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-0441-0611-09_rev2

PRODUCT MODEL NO: RBG41GW
TYPE NAME: BlackBerry
FCC ID: L6ARBG40GW
IC: 2503A-RBG40GW

DATE: 30 March 2007

Statement of Performance:

The BlackBerry Handheld, model RBG41GW, part number CER-13626-001 Rev 2 and accessories when configured and operated per RIM's operation instructions, performs within the requirements of the test standards.

Declaration:

We hereby certify that:
The test data reported herein is an accurate record of the performance of the sample(s) tested.
The test results are valid for the tested unit (s) only.
The test equipment used was suitable for the tests performed and within manufacturer's published specifications and operating parameters.
The test methods were consistent with the methods described in the relevant standards.

Tested by:

Kevin Chow
Compliance Specialist
Date: March 30, 2007

Tested and Reviewed by:

Maurice Battler
Compliance Specialist
Date: March 30, 2007

Tested by:

Masud S. Attayi, P. Eng.
Team Lead, Regulatory Compliance
Date: April 2, 2007

Approved by:

Paul G. Cardinal, Ph.D.
Director
Date: April 2, 2007

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 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 Document

1. Document number RTS-0441-RBG41GW-01

C. Product Identification

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

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

The testing was performed November 7-15, 2006. The sample EUT included:

1a. BlackBerry Handheld model RBG41GW, CER-13626-001 Rev 2, PIN 20528D21, LCD-11059-001.

1b. BlackBerry Handheld model RBG41GW, CER-14120-001, PIN 20571DC9, LCD-11059-001.

2a. BlackBerry Handheld model RBG41GW, CER-13626-001 Rev 1, PIN 20506DB7, LCD-11059-001.

2b. BlackBerry Handheld model RBG41GW, CER-13626-001 Rev 2, PIN 20508232, LCD-11059-003.

Sample 1a and 1b were used for radiated tests and Samples 2a & 2b were used for conducted tests.

To view the differences between CER-13626-001 Rev 1 and CER-13626-001 Rev 2 see document number RTS-0441-RBG41GW-01.

Only the measurements that may have been impacted by the changes from Rev 1 to Rev 2 were re-measured.

D. Support Equipment Used for the Testing of the EUT

1) Communication Tester, Rohde & Schwarz, model CMU 200, serial number 837493/073
2) Communication Tester, Rohde & Schwarz, model CMU 200, serial number 100251
3) DC Power Supply, HP, model 6632B, serial number US37472178

E. Test Voltage

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

F. Test Results Chart

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

G. Modifications to EUT

No modifications were required on the EUT.

H. Summary of Results

1) The EUT met the requirements of the Conducted Spurious Emissions requirements in the GSM850 band as per 47 CFR 2.1051, CFR 22.917, CFR 22.901(d) and RSS-132. The EUT was measured on the low, middle and high channels. The frequency range investigated was from 10 MHz to 10 GHz. (See APPENDIX 1 for test data)

2) The EUT met the requirements of the Tx Conducted Spurious Emissions requirements in the PCS band as per 47 CFR 2.1051, CFR 24.238(a) and RSS-133. The EUT was measured on the low, middle and high channels. The frequency range investigated was from 10 MHz to 20 GHz. (See APPENDIX 1 for test data)

3) The EUT met the requirements of the Occupied Bandwidth and channel mask requirements in the GSM850 band as per 47 CFR 2.202, CFR 22.917 and RSS-132. The EUT was measured on the low, middle and high channels. (See APPENDIX 1 for test data)

4) The EUT met the requirements of the Occupied Bandwidth and channel mask requirements in the PCS band as per 47 CFR 2.202, CFR 24.238 and RSS-133. The EUT was measured on the low, middle and high channels. (See APPENDIX 1 for test data)

5) The EUT met the requirements of the Conducted RF Output Power requirements for both the GSM850 and PCS bands as per 47 CFR 2.1046(a). The EUT was measured 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 requirements for GSM850 band as per 47 CFR 2.1055(a), 2.1055(d), CFR 22.917 and RSS-132.
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 47 CFR 2.1055(a), 2.1055(d), 24.235 and RSS-133. 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).

8) The radiated spurious emissions/harmonics and ERP/EIRP were measured for both GSM850 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 remotely controlled turntable. The EUT height of one metre was set in order to align it with the lowest height of the receiving antenna. The test distance used between the EUT and the receiving antenna was three metres. Then the emissions were maximized by elevating the antenna in the range of 1 to 4 metres. The turntable was rotated to determine the azimuth of the peak emissions. The maximum emissions level was recorded. Both the horizontal and vertical polarisations of the emissions were measured. The maximum emissions level was recorded. The EUT was then substituted with an antenna placed in the same location as the EUT. A Dipole antenna was used for the ERP measurements and a Horn antenna was used for EIRP measurements. After the final maximum reading was obtained the Handheld was substituted with a dipole or horn antenna, which was placed in the same location as the Handheld. The substitution antenna was connected into a signal generator that was set to the test frequency. The emissions were maximized by elevating the antenna in the range of 1 to 4 metres. The signal generator output was then adjusted to match the Handheld output reading. The signal generator output was recorded. Both the horizontal and vertical polarisations of the emissions were measured.

   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 GSM850 band measured was 29.3 dBm at 824.20 MHz (channel 128).
   The highest EIRP in the PCS band measured was 27.2 dBm at 1909.80 MHz (channel 810).

The radiated carrier harmonics were measured up to the 10th harmonic for low, middle and high channels in the GSM850 and PCS bands. Both the horizontal and vertical polarizations were measured. The harmonic emissions above the 6th harmonic were in the noise floor (NF) for the GSM850 band and above the 2nd harmonic for the PCS band.
The worst test margin for GSM850 band harmonic emissions measured was 20.3 dB below the limit at 2472.6 MHz.
The worst test margin for PCS band harmonic emissions measured was 29.6 dB below the limit at 3700.4 MHz.

The EUT's RF local oscillator (LO) emissions were measured in the GSM850 band and PCS band in the standalone configuration on the low and high channels. Both the horizontal and vertical polarizations were measured. The RF LO 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)

To view the test data see APPENDIX 4.

Measurement Uncertainty ±4.0 dB

I. Compliance Test Equipment Used

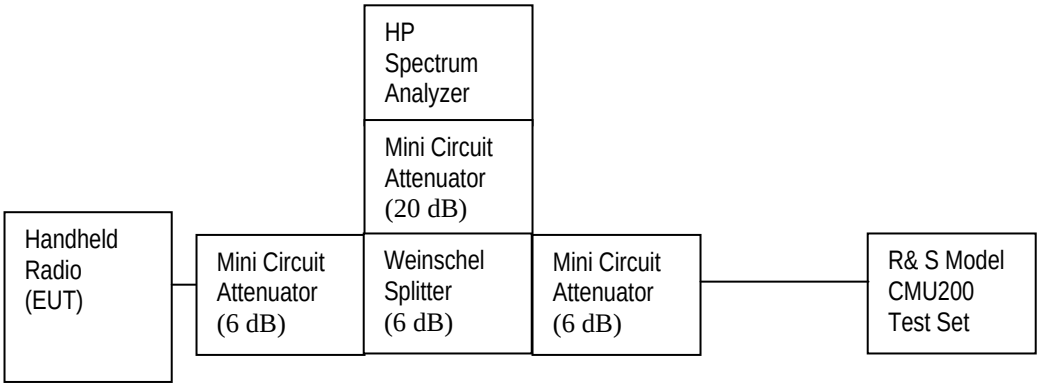
UNIT	MANUFACTURER	MODEL	SERIAL NUMBER	CAL DUE DATE (YY MM DD)	USE
Preamplifier	Sonoma	310N/11909A	185831	06-11-27	Radiated Emissions
Preamplifier system	TDK RF Solutions	PA-02	080010	06-11-25	Radiated Emissions
Hybrid Log Antenna	TDK	HLP-3003C	017401	08-08-04	Radiated Emissions
Horn Antenna	TDK	HRN-0118	030101	08-07-26	Radiated Emissions
Horn Antenna	TDK	HRN-0118	030201	07-01-07	Radiated Emissions
Horn Antenna	Emco	3116	2538	08-09-25	Radiated Emissions
Preamplifier	TDK	18-26	030002	06-11-28	Radiated Emissions
Dipole Antenna	Schwarzbeck	UHAP	973	06-12-13	Radiated Emissions
Dipole Antenna	Schwarzbeck	UHAP	974	08-09-28	Radiated Emissions
Universal Radio Communication Tester	Rohde & Schwarz	CMU 200	837493/073	07-03-23	Radiated Emissions
EMI Receiver	Rohde & Schwarz	ESIB-40	100255	07-05-11	Radiated Emissions
Universal Radio Communication Tester	Rohde & Schwarz	CMU 200	100251	07-04-23	Conducted 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	06-12-23	Radiated Emissions
Environment Monitor	Control Company	1870	230355189	06-12-23	RF Conducted Emissions
Temperature Probe	Hart Scientific	61161-302	21352860	07-08-31	Frequency Stability
Environmental Chamber	ESPEC Corp.	SH-240S1	91007118	N/R	Frequency Stability
Signal Generator	Agilent	8648C	4037U03155	07-09-13	Frequency Stability
Power Meter	Giga-tronics	8541C	1837762	06-12-03	Frequency Stability
Power Sensor	Giga-tronics	80401A	1835838	06-12-03	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.

Test Setup Diagram



The environmental test conditions were:
Temperature 24ºC
Pressure 1004 mb
Relative Humidity 30%

Conducted RF Emission Test Data cont'd

The conducted spurious emissions – As per 47 CFR 2.1051, CFR 24.238(a), RSS-133, CFR 22 Subpart H and RSS-132 were measured from 10 MHz to 20 GHz. The EUT emissions were in the noise floor.
See figures 1 to 12 for the plots of the conducted spurious emissions.

–26 dBc Bandwidth and Occupied Bandwidth (99%)

For each carrier frequency of low, middle and high, 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 bandwidth for the GSM850 was measured to be 270.0 kHz, and for the PCS was measured to be 307.0 kHz as shown below. This results in a 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 GSM850 and PCS selected Frequencies

GSM850 Frequency (MHz)	-26dBc Bandwidth (kHz)	99% Occupied Bandwidth (kHz)
824.2	265	243.3
837.6	267	241.7
848.8	270	241.7

PCS Frequency (MHz)	-26dBc Bandwidth (kHz)	99% Occupied Bandwidth (kHz)
1850.2	275	246.7
1880.0	307	246.7
1909.8	305	243.3

Measurement Plots for GSM850 and PCS
Refer to the following measurement plots for more detail.

See Figures 13 to 24 for the plots of the –26dBc Bandwidth and 99% Occupied Bandwidth.
See Figures 25 to 28 for plots of the channel mask results.

