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-0491-0702-04_rev1

PRODUCT MODEL NO.: RBK41CG
TYPE NAME: BlackBerry
FCC ID: L6ARBK40CG
IC: 2503A-RBK40CG

DATE: 29 March 2007

Statement of Performance:

The BlackBerry Handheld, model RBK41CG, part number CER-14121-001 Rev 3, 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.

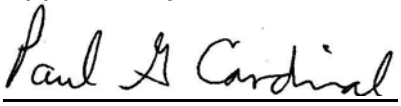
Tested and documented by:

Masud S. Attayi, P.Eng.
Team Lead, Regulatory Compliance
Date: 29 Mar 2007

Reviewed by:

Maurice Battler
Compliance Specialist
Date: 29 Mar 2007

Approved by:



Paul G. Cardinal, Ph.D.
Director
Date: 29 Mar 2007

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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, August 14, 2006, Class B Digital Devices, Unintentional Radiators
- IC ICES-003 Issue 4, February 2004, Class B Digital Devices, Unintentional Radiators
- EN 55022: 1998 A1:2000/A2:2003 Conducted/Radiated Emissions Class B

B. Associated Documents

1. None

C. Product Identification

Manufactured by Research In Motion Limited 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 facility, located at:

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

The testing was performed on March 08 to 12, 2007.

The sample EUT included:

1. BlackBerry Handheld, model RBK41CG, CER-14121-001 Rev 3, PIN: 301726FD

BlackBerry Handheld Accessories Tested

1) Folding Blade Charger, part number ASY-07040-001 with an output voltage of 5.0 volts dc, 0.75 amps and attached USB cable with a lead length of 1.80 metres.
2) Captive Cable Charger, part number ASY-07559-001 with an output voltage of 5.0 volts dc, 0.5 amps and attached USB cable with a lead length of 1.80 metres.
3) Alternative Folding Blade Charger, part number ASY-12709-001 with an output voltage of 5.0 volts dc, 0.75 amps with an attached USB cable with a length of 1.80 metres.
4) USB data cable, part number HDW-06610-001, 1.45 metres long.
5) Stereo Headset, part number HDW-13019-001, 1.5 metres long.
6) Mono Headset, model number HDW-12420-001. The lead length was 1.25 metres long.

D. Support Equipment Used for the Testing of the EUT

1) PC System, Myraid, model EN-P3B-7, serial number CCC0004078
2) Monitor, ViewSonic, model number VCDTS23103-2M, serial number 4B022952648
3) Printer, HP, model number C5884A, serial number US8251W0VQ

E. Test Voltage

The ac input voltage was 120/230 volts, 60/50 Hz where applicable. This configuration was per RIM's specifications.

F. Test Results Chart

SPECIFICATION	Test Type	MEETS REQUIREMENTS	Performed By
FCC CFR 47 Part 15, Subpart B IC ICES-003 Radiated Unintentional Spurious Emissions	Class B	Yes	Masud Attayi
FCC CFR 47 Part 15, Subpart B IC ICES-003 Conducted AC Line Emission	Class B	Yes	Masud Attayi

G. Modifications to EUT

No modifications were required on the EUT.

H. Summary of Results

SPECIFICATION		TEST TYPE	RESULT	TEST DATA APPENDIX
FCC CFR 47	IC			
Part 15, Subpart B	ICES-003	Conducted AC Line Emission	Pass	1
Part 15, Subpart B	ICES-003	Radiated Unintentional Spurious Emissions	Pass	2

a) AC LINE 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.
The following test configurations were measured. The Handheld was in idle and battery charging mode. The ac input to the charger was 230 volts, 50 Hz for the below:

1. The Handheld was connected to the Alternative Folding Blade Charger.
2. The Handheld was connected to the Folding Blade Charger and to the Mono headset.
3. The Handheld was connected to the Captive Cable Charger and to the Stereo Headset.

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 9.38 dB below the limit at 0.714 MHz using the QP detector, and 15.83 dB below the limit at 0.630 MHz using the AV detector for the Folding Blade Charger, Mono headset, test configuration 2.

