

## **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

# **RIM Testing Services (RTS)**

**A division of Research In Motion Limited**

**REPORT NO.:** RTS-1615-0905-17

**PRODUCT MODEL NO.:** RCG41GW  
**TYPE NAME:** BlackBerry® smartphone  
**FCC ID:** L6ARCG40GW  
**IC:** 2503A-RCG40GW

**DATE:** June 02, 2009

<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCG41GW	
<b>Test Report No.</b> RTS-1615-0905-17	<b>Dates of Test</b> March 26 – May 27, 2009	<b>Author Data</b> Michael Cino

**Statement of Performance:**

The BlackBerry® smartphone, model RCG41GW, part number CER-21961-001 Rev. 3, 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.

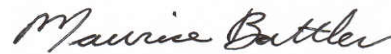
The test methods were consistent with the methods described in the relevant standards.

Documented by:



Michael Cino  
Regulatory Compliance Intern  
Date: 02 June 2009

Reviewed by:



Maurice Battler  
Compliance Specialist  
Date: 02 June 2009

Reviewed by:



Masud S. Attayi, P.Eng.  
Team Lead, Regulatory Compliance  
Date: 03 June 2009

Approved by:



Paul G. Cardinal, Ph.D.  
Director  
Date: 05 June 2009

<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCG41GW	
<b>Test Report No.</b> RTS-1615-0905-17	<b>Dates of Test</b> March 26 – May 27, 2009	<b>Author Data</b> Michael Cino

## Table of Contents

A.	Scope .....	4
B.	Associated Documents .....	4
C.	Product Identification .....	4
D.	Support Equipment Used for the Testing of the EUT.....	5
E.	Test Results Chart .....	6
F.	Modifications to EUT .....	6
G.	Summary of Results.....	7
H.	Compliance Test Equipment Used .....	12
	APPENDIX 1 – AC CONDUCTED EMISSIONS TEST DATA/PLOTS .....	13
	APPENDIX 2 – BLUETOOTH AND 802.11b/g RADIATED EMISSIONS TEST DATA.....	20
	APPENDIX 3 – BLUETOOTH CONDUCTED EMISSIONS TEST DATA/PLOTS.....	33
	APPENDIX 4 – 802.11b/g CONDUCTED EMISSIONS TEST DATA/PLOTS.....	57

<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCG41GW	
<b>Test Report No.</b> RTS-1615-0905-17	<b>Dates of Test</b> March 26 – May 27, 2009	<b>Author Data</b> Michael Cino

## 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, 2008
- 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. Hardware Declaration CER-21961-001\_Rev2
2. Hardware Declaration CER-21961-001\_Rev3

## 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 RIM Testing Services (RTS) EMI test facilities, located at:

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

The testing was performed from March 26 to May 27, 2009.

<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCG41GW	
<b>Test Report No.</b> RTS-1615-0905-17	<b>Dates of Test</b> March 26 – May 27, 2009	<b>Author Data</b> Michael Cino

The sample EUT included:

SAMPLE	MODEL	CER NUMBER	PIN
1	RCG41GW	CER-21961-001 Rev. 1	20E3AC4D
2	RCG41GW	CER-21961-001 Rev. 1	20E44F39
3	RCG41GW	CER-21961-001 Rev. 1	20E44AFD
4	RCG41GW	CER-21961-001 Rev. 2	20EB5E4B
5	RCG41GW	CER-21961-001 Rev. 3	20F3606B
6	RCG41GW	CER-21961-001 Rev. 3	20F361D6
7	RCG41GW	CER-21961-001 Rev. 3	20F36073
8	RCG41GW	CER-21961-001 Rev. 3	20EA401F

To view the differences between CER-21961-001 Rev. 1 and CER-21961-001 Rev. 2, see hardware declaration CER-21961-001\_Rev2. To view the differences between CER-21961-001 Rev. 2 and CER-21961-001 Rev. 3 see hardware declaration CER-21961-001\_Rev3.

Only the measurements that may have been impacted by the changes from Rev 1 to Rev 2 and Rev 2 to Rev 3 were re-measured.

#### BlackBerry® smartphone Accessories Tested

- 1) Captive Cable Charger part number HDW-17957-003 with an output voltage of 5.0 volts dc, 700 mA and attached USB cable with a lead length of 1.80 metres.
- 2) Non-Folding Blade Charger, part number HDW-25966-001 with an output voltage of 5.0 volts dc, 550 mA.
- 3) External Battery Charger (EBC), part number HDW-12738-001.
- 4) Premium Multi-Button Stereo Headset, part number HDW-15765-001, 1.3 metres long.
- 5) USB Data Cable, part number HDW-06610-005, 1.50 metres long.
- 6) USB Y-Cable, part number HDW-19137-002, lead lengths of 26 cm and 11 cm.
- 7) Mini to Micro USB Adapter, part number HDW-19139-001.

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

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

<b>RTS</b> RIM Testing Services		EMI Test Report for the BlackBerry® smartphone Model RCG41GW	
<b>Test Report No.</b> RTS-1615-0905-17		<b>Dates of Test</b> March 26 – May 27, 2009	<b>Author Data</b> Michael Cino

## 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	Pass	2
Part 15.209 Part 15.247	RSS-210 RSS-GEN	802.11 b/g Radiated Spurious Emissions and Radiated Band Edge Compliance	Pass	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, 6 dB Bandwidth	Pass	4
Part 15.247(b)	RSS-210	802.11b/g, Maximum Conducted Output Power	Pass	4
Part 15.247(b)	RSS-210	802.11b/g, Band-Edge	Pass	4
Part 15.247(b)	RSS-210	802.11b/g, Peak Power Spectral Density	Pass	4
Part 15.247(b)	RSS-210	802.11b/g, Spurious RF Conducted Emissions	Pass	4

## F. Modifications to EUT

No modifications were required on the EUT.

<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCG41GW	
<b>Test Report No.</b> RTS-1615-0905-17	<b>Dates of Test</b> March 26 – May 27, 2009	<b>Author Data</b> Michael Cino

## G. 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:

1. The BlackBerry® smartphone, PIN 20E44F39 in Bluetooth Tx mode with the Premium Multi-Button Stereo Headset was connected to the Captive Cable Charger.
2. The BlackBerry® smartphone, PIN 20E44AFD in 802.11b/g Tx mode with the Premium Multi-Button Stereo Headset was connected to a USB Y-Cable in parallel with an External Battery Charger (EBC) which was connected through a Mini to Micro USB Adapter. Both the EBC and the EUT were connected to the Non-Folding Blade Charger via the 1.5 metre USB Data 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 4.66 dB below the QP limit at 2.625 MHz using the quasi-peak detector, and 15.35 dB below the AVE limit at 2.873 MHz using the average detector, with the Captive Cable Charger in test configuration 1.

See APPENDIX 1 for the test data

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

<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCG41GW	
<b>Test Report No.</b> RTS-1615-0905-17	<b>Dates of Test</b> March 26 – May 27, 2009	<b>Author Data</b> Michael Cino

## 2) RADIATED EMISSIONS

### a) Radiated Spurious and Harmonic Emissions

The EUT was placed on a nonconductive styrofoam table, 80 cm high that was positioned on a remotely controlled turntable. The test distance used between the EUT and the receiving antenna was three metres. The turntable was rotated to determine the azimuth of the peak emissions. Then the emissions were maximized by elevating the antenna in the range of 1 to 4 metres. The maximum emission level was recorded. The frequency range measured was from 30 MHz to 25.0 GHz. Both the horizontal and vertical polarizations of the emissions were measured.

The measurements were done in a semi-anechoic chamber (SAC) below 1 GHz and a fully-anechoic room (FAR) above 1 GHz. The SAC's FCC registration number is **778487** and the Industry Canada (IC) file number is **2503B-1**. The FAR's FCC registration number is **959115** and the IC file number is **2503C-1**.

The EUT was configured and operated to produce the maximum radiated emissions while still keeping within RIM's specifications.

The BlackBerry® smartphones PIN 20EB5E4B and PIN 20E44F39 were measured in standalone configuration with Bluetooth transmitting in single frequency mode at low channel (0), middle channel (39) and high channel (78) for packet type "DH5", "2-DH5" and "3-DH5". The system's radiated emission levels were compared with respect to the FCC CFR 47 Part 15, Subpart C, 15.247 and RSS-210.

The BlackBerry® smartphones PIN 20F361D6 and PIN 20F36073 were measured in standalone configuration transmitting at channels 1, 6 & 11 at 1 Mbps, and channel 6 at 6 Mbps for 802.11b/g modes. The system's radiated emission levels were compared with respect to the FCC CFR 47 Part 15 Subpart C, 15.247 and RSS-210.

The Bluetooth harmonics were investigated up to the 10th harmonic. The sample EUT had a worst case test margin of 6.22 dB below the limit at 4882 MHz using the Average detector.

The 802.11b/g harmonics were investigated up to the 10th harmonic. The sample EUT emissions were in the noise floor (NF).

See APPENDIX 2 for the test data

### b) Band-Edge Compliance of RF Radiated Emissions

The BlackBerry® smartphones PIN 20EB5E4B and PIN 20EA401F met the requirements for band-edge compliance of RF radiated emissions for Bluetooth and 802.11b/g as per the requirements of 15.247, 15.209, and RSS-210/RSS-GEN.

### **Measurement Uncertainty ±4.6 dB**

See APPENDIX 2 for the test data



<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCG41GW	
<b>Test Report No.</b> RTS-1615-0905-17	<b>Dates of Test</b> March 26 – May 27, 2009	<b>Author Data</b> Michael Cino

### 3) BLUETOOTH RF CONDUCTED EMISSIONS

The Bluetooth conducted RF emissions from the BlackBerry® smartphone PIN 20E3AC4D 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.

See APPENDIX 3 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 3 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 3 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 3 for the test data.

<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCG41GW	
<b>Test Report No.</b> RTS-1615-0905-17	<b>Dates of Test</b> March 26 – May 27, 2009	<b>Author Data</b> Michael Cino

- 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.  
See APPENDIX 3 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 3 for the test data.
  
- 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 3 for the test data.

#### 4) 802.11b/g RF CONDUCTED EMISSIONS

The 802.11b/g conducted RF emissions from the BlackBerry® smartphone PIN 20F3606B were measured using the methods outlined in FCC CFR 47 Part 15, Subpart C.

- a) **6dB 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.  
See APPENDIX 4 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.  
See APPENDIX 4 for the test data

<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCG41GW	
<b>Test Report No.</b> RTS-1615-0905-17	<b>Dates of Test</b> March 26 – May 27, 2009	<b>Author Data</b> Michael Cino

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 4 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 4 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 4 for the test data.

<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCG41GW	
<b>Test Report No.</b> RTS-1615-0905-17	<b>Dates of Test</b> March 26 – May 27, 2009	<b>Author Data</b> Michael Cino

## H. Compliance Test Equipment Used

<u>UNIT</u>	<u>MANUFACTURER</u>	<u>MODEL</u>	<u>SERIAL NUMBER</u>	<u>CAL DUE DATE</u> (YY MM DD)	<u>USE</u>
EMI Test Receiver	Rohde & Schwarz	ESIB 40	100255	09-12-03	Conducted/Radiated Emissions
EMI Test Receiver	Rohde & Schwarz	ESU 40	100162	10-04-22	Conducted/Radiated Emissions
Hybrid Log Antenna	EMC Automation	HLP-3003C	017401	10-09-26	Radiated Emissions
Horn Antenna	CMT	LHA 0180	R52734-001	09-12-17	Radiated Emissions
Horn Antenna	ETS-Lindgren	3117	47563	09-07-03	Radiated Emissions
Preamplifier	Rohde & Schwarz	TS-ANA4-SP	001	10-05-08	Radiated Emissions
Preamplifier	Sonoma	310N/11909A	185831	09-11-07	Radiated Emissions
Preamplifier	Rohde & Schwarz	TS-ANA-SP	001	10-03-31	Radiated Emissions
L.I.S.N.	Rohde & Schwarz	ENV216	100060	10-04-21	Conducted Emissions
Environment Monitor	Control Company	1870	230355190	10-01-30	Radiated Emissions
EMC Analyzer	Agilent	E7405A	US40240226	09-11-17	Radiated Emissions
Spectrum Analyzer	HP	8563E	3745A08112	09-09-22	RF Conducted Emissions
DC Power Supply	HP	6632B	US37472178	09-09-24	RF Conducted Emissions
Environment Monitor	Control Company	1870	80117164	10-01-08	RF Conducted Emissions
Temperature Probe	Control Company	15-077-21	51129471	10-05-01	Frequency Stability
Environmental Chamber	ESPEC Corp.	SH-240S1	91005607	N/R	Frequency Stability
Bluetooth Tester	Rohde & Schwarz	CBT	100034	09-12-09	RF Conducted Emissions
Bluetooth Tester	Rohde & Schwarz	CBT35	100368	09-12-09	Radiated Emissions
Bluetooth Tester	Rohde & Schwarz	CBT35	100370	09-12-09	Radiated Emissions
Power Meter	Agilent	N1911A	MY45100905	09-06-23	RF Conducted / Frequency Stability
Power Sensor	Agilent	N1921A	MY45100905	09-06-27	RF Conducted / Frequency Stability
Digital Multimeter	Hewlett Packard	34401A	US36042324	09-10-01	Conducted/Radiated Emissions
Environment Monitor	Control Company	1870	230355159	10-01-30	Radiated Emissions

<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCG41GW <b>APPENDIX 1</b>	
<b>Test Report No.</b> RTS-1615-0905-17	<b>Dates of Test</b> March 26 – May 27, 2009	<b>Author Data</b> Michael Cino

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

<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCG41GW <b>APPENDIX 1</b>	
<b>Test Report No.</b> RTS-1615-0905-17	<b>Dates of Test</b> March 26 – May 27, 2009	<b>Author Data</b> Michael Cino

AC Conducted Emission Test Results  
Test Configuration 1

Measurements were performed by Savtej Sandhu.

The EUT met the requirements of the AC Power Line Conducted Emissions as per FCC CFR 47 Part 15, Subpart C and IC RSS-210.

The environmental test conditions were: Temperature: 24°C  
Pressure: 1026 mb  
Relative Humidity: 30%

The BlackBerry® smartphone PIN 20E44F39 was tested on April 16, 2009.

Frequency (MHz)	Line	Reading (QP) (dBµV)	Correction Factor (dB)	Corrected Reading (QP) (dBµV)	Limit (QP) (dBµV)	Margin (QP) Limits (dB)
0.164	L1	32.33	9.99	42.33	65.28	-22.96
0.168	N	32.35	10.03	42.38	65.06	-22.68
0.407	N	27.52	9.87	37.39	57.72	-20.33
0.416	L1	30.93	9.74	40.67	57.54	-16.87
0.533	N	26.28	9.89	36.17	56.00	-19.83
0.537	L1	32.31	9.67	41.98	56.00	-14.02
1.073	N	26.80	9.64	36.43	56.00	-19.57
1.077	L1	31.84	9.51	41.35	56.00	-14.65
2.022	N	30.57	9.61	40.19	56.00	-15.81
2.076	L1	32.94	9.54	42.48	56.00	-13.52
2.576	N	35.36	9.61	44.97	56.00	-11.03
2.603	L1	40.12	9.56	49.68	56.00	-6.32
2.625	L1	41.77	9.56	51.34	56.00	<b>-4.66</b>
2.643	L1	40.99	9.56	50.55	56.00	-5.45

<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCG41GW <b>APPENDIX 1</b>	
	<b>Test Report No.</b> RTS-1615-0905-17	<b>Dates of Test</b> March 26 – May 27, 2009
		<b>Author Data</b> Michael Cino

Test Configuration 1 cont'd

Frequency (MHz)	Line	Reading (QP) (dBµV)	Correction Factor (dB)	Corrected Reading (QP) (dBµV)	Limit (QP) (dBµV)	Margin (QP) Limits (dB)
2.859	L1	40.45	9.58	50.03	56.00	-5.97
2.873	L1	38.28	9.58	47.86	56.00	-8.14
2.873	N	38.62	9.61	48.24	56.00	-7.77
2.922	N	32.11	9.61	41.72	56.00	-14.28
3.863	L1	32.32	9.63	41.95	56.00	-14.05
4.686	N	28.69	9.60	38.29	56.00	-17.71
4.781	N	33.24	9.60	42.83	56.00	-13.17
7.787	L1	35.69	9.75	45.43	60.00	-14.57
7.922	N	32.50	9.63	42.12	60.00	-17.88
10.685	L1	31.85	9.84	41.70	60.00	-18.30
11.198	N	29.75	9.70	39.45	60.00	-20.55

Above measurements were done with the quasi-peak detector.

Frequency (MHz)	Line	Reading (AVE) (dBµV)	Correction Factor (dB)	Corrected Reading (AVE) (dBµV)	Limit (AVE) (dBµV)	Margin (AVE) Limits (dB)
0.407	N	16.09	9.87	25.96	47.72	-21.76
0.416	L1	18.34	9.74	28.07	47.54	-19.46
0.537	L1	16.29	9.67	25.96	46.00	-20.04
1.077	L1	13.56	9.51	23.07	46.00	-22.94
2.022	N	12.73	9.61	22.35	46.00	-23.65
2.076	L1	16.11	9.54	25.65	46.00	-20.35
2.576	N	16.24	9.61	25.85	46.00	-20.15
2.603	L1	19.60	9.56	29.16	46.00	-16.84
2.625	L1	19.73	9.56	29.29	46.00	-16.71
2.643	L1	18.76	9.56	28.33	46.00	-17.68
2.774	L1	20.20	9.58	29.77	46.00	-16.23
2.850	N	16.00	9.61	25.61	46.00	-20.39

<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCG41GW <b>APPENDIX 1</b>	
<b>Test Report No.</b> RTS-1615-0905-17	<b>Dates of Test</b> March 26 – May 27, 2009	<b>Author Data</b> Michael Cino

Test Configuration 1 cont'd

Frequency (MHz)	Line	Reading (AVE) (dBμV)	Correction Factor (dB)	Corrected Reading (AVE) (dBμV)	Limit (AVE) (dBμV)	Margin (AVE) Limits (dB)
2.859	L1	20.85	9.58	30.42	46.00	-15.58
2.873	L1	21.07	9.58	30.65	46.00	<b>-15.35</b>
2.873	N	17.04	9.61	26.65	46.00	-19.35
2.922	N	15.44	9.61	25.06	46.00	-20.94
3.863	L1	17.28	9.63	26.91	46.00	-19.09
4.686	N	14.71	9.60	24.31	46.00	-21.69
4.781	N	14.17	9.60	23.77	46.00	-22.23
7.787	L1	20.89	9.75	30.63	50.00	-19.37
7.922	N	17.64	9.63	27.27	50.00	-22.73
10.685	L1	18.48	9.84	28.33	50.00	-21.68

Above measurements were done with the average detector.

All other emission levels had a test margin of greater than 25 dB.

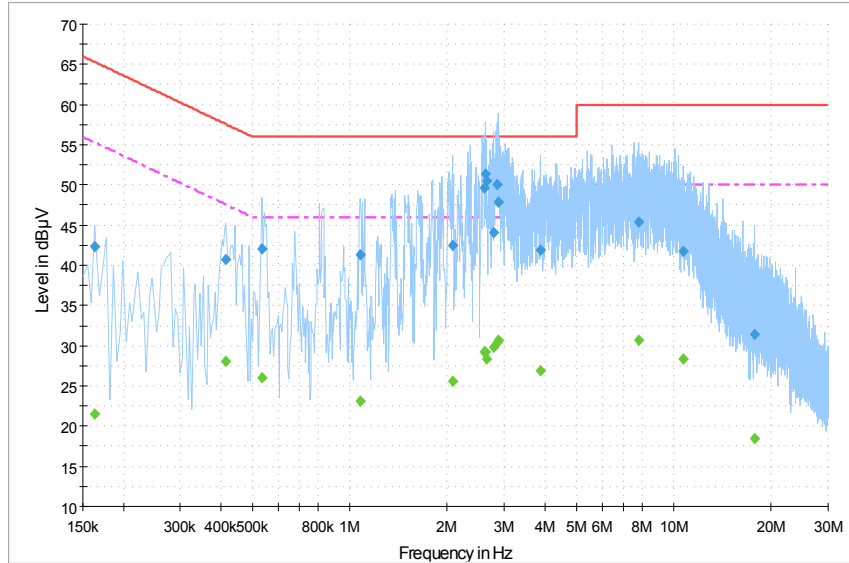
See figure 1-1 and figure 1-2 for the measurement plot of the L1 and N lines of AC power line conducted emissions.



<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCG41GW <b>APPENDIX 1</b>	
	<b>Test Report No.</b> RTS-1615-0905-17	<b>Dates of Test</b> March 26 – May 27, 2009

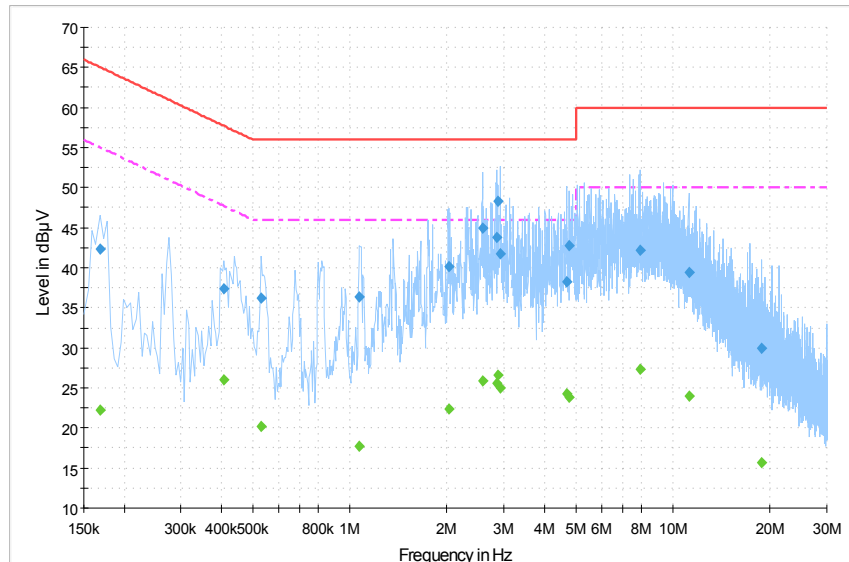
**AC Conducted Emission Test Graphs**  
**Test Configuration 1**

**Figure 1-1**



— EN 55022 Conducted EMI Class B QP.LimitLine  
— Preview Result-Peak Detector  
◆ Final Result-Avg Detector  
- - - EN 55022 Conducted EMI Class B AVG.LimitLine  
◆ Final Result-QP Detector

**Figure 1-2**



— EN 55022 Conducted EMI Class B QP.LimitLine  
— Preview Result-Peak Detector  
◆ Final Result-Avg Detector  
- - - EN 55022 Conducted EMI Class B AVG.LimitLine  
◆ Final Result-QP Detector

<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCG41GW <b>APPENDIX 1</b>	
<b>Test Report No.</b> RTS-1615-0905-17	<b>Dates of Test</b> March 26 – May 27, 2009	<b>Author Data</b> Michael Cino

AC Conducted Emission Test Results  
Test Configuration 2

Measurements were performed by Heng Lin.

The EUT met the requirements of the AC Power Line Conducted Emissions as per FCC CFR 47 Part 15, Subpart C and IC RSS-210.

