

# EMI Test Report

Tested in accordance with  
Federal Communications Commission (FCC)  
Personal Communications Services  
CFR 47, Part 15 Subpart C  
&  
Industry Canada (IC) RSS-210, RSS-GEN




**A division of Research In Motion Limited**

**REPORT NO.:** RTS-2341-1003-33

**PRODUCT MODEL NO.:** RCW41GW  
**TYPE NAME:** BlackBerry® smartphone  
**FCC ID:** L6ARCW40GW  
**IC:** 2503A-RCW40GW

**DATE:** 18 June, 2010

	EMI Test Report for the BlackBerry® smartphone Model RCW41GW	
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### **Statement of Performance:**

The BlackBerry® smartphone, model RCW41GW, part number CER-30952-001 Rev 1 and its accessories perform within the requirements of the test standards when configured and operated under RIM's operation instructions.

### **Declaration:**

We hereby certify that:

The test data reported herein is an accurate record of the performance of the sample(s) tested.

The test results are valid for the tested unit (s) only.

The test equipment used was suitable for the tests performed and within manufacturer's published specifications and operating parameters.

The test methods were consistent with the methods described in the relevant standards.

Documented by:



Mahmood Ahmed  
Regulatory Compliance Associate  
Date: June 18, 2010

Reviewed by:




Michael Cino  
Regulatory Compliance Associate  
Date: June 21, 2010

Reviewed and Approved by:




Masud S. Attayi, P.Eng.  
Manager, Regulatory Compliance  
Date: July 19, 2010

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## A. Scope

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

- o FCC CFR 47 Part 15, Subpart C, October, 2009
- o Industry Canada, RSS-210, Issue 7, June 2007, Low Power Licence-Exempt Radiocommunication Devices
- o Industry Canada, RSS-GEN, Issue 2, June 2007, General Requirements and Information for the Certification of Radiocommunication Equipment

## B. Associated Documents

- 1) Cetecom Report 1-2166-01-03/10A
- 2) Cetecom Report 1-2166-01-04/10A

## 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 on March 25, April 13 – 14 and May 18, 2010.

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The sample EUT included:

SAMPLE	MODEL	CER NUMBER	PIN	Software
1a	RCW41GW	CER-30952-001 Rev 1	3158E0CB	MFI V:6.1.0.6 (Wi-Fi Bundle)
1b	RCW41GW	CER-30952-001 Rev 1	3158E0CB	V5.0.0.541 (Platform 6.1.0.5) Bundle: 917
2	RCW41GW	CER-30953-001 Rev 1	3158CC6F	V5.0.0.541 (Platform 6.1.0.5) Bundle: 917


Samples 1a and 1b were used for AC Line Conducted Emissions testing.  
Sample 2 was used for Bluetooth and 802.11b/g/n Conducted Emissions testing.

#### BlackBerry® smartphone Accessories Tested

- 1) Fixed Blade Charger (Model: RIM-C-4ADUUS-001), part number HDW-24481-001, with and output voltage of 5.0 volts dc, 700 mA.
- 2) Captive Cable Charger, part number HDW-17957-003 with an output voltage of 5.0 volts dc, 700 mA.
- 3) Premium Stereo Headset, part number HDW-15766-005.
- 4) Stereo Headset, part number HDW-14322-003.
- 5) USB Data Cable, part number HDW-06610-009, 1.0 metres long.


#### **D. Support Equipment Used for the Testing of the EUT**

No support equipment used. See section *G. Compliance Test Equipment Used*.

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## E. Test Results Chart

SPECIFICATION		TEST TYPE	Meets Requirements	TEST DATA
FCC CFR 47	IC			APPENDIX
Part 15.207	RSS-210 RSS-GEN	Conducted AC Line Emission	Pass	1
Part 15.209 Part 15.247	RSS-210 RSS-GEN	BT Radiated Spurious Emissions and Radiated Band Edge Compliance	See Cetecom Test Report Number 1-2166-01-03/10	2
Part 15.209 Part 15.247	RSS-210 RSS-GEN	802.11 b/g/n Radiated Spurious Emissions and Radiated Band Edge Compliance	See Cetecom Test Report Number 1-2166-01-04/10	2
Part 15.247(a)	RSS-210	BT, 20 dB Bandwidth	Pass	3
Part 15.247(a)	RSS-210	BT, Carrier Frequency Separation	Pass	3
Part 15.247(a)	RSS-210	BT, Number of Hopping Frequencies	Pass	3
Part 15.247(a)	RSS-210	BT, Time of Occupancy (Dwell Time)	Pass	3
Part 15.247(b)	RSS-210	BT, Maximum Peak Conducted Output Power	Pass	3
Part 15.247(c)	RSS-210	BT, Band-Edge Compliance of RF Conducted Emissions	Pass	3
Part 15.247(c)	RSS-210	BT, Spurious RF Conducted Emissions	Pass	3
Part 15.247(b)	RSS-210	802.11b/g/n, 6 dB Bandwidth	Pass	4
Part 15.247(b)	RSS-210	802.11b/g/n, Maximum Conducted Output Power	Pass	4
Part 15.247(b)	RSS-210	802.11b/g/n, Band-Edge	Pass	4
Part 15.247(b)	RSS-210	802.11b/g/n, Peak Power Spectral Density	Pass	4
Part 15.247(b)	RSS-210	802.11b/g/n, Spurious RF Conducted Emissions	Pass	4

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## F. Summary of Results

### 1) AC LINE CONDUCTED EMISSIONS

The conducted emissions were measured using the test procedure outlined in CISPR Recommendation 22 through a 50 Ohm Line Impedance Stabilization Network (LISN), which was inserted in the power line to the equipment to provide the specified impedance for measurements. The EUT was placed on a nonconductive wooden table, 80 cm high that was positioned 40 cm from a vertical ground plane. The RF output of the network was connected to an EMI receiver system with characteristics that duplicate those of the receiver specified in CISPR Publication 16.

BlackBerry® smartphone was in battery charging mode. The input voltage was 120 V, 60 Hz.


The following test configurations were measured:

Test Configuration	Operating Mode(s)	Charger + Accessories
1	802.11b Tx	Fixed Blade Charger + Premium Stereo Headset + 1.0m USB Cable
2	Bluetooth Tx, Audio Playback	Captive Cable Charger + Stereo Headset + 1.0m USB Cable

The sample EUT's conducted emissions were compared with respect to the FCC CFR 47 Part 15, Subpart C and IC RSS-210 limits. The sample EUT had a worst case test margin of -16.47dB below the QP limit at 2.486 MHz using the quasi-peak detector with the Folding Blade Charger in Test Configuration 2.

See APPENDIX 1 for the test data

**Measurement Uncertainty  $\pm 3.0$  dB**

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## 2) BLUETOOTH RF CONDUCTED EMISSIONS

The Bluetooth conducted RF emissions from the BlackBerry® smartphone were measured using the methods outlined in FCC CFR 47 Part 15, Subpart C.

### a) 20 dB Bandwidth

The BlackBerry® smartphone met the requirements of the 20 dB bandwidth as per 47 CFR 15.247(a) and RSS-210. Low channel (0), middle channel (39) and high channel (78) were measured. The result includes both normal data rate and EDR. The worst case 20 dB bandwidth was 1.310 MHz on channel 0 using EDR. See APPENDIX 2 for the test data.

### b) Carrier Frequency Separation

The BlackBerry® smartphone met the requirements of the carrier frequency separation as per 47 CFR 15.247(a) and RSS-210. Channel 38 to 39 was measured. The result includes both normal data rate and EDR. See APPENDIX 2 for the test data.

### c) Number of Hopping Frequencies

The BlackBerry® smartphone met the requirements of the number of hopping frequencies as per 47 CFR 15.247(a) and RSS-210. The number of hopping channels measured was 79. See APPENDIX 2 for the test data.

### d) Time of Occupancy (Dwell Time)

The EUT met the requirements of the dwell time as per 47 CFR 15.247(a) and RSS-210. Low channel (0), middle channel (39) and high channel (78) were measured in DH1, DH3 and DH5 modes. Bluetooth was operating in frequency hopping (Euro/US) mode during the measurements. See APPENDIX 2 for the test data.

### e) Maximum Peak Conducted Output Power

The BlackBerry® smartphone met the requirements of the maximum peak conducted output power as per 47 CFR 15.247(b) and RSS-210. Low channel (0), middle channel (39) and high channel (78) were measured. The result includes both normal data rate and EDR. The worst case conducted power level was 9.83 dBm (0.00962 W) on channel 0 using normal data rate. See APPENDIX 2 for the test data.


### f) Band-Edge Compliance of RF Conducted Emissions

The BlackBerry® smartphone met the requirements of the band-edge compliance of RF conducted emissions as per 47 CFR 15.247(c) and RSS-210. Channels 0 and 78 were measured in frequency hopping (Euro/US) mode and single frequency mode.

The result includes both normal data rate and EDR.

See APPENDIX 2 for the test data.



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g) Spurious RF Conducted Emissions

The BlackBerry® smartphone met the requirements of the spurious RF conducted emissions as per 47 CFR 15.247(c) and RSS-210. The frequency range measured was 10 MHz to 26 GHz. Low channel (0), middle channel (39) and high channel (78) were measured in single frequency mode and frequency hopping (Euro/US) mode. The result includes both normal data rate and EDR. See APPENDIX 2 for the test data.

3) 802.11b/g/n RF CONDUCTED EMISSIONS

The 802.11b/g/n conducted RF emissions from the BlackBerry® smartphone were measured using the methods outlined in FCC CFR 47 Part 15, Subpart C.

a) 20 dB Bandwidth

The EUT met the requirements of the 6 dB bandwidth as per 47 CFR 15.247(b) and RSS-210. Low channel (1), middle channel (6) and high channel (11) were measured. The worst case 6dB bandwidth was 17.80 MHz on channel 11. See APPENDIX 3 for the test data.

b) Maximum Conducted Output Power

The EUT met the requirements of the maximum conducted output power as per 47 CFR 15.247(b) and RSS-210. Low channel (1), middle channel (6) and high channel (11) were measured. The worst case conducted power level was 18.46 dBm (0.07015 W) on channel 11 using a data rate of 1 Mbps. See APPENDIX 3 for the test data

c) Band-Edge Compliance of RF Conducted Emissions


The EUT met the requirements of band-edge compliance of RF conducted emissions as per 47 CFR 15.247(b) and RSS-210. Low channel (1) and high channel (11) were measured. See APPENDIX 3 for the test data.

d) Peak Power Spectral Density

The EUT met the requirements of peak power spectral density as per 47 CFR 15.247(b) and RSS-210. Low channel (1), middle channel (6) and high channel (11) were measured. See APPENDIX 3 for the test data.

e) Spurious RF Conducted Emissions


The EUT met the requirements of the spurious RF conducted emissions as per 47 CFR 15.247(c) and RSS-210. The frequency range measured was 30 MHz to 26 GHz. Low channel (1), middle channel (6) and high channel (11) were measured. See APPENDIX 3 for the test data.

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## G. Compliance Test Equipment Used

<u>UNIT</u>	<u>MANUFACTURER</u>	<u>MODEL</u>	<u>SERIAL NUMBER</u>	<u>CAL DUE DATE (YY MM DD)</u>	<u>USE</u>
EMI Test Receiver	Rohde & Schwarz	ESIB 40	100255	10-12-01	Conducted/Radiated Emissions
EMI Test Receiver	Rohde & Schwarz	ESU 40	100162	10-11-29	Conducted/Radiated Emissions
L.I.S.N.	Rohde & Schwarz	ENV216	100060	10-12-11	Conducted 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	80117164	11-01-08	RF Conducted Emissions
Temperature Probe	Control Company	15-077-21	51129471	11-04-29	Frequency Stability
Environmental Chamber	ESPEC Corp.	SH-240S1	91005607	N/R	Frequency Stability
Bluetooth Tester	Rohde & Schwarz	CBT	100034	10-11-10	RF Conducted Emissions
Power Meter	Agilent	N1911A	MY45100905	11-01-05	RF Conducted / Frequency Stability
Power Sensor	Agilent	N1921A	SG45240281	10-05-08*	RF Conducted / Frequency Stability
Digital Multimeter	Hewlett Packard	34401A	US36042324	10-10-08	Conducted/Radiated Emissions

\*All tests performed with the Power Sensor N1921A were completed before 10-05-08

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## APPENDIX 1 – AC CONDUCTED EMISSIONS TEST DATA/PLOTS

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### AC Conducted Emissions Test Results

#### Test Configuration:1

Date of the test: May 18, 2010

The environmental conditions were:


Temperature: 24 °C  
Pressure: 1018 mB  
Humidity: 23 %

Frequency (MHz)	Line	Reading (QP) (dBµV)	Correction Factor (dB)	Corrected Reading (QP) (dBµV)	Limit (QP) (dBµV)	Limit (AV) (dBµV)	Margin (QP) Limits (dB)
0.150	L1	37.73	11.20	48.93	66.00	56.00	-17.07
0.186	L1	30.52	10.95	41.48	64.21	54.21	-22.74
0.348	L1	28.38	10.09	38.47	59.01	49.01	-20.54
0.353	N	24.09	10.10	34.19	58.90	48.90	-24.72
0.609	L1	23.71	9.85	33.56	56.00	46.00	-22.44
0.821	L1	23.66	9.82	33.48	56.00	46.00	-22.52
3.282	L1	21.69	9.88	31.57	56.00	46.00	-24.43
4.335	N	21.83	9.91	31.74	56.00	46.00	-24.26
4.502	L1	23.24	9.90	33.15	56.00	46.00	-22.85

All other emission levels test margins greater than 25 dB.

Measurements were done with the quasi-peak detector.

See figure 1-1 and figure 1-2 for the measurement plot of the L1 and N lines of AC power line conducted emissions.

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## AC Conducted Emissions Test Graphs

### Test Configuration 1

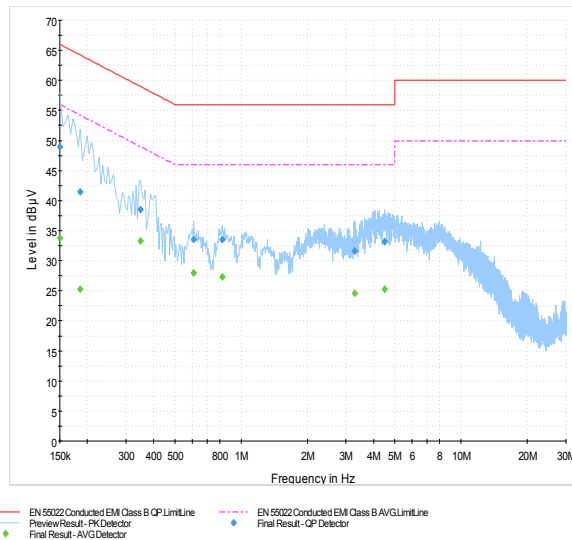


Figure 1-1: L1 lines

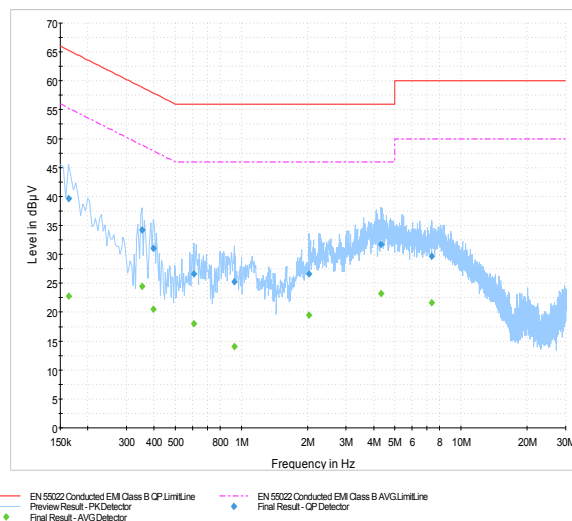



Figure 1-2: N Lines

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## AC Conducted Emissions Test Results cont'd

### Test Configuration:2

Date of the test: May 18, 2010

The environmental conditions were:


Temperature: 24 °C  
Pressure: 1018 mB  
Humidity: 23 %

Frequency (MHz)	Line	Reading (QP) (dBμV)	Correction Factor (dB)	Corrected Reading (QP) (dBμV)	Limit (QP) (dBμV)	Limit (AV) (dBμV)	Margin (QP) Limits (dB)
0.168	L1	36.84	11.08	47.92	65.06	55.06	-17.13
0.200	N	34.15	10.89	45.03	63.63	53.63	-18.60
0.321	N	27.07	10.14	37.21	59.68	49.68	-22.47
0.398	L1	30.78	10.01	40.79	57.91	47.91	-17.11
0.416	N	24.33	10.00	34.32	57.54	47.54	-23.21
0.528	N	25.49	9.90	35.39	56.00	46.00	-20.61
1.181	N	23.34	9.80	33.15	56.00	46.00	-22.85
1.302	L1	23.23	9.80	33.03	56.00	46.00	-22.97
2.378	N	25.08	9.85	34.92	56.00	46.00	-21.08
2.486	L1	29.68	9.85	39.53	56.00	46.00	<b>-16.47</b>
4.061	L1	25.57	9.90	35.47	56.00	46.00	-20.53
4.979	L1	25.08	9.91	34.98	56.00	46.00	-21.02

All other emission levels had test margins greater than 25 dB.

Measurements were done with the quasi-peak detector.

See figure 1-3 and figure 1-4 for the measurement plot of the L1 and N lines of AC power line conducted emissions.

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## AC Conducted Emissions Test Graphs

### Test Configuration 2

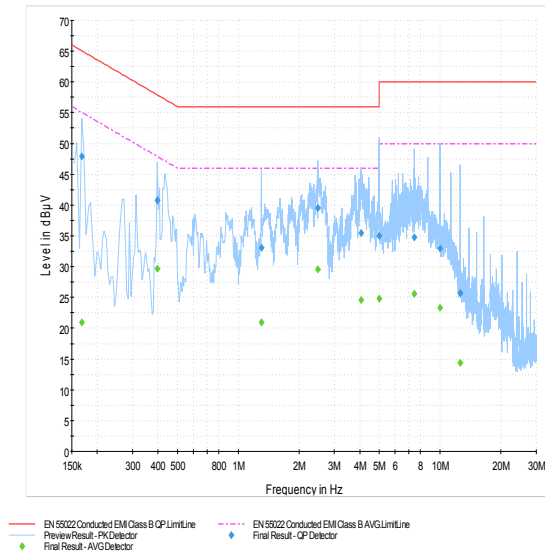


Figure 1-3: L1 lines

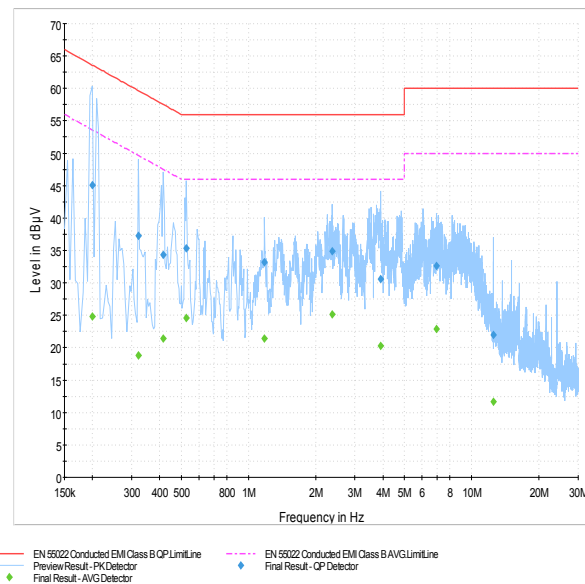




Figure 1-4: N Lines

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## APPENDIX 2 – BLUETOOTH CONDUCTED EMISSIONS TEST DATA/PLOTS



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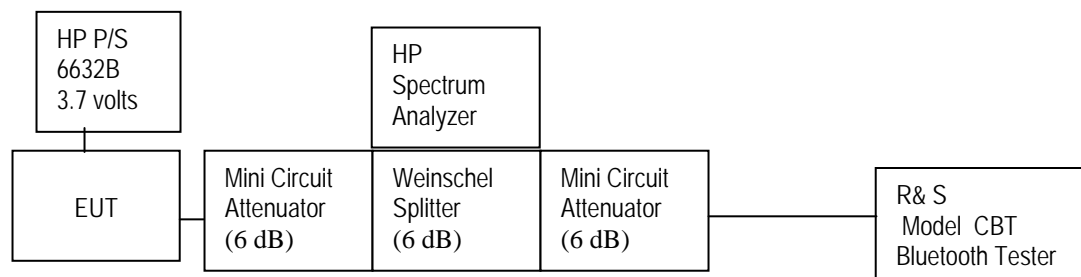
### Bluetooth RF Conducted Emission Test Results

Bluetooth power output from BlackBerry® smartphone was at maximum for all the recorded measurements shown below.

The measurements were performed by Maurice Battler.


Date of test: March,25 2010

### **Test Setup Diagram**



A reference offset of 12.4 dB was applied to the spectrum analyzer reference level for the attenuators and coaxial cable loss in the test circuit.

The environmental test conditions were: Temperature: 23 °C  
Pressure: 1012 mb  
Relative Humidity: 22 %

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### Bluetooth RF Conducted Emission Test Results cont'd

#### 20 dB Bandwidth

The EUT met the requirements of the 20 dB bandwidth as per 47 CFR 15.247(a) and RSS-210. Low channel (0), middle channel (39) and high channel (78) were measured. Bluetooth was operating in single frequency mode.

