EMI Test Report

Research In Motion Limited

REPORT NO.: RIM-0001-0301-03

PRODUCT Model No: R6120CN
Type Name: BlackBerry Wireless Handheld
FCC ID: L6AR6120CN
IC: 2503A-R6120CN

Date: January 10, 2003

Report No. RIM-0001-0212-03 Test Date: December 02 to 04, 2002

Statement of Performance:

The BlackBerry Wireless Handheld, model R6120CN version 10 (ASY-03957-001) tested with the following accessories: AC Cradle Adapter model number PSM05R-068RUS, Docking/Charging Cradle, RIM part number ASY-04615-000, AC Travel Charger model number PSM05R-050RT and Audio Headset model number HDW-03458-001 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 and operating parameters.
The test methods were consistent with the methods described in the relevant standards.

Tested by

Maurice Battler

Maurice Battler
Certification Specialist Date: 09 December 2002

M. Attayi

Masud S Attayi, P.Eng.
Senior Compliance and Certification Engineer Date: 10 December 2002

Reviewed and Approved by:

Paul G Cardinal

Paul G. Cardinal, Ph.D.
Manager, Compliance and Certification Date: 10 December 2002

Table of Contents

A) **Scope**

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

- FCC CFR 47 Part 2, Subpart L, Marketing of Radio Frequency Devices
- FCC CFR 47 Part 22, Subpart H, Cellular Radiotelephone Services
- FCC CFR 47 Part 24, Subpart E, Broadband PCS
- Industry Canada, RSS-129 Issue 2, Sept. 25/99, 800 MHz Dual-Mode CDMA Cellular Telephones
- 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 Limited (RIM) EMI test facility, located at:

305 Phillip Street
Waterloo, Ontario
Canada, N2L 3W8

The investigation began on December 02, 2002 and completed on December 06, 2002. The sample equipment under test (EUT) included:

1) AC Cradle Adapter, model number PSM05R-068RUS, RIM part number PWR-04615-000
2) Docking/Charging Cradle, RIM ASY-04060-001
3) AC Travel Adapter, model number PSM05R-050RT, Rev 01, RIM part number ASY-04510-001
4) BlackBerry Wireless Handheld, Model number R6120CN version 10 (ASY-03957-001)
5) Audio Headset, part number HDW-03458-001

D) Support Equipment Used for the Testing of the EUT

1. PC System, Myraid, model EN-P3B-F, serial number CCC0004078
2. Monitor, ViewSonic, model number VCDTS23103-2M, serial number 24B022952648
3. Printer, H/P, model number C5884A, serial number US8251W0VQ
4. Wireless Communications Test Set, Agilent, model number 8960, serial number GB41070272
5. DC Power Supply, H/P, modle number 6632B, serial number US37472170

E) Test Voltage

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

F) Test Results Chart

SPECIFICATION	Test Type	MEETS REQUIREMENTS	Performed By
FCC CFR 47 Part 22, Subpart H IC RSS-129	Radiated Spurious/harmonic Emission, ERP	Yes	Masud Attayi
FCC CFR 47 Part 22, Subpart H IC RSS-129	Conducted Emissions, Occupied Bandwidth, Frequency Stability	Yes	Daoud Attayi Maurice Battler
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	Daoud Attayi Maurice Battler

G) Modifications to EUT

No modifications were required on the EUT.

H) Summary of Results

a) The Conducted Harmonics Emissions in the Cellular band passed as per 22.917, 22.901(d). The EUT was measured in low, middle and high channels. The frequency range measured was from 10 Mhz to 20 Ghz.
See APPENDIX 1, Figures 1a to 3b for the test data.

b) The Occupied Bandwidth in the Cellular band passed as per 22.917. The EUT was measured in low, middle and high channels.
See APPENDIX 1, Figures 4a to 4c for the test data.

c) The Conducted Harmonics Emissions in the PCS band passed as per 24.238.
The EUT was measured in low, middle and high channels. The frequency range measured was from 10 Mhz to 20 Ghz.
See APPENDIX 1, Figures 5a to 8b for the test data.

d) The Occupied Bandwidth in the PCS band passed as per 24.238. The EUT was measured in low, middle and high channels.
See APPENDIX 1 Figures 9a to 9c for the test data.

e) The PCS band edge mask passed as per 24.238. The EUT was measured in low and high channels.
See APPENDIX 1 Figures 10a and 10b for the test data.

f) The Conducted RF Output Power requirements for both the Cellular and PCS bands passed. The channels measured were low, middle and high.
See APPENDIX 2 Figures 1a to 6b for the test data.

g) The EUT passed the Frequency Stability vs. Temperature and Voltage requirements for Cellular band as per 22.917 and RSS-129.
The maximum frequency error measured was 5.306 Hz and the minimum frequency error measured was –2.117 Hz. The average frequency error was 1.028 Hz.
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 (3.5 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.

h) The EUT passed 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 8.470 Hz and the minimum frequency error measured was –9.570 Hz. The average frequency error was –0.198 Hz.

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 (4.2 volts) dc input voltage at each temperature step and channel at maximum output power.

Note: 4.2 volts is the instantaneous turn-on voltage for a fully charged battery. When the service transmits, this voltage drops to the nominal voltage within a few minutes.

See APPENDIX 3 for the test data.

i) The radiated spurious/harmonic emissions and ERP/EIRP were measured for both Cellular and PCS bands. 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 highest ERP in the Cellular band measured was 25.05 dBm at 848.32 MHz (channel 777).
The highest EIRP in the PCS band measured was 23.49 dBm at 1851.25 MHz (channel 25).

The worst test margin for radiated spurious/harmonic emissions measured for the Cellular band was greater than 20 dB.
The worst test margin for radiated spurious/harmonic emissions measured for the PCS band was 13.1 dB at 3703 MHz (channel 25).

To view the test data see APPENDIX4.

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

l) Compliance Test Equipment Used

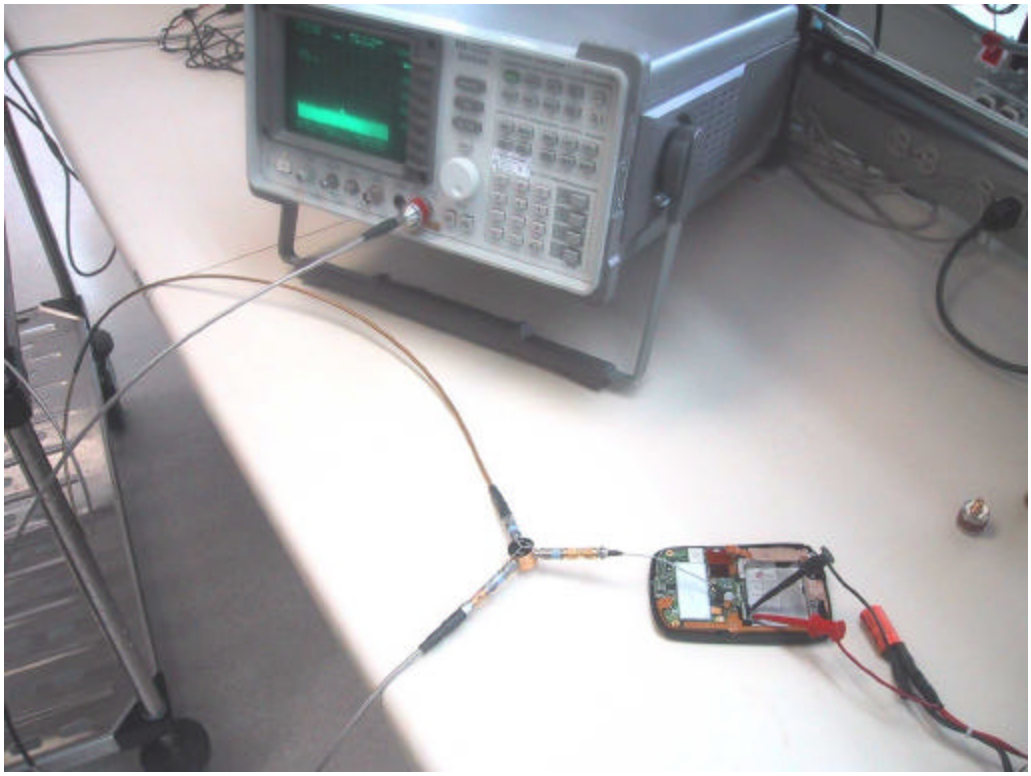
UNIT	MANUFACTURER	MODEL / SERIAL NUMBER	CAL DUE DATE	USE
Preamplifier system	TDK	PA-02 080010	03-10-02	Radiated Emissions
Preamplifier	Sonoma	310N/11909A 185831	03-10-02	Radiated Emissions
EMC Analyzer	Agilent	E7405A US40240226	03-03-21	Radiated Emissions
Spectrum Analyzer	HP	8563E 3745A08114	03-08-16	Conducted Emissions
DC Power Supply	HP	6632B US37472170	03-07-31	Conducted Emissions
Wireless Communications Test Set	Agilent	8960 (E5515C)/GB41070272	03-11-26	Conducted Emissions
Horn Antenna	TDK	HRN-0118 130092	03-08-14	Radiated Emissions
Horn Antenna	TDK	HRN-0118 030101	03-12-21	Radiated Emissions
Signal Generator	Agilent	HP8648C 4037U03130	03-03-20	Radiated Emissions
Environmental Chamber	ESPEC Corp.	SH-240S1 91005607	N/R	Frequency Stability
Wireless Communications Test Set	Rohde & Schwarz	CMU200 837493/073	03-03-27	Radiated Emissions
Temperature Probe	Hart Scientific	61161-302 21352860	03-09-10	Conducted/Radiated Emissions
Dipole Antenna	Schwarzbeck	VHAP 1006	04-03-03	Radiated Emissions
Dipole Antenna	Schwarzbeck	VHAP 1007	04-03-03	Radiated Emissions

