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-2337-1008-47

PRODUCT MODEL NO:	RDG71UW
TYPE NAME:	BlackBerry® smartphone
FCC ID:	L6ARDG70UW
IC:	2503A–RDG70UW
EMISSION DESIGNATOR (GSM):	248KGXW
EMISSION DESIGNATOR (EDGE):	248KG7W
EMISSION DESIGNATOR (WCDMA):	4M19F9W

DATE: August 25, 2010

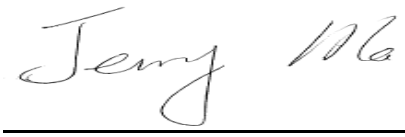
Statement of Performance:

The BlackBerry® smartphone, model RDG71UW, part number CER-33874-001 Rev 1 and accessories performs within the requirements of the test standards when configured and operated per RIM's instructions.

Declaration:

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

Documented by:



Quan (Jerry) Ma
Regulatory Compliance Associate
Date: August 25, 2010

Reviewed by:

Michael Cino
Regulatory Compliance Associate
Date: August 25, 2010

Reviewed and Approved by:

Masud S. Attayi, P.Eng.
Manager, Regulatory Compliance
Date: August 25, 2010

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A) Scope

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

- FCC CFR 47 Part 2, October 2009
- FCC CFR 47 Part 22, Subpart H, Cellular Radiotelephone Services, October 2009
- FCC CFR 47 Part 24 Subpart E, Broadband PCS, October 2009
- Industry Canada, RSS-132 Issue 2, September 2005, Cellular Telephones Employing New Technologies Operating in the Bands 824-849 MHz and 869-894 MHz.
- Industry Canada, RSS-133 Issue 5, February 2009, 2 GHz Personal Communications Services.
- Industry Canada, RSS-GEN Issue 2, June 02007, General Requirements and Information for the Certification of Radiocommunication Equipment

B) Associated Documents

1) RDG71UW_HW_Declaration_CER-33874_Rev1 (Similarity Document)
2) RTS-2337-1002-51

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 July 7 to August 6, 2010.

The sample EUT included:

SAMPLE	MODEL	CER NUBER	PIN	SOFTWARE
1	RDG71UW	CER-33874-001 Rev 1	229CD7F4	V6.0.0.129 (Platform 6.4.0.59) Bundle 259
2	RDG71UW	CER-33874-001 Rev 1	229CD442	V6.0.0.129 (Platform 6.4.0.59) Bundle 259
3	RDG71UW	CER-33874-001 Rev 1	229CD443	V6.0.0.129 (Platform 6.4.0.59) Bundle 259

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

Model RDG71UW is a variant of model RCY71UW.
Only the characteristics that may have been affected by the changes from model RCY71UW to model RDG71UW were re-tested. For more information, see RDG71UW_HW_Declaration_CER-33874_Rev1 (Similarity Document).

D) Support Equipment Used for the Testing of the EUT

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

E) Test Voltage

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

F) Test Results Chart

SPECIFICATION		TEST TYPE	RESULT	TEST DATA APPENDIX
FCC CFR 47	IC			
Part 2.1051 Part 22.917 Part 22.901	RSS-GEN, 4.9	GSM 850 Conducted Spurious Emissions	Pass	1A
Part 2.1051 Part 24.238(a)	RSS-GEN, 4.9	GSM PCS Conducted Spurious Emissions	Pass	1A
Part 2.202 Part 22.917	RSS-GEN, 4.6	GSM 850 Occupied Bandwidth and Channel Mask	Pass	1A
Part 2.202 Part 24.238	RSS-GEN, 4.6	GSM PCS Occupied Bandwidth and Channel Mask	Pass	1A
Part 22, Subpart H, Part 24, Subpart E	RSS-GEN, 4.9	GSM ERP, EIRP	Pass	2A
Part 2.1051 Part 24.238(a)	RSS-GEN, 4.9	WCDMA UMTS1900 Conducted Spurious Emissions	Pass	1B
Part 2.202 Part 24.238	RSS-GEN, 4.6	WCDMA UMTS1900 Occupied Bandwidth and Channel Mask	Pass	1B
Part 24, Subpart E	RSS-GEN, 4.9	WCDMA UMTS1900 Radiated Spurious/Harmonic Emissions, EIRP	Pass	2B
Part 2.1051 Part 22.917 Part 22.901	RSS-GEN, 4.9	GSM 850 Frequency Stability vs. Temperature and Voltage	See Test Report RTS-2337-1002-51	-
Part 2.1051 Part 24.238(a)	RSS-GEN, 4.9	GSM PCS Frequency Stability vs. Temperature and Voltage	See Test Report RTS-2337-1002-51	-
Part 2.1055(a)(d) Part 24.235	RSS-GEN, 4.7	WCDMA UMTS1900 Frequency Stability vs. Temperature and Voltage	See Test Report RTS-2337-1002-51	-

G) Summary of Results

1) Conducted Emission Measurements

a) The BlackBerry® smartphone met the requirements of the Tx Conducted Spurious Emissions requirements in the GSM850 as per 47 CFR 2.1051, CFR 22.917, CFR 22.901(d) and RSS-GEN, 4.9. The EUT was measured on the low, middle and high channels. The frequency range investigated was from 10 MHz to 10 GHz.
See APPENDIX 1A for test data.

The BlackBerry® smartphone met the requirements of the Tx Conducted Spurious Emissions requirements in the PCS1900 as per 47 CFR 2.1051, CFR 24.238(a) and RSS-GEN, 4.9. The EUT was on the low, middle and high channels. The frequency range investigated was from 10 MHz to 20 GHz.
See APPENDIX 1A for test data

b) The BlackBerry® smartphone met the requirements of the Occupied Bandwidth and channel mask requirements in the GSM850 as per 47 CFR 2.202, CFR 22.917 and RSS-GEN, 4.6. The EUT was measured in GSM and EDGE mode on the low, middle and high channels. The worst case 99% Occupied Bandwidth was 248.3 kHz on the high channel for both GSM mode and 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 99% Occupied Bandwidth was 248.3 kHz on the low channel for both GSM mode and EDGE mode.
See APPENDIX 1A for test data.

c) The BlackBerry® smartphone met the requirements of the Conducted Spurious Emissions in the UMTS1900 band as per 47 CFR 2.1057, CFR 24.238 and RSS-GEN, 4.9. The EUT was measured on the low, middle and high channels. The frequency range investigated was from 10 MHz to 20 GHz.
See APPENDIX 1B for the test data.

d) The BlackBerry® smartphone met the requirements of the Occupied Bandwidth and channel mask in the UMTS1900 band as per 47 CFR 2.202, CFR 24.238 and RSS-GEN, 4.6. The low, middle and high channels were measured. The worst case 99% Occupied Bandwidth was 4.192 MHz on the high channel.
See APPENDIX 1B for the test data.

2) Radiated Emission Measurements

a) Radiated Spurious and Harmonic Emissions

The radiated spurious emissions/harmonics and ERP/EIRP were measured for GSM 850, PCS 1900, and UMTS 1900 bands (WCDMA band 2). The results are within the limits. The BlackBerry® smartphone was placed on a nonconductive styrofoam table, 100 cm high that was positioned on a remotely controlled turntable. The test distance used between the BlackBerry® smartphone and the receiving antenna was three metres. Then the emissions were maximized by elevating the antenna in the range of 1 to 4 metres. The turntable was rotated to determine the azimuth of the peak emissions. Both the horizontal and vertical polarizations of the emissions were measured. The maximum emissions level was recorded. The BlackBerry® smartphone was then substituted with an antenna placed in the same location as the BlackBerry® smartphone. A Dipole antenna was used for the ERP measurements and a Horn antenna was used for EIRP measurements. The substitution antenna was connected into a signal generator that was set to the test frequency.

The emissions were maximized by elevating the antenna in the range of 1 to 4 metres. The signal generator output was then adjusted to match the BlackBerry® smartphone output reading. The signal generator output was recorded. Both the horizontal and vertical polarizations of the emissions were measured.

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

The highest ERP measured in the 850 band GSM mode was 28.25 dBm (0.67 W) at 848.80 MHz (channel 251).

The highest ERP measured in the 850 band EDGE mode was 27.38 dBm (0.55 W) at 837.60 MHz (channel 251).

The highest ERP measured in the PCS band GSM mode was 30.51 dBm (1.12 W) at 1909.80 MHz (channel 810).

The highest ERP measured in the PCS band EDGE mode was 30.04 dBm (1.01 W) at 1880.00 MHz (channel 661).

The highest ERP measured in the UMTS Band 2 was 24.05 dBm (0.25 W) at 1880.00 MHz (channel 9400).

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

The harmonic emissions in the GSM850 band for both GSM and EDGE modes were more than 25 dB below the limit for all tested frequencies.

The harmonic emissions in the PCS1900 band for both GSM and EDGE modes were more than 25 dB below the limit for all tested frequencies.

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

The harmonic emissions in the UMTS Band 2 were more than 25 dB below the limit for all tested frequencies.

Sample Calculation:

Field Strength (dBµV/M) is calculated as follows:

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

To view the test data see APPENDIX 2A and 2B.

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	10-11-14	Radiated Emissions
Preamplifier system	TDK RF Solutions	PA-02	080010	10-11-06	Radiated Emissions
Preamplifier	Rohde & Schwarz	TS-ANA4-SP	001	11-02-17	Radiated Emissions
Preamplifier	Rohde & Schwarz	TS-ANA-SP	001	11-02-19	Radiated Emissions
Hybrid Log Antenna	EMC Automation	HLP-3003C	017301	11-02-02	Radiated Emissions
Hybrid Log Antenna	EMC Automation	HLP-3003C	017401	10-09-26	Radiated Emissions
Horn Antenna	EMC Automation	HRN-0118	030101	12-07-20	Radiated Emissions
Horn Antenna	EMC Automation	HRN-0118	030201	11-03-12	Radiated Emissions
Horn Antenna	Emco	3117	47563	11-07-15	Radiated Emissions
Horn Antenna	CMT	LHA 0180	R52734-001	12-01-21	Radiated Emissions
Preamplifier	TDK RF Solutions	18-26	030002	10-11-06	Radiated Emissions
Dipole Antenna	Schwarzbeck	UHAP	1018	11-03-12	Radiated Emissions
Dipole Antenna	Schwarzbeck	UHAP	974	10-10-16	Radiated Emissions
Universal Radio Communication Tester	Rohde & Schwarz	CMU 200	837493/073	10-11-30	Radiated Emissions
Universal Radio Communication Tester	Rohde & Schwarz	CMU 200	112394	10-11-30	Radiated Emissions
Universal Radio Communication Tester	Rohde & Schwarz	CMU 200	102204	10-11-25	RF Conducted Emissions
EMI Receiver	Rohde & Schwarz	ESIB-40	100255	10-11-30	Radiated Emissions
EMI Receiver	Rohde & Schwarz	ESU-40	100162	10-11-29	Radiated Emissions
Spectrum Analyzer	HP	8563E	3745A08112	11-09-30	RF Conducted Emissions
DC Power Supply	HP	6632B	US37472178	10-09-03	RF Conducted Emissions
Environment Monitor	Control Company	1870	230355190	11-01-08	Radiated Emissions

Compliance Test Equipment Used cont'd

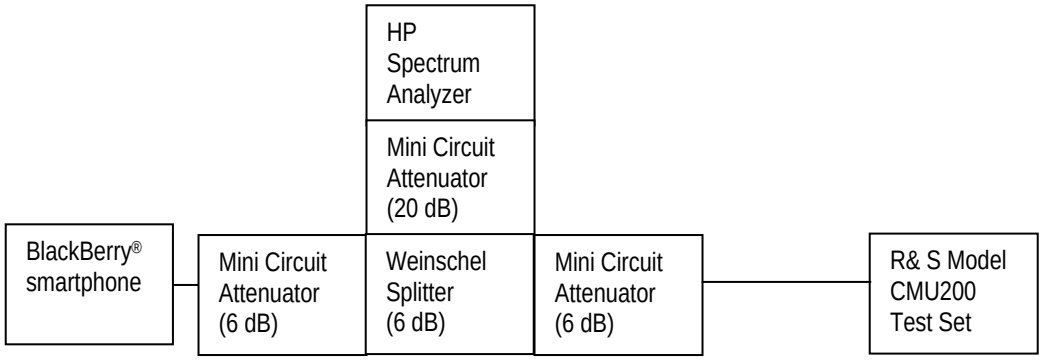
UNIT	MANUFACTURER	MODEL	SERIAL NUMBER	CAL DUE DATE (YY MM DD)	USE
Environment Monitor	Control Company	1870	230355189	11-01-08	RF Conducted Emissions
Environment Monitor	Control Company	1870	80117164	11-01-08	Radiated Emissions
Signal Generator	Agilent	E8257D	MY45140527	11-11-05	Radiated Emissions
Signal Generator	Agilent	83630B	3844A00927	10-10-31	Radiated Emissions

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

GSM Conducted RF Emission Test Data

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

Test Setup Diagram



Date of Test: July 21, 2010

The following tests were performed by Maurice Battler.

The environmental test conditions were:

Temperature:	22 ºC
Pressure:	1011 mb
Relative Humidity:	33 %

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 268 kHz, and for the PCS1900 band was measured to be 275 kHz as shown below. This results in a 3.0 kHz resolution bandwidth.
On any frequency outside the frequency block and outside the adjacent 1 MHz bands, a resolution bandwidth of at least 1 MHz was employed.

