

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-6026-1302-22

PRODUCT MODEL NO.: RFN81UW
TYPE NAME: BlackBerry® smartphone
FCC ID: L6ARFN80UW
IC: 2503A-RFN80UW

DATE: March 27, 2013

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



592

	EMI Test Report for the BlackBerry® smartphone Model RFN81UW	
Test Report No. RTS-6026-1302-22	Dates of Test January 29- February 14 and March 27, 2013	FCC ID: L6ARFN80UW IC: 2503A-RFN80UW

Statement of Performance:

The BlackBerry® smartphone, model RFN81UW, part number CER-53015-001 Rev3-905-01, and its accessories perform within the requirements of the test standards when configured and operated under RIM's operation instructions.

Declaration:

We hereby certify that:

The test data reported herein is an accurate record of the performance of the sample(s) tested.

The test results are valid for the tested unit (s) only.

The test equipment used was suitable for the tests performed and within manufacturer's published specifications and operating parameters.

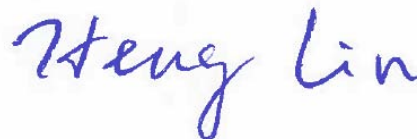
The test methods were consistent with the methods described in the relevant standards.

Documented by:



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A. Scope

This report details the results of compliance tests which were performed in accordance to the requirements of:

- o FCC CFR 47 Part 15, Subpart C, October, 2012
- o FCC CFR 47 Part 15, Subpart E, October, 2012
- 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) MultiSourceDeclaration_RFN81UW_b4318
- 2) Test Report 1-5579_12-01-06-B
- 3) Test Report 1-5579_12-01-07-B
- 4) Test Report 1-5579_12-01-08-C
- 5) Test Report 1-5579_12-01-09-B
- 6) Test Report 1-5579_12-01-11-D

C. Product Identification

Manufactured by Research In Motion Limited whose headquarters is located at:
 295 Phillip Street
 Waterloo, Ontario
 Canada, N2L 3W8
 Phone: 519 888 7465
 Fax: 519 888 6906

The equipment under test (EUT) was tested at the following locations:

RIM Testing Services EMI test facilities	
305 Phillip Street	440 Phillip Street
Waterloo, Ontario	Waterloo, Ontario
Canada, N2L 3W8	Canada, N2L 5R9
Phone: 519 888 7465	Phone: 519 888 7465
Fax: 519 888 6906	Fax: 519 888 6906

The testing was performed from January 29- February 14 and March 27, 2013.

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The sample EUT included:

SAMPLE	MODEL	CER NUMBER	PIN	SOFTWARE
1a	RFN81UW	CER-53015-001 Rev3-905-01	2AB01FA6	OS Version: 127.0.1.3901
1a	RFN81UW	CER-53015-001 Rev3-905-01	2AB01FA6	OS Version: 127.0.1.4318

Conducted Emissions and Near Field Communications testing were performed on sample 1a and 1b.

To view the differences between software bundles 127.0.1.3901 to 127.0.1.4318 for RFN81UW, see document MultiSourceDeclaration_RFN81UW_b4318.

BlackBerry® smartphone Accessories Tested

- 1) Battery, part number BAT-49702-002, capacity 1800mAh, 6.9Wh
- 2) Battery, part number BAT-52961-001, capacity 2100mAh, 8.0Wh

D. Support Equipment Used for the Testing of the EUT

No support equipment required; for list of equipment refer to 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	See Test Report 1-5579_12-01-11-D
Part 15.209 Part 15.247	RSS-210 RSS-GEN	BT/BLE Radiated Spurious Emissions	Pass	See Test Report 1-5579_12-01-06-B 1-5579_12-01-07-B
Part 15.209 Part 15.247	RSS-210 RSS-GEN	BT/BLE Radiated Band Edge Compliance	Pass	See Test Report 1-5579_12-01-06-B 1-5579_12-01-07-B
Part 15.209 Part 15.247	RSS-210 RSS-GEN	802.11b/g/n Radiated Spurious Emissions	Pass	See Test Report 1-5579_12-01-09-B
Part 15.209 Part 15.247	RSS-210 RSS-GEN	802.11b/g/n Radiated Band Edge Compliance	Pass	See Test Report 1-5579_12-01-09-B
Part 15.209 Part 15.407	RSS-210 RSS-GEN	802.11a Radiated Spurious Emissions	Pass	See Test Report 1-5579_12-01-08-C
Part 15.209 Part 15.407	RSS-210 RSS-GEN	802.11a Radiated Band Edge Compliance	Pass	See Test Report 1-5579_12-01-08-C
Part 15.247(a)	RSS-210	BT, 20 dB Bandwidth	Pass	1
Part 15.247(a)	RSS-210	BT, Carrier Frequency Separation	Pass	1
Part 15.247(a)	RSS-210	BT, Number of Hopping Frequencies	Pass	1
Part 15.247(a)	RSS-210	BT, Time of Occupancy (Dwell Time)	Pass	1
Part 15.247(b)	RSS-210	BT, Maximum Peak Conducted Output Power	Pass	1
Part 15.247(c)	RSS-210	BT, Band-Edge Compliance of RF Conducted Emissions	Pass	1
Part 15.247(c)	RSS-210	BT, Spurious RF Conducted Emissions	Pass	1

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Test Results Chart cont'd

SPECIFICATION		TEST TYPE	Meets Requirements	TEST DATA
FCC CFR 47	IC			APPENDIX
Part 15.247(a)	RSS-210	BLE, 6 dB Bandwidth	Pass	1
Part 15.247(b)	RSS-210	BLE, Maximum Conducted Output Power	Pass	1
Part 15.247(c)	RSS-210	BLE, Band-Edge	Pass	1
Part 15.247(d)	RSS-210	BLE, Peak Power Spectral Density	Pass	1
Part 15.247(c)	RSS-210	BLE, Spurious RF Conducted Emissions	Pass	1
Part 15.247(a)	RSS-210	802.11b/g/n, 6 dB Bandwidth	Pass	2
Part 15.247(b)	RSS-210	802.11b/g/n, Maximum Conducted Output Power	Pass	2
Part 15.247(c)	RSS-210	802.11b/g/n, Band-Edge	Pass	2
Part 15.247(d)	RSS-210	802.11b/g/n, Peak Power Spectral Density	Pass	2
Part 15.247(c)	RSS-210	802.11b/g/n, Spurious RF Conducted Emissions	Pass	2
Part 15.407	RSS-210	802.11a, 6 dB Bandwidth	Pass	3
Part 15.407	RSS-210	802.11a, Maximum Conducted Output Power	Pass	3
Part 15.407	RSS-210	802.11a, Band-Edge	Pass	3
Part 15.407	RSS-210	802.11a, Peak Power Spectral Density	Pass	3
Part 15.407	RSS-210	802.11a, Spurious RF Conducted Emissions	Pass	3
Part 15.209 Part 15.225(a)	RSS-210 RSS-GEN	Near Field Communications, Radiated Emissions	Pass	See Test Report 1-5579_12-01-11-D
Part 15.225(e)	RSS-210	Near Field Communications, Occupied Bandwidth	Pass	4
Part 15.225(e)	RSS-210	Near Field Communications, Frequency Stability	Pass	4

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F. Summary of Results

1) i) BLUETOOTH RF CONDUCTED EMISSIONS

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

a) 20 dB Bandwidth

The BlackBerry® smartphone met the requirements of the 20 dB bandwidth as per 47 CFR 15.247(a) and RSS-210. Low channel (0), middle channel (39) and high channel (78) were measured. The result includes both normal data rate and EDR. The worst case 20 dB Bandwidth was 0.923 MHz for channels 39 in normal data rate mode and 1.337 MHz for channel 39 in EDR mode.

See APPENDIX 1 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 1 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 1 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 1 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 10.00 dBm (0.0100 W) for Channel 39 in normal data rate mode and 9.00 dBm (0.00794 W) for channel 39 in EDR mode.

See APPENDIX 1 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 1 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 1 for the test data.

1) ii) BLUETOOTH LOW ENERGY RF CONDUCTED EMISSIONS

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

a) 6dB Bandwidth

The EUT met the requirements of the 6 dB bandwidth as per 47 CFR 15.247(b) and RSS-210. Low channel (0), middle channel (20) and high channel (39) were measured. The worst case 6 dB Bandwidth was 0.720MHz for channel 39. See APPENDIX 1 for the test data.

b) Maximum Conducted Output Power

The EUT met the requirements of the maximum conducted output power as per 47 CFR 15.247(b) and RSS-210. Low channel (0), middle channel (20) and high channel (39) were measured. The worst case Conducted Output Power level was 6.3 dBm (0.00427 W) for channel 39. See APPENDIX 1 for the test data

c) Band-Edge Compliance of RF Conducted Emissions

The EUT met the requirements of band-edge compliance of RF conducted emissions as per 47 CFR 15.247(b) and RSS-210. Low channel (0) and high channel (39) were measured. See APPENDIX 1 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 15.247(b) and RSS-210. Low channel (0), middle channel (20) and high channel (39) were measured.

See APPENDIX 1 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 (0), middle channel (20) and high channel (39) were measured.

See APPENDIX 1 for the test data.

2) 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 8.51 MHz for channel 11 in 802.11b mode, 16.35 MHz for channels 1 and 11 in 802.11g mode, and 17.80 MHz for channel 11 in 802.11n mode.

See APPENDIX 2 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 18.82 dBm (76.12 mW) for channel 1 in 802.11b mode, 20.47 dBm (111.33 mW) for channel 1 in 802.11g mode, and 19.89 dBm (97.51 mW) for channel 1 in 802.11n mode.

See APPENDIX 2 for the test data

c) Band-Edge Compliance of RF Conducted Emissions

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

See APPENDIX 2 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 15.247(b) and RSS-210. Low channel (1), middle channel (6) and high channel (11) were measured.

See APPENDIX 2 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 2 for the test data.

3) 802.11a/n 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, 48, 64, 100, 140, band 165 were measured. The worst case 6 dB Bandwidth was 16.56 MHz for channels 36, 48, 64, 100 and 165 in 802.11a mode.

The EUT met the requirements of the 6 dB bandwidth as per 47 CFR 15.407 and RSS-210. Channels 36, 100 and 165 were measured. The worst case 6 dB Bandwidth was 17.74 MHz for channels 36, 100 and 165 in 802.11n mode.

See APPENDIX 3 for the test data.

b) Maximum Conducted Output Power

The EUT met the requirements of the maximum conducted output power as per 47 CFR 15.407 and RSS-210. Channels 36, 48, 64, 100, 140, and 165 were measured. The worst case Conducted Output Power level was 18.64 dBm (73.18 mW) for channel 36 in 802.11a mode.

The EUT met the requirements of the maximum conducted output power as per 47 CFR 15.407 and RSS-210. Channels 36, 64, 100, 140, and 165 were measured. The worst case Conducted Output Power level was 18.52 dBm (71.04 mW) for channel 100 in 802.11n mode.

See APPENDIX 3 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 15.407 and RSS-210. Channels 36, 64, 100, 140, 149, and 165 were measured.
See APPENDIX 3 for the test data.

d) Peak Power Spectral Density

The EUT met the requirements of peak power spectral density as per 47 CFR 15.407 and RSS-210. Channels 36, 48, 64, 100, 140, and 165 were measured in 802.11a Mode.

The EUT met the requirements of peak power spectral density as per 47 CFR 15.407 and RSS-210. Channels 36, 100, and 165 were measured in 802.11n Mode.

See APPENDIX 3 for the test data.

e) Spurious RF Conducted Emissions

The EUT met the requirements of the spurious RF conducted emissions as per 47 CFR 15.407 and RSS-210. The frequency range measured was 30 MHz to 40 GHz. Channels 64 and 100 were measured.
See APPENDIX 3 for the test data.

4) 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) 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 4 for the test data.

b) 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 4 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>
Spectrum Analyzer	HP	8563E	3745A08113	13-10-05	RF Conducted Emissions
DC Power Supply	HP	6632B	US37472178	13-09-25	RF Conducted Emissions
Environment Monitor	Omega	iTHX-SD	0340060	13-10-30	RF Conducted Emissions
Environmental Chamber	Test Equity	107	0900246	N/R	Frequency Stability
Bluetooth Tester	Rohde & Schwarz	CBT	119549	13-12-04	RF Conducted Emissions
Power Meter	Agilent	N1911A	MY45100951	13-08-16	RF Conducted / Frequency Stability
Power Sensor	Agilent	N1921A	MY45241383	13-09-11	RF Conducted / Frequency Stability
Spectrum Analyzer	Rohde & Schwarz	FSV	101820	13-11-28	RF Conducted Emissions
Spectrum Analyzer	Rohde & Schwarz	FSP	100884	13-11-22	RF Conducted Emissions
EMI Test Receiver	Rohde & Schwarz	ESU 40	100162	13-11-30	Conducted/Radiated Emissions

**APPENDIX 1 – BLUETOOTH AND BLUETOOTH LOW ENERGY CONDUCTED
EMISSIONS TEST DATA/PLOTS**

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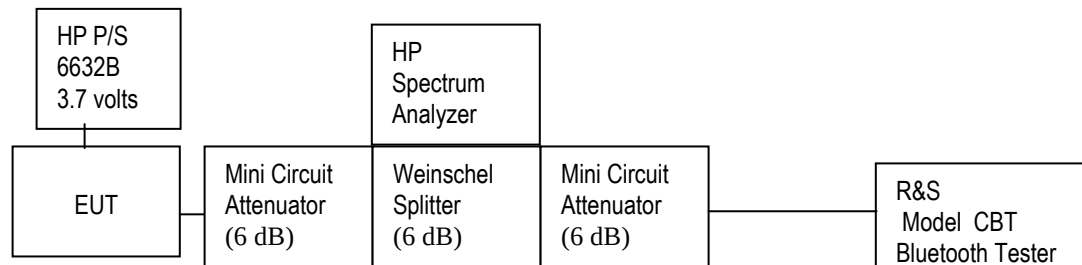
Bluetooth RF Conducted Emission Test Results

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

The measurements were performed by Berkin Can.

Date of test: February 11-14, 2013

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: 23-26.5 °C
Relative Humidity: 19.6-24.4 %

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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	0.920
39	≤1.0	0.923
78	≤1.0	0.920

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

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



Figure 1-2: 20 dB Bandwidth
Single freq., Static PBRs, DH5



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Bluetooth RF Conducted Emission Test Results cont'd

Figure 1-3: 20 dB Bandwidth
Single freq., Static PBRs, DH5



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

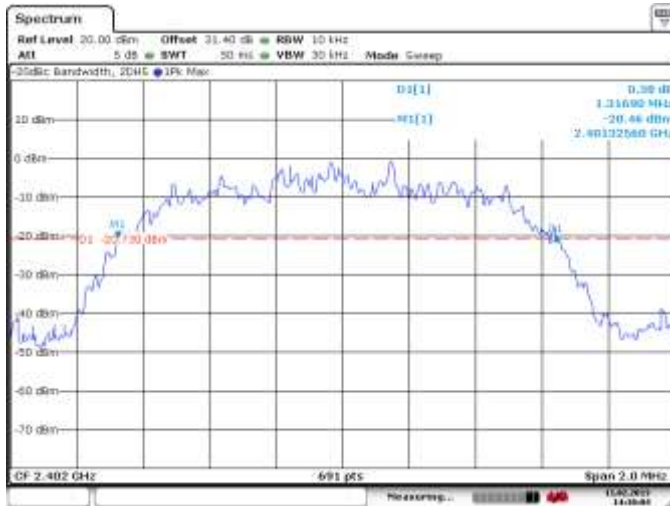
Bluetooth Channel	Limit (MHz)	Measured Level (MHz)
0	≤1.5	1.317
39	≤1.5	1.302
78	≤1.5	1.320

See figures 1-4 to 1-6 for the plots of the 20 dB bandwidth measurements.

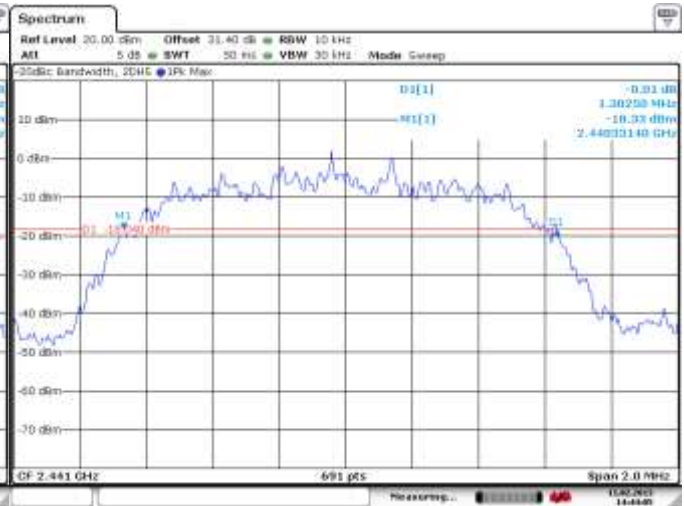
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Bluetooth RF Conducted Emission Test Results cont'd

**Figure 1-4: 20 dB Bandwidth
Single freq., Static PBRS, 2-DH5**



**Figure 1-5: 20 dB Bandwidth
Single freq., Static PBRS, 2-DH5**



**Figure 1-6: 20 dB Bandwidth
Single freq., Static PBRS, 2-DH5**



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

Bluetooth Channel	Limit (MHz)	Measured Level (MHz)
0	≤1.5	1.317
39	≤1.5	1.337
78	≤1.5	1.317

See figures 1-7 to 1-9 for the plots of the 20 dB bandwidth measurements.

Figure 1-7: 20 dB Bandwidth
Single freq., Static PBRS, 3-DH5

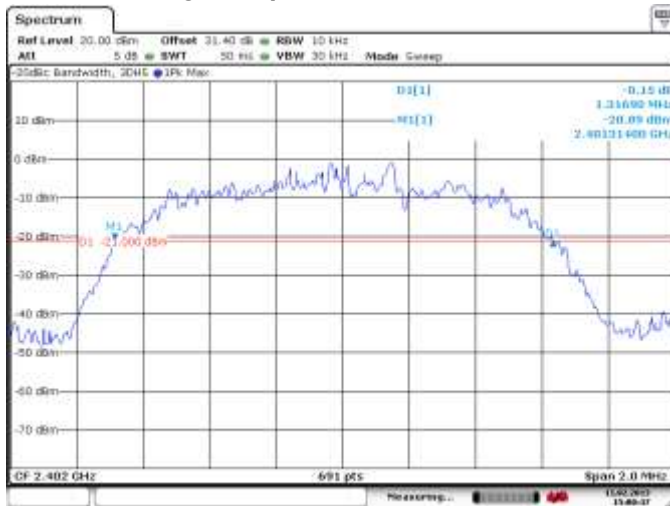


Figure 1-8: 20 dB Bandwidth
Single freq., Static PBRS, 3-DH5

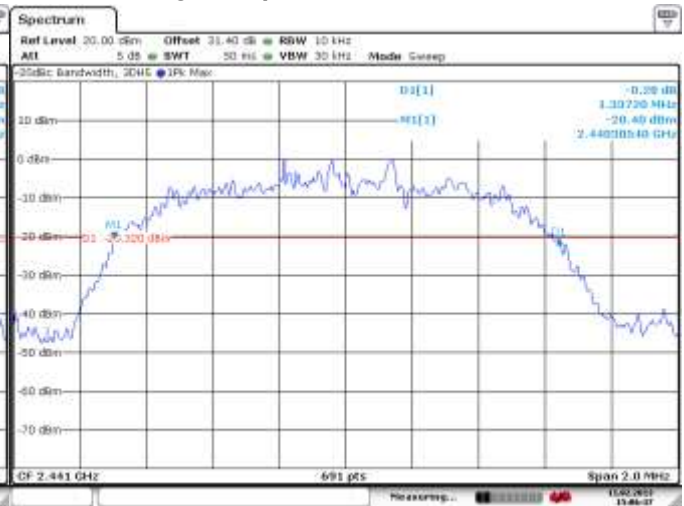


Figure 1-9: 20 dB Bandwidth
Single freq., Static PBRS, 3-DH5



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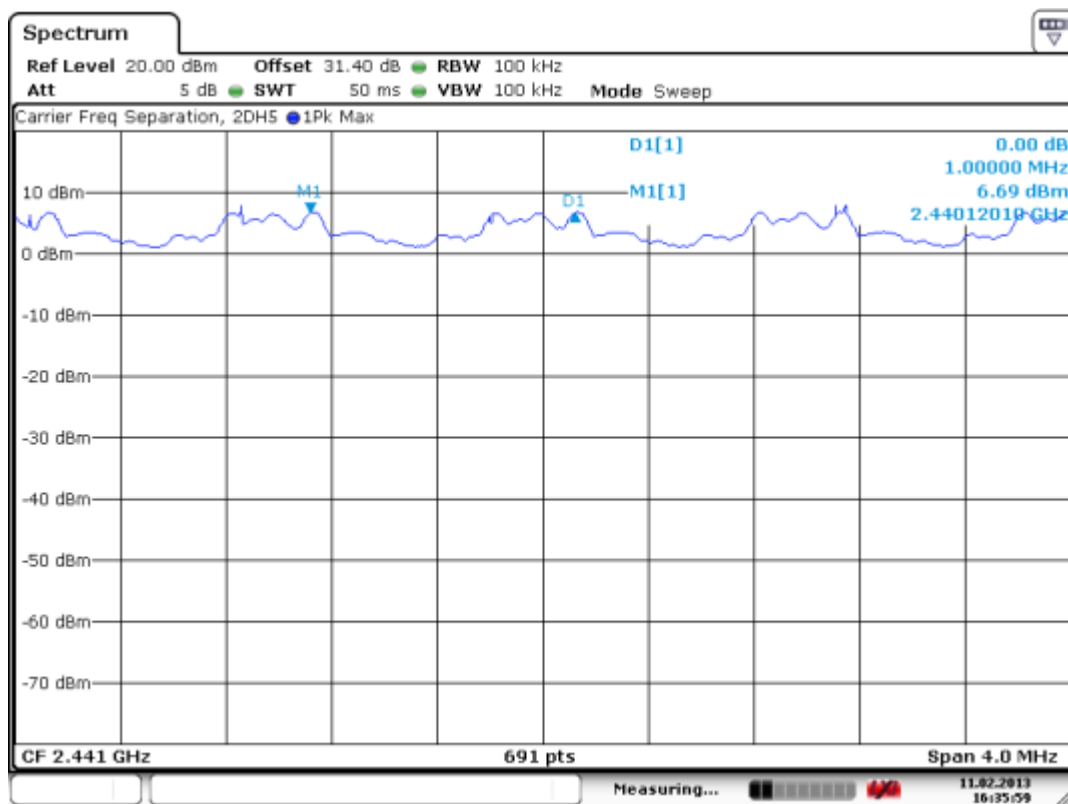
Bluetooth RF Conducted Emission Test Results cont'd

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

Bluetooth Channels	Limit (MHz)	Measured Level (MHz)
38 to 39	≥ 0.025 or 20 dB bandwidth	1.000

See figure 1-11 for the plot of the Carrier Frequency Separation measurement.

Figure 1-11: Carrier Frequency Separation, Freq. Hopping, Static PBRS, 2-DH5, Channels 38 to 39



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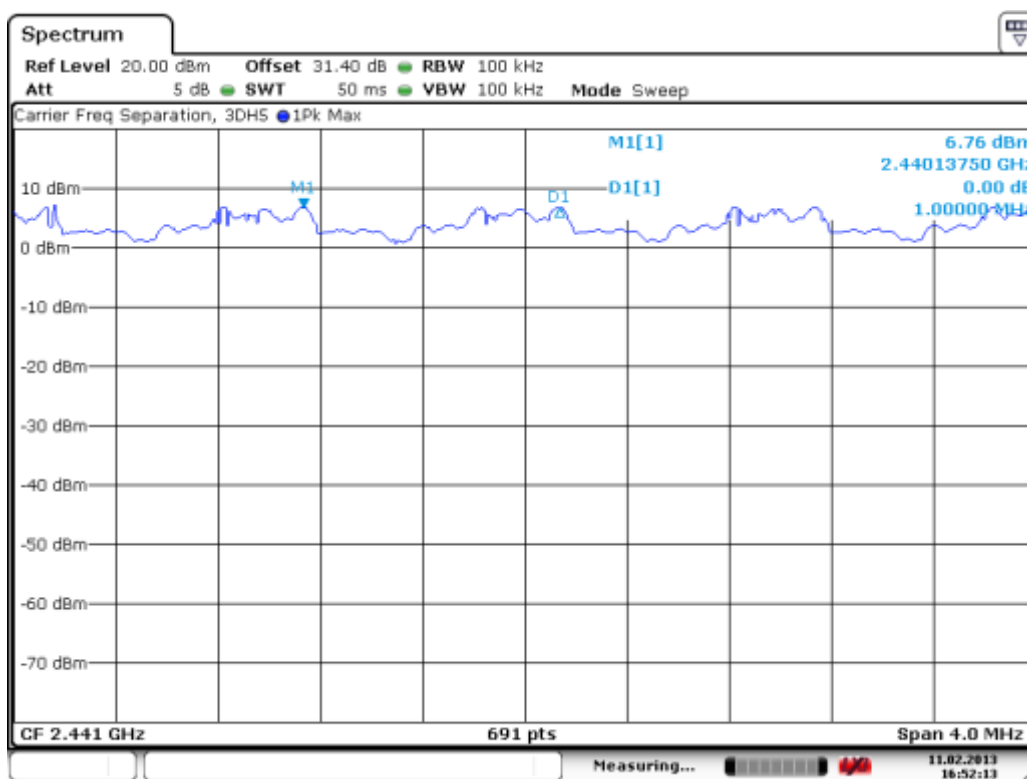
Bluetooth RF Conducted Emission Test Results cont'd

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

Bluetooth Channels	Limit (MHz)	Measured Level (MHz)
38 to 39	≥ 0.025 or 20 dB bandwidth	1.000

See figure 1-12 for the plot of the Carrier Frequency Separation measurement.

Figure 1-12: Carrier Frequency Separation, Freq. Hopping, Static PBRs, 3-DH5, Channels 38 to 39



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Bluetooth RF Conducted Emission Test Results cont'd

Number of Hopping Frequencies

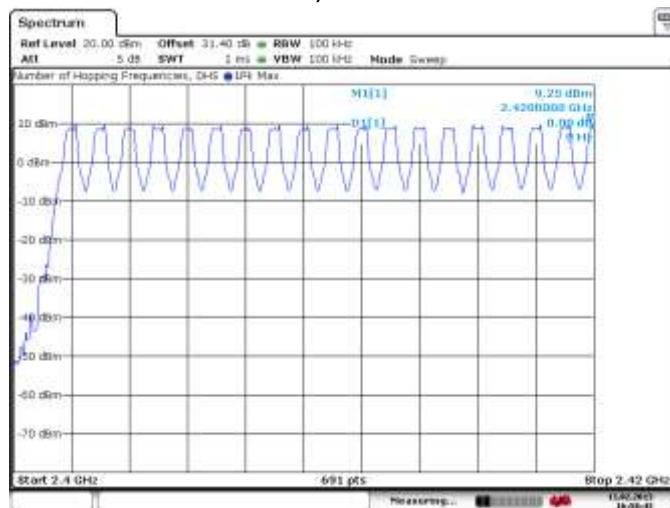
The EUT met the requirements of the number of hopping frequencies as per 47 CFR 15.247(a) and RSS-210. Bluetooth was operating in frequency hopping (Euro/US) mode.

