

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-1271-0810-25

PRODUCT MODEL NO.: RCD21IN
TYPE NAME: BlackBerry® smartphone
FCC ID: L6ARCD20IN
IC: 2503A-RCD20IN

DATE: 07 November, 2008

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Statement of Performance:

The BlackBerry® smartphone, model RCD21IN, part number CER-21467-001 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.

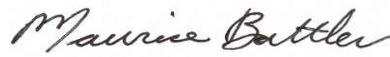
The test methods were consistent with the methods described in the relevant standards.

Documented by:



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

B. Associated Document

No Associated Documents.

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 (RTS) EMI test facilities

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 21 to November 06, 2008.

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The sample EUT included:

SAMPLE	MODEL	CER NUMBER	PIN
1	RCD21IN	CER-21467-001 Rev. 2	40245A3D
2	RCD21IN	CER-21467-001 Rev. 2	40245A62

BlackBerry® smartphone Accessories Tested

- 1) BlackBerry® MDS Power Station, part number HDW-12743-005.
- 2) 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 HDW-14917-001 with an output voltage of 5.0 volts dc, 500 mA and attached USB cable with a lead length of 1.80 meters.
- 4) Alternative Captive Cable Charger part number HDW-14917-003 with an output voltage of 5.0 volts dc, 500 mA and attached USB cable with a lead length of 1.80 meters.
- 5) Mono Headset, 2.5 mm, part number HDW-12420-001, 1.3 metres long.
- 6) Stereo Headset, 2.5 mm, part number HDW-13019-001, 1.3 metres long.
- 7) Alternative Stereo Headset, 2.5 mm, part number HDW-16907-001, 1.3 metres long.
- 8) BlackBerry® Charging Pod, part number HDW-20444-001.
- 9) USB Data Cable, part number ASY-06610-001, 1.50 metres long
- 10) BlackBerry® Remote Stereo Gateway, part number ASY-16007-001.

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.

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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 configurations were measured:

1. The BlackBerry® smartphone PIN 40245A3D in iDEN 800 idle mode with the 2.5 mm Mono Headset connected was connected to the MDS Power Station.
2. The BlackBerry® smartphone PIN 40245A3D in iDEN 900 idle mode with the 2.5 mm Stereo Headset connected was connected to the Folding Blade 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 13.86 dB below the QP limit at 0.164 MHz using the quasi-peak detector for the MDS Power Station, test configuration 1.

Measurement Uncertainty ±3.0 dB

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

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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 (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 measured on the low, middle and high channels.

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 40245A3D in iDEN 800 idle mode with the 2.5 mm Stereo Headset attached was positioned in the Charging Pod which was connected to the Folding Blade Charger.
2. The BlackBerry® smartphone, PIN 40245A3D in iDEN 800 idle mode was connected to the laptop through the USB cable.
3. The BlackBerry® smartphone, PIN 40245A3D in iDEN 900 idle mode and audio playing with the 2.5 mm Alternative Stereo Headset attached was positioned in the Charging Pod which was connected to the Folding Blade Charger.
4. The BlackBerry® smartphone, PIN 40245A3D in Bluetooth Tx mode with the 2.5 mm Stereo Headset attached was connected to the Folding Blade Charger.
5. The BlackBerry® smartphone, PIN 40245A62 in 802.11b/g Tx mode with the 2.5 mm Mono Headset attached was connected to the Captive Cable Charger.
6. The BlackBerry® smartphone, PIN 40245A3D in Bluetooth Tx mode with the 2.5 mm Mono Headset attached was connected to the MDS Power Station which was connected to the laptop with the USB Cable.
7. The BlackBerry® smartphone, PIN 40245A3D in iDEN 900 idle mode with the Bluetooth Stereo Gateway was positioned in the Charging Pod which was connected to the Folding Blade Charger.

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8. The BlackBerry® smartphone, PIN 40245A62 in 802.11b/g Tx mode with the 2.5 mm Mono Headset attached 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 6.95 dB at 52.780 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.

