

EMI Test Report

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



A division of Research In Motion Limited

REPORT NO.: RTS-3933-1105-46_rev1

PRODUCT MODEL NO.: RDU71CW
TYPE NAME: BlackBerry® smartphone
FCC ID: L6ARDU70CW
IC: 2503A-RDU70CW

This report supersedes the report RTS-3993-1105-46 dated May 20, 2011

DATE: July 05, 2011

	EMI Test Report for the BlackBerry® smartphone Model RDU71CW		
Test Report No. RTS-3933-105-46_rev1	Dates of Test February 16, March 31, April 20, May 17 to 31 and June 01, 2011	FCC ID: L6ARDU70CW IC: 2503A-RDU70CW	

Statement of Performance:

The BlackBerry® smartphone, model RDU71CW, part number CER-32268-001 Rev. 4, 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:



Shuo Wang
Regulatory Compliance Specialist
Date: July 05, 2011

Reviewed and Approved by:



Masud S. Attayi, P.Eng.
Manager, Regulatory Compliance
Date: July 05, 2011

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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, 2010
- o FCC CFR 47 Part 15, Subpart E, October, 2010
- o Industry Canada, RSS-210, Issue 8, December 2010, Licence-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. RDU71CW_HW_Declaration_CER-32268_Rev2
2. RDU71CW_HW_Declaration_CER-32268_Rev3
3. RDU71CW_HW_Declaration_CER-32268_Rev4
4. MultiSourceDeclaration_RDU71CW_b421
5. MultiSourceDeclaration_RDU71CW_b825
6. Test Report 1-3016-01-03_11-A
7. Test Report 1-3016-01-04_11-A
8. Test Report 1-3016-01-25_11-A

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 on February 16, March 31, April 20, May 17 to 31 and June 01, 2011.

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The sample EUT included:

SAMPLE	MODEL	CER NUMBER	PIN	SOFTWARE
1	RDU71CW	CER-32268-001 Rev. 1	329F35A2	V6.1.0.16 (Platform:5.0.0.48) Bundle 157
2	RDU71CW	CER-32268-001 Rev. 1	32D4BDA9	V6.1.0.46 (Platform:5.0.0.123) Bundle 421
3	RDU71CW	CER-32268-001 Rev. 2	32D4BD42	MFI Bundle
4	RDU71CW	CER-32268-001 Rev. 4	22E8959A	MFI Bundle
5	RDU71CW	CER-32268-001 Rev. 4	32E895E2	V7.0.0.91 (Platform:5.0.0.261) Bundle 825

AC Line Conducted Emissions testing was performed on sample 5.

Radiated Emissions testing was performed on sample 5.

Conducted Emissions testing was performed on samples 1, 3 and 4.

Near Field Communications testing was performed on samples 2 and 5.

Only the characteristics that may have been affected by the changes from model RDU71CW Rev 1 to RDU71CW Rev 4 were re-tested. For more information, see RDU71CW_HW_Declaration_CER-32268_Rev2, RDU71CW_HW_Declaration_CER-32268_Rev3 and RDU71CW_HW_Declaration_CER-32268_Rev4.

To view the differences between software bundles 157, 421 and 825, see documents MultiSourceDeclaration_RDU71CW_b421 and MultiSourceDeclaration_RDU71CW_b825.

BlackBerry® smartphone Accessories Tested

- 1) Alt. Fixed Blade Charger, part number HDW-24481-001 (model number PSM04A-050QRIM) with an output voltage of 5.0 volts dc.
- 2) Captive Cable Charger, part number HDW-17957-003, with an output voltage of 5.0 volts DC, 750 mA.
- 3) Alt. 1 Stereo Headset, part number HDW-24529-001, with a lead length of 1.1 metres
- 4) Alt. 2 Stereo Headset, part number HDW-24529-001, with a lead length of 1.1 metres
- 5) USB Data Cable, part number HDW-28109-003, 1.20 metres long.

D. Support Equipment Used for the Testing of the EUT

No support equipment used. See section G. *Compliance Test Equipment Used*.

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E. Test Results Chart

SPECIFICATION		TEST TYPE	Meets Requirements	TEST DATA
FCC CFR 47	IC			APPENDIX
Part 15.207	RSS-210 RSS-GEN	Conducted AC Line Emission	Pass	1
Part 15.209 Part 15.247	RSS-210 RSS-GEN	BT Radiated Spurious Emissions	See Test Report 1-3016-01-03_11-A	-
Part 15.209 Part 15.247	RSS-210 RSS-GEN	BT Radiated Band Edge Compliance	See Test Report 1-3016-01-03_11-A	-
Part 15.209 Part 15.407	RSS-210 RSS-GEN	802.11a/n Radiated Spurious Emissions	Pass 1-3016-01-25_11-A	2
Part 15.209 Part 15.247	RSS-210 RSS-GEN	802.11b/g/n Radiated Spurious Emissions	See Test Report 1-3016-01-04_11-A	-
Part 15.209 Part 15.407	RSS-210 RSS-GEN	802.11a Radiated Band Edge Compliance	Pass	2
Part 15.209 Part 15.247	RSS-210 RSS-GEN	802.11b/g/n Radiated Band Edge Compliance	See Test Report 1-3016-01-04_11-A	-
Part 15.247(a)	RSS-210	BT, 20 dB Bandwidth	Pass	3
Part 15.247(a)	RSS-210	BT, Carrier Frequency Separation	Pass	3
Part 15.247(a)	RSS-210	BT, Number of Hopping Frequencies	Pass	3
Part 15.247(a)	RSS-210	BT, Time of Occupancy (Dwell Time)	Pass	3
Part 15.247(b)	RSS-210	BT, Maximum Peak Conducted Output Power	Pass	3
Part 15.247(c)	RSS-210	BT, Band-Edge Compliance of RF Conducted Emissions	Pass	3
Part 15.247(c)	RSS-210	BT, Spurious RF Conducted Emissions	Pass	3
Part 15.247(b)	RSS-210	802.11b/g/n, 6 dB Bandwidth	Pass	4
Part 15.247(b)	RSS-210	802.11b/g/n, Maximum Conducted Output Power	Pass	4
Part 15.247(b)	RSS-210	802.11b/g/n, Band-Edge	Pass	4
Part 15.247(b)	RSS-210	802.11b/g/n, Peak Power Spectral Density	Pass	4
Part 15.247(b)	RSS-210	802.11b/g/n, Spurious RF Conducted Emissions	Pass	4

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Test Results Chart cont'd

SPECIFICATION		TEST TYPE	Meets Requirements	TEST DATA
FCC CFR 47	IC			APPENDIX
Part 15.407	RSS-210	802.11a, 6 dB Bandwidth	Pass	5
Part 15.407	RSS-210	802.11a, Maximum Conducted Output Power	Pass	5
Part 15.407	RSS-210	802.11a, Band-Edge	Pass	5
Part 15.407	RSS-210	802.11a, Peak Power Spectral Density	Pass	5
Part 15.407	RSS-210	802.11a, Spurious RF Conducted Emissions	Pass	5
Part 15.209 Part 15.225(a)	RSS-210 RSS-GEN	Near Field Communications, Radiated Emissions	Pass	6
Part 15.225(e)	RSS-210	Near Field Communications, Occupied Bandwidth	Pass	6
Part 15.225(e)	RSS-210	Near Field Communications, Frequency Stability	Pass	6

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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	Alt. Fixed Blade Charger + Alt. 1 Stereo Headset + USB Cable 1.2m
2	802.11b Tx	Captive Cable Charger + Alt. 2 Stereo 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 9.64 dB below the QP limit at 0.204 MHz using the QP detector and 18.39 dB below the AVE limit at 0.528 MHz in Test Configuration 1.

See APPENDIX 1 for the test data.

Measurement Uncertainty ± 3.0 dB

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2) 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 40.0 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 transmitting on channels 36, 52, 104 and 149 at 6 Mbps for 802.11a mode. The system's radiated emission levels were compared with respect to the FCC CFR 47 Part 15 Subpart E, 15.407 and RSS-210/RSS-GEN.

The 802.11a harmonics were investigated up to the 10th harmonic. The sample EUT emissions were in the noise floor (NF).

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 802.11a as per the requirements of 15.407, 15.209 and RSS-210/ RSS-GEN.

See APPENDIX 2 for the test data

Measurement Uncertainty ±4.6 dB

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3) 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 0.927 MHz for channel 0, 39 and 78 in normal data rate mode and 1.320 MHz 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.

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 10.67 dBm (0.01167 W) for Channel 39 in normal data rate mode and 10.33 dBm (0.01079 W) for channel 39 in EDR mode.

See APPENDIX 3 for the test data.

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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(c) 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(c) 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) 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(b) and RSS-210. Low channel (1), middle channel (6) and high channel (11) were measured. The worst case 6 dB Bandwidth was 11.17 MHz for channel 1 in 802.11b mode, 16.60 MHz for channel 6 and 11 in 802.11g mode, and 17.80 MHz for channel 11 in 802.11n mode.

See APPENDIX 4 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 19.05 dBm (80.35 mW) for channel 6 in 802.11b mode, 18.06 dBm (63.97 mW) for channel 6 in 802.11g mode, and 17.92 dBm (61.94 mW) for channel 6 in 802.11n mode.

See APPENDIX 4 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 4 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(b) and RSS-210. Low channel (1), middle channel (6) and high channel (11) were measured.

See APPENDIX 4 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(c) 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 4 for the test data.

5) 802.11a RF CONDUCTED EMISSIONS

The 802.11a conducted RF emissions from the BlackBerry® smartphone were measured using the methods outlined in FCC CFR 47 Part 15, Subpart E.

a) 6 dB Bandwidth

The EUT met the requirements of the 6 dB bandwidth as per 47 CFR 15.407 and RSS-210. Channels 36, 44, 48, 52, 60, 64, 149, 157 and 161 were measured. The worst case 6 dB Bandwidth was 16.53 MHz for channel 44, 52, 60, 64, 149, 157 and 161 in 802.11a 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 15.407 and RSS-210. Channels 36, 44, 48, 52, 60, 64, 149, 157 and 161 were measured. The worst case Conducted Output Power level was 14.14 dBm (25.94 mW) for channel 161 in 802.11a mode.

See APPENDIX 5 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 15.407 and RSS-210. Channels 36, 48, 52, 64, 149 and 161 were measured.

See APPENDIX 5 for the test data.

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d) Peak Power Spectral Density

The EUT met the requirements of peak power spectral density as per 47 CFR 15.407 and RSS-210. Channels 36, 44, 48, 52, 60, 64, 149, 157 and 161 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 15.407 and RSS-210. The frequency range measured was 30 MHz to 40 GHz. Channels 44, 60 and 157 were measured.

See APPENDIX 5 for the test data.

6) 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 up to 1 GHz. The sample EUT has a field strength measurement of 55.54 dBuV/m.

See APPENDIX 6 for the test data.

b) Occupied Bandwidth

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

See APPENDIX 6 for the test data.

c) Frequency Stability

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 6 for the test data.

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G. Compliance Test Equipment Used

<u>UNIT</u>	<u>MANUFACTURER</u>	<u>MODEL</u>	<u>SERIAL NUMBER</u>	<u>CAL DUE DATE</u> (YY MM DD)	<u>USE</u>
EMI Test Receiver	Rohde & Schwarz	ESIB 40	100255	11-11-28	Conducted/Radiated Emissions
EMI Test Receiver	Rohde & Schwarz	ESU 40	100162	11-11-29	Conducted/Radiated Emissions
Hybrid Log Antenna	EMC Automation	HLP-3003C	017401	12-01-13	Radiated Emissions
Horn Antenna	CMT	LHA 0180	R52734-001	12-01-21	Radiated Emissions
Horn Antenna	ETS-Lindgren	3117	47563	11-07-15	Radiated Emissions
Preamplifier	Rohde & Schwarz	TS-ANA4-SP	001	11-12-01	Radiated Emissions
Preamplifier	Sonoma	310N/11909A	185831	11-11-14	Radiated Emissions
Preamplifier	Rohde & Schwarz	TS-ANA-SP	001	11-12-01	Radiated Emissions
L.I.S.N.	Rohde & Schwarz	ENV216	100060	11-12-10	Conducted Emissions
Environment Monitor	Omega	iTHX-SD	0380561	11-10-13	Radiated Emissions
EMC Analyzer	Agilent	E7405A	US40240226	11-12-10	Radiated Emissions
Spectrum Analyzer	HP	8563E	3745A08112	11-09-30	RF Conducted Emissions
DC Power Supply	HP	6632B	US37472178	11-08-30	RF Conducted Emissions
Environment Monitor	Omega	iTHX-SD	0340060	11-10-13	RF Conducted Emissions
Temperature Probe	Control Company	23609-234	21352860	11-09-14	Frequency Stability
Environmental Chamber	Test Equity	107	0900246	N/R	Frequency Stability
Bluetooth Tester	Rohde & Schwarz	CBT	119549	11-12-08	RF Conducted Emissions
Bluetooth Tester	Rohde & Schwarz	CBT35	100368	11-11-27	Radiated Emissions
Bluetooth Tester	Rohde & Schwarz	CBT35	100370	11-11-29	Radiated Emissions
Power Meter	Agilent	N1911A	MY45100951	11-08-12	RF Conducted / Frequency Stability
Power Sensor	Agilent	N1921A	MY45241383	11-09-01	RF Conducted / Frequency Stability
Digital Multimeter	Hewlett Packard	34401A	US36042324	11-10-28	Conducted/Radiated Emissions
Environment Monitor	Omega	iTHX-SD	0380567	11-10-13	Radiated Emissions
Active Loop Antenna	ETS-Lindgren	6507	00126538	12-06-09	Radiated Emissions

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	<p>EMI Test Report for the BlackBerry® smartphone Model RDU71CW</p> <p>APPENDIX 1</p>	
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APPENDIX 1 – AC CONDUCTED EMISSIONS TEST DATA/PLOTS

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AC Conducted Emission Test Results

The following tests were performed by Savtej Sandhu.

Test Configuration 1

The BlackBerry® smartphone was tested on May 31, 2011.

The environmental test conditions were: Temperature: 25 °C
Relative Humidity: 42 %

Frequency (MHz)	Line	Reading (QP) (dB μ V)	Correction Factor (dB)	Corrected Reading (QP) (dB)	Limit (QP) (dB μ V)	Margin (QP) Limits (dB)
0.150	N	42.84	11.23	54.08	66.00	-11.92
0.155	L1	44.80	11.17	55.97	65.80	-9.83
0.164	N	39.30	11.14	50.45	65.30	-14.86
0.173	N	38.55	11.08	49.63	64.80	-15.17
0.182	L1	40.44	10.99	51.42	64.40	-12.98
0.186	N	36.95	10.98	47.93	64.20	-16.27
0.204	L1	42.93	10.83	53.76	63.40	-9.64
0.204	N	37.07	10.85	47.92	63.40	-15.48
0.218	N	36.04	10.76	46.80	62.90	-16.11
0.227	L1	40.77	10.67	51.44	62.60	-11.16
0.231	N	35.03	10.66	45.69	62.40	-16.71
0.236	L1	35.77	10.61	46.38	62.30	-15.92
0.249	L1	34.68	10.51	45.19	61.80	-16.61
0.263	N	32.67	10.44	43.11	61.40	-18.29
0.272	L1	37.00	10.36	47.36	61.10	-13.74
0.281	L1	33.12	10.29	43.41	60.80	-17.39
0.290	L1	32.69	10.23	42.92	60.50	-17.58
0.317	N	26.67	10.15	36.82	59.80	-22.98
0.339	L1	30.94	10.10	41.04	59.20	-18.16
0.528	N	33.13	9.90	43.03	56.00	-12.97

RIM Testing Services™	EMI Test Report for the BlackBerry® smartphone Model RDU71CW APPENDIX 1					
Test Report No. RTS-3933-1105-6_rev1	Dates of Test February 16, March 31, April 20, May 17 to 31 and June 01, 2011				FCC ID: L6ARDU70CW IC: 2503A-RDU70CW	

AC Conducted Emissions Test Results cont'd

Test Configuration 1

Frequency (MHz)	Line	Reading (QP) (dB μ V)	Correction Factor (dB)	Corrected Reading (QP) (dB)	Limit (QP) (dB μ V)	Margin (QP) Limits (dB)
0.551	L1	28.86	9.88	38.74	56.00	-17.26
0.744	N	27.75	9.83	37.58	56.00	-18.42
1.055	L1	27.67	9.80	37.47	56.00	-18.53
1.293	N	23.92	9.80	33.72	56.00	-22.28
1.428	L1	22.53	9.80	32.33	56.00	-23.67
2.337	L1	22.72	9.84	32.56	56.00	-23.44
10.379	L1	29.66	9.97	39.63	60.00	-20.37
11.805	L1	30.14	10.01	40.15	60.00	-19.85

Frequency (MHz)	Line	Reading (AVE) (dB μ V)	Correction Factor (dB)	Corrected Reading (AVE) (dB)	Limit (AVE) (dB μ V)	Margin (AVE) Limits (dB)
0.150	N	22.80	11.23	34.03	56.00	-21.97
0.204	L1	21.59	10.83	32.42	53.40	-20.98
0.204	N	18.27	10.85	29.12	53.40	-24.28
0.272	L1	17.83	10.36	28.18	51.10	-22.92
0.528	N	17.70	9.90	27.61	46.00	-18.39
0.551	L1	14.09	9.88	23.97	46.00	-22.03
0.744	N	14.76	9.83	24.59	46.00	-21.41
1.055	L1	13.91	9.80	23.71	46.00	-22.29
1.428	L1	13.51	9.80	23.31	46.00	-22.69
2.337	L1	11.63	9.84	21.48	46.00	-24.53
10.379	L1	19.16	9.97	29.13	50.00	-20.87
11.805	L1	19.83	10.01	29.84	50.00	-20.16

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

Measurements were done with the quasi-peak and average detectors.

See figure 1-1 and figure 1-2 for the measurement plot of the L1 and N lines of AC power line conducted emissions.

RIM Testing Services™	EMI Test Report for the BlackBerry® smartphone Model RDU71CW APPENDIX 1	
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AC Conducted Emissions Test Graphs

Test Configuration 1

Figure 1-1: L1 lines

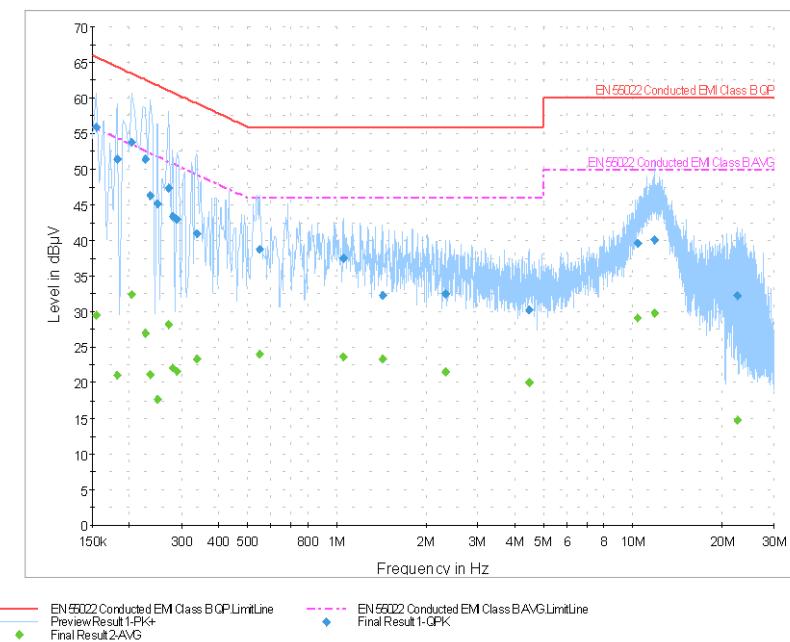
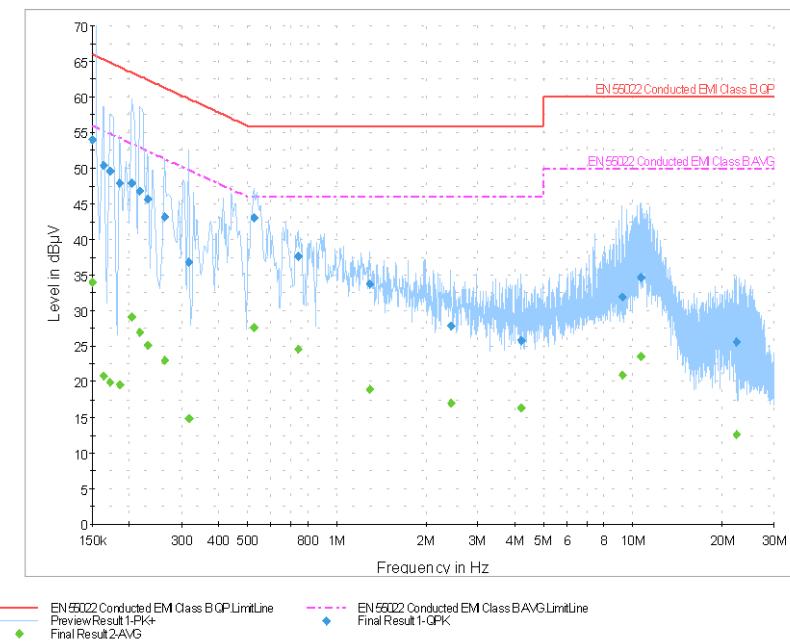


Figure 1-2: N Lines



 RIM Testing Services™	EMI Test Report for the BlackBerry® smartphone Model RDU71CW APPENDIX 1		
Test Report No. RTS-3933-1105-6_rev1	Dates of Test February 16, March 31, April 20, May 17 to 31 and June 01, 2011	FCC ID: L6ARDU70CW IC: 2503A-RDU70CW	

AC Conducted Emission Test Results

Test Configuration 2

The BlackBerry® smartphone was tested on May 31, 2011.

The environmental test conditions were: Temperature: 25 °C
Relative Humidity: 42 %

Frequency (MHz)	Line	Reading (QP) (dB μ V)	Correction Factor (dB)	Corrected Reading (QP) (dB)	Limit (QP) (dB μ V)	Limit (AV) (dB μ V)	Margin (QP) Limits (dB)
0.150	L1	40.47	11.20	51.67	66.00	56.00	-14.33
0.150	N	39.03	11.23	50.27	66.00	56.00	-15.73
0.200	N	34.04	10.89	44.93	63.60	53.60	-18.67
0.393	L1	32.91	10.02	42.93	58.00	48.00	-15.07
0.393	N	26.30	10.03	36.34	58.00	48.00	-21.66
0.488	L1	31.29	9.92	41.21	56.20	46.20	-14.99
0.551	N	26.52	9.89	36.41	56.00	46.00	-19.59
0.600	L1	32.79	9.86	42.65	56.00	46.00	-13.36
0.600	N	26.71	9.86	36.58	56.00	46.00	-19.43
0.650	L1	33.52	9.85	43.36	56.00	46.00	-12.64
0.650	N	27.17	9.85	37.02	56.00	46.00	-18.98
0.699	L1	32.91	9.84	42.74	56.00	46.00	-13.26
0.735	L1	31.39	9.83	41.22	56.00	46.00	-14.79
0.753	L1	31.06	9.82	40.88	56.00	46.00	-15.12
0.807	N	26.72	9.82	36.55	56.00	46.00	-19.46
0.852	L1	32.23	9.81	42.05	56.00	46.00	-13.95
0.951	L1	31.50	9.81	41.31	56.00	46.00	-14.69
0.956	N	26.07	9.81	35.88	56.00	46.00	-20.12
1.118	N	21.27	9.81	31.08	56.00	46.00	-24.92
1.491	L1	30.72	9.80	40.52	56.00	46.00	-15.48

RIM Testing Services™	EMI Test Report for the BlackBerry® smartphone Model RDU71CW APPENDIX 1		
Test Report No. RTS-3933-1105-6_rev1	Dates of Test February 16, March 31, April 20, May 17 to 31 and June 01, 2011	FCC ID: L6ARDU70CW IC: 2503A-RDU70CW	

AC Conducted Emissions Test Results cont'd

Test Configuration 2

Frequency (MHz)	Line	Reading (QP) (dB μ V)	Correction Factor (dB)	Corrected Reading (QP) (dB)	Limit (QP) (dB μ V)	Limit (AV) (dB μ V)	Margin (QP) Limits (dB)
1.608	N	23.73	9.82	33.55	56.00	46.00	-22.45
2.211	L1	27.78	9.83	37.61	56.00	46.00	-18.39
3.944	L1	26.29	9.90	36.19	56.00	46.00	-19.81
10.379	L1	26.64	9.97	36.61	60.00	50.00	-23.39
11.031	L1	27.50	9.98	37.49	60.00	50.00	-22.51

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

Measurements were done with the quasi-peak detector.

See figure 1-3 and figure 1-4 for the measurement plot of the L1 and N lines of AC power line conducted emissions.

RIM Testing Services™	EMI Test Report for the BlackBerry® smartphone Model RDU71CW APPENDIX 1	
Test Report No. RTS-3933-1105-6_rev1	Dates of Test February 16, March 31, April 20, May 17 to 31 and June 01, 2011	FCC ID: L6ARDU70CW IC: 2503A-RDU70CW

AC Conducted Emissions Test Graphs

Test Configuration 2

Figure 1-3: L1 lines

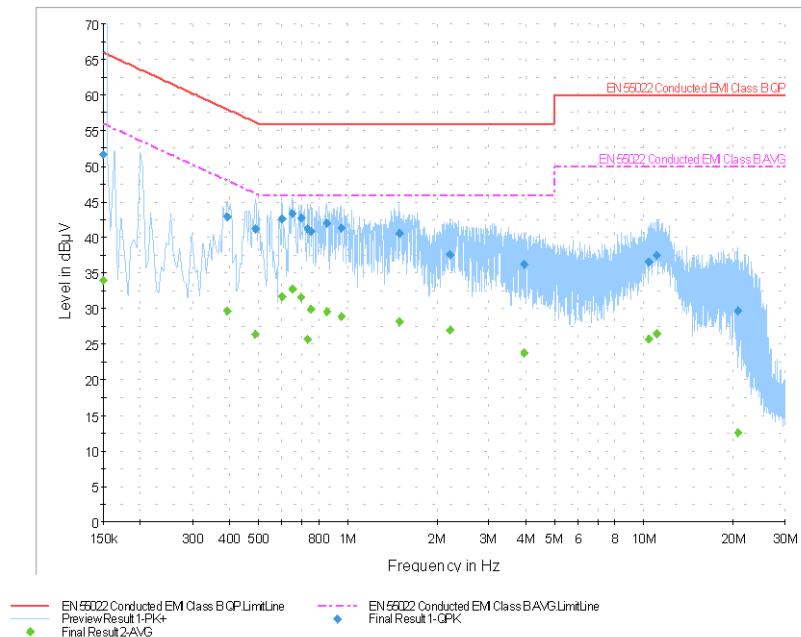
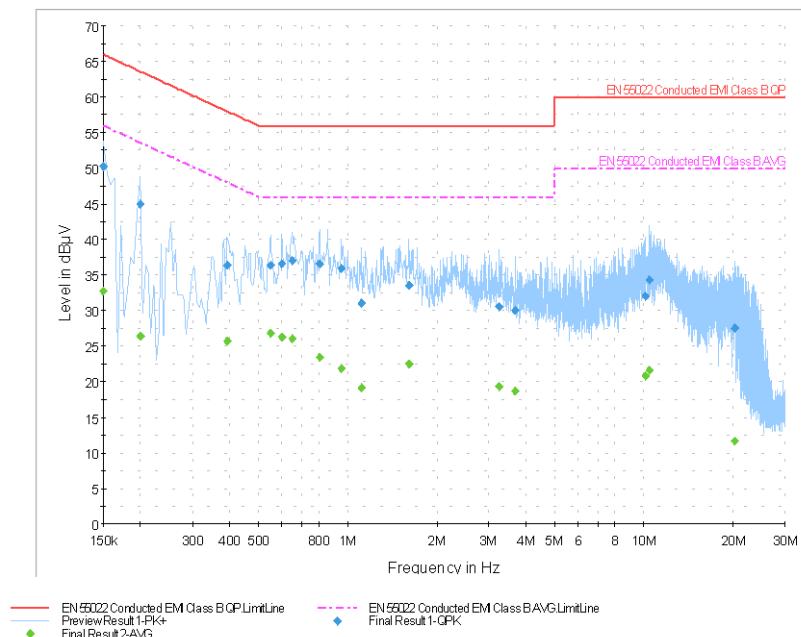


Figure 1-4: N Lines



	<p>EMI Test Report for the BlackBerry® smartphone Model RDU71CW</p> <p>APPENDIX 2</p>	
Test Report No. RTS-3933-1105-46_rev1	Dates of Test February 16, March 31, April 20, May 17 to 31 and June 01, 2011	FCC ID: L6ARDU70CW IC: 2503A-RDU70CW

APPENDIX 2 – 802.11a RADIATED EMISSIONS TEST DATA

	EMI Test Report for the BlackBerry® smartphone Model RDU71CW APPENDIX 2	
Test Report No. RTS-3933-1105-46_rev1	Dates of Test February 16, March 31, April 20, May 17 to 31 and June 01, 2011	FCC ID: L6ARDU70CW IC: 2503A-RDU70CW

Radiated Emissions Test Results
802.11a Band

Date of Test: May 24, 2011

Measurements were performed by Kevin Rose.

The environmental test conditions were: Temperature: 24 °C
Relative Humidity: 36 %

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 vertical position.

The frequency sweep measurements were performed in 802.11a Tx mode at 6 Mbps on channels 36, 52, 104 and 149.

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

Date of Test: May 30 and 31, 2011

Measurements were performed by Shuo Wang.

The environmental test conditions were: Temperature: 25 °C
Relative Humidity: 45 %

The test distance was 3.0 metres with a EUT height of 0.8 metres, and sweep frequency of 1GHz to 40GHz.

The BlackBerry® smartphone was in USB up position.

The frequency sweep measurements were performed in 802.11a Tx mode at 6 Mbps on channels 36, 52, 104 and 149.

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

 RIM Testing Services™	EMI Test Report for the BlackBerry® smartphone Model RDU71CW APPENDIX 2		
Test Report No. RTS-3933-1105-46_rev1	Dates of Test February 16, March 31, April 20, May 17 to 31 and June 01, 2011	FCC ID: L6ARDU70CW IC: 2503A-RDU70CW	

802.11a Band-Edge Compliance of RF Radiated Emissions

Date of Tests: May 31, 2011

Measurements performed by Kevin Rose.

The environmental test conditions were: Temperature: 25 °C
Relative Humidity: 30 %

The measurements were performed on BlackBerry® smartphone in standalone, vertical configuration on channels 36, 64, 149 and 161 for 802.11a mode at 6 Mbps.

The test distance was 3 metres.