Test Data for 850 band and 1900 band selected Frequencies in GSM mode.

850 band Frequency (MHz)	-26dBc Bandwidth (kHz)	99% Occupied Bandwidth (kHz)
824.2	265	246.7
837.6	265	243.3
848.8	268	248.3

1900 band Frequency (MHz)	-26dBc Bandwidth (kHz)	99% Occupied Bandwidth (kHz)
1850.2	270	248.3
1880.0	275	243.3
1909.8	268	245.0

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

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

GSM Conducted RF Emission Test Data cont'd

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

850 band Frequency (MHz)	99% Occupied Bandwidth (kHz)
824.2	246.7
837.6	243.3
848.8	248.3

1900 band Frequency (MHz)	99% Occupied Bandwidth (kHz)
1850.2	248.3
1880.0	243.3
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 1-40a for the plots of the conducted spurious emissions.

See Figures 1-41a to 1-46a for the plots of the 99% Occupied Bandwidth.
See Figures 1-47a to 1-50a for the plots of channel mask 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

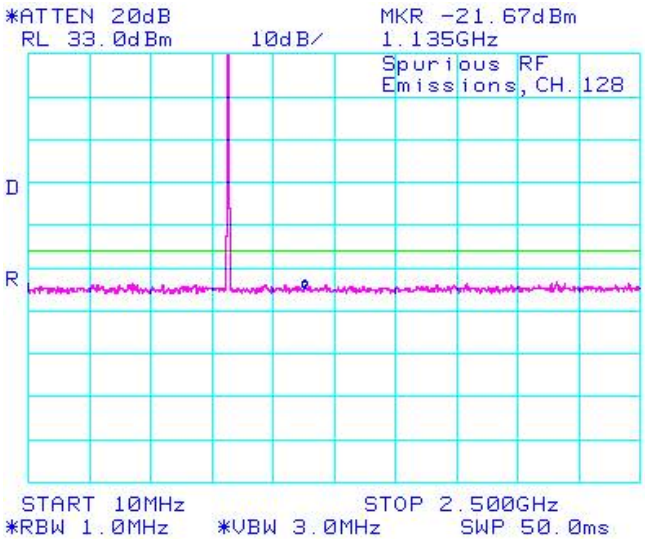


Figure 1-2a: GSM850 band, Spurious Conducted Emissions, Low channel

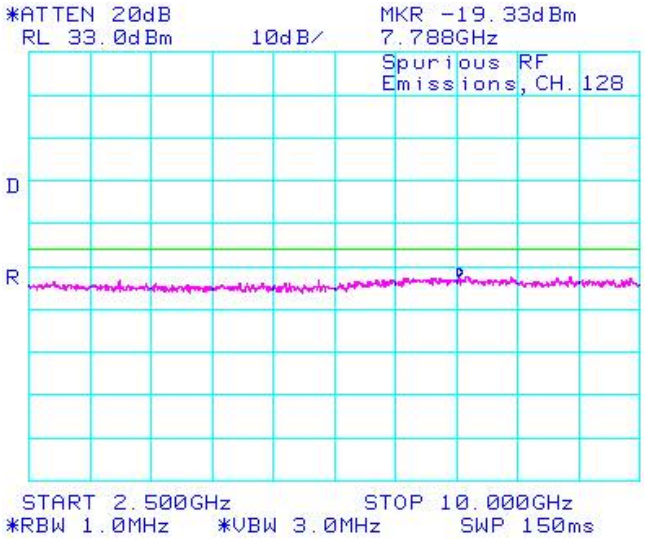


Figure 1-3a: GSM850 band, Spurious Conducted Emissions, Middle Channel

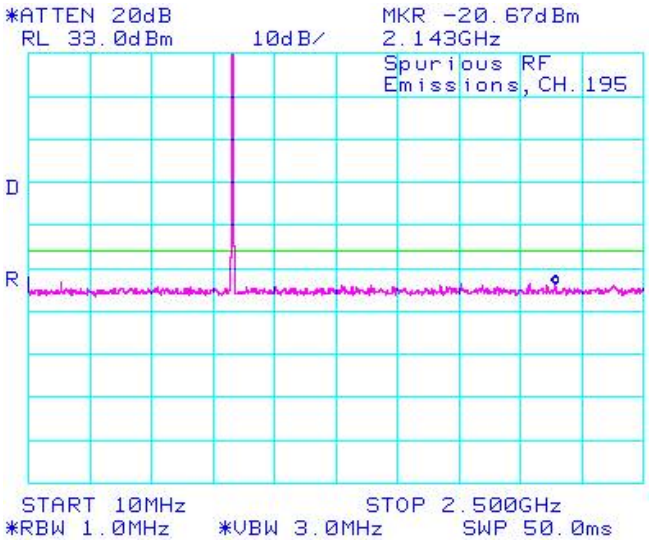
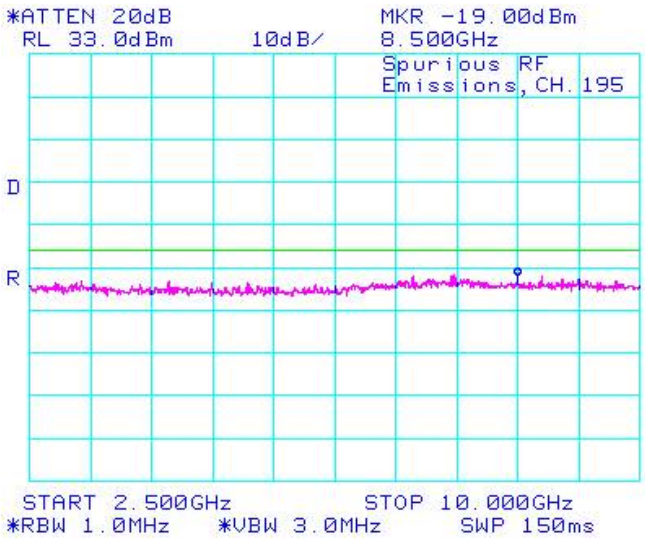


Figure 1-4a: GSM850 band, Spurious Conducted Emissions, Middle Channel



GSM Conducted RF Emission Test Data cont'd

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

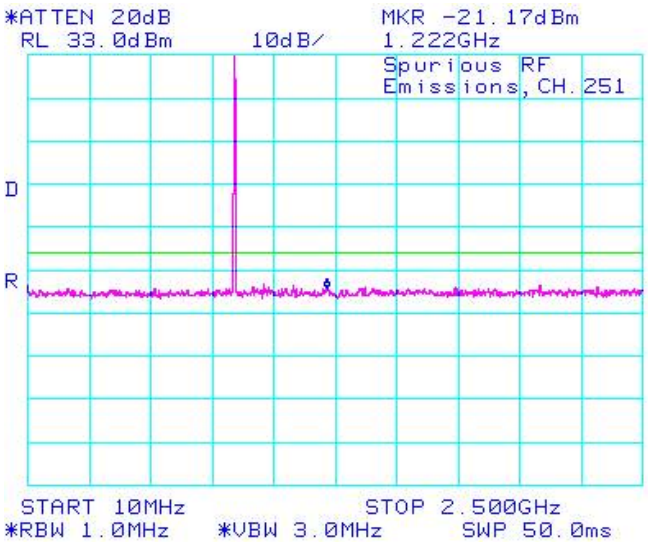


Figure 1-6a: GSM850 band, Spurious Conducted Emissions, High Channel

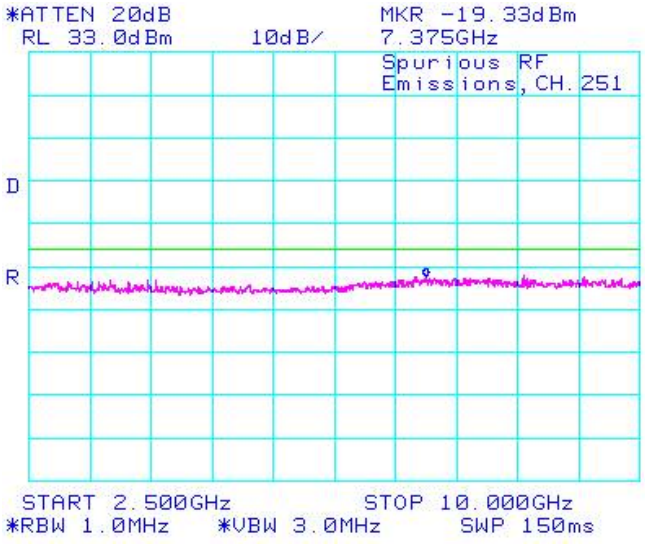


Figure 1-7a: PCS1900 band, Spurious Conducted Emissions, Low Channel

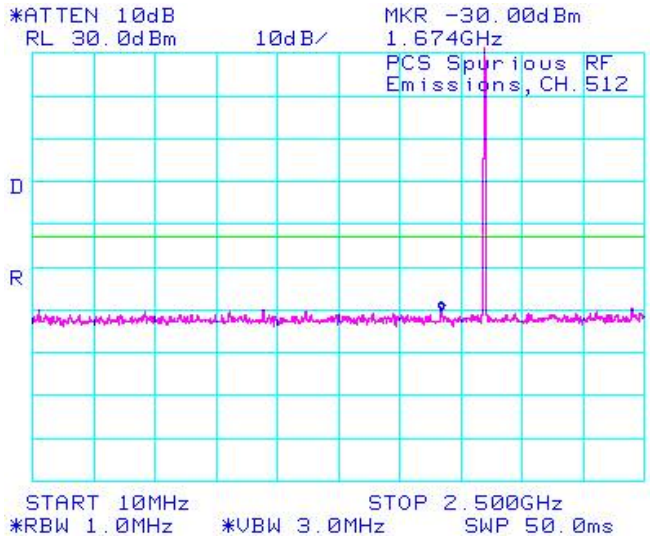
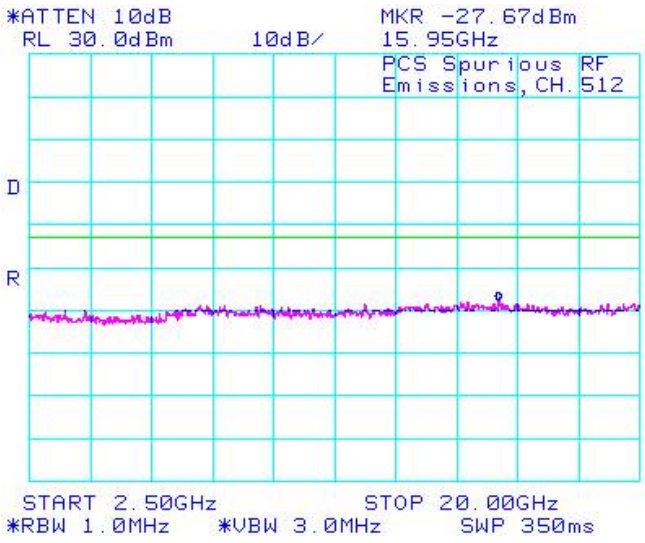


