EMI Test Report

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

RIM Testing Services (RTS)

A division of Research In Motion Limited

REPORT NO.: RTS-0441-0611-08

PRODUCT MODEL NO.: RBG41GW
TYPE NAME: BlackBerry
FCC ID: L6ARBG40GW
IC: 2503A-RBG40GW

DATE: 30 Nov 2006

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Statement of Performance:

The BlackBerry Wireless Handheld, model RBG41GW, part number CER-13626-001 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 by:

Kevin Chow
Compliance Specialist
Date: 27 Nov 2006

Tested and Reviewed by:

Maurice Battler
Compliance Specialist
Date: 30 Nov 2006

Tested and Reviewed by:

Masud S. Attayi, P.Eng.
Team Lead, Regulatory Compliance
Date: 30 Nov 2006

Approved by:

Paul G. Cardinal, Ph.D.
Director
Date: 3 Dec 2006

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A. Scope

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

- FCC CFR 47 Part 15, Subpart C, Aug. 14, 2006
- FCC CFR 47 Part 15, Subpart E, Aug, 14, 2006
- Industry Canada, RSS-210, Issue 6, September 2005, Low Power Licence-Exempt Radiocommunication Devices
- Industry Canada, RSS-GEN, Issue 1, September 2005, General Requirements and Information for the Certification of Radiocommunication Equipment

B. Associated Document

1. Document number RTS-0441-RBG41GW-01

C. Product Identification

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 sample EUT included:

1a. BlackBerry Handheld, model RBE41GW, part number CER-13626-001 Rev. 1, PIN 20502F1C, LCD-11059-003.
1b. BlackBerry Handheld, model RBE41GW, part number CER-13626-001 Rev. 2, PIN 20528D21, LCD-11059-001.
1c. BlackBerry Handheld, model RBE41GW, part number CER-13626-001 Rev. 2, PIN 2053032F, LCD-11059-001
2a. BlackBerry Handheld, model RBE41GW, part number CER-13626-001 Rev. 1, PIN 20506DB7, LCD-11059-001
2b. BlackBerry Handheld, model RBE41GW, part number CER-13626-001 Rev. 2, PIN 205302CB, LCD-11059-003

Sample numbers 1a, 1b, and 1c were used for radiated emission and radiated band edge testing. Sample numbers 2a and 2b were used for conducted tests.

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To view the differences between CER-13626-001 Rev 1 and CER-13626-001 Rev 2 see document number RTS-0441-RBG41GW-01.

Only the measurements that may have been impacted by the changes from Rev 1 to Rev 2 were re-measured.

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 1000134

E. Test Voltage

The ac input voltage was 120/230 volts, 60/50 Hz where applicable. This configuration was per RIM's specifications.

F. Test Results Chart

SPECIFICATION	TEST TYPE	MEETS REQUIREMENTS	PERFORMED BY
FCC CFR 47 Part 15.207 IC RSS-210	AC Line Conducted Emissions	Yes	Masud Attayi
FCC CFR 47 Part 15.209, 15.247, 15.407 IC RSS-210/RSS-GEN	Radiated Emissions Radiated Band Edge Compliance	Yes	Masud Attayi and Kevin Chow
FCC CFR 47 Part 15.247(a), (b), (c) 15.407 IC RSS-210/RSS-GEN	20 and 6 dB Bandwidth Carrier Freq. Separation Number of Hopping freq. Dwell Time Max. Peak Output Power Band Edge Compliance Spurious RF Conducted Emissions	Yes	Maurice Battler
IC RSS-210	Frequency Stability	Yes	Maurice Battler

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G. Modifications to EUT

No modifications were required on the EUT.

H. 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.
The following test configurations were measured:

1. The Handheld 1c in battery charging mode, was connected to the Folding Blade Charger, part number ASY-07040-001. The ac input to the Folding Blade Charger was 120 volts, 60 Hz. The Handheld 1c was also connected to the Stereo Headset, part number HDW-13019-001.
2. The Handheld 1a in battery charging mode, was connected to the Alternative Folding Blade Charger, part number ASY-12709-001. The ac input to the Alternative Folding Blade Charger was 120 volts, 60 Hz. The Handheld 1a was also connected to the Stereo Headset, part number HDW-13019-001.
3. The Handheld 1a in battery charging mode, was connected to the Folding Blade Charger, part number ASY-07040-001. The ac input to the Folding Blade Charger was 120 volts, 60 Hz. The Handheld 1c was also connected to the Stereo Headset, part number HDW-13019-001.

The sample EUT's conducted emissions were compared with respect to the FCC CFR 47 Part 15, Subpart C, E and IC RSS-210 limit. The sample EUT had a worse case test margin of 14.90 dB below the limit at 1.657 MHz using the average detector with the Folding Blade Charger, test configuration 1 and 5.59 dB below the limit at 1.025 MHz using the quasi peak detector with the Folding Blade Charger, test configuration 3.
See APPENDIX 1 for the test data

Measurement Uncertainty ±2.0 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 **IC4240**.
The EUT was configured and operated to produce the maximum radiated emissions while still keeping within RIM's specifications.

The Handheld 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 harmonics were investigated up to the 10th harmonic. The sample EUT had a worse case test margin of 10.8 dB at 4882.0 MHz using the peak detector and a worse case test margin of 2.8 dB at 4882.0 MHz using the average detector.

The radiated emissions from the EUT were also 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 19.06 dB at 4926.65 MHz using the peak detector and a worse case test margin of 8.78 dB at 4925.73 MHz using the average detector.

The radiated emissions from the EUT were also 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 radiated emissions 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 7th harmonic. The sample EUT had a worse case test margin of 2.71 dB at 5099.11 MHz using the peak detector.
See APPENDIX 2 for the test data

Co-Location Measurements
The radiated emissions were measured up to the 18 GHz for middle channels for simultaneous transmission in GSM850/802.11b/g, GSM850/Bluetooth/802.11a, PCS/802.11b/g, and PCS/Bluetooth/802.11a. Both the horizontal and vertical polarizations were measured. The emissions due to different simultaneous transmission did not increase the amplitude of any emissions nor did it produce any new inter-modulation products as a result of mixing.

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. The results include both normal data rate and EDR for Bluetooth.

Measurement Uncertainty ±4.0 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.

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

e) Maximum Peak Conducted Output Power
The 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

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c) Band-Edge Compliance of RF Conducted Emissions
The EUT met the requirements of band-edge compliance of RF conducted emissions as per 47 CFR 15.247(b) and RSS-210. Low channel (1), middle channel (6) and high channel (11) were measured.
See APPENDIX 4 for the test data.

d) Peak Power Spectral Density
The EUT met the requirements of peak power spectral density as per 47 CFR 15.247(b) and RSS-210. Low channel (1), middle channel (6) and high channel (11) were measured.
See APPENDIX 4 for the test data.

e) Spurious RF Conducted Emissions
The EUT met the requirements of the spurious RF conducted emissions as per 47 CFR 15.247(c) and RSS-210. The frequency range measured was 30 MHz to 26 GHz. Low channel (1), middle channel (6) and high channel (11) were measured.
See APPENDIX 4 for the test data.

5) WiFi 802.11a RF CONDUCTED EMISSIONS

a) 6dB Bandwidth
The EUT met the requirements of the 6 dB bandwidth as per 47 CFR 15.407and RSS-210. Channels 36, 44, 48, 52, 60, 64, 49, 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, 49, 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.

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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. Channels 36, 44, 48, 52, 60, 64, 49, 157 and 161 were measured.
See APPENDIX 5 for the test data.

e) Spurious RF Conducted Emissions
The EUT met the requirements of the spurious RF conducted emissions as per 47 CFR 15.407 and RSS-210. The frequency range measured was 30 MHz to 26 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 +60ºC in 10º steps. The dc input voltage was stepped from 3.6, 3.8 to 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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I. Compliance Test Equipment Used

UNIT	MANUFACTURER	MODEL	SERIAL NUMBER	CAL DUE DATE (YY MM DD)	USE
Preamplifier	Sonoma	310N/11909A	185831	06-11-27	Radiated Emissions
Preamplifier system	TDK RF Solutions	PA-02	080010	06-11-25	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	07-01-07	Radiated Emissions
Horn Antenna	Emco	3116	2538	08-09-25	Radiated Emissions
Preamplifier	TDK	18-26	030002	06-11-28	Radiated Emissions
Dipole Antenna	Schwarzbeck	UHAP	973	06-12-13	Radiated Emissions
Dipole Antenna	Schwarzbeck	UHAP	974	08-09-28	Radiated Emissions
Universal Radio Communication Tester	Rohde & Schwarz	CMU 200	837493/073	07-03-23	Radiated Emissions
EMI Receiver	Rohde & Schwarz	ESIB-40	100255	07-05-11	Radiated Emissions
EMI Receiver	Agilent	8546A	3942A00517	07-09-21	Conducted/Radiated Emissions
RF Filter Section	Agilent	85460A	3704A00481	07-09-21	Conducted/Radiated Emissions
Universal Radio Communication Tester	Rohde & Schwarz	CMU 200	100251	07-04-23	Conducted Emissions
Spectrum Analyzer	HP	8563E	3745A08112	07-09-20	RF Conducted Emissions
DC Power Supply	HP	6632B	US37472178	07-09-14	RF Conducted Emissions
Environment Monitor	Control Company	1870	230355190	06-12-23	Radiated Emissions
Environment Monitor	Control Company	1870	230355189	06-12-23	RF Conducted Emissions
Temperature Probe	Hart Scientific	61161-302	21352860	07-08-31	Frequency Stability
Environmental Chamber	ESPEC Corp.	SH-240S1	91005607	N/R	Frequency Stability
Bluetooth Tester	Rohde & Schwarz	CBT	100034	07-06-15	Radiated Emissions
Signal Generator	Agilent	8648C	4037U03155	07-09-13	Frequency Stability
Power Meter	Giga-tronics	8541C	1837762	06-12-03	Frequency Stability
Power Sensor	Giga-tronics	80401A	1835838	06-12-03	Frequency Stability
Power Meter	Aglient	N1911A	GE45100234	08-09-25	Radiated Emissions
Power Sensor	Agilent	N1921A	US44510427	07-05-30	Radiated Emissions
Digital Multimeter	Hewlett Packard	34401A	US36042324	07-09-19	Conducted/Radiated Emissions
L.I.S.N.	Emco	3816/2	1120	08-08-28	Conducted Emissions
Impulse Limiter	Rohde & Schwarz	ESHS-Z2	836248/052	07-11-20	Conducted Emissions

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APPENDIX 1 – AC CONDUCTED EMISSIONS TEST DATA/PLOTS

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Bluetooth AC Conducted Emission Test Results

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	22ºC
Pressure	976 mb
Relative Humidity	38%

Test Configuration 1

Frequency (MHz)	Line	Reading (QP) (dBµV)	Correction Factor (dB)	Corrected Reading (QP) (dB)	Limit (QP) (dBµV)	Margin (QP) Limits (dB)
0.917	N	24.55	9.04	33.59	56.00	-22.41
1.011	N	38.60	9.07	47.67	56.00	-8.33
1.683	L1	28.13	9.34	37.47	56.00	-18.53
1.690	N	38.76	9.34	48.10	56.00	-7.90
1.794	N	36.81	9.37	46.18	56.00	-9.82
1.902	N	35.04	9.37	44.40	56.00	-11.60
2.371	L1	26.24	9.46	35.70	56.00	-20.30

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 Results cont'd

Test Configuration 1

Frequency (MHz)	Line	Reading (AV) (dBµV)	Correction Factor (dB)	Corrected Reading (AV) (dB)	Limit (AV) (dBµV)	Margin (AV) Limits (dB)
0.960	N	13.56	9.04	22.60	46.00	-23.40
1.050	N	13.18	9.07	22.25	46.00	-23.75
1.168	L1	21.39	9.13	30.52	46.00	-15.48
1.167	N	18.77	9.13	27.90	46.00	-18.10
1.657	L1	21.76	9.34	31.10	46.00	**-14.90**
1.661	N	16.23	9.34	25.57	46.00	-20.43
1.756	L1	19.91	9.36	29.27	46.00	-16.73
2.342	L1	18.34	9.46	27.80	46.00	-18.20

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

Measurements were done with the average detector.

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

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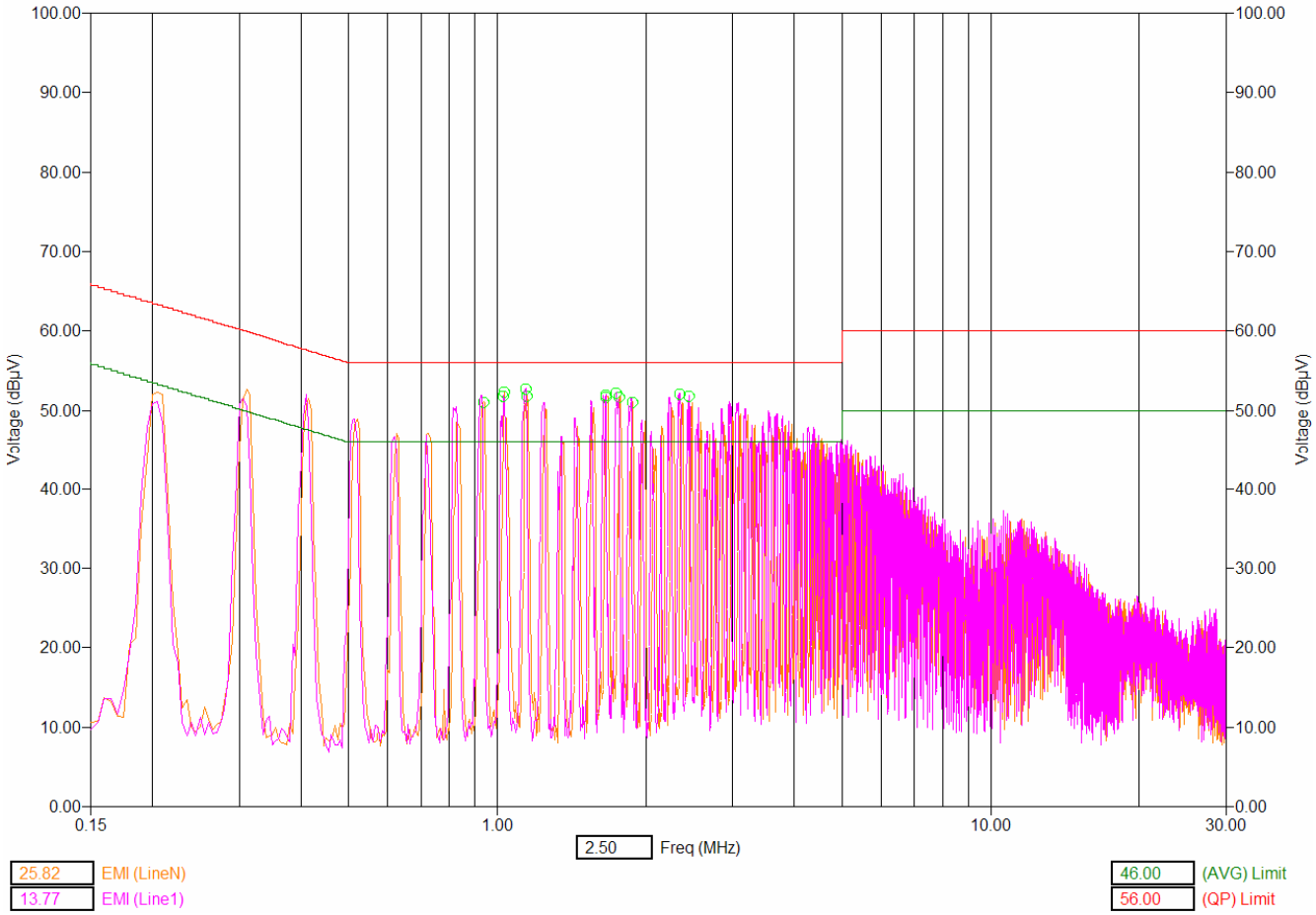
Bluetooth AC Conducted Emission Test Results cont'd

Test Configuration 1

Figure 1-1



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802.11b/g AC Conducted Emission Test Results

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	24ºC
Pressure	1087 mb
Relative Humidity	22%

Test Configuration 2

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)
0.266	N	31.77	8.87	40.64	61.59	51.59	-20.95	-10.95
0.335	N	30.27	8.80	39.07	59.58	49.58	-20.51	-10.51
0.400	L1	31.81	8.65	40.46	58.06	48.06	-17.60	-7.60
0.404	L1	32.26	8.63	40.89	57.85	47.85	-16.96	-6.96
0.406	N	28.20	8.63	36.83	57.85	47.85	-21.02	-11.02
0.432	L1	26.05	8.48	34.53	57.35	47.35	-22.82	-12.82
0.461	N	25.82	8.27	34.09	56.69	46.69	-22.60	-12.60
0.525	L1	26.55	8.17	34.72	56.00	46.00	-21.28	-11.28
0.530	N	25.74	8.14	33.88	56.00	46.00	-22.12	-12.12
0.532	N	25.76	8.23	33.99	56.00	46.00	-22.01	-12.01
0.589	L1	22.97	8.39	31.36	56.00	46.00	-24.64	-14.64
0.606	L1	23.12	8.42	31.54	56.00	46.00	-24.46	-14.46

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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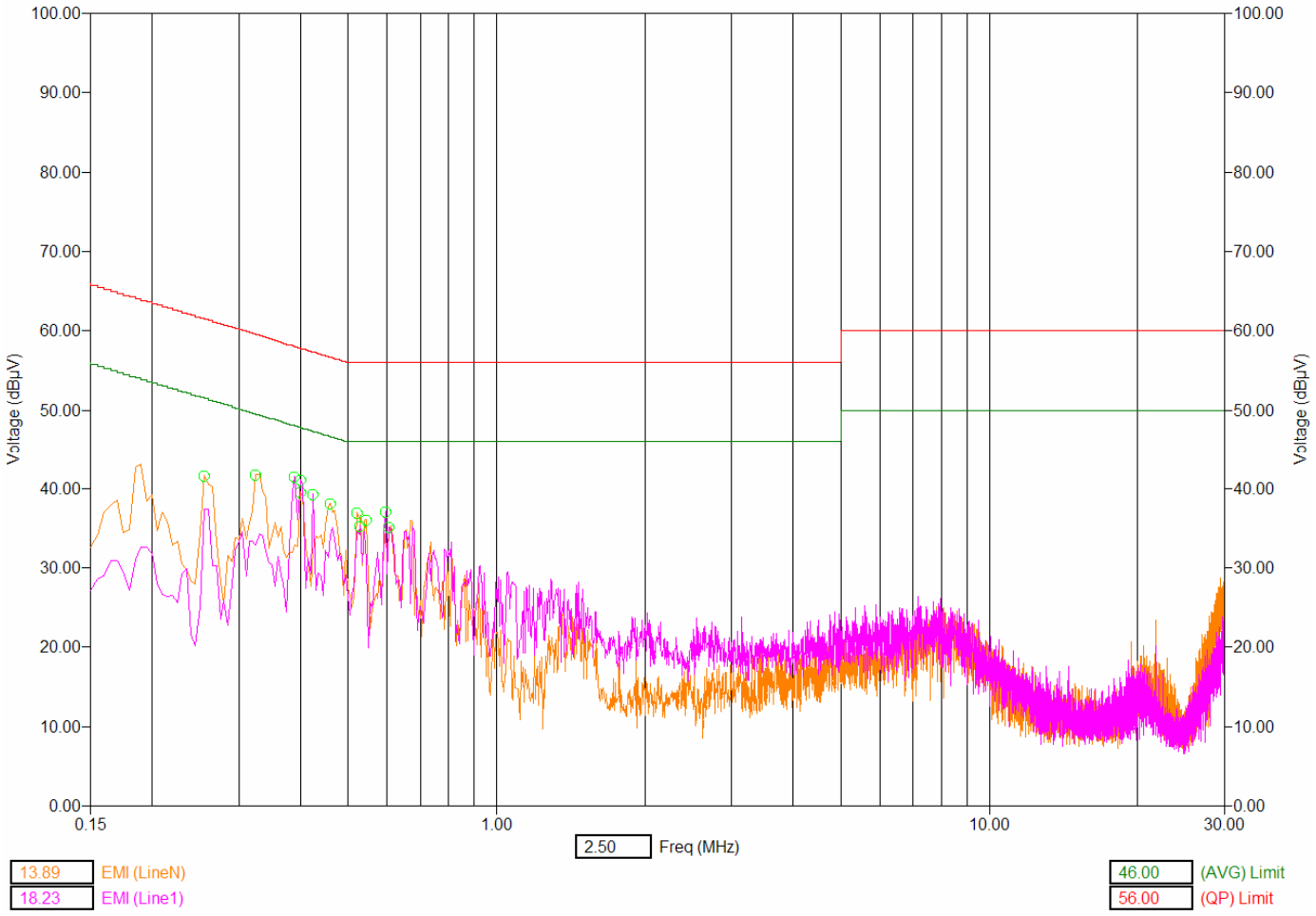
802.11b/g AC Conducted Emission Test Result cont'd

Test Configuration 2

Figure 1-2



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802.11a AC Conducted Emission Test Results

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 E and IC RSS-210.

The environmental test conditions were:

Temperature	24ºC
Pressure	1087 mb
Relative Humidity	22%

Test Configuration 3

Frequency (MHz)	Line	Reading (QP) (dBµV)	Correction Factor (dB)	Corrected Reading (QP) (dB)	Limit (QP) (dBµV)	Margin (QP) Limits (dB)
0.818	L1	41.33	8.81	50.14	56.00	-5.86
0.820	N	40.82	8.79	49.61	56.00	-6.39
0.924	N	41.18	9.04	50.22	56.00	-5.78
1.025	L1	41.34	9.07	50.41	56.00	**-5.59**
1.027	N	40.52	9.06	49.58	56.00	-6.42
1.551	L1	24.04	9.30	33.34	56.00	-22.66
1.638	N	40.42	9.33	49.75	56.00	-6.25
1.703	N	32.23	9.35	41.58	56.00	-14.42
1.740	N	39.00	9.37	48.37	56.00	-7.63
2.264	L1	22.04	9.44	31.48	56.00	-24.52
2.923	L1	35.42	9.62	45.04	56.00	-10.96

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

Measurements were done with the quasi-peak detector.

