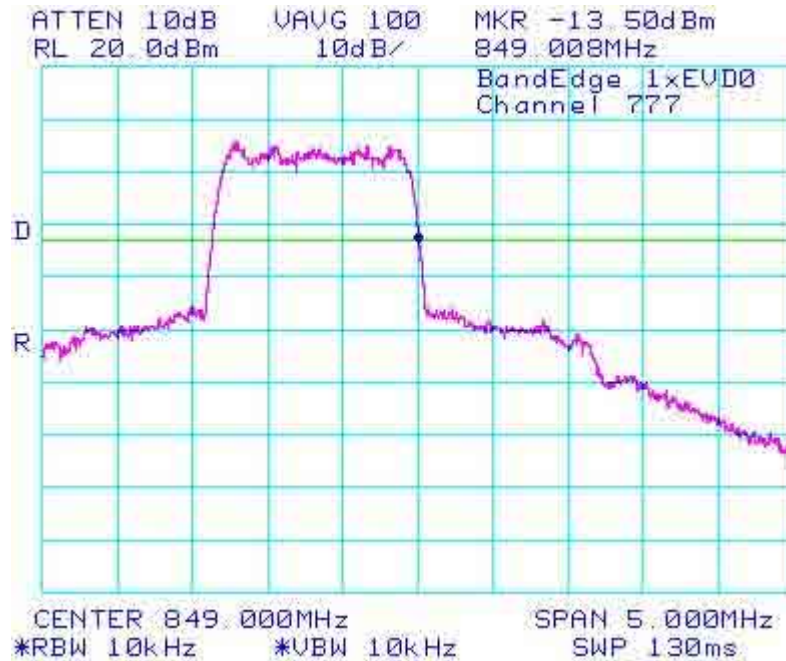
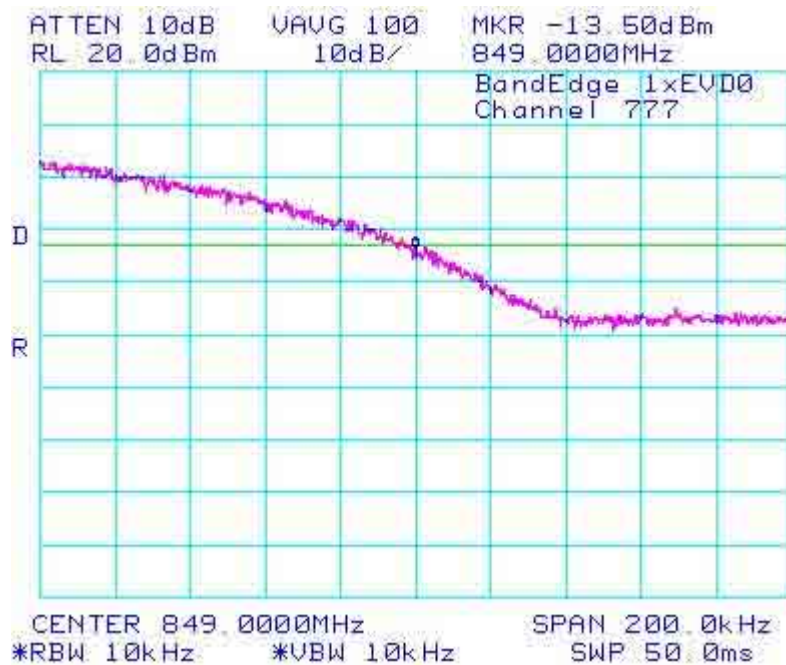



Figure 42b: Cellular 1xEVDO, High Channel Mask



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Conducted Emission Test Results cont'd

