

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-5385-1108-53

PRODUCT MODEL NO.: REC71UW
TYPE NAME: BlackBerry® smartphone
FCC ID: L6AREC70UW
IC: 2503A-REC70UW

DATE: September 13, 2011

	EMI Test Report for the BlackBerry® smartphone Model REC71UW	
Test Report No. RTS-5385-1108-53	Date of Test August 12 - August 17, 2011	FCC ID: L6AREC70UW IC : 2503A-REC70UW

Statement of Performance:

The BlackBerry® smartphone, model REC71UW, part number CER-41249-001 Rev. 1 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:



Shuo Wang
Regulatory Compliance Specialist
Date: September 9, 2011

Reviewed by:



Heng Lin
Regulatory Compliance Specialist
Date: September 12, 2011

Reviewed and Approved by:



Masud S. Attayi, P.Eng.
Manager, Regulatory Compliance
Date: September 13, 2011

	EMI Test Report for the BlackBerry® smartphone Model REC71UW	
Test Report No. RTS-5385-1108-53	Date of Test August 12 - August 17, 2011	FCC ID: L6AREC70UW IC : 2503A-REC70UW

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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, October, 2010 Class B Digital Devices, Unintentional Radiators
- IC ICES-003 Issue 4, February 2004, Class B Digital Devices, Unintentional Radiators

B. Associated Documents

- None

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 from August 12 to August 17, 2011.

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The sample EUT included:

SAMPLE	MODEL	CER NUMBER	PIN	Software
1	REC71UW	CER-41249-001 Rev 1	27DD7A76	V7.0.0.285 Bundle 1423 Platform: 9.0.0.184
2	REC71UW	CER-41249-001 Rev 1	27DD7ADB	V7.0.0.285 Bundle 1423 Platform: 9.0.0.184

AC conducted testing was performed on sample 1.
Radiated Emissions testing was performed on sample 2.

BlackBerry® smartphone Accessories Tested

- 1) Fixed Blade Charger Rev.1, part number HDW-24481-001 (model number RIM-C-4ADUUS-001 with an output voltage of 5.0 volts dc.
- 2) Alt. Fixed Blade Charger Rev.2, part number HDW-24481-001 (model number RIM-C-4ADUUS-001 with an output voltage of 5.0 volts dc.
- 3) Alt.1 Fixed Blade Charger, part number HDW-24481-001 (model number PSM04A-050QRIM-R), with an output voltage of 5.0 volts dc.
- 4) Folding Blade Charger, part number HDW-34724-003 with an output voltage of 5.0 volts dc and current of 1.8 Amps.
- 5) Captive Cable Charger, part number HDW-17957-003 with an output voltage of 5.0 volts dc, 750 mA and attached USB cable with a lead length of 1.80 metres.
- 6) Premium Stereo Headset, part number HDW-15766-005, 1.3 metres long.
- 7) Stereo Headset, part number HDW-24529-001, with a lead length of 1.1 metres
- 8) Alt. Stereo Headset part number HDW-24529-001, with a lead length of 1.1 metres
- 9) Bluetooth Headset part number HDW-25937-001.
- 10) USB Data Cable, part number HDW-28109-001, 0.3 metre long.
- 11) USB Data Cable, part number HDW-28109-003, 1.2 metre long.
- 12) USB Y-Cable, part number HDW-19137-002, lead lengths of 26 cm and 11 cm.
- 13) External Battery Charger, part number HDW-24478-001.
- 14) BlackBerry Charging Pod, part number HDW-43418-001.

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D. Support Equipment Used for the Testing of the EUT

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

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	1
Part 15, Subpart B	ICES-003	Radiated Unintentional Spurious Emissions	Yes	2

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a) AC 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. BlackBerry® smartphone was in battery charging mode. The input voltage was 120 V, 60 Hz.

