

EMI Test Report

Tested in accordance with
Federal Communications Commission (FCC)
Personal Communications Services
CFR 47, Part 15 Subpart C
&
Industry Canada (IC) RSS-210, RSS-GEN



A division of Research In Motion Limited

REPORT NO.: RTS-6036-1304-60

PRODUCT MODEL NO.: RFS121LW
TYPE NAME: BlackBerry® smartphone
FCC ID: L6ARFS120LW
IC: 2503A-RFS120LW

DATE: May 08, 2013

RTS is accredited
according to
EN ISO/IEC 17025 by:



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	EMI Test Report for the BlackBerry® smartphone Model RFS121LW	
Test Report No. RTS-6036-1304-60	Dates of Test March 06 to May 03, 2012	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW

Statement of Performance:

The BlackBerry® smartphone, model RFS121LW, part number CER-54731-001 Rev3-x09-01, and its accessories perform within the requirements of the test standards when configured and operated under RIM's operation instructions.

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 which were performed in accordance to the requirements of:

- o FCC CFR 47 Part 15, Subpart C, October, 2012
- o Industry Canada, RSS-210, Issue 8, December 2010, License-exempt Radio Apparatus
- o Industry Canada, RSS-GEN, Issue 3, December 2010, General Requirements and Information for the Certification of Radio Apparatus

B. Associated Documents

- 1) MultiSourceDeclaration_RFS121LW_b3901
- 2) MultiSourceDeclaration_RFS121LW_b4081
- 3) RFS121LW_HW_Declaration_CER-54731-001_Rev3-x09-01

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 March 06 to May 03, 2012

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The sample EUT included:

SAMPLE	MODEL	CER NUMBER	PIN	SOFTWARE
1	RFS121LW	CER-54731-001Rev1-906-00	2AB02A48	OS Version: 127.0.1.4081 Bundle 4081
2	RFS121LW	CER-54731-001Rev1-906-00	2AB02A58	OS Version: 127.0.1.4081 Bundle 4081
3	RFS121LW	CER-54731-001Rev1-906-00	2AB02A65	OS Version: 127.0.1.4081 Bundle 4081
4	RFS121LW	CER-54731-001Rev1-906-00	2AB02A5A	OS Version: 127.0.1.3901 Bundle 3901
5	RFS121LW	CER-54731-001Rev2-906-00	2AB04CFB	OS Version: 127.0.1.3901 Bundle 3901
6	RFS121LW	CER-54731-001Rev3-x09-01	2FFF9A73	OS Version: 127.0.1.4081 Bundle 4081
7	RFS121LW	CER-54731-001Rev3-x09-01	2FFF9A74	OS Version: 127.0.1.4081 Bundle 4081

AC Line Conducted Emissions testing was performed on sample 3 and 4

Radiated Emissions testing was performed on samples 1, 2, 3, 4, and 5

Conducted Emissions testing was performed on sample 7

Near Field Communications testing was performed on sample 5 and 7

Only the characteristics that may have been affected by the changes from RFS121LW Rev2 to Rev3 were re-tested.

For more details, refer to RFS121LW_HW_Declaration_ CER-54731-001_Rev3-x09-01

To view the differences between software bundles 127.0.1.3901 to 127.0.1.4081 for RFS121LW, see document MultiSourceDeclaration_RFS121LW_b3901 and MultiSourceDeclaration_RFS121LW_b4081

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BlackBerry® smartphone Accessories Tested

- 1) Fixed Blade Charger, part number HDW-47725-001, with an output voltage of 5.0 volts dc, 850 mA
- 2) Alt. Fixed Blade Charger, part number HDW-46445-001, with an output voltage 5.0 volts dc, 850mA
- 3) Folding Blade Charger, part number HDW 34724-001, with an output voltage 5 volts dc, 1.8A
- 4) Wired Headset, part number HDW-44306-003, with a lead length of 1.1 metres.
- 5) Alt. Wired Headset, part number HDW-44306-003, with a lead length of 1.1 metres.
- 6) Alt.2 Wired Headset, part number HDW-49299-001, with a lead length of 1.1 metres.
- 7) Alt.3 Wired Headset, part number HDW-55351-001, with a lead length of 1.1 metres
- 8) USB Data Cable, part number HDW-51800-001, 1.0 metres long.
- 9) Alt. USB Data Cable, part number HDW-51800-001, 1.0 metres long.

D. Support Equipment Used for the Testing of the EUT

N/A

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E. Test Results Chart

SPECIFICATION		TEST TYPE	Meets Requirements	TEST DATA
FCC CFR 47	IC			APPENDIX
Part 15.207	RSS-GEN, 7.2.4	Conducted AC Line Emission	Pass	1
Part 15.209 Part 15.247	RSS-210, A8.5 RSS-GEN, 7.2.2	BT/BLE Radiated Spurious Emissions	Pass	2
Part 15.209 Part 15.247	RSS-210, A8.5 RSS-GEN, 7.2.2	BT/BLE Radiated Band Edge Compliance	Pass	2
Part 15.209 Part 15.247	RSS-210, A8.5 RSS-GEN, 7.2.2	802.11b/g/n Radiated Spurious Emissions	Pass	2
Part 15.209 Part 15.247	RSS-210 RSS-GEN, 7.2.2	802.11b/g/n Radiated Band Edge Compliance	Pass	2
Part 15.247(a)	RSS-210 A8.1(a)	BT, 20 dB Bandwidth	Pass	3
Part 15.247(a)	RSS-210 A8.1(b)	BT, Carrier Frequency Separation	Pass	3
Part 15.247(a)	RSS-210 A8.1(d)	BT, Number of Hopping Frequencies	Pass	3
Part 15.247(a)	RSS-210 A8.1(d)	BT, Time of Occupancy (Dwell Time)	Pass	3
Part 15.247(b)	RSS-210 A8.4(4)	BT, Maximum Peak Conducted Output Power	Pass	3
Part 15.247(d)	RSS-210, A8.5	BT, Band-Edge Compliance of RF Conducted Emissions	Pass	3
Part 15.247(d)	RSS-210, A8.5	BT, Spurious RF Conducted Emissions	Pass	3
Part 15.247(a)	RSS-210, A8.2(a)	BLE, 6 dB Bandwidth	Pass	3
Part 15.247(b)	RSS-210, A8.4(4)	BLE, Maximum Conducted Output Power	Pass	3
Part 15.247(d)	RSS-210, A8.5	BLE, Band-Edge	Pass	3
Part 15.247(e)	RSS-210, A8.2(b)	BLE, Peak Power Spectral Density	Pass	3
Part 15.247(d)	RSS-210, A8.5	BLE, Spurious RF Conducted Emissions	Pass	3

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Test Results Chart cont'd

SPECIFICATION		TEST TYPE	Meets Requirements	TEST DATA
FCC CFR 47	IC			APPENDIX
Part 15.247(a)	RSS-210, A8.2(a)	802.11b/g/n, 6 dB Bandwidth	Pass	4
Part 15.247(b)	RSS-210, A8.4(4)	802.11b/g/n, Maximum Conducted Output Power	Pass	4
Part 15.247(b)	RSS-210, A8.5	802.11b/g/n, Band-Edge	Pass	4
Part 15.247(e)	RSS-210, A8.2(b)	802.11b/g/n, Peak Power Spectral Density	Pass	4
Part 15.247(d)	RSS-210, A8.5	802.11b/g/n, Spurious RF Conducted Emissions	Pass	4
Part 15.209 Part 15.225(a)	RSS-210, A2.6	Near Field Communications, Radiated Emissions	Pass	5
Part 15.225(e)	RSS-210, A2.6	Near Field Communications, Occupied Bandwidth	Pass	5
Part 15.225(e)	RSS-210, A2.6	Near Field Communications, Frequency Stability	Pass	5

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F. Summary of Results

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

The following test configurations were measured:

Test Configuration	Operating Mode(s)	Charger + Accessories
1	Bluetooth Tx + Audio Playing	Fixed Blade Charger + Alt.2 Wired Headset + 1.0m USB Cable
2	802.11b Tx + Video Playing	Alt. Fixed Blade Charger + Wired Headset + Alt.1.0m USB Cable
3	NFC Tx	Folding Blade Charger + Alt. Wired Headset
4	NFC Tx	Folding Blade Charger + Alt.3 Wired Headset

The sample EUT's conducted emissions were compared with respect to the FCC CFR 47 Part 15, Subpart C and IC RSS-210 limits. The sample EUT had a worst case test margin of 9.11 dB below the QP limit at 0.411 MHz in Test Configuration 4 and 6.12 dB below the AV limit at 0.420 MHz with the Folding Blade Charger in Test Configuration 3

See APPENDIX 1 for the test data.

Measurement Uncertainty ± 3.2 dB

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2) BLUETOOTH, BLUETOOTH LOW ENERGY AND 802.11b/g/n RADIATED EMISSIONS

a) Radiated Spurious and Harmonic Emissions

The EUT was placed on a nonconductive styrofoam table, 80 cm high that was positioned on a remotely 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 25.0 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 semi-anechoic chamber (SAC) with floor absorbers above 1 GHz. The SAC's FCC registration number is **778487** and the Industry Canada (IC) file number is **2503B-1**. The SAC with floor absorber's FCC registration number is **959115** and the IC file number is **2503C-1**.

The EUT was configured and operated to produce the maximum radiated emissions while still keeping within RIM's specifications.

The BlackBerry® smartphone was measured in standalone configuration with Bluetooth transmitting in single frequency mode at low channel (0), middle channel (39) and high channel (78) for packet type "DH5", "2-DH5" and "3-DH5". The system's radiated emission levels were compared with respect to the FCC CFR 47 Part 15, Subpart C, 15.247 and RSS-210.

The BlackBerry® smartphone was measured in standalone configuration with Bluetooth Low Energy transmitting in single frequency mode at low channel (0), middle channel (20) and high channel (39). The system's radiated emission levels were compared with respect to the FCC CFR 47 Part 15, Subpart C, 15.247 and RSS-210.

The BlackBerry® smartphone was measured in standalone configuration transmitting on channels 1, 6 & 11 at 1 Mbps for 802.11b mode, at 6 Mbps for 802.11g mode, and at MCS 0 for 802.11n mode. The system's radiated emission levels were compared with respect to the FCC CFR 47 Part 15 Subpart C, 15.247 and RSS-210.

The Bluetooth harmonics were investigated up to the 10th harmonic. The sample EUT emissions were in the noise floor (NF).

The Bluetooth Low Energy harmonics were investigated up to the 10th harmonic. The worst case test margin was 20.68 dB below the accepted limit at 1891.46MHz

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The 802.11b/g/n harmonics were investigated up to the 10th harmonic. The worst case test margin was 5.41 dB below the accepted limit at 2396.54MHz.
See APPENDIX 2 for the test data.

b) Band-Edge Compliance of RF Radiated Emissions

The BlackBerry® smartphone met the requirements for band-edge compliance of RF radiated emissions for Bluetooth, Bluetooth Low Energy and 802.11b/g/n as per the requirements of 15.247, 15.209, and RSS-210/RSS-GEN.

Measurement Uncertainty ±4.5 dB

See APPENDIX 2 for the test data

3) i) BLUETOOTH RF CONDUCTED EMISSIONS

The Bluetooth conducted RF emissions from the BlackBerry® smartphone were measured using the methods outlined in FCC CFR 47 Part 15, Subpart C.

a) 20 dB Bandwidth

The BlackBerry® smartphone met the requirements of the 20 dB bandwidth as per 47 CFR 15.247(a) and RSS-210. Low channel (0), middle channel (39) and high channel (78) were measured. The result includes both normal data rate and EDR. The worst case 20 dB Bandwidth was 0.922 MHz for channels 39 and 78 in normal data rate mode and 1.332MHz for channel 39 in EDR mode.
See APPENDIX 3 for the test data.

b) Carrier Frequency Separation

The BlackBerry® smartphone met the requirements of the carrier frequency separation as per 47 CFR 15.247(a) and RSS-210. Channel 38 to 39 was measured. The result includes both normal data rate and EDR.
See APPENDIX 3 for the test data.

c) Number of Hopping Frequencies

The BlackBerry® smartphone met the requirements of the number of hopping frequencies as per 47 CFR 15.247(a) and RSS-210. The number of hopping channels measured was 79.
See APPENDIX 3 for the test data.

d) Time of Occupancy (Dwell Time)

The EUT met the requirements of the dwell time as per 47 CFR 15.247(a) and RSS-210. Low channel (0), middle channel (39) and high channel (78) were measured in DH1, DH3 and DH5 modes. Bluetooth was operating in frequency hopping (Euro/US) mode during the measurements.
See APPENDIX 3 for the test data.

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e) Maximum Peak Conducted Output Power

The BlackBerry® smartphone met the requirements of the maximum peak conducted output power as per 47 CFR 15.247(b) and RSS-210. Low channel (0), middle channel (39) and high channel (78) were measured. The result includes both normal data rate and EDR. The worst case Conducted Output Power level was 10.00 dBm (0.010 W) for Channel 39 in normal data rate mode and 9.00 dBm (0.00794 W) for channel 39 in EDR mode. See APPENDIX 3 for the test data.

f) Band-Edge Compliance of RF Conducted Emissions

The BlackBerry® smartphone met the requirements of the band-edge compliance of RF conducted emissions as per 47 CFR 15.247(d) and RSS-210. Channels 0 and 78 were measured in frequency hopping (Euro/US) mode and single frequency mode. The result includes both normal data rate and EDR. See APPENDIX 3 for the test data.

g) Spurious RF Conducted Emissions

The BlackBerry® smartphone met the requirements of the spurious RF conducted emissions as per 47 CFR 15.247(d) and RSS-210. The frequency range measured was 10 MHz to 26 GHz. Low channel (0), middle channel (39) and high channel (78) were measured in single frequency mode and frequency hopping (Euro/US) mode. The result includes both normal data rate and EDR. See APPENDIX 3 for the test data.

4) ii) BLUETOOTH LOW ENERGY RF CONDUCTED EMISSIONS

The Bluetooth Low Energy conducted RF emissions from the BlackBerry® smartphone were measured using the methods outlined in FCC CFR 47 Part 15, Subpart C.

a) 6dB Bandwidth

The EUT met the requirements of the 6 dB bandwidth as per 47 CFR 15.247(a) and RSS-210. Low channel (0), middle channel (20) and high channel (39) were measured. The worst case 6 dB Bandwidth was 0.705 MHz for channels 0 and 39. See APPENDIX 3 for the test data.

b) Maximum Conducted Output Power

The EUT met the requirements of the maximum conducted output power as per 47 CFR 15.247(b) and RSS-210. Low channel (0), middle channel (20) and high channel (39) were measured. The worst case Conducted Output Power level was 3.94 dBm (0.00248W) for channel 20.

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See APPENDIX 3 for the test data

c) Band-Edge Compliance of RF Conducted Emissions

The EUT met the requirements of band-edge compliance of RF conducted emissions as per 47 CFR 15.247(d) and RSS-210. Low channel (0) and high channel (39) were measured.

See APPENDIX 3 for the test data.

d) Peak Power Spectral Density

The EUT met the requirements of peak power spectral density as per 47 CFR 15.247(e) and RSS-210. Low channel (0), middle channel (20) and high channel (39) were measured.

See APPENDIX 3 for the test data.

e) Spurious RF Conducted Emissions

The EUT met the requirements of the spurious RF conducted emissions as per 47 CFR 15.247(d) and RSS-210. The frequency range measured was 30 MHz to 26 GHz. Low channel (0), middle channel (20) and high channel (39) were measured.

See APPENDIX 3 for the test data.

4) 802.11b/g/n RF CONDUCTED EMISSIONS

The 802.11b/g/n conducted RF emissions from the BlackBerry® smartphone were measured using the methods outlined in FCC CFR 47 Part 15, Subpart C.

a) 6dB Bandwidth

The EUT met the requirements of the 6 dB bandwidth as per 47 CFR 15.247(a) and RSS-210. Low channel (1), middle channel (6) and high channel (11) were measured. The worst case 6 dB Bandwidth was 8.39 MHz for channels 1 and 6 in 802.11b mode, 16.35 MHz for channels 1 and 6 in 802.11g mode, and 17.44 MHz for channels 6 and 11 in 802.11n mode.

See APPENDIX 5 for the test data.

b) Maximum Conducted Output Power

The EUT met the requirements of the maximum conducted output power as per 47 CFR 15.247(b) and RSS-210. Low channel (1), middle channel (6) and high channel (11) were measured. The worst case Conducted Output Power level was 19.19 dBm (0.083W) for channel 11 in 802.11b mode, 18.65 dBm (0.073W) for channel 11 in 802.11g mode, and 18.67 dBm (0.074W) for channel 11 in 802.11n mode.

See APPENDIX 5 for the test data

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c) Band-Edge Compliance of RF Conducted Emissions

The EUT met the requirements of band-edge compliance of RF conducted emissions as per 47 CFR 15.247(b) and RSS-210. Low channel (1) and high channel (11) were measured.

See APPENDIX 5 for the test data

d) Peak Power Spectral Density

The EUT met the requirements of peak power spectral density as per 47 CFR 15.247(e) and RSS-210. Low channel (1), middle channel (6) and high channel (11) were measured.

See APPENDIX 5 for the test data.

e) Spurious RF Conducted Emissions

The EUT met the requirements of the spurious RF conducted emissions as per 47 CFR 15.247(d) and RSS-210. The frequency range measured was 30 MHz to 26 GHz. Low channel (1), middle channel (6) and high channel (11) were measured.

See APPENDIX 5 for the test data.

7) Near Field Communications (NFC)

The Near Field Communications emissions from the BlackBerry® smartphone were measured using the methods outlined in FCC CFR 47 Part 15, Subpart C.

a) Radiated Emissions

The BlackBerry® smartphone was measured in standalone configuration transmitting at 13.56 MHz. The system's radiated emission levels were compared with respect to the FCC CFR 47 Part 15 Subpart C, 15.209, 15.225(a) and RSS-210/RSS-GEN.

The NFC emissions were investigated from 9 kHz to 1 GHz. The sample EUT has a field strength measurement of 50.46 dBuV/m.

See APPENDIX 5 for the test data.

b) Occupied Bandwidth

The EUT met the requirements of the Occupied bandwidth as per 47 CFR 15 C 15.225(e) and RSS-210. The EUT was measured in test mode with modulation on and transmitting at 13.56 MHz.

See APPENDIX 5 for the test data.

c) Frequency Stability

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The EUT met the requirements of the Frequency Stability as per 47 CFR 15.225(e) and RSS-210. The EUT was measured in test mode with modulation on and transmitting at 13.56 MHz.
See APPENDIX 5 for the test data.

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>
EMI Test Receiver	Rohde & Schwarz	ESIB 40	100255	13-11-30	Conducted/Radiated Emissions
EMI Test Receiver	Rohde & Schwarz	ESU 40	100162	13-11-30	Conducted/Radiated Emissions
Hybrid Log Antenna	EMC Automation	HLP-3003C	017301	13-08-23	Radiated Emissions
Horn Antenna	CMT	3116	R52734-001	14-08-02	Radiated Emissions
Horn Antenna	ETS-Lindgren	3117	2538	13-08-04	Radiated Emissions
Preamplifier	Rohde & Schwarz	TS-ANA4-SP	001	13-09-01	Radiated Emissions
Preamplifier	Sonoma	310N/11909A	185831	13-10-10	Radiated Emissions
Preamplifier	Rohde & Schwarz	TS-ANA-SP	001	13-09-01	Radiated Emissions
L.I.S.N.	Rohde & Schwarz	ENV216	100060	13-10-25	Conducted Emissions
Environment Monitor	Omega	iTHX-SD	0380561	13-10-30	Radiated Emissions
EMC Analyzer	Agilent	E7405A	US40240226	14-01-15	Radiated Emissions
Spectrum Analyzer	HP	8563E	3745A08113	13-10-05	RF Conducted Emissions
DC Power Supply	HP	6632B	US37472178	13-09-25	RF Conducted Emissions
Environment Monitor	Omega	iTHX-SD	0340060	13-10-30	RF Conducted Emissions
Environmental Chamber	Test Equity	107	0900246	N/R	Frequency Stability
Bluetooth Tester	Rohde & Schwarz	CBT	119549	13-12-04	RF Conducted Emissions
Bluetooth Tester	Rohde & Schwarz	CBT35	100368	13-12-04	Radiated Emissions
Bluetooth Tester	Rohde & Schwarz	CBT35	100370	13-12-04	Radiated Emissions
Power Meter	Agilent	N1911A	MY45100951	13-08-16	RF Conducted / Frequency Stability
Power Sensor	Agilent	N1921A	MY45241383	13-09-11	RF Conducted / Frequency Stability
Digital Multimeter	Hewlett Packard	34401A	US36042324	13-11-13	Conducted/Radiated Emissions
Environment Monitor	Omega	iTHX-SD	0380567	13-10-30	Radiated Emissions

APPENDIX 1 – AC CONDUCTED EMISSIONS TEST DATA/PLOTS

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW APPENDIX 1	
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AC Conducted Emission Test Results

The following tests were performed by Mahmood Ahmed

Test Configuration 1

The BlackBerry® smartphone was tested on March 08, 2013

The environmental test conditions were: Temperature: 24.8 °C
Relative Humidity: 21.9 %

Frequency (MHz)	Line	Reading (QP) (dBμV)	Correction Factor (dB)	Corrected Reading (QP) (dB)	Limit (QP) (dBμV)	Limit (AV) (dBμV)	Margin (QP) Limits (dB)
0.182	L1	23.44	10.99	34.43	57.40	47.40	-22.97
0.209	N	24.73	10.82	35.55	56.00	46.00	-20.45
0.420	L1	27.81	9.98	37.80	56.00	46.00	-18.21
1.370	L1	31.59	9.80	41.39	57.30	47.30	-15.91
1.379	N	27.66	9.81	37.47	56.00	46.00	-18.53
2.738	N	23.04	9.87	32.91	56.00	46.00	-23.09

All other emission levels were at least 25 dB below the limit.

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.

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW APPENDIX 1	
Test Report No. RTS-6036-1304-60	Dates of Test March 06 to May 03, 2012	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW

AC Conducted Emissions Test Graphs

Test Configuration 1

Figure 1-1: L1 lines

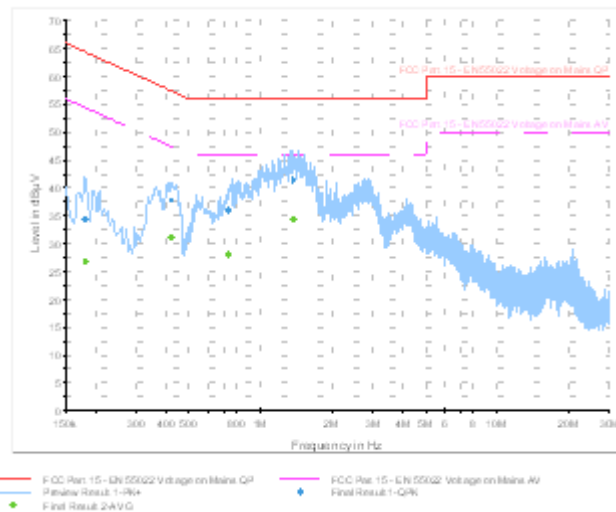
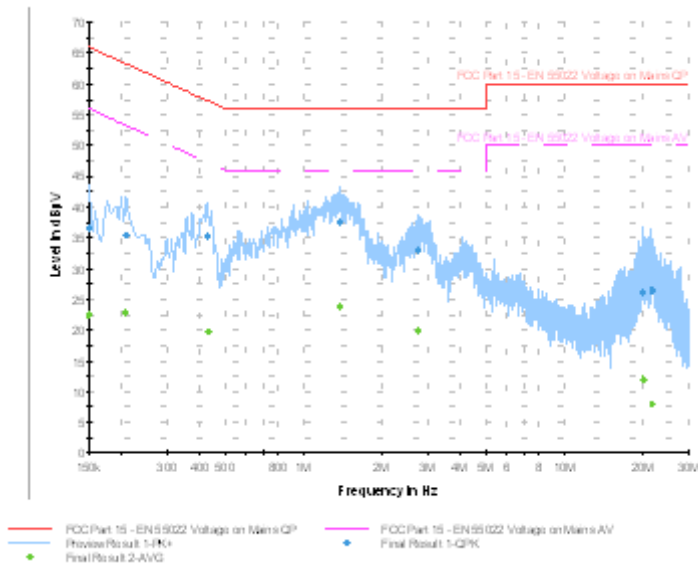


Figure 1-2: N Lines



	EMI Test Report for the BlackBerry® smartphone Model RFS121LW APPENDIX 1	
Test Report No. RTS-6036-1304-60	Dates of Test March 06 to May 03, 2012	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW

AC Conducted Emission Test Results cont'd

Test Configuration 2

The BlackBerry® smartphone was tested on March 08, 2013

The environmental test conditions were: Temperature: 25.1°C
Relative Humidity: 23 %

Frequency (MHz)	Line	Reading (QP) (dBμV)	Correction Factor (dB)	Corrected Reading (QP) (dB)	Limit (QP) (dBμV)	Limit (AV) (dBμV)	Margin (QP) Limits (dB)
0.168	L1	30.85	11.08	41.93	65.10	55.10	-23.17
0.726	L1	25.80	9.83	35.63	56.00	46.00	-20.38
0.794	N	25.17	9.82	35.00	56.00	46.00	-21.01
0.938	L1	30.24	9.81	40.05	56.00	46.00	-15.96
0.951	N	25.42	9.81	35.23	56.00	46.00	-20.77
1.104	N	25.23	9.81	35.04	56.00	46.00	-20.96
1.190	N	25.89	9.80	35.69	56.00	46.00	-20.31
1.194	L1	30.91	9.80	40.71	56.00	46.00	-15.29
1.320	L1	30.76	9.80	40.56	56.00	46.00	-15.44
1.383	N	24.77	9.81	34.58	56.00	46.00	-21.42
2.099	N	28.27	9.83	38.10	56.00	46.00	-17.90
2.112	L1	33.17	9.83	43.00	56.00	46.00	-13.00
2.148	N	28.12	9.83	37.95	56.00	46.00	-18.05
2.211	N	27.47	9.84	37.30	56.00	46.00	-18.70
2.270	L1	33.70	9.84	43.53	56.00	46.00	-12.47
3.764	L1	25.29	9.90	35.18	56.00	46.00	-20.82

All other emission levels were at least 25 dB below the limit.

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.

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW APPENDIX 1	
Test Report No. RTS-6036-1304-60	Dates of Test March 06 to May 03, 2012	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW

AC Conducted Emissions Test Graphs

Test Configuration 2

Figure 1-3: L1 lines

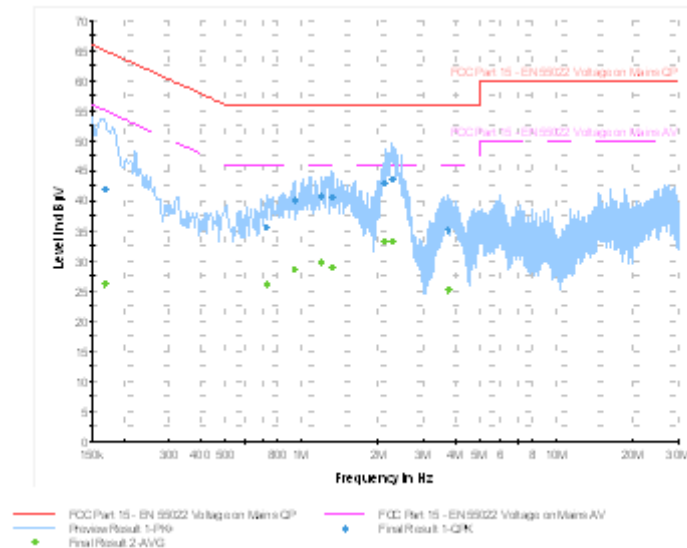
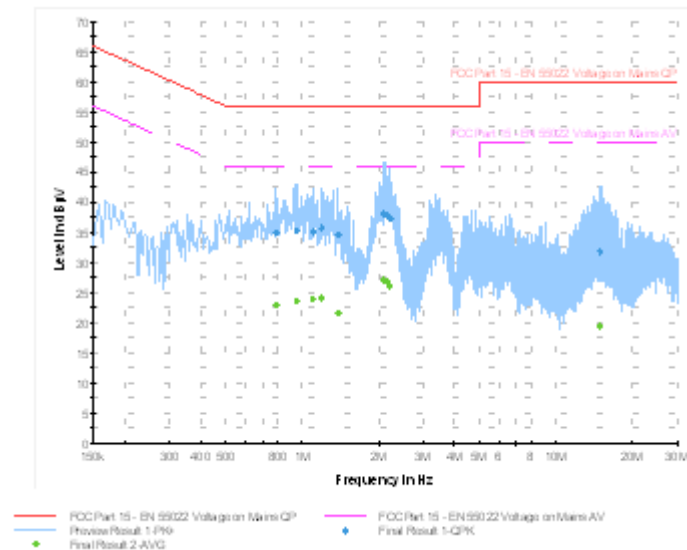


Figure 1-4: N Lines



	EMI Test Report for the BlackBerry® smartphone Model RFS121LW APPENDIX 1	
Test Report No. RTS-6036-1304-60	Dates of Test March 06 to May 03, 2012	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW

AC Conducted Emissions Test Results cont'd

Test Configuration 3

The BlackBerry® smartphone was tested on March 08, 2013

The environmental test conditions were: Temperature: 25.1°C
Relative Humidity: 23 %

Frequency (MHz)	Line	Reading (QP) (dBμV)	Correction Factor (dB)	Corrected Reading (QP) (dB)	Limit (QP) (dBμV)	Margin (QP) Limits (dB)
0.186	L1	37.01	10.95	47.97	64.20	-16.23
0.420	L1	36.59	9.98	46.57	57.40	-10.83
0.425	N	36.89	9.98	46.88	57.40	-10.53
0.434	L1	35.51	9.96	45.47	57.20	-11.73
0.515	N	36.66	9.91	46.57	56.00	-9.43
0.614	L1	31.67	9.85	41.53	56.00	-14.47
0.969	N	34.13	9.81	43.94	56.00	-12.06
0.974	L1	32.82	9.80	42.62	56.00	-13.38
1.064	N	33.45	9.81	43.26	56.00	-12.74
1.199	L1	33.43	9.80	43.23	56.00	-12.77
2.108	N	32.79	9.83	42.62	56.00	-13.38
2.117	L1	33.11	9.83	42.94	56.00	-13.06
2.351	N	34.17	9.84	44.02	56.00	-11.98
2.423	L1	33.35	9.85	43.20	56.00	-12.80
3.539	L1	31.08	9.89	40.97	56.00	-15.03
3.656	N	31.91	9.90	41.80	56.00	-14.20
3.732	L1	30.36	9.89	40.25	56.00	-15.75
4.695	N	31.18	9.91	41.09	56.00	-14.91

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW APPENDIX 1	
Test Report No. RTS-6036-1304-60	Dates of Test March 06 to May 03, 2012	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW

AC Conducted Emissions Test Results cont'd

Test Configuration 3 cont'd

Frequency (MHz)	Line	Reading (QP) (dBμV)	Correction Factor (dB)	Corrected Reading (QP) (dB)	Limit (AV) (dBμV)	Margin (AV) Limits (dB)
0.186	L1	27.21	10.95	38.16	44.20	-16.04
0.420	L1	31.30	9.98	41.28	37.40	-6.12
0.425	N	31.08	9.98	41.07	37.40	-6.34
0.434	L1	26.93	9.96	36.90	37.20	-10.31
0.515	N	29.15	9.91	39.06	36.00	-6.95
0.614	L1	23.88	9.85	33.73	36.00	-12.27
0.969	N	20.32	9.81	30.13	36.00	-15.87
0.974	L1	19.02	9.80	28.83	36.00	-17.17
1.064	N	20.71	9.81	30.52	36.00	-15.48
1.199	L1	26.99	9.80	36.79	36.00	-9.21
2.108	N	26.02	9.83	35.85	36.00	-10.15
2.117	L1	26.56	9.83	36.39	36.00	-9.61
2.351	N	28.43	9.84	38.27	36.00	-7.73
2.423	L1	27.28	9.85	37.13	36.00	-8.88
3.539	L1	25.49	9.89	35.38	36.00	-10.62
3.656	N	26.20	9.90	36.10	36.00	-9.90
3.732	L1	24.77	9.89	34.67	36.00	-11.34
4.695	N	25.42	9.91	35.33	36.00	-10.67

All other emission levels were at least 25 dB below the limit.

Measurements were done with the quasi-peak and average detectors

See figure 1-5 for the measurement plot of the L1 and N lines of AC power line conducted emissions.