Figure 43: PCS, Low Channel Mask

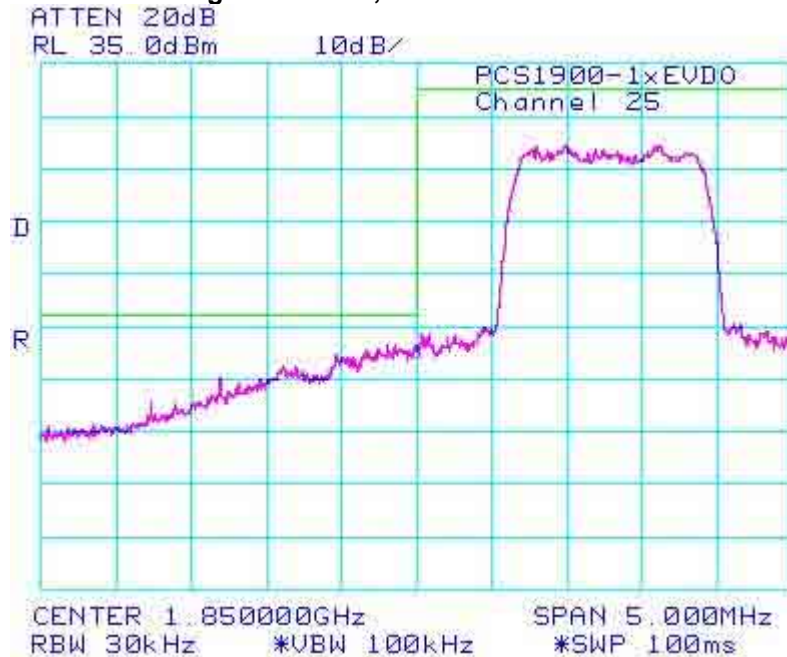
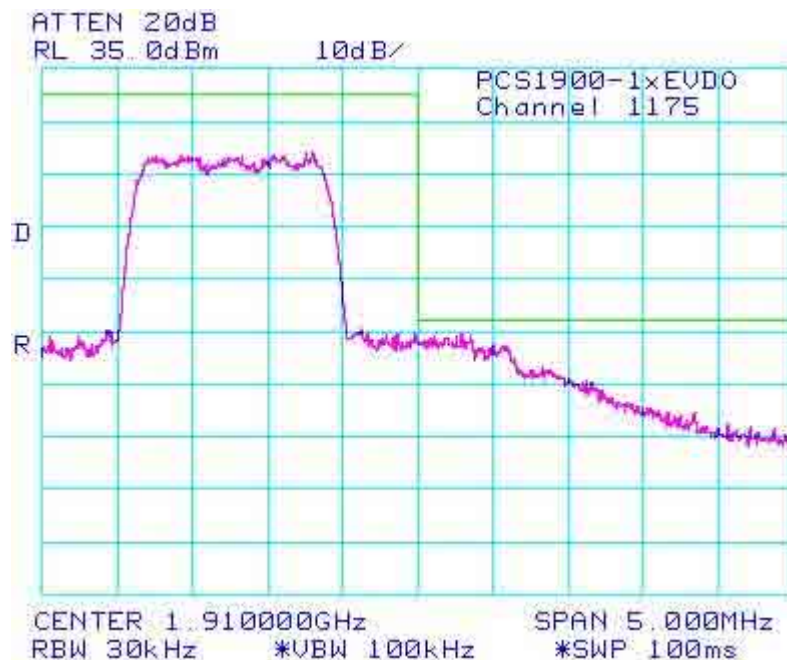



Figure 44: PCS, High Channel Mask



APPENDIX 2 – CONDUCTED RF OUTPUT POWER TEST DATA

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Conducted RF Output Power Test Data

The measurements were performed by Daoud Attayi.

The conducted RF output power was measured using the CDMA base station simulator. Low, middle and high channels were measured at maximum radio output power at different service options and modes.

Peak nominal output power is 24.50 dBm \pm 0.5 dB for Cellular and 23.50 dBm \pm 0.5 dB for PCS.

Date of Test: June 02, 2010

The environmental test conditions were:

Temperature	22 °C
Pressure	1004 mb
Relative Humidity	34 %

Test Results

Band	Channel	1x EvDO (153.6kbps)		CDMA2000 RC	SO2 Loopback		SO55 Loopback		TDSO SO32	
		(dBm)	(Watts)		(dBm)	(Watts)	(dBm)	(Watts)	(dBm)	(Watts)
CDMA 800	1013	24.0	0.25	RC1	24.9	0.31	24.8	0.30	-	-
				RC3	24.9	0.31	24.9	0.31	24.9	0.31
	384	23.7	0.23	RC1	24.7	0.30	24.7	0.30	-	-
				RC3	24.5	0.28	24.6	0.29	24.5	0.28
	777	23.8	0.24	RC1	24.5	0.28	24.4	0.28	-	-
				RC3	24.5	0.28	24.5	0.28	24.5	0.28
Band	Channel	1x EvDO (153.6kbps)		CDMA2000 RC	SO2 Loopback		SO55 Loopback		TDSO SO32	
		(dBm)	(Watts)		(dBm)	(Watts)	(dBm)	(Watts)	(dBm)	(Watts)
CDMA 1900	25	23.0	0.20	RC1	23.9	0.25	23.9	0.25	-	-
				RC3	23.8	0.24	23.9	0.25	23.8	0.24
	600	22.9	0.19	RC1	23.8	0.24	23.9	0.25	-	-
				RC3	23.7	0.23	23.7	0.23	23.8	0.24
	1175	23.0	0.20	RC1	23.8	0.24	23.7	0.23	-	-
				RC3	23.7	0.23	23.7	0.23	23.6	0.23