Measurement Uncertainty ±2.0 dB

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

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 1.0 GHz. Both the horizontal and vertical polarisations of the emissions were measured.
The measurements were done in a semi-anechoic chamber. The semi-anechoic chamber FCC registration number is **778487** and the Industry Canada file number is **IC4240**.
The EUT was configured and operated to produce the maximum radiated emissions while still keeping within RIM's specifications.

The following test configurations were measured. The Handheld was in idle and battery charging mode. The ac input to the charger was 120 volts, 60 Hz for the below:

1. The Handheld was connected to the Captive Cable Charger and to the Mono Headset.
2. The Handheld was connected to the Alternative Folding Blade Charger and to the Stereo Headset.
3. The Handheld was connected to the Folding Blade Charger.
4. The Handheld was connected to the PC via the USB cable and Mono Headset. The PC was connected to its support equipment monitor, printer, keyboard, and mouse.

The system's radiated emission levels in idle mode were compared with respect to the FCC CFR 47 Part 15, Subpart B, and IC ICES-003 limit.
The system met the requirements with a worse case emission test margin of -0.53 dB at 50.0 MHz using Captive Cable Charger, Mono headset, test configuration 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 ±4.0 dB

To view the test data see APPENDIX 2.

I. Compliance Test Equipment Used

UNIT	MANUFACTURER	MODEL	SERIAL NUMBER	CAL DUE DATE (YY MM DD)	USE
Preamplifier	Sonoma	310N/11909A	185831	07-11-23	Radiated Emissions
Preamplifier system	TDK RF Solutions	PA-02	080010	07-11-22	Radiated Emissions
EMI Receiver	Agilent	8546A	3942A00517	07-09-21	Conducted/Radiated Emissions
RF Filter Section	Agilent	85460A	3704A00481	07-09-21	Conducted/Radiated Emissions
Digital Multimeter	Hewlett Packard	34401A	US36042324	07-09-19	Conducted/Radiated Emissions
Environment Monitor	Control Company	1870	230355190	07-12-28	Conducted/Radiated Emissions
L.I.S.N.	Emco	3816/2	1120	08-08-28	Conducted Emissions
Impulse Limiter	Rohde & Schwarz	ESHS-Z2	836248/052	07-11-20	Conducted Emissions
Hybrid Log Antenna	TDK	HLP-3003C	17401	08-08-04	Radiated Emissions
Universal Radio Communication Tester	R&S	CMU 200	837493/073	07-12-01	Radiated/Conducted Emission
EMI Test Receiver	R&S	ESIB 40	100255	07-05-11	Radiated Emission

APPENDIX 1 - AC LINE CONDUCTED EMISSIONS TEST DATA

AC Conducted Emissions Test Results

The environmental test conditions were:

Temperature	23ºC
Pressure	1018mb
Relative Humidity	23%

Date of test: March 12, 2007

Test Configuration 1

FCC CFR 47 Part 15, Subpart B, IC ICES-003 and EN 55022, Class B

Frequency (MHz)	Line	Reading (QP) (dBµV)	Correction Factor for Impulse Limiter, LISN, Cable (dB)	Corrected Reading (QP) (dB)	Limit (QP) (dBµV)	Limit (AV)	Margin (QP) Limits (dB)	Margin (AV) Limits (dB)
0.164	L1	36.48	9.83	46.31	65.21	55.21	-18.90	-8.90
0.165	N	38.46	9.83	48.29	65.21	55.21	-16.92	-6.92
0.184	L1	30.07	9.85	39.92	63.82	53.82	-23.90	-13.90
0.215	N	33.52	9.85	43.37	62.82	52.82	-19.44	-9.44
0.347	L1	27.87	9.85	37.72	58.84	48.84	-21.13	-11.13
0.348	N	29.13	9.85	38.98	58.96	48.96	-19.98	-9.98
0.492	L1	28.58	9.85	38.43	56.00	46.00	-17.57	-7.57
0.492	N	29.90	9.85	39.75	56.00	46.00	-16.25	-6.25
0.541	L1	27.03	9.84	36.87	56.00	46.00	-19.13	-9.13
0.538	N	28.33	9.84	38.17	56.00	46.00	-17.83	-7.83
0.563	N	25.83	9.84	35.67	56.00	46.00	-20.33	-10.33
0.579	L1	23.82	9.84	33.66	56.00	46.00	-22.34	-12.34

