EMI Test Report

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

RIM Testing Services (RTS)

A division of Research In Motion Limited

REPORT NO.: RTS-0491-0702-03

PRODUCT MODEL NO.: RBK41CG
TYPE NAME: BlackBerry
FCC ID: L6ARBK40CG
IC: 2503A-RBK40CG

DATE: 27 March 2007

Statement of Performance:

The BlackBerry Handheld, model RBK41CG, part number CER-14121-001 Rev. 3, 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:

Caitlin O'Neill
Compliance Specialist
Date: 27 Mar 2007

Tested and reviewed by:

Maurice Battler
Compliance Specialist
Date: 27 Mar 2007

Tested and reviewed by:

Masud S. Attayi, P.Eng.
Team Lead, Regulatory Compliance
Date: 30 Mar 2007

Approved by:

Paul G. Cardinal, Ph.D.
Director
Date: 30 Mar 2007

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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, 2005
- FCC CFR 47 Part 22, Subpart H, Cellular Radiotelephone Services, Oct. 1, 2005
- FCC CFR 47 Part 24 Subpart E, Broadband PCS, Oct 1. 2005
- 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

1. Document number RTS-0491-RBK41CG-01

C. Product Identification

Manufactured by Research In Motion Limited 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 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 January 24 to March 27, 2007.
The sample EUT included:

1. BlackBerry Handheld, model RBK41CG, CER-14121-001 Rev. 1, PIN: 3016B213
2. BlackBerry Handheld, model RBK41CG, CER-14121-001 Rev. 1, PIN: 3016B678
3. BlackBerry Handheld, model RBK41CG, CER-14121-001 Rev. 1, PIN: 3016B247

Conducted RF measurements were performed on handheld PIN 3016B213. Radiated Emissions measurements were performed on handheld PIN 3016B678 and 3016B247.

To view the differences between CER-14121-001 Rev. 1 and CER-14121-001 Rev. 3, see document number RTS-0491-RBK41CG-01.

Only the differences that maybe impacted by the changes were re-measured.

The transmit frequency bands operating in North America for the Handheld are: Cellular 824 to 849 MHz, PCS 1867.5 to 1872.5 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 US41070110
2) Communication Tester, Rohde & Schwarz, model CMU 200, serial number 837493/073
3) DC Power Supply, HP, model 6632B, serial number US37472178

E. Test Voltage

The ac input voltage was 120 volts, 60 Hz 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	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	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

SPECIFICATION		TEST TYPE	RESULT	TEST DATA APPENDIX
FCC CFR 47	IC			
Part 22.917 Part 22.901(d)	RSS-132	Conducted Spurious Emissions	Pass	1
Part 2.1057 Part 24.238	RSS-133	Conducted Spurious Emissions	Pass	1
Part 2.202 Part 22.917	RSS-132	Occupied Bandwidth and Channel Mask	Pass	1
Part 2.202 Part 24.238	RSS-133	Occupied Bandwidth and Channel Mask	Pass	1
Part 2.1046(a)	RSS-133 RSS-132	Conducted RF Output Power	Pass	2
Part 22.917	RSS-132	Frequency Stability vs. Temperature and Voltage	Pass	3
Part 24.235	RSS-133	Frequency Stability vs. Temperature and Voltage	Pass	3
Part 22, Subpart H	RSS-132	Radiated Spurious/Harmonic Emissions, ERP, LO	Pass	4
Part 24, Subpart E	RSS-133	Radiated Spurious/Harmonic Emissions, EIRP, LO	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 CDMA2000 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.

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 CDMA2000 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.

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 were measured in CDMA2000 and 1xEVDO mode on the low, middle and high 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 channels were measured in CDMA2000 and 1xEVDO mode on the low, middle and high channels.
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 were measured in CDMA2000 and 1xEVDO mode on the low, middle and high channels.
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 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 **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 23.8 dBm at 836.52 MHz (channel 384).
The highest EIRP in the PCS band measured was 26.5 dBm at 1880.00 MHz (channel 600).

The radiated spurious emissions were measured up to the 10^{th} harmonic for low, middle and high channels in the Cellular and PCS bands.
The lowest test margin for the cellular band was 14.71 dB below the limit at 817.38 MHz.
The lowest test margin for the PCS band was 17.86 dB below the limit at 18701.05 MHz.

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.

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.

I. Compliance Test Equipment Used

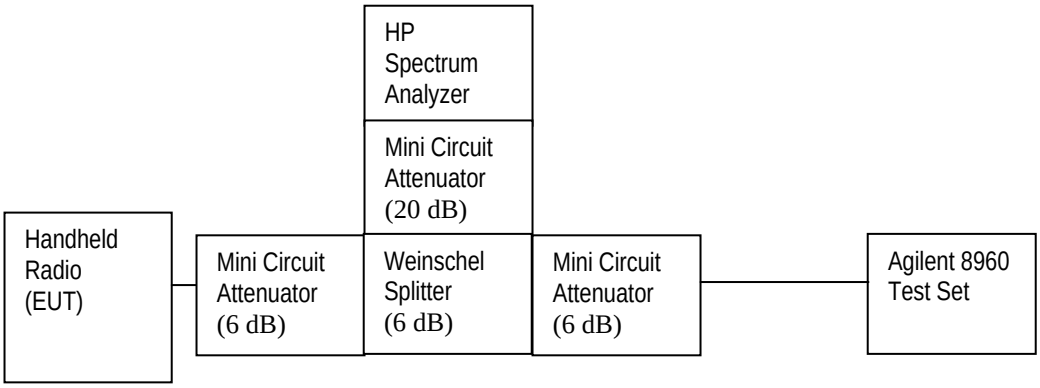
UNIT	MANUFACTURER	MODEL	SERIAL NUMBER	CAL DUE DATE (YY MM DD)	USE
Preamplifier	Sonoma	310N/11909A	185831	07-11-23	Radiated Emissions
Preamplifier system	TDK RF Solutions	PA-02	080010	07-11-22	Radiated Emissions
Hybrid Log Antenna	TDK	HLP-3003C	017401	08-08-04	Radiated Emissions
Horn Antenna	TDK	HRN-0118	030201	09-01-17	Radiated Emissions
Horn Antenna	TDK	HRN-0118	030101	08-07-26	Radiated Emissions
Horn Antenna	Emco	3116	2538	08-09-25	Radiated Emissions
Preamplifier	TDK	18-26	3002	07-11-23	Radiated Emissions
Dipole Antenna	Schwarzbeck	UHAP	973	08-12-18	Radiated Emissions
Dipole Antenna	Schwarzbeck	UHAP	974	08-09-28	Radiated Emissions
Universal Radio Communication Tester	Rohde & Schwarz	CMU 200	837493/073	07-12-01	Radiated Emissions
CDMA base station	Agilent	8960	US41070110	07-08-03	Radiated Emissions
CBT Bluetooth Tester	Rohde & Schwarz	CBT	100034	07-06-15	RF Conducted Power
EMI Receiver	Rohde & Schwarz	ESIB-40	100255	07-05-11	Radiated Emissions
Spectrum Analyzer	HP	8563E	3745A08112	07-09-20	RF Conducted Emissions
DC Power Supply	HP	6632B	US37472178	07-09-14	RF Conducted Emissions
Environment Monitor	Control Company	1870	230355190	07-12-28	Radiated Emissions
Environment Monitor	Control Company	1870	230355189	07-12-28	RF Conducted Emissions
Temperature Probe	Hart Scientific	61161-302	21352860	07-08-31	Frequency Stability
Environmental Chamber	ESPEC Corp.	SH-240S1	91005607	N/R	Frequency Stability

APPENDIX 1 - CONDUCTED RF EMISSIONS TEST DATA/PLOTS

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 on Handheld PIN 3016B213.

Test Setup Diagram



The environmental test conditions were:

Temperature	24ºC
Pressure	1011mb
Relative Humidity	21%

Conducted RF Emission Test Data cont'd

Date of test: January 31, 2007

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 in CDMA2000 mode

Cellular Frequency (MHz)	99% Occupied Bandwidth (MHz)
824.700	1.273
836.520	1.273
848.310	1.280

PCS Frequency (MHz)	99% Occupied Bandwidth (MHz)
1851.200	1.300
1880.000	1.290
1908.750	1.290

Measurement Plots for Cellular and PCS in CDMA2000 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 20 for plots of the channel mask results.

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

Conducted Emission Test Results cont'd

Figure 1: Cellular, Spurious Conducted Emissions, Low channel

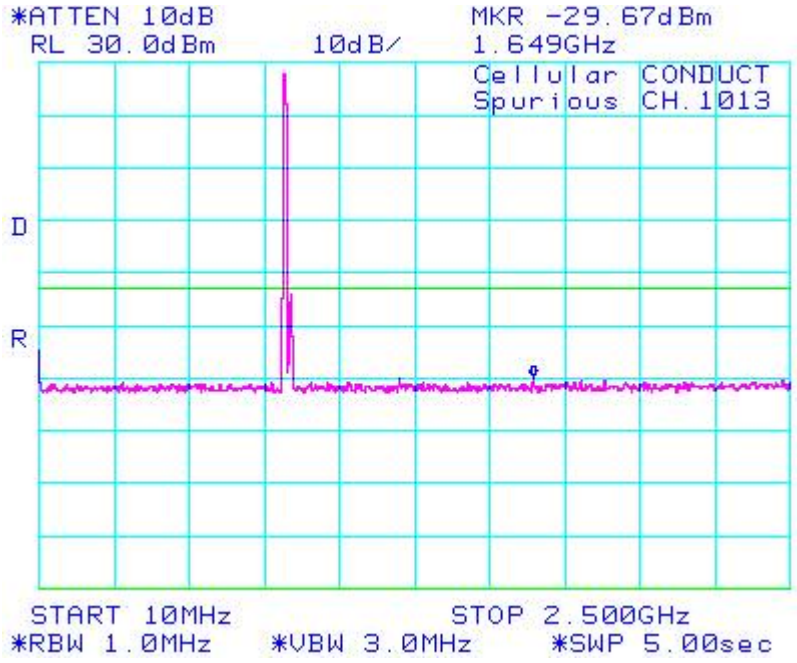
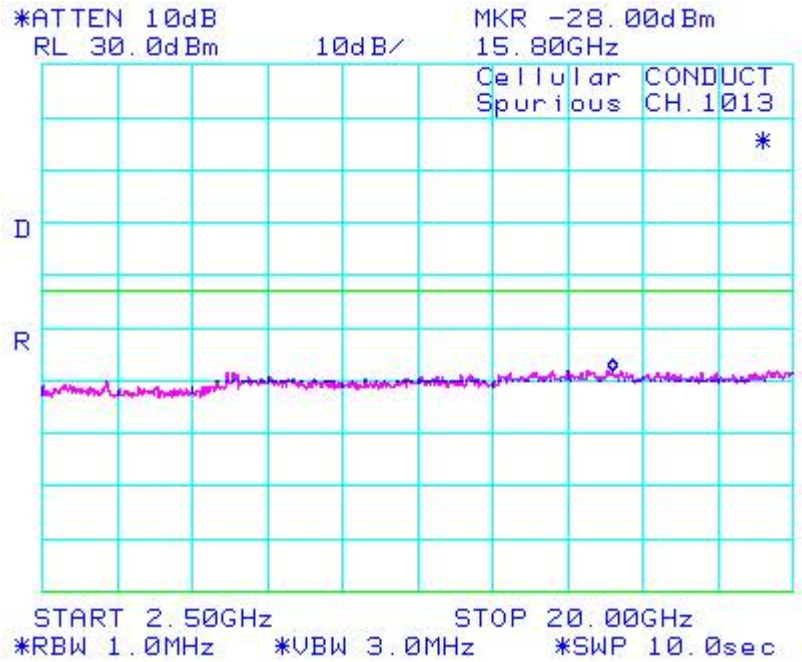


Figure 2: Cellular, Spurious Conducted Emissions, Low channel



Conducted Emission Test Results cont'd

Figure 3: Cellular, Spurious Conducted Emissions, Middle Channel

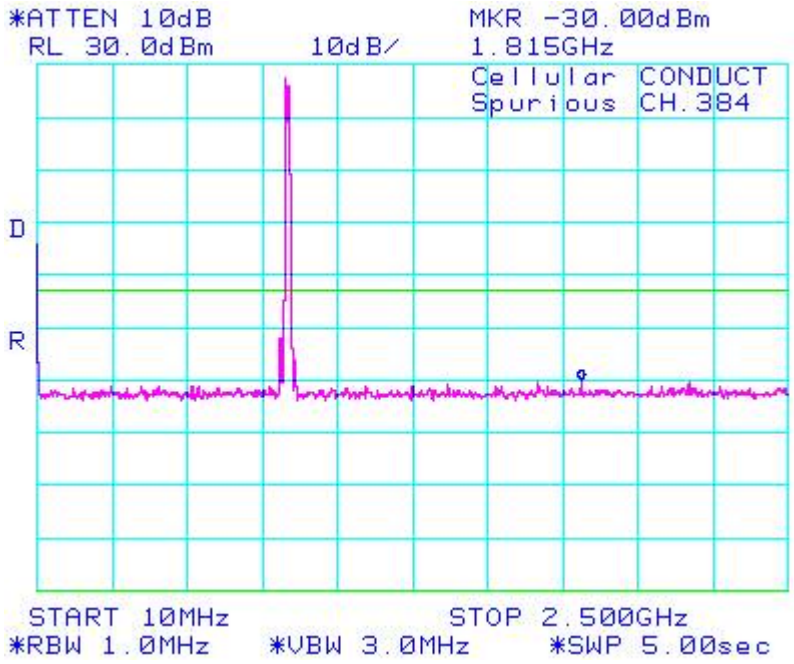
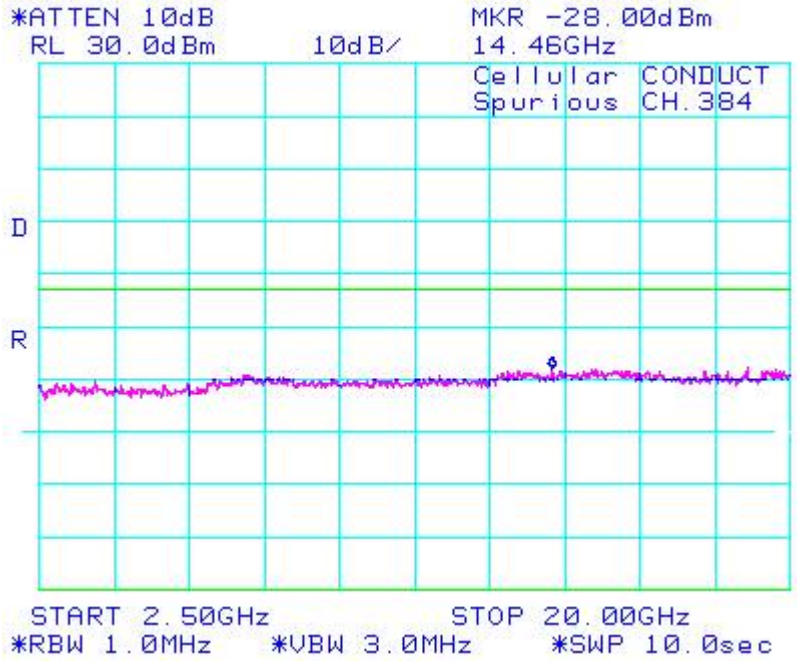


