

EMI Test Report

Tested in accordance with
Federal Communications Commission (FCC)
Personal Communications Services
CFR 47, Parts 15, Subpart B
&
Industry Canada (IC), ICES-003

RIM Testing Services (RTS)

A division of Research In Motion Limited

REPORT NO.: RTS-0665-0710-07

PRODUCT MODEL NO.: RBQ41GW
TYPE NAME: BlackBerry® smartphone
FCC ID: L6ARBQ40GW
IC: 2503A-RBQ40GW

DATE: 05 November 2007

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Statement of Performance:

The BlackBerry® smartphone, model RBQ41GW, part number CER-16647-001 Rev. 2, and accessories when configured and operated per RIM's operation instructions, perform within the requirements of the test standards.

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.

Tested and documented by:



Caitlin O'Neill
Compliance Specialist
Date: 05 Oct 2007

Reviewed by:



Maurice Battler
Compliance Specialist
Date: 06 Nov 2007

Reviewed by:



Masud S. Attayi, P.Eng.
Team Lead, Regulatory Compliance
Date: 06 Nov 2007

Approved by:



Paul G. Cardinal, Ph.D.
Director
Date: 06 Nov 2007

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A. Scope

This report details the results of compliance tests that were performed in accordance with the requirements of:

- FCC CFR 47 Part 15, Subpart B, May 04, 2007 Class B Digital Devices, Unintentional Radiators
- IC ICES-003 Issue 4, February 2004, Class B Digital Devices, Unintentional Radiators

B. Associated Document

1. Document number CER-16647-REV2-Hardware-Change Notification.doc

C. Product Identification

Manufactured by Research In Motion Limited 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 facility, located at:

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

The testing was performed on October 12 to November 05, 2007.

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The sample EUT included:

SAMPLE	MODEL	CER NUMBER	PIN
1	RBQ41GW	CER-16647-001 Rev. 1	20662E34
3	RBQ41GW	CER-16647-001 Rev. 2	2066F1C0

To view the differences between CER-16647-001 Rev. 1 and CER-16647-001 Rev. 2, see document number CER-16647-REV2-Hardware-Change Notification.doc

Only the characteristics that maybe impacted by the changes were re-measured.

BlackBerry® smartphone Accessories Tested

- 1) Folding Blade Charger, part number ASY-07040-001 with an output voltage of 5.0 volts dc, 750 mA and attached USB cable with a lead length of 1.80 metres.
- 2) Alternative Folding Blade Charger, part number ASY-12709-001 with an output voltage of 5.0 volts dc, 750 mA with an attached USB cable with a length of 1.80 metres.
- 3) Captive Cable Charger, part number ASY-07559-001 with an output voltage of 5.0 volts dc, 500 mA and attached USB cable with a lead length of 1.80 metres.
- 4) Alternative Captive Cable Charger part number HDW-14917-001 with an output voltage of 5.0 volts dc, 750 mA and attached USB cable with a lead length of 1.80 metres.
- 5) BlackBerry® Power Station, part number HDW-12736-001 Rev. 1
- 6) BlackBerry® Power Station, part number HDW-12736-001 Rev. 2
- 7) USB Data Cable, part number HDW-06610-001, 1.45 metres long.
- 8) Alternative USB Data Cable, part number HDW-06610-003, 1.0 metre long.
- 9) Mini External Battery Charger, part number HDW-12738-001
- 10) Bluetooth Headset including Charging Pocket, part number ASY-12747-001
- 11) TTY Adapter (3.5 mm plug to 2.5 mm jack), part number HDW-15306-002
- 12) Stereo Headset, 3.5mm, part number HDW-14322-001, 1.3 metres long.
- 13) Stereo Headset, 2.5mm, part number HDW-13019-001, 1.3 metres long
- 14) Alternative Stereo Headset, 3.5mm, part number HDW-15764-001, 1.3 metres long
- 15) Mono Headset, part number HDW-12420-001, 1.25 metres long.

D. Support Equipment Used for the Testing of the EUT

- 1) IBM Thinkpad Lenovo T60p laptop, type 8742, product ID 8742C2U

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E. Modifications to EUT

No modifications were required on the EUT.

F. Summary of Results

SPECIFICATION		TEST TYPE	Meets Requirement	TEST DATA APPENDIX
FCC CFR 47	IC			
Part 15, Subpart B	ICES-003	Conducted AC Line Emission	Yes	1
Part 15, Subpart B	ICES-003	Radiated Unintentional Spurious Emissions	Yes	2

a) 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.