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW APPENDIX 1	
Test Report No. RTS-6036-1304-60	Dates of Test March 06 to May 03, 2012	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW

AC Conducted Emissions Test Graphs

Test Configuration 3

Figure 1-5: L1 Lines

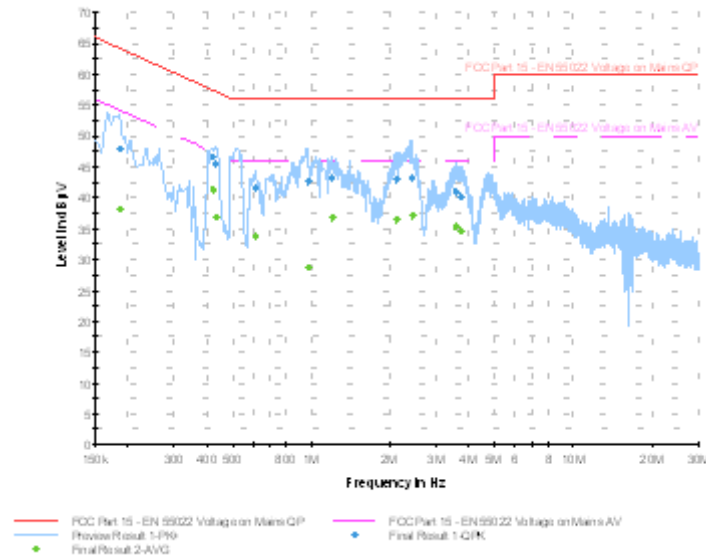
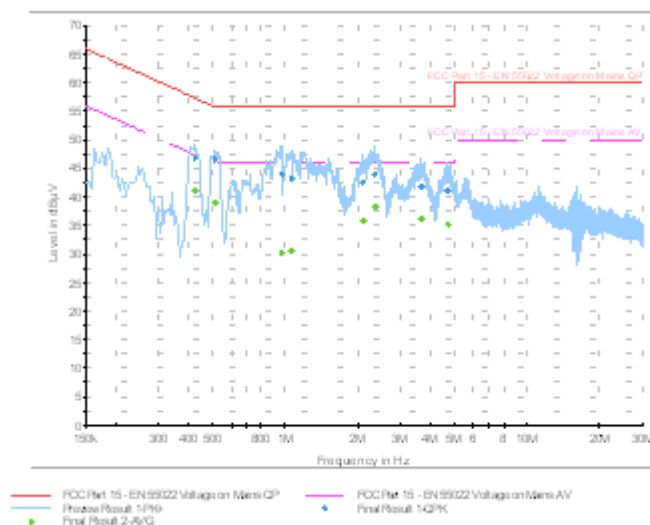


Figure 1-6: N Lines



	EMI Test Report for the BlackBerry® smartphone Model RFS121LW APPENDIX 1	
Test Report No. RTS-6036-1304-60	Dates of Test March 06 to May 03, 2012	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW

AC Conducted Emission Test Results cont'd

Test Configuration 4

The BlackBerry® smartphone was tested on April 25, 2013

The environmental test conditions were: Temperature: 26.8 °C
Relative Humidity: 34.2 %

Frequency (MHz)	Line	Reading (QP) (dBμV)	Correction Factor (dB)	Corrected Reading (QP) (dB)	Limit (QP) (dBμV)	Margin (QP) Limits (dB)
0.173	L1	37.25	11.05	48.30	64.80	-16.50
0.177	N	33.58	11.05	44.63	57.60	-12.97
0.411	L1	36.28	9.99	46.28	56.00	-9.72
0.411	N	36.88	10.01	46.89	56.00	-9.11
0.510	L1	36.24	9.90	46.14	56.00	-9.86
0.519	N	36.56	9.91	46.46	56.00	-9.54
0.960	N	34.69	9.81	44.51	56.00	-11.49
0.965	L1	33.59	9.81	43.40	56.00	-12.61
1.064	L1	32.27	9.80	42.07	56.00	-13.93
1.185	N	34.86	9.80	44.67	60.00	-15.33
1.397	N	32.41	9.81	42.22	64.60	-22.39
2.085	L1	33.39	9.83	43.21	57.60	-14.39
2.328	L1	33.99	9.84	43.83	56.00	-12.17
2.346	N	34.02	9.84	43.87	56.00	-12.13
3.692	N	31.56	9.90	41.45	56.00	-14.55
3.696	L1	30.70	9.89	40.60	56.00	-15.41
4.565	N	31.17	9.91	41.08	56.00	-14.92
4.754	L1	29.45	9.90	39.35	56.00	-16.65
16.040	N	24.81	10.12	34.93	56.00	-21.07

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW APPENDIX 1	
Test Report No. RTS-6036-1304-60	Dates of Test March 06 to May 03, 2012	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW

Frequency (MHz)	Line	Reading (AV) (dBμV)	Correction Factor (dB)	Corrected Reading (AV) (dB)	Limit (AV) (dBμV)	Margin (AV) Limits (dB)
0.173	L1	25.78	11.05	36.83	44.80	-17.97
0.177	N	26.81	11.05	37.86	37.60	-9.74
0.411	L1	28.43	9.99	38.42	36.00	-7.58
0.411	N	29.66	10.01	39.66	36.00	-6.34
0.510	L1	29.10	9.90	39.00	36.00	-7.00
0.519	N	27.25	9.91	37.16	36.00	-8.84
0.960	N	21.57	9.81	31.38	36.00	-14.62
0.965	L1	20.35	9.81	30.16	36.00	-15.84
1.064	L1	19.70	9.80	29.50	36.00	-16.50
1.185	N	28.07	9.80	37.87	40.00	-12.13
1.397	N	23.07	9.81	32.87	44.60	-21.73
2.085	L1	26.26	9.83	36.08	37.60	-11.52
2.328	L1	28.39	9.84	38.23	36.00	-7.77
2.346	N	28.33	9.84	38.17	36.00	-7.83
3.692	N	25.87	9.90	35.76	36.00	-10.24
3.696	L1	25.12	9.89	35.01	36.00	-10.99
4.565	N	25.43	9.91	35.34	36.00	-10.66
4.754	L1	23.88	9.90	33.79	36.00	-12.22
16.040	N	17.59	10.12	27.71	36.00	-18.29

All other emission levels were at least 25 dB below the limit.
Measurements were done with the quasi-peak and the average detectors.
See figure 1-6 and figure 1-7 for the measurement plot of the L1 and N lines of AC power line conducted emissions.

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW APPENDIX 1	
Test Report No. RTS-6036-1304-60	Dates of Test March 06 to May 03, 2012	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW

AC Conducted Emissions Test Graphs

Test Configuration 4

Figure 1-7: L1 lines

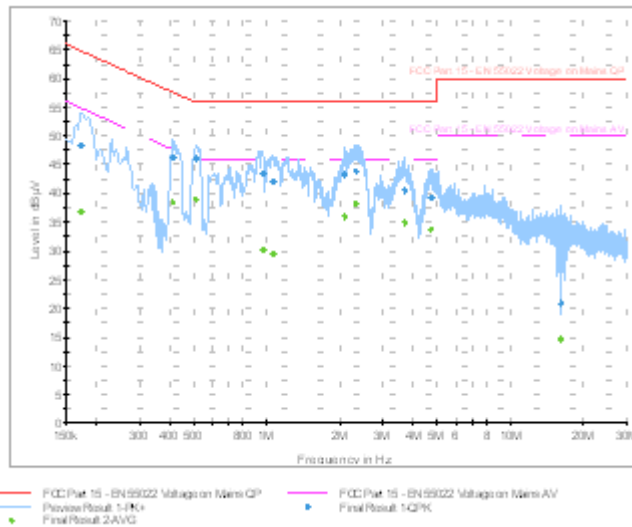
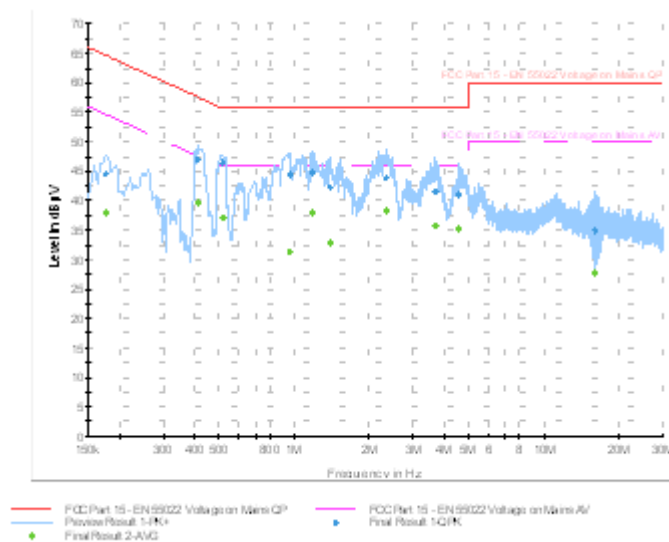


Figure 1-8: N Lines



**APPENDIX 2 – BLUETOOTH, BLUETOOTH LOW ENERGY AND 802.11b/g/n
RADIATED EMISSIONS TEST DATA**

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW APPENDIX 2	
Test Report No. RTS-6036-1304-60	Dates of Test March 06 to May 03, 2012	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW

Radiated Emissions Test Results
Bluetooth Band

Date of Test: March 07, 2013
Measurements were performed by Savtej Sandhu

The environmental test conditions were: Temperature: 25.9 °C
Relative Humidity: 18.1 %

The test distance was 3.0 metres with a EUT height of 0.8 metres, and sweep frequency of 30 MHz to 1 GHz.

The BlackBerry® smartphone in Bluetooth Tx mode was in horizontal position.

The frequency sweep measurements were performed in single frequency mode on channels 0, 39 and 78 using packet types “DH5”, “2-DH5” and “3-DH5”.

All emission levels were at least 25 dB below the limit.

Radiated Emissions Test Results cont'd
Bluetooth Band cont'd

Date of Test: March 11-15, 27, 2013
Measurements were performed by Mahmood Ahmed

The environmental test conditions were: Temperature: 24.8-25.8°C
Relative Humidity: 17.5-31.1 %

The test distance was 3.0 metres with a EUT height of 0.8 metres, and sweep frequency of 1GHz to 25GHz.

The BlackBerry® smartphone in Bluetooth Tx mode was in horizontal down position.

The frequency sweep measurements were performed in single frequency mode on channels 0, 39 and 78 using packet types “DH5”, “2-DH5” and “3-DH5”.

All emission levels were at least 25 dB below the limit.

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW APPENDIX 2		
Test Report No. RTS-6036-1304-60	Dates of Test March 06 to May 03, 2012	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW	

Band-Edge Compliance of RF Radiated Emissions Test Results
Bluetooth Band

Date of test: March 12, 2013

Measurements were performed by Feras Obeid

The environmental test conditions were: Temperature: 25.0 ° C
Relative Humidity: 17.8%

The BlackBerry® smartphone was in standalone, horizontal position and pattern type “Static PBRs” in “DH5”, “2-DH5” and “3-DH5” modulation during the measurements.

The test distance was 3.0 metres.

Channel	Freq. (MHz)	Rx Antenna Type	POL.	Detector	VBW	Corrected Reading (dBuV/m)	Delta Marker (dB)	Corrected Band edge (dBuV/m)	Limit (dBuV/m)	Diff. To Limit (dB)
Low Channel, Packet Type DH5										
0	2402	Horn	V	PK	1 MHz	96.27	51.49	44.78	74	-29.22
0	2402	Horn	H	PK	1 MHz	108.03	63.25	44.78	74	-29.22
0	2402	Horn	V	AVE.	10 Hz	90.29	51.49	38.8	54	-15.2
0	2402	Horn	H	AVE.	10 Hz	101.1	63.25	37.85	54	-16.15
High Channel, Packet Type DH5										
78	2480	Horn	V	PK	1 MHz	99.04	53.87	45.17	74	-28.83
78	2480	Horn	H	PK	1 MHz	108.79	63.81	44.98	74	-29.02
78	2480	Horn	V	AVE.	10 Hz	92.04	53.87	38.17	54	-15.83
78	2480	Horn	H	AVE.	10 Hz	101.74	63.81	37.93	54	-16.07
Low Channel, Packet Type 2-DH5										
0	2402	Horn	V	PK	1 MHz	95.41	50.64	44.77	74	-29.23
0	2402	Horn	H	PK	1 MHz	107.22	62.48	44.74	74	-29.26
0	2402	Horn	V	AVE.	10 Hz	81.59	50.64	30.95	54	-23.05
0	2402	Horn	H	AVE.	10 Hz	92.14	62.48	29.66	54	-24.34
High Channel, Packet Type 2-DH5										
78	2480	Horn	V	PK	1 MHz	97.93	52.68	45.25	74	-28.75
78	2480	Horn	H	PK	1 MHz	107.65	61.21	46.44	74	-27.56
78	2480	Horn	V	AVE.	10 Hz	82.83	52.68	30.15	54	-23.85
78	2480	Horn	H	AVE.	10 Hz	92.45	61.21	31.24	54	-22.76

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW APPENDIX 2	
Test Report No. RTS-6036-1304-60	Dates of Test March 06 to May 03, 2012	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW

Band-Edge Compliance of RF Radiated Emissions Test Results cont'd
Bluetooth Band

Channel	Freq. (MHz)	Rx Antenna		Detector	VBW	Corrected Reading (dBuV/m)	Delta Marker (dB)	Corrected Band edge (dBuV/m)	Limit (dBuV/m)	Diff. To Limit (dB)
		Type	POL.							
Low Channel, Packet Type 3-DH5										
0	2402	Horn	V	PK	1 MHz	95.53	50.94	44.59	74	-29.41
0	2402	Horn	H	PK	1 MHz	107.31	61.97	45.34	74	-28.66
0	2402	Horn	V	AVE.	10 Hz	87.04	50.94	36.1	54	-17.9
0	2402	Horn	H	AVE.	10 Hz	97.45	61.97	35.48	54	-18.52
High Channel, Packet Type 3-DH5										
78	2480	Horn	V	PK	1 MHz	98.19	52.91	45.28	74	-28.72
78	2480	Horn	H	PK	1 MHz	107.82	60.14	47.68	74	-26.32
78	2480	Horn	V	AVE.	10 Hz	88.24	52.91	35.33	54	-18.67
78	2480	Horn	H	AVE.	10 Hz	97.87	60.14	37.73	54	-16.27

See figures 2-1 to 2-12 for the plots of the Bluetooth band-edge compliance.

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW APPENDIX 2	
Test Report No. RTS-6036-1304-60	Dates of Test March 06 to May 03, 2012	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW

Bluetooth Band-Edge Compliance of RF Radiated Emissions cont'd

Figure 2-1: Band-Edge Compliance of RF Rad. Emissions.
Bluetooth, Single freq., Static PBRs,
DH5, Channel 0, Pol: V, Detector: PK

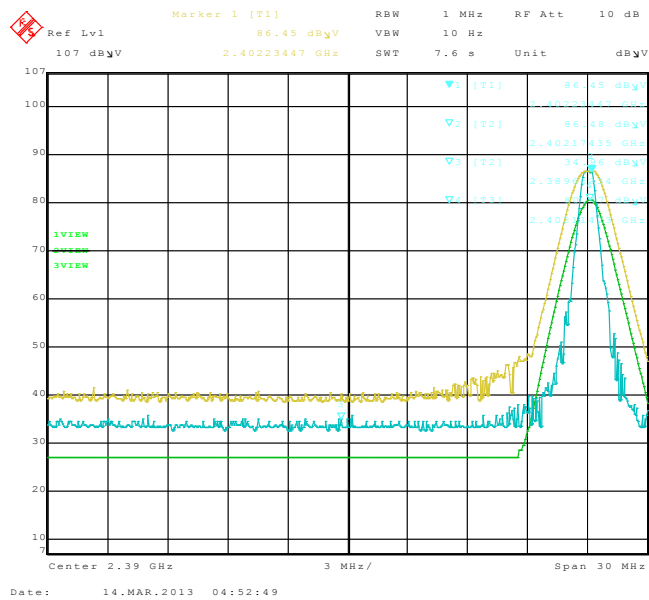


Figure 2-2: Band-Edge Compliance of RF Rad. Emissions.
Bluetooth, Single freq., Static PBRs,
DH5, Channel 0, Pol: H, Detector: PK

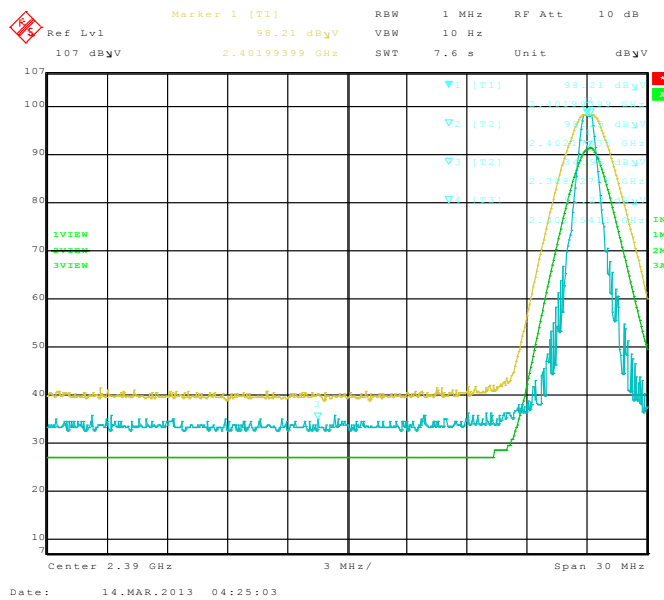


Figure 2-3: Band-Edge Compliance of RF Rad. Emissions.
Bluetooth, Single freq., Static PBRs,
DH5, Channel 78, Pol: V, Detector: PK

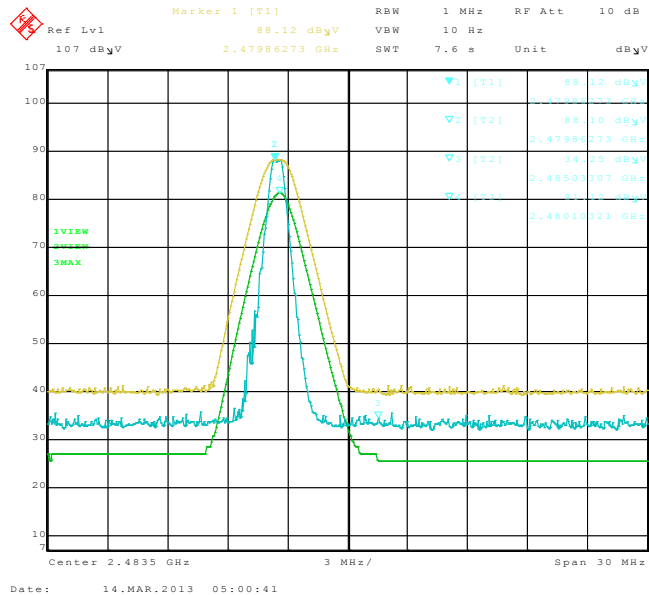
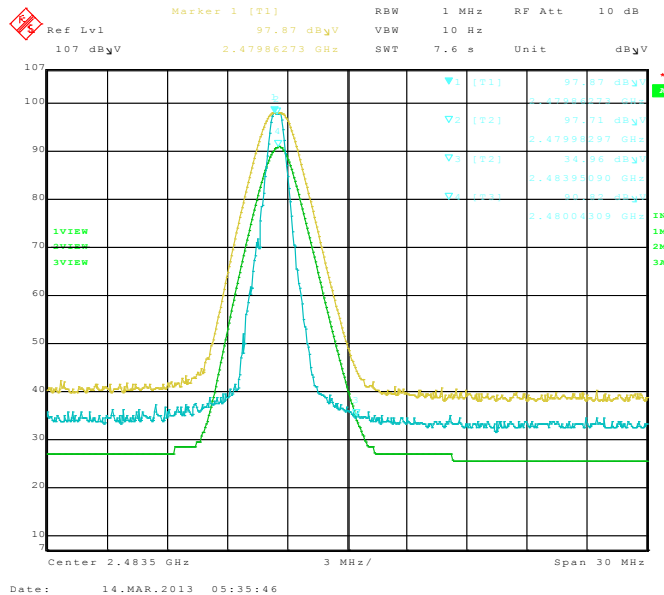


Figure 2-4: Band-Edge Compliance of RF Rad. Emissions.
Bluetooth, Single freq., Static PBRs,
DH5, Channel 78, Pol: H, Detector: PK



	EMI Test Report for the BlackBerry® smartphone Model RFS121LW APPENDIX 2	
Test Report No. RTS-6036-1304-60	Dates of Test March 06 to May 03, 2012	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW

Bluetooth Band-Edge Compliance of RF Radiated Emissions cont'd

Figure 2-5: Band-Edge Compliance of RF Rad. Emissions.
Bluetooth, Single freq., Static PBRs,
2-DH5, Channel 0, Pol: V, Detector: PK

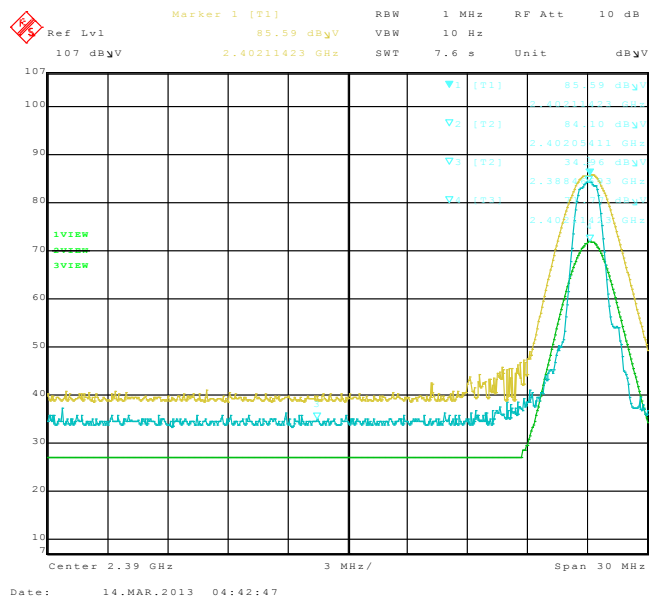


Figure 2-6: Band-Edge Compliance of RF Rad. Emissions.
Bluetooth, Single freq., Static PBRs,
2-DH5, Channel 0, Pol: H, Detector: PK

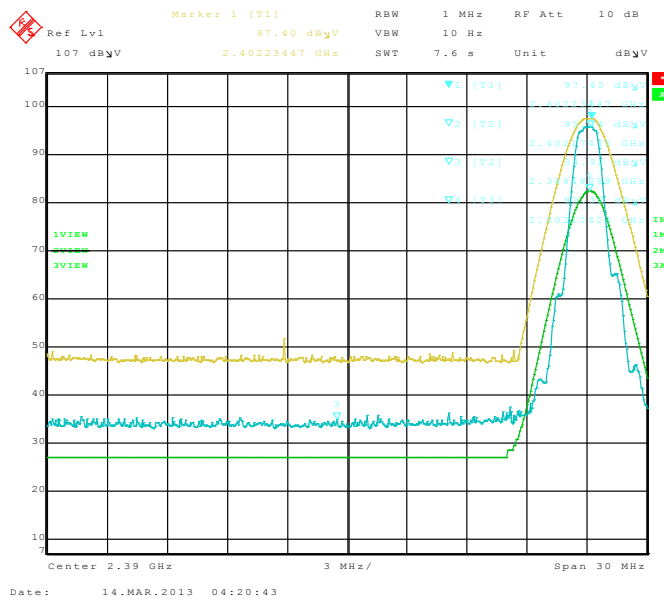


Figure 2-7: Band-Edge Compliance of RF Rad. Emissions.
Bluetooth, Single freq., Static PBRs,
2-DH5, Channel 78, Pol: V, Detector: PK

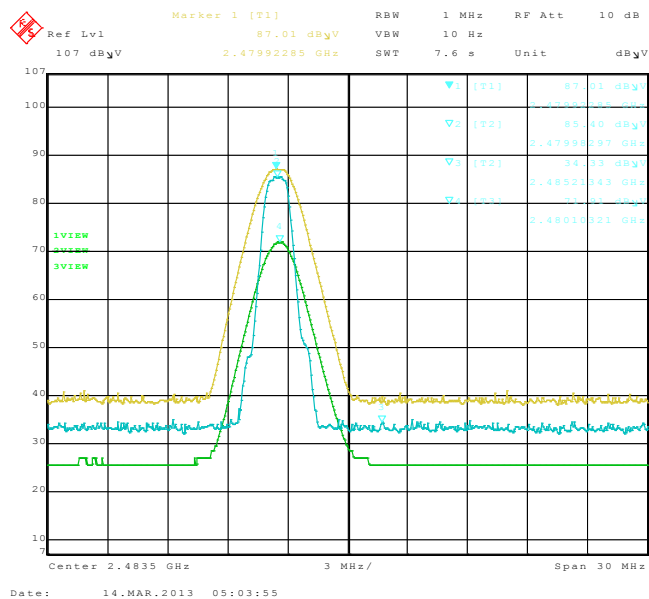
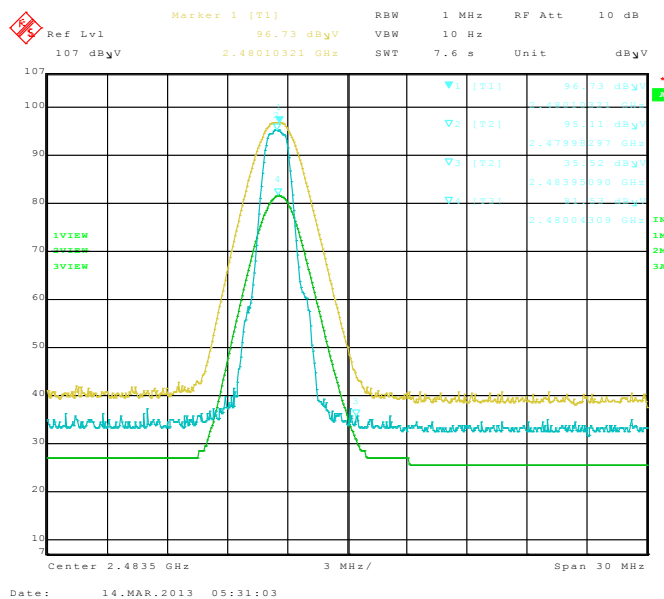


Figure 2-8: Band-Edge Compliance of RF Rad. Emissions.
Bluetooth, Single freq., Static PBRs,
2-DH5, Channel 78, Pol: H, Detector: PK



	EMI Test Report for the BlackBerry® smartphone Model RFS121LW APPENDIX 2	
Test Report No. RTS-6036-1304-60	Dates of Test March 06 to May 03, 2012	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW

Bluetooth Band-Edge Compliance of RF Radiated Emissions cont'd

Figure 2-9: Band-Edge Compliance of RF Rad. Emissions.
Bluetooth, Single freq., Static PBRs,
3-DH5, Channel 0, Pol: V, Detector: PK

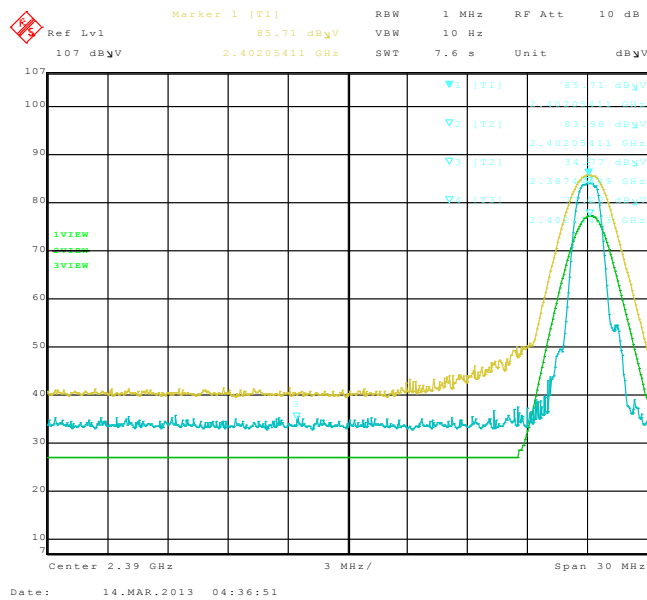


Figure 2-10: Band-Edge Compliance of RF Rad. Emissions.
Bluetooth, Single freq., Static PBRs,
3-DH5, Channel 0, Pol: H, Detector: PK

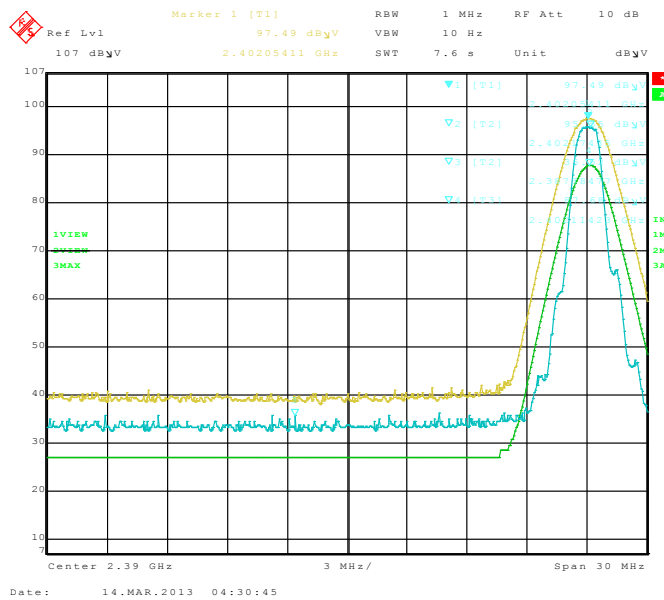


Figure 2-11: Band-Edge Compliance of RF Rad. Emissions.
Bluetooth, Single freq., Static PBRs,
3-DH5, Channel 78, Pol: V, Detector: PK

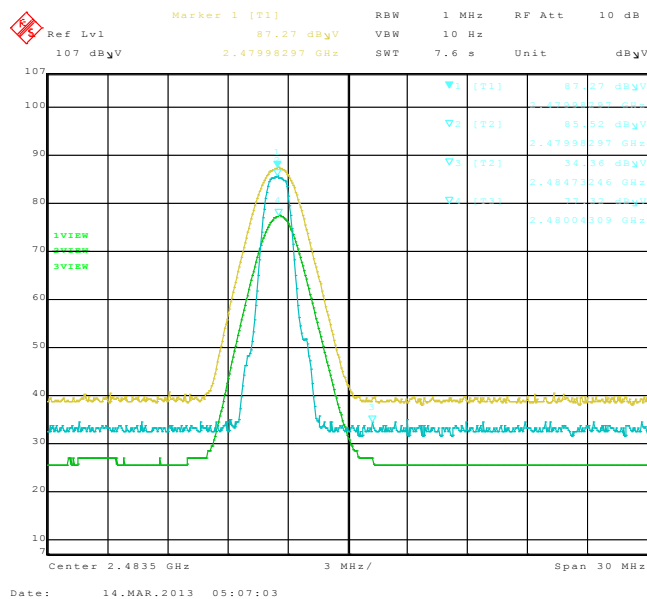
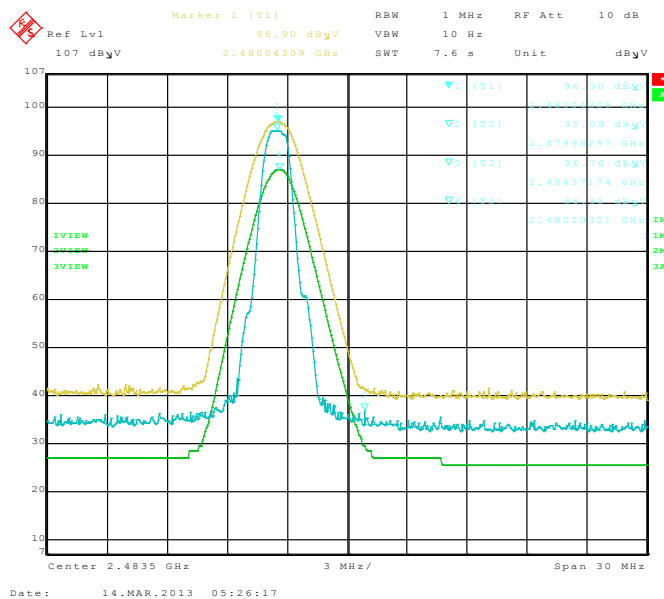


Figure 2-12: Band-Edge Compliance of RF Rad. Emissions.
Bluetooth, Single freq., Static PBRs,
3-DH5, Channel 78, Pol: H, Detector: PK



	EMI Test Report for the BlackBerry® smartphone Model RFS121LW APPENDIX 2	
Test Report No. RTS-6036-1304-60	Dates of Test March 06 to May 03, 2012	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW

Radiated Emissions Test Results cont'd
Bluetooth Low Energy Band

Date of Test: March 07, 2013

Measurements were performed by Feras Obeid.

The environmental test conditions were: Temperature: 25.9 °C
Relative Humidity: 18.1 %

The test distance was 3.0 metres with a EUT height of 0.8 metres, and sweep frequency of 30 MHz to 1 GHz.

The BlackBerry® smartphone in Bluetooth Low Energy Tx mode was in horizontal position.

The frequency sweep measurements were performed in single frequency mode on channels 0, 20 and 39.

All emissions had a test margin of greater than 25.0 dB.

Date of Test: March 12-27, 2013

Measurements were performed by Mahmood Ahmed

The environmental test conditions were: Temperature: 25.0-25.8°C
Relative Humidity: 21.3-31.1%

The test distance was 3.0 metres with a EUT height of 0.8 metres, and sweep frequency of 1GHz to 25GHz.

The BlackBerry® smartphone in Bluetooth Low Energy Tx mode was in horizontal down position.

The frequency sweep measurements were performed in single frequency mode on channels 0, 20 and 39.

