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

A division of Research In Motion Limited

REPORT NO.: RTS-6011-1210-10

PRODUCT MODEL NO.: RFG81UW
TYPE NAME: BlackBerry® smartphone
FCC ID: L6ARFG80UW
IC: 2503A- RFG80UW

DATE: October 15, 2012

RTS is accredited
according to
EN ISO/IEC 17025 by:

592

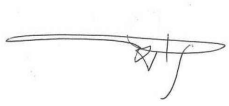
Statement of Performance:

The BlackBerry® smartphone, model RFG81UW part number CER-48928-001 Rev3 and accessories when configured and operated per RIM's operation instructions, and performs 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.

Documented by:



Feras Obeid
Regulatory Compliance Associate
Date: October 15, 2012

Reviewed by:

Savtej S. Sandhu
Regulatory Compliance Specialist
Date: October 15, 2012

Reviewed and Approved by:

Masud S. Attayi, P.Eng.
Manager, Regulatory Compliance
Date: October 16, 2012

Table of Contents

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, October, 2011 Class B Digital Devices, Unintentional Radiators
- IC ICES-003 Issue 5, August 2012, Information Technology Equipment (ITE) – Limits and methods of measurement

B. Associated Documents

1) Test report TR2-0037-12-1-1i
2) Test report TR2-0037-12-1-1i-A4

C. Product Identification

Manufactured by Research In Motion Limited whose headquarters is located at:
295 Phillip Street
Waterloo, Ontario
Canada, N2L 3W8
Phone: 519 888 7465
Fax: 519 888 6906

The equipment under test (EUT) was tested at the following locations:

RIM Testing Services EMI test facilities

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

The testing was performed on October 03 and October 12, 2012

The sample EUT included:

SAMPLE	MODEL	CER NUMBER	PIN	Software
1	RFG81UW	CER-48928-001 Rev3	2A918B37	OS Version 10.0.9.218 Build ID: 307154

Radiated Emissions testing was performed on sample 1.

BlackBerry® smartphone Accessories Tested

1) OMTP Charger, part number HDW-47725-001, with an output of 5 volts, 850mA
2) 12 V DC Charger, part number HDW-46705-001, with an output of 5 volts, 1A
3) Alt. 12 V DC Charger, part number HDW-46706-001, with an output of 5 volts, 1.8A
4) Wired Headset, part number HDW-44306-001, with a lead length of 1.1 metres
5) Alt. Wired Headset, part number HDW-44306-001,with a lead length of 1.1 metres
6) Alt.2 Wired Headset, part number HDW-44306-003, with a lead length of 1.1 metres
7) USB Data Cable, part number HDW-28109-003, 1.2 metres long
8) USB Data Cable, part number HDW-48415-001, 1.0 metre long.
9) HDMI Cable, part number HDW-29572-001, 1.8 metres long

D. Support Equipment Used for the Testing of the EUT

Dell Monitor, Model Number ST2220LC, Product Number CN-0YPY4N-64180-22S-043L

E. 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	See Test Report TR2-0037-12-1-1i TR2-0037-12-1-1i-A4
Part 15, Subpart B	ICES-003	Radiated Unintentional Spurious Emissions	Yes	1 See Test Report TR2-0037-12-1-1i TR2-0037-12-1-1i-A4

a) 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 radiated emissions were measured up to the fifth harmonic of the highest frequency of the band tested. Both the horizontal and vertical polarizations of the emissions were measured.

The measurements were done in a semi-anechoic chamber. The FCC registration number is **778487** and the Industry Canada(IC) file number is **2503B-1**. The EUT was configured and operated to produce the maximum radiated emissions while still keeping within RIM's specifications.

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

Test Configuration	Operating Mode(s)	Charger + Accessories
1	Bluetooth Tx, Charging and Video Playback	OMTP Charger+ Alt. Wired Headset+ 1.2m USB Cable + HDMI Cable+ Monitor
2	802.11b Tx, Charging	12 V DC Charger + Wired Headset + 1.0m USB Cable
3	Bluetooth Tx, Charging	Alt. 12 V DC Charger + Alt.2 Wired Headset

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 worst case emission test margin of 1.53 dB below the QP limit at 607.678MHz using quasi-peak detector in Test Configuration 1.

To view the test data see APPENDIX 1.

Sample Calculation:

Field Strength (dBµV/m) is calculated as follows:
FS = Measured Level (dBµV) + A.F. (dB/m) + Cable Loss (dB) - Preamp (dB) + Filter Loss (dB)