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

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802.11a AC Conducted Emission Test Results cont'd

Frequency (MHz)	Line	Reading (AV) (dBµV)	Correction Factor (dB)	Corrected Reading (AV) (dB)	Limit (AV) (dBµV)	Margin (AV) Limits (dB)
0.805	N	18.82	8.79	27.61	46.00	-18.39
0.814	L1	21.58	8.81	30.39	46.00	-15.61
0.919	N	20.75	9.04	29.79	46.00	-16.21
1.021	N	19.13	9.06	28.19	46.00	-17.81
1.021	L1	21.00	9.07	30.07	46.00	-15.93
1.632	N	18.64	9.33	27.97	46.00	-18.03

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

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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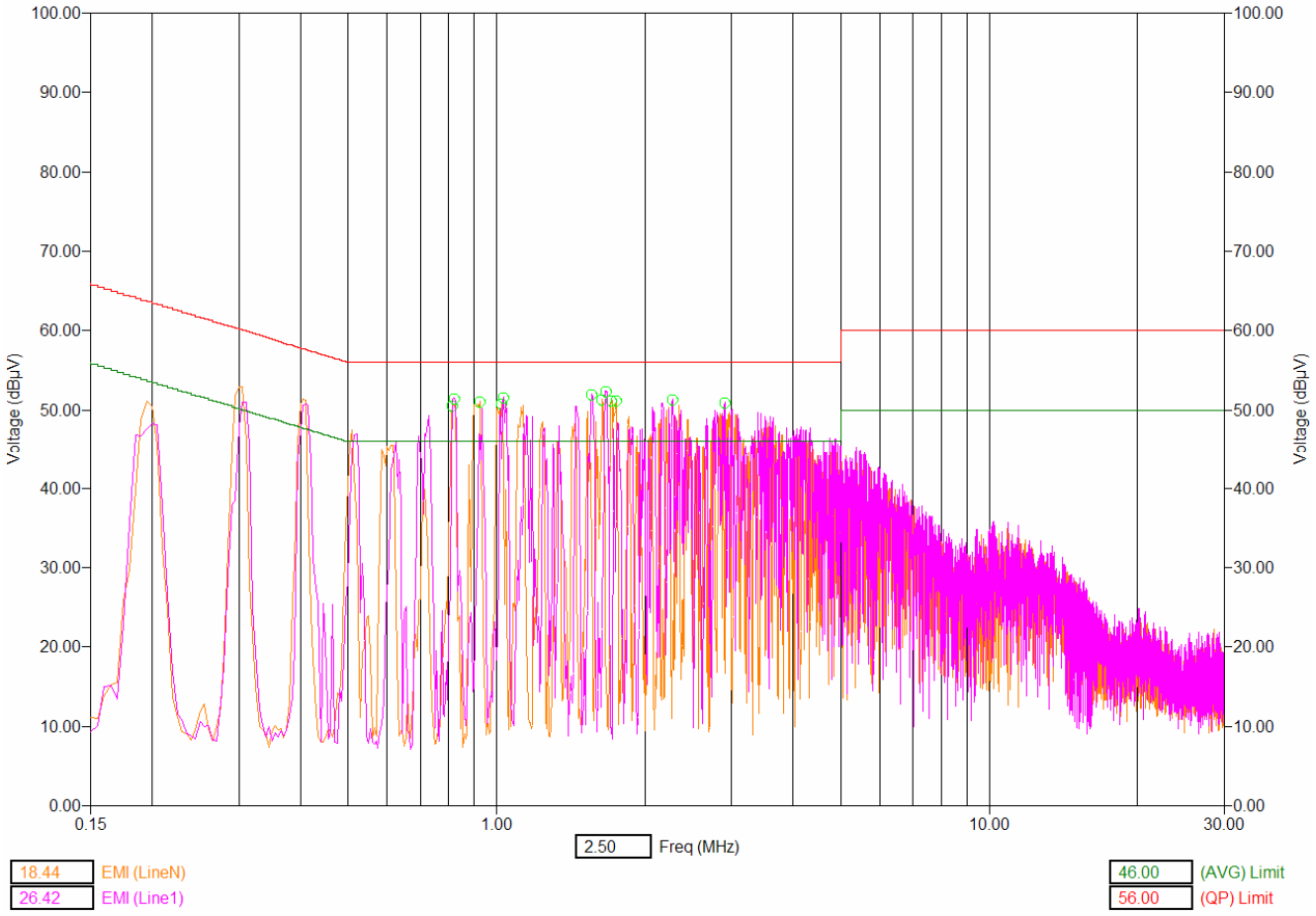
802.11a AC Conducted Emission Test Results cont'd

Test Configuration 3

Figure 1-3



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APPENDIX 2 – RADIATED EMISSIONS TEST DATA

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Radiated Emissions Test Results
Bluetooth Band

Test Distance was 3.0 metre.

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 Type	Antenna Pol	Reading (Peak) (dBuV)	Corrected Reading (dBuV)	Detector (AVE/PK)	Peak Limit (dBuV/m)	Diff. To Limit (dB)
Handheld Standalone, USB side down									
Single frequency mode Low Channel									
2nd	0	4804.0	Horn	V	NF	NF	PK.	74	-
2nd	0	4804.0	Horn	H	NF				
2nd	0	4804.0	Horn	V	NF	NF	AVE.	54	-
2nd	0	4804.0	Horn	H	NF				
The harmonics were investigated up to the 10th harmonic. Emissions were in the noise floor (NF)									
Single frequency mode Middle Channel									
2nd	39	4882.0	Horn	V	42.4	63.2	PK.	74	-10.8
2nd	39	4882.0	Horn	H	NF				
2nd	39	4882.0	Horn	V	30.4	51.2	AVE.	54	-2.8
2nd	39	4882.0	Horn	H	NF				
The harmonics were investigated up to the 10th harmonic. Emissions above the 2nd harmonic were in the NF									
Single frequency mode High Channel									
2nd	78	4960.0	Horn	V	NF	NF	PK.	74	-
2nd	78	4960.0	Horn	H	NF				
2nd	78	4960.0	Horn	V	NF	NF	AVE.	54	-
2nd	78	4960.0	Horn	H	NF				
The harmonics were investigated up to the 10th harmonic. Emissions were in the NF									

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Bluetooth Radiated Emissions Test Results cont'd

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

Type	Channel	Frequency (MHz)	Antenna Type	Antenna Pol	Reading (Peak) (dBuV)	Corrected Reading (dBuV)	Detector (AVE/PK)	Peak Limit (dBuV/m)	Diff. To Limit (dB)
Handheld Standalone, USB side down Hopping mode.									
2nd	0-78	4960.0	Horn	V	NF	NF	PK.	74	-
2nd	0-78	4960.0	Horn	H	NF				
2nd	0-78	4960.0	Horn	V	NF	NF	AVE.	54	-
2nd	0-78	4960.0	Horn	H	NF				
The harmonics were investigated up to the 10th harmonic. Emissions were in the noise floor (NF)									

The environmental test conditions were:

Temperature	23ºC
Pressure	1050 mb
Humidity	33 %

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Bluetooth Band-Edge Compliance of RF Radiated Emissions Test Results

The test distance was 3 metres.

Handheld standalone, vertical, Pattern type "Static PRBS" and packet type "3-DH5" during the measurements.

Channel	Freq. (MHz)	Rx Antenna Type	POL.	Detector (PK, AVE.)	VBW (MHz)	Corrected Reading (dBuV/m)	Delta Marker (dB)	Corrected Band edge (dBuV/m)	Limit (dBuV/m)	Diff. To Limit (dB)
0	2402.0	Horn	V	PK	1.0 MHz	90.9	46.1	44.8	74	-29.2
0	2402.0	Horn	H	PK	1.0 MHz	91.0	49.2	41.8	74	-32.2
0	2402.0	Horn	V	AVE.	10 Hz	80.1	46.1	34.0	54	-20.0
0	2402.0	Horn	H	AVE.	10 Hz	80.9	49.2	31.7	54	-22.3

Handheld standalone, vertical, Pattern type "Static PRBS" and packet type "3-DH5" during the measurements.

Channel	Freq. (MHz)	Rx Antenna Type	POL.	Detector (PK, AVE.)	VBW (MHz)	Corrected Reading (dBuV/m)	Delta Marker (dB)	Corrected Band edge (dBuV/m)	Limit (dBuV/m)	Diff. To Limit (dB)
78	2480.0	Horn	V	PK	1.0 MHz	87.1	42.7	44.4	74	-29.6
78	2480.0	Horn	H	PK	1.0 MHz	88.6	43.5	45.1	74	-28.9
78	2480.0	Horn	V	AVE.	10 Hz	77.7	42.7	35.0	54	-19.0
78	2480.0	Horn	H	AVE.	10 Hz	79.8	43.5	36.3	54	-17.7

Handheld standalone, vertical, Pattern type "Static PRBS" and packet type "DH5" during the measurements.

Channel	Freq. (MHz)	Rx Antenna Type	POL.	Detector (PK, AVE.)	VBW (MHz)	Corrected Reading (dBuV/m)	Delta Marker (dB)	Corrected Band edge (dBuV/m)	Limit (dBuV/m)	Diff. To Limit (dB)
78	2480.0	Horn	V	PK	1.0 MHz	87.1	40.1	47.0	74	-27.0
78	2480.0	Horn	H	PK	1.0 MHz	89.2	44.7	44.5	74	-29.5
78	2480.0	Horn	V	AVE.	10 Hz	80.2	40.1	40.1	54	-13.9
78	2480.0	Horn	H	AVE.	10 Hz	82.3	44.7	37.6	54	-16.4

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 Rad. Emi. Bluetooth, Single freq., Static PBRS, 3-DH5, Channel 0, Pol: V, Detector: PK

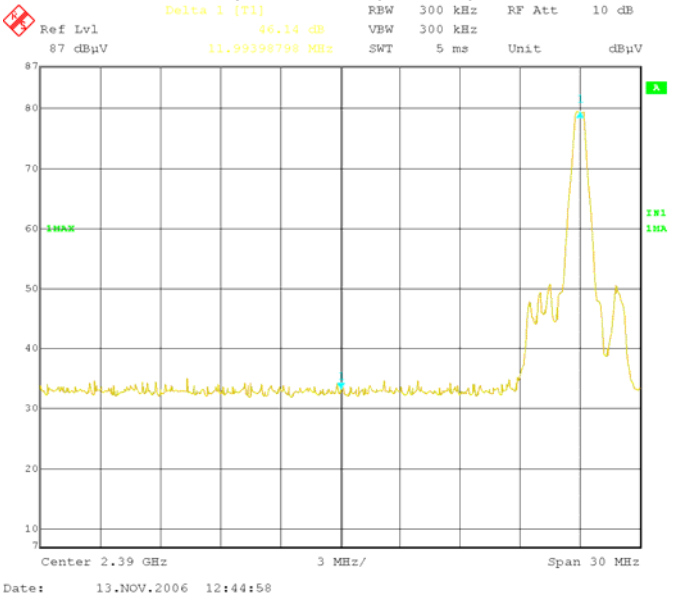


Figure 2-2: Band-Edge Compliance of RF Rad. Emi. Bluetooth, Single freq., Static PBRS, 3-DH5, Channel 0, Pol: H, Detector: PK

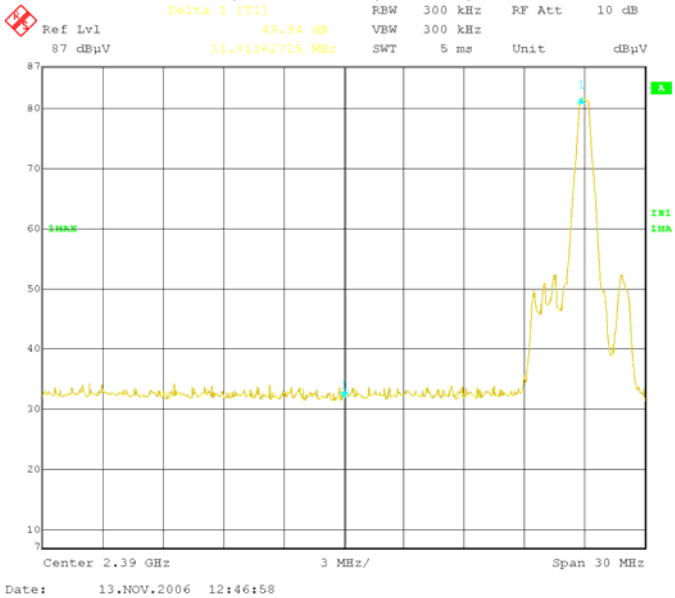


Figure 2-3: Band-Edge Compliance of RF Rad. Emi. Bluetooth, Single freq., Static PBRS, 3-DH5, Channel 78, Pol: V, Detector: PK

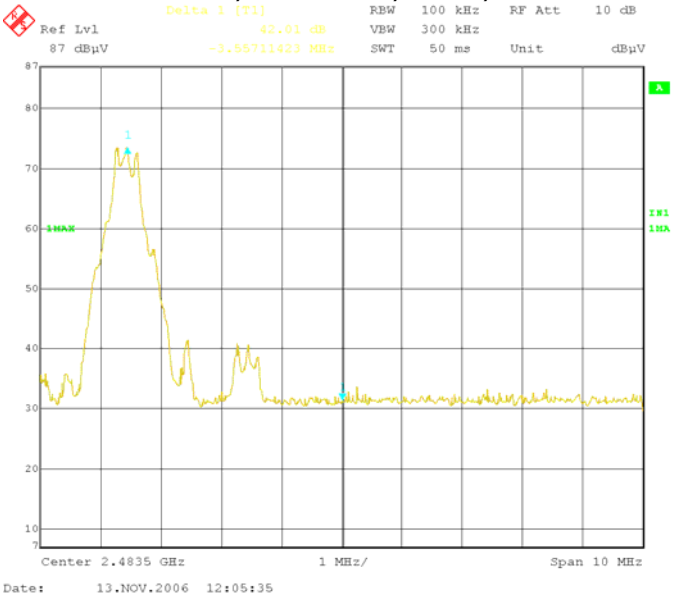
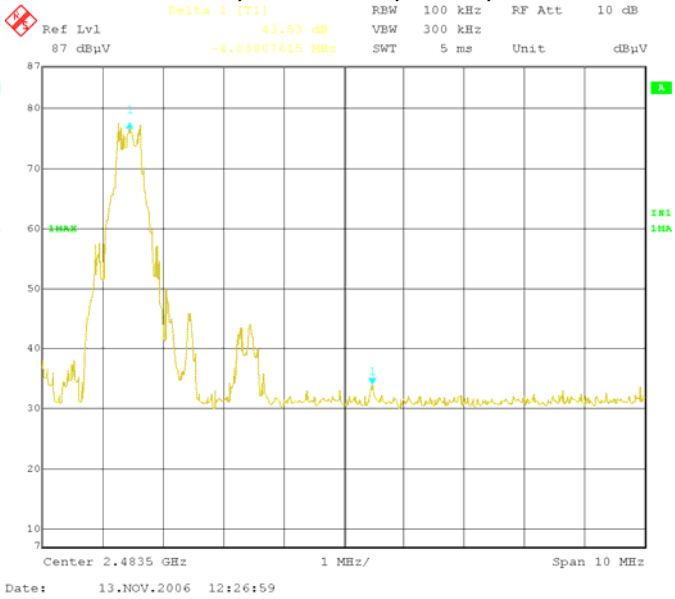


Figure 2-4: Band-Edge Compliance of RF Rad. Emi. Bluetooth, Single freq., Static PBRS, 3-DH5, Channel 78, Pol: H, Detector: PK



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

Test Distance was 3.0 metre.

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

Channel 1, 2412 MHz

Freq (MHz)	Pol	Ttbl Agl (deg)	Twr Ht (cm)	PK/AVE	Trace (dBuV)	Transducer (dB)	Cable (dB)	Filter (dB)	Preamp (dB)	EMI (dBµV/m)	Limit (dBµV/m)	Margin (dB)
4826.21	V	16	199	PK	36.35	32.86	10.72	2.72	28.27	54.38	74.00	-19.62
4826.33	H	357	190	PK	36.28	32.87	10.72	2.72	28.28	54.31	74.00	-19.69
4826.88	V	180	197	AVE	25.85	32.86	10.72	2.72	28.27	43.89	54.00	-10.11
4827.24	H	39	174	AVE	25.83	32.87	10.72	2.72	28.28	43.86	54.00	-10.14

Channel 6, 2437 MHz

Freq (MHz)	Pol	Ttbl Agl (deg)	Twr Ht (cm)	PK/AVE	Trace (dBuV)	Transducer (dB)	Cable (dB)	Filter (dB)	Preamp (dB)	EMI (dBµV/m)	Limit (dBµV/m)	Margin (dB)
4873.97	H	58	199	PK	36.86	32.96	10.95	0.44	28.11	53.09	74.00	-20.91
4872.86	V	316	183	PK	37.09	32.96	10.95	0.44	28.11	53.32	74.00	-20.68
4874.68	H	168	100	AVE	26.47	32.96	10.95	0.44	28.11	42.70	54.00	-11.30
4874.02	V	288	131	AVE	26.45	32.96	10.95	0.44	28.11	42.68	54.00	-11.32

Channel 11, 2462 MHz

Freq (MHz)	Pol	Ttbl Agl (deg)	Twr Ht (cm)	PK/AVE	Trace (dBuV)	Transducer (dB)	Cable (dB)	Filter (dB)	Preamp (dB)	EMI (dBµV/m)	Limit (dBµV/m)	Margin (dB)
4926.65	V	357	141	PK	36.31	33.06	11.06	2.70	28.18	54.94	74.00	-19.06
4927.01	H	136	162	PK	35.88	33.06	11.07	2.70	28.17	54.54	74.00	-19.46
4925.06	V	201	125	AVE	26.54	33.06	11.06	2.70	28.18	45.17	54.00	-8.83
4925.73	H	166	176	AVE	26.57	33.06	11.07	2.70	28.17	45.22	54.00	-8.78

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

The test distance was 3 metres.

Handheld standalone, vertical, the measurements were performed on channels 1 for 802.11 b/g mode. RBW 1 MHz.

Channel	Freq. (MHz)	Rx Antenna Type	Rx Antenna POL.	Detector (PK, AVE.)	VBW (MHz)	Corrected Reading (dBuV/m)	Delta Marker (dB)	Corrected Band edge (dBuV/m)	Limit (dBuV/m)	Diff. To Limit (dB)
1	2412.0	Horn	V	PK	1.0 MHz	101.4	35.2	66.2	74	-7.8
1	2412.0	Horn	H	PK	1.0 MHz	101.3	39.6	61.7	74	-12.3
1	2412.0	Horn	V	AVE.	10 Hz	85.8	34.6	51.2	54	-2.8
1	2412.0	Horn	H	AVE.	10 Hz	84.5	45.6	38.9	54	-15.1

Handheld standalone, vertical, the measurements were performed on channels 11 for 802.11 b/g mode.

