

EMI Test Report

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

RIM Testing Services (RTS)

A division of Research In Motion Limited

REPORT NO.: RTS-0552-0803-02

PRODUCT MODEL NO.: RBT71UW
TYPE NAME: BlackBerry® smartphone
FCC ID: L6ARBT70UW
IC: 2503A-RBT70UW

DATE: 08 May 2008

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Statement of Performance:

The BlackBerry® smartphone, model RBT71UW, part number CER-17671-001 Rev. 2, and accessories when configured and operated per RIM's operation instructions, performs within the requirements of the test standards.

Declaration:

We hereby certify that:

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

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

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

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

Tested and Documented by:



Maurice Battler
Compliance Specialist
Date: 08 May, 2008

Reviewed by:



Masud S. Attayi, P.Eng.
Team Lead, Regulatory Compliance
Date: 09 May, 2008

Approved by:



Paul G. Cardinal, Ph.D.
Director
Date: 14 May, 2008

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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, September 20, 2007
- o FCC CFR 47 Part 15, Subpart E, September 20, 2007
- o Industry Canada, RSS-210, Issue 7, June 2007, Low Power Licence-Exempt Radiocommunication Devices
- o Industry Canada, RSS-GEN, Issue 2, June 2007, General Requirements and Information for the Certification of Radiocommunication Equipment

B. Associated Document

1. Document number RTS-0552-RBT71UW-01

C. Product Identification

Manufactured by Research In Motion Limited whose headquarters is located at:

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

The equipment under test (EUT) was tested at the RIM Testing Services (RTS) EMI test facility, located at:

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

The testing was performed on March 07 to April 03, 2008.

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The sample EUT included:

SAMPLE	MODEL	CER NUMBER	PIN
1	RBT71UW	CER-17671-001 Rev. 1	206CE11A
2	RBT71UW	CER-17671-001 Rev. 1	206CE13A
3	RBT71UW	CER-17671-001 Rev. 1	206CE3F2

To view the differences between CER-17671-001 Rev. 1 and CER-17671-001 Rev. 2, see document number RTS-0552-RBT71UW-01. The changes from Rev. 1 to Rev. 2 would have no impact on the measurements in this report.

BlackBerry® smartphone Accessories Tested

- 1) Folding Blade Charger, part number ASY-07040-002 with an output voltage of 5.0 volts dc, 750 mA and attached USB cable with a lead length of 1.80 metres.
- 2) Alternative Folding Blade Charger, part number ASY-12709-001 with an output voltage of 5.0 volts dc, 750 mA with an attached USB cable with a length of 1.80 metres.
- 3) Headset Adapter (2.5 mm plug to 3.5 mm jack), part number HDW-15306-002
- 4) Stereo Headset, 3.5 mm, part number HDW-14322-001, 1.3 metres long.
- 5) Stereo Headset, 2.5 mm, part number HDW-13019-001, 1.3 metres long

D. Support Equipment Used for the Testing of the EUT

- 1) Communication Tester, Rohde & Schwarz, model CMU 200, serial number 837493/073
- 2) DC Power Supply, H/P, model 6632B, serial number US37472178
- 3) Bluetooth Tester, Rohde & Schwarz, model CBT, serial number 100034
- 4) Bluetooth Tester, Rohde & Schwarz, model CBT, serial number 100370

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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	Radiated Spurious Emissions and Radiated Band Edge Compliance	Pass	2
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, 6 dB Bandwidth	Pass	4
Part 15.247(b)	RSS-210	802.11b/g, Maximum Conducted Output Power	Pass	4
Part 15.247(b)	RSS-210	802.11b/g, Band-Edge	Pass	4
Part 15.247(b)	RSS-210	802.11b/g, Peak Power Spectral Density	Pass	4
Part 15.247(b)	RSS-210	802.11b/g, Spurious RF Conducted Emissions	Pass	4
Part 15.407	RSS-210	802.11a, 6 dB Bandwidth	Pass	4
Part 15.407	RSS-210	802.11a, Maximum Conducted Output Power	Pass	4
Part 15.407	RSS-210	802.11a, Band-Edge	Pass	4
Part 15.407	RSS-210	802.11a, Peak Power Spectral Density	Pass	4
Part 15.407	RSS-210	802.11a, Spurious RF Conducted Emissions	Pass	4
Part 15.407	RSS-210	Frequency Stability	Pass	6

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F. Modifications to EUT

No modifications were required on the EUT.

G. 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, PIN 206CE13A was in battery charging mode. The input voltage was 120 V, 60 Hz.

The following test configurations were measured:

1. The BlackBerry® smartphone in 802.11a Tx mode with the Premium 3.5 mm Stereo Headset connected was connected to the Folding Blade Charger.
2. The BlackBerry® smartphone in 802.11bg Tx mode with the 2.5 mm Stereo Headset and Adapter was connected to the Alternative Folding Blade Charger.
3. The BlackBerry® smartphone in Bluetooth Tx mode with the 3.5 mm Stereo Headset was connected to the Alternative Captive Cable Charger.

The sample EUT's conducted emissions were compared with respect to the FCC CFR 47 Part 15, Subpart C, E and IC RSS-210 limits. The sample EUT had a worse case test margin of 4.82 dB below the limit at 0.174 MHz using the quasi peak detector and 13.01 dB below the limit at 0.161 MHz using the average detector with the Alternative Captive Cable Charger, test configuration 3.

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 polarisations of the emissions were measured.

The measurements were performed in a semi-anechoic chamber. The semi-anechoic chamber's FCC registration number is **778487** and the Industry Canada file number is **2503B-1**.

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

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

The Bluetooth radiated spurious and harmonics were investigated up to the 10th harmonic. The sample EUT had a worse case test margin of 14.47 dB below the Quasi-Peak limit at 36.464 MHz using the peak detector.

See APPENDIX 2 for the test data. The results include both normal data rate and EDR for Bluetooth.

The radiated emissions from the EUT were measured in standalone configuration transmitting at channels 1 & 11 at 6 Mbps, and channel 6 at 1 Mbps for 802.11bg mode. The system's radiated emission levels were compared with respect to the FCC CFR 47 Part 15 Subpart C, 15.247 and RSS-210.

The 802.11b/g harmonics were investigated up to the 10th harmonic. The sample EUT had a worse case test margin of 20.07 dB below the Quasi-Peak limit at 31.965 MHz using the peak detector.

The radiated emissions from the EUT were measured in standalone configuration transmitting at channels 36, 48, 52, 64, 149, and 161 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.

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The 802.11a harmonics were investigated up to the 10th harmonic. The sample EUT had a worse case test margin of 11.62 dB at 11621.61 MHz using the peak detector.

See APPENDIX 2 for the test data

b) Band-Edge Compliance of RF Radiated Emissions

The Band-Edge Compliance of RF Radiated Emissions for Bluetooth, 802.11b/g, and 802.11a met the requirements as per 15.247, 15.407, 15.209, and RSS-210/RSS-GEN.

See APPENDIX 2 for the test data

Measurement Uncertainty ±4.6 dB

3) BLUETOOTH RF CONDUCTED EMISSIONS

a) 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.

See APPENDIX 3 for the test data.

b) 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.

See APPENDIX 3 for the test data.

c) 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. The number of hopping channels measured was 79.

See APPENDIX 3 for the test data.

d) Time of Occupancy (Dwell Time)

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

See APPENDIX 3 for the test data.

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e) Maximum Peak Conducted Output Power

The EUT 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.

See APPENDIX 3 for the test data.

f) Band-Edge Compliance of RF Conducted Emissions

The EUT 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 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 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) WiFi 802.11b/g RF CONDUCTED EMISSIONS

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.

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.

See APPENDIX 4 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 4 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 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) WiFi 802.11a RF CONDUCTED EMISSIONS

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.

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.

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.

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. Channels 36, 44, 48, 52, 60, 64, 149, 157 and 161 were measured.

See APPENDIX 5 for the test data.

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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) FREQUENCY STABILITY

The EUT met the frequency stability requirements of 47 CFR 15.407 and RSS-210. The temperature was varied from -30 to +60°C in 10° steps. The dc input voltage was stepped from 3.6, 3.7 and 4.2 volts.

Channels 0, 39, and 78 were measured for Bluetooth mode.

Channels 1, 6 and 11 were measured for 802.11b/g mode.

Channels 36, 48, 64, 149 and 161 were measured for 802.11a mode.

See APPENDIX 6 for the test data.

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H. 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>
Preamplifier	Sonoma	310N/11909A	185831	08-11-21	Radiated Emissions
Preamplifier system	TDK RF Solutions	PA-02	080010	08-11-16	Radiated Emissions
Hybrid Log Antenna	TDK	HLP-3003C	017401	08-08-04	Radiated Emissions
Horn Antenna	TDK	HRN-0118	030101	08-07-26	Radiated Emissions
Horn Antenna	TDK	HRN-0118	030201	09-01-17	Radiated Emissions
Horn Antenna	Emco	3116	2538	08-09-25	Radiated Emissions
Preamplifier	TDK	18-26	030002	08-11-20	Radiated Emissions
Dipole Antenna	Schwarzbeck	UHAP	973	08-12-18	Radiated Emissions
Dipole Antenna	Schwarzbeck	UHAP	974	08-09-28	Radiated Emissions
EMI Receiver	Rohde & Schwarz	ESIB-40	100255	08-09-24	Radiated Emissions
EMI Receiver	Agilent	8546A	3942A00517	08-11-19	Conducted/Radiated Emissions
RF Filter Section	Agilent	85460A	3704A00481	08-11-19	Conducted/Radiated Emissions
Spectrum Analyzer	HP	8563E	3745A08112	08-09-22	RF Conducted Emissions
DC Power Supply	HP	6632B	US37472178	08-09-24	RF Conducted Emissions
Environment Monitor	Control Company	1870	230355190	08-12-11	Radiated Emissions
Environment Monitor	Control Company	1870	230355189	08-12-11	RF Conducted Emissions
Temperature Probe	Hart Scientific	61161-302	21352860	08-08-14	Frequency Stability
Environmental Chamber	ESPEC Corp.	SH-240S1	91005607	N/R	Frequency Stability
Bluetooth Tester	Rohde & Schwarz	CBT	100034	08-12-06	RF Conducted Emissions
Bluetooth Tester	Rohde & Schwarz	CBT	100370	08-12-06	Radiated Emissions
Signal Generator	Agilent	8648C	4037U03155	09-09-20	Frequency Stability
Power Meter	Agilent	N1911A	MY45100905	08-05-10	Frequency Stability
Power Sensor	Agilent	N1921A	SG45240281	08-04-26	Frequency Stability
Digital Multimeter	Hewlett Packard	34401A	US36042324	08-09-28	Conducted/Radiated Emissions
L.I.S.N.	Emco	3816/2	1120	08-08-28	Conducted Emissions
Impulse Limiter	Rohde &	ESHS-Z2	100786	08-09-11	Conducted Emissions

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APPENDIX 1 – AC CONDUCTED EMISSIONS TEST DATA/PLOTS

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Bluetooth AC Conducted Emission Test Results

The measurements were performed by Anas Hawari and Gurjeev Singh

Test Configuration 1

AC Power Line Conducted Emissions

The EUT met the requirements of the AC Power Line Conducted Emissions as per FCC CFR 47 Part 15, Subpart C and IC RSS-210.

The environmental test conditions were:

Temperature	23°C
Pressure	1022 mb
Relative Humidity	23%

Date of test: April 03, 2008

Frequency (MHz)	Line	Reading (QP) (dBµV)	Correction Factor (dB)	Corrected Reading (QP) (dB)	Limit (QP) (dBµV)	Limit (AV) (dBµV)	Margin (QP) Limits (dB)	Margin (AV) Limits (dB)
0.150	N	36.36	9.87	46.23	65.73	55.73	-19.50	-9.50
0.468	L1	32.27	9.91	42.18	56.34	46.34	-14.16	-4.16
0.588	L1	31.97	9.91	41.88	56.00	46.00	-14.12	-4.12
0.623	N	32.45	9.92	42.37	56.00	46.00	-13.63	-3.63
0.623	N	32.75	9.92	42.67	56.00	46.00	-13.33	-3.33
0.623	L1	32.87	9.93	42.80	56.00	46.00	-13.20	-3.20
0.702	N	33.48	9.94	43.42	56.00	46.00	-12.58	-2.58
0.713	N	24.18	9.94	34.12	56.00	46.00	-21.88	-11.88
0.857	L1	31.29	9.94	41.23	56.00	46.00	-14.77	-4.77
1.352	L1	27.45	9.96	37.41	56.00	46.00	-18.59	-8.59
1.447	L1	26.19	9.96	36.15	56.00	46.00	-19.85	-9.85
1.688	N	28.54	9.97	38.51	56.00	46.00	-17.49	-7.49

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

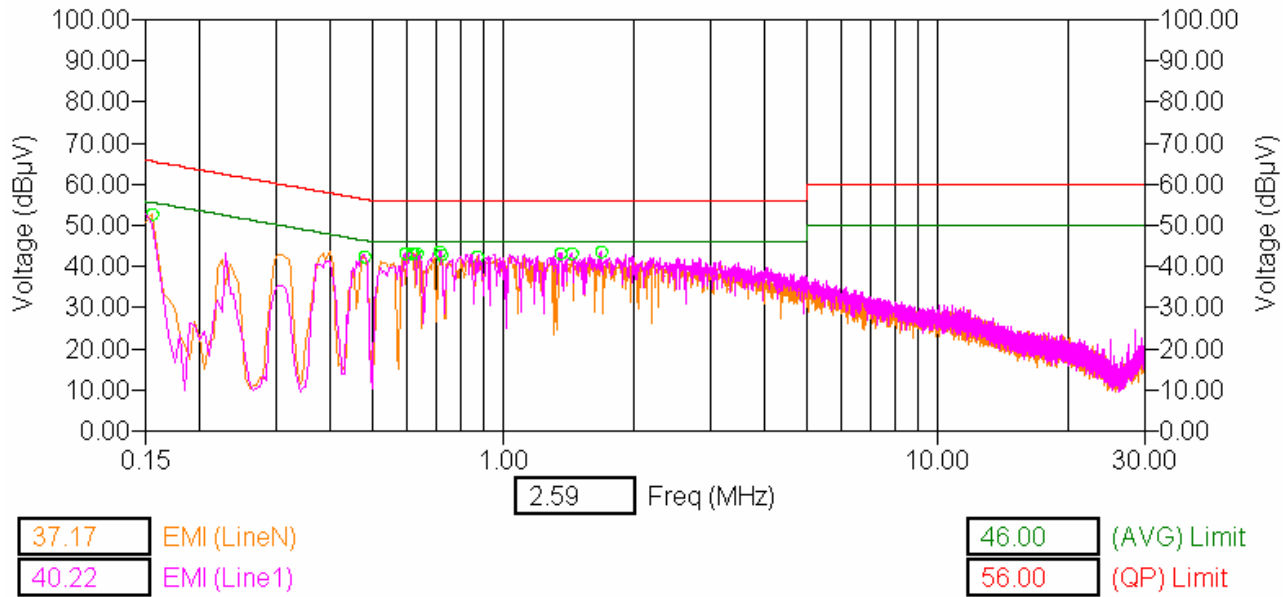
Measurements were done with the quasi-peak detector.

See figure 1-1 for the measurement plot of AC power line conducted emissions.

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Bluetooth AC Conducted Emission Test Graph 1

Figure 1-1



Test Configuration 1

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Bluetooth AC Conducted Emission Test Results

Test Configuration 2

AC Power Line Conducted Emissions

The EUT met the requirements of the AC Power Line Conducted Emissions as per FCC CFR 47 Part 15, Subpart C and IC RSS-210.

The environmental test conditions were:

Temperature	23°C
Pressure	1024 mb
Relative Humidity	23%

Date of test: April 02, 2008

Frequency (MHz)	Line	Reading (QP) (dBµV)	Correction Factor (dB)	Corrected Reading (QP) (dB)	Limit (QP) (dBµV)	Limit (AV) (dBµV)	Margin (QP) Limits (dB)	Margin (AV) Limits (dB)
0.160	L1	36.17	9.87	46.04	65.46	55.46	-19.42	-9.42
0.165	N	39.24	9.87	49.11	65.21	55.21	-16.10	-6.10
0.174	L1	34.64	9.87	44.51	64.96	54.96	-20.45	-10.45
0.358	L1	26.65	9.89	36.54	58.84	48.84	-22.30	-12.30
0.355	N	30.17	9.89	40.06	58.50	48.50	-18.44	-8.44
0.495	N	28.07	9.90	37.97	56.00	46.00	-18.03	-8.03
0.546	N	27.69	9.91	37.60	56.00	46.00	-18.40	-8.40
0.566	N	26.46	9.91	36.37	56.00	46.00	-19.63	-9.63
0.570	L1	25.19	9.91	35.10	56.00	46.00	-20.90	-10.90
0.677	L1	25.33	9.94	35.27	56.00	46.00	-20.73	-10.73
0.974	L1	23.80	9.93	33.73	56.00	46.00	-22.27	-12.27

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

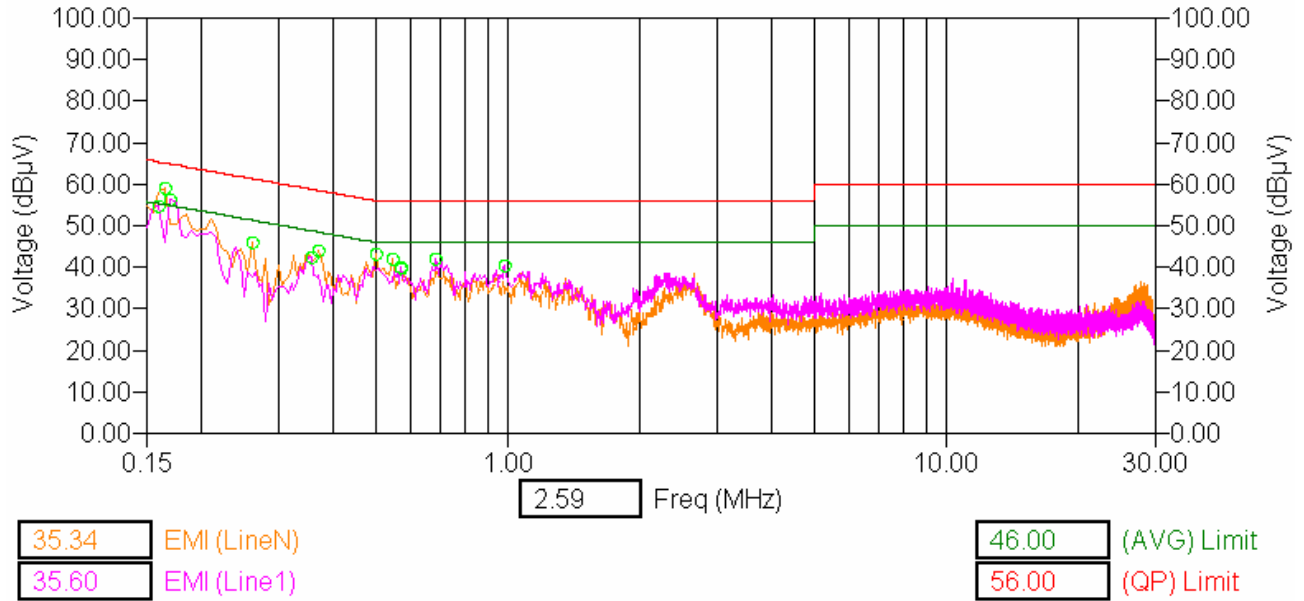
Measurements were done with the quasi-peak detector.

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

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Bluetooth AC Conducted Emission Test Graph 2

Figure 1-2



Test Configuration 2

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Bluetooth AC Conducted Emission Test Results

Test Configuration 3

AC Power Line Conducted Emissions

The EUT met the requirements of the AC Power Line Conducted Emissions as per FCC CFR 47 Part 15, Subpart C and IC RSS-210.

The environmental test conditions were:

Temperature	23°C
Pressure	1024 mb
Relative Humidity	23%

Date of test: April 02, 2008

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

Frequency (MHz)	Line	Reading (QP) (dBµV)	Correction Factor (dB)	Corrected Reading (QP) (dB)	Limit (QP) (dBµV)	Margin (QP) Limits (dB)
0.160	N	46.96	9.87	56.83	66.00	-9.17
0.173	L1	46.48	9.87	56.35	64.96	-8.61
0.174	N	50.03	9.87	59.90	64.72	-4.82
0.198	L1	41.25	9.87	51.12	63.61	-12.49
0.215	L1	39.55	9.87	49.42	62.82	-13.40
0.226	N	43.59	9.87	53.46	62.27	-8.81
0.258	N	34.30	9.87	44.17	61.59	-17.42
0.301	N	30.48	9.90	40.38	60.11	-19.73
0.329	N	30.01	9.89	39.90	59.33	-19.42
0.347	L1	31.17	9.89	41.06	59.08	-18.02
0.487	L1	29.26	9.91	39.17	56.25	-17.09
0.667	L1	27.51	9.94	37.45	56.00	-18.55

Measurements were done with the quasi-peak detector.

See figure 1-3 for the measurement plot of AC power line conducted emissions.

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Bluetooth AC Conducted Emission Test Results

Test Configuration 3 cont'd

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

Frequency (MHz)	Line	Reading (AVE.) (dBµV)	Correction Factor (dB)	Corrected Reading (AVE.) (dB)	Limit (AVE.) (dBµV)	Margin (AVE.) Limits (dB)
0.161	N	33.12	9.87	42.99	56.00	-13.01
0.175	L1	26.44	9.87	36.31	54.96	-18.65
0.176	N	27.53	9.87	37.40	54.72	-17.32
0.196	L1	21.92	9.87	31.79	53.61	-21.82
0.213	L1	22.05	9.87	31.92	52.82	-20.90
0.223	N	18.79	9.87	28.66	52.27	-23.61
0.260	N	24.78	9.87	34.65	51.59	-16.94
0.300	N	18.26	9.90	28.16	50.11	-21.95
0.345	N	22.46	9.89	32.35	49.33	-16.97
0.357	L1	22.61	9.89	32.50	49.08	-16.58
0.495	L1	20.41	9.91	30.32	46.25	-15.94
0.664	L1	18.76	9.94	28.70	46.00	-17.30

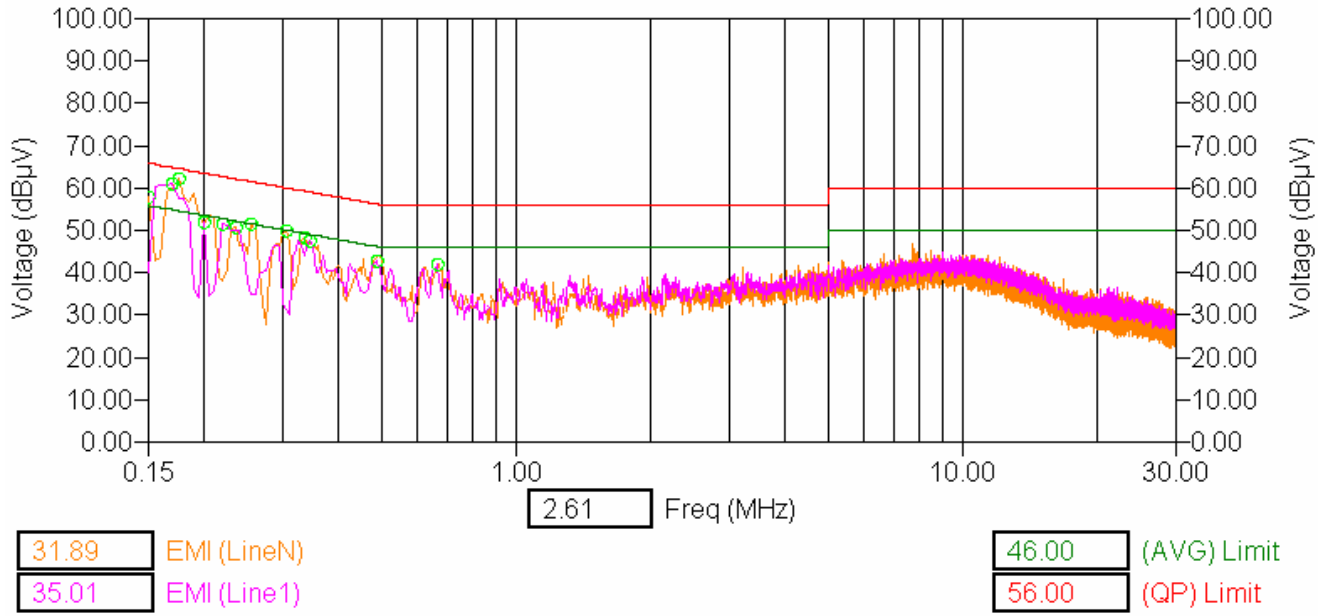
Measurements were done with the average detector.

See figure 1-3 for the measurement plot of AC power line conducted emissions.

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Bluetooth AC Conducted Emission Test Graph 3

Figure 1-3



Test Configuration 3

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APPENDIX 2 – RADIATED EMISSIONS TEST DATA

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Test Report No. RTS-0552-0803-02	Dates of Test March 07 – April 03, 2008	Author Data M. Battler

Radiated Emissions Test Results

Bluetooth Band

The environmental test conditions were:

Temperature	22°C
Pressure	1009 mb
Relative Humidity	23%

The measurements were performed by Anas Hawari and Gurjeev Singh

Date of Test: March 12, 2008

Test Distance was 3.0 metres with a height of 0.8 metres, 30 MHz to 1000 MHz.

The measurements were performed in single frequency Tx mode using packet type “DH5”, channel 39. The BlackBerry® smartphone PIN 206CE13A was in standalone, vertical position.

Frequency (MHz)	Antenna		Test Angle (Deg.)	Detector (PK or QP)	Measured Level (dBµV)	Correction Factor for preamp/antenna/cables/ filter (dB/m)	Field Strength Level (reading+corr) (dBµV/m)	Limit @ 3.0 m (dB)	Test Margin (dB)
	Pol. (V/H)	Height (metres)							
31.854	H	2.06	169	PK	40.62	-18.08	22.54	40.00	-17.46
31.930	V	2.01	102	PK	41.00	-18.09	22.91	40.00	-17.09
34.274	H	3.49	89	PK	37.19	-18.97	18.22	40.00	-21.78
34.606	V	2.39	167	PK	37.27	-19.05	18.22	40.00	-21.78
35.800	H	1.57	354	PK	36.19	-19.27	16.92	40.00	-23.08
36.464	V	1.47	206	PK	44.93	-19.40	25.53	40.00	-14.47
36.857	H	1.84	323	PK	42.88	-19.69	23.19	40.00	-16.81
37.074	V	2.66	197	PK	42.14	-19.70	22.44	40.00	-17.56
77.669	V	3.90	283	PK	39.07	-21.33	17.74	40.00	-22.26

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

The BlackBerry® smartphone PIN 206CE3F2 was tested in sweep mode to 25 GHz in standalone, vertical position.

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Radiated Emissions Test Results cont'd
Bluetooth Band

Date of Test: March 07, 2008 Test Distance was 1.0 metre.
The corrected readings were adjusted to take into account the 3.0 to 1.0 metre distance factor.

The measurements were performed in single frequency and hopping mode (channels 0 to 78) at maximum output power.

Using Pattern type “Static PRBS” and packet type “DH5” during the measurements.

Type	Channel	Frequency (MHz)	Antenna		Reading (Peak) (dBuV)	Corrected Reading (dBuV)	Detector (AVE/PK)	Peak Limit (dBuV/m)	Diff. To Limit (dB)
			Type	Pol					
BlackBerry® smartphone Standalone, USB up position									
Single frequency mode Low Channel									
2 nd	0	4804.0	Horn	V	43.45	43.60	PK.	74	-30.40
2 nd	0	4804.0	Horn	H	44.69				
2 nd	0	4804.0	Horn	V	32.56	32.95	AVE.	54	-21.05
2 nd	0	4804.0	Horn	H	34.04				
3 rd	0	7206.0	Horn	V	41.19	45.66	PK.	74	-28.34
3 rd	0	7206.0	Horn	H	40.81				
3 rd	0	7206.0	Horn	V	28.89	33.36	AVE.	54	-20.64
3 rd	0	7206.0	Horn	H	28.09				
The harmonics were investigated up to the 10 th harmonic. Emissions above the 3 rd harmonic were in the NF									
Single frequency mode Middle Channel									
2 nd	39	4882.0	Horn	V	40.83	40.41	PK.	74	-33.59
2 nd	39	4882.0	Horn	H	41.17				
2 nd	39	4882.0	Horn	V	28.67	29.51	AVE.	54	-24.49
2 nd	39	4882.0	Horn	H	30.27				
3 rd	39	7323.0	Horn	V	40.23	45.15	PK	74	-28.85
3 rd	39	7323.0	Horn	H	NF				
3 rd	39	7323.0	Horn	V	27.63	32.55	AVE	54	-21.45
3 rd	39	7323.0	Horn	H	NF				
The harmonics were investigated up to the 10 th harmonic. Emissions above the 3 rd harmonic were in the NF									

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Radiated Emissions Test Results cont'd

Bluetooth Band

Type	Channel	Frequency (MHz)	Antenna		Reading (Peak) (dBuV)	Corrected Reading (dBuV)	Detector (AVE/PK)	Peak Limit (dBuV/m)	Diff. To Limit (dB)
			Type	Pol					
Single frequency mode High Channel									
2 nd	78	4960.0	Horn	V	40.37	43.61	PK.	74	-30.39
2 nd	78	4960.0	Horn	H	44.03				
2 nd	78	4960.0	Horn	V	28.24	32.59	AVE.	54	-21.41
2 nd	78	4960.0	Horn	H	33.01				
3 rd	78	7440.0	Horn	V	38.94	44.46	PK.	74	-29.54
3 rd	78	7440.0	Horn	H	NF				
3 rd	78	7440.0	Horn	V	26.8	32.32	AVE.	54	-21.68
3 rd	78	7440.0	Horn	H	NF				
The harmonics were investigated up to the 10 th harmonic. Emissions above the 3 rd harmonic were in the NF									

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Bluetooth Radiated Emissions Test Results cont'd

Using Pattern type “Static PRBS” and packet type “DH5” during the measurements.