The following test configurations were measured. The input voltage was 120 V, 60 Hz. The BlackBerry® smartphone was in idle/battery charging mode for configurations 1-2 and Tx/battery charging mode for configuration 3.

1. The BlackBerry® smartphone PIN 20662E34 with the 3.5mm Stereo Headset was connected to the Folding Blade Charger.
2. The BlackBerry® smartphone PIN 20662E34 with the TTY Adapter and 2.5mm Mono Headset was connected to the Captive Cable Charger through the Charging Pod.
3. The BlackBerry® smartphone PIN 2066F1C0 was connected to the BlackBerry® Power Station Rev. 2, which was connected to the extra Bluetooth headset through the USB Data Cable and the Mini External Battery Charger through the Alternative USB Data Cable.

The sample EUT's conducted emissions were compared with respect to the FCC CFR 47 Part 15, Subpart B, and IC ICES-003, Class B limit. The sample EUT had a worse case test margin of 5.08 dB below the QP limit at 0.164 MHz using the quasi-peak detector and 12.34 dB below the AV limit at 0.167 MHz using the Average detector for the BlackBerry® Power Station Rev. 2, test configuration 3.

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Measurement Uncertainty ± 2.0 dB

To view the test data/plots, see APPENDIX 1.

b) RADIATED EMISSIONS

The radiated emissions from the EUT were measured using the methods outlined in CISPR Recommendation 22. The EUT was placed on a nonconductive styrofoam table, 80 cm high that was positioned on a remote 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 2.0 GHz. Both the horizontal and vertical polarisations of the emissions were measured.

The measurements were done in a semi-anechoic chamber. The semi-anechoic chamber FCC registration number is **778487** and the Industry Canada file number is **IC4240**.

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

The BlackBerry® smartphone PIN 20662E34 was in idle/battery charging mode for configurations 1-3, Tx/battery charging mode for configurations 4-5, and GPS tracking/battery charging mode for configuration 6. For configuration 3, high speed USB and simultaneous charging modes were enabled. The ac input voltage was 120V, 60Hz. The following test configurations were measured:

1. The BlackBerry® smartphone in PCS idle mode and battery charging mode with the 2.5mm Stereo Headset and TTY Adapter was connected to the Folding Blade Charger with audio playing continuously.
2. The BlackBerry® smartphone in GSM850 idle mode and battery charging mode was connected to the Alternative Folding Blade Charger.
3. The BlackBerry® smartphone in GSM850 idle mode and battery charging mode with the 3.5mm Alternative Stereo Headset was connected to the Captive Cable Charger through the Charging Pod and the IBM Thinkpad Lenovo T60p laptop through the USB Data Cable.
4. The BlackBerry® smartphone in Bluetooth transmit mode and battery charging mode with the 3.5mm Stereo Headset was connected to the BlackBerry® Power Station Rev. 1.
5. The BlackBerry® smartphone in Bluetooth transmit mode and battery charging mode with the TTY Adapter and 2.5mm Mono Headset was connected to the BlackBerry® Power Station Rev. 2 and the IBM Thinkpad Lenovo T60p laptop through the Alternative USB Data Cable.

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6. The BlackBerry® smartphone in GPS tracking mode and battery charging mode was connected to the Alternative Captive Cable Charger.

The system's radiated emission levels were compared with respect to the FCC CFR 47 Part 15, Subpart B, and IC ICES-003, Class B limit.

The system met the requirements with a worse case emission test margin of 4.68 dB at 50.334 MHz using test configuration 6.

Sample Calculation:

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

$$FS = \text{Measured Level (dB}\mu\text{V)} + \text{A.F. (dB/m)} + \text{Cable Loss (dB)} - \text{Preamp (dB)} + \text{Filter Loss (dB)}$$

Measurement Uncertainty ±4.0 dB

To view the test data see APPENDIX 2.

