

# **EMI Test Report**

Tested in accordance with  
Federal Communications Commission (FCC)  
Personal Communications Services  
CFR 47, Parts 2, 22 and 24

## **RIM Testing Services (RTS)**

**A division of Research In Motion Limited**

**REPORT NO.:** RTS-0373-0606-03

**PRODUCT MODEL NO.:** RBF20CW  
**TYPE NAME:** BlackBerry  
**FCC ID:** L6ARBF20CW  
**IC:** 2503A-RBF20CW

**DATE:** 31-July-2006

<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry Handheld Model RBF20CW	
<b>Test Report No.</b> RTS-0373-0606-03	<b>Dates of Test</b> June 27-28, July 4-14, 2006	<b>Author Data</b> M. Attayi

**Statement of Performance:**

The BlackBerry Handheld, model RBF20CW, part number ASY-11785-XYZ Rev K\_ASY-11783-001 Rev G, 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.

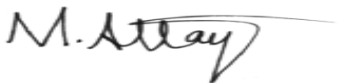
**Tested by:**



Edward A. Davidian  
Compliance Specialist  
Date: July 31, 2006




Maurice Battler  
Compliance Specialist  
Date: July 31, 2006



Masud S. Attayi, P.Eng.  
Senior Compliance Engineer,  
Date: July 31, 2006

**Approved by:**



Paul G. Cardinal, Ph.D.  
Manager  
Date: August 1, 2006

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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, Oct. 1, 2000

FCC CFR 47 Part 22, Subpart H, Cellular Radiotelephone Services, Oct. 1, 2000

FCC CFR 47 Part 24 Subpart E, Broadband PCS, Oct 1. 2000

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 3, June 2005, 2 GHz Personal Communications Services.

## B. Associated Documents

None.

## C. Product Identification

The equipment under test (EUT) was tested at the RIM Testing Services (RTS) EMI test facility, located at:

305 Phillip Street

Waterloo, Ontario

Canada, N2L 3W8

Phone: 519 888 7465

Fax: 519 888 6906

The testing was performed June 27-28, July 4-14, 2006. The sample EUT included:

1. BlackBerry Handheld, model RBF20CW, ASY-11785-XYZ Rev K\_ASY-11783-001 Rev G, Sample 04.
2. BlackBerry Handheld, model RBF20CW, ASY-11785-XYZ Rev K\_ASY-11783-001 Rev G, Sample 05.

The transmit frequency bands operating in North America for the Handheld are: Cellular 824 to 849 MHz, PCS 1850 to 1910 MHz and Bluetooth 2402 to 2480 MHz.

## D. Support Equipment Used for the Testing of the EUT

- 1) Agilent Wireless Communication Test Set, model 8960, serial number GB41070272
- 2) Communication Tester, Rohde & Schwarz, model CMU 200, serial number 837493/073
- 3) DC Power Supply, HP, model 6632B, serial number US37472178

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## E. Test Voltage

The ac input voltage was 120 volts, 60 where applicable. This configuration was per RIM's specifications.

## F. Test Results Chart

SPECIFICATION	TEST TYPE	MEETS REQUIREMENTS	PERFORMED BY
FCC CFR 47 Part 22, Subpart H IC RSS-132	Radiated Spurious/harmonic Emissions, ERP, LO	Yes	Edward Davidian and Masud Attayi
FCC CFR 47 Part 2, Subpart J, Part 22, Subpart H IC RSS-132	Conducted Output Power Conducted Emissions, Occupied Bandwidth, Frequency Stability	Yes	Maurice Battler
FCC CFR 47 Part 24, Subpart E IC RSS-133	Radiated Spurious/harmonic Emissions, EIRP, LO	Yes	Edward Davidian and Masud Attayi
FCC CFR 47 Part 24, Subpart E IC RSS-133	Conducted Emissions, Occupied Bandwidth, Frequency Stability	Yes	Maurice Battler

## G. Modifications to EUT

No modifications were required on the EUT.

## H. Summary of Results

- 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 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.
- 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 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 channels measured were low, middle and high.  
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 channels measured were low, middle and high.  
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 channels measured were low, middle and high.  
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 (3.8 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 (3.8 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.
- 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 EUT height of one metre was set in order to align it with the lowest height of the receiving antenna. 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 measurements were performed in a semi-anechoic chamber. The semi-anechoic chamber FCC registration number is

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**778487** and the Industry Canada file number is **IC4240**. The EUT was measured on the low, middle and high channels.

The highest ERP in the Cellular band measured was 23.85 dBm at 848.32 MHz (channel 777) in EVDO mode.

The highest EIRP in the PCS band measured was 27.4 dBm at 1880.00 MHz (channel 600) in EVDO mode.

The radiated carrier harmonics were measured up to the 10<sup>th</sup> harmonic for low, middle and high channels in the Cellular and PCS bands.

The test margin for the Cellular band was greater than 25dB.

The lowest test margin for the PCS band was 6.6 dB below the limit at 3760.00 MHz in EVDO mode.

The EUT's RF local oscillator emissions were measured in the Cellular band on the low, middle and high channels (1013, 384 and 777) in the standalone vertical position. Both the horizontal and vertical antenna polarizations were measured. The Cellular RF local oscillator emissions were in the NF.

The EUT's RF local oscillator emissions were measured in the PCS band on the low, middle and high channels (25, 600 and 1175) in the standalone Horizontal position. Both the horizontal and vertical antenna polarizations were measured. The PCS RF local oscillator emissions were in the NF.

The radiated carrier harmonics were measured up to the 10<sup>th</sup> harmonic for low, middle and high channels for simultaneous transmission in Cellular/Bluetooth and in PCS/Bluetooth. Both the horizontal and vertical polarizations were measured. The radiated harmonic emissions had a test margin of greater than 25 dB for Cellular band.

The lowest test margin for PCS band was 4.4 dB below the limit at 3760.00 MHz in EVDO mode.

**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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## I. Compliance Test Equipment Used

<u>UNIT</u>	<u>MANUFACTURER</u>	<u>MODEL</u>	<u>SERIAL NUMBER</u>	<u>CAL DUE DATE</u> (YY MM DD)	<u>USE</u>
Preamplifier	Sonoma	310N/11909A	185831	06-11-27	Radiated Emissions
Preamplifier system	TDK RF Solutions	PA-02	080010	06-11-25	Radiated Emissions
Hybrid Log Antenna	TDK	HLP-3003C	017401	06-07-21	Radiated Emissions
Horn Antenna	TDK	HRN-0118	130092	06-09-24	Radiated Emissions
Horn Antenna	TDK	HRN-0118	30101	06-07-21	Radiated Emissions
Horn Antenna	Emco	3116	2538	06-09-27	Radiated Emissions
Preamplifier	TDK	18-26	3002	06-11-28	Radiated Emissions
Dipole Antenna	Schwarzbeck	UHAP	973	06-12-13	Radiated Emissions
Dipole Antenna	Schwarzbeck	UHAP	974	06-09-21	Radiated Emissions
Universal Radio Communication Tester	Rohde & Schwarz	CMU 200	837493/073	07-03-23	Radiated Emissions
CDMA base station	Agilent	8960	6B41070272	06-09-20	Radiated Emissions
EMI Receiver	Rohde & Schwarz	ESIB-40	100255	07-05-11	Radiated Emissions
Spectrum Analyzer	HP	8563E	3745A08112	06-09-10	RF Conducted Emissions
DC Power Supply	HP	6632B	US37472178	07-09-14	RF Conducted Emissions
Environment Monitor	Control Company	1870	230355190	06-12-23	Radiated Emissions
Environment Monitor	Control Company	1870	230355189	06-12-23	RF Conducted Emissions
Temperature Probe	Hart Scientific	61161-302	21352860	06-09-28	Frequency Stability
Environmental Chamber	ESPEC Corp.	SH-240S1	91005607	N/R	Frequency Stability



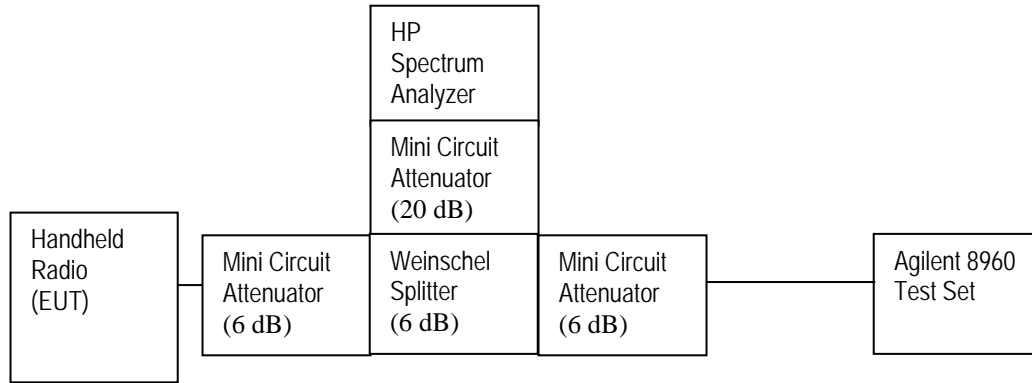
## **APPENDIX 1 - CONDUCTED RF EMISSIONS TEST DATA/PLOTS**

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Conducted RF Emission Test Data cont'd

This appendix contains measurement data pertaining to conducted spurious emissions, -26 dBc bandwidth, 99% power bandwidth and the channel mask.

**Test Setup Diagram**



The environmental test conditions were:

Temperature 25°C

Pressure 1014mb

Relative Humidity 34%

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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-133, CFR 22 Subpart H and RSS-132 were measured from 10 MHz to 20 GHz. The EUT emissions were in the noise floor.