APPENDIX 1

CONDUCTED EMISSIONS TEST DATA/PLOTS

Conducted Emission Test-Setup Photo

FCC CFR 47 Part 22, Subpart H, FCC CFR 47 Part 24, Subpart E



Conducted Emission Test-Results

Figure 1a: Cellular Band, Low Channel

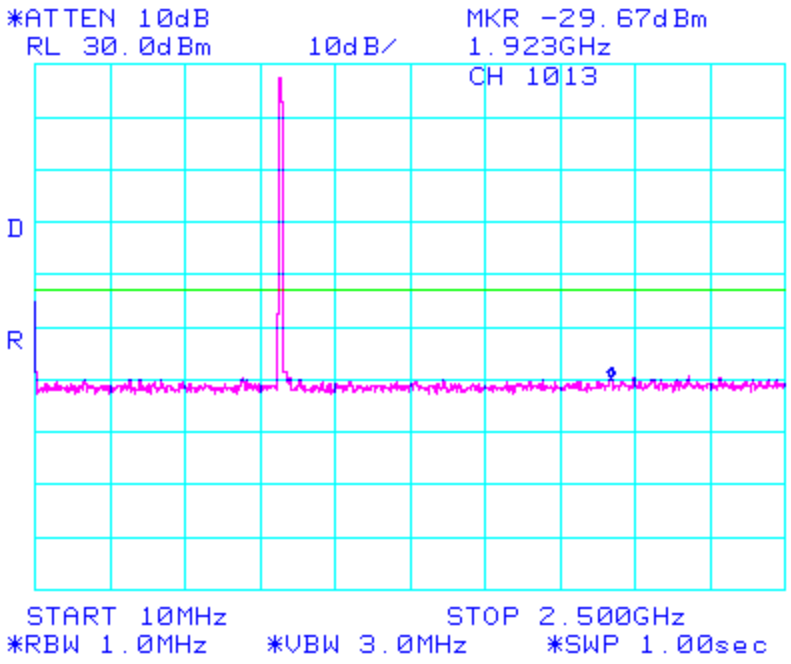
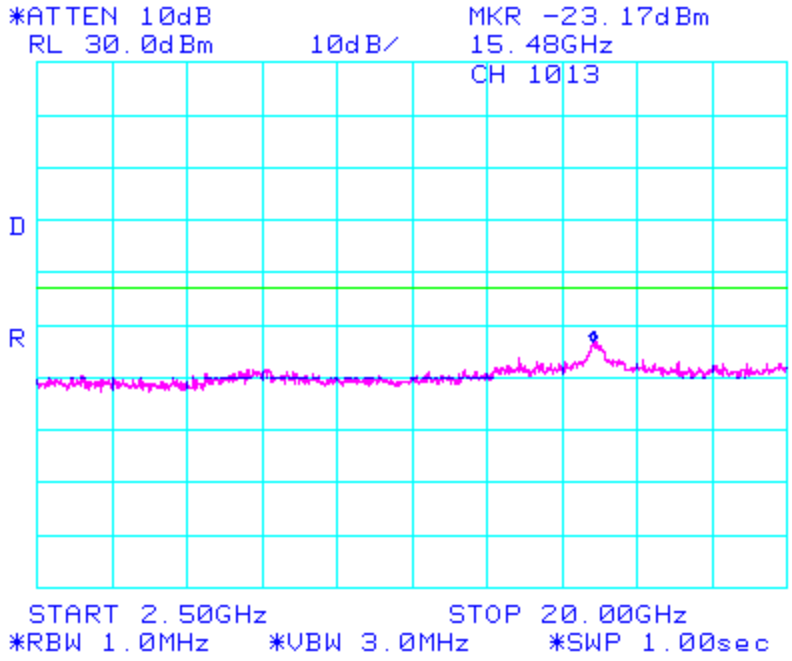


Figure 1b: Cellular Band, Low Channel



Conducted Emission Test-Results con't

Figure 2a: Cellular Band, Middle Channel

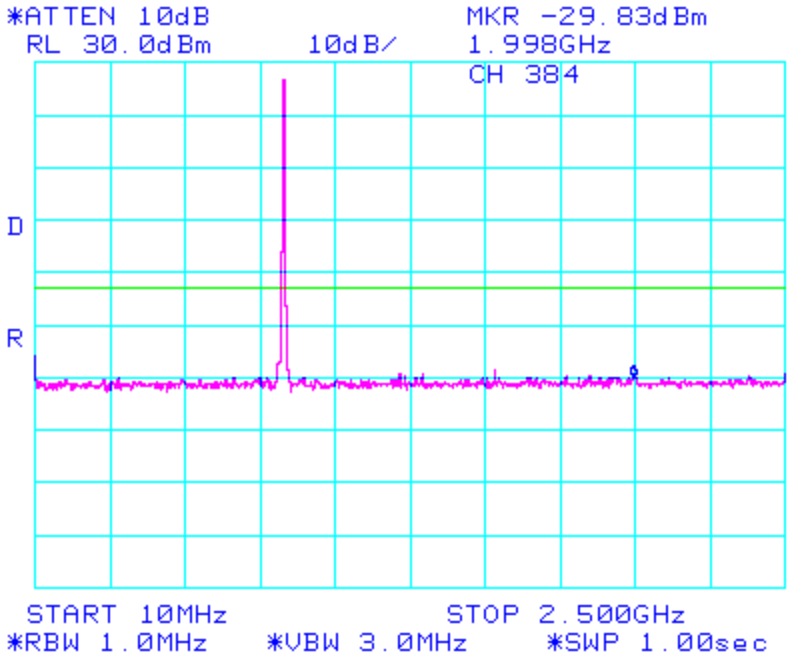
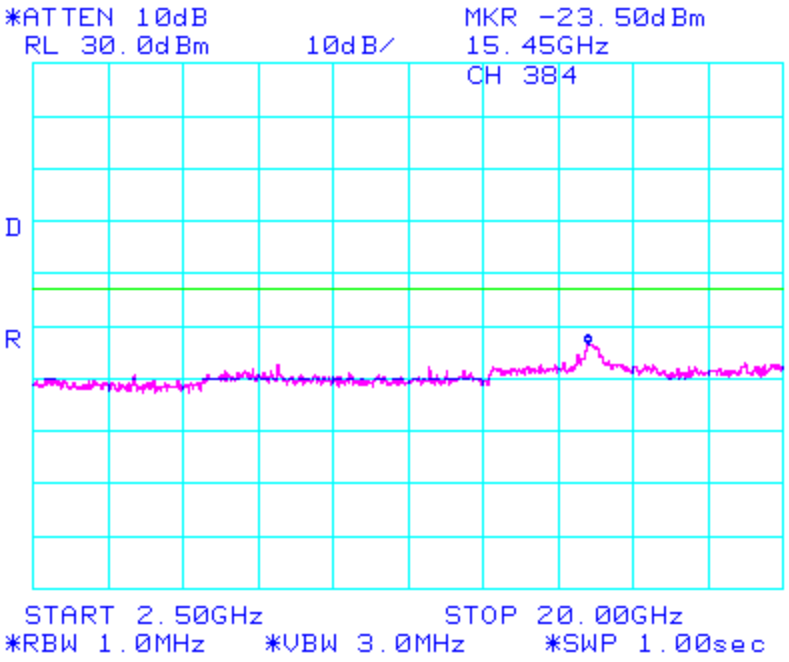


Figure 2b: Cellular Band, Middle Channel



Conducted Emission Test-Results con't

Figure 3a: Cellular Band, High Channel

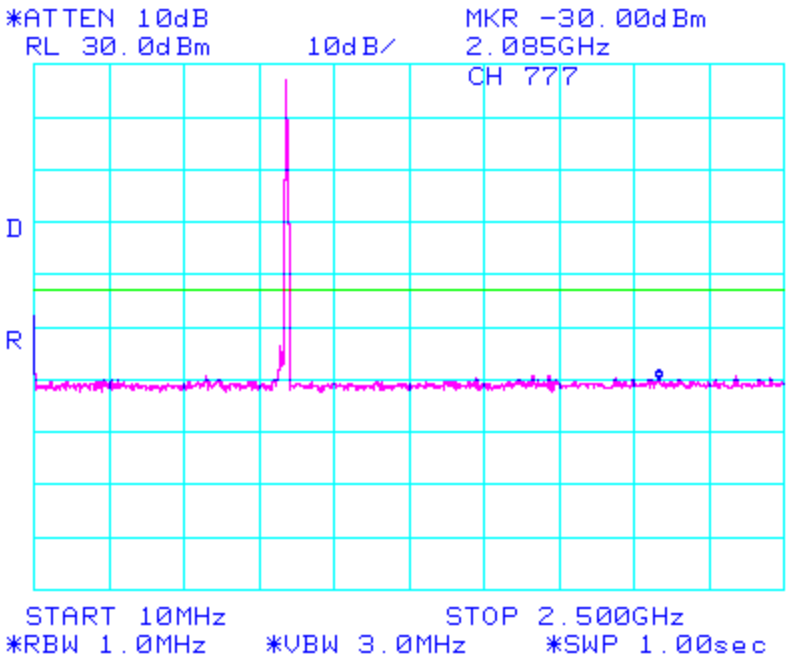
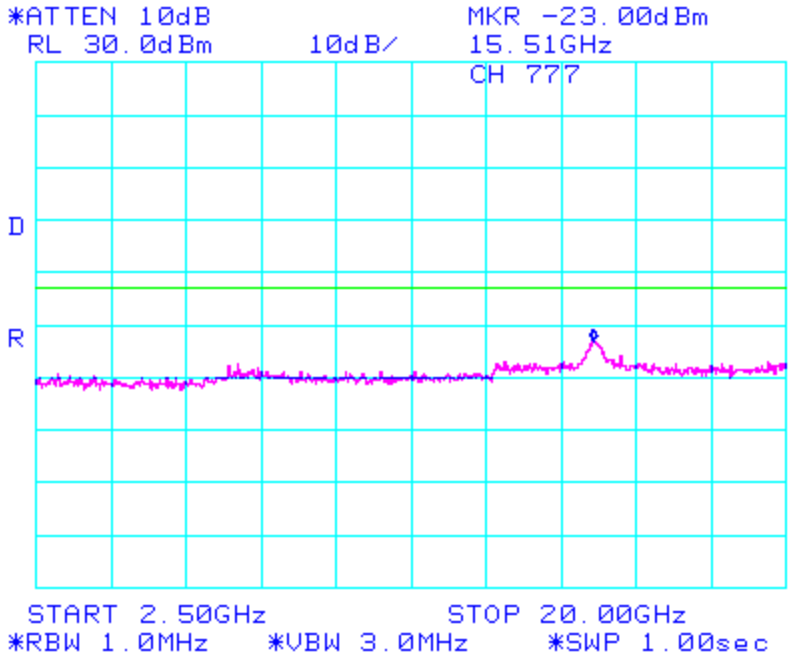