Channel	Freq. (MHz)	Rx Antenna		Detector (PK, AVE.)	VBW (MHz)	Corrected Reading (dBuV/m)	Delta Marker (dB)	Corrected Band edge (dBuV/m)	Limit (dBuV/m)	Diff. To Limit (dB)
		Type	POL.							
36	5180.0	Horn	V	PK	1 MHz	105.93	49.49	56.44	74.00	-17.56
36	5180.0	Horn	H	PK	1 MHz	100.41	44.92	55.49	74.00	-18.51
36	5180.0	Horn	V	AVE.	10 Hz	56.44	49.49	6.95	54.00	-47.05
36	5180.0	Horn	H	AVE.	10 Hz	55.49	44.92	10.57	54.00	-43.43

Channel	Freq. (MHz)	Rx Antenna		Detector (PK, AVE.)	VBW (MHz)	Corrected Reading (dBuV/m)	Delta Marker (dB)	Corrected Band edge (dBuV/m)	Limit (dBuV/m)	Diff. To Limit (dB)
		Type	POL.							
64	5320.0	Horn	V	PK	1 MHz	103.31	46.47	56.84	74.00	-17.16
64	5320.0	Horn	H	PK	1 MHz	102.09	45.75	56.34	74.00	-17.66
64	5320.0	Horn	V	AVE.	10 Hz	56.84	46.47	10.37	54.00	-43.63
64	5320.0	Horn	H	AVE.	10 Hz	56.34	45.75	10.59	54.00	-43.41

RIM Testing Services™	EMI Test Report for the BlackBerry® smartphone Model RDU71CW APPENDIX 2								
Test Report No. RTS-3933-1105-46_rev1	Dates of Test February 16, March 31, April 20, May 17 to 31 and June 01, 2011						FCC ID: L6ARDU70CW IC: 2503A-RDU70CW		

802.11a Band-Edge Compliance of RF Radiated Emissions cont'd

Channel	Freq. (MHz)	Rx Antenna		Detector (PK, AVE.)	VBW (MHz)	Corrected Reading (dBuV/m)	Delta Marker (dB)	Corrected Band edge (dBuV/m)	Limit (dBuV/m)	Diff. To Limit (dB)
		Type	POL.							
149	5745.0	Horn	V	PK	1 MHz	103.08	45.59	57.49	74.00	-16.51
149	5745.0	Horn	H	PK	1 MHz	100.40	42.82	57.58	74.00	-16.42
149	5745.0	Horn	V	AVE.	10 Hz	57.49	45.59	11.90	54.00	-42.10
149	5745.0	Horn	H	AVE.	10 Hz	53.78	42.82	10.96	54.00	-43.04

Channel	Freq. (MHz)	Rx Antenna		Detector (PK, AVE.)	VBW (MHz)	Corrected Reading (dBuV/m)	Delta Marker (dB)	Corrected Band edge (dBuV/m)	Limit (dBuV/m)	Diff. To Limit (dB)
		Type	POL.							
161	5805.0	Horn	V	PK	1 MHz	103.15	44.21	58.94	74.00	-15.06
161	5805.0	Horn	H	PK	1 MHz	100.20	42.29	57.91	74.00	-16.09
161	5805.0	Horn	V	AVE.	10 Hz	58.94	44.21	14.73	54.00	-39.27
161	5805.0	Horn	H	AVE.	10 Hz	57.91	42.29	15.62	54.00	-38.38

See figures 2-1 to 2-8 for the plots of the 802.11a band-edge compliance.

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802.11a Band-Edge Compliance of RF Radiated Emissions cont'd

Figure 2-1: Band-Edge Compliance of RF Radiated Emission
802.11a, Channel 36, 5180 MHz
Pol: V, Detector: PK

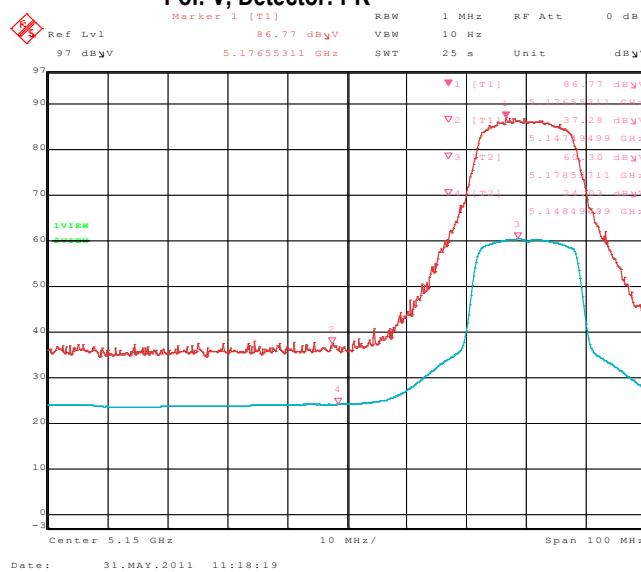


Figure 2-2: Band-Edge Compliance of RF Radiated Emission
802.11a, Channel 36, 5180 MHz
Pol: H, Detector: PK

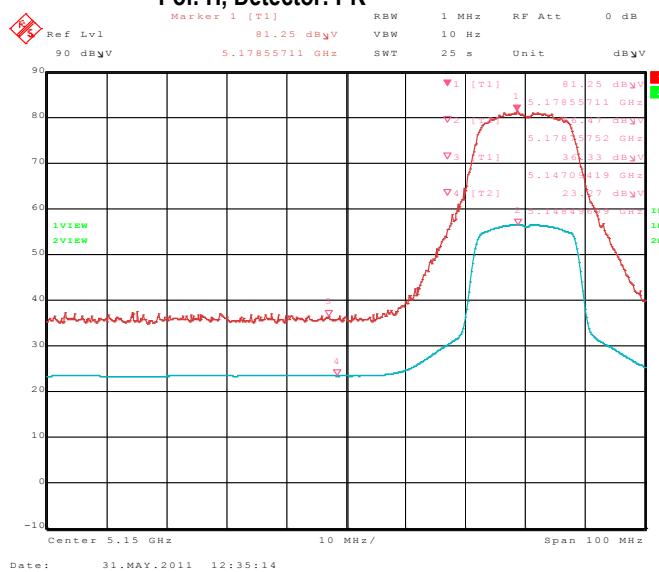


Figure 2-3: Band-Edge Compliance of RF Radiated Emission
802.11a, Channel 64, 5320 MHz
Pol: V, Detector: PK

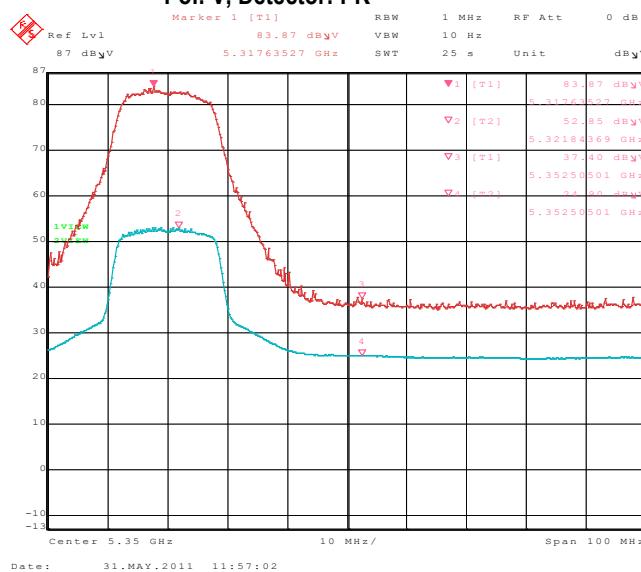
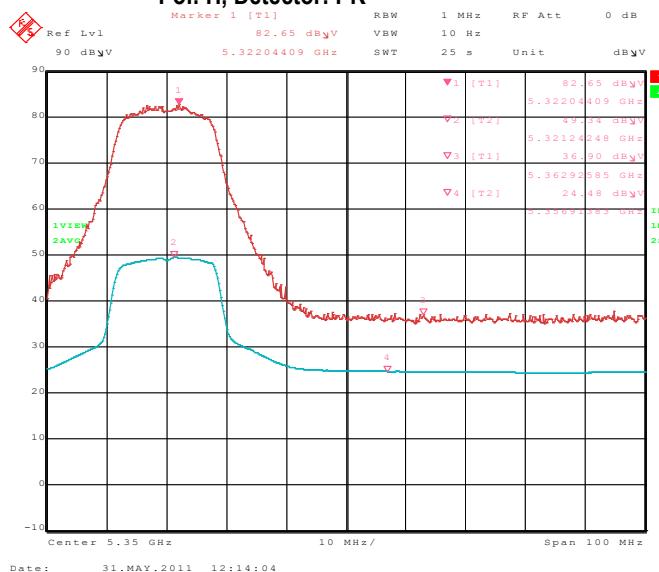


Figure 2-4: Band-Edge Compliance of RF Radiated Emission
802.11a, Channel 64, 5320 MHz
Pol: H, Detector: PK



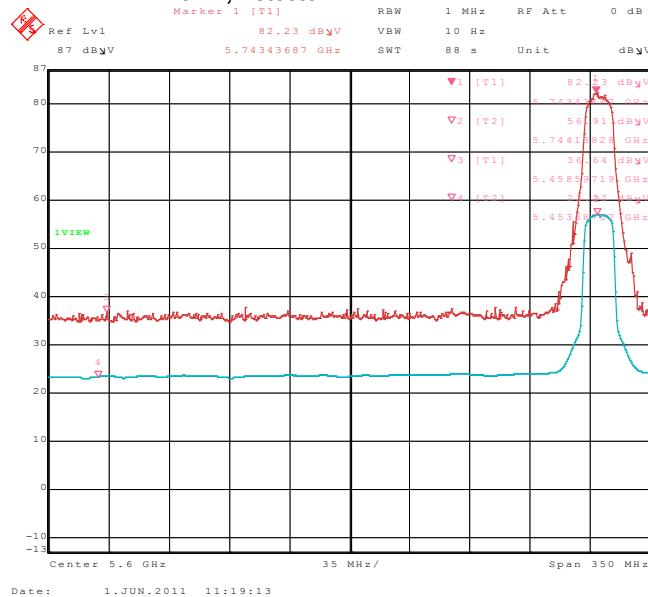
Test Report No.
 RTS-3933-1105-46_rev1

Dates of Test
 February 16, March 31, April 20, May 17
 to 31 and June 01, 2011

FCC ID: L6ARDU70CW
IC: 2503A-RDU70CW

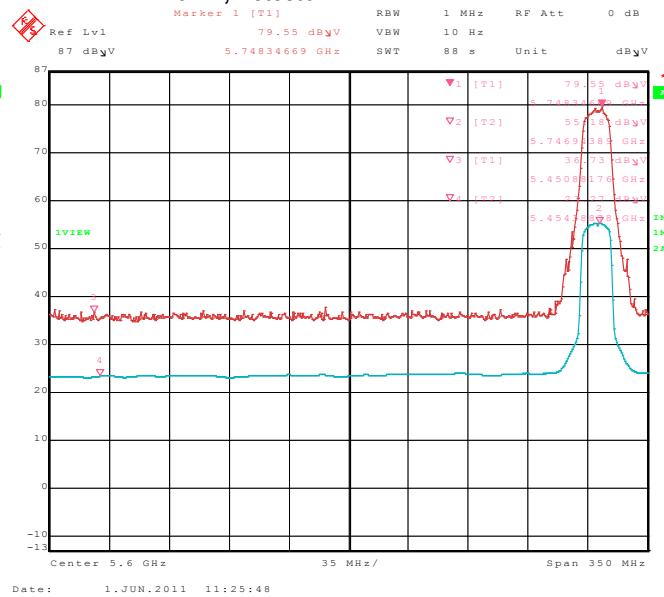
802.11a Band-Edge Compliance of RF Radiated Emissions cont'd

Figure 2-5: Band-Edge Compliance of RF Radiated Emission
 802.11a, Channel 149, 5745 MHz
 Pol: V, Detector: PK



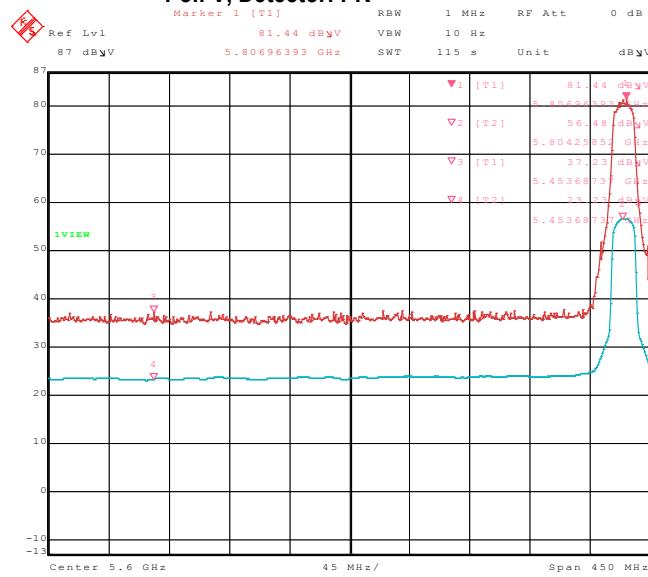
Date: 1.JUN.2011 11:19:13

Figure 2-6: Band-Edge Compliance of RF Radiated Emission
 802.11a, Channel 149, 5745 MHz
 Pol: H, Detector: PK



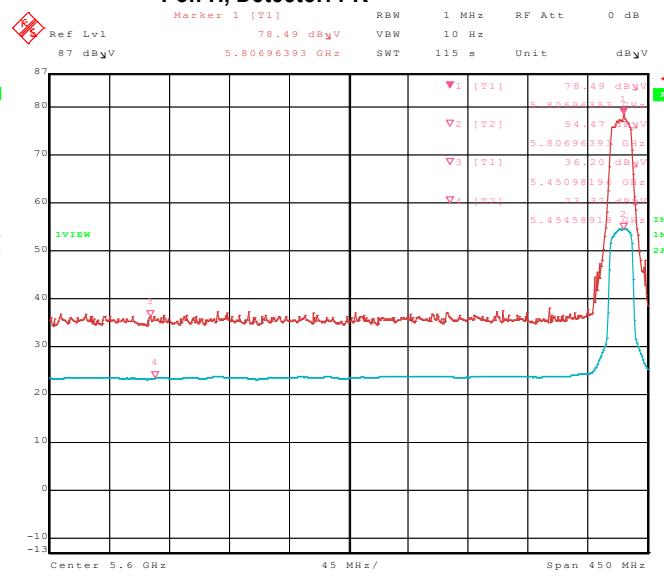
Date: 1.JUN.2011 11:25:48

Figure 2-7: Band-Edge Compliance of RF Radiated Emission
 802.11a, Channel 161, 5805 MHz
 Pol: V, Detector: PK



Date: 1.JUN.2011 11:10:31

Figure 2-8: Band-Edge Compliance of RF Radiated Emission
 802.11a, Channel 161, 5805 MHz
 Pol: H, Detector: PK



Date: 1.JUN.2011 11:00:33

	EMI Test Report for the BlackBerry® smartphone Model RDU71CW APPENDIX 3	
Test Report No. RTS-3933-1105-46_rev1	Dates of Test February 16, March 31, April 20, May 17 to 31 and June 01, 2011	FCC ID: L6ARDU70CW IC: 2503A-RDU70CW

APPENDIX 3 – BLUETOOTH CONDUCTED EMISSIONS TEST DATA/PLOTS

RIM Testing Services™	EMI Test Report for the BlackBerry® smartphone Model RDU71CW APPENDIX 3	
Test Report No. RTS-3933-1105-46_rev1	Dates of Test February 16, March 31, April 20, May 17 to 31 and June 01, 2011	FCC ID: L6ARDU70CW IC: 2503A-RDU70CW

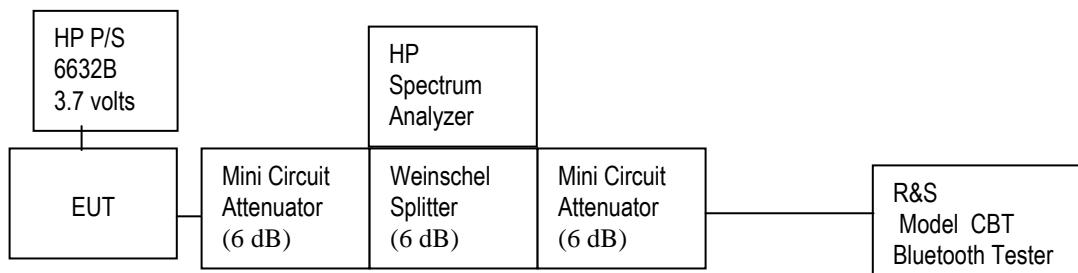
Bluetooth RF Conducted Emission Test Results

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

The measurements were performed by Maurice Battler.

Date of test: February 16, 2011

Test Setup Diagram



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: 23 °C
Relative Humidity: 38 %

Test Report No.
 RTS-3933-1105-46_rev1

Dates of Test
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FCC ID: L6ARDU70CW
IC: 2503A-RDU70CW

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	0.927
39	≤1.0	0.927
78	≤1.0	0.927

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

Figure 3-1: 20 dB Bandwidth

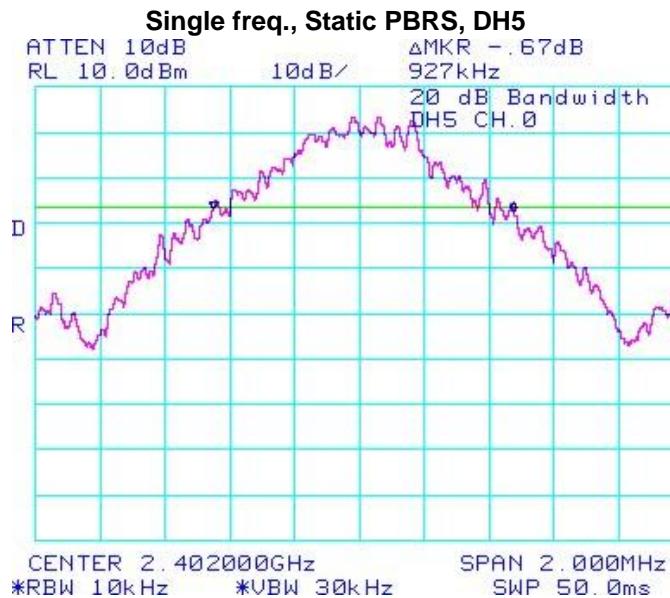
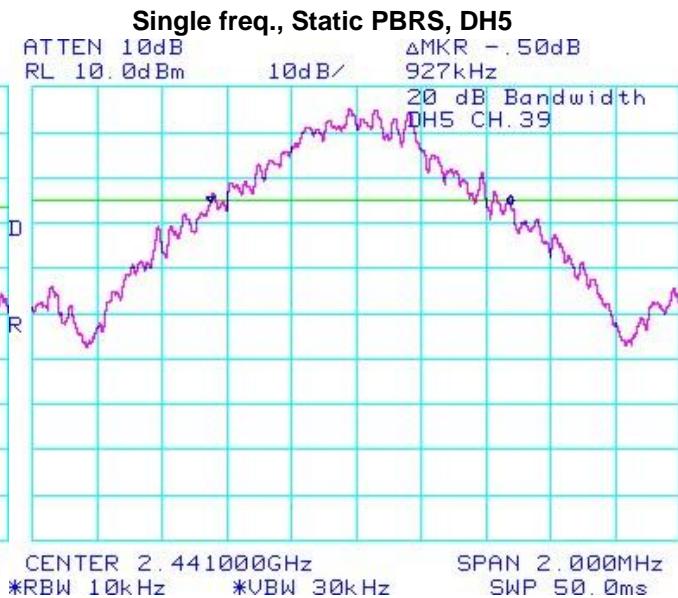


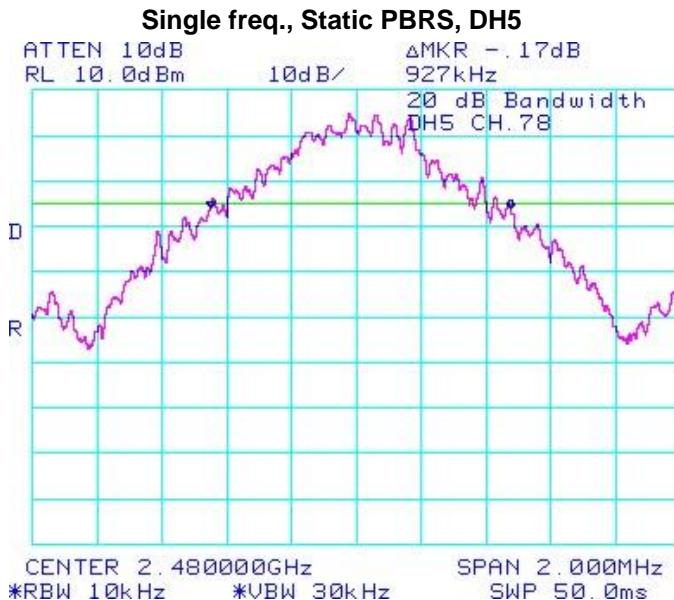
Figure 3-2: 20 dB Bandwidth



RIM Testing Services™	EMI Test Report for the BlackBerry® smartphone Model RDU71CW APPENDIX 3	
Test Report No. RTS-3933-1105-46_rev1	Dates of Test February 16, March 31, April 20, May 17 to 31 and June 01, 2011	FCC ID: L6ARDU70CW IC: 2503A-RDU70CW

Bluetooth RF Conducted Emission Test Results cont'd

Figure 3-3: 20 dB Bandwidth



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

Bluetooth Channel	Limit (MHz)	Measured Level (MHz)
0	≤1.5	1.270
39	≤1.5	1.320
78	≤1.5	1.313

See figures 3-4 to 3-6 for the plots of the 20 dB bandwidth measurements.

Test Report No.
 RTS-3933-1105-46_rev1

Dates of Test
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 to 31 and June 01, 2011

FCC ID: L6ARDU70CW
IC: 2503A-RDU70CW

Bluetooth RF Conducted Emission Test Results cont'd

Figure 3-4: 20 dB Bandwidth

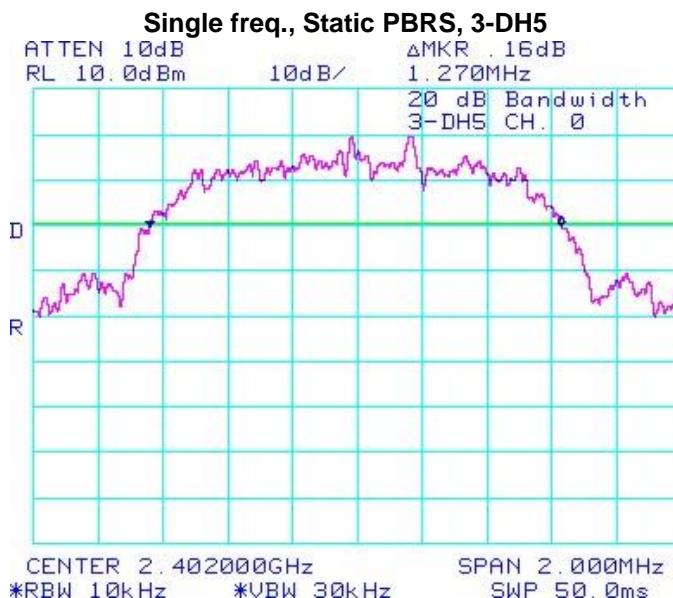


Figure 3-5: 20 dB Bandwidth

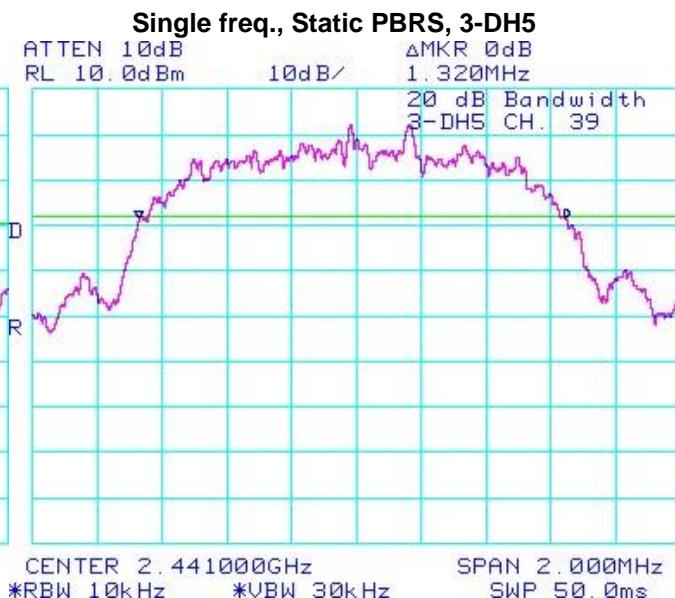
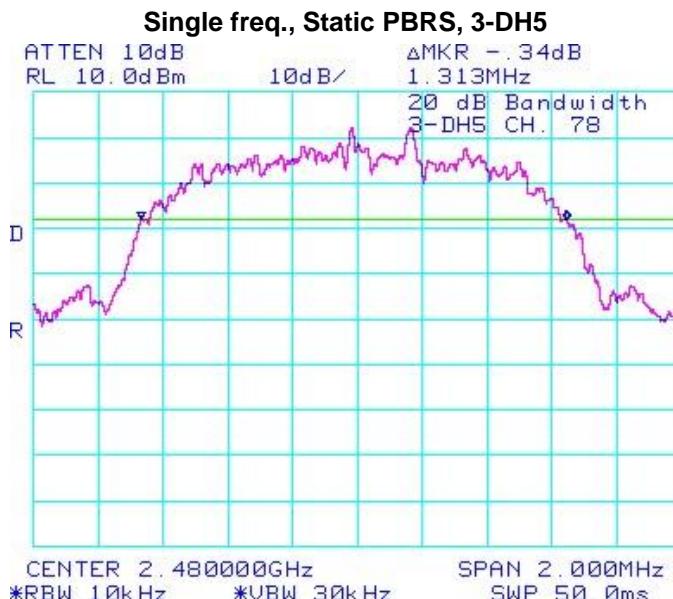


Figure 3-6: 20 dB Bandwidth



RIM Testing Services™	EMI Test Report for the BlackBerry® smartphone Model RDU71CW APPENDIX 3	
Test Report No. RTS-3933-1105-46_rev1	Dates of Test February 16, March 31, April 20, May 17 to 31 and June 01, 2011	FCC ID: L6ARDU70CW IC: 2503A-RDU70CW

Bluetooth RF Conducted Emission Test Results cont'd

Carrier Frequency Separation

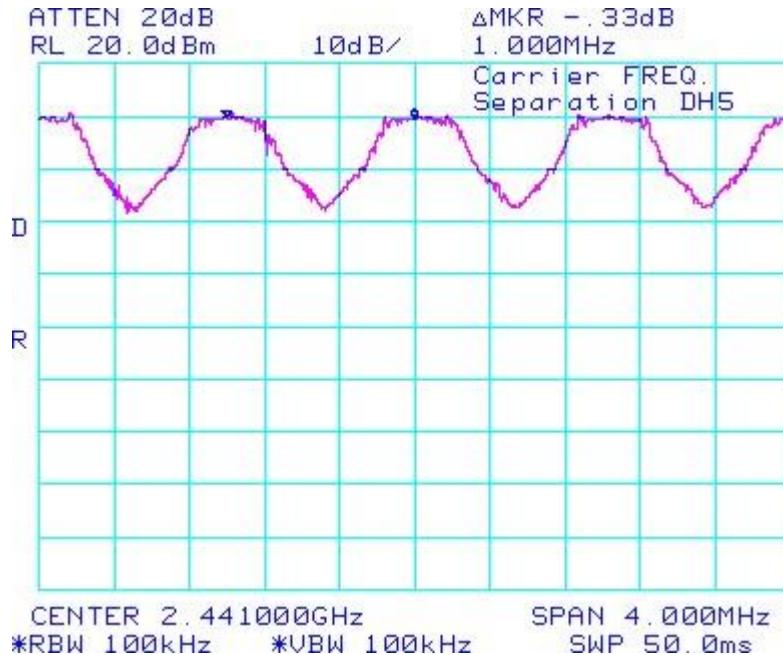
The EUT met the requirements of the Carrier Frequency Separation as per 47 CFR 15.247(a) and RSS-210. Channel 38 to 39 was measured. Bluetooth was operating in frequency hopping (Euro/US) mode.

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	1.000

See figure 3-7 for the plot of the Carrier Frequency Separation measurement.

Figure 3-7: Carrier Frequency Separation, Freq. Hopping, Static PBRS, DH5, Channels 38 to 39



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Test Report No. RTS-3933-1105-46_rev1	Dates of Test February 16, March 31, April 20, May 17 to 31 and June 01, 2011	FCC ID: L6ARDU70CW IC: 2503A-RDU70CW

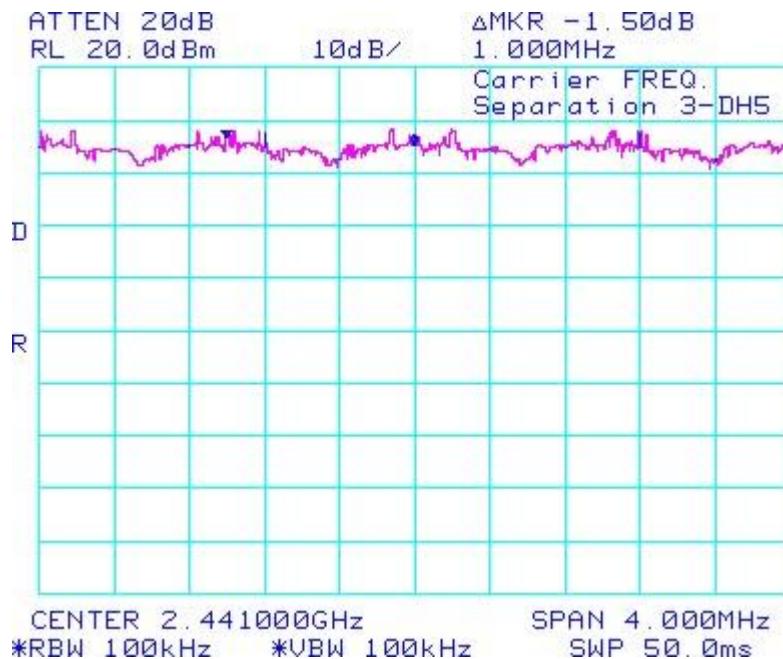
Bluetooth RF Conducted Emission Test Results cont'd

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	1.000

See figure 3-8 for the plot of the Carrier Frequency Separation measurement.

Figure 3-8: Carrier Frequency Separation, Freq. Hopping, Static PBRS, 3-DH5, Channels 38 to 39



RIM Testing Services™	EMI Test Report for the BlackBerry® smartphone Model RDU71CW APPENDIX 3	
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Bluetooth RF Conducted Emission Test Results cont'd

Number of Hopping Frequencies

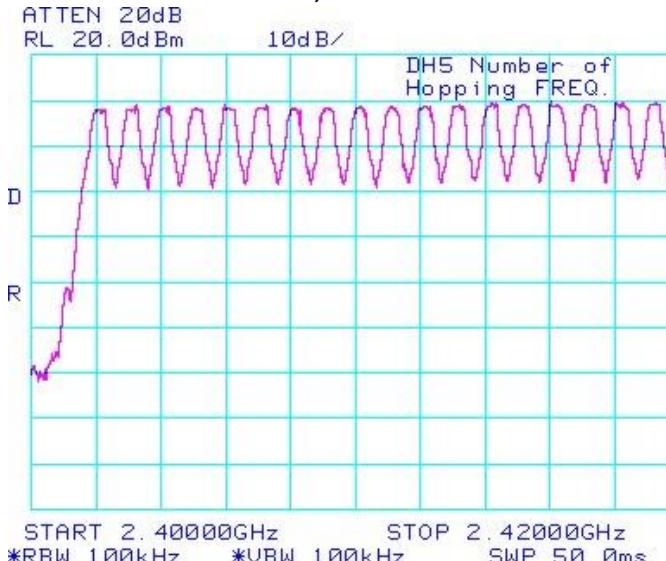
The EUT met the requirements of the number of hopping frequencies as per 47 CFR 15.247(a) and RSS-210. Bluetooth was operating in frequency hopping (Euro/US) mode.