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

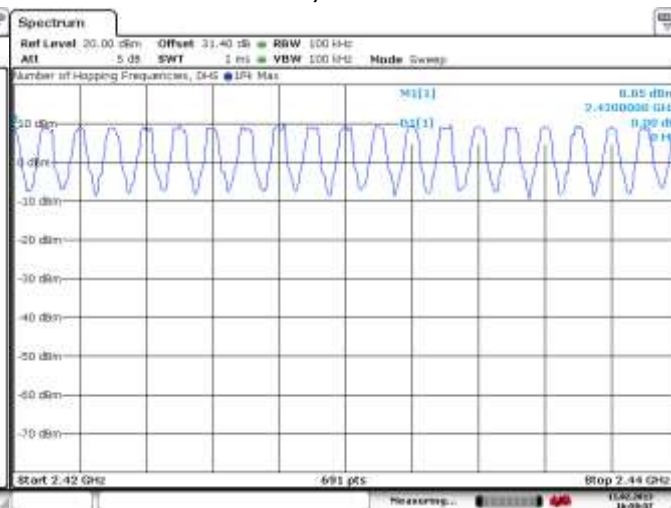
Limit (CH)	Number of Hopping Frequencies (CH)
≥75	79

See figures 1-13 to 1-16 for the plots of the number of hopping frequencies.

**Figure 1-13: Number of Hopping Frequencies
Static PBRs, DH5**



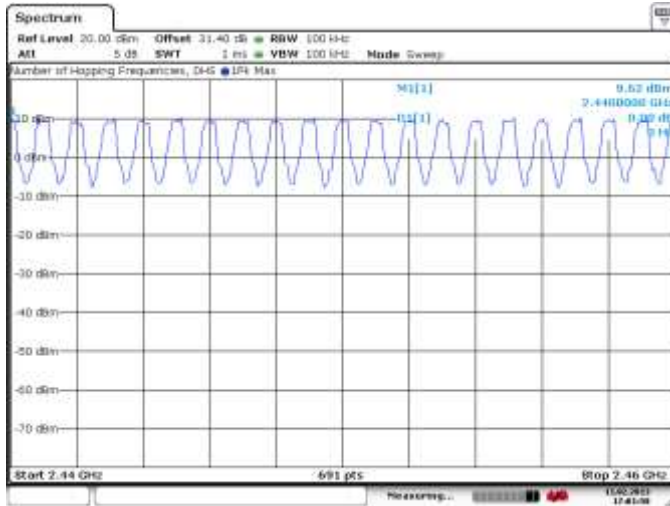
**Figure 1-14: Number of Hopping Frequencies
Static PBRs, DH5**



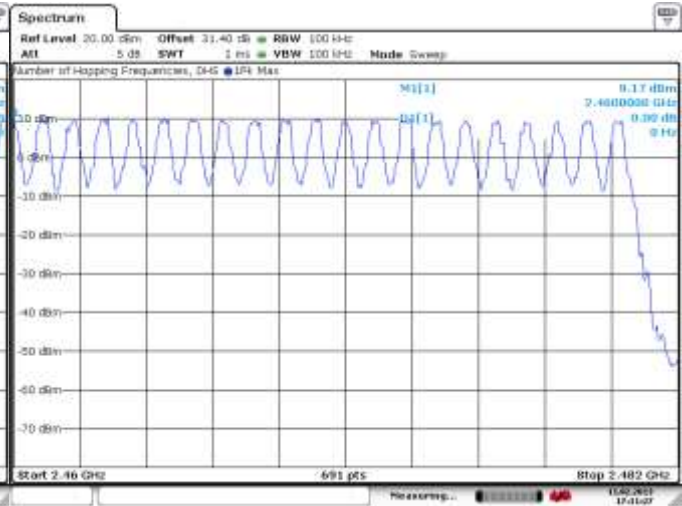
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Bluetooth RF Conducted Emission Test Results cont'd

**Figure 1-15: Number of Hopping Frequencies
Static PBRS, DH5**



**Figure 1-16: Number of Hopping Frequencies
Static PBRS, DH5**



Time of Occupancy (Dwell Time)

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

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

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

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

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Bluetooth RF Conducted Emission Test Results cont'd

Bluetooth Channel	Mode	Tx Time (ms)	Dwell Time/31.6 sec. (msec.)	Limit (msec.)	Margin (msec.)
0	DH1	0.4030	$0.405 \times 320.0 = 129.60$	400	271.04
39	DH1	0.4020	$0.403 \times 320.0 = 128.96$	400	271.36
78	DH1	0.4050	$0.403 \times 320.0 = 128.96$	400	270.40
0	DH3	1.6610	$1.653 \times 159.9 = 264.31$	400	134.41
39	DH3	1.6660	$1.653 \times 159.9 = 264.31$	400	133.61
78	DH3	1.6610	$1.653 \times 159.9 = 264.31$	400	134.41
0	DH5	2.8960	$2.914 \times 106.8 = 311.22$	400	90.71
39	DH5	2.9050	$2.923 \times 106.8 = 312.18$	400	89.75
78	DH5	2.9130	$2.923 \times 106.8 = 312.18$	400	88.89

See figures 1-17 to 1-25 for the plots of the dwell time.

Bluetooth RF Conducted Emission Test Results cont'd

Figure 1-17: Time of Occupancy (Dwell Time)
Freq. Hopping, Static PBRS, DH1

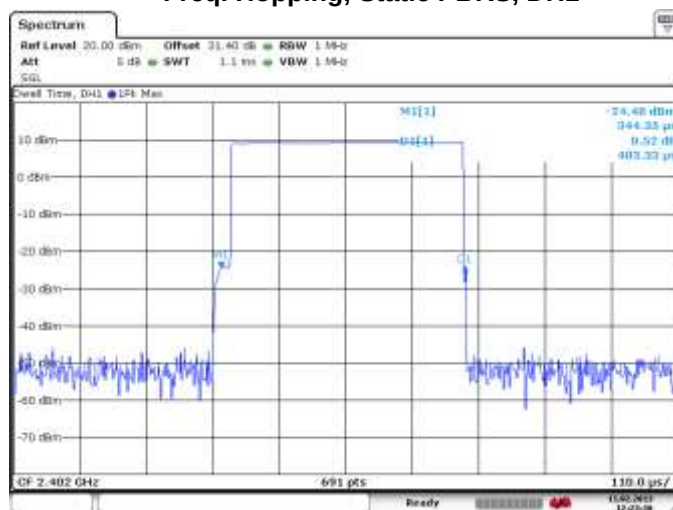
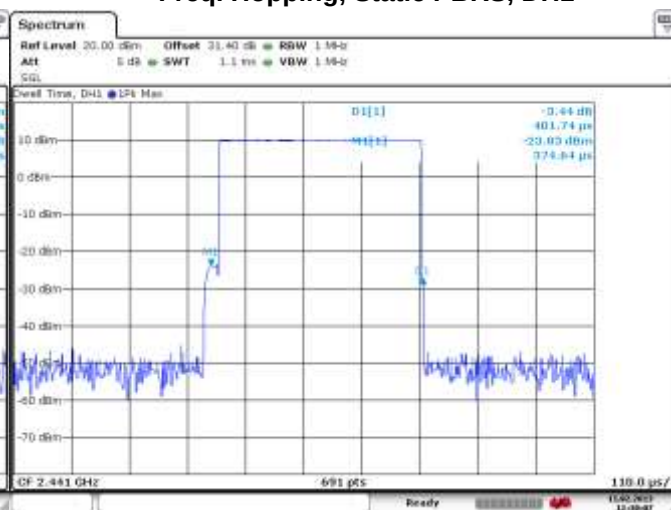


Figure 1-18: Time of Occupancy (Dwell Time)
Freq. Hopping, Static PBRS, DH1



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Bluetooth RF Conducted Emission Test Results cont'd

Figure 1-19: Time of Occupancy (Dwell Time)
Freq. Hopping, Static PBRS, DH1

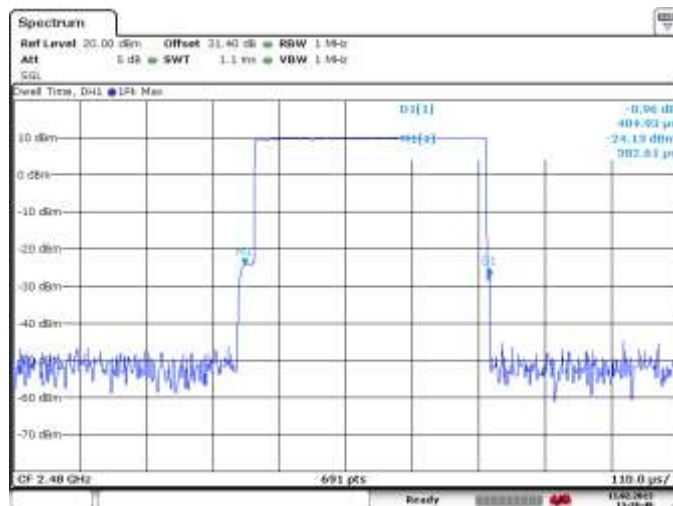


Figure 1-20: Time of Occupancy (Dwell Time)
Freq. Hopping, Static PBRS, DH3

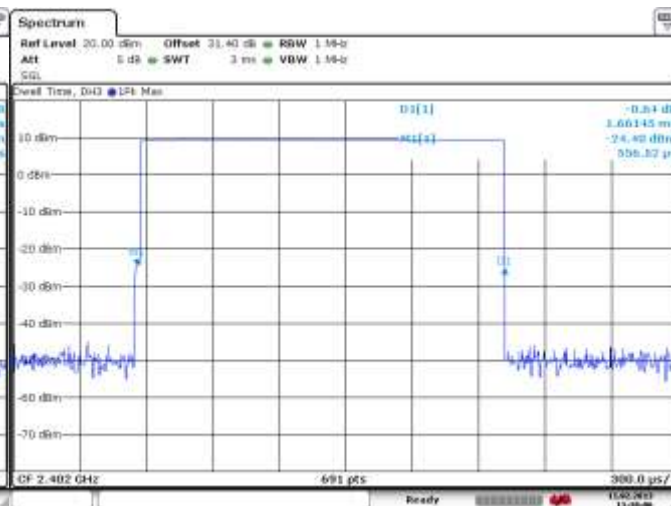


Figure 1-21: Time of Occupancy (Dwell Time)
Freq. Hopping, Static PBRS, DH3

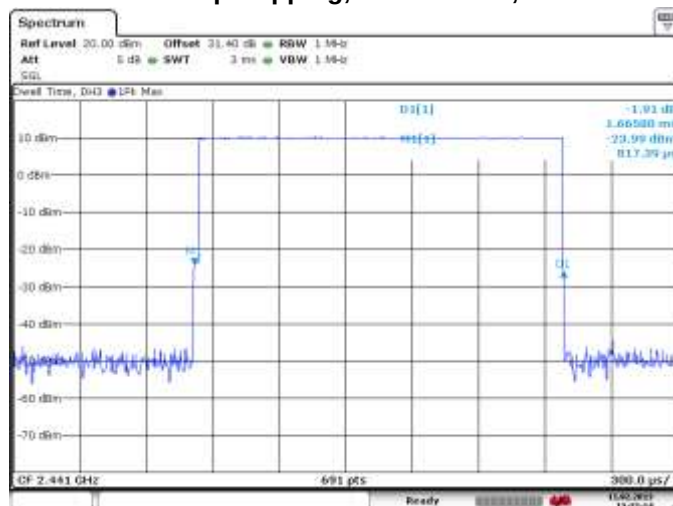
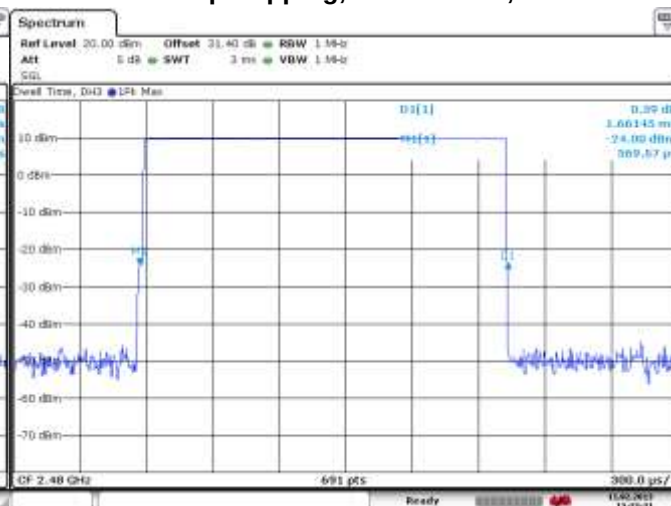


Figure 1-22: Time of Occupancy (Dwell Time)
Freq. Hopping, Static PBRS, DH3



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Bluetooth RF Conducted Emission Test Results cont'd

Figure 1-23: Time of Occupancy (Dwell Time)
Freq. Hopping, Static PBRS, DH5

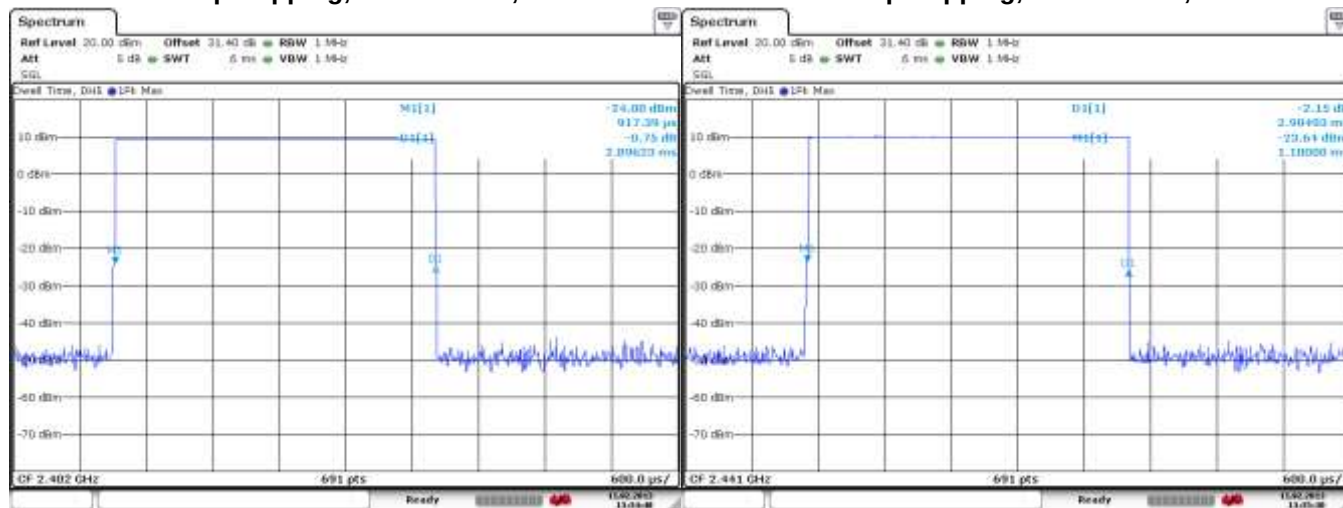


Figure 1-24: Time of Occupancy (Dwell Time)
Freq. Hopping, Static PBRS, DH5

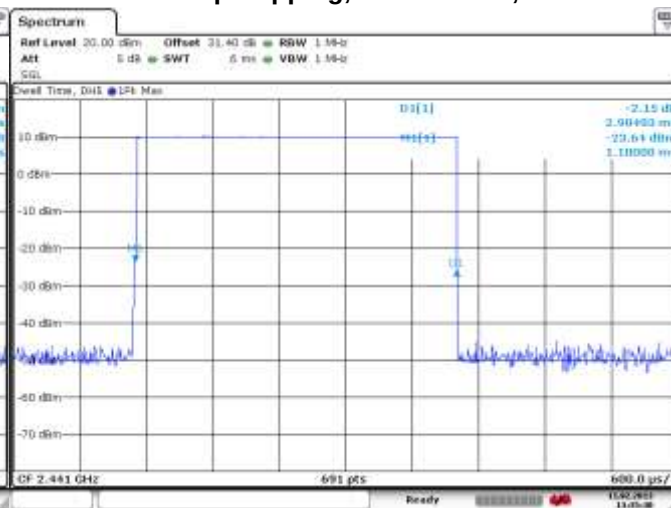
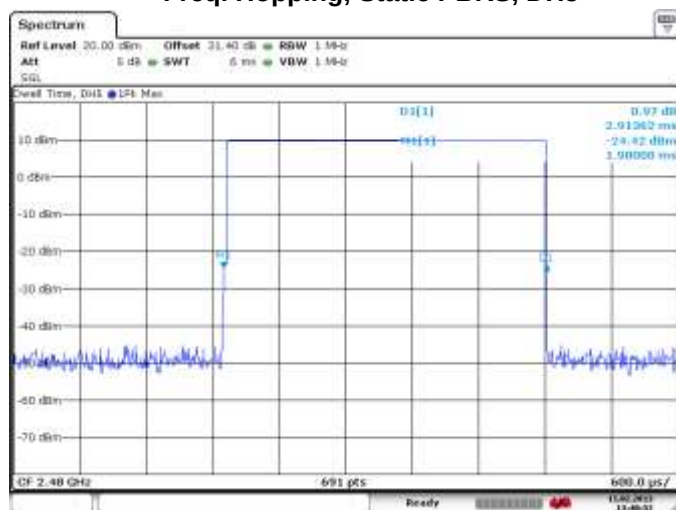


Figure 1-25: Time of Occupancy (Dwell Time)
Freq. Hopping, Static PBRS, DH5



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Bluetooth RF Conducted Emission Test Results cont'd

Maximum Peak Conducted Output Power

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

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

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

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

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

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

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

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Bluetooth RF Conducted Emission Test Results cont'd

Band Edge Compliance

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

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

Bluetooth Channel	Operating Mode	Measured Level (dBc)	Limit (dBc)	Margin (dB)
0	Single Frequency	-59.49	-20	-39.49
78	Single Frequency	-59.9	-20	-39.90
0	Hopping	-60.26	-20	-40.26
78	Hopping	-62.29	-20	-42.29

See figures 1-35 to 1-38 for the plots of the band edge compliance measurements.

Figure 1-35: Band Edge Compliance
Single Freq., Static PBRS, DH5

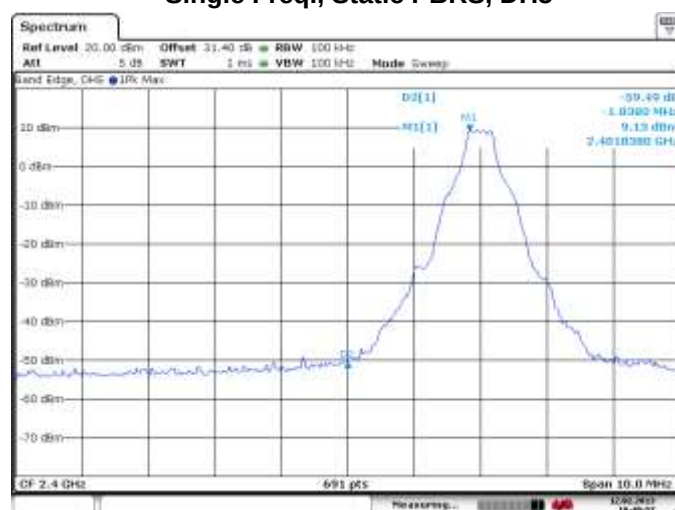
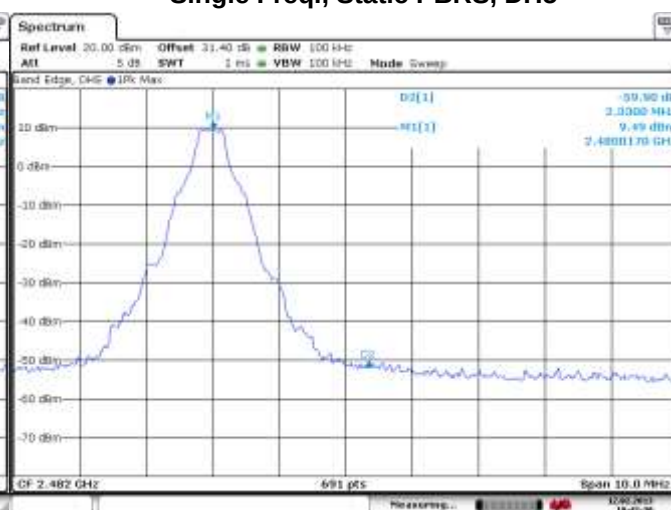


Figure 1-36: Band Edge Compliance
Single Freq., Static PBRS, DH5



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Bluetooth RF Conducted Emission Test Results cont'd

Figure 1-37: Band Edge Compliance
Freq. Hopping, Static PBRS, DH5

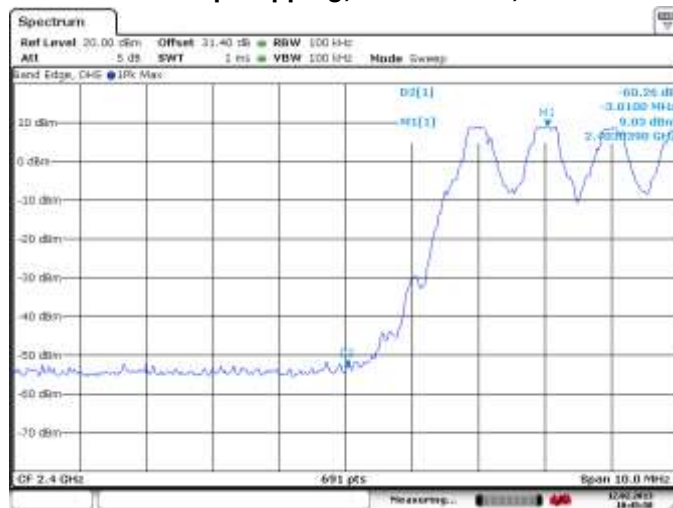
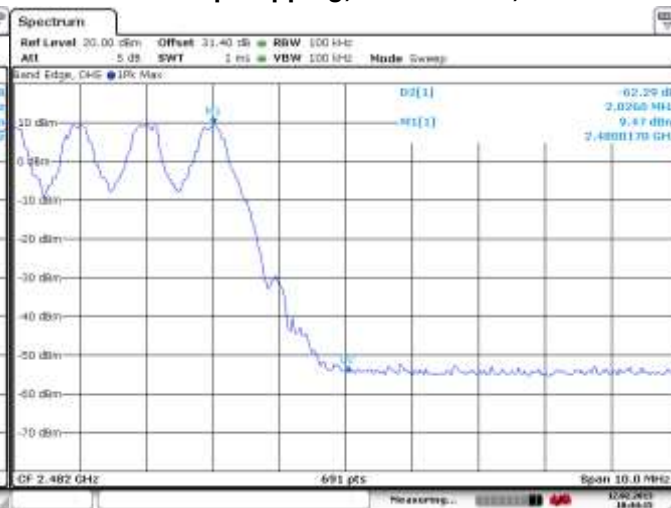


Figure 1-38: Band Edge Compliance
Freq. Hopping, Static PBRS, DH5



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

Bluetooth Channel	Operating Mode	Measured Level (dBc)	Limit (dBc)	Margin (dB)
0	Single Frequency	-56.82	-20	-36.82
78	Single Frequency	-56.69	-20	-36.69
0	Hopping	-57.83	-20	-37.83
78	Hopping	-57.21	-20	-37.21

See figures 1-39 to 1-42 for the plots of the band edge compliance measurements.

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Bluetooth RF Conducted Emission Test Results cont'd

Figure 1-39: Band Edge Compliance
Single Freq., Static PBRS, 2-DH5

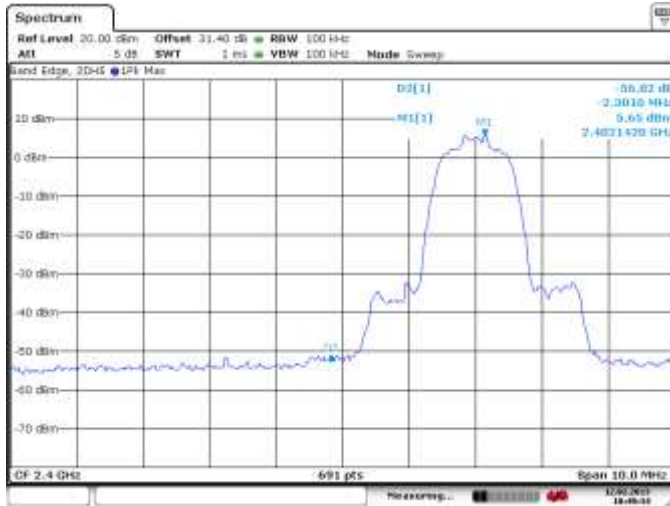


Figure 1-40: Band Edge Compliance
Single Freq., Static PBRS, 2-DH5

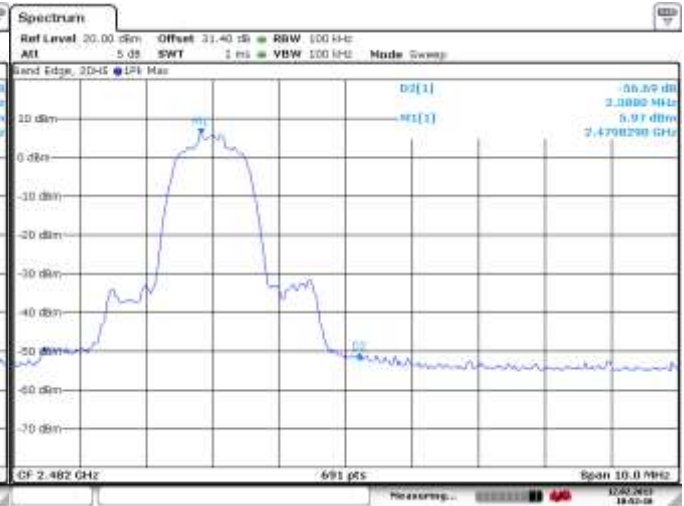


Figure 1-41: Band Edge Compliance
Freq. Hopping, Static PBRS, 2-DH5

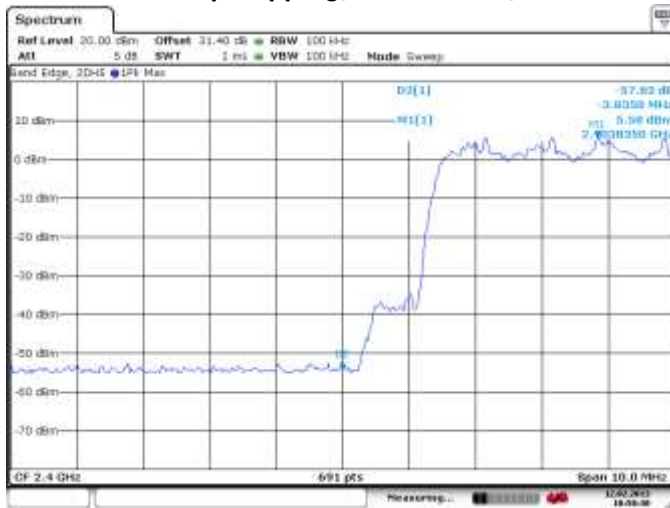
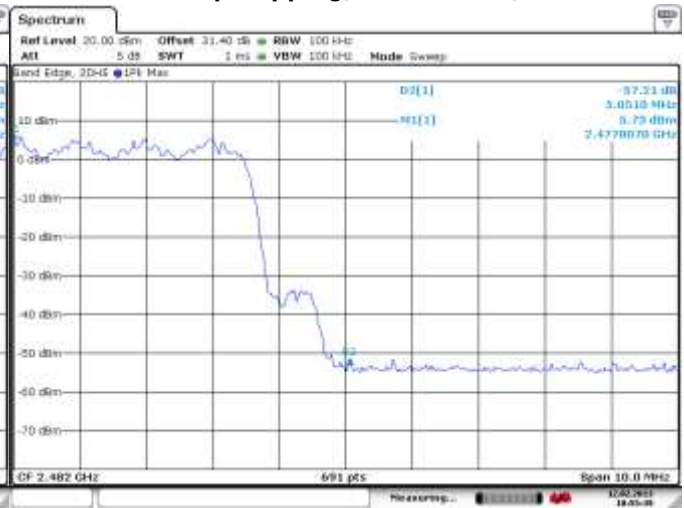


Figure 1-42: Band Edge Compliance
Freq. Hopping, Static PBRS, 2-DH5



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Bluetooth RF Conducted Emission Test Results cont'd

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

Bluetooth Channel	Operating Mode	Measured Level (dBc)	Limit (dBc)	Margin (dB)
0	Single Frequency	-56.60	-20	-36.60
78	Single Frequency	-57.59	-20	-37.59
0	Hopping	-58.86	-20	-38.86
78	Hopping	-59.15	-20	-39.15

See figures 1-43 to 1-46 for the plots of the band edge compliance measurements.