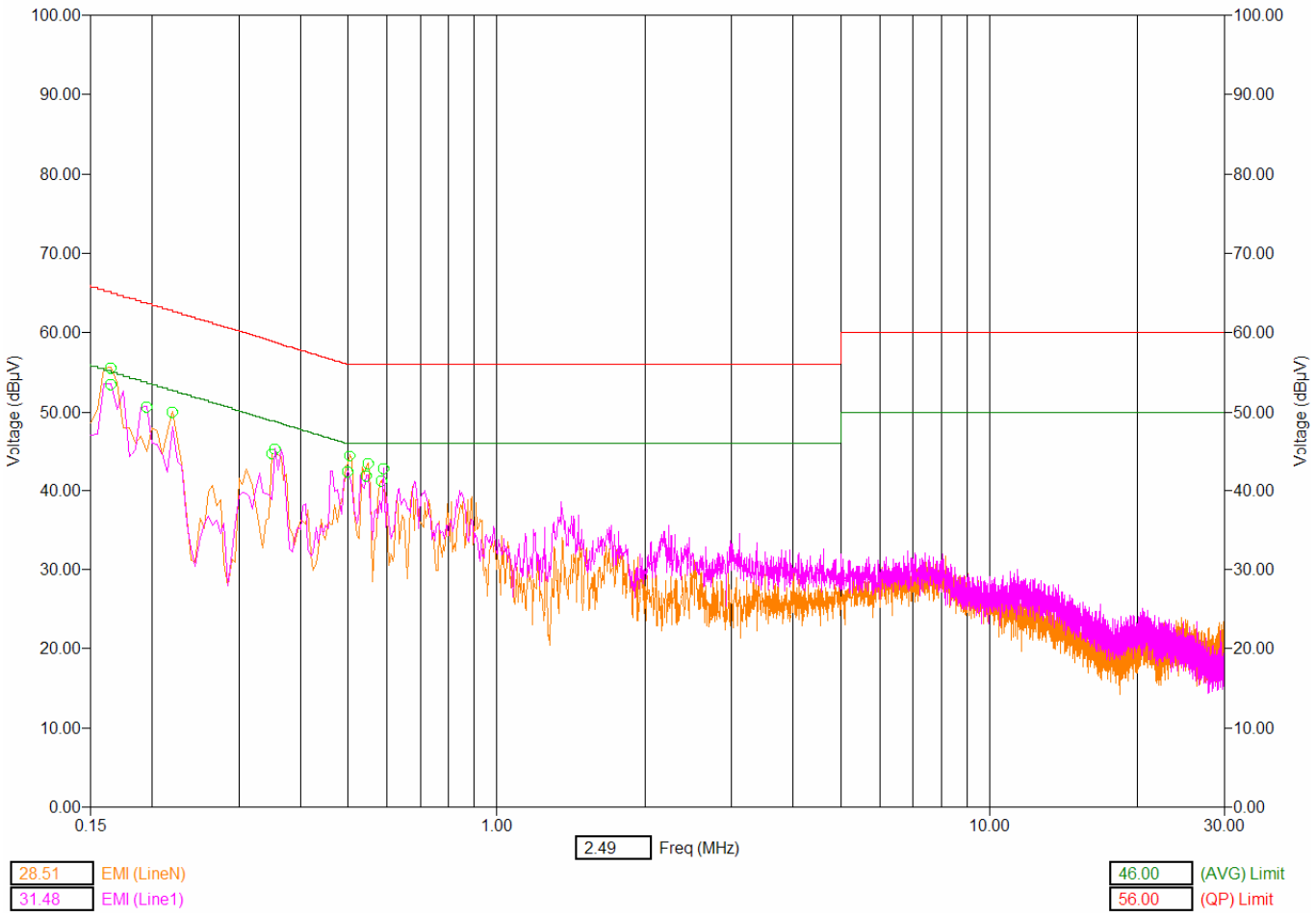
Measurements were done with the quasi-peak detector.