Frequency (MHz)	Channel Of Occurrence	Antenna		Test Angle (Deg.)	Detector (PK or QP)	Measured Level (dBµV)	Correction Factor for preamp/antenna/ cables/ filter (dB)	Field Strength Level (reading+corr) (dBm)	Limit @ 3.0 m (dBm)	Test Margin (dB)
		Pol. (V/H)	Height (meters)							
1891.46	0	V	100	326	QP	14.207	19.11	33.317	54	-20.68
1885.14		V	250	169	QP	11.893	21.11	33.003	54	-20.99

All other emission levels were at least 25 dB below the limit.

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW APPENDIX 2	
Test Report No. RTS-6036-1304-60	Dates of Test March 06 to May 03, 2012	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW

Band-Edge Compliance of RF Radiated Emissions Test Results
Bluetooth Low Energy Band

Date of test: March 12, 2013

Measurements were performed by Feras Obeid.

The environmental test conditions were: Temperature: 25.0° C
Relative Humidity: 17.8 %

The BlackBerry® smartphone was in horizontal position.

The test distance was 3.0 metres.

Channel	Freq. (MHz)	Rx Antenna		Detector	VBW	Corrected Reading (dBuV/m)	Delta Marker (dB)	Corrected Band edge (dBuV/m)	Limit (dBuV/m)	Diff. To Limit (dB)
		Type	POL.							
Low Channel, LE										
0	2402	Horn	V	PK	1 MHz	92.79	48	44.79	74	-29.21
0	2402	Horn	H	PK	1 MHz	104.04	60.51	43.53	74	-30.47
0	2402	Horn	V	AVE.	10 Hz	75.64	48	27.64	54	-26.36
0	2402	Horn	H	AVE.	10 Hz	86.84	60.51	26.33	54	-27.67
High Channel, LE										
78	2480	Horn	V	PK	1 MHz	92.47	47.53	44.94	74	-29.06
78	2480	Horn	H	PK	1 MHz	104.17	59.34	44.83	74	-29.17
78	2480	Horn	V	AVE.	10 Hz	75.1	47.53	27.57	54	-26.43
78	2480	Horn	H	AVE.	10 Hz	87.08	59.34	27.74	54	-26.26

See figures 2-13 to 2-16 for the plots of the Bluetooth Low Energy band-edge compliance.

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW APPENDIX 2	
Test Report No. RTS-6036-1304-60	Dates of Test March 06 to May 03, 2012	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW

Bluetooth Low Energy Band-Edge Compliance of RF Radiated Emissions cont'd

Figure 2-13: Band-Edge Compliance of RF Rad. Emissions.
Bluetooth Low Energy, Single freq.,
LE, Channel 0, Pol: V, Detector: PK

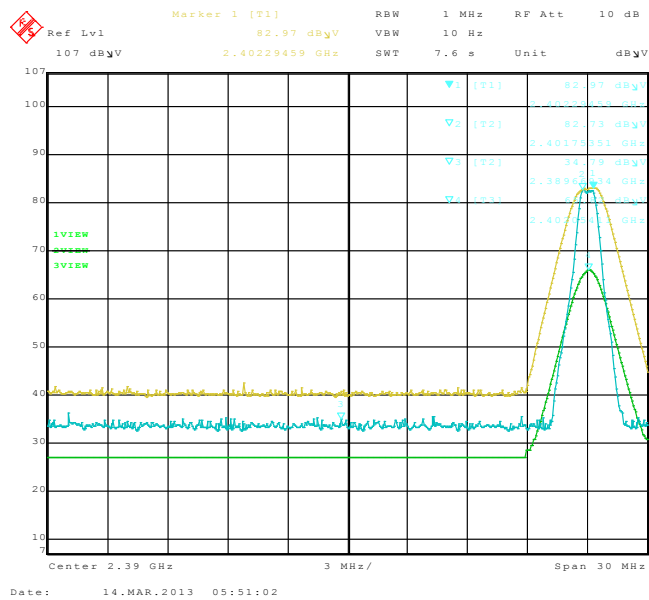


Figure 2-14: Band-Edge Compliance of RF Rad. Emissions.
Bluetooth Low Energy, Single freq.,
LE, Channel 0, Pol: H, Detector: PK

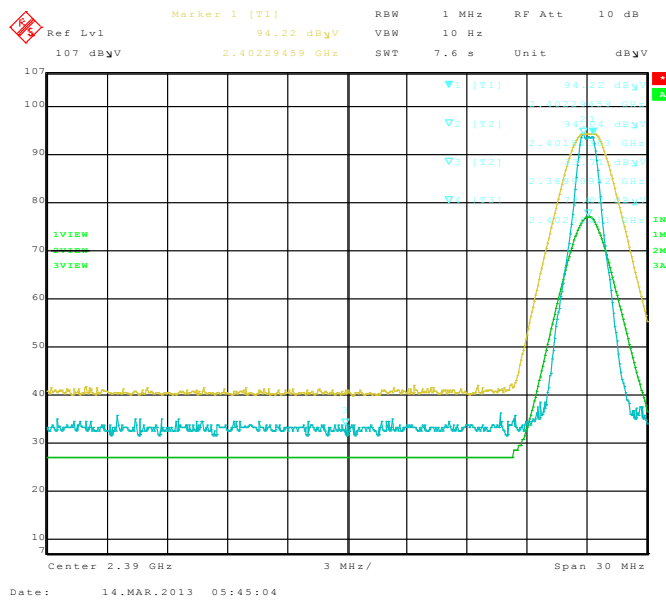


Figure 2-15: Band-Edge Compliance of RF Rad. Emissions.
Bluetooth Low Energy, Single freq.,
LE, Channel 39, Pol: V, Detector: PK

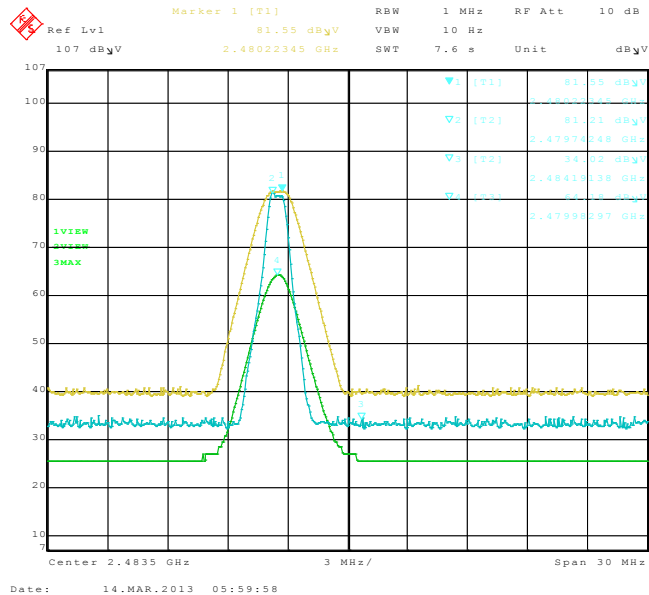
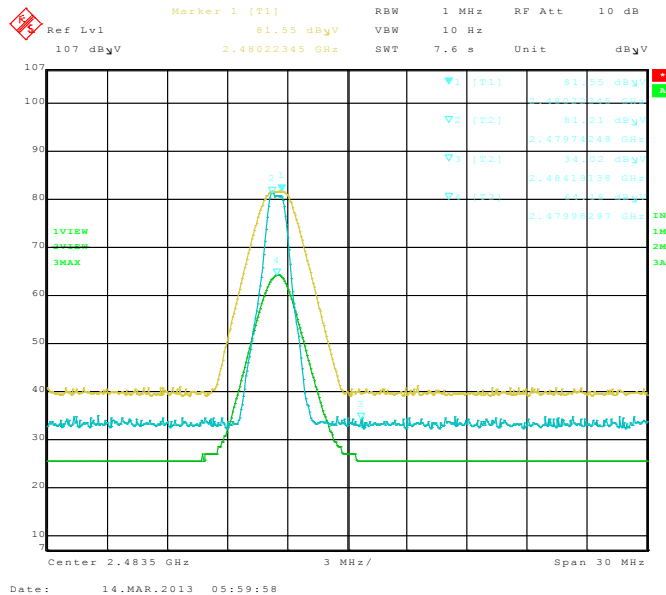


Figure 2-16: Band-Edge Compliance of RF Rad. Emissions.
Bluetooth Low Energy, Single freq.,
LE, Channel 39, Pol: H, Detector: PK



	EMI Test Report for the BlackBerry® smartphone Model RFS121LW APPENDIX 2	
Test Report No. RTS-6036-1304-60	Dates of Test March 06 to May 03, 2012	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW

Radiated Emissions Test Results cont'd
802.11b/g/n Band

Date of Test: March 06, 2013
Measurements performed by Berkin Can

The environmental test conditions were: Temperature: 25.5 °C
Relative Humidity: 16.2%

The test distance was 3.0 metres with a EUT height of 0.8 metres, and sweep frequency of 30 MHz to 1 GHz.

The BlackBerry® smartphone was in USB up position.

The frequency sweep measurements were performed in 802.11b Tx mode at 1 Mbps on channels 1, 6 and 11, in 802.11g Tx mode at 6 Mbps on channels 1, 6 and 11, and in 802.11n Tx mode at MCS 0 on channels 1, 6 and 11.

All other emission levels were at least 25 dB below the limit

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW APPENDIX 2	
Test Report No. RTS-6036-1304-60	Dates of Test March 06 to May 03, 2012	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW

Radiated Emissions Test Results cont'd
802.11b/g/n Band

Date of Test: March 12-15, 28, 2013
Measurements performed by Mahmood Ahmed

The environmental test conditions were: Temperature: 24.1-25.7 °C
Relative Humidity: 17.1- 23.3%

The test distance was 3.0 metres with a EUT height of 0.8 metres, and sweep frequency of 1GHz to 25GHz.

The BlackBerry® smartphone was in horizontal position.

The frequency sweep measurements were performed in 802.11b Tx mode at 1 Mbps on channels 1, 6 and 11, in 802.11g Tx mode at 6 Mbps on channels 1, 6 and 11, and in 802.11n Tx mode at MCS 0 on channels 1, 6 and 11.

All emissions levels were at least 25dB below the limits.

Frequency (MHz)	Channel Of Occurrence	Antenna		Test Angle (Deg.)	Detector (PK or QP)	Measured Level (dBµV)	Correction Factor for preamp/antenna/ cables/ filter (dB)	Field Strength Level (reading+corr) (dBm)	Limit @ 3.0 m (dBm)	Test Margin (dB)
		Pol. (V/H)	Height (meters)							
2394.90	6B	H	1.00	0	PK	53.88	9.03	62.91	74.00	-11.09
2398.82	6B	H	1.00	352	PK	34.01	9.01	43.02	54.00	-10.98
2399.50	11B	H	1.00	0	PK	50.62	9.00	59.63	74.00	-14.37
2397.99	11B	H	1.00	0	PK	29.71	9.01	38.72	54.00	-15.28
2397.81	6G	H	1.00	349	PK	52.70	9.01	61.71	74.00	-12.29
2396.54	6G	H	3.00	224	PK	39.57	9.02	48.59	54.00	-5.41
2400.14	11G	H	3.00	228	PK	50.51	9.00	59.51	74.00	-14.49
2399.37	11G	H	3.00	219	PK	32.13	9.00	41.13	54.00	-12.87
4809.21	1N	V	4.00	202	PK	42.55	19.24	61.79	74.00	-12.21
4809.46	1N	V	4.00	201	PK	28.17	19.24	47.41	54.00	-6.59
2400.69	6N	H	1.00	226	PK	53.22	9.00	62.22	74.00	-11.78
2396.80	6N	H	3.00	218	PK	39.13	9.02	48.14	54.00	-5.86

All other emission levels were at least 25 dB below the limit.

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW APPENDIX 2	
Test Report No. RTS-6036-1304-60	Dates of Test March 06 to May 03, 2012	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW

802.11b/g/n Band-Edge Compliance of RF Radiated Emissions

Date of Tests: February 25, 2013

Measurements performed by Savtej Sandhu.

The environmental test conditions were: Temperature: 24 °C
Relative Humidity: 34 %

802.11b Band

The measurements were performed on BlackBerry® smartphone in standalone, USB up configuration on channels 1 and 11 for 802.11b mode at 1 Mbps.

The test distance was 3 metres.

Channel	Freq. (MHz)	Rx Antenna		Detector	VBW	Carrier Freq Reading (dBuV)	Peak Corrected Reading (dBuV/m)	Delta Marker (dB)	Corrected Band edge (dBuV/m)	Limit (dBuV/m)	Diff. To Limit (dB)
		Type	POL.								
1	2412.00	Horn	V	PK	1 MHz	98.52	108.34	54.57	53.77	74.00	-20.23
1	2412.00	Horn	H	PK	1 MHz	100.25	110.07	54.97	55.10	74.00	-18.90
1	2412.00	Horn	V	AV	10 Hz	95.21	105.03	65.71	39.32	54.00	-14.68
1	2412.00	Horn	H	AV	10 Hz	96.16	105.98	66.66	39.32	54.00	-14.68

Channel	Freq. (MHz)	Rx Antenna		Detector	VBW	Carrier Freq Reading (dBuV)	Peak Corrected Reading (dBuV/m)	Delta Marker (dB)	Corrected Band edge (dBuV/m)	Limit (dBuV/m)	Diff. To Limit (dB)
		Type	POL.								
11	2462.00	Horn	V	PK	1MHz	94.14	103.89	48.11	55.78	74.00	-18.22
11	2462.00	Horn	H	PK	1MHz	98.49	109.51	49.34	60.17	74.00	-13.83
11	2462.00	Horn	V	AV	10 Hz	90.78	100.73	57.55	43.18	54.00	-10.82
11	2462.00	Horn	H	AV	10 Hz	95.3	106.27	57.07	49.20	54.00	-4.80

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW APPENDIX 2	
Test Report No. RTS-6036-1304-60	Dates of Test March 06 to May 03, 2012	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW

802.11g Band

The measurements were performed on the BlackBerry® smartphone in standalone, USB up configuration on channels 1 and 11 for 802.11g mode at 6 Mbps.

The test distance was 3 metres.

Channel	Freq. (MHz)	Rx Antenna		Detector	VBW	Carrier Freq Reading (dBuV)	Peak Corrected Reading (dBuV/m)	Delta Marker (dB)	Corrected Band edge (dBuV/m)	Limit (dBuV/m)	Diff. To Limit (dB)
		Type	POL.								
1	2412.00	Horn	V	PK	1 MHz	101.73	111.55	47.59	63.96	74.00	-10.04
1	2412.00	Horn	H	PK	1 MHz	100.93	110.75	48.52	62.23	74.00	-11.77
1	2412.00	Horn	V	AV	10 Hz	90.54	100.36	56.83	43.53	54.00	-10.47
1	2412.00	Horn	H	AV	10 Hz	89.69	99.51	56.67	42.84	54.00	-11.16

Channel	Freq. (MHz)	Rx Antenna		Detector	VBW	Carrier Freq Reading (dBuV)	Peak Corrected Reading (dBuV/m)	Delta Marker (dB)	Corrected Band edge (dBuV/m)	Limit (dBuV/m)	Diff. To Limit (dB)
		Type	POL.								
11	2462.00	Horn	V	PK	1 MHz	96.13	107.05	47.76	59.29	74.00	-14.71
11	2462.00	Horn	H	PK	1 MHz	102.46	113.38	47.84	65.54	74.00	-8.46
11	2462.00	Horn	V	AV	10 Hz	88.53	99.45	55.51	43.94	54.00	-10.06
11	2462.00	Horn	H	AV	10 Hz	90.91	101.83	52.63	49.20	54.00	-4.80

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW APPENDIX 2	
Test Report No. RTS-6036-1304-60	Dates of Test March 06 to May 03, 2012	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW

802.11n Band

The measurements were performed on the BlackBerry® smartphone in standalone, USB up configuration on channels 1 and 11 for 802.11n mode at MCS 0.

The test distance was 3 metres.

Channel	Freq. (MHz)	Rx Antenna		Detector	VBW	Carrier Freq Reading (dBuV)	Peak Corrected Reading (dBuV/m)	Delta Marker (dB)	Corrected Band edge (dBuV/m)	Limit (dBuV/m)	Diff. To Limit (dB)
		Type	POL.								
1	2412.00	Horn	V	PK	1MHz	92.17	101.99	48.56	53.43	74.00	-20.57
1	2412.00	Horn	H	PK	1MHz	98	107.82	48.96	58.86	74.00	-15.14
1	2412.00	Horn	V	AV	10 Hz	82.59	92.41	54.25	38.16	54.00	-15.84
1	2412.00	Horn	H	AV	10 Hz	88.12	97.94	55.86	42.08	54.00	-11.92

Channel	Freq. (MHz)	Rx Antenna		Detector	VBW	Carrier Freq Reading (dBuV)	Peak Corrected Reading (dBuV/m)	Delta Marker (dB)	Corrected Band edge (dBuV/m)	Limit (dBuV/m)	Diff. To Limit (dB)
		Type	POL.								
11	2462.00	Horn	V	PK	1 MHz	93.43	104.35	46.65	57.70	74.00	-16.30
11	2462.00	Horn	H	PK	1 MHz	97.66	108.58	47.18	61.40	74.00	-12.60
11	2462.00	Horn	V	AV	10 Hz	82.94	93.86	51.51	42.35	54.00	-11.65
11	2462.00	Horn	H	AV	10 Hz	87.32	98.24	52.96	45.28	54.00	-8.72

See figures 2-17 to 2-20 for the plots of the 802.11b band-edge compliance.

See figures 2-21 to 2-24 for the plots of the 802.11g band-edge compliance.

See figures 2-25 to 2-28 for the plots of the 802.11n band-edge compliance.

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW APPENDIX 2	
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802.11b/g/n Band-Edge Compliance of RF Radiated Emissions cont'd

Figure 2-17: Band-Edge Compliance of RF Radiated Emission
802.11b, Channel 1, 2412 MHz, Max Pol: V,
Detector: PK

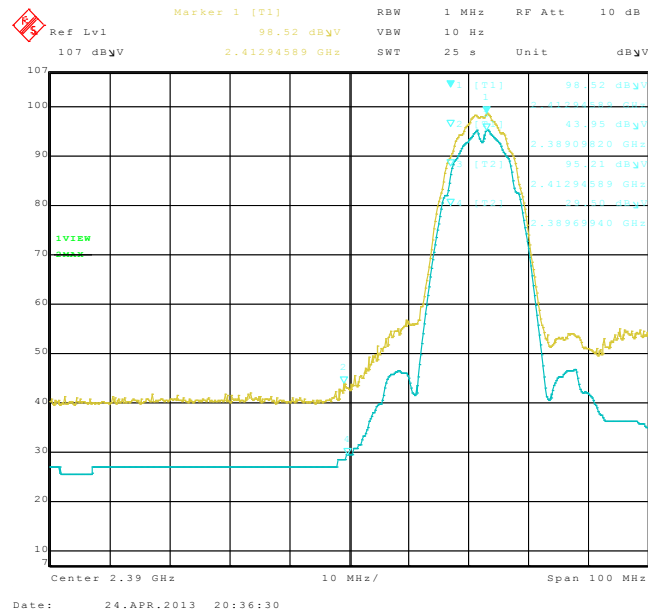


Figure 2-18: Band-Edge Compliance of RF Radiated Emission
802.11b, Channel 1, 2412 MHz, Max Pol: H,
Detector: PK

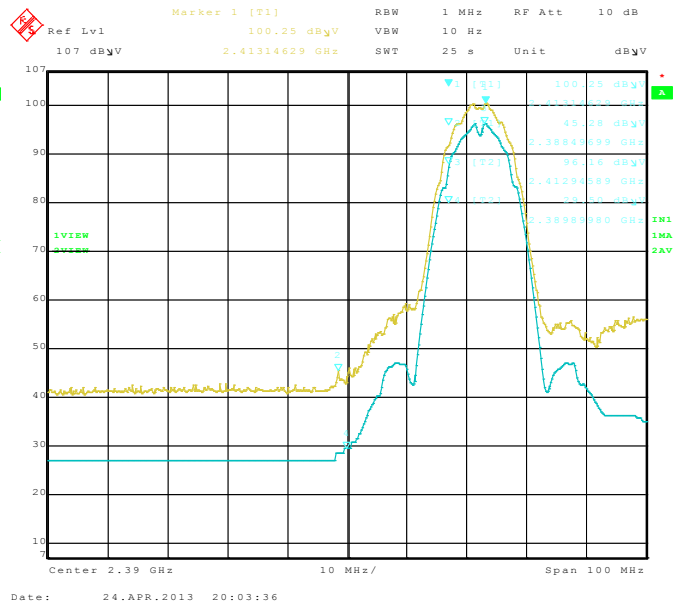


Figure 2-19: Band-Edge Compliance of RF Radiated Emission
802.11b, Channel 11, 2462 MHz, Max Pol: V,
Detector: PK

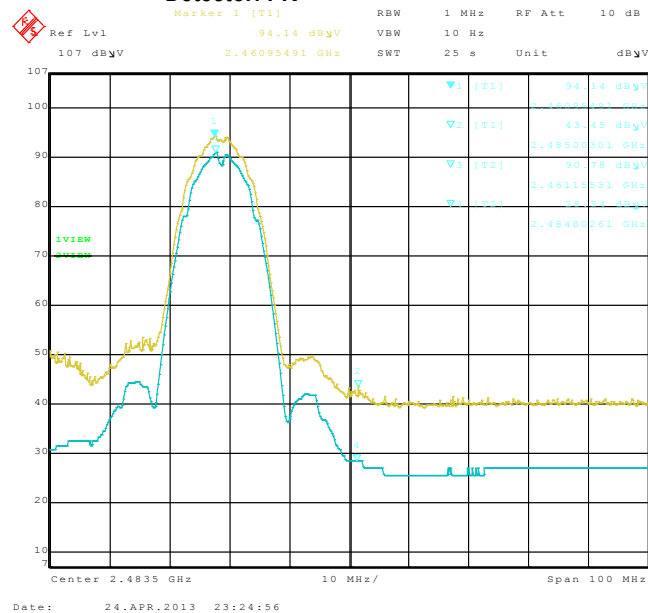
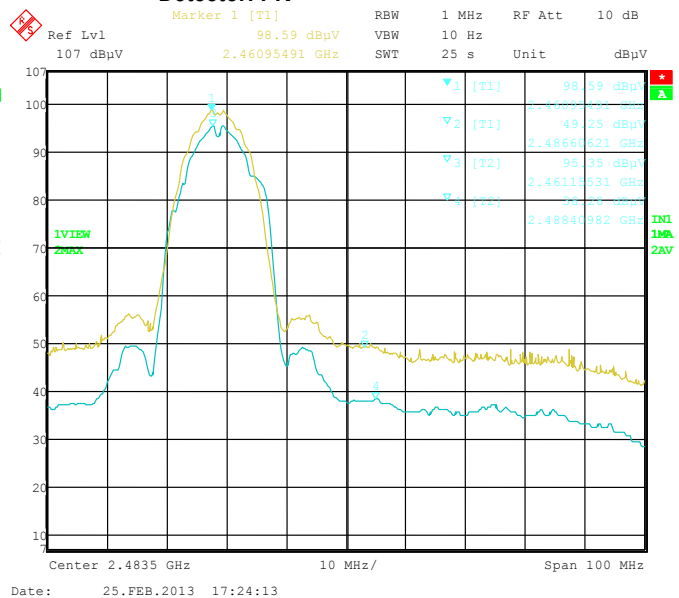


Figure 2-20: Band-Edge Compliance of RF Radiated Emission
802.11b, Channel 11, 2462 MHz, Max Pol: H,
Detector: PK



	EMI Test Report for the BlackBerry® smartphone Model RFS121LW APPENDIX 2	
Test Report No. RTS-6036-1304-60	Dates of Test March 06 to May 03, 2012	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW

Figure 2-21: Band-Edge Compliance of RF Radiated Emission
802.11g, Channel 1, 2412 MHz, Max Pol: V,
Detector: PK

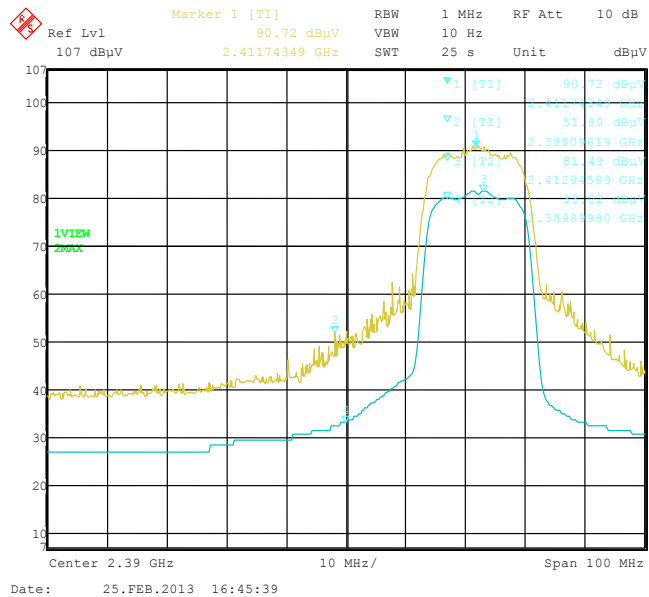


Figure 2-22: Band-Edge Compliance of RF Radiated Emission
802.11g, Channel 1, 2412 MHz, Max Pol: H,
Detector: PK

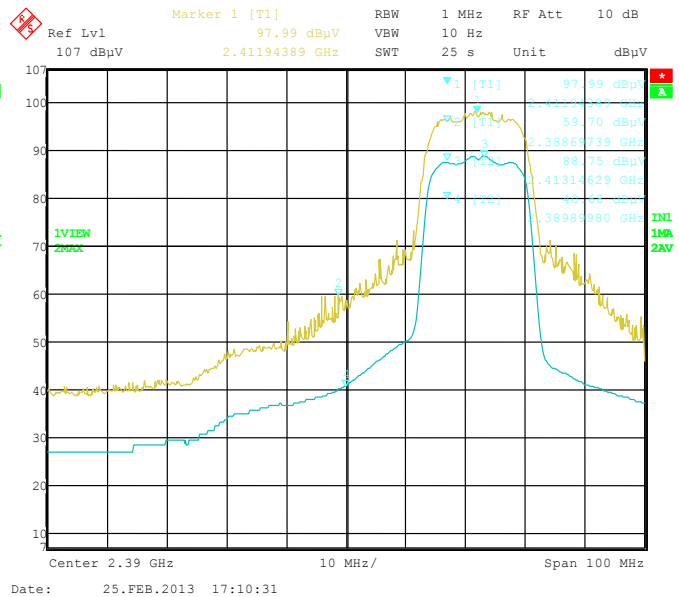


Figure 2-23: Band-Edge Compliance of RF Radiated Emission
802.11g, Channel 11, 2462 MHz, Max Pol: V,
Detector: PK

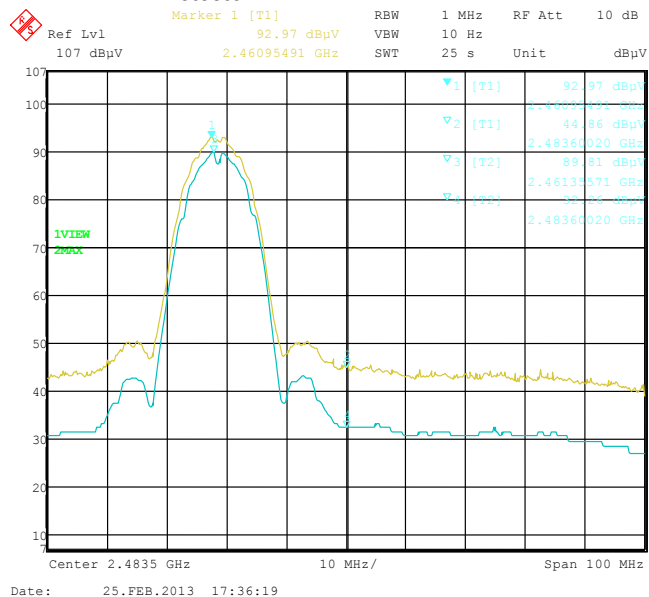
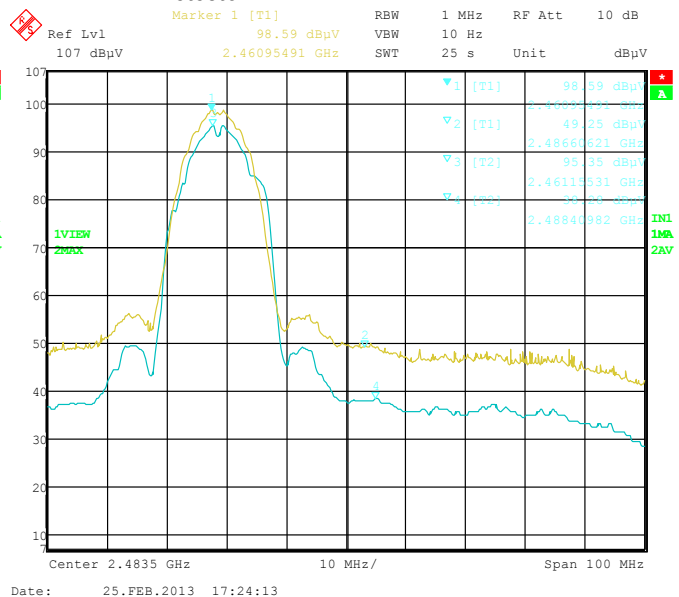


Figure 2-24: Band-Edge Compliance of RF Radiated Emission
802.11g, Channel 11, 2462 MHz, Max Pol: H,
Detector: PK



	EMI Test Report for the BlackBerry® smartphone Model RFS121LW APPENDIX 2	
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Figure 2-25: Band-Edge Compliance of RF Radiated Emission
802.11n, Channel 1, 2412 MHz, Max Pol: V,
Detector: PK

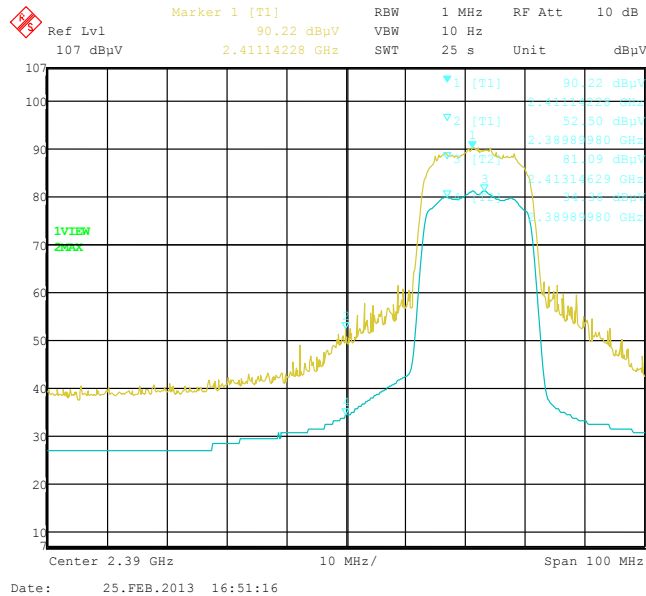


Figure 2-26: Band-Edge Compliance of RF Radiated Emission
802.11n, Channel 1, 2412 MHz, Max Pol: H,
Detector: PK

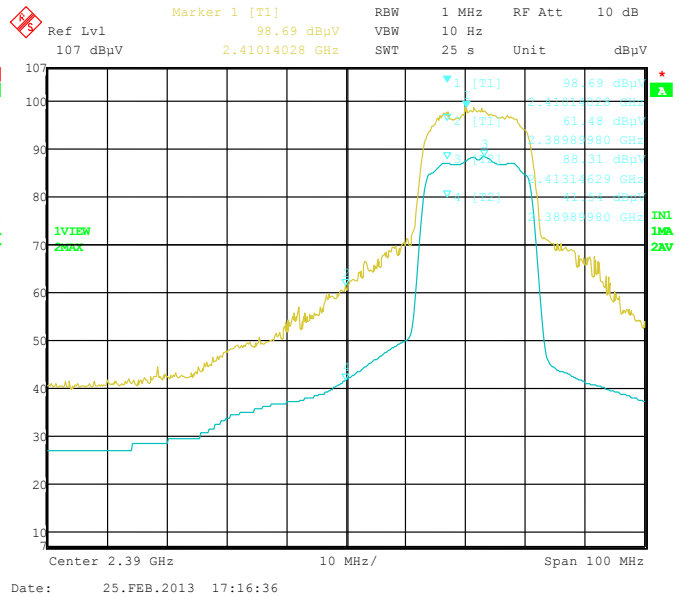


Figure 2-27: Band-Edge Compliance of RF Radiated Emission
802.11n, Channel 11, 2462 MHz, Max Pol: V,
Detector: PK

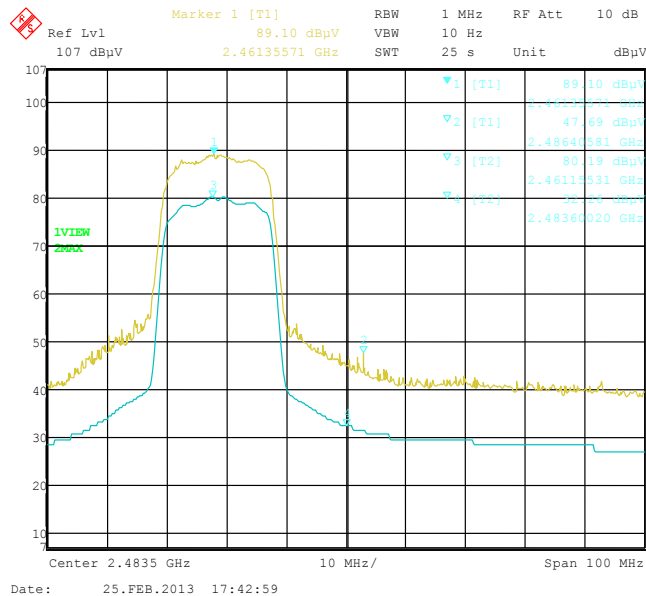
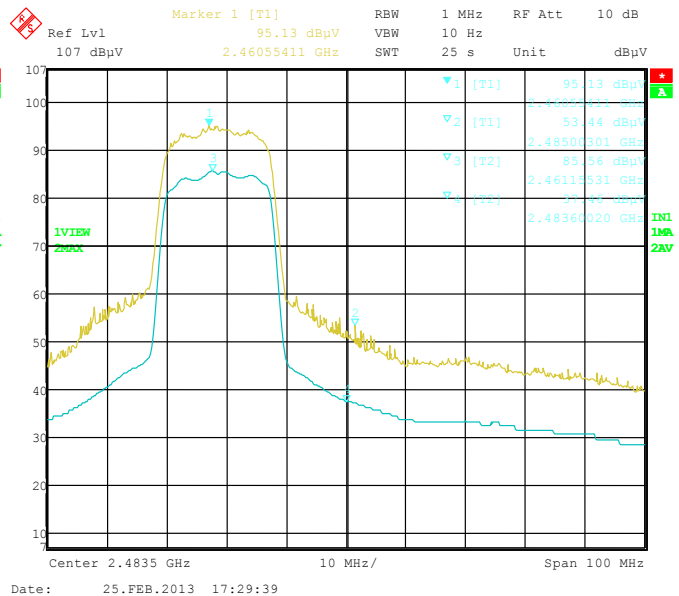


Figure 2-28: Band-Edge Compliance of RF Radiated Emission
802.11n, Channel 11, 2462 MHz, Max Pol: H,
Detector: PK



**APPENDIX 3 – BLUETOOTH AND BLUETOOTH LOW ENERGY CONDUCTED
EMISSIONS TEST DATA/PLOTS**

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW APPENDIX 3	
Test Report No. RTS-6036-1304-60	Dates of Test March 06 to May 03, 2012	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW

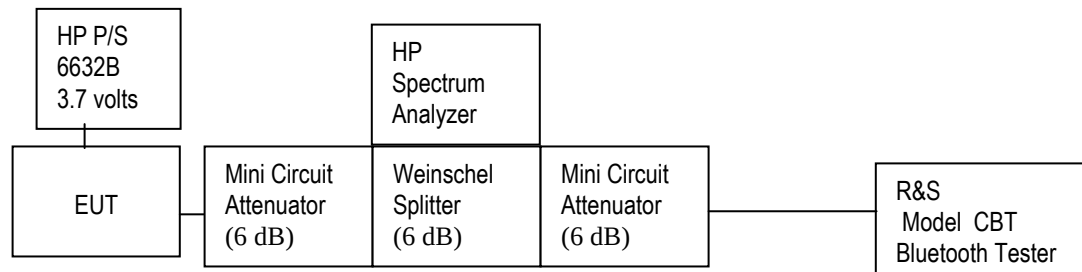
Bluetooth RF Conducted Emission Test Results

Bluetooth power output from BlackBerry® smartphone was at maximum for all the recorded measurements shown below.