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

Conducted RF Emission Test Data cont'd

Figure 1: GSM 850, Spurious Conducted Emissions, Low channel

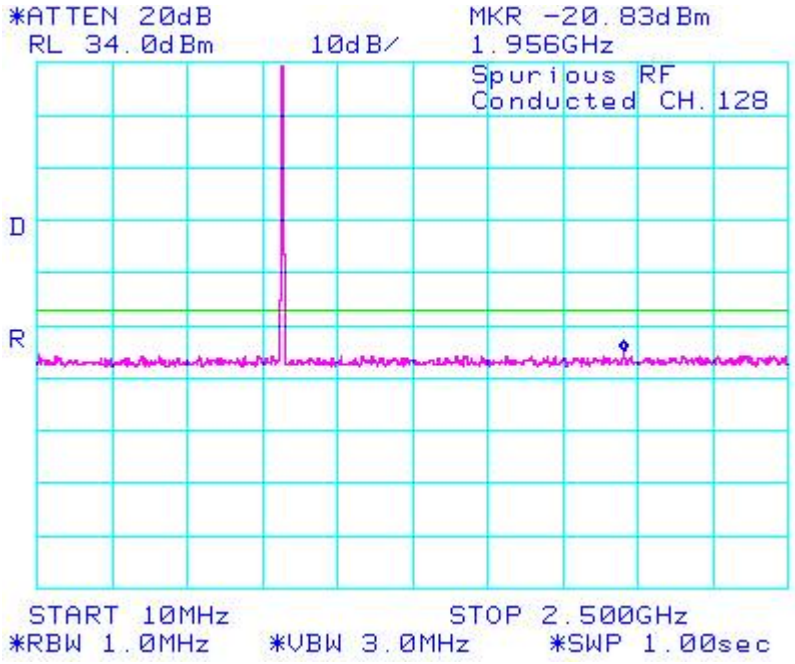
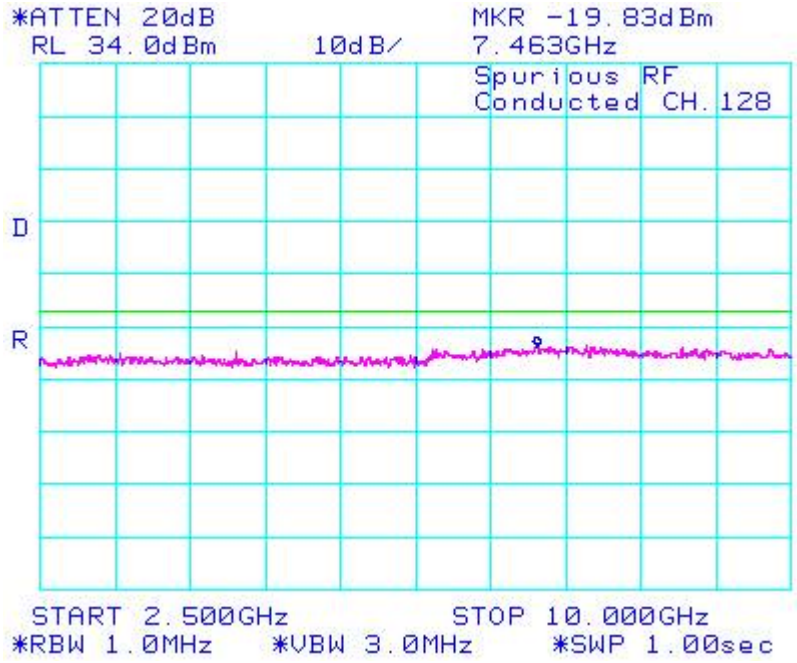


Figure 2: GSM 850, Spurious Conducted Emissions, Low channel



Conducted RF Emission Test Data cont'd

Figure 3: GSM 850, Spurious Conducted Emissions, Middle Channel

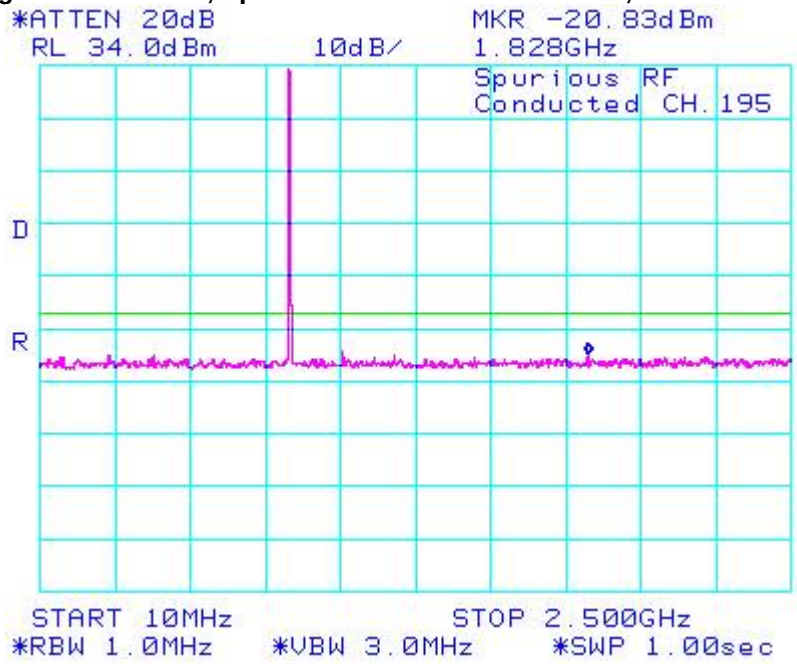
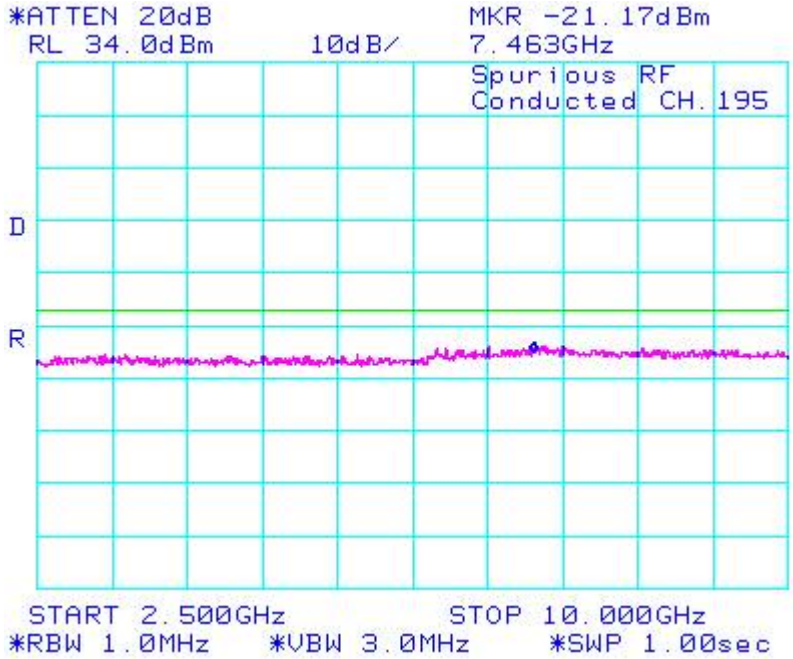


Figure 4: GSM 850, Spurious Conducted Emissions, Middle Channel



Conducted RF Emission Test Data cont'd

Figure 5: GSM 850, Spurious Conducted Emissions, High Channel

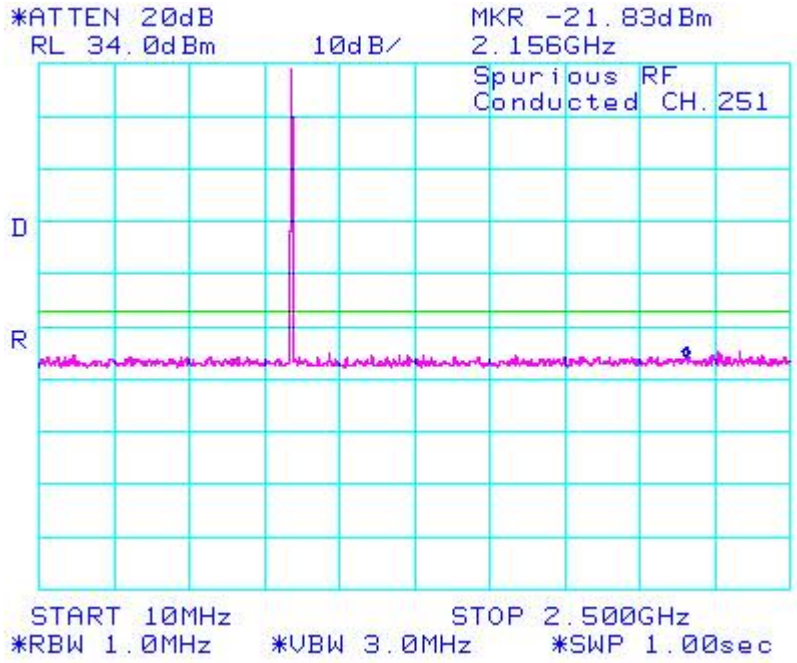
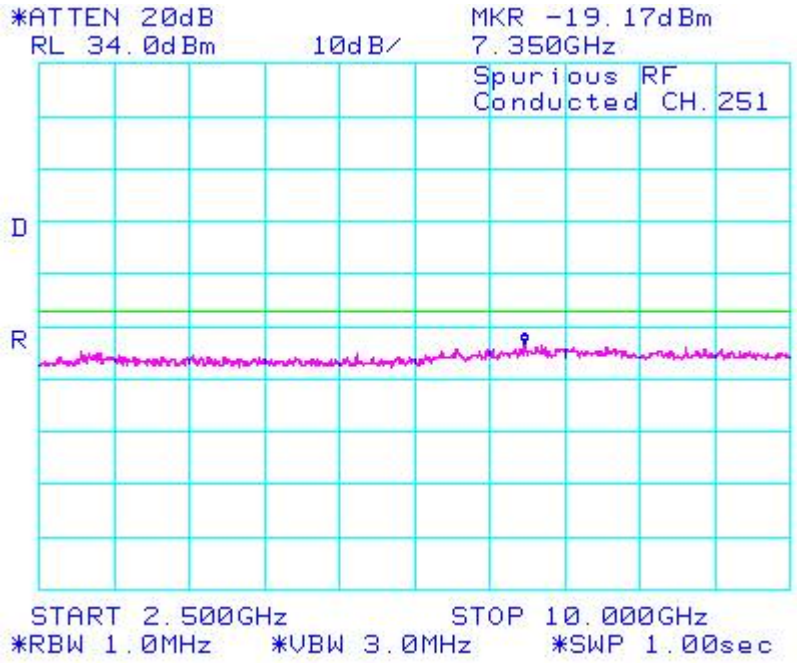


