

TEST REPORT

Test report no.: 1-6234/13-08-11



Testing laboratory

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Accredited Testing Laboratory:

The testing laboratory (area of testing) is accredited according to DIN EN ISO/IEC 17025 (2005) by the Deutsche Akkreditierungsstelle GmbH (DAkkS). The accreditation is valid for the scope of testing procedures as stated in the accreditation certificate with the registration number: D-PL-12076-01-01
Area of Testing: Radio/Satellite Communications

Applicant

Research In Motion Limited
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Waterloo, ON N2L 3W8 / CANADA
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Fax: +1 51 98 88 69 06
Contact: Masud Attayi
e-mail: mattayi@rim.com

Manufacturer

Research In Motion Limited
305 Phillip Street
Waterloo, ON N2L 3W8 / CANADA

Test standard/s

47 CFR Part 15 Title 47 of the Code of Federal Regulations; Chapter I; Part 15 - Radio frequency devices
RSS - 210 Issue 8 Spectrum Management and Telecommunications Radio Standards Specification - Licence-exempt Radio Apparatus (All Frequency Bands): Category I Equipment

For further applied test standards please refer to section 3 of this test report.

Test Item

Kind of test item: Blackberry GSM Phones
Model name: RGF111LW
FCC ID: L6ARGF110LW
IC: 2503A-RGF110LW
Frequency: 13.56 MHz
Technology tested: RFID
Antenna: Integrated antenna
Power supply: 3.80 V DC by Li - polymer battery

This test report is electronically signed and valid without handwriting signature. For verification of the electronic signatures, the public keys can be requested at the testing laboratory.

Test report authorised:

Andreas Luckenbill
Expert

Test performed:

Marco Bertolino
Testing Manager

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2 General information

2.1 Notes and disclaimer

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2.2 Application details

Date of receipt of order:	2013-08-19
Date of receipt of test item:	2013-08-23
Start of test:	2013-08-23
End of test:	2013-09-02
Person(s) present during the test:	-/-

3 Test standard/s

Test standard	Date	Test standard description
47 CFR Part 15	01.10.2012	Title 47 of the Code of Federal Regulations; Chapter I; Part 15 - Radio frequency devices
RSS - 210 Issue 8	01.12.2010	Spectrum Management and Telecommunications Radio Standards Specification - Licence-exempt Radio Apparatus (All Frequency Bands): Category I Equipment

4 Test environment

Temperature:	T_{nom}	+22 °C during room temperature tests
	T_{max}	No tests under extreme conditions!
	T_{min}	No tests under extreme conditions!
Relative humidity content:		54 %
Barometric pressure:		not relevant for this kind of testing
Power supply:	V_{nom}	3.80 V DC by Li - polymer battery
	V_{max}	No tests under extreme conditions!
	V_{min}	No tests under extreme conditions!

5 Test item

Kind of test item	:	Blackberry GSM Phones
Type identification	:	RGF111LW
S/N serial number	:	Radiated units: IMEI EUT 1: 004402242479081 IMEI EUT 2: 004402242479065
HW hardware status	:	CER-57711-001 Rev. 2
SW software status	:	10.2.0.1155
Frequency band [MHz]	:	13.56 MHz
Type of radio transmission	:	single carrier
Use of frequency spectrum	:	
Type of modulation	:	NON
Number of channels	:	1
Antenna	:	Integrated antenna
Power supply	:	3.80 V DC by Li - polymer battery

5.1 Additional information

Test setup- and EUT-photos are included in test reports: 1-6234/13-08-01_AnnexA
1-6234/13-08-01_AnnexD