The environmental test conditions were: Temperature: 24°C  
Pressure: 1026 mb  
Relative Humidity: 30%

The BlackBerry® smartphone PIN 20E44AFD was tested on April 16, 2009.

Frequency (MHz)	Line	Reading (QP) (dBµV)	Correction Factor (dB)	Corrected Reading (QP) (dBµV)	Limit (QP) (dBµV)	Limit (AVE) (dBµV)	Margin (QP) Limits (dB)
0.164	L1	35.18	9.99	45.17	65.28	55.28	-20.12
0.218	N	31.21	9.80	41.01	62.91	52.91	-21.90
0.290	N	26.75	9.82	36.57	60.54	50.54	-23.97
0.425	L1	33.34	9.73	43.07	57.36	47.36	-14.29
0.434	N	29.19	9.87	39.06	57.19	47.19	-18.12
0.438	L1	34.35	9.72	44.07	57.10	47.10	-13.03
0.582	L1	28.15	9.64	37.79	56.00	46.00	-18.21
0.654	L1	26.98	9.61	36.60	56.00	46.00	-19.40
0.848	L1	26.32	9.55	35.88	56.00	46.00	-20.13
1.343	L1	24.88	9.50	34.38	56.00	46.00	-21.62
2.144	L1	22.32	9.56	31.88	56.00	46.00	-24.12
4.790	L1	24.70	9.67	34.37	56.00	46.00	-21.63
8.084	L1	30.14	9.74	39.89	60.00	50.00	-20.11
9.893	N	25.34	9.66	35.00	60.00	50.00	-25.00
10.541	L1	26.65	9.84	36.49	60.00	50.00	-23.51

Above measurements were done with the quasi-peak detector.

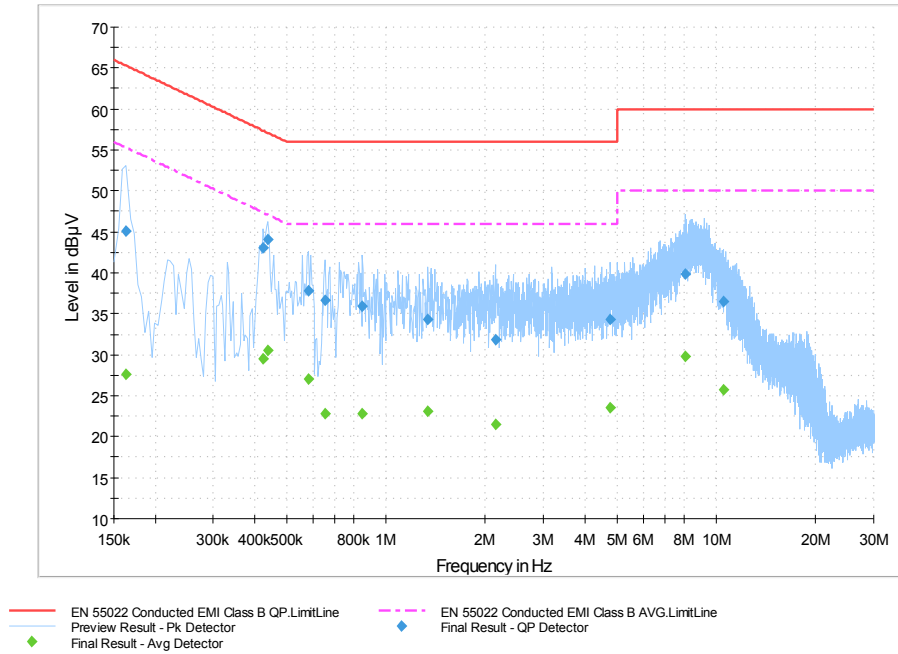
All other emission levels had a test margin of greater than 25 dB.

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

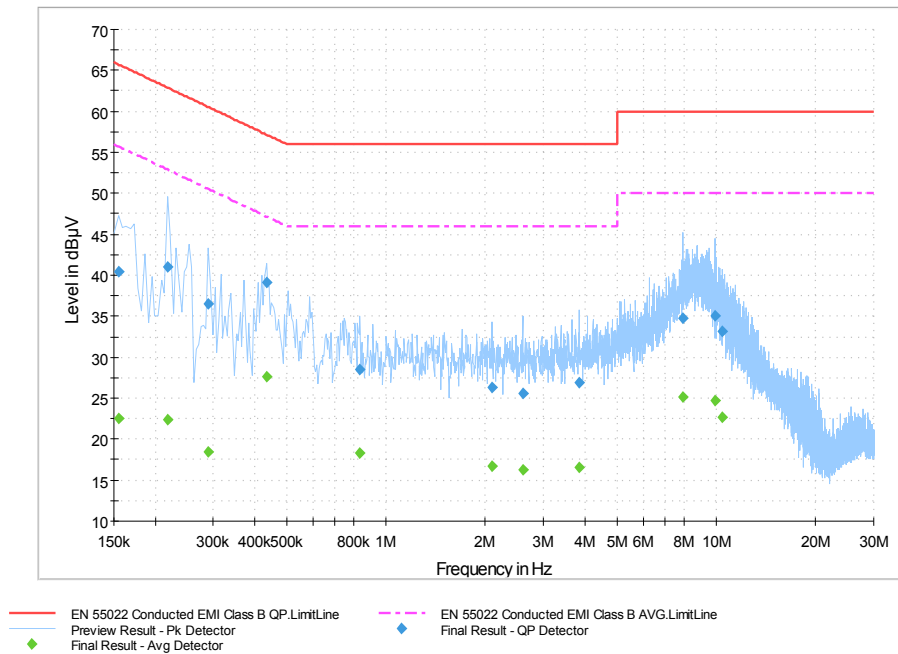
<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCG41GW <b>APPENDIX 1</b>	
	<b>Test Report No.</b> RTS-1615-0905-17	<b>Dates of Test</b> March 26 – May 27, 2009

**AC Conducted Emission Test Graphs**  
**Test Configuration 2**

**Figure 1-3**



**Figure 1-4**



<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCG41GW <b>APPENDIX 2</b>	
<b>Test Report No.</b> RTS-1615-0905-17	<b>Dates of Test</b> March 26 – May 27, 2009	<b>Author Data</b> Michael Cino

**APPENDIX 2 – BLUETOOTH AND 802.11b/g RADIATED EMISSIONS TEST DATA**

<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCG41GW <b>APPENDIX 2</b>	
<b>Test Report No.</b> RTS-1615-0905-17	<b>Dates of Test</b> March 26 – May 27, 2009	<b>Author Data</b> Michael Cino

Radiated Emissions Test Results  
Bluetooth Band

Date of Test: April 07 to 08, 2009  
Measurements were performed by Andrew Fleming.

The environmental test conditions were: Temperature: 25 °C  
Pressure: 993 mb  
Relative Humidity: 22 %

The test distance was 3.0 metres with a EUT height of 0.8 metres, sweep frequency of 30 MHz to 1 GHz.  
The BlackBerry® smartphone PIN 20EB5E4B in Bluetooth Tx mode was in standalone, vertical position.

The frequency sweep measurements were performed in single frequency mode on channels 0, 39 and 78 using packet types “DH5”, “2-DH5” and “3-DH5”.

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

<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCG41GW <b>APPENDIX 2</b>	
	<b>Test Report No.</b> RTS-1615-0905-17	<b>Dates of Test</b> March 26 – May 27, 2009
		<b>Author Data</b> Michael Cino

Radiated Emissions Test Results cont'd  
Bluetooth Band

Date of Test: April 02 to 03, 2009  
Measurements were performed by Heng Lin.

The environmental test conditions were: Temperature: 25 °C  
Pressure: 1011 mb  
Relative Humidity: 26 %

The measurements were performed in single frequency Tx mode using packet types “DH5”, “2-DH5” and “3-DH5” on channel 0. The BlackBerry® smartphone PIN 20E44F39 was in standalone, vertical position.

The test distance was 3.0 metres with a height of 0.8 metres, 1GHz to 25GHz.

Type	Channel	Frequency (MHz)	Antenna		Reading (Peak) (dBuV)	Corrected Reading (dBuV)	Detector (AVE/PK)	Peak Limit (dBuV/m)	Diff. To Limit (dB)
			Type	Pol					
Single frequency mode Low Channel, packet type “DH5”, USB side down									
2 <sup>nd</sup>	0	4804.0	Horn	V	NF	57.82	PK.	74	-16.18
2 <sup>nd</sup>	0	4804.0	Horn	H	39.18				
2 <sup>nd</sup>	0	4804.0	Horn	V	NF	46.20	AVE.	54	-7.80
2 <sup>nd</sup>	0	4804.0	Horn	H	27.57				
The harmonics were investigated up to the 10 <sup>th</sup> harmonic. Emissions above the 2 <sup>nd</sup> harmonic were in the NF.									
Single frequency mode Low Channel, packet type “2-DH5” USB side down.									
2 <sup>nd</sup>	0	4804.0	Horn	V	NF	NF	PK.	74	-
2 <sup>nd</sup>	0	4804.0	Horn	H	NF				
The harmonics were investigated up to the 10th harmonic. Emissions were in the NF.									
Single frequency mode Low Channel, packet type “3-DH5” USB side down.									
2 <sup>nd</sup>	0	4804.0	Horn	V	NF	NF	PK.	74	-
2 <sup>nd</sup>	0	4804.0	Horn	H	NF				
The emissions were investigated up to the 10 <sup>th</sup> harmonic. Emissions were in the NF.									

<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCG41GW <b>APPENDIX 2</b>	
<b>Test Report No.</b> RTS-1615-0905-17	<b>Dates of Test</b> March 26 – May 27, 2009	<b>Author Data</b> Michael Cino

Radiated Emissions Test Results cont'd  
Bluetooth Band

Date of Test: April 01 to 06, 2009  
Measurements were performed by Savtej Sandhu.

The environmental test conditions were: Temperature: 25 °C  
Pressure: 1005 mb  
Relative Humidity: 26 %

The measurements were performed in single frequency Tx mode using packet type “DH5”, “2-DH5” and “3-DH5” on channel 39. The BlackBerry® smartphone PIN 20E44F39 was in standalone, vertical position.

The test distance was 3.0 metres with a height of 0.8 metres, 1GHz to 25GHz.

Type	Channel	Frequency (MHz)	Antenna		Reading (Peak) (dBuV)	Corrected Reading (dBuV)	Detector (AVE/PK)	Peak Limit (dBuV/m)	Diff. To Limit (dB)
			Type	Pol					
Single frequency mode Middle Channel, packet type “DH5”, USB side down									
2 <sup>nd</sup>	39	4882.0	Horn	V	NF	NF	PK.	74	-
2 <sup>nd</sup>	39	4882.0	Horn	H	NF				
2 <sup>nd</sup>	39	4882.0	Horn	V	NF	47.78	AVE.	54	<b>-6.22</b>
2 <sup>nd</sup>	39	4882.0	Horn	H	29.01				
The harmonics were investigated up to the 10 <sup>th</sup> harmonic. Emissions above the 2 <sup>nd</sup> harmonic were in the NF.									
Single frequency mode Middle Channel, packet type “2-DH5” USB side down.									
2 <sup>nd</sup>	39	4882.0	Horn	V	NF	NF	PK.	74	-
2 <sup>nd</sup>	39	4882.0	Horn	H	NF				
The harmonics were investigated up to the 10th harmonic. Emissions were in the NF.									
Single frequency mode Middle Channel, packet type “3-DH5” USB side down.									
2 <sup>nd</sup>	39	4882.0	Horn	V	NF	NF	PK	74	-
2 <sup>nd</sup>	39	4882.0	Horn	H	NF				
The harmonics were investigated up to the 10th harmonic. Emissions were in the NF.									

<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCG41GW <b>APPENDIX 2</b>	
<b>Test Report No.</b> RTS-1615-0905-17	<b>Dates of Test</b> March 26 – May 27, 2009	<b>Author Data</b> Michael Cino

Radiated Emissions Test Results cont'd  
Bluetooth Band

Date of Test: April 02 to 03, 2009  
Measurements were performed by Heng Lin.

The environmental test conditions were: Temperature: 25 °C  
Pressure: 1005 mb  
Relative Humidity: 26 %

The measurements were performed in single frequency Tx mode using packet types “DH5”, “2-DH5” and “3-DH5” on channel 78. The BlackBerry® smartphone PIN 20E44F39 was in standalone, vertical position.

The test distance was 3.0 metres with a height of 0.8 metres, 1GHz to 25GHz.

Type	Channel	Frequency (MHz)	Antenna		Reading (Peak) (dBuV)	Corrected Reading (dBuV)	Detector (AVE/PK)	Peak Limit (dBuV/m)	Diff. To Limit (dB)
			Type	Pol					
Single frequency mode high Channel, packet type “DH5”, USB side down									
2 <sup>nd</sup>	78	4960.0	Horn	V	NF	65.02	PK.	74	-8.98
2 <sup>nd</sup>	78	4960.0	Horn	H	45.30				
2 <sup>nd</sup>	78	4960.0	Horn	V	NF	47.08	AVE.	54	-6.92
2 <sup>nd</sup>	78	4960.0	Horn	H	27.35				
The harmonics were investigated up to the 10 <sup>th</sup> harmonic. Emissions above the 2 <sup>nd</sup> harmonic were in the NF.									
Single frequency mode high Channel, packet type “2-DH5” USB side down.									
2 <sup>nd</sup>	78	4960.0	Horn	V	NF	NF	PK.	74	-
2 <sup>nd</sup>	78	4960.0	Horn	H	NF				
The harmonics were investigated up to the 10th harmonic. Emissions were in the NF.									
Single frequency mode High Channel, packet type “3-DH5” USB side down.									
2 <sup>nd</sup>	78	4960.0	Horn	V	NF	NF	PK	74	-
2 <sup>nd</sup>	78	4960.0	Horn	H	NF				
The harmonics were investigated up to the 10th harmonic. Emissions were in the NF.									



<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCG41GW <b>APPENDIX 2</b>	
	<b>Test Report No.</b> RTS-1615-0905-17	<b>Dates of Test</b> March 26 – May 27, 2009
		<b>Author Data</b> Michael Cino

Band-Edge Compliance of RF Radiated Emissions Test Results  
Bluetooth Band

Date of test: May 07, 2009

Measurements were performed by Arjun Rai Bhatti.

The environmental test conditions were: Temperature: 24 ° C

Pressure: 1003 mb

Relative Humidity: 30 %

BlackBerry® smartphone PIN 20EB5E4B was in standalone, vertical, Pattern type “Static PBRS” in “DH5” and “3-DH5” modulation during the measurements.

The test distance was 3.0 metres.

Channel	Freq. (MHz)	Rx Antenna Type	POL.	Detector (PK, AVE.)	VBW (MHz)	Corrected Reading (dBuV/m)	Delta Marker (dB)	Corrected Band edge (dBuV/m)	Limit (dBuV/m)	Diff. To Limit (dB)
Low Channel, Packet Type 3-DH5										
0	2402.0	Horn	V	PK	1 MHz	97.08	49.14	47.94	74.00	-26.06
0	2402.0	Horn	H	PK	1 MHz	96.50	48.60	47.90	74.00	-26.10
0	2402.0	Horn	V	AVE.	10 Hz	79.99	49.14	30.85	54.00	-23.15
0	2402.0	Horn	H	AVE.	10 Hz	77.79	48.60	29.19	54.00	-24.81
High Channel, Packet Type 3-DH5										
78	2480.0	Horn	V	PK	1 MHz	96.82	49.25	47.57	74.00	-26.43
78	2480.0	Horn	H	PK	1 MHz	96.05	49.32	46.73	74.00	-27.27
78	2480.0	Horn	V	AVE.	10 Hz	80.00	49.25	30.75	54.00	-23.25
78	2480.0	Horn	H	AVE.	10 Hz	79.58	49.32	30.26	54.00	-23.74
High Channel, Packet Type DH5										
78	2480.0	Horn	V	PK	1 MHz	99.43	52.90	46.53	74.00	-27.47
78	2480.0	Horn	H	PK	1 MHz	98.34	51.27	47.07	74.00	-26.93
78	2480.0	Horn	V	AVE.	10 Hz	83.86	52.90	30.96	54.00	-23.04
78	2480.0	Horn	H	AVE.	10 Hz	79.41	51.27	28.14	54.00	-25.86

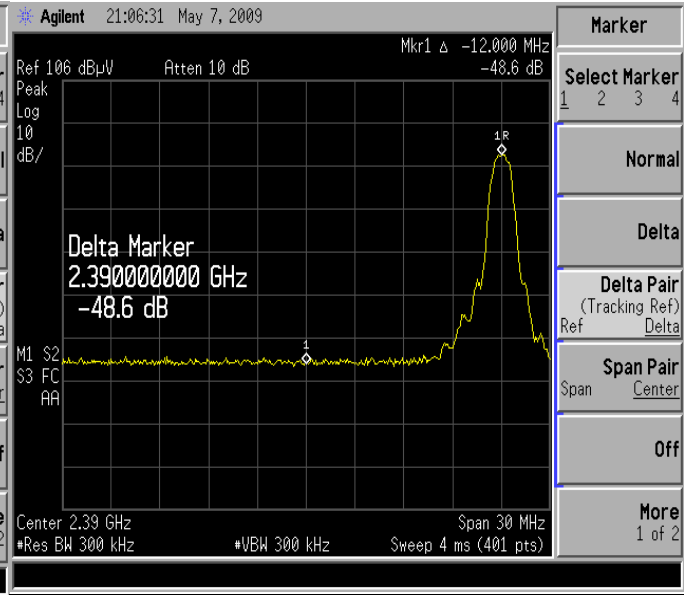
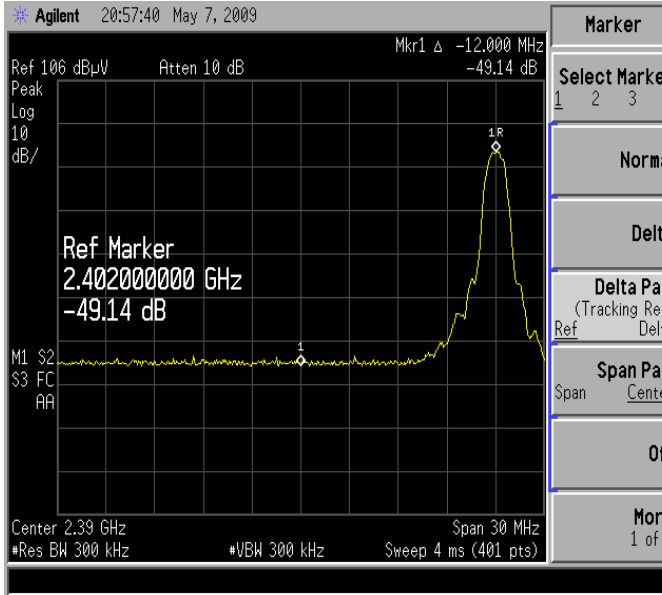
See figures 2-1 to 2-6 for the plots of the Bluetooth band-edge compliance.

<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCG41GW <b>APPENDIX 2</b>	
	<b>Test Report No.</b> RTS-1615-0905-17	<b>Dates of Test</b> March 26 – May 27, 2009

Bluetooth Band-Edge Compliance of RF Radiated Emissions cont'd

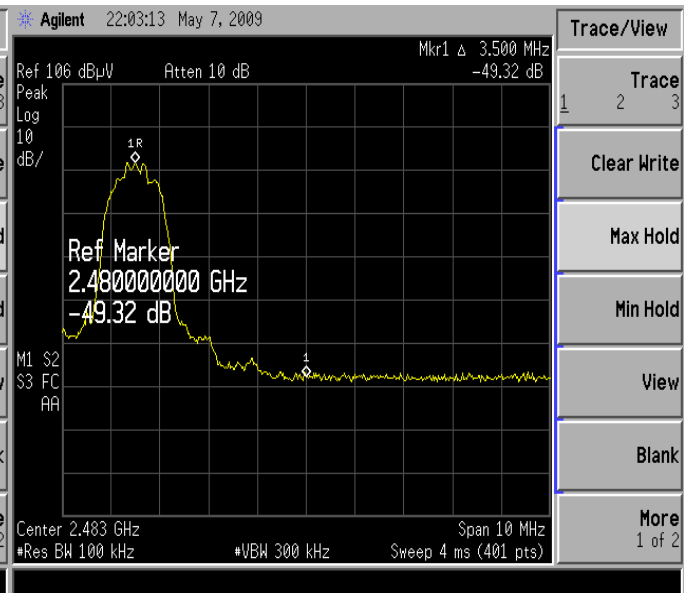
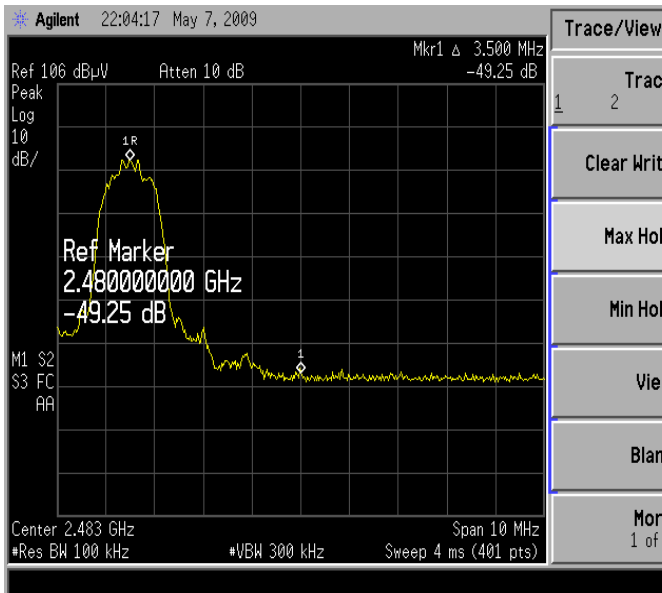
**Figure 2-1: Band-Edge Compliance of RF Rad. Emissions.**  
Bluetooth, Single freq., Static PBRS,  
3-DH5, Channel 0, Pol: V, Detector: PK

**Figure 2-2: Band-Edge Compliance of RF Rad. Emissions.**  
Bluetooth, Single freq., Static PBRS,  
3-DH5, Channel 0, Pol: H, Detector: PK



**Figure 2-3: Band-Edge Compliance of RF Rad. Emissions.**  
Bluetooth, Single freq., Static PBRS,  
3-DH5, Channel 78, Pol: V, Detector: PK

**Figure 2-4: Band-Edge Compliance of RF Rad. Emissions.**  
Bluetooth, Single freq., Static PBRS,  
3-DH5, Channel 78, Pol: H, Detector: PK

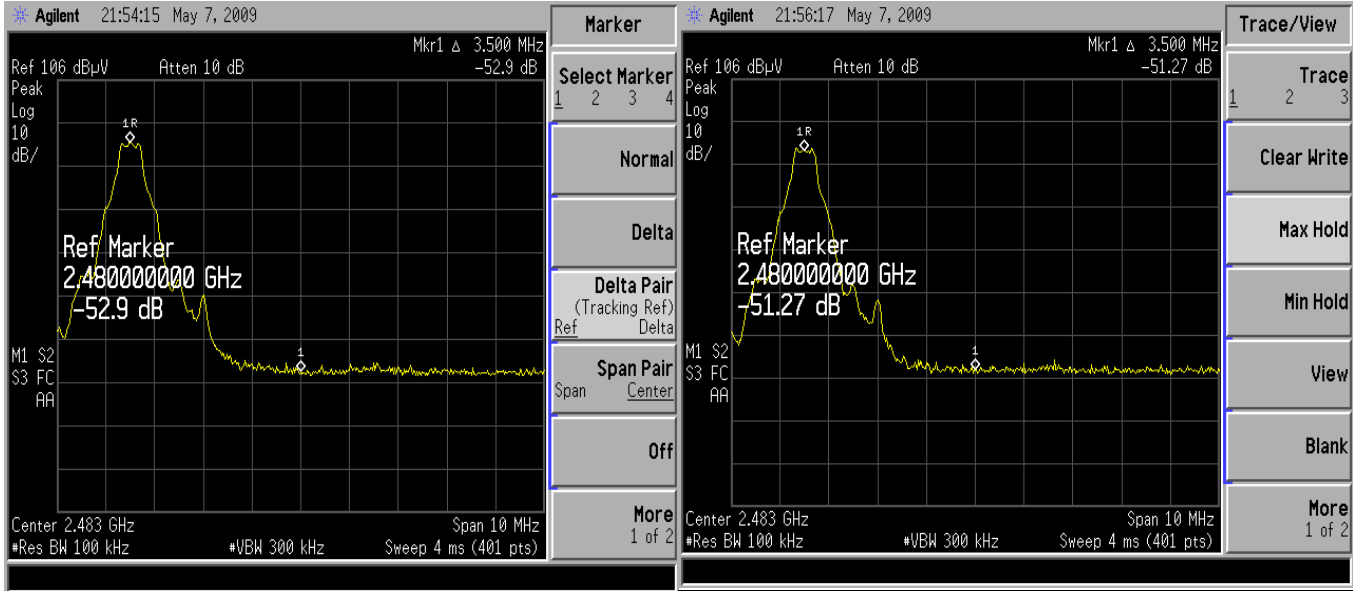


<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCG41GW <b>APPENDIX 2</b>	
<b>Test Report No.</b> RTS-1615-0905-17	<b>Dates of Test</b> March 26 – May 27, 2009	<b>Author Data</b> Michael Cino

Bluetooth Band-Edge Compliance of RF Radiated Emissions cont'd

**Figure 2-5: Band-Edge Compliance of RF Rad. Emissions.**  
Bluetooth, Single freq., Static PBRs,  
DH5, Channel 78, Pol: V, Detector: PK

**Figure 2-6: Band-Edge Compliance of RF Rad. Emissions.**  
Bluetooth, Single freq., Static PBRs,  
DH5, Channel 78, Pol: H, Detector: PK



<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCG41GW <b>APPENDIX 2</b>	
<b>Test Report No.</b> RTS-1615-0905-17	<b>Dates of Test</b> March 26 – May 27, 2009	<b>Author Data</b> Michael Cino

Radiated Emissions Test Results cont'd  
802.11b/g Band

Date of Test: May 20, 2009

Measurements were performed by Andrew Fleming.