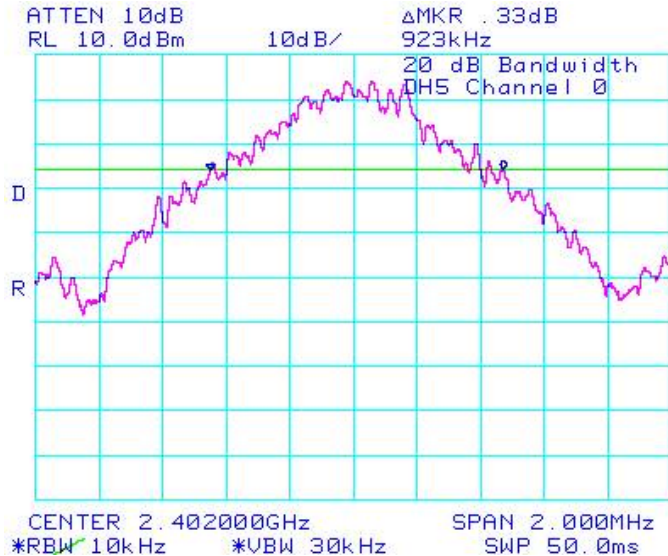
Using pattern type "Static PRBS" and packet type "DH5" during the measurements.

Bluetooth Channel	Limit (MHz)	Measured Level (MHz)
0	$\leq 1.0$	0.923
39	$\leq 1.0$	0.923
78	$\leq 1.0$	0.923

See figures 3-1 to 3-3 for the plots of the 20 dB bandwidth measurements.

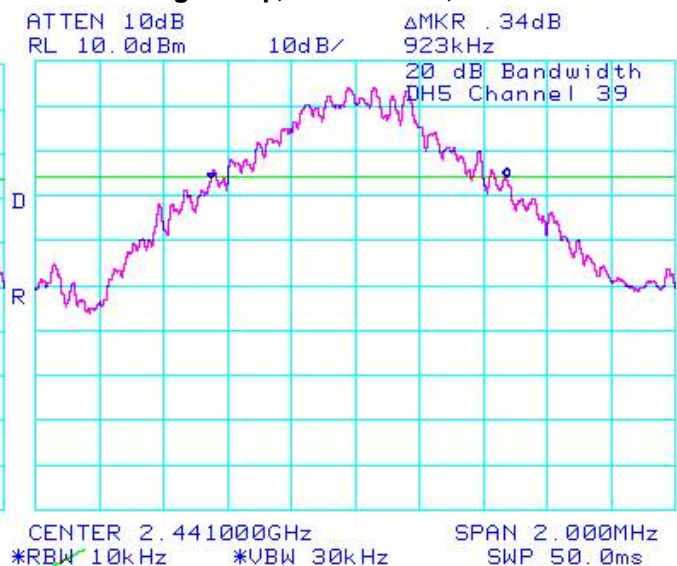
**Figure 3-1: 20 dB Bandwidth**


**Single freq., Static PRBS, DH5**



**Figure 3-2: 20 dB Bandwidth**

**Single freq., Static PRBS, DH5**

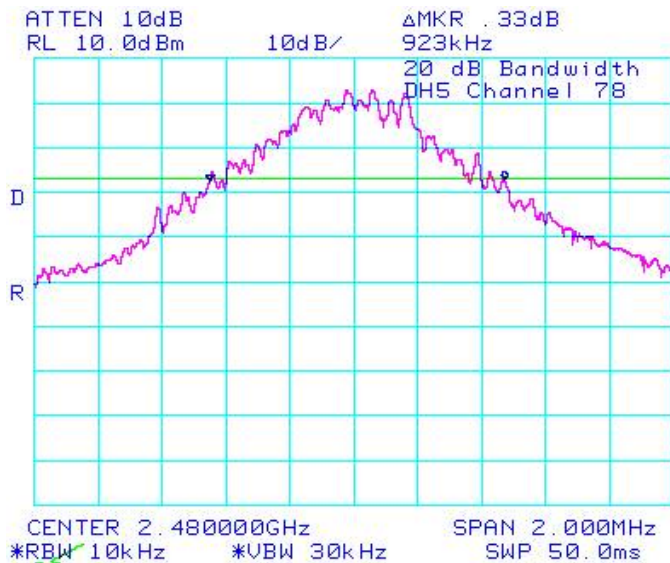


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### Bluetooth RF Conducted Emission Test Results cont'd

**Figure 3-3: 20 dB Bandwidth**


**Single freq., Static PRBS, DH5**



Using Pattern type “Static PRBS” and packet type “3-DH5” during the measurements.

Bluetooth Channel	Limit (MHz)	Measured Level (MHz)
0	≤1.5	<b>1.310</b>
39	≤1.5	1.297
78	≤1.5	1.307

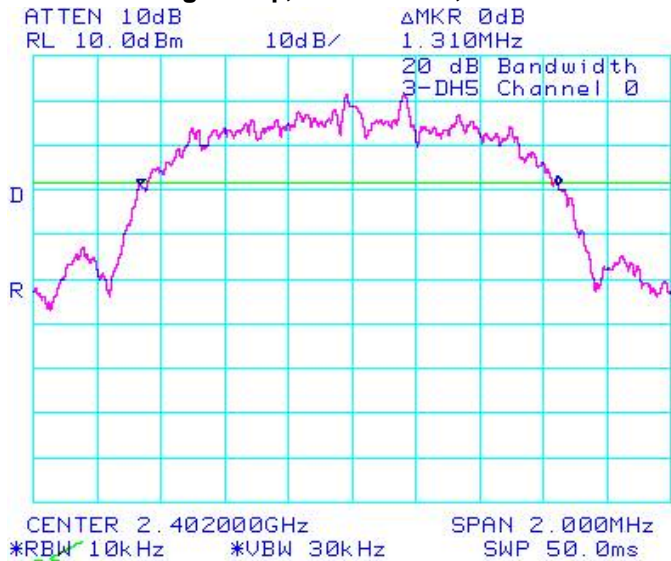
See figures 3-4 to 3-6 for the plots of the 20 dB bandwidth measurements.

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## Bluetooth RF Conducted Emission Test Results cont'd

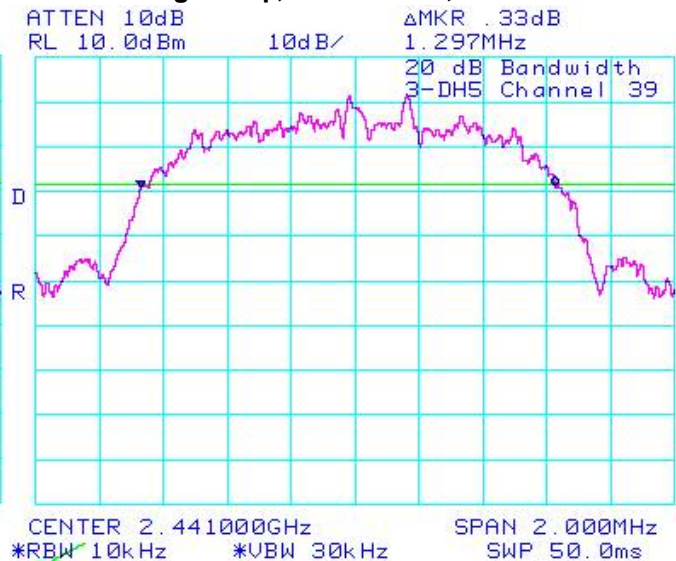
**Figure 3-4: 20 dB Bandwidth**

**Single freq., Static PRBS, 3-DH5**



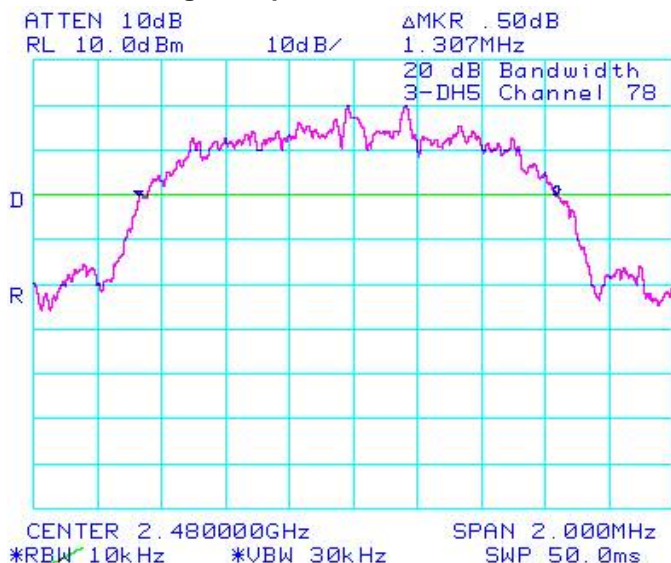
**Figure 3-5: 20 dB Bandwidth**


**Single freq., Static PRBS, 3-DH5**



**Figure 3-6: 20 dB Bandwidth**

**Single freq., Static PRBS, 3-DH5**



	EMI Test Report for the BlackBerry® smartphone Model RCW41GW <b>APPENDIX 2</b>	
Test Report No. RTS-2341-1003-33	Dates of Test March 25, April 13 - 14 and May 18, 2010	FCC ID: L6ARCW40GW IC: 2503A-RCW40GW

### Bluetooth RF Conducted Emission Test Results cont'd

#### **Carrier Frequency Separation**

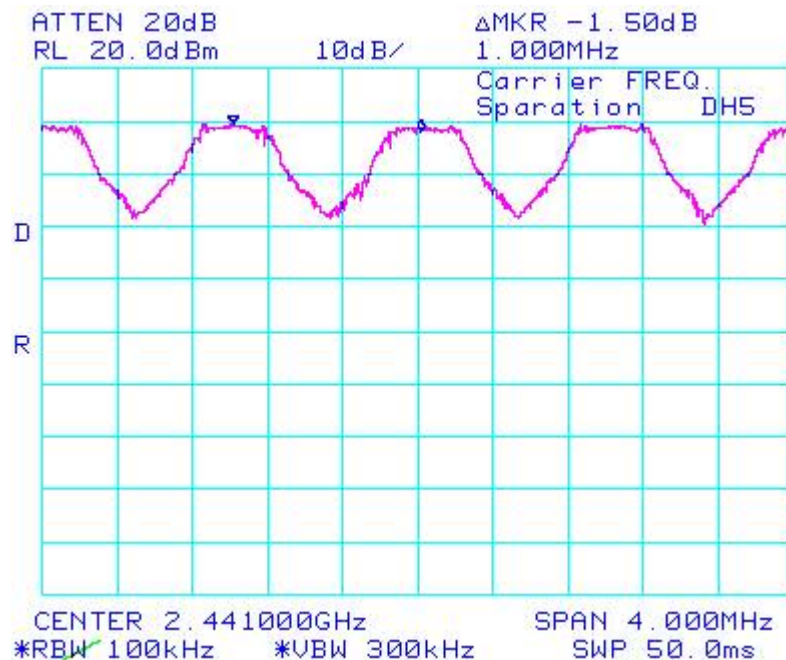
The EUT met the requirements of the Carrier Frequency Separation as per 47 CFR 15.247(a) and RSS-210. Channel 38 to 39 was measured. Bluetooth was operating in frequency hopping (Euro/US) mode.


Using pattern type "Static PRBS" and packet type "DH5" during the measurements.

Bluetooth Channels	Limit (MHz)	Measured Level (MHz)
38 to 39	≥ 0.025 or 20 dB bandwidth	1.000

See figure 3-7 for the plot of the Carrier Frequency Separation measurement.

**Figure 3-7: Carrier Frequency Separation, Freq. Hopping, Static PRBS, DH5, Channels 38 to 39**



	EMI Test Report for the BlackBerry® smartphone Model RCW41GW <b>APPENDIX 2</b>	
<b>Test Report No.</b> RTS-2341-1003-33	<b>Dates of Test</b> March 25, April 13 - 14 and May 18, 2010	<b>FCC ID:</b> L6ARCW40GW <b>IC:</b> 2503A-RCW40GW

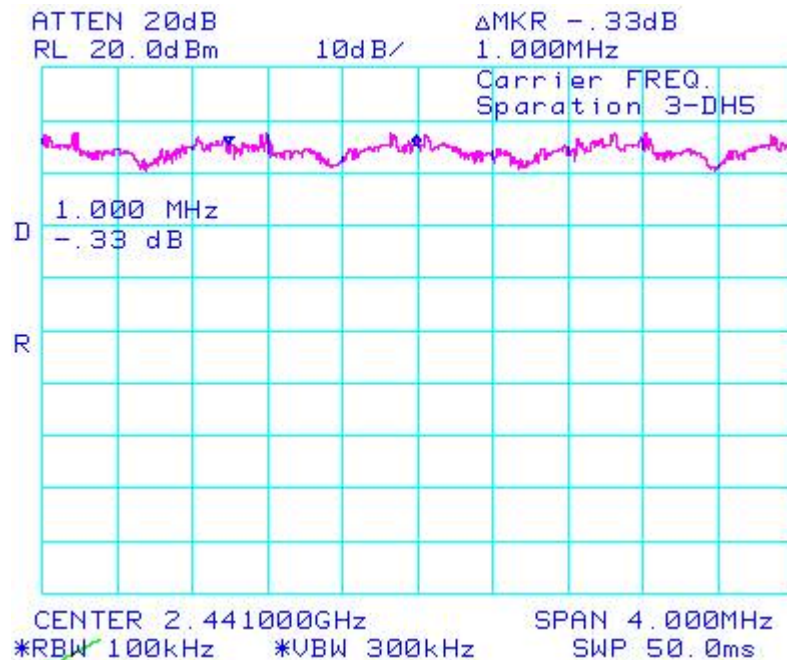
### Bluetooth RF Conducted Emission Test Results cont'd

Using Pattern type "Static PRBS" and packet type "3-DH5" during the measurements.


Bluetooth Channels	Limit (MHz)	Measured Level (MHz)
38 to 39	≥ 0.025 or 20 dB bandwidth	1.000

See figure 3-8 for the plot of the Carrier Frequency Separation measurement.

**Figure 3-8: Carrier Frequency Separation, Freq. Hopping, Static PRBS, 3-DH5, Channels 38 to 39**





	EMI Test Report for the BlackBerry® smartphone Model RCW41GW <b>APPENDIX 2</b>	
<b>Test Report No.</b> RTS-2341-1003-33	<b>Dates of Test</b> March 25, April 13 - 14 and May 18, 2010	<b>FCC ID:</b> L6ARCW40GW <b>IC:</b> 2503A-RCW40GW

### Bluetooth RF Conducted Emission Test Results cont'd

#### Number of Hopping Frequencies

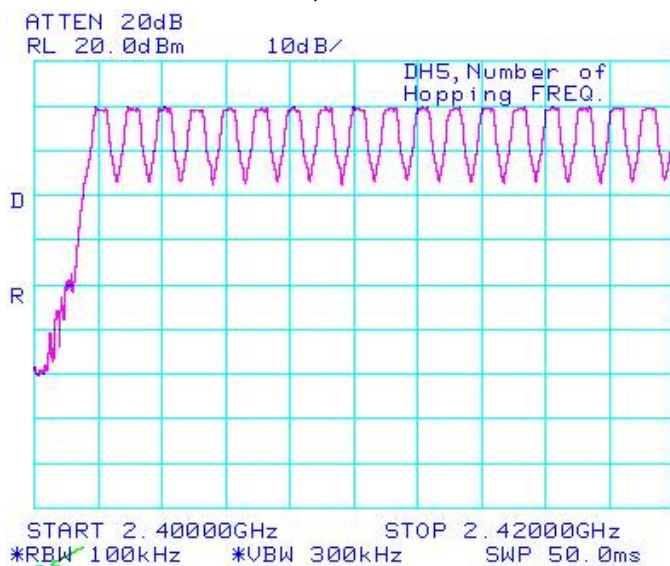
The EUT met the requirements of the number of hopping frequencies as per 47 CFR 15.247(a) and RSS-210. Bluetooth was operating in frequency hopping (Euro/US) mode.

Using pattern type “Static PRBS” and packet type “DH5” during the measurements.

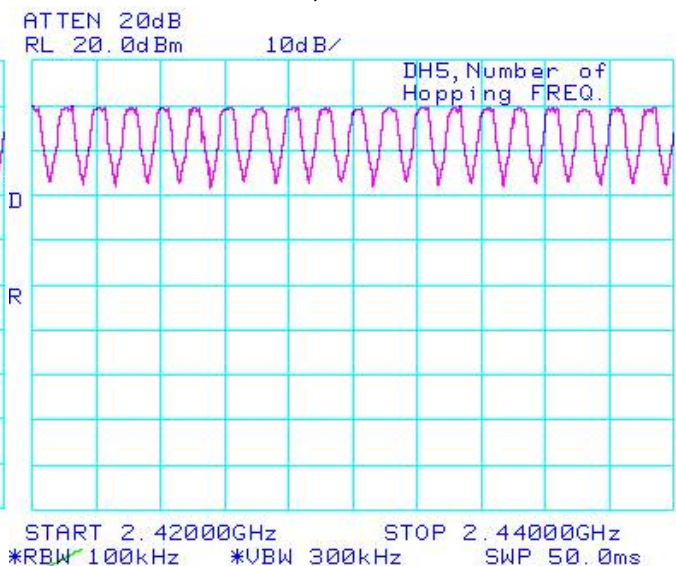
Limit (CH)	Number of Hopping Frequencies (CH)
≥75	79


See figures 3-9 to 3-12 for the plots of the number of hopping frequencies.

**Figure 3-6: Number of Hopping Frequencies  
Static PRBS, DH5**



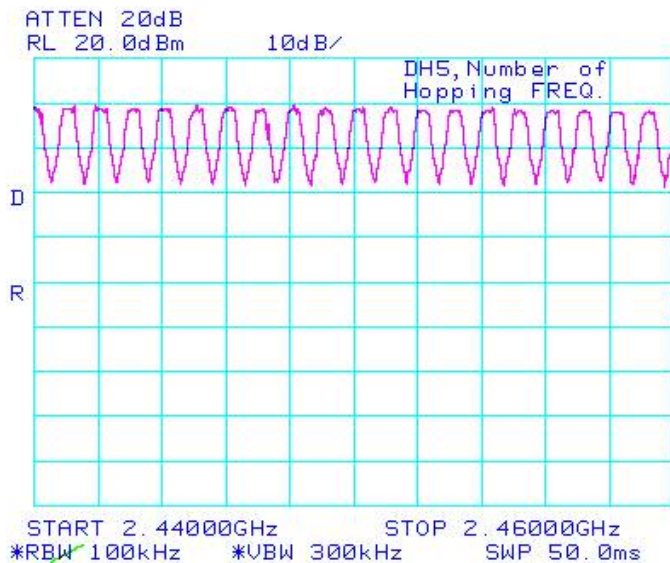
**Figure 3-7: Number of Hopping Frequencies  
Static PRBS, DH5**



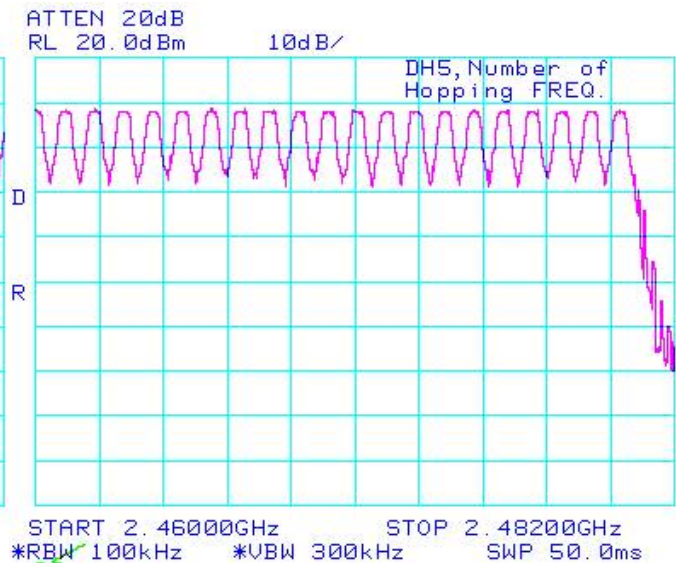
	EMI Test Report for the BlackBerry® smartphone Model RCW41GW <b>APPENDIX 2</b>	
Test Report No. RTS-2341-1003-33	Dates of Test March 25, April 13 - 14 and May 18, 2010	FCC ID: L6ARCW40GW IC: 2503A-RCW40GW

### Bluetooth RF Conducted Emission Test Results cont'd

**Figure 3-8: Number of Hopping Frequencies  
Static PRBS, DH5**



**Figure 3-9: Number of Hopping Frequencies  
Static PRBS, DH5**



### **Time of Occupancy (Dwell Time)**


The EUT met the requirements of the time of occupancy (dwell time) as per 47 CFR 15.247(a) and RSS-210. Low channel (0), middle channel (39) and high channel (78) were measured in packet types DH1, DH3 and DH5. Bluetooth was operating in frequency hopping (Euro/US) mode during the measurements. The frequency hopping is 1600 hops per second for a dwell time of 625  $\mu$ sec for 79 channels.

A DH1 packet needs one time slot for transmitting and one time slot for receiving. The frequency hopping is 800 hops per second with 79 channels which is 10.127 times per second. As per 15.247(a) (iii) "The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed". Therefore for 31.6 seconds (79x0.4) there are 320.0 times of appearance.

A DH3 packet needs one time slot for transmitting and one time slot for receiving. The frequency hopping is 400 hops per second with 79 channels which is 5.06 times per second. Therefore for 31.6 seconds there are 159.9 times of appearance.

A DH5 packet needs one time slot for transmitting and one time slot for receiving. The frequency hopping is 266.7 hops per second with 79 channels which is 3.38 times per second. Therefore for 31.6 seconds there are 106.8 times of appearance.