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

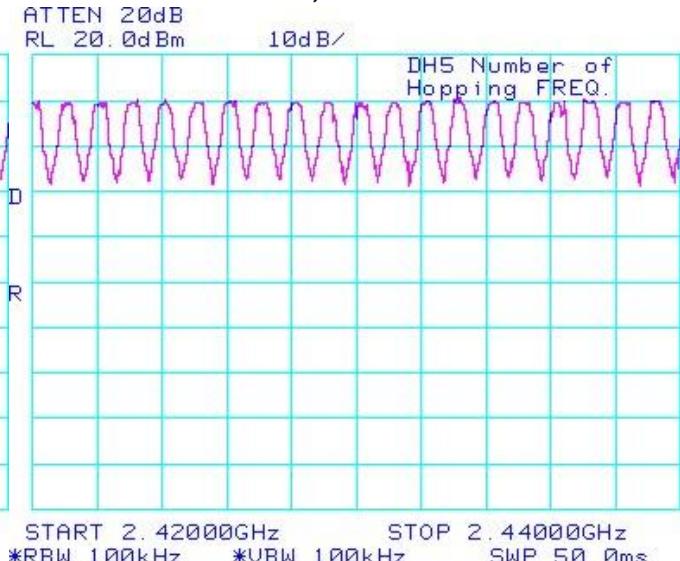
Limit (CH)	Number of Hopping Frequencies (CH)
≥75	79

See figures 3-9 to 3-12 for the plots of the number of hopping frequencies.

**Figure 3-9: Number of Hopping Frequencies
Static PBRS, DH5**



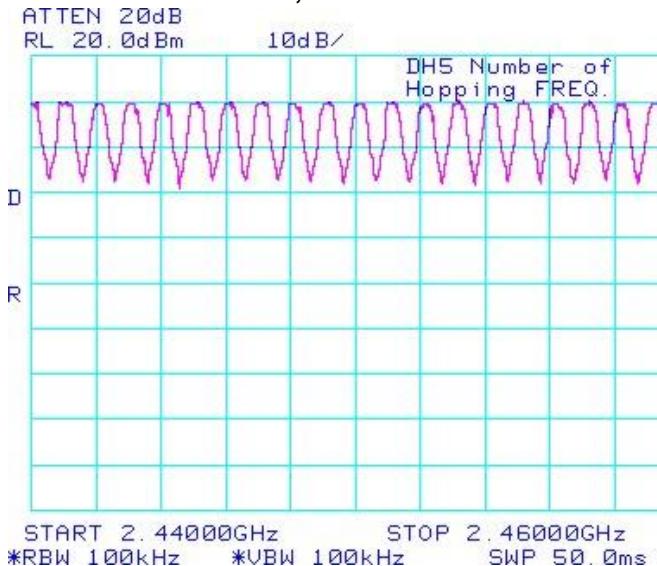
**Figure 3-10: Number of Hopping Frequencies
Static PBRS, DH5**



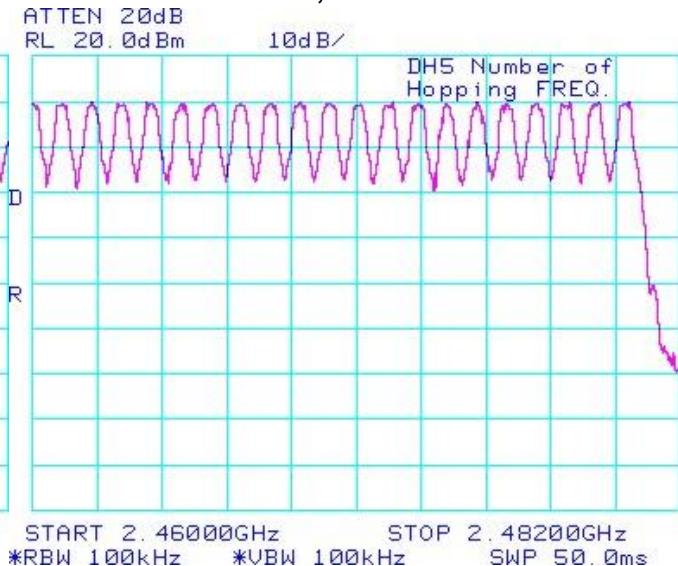
RIM Testing Services™	EMI Test Report for the BlackBerry® smartphone Model RDU71CW APPENDIX 3	
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Bluetooth RF Conducted Emission Test Results cont'd

**Figure 3-11: Number of Hopping Frequencies
Static PBRS, DH5**



**Figure 3-12: 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 μ sec 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	0.4140	0.4140 x 320.0 = 132.48	400	267.52
39	DH1	0.4180	0.4180 x 320.0 = 133.76	400	266.24
78	DH1	0.4180	0.4180 x 320.0 = 133.76	400	266.24
0	DH3	1.6700	1.6700 x 159.9 = 267.03	400	132.97
39	DH3	1.6700	1.6700 x 159.9 = 267.03	400	132.97
78	DH3	1.6800	1.6800 x 159.9 = 268.63	400	131.37
0	DH5	2.9200	2.9200 x 106.8 = 311.86	400	88.14
39	DH5	2.9400	2.9400 x 106.8 = 313.99	400	86.01
78	DH5	2.9400	2.9400 x 106.8 = 313.99	400	86.01

See figures 3-13 to 3-21 for the plots of the dwell time.

Bluetooth RF Conducted Emission Test Results cont'd

Figure 3-13: Time of Occupancy (Dwell Time)

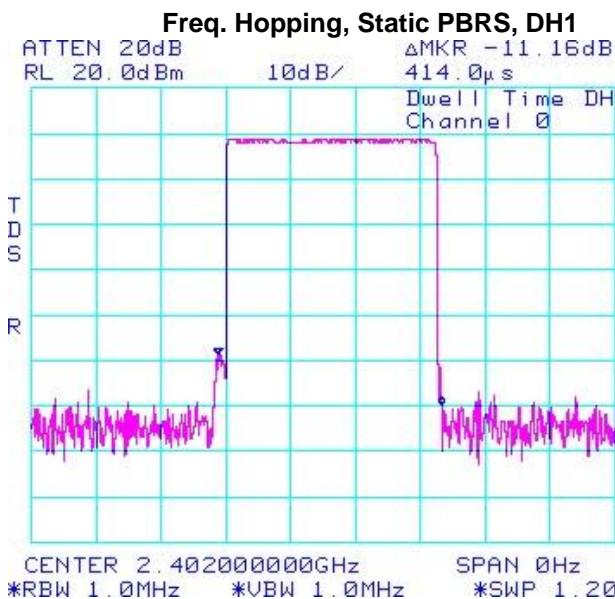
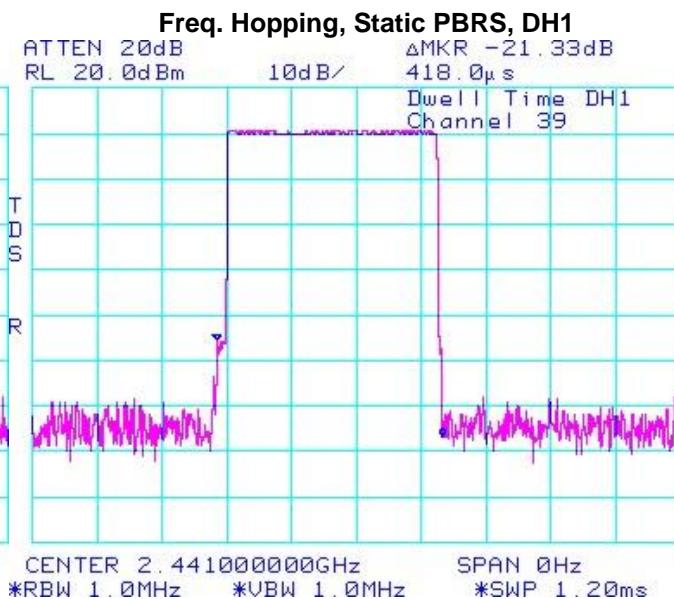


Figure 3-14: Time of Occupancy (Dwell Time)



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Bluetooth RF Conducted Emission Test Results cont'd

Figure 3-15: Time of Occupancy (Dwell Time)
Freq. Hopping, Static PBRS, DH1

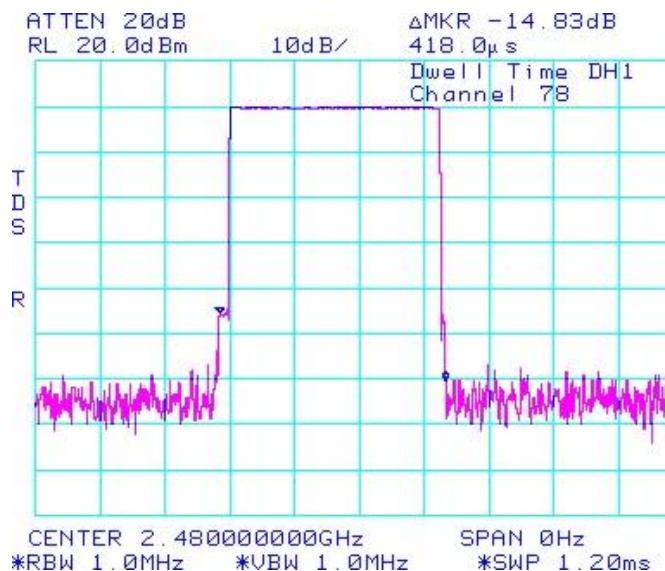


Figure 3-16: Time of Occupancy (Dwell Time)
Freq. Hopping, Static PBRS, DH3

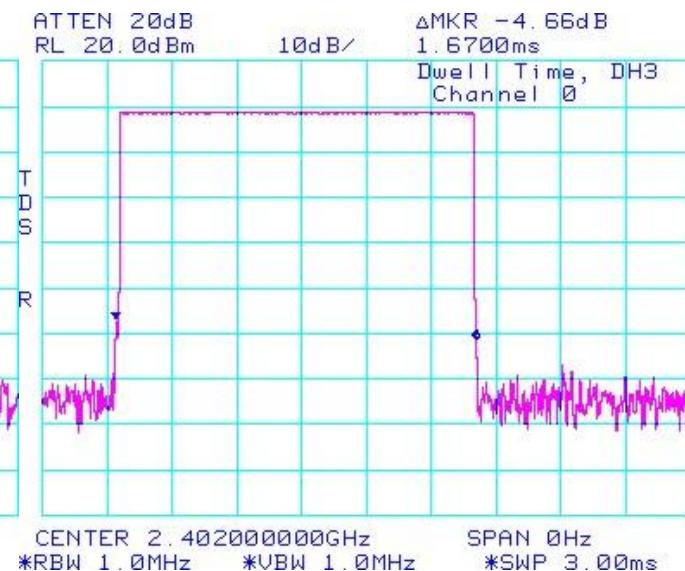


Figure 3-17: Time of Occupancy (Dwell Time)
Freq. Hopping, Static PBRS, DH3

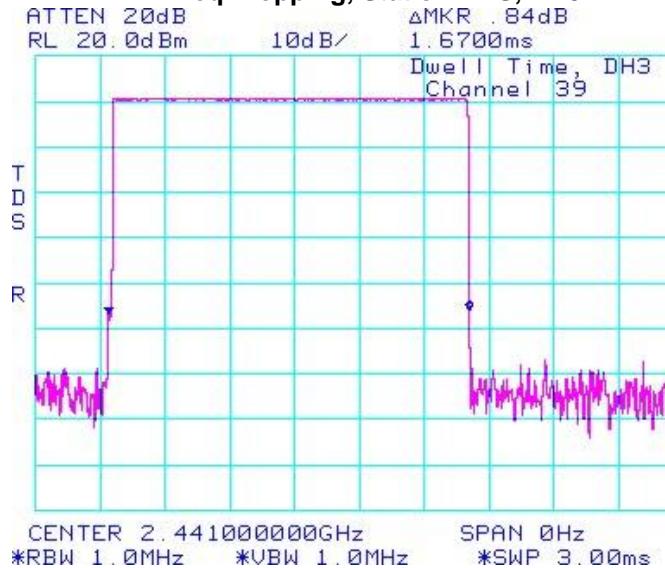
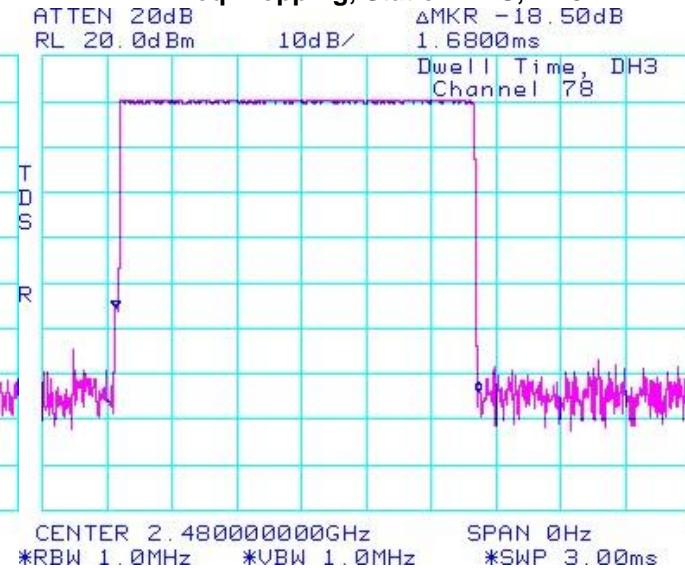


Figure 3-18 : Time of Occupancy (Dwell Time)
Freq. Hopping, Static PBRS, DH3



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Bluetooth RF Conducted Emission Test Results cont'd

Figure 3-19: Time of Occupancy (Dwell Time)

Freq. Hopping, Static PBRS, DH5

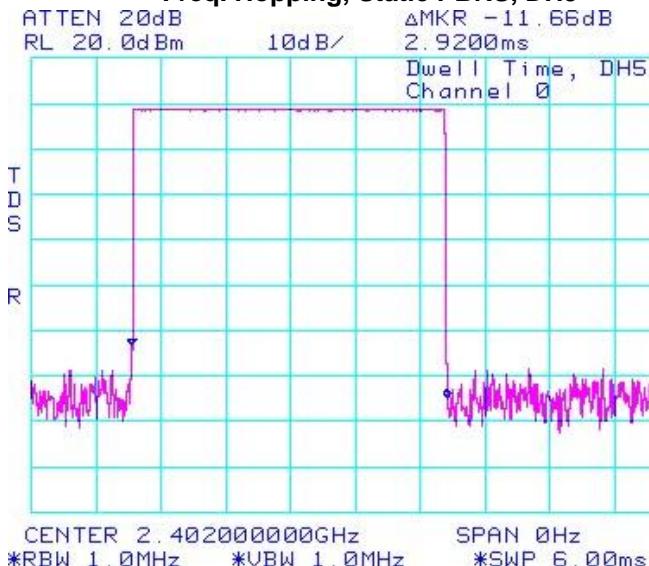


Figure 3-20: Time of Occupancy (Dwell Time)

Freq. Hopping, Static PBRS, DH5

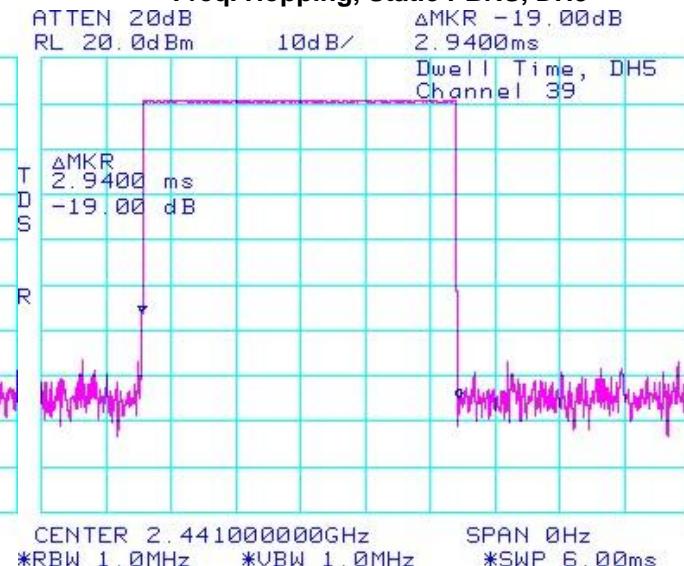
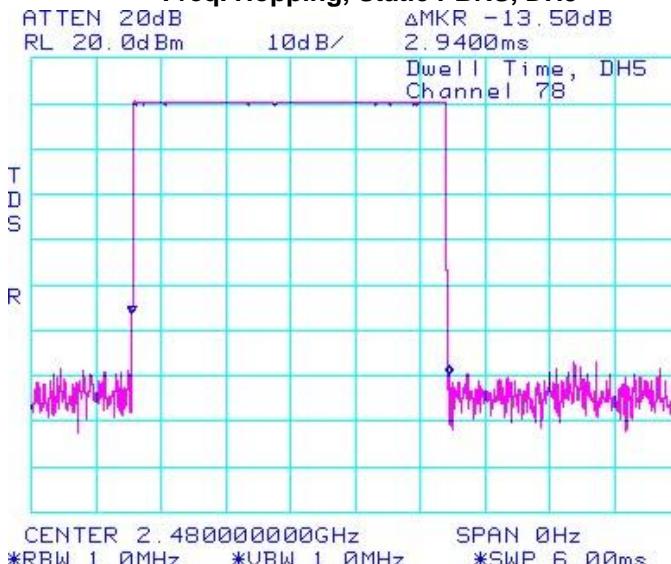


Figure 3-21: Time of Occupancy (Dwell Time)

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	9.00	0.00794	0.0 to 20.0
39	10.67	0.01167	0.0 to 20.0
78	10.33	0.01079	0.0 to 20.0

See figures 3-22 to 3-24 for the plots of the maximum peak conducted output power.

Figure 3-22: Max. Peak Conducted Output Power

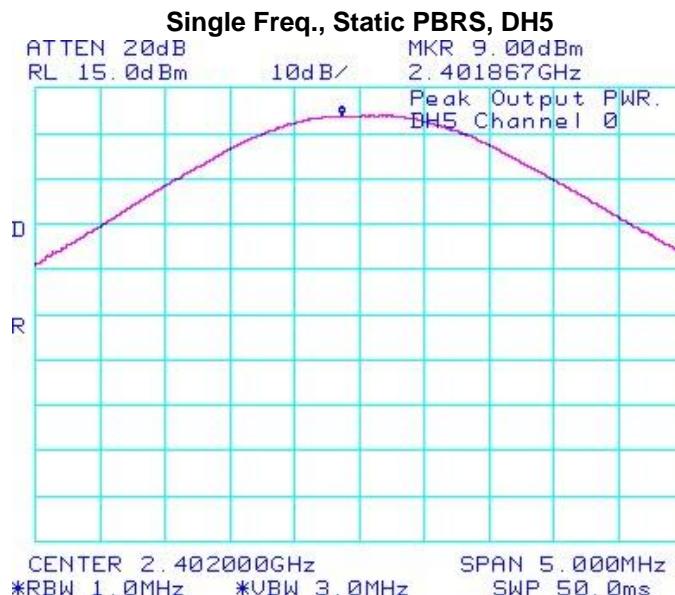
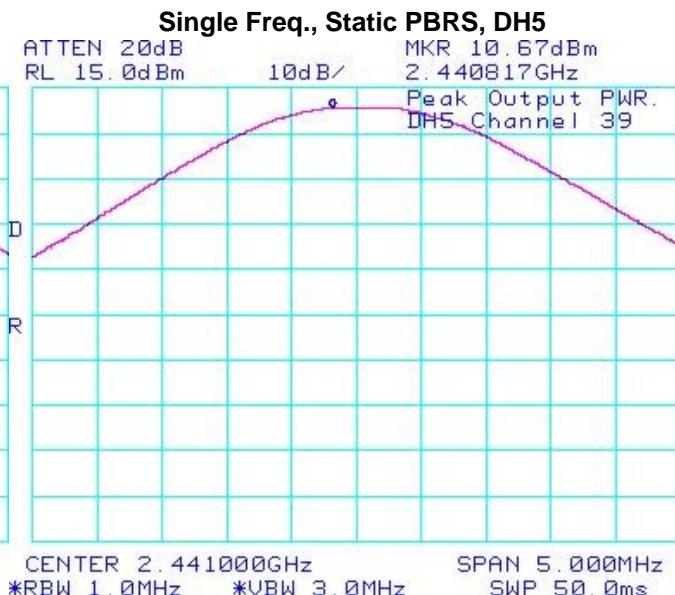


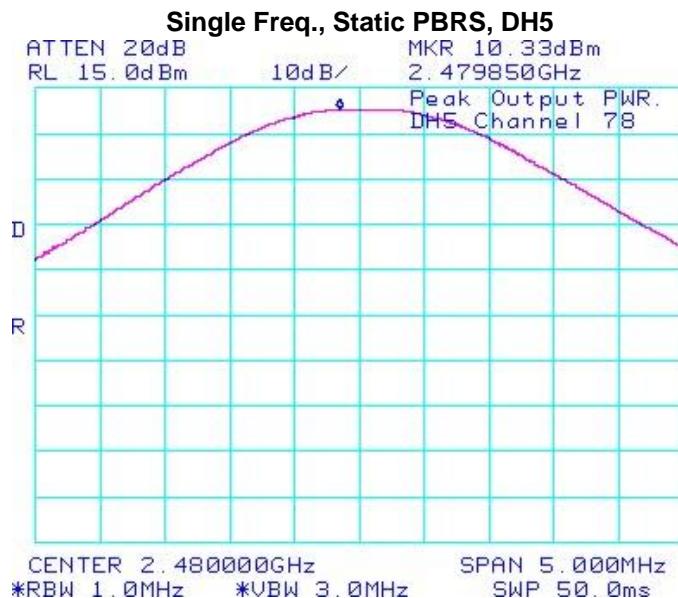
Figure 3-23: Max. Peak Conducted Output Power



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Bluetooth RF Conducted Emission Test Results cont'd

Figure 3-24: Max. Peak Conducted Output Power



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	8.83	0.00764	0.0 to 20.0
39	10.33	0.01079	0.0 to 20.0
78	9.83	0.00962	0.0 to 20.0

See figures 3-25 to 3-27 for the plots of the maximum peak conducted output power.

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Bluetooth RF Conducted Emission Test Results cont'd

Figure 3-25: Max. Peak Conducted Output Power

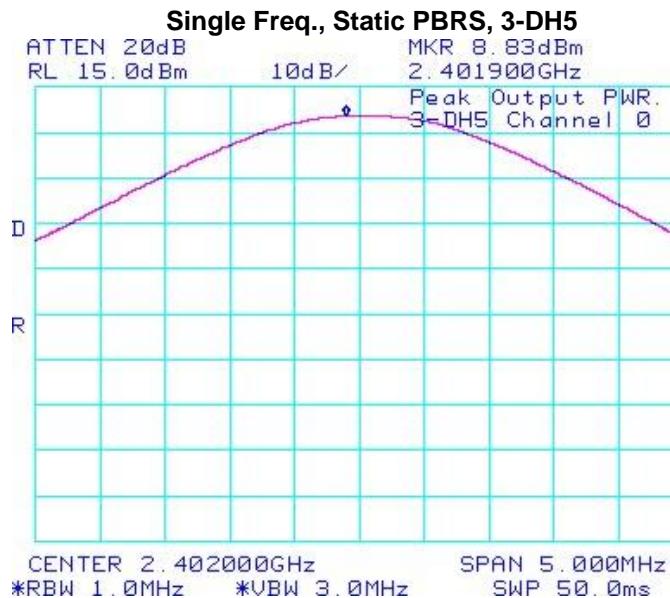


Figure 3-26: Max. Peak Conducted Output Power

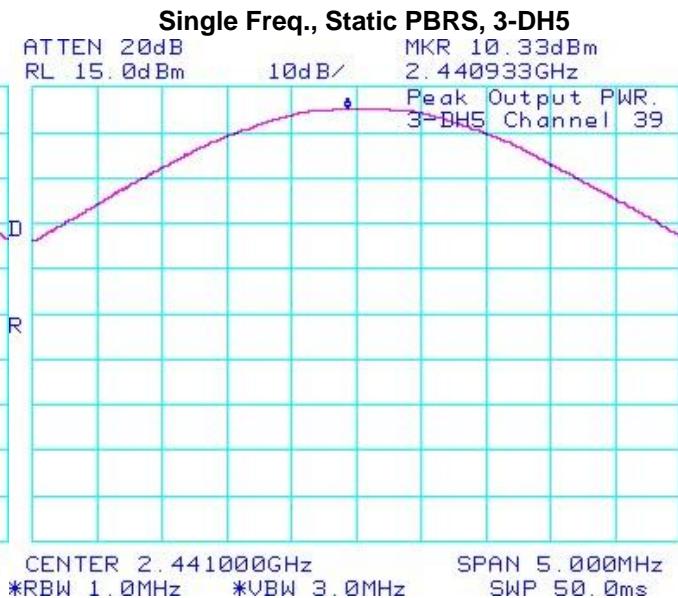
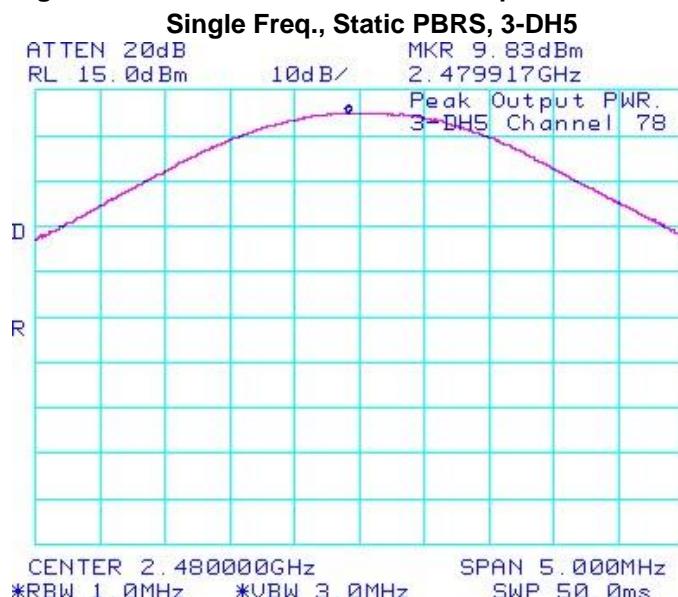


Figure 3-27: Max. Peak Conducted Output Power



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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	-39.16	-20	-19.16
78	Single Frequency	-39.00	-20	-19.00
0	Hopping	-39.50	-20	-19.50
78	Hopping	-39.50	-20	-19.50

See figures 3-28 to 3-31 for the plots of the band edge compliance measurements.

Figure 3-28: Band Edge Compliance

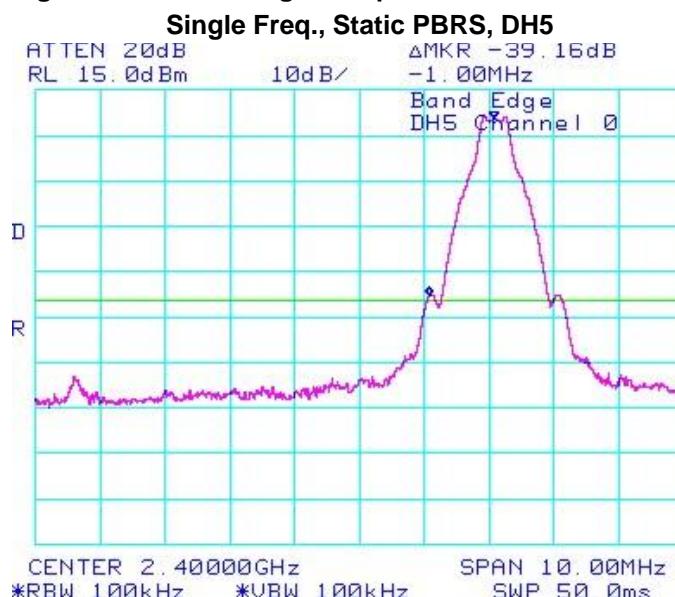
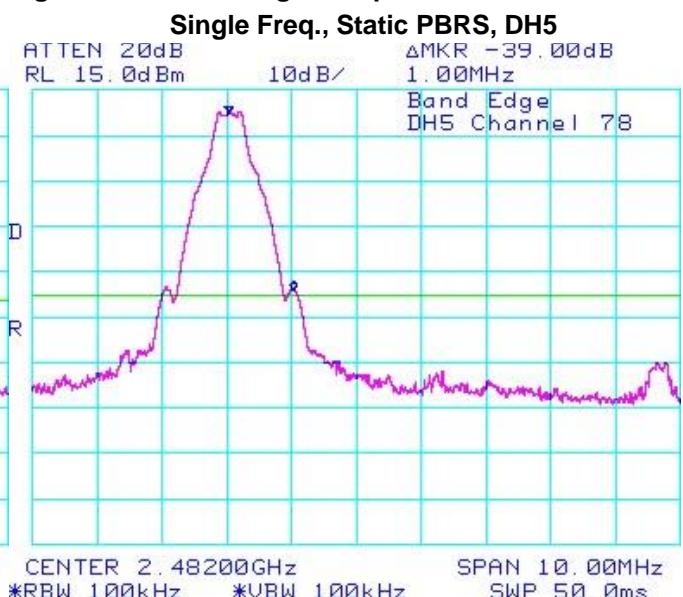


Figure 3-29: Band Edge Compliance



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Bluetooth RF Conducted Emission Test Results cont'd

Figure 3-30: Band Edge Compliance

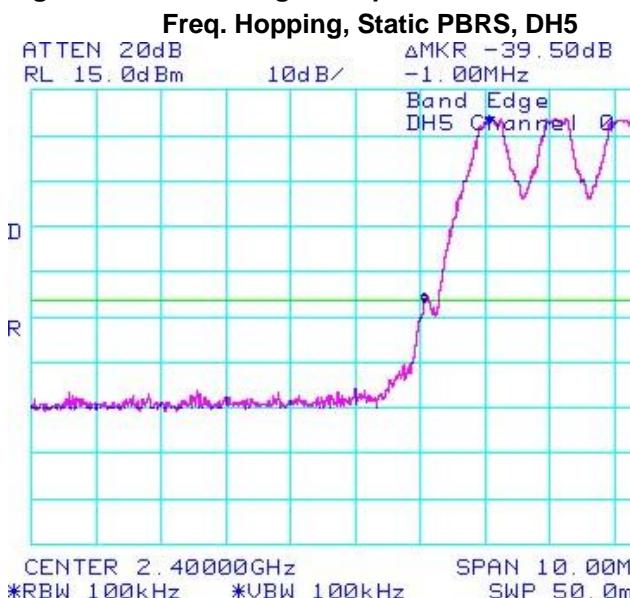
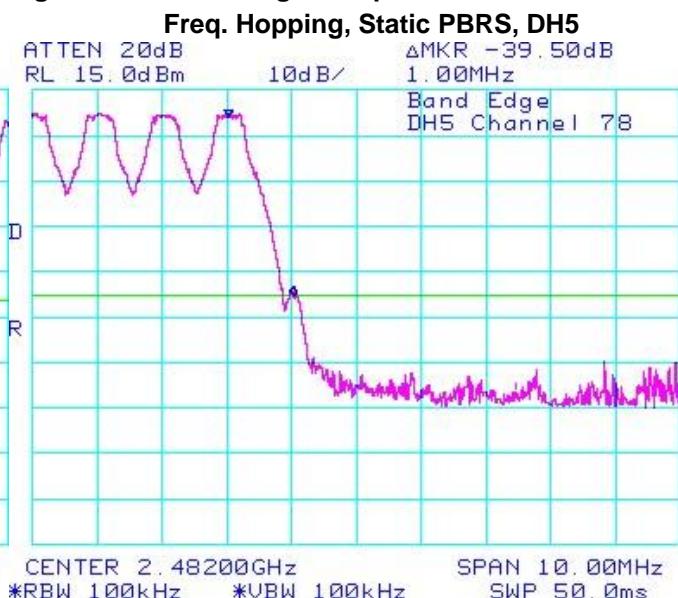


Figure 3-31: Band Edge Compliance



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	-30.83	-20	-10.83
78	Single Frequency	-33.83	-20	-13.83
0	Hopping	-31.67	-20	-11.67
78	Hopping	-33.00	-20	-13.00

See figures 3-32 to 3-35 for the plots of the band edge compliance measurements.

