

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-1191-0810-19

PRODUCT MODEL NO.: RCC51UW
TYPE NAME: BlackBerry® smartphone
FCC ID: L6ARCC50UW
IC: 2503A-RCC50UW

DATE: 20 October, 2008

RTS RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCC51UW	
Test Report No. RTS-1191-0810-19	Dates of Test October 7, 2008	Author Data Shannon Muller

Statement of Performance:

The BlackBerry® smartphone, model RCC51UW, part number CER-21466-001 Rev. 1, 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.

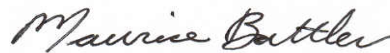
The test methods were consistent with the methods described in the relevant standards.

Documented by:



Shannon Muller
Compliance Specialist
Date: 21 October, 2008

Reviewed by:



Maurice Battler
Compliance Specialist
Date: 22 October, 2008

Reviewed by:



Masud S. Attayi, P.Eng.
Team Lead, Regulatory Compliance
Date: 22 October, 2008

Approved by:



Paul G. Cardinal, Ph.D.
Director
Date: 23 October, 2008

RTS RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCC51UW	
Test Report No. RTS-1191-0810-19	Dates of Test October 7, 2008	Author Data Shannon Muller

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.	Modifications to EUT	6
F.	Summary of Results	6
G.	Compliance Test Equipment Used	8
APPENDIX 1 - AC LINE CONDUCTED EMISSIONS TEST DATA		9
APPENDIX 2 - RADIATED EMISSIONS TEST DATA		13

RTS RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCC51UW	
Test Report No. RTS-1191-0810-19	Dates of Test October 7, 2008	Author Data Shannon Muller

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, July 10, 2008 Class B Digital Devices, Unintentional Radiators
- IC ICES-003 Issue 4, February 2004, Class B Digital Devices, Unintentional Radiators

B. Associated Documents

1. Test report number RTS-1191-0809-13.

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

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

The testing was performed on October 7, 2008.

RTS RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCC51UW	
Test Report No. RTS-1191-0810-19	Dates of Test October 7, 2008	Author Data Shannon Muller

The sample EUT included:

SAMPLE	MODEL	CER NUMBER	PIN
1	RCC51UW	CER-21466-001 Rev 1	20C85601
2	RCC51UW	CER-21466-001 Rev 1	20C856F6

AC Line Conducted Emissions Testing was performed on sample 1.

Radiated Emissions Testing was performed on samples 1 and 2.

Model Number RCC51UW is identical to RBW71CW except without the CDMA band installed.

Only the characteristics that maybe impacted by the changes from RBW71CW to RCC51UW 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 meters.
- 2) USB Data Cable, part number HDW-06610-009, model 6191-10AL-0180, 1.00 metre long.
- 3) Premium Multi-Button Stereo Headset, 3.5 mm, part number HDW-15765-001, 1.3 meters long.
- 4) Premium Mono Headset, 3.5 mm part number HDW-17906-001, 1.3 meters long
- 5) BlackBerry® Charging Pod, part number HDW-19135-001
- 6) External Battery Charger, (EBC), part number HDW-19137-001.
- 7) USB Y-Cable, part number HDW-19137-002, lead lengths of 26 cm and 11 cm

D. Support Equipment Used for the Testing of the EUT

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

RTS RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCC51UW	
Test Report No. RTS-1191-0810-19	Dates of Test October 7, 2008	Author Data Shannon Muller

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) CONDUCTED AC LINE 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 configuration was measured:

1. The BlackBerry® smartphone PIN 20C85601 in GSM850 Idle mode with the 3.5 mm Premium Multi-Button Stereo Headset attached was positioned in the Charging Pod connected to Y-Cable and External Battery Charger to the Captive Cable Charger.

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 9.84 dB below the QP limit at 2.346 MHz using the quasi-peak detector for the Captive Cable Charger, test configuration 1.

Measurement Uncertainty ±3.0 dB

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

RTS RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCC51UW	
Test Report No. RTS-1191-0810-19	Dates of Test October 7, 2008	Author Data Shannon Muller

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 5.0 GHz. Both the horizontal and vertical polarizations of the emissions were measured.

The measurements were done in a semi-anechoic chamber and a fully-anechoic room (FAR). The semi-anechoic chamber 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® smartphone was in battery charging mode for all configurations. The ac input voltage was 120V, 60Hz.

The following test configurations were measured:

1. The BlackBerry® smartphone, PIN 20C85601 in GSM850 idle mode with the 3.5 mm Premium Mono Headset attached was positioned in the Charging Pod which was connected to the Captive Cable Charger.
2. The BlackBerry® smartphone, PIN 20C85601 in GSM850 idle mode with the 3.5 mm Premium Mono Headset attached was positioned in the Charging Pod which was connected to the laptop through the USB cable with data transfer.

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 9.52 dB at 427.478 MHz using test configuration 2.