Figure 1-43: Band Edge Compliance
Single Freq., Static PBRS, 3-DH5

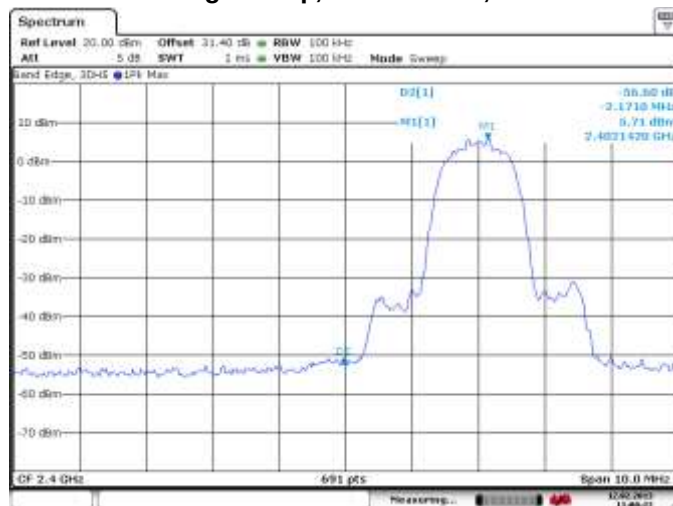
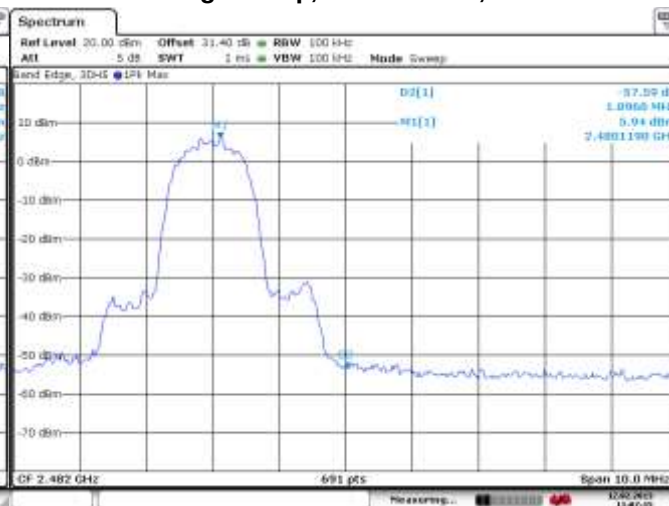


Figure 1-44: Band Edge Compliance
Single Freq., Static PBRS, 3-DH5



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Bluetooth RF Conducted Emission Test Results cont'd

Figure 1-45: Band Edge Compliance
Freq. Hopping, Static PBRS, 3-DH5

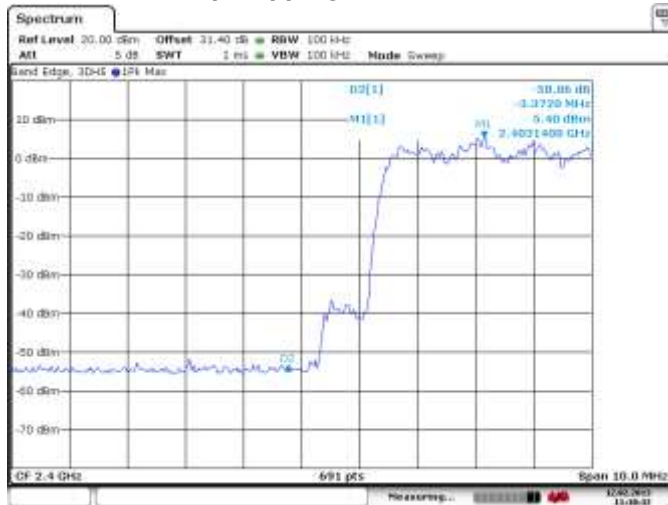
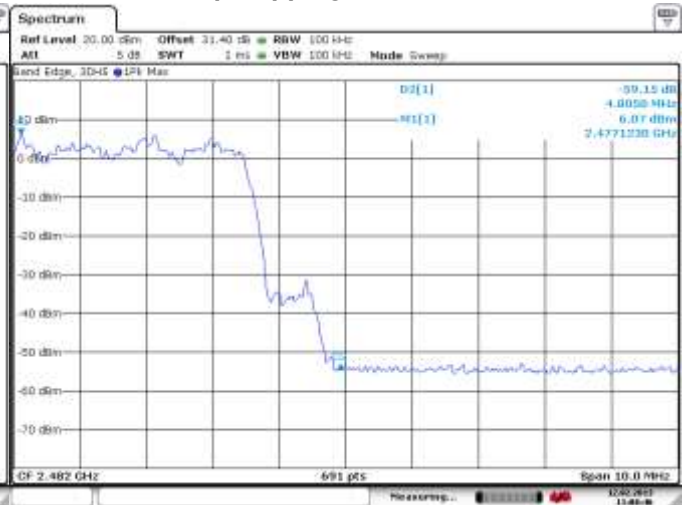


Figure 1-46: Band Edge Compliance
Freq. Hopping, Static PBRS, 3-DH5



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Bluetooth RF Conducted Emission Test Results cont'd

Spurious RF Conducted Emissions

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

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

Bluetooth Channel	Channel Power (dBm)	Max. Measured Level (dBm)	Max. Measured Level from carrier (dBc)	Limit (dBc)
0	9.30	-31.40	-40.70	-20
39	10.00	-30.14	-40.14	-20
78	9.50	-31.11	-40.61	-20
Hopping mode	9.30	-30.68	-39.98	-20

See figures 1-47 to 1-50 for the plots of the spurious RF conducted emissions.

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Bluetooth RF Conducted Emission Test Results cont'd

Figure 1-47: Spurious RF Conducted Emissions
Single Freq., Static PBRs, DH5,

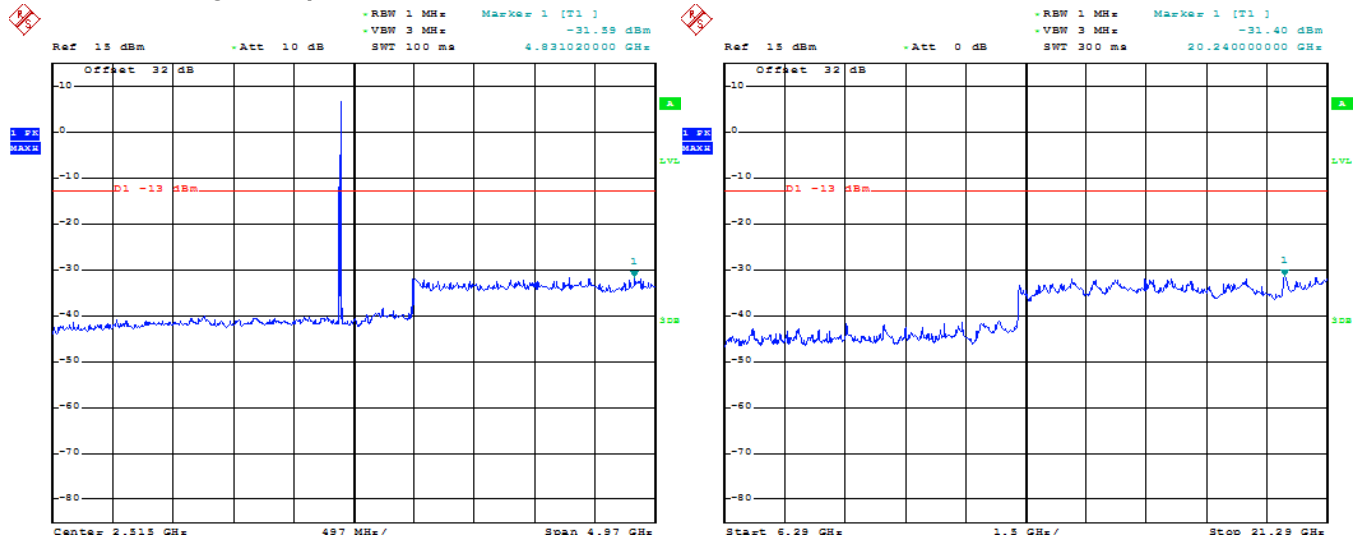
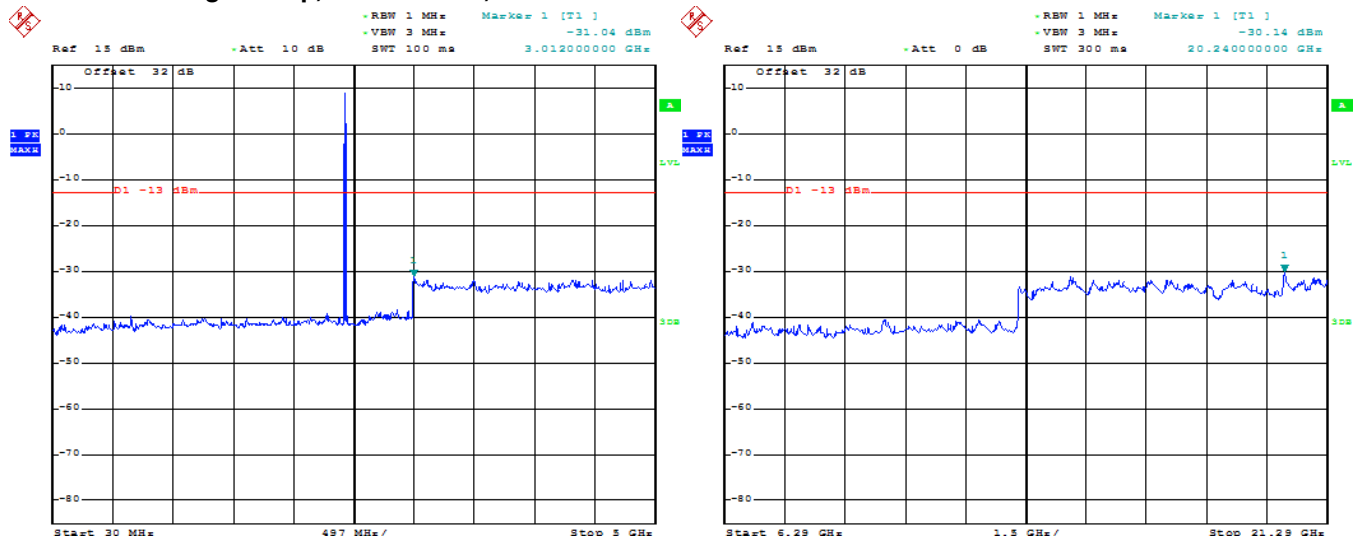


Figure 1-48: Spurious RF Conducted Emissions
Single Freq., Static PBRs, DH5



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Bluetooth RF Conducted Emission Test Results cont'd

Figure 1-49: Spurious RF Conducted Emissions
Single Freq., Static PBRS, DH5

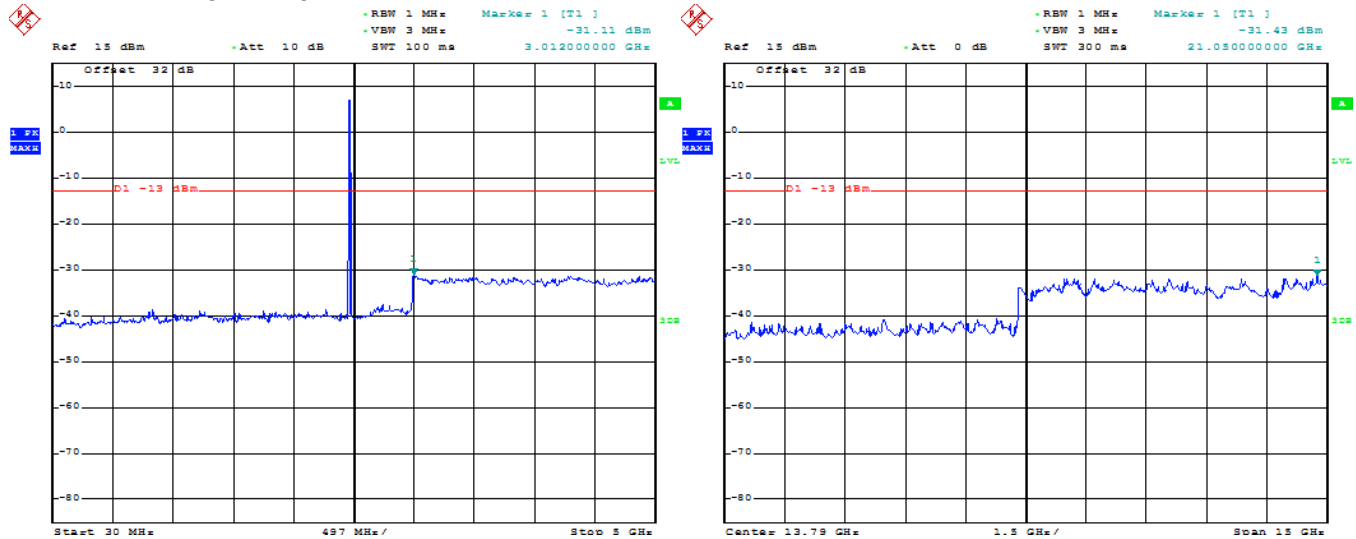
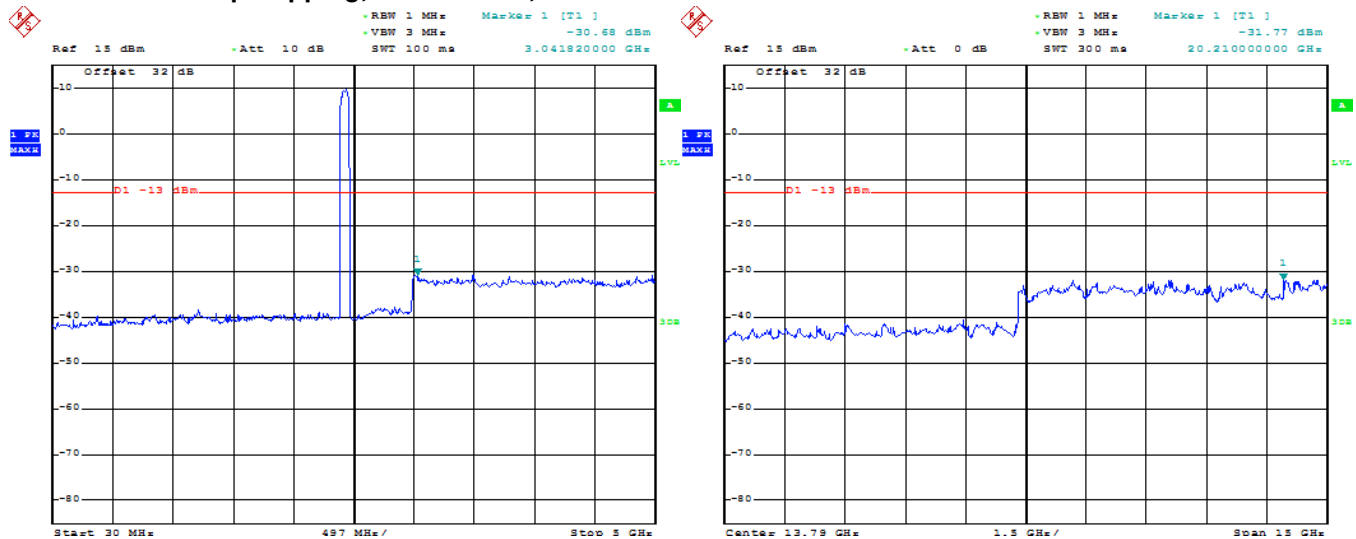


Figure 1-50: Spurious RF Conducted Emissions
Freq. Hopping, Static PBRS, DH5



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Bluetooth RF Conducted Emission Test Results cont'd

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

Bluetooth Channel	Channel Power (dBm)	Max. Measured Level (dBm)	Max. Measured Level from carrier (dBc)	Limit (dBc)
0	8.30	-31.54	-39.84	-20.00
39	9.00	-31.71	-40.71	-20.00
78	8.50	-31.26	-39.76	-20.00
Hopping mode	8.30	-31.20	-39.50	-20.00

See figures 1-51 to 1-54 for the plots of the spurious RF conducted emissions.

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Bluetooth RF Conducted Emission Test Results cont'd

Figure 1-51: Spurious RF Conducted Emissions
Single Freq., Static PBRS, 2-DH5

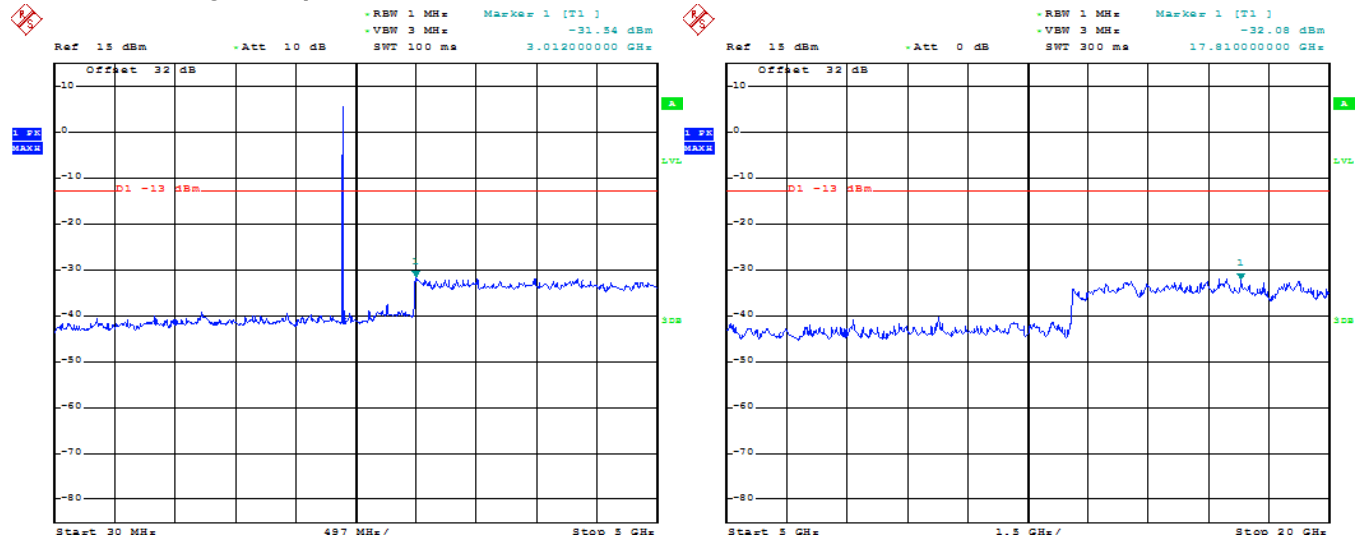
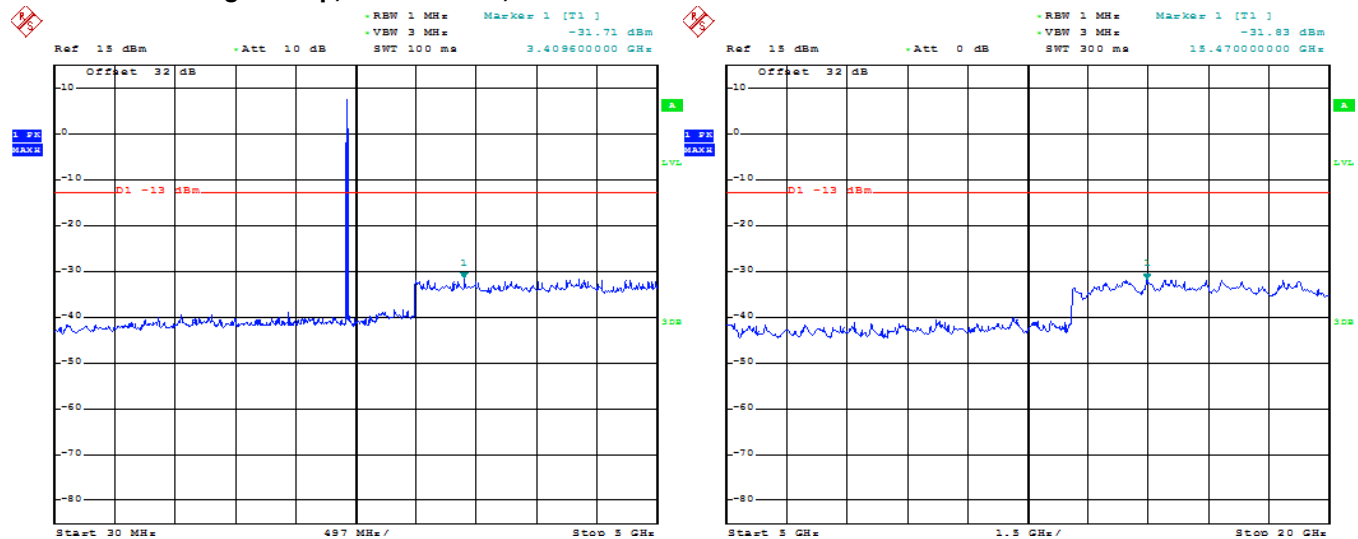


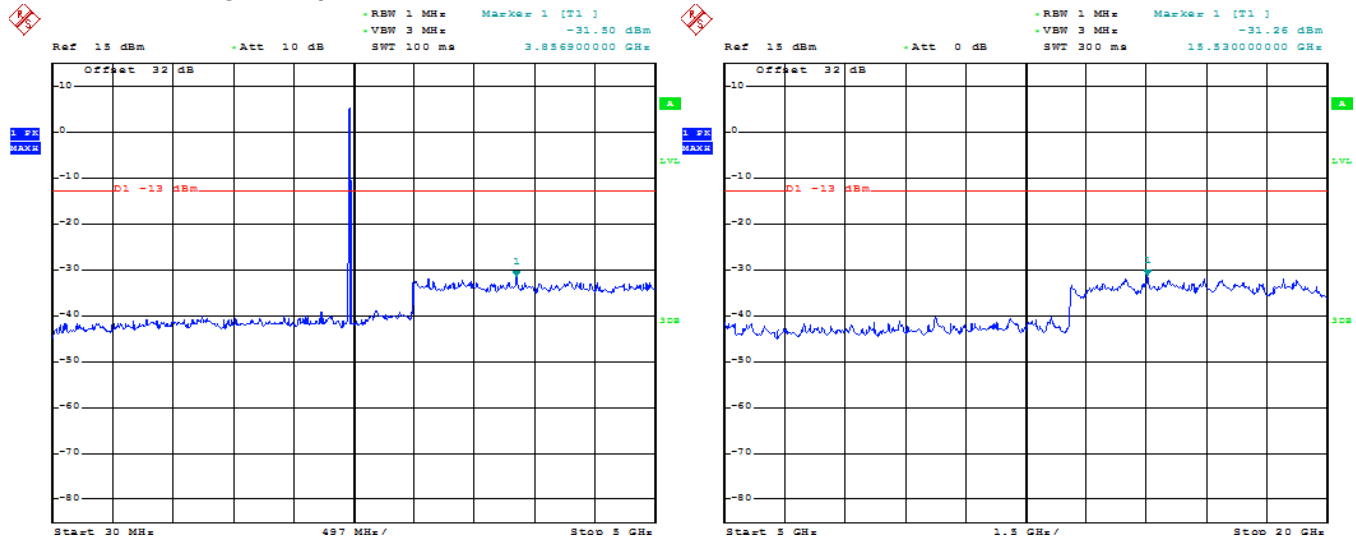
Figure 1-52: Spurious RF Conducted Emissions
Single Freq., Static PBRS, 2-DH5



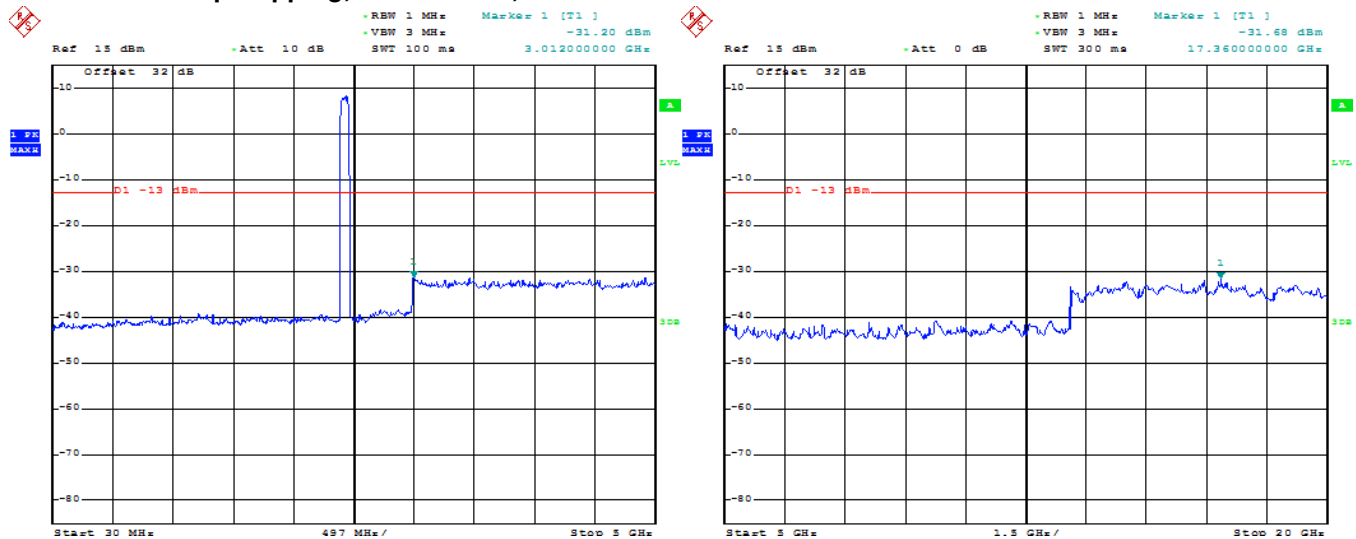
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Bluetooth RF Conducted Emission Test Results cont'd

**Figure 1-53: Spurious RF Conducted Emissions
Single Freq., Static PBRS, 2-DH5**



**Figure 1-54: Spurious RF Conducted Emissions
Freq. Hopping, Static PBRS, 2-DH5**



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Bluetooth RF Conducted Emission Test Results cont'd

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

Bluetooth Channel	Channel Power (dBm)	Max. Measured Level (dBm)	Max. Measured Level from carrier (dBc)	Limit (dBc)
0	7.80	-31.20	-39.00	-20.00
39	8.60	-30.91	-39.51	-20.00
78	8.00	-31.23	-39.23	-20.00
Hopping mode	7.80	-30.72	-38.52	-20.00

See figures 1-55 to 1-58 for the plots of the spurious RF conducted emissions.