Figure 3b: Cellular Band, High Channel



Conducted Emission Test-Results con't

Figure 4a: Cellular Band, Low Channel, Occupied Bandwidth

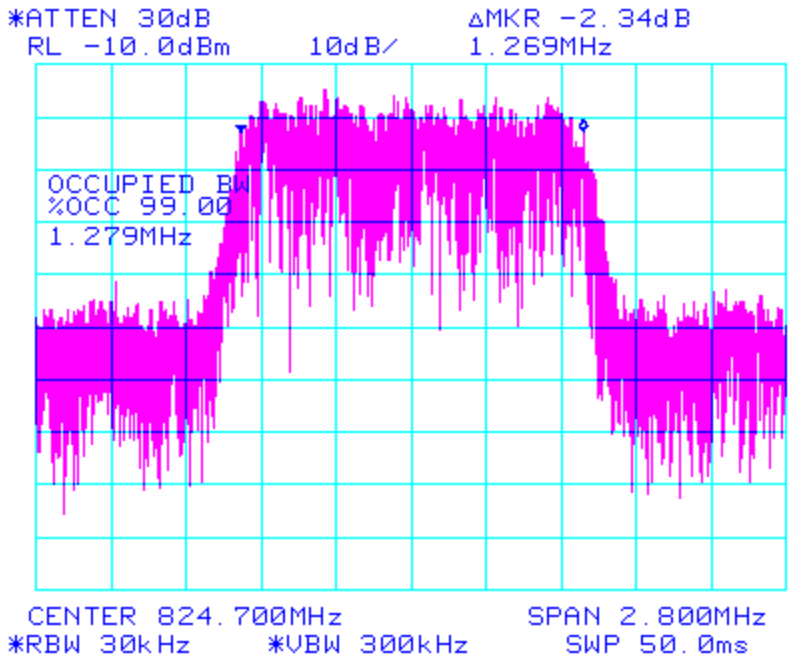
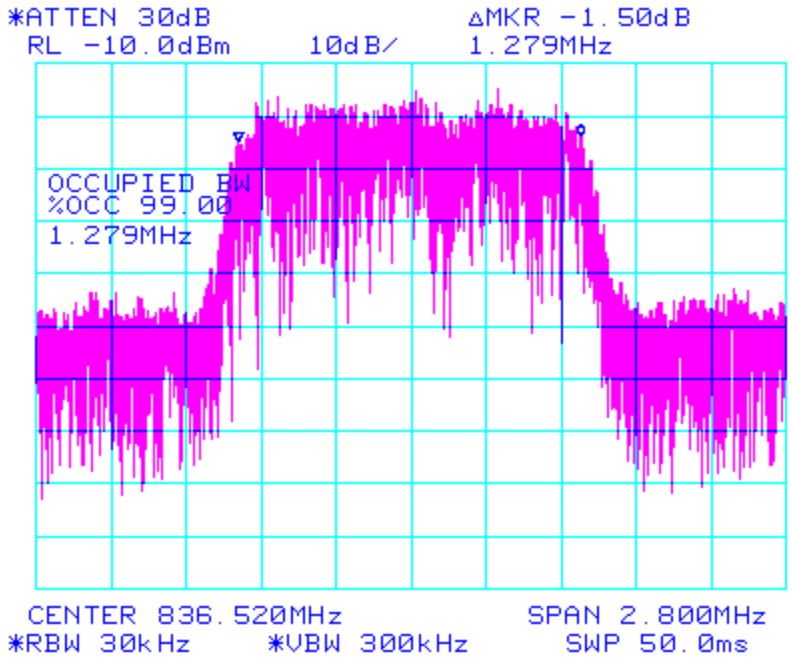
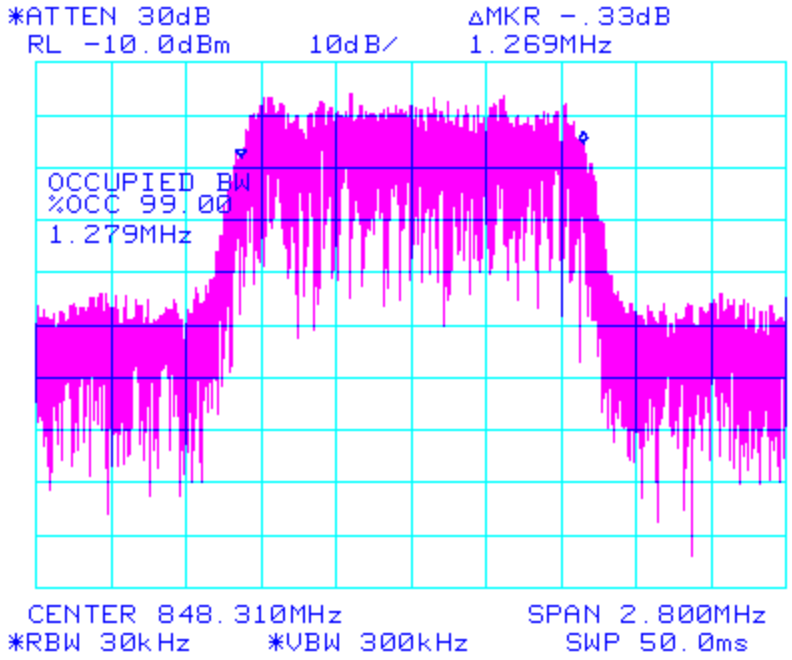


Figure 4b: Cellular Band, Middle Channel, Occupied Bandwidth



Conducted Emission Test-Results con't

Figure 4c: Cellular Band, High Channel, Occupied Bandwidth



Conducted Emission Test-Results con't

Figure 5a: PCS Band, Low Channel

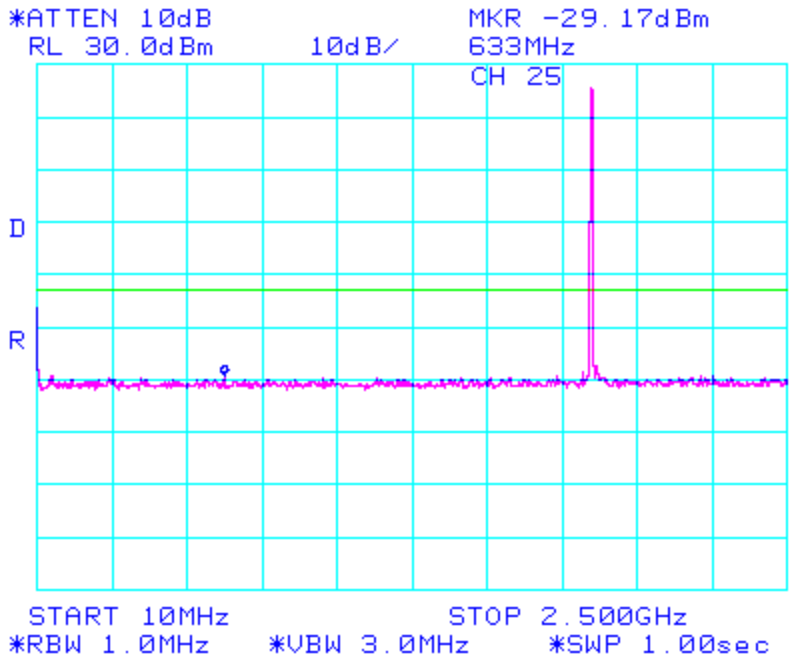
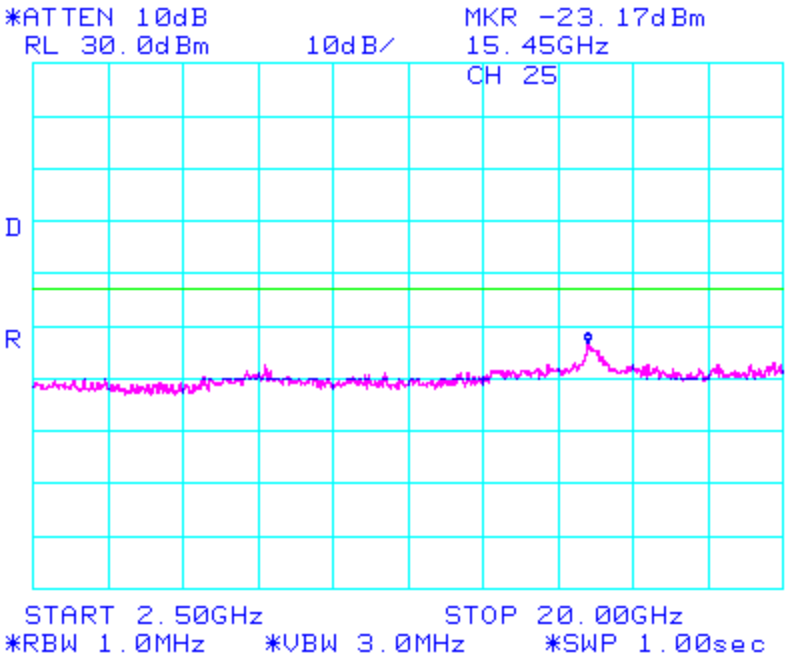