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Bluetooth RF Conducted Emission Test Results cont'd

Figure 3-32: Band Edge Compliance

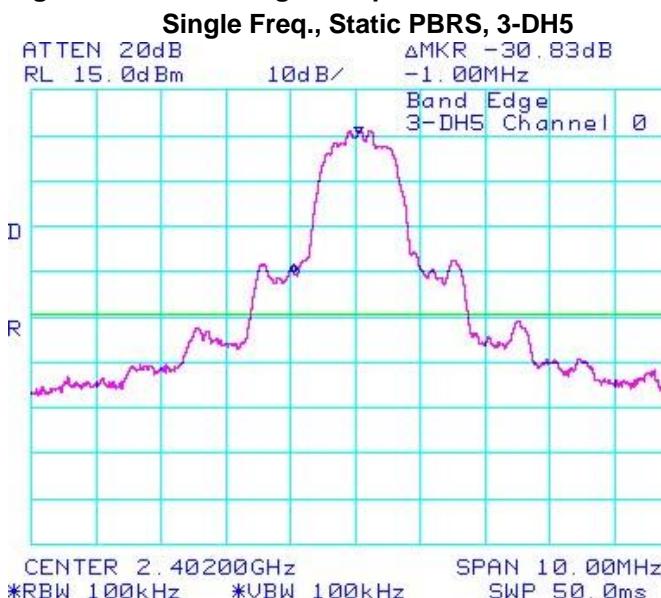


Figure 3-33: Band Edge Compliance

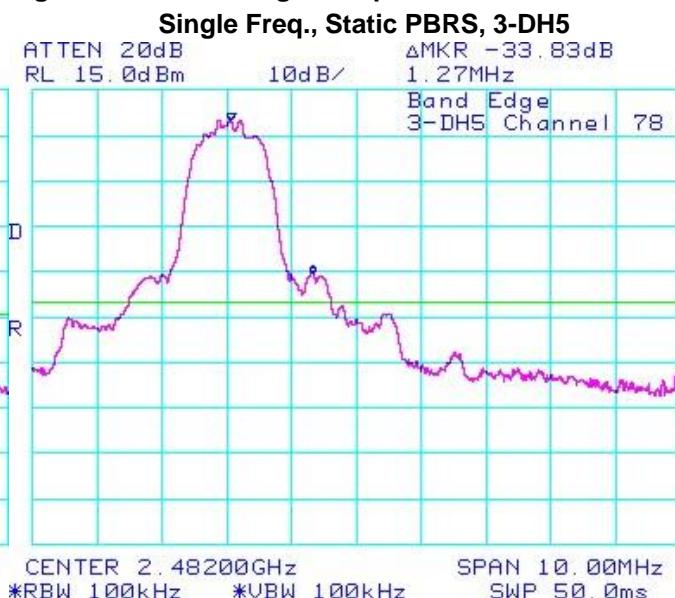


Figure 3-34: Band Edge Compliance

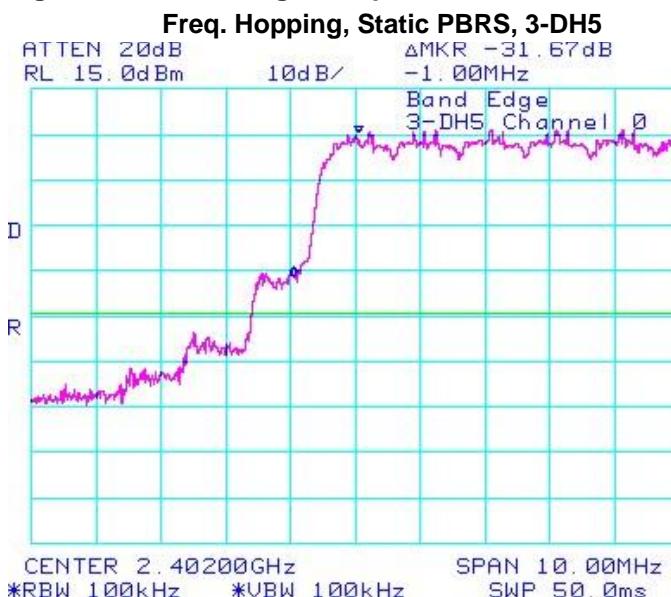
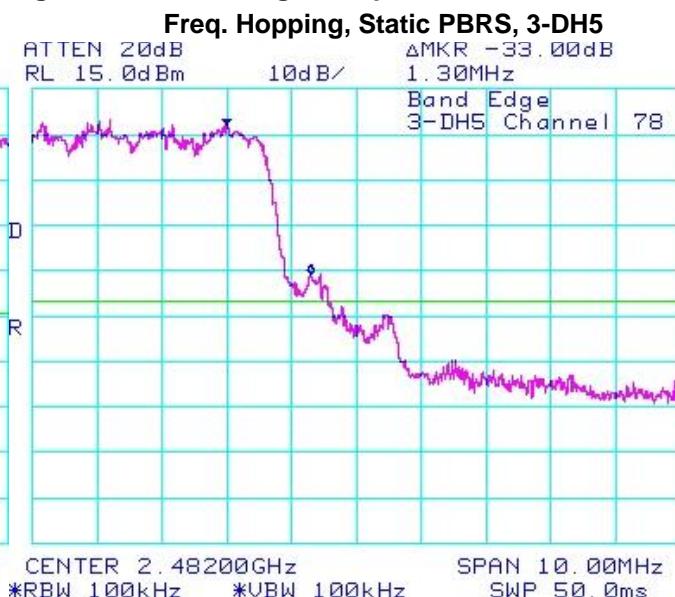


Figure 3-35: Band Edge Compliance



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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	9.00	-54.33	-63.33	-20
39	10.67	-49.33	-60.00	-20
78	10.33	-55.83	-66.16	-20
Hopping mode	9.00	-53.33	-62.33	-20

See figures 3-36 to 3-39 for the plots of the spurious RF conducted emissions.

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Bluetooth RF Conducted Emission Test Results cont'd

Figure 3-36: Spurious RF Conducted Emissions

Single Freq., Static PBRS, DH5,

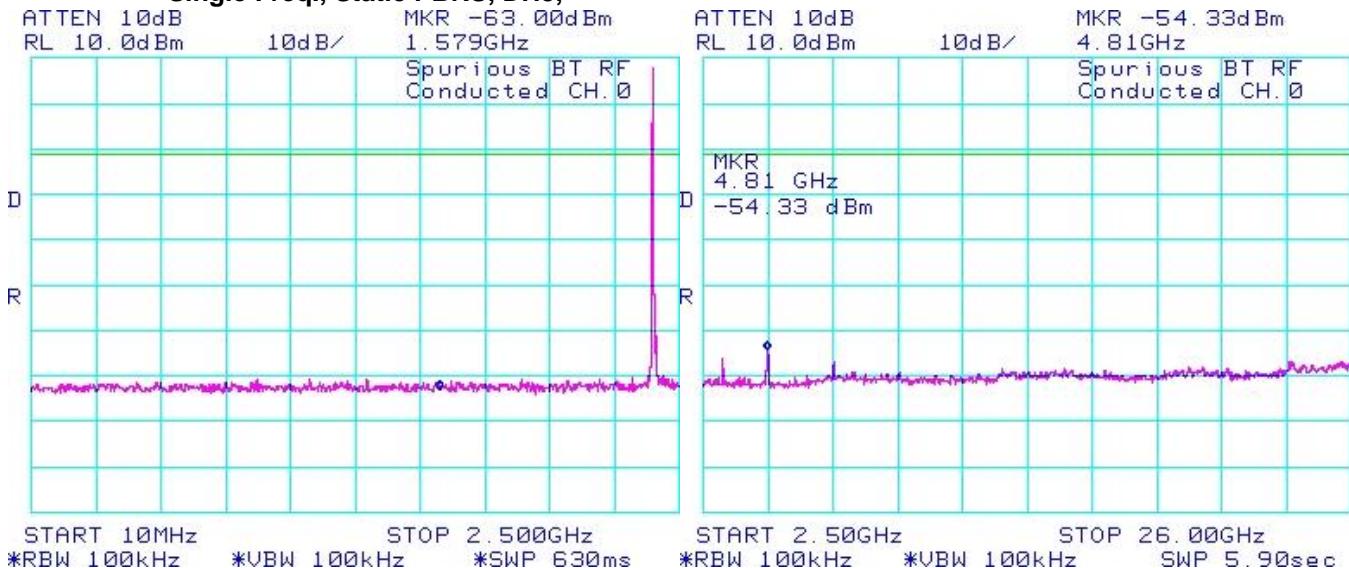
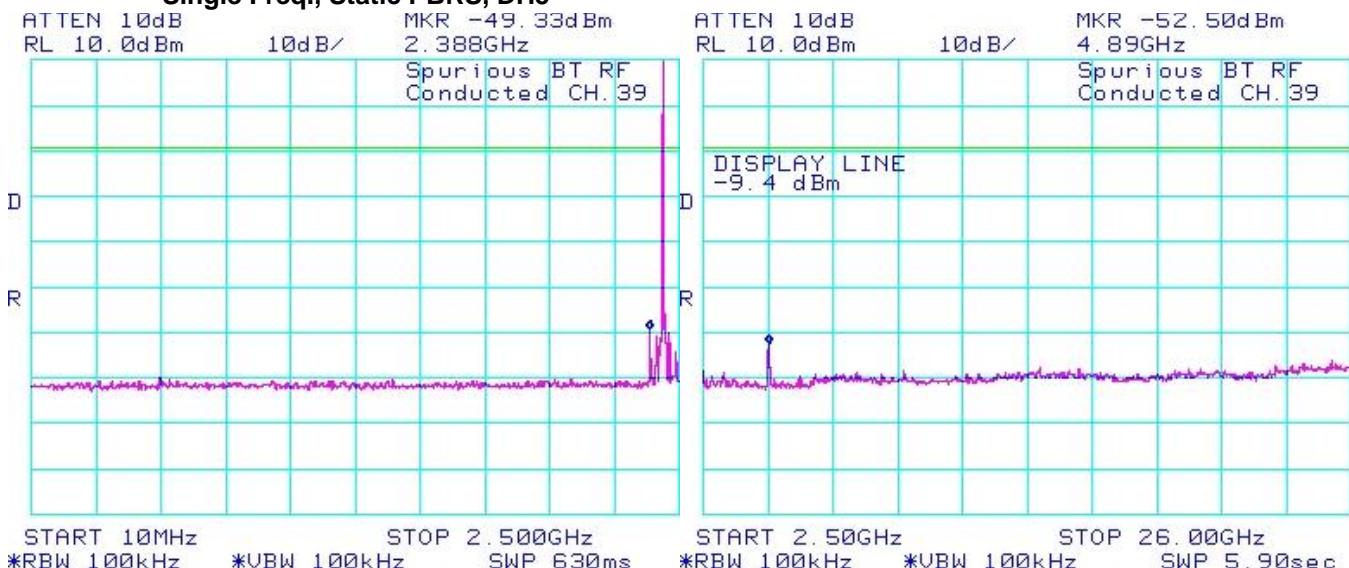


Figure 3-37: Spurious RF Conducted Emissions

Single Freq., Static PBRS, DH5



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Bluetooth RF Conducted Emission Test Results cont'd

Figure 3-38: Spurious RF Conducted Emissions

Single Freq., Static PBRS, DH5

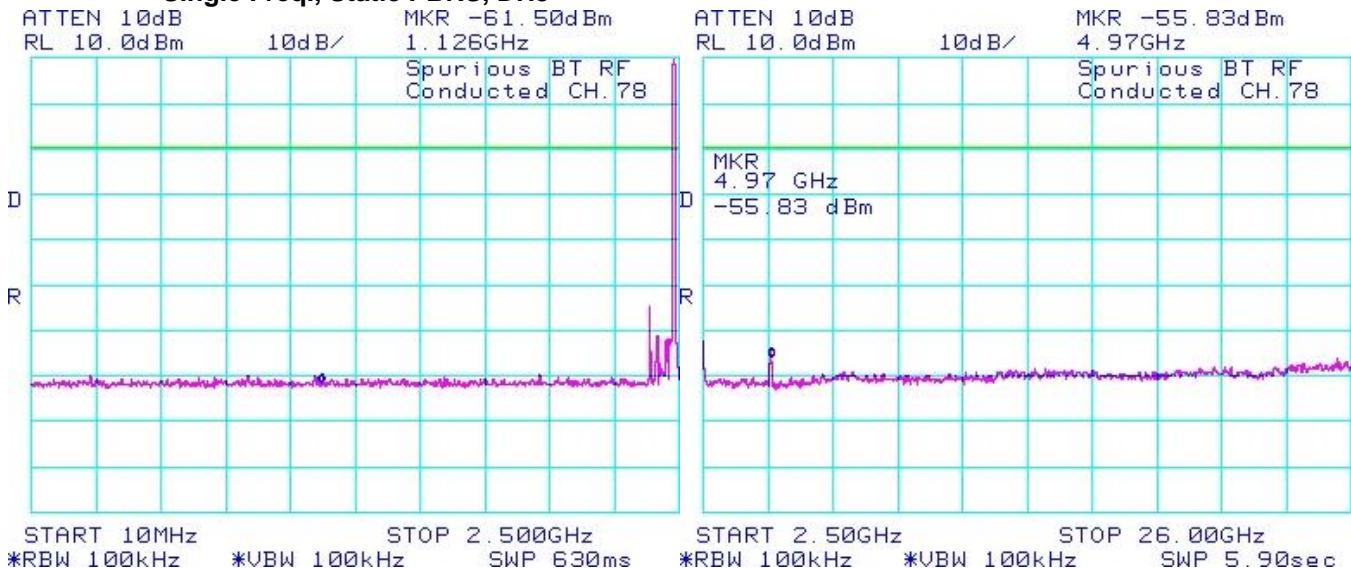
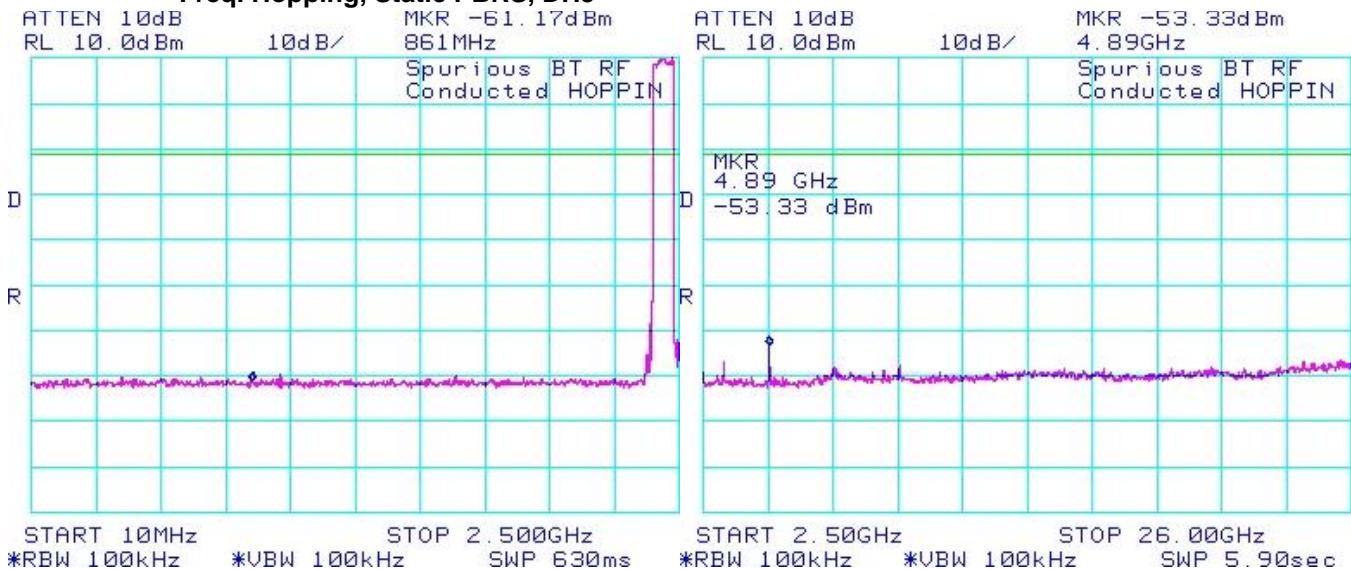


Figure 3-39: Spurious RF Conducted Emissions

Freq. Hopping, Static PBRS, 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	Channel Power (dBm)	Max. Measured Level (dBm)	Max. Measured Level from carrier (dBc)	Limit (dBc)
0	8.83	-57.17	-66.00	-20
39	10.33	-41.50	-51.83	-20
78	9.83	-57.33	-67.16	-20
Hopping mode	8.83	-56.67	-65.50	-20

See figures 3-40 to 3-43 for the plots of the spurious RF conducted emissions.

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Bluetooth RF Conducted Emission Test Results cont'd

Figure 3-40 : Spurious RF Conducted Emissions

Single Freq., Static PBRS, 3-DH5

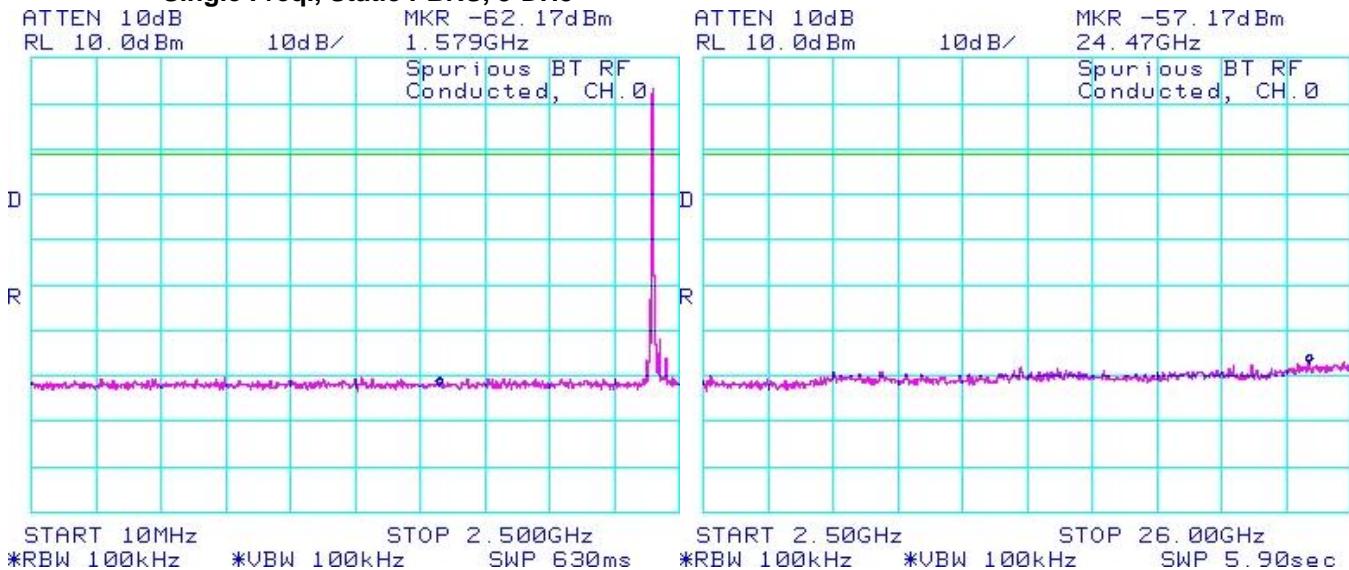
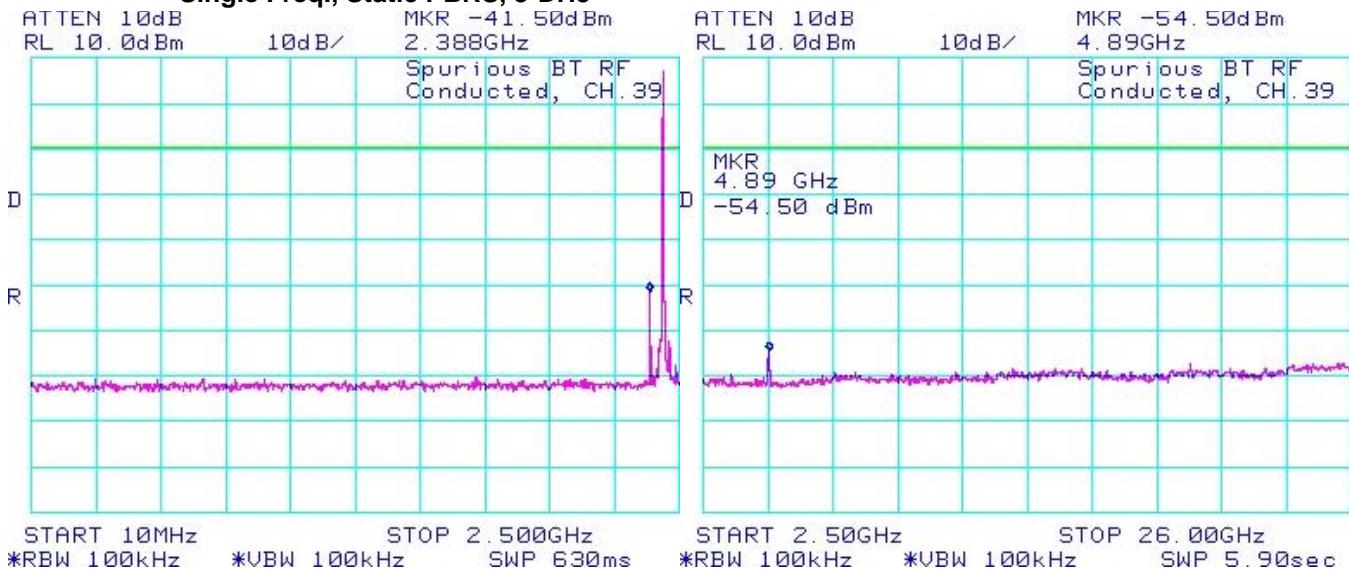


Figure 3-41: Spurious RF Conducted Emissions

Single Freq., Static PBRS, 3-DH5



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Bluetooth RF Conducted Emission Test Results cont'd

Figure 3-42: Spurious RF Conducted Emissions

Single Freq., Static PBRS, 3-DH5

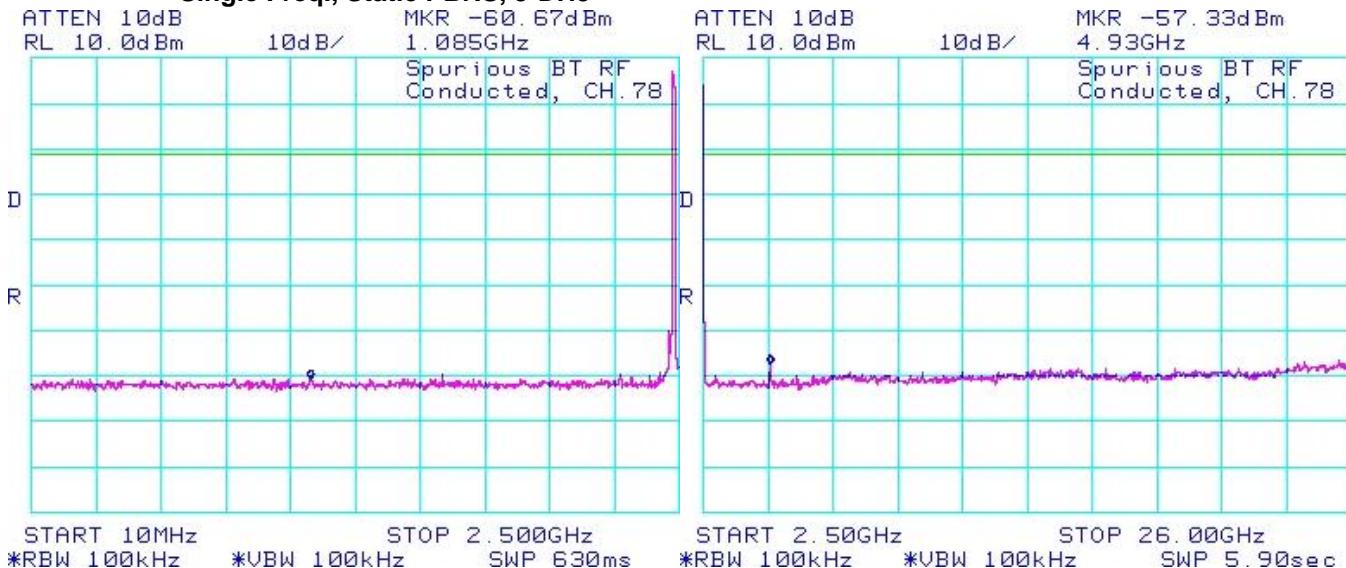
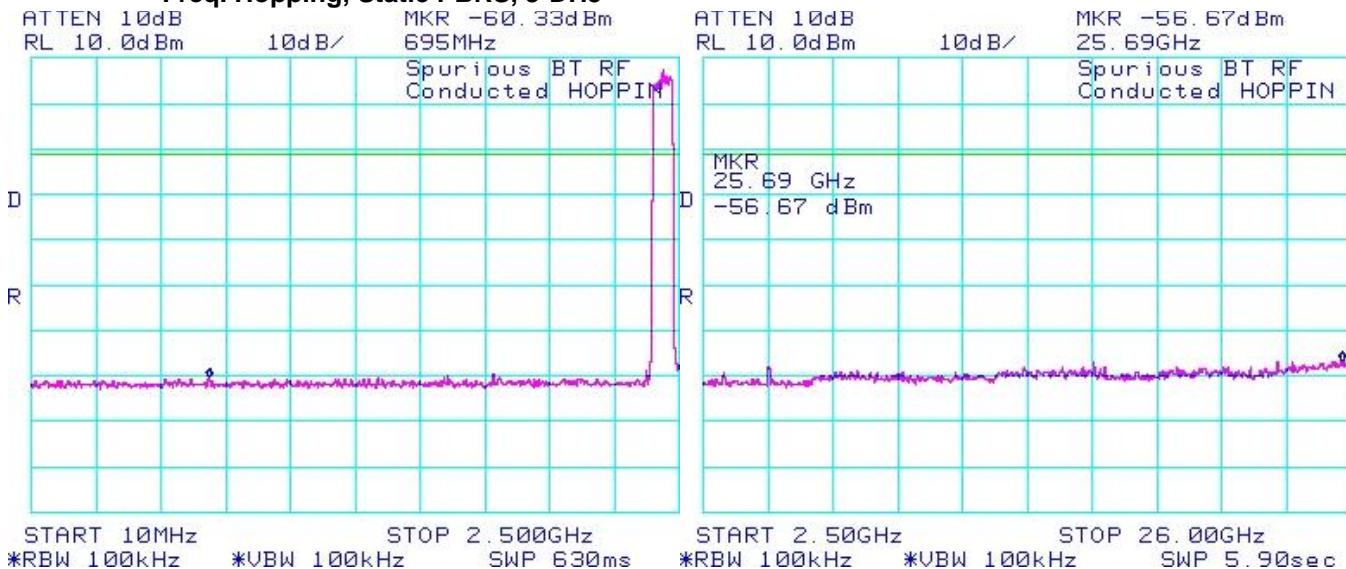


Figure 3-43 : Spurious RF Conducted Emissions

Freq. Hopping, Static PBRS, 3-DH5



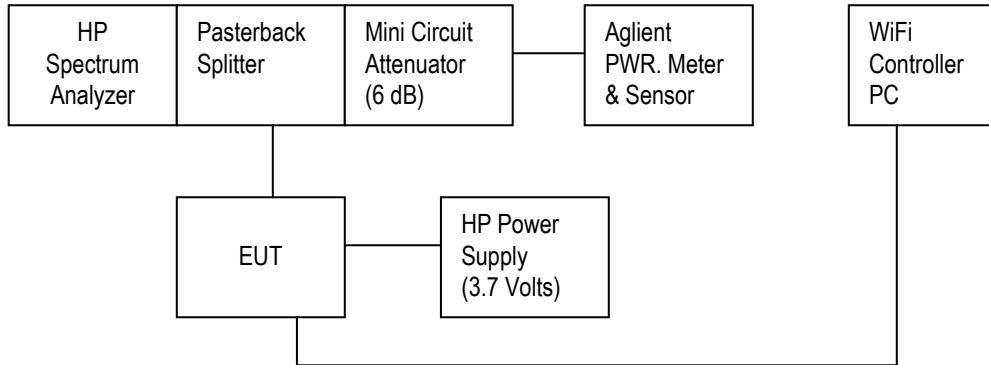
	<p>EMI Test Report for the BlackBerry® smartphone Model RDU71CW</p> <p>APPENDIX 4</p>	
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APPENDIX 4 – 802.11b/g/n CONDUCTED EMISSIONS TEST DATA/PLOTS

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802.11b/g/n RF Conducted Emission Test Results

Test Setup Diagram



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 20, 2011

The measurements on the BlackBerry® smartphone were performed by Maurice Battler.