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

***Test Data for Cellular and PCS selected Frequencies***

<b>Cellular Frequency (MHz)</b>	<b>99% Occupied Bandwidth (MHz)</b>
824.700	1.273
836.520	1.267
848.310	1.267

<b>PCS Frequency (MHz)</b>	<b>99% Occupied Bandwidth (MHz)</b>
1851.200	1.280
1880.000	1.280
1908.750	1.280

***Measurement Plots for Cellular and PCS***

Refer to the following measurement plots for more detail.

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

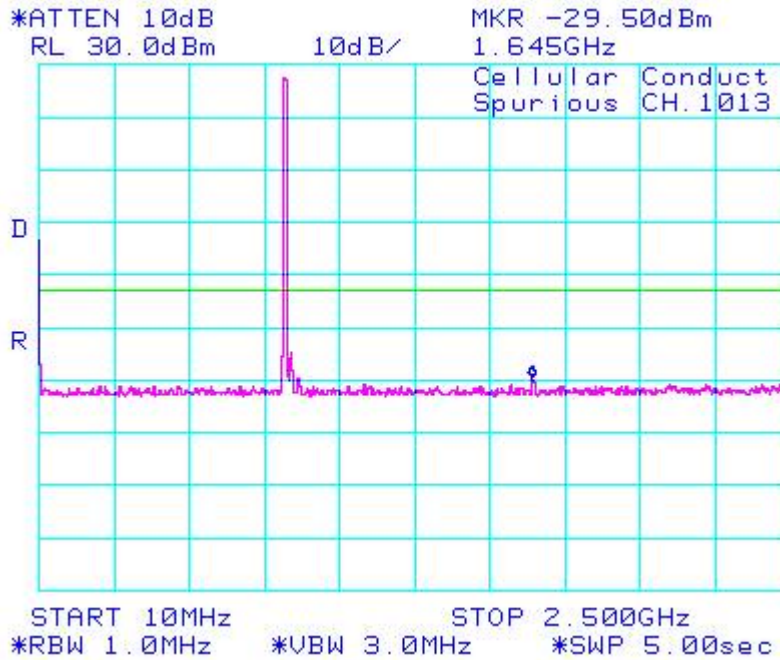
See Figures 19 to 20 for plots of the channel mask results.

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

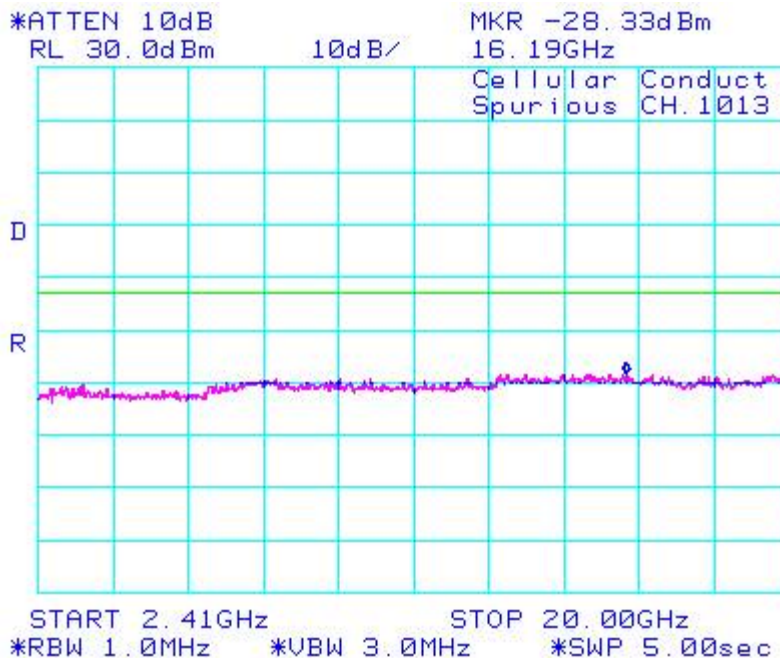
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Conducted Emission Test Results cont'd

**Figure 1: Cellular, Spurious Conducted Emissions, Low channel**



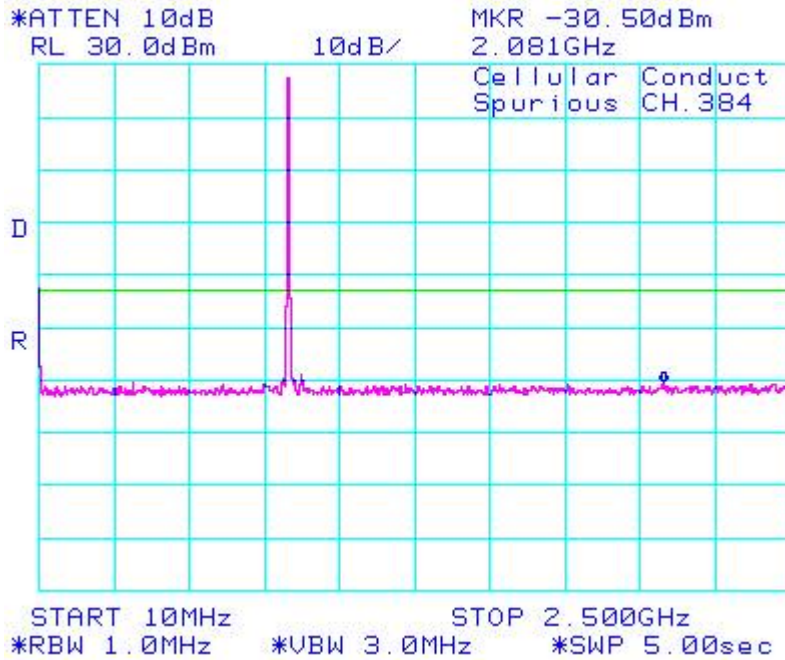
**Figure 2: Cellular, Spurious Conducted Emissions, Low channel**



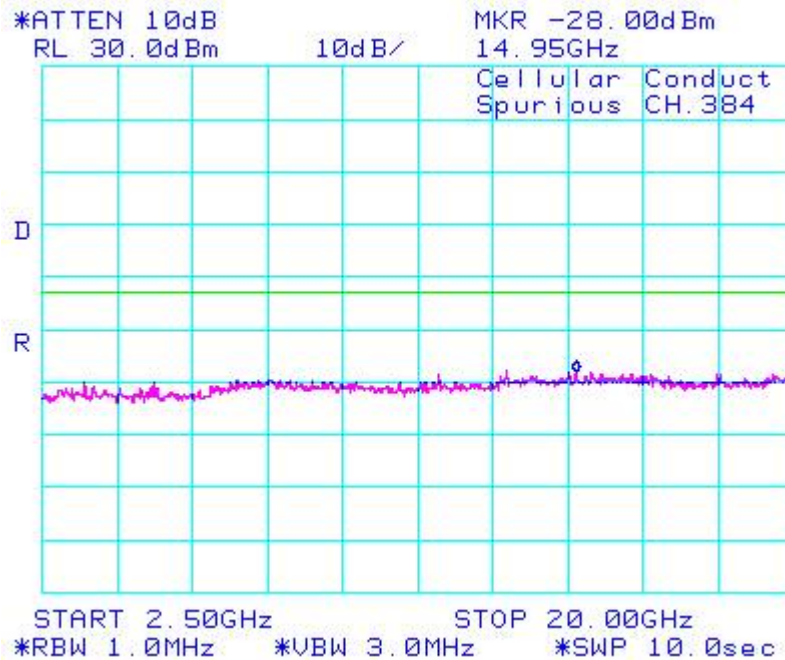
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Conducted Emission Test Results cont'd

**Figure 3: Cellular, Spurious Conducted Emissions, Middle Channel**



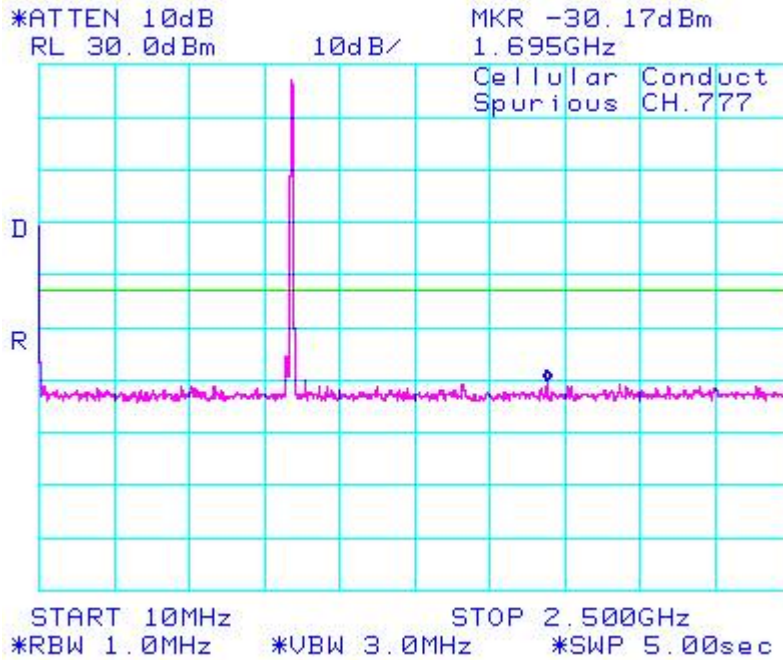
**Figure 4: Cellular, Spurious Conducted Emissions, Middle Channel**