Figure 5b: PCS Band, Low Channel



Conducted Emission Test-Results con't

Figure 6a: PCS Band, Middle Channel

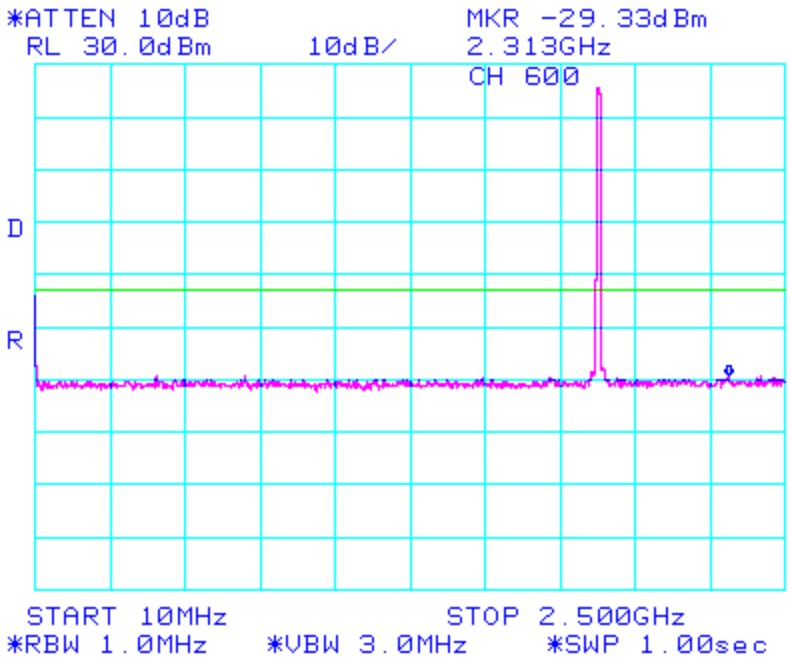
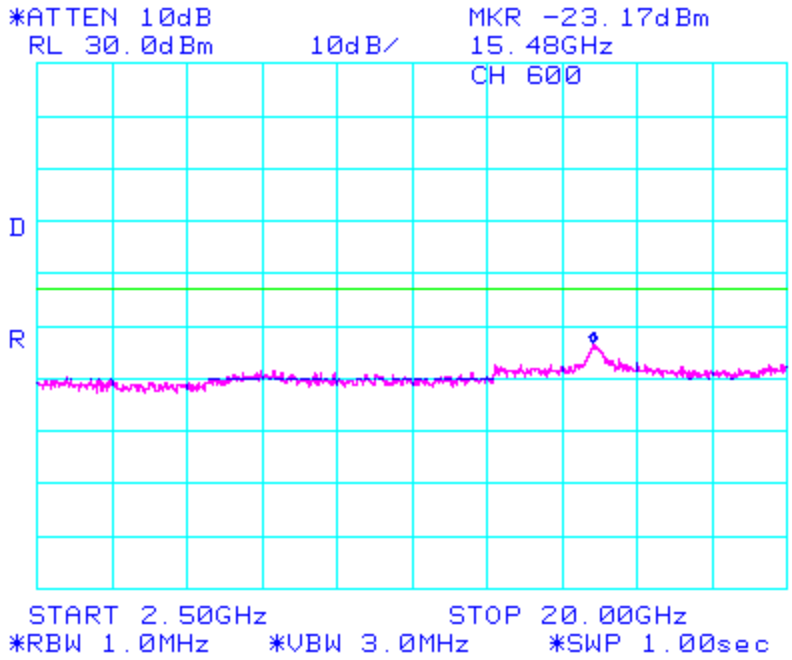


Figure 6b: PCS Band, Middle Channel



Conducted Emission Test-Results con't

Figure 7a: PCS Band, High Channel

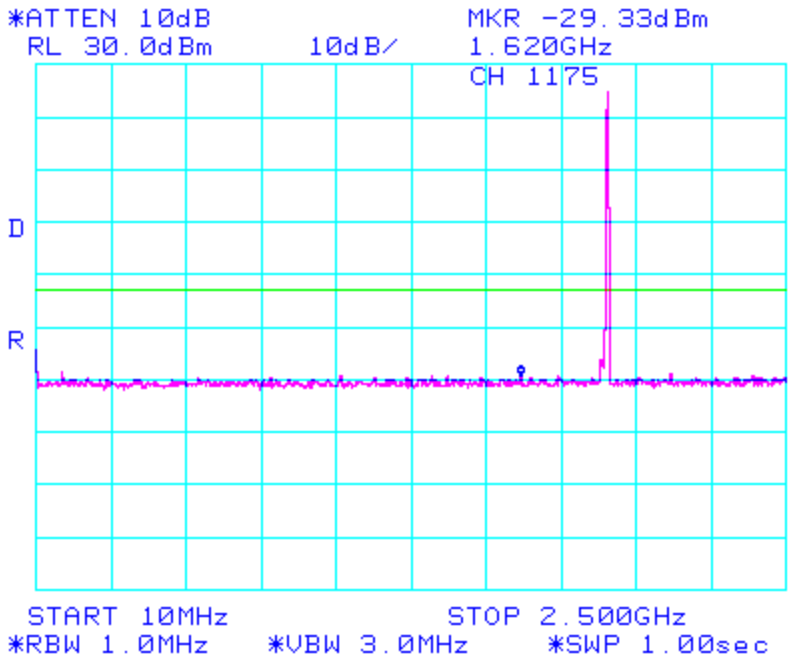
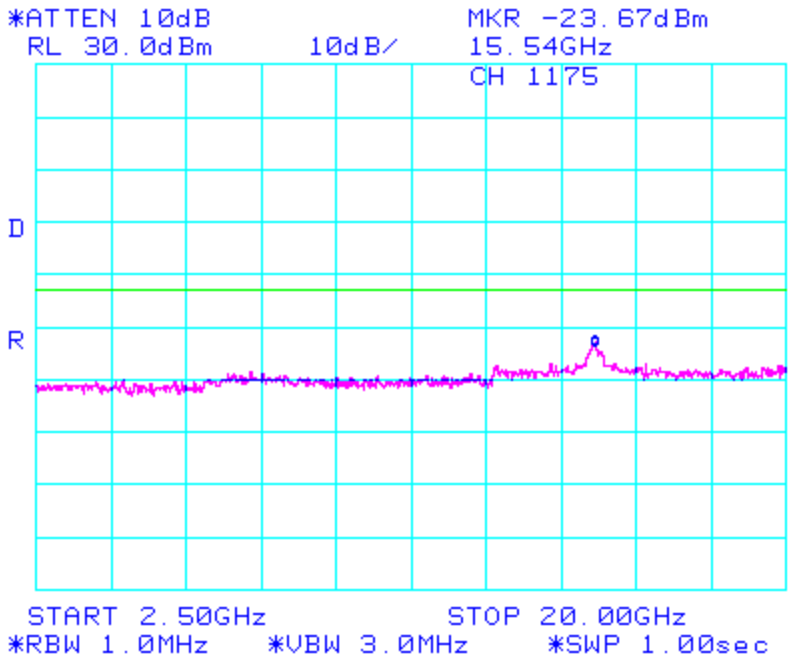


Figure 8b: PCS Band, High Channel



Conducted Emission Test-Results con't

Figure 9a: PCS Band, Low Channel, Occupied Bandwidth

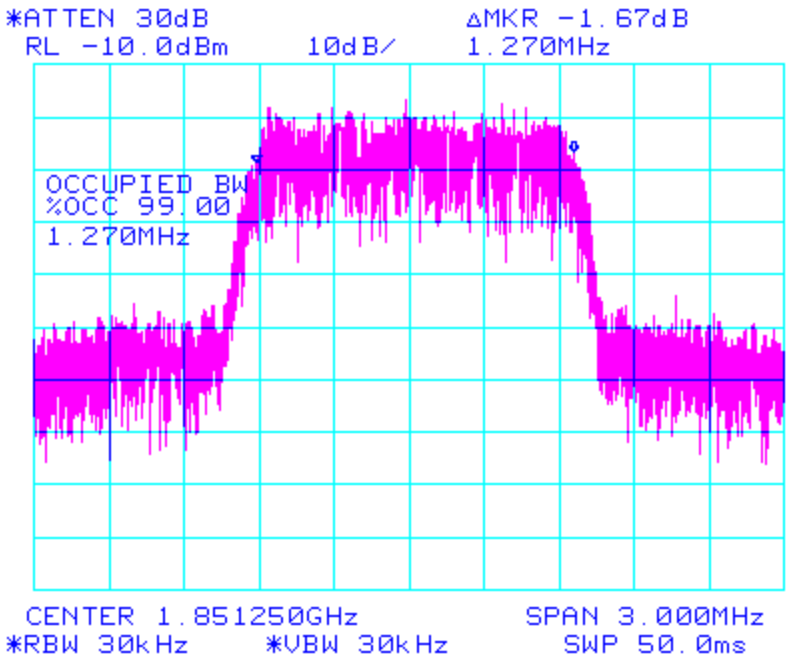
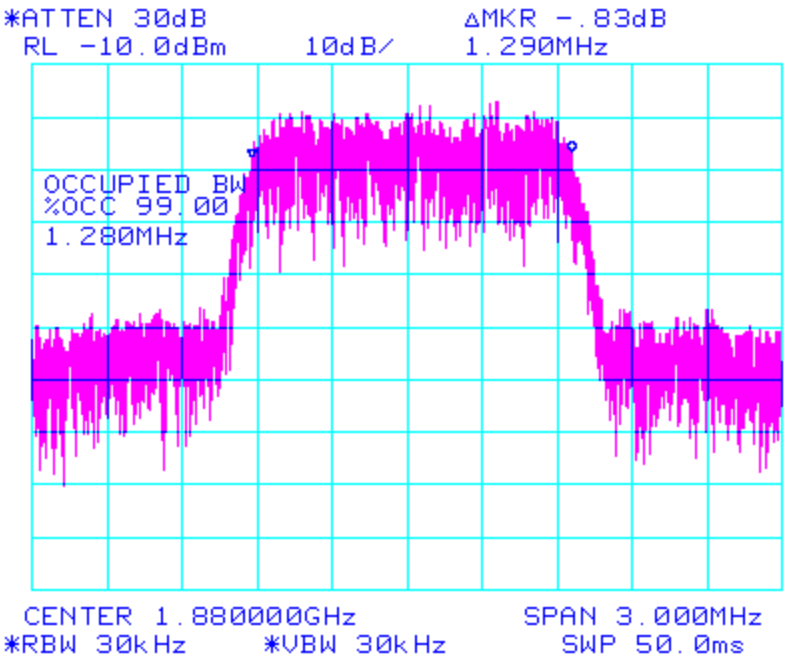
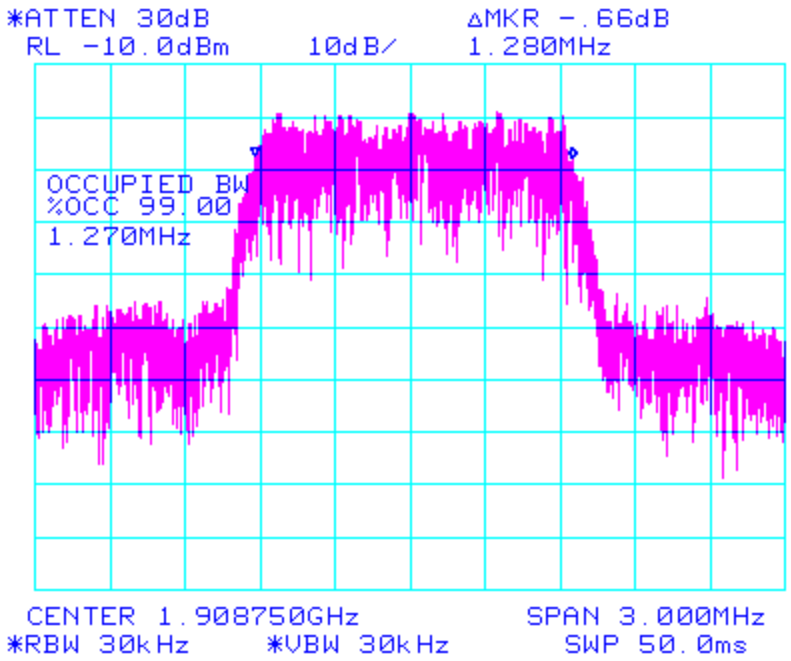