Channel	Freq. (MHz)	Rx Antenna Type	Rx Antenna POL.	Detector (PK, AVE.)	VBW (MHz)	Corrected Reading (dBuV/m)	Delta Marker (dB)	Corrected Band edge (dBuV/m)	Limit (dBuV/m)	Diff. To Limit (dB)
11	2462.0	Horn	V	PK	1.0 MHz	101.8	45.6	56.2	74	-17.8
11	2462.0	Horn	H	PK	1.0 MHz	102.5	44.3	58.2	74	-15.8
11	2462.0	Horn	V	AVE.	10 Hz	85.9	42.0	43.9	54	-10.1
11	2462.0	Horn	H	AVE.	10 Hz	86.0	47.7	38.3	54	-15.7

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

The environmental test conditions were:

Temperature	23ºC
Pressure	1050 mb
Humidity	33 %

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

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

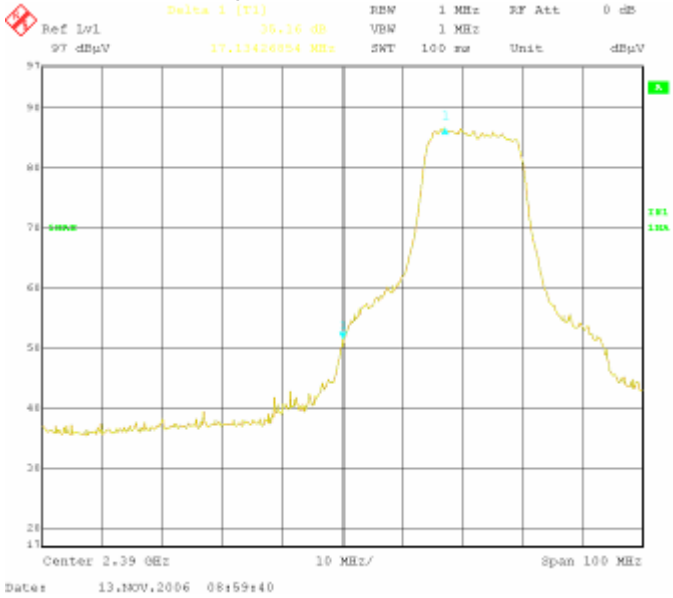


Figure 2-6: Band-Edge Compliance of RF Rad. Emi. 802.11b/g, Channel 1, 2412 MHz, Max Pol: H, Detector: PK

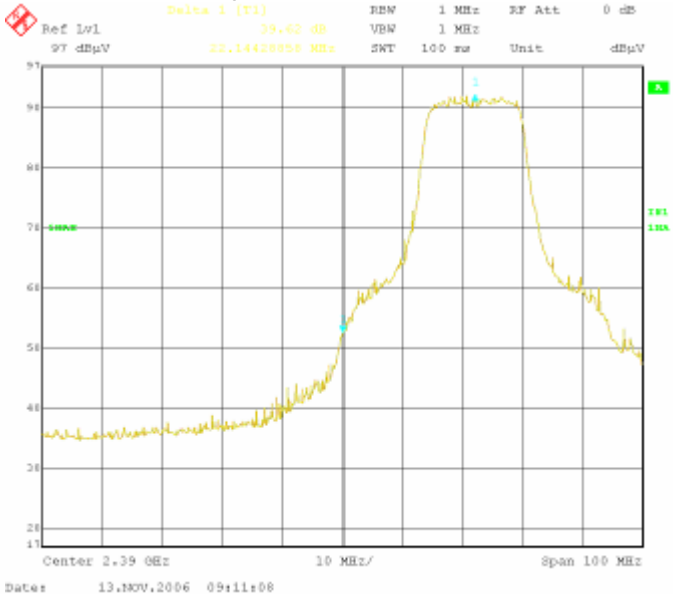


Figure 2-7: Band-Edge Compliance of RF Rad. Emi. 802.11b/g, Channel 11, 2462 MHz, Max Pol: V, Detector: PK

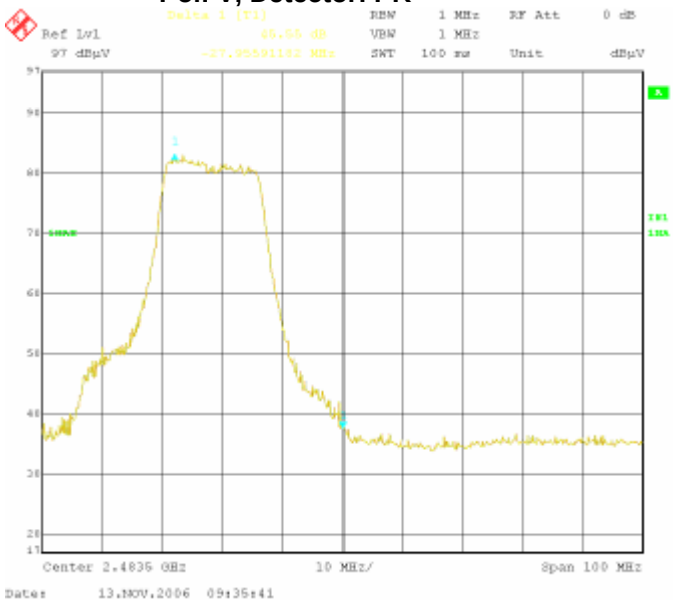
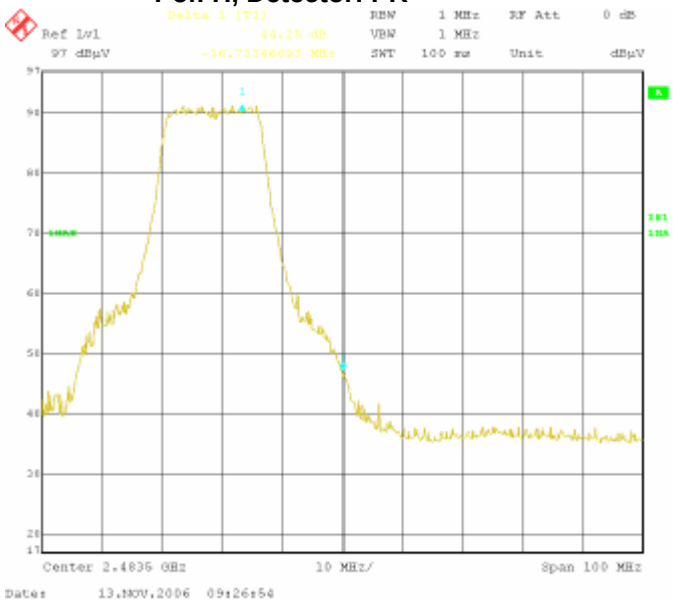


Figure 2-8: Band-Edge Compliance of RF Rad. Emi. 802.11b/g, Channel 11, 2462 MHz, Max Pol: H, Detector: PK



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Radiated Emissions Test Results
802.11a Band

Test Distance was 3.0 metre.

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

Channel 36, 5180 MHz

Freq (MHz)	Pol	Ttbl Agl (deg)	Twr Ht (cm)	Trace (dBuV)	Transducer (dB)	Cable (dB)	Filter (dB)	Preamp (dB)	EMI (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5099.11	V	186	106	46.02	33.51	11.12	2.72	27.88	65.49	68.2	-2.71
10360.36	V	37	102	40.65	38.94	7.64	0.00	33.08	54.15	68.2	-14.05
10361.55	H	228	197	40.66	38.95	7.65	0.00	33.08	54.18	68.2	-14.02

Channel 48, 5240 MHz

Freq (MHz)	Pol	Ttbl Agl (deg)	Twr Ht (cm)	Trace (dBuV)	Transducer (dB)	Cable (dB)	Filter (dB)	Preamp (dB)	EMI (dBµV/m)	Limit (dBµV/m)	Margin (dB)
10475.34	H	260	117	40.63	38.99	7.69	0.00	32.88	54.44	68.2	-13.76
10483.31	V	301	101	40.56	38.99	7.71	0.00	32.86	54.40	68.2	-13.80
15719.15	V	357	138	42.59	39.75	9.37	0.00	32.09	59.62	68.2	-8.58
15907.88	H	357	143	42.05	40.39	9.35	0.00	32.28	59.51	68.2	-8.69

Channel 52, 5260 MHz

Freq (MHz)	Pol	Ttbl Agl (deg)	Twr Ht (cm)	Trace (dBuV)	Transducer (dB)	Cable (dB)	Filter (dB)	Preamp (dB)	EMI (dBµV/m)	Limit (dBµV/m)	Margin (dB)
10520.01	H	357	166	41.10	39.02	7.65	0.00	32.69	55.08	68.2	-13.12
10519.46	V	169	200	40.61	39.02	7.65	0.00	32.69	54.59	68.2	-13.61
11608.99	H	125	131	41.27	39.57	7.99	0.00	32.16	56.67	68.2	-11.53
15776.47	V	357	167	42.70	39.94	9.46	0.00	32.07	60.03	68.2	-8.17
15787.49	H	210	184	42.64	39.99	9.45	0.00	32.03	60.04	68.2	-8.16

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802.11a Radiated Emissions Test Results cont'd

Channel 64, 5320 MHz

Freq (MHz)	Pol	Ttbl Agl (deg)	Twr Ht (cm)	Trace (dBuV)	Transducer (dB)	Cable (dB)	Filter (dB)	Preamp (dB)	EMI (dBµV/m)	Limit (dBµV/m)	Margin (dB)
10641.24	V	183	107	38.90	39.11	7.60	0.00	28.43	57.19	68.2	-11.01
10646.84	H	161	200	38.64	39.12	7.60	0.00	28.41	56.95	68.2	-11.25
15955.67	V	17	115	40.21	40.55	9.49	0.00	29.73	60.52	68.2	-7.68
15967.32	H	273	128	39.38	40.59	9.44	0.00	29.70	59.72	68.2	-8.48

Channel 149, 5745 MHz

Freq (MHz)	Pol	Ttbl Agl (deg)	Twr Ht (cm)	Trace (dBuV)	Transducer (dB)	Cable (dB)	Filter (dB)	Preamp (dB)	EMI (dBµV/m)	Limit (dBµV/m)	Margin (dB)
11488.85	V	357	133	40.45	39.50	7.96	0.00	32.23	55.68	68.2	-12.52
11489.68	H	192	140	40.15	39.50	7.96	0.00	32.24	55.37	68.2	-12.83

Channel 161, 5805 MHz

Freq (MHz)	Pol	Ttbl Agl (deg)	Twr Ht (cm)	Trace (dBuV)	Transducer (dB)	Cable (dB)	Filter (dB)	Preamp (dB)	EMI (dBµV/m)	Limit (dBµV/m)	Margin (dB)
11606.34	V	187	134	42.91	39.56	7.99	0.00	32.17	58.30	68.2	-9.90
11608.18	H	357	98	42.66	39.57	7.99	0.00	32.16	58.05	68.2	-10.15

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802.11a Band-Edge Compliance of RF Radiated Emissions

The test distance was 3 metres.

Handheld standalone, vertical, the measurements were performed on channel 36 for 802.11a mode. This is as per restricted bandedge. RBW 1 MHz.

Channel	Freq.	Rx Antenna		Detector	VBW	Corrected Reading	Delta Marker	Corrected Band edge	Limit	Diff. To Limit
	(MHz)	Type	POL.	(PK, AVE.)	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
36	5180.0	Horn	V	PK	1.0 MHz	108.65	52.5	56.15	74	-17.85
36	5180.0	Horn	H	PK	1.0 MHz	105.95	49.9	56.05	74	-17.95
36	5180.0	Horn	V	AVE.	10 Hz	90.75	48.0	42.75	54	-11.25
36	5180.0	Horn	H	AVE.	10 Hz	89.05	45.9	43.15	54	-10.85

Handheld standalone, vertical, the measurements were performed on channel 64 for 802.11a mode. This is as per restricted bandedge.

Channel	Freq.	Rx Antenna		Detector	VBW	Corrected Reading	Delta Marker	Corrected Band edge	Limit	Diff. To Limit
	(MHz)	Type	POL.	(PK, AVE.)	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
64	5320.0	Horn	V	PK	1.0 MHz	114.14	46.5	67.64	74	-6.36
64	5320.0	Horn	H	PK	1.0 MHz	112.24	45.5	66.74	74	-7.26
64	5320.0	Horn	V	AVE.	10 Hz	96.04	51.4	44.64	54	-9.36
64	5320.0	Horn	H	AVE.	10 Hz	94.24	49.5	44.74	54	-9.26

Handheld standalone, vertical, the measurements were performed on channel 149 for 802.11a mode. This is as per 15.247 (-20dBc limit).

Channel	Freq.	Rx Antenna		Detector	VBW	Corrected Reading	Delta Marker	Corrected Band edge	Limit	Diff. To Limit
	(MHz)	Type	POL.	(PK, AVE.)	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
149	5745.0	Horn	V	PK	1.0 MHz	111.97	58.10	58.10	69.8	-11.70
149	5745.0	Horn	H	PK	1.0 MHz	106.67	63.51	63.51	64.8	-1.29
149	5745.0	Horn	V	AVE.	10 Hz	95.07	33.00	33.00	52.9	-19.90
149	5745.0	Horn	H	AVE.	10 Hz	97.07	35.10	35.10	54.9	-19.80

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

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

Channel	Freq.	Rx Antenna		Detector	VBW	Corrected Reading	Delta Marker	Corrected Band edge	Limit	Diff. To Limit
	(MHz)	Type	POL.	(PK, AVE.)	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
161	5805.0	Horn	V	PK	1.0 MHz	111.21	43.4	43.4	69.1	-25.7
161	5805.0	Horn	H	PK	1.0 MHz	113.21	43.0	43.0	71.1	-28.1
161	5805.0	Horn	V	AVE.	10 Hz	94.31	25.5	25.5	52.2	-26.7
161	5805.0	Horn	H	AVE.	10 Hz	96.81	26.0	26.0	54.4	-28.4

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

The environmental test conditions were:

Temperature	23ºC
Pressure	1050 mb
Humidity	25%

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

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

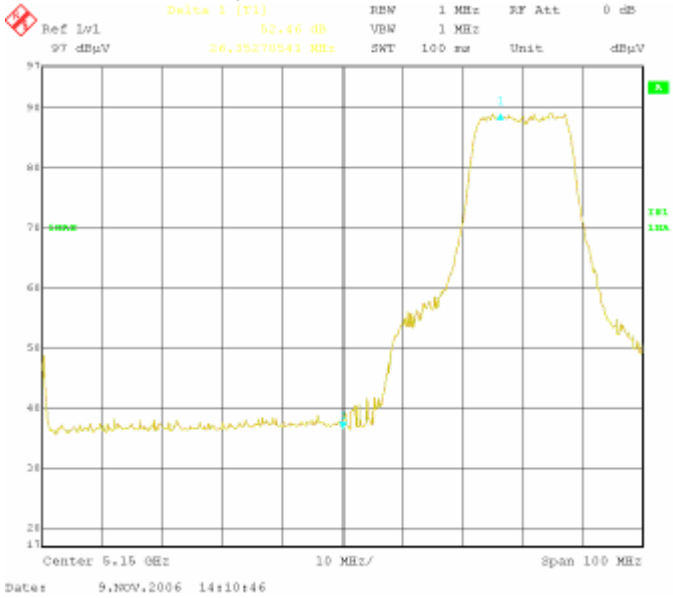


Figure 2-10: Band-Edge Compliance of RF Rad. Emi. 802.11a, Channel 36, 5180 MHz Pol: H, Detector: PK

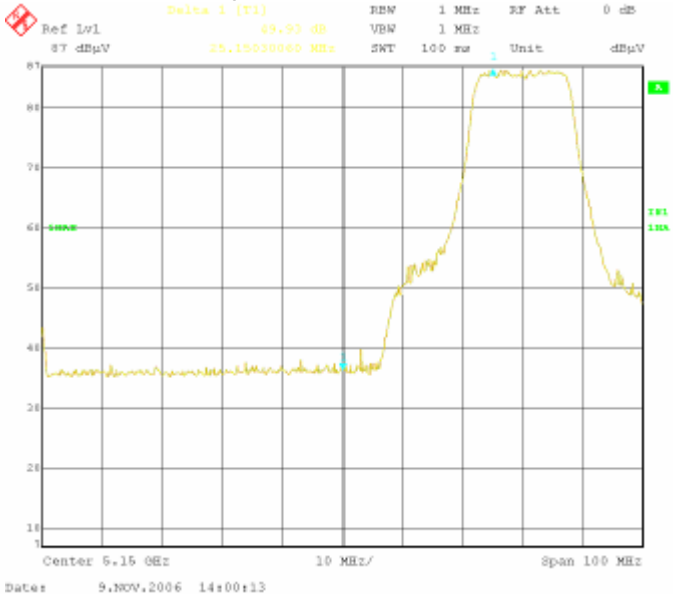


Figure 2-11: Band-Edge Compliance of RF Rad. Emi. 802.11a, Channel 64, 5320 MHz Pol: V, Detector: PK

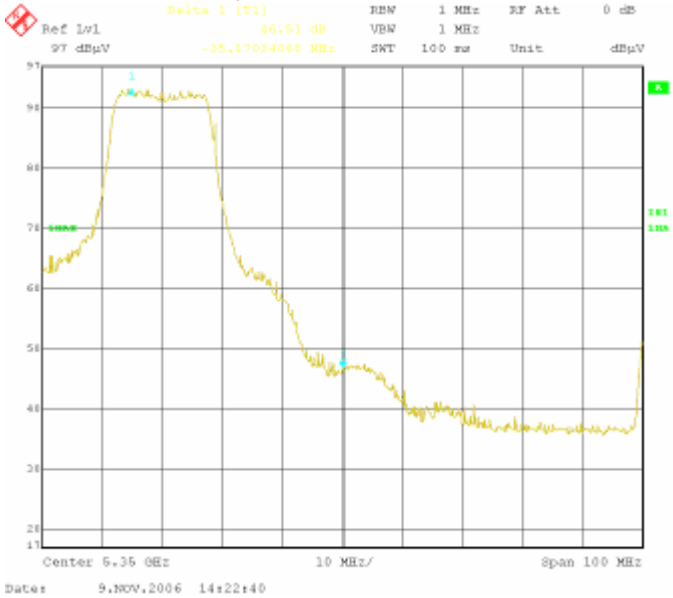
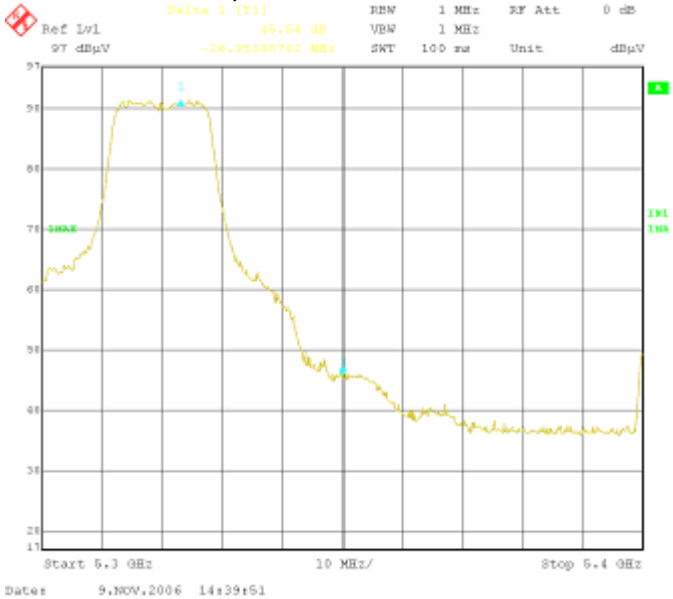


Figure 2-12: Band-Edge Compliance of RF Rad. Emi. 802.11a, Channel 64, 5320 MHz Pol: H, Detector: PK



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

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

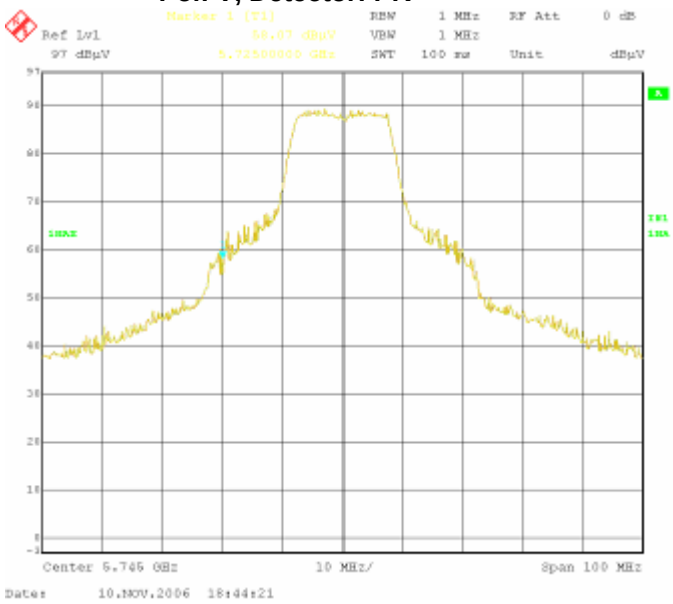


Figure 2-14: Band-Edge Compliance of RF Rad. Emi. 802.11a, Channel 149, 5745 MHz Pol: H, Detector: PK

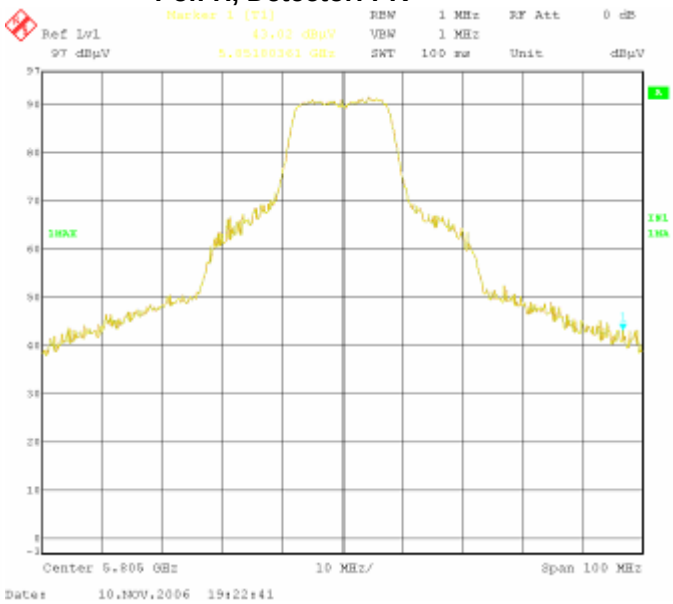


Figure 2-15: Band-Edge Compliance of RF Rad. Emi. 802.11a, Channel 161, 5805 MHz Pol: V, Detector: PK

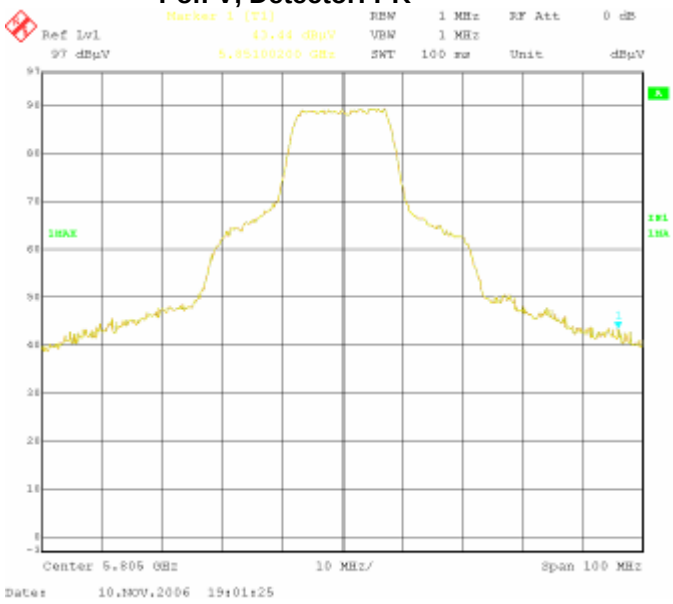
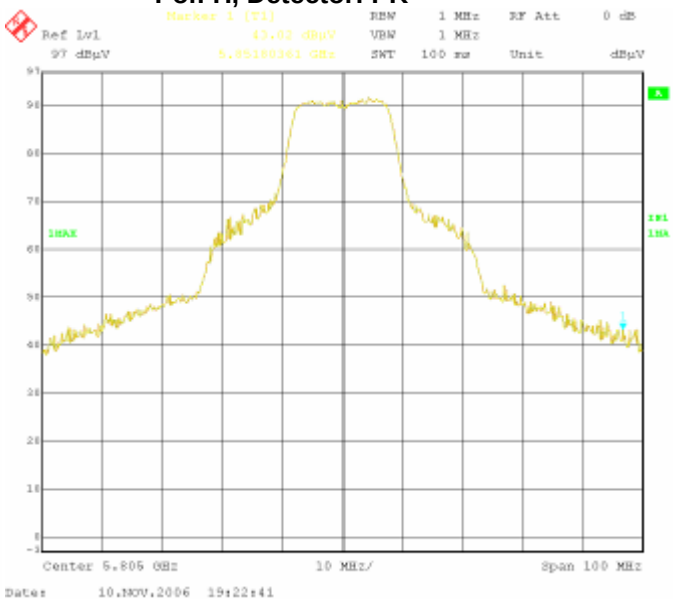


Figure 2-16: Band-Edge Compliance of RF Rad. Emi. 802.11a, Channel 161, 5805 MHz Pol: H, Detector: PK



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802.11a Unwanted Spurious RF Radiated Emissions

The test distance was 3 metres.