	EMI Test Report for the BlackBerry® smartphone Model RCW41GW <b>APPENDIX 2</b>	
Test Report No. RTS-2341-1003-33	Dates of Test March 25, April 13 - 14 and May 18, 2010	FCC ID: L6ARCW40GW IC: 2503A-RCW40GW

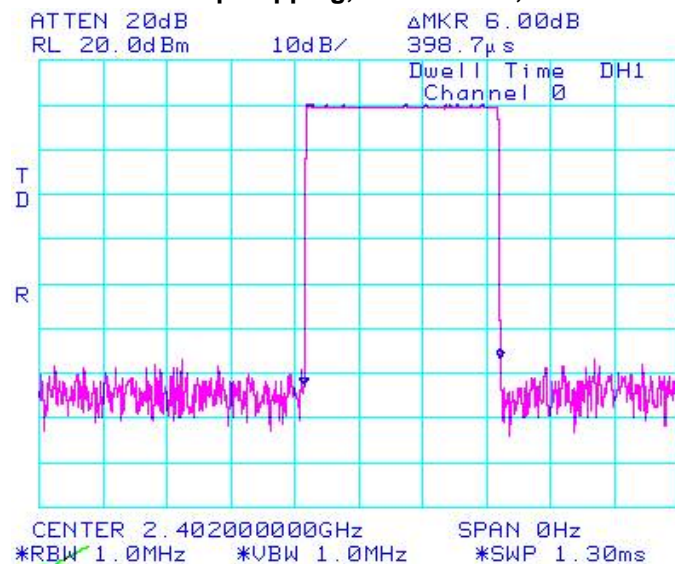
### Bluetooth RF Conducted Emission Test Results cont'd

Bluetooth Channel	Mode	Tx Time (ms)	Dwell Time/31.6 sec. (msec.)	Limit (msec.)	Margin (msec.)
0	DH1	0.3987	$0.3987 \times 320.0 = 127.58$	400	272.42
39	DH1	0.4052	$0.4052 \times 320.0 = 129.66$	400	270.34
78	DH1	0.4008	$0.4008 \times 320.0 = 128.26$	400	271.74
0	DH3	1.6587	$1.6587 \times 159.9 = 265.23$	400	134.77
39	DH3	1.6640	$1.6640 \times 159.9 = 266.07$	400	133.93
78	DH3	1.6587	$1.6587 \times 159.9 = 265.23$	400	134.77
0	DH5	2.9200	$2.9200 \times 106.8 = 311.86$	400	88.14
39	DH5	2.9200	$2.9200 \times 106.8 = 311.86$	400	88.14
78	DH5	2.9300	$2.9300 \times 106.8 = 312.92$	400	87.08

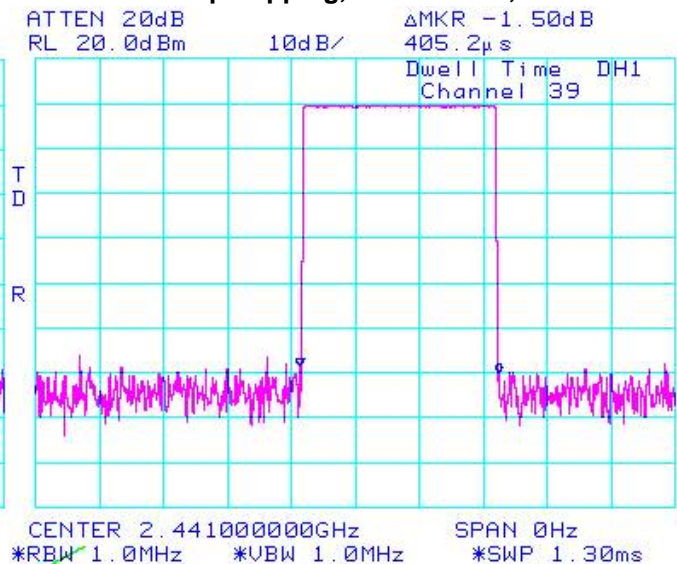
See figures 3-13 to 3-21 for the plots of the dwell time.


### Bluetooth RF Conducted Emission Test Results cont'd

**Figure 3-13: Time of Occupancy (Dwell Time)**  
**Freq. Hopping, Static PRBS, DH1**



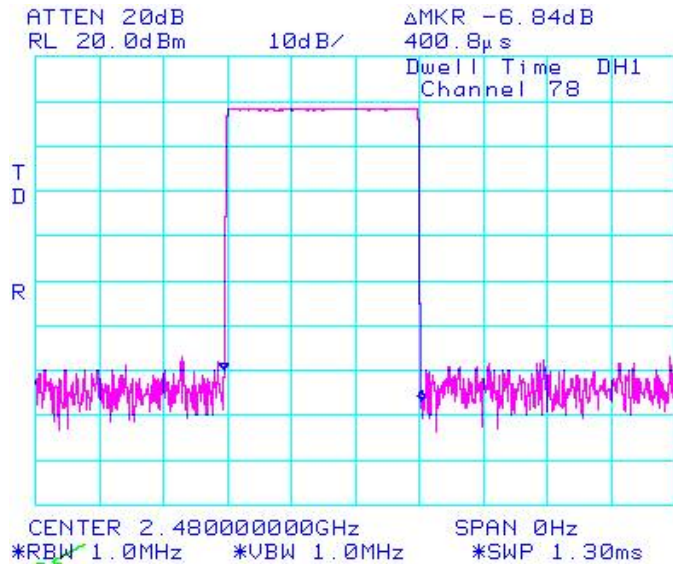
**Figure 3-14: Time of Occupancy (Dwell Time)**  
**Freq. Hopping, Static PRBS, DH1**



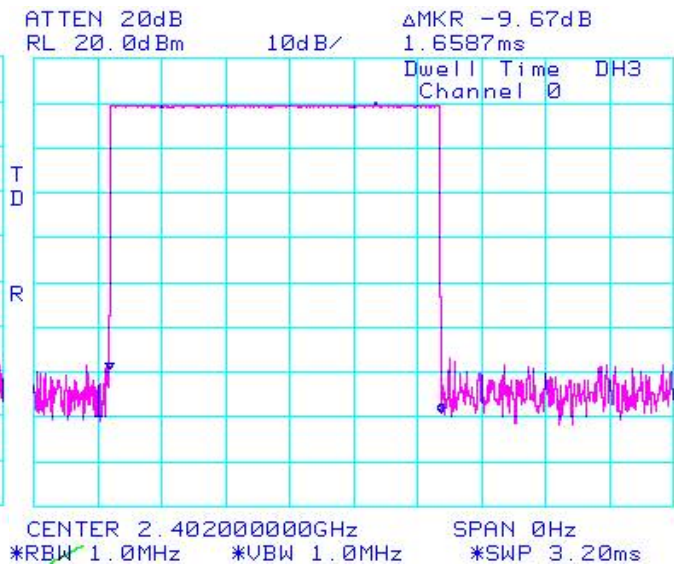
	EMI Test Report for the BlackBerry® smartphone Model RCW41GW <b>APPENDIX 2</b>	
<b>Test Report No.</b> RTS-2341-1003-33	<b>Dates of Test</b> March 25, April 13 - 14 and May 18, 2010	<b>FCC ID:</b> L6ARCW40GW <b>IC:</b> 2503A-RCW40GW

### Bluetooth RF Conducted Emission Test Results cont'd

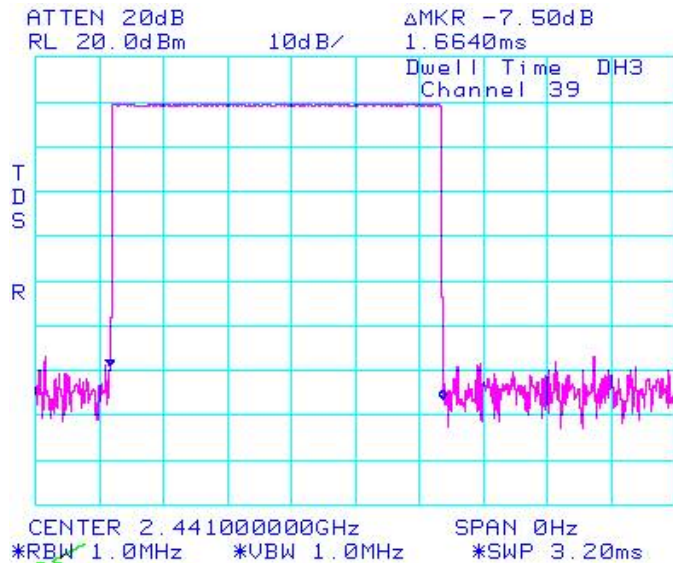
**Figure 3-15: Time of Occupancy (Dwell Time)**  
**Freq. Hopping, Static PRBS, DH1**



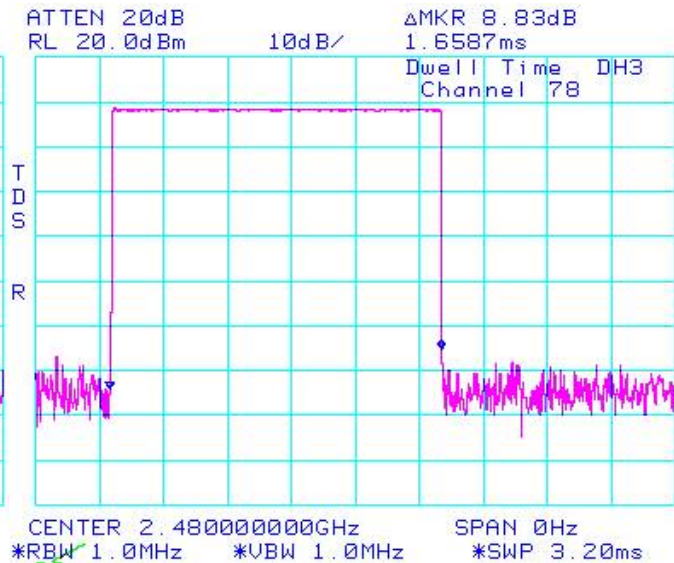
**Figure 3-16: Time of Occupancy (Dwell Time)**  
**Freq. Hopping, Static PRBS, DH3**




**Figure 3-17: Time of Occupancy (Dwell Time)**  
**Freq. Hopping, Static PRBS, DH3**



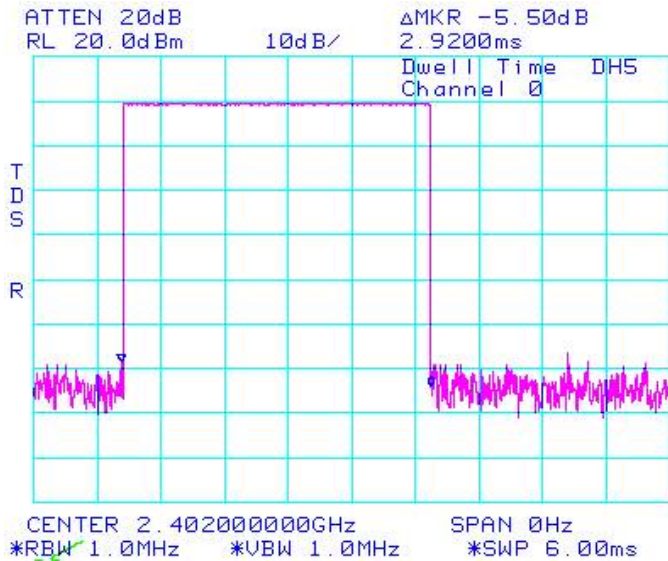
**Figure 3-18 : Time of Occupancy (Dwell Time)**  
**Freq. Hopping, Static PRBS, DH3**



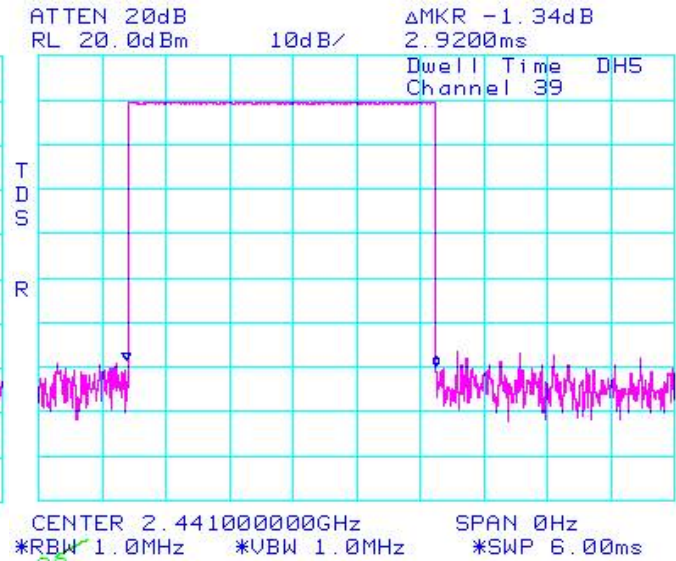
	EMI Test Report for the BlackBerry® smartphone Model RCW41GW <b>APPENDIX 2</b>	
<b>Test Report No.</b> RTS-2341-1003-33	<b>Dates of Test</b> March 25, April 13 - 14 and May 18, 2010	<b>FCC ID:</b> L6ARCW40GW <b>IC:</b> 2503A-RCW40GW

### Bluetooth RF Conducted Emission Test Results cont'd

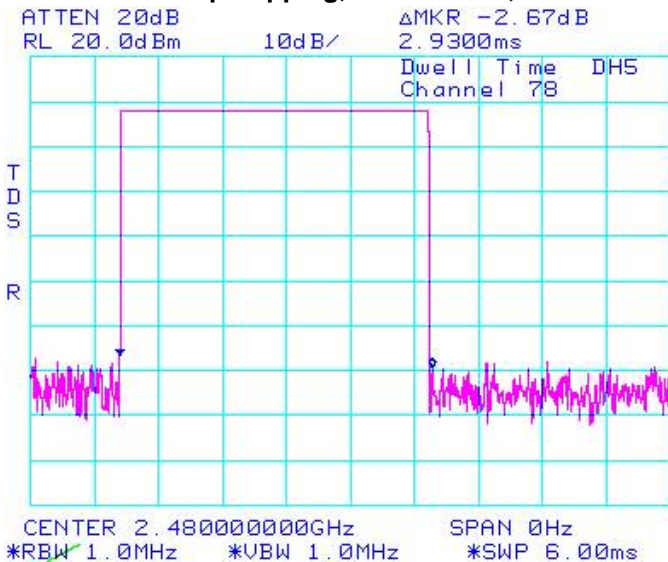
**Figure 3-19: Time of Occupancy (Dwell Time)**  
**Freq. Hopping, Static PRBS, DH5**




**Figure 3-20: Time of Occupancy (Dwell Time)**  
**Freq. Hopping, Static PRBS, DH5**



**Figure 3-21: Time of Occupancy (Dwell Time)**  
**Freq. Hopping, Static PRBS, DH5**



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### Bluetooth RF Conducted Emission Test Results cont'd

#### Maximum Peak Conducted Output Power

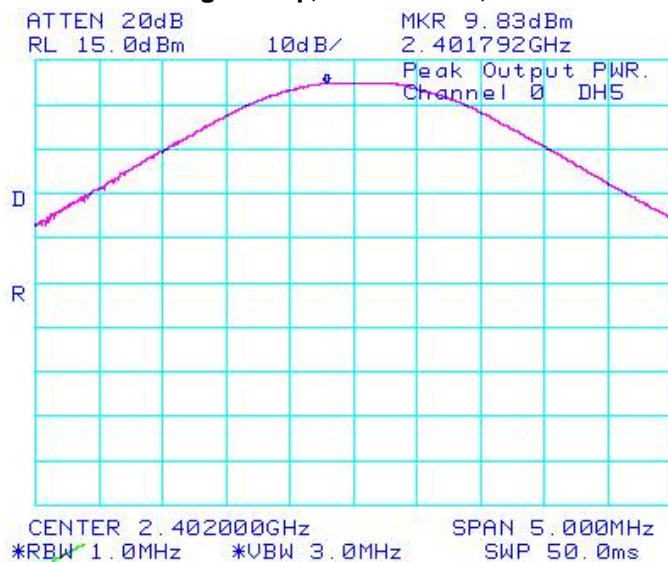
The EUT met the requirements of the maximum peak conducted output power of class 2 as per 47 CFR 15.247(b) and RSS-210. Low channel (0), middle channel (39) and high channel (78) were measured. Bluetooth was operating in single frequency mode during the measurements. A reference offset of 12.4 dB was applied to the spectrum analyzer reference level for the coaxial cable loss and attenuators in the test circuit.

Using pattern type "Static PRBS" and packet type "DH5" during the measurements.

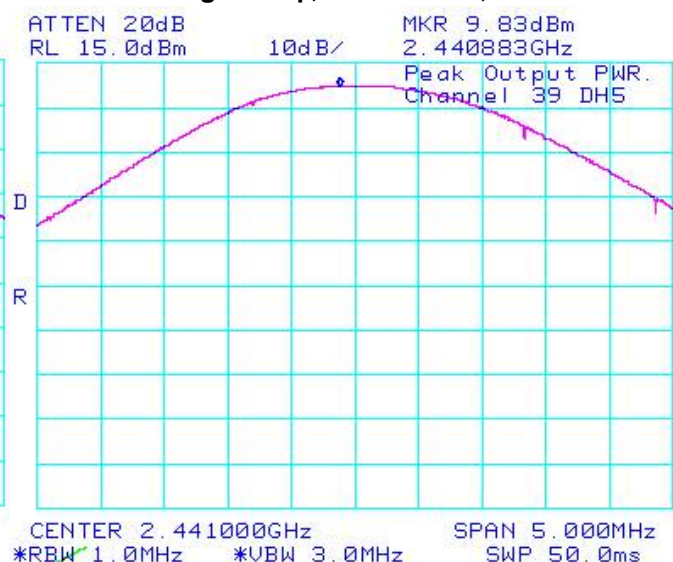
Bluetooth Channel	Measured Level (dBm)	Measured Level (W)	Class 1 Limit (dBm)
0	9.83	0.00962	0.0 to 20.0
39	9.83	0.00962	0.0 to 20.0
78	8.50	0.00708	0.0 to 20.0

See figures 3-22 to 3-24 for the plots of the maximum peak conducted output power.


**Figure 3-22: Max. Peak Conducted Output Power  
Single Freq., Static PRBS, DH5**



**Figure 3-23: Max. Peak Conducted Output Power  
Single Freq., Static PRBS, DH5**

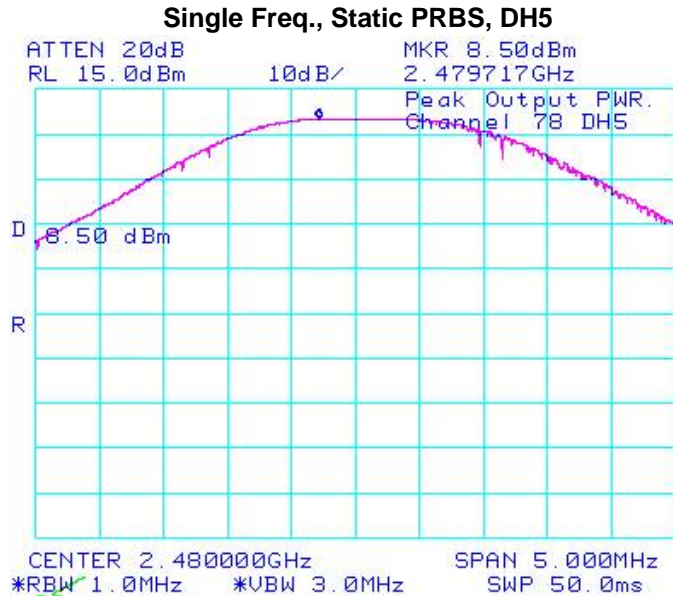




	EMI Test Report for the BlackBerry® smartphone Model RCW41GW <b>APPENDIX 2</b>	
<b>Test Report No.</b> RTS-2341-1003-33	<b>Dates of Test</b> March 25, April 13 - 14 and May 18, 2010	<b>FCC ID:</b> L6ARCW40GW <b>IC:</b> 2503A-RCW40GW

## Bluetooth RF Conducted Emission Test Results cont'd


**Figure 3-24: Max. Peak Conducted Output Power**



Using Pattern type “Static PRBS” and packet type “3-DH5” during the measurements.

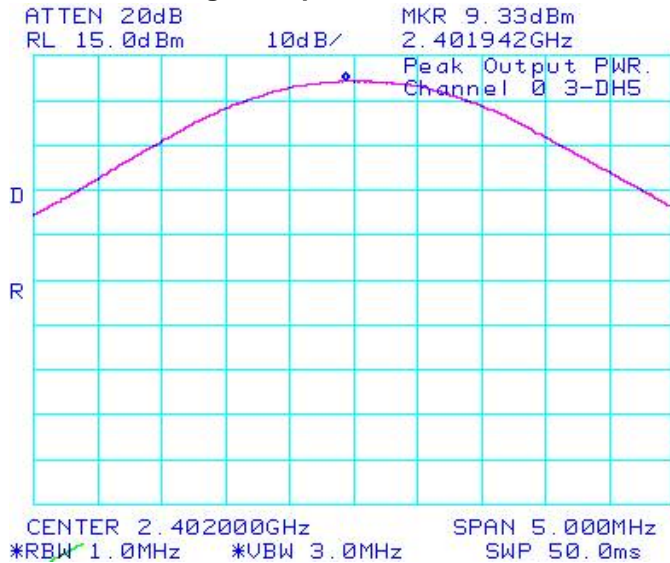
Bluetooth Channel	Measured Level (dBm)	Measured Level (W)	Class 1 Limit (dBm)
0	9.33	0.00857	0.0 to 20.0
39	9.17	0.00826	0.0 to 20.0
78	8.00	0.00631	0.0 to 20.0

See figures 3-25 to 3-27 for the plots of the maximum peak conducted output power.