Figure 6: GSM 850, Spurious Conducted Emissions, High Channel



Conducted RF Emission Test Data cont'd

Figure 7: PCS, Spurious Conducted Emissions, Low Channel

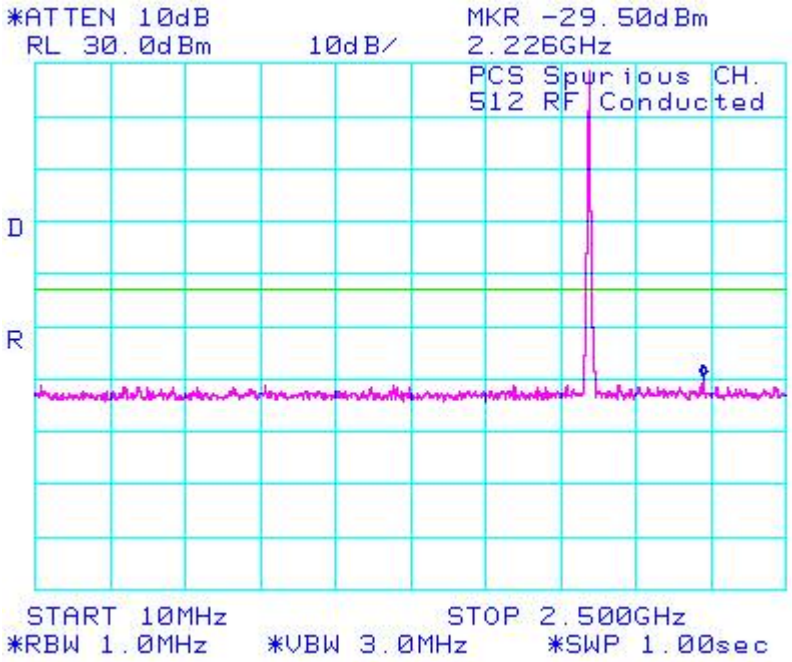
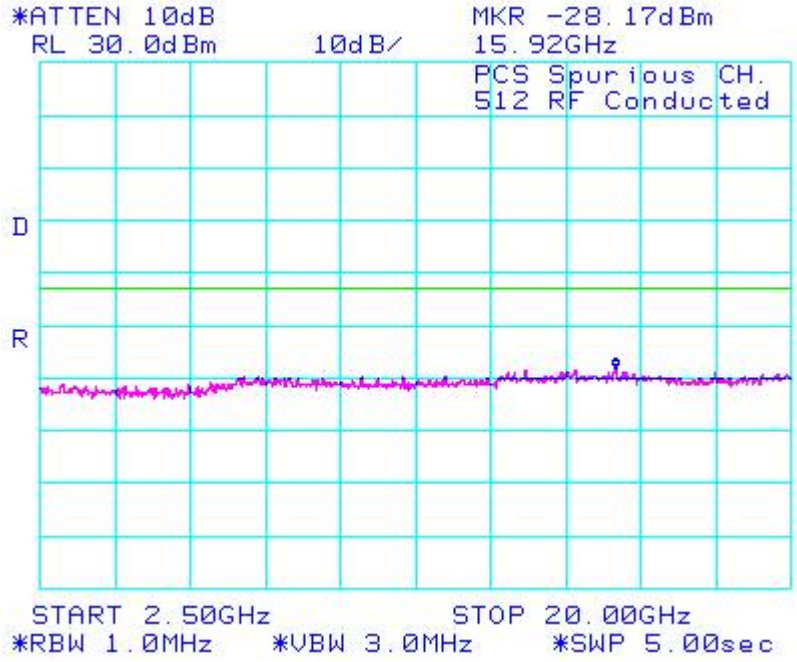


Figure 8: PCS, Spurious Conducted Emissions, Low Channel



Conducted RF Emission Test Data cont'd

Figure 9: PCS, Spurious Conducted Emissions, Middle Channel

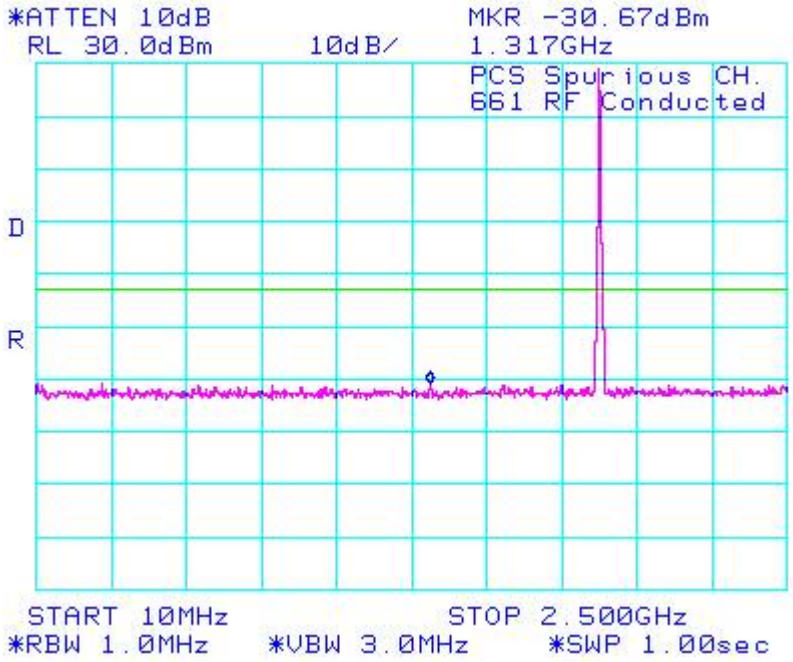
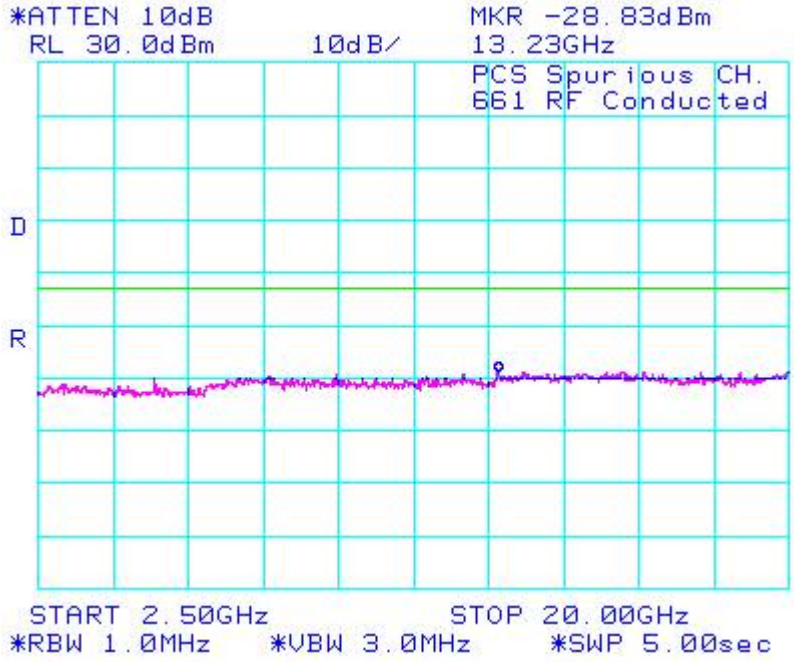


Figure 10: PCS, Spurious Conducted Emissions, Middle Channel



Conducted RF Emission Test Data cont'd

Figure 11: PCS, Spurious Conducted Emissions, High Channel

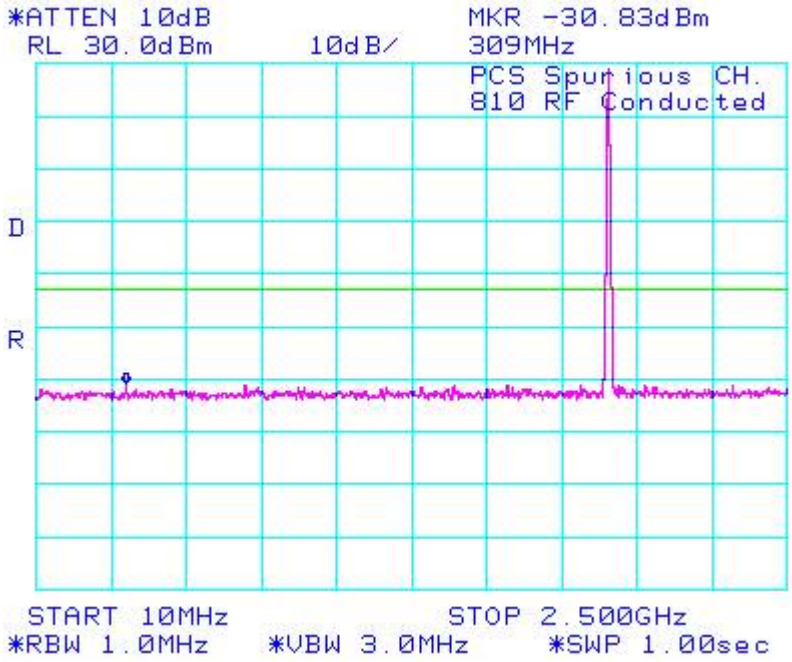
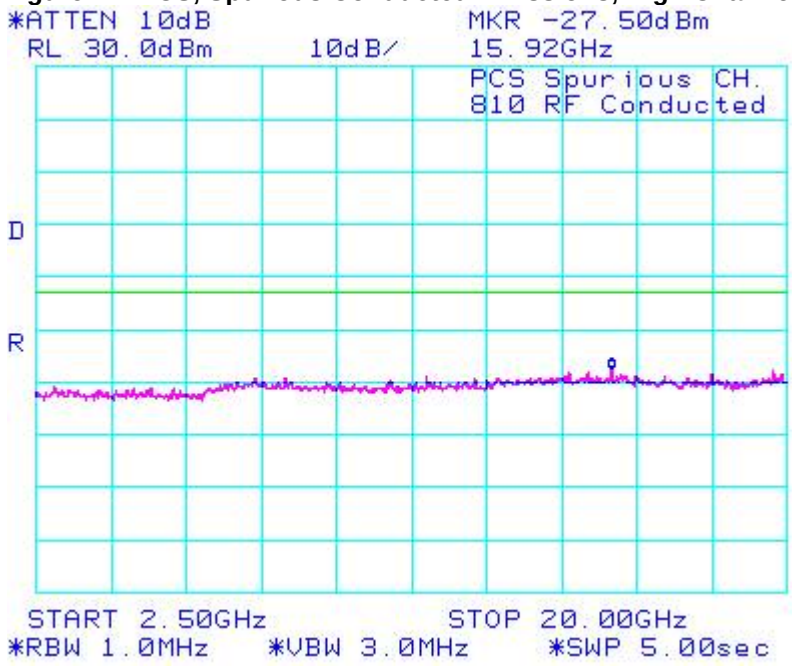