Figure 1-8a: PCS1900 band, Spurious Conducted Emissions, Low Channel



GSM Conducted RF Emission Test Data cont'd

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

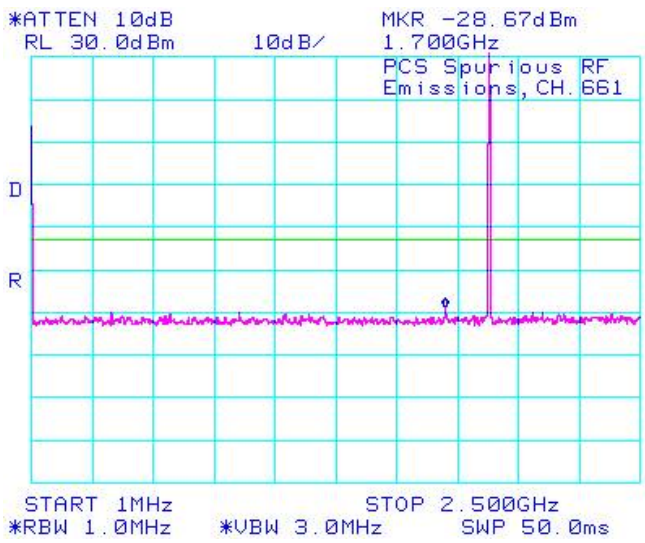


Figure 1-10a: PCS1900 band, Spurious Conducted Emissions, Middle Channel

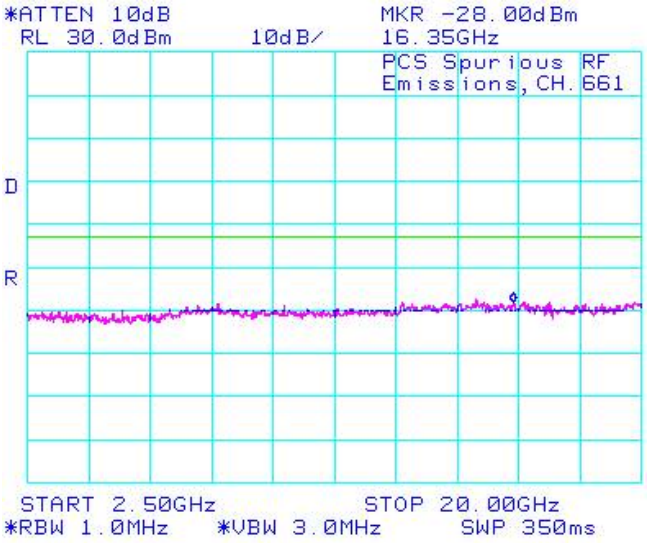


Figure 1-11a: PCS1900 band, Spurious Conducted Emissions, High Channel

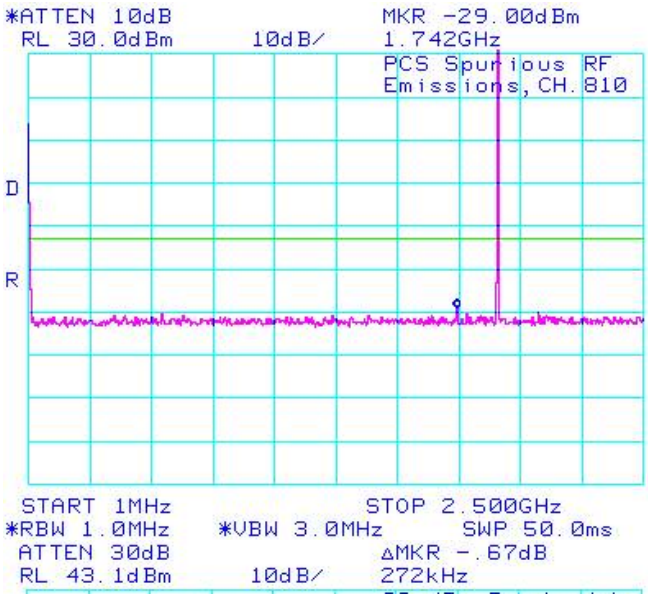
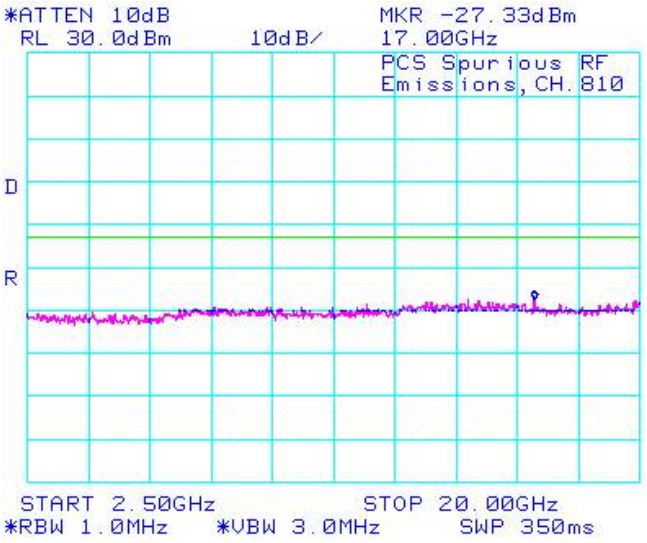


Figure 1-12a: PCS1900 band, Spurious Conducted Emissions, High Channel



GSM Conducted RF Emission Test Data cont'd

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

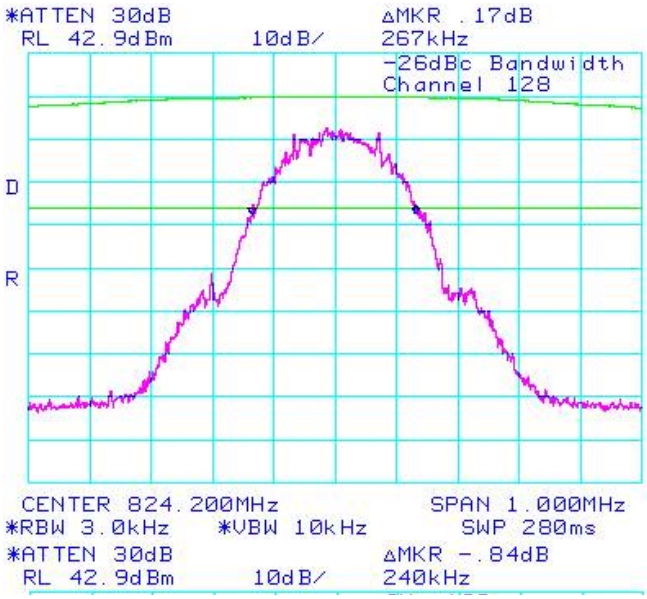


Figure 1-14a: Occupied Bandwidth, GSM850 band Low Channel in GSM mode

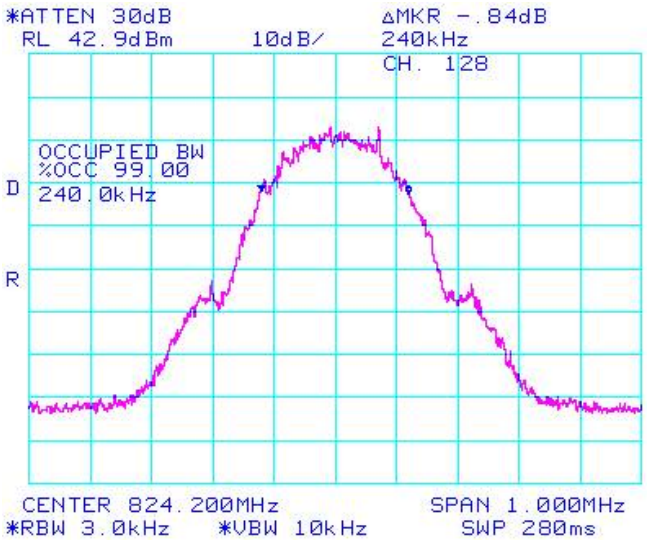


Figure 1-15a: -26dBc bandwidth, GSM850 band Middle Channel in GSM mode

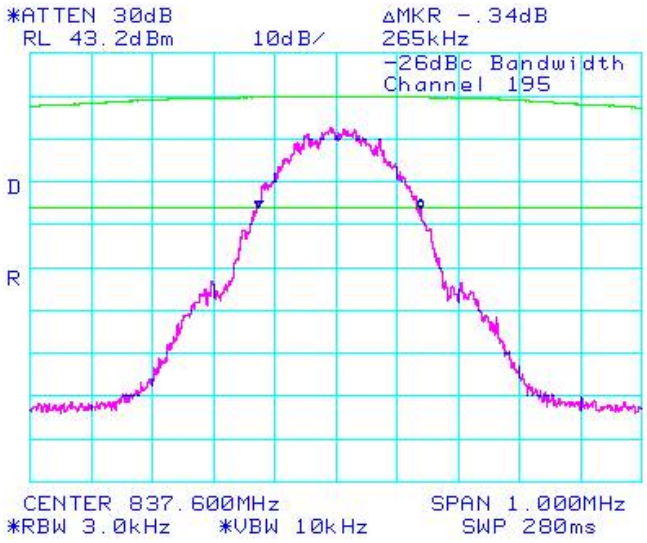
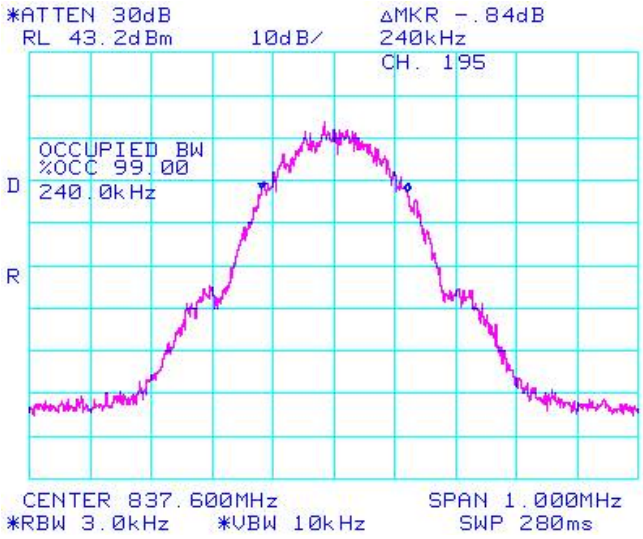


Figure 1-16a: Occupied Bandwidth, GSM850 band Middle Channel in GSM mode



GSM Conducted RF Emission Test Data cont'd

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

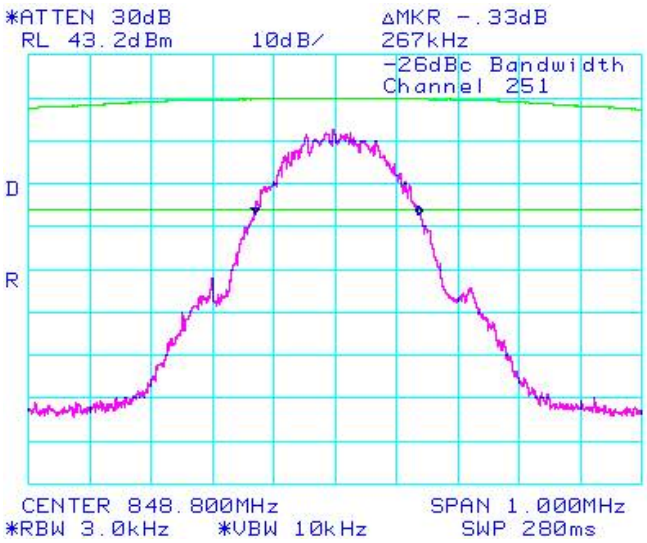


Figure 1-18a: Occupied Bandwidth, GSM850 band High Channel in GSM mode

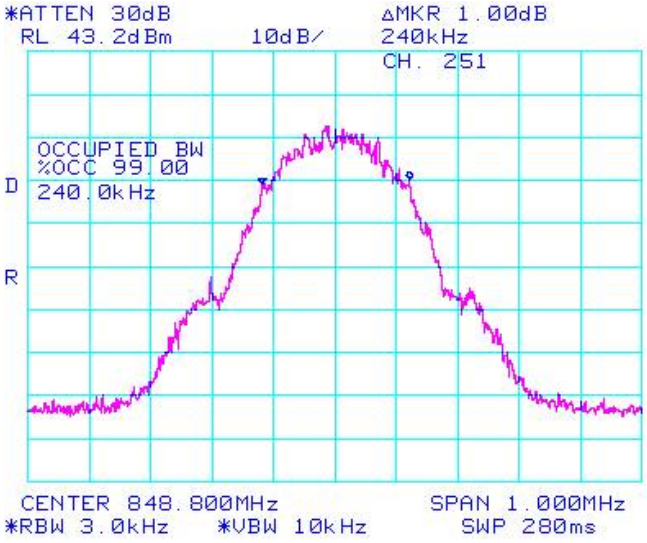


Figure 1-19a: -26dBc bandwidth, PCS1900 Low Channel in GSM mode

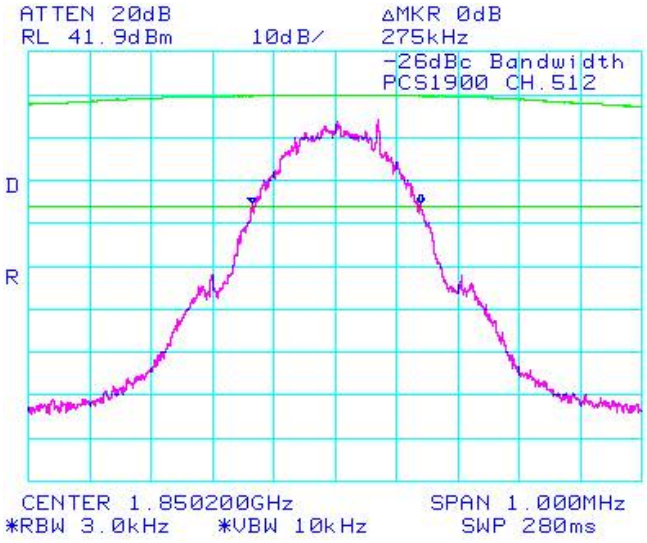
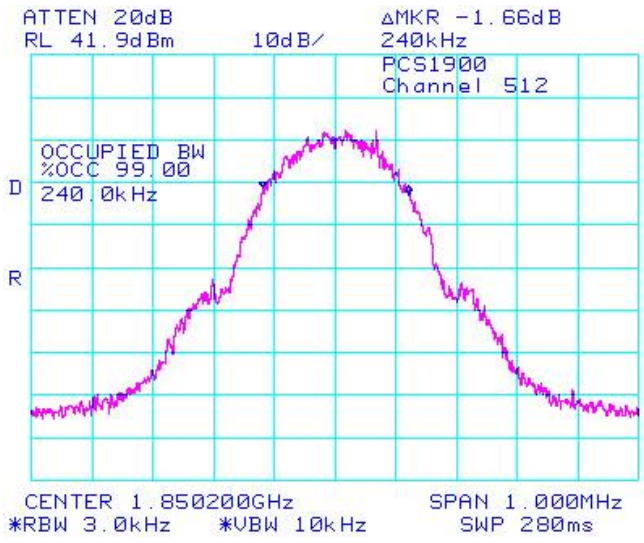