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Bluetooth RF Conducted Emission Test Results cont'd

Figure 1-55: Spurious RF Conducted Emissions
Single Freq., Static PBRS, 3-DH5

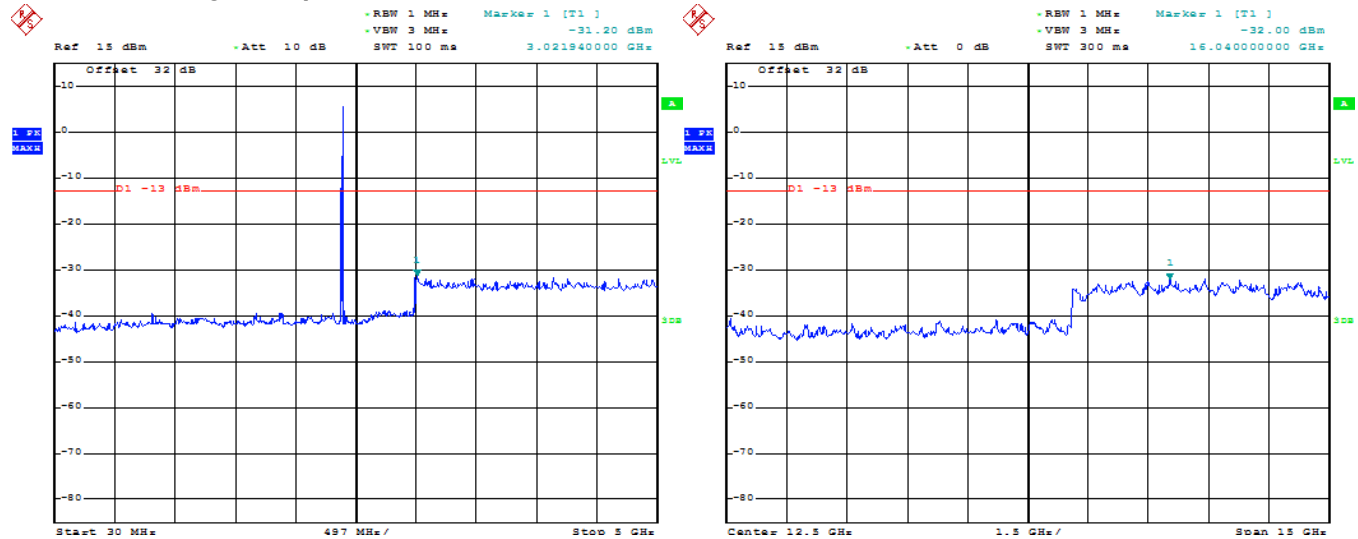
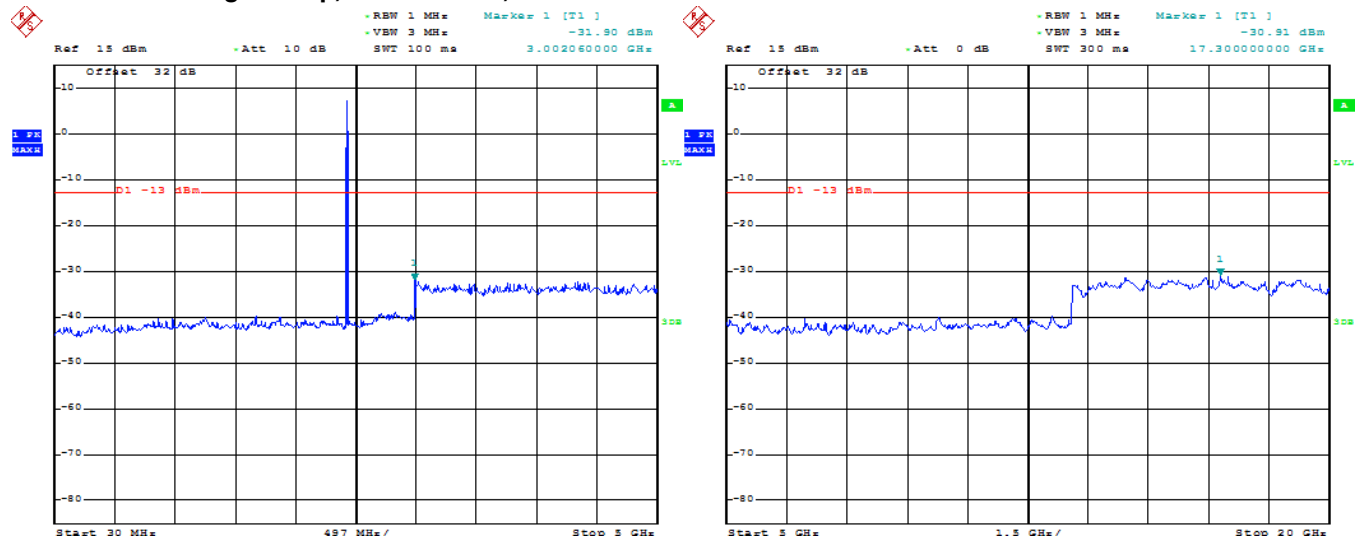


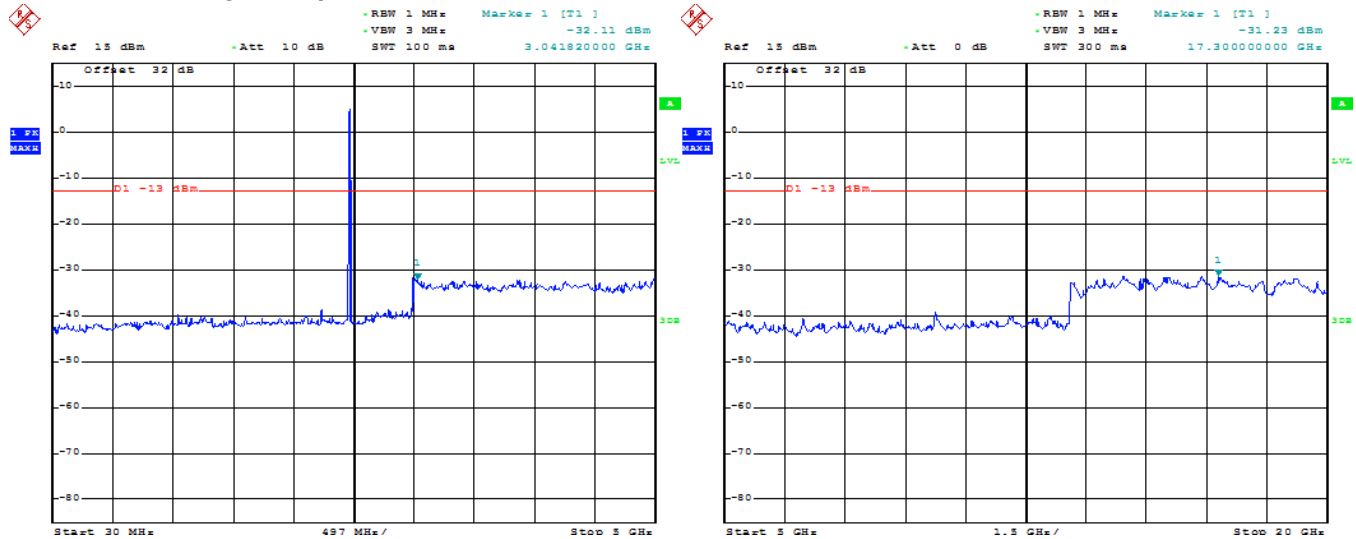
Figure 1-56: Spurious RF Conducted Emissions
Single Freq., Static PBRS, 3-DH5



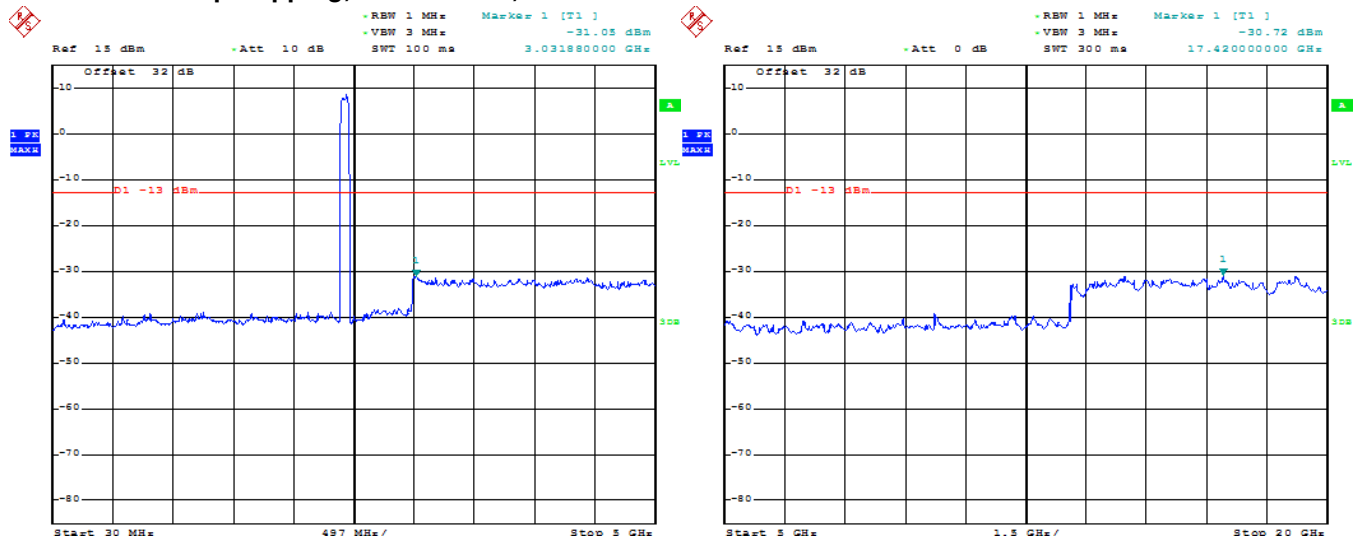
	EMI Test Report for the BlackBerry® smartphone Model RFN81UW APPENDIX 1	
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Bluetooth RF Conducted Emission Test Results cont'd

**Figure 1-57: Spurious RF Conducted Emissions
Single Freq., Static PBRS, 3-DH5**



**Figure 1-58: Spurious RF Conducted Emissions
Freq. Hopping, Static PBRS, 3-DH5**



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Bluetooth Low Energy RF Conducted Emission Test Results

6 dB Bandwidth

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

Channel	Limit (kHz)	Measured Level (KHz)
0	≥ 500	715.00
20	≥ 500	715.00
39	≥ 500	720.00

See figures 1-59 to 1-61 for the plots of the 6 dB bandwidth measurements for Channels 0, 20, and 39.

**Figure 1-59: 6 dB Bandwidth
LE, Channel 0**



**Figure 1-60: 6 dB Bandwidth
LE, Channel 20**



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Bluetooth Low Energy RF Conducted Emission Test Results cont'd

Figure 1-61: 6 dB Bandwidth
LE, Channel 39



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Bluetooth Low Energy RF Conducted Emission Test Results cont'd

Maximum Conducted Output Power

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

Channel	Class 2 Limit (W)	Measured Level (dBm)	Measured Level (W)
0	< 1.00	4.58	2.870780582
20	< 1.00	6.3	4.265795188
39	< 1.00	3.92	2.466039337

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Bluetooth Low Energy RF Conducted Emission Test Results cont'd

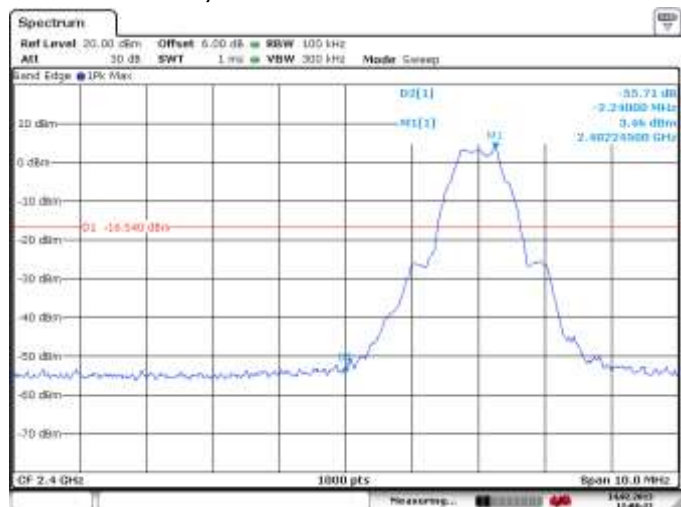
Band Edge Compliance

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

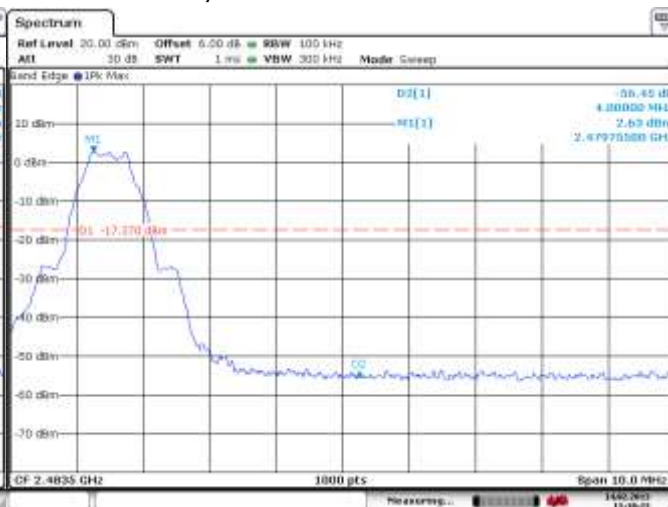
Channel	Limit (dBc)	Measured Level (dBc)	Margin (dBc)
0	< -20	-55.71	-35.71
39	< -20	-56.45	-36.45

See figures 1-62 to 1-63 for the plots of the band edge compliance measurements for Channels 0 and 39.

**Figure 1-62: Band Edge Compliance
LE, Channel 0**



**Figure 1-63: Band Edge Compliance
LE, Channel 39**



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Bluetooth Low Energy RF Conducted Emission Test Results cont'd

Peak Power Spectral Density

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

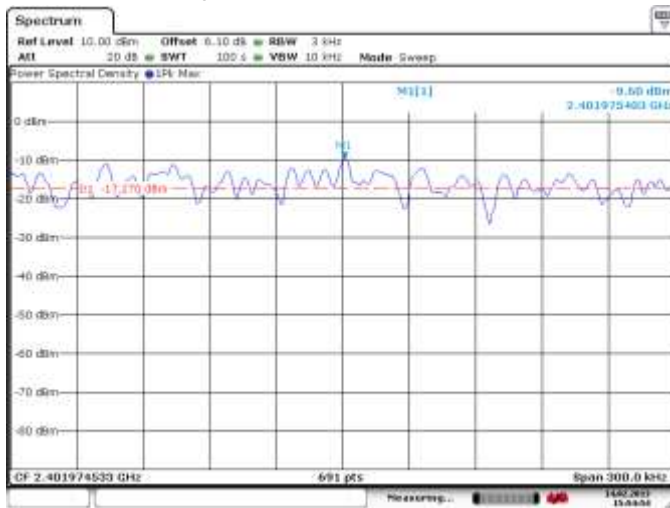
Channel	Limit (dBm)	Measured Level (dBm)	Margin (dBm)
0	< 8.00	-9.60	-17.60
20	< 8.00	-6.29	-14.29
39	< 8.00	-10.51	-18.51

See figures 1-64 to 1-66 for the plots of the peak power spectral density for Channels 0, 20 and 39.

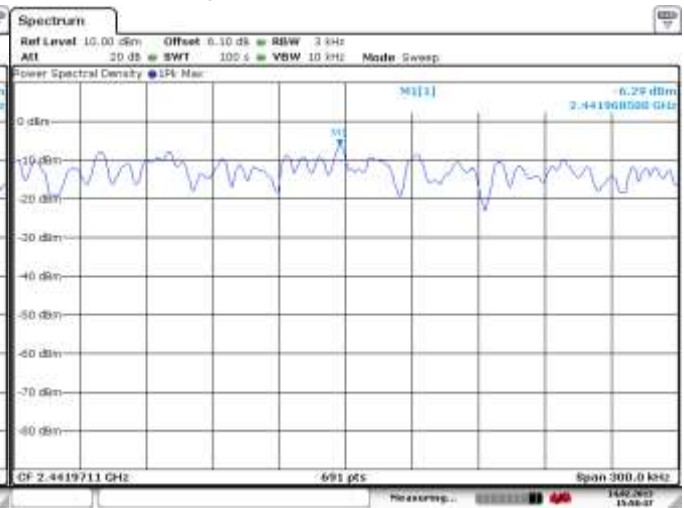
	EMI Test Report for the BlackBerry® smartphone Model RFN81UW APPENDIX 1	
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Bluetooth Low Energy RF Conducted Emission Test Results cont'd

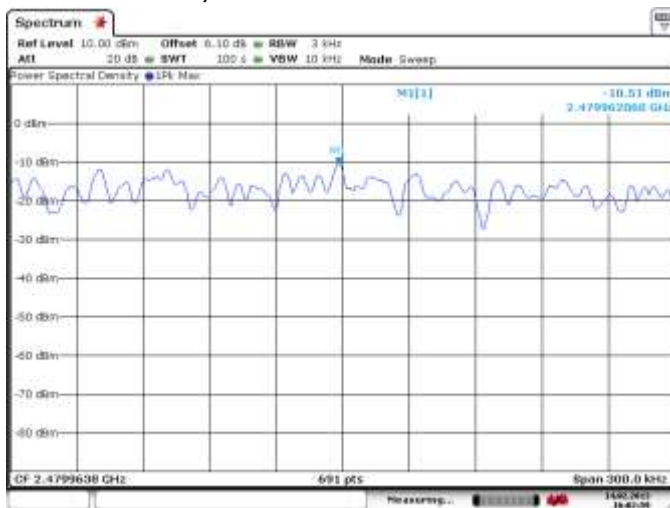
**Figure 1-64: Peak Power Spectral Density
LE, Channel 0**



**Figure 1-65: Peak Power Spectral Density
LE, Channel 20**



**Figure 1-66: Peak Power Spectral Density
LE, Channel 39**



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Bluetooth Low Energy RF Conducted Emission Test Results cont'd

Spurious RF Conducted Emissions

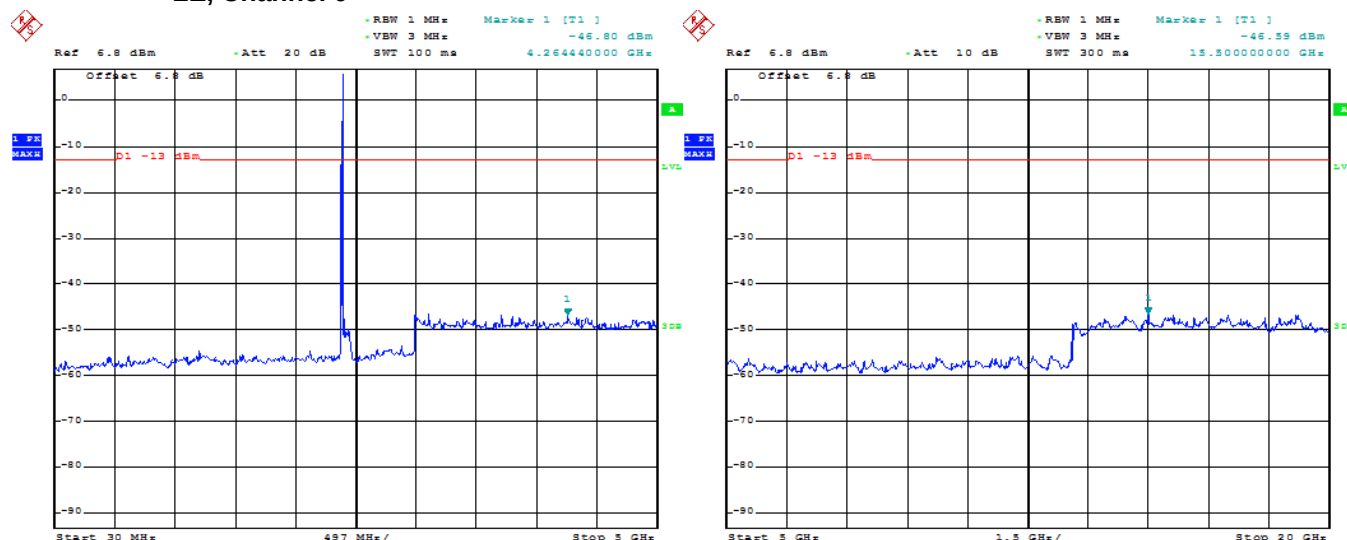
The EUT met the requirements of the spurious RF conducted emissions as per 47 CFR 15.247(c) and RSS-210. Channels 0, 20 and 39 were measured. Peak power was measured using an Agilent power meter, model N1911A with model N1921A power sensor. A reference offset of 6.4 dB was applied to the power meter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

Channel	Power (dBm)	Max. Measured Level (dBm)	Max. Measured Level from Carrier (dBc)	Limit (dBc)
0	4.6	-46.4	-51.0	-20
20	6.3	-46.9	-53.2	-20
39	3.9	-46.2	-50.1	-20

The emissions were in the NF.

See figures 1-67 to 1-69 for the plots of the spurious RF conducted emissions for Channels 0, 20 and 39.

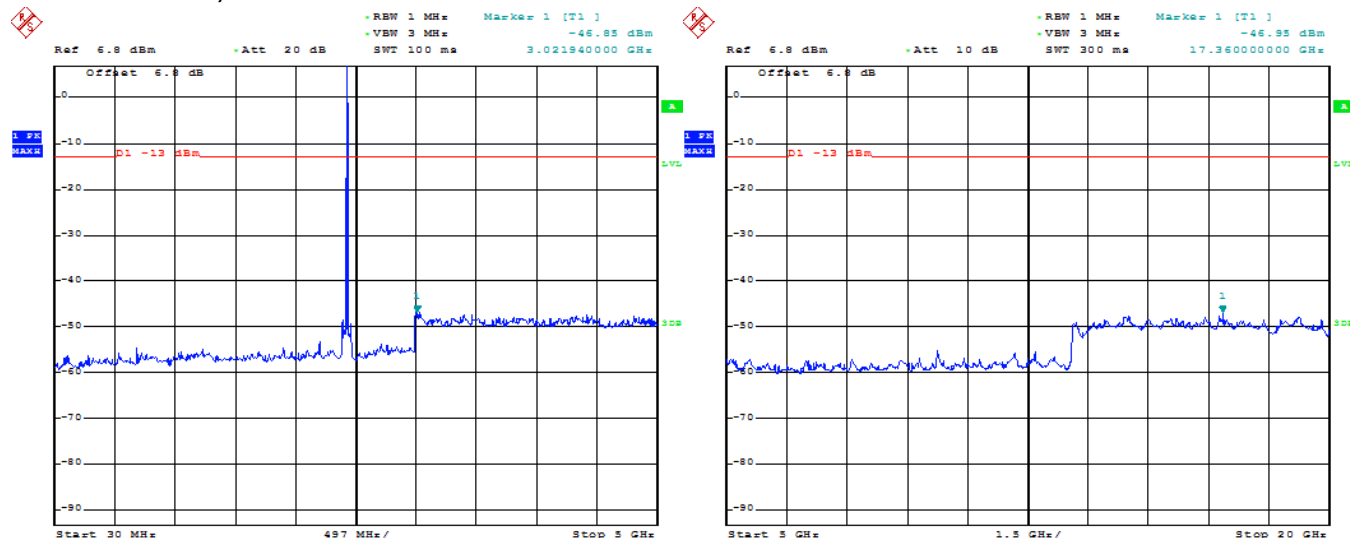
**Figure 1-67: Spurious Conducted RF Emissions
LE, Channel 0**



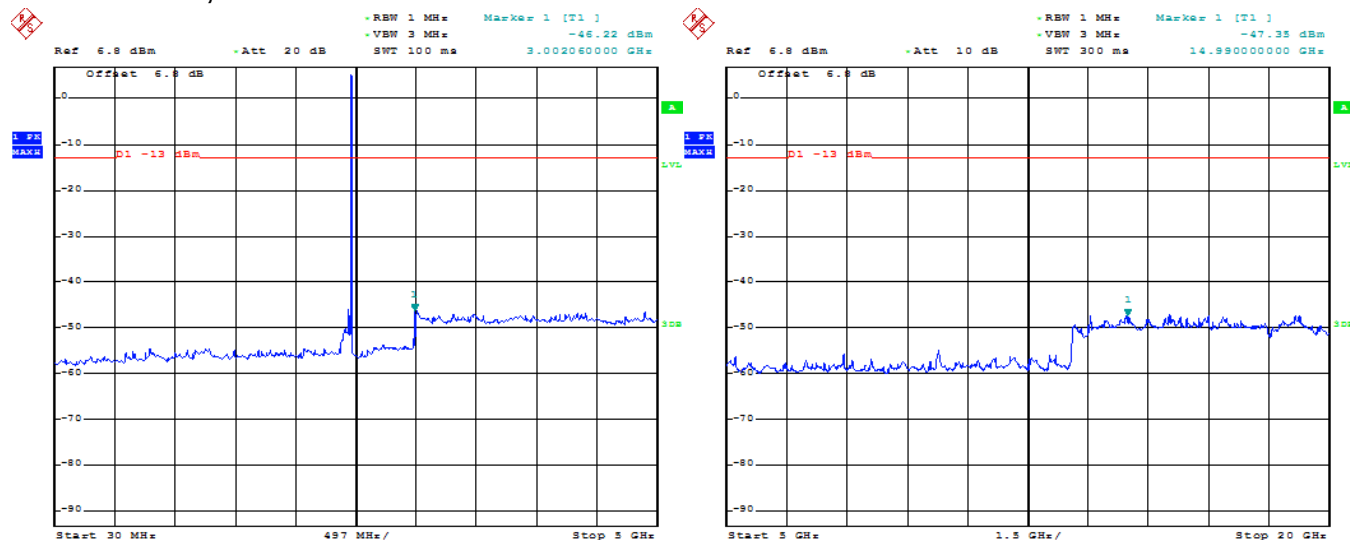
	EMI Test Report for the BlackBerry® smartphone Model RFN81UW APPENDIX 1	
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Bluetooth Low Energy RF Conducted Emission Test Results cont'd

**Figure 1-68 : Spurious Conducted RF Emissions
LE, Channel 20**



**Figure 1-69: Spurious Conducted RF Emissions
LE, Channel 39**

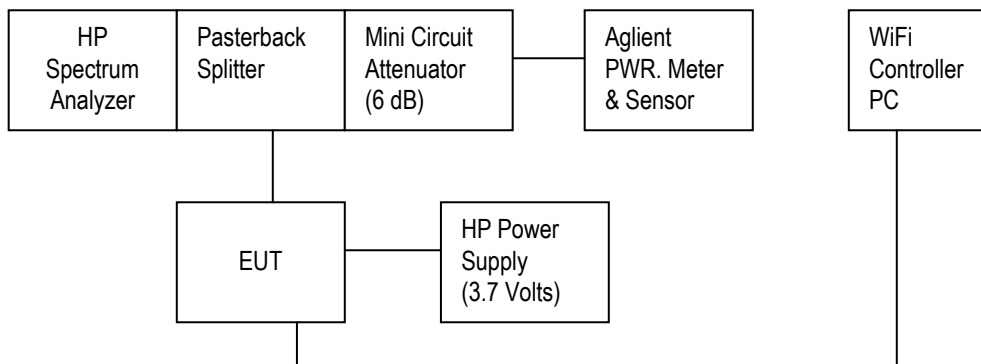


APPENDIX 2 – 802.11b/g/n CONDUCTED EMISSIONS TEST DATA/PLOTS

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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: January 29, 2013

The measurements on the BlackBerry® smartphone were performed by Kevin Guo.