Figure 9b: PCS Band, Middle Channel, Occupied Bandwidth



Conducted Emission Test-Results con't

Figure 9c: PCS Band, High Channel, Occupied Bandwidth



Conducted Emission Test-Results con't

Figure 10a: PCS Band, Low Channel, Mask

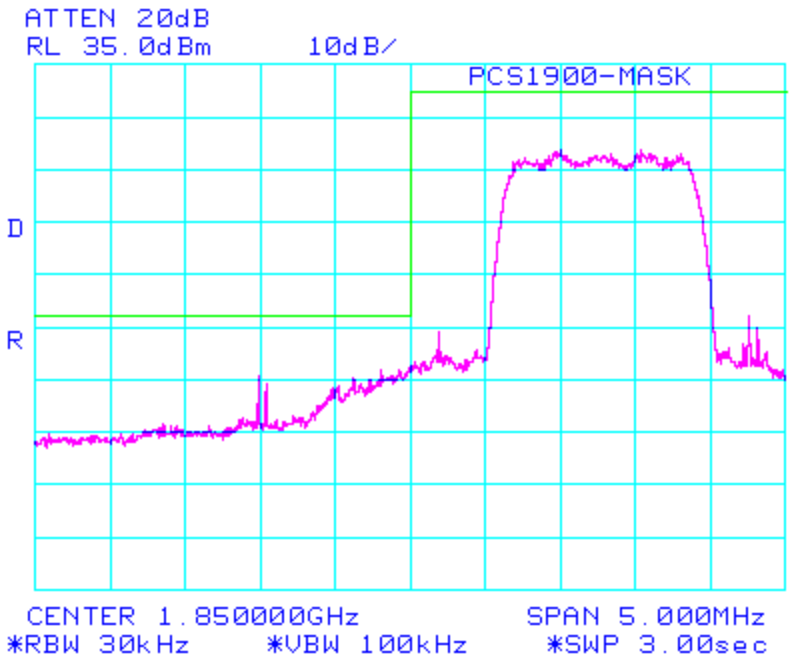
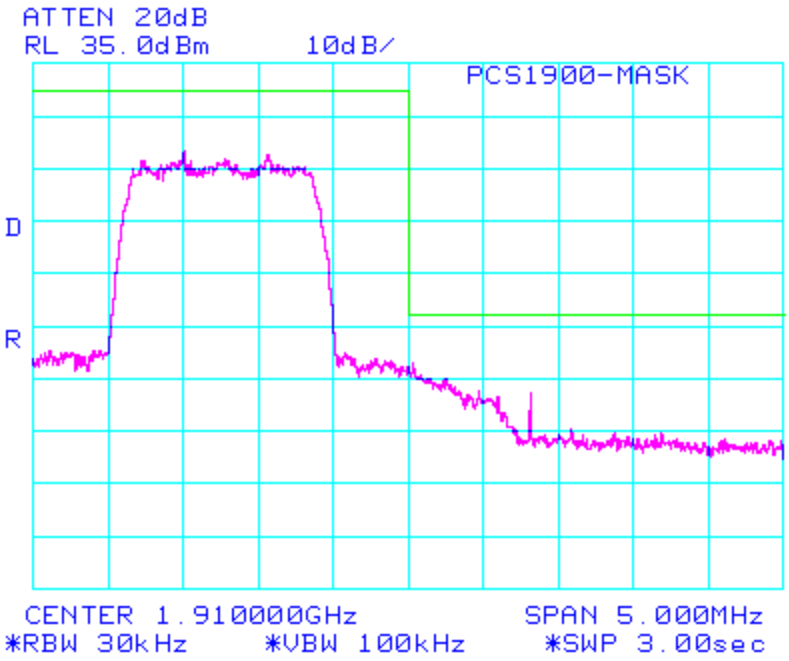


Figure 10b: PCS Band, High Channel, Mask



APPENDIX 2

CONDUCTED RF OUTPUT POWER TEST DATA

Conducted RF Output Power Test Data

PCS Band				Cellular Band		
Channel	Frequency (MHz)	Power (dBm)		Channel	Frequency (MHz)	Power (dBm)
25	1851.25	22.34		1013	824.70	23.26
600	1880.00	22.23		384	836.50	23.12
1175	1908.75	22.34		777	848.32	23.13

Conducted RF Output Power Test Data con't

Figure 1a: Cellular Band, Low Channel

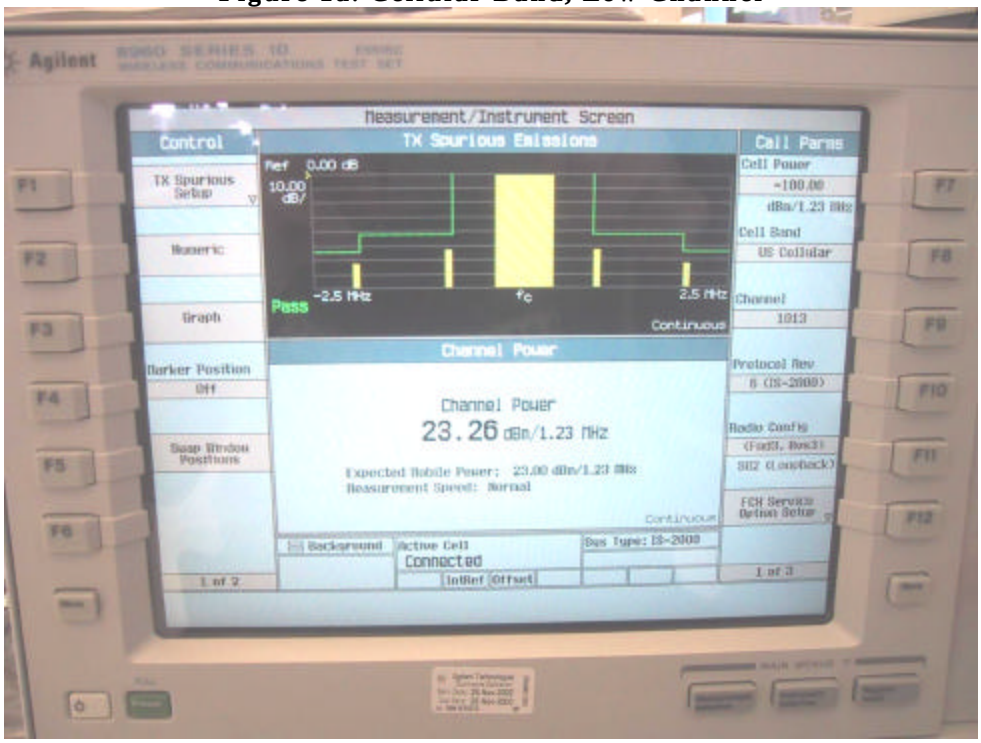
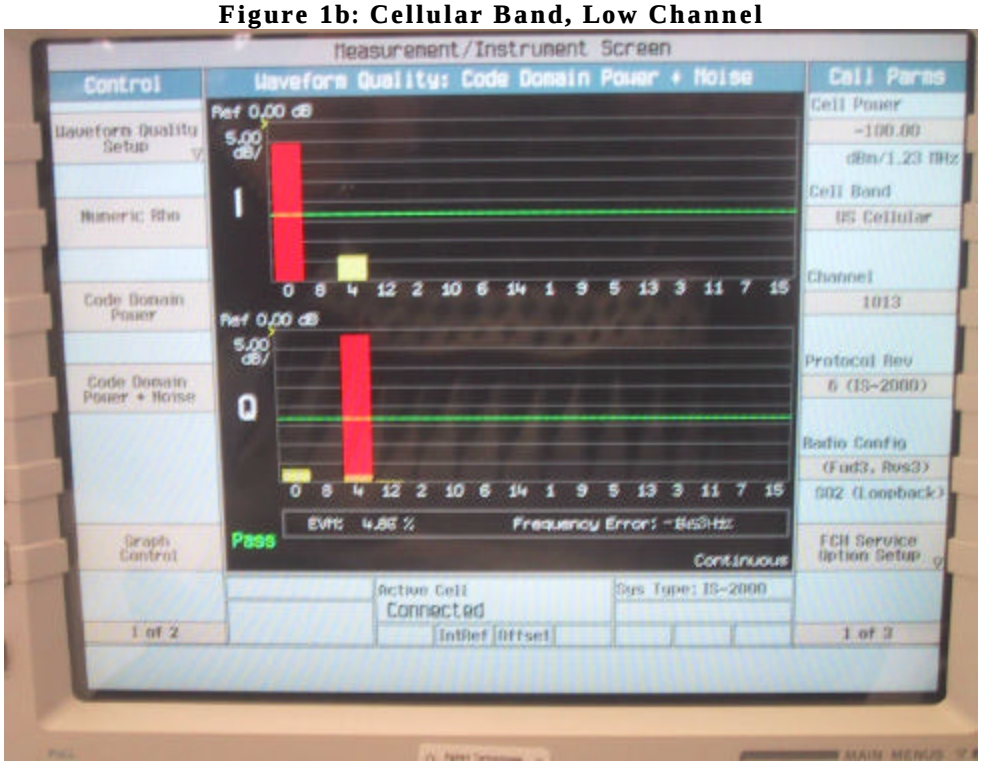