Figure 4: Cellular, Spurious Conducted Emissions, Middle Channel



Conducted Emission Test Results cont'd

Figure 5: Cellular, Spurious Conducted Emissions, High Channel

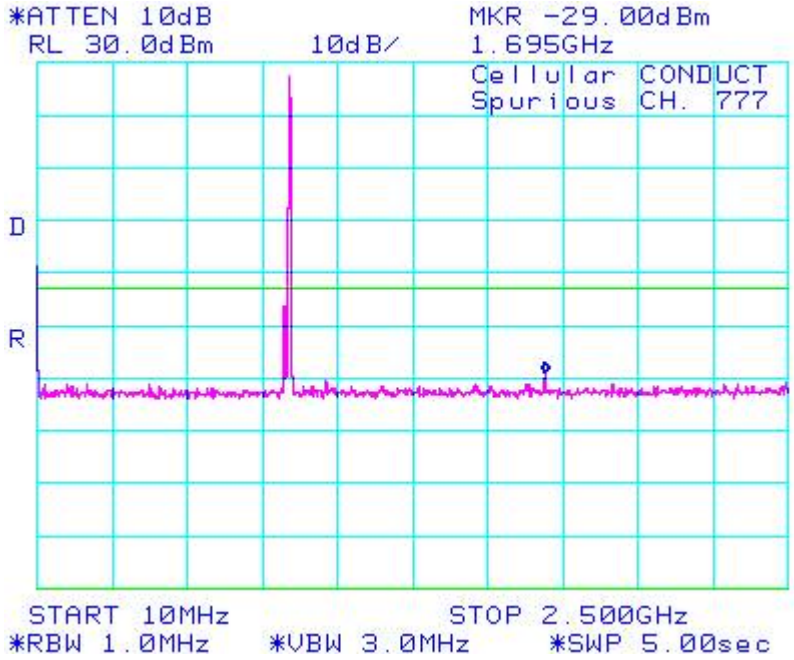
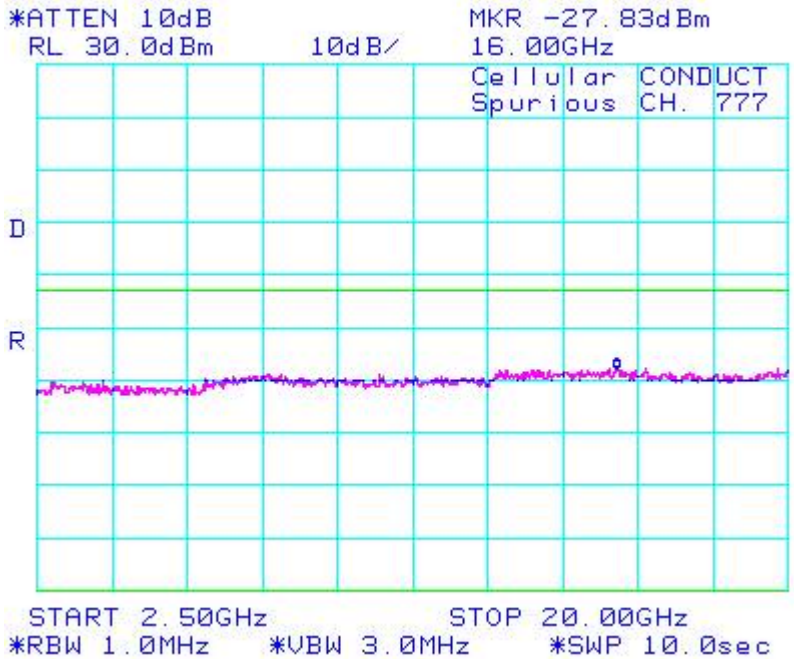


Figure 6: Cellular, Spurious Conducted Emissions, High Channel



Conducted Emission Test Results cont'd

Figure 7: PCS, Spurious Conducted Emissions, Low Channel

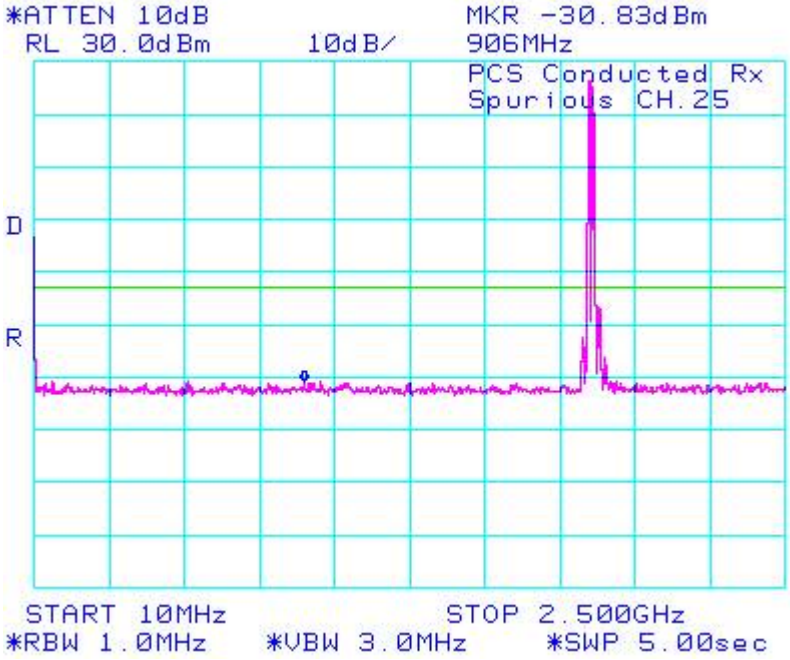
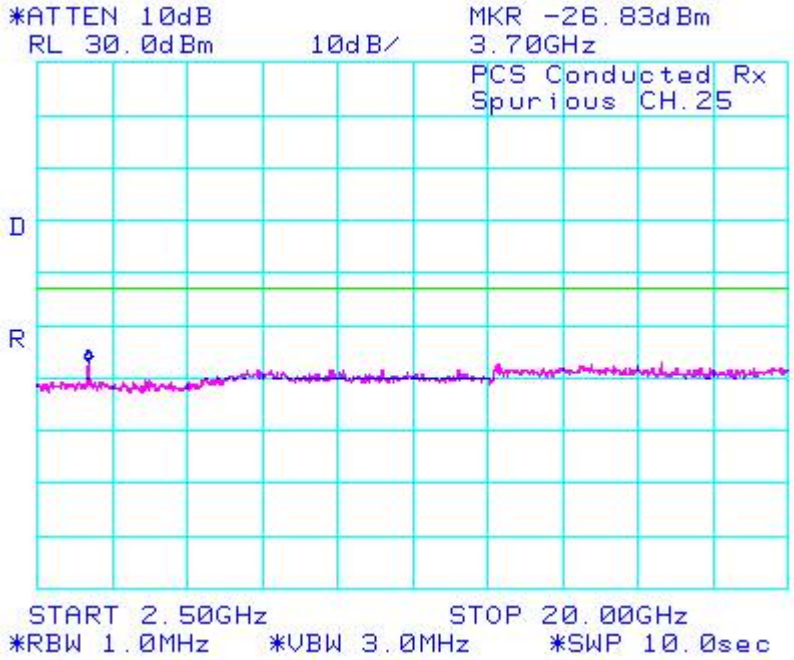


Figure 8: PCS, Spurious Conducted Emissions, Low Channel



Conducted Emission Test Results cont'd

Figure 9: PCS, Spurious Conducted Emissions, Middle Channel

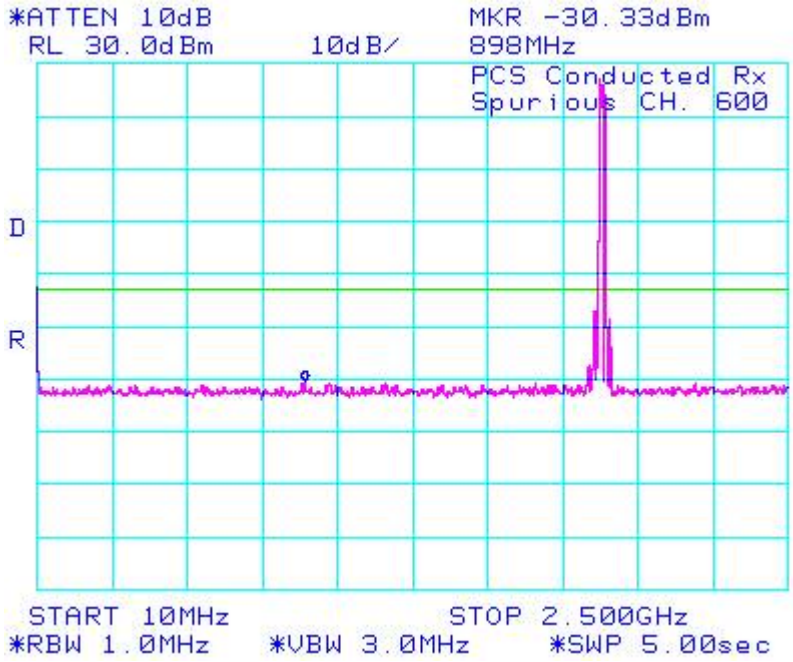
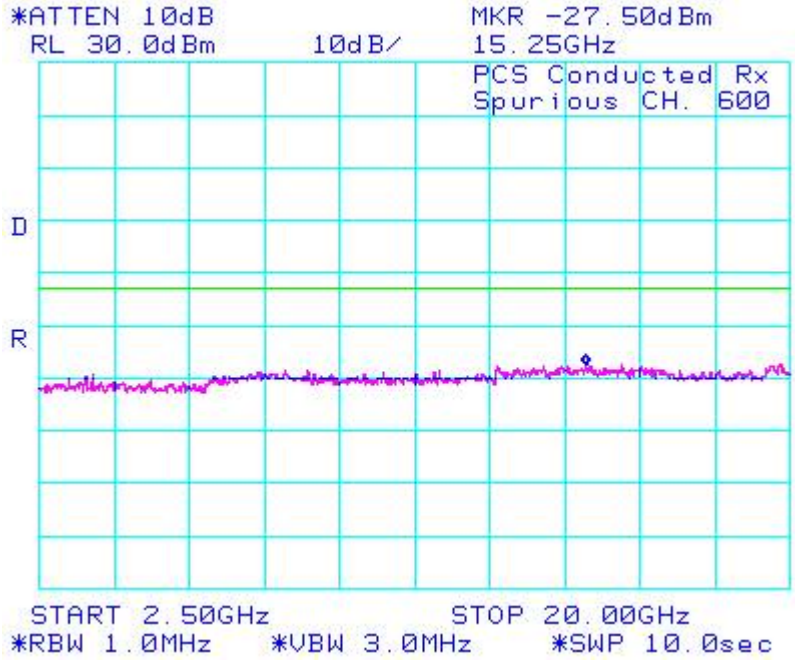


Figure 10: PCS, Spurious Conducted Emissions, Middle Channel



Conducted Emission Test Results cont'd

Figure 11: PCS, Spurious Conducted Emissions, High Channel

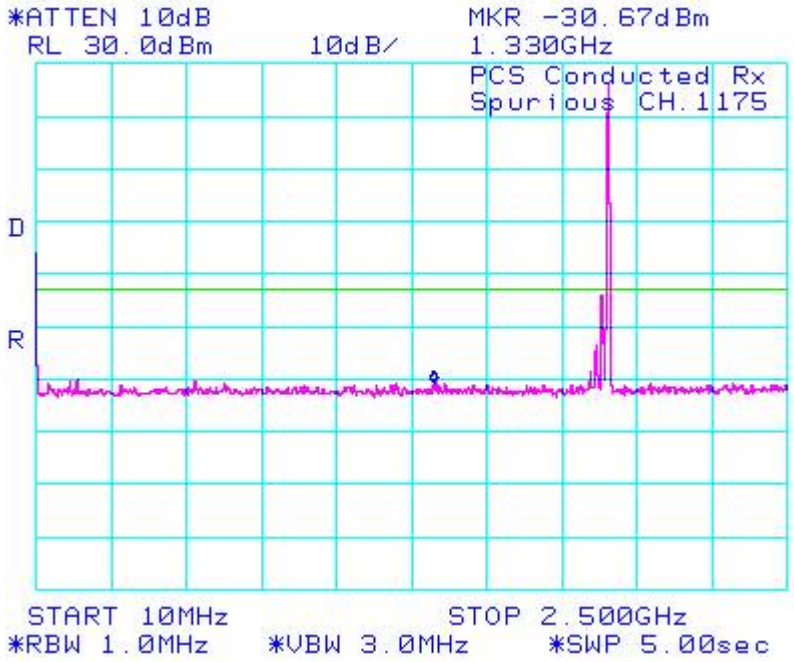
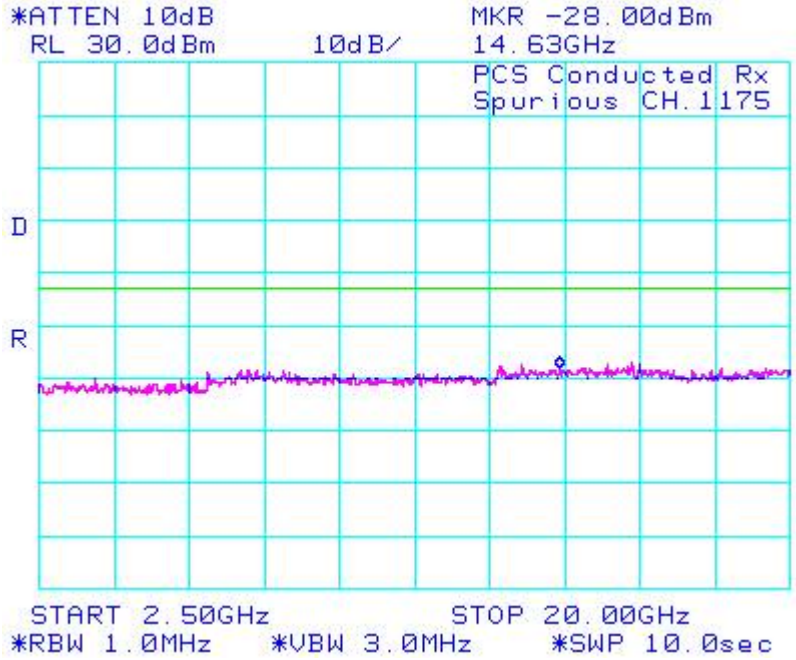


