EMI Test Report

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

A division of Research In Motion Limited

REPORT NO: RTS-5992-1203-10

PRODUCT MODEL NO:	REV71UW
TYPE NAME:	BlackBerry® smartphone
FCC ID:	L6AREV70UW
IC:	2503A-REV70UW
EMISSION DESIGNATOR (GSM):	245KGXW
EMISSION DESIGNATOR (EDGE):	247KG7W
EMISSION DESIGNATOR (WCDMA):	4M06F9W

DATE: March 13, 2012

Statement of Performance:

The BlackBerry® smartphone, model REV71UW, part number CER-48924-001 Rev1 and accessories perform within the requirements of the test standards when configured and operated per RIM's instructions.

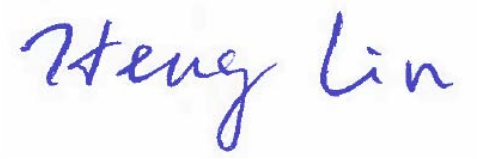
Declaration:

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:

Shuo Wang
Regulatory Compliance Specialist
Date: March 09, 2012

Reviewed by:



Heng Lin
Regulatory Compliance Specialist
Date: March 12, 2012

Reviewed and Approved by:

Masud S. Attayi, P.Eng.
Manager, Regulatory Compliance
Date: March 13, 2012

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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, Oct, 2011
- FCC CFR 47 Part 22, Subpart H, Cellular Radiotelephone Services, Oct., 2011
- FCC CFR 47 Part 24 Subpart E, Broadband PCS, Oct., 2011
- 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.
- Industry Canada, RSS-GEN Issue 3, December 2010, General Requirements and Information for the Certification of Radio communication Equipment

B) Associated Documents

1. MultiSourceDeclaration_REV71UW_b1003

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 07 - March 08, 2012.

The sample EUT included:

Sample	Model	CER NUMBER	PIN	Software Information
1	REV71UW	CER-48924-001 Rev1	295B50C6	v7.1.0.285 (Platform: 9.49.0.22) Bundle 1003
2	REV71UW	CER-48924-001 Rev1	295B06DD	v7.1.0.255 (Platform: 9.0.0.427) Bundle 876
3	REV71UW	CER-48924-001 Rev1	295B0784	v7.1.0.255 (Platform: 9.0.0.427) Bundle 876
4	REV71UW	CER-48924-001 Rev1	295B07DA	v7.1.0.255 (Platform: 9.0.0.427) Bundle 876

RF Conducted Emissions testing was performed on samples 1 and 2.
RF Radiated Emissions testing was performed on samples 3 and 4.

To view the differences between Bundle 876 and Bundle 1003, see document MultiSourceDeclaration_REV71UW_b1003

BlackBerry® smartphone Accessories Tested

1) Bat. JS1, part number BAT-44582-001.
2) Alt. Bat. JS1, part number BAT-44582-002.

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 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	PCS 1900 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	PCS 1900 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	PCS 1900 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 22, Subpart H Part 24, Subpart E	RSS-GEN, 4.9	GSM Radiated Spurious/Harmonic Emissions	Pass	4A
Part 2.1051 Part 22.917 Part 22.901(d)	RSS-GEN, 4.9	UMTS Band 5 Conducted Spurious Emissions	Pass	1B
Part 2.1051 Part 24.238(a)	RSS-GEN, 4.9	UMTS Band 2 Conducted Spurious Emissions	Pass	1B
Part 2.202 Part 22.917	RSS-GEN, 4.6	UMTS Band 5 Occupied Bandwidth and Channel Mask	Pass	1B
Part 2.202 Part 24.238	RSS-GEN, 4.6	UMTS Band 2 Occupied Bandwidth and Channel Mask	Pass	1B
Part 2.1046(a)	RSS-133, 6.4 RSS-132, 4.4	UMTS Band 2 and 5 Conducted RF Output Power	Pass	2B
Part 2.1055(a)(d) Part 22.917	RSS-132, 4.3	UMTS Band 5 Frequency Stability vs. Temperature and Voltage	Pass	3B

Part 2.1055(a)(d) Part 24.235	RSS-GEN, 4.7	UMTS Band 2 Frequency Stability vs. Temperature and Voltage	Pass	3B
Part 22, Subpart H	RSS-GEN, 4.9	UMTS Band 5 Radiated Spurious/Harmonic Emissions, ERP	Pass	4B
Part 24, Subpart E	RSS-GEN, 4.9	UMTS Band 2 Radiated Spurious/Harmonic Emissions, EIRP	Pass	4B

F) 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. The worst case occupied bandwidth was 243.0 kHz on the low channel in GSM mode, and 247.0 kHz on low channel in EDGE mode.
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. The worst case occupied bandwidth was 245.0 kHz on the low channel in GSM, and 247.0 kHz on the low in EDGE mode.
See APPENDIX 1A for test data.

c) The BlackBerry® smartphone met the requirements of the Tx Conducted RF output Power requirements in the GSM850 as per 47 CFR 2.1046, and RSS-GEN, 4.4. The EUT was measured on the low, middle and high channels.
See APPENDIX 2A for test data.

The BlackBerry® smartphone met the requirements of the Tx Conducted RF output Power requirements in the PCS1900 as per 47 CFR 2.1046, and RSS-GEN, 6.4. The EUT was on the low, middle and high channels.
See APPENDIX 2A for test data

d) The BlackBerry® smartphone met the requirements of the Frequency Stability requirements in the GSM850 as per 47 CFR 2.1055, CFR 22.917 and RSS-GEN, 4.3. The EUT was measured in GSM850 mode on the low, middle and high channels.
See APPENDIX 3A for test data.

The BlackBerry® smartphone met the requirements of the Frequency Stability requirements in the PCS1900 as per 47 CFR 2.1055, CFR 24.235 and RSS-GEN, 4.7. The EUT was measured in PCS1900 mode on the low, middle and high channels.
See APPENDIX 3A for test data.

e) The BlackBerry® smartphone met the requirements of the Tx Conducted Spurious Emissions requirements in the UMTS band 5 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 1B for test data.

The BlackBerry® smartphone met the requirements of the Tx Conducted Spurious Emissions requirements in the UMTS band 2 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 1B for test data

f) The BlackBerry® smartphone met the requirements of the Occupied Bandwidth and channel mask requirements in the UMTS band 5 as per 47 CFR 2.202, CFR 22.917 and RSS-GEN, 4.6. The EUT was measured in Loopback and HSUPA mode on the low, middle and high channels. The worst case occupied bandwidth was 4.050 MHz on all three channels in Loopback mode, and 4.042 MHz on all three channels in HSUPA mode.
See APPENDIX 1B for test data.

The BlackBerry® smartphone met the requirements of the Occupied Bandwidth and channel mask requirements in the UMTS band 2 as per 47 CFR 2.202, CFR 24.238 and RSS-GEN, 4.6. The EUT was measured in Loopback and HSUPA mode on the low, middle and high channels. The worst case occupied bandwidth was 4.058 MHz on the low channel in Loopback mode, and 4.050 MHz on all three channels in HSUPA mode.
See APPENDIX 1B for test data.

g) The BlackBerry® smartphone met the requirements of the Tx Conducted RF output Power requirements in the UMTS band 5 as per 47 CFR 2.1046, and RSS-GEN, 4.4. The EUT was measured on the low, middle and high channels.
See APPENDIX 2B for test data.

The BlackBerry® smartphone met the requirements of the Tx Conducted RF output Power requirements in the UMTS band 2 as per 47 CFR 2.1046, and RSS-GEN, 6.4. The EUT was on the low, middle and high channels.
See APPENDIX 2B for test data

h) The BlackBerry® smartphone met the requirements of the Frequency Stability requirements in the UMTS band 5 as per 47 CFR 2.1055, CFR 22.917 and RSS-GEN, 4.3. The EUT was measured in UMTS band 5 mode on the low, middle and high channels.
See APPENDIX 3B for test data.

The BlackBerry® smartphone met the requirements of the Frequency Stability requirements in the UMTS band 2 as per 47 CFR 2.1055, CFR 24.235 and RSS-GEN, 4.7. The EUT was measured in UMTS band 2 mode on the low, middle and high channels.
See APPENDIX 3B for test data.

2) Radiated Emission Measurements

a) The radiated spurious emissions/harmonics and ERP/EIRP were measured for GSM 850 and PCS 1900. 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 meters. Then the emissions were maximized by elevating the antenna in the range of 1 to 4 meters. 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 meters. 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 Semi-anechoic Chamber ((SAC) with floor absorber) above 1 GHz. The SAC's FCC registration number is **778487** and the Industry Canada (IC) file number is **2503B-1**. The SAC with floor absorber'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 highest ERP in the 850 band Call mode measured was 31.36 dBm (1.37 W) at 848.80 MHz (channel 251)

The highest ERP in the 850 band EDGE mode measured was 29.15 dBm (0.82 W) at 848.80 MHz (channel 251).

The highest EIRP in the PCS band Call mode measured was 32.74 dBm (1.88 W) at 1909.80 MHz (channel 810).

The highest EIRP in the PCS band EDGE mode measured was 31.36 dBm (1.37 W) at 1880.00 MHz (channel 661).

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 1900

bands. Each band was measured in GSM and EDGE mode, with both the horizontal and vertical polarizations.

The worst test margin in the 850 band for GSM mode harmonic emissions was 24.03 dB below the limit at 1697.62 MHz.

All margins in the 850 band for GSM mode harmonic emissions were greater than 25 dB below the accepted limits for all test frequencies.

All margins in the 1900 band for GSM mode harmonic emissions w were greater than 25 dB below the accepted limits for all test frequencies.

All margins in the 1900 band for EDGE mode harmonic emissions were greater than 25 dB below the accepted limits for all test frequencies.

The highest ERP in the UMTS band 5, Call Service mode was 23.11 dBm (0.20 W) at 846.60 MHz (channel 4233).

The highest ERP in the UMTS band 5, HSUPA mode was 25.07 dBm (0.32 W) at 846.60 MHz (channel 4233).

The highest EIRP in the UMTS band 2, Call Service mode measured was 26.76 dBm (0.47 W) at 1907.60 MHz (channel 9538).

The highest EIRP in the UMTS band 2, HSUPA mode measured was 27.84 dBm (0.61 W) at 1850.40 MHz (channel 9262).

The radiated carrier harmonics were measured up to the 10th harmonic for low, middle and high channels in the UMTS band 5 and UMTS band 2. Each band was measured in Call, and HSUPA modes. Both the horizontal and vertical polarizations were measured.

All margins in the UMTS band 5 for harmonic emissions were greater than 25 dB below the accepted limits for all test frequencies.

All margins in the UMTS band 2 for harmonic emissions were greater than 25 dB below the accepted limits for all test 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:

- GSM 850 + Bluetooth + 802.11b.
- PCS 1900 + Bluetooth + 802.11g.
- UMTS B2 + Bluetooth + 802.11n.
- UMTS B5 + Bluetooth + 802.11b.

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:

Corrected Signal level (CSL) is calculated as follows:
CSL (dBm) = Measured Level (dBµV) – Antenna Gain (dBi) + Free Space loss (dB) – 107(dB) + Cable Loss (dB) - Preamp (dB) + Filter Loss (dB) -2.15(dB)

See APPENDIX 4A and 4B for test data.

Measurement Uncertainty ±4.6 dB

H) Compliance Test Equipment Used

UNIT	MANUFACTURER	MODEL	SERIAL NUMBER	CAL DUE DATE (YY MM DD)	USE
Preamplifier	Sonoma	310N/11909A	185831	12-10-17	Radiated Emissions
Preamplifier system	TDK RF Solutions	PA-02	080010	12-10-17	Radiated Emissions
Preamplifier	Rohde & Schwarz	TS-ANA4-SP	001	12-09-01	Radiated Emissions
Preamplifier	Rohde & Schwarz	TS-ANA-SP	001	12-09-01	Radiated Emissions
Hybrid Log Antenna	EMC Automation	HLP-3003C	017301	13-08-23	Radiated Emissions
Horn Antenna	EMC Automation	HRN-0118	030101	12-07-20	Radiated Emissions
Horn Antenna	EMC Automation	HRN-0118	030201	12-09-22	Radiated Emissions
Horn Antenna	Emco	3117	47563	13-08-04	Radiated Emissions
Horn Antenna	ETS	3116	2538	12-09-24	Radiated Emissions
Dipole Antenna	Schwarzbeck	UHAP	1013	12-04-21	Radiated Emissions
Dipole Antenna	Schwarzbeck	UHAP	974	12-11-08	Radiated Emissions
Universal Radio Communication Tester	Rohde & Schwarz	CMU 200	837493/073	12-11-30	Radiated Emissions
Universal Radio Communication Tester	Rohde & Schwarz	CMU 200	112394	12-11-21	Radiated Emissions
Universal Radio Communication Tester	Rohde & Schwarz	CMU 200	109747	12-11-20	RF Conducted Emissions
EMI Receiver	Rohde & Schwarz	ESIB-40	100255	12-12-08	Radiated Emissions
EMI Receiver	Rohde & Schwarz	ESU-40	100162	12-12-07	Radiated Emissions
Spectrum Analyzer	HP	8563E	3745A08112	13-10-05	RF Conducted Emissions
DC Power Supply	HP	6632B	US37472178	12-09-27	RF Conducted Emissions
Environment Monitor	Omega	iTHX-SD	0380561	12-10-20	Radiated Emissions

Compliance Test Equipment Used cont'd

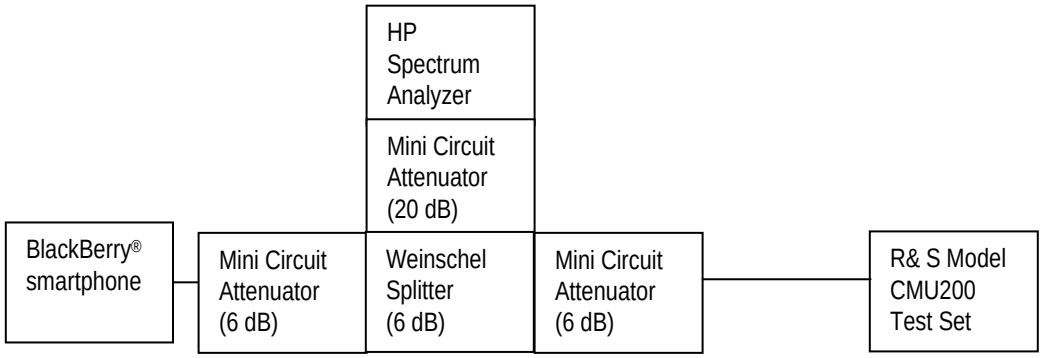
UNIT	MANUFACTURER	MODEL	SERIAL NUMBER	CAL DUE DATE (YY MM DD)	USE
Environment Monitor	Omega	iTHX-SD	0340060	12-10-20	RF Conducted Emissions
Environment Monitor	Omega	iTHX-SD	0380567	12-10-20	Radiated Emissions
Signal Generator	Agilent	E8257D	MY45140527	12-11-18	Radiated Emissions
Signal Generator	Agilent	83630B	3844A00927	12-10-28	Radiated Emissions

APPENDIX 1A – GSM 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.

Test Setup Diagram



Date of Test: February 09, 2012

The environmental test conditions were:

Temperature: 25.0 ºC
Relative Humidity: 37.0 %

The following measurements were performed by Kevin Guo.

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 258 kHz, and for the PCS1900 band was measured to be 272 kHz as shown below. Results were derived 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 applied.

Test Data for 850 band and 1900 band in Call mode

850 band Frequency (MHz)	-26dBc Bandwidth (kHz)	99% Occupied Bandwidth (kHz)
824.2	258	243.0
837.6	258	242.0
848.8	258	242.0

1900 band Frequency (MHz)	-26dBc Bandwidth (kHz)	99% Occupied Bandwidth (kHz)
1850.2	265	245.0
1880.0	265	243.0
1909.8	272	243.0

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

See Figures 1-1a to 1-12a for the plots of the conducted spurious emissions.
See Figures 1-13a to 1-24a for the plots of 26dBc/99% Occupied Bandwidth.
See Figures 1-25a to 1-28a for the plots of the Channel mask.

GSM Conducted RF Emission Test Data cont'd

Test Data for 850 and 1900 bands in EDGE mode

850 band Frequency (MHz)	99% Occupied Bandwidth (kHz)
824.2	247.0
837.6	243.0
848.8	245.0

1900 band Frequency (MHz)	99% Occupied Bandwidth (kHz)
1850.2	247.0
1880.0	245.0
1909.8	245.0

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 EDGE results.
See Figures 1-35a to 1-38a for the plots of channel mask EDGE results.
See Figures 1-39a to 1-50a for the plots of the conducted spurious emissions EDGE results

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

GSM Conducted RF Emission Test Data cont'd

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

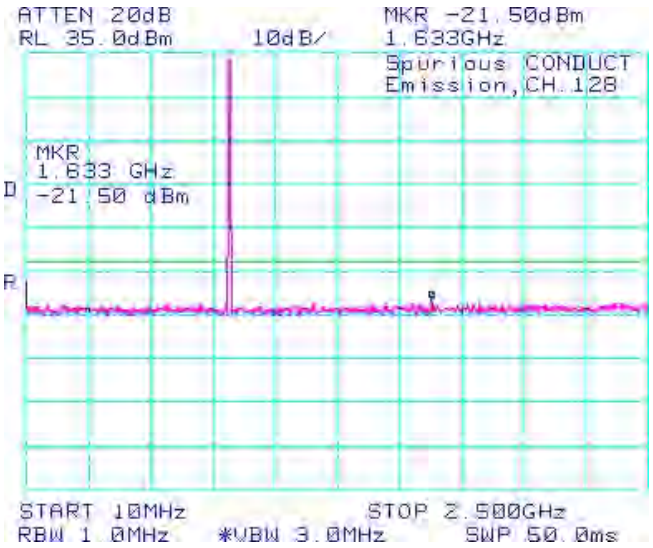


Figure 1-2a: GSM850 band, Spurious Conducted Emissions, Low channel

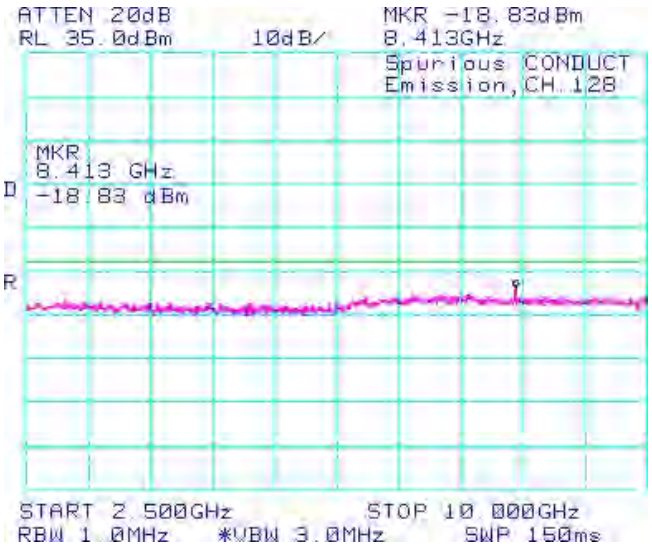


Figure 1-3a: GSM850 band, Spurious Conducted Emissions, Middle Channel

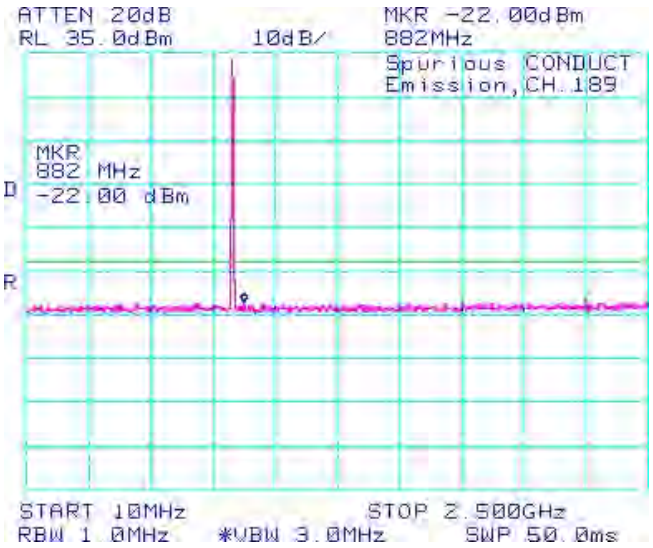
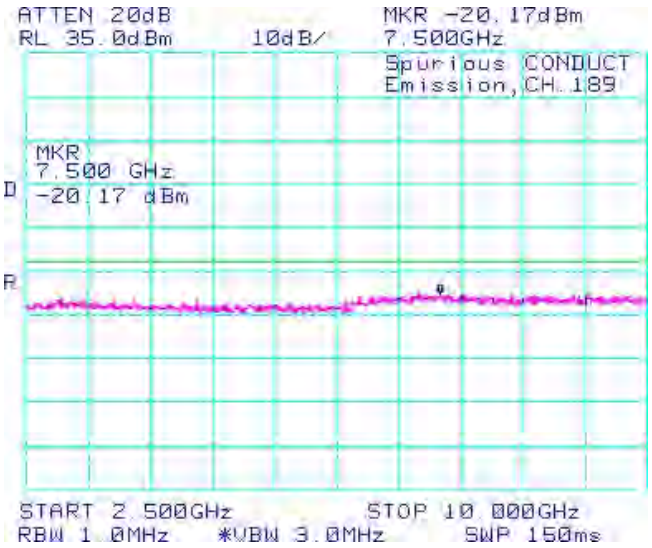