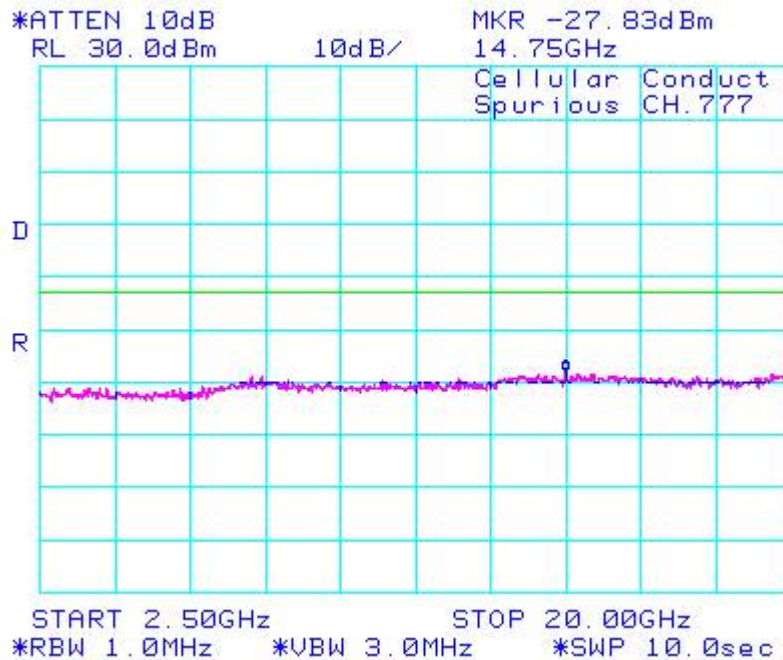
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Conducted Emission Test Results cont'd

**Figure 5: Cellular, Spurious Conducted Emissions, High Channel**



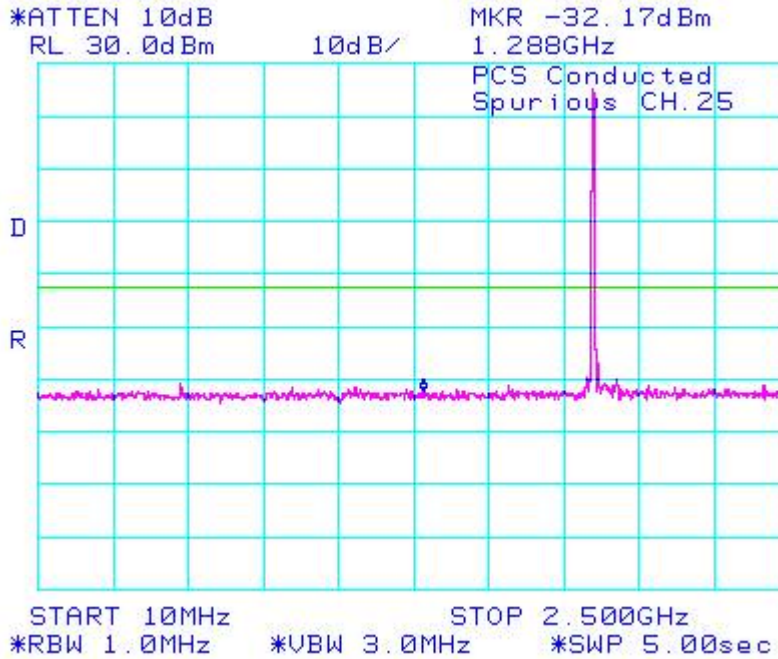
**Figure 6: Cellular, Spurious Conducted Emissions, High Channel**



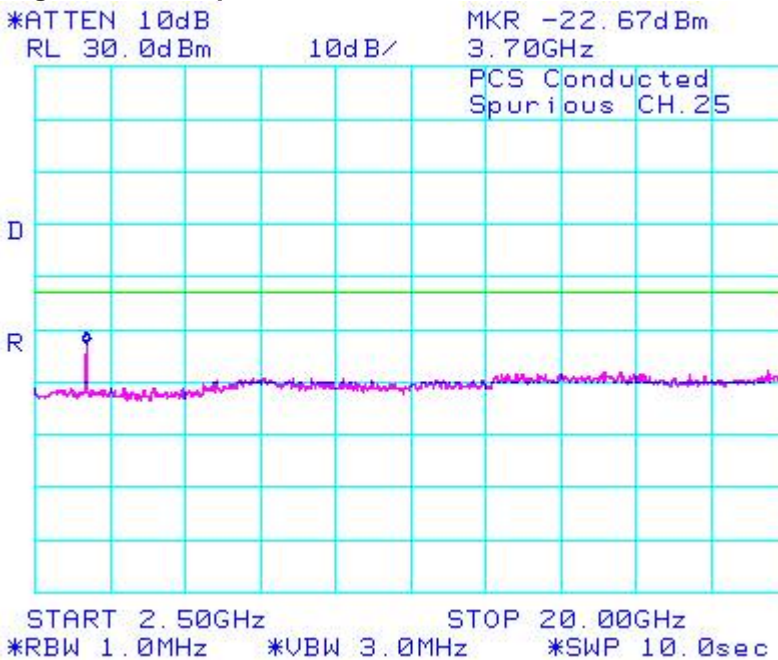
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Conducted Emission Test Results cont'd

**Figure 7: PCS, Spurious Conducted Emissions, Low Channel**



**Figure 8: PCS, Spurious Conducted Emissions, Low Channel**



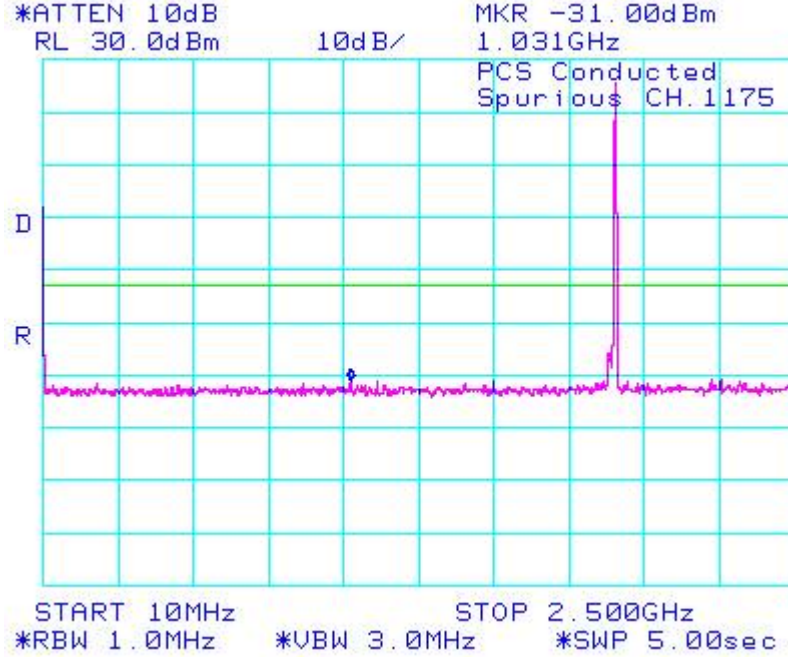




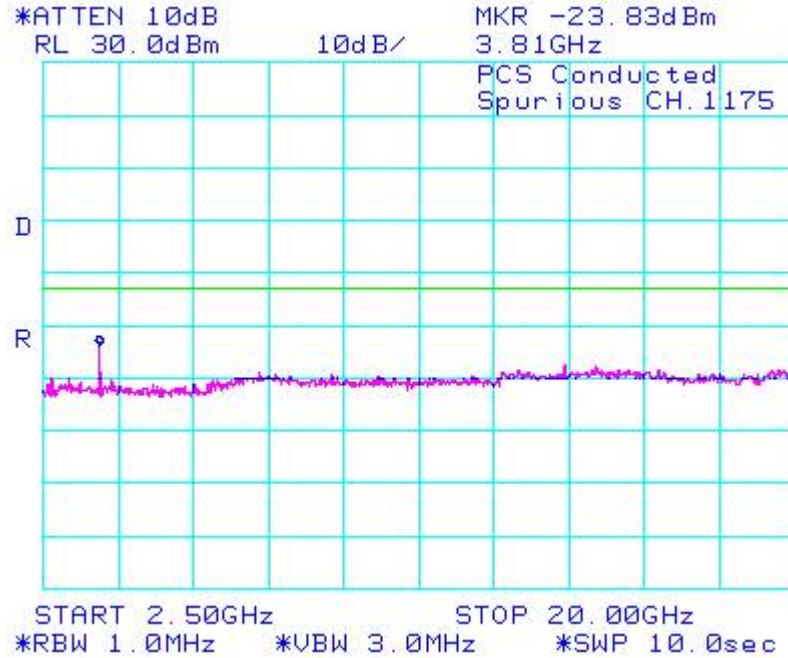
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Conducted Emission Test Results cont'd

**Figure 11: PCS, Spurious Conducted Emissions, High Channel**



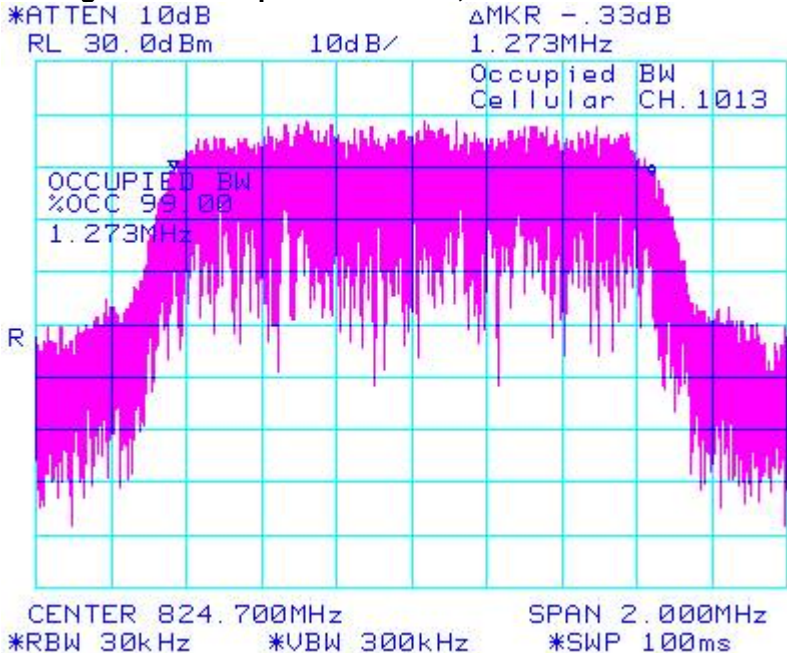
**Figure 12: PCS, Spurious Conducted Emissions, High Channel**



