EMI Test Report

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

A division of Research In Motion Limited

REPORT NO: RTS-2582-0911-32

PRODUCT MODEL NO: RCT41GW
TYPE NAME: BlackBerry® smartphone
FCC ID: L6ARCT40GW
IC: 2503A-RCT40GW
EMISSION DESIGNATOR (GSM): 247KGXW
EMISSION DESIGNATOR (EDGE): 245KG7W

DATE: 16 December, 2009

Statement of Performance:

The BlackBerry® smartphone, model RCT41GW, part number CER-27173-001 Rev. 1 and accessories performs within the requirements of the test standards when configured and operated under RIM's operation instructions.

Declaration:

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

Documented by:

Michael Cino
Regulatory Compliance Associate
Date: 16 December, 2009

Reviewed by:

Kevin Rose
Regulatory Compliance Specialist
Date: 16 December, 2009

Reviewed and Approved by:

Masud S. Attayi, P.Eng.
Manager, Regulatory Compliance
Date:16 December, 2009

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, 2008
- FCC CFR 47 Part 22, Subpart H, Cellular Radiotelephone Services, Oct. 1, 2008
- FCC CFR 47 Part 24 Subpart E, Broadband PCS, Oct 1. 2008

B. Associated Documents

None

C. Product Identification

Manufactured by Research In Motion Limited whose headquarters is located at:

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

The equipment under test (EUT) was tested at the following locations:

RIM Testing Services EMI test facilities

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

440 Phillip Street
Waterloo, Ontario,
Canada , N2L 5R9
Phone: 519 888 7465
Fax: 519 888 6906

The testing was performed from November 16 to 26, 2009.

The sample EUT included:

SAMPLE	MODEL	CER NUMBER	PIN
1	RCT41GW	CER-27173-001 Rev. 1	2151BFF8
2	RCT41GW	CER-27173-001 Rev. 1	2151BFF7
3	RCT41GW	CER-27173-001 Rev. 1	2151BEF0
4	RCT41GW	CER-27173-001 Rev. 1	2151BF6E

Conducted RF measurements were performed on samples 1 and 2.
Radiated Emission measurements were performed on samples 3 and 4.

D. Support Equipment Used for the Testing of the EUT

No support equipment required; for list of equipment refer to section G, Compliance Test Equipment Used.

E. Test Voltage

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

F. Summary of Results

SPECIFICATION	TEST TYPE	RESULT	TEST DATA APPENDIX
FCC CFR 47			
Part 2.1051 Part 22.917 Part 22.901(d)	Conducted Spurious Emissions	Pass	1
Part 2.1051 Part 24.238(a)	Conducted Spurious Emissions	Pass	1
Part 2.202 Part 22.917	Occupied Bandwidth and Channel Mask	Pass	1
Part 2.202 Part 24.238	Occupied Bandwidth and Channel Mask	Pass	1
Part 2.1046(a)	Conducted RF Output Power	Pass	2
Part 2.1055(a)(d) Part 22.917	Frequency Stability vs. Temperature and Voltage	Pass	3
Part 2.1055(a)(d) Part 24.235	Frequency Stability vs. Temperature and Voltage	Pass	3
Part 22, Subpart H	Radiated Spurious/Harmonic Emissions, ERP	Pass	4
Part 24, Subpart E	Radiated Spurious/Harmonic Emissions, EIRP	Pass	4

1) The BlackBerry® smartphone met the requirements of the Tx Conducted Spurious Emissions requirements in the GSM850 as per 47 CFR 2.1051, CFR 22.917, and CFR 22.901(d). 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 BlackBerry® smartphone met the requirements of the Tx Conducted Spurious Emissions requirements in the PCS1900 as per 47 CFR 2.1051 and CFR 24.238(a). The EUT was 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 BlackBerry® smartphone met the requirements of the Occupied Bandwidth and channel mask requirements in the GSM850 as per 47 CFR 2.202 and CFR 22.917. The EUT was measured in GSM and EDGE mode on the low, middle and high channels.
See APPENDIX 1 for test data.

4) The BlackBerry® smartphone met the requirements of the Occupied Bandwidth and channel mask requirements in the PCS1900 as per 47 CFR 2.202 and CFR 24.238. The EUT was measured in GSM and EDGE mode on the low, middle and high channels.
See APPENDIX 1 for test data.

5) The BlackBerry® smartphone met the requirements of the Conducted RF Output Power requirements for the GSM850 and PCS1900 as per 47 CFR 2.1046(a). The EUT was measured in GSM and EDGE mode on the low, middle and high channels.
See APPENDIX 2 for the test data.

6) The BlackBerry® smartphone met the requirements of the Frequency Stability vs. Temperature and Voltage requirements for GSM850 as per 47 CFR 2.1055(a), 2.1055(d) and CFR 22.917. 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 (3.7 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 BlackBerry® smartphone met the requirements of the Frequency Stability vs. Temperature and Voltage requirements for the PCS1900 as per 47 CFR 2.1055(a), 2.1055(d) and 24.235. 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 (3.7 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 GSM850 and PCS1900 bands. The results are within the limits. The BlackBerry® smartphone was placed on a nonconductive styrofoam table, 100 cm high that was positioned on a remotely controlled turntable. The test distance used between the BlackBerry® smartphone 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. Both the horizontal and vertical polarizations of the emissions were measured. The maximum emissions level was recorded. The BlackBerry® smartphone was then substituted with an antenna placed in the same location as the BlackBerry® smartphone. A Dipole antenna was used for the ERP measurements and a Horn antenna was used for EIRP measurements. 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 BlackBerry® smartphone output reading. The signal generator output was recorded. Both the horizontal and vertical polarizations of the emissions were measured.

The measurements were done in a semi-anechoic chamber (SAC) below 1 GHz and a fully-anechoic room (FAR) above 1 GHz. The SAC's FCC registration number is **778487** and the Industry Canada (IC) file number is **2503B-1**. The FAR's FCC registration number is **959115** and the IC file number is **2503C-1**. The BlackBerry® smartphone was measured on the low, middle and high channels.

The ERP in the 850 band, GSM mode was measured on BlackBerry® smartphone. The highest ERP measured was 28.37 dBm (0.69 W) at 837.60 MHz (channel 195).

The ERP in the 850 band, EDGE mode was measured on BlackBerry® smartphone. The highest ERP measured was 24.44 dBm (0.28 W) at 837.60 MHz (channel 195).

The EIRP in the PCS band, GSM mode was measured on BlackBerry® smartphone. The highest ERP measured was 29.69 dBm (0.93 W) at 1909.80 MHz (channel 810).

The EIRP in the PCS band, EDGE mode was measured on BlackBerry® smartphone. The highest ERP measured was 25.99 dBm (0.40 W) at 1909.80 MHz (channel 810).

The radiated spurious emission and carrier harmonics were measured up to the 10th harmonic for low, middle and high channels in the GSM850 and PCS1900 bands. Each band was measured in GSM and EDGE mode. Both the horizontal and vertical polarizations were measured.

The worst case harmonic emissions measured in the GSM850 band for GSM and EDGE modes had a test margin of 10.93 dB at 803.750 MHz.

All harmonic emissions measured in the PCS1900 band for GSM and EDGE modes had a test margin greater than 25.0 dB.

Co-Location Measurements

The radiated emissions were measured up to 18 GHz for middle channels for simultaneous transmission in the following test configuration combinations: GSM850/Bluetooth and PCS1900/Bluetooth. Both the horizontal and vertical polarizations were measured. The emissions due to different simultaneous transmission did not increase the amplitude of any emissions nor did it produce any new inter-modulation products as a result of mixing.

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 ±4.6 dB

G. Compliance Test Equipment Used

UNIT	MANUFACTURER	MODEL	SERIAL NUMBER	CAL DUE DATE (YY MM DD)	USE
Preamplifier	Sonoma	310N/11909A	185831	10-11-14	Radiated Emissions
Preamplifier system	TDK RF Solutions	PA-02	080010	10-11-06	Radiated Emissions
Preamplifier	Rohde & Schwarz	TS-ANA4-SP	001	10-05-08	Radiated Emissions
Preamplifier	Rohde & Schwarz	TS-ANA-SP	001	10-03-13	Radiated Emissions
Hybrid Log Antenna	EMC Automation	HLP-3003C	017301	11-02-02	Radiated Emissions
Hybrid Log Antenna	EMC Automation	HLP-3003C	017401	10-09-26	Radiated Emissions
Horn Antenna	EMC Automation	HRN-0118	030101	10-07-22	Radiated Emissions
Horn Antenna	EMC Automation	HRN-0118	030201	11-03-12	Radiated Emissions
Horn Antenna	Emco	3117	47563	11-07-15	Radiated Emissions
Horn Antenna	CMT	LHA 0180	R52734-001	09-12-17	Radiated Emissions
Preamplifier	TDK RF Solutions	18-26	030002	10-11-06	Radiated Emissions
Dipole Antenna	Schwarzbeck	UHAP	1018	11-03-12	Radiated Emissions
Dipole Antenna	Schwarzbeck	UHAP	974	10-10-16	Radiated Emissions
Universal Radio Communication Tester	Rohde & Schwarz	CMU 200	837493/073	10-11-30	Radiated Emissions
Universal Radio Communication Tester	Rohde & Schwarz	CMU 200	112394	10-11-30	Radiated Emissions
Universal Radio Communication Tester	Rohde & Schwarz	CMU 200	102204	09-12-10	RF Conducted Emissions
EMI Receiver	Rohde & Schwarz	ESIB-40	100255	10-11-30	Radiated Emissions
EMI Receiver	Rohde & Schwarz	ESU-40	100162	10-11-29	Radiated Emissions
Spectrum Analyzer	HP	8563E	3745A08112	11-09-30	RF Conducted Emissions
DC Power Supply	HP	6632B	US37472178	10-06-23	RF Conducted Emissions
Environment Monitor	Control Company	1870	230355190	10-01-30	Radiated Emissions

Compliance Test Equipment Used cont'd

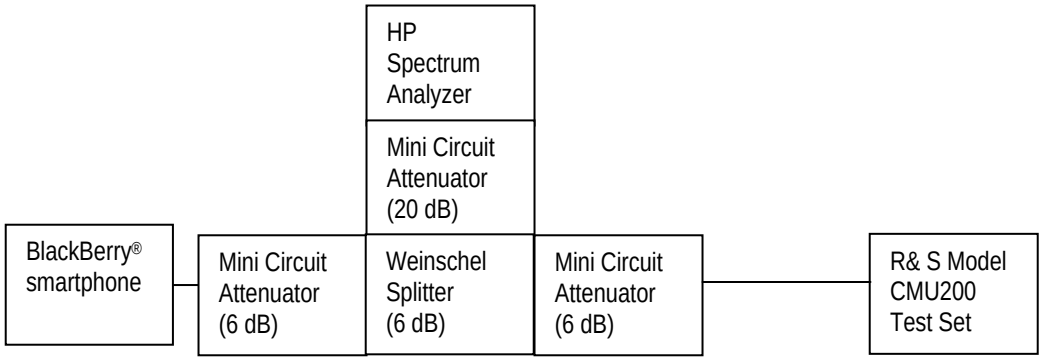
UNIT	MANUFACTURER	MODEL	SERIAL NUMBER	CAL DUE DATE (YY MM DD)	USE
Environment Monitor	Control Company	1870	230355189	10-01-30	RF Conducted Emissions
Environment Monitor	Control Company	1870	80117164	10-01-08	Radiated Emissions
Temperature Probe	Control Company	15-077-21	51129471	10-05-01	Frequency Stability
Environmental Chamber	ESPEC Corp.	SH-240S1	91007118	N/R	Frequency Stability
Signal Generator	Agilent	E8257D	MY45140527	11-11-05	Radiated Emissions
Signal Generator	Agilent	83630B	3844A00927	10-10-31	Radiated Emissions

APPENDIX 1 CONDUCTED RF EMISSIONS TEST DATA/PLOTS

GSM Conducted RF Emission Test Data

This appendix contains measurement data pertaining to conducted spurious emissions, –26 dBc bandwidth, 99% power bandwidth and the channel mask on BlackBerry® smartphone PIN 2151BFF8.