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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>
Bluetooth Tester	Rohde & Schwarz	CBT	100370	08-12-06	Radiated Emissions
Digital Multimeter	Hewlett Packard	34401A	US36042324	09-01-01	Conducted/Radiated Emissions
EMC Analyzer	Aglient	E7405A	US40240226	09-01-01	Radiated Emissions
EMI Test Receiver	Rohde & Schwarz	ESIB 40	100255	08-12-24	Conducted/Radiated Emissions
Environment Monitor	Control Company	1870	80117164	10-01-08	Conducted/Radiated Emissions
Environment Monitor	Control Company	1870	230355190	08-12-11	Radiated Emissions
Horn Antenna	Emco	3116	2538	10-09-15	Radiated Emissions
Hybrid Log Antenna	TDK	HLP-3003C	017201	09-10-24	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
L.I.S.N.	Rohde & Schwarz	ENV216	100060	09-04-21	Conducted Emissions
Universal Radio Communication Tester	Rohde & Schwarz	CMU 200	112394	08-12-10	Conducted/ Radiated Emissions
Universal Radio Communication Tester	Rohde & Schwarz	CMU 200	837493/073	08-12-06	Radiated Emissions

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APPENDIX 1 - AC LINE CONDUCTED EMISSIONS TEST DATA

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AC Conducted Emissions Test Results cont'd

Test Configuration 1 cont'd

Frequency (MHz)	Line	Reading (QP) (dBμV)	Correction Factor (dB)	Corrected Reading (QP) (dB)	Limit (QP) (dBμV)	Limit (AV) (dBμV)	Margin (QP) Limits (dB)
0.501	L1	21.40	9.66	31.06	56.00	46.00	-24.94
0.533	N	23.19	9.89	33.08	56.00	46.00	-22.92
0.686	L1	23.28	9.61	32.89	56.00	46.00	-23.11

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

Measurements were done with the quasi-peak 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.

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AC Conducted Emissions Test Graphs

Test Configuration 1

Figure 1-1: L1 lines

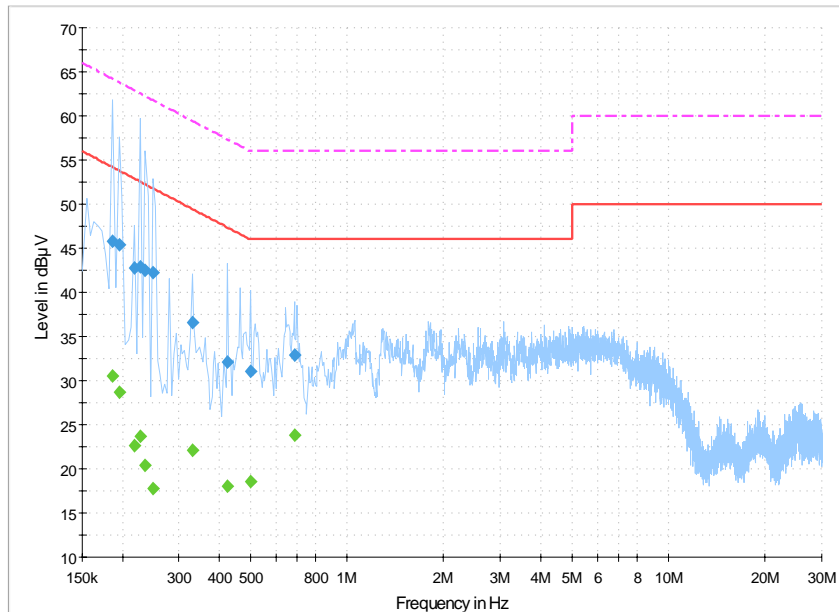
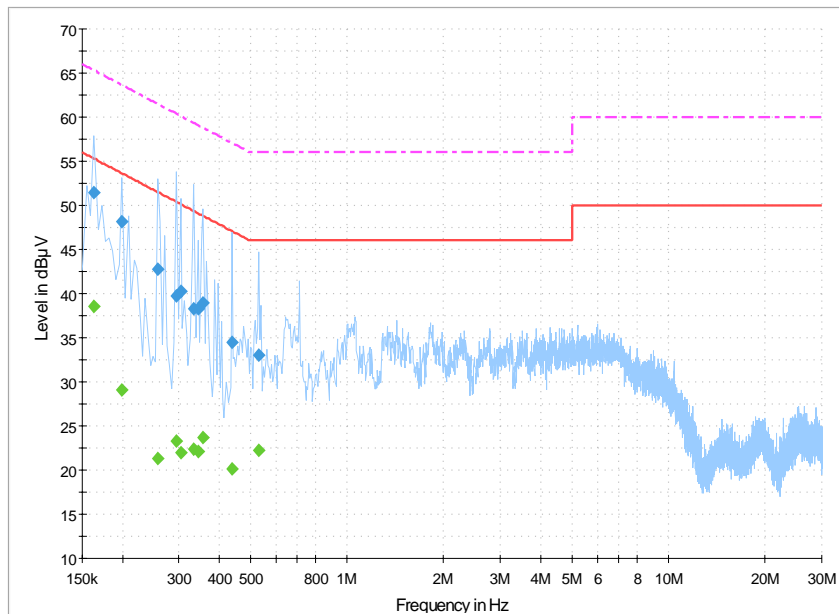