The environmental test conditions were: Temperature: 24 °C  
Pressure: 1017 mb  
Relative Humidity: 24 %

The test distance was 3.0 metres with a height of 0.8 metres, 30 MHz to 1000 MHz.  
The BlackBerry® smartphone PIN 20F361D6 was in standalone, vertical position.

The frequency sweep measurements were performed in 802.11b Tx mode, 1 Mbps, channel 1, 2412 MHz.

All emissions had a test margin greater than 25.0 dB.

Date of Test: May 21, 2009.

Measurements were performed by Heng Lin.

The environmental test conditions were: Temperature: 25 °C  
Pressure: 1018 mb  
Relative Humidity: 24 %

The test distance was 1.0 metres with a height of 0.8 metres, 1GHz to 7GHz, 7GHz to 18GHz and 18GHz to 25GHz.

The BlackBerry® smartphone PIN 20F36073 was in standalone, vertical position.

The frequency sweep measurements were performed in 802.11b Tx mode, 1 Mbps, channel 1, 2412 MHz.

All emissions, including harmonics, had a test margin greater than 25.0 dB.

<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCG41GW <b>APPENDIX 2</b>	
<b>Test Report No.</b> RTS-1615-0905-17	<b>Dates of Test</b> March 26 – May 27, 2009	<b>Author Data</b> Michael Cino

Radiated Emissions Test Results cont'd  
802.11b/g Band

Date of Test: May 20, 2009

Measurements were performed by Andrew Fleming.

The environmental test conditions were: Temperature: 24 °C  
Pressure: 1017 mb  
Relative Humidity: 24 %

The test distance was 3.0 metres with a height of 0.8 metres, 30 MHz to 1000 MHz.  
The BlackBerry® smartphone PIN 20F361D6 was in standalone, vertical position.

The frequency sweep measurements were performed in 802.11b and 802.11g Tx modes, 1 Mbps and 6 Mbps respectively, channel 6, 2437 MHz.

All emissions had a test margin greater than 25.0 dB.

Date of Test: May 22 to 27, 2009

Measurements were performed by Heng Lin.

The environmental test conditions were: Temperature: 25 °C  
Pressure: 1018 mb  
Relative Humidity: 24 %

Test Distance was 1.0 metres with a height of 0.8 metres, 1GHz to 7GHz, 7GHz to 18GHz and 18GHz to 25GHz.

The BlackBerry® smartphone PIN 20F36073 was in standalone, vertical position.

The frequency sweep measurements were performed in 802.11b and 802.11g Tx modes, 1 Mbps and 6 Mbps respectively, channel 6, 2437 MHz.

Frequency	Antenna		Test Angle	Detector	Data Rate	Measured Level	Correction Factor for preamp/antenna/cables/filter	Field Strength Level (reading+corr)	Limit @ 3.0 m	Test Margin
	Pol.	Height								
(MHz)	(V/H)	(m)	(°)	(PK or AVE)	Mbps	(dBµV)	(dB/m)	(dBµV/m)	(dB)	(dB)
2392.019	H	4.00	279	PK	6	42.21	8.84	51.05	74.00	-22.95
2486.683	H	3.99	94	PK	6	41.39	10.27	51.66	74.00	-22.34
2388.173	H	3.00	93	AVE	6	28.77	8.85	37.62	54.00	-16.38
2485.929	H	4.00	266	AVE	6	27.73	10.46	38.19	54.00	-15.81

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

<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCG41GW <b>APPENDIX 2</b>	
<b>Test Report No.</b> RTS-1615-0905-17	<b>Dates of Test</b> March 26 – May 27, 2009	<b>Author Data</b> Michael Cino

Radiated Emissions Test Results cont'd  
802.11b/g Band

Date of Test: May 20, 2009

Measurements were performed by Andrew Fleming.

The environmental test conditions were: Temperature: 24 °C  
Pressure: 1016 mb  
Relative Humidity: 24 %

Test Distance was 3.0 metres with a height of 0.8 metres, 30 MHz to 1000 MHz.  
The BlackBerry® smartphone PIN 20F361D6 was in standalone, vertical position.

The frequency sweep measurements were performed in 802.11b Tx mode, 1 Mbps, channel 11, 2462 MHz.

All emissions had a test margin greater than 25.0 dB.

Date of Test: May 22, 2009

Measurements were performed by Heng Lin.

The environmental test conditions were: Temperature: 24 °C  
Pressure: 1020 mb  
Relative Humidity: 24 %

Test Distance was 1.0 metres with a height of 0.8 metres, 1GHz to 7GHz, 7GHz to 18GHz and 18GHz to 25GHz.  
The BlackBerry® smartphone PIN 20F36073 was in standalone, vertical position.

The frequency sweep measurements were performed in 802.11b Tx mode, 1 Mbps, channel 11, 2462 MHz.

All emissions, including harmonics, had a test margin greater than 25.0 dB.

<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCG41GW <b>APPENDIX 2</b>	
<b>Test Report No.</b> RTS-1615-0905-17	<b>Dates of Test</b> March 26 – May 27, 2009	<b>Author Data</b> Michael Cino

802.11b/g Band-Edge Compliance of RF Radiated Emissions

Date of Test: May 7, 2009

Measurements performed by Arjun Rai Bhatti.

The measurements were performed on BlackBerry® smartphone PIN 20EA401F, standalone in vertical configuration on channel 1 for 802.11 b/g mode, 6 Mbps.

The test distance was 3 metres.

Channel	Freq. (MHz)	Rx Antenna		Detector (MHz)	VBW For Peak (dBuV/m)	Peak Corrected Reading (dBuV/m)	Delta Marker (dB)	Corrected Band edge (dBuV/m)	Limit (dBuV/m)	Diff. To Limit (dB)
		Type	POL.							
1	2412.0	Horn	V	PK	1.0 MHz	97.19	35.71	61.48	74	-12.52
1	2412.0	Horn	H	PK	1.0 MHz	105.60	39.42	66.18	74	-7.82
1	2412.0	Horn	V	AVE.	10 Hz	83.00	35.71	47.29	54	-6.71
1	2412.0	Horn	H	AVE.	10 Hz	90.67	39.42	51.25	54	-2.75

The measurements were performed on the BlackBerry® smartphone PIN 20EA401F, standalone in vertical position, on channel 11 for 802.11 b/g mode.

Channel	Freq. (MHz)	Rx Antenna		Detector (MHz)	VBW For Peak (dBuV/m)	Peak Corrected Reading (dBuV/m)	Delta Marker (dB)	Corrected Band edge (dBuV/m)	Limit (dBuV/m)	Diff. To Limit (dB)
		Type	POL.							
11	2462.0	Horn	V	PK	1.0 MHz	98.16	37.20	60.96	74	-13.04
11	2462.0	Horn	H	PK	1.0 MHz	106.29	40.73	65.56	74	-8.44
11	2462.0	Horn	V	AVE.	10 Hz	84.01	37.20	46.81	54	-7.19
11	2462.0	Horn	H	AVE.	10 Hz	91.51	40.73	50.78	54	-3.22

See figures 2-7 to 2-10 for the plots of the 802.11b/g band-edge compliance.

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

<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCG41GW <b>APPENDIX 2</b>	
<b>Test Report No.</b> RTS-1615-0905-17	<b>Dates of Test</b> March 26 – May 27, 2009	<b>Author Data</b> Michael Cino

802.11b/g Band-Edge Compliance of RF Radiated Emissions cont'd

Figure 2-7: Band-Edge Compliance of RF Radiated Emission  
802.11b/g, Channel 1, 2412 MHz, Max Pol: V,  
Detector: PK

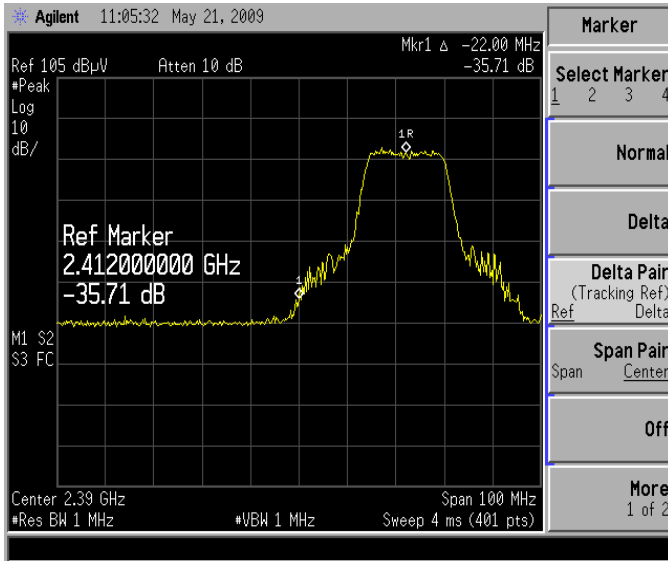


Figure 2-8: Band-Edge Compliance of RF Radiated Emission  
802.11b/g, Channel 1, 2412 MHz, Max Pol: H,  
Detector: PK

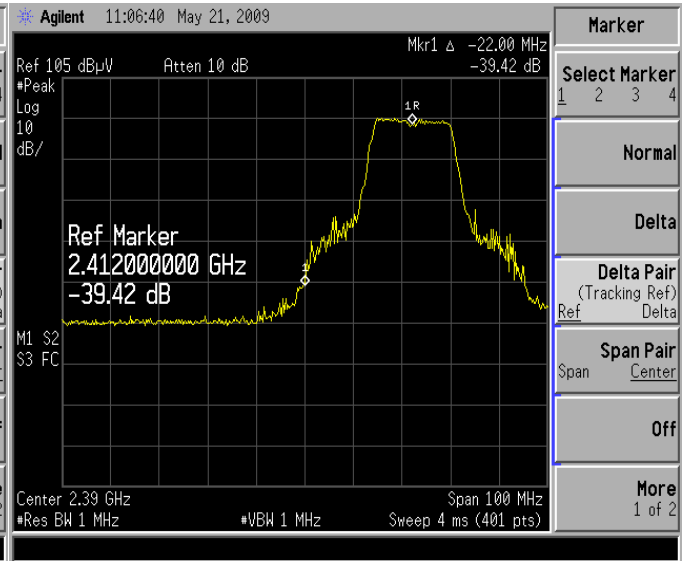


Figure 2-9: Band-Edge Compliance of RF Radiated Emission  
802.11b/g, Channel 11, 2462 MHz, Max Pol: V,  
Detector: PK

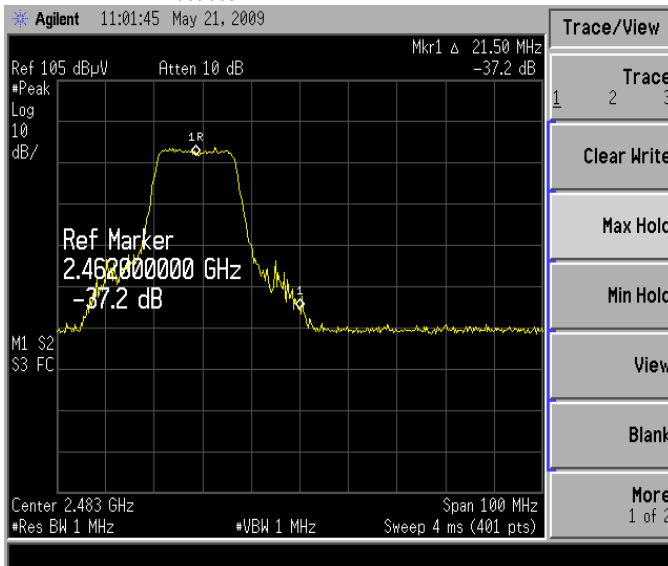
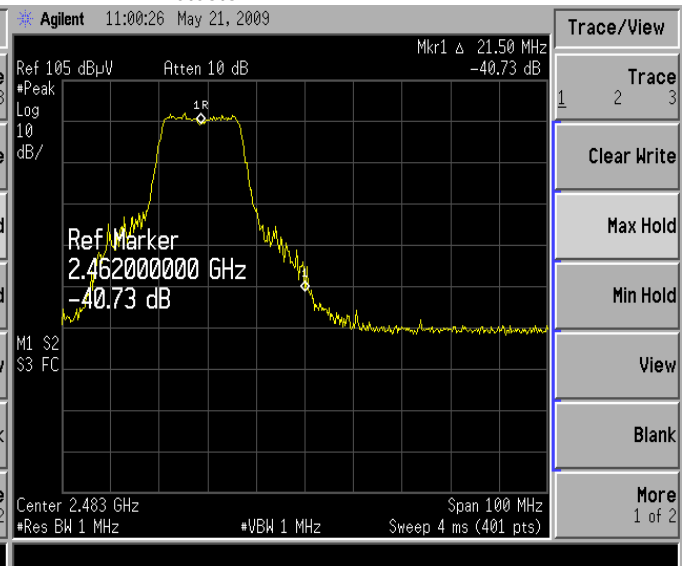


Figure 2-10: Band-Edge Compliance of RF Radiated Emission  
802.11b/g, Channel 11, 2462 MHz, Max Pol: H,  
Detector: PK





<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCG41GW <b>APPENDIX 3</b>	
<b>Test Report No.</b> RTS-1615-0905-17	<b>Dates of Test</b> March 26 – May 27, 2009	<b>Author Data</b> Michael Cino

## APPENDIX 3 – BLUETOOTH CONDUCTED EMISSIONS TEST DATA/PLOTS

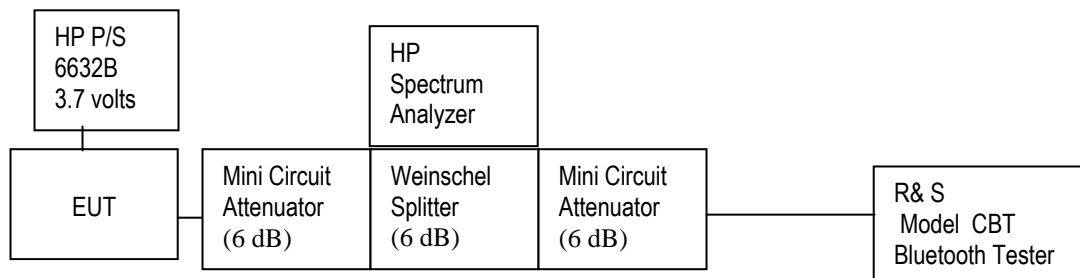
<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCG41GW <b>APPENDIX 3</b>	
<b>Test Report No.</b> RTS-1615-0905-17	<b>Dates of Test</b> March 26 – May 27, 2009	<b>Author Data</b> Michael Cino

Bluetooth RF Conducted Emission Test Results

Bluetooth power output from BlackBerry® smartphone PIN 20E3AC4D was at maximum for all the recorded measurements shown below.  
The measurements were performed by Maurice Battler.

Date of test: March 26, 2009

**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: 1008 mb  
Relative Humidity: 28%

<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCG41GW <b>APPENDIX 3</b>	
<b>Test Report No.</b> RTS-1615-0905-17	<b>Dates of Test</b> March 26 – May 27, 2009	<b>Author Data</b> Michael Cino

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.

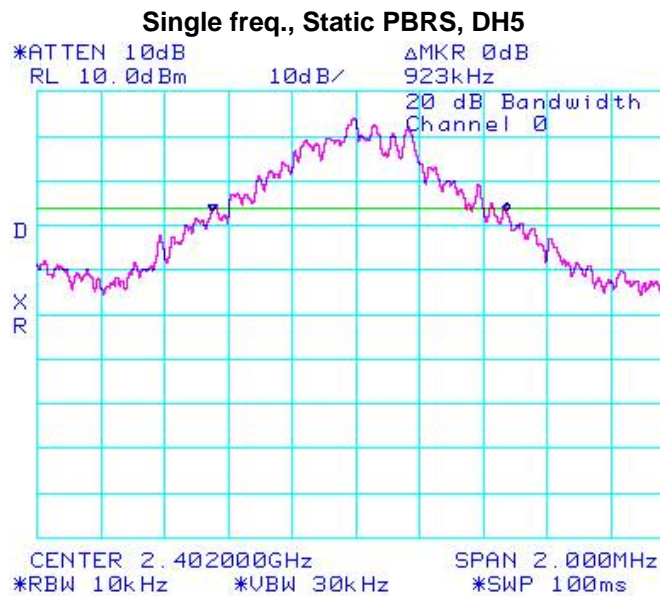
Using pattern type “Static PRBS” and packet type “DH5” during the measurements.

Bluetooth Channel	Limit (MHz)	Measured Level (MHz)
0	≤1.0	0.923
39	≤1.0	0.937
78	≤1.0	0.923

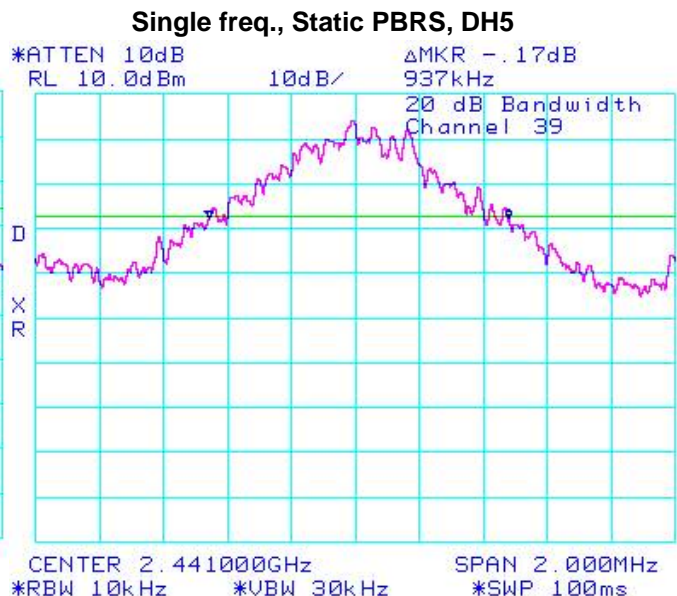
See figures 3-1 to 3-3 for the plots of the 20 dB bandwidth measurements.

The environmental test conditions were: Temperature: 23°C  
 Pressure: 1011 mb  
 Relative Humidity: 34%

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



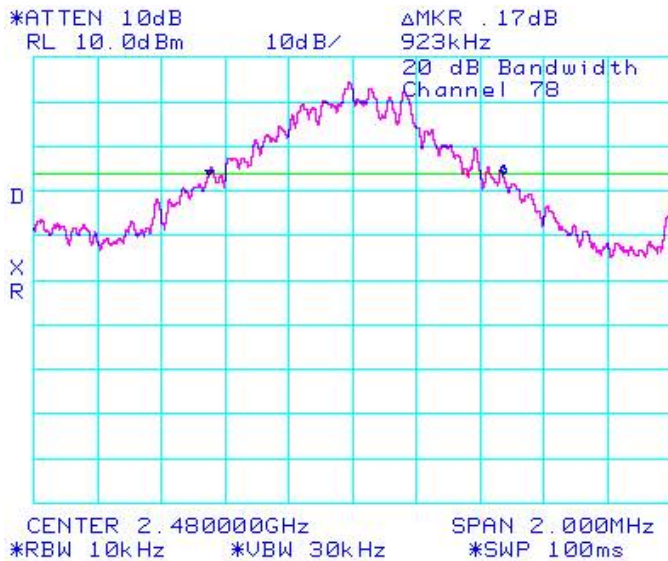
**Figure 3-2: 20 dB Bandwidth**



<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCG41GW <b>APPENDIX 3</b>	
<b>Test Report No.</b> RTS-1615-0905-17	<b>Dates of Test</b> March 26 – May 27, 2009	<b>Author Data</b> Michael Cino

Bluetooth RF Conducted Emission Test Results cont'd

**Figure 3-3: 20 dB Bandwidth**  
**Single freq., Static PBRs, DH5**



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

Bluetooth Channel	Limit (MHz)	Measured Level (MHz)
0	≤1.5	1.240
39	≤1.5	1.247
78	≤1.5	1.243

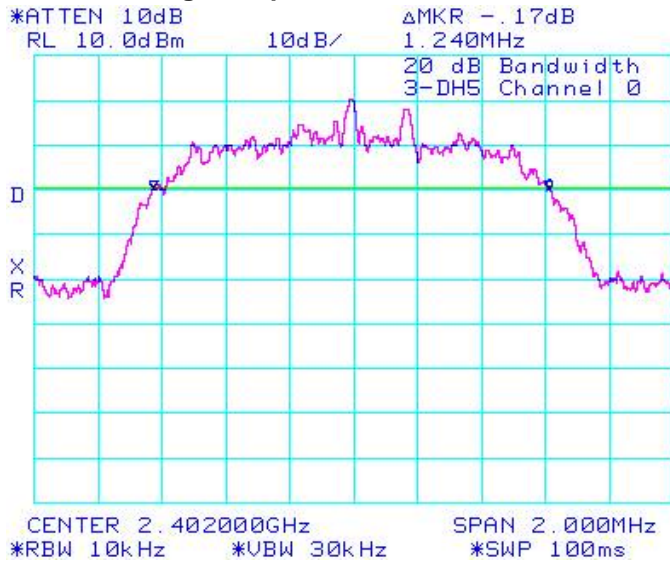
See figures 3-4 to 3-6 for the plots of the 20 dB bandwidth measurements.