The measurements were performed by Berkin Can

Date of test: April 29, 2013

Test Setup Diagram



<u>UNIT</u>	<u>MANUFACTURER</u>	<u>MODEL</u>	<u>SERIAL NUMBER</u>
Attenuator 1	Mini-Circuits	BW-S6W2+	0647
Attenuator 2	Mini-Circuits	BW-S6W2+	0648
Attenuator 3	Mini-Circuits	BW-S20-2W263+	1234
Splitter 1	Weinschel	1515	MES 92

A reference offset of 12.4 dB was applied to the spectrum analyzer reference level for the attenuators and coaxial cable loss in the test circuit.

The environmental test conditions were: Temperature: 22.8 °C
Relative Humidity: 25.8 %

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW APPENDIX 3	
Test Report No. RTS-6036-1304-60	Dates of Test March 06 to May 03, 2012	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW

Bluetooth RF Conducted Emission Test Results cont'd

20 dB Bandwidth

The EUT met the requirements of the 20 dB bandwidth as per 47 CFR 15.247(a) and RSS-210. Low channel (0), middle channel (39) and high channel (78) were measured. Bluetooth was operating in single frequency mode.

Using pattern type “Static PBRs” and packet type “DH5” during the measurements.

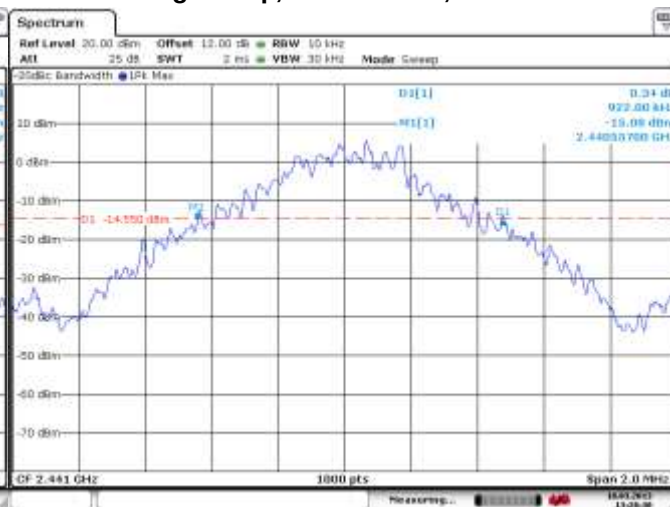
Bluetooth Channel	Limit (MHz)	Measured Level (MHz)
0	≤1.0	0.918
39	≤1.0	0.922
78	≤1.0	0.922

See figures 4-1 to 4-3 for the plots of the 20 dB bandwidth measurements.

Figure 4-1: 20 dB Bandwidth
Single freq., Static PBRs, DH5



Figure 4-2: 20 dB Bandwidth
Single freq., Static PBRs, DH5



	EMI Test Report for the BlackBerry® smartphone Model RFS121LW APPENDIX 3	
Test Report No. RTS-6036-1304-60	Dates of Test March 06 to May 03, 2012	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW

Bluetooth RF Conducted Emission Test Results cont'd

Figure 4-3: 20 dB Bandwidth
Single freq., Static PBRS, DH5



Using Pattern type “Static PBRS” and packet type “2-DH5” during the measurements.

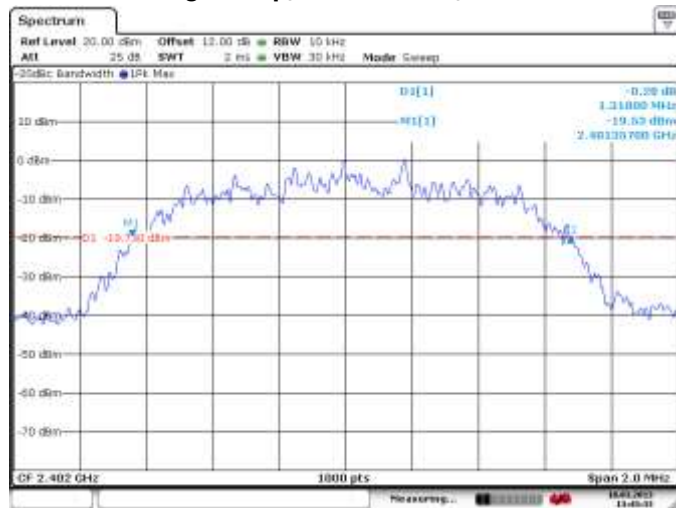
Bluetooth Channel	Limit (MHz)	Measured Level (MHz)
0	≤1.5	1.318
39	≤1.5	1.316
78	≤1.5	1.318

See figures 4-4 to 4-6 for the plots of the 20 dB bandwidth measurements.

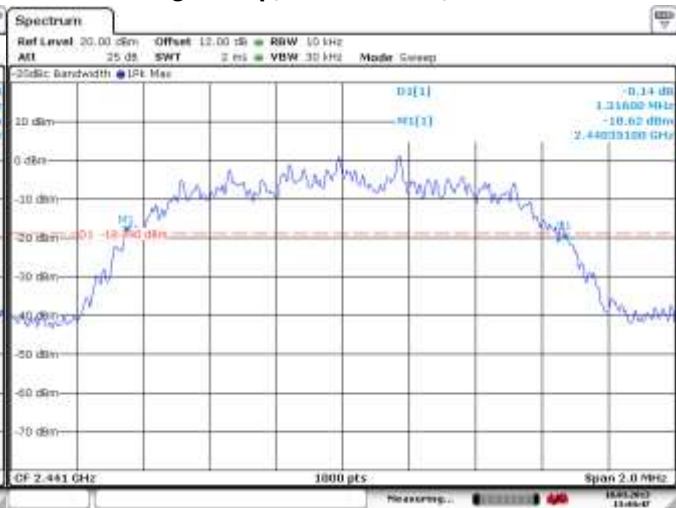
	EMI Test Report for the BlackBerry® smartphone Model RFS121LW APPENDIX 3	
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Bluetooth RF Conducted Emission Test Results cont'd

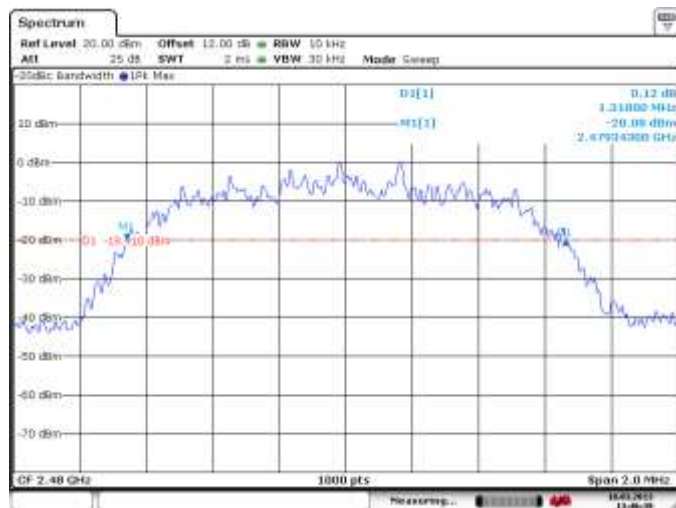
**Figure 4-4: 20 dB Bandwidth
Single freq., Static PBRS, 2-DH5**



**Figure 4-5: 20 dB Bandwidth
Single freq., Static PBRS, 2-DH5**



**Figure 4-6: 20 dB Bandwidth
Single freq., Static PBRS, 2-DH5**



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Bluetooth RF Conducted Emission Test Results cont'd

Using Pattern type “Static PBRs” and packet type “3-DH5” during the measurements.

Bluetooth Channel	Limit (MHz)	Measured Level (MHz)
0	≤1.5	1.328
39	≤1.5	1.332
78	≤1.5	1.290

See figures 4-7 to 4-9 for the plots of the 20 dB bandwidth measurements.

Figure 4-7: 20 dB Bandwidth
Single freq., Static PBRs, 3-DH5

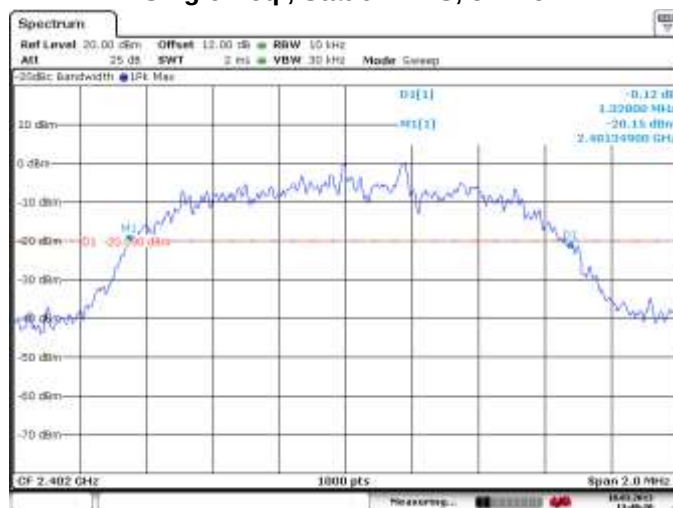
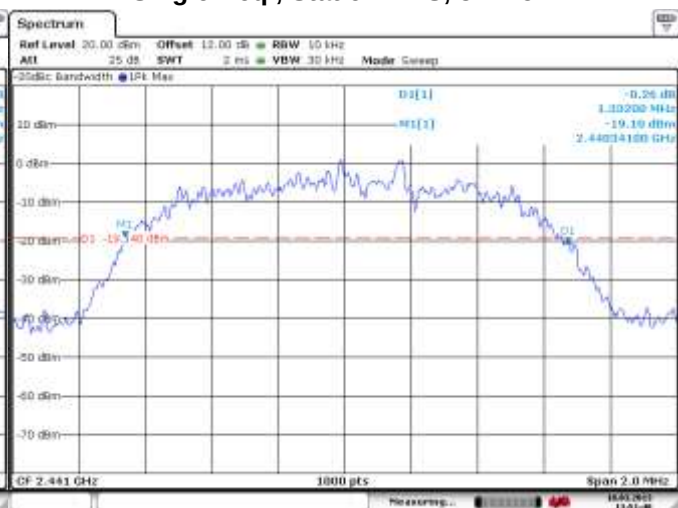


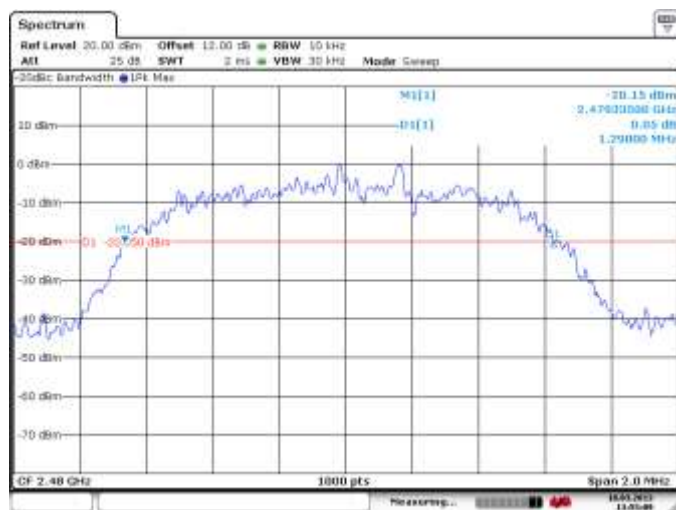
Figure 4-8: 20 dB Bandwidth
Single freq., Static PBRs, 3-DH5



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Bluetooth RF Conducted Emission Test Results cont'd

Figure 4-9: 20 dB Bandwidth
Single freq., Static PBRS, 3-DH5



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Bluetooth RF Conducted Emission Test Results cont'd

Carrier Frequency Separation

The EUT met the requirements of the Carrier Frequency Separation as per 47 CFR 15.247(a) and RSS-210. Channel 38 to 39 was measured. Bluetooth was operating in frequency hopping (Euro/US) mode.

Using pattern type “Static PBRS” and packet type “DH5” during the measurements.

Bluetooth Channels	Limit (MHz)	Measured Level (MHz)
38 to 39	≥ 0.025 or 20 dB bandwidth	0.9986

See figure 4-10 for the plot of the Carrier Frequency Separation measurement.

Figure 4-10: Carrier Frequency Separation, Freq. Hopping, Static PBRS, DH5, Channels 38 to 39



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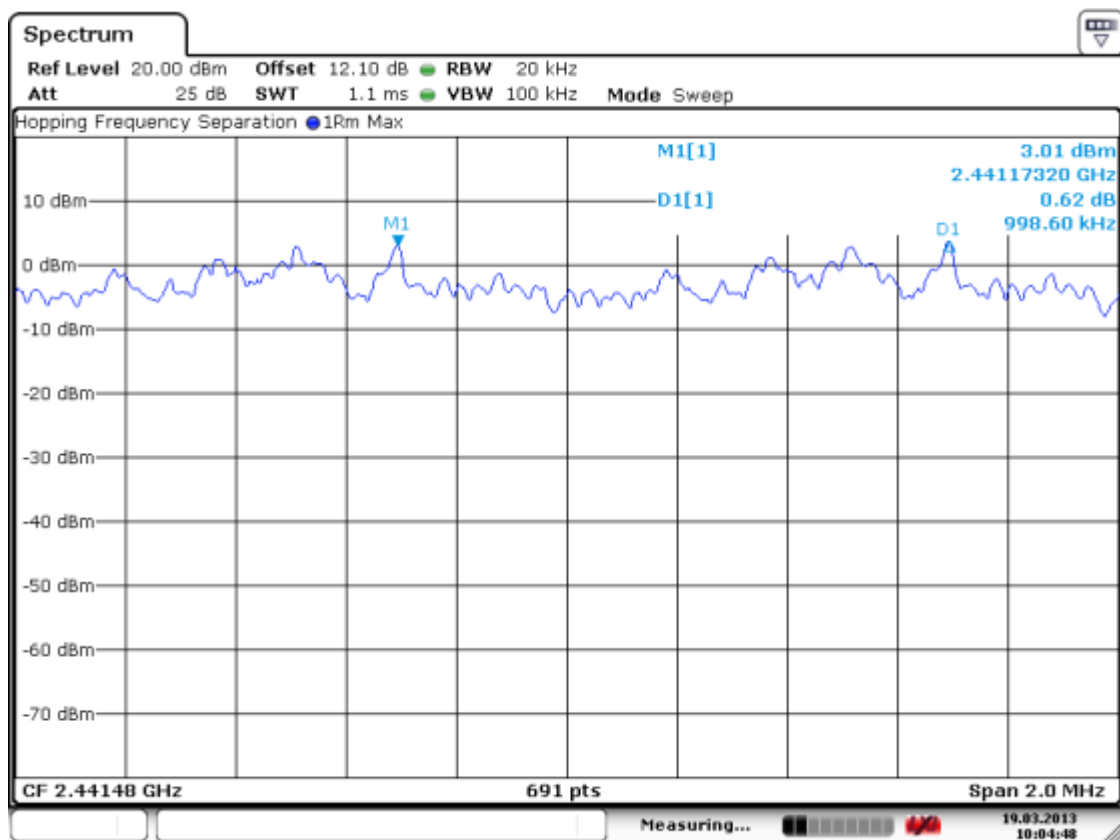
Bluetooth RF Conducted Emission Test Results cont'd

Using Pattern type “Static PBRs” and packet type “2-DH5” during the measurements.

Bluetooth Channels	Limit (MHz)	Measured Level (MHz)
38 to 39	≥ 0.025 or 20 dB bandwidth	0.9986

See figure 4-11 for the plot of the Carrier Frequency Separation measurement.

Figure 4-11: Carrier Frequency Separation, Freq. Hopping, Static PBRs, 2-DH5, Channels 38 to 39



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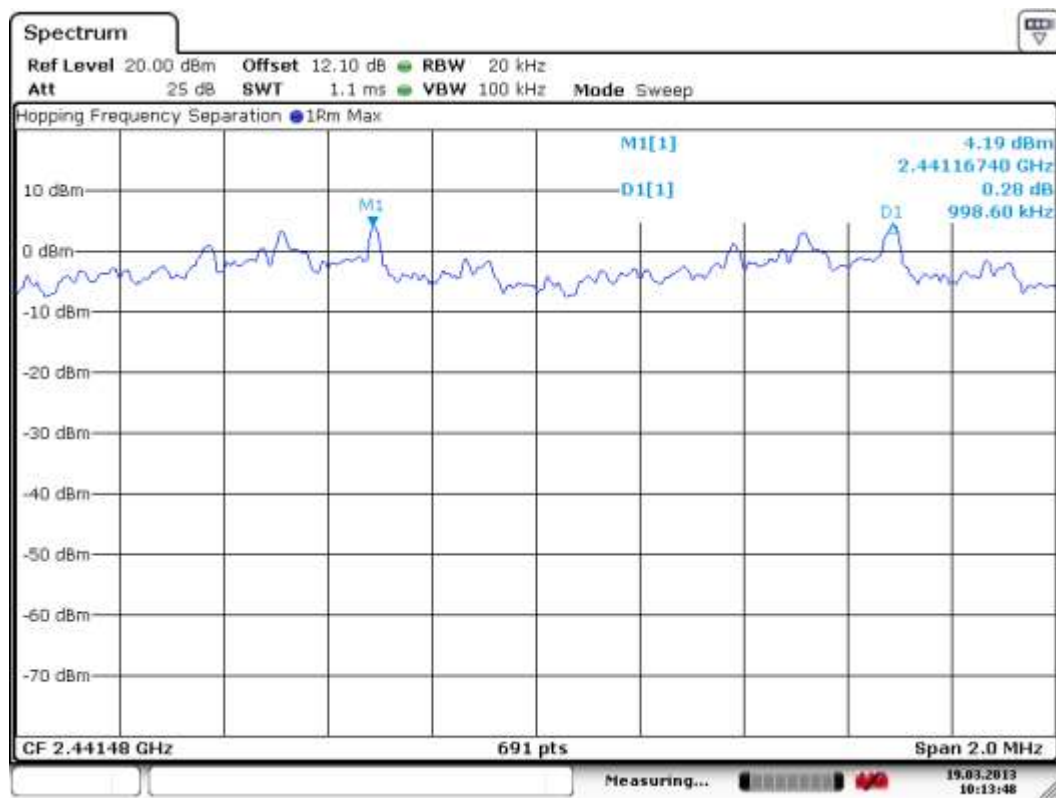
Bluetooth RF Conducted Emission Test Results cont'd

Using Pattern type “Static PBRs” and packet type “3-DH5” during the measurements.

Bluetooth Channels	Limit (MHz)	Measured Level (MHz)
38 to 39	≥ 0.025 or 20 dB bandwidth	0.9986

See figure 4-12 for the plot of the Carrier Frequency Separation measurement.

Figure 4-12: Carrier Frequency Separation, Freq. Hopping, Static PBRs, 3-DH5, Channels 38 to 39



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Bluetooth RF Conducted Emission Test Results cont'd

Number of Hopping Frequencies

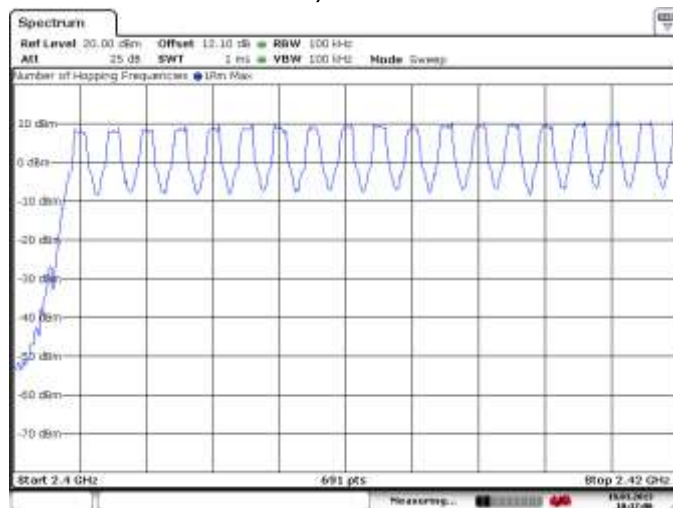
The EUT met the requirements of the number of hopping frequencies as per 47 CFR 15.247(a) and RSS-210. Bluetooth was operating in frequency hopping (Euro/US) mode.

Using pattern type “Static PBRS” and packet type “DH5” during the measurements.

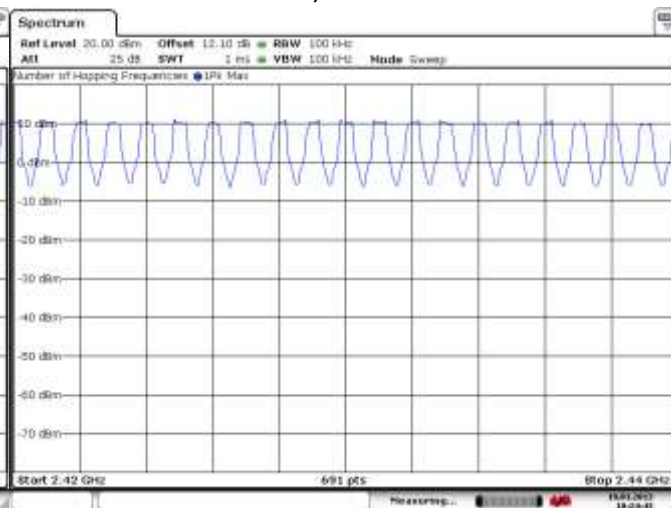
Limit (CH)	Number of Hopping Frequencies (CH)
≥75	79

See figures 4-13 to 4-16 for the plots of the number of hopping frequencies.

**Figure 4-13: Number of Hopping Frequencies
Static PBRS, DH5**



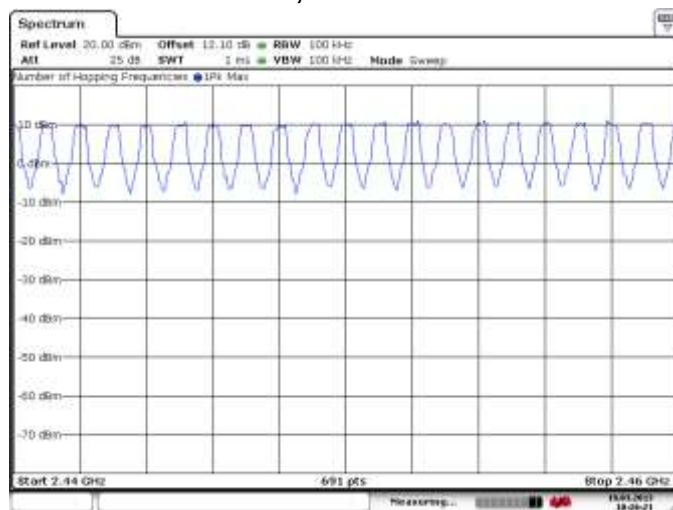
**Figure 4-14: Number of Hopping Frequencies
Static PBRS, DH5**



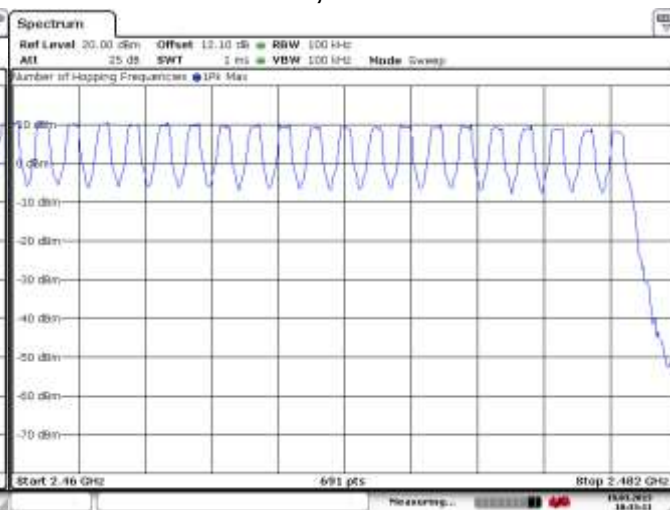
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Bluetooth RF Conducted Emission Test Results cont'd

**Figure 4-15: Number of Hopping Frequencies
Static PBRS, DH5**



**Figure 4-16: Number of Hopping Frequencies
Static PBRS, DH5**



Time of Occupancy (Dwell Time)

The EUT met the requirements of the time of occupancy (dwell time) as per 47 CFR 15.247(a) and RSS-210. Low channel (0), middle channel (39) and high channel (78) were measured in packet types DH1, DH3 and DH5. Bluetooth was operating in frequency hopping (Euro/US) mode during the measurements. The frequency hopping is 1600 hops per second for a dwell time of 625 µsec for 79 channels.

A DH1 packet needs one time slot for transmitting and one time slot for receiving. The frequency hopping is 800 hops per second with 79 channels which is 10.127 times per second. As per 15.247(a) (iii) "The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed". Therefore for 31.6 seconds (79x0.4) there are 320.0 times of appearance.

A DH3 packet needs one time slot for transmitting and one time slot for receiving. The frequency hopping is 400 hops per second with 79 channels which is 5.06 times per second. Therefore for 31.6 seconds there are 159.9 times of appearance.

A DH5 packet needs one time slot for transmitting and one time slot for receiving. The frequency hopping is 266.7 hops per second with 79 channels which is 3.38 times per second. Therefore for 31.6 seconds there are 106.8 times of appearance.

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Bluetooth RF Conducted Emission Test Results cont'd

Bluetooth Channel	Mode	Tx Time (ms)	Dwell Time/31.6 sec. (msec.)	Limit (msec.)	Margin (msec.)
0	DH1	0.3910	$0.405 \times 320.0 = 129.60$	400	274.88
39	DH1	0.3880	$0.403 \times 320.0 = 128.96$	400	275.84
78	DH1	0.3880	$0.403 \times 320.0 = 128.96$	400	275.84
0	DH3	1.6410	$1.653 \times 159.9 = 264.31$	400	137.60
39	DH3	1.6430	$1.653 \times 159.9 = 264.31$	400	137.28
78	DH3	1.6430	$1.653 \times 159.9 = 264.31$	400	137.28
0	DH5	2.8920	$2.914 \times 106.8 = 311.22$	400	91.13
39	DH5	2.8940	$2.923 \times 106.8 = 312.18$	400	90.92
78	DH5	2.9110	$2.923 \times 106.8 = 312.18$	400	89.11

See figures 4-17 to 4-25 for the plots of the dwell time.