The following test configurations were measured for model REC71UW:

Test Configuration	Operating Mode(s)	Charger + Accessories
1	GSM 850 Idle, Audio Playback	Fixed Blade Charger Premium Stereo Headset 1.2m USB cable
2	GSM1900 Idle, Video Playback	Alt. Fixed Blade Charger Stereo Headset 0.3m USB Cable
3	UMTS Band 2 Idle, Audio Playback	Folding Blade Charger Alt.1 Stereo Headset
4	UMTS Band 5 idle, Video Playback	Captive Cable Charger Bluetooth Stereo Headset External Battery Charger USB Y-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 worst case test margin of 5.09 dB below the AVG limit at 0.492 MHz using the average peak detector in Test Configuration 3.

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. 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.

 EMI Test Report for the BlackBerry® smartphone Model REC71UW		
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The following test configurations were measured for model REC71UW:

Test Configuration	Operating Mode(s)	Charger + Accessories
1	GSM 850 Idle, Audio Playback	Fixed Blade Charger Premium Stereo Headset 1.2m USB Cable Charging Pod
2	PCS 1900 Idle, Video Playback	Alt. Fixed Blade Charger Stereo Headset 0.3m USB Cable
3	Bluetooth Tx, Audio Playback	Alt. 1 Fixed Blade Charger Premium Stereo Headset 1.2m USB Cable Charging Pod
4	802.11b Tx, Video Playback	Captive Cable Charger Bluetooth Stereo Headset External Battery charger USB Y-Cable
5	UMTS Band 2 Idle, Audio Playback	Captive Cable Charger Alt. 1 Stereo Headset
6	UMTS Band 5 Idle, Audio Playback	IBM Thinkpad Lenovo T60p laptop Alt. Stereo Headset 0.3m 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 worst case emission test margin of 9.81 dB below the QP limit at 51.00 MHz using quasi-peak detector in Test Configuration 5.

To view the test data see APPENDIX 2.

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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

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F. 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	11-11-14	Radiated Emissions
Preamplifier system	TDK RF Solutions	PA-02	080010	11-09-13	Radiated Emissions
EMC Analyzer	Rohde & Schwarz	ESIB 40	3942A00517	11-11-28	Radiated Emissions
Digital Multimeter	Hewlett Packard	34401A	US36042324	11-10-28	Conducted/Radiated Emissions
T/RH Meter	OMEGA	iTHX-SD	0380561	11-10-13	Radiated Emission
T/RH Meter	OMEGA	iTHX-SD	0380567	11-10-13	Radiated Emission
L.I.S.N.	Rohde & Schwarz	ENV216	100060	11-12-10	Conducted Emissions
Hybrid Log Antenna	EMC Automation	HLP-3003C	017401	12-01-14	Radiated Emissions
Horn Antenna	EMC Automation	HRN-0118	030101	12-07-20	Radiated Emissions
Universal Radio Communication Tester	Rohde & Schwarz	CMU 200	837493/073	11-09-23	Radiated Emissions
Universal Radio Communication Tester	Rohde & Schwarz	CMU 200	112394	11-11-29	Radiated/Conducted Emissions
EMI Test Receiver	Rohde & Schwarz	ESU 40	100162	11-10-30	Radiated/Conducted Emissions
Bluetooth Tester	Rohde & Schwarz	CBT	100368	11-11-27	Radiated Emissions
Bluetooth Tester	Rohde & Schwarz	CBT	100370	11-11-29	Radiated/Conducted Emissions

	EMI Test Report for the BlackBerry® smartphone Model REC71UW, REN71UW APPENDIX 2	
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APPENDIX 1 - AC CONDUCTED EMISSIONS TEST DATA

	EMI Test Report for the BlackBerry® smartphone Model REC71UW APPENDIX 2	
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AC Conducted Emissions Test Results

The following test configurations were measured for model REC71UW.

The following tests were performed by Shuo Wang.