<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCG41GW <b>APPENDIX 3</b>	
Test Report No. RTS-1615-0905-17	Dates of Test March 26 – May 27, 2009	Author Data Michael Cino

Bluetooth RF Conducted Emission Test Results cont'd

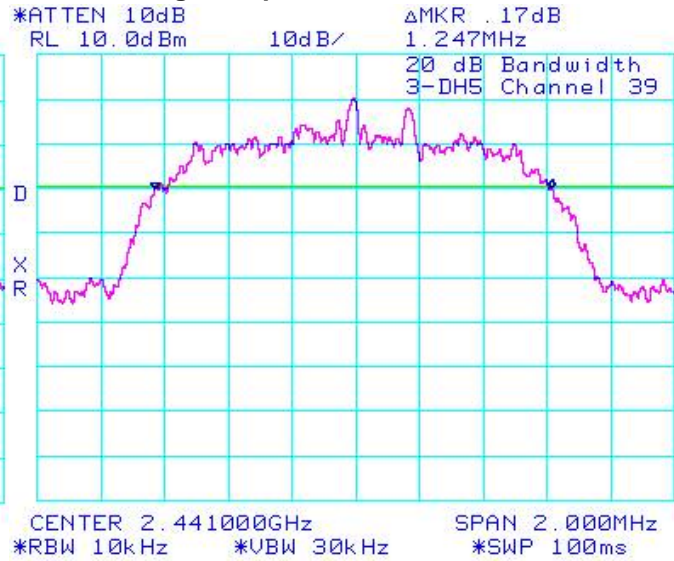
**Figure 3-4: 20 dB Bandwidth**

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



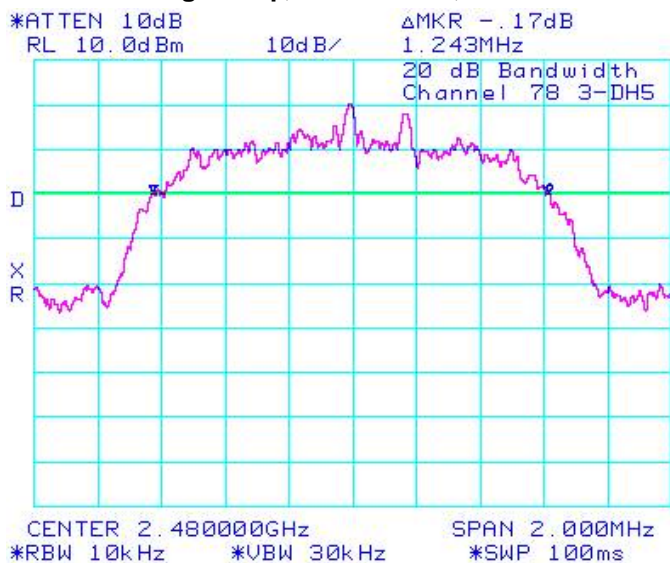
**Figure 3-5: 20 dB Bandwidth**

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



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

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



<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCG41GW <b>APPENDIX 3</b>	
<b>Test Report No.</b> RTS-1615-0905-17	<b>Dates of Test</b> March 26 – May 27, 2009	<b>Author Data</b> Michael Cino

Bluetooth RF Conducted Emission Test Results cont'd

**Carrier Frequency Separation**

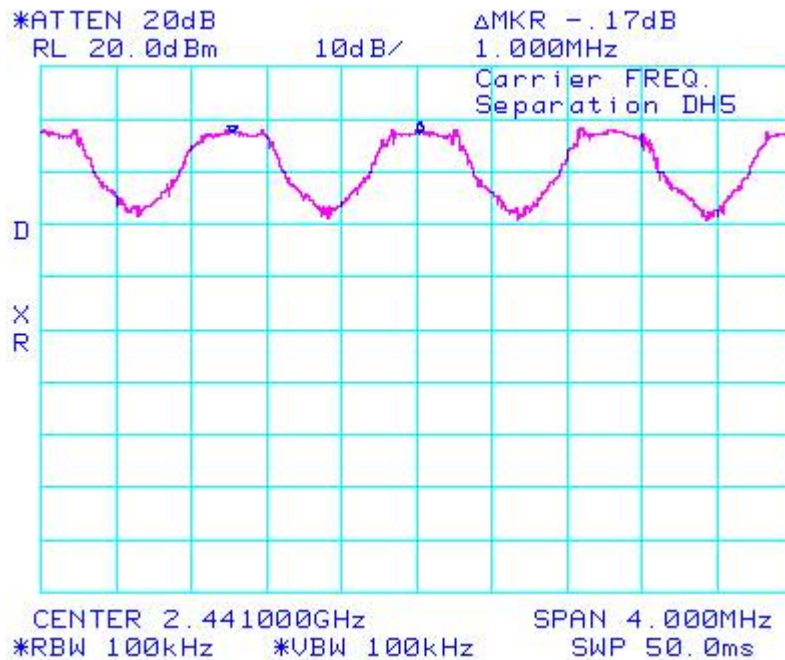
The EUT met the requirements of the Carrier Frequency Separation as per 47 CFR 15.247(a) and RSS-210. Channel 38 to 39 was measured. Bluetooth was operating in frequency hopping (Euro/US) mode.

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 PBRS, DH5, Channels 38 to 39**



<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCG41GW <b>APPENDIX 3</b>	
<b>Test Report No.</b> RTS-1615-0905-17	<b>Dates of Test</b> March 26 – May 27, 2009	<b>Author Data</b> Michael Cino

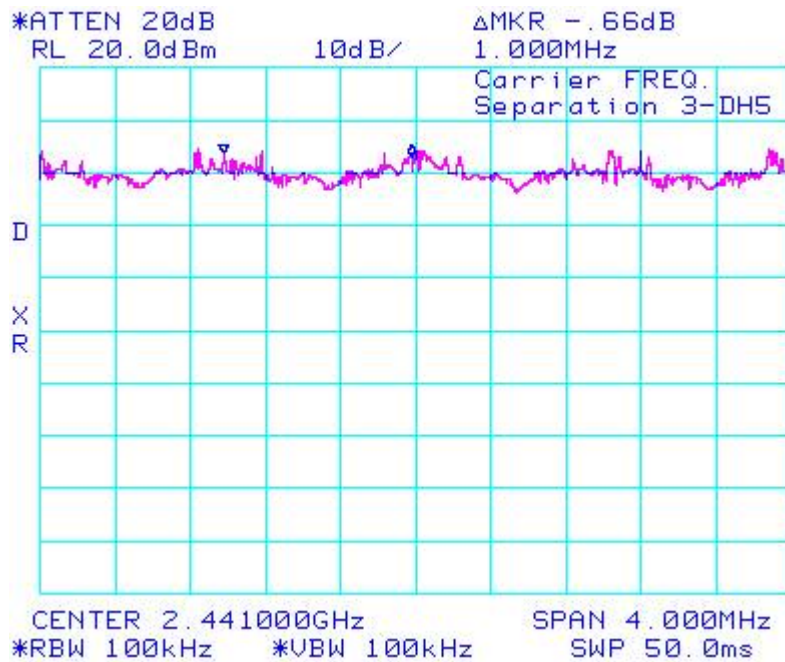
Bluetooth RF Conducted Emission Test Results cont'd

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 PBRS, 3-DH5, Channels 38 to 39**



<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCG41GW <b>APPENDIX 3</b>	
<b>Test Report No.</b> RTS-1615-0905-17	<b>Dates of Test</b> March 26 – May 27, 2009	<b>Author Data</b> Michael Cino

Bluetooth RF Conducted Emission Test Results cont'd

**Number of Hopping Frequencies**

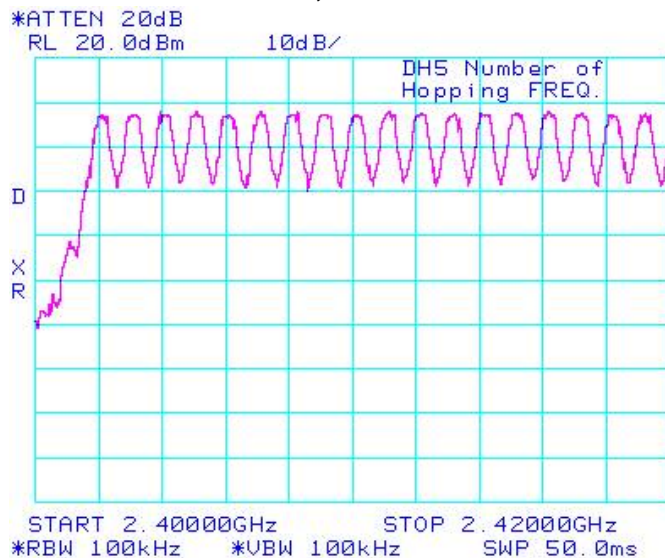
The EUT met the requirements of the number of hopping frequencies as per 47 CFR 15.247(a) and RSS-210. Bluetooth was operating in frequency hopping (Euro/US) mode.

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

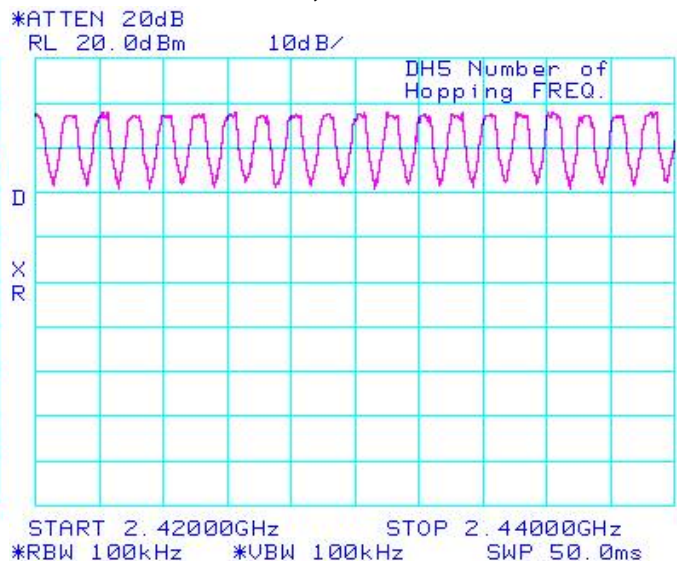
Limit (CH)	Number of Hopping Frequencies (CH)
≥75	79

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

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



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

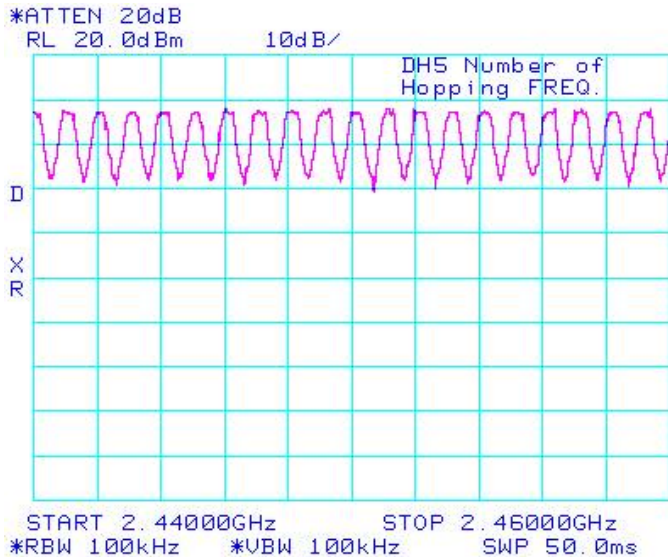




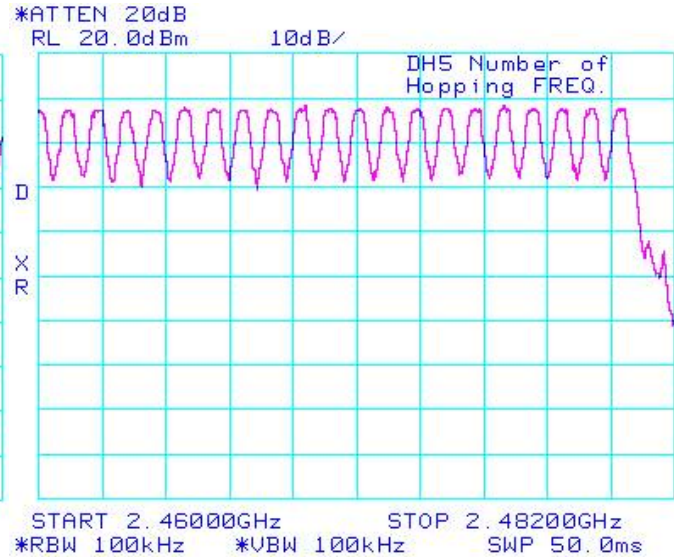
<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCG41GW <b>APPENDIX 3</b>	
Test Report No. RTS-1615-0905-17	Dates of Test March 26 – May 27, 2009	Author Data Michael Cino

Bluetooth RF Conducted Emission Test Results cont'd

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



**Figure 3-9: Number of Hopping Frequencies  
Static PBRs, 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 µsec 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.

<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCG41GW <b>APPENDIX 3</b>	
<b>Test Report No.</b> RTS-1615-0905-17	<b>Dates of Test</b> March 26 – May 27, 2009	<b>Author Data</b> Michael Cino

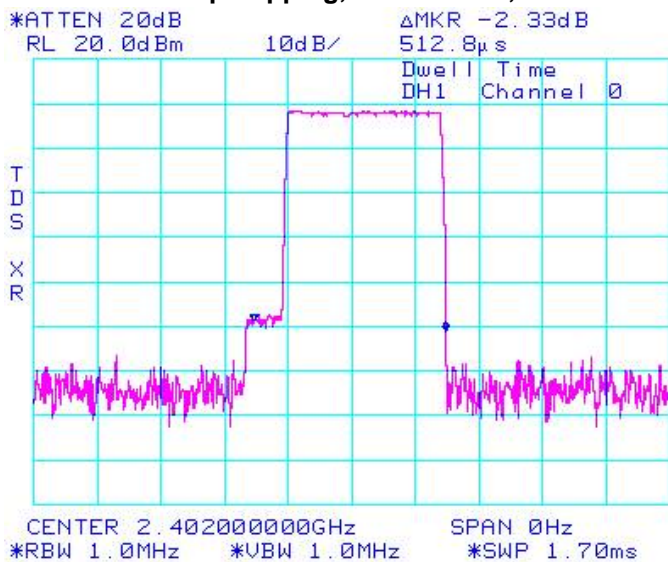
Bluetooth RF Conducted Emission Test Results cont'd

Bluetooth Channel	Mode	Tx Time (ms)	Dwell Time/31.6 sec. (msec.)	Limit (msec.)	Margin (msec.)
0	DH1	0.5128	0.5128 x 320.0 = 164.01	400	235.99
39	DH1	0.5185	0.5185 x 320.0 = 165.92	400	234.08
78	DH1	0.5157	0.5157 x 320.0 = 165.02	400	234.98
0	DH3	1.7600	1.7600x 159.9 = 281.42	400	118.58
39	DH3	1.7800	1.7800 x 159.9 = 284.62	400	115.38
78	DH3	1.7500	1.7500 x 159.9 = 279.83	400	120.17
0	DH5	3.0038	3.0038 x 106.8 = 320.81	400	79.19
39	DH5	3.0150	3.0150 x 106.8 = 322.00	400	78.00
78	DH5	3.0150	3.0150 x 106.8 = 322.00	400	78.00

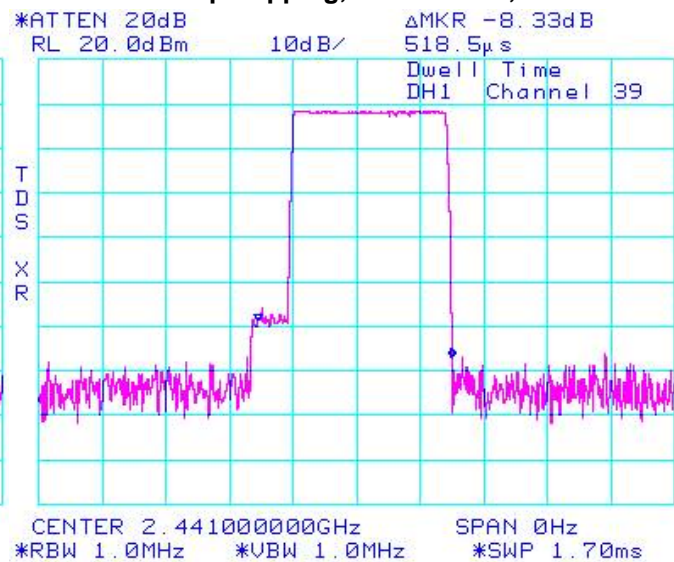
See figures 3-13 to 3-21 for the plots of the dwell time.

Bluetooth RF Conducted Emission Test Results cont'd

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



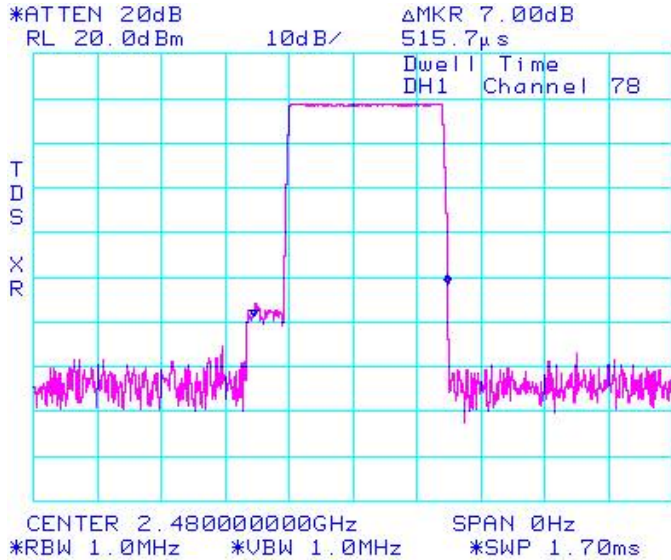
**Figure 3-14: Time of Occupancy (Dwell Time)**  
Freq. Hopping, Static PBRS, DH1



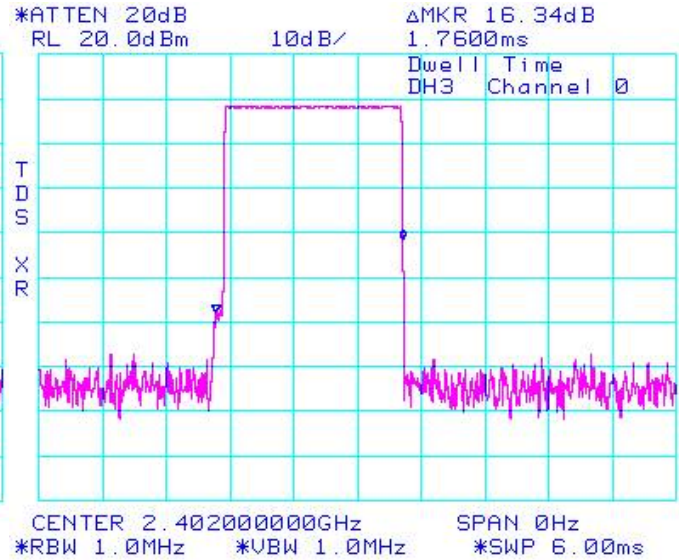
<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCG41GW <b>APPENDIX 3</b>	
	<b>Test Report No.</b> RTS-1615-0905-17	<b>Dates of Test</b> March 26 – May 27, 2009

Bluetooth RF Conducted Emission Test Results cont'd

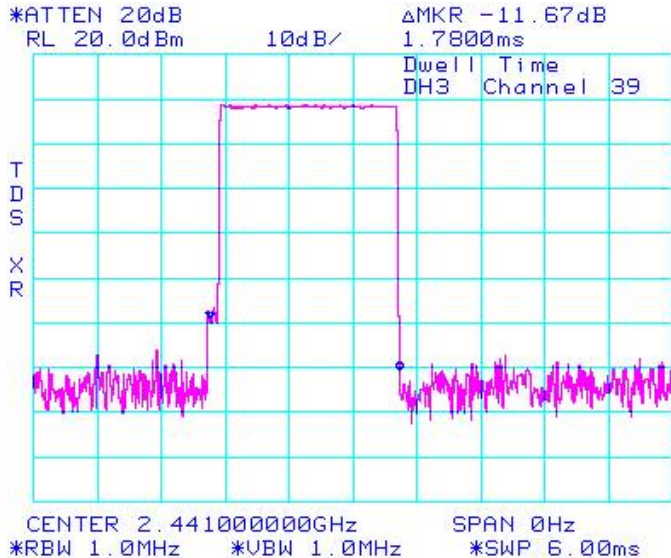
**Figure 3-15: Time of Occupancy (Dwell Time)**  
**Freq. Hopping, Static PBRs, DH1**



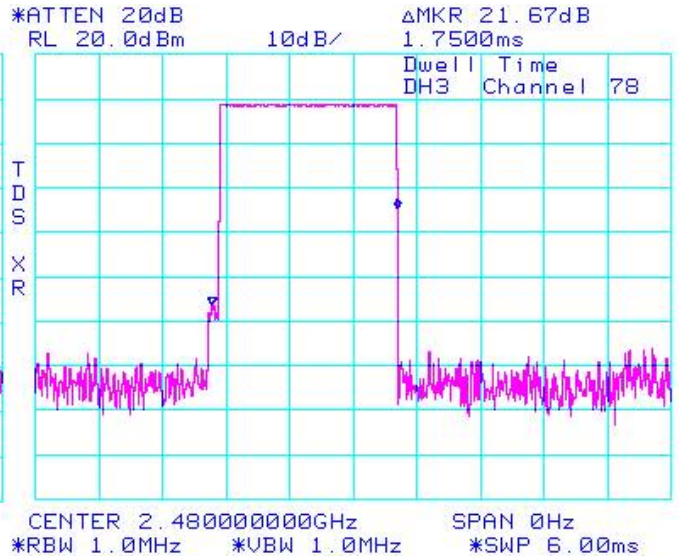
**Figure 3-16: Time of Occupancy (Dwell Time)**  
**Freq. Hopping, Static PBRs, DH3**



