

EMI Test Report

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



A division of Research In Motion Limited

REPORT NO: RTS-2337-1002-51

PRODUCT MODEL NO:	RCY71UW
TYPE NAME:	BlackBerry® smartphone
FCC ID:	L6ARCY70UW
IC:	2503A-RCY70UW
EMISSION DESIGNATOR (GSM):	243KGXW
EMISSION DESIGNATOR (EDGE):	242KG7W
EMISSION DESIGNATOR (WCDMA):	4M19F9W

DATE: May 21, 2010

RIM Testing Services™	EMI Test Report for the BlackBerry® smartphone Model RCY71UW	
Test Report No. RTS-2337-1002-51	Dates of Test February 10 to March 26 and May 17 to 19, 2010	Author Data Fahd Faisal

Statement of Performance:

The BlackBerry® smartphone, model RCY71UW, part number CER-30957-001 Rev 3 and accessories performs within the requirements of the test standards when configured and operated per RIM's 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:



Fahd Faisal
Regulatory Compliance Associate
Date: May 21, 2010

Reviewed by:



Michael Cino
Regulatory Compliance Associate
Date: May 21, 2010

Reviewed and Approved by:



Masud S. Attayi, P.Eng.
Manager, Regulatory Compliance
Date: May 21, 2010

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A) Scope

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

- FCC CFR 47 Part 2, October 2009
- FCC CFR 47 Part 22, Subpart H, Cellular Radiotelephone Services, October 2009
- FCC CFR 47 Part 24 Subpart E, Broadband PCS, October 2009
- 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 5, February 2009, 2 GHz Personal Communications Services.

B) Associated Documents

1. HW_Declaration_CER-30957-001_Rev 2
2. HW_Declaration_CER-30957-001_Rev 3
3. MultiSourceDeclaration_9800_b33
4. MultiSourceDeclaration_9800_b45
5. MultiSourceDeclaration_9800_b60
6. MultiSourceDeclaration_9800_b83
7. MultiSourceDeclaration_9800_b91
8. MultiSourceDeclaration_9800_b100

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	440 Phillip Street
Waterloo, Ontario	Waterloo, Ontario,
Canada, N2L 3W8	Canada , N2L 5R9
Phone: 519 888 7465	Phone: 519 888 7465
Fax: 519 888 6906	Fax: 519 888 6906

The testing was performed from February 10 to March 26 and May 17 to 19, 2010.

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The sample EUT included:

SAMPLE	MODEL	CER NUMBER	PIN	Software
1	RCY71UW	CER-30957-001 Rev 1	21C8E19C	V5.2.0.8 (Platform 6.0.0.5) Bundle 19
2	RCY71UW	CER-30957-001 Rev 2	21FDF04C	V6.0.0.6 (Platform 6.0.0.10) Bundle 17
3a	RCY71UW	CER-30957-001 Rev 2	21FDD041	V6.0.0.6 (Platform 6.0.0.10) Bundle 17
3b	RCY71UW	CER-30957-001 Rev 2	21FDD041	V6.0.0.14 (Platform 6.4.0.7) Bundle 33
4	RCY71UW	CER-30957-001 Rev 3	222FF475	V6.0.0.43 (Platform 6.4.0.22) Bundle 100

RF Conducted Emissions testing was performed on sample 1.

RF Radiated Emissions testing was performed on samples 2, 3a, 3b and 4.

To view the differences between CER-30957-001 Rev 1 and CER-30957-001 Rev 2, see document number HW_Declaration_CER-30957-001_Rev 2. To view the differences between CER-30957-001 Rev 2 and CER-30957-001 Rev 3, see document number HW_Declaration_CER-30957-001_Rev 3.

To view the differences between bundles 17 and 19, and 19 and 33, see document number MultiSourceDeclaration_9800_b33. To see the differences between bundles 33 and 100, see document number MultiSourceDeclaration_9800_b33, MultiSourceDeclaration_9800_b45, MultiSourceDeclaration_9800_b60, MultiSourceDeclaration_9800_b83, MultiSourceDeclaration_9800_b91, and MultiSourceDeclaration_9800_b100.

Only the measurements that may have been impacted by the changes from Rev 1 to Rev 3 were re-measured.

D) Support Equipment Used for the Testing of the EUT

No support equipment required; for list of equipment refer to section H, 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.

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F) Test Results Chart

SPECIFICATION		TEST TYPE	RESULT	TEST DATA APPENDIX
FCC CFR 47	IC			
Part 2.1051 Part 22.917 Part 22.901	RSS-GEN, 4.9	GSM 850 Conducted Spurious Emissions	Pass	1A
Part 2.1051 Part 24.238(a)	RSS-GEN, 4.9	GSM PCS Conducted Spurious Emissions	Pass	1A
Part 2.202 Part 22.917	RSS-GEN, 4.6	GSM 850 Occupied Bandwidth and Channel Mask	Pass	1A
Part 2.202 Part 24.238	RSS-GEN, 4.6	GSM PCS Occupied Bandwidth and Channel Mask	Pass	1A
Part 2.1046(a)	RSS-133, 6.4 RSS-132, 4.4	GSM Conducted RF Output Power	Pass	2A
Part 2.1055(a)(d) Part 22.917	RSS-132, 4.3	GSM 850 Frequency Stability vs. Temperature and Voltage	Pass	3A
Part 2.1055(a)(d) Part 24.235	RSS-132, 4.3	GSM PCS Frequency Stability vs. Temperature and Voltage	Pass	3A
Part 22, Subpart H, Part 24, Subpart E	RSS-GEN, 4.9	GSM ERP, EIRP	Pass	4A
Part 2.1051 Part 22.917 Part 22.901	RSS-GEN, 4.9	WCDMA UMTS850 Conducted Spurious Emissions	Pass	1B
Part 2.1051 Part 24.238(a)	RSS-GEN, 4.9	WCDMA UMTS1900 Conducted Spurious Emissions	Pass	1B
Part 2.202 Part 22.917	RSS-GEN, 4.6	WCDMA UMTS850 Occupied Bandwidth and Channel Mask	Pass	1B
Part 2.202 Part 24.238	RSS-GEN, 4.6	WCDMA UMTS1900 Occupied Bandwidth and Channel Mask	Pass	1B
Part 2.1046(a)	RSS-133, 6.4 RSS-132, 4.4	WCDMA Conducted RF Output Power	Pass	2B
Part 2.1055(a)(d) Part 22.917	RSS-132, 4.3	WCDMA UMTS850 Frequency Stability vs. Temperature and Voltage	Pass	3B

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Test Results Chart cont'd

SPECIFICATION		TEST TYPE	RESULT	TEST DATA APPENDIX
FCC CFR 47	IC			
Part 2.1055(a)(d) Part 24.235	RSS-GEN, 4.7	WCDMA UMTS1900 Frequency Stability vs. Temperature and Voltage	Pass	3B
Part 22, Subpart H	RSS-GEN, 4.9	WCDMA UMTS850 Radiated Spurious/Harmonic Emissions, ERP	Pass	4B
Part 24, Subpart E	RSS-GEN, 4.9	WCDMA UMTS1900 Radiated Spurious/Harmonic Emissions, EIRP	Pass	4B

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G) Summary of Results

1) Conducted Emission Measurements

a) 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, CFR 22.901(d) and RSS-GEN, 4.9. The EUT was measured on the low, middle and high channels. The frequency range investigated was from 10 MHz to 10 GHz.
See APPENDIX 1A for test data.

The BlackBerry® smartphone met the requirements of the Tx Conducted Spurious Emissions requirements in the PCS1900 as per 47 CFR 2.1051, CFR 24.238(a) and RSS-GEN, 4.9. The EUT was on the low, middle and high channels. The frequency range investigated was from 10 MHz to 20 GHz.

See APPENDIX 1A for test data

b) The BlackBerry® smartphone met the requirements of the Occupied Bandwidth and channel mask requirements in the GSM850 as per 47 CFR 2.202, CFR 22.917 and RSS-GEN, 4.6. The EUT was measured in GSM and EDGE mode on the low, middle and high channels.
See APPENDIX 1A for test data.

The BlackBerry® smartphone met the requirements of the Occupied Bandwidth and channel mask requirements in the PCS1900 as per 47 CFR 2.202, CFR 24.238 and RSS-GEN, 4.6. The EUT was measured in GSM and EDGE mode on the low, middle and high channels.

See APPENDIX 1A for test data.

c) 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), RSS 133, 6.4 and RSS 132, 4.4. The EUT was measured in GSM and EDGE mode on the low, middle and high channels.
See APPENDIX 2A for the test data.

d) The BlackBerry® smartphone met the requirements of the Frequency Stability vs. Temperature and Voltage requirements for the PCS1900 band as per 47 CFR 2.1055(a), 2.1055(d), 24.235 and RSS-132, 4.3. 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 3A for the test data.

e) The BlackBerry® smartphone met the requirements of the Conducted Spurious Emissions in the UMTS850 band as per 47 CFR 1057, CFR 22.917, CFR 22.901(d) and RSS-GEN, 4.9. 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 the test data.

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The BlackBerry® smartphone met the requirements of the Conducted Spurious Emissions in the UMTS1900 band as per 47 CFR 2.1057, CFR 24.238 and RSS-GEN, 4.9. 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 the test data.

f) The BlackBerry® smartphone met the requirements of the Occupied Bandwidth in the UMTS850 band as per 47 CFR 2.202, CFR 22.917 and RSS-GEN, 4.6. The low, middle and high channels were measured.

See APPENDIX 1 for the test data.

The BlackBerry® smartphone met the requirements of the Occupied Bandwidth and channel mask in the UMTS1900 band as per 47 CFR 2.202, CFR 24.238 and RSS-GEN, 4.6. The low, middle and high channels were measured.

See APPENDIX 1 for the test data.

g) The BlackBerry® smartphone met the requirements of the Conducted RF Output Power for both the UMTS850 and 1900 bands as per 47 CFR 2.1046(a), RSS-133, 6.4 and RSS-132, 4.4. The low, middle and high channels were measured.

See APPENDIX 2 for the test data.

h) The BlackBerry® smartphone met the requirements of the Frequency Stability vs. Temperature and Voltage for UMTS850 band as per 47 CFR 2.1055(a)(d), CFR 22.917 and RSS-132, 4.3. The maximum frequency error measured was less than 0.1 ppm. The temperature range was from -30°C to +60°C in 10° temperature steps. The BlackBerry® smartphone was measured on low, middle and high channels at each temperature step. The BlackBerry® smartphone 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.

The BlackBerry® smartphone met the requirements of the Frequency Stability vs. Temperature and Voltage requirements for the UMTS1900 band as per 47 CFR 2.1055(a)(d), CFR 24.235 and RSS-GEN, 4.7. The maximum frequency error measured was less than 0.1 ppm. The temperature range was from -30°C to +60°C in 10 degree temperature steps. The BlackBerry® smartphone was measured on low, middle and high channels at each temperature step. The BlackBerry® smartphone 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.

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2) Radiated Emission Measurements

a) Radiated Spurious and Harmonic Emissions

The radiated spurious emissions/harmonics and ERP/EIRP were measured for GSM 850, PCS 1900, UMTS 850 and UMTS 1900 bands (WCDMA band 5 & 2). 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 following 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 34.15 dBm (2.60 W) at 848.80 MHz (channel 251).

The ERP in the 850 band, EDGE mode was measured on BlackBerry® smartphone. The highest ERP measured was 32.87 dBm (1.94 W) at 848.80 MHz (channel 251).

The EIRP in the PCS band, GSM mode was measured on BlackBerry® smartphone. The highest EIRP measured was 32.68 dBm (1.85 W) at 1850.20 MHz (channel 512).

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

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The ERP in the UMTS Band 2 was measured on BlackBerry® smartphone. The highest ERP measured was 26.33 dBm (0.43 W) at 1907.60 MHz (channel 9538).

The ERP in the UMTS Band 5 measured on BlackBerry® smartphone. The highest ERP measured was 23.37 dBm (0.22 W) at 846.60 MHz (channel 4233).

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

The test margins in the GSM850 and PCS1900 bands for both GSM mode and EDGE mode band harmonic emissions were greater than 25 dB below the accepted limits for all tested frequencies.

The radiated spurious emission and carrier harmonics were measured up to the 10th harmonic for low, middle and high channels in the UMTS BAND 2 and UMTS BAND 5. Both the horizontal and vertical polarizations were measured.

The test margin in the UMTS bands harmonic emissions were greater than 25 dB below the accepted limits for all tested frequencies.

b) 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/802.11b, PCS1900/Bluetooth/802.11g, UMTS 850 /Bluetooth/802.11b and UMTS 1900/Bluetooth/802.11g.

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 (dB μ V/M) is calculated as follows:

FS = Measured Level (dB μ V) + A.F. (dB/m) + Cable Loss (dB) - Preamp (dB) + Filter Loss (dB)

To view the test data see APPENDIX 4A and 4B.

Measurement Uncertainty ± 4.6 dB

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H) Compliance Test Equipment Used

<u>UNIT</u>	<u>MANUFACTURER</u>	<u>MODEL</u>	<u>SERIAL NUMBER</u>	<u>CAL DUE DATE</u> (YY MM DD)	<u>USE</u>
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	11-02-17	Radiated Emissions
Preamplifier	Rohde & Schwarz	TS-ANA-SP	001	11-02-19	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	12-01-21	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	10-11-25	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	11-01-08	Radiated Emissions

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Compliance Test Equipment Used cont'd

<u>UNIT</u>	<u>MANUFACTURER</u>	<u>MODEL</u>	<u>SERIAL NUMBER</u>	<u>CAL DUE DATE</u> (YY MM DD)	<u>USE</u>
Environment Monitor	Control Company	1870	230355189	11-01-08	RF Conducted Emissions
Environment Monitor	Control Company	1870	80117164	11-01-08	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

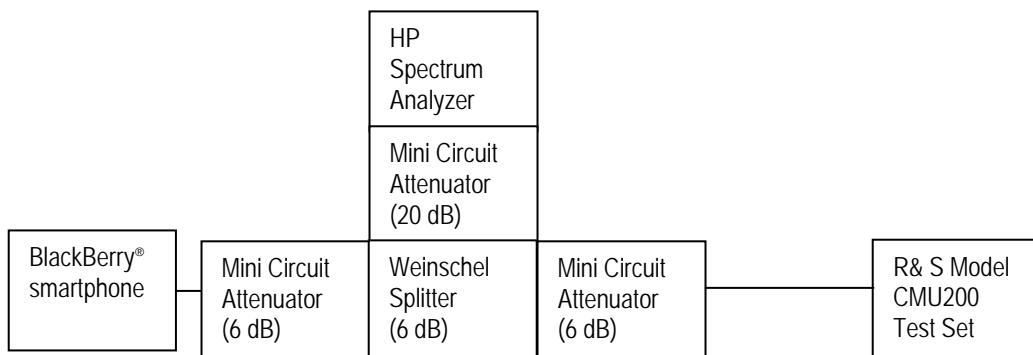
APPENDIX 1A – GSM CONDUCTED RF EMISSIONS TEST DATA/PLOTS

RIM Testing Services™	EMI Test Report for the BlackBerry® smartphone Model RCY71UW APPENDIX 1A	
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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 for the BlackBerry® smartphone.

Test Setup Diagram



Date of Test: February 10, 2010

The environmental test conditions were:

Temperature: 24 °C
 Pressure: 999 mb
 Relative Humidity: 21 %

The following measurements were performed by Maurice Battler.

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GSM Conducted RF Emission Test Data cont'd

The conducted spurious emissions – As per 47 CFR 2.1051, CFR 24.238(a), RSS-GEN, 4.9, 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 1-1a 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 275 kHz, and for the PCS1900 band was measured to be 270 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	263	241.7
837.6	275	241.7
848.8	262	241.7

1900 band Frequency (MHz)	-26dBc Bandwidth (kHz)	99% Occupied Bandwidth (kHz)
1850.2	268	238.3
1880.0	268	241.7
1909.8	270	243.3

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	238.3
837.6	240.0
848.8	238.3

1900 band Frequency (MHz)	99% Occupied Bandwidth (kHz)
1850.2	240.0
1880.0	241.7
1909.8	241.7

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 the plots of channel mask EDGE results.