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

Channel	Freq.	Rx Antenna		Detector	VBW	Power Spectral Density Reading	Corrected Reading	Limit	Diff. To Limit
	(MHz)	Type	POL.	(PK, AVE.)	(MHz)	(dBm/MHz)	(dBm/MHz)	(dBm/MHz)	(dB)
48	5240.0	Horn	V	PK	1.0 MHz	-66.2	-61.1	-27	-34.1

Handheld standalone, vertical, the measurements were performed on channel 52 for 802.11a mode. This is as per 15.407, Power Spectral density (limit -27 dBm/MHz).

Channel	Freq.	Rx Antenna		Detector	VBW	Power Spectral Density Reading	Corrected Reading	Limit	Diff. To Limit
	(MHz)	Type	POL.	(PK, AVE.)	(MHz)	(dBm/MHz)	(dBm/MHz)	(dBm/MHz)	(dB)
52	5260.0	Horn	V	PK	1.0 MHz	-61.5	-56.4	-27	-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	23ºC
Pressure	1050 mb
Humidity	25%

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802.11a Unwanted Spurious RF Radiated Emissions cont'd

Figure 3-29 : Unwanted Spurious RF Rad. Emi.
802.11a, Channel 48, 5240 MHz
Pol: V, Detector: PK

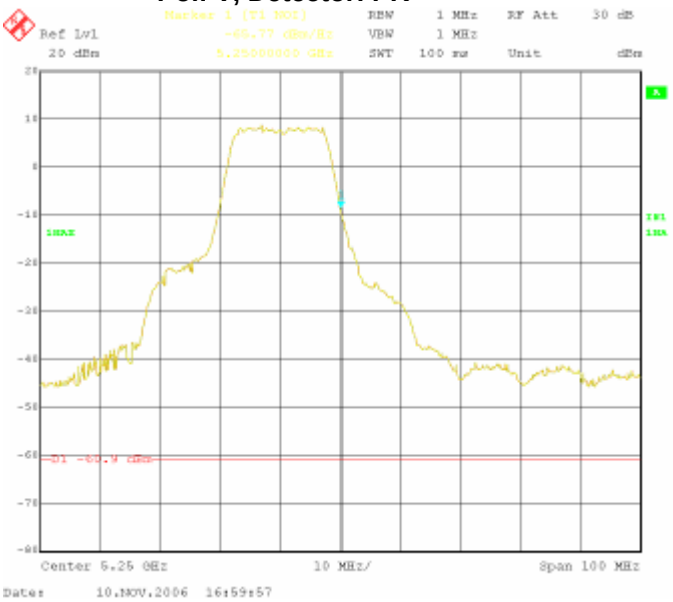
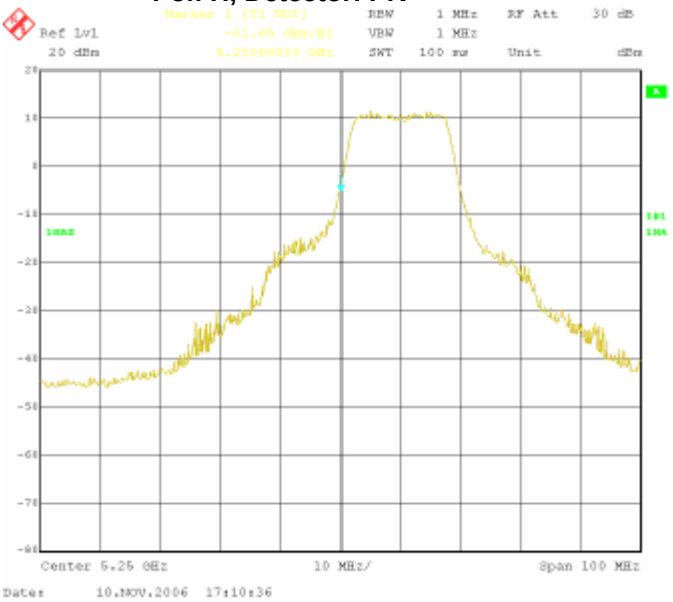


Figure 2-30 : Unwanted Spurious RF Rad. Emi.
802.11a, Channel 52, 5260 MHz
Pol: H, Detector: PK



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APPENDIX 3 – BLUETOOTH CONDUCTED EMISSIONS TEST DATA/PLOTS

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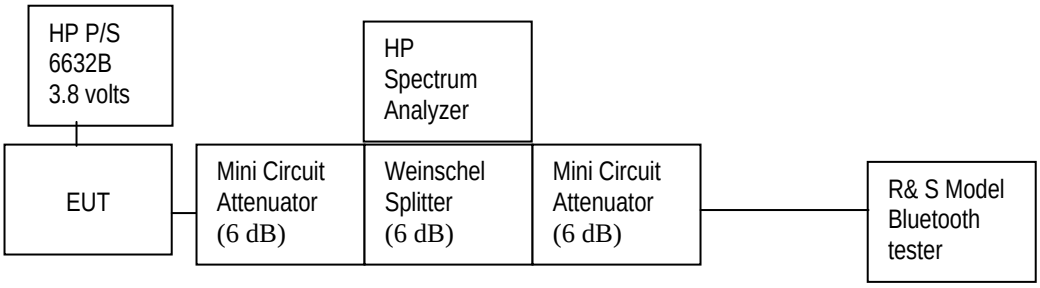
Bluetooth RF Conducted Emission Test Results

Bluetooth power output was at maximum for all the recorded measurements shown below.

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.

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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	0.947
39	<=1.0	0.933
78	<=1.0	0.933

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

The environmental test conditions were:

Temperature	24ºC
Pressure	1003 mb
Relative Humidity	27%

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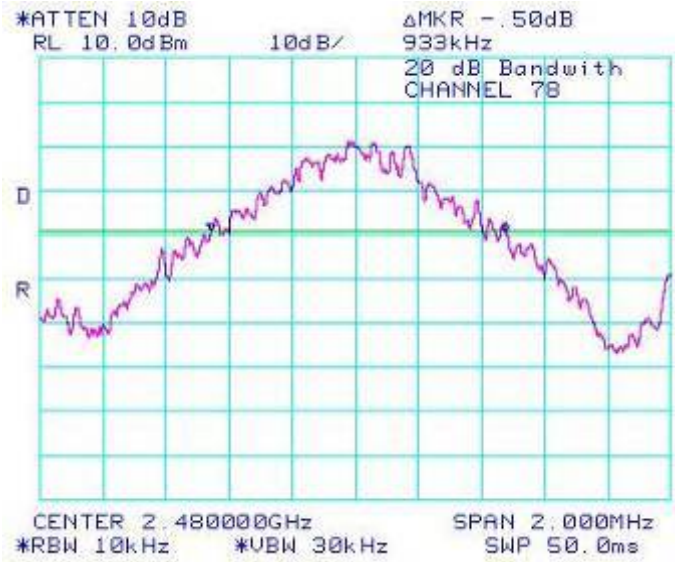
Bluetooth RF Conducted Emission Test Results cont'd

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

Carrier Frequency Separation

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

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

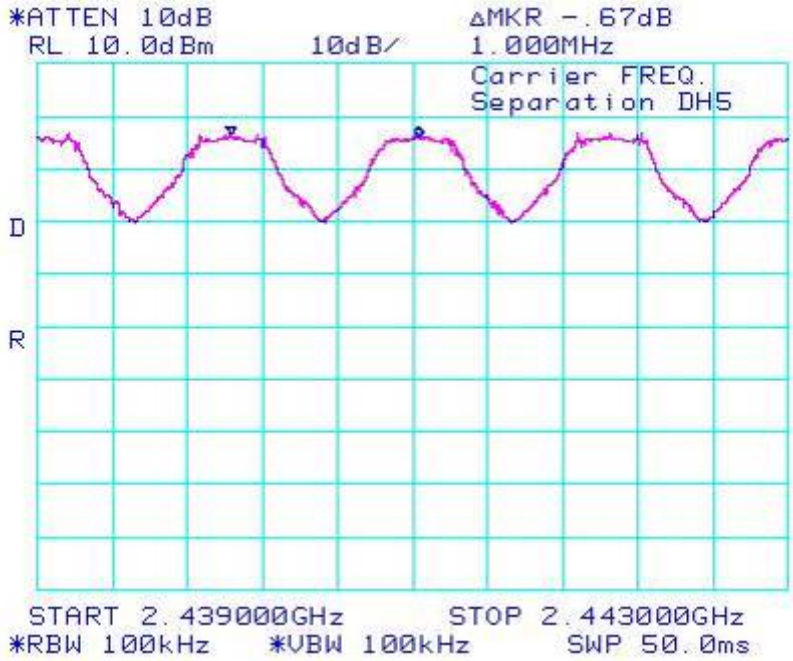
Bluetooth Channels	Limit (MHz)	Measured Level (MHz)
38 to 39	>= 0.025 or 20 dB bandwidth	1.000

The environmental test conditions were:

Temperature	24ºC
Pressure	1003 mb
Relative Humidity	27%

See figure 3-4 for the plot of the Carrier Frequency Separation measurement.

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



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Bluetooth RF Conducted Emission Test Results cont'd

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

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

The environmental test conditions were:

Temperature	24ºC
Pressure	1003 mb
Relative Humidity	27%

See figure 3-5 for the plot of the Carrier Frequency Separation measurement.

Figure 3-5: Carrier Frequency Separation, Freq. Hopping, Static PBRS, 3-DH5, Channels 38 to 39

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Bluetooth RF Conducted Emission Test Results cont'd

Number of Hopping Frequencies

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

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

Limit (CH)	Number of Hopping Frequencies (CH)
>= 75	79

The environmental test conditions were:

Temperature	24ºC
Pressure	1003 mb
Relative Humidity	27%

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

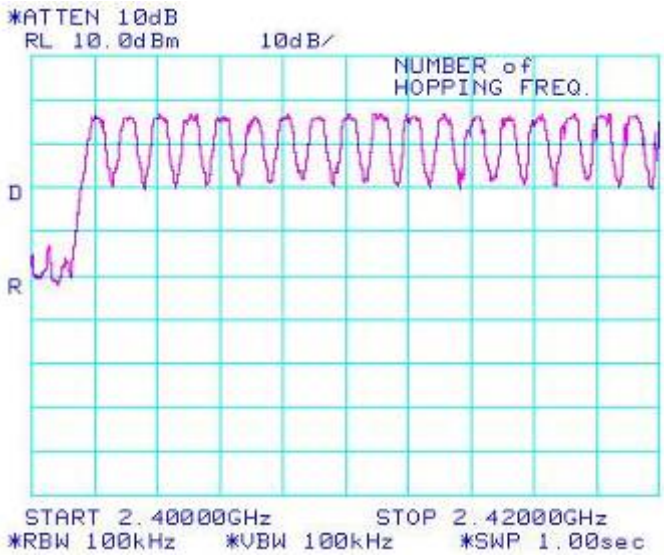


Figure 3-7: Number of Hopping Frequencies Static PBRS, DH5

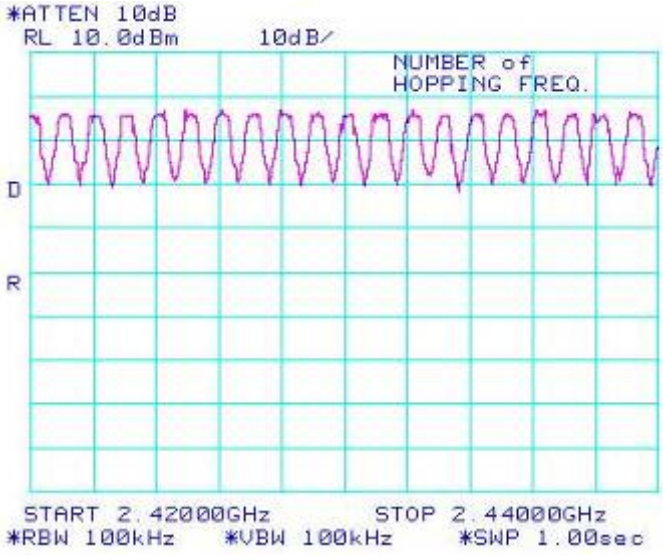


Figure 3-8: Number of Hopping Frequencies Static PBRS, DH5

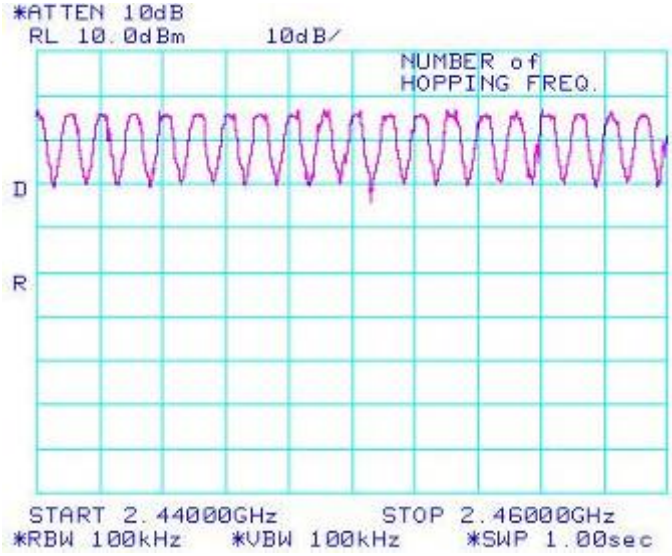
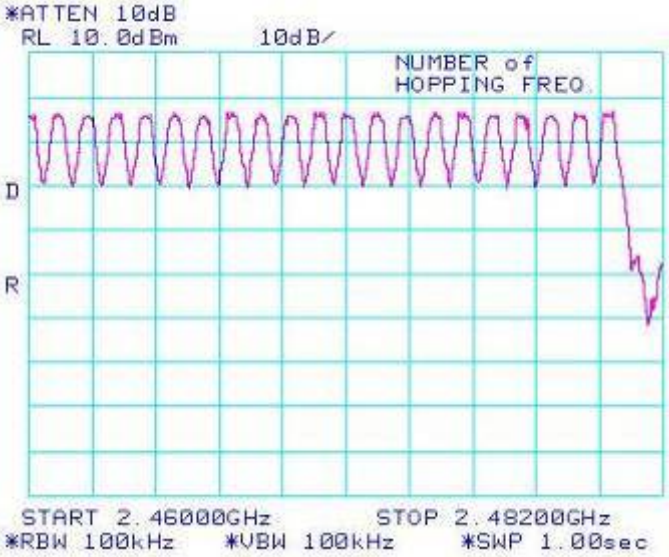


Figure 3-9: Number of Hopping Frequencies Static PBRS, DH5



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Bluetooth RF Conducted Emission Test Results cont'd

Time of Occupancy (Dwell Time)

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

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

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

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

Bluetooth Channel	Mode	Tx Time (ms)	Dwell Time/31.6 sec. (msec.)	Limit (msec.)	Margin (msec.)
0	DH1	0.500	0.500 x 320.0 = 160.00	400	240.00
39	DH1	0.500	0.500 x 320.0 = 160.00	400	240.00
78	DH1	0.500	0.500 x 320.0 = 160.00	400	240.00
0	DH3	1.742	1.742 x 159.9 = 278.55	400	121.45
39	DH3	1.758	1.758 x 159.9 = 281.10	400	118.90
78	DH3	1.767	1.767 x 159.9 = 282.54	400	117.46
0	DH5	3.000	3.00 x 106.8 = 320.40	400	79.60
39	DH5	3.000	3.00 x 106.8 = 320.40	400	79.60
78	DH5	3.000	3.00 x 106.8 = 320.40	400	79.60

The environmental test conditions were:

Temperature	24ºC
Pressure	1003 mb
Relative Humidity	27%

See figures 3-10 to 3-18 for the plots of the dwell time.

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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

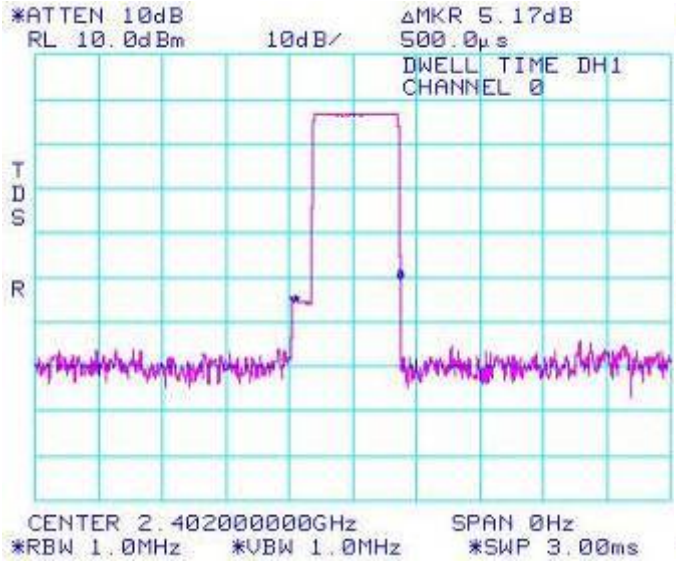


Figure 3-11: Time of Occupancy (Dwell Time)
Freq. Hopping, Static PBRS, DH1

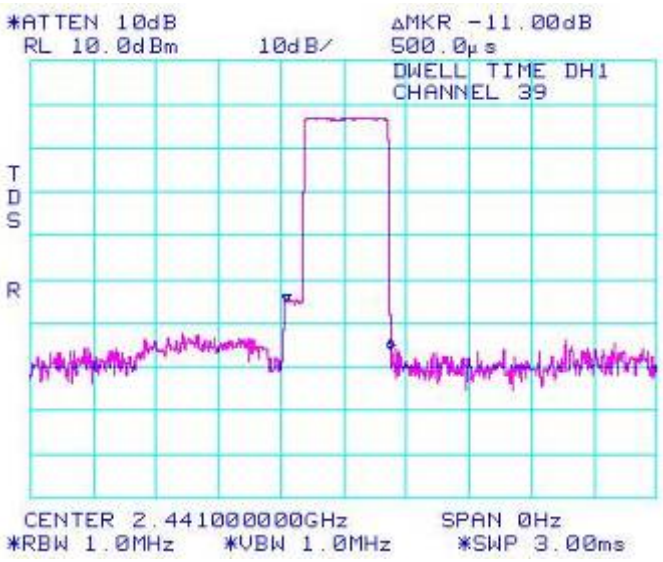


Figure 3-12: Time of Occupancy (Dwell Time)
Freq. Hopping, Static PBRS, DH1

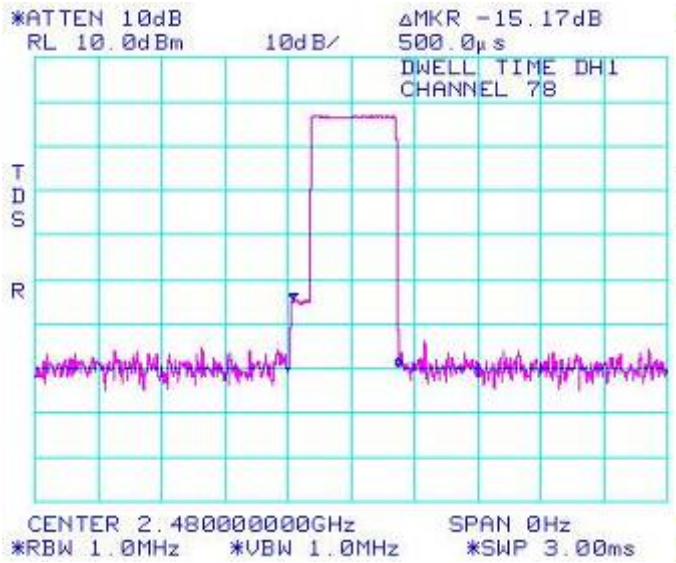
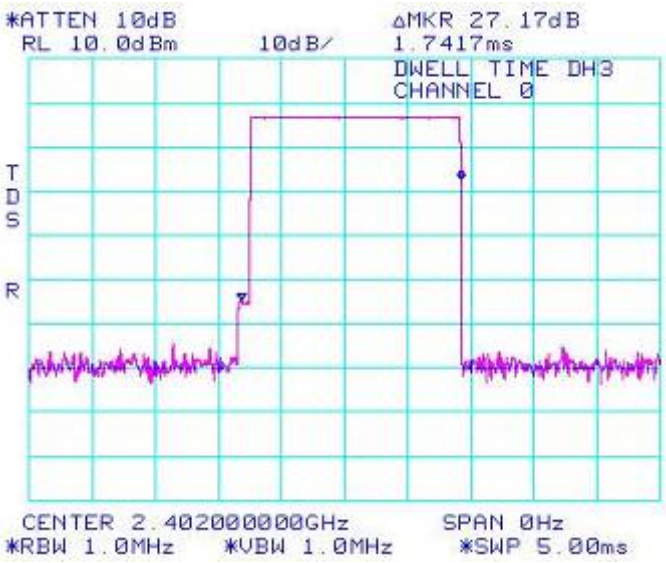


Figure 3-13: Time of Occupancy (Dwell Time)
Freq. Hopping, Static PBRS, DH3



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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