See figure 1-1 for the measurement plot.

AC Conducted Emission

Test Configuration 1

Figure 1-1



AC Conducted Emissions Test Results

Test Configuration 2

FCC CFR 47 Part 15, Subpart B (CISPR 22), IC ICES-003, Class B

Frequency (MHz)	Line	Reading (QP) (dBµV)	Correction Factor for Impulse Limiter, LISN, Cable (dB)	Corrected Reading (QP) (dB)	Limit (QP) (dBµV)	Margin (QP) Limits (dB)
0.397	N	36.75	9.82	46.57	57.75	-11.18
0.476	N	35.59	9.85	45.44	56.25	-10.82
0.477	L1	36.05	9.85	45.90	56.34	-10.44
0.607	L1	35.50	9.84	45.34	56.00	-10.66
0.607	N	35.28	9.85	45.13	56.00	-10.87
0.633	N	35.64	9.87	45.51	56.00	-10.49
0.685	N	32.58	9.86	42.44	56.00	-13.56
0.714	L1	36.69	9.85	46.54	56.00	-9.46
0.714	L1	36.76	9.86	46.62	56.00	**-9.38**
0.740	N	32.31	9.86	42.17	56.00	-13.83
0.969	L1	31.40	9.87	41.27	56.00	-14.73
1.034	L1	34.21	9.87	44.08	56.00	-11.92

Measurements were done with the quasi-peak detector.

See figure 2-1 for the measurement plot.

AC Conducted Emissions Test Results

Test Configuration 2

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

Frequency (MHz)	Line	Reading (AV) (dBµV)	Correction Factor for Impulse Limiter, LISN, Cable (dB)	Corrected Reading (AV) (dB)	Limit (AV) (dBµV)	Margin (AV) Limits (dB)
0.395	N	21.26	9.82	31.08	47.75	-16.67
0.473	L1	20.53	9.85	30.38	46.34	-15.96
0.474	N	19.88	9.85	29.73	46.25	-16.53
0.606	L1	16.93	9.84	26.77	46.00	-19.23
0.630	N	20.32	9.85	30.17	46.00	**-15.83**
0.632	N	20.05	9.87	29.92	46.00	-16.08
0.711	L1	20.26	9.85	30.11	46.00	-15.89
0.713	L1	18.64	9.86	28.50	46.00	-17.50
0.737	N	12.19	9.86	22.05	46.00	-23.95
0.958	L1	11.63	9.87	21.50	46.00	-24.50
1.033	L1	14.85	9.87	24.72	46.00	-21.28

