EMI Test Report

Research In Motion Limited

REPORT NO.: RIM-0206-04

PRODUCT Model No: R6220GW
Type Name: BlackBerry 6225 Wireless Handheld
FCC ID: L6AR6220GW
IC: 2503A-R6220GW

Approved by: _____Paul G Cardinal_____
Paul G. Cardinal, Ph.D.
Manager, Compliance and Certification

Date: _____28 June 2002_____

Table of Contents

A) Scope

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

FCC CFR 47 Part 24, Subpart E, Broadband PCS
Industry Canada, RSS-133 Issue 2, Rev. 1 Nov. 6/99, 2.0 GHz Personal Communications Services

B) Product Identification

The equipment under test (EUT) was tested at the Research In Motion (RIM) EMI test facility, located at:

305 Phillip Street
Waterloo, Ontario
Canada, N2L 3W8
Phone: 519 888 7465
Fax: 519 888 6906
Web Site: www.rim.net

The testing began on May 08, 2002 and completed on June 27, 2002. The sample equipment under test (EUT) included:

1. BlackBerry 6225 Wireless Handheld, model number R6220GW, PIN 2001B917, FCC ID L6AR6220GW, IC: 2503A-R6220GW.
2. USB data cable, model number HDW-04162-001, 1.5 metres long.
3. Travel Charger, model number PSM05R-050Q, RIM part number ASY-04078-001 with an output voltage of 5.0 volts dc.
4. Headset, model number HDW-03458-001

The transmit frequency ranges for the BlackBerry 6225 Wireless Handheld are: GSM band, 880 to 915MHz and PCS band, 1850 to 1910 MHz. Only the PCS band emissions were measured since the GSM band is not available in North America and therefore cannot be used.

C) Support Equipment Used for the Testing of the EUT

1) Rohde & Schwarz, Universal Radio Communication Tester, model number CMU 200, serial number 100251
2) PC, Dell, model number MMP, serial number 6SPS20B
3) Monitor, KDS, model number KD-1460, serial number 4530019652
4) Printer, H/P, model number C5884A, serial number US8251W0VQ
5) DC Power Supply, H/P, model 6632B, serial number US37472179

D) **Test Voltage**

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

E) **Test Results Chart**

Specifications	Test Type	Meets Requirements	Performed By
FCC CFR 47 Part 24, Subpart E IC RSS-133	Radiated Spurious/harmonic Emission, EIRP	Yes	Masud Attayi
FCC CFR 47 Part 24, Subpart E IC RSS-133	Conducted Emissions, Occupied Bandwidth, Frequency Stability	Yes	Jonathan Doll Maurice Battler

F) **Modifications to EUT**

No modifications were required to the EUT.

G) **Summary of Results**

1) The EUT passed the Occupied Bandwidth and channel mask requirements as per 47 CFR 24.238 and RSS-133. The channels measured were low, middle and high.
See APPENDIX 1 for the test data.

2) The EUT passed the Conducted Spurious Emission requirements in the PCS band as per 47 CFR 24.238 and RSS-133. The EUT was measured on the low, middle and high channels. The frequency range measured was from 10 MHz to 20 GHz.
See APPENDIX 1 for the test data.

3) The EUT passed the Conducted RF Output Power requirements. The channels measured were low, middle and high.
See APPENDIX 2 for the test data.

4) The EUT passed the Frequency Stability vs. Temperature and Voltage requirements as per 47 CFR 24.135 and RSS-133. 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 (3.5 volts), nominal (3.8 volts) and high (4.1 volts) dc input voltage at each temperature step and channel at maximum output power.
Note: 4.1 volts is the instantaneous turn-on voltage for a fully charged battery. When the device transmits, this voltage drops to the nominal voltage within a few minutes.
See APPENDIX 3 for the test data.

5) The radiated spurious\harmonic emissions and EIRP passed the limits. The EUT was placed on a nonconductive wooden table, 80 cm high that was positioned on a remotely rotatable turntable. The test distance used between the EUT and the receiving antenna was three metres. 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 turntable was rotated to determine the azimuth of the peak emissions. At this point the emissions were maximized by elevating the antenna in the range of 1 to 4 metres. The maximum emissions level was recorded. The EUT was measured on the low, middle and high channels.

   The radiated harmonics\spurious emissions were measured for the PCS band up to the 10^{th} harmonics for low, middle and high channels. No emissions could be seen above the noise floor of the spectrum analyzer.
   The highest EIRP in the PCS band measured was 30.90 dBm at 1880 MHz (channel 661).
   To view the test data see APPENDIX 4.

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

H) **Compliance Test Equipment Used**

UNIT	MANUFACTURER	MODEL / SERIAL NUMBER	CAL DUE DATE	USE
Preamplifier system	TDK RF Solutions	PA-02 080010	02-06-21	Radiated Emissions
Preamplifier	Sonoma	310N/11909A 185831	02-06-21	Radiated Emissions
EMC Analyzer	Agilent	E7405A US40240226	02-06-21	Radiated Emissions
Spectrum Analyzer	HP	8563E 3745A08112	02-08-02	Conducted Emissions
DC Power Supply	HP	6632B US37472179	02-07-02	Conducted Emissions
L.I.S.N.	Emco	3816/2 1120	02-06-21	Conducted Emissions
L.I.S.N.	Emco	3816/2 1118	02-06-21	Conducted Emissions
Impul se Limiter	Rohde & Schwarz	ESHS-Z2 836248/052	02-06-21	Conducted Emissions
EMI Receiver	Agilent	85462A 3942A00517	03-04-04	Conducted Emissions
RF Filter Section	Agilent	85460A 3704A00481	03-04-04	Conducted Emissions
Hybrid Log Antenna	TDK	HLP-3003C 17301	02-10-03	Radiated Emissions
Horn Antenna	TDK	HRN-0118 090301	02-10-03	Radiated Emissions
Horn Antenna	TDK	HRN-0118 090601	02-10-03	Radiated Emissions
Signal Generator	HP	83630B 3844A00927	03-04-30	Radiated Emissions
Environmental Chamber	ESPEC Corp.	SH-240S1 91005607	N/R	Conducted Emissions
Universal Radio Communication Tester	Rohde & Schwarz	CMU 200 100251	03-03-20	Radiated/Conducted Emissions
Temperature Probe	Hart Scientific	61161-302 21352860	03-09-10	Conducted Emissions
Dipole Antenna	Schwarzbeck	VHAP 1006	03-03-05	Radiated Emissions
Dipole Antenna	Schwarzbeck	VHAP 1007	03-03-05	Radiated Emissions

I) Declaration

Statement of Performance:

The test sample BlackBerry 6225 Wireless Handheld model R6220GW tested with the following accessories: Travel Charger model number PSM05R-050Q RIM part number ASY-04078-001, Headset model number HDW-03458-001 and USB data cable model number HDW-04162-001 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 equipment used was suitable for the tests performed and within manufacturer's published specifications.
The test equipment was used within its published operating parameters.
The test methods were consistent with the methods described in the relevant standards.