Figure 1-20a: Occupied Bandwidth, PCS1900 Low Channel in GSM mode



GSM Conducted RF Emission Test Data cont'd

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

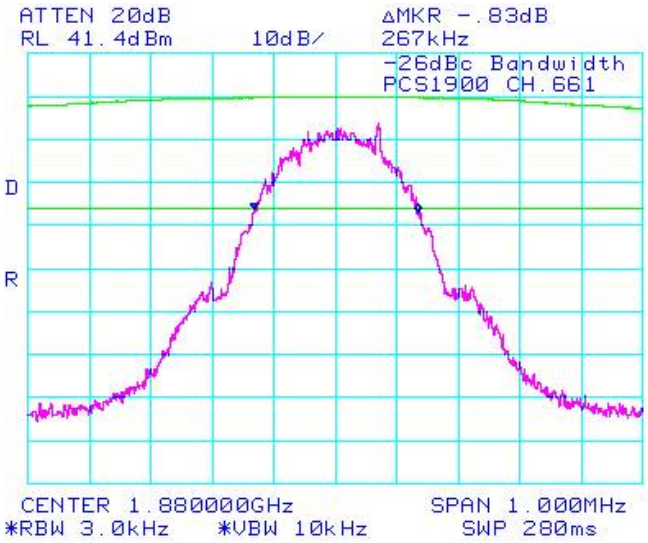


Figure 1-22a: Occupied Bandwidth, PCS1900 Middle Channel in GSM mode

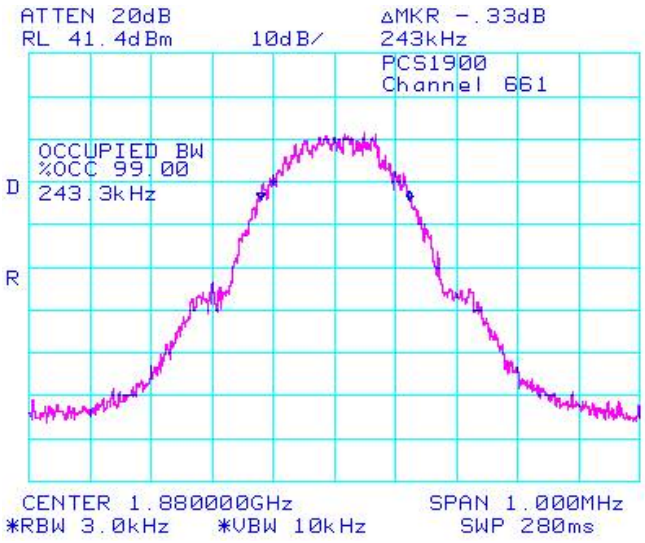


Figure 1-23a: -26dBc bandwidth, PCS1900 High Channel in GSM mode

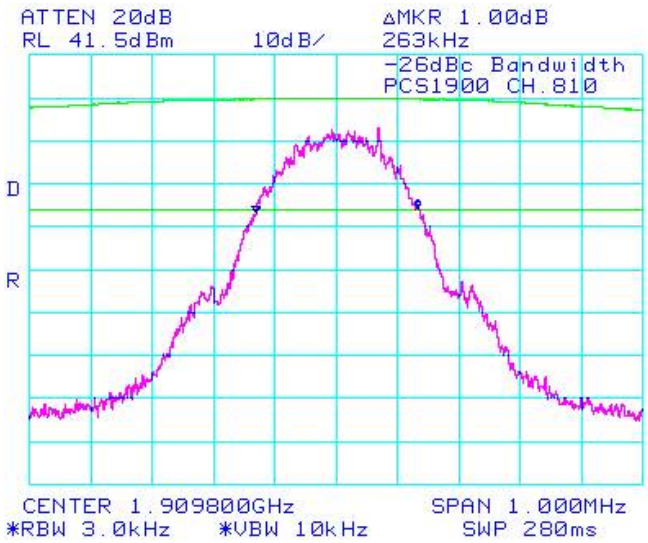
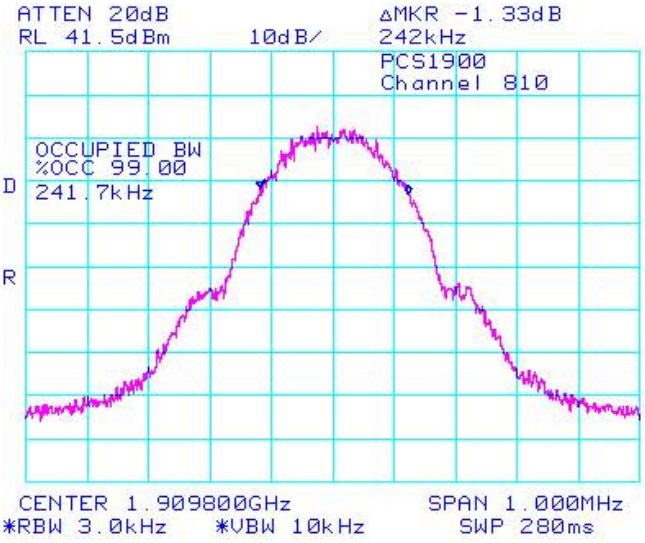


Figure 1-24a: Occupied Bandwidth, PCS1900 High Channel in GSM mode



GSM Conducted RF Emission Test Data cont'd

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

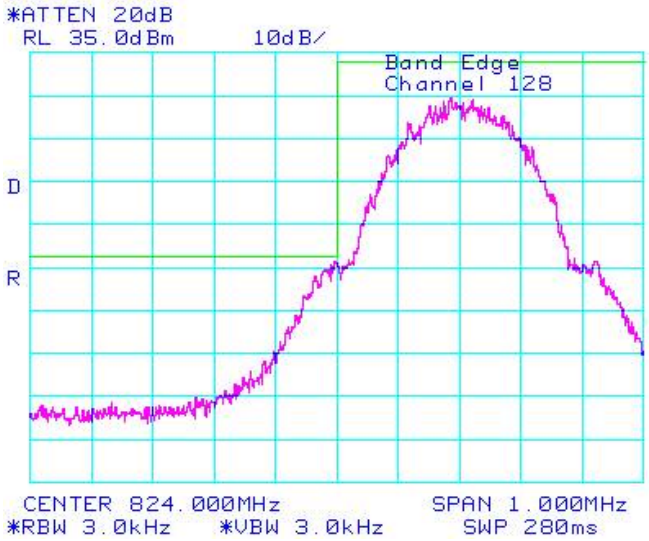


Figure 1-26a: GSM850 band High Channel Mask in GSM mode

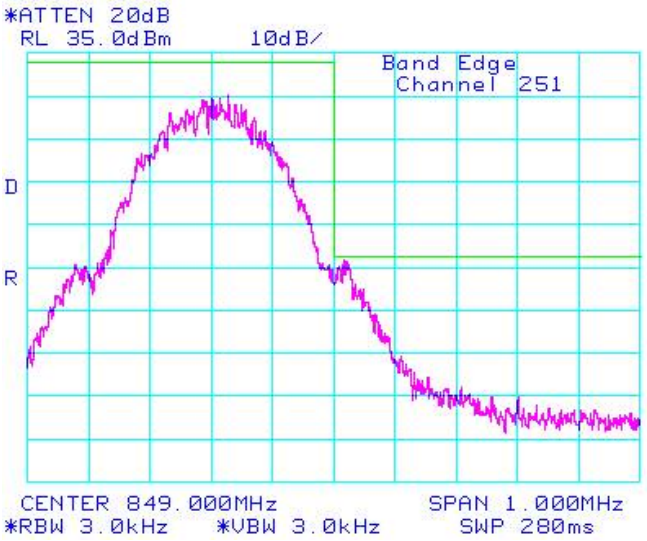


Figure 1-27a: PCS1900, Low Channel Mask in GSM mode

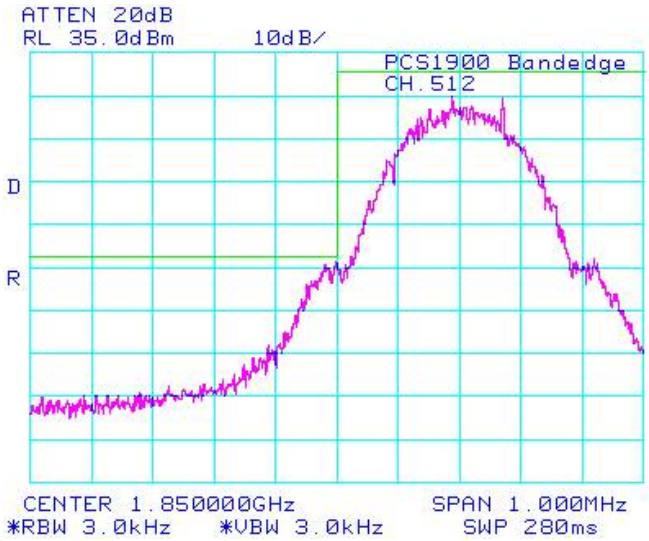
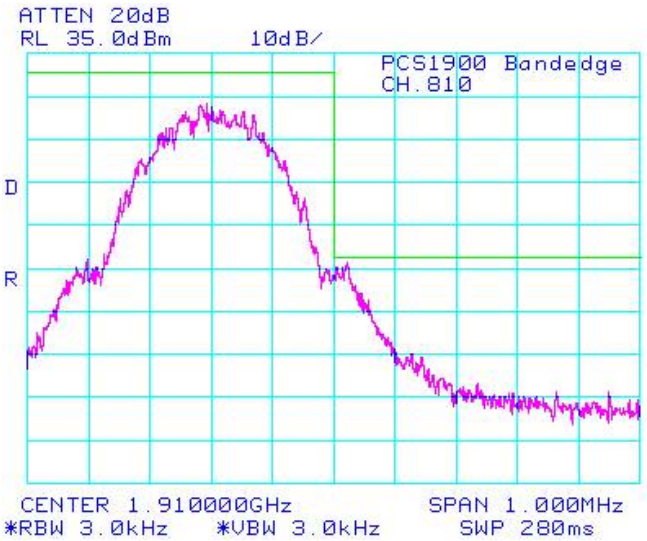


Figure 1-28a: PCS1900, High Channel Mask in GSM mode



GSM Conducted RF Emission Test Data cont'd

Figure 1-29a: GSM850 band, Spurious Conducted Emissions in Edge mode, Low channel

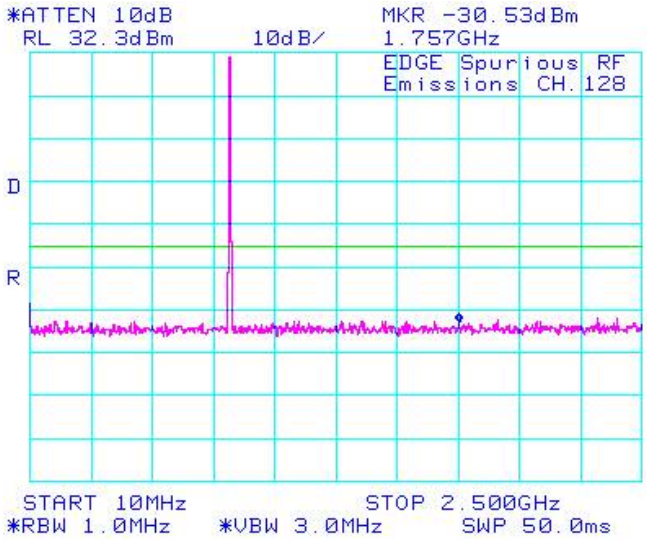


Figure 1-30a: GSM850 band, Spurious Conducted Emissions in Edge mode, Low channel

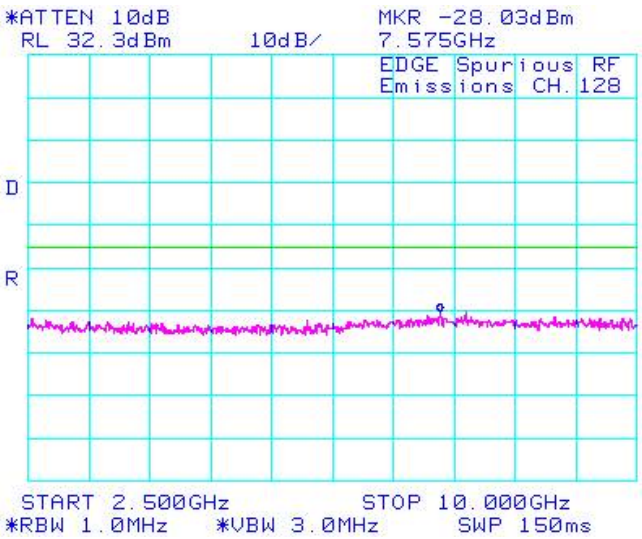


Figure 1-71a: GSM850 band, Spurious Conducted Emissions in Edge mode, Middle Channel