The environmental test conditions were: Temperature: 23.5C
 Relative Humidity: 26 %

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

6 dB Bandwidth

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

Channel	Data Rate	Limit (kHz)	Measured Level (MHz)
1	1 Mbps	≥ 500	8.02
	5.5 Mbps	≥ 500	7.87
	11 Mbps	≥ 500	7.47
	6 Mbps	≥ 500	16.35
	24 Mbps	≥ 500	16.53
	54 Mbps	≥ 500	16.53
	MCS 0	≥ 500	17.57
	MCS 4	≥ 500	17.74
	MCS 7	≥ 500	17.74
6	1 Mbps	≥ 500	7.55
	5.5 Mbps	≥ 500	7.27
	11 Mbps	≥ 500	8.08
	6 Mbps	≥ 500	16.32
	24 Mbps	≥ 500	16.49
	54 Mbps	≥ 500	16.53
	MCS 0	≥ 500	17.37
	MCS 4	≥ 500	17.74
	MCS 7	≥ 500	17.74
11	1 Mbps	≥ 500	8.51
	5.5 Mbps	≥ 500	8.63
	11 Mbps	≥ 500	8.68
	6 Mbps	≥ 500	16.35
	24 Mbps	≥ 500	16.53
	54 Mbps	≥ 500	16.53
	MCS 0	≥ 500	17.80
	MCS 4	≥ 500	17.74
	MCS 7	≥ 500	17.74

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

See figures 2-1 to 2-9 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 2-1: 6 dB Bandwidth
802.11b, Channel 1, 1 Mbps



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

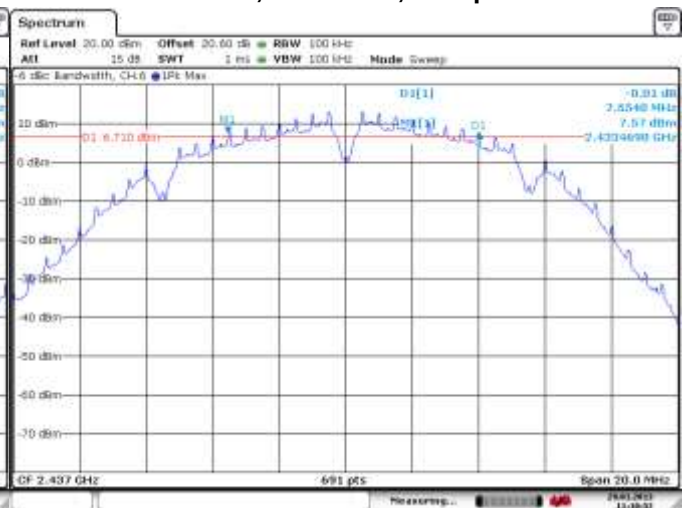
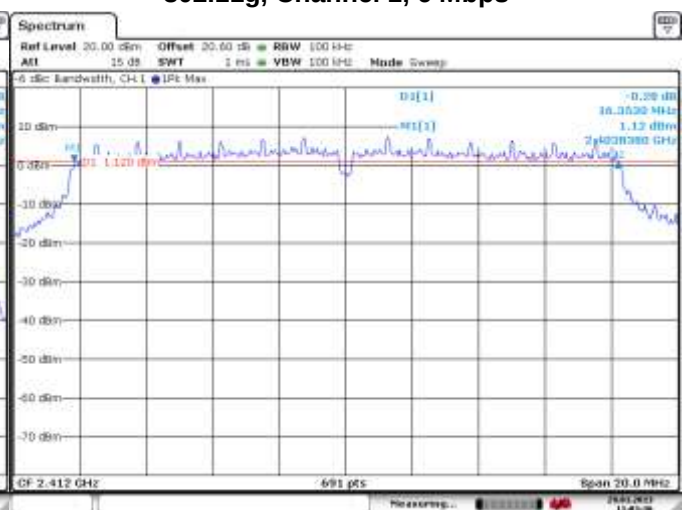


Figure 2-3: 6 dB Bandwidth
802.11b, Channel 11, 1 Mbps



Figure 2-4: 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 2-5: 6 dB Bandwidth
802.11g, Channel 6, 6 Mbps

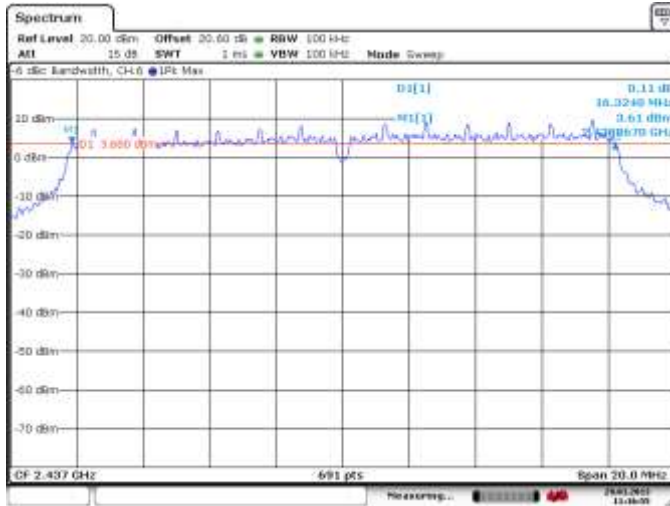


Figure 2-6: 6 dB Bandwidth
802.11g, Channel 11, 6 Mbps

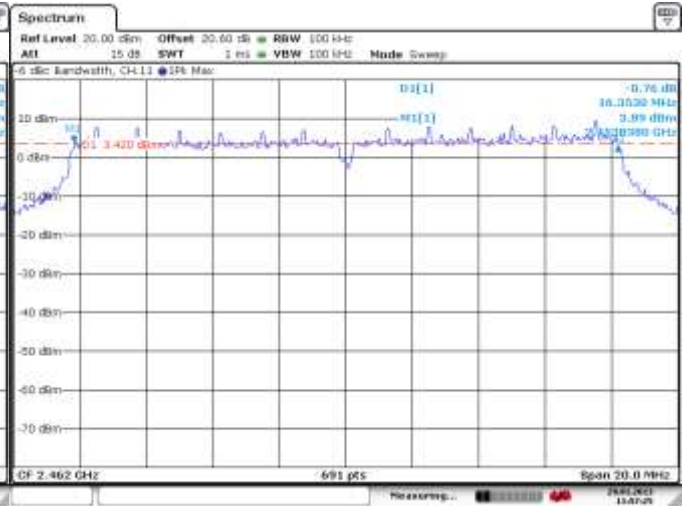


Figure 2-7: 6 dB Bandwidth
802.11n, Channel 1, MCS 0

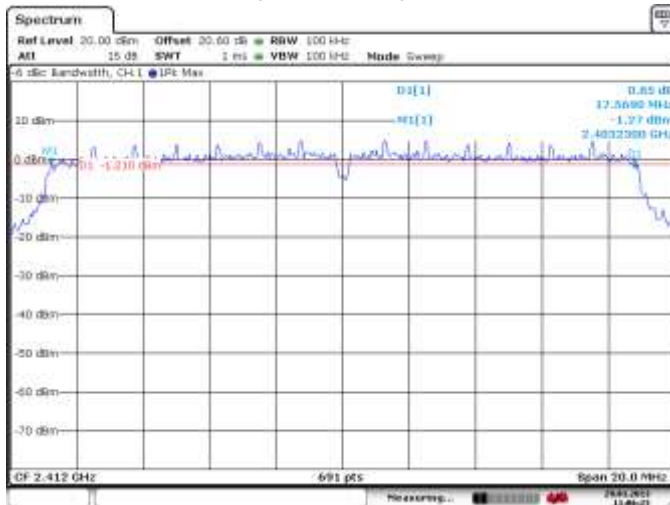
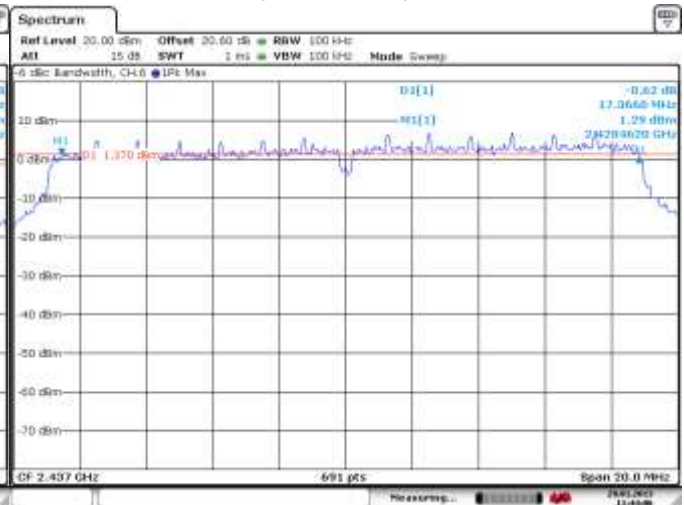
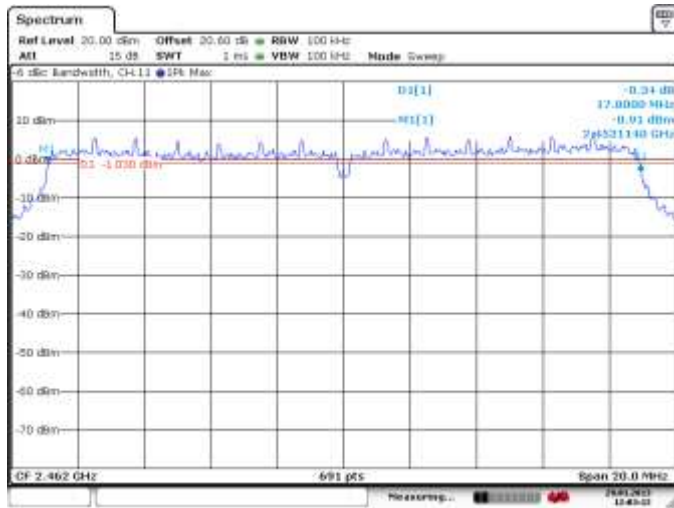


Figure 2-8: 6 dB Bandwidth
802.11n, Channel 6, MCS 0



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Figure 2-9: 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 Aglient 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	17.01	50.28
	5.5 Mbps	< 1.00	16.91	49.14
	11 Mbps	< 1.00	16.84	48.30
	6 Mbps	< 1.00	14.75	29.85
	24 Mbps	< 1.00	14.39	27.45
	54 Mbps	< 1.00	13.96	24.90
	MCS 0	< 1.00	14.65	29.19
	MCS 4	< 1.00	12.94	19.67
	MCS 7	< 1.00	11.62	14.53
6	1 Mbps	< 1.00	18.66	73.53
	5.5 Mbps	< 1.00	18.44	69.80
	11 Mbps	< 1.00	18.38	68.82
	6 Mbps	< 1.00	18.41	69.33
	24 Mbps	< 1.00	17.08	51.01
	54 Mbps	< 1.00	15.50	35.45
	MCS 0	< 1.00	16.28	42.47
	MCS 4	< 1.00	14.63	29.03
	MCS 7	< 1.00	13.36	21.69

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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	18.57	71.98
	5.5 Mbps	< 1.00	18.36	68.47
	11 Mbps	< 1.00	18.31	67.82
	6 Mbps	< 1.00	12.91	19.54
	24 Mbps	< 1.00	12.44	17.54
	54 Mbps	< 1.00	11.92	15.58
	MCS 0	< 1.00	12.72	18.70
	MCS 4	< 1.00	12.19	16.56
	MCS 7	< 1.00	11.81	15.16

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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	-43.44	-23.44
	5.5 Mbps	< -20	-45.4	-25.40
	11 Mbps	< -20	-44.93	-24.93
	6 Mbps	< -20	-29.16	-9.16
	24 Mbps	< -20	-32.22	-12.22
	54 Mbps	< -20	-32.51	-12.51
	MCS 0	< -20	-31.83	-11.83
	MCS 4	< -20	-33.11	-13.11
	MCS 7	< -20	-32.79	-12.79
11	1 Mbps	< -20	-40.08	-20.08
	5.5 Mbps	< -20	-41.93	-21.93
	11 Mbps	< -20	-42.26	-22.26
	6 Mbps	< -20	-33.39	-13.39
	24 Mbps	< -20	-36.47	-16.47
	54 Mbps	< -20	-35.91	-15.91
	MCS 0	< -20	-33.47	-13.47
	MCS 4	< -20	-35.86	-15.86
	MCS 7	< -20	-35.45	-15.45

See figures 2-10 to 2-15 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 2-10: Band Edge Compliance
802.11b, Channel 1, 1 Mbps

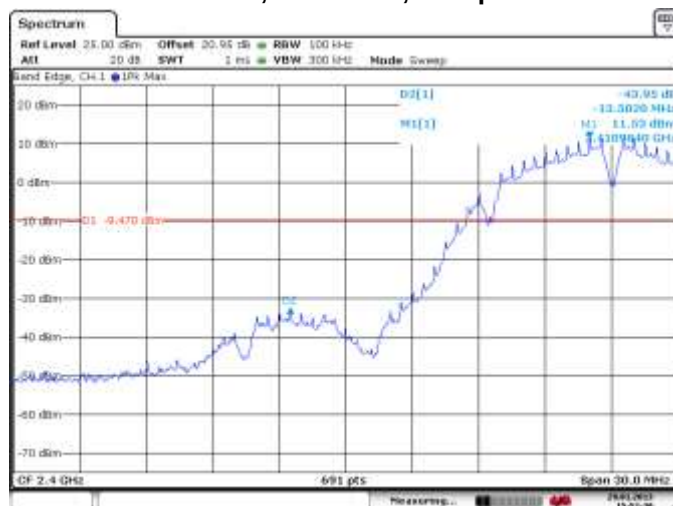


Figure 2-11: Band Edge Compliance
802.11b, Channel 11, 1 Mbps



Figure 2-12: Band Edge Compliance
802.11g, Channel 1, 6 Mbps

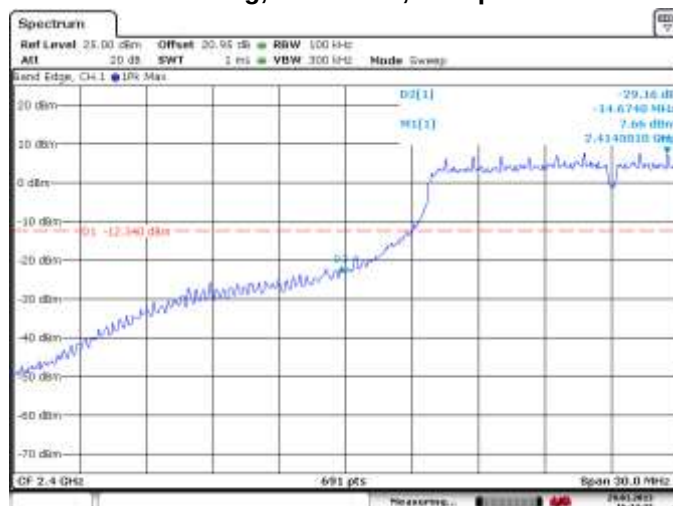


Figure 2-13: Band Edge Compliance
802.11g, Channel 11, 6 Mbps



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

Figure 2-14: Band Edge Compliance
802.11n, Channel 1, MCS 0

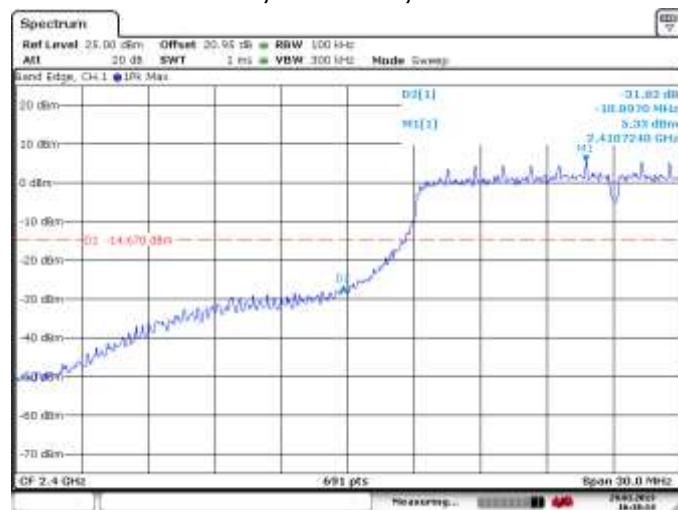
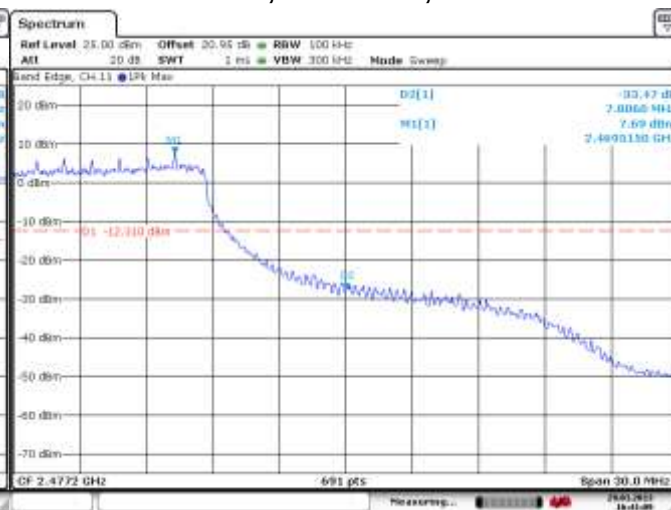


Figure 2-15: Band Edge Compliance
802.11n, Channel 11, MCS 0



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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.

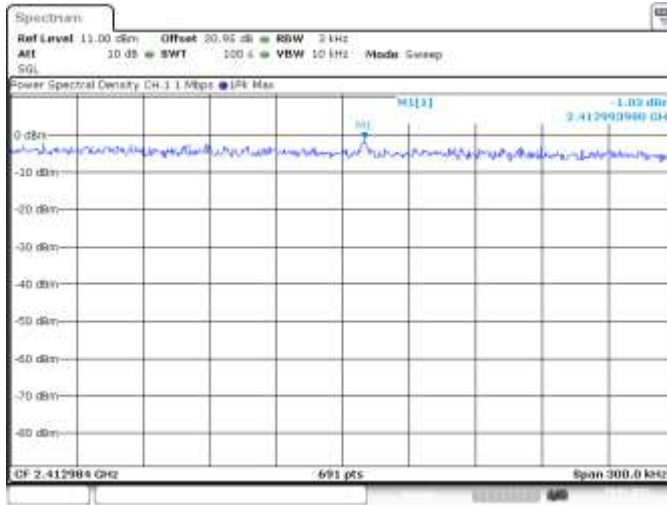
Channel	Data Rate	Limit (dBm)	Measured Level (dBm)	Margin (dBm)
1	1 Mbps	< 8.00	-1.03	-9.03
	5.5 Mbps	< 8.00	-2.25	-10.25
	11 Mbps	< 8.00	-3.03	-11.03
	6 Mbps	< 8.00	-5.57	-13.57
	24 Mbps	< 8.00	-8.36	-16.36
	54 Mbps	< 8.00	-9.15	-17.15
	MCS 0	< 8.00	-7.56	-15.56
	MCS 4	< 8.00	-10.63	-18.63
	MCS 7	< 8.00	-11.14	-19.14
6	1 Mbps	< 8.00	1.22	-6.78
	5.5 Mbps	< 8.00	-0.63	-8.63
	11 Mbps	< 8.00	-0.55	-8.55
	6 Mbps	< 8.00	-4.84	-12.84
	24 Mbps	< 8.00	-6.21	-14.21
	54 Mbps	< 8.00	-6.14	-14.14
	MCS 0	< 8.00	-7.20	-15.20
	MCS 4	< 8.00	-7.49	-15.49
	MCS 7	< 8.00	-8.47	-16.47
11	1 Mbps	< 8.00	0.71	-7.29
	5.5 Mbps	< 8.00	-0.95	-8.95
	11 Mbps	< 8.00	-0.87	-8.87
	6 Mbps	< 8.00	-4.05	-12.05
	24 Mbps	< 8.00	-5.92	-13.92
	54 Mbps	< 8.00	-6.41	-14.41
	MCS 0	< 8.00	-5.51	-13.51
	MCS 4	< 8.00	-7.52	-15.52
	MCS 7	< 8.00	-9.37	-17.37

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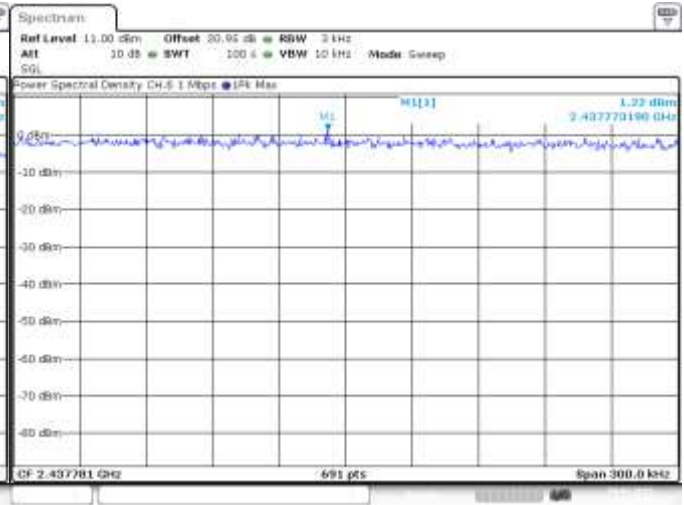
802.11b/g/n RF Conducted Emission Test Results cont'd

See figures 2-16 to 2-24 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.

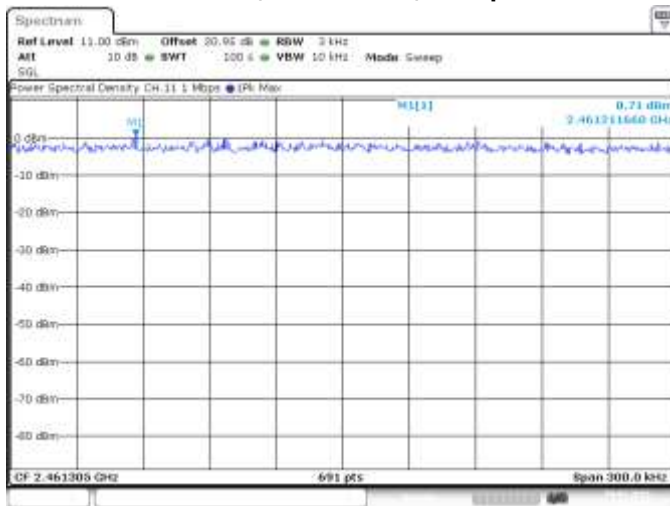
**Figure 2-16: Peak Power Spectral Density
802.11b, Channel 1, 1 Mbps**



**Figure 2-17: Peak Power Spectral Density
802.11b, Channel 6, 1 Mbps**



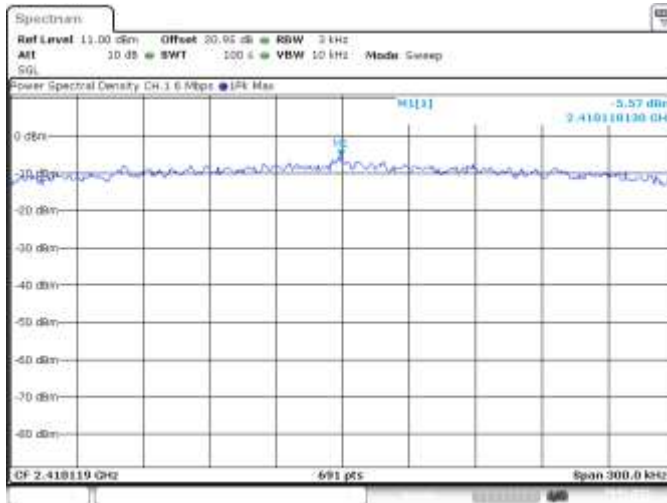
**Figure 2-18: Peak Power Spectral Density
802.11b, Channel 11, 1 Mbps**



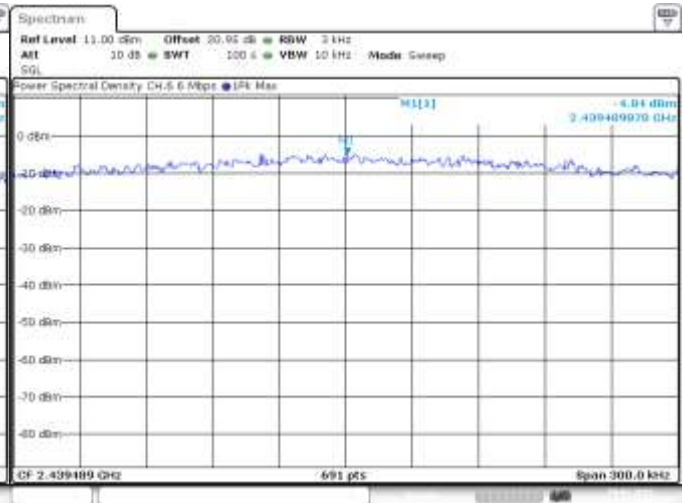
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802.11b/g/n RF Conducted Emission Test Results cont'd

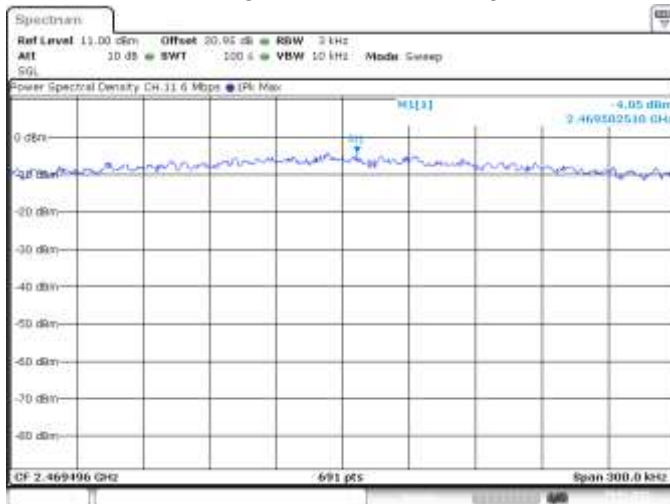
**Figure 2-19: Peak Power Spectral Density
802.11g, Channel 1, 6 Mbps**



**Figure 2-20: Peak Power Spectral Density
802.11g, Channel 6, 6 Mbps**



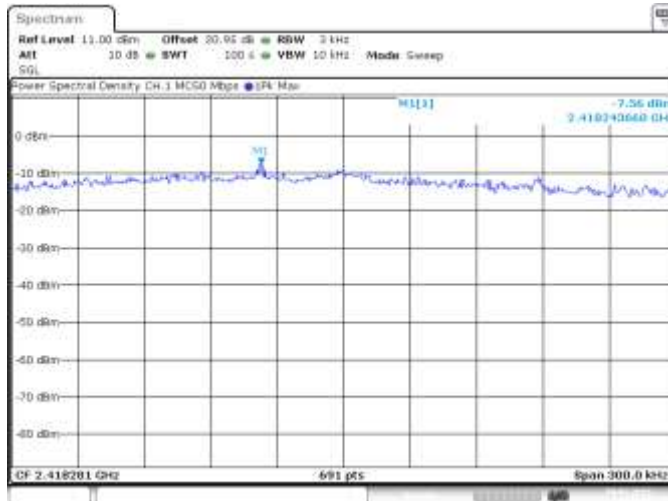
**Figure 2-21: Peak Power Spectral Density
802.11g, Channel 11, 6 Mbps**



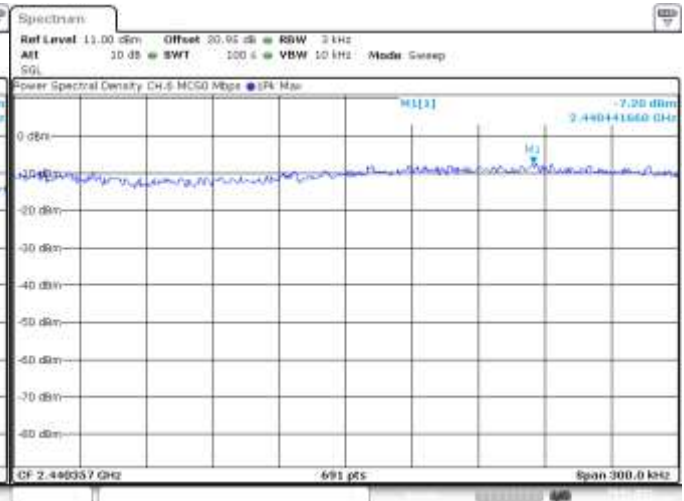
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802.11b/g/n RF Conducted Emission Test Results cont'd

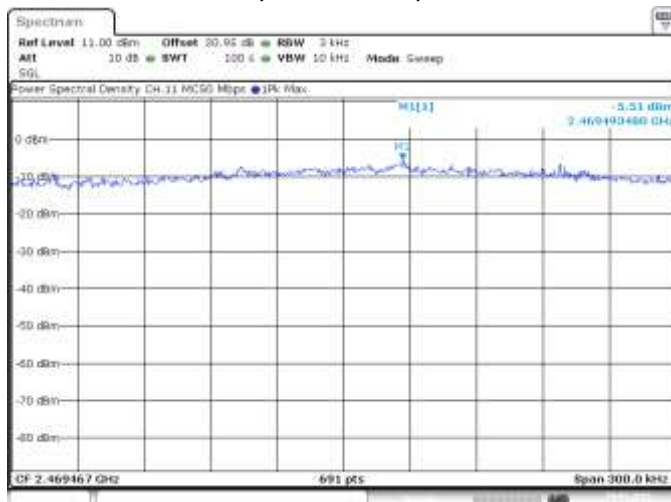
**Figure 2-22: Peak Power Spectral Density
802.11n, Channel 1, MCS 0**



**Figure 2-23: Peak Power Spectral Density
802.11n, Channel 6, MCS 0**



**Figure 2-24: Peak Power Spectral Density
802.11n, Channel 11, MCS 0**



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

Spurious RF Conducted Emissions

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

Channel	Data Rate	Power (dBm)	Max. Measured Level (dBm)	Max. Measured Level from Carrier (dBc)	Limit (dBc)
1	1 Mbps	14.78	-31.82	-50.5960185	-20
	5.5 Mbps	14.63	-32.01	-50.8250776	-20
	11 Mbps	14.56	-31.94	-50.6112535	-20
	6 Mbps	14.32	-32.88	-53.3459625	-20
	24 Mbps	14.37	-32.46	-52.4237453	-20
	54 Mbps	14.23	-32.72	-52.6806398	-20
	MCS 0	14.29	-33.24	-53.1302714	-20
	MCS 4	14.42	-33.15	-52.957184	-20
	MCS 7	14.15	-33.10	-52.8276868	-20
6	1 Mbps	14.82	-32.84	-50.9342972	-20
	5.5 Mbps	14.76	-32.61	-48.3152283	-20
	11 Mbps	14.71	-32.65	-46.786118	-20
	6 Mbps	14.70	-33.58	-53.3514175	-20
	24 Mbps	14.42	-32.46	-49.7856494	-20
	54 Mbps	14.34	-33.17	-48.6336979	-20
	MCS 0	14.63	-32.39	-51.3957981	-20
	MCS 4	14.65	-32.50	-49.1177519	-20
	MCS 7	14.59	-32.84	-47.7782944	-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	14.82	-32.63	-48.3295934	-20
	5.5 Mbps	14.77	-32.88	-45.7455872	-20
	11 Mbps	14.75	-32.41	-44.3545439	-20
	6 Mbps	14.61	-33.02	-50.7468052	-20
	24 Mbps	14.59	-32.79	-47.7877	-20
	54 Mbps	14.38	-33.46	-47.2329835	-20
	MCS 0	14.52	-32.83	-49.8600952	-20
	MCS 4	14.37	-32.94	-47.225708	-20
	MCS 7	14.34	-32.65	-45.4979987	-20

The emissions were in the NF.