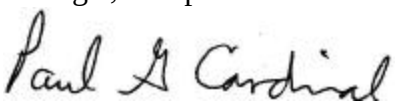
Tested By

Maurice Battler
Compliance Specialist Date: 21 June 2002

Masud S. Attayi, P.Eng.
Senior Engineer, Compliance and Certification Date: 28 June 2002

Reviewed and Approved by:

Paul G. Cardinal, Ph.D.
Manager, Compliance and Certification Date: 28 June 2002



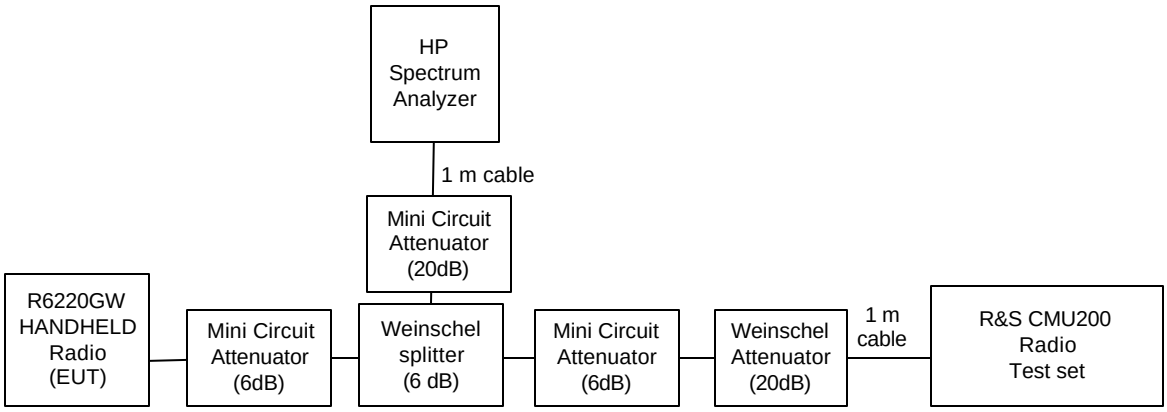
APPENDIX 1

CONDUCTED EMISSIONS TEST DATA/PLOTS

Conducted Emission Test Results

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

Test Setup Diagram



Test Equipment List

Test Instruments	Manufacturer	Model No.	Serial No.	Frequency Range
Spectrum Analyzer	HP	8563E	374A08112	30 Hz – 26.5 GHz
Combination Network	Weinschel	1515	--	DC – 18 GHz
Attenuator	Weinschel	1R-20	--	DC – 18 GHz
Attenuator	Mini Circuit	MCL BW-S6W2	--	DC – 18 GHz
Attenuator	Mini Circuit	MCL BW-S20W2	--	DC – 18 GHz
Universal Radio Communication Tester	Rohde & Schwarz	CMU200	100250	--

Conducted Emission Test Data Con't

Occupied Bandwidth (99%) and –26 dBc Bandwidth

For the low, middle and high channels, the modulation spectrum was measured by both methods of 99% power bandwidth and –26 dBc bandwidth.
The resolution bandwidth required for out-of-band emissions in the 1 MHz bands immediately outside and adjacent to the frequency block, was determined to be at least 1% of the emission bandwidth.
The worst case –26dBc emission bandwidth for the three channels was measured to be 282 kHz which results in 3.0 kHz resolution bandwidth.
On any frequency outside the frequency block and outside the adjacent 1 MHz bands, a resolution bandwidth of at least 1 MHz was employed.

Test Data for selected Frequencies

PCS Frequency (MHz)	99% Occupied Bandwidth (kHz)	-26dBc Bandwidth (kHz)
1850.2	243	273
1880.0	242	282
1909.8	242	277

The conducted spurious emissions – As per 47 CFR 24.238 and RSS-133 were measured from 10 MHz to 20 GHz. No emissions could be seen above the noise floor of the spectrum analyzer.

Measurement Plots for PCS

Refer to the following measurement plots for more detail.

See Figures 1 to 6 for plots of the Spurious Emission results

See Figures 7 to 12 for the plots of the 99% Occupied Bandwidth and –26 dBc
Carrier Reference at 0.0 dB corresponds to maximum peak output power.

See Figures 13 to 14 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 con't

Figure 1: Spurious Conducted Emissions, Low channel

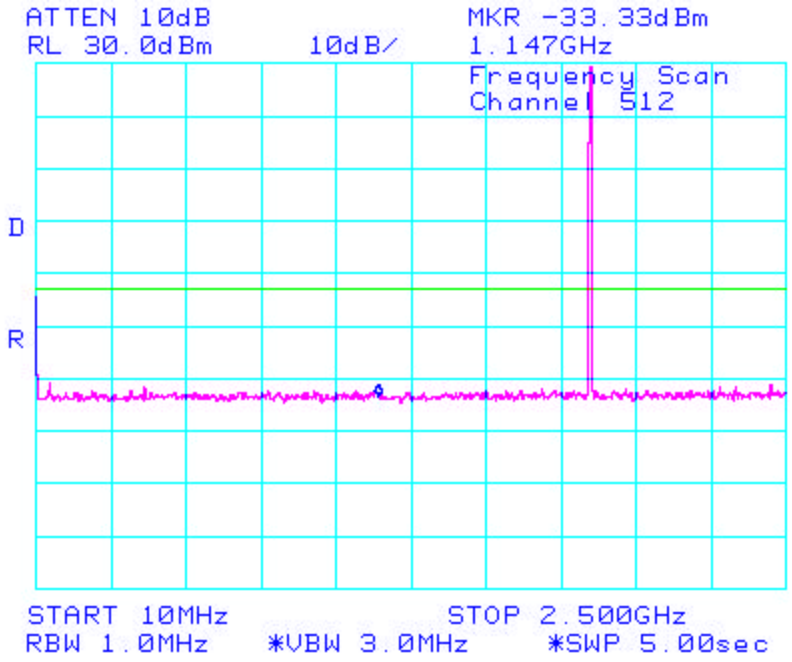
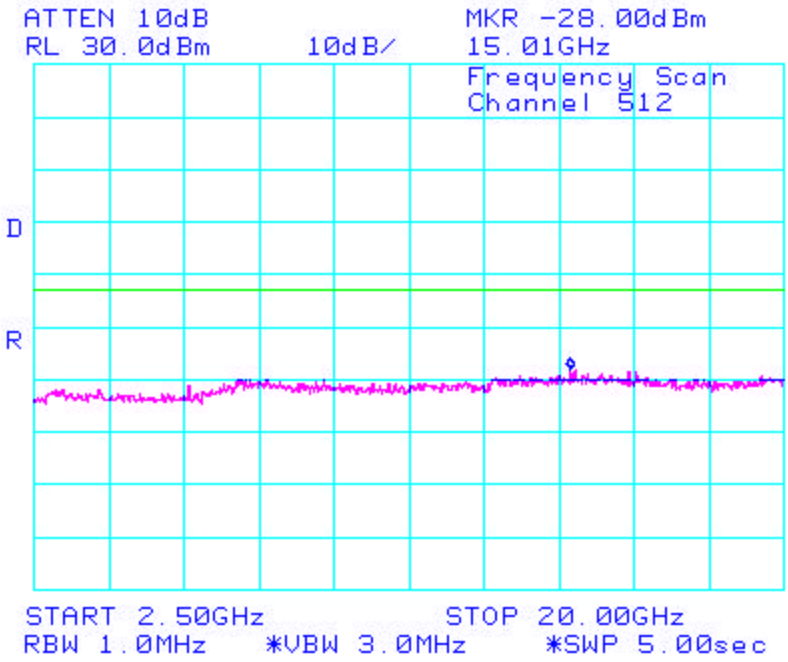