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

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GSM Conducted RF Emission Test Data cont'd

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

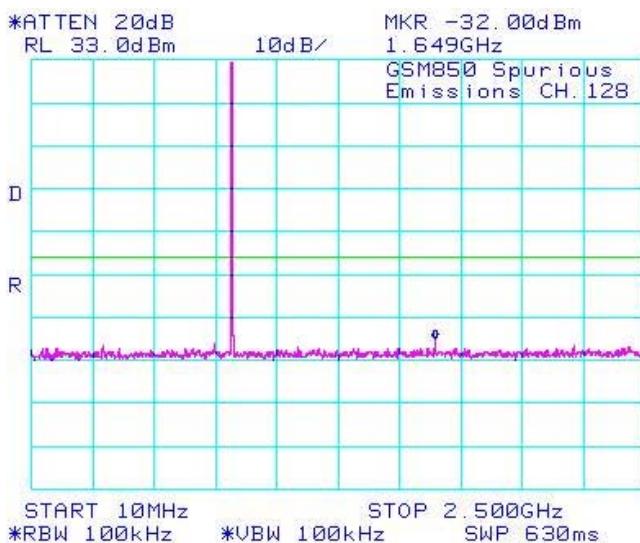


Figure 1-2a: GSM850 band, Spurious Conducted Emissions, Low channel

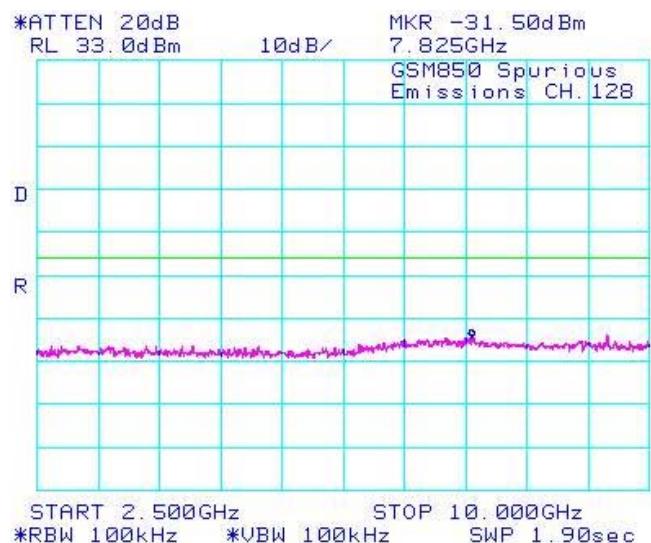


Figure 1-3a: GSM850 band, Spurious Conducted Emissions, Middle Channel

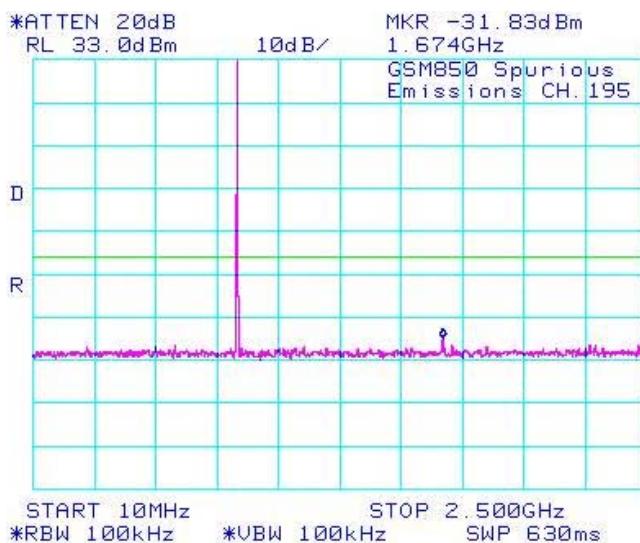
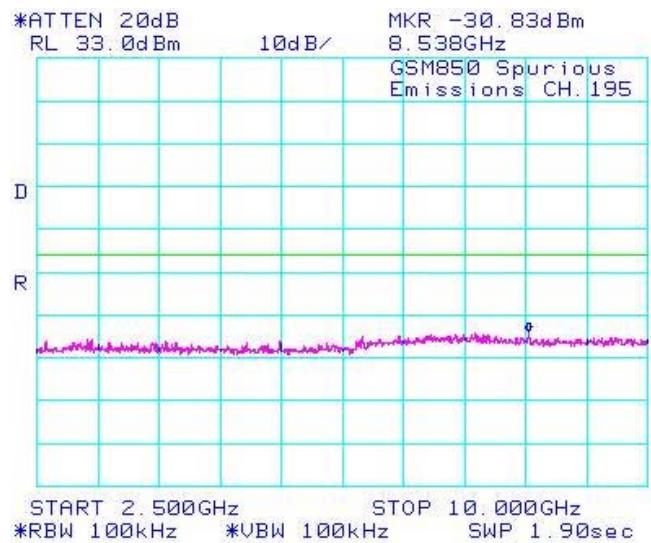


Figure 1-4a: GSM850 band, Spurious Conducted Emissions, Middle Channel



GSM Conducted RF Emission Test Data cont'd

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

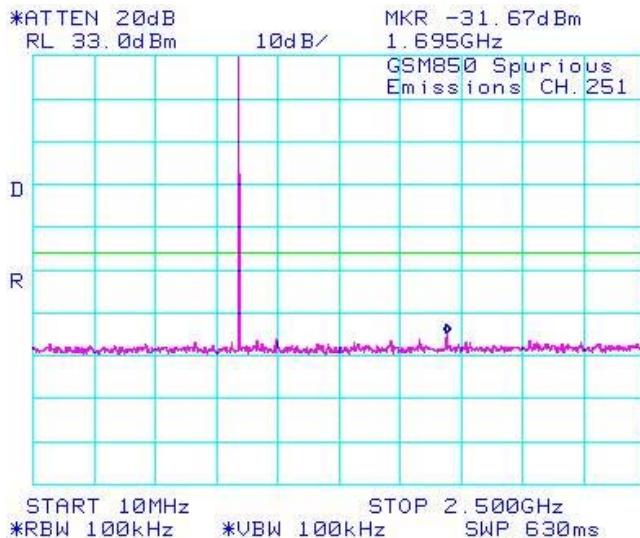


Figure 1-6a: GSM850 band, Spurious Conducted Emissions, High Channel

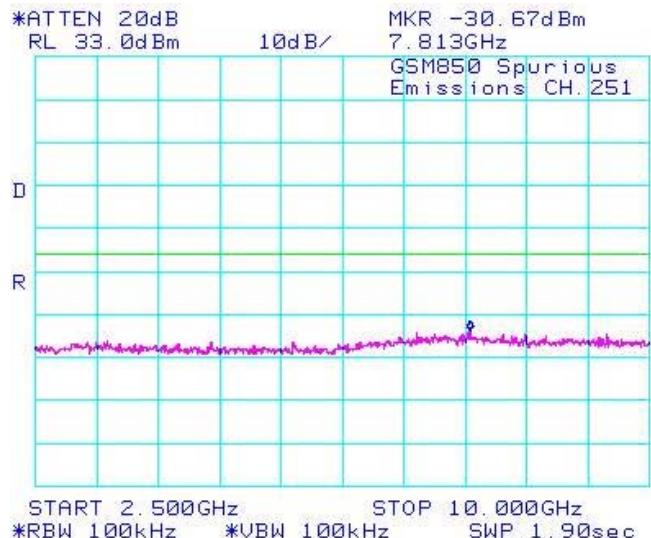


Figure 1-7a: PCS1900 band, Spurious Conducted Emissions, Low Channel

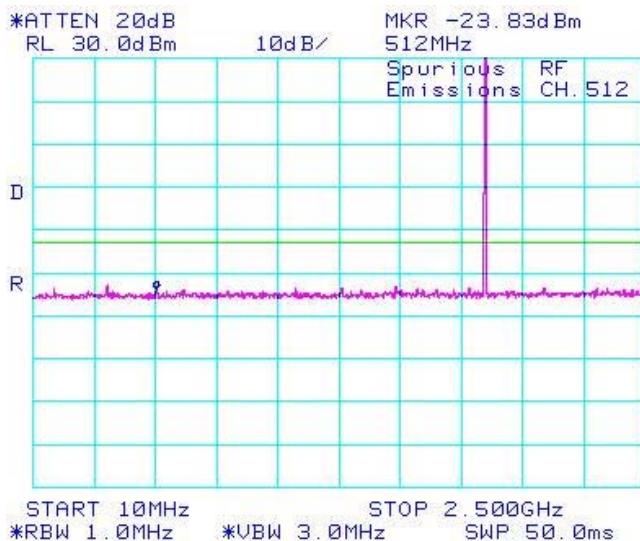
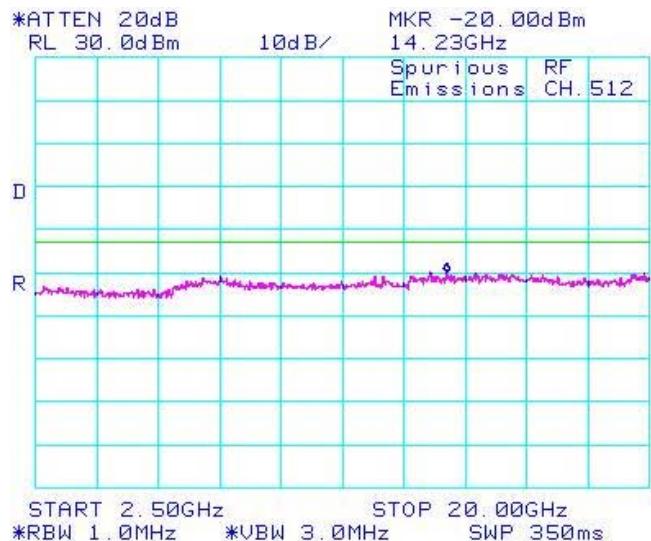


Figure 1-8a: PCS1900 band, Spurious Conducted Emissions, Low Channel



GSM Conducted RF Emission Test Data cont'd

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

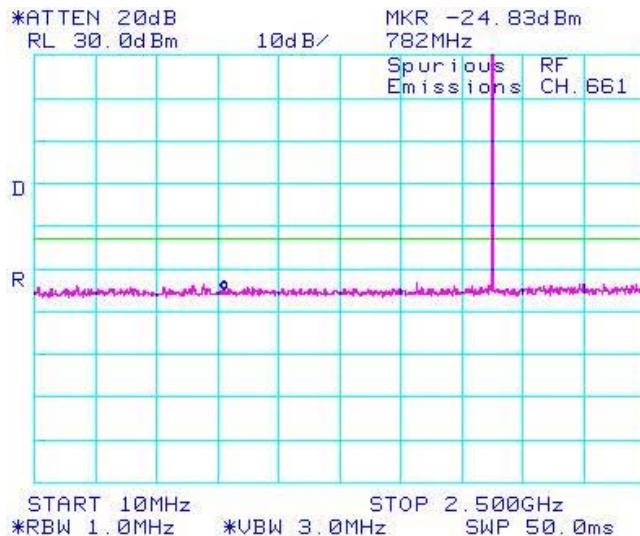


Figure 1-10a: PCS1900 band, Spurious Conducted Emissions, Middle Channel

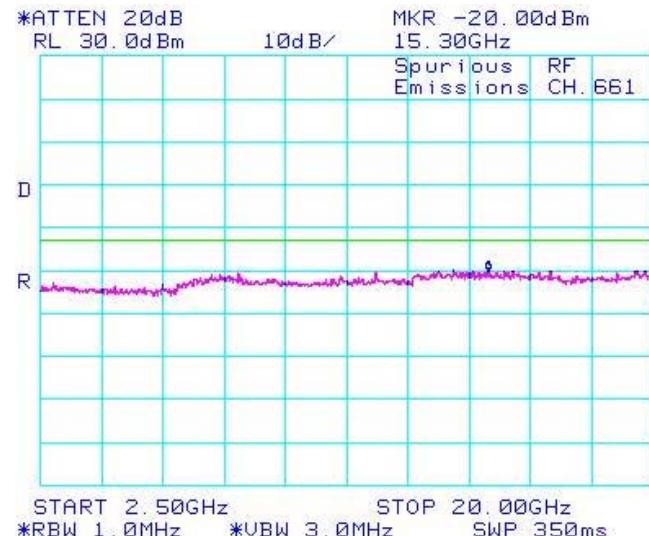


Figure 1-11a: PCS1900 band, Spurious Conducted Emissions, High Channel

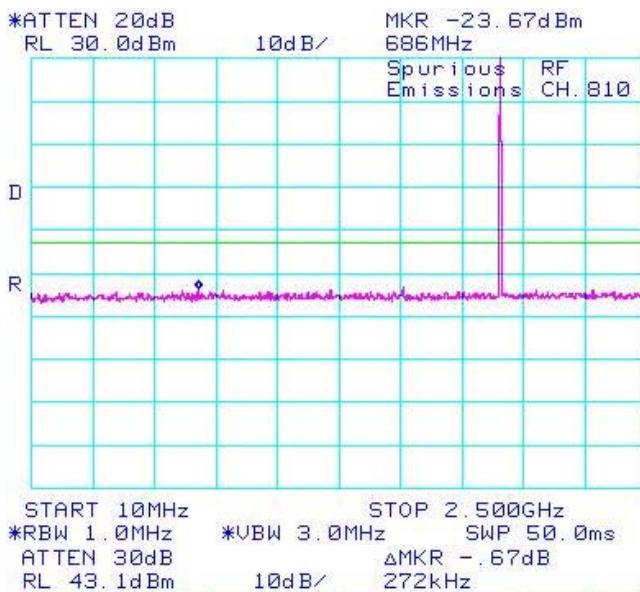
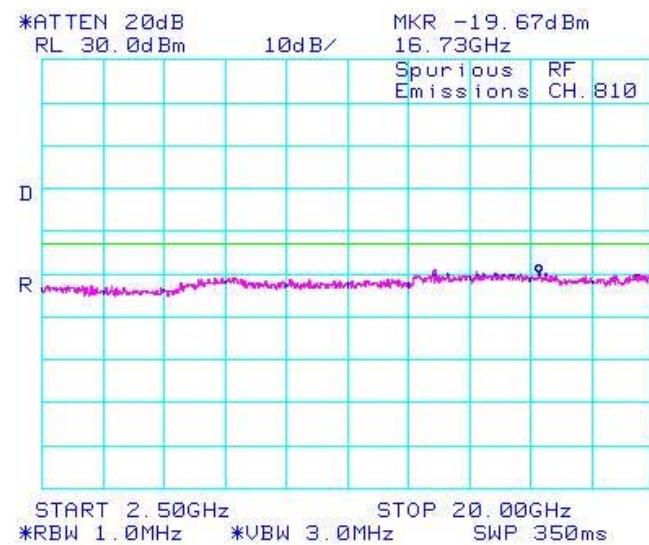
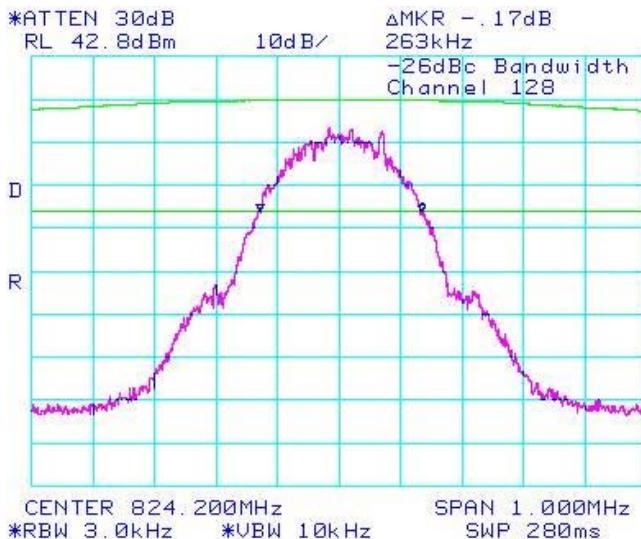


Figure 1-12a: PCS1900 band, Spurious Conducted Emissions, High Channel

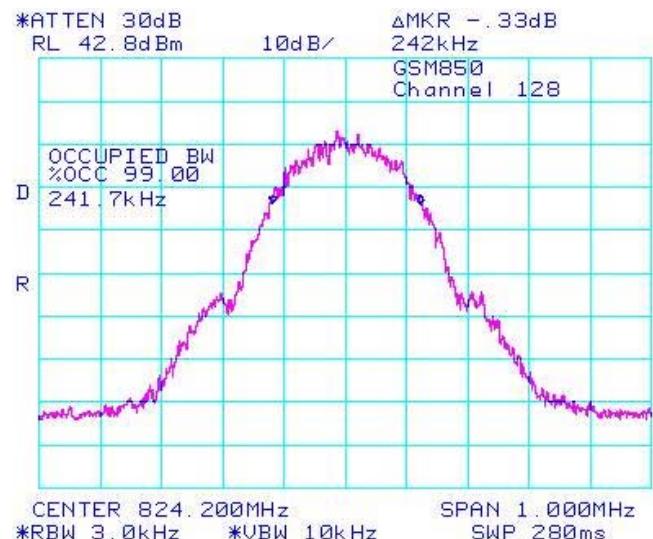


GSM Conducted RF Emission Test Data cont'd

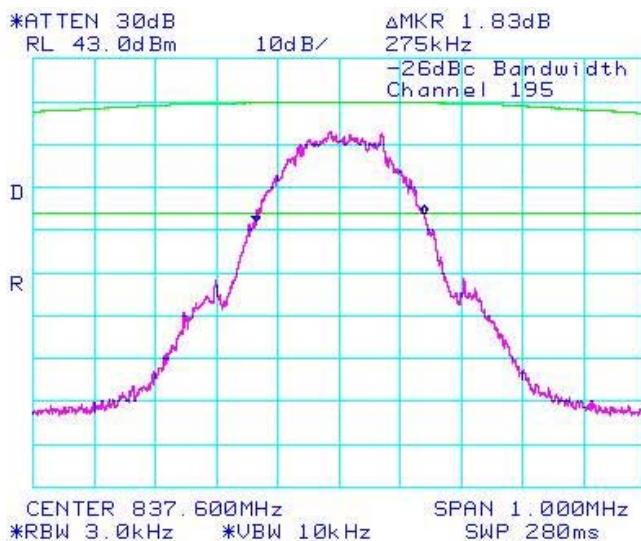
**Figure 1-13a: -26dBc bandwidth, GSM850 band
 Low Channel in GSM mode**



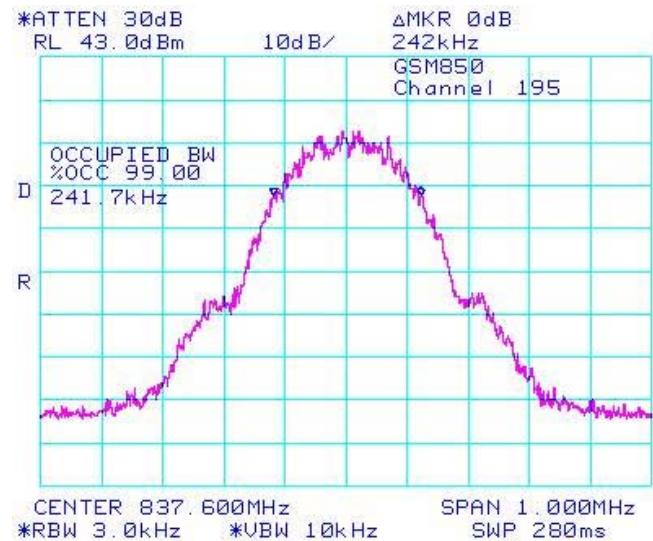
**Figure 1-14a: Occupied Bandwidth, GSM850 band
 Low Channel in GSM mode**



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



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



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GSM Conducted RF Emission Test Data cont'd