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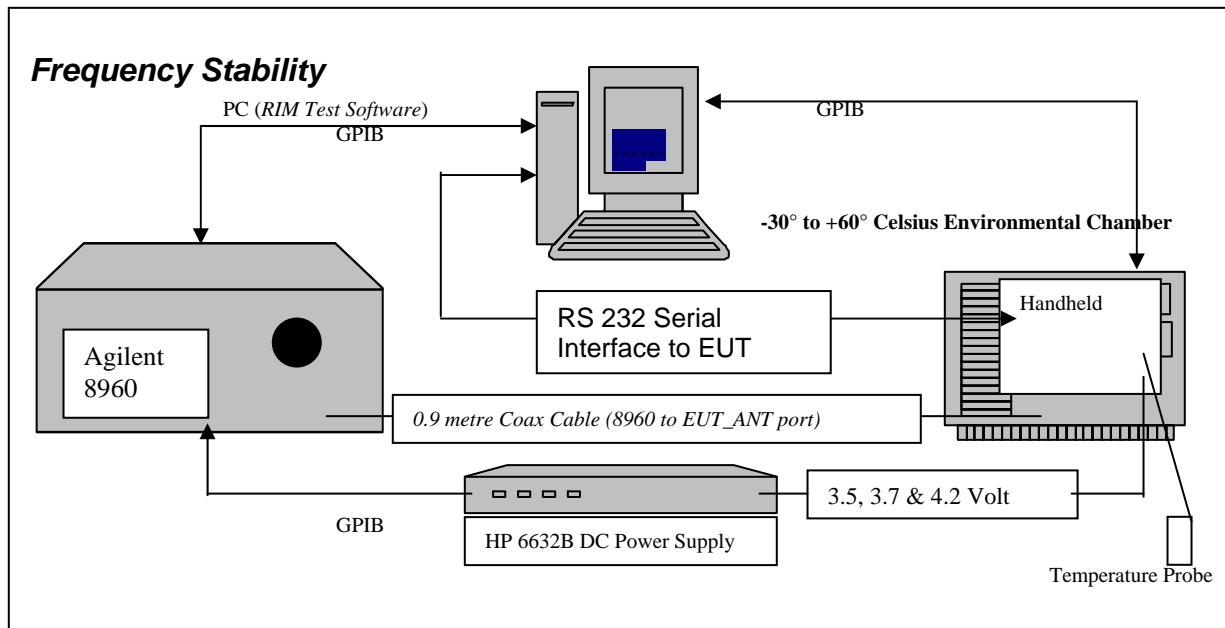
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APPENDIX 3 – FREQUENCY STABILITY TEST DATA

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Frequency Stability Test Data



CFR 47 Chapter 1 - Federal Communications Commission Rules

Part 2 Required Measurements

2.1055 Frequency Stability - Procedures

(a,b) Frequency Stability - Temperature Variation

(d) Frequency Stability - Voltage Variation

24.235 Frequency Stability.

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

The RCU21CW BlackBerry® smartphone, (referred as EUT herein and after) transmitted frequencies are less than 0.1 ppm of the received frequency from the Agilent 8960 CDMA Base Station Simulator

The EUT meets the requirements as stated in CFR 47 chapter 1, Section 24.235, RSS-133, CFR 47 chapter 1, Section 22.917 and RSS-132 Frequency Stability.

Frequency Stability measurement devices were configured as presented in the block diagram recording frequency, power, data, temperatures, and stepped voltages controlled via a GPIB interface linked to the Environmental chamber, a DC power supply, and the Communications Test Set. A 0.9-metre coax cable was calibrated to characterize the insertion loss for the transmitted frequencies between the RF input/output of the base station simulator and the EUT antenna port; located inside the environmental chamber.


Calibration for the Cable Loss was performed in the RF Laboratory using the Giga-tronics power metre and Agilent Signal Generator.

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The cable assembly from the RF input to the RF output was measured at the following Frequencies:

PCS Frequency (MHz)	Cable loss (dB)	Cellular Frequency (MHz)	Cable loss (dB)
1851.20	1.10	824.70	0.50
1880.00	1.10	836.52	0.50
1908.75	1.10	848.31	0.50

Procedure:


The EUT was placed in the Temperature chamber and connected to the Agilent 8960 outside as shown in the figure above. Dry air was pumped inside the temperature chamber to maintain a backpressure during the test. The EUT was kept in the off condition at all times except when the measurements were to be made.

The chamber was switched on and the temperature was set to -30°C. After the chamber stabilized at -30 °C there was a soak period of one hour to alleviate moisture in the chamber, the EUT voltage was enabled. The system software recorded the frequency, power, and associated measurements.

A Computer system controlled the automated software. This application was given the command of activating all machines intrinsic to the temperature and voltage tests controlling the base station simulator via the GPIB Bus. The Environmental Chamber was instructed through an RS-232 serial line. The EUT dialogue was passed through a serial connection.

The EUT repetitively transmitted 100 bursts for each set of programmed parameters recording temperature, voltage settings, and systematically selected frequencies. The power supply was cycled from minimum voltage 3.6 volts, to 3.7 volts nominal voltage to 4.2 volts maximum voltage. The frequency error was measured at a maximum output power and recorded by the automated system test software.

The EUT output power and frequency was measured at 3.6 volts, 3.7 volts and 4.2 volts. The transmit frequency was varied in 3 steps consisting of 824.70, 836.52, and 848.31 MHz for the cellular band and 1851.20, 1880.00 and 1908.75 MHz for the PCS band. This frequency was recorded in MHz and deviation from nominal, in Parts per Million. After the initial one-hour soak at the beginning of the tests, a period of thirty minutes soak was initialized between each ascending temperature step, before proceeding to the next measurement test cycle.

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PROCEDURE:

The test system software for commencing the Frequency Stability Tests carried through the following cycle.