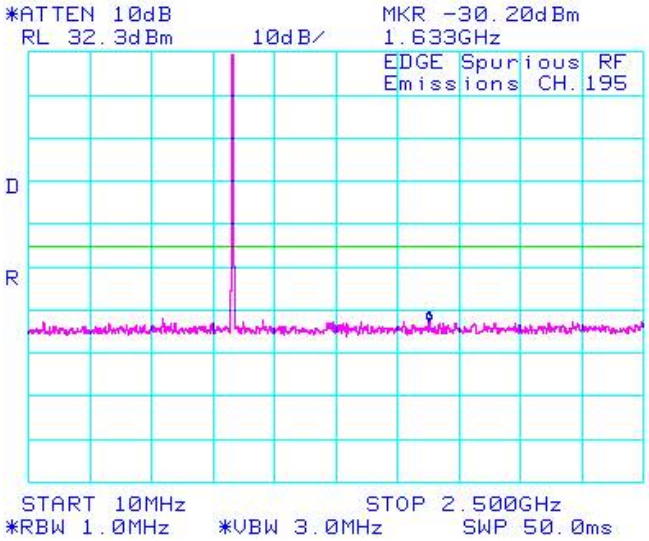
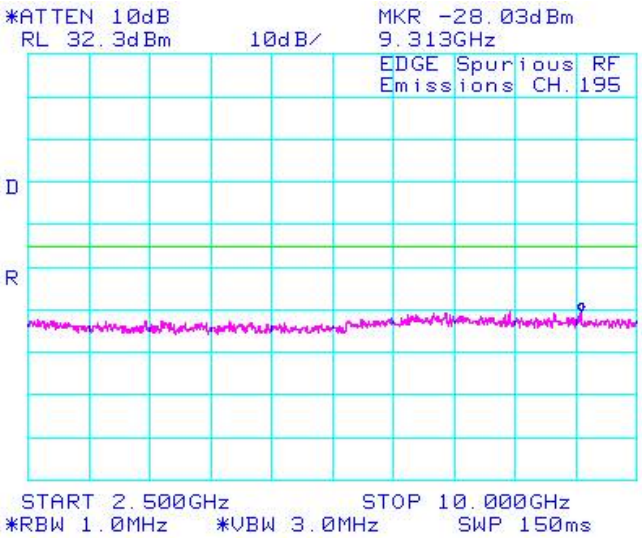


Figure 1-32a: GSM850 band, Spurious Conducted Emissions in Edge mode, Middle Channel



GSM Conducted RF Emission Test Data cont'd

Figure 1-33a: GSM850 band, Spurious Conducted Emissions in Edge mode, High Channel

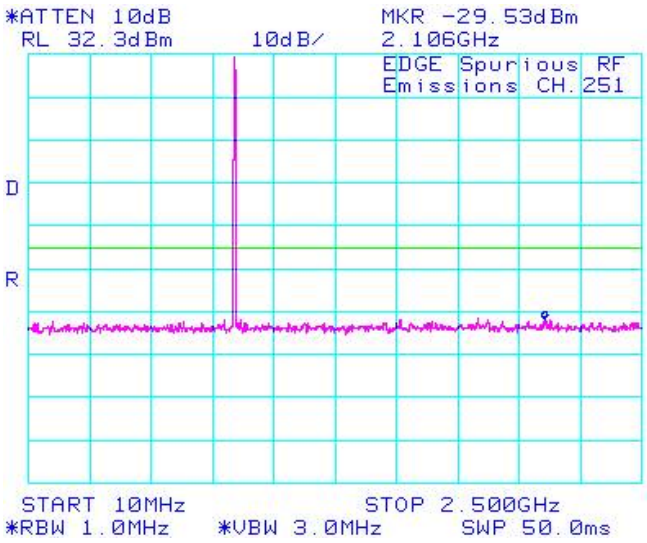


Figure 1-34a: GSM850 band, Spurious Conducted Emissions in Edge mode, High Channel

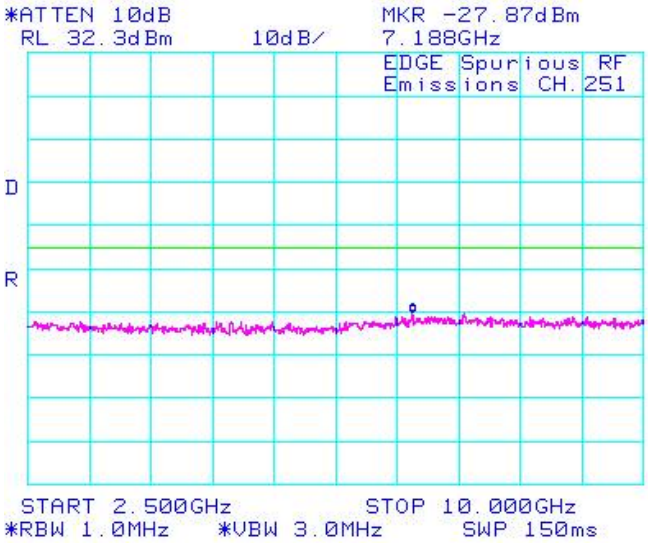


Figure 1-35: PCS1900 band, Spurious Conducted Emissions in Edge mode, Low Channel

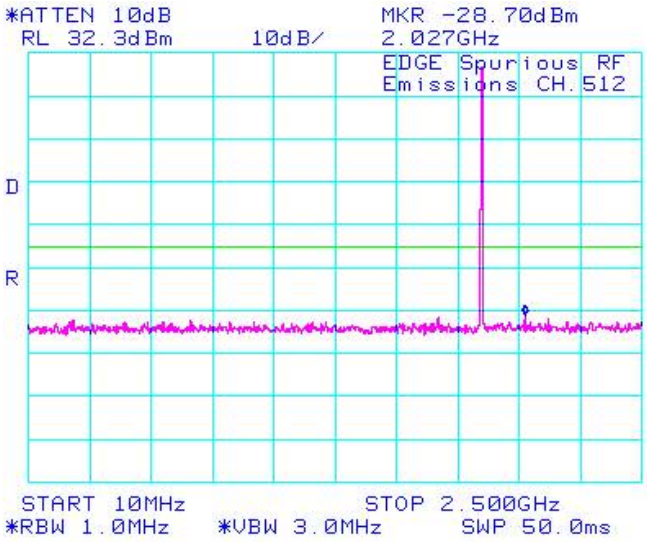
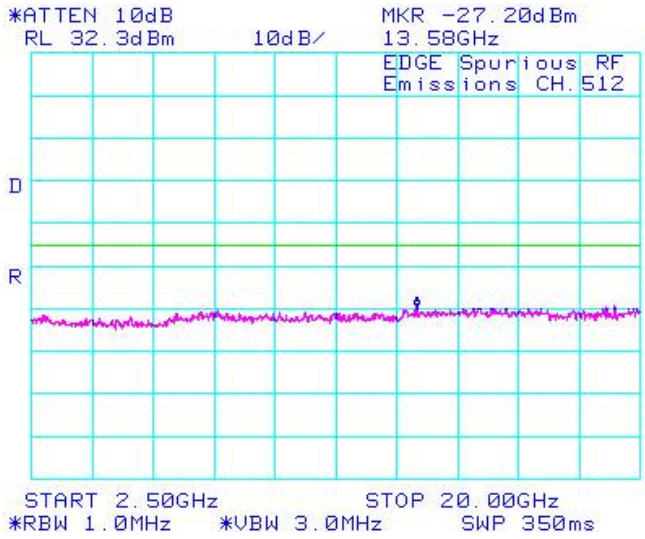


Figure 1-36a: PCS1900 band, Spurious Conducted Emissions in Edge mode, Low Channel



GSM Conducted RF Emission Test Data cont'd

Figure 1-37a: PCS1900 band, Spurious Conducted Emissions in Edge mode, Middle Channel

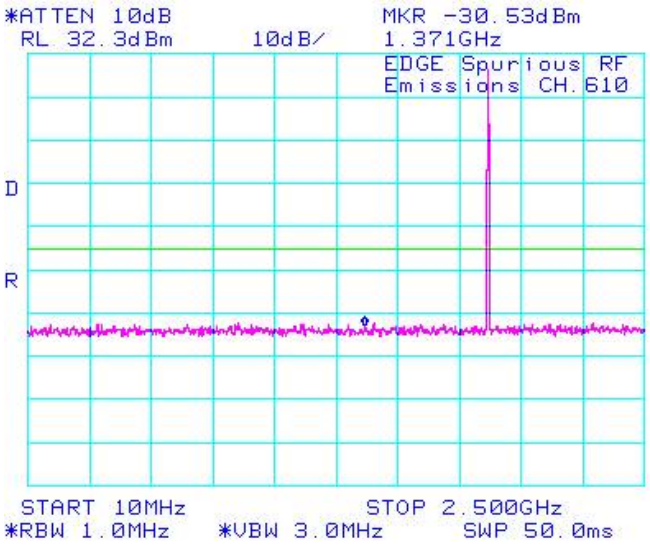


Figure 1-38a: PCS1900 band, Spurious Conducted Emissions in Edge mode, Middle Channel

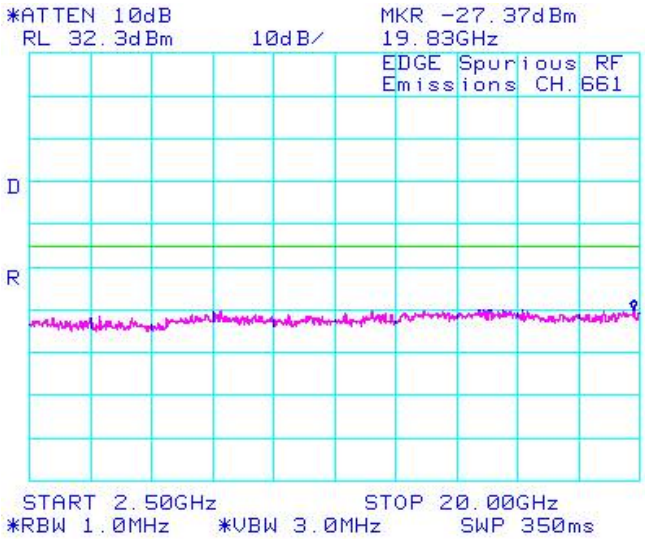


Figure 1-39a: PCS1900 band, Spurious Conducted Emissions in Edge mode, High Channel

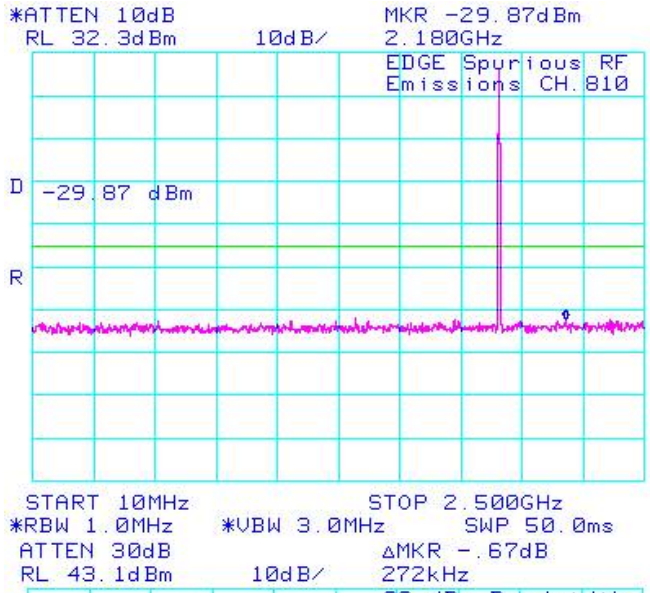
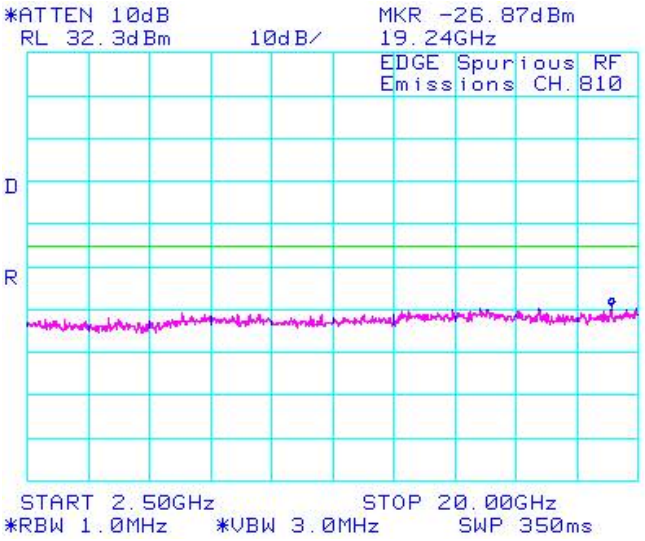


Figure 1-40a: PCS1900 band, Spurious Conducted Emissions in Edge mode, High Channel