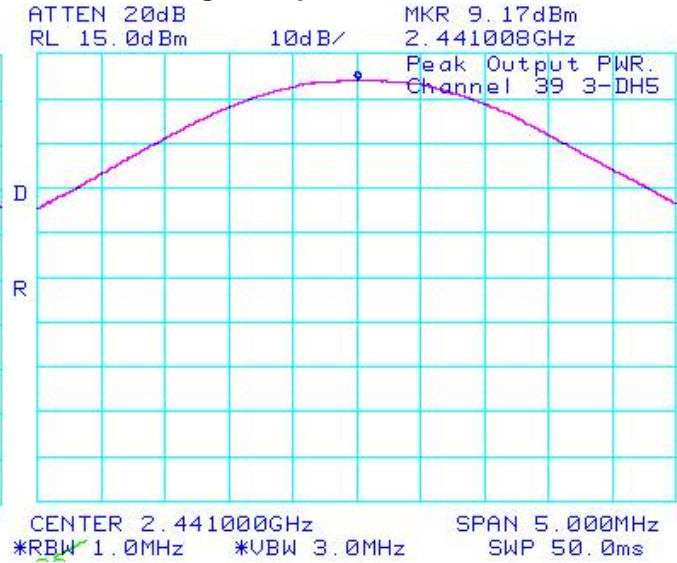
	EMI Test Report for the BlackBerry® smartphone Model RCW41GW <b>APPENDIX 2</b>	
<b>Test Report No.</b> RTS-2341-1003-33	<b>Dates of Test</b> March 25, April 13 - 14 and May 18, 2010	<b>FCC ID:</b> L6ARCW40GW <b>IC:</b> 2503A-RCW40GW

## Bluetooth RF Conducted Emission Test Results cont'd

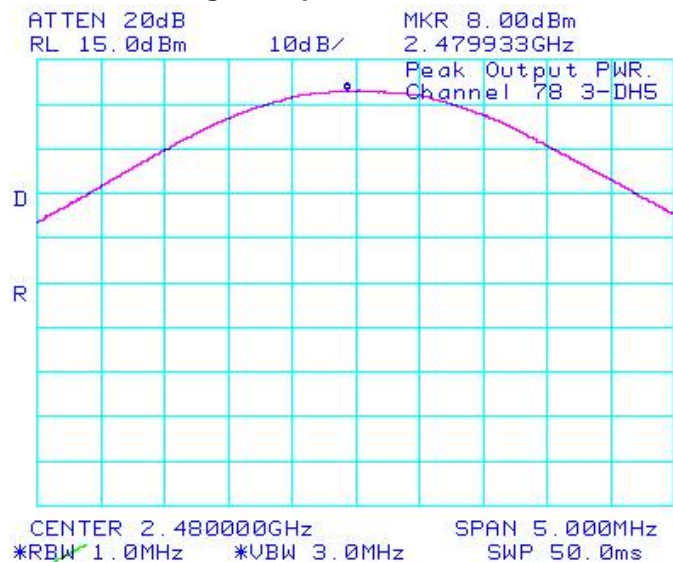
**Figure 3-25: Max. Peak Conducted Output Power**  
**Single Freq., Static PRBS, 3-DH5**




**Figure 3-26: Max. Peak Conducted Output Power**  
**Single Freq., Static PRBS, 3-DH5**



**Figure 3-27: Max. Peak Conducted Output Power**  
**Single Freq., Static PRBS, 3-DH5**



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<b>Test Report No.</b> RTS-2341-1003-33	<b>Dates of Test</b> March 25, April 13 - 14 and May 18, 2010	<b>FCC ID:</b> L6ARCW40GW <b>IC:</b> 2503A-RCW40GW

## Bluetooth RF Conducted Emission Test Results cont'd

### Band Edge Compliance

The EUT met the requirements of the band edge compliance as per 47 CFR 15.247(c) and RSS-210. Low channel (0) and high channel (78) were measured. Bluetooth was operating in single frequency and hopping mode.

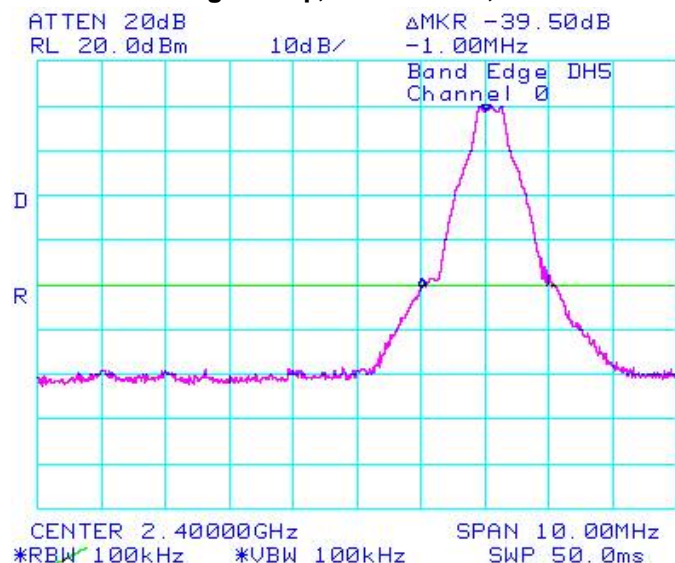
Using pattern type "Static PRBS" and packet type "DH5" during the measurements.

Bluetooth Channel	Operating Mode	Measured Level (dBc)	Limit (dBc)	Margin (dB)
0	Single Frequency	-39.50	-20	-19.50
78	Single Frequency	-29.17	-20	-9.17
0	Hopping	-39.66	-20	-19.66
78	Hopping	-27.84	-20	-7.84

See figures 3-28 to 3-31 for the plots of the band edge compliance measurements.

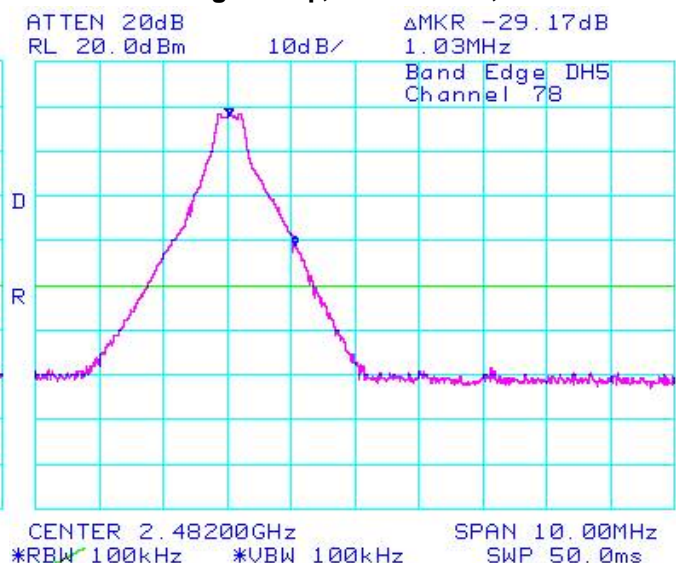
**Figure 3-28: Band Edge Compliance**


Single Freq., Static PRBS, DH5



**Figure 3-29: Band Edge Compliance**

Single Freq., Static PRBS, DH5

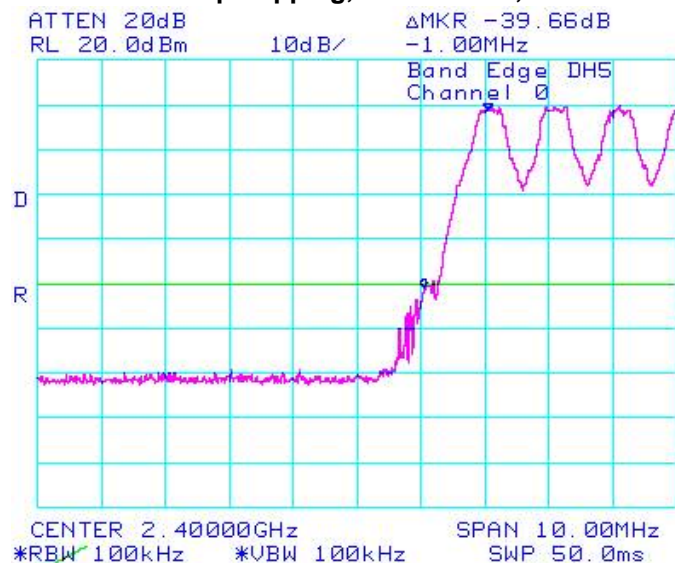


	EMI Test Report for the BlackBerry® smartphone Model RCW41GW <b>APPENDIX 2</b>	
<b>Test Report No.</b> RTS-2341-1003-33	<b>Dates of Test</b> March 25, April 13 - 14 and May 18, 2010	<b>FCC ID:</b> L6ARCW40GW <b>IC:</b> 2503A-RCW40GW

### Bluetooth RF Conducted Emission Test Results cont'd

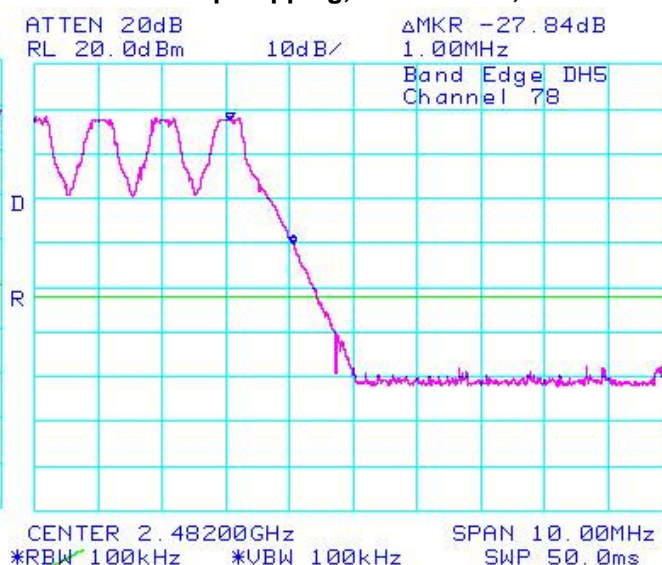
**Figure 3-30: Band Edge Compliance**

**Freq. Hopping, Static PRBS, DH5**



**Figure 3-31: Band Edge Compliance**

**Freq. Hopping, Static PRBS, DH5**




Using pattern type “Static PRBS” and packet type “3-DH5” during the measurements.

Bluetooth Channel	Operating Mode	Measured Level (dBc)	Limit (dBc)	Margin (dB)
0	Single Frequency	-37.67	-20	-17.67
78	Single Frequency	-36.67	-20	-16.67
0	Hopping	-38.16	-20	-18.16
78	Hopping	-37.17	-20	-17.17

See figures 3-32 to 3-35 for the plots of the band edge compliance measurements.

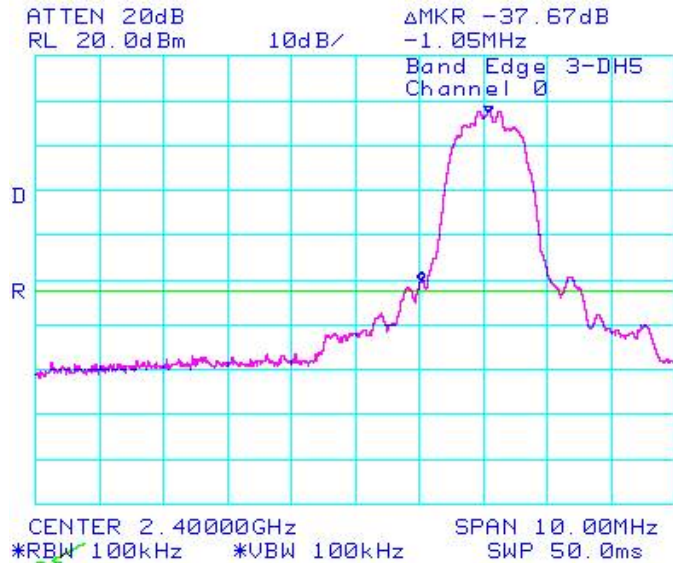


	EMI Test Report for the BlackBerry® smartphone Model RCW41GW <b>APPENDIX 2</b>	
Test Report No. RTS-2341-1003-33	Dates of Test March 25, April 13 - 14 and May 18, 2010	FCC ID: L6ARCW40GW IC: 2503A-RCW40GW

## Bluetooth RF Conducted Emission Test Results cont'd

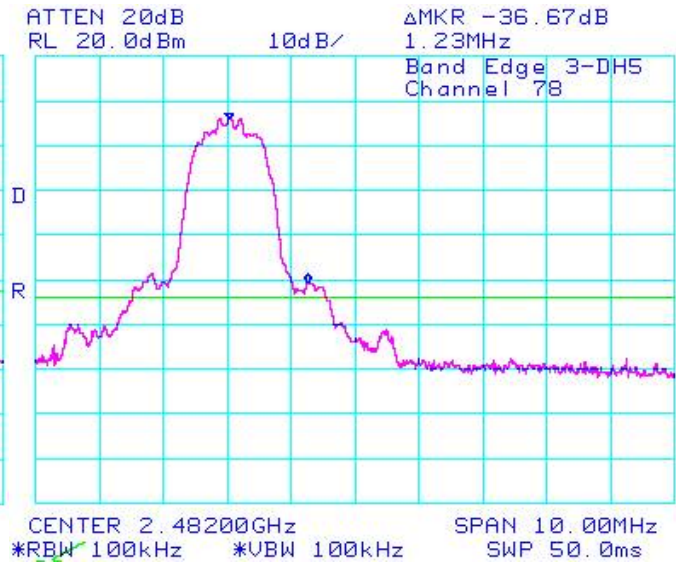
**Figure 3-32: Band Edge Compliance**

**Single Freq., Static PRBS, 3-DH5**



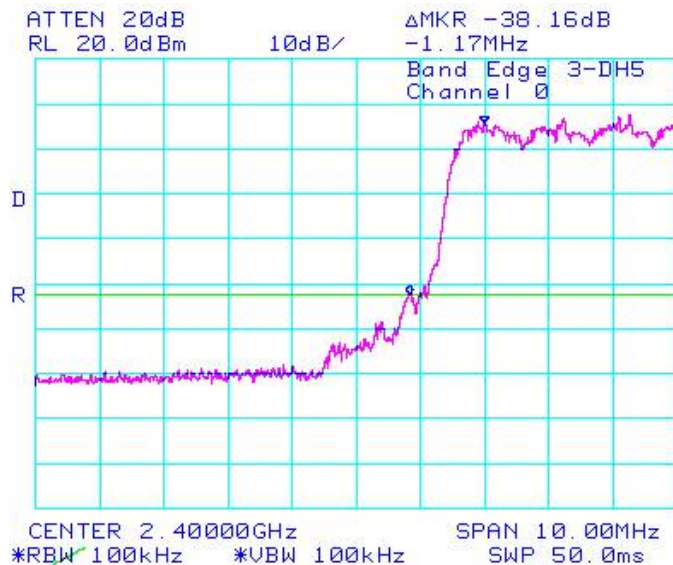
**Figure 3-33: Band Edge Compliance**

**Single Freq., Static PRBS, 3-DH5**



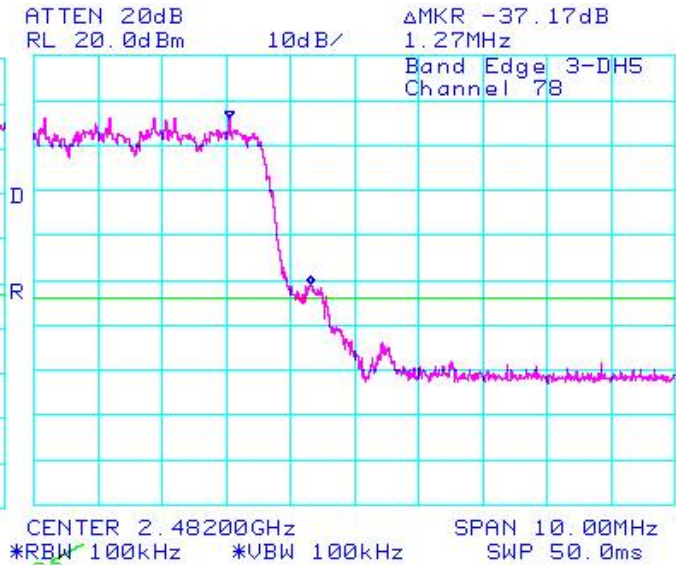
**Figure 3-34: Band Edge Compliance**


**Freq. Hopping, Static PRBS, 3-DH5**



**Figure 3-35: Band Edge Compliance**

**Freq. Hopping, Static PRBS, 3-DH5**



	EMI Test Report for the BlackBerry® smartphone Model RCW41GW <b>APPENDIX 2</b>	
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### Bluetooth RF Conducted Emission Test Results cont'd


#### **Spurious RF Conducted Emissions**

The EUT met the requirements of the spurious RF conducted emissions as per 47 CFR 15.247(c) and RSS-210. Low channel (0), mid channel (39) and high channel (78) were measured. Bluetooth was operating in single frequency and hopping mode. A reference offset of 12.4 dB was applied to the spectrum analyzer reference level for the attenuators and coaxial cable loss in the test circuit.

Using pattern type "Static PRBS" and packet type "DH5" during the measurements.

Bluetooth Channel	Channel Power (dBm)	Max. Measured Level (dBm)	Max. Measured Level from carrier (dBc)	Limit (dBc)
0	9.83	-33.00	-42.83	-20
39	9.83	-37.67	-47.50	-20
78	8.50	-39.50	-48.00	-20
Hopping mode	8.50	-37.50	-46.00	-20

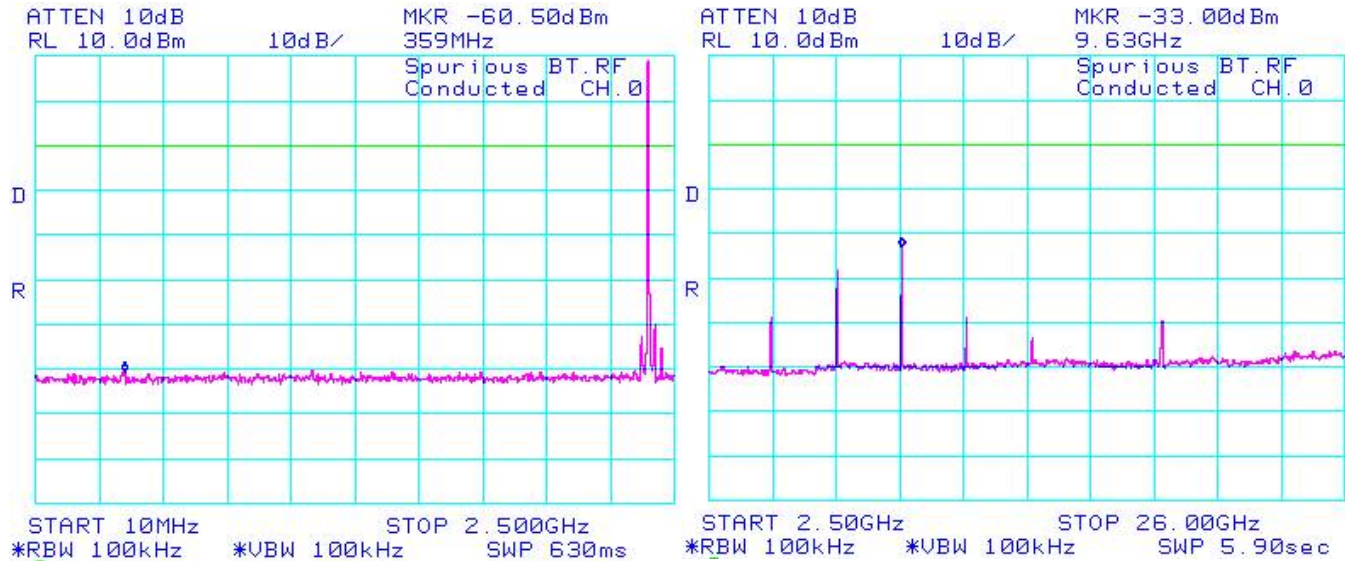
See figures 2-36 to 2-39 for the plots of the spurious RF conducted emissions.