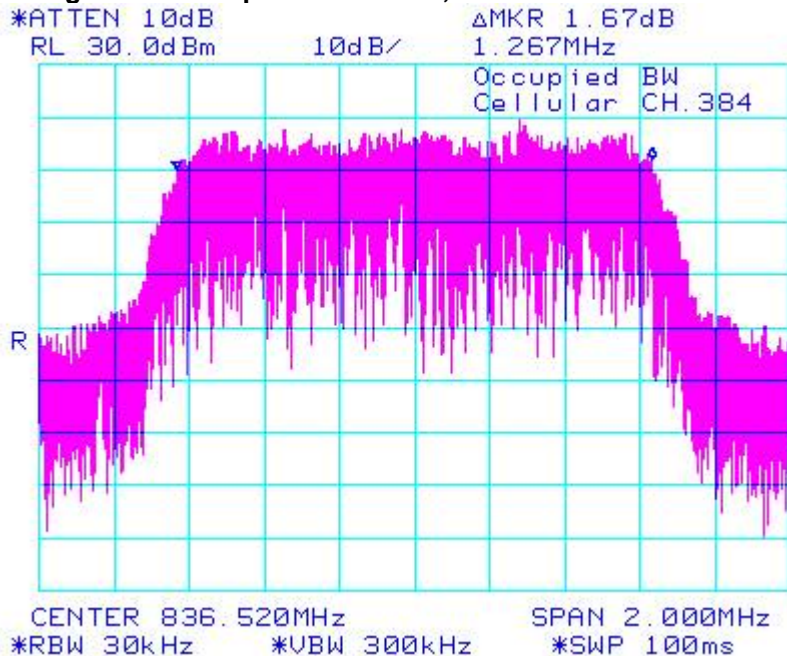
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Conducted Emission Test Results cont'd

**Figure 13: Occupied Bandwidth, Cellular Low Channel**



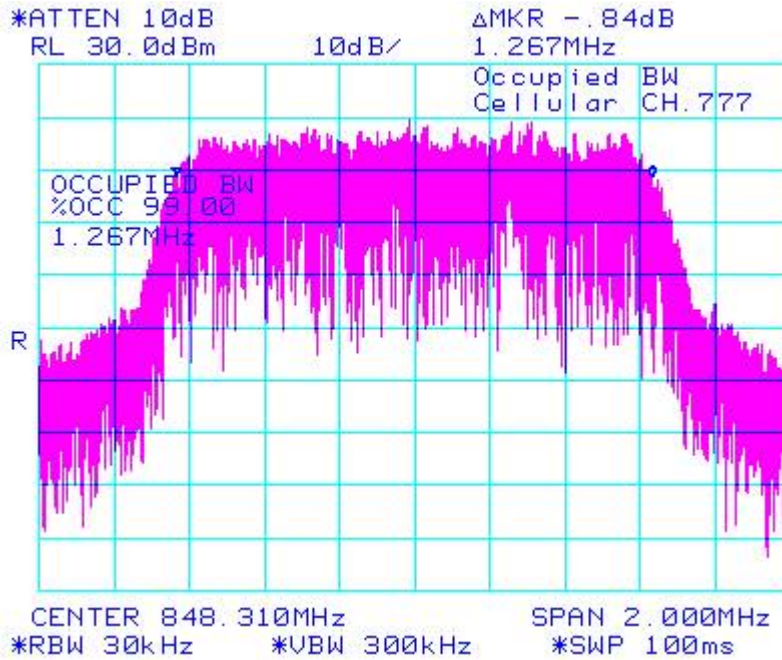
**Figure 14: Occupied Bandwidth, Cellular Middle Channel**



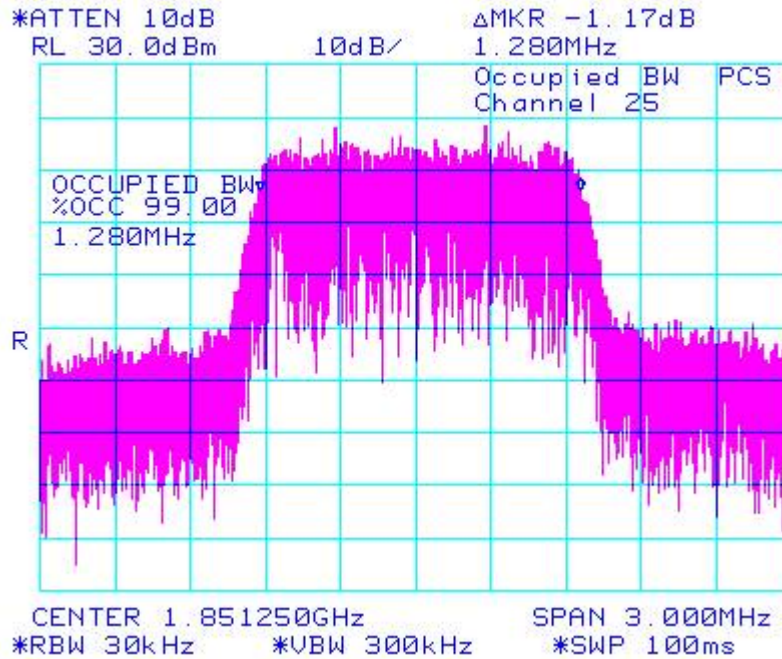
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**Conducted Emission Test Results cont'd**

**Figure 15: Occupied Bandwidth, Cellular High Channel**



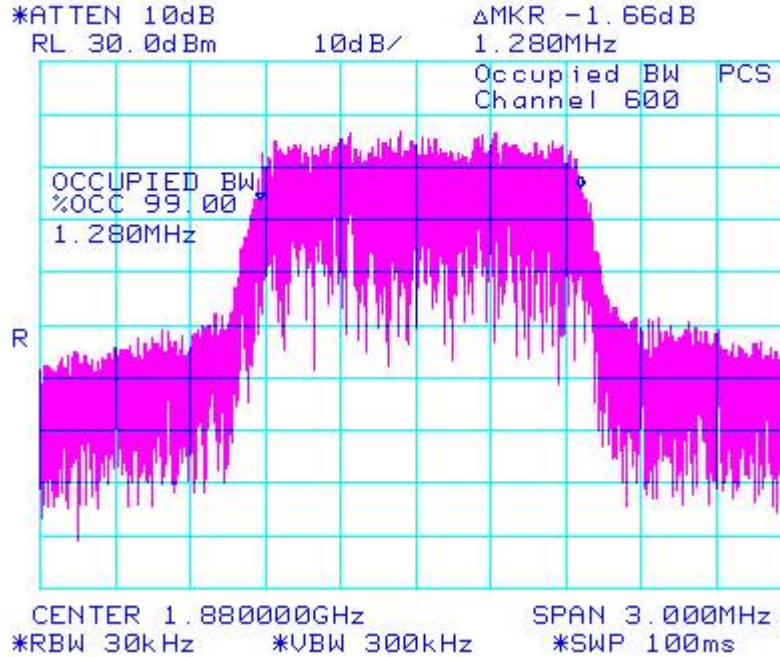
**Figure 16: Occupied Bandwidth, PCS Low Channel**



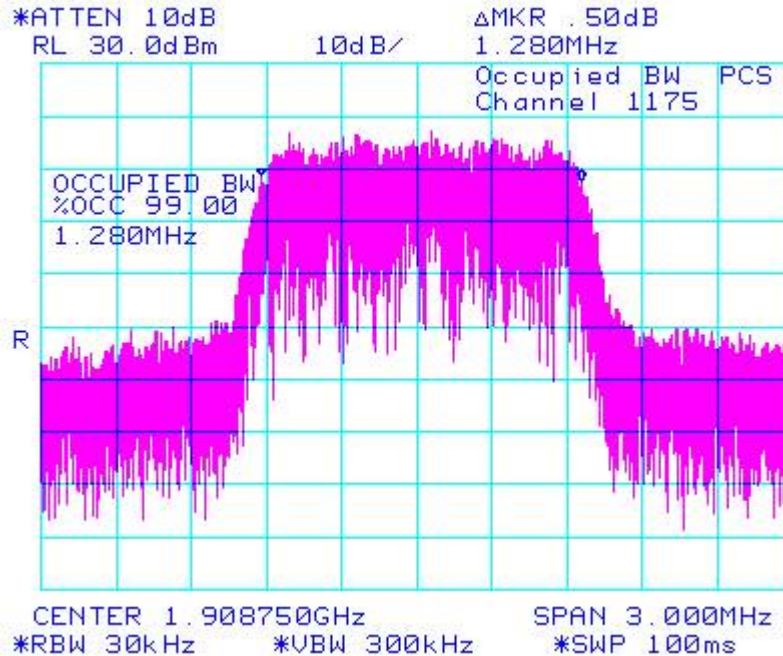
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Conducted Emission Test Results cont'd