Test Setup Diagram



The environmental test conditions were:
Temperature: 24 ºC
Pressure: 1023 mb
Relative Humidity: 22 %

The measurements were performed by Maurice Battler.
Date of test: November 17, 2009

GSM Conducted RF Emission Test Data cont'd

The conducted spurious emissions – As per 47 CFR 2.1051, CFR 24.238(a) and CFR 22 Subpart H were measured from 10 MHz to 20 GHz. The EUT emissions were in the noise floor.
See figures 1-1a to 1-12a 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 band was measured to be 273 kHz, and for the PCS1900 band was measured to be 280 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 850 band and 1900 band selected Frequencies in GSM mode.

850 band Frequency (MHz)	-26dBc Bandwidth (kHz)	99% Occupied Bandwidth (kHz)
824.2	275	245.0
837.6	280	245.0
848.8	278	246.7

1900 band Frequency (MHz)	-26dBc Bandwidth (kHz)	99% Occupied Bandwidth (kHz)
1850.2	275	246.7
1880.0	275	243.3
1909.8	272	245.0

Measurement Plots for 850 and 1900 in GSM mode
Refer to the following measurement plots for more detail.
See Figures 1-13a to 1-24a for the plots of the –26dBc Bandwidth and 99% Occupied Bandwidth.
See Figures 1-25a to 1-28a for plots of the channel mask results.

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

GSM Conducted RF Emission Test Data cont'd

Test Data for 850 and 1900 bands selected Frequencies in EDGE mode.

850 band Frequency (MHz)	99% Occupied Bandwidth (kHz)
824.2	245.0
837.6	245.0
848.8	245.0

1900 band Frequency (MHz)	99% Occupied Bandwidth (kHz)
1850.2	241.7
1880.0	243.3
1909.8	243.3

Measurement Plots for 850 and 1900 bands in EDGE mode
Refer to the following measurement plots for more detail.

See Figures 1-29a to 1-34a for the plots of the 99% Occupied Bandwidth.

See Figures 1-35a to 1-38a for plots of the channel mask results.

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

Date of Test: November 17, 2009

GSM Conducted RF Emission Test Data cont'd

Figure 1-1a: GSM850 band, Spurious Conducted Emissions, Low channel

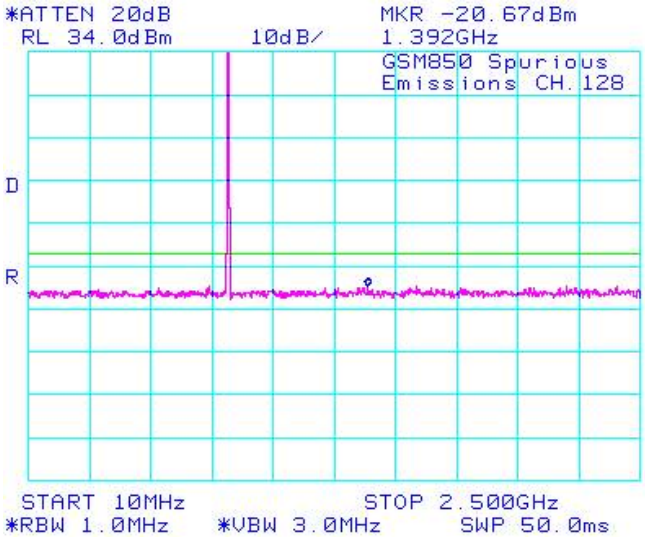


Figure 1-2a: GSM850 band, Spurious Conducted Emissions, Low channel

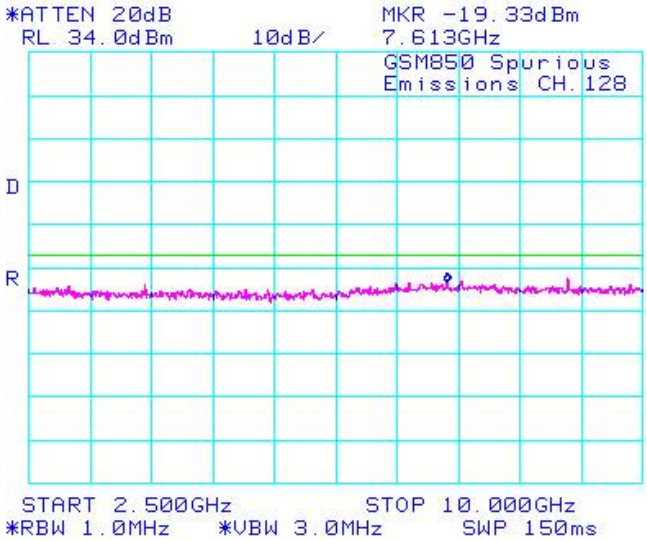


Figure 1-3a: GSM850 band, Spurious Conducted Emissions, Middle Channel

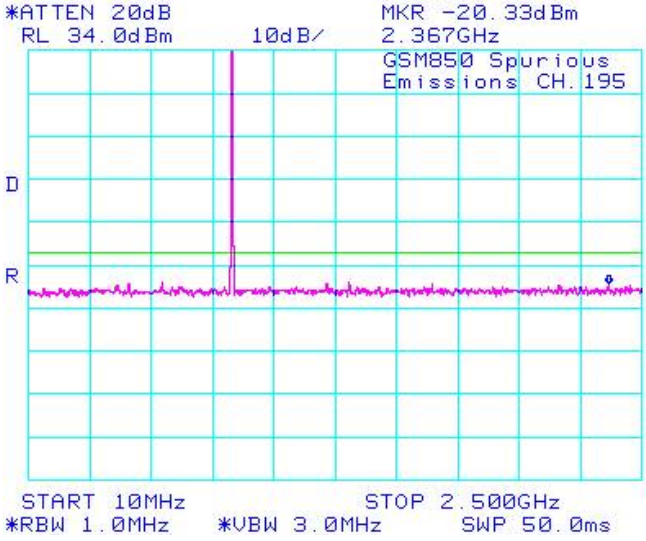
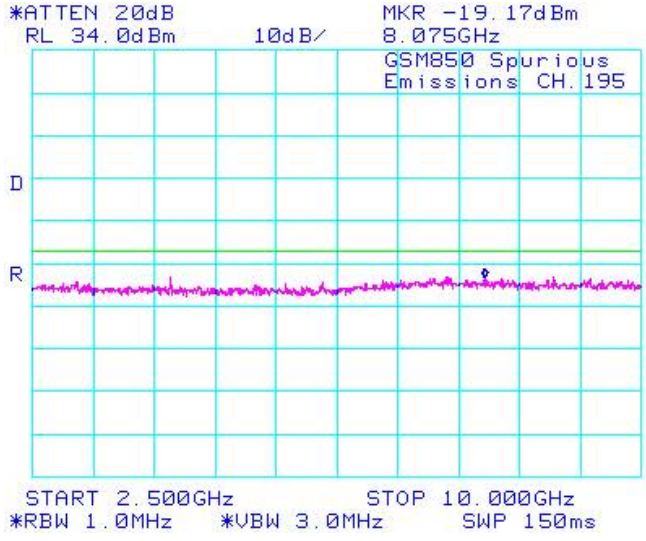