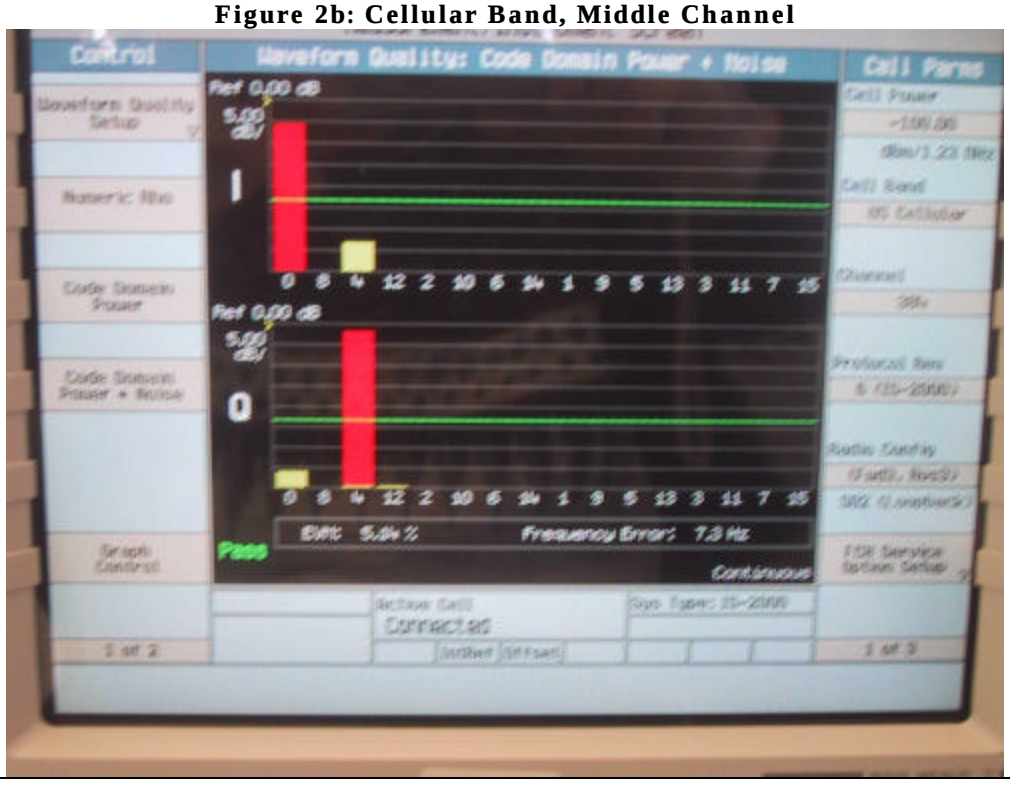
Figure 1b: Cellular Band, Low Channel



Conducted RF Output Power Test Data con't

Figure 2a: Cellular Band, Middle Channel

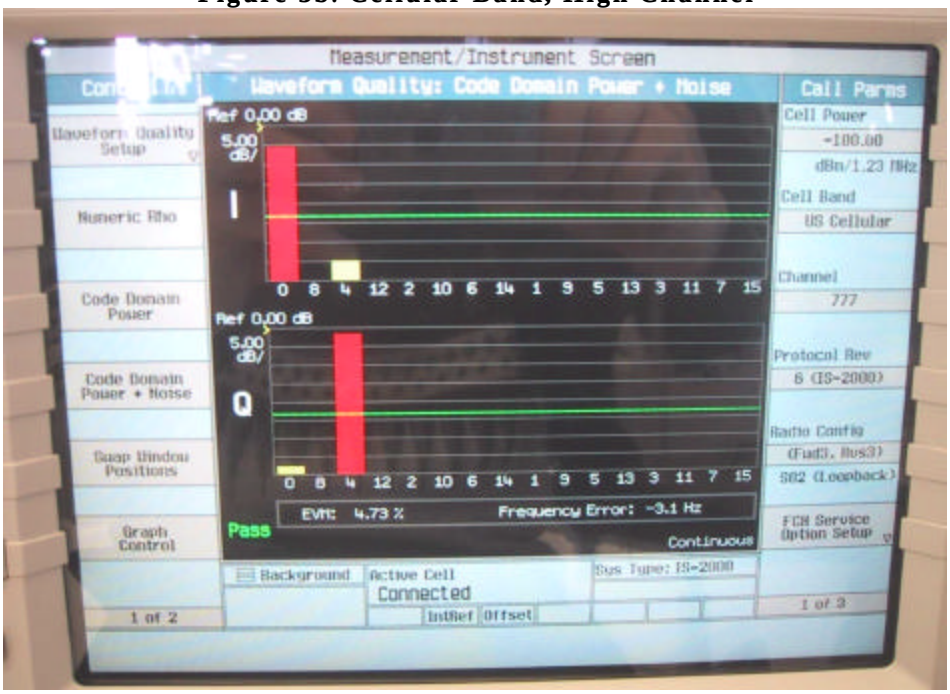
Figure 2b: Cellular Band, Middle Channel