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

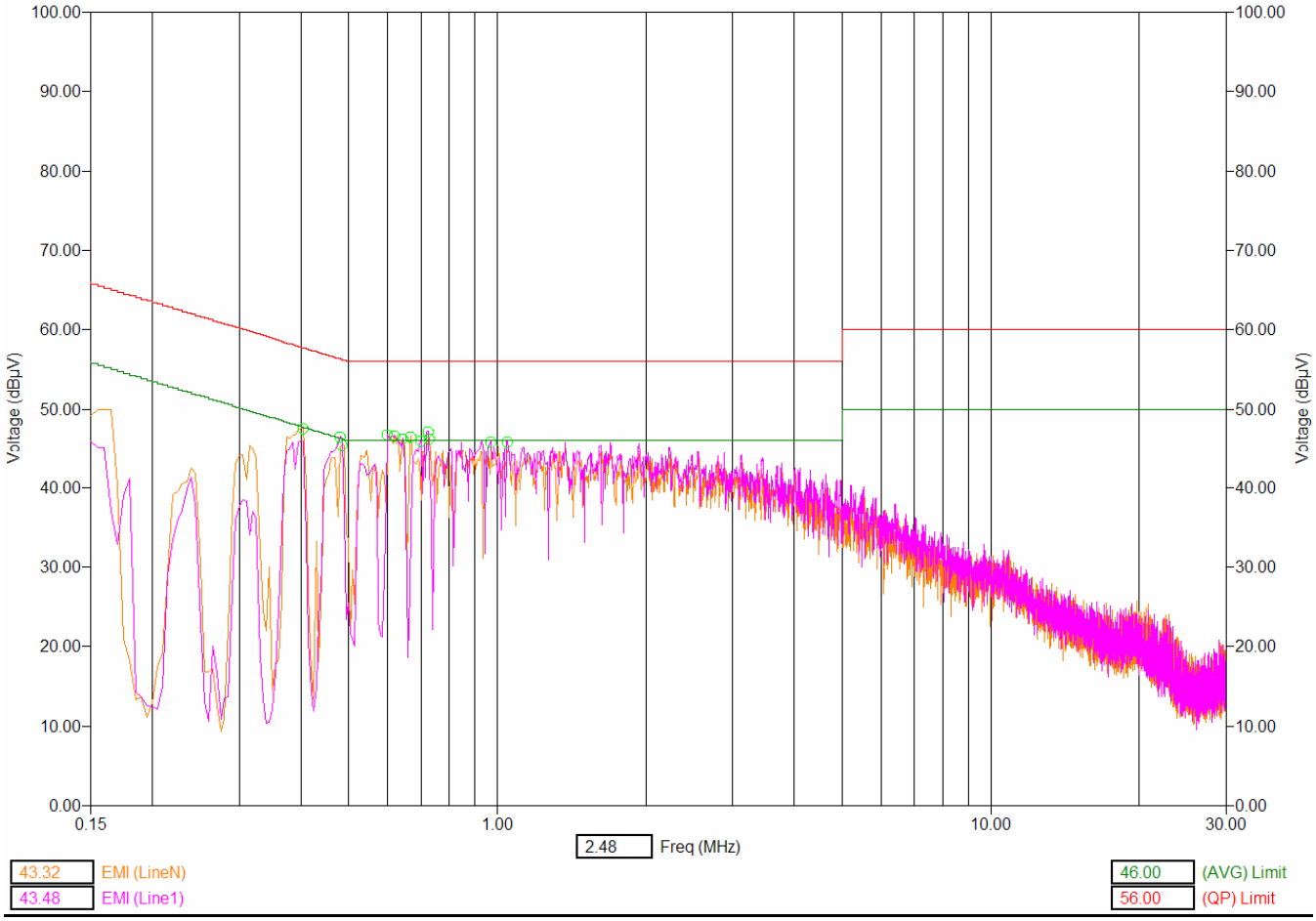
Measurements were done with the average detector.

See figure 2-1 for the measurement plot.

AC Conducted Emissions

Test Configuration 2

Figure 2-1



Test Configuration 3

FCC CFR 47 Part 15, Subpart B (CISPR 22), IC ICES-003, Class B

Frequency (MHz)	Line	Reading (QP) (dBµV)	Correction Factor (dB)	Corrected Reading (QP) (dB)	Limit (QP) (dBµV)	Limit (AV)	Margin (QP) Limits (dB)	Margin (AV) Limits (dB)
0.150	L1	43.64	9.82	53.46	65.73	55.73	-12.26	-2.26
0.153	N	40.24	9.82	50.06	65.73	55.73	-15.66	-5.66
0.252	L1	32.44	9.86	42.30	61.92	51.92	-19.63	-9.63
0.265	N	34.66	9.86	44.52	61.43	51.43	-16.91	-6.91
0.266	L1	36.06	9.85	45.91	60.97	50.97	-15.05	-5.05
0.391	L1	23.53	9.83	33.36	58.28	48.28	-24.92	-14.92
0.399	N	26.48	9.82	36.30	57.75	47.75	-21.45	-11.45
0.533	N	21.91	9.84	31.75	56.00	46.00	-24.25	-14.25
0.534	L1	24.56	9.84	34.40	56.00	46.00	-21.60	-11.0
0.674	N	22.90	9.86	32.76	56.00	46.00	-23.24	-13.24
0.683	L1	21.15	9.85	31.00	56.00	46.00	-25.00	-15.00
2.715	N	19.03	9.95	28.88	56.00	46.00	-27.12	-17.12