**Figure 17: Occupied Bandwidth, PCS Middle Channel**



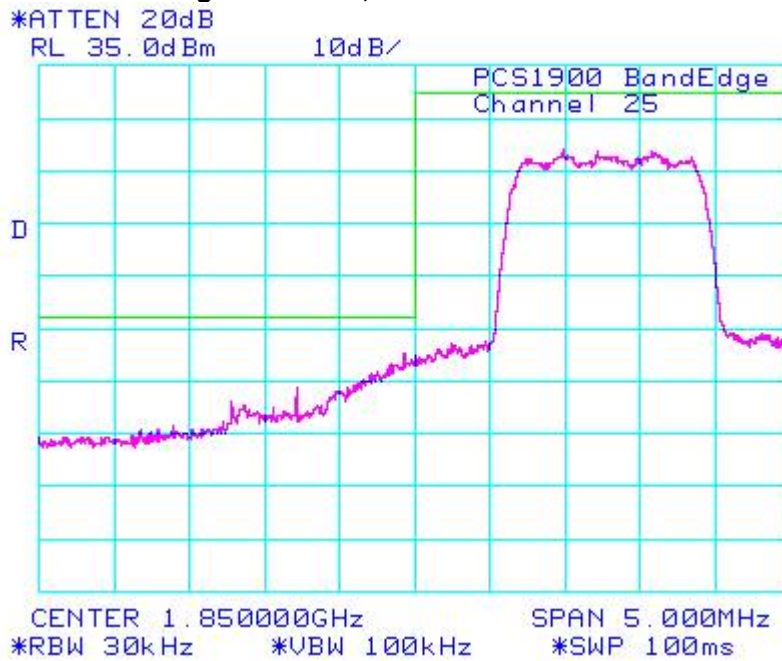
**Figure 18: Occupied Bandwidth, PCS High Channel**



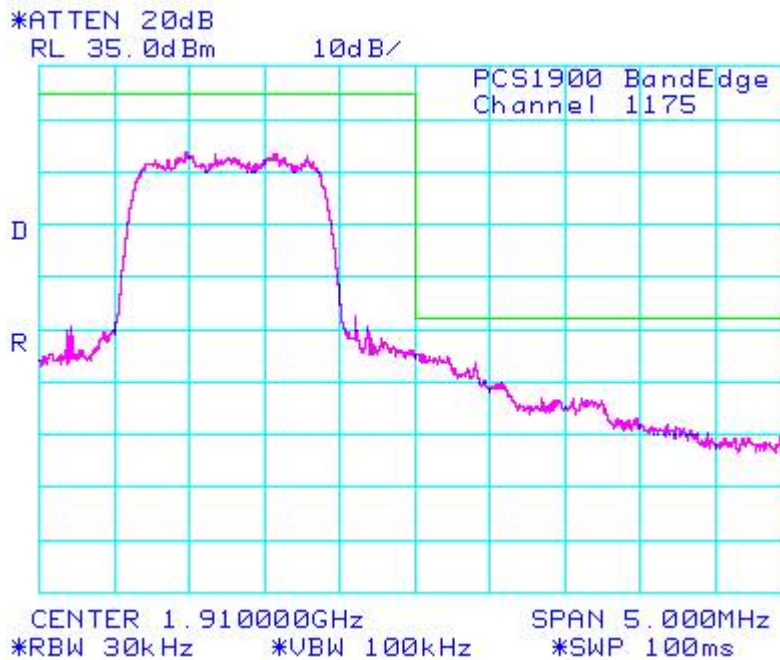
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**Figure 19: PCS, Low Channel Mask**



**Figure 20: PCS, High Channel Mask**



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## APPENDIX 2 – CONDUCTED RF OUTPUT POWER TEST DATA

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### Conducted RF Output Power Test Data

The conducted RF output power was measured using the CDMA base station simulator, Agilent, model 8960. 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.

### Test Results

Band	Channel	1x EvDO (153.6kbps)	CDMA2000 RC	SO2 Loopback	SO55 Loopback	TDSO SO32
CDMA 800	1013	24.73	RC1	24.68	24.68	-
			RC3	24.74	<b>24.74</b>	24.73
	384	24.52	RC1	24.47	24.44	-
			RC3	24.55	<b>24.56</b>	24.52
	777	24.58	RC1	24.52	24.52	-
			RC3	24.57	24.57	<b>24.58</b>
Band	Channel	1x EvDO (153.6kbps)	CDMA2000 RC	SO2 Loopback	SO55 Loopback	TDSO SO32
CDMA 1900	25	23.07	RC1	23.07	23.05	-
			RC3	23.15	<b>23.27</b>	23.18
	600	23.44	RC1	23.42	23.42	-
			RC3	<b>23.48</b>	23.47	23.47
	1175	23.52	RC1	23.35	23.34	-
			RC3	23.42	23.44	<b>23.49</b>

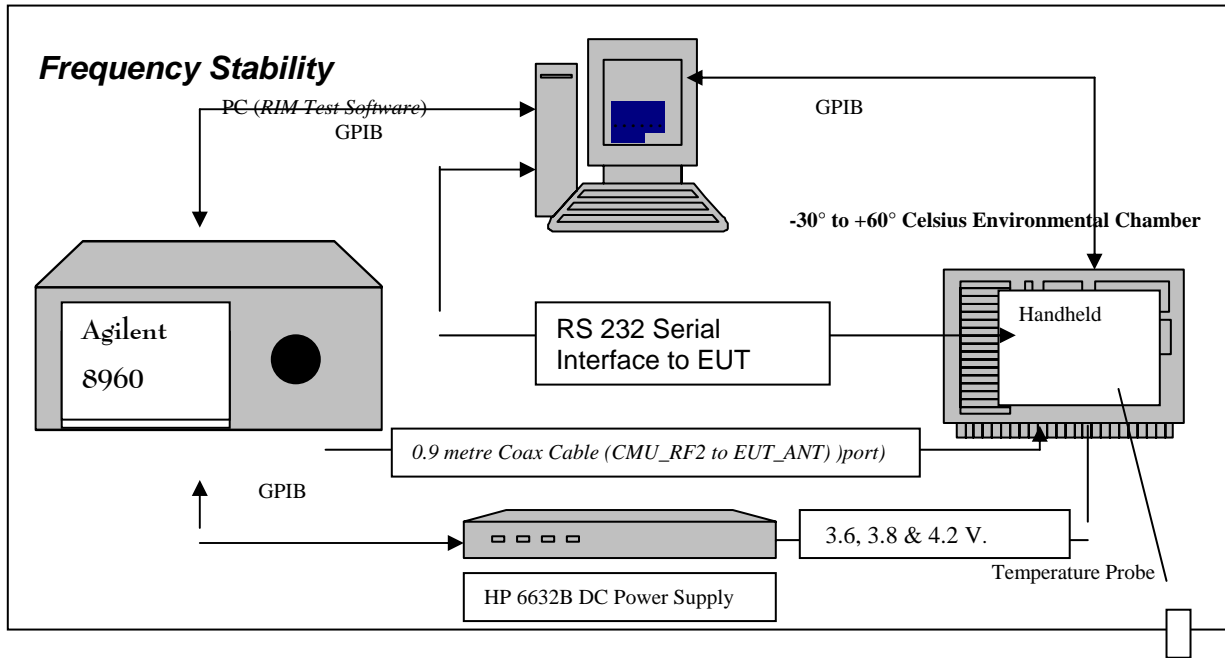
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### APPENDIX 3 – FREQUENCY STABILITY TEST DATA



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### Frequency Stability Test Data



#### CFR 47 Chapter 1 - Federal Communications Commission Rules

##### Part 2 Required Measurements

- 2.995 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 RBF20CW handheld, (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)
1851.20	1.40
1880.00	1.40
1908.75	1.40

Cellular Frequency (MHz)	Cable loss (dB)
824.70	0.90
836.52	0.90
848.31	0.90

**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 3.8 volts to 4.2 volts nominal 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, 3.8 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  $-30^{\circ}\text{C}$  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 3.8 Volts
12. Increase temperature by  $10^{\circ}\text{C}$  and soak for 1/2 hour.
13. Repeat steps 4 - 12 for temperatures  $-30^{\circ}\text{C}$  to  $60^{\circ}\text{C}$ .
14. Repeat steps 5 to 10 changing the supply voltage to 4.2 volts

Procedure 5 to 10 was repeated at room temperature ( $20^{\circ}\text{C}$ ) with the power supply voltage set to 3.6, 3.8 and 4.2 volts.

The maximum frequency error in the Cellular band measured was 0.0014 PPM.

The maximum frequency error in the PCS band measured was -0.0024 PPM.

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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	-0.55	-0.0007
384	836.520	3.6	20	0.50	0.0006
777	848.310	3.6	20	-0.32	0.0004

Traffic Channel Number	Cellular Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
1013	824.700	3.8	20	0.88	0.0011
384	836.520	3.8	20	1.19	0.0014
777	848.310	3.8	20	0.36	0.0004

Traffic Channel Number	Cellular Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
1013	824.700	4.2	20	0.52	0.0006
384	836.520	4.2	20	0.23	0.0003
777	848.310	4.2	20	-0.20	-0.0002

<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry Handheld Model RBF20CW	
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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	0.73	0.0009
1013	824.700	3.6	-20	0.57	0.0007
1013	824.700	3.6	-10	1.19	<b>0.0014</b>
1013	824.700	3.6	0	-0.78	-0.0009
1013	824.700	3.6	10	1.02	0.0012
1013	824.700	3.6	20	-0.55	-0.0007
1013	824.700	3.6	30	-0.35	-0.0004
1013	824.700	3.6	40	-0.48	-0.0006
1013	824.700	3.6	50	-0.12	-0.0001
1013	824.700	3.6	60	-0.90	-0.0011

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
1013	824.700	3.8	-30	-0.54	-0.0007
1013	824.700	3.8	-20	0.28	0.0003
1013	824.700	3.8	-10	0.46	0.0006
1013	824.700	3.8	0	-0.09	-0.0001
1013	824.700	3.8	10	-0.30	-0.0004
1013	824.700	3.8	20	0.88	0.0011
1013	824.700	3.8	30	0.03	0.0000
1013	824.700	3.8	40	-0.59	-0.0007
1013	824.700	3.8	50	-0.40	-0.0005
1013	824.700	3.8	60	0.00	0.0000