1. Switch on the HP 6632B power supply; AGILENT 8960, and Environmental Chamber.
2. Start test program
3. Set the Temperature to –30°C and maintain a period of one- hour soak time, with the EUT supply voltage disabled.
4. Set power supply voltage to 3.6 volts.
5. Set up base station simulator.
6. Command the base station simulator to switch to the low channel.
7. Enable the voltage to the EUT, and connect a link to the base station simulator.
8. EUT is commanded to Transmit 100 Bursts.
9. Software logs the following data from the base station simulator, power supply and temperature chamber: Traffic Channel Number, Traffic Channel Frequency, Power Level, Chamber Temperature, Supply Voltage, Power, Frequency Error.
10. The base station simulator commands the EUT to change frequency to the middle channel and high channel and repeats steps 7 to 9.
11. Repeat steps 5 to 10 changing the supply voltage to 3.7 Volts
12. Increase temperature by 10°C and soak for 1/2 hour.
13. Repeat steps 4 - 12 for temperatures –30°C to 60°C.
14. Repeat steps 5 to 10 changing the supply voltage to 4.2 volts


Procedure 5 to 10 was repeated at room temperature (20°C) with the power supply voltage set to 3.6, 3.7 and 4.2 volts.

The maximum frequency error in the Cellular band measured was **0.0103 PPM**.

The maximum frequency error in the PCS band measured was **0.0046 PPM**.

Date of test: May 18, 2010

The measurements were performed by Maurice Battler.


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Cellular Channel results: channels 1013, 384 and 777 @ 20°C maximum transmitted power

Traffic Channel Number	Cellular Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
1013	824.700	3.6	20	-1.63	-0.0016
384	836.520	3.6	20	0.38	0.0005
777	848.310	3.6	20	0.65	0.0017

Traffic Channel Number	Cellular Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
1013	824.700	3.7	20	-0.27	-0.0003
384	836.520	3.7	20	-0.39	-0.0010
777	848.310	3.7	20	-0.69	-0.0019

Traffic Channel Number	Cellular Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
1013	824.700	4.2	20	-0.64	-0.0006
384	836.520	4.2	20	0.04	0.0001
777	848.310	4.2	20	-0.06	-0.0001

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Cellular Results: channel 1013 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
1013	824.700	3.6	-30	-0.76	-0.0008
1013	824.700	3.6	-20	-1.52	-0.0015
1013	824.700	3.6	-10	-1.32	-0.0013
1013	824.700	3.6	0	-1.16	-0.0011
1013	824.700	3.6	10	-1.57	-0.0015
1013	824.700	3.6	20	-1.63	-0.0016
1013	824.700	3.6	30	-1.89	-0.0019
1013	824.700	3.6	40	-1.61	-0.0016
1013	824.700	3.6	50	-1.43	-0.0014
1013	824.700	3.6	60	-1.66	-0.0016


Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
1013	824.700	3.7	-30	-4.39	-0.0043
1013	824.700	3.7	-20	2.23	0.0022
1013	824.700	3.7	-10	0.49	0.0005
1013	824.700	3.7	0	3.48	0.0034
1013	824.700	3.7	10	3.60	0.0036
1013	824.700	3.7	20	-0.27	-0.0003
1013	824.700	3.7	30	-1.84	-0.0018
1013	824.700	3.7	40	-1.78	-0.0018
1013	824.700	3.7	50	-1.94	-0.0019
1013	824.700	3.7	60	1.48	0.0015

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
1013	824.700	4.2	-30	-0.17	-0.0002
1013	824.700	4.2	-20	1.73	0.0017
1013	824.700	4.2	-10	0.15	0.0001
1013	824.700	4.2	0	0.58	0.0006
1013	824.700	4.2	10	0.55	0.0005
1013	824.700	4.2	20	-0.64	-0.0006
1013	824.700	4.2	30	-0.61	-0.0006
1013	824.700	4.2	40	-0.36	-0.0004
1013	824.700	4.2	50	-0.13	-0.0001
1013	824.700	4.2	60	1.13	0.0011

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Cellular Results: channel 384 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
384	836.520	3.6	-30	-2.36	-0.0061
384	836.520	3.6	-20	1.85	0.0048
384	836.520	3.6	-10	2.17	0.0056
384	836.520	3.6	0	3.42	0.0089
384	836.520	3.6	10	3.94	0.0103
384	836.520	3.6	20	0.65	0.0017
384	836.520	3.6	30	-0.74	-0.0019
384	836.520	3.6	40	-0.52	-0.0014
384	836.520	3.6	50	-0.78	-0.0020
384	836.520	3.6	60	1.04	0.0027


Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
384	836.520	3.7	-30	-3.10	-0.0081
384	836.520	3.7	-20	1.65	0.0043
384	836.520	3.7	-10	-0.34	-0.0009
384	836.520	3.7	0	2.15	0.0056
384	836.520	3.7	10	2.04	0.0053
384	836.520	3.7	20	-0.39	-0.0010
384	836.520	3.7	30	-1.32	-0.0034
384	836.520	3.7	40	-1.66	-0.0043
384	836.520	3.7	50	-1.70	-0.0044
384	836.520	3.7	60	0.51	0.0013

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
384	836.520	4.2	-30	-0.21	-0.0005
384	836.520	4.2	-20	0.09	0.0002
384	836.520	4.2	-10	-0.19	-0.0005
384	836.520	4.2	0	0.70	0.0018
384	836.520	4.2	10	0.29	0.0007
384	836.520	4.2	20	0.04	0.0001
384	836.520	4.2	30	-0.95	-0.0025
384	836.520	4.2	40	-0.37	-0.0010
384	836.520	4.2	50	-1.02	-0.0026
384	836.520	4.2	60	0.58	0.0015