Test Configuration 1

Date of the test: August 12, 2011

The environmental conditions were: Temperature: 25.2 °C
 Humidity: 42.0 %

Frequency (MHz)	Line	Reading (QP) (dBμV)	Correction Factor (dB)	Corrected Reading (QP) (dBμV)	Limit (QP) (dBμV)	Limit (AV) (dBμV)	Margin (QP) Limits (dB)
0.150	L1	34.15	11.20	45.35	66.00	56.00	-20.65
0.168	L1	38.60	11.08	49.68	65.10	55.10	-15.42
0.380	N	24.51	10.05	34.56	58.30	48.30	-23.74
0.425	L1	27.75	9.97	37.72	57.40	47.40	-19.68
0.641	L1	26.48	9.85	36.33	56.00	46.00	-19.67
0.668	N	24.50	9.85	34.35	56.00	46.00	-21.65
1.158	N	26.12	9.80	35.92	56.00	46.00	-20.08
1.185	L1	24.67	9.80	34.47	56.00	46.00	-21.53
1.721	L1	23.28	9.81	33.10	56.00	46.00	-22.90
2.027	N	25.52	9.83	35.36	56.00	46.00	-20.65
2.261	N	31.35	9.84	41.19	56.00	46.00	-14.81
2.657	L1	29.97	9.86	39.83	56.00	46.00	-16.17
2.810	N	29.52	9.87	39.39	56.00	46.00	-16.61
3.674	L1	29.09	9.89	38.98	56.00	46.00	-17.02
4.164	N	25.83	9.91	35.74	56.00	46.00	-20.26
7.278	N	25.57	9.97	35.54	60.00	50.00	-24.46

All other emission levels had test margins 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

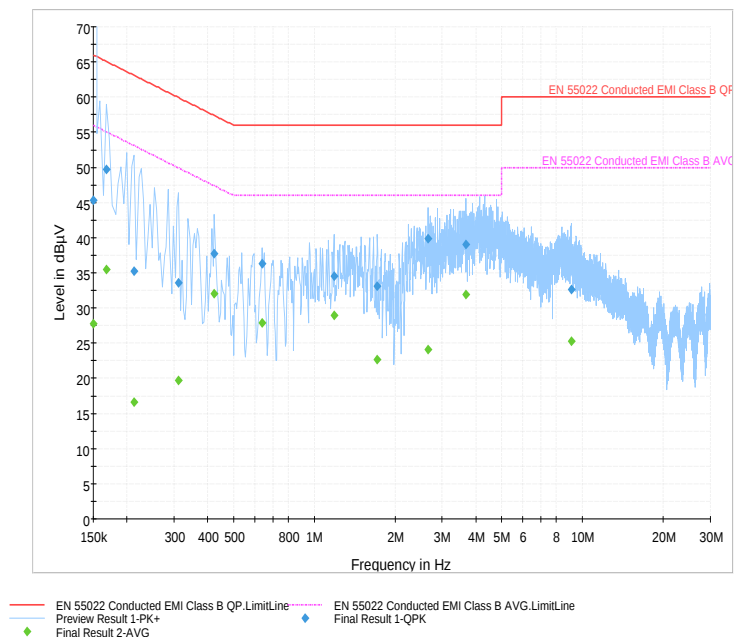
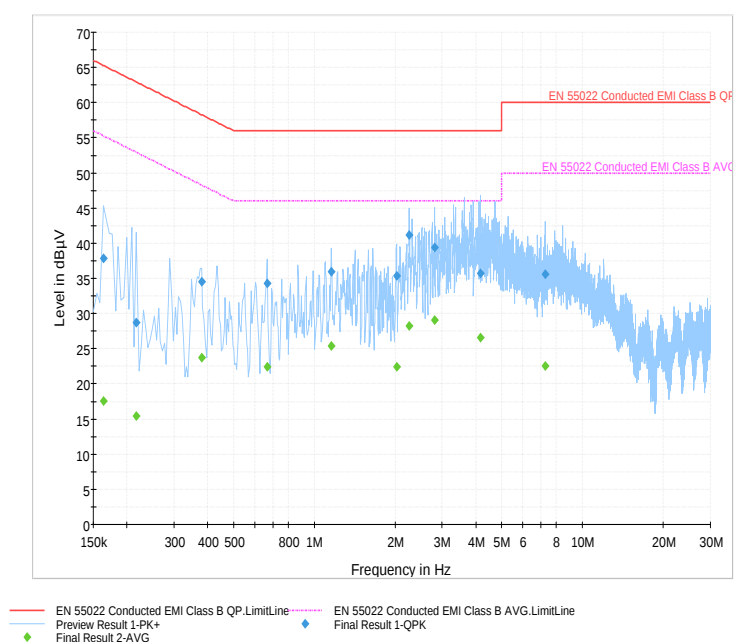


