

# 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-1765-0908-26

**PRODUCT MODEL NO.:** RCP51UW  
**TYPE NAME:** BlackBerry® smartphone  
**FCC ID:** L6ARCP50UW  
**IC:** 2503A-RCP50UW

**DATE:** 26 August, 2009

	EMI Test Report for the BlackBerry® smartphone Model RCP51UW	
Test Report No. RTS-1765-0908-26	Dates of Test August 10 and 11, 2009	Author Data Savtej Sandhu

### **Statement of Performance:**

The BlackBerry® smartphone, model RCP51UW, part number CER-27169-001 Rev. 2, and accessories when configured and operated per RIM's operation instructions, performs within the requirements of the test standards.

### **Declaration:**

We hereby certify that:

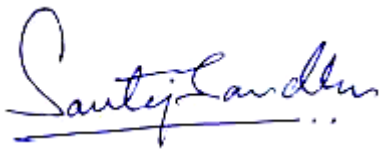
The test data reported herein is an accurate record of the performance of the sample(s) tested.

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:



Savtej Sandhu  
Compliance Specialist  
Date: 26 August, 2009

Reviewed by:




Masud S. Attayi, P.Eng.  
Manager, Regulatory Compliance  
Date: 31 August, 2009

Approved by:




Paul G. Cardinal, Ph.D.  
Director  
Date: 01 September, 2009

	EMI Test Report for the BlackBerry® smartphone Model RCP51UW	
Test Report No. RTS-1765-0908-26	Dates of Test August 10 and 11, 2009	Author Data Savtej Sandhu

## Table of Contents

A.	Scope .....	4
B.	Associated Document.....	4
C.	Product Identification.....	4
D.	Support Equipment Used for the Testing of the EUT .....	5
E.	Modifications to EUT .....	5
F.	Summary of Results .....	5
G.	Compliance Test Equipment Used .....	7
	APPENDIX 1 - RADIATED EMISSIONS TEST DATA .....	8

	EMI Test Report for the BlackBerry® smartphone Model RCP51UW	
Test Report No. RTS-1765-0908-26	Dates of Test August 10 and 11, 2009	Author Data Savtej Sandhu

## 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 01, 2008 Class B Digital Devices, Unintentional Radiators
- IC ICES-003 Issue 4, February 2004, Class B Digital Devices, Unintentional Radiators

## B. Associated Document

1. Test Report RTS-1765-0908-03.
2. Declaration\_of\_Test\_Applicability

## 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 location:


RIM Testing Services EMI test facility  
305 Phillip Street  
Waterloo, Ontario  
Canada, N2L 3W8  
Phone: 519 888 7465  
Fax: 519 888 6906

The testing was performed on August 10 and 11, 2009.

The sample EUT included:

SAMPLE	MODEL	CER NUMBER	PIN
1	RCP51UW	CER-27169-001 Rev. 1	30C3A0A6

Radiated Emissions testing was performed on sample 1.

	EMI Test Report for the BlackBerry® smartphone Model RCP51UW	
Test Report No. RTS-1765-0908-26	Dates of Test August 10 and 11, 2009	Author Data Savtej Sandhu

### BlackBerry® smartphone Accessories Tested

- 1) Folding Blade Charger part number HDW-17955-001 with an output voltage of 5.0 volts dc, 700 mA and attached USB cable with a lead length of 1.80 metres.
- 2) 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.
- 3) Bluetooth Headset, part number HDW-23439-001.
- 4) D-X1 Sleeve External Battery Charger, (EBC), part number HDW-19137-001.
- 5) USB Y-Cable, part number HDW-19137-002, lead lengths of 26 cm and 11 cm.
- 6) Premium Single Button Stereo Headset, part number HDW-15766-005, 1.3 meters long.
- 7) USB Data Cable, part number HDW-06610-013, 0.30 metres long.
- 8) USB Data Cable, part number HDW-06610-009, 1.00 metre long.
- 9) Charging POD, part number HDW-24477-001.