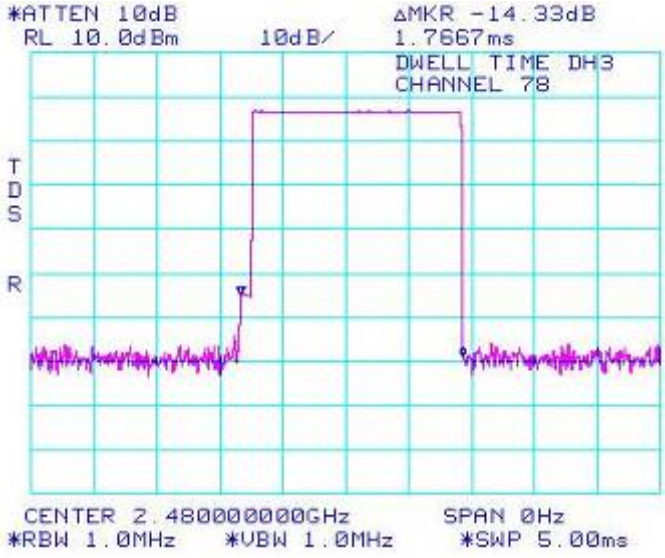


Figure 3-16: Time of Occupancy (Dwell Time)
Freq. Hopping, Static PBRS, DH5

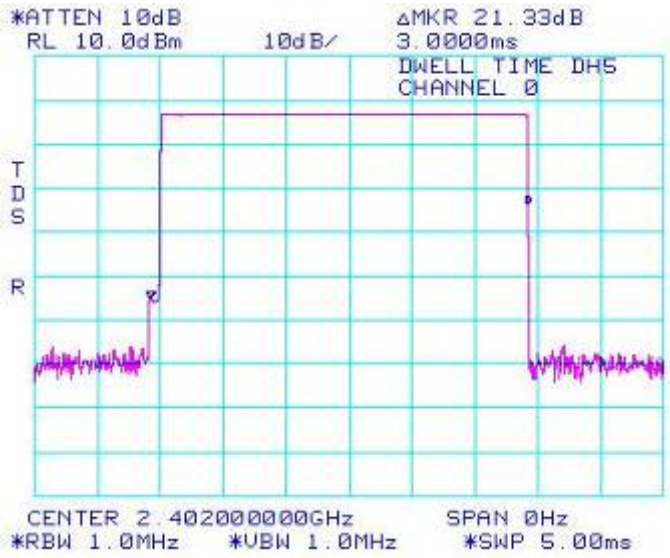
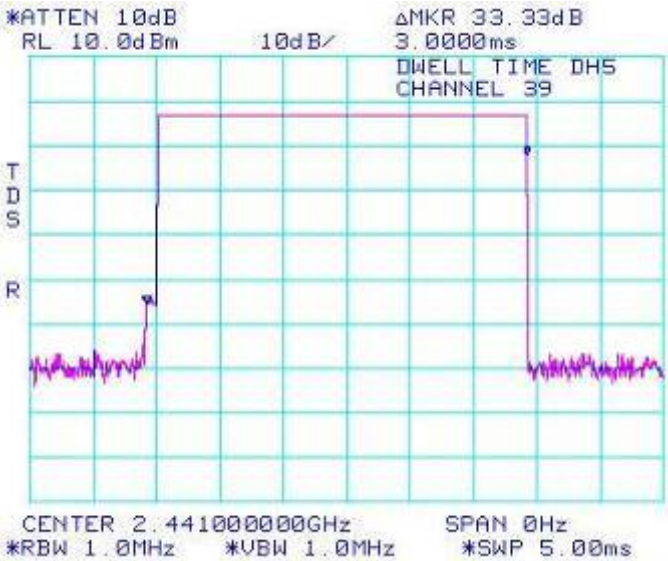


Figure 3-17: Time of Occupancy (Dwell Time)
Freq. Hopping, Static PBRS, DH5



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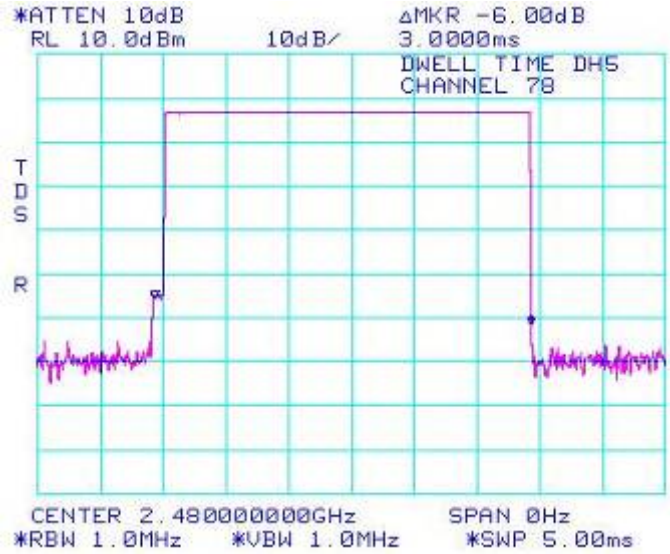
Bluetooth RF Conducted Emission Test Results cont'd

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

Maximum Peak Conducted Output Power

The EUT met the requirements of the maximum peak conducted output power of class 2 as per 47 CFR 15.247(b) and RSS-210. Low channel (0), middle channel (39) and high channel (78) were measured. Bluetooth was operating in single frequency mode during the measurements. A reference offset of 12.4 dB was applied to the spectrum analyzer reference level for the coaxial cable loss and attenuators in the test circuit.

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

Bluetooth Channel	Measured Level (dBm)	Class 2 Limit (dBm)
0	-3.00	-6.0 to 4.0
39	-3.00	-6.0 to 4.0
78	-3.17	-6.0 to 4.0

The environmental test conditions were:

Temperature	24ºC
Pressure	1003 mb
Relative Humidity	27%

See figures 3-19 to 3-21 for the plots of the maximum peak conducted output power.

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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

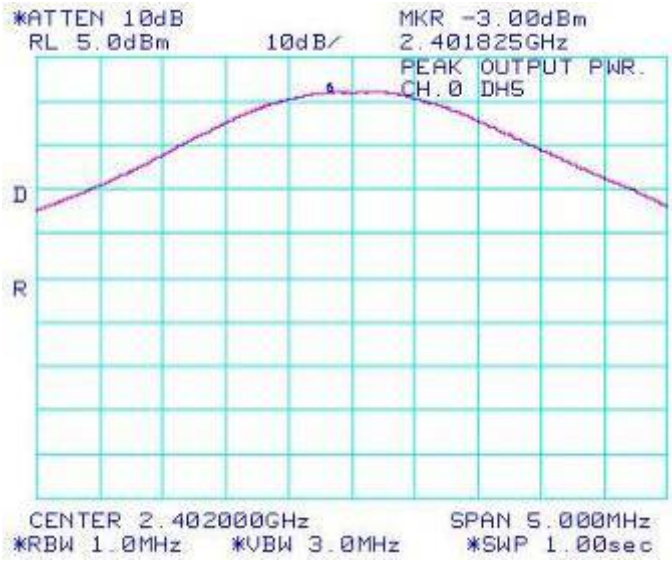


Figure 3-20: Max. Peak Conducted Output Power
Single Freq., Static PBRS, DH5

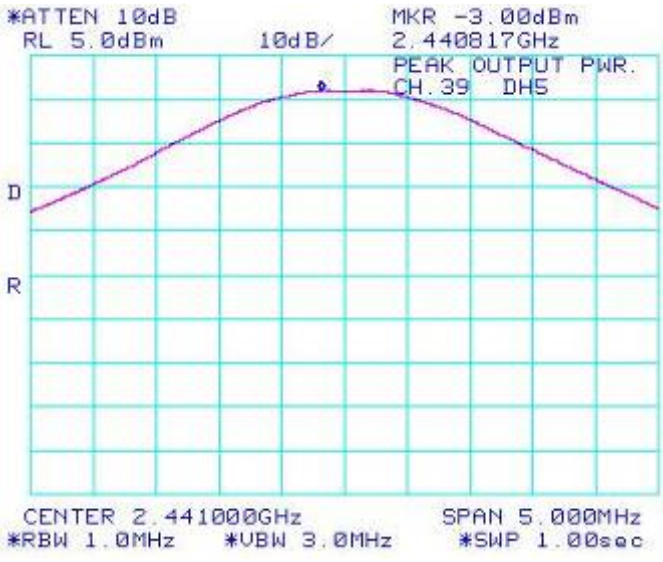
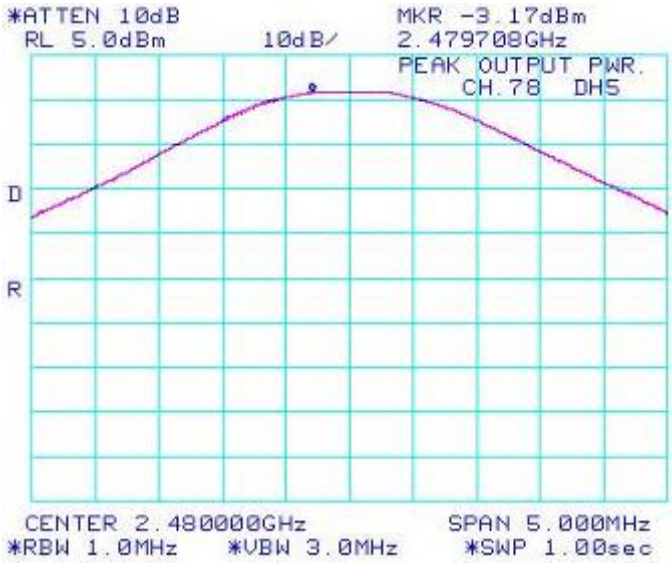


Figure 3-21: Max. Peak Conducted Output Power
Single Freq., Static PBRS, DH5



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Bluetooth RF Conducted Emission Test Results cont'd

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

Bluetooth Channel	Measured Level (dBm)	Class 2 Limit (dBm)
0	-1.50	-6.0 to 4.0
39	-1.50	-6.0 to 4.0
78	-1.83	-6.0 to 4.0

The environmental test conditions were:

Temperature	24ºC
Pressure	1003 mb
Relative Humidity	27%

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

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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

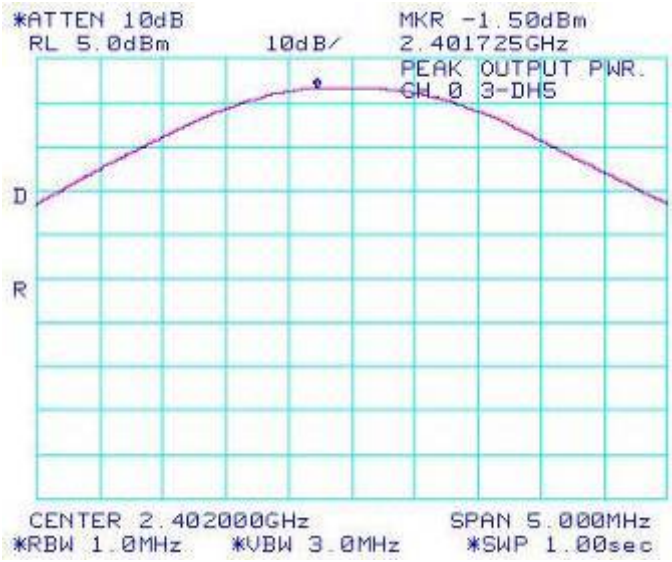


Figure 3-23: Max. Peak Conducted Output Power
Single Freq., Static PBRS, 3-DH5

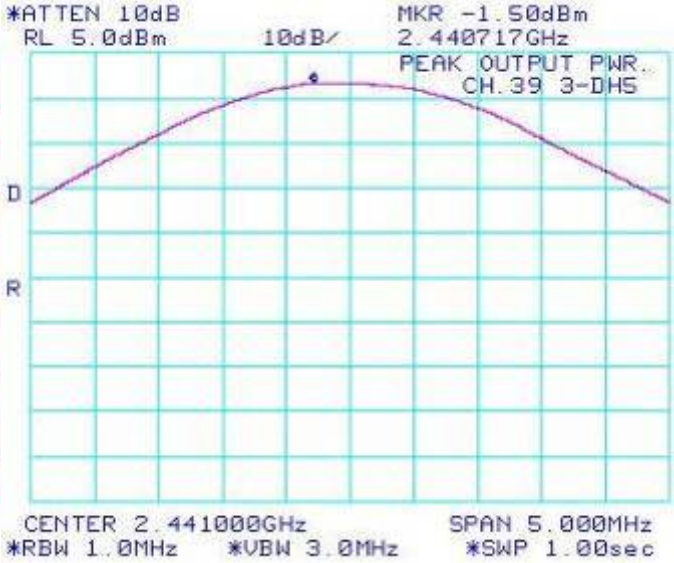
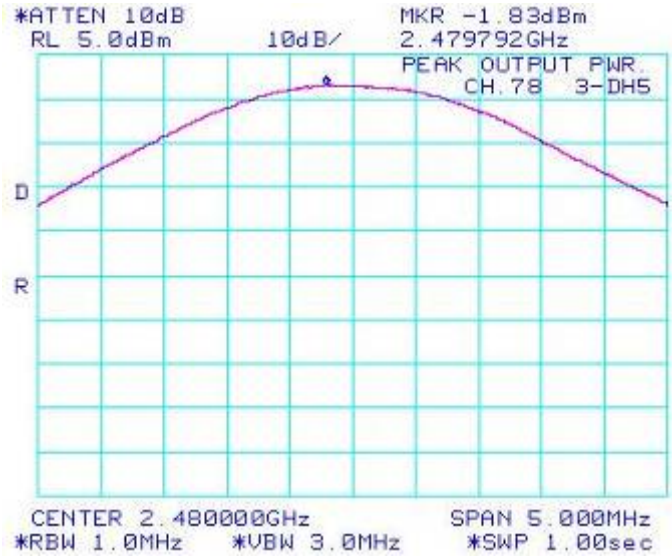


Figure 3-24: Max. Peak Conducted Output Power
Single Freq., Static PBRS, 3-DH5



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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	-29.17	-20	-9.17
78	Single Frequency	-32.34	-20	-12.34
0 - 78	Hopping	-29.66	-20	-9.66
0 - 78	Hopping	-31.66	-20	-11.66

The environmental test conditions were:

Temperature	24ºC
Pressure	1003 mb
Relative Humidity	27%

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

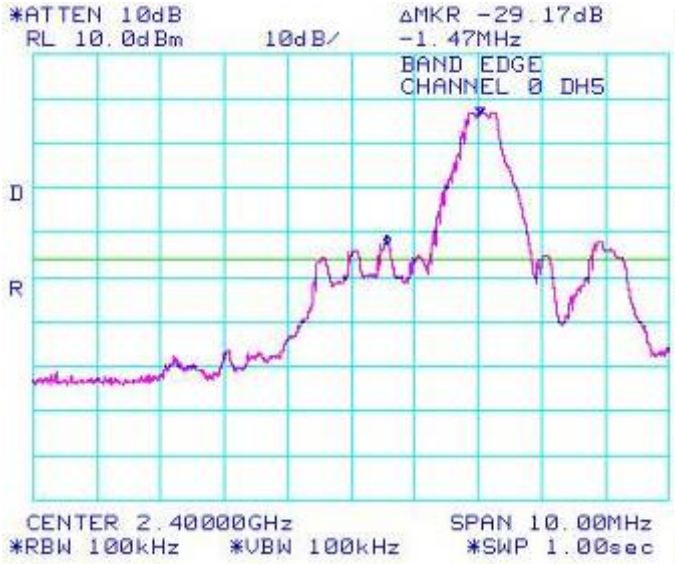


Figure 3-26: Band Edge Compliance
Single Freq., Static PBRS, DH5

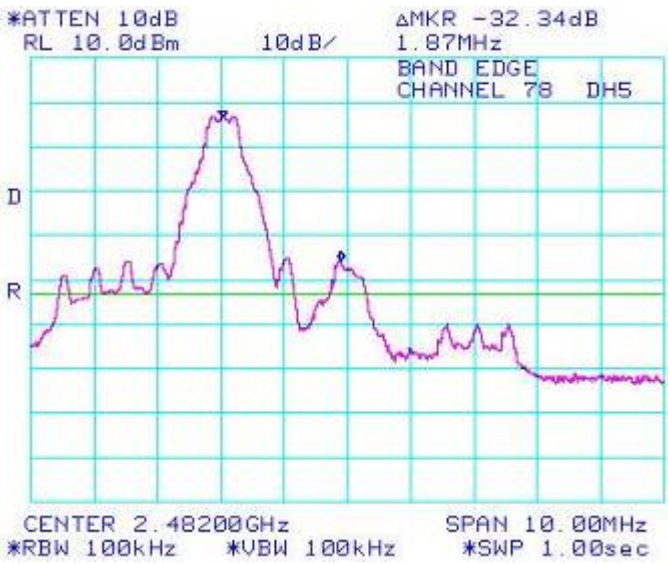


Figure 3-27: Band Edge Compliance
Freq. Hopping, Static PBRS, DH5

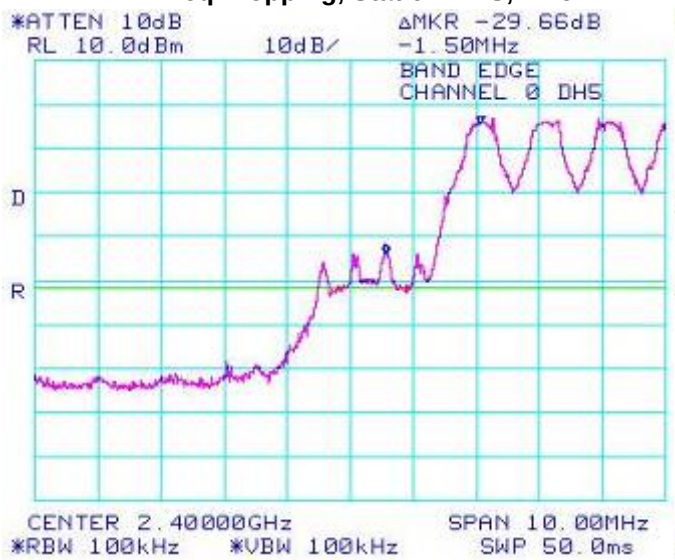
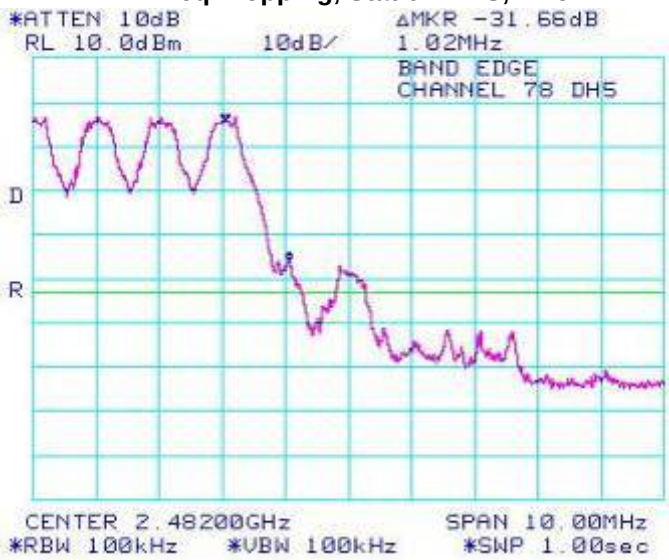


Figure 3-28: Band Edge Compliance
Freq. Hopping, Static PBRS, DH5



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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	-32.84	-20	-12.84
78	Single Frequency	-33.33	-20	-13.33
0 - 78	Hopping	-33.33	-20	-13.33
0 - 78	Hopping	-35.16	-20	-15.16

The environmental test conditions were: Temperature 24ºC
Pressure 1003 mb
Relative Humidity 27%

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

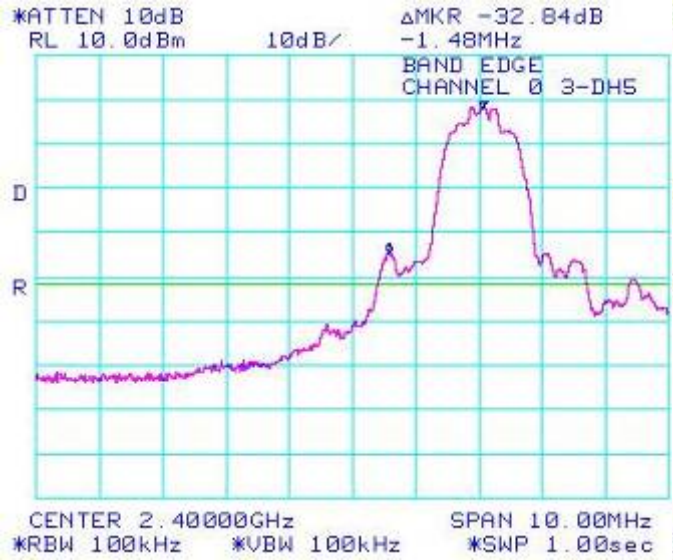

Figure 3-30: Band Edge Compliance
Single Freq., Static PBRS, 3-DH5

Figure 3-31: Band Edge Compliance
Freq. Hopping, Static PBRS, 3-DH5

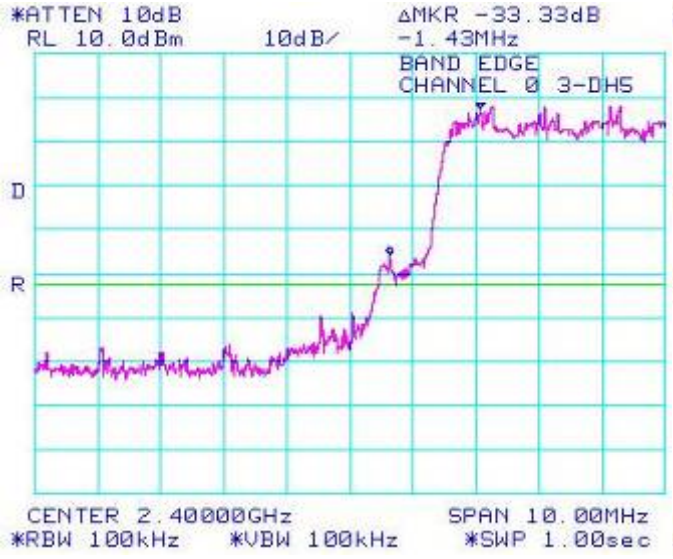

Figure 3-32: Band Edge Compliance
Freq. Hopping, Static PBRS, 3-DH5

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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	-51.33	-48.33	-20
39	-3.00	-51.33	-48.33	-20
78	-3.17	-53.67	-50.50	-20
Hopping mode	-3.00	-52.17	-49.17	-20

The environmental test conditions were:

Temperature	23ºC
Pressure	1005 mb
Relative Humidity	25%

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,

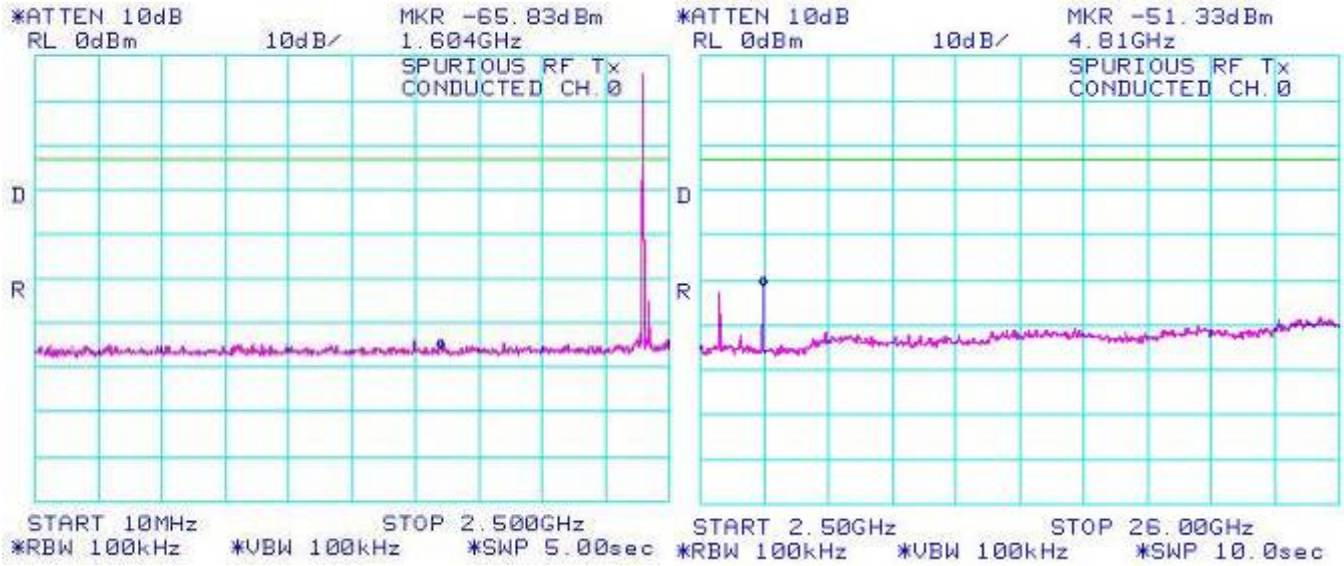
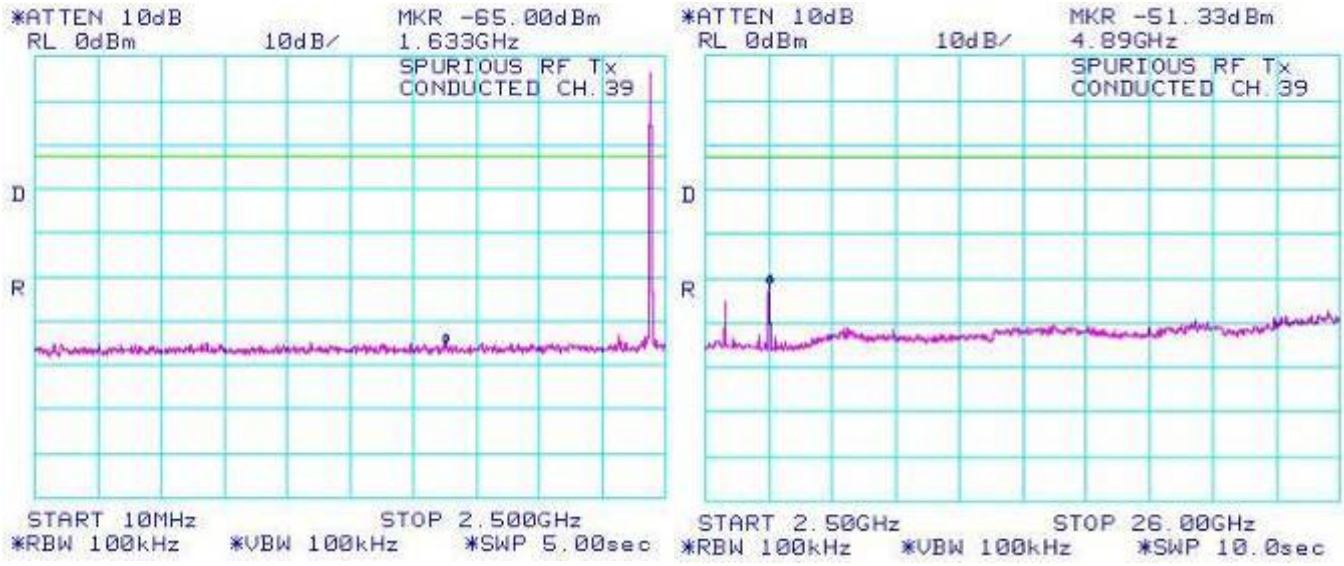


Figure 2-34: Spurious RF Conducted Emissions
Single Freq., Static PBRS, DH5



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Bluetooth RF Conducted Emission Test Results cont'd

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

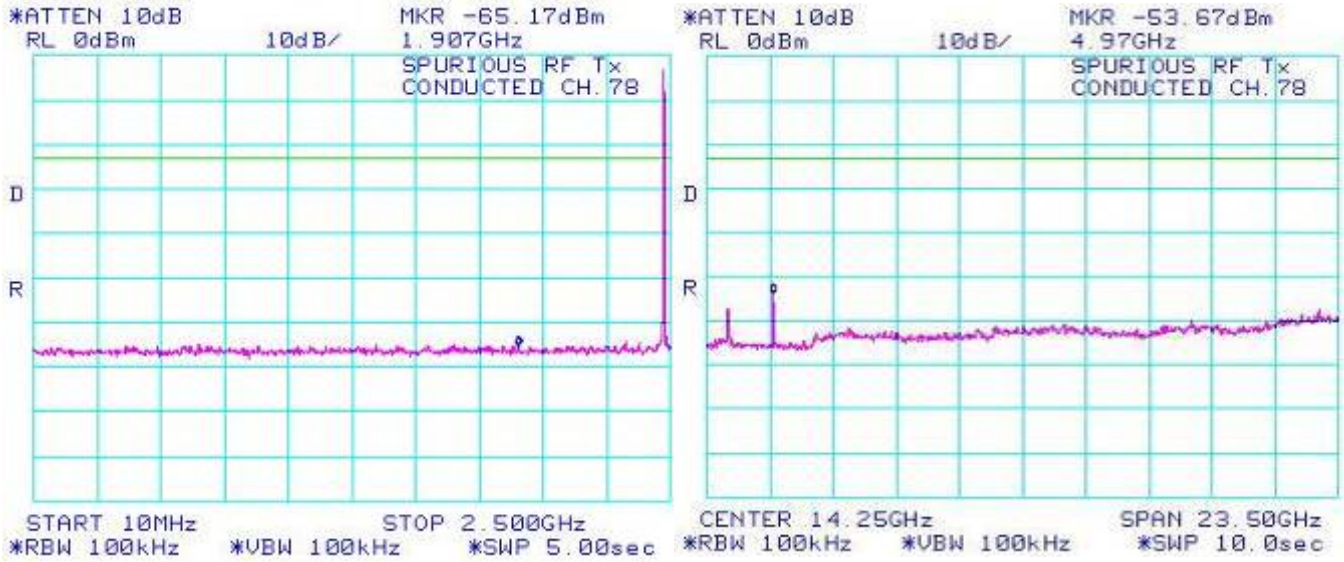
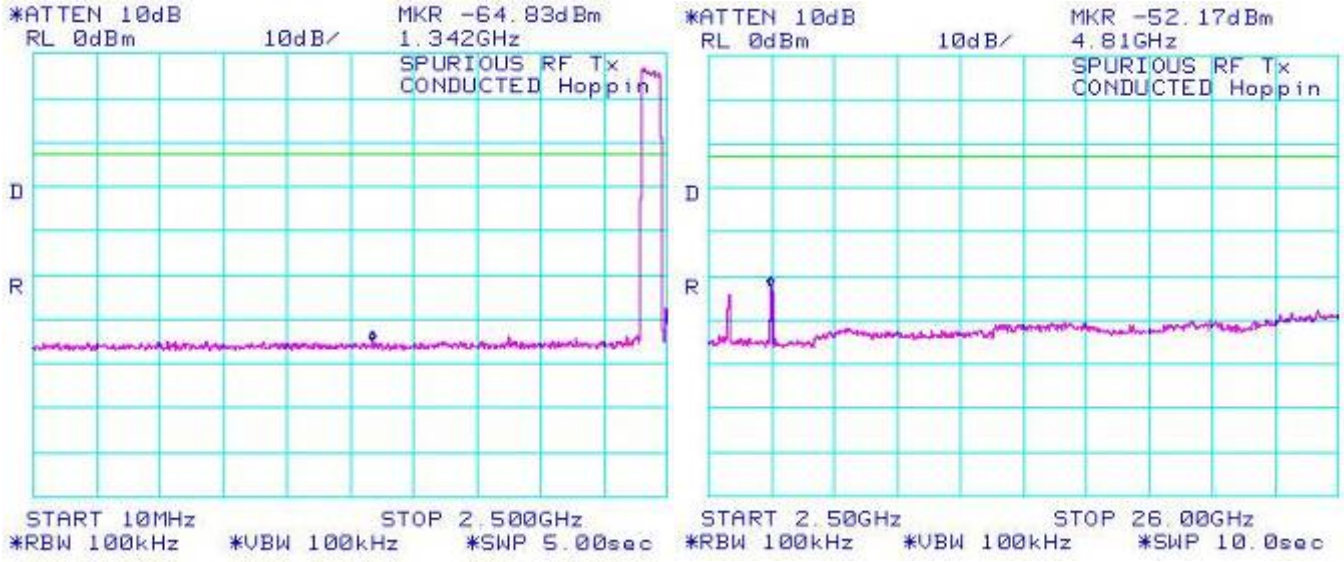


Figure 2-36: Spurious RF Conducted Emissions
Freq. Hopping, Static PBRS, DH5



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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	-1.50	-57.83	-56.33	-20
39	-1.50	-57.00	-55.50	-20
78	-1.83	-56.33	-54.50	-20
Hopping mode	-1.50	-55.83	-54.33	-20

The environmental test conditions were:

Temperature	24ºC
Pressure	1004 mb
Relative Humidity	26%

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

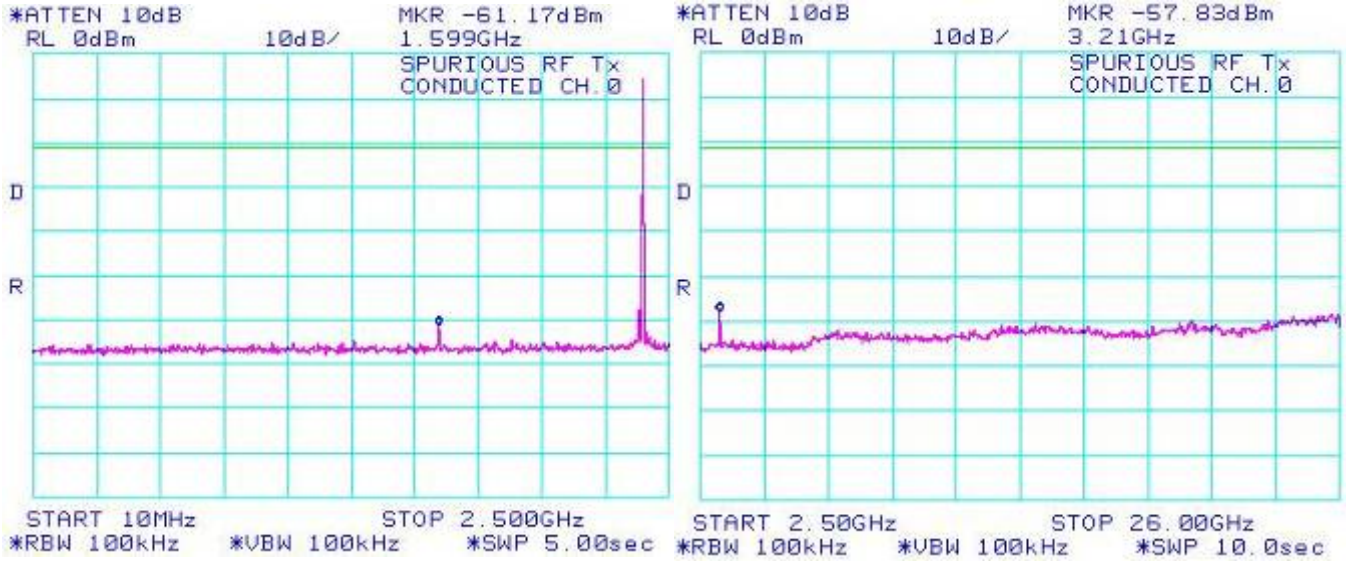
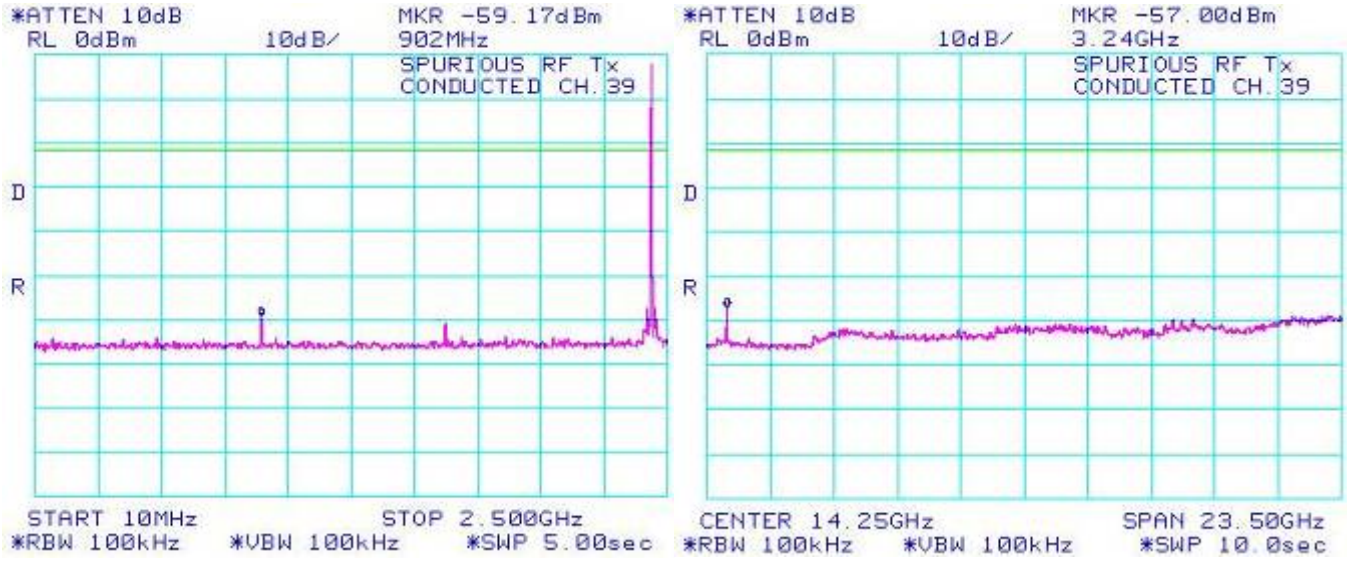


Figure 3-38: Spurious RF Conducted Emissions
Single Freq., Static PBRS, 3-DH5



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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

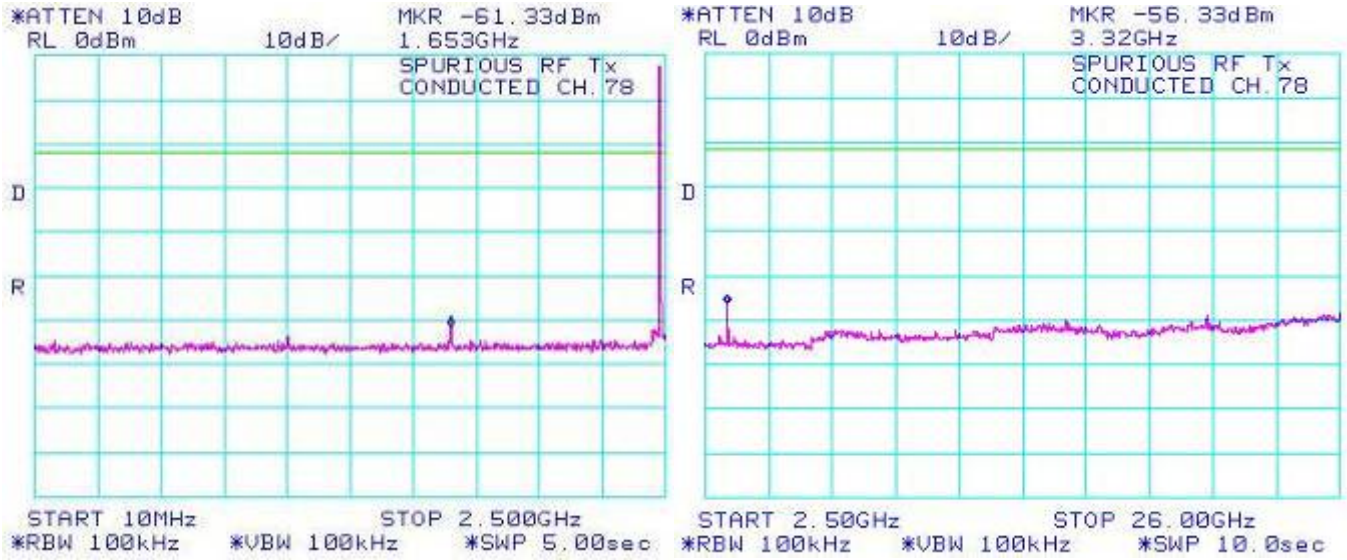
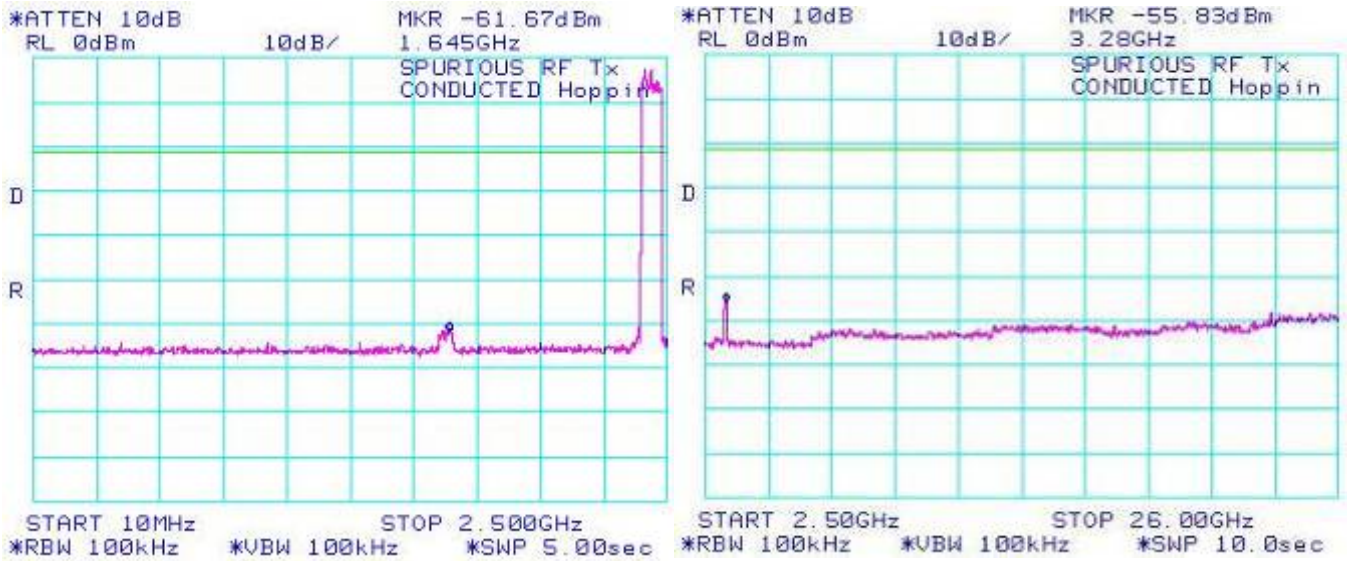


Figure 3-40 : Spurious RF Conducted Emissions
Freq. Hopping, Static PBRS, 3-DH5



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

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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	14.0
6	2437 MHz	1 Mbps	18.0	6 Mbps	17.0
		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	14.0

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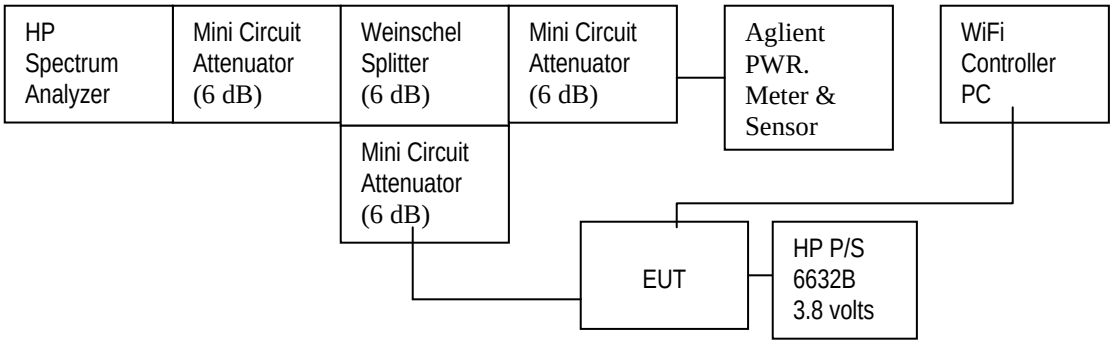
Test Setup Diagram



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.