Figure 12: PCS, Spurious Conducted Emissions, High Channel



Conducted RF Emission Test Data cont'd

Figure 13: -26dBc bandwidth, GSM 850 Low Channel

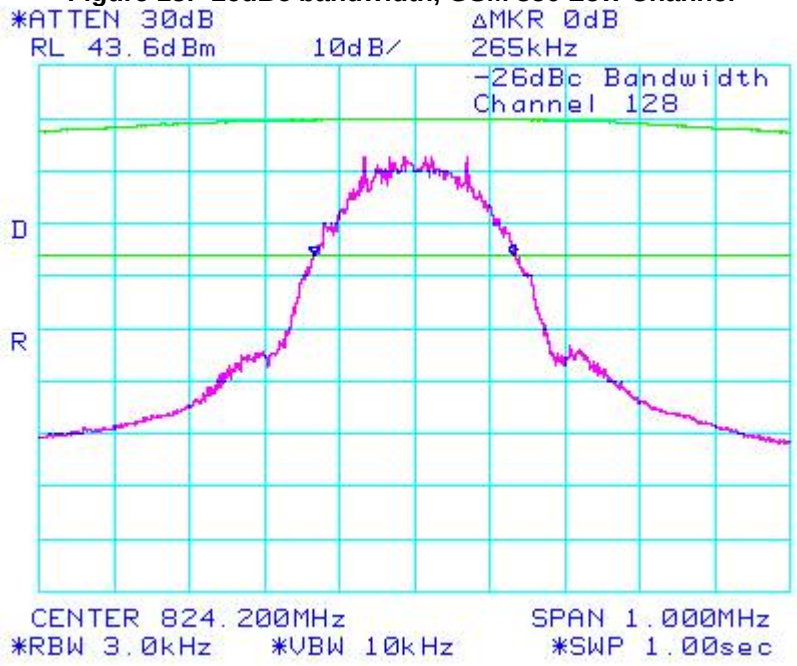
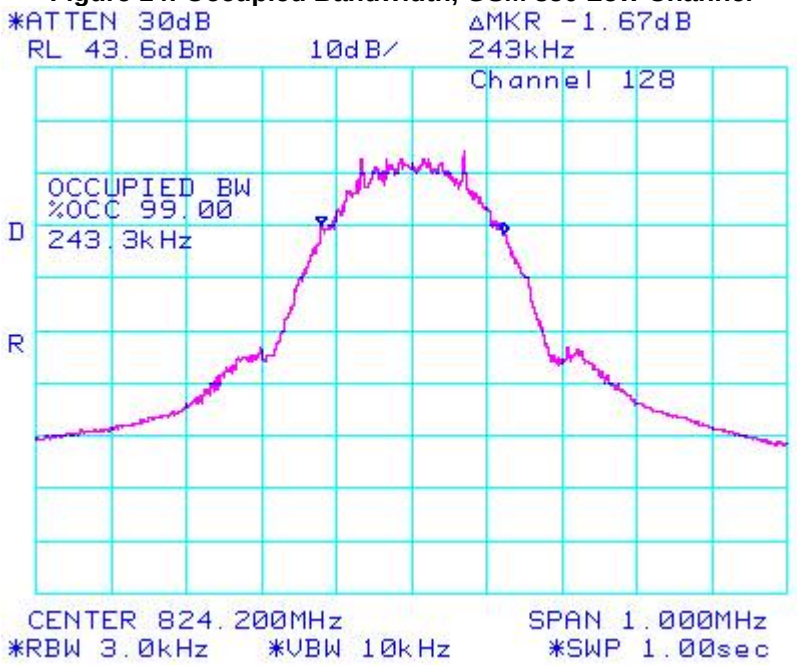


Figure 14: Occupied Bandwidth, GSM 850 Low Channel



Conducted RF Emission Test Data cont'd

Figure 15: -26dBc bandwidth, GSM 850 Middle Channel

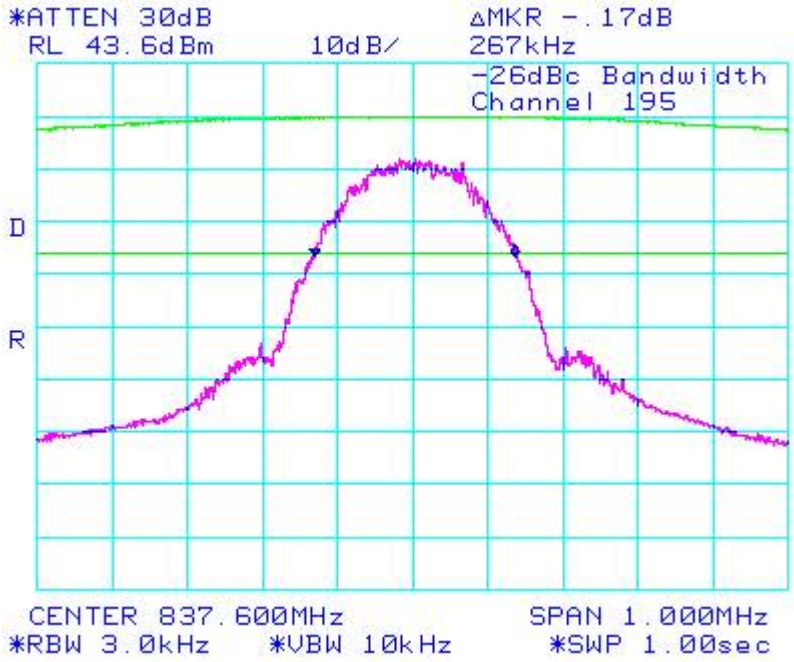
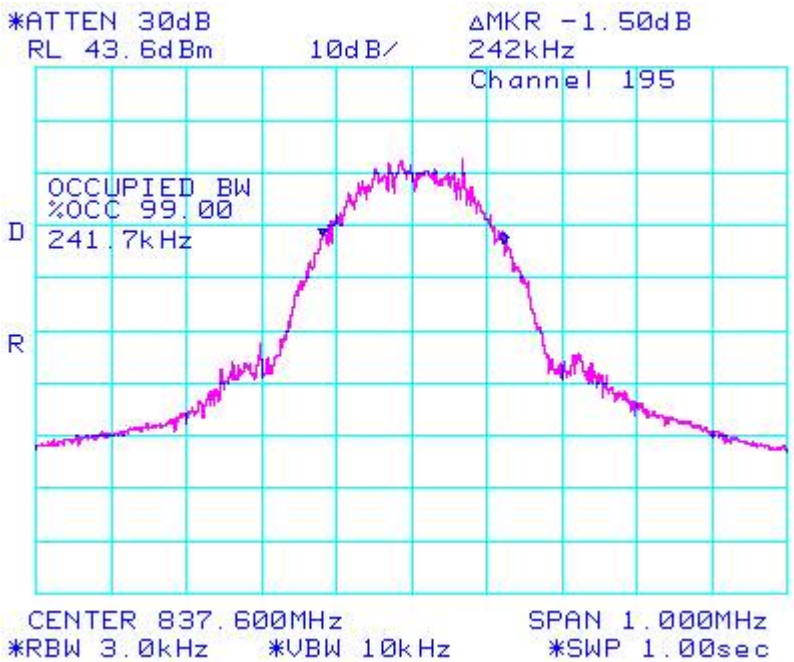


Figure 16: Occupied Bandwidth, GSM 850 Middle Channel



Conducted RF Emission Test Data cont'd

Figure 17: -26dBc bandwidth, GSM 850 High Channel

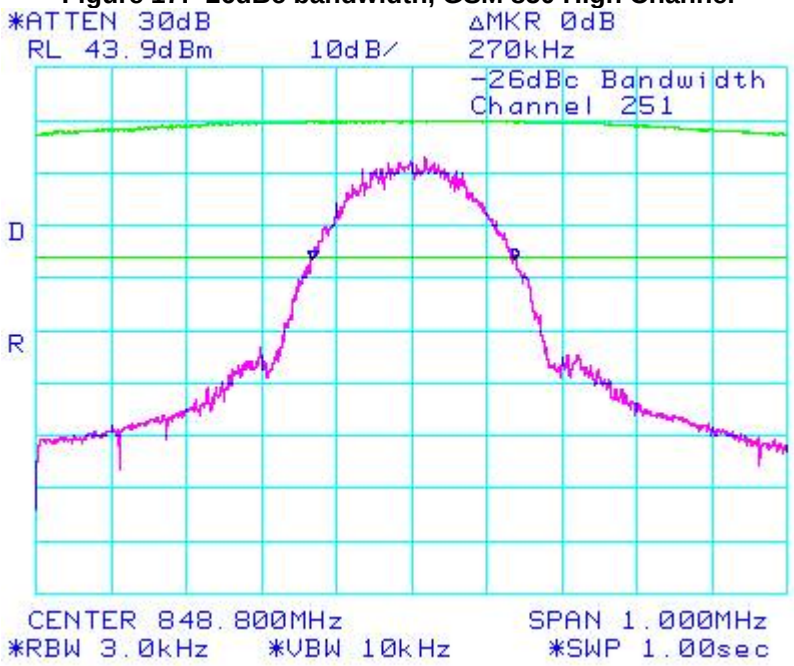
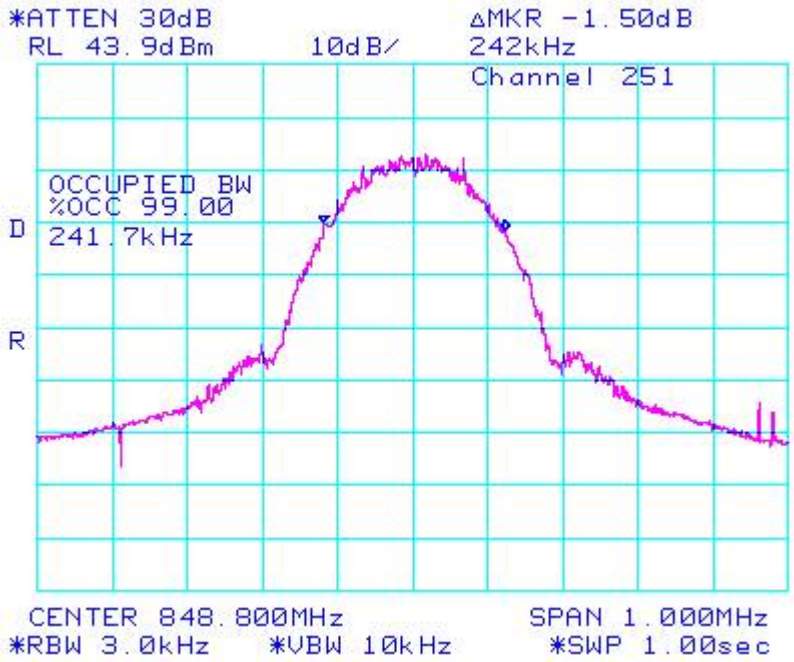