Figure 1-4a: GSM850 band, Spurious Conducted Emissions, Middle Channel



GSM Conducted RF Emission Test Data cont'd

Figure 1-5a: GSM850 band, Spurious Conducted Emissions, High Channel

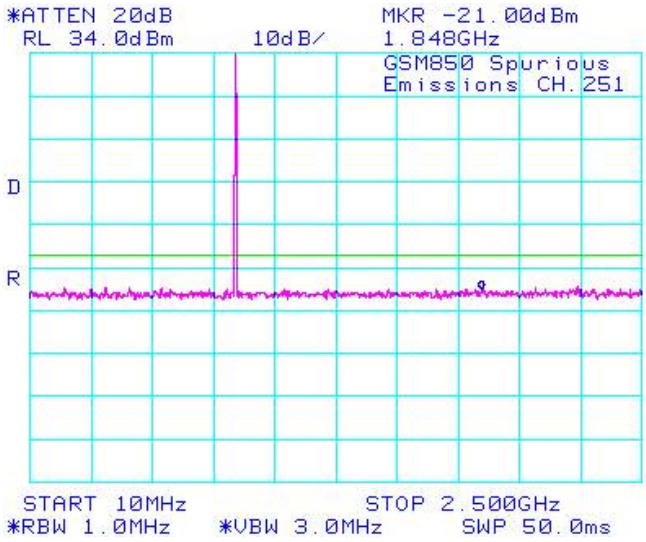


Figure 1-6a: GSM850 band, Spurious Conducted Emissions, High Channel

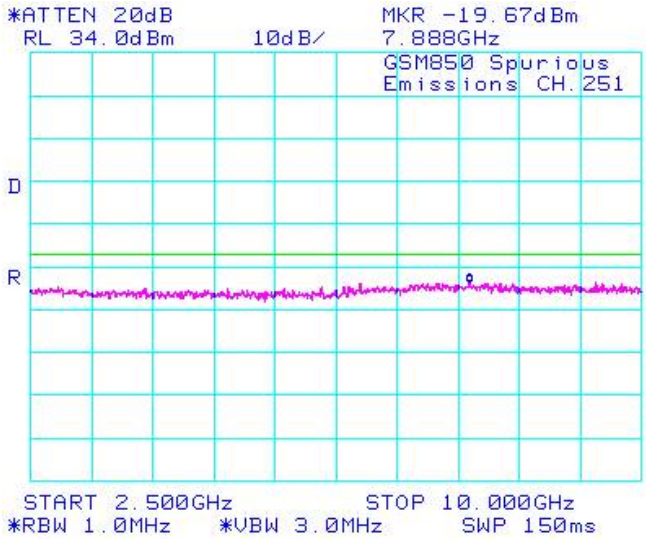


Figure 1-7a: PCS1900 band, Spurious Conducted Emissions, Low Channel

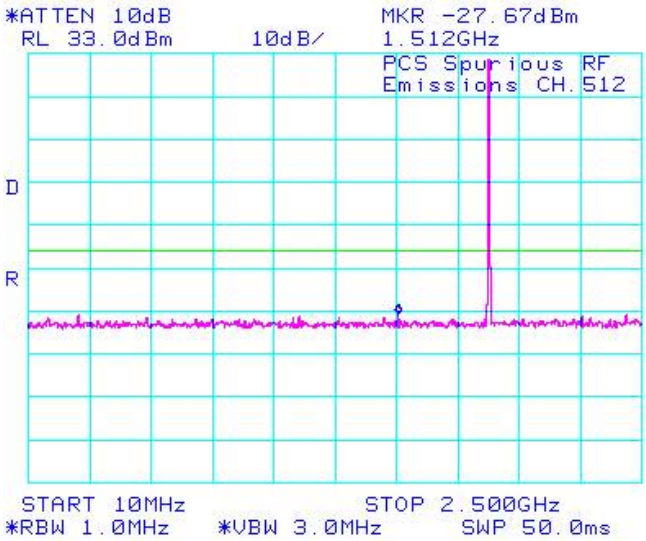
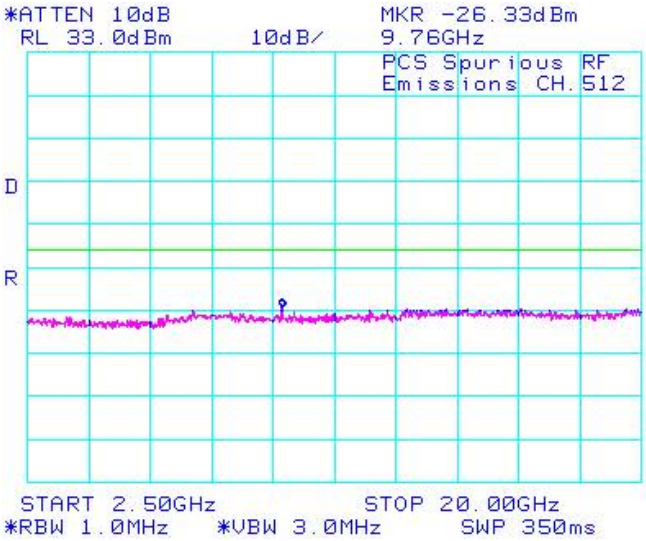


Figure 1-8a: PCS1900 band, Spurious Conducted Emissions, Low Channel



GSM Conducted RF Emission Test Data cont'd

Figure 1-9a: PCS1900 band, Spurious Conducted Emissions, Middle Channel

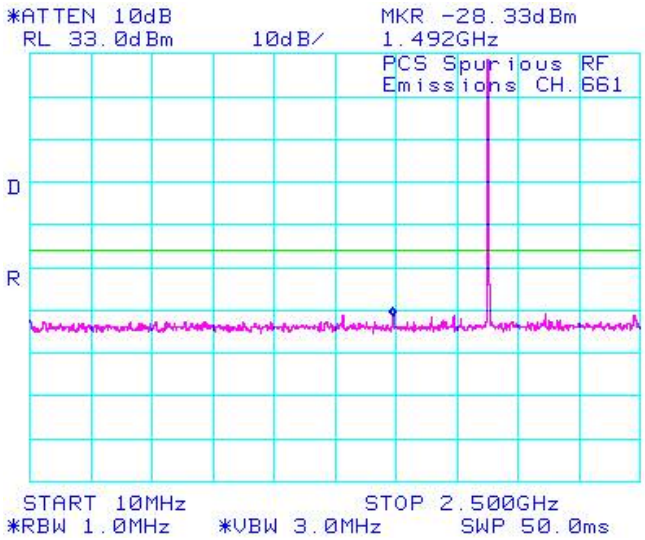


Figure 1-10a: PCS1900 band, Spurious Conducted Emissions, Middle Channel

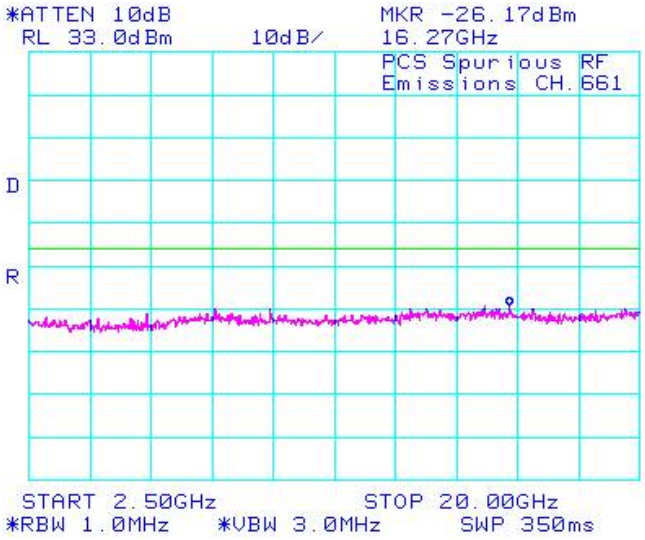


Figure 1-11a: PCS1900 band, Spurious Conducted Emissions, High Channel

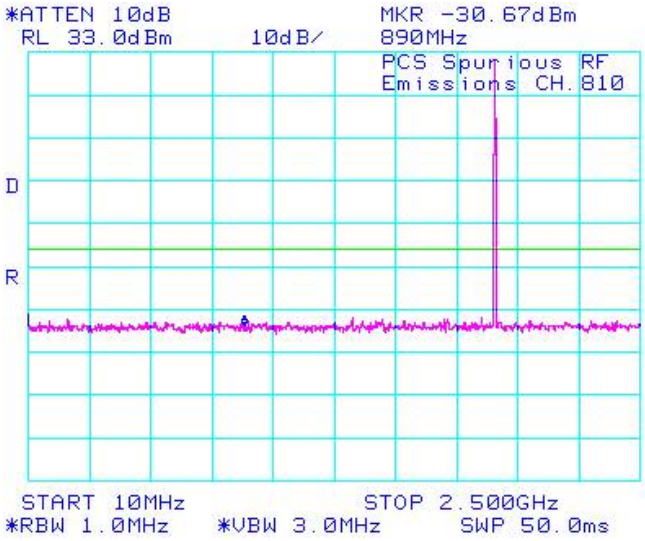
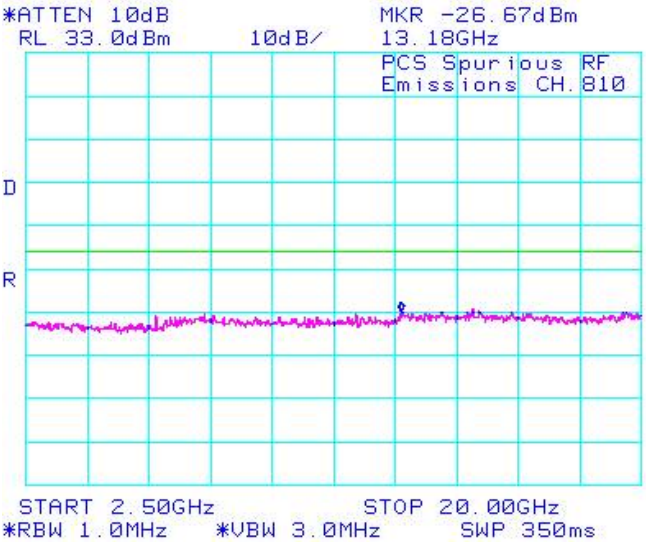


Figure 1-12a: PCS1900 band, Spurious Conducted Emissions, High Channel



GSM Conducted RF Emission Test Data cont'd

Figure 1-13a: -26dBc bandwidth, GSM850 band Low Channel in GSM mode

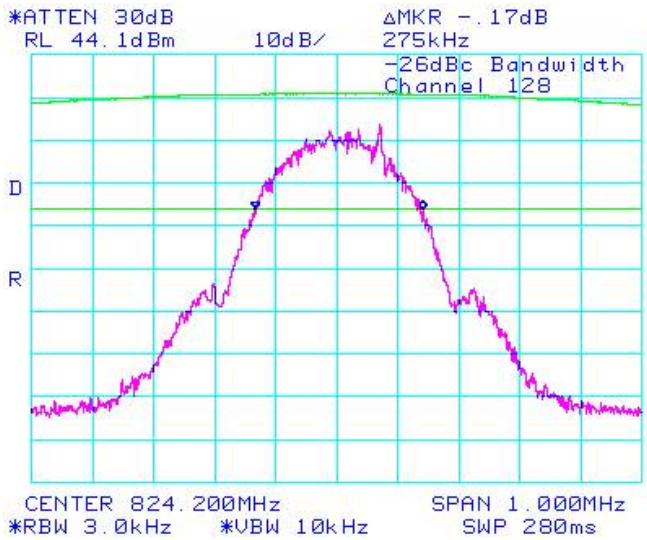


Figure 1-14a: Occupied Bandwidth, GSM850 band Low Channel in GSM mode

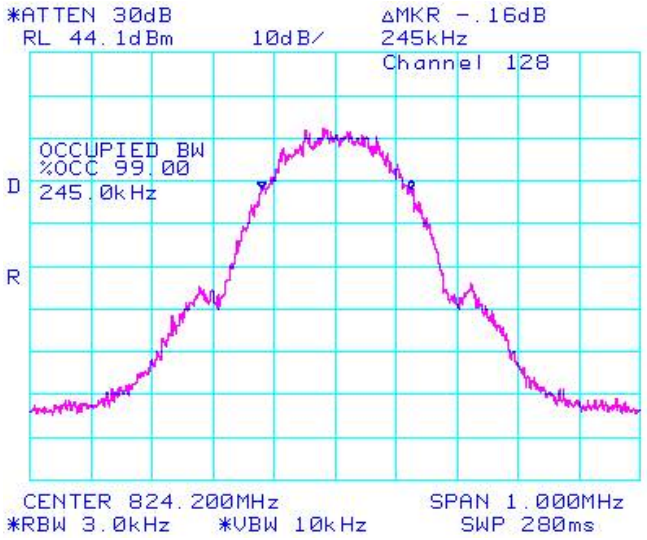


Figure 1-15a: -26dBc bandwidth, GSM850 band Middle Channel in GSM mode

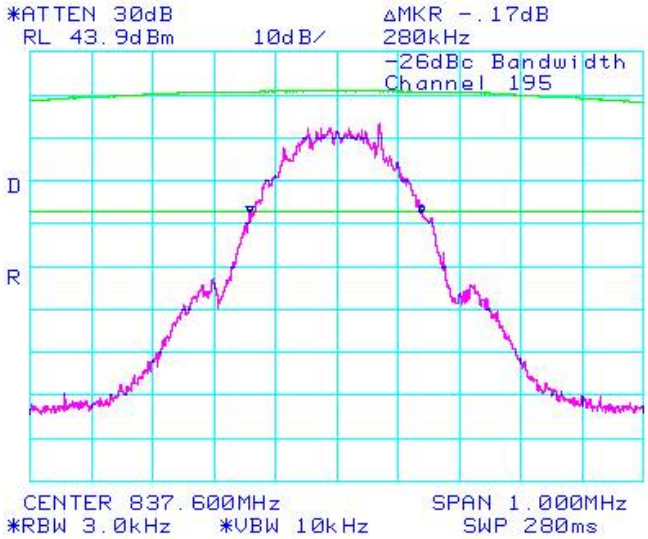
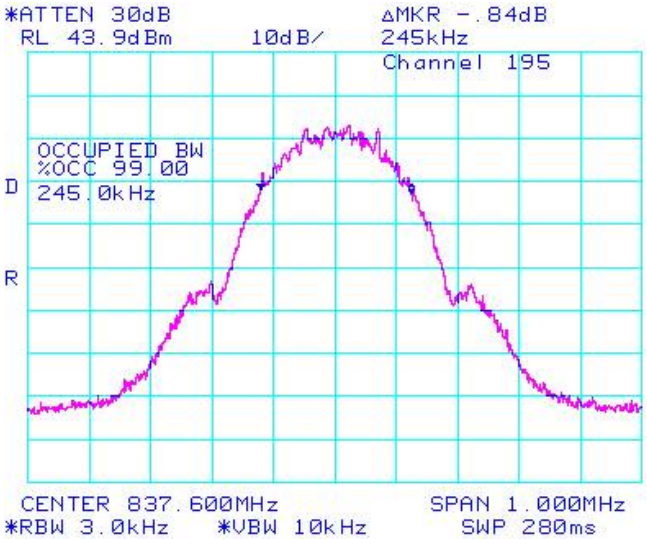