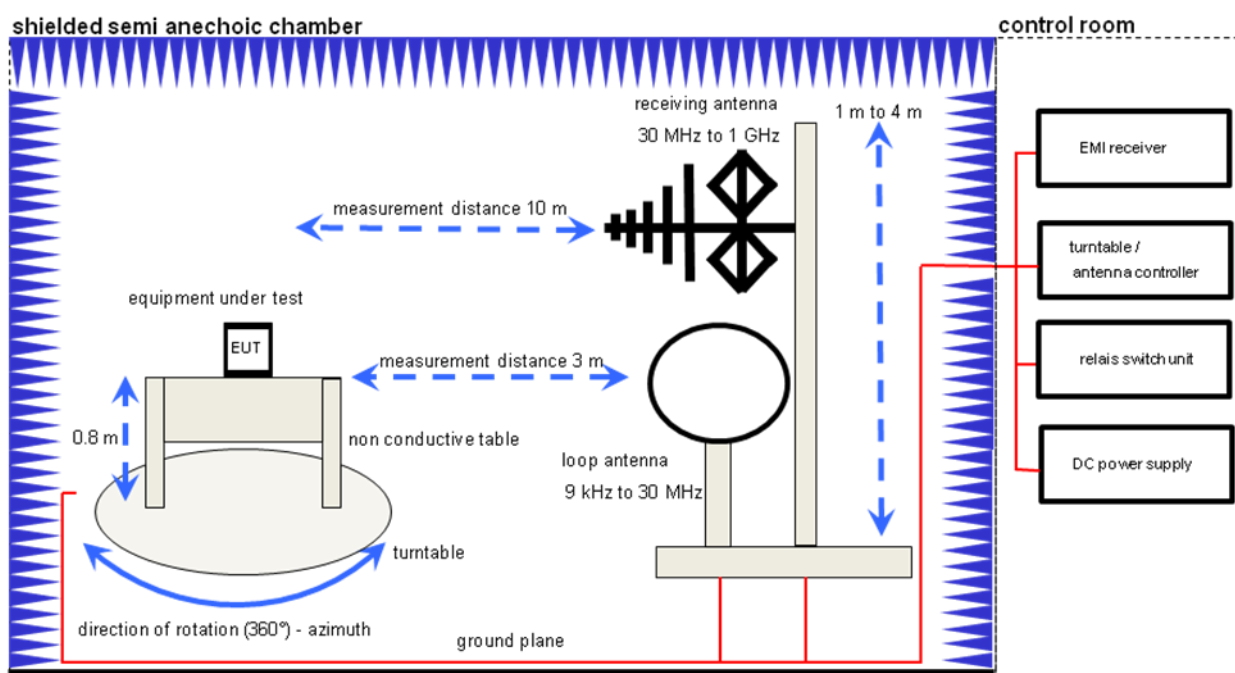
6 Test laboratories sub-contracted

None

7 Description of the test setup

7.1 Radiated measurements

The radiated measurements are performed in vertical and horizontal plane in the frequency range from 9 kHz to 1 GHz in semi-anechoic chambers. The EUT is positioned on a non-conductive support with a height of 0.80 m above a conductive ground plane that covers the whole chamber. The receiving antennas are confirmed with specifications ANSI C63. These antennas can be moved over the height range between 1.0 m and 4.0 m in order to search for maximum field strength emitted from EUT. The measurement distances between EUT and receiving antennas are indicated in the test setups for the various frequency ranges. For each measurement, the EUT is rotated in all three axes until the maximum field strength is received. The wanted and unwanted emissions are received by spectrum analysers where the detector modes and resolution bandwidths over various frequency ranges are set according to requirement ANSI C63.



Equipment table:

Equipment	Type	Manufacturer	Serial No.	INV. No Cetecom
Switch-Unit	3488A	HP Meßtechnik	2719A14505	300000368
DC power supply, 60Vdc, 50A, 1200 W	6032A	HP Meßtechnik	2920A04466	300000580
EMI Test Receiver	ESCI 3	R&S	100083	300003312
Amplifier	JS42-00502650-28-5A	MITEQ	1084532	300003379
Antenna Tower	Model 2175	ETS-LINDGREN	64762	300003745
Positioning Controller	Model 2090	ETS-LINDGREN	64672	300003746
Turntable Interface-Box	Model 105637	ETS-LINDGREN	44583	300003747
TRILOG Broadband Test-Antenna 30 MHz - 3 GHz	VULB9163	Schwarzbeck	295	300003787
Test Receiver	ESH2	R&S	871921/095	300002505
Loop Antenna 9 KHz - 30 MHz	HFH2-Z2	R&S	872096/61	300001824
EMI Test Receiver 9 kHz - 3 GHz incl. Preselector	ESPI3	R&S	101713	300004059

8 Summary of measurement results

- No deviations from the technical specifications were ascertained**
- There were deviations from the technical specifications ascertained

TC Identifier	Description	Verdict	Date	Remark
RF-Testing	CFR Part 15 RSS 210, Issue 8, Annex 2.6	Passed	2013-09-03	Tests according to manufacturer test plan.