Figure 12: PCS, Spurious Conducted Emissions, High Channel



Conducted Emission Test Results cont'd

Figure 13: Occupied Bandwidth, Cellular Low Channel

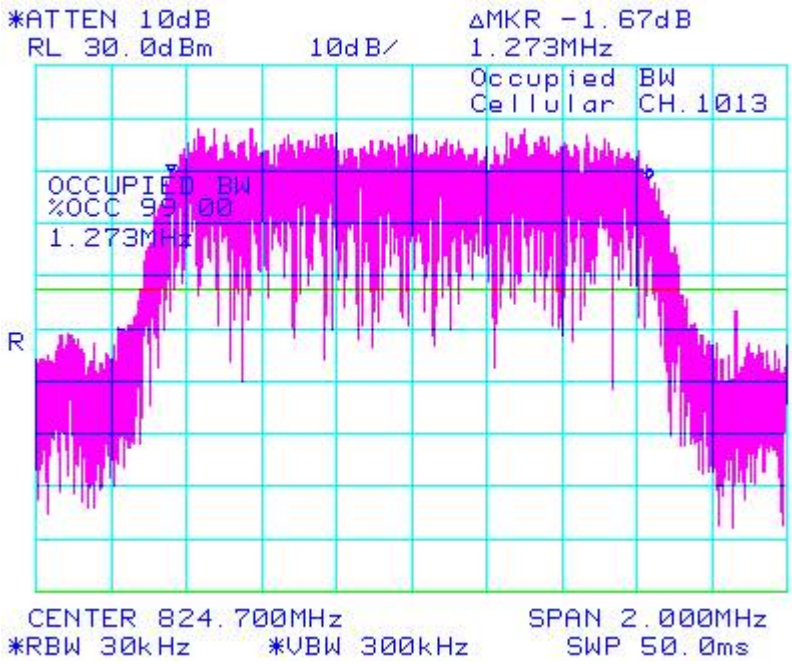
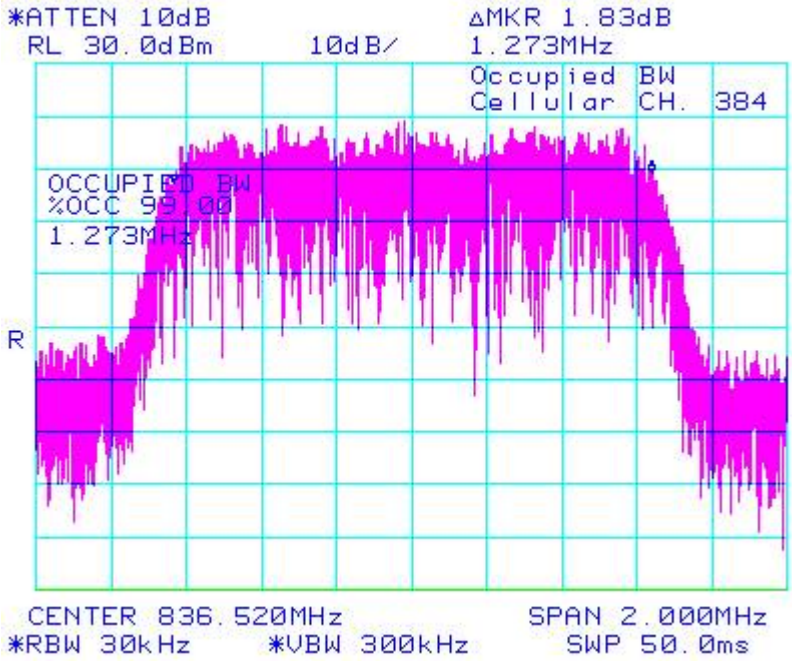


Figure 14: Occupied Bandwidth, Cellular Middle Channel



Conducted Emission Test Results cont'd

Figure 15: Occupied Bandwidth, Cellular High Channel

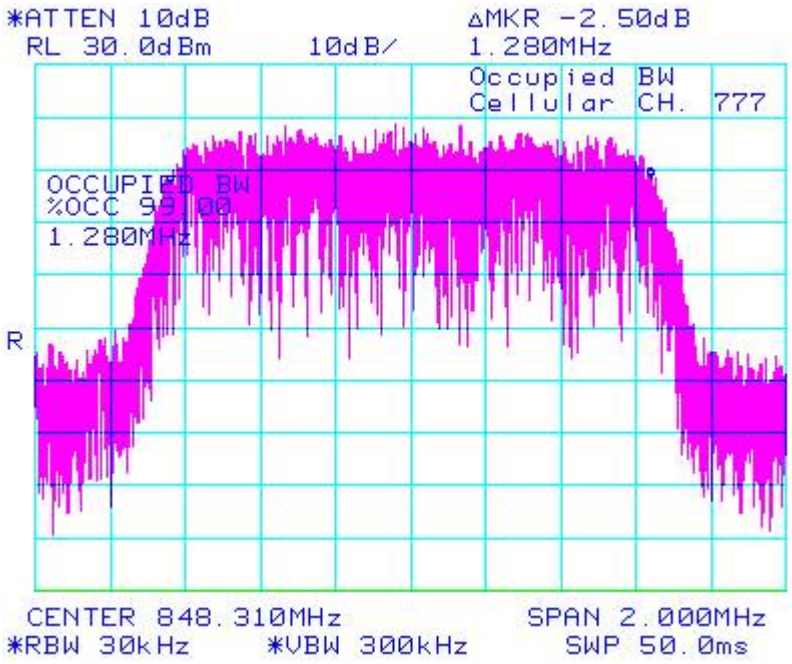
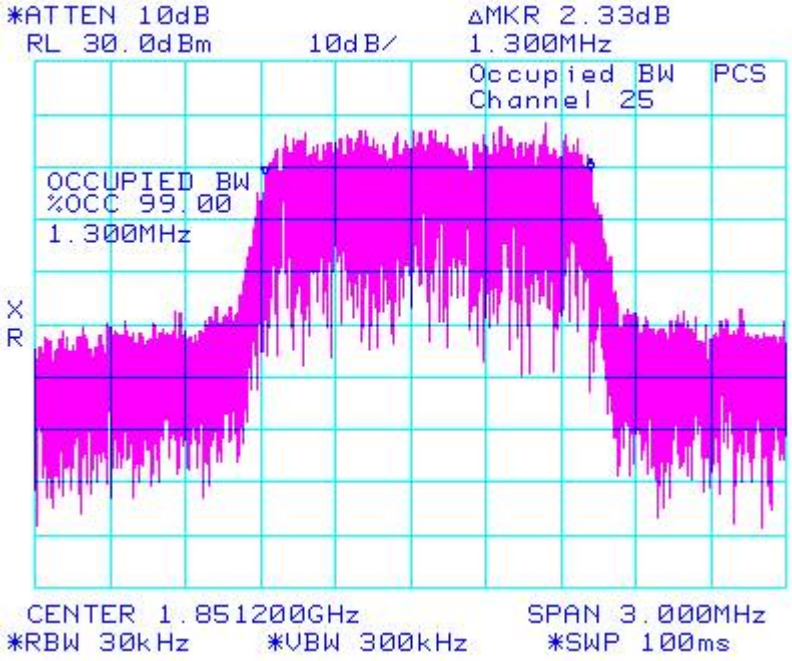


Figure 16: Occupied Bandwidth, PCS Low Channel



Conducted Emission Test Results cont'd

Figure 17: Occupied Bandwidth, PCS Middle Channel

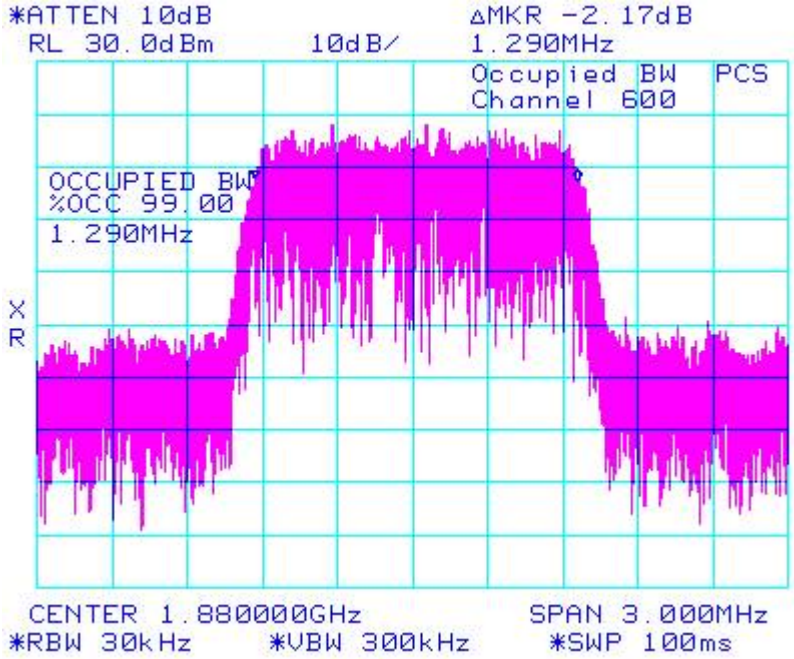
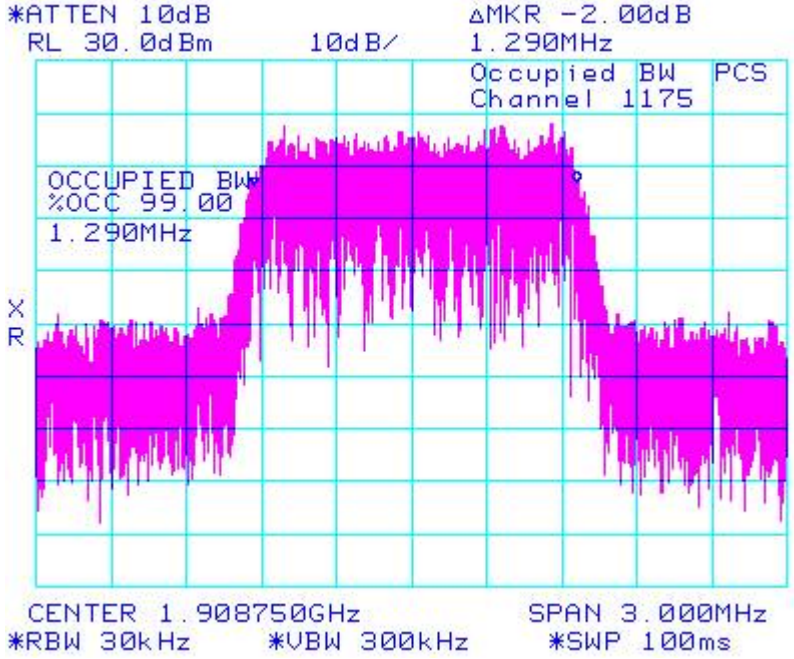


Figure 18: Occupied Bandwidth, PCS High Channel



Conducted Emission Test Results cont'd

Figure 19: PCS, Low Channel Mask

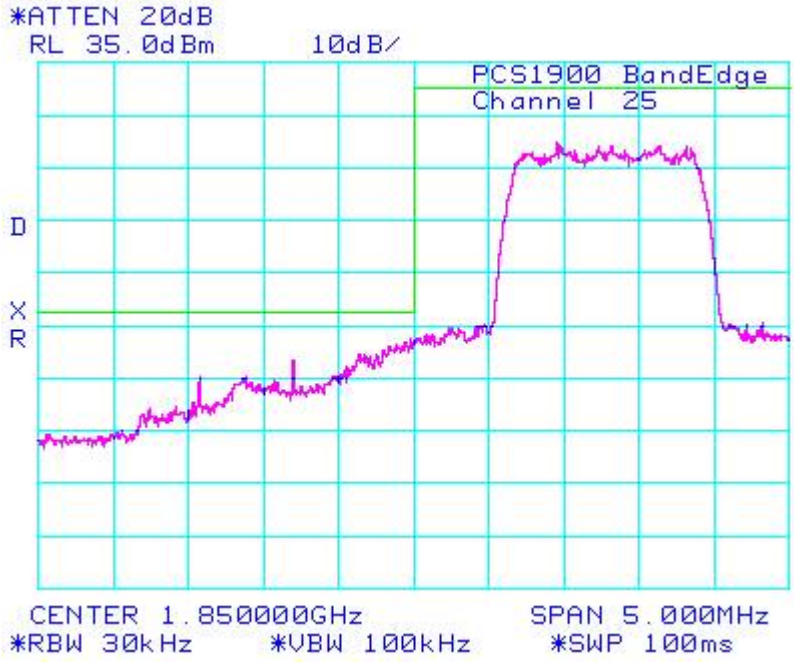
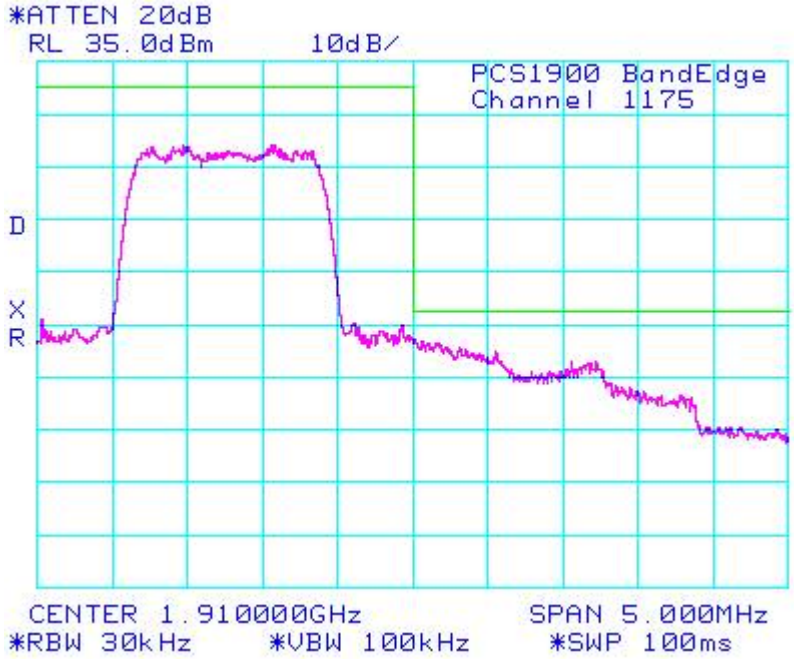


Figure 20: PCS, High Channel Mask



Conducted RF Emission Test Data cont'd

Date of test: February 1, 2007

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 21 to 32 for the plots of the conducted spurious emissions.