See figures 2-25 to 2-33 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 2-25: Spurious Conducted RF Emissions
802.11b, Channel 1, 1 Mbps

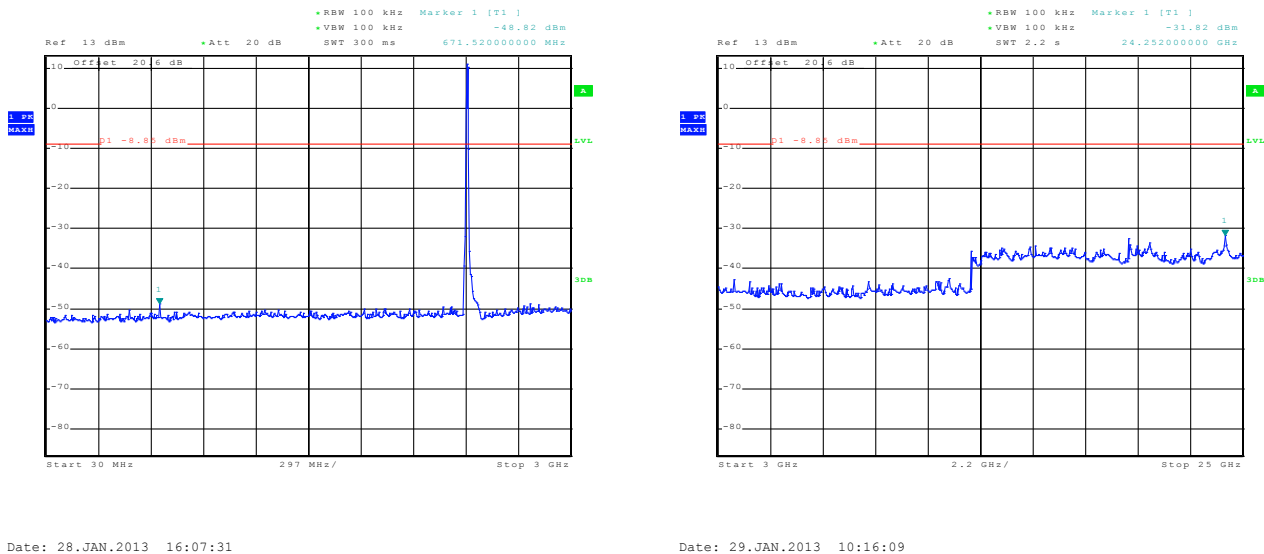
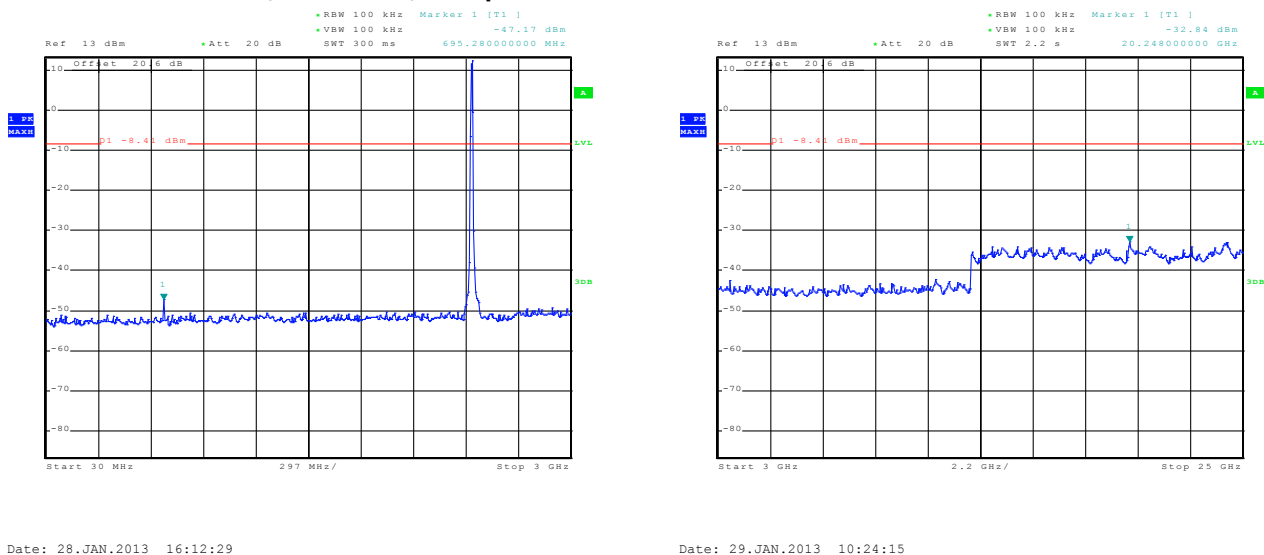


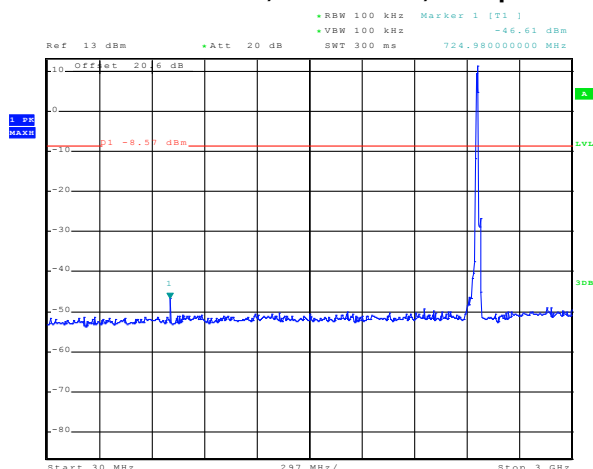
Figure 2-26 : Spurious Conducted RF Emissions
802.11b, Channel 6, 1 Mbps



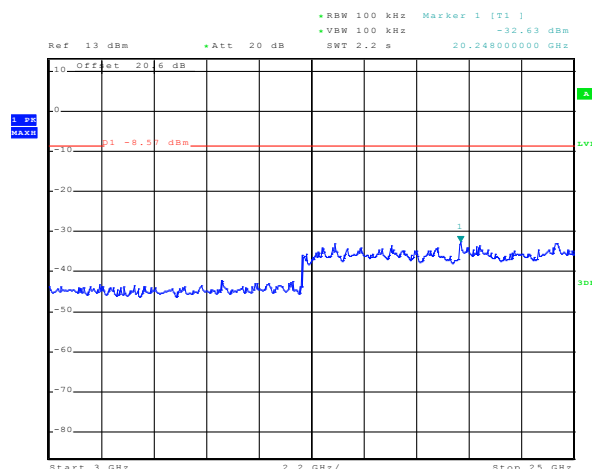
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802.11b/g/n RF Conducted Emission Test Results cont'd

Figure 2-27: Spurious Conducted RF Emissions
802.11b, Channel 11, 1 Mbps

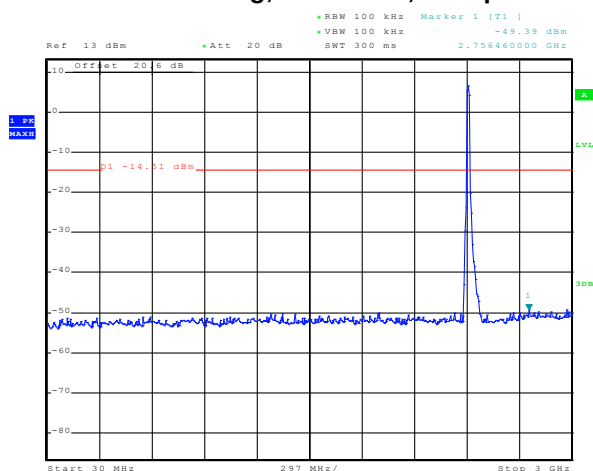


Date: 28.JAN.2013 16:17:56

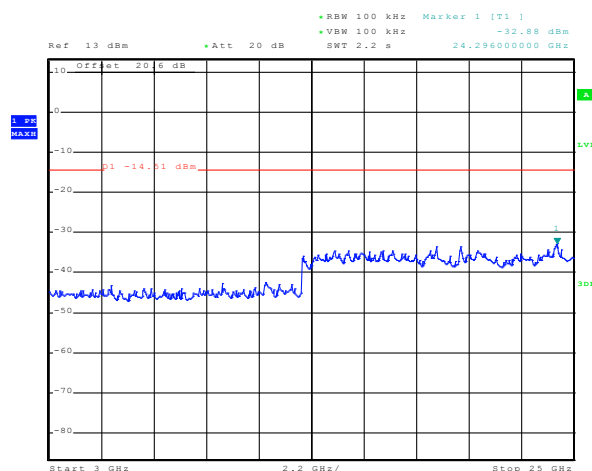


Date: 29.JAN.2013 10:35:18

Figure 2-28: Spurious Conducted RF Emissions
802.11g, Channel 1, 6 Mbps



Date: 28.JAN.2013 16:09:40

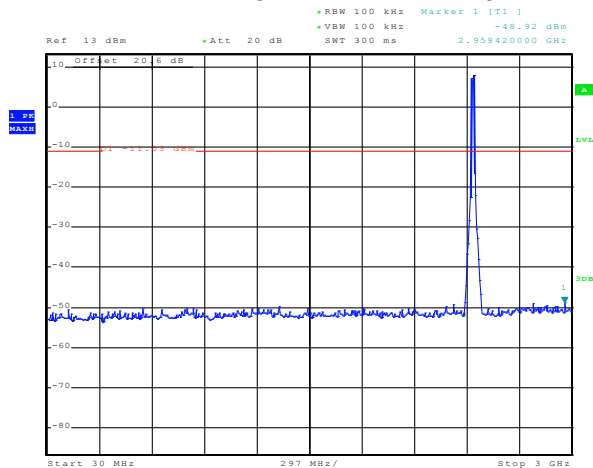


Date: 29.JAN.2013 10:17:10

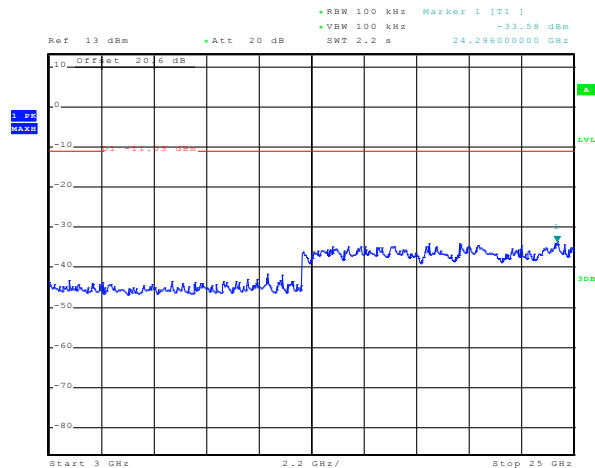
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802.11b/g/n RF Conducted Emission Test Results cont'd

**Figure 2-29: Spurious Conducted RF Emissions
802.11g, Channel 6, 6 Mbps**

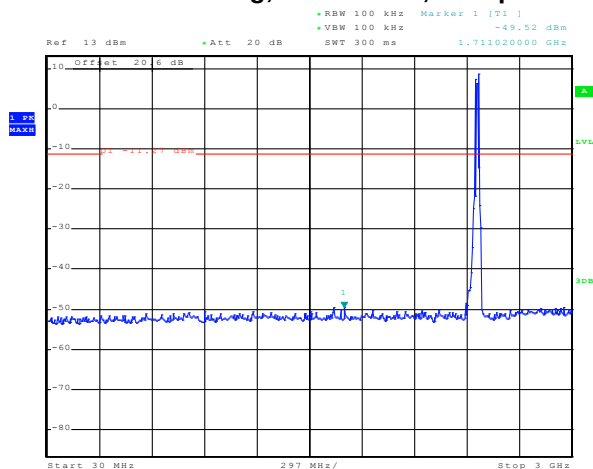


Date: 28.JAN.2013 16:14:20

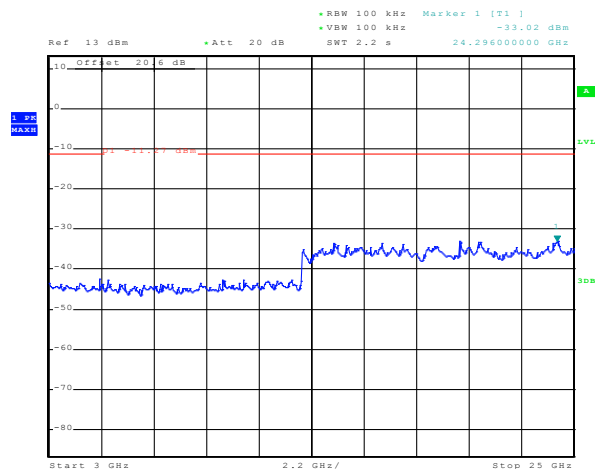


Date: 29.JAN.2013 10:26:49

**Figure 2-30: Spurious Conducted RF Emissions
802.11g, Channel 11, 6 Mbps**



Date: 28.JAN.2013 16:18:59

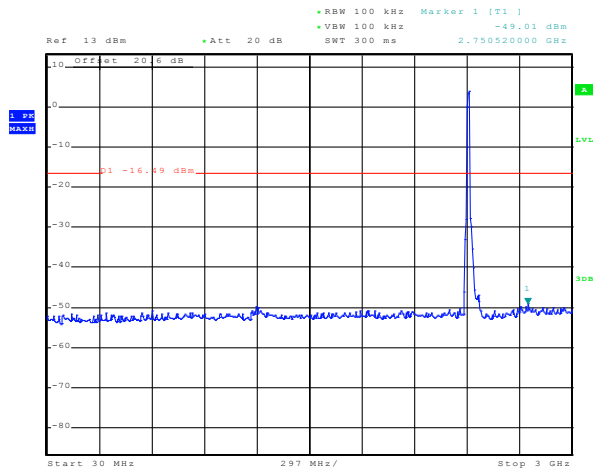


Date: 29.JAN.2013 10:39:06

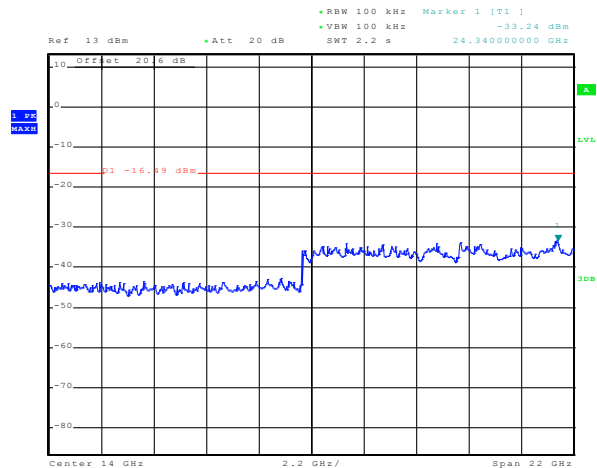
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802.11b/g/n RF Conducted Emission Test Results cont'd

**Figure 2-31: Spurious Conducted RF Emissions
802.11n, Channel 1, MCS 0**

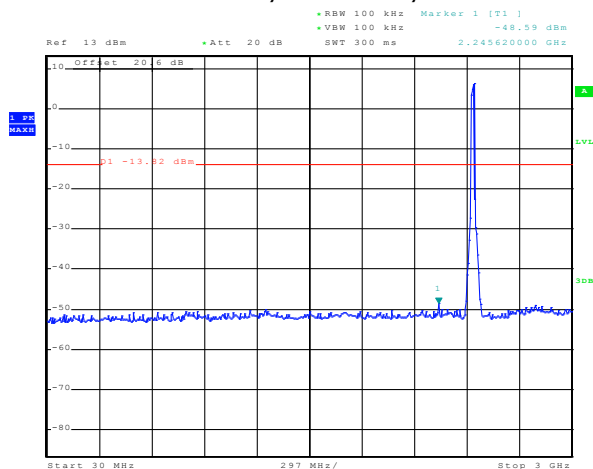


Date: 28.JAN.2013 16:11:23

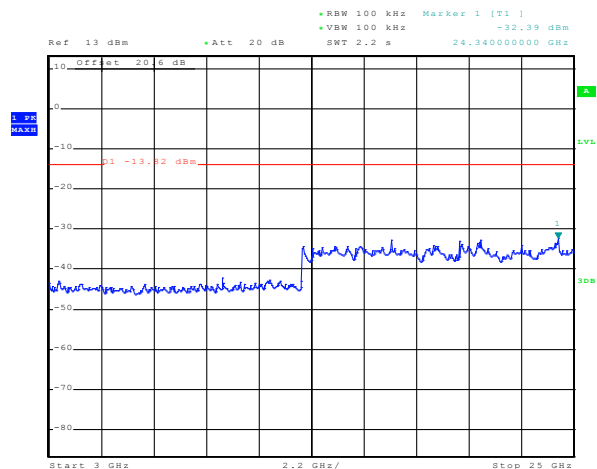


Date: 29.JAN.2013 10:19:28

**Figure 2-32: Spurious Conducted RF Emissions
802.11n, Channel 6, MCS 0**



Date: 28.JAN.2013 16:15:54

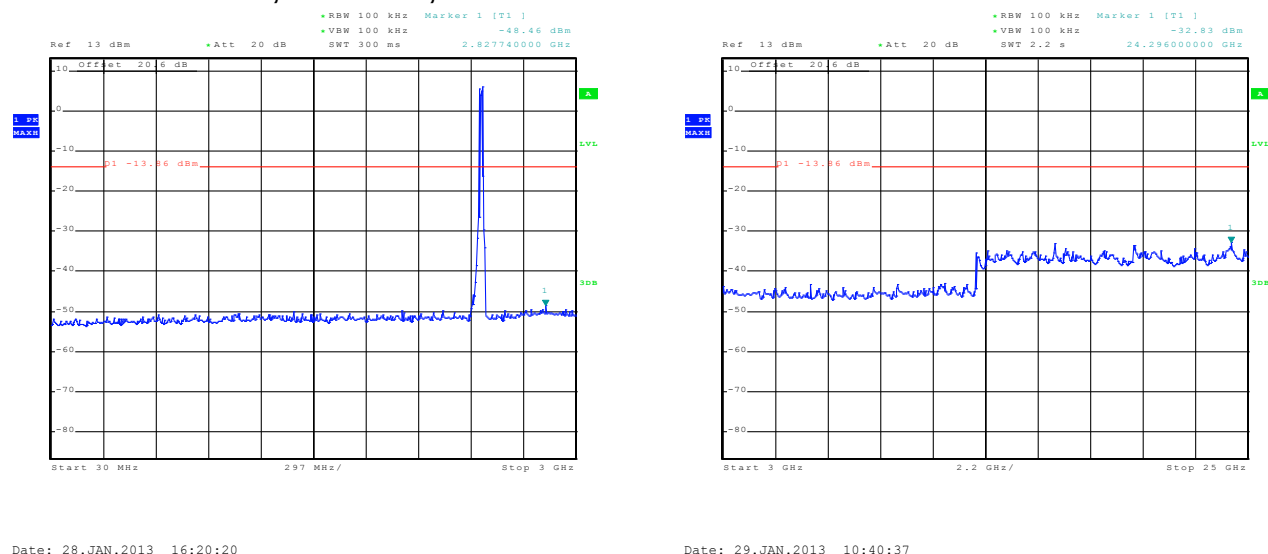


Date: 29.JAN.2013 10:30:26

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

**Figure 2-33: Spurious Conducted RF Emissions
802.11n, Channel 11, MCS 0**

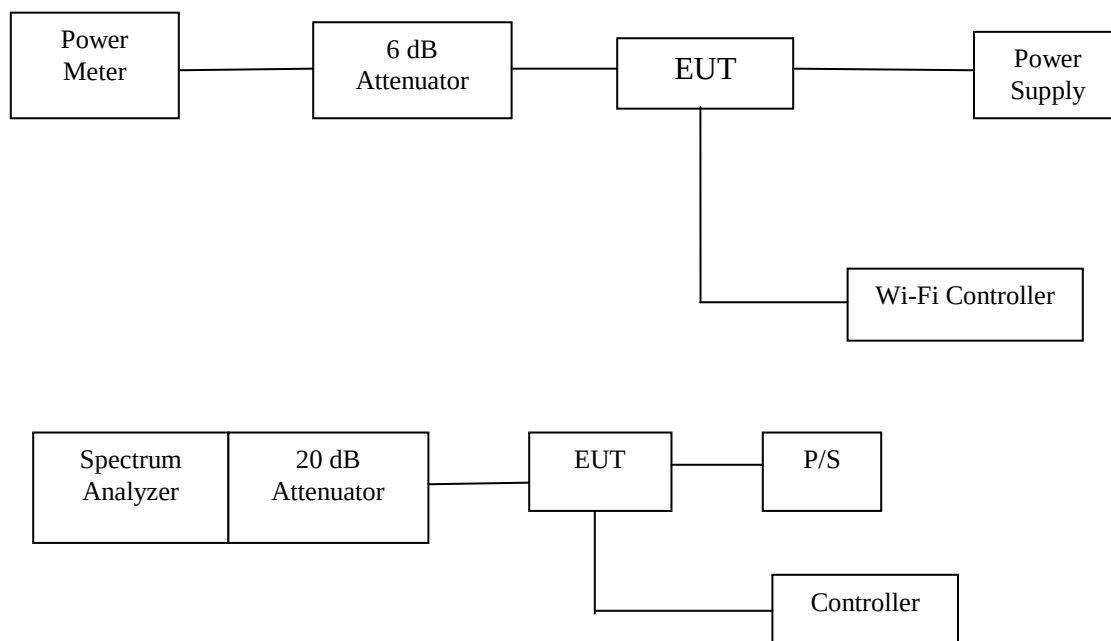


APPENDIX 3 – 802.11a/n CONDUCTED EMISSIONS TEST DATA/PLOTS

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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: February 14, 2013

The measurements were performed by Berkin Can

The environmental test conditions were: Temperature: 24 °C
 Relative Humidity: 42 %

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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, 100, 140, 149, 157, 161 and 165 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	16.47
	24 Mbps	≥ 500	16.56
	54 Mbps	≥ 500	16.56
48	6 Mbps	≥ 500	16.41
	24 Mbps	≥ 500	16.56
	54 Mbps	≥ 500	16.56
64	6 Mbps	≥ 500	16.41
	24 Mbps	≥ 500	16.56
	54 Mbps	≥ 500	16.56
100	6 Mbps	≥ 500	16.44
	24 Mbps	≥ 500	16.53
	54 Mbps	≥ 500	16.56
140	6 Mbps	≥ 500	16.47
	24 Mbps	≥ 500	16.53
	54 Mbps	≥ 500	16.53
165	6 Mbps	≥ 500	16.41
	24 Mbps	≥ 500	16.56
	54 Mbps	≥ 500	16.56

See figures 3-1 to 3-6 for the plots of the 6 dB bandwidth measurements for Channel 36, , 48, 64, 100, 140, and 165 at 6 Mbps each for 802.11a mode.