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 ±4.6 dB

To view the test data see APPENDIX 2.

RTS RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCC51UW	
Test Report No. RTS-1191-0810-19	Dates of Test October 7, 2008	Author Data Shannon Muller

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	08-11-21	Radiated Emissions
Preamplifier system	TDK RF Solutions	PA-02	080010	08-11-16	Radiated Emissions
Preamplifier	Rohde & Schwarz	TS-ANA4-SP	001	09-06-03	Radiated Emissions
Preamplifier	Rohde & Schwarz	TS-ANA-SP	001	09-02-29	Radiated Emissions
EMC Analyzer	Aglient	E7405A	US40240226	09-01-01	Radiated Emissions
Digital Multimeter	Hewlett Packard	34401A	US36042324	09-01-01	Conducted/Radiated Emissions
Environment Monitor	Control Company	1870	230355190	08-12-11	Radiated Emissions
Environment Monitor	Control Company	1870	80117164	10-08-01	Conducted/Radiated Emissions
L.I.S.N.	Rohde & Schwarz	ENV216	100060	10-04-08	Conducted Emissions
Hybrid Log Antenna	TDK	HLP-3003C	017301	08-12-15	Radiated Emissions
Hybrid Log Antenna	TDK	HLP-3003C	017201	09-10-24	Radiated Emissions
Horn Antenna	TDK	HRN-0118	030201	09-01-17	Radiated Emissions
Universal Radio Communication Tester	Rohde & Schwarz	CMU 200	837493/073	08-12-06	Radiated Emissions
Universal Radio Communication Tester	Rohde & Schwarz	CMU 200	112394	08-12-10	Radiated/Conducted Emissions
EMI Test Receiver	Rohde & Schwarz	ESIB 40	100255	08-12-24	Conducted/Radiated Emissions

RTS RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCC51UW APPENDIX 1	
Test Report No. RTS-1191-0810-19	Dates of Test October 7, 2008	Author Data Shannon Muller

APPENDIX 1 - AC LINE CONDUCTED EMISSIONS TEST DATA

RTS RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCC51UW APPENDIX 1	
Test Report No. RTS-1191-0810-19	Dates of Test October 7, 2008	Author Data Shannon Muller

AC Conducted Emissions Test Results

The measurements were performed by Andrew Fleming and Savtej Sandhu.

Test Configuration 1

The environmental test conditions were:

Temperature	25°C
Pressure	1026 mb
Relative Humidity	22%

FCC CFR 47 Part 15, Subpart B and IC ICES-003, Class B

Date of test: October 7, 2008

Frequency (MHz)	Line	Reading (QP) (dBµV)	Correction Factor (dB)	Corrected Reading (QP) (dB)	Limit (QP) (dBµV)	Margin (QP) Limits (dB)
0.177	N	31.72	10.05	41.78	64.63	-22.85
0.186	L1	30.64	9.81	40.45	64.21	-23.77
0.272	N	27.69	9.81	37.50	61.07	-23.57
0.411	L1	33.09	9.75	42.84	57.63	-14.79
0.411	N	33.22	9.87	43.09	57.63	-14.54
1.239	N	31.17	9.62	40.79	56.00	-15.21
2.346	L1	36.61	9.55	46.16	56.00	-9.84
2.346	N	35.63	9.61	45.25	56.00	-10.75
2.531	L1	34.59	9.56	44.15	56.00	-11.85
3.795	N	34.54	9.61	44.15	56.00	-11.85
4.191	L1	33.54	9.63	43.17	56.00	-12.83
9.078	L1	33.55	9.79	43.34	60.00	-16.66

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

Measurements were done with the quasi-peak detector.

RTS RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCC51UW APPENDIX 1	
Test Report No. RTS-1191-0810-19	Dates of Test October 7, 2008	Author Data Shannon Muller

AC Conducted Emissions Test Results cont'd

Test Configuration 1

Frequency (MHz)	Line	Reading (AV) (dBµV)	Correction Factor (dB)	Corrected Reading (AV) (dB)	Limit (AV) (dBµV)	Margin (AV) Limits (dB)
0.411	L1	22.92	9.75	32.66	47.63	-24.97
0.411	N	23.04	9.87	32.91	47.63	-24.72
2.346	L1	23.79	9.55	33.34	46.00	-22.66
2.346	N	23.40	9.61	33.01	46.00	-22.99
2.531	L1	24.66	9.56	34.21	46.00	-21.79
3.795	N	23.28	9.61	32.89	46.00	-23.12
4.191	L1	23.20	9.63	32.84	46.00	-23.16

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

Measurements were done with the average detector.

