

Partial 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-132 and 133




A division of Research In Motion Limited

REPORT NO: RTS-2341-1004-03

PRODUCT MODEL NO:	RCW41GW
TYPE NAME:	BlackBerry® smartphone
FCC ID:	L6ARCW40GW
IC:	2503A-RCW40GW
EMISSION DESIGNATOR (GSM):	242KGXW
EMISSION DESIGNATOR (EDGE):	240KG7W

DATE: 21 June 2010

	EMI Test Report for the BlackBerry® smartphone Model RCW41GW	
Test Report No. RTS-2341-1004-03	Dates of Test April 6-7 and 13-29, 2010	FCC ID: L6ARCW40GW IC: 2503A-RCW40GW

Statement of Performance:

The BlackBerry® smartphone, model RCW41GW, part number CER-30952-001 Rev 3 and accessories performs within the requirements of the test standards when configured and operated per RIM's instructions.

Declaration:

We hereby certify that:

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

Documented by:



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Date: 21 June 2010

Reviewed by:



Michael Cino
Regulatory Compliance Associate
Date: 23 June 2010

Reviewed and Approved by:



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Manager, Regulatory Compliance
Date: 19 July 2010



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A) Scope

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

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

B) Associated Documents

- 1) Cetecom Report no. 1-2166-01-02/10A
- 2) HW_Declaration_CER-30952_Rev2
- 3) HW_Declaration_CER-30952_Rev3
- 4) MultiSourceDeclaration_8980_b1106
- 5) MultiSourceDeclaration_8980_b1163

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

CETECOM ICT Services GmbH
Untertürkheimer Str. 6 – 10
D-66117 Saarbrücken
Germany

The testing was performed from April 6-7 and 13-29, 2010.

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The sample EUT included:

SAMPLE	MODEL	CER NUMBER	PIN	Software
1	RCW41GW	CER-30952-001 Rev 1	3158CC6F	V5.0.0.582(Platform 6.1.0.5) Bundle 917
2	RCW41GW	CER-30952-001 Rev 1	3158DADE	V5.0.0.653(Platform 6.1.0.15) Bundle 1106
3	RCW41GW	CER-30952-001 Rev 2	316FA096	V5.0.0.653(Platform 6.1.0.15) Bundle 1106
4	RCW41GW	CER-30952-001 Rev 3	31765AA5	V5.0.0.677(Platform 6.1.0.16) Bundle 1163
5	RCW41GW	CER-30952-001 Rev 3	317658B9	V5.0.0.541(Platform 6.1.0.5) Bundle 917

RF Conducted Emission testing was performed on samples 1, 2, 3 and 4.
PCS 1900 band Radiated EIRP testing was performed on samples 5.

To view the differences between Rev1 and Rev2, see document number HW_Declaration_CER-30952_Rev2. To view the differences between Rev2 and Rev3, see document number HW_Declaration_CER-30952_Rev3.

To view the differences between Bundle 917 to Bundle 1106, see document number MultiSourceDeclaration_8980_b1106. To view the differences between Bundle 1106 and Bundle 1163, see document number MultiSourceDeclaration_8980_b1163.


Only the characteristics that may have been impacted by the changes from Rev1 to Rev3 were re-measured.

D) Support Equipment Used for the Testing of the EUT

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


E) Test Voltage

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

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F) Test Result 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	1
Part 2.1051 Part 24.238(a)	RSS-GEN, 4.9	GSM PCS Conducted Spurious Emissions	Pass	1
Part 2.202 Part 22.917	RSS-GEN, 4.6	GSM 850 Occupied Bandwidth and Channel Mask	Pass	1
Part 2.202 Part 24.238	RSS-GEN, 4.6	GSM PCS Occupied Bandwidth and Channel Mask	Pass	1
Part 2.1046(a)	RSS-133, 6.4 RSS-132, 4.4	GSM Conducted RF Output Power	Pass	2
Part 2.1055(a)(d) Part 22.917	RSS-132, 4.3	GSM 850 Frequency Stability vs. Temperature and Voltage	Pass	3
Part 2.1055(a)(d) Part 24.235	RSS-132, 4.3	GSM PCS Frequency Stability vs. Temperature and Voltage	Pass	3
Part 22, Subpart H,	RSS-GEN, 4.9	GSM 850 ERP	See Cetecom Test Report 1-2166-01-02/10A	-
Part 24, Subpart E	RSS-GEN, 4.9	GSM 1900 EIRP	Pass	4
Part 22, Subpart H Part 24, Subpart E	RSS-GEN, 4.9	GSM Radiated Spurious/Harmonic Emissions	See Cetecom Test Report 1-2166-01-02/10A	-

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G) Summary of Results

1) Conducted Emission Measurements

- a) The BlackBerry® smartphone met the requirements of the Conducted Spurious Emissions in the GSM850 band as per 47 CFR 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 1 for the test data.
- b) The BlackBerry® smartphone met the requirements of the Conducted Spurious Emissions in the PCS1900 band as per 47 CFR 2.1051, CFR 24.238 and RSS-GEN, 4.9. The EUT was measured on the low, middle and high channels. The frequency range investigated was from 10 MHz to 20 GHz.
See APPENDIX 1 for the test data.
- c) The BlackBerry® smartphone met the requirements of the Occupied Bandwidth in the GSM850 band 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 worse case occupied bandwidth was 240.0 kHz on all three channels.
See APPENDIX 1 for the test data.
- d) The BlackBerry® smartphone met the requirements of the Occupied Bandwidth and channel mask requirements in the PCS1900 band 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 241.7 kHz on the middle channel.
See APPENDIX 1 for the test data.
- e) The BlackBerry® smartphone met the requirements of the Conducted RF Output Power for both the GSM850 and PCS1900 bands as per 47 CFR 2.1046(a), RSS-133, 6.4 and RSS-132, 4.4. The EUT was measured in GSM and EDGE mode on the low, middle and high channels. The worst case conducted output power in the GSM850 band was 32.6 dBm (1.82W) on both the middle and high channel. The worst case conducted output power in the PCS1900 band was 28.4 dBm (0.69W) on the low channel.
See APPENDIX 2 for the test data.
- f) The BlackBerry® smartphone met the requirements of the Frequency Stability vs. Temperature and Voltage requirements for GSM850 band as per 47 CFR 2.1055(a)(d), CFR 22.917 and RSS-132, 4.3. The maximum frequency error measured was less than 0.1 ppm. The temperature range was from -30°C to +60°C in 10° temperature steps. The BlackBerry® smartphone was measured on low, middle and high channels at each temperature step. The BlackBerry® smartphone was measured at low (3.6 volts), nominal (3.7 volts) and high (4.2 volts) dc input voltage at each temperature step and channel at maximum output power.
See APPENDIX 3 for the test data.
- g) The BlackBerry® smartphone met the requirements of the Frequency Stability vs. Temperature and Voltage requirements for the PCS1900 band as per 47 CFR 2.1055(a)(d), CFR 24.235 and RSS-GEN, 4.7. The maximum frequency error measured was less than 0.1

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ppm. The temperature range was from -30°C to +60°C in 10 degree temperature steps. The BlackBerry® smartphone was measured on low, middle and high channels at each temperature step. The BlackBerry® smartphone was measured at low (3.6 volts), nominal (3.7 volts) and high (4.2 volts) dc input voltage at each temperature step and channel at maximum output power.

See APPENDIX 3 for the test data.

2) Radiated Emission Measurements

The radiated EIRP was measured for 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 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 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 fully-anechoic room (FAR). 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 EIRP in the PCS band, GSM mode was measured on BlackBerry® smartphone. The highest EIRP measured was 32.83 dBm (1.92 W) at 1880.00 MHz (channel 661).

The EIRP in the PCS band, EDGE mode was measured on BlackBerry® smartphone. The highest EIRP measured was 31.75 dBm (1.50 W) at 1850.20 MHz (channel 512).


Sample Calculation:

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

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


To view the test data see APPENDIX 4.

Measurement Uncertainty ±4.6 dB

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H) Compliance Test Equipment

<u>UNIT</u>	<u>MANUFACTURER</u>	<u>MODEL</u>	<u>SERIAL NUMBER</u>	<u>CAL DUE DATE (YY MM DD)</u>	<u>USE</u>
Preamplifier	Sonoma	310N/11909A	185831	10-11-14	Radiated Emissions
Preamplifier system	TDK RF Solutions	PA-02	080010	10-11-06	Radiated Emissions
Preamplifier	Rohde & Schwarz	TS-ANA4-SP	001	11-02-17	Radiated Emissions
Preamplifier	Rohde & Schwarz	TS-ANA-SP	001	11-02-19	Radiated Emissions
Hybrid Log Antenna	EMC Automation	HLP-3003C	017301	11-02-02	Radiated Emissions
Hybrid Log Antenna	EMC Automation	HLP-3003C	017401	10-09-26	Radiated Emissions
Horn Antenna	EMC Automation	HRN-0118	030101	10-07-22	Radiated Emissions
Horn Antenna	EMC Automation	HRN-0118	030201	11-03-12	Radiated Emissions
Horn Antenna	Emco	3117	47563	11-07-15	Radiated Emissions
Horn Antenna	CMT	LHA 0180	R52734-001	12-01-21	Radiated Emissions
Preamplifier	TDK RF Solutions	18-26	030002	10-11-06	Radiated Emissions
Dipole Antenna	Schwarzbeck	UHAP	1018	11-03-12	Radiated Emissions
Dipole Antenna	Schwarzbeck	UHAP	974	10-10-16	Radiated Emissions
Universal Radio Communication Tester	Rohde & Schwarz	CMU 200	837493/073	10-11-30	Radiated Emissions
Universal Radio Communication Tester	Rohde & Schwarz	CMU 200	112394	10-11-30	Radiated Emissions
Universal Radio Communication Tester	Rohde & Schwarz	CMU 200	102204	10-11-25	RF Conducted Emissions
EMI Receiver	Rohde & Schwarz	ESIB-40	100255	10-11-30	Radiated Emissions
EMI Receiver	Rohde & Schwarz	ESU-40	100162	10-11-29	Radiated Emissions
Spectrum Analyzer	HP	8563E	3745A08112	11-09-30	RF Conducted Emissions
DC Power Supply	HP	6632B	US37472178	10-06-23	RF Conducted Emissions
Environment Monitor	Control Company	1870	230355190	11-01-08	Radiated Emissions
Environment Monitor	Control Company	1870	230355189	11-01-08	RF Conducted Emissions


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Compliance Test Equipment cont'd

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

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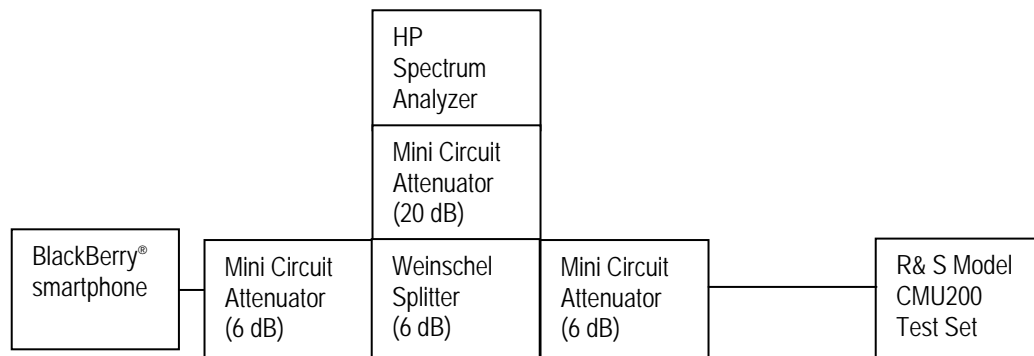
APPENDIX 1 – GSM CONDUCTED EMISSIONS TEST DATA/PLOTS

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GSM Conducted RF Emission Test Data

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

Test Setup Diagram




Date of Test: April 06, 2010

The environmental test conditions were:

Temperature:	26 °C
Pressure:	1011 mb
Relative Humidity:	22 %

The following measurements were performed by Maurice Battler.