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

Cellular Frequency (MHz)	99% Occupied Bandwidth (MHz)
824.700	1.280
836.520	1.273
848.310	1.280

PCS Frequency (MHz)	99% Occupied Bandwidth (MHz)
1851.200	1.290
1880.000	1.290
1908.750	1.290

Measurement Plots for Cellular and PCS in 1xEVDO mode
Refer to the following measurement plots for more detail.

See Figures 33 to 38 for the plots of the 99% Occupied Bandwidth.
See Figures 39 to 40 for plots of the channel mask results.

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

Conducted Emission Test Results cont'd

Figure 21: Cellular, Spurious Conducted Emissions, Low channel

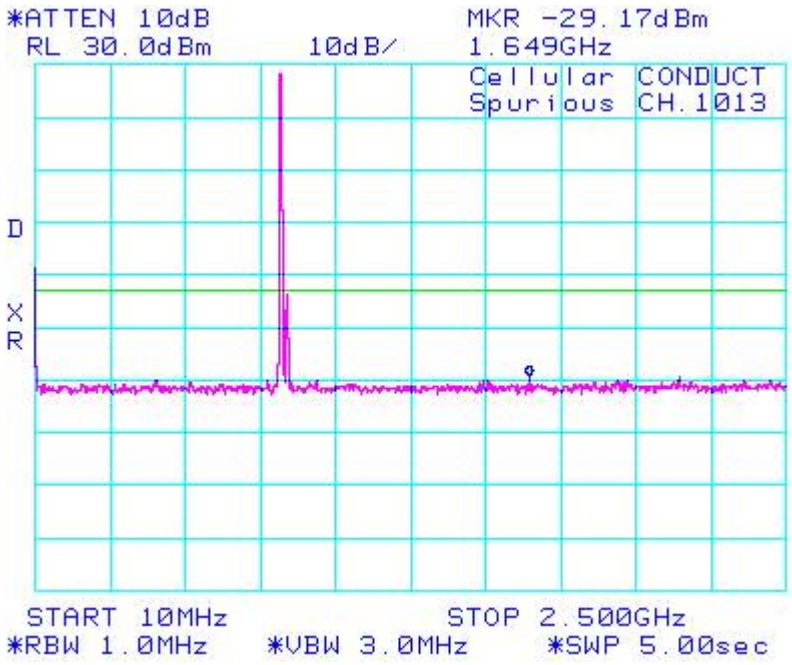
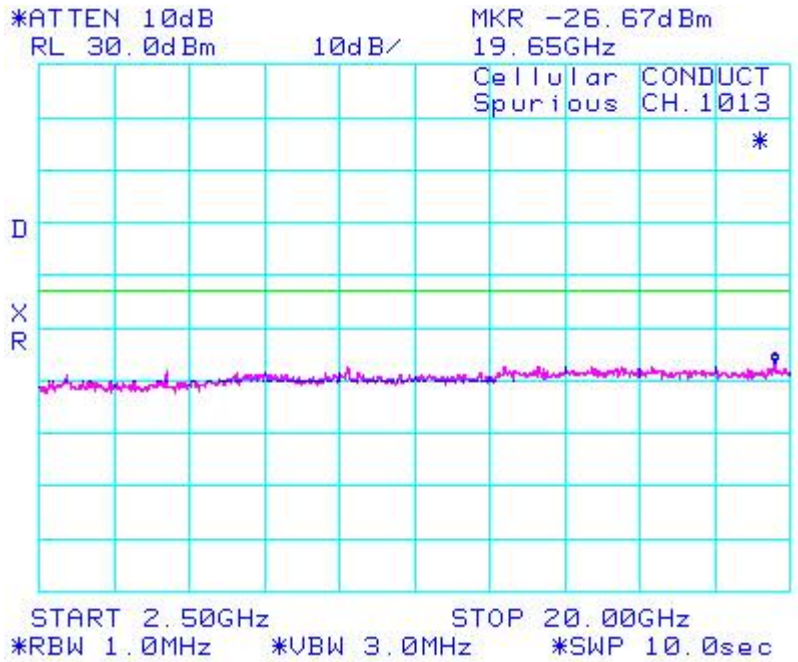


Figure 22: Cellular, Spurious Conducted Emissions, Low channel



Conducted Emission Test Results cont'd

Figure 23: Cellular, Spurious Conducted Emissions, Middle Channel

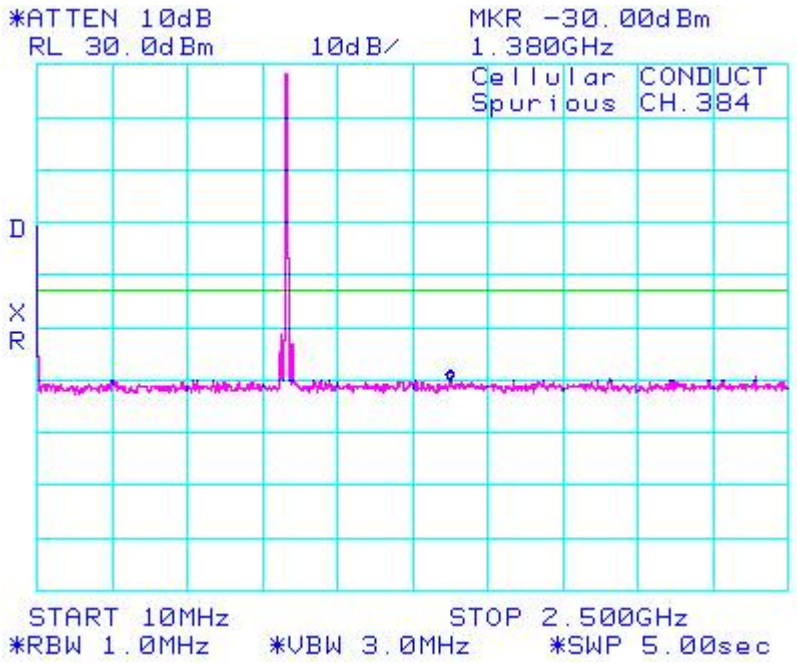
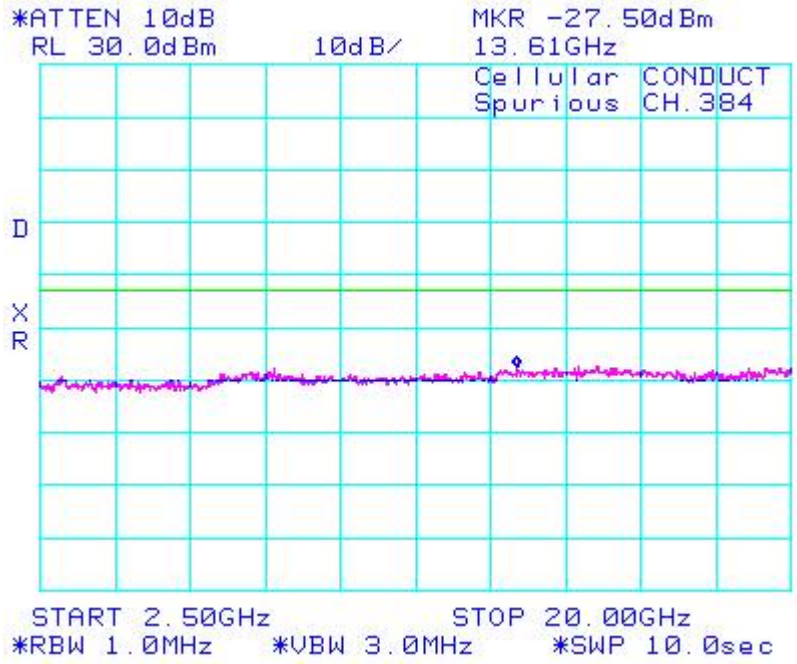


Figure 24: Cellular, Spurious Conducted Emissions, Middle Channel



Conducted Emission Test Results cont'd

Figure 25: Cellular, Spurious Conducted Emissions, High Channel

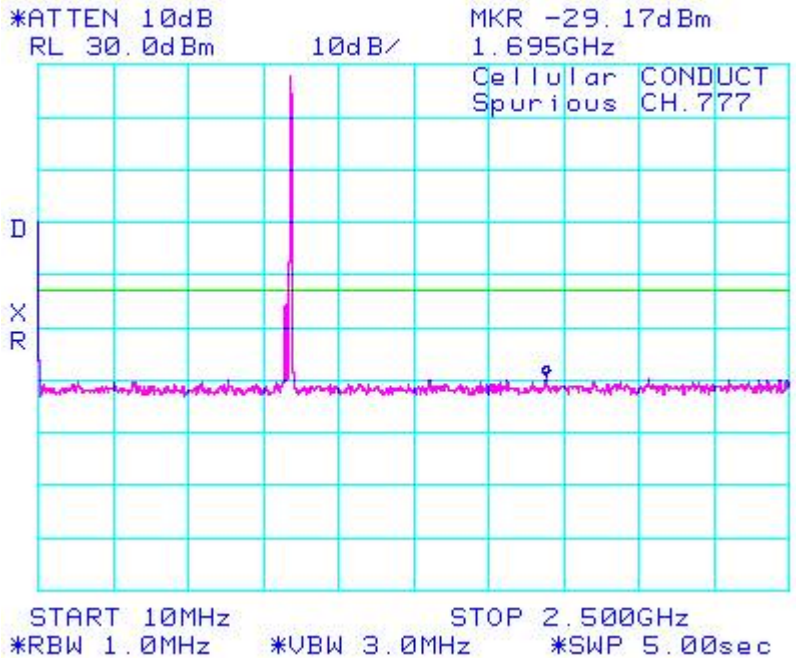
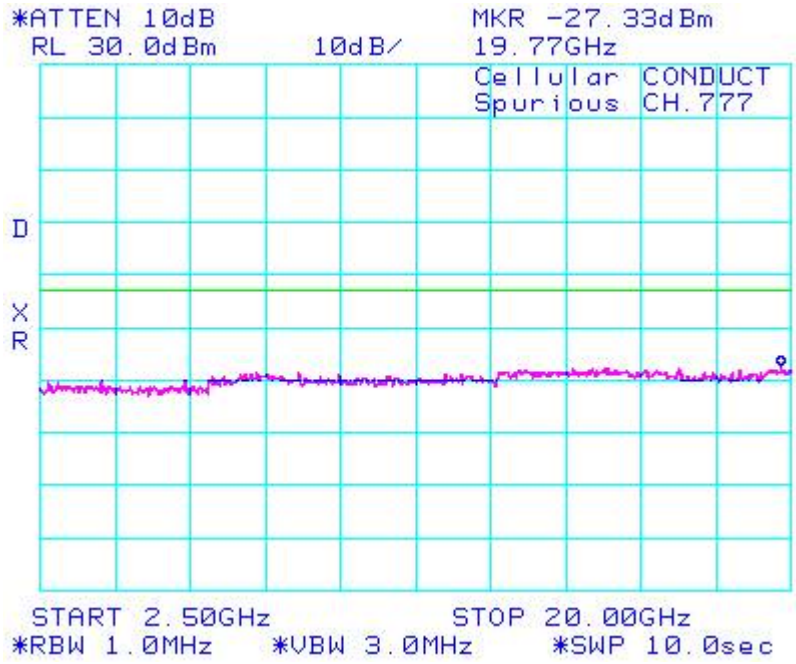