The environmental test conditions were: Temperature: 23 °C
Relative Humidity: 47 %

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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	10.10
	5.5 Mbps	≥ 500	10.47
	11 Mbps	≥ 500	11.17
	6 Mbps	≥ 500	16.40
	24 Mbps	≥ 500	16.57
	54 Mbps	≥ 500	16.57
	MCS 0	≥ 500	17.03
	MCS 4	≥ 500	17.77
	MCS 7	≥ 500	17.70
6	1 Mbps	≥ 500	10.10
	5.5 Mbps	≥ 500	10.37
	11 Mbps	≥ 500	11.13
	6 Mbps	≥ 500	16.43
	24 Mbps	≥ 500	16.47
	54 Mbps	≥ 500	16.60
	MCS 0	≥ 500	16.77
	MCS 4	≥ 500	17.70
	MCS 7	≥ 500	17.73

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

Channel	Data Rate	Limit (kHz)	Measured Level (MHz)
11	1 Mbps	≥ 500	10.10
	5.5 Mbps	≥ 500	10.57
	11 Mbps	≥ 500	10.73
	6 Mbps	≥ 500	16.43
	24 Mbps	≥ 500	16.60
	54 Mbps	≥ 500	16.57
	MCS 0	≥ 500	17.03
	MCS 4	≥ 500	17.80
	MCS 7	≥ 500	17.63

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

See figures 4-1 to 4-9 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 4-1: 6 dB Bandwidth

802.11b, Channel 1, 1 Mbps

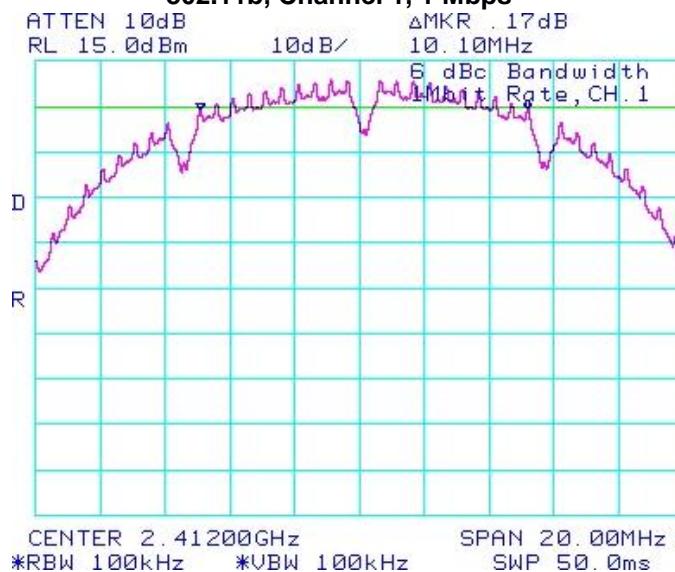


Figure 4-2: 6 dB Bandwidth

802.11b, Channel 6, 1 Mbps

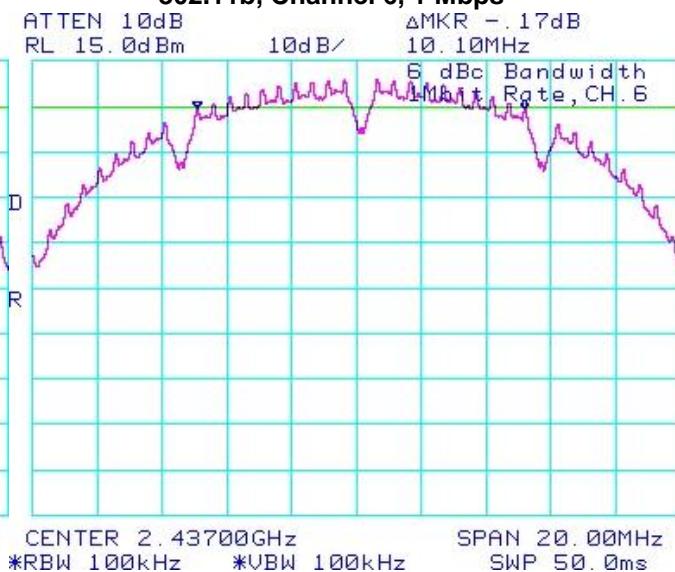


Figure 4-3: 6 dB Bandwidth

802.11b, Channel 11, 1 Mbps

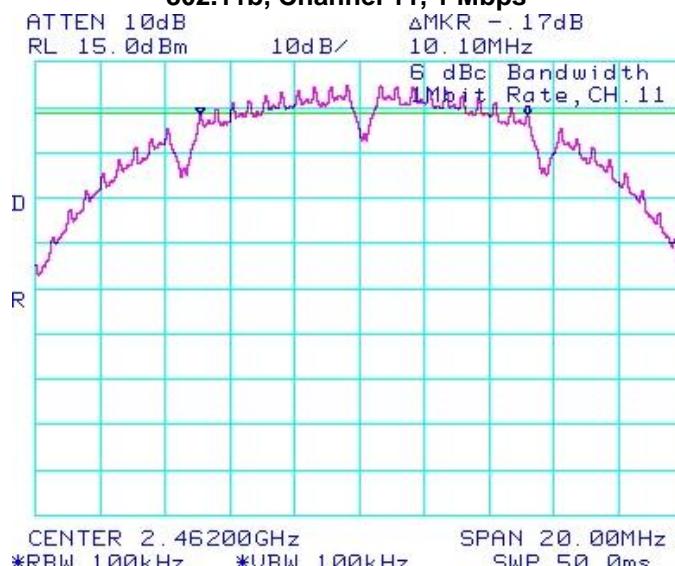
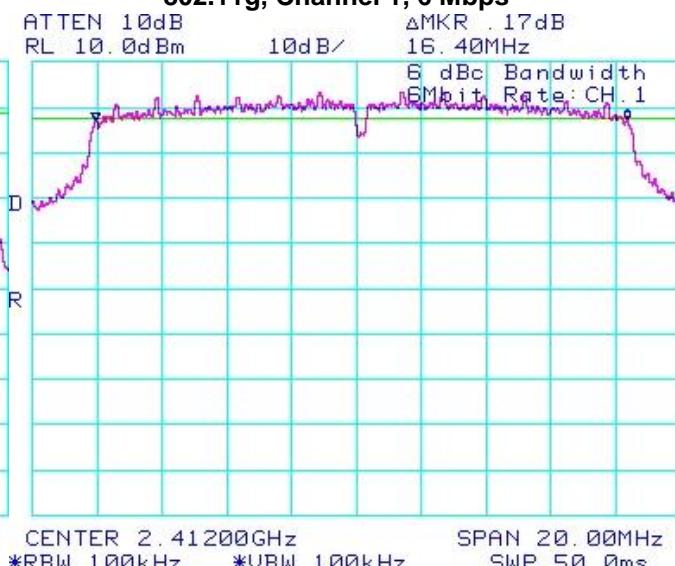


Figure 4-4: 6 dB Bandwidth

802.11g, Channel 1, 6 Mbps



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

Figure 4-5: 6 dB Bandwidth

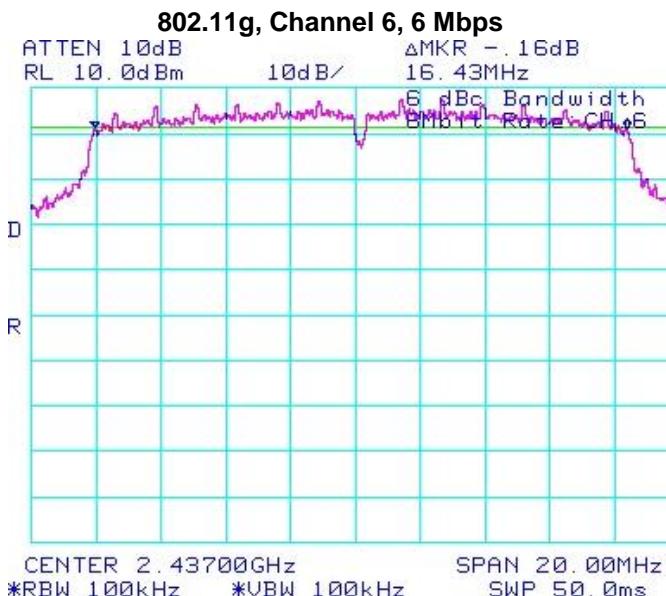


Figure 4-6: 6 dB Bandwidth

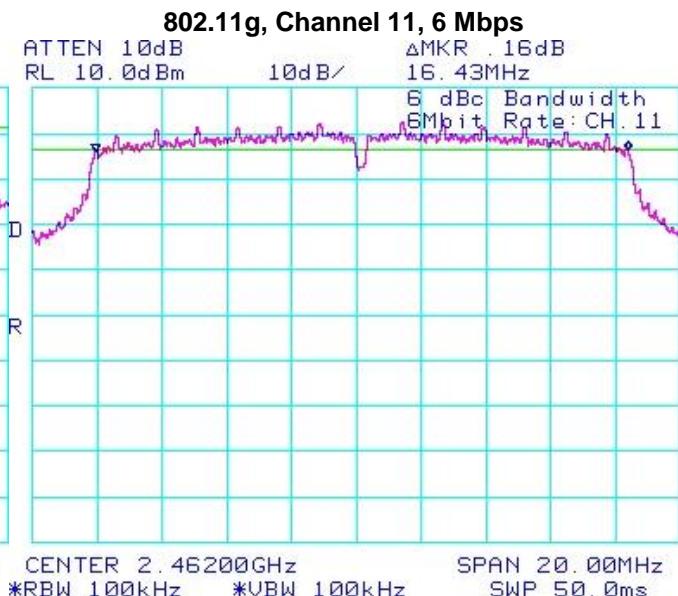


Figure 4-7: 6 dB Bandwidth

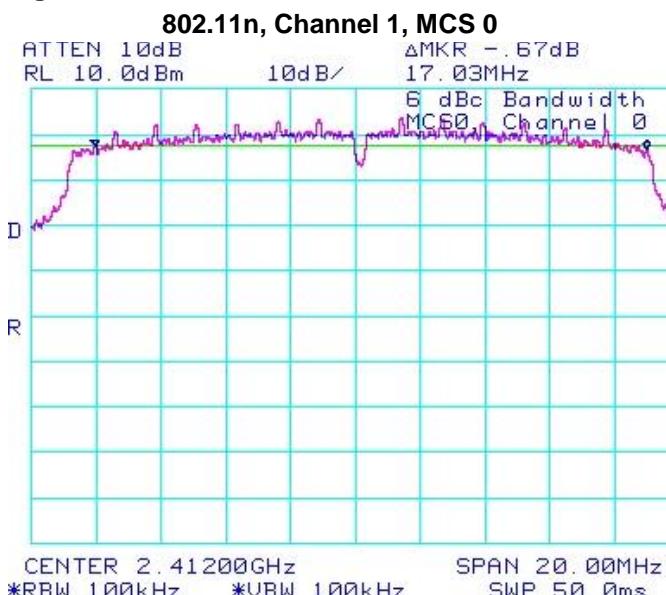
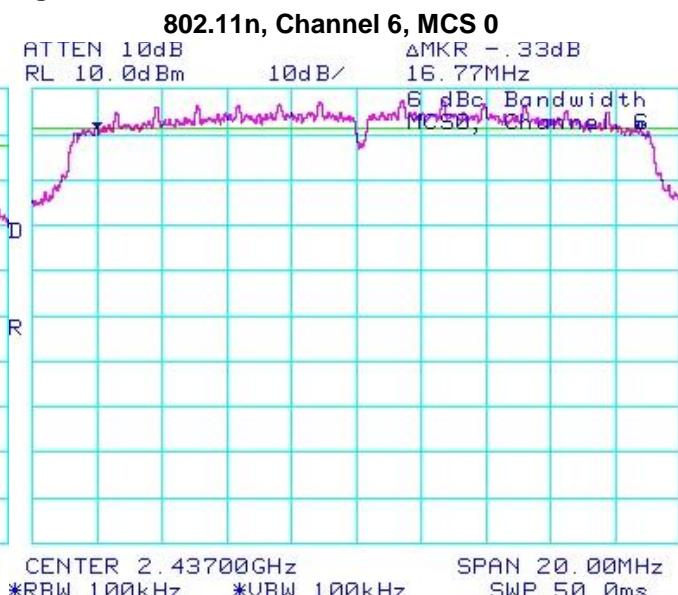


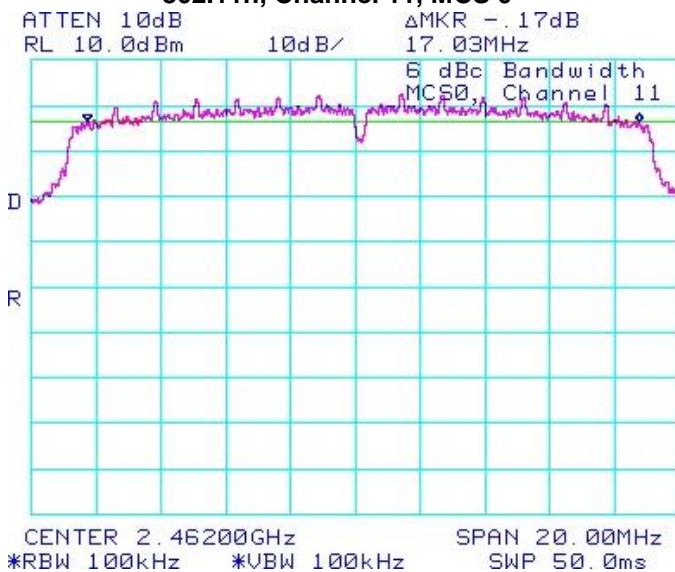
Figure 4-8: 6 dB Bandwidth



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Figure 4-9: 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 (mW)
1	1 Mbps	< 1.00	18.88	77.27
	5.5 Mbps	< 1.00	18.71	74.30
	11 Mbps	< 1.00	17.74	59.43
	6 Mbps	< 1.00	14.20	26.30
	24 Mbps	< 1.00	14.25	26.61
	54 Mbps	< 1.00	14.30	26.92
	MCS 0	< 1.00	14.13	25.88
	MCS 4	< 1.00	14.16	26.06
	MCS 7	< 1.00	13.70	23.44
6	1 Mbps	< 1.00	19.05	80.35
	5.5 Mbps	< 1.00	18.85	76.74
	11 Mbps	< 1.00	18.88	77.27
	6 Mbps	< 1.00	18.06	63.97
	24 Mbps	< 1.00	15.75	37.58
	54 Mbps	< 1.00	14.35	27.23
	MCS 0	< 1.00	17.92	61.94
	MCS 4	< 1.00	15.69	37.07
	MCS 7	< 1.00	13.40	21.88

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

Channel	Data Rate	Class 2 Limit (W)	Measured Level (dBm)	Measured Level (mW)
11	1 Mbps	< 1.00	18.18	65.77
	5.5 Mbps	< 1.00	18.05	63.83
	11 Mbps	< 1.00	18.01	63.24
	6 Mbps	< 1.00	13.52	22.49
	24 Mbps	< 1.00	13.50	22.39
	54 Mbps	< 1.00	13.50	22.39
	MCS 0	< 1.00	13.39	21.83
	MCS 4	< 1.00	13.50	22.39
	MCS 7	< 1.00	12.97	19.82

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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	-43.83	-23.83
	5.5 Mbps	< -20	-43.50	-23.50
	11 Mbps	< -20	-44.00	-24.00
	6 Mbps	< -20	-27.17	-7.17
	24 Mbps	< -20	-29.50	-9.50
	54 Mbps	< -20	-29.33	-9.33
	MCS 0	< -20	-26.17	-6.17
	MCS 4	< -20	-27.16	-7.16
	MCS 7	< -20	-28.17	-8.17
11	1 Mbps	< -20	-43.17	-23.17
	5.5 Mbps	< -20	-56.00	-36.00
	11 Mbps	< -20	-54.67	-34.67
	6 Mbps	< -20	-47.50	-27.50
	24 Mbps	< -20	-46.33	-26.33
	54 Mbps	< -20	-50.17	-30.17
	MCS 0	< -20	-43.83	-23.83
	MCS 4	< -20	-49.67	-29.67
	MCS 7	< -20	-48.33	-28.33

See figures 4-10 to 4-15 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 4-10: Band Edge Compliance

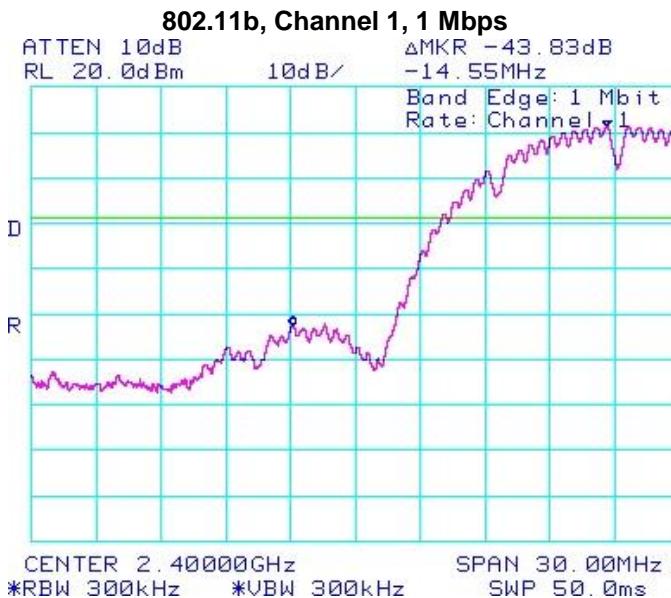


Figure 4-11: Band Edge Compliance

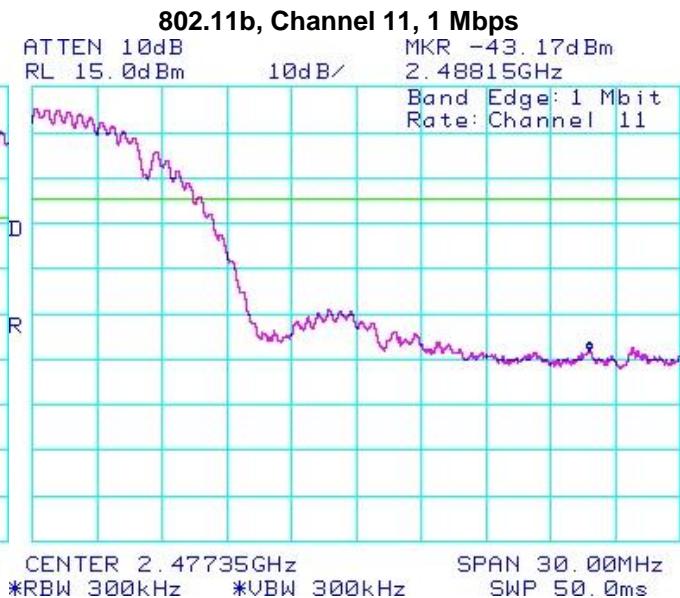


Figure 4-12: Band Edge Compliance

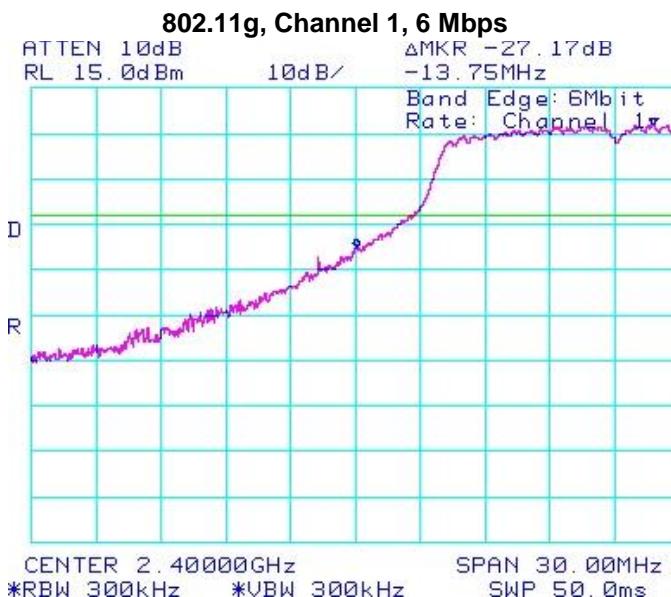
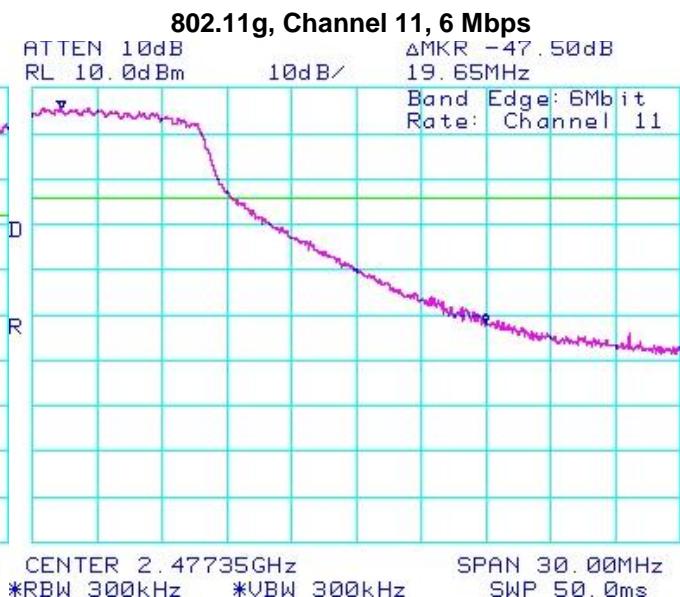


Figure 4-13: Band Edge Compliance



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

Figure 4-14: Band Edge Compliance

802.11n, Channel 1, MCS 0

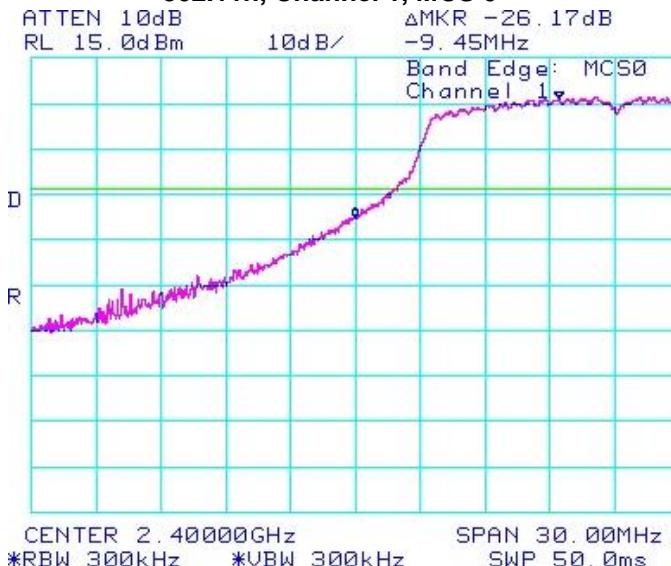


Figure 4-15: Band Edge Compliance

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	-0.83	-8.83
	5.5 Mbps	< 8.00	-2.67	-10.67
	11 Mbps	< 8.00	-2.17	-10.17
	6 Mbps	< 8.00	-9.17	-17.17
	24 Mbps	< 8.00	-8.50	-16.50
	54 Mbps	< 8.00	-9.00	-17.00
	MCS 0	< 8.00	-8.50	-16.50
	MCS 4	< 8.00	-9.00	-17.00
	MCS 7	< 8.00	-9.67	-17.67
6	1 Mbps	< 8.00	-1.33	-9.33
	5.5 Mbps	< 8.00	-2.83	-10.83
	11 Mbps	< 8.00	-2.00	-10.00
	6 Mbps	< 8.00	-5.50	-13.50
	24 Mbps	< 8.00	-7.17	-15.17
	54 Mbps	< 8.00	-8.67	-16.67
	MCS 0	< 8.00	-4.67	-12.67
	MCS 4	< 8.00	-7.67	-15.67
	MCS 7	< 8.00	-10.00	-18.00

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

Channel	Data Rate	Limit (dBm)	Measured Level (dBm)	Margin (dBm)
11	1 Mbps	< 8.00	-2.50	-10.50
	5.5 Mbps	< 8.00	-3.83	-11.83
	11 Mbps	< 8.00	-3.17	-11.17
	6 Mbps	< 8.00	-10.17	-18.17
	24 Mbps	< 8.00	-9.67	-17.67
	54 Mbps	< 8.00	-10.00	-18.00
	MCS 0	< 8.00	-9.67	-17.67
	MCS 4	< 8.00	-10.33	-18.33
	MCS 7	< 8.00	-10.83	-18.83

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

See figures 4-16 to 4-24 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 4-16: Peak Power Spectral Density

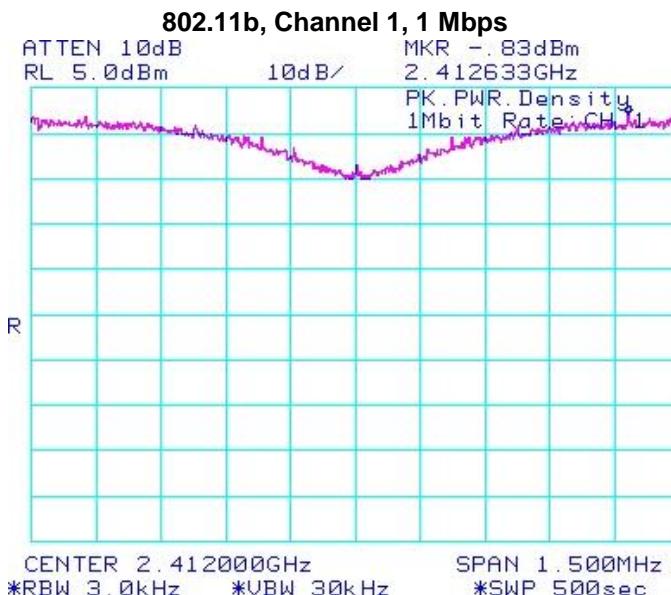


Figure 4-17: Peak Power Spectral Density

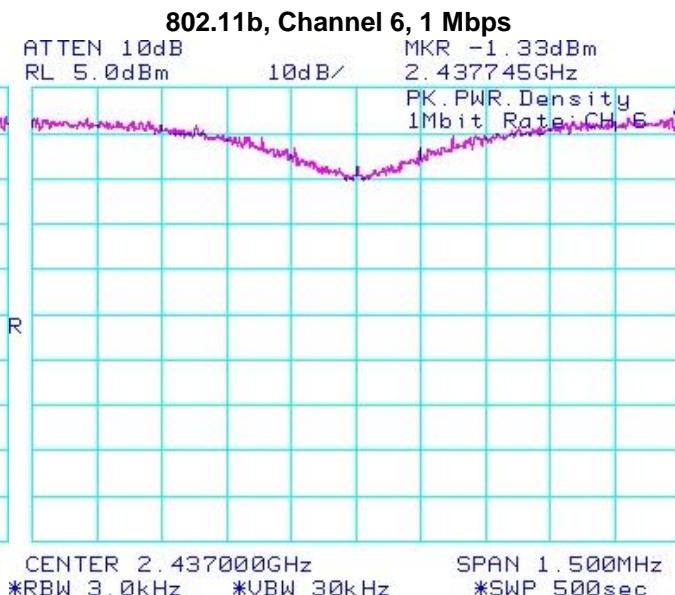
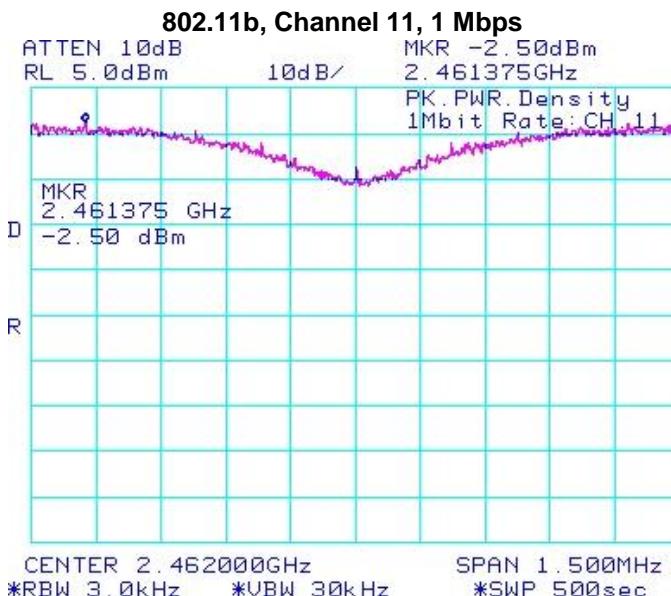


Figure 4-18: Peak Power Spectral Density



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

Figure 4-19: Peak Power Spectral Density

802.11g, Channel 1, 6 Mbps

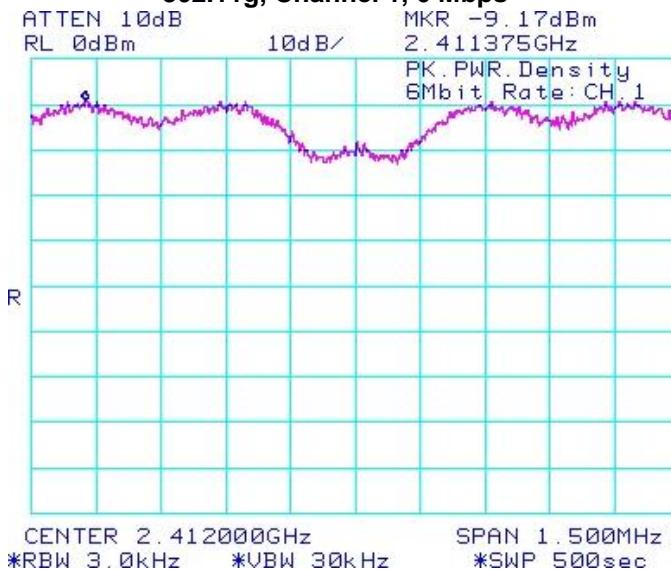


Figure 4-20: Peak Power Spectral Density

802.11g, Channel 6, 6 Mbps

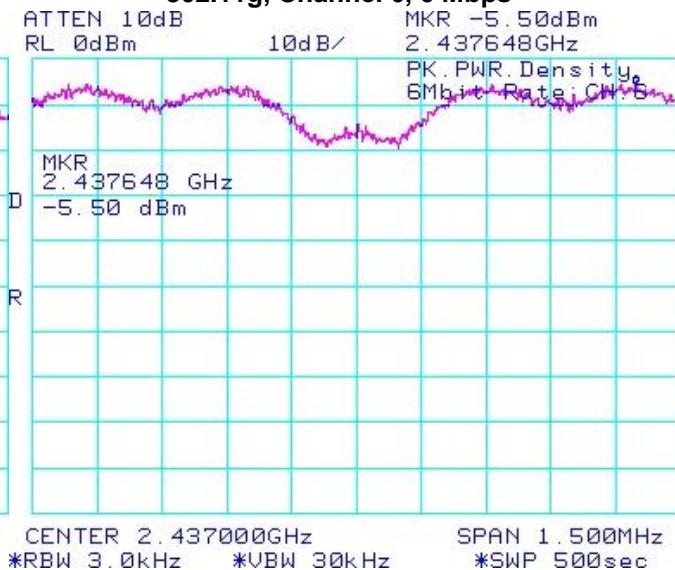
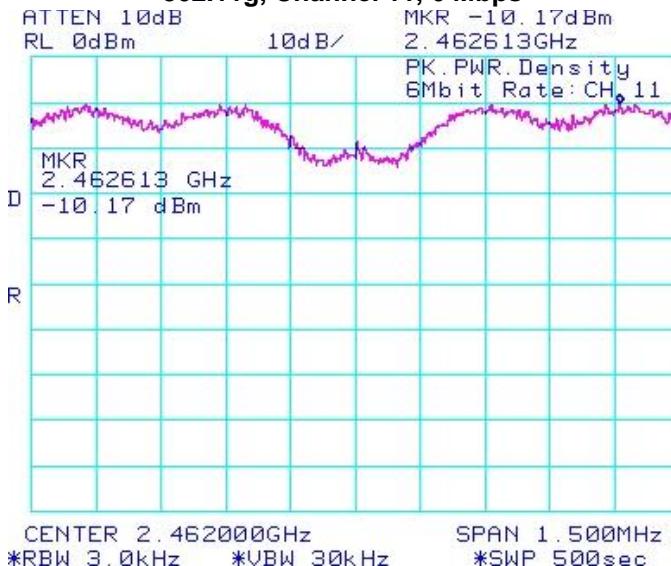


Figure 4-21: Peak Power Spectral Density

802.11g, Channel 11, 6 Mbps



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

Figure 4-22: Peak Power Spectral Density

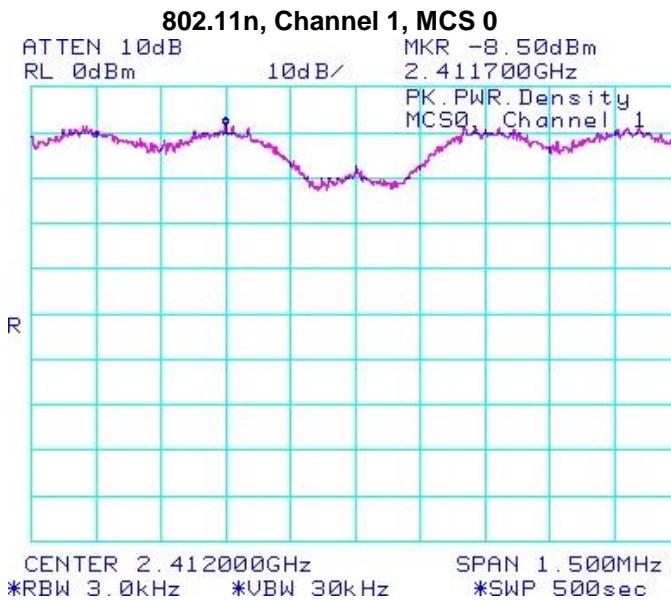


Figure 4-23: Peak Power Spectral Density

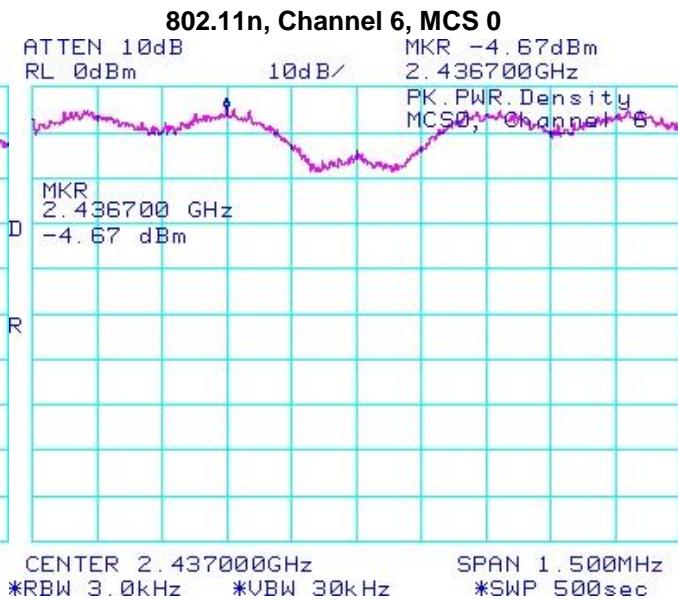
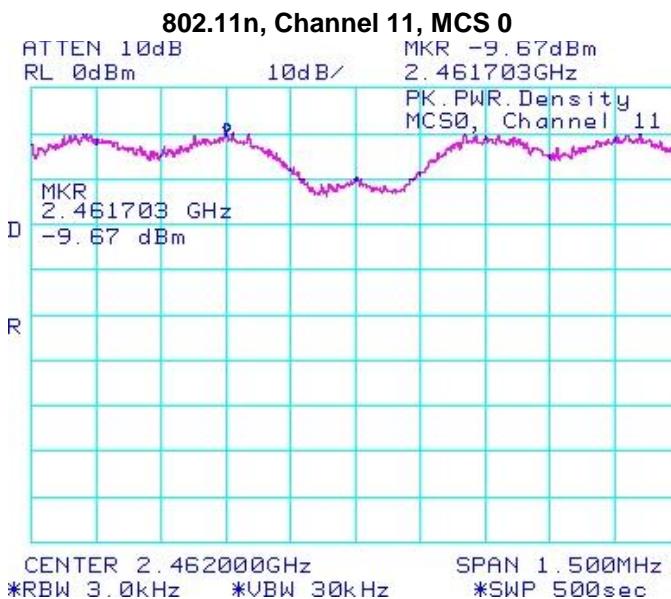


Figure 4-24: Peak Power Spectral Density



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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	18.88	-41.50	-60.38	-20
	5.5 Mbps	18.71	-47.50	-66.21	-20
	11 Mbps	17.74	-44.67	-62.41	-20
	6 Mbps	14.20	-46.17	-60.37	-20
	24 Mbps	14.25	-45.17	-59.42	-20
	54 Mbps	14.30	-46.67	-60.97	-20
	MCS 0	14.13	-45.50	-59.63	-20
	MCS 4	14.16	-46.50	-60.66	-20
	MCS 7	13.70	-47.33	-61.03	-20
6	1 Mbps	19.05	-48.00	-67.05	-20
	5.5 Mbps	18.85	-47.60	-66.45	-20
	11 Mbps	18.88	-47.83	-66.71	-20
	6 Mbps	18.06	-47.67	-65.73	-20
	24 Mbps	15.75	-47.67	-63.42	-20
	54 Mbps	14.35	-47.33	-61.68	-20
	MCS 0	17.92	-47.67	-65.59	-20
	MCS 4	15.69	-47.67	-63.36	-20
	MCS 7	13.40	-50.33	-63.73	-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	1 Mbps	18.18	-47.50	-65.68	-20
	5.5 Mbps	18.05	-49.17	-67.22	-20
	11 Mbps	18.01	-41.67	-59.68	-20
	6 Mbps	13.52	-41.83	-55.35	-20
	24 Mbps	13.50	-48.00	-61.50	-20
	54 Mbps	13.50	-49.00	-62.50	-20
	MCS 0	13.39	-47.00	-60.39	-20
	MCS 4	13.50	-49.33	-62.83	-20
	MCS 7	12.97	-48.67	-61.64	-20

The emissions were in the noise floor.