Type	Channel	Frequency (MHz)	Antenna		Reading (Peak) (dBuV)	Corrected Reading (dBuV)	Detector (AVE/PK)	Peak Limit (dBuV/m)	Diff. To Limit (dB)
			Type	Pol					
BlackBerry® smartphone Standalone, USB up position Hopping mode.									
2 nd	39	4882.0	Horn	V	39.88	40.68	PK.	74	-33.32
2 nd	39	4882.0	Horn	H	41.44				
2 nd	39	4882.0	Horn	V	26.23	25.58	AVE.	54	-28.42
2 nd	39	4882.0	Horn	H	26.34				
3 rd	39	7323.0	Horn	V	40.14	45.06	PK.	74	-28.94
3 rd	39	7323.0	Horn	H	NF				
3 rd	39	7323.0	Horn	V	26.55	31.47	AVE.	54	-22.53
3 rd	39	7323.0	Horn	H	NF				
The harmonics were investigated up to the 10 th harmonic. Emissions above the 3 rd harmonic were in the NF									

RTS RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RBT71UW APPENDIX 2	
Test Report No. RTS-0552-0803-02	Dates of Test March 07 – April 03, 2008	Author Data M. Battler

Bluetooth Band-Edge Compliance of RF Radiated Emissions Test Results

The test distance was 3 metres.

BlackBerry® smartphone standalone, vertical position, Pattern type “Static PRBS” and packet type “3-DH5” during the measurements.

Channel	Freq. (MHz)	Rx Antenna		Detector	VBW	Corrected Reading	Delta Marker	Corrected Band edge	Limit	Diff. To Limit
		Type	POL.	(PK, AVE.)	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
0	2402.0	Horn	V	PK	1.0 MHz	69.03	32.81	36.22	74.00	-37.78
0	2402.0	Horn	H	PK	1.0 MHz	69.96	30.71	39.25	74.00	-34.75
0	2402.0	Horn	V	AV	10 Hz	57.43	32.81	24.62	54.00	-29.38
0	2402.0	Horn	H	AV	10 Hz	59.03	30.71	28.32	54.00	-25.68

BlackBerry® smartphone standalone, vertical, Pattern type “Static PRBS” and packet type “3-DH5” during the measurements.

Channel	Freq. (MHz)	Rx Antenna		Detector	VBW	Corrected Reading	Delta Marker	Corrected Band edge	Limit	Diff. To Limit
		Type	POL.	(PK, AVE.)	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
78	2480.0	Horn	V	PK	1.0 MHz	67.57	33.93	33.64	74	-40.36
78	2480.0	Horn	H	PK	1.0 MHz	67.98	31.76	36.22	74	-37.78
78	2480.0	Horn	V	AV	10 Hz	56.53	33.93	22.6	54	-31.4
78	2480.0	Horn	H	AV	10 Hz	57.65	31.76	25.89	54	-28.11

BlackBerry® smartphone standalone, vertical, Pattern type “Static PRBS” and packet type “DH5” during the measurements.

Channel	Freq. (MHz)	Rx Antenna		Detector	VBW	Corrected Reading	Delta Marker	Corrected Band edge	Limit	Diff. To Limit
		Type	POL.	(PK, AVE.)	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
78	2480.0	Horn	V	PK	1.0 MHz	68.48	35.73	32.75	74	-41.25
78	2480.0	Horn	H	PK	1.0 MHz	69.16	32.55	36.61	74	-37.39
78	2480.0	Horn	V	AV	10 Hz	61.54	35.73	25.81	54	-28.19
78	2480.0	Horn	H	AV	10 Hz	62.29	32.55	29.74	54	-24.26

See figures 2-1 to 2-4 for the plots of the Bluetooth band-edge compliance.

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

Figure 2-1: Band-Edge Compliance of RF Radiated Emission.
Bluetooth, Single freq., Static PBRS,
3-DH5, Channel 0, Pol: V, Detector: PK

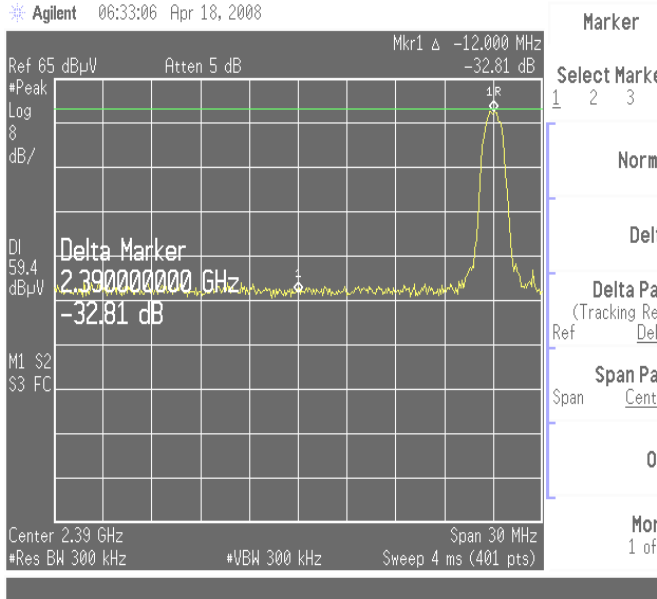


Figure 2-2: Band-Edge Compliance of RF Radiated Emission
Bluetooth, Single freq., Static PBRS,
3-DH5, Channel 0, Pol: H, Detector: PK

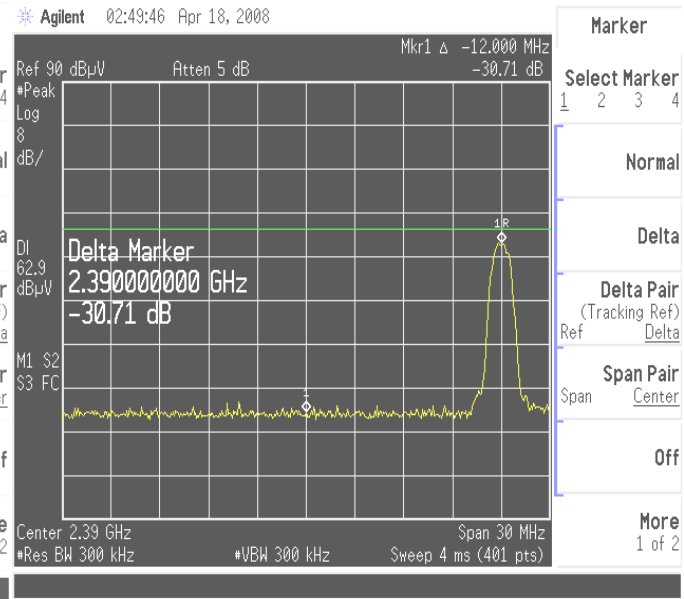


Figure 2-3: Band-Edge Compliance of RF Radiated Emission
Bluetooth, Single freq., Static PBRS,
3-DH5, Channel 78, Pol: V, Detector: PK

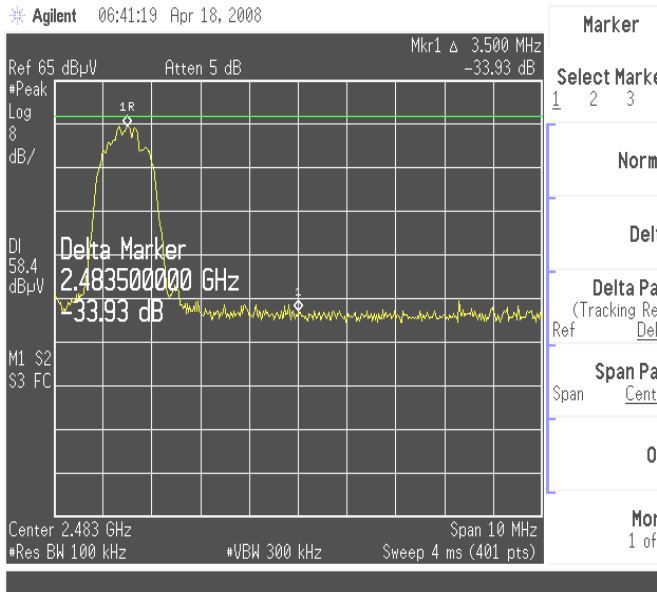
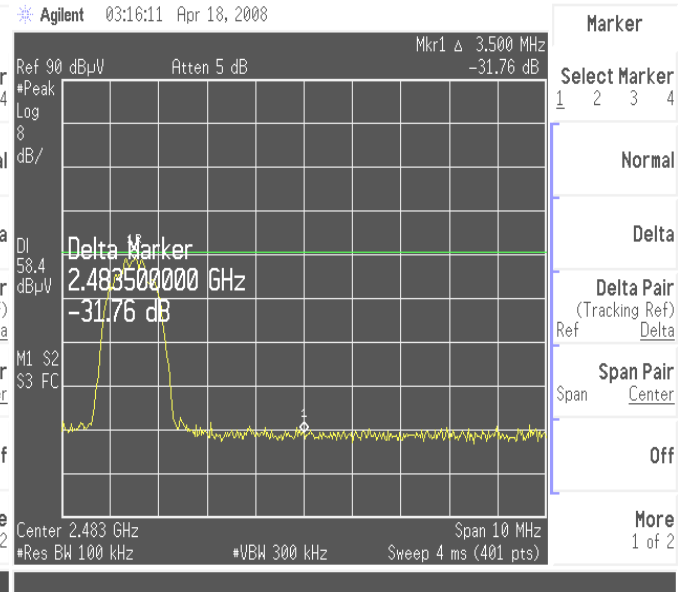


Figure 2-4: Band-Edge Compliance of RF Radiated Emission
Bluetooth, Single freq., Static PBRS,
3-DH5, Channel 78, Pol: H, Detector: PK



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

Figure 2-5: Band-Edge Compliance of RF Radiated Emission.
Bluetooth, Single freq., Static PBRs,
DH5, Channel 78, Pol: V, Detector: PK

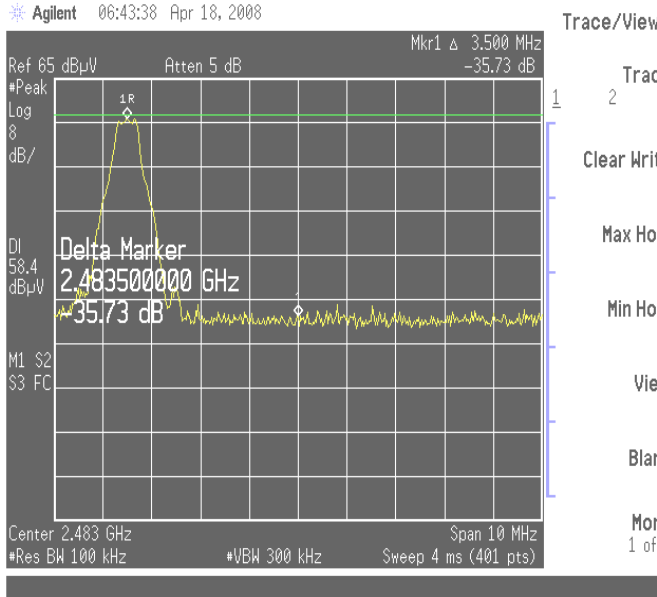
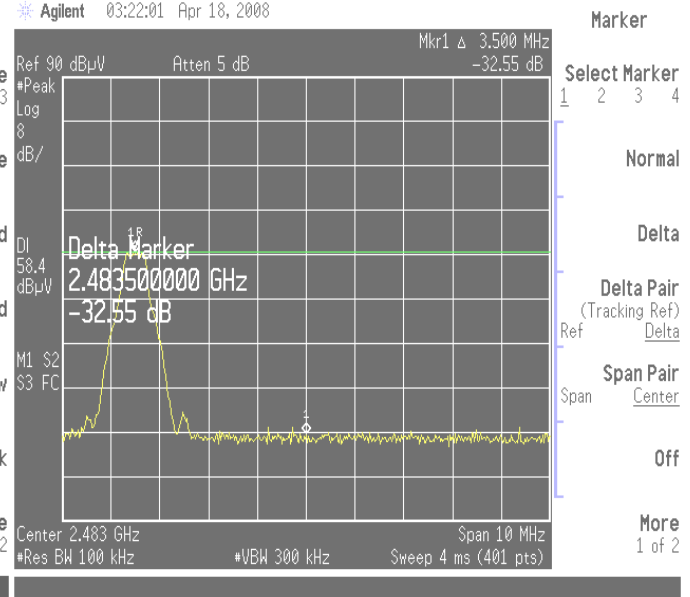


Figure 2-6: Band-Edge Compliance of RF Radiated Emission.
Bluetooth, Single freq., Static PBRs,
DH5, Channel 78, Pol: H, Detector: PK



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Author Data
M. Battler

Radiated Emissions Test Results cont'd

802.11b/g Band

Date of Test: March 07, 2008

Test Distance was 1.0 metre.

The corrected readings were adjusted to take into account the 3.0 to 1.0 metre distance factor.

The measurements were performed on channels 1, 6 and 11 for 802.11 b/g mode.

Type	Channel	Frequency (MHz)	Antenna		Reading (Peak) (dBuV)	Corrected Reading (dBuV)	Detector (AVE/PK)	Peak Limit (dBuV/m)	Diff. To Limit (dB)
			Type	Pol					
Handheld Standalone, USB side up									
Single frequency mode Low Channel									
2 nd	1	4824.0	Horn	V	38.65	37.6	PK	74.00	-36.40
2 nd	1	4824.0	Horn	H	37.58				
2 nd	1	4824.0	Horn	V	25.25	24.2	AVE	54.00	-29.80
2 nd	1	4824.0	Horn	H	NF				
The harmonics were investigated up to the 10 th harmonic. Emissions above the 2nd harmonic were in the NF.									
Single frequency mode Middle Channel									
2 nd	6	4874.0	Horn	V	41.56	40.70	PK	74.00	-33.30
2 nd	6	4874.0	Horn	H	38.81				
2 nd	6	4874.0	Horn	V	33.80	32.94	AVE	54.00	-21.06
2 nd	6	4874.0	Horn	H	28.38				
The harmonics were investigated up to the 10 th harmonic. Emissions above the 2nd harmonic were in the NF									
Single frequency mode High Channel									
2 nd	11	4924.00	Horn	V	41.27	40.73	PK	74.00	-33.27
2 nd	11	4924.00	Horn	H	37.92				
2 nd	11	4924.00	Horn	V	25.29	24.75	AVE	54.00	-29.25
2 nd	11	4924.00	Horn	H	24.04				
The harmonics were investigated up to the 10 th harmonic. Emissions above the 2nd harmonic were in the NF									

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

Date of Test: March 07, 2008

The test distance was 3 metres.

The measurements were performed on BlackBerry® smartphone standalone in vertical configuration on channel 1 for 802.11 b/g mode.

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.							
1	2412.0	Horn	V	PK	1.0 MHz	78.34	31.68	46.66	74.00	-27.34
1	2412.0	Horn	H	PK	1.0 MHz	82.59	35.44	47.15	74.00	-26.85
1	2412.0	Horn	V	AVE.	10 Hz	66.75	31.68	35.07	54.00	-18.93
1	2412.0	Horn	H	AVE.	10 Hz	72.13	35.44	36.69	54.00	-17.31

The measurements were performed on the BlackBerry® smartphone standalone in vertical position, on channel 11 for 802.11 b/g mode.

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.							
11	2462.0	Horn	V	PK	1.0 MHz	75.99	30.20	45.79	74.00	-28.21
11	2462.0	Horn	H	PK	1.0 MHz	81.93	29.83	52.10	74.00	-21.90
11	2462.0	Horn	V	AVE.	10 Hz	64.66	30.20	34.46	54.00	-19.54
11	2462.0	Horn	H	AVE.	10 Hz	70.92	29.83	41.09	54.00	-12.91

See figures 2-5 to 2-8 for the plots of the 802.11b/g band-edge compliance.

The environmental test conditions were:

Temperature	24°C
Pressure	1017 mb
Relative Humidity	22%

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Test Report No. RTS-0552-0803-02	Dates of Test March 07 – April 03, 2008	Author Data M. Battler

802.11b/g Band-Edge Compliance of RF Radiated Emissions cont'd

Figure 2-5: Band-Edge Compliance of RF Radiated Emission
802.11b/g, Channel 1, 2412 MHz, Max Pol: V,
Detector: PK

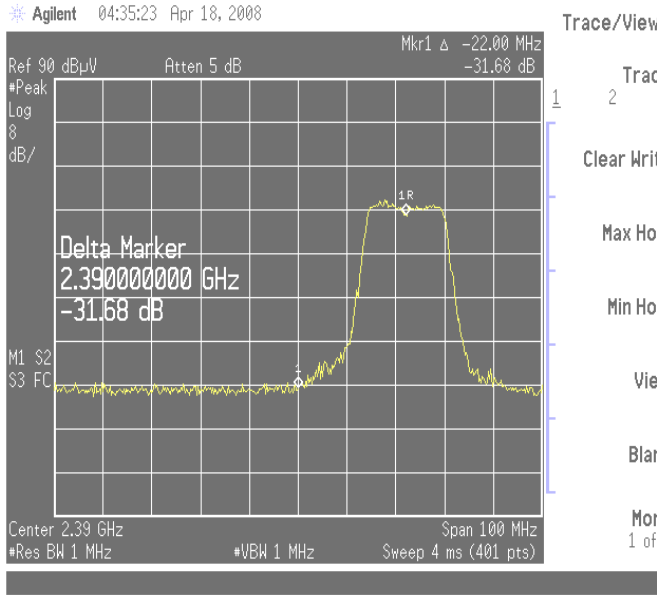


Figure 2-6: Band-Edge Compliance of RF Radiated Emission
802.11b/g, Channel 1, 2412 MHz, Max Pol: H,
Detector: PK

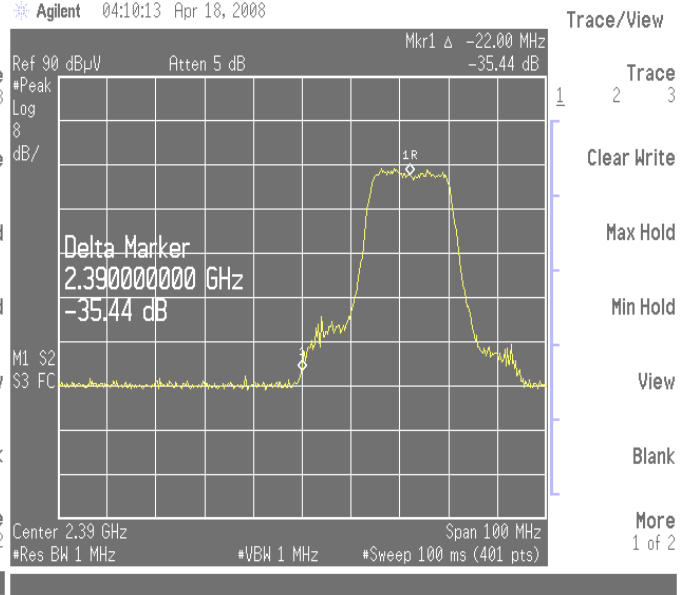


Figure 2-7: Band-Edge Compliance of RF Radiated Emission
802.11b/g, Channel 11, 2462 MHz, Max Pol: V,
Detector: PK

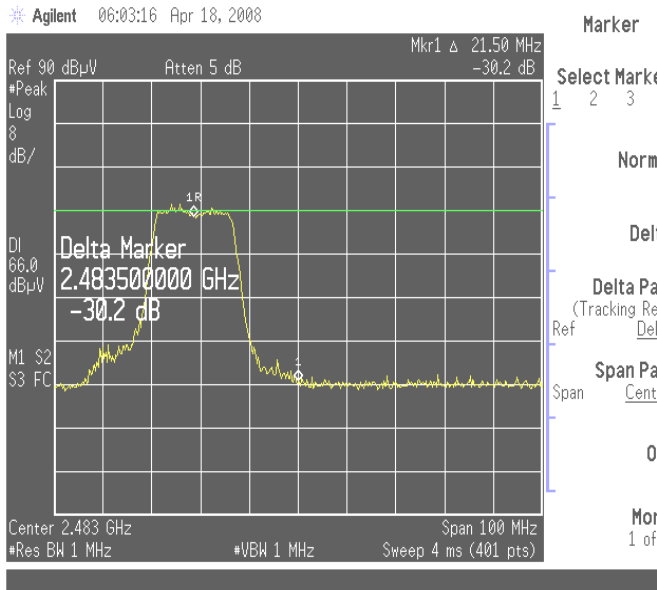
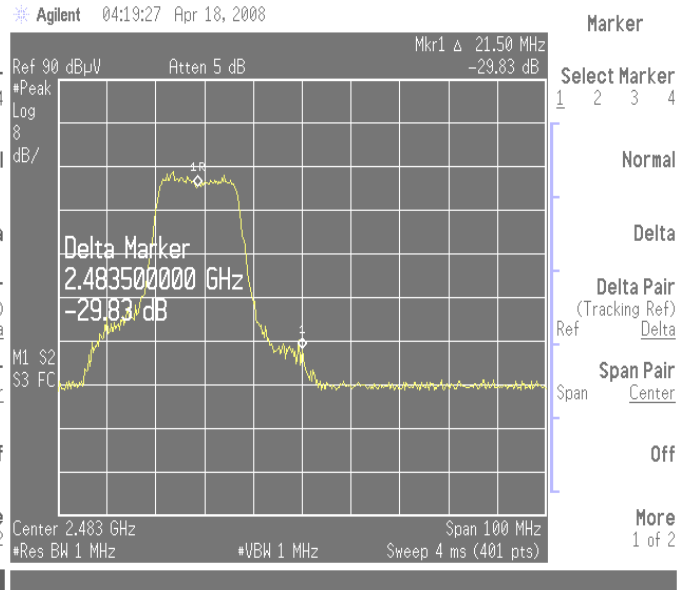


Figure 2-8: Band-Edge Compliance of RF Radiated Emission
802.11b/g, Channel 11, 2462 MHz, Max Pol: H,
Detector: PK



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Radiated Emissions Test Results

802.11a Band

The environmental test conditions were:

Temperature	23°C
Pressure	1021 mb
Relative Humidity	22%

Date of Test: March 24, 2008

Test Distance was 3.0 metres with a height of 0.8 metres, 30 MHz to 40 GHz.
The BlackBerry® smartphone PIN 206CE3F2 was in standalone, vertical position.

The measurements were performed on channels 36, 48, 52, 64, 149, and 161 for 802.11a Tx mode.

Frequency (MHz)	Antenna		Test Angle (Deg.)	Detector (PK or QP)	Measured Level (dBµV)	Correction Factor for preamp/antenna/ cables/ filter (dB/m)	Field Strength Level (reading+corr) (dBµV/m)	Limit @ 3.0 m (dB)	Test Margin (dB)
	Pol. (V/H)	Height (metres)							
11609.56	H	3.07	145	PK	39.12	16.71	55.83	68.20	-12.37
11609.63	V	2.76	291	PK	38.99	16.71	55.70	68.20	-12.50
11621.95	H	3.80	178	PK	38.59	16.73	55.32	68.20	-12.88
11621.61	V	2.52	50	PK	39.85	16.73	56.58	68.20	-11.62

All other emissions from 30 MHz to 40 GHz were in the NF.

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Test Report No. RTS-0552-0803-02	Dates of Test March 07 – April 03, 2008	Author Data M. Battler

802.11a Band-Edge Compliance of RF Radiated Emissions

The test distance was 3 metres.

The measurements were performed on the BlackBerry® smartphone standalone in vertical position on channel 36 for 802.11a mode. This is as per restricted bandedge.

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	1.0 MHz	85.87	33.18	52.69	74.00	-21.31
36	5180.0	Horn	H	PK	1.0 MHz	84.63	31.18	53.45	74.00	-20.55
36	5180.0	Horn	V	AVE.	10 Hz	76.17	33.18	42.99	54.00	-11.01
36	5180.0	Horn	H	AVE.	10 Hz	75.14	31.18	43.96	54.00	-10.04

The measurements were performed on the BlackBerry® smartphone standalone in vertical position on channel 64 for 802.11a mode. This is as per restricted bandedge.

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	1.0 MHz	87.40	33.74	53.66	74.00	-20.34
64	5320.0	Horn	H	PK	1.0 MHz	87.24	33.06	54.18	74.00	-19.82
64	5320.0	Horn	V	AVE.	10 Hz	78.06	33.74	44.32	54.00	-9.68
64	5320.0	Horn	H	AVE.	10 Hz	77.25	33.06	44.19	54.00	-9.81

The measurements were performed on the BlackBerry® smartphone standalone in vertical position on channel 149 for 802.11a mode. This is as per 15.247 (-20dBc limit).

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	1.0 MHz	84.95	27.81	27.81	69.80	-41.99
149	5745.0	Horn	H	PK	1.0 MHz	88.03	29.36	29.36	64.80	-35.44
149	5745.0	Horn	V	AVE.	10 Hz	75.35	27.81	27.81	52.90	-25.09
149	5745.0	Horn	H	AVE.	10 Hz	78.01	29.36	29.36	54.90	-25.54

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

BlackBerry® smartphone standalone, vertical, the measurements were performed on channel 161 for 802.11a mode. This is as per 15.247 (-20dBc limit).

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	1.0 MHz	85.33	28.69	28.69	69.10	-40.41
161	5805.0	Horn	H	PK	1.0 MHz	84.73	30.50	30.50	71.10	-40.60
161	5805.0	Horn	V	AVE.	10 Hz	75.72	28.69	28.69	52.20	-23.51
161	5805.0	Horn	H	AVE.	10 Hz	75.38	30.50	30.50	54.40	-23.90

See figures 2-9 to 2-16 for the plots of the 802.11a band-edge compliance.