Figure 18: Occupied Bandwidth, GSM 850 High Channel



Conducted RF Emission Test Data cont'd

Figure 19: -26dBc bandwidth, PCS Low Channel

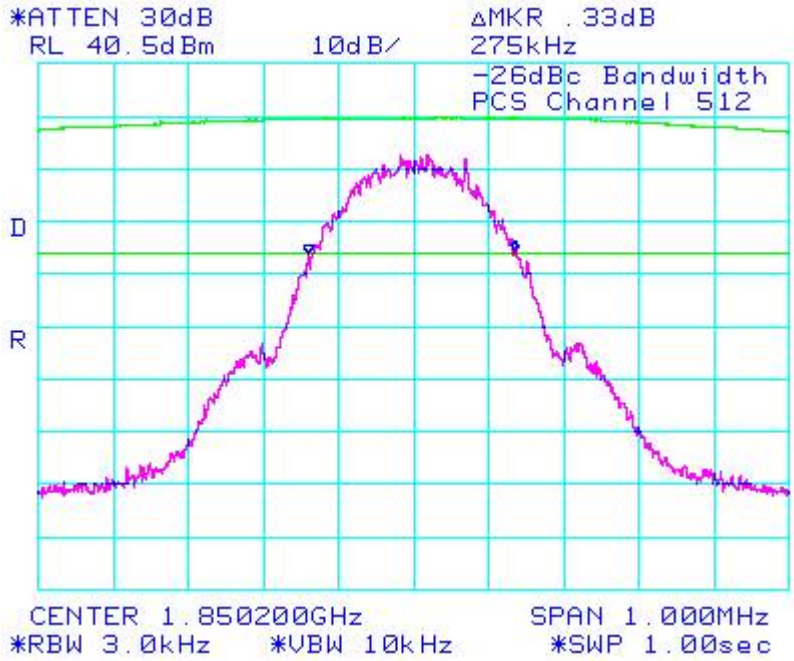
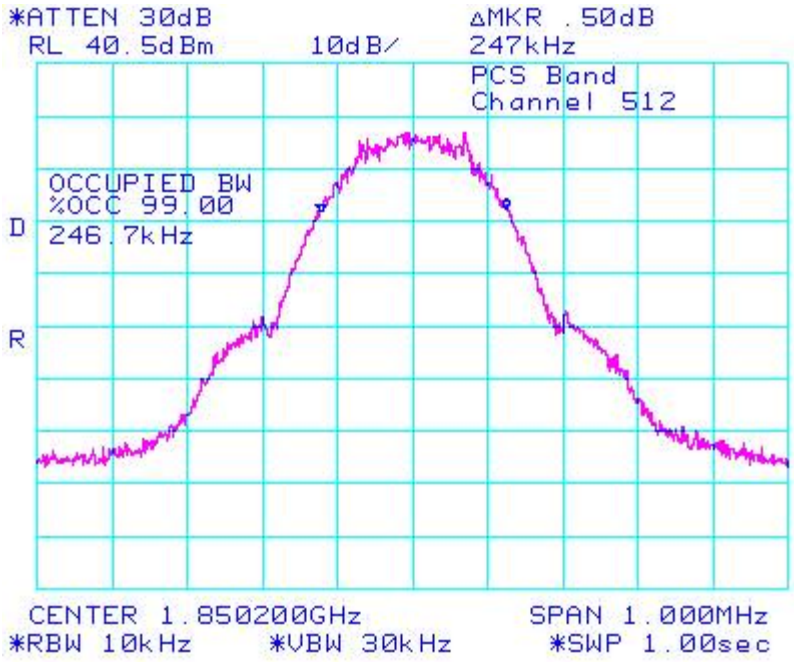


Figure 20: Occupied Bandwidth, PCS Low Channel



Conducted RF Emission Test Data cont'd

Figure 21: -**26dBc bandwidth, PCS Middle Channel**

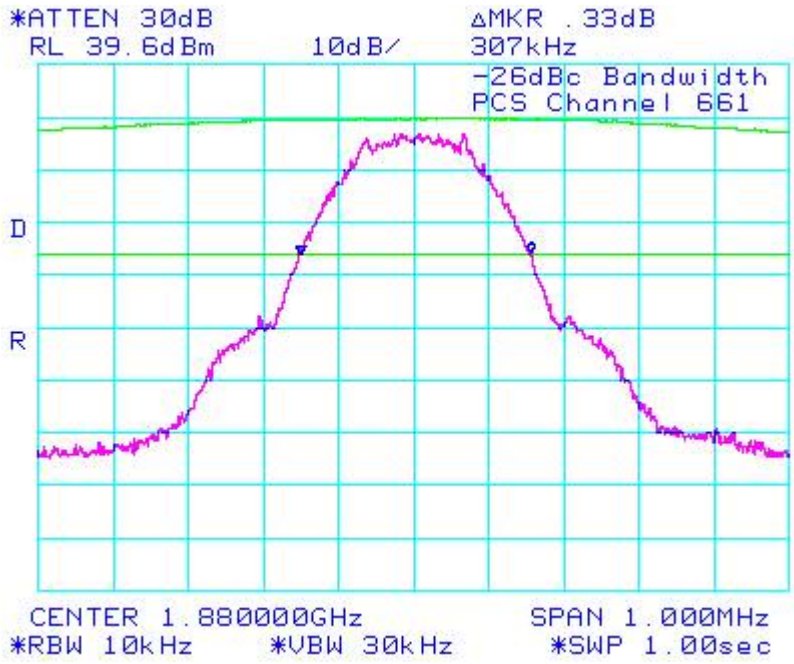
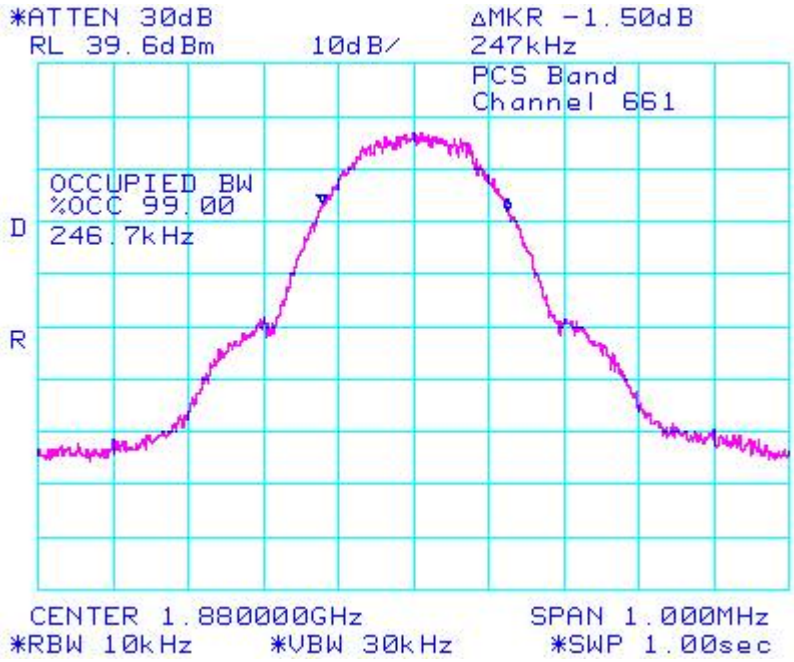


Figure 22: Occupied Bandwidth, PCS Middle Channel



Conducted RF Emission Test Data cont'd

Figure 23: -26dBc bandwidth, PCS High Channel

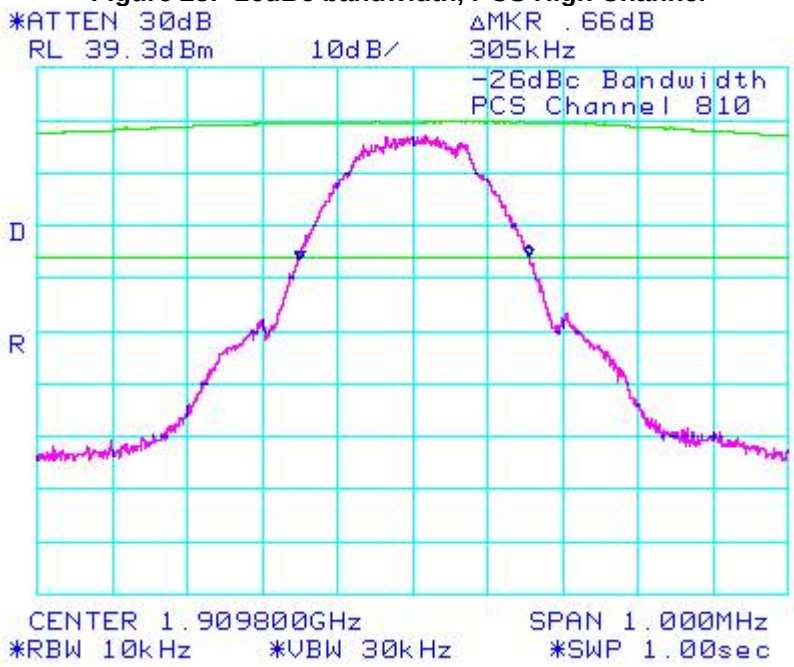
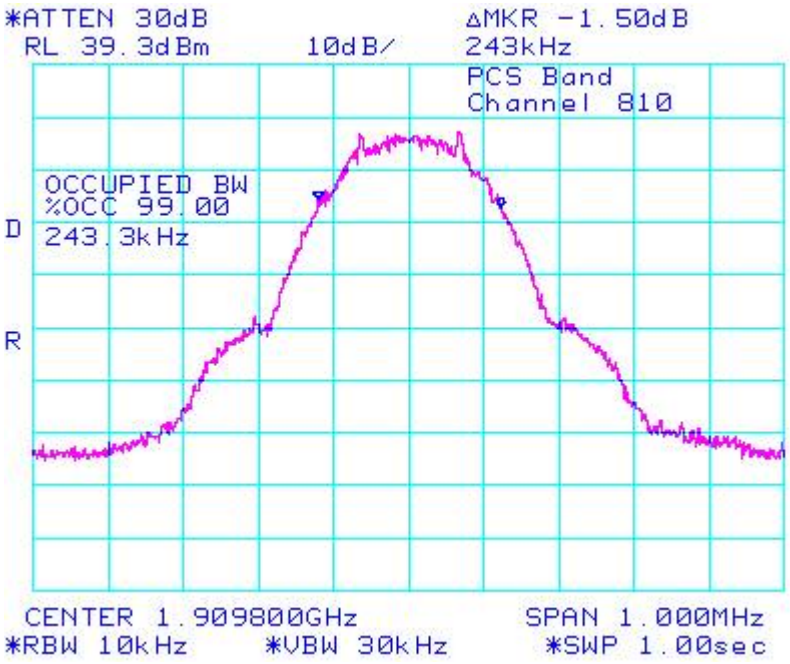