	EMI Test Report for the BlackBerry® smartphone Model RCW41GW <b>APPENDIX 2</b>	
<b>Test Report No.</b> RTS-2341-1003-33	<b>Dates of Test</b> March 25, April 13 - 14 and May 18, 2010	<b>FCC ID:</b> L6ARCW40GW <b>IC:</b> 2503A-RCW40GW

## Bluetooth RF Conducted Emission Test Results cont'd

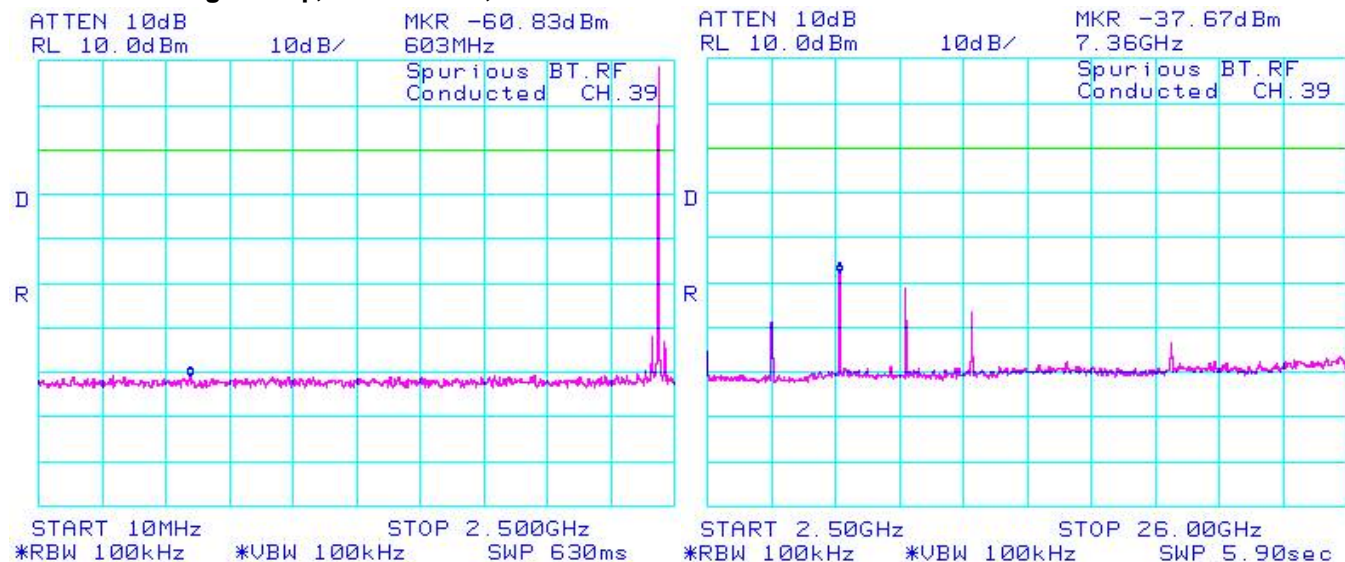
**Figure 2-36: Spurious RF Conducted Emissions**


**Single Freq., Static PRBS, DH5,**



**Figure 2-37: Spurious RF Conducted Emissions**

**Single Freq., Static PRBS, DH5**

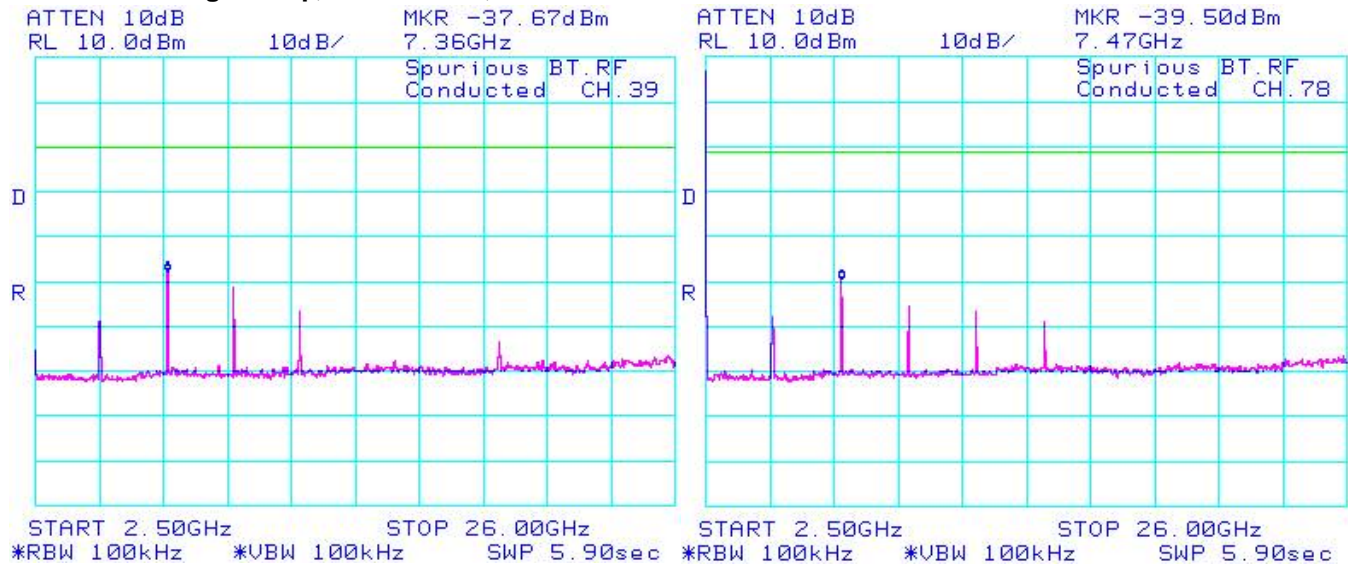


	EMI Test Report for the BlackBerry® smartphone Model RCW41GW <b>APPENDIX 2</b>	
<b>Test Report No.</b> RTS-2341-1003-33	<b>Dates of Test</b> March 25, April 13 - 14 and May 18, 2010	<b>FCC ID:</b> L6ARCW40GW <b>IC:</b> 2503A-RCW40GW

## Bluetooth RF Conducted Emission Test Results cont'd

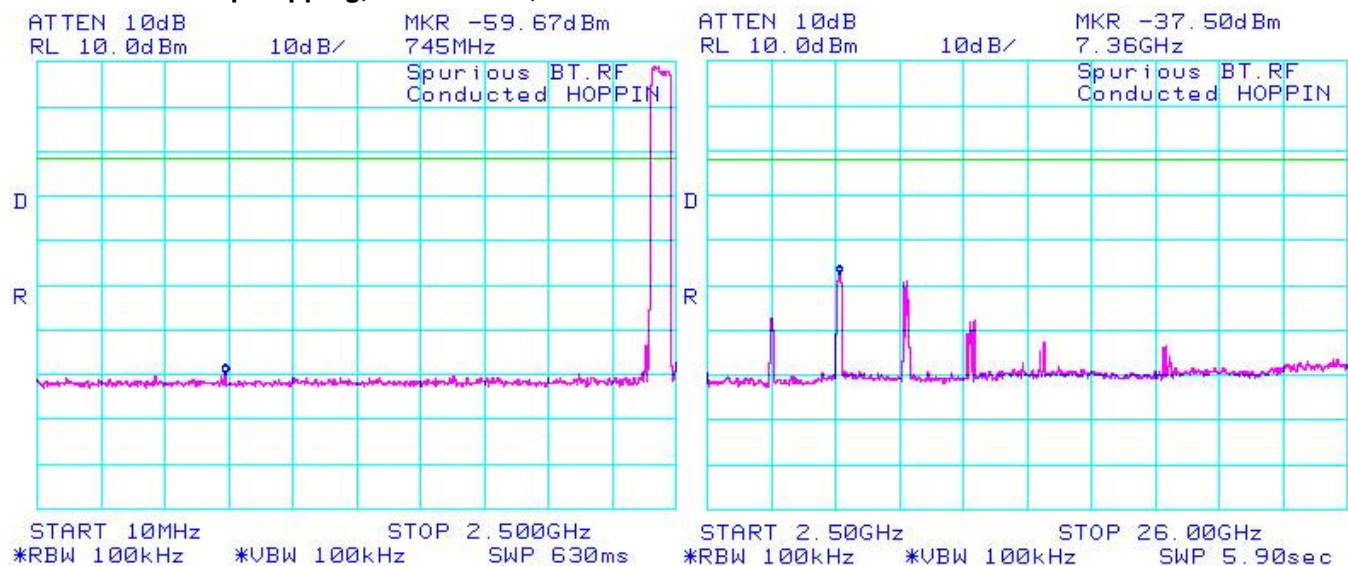
**Figure 2-38: Spurious RF Conducted Emissions**

**Single Freq., Static PRBS, DH5**




**Figure 2-39: Spurious RF Conducted Emissions**

**Freq. Hopping, Static PRBS, DH5**






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<b>Test Report No.</b> RTS-2341-1003-33	<b>Dates of Test</b> March 25, April 13 - 14 and May 18, 2010	FCC ID: L6ARCW40GW IC: 2503A-RCW40GW

### Bluetooth RF Conducted Emission Test Results cont'd

Using pattern type "Static PRBS" and packet type "3-DH5" during the measurements.

Bluetooth Channel	Channel Power (dBm)	Max. Measured Level (dBm)	Max. Measured Level from carrier (dBc)	Limit (dBc)
0	9.33	-36.83	-46.16	-20
39	9.17	-41.17	-50.34	-20
78	8.00	-42.17	-50.17	-20
Hopping mode	8.00	-40.67	-48.67	-20

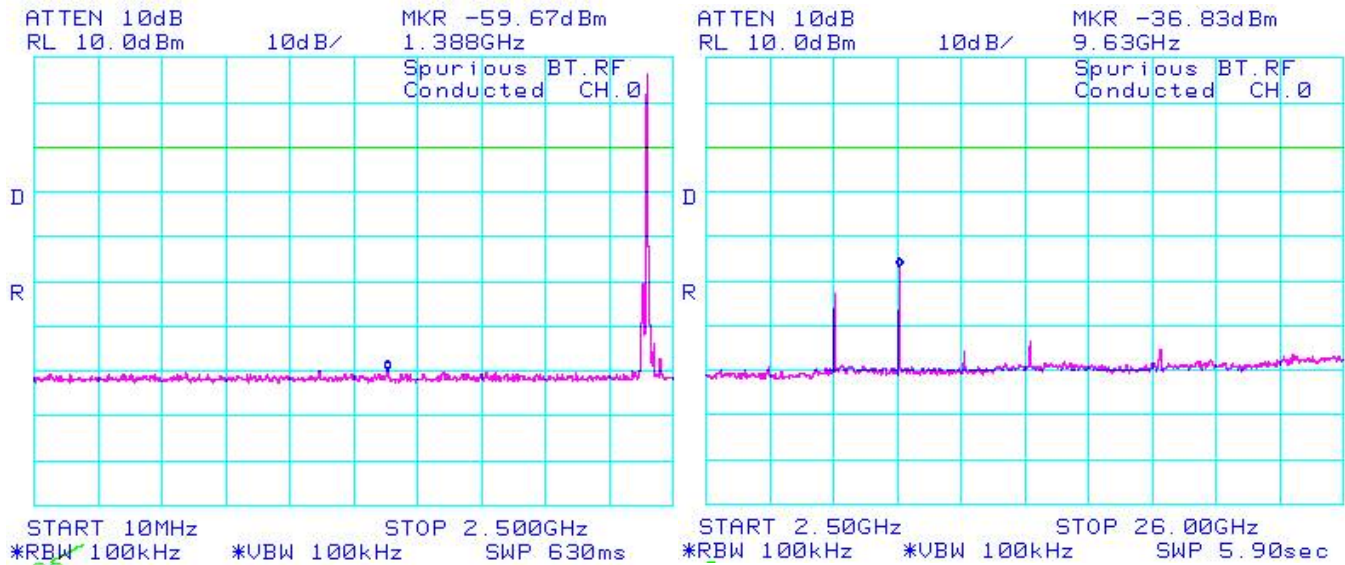
See figures 3-40 to 3-43 for the plots of the spurious RF conducted emissions.

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<b>Test Report No.</b> RTS-2341-1003-33	<b>Dates of Test</b> March 25, April 13 - 14 and May 18, 2010	<b>FCC ID:</b> L6ARCW40GW <b>IC:</b> 2503A-RCW40GW

### Bluetooth RF Conducted Emission Test Results cont'd

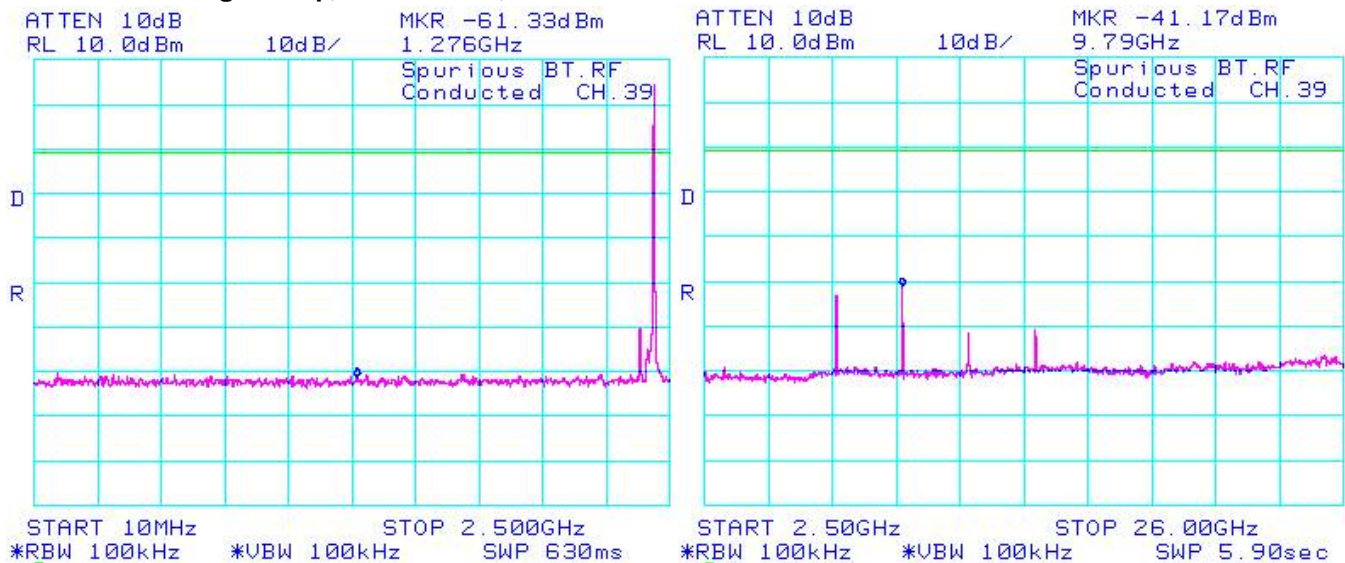
**Figure 3-40 : Spurious RF Conducted Emissions**


**Single Freq., Static PRBS, 3-DH5**



**Figure 3-41: Spurious RF Conducted Emissions**

**Single Freq., Static PRBS, 3-DH5**

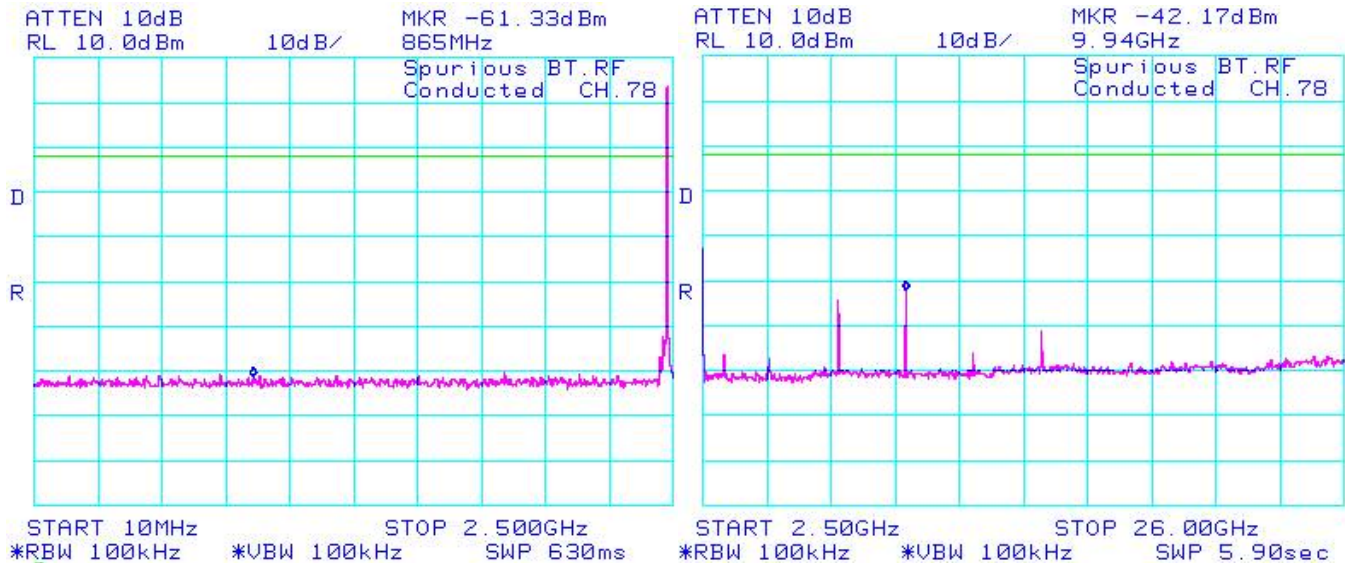


	EMI Test Report for the BlackBerry® smartphone Model RCW41GW <b>APPENDIX 2</b>	
<b>Test Report No.</b> RTS-2341-1003-33	<b>Dates of Test</b> March 25, April 13 - 14 and May 18, 2010	<b>FCC ID:</b> L6ARCW40GW <b>IC:</b> 2503A-RCW40GW

### Bluetooth RF Conducted Emission Test Results cont'd

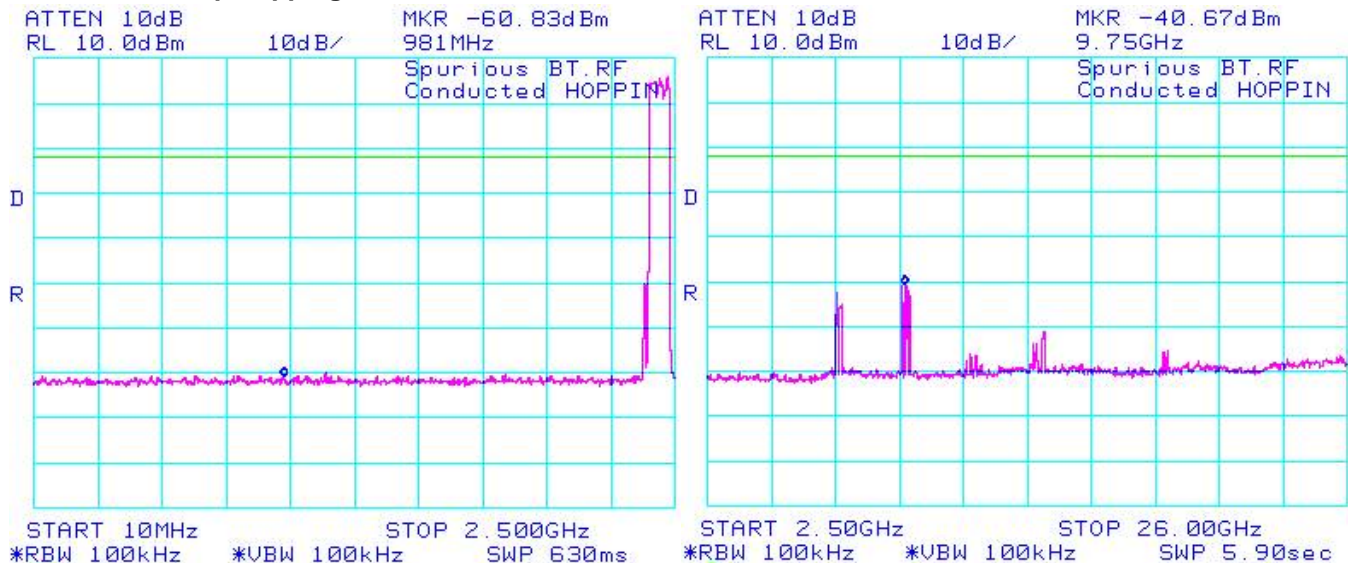
**Figure 3-42: Spurious RF Conducted Emissions**


**Single Freq., Static PRBS, 3-DH5**



**Figure 3-43 : Spurious RF Conducted Emissions**


**Freq. Hopping, Static PRBS, 3-DH5**



	EMI Test Report for the BlackBerry® smartphone Model RCW41GW <b>APPENDIX 3</b>	
<b>Test Report No.</b> RTS-2341-1003-33	<b>Dates of Test</b> March 25, April 13 - 14 and May 18, 2010	FCC ID: L6ARCW40GW IC: 2503A-RCW40GW

## APPENDIX 3 – 802.11b/g/n CONDUCTED EMISSIONS TEST DATA/PLOTS



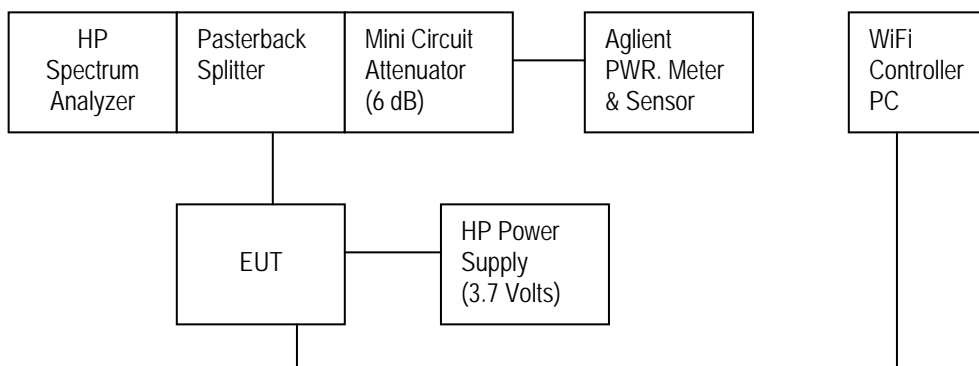
	EMI Test Report for the BlackBerry® smartphone Model RCW41GW <b>APPENDIX 3</b>	
<b>Test Report No.</b> RTS-2341-1003-33	<b>Dates of Test</b> March 25, April 13 - 14 and May 18, 2010	<b>FCC ID:</b> L6ARCW40GW <b>IC:</b> 2503A-RCW40GW

### **802.11b/g/n RF Conducted Emission Test Results**

**802.11b/g/n Target Power Output for all the recorded measurements shown below:**

Channel	Frequency	802.11b		802.11g		802.11n	
		Data Rate	Power output (dBm)	Data Rate	Power output (dBm)	Data Rate	Power output (dBm)
1	2412 MHz	1 Mbps	18.0	6 Mbps	14.0	MCS 0	15.0
		5.5 Mbps	18.0	24 Mbps	14.0	MCS 4	14.5
		11 Mbps	18.0	54 Mbps	13.0	MCS 7	12.0
6	2437 MHz	1 Mbps	18.0	6 Mbps	17.0	MCS 0	17.0
		5.5 Mbps	18.0	24 Mbps	14.5	MCS 4	14.5
		11 Mbps	18.0	54 Mbps	13.0	MCS 7	12.0
11	2462 MHz	1 Mbps	18.0	6 Mbps	14.0	MCS 0	15.0
		5.5 Mbps	18.0	24 Mbps	14.0	MCS 4	14.5
		11 Mbps	18.0	54 Mbps	13.0	MCS 7	12.0

### **Test Setup Diagram**




A reference offset of 20.4 dB was applied to the spectrum analyzer and 6.6 dB was applied to the Power Meter reference level for the attenuators and coaxial cable loss in the test circuit.

Date of test: April 13 and 14, 2010

The measurements on the BlackBerry® smartphone were performed by Maurice Battler.

The environmental test conditions were:

Temperature:	22-24 °C
Pressure:	1027-1030 mb
Relative Humidity:	22-23 %

	EMI Test Report for the BlackBerry® smartphone Model RCW41GW <b>APPENDIX 3</b>	
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### 802.11b/g/n RF Conducted Emission Test Results cont'd

#### **6 dB Bandwidth**

The EUT met the requirements of the 6 dB bandwidth as per 47 CFR 15.247(a)(2) and RSS-210. Channels 1, 6 and 11 were measured at 1 Mbps, 5.5 Mbps, and 11Mbps each for 802.11b mode, 6 Mbps, 24 Mbps, and 54 Mbps each for 802.11g mode, and MCS 0, 4, and 7 for 802.11n mode.