Figure 2: Spurious Conducted Emissions, Low channel



Conducted Emission Test Results Con't

Figure 3: Spurious Conducted Emissions, Middle Channel

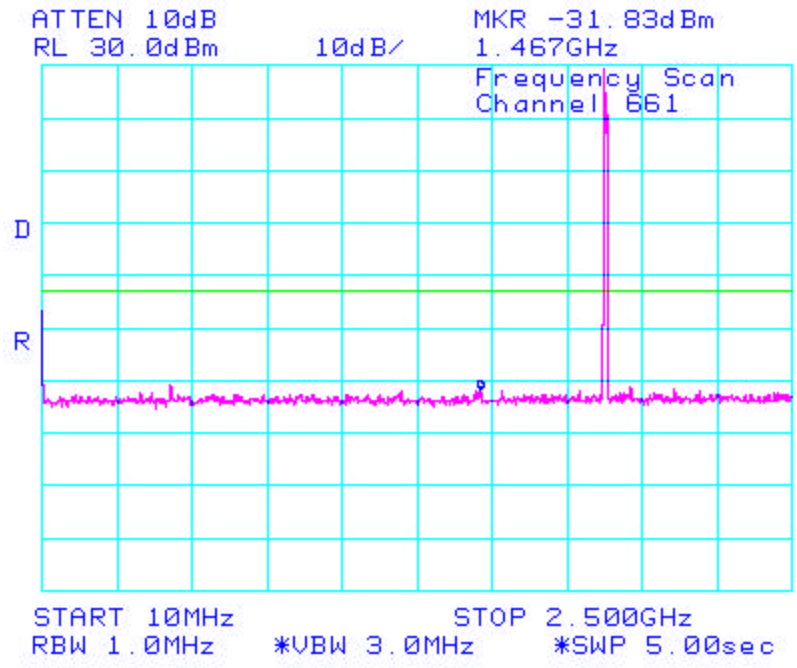
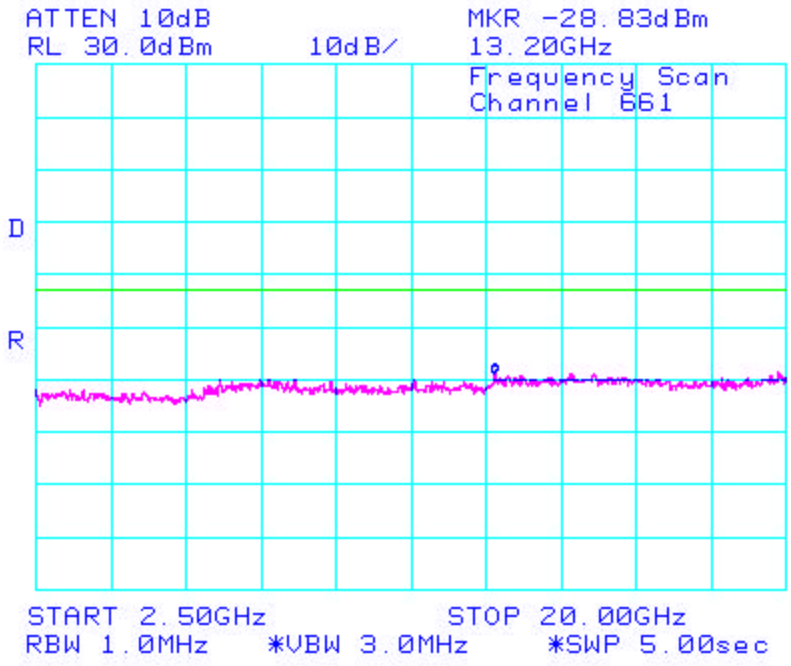


Figure 4: Spurious Conducted Emissions, Middle Channel



Conducted Emission Test Results Con't

Figure 5: Spurious Conducted Emissions, High Channel

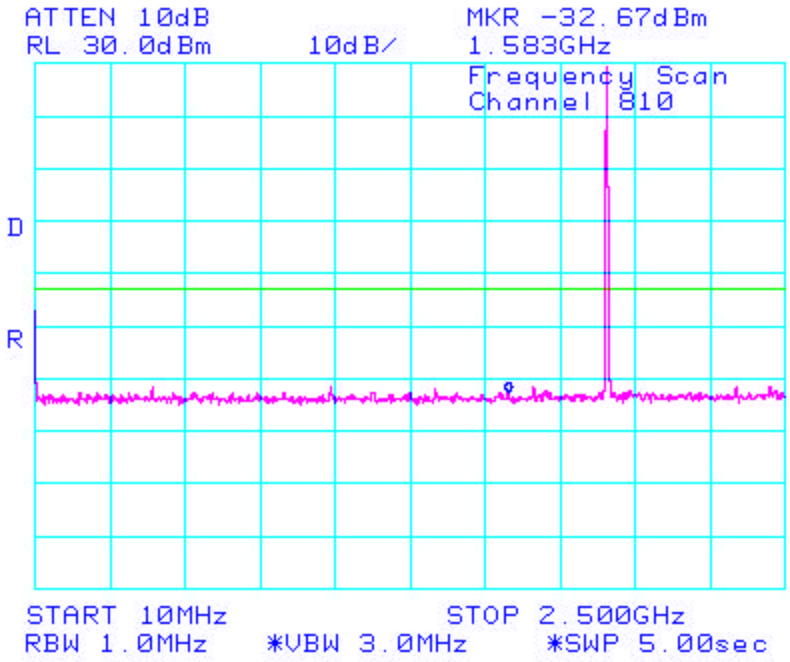
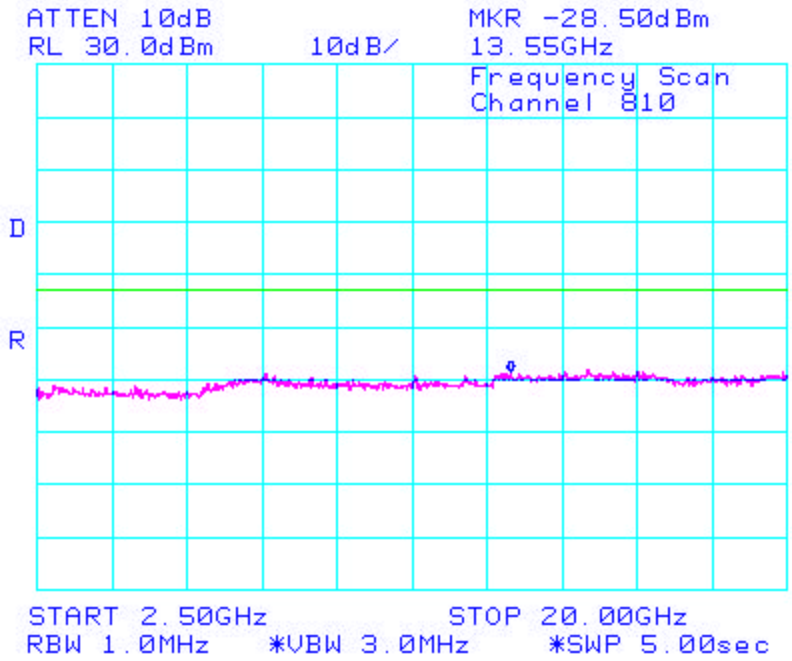