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GSM Conducted RF Emission Test Data cont'd

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

–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 263.0 kHz, and for the PCS1900 band was measured to be 272.0 kHz as shown below. This results in a 3.0 kHz resolution bandwidth.

On any frequency outside the frequency block and outside the adjacent 1 MHz bands, a resolution bandwidth of at least 1 MHz was employed.

Test Data for GSM850 band and PCS 1900 band selected Frequencies in GSM mode..

GSM 850 Band Frequency (MHz)	-26dBc Bandwidth (kHz)	99% Occupied Bandwidth (kHz)
824.2	263.0	240.0
837.6	263.0	240.0
848.8	262.0	240.0

PCS 1900 Band Frequency (MHz)	-26dBc Bandwidth (kHz)	99% Occupied Bandwidth (kHz)
1850.2	272.0	238.3
1880.0	267.0	241.7
1909.8	265.0	238.3


Measurement Plots for GSM850 band and PCS 1900 band in GSM mode

Refer to the following measurement plots for more detail.

See Figures 1-13 to 1-24 for the plots of the –26dBc Bandwidth and 99% Occupied Bandwidth.

See Figures 1-25 to 1-28 for plots of the channel mask results.

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

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GSM Conducted RF Emission Test Data cont'd

Test Data for GSM850 band and PCS1900 band selected Frequencies in EDGE mode..

GSM 850 Band Frequency (MHz)	99% Occupied Bandwidth (kHz)
824.2	238.3
837.6	236.7
848.8	240.0

PCS 1900 Band Frequency (MHz)	99% Occupied Bandwidth (kHz)
1850.2	240.0
1880.0	238.3
1909.8	240.0


Measurement Plots for GSM850 band and PCS 1900 band in GSM mode

Refer to the following measurement plots for more detail.

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

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

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

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GSM Conducted RF Emission Test Data cont'd

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

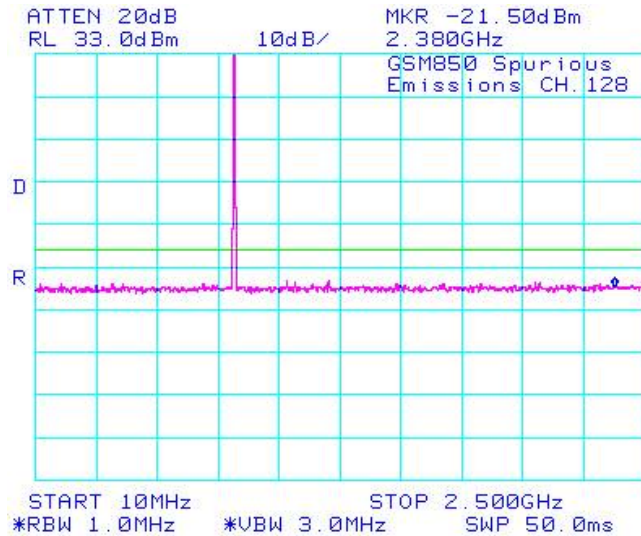


Figure 1-2: GSM850 band, Spurious Conducted Emissions, Low channel

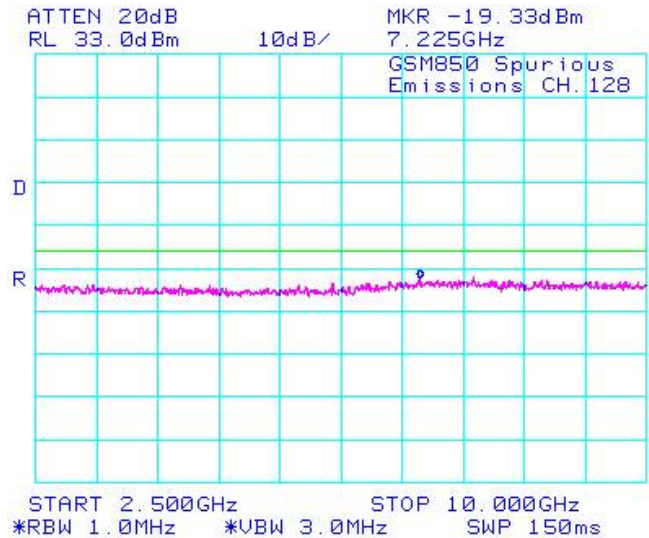


Figure 1-3: GSM850 band, Spurious Conducted Emissions, Middle channel

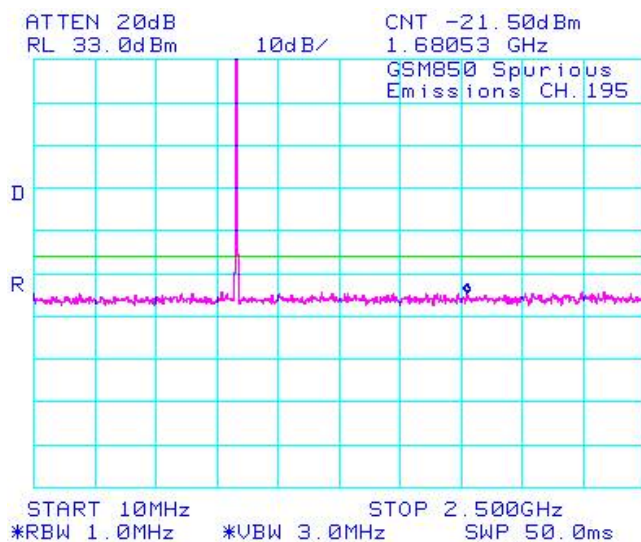
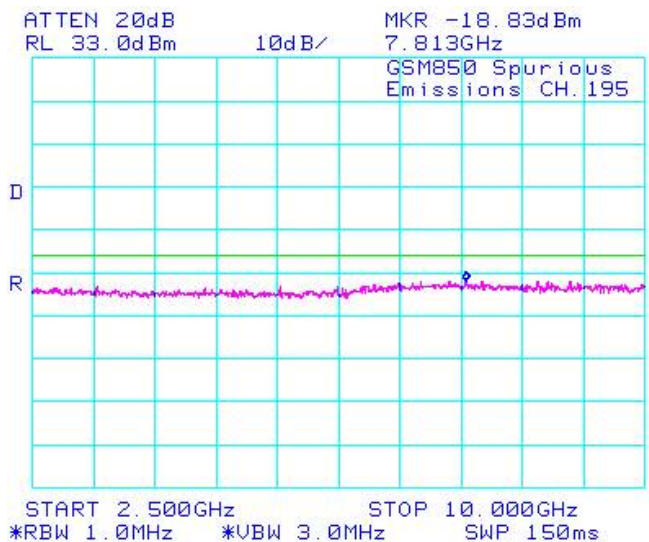



Figure 1-4: GSM850 band, Spurious Conducted Emissions, Middle channel



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GSM Conducted RF Emission Test Data cont'd