Figure 1-16a: Occupied Bandwidth, GSM850 band Middle Channel in GSM mode



GSM Conducted RF Emission Test Data cont'd

Figure 1-17a: -26dBc bandwidth, GSM850 band High Channel in GSM mode

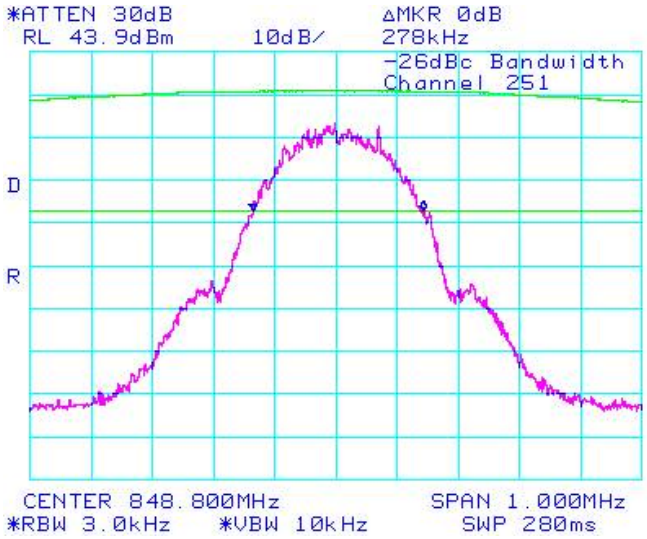


Figure 1-18a: Occupied Bandwidth, GSM850 band High Channel in GSM mode

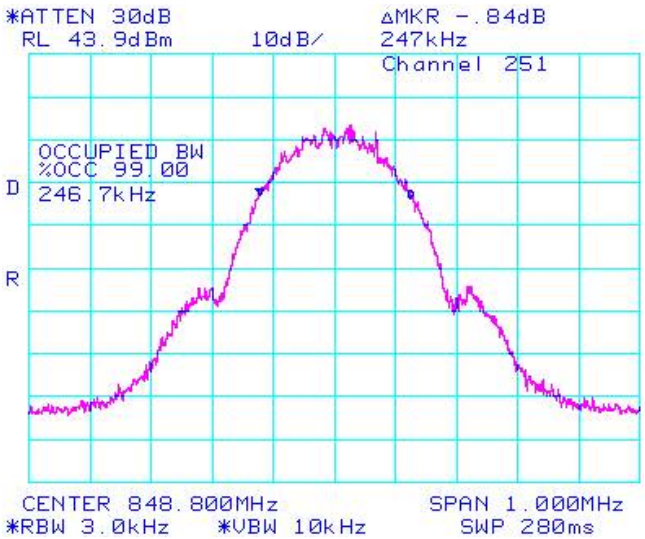


Figure 1-19a: -26dBc bandwidth, PCS1900 Low Channel in GSM mode

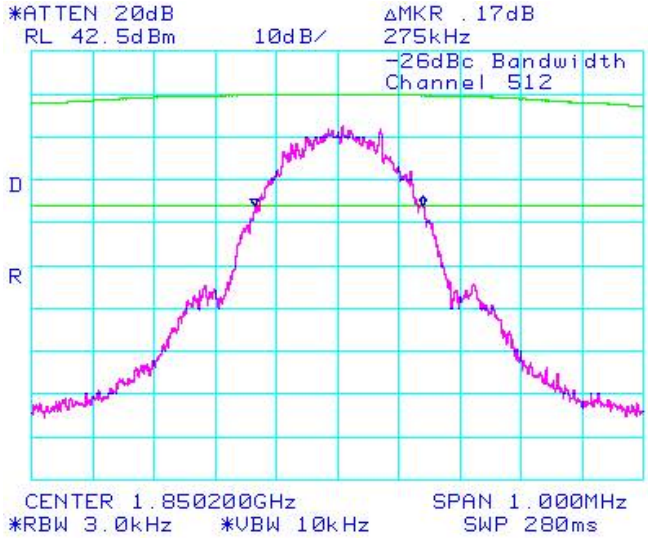
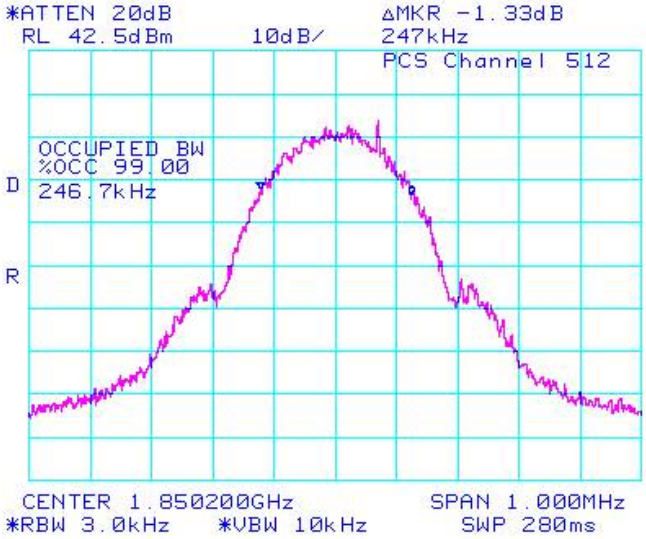


Figure 1-20a: Occupied Bandwidth, PCS1900 Low Channel in GSM mode



GSM Conducted RF Emission Test Data cont'd

Figure 1-21a: -26dBc bandwidth, PCS1900 Middle Channel in GSM mode

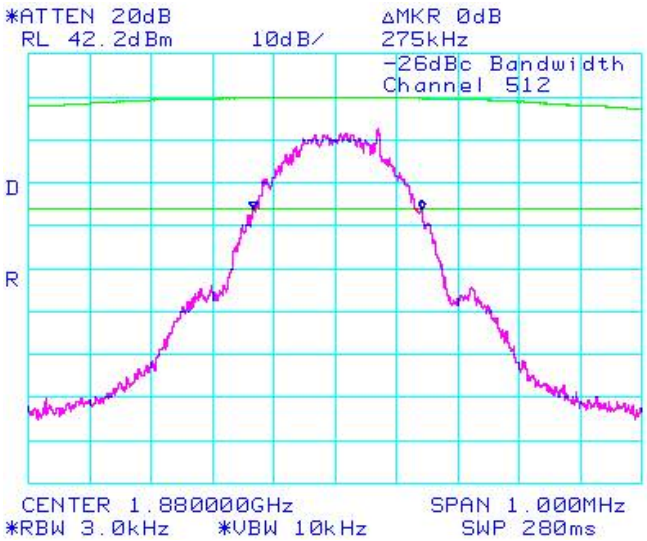


Figure 1-22a: Occupied Bandwidth, PCS1900 Middle Channel in GSM mode

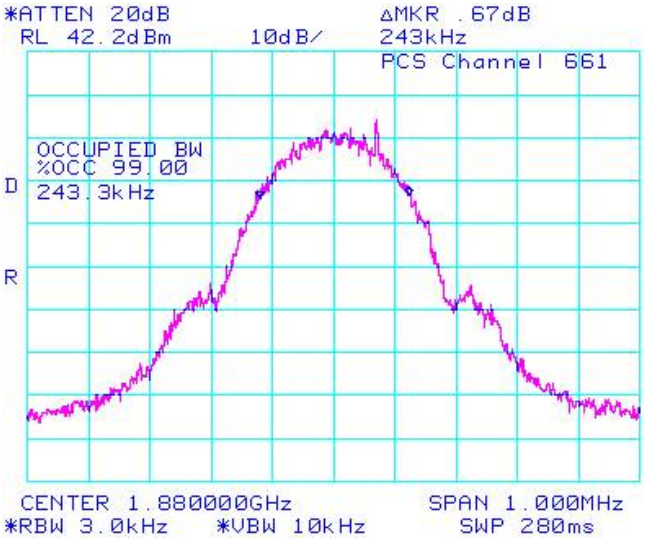


Figure 1-23a: -26dBc bandwidth, PCS1900 High Channel in GSM mode

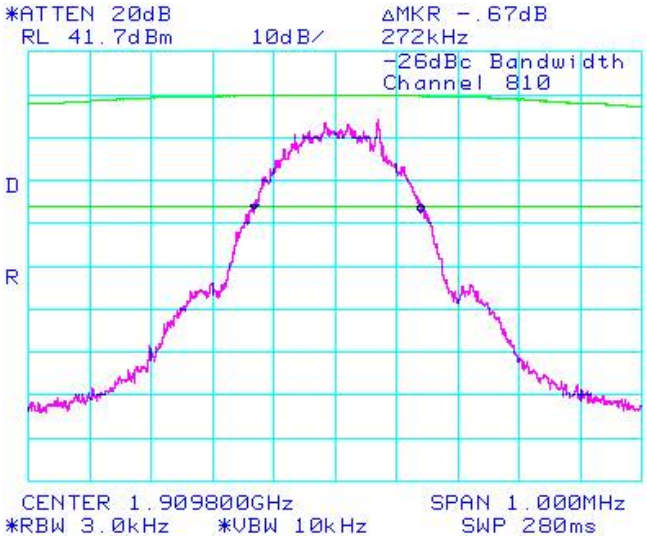
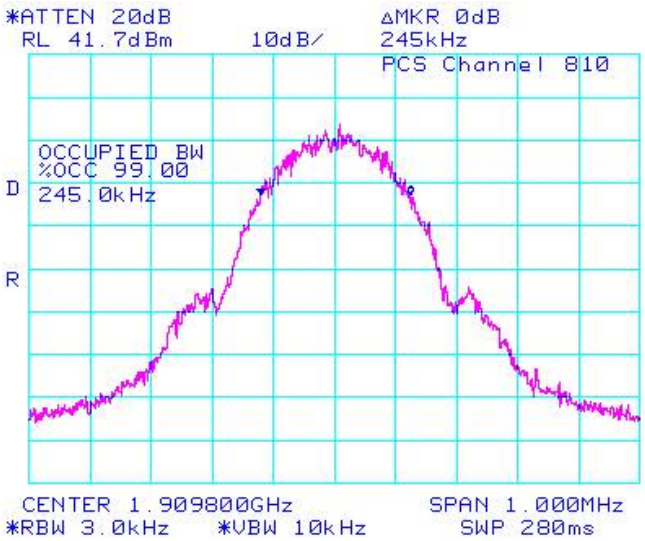