Figure 6: Spurious Conducted Emissions, High Channel



Conducted Emission Test Results Con't

Figure 7: -26dBc bandwidth, Low Channel

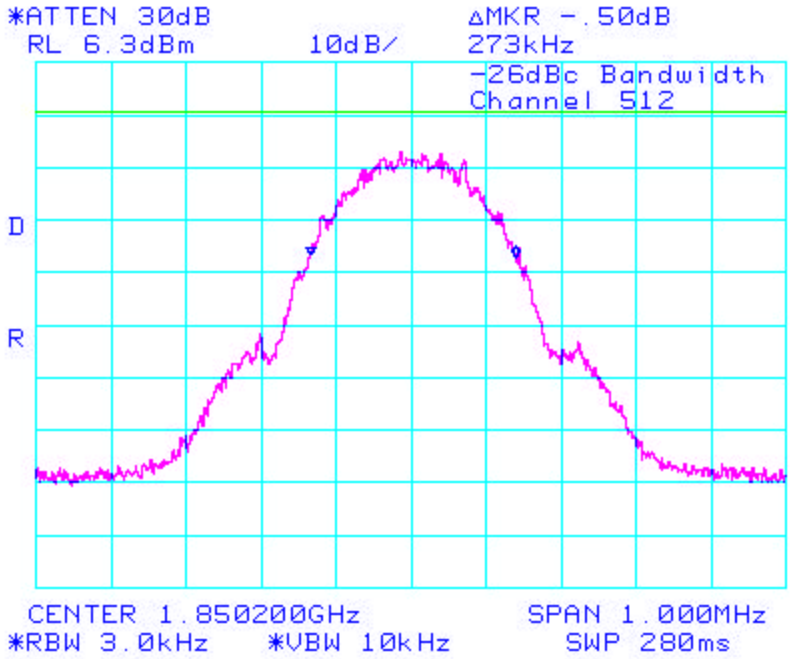
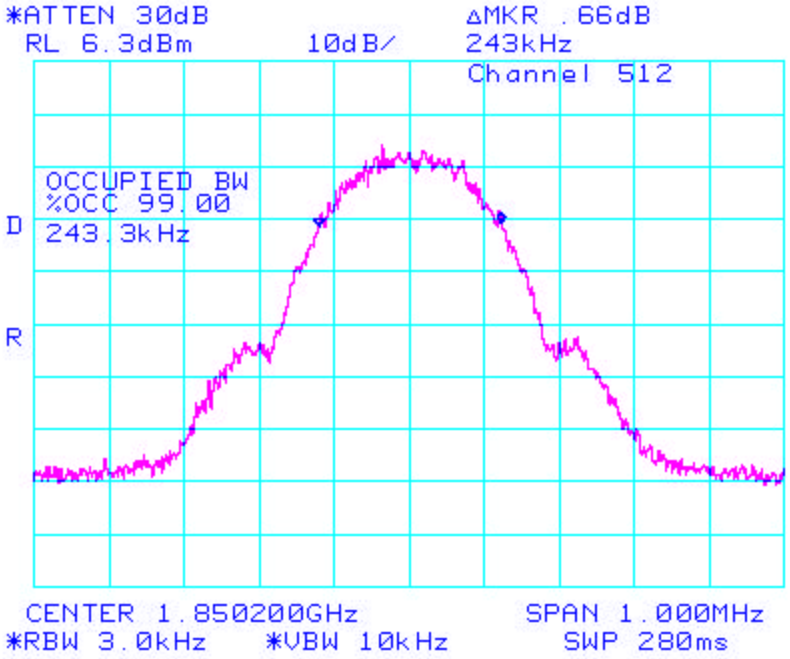


Figure8: Occupied Bandwidth, Low Channel



Conducted Emission Test Results Con't

Figure 9: -26dBc bandwidth, Middle Channel

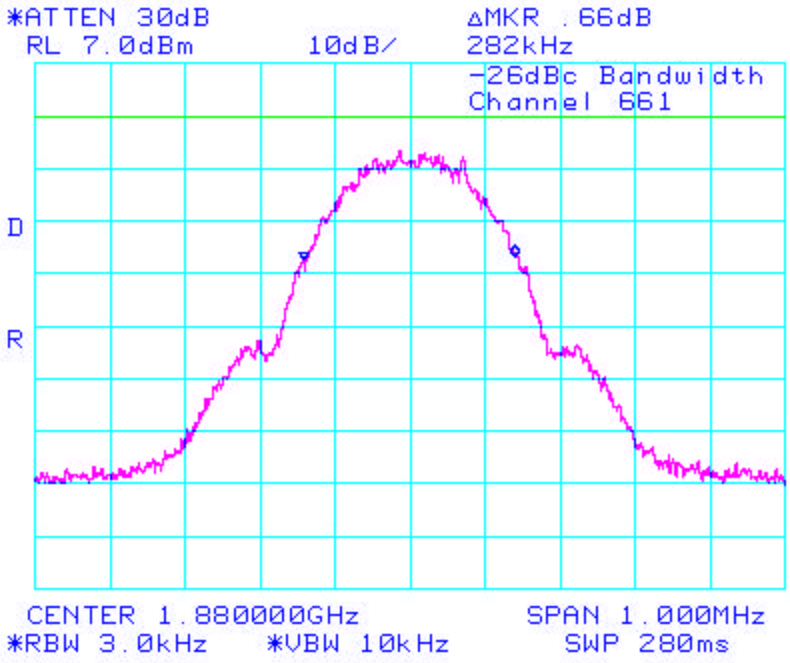
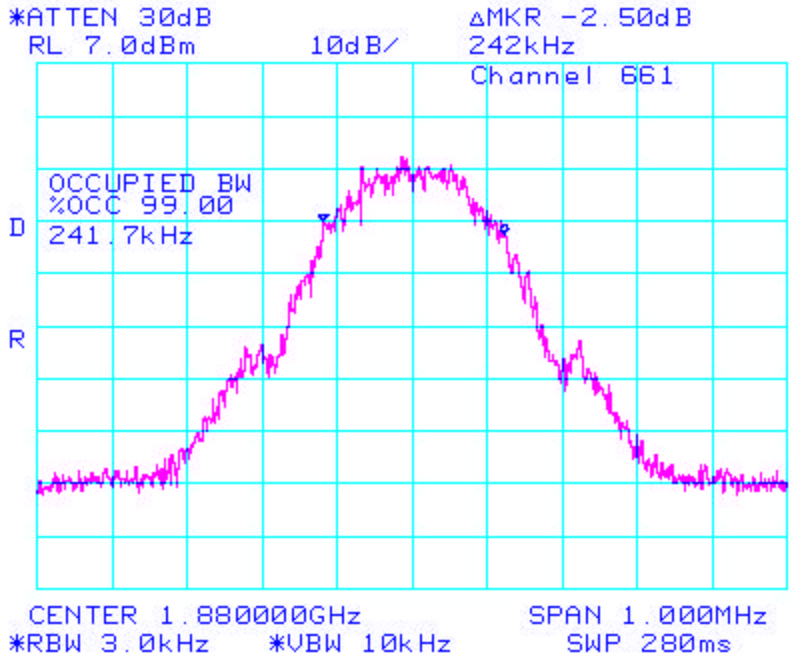