Figure 1-4a: GSM850 band, Spurious Conducted Emissions, Middle Channel



GSM Conducted RF Emission Test Data cont'd

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

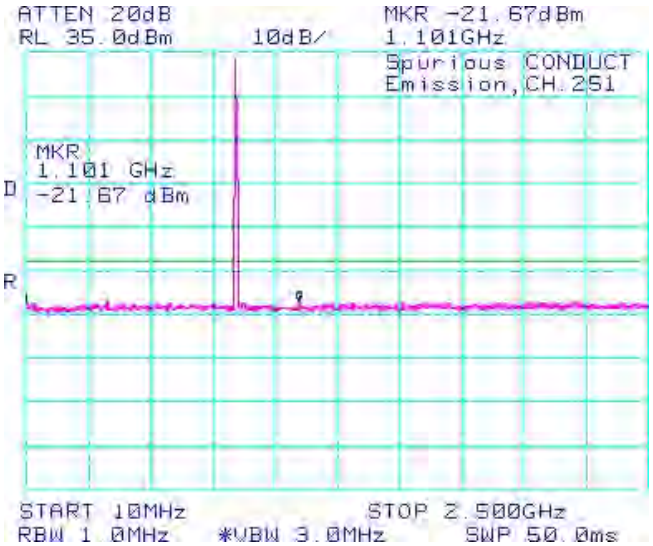


Figure 1-6a: GSM850 band, Spurious Conducted Emissions, High Channel

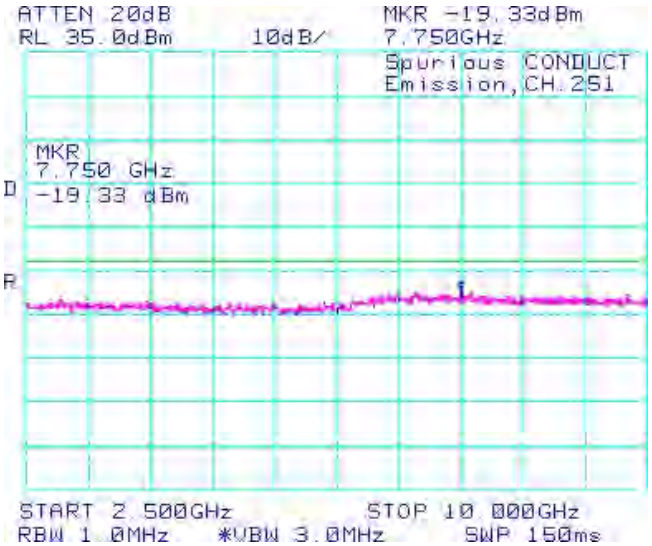


Figure 1-7a: PCS1900 band, Spurious Conducted Emissions, Low Channel

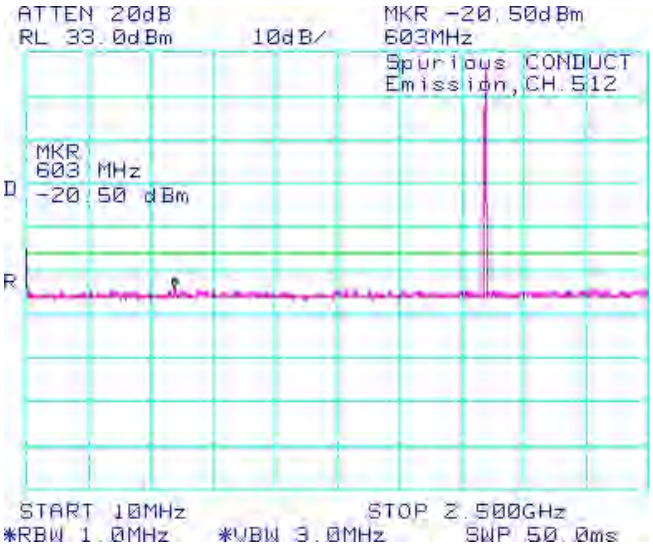
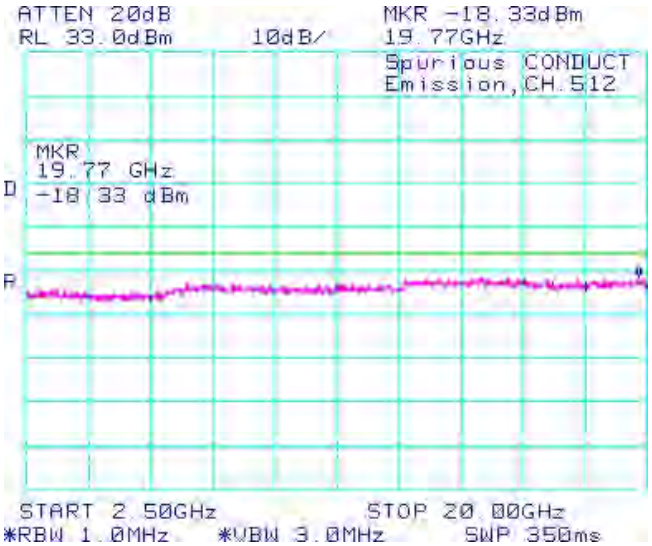


Figure 1-8a: PCS1900 band, Spurious Conducted Emissions, Low Channel



GSM Conducted RF Emission Test Data cont'd

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

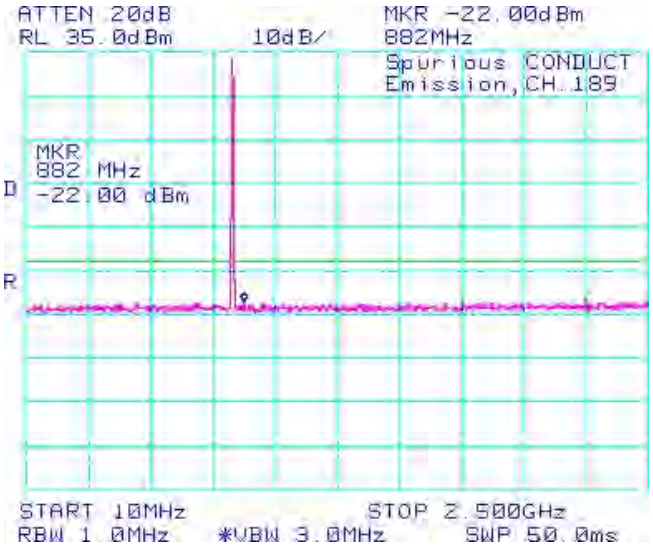


Figure 1-10a: PCS1900 band, Spurious Conducted Emissions, Middle Channel

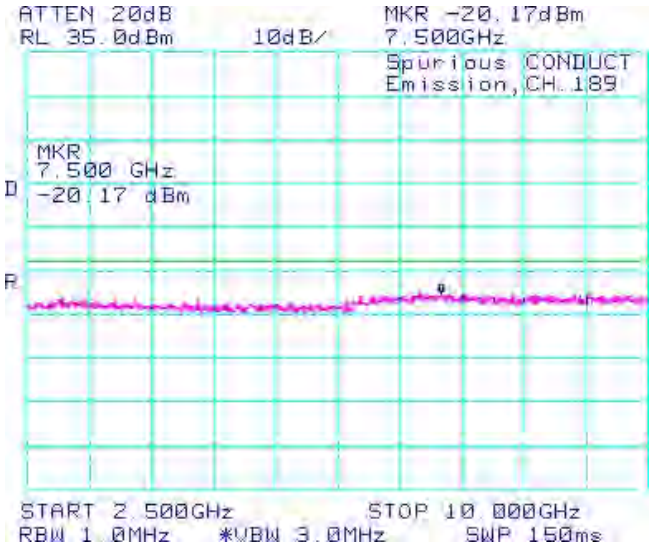


Figure 1-11a: PCS1900 band, Spurious Conducted Emissions, High Channel

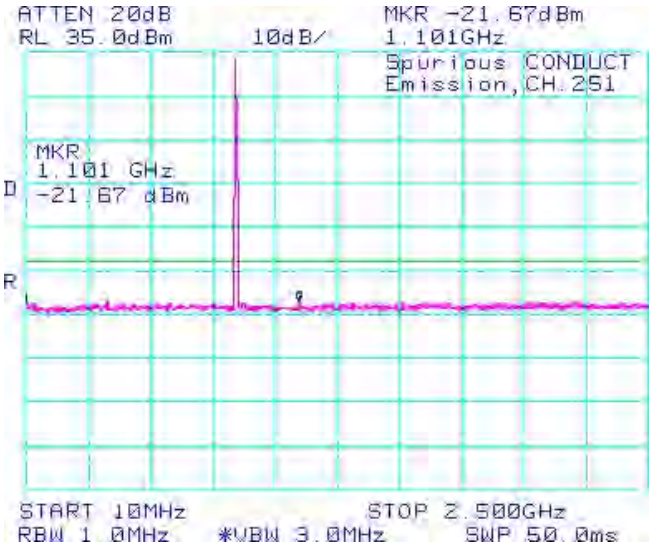
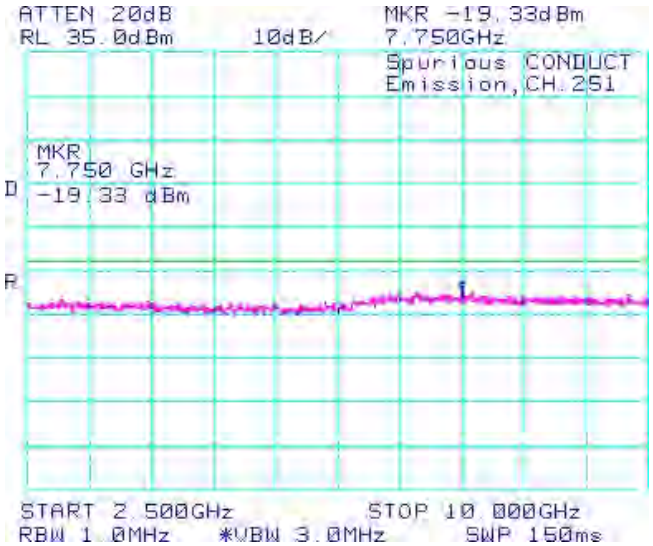


Figure 1-12a: PCS1900 band, Spurious Conducted Emissions, High Channel



GSM Conducted RF Emission Test Data cont'd

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

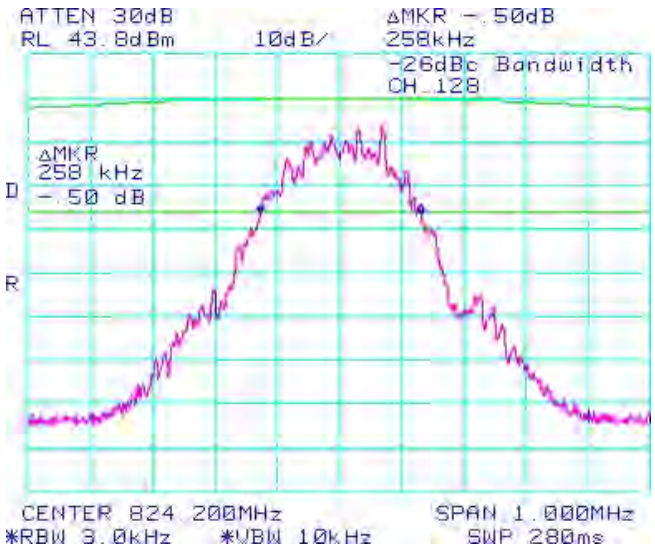


Figure 1-14a: Occupied Bandwidth, GSM850 band Low Channel in GSM mode

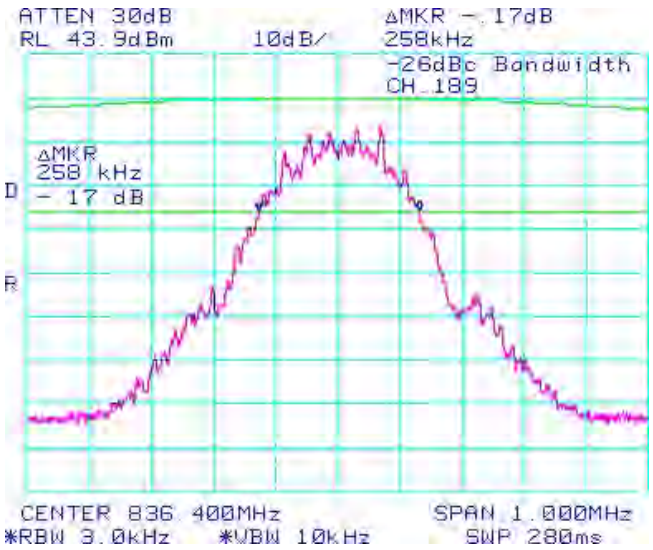


Figure 1-15a: -26dBc bandwidth, GSM850 band Middle Channel in GSM mode

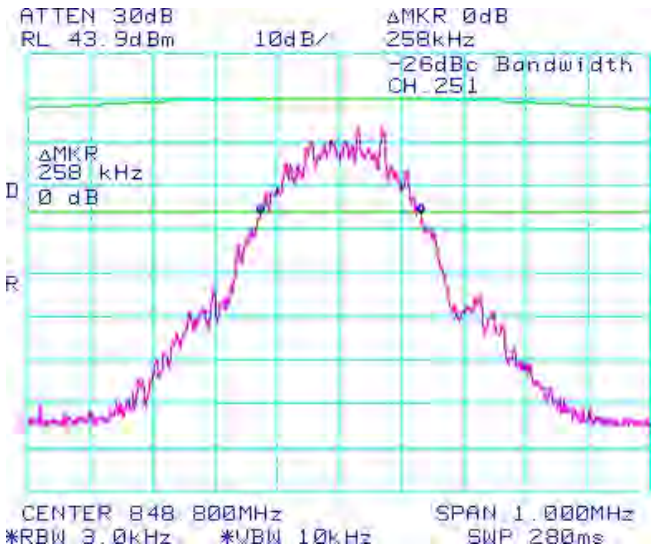
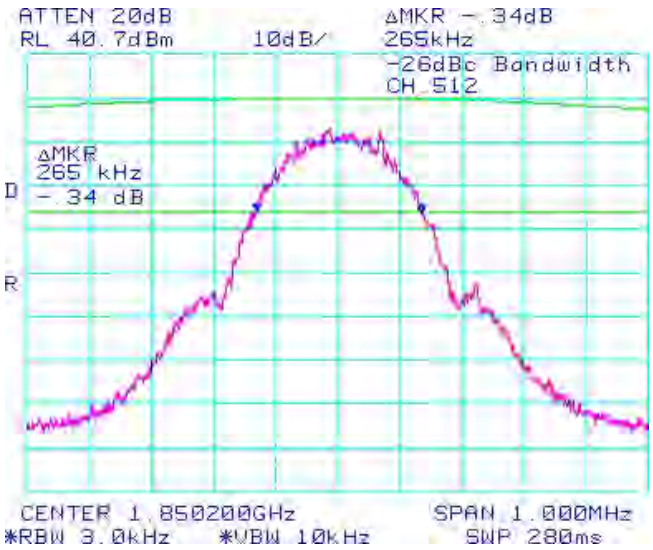


Figure 1-16a: Occupied Bandwidth, GSM850 band Middle Channel in GSM mode



GSM Conducted RF Emission Test Data cont'd

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

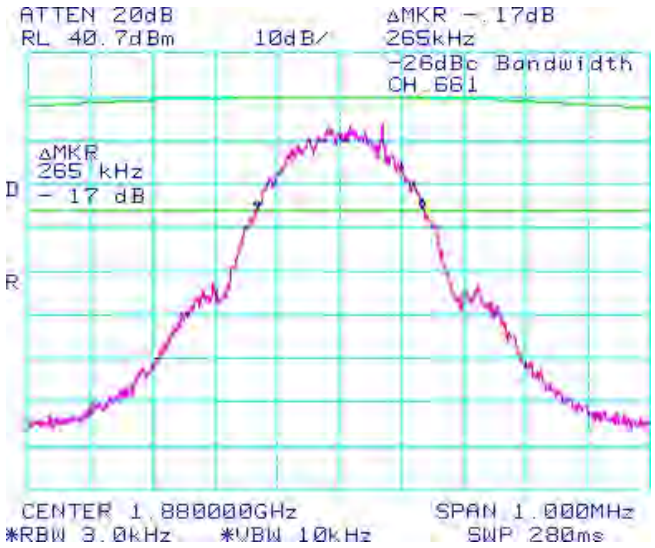


Figure 1-18a: Occupied Bandwidth, GSM850 band High Channel in GSM mode

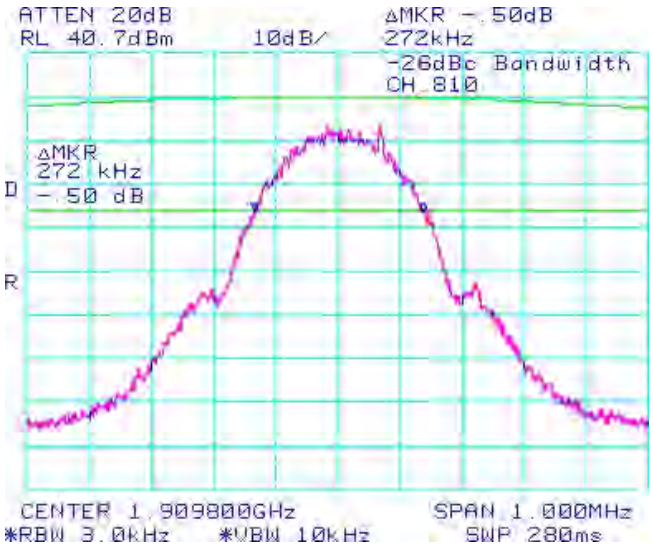


Figure 1-19a: -26dBc bandwidth, PCS1900 Low Channel in GSM mode

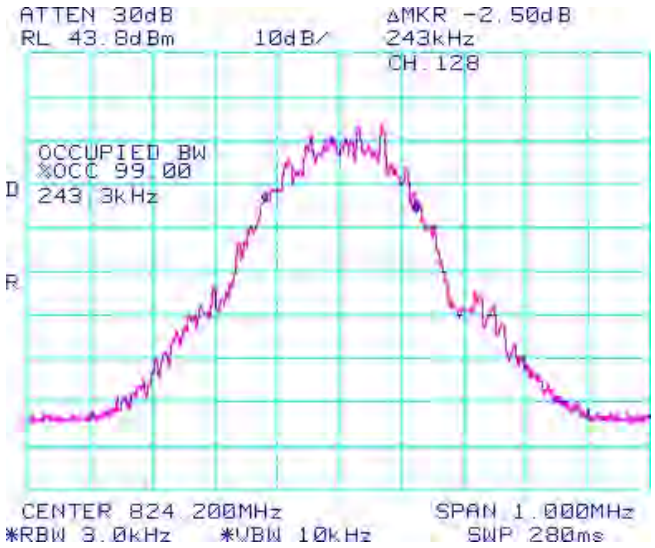
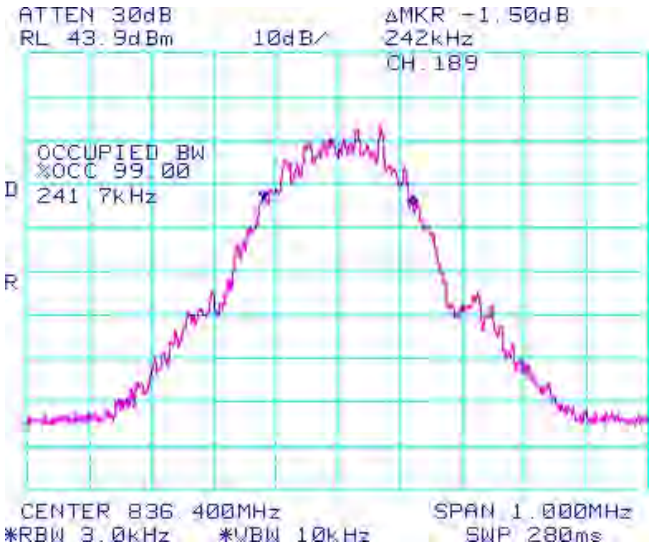


Figure 1-20a: Occupied Bandwidth, PCS1900 Low Channel in GSM mode



GSM Conducted RF Emission Test Data cont'd

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

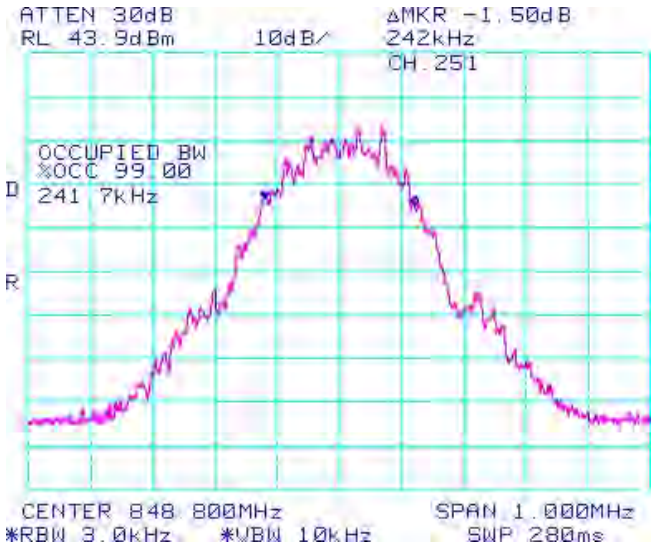


Figure 1-22a: Occupied Bandwidth, PCS1900 Middle Channel in GSM mode

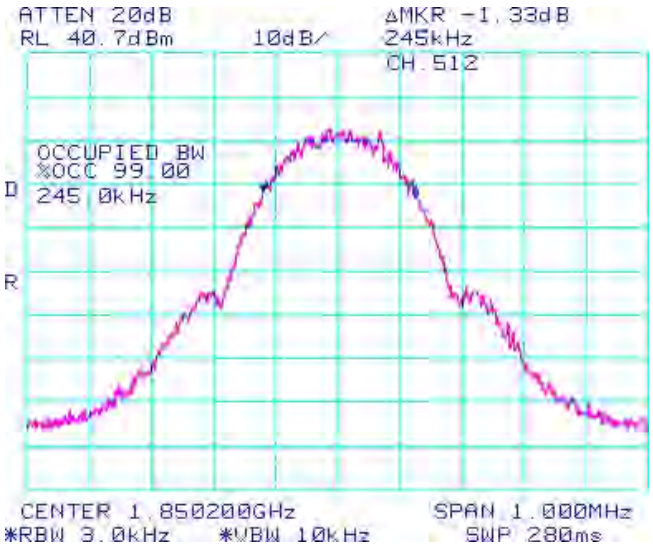


Figure 1-23a: -26dBc bandwidth, PCS1900 High Channel in GSM mode

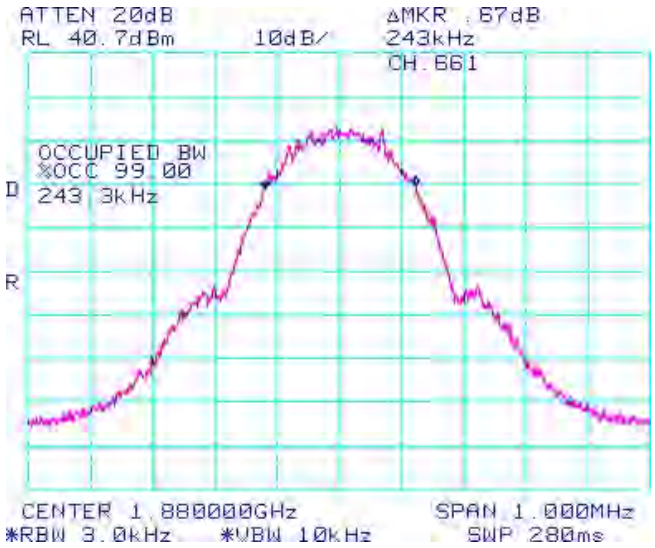
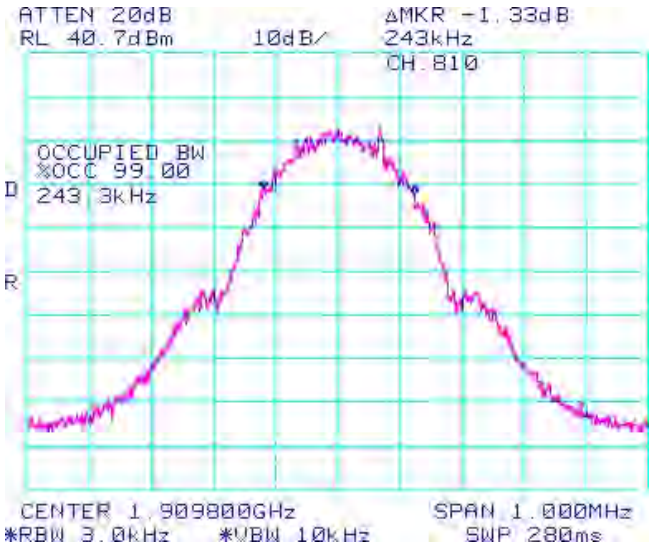