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

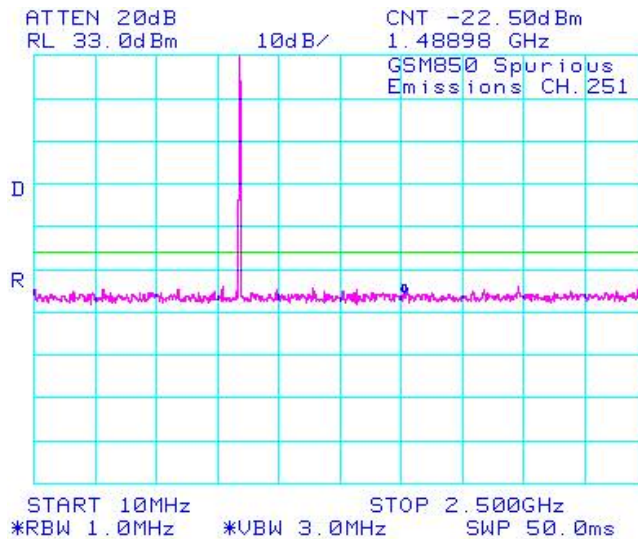


Figure 1-6: GSM850 band, Spurious Conducted Emissions, High Channel

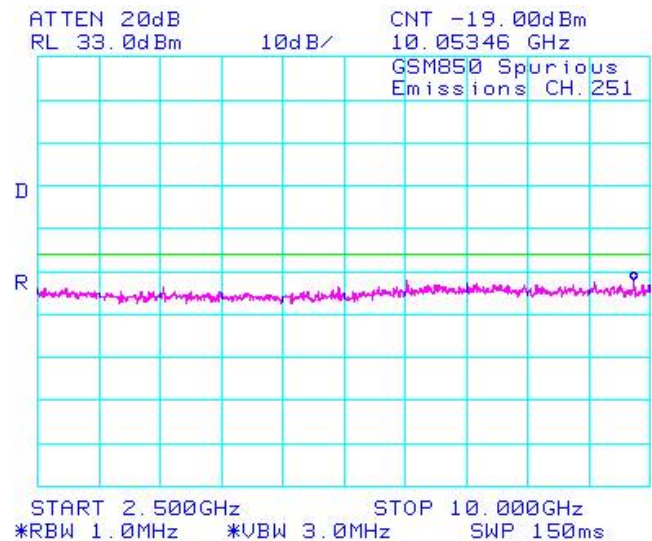


Figure 1-7: PCS1900 band, Spurious Conducted Emissions, Low channel

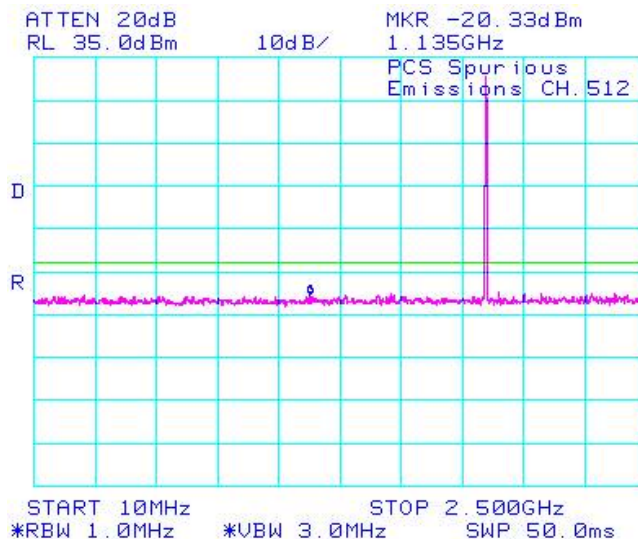
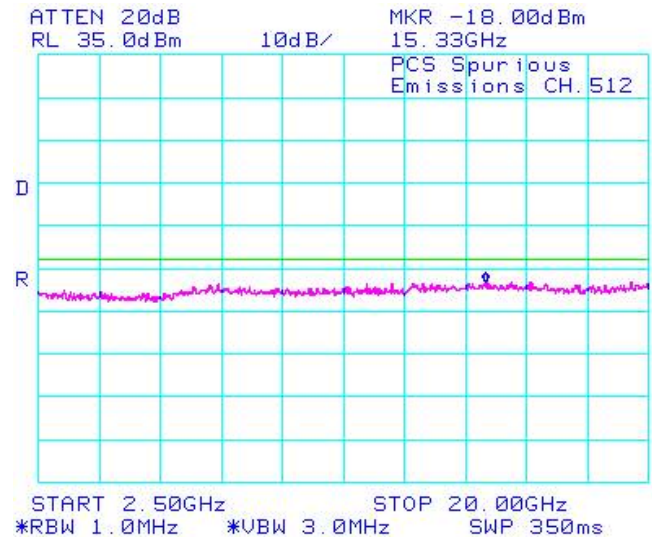



Figure 1-8: PCS1900 band, Spurious Conducted Emissions, Low channel



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GSM Conducted RF Emission Test Data cont'd

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

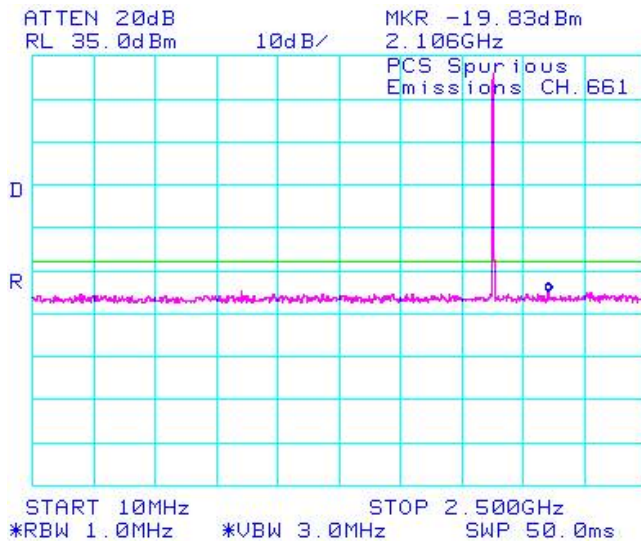


Figure 1-10: PCS1900 band, Spurious Conducted Emissions, Middle channel

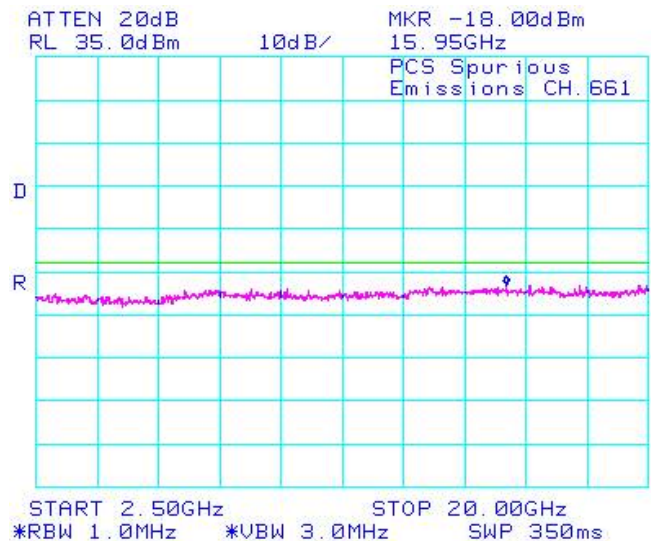


Figure 1-11: PCS1900 band, Spurious Conducted Emissions, High channel

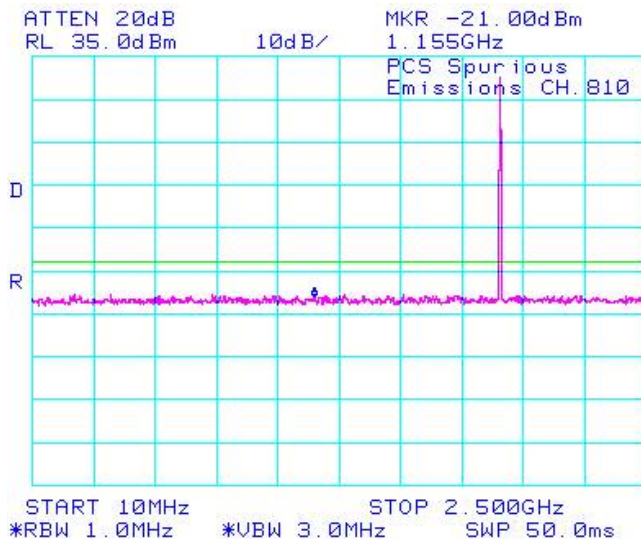
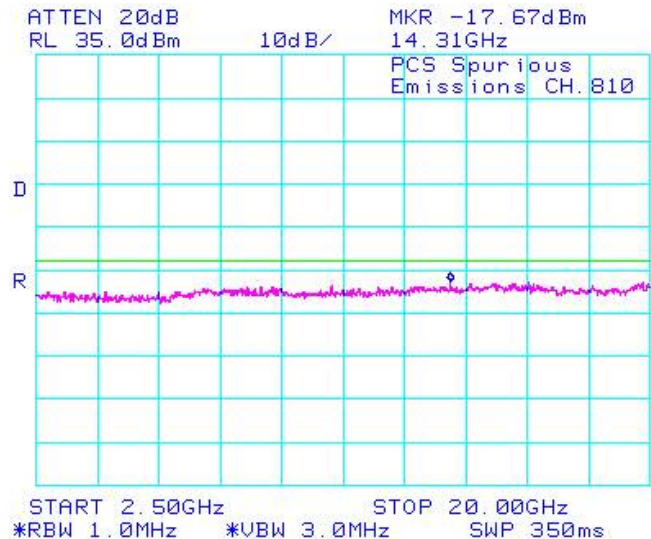



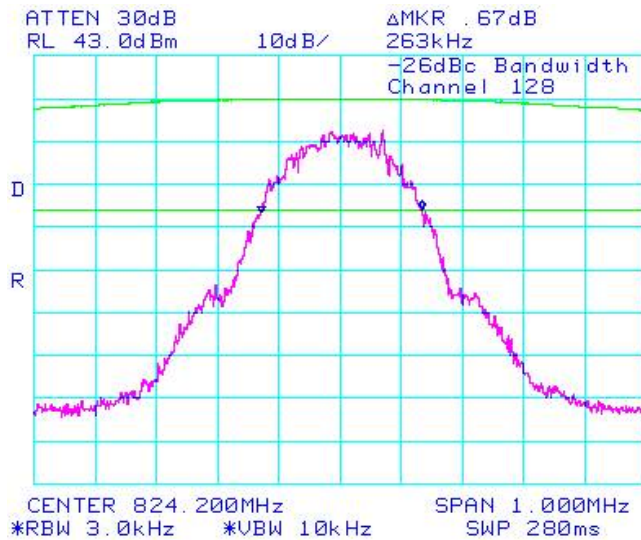
Figure 1-12: PCS1900 band, Spurious Conducted Emissions, High channel



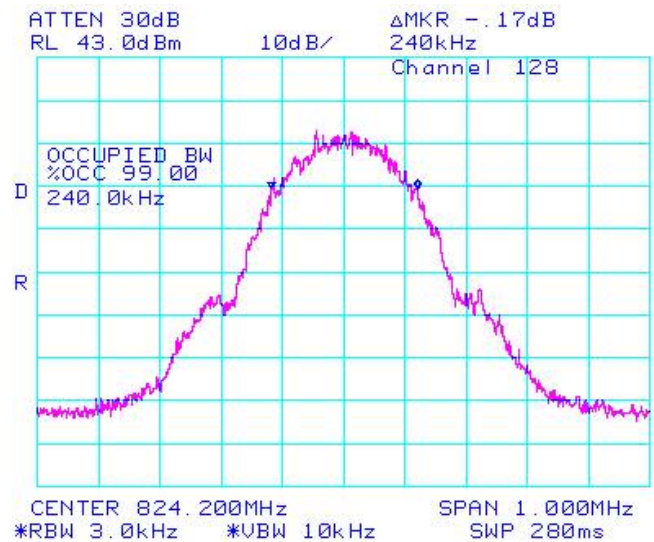
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GSM Conducted RF Emission Test Data cont'd

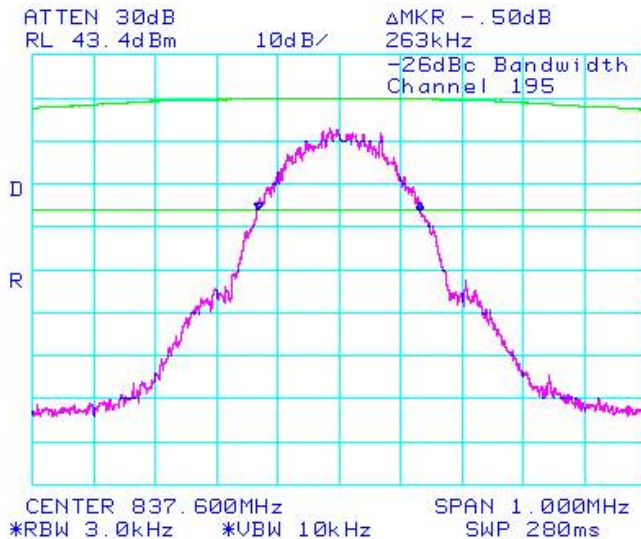
**Figure 1-13: -26dBc bandwidth,GSM850 band
Low Channel in GSM mode**