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

6 dB Bandwidth

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

Channel	Data Rate	Limit (kHz)	Measured Level (MHz)
1	1 Mbps	>= 500	11.17
	5.5 Mbps	>= 500	11.13
	11 Mbps	>= 500	9.70
	6 Mbps	>= 500	16.53
	24 Mbps	>= 500	16.70
	54 Mbps	>= 500	16.67
6	1 Mbps	>= 500	10.03
	5.5 Mbps	>= 500	11.07
	11 Mbps	>= 500	10.23
	6 Mbps	>= 500	16.53
	24 Mbps	>= 500	16.67
	54 Mbps	>= 500	16.67
11	1 Mbps	>= 500	11.30
	5.5 Mbps	>= 500	11.20
	11 Mbps	>= 500	10.33
	6 Mbps	>= 500	16.53
	24 Mbps	>= 500	16.67
	54 Mbps	>= 500	16.50

See figures 4-1 to 4-6 for the plots of the 6 dB bandwidth measurements 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	23ºC
Pressure	1008 mb
Relative Humidity	24%

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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

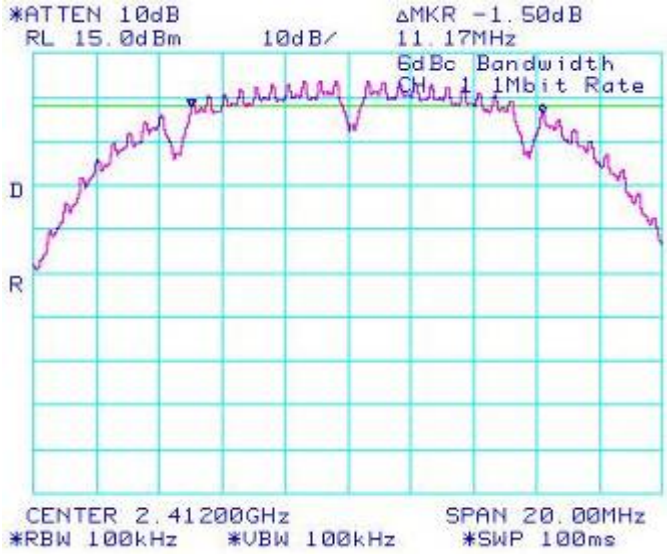


Figure 4-2: 6 dB Bandwidth
802.11b, Channel 6, 1 Mbps

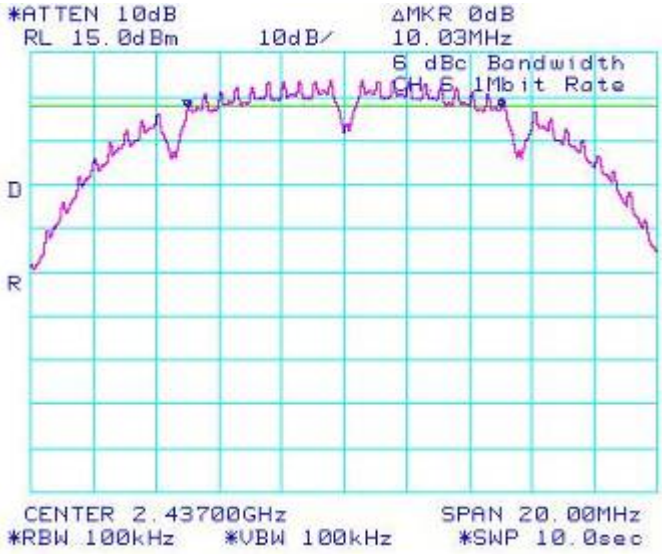
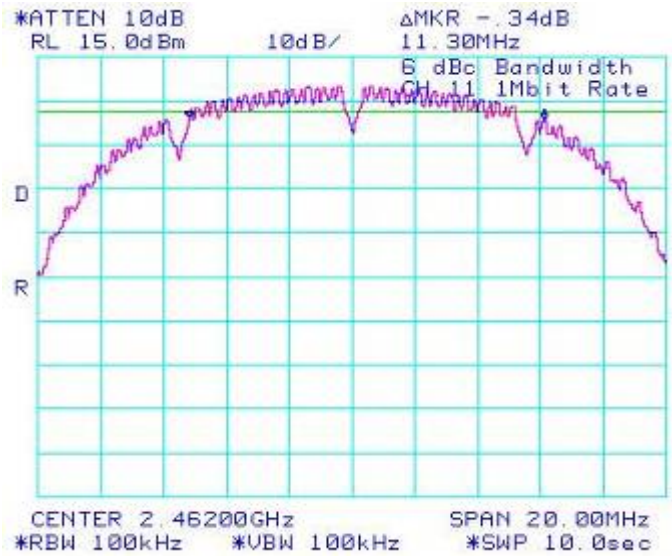


Figure 4-3: 6 dB Bandwidth
802.11b, Channel 11, 1 Mbps



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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

Maximum Conducted Output Power

The EUT met the requirements of the maximum conducted output power of class 2 as per 47 CFR 15.247(b)(3) and RSS-210. Channels 1, 6 and 11 were measured at 1 Mbps, 5.5 Mbps, and 11Mbps each for 802.11b mode and 6 Mbps, 24 Mbps, and 54 Mbps each for 802.11g mode using an Aglient 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)
1	1 Mbps	< 1.00	18.10	64.46
	5.5 Mbps	< 1.00	18.05	63.38
	11 Mbps	< 1.00	18.05	63.38
	6 Mbps	< 1.00	14.00	25.11
	24 Mbps	< 1.00	14.00	25.11
	54 Mbps	< 1.00	14.00	25.11
6	1 Mbps	< 1.00	18.10	64.46
	5.5 Mbps	< 1.00	18.10	64.46
	11 Mbps	< 1.00	18.00	63.10
	6 Mbps	< 1.00	17.15	51.88
	24 Mbps	< 1.00	14.50	28.18
	54 Mbps	< 1.00	13.00	20.00
11	1 Mbps	< 1.00	14.00	25.11
	5.5 Mbps	< 1.00	18.05	63.38
	11 Mbps	< 1.00	18.05	63.38
	6 Mbps	< 1.00	14.00	25.11
	24 Mbps	< 1.00	14.00	25.11
	54 Mbps	< 1.00	14.00	25.11

The environmental test conditions were:

Temperature	23ºC
Pressure	1012 mb
Relative Humidity	23%

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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 11Mbps 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	-35.50	-15.50
	5.5 Mbps	< -20	-33.17	-13.17
	11 Mbps	< -20	-32.50	-12.50
	6 Mbps	< -20	-30.34	-10.34
	24 Mbps	< -20	-29.83	-9.83
	54 Mbps	< -20	-29.67	-9.67
11	1 Mbps	< -20	-41.67	-21.67
	5.5 Mbps	< -20	-43.17	-23.17
	11 Mbps	< -20	-43.67	-23.67
	6 Mbps	< -20	-41.83	-21.83
	24 Mbps	< -20	-41.17	-21.17
	54 Mbps	< -20	-43.67	-23.67

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	23ºC
Pressure	1012 mb
Relative Humidity	23%

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

Figure 4-7: Band Edge Compliance
802.11b, Channel 1, 1 Mbps

Figure 4-8: Band Edge Compliance
802.11b, Channel 11, 1 Mbps

Figure 4-9: Band Edge Compliance
802.11g, Channel 1, 6 Mbps

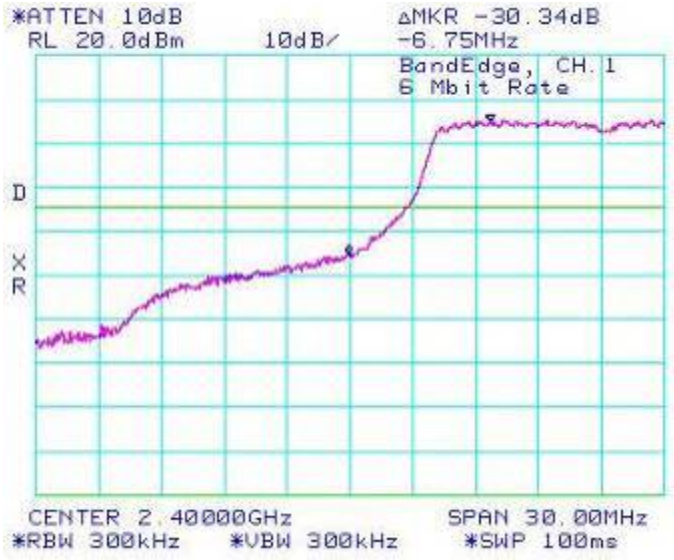
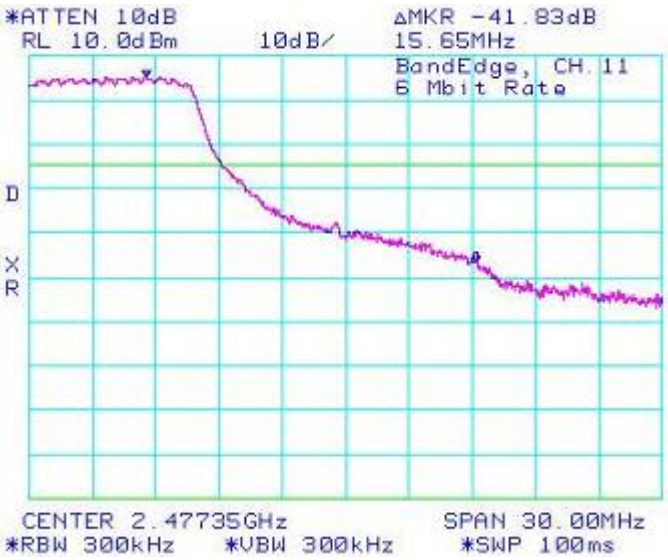


Figure 4-10: Band Edge Compliance
802.11g, Channel 11, 6 Mbps



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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	-4.83	12.83
	5.5 Mbps	< 8.00	-4.67	12.67
	11 Mbps	< 8.00	-5.00	13.00
	6 Mbps	< 8.00	-10.83	18.83
	24 Mbps	< 8.00	-9.67	17.67
	54 Mbps	< 8.00	-11.83	19.83
6	1 Mbps	< 8.00	-5.00	13.00
	5.5 Mbps	< 8.00	-5.17	13.17
	11 Mbps	< 8.00	-6.17	14.17
	6 Mbps	< 8.00	-8.00	16.00
	24 Mbps	< 8.00	-10.00	18.00
	54 Mbps	< 8.00	-12.50	20.50
11	1 Mbps	< 8.00	-5.00	13.00
	5.5 Mbps	< 8.00	-5.33	13.33
	11 Mbps	< 8.00	-6.00	14.00
	6 Mbps	< 8.00	-11.33	19.33
	24 Mbps	< 8.00	-10.00	18.00
	54 Mbps	< 8.00	-12.33	20.33

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	23ºC
Pressure	1012 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

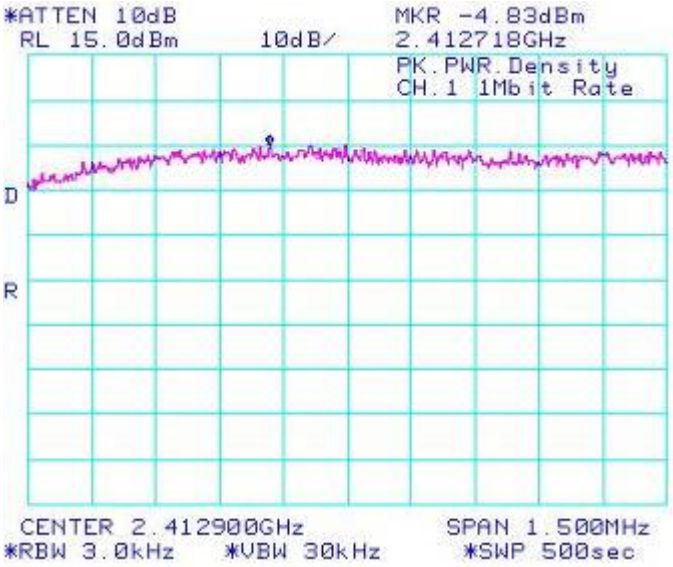


Figure 4-12: Peak Power Spectral Density
802.11b, Channel 6, 1 Mbps

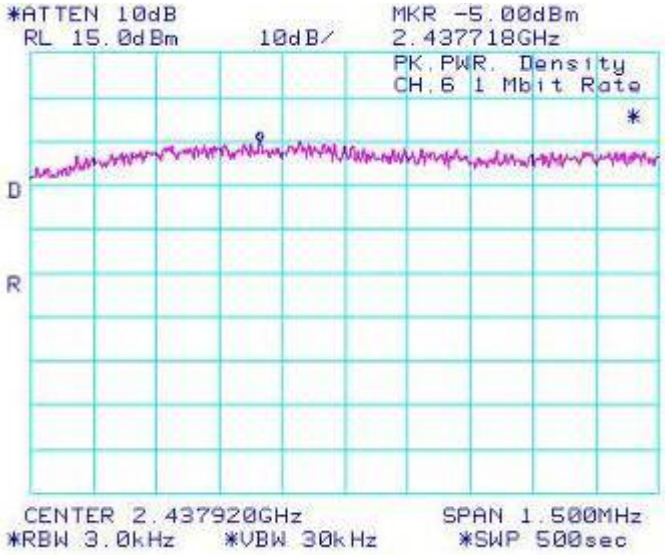
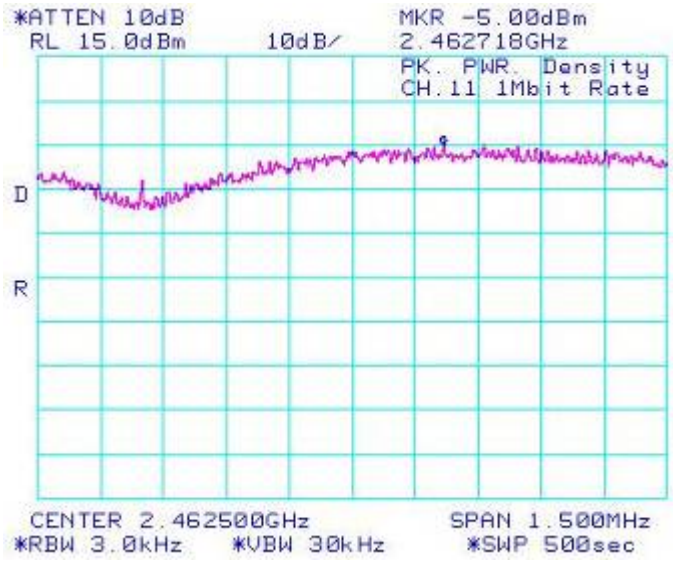


Figure 4-13: Peak Power Spectral Density
802.11b, Channel 11, 1 Mbps



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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

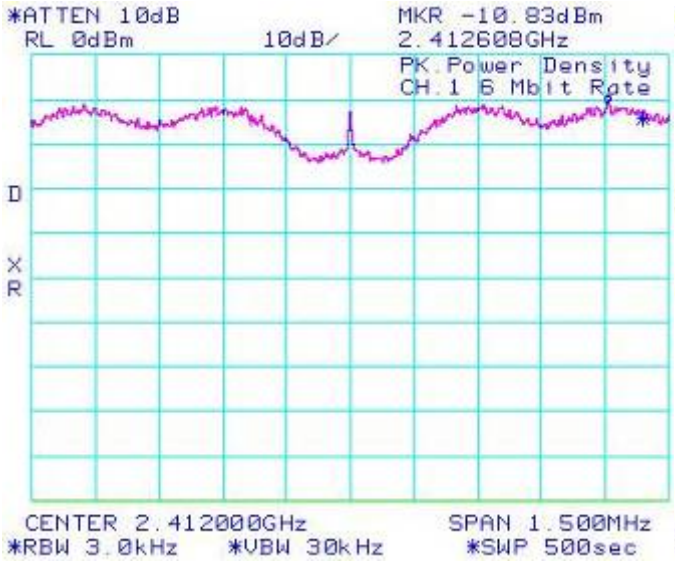


Figure 4-15: Peak Power Spectral Density 802.11g, Channel 6, 6 Mbps

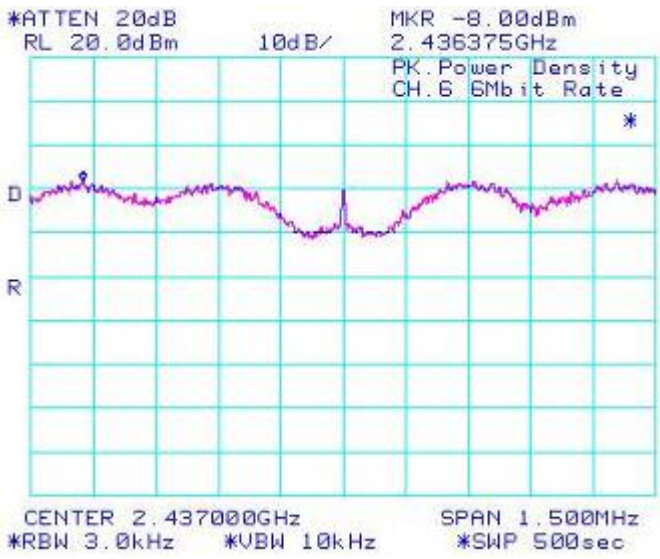
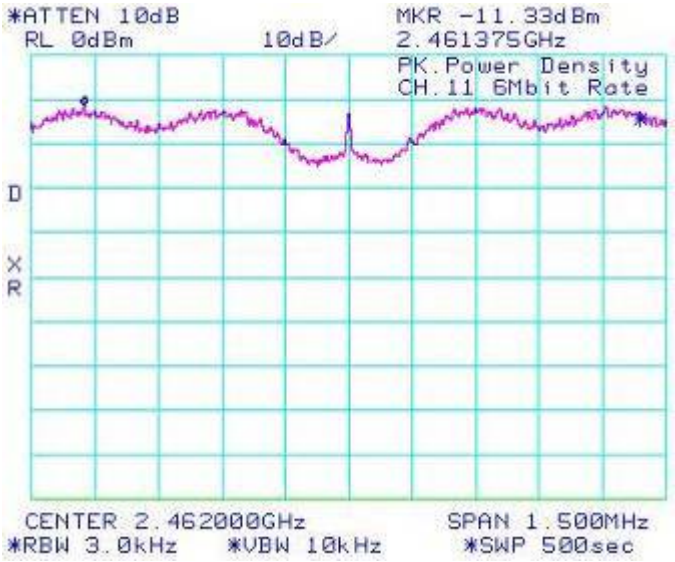


Figure 4-16: Peak Power Spectral Density 802.11g, Channel 11, 6 Mbps



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

Channel	Data Rate	Peak Power (dBm)	Max. Measured Level (dBm)	Max. Measured Level from Carrier (dBc)	Limit (dBc)
1	1 Mbps	15.67	-50.17	-65.84	-20
	5.5 Mbps	16.33	-49.17	-65.50	-20
	11 Mbps	18.33	-49.83	-68.16	-20
	6 Mbps	15.67	-49.83	-65.50	-20
	24 Mbps	15.50	-49.83	-65.33	-20
	54 Mbps	15.33	-50.67	-66.00	-20
6	1 Mbps	16.50	-49.00	-65.50	-20
	5.5 Mbps	16.50	-49.33	-65.83	-20
	11 Mbps	18.00	-50.00	-68.00	-20
	6 Mbps	19.00	-48.33	-67.33	-20
	24 Mbps	15.67	-50.33	-66.00	-20
	54 Mbps	15.00	-49.67	-64.67	-20
11	1 Mbps	15.67	-49.50	-65.17	-20
	5.5 Mbps	16.00	-48.17	-64.17	-20
	11 Mbps	17.83	-50.17	-68.00	-20
	6 Mbps	15.50	-50.17	-65.67	-20
	24 Mbps	15.33	-50.83	-66.16	-20
	54 Mbps	15.33	-50.50	-65.83	-20

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	23ºC
Pressure	1008 mb
Relative Humidity	24%

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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

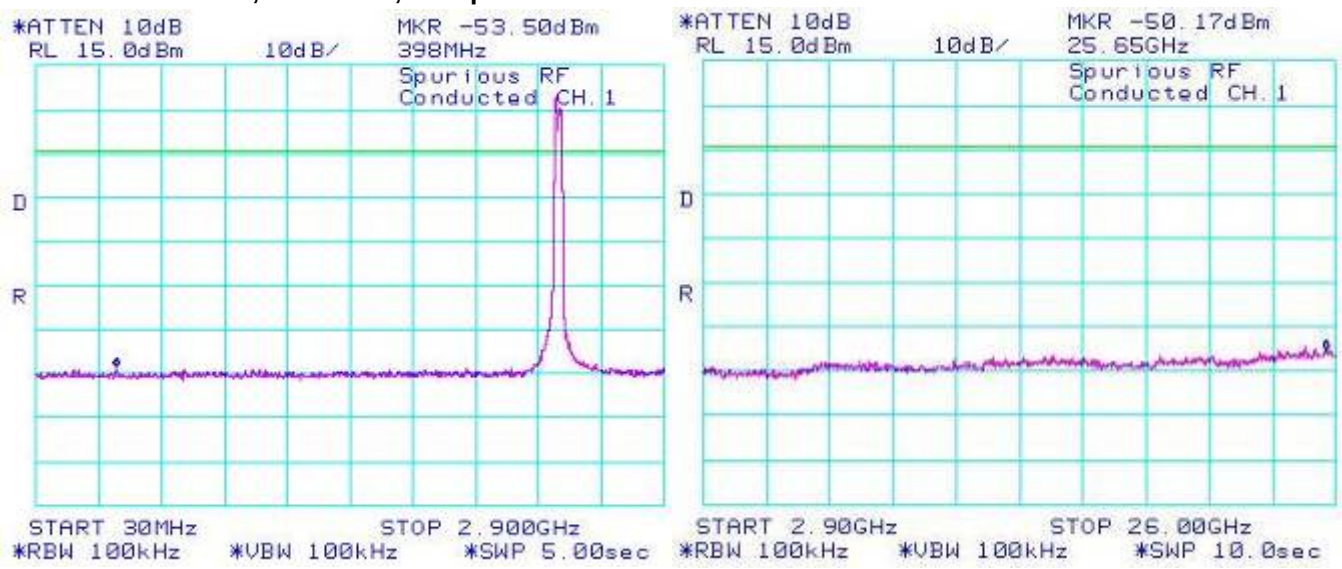
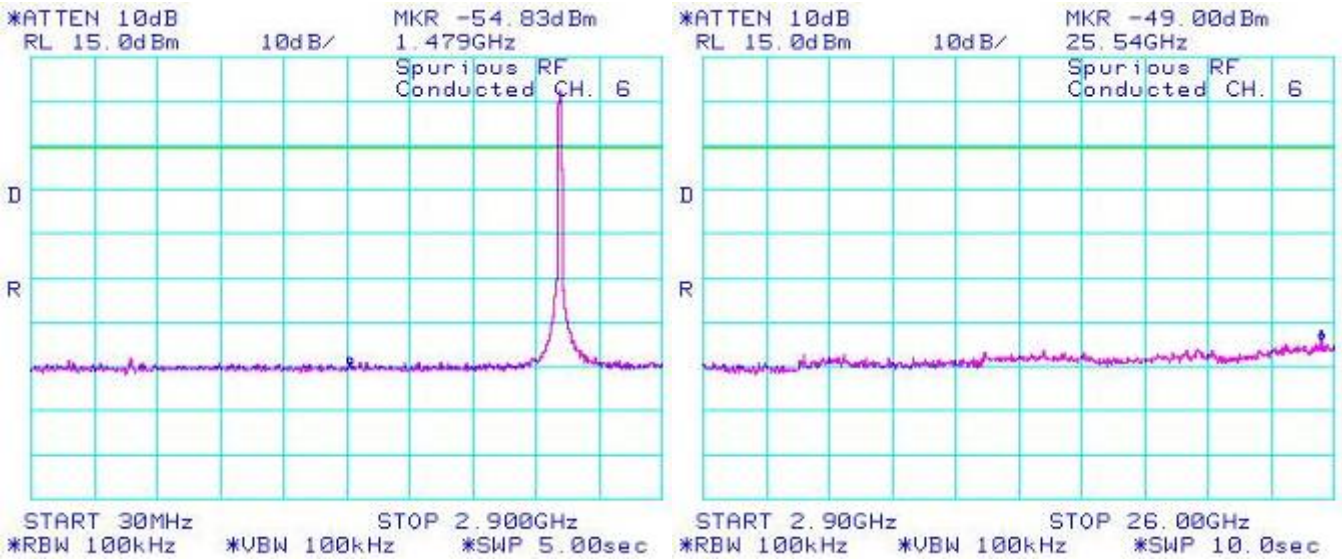