Figure 1-24a: Occupied Bandwidth, PCS1900 High Channel in GSM mode



GSM Conducted RF Emission Test Data cont'd

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

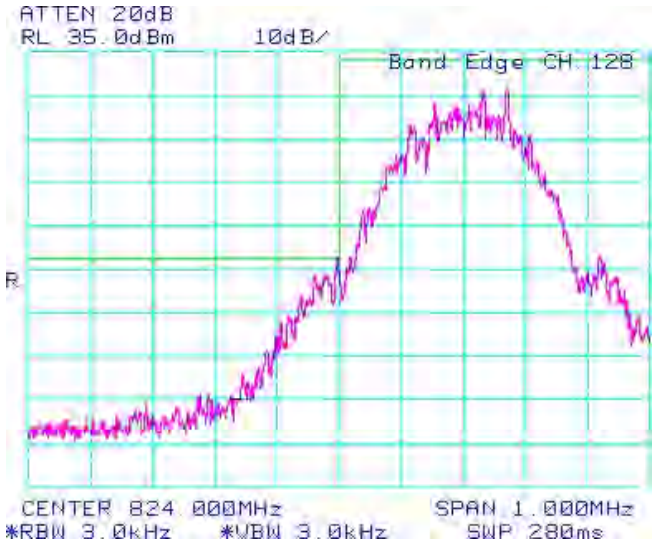


Figure 1-26a: GSM850 band High Channel Mask in GSM mode

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

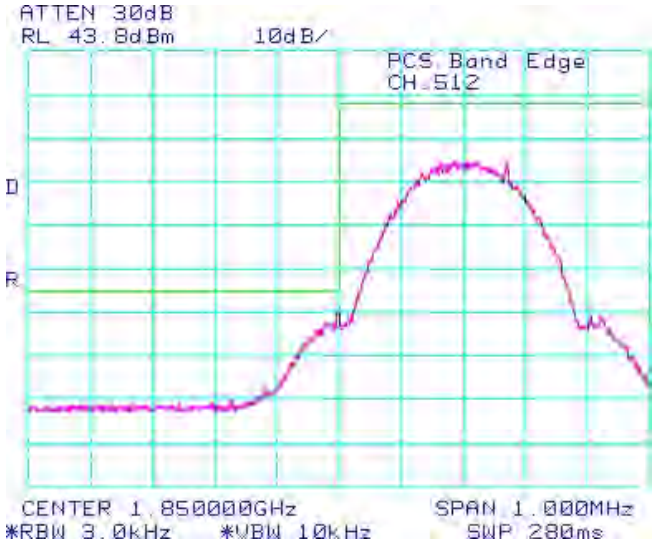
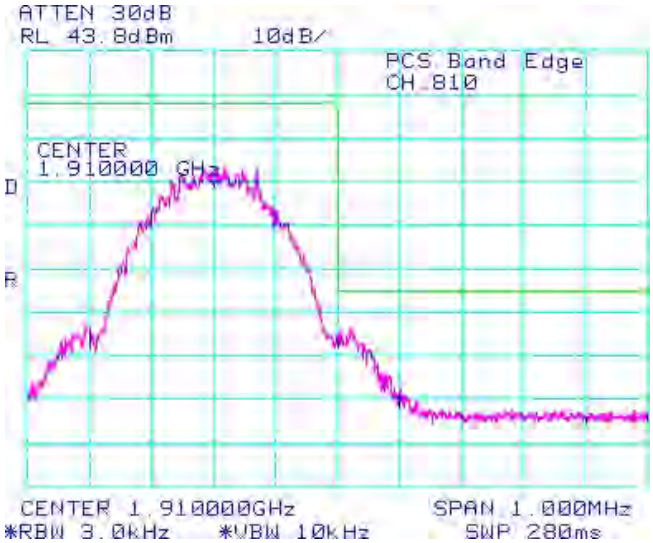


Figure 1-28a: PCS1900, High Channel Mask in GSM mode



GSM Conducted RF Emission Test Data cont'd

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

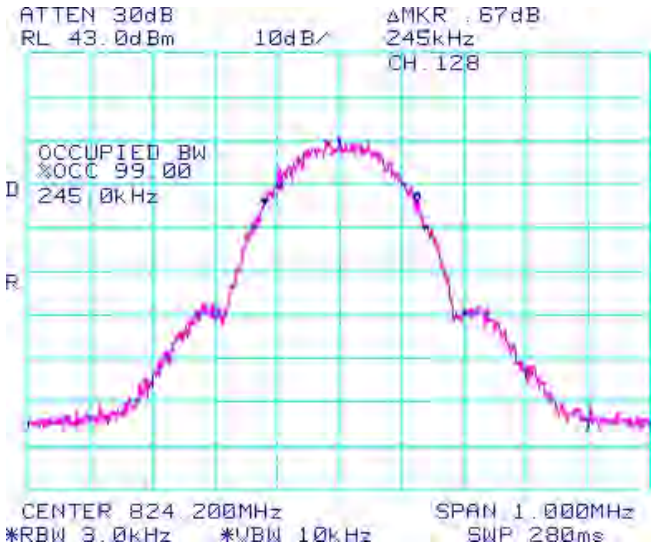


Figure 1-30a: Occupied Bandwidth, GSM850 Band, Middle Channel in EDGE mode

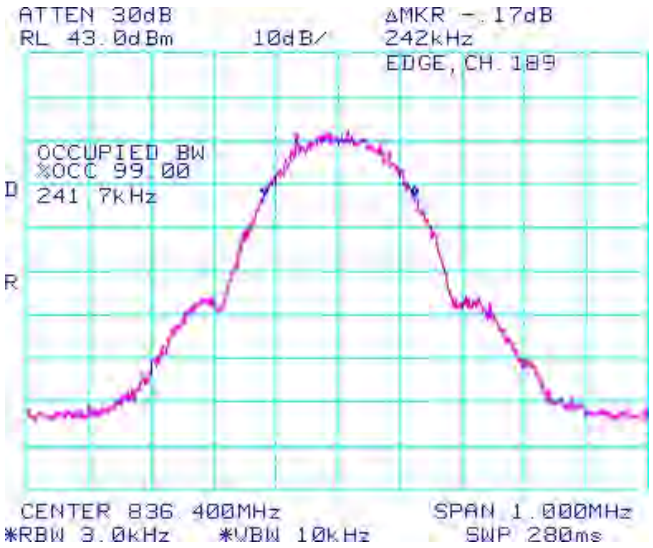
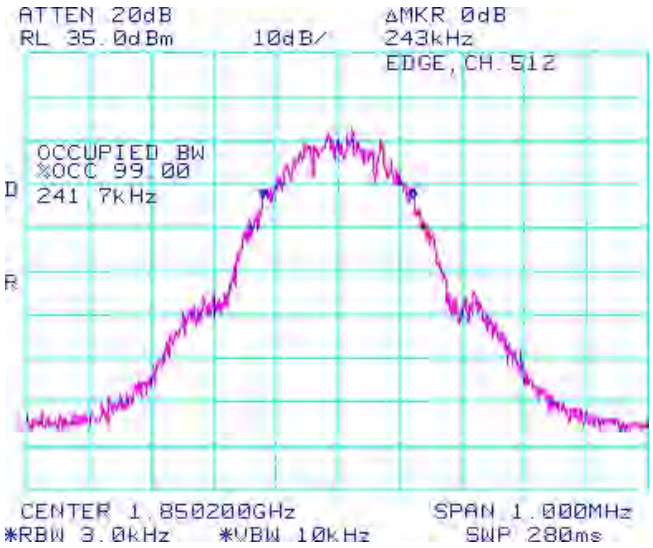


Figure 1-31a: Occupied Bandwidth, GSM850 band, High Channel in EDGE mode

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

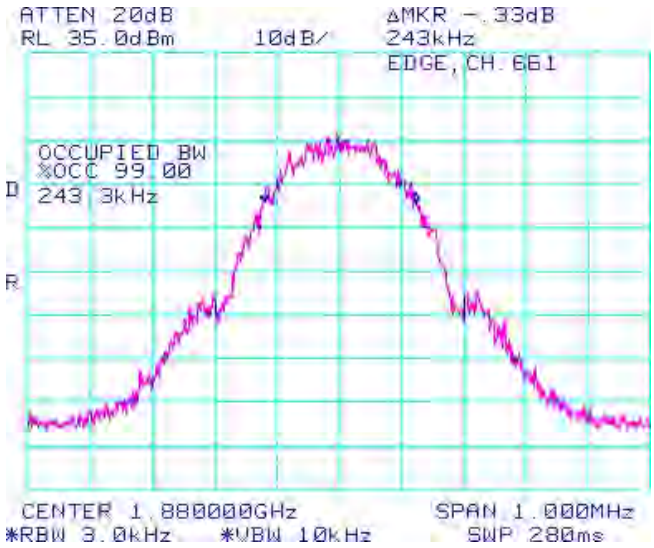


Figure 1-34a: Occupied Bandwidth, PCS1900 Band, High Channel in EDGE mode

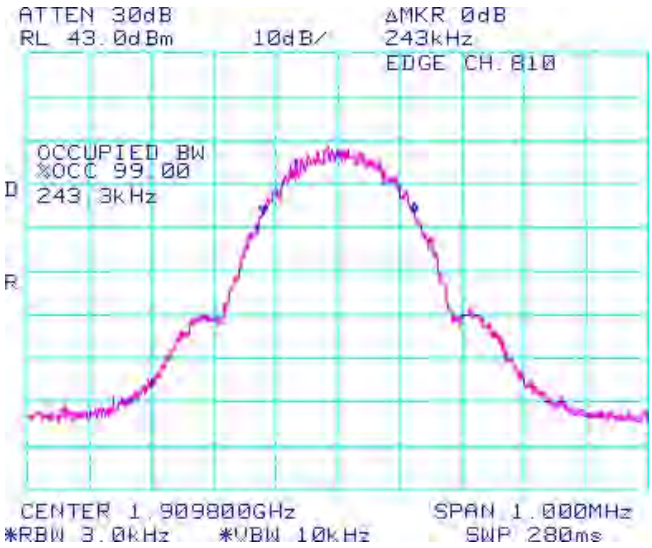


Figure 1-35a: GSM850 Band, Low Channel Mask in EDGE mode

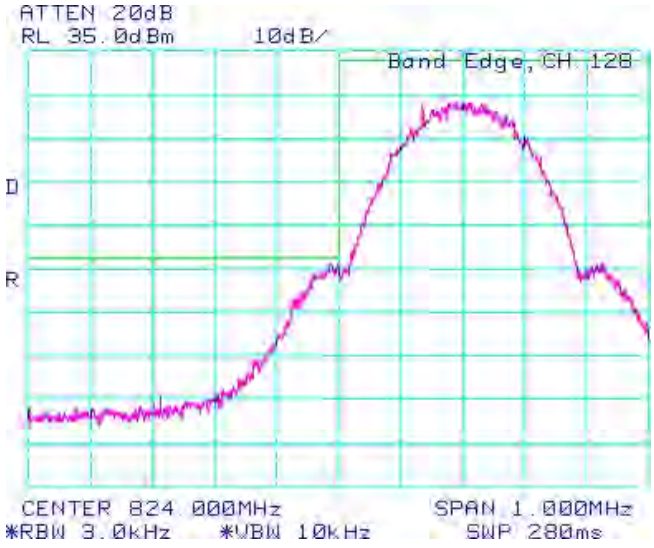


Figure 1-36a: GSM850 Band, High Channel Mask in EDGE mode

GSM Conducted RF Emission Test Data cont'd

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

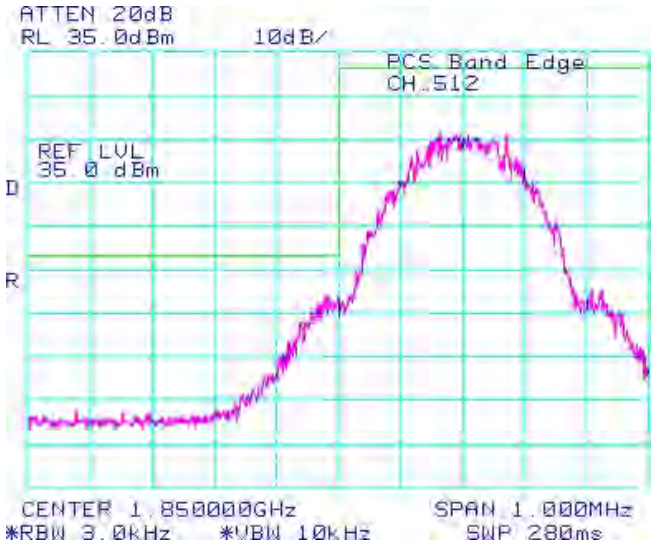
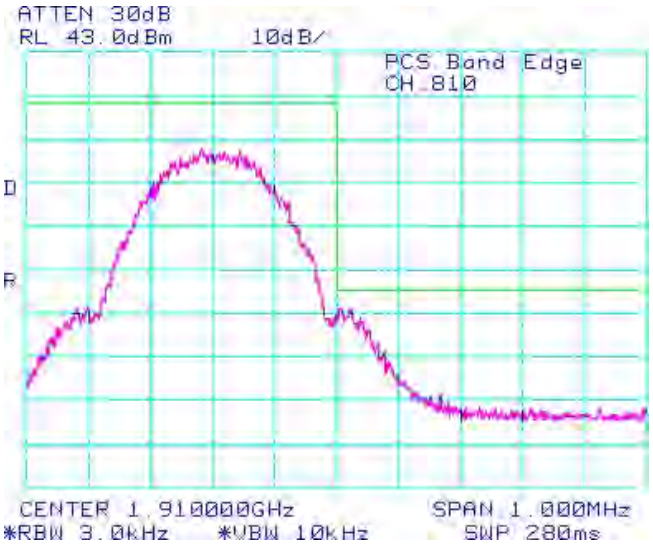


Figure 1-38a: PCS1900 Band, High Channel Mask in EDGE mode



GSM Conducted RF Emission Test Data cont'd

Figure 1-39a: GSM850 band, Spurious Conducted Emissions, Low channel in Edge Mode

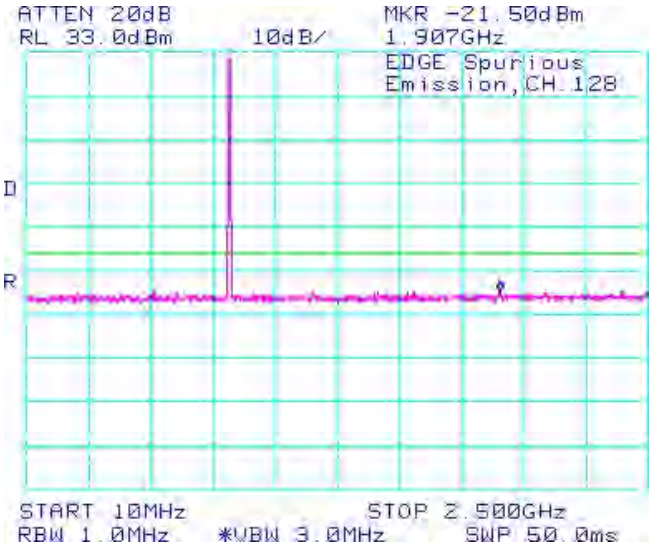


Figure 1-40a: GSM850 band, Spurious Conducted Emissions, Low channel in Edge Mode

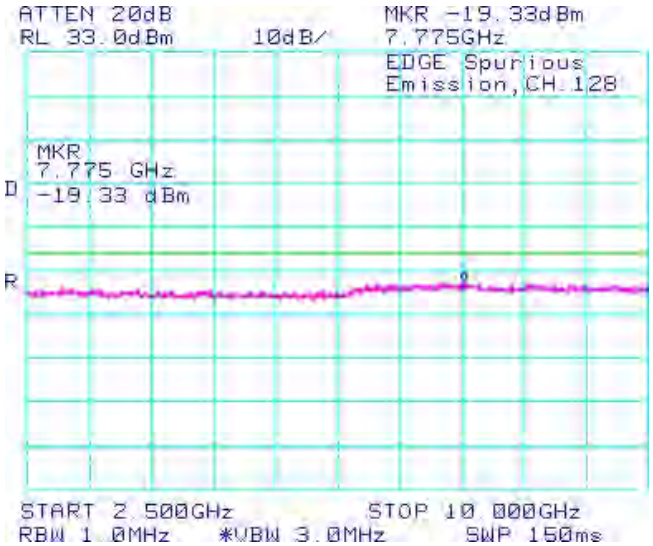


Figure 1-41a: GSM850 band, Spurious Conducted Emissions, Middle channel in Edge Mode

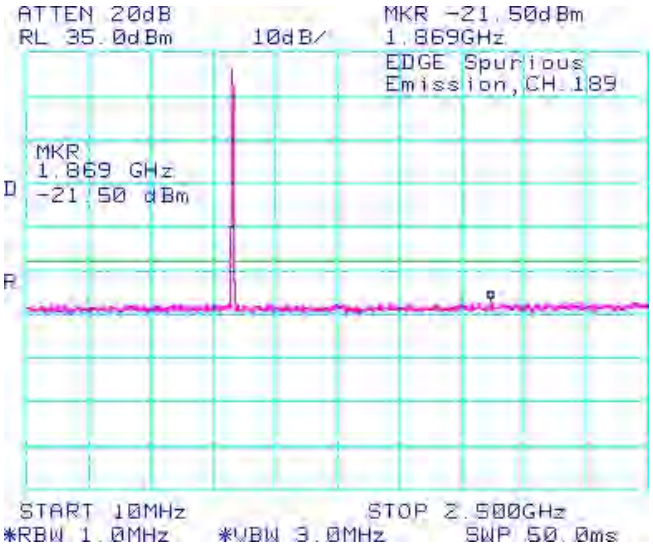
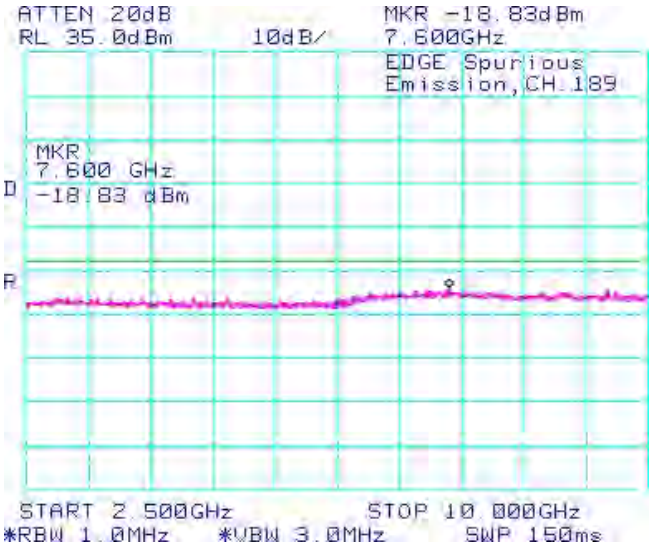


Figure 1-42a: GSM850 band, Spurious Conducted Emissions, Middle channel in Edge Mode



GSM Conducted RF Emission Test Data cont'd

Figure 1-43a: GSM850 band, Spurious Conducted Emissions, High channel in Edge Mode

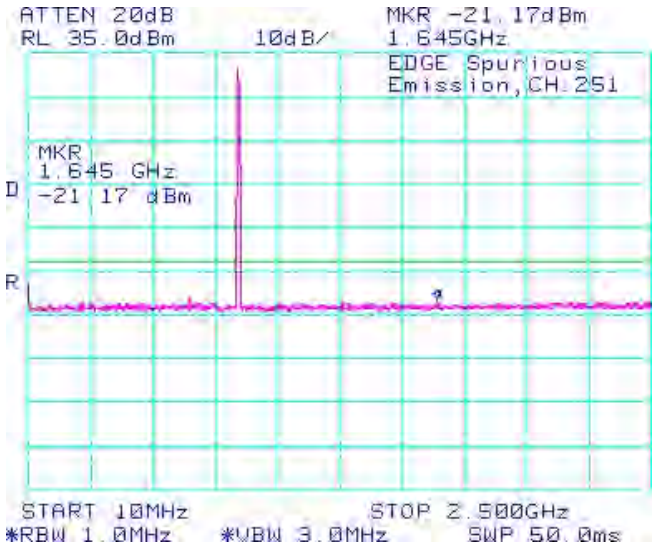


Figure 1-44a: GSM850 band, Spurious Conducted Emissions, High channel in Edge Mode

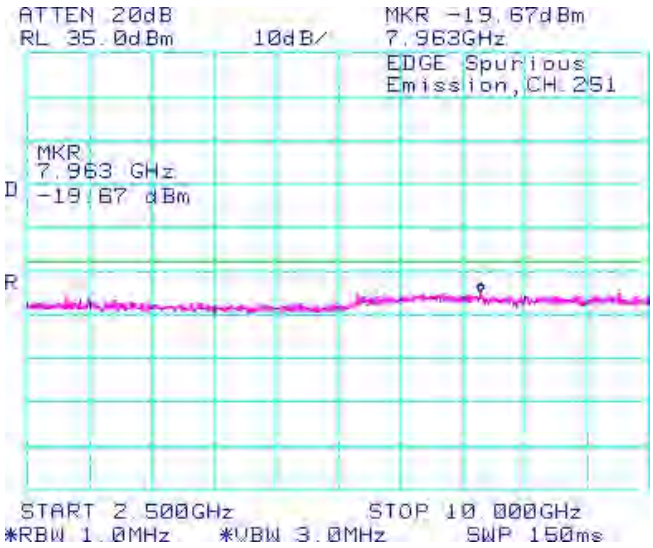


Figure 1-45a: PCS1900 band, Spurious Conducted Emissions, Low channel in Edge Mode

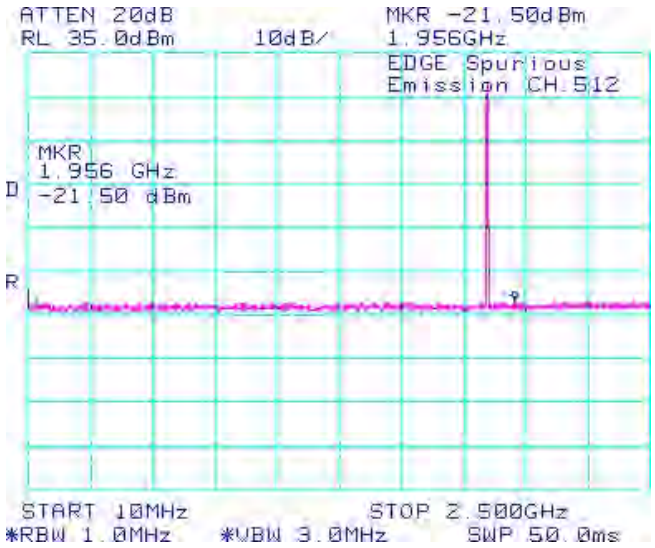
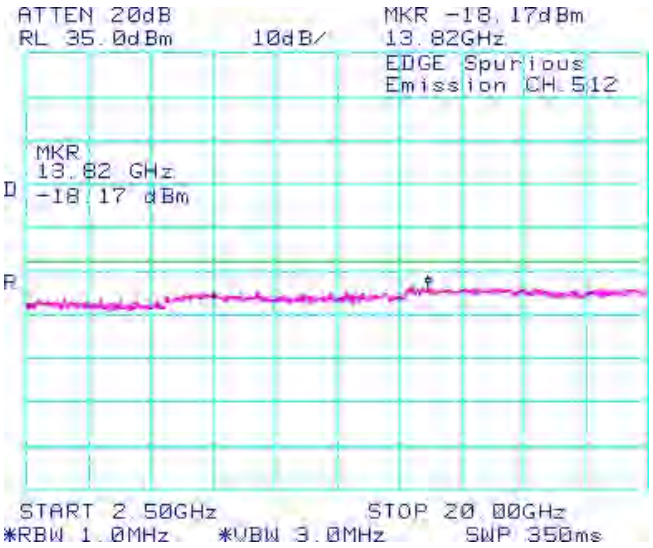