The environmental test conditions were:

Temperature	24°C
Pressure	1017 mb
Humidity	22%

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

Figure 2-9: Band-Edge Compliance of RF Radiated Emission
802.11a, Channel 36, 5180 MHz
Pol: V, Detector: PK

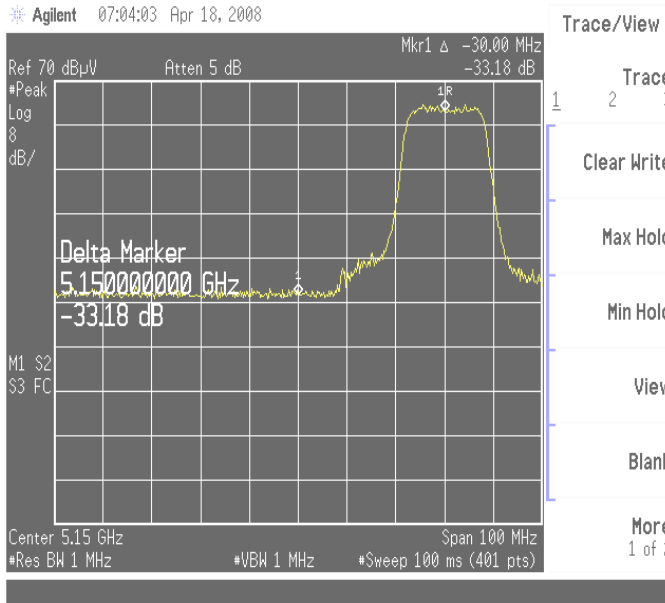


Figure 2-10: Band-Edge Compliance of RF Radiated Emission
802.11a, Channel 36, 5180 MHz
Pol: H, Detector: PK

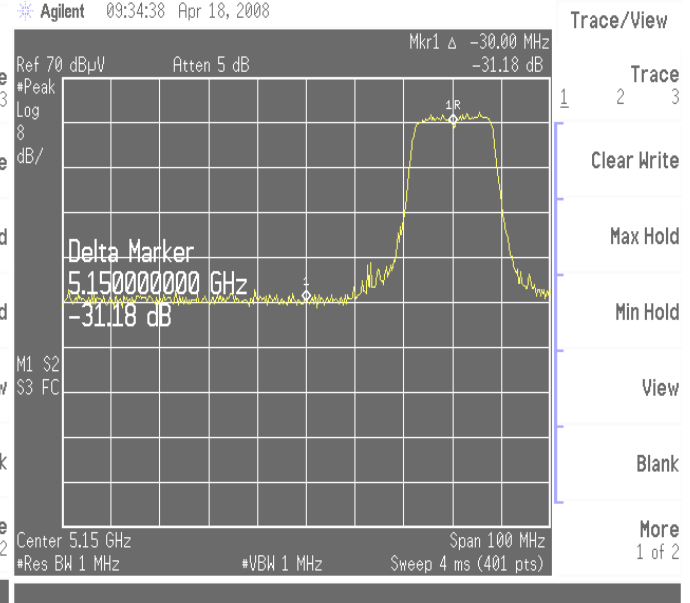


Figure 2-11: Band-Edge Compliance of RF Radiated Emission
802.11a, Channel 64, 5320 MHz
Pol: V, Detector: PK

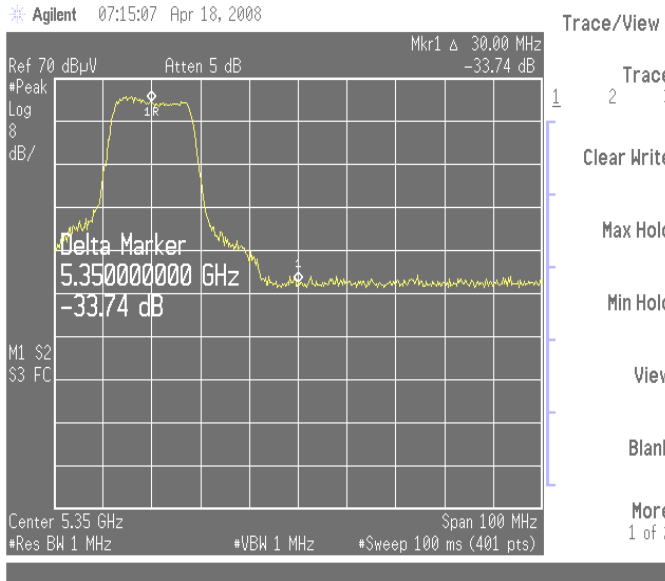
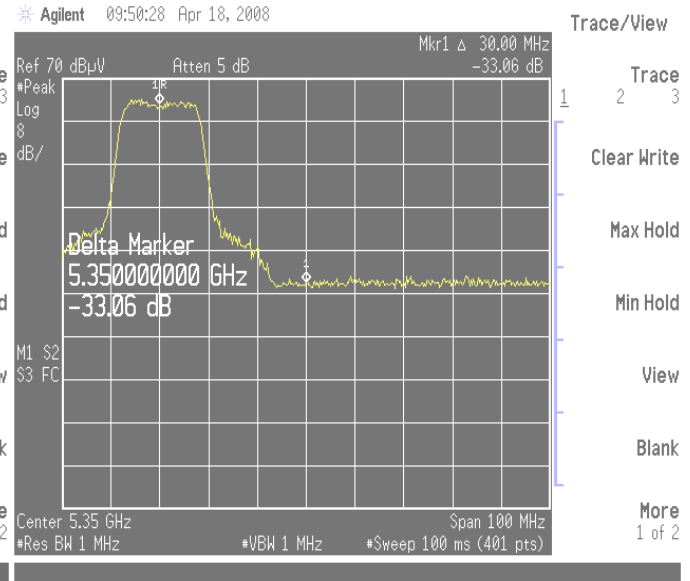


Figure 2-12: Band-Edge Compliance of RF Radiated Emission
802.11a, Channel 64, 5320 MHz
Pol: H, Detector: PK



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

Figure 2-13: Band-Edge Compliance of RF Radiated Emission
802.11a, Channel 149, 5745 MHz
Pol: V, Detector: PK

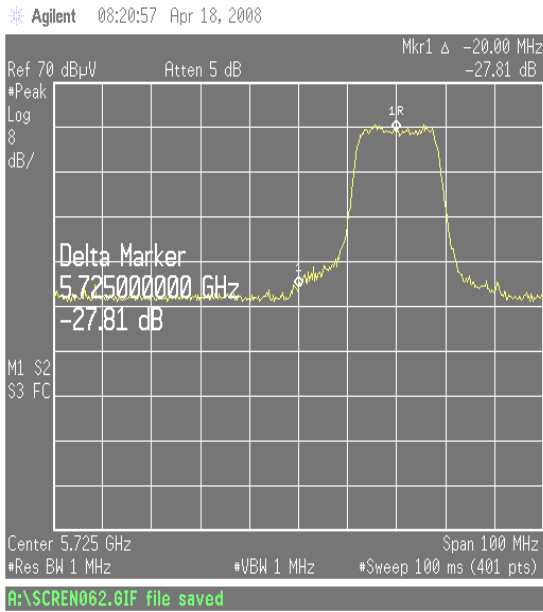


Figure 2-14: Band-Edge Compliance of RF Radiated Emission.
802.11a, Channel 149, 5745 MHz
Pol: H, Detector: PK

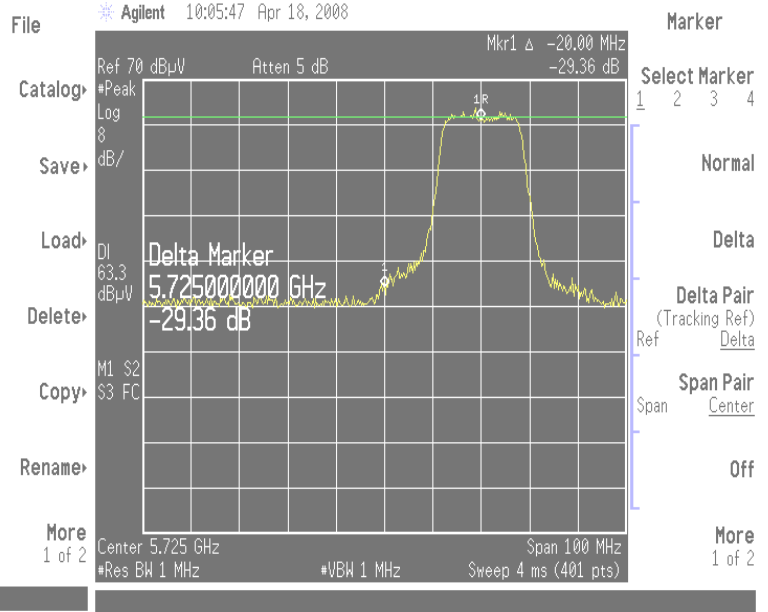


Figure 2-15: Band-Edge Compliance of RF Radiated Emission.
802.11a, Channel 161, 5805 MHz
Pol: V, Detector: PK

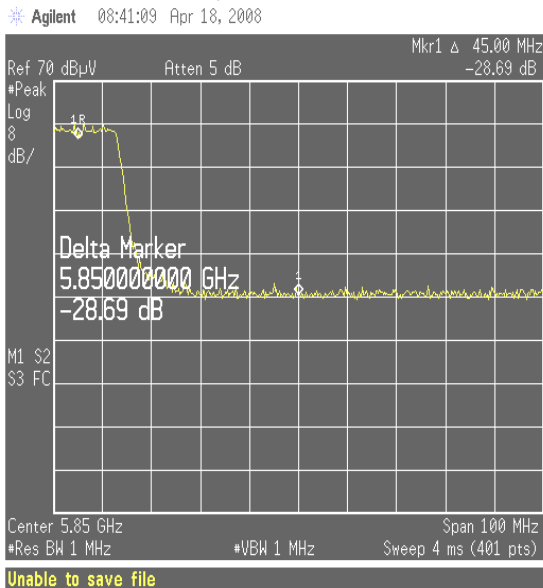
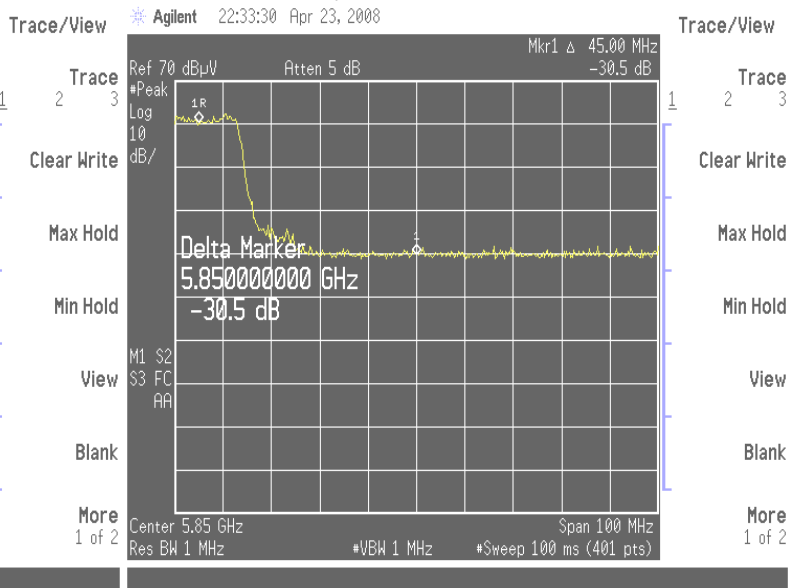


Figure 2-16: Band-Edge Compliance of RF Radiated Emission.
802.11a, Channel 161, 5805 MHz
Pol: H, Detector: PK



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802.11a Unwanted Spurious RF Radiated Emissions

The test distance was 3 metres.

The measurements were performed on the BlackBerry® smartphone standalone in vertical position on channel 48 for 802.11a mode. This is as per 15.407, Power Spectral density (limit -27 dBm/MHz).

Channel	Freq. (MHz)	Rx Antenna		Detector (PK, AVE.)	VBW (MHz)	Power Spectral Density Reading (dBm/Hz)	Corrected Reading (dBm/MHz)	Limit (dBm/MHz)	Diff. To Limit (dB)
		Type	POL.						
48	5240.0	Horn	V	PK	1.0 MHz	-66.2	-61.1	-27.0	-34.1

The measurements were performed on the BlackBerry® smartphone standalone in vertical position on channel 52 for 802.11a mode.

This is as per 15.407, Power Spectral density (limit -27 dBm/MHz).

Channel	Freq. (MHz)	Rx Antenna		Detector (PK, AVE.)	VBW (MHz)	Power Spectral Density Reading (dBm/Hz)	Corrected Reading (dBm/MHz)	Limit (dBm/MHz)	Diff. To Limit (dB)
		Type	POL.						
52	5260.0	Horn	V	PK	1.0 MHz	-61.5	-56.4	-27.0	-29.4

See figures 2-29 to 2-30 for the plots of the 802.11a unwanted spurious RF radiated emissions.

The environmental test conditions were:

Temperature	23°C
Pressure	1050 mb
Humidity	25%

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802.11a Unwanted Spurious RF Radiated Emissions cont'd

Figure 3-29 : Unwanted Spurious RF Radiated Emissions.

802.11a, Channel 48, 5240 MHz
Pol: V, Detector: PK

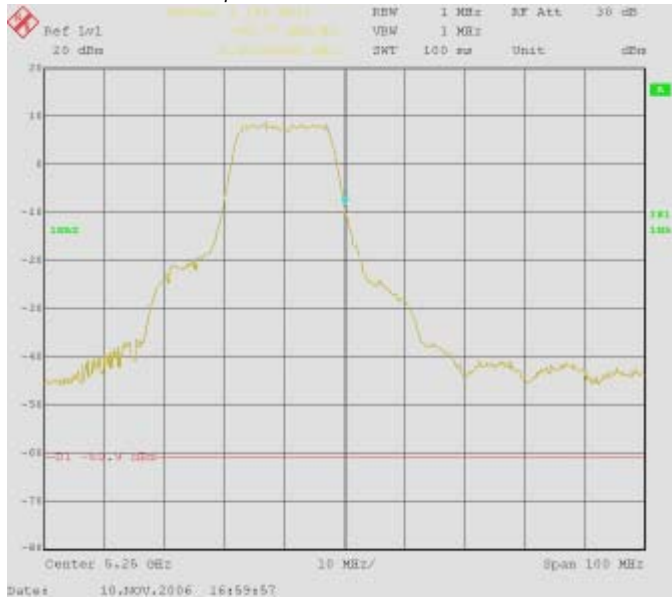
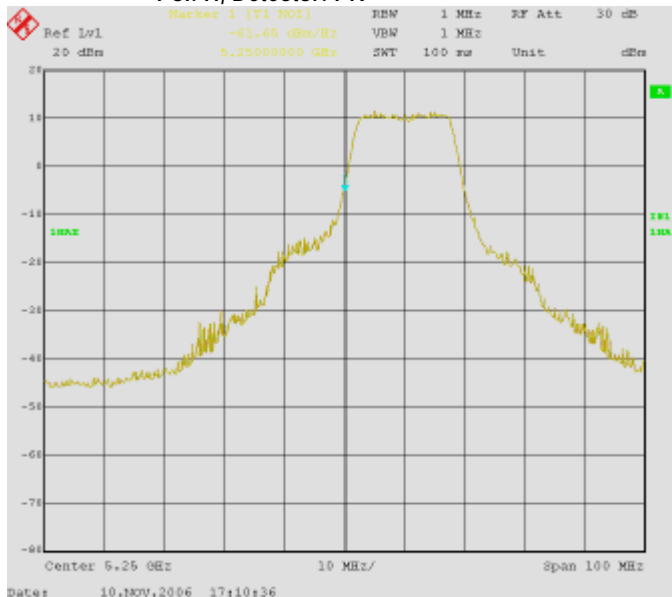


Figure 2-30 : Unwanted Spurious RF Radiated Emissions.

802.11a, Channel 52, 5260 MHz
Pol: H, Detector: PK



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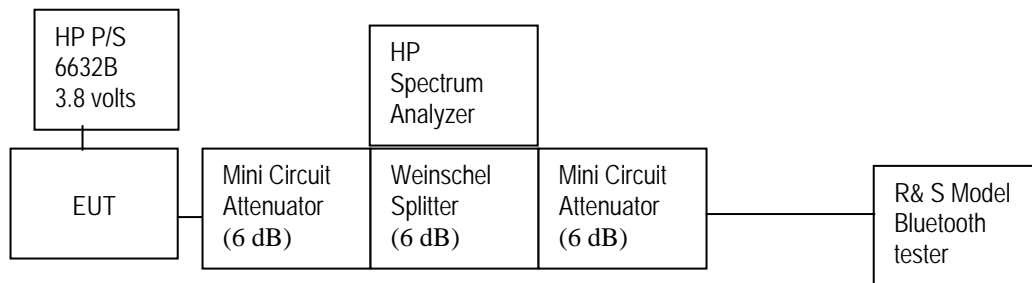
APPENDIX 3 – BLUETOOTH CONDUCTED EMISSIONS TEST DATA/PLOTS

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Bluetooth RF Conducted Emission Test Results

Bluetooth power output was at maximum for all the recorded measurements shown below. The measurements were performed by Maurice Battler.
Date of test: March 10, 2008

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 measurements were performed by Maurice Battler.

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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 PRBS" and packet type "DH5" during the measurements.

Bluetooth Channel	Limit (MHz)	Measured Level (MHz)
0	<=1.0	0.783
39	<=1.0	0.763
78	<=1.0	0.783

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

The environmental test conditions were:

Temperature	24°C
Pressure	1023 mb
Relative Humidity	21%

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Bluetooth RF Conducted Emission Test Results cont'd

Figure 3-1: 20 dB Bandwidth

Single freq., Static PBRs, DH5

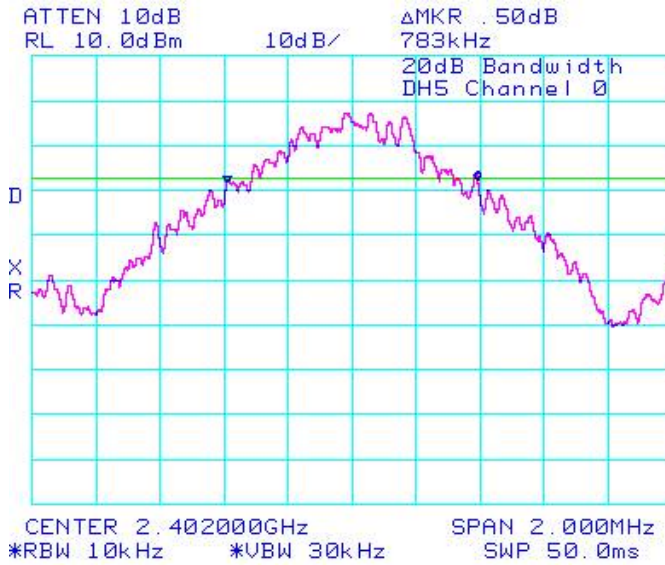


Figure 3-2: 20 dB Bandwidth

Single freq., Static PBRs, DH5

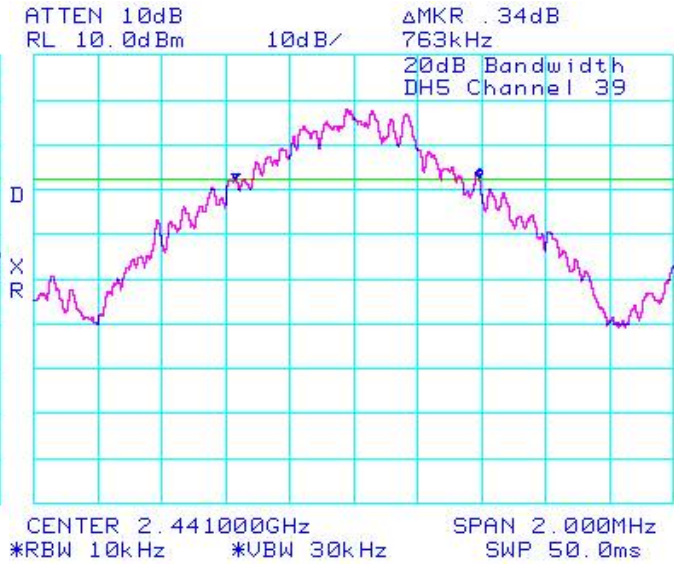
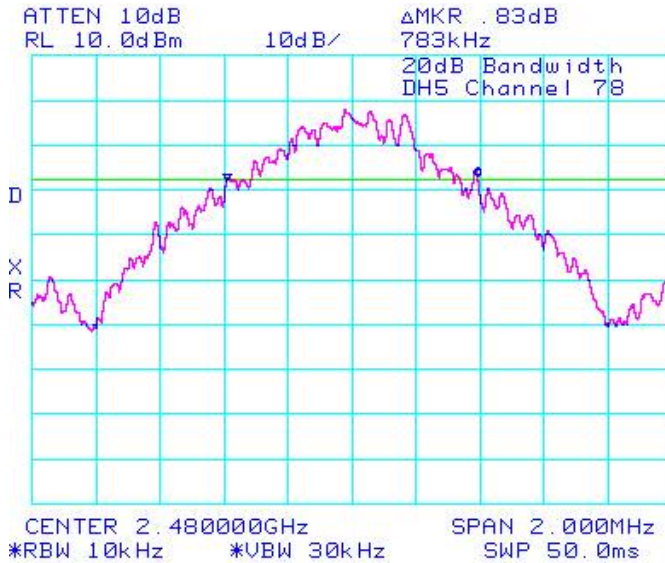


Figure 3-3: 20 dB Bandwidth

Single freq., Static PBRs, DH5



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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 PRBS” and packet type “DH5” during the measurements.

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

The environmental test conditions were:

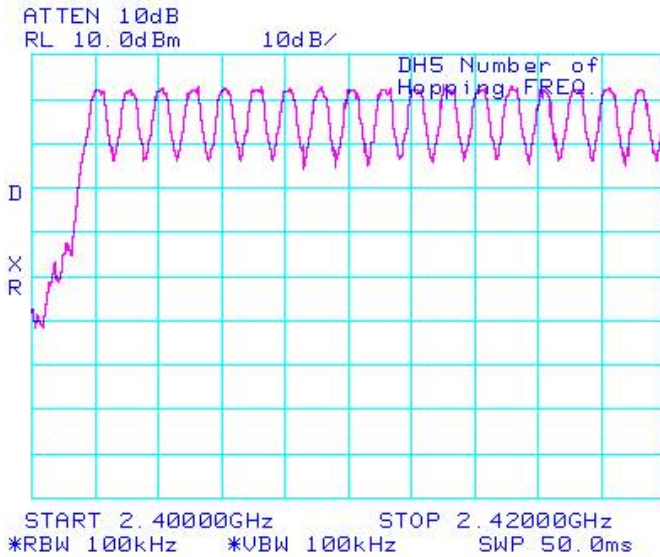
Temperature	24°C
Pressure	1023 mb
Relative Humidity	21%

See figures 3-6 to 3-9 for the plots of the number of hopping frequencies.

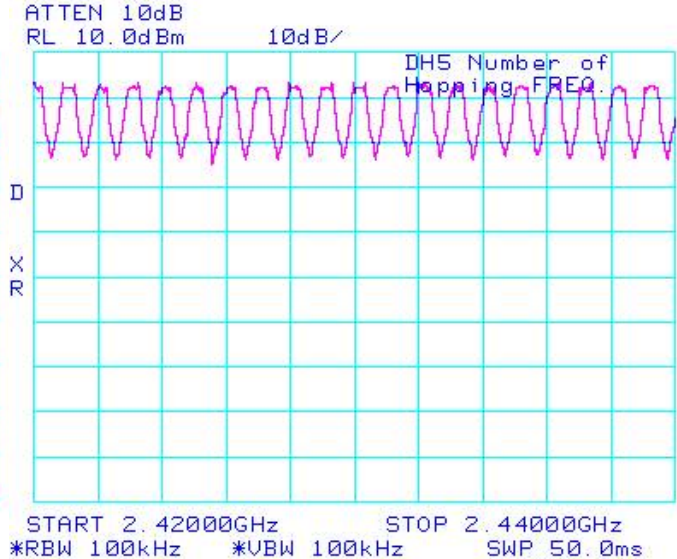
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Bluetooth RF Conducted Emission Test Results cont'd

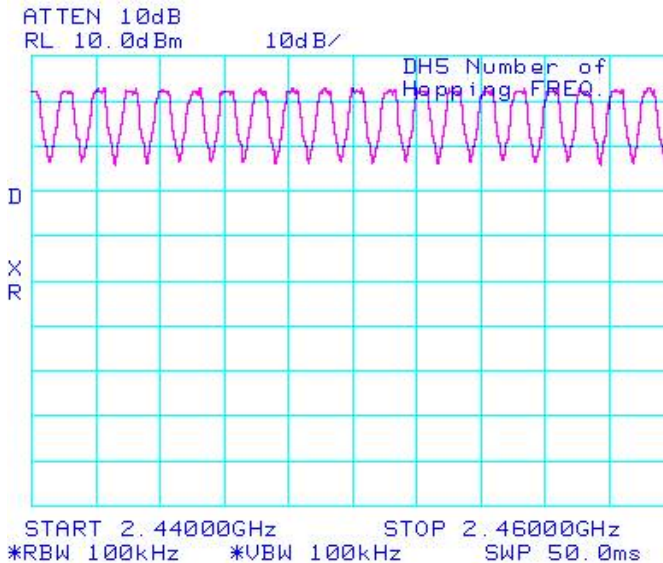
**Figure 3-6: Number of Hopping Frequencies
Static PBRs, DH5**



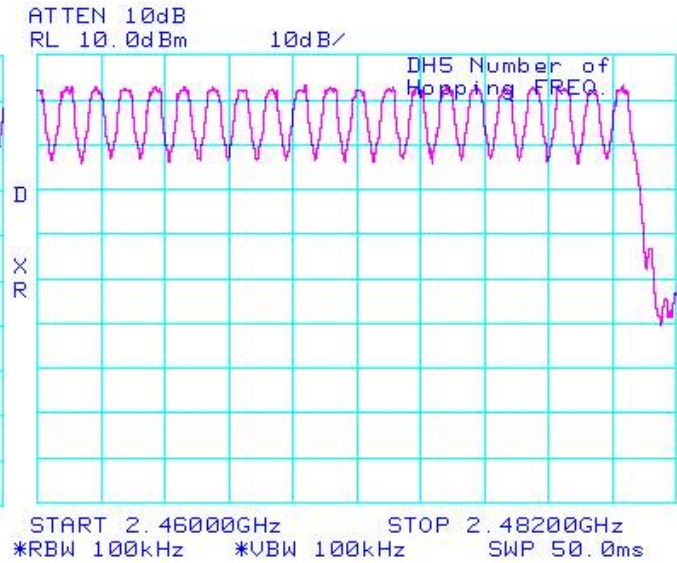
**Figure 3-7: Number of Hopping Frequencies
Static PBRs, DH5**



**Figure 3-8: Number of Hopping Frequencies
Static PBRs, DH5**



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



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Bluetooth RF Conducted Emission Test Results cont'd

Figure 3-10: Time of Occupancy (Dwell Time)
Freq. Hopping, Static PBRs, DH1

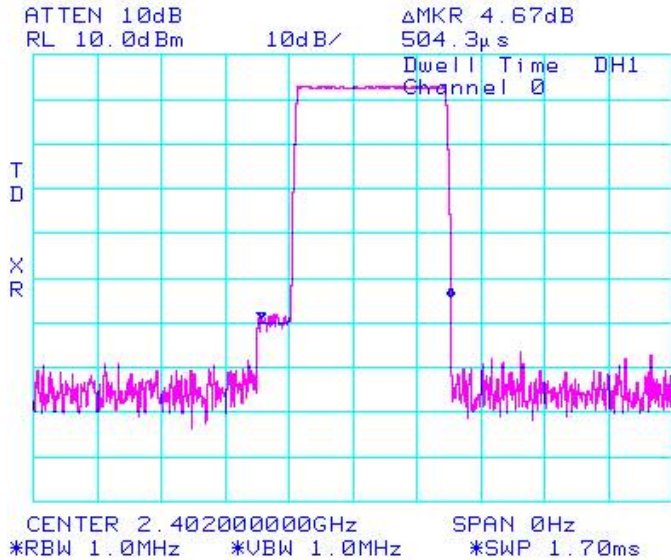


Figure 3-11: Time of Occupancy (Dwell Time)
Freq. Hopping, Static PBRs, DH1

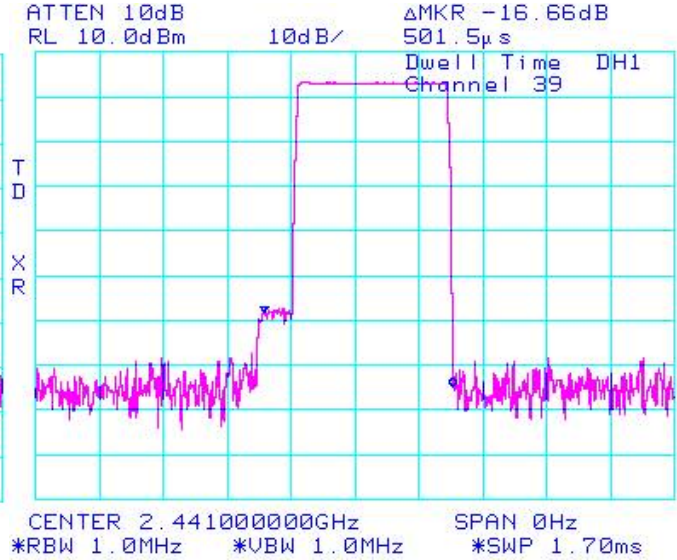


Figure 3-12: Time of Occupancy (Dwell Time)
Freq. Hopping, Static PBRs, DH1

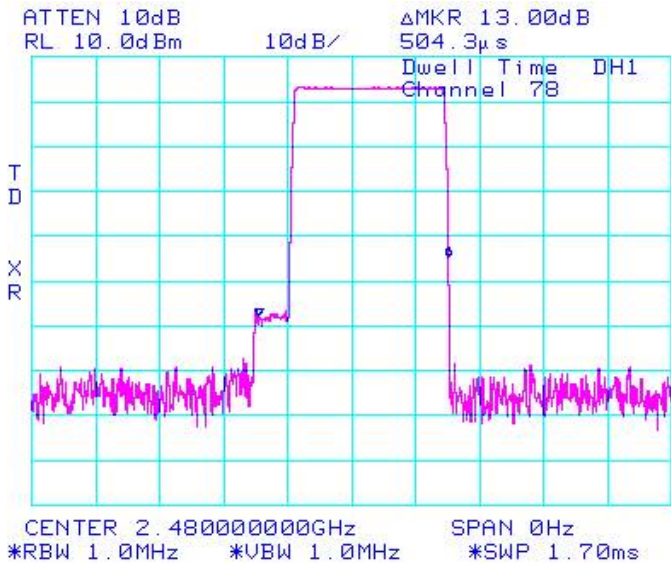
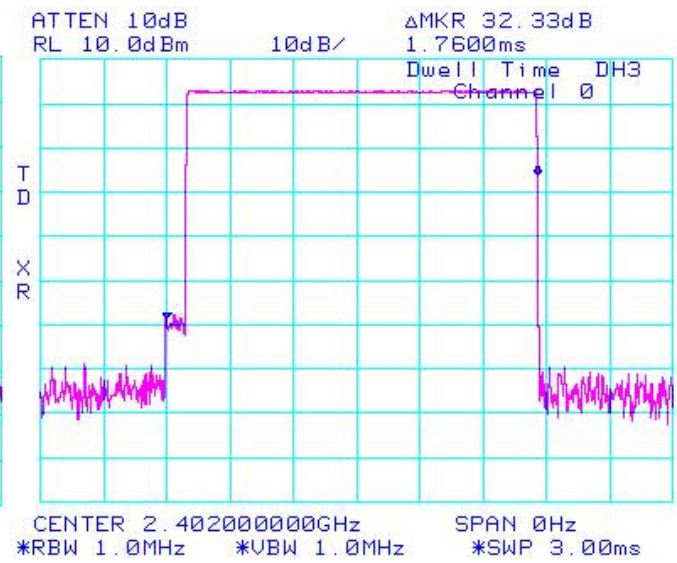


Figure 3-13: Time of Occupancy (Dwell Time)
Freq. Hopping, Static PBRs, DH3



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Bluetooth RF Conducted Emission Test Results cont'd