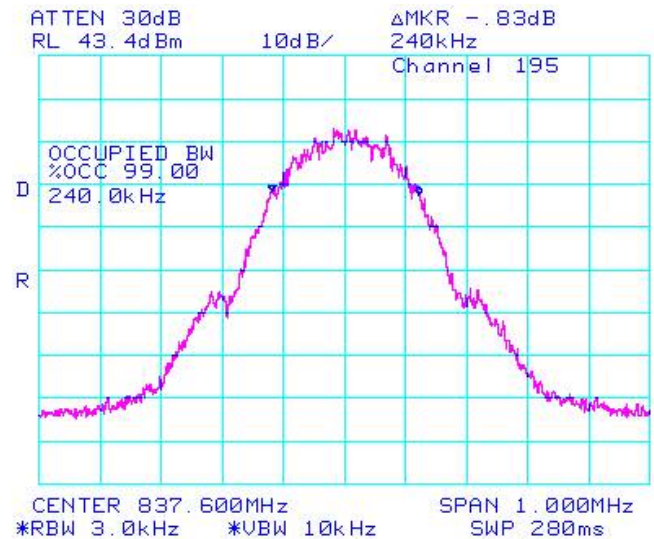
**Figure 1-14: Occupied bandwidth,GSM850 band
Low Channel in GSM mode**




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



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



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GSM Conducted RF Emission Test Data cont'd

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

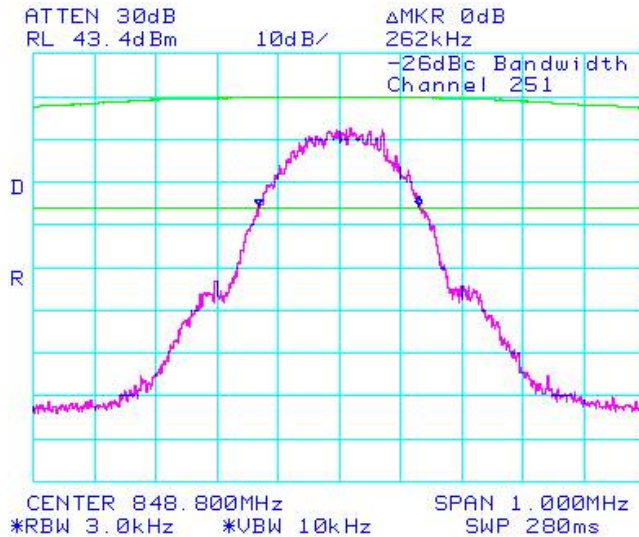


Figure 1-18: Occupied bandwidth,GSM850 band High Channel in GSM mode

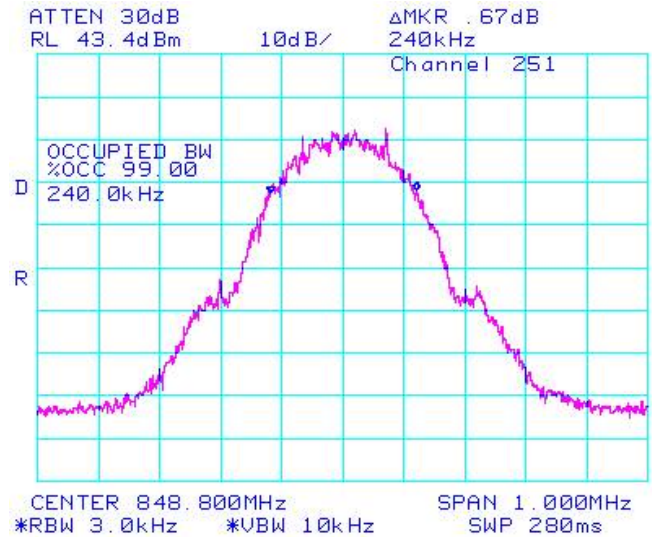


Figure 1-19: -26dBc bandwidth,PCS1900 band Low Channel in GSM mode

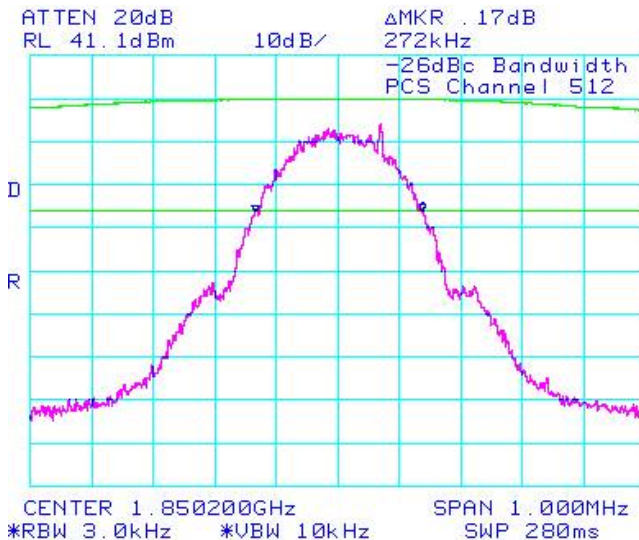
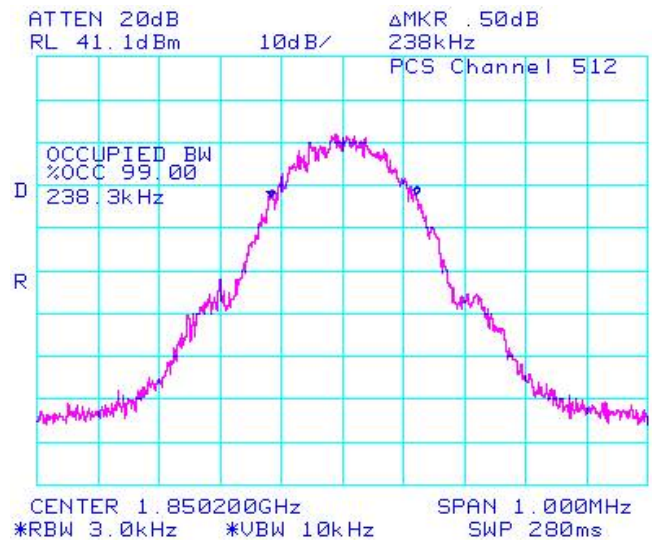



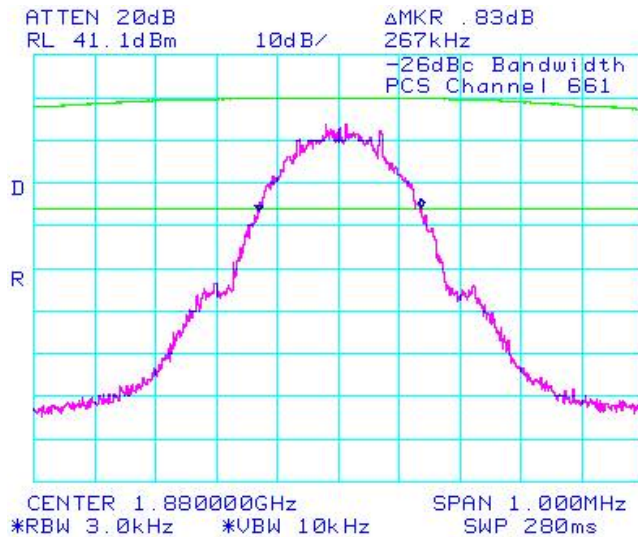
Figure 1-20: -26dBc bandwidth,PCS1900 band Low Channel in GSM mode



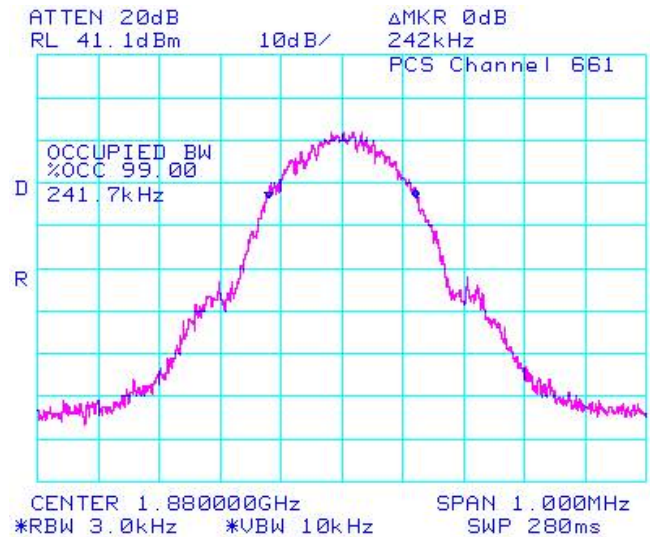
	EMI Test Report for the BlackBerry® smartphone Model RCW41GW APPENDIX 1	
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GSM Conducted RF Emission Test Data cont'd

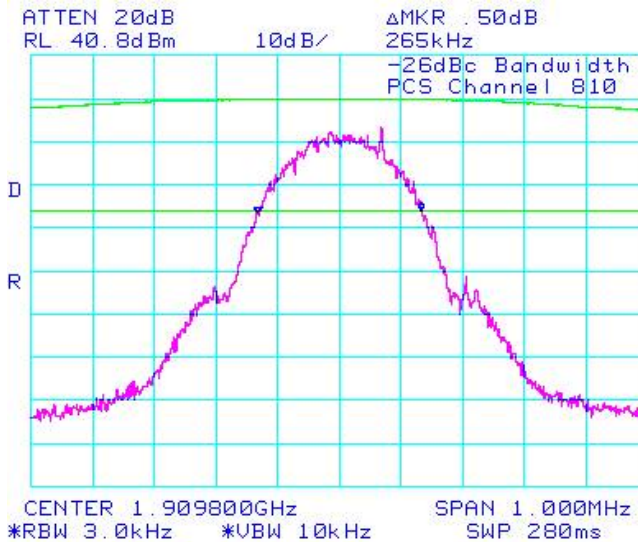
**Figure 1-21: -26dBc bandwidth,PCS1900 band
Middle Channel in GSM mode**



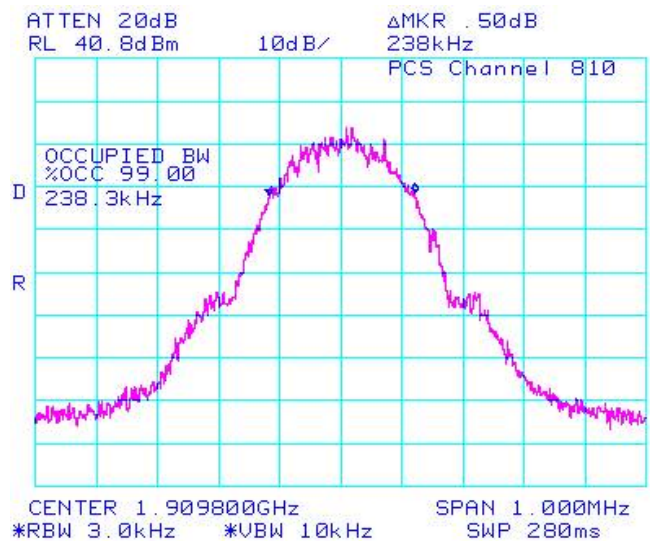
**Figure 1-22: -26dBc bandwidth,PCS1900 band
Middle Channel in GSM mode**