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



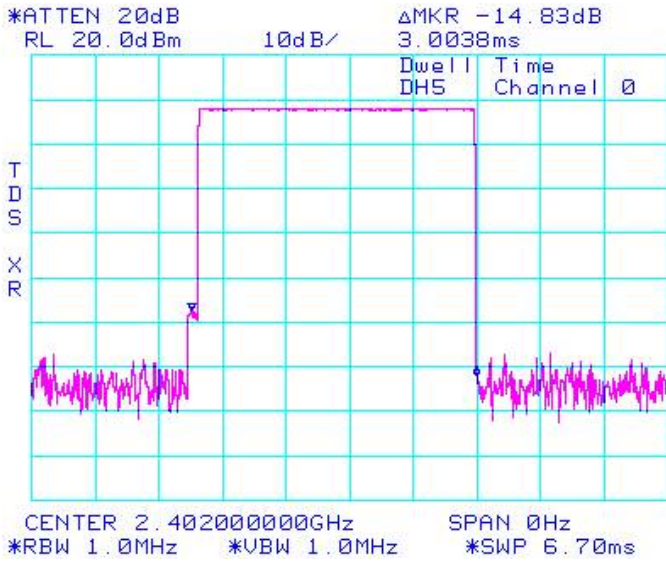
**Figure 3-18 : Time of Occupancy (Dwell Time)**  
**Freq. Hopping, Static PBRs, DH3**



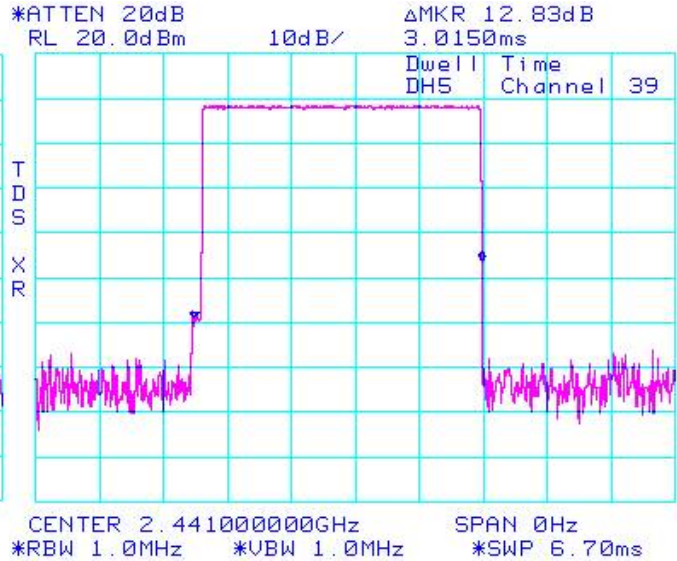
<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCG41GW <b>APPENDIX 3</b>	
	<b>Test Report No.</b> RTS-1615-0905-17	<b>Dates of Test</b> March 26 – May 27, 2009

Bluetooth RF Conducted Emission Test Results cont'd

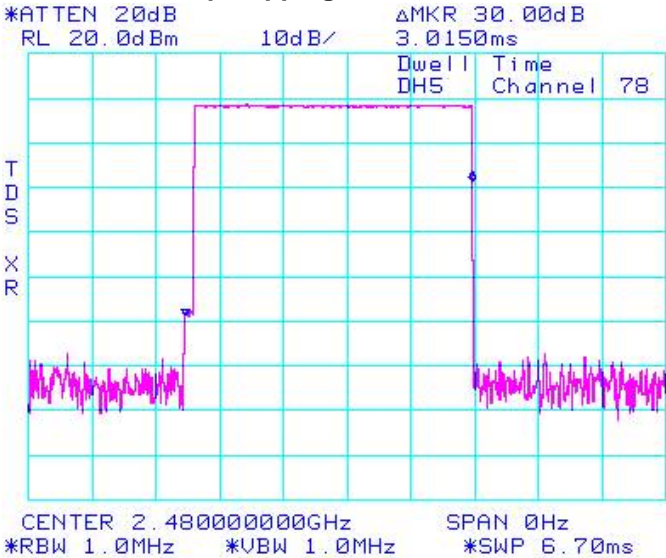
**Figure 3-19: Time of Occupancy (Dwell Time)**  
**Freq. Hopping, Static PBRs, DH5**



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



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



<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCG41GW <b>APPENDIX 3</b>	
Test Report No. RTS-1615-0905-17	Dates of Test March 26 – May 27, 2009	Author Data Michael Cino

Bluetooth RF Conducted Emission Test Results cont'd

**Maximum Peak Conducted Output Power**

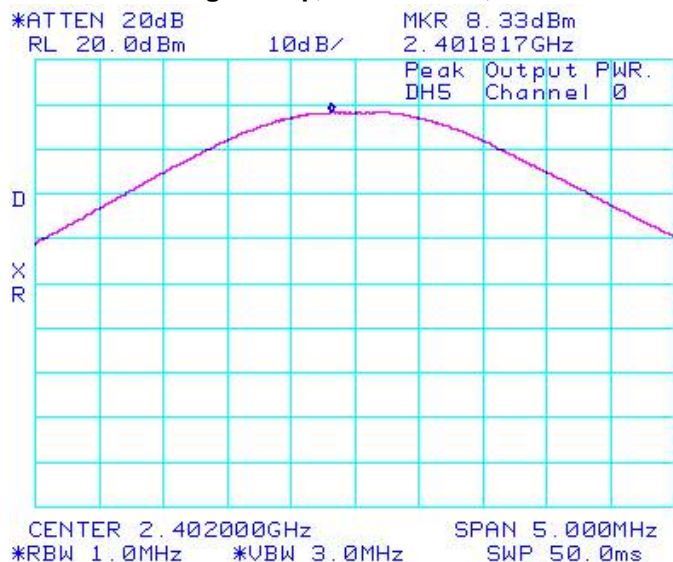
The EUT met the requirements of the maximum peak conducted output power of class 2 as per 47 CFR 15.247(b) and RSS-210. Low channel (0), middle channel (39) and high channel (78) were measured. Bluetooth was operating in single frequency mode during the measurements. A reference offset of 12.4 dB was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

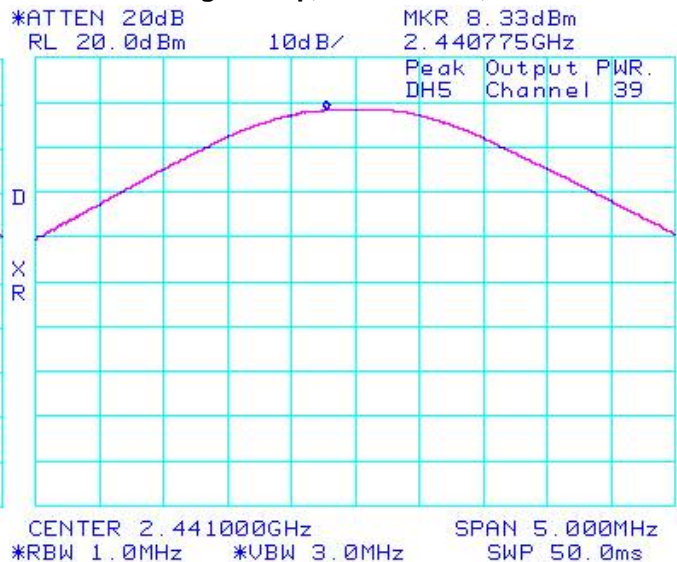
Bluetooth Channel	Measured Level (dBm)	Measured Level (W)	Class 1 Limit (dBm)
0	8.33	0.00681	0.0 to 20.0
39	8.33	0.00681	0.0 to 20.0
78	8.67	0.00736	0.0 to 20.0

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



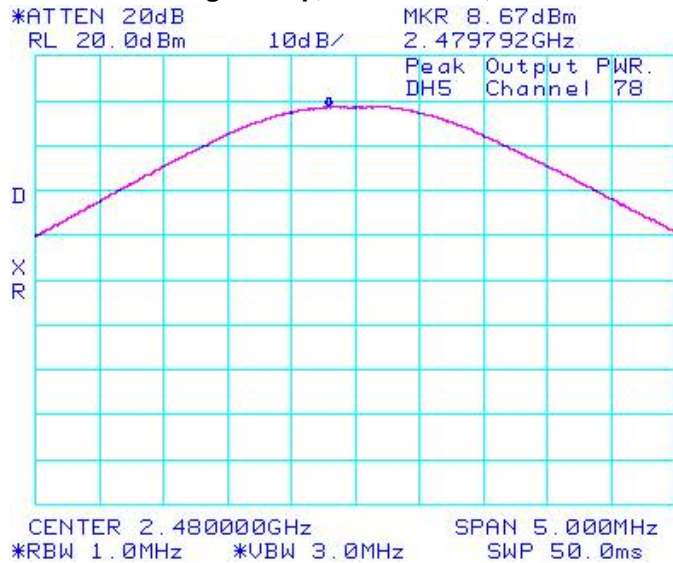
**Figure 3-23: Max. Peak Conducted Output Power**  
Single Freq., Static PRBS, DH5



<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCG41GW <b>APPENDIX 3</b>	
<b>Test Report No.</b> RTS-1615-0905-17	<b>Dates of Test</b> March 26 – May 27, 2009	<b>Author Data</b> Michael Cino

Bluetooth RF Conducted Emission Test Results cont'd

**Figure 3-24: Max. Peak Conducted Output Power  
Single Freq., Static PBRs, DH5**



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

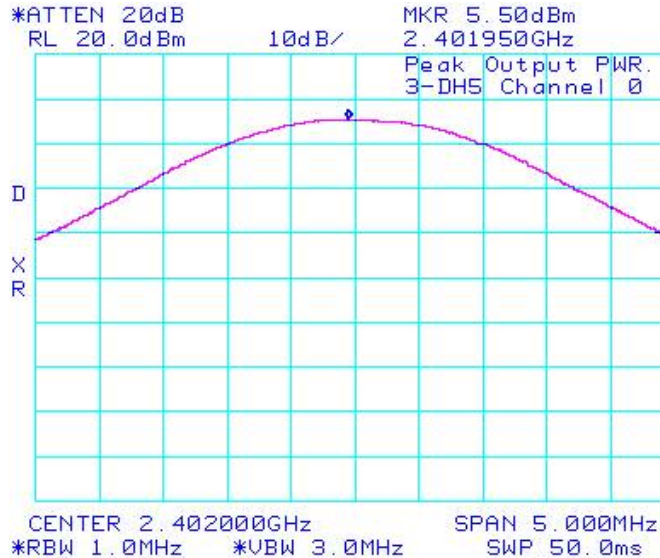
Bluetooth Channel	Measured Level (dBm)	Measured Level (W)	Class 1 Limit (dBm)
0	5.50	0.00355	0.0 to 20.0
39	5.17	0.00329	0.0 to 20.0
78	5.33	0.00341	0.0 to 20.0

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

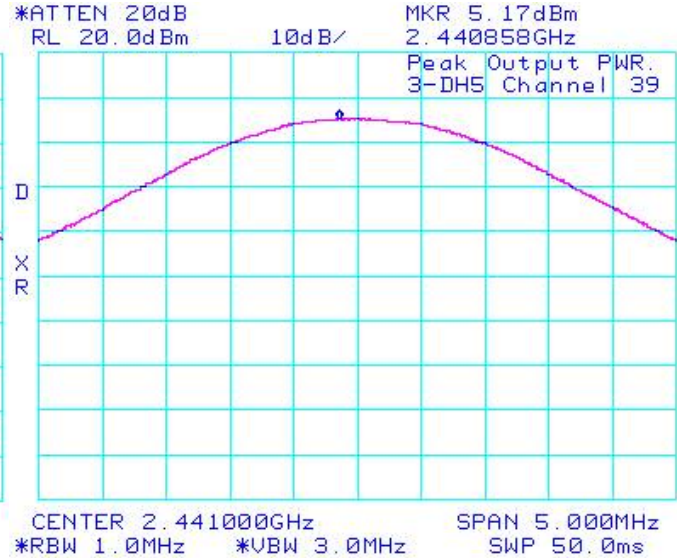
<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCG41GW <b>APPENDIX 3</b>	
	<b>Test Report No.</b> RTS-1615-0905-17	<b>Dates of Test</b> March 26 – May 27, 2009
		<b>Author Data</b> Michael Cino

Bluetooth RF Conducted Emission Test Results cont'd

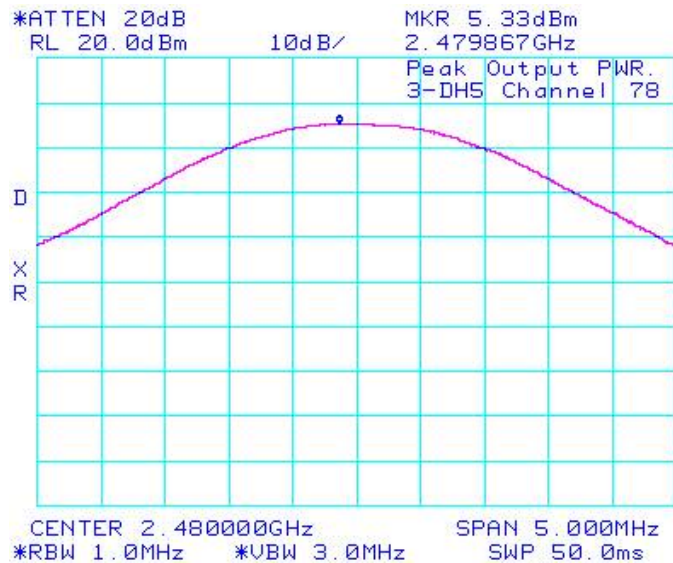
**Figure 3-25: Max. Peak Conducted Output Power  
Single Freq., Static PBRs, 3-DH5**



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



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



<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCG41GW <b>APPENDIX 3</b>	
<b>Test Report No.</b> RTS-1615-0905-17	<b>Dates of Test</b> March 26 – May 27, 2009	<b>Author Data</b> Michael Cino

Bluetooth RF Conducted Emission Test Results cont'd

**Band Edge Compliance**

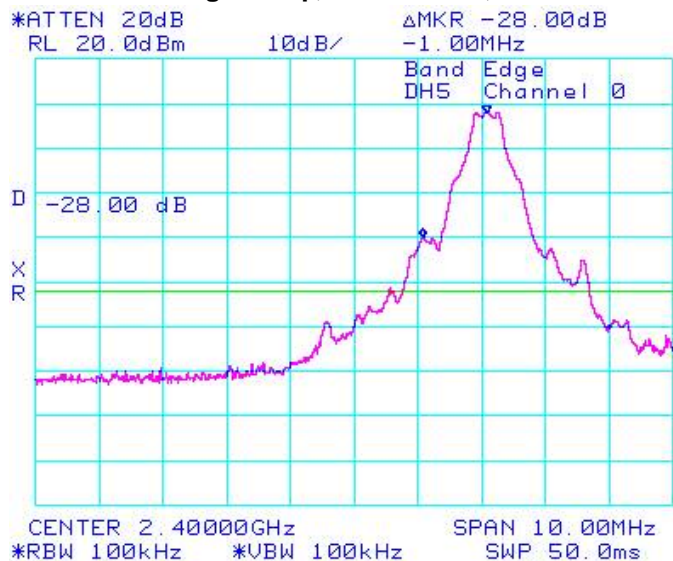
The EUT met the requirements of the band edge compliance as per 47 CFR 15.247(c) and RSS-210. Low channel (0) and high channel (78) were measured. Bluetooth was operating in single frequency and hopping mode.

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

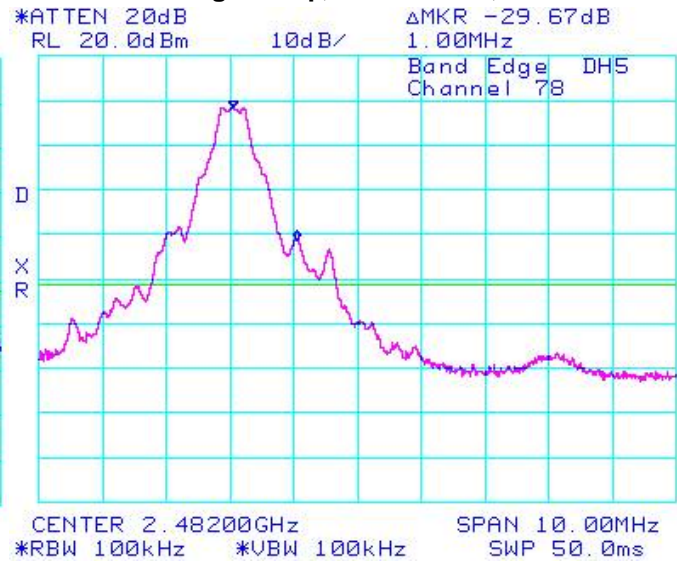
Bluetooth Channel	Operating Mode	Measured Level (dBc)	Limit (dBc)	Margin (dB)
0	Single Frequency	-28.00	-20	-8.00
78	Single Frequency	-29.67	-20	-9.67
0	Hopping	-28.67	-20	-8.67
78	Hopping	-30.66	-20	-10.66

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



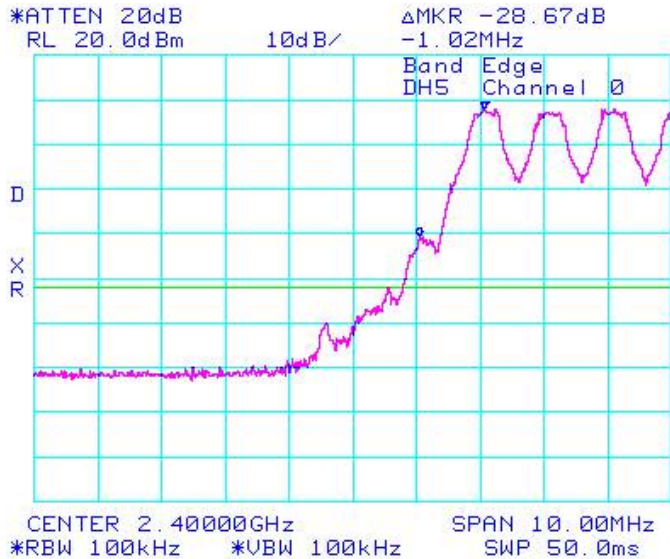


<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCG41GW <b>APPENDIX 3</b>	
Test Report No. RTS-1615-0905-17	Dates of Test March 26 – May 27, 2009	Author Data Michael Cino

Bluetooth RF Conducted Emission Test Results cont'd

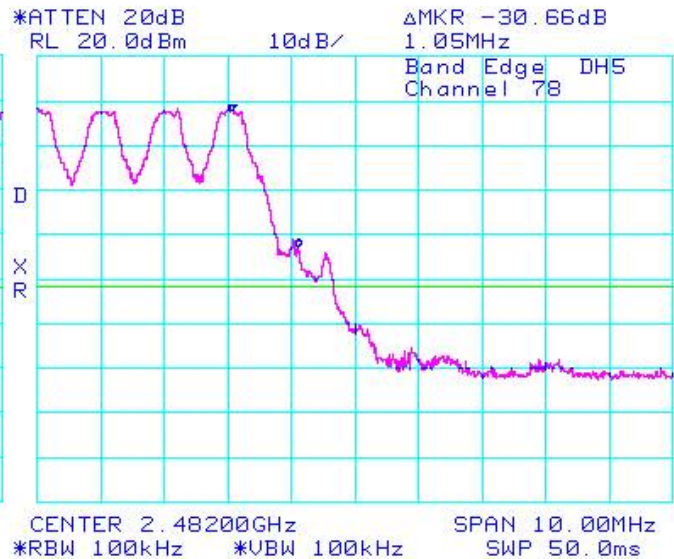
**Figure 3-30: Band Edge Compliance**

**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	-32.17	-20	-12.17
78	Single Frequency	-37.17	-20	-17.17
0 - 78	Hopping	-33.34	-20	-13.34
0 - 78	Hopping	-37.84	-20	-17.84

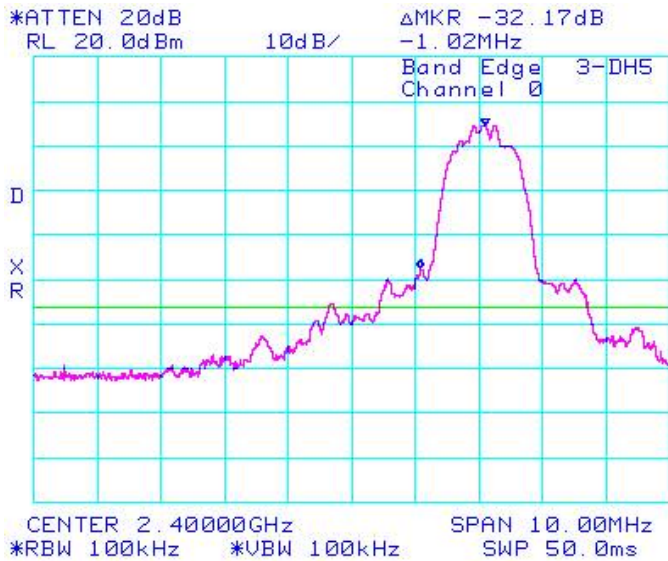
See figures 3-32 to 3-35 for the plots of the band edge compliance measurements.

<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCG41GW <b>APPENDIX 3</b>	
	Test Report No. RTS-1615-0905-17	Dates of Test March 26 – May 27, 2009

Bluetooth RF Conducted Emission Test Results cont'd

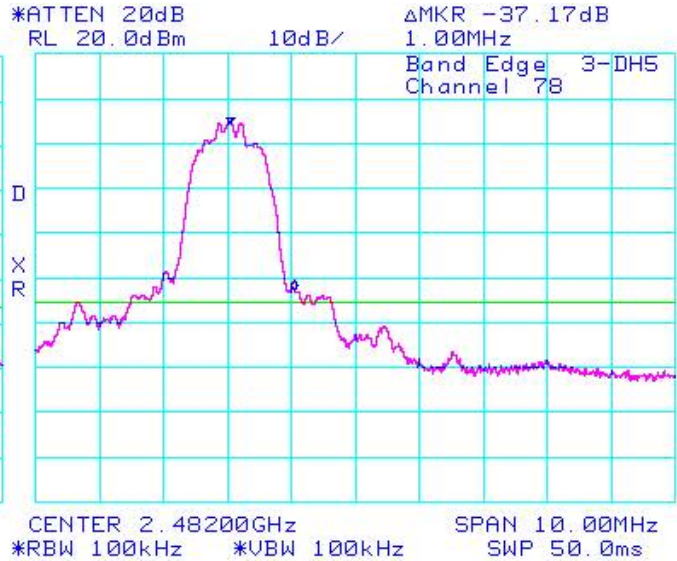
**Figure 3-32: Band Edge Compliance**

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



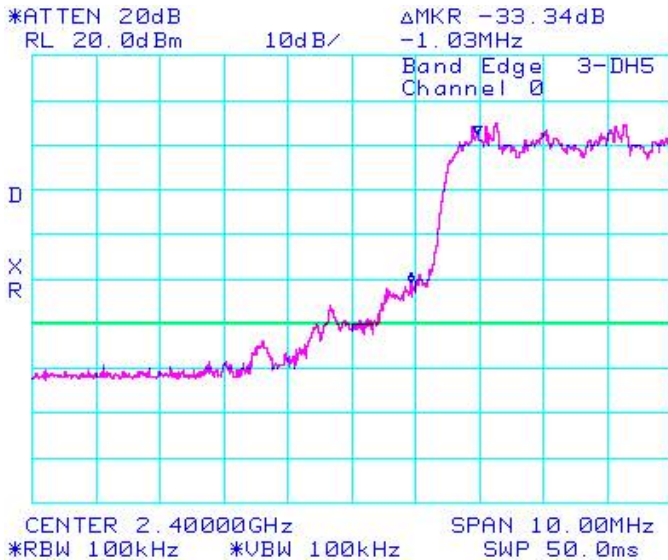
**Figure 3-33: Band Edge Compliance**

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



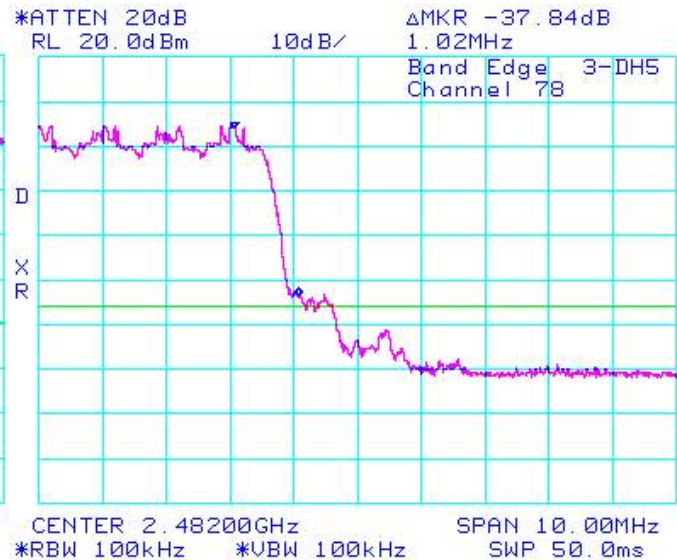
**Figure 3-34: Band Edge Compliance**

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



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

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



<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCG41GW <b>APPENDIX 3</b>	
<b>Test Report No.</b> RTS-1615-0905-17	<b>Dates of Test</b> March 26 – May 27, 2009	<b>Author Data</b> Michael Cino

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.