Figure 3-14: Time of Occupancy (Dwell Time)
Freq. Hopping, Static PBRs, DH3

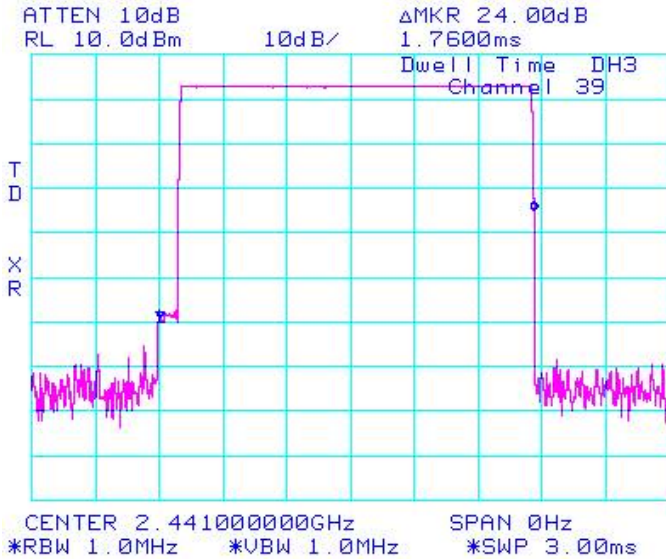


Figure 3-5 : Time of Occupancy (Dwell Time)
Freq. Hopping, Static PBRs, DH3

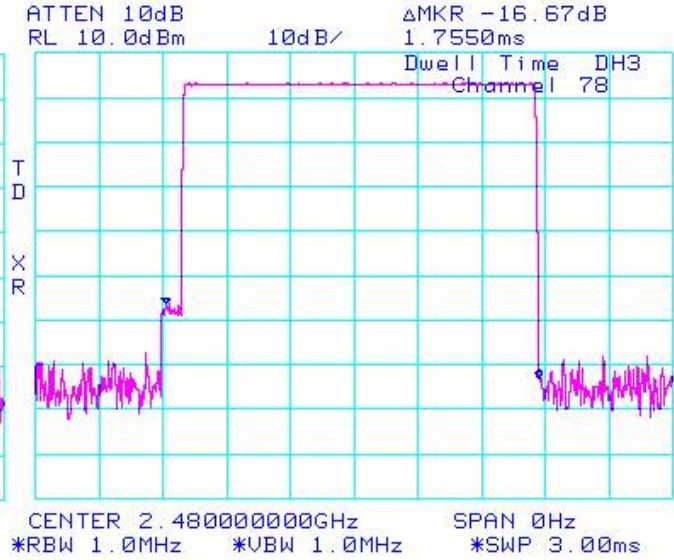


Figure 3-16: Time of Occupancy (Dwell Time)
Freq. Hopping, Static PBRs, DH5

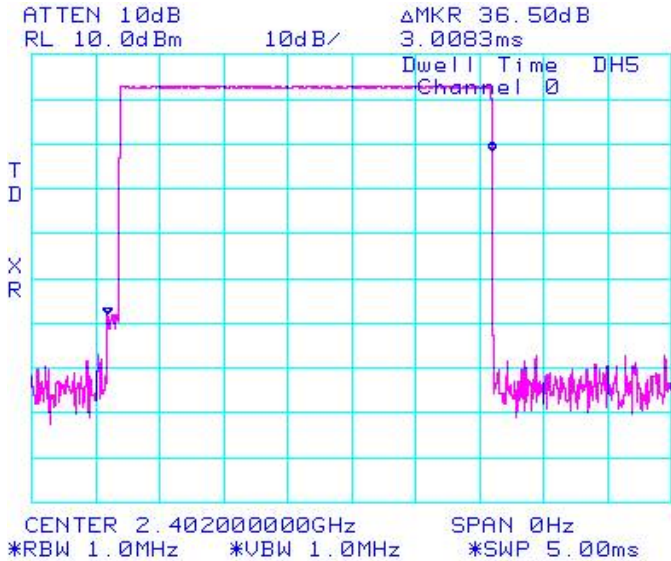
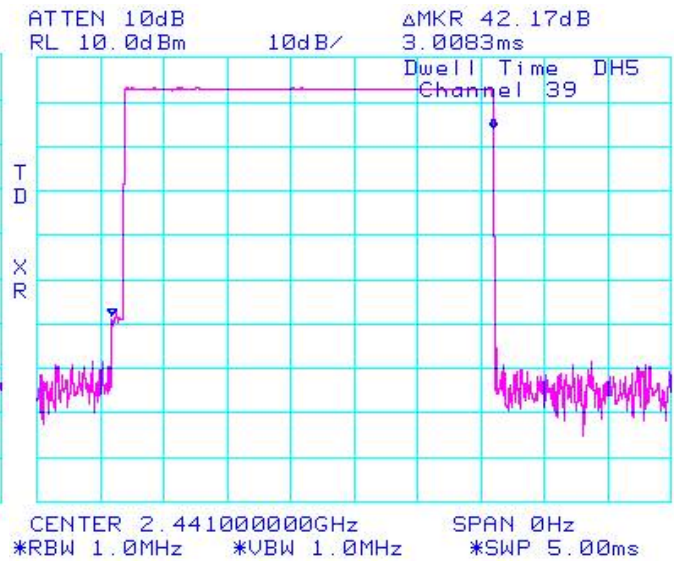


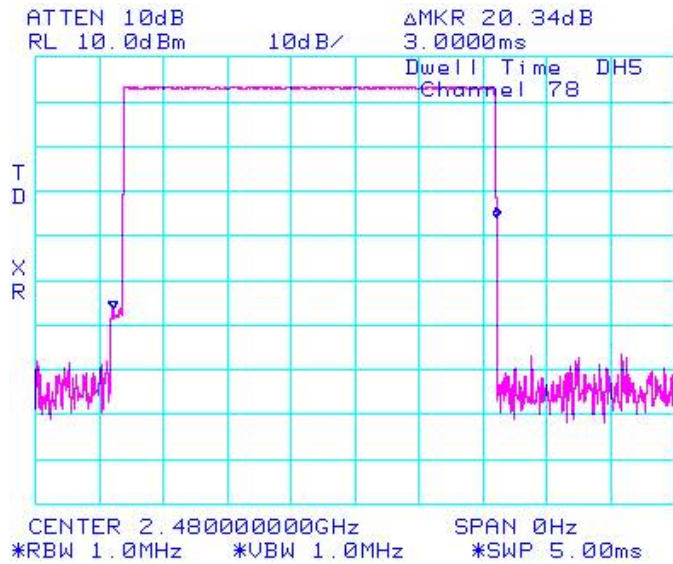
Figure 3-17: Time of Occupancy (Dwell Time)
Freq. Hopping, Static PBRs, DH5



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Bluetooth RF Conducted Emission Test Results cont'd

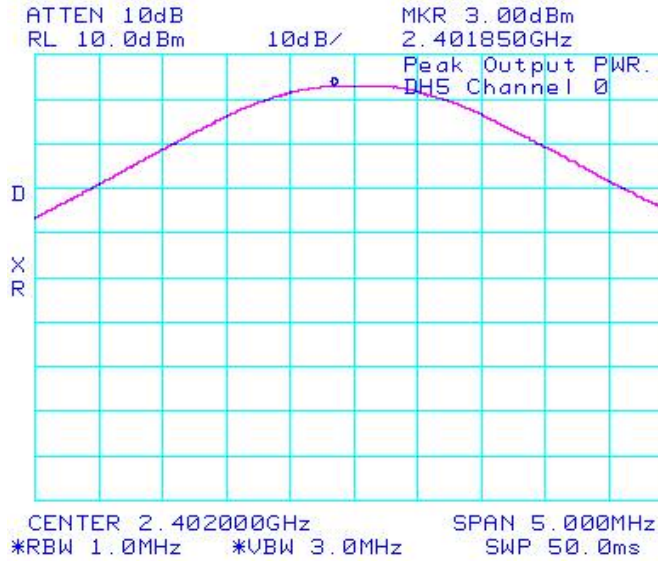
Figure 3-18: Time of Occupancy (Dwell Time)
Freq. Hopping, Static PBRs, DH5



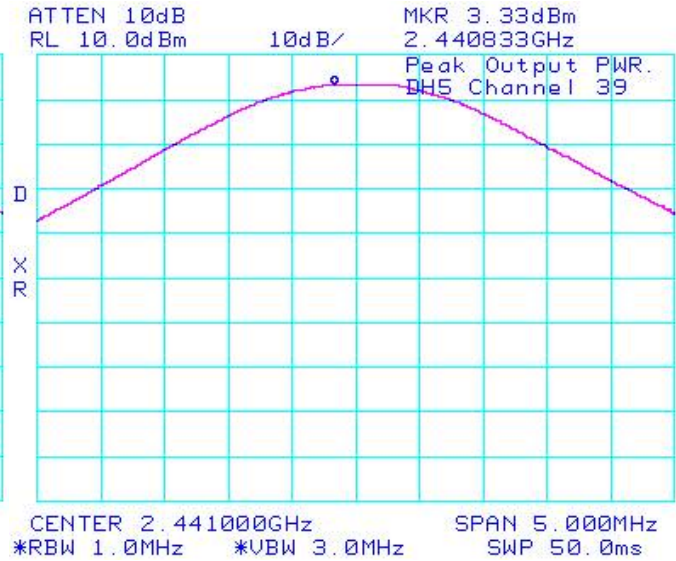
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Bluetooth RF Conducted Emission Test Results cont'd

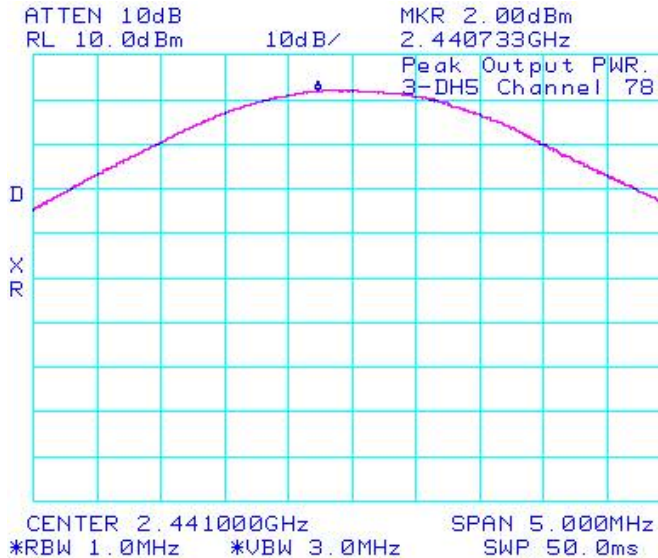
**Figure 3-19: Max. Peak Conducted Output Power
Single Freq., Static PBRS, DH5**



**Figure 3-20: Max. Peak Conducted Output Power
Single Freq., Static PBRS, DH5**



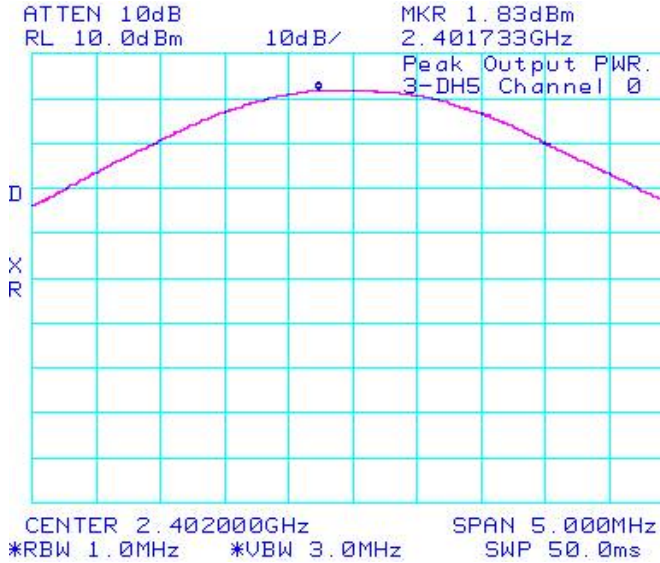
**Figure 3-21: Max. Peak Conducted Output Power
Single Freq., Static PBRS, DH5**



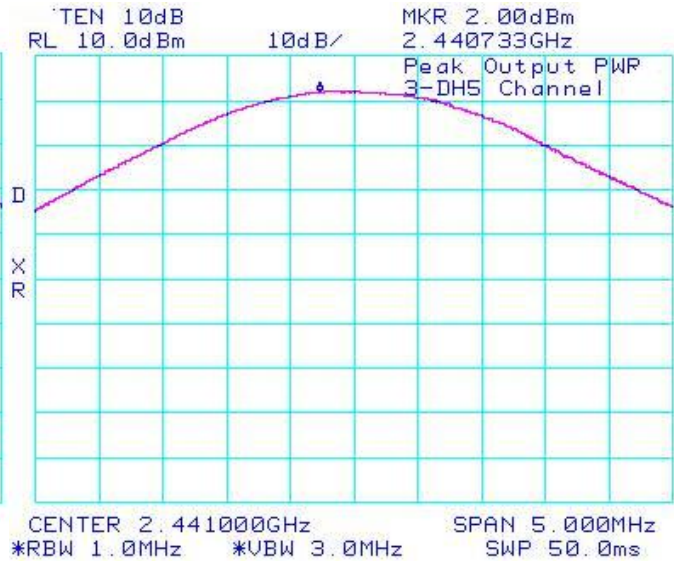
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Bluetooth RF Conducted Emission Test Results cont'd

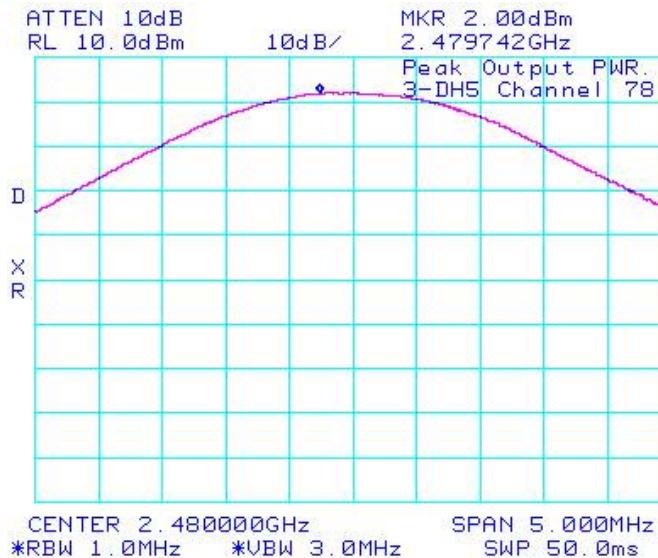
**Figure 3-22: Max. Peak Conducted Output Power
Single Freq., Static PBRS, 3-DH5**



**Figure 3-23: Max. Peak Conducted Output Power
Single Freq., Static PBRS, 3-DH5**



**Figure 3-24: Max. Peak Conducted Output Power
Single Freq., Static PBRS, 3-DH5**



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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 PRBS” and packet type “DH5” during the measurements.

Bluetooth Channel	Operating Mode	Measured Level (dBc)	Limit (dBc)	Margin (dB)
0	Single Frequency	-34.00	-20	-14.00
78	Single Frequency	-35.50	-20	-15.50
0 - 78	Hopping	-35.17	-20	-15.17
0 - 78	Hopping	-35.67	-20	-15.67

The environmental test conditions were:

Temperature	24°C
Pressure	1023 mb
Relative Humidity	21%

See figures 3-25 to 3-28 for the plots of the band edge compliance measurements.

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Bluetooth RF Conducted Emission Test Results cont'd

Figure 3-25: Band Edge Compliance

Single Freq., Static PBRS, DH5

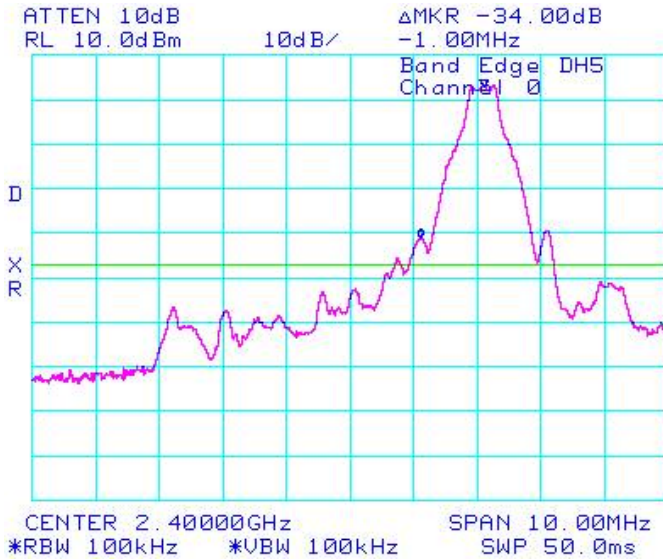


Figure 3-26: Band Edge Compliance

Single Freq., Static PBRS, DH5

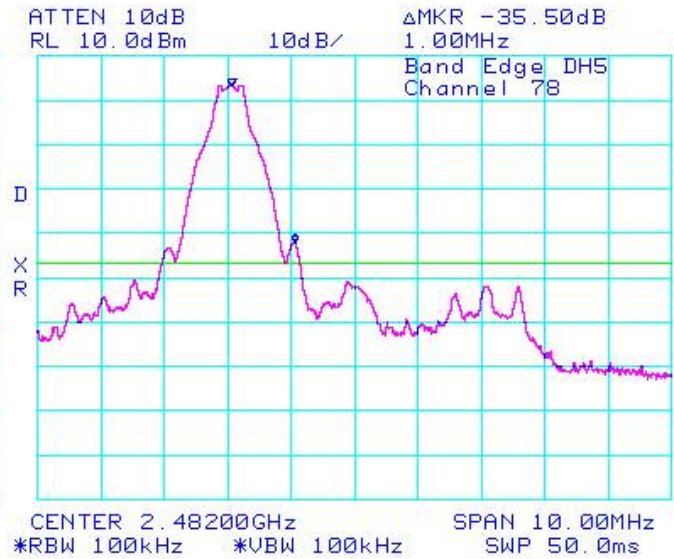


Figure 3-27: Band Edge Compliance

Freq. Hopping, Static PBRS, DH5

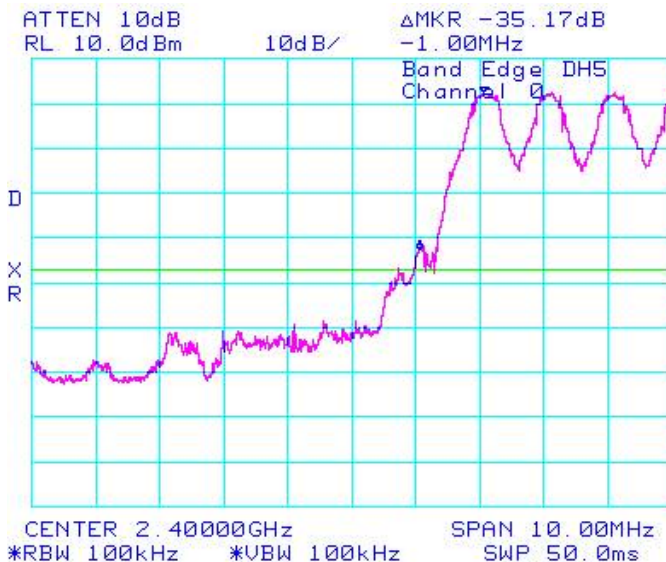
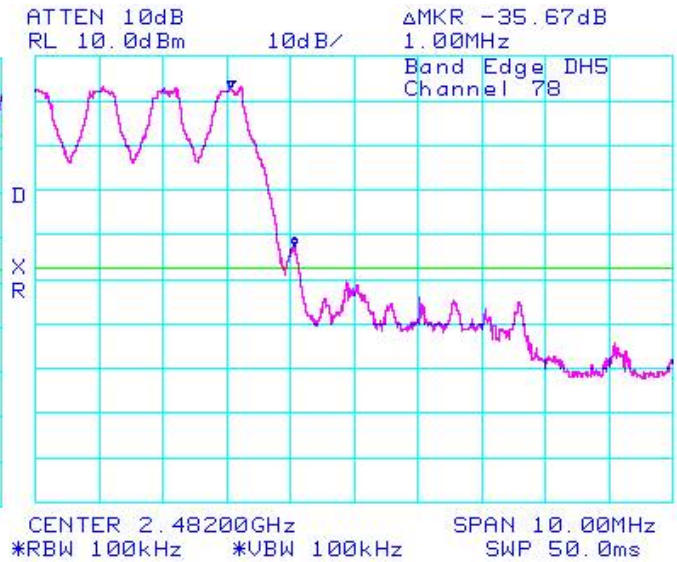


Figure 3-28: Band Edge Compliance

Freq. Hopping, Static PBRS, DH5



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Bluetooth RF Conducted Emission Test Results cont'd

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

Bluetooth Channel	Operating Mode	Measured Level (dBc)	Limit (dBc)	Margin (dB)
0	Single Frequency	-31.50	-20	-11.50
78	Single Frequency	-31.00	-20	-11.00
0 - 78	Hopping	-34.50	-20	-14.50
0 - 78	Hopping	-30.66	-20	-10.66

The environmental test conditions were:

Temperature	24°C
Pressure	1023 mb
Relative Humidity	21%

See figures 3-29 to 3-32 for the plots of the band edge compliance measurements.

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Bluetooth RF Conducted Emission Test Results cont'd

Figure 3-29: Band Edge Compliance

Single Freq., Static PBRs, 3-DH5

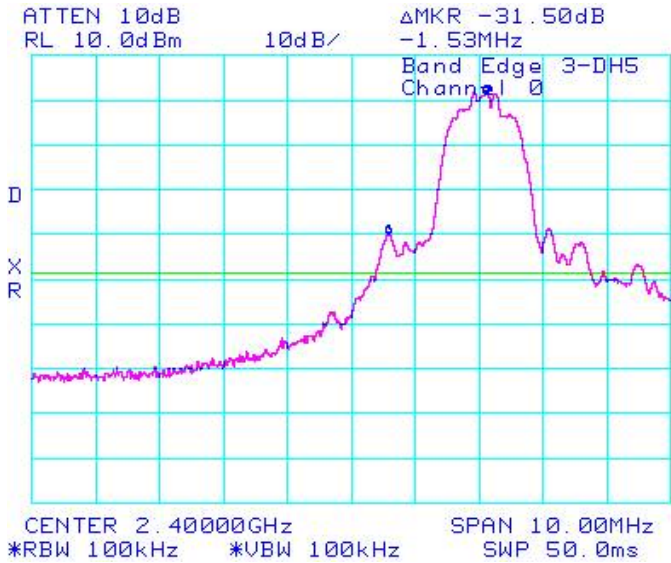


Figure 3-30: Band Edge Compliance

Single Freq., Static PBRs, 3-DH5

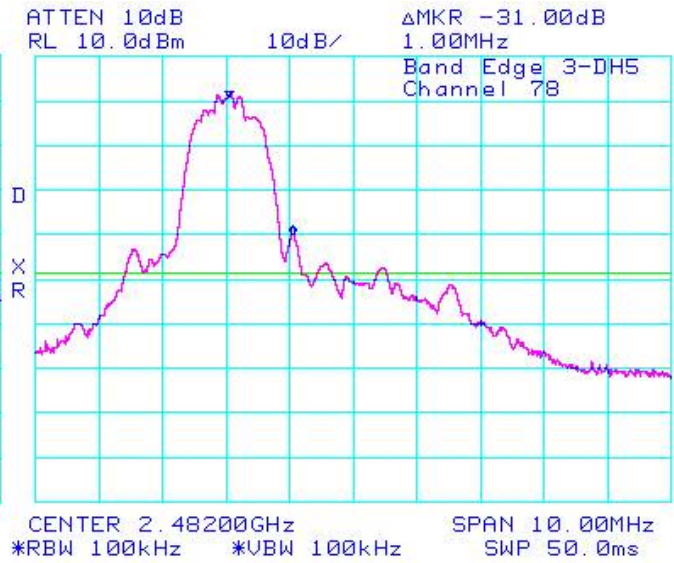


Figure 3-31: Band Edge Compliance

Freq. Hopping, Static PBRs, 3-DH5

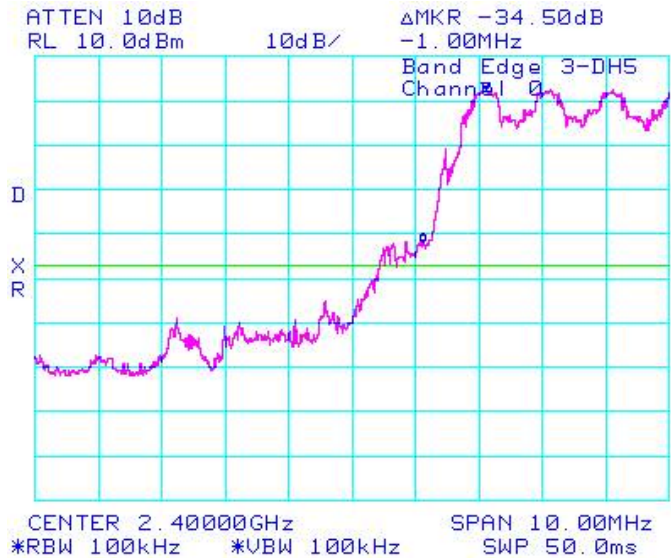


Figure 3-32: Band Edge Compliance

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 PRBS" 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	3.00	-46.50	-49.50	-20
39	3.33	-46.50	-49.83	-20
78	3.33	-46.33	-49.66	-20
Hopping mode	3.00	-45.83	-48.83	-20

The emissions were in the noise floor.

The environmental test conditions were:

Temperature	24°C
Pressure	1023 mb
Relative Humidity	21%

See figures 2-33 to 2-36 for the plots of the spurious RF conducted emissions.

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Bluetooth RF Conducted Emission Test Results cont'd

Figure 2-33: Spurious RF Conducted Emissions
Single Freq., Static PBRS, DH5,

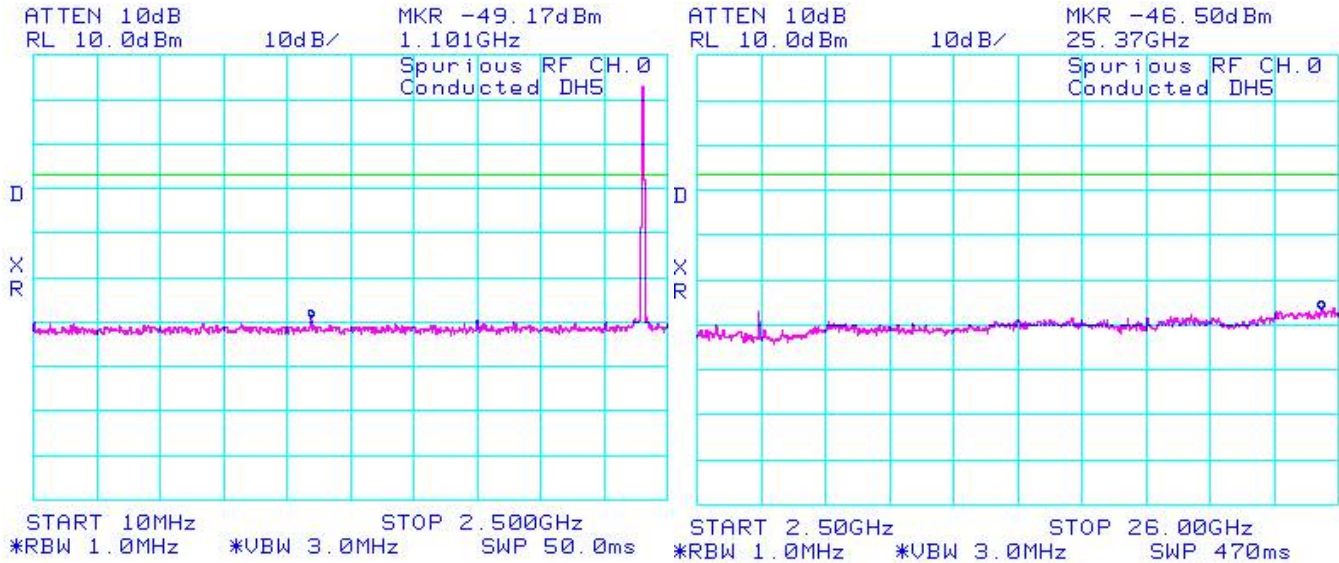
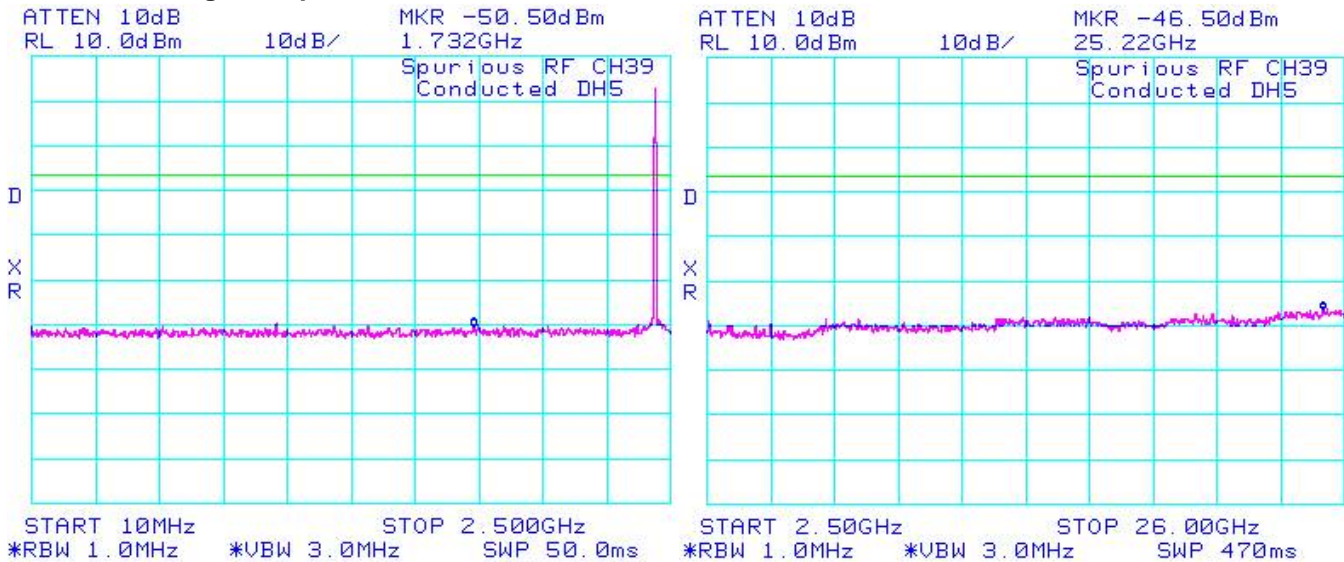