See figures 4-25 to 4-33 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 4-25: Spurious Conducted RF Emissions

802.11b, Channel 1, 1 Mbps

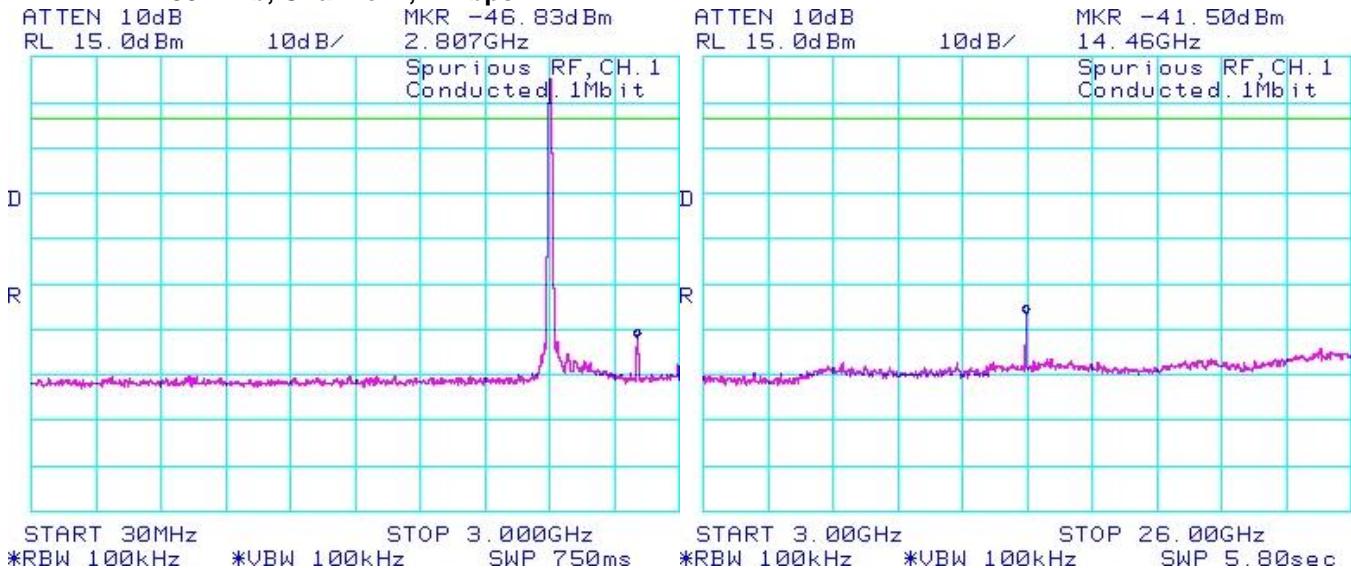
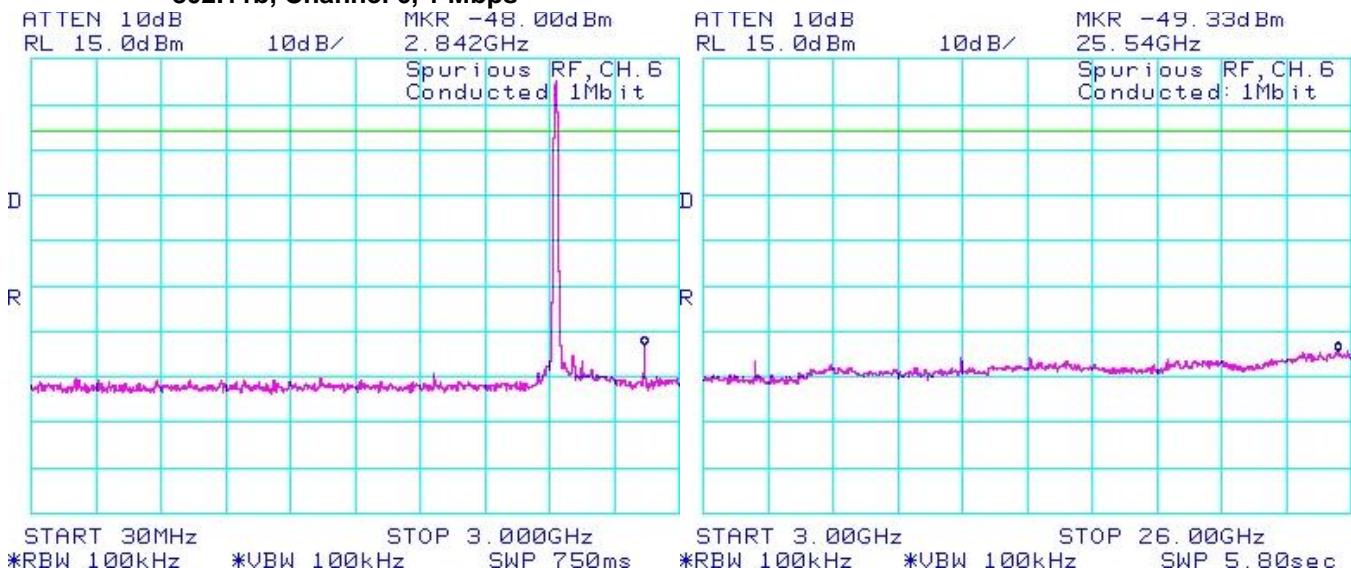


Figure 4-26 : Spurious Conducted RF Emissions

802.11b, Channel 6, 1 Mbps



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

Figure 4-27: Spurious Conducted RF Emissions

802.11b, Channel 11, 1 Mbps

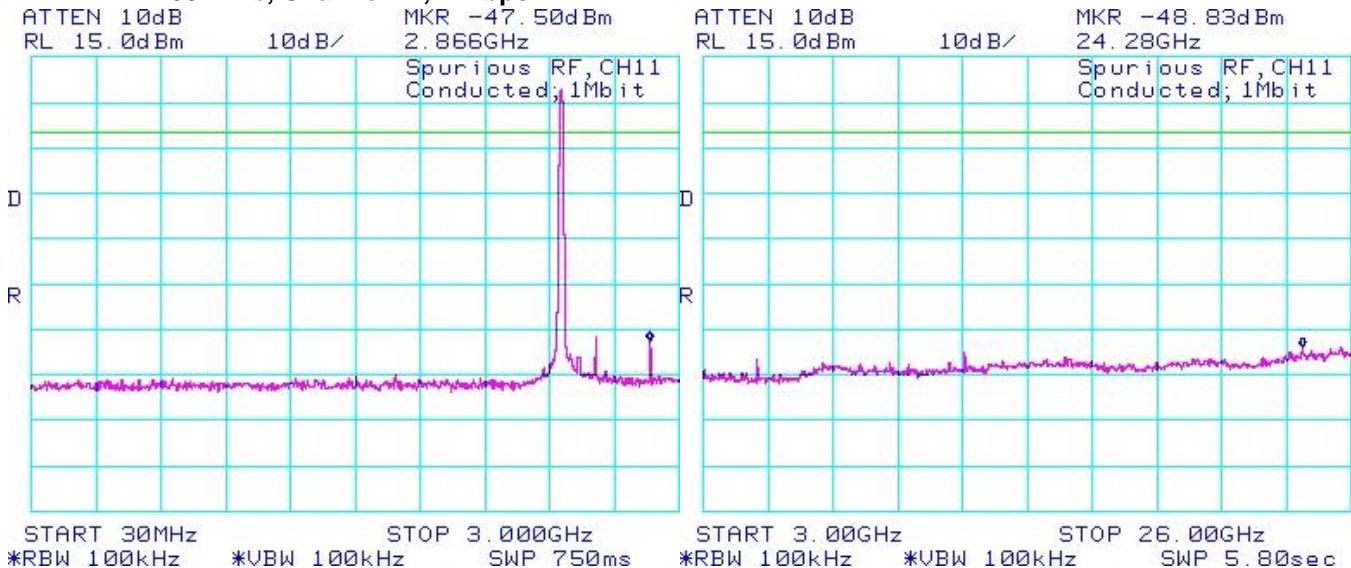
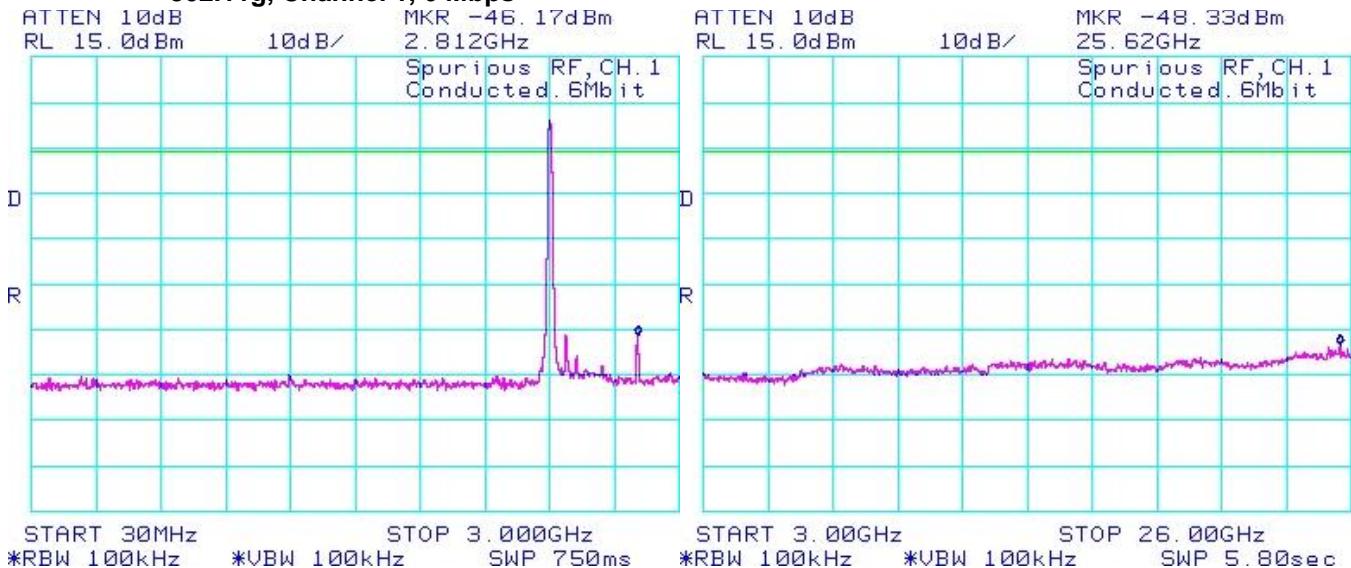


Figure 4-28: Spurious Conducted RF Emissions

802.11g, Channel 1, 6 Mbps



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

Figure 4-29: Spurious Conducted RF Emissions

802.11g, Channel 6, 6 Mbps

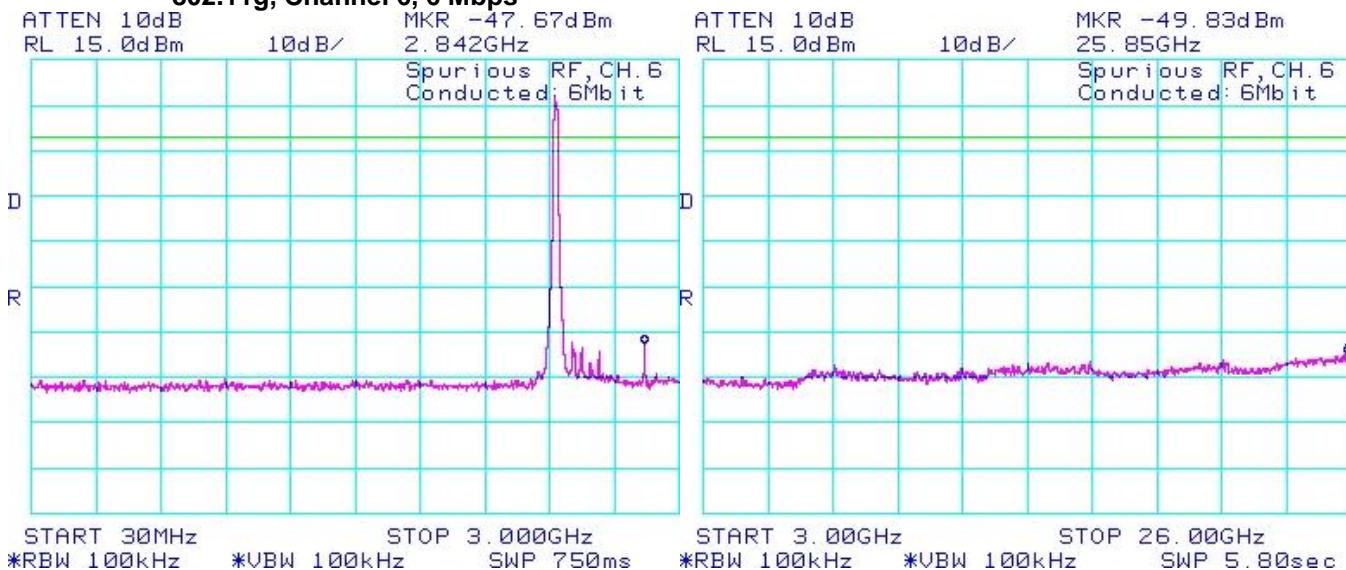
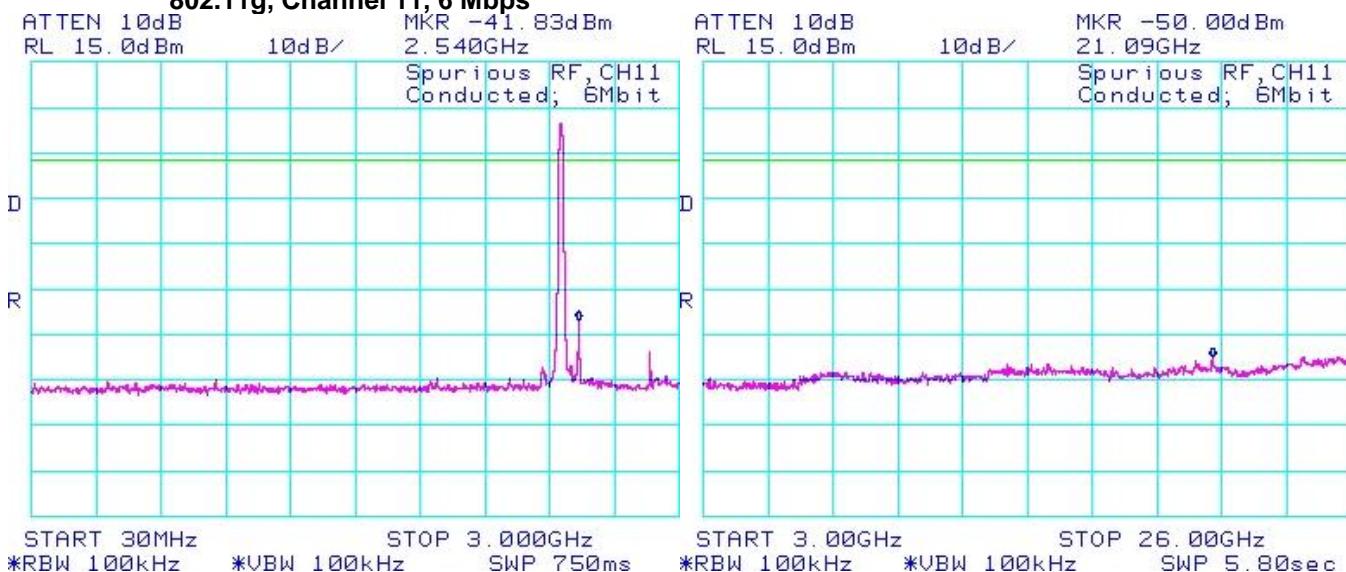


Figure 4-30: Spurious Conducted RF Emissions

802.11g, Channel 11, 6 Mbps



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

Figure 4-31: Spurious Conducted RF Emissions

802.11n, Channel 1, MCS 0

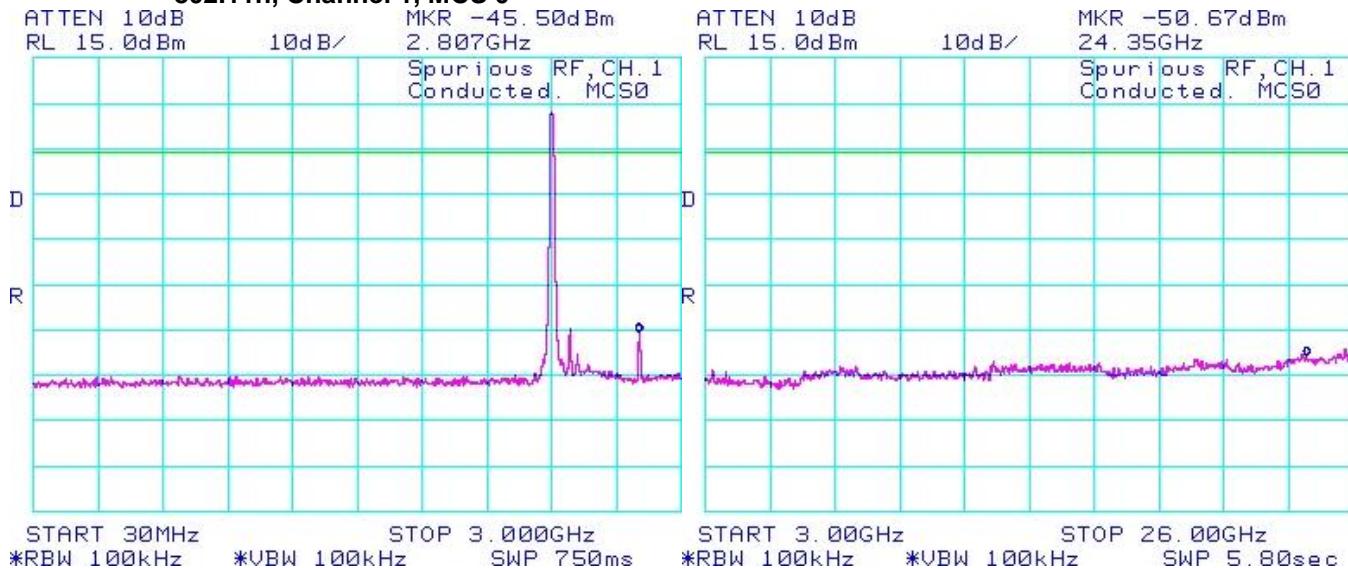
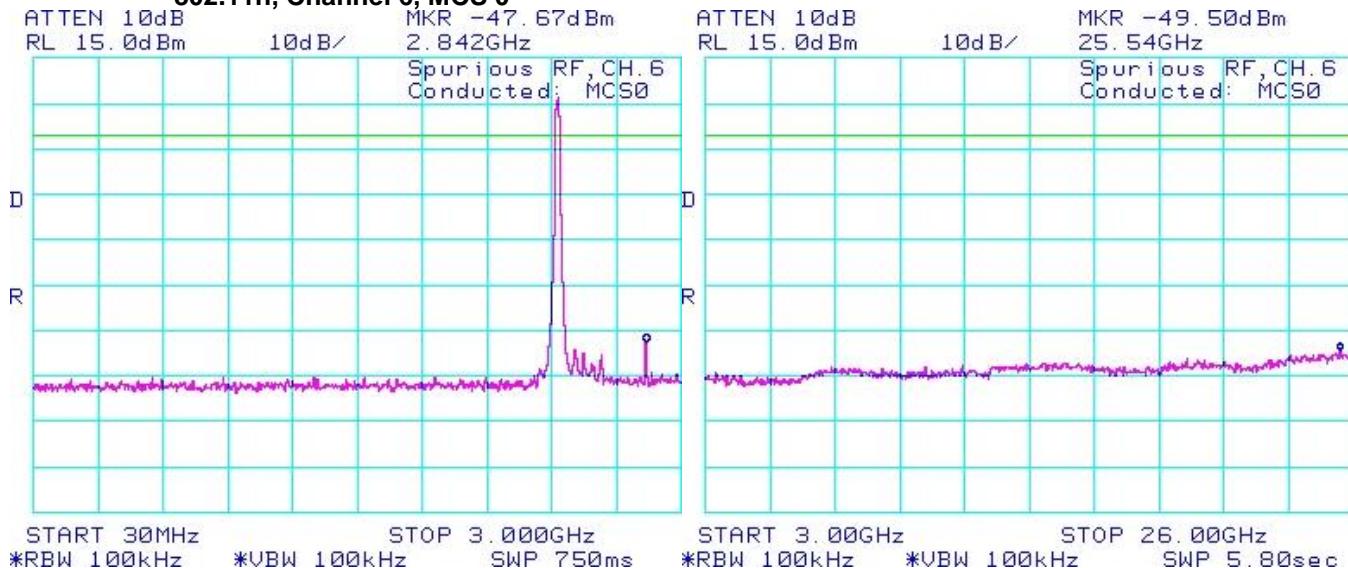


Figure 4-32: Spurious Conducted RF Emissions

802.11n, Channel 6, MCS 0



Test Report No.
 RTS-3933-1105-46_rev1

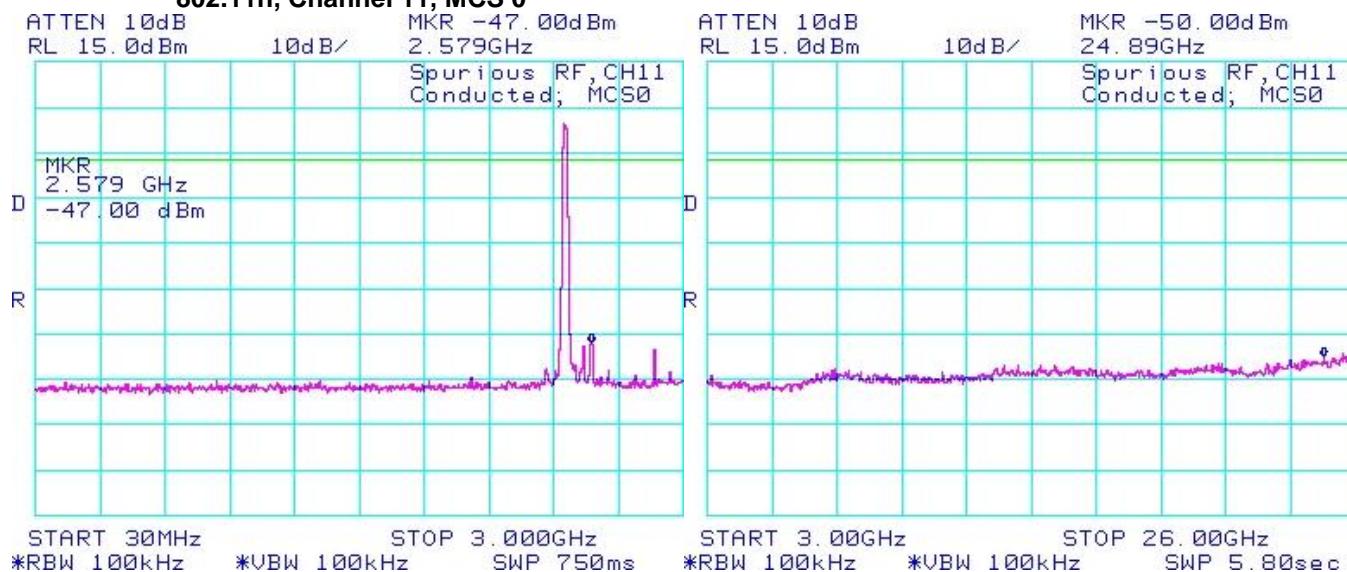
Dates of Test
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FCC ID: L6ARDU70CW
IC: 2503A-RDU70CW

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

Figure 4-33: Spurious Conducted RF Emissions

802.11n, Channel 11, MCS 0



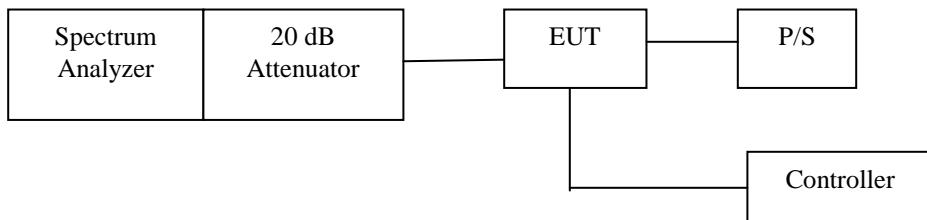
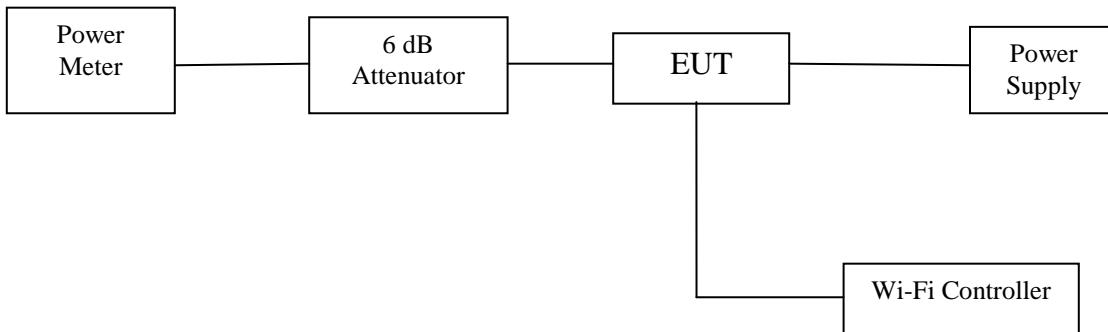
	<p>EMI Test Report for the BlackBerry® smartphone Model RDU71CW</p> <p>APPENDIX 5</p>	
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APPENDIX 5 – 802.11a CONDUCTED EMISSIONS TEST DATA/PLOTS

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802.11a RF Conducted Emission Test Results

Test Setup Diagram



A reference offset of 8.9 dB was applied to the spectrum analyzer and 7.4 dB to the Power Meter reference level for the attenuators and coaxial cable loss in the test circuit.

Date of test: May 17, May 27 and May 31, 2011.

The measurements were performed by Maurice Battler.

The environmental test conditions were: Temperature: 24 °C
Relative Humidity: 46 %

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802.11a 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 36, 44, 48, 52, 60, 64, 149, 157, and 161 were measured at 6 Mbps, 24 Mbps, and 54 Mbps each for 802.11a mode.

Channel	Data Rate	Limit (kHz)	Measured Level (MHz)
36	6 Mbps	≥ 500	16.37
	24 Mbps	≥ 500	16.50
	54 Mbps	≥ 500	16.50
44	6 Mbps	≥ 500	16.37
	24 Mbps	≥ 500	16.53
	54 Mbps	≥ 500	16.53
48	6 Mbps	≥ 500	16.37
	24 Mbps	≥ 500	16.47
	54 Mbps	≥ 500	16.50
52	6 Mbps	≥ 500	16.33
	24 Mbps	≥ 500	16.47
	54 Mbps	≥ 500	16.53
60	6 Mbps	≥ 500	16.30
	24 Mbps	≥ 500	16.53
	54 Mbps	≥ 500	16.47
64	6 Mbps	≥ 500	16.40
	24 Mbps	≥ 500	16.53
	54 Mbps	≥ 500	16.50
149	6 Mbps	≥ 500	16.33
	24 Mbps	≥ 500	16.53
	54 Mbps	≥ 500	16.47
157	6 Mbps	≥ 500	16.37
	24 Mbps	≥ 500	16.53
	54 Mbps	≥ 500	16.37
161	6 Mbps	≥ 500	16.37
	24 Mbps	≥ 500	16.47
	54 Mbps	≥ 500	16.53

See figures 5-1 to 5-9 for the plots of the 6 dB bandwidth measurements for Channel 36, 44, 48, 52, 60, 64, 149, 157 and 161 at 6 Mbps each for 802.11a mode.