Test Specification Clause	Test Case	Temperature Conditions	Power Source Voltages	Pass	Fail	NA	NP	Remark
§ 15.35 (c)/ RSS-GEN Issue 3	Timing of the transmitter (Duty cycle correction factor)	Nominal	Nominal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	-/-
RSS-GEN Issue 3	99 % emission bandwidth	Nominal	Nominal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	-/-
§ 15.225 (a)/ RSS-210 Issue 8 Annex 2.6	Fieldstrength of Fundamental	Nominal	Nominal	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	complies
§ 15.209/ RSS-210 Issue 8 Annex 2.6	Fieldstrength of harmonics and spurious	Nominal	Nominal	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	complies
§ 15.225 (e)/ RSS-210 Issue 8 Annex 2.6	Frequency tolerance	Nominal	Extreme	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	-/-
		Extreme	Nominal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
§15.107	Conducted emissions < 30 MHz	Nominal	Nominal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	-/-

Note: NA = Not Applicable; NP = Not Performed

9 Additional comments

Reference documents: RIM_EMI_Matrix for Cetecom_King_RGF111LW (Aug-12-2013)

Special test descriptions: Tests according to manufacturer test plan.

Configuration descriptions: None

10 Measurement results

10.1 Timing of the transmitter

Not performed – tests according to manufacturer test plan.

10.2 Field strength of the fundamental

Measurement:

Measurement parameter	
Detector:	Quasi Peak
Resolution bandwidth:	200 Hz up to 150 kHz, 9 kHz up to 30 MHz, 120 kHz up to 1 GHz
Video bandwidth:	≥ RBW
Trace-Mode:	Max Hold

Limits:

FCC		IC	
Fundamental Frequency (MHz)	Field strength of Fundamental (μV/m / dBμV/m)	Measurement distance (m)	
13.553 to 13.567	15848 μV/m (84 dBμV/m)	30	
	158489 μV/m (104 dBμV/m)	10 (Recalculated acc. to FCC part15.31 (f2))	

Result:

TEST CONDITIONS		MAXIMUM POWER (dBμV/m)	
Frequency		13.56 MHz	13.56 MHz
Mode		at 10 m distance	at 30 m distance
T _{nom}	V _{nom}	47.0	27*
Measurement uncertainty		±3dB	

* Limits recalculated from 10m to 30m with 40 dB/decade according to FCC 15.31 (f2).

Result: passed

10.3 99 % emission bandwidth

Not performed – tests according to manufacturer test plan.

10.4 Field strength of the harmonics and spurious

Measurement:

Measurement parameter	
Detector:	Quasi Peak / Average
Sweep time:	Auto
Resolution bandwidth:	120 kHz
Video bandwidth:	300 kHz
Span:	See plots!
Trace-Mode:	Max hold

Limits:

FCC		IC	
Field strength of the harmonics and spurious.			
Frequency (MHz)	Field strength ($\mu\text{V/m}$)	Measurement distance (m)	
0.009 – 0.490	2400/F(kHz)	300	
0.490 – 1.705	24000/F(kHz)	30	
1.705 – 30	30 (29.5 dB $\mu\text{V/m}$)	30	
30 – 88	100 (40 dB $\mu\text{V/m}$)	3	
88 – 216	150 (43.5 dB $\mu\text{V/m}$)	3	
216 – 960	200 (46 dB $\mu\text{V/m}$)	3	

Result:

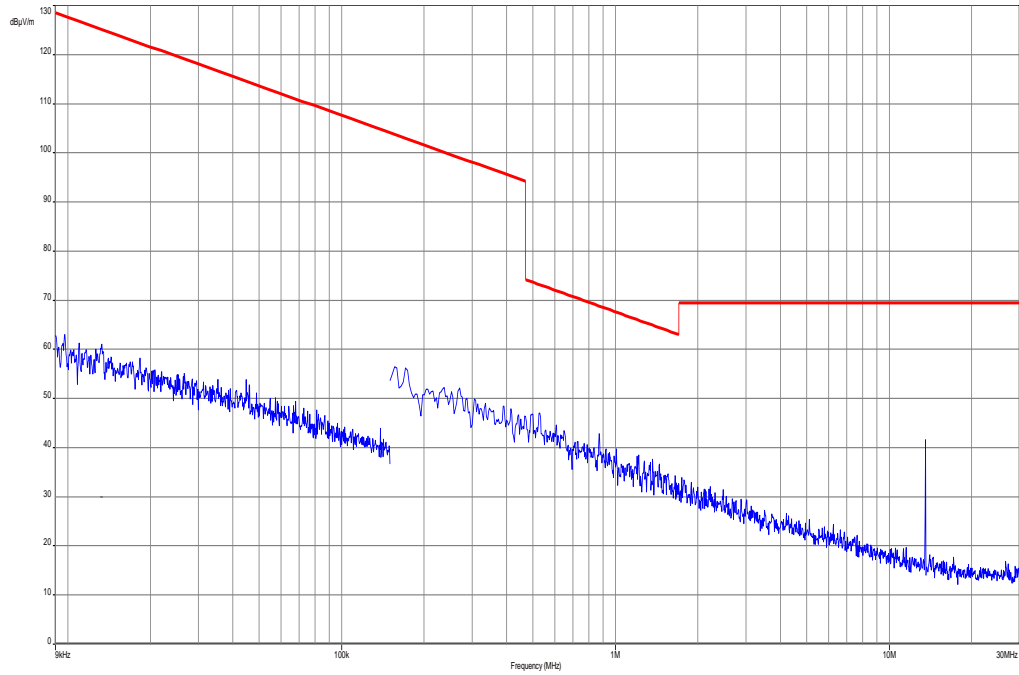
EMISSION LIMITATIONS				
f [MHz]	Detector	Limit max. allowed [dB $\mu\text{V/m}$]	Amplitude of emission [dB $\mu\text{V/m}$]	Results
No spurious emissions detected. Please take a look at the table below the 1 GHz plot.				