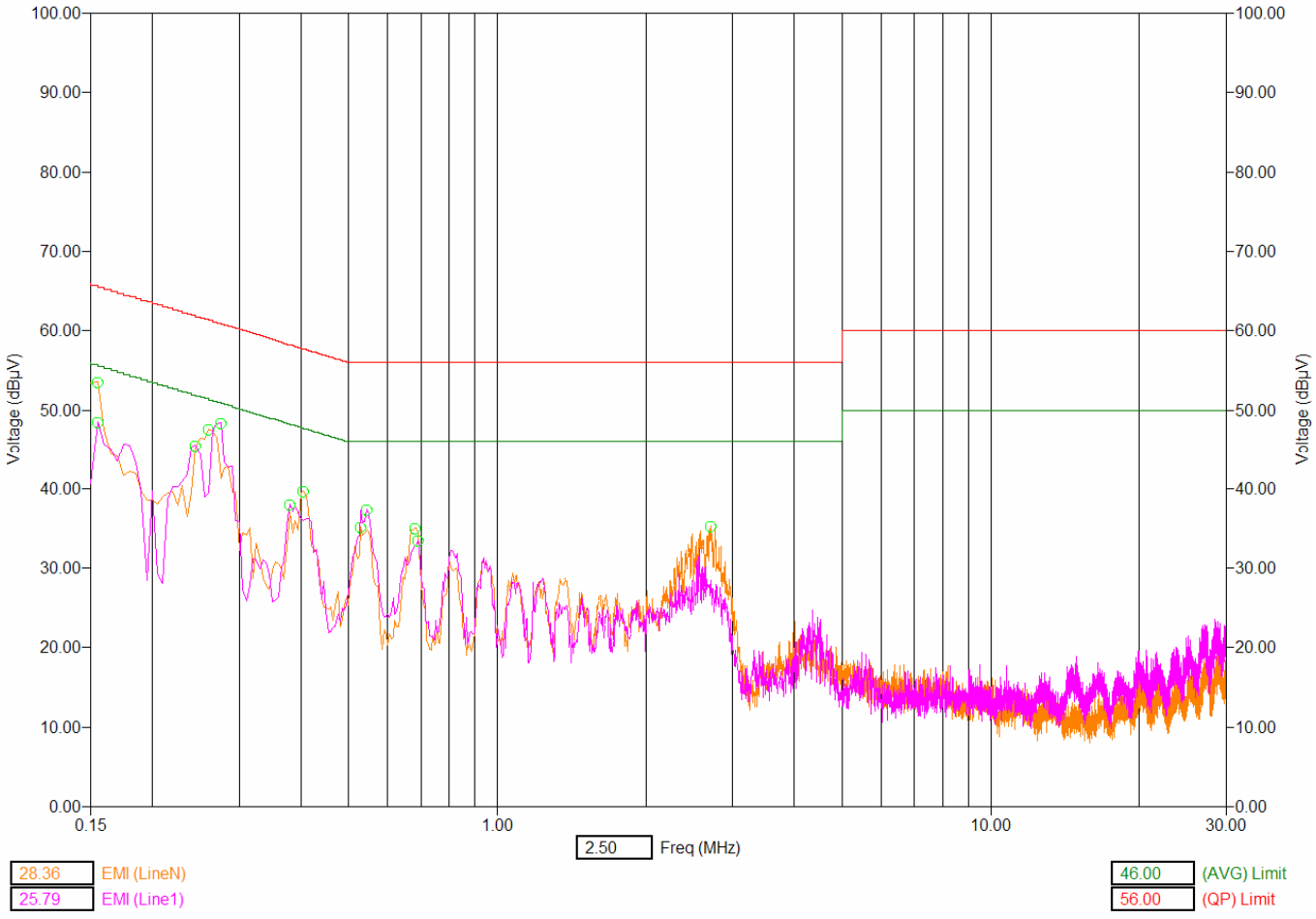
Measurements were done with the quasi-peak detector.