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



**Figure 1-24: -26dBc bandwidth,PCS1900 band
High Channel in GSM mode**



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GSM Conducted RF Emission Test Data cont'd

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

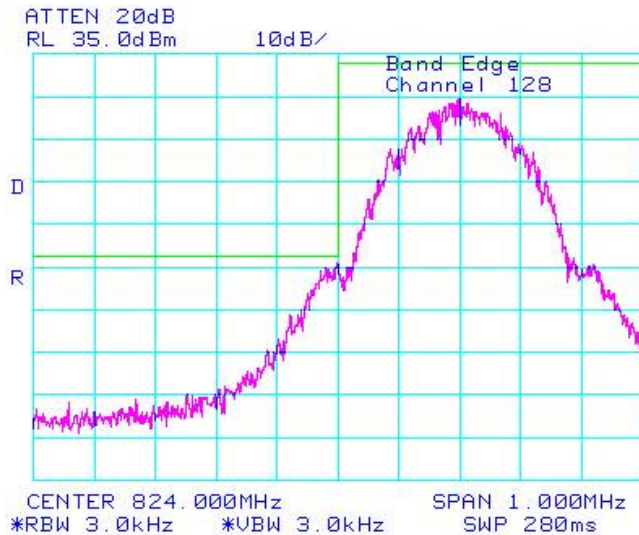


Figure 1-26: GSM850 band, High Channel Mask in GSM mode

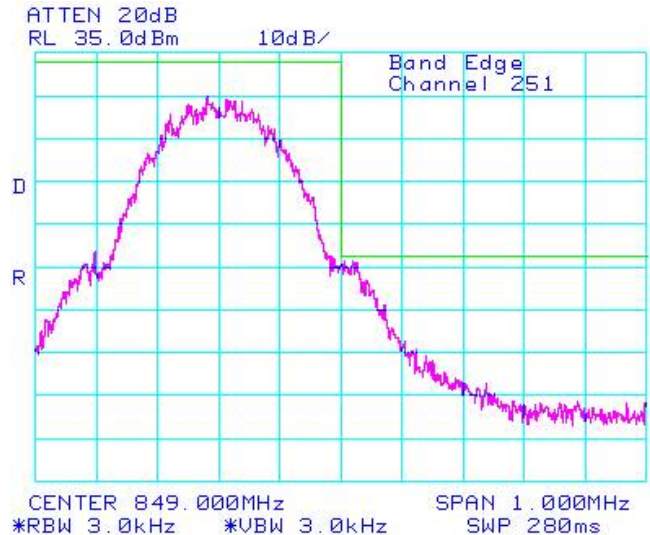


Figure 1-27: PCS1900 band, Low Channel Mask in GSM mode

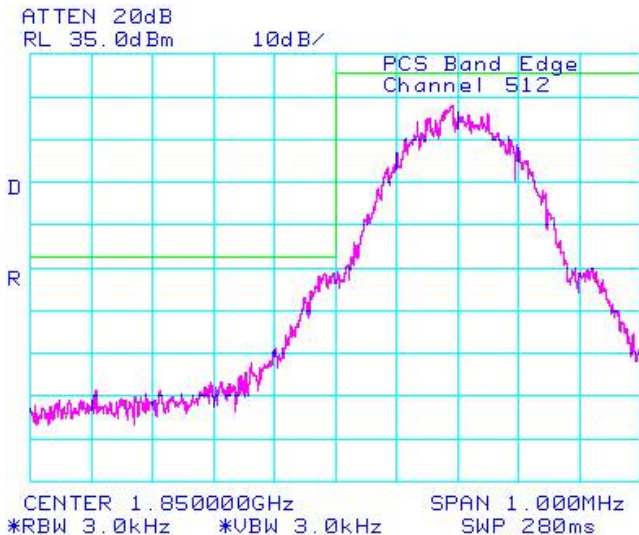
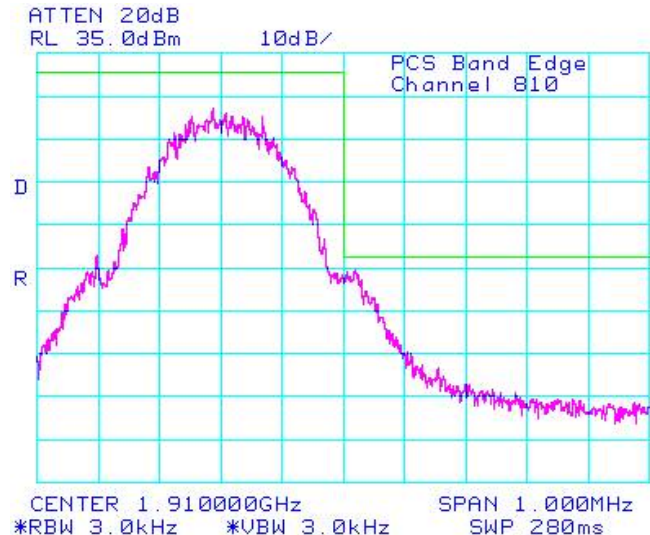



Figure 1-28: PCS1900 band, High Channel Mask in GSM mode



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GSM Conducted RF Emission Test Data cont'd

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

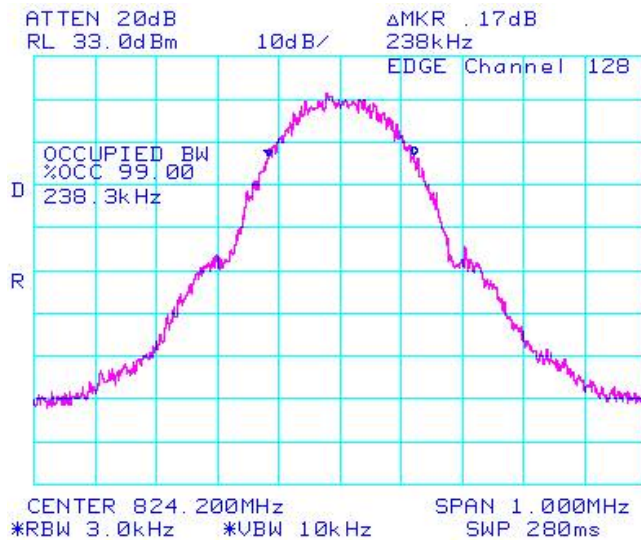


Figure 1-30: Occupied Bandwidth, GSM850 band, Middle Channel in EDGE mode

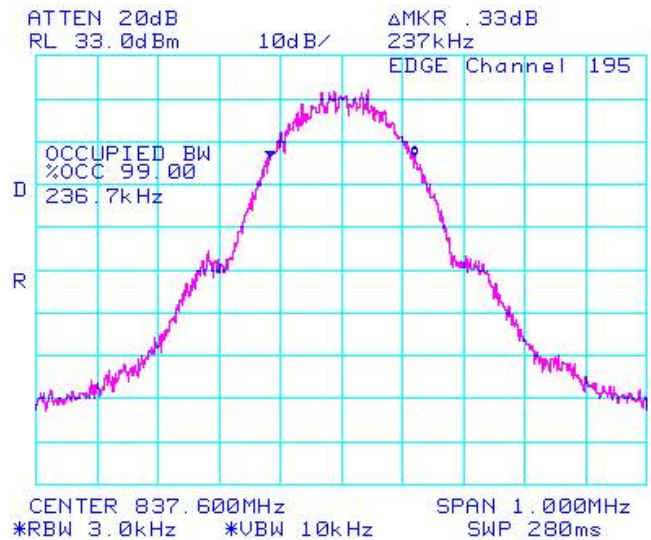


Figure 1-31: Occupied Bandwidth, GSM850 band, High Channel in EDGE mode

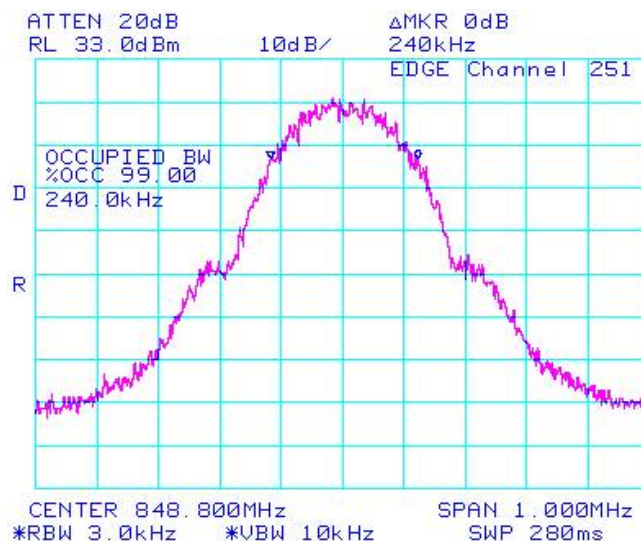
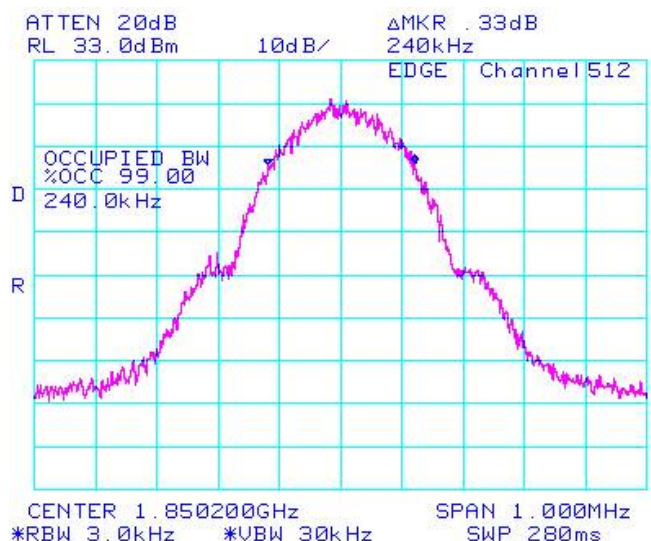



Figure 1-32: Occupied Bandwidth, PCS1900 band, Low Channel in EDGE mode



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GSM Conducted RF Emission Test Data cont'd