Conducted RF Output Power Test Data con't

Figure 3a: Cellular Band, High Channel

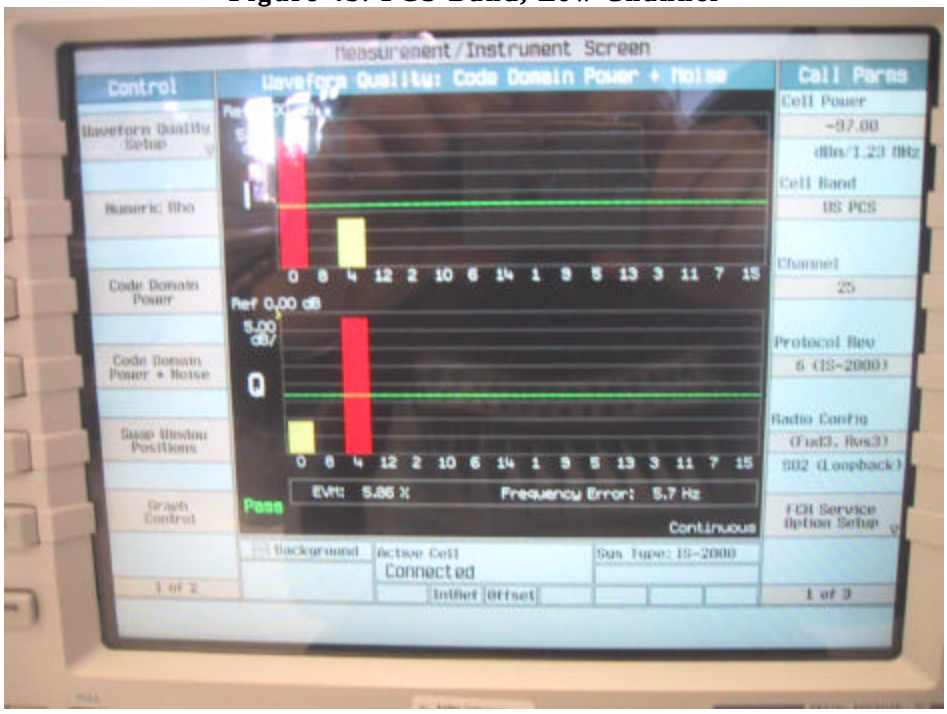
Figure 3b: Cellular Band, High Channel



Conducted RF Output Power Test Data con't

Figure 4a: PCS Band, Low Channel

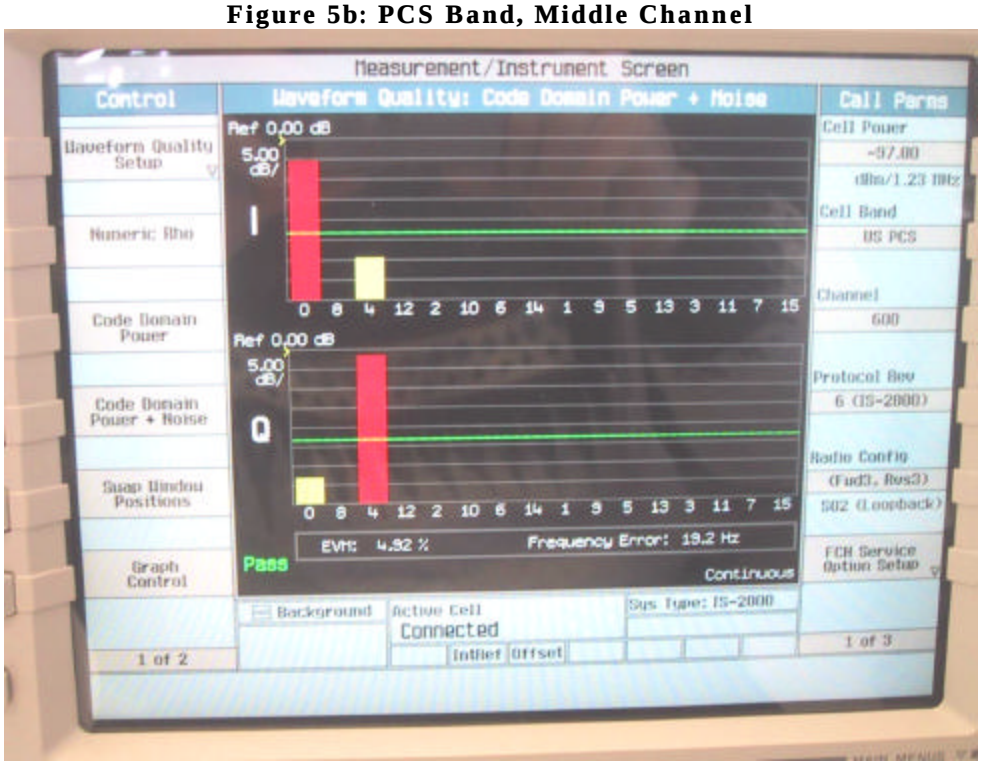
Figure 4b: PCS Band, Low Channel



Conducted RF Output Power Test Data con't

Figure 5a: PCS Band, Middle Channel

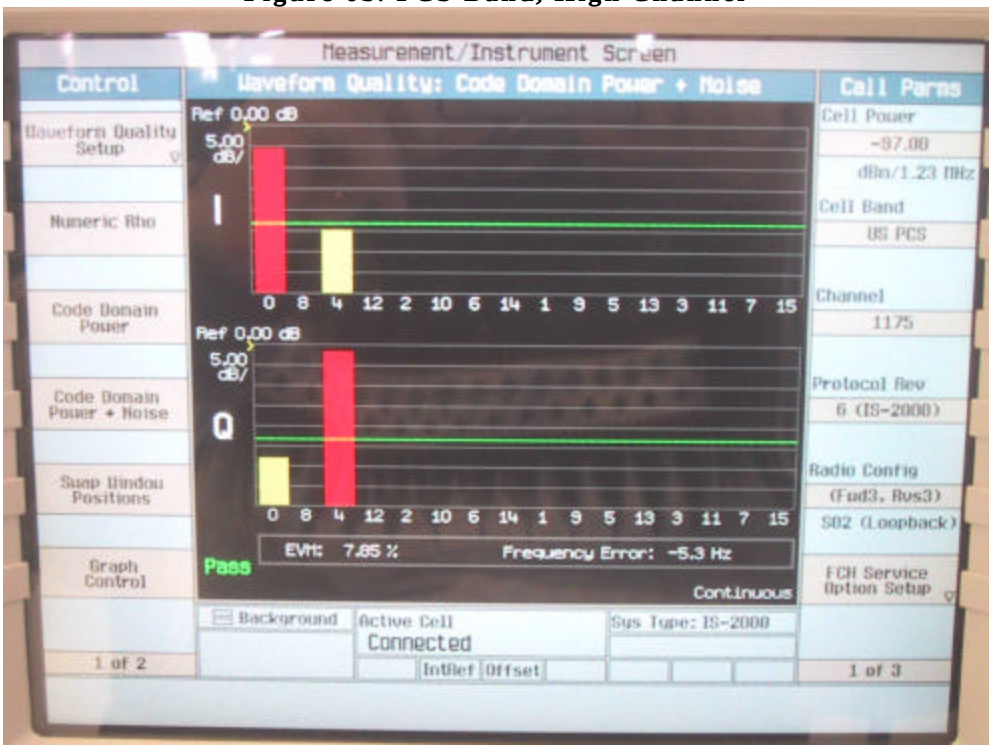
Figure 5b: PCS Band, Middle Channel



Conducted RF Output Power Test Data con't

Figure 6a: PCS Band, High Channel

Figure 6b: PCS Band, High Channel



APPENDIX 3

FREQUENCY STABILITY TEST DATA

Frequency Stability Test Data

Cellular Band Results.
Output power was at maximum output.

Chamber Temp. (Deg. C)	Supply Voltage (V)	Chan. Power (dBm)	Channel Number	Freq Error (Hz)	Supply Voltage (V)	Chan. Power (dBm)	Channel Number	Freq Error (Hz)	Supply Voltage (V)	Chan. Power (dBm)	Channel Number	Freq Error (Hz)
60	3.5	22.94	1013	0.443	3.85	23.24	1013	1.920	4.2	23.47	1013	2.484
60	3.5	23.37	384	1.310	3.85	23.78	384	0.911	4.2	24.03	384	-1.328
60	3.5	23.74	777	-1.186	3.85	24.06	777	1.101	4.2	24.27	777	0.395
50	3.5	23.52	1013	0.274	3.85	23.84	1013	-0.120	4.2	24.09	1013	2.138
50	3.5	24.36	384	0.287	3.85	24.56	384	0.253	4.2	23.37	384	-0.006
50	3.5	24.37	777	1.325	3.85	24.59	777	-1.959	4.2	24.59	777	0.451
40	3.5	24.19	1013	-0.216	3.85	24.47	1013	1.349	4.2	24.56	1013	2.561
40	3.5	24.57	384	0.112	3.85	24.54	384	1.609	4.2	24.57	384	0.376
40	3.5	24.58	777	-2.115	3.85	24.60	777	1.027	4.2	24.55	777	3.519
30	3.5	24.60	1013	0.581	3.85	24.56	1013	0.055	4.2	24.58	1013	2.863
30	3.5	24.58	384	-2.117	3.85	24.61	384	-1.959	4.2	24.57	384	1.413
30	3.5	24.56	777	-0.357	3.85	24.60	777	-1.936	4.2	24.56	777	1.752
25	3.5	24.57	1013	-0.848	3.85	24.59	1013	-1.073	4.2	24.59	1013	0.750
25	3.5	24.57	384	1.284	3.85	24.54	384	1.350	4.2	24.52	384	2.743
25	3.5	24.57	777	0.206	3.85	24.56	777	-0.018	4.2	24.55	777	-0.174
20	3.5	24.63	1013	0.653	3.85	24.58	1013	0.045	4.2	24.61	1013	2.175
20	3.5	24.59	384	1.210	3.85	24.58	384	1.388	4.2	24.57	384	-0.605
20	3.5	24.52	777	0.870	3.85	24.57	777	1.718	4.2	24.55	777	1.466
10	3.5	24.59	1013	0.576	3.85	24.60	1013	0.923	4.2	24.59	1013	-0.206
10	3.5	24.61	384	0.772	3.85	24.62	384	-0.754	4.2	24.53	384	0.345
10	3.5	24.58	777	2.110	3.85	24.56	777	0.434	4.2	24.59	777	-0.351
0	3.5	24.58	1013	3.011	3.85	24.54	1013	0.979	4.2	24.58	1013	1.094
0	3.5	24.55	384	-1.241	3.85	24.55	384	-0.850	4.2	24.53	384	1.958
0	3.5	24.56	777	0.890	3.85	24.55	777	2.564	4.2	24.54	777	1.975
-10	3.5	24.54	1013	2.719	3.85	24.48	1013	2.985	4.2	24.60	1013	1.138
-10	3.5	24.53	384	-0.119	3.85	24.52	384	0.808	4.2	24.53	384	2.590
-10	3.5	24.57	777	3.175	3.85	24.59	777	1.728	4.2	24.54	777	2.734

Frequency Stability Test Data, con't

Cellular Band Results con't

Chamber Temp. (Deg. C)	Supply Voltage (V)	Chan. Power (dBm)	Channel Number	Freq Error (Hz)	Supply Voltage (V)	Chan. Power (dBm)	Chamber Number	Freq Error (Hz)	Supply Voltage (V)	Chan. Power (dBm)	Channel Number	Freq Error (Hz)
-20	3.5	24.53	1013	3.512	3.85	24.53	1013	1.751	4.2	24.58	1013	3.184
-20	3.5	24.49	384	2.144	3.85	24.49	384	0.025	4.2	24.51	384	1.033
-20	3.5	24.57	777	4.010	3.85	24.58	777	3.916	4.2	24.62	777	2.320
-30	3.5	24.57	1013	2.073	3.85	24.58	1013	5.306	4.2	24.55	1013	1.935
-30	3.5	24.57	384	1.373	3.85	24.52	384	1.000	4.2	24.55	384	0.924
-30	3.5	24.46	777	2.205	3.85	24.60	777	1.795	4.2	24.61	777	0.960

The maximum frequency error measured was 5.306 Hz
The minimum frequency error measured was –2.117 Hz
The Average frequency error measured was 1.028 Hz

Frequency Stability Test Data con't

PCS Band Results.

Output power was at maximum output.

Chamber Temp. (Deg. C)	Supply Voltage (V)	Channel Number	Freq Error (Hz)	Supply Voltage (V)	Channel Number	Freq Error (Hz)	Supply Voltage (V)	Channel Number	Freq Error (Hz)
60	3.50	25	-0.010	3.85	25	1.673	4.20	25	-0.103
60	3.50	600	1.410	3.85	600	5.607	4.20	600	1.660
60	3.50	1175	-6.542	3.85	1175	-7.310	4.20	1175	-9.307
50	3.50	25	-0.128	3.85	25	3.439	4.20	25	-3.109
50	3.50	600	-1.724	3.85	600	3.871	4.20	600	3.969
50	3.50	1175	-1.536	3.85	1175	-1.821	4.20	1175	2.337
40	3.50	25	-1.033	3.85	25	2.086	4.20	25	-1.804
40	3.50	600	0.264	3.85	600	-3.210	4.20	600	4.929
40	3.50	1175	-3.781	3.85	1175	-0.091	4.20	1175	-0.236
30	3.50	25	-1.418	3.85	25	-2.391	4.20	25	2.027
30	3.50	600	-0.311	3.85	600	-1.528	4.20	600	4.603
30	3.50	1175	-3.764	3.85	1175	-0.344	4.20	1175	6.010
20	3.50	25	-0.849	3.85	25	8.470	4.20	25	0.563
20	3.50	600	3.661	3.85	600	0.0784	4.20	600	2.152
20	3.50	1175	-0.951	3.85	1175	3.994	4.20	1175	5.072
10	3.50	25	5.173	3.85	25	-0.963	4.20	25	0.813
10	3.50	600	-0.900	3.85	600	0.631	4.20	600	-2.500
10	3.50	1175	-0.4497	3.85	1175	-3.071	4.20	1175	0.270
0	3.50	25	-0.769	3.85	25	5.060	4.20	25	-1.555
0	3.50	600	-9.570	3.85	600	-1.069	4.20	600	-0.714
0	3.50	1175	1.388	3.85	1175	0.732	4.20	1175	-5.045
-10	3.50	25	2.241	3.85	25	3.086	4.20	25	2.049
-10	3.50	600	-1.785	3.85	600	-0.712	4.20	600	-5.210
-10	3.50	1175	3.956	3.85	1175	-1.290	4.20	1175	-1.020
-20	3.50	25	-1.280	3.85	25	0.592	4.20	25	-0.043
-20	3.50	600	0.281	3.85	600	-0.053	4.20	600	4.833