Figure 2-34: Spurious RF Conducted Emissions
Single Freq., Static PBRS, DH5



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Bluetooth RF Conducted Emission Test Results cont'd

Figure 2-35: Spurious RF Conducted Emissions
Single Freq., Static PBRS, DH5

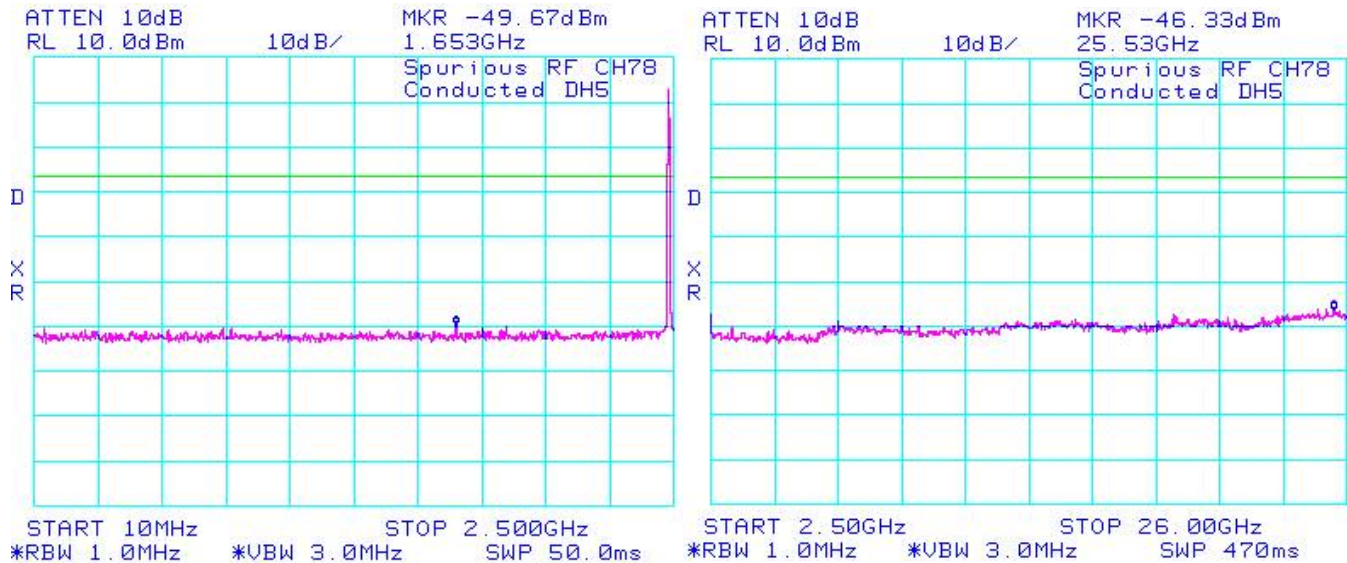
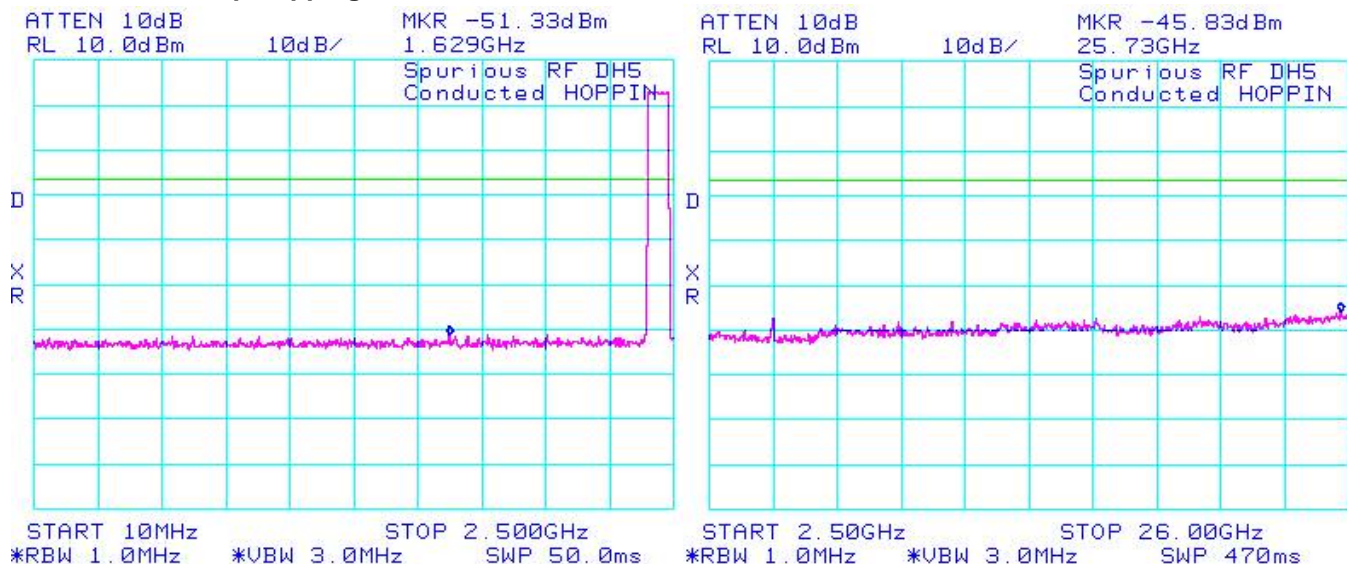


Figure 2-36: Spurious RF Conducted Emissions
Freq. Hopping, Static PBRS, DH5



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Bluetooth RF Conducted Emission Test Results cont'd

Using pattern type “Static PRBS” 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	1.83	-46.17	-48.00	-20
39	2.00	-45.83	47.83	-20
78	2.00	-46.50	-48.50	-20
Hopping mode	1.83	-46.33	-48.16	-20

The emissions were in the noise floor.

The environmental test conditions were: Temperature 25°C
 Pressure 1023 mb
 Relative Humidity 21%

See figures 3-37 to 3-40 for the plots of the spurious RF conducted emissions.

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Bluetooth RF Conducted Emission Test Results cont'd

Figure 3-37 : Spurious RF Conducted Emissions
Single Freq., Static PBRS, 3-DH5

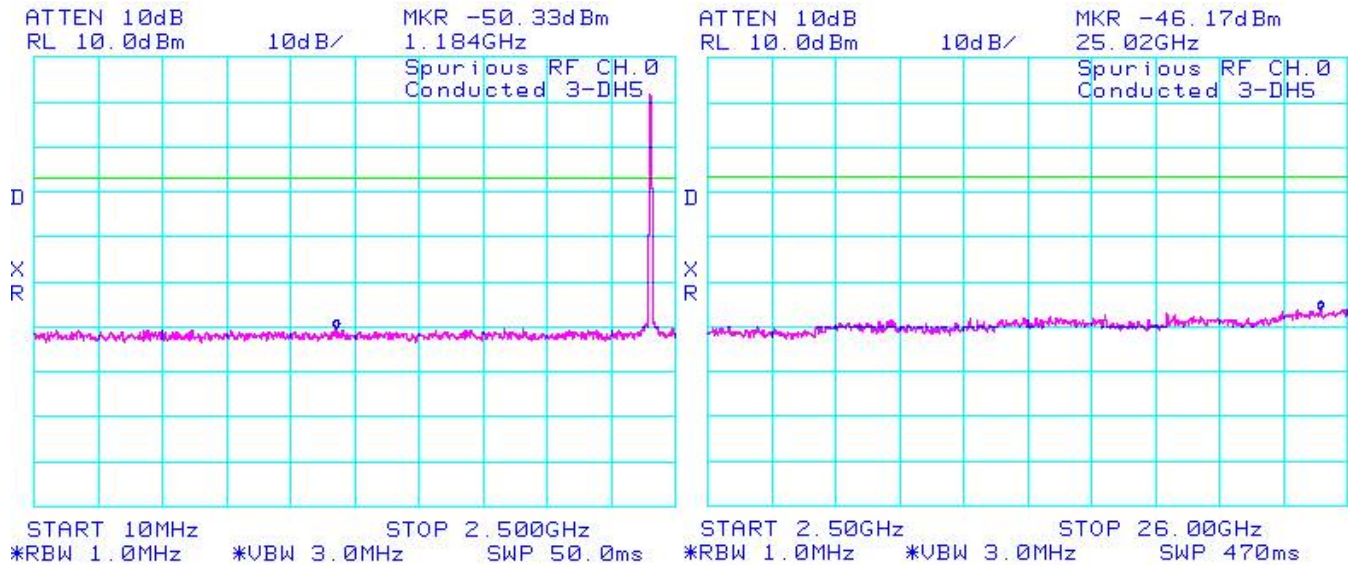
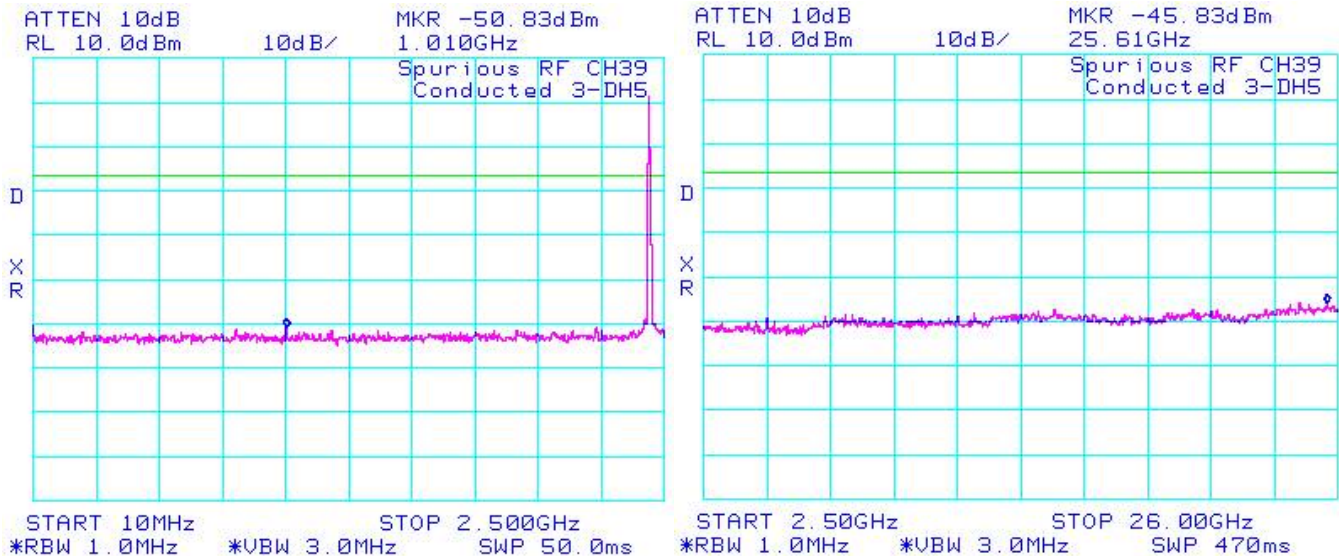


Figure 3-38: Spurious RF Conducted Emissions
Single Freq., Static PBRS, 3-DH5



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Bluetooth RF Conducted Emission Test Results cont'd

Figure 3-39: Spurious RF Conducted Emissions
Single Freq., Static PBRs, 3-DH5

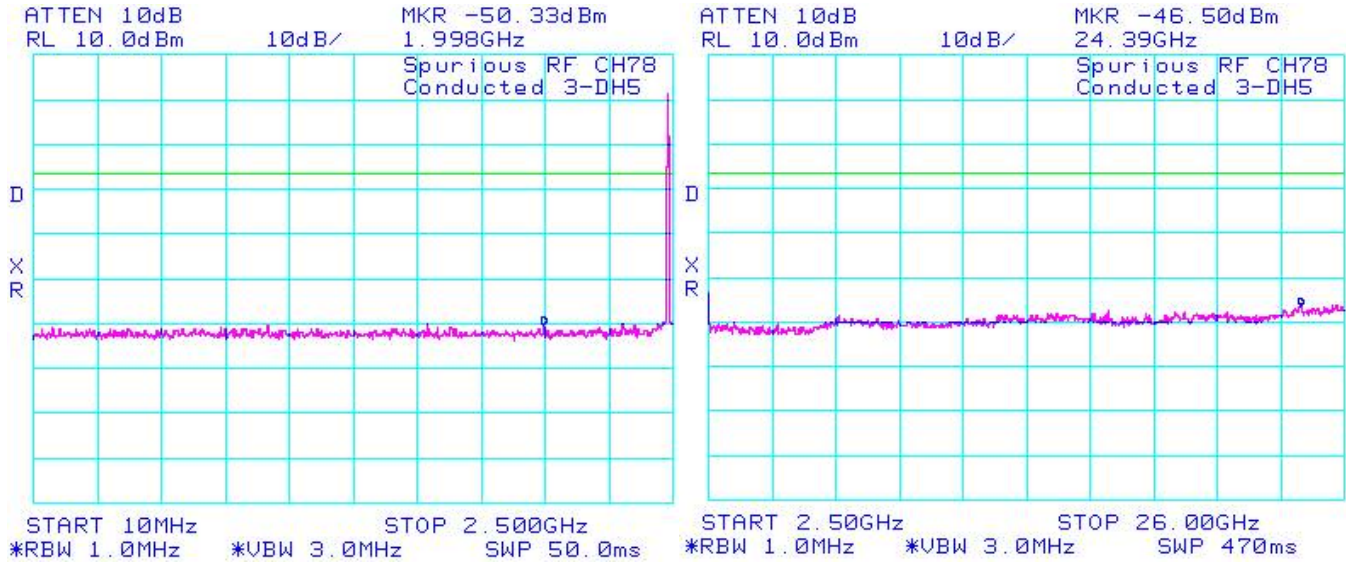
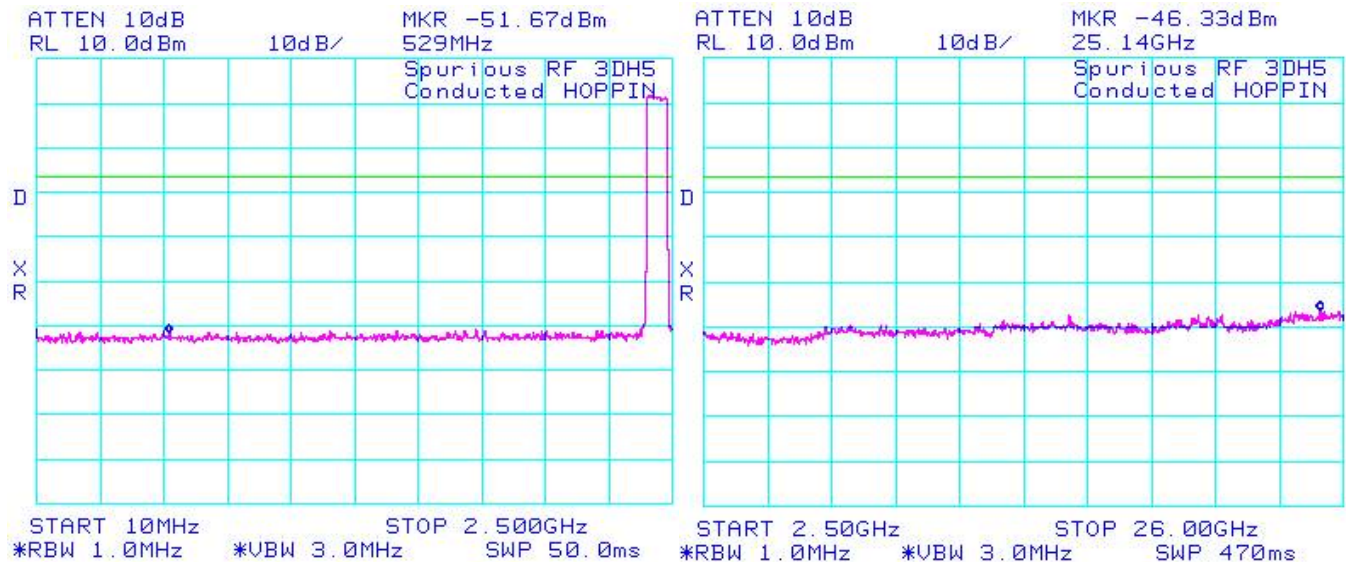


Figure 3-40 : Spurious RF Conducted Emissions
Freq. Hopping, Static PBRs, 3-DH5



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

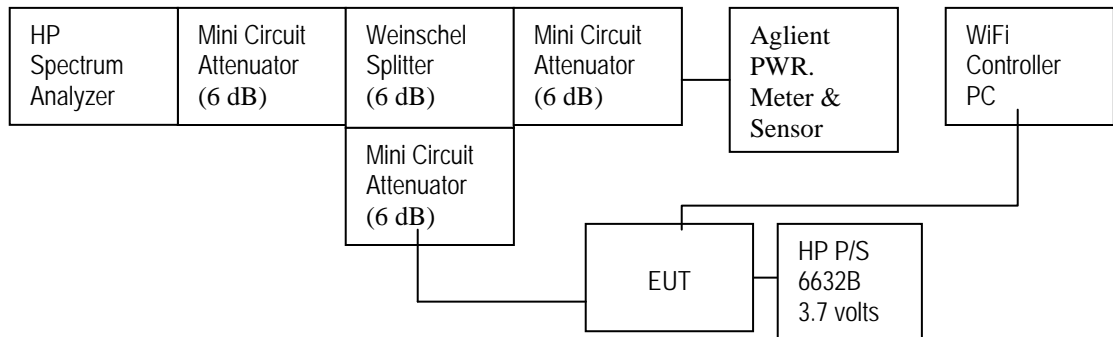
RTS RIM Testing Services	EMI Test Report for the BlackBerry® smartphone Model RBT71UW APPENDIX 4	
Test Report No. RTS-0552-0803-02	Dates of Test March 07 – April 03, 2008	Author Data M. Battler

802.11b/g RF Conducted Emission Test Results

802.11b/g Target Power Output for all the recorded measurements shown below:

Channel	Frequency	802.11b		802.11g	
		Data Rate	Power output (dBm)	Data Rate	Power output (dBm)
1	2412 MHz	1 Mbps	18.0	6 Mbps	14.0
		5.5 Mbps	18.0	24 Mbps	14.0
		11 Mbps	18.0	54 Mbps	13.0
6	2437 MHz	1 Mbps	18.0	6 Mbps	17.5
		5.5 Mbps	18.0	24 Mbps	14.5
		11 Mbps	18.0	54 Mbps	13.0
11	2462 MHz	1 Mbps	18.0	6 Mbps	14.0
		5.5 Mbps	18.0	24 Mbps	14.0
		11 Mbps	18.0	54 Mbps	13.0

Test Setup Diagram



A reference offset of 18.4 dB was applied to the spectrum analyzer and Power Meter reference level for the attenuators and coaxial cable loss in the test circuit.

Date of test: March 18 to April 02, 2008
The measurements were performed by Maurice Battler.

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

Figure 4-1: 6 dB Bandwidth

802.11b, Channel 1, 1 Mbps

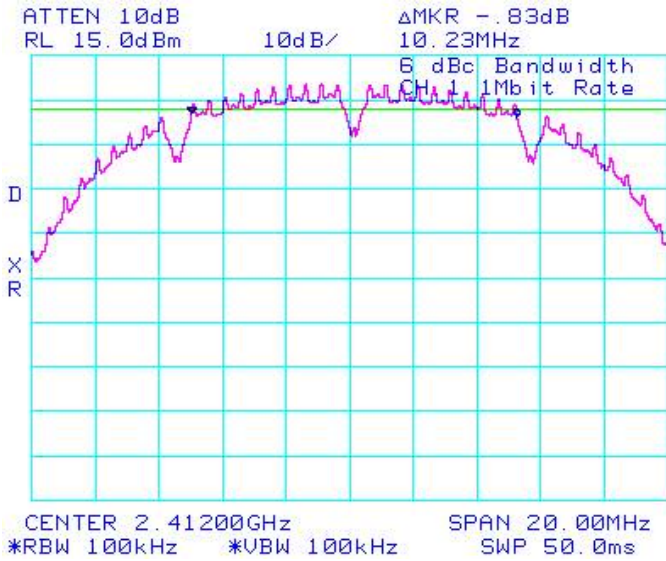


Figure 4-2: 6 dB Bandwidth

802.11b, Channel 6, 1 Mbps

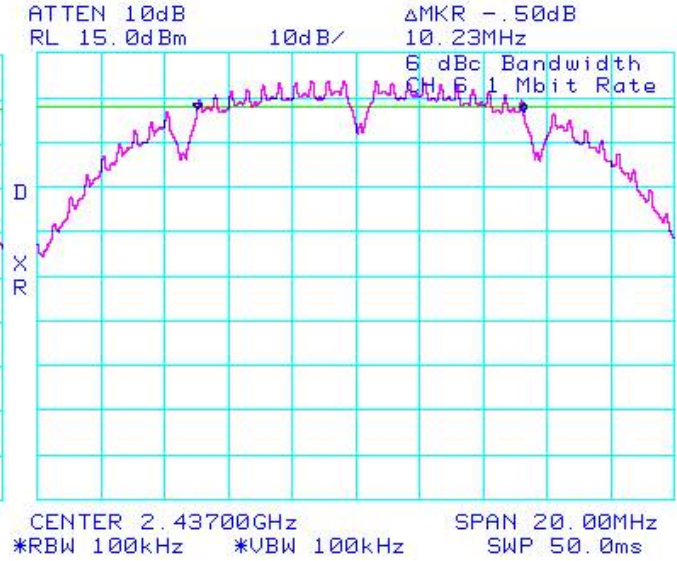
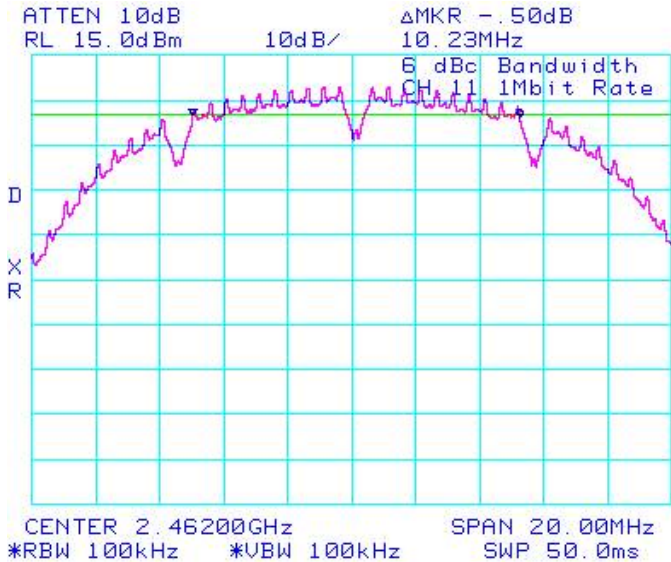


Figure 4-3: 6 dB Bandwidth

802.11b, Channel 11, 1 Mbps



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

Figure 4-4: 6 dB Bandwidth

802.11g, Channel 1, 6 Mbps

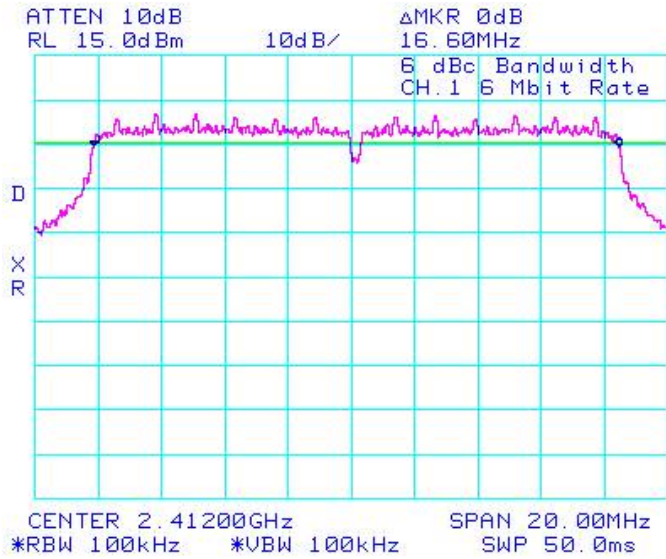


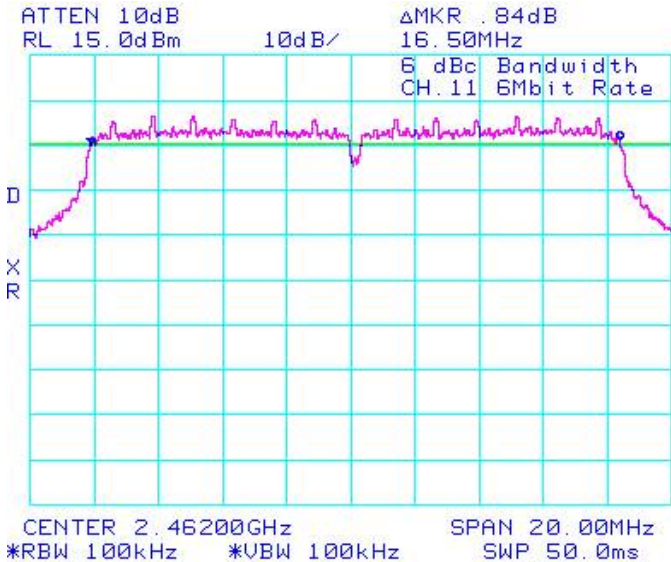
Figure 4-5: 6 dB Bandwidth

802.11g, Channel 6, 6 Mbps



Figure 4-6: 6 dB Bandwidth

802.11g, Channel 11, 6 Mbps



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802.11b/g 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 and 6 Mbps, 24 Mbps, and 54 Mbps each for 802.11g mode.

Channel	Data Rate	Limit (dBc)	Measured Level (dBc)	Margin (dBc)
1	1 Mbps	< -20	-35.00	-15.00
	5.5 Mbps	< -20	-40.00	-20.00
	11 Mbps	< -20	-38.50	-18.50
	6 Mbps	< -20	-29.16	-9.16
	24 Mbps	< -20	-29.00	-9.00
	54 Mbps	< -20	-29.50	-9.50
11	1 Mbps	< -20	-50.67	-30.67
	5.5 Mbps	< -20	-47.00	-27.00
	11 Mbps	< -20	-51.50	-31.50
	6 Mbps	< -20	-37.00	-17.00
	24 Mbps	< -20	-36.33	-16.33
	54 Mbps	< -20	-38.33	-18.33

See figures 4-7 to 4-10 for the plots of the band edge compliance measurements for Channels 1, and 11, at 1 Mbps each for 802.11b mode and at 6 Mbps each for 802.11g mode.

The environmental test conditions were:

Temperature	23°C
Pressure	1009 mb
Relative Humidity	23%

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

Figure 4-7: Band Edge Compliance

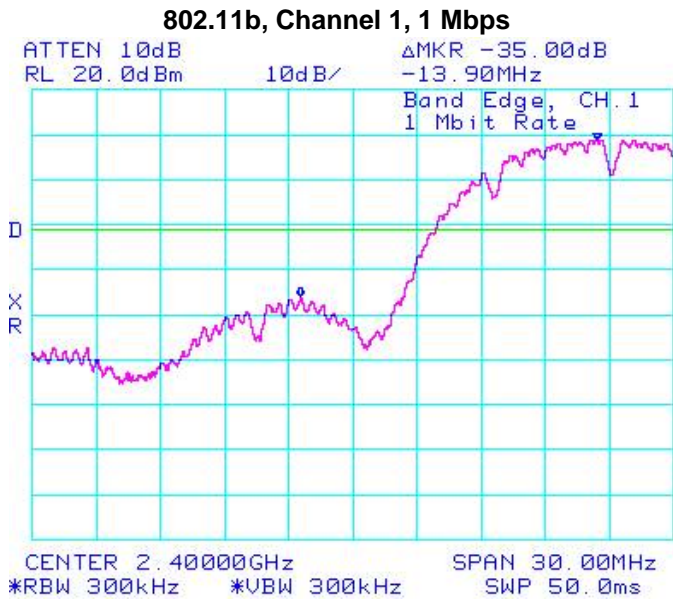


Figure 4-8: Band Edge Compliance

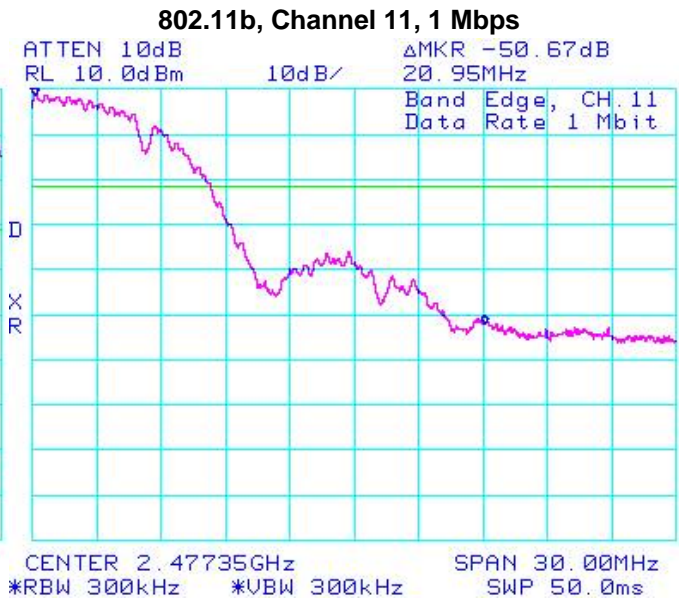


Figure 4-9: Band Edge Compliance

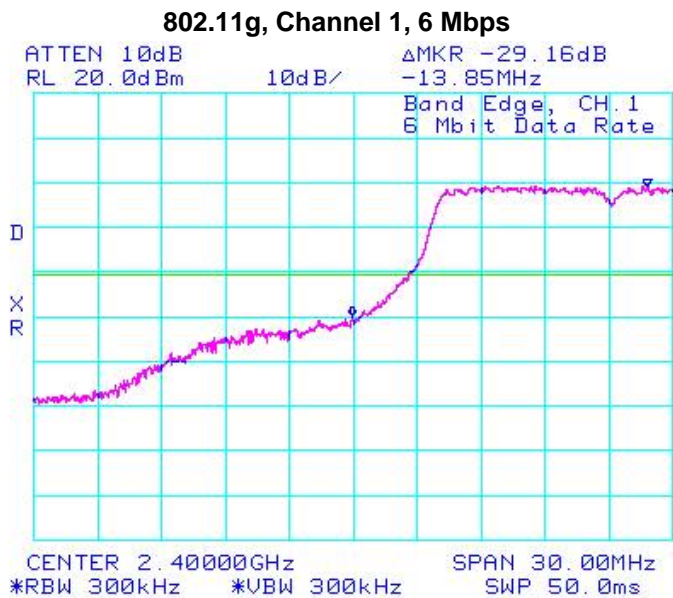
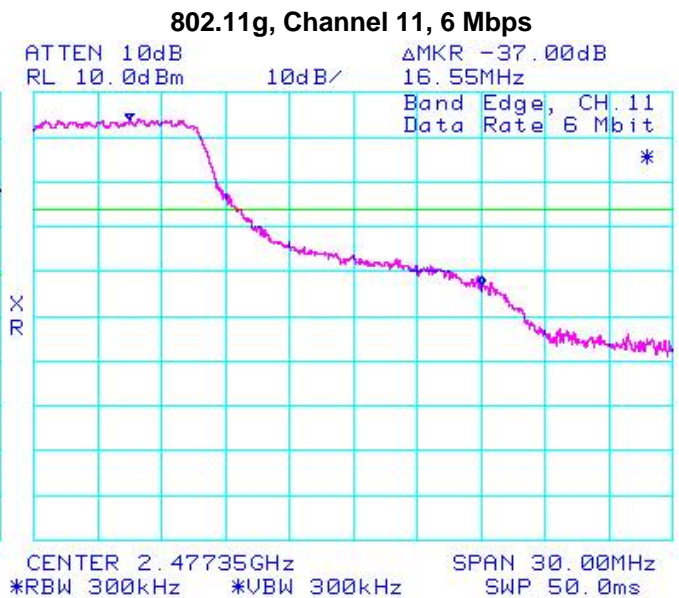


Figure 4-10: Band Edge Compliance



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802.11b/g 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 11Mbps each for 802.11b mode and 6 Mbps, 24 Mbps, and 54 Mbps each for 802.11g mode.