Figure 1-2: N Lines



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AC Conducted Emissions Test Results cont'd

Test Configuration 2

Date of the test: August 12, 2011

The environmental conditions were: Temperature: 25.2 °C
Humidity: 42.0 %

Frequency (MHz)	Line	Reading (QP) (dBμV)	Correction Factor (dB)	Corrected Reading (QP) (dBμV)	Limit (QP) (dBμV)	Limit (AV) (dBμV)	Margin (QP) Limits (dB)
0.150	L1	34.52	11.20	45.72	66.00	56.00	-20.28
0.150	N	31.69	11.23	42.93	66.00	56.00	-23.07
0.164	L1	39.41	11.11	50.52	65.30	55.30	-14.78
0.168	N	29.86	11.11	40.97	65.10	55.10	-24.13
0.191	L1	31.71	10.92	42.63	64.00	54.00	-21.37
0.213	L1	28.70	10.77	39.46	63.10	53.10	-23.64
0.272	L1	27.38	10.36	37.74	61.10	51.10	-23.36
0.353	L1	31.91	10.08	42.00	58.90	48.90	-16.90
0.353	N	27.02	10.10	37.12	58.90	48.90	-21.78
0.407	L1	30.63	10.00	40.63	57.70	47.70	-17.07
0.569	L1	26.77	9.87	36.64	56.00	46.00	-19.36
0.920	N	23.71	9.81	33.53	56.00	46.00	-22.47
3.485	L1	28.27	9.89	38.16	56.00	46.00	-17.84
4.011	N	26.32	9.90	36.22	56.00	46.00	-19.78

All other emission levels had test margins of greater than 25 dB.
Measurements were done with the quasi-peak detector.

See figure 1-3 and figure 1-4 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 2

Figure 1-3: L1 lines

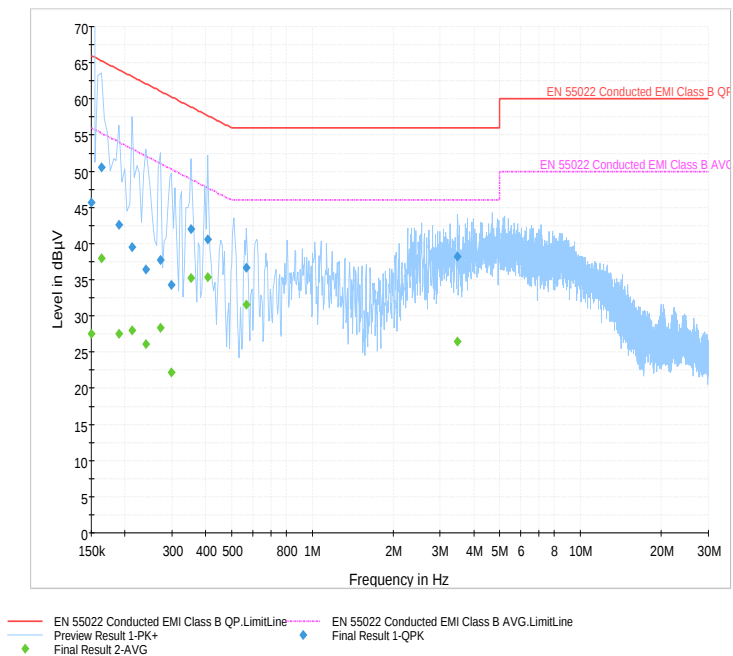
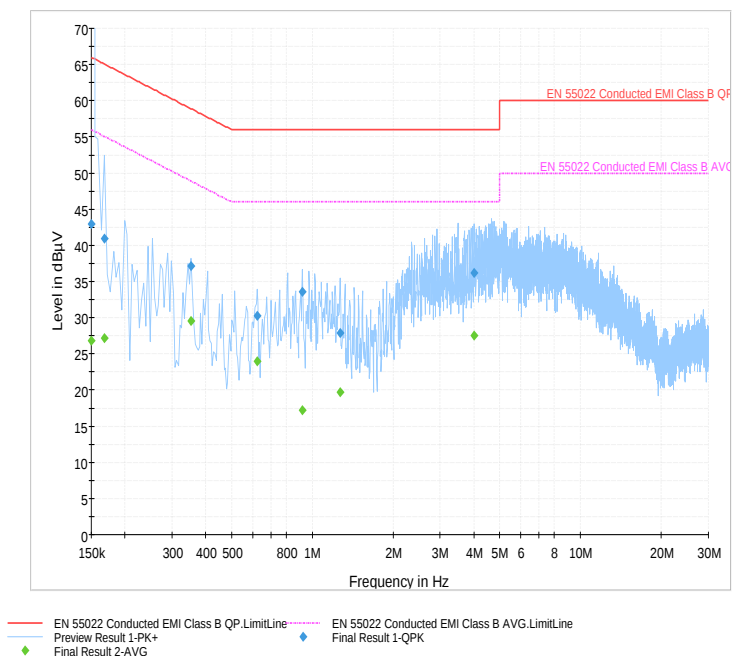