Result: passed

Plots of the measurements

Plot 1: 9 kHz – 30 MHz; Part 15.209 Magnetics, Measurement distance 3m

Transmit frequency 13.56 MHz



Plot 2: 30 MHz – 1000 MHz

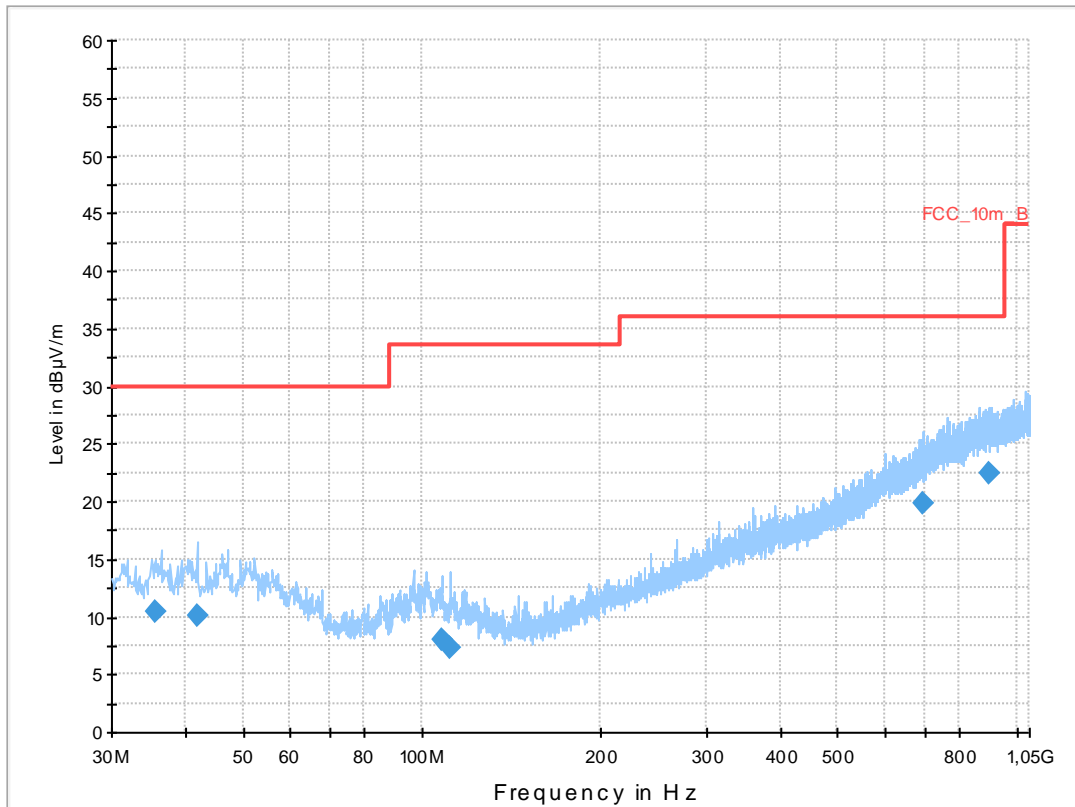
Common Information

EUT: RGF111LW
 Serial Number: imei: 004402242479065
 Test Description: FCC part 15 class B
 Operating Conditions: NFC tx testmode
 Operator Name: Wolsdorfer
 Comment: battery powered

Scan Setup: STAN_Fin [EMI radiated]

Hardware Setup: Electric Field (NOS)
 Receiver: [ESCI 3]
 Level Unit: dBµV/m

Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
35.520000	10.5	1000.0	120.000	170.0	H	316.0	13.1	19.5	30.0	
41.760000	10.0	1000.0	120.000	270.0	V	0.0	13.4	20.0	30.0	
107.760000	7.9	1000.0	120.000	132.0	V	104.0	11.2	25.6	33.5	
111.360000	7.4	1000.0	120.000	248.0	V	119.0	10.9	26.1	33.5	
694.200000	19.7	1000.0	120.000	270.0	H	298.0	22.3	16.3	36.0	
895.800000	22.5	1000.0	120.000	270.0	H	168.0	25.1	13.5	36.0	

10.5 Frequency tolerance

Not performed – tests according to manufacturer test plan.