GSM Conducted RF Emission Test Data cont'd

Figure 1-41a: Occupied Bandwidth, GSM850 Band, Low Channel in EDGE mode

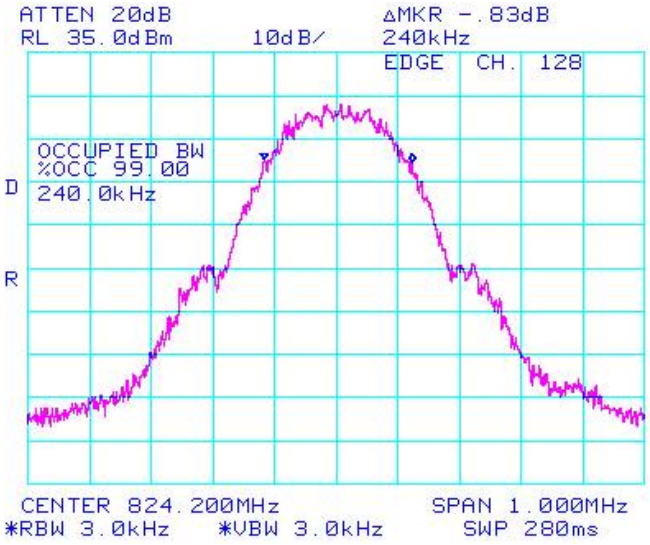


Figure 1-42a: Occupied Bandwidth, GSM850 Band, Middle Channel in EDGE mode

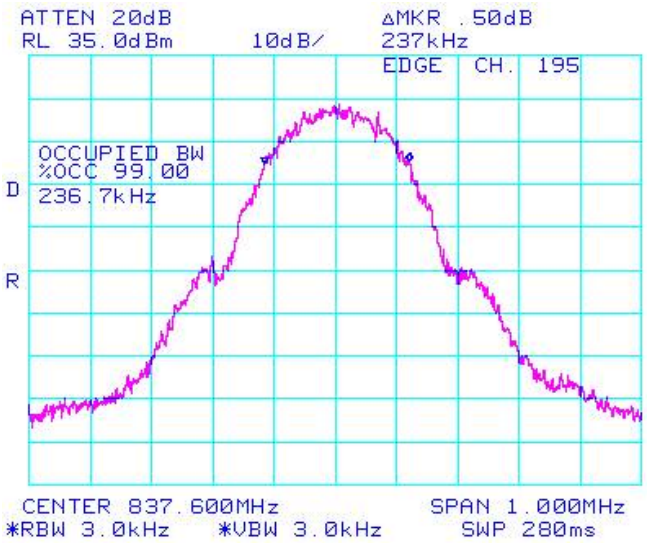


Figure 1-43a: Occupied Bandwidth, GSM850 band, High Channel in EDGE mode

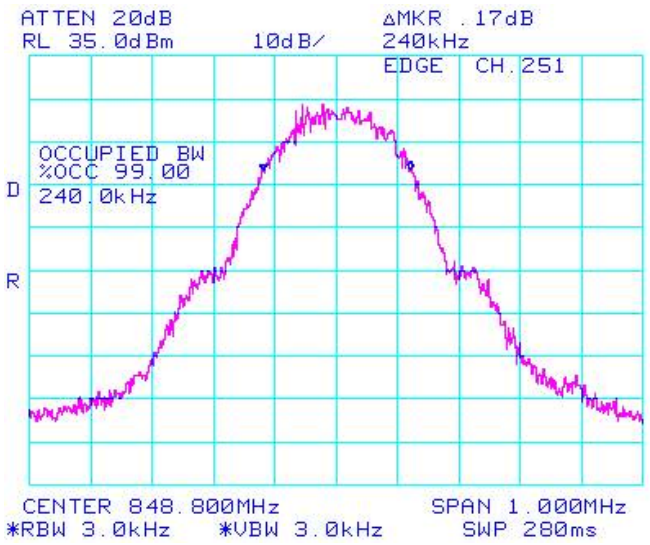
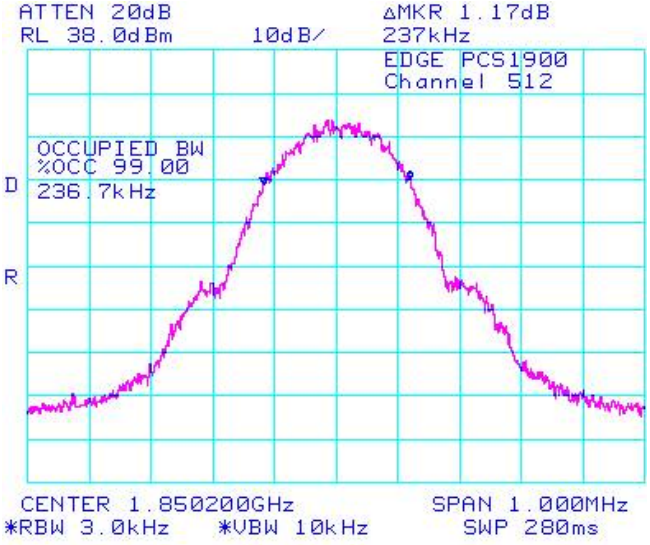


Figure 1-44a: Occupied Bandwidth, PCS1900 Band, Low Channel in EDGE mode



GSM Conducted RF Emission Test Data cont'd

Figure 1-45a: Occupied Bandwidth, PCS1900 Band, Middle Channel in EDGE mode

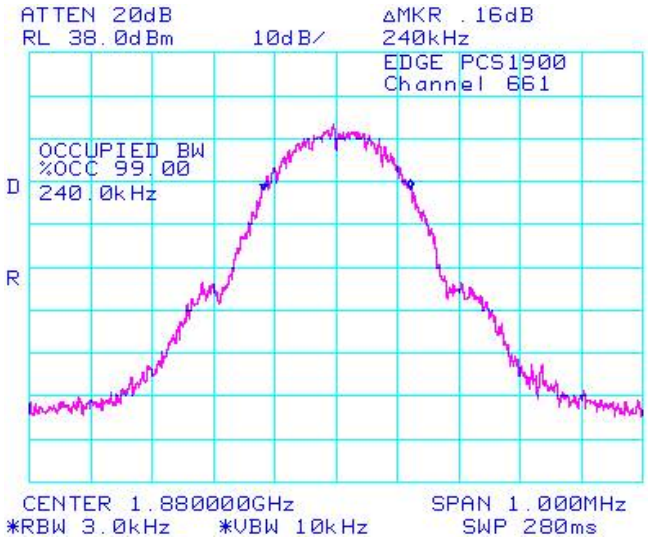


Figure 1-46a: Occupied Bandwidth, PCS1900 Band, High Channel in EDGE mode

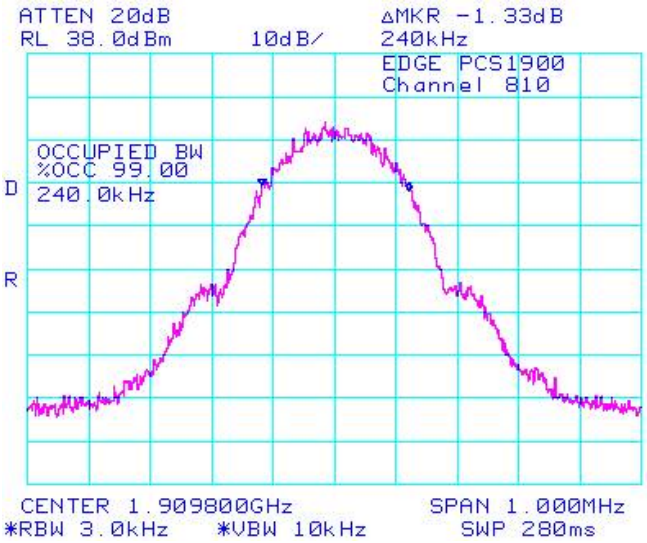


Figure 1-47a: GSM850 Band, Low Channel Mask in EDGE mode

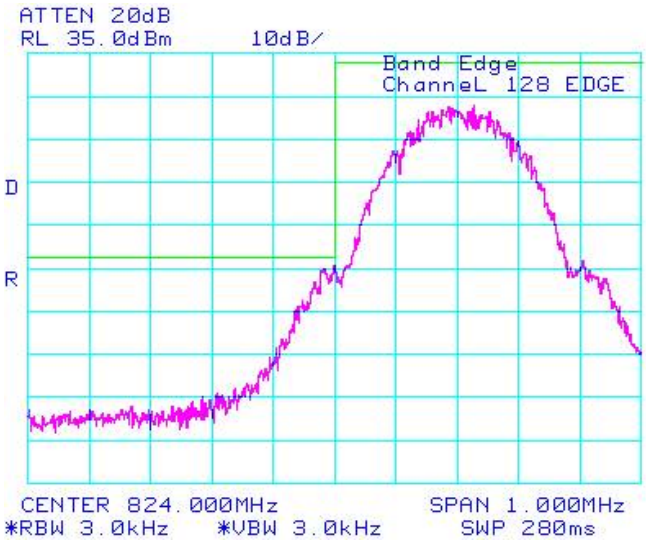
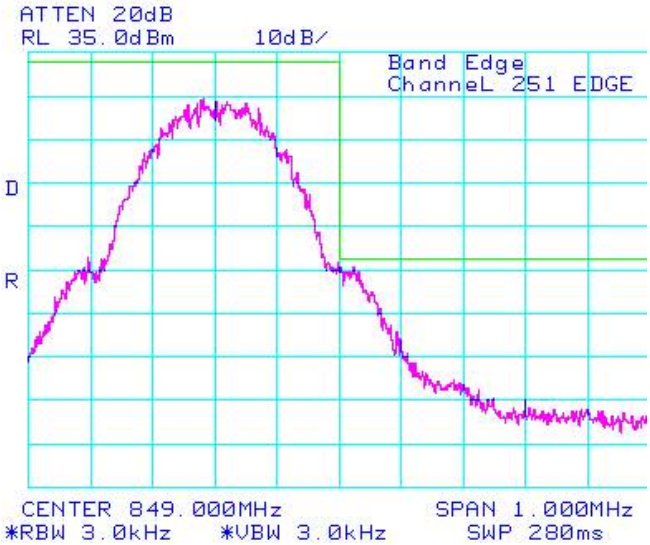


Figure 1-48a: GSM850 Band, High Channel Mask in EDGE mode



GSM Conducted RF Emission Test Data cont'd

Figure 1-49a: PCS1900 Band, Low Channel Mask in EDGE mode

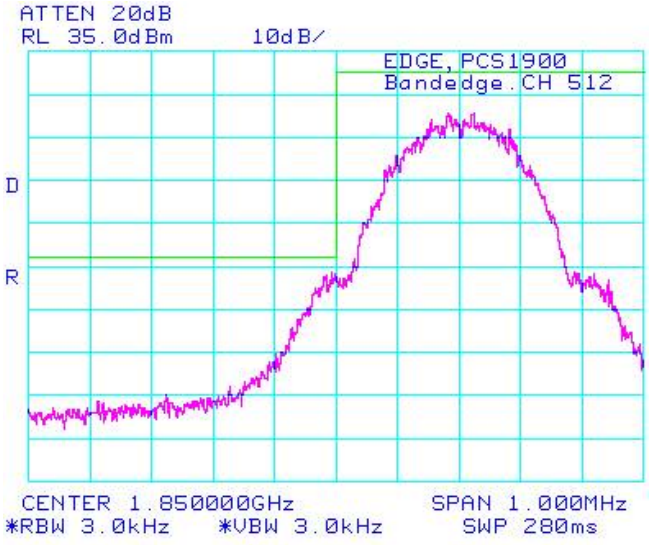
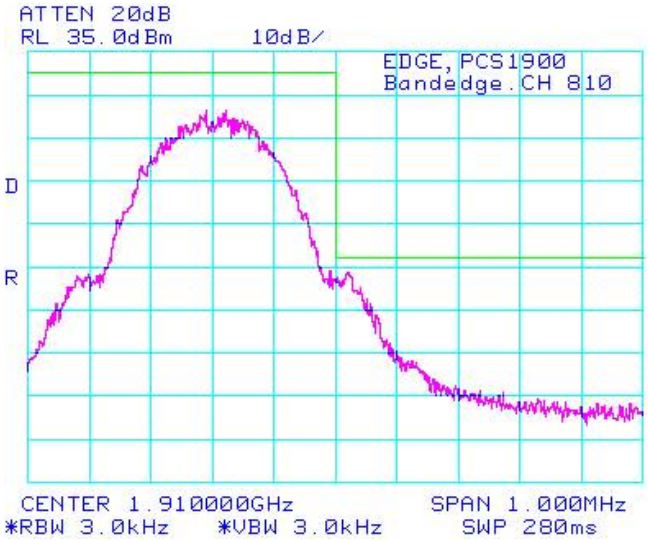


Figure 1-50a: PCS1900 Band, High Channel Mask in EDGE mode

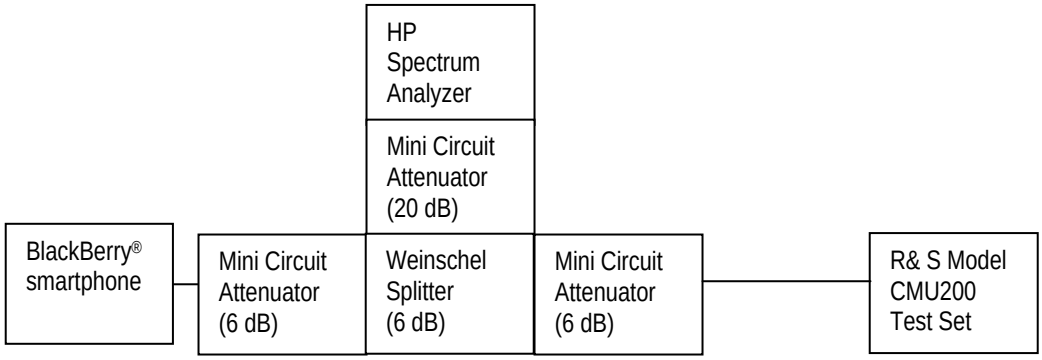


APPENDIX 1B – WCDMA CONDUCTED RF EMISSIONS TEST DATA/PLOTS

WCDMA Conducted RF Emission Test Data

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

Test Setup Diagram



Date of Test: July 21, 2010

The environmental test conditions were:	Temperature:	21 ºC
	Pressure:	1011 mb
	Relative Humidity:	34%

WCDMA Conducted RF Emission Test Data cont'd

The conducted spurious emissions – As per 47 CFR 2.1051, CFR 24.238(a), CFR 4.202, CFR 22 Subpart H, RSS – 132 and RSS – 133 were measured from 10 MHz to 20 GHz.
The EUT emissions were in the noise floor.
See figures 1-1 to 1-6 for the plots of the conducted spurious emissions on Band 2

–26 dBc Bandwidth and Occupied Bandwidth (99%)

For each carrier frequency of low, middle and high, the modulation spectrum was measured by both methods of 99% power bandwidth and –26 dBc bandwidth.
The resolution bandwidth required for out-of-band emissions in the 1 MHz bands immediately outside and adjacent to the frequency block, was determined to be at least 1% of the emission bandwidth.
The worst case –26dBc bandwidth for the UMTS1900 band was measured to be 4.692 MHz as shown below. This results in a 3.0 kHz resolution bandwidth.
On any frequency outside the frequency block and outside the adjacent 1 MHz bands, a resolution bandwidth of at least 2 MHz was employed.