Bluetooth RF Conducted Emission Test Results cont'd

Figure 4-17: Time of Occupancy (Dwell Time)
Freq. Hopping, Static PBRS, DH1

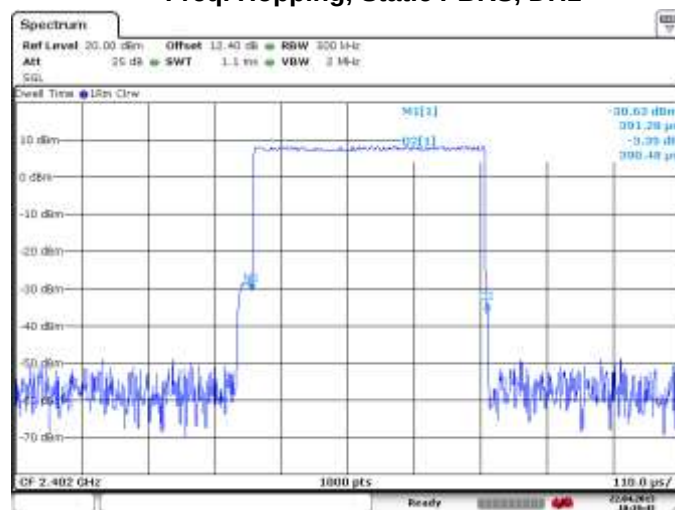
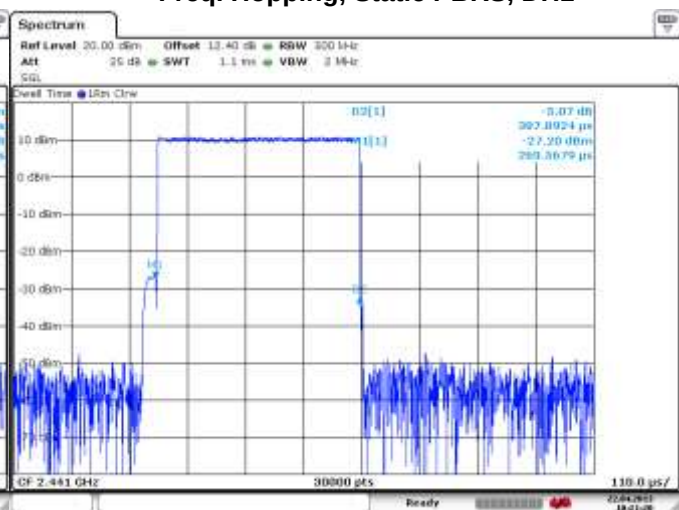


Figure 4-18: Time of Occupancy (Dwell Time)
Freq. Hopping, Static PBRS, DH1



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Bluetooth RF Conducted Emission Test Results cont'd

Figure 4-19: Time of Occupancy (Dwell Time)
Freq. Hopping, Static PBRS, DH1

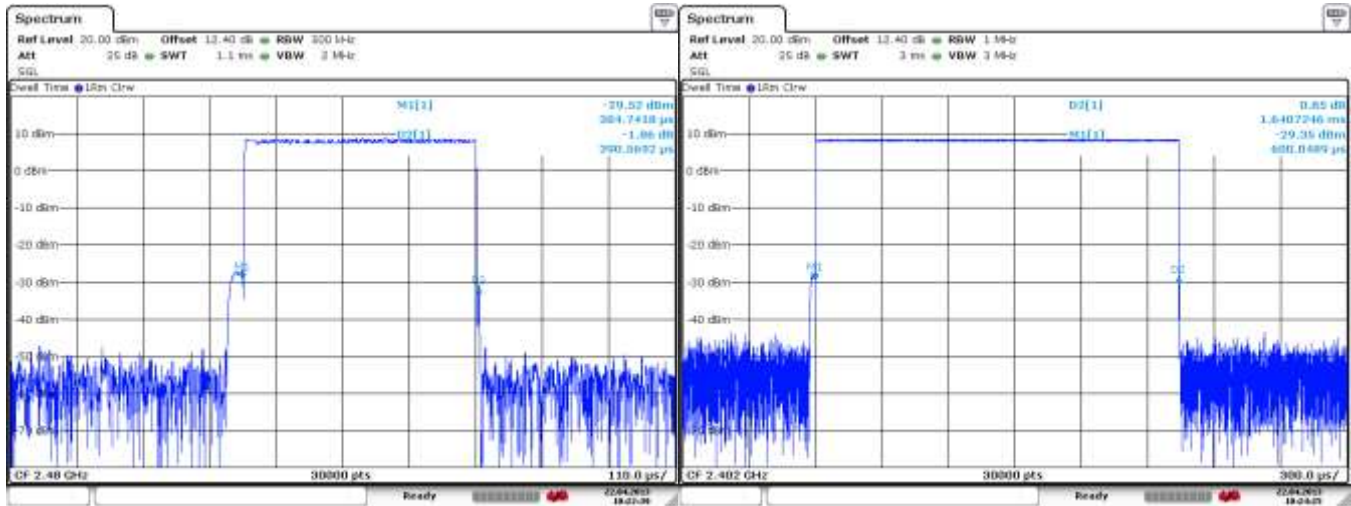


Figure 4-20: Time of Occupancy (Dwell Time)
Freq. Hopping, Static PBRS, DH3

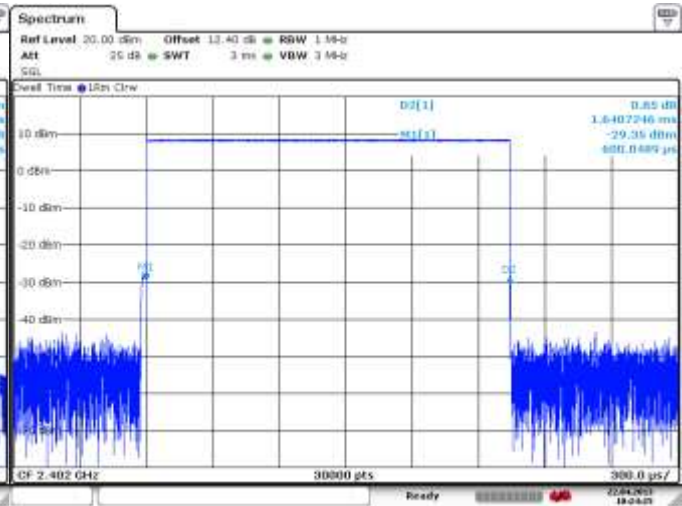


Figure 4-21: Time of Occupancy (Dwell Time)
Freq. Hopping, Static PBRS, DH3

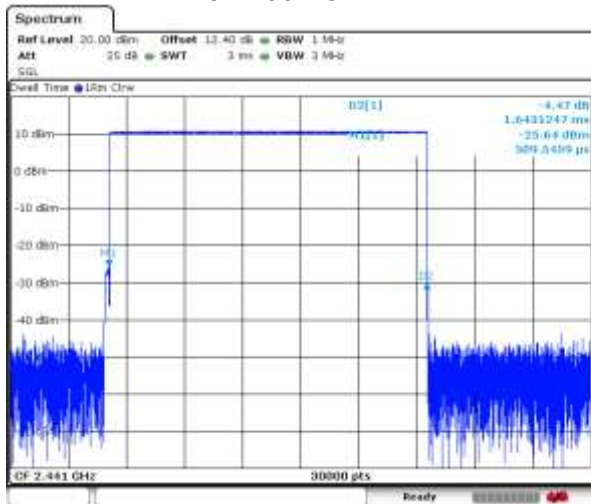
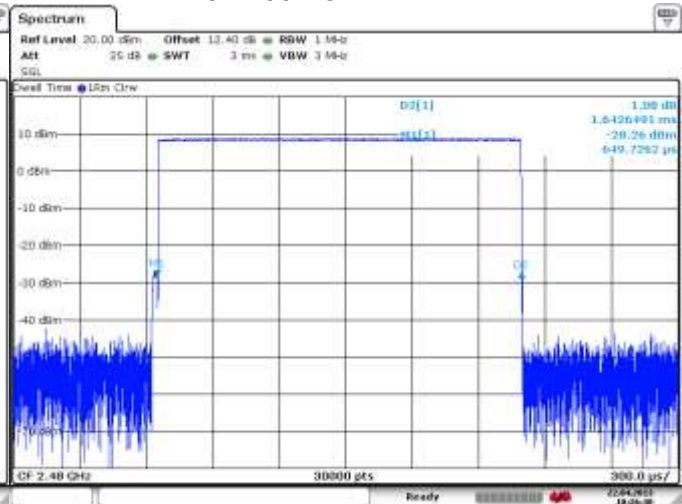


Figure 4-22: Time of Occupancy (Dwell Time)
Freq. Hopping, Static PBRS, DH3



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Bluetooth RF Conducted Emission Test Results cont'd

Figure 4-23: Time of Occupancy (Dwell Time)
Freq. Hopping, Static PBRS, DH5

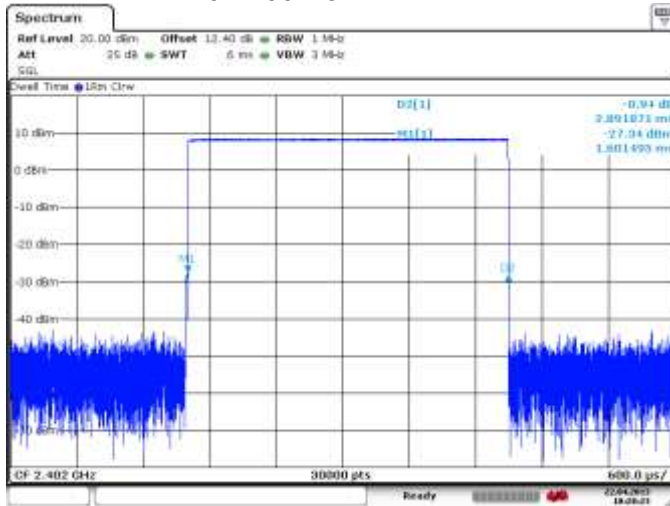


Figure 4-24: Time of Occupancy (Dwell Time)
Freq. Hopping, Static PBRS, DH5

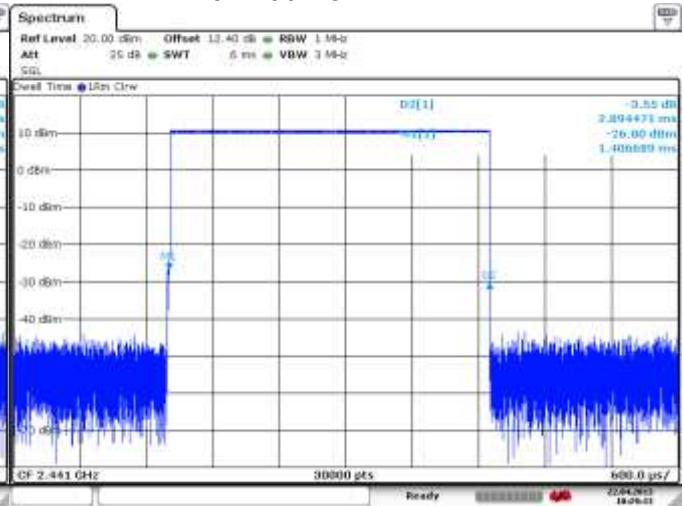
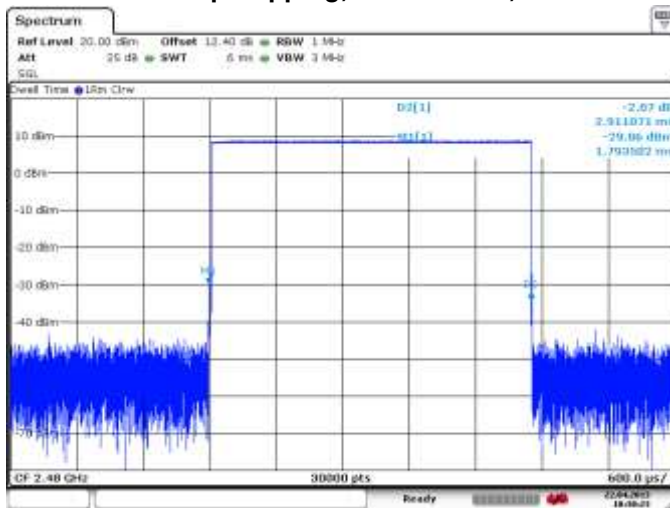


Figure 4-25: Time of Occupancy (Dwell Time)
Freq. Hopping, Static PBRS, DH5



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Bluetooth RF Conducted Emission Test Results cont'd

Maximum Peak Conducted Output Power

The EUT met the requirements of the maximum peak conducted output power of class 1 as per 47 CFR 15.247(b) and RSS-210. Low channel (0), middle channel (39) and high channel (78) were measured. Bluetooth was operating in single frequency mode during the measurements. A reference offset of 12.4 dB was applied to the spectrum analyzer reference level for the coaxial cable loss and attenuators in the test circuit.

Using pattern type "Static PBRs" and packet type "DH5" during the measurements.

Bluetooth Channel	Measured Level (dBm)	Measured Level (W)	Class 1 Limit (dBm)
0	9.30	0.00851	0.0 to 20.0
39	10.00	0.01000	0.0 to 20.0
78	9.50	0.00891	0.0 to 20.0

Using Pattern type "Static PBRs" and packet type "2-DH5" during the measurements.

Bluetooth Channel	Measured Level (dBm)	Measured Level (W)	Class 1 Limit (dBm)
0	7.80	0.00603	0.0 to 20.0
39	8.60	0.00724	0.0 to 20.0
78	8.00	0.00631	0.0 to 20.0

Using Pattern type "Static PBRs" and packet type "3-DH5" during the measurements.

Bluetooth Channel	Measured Level (dBm)	Measured Level (W)	Class 1 Limit (dBm)
0	8.30	0.00676	0.0 to 20.0
39	9.00	0.00794	0.0 to 20.0
78	8.50	0.00708	0.0 to 20.0

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Bluetooth RF Conducted Emission Test Results cont'd

Band Edge Compliance

The EUT met the requirements of the band edge compliance as per 47 CFR 15.247(c) and RSS-210. Low channel (0) and high channel (78) were measured. Bluetooth was operating in single frequency and hopping mode.

Using pattern type “Static PBRS” and packet type “DH5” during the measurements.

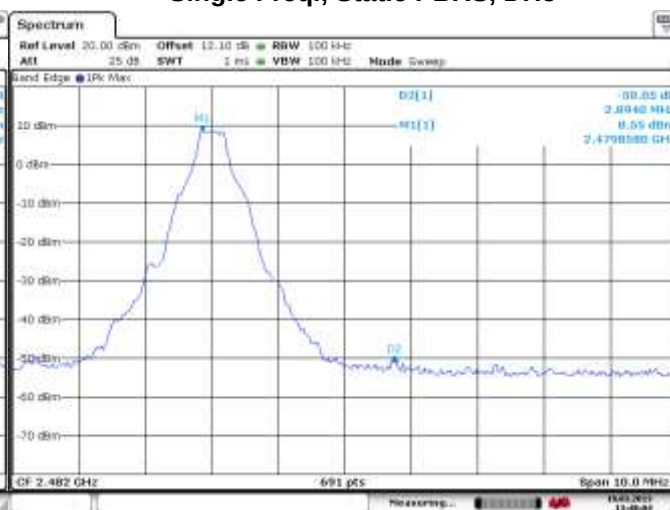
Bluetooth Channel	Operating Mode	Measured Level (dBc)	Limit (dBc)	Margin (dB)
0	Single Frequency	-58.15	-20	-38.15
78	Single Frequency	-58.05	-20	-38.05
0	Hopping	-61.81	-20	-41.81
78	Hopping	-61.24	-20	-41.24

See figures 4-35 to 4-38 for the plots of the band edge compliance measurements.

Figure 4-35: Band Edge Compliance
Single Freq., Static PBRS, DH5



Figure 4-36: Band Edge Compliance
Single Freq., Static PBRS, DH5



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Bluetooth RF Conducted Emission Test Results cont'd

Figure 4-37: Band Edge Compliance
Freq. Hopping, Static PBRS, DH5

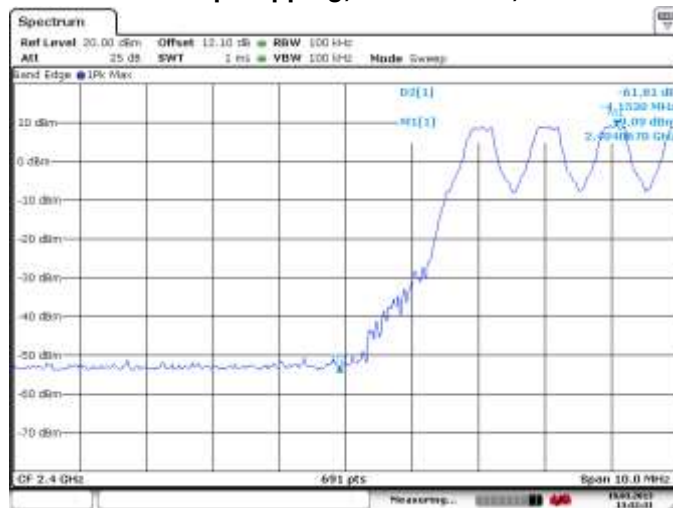


Figure 4-38: Band Edge Compliance
Freq. Hopping, Static PBRS, DH5



Using pattern type “Static PBRS” and packet type “2-DH5” during the measurements.

Bluetooth Channel	Operating Mode	Measured Level (dBc)	Limit (dBc)	Margin (dB)
0	Single Frequency	-56.32	-20	-36.32
78	Single Frequency	-57.81	-20	-37.81
0	Hopping	-59.26	-20	-39.26
78	Hopping	-59.02	-20	-39.02

See figures 4-39 to 4-42 for the plots of the band edge compliance measurements.

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Bluetooth RF Conducted Emission Test Results cont'd

Figure 4-39: Band Edge Compliance
Single Freq., Static PBRS, 2-DH5

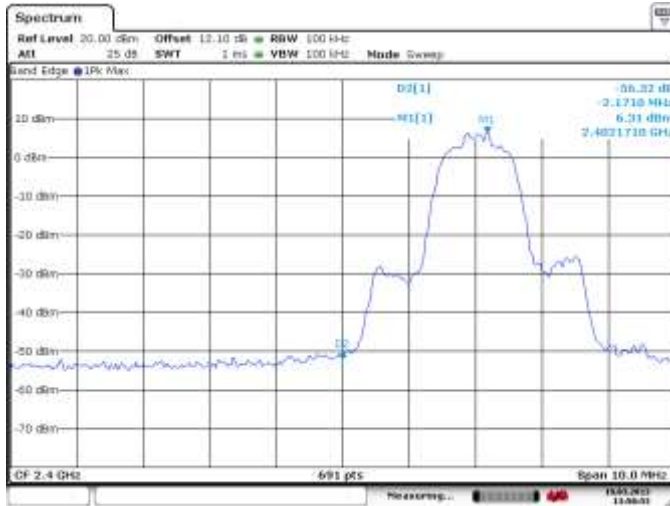


Figure 4-40: Band Edge Compliance
Single Freq., Static PBRS, 2-DH5

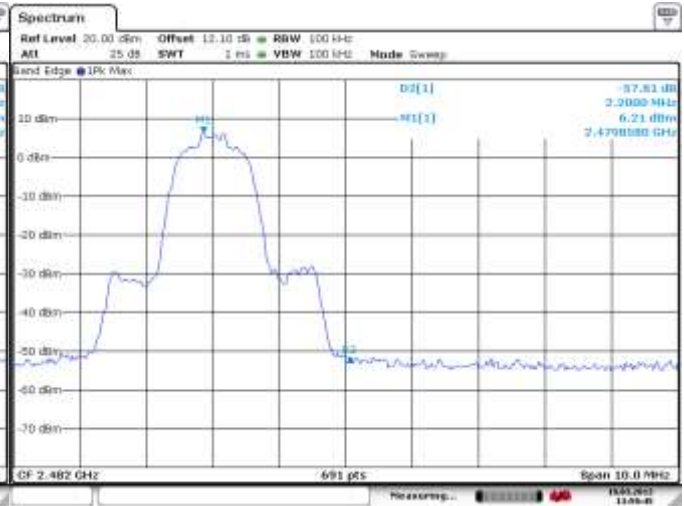


Figure 4-41: Band Edge Compliance
Freq. Hopping, Static PBRS, 2-DH5

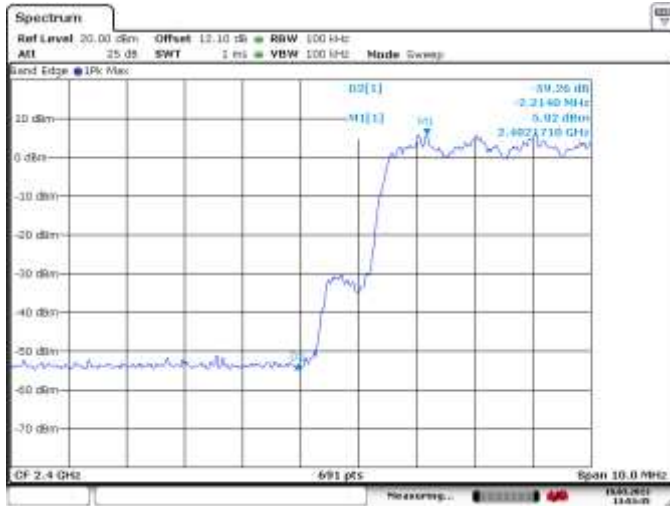
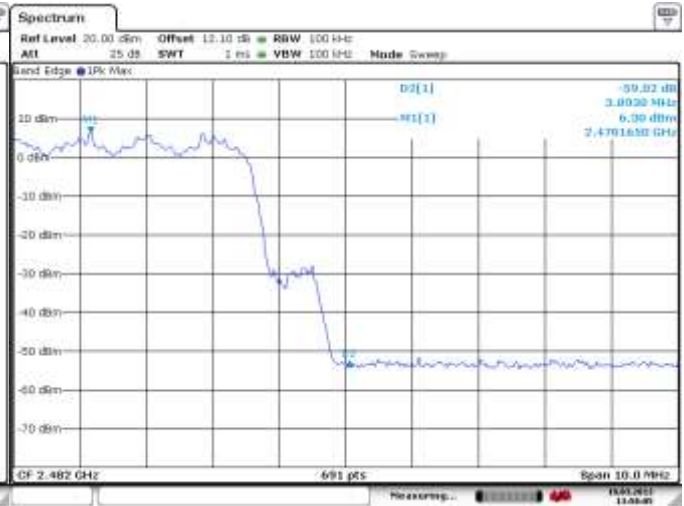


Figure 4-42: Band Edge Compliance
Freq. Hopping, Static PBRS, 2-DH5



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Bluetooth RF Conducted Emission Test Results cont'd

Using pattern type "Static PBRS" and packet type "3-DH5" during the measurements.

Bluetooth Channel	Operating Mode	Measured Level (dBc)	Limit (dBc)	Margin (dB)
0	Single Frequency	-57.28	-20	-37.28
78	Single Frequency	-56.05	-20	-36.05
0	Hopping	-57.69	-20	-37.69
78	Hopping	-59.71	-20	-39.71

See figures 4-43 to 4-46 for the plots of the band edge compliance measurements.

Figure 4-43: Band Edge Compliance
Single Freq., Static PBRS, 3-DH5

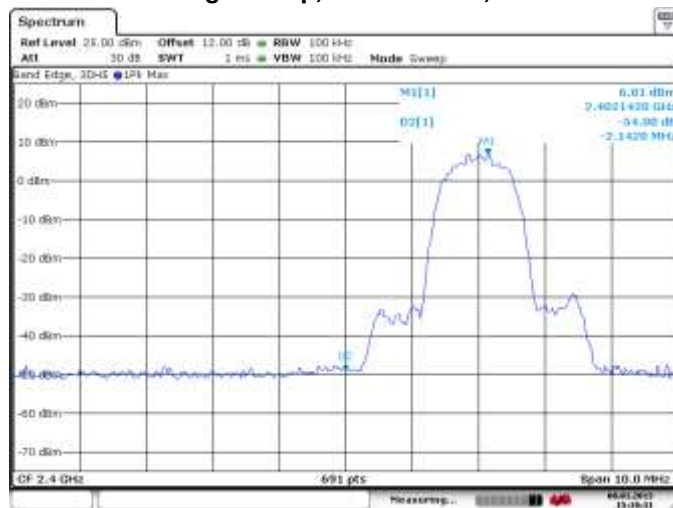
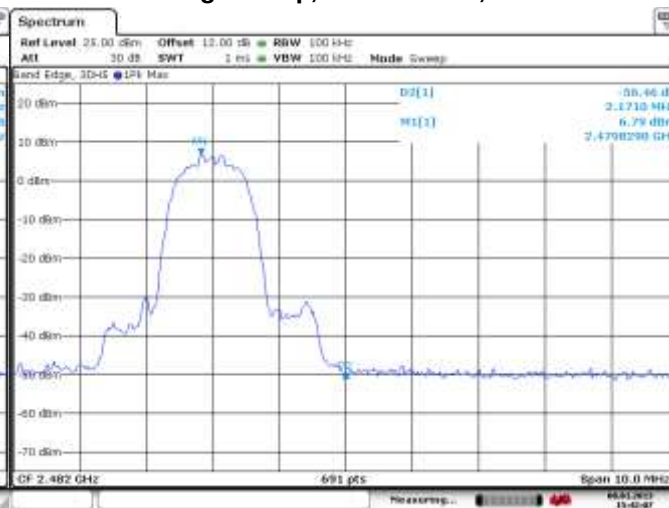


Figure 4-44: Band Edge Compliance
Single Freq., Static PBRS, 3-DH5



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Bluetooth RF Conducted Emission Test Results cont'd

Figure 4-45: Band Edge Compliance
Freq. Hopping, Static PBRS, 3-DH5

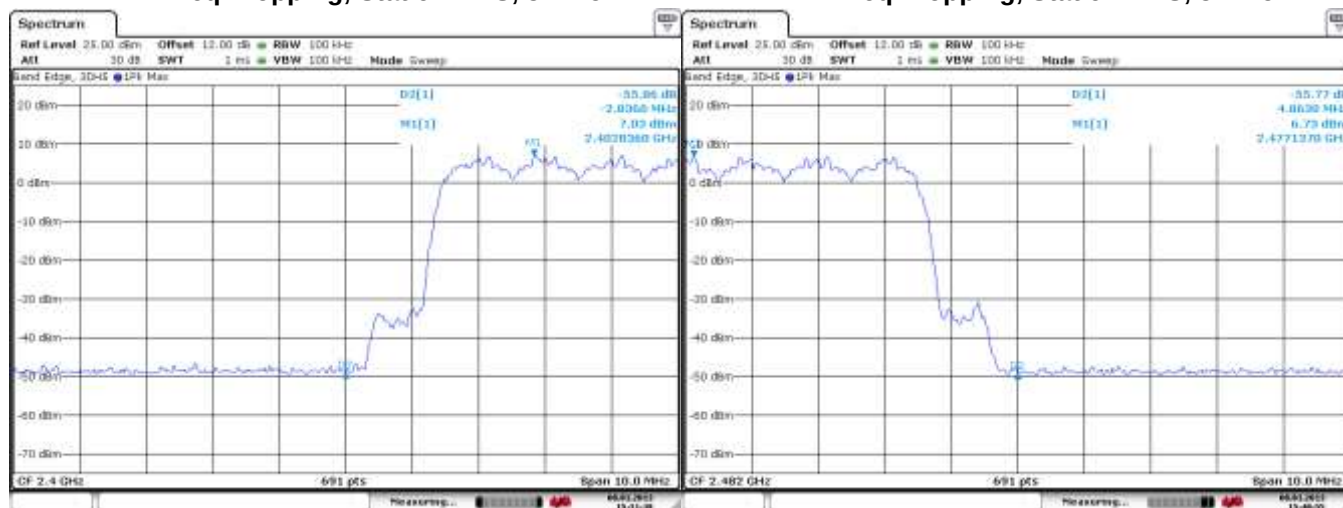
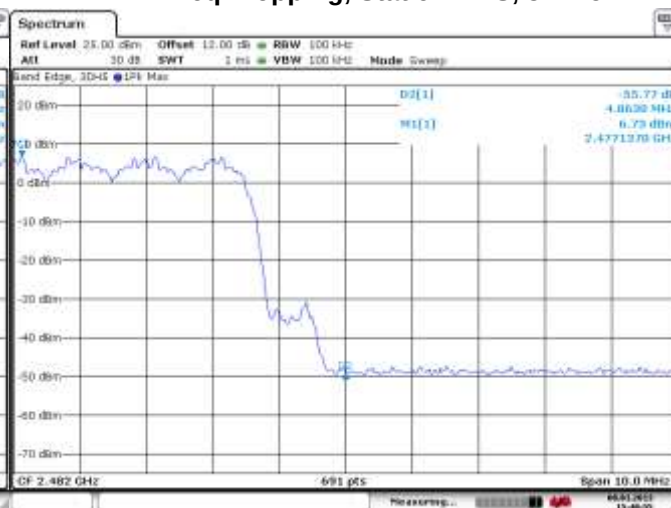


Figure 4-46: Band Edge Compliance
Freq. Hopping, Static PBRS, 3-DH5



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Bluetooth RF Conducted Emission Test Results cont'd

Spurious RF Conducted Emissions

The EUT met the requirements of the spurious RF conducted emissions as per 47 CFR 15.247(c) and RSS-210. Low channel (0), mid channel (39) and high channel (78) were measured. Bluetooth was operating in single frequency and hopping mode. A reference offset of 12.4 dB was applied to the spectrum analyzer reference level for the attenuators and coaxial cable loss in the test circuit.

Using pattern type "Static PBRs" and packet type "DH5" during the measurements.

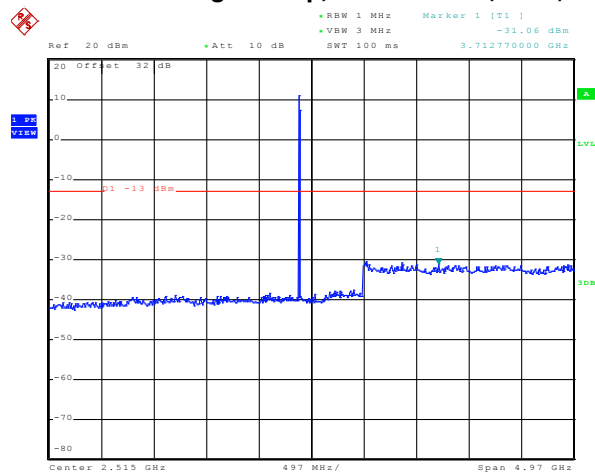
Bluetooth Channel	Channel Power (dBm)	Max. Measured Level (dBm)	Max. Measured Level from carrier (dBc)	Limit (dBc)
0	9.80	-31.06	-40.86	-20.00
39	10.20	-31.91	-42.11	-20.00
78	9.90	-31.88	-41.78	-20.00
Hopping mode	9.80	-31.12	-40.92	-20.00

See figures 4-47 to 4-50 for the plots of the spurious RF conducted emissions.

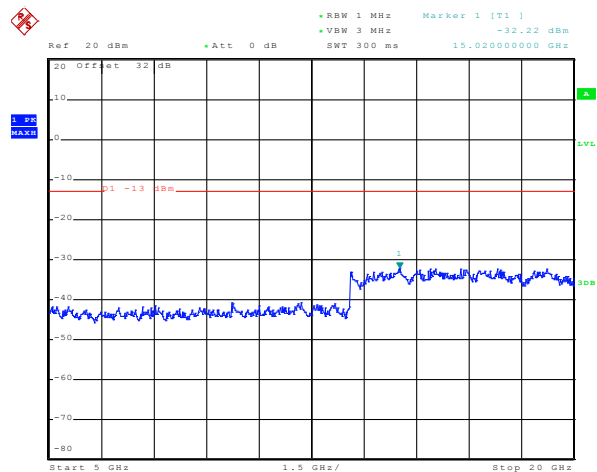
	EMI Test Report for the BlackBerry® smartphone Model RFS121LW APPENDIX 3	
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Bluetooth RF Conducted Emission Test Results cont'd

**Figure 4-47: Spurious RF Conducted Emissions
Single Freq., Static PBRS, DH5,**

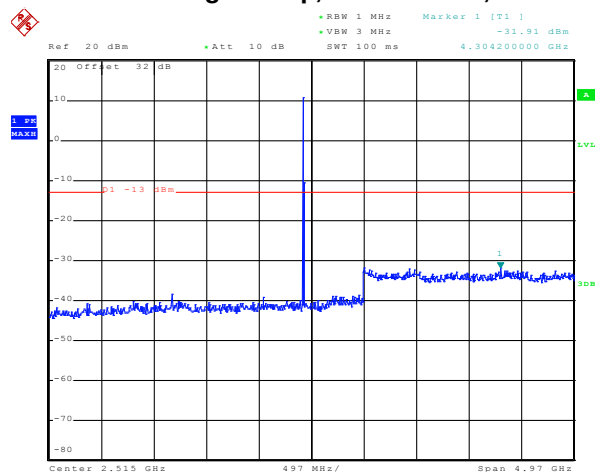


Date: 8.JAN.2013 16:09:57

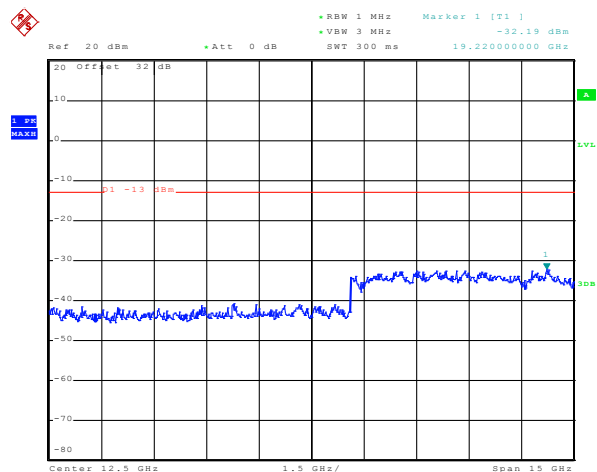


Date: 8.JAN.2013 16:18:05

**Figure 4-48: Spurious RF Conducted Emissions
Single Freq., Static PBRS, DH5**



Date: 8.JAN.2013 16:11:17

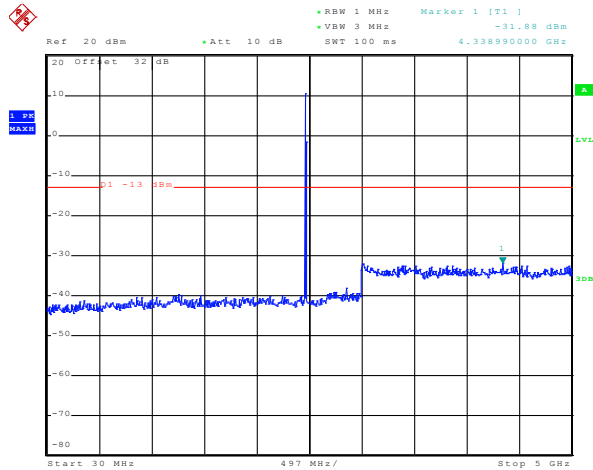


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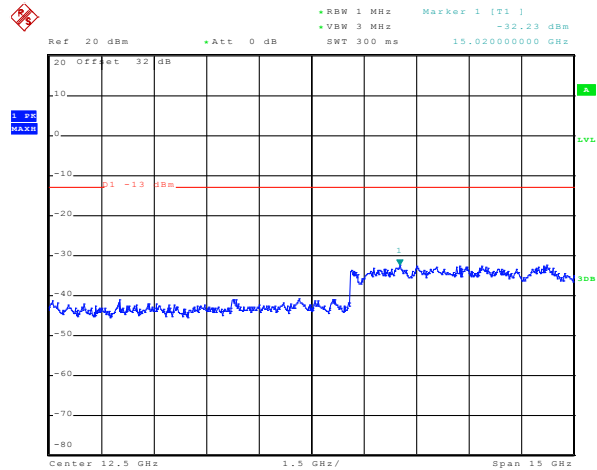
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Bluetooth RF Conducted Emission Test Results cont'd

**Figure 4-49: Spurious RF Conducted Emissions
Single Freq., Static PBRS, DH5**

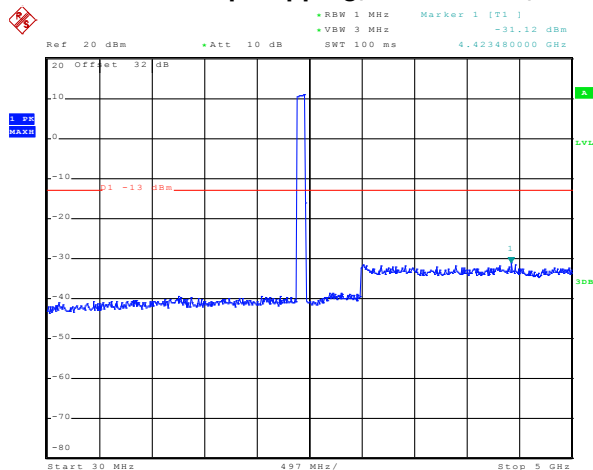


Date: 8.JAN.2013 16:12:06

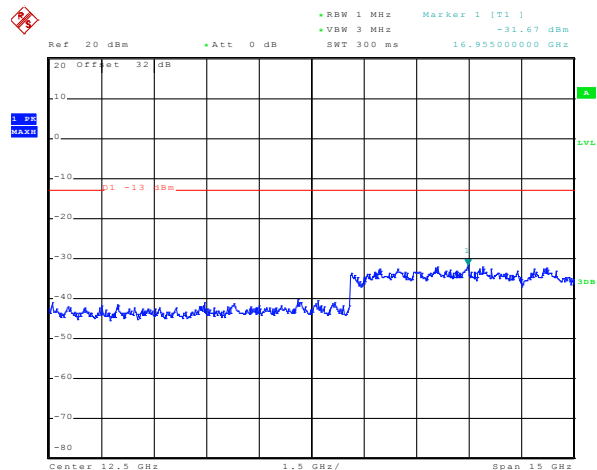


Date: 8.JAN.2013 16:19:48

**Figure 4-50: Spurious RF Conducted Emissions
Freq. Hopping, Static PBRS, DH5**



Date: 8.JAN.2013 16:13:55



Date: 8.JAN.2013 16:20:38

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW APPENDIX 3	
Test Report No. RTS-6036-1304-60	Dates of Test March 06 to May 03, 2012	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW

Bluetooth RF Conducted Emission Test Results cont'd

Using pattern type "Static PBRS" and packet type "2-DH5" during the measurements.