Figure 24: Occupied Bandwidth, PCS High Channel



Conducted RF Emission Test Data cont'd

Figure 25: GSM 850, Low Channel Mask

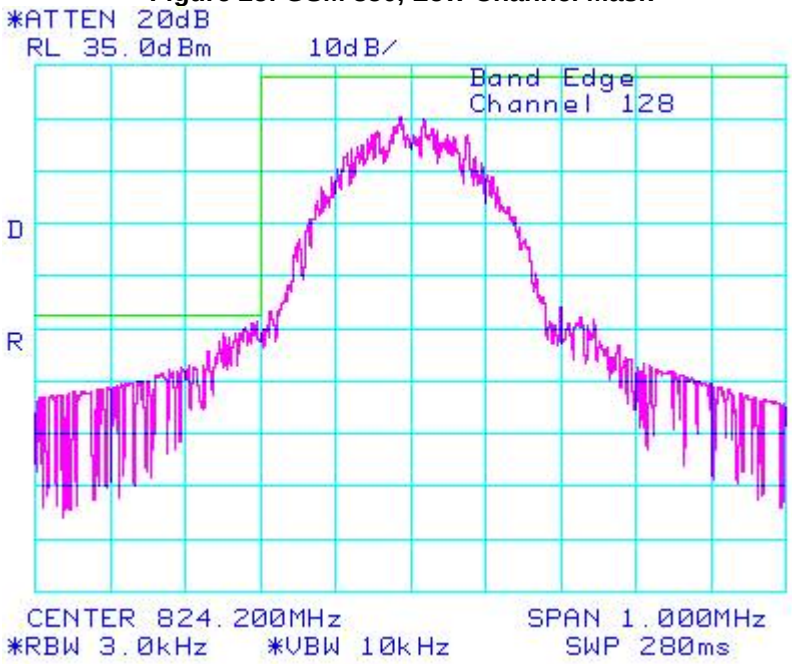
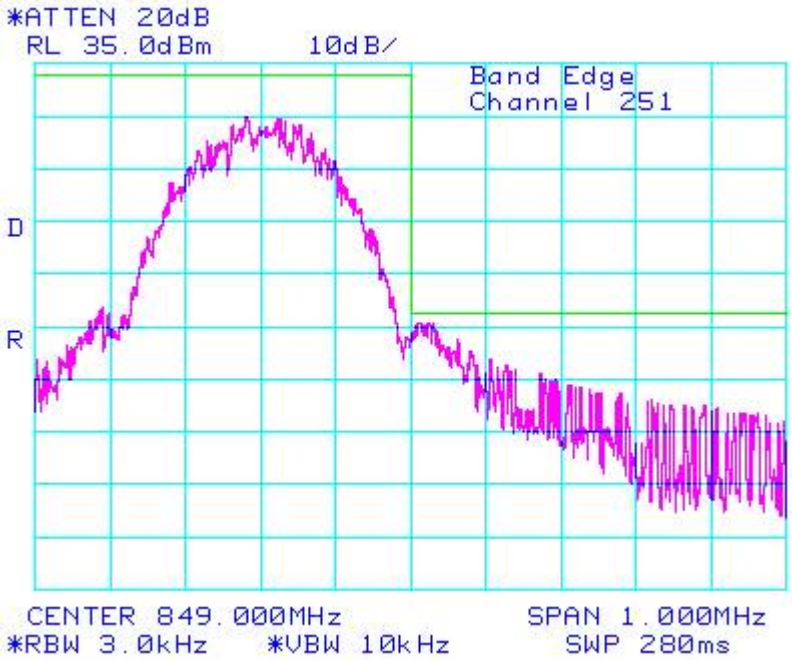


Figure 26: GSM 850 High Channel Mask



Conducted RF Emission Test Data cont'd

Figure27: PCS, Low Channel Mask

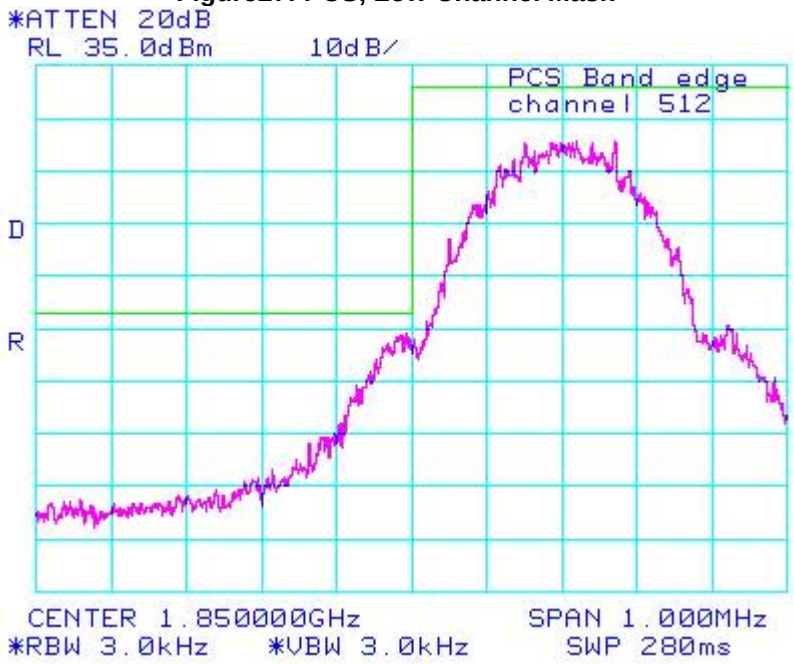
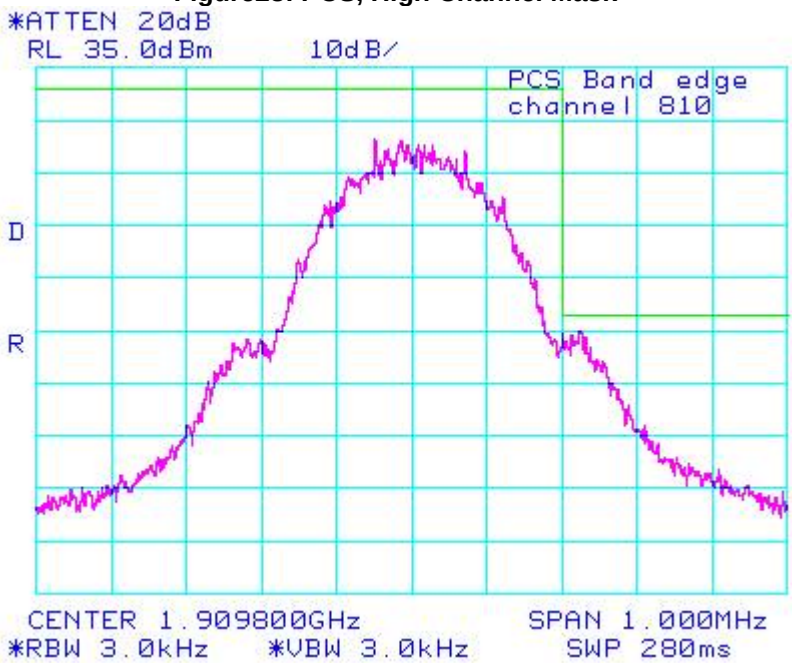


Figure28: PCS, High Channel Mask



APPENDIX 2 – CONDUCTED RF OUTPUT POWER TEST DATA

Conducted RF Output Power Test Data

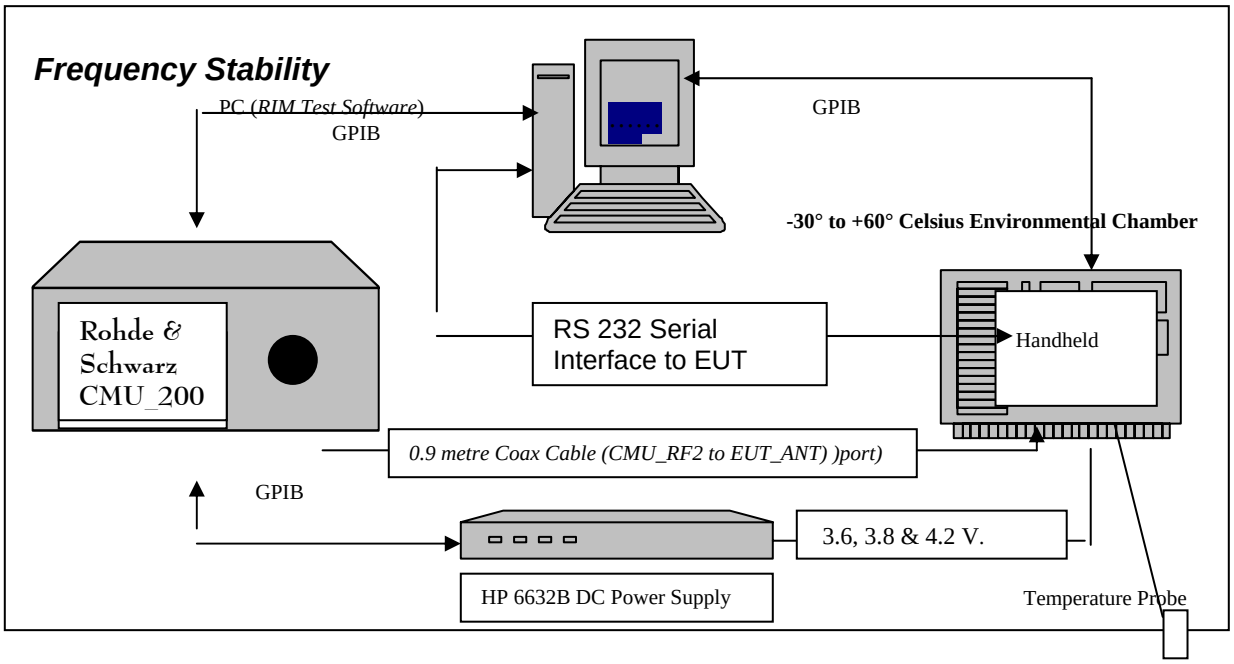
The conducted RF output power was measured using the Communication Tester, Rohde & Schwarz, model CMU 200. The low, middle and high channels were measured at maximum radio output power. The insertion loss of the coaxial cable from the CMU 200 to the Handheld was compensated for in the measurements.
Peak nominal output power is 32.3 dBm ±0.5 dB for GSM850 and 30.3 dBm ±0.5 dB for PCS.

Test Results

Channel	Frequency (MHz)	Maximum Output Power (dBm)
GSM850		
128	824.20	**32.4**
189	837.60	32.3
251	848.80	32.4
PCS		
512	1850.2	**30.5**
661	1880.0	30.0
810	1909.8	29.8

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 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 CMU 200 and the EUT antenna port.

Calibration for the Cable Loss was performed in the RF Laboratory using the Giga-tronics power meter 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)
1850.2	1.40
1880.0	1.40
1909.8	1.40

GSM 850 Frequency (MHz)	Cable loss (dB)
824.2	0.90
836.4	0.90
848.6	0.90

Procedure:

The EUT was placed in the Temperature chamber and connected to 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, 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. 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 824.2, 836.4, and 848.6 MHz for the GSM850 band and 1850.2, 1880.0 and 1909.8 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; CMU 200 Communications test Set, 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 CMU 200 Radio Communication Tester.
6. Command the CMU 200 to switch to the low channel.
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 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 GSM850 band measured was -**0.1213 PPM**.
The maximum frequency error in the PCS band measured was **-0.0369 PPM**.