Figure 1-4: N Lines



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AC Conducted Emissions Test Results cont'd

Test Configuration 3

Date of the test: August 12, 2011

The environmental conditions were: Temperature: 25.2 °C
 Humidity: 42.0 %

Frequency (MHz)	Line	Reading (QP) (dBµV)	Correction Factor (dB)	Corrected Reading (QP) (dBµV)	Limit (QP) (dBµV)	Limit (AV) (dBµV)	Margin (QP) Limits (dB)
0.150	N	42.02	11.23	53.25	66.00	56.00	-12.75
0.173	N	31.04	11.08	42.12	64.80	54.80	-22.68
0.191	N	31.27	10.95	42.22	64.00	54.00	-21.78
0.344	L1	31.55	10.10	41.65	59.10	49.10	-17.45
0.492	N	36.48	9.92	46.40	56.10	46.10	-9.70
0.555	L1	34.17	9.88	44.05	56.00	46.00	-11.95
0.735	N	27.86	9.83	37.69	56.00	46.00	-18.31
0.812	L1	29.01	9.82	38.83	56.00	46.00	-17.17
2.148	L1	29.82	9.83	39.66	56.00	46.00	-16.35
15.990	N	28.15	10.11	38.26	60.00	50.00	-21.74
27.987	N	28.67	10.41	39.08	60.00	50.00	-20.92

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AC Conducted Emissions Test Results cont'd

Test Configuration 3 cont'd

Frequency (MHz)	Line	Reading (AVG) (dBμV)	Correction Factor (dB)	Corrected Reading (AVG) (dBμV)	Limit (QP) (dBμV)	Limit (AV) (dBμV)	Margin (AVG) Limits (dB)
0.213	L1	18.51	10.77	29.28	53.10	43.10	-23.82
0.344	L1	24.56	10.10	34.65	49.10	39.10	-14.45
0.555	L1	24.30	9.88	34.18	46.00	36.00	-11.82
0.812	L1	24.08	9.82	33.90	46.00	36.00	-12.10
2.148	L1	22.47	9.83	32.30	46.00	36.00	-13.70
0.150	N	34.72	11.23	45.96	56.00	46.00	-10.04
0.191	N	19.23	10.95	30.18	54.00	44.00	-23.82
0.492	N	31.08	9.92	41.01	46.10	36.10	-5.09
0.735	N	21.83	9.83	31.66	46.00	36.00	-14.34
15.990	N	25.57	10.11	35.68	50.00	40.00	-14.32
27.987	N	16.78	10.41	27.19	50.00	40.00	-22.81

All other emission levels had test margins of greater than 25 dB.
Measurements were done with the quasi-peak detector.