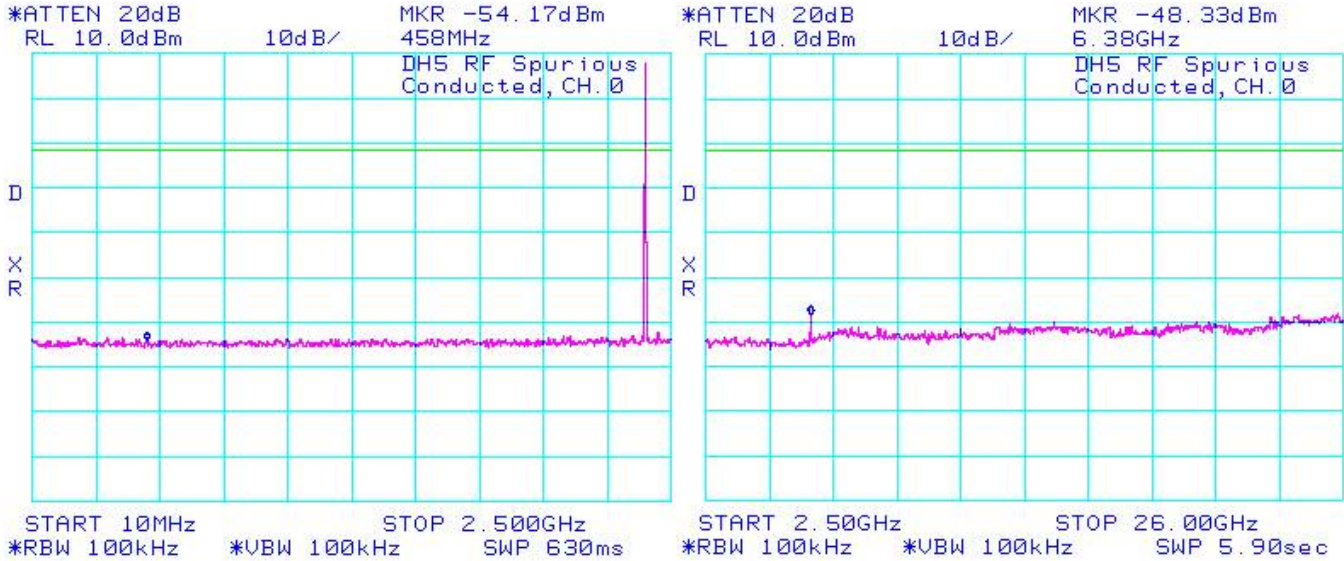
Bluetooth Channel	Channel Power (dBm)	Max. Measured Level (dBm)	Max. Measured Level from carrier (dBc)	Limit (dBc)
0	8.33	-48.33	-56.66	-20
39	8.33	-47.67	-56.00	-20
78	8.67	-41.83	-50.50	-20
Hopping mode	8.33	-47.50	-55.83	-20

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

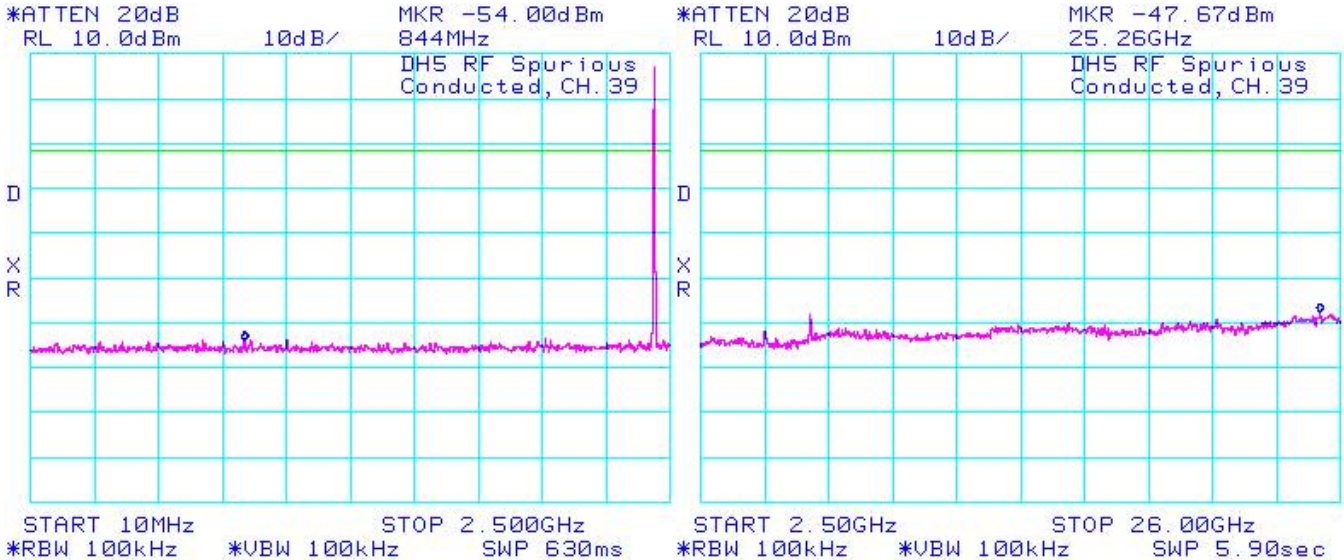
<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCG41GW <b>APPENDIX 3</b>	
	Test Report No. RTS-1615-0905-17	Dates of Test March 26 – May 27, 2009

Bluetooth RF Conducted Emission Test Results cont'd

**Figure 2-36: Spurious RF Conducted Emissions**  
Single Freq., Static PBRS, DH5,



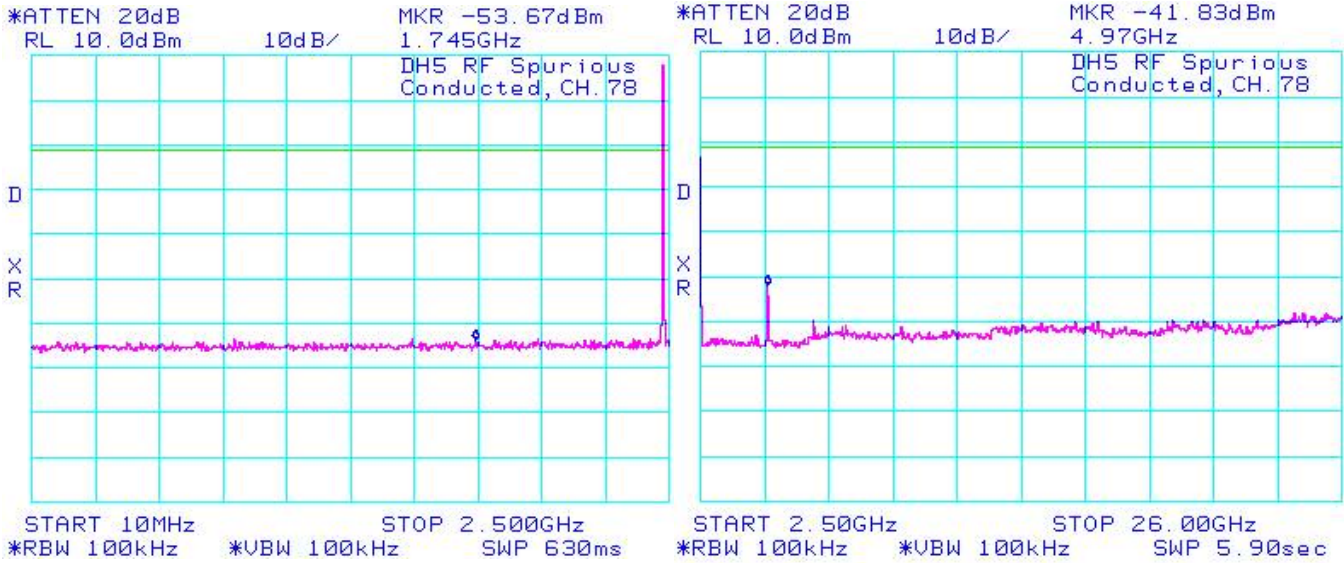
**Figure 2-37: Spurious RF Conducted Emissions**  
Single Freq., Static PBRS, DH5



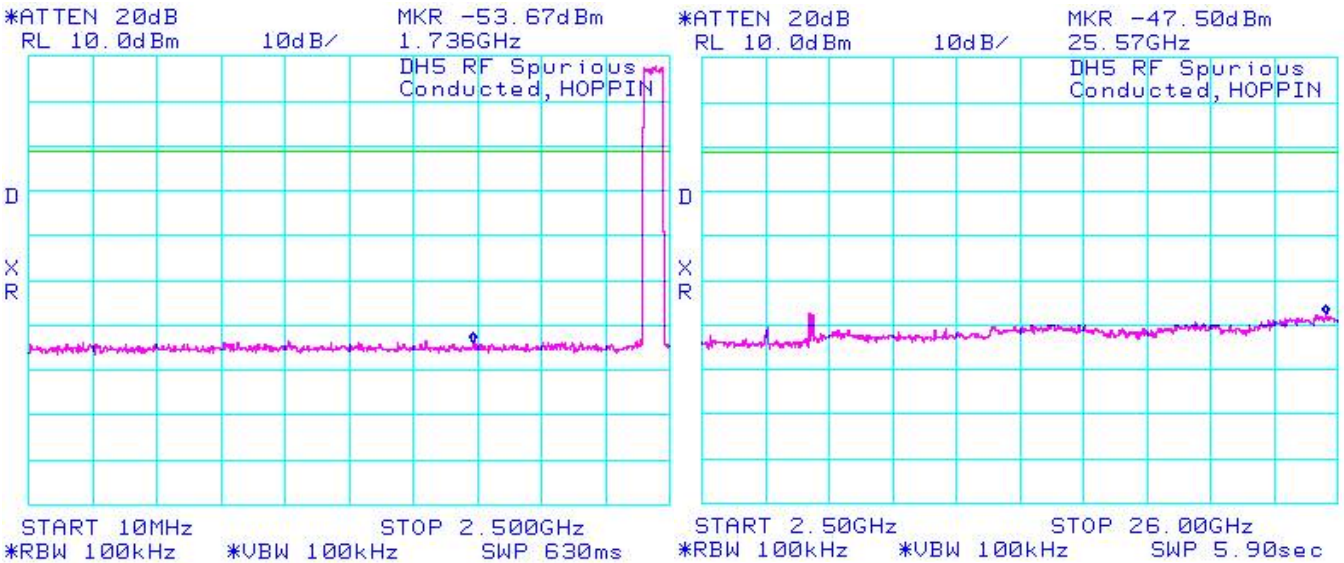
<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCG41GW <b>APPENDIX 3</b>	
	Test Report No. RTS-1615-0905-17	Dates of Test March 26 – May 27, 2009

Bluetooth RF Conducted Emission Test Results cont'd

**Figure 2-38: Spurious RF Conducted Emissions**  
**Single Freq., Static PBRs, DH5**



**Figure 2-39: Spurious RF Conducted Emissions**  
**Freq. Hopping, Static PBRs, DH5**



<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCG41GW <b>APPENDIX 3</b>	
<b>Test Report No.</b> RTS-1615-0905-17	<b>Dates of Test</b> March 26 – May 27, 2009	<b>Author Data</b> Michael Cino

Bluetooth RF Conducted Emission Test Results cont'd

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

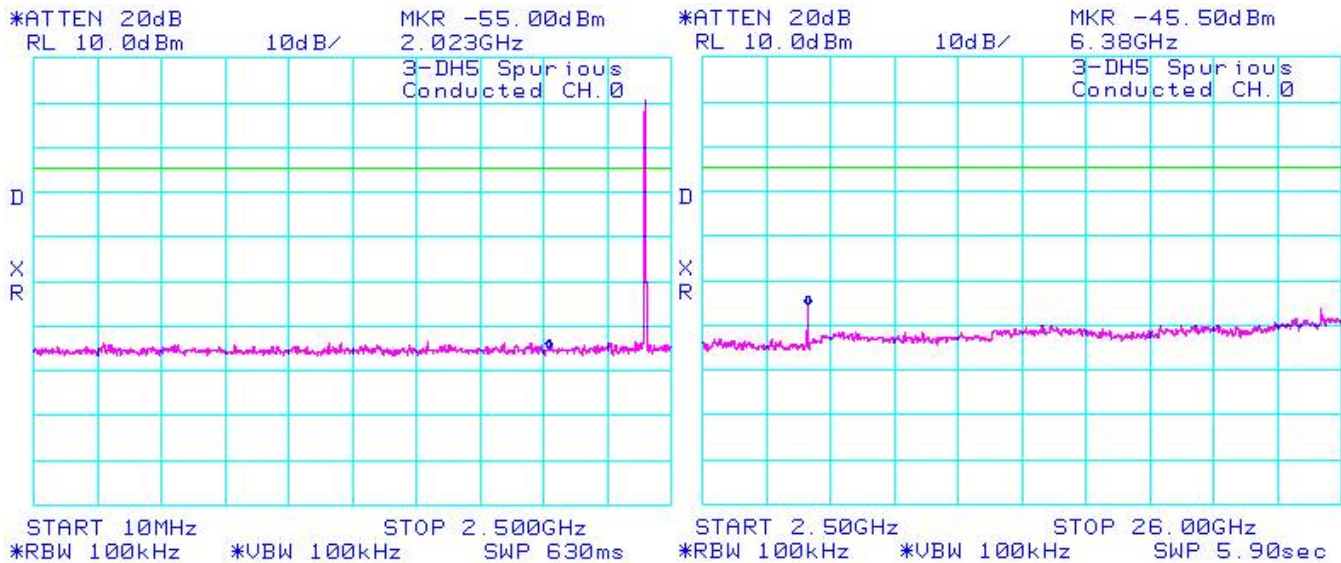
<b>Bluetooth Channel</b>	<b>Channel Power (dBm)</b>	<b>Max. Measured Level (dBm)</b>	<b>Max. Measured Level from carrier (dBc)</b>	<b>Limit (dBc)</b>
0	5.50	-45.50	-51.00	-20
39	5.17	-45.00	-50.17	-20
78	5.33	-46.67	-52.00	-20
Hopping mode	5.17	-44.50	-49.67	-20

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

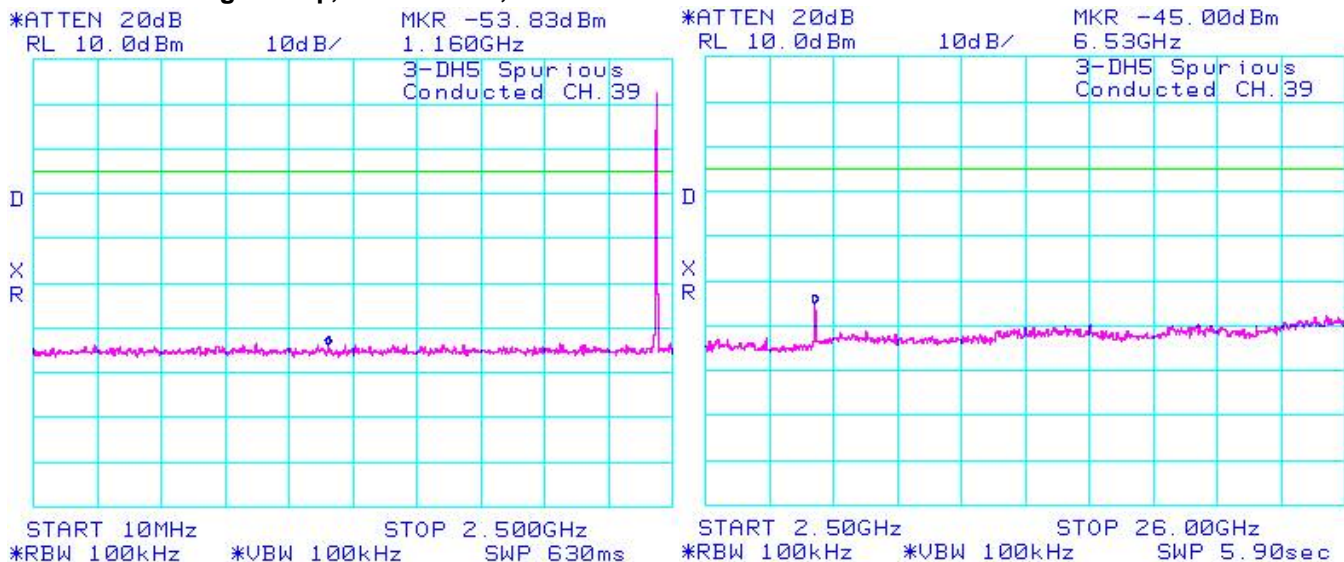
<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCG41GW <b>APPENDIX 3</b>	
	Test Report No. RTS-1615-0905-17	Dates of Test March 26 – May 27, 2009

Bluetooth RF Conducted Emission Test Results cont'd

**Figure 3-40 : Spurious RF Conducted Emissions**  
Single Freq., Static PBRS, 3-DH5



**Figure 3-41: Spurious RF Conducted Emissions**  
Single Freq., Static PBRS, 3-DH5

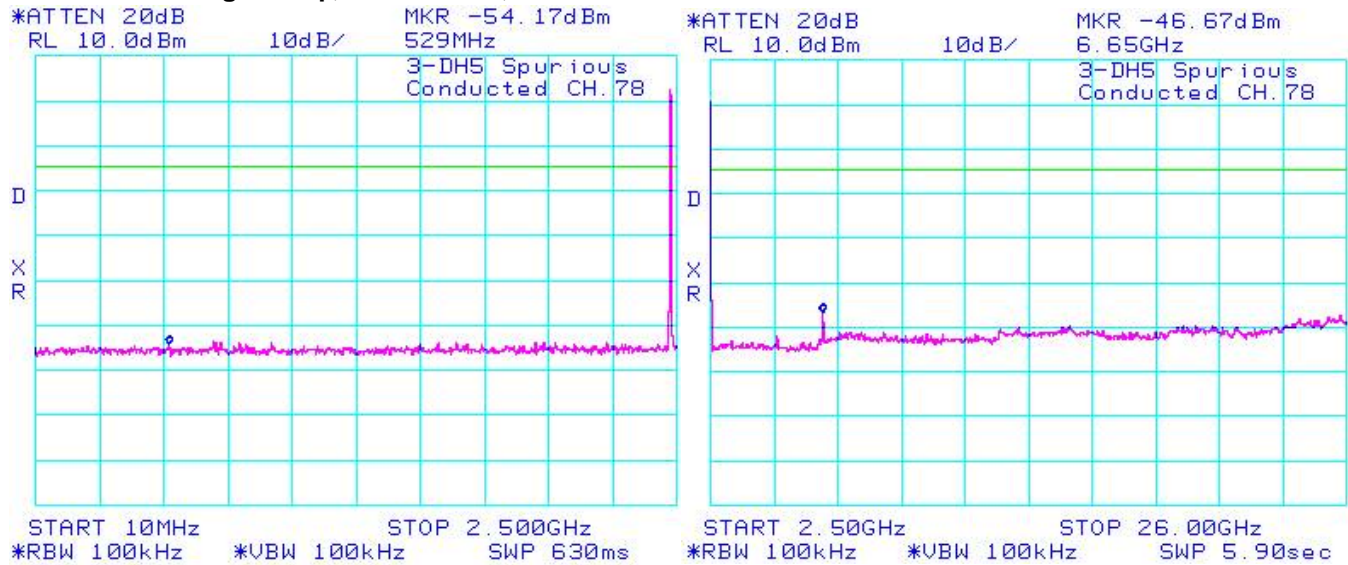


<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCG41GW	
	<b>APPENDIX 3</b>	
Test Report No. RTS-1615-0905-17	Dates of Test March 26 – May 27, 2009	Author Data Michael Cino

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

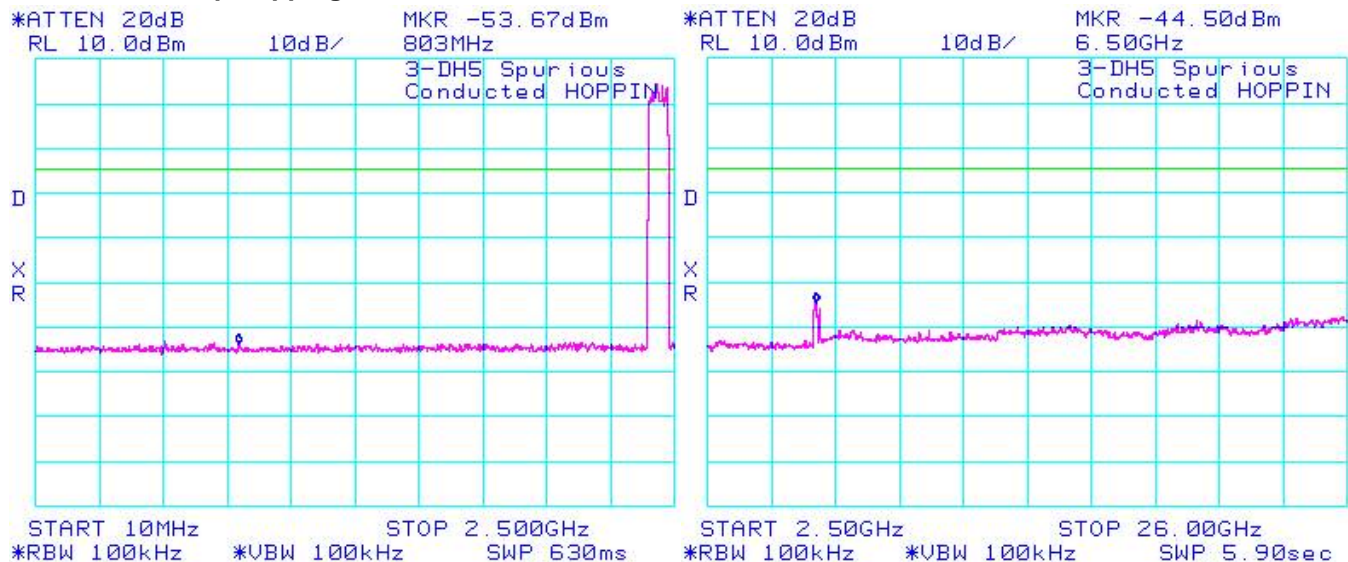
**Figure 3-42: Spurious RF Conducted Emissions**

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



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

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





<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCG41GW <b>APPENDIX 4</b>	
<b>Test Report No.</b> RTS-1615-0905-17	<b>Dates of Test</b> March 26 – May 27, 2009	<b>Author Data</b> Michael Cino

## APPENDIX 4 – 802.11b/g CONDUCTED EMISSIONS TEST DATA/PLOTS

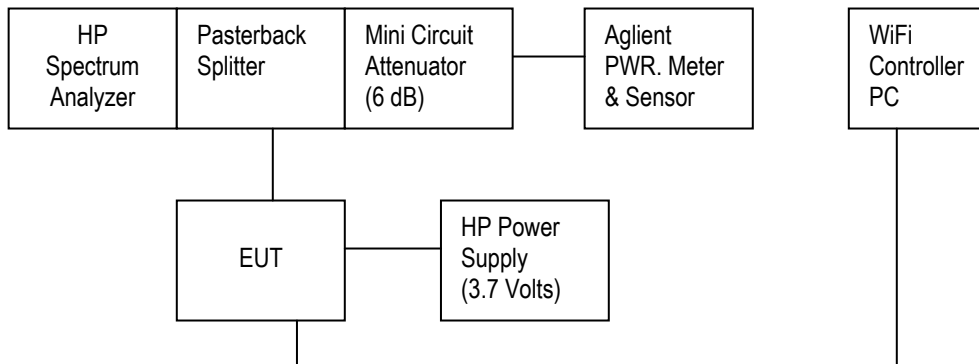
<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCG41GW <b>APPENDIX 4</b>	
Test Report No. RTS-1615-0905-17	Dates of Test March 26 – May 27, 2009	Author Data Michael Cino

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

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

Channel	Frequency	802.11b		802.11g	
		Data Rate	Power output (dBm)	Data Rate	Power output (dBm)
1	2412 MHz	1 Mbps	18.0	6 Mbps	14.0
		5.5 Mbps	18.0	24 Mbps	14.0
		11 Mbps	18.0	54 Mbps	13.0
6	2437 MHz	1 Mbps	18.0	6 Mbps	17.5
		5.5 Mbps	18.0	24 Mbps	14.5
		11 Mbps	18.0	54 Mbps	13.0
11	2462 MHz	1 Mbps	18.0	6 Mbps	14.0
		5.5 Mbps	18.0	24 Mbps	14.0
		11 Mbps	18.0	54 Mbps	13.0

### 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: May 21 to 25, 2009

The measurements on BlackBerry® smartphone PIN 20F3606B were performed by Maurice Battler.