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

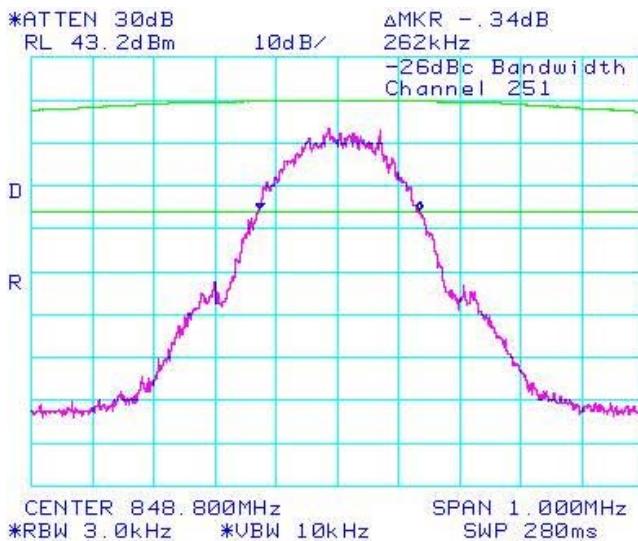


Figure 1-18a: Occupied Bandwidth, GSM850 band High Channel in GSM mode

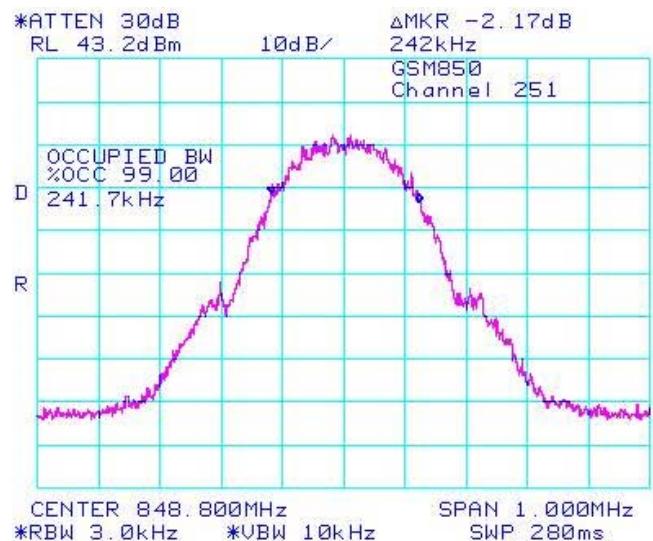


Figure 1-19a: -26dBc bandwidth, PCS1900 Low Channel in GSM mode

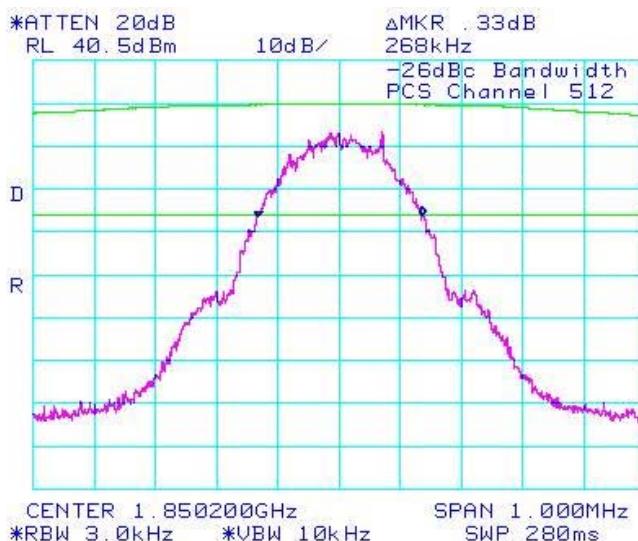
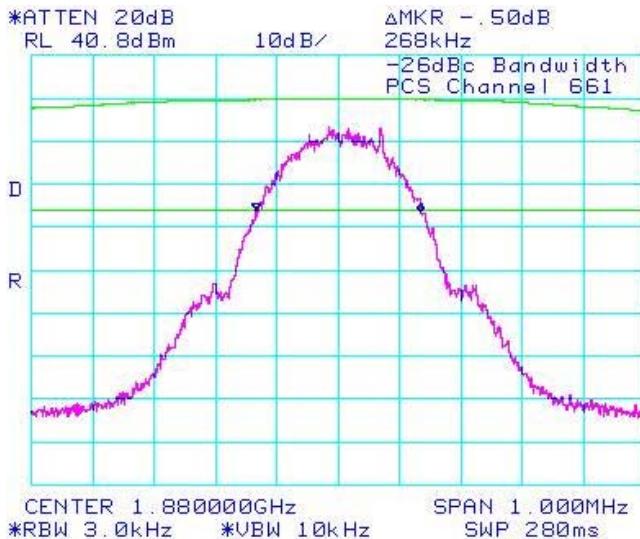


Figure 1-20a: Occupied Bandwidth, PCS1900 Low Channel in GSM mode



GSM Conducted RF Emission Test Data cont'd

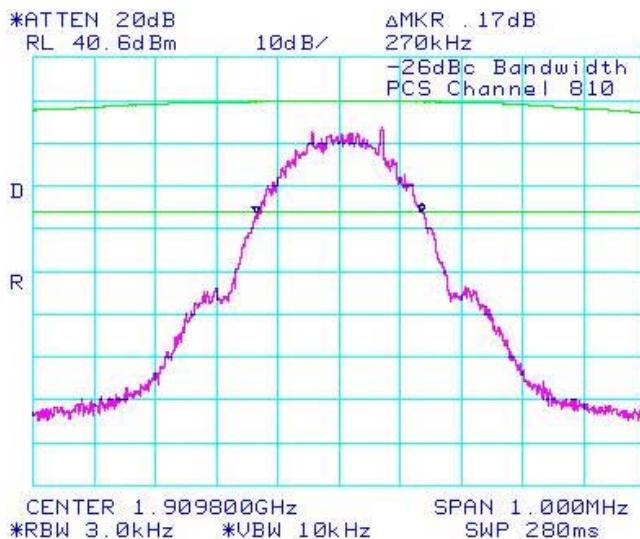
**Figure 1-21a: -26dBc bandwidth, PCS1900
 Middle Channel in GSM mode**



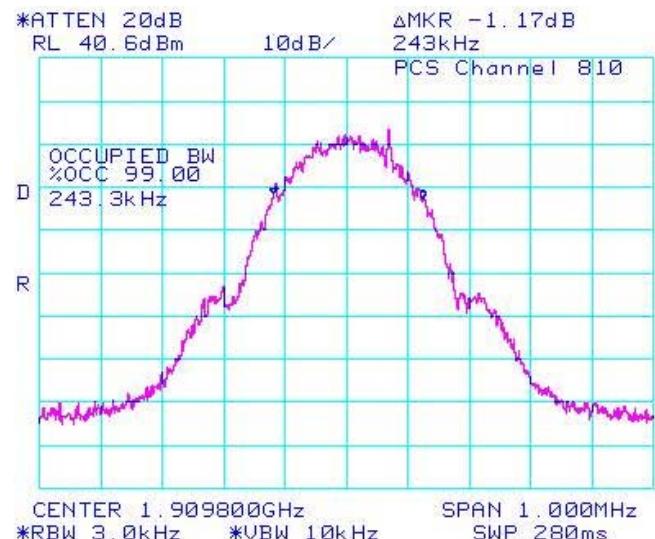
**Figure 1-22a: Occupied Bandwidth, PCS1900
 Middle Channel in GSM mode**



**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

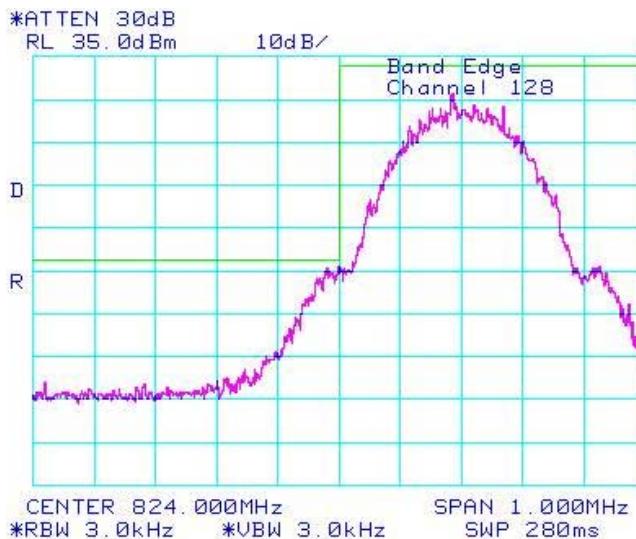


Figure 1-26a: GSM850 band High Channel Mask in GSM mode

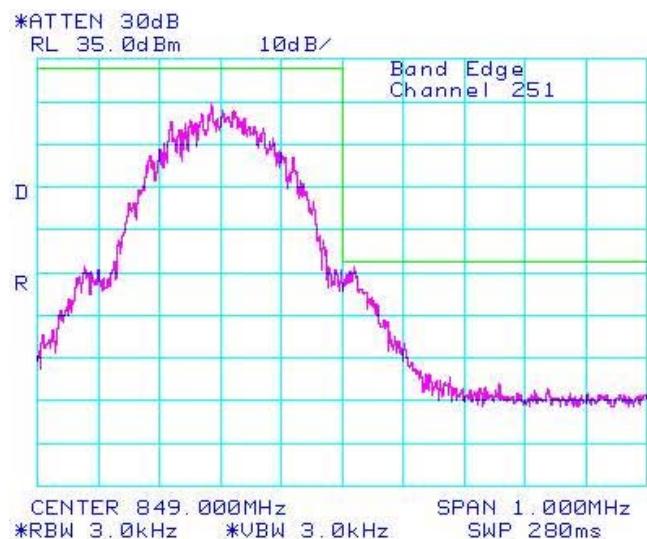


Figure 1-27a: PCS1900, Low Channel Mask in GSM mode

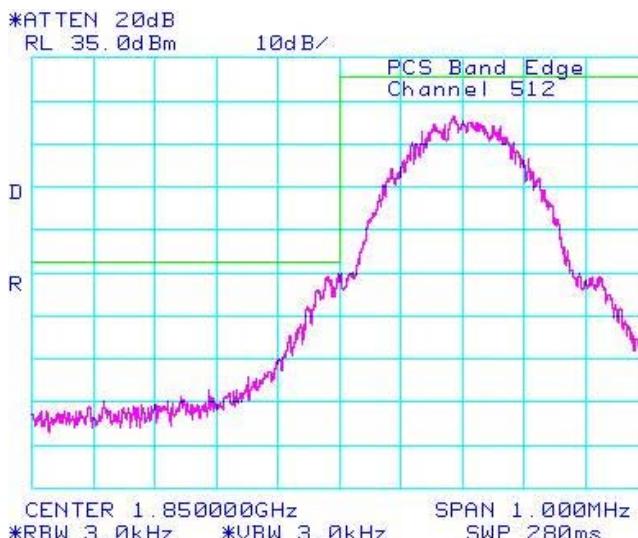
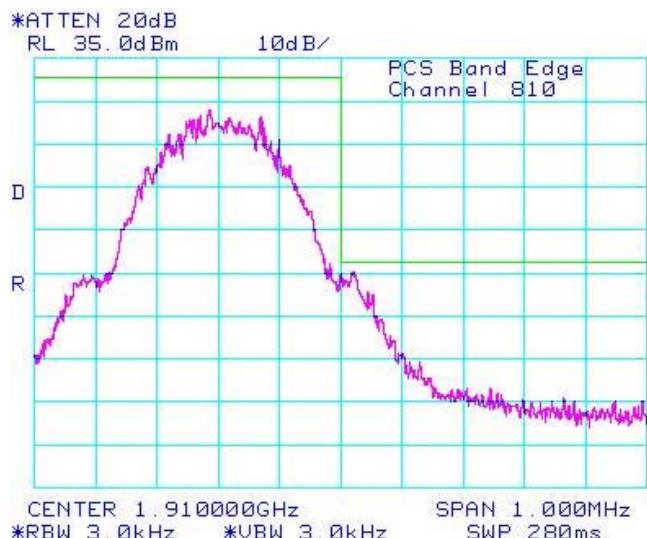


Figure 1-28a: PCS1900, High Channel Mask in GSM mode



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GSM Conducted RF Emission Test Data cont'd

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

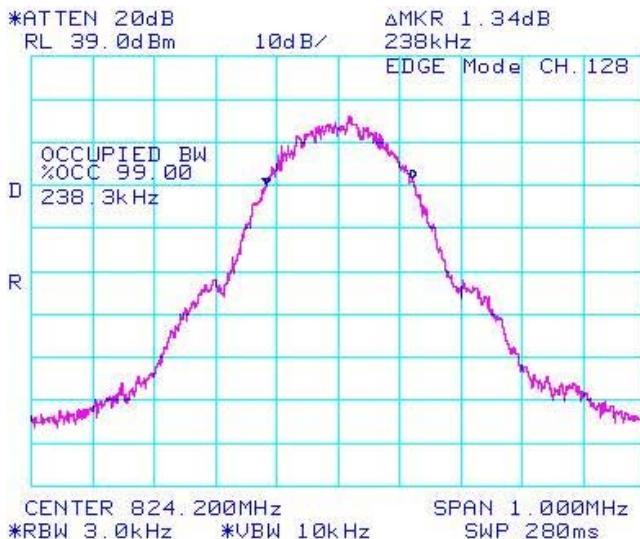


Figure 1-30a: Occupied Bandwidth, GSM850 Band, Middle Channel in EDGE mode

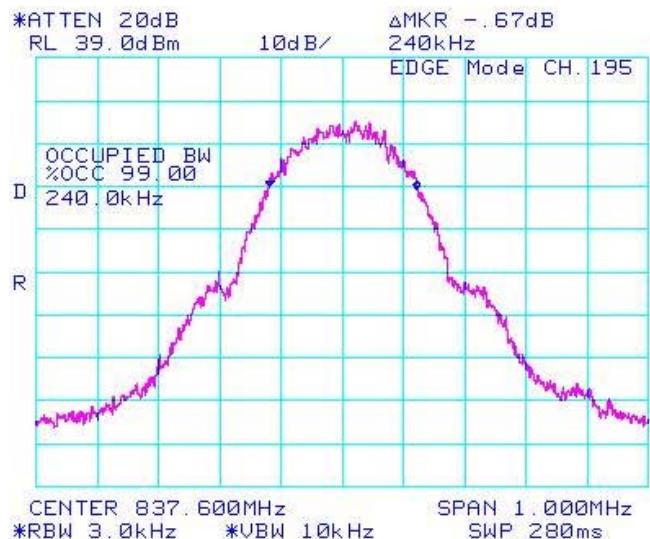


Figure 1-31a: Occupied Bandwidth, GSM850 band, High Channel in EDGE mode

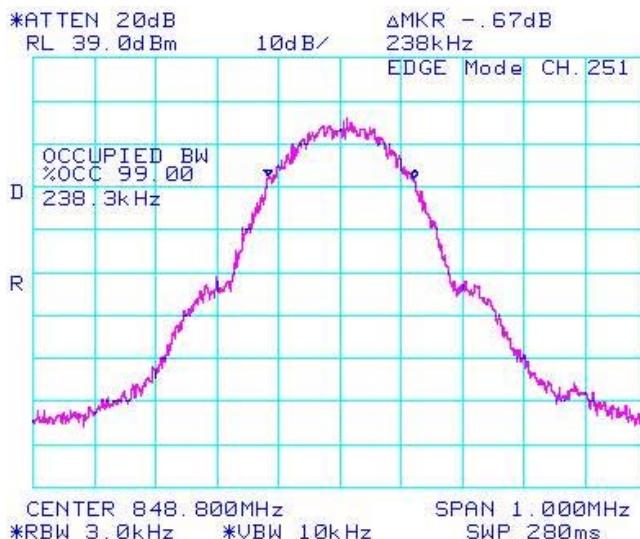
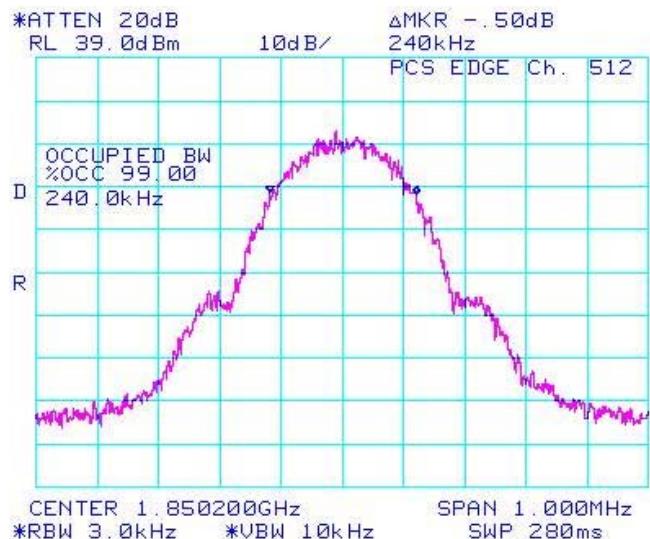