Figure 26: Cellular, Spurious Conducted Emissions, High Channel



Conducted Emission Test Results cont'd

Figure 27: PCS, Spurious Conducted Emissions, Low Channel

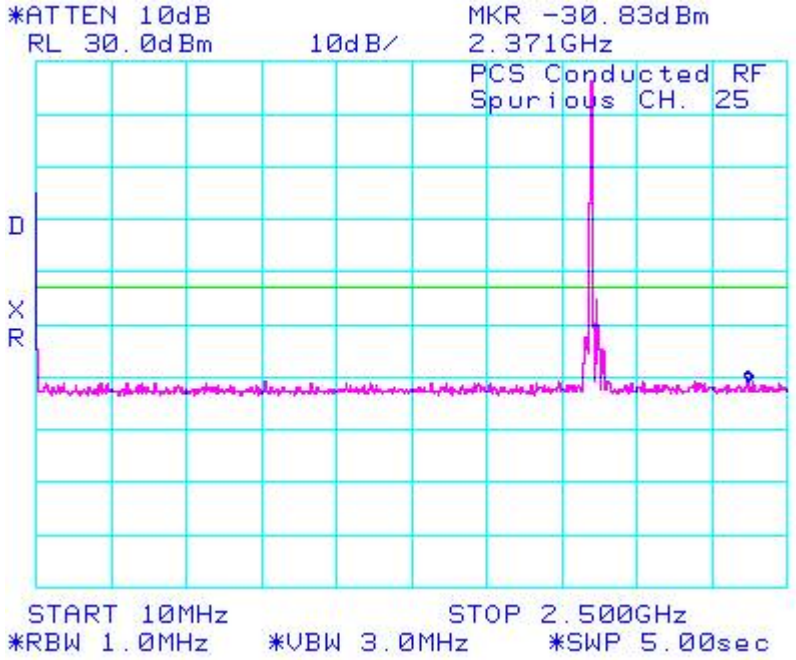
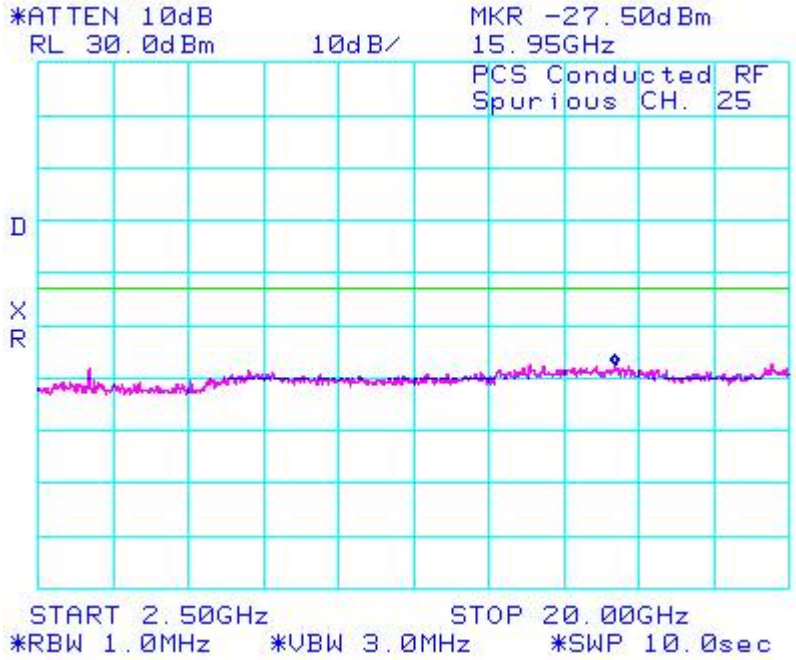


Figure 28: PCS, Spurious Conducted Emissions, Low Channel



Conducted Emission Test Results cont'd

Figure 29: PCS, Spurious Conducted Emissions, Middle Channel

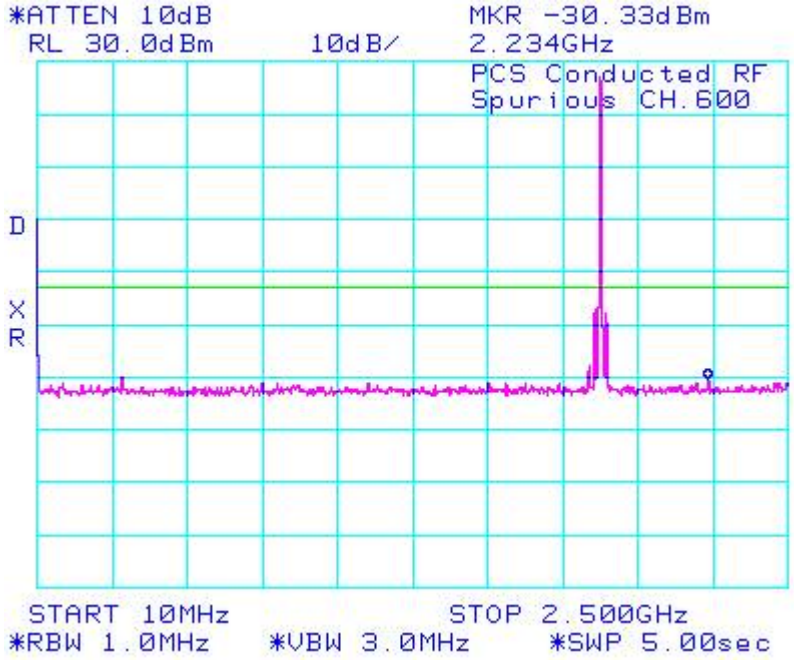
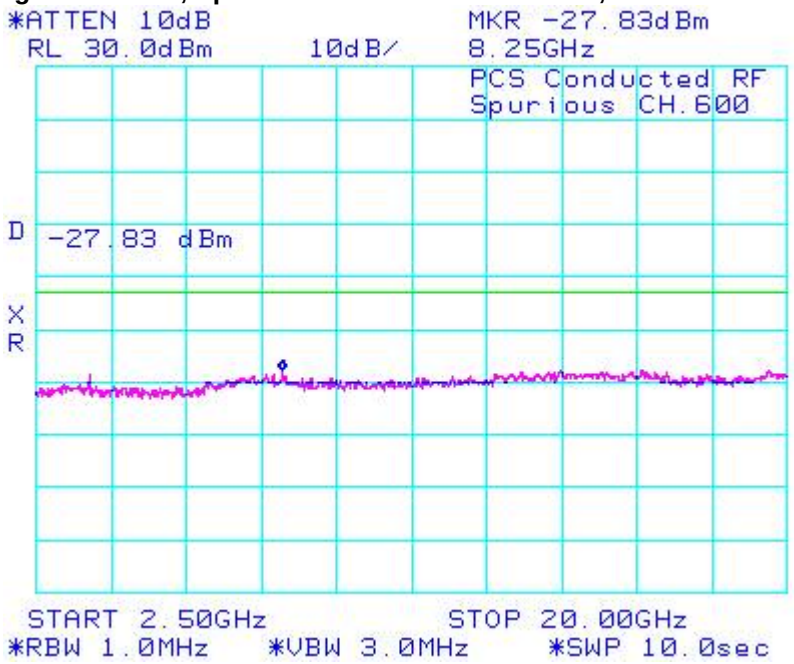


Figure 30: PCS, Spurious Conducted Emissions, Middle Channel



Conducted Emission Test Results cont'd

Figure 31: PCS, Spurious Conducted Emissions, High Channel

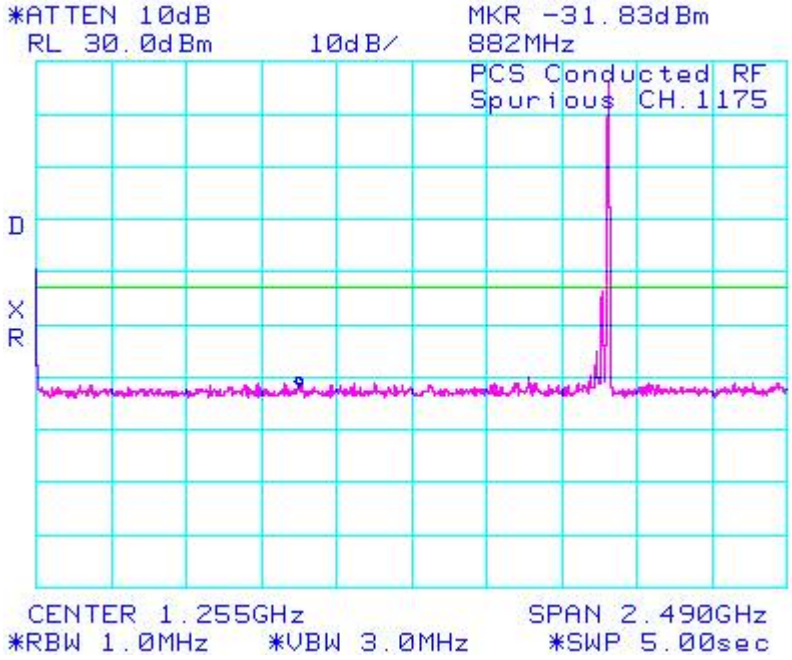
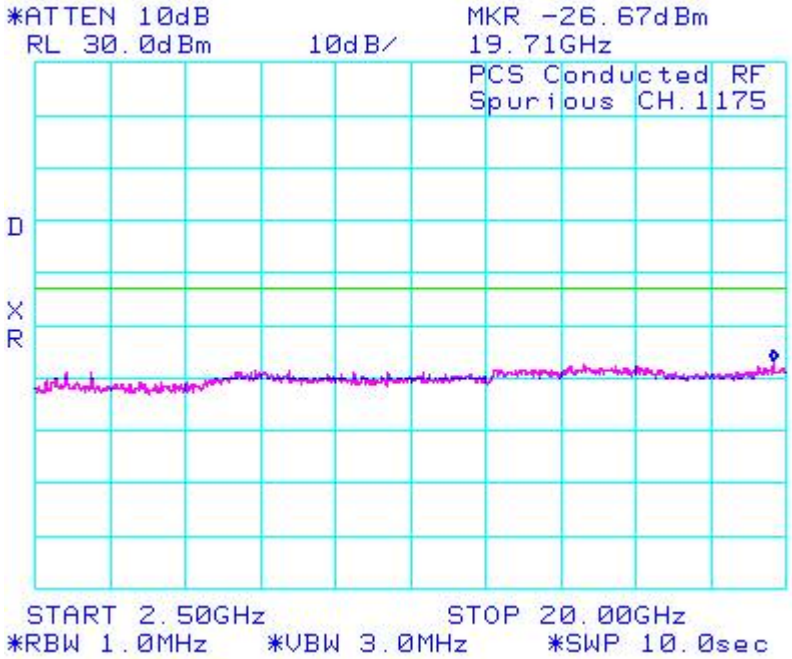


Figure 32: PCS, Spurious Conducted Emissions, High Channel



Conducted Emission Test Results cont'd

Figure 33: Occupied Bandwidth, Cellular Low Channel

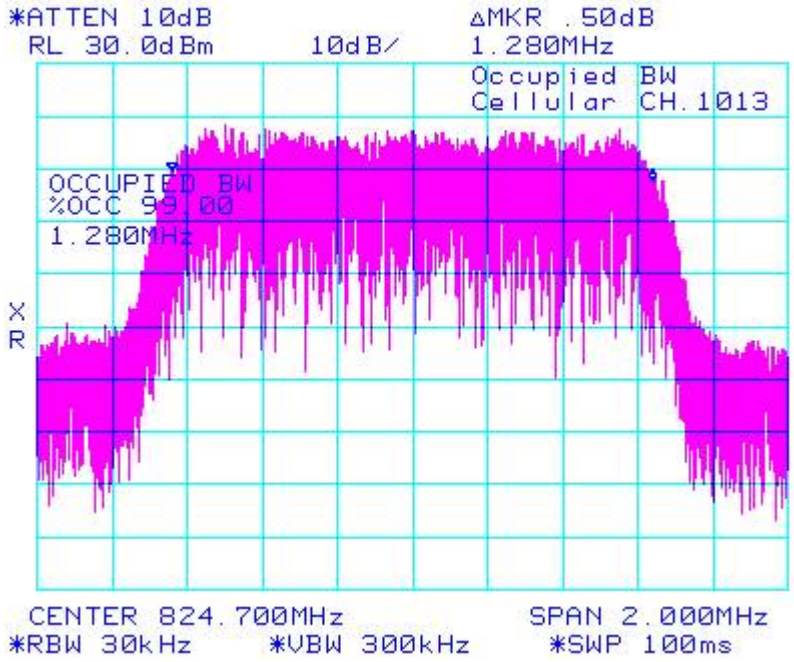
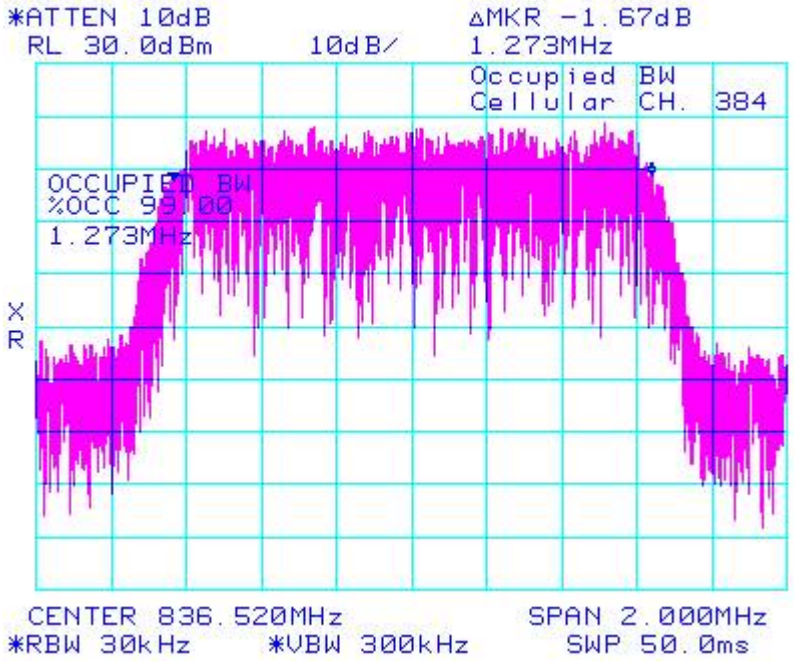