See figure 3-1 for the measurement plot.

AC Conducted Emissions

Test Configuration 3

Figure 3-1



APPENDIX 2 - RADIATED EMISSIONS TEST DATA

Radiated Emissions Test Results

The environmental test conditions were:

Temperature	24ºC
Pressure	1021 mb
Relative Humidity	21%

Date of test: March 8-9, 2007

Test Distance was 3.0 metres

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

Test Configuration 1

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 (dB)	Test Margin (dB)
49.26	H	2.98	270	QP	52.52	-22.51	30.01	40.00	-9.99
49.97	V	1.41	72	QP	62.05	-22.58	39.47	40.00	**-0.53**
52.23	H	3.16	257	QP	49.50	-22.71	26.79	40.00	-13.21
59.65	V	1.43	352	QP	46.88	-22.51	24.37	40.00	-15.63
62.91	H	2.93	83	QP	40.37	-22.20	18.17	40.00	-21.83
62.96	V	2.13	352	QP	44.47	-22.18	22.29	40.00	-17.71
120.02	H	3.04	273	QP	41.75	-18.18	23.57	43.50	-19.93
203.10	V	2.66	336	QP	33.28	-13.91	19.37	43.50	-24.13
207.67	V	1.43	157	QP	41.65	-14.27	27.38	43.50	-16.12

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

Radiated Emissions Test Results cont'd

Test Configuration 2

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)
38.21	V	1.40	217	QP	41.68	-20.36	21.32	40.00	-18.68
40.40	V	1.60	160	QP	46.12	-20.96	25.16	40.00	-14.84
45.06	V	1.60	169	QP	45.23	-21.96	23.27	40.00	-16.73
62.50	H	1.00	84	QP	37.41	-22.25	15.16	40.00	-24.84
826.38	H	3.54	169	QP	23.55	-1.38	22.17	46.00	-23.83
831.58	V	1.42	18	QP	27.02	-1.14	25.88	46.00	-20.12
834.56	V	1.40	352	QP	27.59	-1.05	26.54	46.00	-19.46
836.68	V	2.47	281	QP	24.38	-0.97	23.41	46.00	-22.59

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

Radiated Emissions Test Results cont'd

Test Configuration 3

Frequency	Antenna		Test Angle	Detector	Measured Level	Correction Factor for preamp/antenna / cables/ filter	Field Strength Level (reading+corr)	Limit @ 3.0 m	Test Margin
	Pol.	Height		(Q.P. or Peak)	(dBµV)	(dB/m)	(dBµV/m)	(dBµV/m)	(dB)
(MHz)	(V/H)	(metres)	(Deg.)						
63.00	H	1.00	152	QP	39.24	-22.15	17.09	40.00	-22.91
839.75	V	1.43	352	QP	26.28	-0.86	25.42	46.00	-20.58

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

Radiated Emissions Test Results cont'd

Test Configuration 4

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)
32.09	V	1.63	196	QP	43.67	-18.48	25.19	40.00	-14.81
36.38	V	2.16	265	QP	47.45	-19.82	27.63	40.00	-12.37
46.36	H	3.76	352	QP	49.34	-22.09	27.25	40.00	-12.75
57.95	V	2.04	347	QP	49.43	-22.79	26.64	40.00	-13.36
111.68	H	2.86	80	QP	44.64	-18.35	26.29	43.50	-17.21
144.04	V	1.43	66	QP	48.95	-18.12	30.83	43.50	-12.67
168.06	H	1.04	85	QP	46.52	-17.66	28.86	43.50	-14.64
201.32	H	1.04	297	QP	42.12	-13.78	28.34	43.50	-15.16

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