Figure 1-32a: Occupied Bandwidth, PCS1900 Band, Low Channel in EDGE mode



GSM Conducted RF Emission Test Data cont'd

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

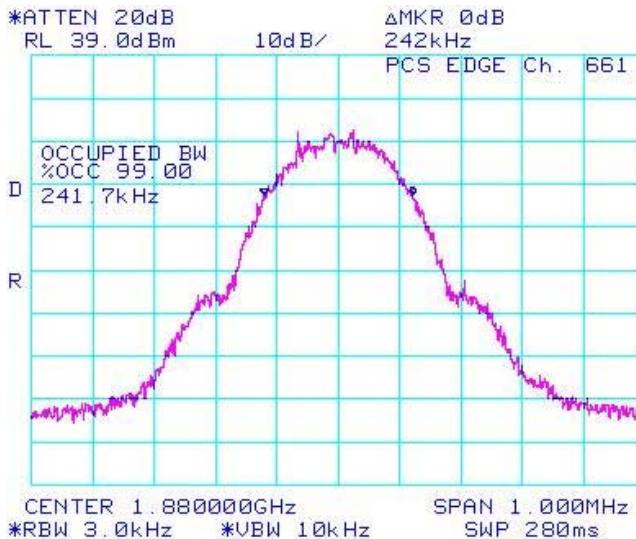


Figure 1-34a: Occupied Bandwidth, PCS1900 Band, High Channel in EDGE mode

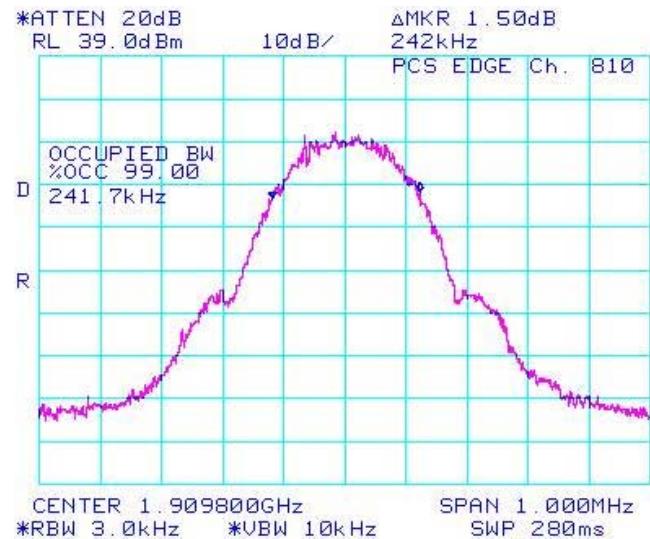


Figure 1-35a: GSM850 Band, Low Channel Mask in EDGE mode

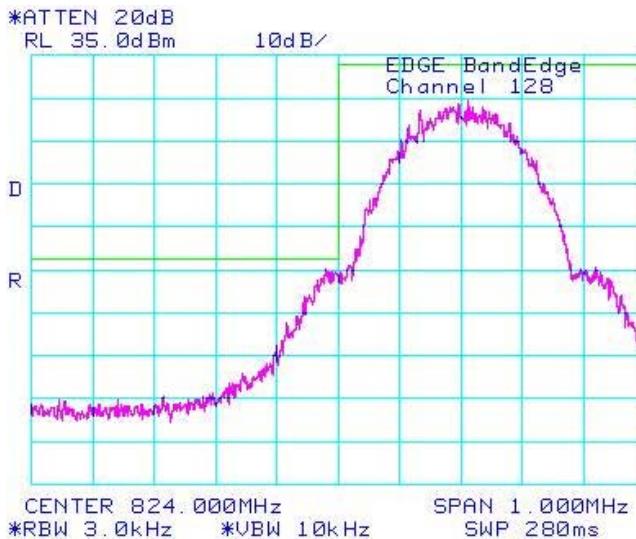
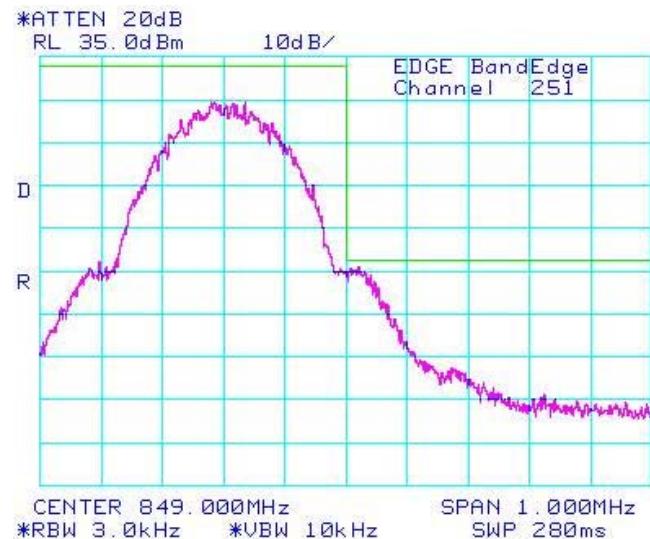


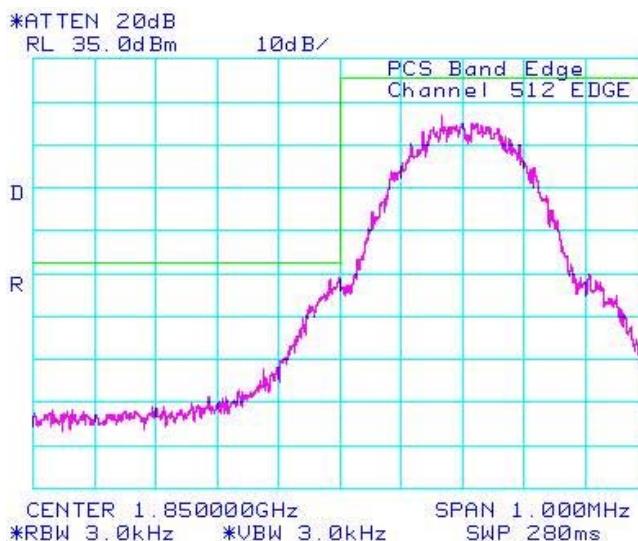
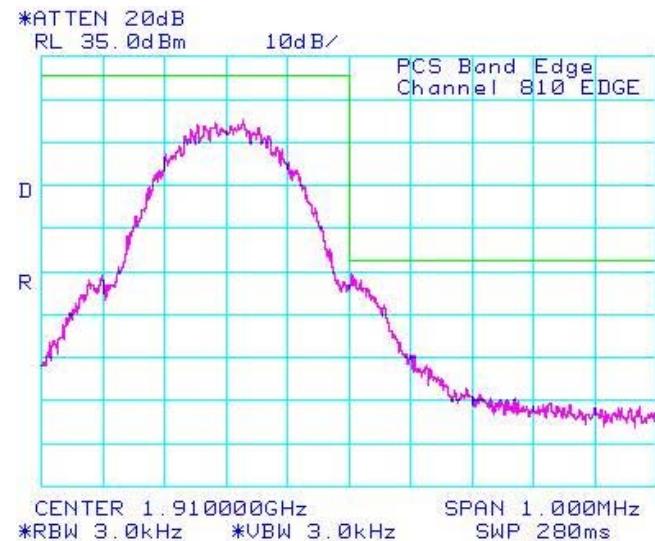
Figure 1-36a: GSM850 Band, High Channel Mask in EDGE mode



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GSM Conducted RF Emission Test Data cont'd
Figure 1-37a: PCS1900 Band, Low Channel Mask in EDGE mode

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


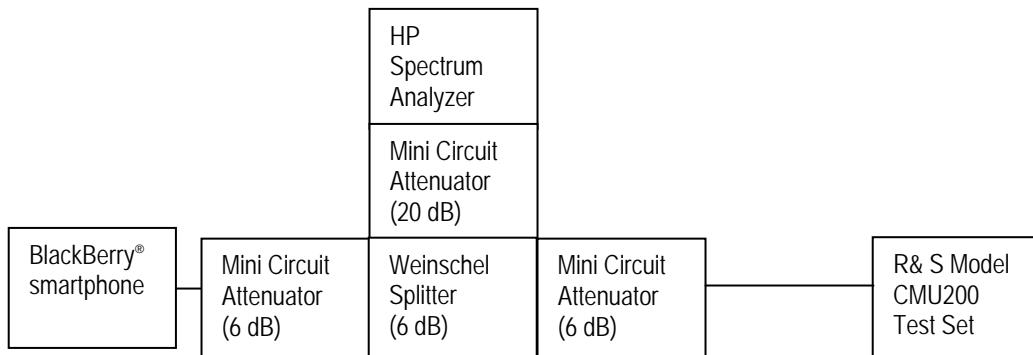
APPENDIX 1B – WCDMA CONDUCTED RF EMISSIONS TEST DATA/PLOTS

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WCDMA Conducted RF Emission Test Data

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

Test Setup Diagram



Date of Test: February 10, 2010

The environmental test conditions were:

Temperature:	24 °C
Pressure:	999 mb
Relative Humidity:	21 %

The following measurements were performed by Maurice Battler.

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WCDMA Conducted RF Emission Test Data cont'd

The conducted spurious emissions – As per 47 CFR 2.1051, CFR 24.238(a), CFR 4.202, CFR 22 Subpart H, RSS – 132 and RSS – 133 were measured from 10 MHz to 20 GHz. The EUT emissions were in the noise floor. See figures 1-1 to 1-12 for the plots of the conducted spurious emissions on Band 5 See figures 2-1 to 2-12 for the plots of the conducted spurious emissions on Band 2

-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 UMTS850 band was measured to be 4.667 MHz, and for the UMTS1900 band was measured to be 4.667 MHz 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 2 MHz was employed.

Test Data for band 5 and 2 in UMTS mode.

Band 5 Frequency (MHz)	-26dBc Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
826.4	4.667	4.192
836.4	4.658	4.175
846.6	4.667	4.175

Band 2 Frequency (MHz)	-26dBc Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
1852.4	4.667	4.183
1880.0	4.650	4.167
1907.6	4.667	4.175

Measurement Plots for band 5 and band 2 in UMTS mode

Refer to the following measurement plots for more detail.

See Figures 1-7 to 1-12 (Band 5) & 2-1 to 2-12 (Band 2) for the plots of the –26dBc Bandwidth and 99% Occupied Bandwidth.

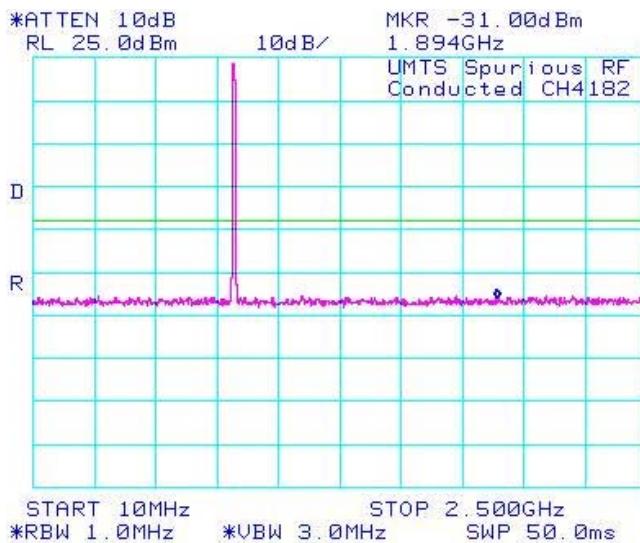
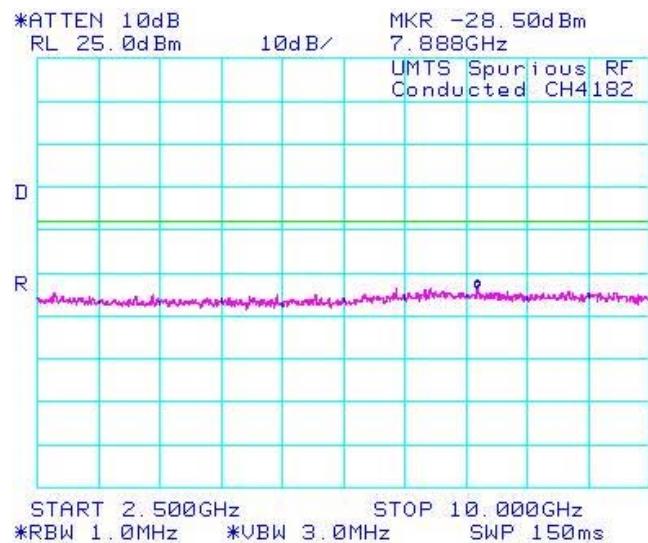
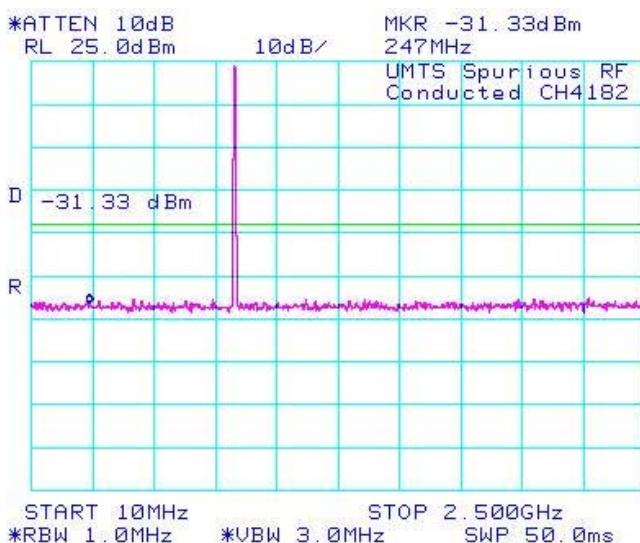
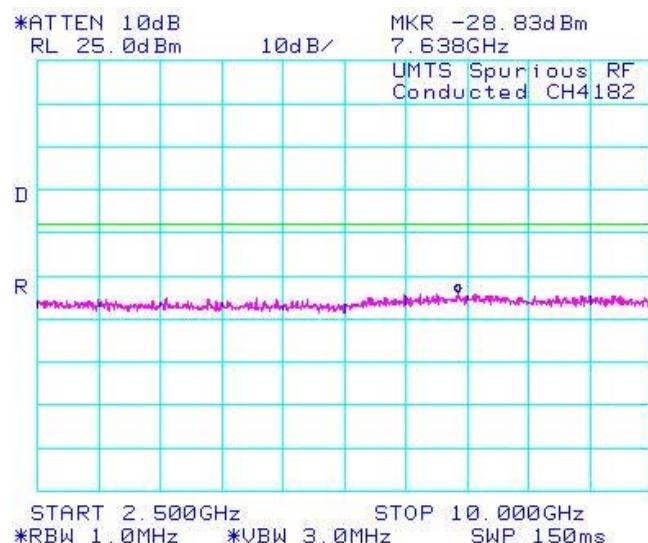
See Figures 1-13 to 1-14 & 2-13 to 2-14 for plots of the channel mask results.