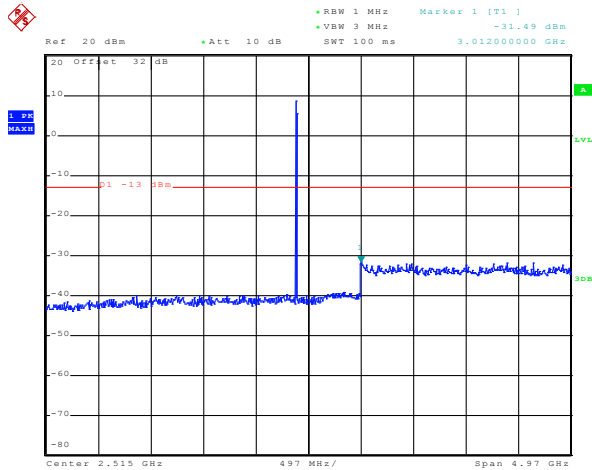
Bluetooth Channel	Channel Power (dBm)	Max. Measured Level (dBm)	Max. Measured Level from carrier (dBc)	Limit (dBc)
0	6.40	-31.49	-37.89	-20.00
39	6.60	-32.08	-38.68	-20.00
78	6.50	-32.16	-38.66	-20.00
Hopping mode	6.40	-31.24	-37.64	-20.00

See figures 4-51 to 4-54 for the plots of the spurious RF conducted emissions.

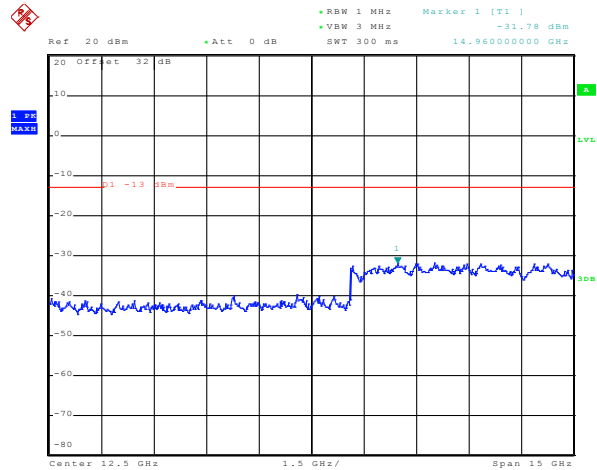
	EMI Test Report for the BlackBerry® smartphone Model RFS121LW APPENDIX 3	
Test Report No. RTS-6036-1304-60	Dates of Test March 06 to May 03, 2012	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW

Bluetooth RF Conducted Emission Test Results cont'd

**Figure 4-51: Spurious RF Conducted Emissions
Single Freq., Static PBRS, 2-DH5**

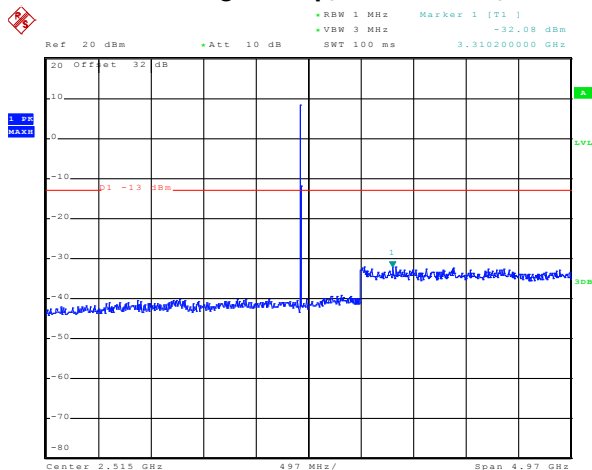


Date: 8.JAN.2013 17:09:13

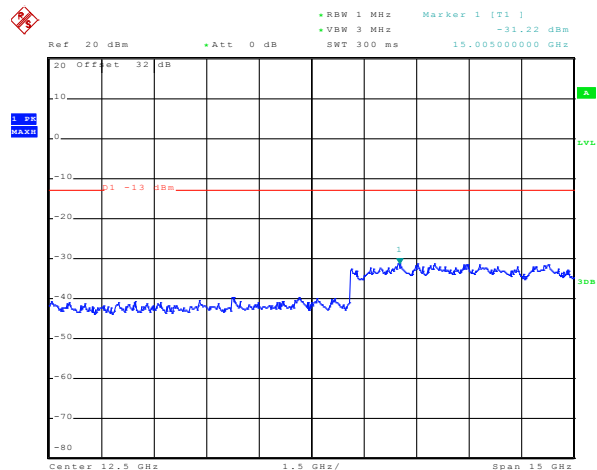


Date: 8.JAN.2013 16:25:30

**Figure 4-52: Spurious RF Conducted Emissions
Single Freq., Static PBRS, 2-DH5**



Date: 8.JAN.2013 17:08:00

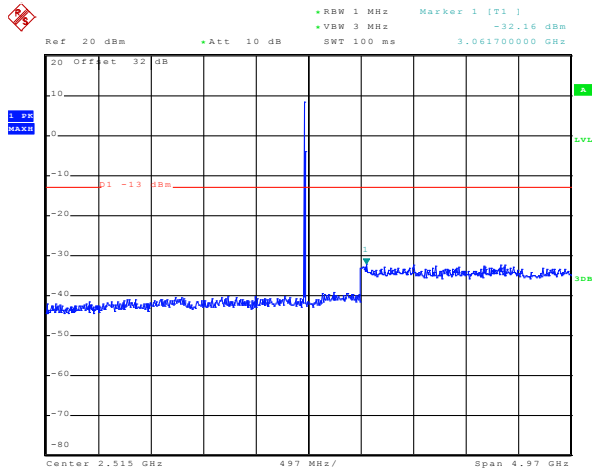


Date: 8.JAN.2013 16:54:55

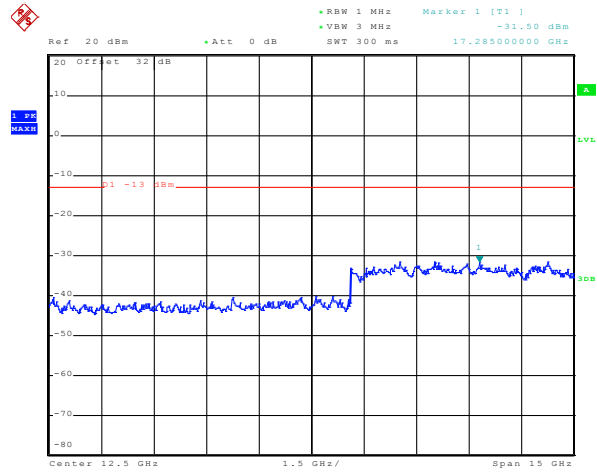
	EMI Test Report for the BlackBerry® smartphone Model RFS121LW APPENDIX 3	
Test Report No. RTS-6036-1304-60	Dates of Test March 06 to May 03, 2012	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW

Bluetooth RF Conducted Emission Test Results cont'd

**Figure 4-53: Spurious RF Conducted Emissions
Single Freq., Static PBRS, 2-DH5**

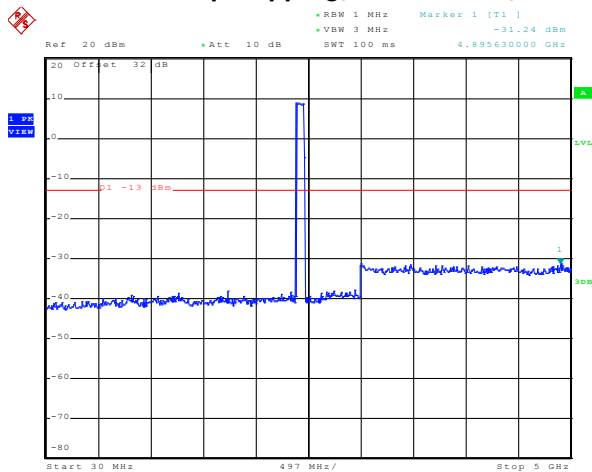


Date: 8.JAN.2013 17:07:18

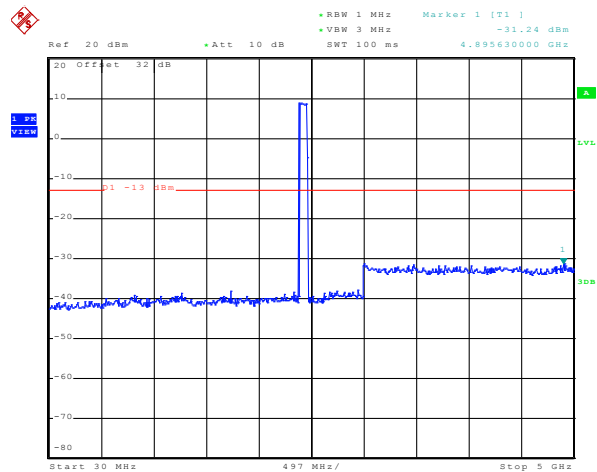


Date: 8.JAN.2013 16:59:08

**Figure 4-54: Spurious RF Conducted Emissions
Freq. Hopping, Static PBRS, 2-DH5**



Date: 8.JAN.2013 17:06:37



Date: 8.JAN.2013 17:06:37

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW APPENDIX 3	
Test Report No. RTS-6036-1304-60	Dates of Test March 06 to May 03, 2012	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW

Bluetooth RF Conducted Emission Test Results cont'd

Using pattern type "Static PBRS" and packet type "3-DH5" during the measurements.

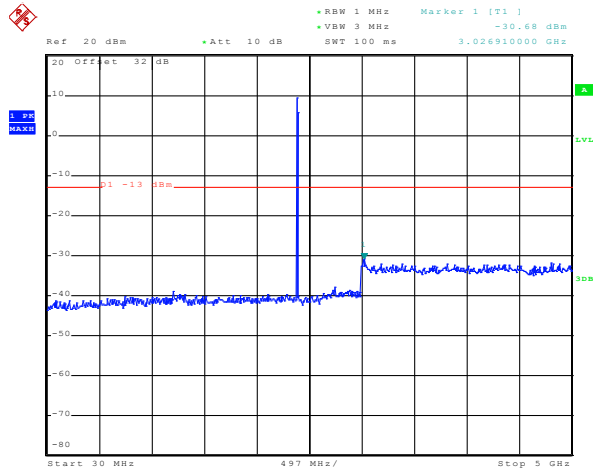
Bluetooth Channel	Channel Power (dBm)	Max. Measured Level (dBm)	Max. Measured Level from carrier (dBc)	Limit (dBc)
0	6.50	-30.68	-37.18	-20.00
39	6.70	-31.61	-38.31	-20.00
78	6.50	-31.26	-37.76	-20.00
Hopping mode	6.50	-30.83	-37.33	-20.00

See figures 4-55 to 4-58 for the plots of the spurious RF conducted emissions.

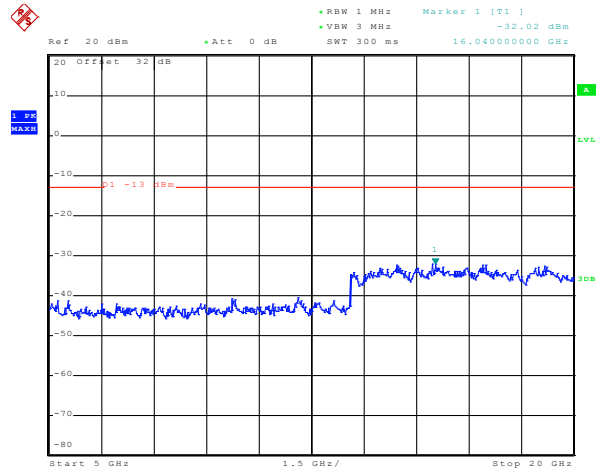
	EMI Test Report for the BlackBerry® smartphone Model RFS121LW APPENDIX 3	
Test Report No. RTS-6036-1304-60	Dates of Test March 06 to May 03, 2012	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW

Bluetooth RF Conducted Emission Test Results cont'd

**Figure 4-55: Spurious RF Conducted Emissions
Single Freq., Static PBRS, 3-DH5**

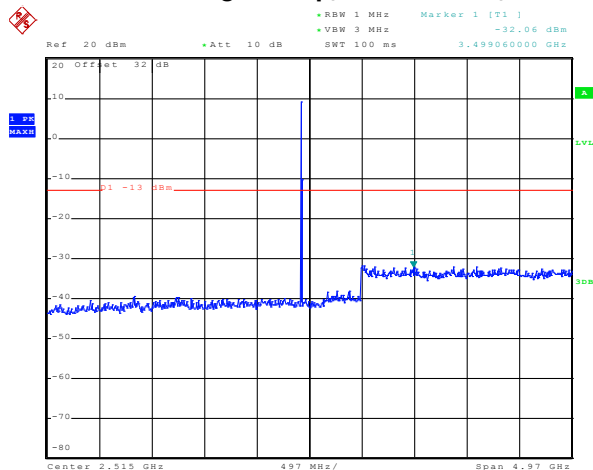


Date: 9.JAN.2013 10:52:25

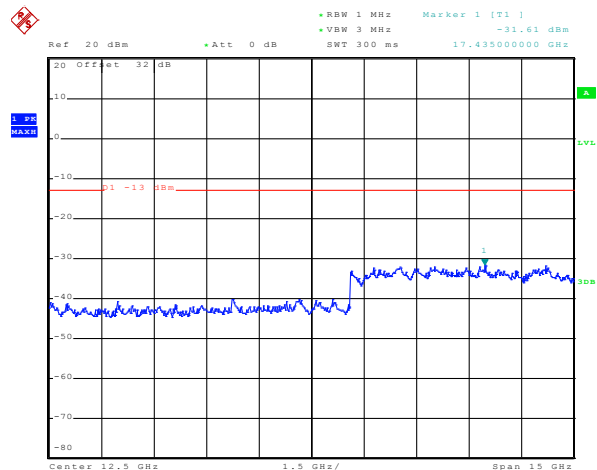


Date: 9.JAN.2013 11:07:28

**Figure 4-56: Spurious RF Conducted Emissions
Single Freq., Static PBRS, 3-DH5**



Date: 9.JAN.2013 10:53:18

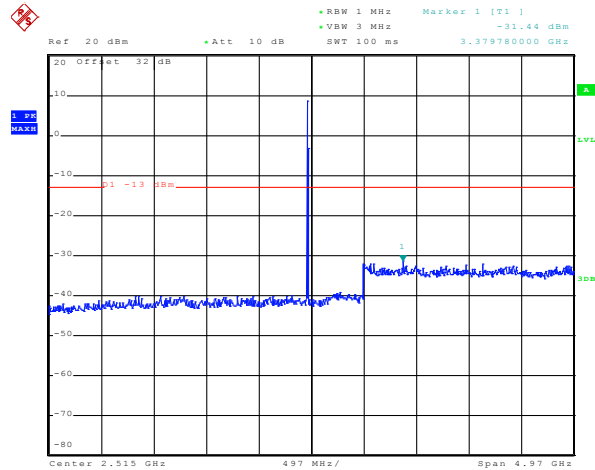


Date: 9.JAN.2013 11:06:47

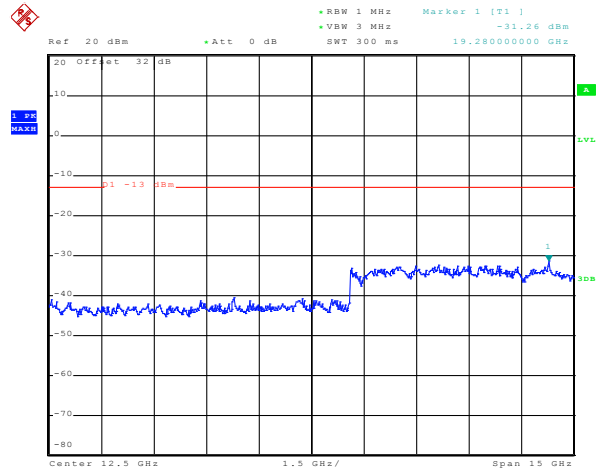
	EMI Test Report for the BlackBerry® smartphone Model RFS121LW APPENDIX 3	
Test Report No. RTS-6036-1304-60	Dates of Test March 06 to May 03, 2012	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW

Bluetooth RF Conducted Emission Test Results cont'd

**Figure 4-57: Spurious RF Conducted Emissions
Single Freq., Static PBRS, 3-DH5**

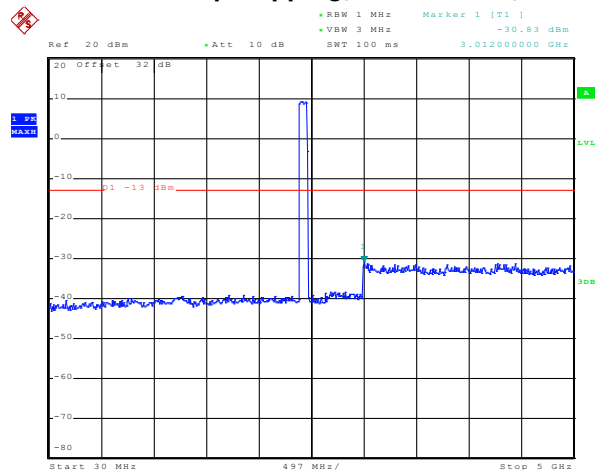


Date: 9.JAN.2013 10:54:23

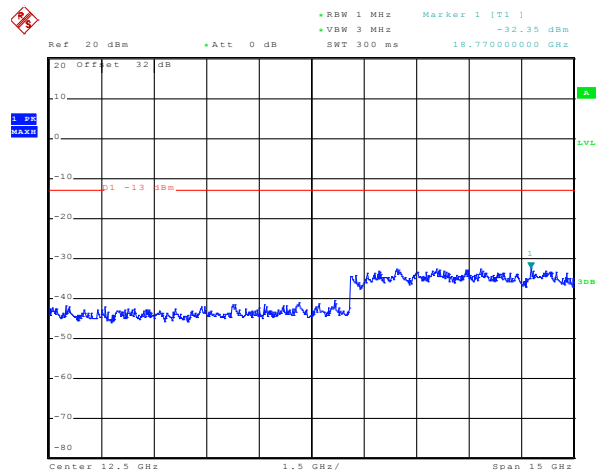


Date: 9.JAN.2013 11:03:17

**Figure 4-58: Spurious RF Conducted Emissions
Freq. Hopping, Static PBRS, 3-DH5**



Date: 9.JAN.2013 10:59:39



Date: 9.JAN.2013 11:01:59

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW APPENDIX 3	
Test Report No. RTS-6036-1304-60	Dates of Test March 06 to May 03, 2012	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW

Bluetooth Low Energy RF Conducted Emission Test Results

6 dB Bandwidth

The EUT met the requirements of the 6 dB bandwidth as per 47 CFR 15.247(a)(2) and RSS-210. Channels 0, 20 and 39 were measured.

Channel	Limit (kHz)	Measured Level (MHz)
0	≥ 500	705.00
20	≥ 500	695.00
39	≥ 500	705.00

See figures 4-59 to 4-61 for the plots of the 6 dB bandwidth measurements for Channels 0, 20, and 39.

**Figure 4-59: 6 dB Bandwidth
LE, Channel 0**



**Figure 4-60: 6 dB Bandwidth
LE, Channel 20**



	EMI Test Report for the BlackBerry® smartphone Model RFS121LW APPENDIX 3	
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Bluetooth Low Energy RF Conducted Emission Test Results cont'd

Figure 4-61: 6 dB Bandwidth
LE, Channel 39



	EMI Test Report for the BlackBerry® smartphone Model RFS121LW APPENDIX 3	
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Bluetooth Low Energy RF Conducted Emission Test Results cont'd

Maximum Conducted Output Power

The EUT met the requirements of the maximum conducted output power of class 2 as per 47 CFR 15.247(b)(3) and RSS-210. Channels 0, 20 and 39 were measured using an Agilent power meter, model N1911A with model N1921A power sensor. A reference offset of 6.4 dB was applied to the power meter reference level for the coaxial cable loss and attenuators in the test circuit.

Channel	Class 2 Limit (W)	Measured Level (dBm)	Measured Level (W)
0	< 1.00	3.21	0.00209
20	< 1.00	3.94	0.00248
39	< 1.00	3.17	0.00207

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Bluetooth Low Energy RF Conducted Emission Test Results cont'd

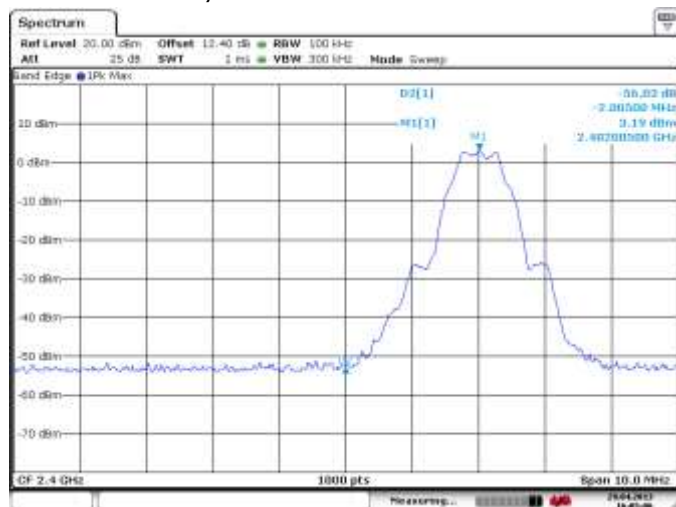
Band Edge Compliance

The EUT met the requirements of the band edge compliance as per 47 CFR 15.247(c) and RSS-210. Channels 0 and 39 were measured.

Channel	Limit (dBc)	Measured Level (dBc)	Margin (dBc)
0	< -20	-55.77	-35.77
39	< -20	-54.52	-34.52

See figures 4-62 to 4-63 for the plots of the band edge compliance measurements for Channels 0 and 39.

**Figure 4-62: Band Edge Compliance
LE, Channel 0**



**Figure 4-63: Band Edge Compliance
LE, Channel 39**



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Bluetooth Low Energy RF Conducted Emission Test Results cont'd

Peak Power Spectral Density

The EUT met the requirements of the peak power spectral density as per 47 CFR 15.247(d) and RSS-210. Channels 0, 20 and 39 were measured.

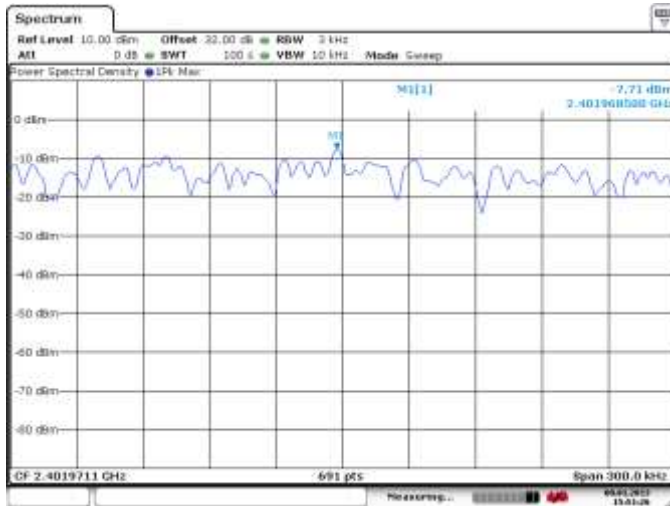
Channel	Limit (dBm)	Measured Level (dBm)	Margin (dBm)
0	< 8.00	-7.71	-15.71
20	< 8.00	-8.19	-16.19
39	< 8.00	-8.52	-16.52

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Test Report No. RTS-6036-1304-60	Dates of Test March 06 to May 03, 2012	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW

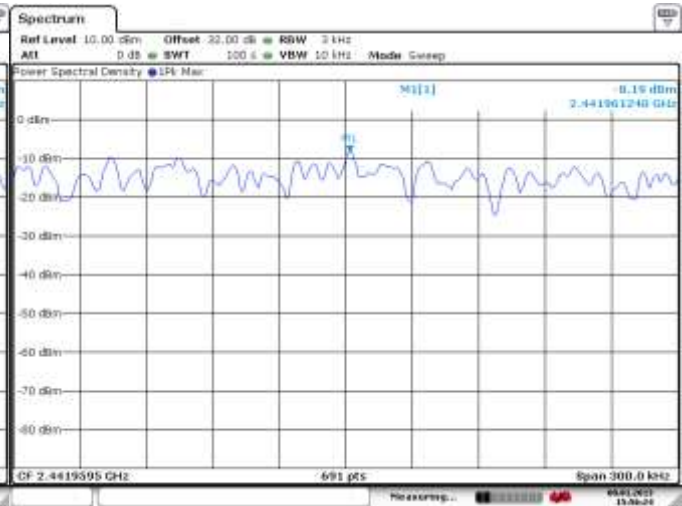
Bluetooth Low Energy RF Conducted Emission Test Results cont'd

See figures 4-64 to 4-66 for the plots of the peak power spectral density for Channels 0, 20 and 39.

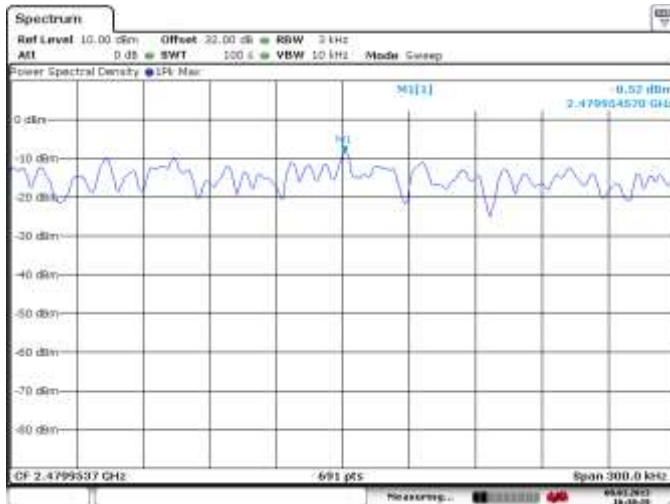
**Figure 4-64: Peak Power Spectral Density
LE, Channel 0**



**Figure 4-65: Peak Power Spectral Density
LE, Channel 20**



**Figure 4-66: Peak Power Spectral Density
LE, Channel 39**

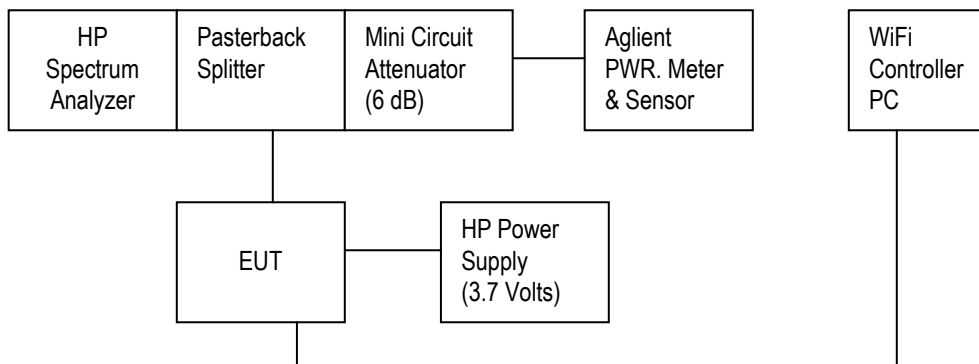


APPENDIX 4 – 802.11b/g/n CONDUCTED EMISSIONS TEST DATA/PLOTS

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW APPENDIX 4	
Test Report No. RTS-6036-1304-60	Dates of Test March 06 to May 03, 2012	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW

802.11b/g/n RF Conducted Emission Test Results

Test Setup Diagram



<u>UNIT</u>	<u>MANUFACTURER</u>	<u>MODEL</u>	<u>SERIAL NUMBER</u>
Attenuator 1	Mini-Circuits	BW-S6W2+	0647
Attenuator 2	Mini-Circuits	BW-S6W2+	0648
Attenuator 3	Mini-Circuits	BW-S20-2W263+	1234
Splitter 1	Weinschel	1515	MES 92

A reference offset of 20.4 dB was applied to the spectrum analyzer and 6.6 dB was applied to the Power Meter reference level for the attenuators and coaxial cable loss in the test circuit.

Date of test: April 29, 2013

The measurements on the BlackBerry® smartphone were performed by Berkin Can

The environmental test conditions were: Temperature: 22.8°C
 Relative Humidity: 25.8 %

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW APPENDIX 4	
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802.11b/g/n RF Conducted Emission Test Results cont'd

6 dB Bandwidth

The EUT met the requirements of the 6 dB bandwidth as per 47 CFR 15.247(a)(2) and RSS-210. Channels 1, 6 and 11 were measured at 1 Mbps, 5.5 Mbps, and 11Mbps each for 802.11b mode, 6 Mbps, 24 Mbps, and 54 Mbps each for 802.11g mode, and MCS 0, 4, and 7 for 802.11n mode.

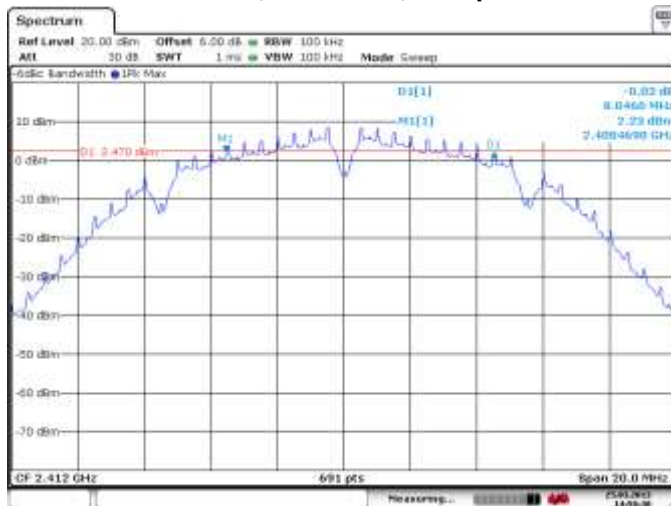
Channel	Data Rate	Limit (kHz)	Measured Level (MHz)
1	1 Mbps	≥ 500	8.05
	5.5 Mbps	≥ 500	8.39
	11 Mbps	≥ 500	8.25
	6 Mbps	≥ 500	15.66
	24 Mbps	≥ 500	16.35
	54 Mbps	≥ 500	16.35
	MCS 0	≥ 500	15.37
	MCS 4	≥ 500	17.28
	MCS 7	≥ 500	16.67
6	1 Mbps	≥ 500	7.55
	5.5 Mbps	≥ 500	8.22
	11 Mbps	≥ 500	8.39
	6 Mbps	≥ 500	15.31
	24 Mbps	≥ 500	16.35
	54 Mbps	≥ 500	16.35
	MCS 0	≥ 500	16.87
	MCS 4	≥ 500	17.21
	MCS 7	≥ 500	17.44
11	1 Mbps	≥ 500	8.05
	5.5 Mbps	≥ 500	7.12
	11 Mbps	≥ 500	7.50
	6 Mbps	≥ 500	15.34
	24 Mbps	≥ 500	15.75
	54 Mbps	≥ 500	15.75
	MCS 0	≥ 500	16.06
	MCS 4	≥ 500	17.35
	MCS 7	≥ 500	17.44

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW APPENDIX 4	
Test Report No. RTS-6036-1304-60	Dates of Test March 06 to May 03, 2012	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW

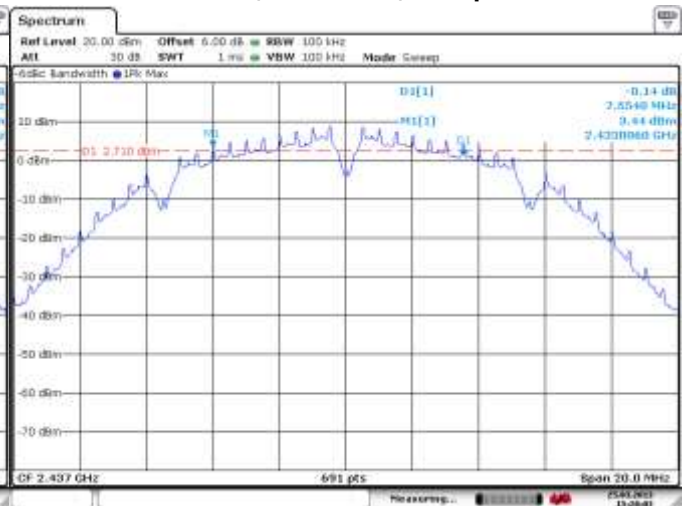
802.11b/g/n RF Conducted Emission Test Results cont'd

See figures 5-1 to 5-9 for the plots of the 6 dB bandwidth measurements for Channels 1, 6, and 11, at 1 Mbps each for 802.11b mode, 6 Mbps each for 802.11g mode, and MCS 0 each for 802.11n mode.