Test Data for band 2 in UMTS mode.

Band 2 Frequency (MHz)	-26dBc Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
1852.4	4.692	4.175
1880.0	4.658	4.167
1907.6	4.683	4.192

Measurement Plots for band 2 in UMTS mode
Refer to the following measurement plots for more detail.
See Figures 1-7 to 1-12 for the plots of the –26dBc Bandwidth and 99% Occupied Bandwidth.
See Figures 1-13 to 1-14 for plots of the channel mask results.

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

WCDMA Conducted RF Emission Test Data cont'd

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

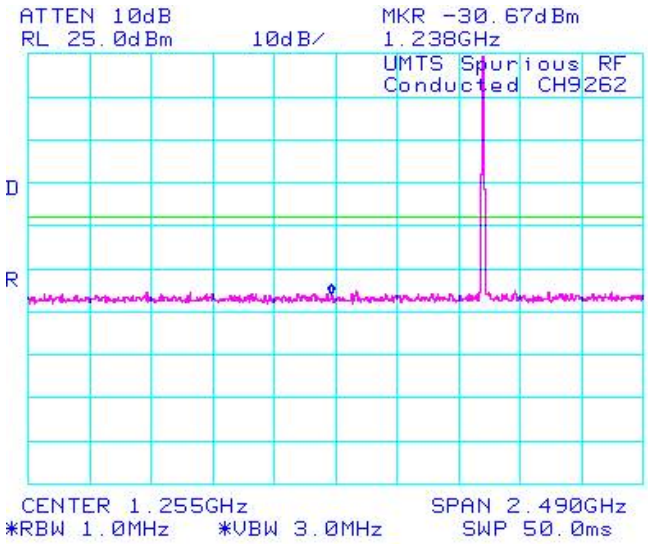


Figure 1-2: UMTS band 2, Spurious Conducted Emissions, Low channel

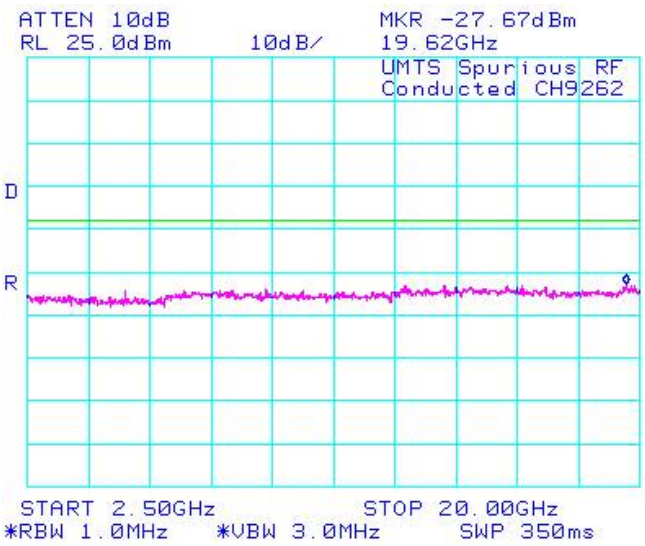


Figure 1-3: UMTS band 2, Spurious Conducted Emissions, Middle Channel

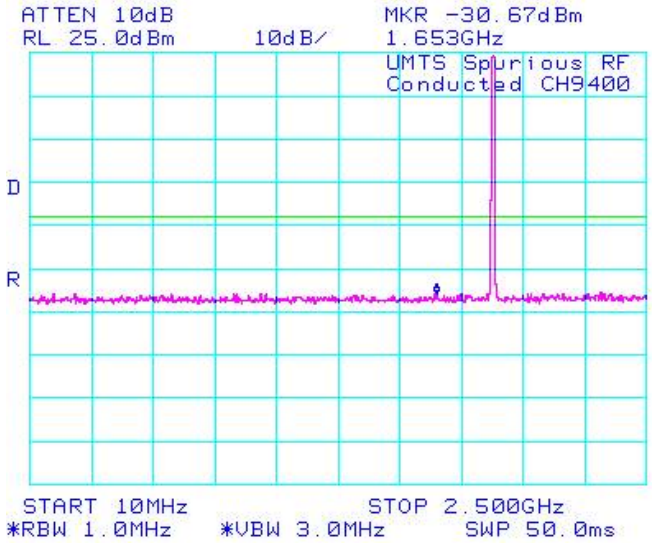
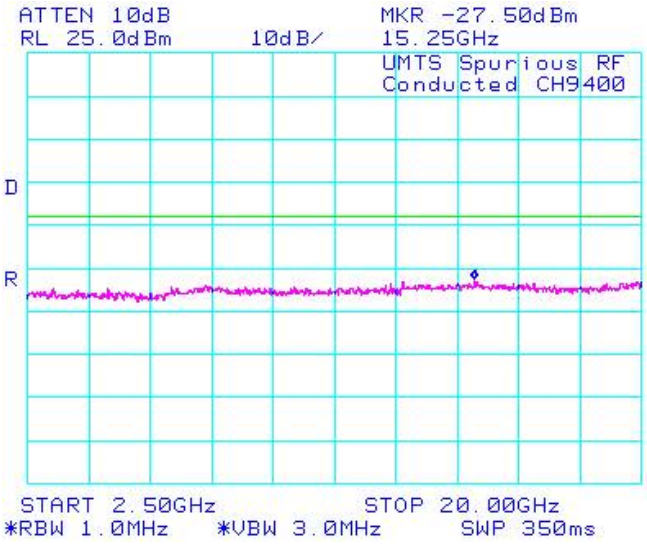


Figure 1-4: UMTS band 2, Spurious Conducted Emissions, Middle Channel



WCDMA Conducted RF Emission Test Data cont'd

Figure 1-5: UMTS band 2, Spurious Conducted Emissions, High Channel

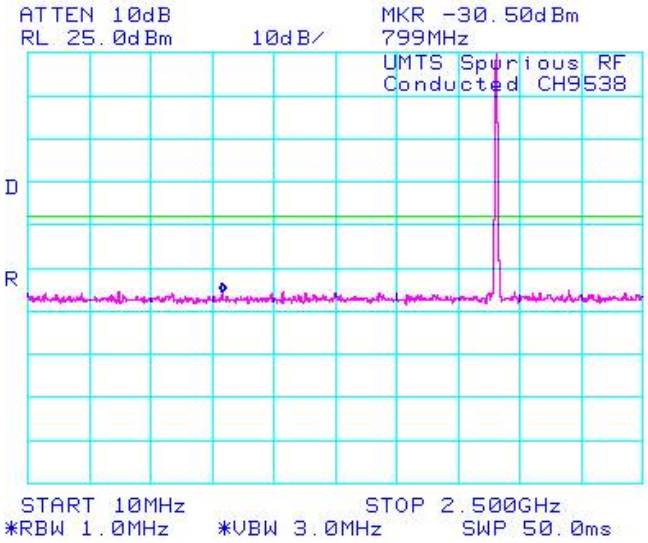


Figure 1-6: UMTS band 2, Spurious Conducted Emissions, High Channel

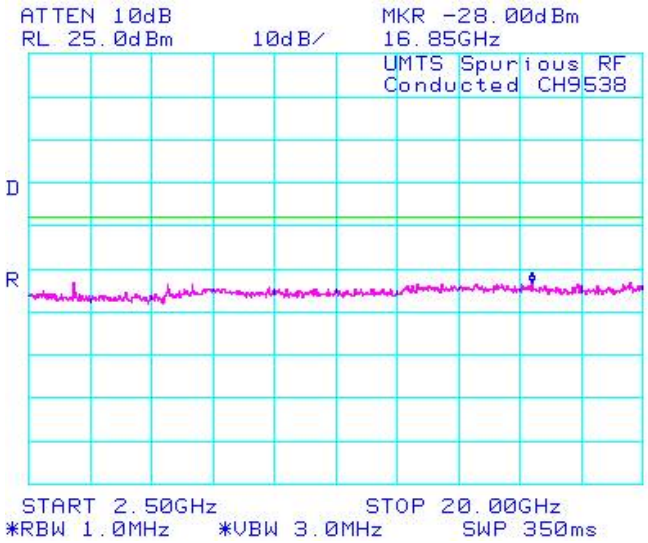


Figure 1-7: -26dBc bandwidth, UMTS band 2 Low Channel

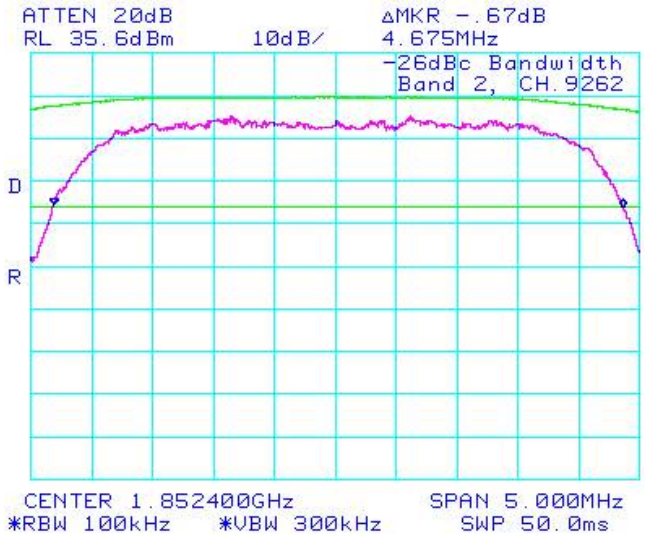
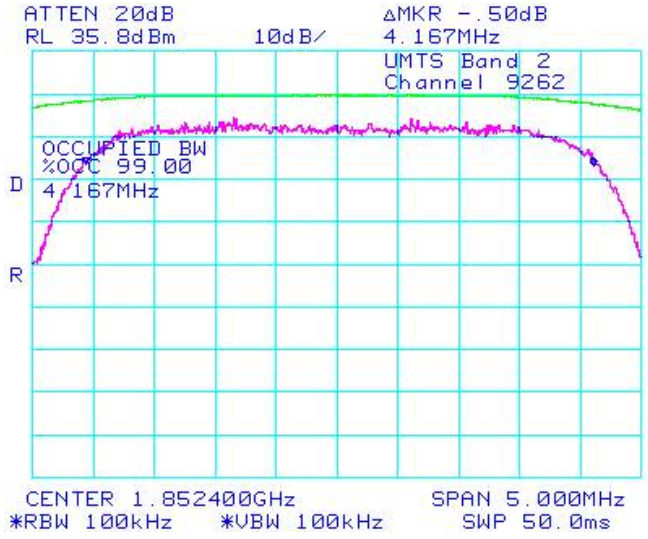