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802.11a RF Conducted Emission Test Results cont'd

Figure 5-1: 6 dB Bandwidth

802.11a, Channel 36, 6 Mbps

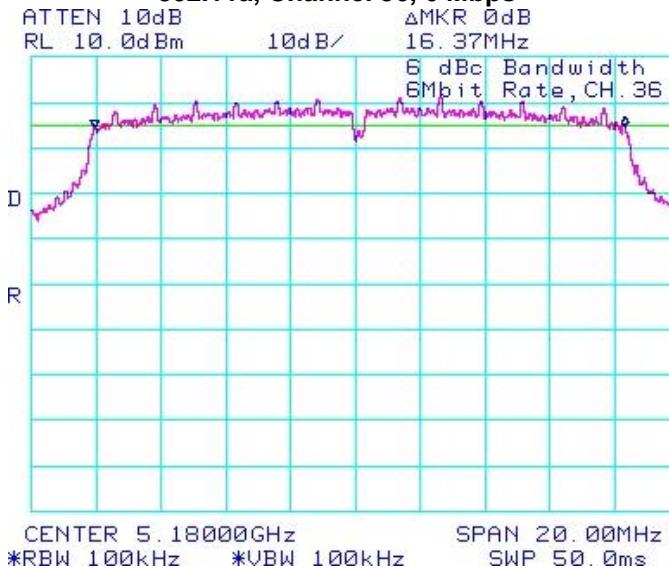


Figure 5-2: 6 dB Bandwidth

802.11a, Channel 44, 6 Mbps

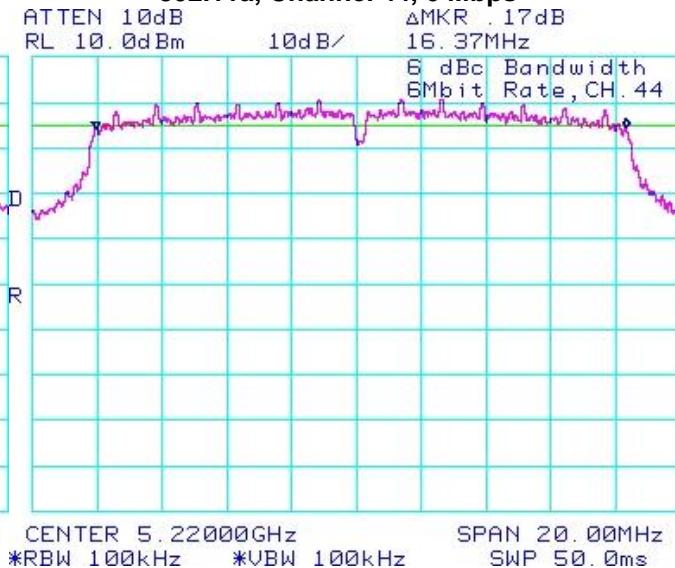


Figure 5-3: 6 dB Bandwidth

802.11a, Channel 48, 6 Mbps

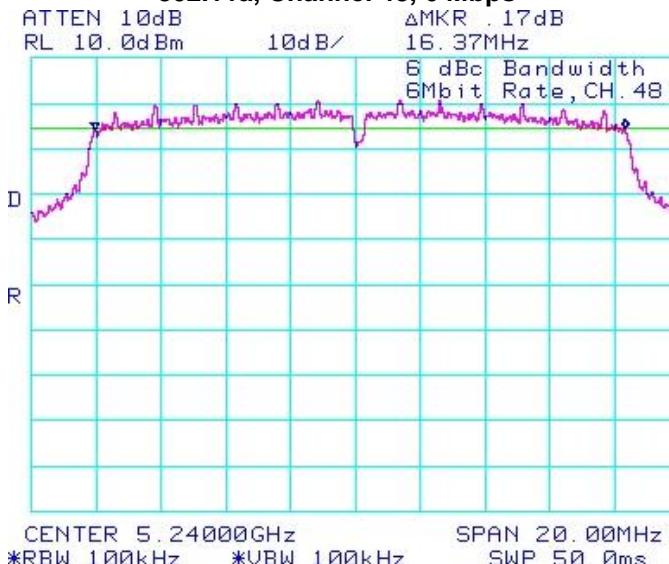


Figure 5-4: 6 dB Bandwidth

802.11a, Channel 52, 6 Mbps



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802.11a RF Conducted Emission Test Results cont'd

Figure 5-5: 6 dB Bandwidth

802.11a, Channel 60, 6 Mbps

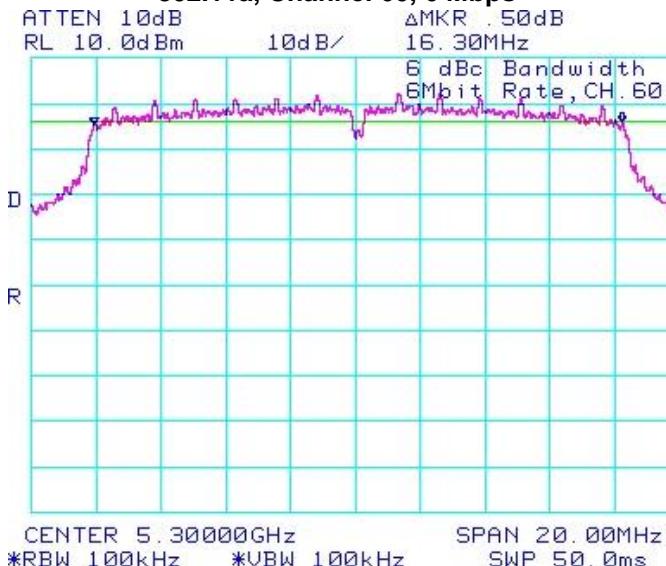


Figure 5-6: 6 dB Bandwidth

802.11a, Channel 64, 6 Mbps



Figure 5-7: 6 dB Bandwidth

802.11a, Channel 149, 6 Mbps

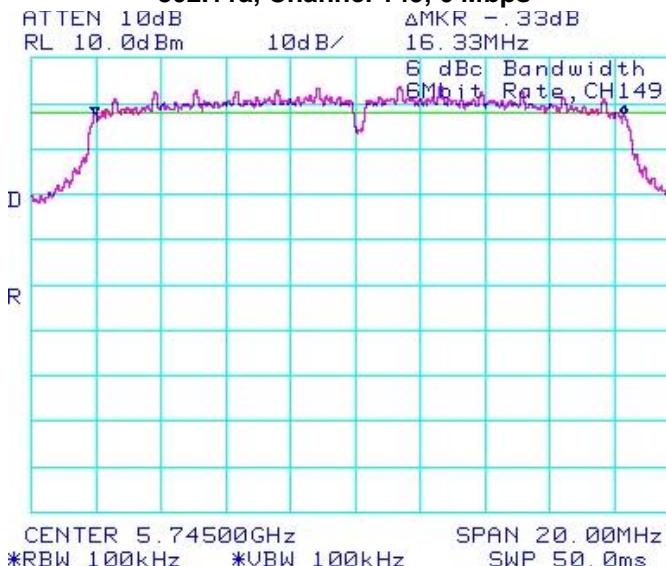
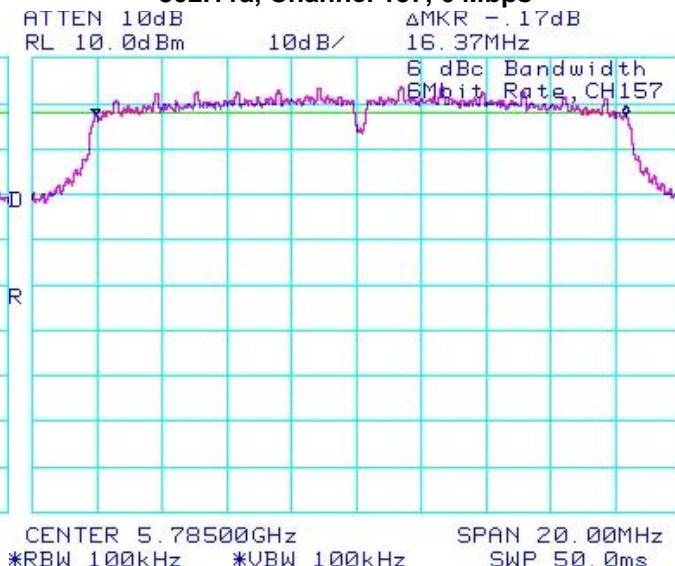


Figure 5-8: 6 dB Bandwidth

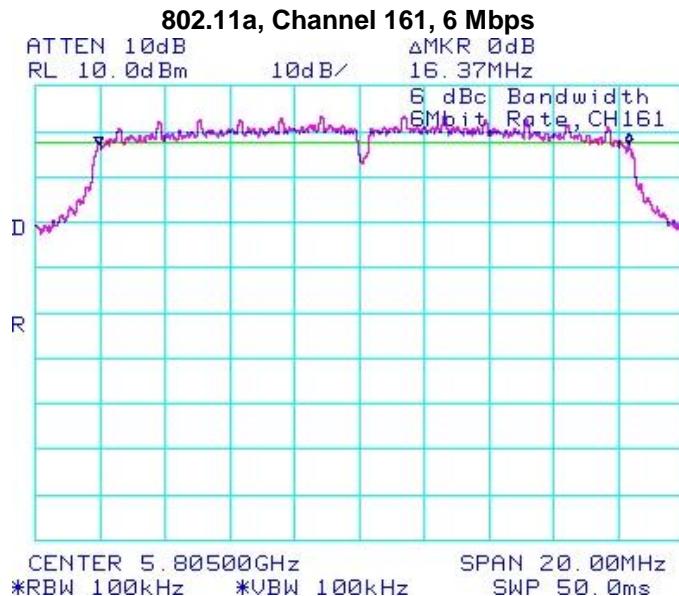
802.11a, Channel 157, 6 Mbps



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802.11a RF Conducted Emission Test Results cont'd

Figure 5-9: 6 dB Bandwidth



 RIM Testing Services™	EMI Test Report for the BlackBerry® smartphone Model RDU71CW APPENDIX 5		
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802.11a 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 15.407 and RSS-210. Channels 36, 44, 48, 52, 60, 64, 149, 157, and 161 were measured for 802.11a mode using an Agilent power meter, model N1911A with model N1921A power sensor. A reference offset of 8.9 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 (mW)
36	6 Mbps	< 1.00	12.46	17.62
	24 Mbps	< 1.00	12.30	16.98
	54 Mbps	< 1.00	11.26	13.36
44	6 Mbps	< 1.00	12.34	17.14
	24 Mbps	< 1.00	10.30	10.71
	54 Mbps	< 1.00	10.71	11.78
48	6 Mbps	< 1.00	12.24	16.75
	24 Mbps	< 1.00	12.24	16.75
	54 Mbps	< 1.00	12.30	16.98
52	6 Mbps	< 1.00	13.40	21.88
	24 Mbps	< 1.00	13.20	20.89
	54 Mbps	< 1.00	12.11	16.25
60	6 Mbps	< 1.00	13.17	20.75
	24 Mbps	< 1.00	12.01	15.88
	54 Mbps	< 1.00	13.20	20.89
64	6 Mbps	< 1.00	13.11	20.46
	24 Mbps	< 1.00	13.14	20.61
	54 Mbps	< 1.00	13.01	20.00
149	6 Mbps	< 1.00	13.56	22.70
	24 Mbps	< 1.00	11.01	12.62
	54 Mbps	< 1.00	11.71	14.82
157	6 Mbps	< 1.00	13.06	20.23
	24 Mbps	< 1.00	11.01	12.62
	54 Mbps	< 1.00	11.17	13.09
161	6 Mbps	< 1.00	14.14	25.94
	24 Mbps	< 1.00	13.40	21.88
	54 Mbps	< 1.00	12.40	17.38

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802.11a RF Conducted Emission Test Results cont'd

Band Edge Compliance

The EUT met the requirements of the band edge compliance as per 47 CFR 15.407 and RSS-210. Channels 36, 48, 52, 64, 149, and 161 were measured at 6 Mbps, 24 Mbps, and 54 Mbps each for 802.11a mode.

Channel	Data Rate	Limit (dBc)	Measured Level (dBc)	Margin (dBc)
36	6 Mbps	< -20	-50.50	-30.50
	24 Mbps	< -20	-50.17	-30.17
	54 Mbps	< -20	-50.83	-30.83
48	6 Mbps	< -20	-21.17	-1.17
	24 Mbps	< -20	-22.00	-2.00
	54 Mbps	< -20	-23.17	-3.17
52	6 Mbps	< -20	-21.50	-1.50
	24 Mbps	< -20	-23.50	-3.50
	54 Mbps	< -20	-22.33	-2.33
64	6 Mbps	< -20	-49.17	-29.17
	24 Mbps	< -20	-50.66	-30.66
	54 Mbps	< -20	-49.17	-29.17
149	6 Mbps	< -20	-38.00	-18.00
	24 Mbps	< -20	-40.33	-20.33
	54 Mbps	< -20	-44.83	-24.83
161	6 Mbps	< -20	-47.83	-27.83
	24 Mbps	< -20	-46.66	-26.66
	54 Mbps	< -20	-45.67	-25.67

See figures 5-10 to 5-15 for the plots of the band edge compliance measurements for Channel 36, 48, 52, 64, 149, and 161 at 6 Mbps each for 802.11a mode.

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802.11a RF Conducted Emission Test Results cont'd

Figure 5-10: Band Edge Compliance

802.11a, Channel 36, 6 Mbps



Figure 5-11: Band Edge Compliance

802.11a, Channel 48, 6 Mbps



Figure 5-12: Band Edge Compliance

802.11a, Channel 52, 6 Mbps

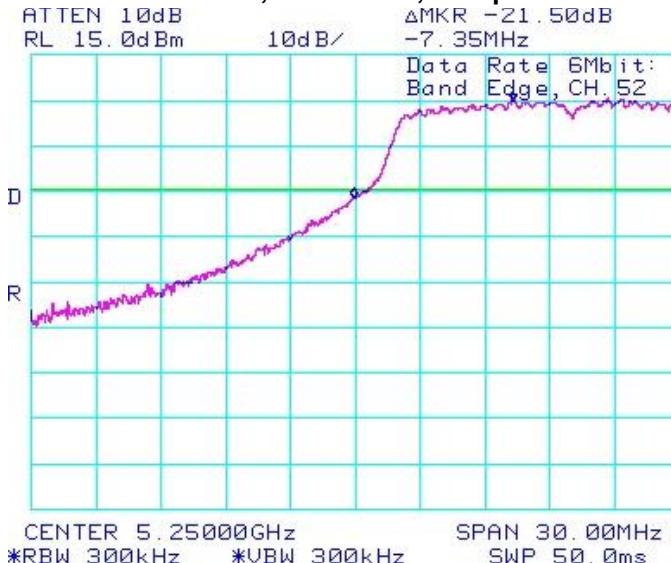
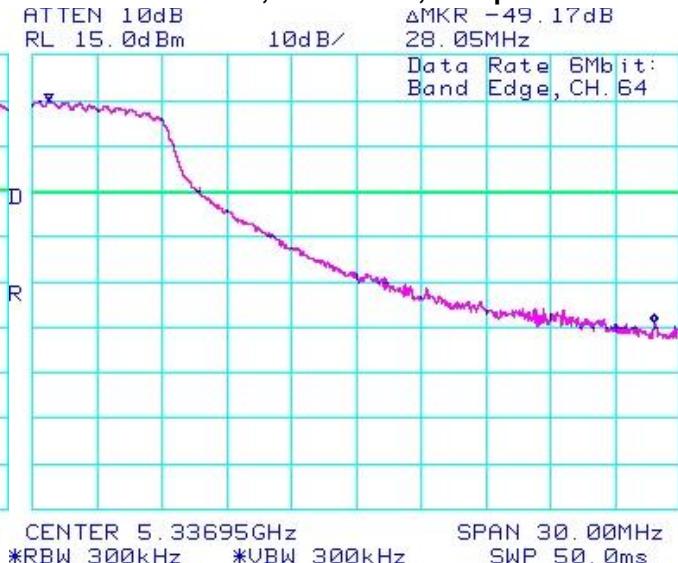


Figure 5-13: Band Edge Compliance

802.11a, Channel 64, 6 Mbps



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802.11a RF Conducted Emission Test Results cont'd

Figure 5-14: Band Edge Compliance

802.11a, Channel 149, 6 Mbps

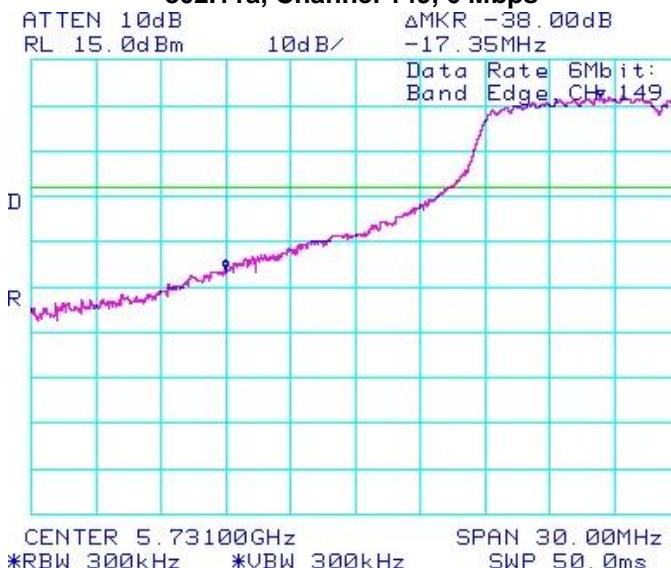
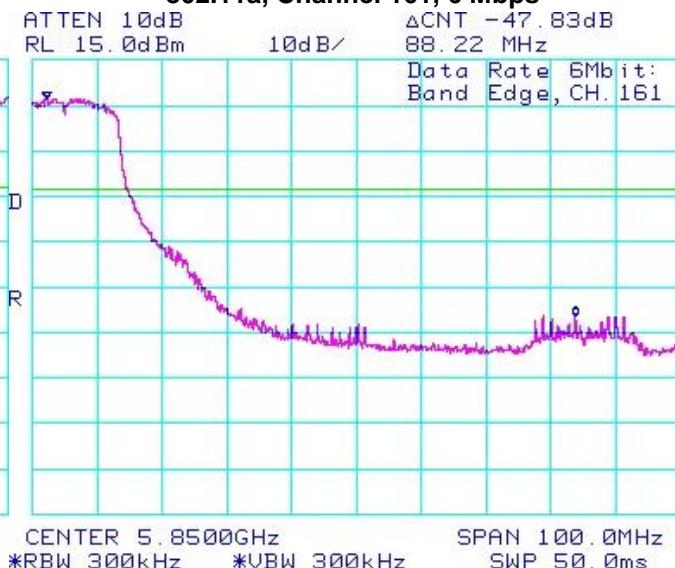


Figure 5-15: Band Edge Compliance

802.11a, Channel 161, 6 Mbps



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802.11a 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 15.407 and RSS-210. Channels 36, 44, 48, 52, 60, 64, 149, 157, and 161 were measured at 6 Mbps, 24 Mbps, and 54 Mbps each for 802.11a mode.

Channel	Data Rate	Limit (dBm)	Measured Level (dBm)	Margin (dBm)
36	6 Mbps	< 8.00	-10.83	-18.83
	24 Mbps	< 8.00	-10.37	-18.37
	54 Mbps	< 8.00	-10.70	-18.70
44	6 Mbps	< 8.00	-11.00	-19.00
	24 Mbps	< 8.00	-10.43	-18.43
	54 Mbps	< 8.00	-11.10	-19.10
48	6 Mbps	< 8.00	-11.17	-19.17
	24 Mbps	< 8.00	-10.53	-18.53
	54 Mbps	< 8.00	-11.20	-19.20
52	6 Mbps	< 8.00	-10.00	-18.00
	24 Mbps	< 8.00	-9.43	-17.43
	54 Mbps	< 8.00	-9.77	-17.77
60	6 Mbps	< 8.00	-10.17	-18.17
	24 Mbps	< 8.00	-9.73	-17.73
	54 Mbps	< 8.00	-10.07	-18.07
64	6 Mbps	< 8.00	-9.83	-17.83
	24 Mbps	< 8.00	-9.77	-17.77
	54 Mbps	< 8.00	-9.60	-17.60
149	6 Mbps	< 8.00	-8.00	-16.00
	24 Mbps	< 8.00	-7.87	-15.87
	54 Mbps	< 8.00	-9.60	-17.60
157	6 Mbps	< 8.00	-8.17	-16.17
	24 Mbps	< 8.00	-8.17	-16.17
	54 Mbps	< 8.00	-10.11	-18.11
161	6 Mbps	< 8.00	-8.00	-16.00
	24 Mbps	< 8.00	-8.17	-16.17
	54 Mbps	< 8.00	-10.00	-18.00

See figures 5-16 to 5-24 for the plots of the peak power spectral density for Channel 36, 44, 48, 52, 60, 64, 149, 157 and 161 at 6 Mbps each for 802.11a mode.

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802.11a RF Conducted Emission Test Results cont'd

Figure 5-16: Peak Power Spectral Density

802.11a, Channel 36, 6 Mbps



Figure 5-17: Peak Power Spectral Density

802.11a, Channel 44, 6 Mbps

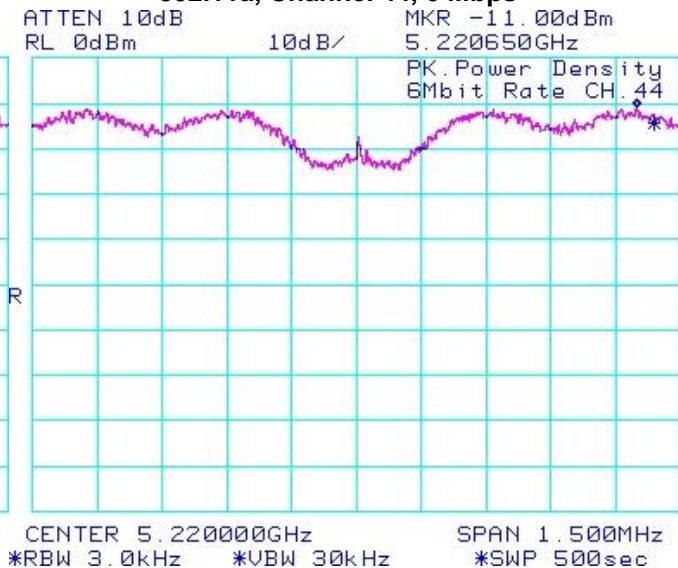


Figure 5-18: Peak Power Spectral Density

802.11a, Channel 48, 6 Mbps

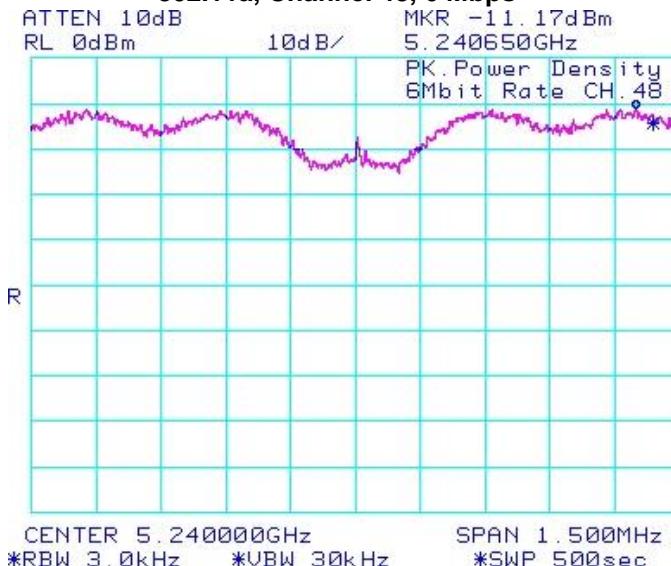
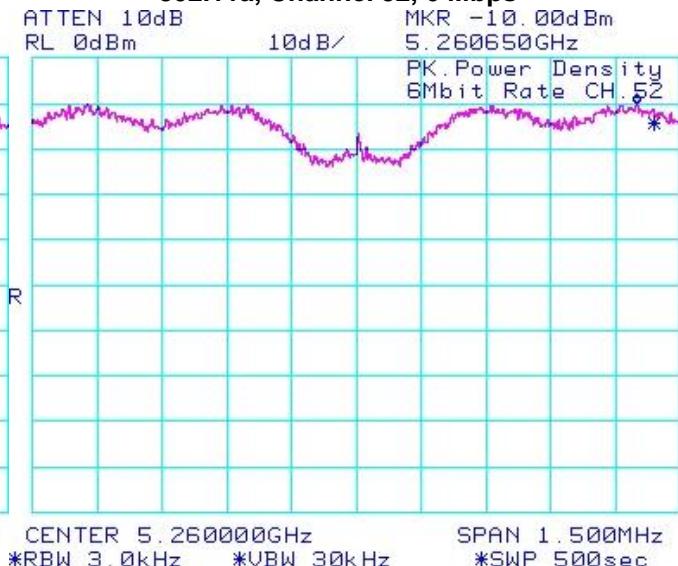


Figure 5-19: Peak Power Spectral Density

802.11a, Channel 52, 6 Mbps



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802.11a RF Conducted Emission Test Results cont'd

Figure 5-20: Peak Power Spectral Density

802.11a, Channel 60, 6 Mbps

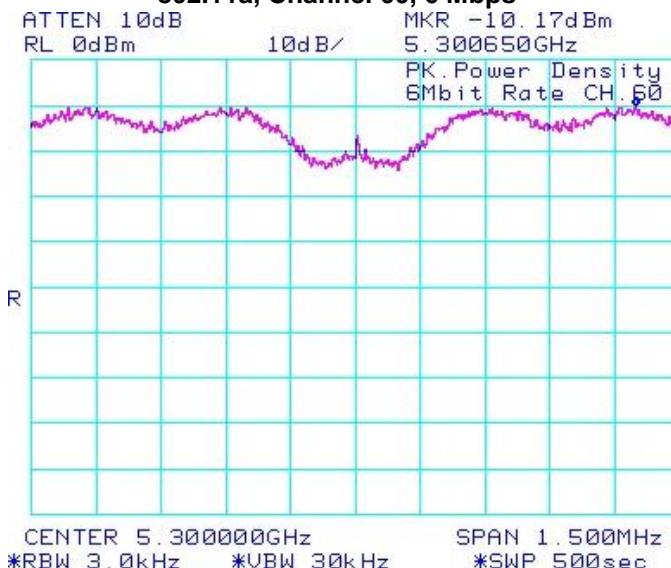


Figure 5-21: Peak Power Spectral Density

802.11a, Channel 64, 6 Mbps

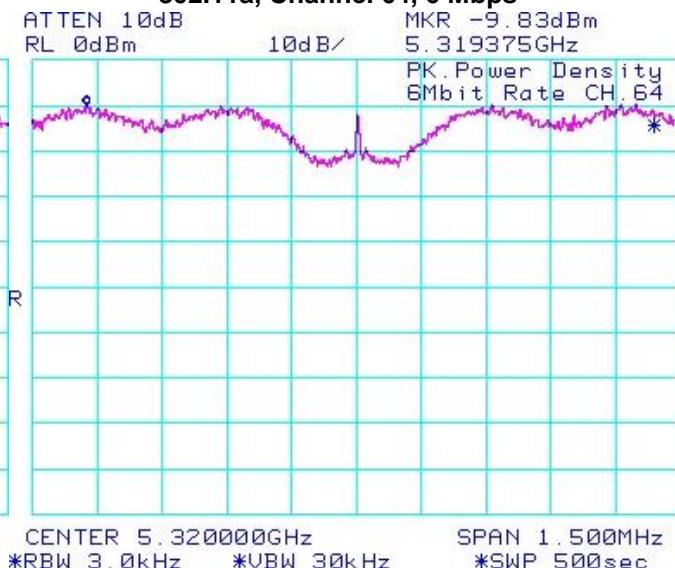


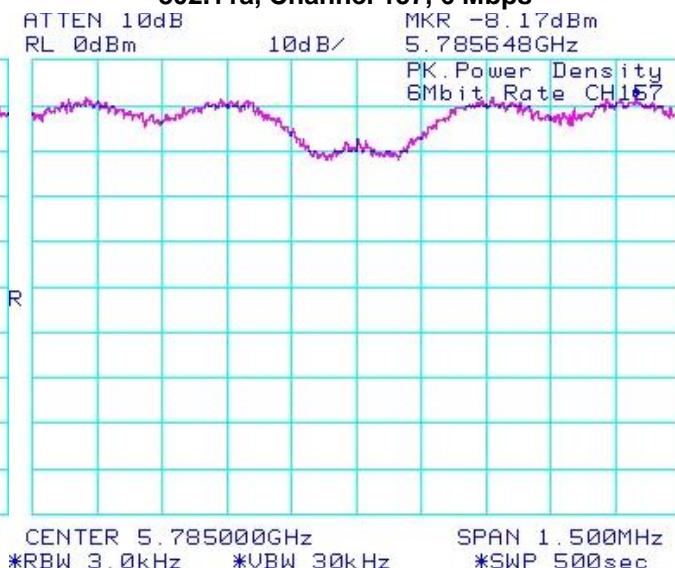
Figure 5-22: Peak Power Spectral Density

802.11a, Channel 149, 6 Mbps



Figure 5-23: Peak Power Spectral Density

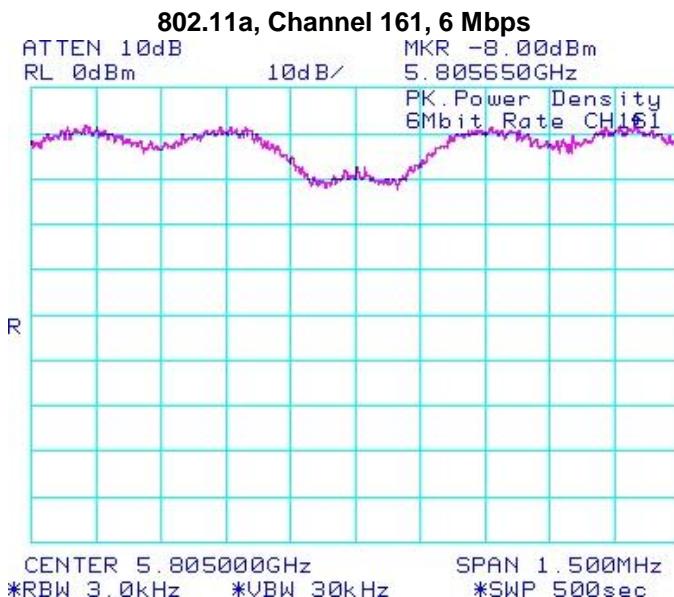
802.11a, Channel 157, 6 Mbps



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802.11a RF Conducted Emission Test Results cont'd

Figure 5-24: Peak Power Spectral Density



Spurious RF Conducted Emissions

The EUT met the requirements of the spurious RF conducted emissions as per 47 CFR 15.407 and RSS-210. Channels 44, 60, and 157 were measured at 6 Mbps each for 802.11a mode. Peak power was measured using an Agilent power meter, model N1911A with model N1921A power sensor. A reference offset of 29.0 dB was applied to the spectrum analyzer reference level for the attenuators and coaxial cable loss in the test circuit.