Channel	Data Rate	Limit (dBm)	Measured Level (dBm)	Margin (dBm)
1	1 Mbps	< 8.00	-2.00	-10.00
	5.5 Mbps	< 8.00	-4.50	-12.50
	11 Mbps	< 8.00	-4.00	-12.00
	6 Mbps	< 8.00	-9.50	-17.50
	24 Mbps	< 8.00	-11.33	-19.33
	54 Mbps	< 8.00	-12.50	-20.50
6	1 Mbps	< 8.00	-4.00	-12.00
	5.5 Mbps	< 8.00	-4.33	-12.33
	11 Mbps	< 8.00	-4.00	-12.00
	6 Mbps	< 8.00	-7.00	-15.00
	24 Mbps	< 8.00	-11.00	-19.00
	54 Mbps	< 8.00	-13.33	-21.33
11	1 Mbps	< 8.00	-3.83	-11.83
	5.5 Mbps	< 8.00	-5.17	-13.17
	11 Mbps	< 8.00	-5.33	-13.33
	6 Mbps	< 8.00	-9.83	-17.83
	24 Mbps	< 8.00	-10.83	-18.83
	54 Mbps	< 8.00	-14.17	-22.17

See figures 4-11 to 4-16 for the plots of the peak power spectral density for Channels 1, 6 and 11, at 1 Mbps each for 802.11b mode and at 6 Mbps each for 802.11g mode.

The environmental test conditions were:

Temperature	23°C
Pressure	1019 mb
Relative Humidity	22%

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

Figure 4-11: Peak Power Spectral Density
802.11b, Channel 1, 1 Mbps

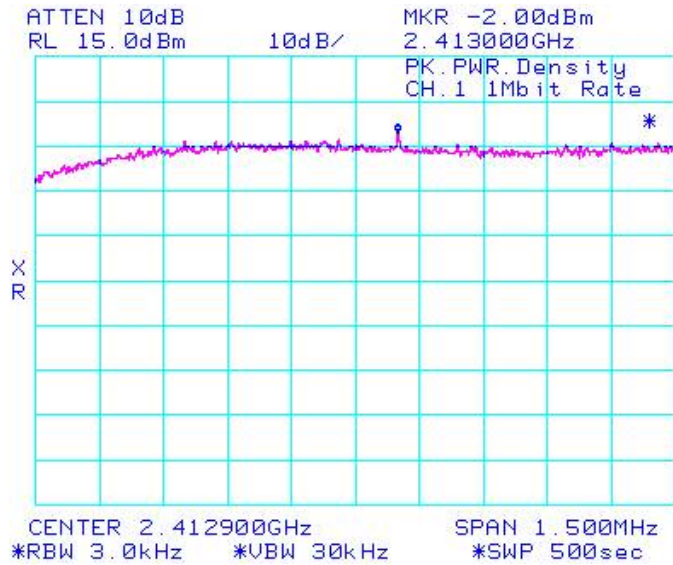


Figure 4-12: Peak Power Spectral Density
802.11b, Channel 6, 1 Mbps

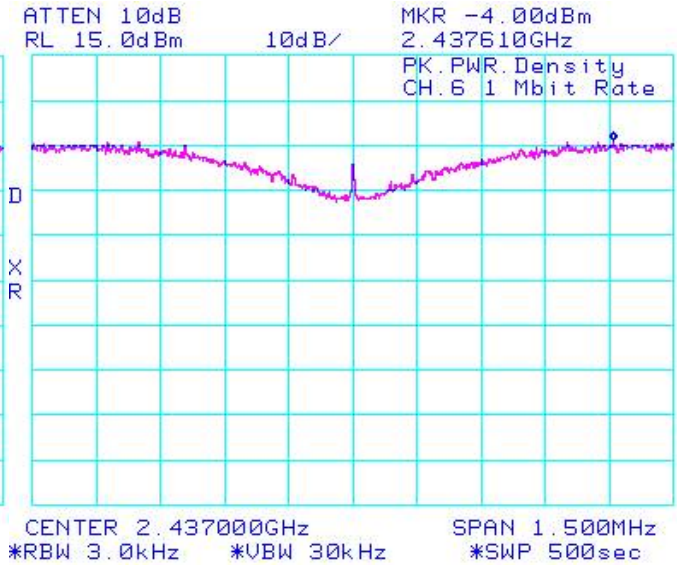
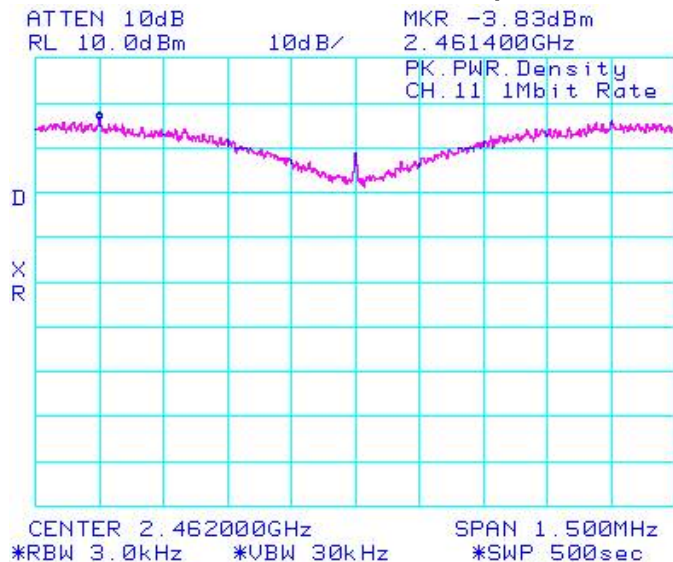


Figure 4-13: Peak Power Spectral Density
802.11b, Channel 11, 1 Mbps



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

Figure 4-14: Peak Power Spectral Density
802.11g, Channel 1, 6 Mbps

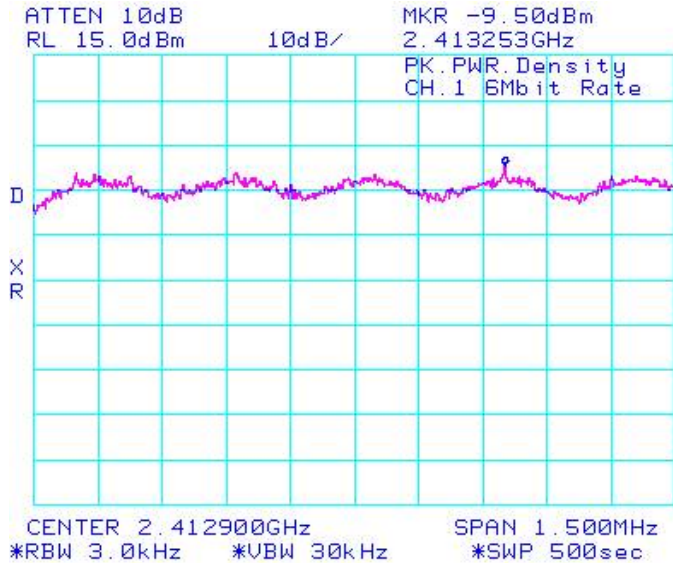


Figure 4-15: Peak Power Spectral Density
802.11g, Channel 6, 6 Mbps

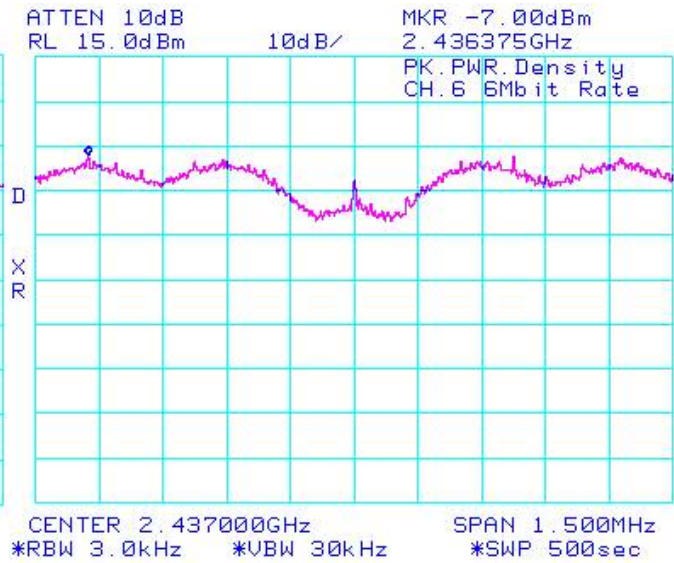
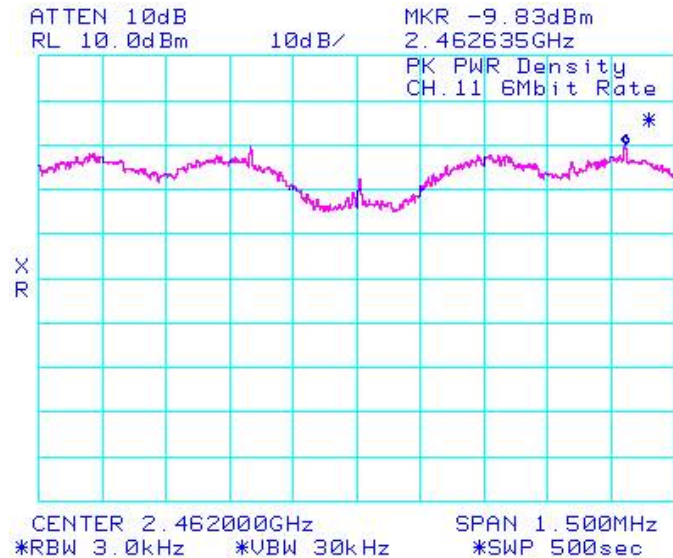


Figure 4-16: Peak Power Spectral Density
802.11g, Channel 11, 6 Mbps



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802.11b/g 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 and 6 Mbps, 24 Mbps, and 54 Mbps each for 802.11g mode. Peak power was measured from the spectrum analyzer. A reference offset of 20.3 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)
1	1 Mbps	18.6	-50.17	-68.77	-20
	5.5 Mbps	18.6	-50.00	-68.60	-20
	11 Mbps	18.6	-49.50	-68.10	-20
	6 Mbps	14.1	-50.17	-64.27	-20
	24 Mbps	14.3	-49.83	-64.13	-20
	54 Mbps	13.1	-50.00	-63.10	-20
6	1 Mbps	18.0	-49.67	-67.67	-20
	5.5 Mbps	18.0	-50.33	-68.33	-20
	11 Mbps	18.1	-50.50	-68.50	-20
	6 Mbps	17.0	-50.50	-67.50	-20
	24 Mbps	14.3	-50.00	-64.30	-20
	54 Mbps	12.6	-50.17	62.77	-20
11	1 Mbps	17.8	-49.83	-67.63	-20
	5.5 Mbps	17.8	-49.33	-67.13	-20
	11 Mbps	17.8	-50.17	-67.97	-20
	6 Mbps	13.4	-50.00	-63.40	-20
	24 Mbps	13.5	-49.33	-62.83	-20
	54 Mbps	12.3	-49.83	-62.13	-20

The emissions were in the noise floor.

See figures 4-17 to 4-22 for the plots of the spurious RF conducted emissions for Channels 1, 6 and 11, at 1 Mbps each for 802.11b mode and at 6 Mbps each for 802.11g mode.

The environmental test conditions were:

Temperature	24°C
Pressure	1016 mb
Relative Humidity	21%

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

Figure 4-17: Spurious Conducted RF Emissions

802.11b, Channel 1, 1 Mbps

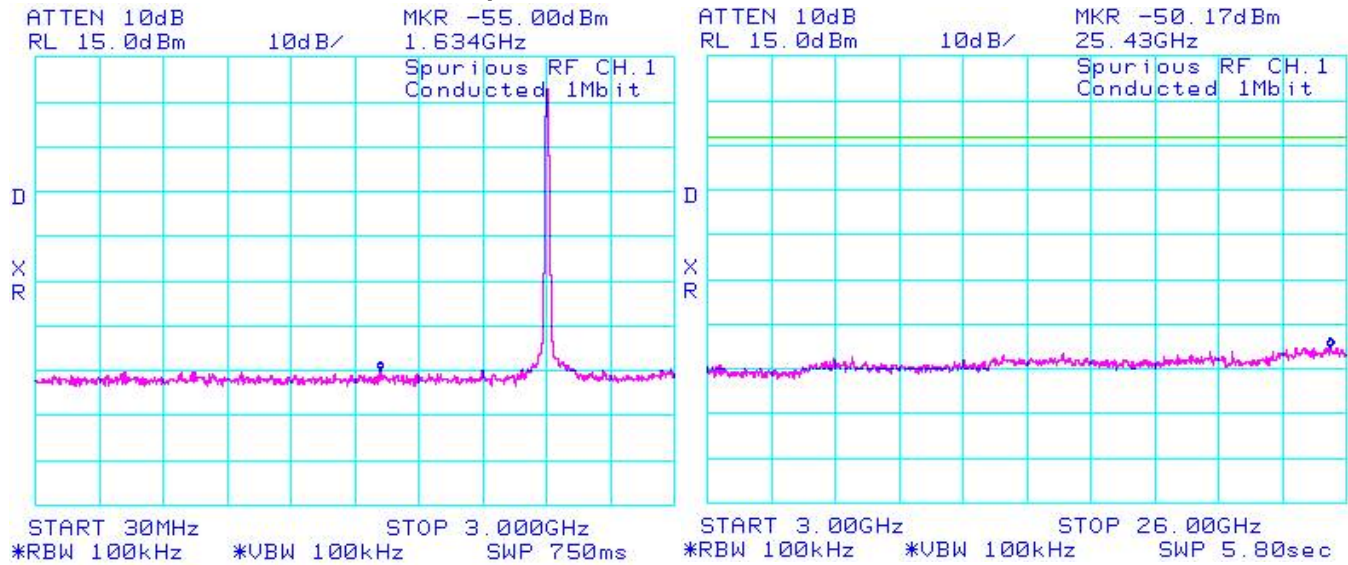
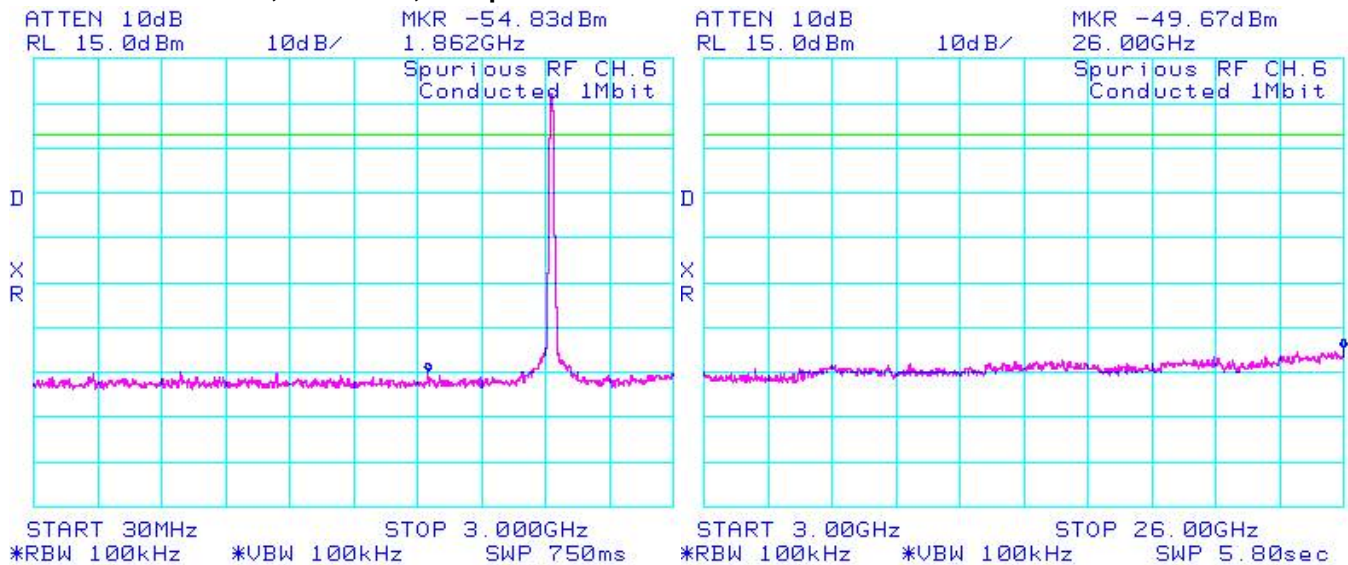


Figure 4-18 : Spurious Conducted RF Emissions

802.11b, Channel 6, 1 Mbps



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

Figure 4-19: Spurious Conducted RF Emissions
802.11b, Channel 11, 1 Mbps

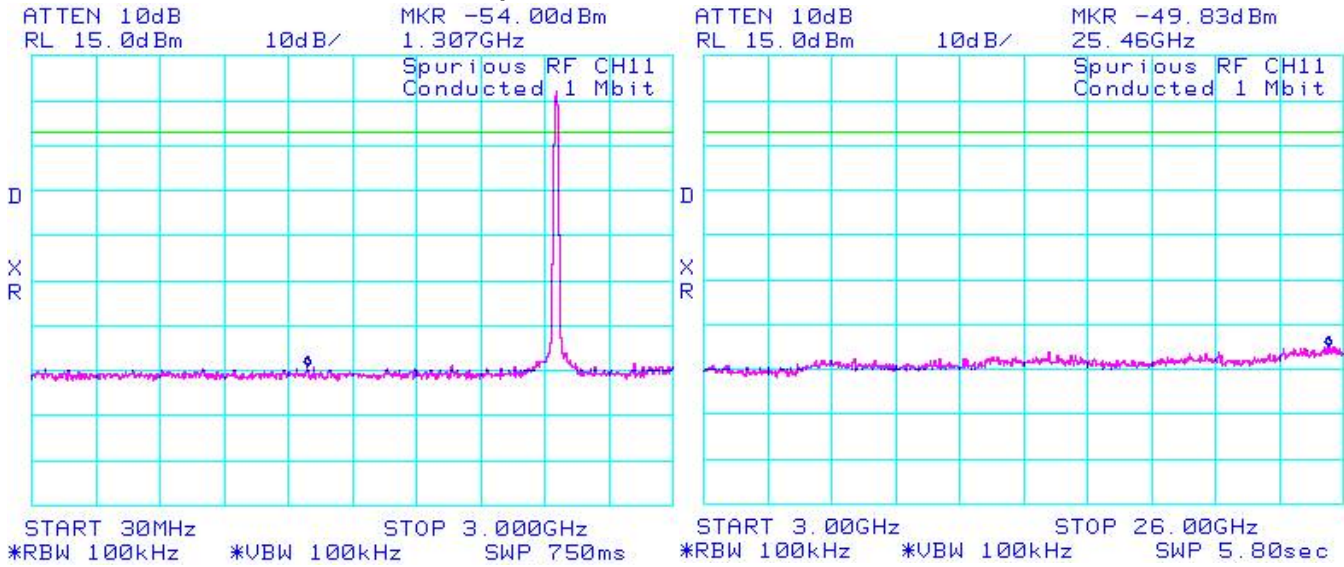
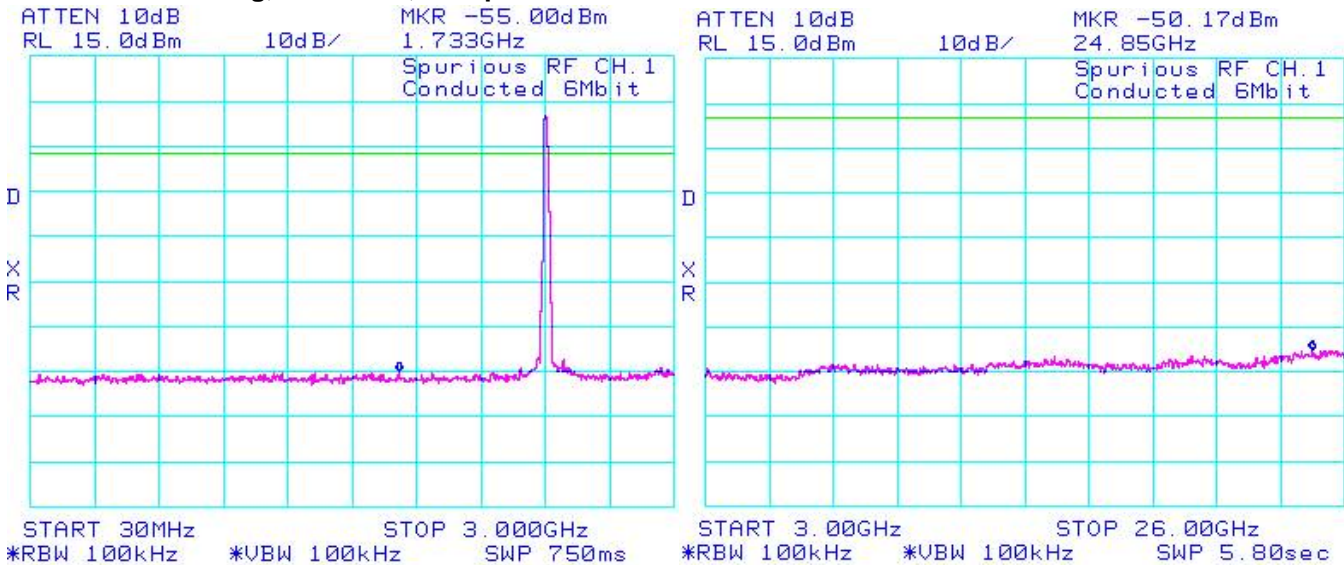


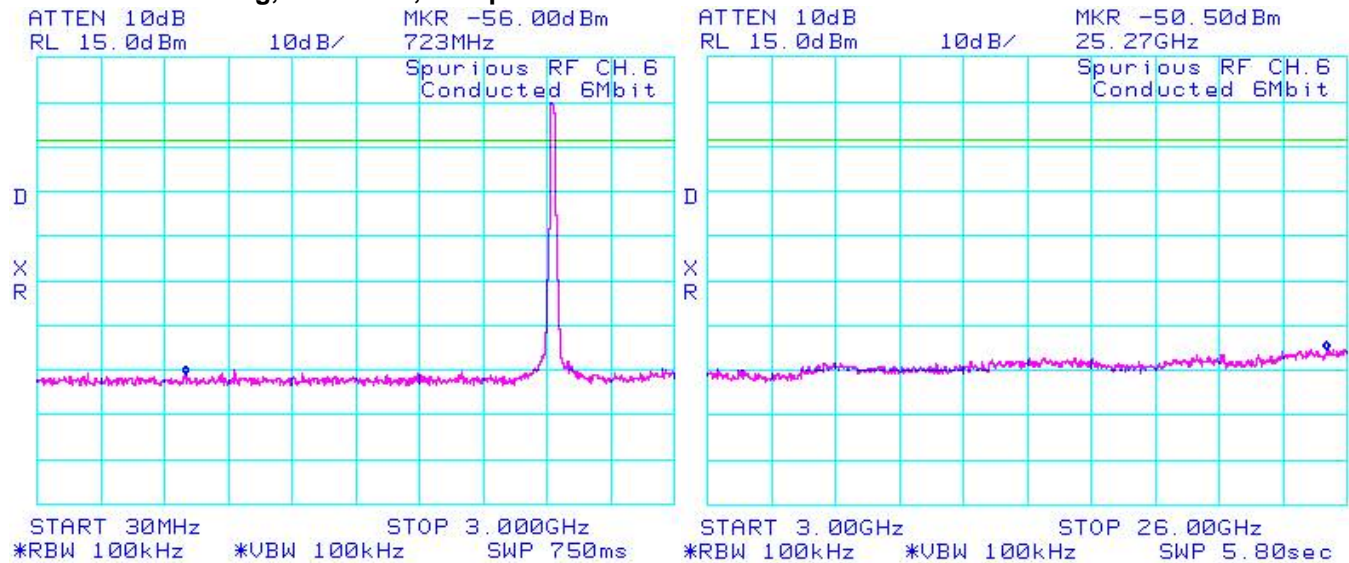
Figure 4-20: Spurious Conducted RF Emissions
802.11g, Channel 1, 6 Mbps



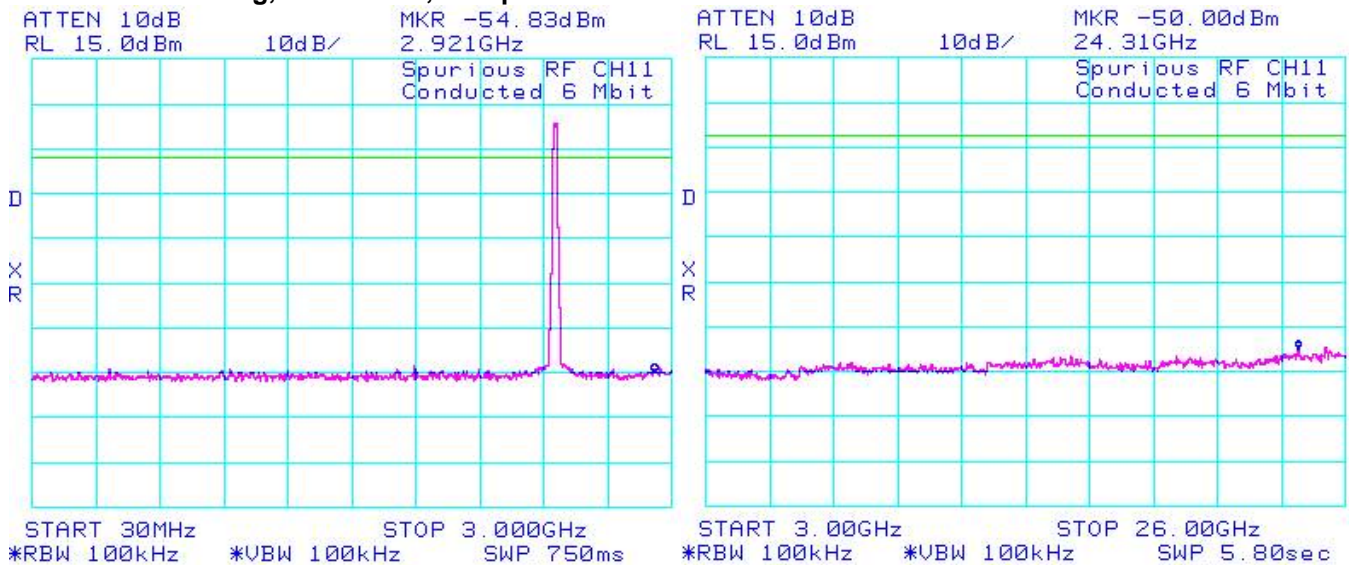
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802.11b/g RF Conducted Emission Test Results cont'd

**Figure 4-21: Spurious Conducted RF Emissions
802.11g, Channel 6, 6 Mbps**



**Figure 4-22: Spurious Conducted RF Emissions
802.11g, Channel 11, 6 Mbps**



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APPENDIX 5 – 802.11a CONDUCTED EMISSIONS TEST DATA/PLOTS

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802.11a RF Conducted Emission Test Results

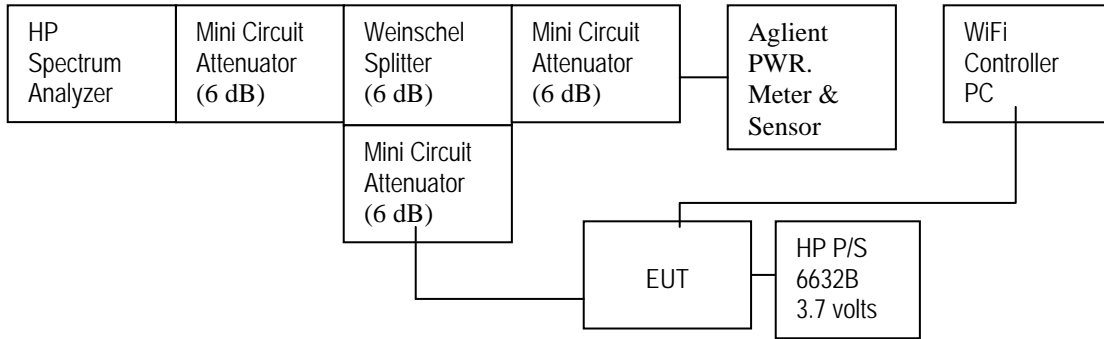
802.11a Target Power Output for all the recorded measurements shown below:

Channel	Frequency	Data Rate	Power output (dBm)
36	5180 MHz	6 Mbps	14.5
		24 Mbps	14.5
		54 Mbps	14.5
44	5220 MHz	6 Mbps	14.5
		24 Mbps	14.5
		54 Mbps	14.5
48	5240 MHz	6 Mbps	17.0
		24 Mbps	15.0
		54 Mbps	13.0
52	5260 MHz	6 Mbps	17.0
		24 Mbps	15.0
		54 Mbps	13.0
60	5300 MHz	6 Mbps	17.0
		24 Mbps	15.0
		54 Mbps	13.0
64	5320 MHz	6 Mbps	17.0
		24 Mbps	15.0
		54 Mbps	13.0
149	5745 MHz	6 Mbps	16.0
		24 Mbps	15.0
		54 Mbps	13.0
157	5785 MHz	6 Mbps	16.0
		24 Mbps	15.0
		54 Mbps	13.0
161	5805 MHz	6 Mbps	16.0
		24 Mbps	15.0
		54 Mbps	13.0

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802.11a RF Conducted Emission Test Results cont'd

Test Setup Diagram



A reference offset of 20.5 dB was applied to the spectrum analyzer and Power Meter reference level for the attenuators and coaxial cable loss in the test circuit.