Figure 1-24a: Occupied Bandwidth, PCS1900 High Channel in GSM mode



GSM Conducted RF Emission Test Data cont'd

Figure 1-25a: GSM850 band, Low Channel Mask in GSM mode

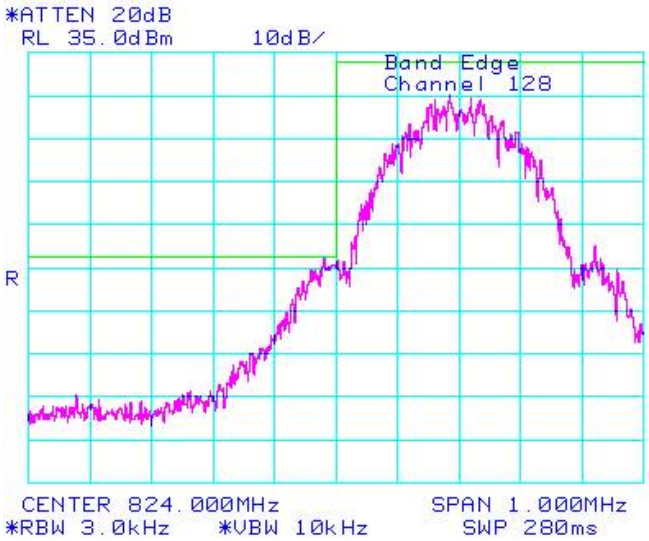


Figure 1-26a: GSM850 band High Channel Mask in GSM mode

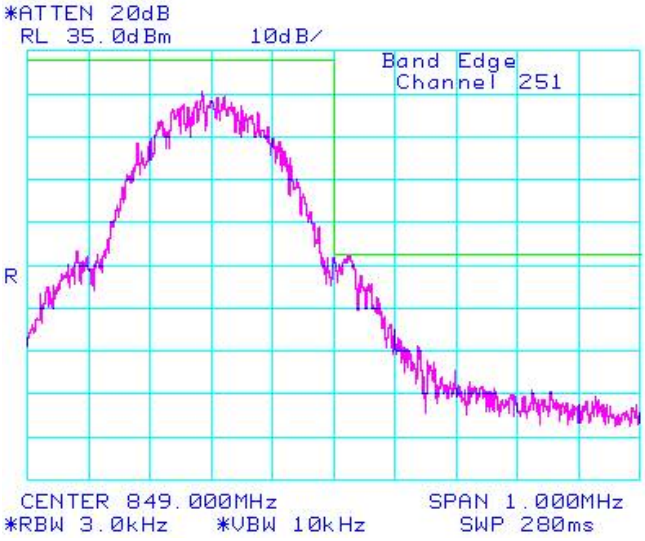


Figure 1-27a: PCS1900, Low Channel Mask in GSM mode

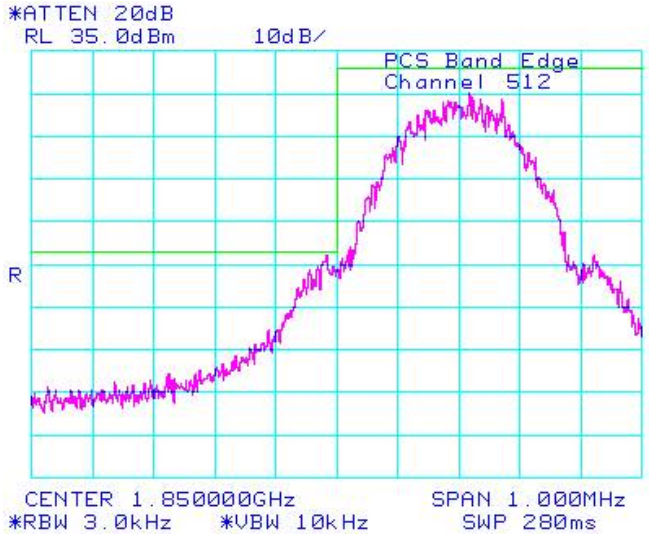
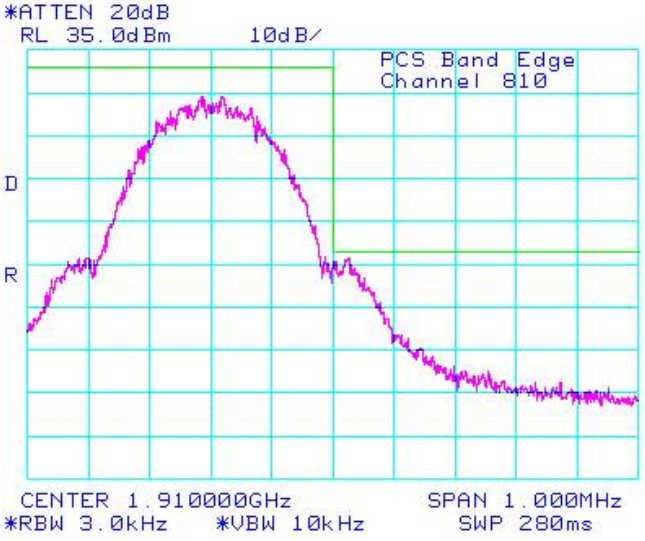


Figure 1-28a: PCS1900, High Channel Mask in GSM mode



GSM Conducted RF Emission Test Data cont'd

Figure 1-29a: Occupied Bandwidth, GSM850 Band, Low Channel in EDGE mode

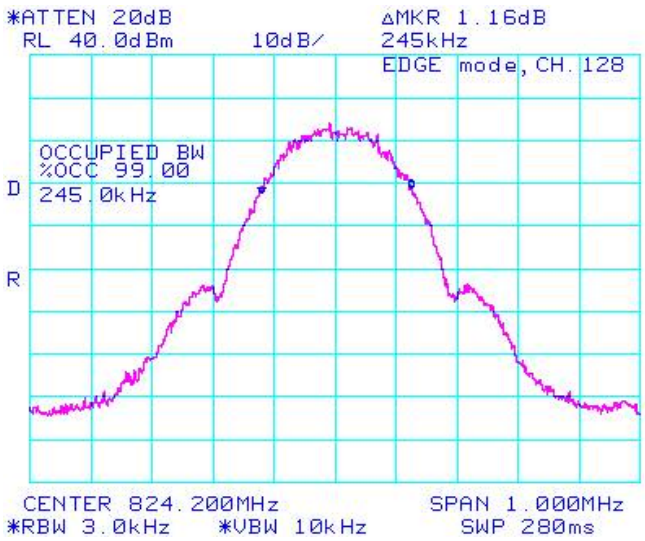


Figure 1-30a: Occupied Bandwidth, GSM850 Band, Middle Channel in EDGE mode

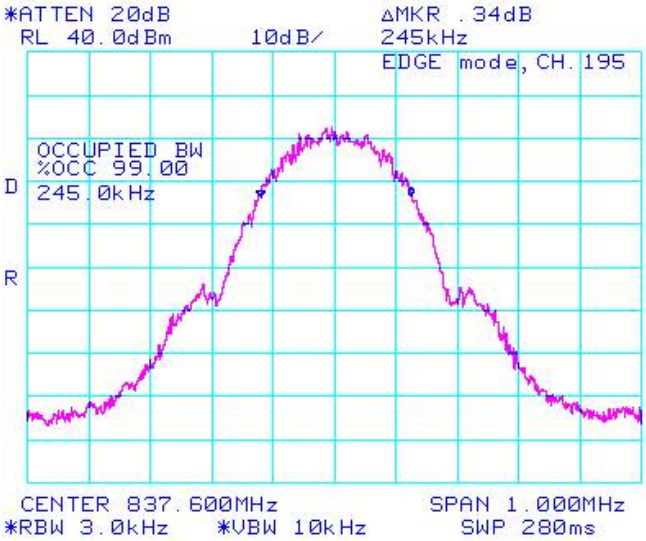


Figure 1-31a: Occupied Bandwidth, GSM850 band, High Channel in EDGE mode

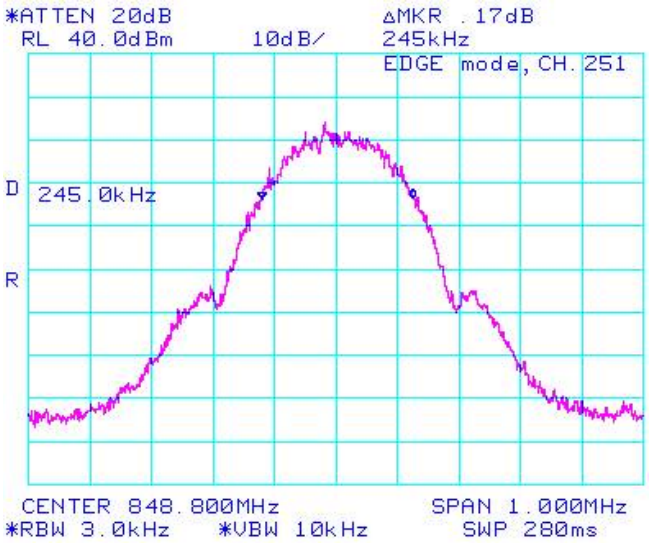
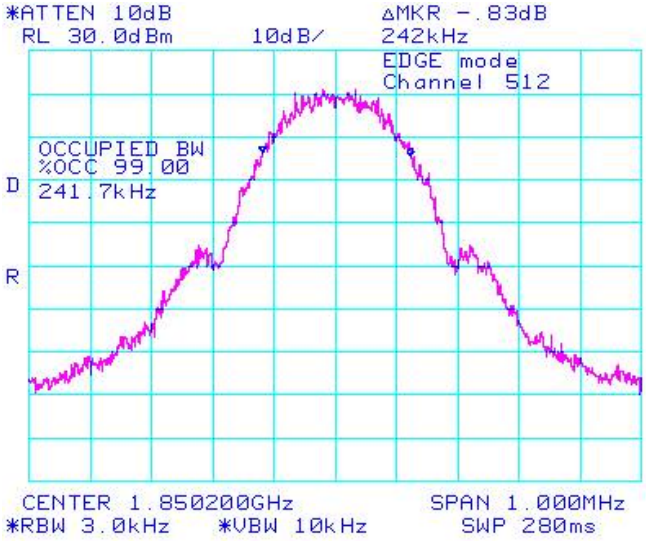