Figure 1-46a: PCS1900 band, Spurious Conducted Emissions, Low channel in Edge Mode



GSM Conducted RF Emission Test Data cont'd

Figure 1-47a: PCS1900 band, Spurious Conducted Emissions, middle channel in Edge Mode

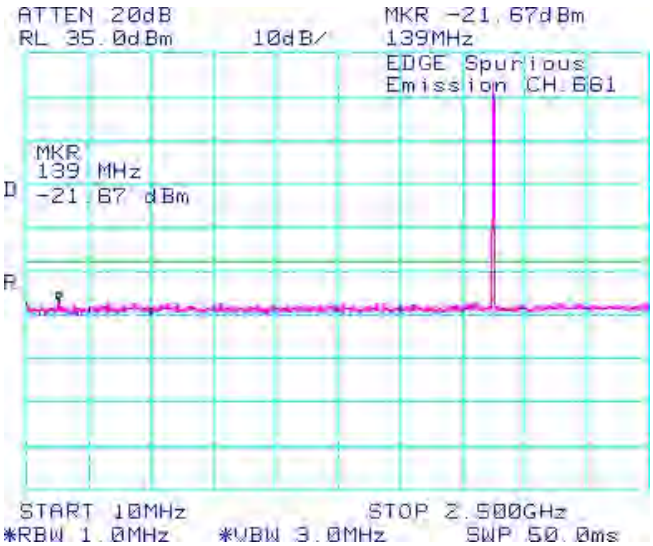


Figure 1-48a: PCS1900 band, Spurious Conducted Emissions, middle channel in Edge Mode

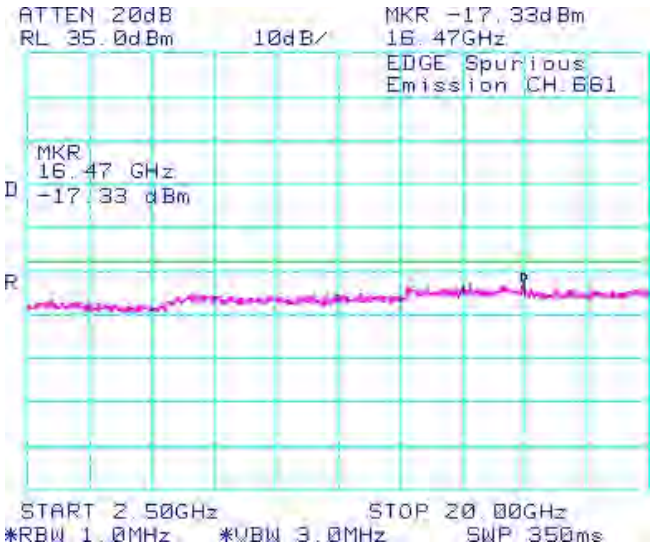


Figure 1-49a: PCS1900 band, Spurious Conducted Emissions, High channel in Edge Mode

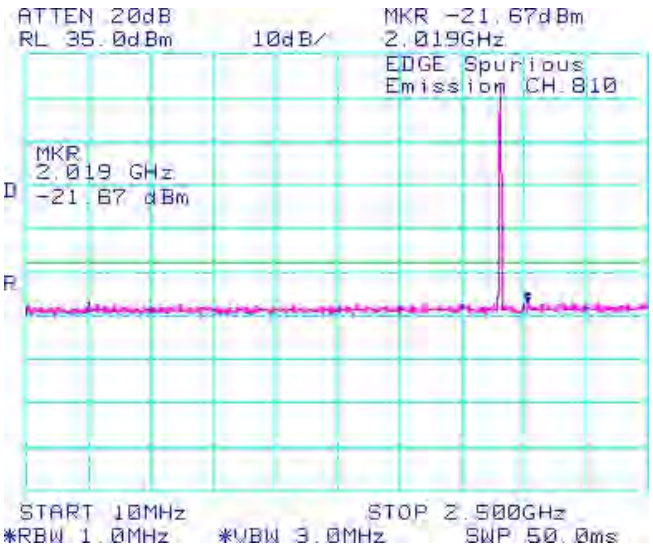
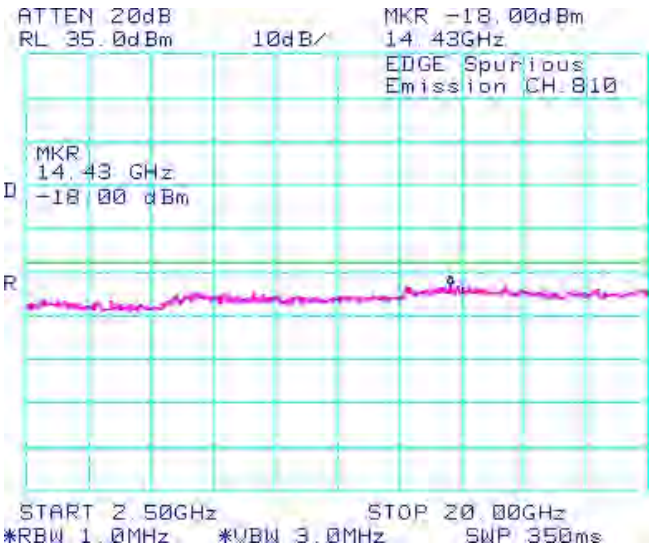


Figure 1-50a: PCS1900 band, Spurious Conducted Emissions, High channel in Edge Mode

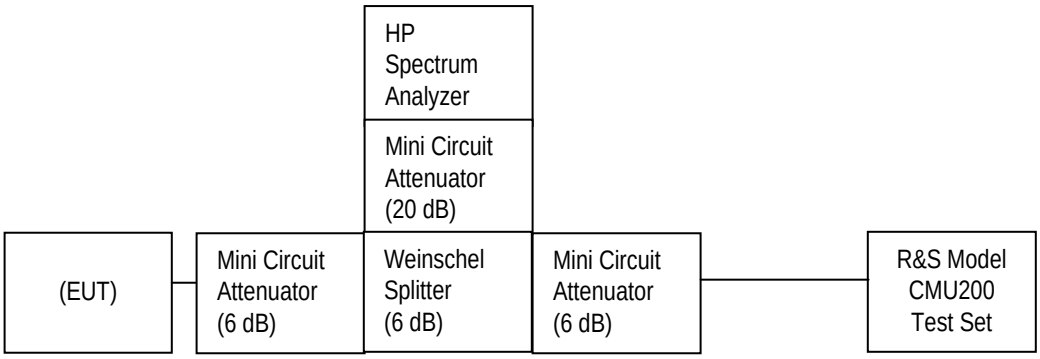


APPENDIX 1B– UMTS Band 2/5 CONDUCTED RF EMISSIONS TEST DATA/PLOTS

UMTS BAND 2/5 Conducted RF Emission Test Data

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

Test Setup Diagram



Date of Test: February 10, 2012

The environmental test conditions were: Temperature: 25.0ºC
Relative Humidity: 37.0 %

The following measurements were performed by Kevin Guo.

UMTS 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.

–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 UMTS band 5 was measured to be 4.517 MHz, and for the PCS1900 band was measured to be 4.508 MHz as shown below. Results were derived 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 applied.

Test Data for UMTS Band 5/2 selected Frequencies in Loopback mode

UMTS band 5 Frequency (MHz)	26dBc Occupied Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
826.400	4.517	4.050
836.400	4.492	4.050
846.600	4.483	4.050

UMTS band 2 Frequency (MHz)	26dBc Occupied Bandwidth (MHz	99% Occupied Bandwidth (MHz)
1852.400	4.508	4.058
1880.000	4.483	4.050
1907.600	4.500	4.050

Measurement Plots for UMTS Band 5 and UMTS BAND 2 in Loopback mode
Refer to the following measurement plots for more detail:

See Figures 1-1b to 1-12b for the plots of the conducted spurious emissions.
See Figures 1-13b to 1-24b for the plots of 99% Occupied Bandwidth and -26 dBc Bandwidth.
See Figures 1-25b to 1-28b for the plots of the Channel mask.

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

UMTS Conducted RF Emission Test Data cont'd

Figure 1-1b: Band 5, Spurious Conducted Emissions, Low channel

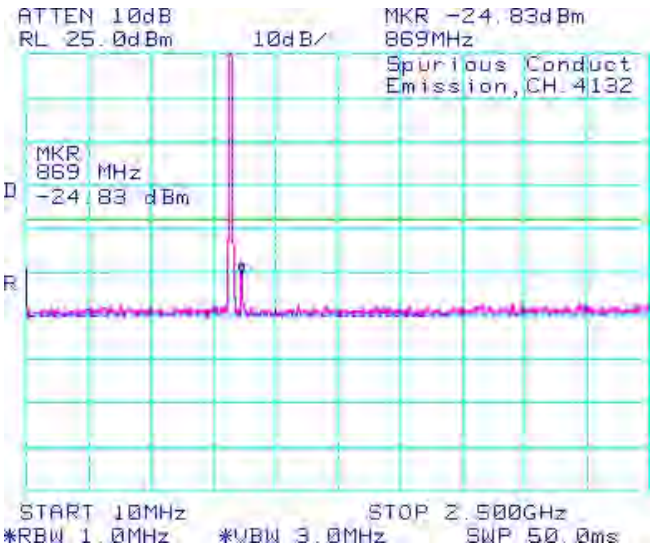


Figure 1-2b: Band 5, Spurious Conducted Emissions, Low channel

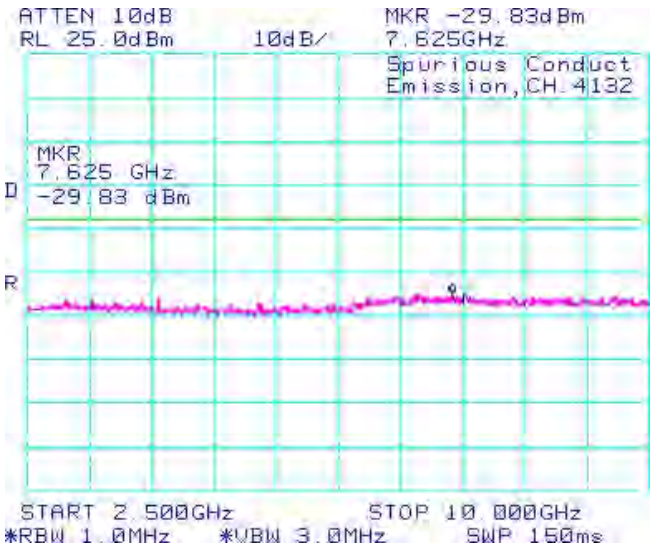


Figure 1-3b: Band 5, Spurious Conducted Emissions, Middle channel

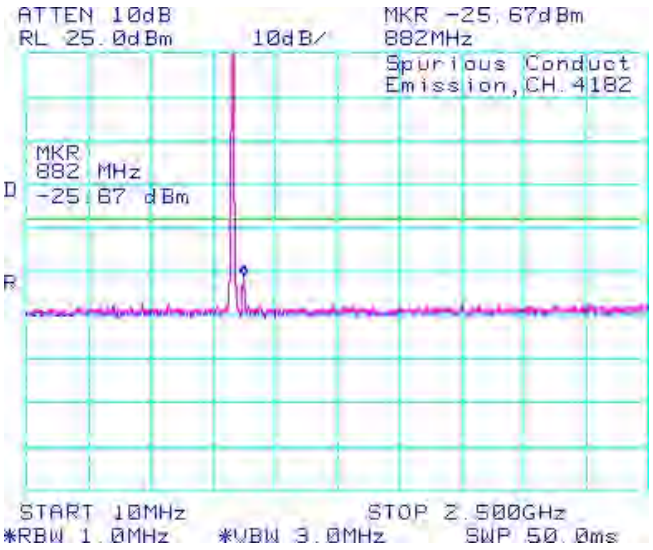
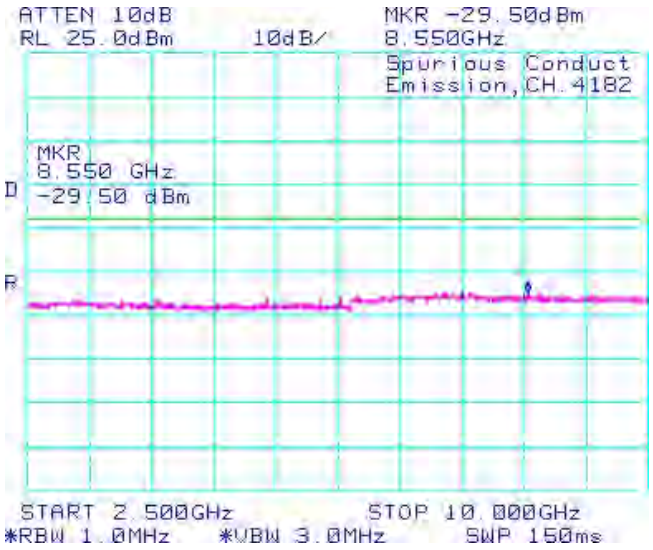


Figure 1-4b: Band 5, Spurious Conducted Emissions, Middle channel



UMTS Conducted RF Emission Test Data cont'd

Figure 1-5b: Band 5, Spurious Conducted Emissions, High Channel

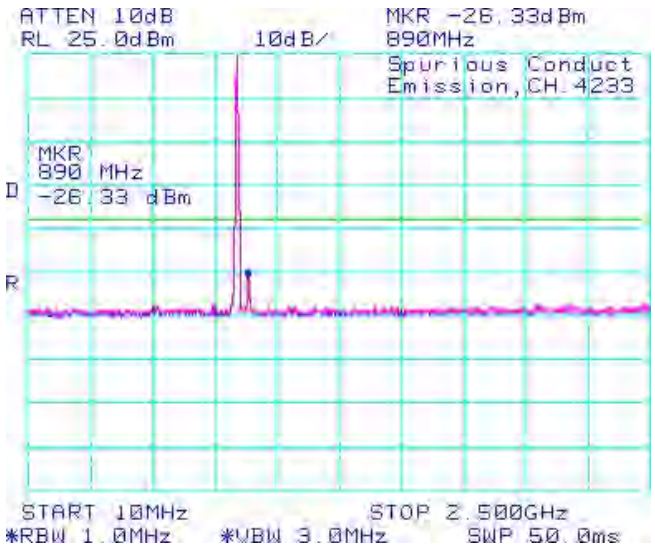


Figure 1-6b: Band 5, Spurious Conducted Emissions, High Channel

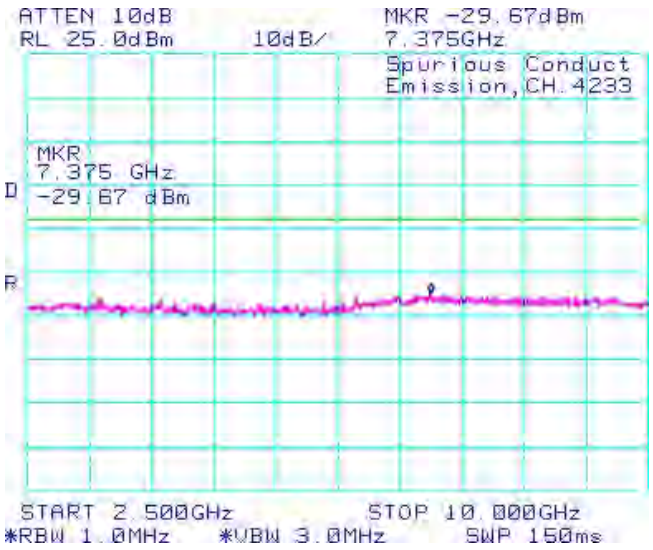


Figure 1-7b:, BAND 2 Spurious Conducted Emissions, Low Channel

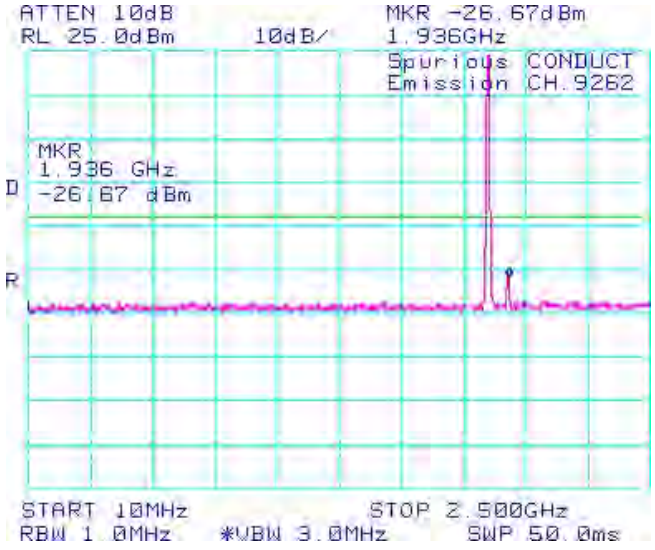
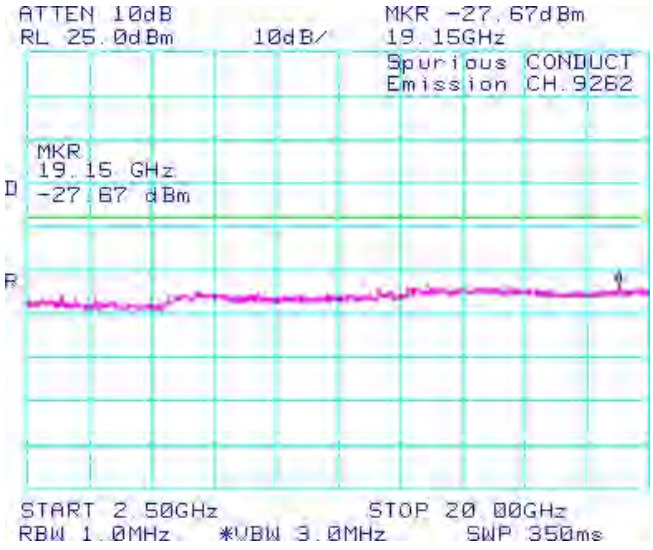


Figure 1-8b: BAND 2, Spurious Conducted Emissions, Low Channel



UMTS Conducted RF Emission Test Data cont'd

Figure 1-9b: BAND 2, Spurious Conducted Emissions, Middle Channel

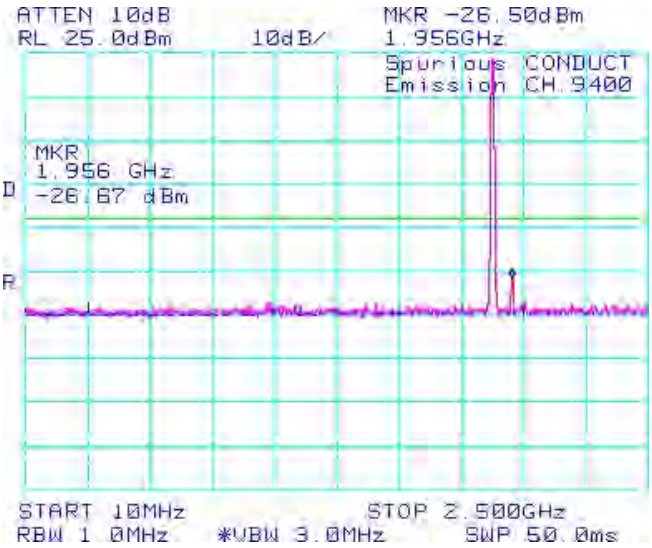


Figure 1-10b: BAND 2, Spurious Conducted Emissions, Middle Channel

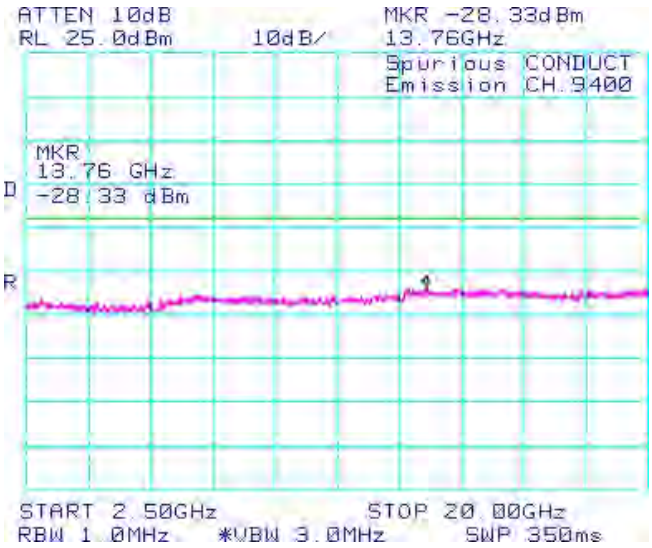


Figure 1-11b: BAND 2, Spurious Conducted Emissions, High Channel

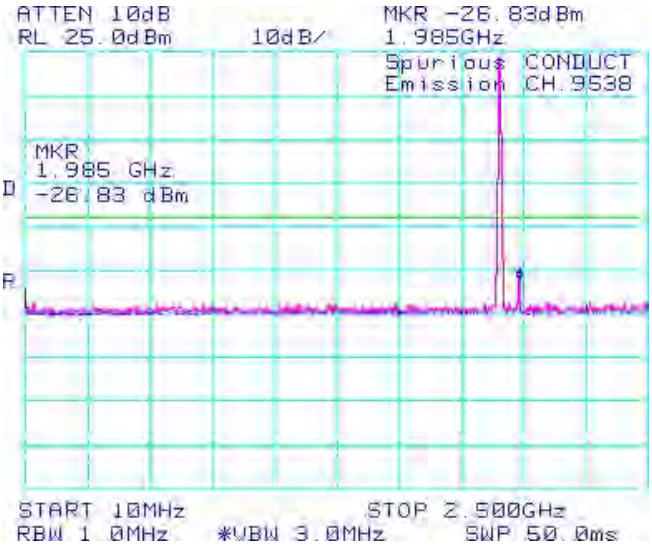
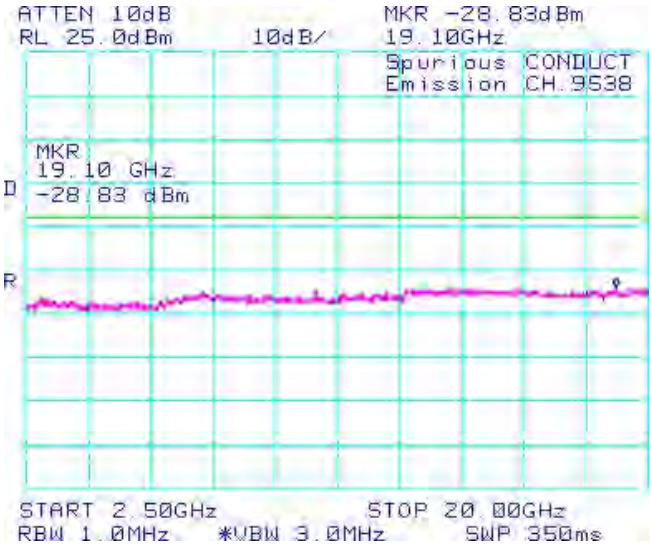