See figure 1-5 and figure 1-6 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 3

Figure 1-5: L1 lines

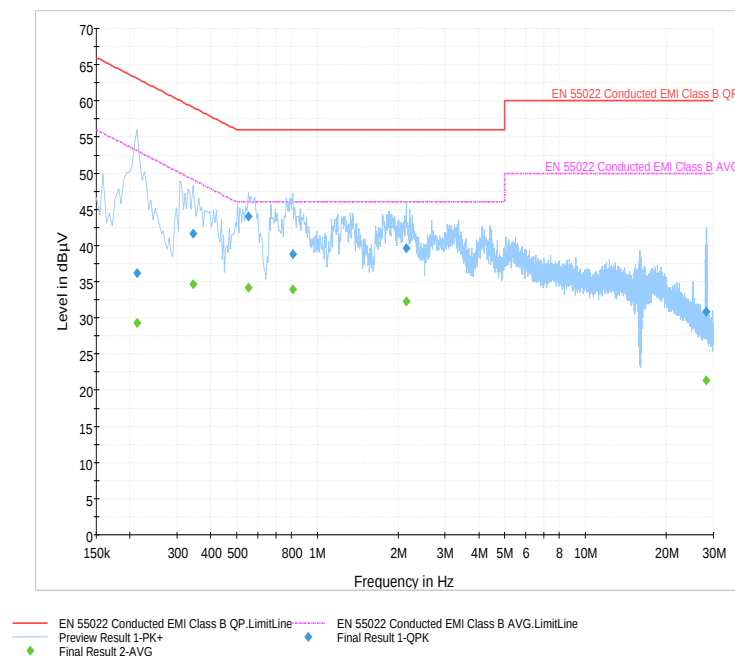
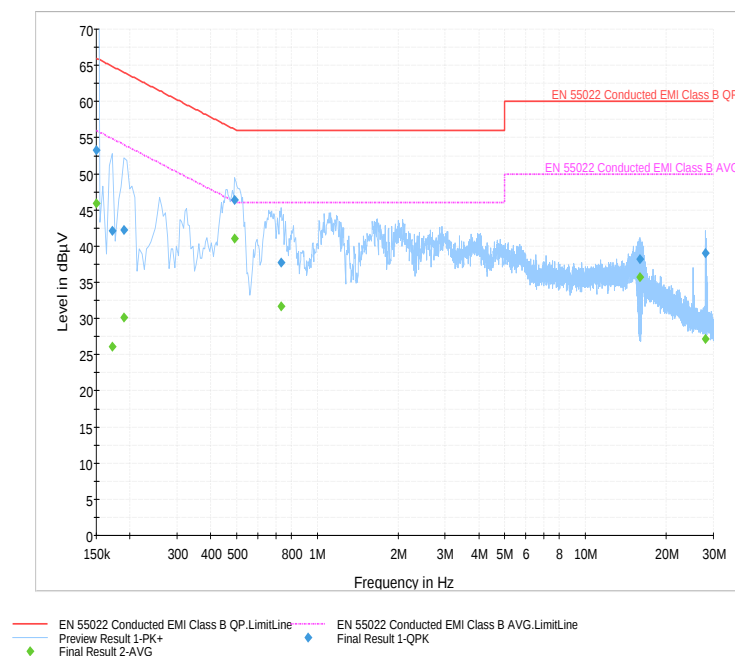


Figure 1-6: N Lines



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AC Conducted Emissions Test Results cont'd