GSM850 Channel results: channels 128, 189 and 250 @ 20°C maximum transmitted power

Traffic Channel Number	GSM850 Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
128	824.20	3.6	20	-30	-0.0367
189	836.40	3.6	20	-42	-0.0503
250	848.60	3.6	20	-10	-0.0119

Traffic Channel Number	GSM850 Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
128	824.20	3.8	20	-24	-0.0289
189	836.40	3.8	20	-10	-0.0122
250	848.60	3.8	20	-65	-0.0765

Traffic Channel Number	GSM850 Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
128	824.20	4.2	20	-100	**-0.1213**
189	836.40	4.2	20	-42	-0.0506
250	848.60	4.2	20	-29	-0.0339

GSM850 Results: channel 128 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
128	824.20	3.60	-30	29	0.0356
128	824.20	3.60	-20	12	0.0146
128	824.20	3.60	-10	-30	-0.0363
128	824.20	3.60	0	-16	-0.0197
128	824.20	3.60	10	-35	-0.0425
128	824.20	3.60	20	-30	-0.0367
128	824.20	3.60	30	-40	-0.0479
128	824.20	3.60	40	-38	-0.0458
128	824.20	3.60	50	-34	-0.0407
128	824.20	3.60	60	-40	-0.0490

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
128	824.20	3.80	-30	-46	-0.0559
128	824.20	3.80	-20	-20	-0.0242
128	824.20	3.80	-10	-35	-0.0426
128	824.20	3.80	0	-30	-0.0361
128	824.20	3.80	10	-36	-0.0432
128	824.20	3.80	20	-24	-0.0289
128	824.20	3.80	30	-16	-0.0197
128	824.20	3.80	40	-20	-0.0241
128	824.20	3.80	50	-39	-0.0471
128	824.20	3.80	60	-30	-0.0368

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
128	824.20	4.20	-30	-54	-0.0658
128	824.20	4.20	-20	-62	-0.0751
128	824.20	4.20	-10	-83	-0.1003
128	824.20	4.20	0	-81	-0.0981
128	824.20	4.20	10	-63	-0.0768
128	824.20	4.20	20	-100	**-0.1213**
128	824.20	4.20	30	-81	-0.0980
128	824.20	4.20	40	-74	-0.0896
128	824.20	4.20	50	-71	-0.0865
128	824.20	4.20	60	-44	-0.0534

GSM850 Results: channel 189 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
189	836.40	3.60	-30	-55	-0.0652
189	836.40	3.60	-20	18	0.0219
189	836.40	3.60	-10	-31	-0.0376
189	836.40	3.60	0	-21	-0.0255
189	836.40	3.60	10	-17	-0.0205
189	836.40	3.60	20	-42	-0.0503
189	836.40	3.60	30	-28	-0.0338
189	836.40	3.60	40	-29	-0.0352
189	836.40	3.60	50	-12	-0.0139
189	836.40	3.60	60	-37	-0.0441

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
189	836.40	3.8	-30	-76	-0.0911
189	836.40	3.8	-20	-83	-0.0986
189	836.40	3.8	-10	-80	-0.0960
189	836.40	3.8	0	-63	-0.0751
189	836.40	3.8	10	-36	-0.0425
189	836.40	3.8	20	-10	-0.0122
189	836.40	3.8	30	13	0.0152
189	836.40	3.8	40	-14	-0.0171
189	836.40	3.8	50	-37	-0.0442
189	836.40	3.8	60	-30	-0.0354

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
189	836.40	4.2	-30	-35	-0.0418
189	836.40	4.2	-20	-36	-0.0432
189	836.40	4.2	-10	-60	-0.0720
189	836.40	4.2	0	-44	-0.0526
189	836.40	4.2	10	-25	-0.0297
189	836.40	4.2	20	-42	-0.0506
189	836.40	4.2	30	-35	-0.0422
189	836.40	4.2	40	-46	-0.0556
189	836.40	4.2	50	-86	-0.1034
189	836.40	4.2	60	-77	-0.0918

GSM850 Results: channel 250 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
250	848.60	3.60	-30	-84	-0.0990
250	848.60	3.60	-20	-85	-0.1006
250	848.60	3.60	-10	-36	-0.0430
250	848.60	3.60	0	-21	-0.0250
250	848.60	3.60	10	-21	-0.0247
250	848.60	3.60	20	-10	-0.0119
250	848.60	3.60	30	-38	-0.0442
250	848.60	3.60	40	-42	-0.0489
250	848.60	3.60	50	-27	-0.0323
250	848.60	3.60	60	-15	-0.0182

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
250	848.60	3.80	-30	-60	-0.0704
250	848.60	3.80	-20	-70	-0.0825
250	848.60	3.80	-10	-100	-0.1176
250	848.60	3.80	0	-76	-0.0891
250	848.60	3.80	10	-94	-0.1104
250	848.60	3.80	20	-65	-0.0765
250	848.60	3.80	30	-21	-0.0246
250	848.60	3.80	40	9	0.0111
250	848.60	3.80	50	-32	-0.0373
250	848.60	3.80	60	-32	-0.0377

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
250	848.60	4.20	-30	-29	-0.0346
250	848.60	4.20	-20	-36	-0.0422
250	848.60	4.20	-10	-53	-0.0629
250	848.60	4.20	0	-40	-0.0467
250	848.60	4.20	10	-12	-0.0145
250	848.60	4.20	20	-29	-0.0339
250	848.60	4.20	30	-19	-0.0219
250	848.60	4.20	40	-25	-0.0295
250	848.60	4.20	50	-55	-0.0649
250	848.60	4.20	60	-62	-0.0733

PCS Channel results: channels 512, 661, & 810 @ 20°C maximum transmitted power

Traffic Channel Number	PCS Frequency (MHz	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	*PPM*
512	1850.2	3.6	20	-47	-0.0252
661	1880	3.6	20	-38	-0.0202
810	1909.8	3.6	20	-50	-0.0263

Traffic Channel Number	PCS Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
512	1850.2	3.8	20	-36	-0.0195
661	1880	3.8	20	-42	-0.0225
810	1909.8	3.8	20	-45	-0.0236

Traffic Channel Number	PCS Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
512	1850.2	4.2	20	-29	-0.0155
661	1880	4.2	20	-20	-0.0107
810	1909.8	4.2	20	-34	-0.0177

PCS 1900 Results: channel 512 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
512	1850.2	3.6	-30	-46	-0.0248
512	1850.2	3.6	-20	-44	-0.0240
512	1850.2	3.6	-10	-48	-0.0259
512	1850.2	3.6	0	-40	-0.0215
512	1850.2	3.6	10	-41	-0.0222
512	1850.2	3.6	20	-47	-0.0252
512	1850.2	3.6	30	-22	-0.0118
512	1850.2	3.6	40	-43	-0.0235
512	1850.2	3.6	50	-50	-0.0268
512	1850.2	3.6	60	-60	-0.0322

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
512	1850.2	3.8	-30	-55	-0.0298
512	1850.2	3.8	-20	-27	-0.0145
512	1850.2	3.8	-10	-35	-0.0192
512	1850.2	3.8	0	-24	-0.0128
512	1850.2	3.8	10	-41	-0.0221
512	1850.2	3.8	20	-36	-0.0195
512	1850.2	3.8	30	-28	-0.0152
512	1850.2	3.8	40	-35	-0.0188
512	1850.2	3.8	50	-27	-0.0146
512	1850.2	3.8	60	-51	-0.0277

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
512	1850.2	4.2	-30	-52	-0.0280
512	1850.2	4.2	-20	-17	-0.0092
512	1850.2	4.2	-10	-19	-0.0103
512	1850.2	4.2	0	-34	-0.0186
512	1850.2	4.2	10	-37	-0.0202
512	1850.2	4.2	20	-29	-0.0155
512	1850.2	4.2	30	-68	**-0.0369**
512	1850.2	4.2	40	-19	-0.0104
512	1850.2	4.2	50	-51	-0.0277
512	1850.2	4.2	60	-48	-0.0258

PCS 1900 Results: channel 661 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
661	1880	3.6	-30	-45	-0.0242
661	1880	3.6	-20	-38	-0.0200
661	1880	3.6	-10	-47	-0.0252
661	1880	3.6	0	-51	-0.0269
661	1880	3.6	10	-44	-0.0233
661	1880	3.6	20	-38	-0.0202
661	1880	3.6	30	14	0.0072
661	1880	3.6	40	-42	-0.0222
661	1880	3.6	50	-37	-0.0195
661	1880	3.6	60	-48	-0.0258

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
661	1880	3.8	-30	-53	-0.0282
661	1880	3.8	-20	-28	-0.0146
661	1880	3.8	-10	-37	-0.0196
661	1880	3.8	0	-37	-0.0198
661	1880	3.8	10	-56	-0.0297
661	1880	3.8	20	-42	-0.0225
661	1880	3.8	30	-36	-0.0193
661	1880	3.8	40	-44	-0.0233
661	1880	3.8	50	-32	-0.0170
661	1880	3.8	60	-58	-0.0310

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
661	1880	4.2	-30	-39	-0.0209
661	1880	4.2	-20	-45	-0.0240
661	1880	4.2	-10	-37	-0.0199
661	1880	4.2	0	-30	-0.0160
661	1880	4.2	10	-32	-0.0169
661	1880	4.2	20	-20	-0.0107
661	1880	4.2	30	-45	-0.0237
661	1880	4.2	40	-58	-0.0308
661	1880	4.2	50	-44	-0.0234
661	1880	4.2	60	-40	-0.0210

PCS 1900 Results: channel 810 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
810	1909.8	3.6	-30	-52	-0.0274
810	1909.8	3.6	-20	-33	-0.0173
810	1909.8	3.6	-10	-45	-0.0237
810	1909.8	3.6	0	-54	-0.0283
810	1909.8	3.6	10	-52	-0.0271
810	1909.8	3.6	20	-50	-0.0263
810	1909.8	3.6	30	-25	-0.0129
810	1909.8	3.6	40	-45	-0.0234
810	1909.8	3.6	50	-34	-0.0179
810	1909.8	3.6	60	-52	-0.0270

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
810	1909.8	3.8	-30	-48	-0.0249
810	1909.8	3.8	-20	-59	-0.0307
810	1909.8	3.8	-10	-31	-0.0164
810	1909.8	3.8	0	-41	-0.0213
810	1909.8	3.8	10	-53	-0.0275
810	1909.8	3.8	20	-45	-0.0236
810	1909.8	3.8	30	-32	-0.0167
810	1909.8	3.8	40	-43	-0.0223
810	1909.8	3.8	50	-27	-0.0141
810	1909.8	3.8	60	-35	-0.0185

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
810	1909.8	4.2	-30	-39	-0.0207
810	1909.8	4.2	-20	-55	-0.0286
810	1909.8	4.2	-10	-40	-0.0211
810	1909.8	4.2	0	-31	-0.0164
810	1909.8	4.2	10	-38	-0.0198
810	1909.8	4.2	20	-34	-0.0177
810	1909.8	4.2	30	-51	-0.0267
810	1909.8	4.2	40	-63	-0.0328
810	1909.8	4.2	50	-54	-0.0283
810	1909.8	4.2	60	-37	-0.0195

APPENDIX 4 – RADIATED EMMISIONS TEST DATA

Radiated Emissions Test Data Results

The environmental tests conditions were: Temperature 24^0 C
Pressure 1020 mb
Relative Humidity 22%

Test distance is 3.0 metres

EUT				Rx Antenna		Spectrum Analyzer		Substitution Method Tracking Generator				
Type	Ch	Frequency (MHz)	Band	Type	Pol.	Reading (dBuV)	Max (V,H) (dBuV)	Pol. Tx-Rx	Reading (dBm)	Corrected Reading (relative to Dipole)	Limit (dBm)	Diff. To Limit (dB)
GSM850 Band (ERP) – GSM Mode Handheld Standalone, USB up												
F0	128	824.20	850	Dipole	V	73.4	88.3	V-V	13.30	**29.3**	38.50	-9.2
F0	128	824.20	850	Dipole	H	88.3		H-H	11.46			
F0	195	837.60	850	Dipole	V	73.2	87.5	V-V	13.30	29.3	38.50	-9.2
F0	195	837.60	850	Dipole	H	87.5		H-H	10.74			
F0	251	848.80	850	Dipole	V	73.3	87.4	V-V	12.76	28.7		
F0	251	848.80	850	Dipole	H	87.4		H-H	11.56		38.50	-9.8
GSM850 Band (ERP) – EDGE Mode Handheld Standalone, USB up												
F0	128	824.20	850	Dipole	V	74.71	84.43	V-V	9.98	24.23	38.50	-14.27
F0	128	824.20	850	Dipole	H	84.43		H-H	10.46			
F0	195	837.60	850	Dipole	V	74.59	83.80	V-V	9.72	24.30	38.50	-14.20
F0	195	837.60	850	Dipole	H	83.8		H-H	10.74			
F0	251	848.80	850	Dipole	V	74.90	86.34	V-V	11.00	24.37	38.50	-14.13
F0	251	848.80	850	Dipole	H	86.34		H-H	9.14			