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

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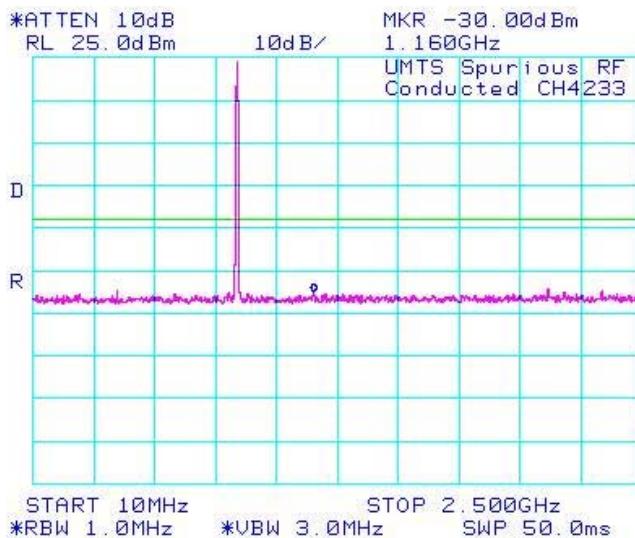
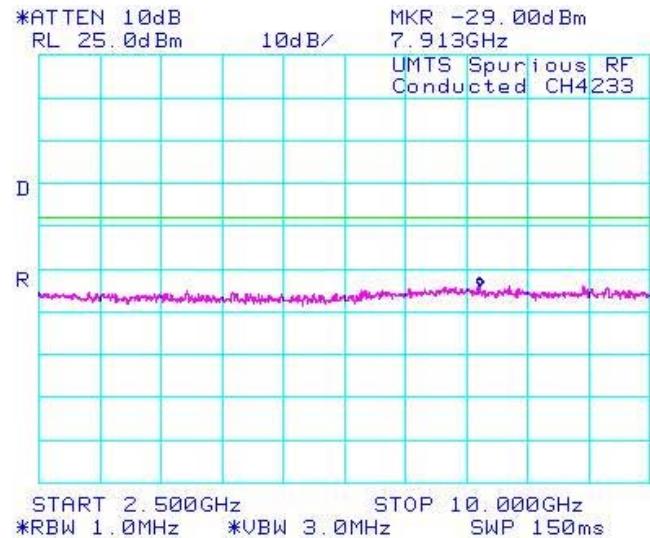
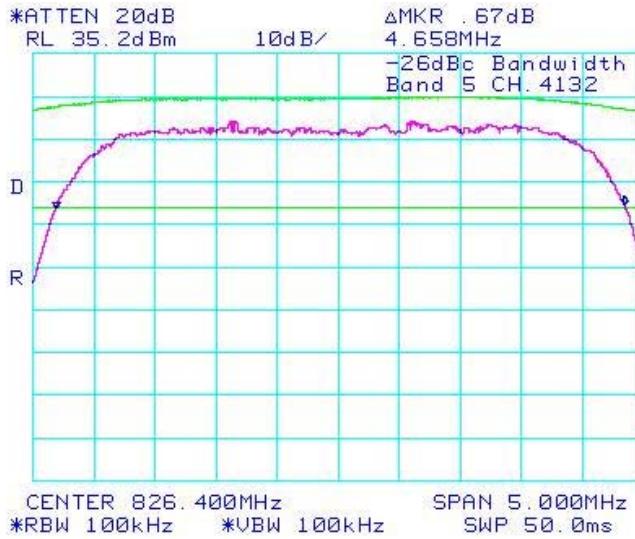
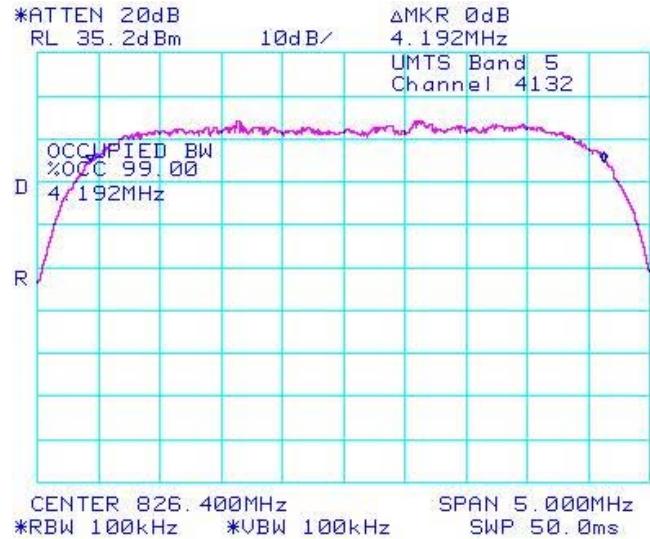
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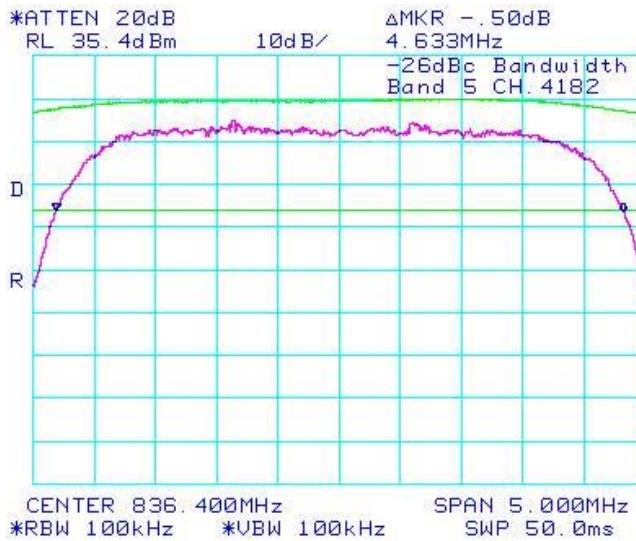
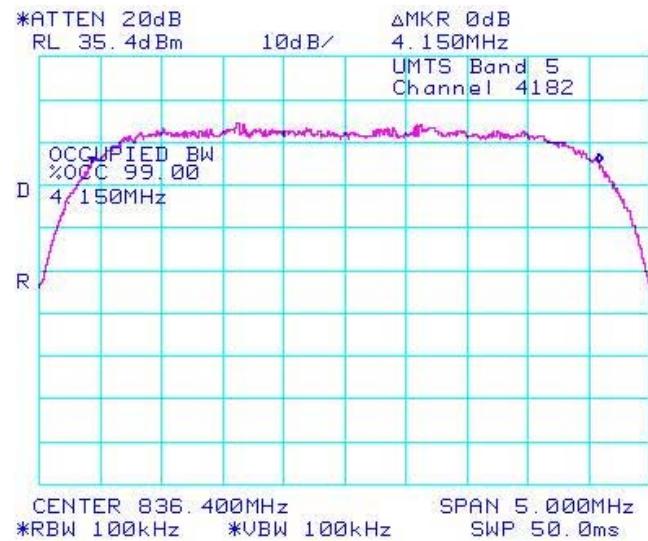
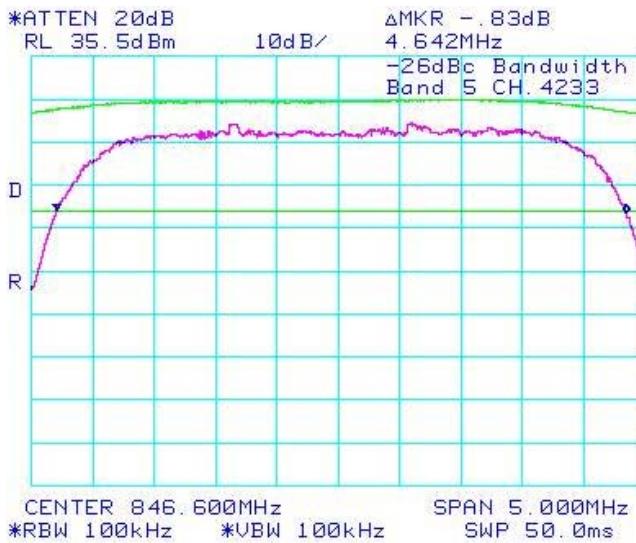
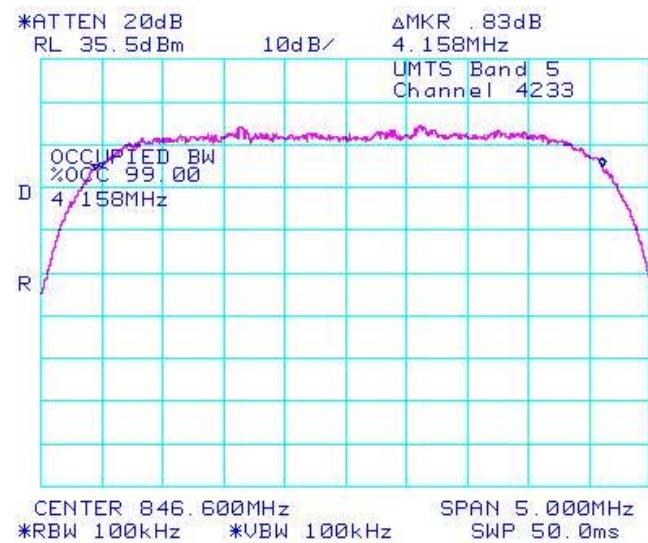
WCDMA Conducted RF Emission Test Data cont'd
Figure 1-1: UMTS band 5, Spurious Conducted Emissions, Low channel

Figure 1-2: UMTS band 5, Spurious Conducted Emissions, Low channel

Figure 1-3: UMTS band 5, Spurious Conducted Emissions, Middle Channel

Figure 1-4: UMTS band 5, Spurious Conducted Emissions, Middle Channel


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WCDMA Conducted RF Emission Test Data cont'd
Figure 1-5: UMTS band 5, Spurious Conducted Emissions, High Channel

Figure 1-6: UMTS band 5, Spurious Conducted Emissions, High Channel

Figure 1-7: -26dBc bandwidth, UMTS band 5 Low Channel

Figure 1-8: Occupied Bandwidth, UMTS band 5 Low Channel


WCDMA Conducted RF Emission Test Data cont'd
Figure 1-9: -26dBc bandwidth, UMTS band 5 Middle Channel

Figure 1-10: Occupied Bandwidth, UMTS band 5 Middle Channel

Figure 1-11: -26dBc bandwidth, UMTS band 5 High Channel

Figure 1-12: Occupied Bandwidth, UMTS band 5 High Channel


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WCDMA Conducted RF Emission Test Data cont'd

Figure 1-13: UMTS band 5, Low Channel Mask

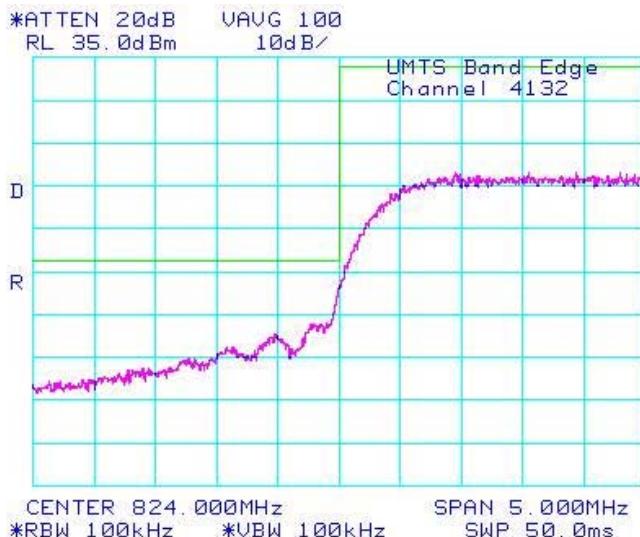
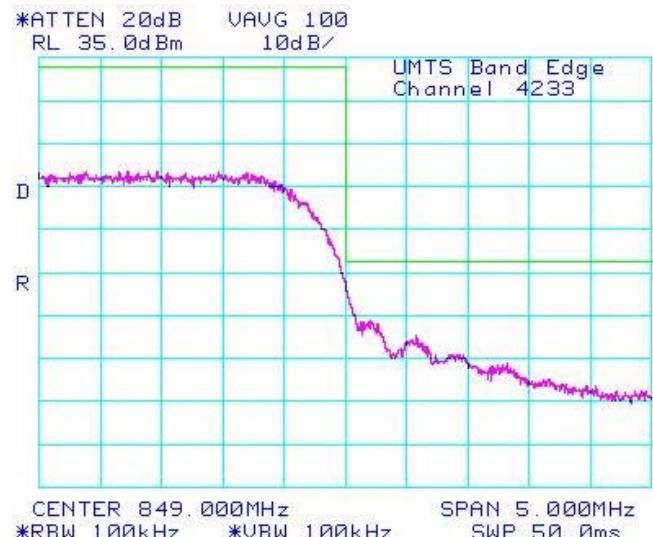


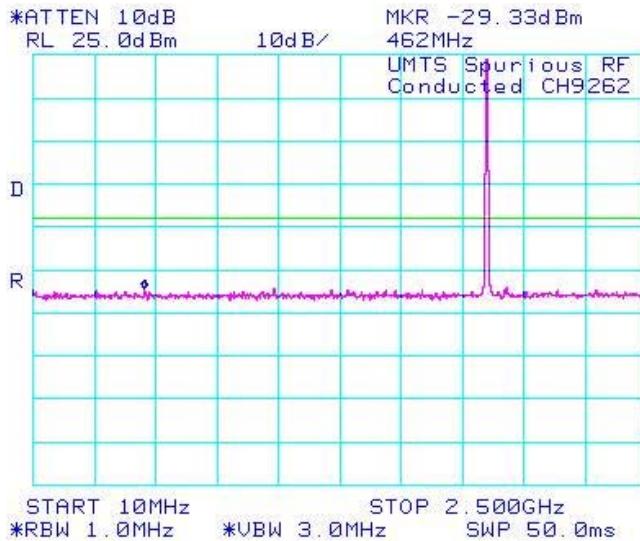
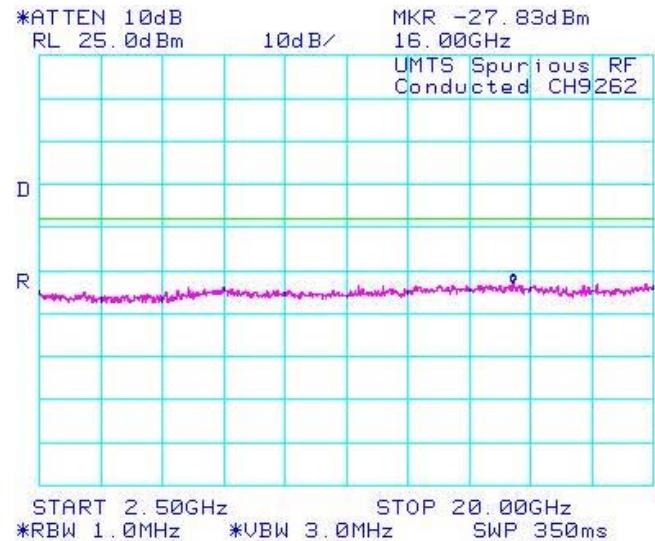
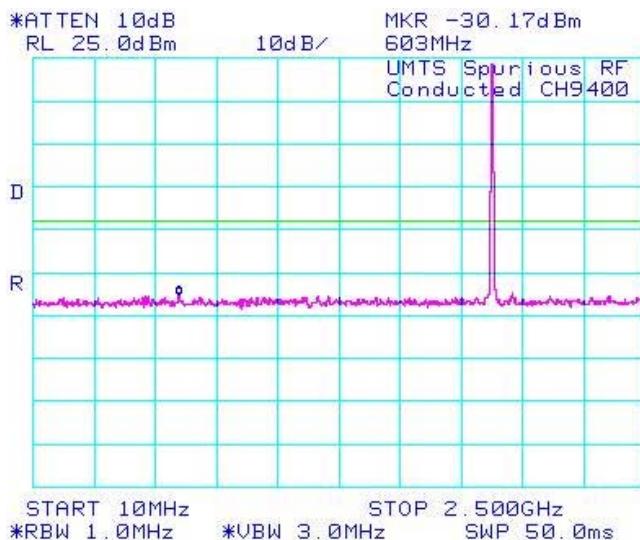
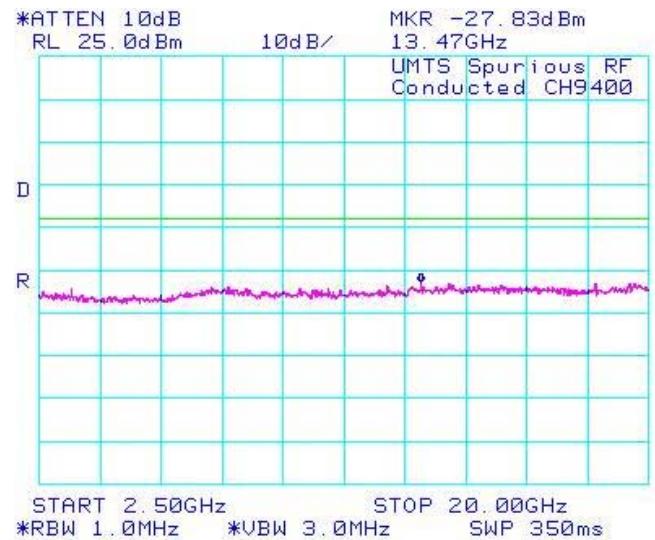
Figure 1-14: UMTS band 5, High Channel Mask



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WCDMA Conducted RF Emission Test Data cont'd
Figure 2-1: UMTS band 2, Spurious Conducted Emissions, Low channel

Figure 2-2: UMTS band 2, Spurious Conducted Emissions, Low channel

Figure 2-3: UMTS band 2, Spurious Conducted Emissions, Middle Channel

Figure 2-4: UMTS band 2, Spurious Conducted Emissions, Middle Channel


WCDMA Conducted RF Emission Test Data cont'd

Figure 2-5: UMTS band 2, Spurious Conducted Emissions, High Channel

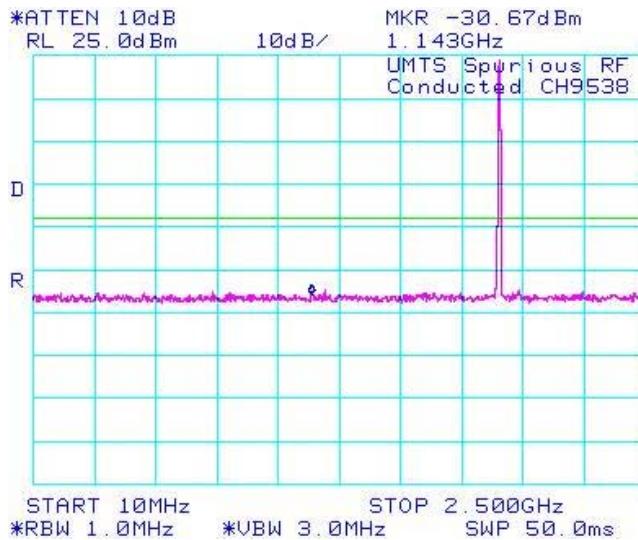


Figure 2-6: UMTS band 2, Spurious Conducted Emissions, High Channel

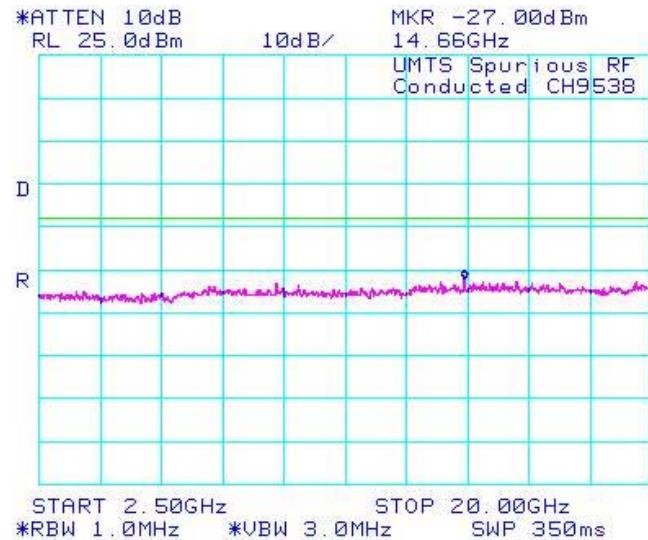


Figure 2-7: -26dBc bandwidth, UMTS band 2 Low Channel

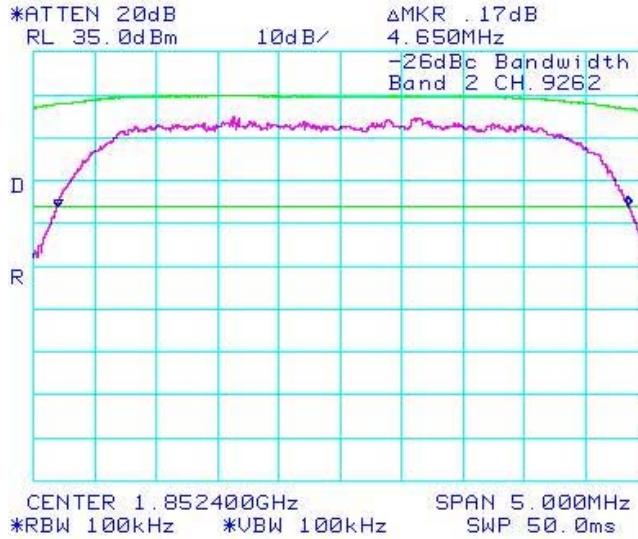
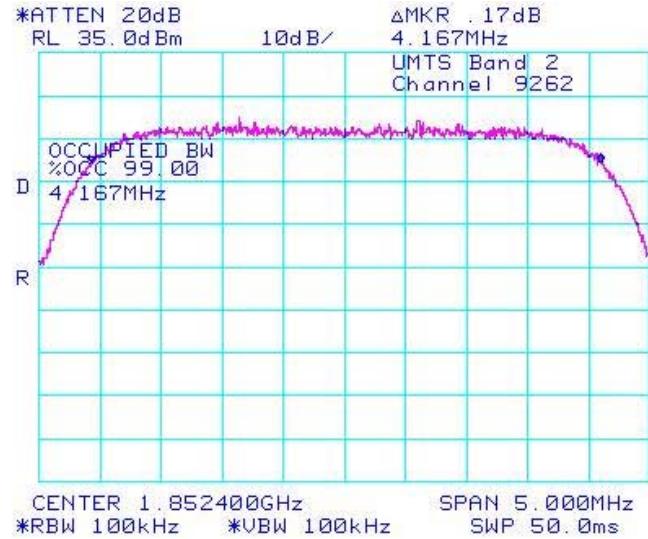