Date of test: March 18 to April 02, 2008
 The measurements were performed by Maurice Battler.

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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	16.53
	24 Mbps	>= 500	16.60
	54 Mbps	>= 500	16.63
44	6 Mbps	>= 500	16.53
	24 Mbps	>= 500	16.60
	54 Mbps	>= 500	16.60
48	6 Mbps	>= 500	16.47
	24 Mbps	>= 500	16.60
	54 Mbps	>= 500	16.60
52	6 Mbps	>= 500	16.47
	24 Mbps	>= 500	16.60
	54 Mbps	>= 500	16.60
60	6 Mbps	>= 500	16.40
	24 Mbps	>= 500	16.53
	54 Mbps	>= 500	16.57
64	6 Mbps	>= 500	16.50
	24 Mbps	>= 500	16.57
	54 Mbps	>= 500	16.57
149	6 Mbps	>= 500	16.47
	24 Mbps	>= 500	16.60
	54 Mbps	>= 500	16.60
157	6 Mbps	>= 500	16.50
	24 Mbps	>= 500	16.60
	54 Mbps	>= 500	16.63
161	6 Mbps	>= 500	16.47
	24 Mbps	>= 500	16.60
	54 Mbps	>= 500	16.60

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 5-5: 6 dB Bandwidth

802.11a, Channel 60, 6 Mbps

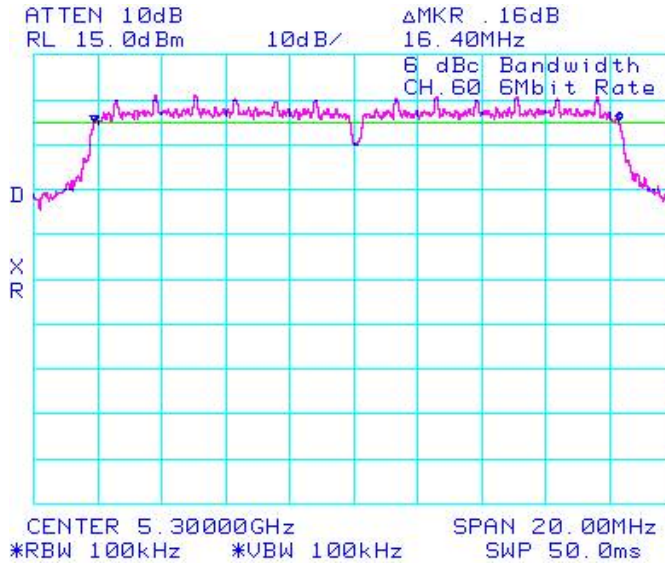


Figure 5-6: 6 dB Bandwidth

802.11a, Channel 64, 6 Mbps

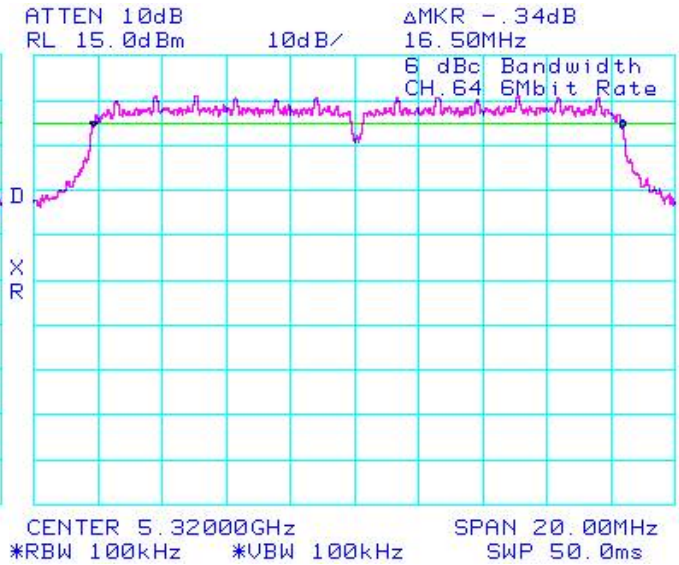


Figure 5-7: 6 dB Bandwidth

802.11a, Channel 149, 6 Mbps

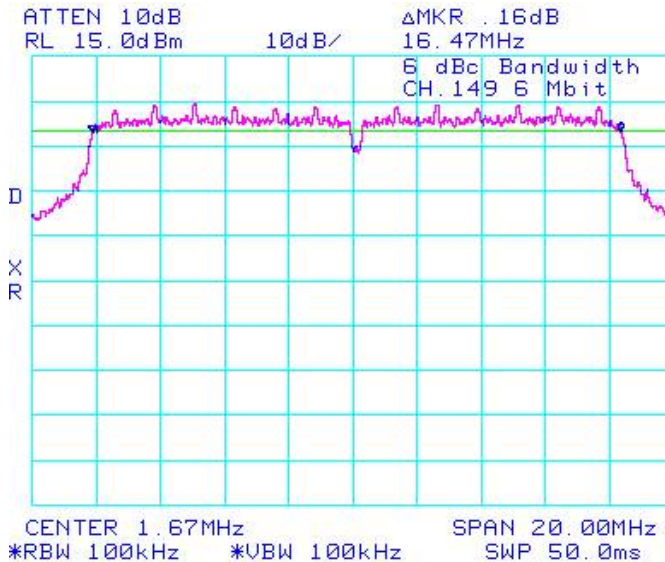
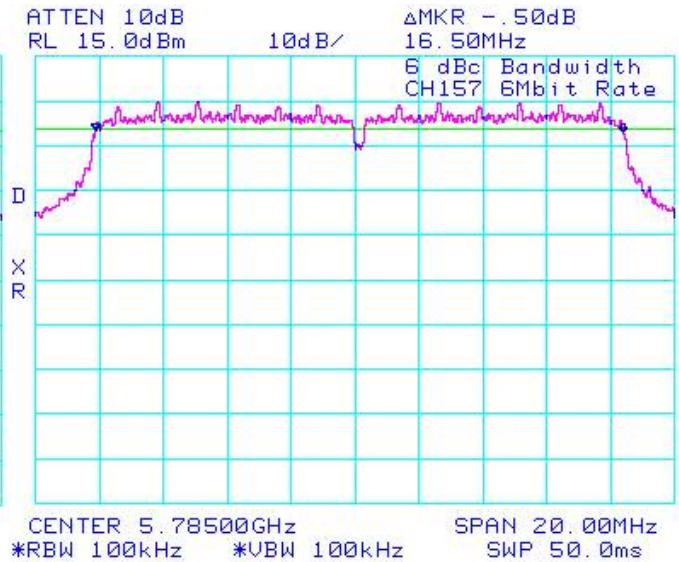


Figure 5-8: 6 dB Bandwidth

802.11a, Channel 157, 6 Mbps

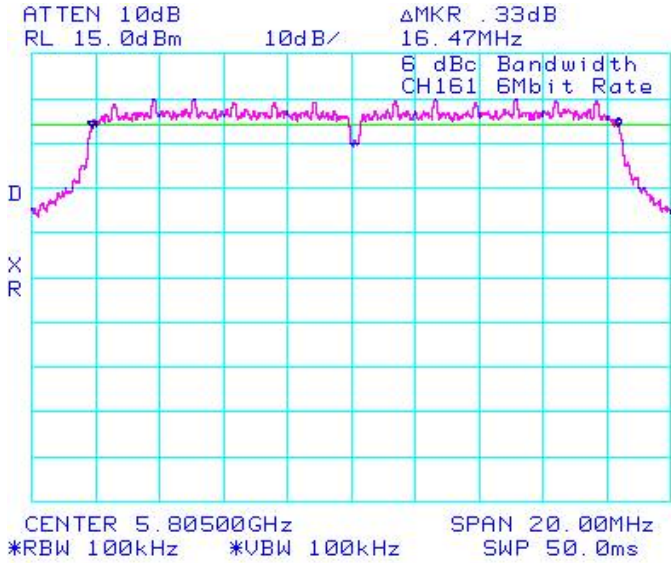


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802.11a RF Conducted Emission Test Results cont'd

Figure 5-9: 6 dB Bandwidth

802.11a, Channel 161, 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, 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 20.5 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	13.7	23.44
	24 Mbps	< 1.00	13.8	23.99
	54 Mbps	< 1.00	12.2	16.60
44	6 Mbps	< 1.00	14.3	29.92
	24 Mbps	< 1.00	14.4	27.54
	54 Mbps	< 1.00	12.7	18.62
48	6 Mbps	< 1.00	14.6	28.84
	24 Mbps	< 1.00	14.7	29.51
	54 Mbps	< 1.00	13.0	19.95
52	6 Mbps	< 1.00	17.5	56.23
	24 Mbps	< 1.00	15.5	35.48
	54 Mbps	< 1.00	13.3	21.38
60	6 Mbps	< 1.00	17.9	61.66
	24 Mbps	< 1.00	16.0	39.81
	54 Mbps	< 1.00	13.7	23.44
64	6 Mbps	< 1.00	17.9	61.66
	24 Mbps	< 1.00	16.0	39.81
	54 Mbps	< 1.00	13.7	23.44
149	6 Mbps	< 1.00	16.3	42.66
	24 Mbps	< 1.00	15.2	33.11
	54 Mbps	< 1.00	13.1	20.42
157	6 Mbps	< 1.00	16.1	40.74
	24 Mbps	< 1.00	14.9	30.90
	54 Mbps	< 1.00	13.0	19.95
161	6 Mbps	< 1.00	15.9	38.90
	24 Mbps	< 1.00	14.8	30.20
	54 Mbps	< 1.00	12.7	18.62

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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	-53.00	-33.00
	24 Mbps	< -20	-52.83	-32.83
	54 Mbps	< -20	-51.00	-31.00
48	6 Mbps	< -20	-22.17	-2.17
	24 Mbps	< -20	-23.17	-3.17
	54 Mbps	< -20	-23.34	-3.34
52	6 Mbps	< -20	-21.66	-1.66
	24 Mbps	< -20	-21.83	-1.83
	54 Mbps	< -20	-23.50	-3.50
64	6 Mbps	< -20	-47.00	-27.00
	24 Mbps	< -20	-53.17	-33.17
	54 Mbps	< -20	-50.50	-30.50
149	6 Mbps	< -20	-34.16	-14.16
	24 Mbps	< -20	-38.33	-18.33
	54 Mbps	< -20	-42.00	-22.00
161	6 Mbps	< -20	-54.24	-34.24
	24 Mbps	< -20	-52.67	-32.67
	54 Mbps	< -20	-53.16	-33.16

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.

The environmental test conditions were:

Temperature	23°C
Pressure	1019 mb
Relative Humidity	22%

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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

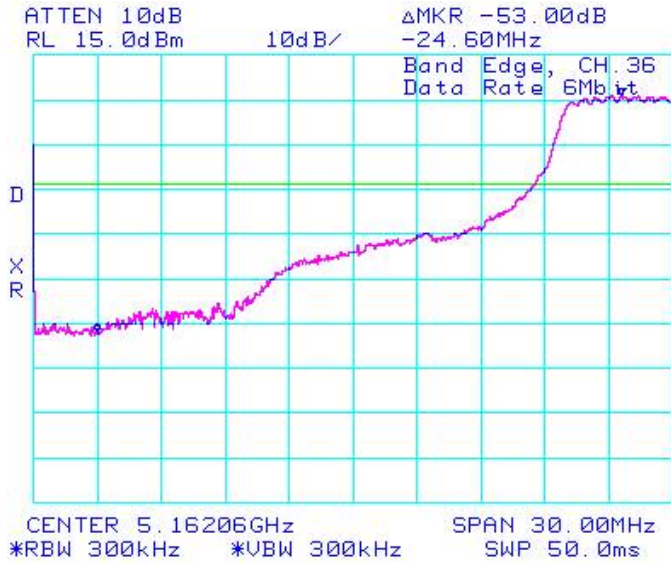


Figure 5-11: Band Edge Compliance

802.11a, Channel 48, 6 Mbps

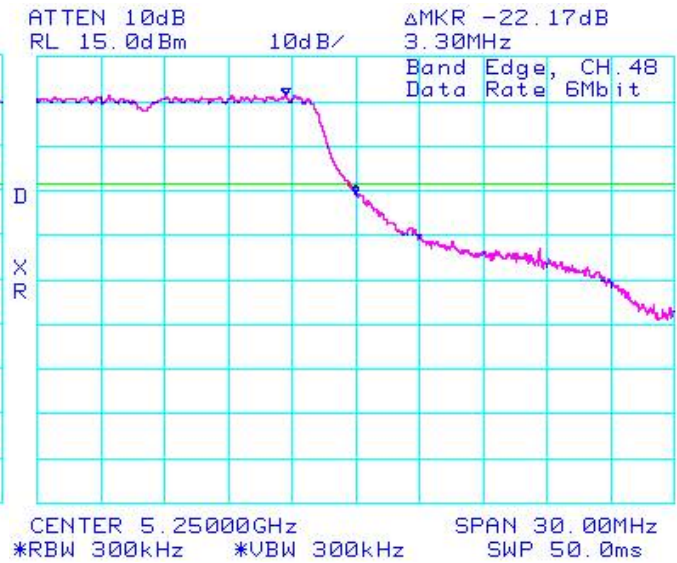


Figure 5-12: Band Edge Compliance

802.11a, Channel 52, 6 Mbps

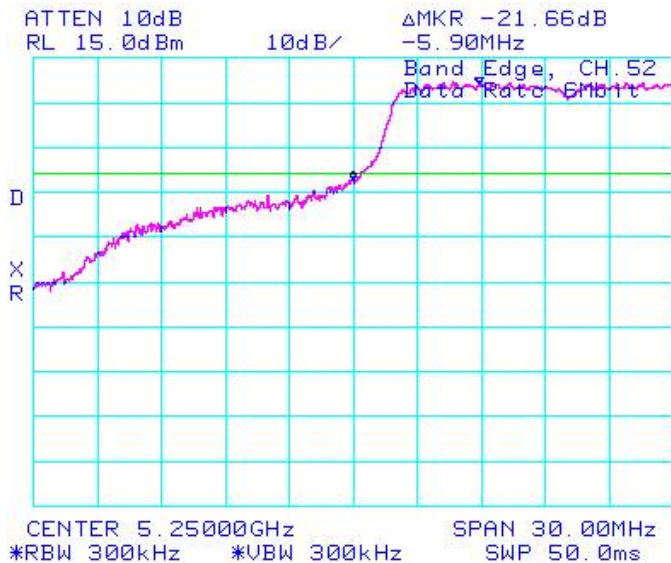
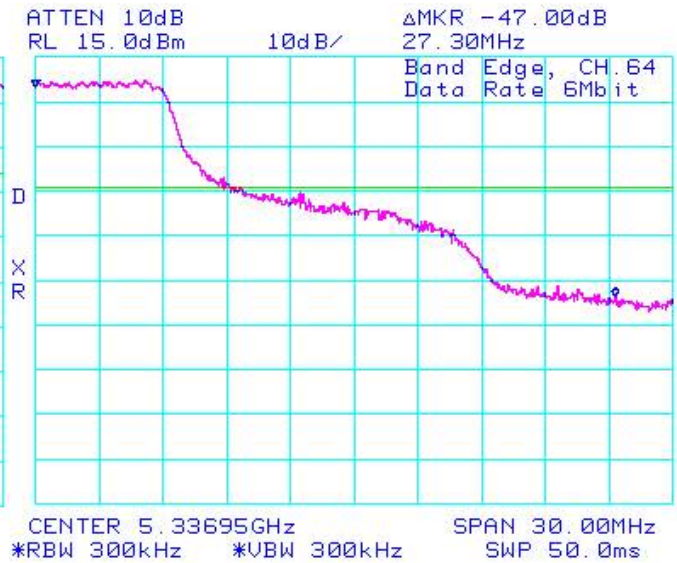


Figure 5-13: Band Edge Compliance

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

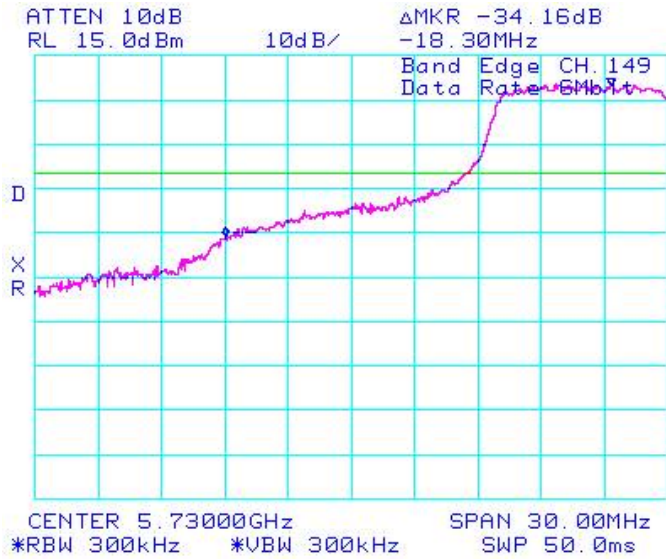
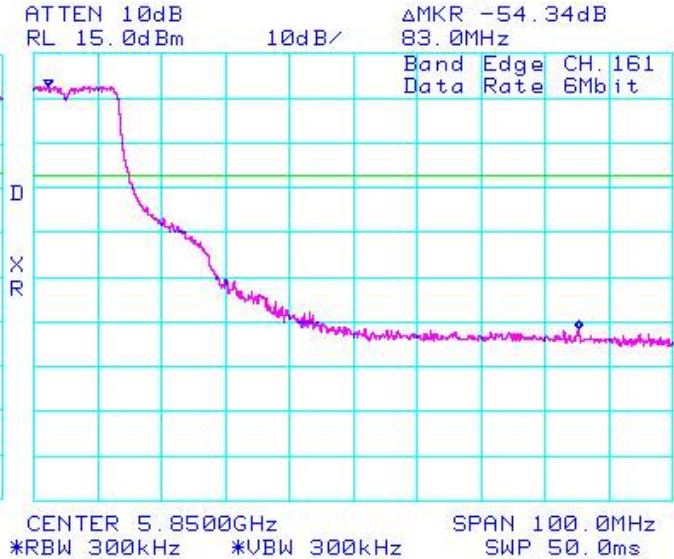


Figure 5-15: Band Edge Compliance

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	-9.17	-17.17
	24 Mbps	< 8.00	-10.67	-18.67
	54 Mbps	< 8.00	-13.00	-21.00
44	6 Mbps	< 8.00	-9.17	-17.17
	24 Mbps	< 8.00	-10.00	-18.00
	54 Mbps	< 8.00	-12.00	-20.00
48	6 Mbps	< 8.00	-8.83	-16.83
	24 Mbps	< 8.00	-10.00	-18.00
	54 Mbps	< 8.00	-14.17	-22.17
52	6 Mbps	< 8.00	-7.17	-15.17
	24 Mbps	< 8.00	-7.83	-15.83
	54 Mbps	< 8.00	-10.67	-18.67
60	6 Mbps	< 8.00	-6.83	-14.83
	24 Mbps	< 8.00	-9.50	-17.50
	54 Mbps	< 8.00	-11.83	-19.83
64	6 Mbps	< 8.00	-7.00	-15.00
	24 Mbps	< 8.00	-10.17	-18.17
	54 Mbps	< 8.00	-12.33	-20.33
149	6 Mbps	< 8.00	7.83	-15.83
	24 Mbps	< 8.00	-10.17	-18.17
	54 Mbps	< 8.00	-12.00	-20.00
157	6 Mbps	< 8.00	-7.67	-15.67
	24 Mbps	< 8.00	-9.50	-17.50
	54 Mbps	< 8.00	-13.50	-21.50
161	6 Mbps	< 8.00	-7.17	-15.17
	24 Mbps	< 8.00	-9.50	-17.50
	54 Mbps	< 8.00	-12.83	-20.83

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 5-20: Peak Power Spectral Density
802.11a, Channel 60, 6 Mbps

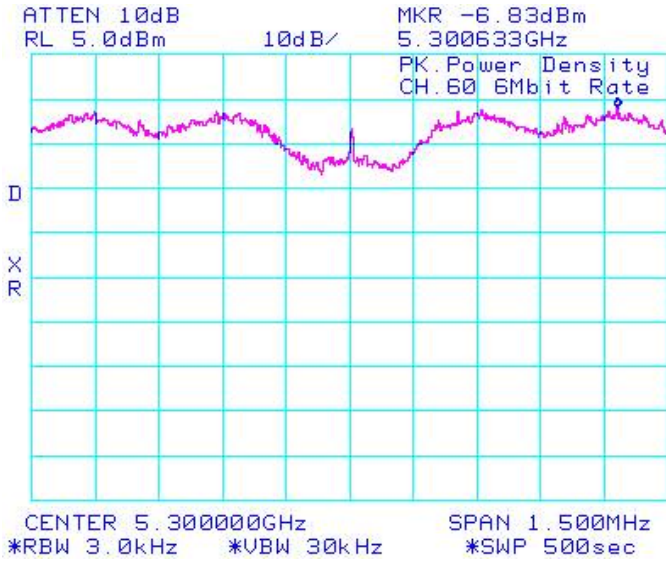


Figure 5-21: Peak Power Spectral Density
802.11a, Channel 64, 6 Mbps

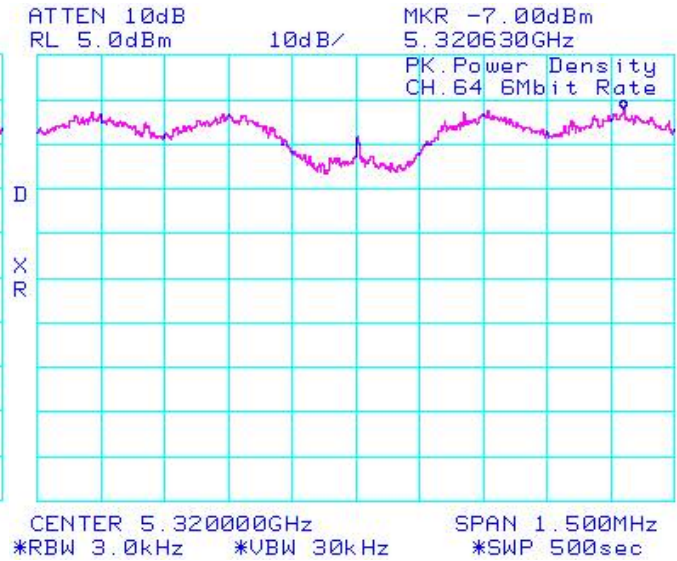


Figure 5-22: Peak Power Spectral Density
802.11a, Channel 149, 6 Mbps

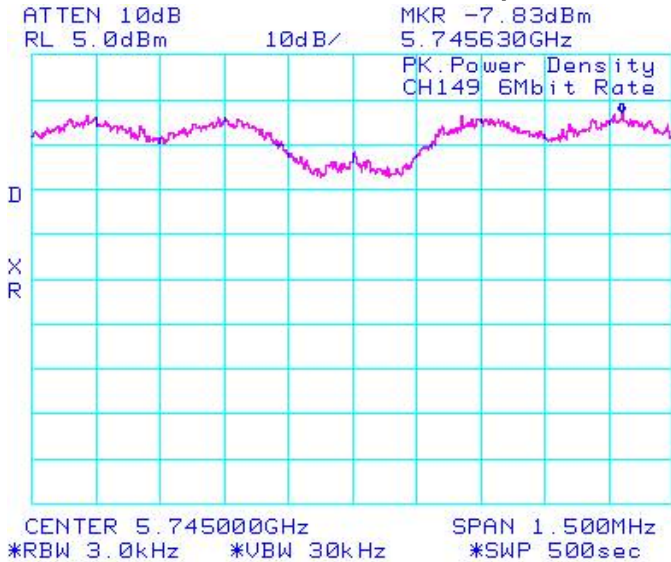
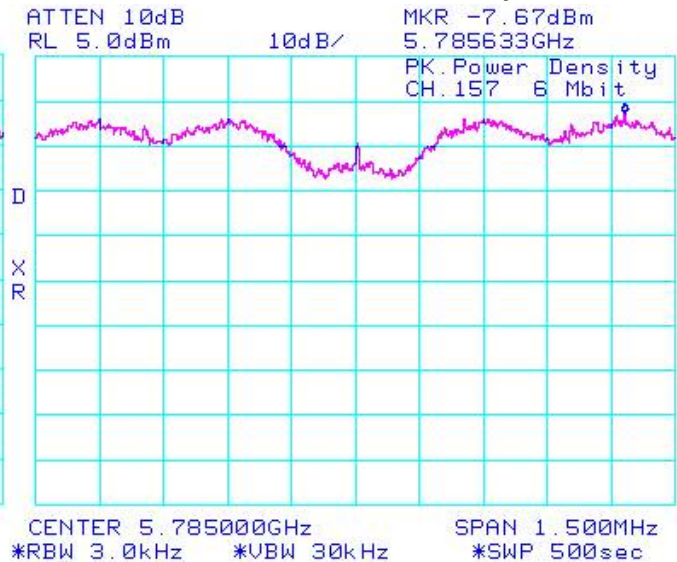


Figure 5-23: Peak Power Spectral Density
802.11a, Channel 157, 6 Mbps

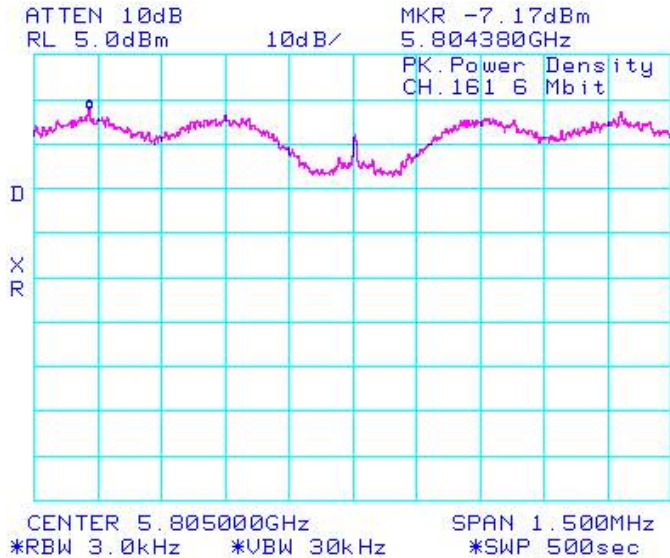


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802.11a RF Conducted Emission Test Results cont'd

Figure 5-24: Peak Power Spectral Density

802.11a, Channel 161, 6 Mbps



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. A reference offset of 21.0 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	14.3	-54.22	-68.52	-20
60	6 Mbps	17.9	-52.12	-70.02	-20
157	6 Mbps	16.1	-54.27	70.37	-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 36.