Figure 10: Occupied Bandwidth, Middle Channel



Conducted Emission Test Results Con't

Figure 11: -26dBc bandwidth**, High Channel**

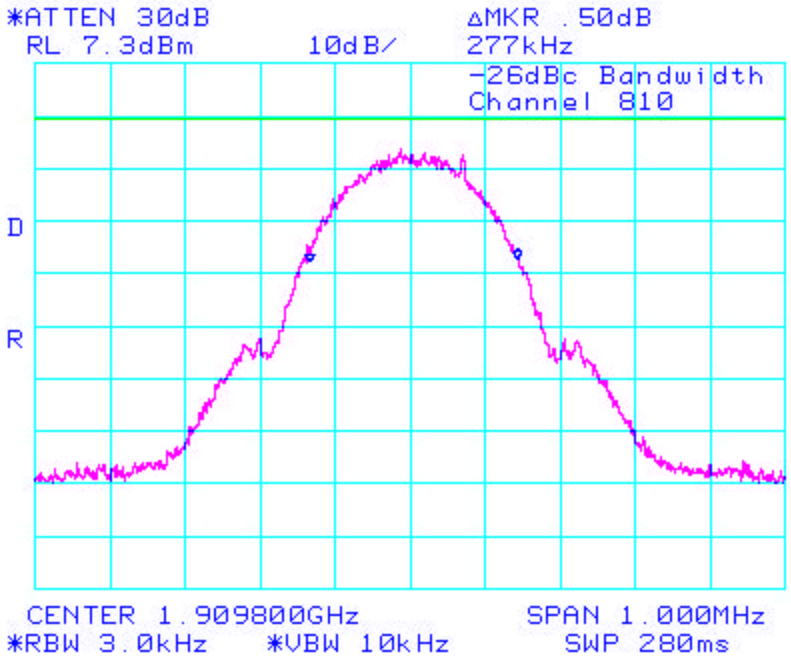
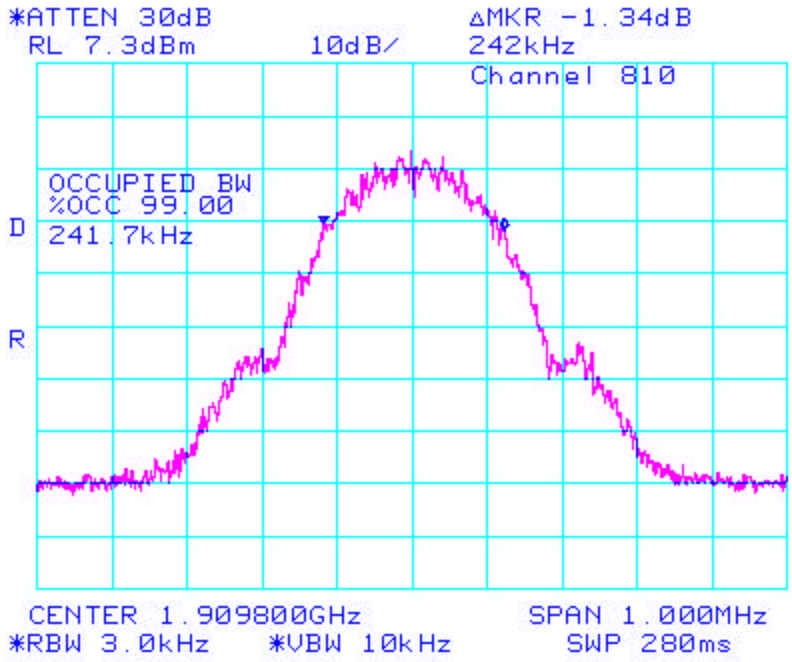


Figure 12: Occupied Bandwidth, High Channel



Conducted Emission Test Results Con't

Figure 13: Low Channel Mask

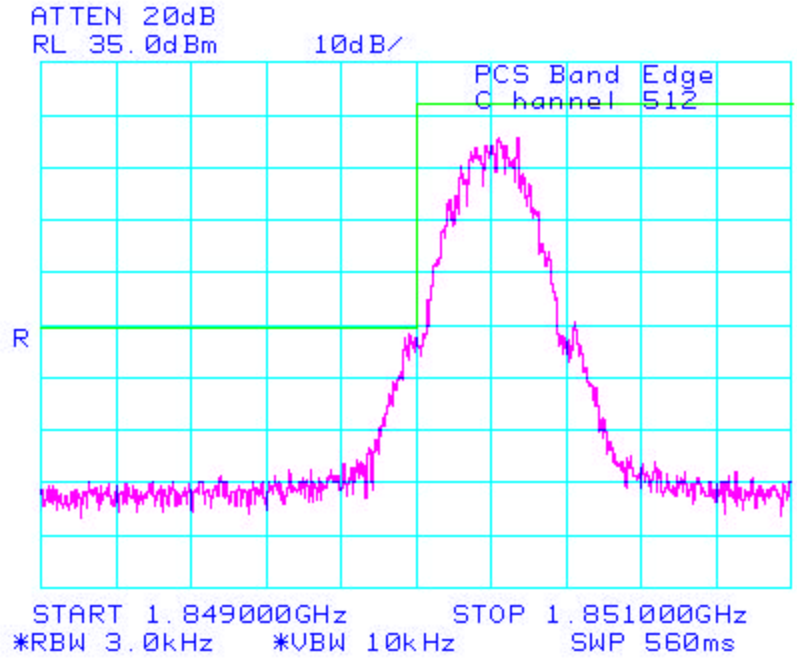
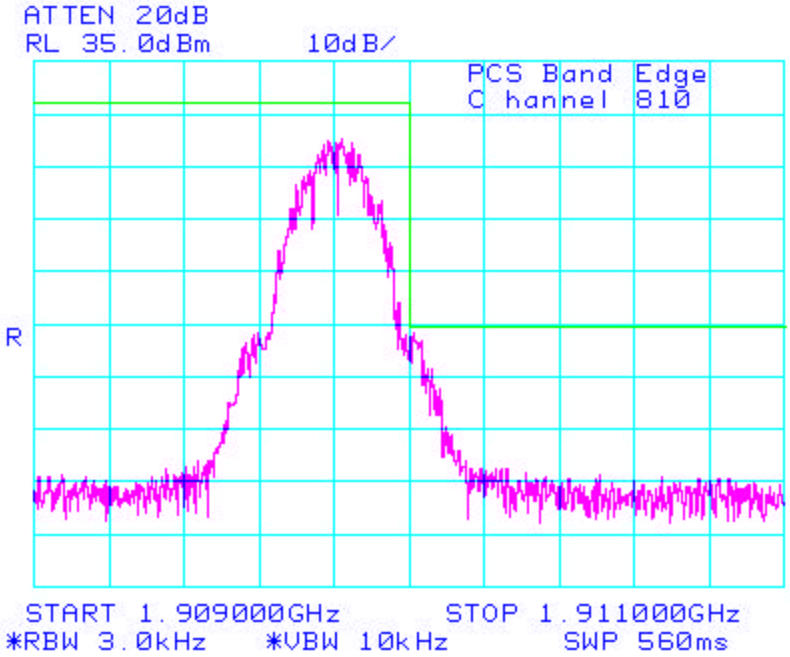
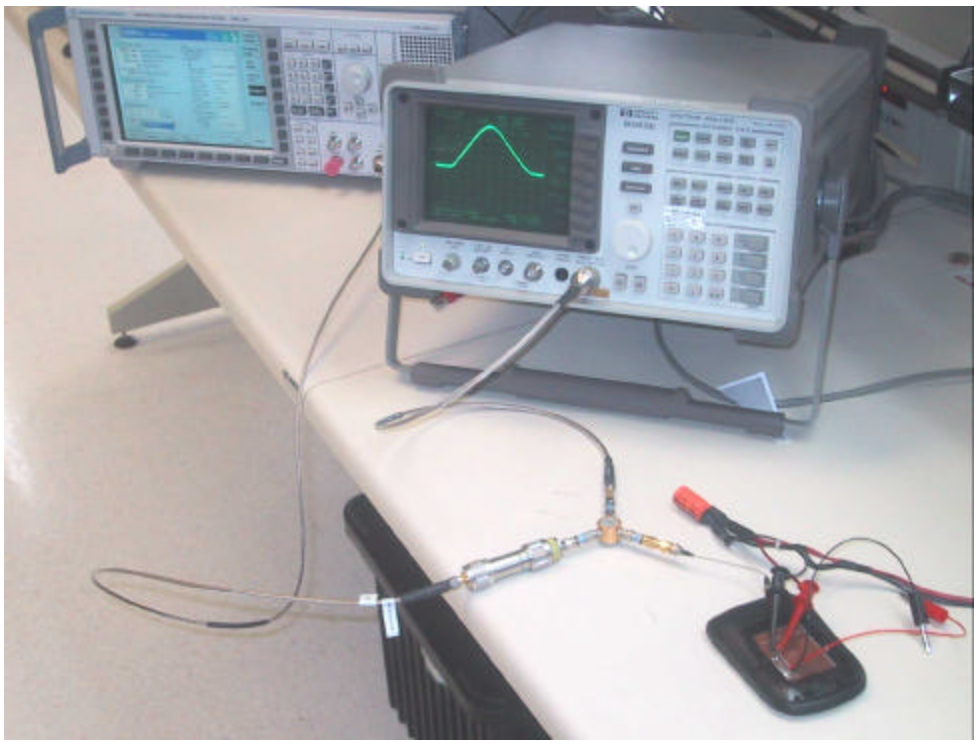