Channel	Data Rate	Limit (kHz)	Measured Level (MHz)
1	1 Mbps	≥ 500	10.10
	5.5 Mbps	≥ 500	10.67
	11 Mbps	≥ 500	11.10
	6 Mbps	≥ 500	16.53
	24 Mbps	≥ 500	16.57
	54 Mbps	≥ 500	16.60
	MCS 0	≥ 500	17.77
	MCS 4	≥ 500	17.73
	MCS 7	≥ 500	17.77
6	1 Mbps	≥ 500	10.10
	5.5 Mbps	≥ 500	10.13
	11 Mbps	≥ 500	10.90
	6 Mbps	≥ 500	16.57
	24 Mbps	≥ 500	16.60
	54 Mbps	≥ 500	16.60
	MCS 0	≥ 500	17.37
	MCS 4	≥ 500	17.77
	MCS 7	≥ 500	17.70
11	1 Mbps	≥ 500	10.10
	5.5 Mbps	≥ 500	10.77
	11 Mbps	≥ 500	11.17
	6 Mbps	≥ 500	16.37
	24 Mbps	≥ 500	16.57
	54 Mbps	≥ 500	16.60
	MCS 0	≥ 500	16.90
	MCS 4	≥ 500	17.70
	MCS 7	≥ 500	<b>17.80</b>

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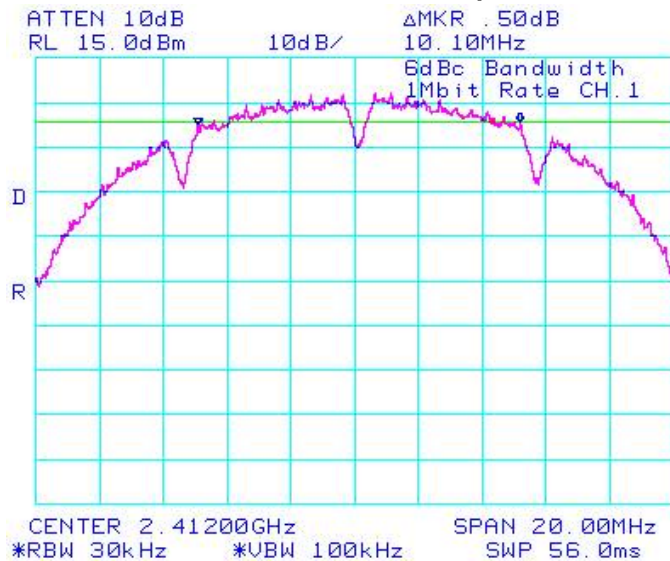
	EMI Test Report for the BlackBerry® smartphone Model RCW41GW <b>APPENDIX 3</b>	
<b>Test Report No.</b> RTS-2341-1003-33	<b>Dates of Test</b> March 25, April 13 - 14 and May 18, 2010	<b>FCC ID:</b> L6ARCW40GW <b>IC:</b> 2503A-RCW40GW

### 802.11b/g/n RF Conducted Emission Test Results cont'd

See figures 4-1 to 4-9 for the plots of the 6 dB bandwidth measurements for Channels 1, 6, and 11, at 1 Mbps each for 802.11b mode, 6 Mbps each for 802.11g mode, and MCS 0 each for 802.11n mode.

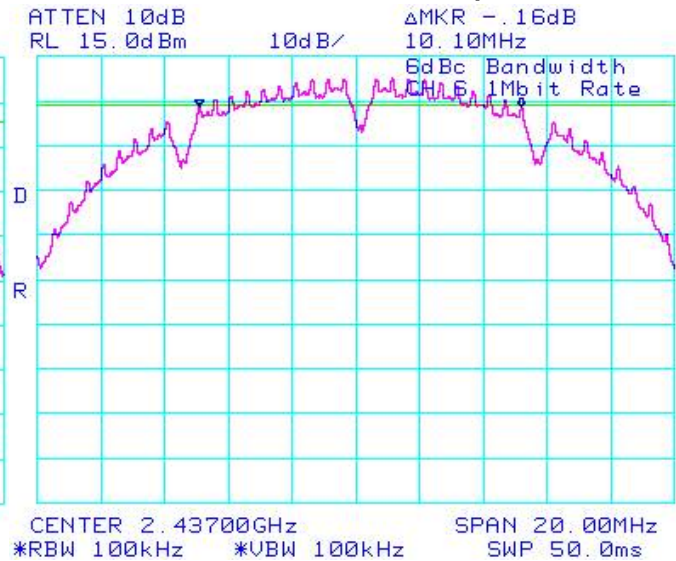
**Figure 4-1: 6 dB Bandwidth**

**802.11b, Channel 1, 1 Mbps**



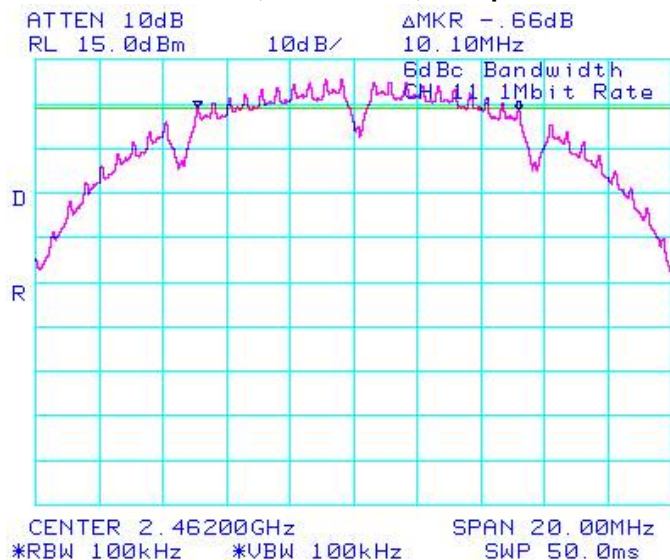
**Figure 4-2: 6 dB Bandwidth**

**802.11b, Channel 6, 1 Mbps**



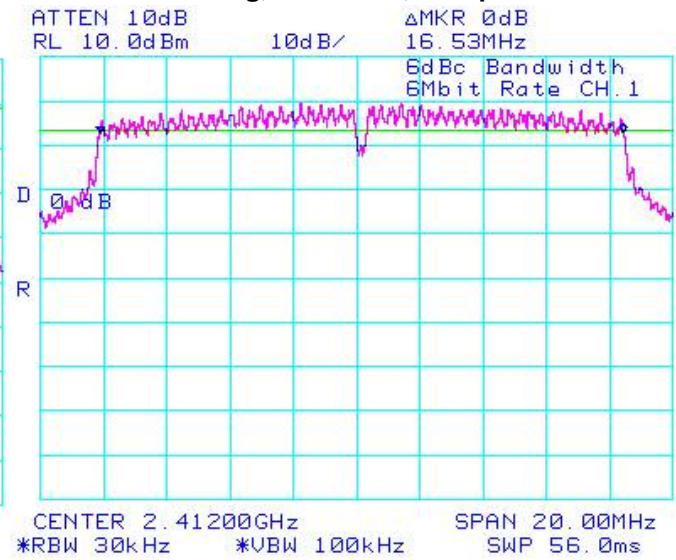
**Figure 4-3: 6 dB Bandwidth**


**802.11b, Channel 11, 1 Mbps**



**Figure 4-4: 6 dB Bandwidth**

**802.11g, Channel 1, 6 Mbps**

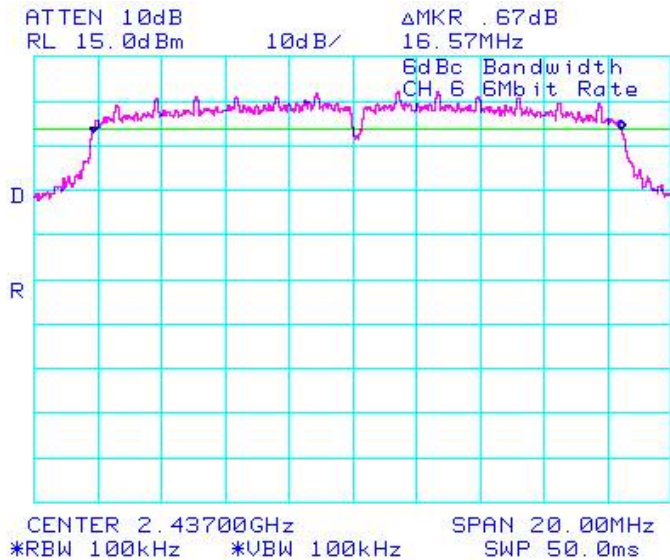


	EMI Test Report for the BlackBerry® smartphone Model RCW41GW <b>APPENDIX 3</b>	
<b>Test Report No.</b> RTS-2341-1003-33	<b>Dates of Test</b> March 25, April 13 - 14 and May 18, 2010	<b>FCC ID:</b> L6ARCW40GW <b>IC:</b> 2503A-RCW40GW

## 802.11b/g/n RF Conducted Emission Test Results cont'd

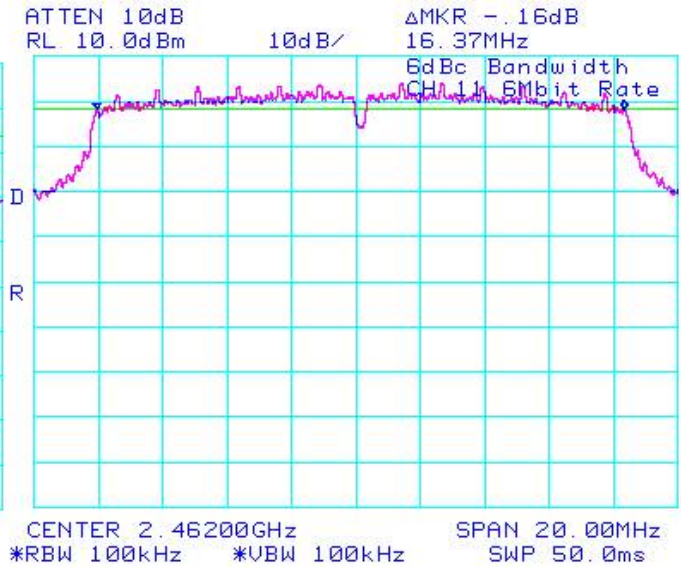
**Figure 4-5: 6 dB Bandwidth**

**802.11g, Channel 6, 6 Mbps**



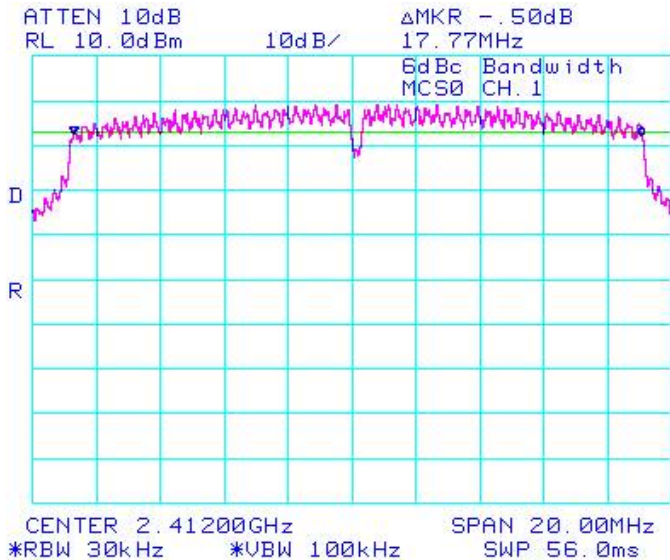
**Figure 4-6: 6 dB Bandwidth**

**802.11g, Channel 11, 6 Mbps**



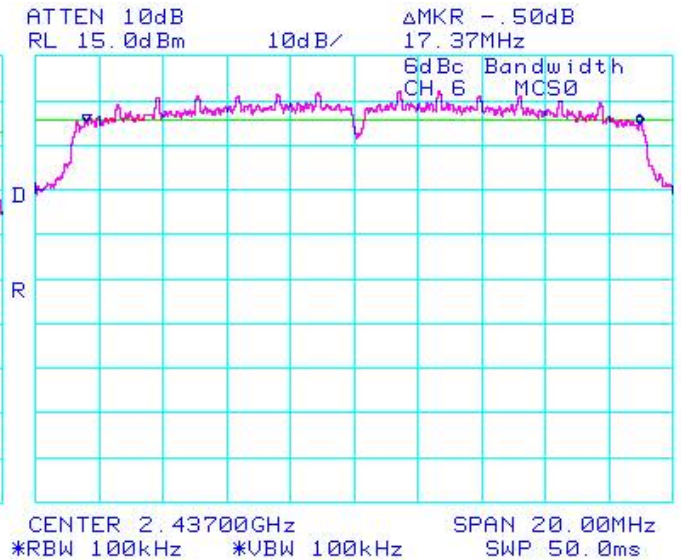
**Figure 4-7: 6 dB Bandwidth**


**802.11n, Channel 1, MCS 0**



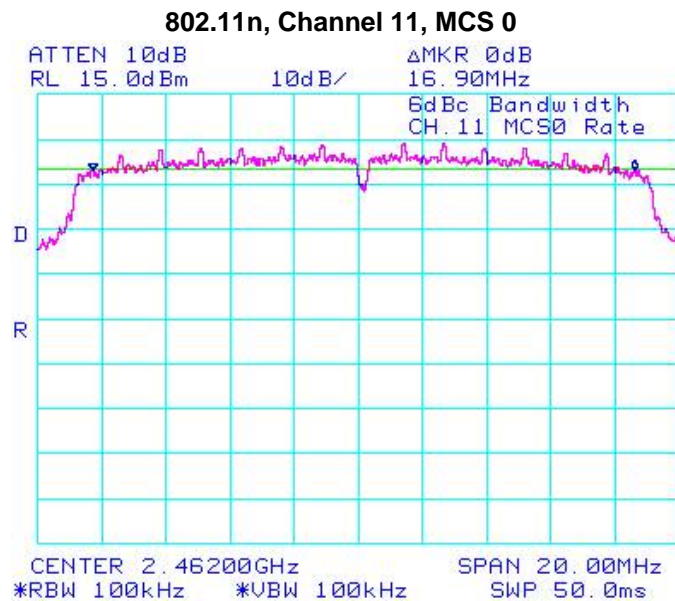
**Figure 4-8: 6 dB Bandwidth**

**802.11n, Channel 6, MCS 0**




	EMI Test Report for the BlackBerry® smartphone Model RCW41GW <b>APPENDIX 3</b>	
<b>Test Report No.</b> RTS-2341-1003-33	<b>Dates of Test</b> March 25, April 13 - 14 and May 18, 2010	<b>FCC ID:</b> L6ARCW40GW <b>IC:</b> 2503A-RCW40GW

**Figure 4-9: 6 dB Bandwidth**





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### 802.11b/g/n RF Conducted Emission Test Results cont'd

#### **Maximum Conducted Output Power**

The EUT met the requirements of the maximum conducted output power of class 2 as per 47 CFR 15.247(b)(3) and RSS-210. Channels 1, 6 and 11 were measured at 1 Mbps, 5.5 Mbps, and 11 Mbps each for 802.11b mode, 6 Mbps, 24 Mbps, and 54 Mbps each for 802.11g mode, and MCS 0, 4 and 7 for 802.11n mode using an Aglient power meter, model N1911A with model N1921A power sensor. A reference offset of 18.4 dB was applied to the power meter reference level for the coaxial cable loss and attenuators in the test circuit.


Channel	Data Rate	Class 2 Limit (W)	Measured Level (dBm)	Measured Level (mW)
1	1 Mbps	< 1.00	18.19	65.92
	5.5 Mbps	< 1.00	18.00	63.10
	11 Mbps	< 1.00	18.00	63.10
	6 Mbps	< 1.00	14.25	26.61
	24 Mbps	< 1.00	14.10	25.70
	54 Mbps	< 1.00	12.00	15.85
	MCS 0	< 1.00	13.95	24.83
	MCS 4	< 1.00	14.08	25.59
	MCS 7	< 1.00	11.90	15.49
6	1 Mbps	< 1.00	18.13	65.01
	5.5 Mbps	< 1.00	18.10	64.57
	11 Mbps	< 1.00	18.10	64.57
	6 Mbps	< 1.00	17.42	55.21
	24 Mbps	< 1.00	14.00	25.12
	54 Mbps	< 1.00	11.50	14.13
	MCS 0	< 1.00	14.03	25.29
	MCS 4	< 1.00	14.14	25.94
	MCS 7	< 1.00	11.00	12.59



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802.11b/g/n RF Conducted Emission Test Results cont'd

Channel	Data Rate	Class 2 Limit (W)	Measured Level (dBm)	Measured Level (mW)
11	1 Mbps	< 1.00	<b>18.46</b>	<b>70.15</b>
	5.5 Mbps	< 1.00	18.35	68.39
	11 Mbps	< 1.00	17.95	62.37
	6 Mbps	< 1.00	15.03	31.84
	24 Mbps	< 1.00	14.50	28.18
	54 Mbps	< 1.00	12.50	17.78
	MCS 0	< 1.00	14.95	31.26
	MCS 4	< 1.00	15.07	32.14
	MCS 7	< 1.00	11.50	14.13

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### 802.11b/g/n RF Conducted Emission Test Results cont'd

#### **Band Edge Compliance**

The EUT met the requirements of the band edge compliance as per 47 CFR 15.247(c) and RSS-210. Channels 1 and 11 were measured at 1 Mbps, 5.5 Mbps, and 11 Mbps each for 802.11b mode, 6 Mbps, 24 Mbps, and 54 Mbps each for 802.11g mode, and MCS 0, 4 and 7 for 802.11n mode.

Channel	Data Rate	Limit (dBc)	Measured Level (dBc)	Margin (dBc)
1	1 Mbps	< -20	-41.50	-21.50
	5.5 Mbps	< -20	-42.33	-22.33
	11 Mbps	< -20	-42.83	-22.83
	6 Mbps	< -20	-26.66	-6.66
	24 Mbps	< -20	-28.17	-8.17
	54 Mbps	< -20	-29.66	-9.66
	MCS 0	< -20	-25.33	-5.33
	MCS 4	< -20	-27.83	-7.83
	MCS 7	< -20	-28.50	-8.50
11	1 Mbps	< -20	-56.67	-36.67
	5.5 Mbps	< -20	-56.84	-36.84
	11 Mbps	< -20	-57.17	-37.17
	6 Mbps	< -20	-41.00	-21.00
	24 Mbps	< -20	-42.67	-22.67
	54 Mbps	< -20	-46.67	-26.67
	MCS 0	< -20	-38.66	-18.66
	MCS 4	< -20	-42.16	-22.16
	MCS 7	< -20	-48.33	-28.33

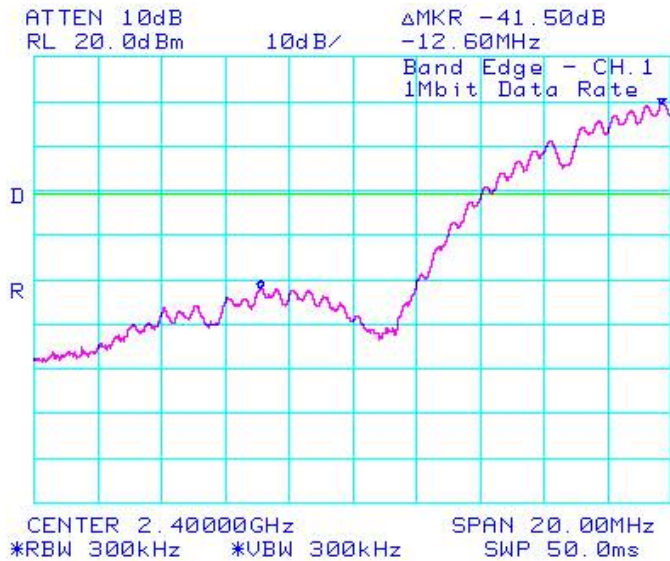
See figures 4-10 to 4-15 for the plots of the band edge compliance measurements for Channels 1 and 11, at 1 Mbps each for 802.11b mode, 6 Mbps each for 802.11g mode, and MCS 0 each for 802.11n mode.