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Cellular Results: channel 777 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
777	848.310	3.6	-30	-3.38	-0.0044
777	848.310	3.6	-20	2.17	0.0028
777	848.310	3.6	-10	1.62	0.0021
777	848.310	3.6	0	3.44	0.0044
777	848.310	3.6	10	3.67	0.0047
777	848.310	3.6	20	0.38	0.0005
777	848.310	3.6	30	-1.27	-0.0016
777	848.310	3.6	40	-1.36	-0.0017
777	848.310	3.6	50	-1.09	-0.0014
777	848.310	3.6	60	1.28	0.0016


Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
777	848.310	3.7	-30	-2.41	-0.0031
777	848.310	3.7	-20	1.38	0.0018
777	848.310	3.7	-10	0.08	0.0001
777	848.310	3.7	0	2.20	0.0028
777	848.310	3.7	10	0.96	0.0012
777	848.310	3.7	20	-0.69	-0.0009
777	848.310	3.7	30	-1.52	-0.0020
777	848.310	3.7	40	-1.68	-0.0022
777	848.310	3.7	50	-1.63	-0.0021
777	848.310	3.7	60	0.42	0.0005

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
777	848.310	4.2	-30	-0.32	-0.0004
777	848.310	4.2	-20	1.22	0.0016
777	848.310	4.2	-10	0.11	0.0001
777	848.310	4.2	0	1.05	0.0014
777	848.310	4.2	10	0.15	0.0002
777	848.310	4.2	20	-0.06	-0.0001
777	848.310	4.2	30	-0.37	-0.0005
777	848.310	4.2	40	-0.79	-0.0010
777	848.310	4.2	50	-0.65	-0.0008
777	848.310	4.2	60	-0.11	-0.0001

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PCS Channel results: channels 25, 600, & 1175 @ 20°C maximum transmitted power

Traffic Channel Number	PCS Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
25	1851.20	3.6	20	-2.07	-0.0011
600	1880.00	3.6	20	1.53	0.0008
1175	1908.75	3.6	20	0.54	0.0003

Traffic Channel Number	PCS Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
25	1851.20	3.7	20	-0.09	0.0000
600	1880.00	3.7	20	-1.09	-0.0006
1175	1908.75	3.7	20	-1.51	-0.0008

Traffic Channel Number	PCS Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
25	1851.20	4.2	20	-0.51	-0.0003
600	1880.00	4.2	20	-1.19	-0.0006
1175	1908.75	4.2	20	-1.12	-0.0006

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PCS Results: channel 25 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
25	1851.20	3.6	-30	-0.76	-0.0004
25	1851.20	3.6	-20	-1.60	-0.0009
25	1851.20	3.6	-10	-2.66	-0.0014
25	1851.20	3.6	0	-2.39	-0.0013
25	1851.20	3.6	10	-1.97	-0.0011
25	1851.20	3.6	20	-2.07	-0.0011
25	1851.20	3.6	30	-1.40	-0.0008
25	1851.20	3.6	40	-3.39	-0.0018
25	1851.20	3.6	50	-2.04	-0.0011
25	1851.20	3.6	60	-2.50	-0.0013

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
25	1851.20	3.7	-30	-7.23	-0.0039
25	1851.20	3.7	-20	3.62	0.0020
25	1851.20	3.7	-10	0.45	0.0002
25	1851.20	3.7	0	5.75	0.0031
25	1851.20	3.7	10	5.92	0.0032
25	1851.20	3.7	20	-0.09	0.0000
25	1851.20	3.7	30	-2.63	-0.0014
25	1851.20	3.7	40	-2.85	-0.0015
25	1851.20	3.7	50	-2.90	-0.0016
25	1851.20	3.7	60	1.84	0.0010


Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
25	1851.20	4.2	-30	-1.20	-0.0006
25	1851.20	4.2	-20	2.60	0.0014
25	1851.20	4.2	-10	0.21	0.0001
25	1851.20	4.2	0	3.33	0.0018
25	1851.20	4.2	10	1.48	0.0008
25	1851.20	4.2	20	-0.51	-0.0003
25	1851.20	4.2	30	-0.79	-0.0004
25	1851.20	4.2	40	0.69	0.0004
25	1851.20	4.2	50	-0.13	-0.0001
25	1851.20	4.2	60	1.27	0.0007

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PCS Results: channel 600 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
600	1880.00	3.6	-30	-6.47	-0.0034
600	1880.00	3.6	-20	3.96	0.0021
600	1880.00	3.6	-10	3.06	0.0016
600	1880.00	3.6	0	7.93	0.0042
600	1880.00	3.6	10	8.73	0.0046
600	1880.00	3.6	20	1.53	0.0008
600	1880.00	3.6	30	-2.67	-0.0014
600	1880.00	3.6	40	-2.21	-0.0012
600	1880.00	3.6	50	-1.69	-0.0009
600	1880.00	3.6	60	1.67	0.0009


Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
600	1880.00	3.7	-30	-6.82	-0.0036
600	1880.00	3.7	-20	2.98	0.0016
600	1880.00	3.7	-10	-1.13	-0.0006
600	1880.00	3.7	0	5.32	0.0028
600	1880.00	3.7	10	3.92	0.0021
600	1880.00	3.7	20	-1.09	-0.0006
600	1880.00	3.7	30	-3.28	-0.0017
600	1880.00	3.7	40	-4.12	-0.0022
600	1880.00	3.7	50	-3.56	-0.0019
600	1880.00	3.7	60	0.86	0.0005