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802.11a RF Conducted Emission Test Results cont'd

Figure 3-1: 6 dB Bandwidth
802.11a, Channel 36, 6 Mbps

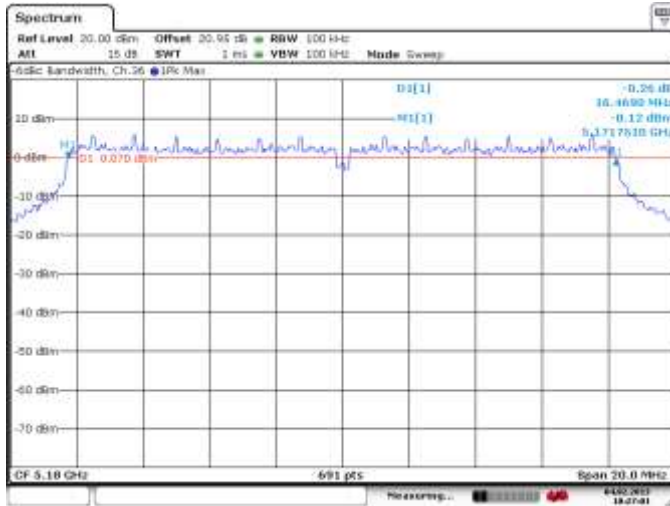


Figure 3-2: 6 dB Bandwidth
802.11a, Channel 48, 6 Mbps

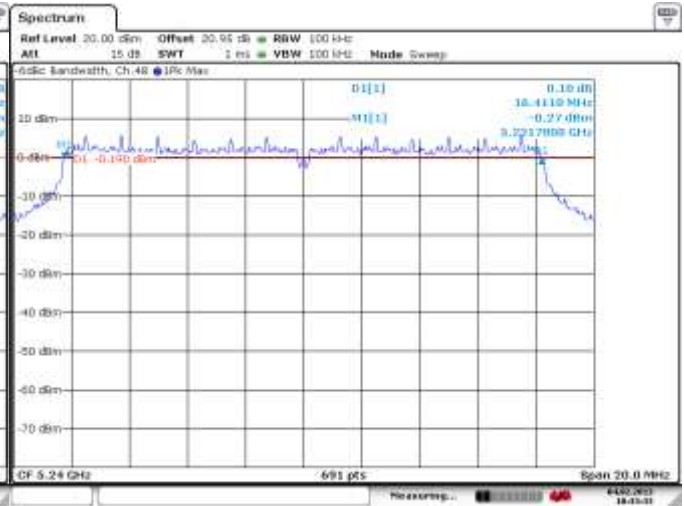


Figure 3-3: 6 dB Bandwidth
802.11a, Channel 64, 6 Mbps

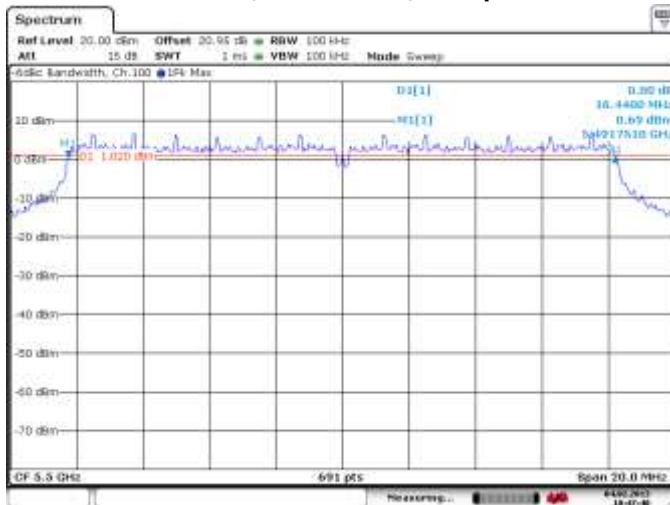
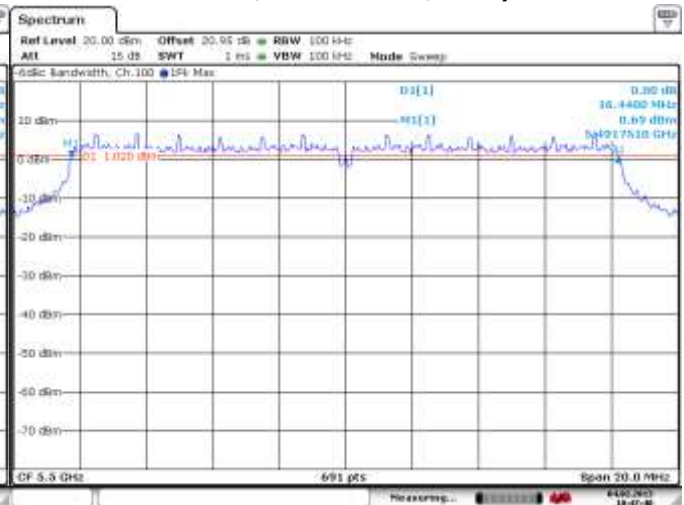
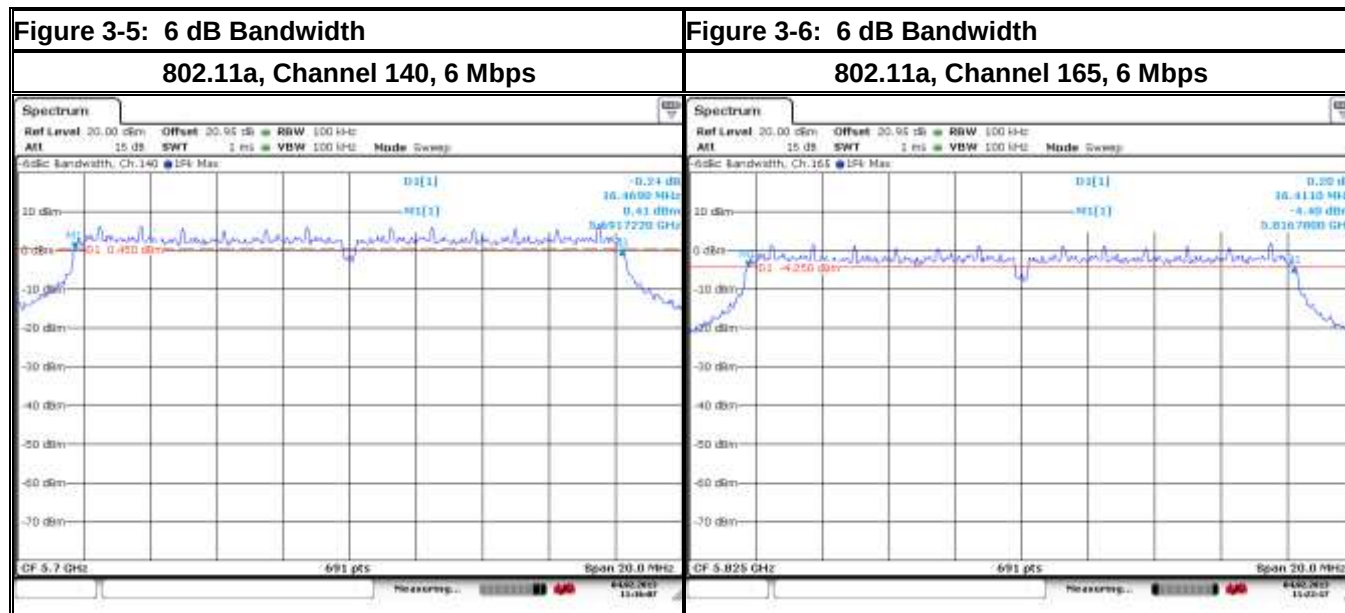


Figure 3-4: 6 dB Bandwidth
802.11a, Channel 100, 6 Mbps



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802.11a RF Conducted Emission Test Results cont'd



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802.11n RF Conducted Emission Test Results cont'd

Channel	Data Rate	Limit (kHz)	Measured Level (MHz)
36	6 Mbps	≥ 500	17.63
	24 Mbps	≥ 500	17.74
	54 Mbps	≥ 500	17.74
100	6 Mbps	≥ 500	17.69
	24 Mbps	≥ 500	17.74
	54 Mbps	≥ 500	17.74
165	6 Mbps	≥ 500	17.63
	24 Mbps	≥ 500	17.74
	54 Mbps	≥ 500	17.74

See figures 3-7 to 3-9 for the plots of the 6 dB bandwidth measurements for Channel 36, 100 and 165at 6 Mbps each for 802.11a mode.

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802.11n RF Conducted Emission Test Results cont'd

Figure 3-7: 6 dB Bandwidth
802.11n, Channel 36, 6 Mbps

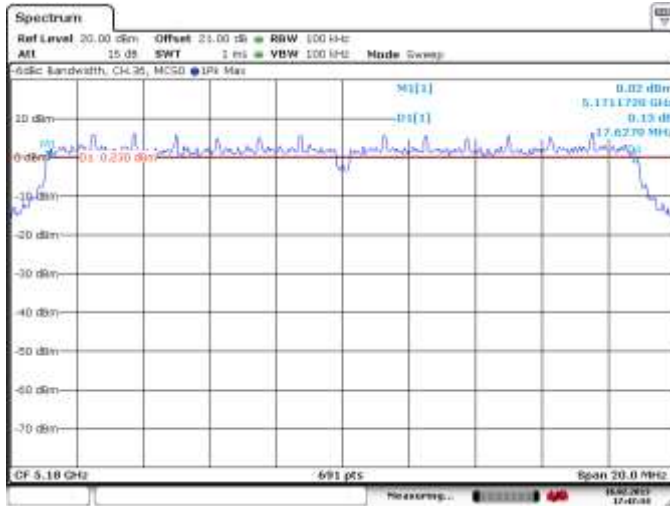


Figure 3-8: 6 dB Bandwidth
802.11n, Channel 100, 6 Mbps

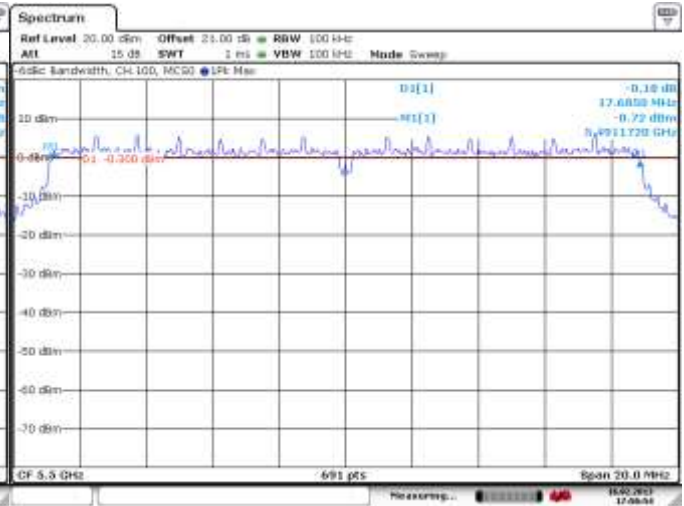
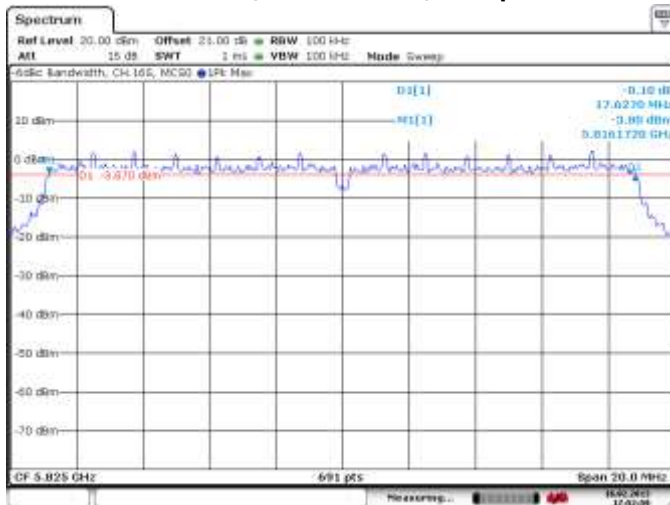


Figure 3-9: 6 dB Bandwidth
802.11n, Channel 165, 6 Mbps



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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, 48, 52, 60, 64, 100, 140 and 165 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	13.95	24.83
	24 Mbps	< 1.00	13.54	22.58
	54 Mbps	< 1.00	13.12	20.51
48	6 Mbps	< 1.00	13.70	23.44
	24 Mbps	< 1.00	13.34	21.56
	54 Mbps	< 1.00	12.83	19.17
52	6 Mbps	< 1.00	15.80	38.04
	24 Mbps	< 1.00	15.34	34.16
	54 Mbps	< 1.00	14.85	30.55
60	6 Mbps	< 1.00	15.69	37.07
	24 Mbps	< 1.00	15.40	34.67
	54 Mbps	< 1.00	14.82	30.34
64	6 Mbps	< 1.00	13.41	21.94
	24 Mbps	< 1.00	13.08	20.32
	54 Mbps	< 1.00	12.51	17.84
100	6 Mbps	< 1.00	12.68	18.52
	24 Mbps	< 1.00	12.28	16.90
	54 Mbps	< 1.00	11.71	14.83
140	6 Mbps	< 1.00	13.78	23.89
	24 Mbps	< 1.00	13.47	22.21
	54 Mbps	< 1.00	12.85	19.29
165	6 Mbps	< 1.00	10.94	12.41
	24 Mbps	< 1.00	10.58	11.43
	54 Mbps	< 1.00	10.02	10.04

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802.11n RF Conducted Emission Test Results

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, 48, 52, 60, 64, 100, 140 and 165 were measured for 802.11n 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	13.91	24.60
	24 Mbps	< 1.00	13.30	21.36
	54 Mbps	< 1.00	12.92	19.60
48	6 Mbps	< 1.00	13.65	23.18
	24 Mbps	< 1.00	13.08	20.31
	54 Mbps	< 1.00	12.66	18.46
52	6 Mbps	< 1.00	15.66	36.82
	24 Mbps	< 1.00	15.05	32.02
	54 Mbps	< 1.00	14.77	30.01
60	6 Mbps	< 1.00	15.65	36.73
	24 Mbps	< 1.00	14.94	31.19
	54 Mbps	< 1.00	14.65	29.17
64	6 Mbps	< 1.00	15.44	35.03
	24 Mbps	< 1.00	14.82	30.37
	54 Mbps	< 1.00	14.48	28.05
100	6 Mbps	< 1.00	12.54	17.96
	24 Mbps	< 1.00	12.07	16.09
	54 Mbps	< 1.00	11.63	14.54
140	6 Mbps	< 1.00	11.89	15.46
	24 Mbps	< 1.00	11.24	13.31
	54 Mbps	< 1.00	10.96	12.49
165	6 Mbps	< 1.00	10.94	12.41
	24 Mbps	< 1.00	10.25	10.60
	54 Mbps	< 1.00	9.92	9.82

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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, 100, 149, 161 and 165 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	-44.96	-24.96
	24 Mbps	< -20	-48.08	-28.08
	54 Mbps	< -20	-49.38	-29.38
64	6 Mbps	< -20	-45.70	-25.70
	24 Mbps	< -20	-48.23	-28.23
	54 Mbps	< -20	-48.91	-28.91
100	6 Mbps	< -20	-42.99	-22.99
	24 Mbps	< -20	-48.12	-28.12
	54 Mbps	< -20	-49.14	-29.14
140	6 Mbps	< -20	-41.31	-21.31
	24 Mbps	< -20	-46.41	-26.41
	54 Mbps	< -20	-48.66	-28.66
149	6 Mbps	< -20	-43.04	-23.04
	24 Mbps	< -20	-43.36	-23.36
	54 Mbps	< -20	-44.12	-24.12
165	6 Mbps	< -20	-22.68	-2.68
	24 Mbps	< -20	-24.76	-4.76
	54 Mbps	< -20	-24.85	-4.85

See figures 3-10 to 3-15 for the plots of the band edge compliance measurements for Channel 36, 64, 100, 140, 149, and 165 at 6 Mbps each for 802.11a mode.

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802.11a RF Conducted Emission Test Results cont'd

Figure 3-10: Band Edge Compliance
802.11a, Channel 36, 6 Mbps

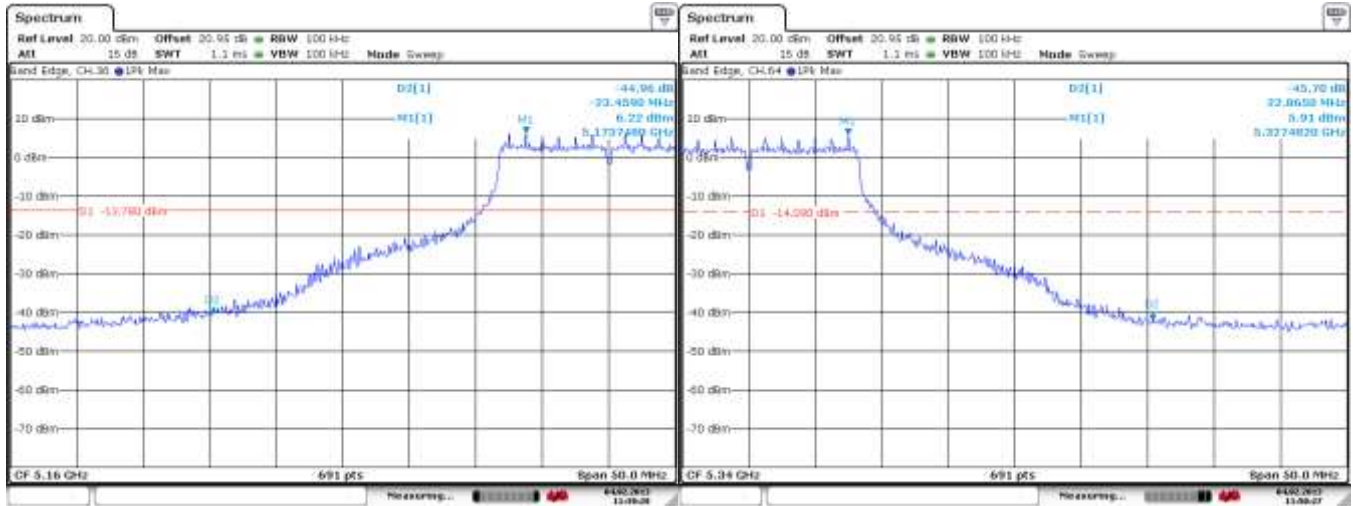


Figure 3-11: Band Edge Compliance
802.11a, Channel 64, 6 Mbps

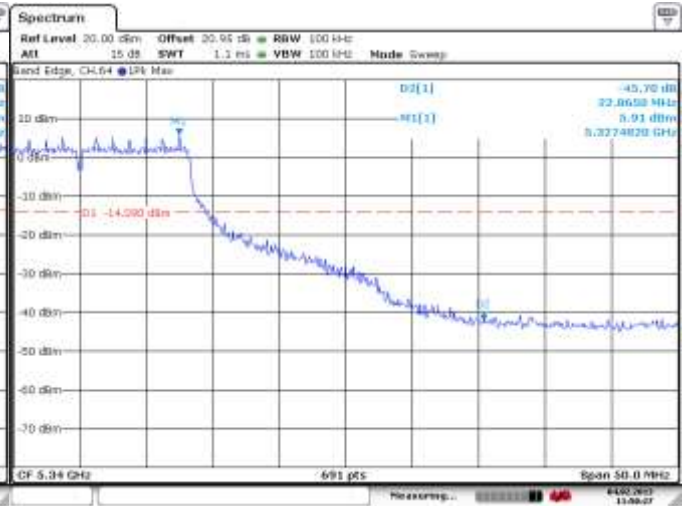


Figure 3-12: Band Edge Compliance
802.11a, Channel 100, 6 Mbps

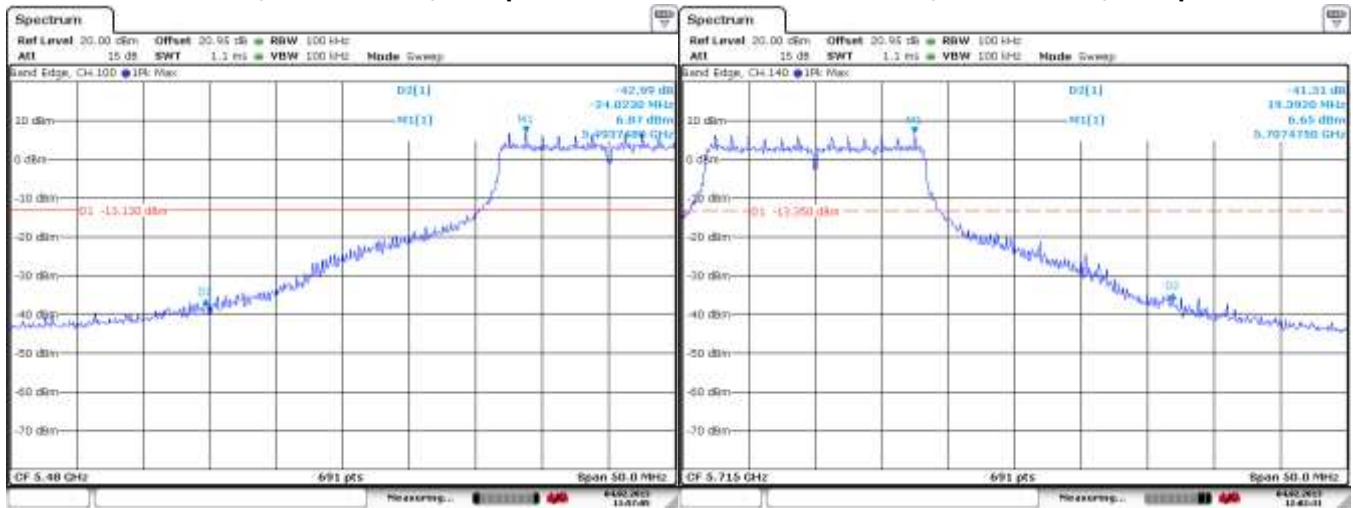
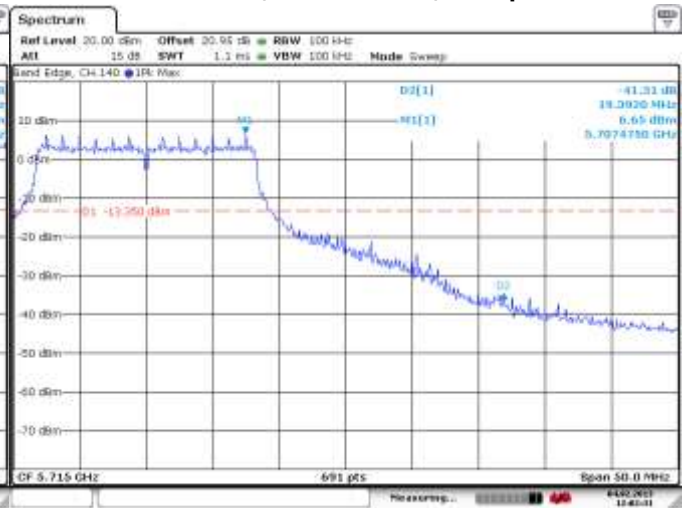


Figure 3-13: Band Edge Compliance
802.11a, Channel 140, 6 Mbps



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802.11a RF Conducted Emission Test Results cont'd

Figure 3-14: Band Edge Compliance
802.11a, Channel 149, 6 Mbps

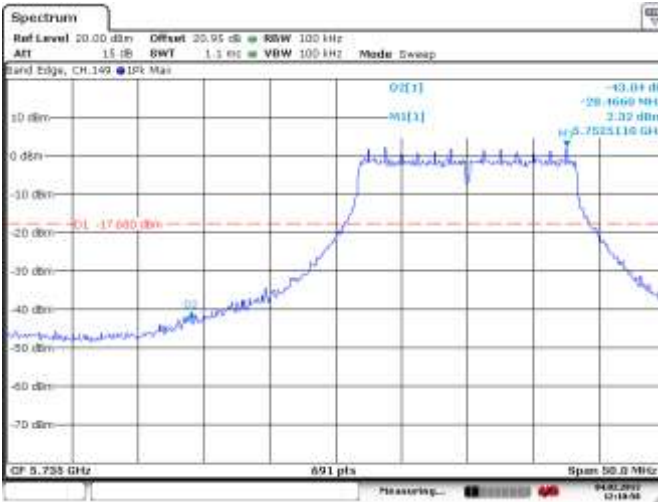
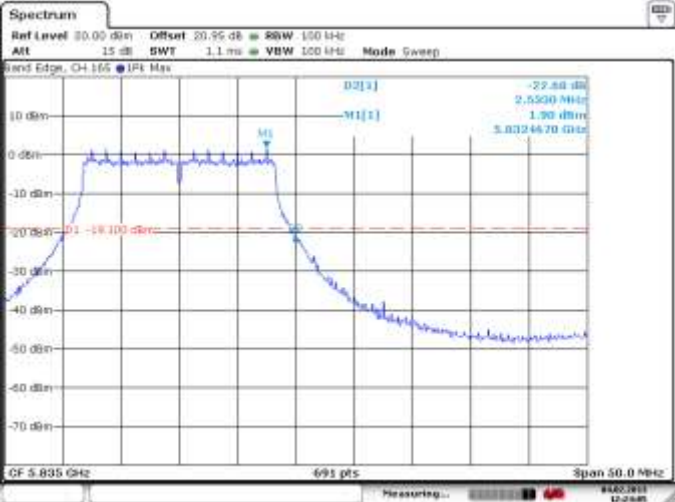


Figure 3-15: Band Edge Compliance
802.11a, Channel 165, 6 Mbps



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802.11n RF Conducted Emission Test Results

Band Edge Compliance

The EUT met the requirements of the band edge compliance as per 47 CFR 15.407 and RSS-210. Channels 36, 64, 100, 140, 149, and 165 were measured at MCS0, MCS4, and MCS7 each for 802.11n mode.

Channel	Data Rate	Limit (dBc)	Measured Level (dBc)	Margin (dBc)
36	MCS0	< -20	-31.86	-11.86
	MCS4	< -20	-37.39	-17.39
	MCS7	< -20	-37.46	-17.46
64	MCS0	< -20	-36.57	-16.57
	MCS4	< -20	-41.24	-21.24
	MCS7	< -20	-41.31	-21.31
100	MCS0	< -20	-34.21	-14.21
	MCS4	< -20	-38.22	-18.22
	MCS7	< -20	-38.74	-18.74
140	MCS0	< -20	-37.23	-17.23
	MCS4	< -20	-37.69	-17.69
	MCS7	< -20	-39.16	-19.16
149	MCS0	< -20	-36.92	-16.92
	MCS4	< -20	-41.12	-21.12
	MCS7	< -20	-41.58	-21.58
165	MCS0	< -20	-22.18	-2.18
	MCS4	< -20	-23.21	-3.21
	MCS7	< -20	-23.24	-3.24

See figures 3-16 to 3-21 for the plots of the band edge compliance measurements for Channel 36, 64, 100, 140, 149, and 165 at 6 Mbps each for 802.11n mode.