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

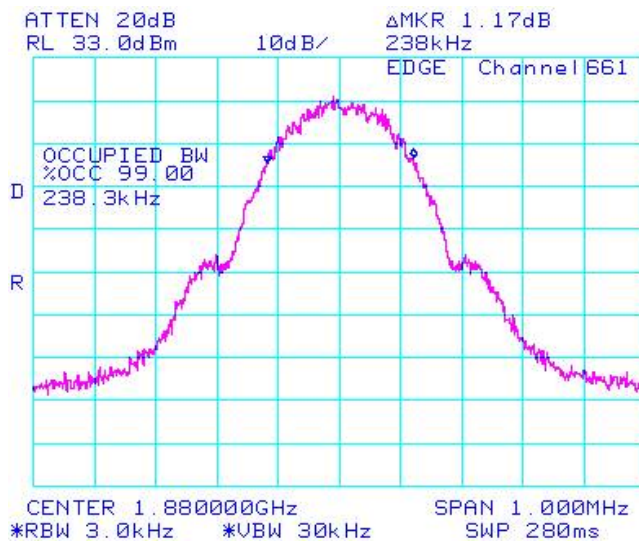


Figure 1-34: Occupied Bandwidth, PCS1900 band, High Channel in EDGE mode

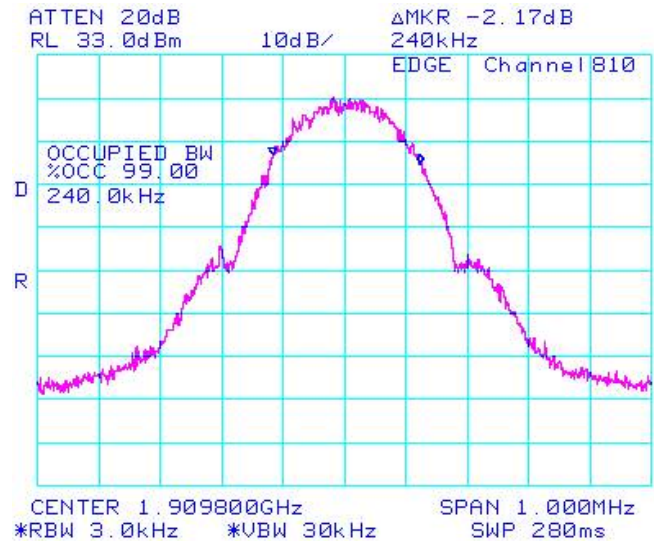


Figure 1-35: GSM850 Band, Low Channel Mask in EDGE mode

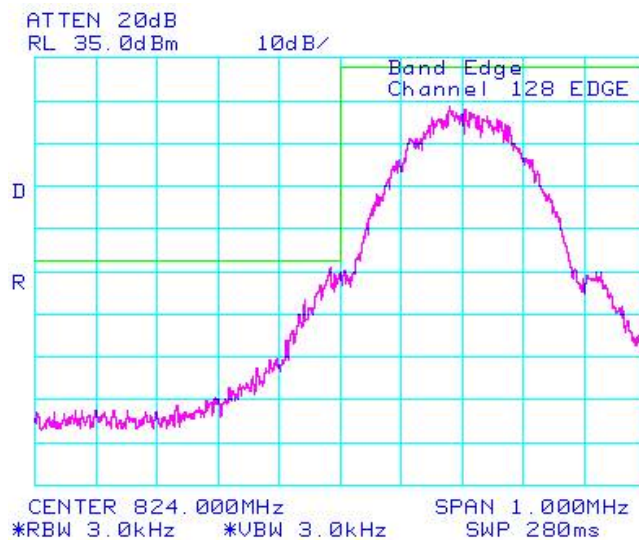
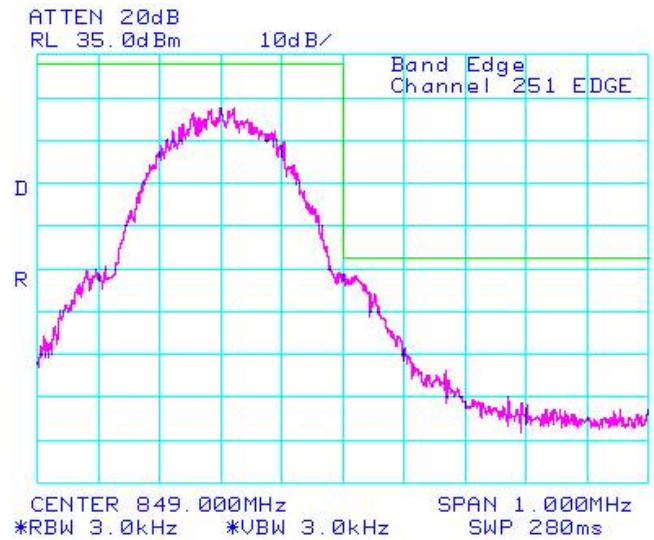



Figure 1-36: GSM850 Band, High Channel Mask in EDGE mode



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GSM Conducted RF Emission Test Data cont'd

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

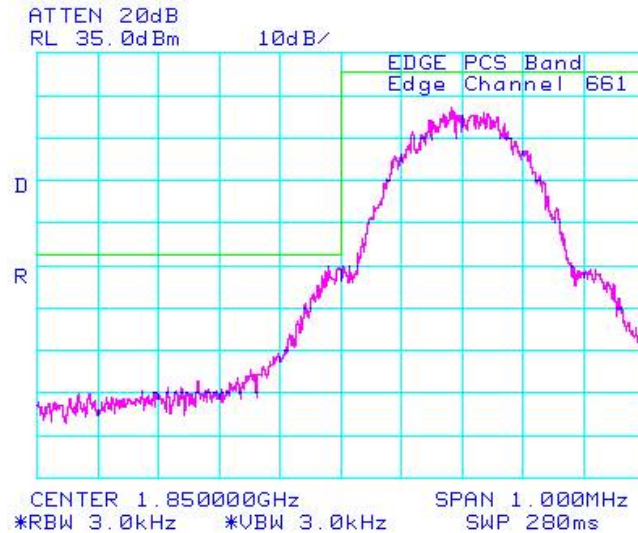
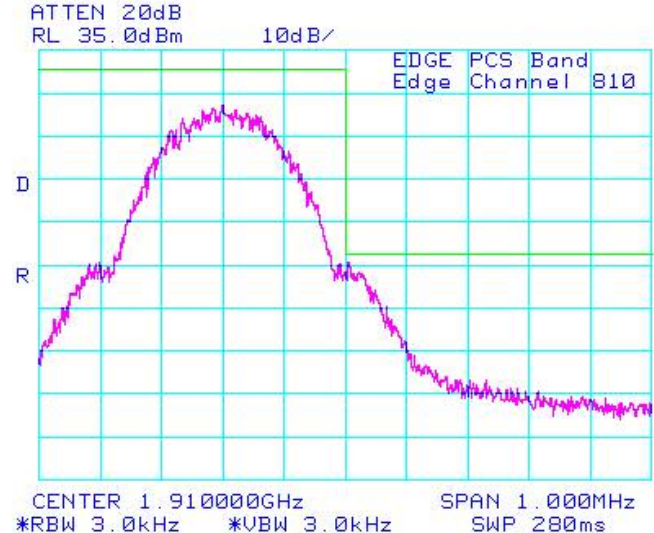




Figure 1-38: PCS1900 Band, High Channel Mask in EDGE mode



	EMI Test Report for the BlackBerry® smartphone Model RCW41GW APPENDIX 2	
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APPENDIX 2 – GSM CONDUCTED RF OUTPUT POWER TEST DATA

	EMI Test Report for the BlackBerry® smartphone Model RCW41GW APPENDIX 2	
Test Report No. RTS-2341-1004-03	Dates of Test April 6-7 and 13-29, 2010	FCC ID: L6ARCW40GW IC: 2503A-RCW40GW

GSM Conducted RF Output Power Test Data

The following measurements were performed by Daoud Attayi.


The conducted RF output power was measured on the BlackBerry® smartphone using the Communication Tester, Rohde & Schwarz, model CMU 200. The low, middle and high channels were measured at maximum radio output power. The insertion loss of the coaxial cable from the CMU 200 to the BlackBerry® smartphone was compensated for in the measurements.

Peak nominal output power is 32.5 dBm \pm 0.5 dB for GSM850 and 28.0 dBm \pm 0.5 dB for PCS1900. Peak nominal output power is 30.0 dBm \pm 0.5 dB for GSM850 EDGE Mode (2-timeslot uplink) and 26.5 dBm \pm 0.5 dB for PCS1900 EDGE Mode (2-timeslot uplink).


Date of Test: April 13-29, 2010

The environmental tests conditions were: Temperature: 22 - 24 °C
Pressure: 1002 - 1013 mb
Relative Humidity: 22 - 24 %

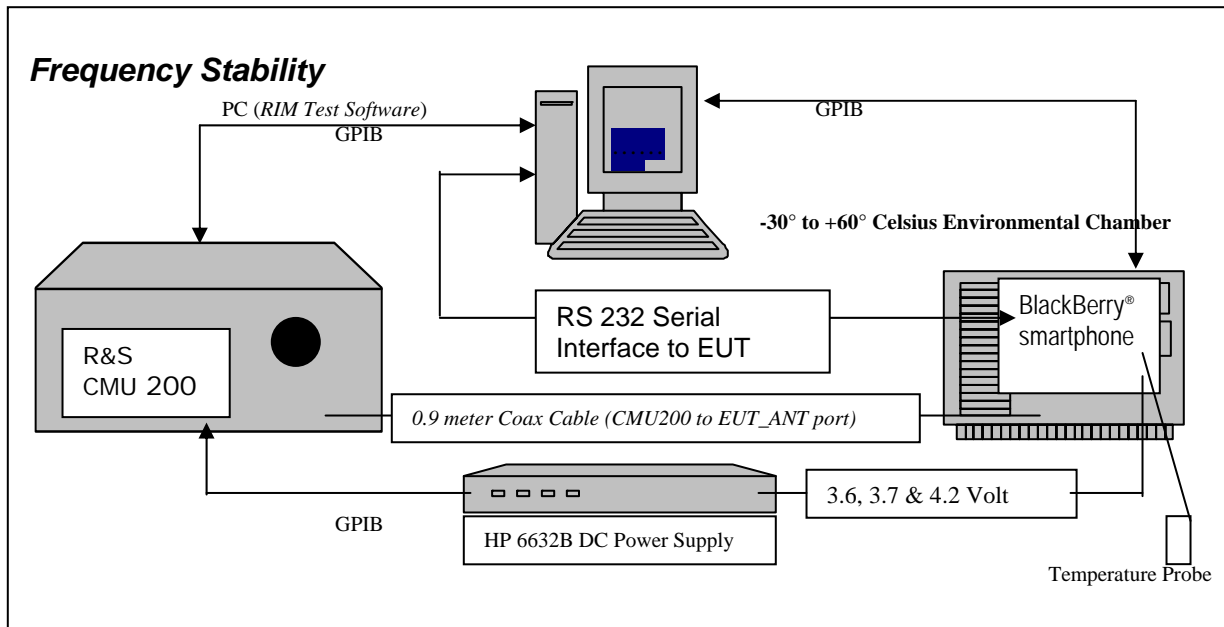
Channel	Frequency (MHz)	Maximum Output Power (dBm)	Maximum Output Power (Watts)	Channel	Frequency (MHz)	Maximum Output Power (dBm)	Maximum Output Power (Watts)
<u>GSM850</u>				<u>GSM850 EDGE/GPRS/GSM (2-timeslot)</u>			
128	824.20	32.4	1.74	128	824.20	29.8	0.96
189	837.60	32.6	1.82	189	837.60	29.9	0.98
251	848.80	32.6	1.82	251	848.80	30.0	1.00
<u>PCS</u>				<u>PCS EDGE/GPRS/GSM (2-timeslot)</u>			
512	1850.2	28.4	0.69	512	1850.2	26.6	0.46
661	1880.0	28.2	0.66	661	1880.0	26.6	0.46
810	1909.8	28.2	0.66	810	1909.8	26.6	0.46

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APPENDIX 3 – GSM FREQUENCY STABILITY TEST DATA

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GSM Frequency Stability Test Data



The following measurements were performed by Maurice Battler.