Figure 1-32a: Occupied Bandwidth, PCS1900 Band, Low Channel in EDGE mode



GSM Conducted RF Emission Test Data cont'd

Figure 1-33a: Occupied Bandwidth, PCS1900 Band, Middle Channel in EDGE mode

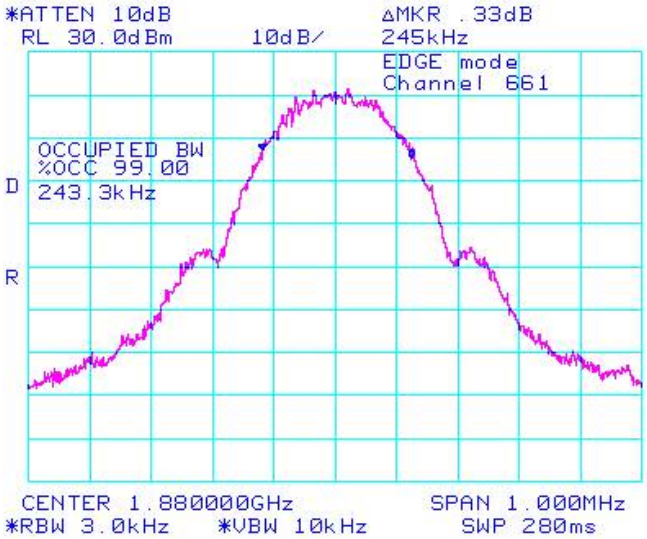
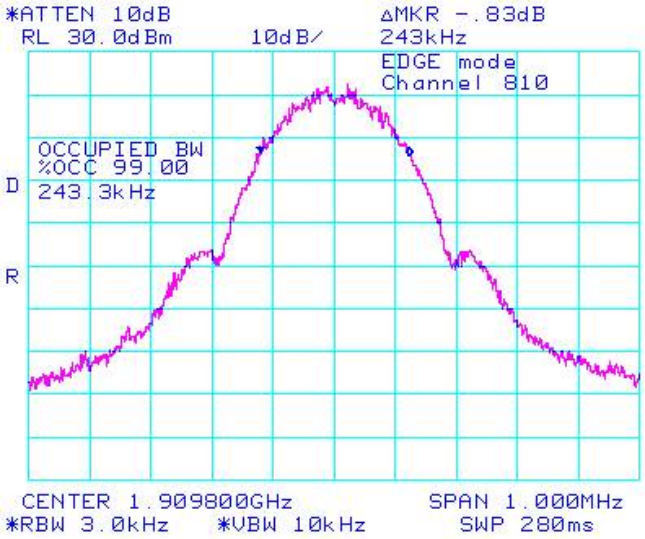


Figure 1-34a: Occupied Bandwidth, PCS1900 Band, High Channel in EDGE mode



GSM Conducted RF Emission Test Data cont'd

Figure 1-35a: GSM850 band, Low Channel Mask in EDGE mode

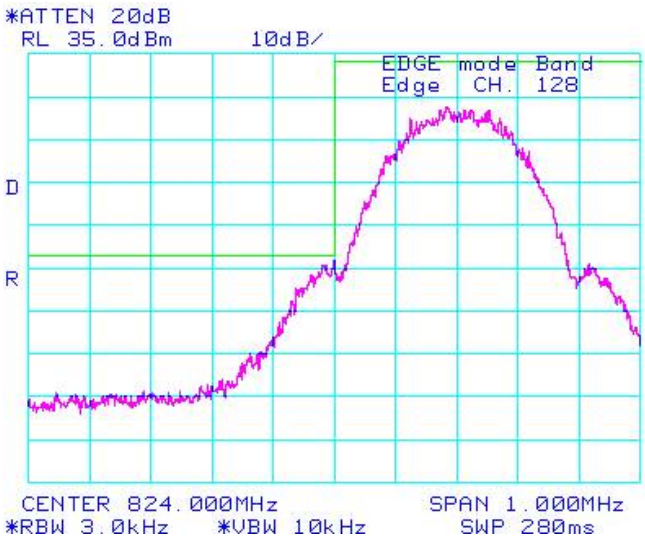


Figure 1-36a: GSM850 band High Channel Mask in EDGE mode

Figure 1-37a: PCS1900, Low Channel Mask in EDGE mode

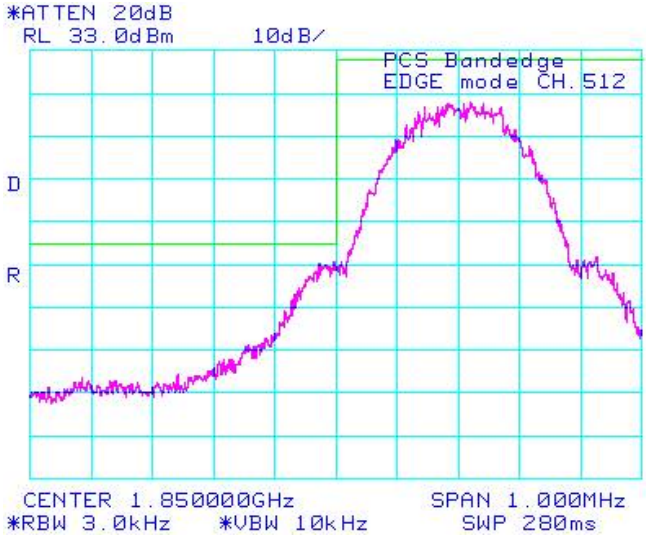
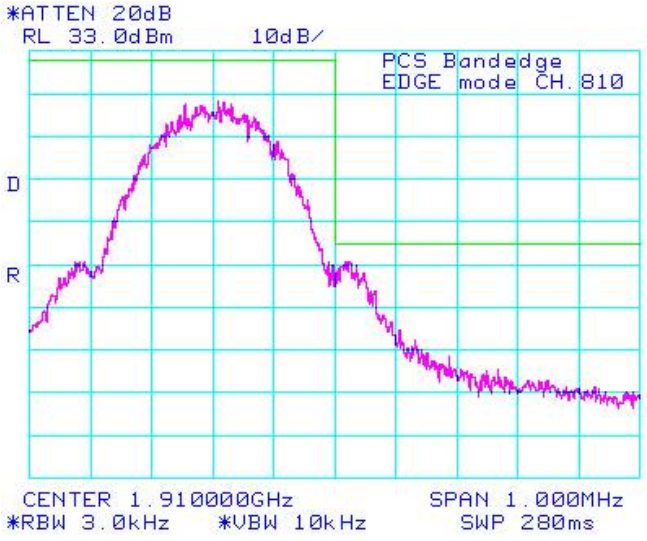


Figure 1-38a: PCS1900, High Channel Mask in EDGE mode



APPENDIX 2 CONDUCTED RF OUTPUT POWER TEST DATA

GSM Conducted RF Output Power Test Data

The conducted RF output power was measured on the BlackBerry® smartphone PIN 2151BFF7 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 BlackBerry® smartphone was compensated for in the measurements.
Peak nominal output power is 33.0 dBm ±0.5 dB for GSM850 and 30.5 dBm ±0.5 dB for PCS.
Peak nominal output power is 30.5 dBm ±0.5 dB for GSM850 EDGE Mode and 27.0 dBm ±0.5 dB for PCS EDGE Mode.

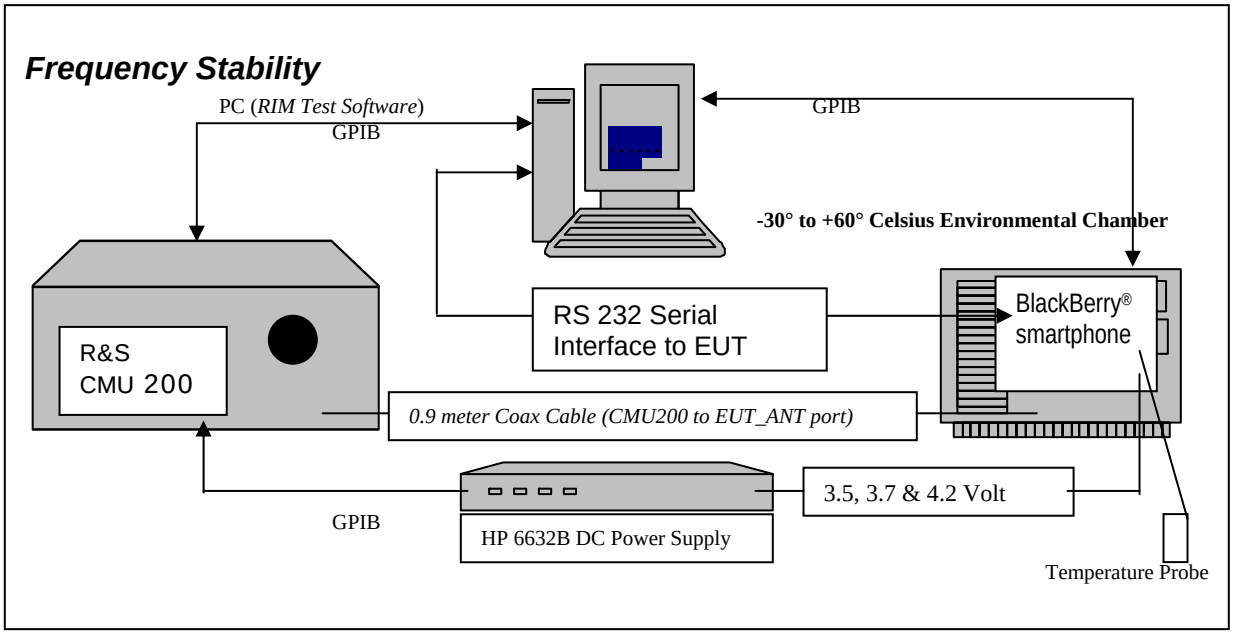
Date of Test: November 26, 2009

The measurements were performed by: Daoud Attayi

Channel	Frequency (MHz)	Maximum Output Power (dBm)	Maximum Output Power (Watts)	Channel	Frequency (MHz)	Maximum Output Power (dBm)	Maximum Output Power (Watts)
GSM850				GSM850 EDGE/GPRS/GSM (2-timeslot)			
128	824.20	33.1	2.04	128	824.20	30.5	1.12
191	836.80	33.0	2.00	191	836.80	30.3	1.07
251	848.80	32.9	1.95	251	848.80	30.3	1.07
PCS				PCS EDGE/GPRS/GSM (2-timeslot)			
512	1850.2	30.5	1.12	512	1850.2	27.4	0.55
661	1880.0	30.4	1.10	661	1880.0	27.4	0.55
810	1909.8	30.2	1.05	810	1909.8	27.2	0.52

APPENDIX 3 FREQUENCY STABILITY TEST DATA

GSM Frequency Stability Test Data



The measurements were performed by Maurice Battler.