Figure 34: Occupied Bandwidth, Cellular Middle Channel



Conducted Emission Test Results cont'd

Figure 35: Occupied Bandwidth, Cellular High Channel

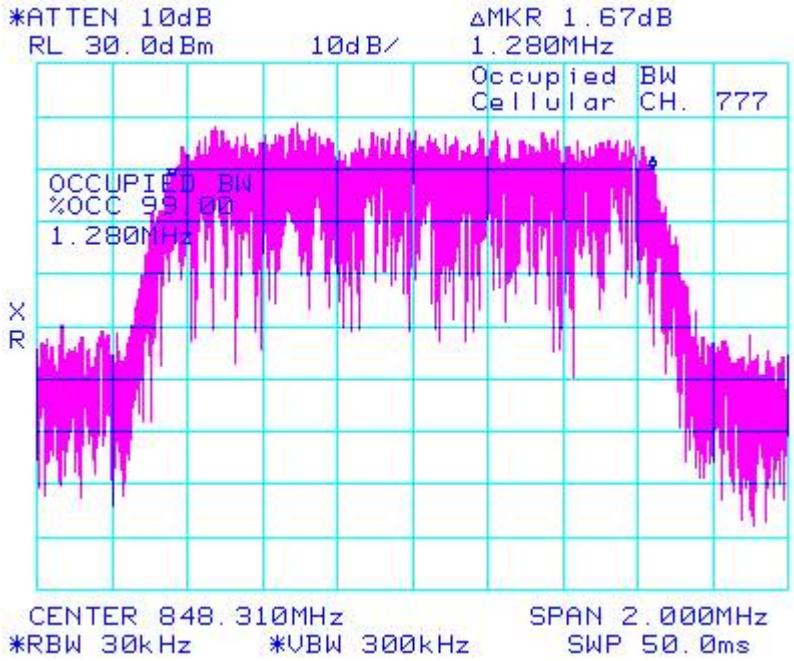
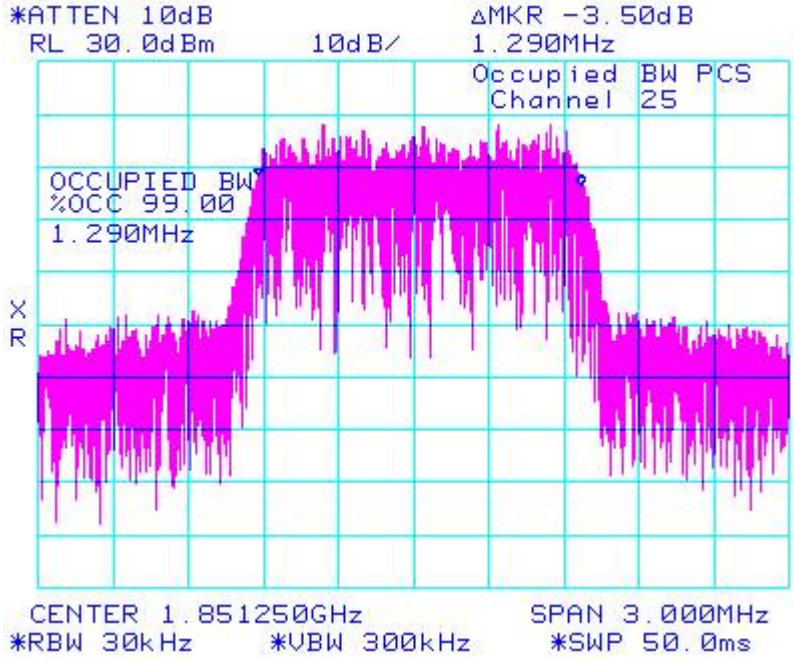


Figure 36: Occupied Bandwidth, PCS Low Channel



Conducted Emission Test Results cont'd

Figure 37: Occupied Bandwidth, PCS Middle Channel

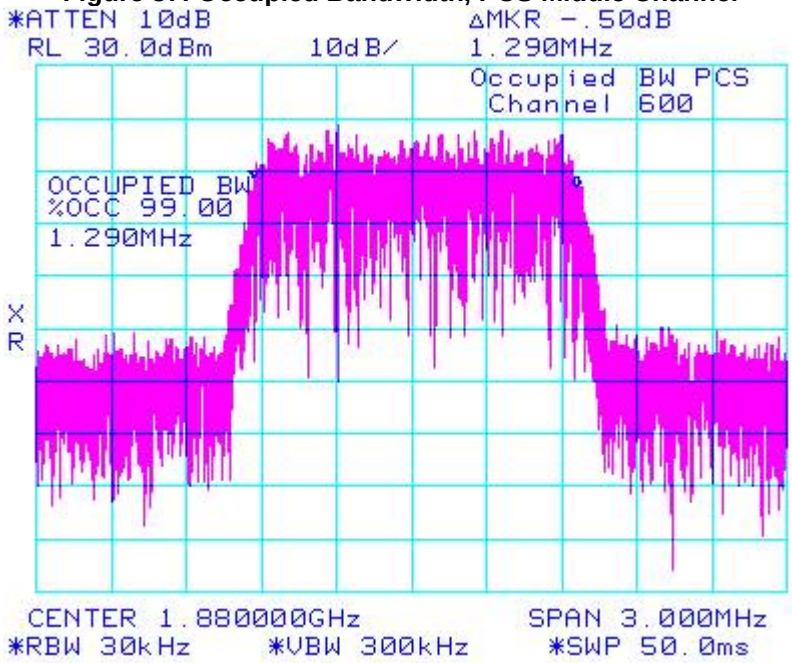
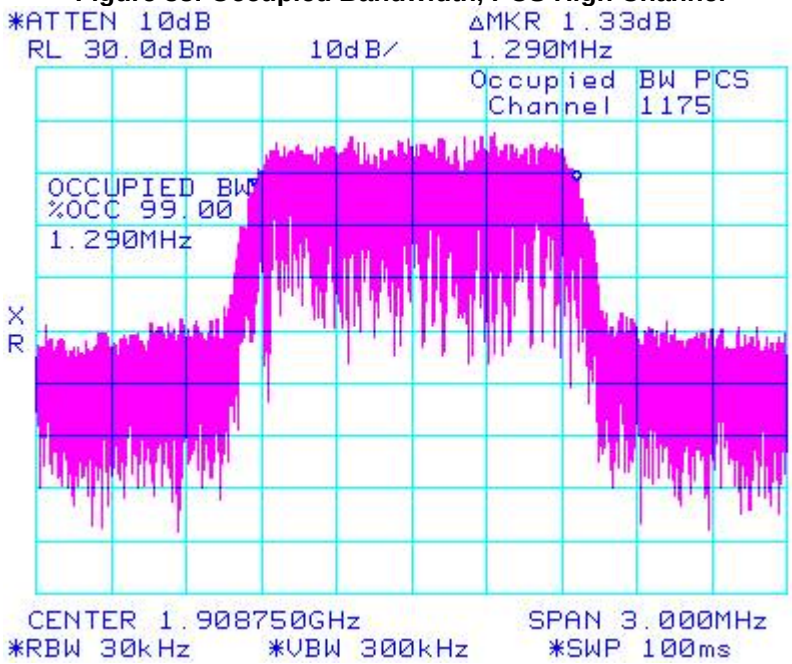


Figure 38: Occupied Bandwidth, PCS High Channel



Conducted Emission Test Results cont'd

Figure 39: PCS, Low Channel Mask

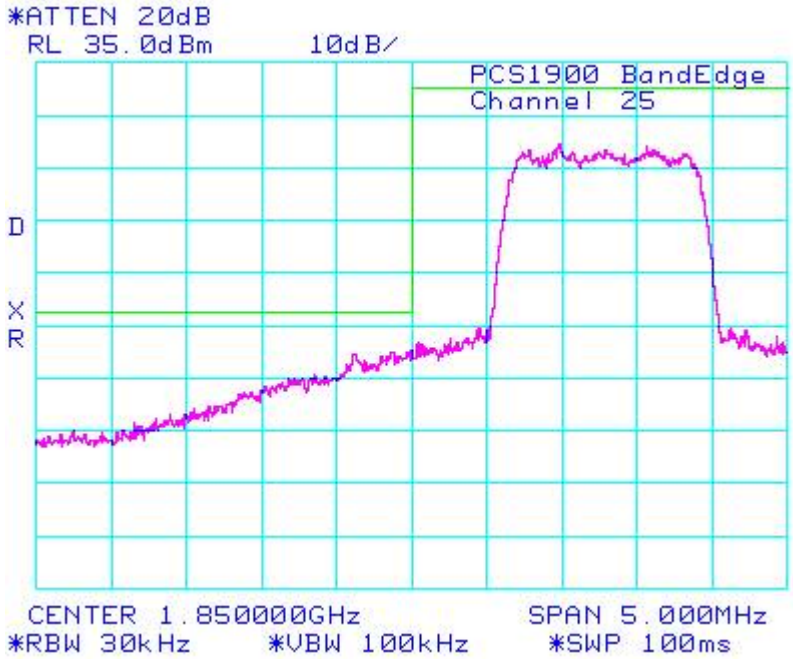
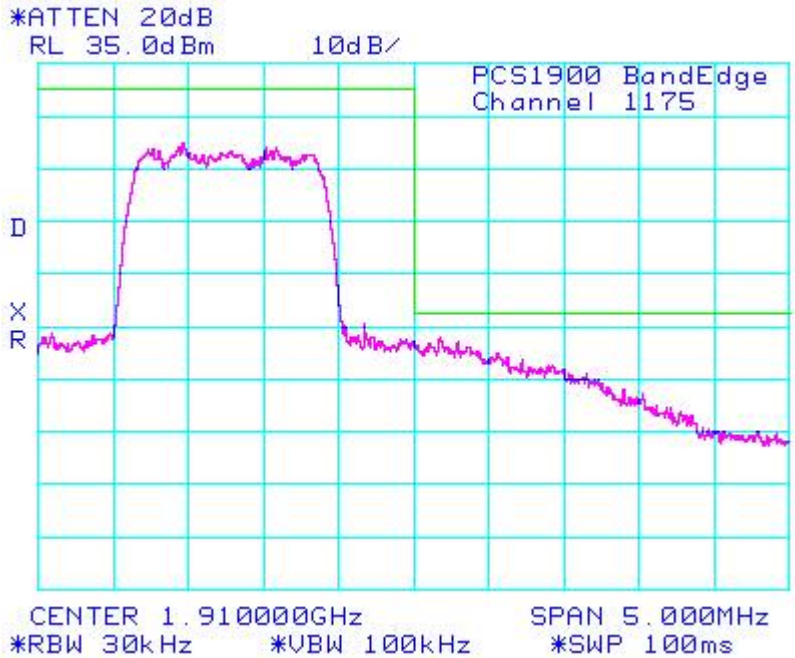


Figure 40: PCS, High Channel Mask



APPENDIX 2 – CONDUCTED RF OUTPUT POWER TEST DATA

Conducted RF Output Power Test Data

The conducted RF output power was measured using the CDMA base station simulator, Rohde & Schwarz CBT Bluetooth Tester. 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 ±0.5 dB for Cellular and 23.50 dBm ±0.5 dB for PCS.

Date of Test: January 31, 2007

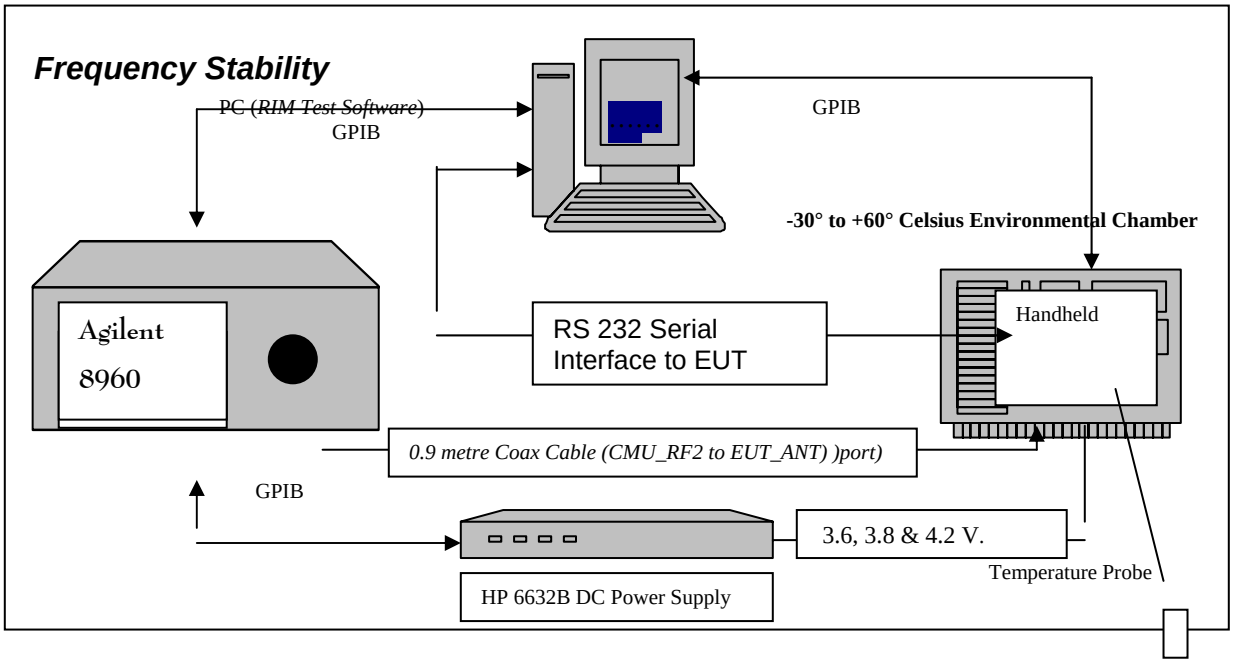
Test Results

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	24.30	0.269	RC1	24.70	0.295	24.70	0.295	-	-
				RC3	24.60	0.288	24.70	0.295	24.70	0.295
	384	24.64	0.291	RC1	24.80	0.302	24.80	0.302	-	-
				RC3	24.80	0.302	24.80	0.302	24.70	0.295
	777	24.61	0.289	RC1	24.90	0.309	24.90	0.309	-	-
				RC3	24.90	0.309	24.90	0.309	24.90	0.309

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	23.10	0.204	RC1	23.80	0.240	23.70	0.234	-	-
				RC3	23.80	0.240	23.70	0.234	23.65	0.232
	600	23.60	0.229	RC1	23.80	0.240	23.80	0.240	-	-
				RC3	23.80	0.240	23.70	0.234	23.70	0.234
	1175	23.76	0.238	RC1	23.90	0.245	23.90	0.245	-	-
				RC3	23.90	0.245	23.90	0.245	23.80	0.240

APPENDIX 3 – FREQUENCY STABILITY TEST DATA

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 RBK41CG 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 baste 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.

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.

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 3.8 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, 3.8 and 4.2 volts.

The maximum frequency error in the Cellular band measured was -0.0109 PPM.
The maximum frequency error in the PCS band measured was -0.0114 PPM.

Date of test, March 26 - 27, 2007.