10.6 AC line conducted

Not performed – tests according to manufacturer test plan.

11 Test equipment and ancillaries used for tests

Typically, the calibrations of the test apparatus are commissioned to and performed by an accredited calibration laboratory. The calibration intervals are determined in accordance with the DIN EN ISO/IEC 17025. In addition to the external calibrations, the laboratory executes comparison measurements with other calibrated test systems or effective verifications. Weekly chamber inspections and range calibrations are performed. Where possible, rf-generating and signalling equipment as well as measuring receivers and analyzers are connected to an external high-precision 10 MHz reference (GPS-based or rubidium frequency standard).

In order to simplify the identification of the equipment used at some special tests, some items of test equipment and ancillaries can be provided with an identifier or number in the equipment list below (Labor/Item).

No.	Lab / Item	Equipment	Type	Manufact.	Serial No.	INV. No Cetecom	Kind of Calibration	Last Calibration	Next Calibration
1	45	Switch-Unit	3488A	HP Meßtechnik	2719A14505	300000368	g		
2	50	DC power supply, 60Vdc, 50A, 1200 W	6032A	HP Meßtechnik	2920A04466	300000580	ne		
3	n. a.	software	SPS_PHE 1.4f	Spitzberger & Spieß	B5981; 5D1081;B597 9	300000210	ne		
4	n. a.	EMI Test Receiver	ESCI 3	R&S	100083	300003312	k	09.01.2013	09.01.2014
5	n. a.	Analyzer- Reference- System (Harmonics and Flicker)	ARS 16/1	SPS	A3509 07/0 0205	300003314	Ve	14.07.2011	14.01.2014
6	n. a.	Amplifier	JS42- 00502650- 28-5A	MITEQ	1084532	300003379	ev		
7	n. a.	Antenna Tower	Model 2175	ETS- LINDGREN	64762	300003745	izw		
8	n. a.	Positioning Controller	Model 2090	ETS- LINDGREN	64672	300003746	izw		
9	n. a.	Turntable Interface-Box	Model 105637	ETS- LINDGREN	44583	300003747	izw		
10	n. a.	TRILOG Broadband Test-Antenna 30 MHz - 3 GHz	VULB9163	Schwarzbe ck	295	300003787	k	12.04.2012	12.04.2014
11	n. a.	Spectrum- Analyzer	FSU26	R&S	200809	300003874	k	16.01.2013	16.01.2014
12	n. a.	Anechoic chamber	FAC 3/5m	MWB / TDK	87400/02	300000996	ev		
13	90	Active Loop Antenna 10 kHz to 30 MHz	6502	Kontron Psychotech	8905-2342	300000256	k	13.06.2013	13.06.2015
14	n. a.	Test Receiver	ESH2	R&S	871921/095	300002505	Ve	12.01.2012	12.01.2014
15	n. a.	Loop Antenna 9 KHz - 30 MHz	HFH2-Z2	R&S	872096/61	300001824	vKl!	09.03.2012	09.03.2015

Agenda: Kind of Calibration

k calibration / calibrated
 ne not required (k, ev, izw, zw not required)
 ev periodic self verification
 Ve long-term stability recognized
 vKl! Attention: extended calibration interval
 NK! Attention: not calibrated

EK limited calibration
 zw cyclical maintenance (external cyclical maintenance)
 izw internal cyclical maintenance
 g blocked for accredited testing
 *) next calibration ordered / currently in progress

12 Observations

No observations exceeding those reported with the single test cases have been made.

Annex A Document history

Version	Applied changes	Date of release
1.0	Initial release	2013-09-03

Annex B Further information**Glossary**

AVG	-	Average
DUT	-	Device under test
EMC	-	Electromagnetic Compatibility
EN	-	European Standard
EUT	-	Equipment under test
ETSI	-	European Telecommunications Standard Institute
FCC	-	Federal Communication Commission
FCC ID	-	Company Identifier at FCC
HW	-	Hardware
IC	-	Industry Canada
Inv. No.	-	Inventory number
N/A	-	Not applicable
PP	-	Positive peak
QP	-	Quasi peak
S/N	-	Serial number
SW	-	Software