Test Configuration 4

Date of the test: August 12, 2011

The environmental conditions were: Temperature: 25.2 °C
 Humidity: 42.0 %

Frequency (MHz)	Line	Reading (QP) (dBμV)	Correction Factor (dB)	Corrected Reading (QP) (dBμV)	Limit (QP) (dBμV)	Limit (AV) (dBμV)	Margin (QP) Limits (dB)
0.150	L1	44.11	11.20	55.31	66.00	56.00	-10.69
0.150	N	37.80	11.23	49.04	66.00	56.00	-16.96
0.200	L1	37.23	10.86	48.09	63.60	53.60	-15.51
0.209	L1	36.35	10.80	47.15	63.30	53.30	-16.15
0.222	L1	32.30	10.70	43.00	62.70	52.70	-19.70
0.407	L1	35.40	10.00	45.40	57.70	47.70	-12.30
0.407	N	28.75	10.01	38.76	57.70	47.70	-18.94
0.506	L1	34.90	9.91	44.81	56.00	46.00	-11.19
0.605	N	27.43	9.86	37.29	56.00	46.00	-18.71
0.672	L1	34.65	9.84	44.49	56.00	46.00	-11.51
0.722	N	28.02	9.83	37.85	56.00	46.00	-18.15
0.735	L1	31.17	9.83	41.00	56.00	46.00	-15.01
0.785	L1	33.88	9.82	43.70	56.00	46.00	-12.30
0.861	N	27.13	9.82	36.95	56.00	46.00	-19.05
0.906	N	27.52	9.81	37.33	56.00	46.00	-18.67
1.023	N	27.15	9.81	36.96	56.00	46.00	-19.04
1.365	N	26.26	9.81	36.07	56.00	46.00	-19.93
1.415	N	26.97	9.81	36.78	56.00	46.00	-19.23
1.487	N	25.55	9.81	35.36	56.00	46.00	-20.64
1.514	L1	32.53	9.80	42.34	56.00	46.00	-13.66
1.707	N	24.57	9.82	34.39	56.00	46.00	-21.61
2.148	N	24.25	9.83	34.09	56.00	46.00	-21.91
2.162	L1	28.64	9.83	38.47	56.00	46.00	-17.53
3.750	L1	27.75	9.89	37.65	56.00	46.00	-18.35

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3.899	N	22.55	9.90	32.45	56.00	46.00	-23.55
10.379	L1	26.46	9.97	36.43	60.00	50.00	-23.57
11.400	L1	27.67	9.99	37.67	60.00	50.00	-22.33

All other emission levels had test margins greater than 25 dB.
Measurements were done with the quasi-peak and the average detector.

See figure 1-7 and figure 1-8 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 4

Figure 1-7: L1 lines

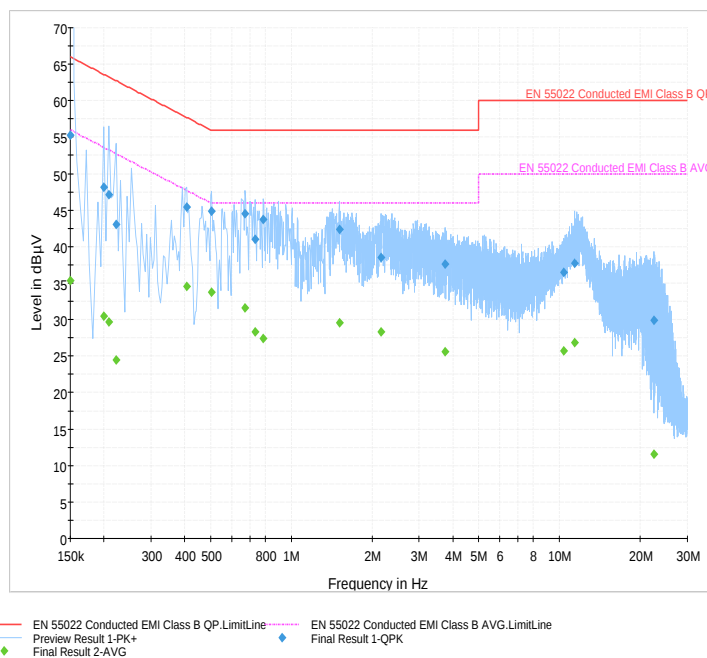
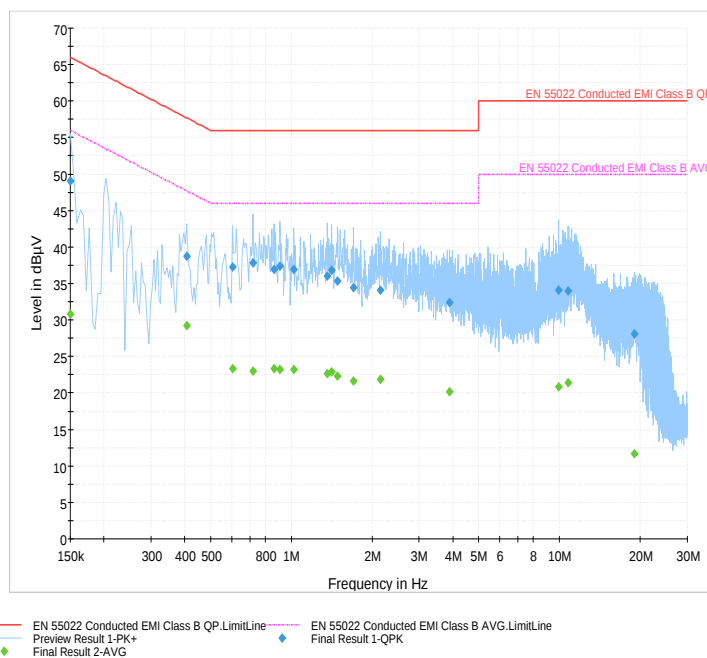