Figure 2-8: Occupied Bandwidth, UMTS band 2 Low Channel



WCDMA Conducted RF Emission Test Data cont'd

Figure 2-9b: -26dBc bandwidth, UMTS band 2 Middle Channel



Figure 2-10: Occupied Bandwidth, UMTS band 2 Middle Channel

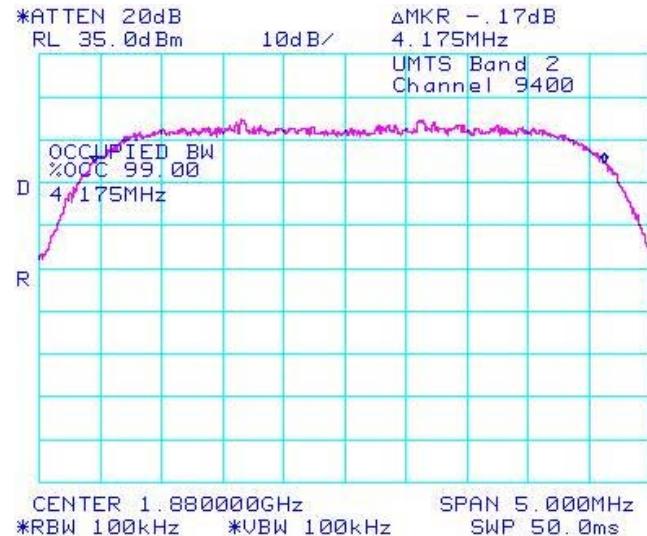


Figure 2-11: -26dBc bandwidth, UMTS band 2 High Channel

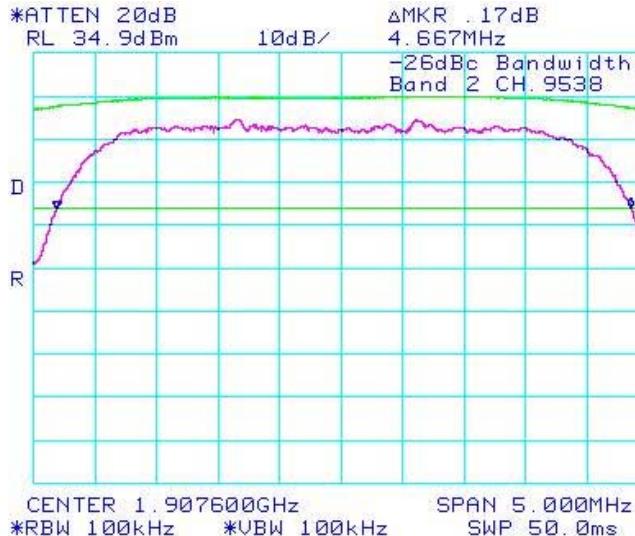
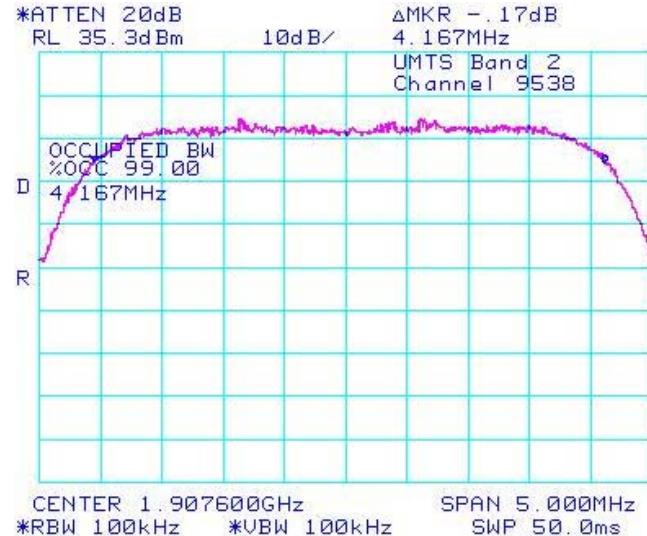
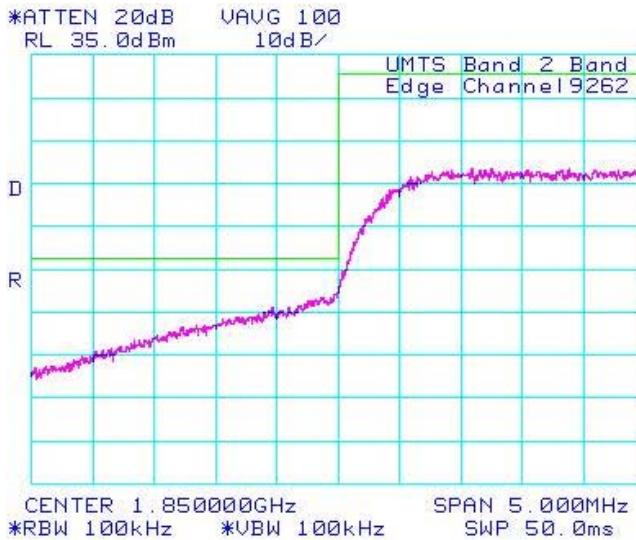


Figure 2-12: Occupied Bandwidth, UMTS band 2 High Channel



WCDMA Conducted RF Emission Test Data cont'd

Figure 2-13: UMTS band 2, Low Channel Mask

Figure 2-14: UMTS band 2, High Channel Mask


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APPENDIX 2A – GSM CONDUCTED RF OUTPUT POWER TEST DATA

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GSM Conducted RF Output Power Test Data

The following measurements were performed by Daoud Attayi.

The conducted RF output power was measured on the BlackBerry® smartphone using the Communication Tester, Rohde & Schwarz, model CMU 200. The low, middle and high channels were measured at maximum 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 32.5 dBm ± 0.5 dB for GSM850 and 29.5 dBm ± 0.5 dB for PCS.

Peak nominal output power is 31.0 dBm ± 0.5 dB for GSM850 EDGE Mode (2-timeslot uplink) and 28.5 dBm ± 0.5 dB for PCS EDGE Mode (2-timeslot uplink).

Date of Test: March 18 and May 19, 2010

The environmental test conditions were: Temperature: 22.5 – 23.5 °C
Pressure: 1002 – 1013 mb
Relative Humidity: 23 – 24 %

Channel	Frequency (MHz)	Maximum Output Power (dBm)	Maximum Output Power (Watts)	Channel	Frequency (MHz)	Maximum Output Power (dBm)	Maximum Output Power (Watts)
<u>GSM850</u>				<u>GSM850 EDGE/GPRS/GSM (2-timeslot)</u>			
128	824.2	32.4	1.74	128	824.2	30.9	1.23
189	837.6	32.5	1.78	189	837.6	31.0	1.26
251	848.8	32.6	1.82	251	848.8	31.1	1.29
<u>PCS</u>				<u>PCS EDGE/GPRS/GSM (2-timeslot)</u>			
512	1850.2	29.0	0.79	512	1850.2	28.2	0.66
661	1880.0	29.8	0.95	661	1880.0	28.3	0.68
810	1909.8	30.0	1.00	810	1909.8	28.3	0.68

APPENDIX 2B – WCDMA CONDUCTED RF OUTPUT POWER TEST DATA

	EMI Test Report for the BlackBerry® smartphone Model RCY71UW APPENDIX 2B		
Test Report No. RTS-2337-1002-51	Dates of Test February 10 to March 26 and May 17 to 19, 2010	Author Data Fahd Faisal	

WCDMA Conducted RF Output Power Test Data

The following measurements were performed by Daoud Attayi.

The conducted RF output power was measured on the BlackBerry® smartphone using the Communication Tester, Rohde & Schwarz, model CMU 200. The low, middle and high channels were measured at maximum 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 23.6 dBm ± 0.5 dB for UMTS850 and 23.0 dBm ± 0.5 dB for UMTS1900.

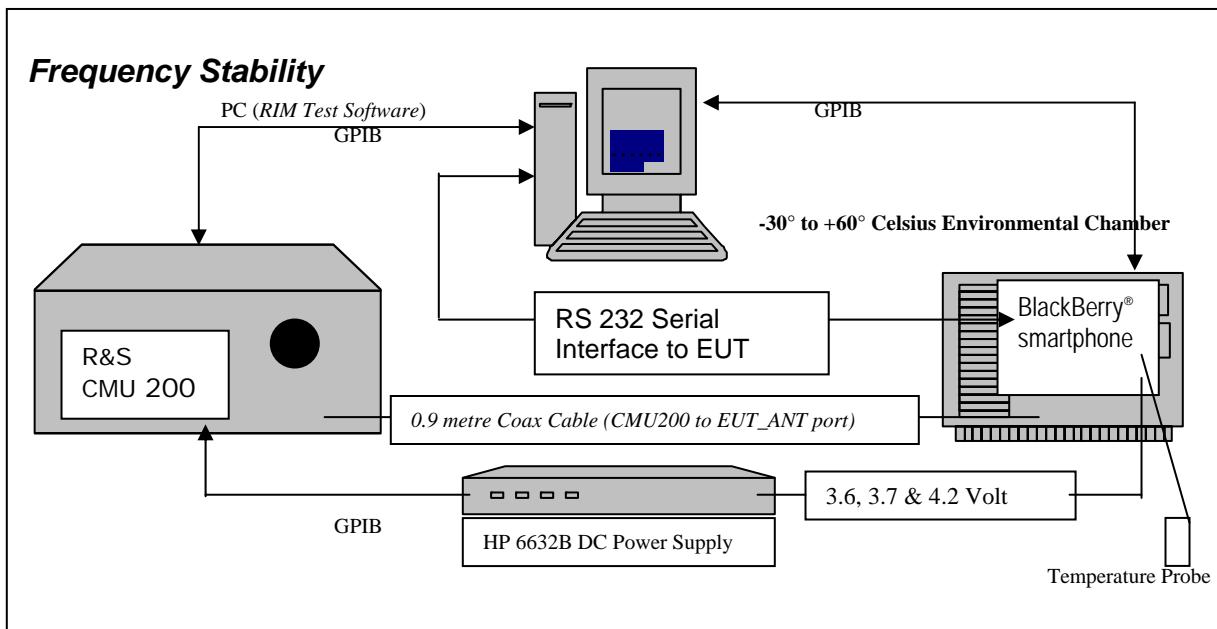
Date of Test: March 18, 2010

The environmental tests conditions were: Temperature: 22 °C
Pressure: 1002 mb
Relative Humidity: 23 %

	Band	UMTS850			UMTS1900		
	Channel	4132	4182	4233	9262	9400	9538
	Freq (MHz)	826.4	836.4	846.6	1852.4	1880.0	1907.6
Mode	Subtest	Conducted Transmit Power (dBm)			Conducted Transmit Power (dBm)		
Rel99	12.2 kbps RMC	23.77	24.01	24.02	23.16	23.25	23.49
Rel99	12.2 kbps, voice, AMR, SRB 3.4 kbps	23.74	24.00	24.02	23.18	23.23	23.44
Rel5 HSDPA	1	23.40	23.70	23.71	22.73	23.05	23.10
Rel5 HSDPA	2	23.33	23.60	23.70	22.70	23.03	23.24
Rel5 HSDPA	3	23.31	23.65	23.66	22.70	23.05	22.73
Rel5 HSDPA	4	23.31	23.58	23.67	22.77	23.02	23.20

APPENDIX 3A – GSM FREQUENCY STABILITY TEST DATA

GSM Frequency Stability Test Data



The following 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 and RSS-132, 4.3 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:



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RTS-2337-1002-51

Dates of Test
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Fahd Faisal

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 following 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 parametres 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.

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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 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 **-0.0588 PPM**.
The maximum frequency error in the PCS1900 band measured was **-0.0365 PPM**.

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

The BlackBerry® smartphone was tested on February 10, 2010.

Traffic Channel Number	GSM850 Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
128	824.20	3.6	20	-37.32	-0.0453
189	836.40	3.6	20	-48.11	-0.0575
250	848.60	3.6	20	10.14	0.0119

Traffic Channel Number	GSM850 Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
128	824.20	3.7	20	-6.65	-0.0081
189	836.40	3.7	20	7.94	0.0095
250	848.60	3.7	20	6.59	0.0078

Traffic Channel Number	GSM850 Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
128	824.20	4.2	20	25.44	0.0309
189	836.40	4.2	20	27.57	0.0330
250	848.60	4.2	20	26.67	0.0314



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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	32.03	0.0389
128	824.20	3.6	-20	-28.09	-0.0341
128	824.20	3.6	-10	26.73	0.0324
128	824.20	3.6	0	30.80	0.0374
128	824.20	3.6	10	17.24	0.0209
128	824.20	3.6	20	-37.32	-0.0453
128	824.20	3.6	30	-31.96	-0.0388
128	824.20	3.6	40	-39.58	-0.0480
128	824.20	3.6	50	7.68	0.0093
128	824.20	3.6	60	-8.20	-0.0099

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
128	824.20	3.7	-30	5.62	0.0068
128	824.20	3.7	-20	14.59	0.0177
128	824.20	3.7	-10	17.76	0.0215
128	824.20	3.7	0	-10.65	-0.0129
128	824.20	3.7	10	-22.21	-0.0269
128	824.20	3.7	20	-6.65	-0.0081
128	824.20	3.7	30	-40.36	-0.0490
128	824.20	3.7	40	-6.01	-0.0073
128	824.20	3.7	50	-9.43	-0.0114
128	824.20	3.7	60	-33.45	-0.0406

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
128	824.20	4.2	-30	-26.15	-0.0317
128	824.20	4.2	-20	33.32	0.0404
128	824.20	4.2	-10	-8.52	-0.0103
128	824.20	4.2	0	37.06	0.0450
128	824.20	4.2	10	21.57	0.0262
128	824.20	4.2	20	25.44	0.0309
128	824.20	4.2	30	-39.71	-0.0482
128	824.20	4.2	40	13.50	0.0164
128	824.20	4.2	50	-14.79	-0.0179
128	824.20	4.2	60	-22.79	-0.0277



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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	-11.56	-0.0138
189	836.40	3.6	-20	-39.58	-0.0473
189	836.40	3.6	-10	21.89	0.0262
189	836.40	3.6	0	15.88	0.0190
189	836.40	3.6	10	-11.36	-0.0136
189	836.40	3.6	20	-48.11	-0.0575
189	836.40	3.6	30	-36.87	-0.0441
189	836.40	3.6	40	-47.01	-0.0562
189	836.40	3.6	50	10.07	0.0120
189	836.40	3.6	60	-18.92	-0.0226

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
189	836.40	3.7	-30	15.43	0.0184
189	836.40	3.7	-20	22.15	0.0265
189	836.40	3.7	-10	22.92	0.0274
189	836.40	3.7	0	8.39	0.0100
189	836.40	3.7	10	-18.92	-0.0226
189	836.40	3.7	20	7.94	0.0095
189	836.40	3.7	30	-39.32	-0.0470
189	836.40	3.7	40	10.98	0.0131
189	836.40	3.7	50	9.17	0.0110
189	836.40	3.7	60	-23.18	-0.0277

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
189	836.40	4.2	-30	-22.41	-0.0268
189	836.40	4.2	-20	43.78	0.0523
189	836.40	4.2	-10	10.07	0.0120
189	836.40	4.2	0	6.52	0.0078
189	836.40	4.2	10	24.73	0.0296
189	836.40	4.2	20	27.57	0.0330
189	836.40	4.2	30	-37.19	-0.0445
189	836.40	4.2	40	20.02	0.0239
189	836.40	4.2	50	-10.20	-0.0122
189	836.40	4.2	60	-13.11	-0.0157



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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	14.59	0.0172
250	848.60	3.6	-20	-46.23	-0.0545
250	848.60	3.6	-10	19.50	0.0230
250	848.60	3.6	0	-7.04	-0.0083
250	848.60	3.6	10	-19.76	-0.0233
250	848.60	3.6	20	10.14	0.0119
250	848.60	3.6	30	-42.04	-0.0495
250	848.60	3.6	40	-49.91	-0.0588
250	848.60	3.6	50	9.36	0.0110
250	848.60	3.6	60	-25.57	-0.0301

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
250	848.60	3.7	-30	24.73	0.0291
250	848.60	3.7	-20	18.02	0.0212
250	848.60	3.7	-10	23.57	0.0278
250	848.60	3.7	0	-8.91	-0.0105
250	848.60	3.7	10	-20.99	-0.0247
250	848.60	3.7	20	6.59	0.0078
250	848.60	3.7	30	-37.26	-0.0439
250	848.60	3.7	40	11.88	0.0140
250	848.60	3.7	50	8.72	0.0103
250	848.60	3.7	60	-24.60	-0.0290

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
250	848.60	4.2	-30	-25.76	-0.0304
250	848.60	4.2	-20	44.94	0.0530
250	848.60	4.2	-10	10.14	0.0119
250	848.60	4.2	0	-7.49	-0.0088
250	848.60	4.2	10	27.18	0.0320
250	848.60	4.2	20	26.67	0.0314
250	848.60	4.2	30	-41.26	-0.0486
250	848.60	4.2	40	20.34	0.0240
250	848.60	4.2	50	-11.43	-0.0135
250	848.60	4.2	60	-13.56	-0.0160

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

Date of Test: February 11, 2010

Traffic Channel Number	PCS Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
512	1850.2	3.6	20	23.12	0.0125
661	1880.0	3.6	20	-37.32	-0.0199
810	1909.8	3.6	20	-34.48	-0.0181

Traffic Channel Number	PCS Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
512	1850.2	3.7	20	-26.54	-0.0143
661	1880.0	3.7	20	-36.10	-0.0192
810	1909.8	3.7	20	-36.74	-0.0192

Traffic Channel Number	PCS Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
512	1850.2	4.2	20	31.51	0.0170
661	1880.0	4.2	20	22.86	0.0122
810	1909.8	4.2	20	32.93	0.0172



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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	-32.03	-0.0173
512	1850.2	3.6	-20	-20.15	-0.0109
512	1850.2	3.6	-10	-45.91	-0.0248
512	1850.2	3.6	0	-25.05	-0.0135
512	1850.2	3.6	10	-58.70	-0.0317
512	1850.2	3.6	20	23.12	0.0125
512	1850.2	3.6	30	-33.90	-0.0183
512	1850.2	3.6	40	19.05	0.0103
512	1850.2	3.6	50	-40.74	-0.0220
512	1850.2	3.6	60	-37.13	-0.0201