	EMI Test Report for the BlackBerry® smartphone Model RCW41GW <b>APPENDIX 3</b>	
Test Report No. RTS-2341-1003-33	Dates of Test March 25, April 13 - 14 and May 18, 2010	FCC ID: L6ARCW40GW IC: 2503A-RCW40GW

## 802.11b/g/n RF Conducted Emission Test Results cont'd

**Figure 4-10: Band Edge Compliance**

**802.11b, Channel 1, 1 Mbps**



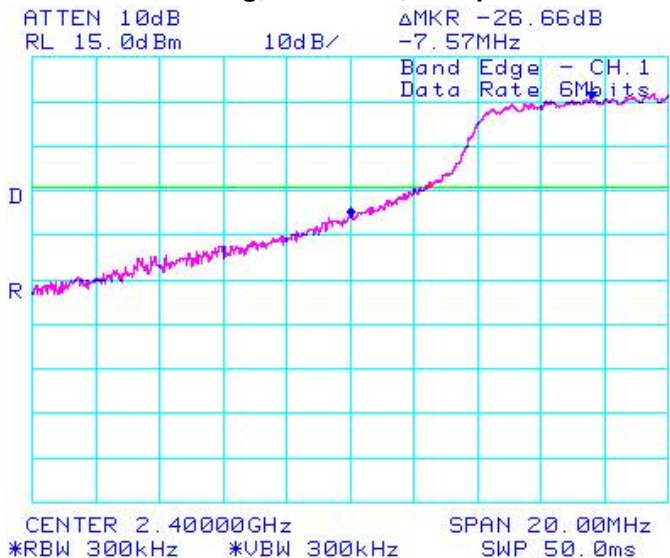
**Figure 4-11: Band Edge Compliance**

**802.11b, Channel 11, 1 Mbps**



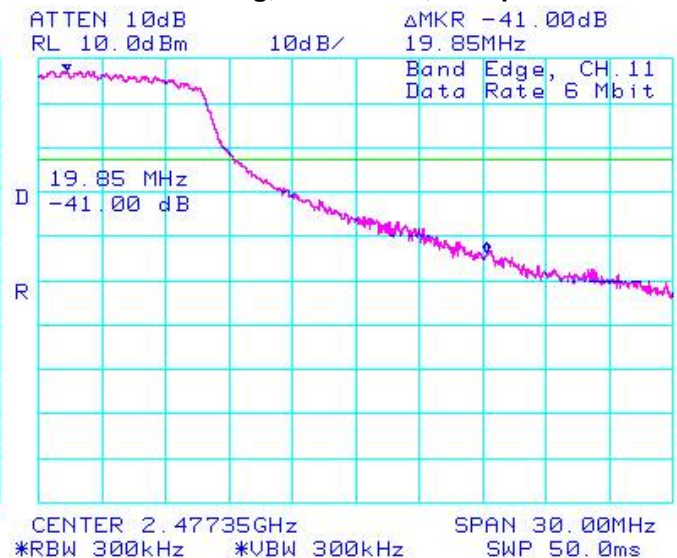
**Figure 4-12: Band Edge Compliance**


**802.11g, Channel 1, 6 Mbps**



**Figure 4-13: Band Edge Compliance**

**802.11g, Channel 11, 6 Mbps**

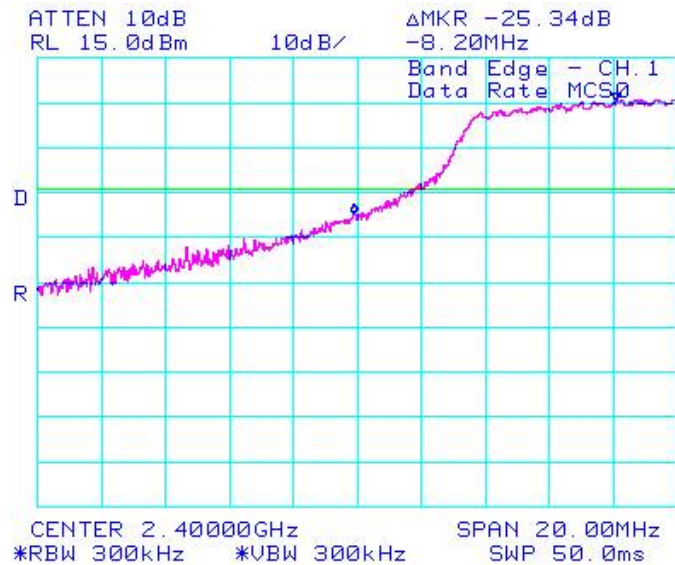


	EMI Test Report for the BlackBerry® smartphone Model RCW41GW <b>APPENDIX 3</b>	
<b>Test Report No.</b> RTS-2341-1003-33	<b>Dates of Test</b> March 25, April 13 - 14 and May 18, 2010	<b>FCC ID:</b> L6ARCW40GW <b>IC:</b> 2503A-RCW40GW

## 802.11b/g/n RF Conducted Emission Test Results cont'd

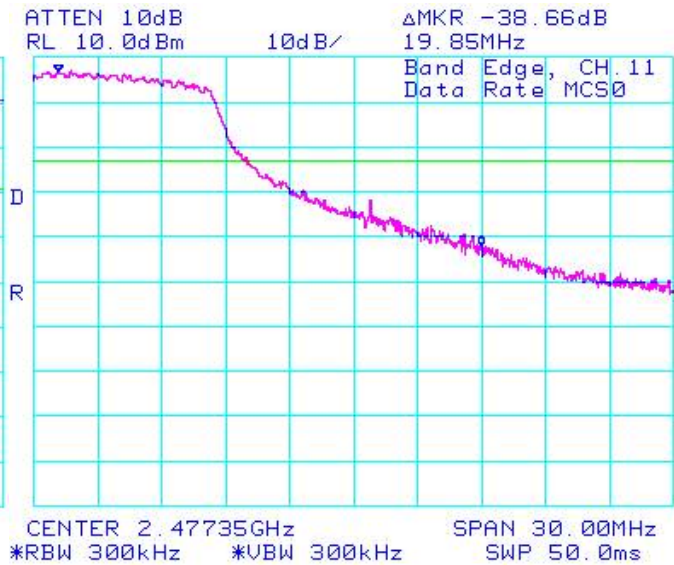
**Figure 4-14: Band Edge Compliance**


**802.11n, Channel 1, MCS 0**



**Figure 4-15: Band Edge Compliance**

**802.11n, Channel 11, MCS 0**



	EMI Test Report for the BlackBerry® smartphone Model RCW41GW <b>APPENDIX 3</b>	
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### 802.11b/g/n RF Conducted Emission Test Results cont'd


#### **Peak Power Spectral Density**

The EUT met the requirements of the peak power spectral density as per 47 CFR 15.247(d) and RSS-210. Channels 1, 6 and 11 were measured at 1 Mbps, 5.5 Mbps, and 11 Mbps each for 802.11b mode, 6 Mbps, 24 Mbps, and 54 Mbps each for 802.11g mode, and MCS 0, 4, and 7 for 802.11n mode.

Channel	Data Rate	Limit (dBm)	Measured Level (dBm)	Margin (dBm)
1	1 Mbps	< 8.00	-2.00	-10.00
	5.5 Mbps	< 8.00	-3.50	-11.50
	11 Mbps	< 8.00	-2.67	-10.67
	6 Mbps	< 8.00	-9.17	-17.17
	24 Mbps	< 8.00	-8.83	-16.83
	54 Mbps	< 8.00	-10.67	-18.67
	MCS 0	< 8.00	-8.50	-16.50
	MCS 4	< 8.00	-9.00	-17.00
	MCS 7	< 8.00	-11.67	-19.67
6	1 Mbps	< 8.00	-2.00	-10.00
	5.5 Mbps	< 8.00	-3.50	-11.50
	11 Mbps	< 8.00	-2.83	-10.83
	6 Mbps	< 8.00	-6.00	-14.00
	24 Mbps	< 8.00	-8.33	-16.33
	54 Mbps	< 8.00	-10.33	-18.33
	MCS 0	< 8.00	-5.17	-13.17
	MCS 4	< 8.00	-8.83	-16.83
	MCS 7	< 8.00	-11.17	-19.17
11	1 Mbps	< 8.00	-1.83	-9.83
	5.5 Mbps	< 8.00	-3.33	-11.33
	11 Mbps	< 8.00	-2.67	-10.67
	6 Mbps	< 8.00	-8.50	-16.50
	24 Mbps	< 8.00	-8.33	-16.33
	54 Mbps	< 8.00	-10.17	-18.17
	MCS 0	< 8.00	-8.00	-16.00
	MCS 4	< 8.00	-8.83	-16.83
	MCS 7	< 8.00	-11.17	-19.17

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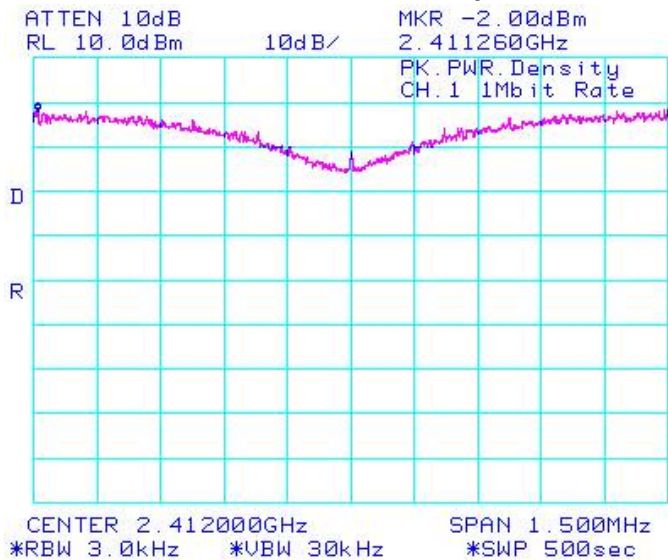


	EMI Test Report for the BlackBerry® smartphone Model RCW41GW <b>APPENDIX 3</b>	
<b>Test Report No.</b> RTS-2341-1003-33	<b>Dates of Test</b> March 25, April 13 - 14 and May 18, 2010	<b>FCC ID:</b> L6ARCW40GW <b>IC:</b> 2503A-RCW40GW

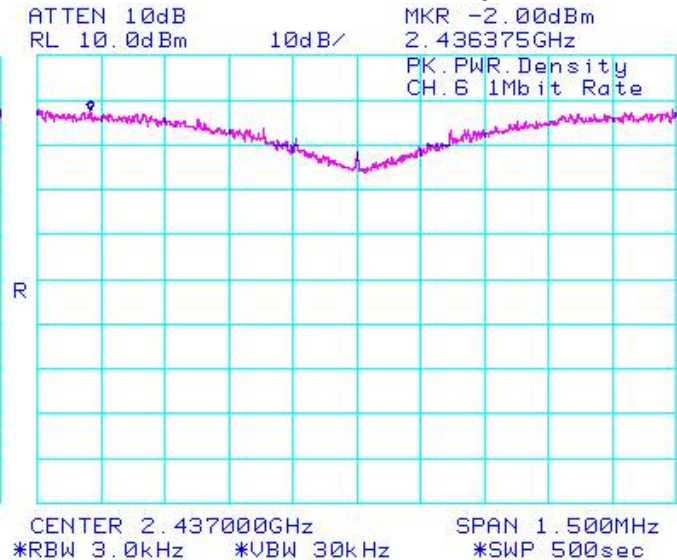
### 802.11b/g/n RF Conducted Emission Test Results cont'd

See figures 4-16 to 4-24 for the plots of the peak power spectral density for Channels 1, 6 and 11, at 1 Mbps each for 802.11b mode, 6 Mbps each for 802.11g mode, and MCS 0 for 802.11n mode.

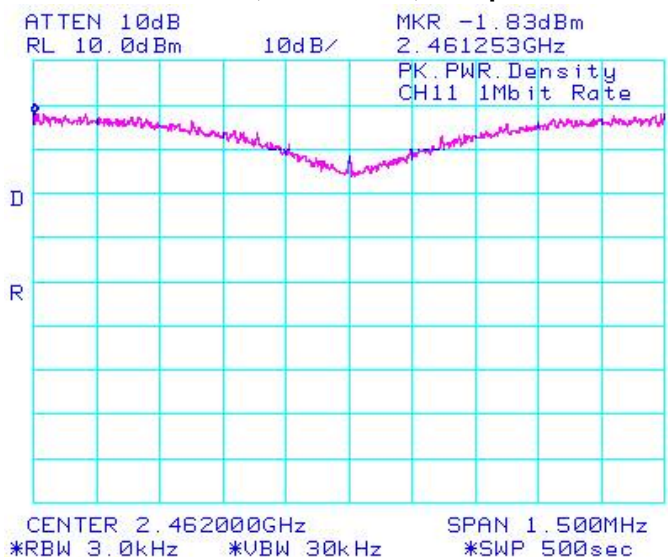
**Figure 4-16: Peak Power Spectral Density**  
**802.11b, Channel 1, 1 Mbps**




**Figure 4-17: Peak Power Spectral Density**  
**802.11b, Channel 6, 1 Mbps**



**Figure 4-18: Peak Power Spectral Density**  
**802.11b, Channel 11, 1 Mbps**

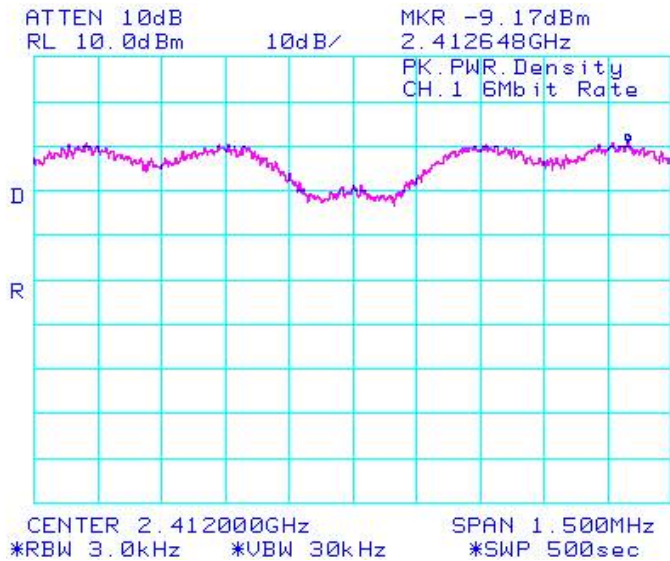




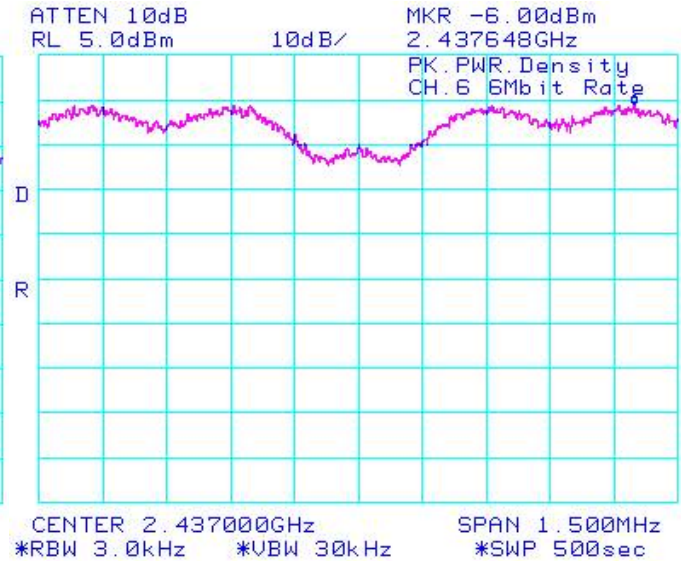
	EMI Test Report for the BlackBerry® smartphone Model RCW41GW <b>APPENDIX 3</b>	
<b>Test Report No.</b> RTS-2341-1003-33	<b>Dates of Test</b> March 25, April 13 - 14 and May 18, 2010	<b>FCC ID:</b> L6ARCW40GW <b>IC:</b> 2503A-RCW40GW

### 802.11b/g/n RF Conducted Emission Test Results cont'd

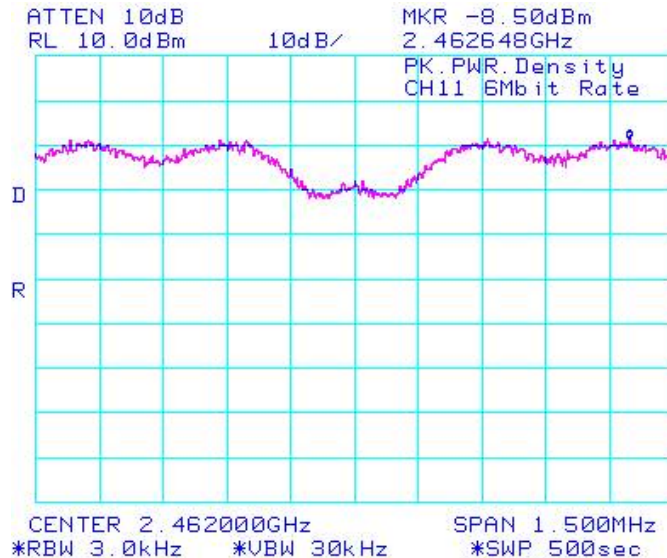
**Figure 4-19: Peak Power Spectral Density**  
**802.11g, Channel 1, 6 Mbps**




**Figure 4-20: Peak Power Spectral Density**  
**802.11g, Channel 6, 6 Mbps**



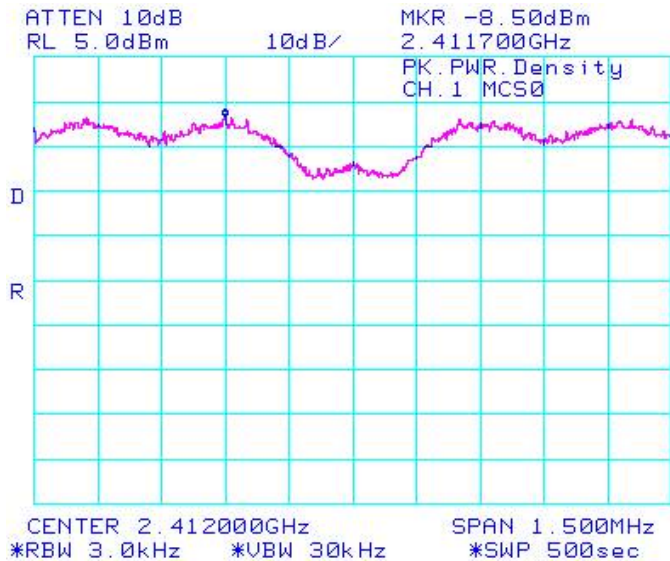
**Figure 4-21: Peak Power Spectral Density**  
**802.11g, Channel 11, 6 Mbps**



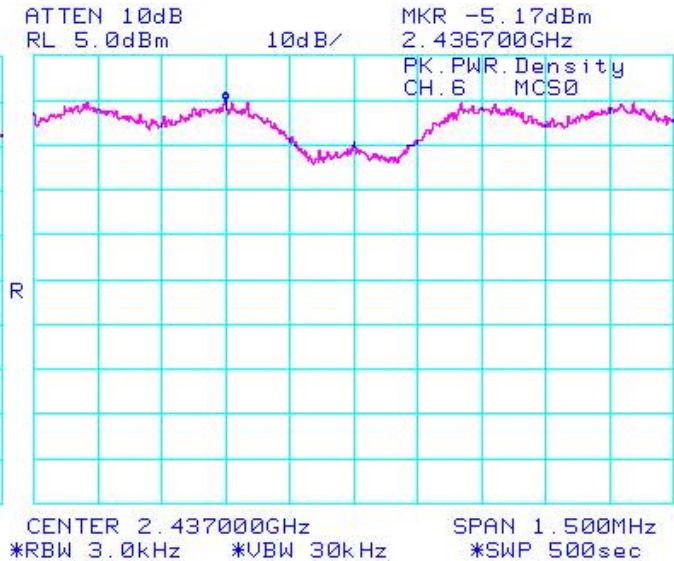
	EMI Test Report for the BlackBerry® smartphone Model RCW41GW <b>APPENDIX 3</b>	
<b>Test Report No.</b> RTS-2341-1003-33	<b>Dates of Test</b> March 25, April 13 - 14 and May 18, 2010	<b>FCC ID:</b> L6ARCW40GW <b>IC:</b> 2503A-RCW40GW

### 802.11b/g/n RF Conducted Emission Test Results cont'd

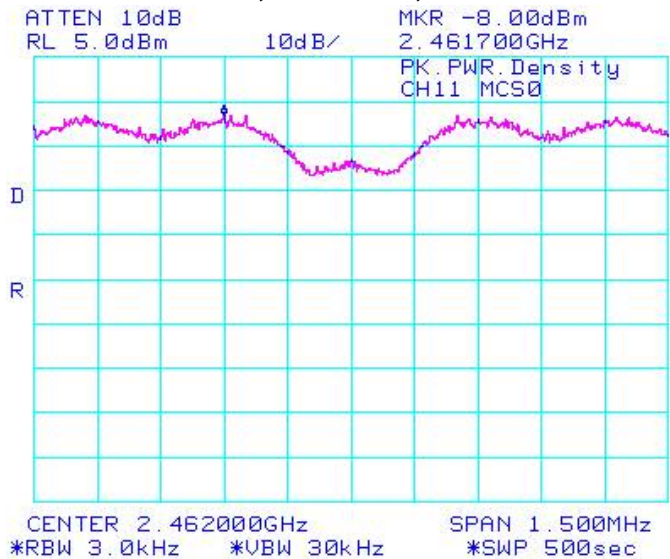
**Figure 4-22: Peak Power Spectral Density**  
**802.11n, Channel 1, MCS 0**




**Figure 4-23: Peak Power Spectral Density**  
**802.11n, Channel 6, MCS 0**



**Figure 4-24: Peak Power Spectral Density**  
**802.11n, Channel 11, MCS 0**




	EMI Test Report for the BlackBerry® smartphone Model RCW41GW <b>APPENDIX 3</b>	
Test Report No. RTS-2341-1003-33	Dates of Test March 25, April 13 - 14 and May 18, 2010	FCC ID: L6ARCW40GW IC: 2503A-RCW40GW

### 802.11b/g/n RF Conducted Emission Test Results cont'd

#### **Spurious RF Conducted Emissions**

The EUT met the requirements of the spurious RF conducted emissions as per 47 CFR 15.247(c) and RSS-210. Channels 1, 6 and 11 were measured at 1 Mbps, 5.5 Mbps, and 11 Mbps each for 802.11b mode, 6 Mbps, 24 Mbps, and 54 Mbps each for 802.11g mode, and MCS 0, 4, and 7 for 802.11n mode. Peak power was measured using an Agilent power meter, model N1911A with model N1921A power sensor. A reference offset of 18.4 dB was applied to the power meter reference level for the coaxial cable loss and attenuators in the test circuit.