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

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

#### **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	See Test Report RTS-1765-0908-03	-
Part 15, Subpart B	ICES-003	Radiated Unintentional Spurious Emissions	Yes	1

Model RCP51UW is identical to RCK71CW except that the CDMA section is depopulated. Only the characteristics that may have been impacted by the changes from RCK71CW to RCP51UW were re-measured. For more details, refer to the Declaration\_of\_Test\_Applicability.

##### **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

	EMI Test Report for the BlackBerry® smartphone Model RCP51UW	
Test Report No. RTS-1765-0908-26	Dates of Test August 10 and 11, 2009	Author Data Savtej Sandhu

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. 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.

The following test configurations were measured:

1. The BlackBerry® smartphone, PIN 30C3A0A6 in PCS1900 idle mode and communicating with the Bluetooth Headset was connected to the Folding Blade Charger, HDW-17955-001.
2. The BlackBerry® smartphone, PIN 30C3A0A6 in 802.11b Tx mode with the Premium Single-Button Stereo Headset attached was connected to the Captive Cable Charger, HDW-17957-003. The External Battery Charger was connected to the Captive Cable Charger via the USB Y-Cable.
3. The BlackBerry® smartphone, PIN 30C3A0A6 in GSM850 idle mode on the Charging Pod was connected to the Laptop in USB high speed mode via the 0.3 metre USB Cable.
4. The BlackBerry® smartphone, PIN 30C3A0A6 in GSM850 idle mode was connected to the Laptop in USB high speed mode via the 1.0 metre USB Cable.

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 4.30 dB at 215.984 MHz using test configuration 4.


### **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 1.

	EMI Test Report for the BlackBerry® smartphone Model RCP51UW	
Test Report No. RTS-1765-0908-26	Dates of Test August 10 and 11, 2009	Author Data Savtej Sandhu


## G. Compliance Test Equipment Used

UNIT	MANUFACTURER	MODEL	SERIAL NUMBER	CAL DUE DATE (YY MM DD)	USE
Preamplifier	Sonoma	310N/11909A	185831	09-11-07	Radiated Emissions
Preamplifier system	TDK RF Solutions	PA-02	080010	09-11-07	Radiated Emissions
EMI Receiver	Hewlett Packard	8546A	3942A00517	10-02-10	Radiated Emissions
RF Filter section	Hewlett Packard	85460A	3704A00481	10-02-10	Radiated Emissions
Digital Multimeter	Hewlett Packard	34401A	US36042324	09-10-03	Conducted/Radiated Emissions
Environment Monitor	Control Company	1870	230355190	10-01-30	Radiated Emissions
Hybrid Log Antenna	EMC Automation	HLP-3003C	017401	10-09-26	Radiated Emissions
Horn Antenna	EMC Automation	HRN-0118	030101	10-07-22	Radiated Emissions
Universal Radio Communication Tester	Rohde & Schwarz	CMU 200	837493/073	09-12-08	Radiated Emissions
Bluetooth Tester	Rohde & Schwarz	CBT	100368	09-12-09	Radiated Emissions

	EMI Test Report for the BlackBerry® smartphone Model RCP51UW <b>APPENDIX 1</b>	
<b>Test Report No.</b> RTS-1765-0908-26	<b>Dates of Test</b> August 10 and 11, 2009	<b>Author Data</b> Savtej Sandhu

## APPENDIX 1 - RADIATED EMISSIONS TEST DATA



	EMI Test Report for the BlackBerry® smartphone Model RCP51UW <b>APPENDIX 1</b>	
<b>Test Report No.</b> RTS-1765-0908-26	<b>Dates of Test</b> August 10 and 11, 2009	<b>Author Data</b> Savtej Sandhu

### Radiated Emissions Test Results

The measurements were performed by Fahd Faisal.

#### Test Configuration 1

The environmental test conditions were: Temperature: 24°C  
Pressure: 1009 mb  
Relative Humidity: 32%


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

The BlackBerry® smartphone, PIN 30C3A0A6 was tested on August 10, 2009.