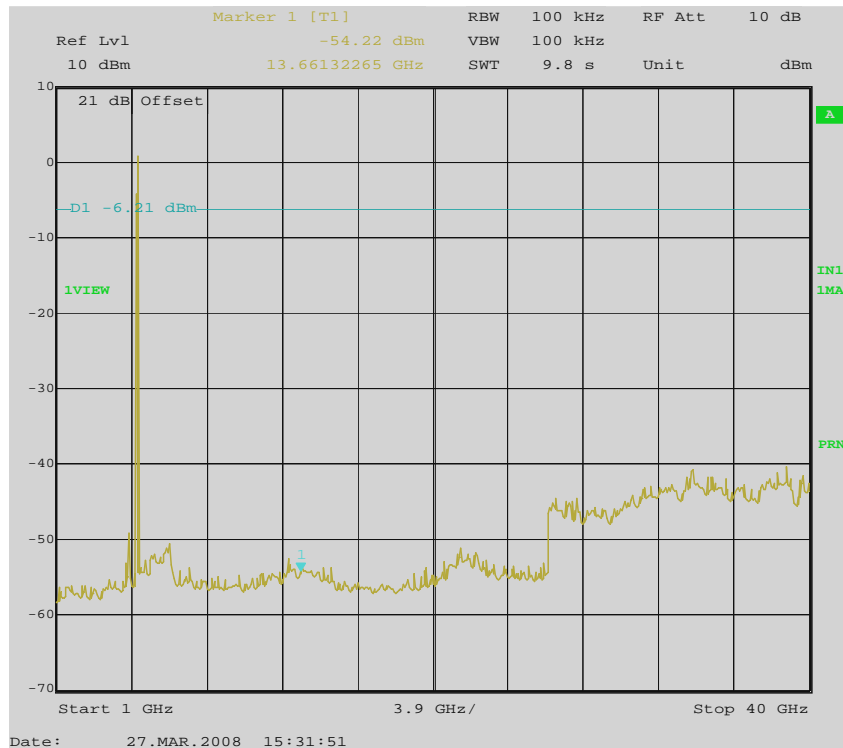
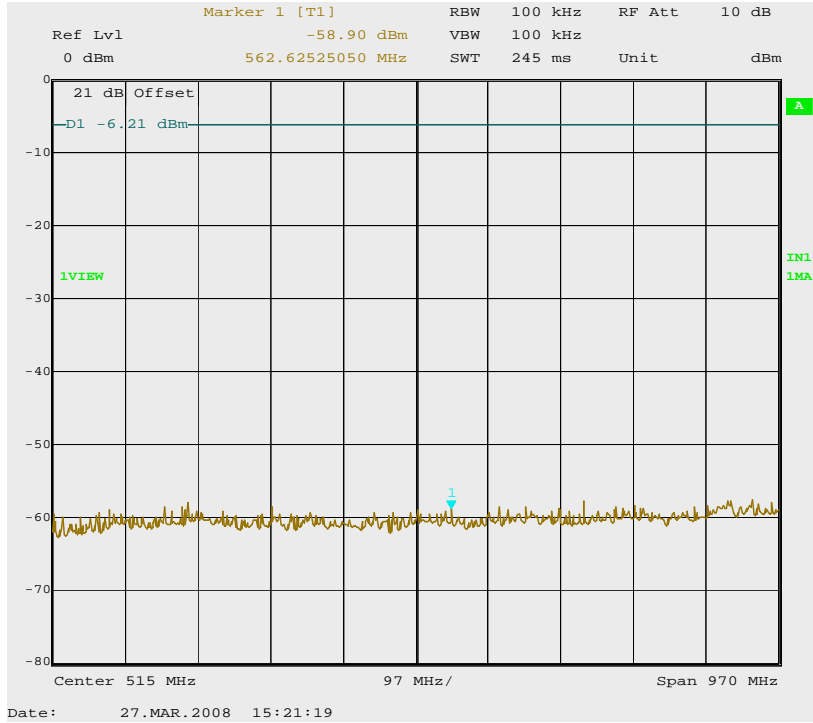
The environmental test conditions were:

Temperature	23°C
Pressure	1010 mb
Relative Humidity	24%

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802.11a RF Conducted Emission Test Results cont'd

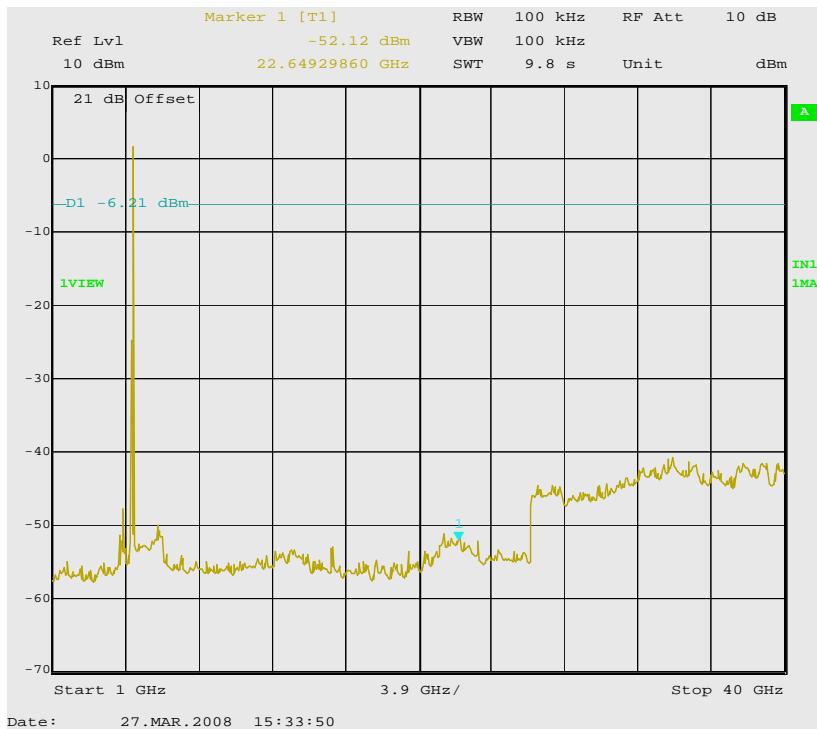
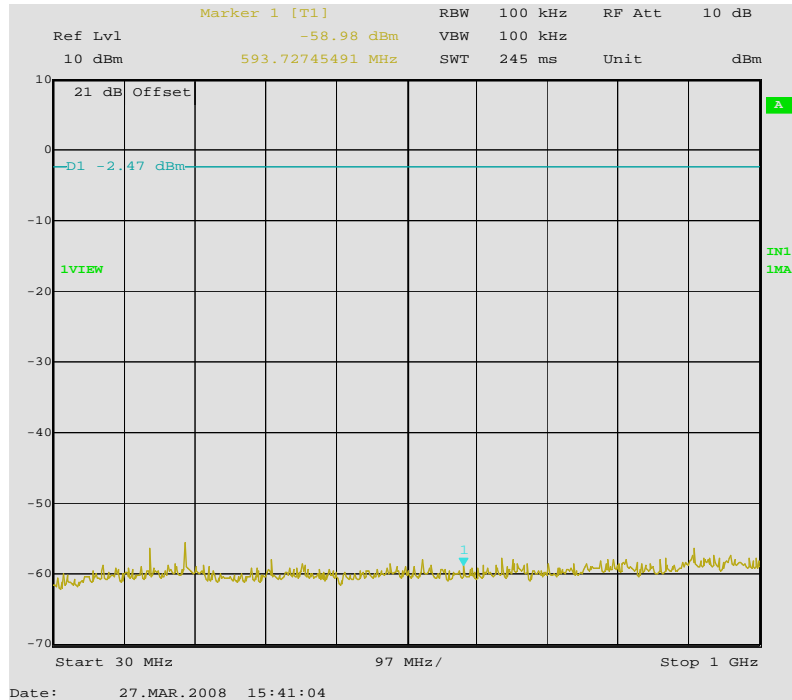
Figure 5-25: Spurious RF Conducted Emissions, 802.11a Channel 44, 6 Mbps



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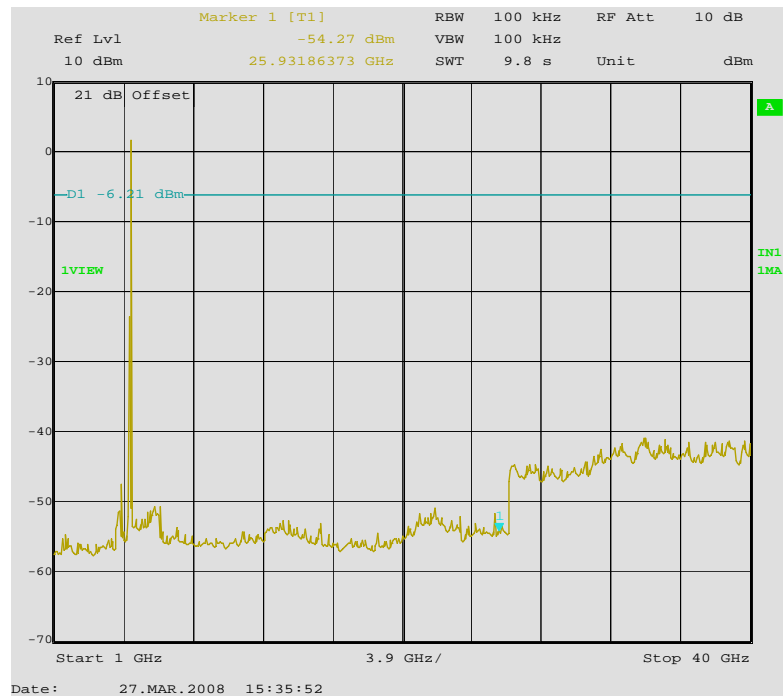
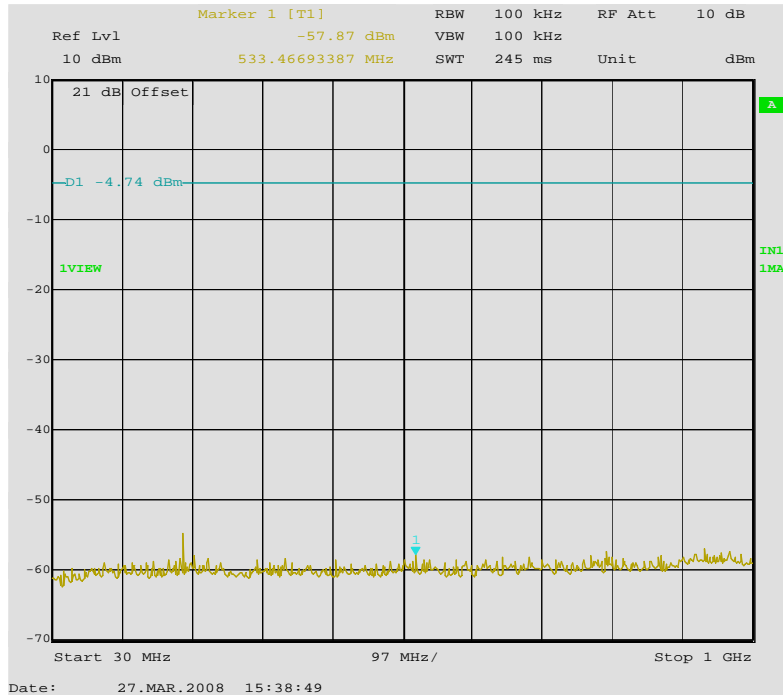
Figure 5-26: Spurious RF Conducted Emissions, 802.11a Channel 60, 6 Mbps



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802.11a RF Conducted Emission Test Results cont'd

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



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APPENDIX 6 – FREQUENCY STABILITY TEST DATA

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Bluetooth RF Conducted Emission Test Results

Frequency Stability

The EUT met the requirements of the frequency stability compliance as per 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 PRBS and packet type DH5 during the measurements. The input voltage was stepped from 3.6 volts, 3.7 and 4.2 volts. The frequency drift was measured using a Rohde and Schwarz, wireless communication tester set, model CBT with reference to its value at +23°C.

Date of Test: March 10, 2008

The measurements were performed by Maurice Battler.

Channel Number	Frequency (MHz)	Input Voltage (Volts)	Temperature (Celsius)	Frequency Error (kHz)
0	2402	3.6	23	28
39	2441	3.6	23	21
78	2480	3.6	23	24
0	2402	3.7	23	29
39	2441	3.7	23	21
78	2480	3.7	23	20
0	2402	4.2	23	27
39	2441	4.2	23	21
78	2480	4.2	23	24

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Bluetooth RF Conducted Emission Test Results cont'd

Ch. Number	Frequency (MHz)	Input Voltage (Volts)	Temperature (Celsius)	Frequency Error (kHz)	Frequency Error referenced to 23 °C (kHz)	PPM
0	2402	3.6	-20	27	-1	-0.4163
39	2441	3.6	-20	22	1	0.4097
78	2480	3.6	-20	22	-2	-0.8065
0	2402	3.6	55	33	5	2.0816
39	2441	3.6	55	25	4	1.6387
78	2480	3.6	55	22	-2	-0.8065
0	2402	3.7	-20	25	-4	-1.6653
39	2441	3.7	-20	21	0	0.0000
78	2480	3.7	-20	22	2	0.8065
0	2402	3.7	55	23	6	2.4979
39	2441	3.7	55	21	0	0.0000
78	2480	3.7	55	18	-2	-0.8065
0	2402	4.2	-20	24	-3	-1.2490
39	2441	4.2	-20	21	-2	-0.8193
78	2480	4.2	-20	18	-6	-2.4194
0	2402	4.2	55	20	-7	-2.9142
39	2441	4.2	55	20	-3	-1.2290
78	2480	4.2	55	21	-3	-1.2097

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802.11b/g RF Conducted Emission Test Results

Frequency Stability

The EUT met the requirements of the frequency stability compliance as per RSS-210. Channels 1, 6 and 11 were measured at 6 Mbps, maximum power output for 802.11b/g mode. The input voltage was stepped from 3.6 volts, 3.7 and 4.2 volts. The frequency drift was measured using a Spectrum Analyzer with reference to its value at +20°C. The temperature was varied from -30°C to +60°C in 10° steps.

Date of Test: March 21, 2008

Channel Number	Frequency (MHz)	Input Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)
1	2412	3.6	20	-1300
6	2437	3.6	20	-800
11	2462	3.6	20	-500

Traffic Channel Number	GSM850 Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)
1	2412	3.7	20	-800
6	2437	3.7	20	-1000
11	2462	3.7	20	-1200

Traffic Channel Number	GSM850 Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)
1	2412	4.2	20	-800
6	2437	4.2	20	-500
11	2462	4.2	20	-1000

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

Channel Number	Frequency (MHz)	Input Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	Frequency Error referenced to 20 °C (Hz)	PPM
1	2412	3.6	-30	200	1500	0.6219
1	2412	3.6	-20	-300	1000	0.4146
1	2412	3.6	-10	-700	600	0.2488
1	2412	3.6	0	-800	500	0.2073
1	2412	3.6	10	-800	500	0.2073
1	2412	3.6	30	-500	800	0.3317
1	2412	3.6	40	-1000	300	0.1244
1	2412	3.6	50	-1500	-200	-0.0829
1	2412	3.6	60	-1000	300	0.1244
1	2412	3.7	-30	0	800	0.3317
1	2412	3.7	-20	-300	500	0.2073
1	2412	3.7	-10	-800	0	0.0000
1	2412	3.7	0	-1000	-200	-0.0829
1	2412	3.7	10	-800	0	0.0000
1	2412	3.7	30	-500	300	0.1244
1	2412	3.7	40	-1200	-400	-0.1658
1	2412	3.7	50	-1800	-1000	-0.4146
1	2412	3.7	60	-1000	-200	-0.0829
1	2412	4.2	-30	-200	600	0.2488
1	2412	4.2	-20	-200	600	0.2488
1	2412	4.2	-10	-800	0	0.0000
1	2412	4.2	0	-800	0	0.0000
1	2412	4.2	10	-800	0	0.0000
1	2412	4.2	30	-500	300	0.1244
1	2412	4.2	40	-800	0	0.0000
1	2412	4.2	50	-1700	-900	0.3731
1	2412	4.2	60	-800	0	0.0000

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

Channel Number	Frequency (MHz)	Input Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	Frequency Error referenced to 20 °C (Hz)	PPM
6	2437	3.6	-30	300	1100	0.4514
6	2437	3.6	-20	-200	500	0.2052
6	2437	3.6	-10	-500	300	0.1231
6	2437	3.6	0	-700	100	0.0410
6	2437	3.6	10	-1000	-200	-0.0821
6	2437	3.6	30	-1000	-200	-0.0821
6	2437	3.6	40	-1300	-500	-0.2052
6	2437	3.6	50	-1700	-900	-0.3693
6	2437	3.6	60	-1200	-400	-0.1641
6	2437	3.7	-30	0	1000	0.4103
6	2437	3.7	-20	-200	800	0.3283
6	2437	3.7	-10	-800	200	0.0821
6	2437	3.7	0	-1000	0	0.0000
6	2437	3.7	10	-800	200	0.0821
6	2437	3.7	30	-1000	0	0.0000
6	2437	3.7	40	-1300	-300	-0.1231
6	2437	3.7	50	-1700	-700	-0.2824
6	2437	3.7	60	-800	200	0.0821
6	2437	4.2	-30	-200	300	0.1231
6	2437	4.2	-20	-300	200	0.0821
6	2437	4.2	-10	-800	-300	-0.1231
6	2437	4.2	0	-1000	-500	0.2052
6	2437	4.2	10	-800	-300	-0.1231
6	2437	4.2	30	-800	-300	-0.1231
6	2437	4.2	40	-1300	-800	-0.3283
6	2437	4.2	50	-1700	-1200	-0.4924
6	2437	4.2	60	-800	-300	-0.1231

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

Channel Number	Frequency (MHz)	Input Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	Frequency Error referenced to 20 °C (Hz)	PPM
11	2462	3.6	-30	200	700	0.2843
11	2462	3.6	-20	-300	200	0.0812
11	2462	3.6	-10	-1000	-500	-0.2031
11	2462	3.6	0	-1000	-500	-0.2031
11	2462	3.6	10	-700	-200	-0.0812
11	2462	3.6	30	-800	-500	-0.2031
11	2462	3.6	40	-1300	-800	-0.3250
11	2462	3.6	50	-1700	-1200	-0.4874
11	2462	3.6	60	-800	-500	-0.2031
11	2462	3.7	-30	200	1400	0.5686
11	2462	3.7	-20	-300	900	0.3656
11	2462	3.7	-10	-1000	200	0.0812
11	2462	3.7	0	-1000	200	0.0812
11	2462	3.7	10	-800	400	0.1625
11	2462	3.7	30	-1000	200	0.0812
11	2462	3.7	40	-1200	0	0.0000
11	2462	3.7	50	-1700	-500	-0.2031
11	2462	3.7	60	-800	400	0.1625
11	2462	4.2	-30	200	800	0.3250
11	2462	4.2	-20	-300	700	0.2843
11	2462	4.2	-10	-1000	0	0.0000
11	2462	4.2	0	-1000	0	0.0000
11	2462	4.2	10	-1000	0	0.0000
11	2462	4.2	30	-1000	0	0.0000
11	2462	4.2	40	-1200	-200	-0.0812
11	2462	4.2	50	-1500	-500	-0.2031
11	2462	4.2	60	-800	-200	-0.0812

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802.11a RF Conducted Emission Test Results

Frequency Stability

The EUT met the requirements of frequency stability as per RSS-210. Channels 36, 48, 52, 64, 149 and 161 were measured at 6 Mbps, maximum power output for 802.11a mode. The input voltage was stepped from 3.6 volts, 3.7 and 4.2 volts. The frequency drift was measured using a Spectrum Analyzer with reference to its value at +20°C. The temperature was varied from -30°C to +60°C in 10° steps.

Date of Test: March 24, 2008

Channel Number	Frequency (MHz)	Input Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)
36	5180	3.6	20	3700
48	5240	3.6	20	3700
52	5260	3.6	20	3800
64	5320	3.6	20	3700
149	5745	3.6	20	4200
161	5805	3.6	20	4000
36	5180	3.7	20	3700
48	5240	3.7	20	3700
52	5260	3.7	20	3800
64	5320	3.7	20	3700
149	5745	3.7	20	4000
161	5805	3.7	20	4200
36	5180	4.2	20	3700
48	5240	4.2	20	3500
52	5260	4.2	20	4000
64	5320	4.2	20	3700
149	5745	4.2	20	4300
161	5805	4.2	20	4200

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802.11a RF Conducted Emission Test Results cont'd

Channel Number	Frequency (MHz)	Input Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	Frequency Error referenced to 20 °C (Hz)	PPM
36	5180	3.6	-30	7800	4100	0.7915
36	5180	3.6	-20	5300	1600	0.3089
36	5180	3.6	-10	4700	1000	0.1931
36	5180	3.6	0	3300	-400	-0.0772
36	5180	3.6	10	3800	100	0.0193
36	5180	3.6	30	3700	0	0.0000
36	5180	3.6	40	3300	-400	-0.0772
36	5180	3.6	50	3000	-700	-0.1351
36	5180	3.6	60	4000	300	0.0579
36	5180	3.7	-30	7000	3300	0.6371
36	5180	3.7	-20	5500	1800	0.3475
36	5180	3.7	-10	4300	600	0.1158
36	5180	3.7	0	3300	-400	-0.0772
36	5180	3.7	10	3800	100	0.0193
36	5180	3.7	30	3700	0	0.0000
36	5180	3.7	40	3300	-400	-0.0772
36	5180	3.7	50	2700	-1000	-0.1931
36	5180	3.7	60	4300	600	0.1158
36	5180	4.2	-30	7000	3300	0.6371
36	5180	4.2	-20	5300	1600	0.3089
36	5180	4.2	-10	4300	600	0.1158
36	5180	4.2	0	3500	-200	-0.0386
36	5180	4.2	10	4000	300	0.0579
36	5180	4.2	30	3700	0	0.0000
36	5180	4.2	40	3200	-500	-0.0965
36	5180	4.2	50	2700	-1000	-0.1931
36	5180	4.2	60	4300	600	0.1158

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802.11a RF Conducted Emission Test Results cont'd

Channel Number	Frequency (MHz)	Input Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	Frequency Error referenced to 20 °C (Hz)	PPM
48	5240	3.6	-30	6800	3100	0.5916
48	5240	3.6	-20	5300	1600	0.3053
48	5240	3.6	-10	4200	500	0.0954
48	5240	3.6	0	3300	-400	-0.0763
48	5240	3.6	10	3800	100	0.0191
48	5240	3.6	30	3700	0	0.0000
48	5240	3.6	40	3200	-500	-0.0954
48	5240	3.6	50	2700	-1000	-0.1908
48	5240	3.6	60	4300	600	0.1145
48	5240	3.7	-30	6500	2800	0.5344
48	5240	3.7	-20	5500	1800	0.3435
48	5240	3.7	-10	4300	600	0.1145
48	5240	3.7	0	3500	-200	-0.0382
48	5240	3.7	10	3800	100	0.0191
48	5240	3.7	30	3700	0	0.0000
48	5240	3.7	40	3300	-400	-0.0763
48	5240	3.7	50	2700	-1000	-0.1908
48	5240	3.7	60	4000	300	0.0573
48	5240	4.2	-30	6700	3200	0.6107
48	5240	4.2	-20	5300	1800	0.3435
48	5240	4.2	-10	4000	500	0.0954
48	5240	4.2	0	3500	0	0.0000
48	5240	4.2	10	3800	300	0.0573
48	5240	4.2	30	3700	200	0.0382
48	5240	4.2	40	3200	-300	-0.0573
48	5240	4.2	50	2700	-800	-0.1527
48	5240	4.2	60	4300	800	0.1527

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802.11a RF Conducted Emission Test Results cont'd

Channel Number	Frequency (MHz)	Input Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	Frequency Error referenced to 20 °C (Hz)	PPM
52	5260	3.6	-30	6700	2900	0.5513
52	5260	3.6	-20	5300	1500	0.2852
52	5260	3.6	-10	4000	200	0.0380
52	5260	3.6	0	3300	-500	-0.0951
52	5260	3.6	10	3800	0	0.0000
52	5260	3.6	30	3700	-100	-0.0190
52	5260	3.6	40	3200	-600	-0.1141
52	5260	3.6	50	2500	-1300	-0.2471
52	5260	3.6	60	4000	200	0.0380
52	5260	3.7	-30	6700	2900	0.5513
52	5260	3.7	-20	5500	1700	0.3232
52	5260	3.7	-10	4200	400	0.0760
52	5260	3.7	0	3500	-300	-0.0570
52	5260	3.7	10	4000	200	0.0380
52	5260	3.7	30	3700	-100	-0.0190
52	5260	3.7	40	3200	-600	-0.1141
52	5260	3.7	50	2800	-1000	-0.1901
52	5260	3.7	60	4500	700	0.1331
52	5260	4.2	-30	6700	2700	0.5133
52	5260	4.2	-20	5300	1300	0.2471
52	5260	4.2	-10	4200	200	0.0380
52	5260	4.2	0	3500	-500	-0.0951
52	5260	4.2	10	3800	-200	-0.0380
52	5260	4.2	30	3800	-200	-0.0380
52	5260	4.2	40	3200	-800	-0.1521
52	5260	4.2	50	2500	-1500	-0.2852
52	5260	4.2	60	4500	500	0.0951

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802.11a RF Conducted Emission Test Results cont'd

Channel Number	Frequency (MHz)	Input Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	Frequency Error referenced to 20 °C (Hz)	PPM
64	5320	3.6	-30	6500	2800	0.5263
64	5320	3.6	-20	5300	1600	0.3008
64	5320	3.6	-10	4300	600	0.1128
64	5320	3.6	0	3200	-500	-0.0940
64	5320	3.6	10	3800	100	0.0188
64	5320	3.6	30	3500	-200	-0.0376
64	5320	3.6	40	3000	-700	-0.1316
64	5320	3.6	50	2700	-1000	-0.1880
64	5320	3.6	60	4300	600	0.1128
64	5320	3.7	-30	6700	3000	0.5639
64	5320	3.7	-20	5300	1600	0.3008
64	5320	3.7	-10	4200	500	0.0940
64	5320	3.7	0	3500	-200	-0.0376
64	5320	3.7	10	4000	300	0.5639
64	5320	3.7	30	3700	0	0.0000
64	5320	3.7	40	3200	-500	-0.0940
64	5320	3.7	50	2800	-900	-0.1692
64	5320	3.7	60	4800	1100	0.2168
64	5320	4.2	-30	6800	3100	0.5827
64	5320	4.2	-20	5300	1500	0.2820
64	5320	4.2	-10	4200	400	0.0752
64	5320	4.2	0	3500	-300	-0.0564
64	5320	4.2	10	3800	100	0.0188
64	5320	4.2	30	3700	0	0.0000
64	5320	4.2	40	3200	-500	-0.0940
64	5320	4.2	50	2700	-1000	-0.1880
64	5320	4.2	60	4300	600	0.1128

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802.11a RF Conducted Emission Test Results cont'd

Channel Number	Frequency (MHz)	Input Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	Frequency Error referenced to 20 °C (Hz)	PPM
149	5745	3.6	-30	7200	3000	0.5222
149	5745	3.6	-20	5700	1500	0.2611
149	5745	3.6	-10	4500	300	0.0522
149	5745	3.6	0	3500	-700	-0.1218
149	5745	3.6	10	4300	100	0.0174
149	5745	3.6	30	3800	-400	-0.0696
149	5745	3.6	40	3200	-1000	-0.1741
149	5745	3.6	50	3200	-1000	-0.1741
149	5745	3.6	60	4300	100	0.0174
149	5745	3.7	-30	7200	3200	0.5570
149	5745	3.7	-20	5700	1700	0.2959
149	5745	3.7	-10	4500	500	0.0870
149	5745	3.7	0	3700	-300	-0.0522
149	5745	3.7	10	4200	200	0.0348
149	5745	3.7	30	4000	0	0.0000
149	5745	3.7	40	3200	-800	-0.1393
149	5745	3.7	50	3200	-800	-0.1393
149	5745	3.7	60	4700	700	0.1218
149	5745	4.2	-30	6800	2500	0.4352
149	5745	4.2	-20	5700	1400	0.2437
149	5745	4.2	-10	4700	400	0.0696
149	5745	4.2	0	3700	-600	-0.1044
149	5745	4.2	10	4500	200	0.0348
149	5745	4.2	30	3800	-500	-0.0870
149	5745	4.2	40	3300	-1000	-0.0174
149	5745	4.2	50	2800	-1500	-0.2611
149	5745	4.2	60	4700	400	0.0696

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802.11a RF Conducted Emission Test Results cont'd

Channel Number	Frequency (MHz)	Input Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	Frequency Error referenced to 20 °C (Hz)	PPM
161	5805	3.6	-30	7200	3200	0.5512
161	5805	3.6	-20	5700	1700	0.2929
161	5805	3.6	-10	4700	700	0.1206
161	5805	3.6	0	3700	-300	-0.0517
161	5805	3.6	10	4000	0	0.0000
161	5805	3.6	30	4000	0	0.0000
161	5805	3.6	40	3200	-800	-0.1378
161	5805	3.6	50	2800	-1200	-0.2067
161	5805	3.6	60	4300	300	-0.0517
161	5805	3.7	-30	7000	2800	0.4823
161	5805	3.7	-20	5700	1500	0.2584
161	5805	3.7	-10	4300	100	0.0172
161	5805	3.7	0	3800	-400	-0.0689
161	5805	3.7	10	4300	100	0.0172
161	5805	3.7	30	3800	-400	-0.0689
161	5805	3.7	40	3200	-1000	-0.1723
161	5805	3.7	50	2800	-1400	-0.2412
161	5805	3.7	60	4700	500	0.0861
161	5805	4.2	-30	7000	2800	0.4823
161	5805	4.2	-20	6000	1800	0.3101
161	5805	4.2	-10	4500	300	0.0517
161	5805	4.2	0	3800	-400	-0.0689
161	5805	4.2	10	4300	100	0.0172
161	5805	4.2	30	3800	-400	-0.0689
161	5805	4.2	40	3500	-700	-0.1206
161	5805	4.2	50	3300	-900	-0.1550
161	5805	4.2	60	4500	300	0.0517