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
1013	824.700	4.2	-30	-0.07	-0.0001
1013	824.700	4.2	-20	0.11	0.0001
1013	824.700	4.2	-10	-0.21	-0.0003
1013	824.700	4.2	0	0.07	0.0001
1013	824.700	4.2	10	0.65	0.0008
1013	824.700	4.2	20	0.52	0.0006
1013	824.700	4.2	30	-0.64	-0.0008
1013	824.700	4.2	40	-0.29	-0.0003
1013	824.700	4.2	50	0.02	0.0000
1013	824.700	4.2	60	0.53	0.0006

<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry Handheld Model RBF20CW	
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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	0.06	0.0001
384	836.520	3.6	-20	-0.03	0.0000
384	836.520	3.6	-10	-0.53	-0.0006
384	836.520	3.6	0	-0.22	-0.0003
384	836.520	3.6	10	0.03	0.0000
384	836.520	3.6	20	0.50	0.0006
384	836.520	3.6	30	-0.45	-0.0005
384	836.520	3.6	40	-0.06	-0.0001
384	836.520	3.6	50	1.10	0.0013
384	836.520	3.6	60	-0.64	-0.0008

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
384	836.520	3.8	-30	-0.97	-0.0012
384	836.520	3.8	-20	-0.63	-0.0008
384	836.520	3.8	-10	-0.11	-0.0001
384	836.520	3.8	0	-0.07	-0.0001
384	836.520	3.8	10	-0.60	-0.0007
384	836.520	3.8	20	1.19	<b>0.0014</b>
384	836.520	3.8	30	-0.15	-0.0002
384	836.520	3.8	40	-0.54	-0.0006
384	836.520	3.8	50	-0.45	-0.0005
384	836.520	3.8	60	0.14	0.0002

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
384	836.520	4.2	-30	-0.25	-0.0003
384	836.520	4.2	-20	-0.35	-0.0004
384	836.520	4.2	-10	0.42	0.0005
384	836.520	4.2	0	0.17	0.0002
384	836.520	4.2	10	-0.29	-0.0003
384	836.520	4.2	20	0.23	0.0003
384	836.520	4.2	30	-0.32	-0.0004
384	836.520	4.2	40	-0.25	-0.0003
384	836.520	4.2	50	-0.09	-0.0001
384	836.520	4.2	60	0.05	0.0001

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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	0.07	0.0001
777	848.310	3.6	-20	-0.35	-0.0004
777	848.310	3.6	-10	0.41	0.0005
777	848.310	3.6	0	0.54	0.0006
777	848.310	3.6	10	0.27	0.0003
777	848.310	3.6	20	0.32	0.0004
777	848.310	3.6	30	0.09	0.0001
777	848.310	3.6	40	0.29	0.0003
777	848.310	3.6	50	-0.71	-0.0008
777	848.310	3.6	60	0.48	0.0006

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
777	848.310	3.8	-30	0.05	0.0001
777	848.310	3.8	-20	0.50	0.0006
777	848.310	3.8	-10	-0.70	-0.0008
777	848.310	3.8	0	-0.29	-0.0003
777	848.310	3.8	10	-0.47	-0.0006
777	848.310	3.8	20	0.36	0.0004
777	848.310	3.8	30	0.78	0.0009
777	848.310	3.8	40	0.09	0.0001
777	848.310	3.8	50	-0.38	-0.0004
777	848.310	3.8	60	0.33	0.0004

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
777	848.310	4.2	-30	0.01	0.0000
777	848.310	4.2	-20	-0.58	-0.0007
777	848.310	4.2	-10	-0.90	-0.0011
777	848.310	4.2	0	0.13	0.0002
777	848.310	4.2	10	0.72	0.0008
777	848.310	4.2	20	-0.20	-0.0002
777	848.310	4.2	30	0.15	0.0002
777	848.310	4.2	40	-0.23	-0.0003
777	848.310	4.2	50	-0.99	-0.0012
777	848.310	4.2	60	0.31	0.0004

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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	3.5	20	-1.06	-0.0006
600	1880.00	3.5	20	0.26	0.0001
1175	1908.75	3.5	20	-0.13	-0.0001

Traffic Channel Number	PCS Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
25	1851.20	3.8	20	1.13	0.0006
600	1880.00	3.8	20	-0.72	-0.0004
1175	1908.75	3.8	20	-0.02	0.0000

Traffic Channel Number	PCS Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
25	1851.20	4.2	20	-2.40	-0.0013
600	1880.00	4.2	20	-0.23	-0.0001
1175	1908.75	4.2	20	-2.20	-0.0012



<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry Handheld Model RBF20CW	
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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	-4.43	<b>-0.0024</b>
25	1851.20	3.6	-20	-0.84	-0.0005
25	1851.20	3.6	-10	-3.55	-0.0019
25	1851.20	3.6	0	-0.92	-0.0005
25	1851.20	3.6	10	1.75	0.0009
25	1851.20	3.6	20	-1.06	-0.0006
25	1851.20	3.6	30	-1.73	-0.0009
25	1851.20	3.6	40	-2.50	-0.0013
25	1851.20	3.6	50	-2.12	-0.0011
25	1851.20	3.6	60	-0.88	-0.0005

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
25	1851.20	3.8	-30	-0.98	-0.0005
25	1851.20	3.8	-20	-3.64	-0.0020
25	1851.20	3.8	-10	-2.62	-0.0014
25	1851.20	3.8	0	-0.64	-0.0003
25	1851.20	3.8	10	-1.92	-0.0010
25	1851.20	3.8	20	1.13	0.0006
25	1851.20	3.8	30	2.71	0.0015
25	1851.20	3.8	40	-0.39	-0.0002
25	1851.20	3.8	50	-0.80	-0.0004
25	1851.20	3.8	60	-0.16	-0.0001

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
25	1851.20	4.2	-30	-2.05	-0.0011
25	1851.20	4.2	-20	0.00	0.0000
25	1851.20	4.2	-10	-0.43	-0.0002
25	1851.20	4.2	0	-2.05	-0.0011
25	1851.20	4.2	10	-1.44	-0.0008
25	1851.20	4.2	20	-2.40	-0.0013
25	1851.20	4.2	30	1.36	0.0007
25	1851.20	4.2	40	-0.73	-0.0004
25	1851.20	4.2	50	-0.83	-0.0004
25	1851.20	4.2	60	-0.92	-0.0005

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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	0.29	0.0002
600	1880.00	3.6	-20	0.99	0.0005
600	1880.00	3.6	-10	0.76	0.0004
600	1880.00	3.6	0	-1.16	-0.0006
600	1880.00	3.6	10	-0.23	-0.0001
600	1880.00	3.6	20	0.26	0.0001
600	1880.00	3.6	30	0.29	0.0002
600	1880.00	3.6	40	-0.97	-0.0005
600	1880.00	3.6	50	2.77	0.0015
600	1880.00	3.6	60	1.13	0.0006

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
600	1880.00	3.8	-30	1.34	0.0007
600	1880.00	3.8	-20	0.50	0.0003
600	1880.00	3.8	-10	-1.12	-0.0006
600	1880.00	3.8	0	-1.22	-0.0006
600	1880.00	3.8	10	-0.66	-0.0003
600	1880.00	3.8	20	-0.72	-0.0004
600	1880.00	3.8	30	0.60	0.0003
600	1880.00	3.8	40	0.38	0.0002
600	1880.00	3.8	50	0.79	0.0004
600	1880.00	3.8	60	-2.34	-0.0012

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
600	1880.00	4.2	-30	-1.14	-0.0006
600	1880.00	4.2	-20	1.25	0.0007
600	1880.00	4.2	-10	-2.00	-0.0011
600	1880.00	4.2	0	-0.84	-0.0004
600	1880.00	4.2	10	-0.77	-0.0004
600	1880.00	4.2	20	-0.23	-0.0001
600	1880.00	4.2	30	1.31	0.0007
600	1880.00	4.2	40	1.32	0.0007
600	1880.00	4.2	50	1.61	0.0009
600	1880.00	4.2	60	-0.66	-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	-0.49	-0.0003
1175	1908.75	3.6	-20	0.72	0.0004
1175	1908.75	3.6	-10	1.09	0.0006
1175	1908.75	3.6	0	0.71	0.0004
1175	1908.75	3.6	10	-1.15	-0.0006
1175	1908.75	3.6	20	-0.13	-0.0001
1175	1908.75	3.6	30	1.67	0.0009
1175	1908.75	3.6	40	0.89	0.0005
1175	1908.75	3.6	50	-0.82	-0.0004
1175	1908.75	3.6	60	-0.37	-0.0002

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
1175	1908.75	3.8	-30	-1.74	-0.0009
1175	1908.75	3.8	-20	1.36	0.0007
1175	1908.75	3.8	-10	-0.49	-0.0003
1175	1908.75	3.8	0	-0.61	-0.0003
1175	1908.75	3.8	10	-1.20	-0.0006
1175	1908.75	3.8	20	-0.02	0.0000
1175	1908.75	3.8	30	-0.35	-0.0002
1175	1908.75	3.8	40	0.19	0.0001
1175	1908.75	3.8	50	1.11	0.0006
1175	1908.75	3.8	60	0.24	0.0001

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
1175	1908.75	4.2	-30	-0.83	-0.0004
1175	1908.75	4.2	-20	0.09	0.0000
1175	1908.75	4.2	-10	-0.63	-0.0003
1175	1908.75	4.2	0	1.50	0.0008
1175	1908.75	4.2	10	-0.96	-0.0005
1175	1908.75	4.2	20	-2.20	-0.0012
1175	1908.75	4.2	30	0.15	0.0001
1175	1908.75	4.2	40	1.14	0.0006
1175	1908.75	4.2	50	-1.20	-0.0006
1175	1908.75	4.2	60	0.61	0.0003

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#### APPENDIX 4 - RADIATED EMISSIONS TEST DATA

<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry Handheld Model RBF20CW	
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### Radiated Emissions Test Data Results

The environmental test conditions were:

Temperature 22°C

Pressure 1016mb

Relative Humidity 38%

Test distance was 3.0 metres.