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
512	1850.2	3.7	-30	33.96	0.0184
512	1850.2	3.7	-20	18.08	0.0098
512	1850.2	3.7	-10	-23.44	-0.0127
512	1850.2	3.7	0	-25.18	-0.0136
512	1850.2	3.7	10	-48.49	-0.0262
512	1850.2	3.7	20	-26.54	-0.0143
512	1850.2	3.7	30	-45.72	-0.0247
512	1850.2	3.7	40	-38.10	-0.0206
512	1850.2	3.7	50	-54.37	-0.0294
512	1850.2	3.7	60	-26.22	-0.0142

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
512	1850.2	4.2	-30	-28.67	-0.0155
512	1850.2	4.2	-20	45.52	0.0246
512	1850.2	4.2	-10	19.63	0.0106
512	1850.2	4.2	0	-29.38	-0.0159
512	1850.2	4.2	10	32.03	0.0173
512	1850.2	4.2	20	31.51	0.0170
512	1850.2	4.2	30	-43.20	-0.0233
512	1850.2	4.2	40	-27.70	-0.0150
512	1850.2	4.2	50	28.73	0.0155
512	1850.2	4.2	60	11.82	0.0064

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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	-51.14	-0.0272
661	1880	3.6	-20	-33.96	-0.0181
661	1880	3.6	-10	-42.49	-0.0226
661	1880	3.6	0	-27.83	-0.0148
661	1880	3.6	10	-40.16	-0.0214
661	1880	3.6	20	-37.32	-0.0199
661	1880	3.6	30	-47.52	-0.0253
661	1880	3.6	40	-42.68	-0.0227
661	1880	3.6	50	-64.38	-0.0342
661	1880	3.6	60	-27.77	-0.0148

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
661	1880	3.7	-30	-24.54	-0.0131
661	1880	3.7	-20	-47.33	-0.0252
661	1880	3.7	-10	-56.05	-0.0298
661	1880	3.7	0	-55.47	-0.0295
661	1880	3.7	10	-65.35	-0.0348
661	1880	3.7	20	-36.10	-0.0192
661	1880	3.7	30	-49.53	-0.0263
661	1880	3.7	40	-51.79	-0.0275
661	1880	3.7	50	-64.38	-0.0342
661	1880	3.7	60	-44.17	-0.0235

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
661	1880	4.2	-30	15.69	0.0083
661	1880	4.2	-20	16.34	0.0087
661	1880	4.2	-10	-26.15	-0.0139
661	1880	4.2	0	-51.46	-0.0274
661	1880	4.2	10	-15.63	-0.0083
661	1880	4.2	20	22.86	0.0122
661	1880	4.2	30	-52.17	-0.0278
661	1880	4.2	40	-41.71	-0.0222
661	1880	4.2	50	-13.30	-0.0071
661	1880	4.2	60	-27.83	-0.0148

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PCS1900 Results: channel 810 @ maximum transmitted power

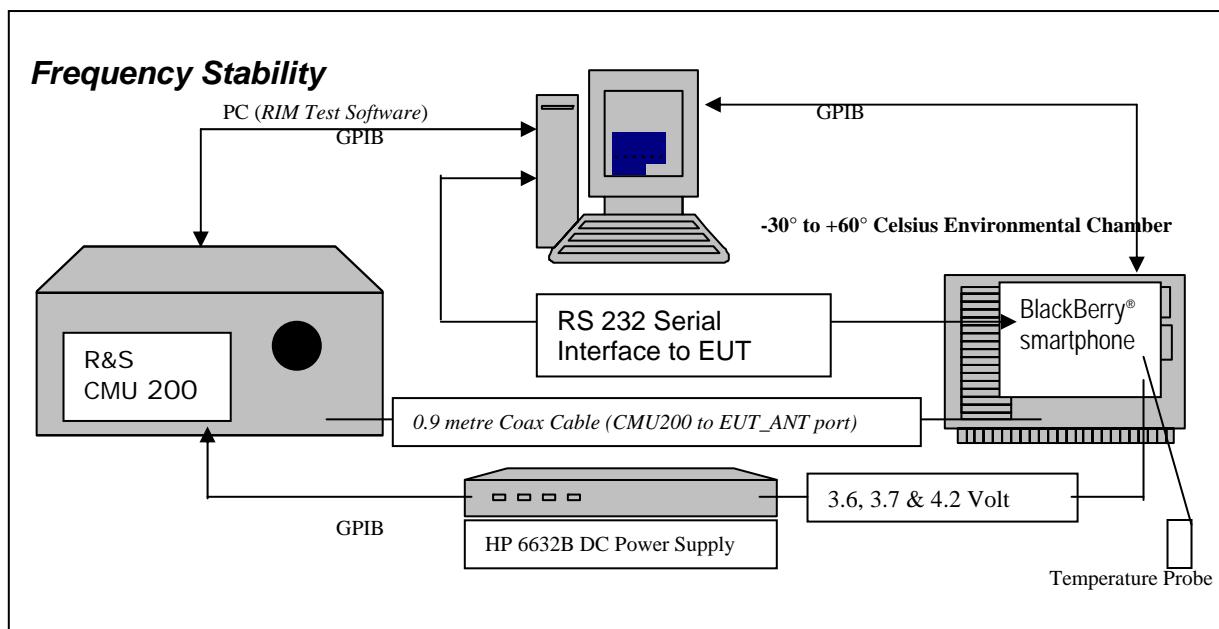
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
810	1909.8	3.6	-30	-31.38	-0.0164
810	1909.8	3.6	-20	-13.37	-0.0070
810	1909.8	3.6	-10	-29.90	-0.0157
810	1909.8	3.6	0	-20.08	-0.0105
810	1909.8	3.6	10	-34.80	-0.0182
810	1909.8	3.6	20	-34.48	-0.0181
810	1909.8	3.6	30	-58.95	-0.0309
810	1909.8	3.6	40	-49.46	-0.0259
810	1909.8	3.6	50	-64.12	-0.0336
810	1909.8	3.6	60	-41.26	-0.0216

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
810	1909.8	3.7	-30	-14.46	-0.0076
810	1909.8	3.7	-20	-19.05	-0.0100
810	1909.8	3.7	-10	-32.67	-0.0171
810	1909.8	3.7	0	-24.92	-0.0130
810	1909.8	3.7	10	-40.81	-0.0214
810	1909.8	3.7	20	-36.74	-0.0192
810	1909.8	3.7	30	-50.56	-0.0265
810	1909.8	3.7	40	-56.56	-0.0296
810	1909.8	3.7	50	-69.67	-0.0365
810	1909.8	3.7	60	-45.33	-0.0237

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
810	1909.8	4.2	-30	15.37	0.0080
810	1909.8	4.2	-20	40.29	0.0211
810	1909.8	4.2	-10	19.57	0.0102
810	1909.8	4.2	0	-21.63	-0.0113
810	1909.8	4.2	10	40.16	0.0210
810	1909.8	4.2	20	32.93	0.0172
810	1909.8	4.2	30	-51.66	-0.0270
810	1909.8	4.2	40	-35.77	-0.0187
810	1909.8	4.2	50	-22.02	-0.0115
810	1909.8	4.2	60	-27.89	-0.0146

APPENDIX 3B – WCDMA FREQUENCY STABILITY TEST DATA

WCDMA Frequency Stability Test Data



The following 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 27.54, CFR 47 and RSS-139, 6.3 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:

UMTS1700 Frequency (MHz)	Cable loss (dB)
1712.4	0.90
1732.6	0.90
1752.6	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 following 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 parametres 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 1712.4, 1732.6 and 1752.5 MHz for the UMTS1700 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.

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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 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 UMTS band 5 measured was **-0.0275 PPM**.
The maximum frequency error in the UMTS band 2 measured was **-0.0235 PPM**.



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Test Report No.
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Fahd Faisal

UMTS Band 5 Channel results: channels 4132, 4182 and 4233 @ 20°C maximum transmitted power

The BlackBerry® smartphone was tested on February 17, 2010.

Traffic Channel Number	UMTS band 5 Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
4132	826.4	3.6	20	-13.67	-0.0165
4182	836.4	3.6	20	-8.21	-0.0098
4233	846.6	3.6	20	-8.80	-0.0104

Traffic Channel Number	UMTS band 5 Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
4132	826.4	3.7	20	-13.00	-0.0157
4182	836.4	3.7	20	3.30	0.0039
4233	846.6	3.7	20	-8.47	-0.0100

Traffic Channel Number	UMTS band 5 Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
4132	826.4	4.2	20	-4.33	-0.0052
4182	836.4	4.2	20	-9.51	-0.0114
4233	846.6	4.2	20	-15.76	-0.0186



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Test Report No.
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Fahd Faisal

UMTS band 5 Results: channel 4132 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
4132	826.4	3.6	-30	-16.83	-0.0204
4132	826.4	3.6	-20	-14.07	-0.0170
4132	826.4	3.6	-10	-16.40	-0.0198
4132	826.4	3.6	0	-4.33	-0.0052
4132	826.4	3.6	10	-11.60	-0.0140
4132	826.4	3.6	20	-13.67	-0.0165
4132	826.4	3.6	30	-11.72	-0.0142
4132	826.4	3.6	40	-16.91	-0.0205
4132	826.4	3.6	50	-18.51	-0.0224
4132	826.4	3.6	60	-18.49	-0.0224

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
4132	826.4	3.7	-30	-15.21	-0.0184
4132	826.4	3.7	-20	-7.86	-0.0095
4132	826.4	3.7	-10	-15.64	-0.0189
4132	826.4	3.7	0	6.85	0.0083
4132	826.4	3.7	10	8.96	0.0108
4132	826.4	3.7	20	-13.00	-0.0157
4132	826.4	3.7	30	3.52	0.0043
4132	826.4	3.7	40	-3.14	-0.0038
4132	826.4	3.7	50	-16.83	-0.0204
4132	826.4	3.7	60	-5.23	-0.0063

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
4132	826.4	4.2	-30	-14.50	-0.0175
4132	826.4	4.2	-20	-15.12	-0.0183
4132	826.4	4.2	-10	-15.01	-0.0182
4132	826.4	4.2	0	5.13	0.0062
4132	826.4	4.2	10	-4.26	-0.0052
4132	826.4	4.2	20	-4.78	-0.0058
4132	826.4	4.2	30	-4.33	-0.0052
4132	826.4	4.2	40	-14.47	-0.0175
4132	826.4	4.2	50	-12.51	-0.0151
4132	826.4	4.2	60	-7.60	-0.0092

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UMTS band 5 Results: channel 4182 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
4182	836.4	3.6	-30	-15.81	-0.0189
4182	836.4	3.6	-20	-3.25	-0.0039
4182	836.4	3.6	-10	-8.77	-0.0105
4182	836.4	3.6	0	6.13	0.0073
4182	836.4	3.6	10	7.16	0.0086
4182	836.4	3.6	20	-8.21	-0.0098
4182	836.4	3.6	30	5.40	0.0065
4182	836.4	3.6	40	-21.01	-0.0251
4182	836.4	3.6	50	-34.07	-0.0407
4182	836.4	3.6	60	-5.77	-0.0069

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
4182	836.4	3.7	-30	-14.82	-0.0177
4182	836.4	3.7	-20	-11.89	-0.0142
4182	836.4	3.7	-10	-7.64	-0.0091
4182	836.4	3.7	0	-4.61	-0.0055
4182	836.4	3.7	10	3.97	0.0047
4182	836.4	3.7	20	3.30	0.0039
4182	836.4	3.7	30	-12.63	-0.0151
4182	836.4	3.7	40	-13.47	-0.0161
4182	836.4	3.7	50	-5.42	-0.0065
4182	836.4	3.7	60	-8.85	-0.0106

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
4182	836.4	4.2	-30	-7.77	-0.0093
4182	836.4	4.2	-20	-15.08	-0.0180
4182	836.4	4.2	-10	6.87	0.0082
4182	836.4	4.2	0	-4.10	-0.0049
4182	836.4	4.2	10	-6.32	-0.0076
4182	836.4	4.2	20	-9.55	-0.0114
4182	836.4	4.2	30	-9.51	-0.0114
4182	836.4	4.2	40	-15.40	-0.0184
4182	836.4	4.2	50	-16.92	-0.0202
4182	836.4	4.2	60	-16.82	-0.0201



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 Fahd Faisal

UMTS band 5 Results: channel 4233 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
4233	846.6	3.6	-30	-13.96	-0.0165
4233	846.6	3.6	-20	-6.74	-0.0080
4233	846.6	3.6	-10	-7.86	-0.0093
4233	846.6	3.6	0	-10.16	-0.0120
4233	846.6	3.6	10	-11.18	-0.0132
4233	846.6	3.6	20	-8.80	-0.0104
4233	846.6	3.6	30	-14.95	-0.0177
4233	846.6	3.6	40	-14.45	-0.0171
4233	846.6	3.6	50	-15.37	-0.0182
4233	846.6	3.6	60	-20.22	-0.0239

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
4233	846.6	3.7	-30	5.69	0.0067
4233	846.6	3.7	-20	-6.74	-0.0080
4233	846.6	3.7	-10	4.36	0.0052
4233	846.6	3.7	0	-15.20	-0.0180
4233	846.6	3.7	10	3.60	0.0043
4233	846.6	3.7	20	-8.47	-0.0100
4233	846.6	3.7	30	-6.55	-0.0077
4233	846.6	3.7	40	-13.08	-0.0154
4233	846.6	3.7	50	-13.82	-0.0163
4233	846.6	3.7	60	-13.23	-0.0156

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
4233	846.6	4.2	-30	-5.48	-0.0065
4233	846.6	4.2	-20	-16.28	-0.0192
4233	846.6	4.2	-10	-11.12	-0.0131
4233	846.6	4.2	0	-3.07	-0.0036
4233	846.6	4.2	10	4.79	0.0057
4233	846.6	4.2	20	-15.91	-0.0188
4233	846.6	4.2	30	-15.76	-0.0186
4233	846.6	4.2	40	-23.32	-0.0275
4233	846.6	4.2	50	-5.69	-0.0067
4233	846.6	4.2	60	-13.21	-0.0156

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UMTS band 2 Channel results: channels 9262, 9400, & 9538 @ 20°C maximum transmitted power

Date of Test: February 10, 2010

Traffic Channel Number	UMTS1900 Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
9262	1852.4	3.6	20	-11.98	-0.0065
9400	1880.0	3.6	20	-23.79	-0.0127
9538	1907.6	3.6	20	-24.63	-0.0129

Traffic Channel Number	UMTS1900 Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
9262	1852.4	3.7	20	-20.83	-0.0112
9400	1880.0	3.7	20	-24.69	-0.0131
9538	1907.6	3.7	20	-25.85	-0.0136

Traffic Channel Number	UMTS1900 Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
9262	1852.4	4.2	20	-24.66	-0.0133
9400	1880.0	4.2	20	-18.37	-0.0098
9538	1907.6	4.2	20	-26.72	-0.0140



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 Fahd Faisal

UMTS band 2 Results: channel 9262 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
9262	1852.4	3.6	-30	-25.47	-0.0137
9262	1852.4	3.6	-20	-16.91	-0.0091
9262	1852.4	3.6	-10	-17.58	-0.0095
9262	1852.4	3.6	0	16.08	0.0087
9262	1852.4	3.6	10	15.95	0.0086
9262	1852.4	3.6	20	-11.98	-0.0065
9262	1852.4	3.6	30	-23.15	-0.0125
9262	1852.4	3.6	40	-25.44	-0.0137
9262	1852.4	3.6	50	-28.15	-0.0152
9262	1852.4	3.6	60	-26.73	-0.0144

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
9262	1852.4	3.7	-30	-24.66	-0.0133
9262	1852.4	3.7	-20	-9.89	-0.0053
9262	1852.4	3.7	-10	-7.28	-0.0039
9262	1852.4	3.7	0	19.00	0.0103
9262	1852.4	3.7	10	14.54	0.0079
9262	1852.4	3.7	20	-20.83	-0.0112
9262	1852.4	3.7	30	-16.88	-0.0091
9262	1852.4	3.7	40	-21.33	-0.0115
9262	1852.4	3.7	50	-24.41	-0.0132
9262	1852.4	3.7	60	-23.41	-0.0126

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
9262	1852.4	4.2	-30	-22.61	-0.0122
9262	1852.4	4.2	-20	8.76	0.0047
9262	1852.4	4.2	-10	-11.66	-0.0063
9262	1852.4	4.2	0	12.25	0.0066
9262	1852.4	4.2	10	-15.49	-0.0084
9262	1852.4	4.2	20	-24.66	-0.0133
9262	1852.4	4.2	30	-22.46	-0.0121
9262	1852.4	4.2	40	-23.42	-0.0126
9262	1852.4	4.2	50	-23.91	-0.0129
9262	1852.4	4.2	60	-14.34	-0.0077



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UMTS band 2 Results: channel 9400 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
9400	1880.0	3.6	-30	-22.23	-0.0118
9400	1880.0	3.6	-20	-13.03	-0.0069
9400	1880.0	3.6	-10	-27.15	-0.0144
9400	1880.0	3.6	0	13.41	0.0071
9400	1880.0	3.6	10	-11.05	-0.0059
9400	1880.0	3.6	20	-23.79	-0.0127
9400	1880.0	3.6	30	-24.03	-0.0128
9400	1880.0	3.6	40	-31.91	-0.0170
9400	1880.0	3.6	50	-36.90	-0.0196
9400	1880.0	3.6	60	-44.10	-0.0235

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
9400	1880.0	3.7	-30	-14.53	-0.0077
9400	1880.0	3.7	-20	-17.84	-0.0095
9400	1880.0	3.7	-10	-9.34	-0.0050
9400	1880.0	3.7	0	-13.50	-0.0072
9400	1880.0	3.7	10	-10.62	-0.0056
9400	1880.0	3.7	20	-24.69	-0.0131
9400	1880.0	3.7	30	-25.51	-0.0136
9400	1880.0	3.7	40	-22.09	-0.0118
9400	1880.0	3.7	50	-27.30	-0.0145
9400	1880.0	3.7	60	-27.07	-0.0144