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

RTS RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCC51UW APPENDIX 1	
Test Report No. RTS-1191-0810-19	Dates of Test October 7, 2008	Author Data Shannon Muller

AC Conducted Emissions Test Graphs

Test Configuration 1

Figure 1-1: L1 lines

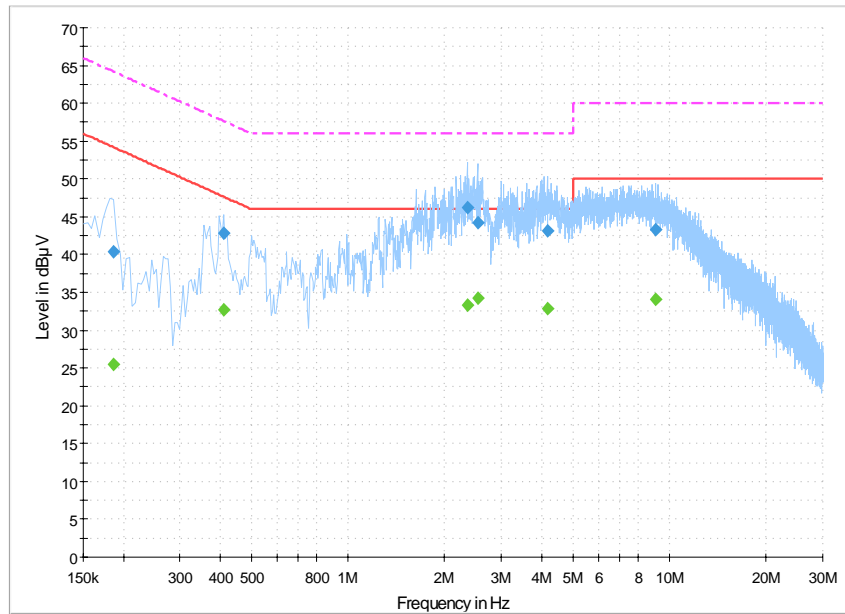
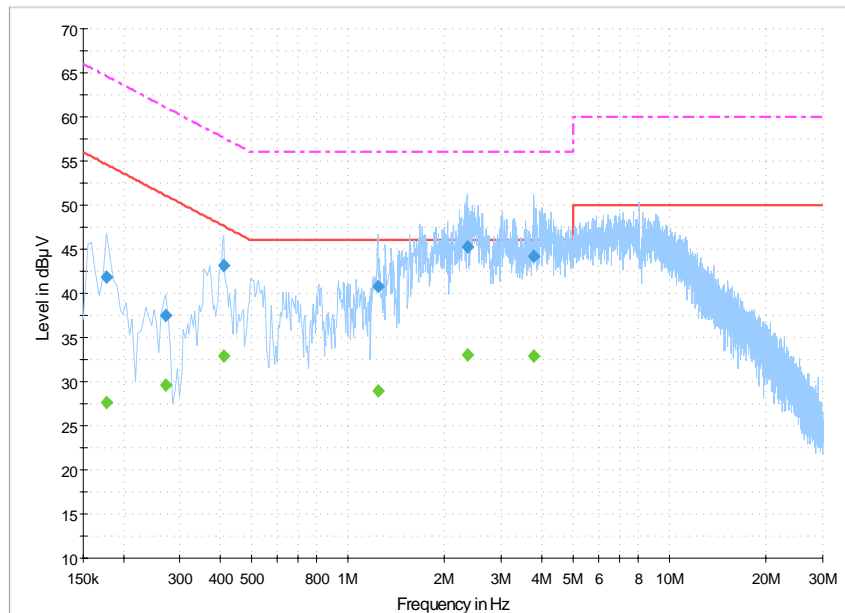


Figure 1-2: N Lines



RTS RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCC51UW APPENDIX 2	
Test Report No. RTS-1191-0810-19	Dates of Test October 7, 2008	Author Data Shannon Muller

APPENDIX 2 - RADIATED EMISSIONS TEST DATA

RTS RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RCC51UW APPENDIX 2	
Test Report No. RTS-1191-0810-19	Dates of Test October 7, 2008	Author Data Shannon Muller

Radiated Emissions Test Results

The measurements were performed by Savtej Sandhu and Andrew Fleming.

Test Configuration 1

The environmental test conditions were:

Temperature	25°C
Pressure	1026 mb
Relative Humidity	22%

FCC CFR 47 Part 15, Subpart B and IC ICES-003, Class B

Date of test: October 7, 2008

Test Distance was 3.0 metres.

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)							
44.198	V	1.25	255	Q.P.	49.79	-21.99	27.80	40.00	-12.20
140.681	H	2.86	180	Q.P.	50.75	-20.15	30.60	43.50	-12.90
200.920	V	1.00	177	Q.P.	45.61	-16.26	29.35	43.50	-14.15
246.848	H	1.46	0	Q.P.	51.82	-18.21	33.62	46.00	-12.38
292.816	H	1.00	342	Q.P.	52.40	-16.63	35.77	46.00	-10.23

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