Measurement Uncertainty ±4.5 dB

F. Compliance Test Equipment Used

UNIT	MANUFACTURER	MODEL	SERIAL NUMBER	CAL DUE DATE (YY MM DD)	USE
Preamplifier	Sonoma	310N/11909A	185831	12-10-17	Radiated Emissions
Preamplifier system	TDK RF Solutions	PA-02	080010	12-10-17	Radiated Emissions
EMC Analyzer	Rohde & Schwarz	ESIB 40	100255	12-12-08	Radiated Emissions
Digital Multimeter	Hewlett Packard	34401A	US36042324	12-11-16	Conducted/Radiated Emissions
Environment Monitor	OMEGA	iTHX-SD	0380561	12-10-20	Radiated Emission
Environment Monitor	OMEGA	iTHX-SD	0380567	12-10-20	Radiated Emission
L.I.S.N.	Rohde & Schwarz	ENV216	100060	13-10-25	Conducted Emissions
Hybrid Log Antenna	EMC Automation	HLP-3003C	017401	13-08-23	Radiated Emissions
Horn Antenna	EMC Automation	HRN-0118	030101	14-08-07	Radiated Emissions
Universal Radio Communication Tester	Rohde & Schwarz	CMU 200	837493/073	12-11-30	Radiated Emissions
Universal Radio Communication Tester	Rohde & Schwarz	CMU 200	112394	12-11-30	Radiated/Conducted Emissions
EMI Test Receiver	Rohde & Schwarz	ESU 40	100162	12-12-07	Radiated/Conducted Emissions
Bluetooth Tester	Rohde & Schwarz	CBT	100368	12-11-30	Radiated Emissions
Bluetooth Tester	Rohde & Schwarz	CBT	100370	12-11-30	Radiated/Conducted Emissions

APPENDIX 1 - RADIATED EMISSIONS TEST DATA

Radiated Emissions Test Results

The following tests were performed by Feras Obeid and Savtej Sandhu

Test Configuration 1

Date of the test: October 12, 2012

Frequency (MHz)	Antenna Pol. (V/H)	Antenna Height (metres)	Test Angle (Deg.)	Detector (Q.P. or Peak)	Measured Level (dBµV)	Correction Factor for preamp/antenna / cables/ filter (dB/m)	Field Strength Level (reading +corr) (dBµV/m)	Limit @ 3.0 m (dBµV/m)	Test Margin (dB)
36.356	V	1.57	159.00	Q.P.	36.98	-13.73	23.25	40.00	-16.75
76.661	V	1.58	352.00	Q.P.	33.02	-14.68	18.34	40.00	-21.66
148.515	V	1.41	355.00	Q.P.	52.48	-11.65	40.83	43.50	-2.67
206.285	H	1.80	155.00	Q.P.	41.97	-7.82	34.15	43.50	-9.35
303.820	H	1.81	192.00	Q.P.	49.56	-6.61	42.95	46.00	-3.05
337.544	H	1.07	198.00	Q.P.	36.01	-3.20	32.81	46.00	-13.19
445.518	H	1.03	344.00	Q.P.	40.58	-2.39	38.19	46.00	-7.81
546.892	V	2.05	182.00	Q.P.	36.26	1.10	37.36	46.00	-8.64
593.989	V	2.05	190.00	Q.P.	40.29	2.07	42.36	46.00	-3.64
607.678	V	1.41	137.00	Q.P.	41.75	2.72	44.47	46.00	**-1.53**
619.301	V	1.43	142.00	Q.P.	38.76	2.54	41.30	46.00	-4.70
678.171	V	1.90	161.00	Q.P.	27.84	2.45	30.29	46.00	-15.71
742.910	V	1.92	172.00	Q.P.	35.68	4.02	39.70	46.00	-6.30
826.028	V	2.27	182.00	Q.P.	30.32	5.39	35.71	46.00	-10.29
891.026	H	1.77	353.00	Q.P.	33.84	7.58	41.42	46.00	-4.58
963.596	H	1.43	191.00	Q.P.	30.15	9.03	39.18	54.00	-14.82
4881.566	H	1.54	205.00	Q.P.	42.69	21.04	63.73	74.00	-10.27

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

Radiated Emissions Test Results

The following tests were performed by Feras Obeid

Test Configuration 2

Date of the test: October 03, 2012

Frequency (MHz)	Antenna Pol. (V/H)	Antenna Height (metres)	Test Angle (Deg.)	Detector (Q.P. or Peak)	Measured Level (dBµV)	Correction Factor for preamp/antenna / cables/ filter (dB/m)	Field Strength Level (reading +corr) (dBµV/m)	Limit @ 3.0 m (dBµV/m)	Test Margin (dB)
37.653	V	1.38	197.00	Q.P.	48.97	-14.04	34.93	40.00	-5.07
42.329	V	1.83	311.00	Q.P.	37.04	-15.43	21.61	40.00	-18.39
150.345	H	2.50	278.00	Q.P.	32.73	-11.66	21.07	43.50	-22.43

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

Radiated Emissions Test Results cont'd

Test Configuration 3

Date of the test: October 03, 2012

Frequency (MHz)	Antenna		Test Angle (Deg.)	Detector (Q.P. or Peak)	Measured Level (dBµV)	Correction Factor for preamp/antenna / cables/ filter (dB/m)	Field Strength Level (reading +corr) (dBµV/m)	Limit @ 3.0 m (dBµV/m)	Test Margin (dB)
	Pol. (V/H)	Height (metres)							
30.059	V	1.46	220.00	Q.P.	37.73	-11.74	25.99	40.00	-14.01
150.191	V	1.44	242.00	Q.P.	42.54	-11.66	30.88	43.50	-12.62
253.648	H	1.78	7.00	Q.P.	30.76	-9.20	21.56	46.00	-24.44
270.461	H	1.17	207.00	Q.P.	34.28	-8.68	25.60	46.00	-20.40

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