Figure 14: High Channel Mask



Conducted Emission Test-Setup Photo

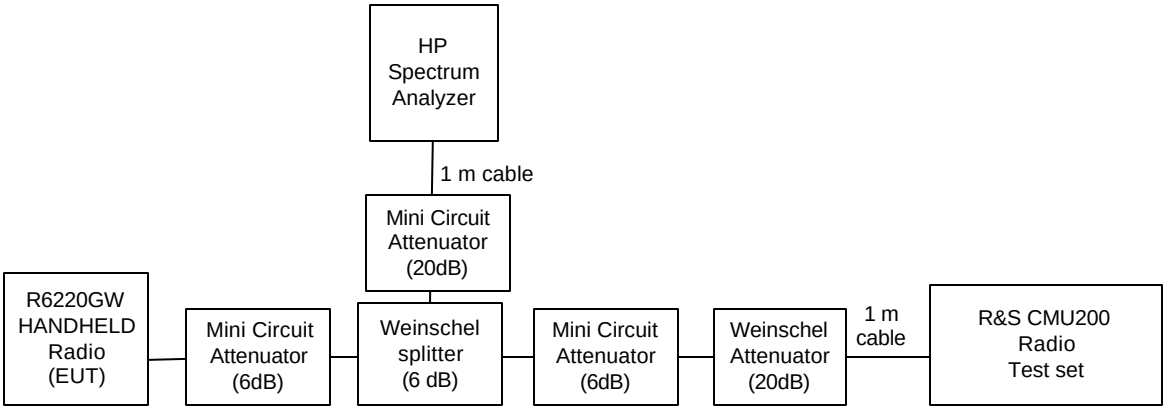
FCC CFR 47 Part 24, Subpart E, RSS-133



APPENDIX 2

CONDUCTED RF OUTPUT POWER TEST DATA

Conducted RF Output Power Test Data

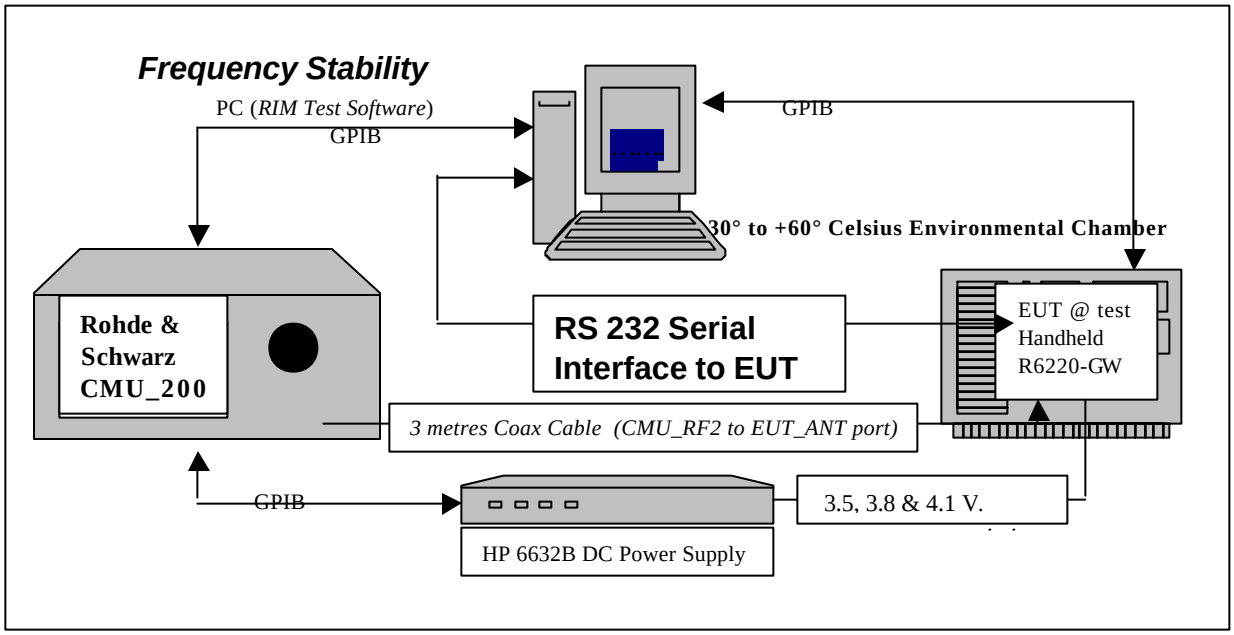


Channel	Frequency (MHz)	Measured Peak Conducted Power (dBm)	Total Correction Factor (dB)	Corrected Peak Conducted Power (dBm)
512	1850.2	-2.83	33.0	30.17
661	1880.0	-3.0	33.0	30.0
810	1909.8	-2.83	33.0	30.17

APPENDIX 3

FREQUENCY STABILITY TEST DATA

Frequency Stability Test Data



SYSTEM	*Model*	*Serial Number*	*Calibration Due Date.*
R & S Universal Radio Communication Test Set	**CMU200**	100120	21-March-2003
HP System DC Power Supply	**6632B**	20A80400711	30-July-2002
Network Analyzer	**HP 8753D**	20A80400806	07-Aug-2002
Calibration Kit	**HP85033D**	3423A02787	01-Nov-2002
Espec Environmental Chamber	**SH240**	91005607	N/A
Hart Temperature Probe	**61161-302**	21352860	10-Sept-2003

CFR 47 Chapter 1 - Federal Communications Commission Rules

24.135 ***Frequency Stability***.