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802.11n RF Conducted Emission Test Results cont'd

Figure 3-16: Band Edge Compliance
802.11n, Channel 36, 6 Mbps

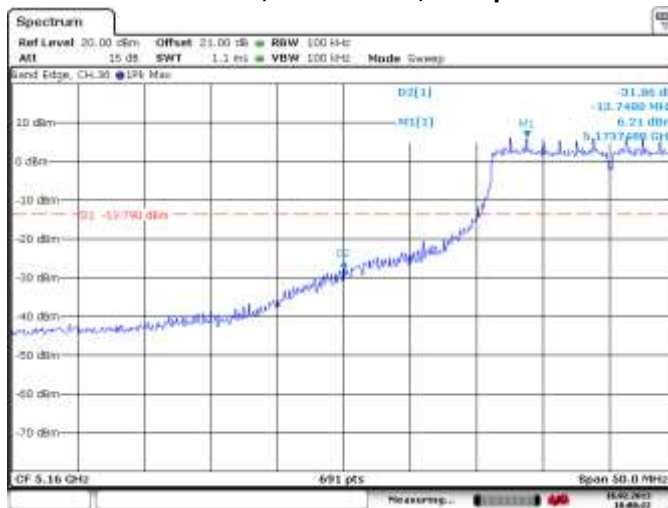


Figure 3-17: Band Edge Compliance
802.11n, Channel 64, 6 Mbps

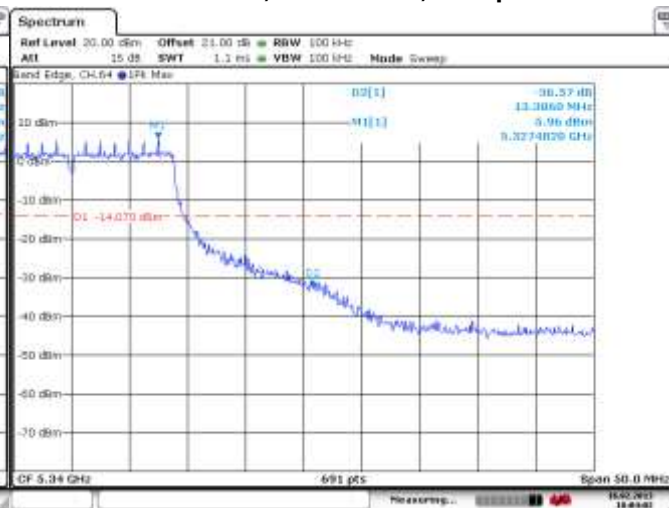


Figure 3-18: Band Edge Compliance
802.11n, Channel 100, 6 Mbps

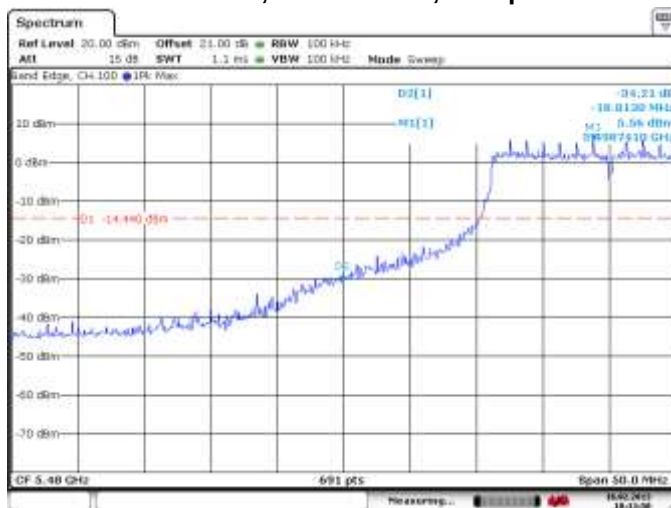
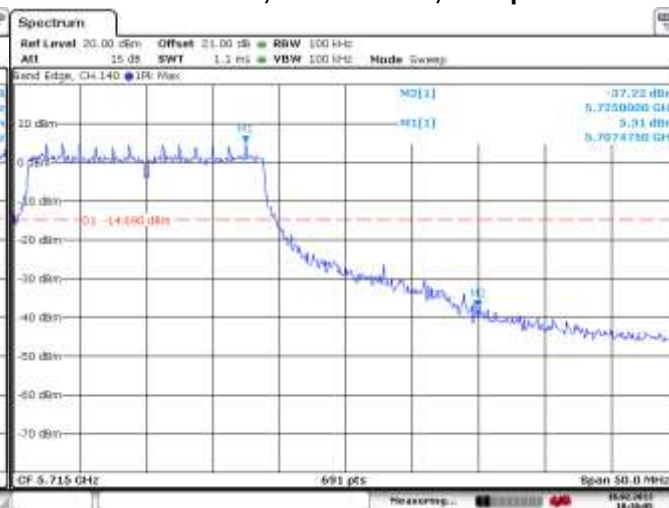


Figure 3-19: Band Edge Compliance
802.11n, Channel 140, 6 Mbps



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802.11n RF Conducted Emission Test Results cont'd

Figure 3-20: Band Edge Compliance
802.11n, Channel 149, 6 Mbps

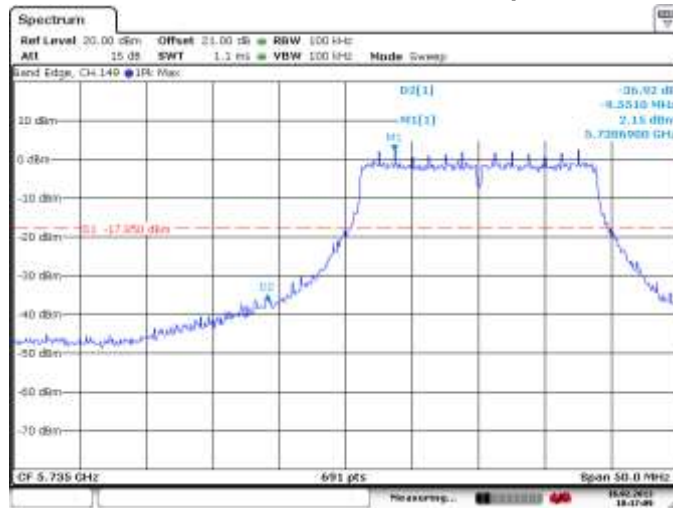
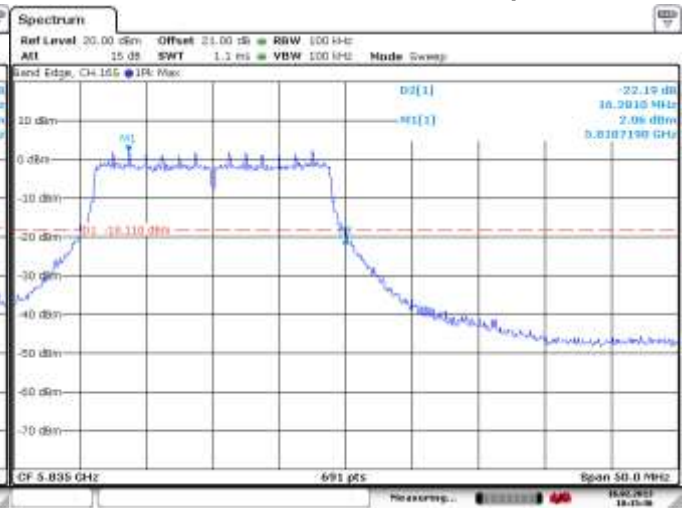


Figure 3-21: Band Edge Compliance
802.11n, Channel 165, 6 Mbps



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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, 48, 64, 100, 140, and 165 were measured at 6 Mbps, 24 Mbps, and 54 Mbps each for 802.11a mode.

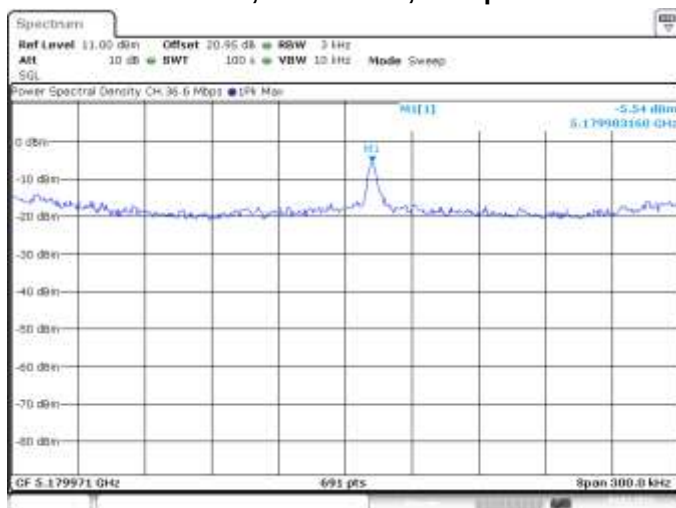
Channel	Data Rate	Limit (dBm)	Measured Level (dBm)	Margin (dBm)
36	6 Mbps	< 4.00	-5.54	-9.54
	24 Mbps	< 4.00	-6.94	-10.94
	54 Mbps	< 4.00	-9.01	-13.01
48	6 Mbps	< 4.00	-5.21	-9.21
	24 Mbps	< 4.00	-7.50	-11.50
	54 Mbps	< 4.00	-8.19	-12.19
64	6 Mbps	< 11.00	-5.76	-16.76
	24 Mbps	< 11.00	-7.33	-18.33
	54 Mbps	< 11.00	-8.43	-19.43
100	6 Mbps	< 11.00	-6.81	-17.81
	24 Mbps	< 11.00	-8.77	-19.77
	54 Mbps	< 11.00	-9.84	-20.84
140	6 Mbps	< 11.00	-6.74	-17.74
	24 Mbps	< 11.00	-9.80	-20.80
	54 Mbps	< 11.00	-9.77	-20.77
165	6 Mbps	< 17.00	-10.89	-27.89
	24 Mbps	< 17.00	-11.29	-28.29
	54 Mbps	< 17.00	-11.37	-28.37

See figures 3-22 to 3-27 for the plots of the peak power spectral density for Channel 36, 44, 64, 100, 140, and 165 at 6 Mbps each for 802.11a mode.

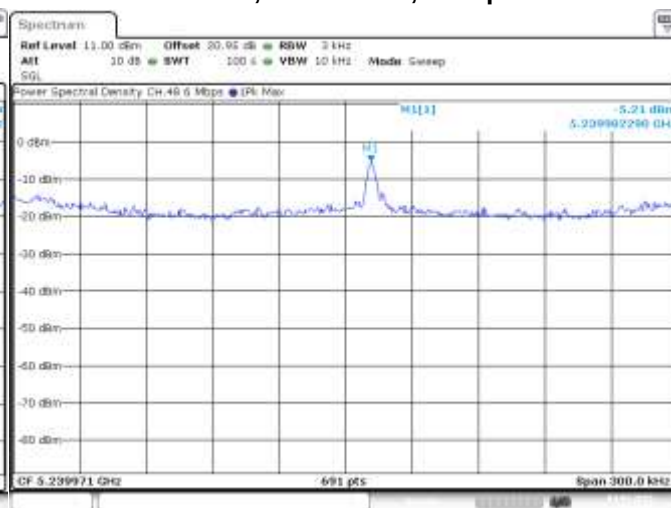
	EMI Test Report for the BlackBerry® smartphone Model RFN81UW APPENDIX 3	
Test Report No. RTS-6026-1302-22	Dates of Test January 29- February 14 and March 27, 2013	FCC ID: L6ARFN80UW IC: 2503A-RFN80UW

802.11a RF Conducted Emission Test Results cont'd

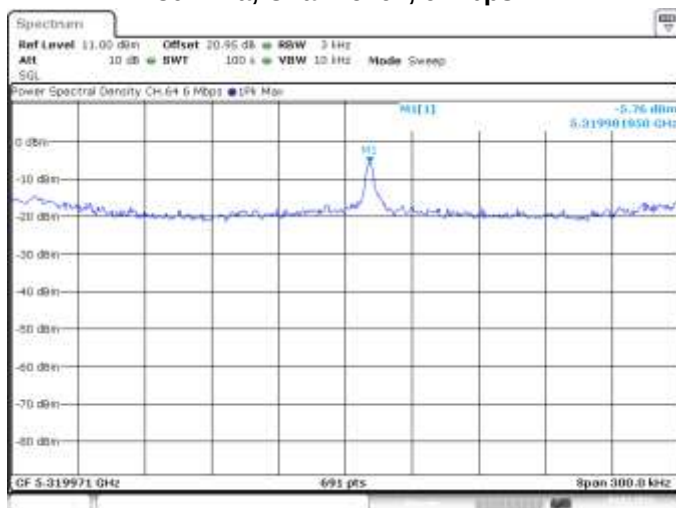
**Figure 3-22: Peak Power Spectral Density
802.11a, Channel 36, 6 Mbps**



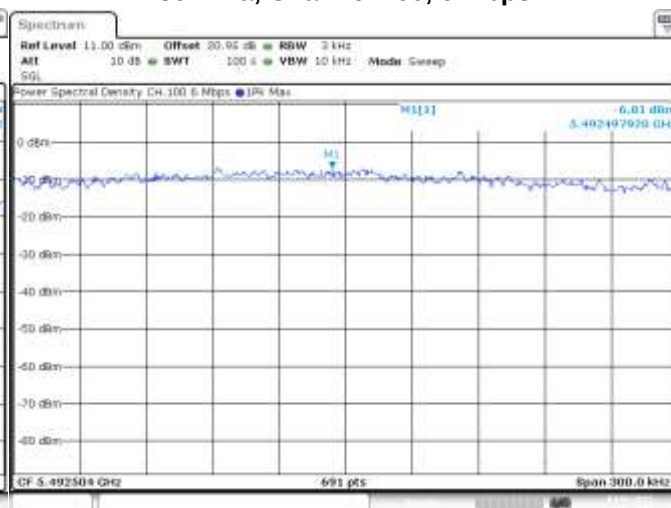
**Figure 3-23: Peak Power Spectral Density
802.11a, Channel 48, 6 Mbps**



**Figure 3-24: Peak Power Spectral Density
802.11a, Channel 64, 6 Mbps**



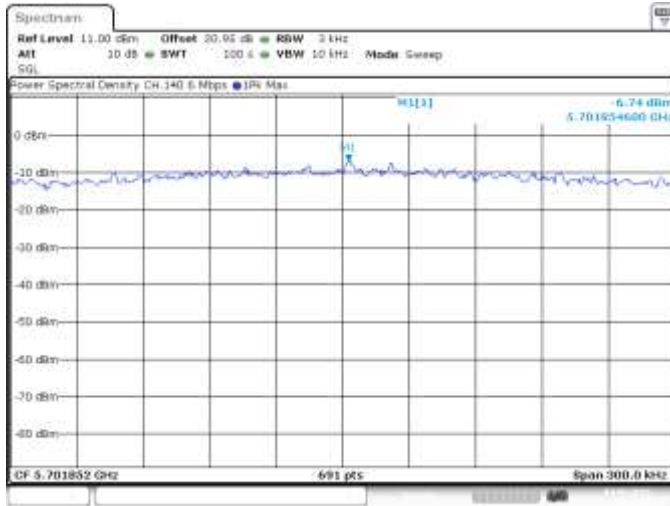
**Figure 3-25: Peak Power Spectral Density
802.11a, Channel 100, 6 Mbps**



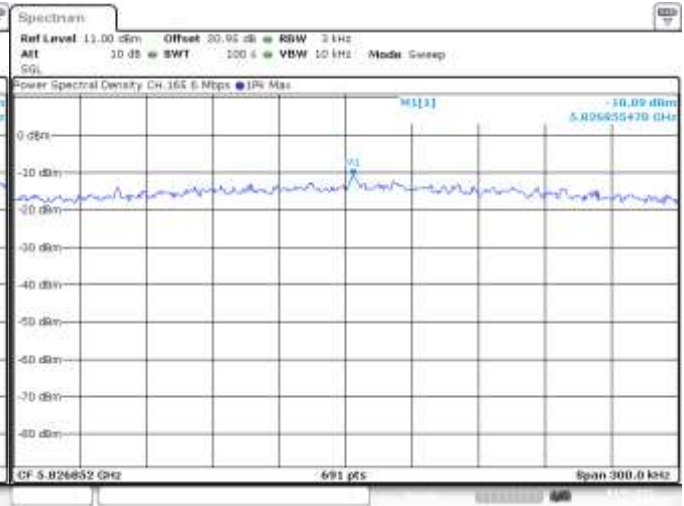
	EMI Test Report for the BlackBerry® smartphone Model RFN81UW APPENDIX 3	
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802.11a RF Conducted Emission Test Results cont'd

**Figure 3-26: Peak Power Spectral Density
802.11a, Channel 140, 6 Mbps**



**Figure 3-27: Peak Power Spectral Density
802.11a, Channel 165, 6 Mbps**



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802.11n RF Conducted Emission Test Results

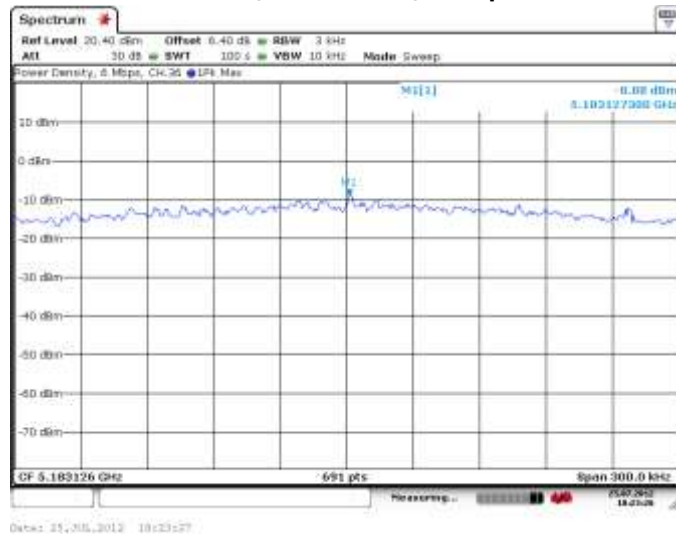
Channel	Data Rate	Limit (dBm)	Measured Level (dBm)	Margin (dBm)
36	6 Mbps	< 4.00	-7.25	-11.25
	24 Mbps	< 4.00	-8.05	-12.05
	54 Mbps	< 4.00	-8.74	-12.74
100	6 Mbps	< 11.00	-7.76	-18.76
	24 Mbps	< 11.00	-8.15	-19.15
	54 Mbps	< 11.00	-9.14	-20.14
165	6 Mbps	< 17.00	-11.31	-28.31
	24 Mbps	< 17.00	-12.56	-29.56
	54 Mbps	< 17.00	-12.75	-29.75

See figures 3-28 to 3-30 for the plots of the peak power spectral density for Channel 36, 100, and 165 at 6 Mbps each for 802.11n mode.

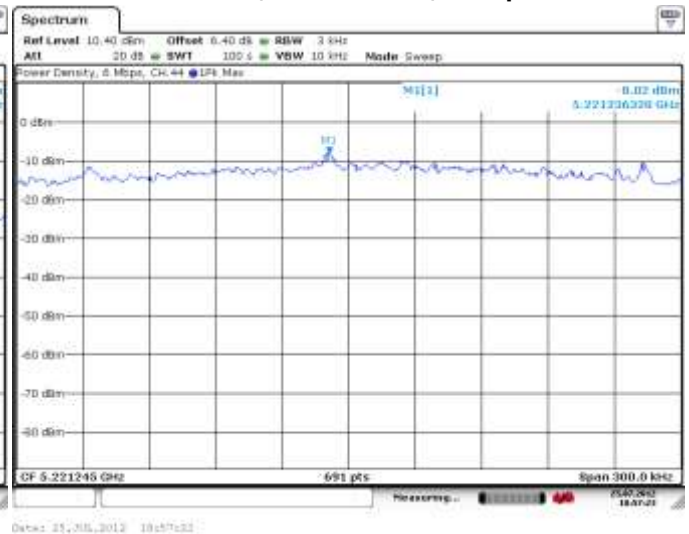
	EMI Test Report for the BlackBerry® smartphone Model RFN81UW APPENDIX 3	
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802.11n RF Conducted Emission Test Results cont'd

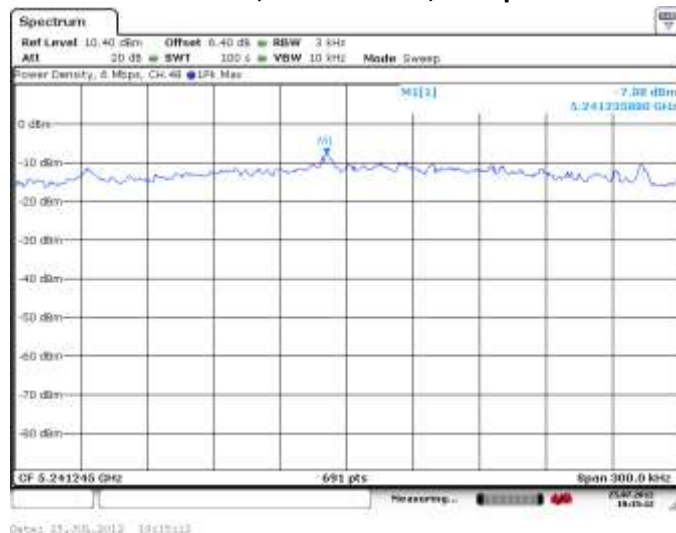
**Figure 3-28: Peak Power Spectral Density
802.11n, Channel 36, 6 Mbps**



**Figure 3-29: Peak Power Spectral Density
802.11n, Channel 100, 6 Mbps**



**Figure 3-30: Peak Power Spectral Density
802.11n, Channel 165, 6 Mbps**



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802.11a 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 15.407 and RSS-210. Channels 64, and 100 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.

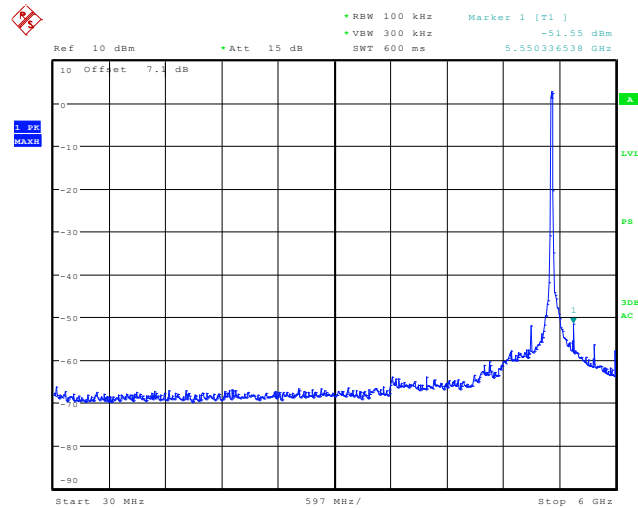
Channel	Data Rate	Power (dBm)	Max. Measured Level (dBm)	Limit (dBc)	Margin (dB)
64	6 Mbps	18.64	-49.31	-20	-29.31
100	6 Mbps	17.18	-51.22	-20	-31.22

See figures 3-31 to 6-32 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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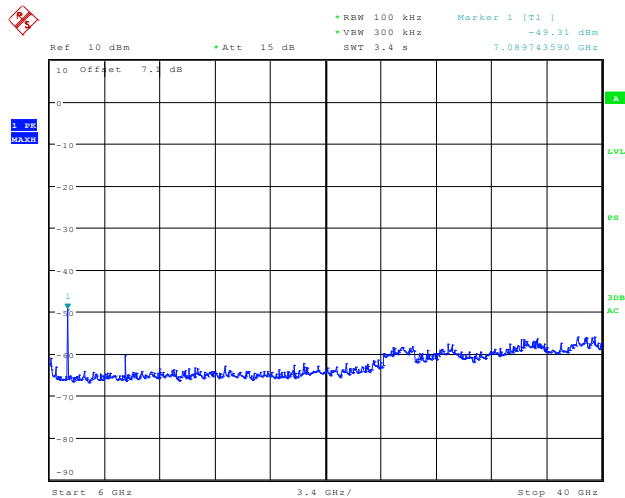
802.11a RF Conducted Emission Test Results cont'd

Figure 3-31a: Spurious RF Conducted Emissions, 802.11a Channel 60, 6 Mbps



Date: 16.FEB.2013 19:07:04

Figure 3-31b: Spurious RF Conducted Emissions, 802.11a Channel 60, 6 Mbps

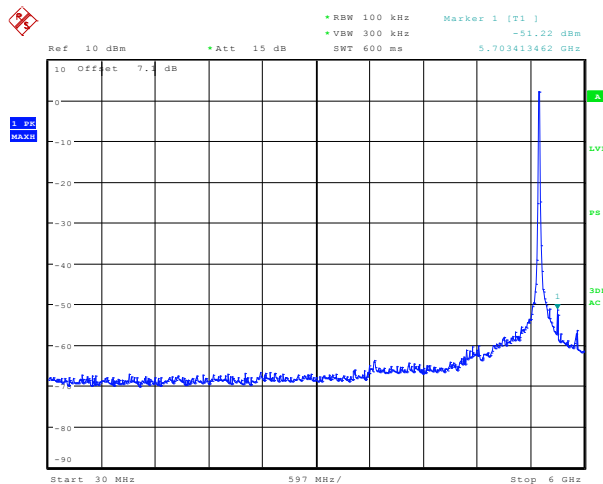


Date: 16.FEB.2013 19:07:25

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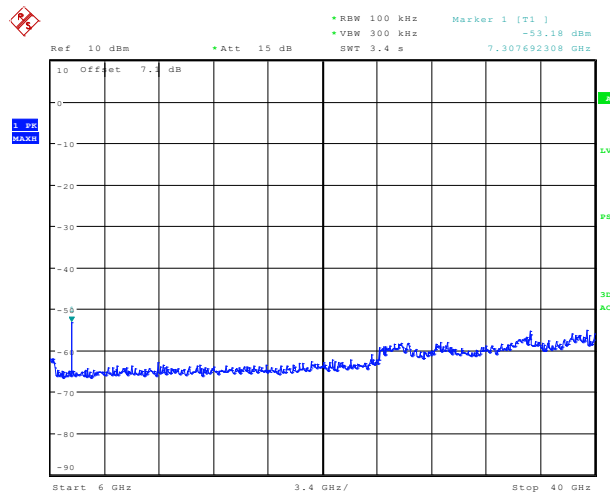
802.11a RF Conducted Emission Test Results cont'd

Figure 3-32a: Spurious RF Conducted Emissions, 802.11a Channel 157, 6 Mbps



Date: 16.FEB.2013 19:07:48

Figure 3-33b: Spurious RF Conducted Emissions, 802.11a Channel 157, 6 Mbps



Date: 16.FEB.2013 19:08:11

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APPENDIX 4 – NEAR FIELD COMMUNICATIONS TEST DATA/PLOTS

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Near Field Communications (NFC) Test Results

Occupied Bandwidth

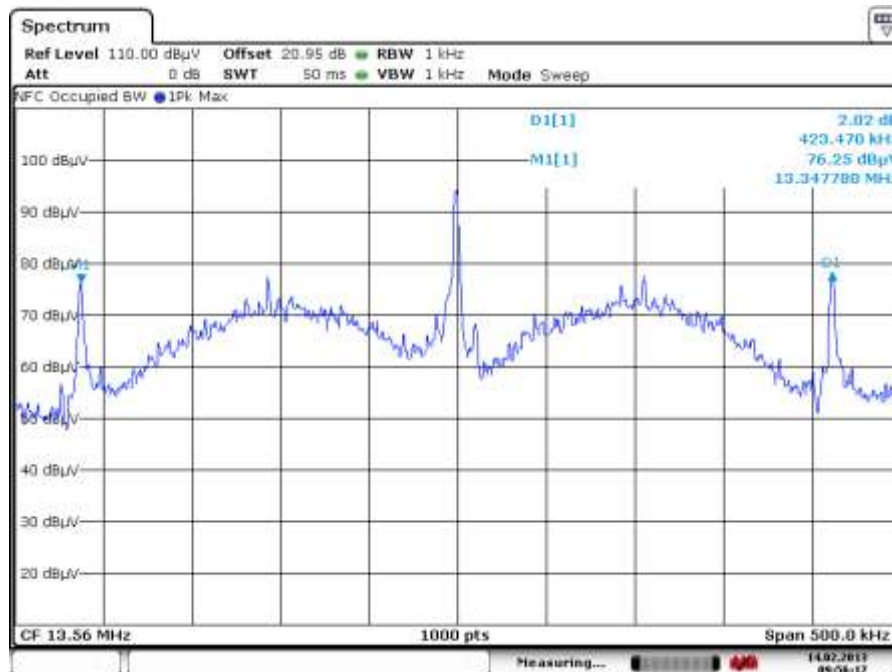
Date of test: February 13, 2013

The measurements were performed by Berkin Can

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

Operation mode (TX ON)	Occupied Bandwidth (kHz)
NFC, modulated	423047

Figure 4-1: Occupied Bandwidth, NFC TX Frequency = 13.56 MHz



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Near Field Communications (NFC) Test Results cont'd

Frequency Stability

Date of test: February 14, 2013

The measurements were performed by Berkin Can

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	13.559622	3.6	-0.000378	-378	-0.00279
-20	13.56	13.559686	3.8	-0.000314	-314	-0.00232
-20	13.56	13.559692	4.35	-0.000308	-308	-0.00227
-10	13.56	13.559570	3.6	-0.000430	-430	-0.00317
-10	13.56	13.559492	3.8	-0.000508	-508	-0.00375
-10	13.56	13.559519	4.35	-0.000481	-481	-0.00355
0	13.56	13.559516	3.6	-0.000484	-484	-0.00357
0	13.56	13.559478	3.8	-0.000522	-522	-0.00385
0	13.56	13.559712	4.35	-0.000288	-288	-0.00212
10	13.56	13.559557	3.6	-0.000443	-443	-0.00327
10	13.56	13.559578	3.8	-0.000422	-422	-0.00311
10	13.56	13.559581	4.35	-0.000419	-419	-0.00309
20	13.56	13.559584	3.6	-0.000416	-416	-0.00307
20	13.56	13.559652	3.8	-0.000348	-348	-0.00257
20	13.56	13.559316	4.35	-0.000684	-684	-0.00504

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Near Field Communications (NFC) Test Results cont'd

Frequency Stability cont'd

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