Figure 1-2: N Lines



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AC Conducted Emissions Test Graphs

Test Configuration 2

Figure 1-3: L1 lines

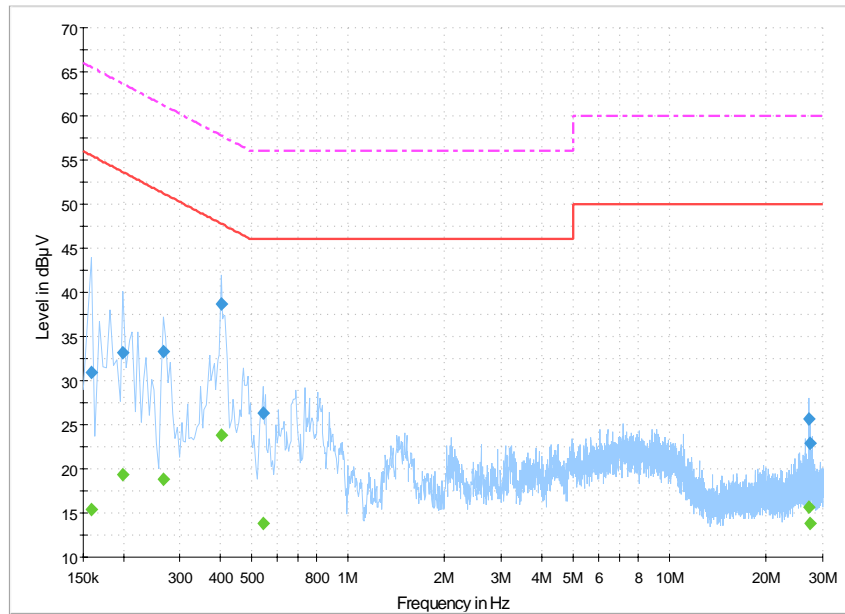
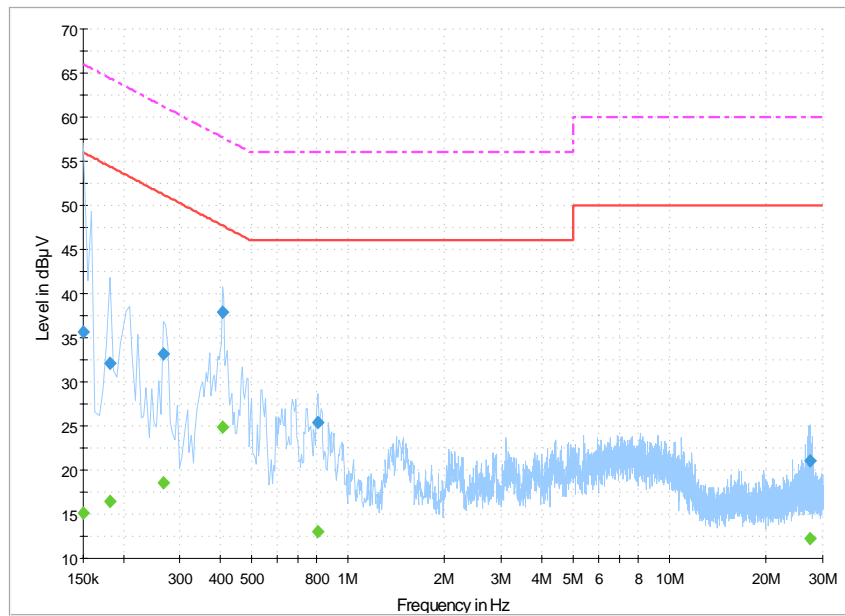


Figure 1-4: N Lines



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APPENDIX 2 - RADIATED EMISSIONS TEST DATA

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Radiated Emissions Test Results cont'd

Test Configuration 3

The environmental test conditions were:

Temperature	26°C
Pressure	1033 mb
Relative Humidity	21%

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

Date of test: October 23, 2008

Test Distance was 3.0 metres.

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

Test Configuration 4

The environmental test conditions were:

Temperature	26.5°C
Pressure	1030 mb
Relative Humidity	20%

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

Date of test: October 22, 2008

Test Distance was 3.0 metres.

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

Test Configuration 5

The environmental test conditions were:

Temperature	27°C
Pressure	1014 mb
Relative Humidity	28%

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

Date of test: October 21, 2008

Test Distance was 3.0 metres.

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