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)							
450.544	V	3.37	232	Q.P.	32.79	-8.15	24.64	46.00	-21.36
598.306	H	1.14	131	Q.P.	33.56	-4.61	28.95	46.00	-17.05
786.259	V	2.28	165	Q.P.	34.24	-1.37	32.87	46.00	-13.13
963.238	V	2.10	353	Q.P.	31.18	2.17	33.35	54.00	-20.65

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

	EMI Test Report for the BlackBerry® smartphone Model RCP51UW <b>APPENDIX 1</b>	
Test Report No. RTS-1765-0908-26	Dates of Test August 10 and 11, 2009	Author Data Savtej Sandhu

### Radiated Emissions Test Results cont'd

#### Test Configuration 2

The environmental test conditions were: Temperature: 24°C  
Pressure: 1009 mb  
Relative Humidity: 32%


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

The BlackBerry® smartphone, PIN 30C3A0A6 was tested on August 10, 2009.

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)							
34.188	V	1.45	260	Q.P.	46.31	-18.13	28.18	40.00	-11.82
39.115	V	1.42	185	Q.P.	45.92	-19.48	26.44	40.00	-13.56
42.866	V	1.45	147	Q.P.	51.42	-20.27	31.15	40.00	-8.85

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

	EMI Test Report for the BlackBerry® smartphone Model RCP51UW <b>APPENDIX 1</b>	
<b>Test Report No.</b> RTS-1765-0908-26	<b>Dates of Test</b> August 10 and 11, 2009	<b>Author Data</b> Savtej Sandhu

### Radiated Emissions Test Results cont'd

#### Test Configuration 3

The environmental test conditions were: Temperature: 24°C  
Pressure: 1009 mb  
Relative Humidity: 32%


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

The BlackBerry® smartphone, PIN 30C3A0A6 was tested on August 10, 2009.

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)							
48.031	V	2.01	77	Q.P.	51.84	-21.14	30.70	40.00	-9.30
122.599	H	1.92	78	Q.P.	48.57	-17.11	31.46	43.50	-12.04
239.987	H	1.34	269	Q.P.	54.12	-15.41	38.71	46.00	-7.29
366.391	H	1.03	202	Q.P.	46.89	-11.05	35.84	46.00	-10.16
427.417	H	1.94	111	Q.P.	49.34	-8.87	40.47	46.00	-5.53
527.996	V	2.16	295	Q.P.	39.74	-6.62	33.12	46.00	-12.88
672.349	H	1.28	102	Q.P.	34.92	-3.58	31.34	46.00	-14.66
971.890	V	2.57	191	Q.P.	26.85	2.39	29.24	54.00	-24.76

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

	EMI Test Report for the BlackBerry® smartphone Model RCP51UW <b>APPENDIX 1</b>	
<b>Test Report No.</b> RTS-1765-0908-26	<b>Dates of Test</b> August 10 and 11, 2009	<b>Author Data</b> Savtej Sandhu

## Radiated Emissions Test Results cont'd

### Test Configuration 4

The environmental test conditions were: Temperature: 24°C  
Pressure: 1009 mb  
Relative Humidity: 32%

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

The BlackBerry® smartphone, PIN 30C3A0A6 was tested on August 10, 2009.

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)							
95.952	H	1.75	171	Q.P.	49.09	-18.39	30.70	43.50	-12.80
215.984	H	1.57	251	Q.P.	53.77	-14.57	39.20	43.50	<b>-4.30</b>
244.202	H	1.45	277	Q.P.	53.49	-15.35	38.14	46.00	-7.86
366.390	V	2.44	353	Q.P.	43.80	-11.05	32.75	46.00	-13.25
430.339	V	2.49	23	Q.P.	47.47	-8.85	38.62	46.00	-7.38
527.986	V	1.97	285	Q.P.	40.05	-6.62	33.43	46.00	-12.57
719.960	V	1.77	334	Q.P.	35.72	-2.31	33.41	46.00	-12.59

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