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

The R6220GW World Band Handheld, (referred as EUT herein and after) transmitted frequencies are less than 0.1 ppm off the received frequency from the Rhode & Schwarz CMU 200 Universal Radio Communication Test Set.
The R6220GW World Band Handheld meets the requirements as stated in CFR 47 chapter 1, Section 24.135 and RSS-133 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 three-meter coax cable was calibrated to characterize the insertion loss for the transmitted frequencies between the RF input/output of the CMU 200 and the EUT antenna port; located inside the environmental chamber.

Calibration for the Cable Loss was performed in the RF Laboratory on May 8th 02.

Procedure:
Full_ Two port Calibration of 8720D using the 85033D was completed.

A three-meter long coax cable was used to complete the RF power measurement.

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

PCS Frequency (MHz)	Cable loss (dB)
1850.2	*6.7*
1877.2.0	*6.7*
1904.2	*6.7*

Procedure:

The EUT was placed in the Temperature chamber and connected to the CMU 200 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, then 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 CMU 200 via the GPIB Bus set to the 1900 PCS band. 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 of 1850.2, 1877.2 & 1904.2 MHz.
The power supply was cycled from the minimum voltage of 3.5 volts, to 3.8 volts, and then to 4.1 volts nominal voltage.
The frequency error was measured at a maximum output power of 30 dBm and recorded by the automated system test software.

The EUT output power and frequency was measured at 3.5V, 3.8V,and 4.1VDC. The transmit frequency was varied in 3 steps consisting of 1850.2 MHz, 1877.2 MHz and 1904.2 MHz. 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 start of the measurement 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; CMU 200 Communications Test Set, and Environmental Chamber.
2. Start test program
3. Set the Temperature to –30 degrees Celsius and maintain a period of one- hour soak time, with the EUT supply voltage disabled.
4. Set power supply voltage to 3.5 Volts
5. Set up CMU 200 Radio Communication Tester
6. Command the CMU 200 to switch to 1850.2 MHz
7. Enable the voltage to the EUT, and connect a link to the CMU 200 test set
8. EUT is commanded to Transmit 100 Bursts
9. Software logs the following data from the CMU 200, power supply and temperature chamber: Traffic Channel Number, Traffic Channel Frequency, Power Level, Chamber Temperature, Supply Voltage, Power, Frequency Error.
10. The CMU 200 commands the EUT to change frequency to 1877.2 and 1904.2 MHz 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 degrees to 60 degrees Celsius.
14. Repeat steps 5, to 10 changing the supply voltage to 4.1 Volts

Procedure 5, to 10 was repeated at room temperature (20?C) with the power supply voltage set to 3.5V, 3.8V, and 4.1 Volts

PCS Channel results: 512, 647, & 782 @ 20°C maximum transmitted power

Traffic Channel Number	*PCS Frequency (MHz*	*PCL (dBm)*	*Voltage (Volts)*	*Temperature (Celsius)*	*Frequency Error (Hz)*	*PPM*
512	1850.2	30	3.5	20	-26.6	0.0144
647	1877.2	30	3.5	20	-28.02	0.0149
782	1904.2	30	3.5	20	-34.93	0.0183

Traffic Channel Number	*PCS Frequency (MHz*	*PCL (dBm)*	*Voltage (Volts)*	*Temperature (Celsius)*	*Frequency Error (Hz)*	*PPM*
512	1850.2	30	3.8	20	-26.15	0.0141
647	1877.2	30	3.8	20	-34.55	0.0184
782	1904.2	30	3.8	20	-28.54	0.0150

Traffic Channel Number	*PCS Frequency (MHz*	*PCL (dBm)*	*Voltage (Volts)*	*Temperature (Celsius)*	*Frequency Error (Hz)*	*PPM*
512	1850.2	30	4.1	20	-22.28	0.0120
647	1877.2	30	4.1	20	-38.74	0.0206
782	1904.2	30	4.1	20	-40.23	0.0211

Channel Results: 512 @ maximum transmitted power

Traffic Channel Number	*Frequency (MHz)*	*PCL (dBm)*	*Voltage (Volts)*	*Temperature (Celsius)*	*Frequency Error (Hz)*	*PPM*
512	1850.2	30	3.5	-30	-61.34	0.0332
512	1850.2	30	3.5	-20	-31.58	0.0171
512	1850.2	30	3.5	-10	-68.96	0.0373
512	1850.2	30	3.5	0	-23.57	0.0127
512	1850.2	30	3.5	10	-20.02	0.0108
512	1850.2	30	3.5	20	-26.6	0.0144
512	1850.2	30	3.5	30	29.44	-0.0159
512	1850.2	30	3.5	40	23.37	-0.0126
512	1850.2	30	3.5	50	26.8	-0.0145
512	1850.2	30	3.5	60	-32.74	0.0177

Traffic Channel Number	*Frequency (MHz)*	*PCL (dBm)*	*Voltage (Volts)*	*Temperature (Celsius)*	*Frequency Error (Hz)*	*PPM*
512	1850.2	30	3.8	-30	-27.77	0.0150
512	1850.2	30	3.8	-20	26.67	-0.0144
512	1850.2	30	3.8	-10	-50.95	0.0275
512	1850.2	30	3.8	0	-24.15	0.0131
512	1850.2	30	3.8	10	30.03	-0.0162
512	1850.2	30	3.8	20	-26.15	0.0141
512	1850.2	30	3.8	30	24.8	-0.0134
512	1850.2	30	3.8	40	27.18	-0.0147
512	1850.2	30	3.8	50	24.67	-0.0133
512	1850.2	30	3.8	60	-30.87	0.0167

Traffic Channel Number	*Frequency (MHz)*	*PCL (dBm)*	*Voltage (Volts)*	*Temperature (Celsius)*	*Frequency Error (Hz)*	*PPM*
512	1850.2	30	4.1	-30	25.89	-0.0140
512	1850.2	30	4.1	-20	-20.99	0.0113
512	1850.2	30	4.1	-10	36.22	-0.0196
512	1850.2	30	4.1	0	25.63	-0.0139
512	1850.2	30	4.1	10	-23.37	0.0126
512	1850.2	30	4.1	20	-22.28	0.0120
512	1850.2	30	4.1	30	-27.51	0.0149
512	1850.2	30	4.1	40	21.5	-0.0116
512	1850.2	30	4.1	50	35.0	-0.060,
512	1850.2	30	4.1	60	-25.57	0.0138

Channel Results: 647 @ maximum transmitted power

Traffic Channel Number	*Frequency (MHz)*	*PCL (dBm)*	*Voltage (Volts)*	*Temperature (Celsius)*	*Frequency Error (Hz)*	*PPM*
647	1877.2	30	3.5	-30	-53.47	0.0285
647	1877.2	30	3.5	-20	-48.3	0.0257
647	1877.2	30	3.5	-10	-57.79	0.0308
647	1877.2	30	3.5	0	-26.99	0.0144
647	1877.2	30	3.5	10	-30.61	0.0163
647	1877.2	30	3.5	20	-28.02	0.0149
647	1877.2	30	3.5	30	-25.83	0.0138
647	1877.2	30	3.5	40	18.08	-0.0096
647	1877.2	30	3.5	50	18.85	-0.0100
647	1877.2	30	3.5	60	-26.67	0.0142