**Figure 5-1: 6 dB Bandwidth
802.11b, Channel 1, 1 Mbps**



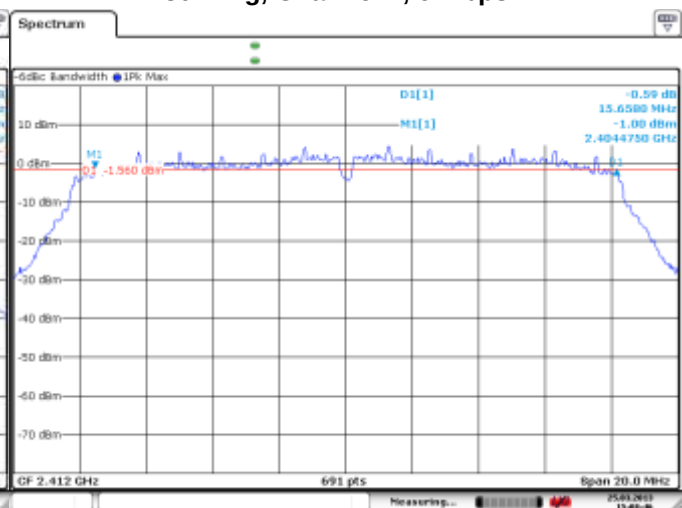
**Figure 5-2: 6 dB Bandwidth
802.11b, Channel 6, 1 Mbps**



**Figure 5-3: 6 dB Bandwidth
802.11b, Channel 11, 1 Mbps**



**Figure 5-4: 6 dB Bandwidth
802.11g, Channel 1, 6 Mbps**



	EMI Test Report for the BlackBerry® smartphone Model RFS121LW APPENDIX 4	
Test Report No. RTS-6036-1304-60	Dates of Test March 06 to May 03, 2012	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW

802.11b/g/n RF Conducted Emission Test Results cont'd

Figure 5-5: 6 dB Bandwidth
802.11g, Channel 6, 6 Mbps

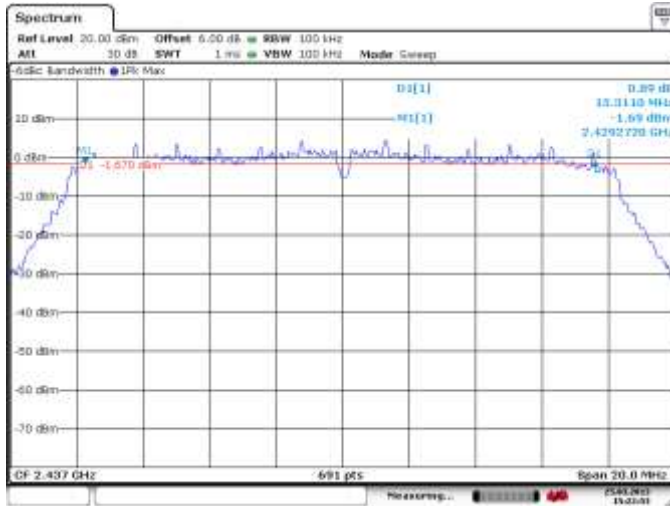


Figure 5-6: 6 dB Bandwidth
802.11g, Channel 11, 6 Mbps

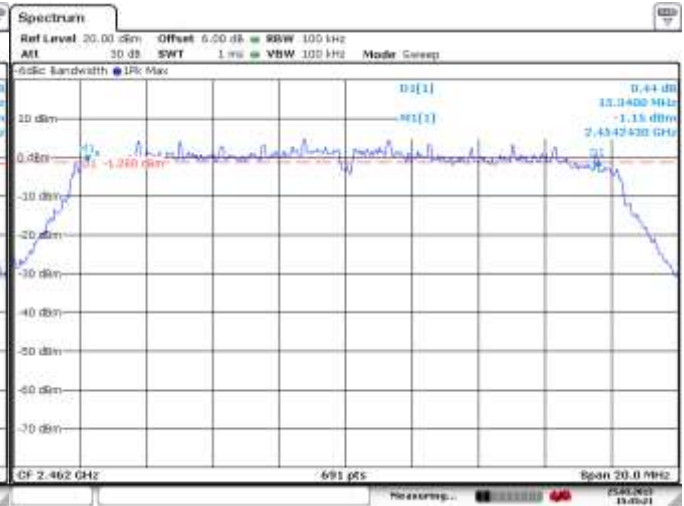


Figure 5-7: 6 dB Bandwidth
802.11n, Channel 1, MCS 0

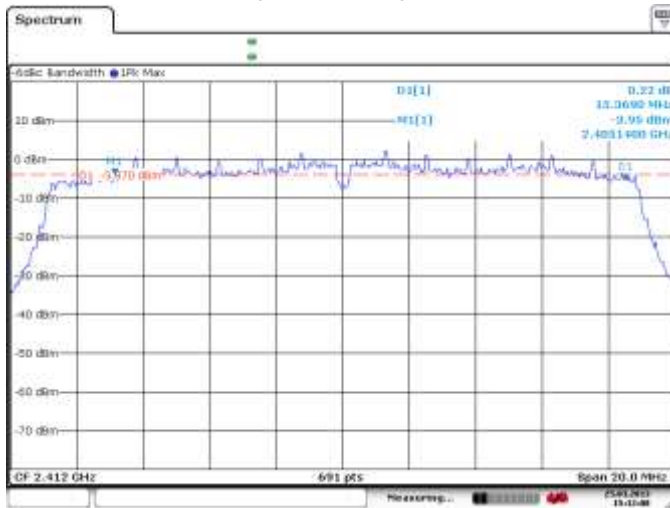
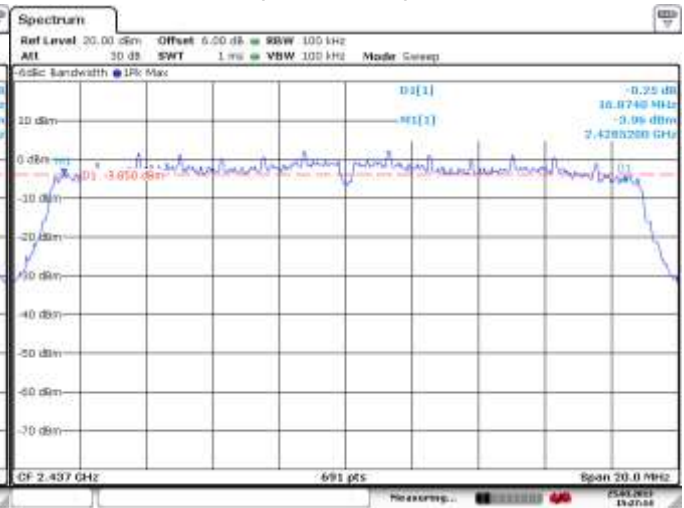
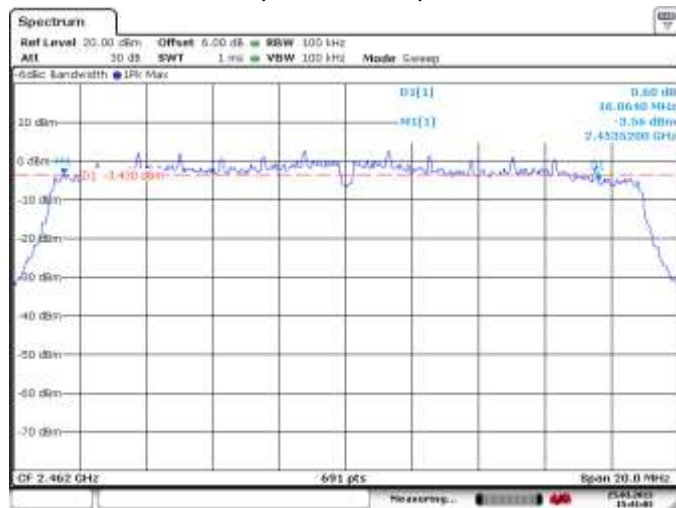


Figure 5-8: 6 dB Bandwidth
802.11n, Channel 6, MCS 0



	EMI Test Report for the BlackBerry® smartphone Model RFS121LW APPENDIX 4	
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Figure 5-9: 6 dB Bandwidth
802.11n, Channel 11, MCS 0



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802.11b/g/n RF Conducted Emission Test Results cont'd

Maximum Conducted Output Power

The EUT met the requirements of the maximum conducted output power of class 2 as per 47 CFR 15.247(b)(3) and RSS-210. Channels 1, 6 and 11 were measured at 1 Mbps, 5.5 Mbps, and 11 Mbps each for 802.11b mode, 6 Mbps, 24 Mbps, and 54 Mbps each for 802.11g mode, and MCS 0, 4 and 7 for 802.11n mode using an Agilent power meter, model N1911A with model N1921A power sensor. A reference offset of 18.4 dB was applied to the power meter reference level for the coaxial cable loss and attenuators in the test circuit.

Channel	Data Rate	Class 2 Limit (W)	Measured Level (dBm)	Measured Level (W)
1	1 Mbps	< 1.00	18.92	0.0780
	5.5 Mbps	< 1.00	18.90	0.0775
	11 Mbps	< 1.00	18.76	0.0752
	6 Mbps	< 1.00	18.57	0.0720
	24 Mbps	< 1.00	18.22	0.0664
	54 Mbps	< 1.00	17.63	0.0579
	MCS 0	< 1.00	18.60	0.0725
	MCS 4	< 1.00	17.97	0.0626
	MCS 7	< 1.00	17.59	0.0574
6	1 Mbps	< 1.00	18.90	0.0775
	5.5 Mbps	< 1.00	18.80	0.0758
	11 Mbps	< 1.00	18.61	0.0725
	6 Mbps	< 1.00	18.46	0.0701
	24 Mbps	< 1.00	18.08	0.0643
	54 Mbps	< 1.00	17.58	0.0572
	MCS 0	< 1.00	18.55	0.0716
	MCS 4	< 1.00	17.85	0.0609
	MCS 7	< 1.00	17.53	0.0567

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW APPENDIX 4	
Test Report No. RTS-6036-1304-60	Dates of Test March 06 to May 03, 2012	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW

802.11b/g/n RF Conducted Emission Test Results cont'd

Channel	Data Rate	Class 2 Limit (W)	Measured Level (dBm)	Measured Level (W)
11	1 Mbps	< 1.00	19.19	0.0830
	5.5 Mbps	< 1.00	19.05	0.0803
	11 Mbps	< 1.00	18.91	0.0778
	6 Mbps	< 1.00	18.65	0.0732
	24 Mbps	< 1.00	18.26	0.0670
	54 Mbps	< 1.00	17.70	0.0589
	MCS 0	< 1.00	18.67	0.0736
	MCS 4	< 1.00	18.03	0.0636
	MCS 7	< 1.00	17.65	0.0582

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW APPENDIX 4	
Test Report No. RTS-6036-1304-60	Dates of Test March 06 to May 03, 2012	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW

802.11b/g/n RF Conducted Emission Test Results cont'd

Band Edge Compliance

The EUT met the requirements of the band edge compliance as per 47 CFR 15.247(c) and RSS-210. Channels 1 and 11 were measured at 1 Mbps, 5.5 Mbps, and 11 Mbps each for 802.11b mode, 6 Mbps, 24 Mbps, and 54 Mbps each for 802.11g mode, and MCS 0, 4 and 7 for 802.11n mode.

Channel	Data Rate	Limit (dBc)	Measured Level (dBc)	Margin (dBc)
1	1 Mbps	< -20	-50.11	-30.11
	5.5 Mbps	< -20	-50.83	-30.83
	11 Mbps	< -20	-50.47	-30.47
	6 Mbps	< -20	-37.23	-17.23
	24 Mbps	< -20	-41.44	-21.44
	54 Mbps	< -20	-41.62	-21.62
	MCS 0	< -20	-41.35	-21.35
	MCS 4	< -20	-44.87	-24.87
	MCS 7	< -20	-44.24	-24.24
11	1 Mbps	< -20	-49.71	-29.71
	5.5 Mbps	< -20	-51.72	-31.72
	11 Mbps	< -20	-53.14	-33.14
	6 Mbps	< -20	-40.60	-20.60
	24 Mbps	< -20	-43.84	-23.84
	54 Mbps	< -20	-43.51	-23.51
	MCS 0	< -20	-41.74	-21.74
	MCS 4	< -20	-44.37	-24.37
	MCS 7	< -20	-46.88	-26.88

See figures 5-10 to 5-15 for the plots of the band edge compliance measurements for Channels 1 and 11, at 1 Mbps each for 802.11b mode, 6 Mbps each for 802.11g mode, and MCS 0 each for 802.11n mode.

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802.11b/g/n RF Conducted Emission Test Results cont'd

Figure 5-10: Band Edge Compliance
802.11b, Channel 1, 1 Mbps

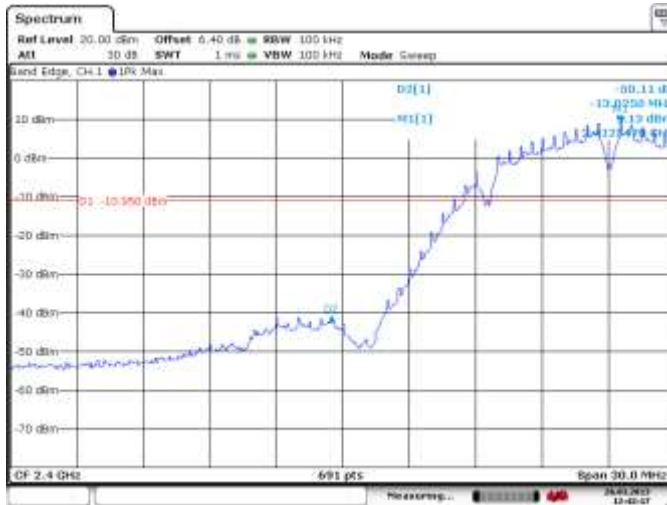


Figure 5-11: Band Edge Compliance
802.11b, Channel 11, 1 Mbps

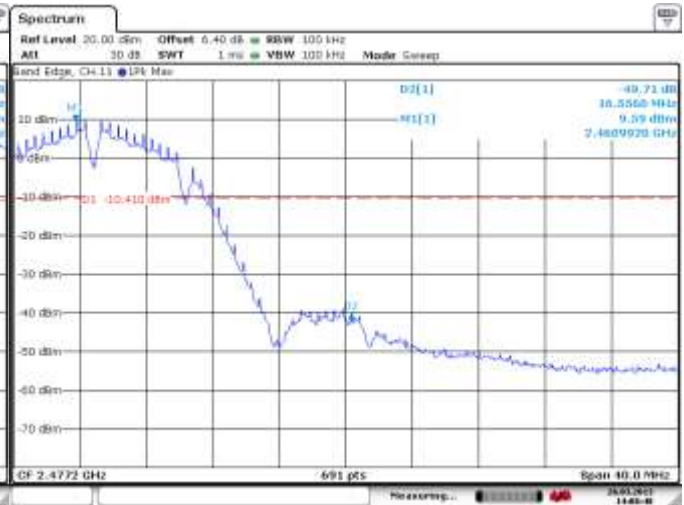


Figure 5-12: Band Edge Compliance
802.11g, Channel 1, 6 Mbps

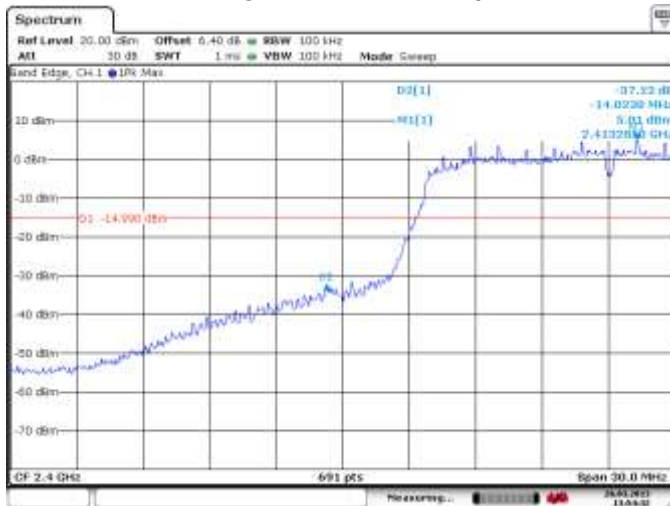
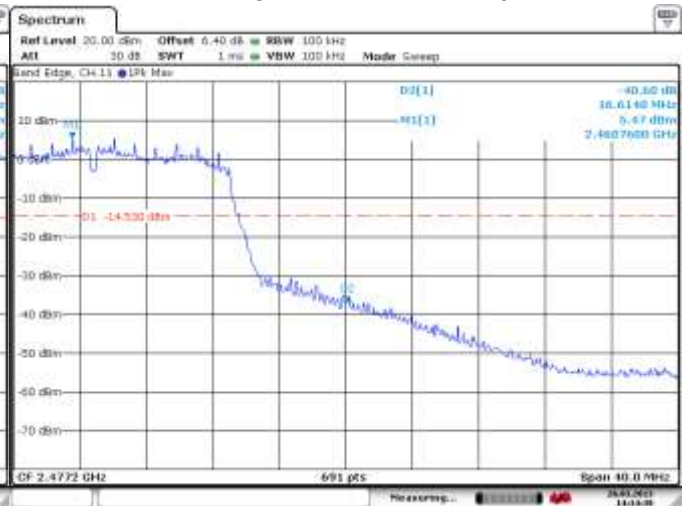


Figure 5-13: Band Edge Compliance
802.11g, Channel 11, 6 Mbps



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802.11b/g/n RF Conducted Emission Test Results cont'd

Figure 5-14: Band Edge Compliance
802.11n, Channel 1, MCS 0

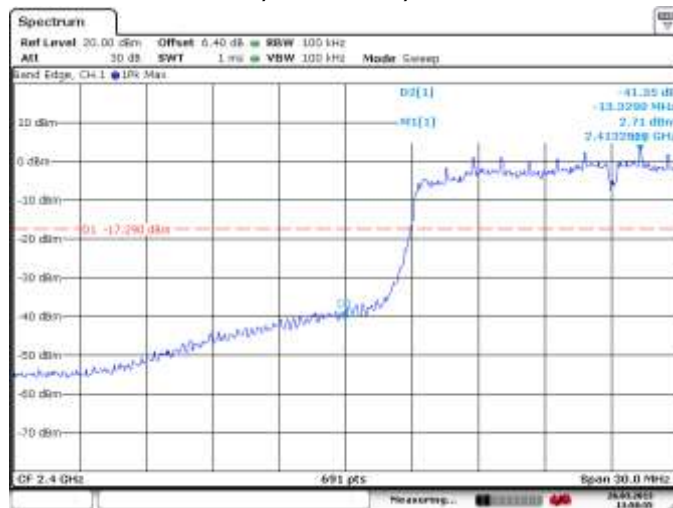


Figure 5-15: Band Edge Compliance
802.11n, Channel 11, MCS 0



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802.11b/g/n RF Conducted Emission Test Results cont'd

Peak Power Spectral Density

The EUT met the requirements of the peak power spectral density as per 47 CFR 15.247(d) and RSS-210. Channels 1, 6 and 11 were measured at 1 Mbps, 5.5 Mbps, and 11 Mbps each for 802.11b mode, 6 Mbps, 24 Mbps, and 54 Mbps each for 802.11g mode, and MCS 0, 4, and 7 for 802.11n mode.

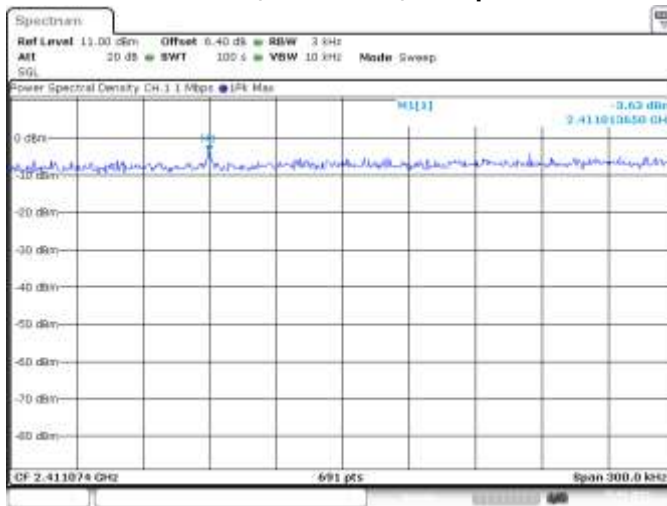
Channel	Data Rate	Limit (dBm)	Measured Level (dBm)	Margin (dBm)
1	1 Mbps	< 8.00	-3.63	-11.63
	5.5 Mbps	< 8.00	-5.36	-13.36
	11 Mbps	< 8.00	-5.72	-13.72
	6 Mbps	< 8.00	-8.82	-16.82
	24 Mbps	< 8.00	-10.36	-18.36
	54 Mbps	< 8.00	-12.39	-20.39
	MCS 0	< 8.00	-10.02	-18.02
	MCS 4	< 8.00	-13.38	-21.38
	MCS 7	< 8.00	-14.35	-22.35
6	1 Mbps	< 8.00	-3.07	-11.07
	5.5 Mbps	< 8.00	-4.87	-12.87
	11 Mbps	< 8.00	-5.43	-13.43
	6 Mbps	< 8.00	-8.06	-16.06
	24 Mbps	< 8.00	-10.13	-18.13
	54 Mbps	< 8.00	-11.63	-19.63
	MCS 0	< 8.00	-10.28	-18.28
	MCS 4	< 8.00	-13.14	-21.14
	MCS 7	< 8.00	-13.70	-21.70
11	1 Mbps	< 8.00	-3.35	-11.35
	5.5 Mbps	< 8.00	-5.05	-13.05
	11 Mbps	< 8.00	-5.30	-13.30
	6 Mbps	< 8.00	-8.49	-16.49
	24 Mbps	< 8.00	-10.19	-18.19
	54 Mbps	< 8.00	-11.13	-19.13
	MCS 0	< 8.00	-11.19	-19.19
	MCS 4	< 8.00	-13.34	-21.34
	MCS 7	< 8.00	-13.59	-21.59

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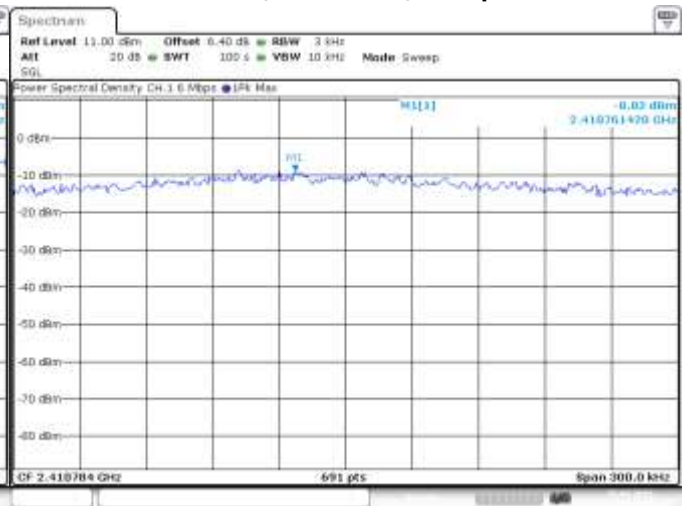
802.11b/g/n RF Conducted Emission Test Results cont'd

See figures 5-16 to 5-24 for the plots of the peak power spectral density for Channels 1, 6 and 11, at 1 Mbps each for 802.11b mode, 6 Mbps each for 802.11g mode, and MCS 0 for 802.11n mode.

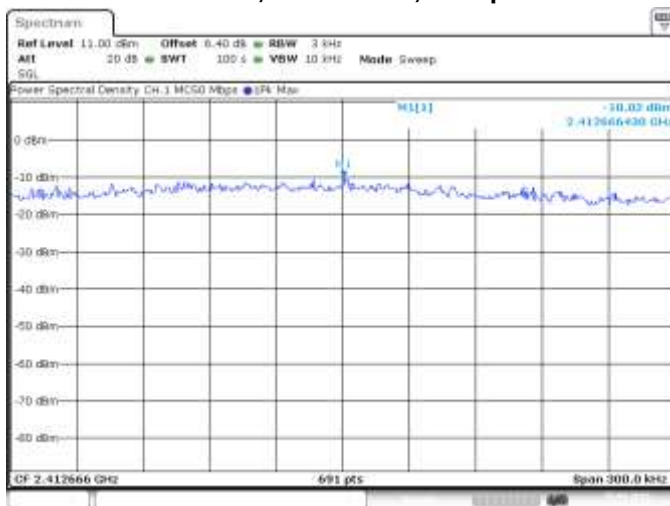
**Figure 5-16: Peak Power Spectral Density
802.11b, Channel 1, 1 Mbps**



**Figure 5-17: Peak Power Spectral Density
802.11b, Channel 6, 1 Mbps**



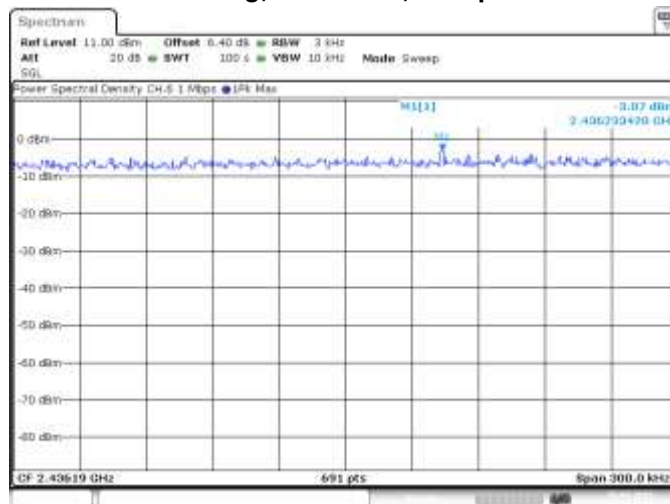
**Figure 5-18: Peak Power Spectral Density
802.11b, Channel 11, 1 Mbps**



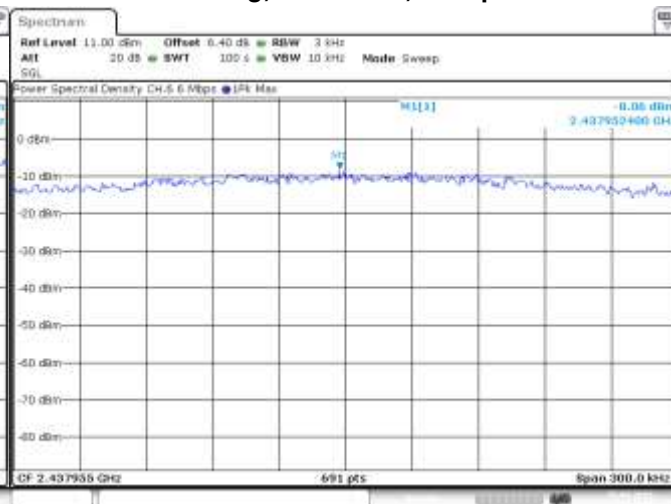
	EMI Test Report for the BlackBerry® smartphone Model RFS121LW APPENDIX 4	
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802.11b/g/n RF Conducted Emission Test Results cont'd

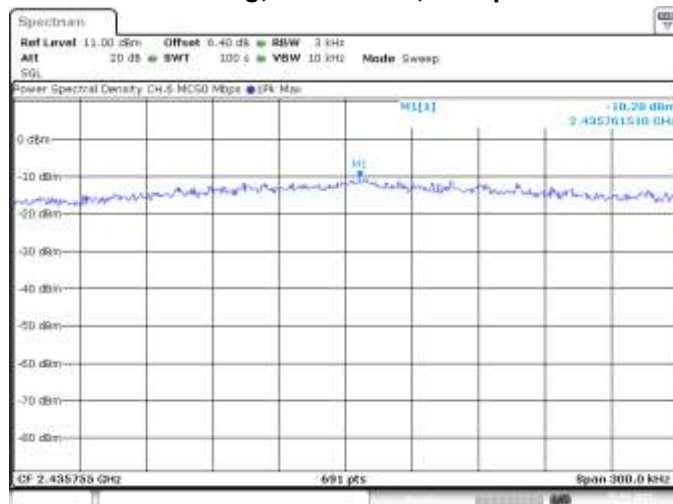
**Figure 5-19: Peak Power Spectral Density
802.11g, Channel 1, 6 Mbps**



**Figure 5-20: Peak Power Spectral Density
802.11g, Channel 6, 6 Mbps**



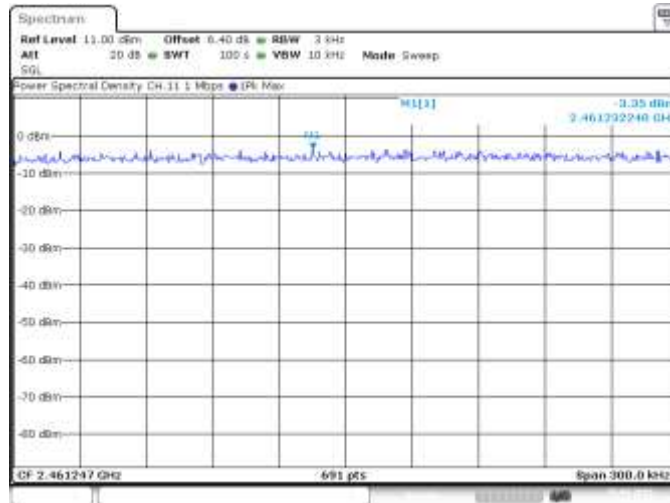
**Figure 5-21: Peak Power Spectral Density
802.11g, Channel 11, 6 Mbps**



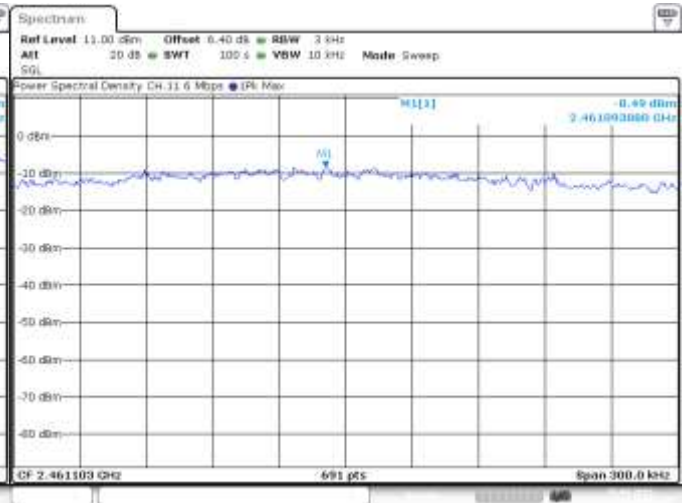
	EMI Test Report for the BlackBerry® smartphone Model RFS121LW APPENDIX 4	
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802.11b/g/n RF Conducted Emission Test Results cont'd

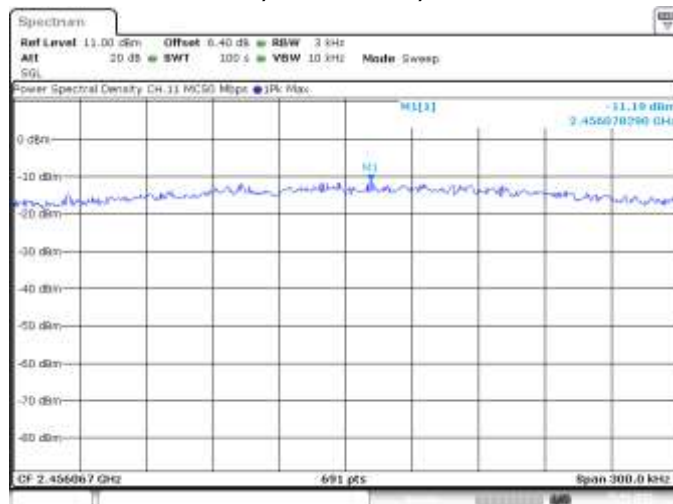
**Figure 5-22: Peak Power Spectral Density
802.11n, Channel 1, MCS 0**



**Figure 5-23: Peak Power Spectral Density
802.11n, Channel 6, MCS 0**



**Figure 5-24: Peak Power Spectral Density
802.11n, Channel 11, MCS 0**



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802.11b/g/n RF Conducted Emission Test Results cont'd

Spurious RF Conducted Emissions

The EUT met the requirements of the spurious RF conducted emissions as per 47 CFR 15.247(c) and RSS-210. Channels 1, 6 and 11 were measured at 1 Mbps, 5.5 Mbps, and 11 Mbps each for 802.11b mode, 6 Mbps, 24 Mbps, and 54 Mbps each for 802.11g mode, and MCS 0, 4, and 7 for 802.11n mode. Peak power was measured using an Agilent power meter, model N1911A with model N1921A power sensor. A reference offset of 18.4 dB was applied to the power meter reference level for the coaxial cable loss and attenuators in the test circuit.