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	-1.177	-0.0014
384	836.520	3.6	20	0.422	0.0005
777	848.310	3.6	20	-0.231	-0.0003

Traffic Channel Number	Cellular Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
1013	824.700	3.8	20	0.381	0.0005
384	836.520	3.8	20	-0.207	-0.0002
777	848.310	3.8	20	-0.680	-0.0008

Traffic Channel Number	Cellular Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
1013	824.700	4.2	20	-0.159	-0.0002
384	836.520	4.2	20	-0.551	-0.0007
777	848.310	4.2	20	-0.086	-0.0001

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	-0.814	-0.0010
1013	824.700	3.6	-20	-1.092	-0.0013
1013	824.700	3.6	-10	-0.435	-0.0005
1013	824.700	3.6	0	-0.754	-0.0009
1013	824.700	3.6	10	-0.698	-0.0008
1013	824.700	3.6	20	-1.177	-0.0014
1013	824.700	3.6	30	-0.985	-0.0012
1013	824.700	3.6	40	-1.244	-0.0015
1013	824.700	3.6	50	-1.265	-0.0015
1013	824.700	3.6	60	-1.567	-0.0019

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
1013	824.700	3.8	-30	-6.176	-0.0075
1013	824.700	3.8	-20	5.311	0.0064
1013	824.700	3.8	-10	2.579	0.0031
1013	824.700	3.8	0	3.946	0.0048
1013	824.700	3.8	10	2.064	0.0025
1013	824.700	3.8	20	0.381	0.0005
1013	824.700	3.8	30	0.010	0.0000
1013	824.700	3.8	40	1.268	0.0015
1013	824.700	3.8	50	0.802	0.0010
1013	824.700	3.8	60	3.511	0.0043

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
1013	824.700	4.2	-30	-1.418	-0.0017
1013	824.700	4.2	-20	4.293	0.0052
1013	824.700	4.2	-10	1.395	0.0017
1013	824.700	4.2	0	3.041	0.0037
1013	824.700	4.2	10	2.097	0.0025
1013	824.700	4.2	20	-0.159	-0.0002
1013	824.700	4.2	30	0.341	0.0004
1013	824.700	4.2	40	0.692	0.0008
1013	824.700	4.2	50	0.582	0.0007
1013	824.700	4.2	60	4.022	0.0049

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	-9.112	**-0.0109**
384	836.520	3.6	-20	6.320	0.0076
384	836.520	3.6	-10	2.979	0.0036
384	836.520	3.6	0	3.966	0.0047
384	836.520	3.6	10	3.288	0.0039
384	836.520	3.6	20	0.422	0.0005
384	836.520	3.6	30	-0.836	-0.0010
384	836.520	3.6	40	-0.065	-0.0001
384	836.520	3.6	50	0.047	0.0001
384	836.520	3.6	60	2.545	0.0030

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
384	836.520	3.8	-30	-6.168	-0.0074
384	836.520	3.8	-20	4.953	0.0059
384	836.520	3.8	-10	0.992	0.0012
384	836.520	3.8	0	2.518	0.0030
384	836.520	3.8	10	1.872	0.0022
384	836.520	3.8	20	-0.207	-0.0002
384	836.520	3.8	30	-0.200	-0.0002
384	836.520	3.8	40	-0.057	-0.0001
384	836.520	3.8	50	-0.498	-0.0006
384	836.520	3.8	60	2.811	0.0034

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
384	836.520	4.2	-30	-2.324	-0.0028
384	836.520	4.2	-20	3.337	0.0040
384	836.520	4.2	-10	1.128	0.0013
384	836.520	4.2	0	2.119	0.0025
384	836.520	4.2	10	0.232	0.0003
384	836.520	4.2	20	-0.551	-0.0007
384	836.520	4.2	30	-0.288	-0.0003
384	836.520	4.2	40	0.024	0.0000
384	836.520	4.2	50	-0.245	-0.0003
384	836.520	4.2	60	2.983	0.0036

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	-8.352	-0.0099
777	848.310	3.6	-20	5.608	0.0066
777	848.310	3.6	-10	2.441	0.0029
777	848.310	3.6	0	3.950	0.0047
777	848.310	3.6	10	2.680	0.0032
777	848.310	3.6	20	-0.231	-0.0003
777	848.310	3.6	30	-0.426	-0.0005
777	848.310	3.6	40	0.329	0.0004
777	848.310	3.6	50	-0.907	-0.0011
777	848.310	3.6	60	2.908	0.0034

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
777	848.310	3.8	-30	-4.571	-0.0054
777	848.310	3.8	-20	4.435	0.0053
777	848.310	3.8	-10	1.863	0.0022
777	848.310	3.8	0	2.693	0.0032
777	848.310	3.8	10	1.443	0.0017
777	848.310	3.8	20	-0.680	-0.0008
777	848.310	3.8	30	-1.035	-0.0012
777	848.310	3.8	40	-0.697	-0.0008
777	848.310	3.8	50	-0.281	-0.0003
777	848.310	3.8	60	2.736	0.0032

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
777	848.310	4.2	-30	-1.589	-0.0019
777	848.310	4.2	-20	3.694	0.0044
777	848.310	4.2	-10	1.291	0.0015
777	848.310	4.2	0	2.431	0.0029
777	848.310	4.2	10	0.811	0.0010
777	848.310	4.2	20	-0.086	-0.0001
777	848.310	4.2	30	-0.568	-0.0007
777	848.310	4.2	40	-0.357	-0.0004
777	848.310	4.2	50	-0.339	-0.0004
777	848.310	4.2	60	3.442	0.0041

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	-3.910	-0.0021
600	1880.00	3.6	20	0.909	0.0005
1175	1908.75	3.6	20	-0.308	-0.0002

Traffic Channel Number	PCS Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
25	1851.20	3.8	20	-0.198	-0.0001
600	1880.00	3.8	20	-0.547	-0.0003
1175	1908.75	3.8	20	-1.077	-0.0006

Traffic Channel Number	PCS Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
25	1851.20	4.2	20	-0.115	-0.0001
600	1880.00	4.2	20	-1.456	-0.0008
1175	1908.75	4.2	20	-1.569	-0.0008

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	0.317	0.0002
25	1851.20	3.6	-20	-2.654	-0.0014
25	1851.20	3.6	-10	-1.829	-0.0010
25	1851.20	3.6	0	-2.056	-0.0011
25	1851.20	3.6	10	-2.761	-0.0015
25	1851.20	3.6	20	-3.910	-0.0021
25	1851.20	3.6	30	-1.855	-0.0010
25	1851.20	3.6	40	-4.341	-0.0023
25	1851.20	3.6	50	-2.807	-0.0015
25	1851.20	3.6	60	-3.300	-0.0018

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
25	1851.20	3.8	-30	-15.737	-0.0085
25	1851.20	3.8	-20	13.003	0.0070
25	1851.20	3.8	-10	4.745	0.0026
25	1851.20	3.8	0	9.762	0.0053
25	1851.20	3.8	10	6.550	0.0035
25	1851.20	3.8	20	-0.198	-0.0001
25	1851.20	3.8	30	-0.089	0.0000
25	1851.20	3.8	40	0.980	0.0005
25	1851.20	3.8	50	-0.871	-0.0005
25	1851.20	3.8	60	9.263	0.0050

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
25	1851.20	4.2	-30	-4.969	-0.0027
25	1851.20	4.2	-20	8.407	0.0045
25	1851.20	4.2	-10	5.381	0.0029
25	1851.20	4.2	0	6.393	0.0035
25	1851.20	4.2	10	4.231	0.0023
25	1851.20	4.2	20	-0.115	-0.0001
25	1851.20	4.2	30	0.666	0.0004
25	1851.20	4.2	40	0.568	0.0003
25	1851.20	4.2	50	0.631	0.0003
25	1851.20	4.2	60	8.549	0.0046

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	-20.250	-0.0108
600	1880.00	3.6	-20	11.502	0.0061
600	1880.00	3.6	-10	5.076	0.0027
600	1880.00	3.6	0	7.730	0.0041
600	1880.00	3.6	10	5.236	0.0028
600	1880.00	3.6	20	0.909	0.0005
600	1880.00	3.6	30	-1.646	-0.0009
600	1880.00	3.6	40	-1.605	-0.0009
600	1880.00	3.6	50	-2.206	-0.0012
600	1880.00	3.6	60	4.048	0.0022

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
600	1880.00	3.8	-30	-17.481	-0.0093
600	1880.00	3.8	-20	12.007	0.0064
600	1880.00	3.8	-10	3.617	0.0019
600	1880.00	3.8	0	7.374	0.0039
600	1880.00	3.8	10	5.051	0.0027
600	1880.00	3.8	20	-0.547	-0.0003
600	1880.00	3.8	30	-3.394	-0.0018
600	1880.00	3.8	40	-0.550	-0.0003
600	1880.00	3.8	50	-1.411	-0.0008
600	1880.00	3.8	60	6.409	0.0034

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
600	1880.00	4.2	-30	-9.135	-0.0049
600	1880.00	4.2	-20	9.558	0.0051
600	1880.00	4.2	-10	2.708	0.0014
600	1880.00	4.2	0	5.255	0.0028
600	1880.00	4.2	10	3.214	0.0017
600	1880.00	4.2	20	-1.456	-0.0008
600	1880.00	4.2	30	-1.452	-0.0008
600	1880.00	4.2	40	-2.546	-0.0014
600	1880.00	4.2	50	-1.419	-0.0008
600	1880.00	4.2	60	6.185	0.0033

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	-21.680	**-0.0114**
1175	1908.75	3.6	-20	12.307	0.0064
1175	1908.75	3.6	-10	6.213	0.0033
1175	1908.75	3.6	0	7.953	0.0042
1175	1908.75	3.6	10	6.589	0.0035
1175	1908.75	3.6	20	-0.308	-0.0002
1175	1908.75	3.6	30	-1.088	-0.0006
1175	1908.75	3.6	40	-1.541	-0.0008
1175	1908.75	3.6	50	-1.274	-0.0007
1175	1908.75	3.6	60	5.364	0.0028

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
1175	1908.75	3.8	-30	-14.024	-0.0073
1175	1908.75	3.8	-20	9.875	0.0052
1175	1908.75	3.8	-10	2.494	0.0013
1175	1908.75	3.8	0	6.669	0.0035
1175	1908.75	3.8	10	2.296	0.0012
1175	1908.75	3.8	20	-1.077	-0.0006
1175	1908.75	3.8	30	-3.624	-0.0019
1175	1908.75	3.8	40	1.914	0.0010
1175	1908.75	3.8	50	-1.532	-0.0008
1175	1908.75	3.8	60	7.515	0.0039

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
1175	1908.75	4.2	-30	-7.198	-0.0038
1175	1908.75	4.2	-20	7.061	0.0037
1175	1908.75	4.2	-10	2.220	0.0012
1175	1908.75	4.2	0	5.689	0.0030
1175	1908.75	4.2	10	2.502	0.0013
1175	1908.75	4.2	20	-1.569	-0.0008
1175	1908.75	4.2	30	-2.638	-0.0014
1175	1908.75	4.2	40	-1.537	-0.0008
1175	1908.75	4.2	50	-0.616	-0.0003
1175	1908.75	4.2	60	5.503	0.0029

APPENDIX 4 - RADIATED EMISSIONS TEST DATA

Radiated Emissions Test Data Results

The environmental test conditions were:
Temperature 22ºC
Pressure 1011mb
Relative Humidity 22%

Dates of test: January 24, 2007 to February 2, 2007

Test distance was 3.0 metres.

Cellular Band

EUT				Rx Antenna		Spectrum Analyzer		Substitution Method Tracking Generator					
Type	Ch	Frequency (MHz)	Band	Type	Pol.	Reading (dBuV)	Max (V,H) (dBuV)	Pol. Tx-Rx	Reading (dBm)	Corrected Reading (relative to dipole) (dBm)	(Watts)	Limit (dBm)	Diff to Limit (dB)
Cellular Band (ERP), CDMA2000, (RC3, SO55), CH 1013, CH 384, CH 777 Handheld Standalone, USB down													
F0	1013	824.70	800	Dipole	V	72.1	83.2	V V	9.6	23.4	0.219	39.00	-15.6
F0	1013	824.70	800	Dipole	H	83.2		H H	7.3				
F0	384	836.52	800	Dipole	V	72.2	83.5	V V	10.1	**23.8**	0.240	39.00	-15.2
F0	384	836.52	800	Dipole	H	83.5		H H	8.1				
F0	777	848.32	800	Dipole	V	71.4	82.6	V V	8.5	21.9	0.155	39.00	-17.1
F0	777	848.32	800	Dipole	H	82.6		H H	8.1				

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

Radiated Emissions Test Data Results cont'd

Cellular Band

The environmental test conditions were:

Temperature	23ºC
Pressure	1003 mb
Relative Humidity	23%

Date of Test: January 23 2007

Test Distance was 3.0 metres with a EUT height of 1.0 metres, 30 MHz to 1000 MHz. The Handheld PIN 3016B678 was in standalone, vertical position.

The measurements were performed in CDMA2000 (RC3, SO55) mode, channel 384.

Frequency (MHz)	Antenna Pol. (V/H)	Antenna Height (metres)	Test Angle (Deg.)	Detector (PK or AVE)	Measured Level (dBµV)	Correction Factor for preamp/antenna/ cables/ filter (dB/m)	Field Strength Level (reading+corr) (dBµV/m)	Limit @ 3.0 m (dB)	Test Margin (dB)
817.38	V	1.91	78	PK	70.38	-98.09	-27.71	-13	**-14.71**
855.62	V	1.55	173	PK	63.26	-96.90	-33.64	-13	-20.64

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

Radiated Emissions Test Data Results cont'd

Test distance was 3.0 metres.