Figure 1-8: Occupied Bandwidth, UMTS band 2 Low Channel



WCDMA Conducted RF Emission Test Data cont'd

Figure 1-9: -26dBc bandwidth, UMTS band 2 Middle Channel

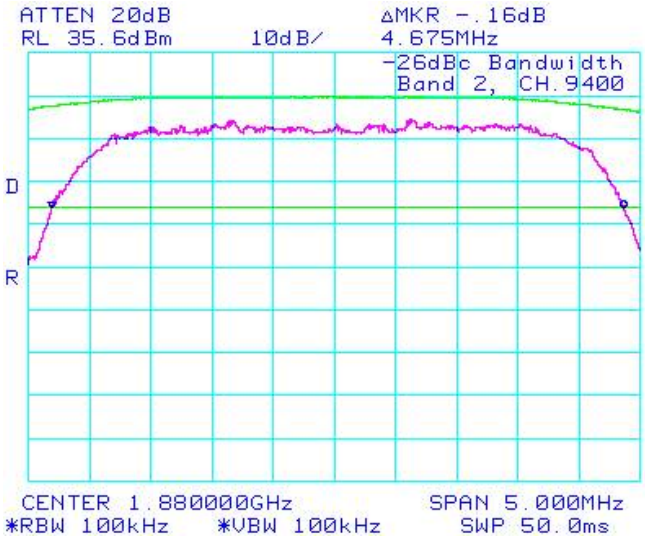


Figure 1-10: Occupied Bandwidth, UMTS band 2 Middle Channel

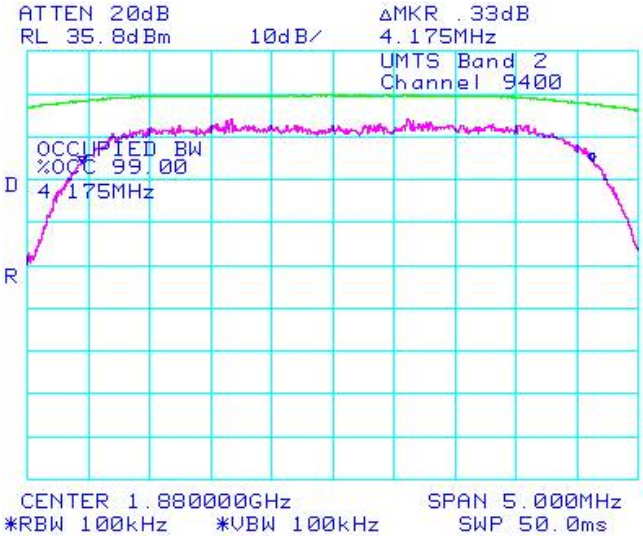


Figure 1-11: -26dBc bandwidth, UMTS band 2 High Channel

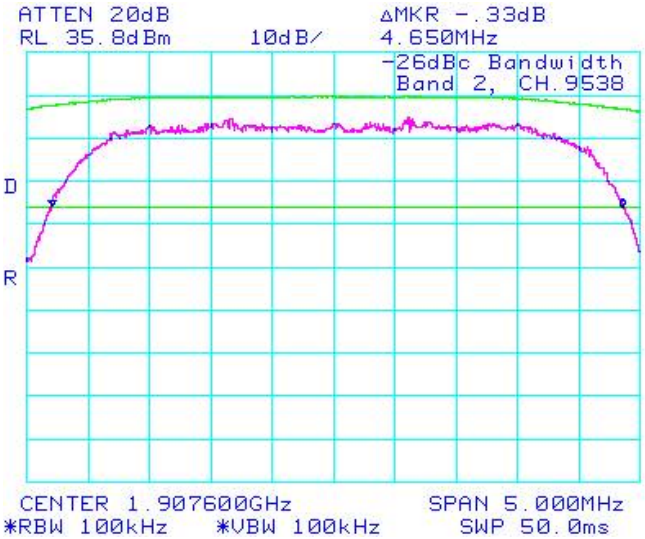
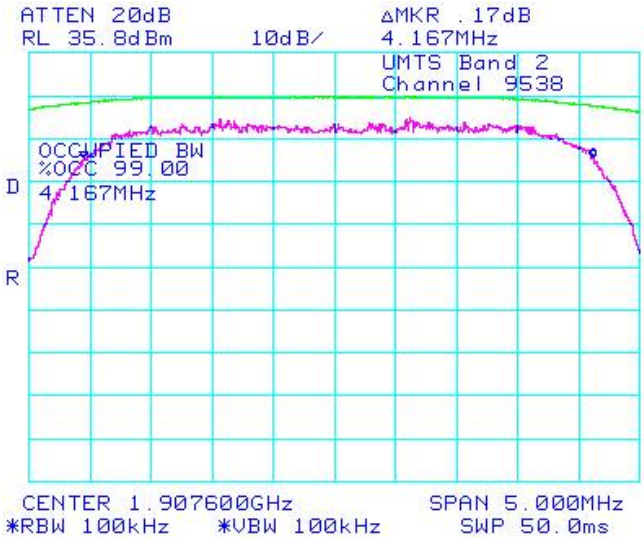


Figure 1-12: Occupied Bandwidth, UMTS band 2 High Channel



WCDMA Conducted RF Emission Test Data cont'd

Figure 1-13: UMTS band 2, Low Channel Mask

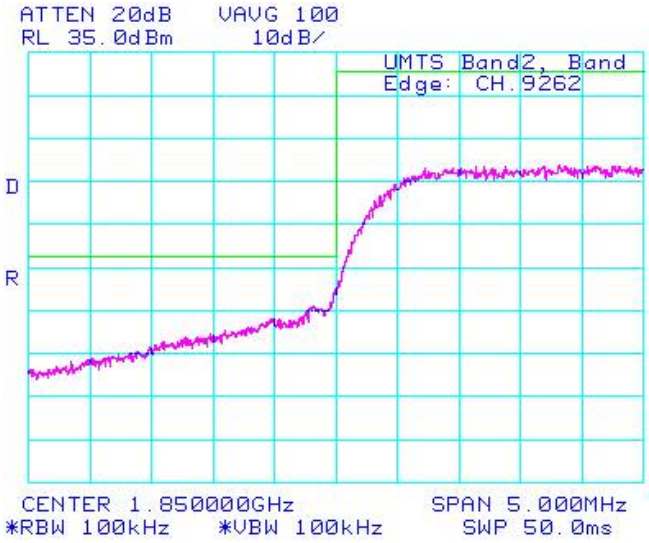
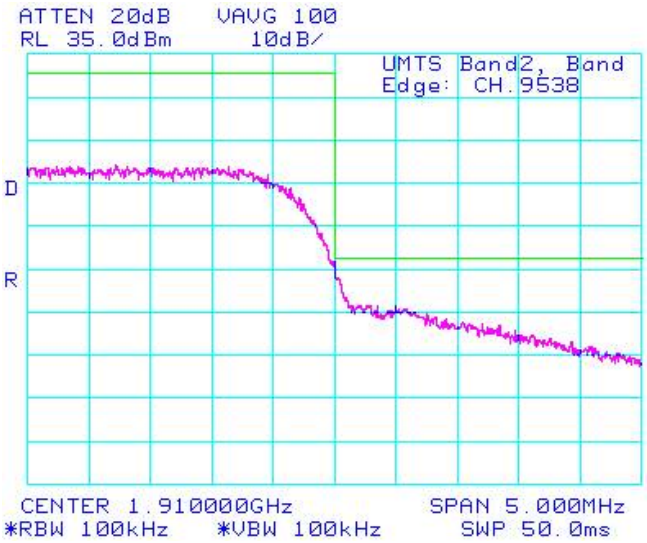


Figure 1-14: UMTS band 2, High Channel Mask



APPENDIX 2A – GSM RADIATED EMISSIONS TEST DATA

Radiated Power Test Data Results

Date of test: July 7, 2010

The following tests were performed by Quan (Jerry) Ma.

The environmental tests conditions were: Temperature: 21 °C
Pressure: 1004 mb
Relative Humidity: 31 %

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

Test distance is 3.0 metres

GSM850 Band

GSM Mode

EUT				Rx Antenna		Spectrum Analyzer		Substitution Method / Tracking Generator					
Type	Ch	Frequency (MHz)	Band	Type	Pol.	Reading (dBuV)	Max (V,H) (dBuV)	Pol. Tx-Rx	Reading (dBm)	Corrected Reading (relative to Dipole) (dBm)	(W)	Limit (dBm)	Diff. To Limit (dB)
F0	128	824.20	850	Dipole	V	74.54	83.63	V-V	10.33	27.88	0.61	38.50	-10.62
F0	128	824.20	850	Dipole	H	83.63		H-H	8.75				
F0	190	837.60	850	Dipole	V	73.68	82.89	V-V	11.03	28.12	0.65	38.50	-10.38
F0	190	837.60	850	Dipole	H	82.89		H-H	8.18				
F0	251	848.80	850	Dipole	V	74.39	83.23	V-V	10.86	**28.25**	0.67	38.50	-10.25
F0	251	848.80	850	Dipole	H	83.23		H-H	8.69				

EDGE Mode

EUT				Rx Antenna		Spectrum Analyzer		Substitution Method / Tracking Generator					
Type	Ch	Frequency (MHz)	Band	Type	Pol.	Reading (dBuV)	Max (V,H) (dBuV)	Pol. Tx-Rx	Reading (dBm)	Corrected Reading (relative to Dipole) (dBm)	(W)	Limit (dBm)	Diff. To Limit (dB)
F0	128	824.20	850	Dipole	V	73.91	82.47	V-V	9.17	25.97	0.40	38.50	-12.53
F0	128	824.20	850	Dipole	H	82.47		H-H	7.59				
F0	190	837.60	850	Dipole	V	74.32	82.63	V-V	10.77	**27.38**	0.55	38.50	-11.12
F0	190	837.60	850	Dipole	H	82.63		H-H	7.92				
F0	251	848.80	850	Dipole	V	73.91	82.47	V-V	10.10	27.08	0.51	38.50	-11.42
F0	251	848.80	850	Dipole	H	82.47		H-H	7.93				

Radiated Power Test Data Results cont'd

Date of test: July 7, 2010

The environmental tests conditions were: Temperature: 23 °C
Pressure: 1014 mb
Relative Humidity: 30 %

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

PCS1900 Band

GSM Mode

EUT				Rx Antenna		Spectrum Analyzer		Substitution Method / 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	89.87	89.87	V-V	-4.07	29.46	0.88	33.00	-3.54
F0	512	1850.20	1900	Horn	H	83.47		H-H	-4.08				
F0	661	1880.00	1900	Horn	V	90.64	90.38	V-V	-3.31	30.45	1.11	33.00	-2.55
F0	661	1880.00	1900	Horn	H	84.02		H-H	-3.51				
F0	810	1909.80	1900	Horn	V	90.14	90.04	V-V	-2.33	**30.51**	1.12	33.00	-2.49
F0	810	1909.80	1900	Horn	H	83.88		H-H	-2.51				

EDGE Mode

EUT				Rx Antenna		Spectrum Analyzer		Substitution Method / 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	90.36	90.36	V-V	-3.58	29.95	0.99	33.00	-3.05
F0	512	1850.20	1900	Horn	H	87.56		H-H	-3.59				
F0	661	1880.00	1900	Horn	V	89.97	89.97	V-V	-3.72	**30.04**	1.01	33.00	-2.96
F0	661	1880.00	1900	Horn	H	88.17		H-H	-3.92				
F0	810	1909.80	1900	Horn	V	89.47	89.47	V-V	-2.90	29.94	0.99	33.00	-3.06
F0	810	1909.80	1900	Horn	H	86.94		H-H	-3.55				

Radiated Emissions Test Data Results cont'd

GSM850

GSM Mode

Date of Test: July 20, 2010

The following tests were performed by Fahd Faisal

The environmental test conditions were: Temperature: 24 ºC
Pressure: 1003 mb
Relative Humidity: 30 %

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

The BlackBerry® smartphone was in standalone, horizontal position.

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

All emissions had a test margin greater than 25.0 dB.

Date of Test: July 20 & July 29, 2010

The following tests were performed by Steven Wang

The environmental test conditions were: Temperature: 23 ºC
Pressure: 1019 mb
Relative Humidity: 31 %

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

The BlackBerry® smartphone was in standalone, horizontal position.

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

All emissions had a test margin greater than 25.0 dB.

Radiated Emissions Test Data Results cont'd

GSM850

EDGE Mode

Date of Test: July 20, 2010

The environmental test conditions were: Temperature: 24 ºC
Pressure: 1003 mb
Relative Humidity: 30 %

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

The BlackBerry® smartphone was in standalone, horizontal position.

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

All emissions had a test margin greater than 25.0 dB.

Date of Test: July 20 & July 29, 2010

The environmental test conditions were: Temperature: 23 ºC
Pressure: 1010mb
Relative Humidity: 31 %

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

The BlackBerry® smartphone was in standalone, horizontal position.

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

All emissions had a test margin greater than 25.0 dB.

Radiated Emissions Test Data Results cont'd

PCS1900

GSM Mode

Date of Test: July 21, 2010

The environmental test conditions were: Temperature: 24 ºC
Pressure: 1002 mb
Relative Humidity: 30 %

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

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

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

All emissions had a test margin greater than 25.0 dB.

Date of Test: July 21, 2010

The environmental test conditions were: Temperature: 23 ºC
Pressure: 1009 mb
Relative Humidity: 25 %

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

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

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

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

Radiated Emissions Test Data Results cont'd

PCS1900

EDGE Mode

Date of Test: July 21, 2010

The environmental test conditions were: Temperature: 24 ºC
Pressure: 1002 mb
Relative Humidity: 30 %

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

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

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

All emissions had a test margin greater than 25.0 dB.

Date of Test: July 21, July 27 and August 06, 2010

The environmental test conditions were: Temperature: 24 ºC
Pressure: 1006-1023 mb
Relative Humidity: 25-30 %

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

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

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

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

APPENDIX 2B – WCDMA RADIATED EMISSIONS TEST DATA

Radiated Power Test Data Results

Date of test: July 7, 2010

The environmental tests conditions were: Temperature: 22 °C
Pressure: 1004 mb
Relative Humidity: 31 %

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

Test distance is 3.0 metres

UMTS Band 2 (1900 MHz)

Call Mode

EUT				Rx Antenna		Spectrum Analyzer		Substitution Method Tracking Generator					
Type	Ch	Frequency (MHz)	Band	Type	Pol.	Reading (dBuV)	Max (V,H) (dBuV)	Pol. Tx-Rx	Reading (dBm)	Corrected Reading (relative to Dipole) (dBm)	Corrected Reading (relative to Dipole) (W)	Limit (dBm)	Diff. To Limit (dB)
F0	9262	1852.40	1900	Horn	V	86.57	86.57	V-V	-13.15	23.92	0.25	33.00	-9.08
F0	9262	1852.40	1900	Horn	H	81.67		H-H	-12.12				
F0	9400	1880.00	1900	Horn	V	86.21	86.21	V-V	-12.95	**24.05**	0.25	33.00	-8.95
F0	9400	1880.00	1900	Horn	H	80.54		H-H	-11.90				
F0	9538	1907.60	1900	Horn	V	86.3	86.3	V-V	-12.44	23.96	0.25	33.00	-9.04
F0	9538	1907.60	1900	Horn	H	78.1		H-H	-11.73				

Radiated Emissions Test Data Results

UMTS Band 2 (1900 MHz)

Date of Test: July 22, 2010

The environmental test conditions were: Temperature: 22 ºC
Pressure: 1014 mb
Relative Humidity: 24 %

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

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

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

All emissions had a test margin greater than 25.0 dB.

Date of Test: July 29 & August 6, 2010

The environmental test conditions were: Temperature: 25 ºC
Pressure: 1006 mb
Relative Humidity: 25%

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

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

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