G. Compliance Test Equipment Used

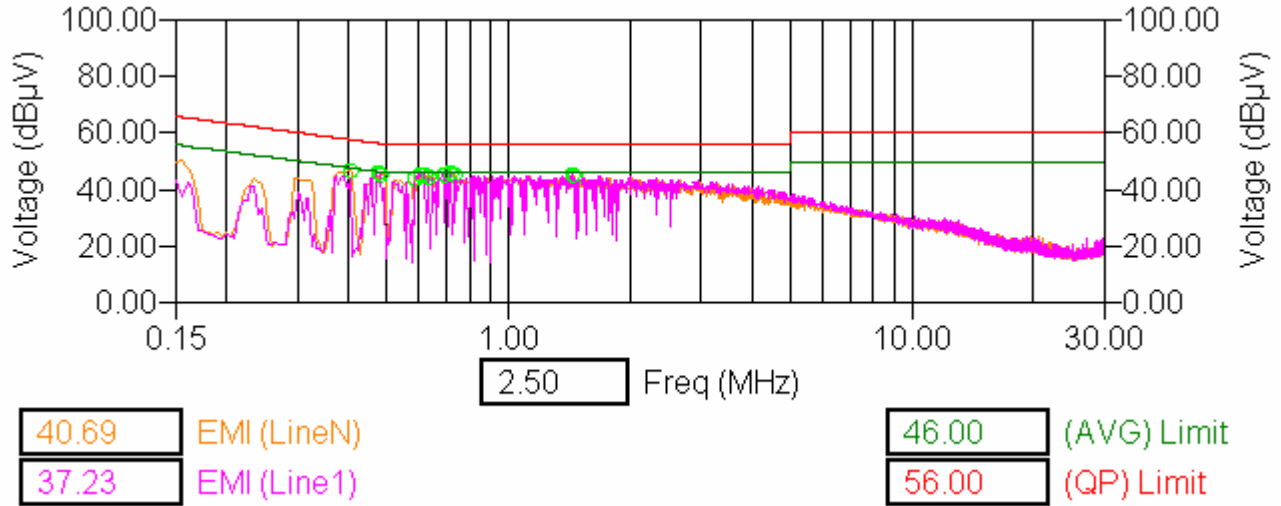
<u>UNIT</u>	<u>MANUFACTURER</u>	<u>MODEL</u>	<u>SERIAL NUMBER</u>	<u>CAL DUE DATE</u> (YY MM DD)	<u>USE</u>
Preamplifier	Sonoma	310N/11909A	185831	07-11-23	Radiated Emissions
Preamplifier system	TDK RF Solutions	PA-02	080010	07-11-22	Radiated Emissions
EMI Receiver	Rohde & Schwarz	ESIB 40	100255	08-09-18	Conducted/Radiated Emissions
Digital Multimeter	Hewlett Packard	34401A	US36042324	08-09-28	Conducted/Radiated Emissions
Environment Monitor	Control Company	1870	230355190	07-12-28	Conducted/Radiated Emissions
L.I.S.N.	Emco	3816/2	1120	08-08-28	Conducted Emissions
Impulse Limiter	Rohde & Schwarz	ESHS-Z2	100786	08-09-11	Conducted Emissions
Hybrid Log Antenna	TDK	HLP-3003C	17401	08-08-04	Radiated Emissions
Universal Radio Communication Tester	R&S	CMU 200	837493/073	07-12-01	Radiated/Conducted Emission

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APPENDIX 1 - AC LINE CONDUCTED EMISSIONS TEST DATA

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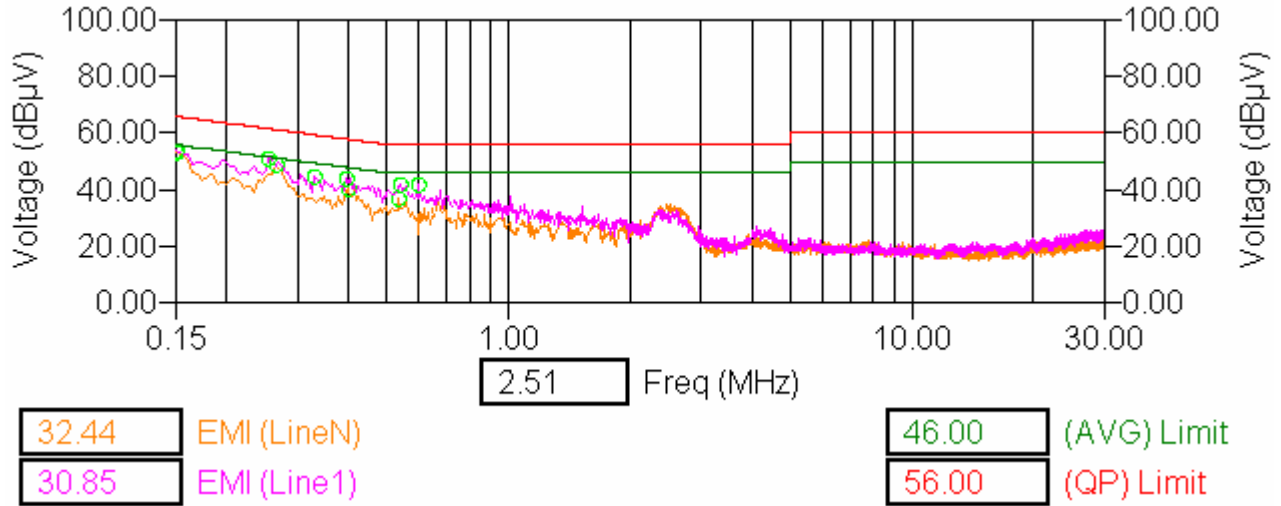
AC Conducted Emissions Test Graph 1