Figure 1-12b: BAND 2, Spurious Conducted Emissions, High Channel



UMTS Conducted RF Emission Test Data cont'd

Figure 1-13b: Occupied Bandwidth, Band 5 Low Channel

Figure 1-14b: Occupied Bandwidth, Band 5 Middle Channel

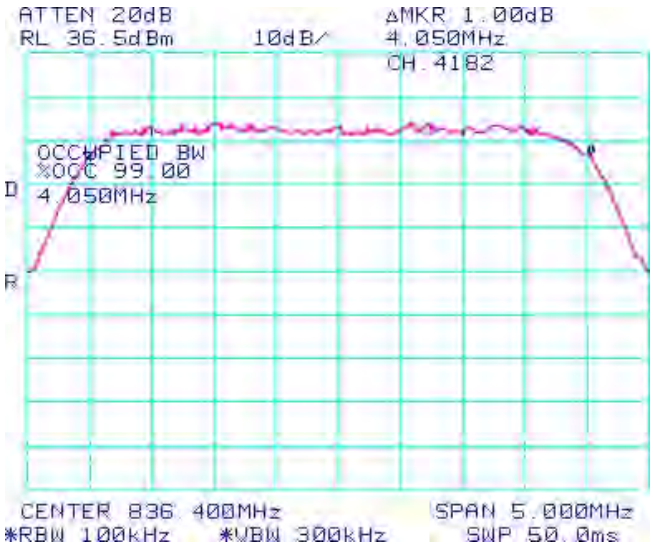


Figure 1-15b: Occupied Bandwidth, Band 5 High Channel

Figure 1-16b: Occupied Bandwidth, BAND 2 Low Channel

UMTS Conducted RF Emission Test Data cont'd

Figure 1-17b: Occupied Bandwidth, BAND 2 Middle Channel

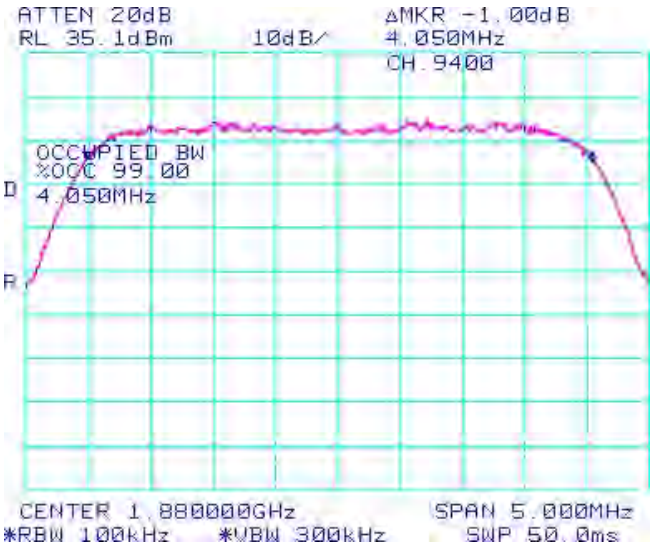


Figure 1-18b: Occupied Bandwidth, BAND 2 High Channel

Figure 1-19b: -26 dBc Bandwidth, Band 5 Low Channel

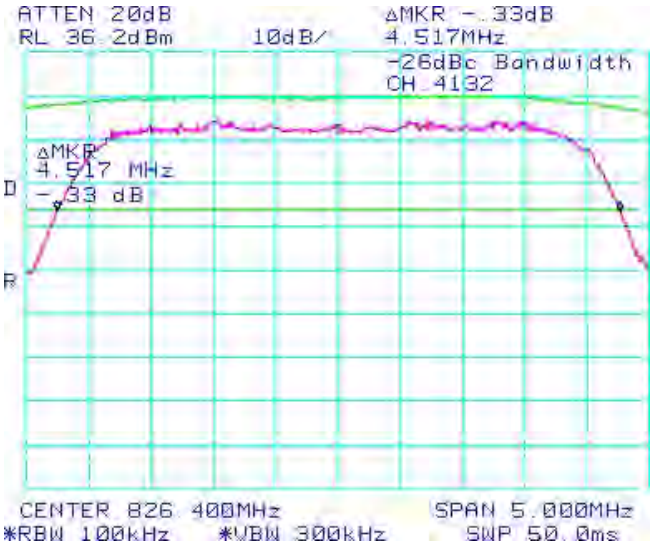
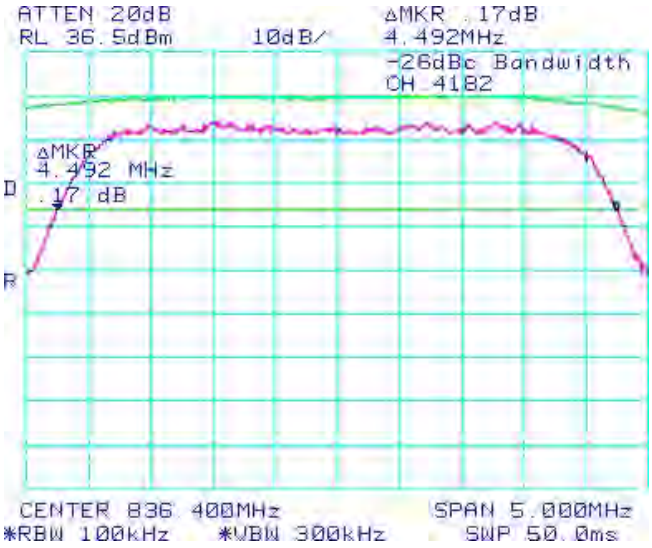


Figure 1-20b: -26 dBc Bandwidth, Band 2 Low Channel



UMTS Conducted RF Emission Test Data cont'd

Figure 1-21b: -26 dBc Bandwidth, Band 5 Middle Channel

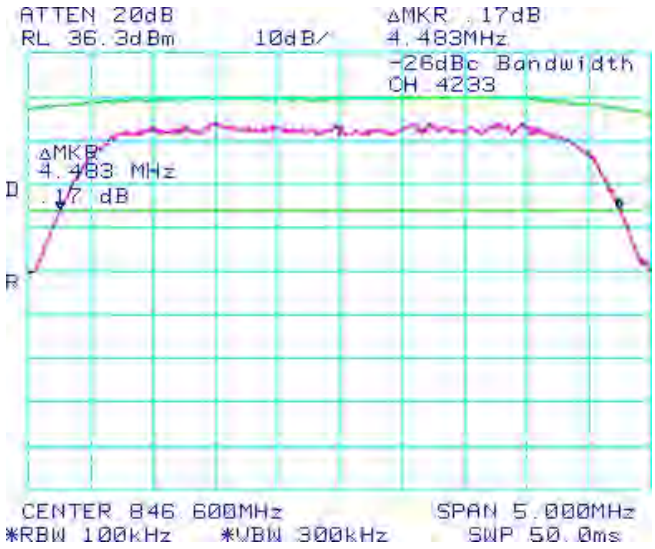


Figure 1-22b: -26 dBc Bandwidth, Band 2 Middle Channel

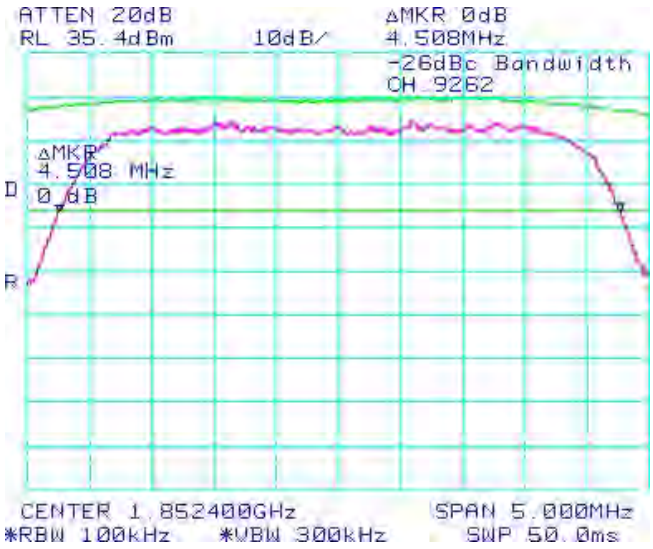


Figure 1-23b: -26 dBc Bandwidth, Band 5 High Channel

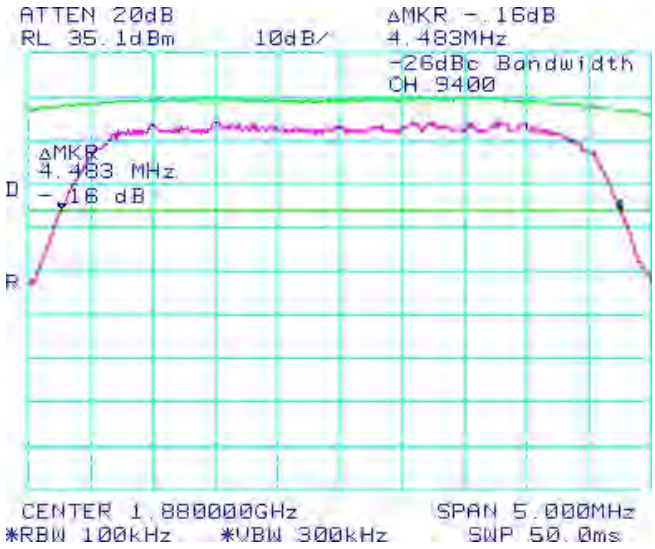
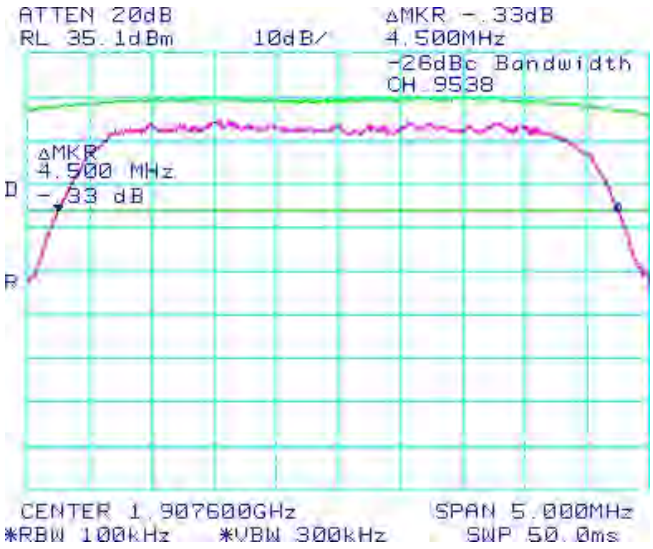


Figure 1-24b: -26 dBc Bandwidth, Band 2 High Channel



UMTS Conducted RF Emission Test Data cont'd

Figure 1-25b: Band 2 Low Channel Mask

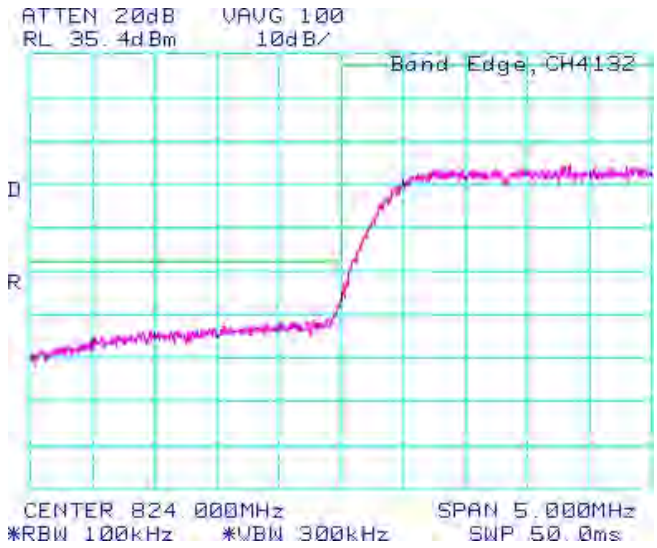


Figure 1-26b: Band 2 High Channel Mask

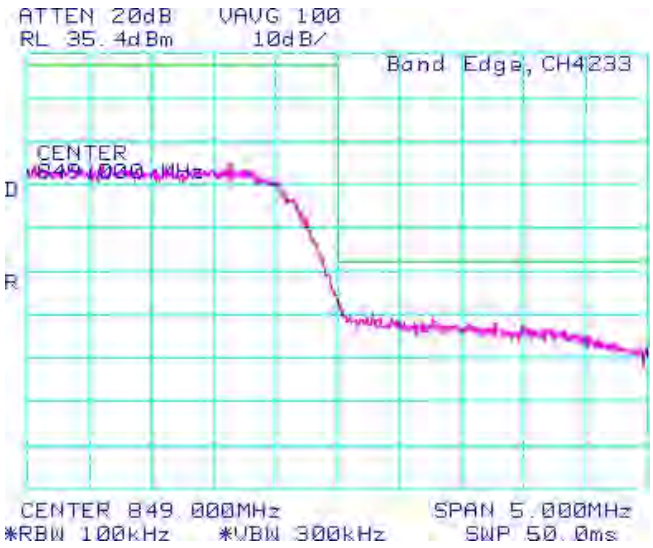


Figure 1-27b: Band 5 Low Channel Mask

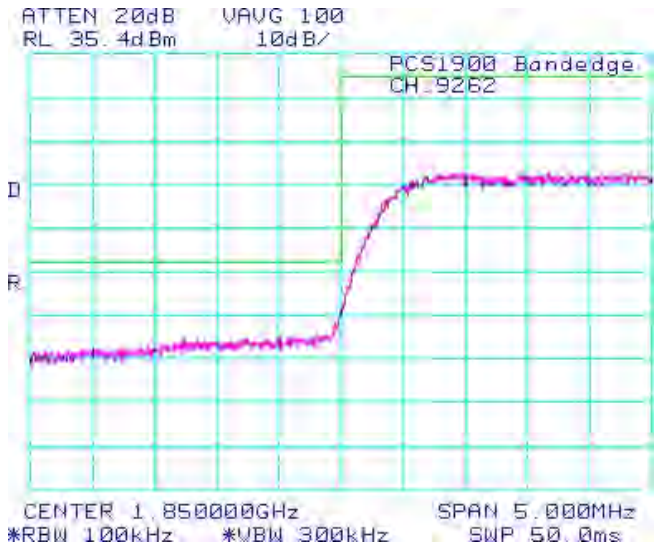
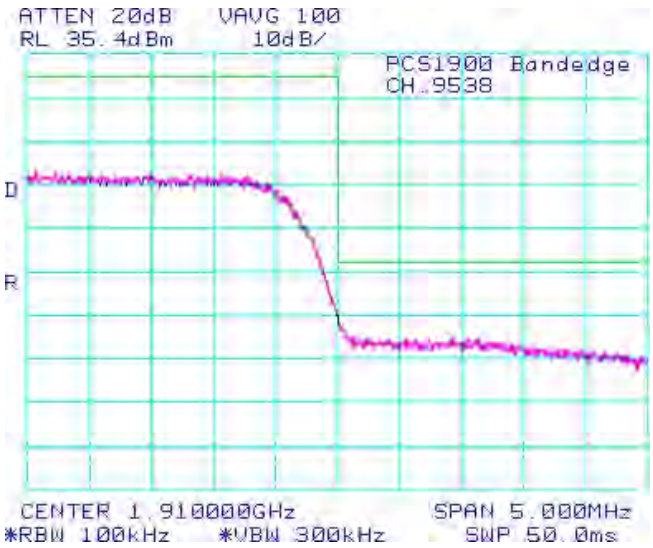


Figure 1-28b: Band 5 High Channel Mask



UMTS Conducted RF Emission Test Data cont'd

The conducted spurious emissions – As per 47 CFR 2.1051, CFR 24.238(a), CFR 22 Subpart H, RSS-132 and RSS - 133 were measured from 10 MHz to 20 GHz.

Date of Test: February 10, 2012

The environmental test conditions were: Temperature: 25.0 ºC
Relative Humidity: 37.0 %

Test Data for UMTS Band 5 and UMTS Band 2 selected Frequencies in HSUPA mode

Band 5 Frequency (MHz)	99% Occupied Bandwidth (MHz)
826.400	4.042
836.400	4.042
846.600	4.042

BAND 2 Frequency (MHz)	99% Occupied Bandwidth (MHz)
1852.400	4.050
1880.000	4.050
1907.600	4.050

Measurement Plots for UMTS Band 5 and UMTS BAND 2 in HSUPA mode
Refer to the following measurement plots for more detail:

See Figures 1-29b to 1-40b for the plots of the conducted spurious emissions.
See Figures 1-41b to 1-46b for the plots of 99% Occupied Bandwidth.
See Figures 1-47b to 1-50b for the plots of the Channel mask.

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

UMTS Conducted RF Emission Test Data cont'd

Figure 1-29b: Band 5 , Spurious Conducted Emissions, Low channel

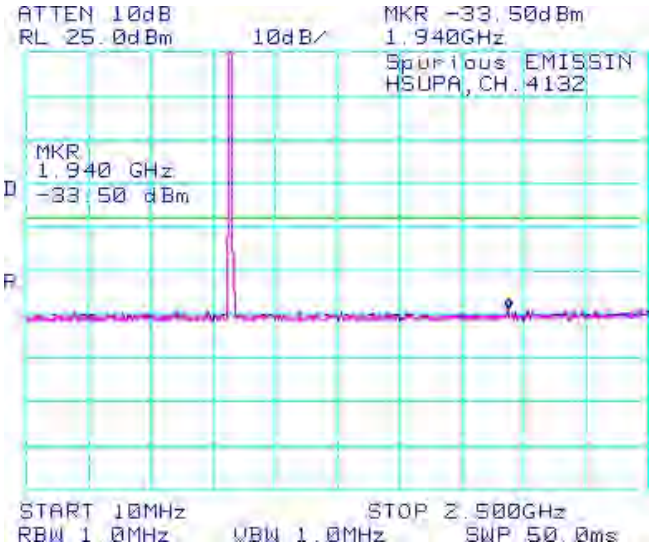


Figure 1-30b: Band 5 , Spurious Conducted Emissions, Low channel

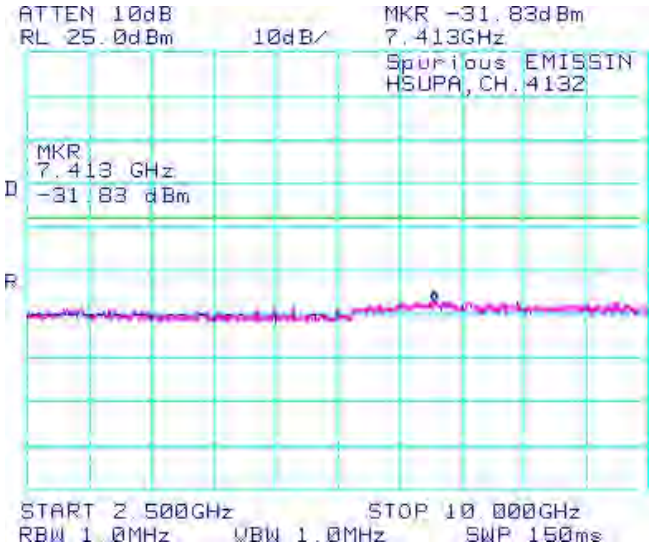


Figure 1-31b: Band 5 , Spurious Conducted Emissions, Middle channel

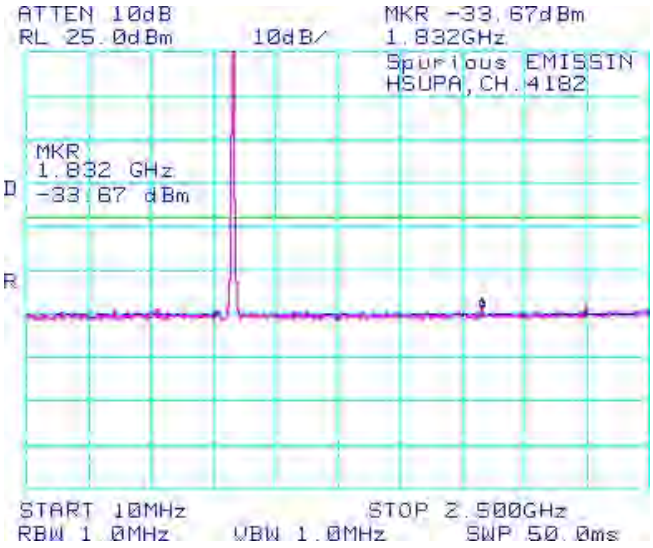
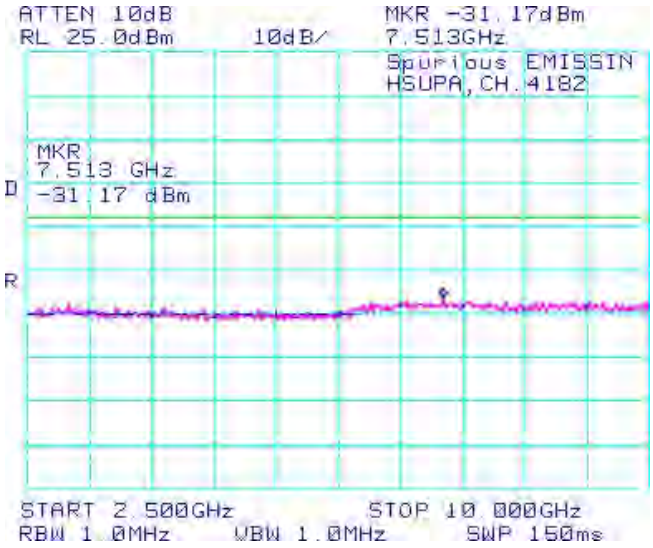