Cellular Band

EUT				Rx Antenna		Spectrum Analyzer		Substitution Method Tracking Generator				
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 (Harmonics) CDMA2000, (RC3, SO55), CH 1013, CH 384, CH 777 Handheld Standalone, USB down **Low Channel –** 824.70 MHz												
2nd	1013	1649.40	800	Horn	V	51.6	54.9	V-V	-17.1	-45.3	-13	-32.3
2nd	1013	1649.40	800	Horn	H	54.9		H-H	-16.6			
The harmonics were investigated up to the 10th harmonic. Harmonics above the 2nd harmonic were in the noise floor (NF) **Middle Channel** – 836.52 MHz												
2nd	384	1673.04	800	Horn	V	54.9	58.3	V-V	-13.3	-41.5	-13	-28.5
2nd	384	1673.04	800	Horn	H	58.3		H-H	-12.8			
The harmonics were investigated up to the 10th harmonic. Harmonics above the 2nd harmonic were in the NF **High Channel** – 848.32 MHz												
2nd	777	1696.64	800	Horn	V	52.1	60.2	V-V	-11.5	-39.6	-13	-26.6
2nd	777	1696.64	800	Horn	H	60.2		H-H	-10.8			
The harmonics were investigated up to the 10th harmonic. Harmonics above the 2nd harmonic were in the NF												

Radiated Emissions Test Data Results cont'd

Test distance was 3.0 metres.

Cellular Band

EUT				Rx Antenna		Spectrum Analyzer		Substitution Method Tracking Generator				
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 (Harmonics) CDMA2000, (RC3, TDSO SO32), CH 1013, CH 384, CH 777 Handheld Standalone, USB up **Low Channel –** 824.70 MHz												
2nd	1013	1649.40	800	Horn	V	51.8	54.9	V-V	-16.9	-45.3	-13	-32.3
2nd	1013	1649.40	800	Horn	H	54.9		H-H	-16.6			
The harmonics were investigated up to the 10th harmonic. Harmonics above the 2nd harmonic were in the noise floor (NF) **Middle Channel** – 836.52 MHz												
2nd	384	1673.04	800	Horn	V	51.1	53.8	V-V	-18.4	-46.5	-13	-33.5
2nd	384	1673.04	800	Horn	H	53.8		H-H	-17.8			
The harmonics were investigated up to the 10th harmonic. Harmonics above the 2nd harmonic were in the NF. **High Channel** – 848.32 MHz												
2nd	777	1696.64	800	Horn	V	56.8	59.9	V-V	-11.8	-39.9	-13	-26.9
2nd	777	1696.64	800	Horn	H	59.9		H-H	-11.1			
The harmonics were investigated up to the 10th harmonic. Harmonics above the 2nd harmonic were in the NF												

Radiated Emissions Test Data Results cont'd

Cellular Band

The environmental test conditions were:

Temperature	24ºC
Pressure	1013 mb
Relative Humidity	22%

Date of Test: January 18 2007

Test Distance was 3.0 metres with a EUT height of 1.0 metres, 30 MHz to 1000 MHz. The Handheld PIN 3016B247 was in standalone, vertical position.

The measurements were performed in 1xEVDO mode, channel 384.

Frequency (MHz)	Antenna Pol. (V/H)	Antenna Height (metres)	Test Angle (Deg.)	Detector (PK or AVE)	Measured Level (dBµV)	Correction Factor for preamp/antenna/ cables/ filter (dB/m)	Field Strength Level (reading+corr) (dBµV/m)	Limit @ 3.0 m (dB)	Test Margin (dB)
817.40	V	1.90	303	PK	68.72	-98.09	-29.37	-13	-16.37
855.63	V	1.65	271	PK	63.89	-96.90	-33.01	-13	-20.01

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

Radiated Emissions Test Data Results cont'd

Test distance was 3.0 metres.

Cellular Band

EUT				Rx Antenna		Spectrum Analyzer		Substitution Method Tracking Generator				
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 (Harmonics) 1xEVDO, CH 1013, CH 384, CH 777 Handheld Standalone, USB up **Low Channel –** 824.70 MHz												
2nd	1013	1649.40	800	Horn	V	50.7	55.1	V-V	-16.7	-45.1	-13	-32.1
2nd	1013	1649.40	800	Horn	H	55.1		H-H	-16.4			
The harmonics were investigated up to the 10th harmonic. Harmonics above the 2nd harmonic were in the noise floor (NF) **Middle Channel** – 836.52 MHz												
2nd	384	1673.04	800	Horn	V	50.0	53.1	V-V	-19.2	-47.3	-13	-34.3
2nd	384	1673.04	800	Horn	H	53.1		H-H	-18.6			
The harmonics were investigated up to the 10th harmonic. Harmonics above the 2nd harmonic were in the NF **High Channel** – 848.32 MHz												
2nd	777	1696.64	800	Horn	V	48.5	54.2	V-V	-18.1	-46.1	-13	-33.1
2nd	777	1696.64	800	Horn	H	54.2		H-H	-17.3			
The harmonics were investigated up to the 10th harmonic. Harmonics above the 2nd harmonic were in the NF												

Radiated Emissions Test Data Results cont'd

Test distance was 3.0 metres.

Cellular Band

EUT				Rx Antenna		Spectrum Analyzer		Substitution Method Tracking Generator				
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)
Cellular BAND **RF Local Oscillator (LO)** Handheld Standalone, vertical position **Low Channel**												
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. **Middle Channel**												
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. **High Channel**												
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.												

Radiated Emissions Test Data Results

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)	(Watts)	Limit (dBm)	Diff to Limit (dB)
PCS BAND (EIRP), CDMA2000, (RC3, SO55) - CH 25, CH 600, CH 1175 Handheld Standalone, USB down													
F0	25	1851.25	1900	Horn	V	87.1	87.1	V-V	-12.3	24.6	0.288	33	-8.4
F0	25	1851.25	1900	Horn	H	86.0		H-H	-10.7				
F0	600	1880.00	1900	Horn	V	87.9	87.9	V-V	-10.3	**26.5**	0.447	33	-6.5
F0	600	1880.00	1900	Horn	H	85.3		H-H	-8.6				
F0	1175	1908.75	1900	Horn	V	87.6	87.6	V-V	-10.3	26.0	0.398	33	-7.0
F0	1175	1908.75	1900	Horn	H	82.6		H-H	-8.9				

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

Radiated Emissions Test Data Results cont'd

PCS Band

The environmental test conditions were:

Temperature	23ºC
Pressure	1029mb
Relative Humidity	22%

Date of Test: January 22 2007

Test Distance was 3.0 metres with a EUT height of 1.0 metres, 30 MHz to 1000 MHz. The Handheld PIN 3016B678 was in standalone, vertical position.

The measurements were performed in CDMA2000 (RC3, SO55) mode, channel 600.

Frequency	Antenna		Test Angle	Detector	Measured Level	Correction Factor for preamp/antenna/ cables/ filter	Field Strength Level (reading+corr)	Limit @ 3.0 m	Test Margin
	Pol.	Height		(PK or AVE)	(dBµV)	(dB/m)	(dBµV/m)	(dB)	(dB)
(MHz)	(V/H)	(metres)	(Deg.)						
-	-	-	-	-	-	-	-	-	-

All emissions were in the noise floor (NF).

Radiated Emissions Test Data Results cont'd

PCS Band

The environmental test conditions were:

Temperature	23ºC
Pressure	1018 mb
Relative Humidity	23%

Date of Test: January 16 2007

Test Distance was 3.0 metres with a EUT height of 1.0 metres, 1 GHz to 19 GHz.
The Handheld PIN 3016B247 was in standalone, vertical position.

The measurements were performed in CDMA2000 (RC3, SO55) mode, channel 600.

Frequency (MHz)	Antenna Pol. (V/H)	Antenna Height (metres)	Test Angle (Deg.)	Detector (PK or AVE)	Measured Level (dBµV)	Correction Factor for preamp/antenna/ cables/ filter (dB/m)	Field Strength Level (reading+corr) (dBµV/m)	Limit @ 3.0 m (dB)	Test Margin (dB)
1840.74	V	1.88	32	PK	58.63	-93.22	-34.59	-13	-21.59
18705.05	V	2.53	306	PK	42.01	-73.22	-31.21	-13	-18.21
18700.33	H	1.42	175	PK	41.34	-73.03	-31.69	-13	-18.69

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

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)
PCS BAND (Harmonics) CDMA2000, (RC3, SO55) - CH 25, CH 600, CH 1175 Handheld Standalone, USB down **Low Channel** 1851.25 MHz												
2nd	25	3702.50	1900	Horn	V	45.9	46.5	V-V	-14.4	-36.4	-13	-23.4
2nd	25	3702.50	1900	Horn	H	46.5		H-H	-14.7			
The harmonics were investigated up to the 10th harmonic. Emissions above the 2nd harmonic were in the noise floor (NF) **Middle Channel** 1880.00 MHz												
2nd	600	3760.00	1900	Horn	V	45.2	46.7	V-V	-14.8	-35.6	-13	-22.6
2nd	600	3760.00	1900	Horn	H	46.7		H-H	-13.5			
The harmonics were investigated up to the 10th harmonic. Emissions above the 2rd harmonic were in the NF **High Channel** 1908.75 MHz												
2nd	600	3760.00	1900	Horn	V	45.5	45.9	V-V	-15.1	-37.3	-13	-24.3
2nd	600	3760.00	1900	Horn	H	45.9		H-H	-15.3			
The harmonics were investigated up to the 10th harmonic.												
Emissions above the 2rd harmonic were in the NF												

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)
PCS BAND (Harmonics) CDMA2000, (RC3, TDSO SO32) - CH 25, CH 600, CH 1175 Handheld Standalone, USB down **Low Channel** 1851.25 MHz												
2nd	25	3702.50	1900	Horn	V	44.9	46.3	V-V	-14.6	-36.6	-13	-23.6
2nd	25	3702.50	1900	Horn	H	46.3		H-H	-15.1			
The harmonics were investigated up to the 10th harmonic. Harmonics above the 2nd harmonic were in the noise floor (NF) **Middle Channel** 1880.00 MHz												
2nd	600	3760.00	1900	Horn	V	44.8	45.6	V-V	-14.8	-36.9	-13	-23.9
2nd	600	3760.00	1900	Horn	H	45.6		H-H	-15.0			
The harmonics were investigated up to the 10th harmonic. Harmonics above the 2nd harmonic were in the NF **High Channel** 1908.75 MHz												
2nd	600	3760.00	1900	Horn	V	45.3	46.2	V-V	-15.0	-37.2	-13	-24.2
2nd	600	3760.00	1900	Horn	H	46.2		H-H	-15.1			
The harmonics were investigated up to the 10th harmonic.												
Harmonics above the 2nd harmonic were in the NF												

Radiated Emissions Test Data Results cont'd

PCS Band

The environmental test conditions were:

Temperature	23ºC
Pressure	1029mb
Relative Humidity	22%

Date of Test: January 19 2007

Test Distance was 3.0 metres with a EUT height of 1.0 metres, 30 MHz to 1000 MHz. The Handheld PIN 3016B678 was in standalone, vertical position.

The measurements were performed in 1xEVDO mode, channel 600.

Frequency (MHz)	Antenna Pol. (V/H)	Antenna Height (metres)	Test Angle (Deg.)	Detector (PK or AVE)	Measured Level (dBµV)	Correction Factor for preamp/antenna/ cables/ filter (dB/m)	Field Strength Level (reading+corr) (dBµV/m)	Limit @ 3.0 m (dB)	Test Margin (dB)
-	-	-	-	-	-	-	-	-	-

All emissions were in the noise floor (NF).

Radiated Emissions Test Data Results cont'd

PCS Band

The environmental test conditions were:

Temperature	23ºC
Pressure	1029 mb
Relative Humidity	22%

Date of Test: January 16 2007

Test Distance was 3.0 metres with a EUT height of 1.0 metres, 1 GHz to 19 GHz.
The Handheld PIN 3016B247 was in standalone, vertical position.

The measurements were performed in 1xEVDO mode, channel 600.

Frequency (MHz)	Antenna Pol. (V/H)	Antenna Height (metres)	Test Angle (Deg.)	Detector (PK or AVE)	Measured Level (dBµV)	Correction Factor for preamp/antenna/ cables/ filter (dB/m)	Field Strength Level (reading+corr) (dBµV/m)	Limit @ 3.0 m (dB)	Test Margin (dB)
1840.40	V	1.81	45	PK	59.30	-93.22	-33.92	-13	-20.92
18704.96	H	1.47	297	PK	42.28	-73.22	-30.94	-13	-17.94
18701.05	V	1.04	226	PK	42.30	-73.16	-30.86	-13	**-17.86**
18726.03	H	1.63	49	PK	42.44	-75.56	-33.12	-13	-20.12

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

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)
PCS BAND (Harmonics) 1xEVDO - CH 25, CH 600, CH 1175 Handheld Standalone, USB down **Low Channel** 1851.25 MHz												
2nd	25	3702.50	1900	Horn	V	45.7	48.1	V-V	-12.4	-34.4	-13	-21.4
2nd	25	3702.50	1900	Horn	H	48.1		H-H	-12.6			
The harmonics were investigated up to the 10th harmonic. Harmonics above the 2nd were in the noise floor (NF) **Middle Channel** 1880.00 MHz												
2nd	600	3760.00	1900	Horn	V	45.5	46.7	V-V	-13.4	-35.5	-13	-22.5
2nd	600	3760.00	1900	Horn	H	46.7		H-H	-13.5			
The harmonics were investigated up to the 10th harmonic. Harmonics above the 2nd harmonic were in the NF **High Channel** 1908.75 MHz												
2nd	600	3760.00	1900	Horn	V	44.5	47.6	V-V	-13.5	-35.4	-13	-22.4
2nd	600	3760.00	1900	Horn	H	47.6		H-H	-13.2			
The harmonics were investigated up to the 10th harmonic.												
Harmonics above the 2nd harmonic were in the NF												

Radiated Emissions Test Data Results cont'd

Test distance was 3.0 metres.

PCS Band

								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 – RF LO Transmit mode with the handheld in standalone USB down position. **Low Channel**												
F0	25	1716.67	1900	Horn	V	NF	-	V-V	-	-	-13	-
F0	25	1716.67	1900	Horn	H	NF		H-H	-			
Emissions were in the NF. **Middle Channel**												
F0	600	1742.22	1900	Horn	V	NF	-	V-V	-	-	-13	-
F0	600	1742.22	1900	Horn	H	NF		H-H	-			
Emissions were in the NF. **High Channel**												
F0	1175	1767.78	1900	Horn	V	NF	-	V-V	-	-	-13	-
F0	1175	1767.78	1900	Horn	H	NF		H-H	-			
Emissions were in the NF.												