Channel	Data Rate	Power (dBm)	Max. Measured Level (dBm)	Max. Measured Level from Carrier (dBc)	Limit (dBc)
44	6 Mbps	3.16	-31.43	-34.59	-20
60	6 Mbps	4.43	-31.13	-35.56	-20
157	6 Mbps	5.77	-32.33	-38.10	-20

The emissions were in the noise floor.

See figures 5-25 to 5-27 for the plots of the spurious RF conducted emissions for Channel 44, 60 and 157 at 6 Mbps each for 802.11a mode.

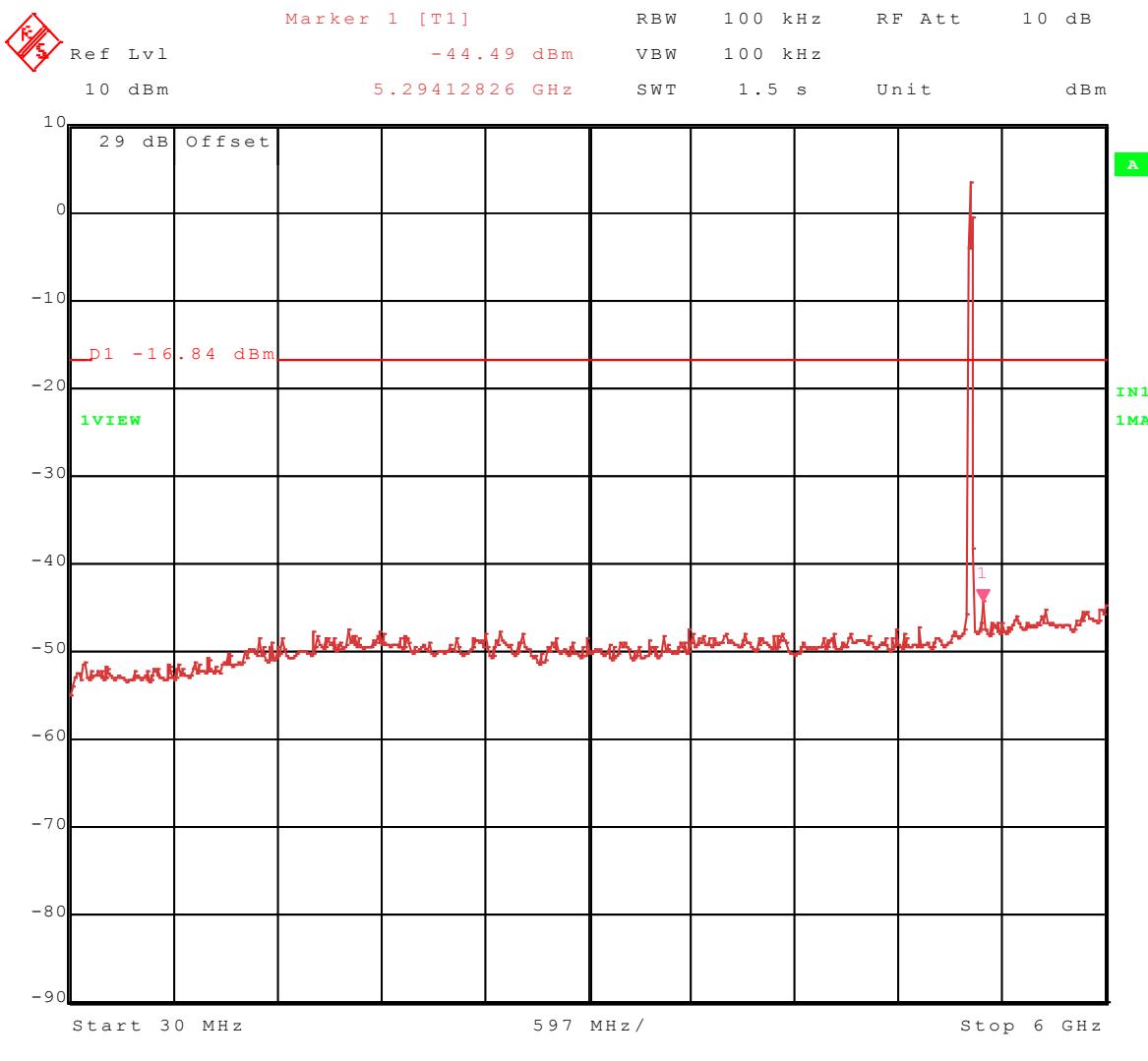
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FCC ID: L6ARDU70CW
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802.11a RF Conducted Emission Test Results cont'd

Figure 5-25a: Spurious RF Conducted Emissions, 802.11a Channel 44, 6 Mbps



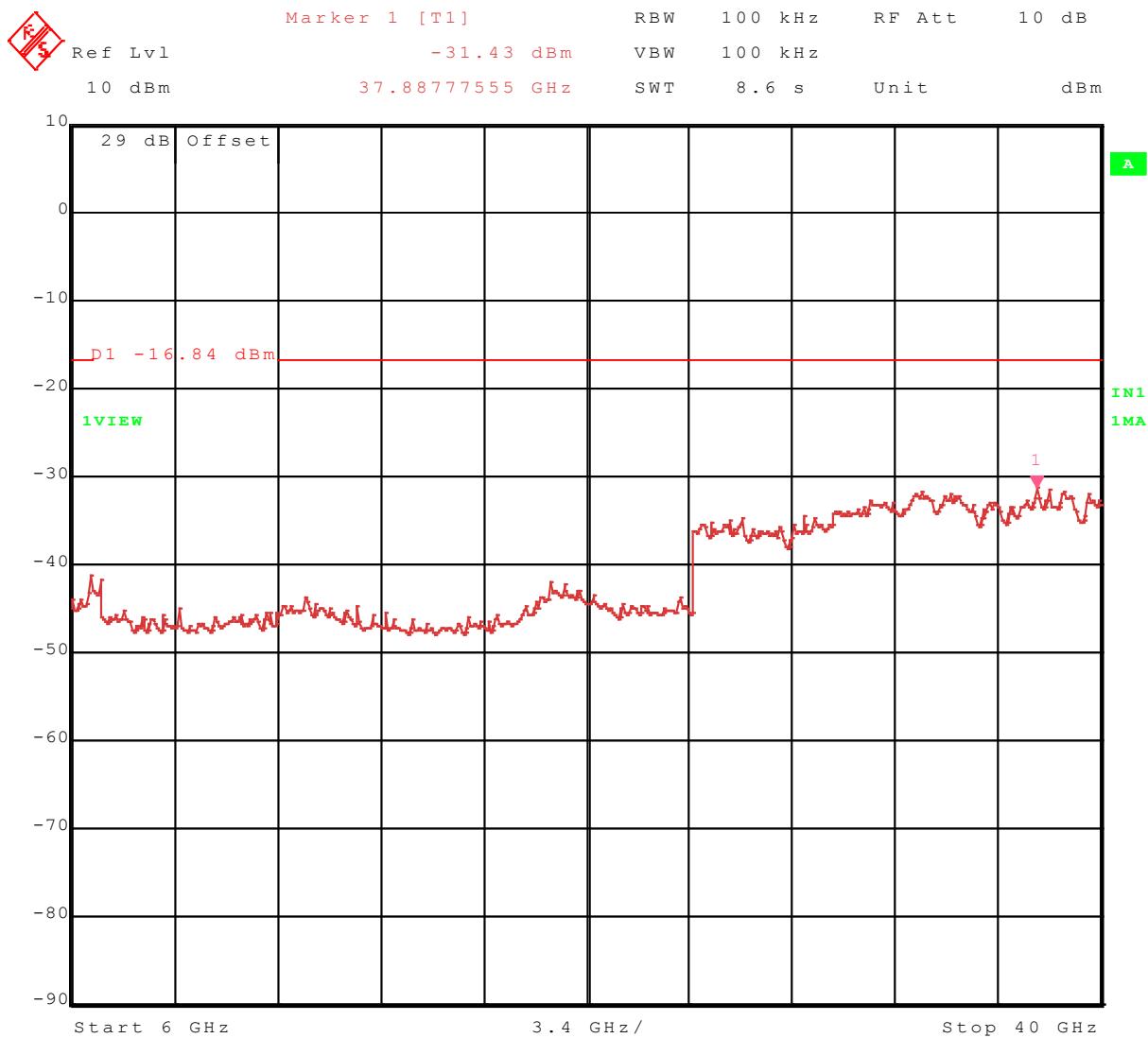
Test Report No.
 RTS-3933-1105-46_rev1

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FCC ID: L6ARDU70CW
IC: 2503A-RDU70CW

802.11a RF Conducted Emission Test Results cont'd

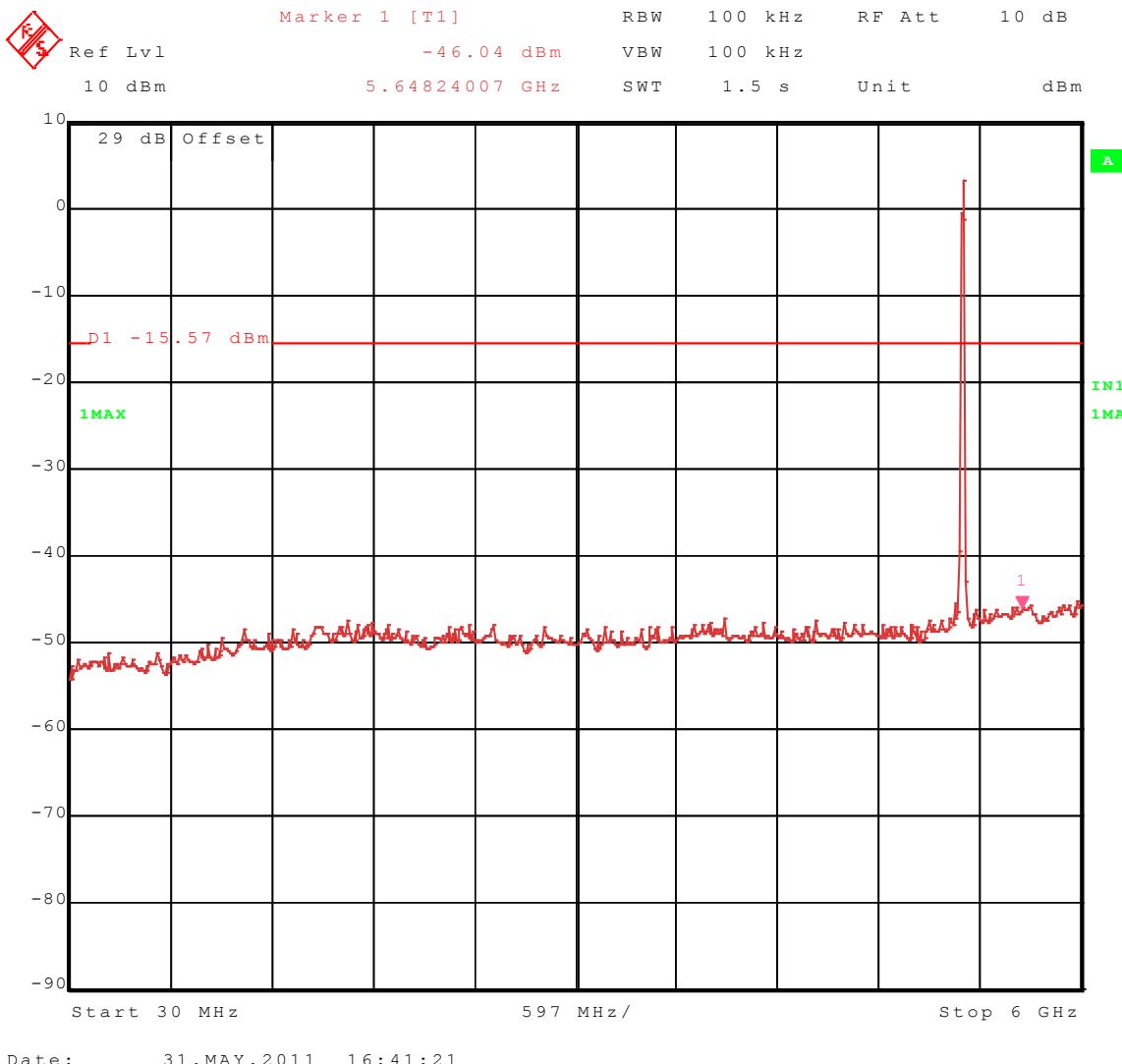
Figure 5-25b: Spurious RF Conducted Emissions, 802.11a Channel 44, 6 Mbps



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802.11a RF Conducted Emission Test Results cont'd

Figure 5-26a: Spurious RF Conducted Emissions, 802.11a Channel 60, 6 Mbps



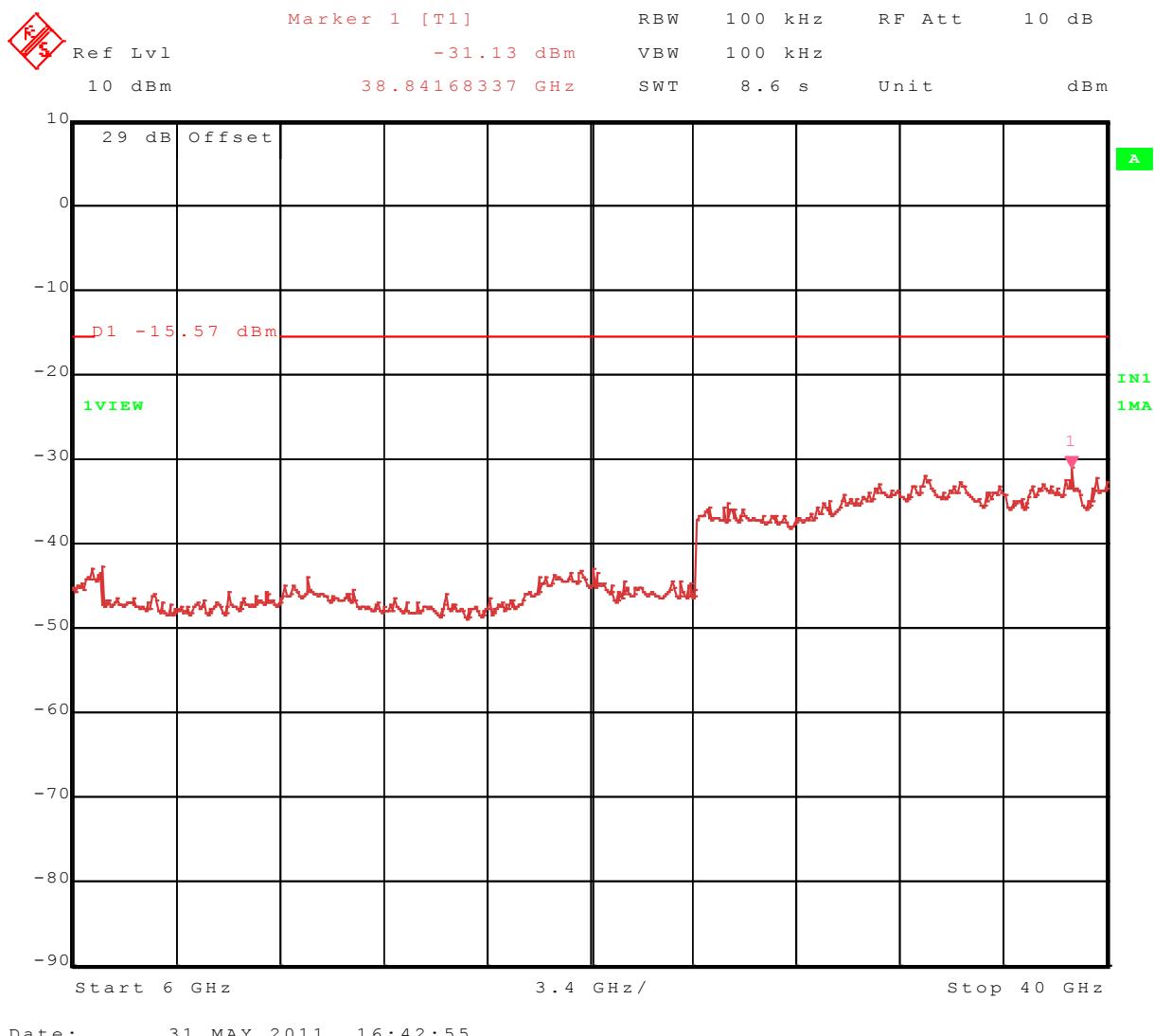
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FCC ID: L6ARDU70CW
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802.11a RF Conducted Emission Test Results cont'd

Figure 5-26b: Spurious RF Conducted Emissions, 802.11a Channel 60, 6 Mbps



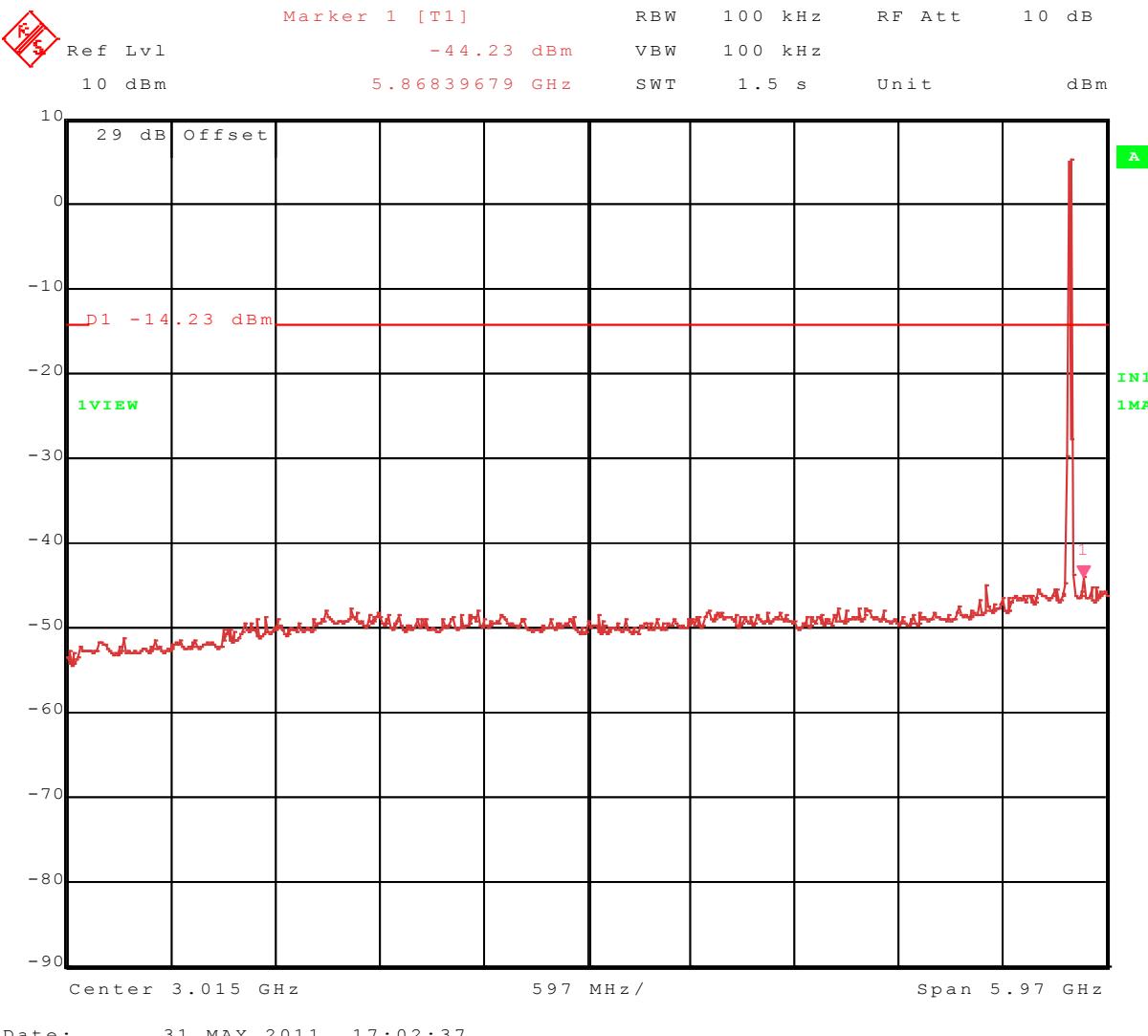
Test Report No.
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 to 31 and June 01, 2011

FCC ID: L6ARDU70CW
IC: 2503A-RDU70CW

802.11a RF Conducted Emission Test Results cont'd

Figure 5-27a: Spurious RF Conducted Emissions, 802.11a Channel 157, 6 Mbps



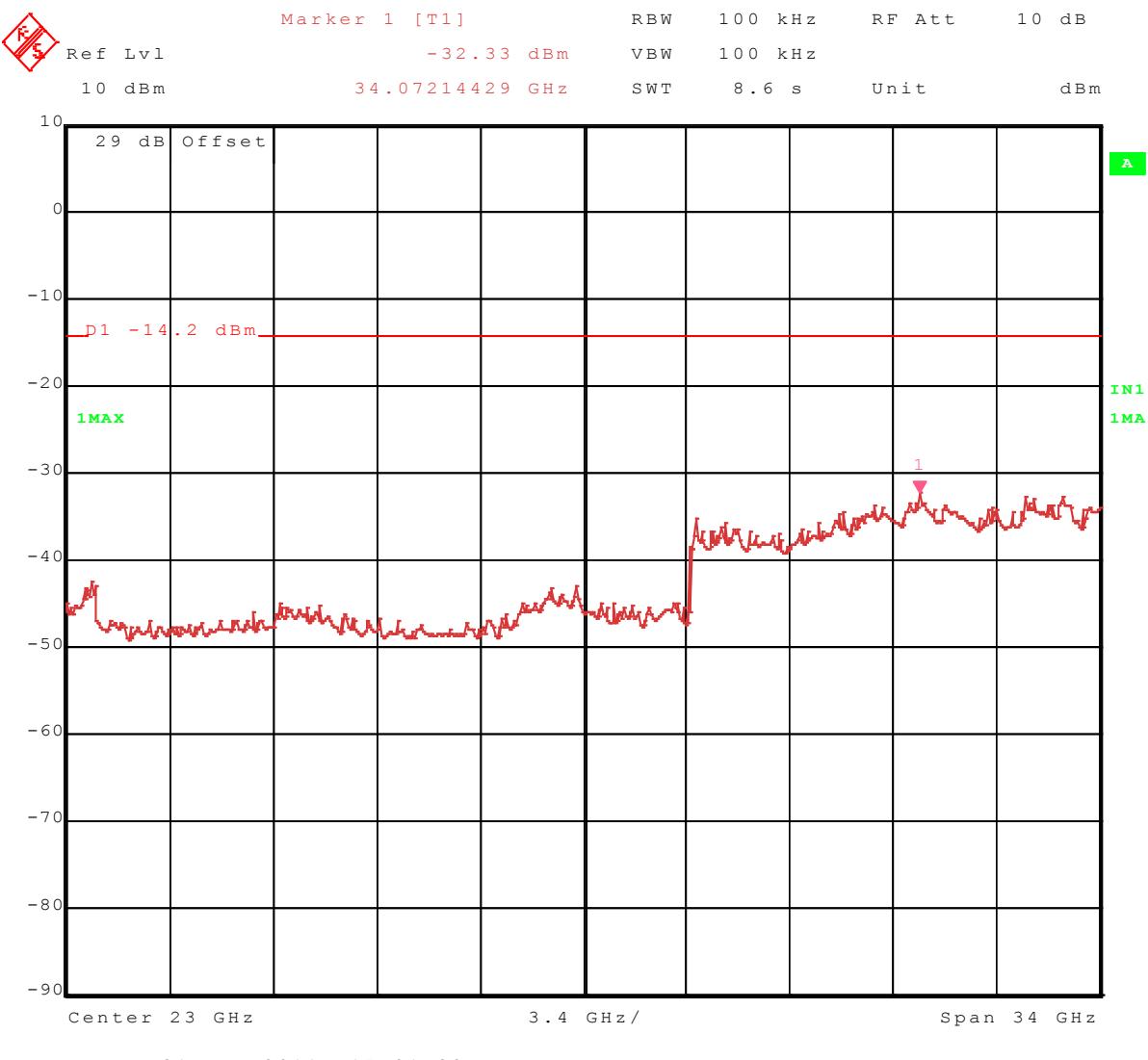
Test Report No.
 RTS-3933-1105-46_rev1

Dates of Test
 February 16, March 31, April 20, May 17
 to 31 and June 01, 2011

FCC ID: L6ARDU70CW
IC: 2503A-RDU70CW

802.11a RF Conducted Emission Test Results cont'd

Figure 5-27b: Spurious RF Conducted Emissions, 802.11a Channel 157, 6 Mbps



	EMI Test Report for the BlackBerry® smartphone Model RDU71CW APPENDIX 6	
Test Report No. RTS-3933-1105-46_rev1	Dates of Test February 16, March 31, April 20, May 17 to 31 and June 01, 2011	FCC ID: L6ARDU70CW IC: 2503A-RDU70CW

APPENDIX 6 – NEAR FIELD COMMUNICATIONS TEST DATA/PLOTS

 RIM Testing Services™	EMI Test Report for the BlackBerry® smartphone Model RDU71CW APPENDIX 6		
Test Report No. RTS-3933-1105-46_rev1	Dates of Test February 16, March 31, April 20, May 17 to 31 and June 01, 2011	FCC ID: L6ARDU70CW IC: 2503A-RDU70CW	

Near Field Communications (NFC) Test Results cont'd

Radiated Emissions

Date of Test: June 01, 2011

Measurements were performed by Kevin Rose.

The environmental test conditions were: Temperature: 24 °C
Relative Humidity: 31 %

The test distance was 3.0 metres with a EUT height of 0.8 metres, and sweep frequency of 10 kHz to 1 GHz.

The BlackBerry® smartphone was in USB down position.

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

Frequency (MHz)	Reading (PK) (dB μ V)	Correction Factor (dB)	Corrected Reading (PK) (dB μ V/m)	Limit (dB μ V/m)	Test Margin (dB)
13.56	33.30	22.24	55.54	124.00	-68.46

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

 RIM Testing Services™	EMI Test Report for the BlackBerry® smartphone Model RDU71CW APPENDIX 6	
Test Report No. RTS-3933-1105-46_rev1	Dates of Test February 16, March 31, April 20, May 17 to 31 and June 01, 2011	FCC ID: L6ARDU70CW IC: 2503A-RDU70CW

Near Field Communications (NFC) Test Results cont'd

Occupied Bandwidth

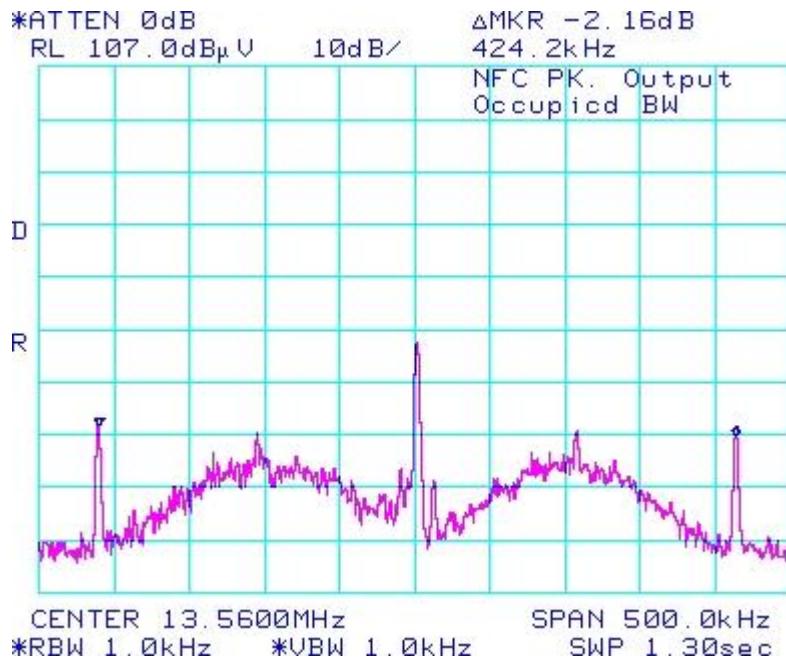
Date of test: March 31, 2011.

The measurements were performed by Maurice Battler.

The environmental test conditions were: Temperature: 24 °C
Relative Humidity: 46 %

Operation mode (TX ON)	Occupied Bandwidth (kHz)
NFC, modulated	424.20

Figure 6-1: Occupied Bandwidth, NFC TX Frequency = 13.56 MHz



 Testing Services™	EMI Test Report for the BlackBerry® smartphone Model RDU71CW APPENDIX 6	
Test Report No. RTS-3933-1105-46_rev1	Dates of Test February 16, March 31, April 20, May 17 to 31 and June 01, 2011	FCC ID: L6ARDU70CW IC: 2503A-RDU70CW

Near Field Communications (NFC) Test Results cont'd

Frequency Stability

Date of test: March 31, 2011.

The measurements were performed by Maurice Battler.

The environmental test conditions were: Temperature: 24 °C
Relative Humidity: 46 %

Test Temperature (Celsius)	Nominal Freq. (MHz)	Measured Freq. (MHz)	Input Voltage (Volts)	Max Freq Error (Hz)	% Deviation (Limit .01%)	PPM
-20	13.56	13.560150	3.6	150	0.00111	11.0619
-20	13.56	13.560150	3.7	150	0.00111	11.0619
-20	13.56	13.560150	4.2	150	0.00111	11.0619
-10	13.56	13.560450	3.6	450	0.00332	33.1858
-10	13.56	13.560450	3.7	450	0.00332	33.1858
-10	13.56	13.560450	4.2	450	0.00332	33.1858
0	13.56	13.560575	3.6	575	0.00424	42.4041
0	13.56	13.560575	3.7	575	0.00424	42.4041
0	13.56	13.560575	4.2	575	0.00424	42.4041
10	13.56	13.560692	3.6	692	0.00510	51.0324
10	13.56	13.560692	3.7	692	0.00510	51.0324
10	13.56	13.560692	4.2	692	0.00510	51.0324
20	13.56	13.560692	3.6	692	0.00510	51.0324
20	13.56	13.560692	3.7	692	0.00510	51.0324
20	13.56	13.560692	4.2	692	0.00510	51.0324
30	13.56	13.560708	3.6	708	0.00522	52.2124
30	13.56	13.560708	3.7	708	0.00522	52.2124
30	13.56	13.560708	4.2	708	0.00522	52.2124

 RIM Testing Services™	EMI Test Report for the BlackBerry® smartphone Model RDU71CW APPENDIX 6		
Test Report No. RTS-3933-1105-46_rev1	Dates of Test February 16, March 31, April 20, May 17 to 31 and June 01, 2011	FCC ID: L6ARDU70CW IC: 2503A-RDU70CW	

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
40	13.56	13.560708	3.6	708	0.00522	52.2124
40	13.56	13.560708	3.7	708	0.00522	52.2124
40	13.56	13.560708	4.2	708	0.00522	52.2124
50	13.56	13.560442	3.6	442	0.00326	32.5959
50	13.56	13.560442	3.7	442	0.00326	32.5959
50	13.56	13.560442	4.2	442	0.00326	32.5959
60	13.56	13.560208	3.6	208	0.00153	15.3392
60	13.56	13.560208	3.7	208	0.00153	15.3392
60	13.56	13.560208	4.2	208	0.00153	15.3392