Channel	Data Rate	Power (dBm)	Max. Measured Level (dBm)	Max. Measured Level from Carrier (dBc)	Limit (dBc)
1	1 Mbps	18.21	-32.24	-51.1625821	-20
	5.5 Mbps	18.01	-31.41	-50.3059992	-20
	11 Mbps	18	-32.27	-51.0358082	-20
	6 Mbps	17.72	-25.46	-44.0345367	-20
	24 Mbps	14.91	-27.81	-46.0330567	-20
	54 Mbps	13.46	-27.15	-44.7783856	-20
	MCS 0	17.7	-32.71	-51.3130863	-20
	MCS 4	14.7	-33.06	-51.0283053	-20
	MCS 7	13.28	-32.89	-50.4766323	-20
6	1 Mbps	18.88	-32.82	-51.7154311	-20
	5.5 Mbps	18.663	-32.41	-51.2072146	-20
	11 Mbps	18.61	-32.58	-51.18559	-20
	6 Mbps	17.88	-19.54	-37.9974988	-20
	24 Mbps	15.12	-31.46	-49.5388429	-20
	54 Mbps	13.49	-21.62	-39.196791	-20
	MCS 0	17.95	-32.73	-51.2784451	-20
	MCS 4	14.94	-31.64	-49.4912561	-20
	MCS 7	13.51	-32.55	-50.0833897	-20

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802.11b/g/n RF Conducted Emission Test Results cont'd

Channel	Data Rate	Power (dBm)	Max. Measured Level (dBm)	Max. Measured Level from Carrier (dBc)	Limit (dBc)
11	18.85	-44.00	-32.56	-51.7499113	-20
	18.62	-44.23	-32.88	-51.9261802	-20
	18.57	-48.21	-32.41	-51.3222962	-20
	17.85	-48.43	-24.60	-43.2450575	-20
	15.12	-48.11	-31.76	-50.0217632	-20
	13.52	-48.42	-31.51	-49.2117658	-20
	17.93	-48.37	-32.94	-51.6076632	-20
	14.9	-48.28	-32.65	-50.682683	-20
	13.5	-48.34	-32.59	-50.2411595	-20

The emissions were in the NF.

See figures 5-25 to 5-33 for the plots of the spurious RF conducted emissions for Channels 1, 6 and 11, at 1 Mbps each for 802.11b mode, 6 Mbps each for 802.11g mode, and MCS 0 each for 802.11n mode.

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802.11b/g/n RF Conducted Emission Test Results cont'd

Figure 5-25: Spurious Conducted RF Emissions
802.11b, Channel 1, 1 Mbps

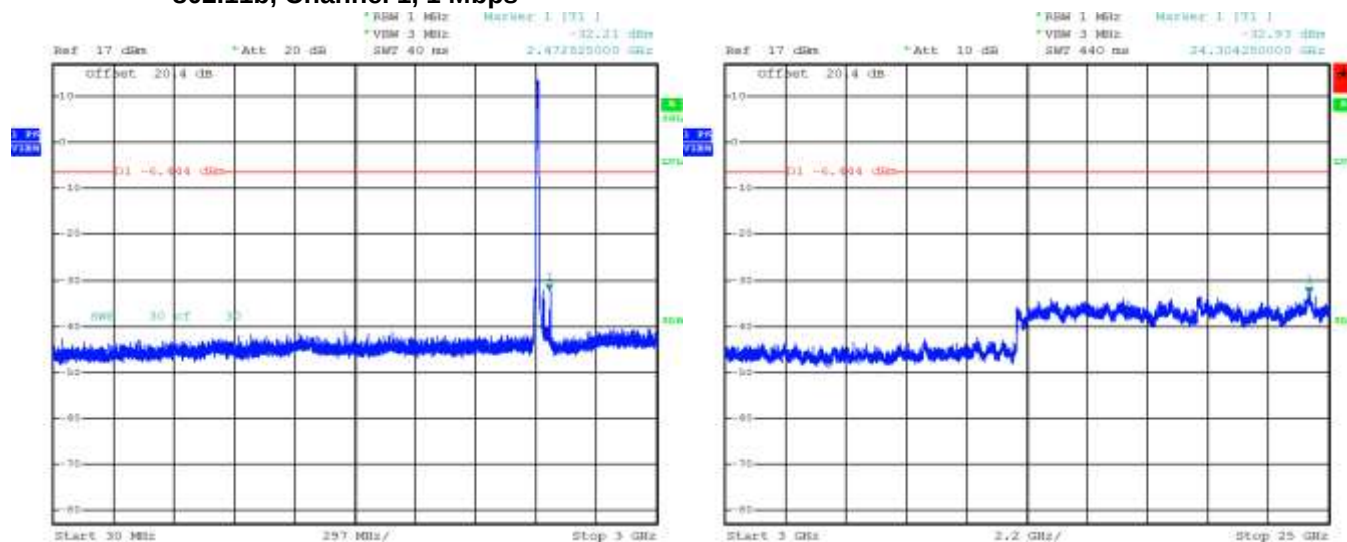
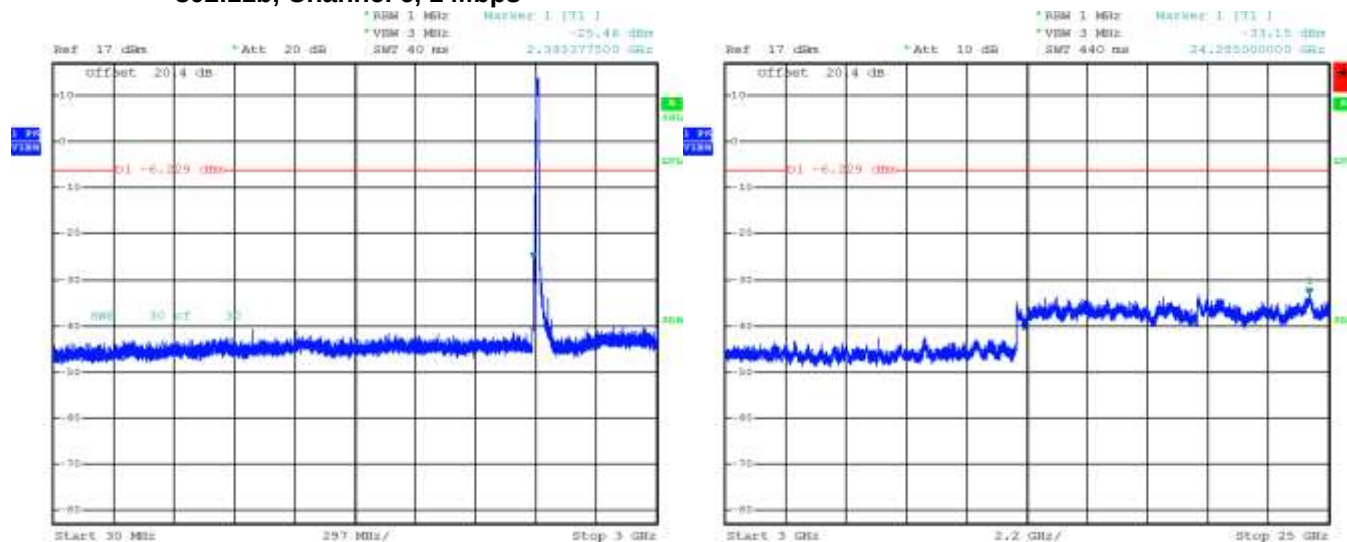


Figure 5-26 : Spurious Conducted RF Emissions
802.11b, Channel 6, 1 Mbps



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802.11b/g/n RF Conducted Emission Test Results cont'd

Figure 5-27: Spurious Conducted RF Emissions
802.11b, Channel 11, 1 Mbps

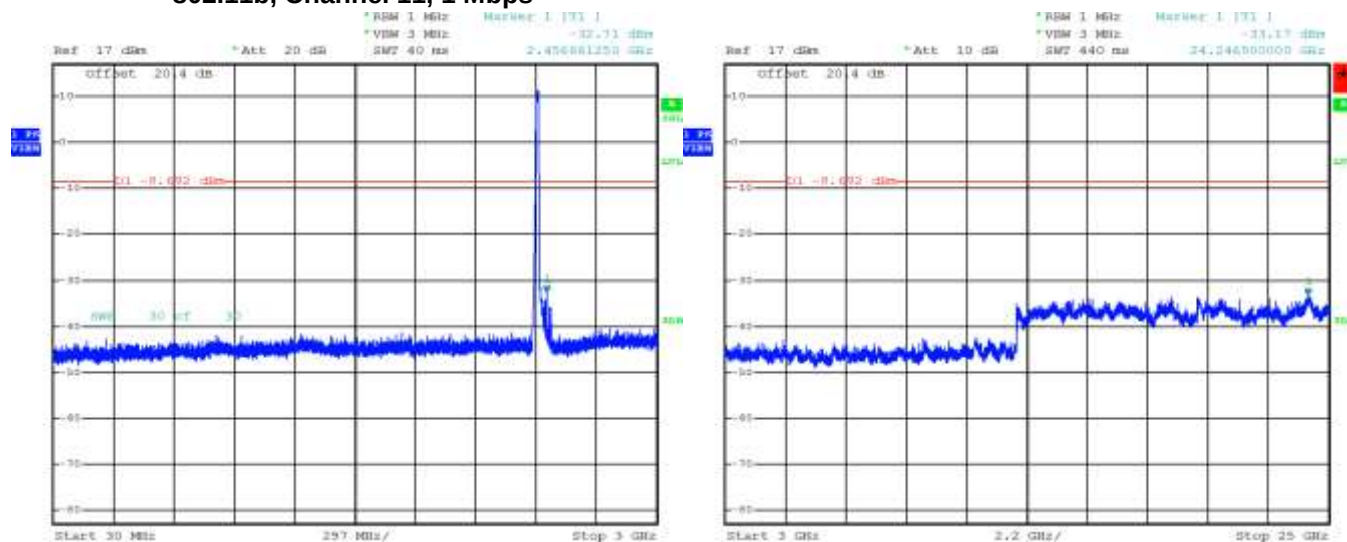
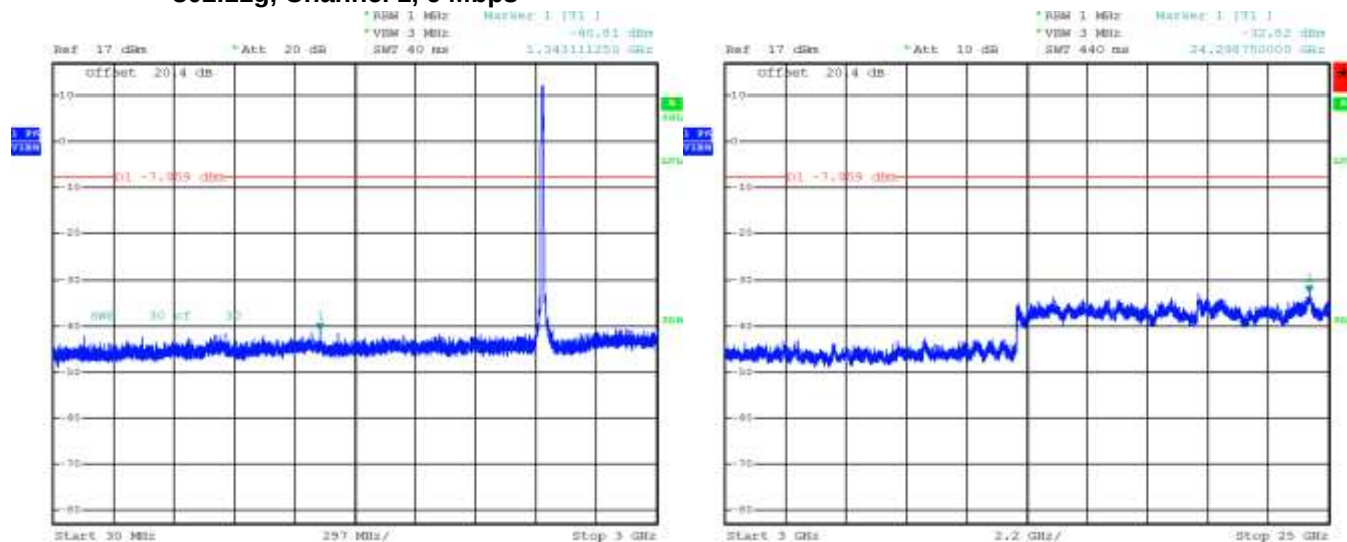


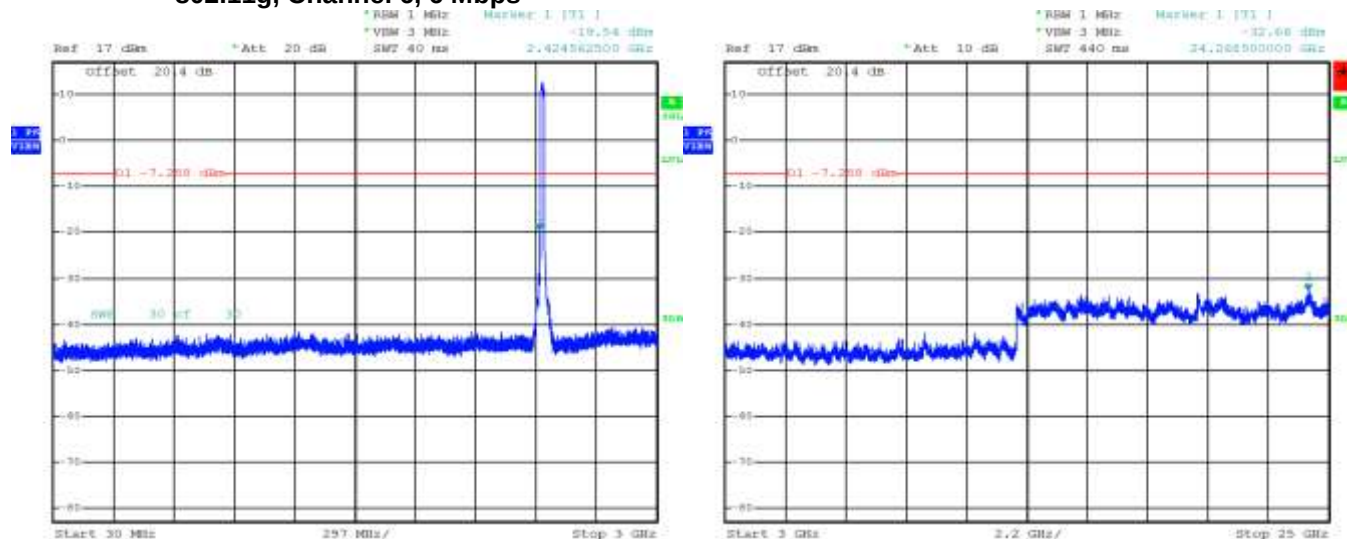
Figure 5-28: Spurious Conducted RF Emissions
802.11g, Channel 1, 6 Mbps



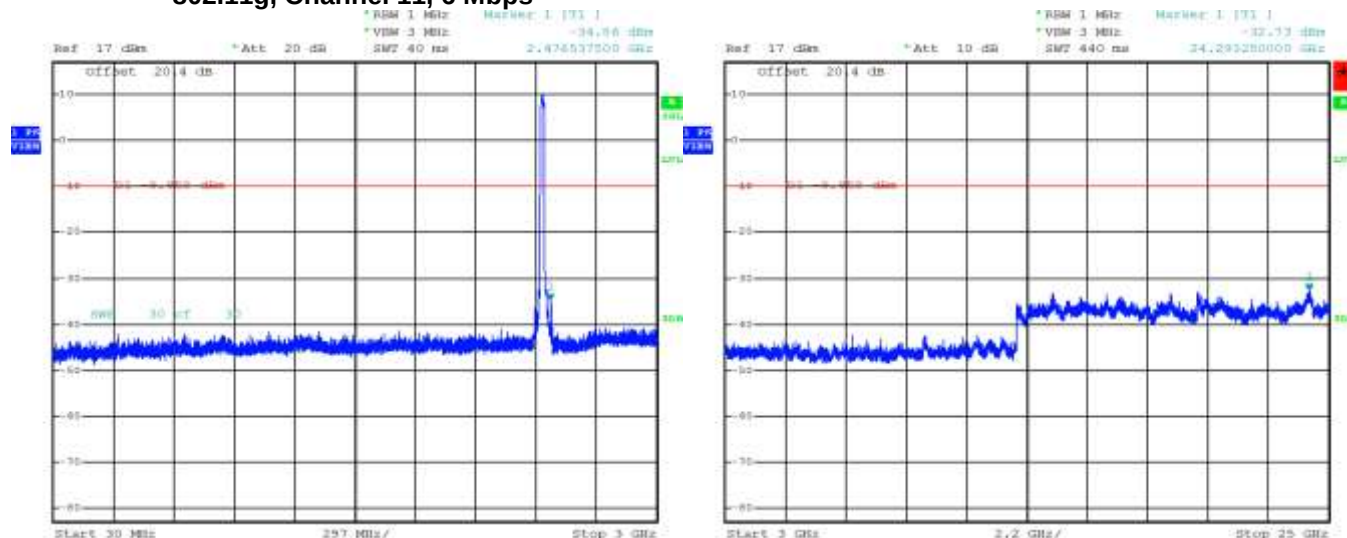
	EMI Test Report for the BlackBerry® smartphone Model RFS121LW APPENDIX 4	
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802.11b/g/n RF Conducted Emission Test Results cont'd

**Figure 5-29: Spurious Conducted RF Emissions
802.11g, Channel 6, 6 Mbps**



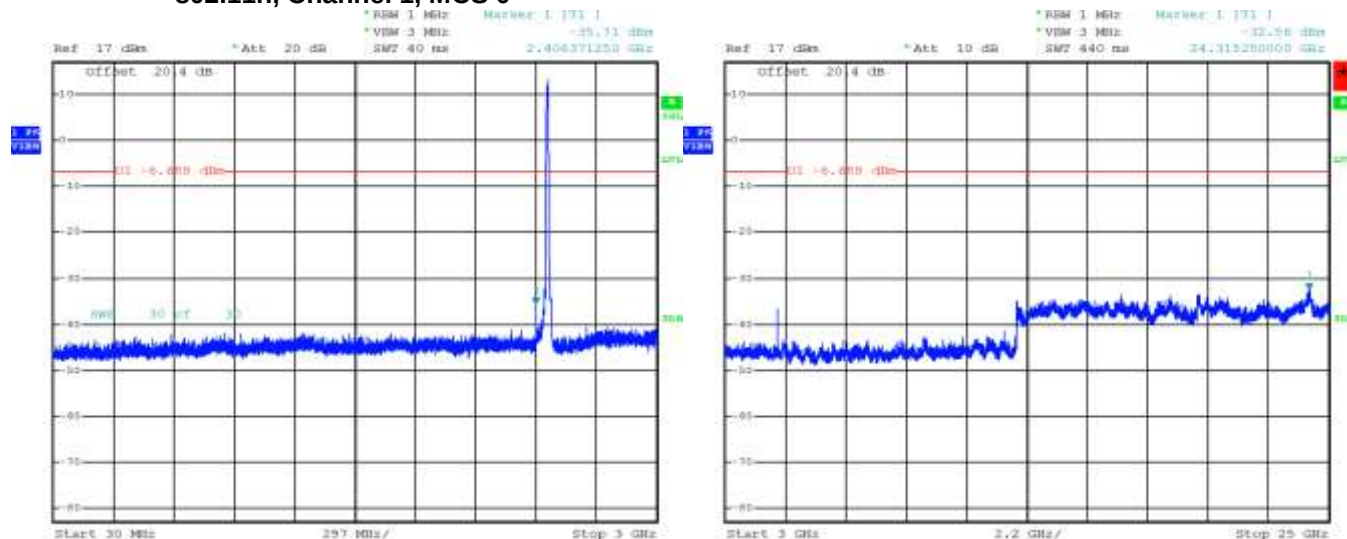
**Figure 5-30: Spurious Conducted RF Emissions
802.11g, Channel 11, 6 Mbps**



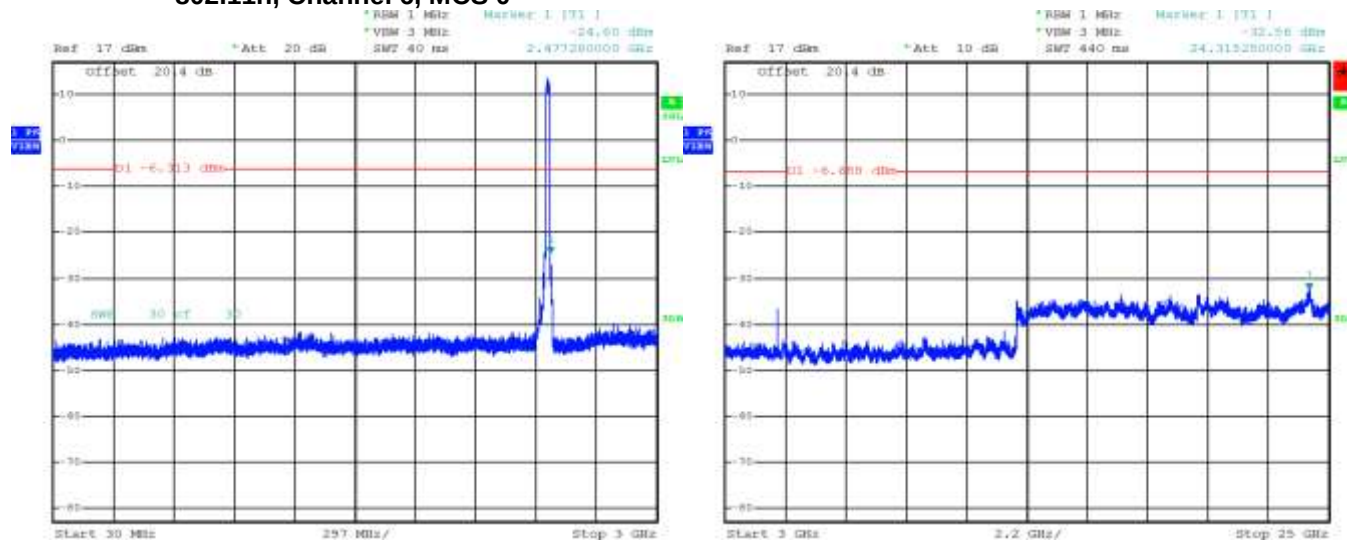
	EMI Test Report for the BlackBerry® smartphone Model RFS121LW APPENDIX 4	
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802.11b/g/n RF Conducted Emission Test Results cont'd

**Figure 5-31: Spurious Conducted RF Emissions
802.11n, Channel 1, MCS 0**



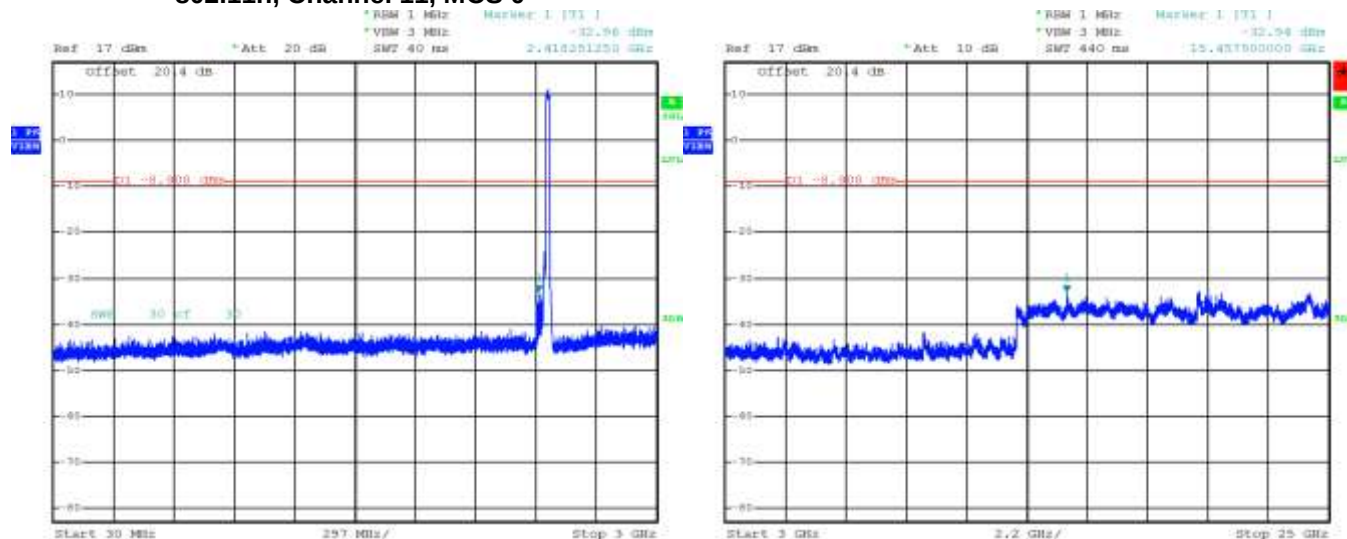
**Figure 5-32: Spurious Conducted RF Emissions
802.11n, Channel 6, MCS 0**



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802.11b/g/n RF Conducted Emission Test Results cont'd

Figure 5-33: Spurious Conducted RF Emissions
802.11n, Channel 11, MCS 0



APPENDIX 5 – NEAR FIELD COMMUNICATIONS TEST DATA/PLOTS

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Test Report No. RTS-6036-1304-60	Dates of Test March 06 to May 03, 2012	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW

Near Field Communications (NFC) Test Results

Radiated Emissions

Date of Test: April 25, 2013

Measurements were performed by Savtej Sandhu.

The environmental test conditions were: Temperature: 25.4°C
Relative Humidity: 18.1 %

The test distance was 3.0 metres with a EUT height of 0.8 metres, and sweep frequency of 9 kHz to 1 GHz.

The BlackBerry® smartphone was in vertical position.

The frequency sweep measurements were performed in Near Field Communications Tx mode at 13.56 MHz.

Frequency (MHz)	Reading (QP) (dBμV)	Correction Factor (dB)	Corrected Reading (QP) (dBμV/m)	Limit (dBμV/m)	Test Margin (dB)
13.558	32.56	18.13	50.69	124.00	-73.31
14.408	24.56	13.19	42.72	69.50	-26.78

All other emissions had a test margin of greater than 25.0 dB.

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Near Field Communications (NFC) Test Results cont'd

Occupied Bandwidth

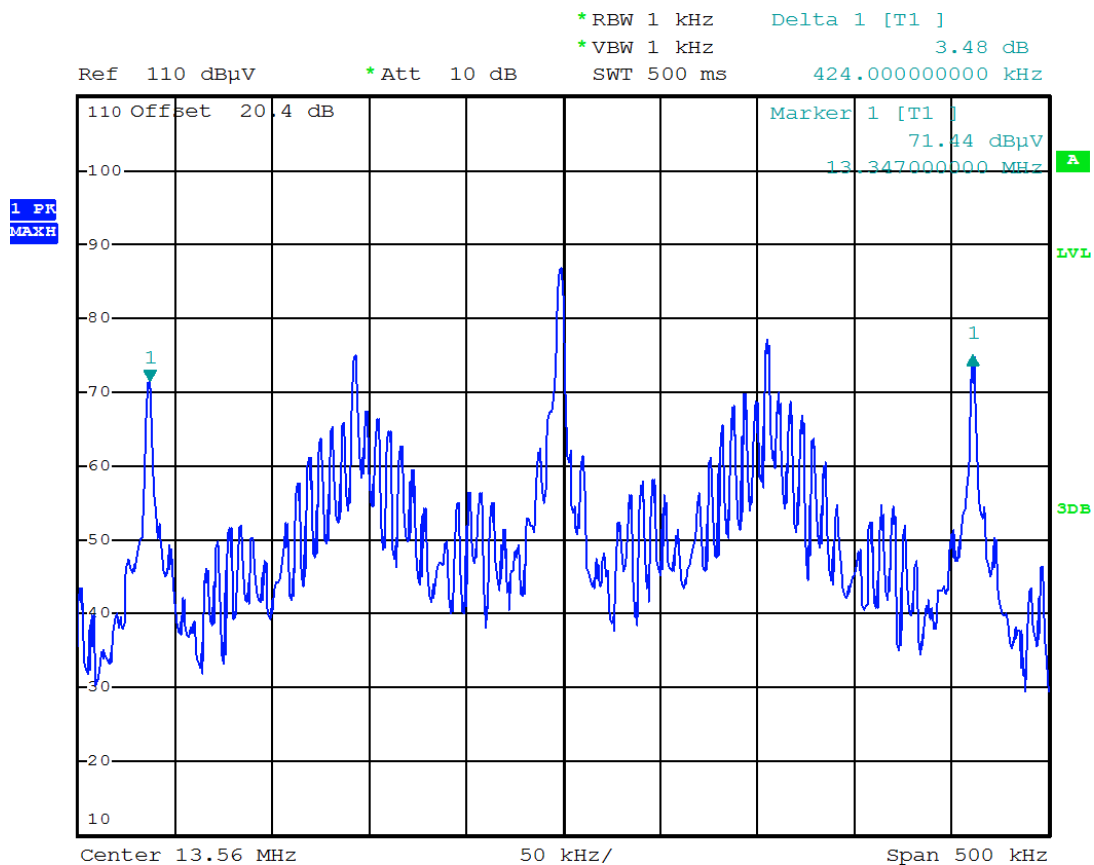
Date of test: May 03, 2013

The measurements were performed by Berkin Can.

The environmental test conditions were: Temperature: 24.2 °C
 Relative Humidity: 23.6 %

Operation mode (TX ON)	Occupied Bandwidth (kHz)
NFC, modulated	424

Figure 7-1: Occupied Bandwidth, NFC TX Frequency = 13.56 MHz



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Near Field Communications (NFC) Test Results cont'd

Frequency Stability

Date of test: May 03, 2013.

The measurements were performed by Berkin Can.

The environmental test conditions were: Temperature: 24.2 °C
Relative Humidity: 23.6 %

Test Temperature (Celsius)	Nominal Freq. (MHz)	Measured Freq. (MHz)	Input Voltage (Volts)	Max Freq Error (Hz)	% Deviation (Limit .01%)	PPM
-20	13.56	13.559622	3.6	-0.000378	-378	-0.00279
-20	13.56	13.559686	3.8	-0.000314	-314	-0.00232
-20	13.56	13.559692	4.35	-0.000308	-308	-0.00227
-10	13.56	13.559570	3.6	-0.000430	-430	-0.00317
-10	13.56	13.559492	3.8	-0.000508	-508	-0.00375
-10	13.56	13.559519	4.35	-0.000481	-481	-0.00355
0	13.56	13.559516	3.6	-0.000484	-484	-0.00357
0	13.56	13.559478	3.8	-0.000522	-522	-0.00385
0	13.56	13.559712	4.35	-0.000288	-288	-0.00212
10	13.56	13.559557	3.6	-0.000443	-443	-0.00327
10	13.56	13.559578	3.8	-0.000422	-422	-0.00311
10	13.56	13.559581	4.35	-0.000419	-419	-0.00309
20	13.56	13.559584	3.6	-0.000416	-416	-0.00307
20	13.56	13.559652	3.8	-0.000348	-348	-0.00257
20	13.56	13.559316	4.35	-0.000684	-684	-0.00504

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Near Field Communications (NFC) Test Results cont'd

Frequency Stability cont'd

Test Temperature (Celsius)	Nominal Freq. (MHz)	Measured Freq. (MHz)	Input Voltage (Volts)	Max Freq Error (Hz)	% Deviation (Limit .01%)	PPM
30	13.56	13.559355	3.6	-0.000645	-645	-0.00476
30	13.56	13.559747	3.8	-0.000253	-253	-0.00187
30	13.56	13.559482	4.35	-0.000518	-518	-0.00382
40	13.56	13.559512	3.6	-0.000488	-488	-0.00360
40	13.56	13.559643	3.8	-0.000357	-357	-0.00263
40	13.56	13.559451	4.35	-0.000549	-549	-0.00405
50	13.56	13.559496	3.6	-0.000504	-504	-0.00372
50	13.56	13.559630	3.8	-0.000370	-370	-0.00273
50	13.56	13.559594	4.35	-0.000406	-406	-0.00299
60	13.56	13.559485	3.6	-0.000515	-515	-0.00380
60	13.56	13.559654	3.8	-0.000346	-346	-0.00255
60	13.56	13.559307	4.35	-0.000693	-693	-0.00511