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
9400	1880.0	4.2	-30	-8.71	-0.0046
9400	1880.0	4.2	-20	-18.55	-0.0099
9400	1880.0	4.2	-10	-8.61	-0.0046
9400	1880.0	4.2	0	-12.31	-0.0065
9400	1880.0	4.2	10	-6.56	-0.0035
9400	1880.0	4.2	20	-18.37	-0.0098
9400	1880.0	4.2	30	-10.99	-0.0058
9400	1880.0	4.2	40	-16.62	-0.0088
9400	1880.0	4.2	50	-24.06	-0.0128
9400	1880.0	4.2	60	-28.64	-0.0152

	EMI Test Report for the BlackBerry® smartphone Model RCY71UW APPENDIX 3B				
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UMTS band 2 Results: channel 9538 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
9538	1907.6	3.6	-30	-23.62	-0.0124
9538	1907.6	3.6	-20	-22.11	-0.0116
9538	1907.6	3.6	-10	-12.76	-0.0067
9538	1907.6	3.6	0	8.91	0.0047
9538	1907.6	3.6	10	-14.65	-0.0077
9538	1907.6	3.6	20	-24.63	-0.0129
9538	1907.6	3.6	30	-17.38	-0.0091
9538	1907.6	3.6	40	-26.89	-0.0141
9538	1907.6	3.6	50	-21.03	-0.0110
9538	1907.6	3.6	60	-28.53	-0.0150

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
9538	1907.6	3.7	-30	-31.49	-0.0165
9538	1907.6	3.7	-20	-11.18	-0.0059
9538	1907.6	3.7	-10	-21.30	-0.0112
9538	1907.6	3.7	0	-9.51	-0.0050
9538	1907.6	3.7	10	-15.20	-0.0080
9538	1907.6	3.7	20	-25.85	-0.0136
9538	1907.6	3.7	30	-12.66	-0.0066
9538	1907.6	3.7	40	-21.10	-0.0111
9538	1907.6	3.7	50	-26.09	-0.0137
9538	1907.6	3.7	60	-22.38	-0.0117

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
9538	1907.6	4.2	-30	-18.34	-0.0096
9538	1907.6	4.2	-20	-23.70	-0.0124
9538	1907.6	4.2	-10	-18.49	-0.0097
9538	1907.6	4.2	0	-14.53	-0.0076
9538	1907.6	4.2	10	-11.47	-0.0060
9538	1907.6	4.2	20	-26.72	-0.0140
9538	1907.6	4.2	30	-15.09	-0.0079
9538	1907.6	4.2	40	-22.78	-0.0119
9538	1907.6	4.2	50	-27.34	-0.0143
9538	1907.6	4.2	60	-27.02	-0.0142

	EMI Test Report for the BlackBerry® smartphone Model RCY71UW APPENDIX 3B	
Test Report No. RTS-2337-1002-51	Dates of Test February 10 to March 26 and May 17 to 19, 2010	Author Data Fahd Faisal

APPENDIX 4A – GSM RADIATED EMISSIONS TEST DATA

 Testing Services™	EMI Test Report for the BlackBerry® smartphone Model RCY71UW APPENDIX 3B									
Test Report No. RTS-2337-1002-51	Dates of Test February 10 to March 26 and May 17 to 19, 2010								Author Data Fahd Faisal	

Radiated Power Test Data Results

Date of test: February 18, May 17 and 19, 2010

The measurements were performed by Kevin Rose.

The environmental tests conditions were: Temperature: 24 – 25 °C
Pressure: 1013 – 1022 mb
Relative Humidity: 23 – 26 %

The BlackBerry® smartphone 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.	Reading (dBm)	Corrected Reading (relative to Dipole) (dBm)	(W)	Limit (dBm)	Diff. To Limit (dB)
F0	128	824.20	850	Dipole	V	74.43	86.38	V-V	16.26	31.30	1.35	38.50	-7.20
F0	128	824.20	850	Dipole	H	86.38		H-H	14.72				
F0	195	837.60	850	Dipole	V	78.37	86.29	V-V	16.95	32.63	1.83	38.50	-5.87
F0	195	837.60	850	Dipole	H	86.29		H-H	15.38				
F0	251	848.80	850	Dipole	V	78.26	87.02	V-V	18.66	34.15	2.60	38.50	-4.35
F0	251	848.80	850	Dipole	H	87.02		H-H	15.91				

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.	Reading (dBm)	Corrected Reading (relative to Dipole) (dBm)	(W)	Limit (dBm)	Diff. To Limit (dB)
F0	128	824.20	850	Dipole	V	76.04	84.23	V-V	14.11	29.15	0.82	38.50	-9.35
F0	128	824.20	850	Dipole	H	84.23		H-H	12.57				
F0	195	837.60	850	Dipole	V	76.97	84.47	V-V	15.13	30.81	1.21	38.50	-7.69
F0	195	837.60	850	Dipole	H	84.47		H-H	13.56				
F0	251	848.80	850	Dipole	V	76.73	85.74	V-V	17.38	32.87	1.94	38.50	-5.63
F0	251	848.80	850	Dipole	H	85.74		H-H	11.27				

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Radiated Power Test Data Results cont'd
PCS1900 Band
GSM Mode

EUT				Rx Antenna	Spectrum Analyzer		Substitution Method			Corrected Reading (relative to Isotropic Radiator)		Limit		
							Tracking Generator		Pol.					
Type	Ch	Frequency (MHz)	Band	Type	Pol.	Reading (dBuV)	Max (V,H)	Pol.	Reading (dBm)	(dBm)	(W)	(dBm)	(dBm)	(dB)
F0	512	1850.20	1900	Horn	V	80.8	93.04	V-V	-0.85	32.68	1.85	33.00	-0.32	
F0	512	1850.20	1900	Horn	H	93.04		H-H	-0.96					
F0	661	1880.00	1900	Horn	V	81.75	92.15	V-V	-1.62	32.14	1.64	33.00	-0.86	
F0	661	1880.00	1900	Horn	H	92.15		H-H	-1.73					
F0	810	1909.80	1900	Horn	V	83.19	92.09	V-V	-0.36	32.48	1.77	33.00	-0.52	
F0	810	1909.80	1900	Horn	H	92.09		H-H	-0.80					

EDGE Mode

EUT				Rx Antenna	Spectrum Analyzer		Substitution Method			Corrected Reading (relative to Isotropic Radiator)		Limit		
							Tracking Generator		Pol.					
Type	Ch	Frequency (MHz)	Band	Type	Pol.	Reading (dBuV)	Max (V,H)	Pol.	Reading (dBm)	(dBm)	(W)	(dBm)	(dBm)	(dB)
F0	512	1850.20	1900	Horn	V	84.97	90.59	V-V	-7.78	29.67	0.93	33.00	-3.33	
F0	512	1850.20	1900	Horn	H	90.59		H-H	-6.71					
F0	661	1880.00	1900	Horn	V	80.2	89.74	V-V	-7.69	29.54	0.90	33.00	-3.46	
F0	661	1880.00	1900	Horn	H	89.74		H-H	-6.74					
F0	810	1909.80	1900	Horn	V	77.93	89.61	V-V	-7.36	29.69	0.93	33.00	-3.31	
F0	810	1909.80	1900	Horn	H	89.61		H-H	-6.63					

	EMI Test Report for the BlackBerry® smartphone Model RCY71UW APPENDIX 3B	
Test Report No. RTS-2337-1002-51	Dates of Test February 10 to March 26 and May 17 to 19, 2010	Author Data Fahd Faisal

Radiated Emissions Test Data Results

GSM850

GSM Mode

Date of Test: March 11, 2010

The measurements were performed by Fahd Faisal.

The environmental test conditions were: Temperature: 23 °C

Pressure: 1006 mb

Relative Humidity: 26 %

Test Distance was 3.0 metres with a height of 1.0 metre, 30 MHz to 1000 MHz.

The BlackBerry® smartphone was in standalone, USB Down position.

The measurements were performed in GSM850 Tx mode on channels 128, 190 and 251.

All emissions had a test margin greater than 25.0 dB.

Date of Test: March 15, 2010

The measurements were performed by Heng Lin.

The environmental test conditions were: Temperature: 23 °C

Pressure: 1015 mb

Relative Humidity: 28 %

Test Distance was 3.0 metres with a height of 1.0 metre, 1 GHz to 9 GHz.

The BlackBerry® smartphone was in standalone, USB Down position.

The measurements were performed in GSM850 Tx mode on channels 128, 190 and 251.

All emissions had a test margin greater than 25.0 dB.

	EMI Test Report for the BlackBerry® smartphone Model RCY71UW APPENDIX 3B	
Test Report No. RTS-2337-1002-51	Dates of Test February 10 to March 26 and May 17 to 19, 2010	Author Data Fahd Faisal

Radiated Emissions Test Data Results cont'd

GSM850

EDGE Mode

Date of Test: March 11, 2010

The environmental test conditions were: Temperature: 23 °C

Pressure: 1006 mb

Relative Humidity: 26 %

Test Distance was 3.0 metres with a height of 1.0 metre, 30 MHz to 1000 MHz.
The BlackBerry® smartphone was in standalone, USB down position.

The measurements were performed in GSM850 EDGE Tx mode on channels 128, 190 and 251.

All emissions had a test margin greater than 25.0 dB.

Date of Test: March 15, 2010

The environmental test conditions were: Temperature: 25 °C

Pressure: 1012 mb

Relative Humidity: 29 %

Test Distance was 3.0 metres with a height of 1.0 metre, 1 GHz to 9 GHz.
The BlackBerry® smartphone was in standalone, USB down position.

The measurements were performed in GSM850 EDGE Tx mode on channels 128, 190 and 251.

All emissions had a test margin greater than 25.0 dB.

	EMI Test Report for the BlackBerry® smartphone Model RCY71UW APPENDIX 3B	
Test Report No. RTS-2337-1002-51	Dates of Test February 10 to March 26 and May 17 to 19, 2010	Author Data Fahd Faisal

PCS1900

GSM Mode

Date of Test: March 16, 2010

The environmental test conditions were: Temperature: 22 °C
 Pressure: 996 mb
 Relative Humidity: 22 %

Test Distance was 3.0 metres with a height of 1.0 metre, 30 MHz to 1000 MHz.
 The BlackBerry® smartphone was in standalone, USB Up position.

The measurements were performed in PCS1900 Tx mode on channels 512, 661 and 810.

All emissions had a test margin greater than 25.0 dB.

Date of Test: March 15, 2010

The environmental test conditions were: Temperature: 23 – 25 °C
 Pressure: 1003 – 1023 mb
 Relative Humidity: 29 – 30 %

Test Distance was 3.0 metres with a height of 1.0 metre, 1 GHz to 20 GHz.
 The BlackBerry® smartphone was in standalone, USB up position.

The measurements were performed in PCS1900 Tx mode on channels 512, 661 and 810.

All emissions had a test margin greater than 25.0 dB.

	EMI Test Report for the BlackBerry® smartphone Model RCY71UW APPENDIX 3B	
Test Report No. RTS-2337-1002-51	Dates of Test February 10 to March 26 and May 17 to 19, 2010	Author Data Fahd Faisal

Radiated Emissions Test Data Results cont'd

PCS1900

EDGE Mode

Date of Test: March 16, 2010

The environmental test conditions were: Temperature: 22 °C
 Pressure: 996 mb
 Relative Humidity: 22 %

Test Distance was 3.0 metres with a height of 1.0 metre, 30 MHz to 1000 MHz.
 The BlackBerry® smartphone was in standalone, USB Up position.

The measurements were performed in PCS1900 EDGE Tx mode on channels 512, 661 and 810.

All emissions had a test margin greater than 25.0 dB.

Date of Test: March 19, 2010

The environmental test conditions were: Temperature: 24 °C
 Pressure: 1021 mb
 Relative Humidity: 28 %

Test Distance was 3.0 metres with a height of 1.0 metre, 1 GHz to 20 GHz.
 The BlackBerry® smartphone was in standalone, USB up position.

The measurements were performed in PCS1900 EDGE Tx mode on channels 512, 661 and 810.

All emissions had a test margin greater than 25.0 dB.

	EMI Test Report for the BlackBerry® smartphone Model RCY71UW APPENDIX 3B	
Test Report No. RTS-2337-1002-51	Dates of Test February 10 to March 26 and May 17 to 19, 2010	Author Data Fahd Faisal

APPENDIX 4B – WCDMA RADIATED EMISSIONS TEST DATA

	EMI Test Report for the BlackBerry® smartphone Model RCY71UW APPENDIX 3B		
Test Report No. RTS-2337-1002-51	Dates of Test February 10 to March 26 and May 17 to 19, 2010	Author Data Fahd Faisal	

Radiated Power Test Data Results

Date of test: November 02, 2009

The measurements were performed by Kevin Rose.

The environmental tests conditions were: Temperature: 25 °C
Pressure: 1013 mb
Relative Humidity: 23 %

The BlackBerry® smartphone was in standalone, Horizontal down position.

Test distance is 3.0 metres

UMTS Band 2 (1900 MHz)

Call Mode

EUT				Rx Antenna		Spectrum Analyzer		Substitution Method					
								Tracking Generator					
Type	Ch	Frequency (MHz)	Band	Type	Pol.	Reading (dBuV)	Max (V,H) (dBuV)	Pol.	Reading (dBm)	Corrected Reading (relative to Dipole) (dBm)	Limit (dBm)	Diff. To Limit (dB)	
F0	9262	1852.40	Band 2	Horn	V	78.15	85.96	V-V	-12.30	25.16	0.33	33.00	-7.84
F0	9262	1852.40	Band 2	Horn	H	85.96		H-H	-11.22				
F0	9400	1880.00	Band 2	Horn	V	77.93	86.05	V-V	-11.38	25.85	0.38	33.00	-7.15
F0	9400	1880.00	Band 2	Horn	H	86.05		H-H	-10.43				
F0	9538	1907.60	Band 2	Horn	V	77.93	86.05	V-V	-10.68	26.33	0.43	33.00	-6.67
F0	9538	1907.60	Band 2	Horn	H	86.05		H-H	-9.99				

	EMI Test Report for the BlackBerry® smartphone Model RCY71UW APPENDIX 3B	
Test Report No. RTS-2337-1002-51	Dates of Test February 10 to March 26 and May 17 to 19, 2010	Author Data Fahd Faisal

Radiated Emissions Test Data Results

UMTS Band 2 (1800 MHz)

Date of Test: February 10, 2010

The measurements were performed by Fahd Faisal

The environmental test conditions were: Temperature: 24 °C

Pressure: 1015 mb

Relative Humidity: 21 %

Test Distance was 3.0 metres with a height of 1.0 metre, 30 MHz to 1000 MHz.

The BlackBerry® smartphone was in standalone, Vertical Upside down position.

The measurements were performed in Call Tx mode, on channels 9262, 9400 and 9538.

All emissions had a test margin greater than 25.0 dB.

Date of Test: March 26, 2010

The measurements were performed by Steven Wang.

The environmental test conditions were: Temperature: 24 °C

Pressure: 1015 mb

Relative Humidity: 24 %

Test Distance was 3.0 metres with a height of 1.0 metre, 1 GHz to 20 GHz.

The BlackBerry® smartphone was in standalone, Vertical Upside down position.

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

 Testing Services™	EMI Test Report for the BlackBerry® smartphone Model RCY71UW APPENDIX 3B		
Test Report No. RTS-2337-1002-51	Dates of Test February 10 to March 26 and May 17 to 19, 2010	Author Data Fahd Faisal	

Radiated Power Test Data Results

Date of test: November 02, 2009

The measurements were performed by Kevin Rose.

The environmental tests conditions were: Temperature: 25 °C
Pressure: 1013 mb
Relative Humidity: 23 %

The BlackBerry® smartphone was in standalone, Horizontal down position.

Test distance is 3.0 metres

UMTS Band 5 (850 MHz)

Call Mode

EUT				Rx Antenna		Spectrum Analyzer		Substitution Method					
								Tracking Generator					
Type	Ch	Frequency (MHz)	Band	Type	Pol.	Reading (dBuV)	Max (V,H) (dBuV)	Pol.	Reading (dBm)	Corrected Reading (relative to Dipole) (dBm)	Limit (dBm)	Diff. To Limit (dB)	
F0	4132	826.40	UMTS 5	Dipole	V	66.03	75.92	V-V	5.92	20.96	0.12	33.00	-12.04
F0	4132	826.40	UMTS 5	Dipole	H	75.92		H-H	4.53				
F0	4182	836.40	UMTS 5	Dipole	V	67.31	75.26	V-V	5.79	21.47	0.14	33.00	-11.53
F0	4182	836.40	UMTS 5	Dipole	H	75.26		H-H	3.87				
F0	4233	846.60	UMTS 5	Dipole	V	68.48	76.24	V-V	7.88	23.37	0.22	33.00	-9.63
F0	4233	846.60	UMTS 5	Dipole	H	76.24		H-H	5.26				

	EMI Test Report for the BlackBerry® smartphone Model RCY71UW APPENDIX 3B	
Test Report No. RTS-2337-1002-51	Dates of Test February 10 to March 26 and May 17 to 19, 2010	Author Data Fahd Faisal

Radiated Emissions Test Data Results

UMTS Band 5 (850 MHz)

Date of Test: March 16, 2010

The measurements were performed by Fahd Faisal

The environmental test conditions were: Temperature: 24 °C

Pressure: 1012 mb

Relative Humidity: 22 %

Test Distance was 3.0 metres with a height of 1.0 metre, 30 MHz to 1000 MHz.

The BlackBerry® smartphone was in standalone, Vertical Upside down position.

The measurements were performed in Call Tx mode, on channels 4132, 1413 and 1513.

All emissions had a test margin greater than 25.0 dB.

Date of Test: March 26, 2010.

The measurements were performed by Heng Lin.

The environmental test conditions were: Temperature: 23 °C

Pressure: 1017 mb

Relative Humidity: 33 %

Test Distance was 3.0 metres with a height of 1.0 metre, 1 GHz to 9 GHz.

The BlackBerry® smartphone was in standalone, Vertical Upside down position.

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