Test Configuration 1

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AC Conducted Emissions Test Graph 2



Test Configuration 2

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AC Conducted Emission Test Results cont'd

Test Configuration 3 cont'd

Date of test: November 05, 2007

Frequency (MHz)	Line	Reading (AV) (dBμV)	Correction Factor (dB)	Corrected Reading (AV) (dB)	Limit (AV) (dBμV)	Margin (AV) Limits (dB)
0.153	L1	27.48	9.87	37.35	56.00	-18.65
0.167	N	32.75	9.87	42.62	54.96	-12.34
0.246	L1	17.94	9.88	27.82	51.59	-23.78
0.347	L1	18.12	9.89	28.01	49.08	-21.07
0.657	L1	14.66	9.94	24.60	46.00	-21.40
0.669	L1	14.40	9.94	24.34	46.00	-21.66
1.057	L1	11.69	9.94	21.63	46.00	-24.37

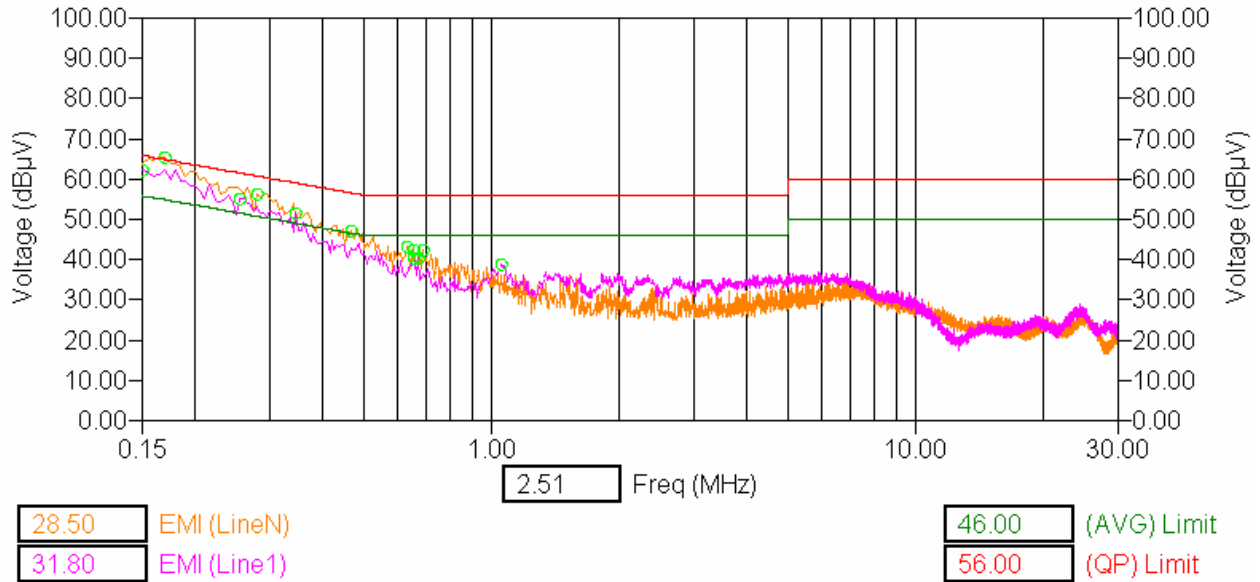
All other emission levels had a test margin of greater than 25 dB.

Measurements were done with the average detector.

See graph 3 for the measurement plot.

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AC Conducted Emissions Test Graph 3



Test Configuration 3

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APPENDIX 2 - RADIATED EMISSIONS TEST DATA