Figure 1-32b: Band 5 , Spurious Conducted Emissions, Middle channel



UMTS Conducted RF Emission Test Data cont'd

Figure 1-33b: Band 5 , Spurious Conducted Emissions, High Channel

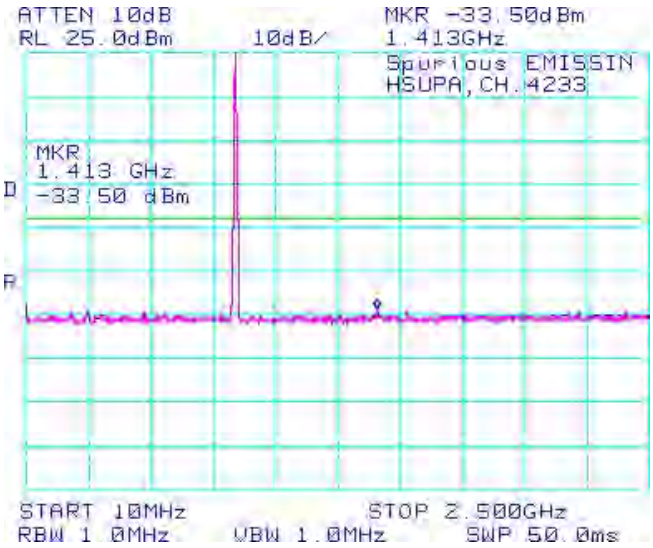


Figure 1-34b: Band 5 , Spurious Conducted Emissions, High Channel

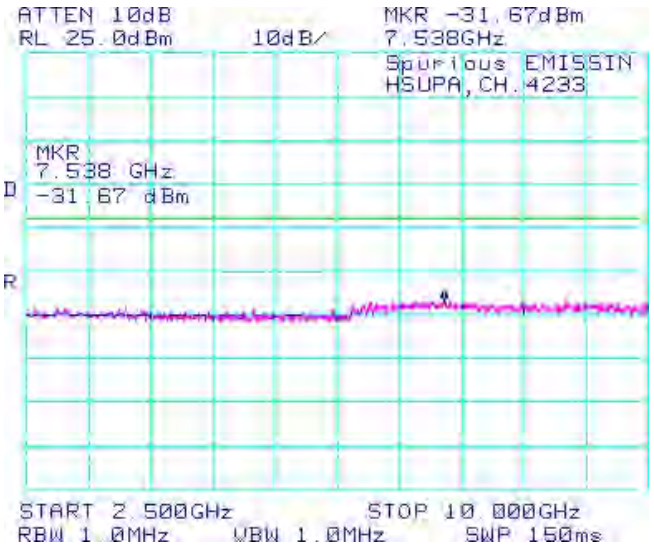


Figure 1-35b: Band 2, Spurious Conducted Emissions, Low Channel

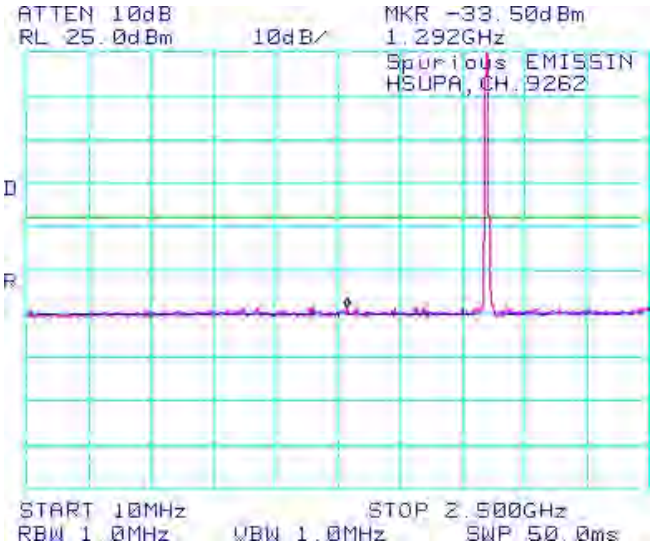
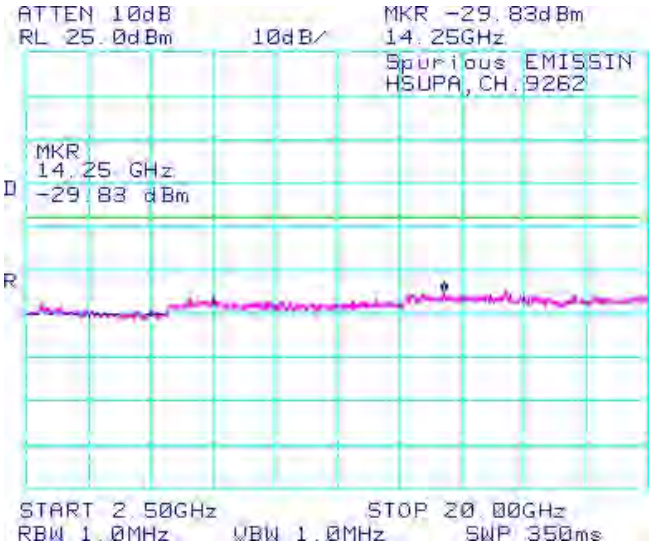


Figure 1-36b: Band 2, Spurious Conducted Emissions, Low Channel



UMTS Conducted RF Emission Test Data cont'd

Figure 1-37b: Band 2, Spurious Conducted Emissions, Middle Channel

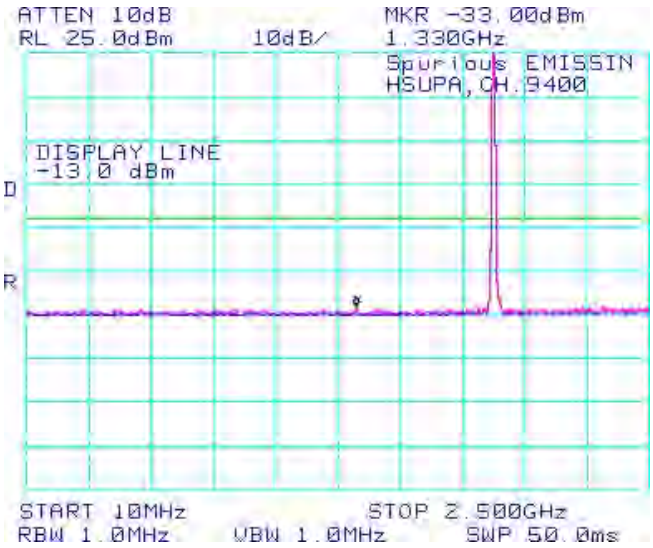


Figure 1-38b: Band 2, Spurious Conducted Emissions, Middle Channel

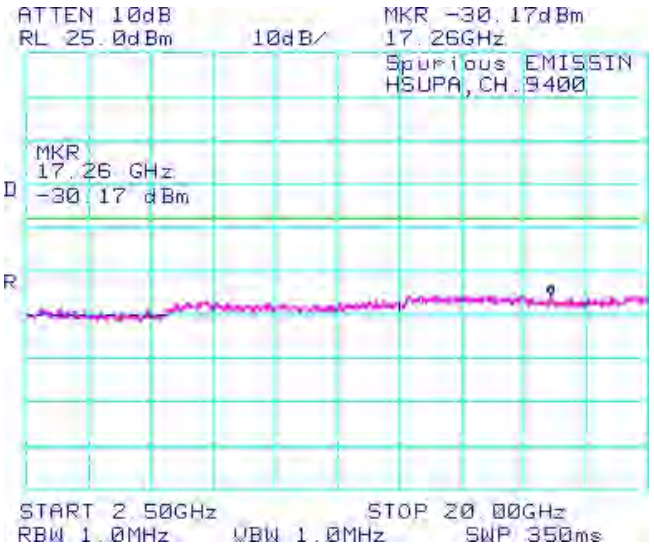


Figure 1-39b: Band 2, Spurious Conducted Emissions, High Channel

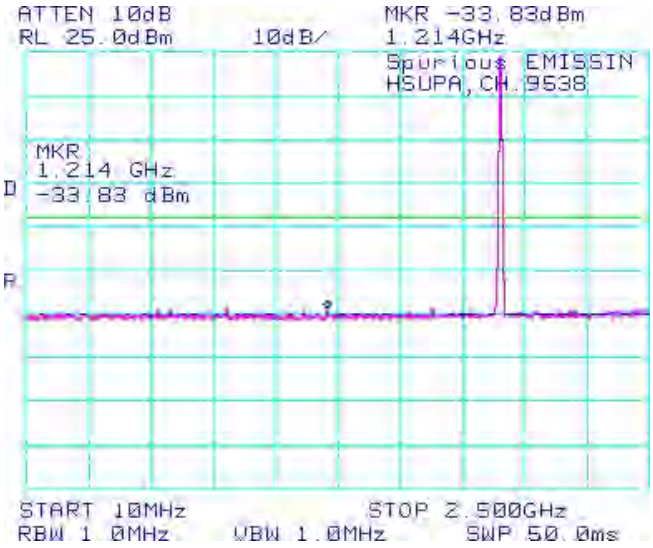
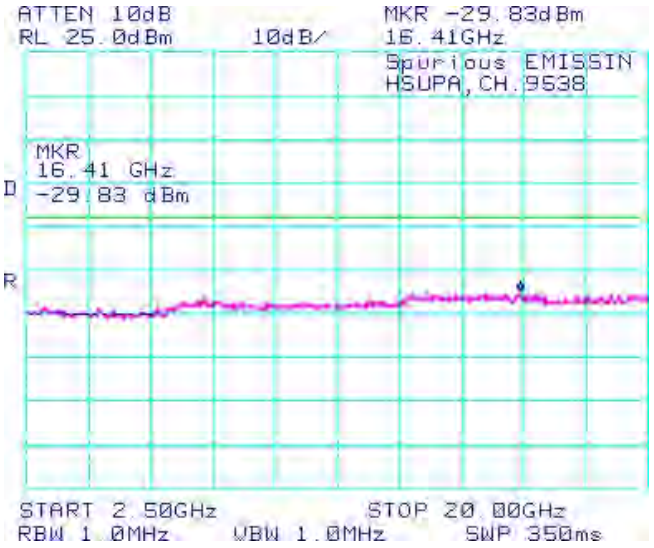


Figure 1-40b: Band 2, Spurious Conducted Emissions, High Channel



UMTS Conducted RF Emission Test Data cont'd

Figure 1-41b: Occupied Bandwidth, Band 5 Low Channel

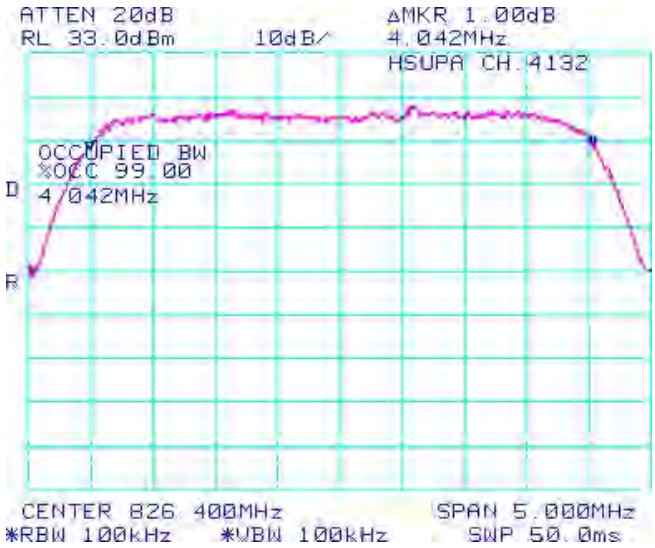


Figure 1-42b: Occupied Bandwidth, Band 5 Middle Channel

Figure 1-43b: Occupied Bandwidth, Band 5 High Channel

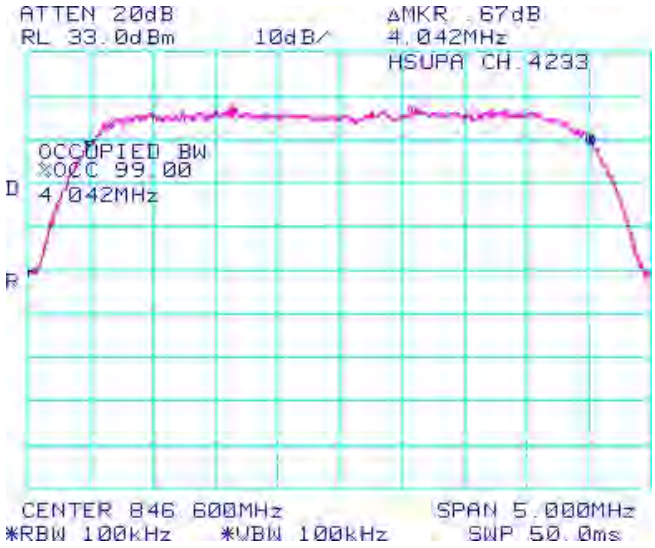
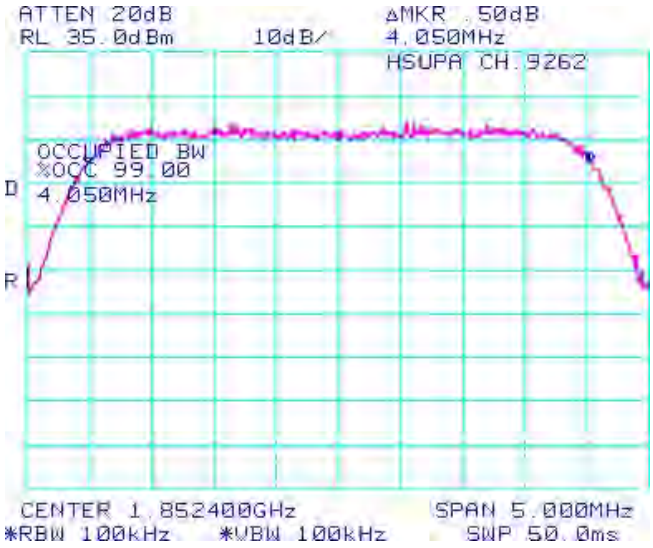


Figure 1-44b: Occupied Bandwidth, BAND 2 Low Channel



UMTS Conducted RF Emission Test Data cont'd

Figure 1-45b: Occupied Bandwidth, BAND 2 Middle Channel

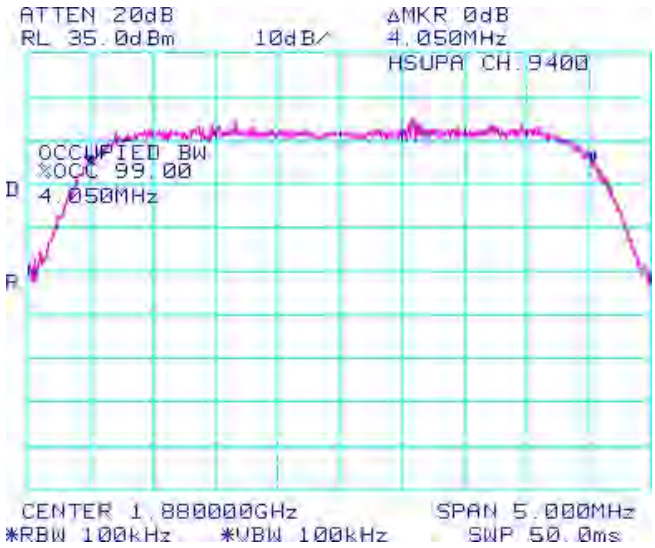


Figure 1-46b: Occupied Bandwidth, BAND 2 High Channel

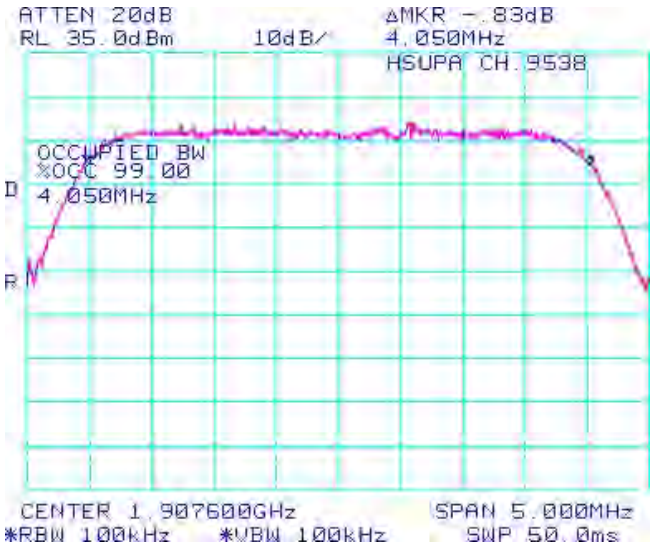


Figure 1-47b: Band 5 , Low Channel Mask

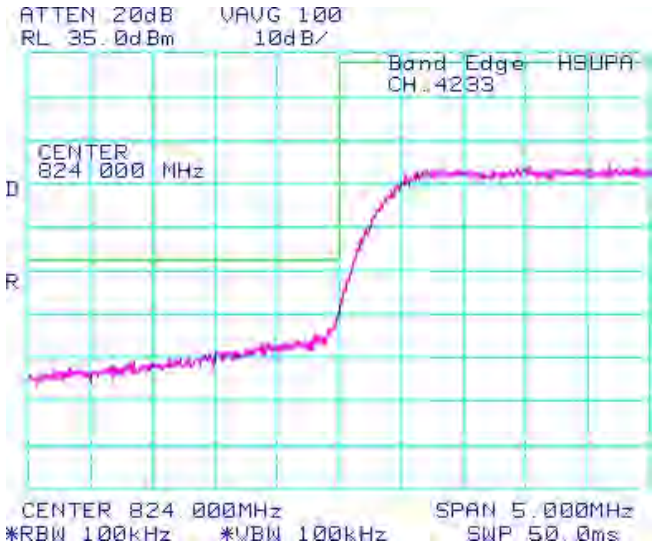
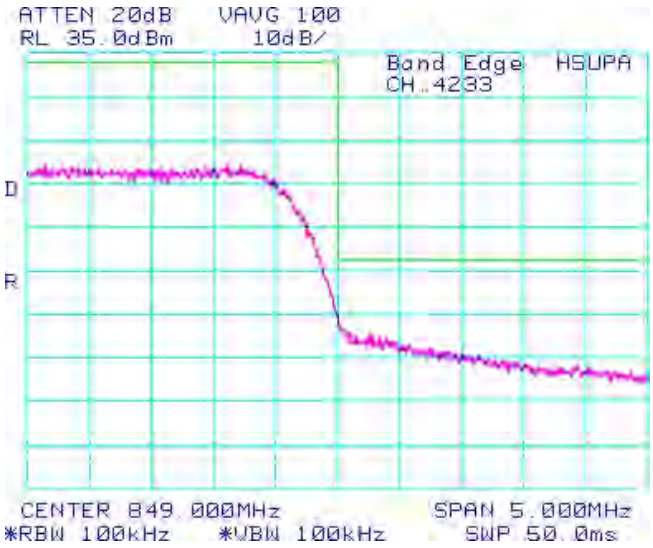


Figure 1-48b: Band 5 , High Channel Mask



UMTS Conducted RF Emission Test Data cont'd

Figure 1-49b: Band 2, Low Channel Mask

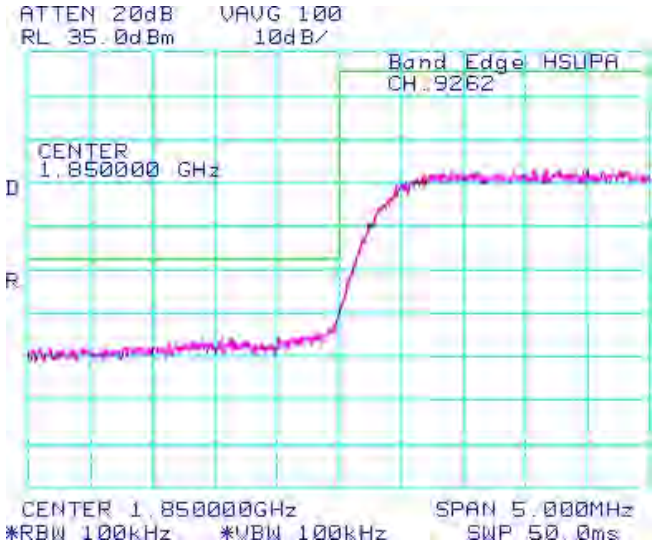
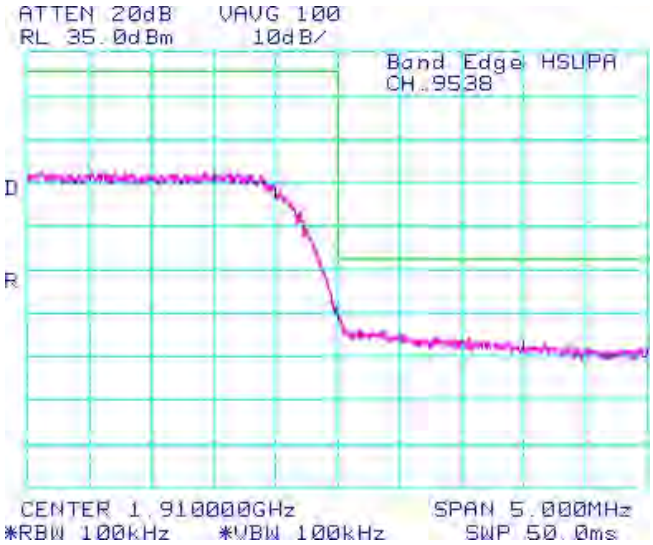


Figure 1-50b: Band 2, High Channel Mask



APPENDIX 2A – GSM CONDUCTED RF OUTPUT POWER TEST DATA

GSM Conducted RF Output Power Test Data

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.

Date of Test: February 22, 2012

The environmental conditions were: Temperature: 23.0 °C
Humidity: 29.7 %

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			
128	824.20	33.2	2.09	128	824.20	31.2	1.32
189	837.60	33.2	2.09	189	837.60	31.1	1.29
251	848.80	33.3	2.14	251	848.80	31.2	1.32
PCS				PCS EDGE			
512	1850.2	30.1	1.02	512	1850.2	28.3	0.68
661	1880.0	30.0	1.00	661	1880.0	28.2	0.66
810	1909.8	30.1	1.02	810	1909.8	28.1	0.65

APPENDIX 2B – UMTS Band 2/5 CONDUCTED RF OUTPUT POWER TEST DATA

UMTS Band 2/5 Conducted RF Output Power Test Data

The conducted RF output power was measured using the CMU200 base station simulator. Low, middle and high channels were measured at maximum radio output power at different service options and modes.

Date of Test: February 22, 2012

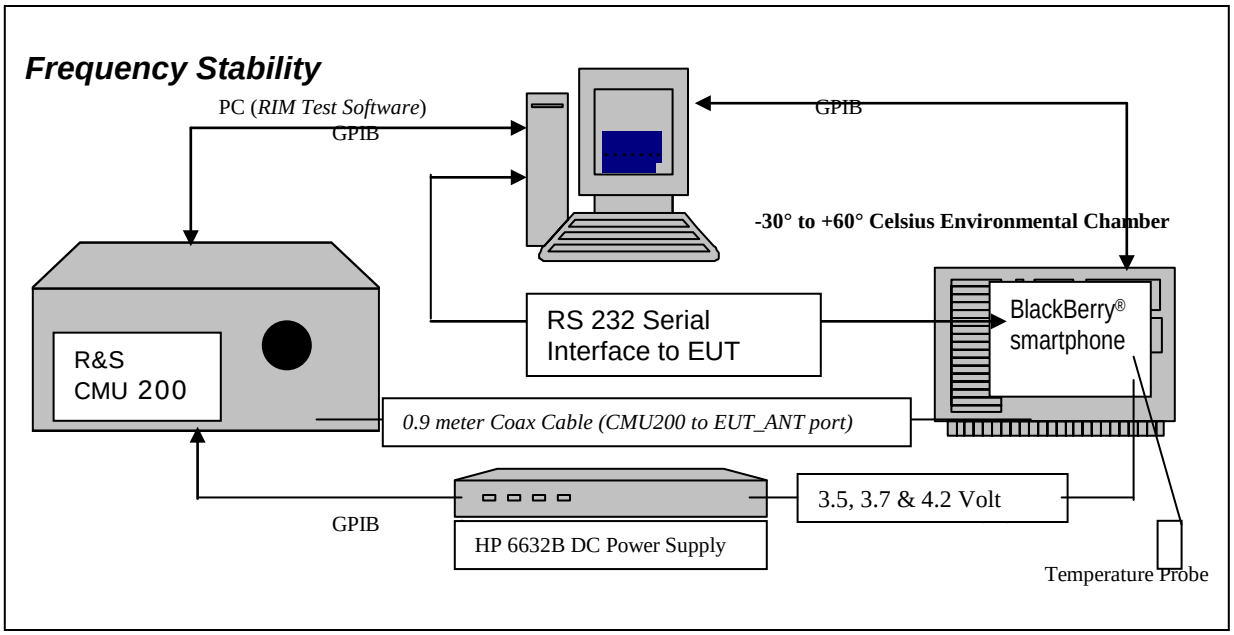
The environmental conditions were: Temperature: 23.0 °C
Humidity: 29.7 %

The measurements were performed by Daoud Attayi.