<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCG41GW <b>APPENDIX 4</b>	
<b>Test Report No.</b> RTS-1615-0905-17	<b>Dates of Test</b> March 26 – May 27, 2009	<b>Author Data</b> Michael Cino

802.11b/g 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 and 6 Mbps, 24 Mbps, and 54 Mbps each for 802.11g mode.

Channel	Data Rate	Limit (kHz)	Measured Level (MHz)
1	1 Mbps	≥ 500	11.17
	5.5 Mbps	≥ 500	10.80
	11 Mbps	≥ 500	10.67
	6 Mbps	≥ 500	16.53
	24 Mbps	≥ 500	16.67
	54 Mbps	≥ 500	16.73
6	1 Mbps	≥ 500	10.23
	5.5 Mbps	≥ 500	11.10
	11 Mbps	≥ 500	10.82
	6 Mbps	≥ 500	16.63
	24 Mbps	≥ 500	16.73
	54 Mbps	≥ 500	16.73
11	1 Mbps	≥ 500	10.23
	5.5 Mbps	≥ 500	10.90
	11 Mbps	≥ 500	10.60
	6 Mbps	≥ 500	16.63
	24 Mbps	≥ 500	16.70
	54 Mbps	≥ 500	16.70

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

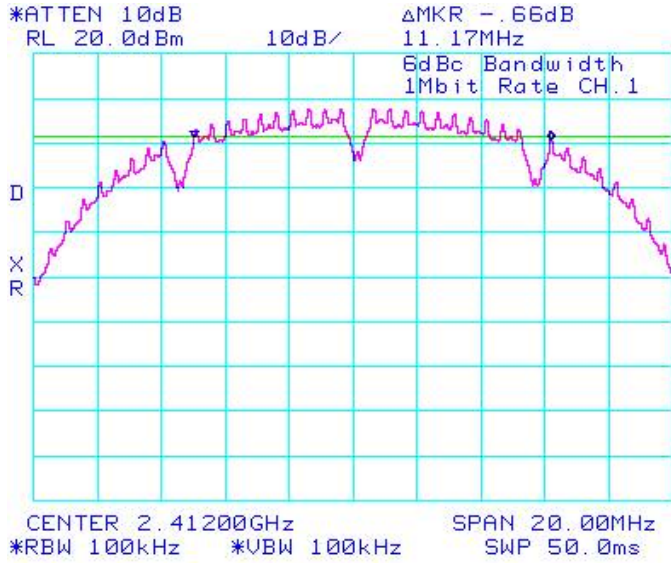
The environmental test conditions were: Temperature: 24°C  
Pressure: 1018 mb  
Relative Humidity: 28%

<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCG41GW <b>APPENDIX 4</b>	
	Test Report No. RTS-1615-0905-17	Dates of Test March 26 – May 27, 2009

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

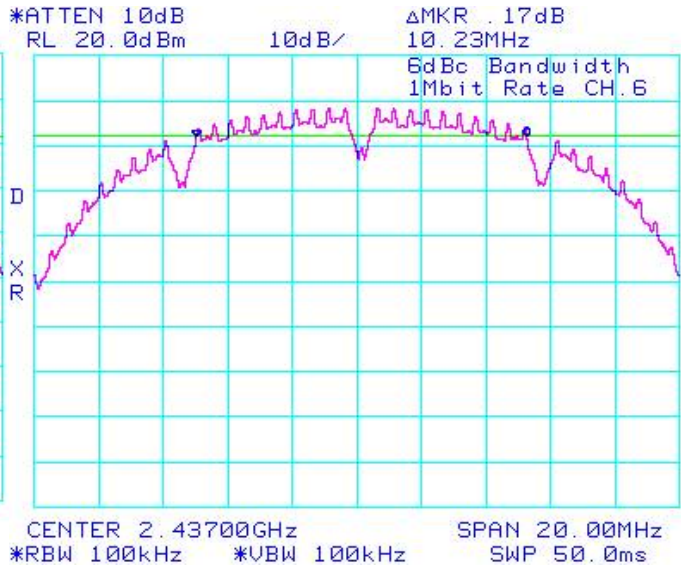
**Figure 4-1: 6 dB Bandwidth**

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



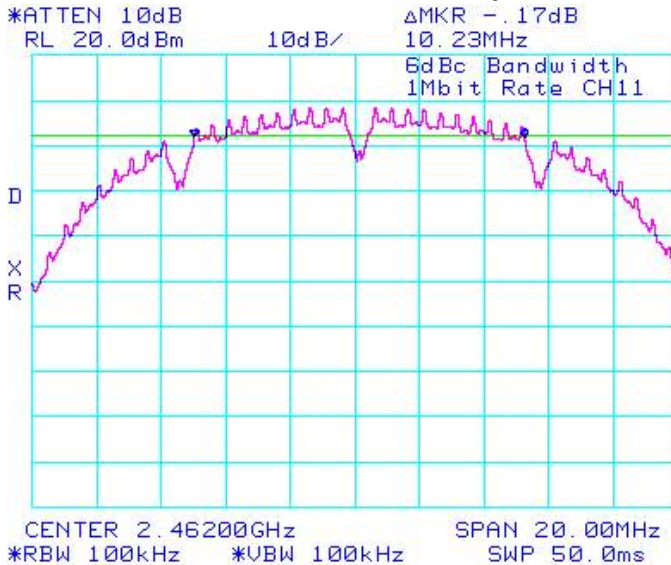
**Figure 4-2: 6 dB Bandwidth**

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



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

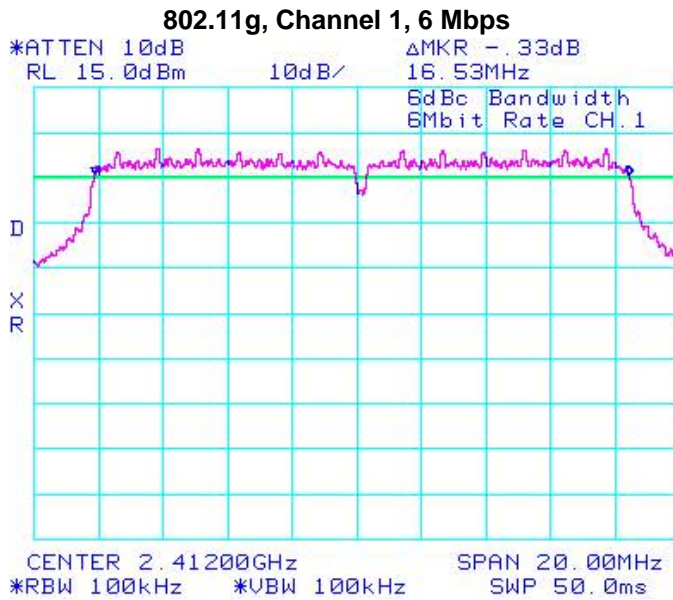
**802.11b, Channel 11, 1 Mbps**



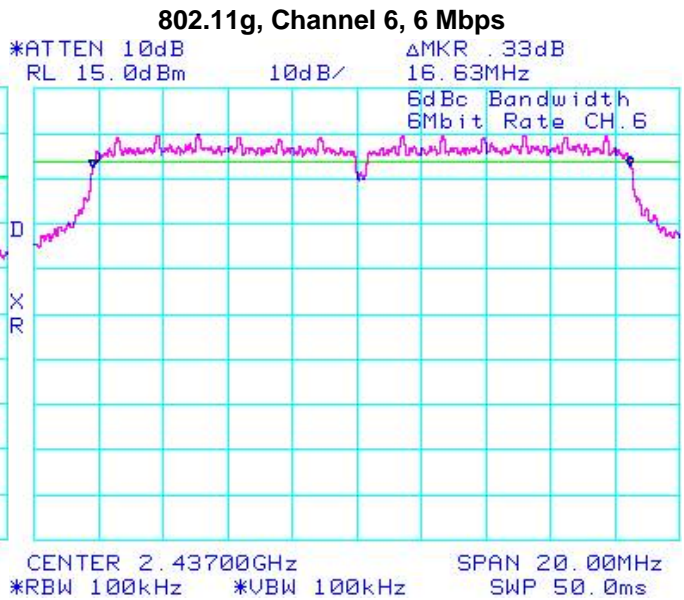
<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCG41GW <b>APPENDIX 4</b>	
<b>Test Report No.</b> RTS-1615-0905-17	<b>Dates of Test</b> March 26 – May 27, 2009	<b>Author Data</b> Michael Cino

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

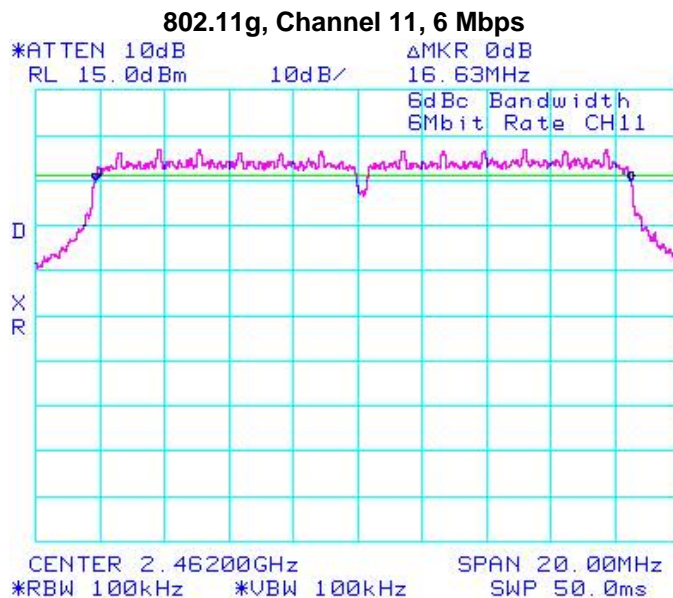
**Figure 4-4: 6 dB Bandwidth**



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



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



<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCG41GW <b>APPENDIX 4</b>	
<b>Test Report No.</b> RTS-1615-0905-17	<b>Dates of Test</b> March 26 – May 27, 2009	<b>Author Data</b> Michael Cino

802.11b/g 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 and 6 Mbps, 24 Mbps, and 54 Mbps each for 802.11g mode 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	Class 2 Limit (W)	Measured Level (dBm)	Measured Level (mW)
1	1 Mbps	< 1.00	16.82	48.08
	5.5 Mbps	< 1.00	16.84	48.31
	11 Mbps	< 1.00	16.85	48.42
	6 Mbps	< 1.00	13.00	19.95
	24 Mbps	< 1.00	13.34	21.58
	54 Mbps	< 1.00	11.73	14.89
6	1 Mbps	< 1.00	17.09	51.17
	5.5 Mbps	< 1.00	17.11	51.40
	11 Mbps	< 1.00	17.10	51.29
	6 Mbps	< 1.00	16.10	40.74
	24 Mbps	< 1.00	14.17	26.12
	54 Mbps	< 1.00	12.08	16.14
11	1 Mbps	< 1.00	17.43	55.34
	5.5 Mbps	< 1.00	17.45	55.59
	11 Mbps	< 1.00	17.43	55.34
	6 Mbps	< 1.00	13.45	22.13
	24 Mbps	< 1.00	13.80	23.99
	54 Mbps	< 1.00	12.19	16.56

The environmental test conditions were: Temperature: 24°C  
Pressure: 1016 mb  
Relative Humidity: 27%

<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCG41GW <b>APPENDIX 4</b>	
<b>Test Report No.</b> RTS-1615-0905-17	<b>Dates of Test</b> March 26 – May 27, 2009	<b>Author Data</b> Michael Cino

802.11b/g 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 and 6 Mbps, 24 Mbps, and 54 Mbps each for 802.11g mode.

Channel	Data Rate	Limit (dBc)	Measured Level (dBc)	Margin (dBc)
1	1 Mbps	< -20	-41.67	-21.67
	5.5 Mbps	< -20	-45.67	-25.67
	11 Mbps	< -20	-43.50	-23.50
	6 Mbps	< -20	-26.67	-6.67
	24 Mbps	< -20	-28.67	-8.67
	54 Mbps	< -20	-30.50	-10.50
11	1 Mbps	< -20	-49.84	-29.84
	5.5 Mbps	< -20	-55.00	-35.00
	11 Mbps	< -20	-53.00	-33.00
	6 Mbps	< -20	-42.83	-22.83
	24 Mbps	< -20	-41.83	-21.83
	54 Mbps	< -20	-43.50	-23.50

See figures 4-7 to 4-10 for the plots of the band edge compliance measurements for Channels 1, and 11, at 1 Mbps each for 802.11b mode and at 6 Mbps each for 802.11g mode.

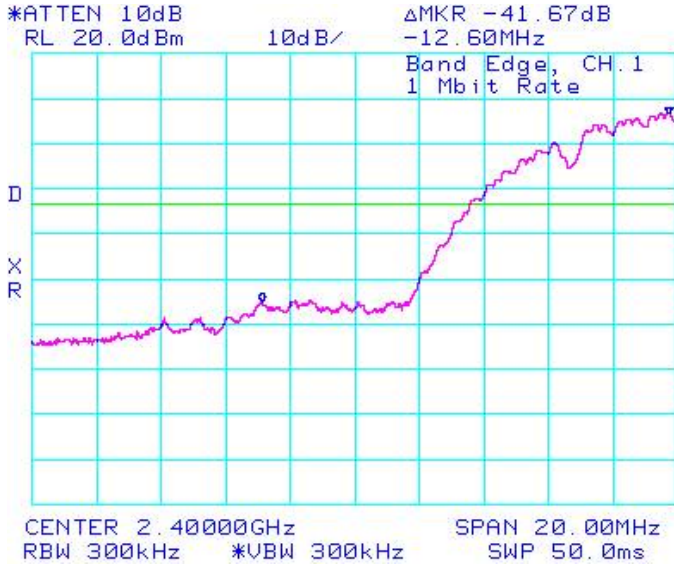
The environmental test conditions were: Temperature: 24°C  
Pressure: 1016 mb  
Relative Humidity: 27%

<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCG41GW <b>APPENDIX 4</b>	
Test Report No. RTS-1615-0905-17	Dates of Test March 26 – May 27, 2009	Author Data Michael Cino

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

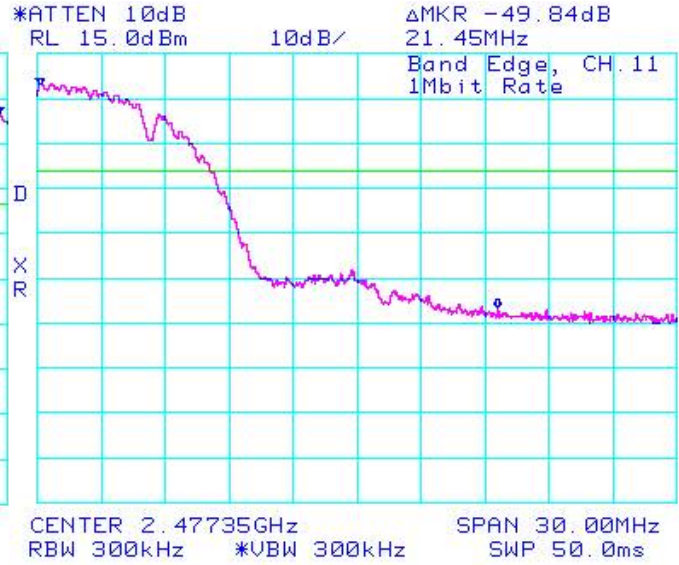
**Figure 4-7: Band Edge Compliance**

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



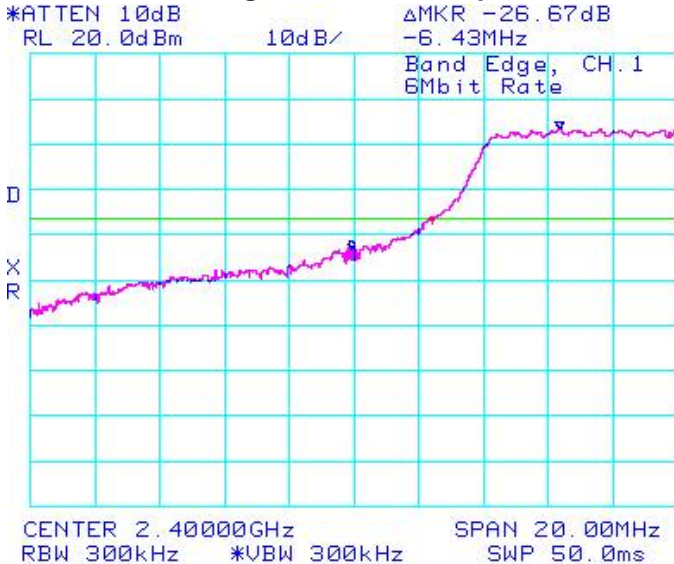
**Figure 4-8: Band Edge Compliance**

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



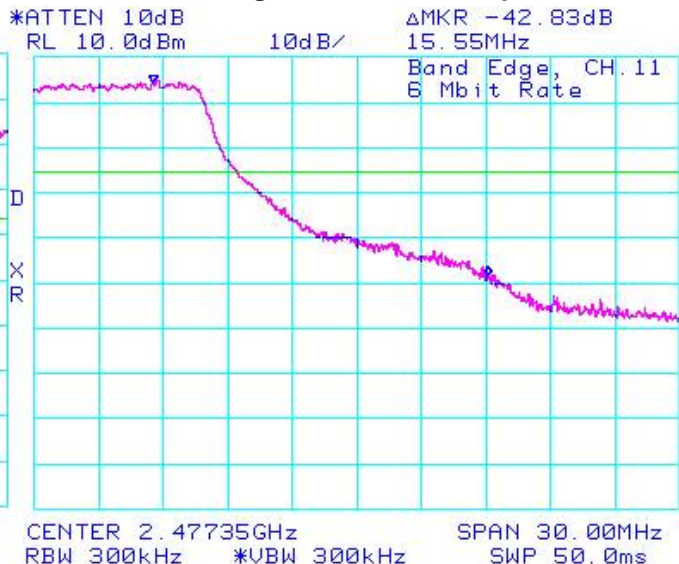
**Figure 4-9: Band Edge Compliance**

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



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

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





<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCG41GW <b>APPENDIX 4</b>	
<b>Test Report No.</b> RTS-1615-0905-17	<b>Dates of Test</b> March 26 – May 27, 2009	<b>Author Data</b> Michael Cino

802.11b/g 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 and 6 Mbps, 24 Mbps, and 54 Mbps each for 802.11g mode.

Channel	Data Rate	Limit (dBm)	Measured Level (dBm)	Margin (dBm)
1	1 Mbps	< 8.00	-4.17	-12.17
	5.5 Mbps	< 8.00	-5.33	-13.33
	11 Mbps	< 8.00	-5.33	-13.33
	6 Mbps	< 8.00	-12.83	-20.83
	24 Mbps	< 8.00	-12.33	-20.33
	54 Mbps	< 8.00	-15.00	-23.00
6	1 Mbps	< 8.00	-4.33	-12.33
	5.5 Mbps	< 8.00	-4.83	-14.83
	11 Mbps	< 8.00	-5.33	-13.33
	6 Mbps	< 8.00	-9.50	-17.50
	24 Mbps	< 8.00	-12.00	-20.00
	54 Mbps	< 8.00	-14.17	-22.17
11	1 Mbps	< 8.00	-3.83	-12.83
	5.5 Mbps	< 8.00	-5.50	-13.50
	11 Mbps	< 8.00	-5.50	-13.50
	6 Mbps	< 8.00	-11.83	-19.83
	24 Mbps	< 8.00	-12.83	-20.83
	54 Mbps	< 8.00	-13.83	-20.83

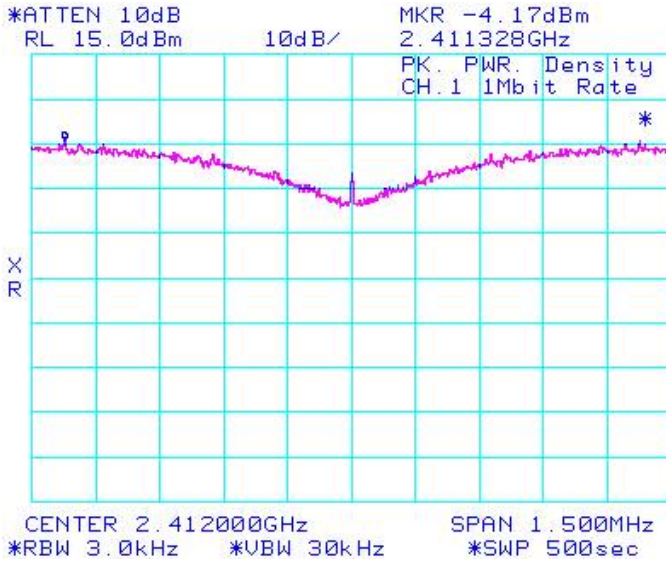
See figures 4-11 to 4-16 for the plots of the peak power spectral density for Channels 1, 6 and 11, at 1 Mbps each for 802.11b mode and at 6 Mbps each for 802.11g mode.