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

Radiated Emissions Test Data Results cont'd

Test distance is 3.0 metres

EUT				Rx Antenna		Spectrum Analyzer		Substitution Method Tracking Generator				
Type	Ch	Frequency (MHz)	Band	Type	Pol.	Reading (dBuV)	Max (V,H) (dBuV)	Pol. Tx-Rx	Reading (dBm)	Corrected Reading (relative to dipole)	Limit (dBm)	Diff to Limit (dB)
GSM850 Band (Harmonics) Handheld Standalone, USB up **Low Channel –** 824.2 MHz												
2nd	128	1648.40	850	Horn	V	56	59.8	V-V	-10.5	-38.6	-13	-25.6
2nd	128	1648.40	850	Horn	H	59.8		H-H	-12.1			
3rd	128	2472.60	850	Horn	V	55.8	55.8	V-V	-4.2	-33.3	-13	**-20.3**
3rd	128	2472.60	850	Horn	H	54.8		H-H	-7.7			
4th	128	3296.80	850	Horn	V	NF	NF	V-V	-	-	-	-
4th	128	3296.80	850	Horn	H	NF		H-H	-			
5th	128	4121.00	850	Horn	V	NF	NF	V-V	-	-	-	-
5th	128	4121.00	850	Horn	H	NF		H-H	-			
6th	128	4945.20	850	Horn	V	41.1	44.9	V-V	-7.6	-36.4	-13	-23.4
6th	128	4945.20	850	Horn	H	44.9		H-H	-6			

The emissions were investigated up to the 10th harmonic.
Emissions above the 6th harmonic were in the noise floor (NF)

Radiated Emissions Test Data Results cont'd

Test distance is 3.0 metres

EUT				Rx Antenna		Spectrum Analyzer		Substitution Method Tracking Generator				
Type	Ch	Frequency (MHz)	Band	Type	Pol.	Reading (dBuV)	Max (V,H) (dBuV)	Pol. Tx-Rx	Reading (dBm)	Corrected Reading (relative to dipole)	Limit (dBm)	Diff to Limit (dB)
GSM850 Band (Harmonics) Handheld Standalone, USB up **Mid Channel –**837.60 MHz												
2nd	128	1648.40	850	Horn	V	52.7	57.4	V-V	-16.9	-42.1	-13	-29.1
2nd	128	1648.40	850	Horn	H	57.4		H-H	-13.8			
3rd	128	2472.60	850	Horn	V	53.8	53.8	V-V	-6.1	-35.3	-13	-22.3
3rd	128	2472.60	850	Horn	H	51.8		H-H	-7.4			
4th	128	3296.80	850	Horn	V	NF	NF	V-V	-	-	-	-
4th	128	3296.80	850	Horn	H	NF		H-H	-			
5th	128	4121.00	850	Horn	V	NF	NF	V-V	-	-	-	-
5th	128	4121.00	850	Horn	H	NF		H-H	-			
6th	128	4945.20	850	Horn	V	39.2	44.0	V-V	-8.2	-38.1	-13	-25.1
6th	128	4945.20	850	Horn	H	44.0		H-H	-7.6			

The emissions were investigated up to the 10th harmonic.
Emissions above the 6th harmonic were in the noise floor (NF)

Radiated Emissions Test Data Results cont'd

Test distance is 3.0 metres

EUT				Rx Antenna		Spectrum Analyzer		Substitution Method Tracking Generator				
Type	Ch	Frequency (MHz)	Band	Type	Pol.	Reading (dBuV)	Max (V,H) (dBuV)	Pol. Tx-Rx	Reading (dBm)	Corrected Reading (relative to dipole)	Limit (dBm)	Diff to Limit (dB)
GSM850 Band (Harmonics) Handheld Standalone, USB up **High Channel –** 848.8 MHz												
2nd	128	1648.40	850	Horn	V	52.9	55.1	V-V	-17.0	-44.8	-13	-31.8
2nd	128	1648.40	850	Horn	H	55.1		H-H	-16.5			
3rd	128	2472.60	850	Horn	V	50.2	50.2	V-V	-9.6	-38.5	-13	-25.5
3rd	128	2472.60	850	Horn	H	49.8		H-H	-10.9			
4th	128	3296.80	850	Horn	V	NF	NF	V-V	-	-	-	-
4th	128	3296.80	850	Horn	H	NF		H-H	-			
5th	128	4121.00	850	Horn	V	NF	NF	V-V	-	-	-	-
5th	128	4121.00	850	Horn	H	NF		H-H	-			
6th	128	4945.20	850	Horn	V	42.4	42.4	V-V	-9.8	-39.8	-13	-26.8
6th	128	4945.20	850	Horn	H	NF		H-H	-9.3			

The emissions were investigated up to the 10th harmonic.
Emissions above the 6th harmonic were in the noise floor (NF)

Radiated Emissions Test Data Results cont'd

Test distance is 3.0 metres

EUT				Rx Antenna		Spectrum Analyzer		Substitution Method Tracking Generator				
Type	Ch	Frequency (MHz)	Band	Type	Pol.	Reading (dBuV)	Max (V,H) (dBuV)	Pol. Tx-Rx	Reading (dBm)	Corrected Reading (relative to dipole)	Limit (dBm)	Diff to Limit (dB)
GSM BAND **RF Local Oscillator (LO_1)** Handheld Standalone, USB up **Low Channel (824.2 MHz)**												
F0	128	3296.8	850	Horn	V	NF	N/A	V-V	N/A	N/A	-	N/A
F0	128	3296.8	850	Horn	H	NF						
Emissions were in the NF.												
High Channel (848.8 MHz)												
F0	251	3395.2	850	Horn	V	NF	N/A	V-V	N/A	N/A	-	N/A
F0	251	3395.2	850	Horn	H	NF						
Emissions were in the NF.												
RF LO_2 **Low Channel (824.2 MHz)**												
F0	128	3476.80	850	Horn	V	NF	N/A	V-V	N/A	N/A	-	N/A
F0	128	3476.80	850	Horn	H	NF						
Emissions were in the NF.												
High Channel (848.8 MHz)												
F0	251	3575.20	850	Horn	V	NF	N/A	V-V	N/A	N/A	-	N/A
F0	251	3575.20	850	Horn	H	NF						
Emissions 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 (EIRP) – GSM Mode												
Handheld Standalone, USB down												
F0	512	1850.20	1900	Horn	V	86.8	89.8	V-V	-10.5	26.2	33	-6.8
F0	512	1850.20	1900	Horn	H	89.8		H-H	-9.2			
F0	661	1880.00	1900	Horn	V	86.3	89.8	V-V	-9.5	26.8	33	-6.2
F0	661	1880.00	1900	Horn	H	89.8		H-H	-8.6			
F0	810	1909.80	1900	Horn	V	87.0	88.9	V-V	-8.8	**27.2**	33	-5.8
F0	810	1909.80	1900	Horn	H	88.9		H-H	-8.2			
PCS BAND (EIRP) – EDGE Mode												
Handheld Standalone, USB down												
F0	512	1850.20	1900	Horn	V	87.69	88.56	V-V	-11.8	24.48	33	-8.52
F0	512	1850.20	1900	Horn	H	88.56		H-H	-10.22			
F0	661	1880.00	1900	Horn	V	85.72	87.99	V-V	-10.42	25.02	33	-7.98
F0	661	1880.00	1900	Horn	H	87.99		H-H	-9.48			
F0	810	1909.80	1900	Horn	V	85.38	87.84	V-V	-10.84	24.12	33	-8.88
F0	810	1909.80	1900	Horn	H	87.84		H-H	-10.08			

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

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	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) Handheld Standalone, Horizontal **Low Channel** 1850.20 MHz												
2nd	512	3700.40	1900	Horn	V	41.7	41.7	V-V	-16.6	-42.6	-13	**-29.6**
2nd	512	3700.40	1900	Horn	H	40.9		H-H	-14.5			
3rd	512	5550.60	1900	Horn	V	NF	NF	V-V	-	-	-	-
3rd	512	5550.60	1900	Horn	H	NF		H-H	-			
The emissions were investigated up to the 10th harmonic. Emissions above the 2nd harmonic were in the NF **Middle Channel** 1880.00 MHz												
2nd	661	3760.00	1900	Horn	V	NF	38.7	V-V	-20	-48	-13	-35.0
2nd	661	3760.00	1900	Horn	H	38.7		H-H	-20			
3rd	661	5640.00	1900	Horn	V	NF	NF	V-V	-	-	-	-
3rd	661	5640.00	1900	Horn	H	NF		H-H	-			
The emissions were investigated up to the 10th harmonic. Emissions above the 2nd harmonic were in the NF **High Channel** 1909.8 MHz												
2nd	810	3819.60	1900	Horn	V	NF	38.6	V-V	-20	-48.1	-13	-35.1
2nd	810	3819.60	1900	Horn	H	38.6		H-H	-20			
3rd	810	5729.40	1900	Horn	V	NF	NF	V-V	-	-	-	-
3rd	810	5729.40	1900	Horn	H	NF		H-H	-			
The emissions were investigated up to the 10th harmonic. Emissions above the 2nd harmonic were in the NF												

Radiated Emissions Test Results cont'd
PCS Band

Test Distance was 3.0 metres.
The measurements were performed in transmit mode with the handheld in standalone position.

EUT				Rx Antenna		Spectrum Analyzer			Substitution Method Tracking Generator				
Type	Ch	Frequency (MHz)	Band	Type	Pol.	Reading (dBuV)	Corrected Reading (dBuV)	Max (V,H) (dBuV)	Pol. Tx-Rx	Reading (dBm)	Corrected Reading (relative to Isotropic Radiator) (dBm)	Limit (dBm)	Diff to Limit (dB)
RF LO_1 . Handheld Standalone, Horizontal													
Low Channel													
F0	512	3700.4	1900	Horn	V	NF	NF	N/A	V-V	N/A	N/A	-	N/A
F0	512	3700.4	1900	Horn	H	NF							
Emissions were in the NF.													
High Channel													
F0	810	3819.6	1900	Horn	V	NF	NF	N/A	V-V	N/A	N/A	-	N/A
F0	810	3819.6	1900	Horn	H	NF							
Emissions were in the NF.													
RF LO_2 **Low Channel**													
F0	512	3860.4	1900	Horn	V	NF	NF	N/A	V-V	N/A	N/A	-	N/A
F0	512	3860.4	1900	Horn	H	NF							
Emissions were in the NF.													
High Channel													
F0	810	3979.6	1900	Horn	V	NF	NF	N/A	V-V	N/A	N/A	-	N/A
F0	810	3979.6	1900	Horn	H	NF							
Emissions were in the NF.													