	Band	FDD V (850)			FDD II (1900)		
	Channel	4132	4182	4233	9262	9400	9538
	Freq (MHz)	826.4	836.4	846.6	1852.4	1880.0	1907.6
Mode	**Subtest**	**Max burst averaged conducted power (dBm)**			**Max burst averaged conducted power (dBm)**		
Rel99	12.2 kbps RMC	24.5	24.5	24.4	23.7	23.6	23.6
Rel99	12.2 kbps AMR, SRB 3.4 kbps	24.5	24.5	24.5	23.7	23.6	23.6
Rel5 HSDPA	1	24.4	24.3	24.3	23.6	23.5	23.4
Rel5 HSDPA	2	24.4	24.3	24.3	23.6	23.5	23.4
Rel5 HSDPA	3	24.4	24.4	24.4	23.6	23.5	23.4
Rel5 HSDPA	4	24.3	24.4	24.3	23.6	23.5	23.4
Rel6 HSUPA	1	24.4	24.3	24.3	23.6	23.4	23.4
Rel6 HSUPA	2	24.4	24.3	24.3	23.6	23.4	23.4
Rel6 HSUPA	3	24.3	24.3	24.3	23.5	23.4	23.5
Rel6 HSUPA	4	24.4	24.3	24.3	23.6	23.5	23.4
Rel6 HSUPA	5	24.4	24.3	24.3	23.5	23.5	23.5

APPENDIX 3A – GSM FREQUENCY STABILITY TEST DATA

GSM Frequency Stability Test Data



The measurements were performed by Kevin Guo.

CFR 47 Chapter 1 - Federal Communications Commission Rules

Part 2 Required Measurements
2.995 Frequency Stability - Procedures
(a,b) Frequency Stability - Temperature Variation
(d) Frequency Stability - Voltage Variation

24.235/22.917 *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 RSS-132, 4.3 Frequency Stability, and RSS-133, 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.

Test setup:

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 848.8 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. 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 -**0.0500 PPM**.
The maximum frequency error in the PCS1900 band measured was **-0.0345 PPM**.

Date of Test: February 09, 2012

GSM850 results: channels 128, 189 and 251 @ 20°C maximum transmitted power

Traffic Channel Number	GSM850 Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
128	824.20	3.6	20	10.20	0.0124
189	836.40	3.6	20	8.78	0.0105
251	848.60	3.6	20	10.85	0.0128

Traffic Channel Number	GSM850 Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
128	824.20	3.7	20	9.04	0.0110
189	836.40	3.7	20	9.75	0.0117
251	848.60	3.7	20	9.81	0.0116

Traffic Channel Number	GSM850 Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
128	824.20	4.2	20	9.62	0.0117
189	836.40	4.2	20	9.81	0.0117
251	848.60	4.2	20	11.56	0.0136

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	5.88	0.0071
128	824.20	3.6	-20	14.92	0.0181
128	824.20	3.6	-10	6.33	0.0077
128	824.20	3.6	0	-7.10	-0.0086
128	824.20	3.6	10	6.72	0.0082
128	824.20	3.6	20	10.20	0.0124
128	824.20	3.6	30	5.62	0.0068
128	824.20	3.6	40	13.82	0.0168
128	824.20	3.6	50	-10.01	-0.0121
128	824.20	3.6	60	-8.91	-0.0108

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
128	824.20	3.7	-30	6.20	0.0075
128	824.20	3.7	-20	13.11	0.0159
128	824.20	3.7	-10	5.17	0.0063
128	824.20	3.7	0	-5.94	-0.0072
128	824.20	3.7	10	6.13	0.0074
128	824.20	3.7	20	9.04	0.0110
128	824.20	3.7	30	-4.52	-0.0055
128	824.20	3.7	40	14.98	0.0182
128	824.20	3.7	50	-11.56	-0.0140
128	824.20	3.7	60	-9.69	-0.0118

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
128	824.20	4.2	-30	7.17	0.0087
128	824.20	4.2	-20	13.24	0.0161
128	824.20	4.2	-10	6.20	0.0075
128	824.20	4.2	0	-5.10	-0.0062
128	824.20	4.2	10	8.27	0.0100
128	824.20	4.2	20	9.62	0.0117
128	824.20	4.2	30	-4.13	**-0.0500**
128	824.20	4.2	40	15.11	0.0183
128	824.20	4.2	50	-11.49	-0.0139
128	824.20	4.2	60	-8.20	-0.0099

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	5.23	0.0063
189	836.40	3.6	-20	12.46	0.0149
189	836.40	3.6	-10	5.62	0.0067
189	836.40	3.6	0	-5.62	-0.0067
189	836.40	3.6	10	9.30	0.0111
189	836.40	3.6	20	8.78	0.0105
189	836.40	3.6	30	-5.55	-0.0066
189	836.40	3.6	40	11.75	0.0141
189	836.40	3.6	50	-10.53	-0.0126
189	836.40	3.6	60	-11.62	-0.0139

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
189	836.40	3.7	-30	7.10	0.0085
189	836.40	3.7	-20	13.50	0.0161
189	836.40	3.7	-10	6.59	0.0079
189	836.40	3.7	0	-5.49	-0.0066
189	836.40	3.7	10	10.14	0.0121
189	836.40	3.7	20	9.75	0.0117
189	836.40	3.7	30	-5.88	-0.0070
189	836.40	3.7	40	14.14	0.0169
189	836.40	3.7	50	-10.46	-0.0125
189	836.40	3.7	60	-8.52	-0.0102

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
189	836.40	4.2	-30	7.75	0.0093
189	836.40	4.2	-20	13.95	0.0167
189	836.40	4.2	-10	7.36	0.0088
189	836.40	4.2	0	-7.88	-0.0094
189	836.40	4.2	10	10.65	0.0127
189	836.40	4.2	20	9.81	0.0117
189	836.40	4.2	30	4.91	0.0059
189	836.40	4.2	40	13.50	0.0161
189	836.40	4.2	50	-10.46	-0.0125
189	836.40	4.2	60	-8.52	-0.0102

GSM850 Results: channel 251 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
251	848.8	3.6	-30	7.49	0.0088
251	848.8	3.6	-20	11.75	0.0138
251	848.8	3.6	-10	4.71	0.0055
251	848.8	3.6	0	-6.26	-0.0074
251	848.8	3.6	10	8.78	0.0103
251	848.8	3.6	20	10.85	0.0128
251	848.8	3.6	30	-4.00	-0.0047
251	848.8	3.6	40	13.24	0.0156
251	848.8	3.6	50	-10.85	-0.0128
251	848.8	3.6	60	-10.65	-0.0125

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
251	848.8	3.7	-30	6.65	0.0078
251	848.8	3.7	-20	12.33	0.0145
251	848.8	3.7	-10	4.65	0.0055
251	848.8	3.7	0	-5.94	-0.0070
251	848.8	3.7	10	8.39	0.0099
251	848.8	3.7	20	9.81	0.0116
251	848.8	3.7	30	-4.91	-0.0058
251	848.8	3.7	40	12.33	0.0145
251	848.8	3.7	50	-10.72	-0.0126
251	848.8	3.7	60	-9.81	-0.0116

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
251	848.8	4.2	-30	7.49	0.0088
251	848.8	4.2	-20	15.24	0.0180
251	848.8	4.2	-10	5.81	0.0068
251	848.8	4.2	0	-4.97	-0.0059
251	848.8	4.2	10	11.75	0.0138
251	848.8	4.2	20	11.56	0.0136
251	848.8	4.2	30	5.62	0.0066
251	848.8	4.2	40	12.40	0.0146
251	848.8	4.2	50	-9.36	-0.0110
251	848.8	4.2	60	-8.27	-0.0097

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

Traffic Channel Number	PCS Frequency (MHz	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
512	1850.20	3.6	20	33.96	0.0184
661	1880.00	3.6	20	43.97	0.0234
810	1909.80	3.6	20	43.59	0.0228

Traffic Channel Number	PCS Frequency (MHz)	Voltage (Volts)	Temperatur e (Celsius)	Frequency Error (Hz)	PPM
512	1850.20	3.7	20	35.64	0.0193
661	1880.00	3.7	20	37.97	0.0202
810	1909.80	3.7	20	41.46	0.0217

Traffic Channel Number	PCS Frequency (MHz)	Voltage (Volts)	Temperatur e (Celsius)	Frequency Error (Hz)	PPM
512	1850.20	4.2	20	36.16	0.0195
661	1880.00	4.2	20	46.30	0.0246
810	1909.80	4.2	20	41.78	0.0219

PCS1900 Results: channel 512 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
512	1850.20	3.6	-30	53.08	0.0287
512	1850.20	3.6	-20	32.35	0.0175
512	1850.20	3.6	-10	-25.89	-0.0140
512	1850.20	3.6	0	15.50	0.0084
512	1850.20	3.6	10	12.72	0.0069
512	1850.20	3.6	20	33.96	0.0184
512	1850.20	3.6	30	19.89	0.0108
512	1850.20	3.6	40	27.38	0.0148
512	1850.20	3.6	50	-56.69	-0.0306
512	1850.20	3.6	60	-25.70	-0.0139

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
512	1850.20	3.7	-30	14.72	0.0080
512	1850.20	3.7	-20	38.42	0.0208
512	1850.20	3.7	-10	-27.64	-0.0149
512	1850.20	3.7	0	16.72	0.0090
512	1850.20	3.7	10	14.92	0.0081
512	1850.20	3.7	20	35.64	0.0193
512	1850.20	3.7	30	30.74	0.0166
512	1850.20	3.7	40	30.09	0.0163
512	1850.20	3.7	50	-56.18	-0.0304
512	1850.20	3.7	60	-30.80	-0.0166

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
512	1850.20	4.2	-30	33.96	0.0184
512	1850.20	4.2	-20	43.65	0.0236
512	1850.20	4.2	-10	-26.93	-0.0146
512	1850.20	4.2	0	17.82	0.0096
512	1850.20	4.2	10	15.95	0.0086
512	1850.20	4.2	20	36.16	0.0195
512	1850.20	4.2	30	26.47	0.0143
512	1850.20	4.2	40	31.06	0.0168
512	1850.20	4.2	50	-63.80	**-0.0345**
512	1850.20	4.2	60	-26.86	-0.0145

PCS1900 Results: channel 661 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
661	1880.00	3.6	-30	35.64	0.0190
661	1880.00	3.6	-20	49.14	0.0261
661	1880.00	3.6	-10	-27.64	-0.0147
661	1880.00	3.6	0	16.98	0.0090
661	1880.00	3.6	10	17.5	0.0093
661	1880.00	3.6	20	43.97	0.0234
661	1880.00	3.6	30	33.84	0.0180
661	1880.00	3.6	40	27.77	0.0148
661	1880.00	3.6	50	15.76	0.0084
661	1880.00	3.6	60	-23.7	-0.0126

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
661	1880.00	3.7	-30	36.16	0.0192
661	1880.00	3.7	-20	49.01	0.0261
661	1880.00	3.7	-10	-28.09	-0.0149
661	1880.00	3.7	0	18.27	0.0097
661	1880.00	3.7	10	20.21	0.0107
661	1880.00	3.7	20	37.97	0.0202
661	1880.00	3.7	30	29.90	0.0159
661	1880.00	3.7	40	27.12	0.0144
661	1880.00	3.7	50	12.66	0.0067
661	1880.00	3.7	60	-26.99	-0.0144

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
661	1880.00	4.2	-30	43.97	0.0234
661	1880.00	4.2	-20	52.30	0.0278
661	1880.00	4.2	-10	-28.35	-0.0151
661	1880.00	4.2	0	20.86	0.0111
661	1880.00	4.2	10	18.85	0.0100
661	1880.00	4.2	20	46.30	0.0246
661	1880.00	4.2	30	31.64	0.0168
661	1880.00	4.2	40	29.70	0.0158
661	1880.00	4.2	50	14.92	0.0079
661	1880.00	4.2	60	-29.83	-0.0159

PCS1900 Results: channel 810 @ maximum transmitted power

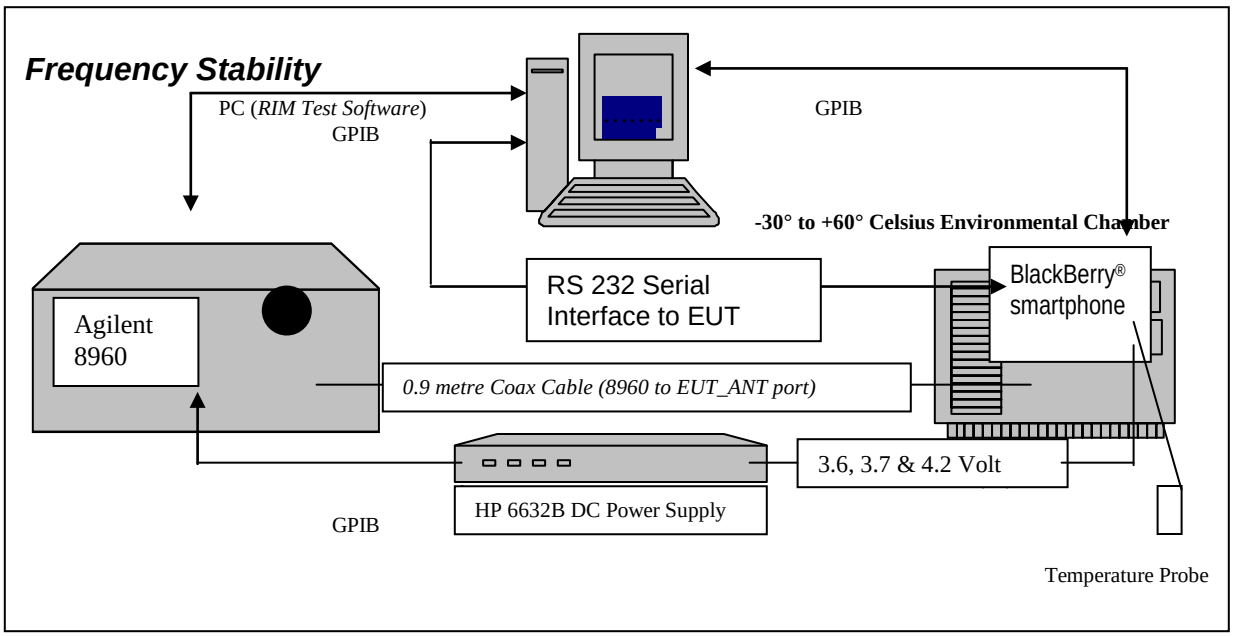
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
810	1909.80	3.6	-30	37.97	0.0199
810	1909.80	3.6	-20	53.92	0.0282
810	1909.80	3.6	-10	-27.7	-0.0145
810	1909.80	3.6	0	23.5	0.0123
810	1909.80	3.6	10	21.7	0.0114
810	1909.80	3.6	20	43.59	0.0228
810	1909.80	3.6	30	36.74	0.0192
810	1909.80	3.6	40	33.13	0.0173
810	1909.80	3.6	50	19.37	0.0101
810	1909.80	3.6	60	-22.6	-0.0118

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
810	1909.80	3.7	-30	46.3	0.0242
810	1909.80	3.7	-20	51.53	0.0270
810	1909.80	3.7	-10	-28.61	-0.0150
810	1909.80	3.7	0	20.86	0.0109
810	1909.80	3.7	10	14.59	0.0076
810	1909.80	3.7	20	41.46	0.0217
810	1909.80	3.7	30	30.48	0.0160
810	1909.80	3.7	40	29.12	0.0152
810	1909.80	3.7	50	17.5	0.0092
810	1909.80	3.7	60	-22.41	-0.0117

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
810	1909.80	4.2	-30	47.72	0.0250
810	1909.80	4.2	-20	50.3	0.0263
810	1909.80	4.2	-10	-30.22	-0.0158
810	1909.80	4.2	0	13.56	0.0071
810	1909.80	4.2	10	14.72	0.0077
810	1909.80	4.2	20	41.78	0.0219
810	1909.80	4.2	30	31.38	0.0164
810	1909.80	4.2	40	29.38	0.0154
810	1909.80	4.2	50	16.21	0.0085
810	1909.80	4.2	60	-23.18	-0.0121

APPENDIX 3B – UMTS Band 2/5 FREQUENCY STABILITY TEST DATA

UMTS Frequency Stability Test Data



The following measurements were performed by Kevin Guo.

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.

Test Setup:

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 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 1852.4, 1880.0 and 1907.6 MHz for the UMTS band 2. This frequency was recorded in MHz and deviation from nominal, in Parts Per Million.
After the initial one-hour soak at the beginning of the tests, a period of thirty minutes soak was initialized between each ascending temperature step, before proceeding to the next measurement test cycle.

Procedure:

The test system software for commencing the Frequency Stability Tests carried through the following cycle.

1. Switch on the HP 6632B power supply; CMU 200 Communications test Set, and Environmental Chamber.
2. Start test program
3. Set the Temperature to –30°C and maintain a period of one- hour soak time, with the EUT supply voltage disabled.
4. Set power supply voltage to 3.6 volts.
5. Set up CMU 200 Radio Communication Tester.
6. Command the CMU 200 to switch to the low channel.
7. Enable the voltage to the EUT, and connect a link to the CMU 200 test set.
8. EUT is commanded to Transmit 100 Bursts.
9. Software logs the following data from the CMU 200, power supply and temperature chamber: Traffic Channel Number, Traffic Channel Frequency, Power Level, Chamber Temperature, Supply Voltage, Power 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 **0.0290 PPM**.
The maximum frequency error in the UMTS band 2 measured was **0.0221 PPM.**

Date of Test: February 10, 2012

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

Traffic Channel Number	UMTS band 5 Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
4132	826.4	3.6	20	15	0.0182
4182	836.4	3.6	20	13	0.0155
4233	846.6	3.6	20	7	0.0083

Traffic Channel Number	UMTS band 5 Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
4132	826.4	3.7	20	7	0.0085
4182	836.4	3.7	20	5	0.0060
4233	846.6	3.7	20	13	0.0154

Traffic Channel Number	UMTS band 5 Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
4132	826.4	4.2	20	13	0.0157
4182	836.4	4.2	20	9	0.0108
4233	846.6	4.2	20	-8	-0.0094

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	24	**0.0290**
4132	826.4	3.6	-20	16	0.0194
4132	826.4	3.6	-10	-24	-0.0290
4132	826.4	3.6	0	-20	0.0230
4132	826.4	3.6	10	-16	-0.0194
4132	826.4	3.6	20	15	0.0182
4132	826.4	3.6	30	19	0.0230
4132	826.4	3.6	40	13	0.0157
4132	826.4	3.6	50	-15	-0.0182
4132	826.4	3.6	60	19	0.0230

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
4132	826.4	3.7	-30	19	0.0230
4132	826.4	3.7	-20	-16	-0.0194
4132	826.4	3.7	-10	-22	-0.0266
4132	826.4	3.7	0	-21	-0.0254
4132	826.4	3.7	10	19	0.0230
4132	826.4	3.7	20	7	0.0085
4132	826.4	3.7	30	-13	-0.0157
4132	826.4	3.7	40	14	0.0169
4132	826.4	3.7	50	-16	-0.0194
4132	826.4	3.7	60	13	0.0157

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
4132	826.4	4.2	-30	13	0.0157
4132	826.4	4.2	-20	18	0.0218
4132	826.4	4.2	-10	21	0.0254
4132	826.4	4.2	0	15	0.0182
4132	826.4	4.2	10	17	0.0206
4132	826.4	4.2	20	13	0.0157
4132	826.4	4.2	30	-16	-0.0194
4132	826.4	4.2	40	-12	-0.0145
4132	826.4	4.2	50	9	0.0109
4132	826.4	4.2	60	13	0.0157

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	16	0.0191
4182	836.4	3.6	-20	9	0.0108
4182	836.4	3.6	-10	15	0.0179
4182	836.4	3.6	0	-13	0.0239
4182	836.4	3.6	10	18	0.0215
4182	836.4	3.6	20	13	0.0155
4182	836.4	3.6	30	20	0.0239
4182	836.4	3.6	40	17	0.0203
4182	836.4	3.6	50	16	0.0191
4182	836.4	3.6	60	20	0.0239

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
4182	836.4	3.7	-30	15	0.0179
4182	836.4	3.7	-20	-15	-0.0179
4182	836.4	3.7	-10	-19	-0.0227
4182	836.4	3.7	0	18	0.0215
4182	836.4	3.7	10	21	0.0251
4182	836.4	3.7	20	5	0.0060
4182	836.4	3.7	30	20	0.0239
4182	836.4	3.7	40	13	0.0155
4182	836.4	3.7	50	15	0.0179
4182	836.4	3.7	60	12	0.0143

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
4182	836.4	4.2	-30	15	0.0179
4182	836.4	4.2	-20	11	0.0132
4182	836.4	4.2	-10	15	0.0179
4182	836.4	4.2	0	21	0.0251
4182	836.4	4.2	10	-16	-0.0191
4182	836.4	4.2	20	9	0.0108
4182	836.4	4.2	30	11	0.0132
4182	836.4	4.2	40	12	0.0143
4182	836.4	4.2	50	-11	-0.0132
4182	836.4	4.2	60	11	0.0132

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	15	0.0177
4233	846.6	3.6	-20	14	0.0165
4233	846.6	3.6	-10	20	0.0236
4233	846.6	3.6	0	15	0.0106
4233	846.6	3.6	10	19	0.0224
4233	846.6	3.6	20	7	0.0083
4233	846.6	3.6	30	-16	-0.0189
4233	846.6	3.6	40	16	0.0189
4233	846.6	3.6	50	12	0.0142
4233	846.6	3.6	60	9	0.0106

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
4233	846.6	3.7	-30	11	0.0130
4233	846.6	3.7	-20	14	0.0165
4233	846.6	3.7	-10	18	0.0213
4233	846.6	3.7	0	22	0.0260
4233	846.6	3.7	10	-22	-0.0260
4233	846.6	3.7	20	13	0.0154
4233	846.6	3.7	30	15	0.0177
4233	846.6	3.7	40	-17	-0.0201
4233	846.6	3.7	50	-13	-0.0154
4233	846.6	3.7	60	-8	-0.0094

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
4233	846.6	4.2	-30	11	0.0130
4233	846.6	4.2	-20	13	0.0154
4233	846.6	4.2	-10	16	0.0189
4233	846.6	4.2	0	19	0.0224
4233	846.6	4.2	10	-13	-0.0154
4233	846.6	4.2	20	-8	-0.0094
4233	846.6	4.2	30	5	0.0059
4233	846.6	4.2	40	16	0.0189
4233	846.6	4.2	50	12	0.0142
4233	846.6	4.2	60	17	0.0201

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

Traffic Channel Number	UMTS1900 Frequency (MHz	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
9262	1852.40	3.6	20	23	0.0124
9400	1880.00	3.6	20	29	0.0154
9538	1907.60	3.6	20	16	0.0084

Traffic Channel Number	UMTS1900 Frequency (MHz	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
9262	1852.40	3.7	20	25	0.0135
9400	1880.00	3.7	20	-17	-0.0090
9538	1907.60	3.7	20	-31	-0.0163

Traffic Channel Number	UMTS1900 Frequency (MHz	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
9262	1852.40	4.2	20	22	0.0119
9400	1880.00	4.2	20	19	0.0101
9538	1907.60	4.2	20	22	0.0115

UMTS band 2 Results: channel 9262 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
9262	1852.40	3.6	-30	16	0.0086
9262	1852.40	3.6	-20	29	0.0157
9262	1852.40	3.6	-10	-30	-0.0162
9262	1852.40	3.6	0	-28	-0.0151
9262	1852.40	3.6	10	-17	-0.0092
9262	1852.40	3.6	20	23	0.0124
9262	1852.40	3.6	30	-16	-0.0086
9262	1852.40	3.6	40	15	0.0081
9262	1852.40	3.6	50	13	0.0070
9262	1852.40	3.6	60	-20	-0.0108