CFR 47 Chapter 1 - Federal Communications Commission Rules

Part 2 Required Measurements

2.1055 Frequency Stability - Procedures

(a,b) Frequency Stability - Temperature Variation

(d) Frequency Stability - Voltage Variation


24.235 *Frequency Stability.*

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

The EUT meets the requirements as stated in CFR 47 chapter 1, Section 24.235, CFR 47 chapter 1, Section 22.917 and RSS-132, 4.3 Frequency Stability.

Frequency Stability measurement devices were configured as presented in the block diagram recording frequency, power, data, temperatures, and stepped voltages controlled via a GPIB interface linked to the Environmental chamber, a DC power supply, and the Communications Test Set. A 0.9-metre coax cable was calibrated to characterize the insertion loss for the transmitted frequencies between the RF input/output of the CMU 200 and the EUT antenna port.

Calibration for the Cable Loss was performed in the RF Laboratory using the Agilent power meter and Agilent Signal Generator.

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The cable assembly from the RF input to the RF output was measured at the following Frequencies:

PCS1900 Frequency (MHz)	Cable loss (dB)	GSM850 Frequency (MHz)	Cable loss (dB)
1850.2	1.20	824.2	0.90
1880.0	1.20	836.4	0.90
1909.8	1.20	848.6	0.90

Procedure:


The EUT was placed in the Temperature chamber and connected to CMU 200 outside as shown in the figure above. Dry air was pumped inside the temperature chamber to maintain a backpressure during the test. The EUT was kept in the off condition at all times except when the following measurements were to be made.

The chamber was switched on and the temperature was set to -30°C.
After the chamber stabilized at -30 °C there was a soak period of one hour to alleviate moisture in the chamber, the EUT voltage was enabled.
The system software recorded the frequency, power, and associated measurements.

A Computer system controlled the automated software. This application was given the command of activating all machines intrinsic to the temperature and voltage tests controlling the CMU 200 via the GPIB Bus. The Environmental Chamber was instructed through an RS-232 serial line. The EUT dialogue was passed through a serial connection.

The EUT repetitively transmitted 100 bursts for each set of programmed parameters recording temperature, voltage settings, and systematically selected frequencies. The power supply was cycled from minimum voltage 3.6 volts, to 3.7 volts to 4.2 volts maximum voltage. The frequency error was measured at a maximum output power and recorded by the automated system test software.

The EUT output power and frequency was measured at 3.6 volts, 3.7 volts and 4.2 volts. The transmit frequency was varied in 3 steps consisting of 824.2, 836.4, and 848.6 MHz for the GSM850 band, 1850.2, 1880.0 and 1909.8 MHz for the PCS1900 band. This frequency was recorded in MHz and deviation from nominal, in Parts Per Million.
After the initial one-hour soak at the beginning of the tests, a period of thirty minutes soak was initialized between each ascending temperature step, before proceeding to the next measurement test cycle.

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PROCEDURE:

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

1. Switch on the HP 6632B power supply; CMU 200 Communications test Set, and Environmental Chamber.
2. Start test program
3. Set the Temperature to –30°C and maintain a period of one- hour soak time, with the EUT supply voltage disabled.
4. Set power supply voltage to 3.6 volts.
5. Set up CMU 200 Radio Communication Tester.
6. Command the CMU 200 to switch to the low channel.
7. Enable the voltage to the EUT, and connect a link to the CMU 200 test set.
8. EUT is commanded to Transmit 100 Bursts.
9. Software logs the following data from the CMU 200, power supply and temperature chamber: Traffic Channel Number, Traffic Channel Frequency, Power Level, Chamber Temperature, Supply Voltage, Power and Frequency Error.
10. The CMU 200 commands the EUT to change frequency to the middle channel and high channel and repeats steps 7 to 9.
11. Repeat steps 5 to 10 changing the supply voltage to 3.7 Volts
12. Increase temperature by 10°C and soak for 1/2 hour.
13. Repeat steps 4 - 12 for temperatures –30°C to 60°C.
14. Repeat steps 5 to 10 changing the supply voltage to 4.2 volts

Procedure 5 to 10 was repeated at room temperature (20°C) with the power supply voltage set to 3.6, 3.7 and 4.2 volts.

The maximum frequency error in the GSM850 band measured was **-0.0619 PPM**.
The maximum frequency error in the PCS1900 band measured was **0.0371 PPM**.

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

The BlackBerry® smartphone was tested on April 06, 2010.

Traffic Channel Number	GSM850 Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
128	824.2	3.6	20	-48.24	-0.0585
189	836.4	3.6	20	-16.08	-0.0192
250	848.6	3.6	20	-24.60	-0.0290

Traffic Channel Number	GSM850 Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
128	824.2	3.7	20	-26.86	-0.0326
189	836.4	3.7	20	-21.11	-0.0252
250	848.6	3.7	20	-23.12	-0.0272

Traffic Channel Number	GSM850 Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
128	824.2	4.2	20	-8.39	-0.0102
189	836.4	4.2	20	6.97	0.0083
250	848.6	4.2	20	7.23	0.0085


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GSM850 Results: channel 128 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
128	824.2	3.6	-30	-7.68	-0.0093
128	824.2	3.6	-20	-9.36	-0.0114
128	824.2	3.6	-10	-3.81	-0.0046
128	824.2	3.6	0	-35.39	-0.0429
128	824.2	3.6	10	-17.18	-0.0208
128	824.2	3.6	20	-48.24	-0.0585
128	824.2	3.6	30	-36.16	-0.0439
128	824.2	3.6	40	-18.60	-0.0226
128	824.2	3.6	50	-10.91	-0.0130
128	824.2	3.6	60	-32.54	-0.0395

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
128	824.2	3.7	-30	28.09	0.0341
128	824.2	3.7	-20	17.24	0.0209
128	824.2	3.7	-10	9.75	0.0118
128	824.2	3.7	0	-9.10	-0.0110
128	824.2	3.7	10	-51.01	-0.0619
128	824.2	3.7	20	-26.86	-0.0326
128	824.2	3.7	30	5.68	0.0069
128	824.2	3.7	40	-33.00	-0.0400
128	824.2	3.7	50	-16.98	-0.0206
128	824.2	3.7	60	-18.08	-0.0219

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
128	824.2	4.2	-30	-6.59	-0.0080
128	824.2	4.2	-20	-14.53	-0.0176
128	824.2	4.2	-10	-20.47	-0.0248
128	824.2	4.2	0	10.98	0.0133
128	824.2	4.2	10	-21.50	-0.0261
128	824.2	4.2	20	-8.39	-0.0102
128	824.2	4.2	30	19.44	0.0236
128	824.2	4.2	40	-26.54	-0.0322
128	824.2	4.2	50	-12.27	-0.0149
128	824.2	4.2	60	7.23	0.0088


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GSM850 Results: channel 189 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
189	836.4	3.6	-30	49.01	0.0586
189	836.4	3.6	-20	10.78	0.0129
189	836.4	3.6	-10	6.26	0.0075
189	836.4	3.6	0	-46.30	-0.0554
189	836.4	3.6	10	-37.90	-0.0453
189	836.4	3.6	20	-16.08	-0.0192
189	836.4	3.6	30	-47.52	-0.0568
189	836.4	3.6	40	-28.35	-0.0339
189	836.4	3.6	50	-10.91	-0.0130
189	836.4	3.6	60	-5.04	-0.0060

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
189	836.4	3.7	-30	27.77	0.0332
189	836.4	3.7	-20	18.79	0.0225
189	836.4	3.7	-10	14.33	0.0171
189	836.4	3.7	0	-7.88	-0.0094
189	836.4	3.7	10	-48.30	-0.0577
189	836.4	3.7	20	-21.11	-0.0252
189	836.4	3.7	30	7.55	0.0090
189	836.4	3.7	40	-30.87	-0.0369
189	836.4	3.7	50	-13.88	-0.0166
189	836.4	3.7	60	-12.33	-0.0147

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
189	836.4	4.2	-30	-21.31	-0.0255
189	836.4	4.2	-20	-17.69	-0.0212
189	836.4	4.2	-10	-20.79	-0.0249
189	836.4	4.2	0	16.21	0.0194
189	836.4	4.2	10	-13.17	-0.0157
189	836.4	4.2	20	6.97	0.0083
189	836.4	4.2	30	22.47	0.0269
189	836.4	4.2	40	-23.57	-0.0282
189	836.4	4.2	50	-6.97	-0.0083
189	836.4	4.2	60	17.89	0.0214


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GSM850 Results: channel 250 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
250	848.6	3.6	-30	20.28	0.0239
250	848.6	3.6	-20	18.08	0.0213
250	848.6	3.6	-10	9.94	0.0117
250	848.6	3.6	0	-49.01	-0.0578
250	848.6	3.6	10	-47.20	-0.0556
250	848.6	3.6	20	-24.60	-0.0290
250	848.6	3.6	30	8.01	0.0094
250	848.6	3.6	40	-30.28	-0.0357
250	848.6	3.6	50	-13.95	-0.0164
250	848.6	3.6	60	-10.78	-0.0127

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
250	848.6	3.7	-30	33.58	0.0396
250	848.6	3.7	-20	20.86	0.0246
250	848.6	3.7	-10	12.14	0.0143
250	848.6	3.7	0	-8.39	-0.0099
250	848.6	3.7	10	-49.33	-0.0581
250	848.6	3.7	20	-23.12	-0.0272
250	848.6	3.7	30	7.88	0.0093
250	848.6	3.7	40	-30.22	-0.0356
250	848.6	3.7	50	-13.82	-0.0163
250	848.6	3.7	60	-10.78	-0.0127