Channel	Data Rate	Power (dBm)	Max. Measured Level (dBm)	Max. Measured Level from Carrier (dBc)	Limit (dBc)
1	1 Mbps	18.19	-45.00	-63.19	-20
	5.5 Mbps	18.00	-44.17	-62.17	-20
	11 Mbps	18.00	-42.67	-60.67	-20
	6 Mbps	14.25	-48.33	-62.58	-20
	24 Mbps	14.10	-47.33	-61.43	-20
	54 Mbps	12.00	-46.50	-58.50	-20
	MCS 0	13.95	-46.67	-60.62	-20
	MCS 4	14.08	-46.67	-60.75	-20
	MCS 7	11.90	-48.00	-59.90	-20
6	1 Mbps	18.13	-48.83	-66.96	-20
	5.5 Mbps	18.10	-49.83	-67.93	-20
	11 Mbps	18.10	-42.17	-60.27	-20
	6 Mbps	17.42	-46.83	-64.25	-20
	24 Mbps	14.00	-46.33	-60.33	-20
	54 Mbps	11.50	-48.50	-60.00	-20
	MCS 0	14.03	-46.33	-60.36	-20
	MCS 4	14.14	-45.83	-59.97	-20
	MCS 7	11.00	-49.00	-60.00	-20


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### 802.11b/g/n RF Conducted Emission Test Results cont'd

Channel	Data Rate	Power (dBm)	Max. Measured Level (dBm)	Max. Measured Level from Carrier (dBc)	Limit (dBc)
11	1 Mbps	18.46	-49.50	-67.96	-20
	5.5 Mbps	18.35	-42.50	-60.85	-20
	11 Mbps	17.95	-47.50	-65.45	-20
	6 Mbps	15.03	-46.50	-61.53	-20
	24 Mbps	14.50	-47.00	-61.50	-20
	54 Mbps	12.50	-47.50	-60.00	-20
	MCS 0	14.95	-48.17	-63.12	-20
	MCS 4	15.07	-47.17	-62.24	-20
	MCS 7	11.50	-47.50	-59.00	-20

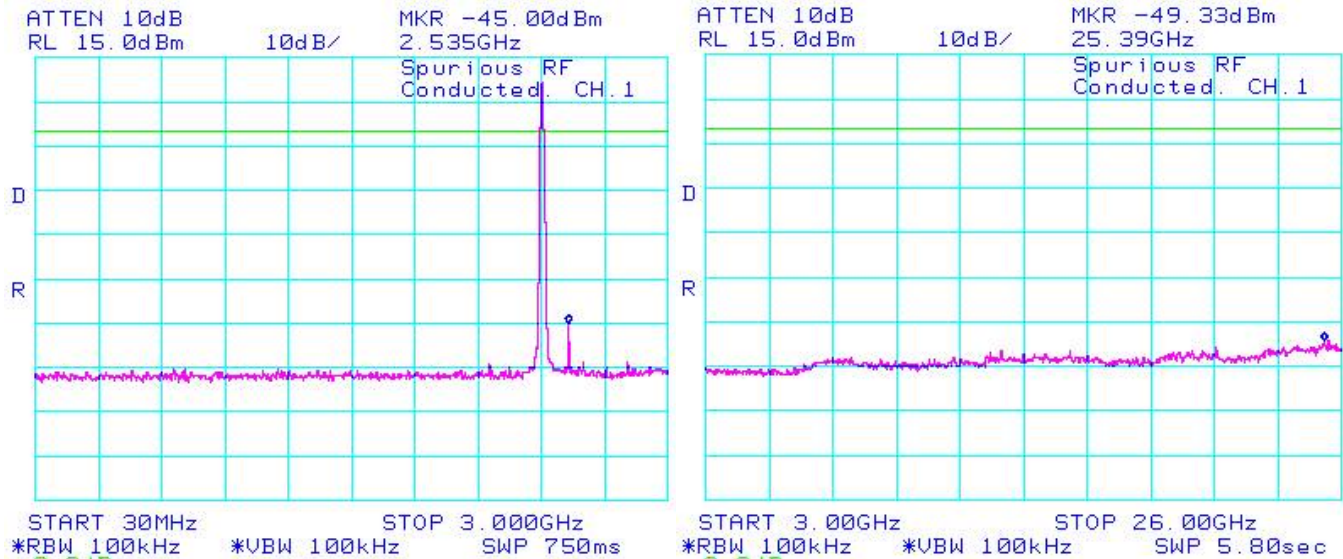
The emissions were in the NF.

See figures 4-25 to 4-33 for the plots of the spurious RF conducted emissions for Channels 1, 6 and 11, at 1 Mbps each for 802.11b mode, 6 Mbps each for 802.11g mode, and MCS 0 each for 802.11n mode.

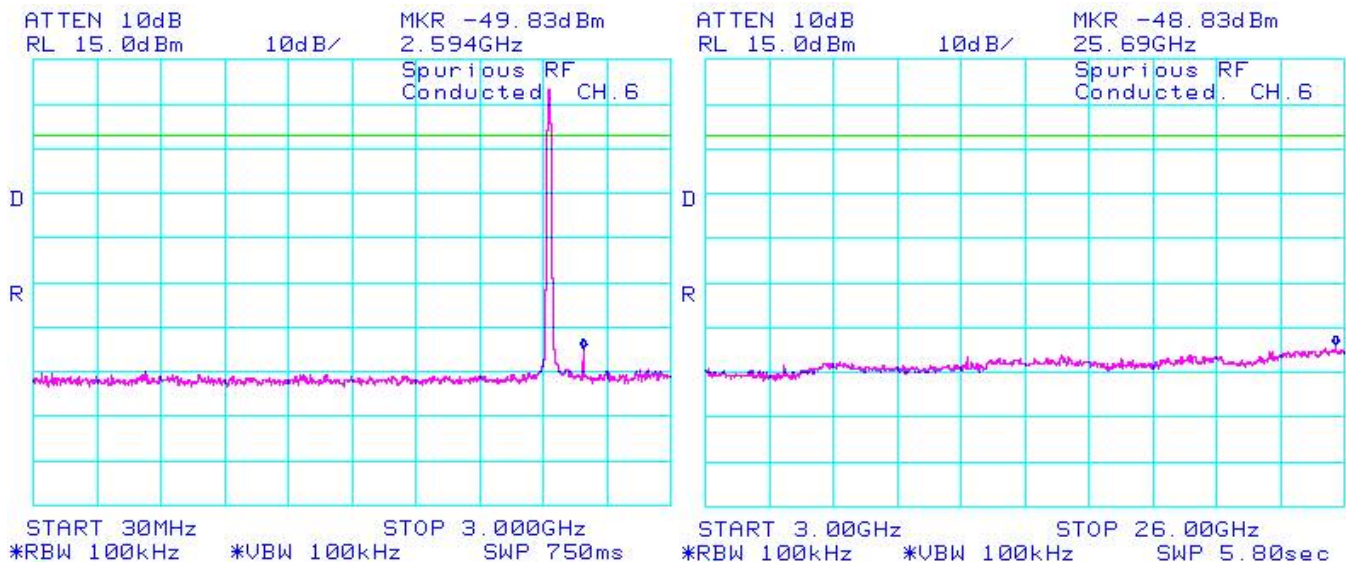
	EMI Test Report for the BlackBerry® smartphone Model RCW41GW <b>APPENDIX 3</b>	
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## 802.11b/g/n RF Conducted Emission Test Results cont'd


**Figure 4-25: Spurious Conducted RF Emissions**  
**802.11b, Channel 1, 1 Mbps**



**Figure 4-26 : Spurious Conducted RF Emissions**  
**802.11b, Channel 6, 1 Mbps**

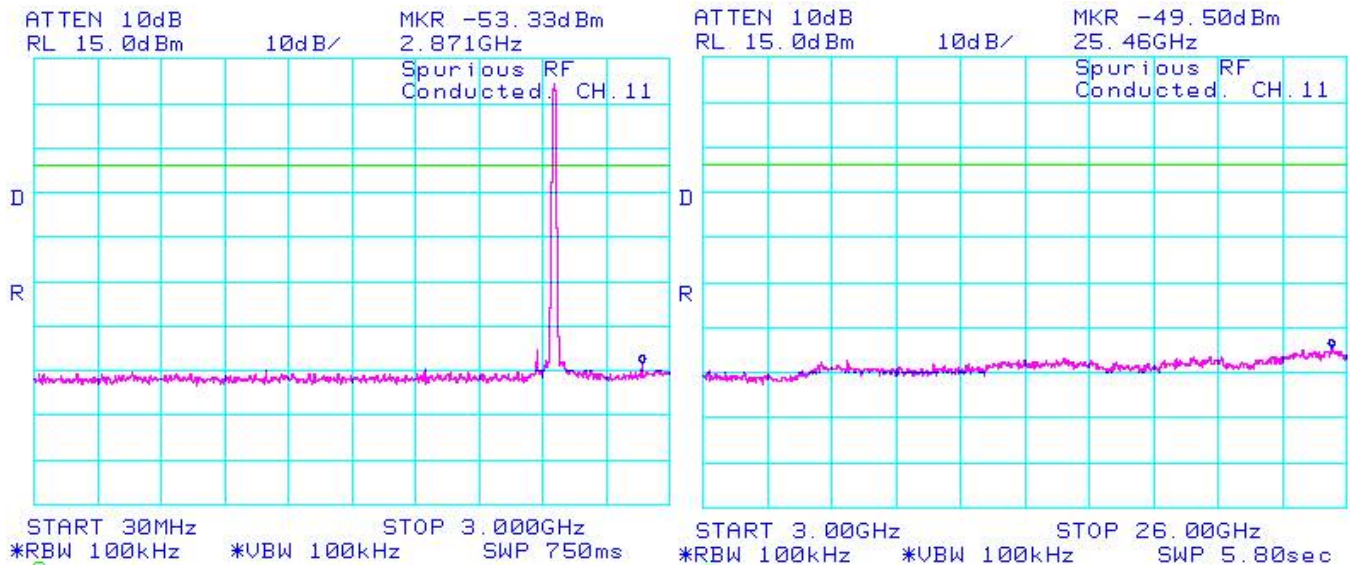




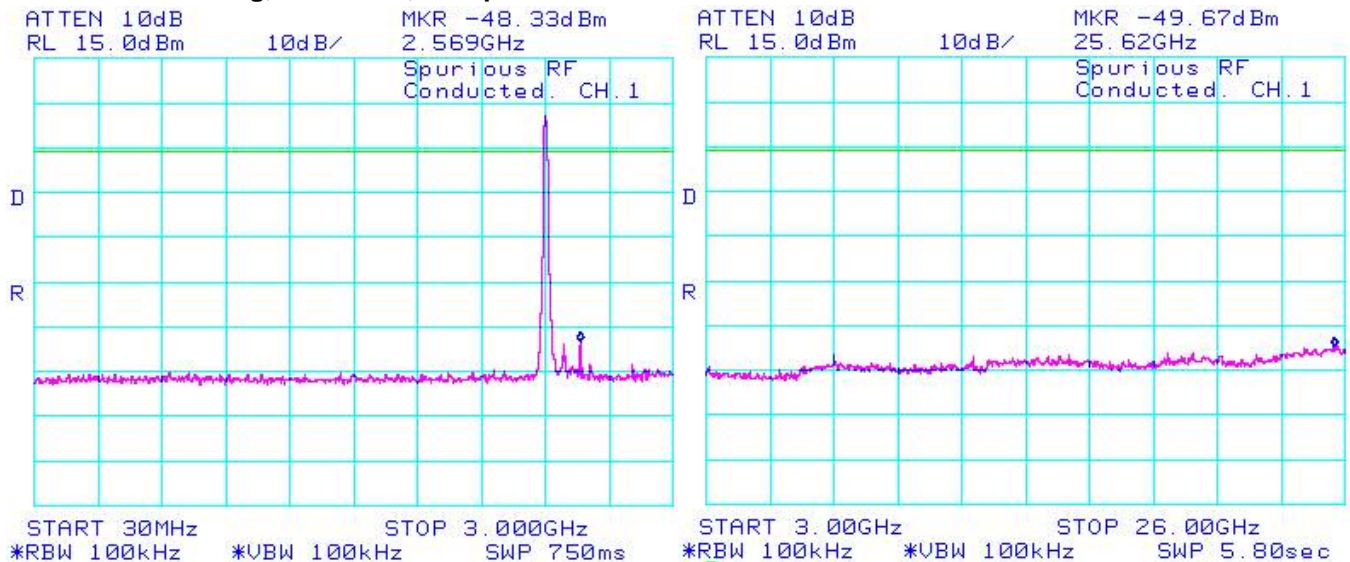
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### 802.11b/g/n RF Conducted Emission Test Results cont'd


**Figure 4-27: Spurious Conducted RF Emissions**  
**802.11b, Channel 11, 1 Mbps**



**Figure 4-28: Spurious Conducted RF Emissions**  
**802.11g, Channel 1, 6 Mbps**

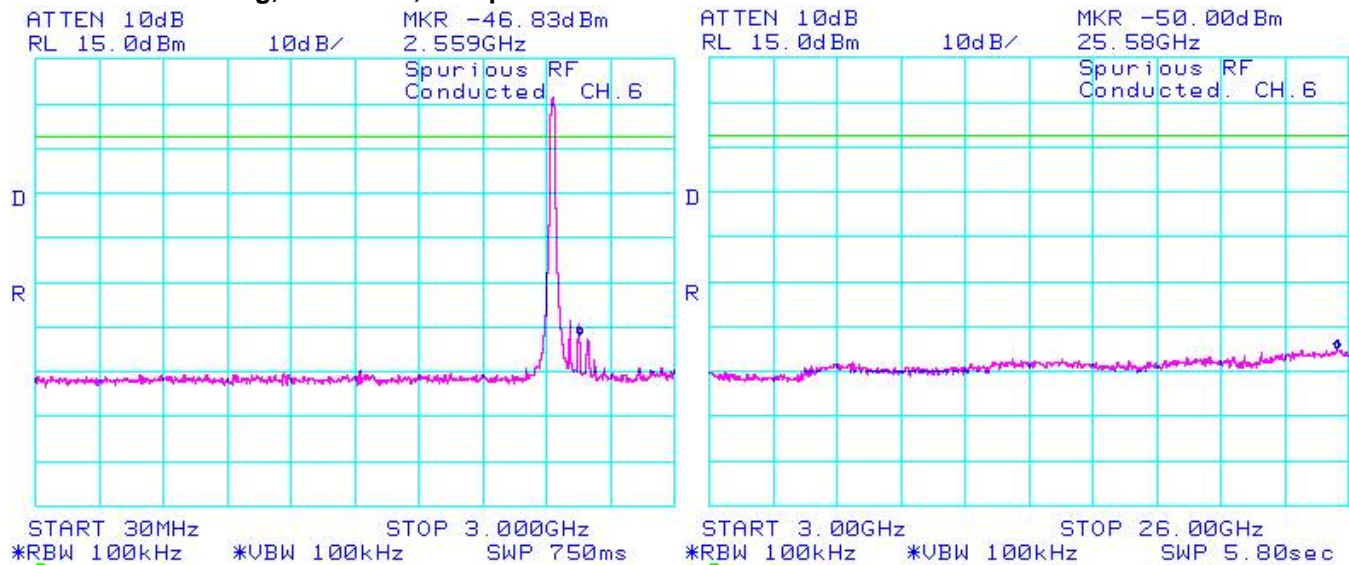




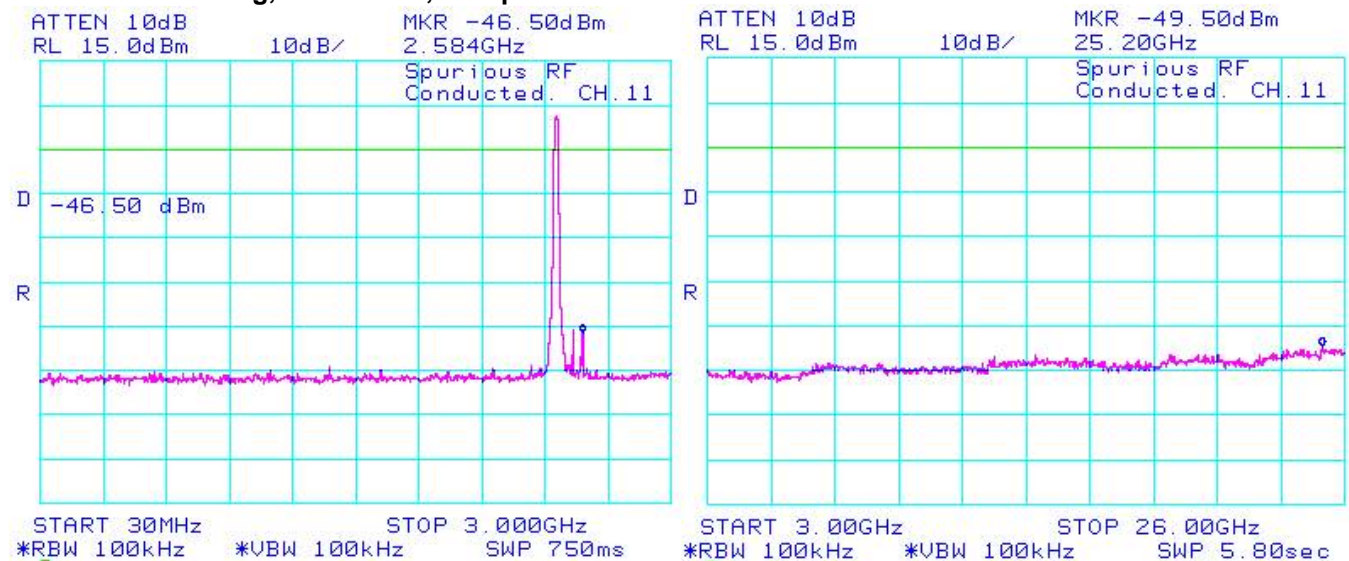
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### 802.11b/g/n RF Conducted Emission Test Results cont'd

**Figure 4-29: Spurious Conducted RF Emissions**  
802.11g, Channel 6, 6 Mbps



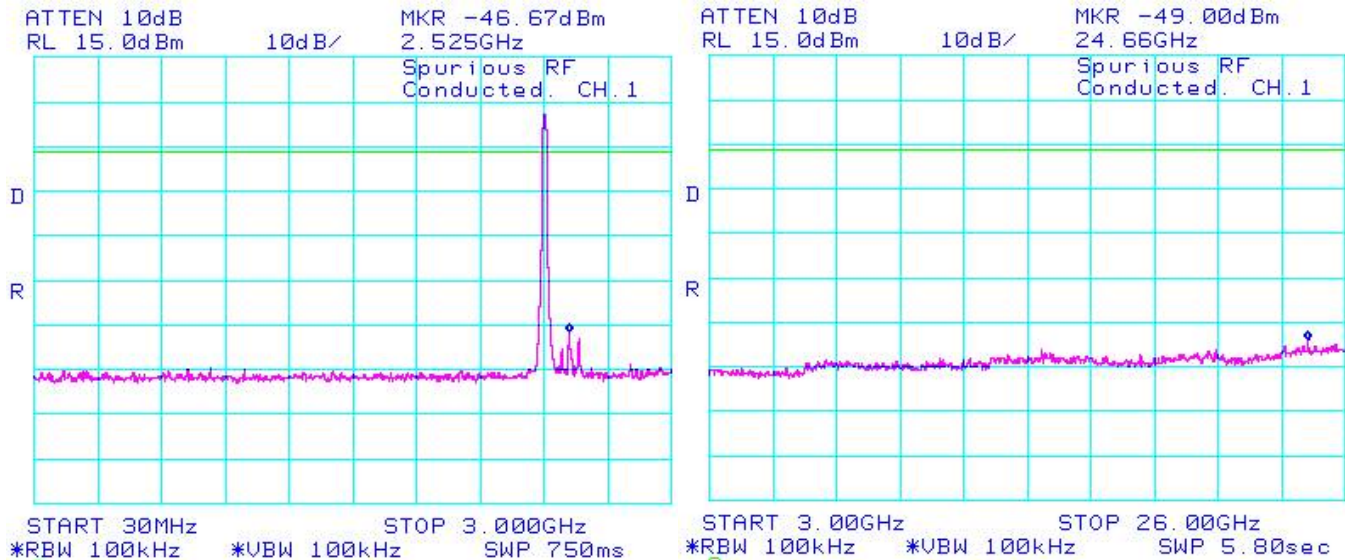
**Figure 4-30: Spurious Conducted RF Emissions**  
802.11g, Channel 11, 6 Mbps



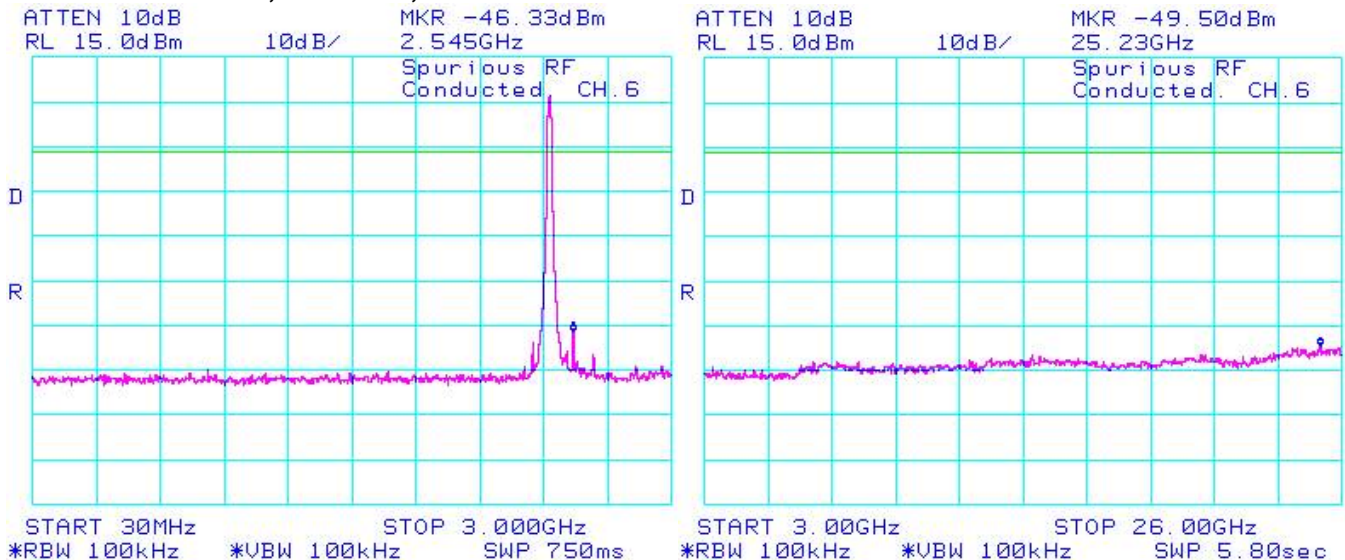
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### 802.11b/g/n RF Conducted Emission Test Results cont'd

**Figure 4-31: Spurious Conducted RF Emissions  
802.11n, Channel 1, MCS 0**



**Figure 4-32: Spurious Conducted RF Emissions  
802.11n, Channel 6, MCS 0**



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### 802.11b/g/n RF Conducted Emission Test Results cont'd

**Figure 4-33: Spurious Conducted RF Emissions**  
**802.11n, Channel 11, MCS 0**