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
600	1880.00	4.2	-30	-1.22	-0.0006
600	1880.00	4.2	-20	1.55	0.0008
600	1880.00	4.2	-10	0.27	0.0001
600	1880.00	4.2	0	1.18	0.0006
600	1880.00	4.2	10	0.28	0.0001
600	1880.00	4.2	20	-1.19	-0.0006
600	1880.00	4.2	30	-1.73	-0.0009
600	1880.00	4.2	40	-1.35	-0.0007
600	1880.00	4.2	50	-1.99	-0.0011
600	1880.00	4.2	60	0.67	0.0004

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PCS Results: channel 1175 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
1175	1908.75	3.6	-30	-6.78	-0.0036
1175	1908.75	3.6	-20	3.70	0.0019
1175	1908.75	3.6	-10	1.59	0.0008
1175	1908.75	3.6	0	6.83	0.0036
1175	1908.75	3.6	10	5.73	0.0030
1175	1908.75	3.6	20	0.54	0.0003
1175	1908.75	3.6	30	-2.77	-0.0014
1175	1908.75	3.6	40	-3.19	-0.0017
1175	1908.75	3.6	50	-2.18	-0.0011
1175	1908.75	3.6	60	3.22	0.0017


Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
1175	1908.75	3.7	-30	-5.08	-0.0027
1175	1908.75	3.7	-20	2.35	0.0012
1175	1908.75	3.7	-10	-1.17	-0.0006
1175	1908.75	3.7	0	3.38	0.0018
1175	1908.75	3.7	10	1.93	0.0010
1175	1908.75	3.7	20	-1.51	-0.0008
1175	1908.75	3.7	30	-3.82	-0.0020
1175	1908.75	3.7	40	-2.91	-0.0015
1175	1908.75	3.7	50	-3.99	-0.0021
1175	1908.75	3.7	60	1.53	0.0008

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
1175	1908.75	4.2	-30	0.31	0.0002
1175	1908.75	4.2	-20	1.73	0.0009
1175	1908.75	4.2	-10	0.05	0.0000
1175	1908.75	4.2	0	0.78	0.0004
1175	1908.75	4.2	10	-0.83	-0.0004
1175	1908.75	4.2	20	-1.12	-0.0006
1175	1908.75	4.2	30	-0.83	-0.0004
1175	1908.75	4.2	40	-0.95	-0.0005
1175	1908.75	4.2	50	-2.14	-0.0011
1175	1908.75	4.2	60	0.72	0.0004


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APPENDIX 4 - RADIATED EMISSIONS TEST DATA

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Test Report No. RTS-2581-1007-55	Dates of Test May 02 to June 08, 2010		FCC ID: L6ARCU20CW IC: 2503A-RCU20CW

Radiated Power Test Data Results

The following measurements were performed by Kevin Rose.

Date of tests: May 18, 2010


The environmental tests conditions were: Temperature: 24 °C
Pressure: 1022 mb
Relative Humidity: 30 %

Cellular Band

Loopback Service

The BlackBerry® smartphone was in standalone, USB down position.
Test distance is 3.0 metres

EUT				Rx Antenna		Spectrum Analyzer		Substitution Method					
								Tracking Generator					
Type	Ch	Frequency	Band	Type	Pol.	Reading (dBuV)	Max (V,H) (dBuV)	Pol.	Reading	Corrected Reading (relative to Dipole)		Limit (dBm)	Diff. To Limit (dB)
		(MHz)						Tx-Rx	(dBm)	(dBm)	(W)		
F0	1013	824.70	800	Dipole	V	65.03	82.41	V-V	8.42	26.55	0.45	39.00	-12.45
F0	1013	824.70	800	Dipole	H	82.41		H-H	7.32				
F0	384	836.52	800	Dipole	V	76.64	83.53	V-V	10.25	28.23	0.67	39.00	-10.77
F0	384	836.52	800	Dipole	H	83.53		H-H	9.47				
F0	777	848.31	800	Dipole	V	68.74	81.57	V-V	8.85	26.88	0.49	39.00	-12.12
F0	777	848.31	800	Dipole	H	81.57		H-H	7.1				

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Radiated Power Test Data Results cont'd

Cellular Band

1xEVDO

The BlackBerry® smartphone was in standalone, horizontal face down position.

Test Distance was 3.0 metres.


EUT				Rx Antenna		Spectrum Analyzer		Substitution Method					
								Tracking Generator					
Type	Ch	Frequency (MHz)	Band	Type	Pol.	Reading (dBuV)	Max (V,H) (dBuV)	Pol.	Reading	Corrected Reading (relative to Dipole)		Limit (dBm)	Diff. To Limit (dB)
								Tx-Rx	(dBm)	(dBm)	(W)		
F0	1013	824.70	800	Dipole	V	75.28	83.58	V-V	9.62	27.75	0.60	39.00	-11.25
F0	1013	824.70	800	Dipole	H	83.58		H-H	8.51				
F0	384	836.52	800	Dipole	V	76.35	84.62	V-V	11.36	29.34	0.86	39.00	-9.66
F0	384	836.52	800	Dipole	H	84.62		H-H	10.58				
F0	777	848.32	800	Dipole	V	76.05	84.13	V-V	11.46	29.49	0.89	39.00	-9.51
F0	777	848.32	800	Dipole	H	84.13		H-H	9.72				

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Radiated Power Test Data Results cont'd

PCS Band

Loopback Service

The BlackBerry® smartphone was in standalone, USB down position.
Test Distance was 3.0 metres.