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
9262	1852.40	3.7	-30	-16	-0.0086
9262	1852.40	3.7	-20	19	0.0103
9262	1852.40	3.7	-10	41	**0.0221**
9262	1852.40	3.7	0	16	0.0086
9262	1852.40	3.7	10	26	0.0140
9262	1852.40	3.7	20	25	0.0135
9262	1852.40	3.7	30	-33	-0.0178
9262	1852.40	3.7	40	20	0.0108
9262	1852.40	3.7	50	19	0.0103
9262	1852.40	3.7	60	-9	-0.0049

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
9262	1852.40	4.2	-30	-29	-0.0157
9262	1852.40	4.2	-20	19	0.0103
9262	1852.40	4.2	-10	25	0.0135
9262	1852.40	4.2	0	-19	-0.0103
9262	1852.40	4.2	10	-18	-0.0097
9262	1852.40	4.2	20	22	0.0119
9262	1852.40	4.2	30	-31	-0.0167
9262	1852.40	4.2	40	-16	-0.0086
9262	1852.40	4.2	50	-18	-0.0097
9262	1852.40	4.2	60	-28	-0.0151

UMTS band 2 Results: channel 9400 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
9400	1880.00	3.6	-30	19	0.0101
9400	1880.00	3.6	-20	34	0.0181
9400	1880.00	3.6	-10	-26	-0.0138
9400	1880.00	3.6	0	-22	-0.0117
9400	1880.00	3.6	10	-19	-0.0101
9400	1880.00	3.6	20	29	0.0154
9400	1880.00	3.6	30	-17	-0.0090
9400	1880.00	3.6	40	22	0.0117
9400	1880.00	3.6	50	-30	-0.0160
9400	1880.00	3.6	60	-16	-0.0085

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
9400	1880.00	3.7	-30	27	0.0144
9400	1880.00	3.7	-20	22	0.0117
9400	1880.00	3.7	-10	38	0.0202
9400	1880.00	3.7	0	-21	-0.0112
9400	1880.00	3.7	10	19	0.0101
9400	1880.00	3.7	20	-17	-0.0090
9400	1880.00	3.7	30	-37	-0.0197
9400	1880.00	3.7	40	-18	-0.0096
9400	1880.00	3.7	50	29	0.0154
9400	1880.00	3.7	60	-31	-0.0165

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
9400	1880.00	4.2	-30	39	0.0207
9400	1880.00	4.2	-20	15	0.0080
9400	1880.00	4.2	-10	25	0.0133
9400	1880.00	4.2	0	-23	-0.0122
9400	1880.00	4.2	10	-32	-0.0170
9400	1880.00	4.2	20	19	0.0101
9400	1880.00	4.2	30	-25	-0.0133
9400	1880.00	4.2	40	-17	-0.0090
9400	1880.00	4.2	50	22	0.0117
9400	1880.00	4.2	60	-31	-0.0165

UMTS band 2 Results: channel 9538 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	21B**PPM**
9538	1907.60	3.6	-30	29	0.0152
9538	1907.60	3.6	-20	35	0.0183
9538	1907.60	3.6	-10	-18	-0.0094
9538	1907.60	3.6	0	31	0.0163
9538	1907.60	3.6	10	28	0.0147
9538	1907.60	3.6	20	16	0.0084
9538	1907.60	3.6	30	29	0.0152
9538	1907.60	3.6	40	-33	-0.0173
9538	1907.60	3.6	50	-21	-0.0110
9538	1907.60	3.6	60	-20	-0.0105

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
9538	1907.60	3.7	-30	-16	-0.0084
9538	1907.60	3.7	-20	29	0.0152
9538	1907.60	3.7	-10	26	0.0136
9538	1907.60	3.7	0	-26	-0.0136
9538	1907.60	3.7	10	13	0.0068
9538	1907.60	3.7	20	-31	-0.0163
9538	1907.60	3.7	30	-24	-0.0126
9538	1907.60	3.7	40	26	0.0136
9538	1907.60	3.7	50	24	0.0126
9538	1907.60	3.7	60	-21	-0.0110

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
9538	1907.60	4.2	-30	-28	-0.0147
9538	1907.60	4.2	-20	16	0.0084
9538	1907.60	4.2	-10	21	0.0110
9538	1907.60	4.2	0	-19	-0.0100
9538	1907.60	4.2	10	17	0.0089
9538	1907.60	4.2	20	22	0.0115
9538	1907.60	4.2	30	-28	-0.0147
9538	1907.60	4.2	40	-24	-0.0126
9538	1907.60	4.2	50	-15	-0.0079
9538	1907.60	4.2	60	-22	-0.0115

APPENDIX 4A – GSM RADIATED EMISSIONS TEST DATA

Radiated Power Test Data Results

Date of test: February 14, 2012

The following measurements were performed by Nielven Olis.
The environmental tests conditions were: Temperature: 25.9 °C
Relative Humidity: 13.3 %

The BlackBerry® smartphone was standalone, horizontal with LCD up and top pointing to RX antenna when the turntable is at 0 degree position.
Test Distance was 3.0 meters with the RX antenna height scans between 1-4 meters height.

GSM850 Band 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. Tx-Rx	Reading (dBm)	Corrected Reading (relative to Dipole) (dBm)	Corrected Reading (relative to Dipole) (W)	Limit (dBm)	Diff. To Limit (dB)
F0	128	824.20	850	Dipole	V	77.07	85.34	V-V	12.42	30.18	1.04	38.50	-8.32
F0	128	824.20	850	Dipole	H	85.34		H-H	10.74				
F0	190	836.60	850	Dipole	V	77.67	85.85	V-V	12.40	29.84	0.96	38.50	-8.66
F0	190	836.60	850	Dipole	H	85.85		H-H	12.19				
F0	251	848.80	850	Dipole	V	78.24	86.71	V-V	13.84	31.36	1.37	38.50	**-7.14**
F0	251	848.80	850	Dipole	H	86.71		H-H	12.76				

GSM850 Band 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)	Corrected Reading (relative to Dipole) (W)	Limit (dBm)	Diff. To Limit (dB)
F0	128	824.20	850	Dipole	V	74.99	83.38	V-V	10.40	28.16	0.65	38.50	-10.34
F0	128	824.20	850	Dipole	H	83.38		H-H	8.70				
F0	190	836.60	850	Dipole	V	75.54	83.15	V-V	9.67	27.11	0.51	38.50	-11.39
F0	190	836.60	850	Dipole	H	83.15		H-H	9.41				
F0	251	848.80	850	Dipole	V	76.31	84.59	V-V	11.63	29.15	0.82	38.50	**-9.35**
F0	251	848.80	850	Dipole	H	84.59		H-H	10.55				

Radiated Power Test Data Results cont'd

Date of test: February 13, 2012
The following measurements were performed by Shuo Wang.
The environmental tests conditions were: Temperature: 24.7 °C
Relative Humidity: 42.7 %
The BlackBerry® smartphone was standalone, horizontal with LCD down and head pointing to RX antenna when the turntable is at 0 degree position.
Test Distance was 3.0 meters with the RX antenna height scans between 1-4 meters height.

PCS1900 Band Call Mode

								Substitution Method					
EUT				Receive Antenna		Spectrum Analyzer		Tracking Generator					
										Corrected Reading (relative to Isotropic Radiator)			
Type	Ch	Frequency (MHz)	Band	Type	Pol.	Reading (dBuV)	Max (V,H) dBuV	Pol. Tx-Rx	Reading (dBm)	(dBm)	(W)	Limit (dBm)	Diff to Limit (dB)
F0	512	1850.20	1900	Horn	V	89.96	91.11	V-V	-2.72	32.09	1.62	33.00	-0.91
F0	512	1850.20	1900	Horn	H	91.11		H-H	-2.79				
F0	661	1880.00	1900	Horn	V	89.74	91.35	V-V	-2.59	32.29	1.69	33.00	-0.71
F0	661	1880.00	1900	Horn	H	91.35		H-H	-2.52				
F0	810	1909.80	1900	Horn	V	89.85	90.78	V-V	-2.07	32.74	1.88	33.00	**-0.26**
F0	810	1909.80	1900	Horn	H	90.78		H-H	-2.22				

PCS1900 Band EDGE Mode

								Substitution Method					
EUT				Receive Antenna		Spectrum Analyzer		Tracking Generator					
										Corrected Reading (relative to Isotropic Radiator)			
Type	Ch	Frequency (MHz)	Band	Type	Pol.	Reading (dBuV)	Max (V,H) dBuV	Pol. Tx-Rx	Reading (dBm)	(dBm)	(W)	Limit (dBm)	Diff to Limit (dB)
F0	512	1850.20	1900	Horn	V	88.84	90.28	V-V	-3.55	31.26	1.34	33.00	-1.74
F0	512	1850.20	1900	Horn	H	90.28		H-H	-3.62				
F0	661	1880.00	1900	Horn	V	89.01	90.42	V-V	-3.66	31.36	1.37	33.00	**-1.64**
F0	661	1880.00	1900	Horn	H	90.42		H-H	-3.45				
F0	810	1909.80	1900	Horn	V	88.43	88.94	V-V	-3.91	30.90	1.23	33.00	-2.10
F0	810	1909.80	1900	Horn	H	88.94		H-H	-4.06				

Radiated Emissions Test Data Results cont'd

GSM850 Call Mode

Date of Test: February 21, 2012
The following measurements were performed by Nielven Olis.
The environmental test conditions were: Temperature: 26.4 ºC
Relative Humidity: 14.1 %
Test Distance was 3.0 meters with the RX antenna height scans between 1-4 meters height, and a frequency range of 30 MHz to 1000 MHz.

The BlackBerry® smartphone was standalone, horizontal with LCD facing up and top pointing to the RX antenna when the turntable is at 0 degree position.

Measurements were performed in GSM850 Call Tx mode, channels 128, 190, 251.
All emissions had test margins greater than 25.0 dB.

Date of Test: February 21, 2012
The following measurements were performed by Shuo Wang
The environmental test conditions were: Temperature: 25.4 ºC
Relative Humidity: 41.7 %
Test Distance was 3.0 meters with the RX antenna height scans between 1-4 meters height, and a frequency range of 1 GHz to 9 GHz.

The BlackBerry® smartphone was standalone vertical, with LCD facing the RX antenna when the turntable is at 0 degree position.

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

BlackBerry® smartphone PIN 293A70F8										
Frequency (MHz)	Channel Of Occurrence	Antenna Pol. (V/H)	Antenna Height (meters)	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)
1672.832	128	V	2.50	108.00	PK	53.68	-91.63	-37.95	-13.00	-24.95
1697.624	190	V	2.50	84.00	PK	54.79	-91.83	-37.03	-13.00	**-24.03**

All other emissions had test margins greater than 25.0 dB

Radiated Emissions Test Data Results cont'd

GSM850 EDGE Mode

Date of Test: February 21, 2012
The following measurements were performed by Nielven Olis.
The environmental test conditions were: Temperature: 26.4 ºC
Relative Humidity: 14.1 %

Test Distance was 3.0 meters with the RX antenna height scans between 1-4 meters height, and a frequency range of 30 MHz to 1000 MHz.

The BlackBerry® smartphone was standalone, horizontal with LCD facing up and top pointing to the RX antenna when the turntable is at 0 degree position.

Measurements were performed in GSM850 EDGE Tx mode, channels 128, 190, 251.
All emissions had test margins greater than 25.0 dB.

Date of Test: February 21, 2012
The following measurements were performed by Shuo Wang
The environmental test conditions were: Temperature: 25.4 ºC
Relative Humidity: 41.7 %

Test Distance was 3.0 meters with the RX antenna height scans between 1-4 meters height,, and a frequency range of 1 GHz to 9 GHz.

The BlackBerry® smartphone was standalone vertical, with LCD facing the RX antenna when the turntable is at 0 degree position.

Measurements were performed in GSM850 EDGE Tx mode, channels 128, 190, 251.
All emissions had test margins greater than 25.0 dB.

Radiated Emissions Test Data Results cont'd

PCS1900 GSM Mode

Date of Test: February 23, 2012
The following measurements were performed by Nielven Olis.
The environmental test conditions were: Temperature: 27.7 ºC
Relative Humidity: 15.6 %
Test Distance was 3.0 meters with the RX antenna height scans between 1-4 meters height, and a frequency range of 30 MHz to 1000 MHz.

The BlackBerry® smartphone was standalone vertical, top down, with LCD facing the RX antenna when the turntable is at 0 degree position.

Measurements were performed in PCS1900 Call Tx mode, channels 512, 661, 810.
All emissions had test margins greater than 25.0 dB.

Date of Test: March 01, 2012
The following measurements were performed by Shuo Wang.
The environmental test conditions were: Temperature: 25.1 ºC
Relative Humidity: 37.7 %
Test Distance was 3.0 meters with the RX antenna height scans between 1-4 meters height, and a frequency range of 1 GHz to 20 GHz.

The BlackBerry® smartphone was standalone, horizontal with LCD facing down and top pointing the RX antenna when the turntable is at 0 degree position.

Measurements were performed in PCS1900 Call Tx mode, channels 512, 661, 810.
All emissions had test margins greater than 25.0 dB.

Radiated Emissions Test Data Results cont'd

PCS1900 EDGE Mode

Date of Test: February 23, 2012
The following measurements were performed by Nielven Olis.
The environmental test conditions were: Temperature: 27.7 ºC
Relative Humidity: 15.6 %

Test Distance was 3.0 meters with the RX antenna height scans between 1-4 meters height, and a frequency range of 30 MHz to 1000 MHz.

The BlackBerry® smartphone was standalone vertical, top down, with LCD facing the RX antenna when the turntable is at 0 degree position.

Measurements were performed in PCS1900 EDGE Tx mode, channels 512, 661, 810.
All emissions had test margins greater than 25.0 dB.

Date of Test: March 01, 2012
The following measurements were performed by Shuo Wang.
The environmental test conditions were: Temperature: 25.1 ºC
Relative Humidity: 37.7 %

Test Distance was 3.0 meters with the RX antenna height scans between 1-4 meters height, and a frequency range of 1 GHz to 20 GHz.

The BlackBerry® smartphone was standalone, horizontal with LCD facing down and with top pointing to the RX antenna when the turntable is at 0 degree position.

Measurements were performed in PCS1900 EDGE Tx mode, channels 512, 661, 810.
All emissions had test margins greater than 25.0 dB.

APPENDIX 4B – UMTS Band 2/5 RADIATED EMISSIONS TEST DATA

Radiated Power Test Data Results

Date of Test: February 17, 2012

The following measurements were performed by Nielven Olis.
The environmental tests conditions were: Temperature: 27.4 °C
Relative Humidity: 14.6 %

The BlackBerry® smartphone was standalone vertical, with LCD facing the RX antenna when the turntable is at 0 degree position.
Test Distance was 3.0 meters with the RX antenna height scans between 1-4 meters height.

UMTS band 5 Call Service 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)	Corrected Reading (relative to Dipole) (W)	Limit (dBm)	Diff. To Limit (dB)
F0	4132	826.40	5	Dipole	V	77.34	77.34	V-V	4.18	21.92	0.16	39	-17.08
F0	4132	826.40	5	Dipole	H	68.25		H-H	3.04				
F0	4182	836.40	5	Dipole	V	78.83	78.83	V-V	5.18	22.62	0.18	39	-16.38
F0	4182	836.40	5	Dipole	H	68.49		H-H	5.02				
F0	4233	846.60	5	Dipole	V	78.67	78.67	V-V	5.66	23.11	0.20	39	**-15.89**
F0	4233	846.60	5	Dipole	H	69.98		H-H	4.42				

UMTS band 5 HSUPA 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)	Corrected Reading (relative to Dipole) (W)	Limit (dBm)	Diff. To Limit (dB)
F0	4132	826.40	5	Dipole	V	79.63	79.63	V-V	6.52	24.26	0.27	39	-14.74
F0	4132	826.40	5	Dipole	H	69.97		H-H	5.40				
F0	4182	836.40	5	Dipole	V	80.89	80.89	V-V	7.22	24.66	0.29	39	-14.34
F0	4182	836.40	5	Dipole	H	70.75		H-H	7.08				
F0	4233	846.60	5	Dipole	V	80.61	80.61	V-V	7.62	25.07	0.32	39	**-13.93**
F0	4233	846.60	5	Dipole	H	71.95		H-H	6.44				

Radiated Power Test Data Results cont'd

Date of Test: February 21, 2012

The following measurements were performed by Nielven Olis.
The environmental test conditions were: Temperature: 26.4 ºC
Relative Humidity: 14.1 %

The BlackBerry® smartphone was standalone vertical, top down with LCD facing the RX antenna when the turntable is at 0 degree position.
Test Distance was 3.0 meters with the RX antenna height scans between 1-4 meters height.

UMTS band 2 Call Service Mode

								Substitution Method						
EUT				Receive Antenna		Spectrum Analyzer		Tracking Generator						
Type	Ch	Frequency (MHz)	Band	Type	Pol.	Reading (dBuV)	Max (V,H) (dBuV)	Pol. Tx-Rx	Reading (dBm)	(dBm)	(W)	Limit (dBm)	Diff to Limit (dB)
F0	9262	1852.40	2	Horn	V	85.42	85.42	V-V	-13.21	26.75	0.47	33.00	-6.25
F0	9262	1852.40	2	Horn	H	83.60		H-H	-12.34				
F0	9400	1880.00	2	Horn	V	84.98	84.98	V-V	-13.27	26.56	0.45	33.00	-6.44
F0	9400	1880.00	2	Horn	H	82.17		H-H	-12.37				
F0	9538	1907.60	2	Horn	V	84.76	84.76	V-V	-13.07	26.76	0.47	33.00	**-6.24**
F0	9538	1907.60	2	Horn	H	81.80		H-H	-12.27				

UMTS band 2 HSUPA Mode

								Substitution Method						
EUT				Receive Antenna		Spectrum Analyzer		Tracking Generator						
Type	Ch	Frequency (MHz)	Band	Type	Pol.	Reading (dBuV)	Max (V,H) (dBuV)	Pol. Tx-Rx	Reading (dBm)	(dBm)	(W)	Limit (dBm)	Diff to Limit (dB)
F0	9262	1852.40	2	Horn	V	86.52	86.52	V-V	-12.09	27.84	0.61	33.00	**-5.16**
F0	9262	1852.40	2	Horn	H	84.10		H-H	-11.25				
F0	9400	1880.00	2	Horn	V	86.12	86.12	V-V	-12.12	27.72	0.59	33.00	-5.28
F0	9400	1880.00	2	Horn	H	83.39		H-H	-11.21				
F0	9538	1907.60	2	Horn	V	85.55	85.55	V-V	-12.23	27.58	0.57	33.00	-5.42
F0	9538	1907.60	2	Horn	H	82.89		H-H	-11.45				

Radiated Emissions Test Data Results cont'd

UMTS band 5 Call Service Mode

Date of Test: February 21, 2011

The following measurements were performed by Nielven Olis.

The environmental test conditions were: Temperature: 27.4 ºC
Relative Humidity: 16.0 %

The BlackBerry® smartphone was standalone vertical on the 1.0m turntable, with LCD facing the RX antenna when the turntable is at 0 degree position.

Test Distance was 3.0 meters with the RX antenna height scans between 1-4 meters height, and the frequency range scanned was 30MHz – 1GHz.

Measurements were performed in UMTS band 5 Call mode on channels 4132, 4182, and 4233.

All emissions had test margins greater than 25.0 dB.

Date of Test: February 22, 2012

The following measurements were performed by Shuo Wang

The environmental test conditions were: Temperature: 25.4 ºC
Relative Humidity: 41.7 %

Test Distance was 3.0 meters with the RX antenna height scans between 1-4 meters height, and the frequency range scanned was 1 – 9 GHz.

The BlackBerry® smartphone was standalone vertical, with LCD facing the RX antenna when the turntable is at 0 degree position.

Measurements were performed in UMTS band 5 Call mode on channels 4132, 4182, and 4233.

All emissions had test margins greater than 25.0 dB.

Radiated Emissions Test Data Results cont'd
UMTS 5 HSUPA Mode

Date of Test: February 21, 2011

The following measurements were performed by Nielven Olis.

The environmental test conditions were: Temperature: 27.4 ºC
Relative Humidity: 16.0 %

The BlackBerry® smartphone was standalone vertical on the 1.0m turntable, with LCD facing the RX antenna when the turntable is at 0 degree position.

Test Distance was 3.0 meters with the RX antenna height scans between 1-4 meters height, and the frequency range scanned was 30MHz – 1GHz.

Measurements were performed in UMTS band 5 HSUPA mode on channels 4132, 4182, and 4233.

All emissions had test margins greater than 25.0 dB.

Date of Test: February 22, 2012

The following measurements were performed by Shuo Wang

The environmental test conditions were: Temperature: 25.4 ºC
Relative Humidity: 41.7 %

The BlackBerry® smartphone was standalone vertical, with LCD facing the RX antenna when the turntable is at 0 degree position.

Test Distance was 3.0 meters with the RX antenna height scans between 1-4 meters height, and the frequency range scanned was 1 – 9 GHz.

Measurements were performed in UMTS band 5 HSUPA mode on channels 4132, 4182, and 4233.

All emissions had test margins greater than 25.0 dB.

Radiated Emissions Test Data Results cont'd

UMTS band 2 Call Service mode

Date of Test: February 21, 2012

The following measurements were performed by Nielven Olis.
The environmental test conditions were: Temperature: 26.4 ºC
Relative Humidity: 14.1 %

The BlackBerry® smartphone was standalone vertical, top down with LCD facing the RX antenna when the turntable is at 0 degree position.

Test Distance was 3.0 meters with the RX antenna height scans between 1-4 meters height, and the frequency range scanned was 30MHz – 1GHz.

Measurements were performed in UMTS band 2 Call mode on channels 9262, 9400, and 9538.

All emissions had test margins greater than 25.0 dB.

Date of Test: March 02, 2012

The following measurements were performed by Shuo Wang

The environmental test conditions were: Temperature: 25.1ºC
Relative Humidity: 35.5 %

Test Distance was 3.0 meters with the RX antenna height scans between 1-4 meters height, and a frequency range of 1GHz to 20 GHz.

The BlackBerry® smartphone was standalone vertical, top down with LCD facing the RX antenna when the turntable is at 0 degree position.

Measurements were performed in UMTS band 2 Call mode on channels 9262, 9400, 9538.

All emissions had test margins greater than 25.0 dB.

Radiated Emissions Test Data Results cont'd
UMTS band 2 HSUPA Mode

Date of Test: February 21, 2012

The following measurements were performed by Nielven Olis.
The environmental test conditions were: Temperature: 26.4 ºC
Relative Humidity: 14.1 %

The BlackBerry® smartphone was standalone vertical, top down with LCD screen facing the RX antenna when the turntable is at 0 degree position.

Test Distance was 3.0 meters with the RX antenna height scans between 1-4 meters height, and the frequency range scanned was 30MHz – 1GHz.

Measurements were performed in UMTS band 2 HSUPA mode on channels 9262, 9400, and 9538.

All emissions had test margins greater than 25.0 dB.

Date of Test: March 02, 2012

The following measurements were performed by Shuo Wang

The environmental test conditions were: Temperature: 25.1ºC
Relative Humidity: 35.5 %

Test Distance was 3.0 meters with the RX antenna height scans between 1-4 meters height, and a frequency range of 1GHz to 20 GHz.

The BlackBerry® smartphone was standalone vertical, top down with LCD screen facing the RX antenna when the turntable is at 0 degree position.

Measurements were performed in UMTS band 2 HSUPA mode on channels 9262, 9400, 9538.

All emissions had test margins greater than 25.0 dB.