Traffic Channel Number	*Frequency (MHz)*	*PCL (dBm)*	*Voltage (Volts)*	*Temperature (Celsius)*	*Frequency Error (Hz)*	*PPM*
647	1877.2	30	3.8	-30	-46.62	0.0248
647	1877.2	30	3.8	-20	-20.66	0.0110
647	1877.2	30	3.8	-10	-59.86	0.0319
647	1877.2	30	3.8	0	-39.84	0.0212
647	1877.2	30	3.8	10	-27.96	0.0149
647	1877.2	30	3.8	20	-34.55	0.0184
647	1877.2	30	3.8	30	-30.74	0.0164
647	1877.2	30	3.8	40	26.09	-0.0139
647	1877.2	30	3.8	50	17.76	-0.0095
647	1877.2	30	3.8	60	-31.83	0.0170

Traffic Channel Number	*Frequency (MHz)*	*PCL (dBm)*	*Voltage (Volts)*	*Temperature (Celsius)*	*Frequency Error (Hz)*	*PPM*
647	1877.2	30	4.1	-30	-38.94	0.0207
647	1877.2	30	4.1	-20	-21.18	0.0113
647	1877.2	30	4.1	-10	-47.4	0.0253
647	1877.2	30	4.1	0	-28.28	0.0151
647	1877.2	30	4.1	10	-20.79	0.0111
647	1877.2	30	4.1	20	-38.74	0.0206
647	1877.2	30	4.1	30	-27.64	0.0147
647	1877.2	30	4.1	40	-31.58	0.0168
647	1877.2	30	4.1	50	-21.44	0.0114
647	1877.2	30	4.1	60	-30.74	0.0164

Channel Results: 782 @ maximum transmitted power

Traffic Channel Number	*Frequency (MHz)*	*PCL (dBm)*	*Voltage (Volts)*	*Temperature (Celsius)*	*Frequency Error (Hz)*	*PPM*
782	1904.2	30	3.5	-30	-78.26	0.0411
782	1904.2	30	3.5	-20	-48.36	0.0254
782	1904.2	30	3.5	-10	-83.94	0.0441
782	1904.2	30	3.5	0	-26.54	0.0139
782	1904.2	30	3.5	10	-24.41	0.0128
782	1904.2	30	3.5	20	-34.93	0.0183
782	1904.2	30	3.5	30	24.34	-0.0128
782	1904.2	30	3.5	40	-21.24	0.0112
782	1904.2	30	3.5	50	22.47	-0.0118
782	1904.2	30	3.5	60	-30.93	0.0162

Traffic Channel Number	*Frequency (MHz)*	*PCL (dBm)*	*Voltage (Volts)*	*Temperature (Celsius)*	*Frequency Error (Hz)*	*PPM*
782	1904.2	30	3.8	-30	-43.13	0.0226
782	1904.2	30	3.8	-20	-41.13	0.0216
782	1904.2	30	3.8	-10	-38.1	0.0200
782	1904.2	30	3.8	0	-30.61	0.0161
782	1904.2	30	3.8	10	-31.96	0.0168
782	1904.2	30	3.8	20	-28.54	0.0150
782	1904.2	30	3.8	30	-34.35	0.0180
782	1904.2	30	3.8	40	-19.5	0.0102
782	1904.2	30	3.8	50	-20.53	0.0108
782	1904.2	30	3.8	60	-35.64	0.0187

Traffic Channel Number	*Frequency (MHz)*	*PCL (dBm)*	*Voltage (Volts)*	*Temperature (Celsius)*	*Frequency Error (Hz)*	*PPM*
782	1904.2	30	4.1	-30	-54.5	0.0286
782	1904.2	30	4.1	-20	-40.42	0.0212
782	1904.2	30	4.1	-10	-47.01	0.0247
782	1904.2	30	4.1	0	-31.45	0.0165
782	1904.2	30	4.1	10	-25.05	0.0132
782	1904.2	30	4.1	20	-40.23	0.0211
782	1904.2	30	4.1	30	-26.99	0.0142
782	1904.2	30	4.1	40	-34.42	0.0181
782	1904.2	30	4.1	50	-21.89	0.0115
782	1904.2	30	4.1	60	-26.47	0.0139

APPENDIX 4

RADIATED EMISSIONS TEST DATA

Radiated Emissions Test Data Results

Test Distance is 3.0 metres

										Substitution Method				
EUT				Receive Antenna			Spectrum Analyzer			Tracking Generator				
Type	Ch	Freq (MHz)	Band	Pol.	Type	Pol.	Reading (dBuV)	Corrected Reading (dBuV)	Max (V,H) dBuV	Reading (dBm)	Corrected Reading (relative to dipole) (dBm)	Pol.	Limit dBm	Diff to Limit (dB)
PCS BAND (EIRP) - Handheld Standalone, upright position, connected to headset														
F0	512	1850.2	1900	V	Horn	V	93.1	93.1	93.1	-2.1	29.96	VV	33	-3.04
F0	512	1850.2	1900	V	Horn	H	87.9	87.9		-1.3		HH		
F0	661	1880.0	1900	V	Horn	V	93.2	93.2	93.2	-1.5	30.86	VV	33	-2.14
F0	661	1880.0	1900	V	Horn	H	88.5	88.5		-0.4		HH		
F0	810	1909.8	1900	V	Horn	V	92	92	92	-1.9	30.36	VV	33	-2.64
F0	810	1909.8	1900	V	Horn	H	88.2	88.2		-0.9		HH		
PCS BAND (EIRP) - Handheld connected to the Travel Charger & headset														
F0	512	1850.2	1900	V	Horn	V	92.7	92.7	92.7	-2.5	29.56	VV	33	-3.44
F0	512	1850.2	1900	V	Horn	H	89.5	89.5		-1.7		HH		
F0	661	1880	1900	V	Horn	V	92.3	92.3	92.3	-2.4	29.96	VV	33	-3.04
F0	661	1880	1900	V	Horn	H	88.3	88.3		-1.3		HH		
F0	810	1909.8	1900	V	Horn	V	90.4	90.4	90.4	-3.5	28.76	VV	33	-4.24
F0	810	1909.8	1900	V	Horn	H	87.5	87.5		-2.5		HH		
PCS BAND (Harmonics) - Handheld Standalone, upright position, connected to headset Low Channel														
2nd	512	3700.4	1900	V	Horn	V	NF	NF	0			VV	-13	
2nd	512	3700.4	1900	V	Horn	H	NF	NF				HH		
The harmonics were investigated up to the 10th harmonic. No Emissions could be seen above the spectrum analyzer noise floor.														

Radiated Emissions Test Data Results con't

Test distance is 3.0 metres.

										Substitution Method				
EUT				Receive Antenna			Spectrum Analyzer			Tracking Generator				
Type	Ch	Freq (MHz)	Band	Pol.	Type	Pol.	Reading (dBuV)	Corrected Reading (dBuV)	Max (V,H) dBuV	Reading (dBm)	Corrected Reading (relative to dipole) (dBm)	Pol.	Limit dBm	Diff to Limit (dB)
Middle Channel														
2nd	661	3760	1900	V	Horn	V	NF	NF	0			VV	-13	
2nd	661	3760	1900	V	Horn	H	NF	NF				HH		
The harmonics were investigated up to the 10th harmonic. No Emissions could be seen above the spectrum analyzer noise floor.														
High Channel														
2nd	810	3819.6	1900	V	Horn	V	NF	NF	0			VV	-13	
2nd	810	3819.6	1900	V	Horn	H	NF	NF				HH		
The harmonics were investigated up to the 10th harmonic. No Emissions could be seen above the spectrum analyzer noise floor.														

Radiated Emissions Test Photo con't

Radiated Emissions at 3.0 metres