								Substitution Method					
EUT				Receive Antenna		Spectrum Analyzer		Tracking Generator					
Type	Ch	Frequency (MHz)	Band	Type	Pol.	Reading (dBuV)	Max (V,H) dBuV	Pol. Tx-Rx	Reading (dBm)	Corrected Reading (relative to Isotropic Radiator)		Limit (dBm)	Diff to Limit (dB)
										(dBm)	(W)		
F0	25	1851.25	1900	Horn	V	87.3	87.3	V-V	-11.54	25.77	0.38	33.00	-7.23
F0	25	1851.25	1900	Horn	H	85.41		H-H	-10.41				
F0	600	1880.00	1900	Horn	V	87.19	87.19	V-V	-11.12	25.45	0.35	33.00	-7.55
F0	600	1880.00	1900	Horn	H	84.19		H-H	-10.32				
F0	1175	1908.75	1900	Horn	V	87.2	87.2	V-V	-11.12	25.24	0.33	33.00	-7.76
F0	1175	1908.75	1900	Horn	H	82.1		H-H	-10.48				

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Radiated Power Test Data Results cont'd

PCS Band

1xEVDO

The BlackBerry® smartphone was in standalone, horizontal face down position.

Test Distance was 3.0 metres.


								Substitution Method					
EUT				Receive Antenna		Spectrum Analyzer		Tracking Generator					
Type	Ch	Frequency (MHz)	Band	Type	Pol.	Reading (dBuV)	Max (V,H) dBuV	Pol. Tx-Rx	Reading (dBm)	Corrected Reading (relative to Isotropic Radiator)		Limit (dBm)	Diff to Limit (dB)
F0	25	1851.25	1900	Horn	V	81.03	89.37	V-V	-9.4	30.08	1.02	33.00	-2.92
F0	25	1851.25	1900	Horn	H	89.37		H-H	-8.33				
F0	600	1880.00	1900	Horn	V	81.59	88.87	V-V	-9.48	29.05	0.80	33.00	-3.95
F0	600	1880.00	1900	Horn	H	88.87		H-H	-8.38				
F0	1175	1908.75	1900	Horn	V	79.12	86.81	V-V	-11.53	27.39	0.55	33.00	-5.61
F0	1175	1908.75	1900	Horn	H	86.81		H-H	-10.38				

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Radiated Emissions Test Data Results

Cellular Band

Loopback Service

Date of Test: Date of tests: May 18, 2010

The environmental test conditions were: Temperature: 23 °C
Pressure: 1014 mb
Relative Humidity: 27 %

Test Distance was 3.0 metres with a height of 1.0 metres, 30 MHz to 1000 MHz.
The BlackBerry® smartphone was in standalone, USB down position.

The following measurements were performed in Cellular Tx mode on channels 1013, 384 and 777.

All emissions had a test margin greater than 25.0 dB.


Date of Test: Date of tests: May 18, 2010

The environmental test conditions were: Temperature: 24 °C
Pressure: 1017 mb
Relative Humidity: 31 %

Test Distance was 3.0 metres with a height of 1.0 metres, 1 GHz to 9 GHz.
The BlackBerry® smartphone was in standalone, USB down position.

The following measurements were performed in CDMA Cellular Tx mode on channels 1013, 384 and 777.

All emissions, including harmonics, had a test margin greater than 25.0 dB.

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Radiated Emissions Test Data Results cont'd

Cellular Band

Test Data

Date of Test: May 18, 2010

The environmental test conditions were: Temperature: 23 °C
Pressure: 1014 mb
Relative Humidity: 27 %

Test Distance was 3.0 metres with a height of 1.0 metres, 30 MHz to 1000 MHz.
The BlackBerry® smartphone was in standalone, USB down position.

The following measurements were performed in Cellular Tx mode on channels 1013, 384 and 777.


All emissions had a test margin greater than 25.0 dB.

Date of Test: May 31, 2010

The environmental test conditions were: Temperature: 24 °C
Pressure: 1017 mb
Relative Humidity: 30 %

Test Distance was 3.0 metres with a height of 1.0 metres, 1 GHz to 9 GHz.
The BlackBerry® smartphone was in standalone, USB down position.
The following measurements were performed in CDMA Cellular Tx mode on channels 1013, 384 and 777.

All emissions, including harmonics, had a test margin greater than 25.0 dB.

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Radiated Emissions Test Data Results cont'd

Cellular Band

1xEVDO

Date of Test: May 18, 2010

The environmental test conditions were: Temperature: 23 °C
Pressure: 1014 mb
Relative Humidity: 27 %

Test Distance was 3.0 metres with a height of 1.0 metres, 30 MHz to 1000 MHz.
The BlackBerry® smartphone was in standalone, USB down position.

The following measurements were performed in Cellular EVDO Tx mode on channels 1013, 384 and 777.

All emissions had a test margin greater than 25.0 dB.