The environmental test conditions were: Temperature: 23°C  
Pressure: 1020 mb  
Relative Humidity: 31%

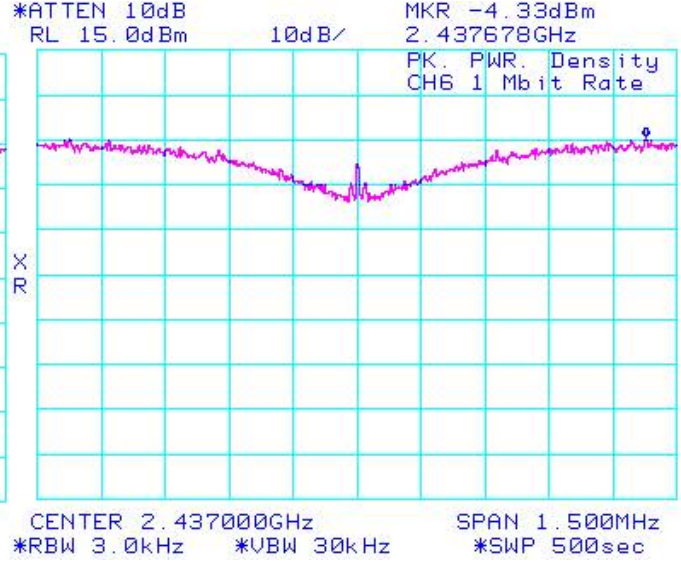
<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCG41GW <b>APPENDIX 4</b>	
Test Report No. RTS-1615-0905-17	Dates of Test March 26 – May 27, 2009	Author Data Michael Cino

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

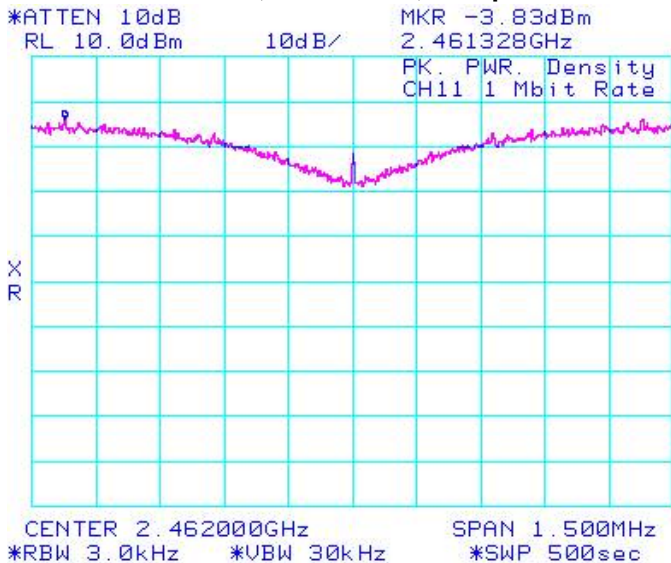
**Figure 4-11: Peak Power Spectral Density**  
**802.11b, Channel 1, 1 Mbps**



**Figure 4-12: Peak Power Spectral Density**  
**802.11b, Channel 6, 1 Mbps**



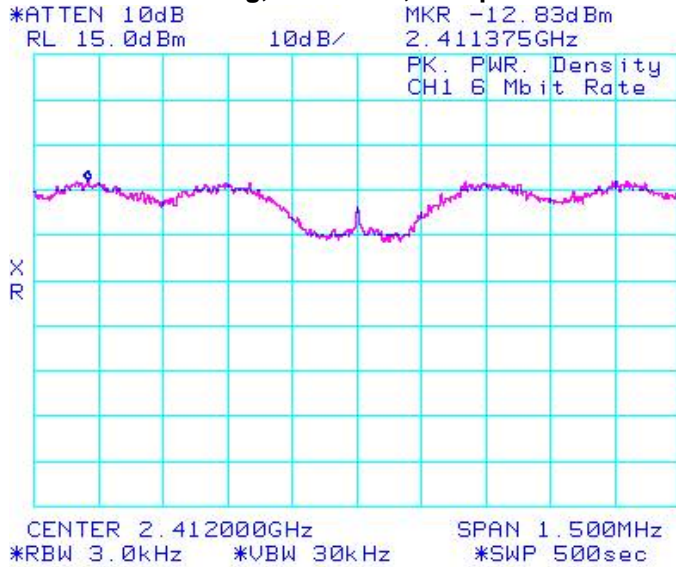
**Figure 4-13: Peak Power Spectral Density**  
**802.11b, Channel 11, 1 Mbps**



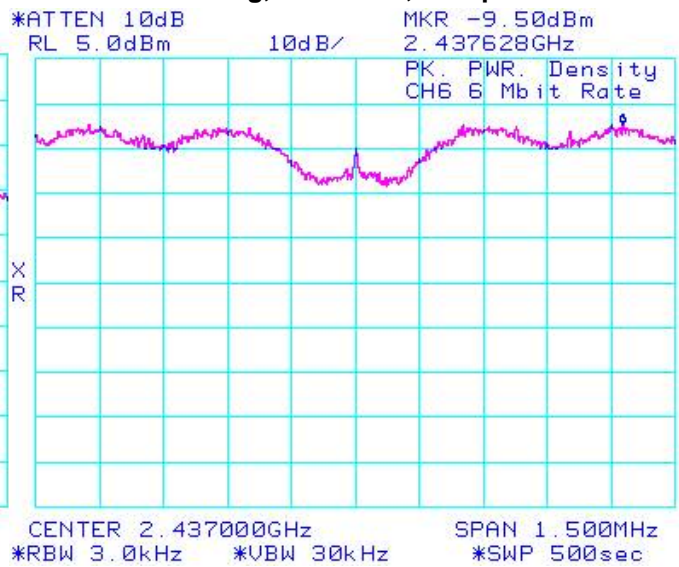
<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCG41GW <b>APPENDIX 4</b>	
	Test Report No. RTS-1615-0905-17	Dates of Test March 26 – May 27, 2009

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

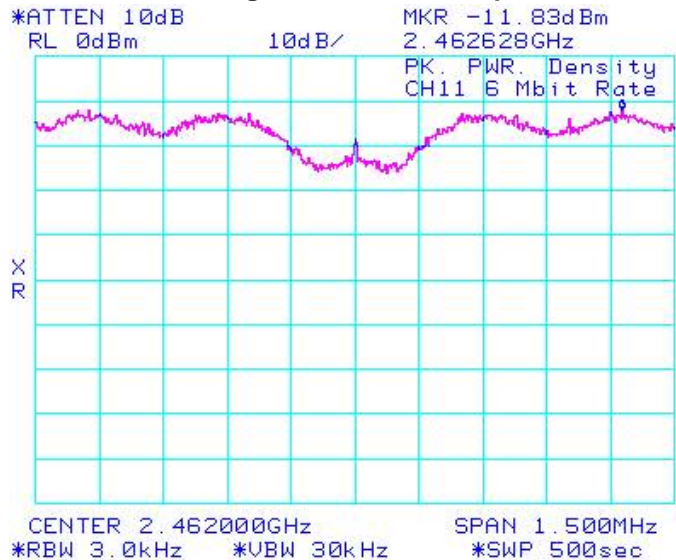
**Figure 4-14: Peak Power Spectral Density**  
**802.11g, Channel 1, 6 Mbps**



**Figure 4-15: Peak Power Spectral Density**  
**802.11g, Channel 6, 6 Mbps**



**Figure 4-16: Peak Power Spectral Density**  
**802.11g, Channel 11, 6 Mbps**



<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCG41GW <b>APPENDIX 4</b>	
Test Report No. RTS-1615-0905-17	Dates of Test March 26 – May 27, 2009	Author Data Michael Cino

802.11b/g 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 and 6 Mbps, 24 Mbps, and 54 Mbps each for 802.11g 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	16.82	-49.67	-66.49	-20
	5.5 Mbps	16.84	-49.33	-66.17	-20
	11 Mbps	16.85	-50.00	-66.85	-20
	6 Mbps	13.00	-49.83	-62.83	-20
	24 Mbps	13.34	-50.17	-63.51	-20
	54 Mbps	11.73	-49.50	-61.23	-20
6	1 Mbps	17.09	-49.00	-66.09	-20
	5.5 Mbps	17.11	-49.83	-66.94	-20
	11 Mbps	17.10	-50.17	-67.27	-20
	6 Mbps	16.10	-49.83	-65.93	-20
	24 Mbps	14.17	-50.17	-64.34	-20
	54 Mbps	12.08	-49.50	-61.58	-20
11	1 Mbps	17.43	-50.17	-67.60	-20
	5.5 Mbps	17.45	-50.50	-67.95	-20
	11 Mbps	17.43	-49.83	-67.26	-20
	6 Mbps	13.45	-50.00	-63.45	-20
	24 Mbps	13.80	-49.50	-63.30	-20
	54 Mbps	12.19	-49.00	-61.19	-20

The emissions were in the NF.

See figures 4-17 to 4-22 for the plots of the spurious RF conducted emissions for Channels 1, 6 and 11, at 1 Mbps each for 802.11b mode and at 6 Mbps each for 802.11g mode.

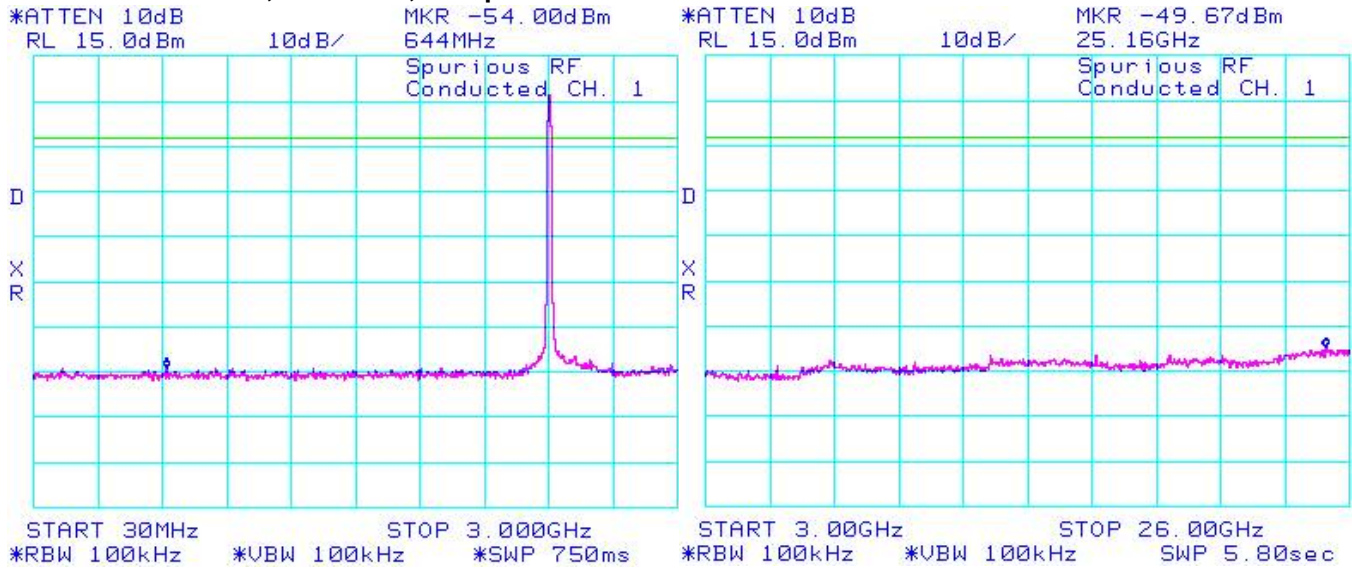
The environmental test conditions were: Temperature: 23°C  
Pressure: 1020 mb  
Relative Humidity: 29%

<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCG41GW <b>APPENDIX 4</b>	
Test Report No. RTS-1615-0905-17	Dates of Test March 26 – May 27, 2009	Author Data Michael Cino

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

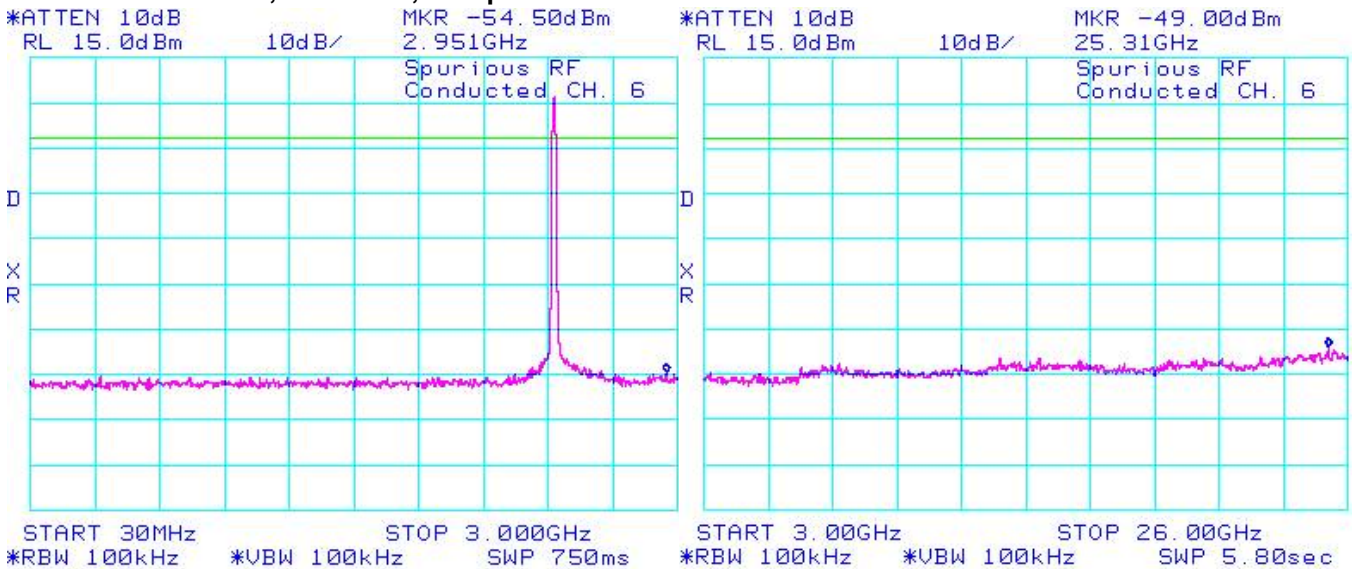
**Figure 4-17: Spurious Conducted RF Emissions**

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



**Figure 4-18 : Spurious Conducted RF Emissions**

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

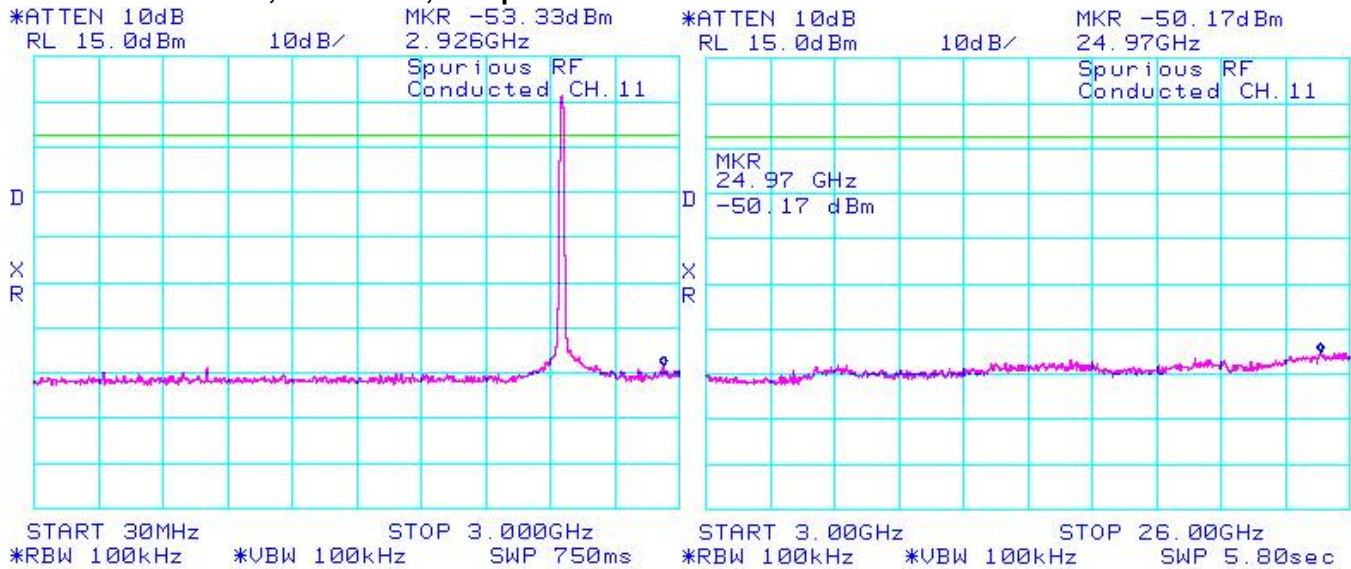


<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCG41GW <b>APPENDIX 4</b>	
	Test Report No. RTS-1615-0905-17	Dates of Test March 26 – May 27, 2009

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

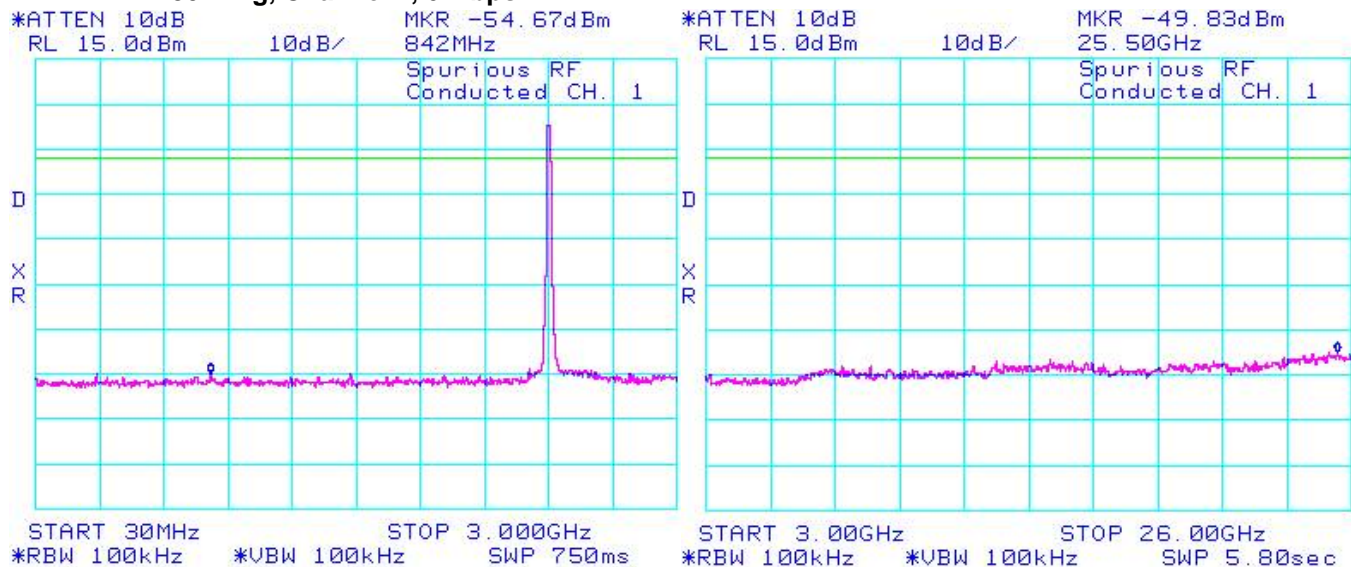
**Figure 4-19: Spurious Conducted RF Emissions**

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



**Figure 4-20: Spurious Conducted RF Emissions**

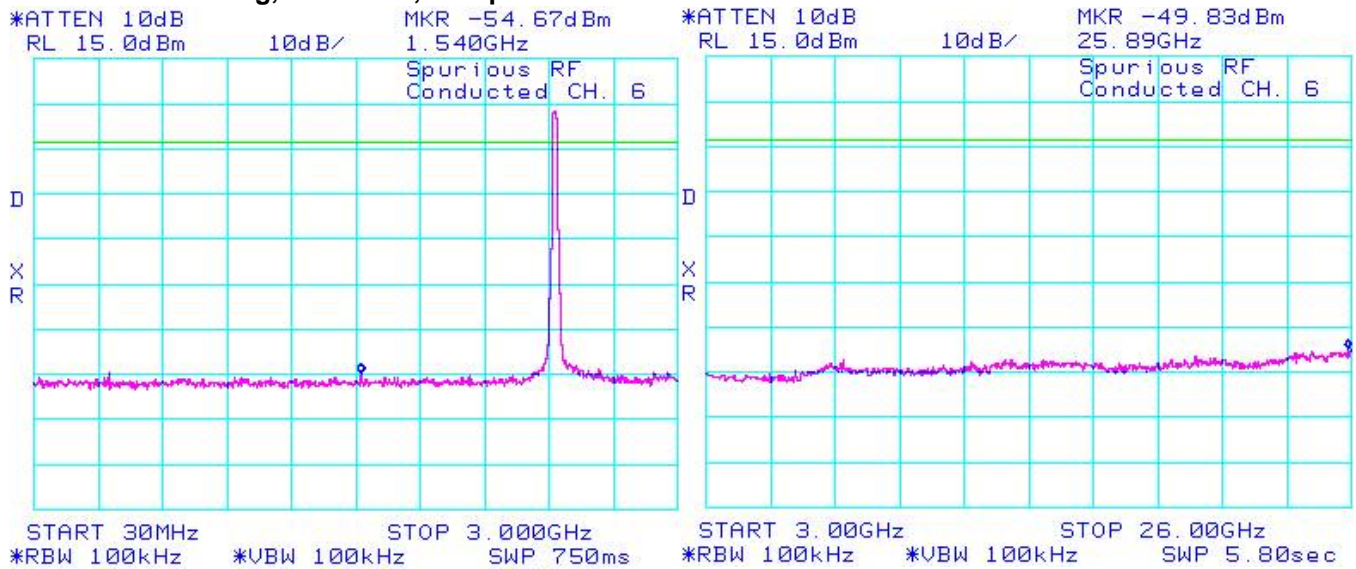
**802.11g, Channel 1, 6 Mbps**



<b>RTS</b> RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCG41GW <b>APPENDIX 4</b>	
	Test Report No. RTS-1615-0905-17	Dates of Test March 26 – May 27, 2009
		Author Data Michael Cino

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

**Figure 4-21: Spurious Conducted RF Emissions**  
802.11g, Channel 6, 6 Mbps



**Figure 4-22: Spurious Conducted RF Emissions**  
802.11g, Channel 11, 6 Mbps