#### Cellular Band

EUT				Rx Antenna		Spectrum Analyzer		Substitution Method				
Type	Ch	Frequency (MHz)	Band	Type	Pol.	Reading (dBuV)	Max (V,H) (dBuV)	Pol. Tx-Rx	Reading (dBm)	Corrected Reading (relative to dipole)	Limit (dBm)	Diff to Limit (dB)
Cellular Band (ERP), CDMA2000, CH 1013 (RC3, SO55), CH 384 (RC3, SO55), CH 777 (RC3, SO32)												
Handheld Standalone, Vertical												
F0	1013	824.70	800	Dipole	V	82.2	82.2	V V	8	23.15	39.00	-15.9
F0	1013	824.70	800	Dipole	H	64.3		H H	6.8			
F0	384	836.52	800	Dipole	V	81.6	81.6	V V	8.3	23.45	39.00	-15.6
F0	384	836.52	800	Dipole	H	69.8		H H	6.5			
F0	777	848.32	800	Dipole	V	80.9	80.9	V V	8.1	23.25	39.00	-15.8
F0	777	848.32	800	Dipole	H	65.5		H H	5.9			
Cellular Band (ERP), EVDO												
Handheld Standalone, Vertical												
F0	1013	824.70	800	Dipole	V	82.2	81.6	V V	8.3	23.45	39.00	-15.6
F0	1013	824.70	800	Dipole	H	68.3		H H	7.1			
F0	384	836.52	800	Dipole	V	81.7	90.9	V V	8.4	23.55	39.00	-15.5
F0	384	836.52	800	Dipole	H	64.2		H H	6.5			
F0	777	848.32	800	Dipole	V	81.7	80.1	V V	8.7	<b>23.85</b>	39.00	-15.2
F0	777	848.32	800	Dipole	H	66.4		H H	6.5			

ERP = Tracking Generator Level + Antenna Gain – Cable Loss + Preamp

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Radiated Emissions Test Data Results cont'd

Test distance was 3.0 metres.

Cellular Band

EUT				Rx Antenna		Spectrum Analyzer		Substitution Method				
Type	Ch	Frequency (MHz)	Band	Type	Pol.	Reading (dBuV)	Max (V,H) (dBuV)	Pol. Tx-Rx	Reading (dBm)	Corrected Reading (relative to dipole)	Limit (dBm)	Diff to Limit (dB)
<b>Cellular Band (Harmonics), CDMA2000, CH 1013 (RC3, SO55), CH 384 (RC3, SO55), CH 777 (RC3, SO32)</b> Handheld Standalone, Vertical												
<b>Low Channel – 824.70 MHz</b>												
2 <sup>nd</sup>	1013	1649.40	800	Horn	V	51.5	51.5	V-V	-20	-48.6	-13	-35.6
2 <sup>nd</sup>	1013	1649.40	800	Horn	H	49		H-H	-20.5			
The harmonics were investigated up to the 10 <sup>th</sup> harmonic. Emissions above the 2 <sup>nd</sup> harmonic were in the noise floor (NF)												
<b>Middle Channel – 836.52 MHz</b>												
2 <sup>nd</sup>	384	1673.04	800	Horn	V	49.7	51.6	V-V	-20	-48.6	-13	-35.6
2 <sup>nd</sup>	384	1673.04	800	Horn	H	51.6		H-H	-20.4			
The harmonics were investigated up to the 10 <sup>th</sup> harmonic. Emissions above the 2 <sup>nd</sup> harmonic were in the NF												
<b>High Channel – 848.32 MHz</b>												
2 <sup>nd</sup>	777	1696.64	800	Horn	V	52.9	52.9	V-V	-18.7	-47.1	-13	-34.1
2 <sup>nd</sup>	777	1696.64	800	Horn	H	52.3		H-H	-18.5			
The harmonics were investigated up to the 10 <sup>th</sup> harmonic. Emissions above the 2 <sup>nd</sup> harmonic were in the NF												
<b>Cellular Band (Harmonics), EVDO</b>												
<b>Middle Channel – 836.52 MHz</b>												
2 <sup>nd</sup>	384	1673.04	800	Horn	V	53.1	53.1	V-V	-18.8	-47.12	-13	<b>-34.1</b>
2 <sup>nd</sup>	384	1673.04	800	Horn	H	52		H-H	-18.52			
The harmonics were investigated up to the 10 <sup>th</sup> harmonic. Emissions above the 2 <sup>nd</sup> harmonic were in the NF												

<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry Handheld Model RBF20CW	
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Radiated Emissions Test Data Results cont'd

Test distance was 3.0 metres      Cellular Band and Bluetooth

EUT				Rx Antenna		Spectrum Analyzer		Substitution Method				
Type	Ch	Frequency (MHz)	Band	Type	Pol.	Reading (dBuV)	Max (V,H) (dBuV)	Pol. Tx-Rx	Reading (dBm)	Corrected Reading (relative to dipole)	Limit (dBm)	Diff to Limit (dB)
<b>Cellular Band (Harmonics)</b> , CDMA2000, CH 1013 (RC3, SO55), CH 384 (RC3, SO55), CH 777 (RC3, SO32) Handheld Standalone, Vertical <b>Cell Low Channel – 824.70 MHz</b> <b>Bluetooth Low Channel - 2402.0 MHz</b>												
2 <sup>nd</sup>	1013	1649.40	800	Horn	V	52	52	V-V	-19.6	-48.2	-13	-35.2
2 <sup>nd</sup>	1013	1649.40	800	Horn	H	49.5		H-H	-20			
3 <sup>rd</sup>	1013	2474.10	800	Horn	V	NF	NF	V-V		-	-13	
3 <sup>rd</sup>	1013	2474.20	800	Horn	H	NF		H-H				
The harmonics were investigated up to the 10 <sup>th</sup> harmonic. Emissions above the 3 <sup>rd</sup> harmonic were in the noise floor (NF) <b>Cell Middle Channel – 836.52 MHz</b> <b>Bluetooth Middle Channel - 2441.0 MHz</b>												
2 <sup>nd</sup>	384	1673.04	800	Horn	V	52.4	52.4	V-V	-19	-47.6	-13	-34.6
2 <sup>nd</sup>	384	1673.04	800	Horn	H	51.5		H-H	-19.24			
3 <sup>rd</sup>	384	2509.56	800	Horn	V	NF	NF	V-V		-	-13	
3 <sup>rd</sup>	384	2509.56	800	Horn	H	NF		H-H				
The harmonics were investigated up to the 10 <sup>th</sup> harmonic. Emissions above the 3 <sup>rd</sup> harmonic were in the NF												
<b>High Channel – 848.32 MHz</b> <b>Bluetooth High Channel - 2480.0 MHz</b>												
2 <sup>nd</sup>	777	1696.64	800	Horn	V	53.7	53.7	V-V	-17.9	-46.4	-13	-33.4
2 <sup>nd</sup>	777	1696.64	800	Horn	H	52.5		H-H	-17.8			
3 <sup>rd</sup>	777	2544.96	800	Horn	V	NF	NF	V-V		-	-13	
3 <sup>rd</sup>	777	2544.96	800	Horn	H	NF		H-H				
The harmonics were investigated up to the 10 <sup>th</sup> harmonic. Emissions above the 3 <sup>rd</sup> harmonic were in the NF												

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<b>Cell Middle Channel</b> – 836.52 MHz, EVDO												
<b>Bluetooth Middle Channel</b> - 2441.0 MHz												
2 <sup>nd</sup>	384	1673.04	800	Horn	V	53.3	53.3	V-V	-18.6	-41	-13	-28
2 <sup>nd</sup>	384	1673.04	800	Horn	H	52.9		H-H	-18.4			
3 <sup>rd</sup>	384	2509.56	800	Horn	V	NF	NF	V-V		-	-13	-
3 <sup>rd</sup>	384	2509.56	800	Horn	H	NF		H-H				
The harmonics were investigated up to the 10 <sup>th</sup> harmonic. Emissions above the 3 <sup>rd</sup> harmonic were in the NF												

Test distance was 3.0 metres.

EUT				Rx Antenna		Spectrum Analyzer		Substitution Method				
Type	Ch	Frequency (MHz)	Band	Type	Pol.	Reading (dBuV)	Max (V,H) (dBuV)	Pol. Tx-Rx	Reading (dBm)	Corrected Reading (relative to dipole) (dBm)	Limit (dBm)	Diff to Limit (dB)
<b>Cellular BAND</b>												
<b>RF Local Oscillator (LO)</b>												
Handheld Standalone, vertical position												
<b>Low Channel</b>												
F0	1013	1739.40	800	Horn	V	NF		V-V			-13	
F0	1013	1739.40	800	Horn	H	NF		H-H				
Emissions were in the NF.												
<b>Middle Channel</b>												
F0	384	1763.04	800	Horn	V	NF		V-V			-13	
F0	384	1763.04	800	Horn	H	NF		H-H				
Emissions were in the NF.												
<b>High Channel</b>												
F0	777	1786.62	800	Horn	V	NF		V-V			-13	
F0	777	1786.62	800	Horn	H	NF		H-H				
Emissions were in the NF.												