Date of Test: May 26 to June 8, 2010

The environmental test conditions were: Temperature: 24 °C
Pressure: 1017 mb
Relative Humidity: 31%

Test Distance was 3.0 metres with a height of 1.0 metres, 1 GHz to 9 GHz.
The BlackBerry® smartphone was in standalone, USB down position.

The following measurements were performed in CDMA Cellular EVDO Tx mode on channels 1013, 384 and 777.

All emissions, including harmonics, had a test margin greater than 25.0 dB.

	EMI Test Report for the BlackBerry® smartphone Model RCU21CW APPENDIX 4	
Test Report No. RTS-2581-1007-55	Dates of Test May 02 to June 08, 2010	FCC ID: L6ARCU20CW IC: 2503A-RCU20CW

Radiated Emissions Test Data Results cont'd

PCS Band

Loopback Service

Date of Test: May 28, 2010

The environmental test conditions were: Temperature: 22 °C
Pressure: 1010 mb
Relative Humidity: 31 %

Test Distance was 3.0 metres with a height of 1.0 metres, 30 MHz to 1000 MHz.
The BlackBerry® smartphone was in standalone, horizontal position.

The following measurements were performed in PCS Tx mode on channels 25, 600 and 1175.

All emissions had a test margin greater than 25.0 dB.


Date of Test: May 27, 2010

The environmental test conditions were: Temperature: 24 °C
Pressure: 1017 mb
Relative Humidity: 30 %

Test Distance was 3.0 metres with a height of 1.0 metres, 1 GHz to 20 GHz.
The BlackBerry® smartphone was in standalone, horizontal position.
The following measurements were performed in PCS Tx mode on channels 25, 600 and 1175.

Frequency (MHz)	Channel of Occurrence	Antenna		Test Angle (Deg.)	Detector (PK or QP)	Measured Level (dBµV)	Correction Factor for preamp/antenna/ cables/ filter (dB)	Field Strength Level (reading+corr) (dBm)	Limit @ 3.0 m (dBm)	Test Margin (dB)
		Pol. (V/H)	Height (metres)							
3817.736	1175	H	3.53	136.00	PK	53.61	-81.67	-28.06	-13.00	-15.06

All other emissions, including harmonics, had a test margin greater than 25.0 dB.

	EMI Test Report for the BlackBerry® smartphone Model RCU21CW APPENDIX 4	
Test Report No. RTS-2581-1007-55	Dates of Test May 02 to June 08, 2010	FCC ID: L6ARCU20CW IC: 2503A-RCU20CW

Radiated Emissions Test Data Results cont'd

PCS Band

Test Data

Date of Test: May 02, 2010

The environmental test conditions were: Temperature: 23 °C
Pressure: 1010 mb
Relative Humidity: 31 %

Test Distance was 3.0 metres with a height of 1.0 metres, 30 MHz to 1000 MHz.
The BlackBerry® smartphone was in standalone, horizontal position.

The following measurements were performed in PCS Tx mode on channels 25, 600 and 1175.

All emissions had a test margin greater than 25.0 dB.


Date of Test: May 27, 2010

The environmental test conditions were: Temperature: 24 °C
Pressure: 1017 mb
Relative Humidity: 30 %

Test Distance was 3.0 metres with a height of 1.0 metres, 1 GHz to 20 GHz.
The BlackBerry® smartphone was in standalone, horizontal position.
The following measurements were performed in PCS Tx mode on channels 25, 600 and 1175.

Frequency (MHz)	Channel of Occurrence	Antenna		Test Angle (Deg.)	Detector (PK or QP)	Measured Level (dBµV)	Correction Factor for preamp/antenna/ cables/ filter (dB)	Field Strength Level (reading+corr) (dBm)	Limit @ 3.0 m (dBm)	Test Margin (dB)
		Pol. (V/H)	Height (metres)							
3817.176	1175	H	2.44	137.00	PK	55.01	-81.67	-26.67	-13.00	-13.67

All other emissions, including harmonics, had a test margin greater than 25.0 dB.

	EMI Test Report for the BlackBerry® smartphone Model RCU21CW APPENDIX 4	
Test Report No. RTS-2581-1007-55	Dates of Test May 02 to June 08, 2010	FCC ID: L6ARCU20CW IC: 2503A-RCU20CW

Radiated Emissions Test Data Results cont'd

PCS Band

1xEVDO

Date of Test: June 08, 2010

The environmental test conditions were: Temperature: 22 °C
Pressure: 1010 mb
Relative Humidity: 1 %

Test Distance was 3.0 metres with a height of 1.0 metres, 30 MHz to 1000 MHz.
The BlackBerry® smartphone was in standalone, horizontal position.

The following measurements were performed in PCS Tx mode on channels 25, 600 and 1175.

All emissions had a test margin greater than 25.0 dB.

Date of Test: June 08, 2010

The environmental test conditions were: Temperature: 24 °C
Pressure: 1010 mb
Relative Humidity: 30 %

Test Distance was 3.0 metres with a height of 1.0 metres, 1 GHz to 20 GHz.
The BlackBerry® smartphone was in standalone, horizontal position.
The following measurements were performed in PCS Tx mode on channels 25, 600 and 1175.

All emissions, including harmonics, had a test margin greater than 25.0 dB.