Figure 1-8: N Lines



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APPENDIX 2 - RADIATED EMISSIONS TEST DATA (REC71UW)

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Radiated Emissions Test Results

The following test configurations were measured for model REC71UW.

The following tests were performed by Ven Olis.

Test Configuration 1

Date of the test: August 16, 2011

The environmental conditions were: Temperature: 24.4 °C
Humidity: 40.8 %

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)							
33.850	V	-0.15	140.00	Q.P.	-257.08	282.03	24.95	40.00	-15.05
52.350	V	-0.16	140.00	Q.P.	-26.76	50.63	23.87	40.00	-16.13
65.300	V	-0.23	140.00	Q.P.	-43.53	60.93	17.40	40.00	-22.60
85.050	H	-0.24	227.00	Q.P.	-157.13	173.43	16.30	40.00	-23.70
87.300	V	-0.20	140.00	Q.P.	-257.16	277.04	19.88	40.00	-20.12

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

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Test Report No. RTS-5385-1108-53	Date of Test August 12 - August 17, 2011	FCC ID: L6AREC70UW IC : 2503A-REC70UW

Radiated Emissions Test Results cont'd

Test Configuration 3

Date of the test: August 17, 2011

The environmental conditions were: Temperature: 25.2 °C
 Humidity: 38.2 %

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+c orr) (dBµV/m)	Limit @ 3.0 m (dBµV/m)	Test Margin (dB)
	Pol. (V/H)	Height (metres)							
37.750	V	1.57	90.00	Q.P.	36.74	-14.85	21.89	40.00	-18.11
52.700	V	1.40	144.00	Q.P.	36.19	-17.30	18.89	40.00	-21.11
70.100	H	2.45	166.00	Q.P.	32.08	-16.35	15.73	40.00	-24.27
70.100	V	1.40	285.00	Q.P.	34.65	-16.35	18.30	40.00	-21.70

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

	EMI Test Report for the BlackBerry® smartphone Model REC71UW APPENDIX 2	
Test Report No. RTS-5385-1108-53	Date of Test August 12 - August 17, 2011	FCC ID: L6AREC70UW IC : 2503A-REC70UW

Radiated Emissions Test Results cont'd

Test Configuration 5

Date of the test: August 16, 2011

The environmental conditions were: Temperature: 25.4 °C
 Humidity: 37.9 %

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+c orr) (dBµV/m)	Limit @ 3.0 m (dBµV/m)	Test Margin (dB)
	Pol. (V/H)	Height (metres)							
38.900	V	1.56	69.00	Q.P.	37.39	-15.17	22.22	40.00	-17.78
51.000	V	1.46	282.00	Q.P.	47.40	-17.21	30.19	40.00	-9.81
86.850	V	1.49	36.00	Q.P.	34.59	-14.59	20.00	40.00	-20.00

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