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Radiated Emissions Test Data Results cont'd

PCS Band

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) (dBm)	Limit (dBm)	Diff to Limit (dB)
PCS BAND (EIRP), CDMA2000 - CH 25 (RC3, SO55), CH 600 (RC3, SO2), CH 1175 (RC3, SO32)												
Handheld Standalone, horizontal												
F0	25	1851.25	1900	Horn	V	82.2	88.6	V-V	-11.32	25.2	33	-7.8
F0	25	1851.25	1900	Horn	H	88.6		H-H	-10.38			
F0	600	1880.00	1900	Horn	V	81.6	86.6	V-V	-13.20	24.0	33	-9.0
F0	600	1880.00	1900	Horn	H	86.6		H-H	-11.60			
F0	1175	1908.75	1900	Horn	V	81	87	V-V	-11.68	24.6	33	-8.4
F0	1175	1908.75	1900	Horn	H	87		H-H	-11.04			
PCS BAND (EIRP), EVDO												
Handheld Standalone, horizontal												
F0	25	1851.25	1900	Horn	V	83	88.9	V-V	-10.14	25.5	33	-7.5
F0	25	1851.25	1900	Horn	H	88.9		H-H	-10.06			
F0	600	1880.00	1900	Horn	V	83.8	89.9	V-V	-9.06	27.4	33	-5.6
F0	600	1880.00	1900	Horn	H	89.9		H-H	-8.20			
F0	1175	1908.75	1900	Horn	V	81.2	85.5	V-V	-13.02	23.0	33	-10.0

EIRP = Tracking Generator Level + Antenna Factor – Cable Loss + Preamp Gain

<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry Handheld Model RBF20CW	
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Radiated Emissions Test Data Results cont'd

PCS Band

Test distance was 3.0 metres.

								Substitution Method				
EUT				Receive Antenna		Spectrum Analyzer		Tracking Generator				
Type	Ch	Frequency (MHz)	Band	Pol. Type	Pol.	Reading (dBuV)	Max (V,H) (dBuV)	Pol. Tx-Rx	Reading (dBm)	Corrected Reading (relative to Isotropic Radiator) (dBm)	Limit (dBm)	Diff to Limit (dB)
<b>PCS BAND (Harmonics), CDMA2000 - CH 25 (RC3, SO55), CH 600 (RC3, SO2), CH 1175 (RC3, SO32)</b>												
Handheld Standalone, horizontal position												
<b>Low Channel</b> 1851.25 MHz												
2 <sup>nd</sup>	25	3702.50	1900	Horn	V	59.4	59.4	V-V	0.36	-21.44	-13	-8.4
2 <sup>nd</sup>	25	3702.50	1900	Horn	H	59.3		H-H	1.16			
3 <sup>rd</sup>	25	5553.75	1900	Horn	V	NF	NF	V-V		-	-13	-
3 <sup>rd</sup>	25	5553.75	1900	Horn	H	NF		H-H				
The harmonics were investigated up to the 10th harmonic. Emissions above the 3 <sup>rd</sup> harmonic were in the NF												
<b>Middle Channel</b> 1880.00 MHz												
2 <sup>nd</sup>	600	3760.00	1900	Horn	V	58.2	59.5	V-V	2.20	-20.4	-13	-7.4
2 <sup>nd</sup>	600	3760.00	1900	Horn	H	59.5		H-H	2.10			
3 <sup>rd</sup>	600	5640.00	1900	Horn	V	NF	NF	V-V		-	-13	-
3 <sup>rd</sup>	600	5640.00	1900	Horn	H	NF		H-H				
The harmonics were investigated up to the 10th harmonic. Emissions above the 3 <sup>rd</sup> harmonic were in the NF												
<b>High Channel</b> 1908.75 MHz												
2 <sup>nd</sup>	600	3760.00	1900	Horn	V	58.1	59	V-V	0.68	-21.8	-13	-8.8
2 <sup>nd</sup>	600	3760.00	1900	Horn	H	59		H-H	0.80			
3 <sup>rd</sup>	600	5640.00	1900	Horn	V	NF	NF	V-V		-	-13	-
3 <sup>rd</sup>	600	5640.00	1900	Horn	H	NF		H-H				
The harmonics were investigated up to the 10th harmonic. Emissions above the 3 <sup>rd</sup> harmonic were in the NF												

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Radiated Emissions Test Data Results cont'd  
PCS Band

<b>Middle Channel</b> 1880.00 MHz, EVDO												
Type	Ch	Frequency (MHz)	Band	Pol. Type	Pol.	Reading (dBuV)	Max (V,H) (dBuV)	Pol. Tx-Rx	Reading (dBm)	Corrected Reading (relative to Isotropic Radiator) (dBm)	Limit (dBm)	Diff to Limit (dB)
2 <sup>nd</sup>	600	3760.00	1900	Horn	V	59.4	60.4	V-V	3.04	-19.56	-13	<b>-6.6</b>
2 <sup>nd</sup>	600	3760.00	1900	Horn	H	60.4		H-H	2.94			
3 <sup>rd</sup>	600	5640.00	1900	Horn	V	NF	NF	V-V		-	-13	-
3 <sup>rd</sup>	600	5640.00	1900	Horn	H	NF		H-H				
The harmonics were investigated up to the 10th harmonic. Emissions above the 3 <sup>rd</sup> harmonic were in the NF												

EUT										Substitution Method			
EUT				Receive Antenna		Spectrum Analyzer		Tracking Generator					
Type	Ch	Frequency (MHz)	Band	Pol. Type	Pol.	Reading (dBuV)	Max (V,H) (dBuV)	Pol. Tx-Rx	Reading (dBm)	Corrected Reading (relative to Isotropic Radiator) (dBm)	Limit (dBm)	Diff to Limit (dB)	
<b>PCS BAND (Harmonics)</b> , CDMA2000 - CH 25 (RC3, SO55), CH 600 (RC3, SO2), CH 1175 (RC3, SO32) Handheld Standalone, horizontal position													
<b>PCS Low Channel</b> 1851.25 MHz <b>Bluetooth Low Channel</b> - 2402.0 MHz													
2 <sup>nd</sup>	25	3702.50	1900	Horn	V	58.8	60.1	V-V	1.50	-20.9	-13	-7.9	
2 <sup>nd</sup>	25	3702.50	1900	Horn	H	60.1		H-H	1.70				
3 <sup>rd</sup>	25	5553.75	1900	Horn	V	NF	NF	V-V		-	-13	-	
3 <sup>rd</sup>	25	5553.75	1900	Horn	H	NF		H-H					
The harmonics were investigated up to the 10th harmonic. Emissions above the 3 <sup>rd</sup> harmonic were in the NF													
<b>PCS Middle Channel</b> 1880.00 MHz <b>Bluetooth Middle Channel</b> - 2441.0 MHz													
2 <sup>nd</sup>	600	3760.00	1900	Horn	V	57.2	58.1	V-V	0.58	-22.0	-13	-9.0	
2 <sup>nd</sup>	600	3760.00	1900	Horn	H	58.1		H-H	0.54				
3 <sup>rd</sup>	600	5640.00	1900	Horn	V	NF	NF	V-V		-	-13	-	
3 <sup>rd</sup>	600	5640.00	1900	Horn	H	NF		H-H					
The harmonics were investigated up to the 10th harmonic.													

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Emissions above the 3<sup>rd</sup> harmonic were in the NF

**Radiated Emissions Test Data Results cont'd**  
**PCS Band**

**PCS High Channel** 1908.75 MHz  
**Bluetooth High Channel** - 2480.0 MHz

2 <sup>nd</sup>	600	3760.00	1900	Horn	V	58.6	58.6	V-V	0.26	-22.34	-13	-9.3
2 <sup>nd</sup>	600	3760.00	1900	Horn	H	58.4		H-H	0.26			
3 <sup>rd</sup>	600	5640.00	1900	Horn	V	NF	NF	V-V		-	-13	-
3 <sup>rd</sup>	600	5640.00	1900	Horn	H	NF		H-H				

The harmonics were investigated up to the 10th harmonic.  
Emissions above the 3<sup>rd</sup> harmonic were in the NF  
**PCS Middle Channel 1880.00 MHz, EVDO**  
**Bluetooth Middle Channel** - 2441.0 MHz

2 <sup>nd</sup>	600	3760.00	1900	Horn	V	61.5	62.4	V-V	4.64	-17.44	-13	<b>-4.4</b>
2 <sup>nd</sup>	600	3760.00	1900	Horn	H	62.4		H-H	5.16			
3 <sup>rd</sup>	600	5640.00	1900	Horn	V	NF	NF	V-V		-	-13	-
3 <sup>rd</sup>	600	5640.00	1900	Horn	H	NF		H-H				

The harmonics were investigated up to the 10th harmonic.  
Emissions above the 3<sup>rd</sup> harmonic were in the NF

								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) (dBm)	Limit (dBm)	Diff to Limit (dB)
<b>PCS Band – RF LO</b> Transmit mode with the handheld in standalone horizontal position. <b>Low Channel</b>												
F0	25	1716.67	1900	Horn	V	NF	NF	V-V	NF	-	-13	-
F0	25	1716.67	1900	Horn	H	NF		H-H				
Emissions were in the NF. <b>Middle Channel</b>												
F0	600	1742.22	1900	Horn	V	NF	NF	V-V	NF	-	-13	-
F0	600	1742.22	1900	Horn	H	NF		H-H				
Emissions were in the NF.												

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Radiated Emissions Test Results cont'd  
PCS Band

Test distance was 3.0 metres.

EUT				Rx Antenna		Spectrum Analyzer		Substitution Method				
Type	Ch	Frequency (MHz)	Band	Type	Pol.	Reading (dBuV)	Max (V,H) (dBuV)	Pol. Tx-Rx	Reading (dBm)	Corrected Reading (relative to Isotropic Radiator) (dBm)	Limit (dBm)	Diff to Limit (dB)
<b><u>High Channel</u></b>												
F0	1175	1767.78	1900	Horn	V	NF	NF	V-V		-	-13	-
F0	1175	1767.78	1900	Horn	H	NF		H-H				
Emissions were in the NF.												