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
250	848.6	4.2	-30	-23.70	-0.0279
250	848.6	4.2	-20	-18.85	-0.0222
250	848.6	4.2	-10	-21.63	-0.0255
250	848.6	4.2	0	17.89	0.0211
250	848.6	4.2	10	-10.59	-0.0125
250	848.6	4.2	20	7.23	0.0085
250	848.6	4.2	30	23.63	0.0278
250	848.6	4.2	40	-22.34	-0.0263
250	848.6	4.2	50	-7.10	-0.0084
250	848.6	4.2	60	17.24	0.0203

	EMI Test Report for the BlackBerry® smartphone Model RCW41GW APPENDIX 3	
Test Report No. RTS-2341-1004-03	Dates of Test April 6-7 and 13-29, 2010	FCC ID: L6ARCW40GW IC: 2503A-RCW40GW


PCS1900 results: channels 512, 661, &810 @ 20°C maximum transmitted power

Date of Test: April 07, 2010

Traffic Channel Number	PCS1900 Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
512	1850.2	3.6	20	49.46	0.0267
661	1880.0	3.6	20	-21.18	-0.0113
810	1909.8	3.6	20	-29.38	-0.0154

Traffic Channel Number	PCS1900 Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
512	1850.2	3.7	20	-26.09	-0.0141
661	1880.0	3.7	20	-34.09	-0.0181
810	1909.8	3.7	20	-34.48	-0.0181

Traffic Channel Number	UMTS1900 Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
512	1850.2	4.2	20	31.64	0.0171
661	1880.0	4.2	20	22.41	0.0119
810	1909.8	4.2	20	27.06	0.0142


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Test Report No. RTS-2341-1004-03	Dates of Test April 6-7 and 13-29, 2010	FCC ID: L6ARCW40GW IC: 2503A-RCW40GW

PCS1900 Results: channel 512 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
512	1850.2	3.6	-30	68.58	0.0371
512	1850.2	3.6	-20	37.32	0.0202
512	1850.2	3.6	-10	42.04	0.0227
512	1850.2	3.6	0	-36.42	-0.0197
512	1850.2	3.6	10	22.47	0.0121
512	1850.2	3.6	20	49.46	0.0267
512	1850.2	3.6	30	-41.78	-0.0226
512	1850.2	3.6	40	-39.13	-0.0211
512	1850.2	3.6	50	-40.74	-0.0220
512	1850.2	3.6	60	35.13	0.0190

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
512	1850.2	3.7	-30	54.63	0.0295
512	1850.2	3.7	-20	30.28	0.0164
512	1850.2	3.7	-10	-11.75	-0.0064
512	1850.2	3.7	0	-56.24	-0.0304
512	1850.2	3.7	10	10.78	0.0058
512	1850.2	3.7	20	-26.09	-0.0141
512	1850.2	3.7	30	-25.63	-0.0139
512	1850.2	3.7	40	12.72	0.0069
512	1850.2	3.7	50	-21.83	-0.0118
512	1850.2	3.7	60	-36.48	-0.0197

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
512	1850.2	4.2	-30	12.79	0.0069
512	1850.2	4.2	-20	-30.41	-0.0164
512	1850.2	4.2	-10	-48.95	-0.0265
512	1850.2	4.2	0	20.28	0.0110
512	1850.2	4.2	10	44.94	0.0243
512	1850.2	4.2	20	31.64	0.0171
512	1850.2	4.2	30	23.44	0.0127
512	1850.2	4.2	40	17.82	0.0096
512	1850.2	4.2	50	-10.40	-0.0056
512	1850.2	4.2	60	-24.60	-0.0133


	EMI Test Report for the BlackBerry® smartphone Model RCW41GW APPENDIX 3	
Test Report No. RTS-2341-1004-03	Dates of Test April 6-7 and 13-29, 2010	FCC ID: L6ARCW40GW IC: 2503A-RCW40GW

PCS1900 Results: channel 661 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
661	1880.0	3.6	-30	36.03	0.0192
661	1880.0	3.6	-20	20.40	0.0109
661	1880.0	3.6	-10	61.99	0.0330
661	1880.0	3.6	0	-56.37	-0.0300
661	1880.0	3.6	10	-63.54	-0.0338
661	1880.0	3.6	20	-21.18	-0.0113
661	1880.0	3.6	30	-25.96	-0.0138
661	1880.0	3.6	40	9.56	0.0051
661	1880.0	3.6	50	-24.86	-0.0132
661	1880.0	3.6	60	-38.36	-0.0204

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
661	1880.0	3.7	-30	29.25	0.0156
661	1880.0	3.7	-20	45.91	0.0244
661	1880.0	3.7	-10	-9.23	-0.0049
661	1880.0	3.7	0	-56.37	-0.0300
661	1880.0	3.7	10	-22.41	-0.0119
661	1880.0	3.7	20	-34.09	-0.0181
661	1880.0	3.7	30	-34.74	-0.0185
661	1880.0	3.7	40	-16.59	-0.0088
661	1880.0	3.7	50	-35.84	-0.0191
661	1880.0	3.7	60	-59.28	-0.0315

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
661	1880.0	4.2	-30	21.05	0.0112
661	1880.0	4.2	-20	-28.73	-0.0153
661	1880.0	4.2	-10	-55.92	-0.0297
661	1880.0	4.2	0	11.24	0.0060
661	1880.0	4.2	10	35.06	0.0186
661	1880.0	4.2	20	22.41	0.0119
661	1880.0	4.2	30	12.72	0.0068
661	1880.0	4.2	40	11.95	0.0064
661	1880.0	4.2	50	-24.41	-0.0130
661	1880.0	4.2	60	-38.42	-0.0204


	EMI Test Report for the BlackBerry® smartphone Model RCW41GW APPENDIX 3	
Test Report No. RTS-2341-1004-03	Dates of Test April 6-7 and 13-29, 2010	FCC ID: L6ARCW40GW IC: 2503A-RCW40GW

PCS1900 Results: channel 810 @ maximum transmitted power


Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
810	1909.8	3.6	-30	53.66	0.0281
810	1909.8	3.6	-20	26.09	0.0137
810	1909.8	3.6	-10	-19.69	-0.0103
810	1909.8	3.6	0	-66.38	-0.0348
810	1909.8	3.6	10	-14.08	-0.0074
810	1909.8	3.6	20	-29.38	-0.0154
810	1909.8	3.6	30	-31.32	-0.0164
810	1909.8	3.6	40	-11.69	-0.0061
810	1909.8	3.6	50	-30.80	-0.0161
810	1909.8	3.6	60	-52.50	-0.0275

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
810	1909.8	3.7	-30	28.35	0.0148
810	1909.8	3.7	-20	38.81	0.0203
810	1909.8	3.7	-10	-18.92	-0.0099
810	1909.8	3.7	0	-21.31	-0.0112
810	1909.8	3.7	10	-27.51	-0.0144
810	1909.8	3.7	20	-34.48	-0.0181
810	1909.8	3.7	30	-31.96	-0.0167
810	1909.8	3.7	40	-14.98	-0.0078
810	1909.8	3.7	50	-36.16	-0.0189
810	1909.8	3.7	60	-60.70	-0.0318

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
810	1909.8	4.2	-30	-22.60	-0.0118
810	1909.8	4.2	-20	-47.33	-0.0248
810	1909.8	4.2	-10	-65.15	-0.0341
810	1909.8	4.2	0	13.88	0.0073
810	1909.8	4.2	10	38.10	0.0199
810	1909.8	4.2	20	27.06	0.0142
810	1909.8	4.2	30	14.59	0.0076
810	1909.8	4.2	40	11.62	0.0061
810	1909.8	4.2	50	-24.54	-0.0128
810	1909.8	4.2	60	-34.74	-0.0182

	EMI Test Report for the BlackBerry® smartphone Model RCW41GW APPENDIX 4	
Test Report No. RTS-2341-1004-03	Dates of Test April 6-7 and 13-29, 2010	FCC ID: L6ARCW40GW IC: 2503A-RCW40GW

APPENDIX 4 – GSM 1900 RADIATED EMISSIONS TEST DATA

		EMI Test Report for the BlackBerry® smartphone Model RCW41GW APPENDIX 4	
Test Report No. RTS-2341-1004-03	Dates of Test April 6-7 and 13-29, 2010		FCC ID: L6ARCW40GW IC: 2503A-RCW40GW

Radiated Power Test Data Results

Date of test: April 16, 2010

The measurements were performed by Steven Wang.

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

The BlackBerry® smartphone was in standalone, Horizontal face down position.
Test distance is 3.0 metres

PCS1900 Band

GSM Mode

EUT				Rx Antenna		Spectrum Analyzer		Substitution Method					
Type	Ch	Frequency (MHz)	Band	Type	Pol.	Reading (dBuV)	Max (V,H) dBuV	Tracking Generator					
								Tx-Rx	Reading (dBm)	Corrected Reading (relative to Isotropic Radiator)		Limit (dBm)	Diff to Limit (dB)
										(dBm)	(W)		
F0	512	1850.20	1900	Horn	V	75.39	88.33	V-V	-2.07	32.26	1.68	33.00	-0.74
F0	512	1850.20	1900	Horn	H	88.33		H-H	-3.17				
F0	661	1880.00	1900	Horn	V	78.11	89.64	V-V	-1.75	32.83	1.92	33.00	-0.17
F0	661	1880.00	1900	Horn	H	89.64		H-H	-2.85				
F0	810	1909.80	1900	Horn	V	74.33	88.96	V-V	-1.34	32.28	1.69	33.00	-0.72
F0	810	1909.80	1900	Horn	H	88.96		H-H	-2.58				

EDGE Mode

EUT				Rx Antenna		Spectrum Analyzer		Substitution Method					
								Tracking Generator					
Type	Ch	Frequency	Band	Type	Pol.	Reading	Max (V,H)	Pol.	Reading	Corrected Reading (relative to Isotropic Radiator)		Limit	Diff to Limit
		(MHz)				(dBuV)	(dBuV)			(dBm)	(dBm)		
F0	512	1850.20	1900	Horn	V	74.12	87.00	V-V	-2.58	31.75	1.50	33.00	-1.25
F0	512	1850.20	1900	Horn	H	87		H-H	-3.39				
F0	661	1880.00	1900	Horn	V	72.66	87.35	V-V	-3.14	31.44	1.39	33.00	-1.56
F0	661	1880.00	1900	Horn	H	87.35		H-H	-3.44				
F0	810	1909.80	1900	Horn	V	70.64	86.98	V-V	-2.07	31.55	1.43	33.00	-1.45
F0	810	1909.80	1900	Horn	H	86.98		H-H	-2.89				