CFR 47 Chapter 1 - Federal Communications Commission Rules

Part 2 Required Measurements
2.1055 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, CFR 47 chapter 1, Section 22.917 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 Agilent power meter and Agilent Signal Generator.
The cable assembly from the RF input to the RF output was measured at the following Frequencies:

PCS1900 Frequency (MHz)	Cable loss (dB)
1850.2	1.20
1880.0	1.20
1909.8	1.20

GSM850 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 3.7 volts to 4.2 volts maximum 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, 3.7 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, 1850.2, 1880.0 and 1909.8 MHz for the PCS1900 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. Set 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 and 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 3.7 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, 3.7 and 4.2 volts.

The maximum frequency error in the GSM850 band measured was **-0.0641 PPM**.
The maximum frequency error in the PCS1900 band measured was**-0.0397 PPM**.

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

The BlackBerry® smartphone PIN 2151BFF8 was tested on November 16, 2009 by Maurice Battler.

Traffic Channel Number	GSM850 Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
128	824.20	3.6	20	-52.82	-0.0641
189	836.40	3.6	20	4.58	0.0055
250	848.60	3.6	20	-2.91	-0.0034

Traffic Channel Number	GSM850 Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
128	824.20	3.7	20	-10.53	-0.0128
189	836.40	3.7	20	-4.13	-0.0049
250	848.60	3.7	20	-4.65	-0.0055

Traffic Channel Number	GSM850 Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
128	824.20	4.2	20	-13.24	-0.0161
189	836.40	4.2	20	-9.43	-0.0113
250	848.60	4.2	20	-10.78	-0.0127

GSM850 Results: channel 128 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
128	824.20	3.6	-30	37.32	0.0453
128	824.20	3.6	-20	38.10	0.0462
128	824.20	3.6	-10	-49.66	-0.0603
128	824.20	3.6	0	-19.69	-0.0239
128	824.20	3.6	10	-15.11	-0.0183
128	824.20	3.6	20	-52.82	**-0.0641**
128	824.20	3.6	30	-42.75	-0.0519
128	824.20	3.6	40	-30.09	-0.0365
128	824.20	3.6	50	-26.67	-0.0324
128	824.20	3.6	60	-28.67	-0.0348

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
128	824.20	3.7	-30	32.22	0.0391
128	824.20	3.7	-20	24.28	0.0295
128	824.20	3.7	-10	-9.04	-0.0110
128	824.20	3.7	0	-28.99	-0.0352
128	824.20	3.7	10	-25.70	-0.0312
128	824.20	3.7	20	-10.53	-0.0128
128	824.20	3.7	30	-51.14	-0.0620
128	824.20	3.7	40	-30.61	-0.0371
128	824.20	3.7	50	-35.71	-0.0433
128	824.20	3.7	60	-40.94	-0.0497

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
128	824.20	4.2	-30	9.88	0.0120
128	824.20	4.2	-20	40.10	0.0487
128	824.20	4.2	-10	-3.16	-0.0038
128	824.20	4.2	0	-20.73	-0.0252
128	824.20	4.2	10	-13.88	-0.0168
128	824.20	4.2	20	-13.24	-0.0161
128	824.20	4.2	30	-37.90	-0.0460
128	824.20	4.2	40	-13.30	-0.0161
128	824.20	4.2	50	-12.72	-0.0154
128	824.20	4.2	60	-12.27	-0.0149

GSM850 Results: channel 189 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
189	836.40	3.6	-30	35.71	0.0427
189	836.40	3.6	-20	32.67	0.0391
189	836.40	3.6	-10	-51.85	-0.0620
189	836.40	3.6	0	-23.89	-0.0286
189	836.40	3.6	10	-17.82	-0.0213
189	836.40	3.6	20	4.58	0.0055
189	836.40	3.6	30	-42.68	-0.0510
189	836.40	3.6	40	-20.92	-0.0250
189	836.40	3.6	50	-23.89	-0.0286
189	836.40	3.6	60	-28.09	-0.0336

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
189	836.40	3.7	-30	36.74	0.0439
189	836.40	3.7	-20	28.54	0.0341
189	836.40	3.7	-10	-5.88	-0.0070
189	836.40	3.7	0	-25.18	-0.0301
189	836.40	3.7	10	-21.05	-0.0252
189	836.40	3.7	20	-4.13	-0.0049
189	836.40	3.7	30	-44.49	-0.0532
189	836.40	3.7	40	-21.11	-0.0252
189	836.40	3.7	50	-26.93	-0.0322
189	836.40	3.7	60	-27.44	-0.0328

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
189	836.40	4.2	-30	15.05	0.0180
189	836.40	4.2	-20	-4.52	-0.0054
189	836.40	4.2	-10	3.68	0.0044
189	836.40	4.2	0	-17.37	-0.0208
189	836.40	4.2	10	-9.04	-0.0108
189	836.40	4.2	20	-9.43	-0.0113
189	836.40	4.2	30	-33.77	-0.0404
189	836.40	4.2	40	-10.40	-0.0124
189	836.40	4.2	50	-7.62	-0.0091
189	836.40	4.2	60	-5.29	-0.0063

GSM850 Results: channel 250 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
250	848.60	3.6	-30	34.09	0.0402
250	848.60	3.6	-20	28.73	0.0339
250	848.60	3.6	-10	-8.65	-0.0102
250	848.60	3.6	0	-26.35	-0.0311
250	848.60	3.6	10	-20.47	-0.0241
250	848.60	3.6	20	-2.91	-0.0034
250	848.60	3.6	30	-45.85	-0.0540
250	848.60	3.6	40	-24.99	-0.0294
250	848.60	3.6	50	-25.51	-0.0301
250	848.60	3.6	60	-25.38	-0.0299

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
250	848.60	3.7	-30	36.42	0.0429
250	848.60	3.7	-20	27.70	0.0326
250	848.60	3.7	-10	-7.10	-0.0084
250	848.60	3.7	0	-27.18	-0.0320
250	848.60	3.7	10	-21.89	-0.0258
250	848.60	3.7	20	-4.65	-0.0055
250	848.60	3.7	30	-44.88	-0.0529
250	848.60	3.7	40	-23.50	-0.0277
250	848.60	3.7	50	-23.57	-0.0278
250	848.60	3.7	60	-22.73	-0.0268

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
250	848.60	4.2	-30	15.05	0.0177
250	848.60	4.2	-20	-6.01	-0.0071
250	848.60	4.2	-10	1.94	0.0023
250	848.60	4.2	0	-18.66	-0.0220
250	848.60	4.2	10	-10.53	-0.0124
250	848.60	4.2	20	-10.78	-0.0127
250	848.60	4.2	30	-33.64	-0.0396
250	848.60	4.2	40	-8.52	-0.0100
250	848.60	4.2	50	-9.88	-0.0116
250	848.60	4.2	60	-2.97	-0.0035

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

The BlackBerry® smartphone PIN 2151BFF8 was tested on November 17, 2009 by Maurice Battler.

Traffic Channel Number	PCS Frequency (MHz	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	*PPM*
512	1850.2	3.6	20	-58.11	-0.0314
661	1880.0	3.6	20	-68.70	-0.0365
810	1909.8	3.6	20	-19.44	-0.0102

Traffic Channel Number	PCS Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
512	1850.2	3.7	20	-19.57	-0.0106
661	1880.0	3.7	20	-15.76	-0.0084
810	1909.8	3.7	20	-19.76	-0.0103

Traffic Channel Number	PCS Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
512	1850.2	4.2	20	14.40	0.0078
661	1880.0	4.2	20	16.59	0.0088
810	1909.8	4.2	20	15.24	0.0080

PCS1900 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	9.10	0.0049
512	1850.2	3.6	-20	32.61	0.0176
512	1850.2	3.6	-10	-32.67	-0.0177
512	1850.2	3.6	0	-35.84	-0.0194
512	1850.2	3.6	10	-35.32	-0.0191
512	1850.2	3.6	20	-58.11	-0.0314
512	1850.2	3.6	30	-56.82	-0.0307
512	1850.2	3.6	40	10.01	0.0054
512	1850.2	3.6	50	12.98	0.0070
512	1850.2	3.6	60	14.53	0.0079

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
512	1850.2	3.7	-30	9.62	0.0052
512	1850.2	3.7	-20	9.36	0.0051
512	1850.2	3.7	-10	-43.39	-0.0235
512	1850.2	3.7	0	-50.56	-0.0273
512	1850.2	3.7	10	-57.53	-0.0311
512	1850.2	3.7	20	-19.57	-0.0106
512	1850.2	3.7	30	-22.86	-0.0124
512	1850.2	3.7	40	-26.67	-0.0144
512	1850.2	3.7	50	-35.13	-0.0190
512	1850.2	3.7	60	-33.51	-0.0181

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
512	1850.2	4.2	-30	-18.21	-0.0098
512	1850.2	4.2	-20	32.16	0.0174
512	1850.2	4.2	-10	-37.26	-0.0201
512	1850.2	4.2	0	-41.33	-0.0223
512	1850.2	4.2	10	-42.49	-0.0230
512	1850.2	4.2	20	14.40	0.0078
512	1850.2	4.2	30	6.13	0.0033
512	1850.2	4.2	40	-7.75	-0.0042
512	1850.2	4.2	50	-5.62	-0.0030
512	1850.2	4.2	60	5.42	0.0029

PCS1900 Results: channel 661 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
661	1880	3.6	-30	5.62	0.0030
661	1880	3.6	-20	16.21	0.0086
661	1880	3.6	-10	-44.49	-0.0237
661	1880	3.6	0	-48.11	-0.0256
661	1880	3.6	10	-50.69	-0.0270
661	1880	3.6	20	-68.70	-0.0365
661	1880	3.6	30	-74.58	**-0.0397**
661	1880	3.6	40	-14.53	-0.0077
661	1880	3.6	50	-20.73	-0.0110
661	1880	3.6	60	-19.89	-0.0106

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
661	1880	3.7	-30	9.62	0.0051
661	1880	3.7	-20	9.49	0.0050
661	1880	3.7	-10	-45.07	-0.0240
661	1880	3.7	0	-52.95	-0.0282
661	1880	3.7	10	-60.96	-0.0324
661	1880	3.7	20	-15.76	-0.0084
661	1880	3.7	30	-19.63	-0.0104
661	1880	3.7	40	-26.93	-0.0143
661	1880	3.7	50	-30.87	-0.0164
661	1880	3.7	60	-31.45	-0.0167

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
661	1880	4.2	-30	-14.59	-0.0078
661	1880	4.2	-20	35.51	0.0189
661	1880	4.2	-10	-39.32	-0.0209
661	1880	4.2	0	-41.39	-0.0220
661	1880	4.2	10	-39.07	-0.0208
661	1880	4.2	20	16.59	0.0088
661	1880	4.2	30	11.95	0.0064
661	1880	4.2	40	10.14	0.0054
661	1880	4.2	50	10.33	0.0055
661	1880	4.2	60	14.92	0.0079

PCS1900 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	7.04	0.0037
810	1909.8	3.6	-20	10.98	0.0057
810	1909.8	3.6	-10	-47.33	-0.0248
810	1909.8	3.6	0	-52.37	-0.0274
810	1909.8	3.6	10	-62.51	-0.0327
810	1909.8	3.6	20	-19.44	-0.0102
810	1909.8	3.6	30	-19.57	-0.0102
810	1909.8	3.6	40	-28.73	-0.0150
810	1909.8	3.6	50	-32.16	-0.0168
810	1909.8	3.6	60	-32.35	-0.0169