Frequency Stability Test Data con't

PCS Band Results con't

Chamber Temp. (Deg. C)	Supply Voltage (V)	Channel Number	Freq Error (Hz)	Supply Voltage (V)	Channel Number	Freq Error (Hz)	Supply Voltage (V)	Channel Number	Freq Error (Hz)
-20	3.50	1175	-4.715	3.85	1175	-4.295	4.20	1175	0.999
-30	3.50	25	-1.109	3.85	25	-1.819	4.20	25	3.239
-30	3.50	600	-3.113	3.85	600	-7.080	4.20	600	-2.301
-30	3.50	1175	-3.625	3.85	1175	0.513	4.20	1175	-2.172

The maximum frequency error measured was 8.470 Hz
The minimum frequency error measured was –9.570 Hz
The Average frequency error measured was –0.198 Hz

The frequency stability for BlackBerry 6750 Wireless Handheld, model number R6120CN of the transmitter is less than 0.1 ppm of the received frequency from the Agilent, model E5515C, Wireless Communications Test Set.

Frequency was tested and recorded across temperature, voltage and channel with the same test set up. The output power was set to maximum. The set up used is a PC with a GPIB interface linked to the Environmental Chamber, a DC power supply and the Agilent, model E5515C, Wireless Communications Test Set. A coax cable was connected between the RF input/output of the E5515C and the EUT antenna port.

The radio is located inside the environmental chamber, and controlled by a PC terminal and associated software via an RS232 serial interface. A temperature probe monitored the chamber temperature. The coax cable was calibrated to allow compensation of the insertion loss between the transmitter and the E5515C.

The Handheld was placed in the temperature chamber and connected to model E5515C outside the temperature chamber as shown in the figure below. Dry air was pumped inside the temperature chamber to maintain back-pressure during the test.
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.
A computer controlled RIM automated software "TestPilot" was ran to test and log the results. Test Pilot controlled the model E5515C, temperature chamber, and power supply via the GPIB Bus. The power supply was cycled through the voltage steps of 3.5, 3.8, 4.2 Volts and the Frequency Error was measured at the maximum output power.

Frequency Stability Test Data con't

After the initial one-hour soak the temperature was incremented by 10 degrees Celsius with a half-hour soak between each subsequent temperature steps.

APPENDIX 4

RADIATED EMISSIONS TEST DATA

Radiated Emissions Test Data Results

The measurements were done in three configurations:

1. The Handheld standalone in the upright position
2. The Handheld connected to the Docking/Charging Cradle with the AC Power Adapter and Headset
3. The Handheld connected to the Travel Charger and Headset

Test Distance is 3.0 metres.

CELLULAR Band (ERP)

										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)
Test Configuration 1														
F0	1013	824.70	800	V	Dipole	V	77.2	77.2	77.2	2.9	18.85	VV	27.78	-8.93
F0	1013	812.70	800	V	Dipole	H	71.9	71.9		1.6		HH		
F0	417	837.49	800	V	Dipole	V	79.5	79.5	79.5	6.0	21.95	VV	27.78	-5.83
F0	417.	837.49	800	V	Dipole	H	73.2	73.2		3.8		HH		
F0	777	848.32	800	V	Dipole	V	80.5	80.5	80.5	8.0	23.95	VV	27.78	-3.83
F0	777	848.32	800	V	Dipole	H	73.7	73.7		4.8		HH		
Test Configuration 2														
F0	1013	824.70	800	V	Dipole	V	70.8	70.8	73.5	-0.9	15.05	VV	27.78	-12.73
F0	1013	812.70	800	V	Dipole	H	73.5	73.5		-2.2		HH		
F0	417	837.49	800	V	Dipole	V	73.3	73.3	76.2	2.6	18.55	VV	27.78	-9.23
F0	417.	837.49	800	V	Dipole	H	76.2	76.2		0.4		HH		
F0	777	848.32	800	V	Dipole	V	75.1	75.1	76.9	4.3	20.25	VV	27.78	-7.53
F0	777	848.32	800	V	Dipole	H	76.9	76.9		1.1		HH		
Test Configuration 3														
F0	1013	824.70	800	V	Dipole	V	70.8	70.8	80.5	6.3	22.25	VV	27.78	-5.53
F0	1013	812.70	800	V	Dipole	H	80.5	80.5		5.0		HH		
F0	417	837.49	800	V	Dipole	V	72.7	72.7	81.6	8.1	24.05	VV	27.78	-3.73
F0	417.	837.49	800	V	Dipole	H	81.6	81.6		6.0		HH		
F0	777	848.32	800	V	Dipole	V	72.1	72.1	81.6	9.1	25.05	VV	27.78	-2.73
F0	777	848.32	800	V	Dipole	H	81.6	81.6		5.9		HH		

Radiated Emissions Test Data Results con't

Test Distance is 3.0 metres.

PCS Band (EIRP)

										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)
Test Configuration 1														
F0	25	1851.25	1900	V	Horn	V	87.0	87.0	87.0	-9.2	23.49	VV	33	-9.51
F0	25	1851.25	1900	V	Horn	H	73.5	73.5		-8.2		HH		
F0	600	1888.00	1900	V	Horn	V	86.0	86.0	86.0	-9.3	23.39	VV	33	-9.61
F0	600	1880.00	1900	V	Horn	H	73.5	73.5		-8.3		HH		
F0	1175	1908.75	1900	V	Horn	V	83.5	83.5	83.5	-11.2	21.39	VV	33	-11.61
F0	1175	1908.75	1900	V	Horn	H	72.5	72.5		-10.3		HH		
Test Configuration 2														
F0	25	1851.25	1900	V	Horn	V	81.0	81.0	81.0	-15.0	17.49	VV	33	-15.51
F0	25	1851.25	1900	V	Horn	H	79.4	79.4		-14.2		HH		
F0	600	1888.00	1900	V	Horn	V	81.9	81.9	81.9	-13.4	19.29	VV	33	-13.71
F0	600	1880.00	1900	V	Horn	H	78.7	78.7		-12.4		HH		
F0	1175	1908.75	1900	V	Horn	V	81.2	81.2	81.2	-13.5	19.09	VV	33	-13.91
F0	1175	1908.75	1900	V	Horn	H	77.7	77.7		-12.6		HH		
Test Configuration 3														
F0	25	1851.25	1900	V	Horn	V	80.2	81.0	82.0	-14.0	18.49	VV	33	-14.51
F0	25	1851.25	1900	V	Horn	H	82.0	79.4		-13.2		HH		
F0	600	1888.00	1900	V	Horn	V	81.5	81.9	81.6	-13.7	18.99	VV	33	-14.01
F0	600	1880.00	1900	V	Horn	H	81.6	78.7		-12.7		HH		
F0	1175	1908.75	1900	V	Horn	V	80.9	81.2	80.9	-13.7	18.79	VV	33	-14.21
F0	1175	1908.75	1900	V	Horn	H	79.1	77.7		-12.9		HH		

Radiated Emissions Test Data Results con't

The measurements were done with the Handheld in standalone mode in the upright position.
Test Distance is 3.0 metres.

Spurious harmonics emissions CELLULAR Band

										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)
LOW CHANNEL														
2nd to 10th	1013	1649	800	V	Horn	V	NF	NF				V V	-13.0	
2nd to 10th	1013	1649	800	V	Horn	H	NF	NF				H H		
The harmonics were investigated up to the 10th harmonic. No Emissions could be seen since they were below the spectrum analyzer noise floor.														
MIDDLE CHANNEL														
2nd to 10th	417	1675	800	V	Horn	V	NF	NF				V V	-13.0	
2nd to 10th	417	1675	800	V	Horn	H	NF	NF						
The harmonics were investigated up to the 10th harmonic. No Emissions could be seen since they were below the spectrum analyzer noise floor.														
HIGH CHANNEL														
2nd to 10th	777	1697	800	V	Horn	V	NF	NF				V V	-13.0	
2nd to 10th	777	1697	800	V	Horn	H	NF	NF						
The harmonics were investigated up to the 10th harmonic.														

No Emissions could be seen since they were below the spectrum analyzer noise floor.

Radiated Emissions Test Data Results con't

The measurements were done with the Handheld in standalone mode in the upright position
Test Distance is 3.0 metres.

Spurious harmonics emissions PCS Band

										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)
LOW CHANNEL														
2nd	25	3703	1900	V	Horn	V	55.6	55.6	55.6	-29.8	-26.1	V V	-13.0	-13.1
2nd	25	3703	1900	V	Horn	H	48.6	48.6		-29.7		H H		
The harmonics were investigated up to the 10th harmonic. No Emissions could be seen above the 2nd harmonic since the were below the spectrum analyzer noise floor.														
MIDDLE CHANNEL														
2nd	600	3760	1900	V	Horn	V	48.5	48.5	48.5	-36.7	-33.0	V V	-13.0	-20.0
2nd	600	3760	1900	V	Horn	H	44.3	44.3		-36.6				
The harmonics were investigated up to the 10th harmonic. No Emissions could be seen above the 2nd harmonic since they were below the spectrum analyzer noise floor.														
HIGH CHANNEL														
2nd	1175	3818	1900	V	Horn	V	45.4	45.4	46.4	-40.4	-36.2	V V	-13.0	-23.2
2nd	1175	3818	1900	V	Horn	H	46.4	46.4		-39.8				
The harmonics were investigated up to the 10th harmonic. No Emissions could be seen above the 2nd harmonic since they were below the spectrum analyzer noise floor.														

Radiated Emissions Test Set-up