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
810	1909.8	3.7	-30	13.75	0.0072
810	1909.8	3.7	-20	7.88	0.0041
810	1909.8	3.7	-10	-46.23	-0.0242
810	1909.8	3.7	0	-53.59	-0.0281
810	1909.8	3.7	10	-60.63	-0.0317
810	1909.8	3.7	20	-19.76	-0.0103
810	1909.8	3.7	30	-23.50	-0.0123
810	1909.8	3.7	40	-28.67	-0.0150
810	1909.8	3.7	50	-35.58	-0.0186
810	1909.8	3.7	60	-35.58	-0.0186

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
810	1909.8	4.2	-30	-10.98	-0.0057
810	1909.8	4.2	-20	38.36	0.0201
810	1909.8	4.2	-10	-39.78	-0.0208
810	1909.8	4.2	0	-44.17	-0.0231
810	1909.8	4.2	10	-42.42	-0.0222
810	1909.8	4.2	20	15.24	0.0080
810	1909.8	4.2	30	10.46	0.0055
810	1909.8	4.2	40	6.84	0.0036
810	1909.8	4.2	50	9.81	0.0051
810	1909.8	4.2	60	12.14	0.0064

APPENDIX 4 RADIATED EMISSIONS TEST DATA

Radiated Power Test Data Results

The measurements were performed by Fahd Faisal.
Date of test: November 25, 2009
The environmental tests conditions were: Temperature: 23 °C
Pressure: 996 mb
Relative Humidity: 28 %

The BlackBerry® smartphone PIN 2151BEF0 was in standalone, USB up position.
Test distance is 3.0 metres.

GSM850 Band

GSM Mode

EUT				Rx Antenna		Spectrum Analyzer		Substitution Method / Tracking Generator					
Type	Ch	Frequency (MHz)	Band	Type	Pol.	Reading (dBuV)	Max(V,H) (dBuV)	Pol. Tx-Rx	Reading (dBm)	Corrected Reading (relative to Dipole) (dBm)	(W)	Limit (dBm)	Diff. To Limit (dB)
F0	128	824.20	850	Dipole	V	77.59	86.24	V-V	12.11	27.15	0.52	38.50	-11.35
F0	128	824.20	850	Dipole	H	86.24		H-H	11.57				
F0	195	837.60	850	Dipole	V	79.02	86.45	V-V	12.69	**28.37**	0.69	38.50	-10.13
F0	195	837.60	850	Dipole	H	86.45		H-H	12.10				
F0	251	848.80	850	Dipole	V	78.49	86.42	V-V	12.63	28.12	0.65	38.50	-10.38
F0	251	848.80	850	Dipole	H	86.42		H-H	12.04				

EDGE Mode

EUT				Rx Antenna		Spectrum Analyzer		Substitution Method / Tracking Generator					
Type	Ch	Frequency (MHz)	Band	Type	Pol.	Reading (dBuV)	Max(V,H) (dBuV)	Pol. Tx-Rx	Reading (dBm)	Corrected Reading (relative to Dipole) (dBm)	(W)	Limit (dBm)	Diff. To Limit (dB)
F0	128	824.20	850	Dipole	V	72.11	80.17	V-V	7.28	22.32	0.17	38.50	-16.18
F0	128	824.20	850	Dipole	H	80.17		H-H	5.45				
F0	195	837.60	850	Dipole	V	72.14	80.58	V-V	8.76	**24.44**	0.28	38.50	-14.06
F0	195	837.60	850	Dipole	H	80.58		H-H	6.06				
F0	251	848.80	850	Dipole	V	72.31	80.72	V-V	7.16	22.65	0.18	38.50	-15.85
F0	251	848.80	850	Dipole	H	80.72		H-H	6.20				

Radiated Power Test Data Results cont'd

PCS1900 Band

GSM Mode

EUT				Receive 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 Isotropic Radiator) (dBm)	(W)	Limit (dBm)	Diff to Limit (dB)
F0	512	1850.20	1900	Horn	V	88.98	88.98	V-V	-9.75	27.21	0.53	33.00	-5.79
F0	512	1850.20	1900	Horn	H	81.49		H-H	-9.17				
F0	661	1880.00	1900	Horn	V	89.53	89.53	V-V	-9.21	28.28	0.67	33.00	-4.72
F0	661	1880.00	1900	Horn	H	79.84		H-H	-8.00				
F0	810	1909.80	1900	Horn	V	90.88	90.88	V-V	-8.68	**29.69**	0.93	33.00	-3.31
F0	810	1909.80	1900	Horn	H	81.68		H-H	-6.63				

EDGE Mode

EUT				Receive 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 Isotropic Radiator) (dBm)	(W)	Limit (dBm)	Diff to Limit (dB)
F0	512	1850.20	1900	Horn	V	84.96	84.96	V-V	-13.90	23.20	0.21	33.00	-9.80
F0	512	1850.20	1900	Horn	H	77.57		H-H	-13.18				
F0	661	1880.00	1900	Horn	V	86.35	86.35	V-V	-12.17	25.14	0.33	33.00	-7.86
F0	661	1880.00	1900	Horn	H	77.82		H-H	-11.14				
F0	810	1909.80	1900	Horn	V	87.14	87.14	V-V	-11.28	**25.99**	0.40	33.00	-7.01
F0	810	1909.80	1900	Horn	H	77.83		H-H	-10.33				

Radiated Emissions Test Data Results

GSM850

GSM Mode

The measurements were performed by Fahd Faisal.
Date of Test: November 17, 2009
The environmental test conditions were: Temperature: 25ºC
Pressure: 1016 mb
Relative Humidity: 28%

Test Distance was 3.0 metres with a height of 1.0 metre, 30 MHz to 1000 MHz.
The BlackBerry® smartphone PIN 2151BEF0 was in standalone, Vertical position.
The measurements were performed in GSM850 Tx mode, channel 128, 195 and 251.

All emissions had a test margin greater than 25.0 dB.

The measurements were performed by Steven Wang.
Date of Test: November 18, 2009
The environmental test conditions were: Temperature: 24 ºC
Pressure: 1021 mb
Relative Humidity: 22 %

Test Distance was 3.0 metres with a height of 1.0 metre, 1 GHz to 9 GHz.
The BlackBerry® smartphone PIN 2151BF6E was in standalone, Vertical position.
The measurements were performed in GSM Tx mode, channel 128, 195 and 251.

Frequency (MHz)	Channel of Occurrence	Antenna Pol. (V/H)	Antenna Height (metres)	Test Angle (Deg.)	Detector (PK or QP)	Measured Level (dBµV)	Correction Factor for preamp/antenna/ cables/ filter (dB)	Field Strength Level (reading+corr) (dBm)	Limit @ 3.0 m (dBm)	Test Margin (dB)
2472.324	128	V	1.00	237.00	PK	54.85	-86.81	-31.96	-13.00	-18.96

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

Radiated Emissions Test Data Results cont'd

GSM850

EDGE Mode

The measurements were performed by Kevin Rose.
Date of Test: November 17, 2009
The environmental test conditions were: Temperature: 23 ºC
Pressure: 1012 mb
Relative Humidity: 31 %

Test Distance was 3.0 metres with a height of 1.0 metres, 30 MHz to 1000 MHz.
The BlackBerry® smartphone PIN 2151BEF0 was in standalone, Vertical position.
The measurements were performed in GSM850 EDGE Tx mode, channel 128, 195 and 251.

Frequency (MHz)	Channel of Occurrence	Antenna Pol. (V/H)	Antenna Height (metres)	Test Angle (Deg.)	Detector (PK or QP)	Measured Level (dBµV)	Correction Factor for preamp/antenna/ cables/ filter (dB)	Field Strength Level (reading+corr) (dBm)	Limit @ 3.0 m (dBm)	Test Margin (dB)
779.250	128	V	1.41	247.00	PEAK	-23.81	-0.97	-24.78	-13.00	-11.78
803.750	251	V	2.32	133.00	PEAK	-23.41	-0.52	-23.93	-13.00	**-10.93**

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

The measurements were performed by Steven Wang.
Date of Test: November 18 to 22, 2009
The environmental test conditions were: Temperature: 24 ºC
Pressure: 1017 – 1021 mb
Relative Humidity: 22 – 23 %

Test Distance was 3.0 metres with a height of 1.0 metres, 1 GHz to 9 GHz.
The BlackBerry® smartphone PIN 2151BF6E was in standalone, Vertical position.
The measurements were performed in GSM850 EDGE Tx mode, channels 128, 195 and 251.

All emissions had a test margin greater than 25.0 dB.

Radiated Emissions Test Data Results cont'd

PCS1900

GSM Mode

The measurements were performed by Fahd Faisal.
Date of Test: November 18, 2009
The environmental test conditions were: Temperature: 25 ºC
Pressure: 1016 mb
Relative Humidity: 28 %

Test Distance was 3.0 metres with a height of 1.0 metre, 30 MHz to 1000 MHz.
The BlackBerry® smartphone PIN 2151BEF0 was in standalone, Horizontal down position
The measurements were performed in PCS1900 Tx mode, channels 512, 661 and 810.

All emissions had a test margin greater than 25.0 dB.

The measurements were performed by Heng Lin.
Date of Test: November 17 to 24, 2009
The environmental test conditions were: Temperature: 24 ºC
Pressure: 1021 – 1028 mb
Relative Humidity: 21 – 22 %

Test Distance was 3.0 metres with a height of 1.0 metres, 1 GHz to 20 GHz.
The BlackBerry® smartphone PIN 2151BF6E was in standalone, Horizontal down position.
The measurements were performed in PCS1900 Tx mode, channels 512, 661 and 810.

All emissions had a test margin greater than 25.0 dB.

Radiated Emissions Test Data Results cont'd

PCS1900

EDGE Mode

The measurements were performed by Fahd Faisal.
Date of Test: November 18, 2009
The environmental test conditions were: Temperature: 25 ºC
Pressure: 1016 mb
Relative Humidity: 28 %

Test Distance was 3.0 metres with a height of 1.0 metres, 30 MHz to 1000 MHz.
The BlackBerry® smartphone PIN 2151BEF0 was in standalone, Horizontal down position
The measurements were performed in PCS1900 EDGE Tx mode, channels 512, 661 and 810.

All emissions had a test margin greater than 25.0 dB.

The measurements were performed by Steven Wang.
Date of Test: November 22 to 25, 2009
The environmental test conditions were: Temperature: 24 ºC
Pressure: 1005 – 1022 mb
Relative Humidity: 21 – 27 %

Test Distance was 3.0 metres with a height of 1.0 metres, 1 GHz to 20 GHz.
The BlackBerry® smartphone PIN 2151BF6E was in standalone, Horizontal down position.
The measurements were performed in PCS1900 EDGE Tx mode, channels 512, 661 and 810.

All emissions had a test margin greater than 25.0 dB.