Figure 4-18 : Spurious Conducted RF Emissions
802.11b, Channel 6, 1 Mbps



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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

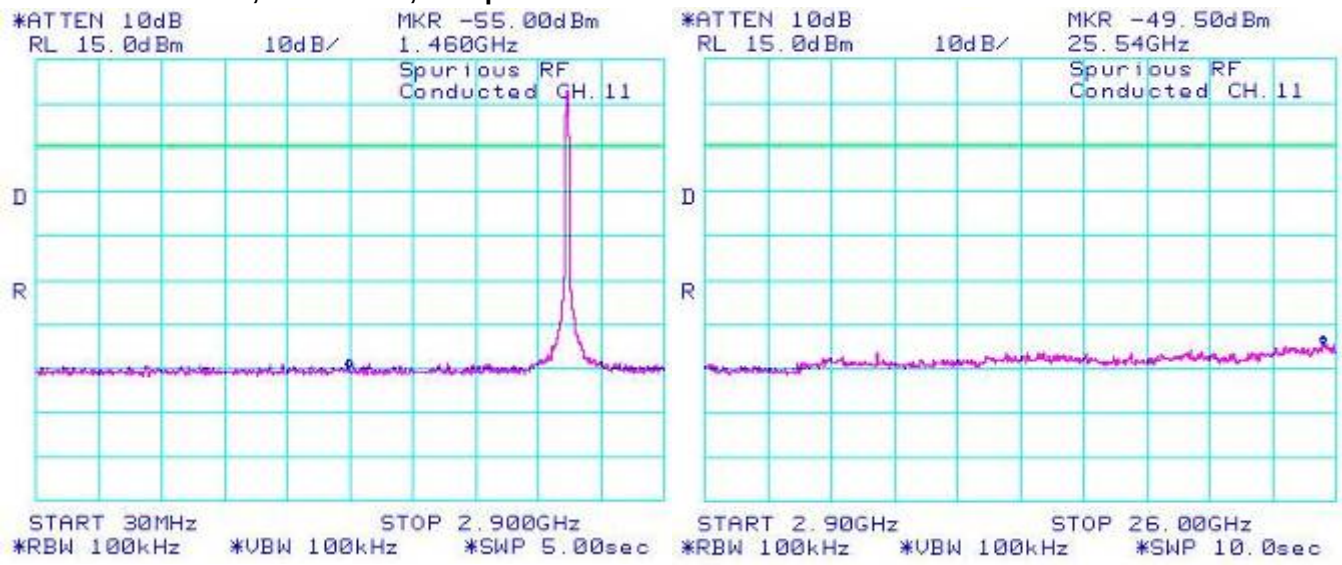
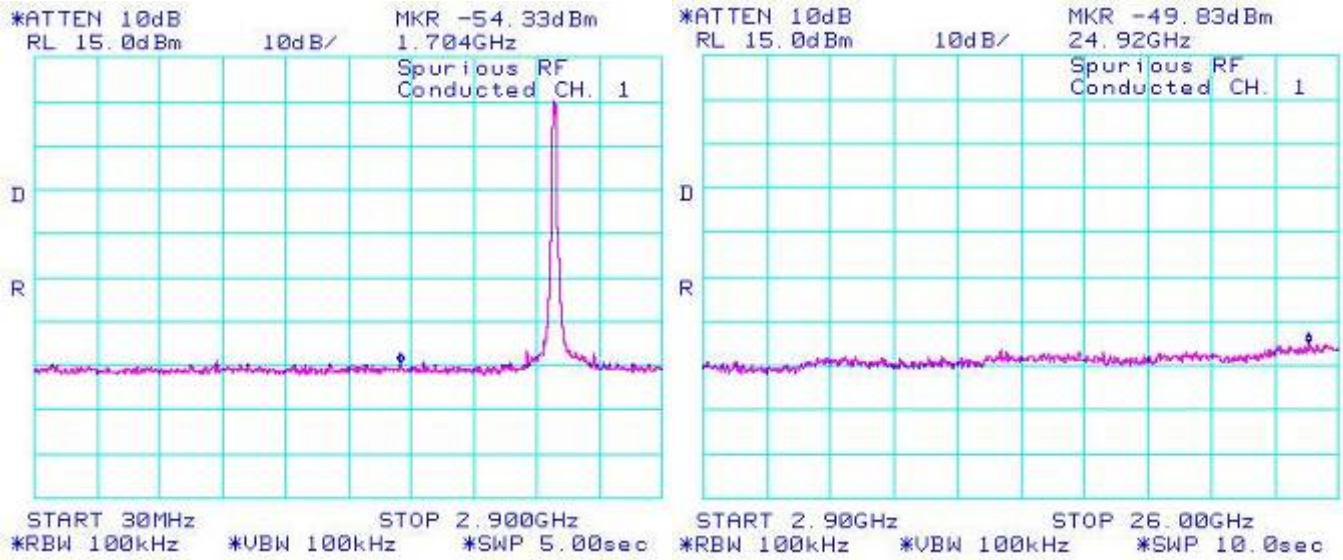


Figure 4-20: Spurious Conducted RF Emissions
802.11g, Channel 1, 6 Mbps



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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

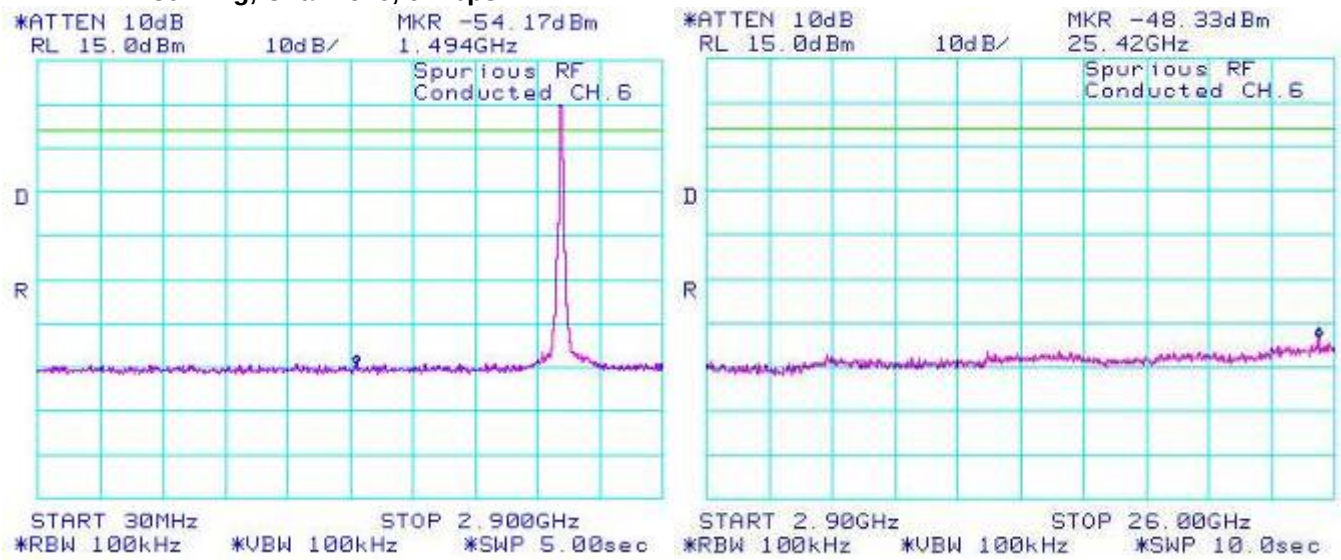
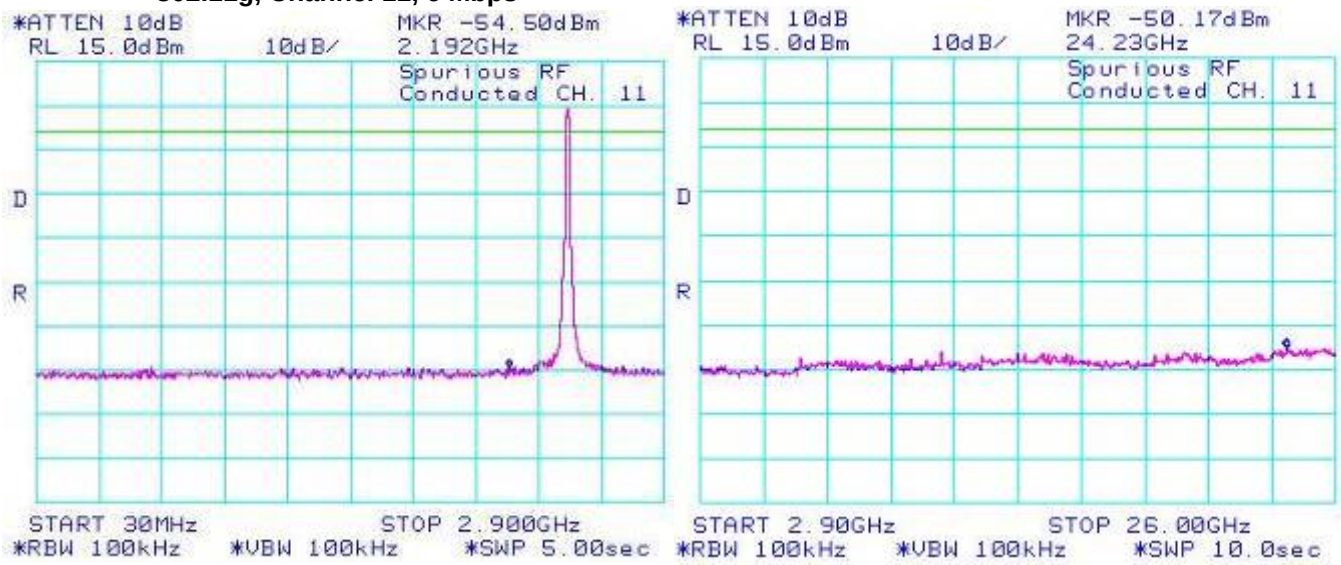


Figure 4-22: Spurious Conducted RF Emissions
802.11g, Channel 11, 6 Mbps



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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	13.0
44	5220 MHz	6 Mbps	14.5
		24 Mbps	14.5
		54 Mbps	13.0
48	5240 MHz	6 Mbps	14.5
		24 Mbps	14.5
		54 Mbps	13.0
52	5260 MHz	6 Mbps	18.0
		24 Mbps	15.0
		54 Mbps	13.5
60	5300 MHz	6 Mbps	18.0
		24 Mbps	15.0
		54 Mbps	13.5
64	5320 MHz	6 Mbps	18.0
		24 Mbps	15.0
		54 Mbps	13.5

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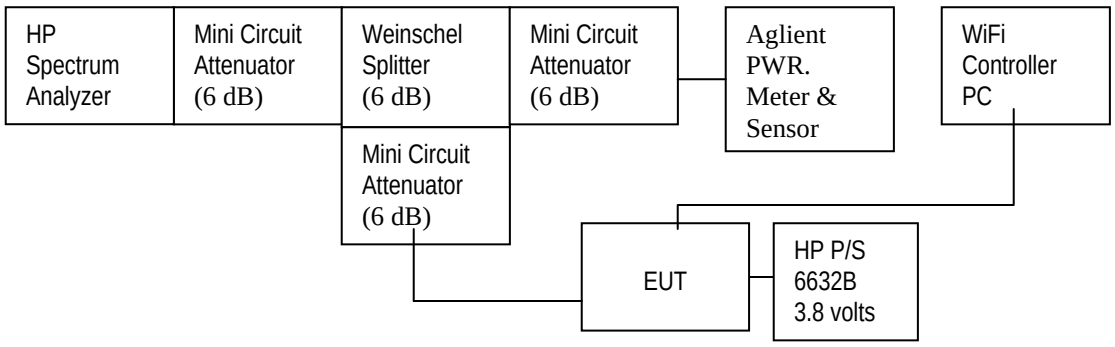
802.11a RF Conducted Emission Test Results cont'd

Channel	Frequency	Data Rate	Power output (dBm)
149	5745 MHz	6 Mbps	18.0
		24 Mbps	15.0
		54 Mbps	13.5
157	5785 MHz	6 Mbps	18.0
		24 Mbps	15.0
		54 Mbps	13.5
161	5805 MHz	6 Mbps	18.0
		24 Mbps	15.0
		54 Mbps	13.5

Test Setup Diagram



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.

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802.11a RF Conducted Emission Test Results cont'd

6 dB Bandwidth

The EUT met the requirements of the 6 dB bandwidth as per 47 CFR 15.247(a)(2) and RSS-210. Channels 36, 44, 48, 52, 60, 64, 149, 157, and 161 were measured at 6 Mbps, 24 Mbps, and 54 Mbps each for 802.11a mode.

Channel	Data Rate	Limit (kHz)	Measured Limit (MHz)
36	6 Mbps	>= 500	16.47
	24 Mbps	>= 500	16.63
	54 Mbps	>= 500	16.63
44	6 Mbps	>= 500	16.50
	24 Mbps	>= 500	16.70
	54 Mbps	>= 500	16.70
48	6 Mbps	>= 500	16.60
	24 Mbps	>= 500	16.70
	54 Mbps	>= 500	16.63
52	6 Mbps	>= 500	16.47
	24 Mbps	>= 500	16.60
	54 Mbps	>= 500	16.60
60	6 Mbps	>= 500	16.30
	24 Mbps	>= 500	16.60
	54 Mbps	>= 500	16.57
64	6 Mbps	>= 500	16.53
	24 Mbps	>= 500	16.60
	54 Mbps	>= 500	16.57
149	6 Mbps	>= 500	16.50
	24 Mbps	>= 500	16.67
	54 Mbps	>= 500	16.67
157	6 Mbps	>= 500	16.50
	24 Mbps	>= 500	16.63
	54 Mbps	>= 500	16.63
161	6 Mbps	>= 500	16.50
	24 Mbps	>= 500	16.63
	54 Mbps	>= 500	16.63

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

The environmental test conditions were:

Temperature	23ºC
Pressure	1013 mb
Relative Humidity	23%

Figure 5-1: 6 dB Bandwidth
802.11a, Channel 36, 6 Mbps

Figure 5-2: 6 dB Bandwidth
802.11a, Channel 44, 6 Mbps

Figure 5-3: 6 dB Bandwidth
802.11a, Channel 48, 6 Mbps

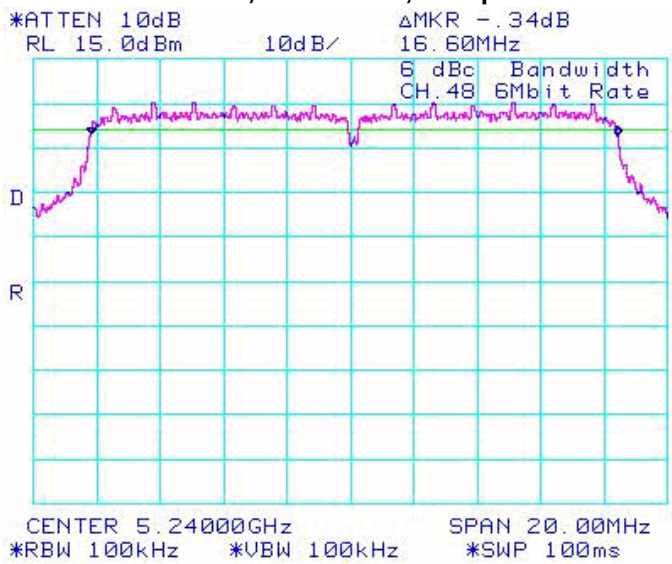
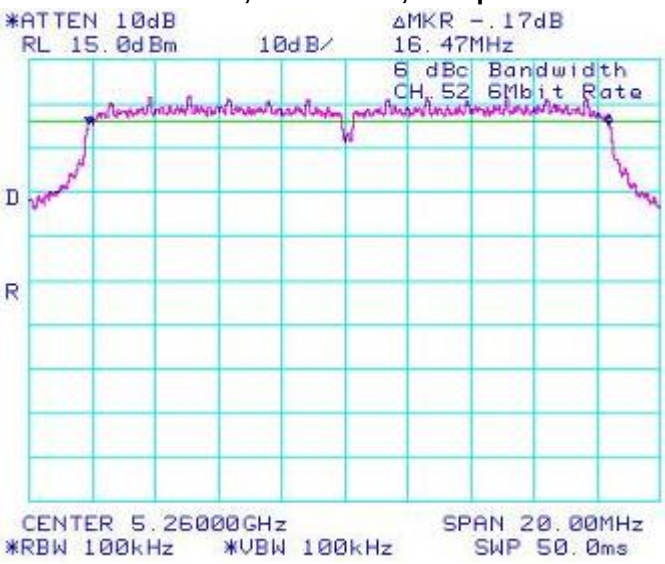


Figure 5-4: 6 dB Bandwidth
802.11a, Channel 52, 6 Mbps



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802.11a RF Conducted Emission Test Results cont'd

Figure 5-5: 6 dB Bandwidth
802.11a, Channel 60, 6 Mbps

Figure 5-6: 6 dB Bandwidth
802.11a, Channel 64, 6 Mbps

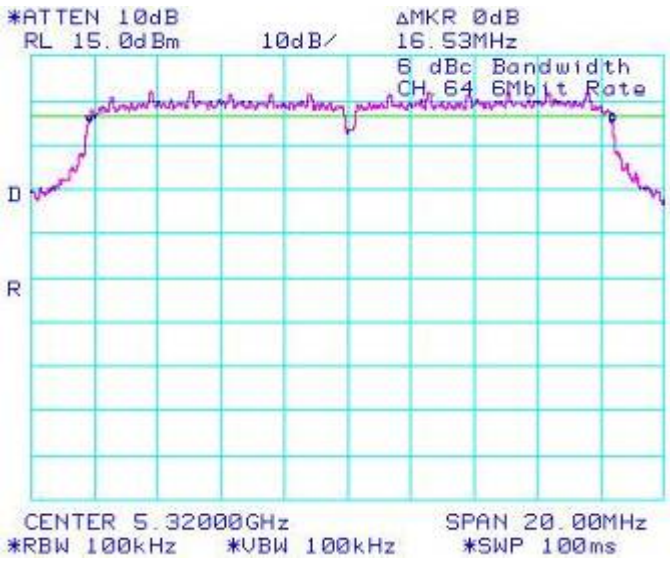

Figure 5-7: 6 dB Bandwidth
802.11a, Channel 149, 6 Mbps

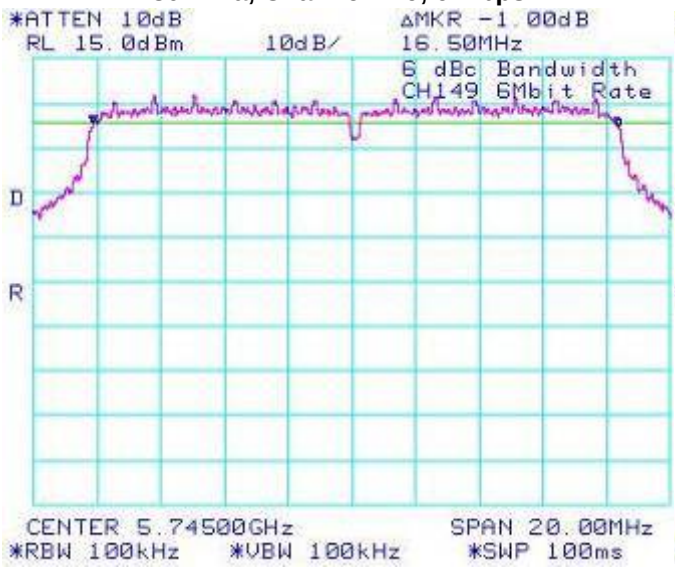

Figure 5-8: 6 dB Bandwidth
802.11a, Channel 157, 6 Mbps

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802.11a RF Conducted Emission Test Results cont'd

Figure 5-9: 6 dB Bandwidth

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 Aglient 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	14.53	28.38
	24 Mbps	< 1.00	14.45	27.86
	54 Mbps	< 1.00	13.58	22.80
44	6 Mbps	< 1.00	14.56	28.58
48	6 Mbps	< 1.00	14.58	28.71
52	6 Mbps	< 1.00	18.21	66.22
	24 Mbps	< 1.00	15.20	33.11
	54 Mbps	< 1.00	13.35	21.63
60	6 Mbps	< 1.00	18.16	65.46
64	6 Mbps	< 1.00	18.03	63.53
149	6 Mbps	< 1.00	18.04	63.68
	24 Mbps	< 1.00	14.85	30.55
	54 Mbps	< 1.00	12.96	19.77
157	6 Mbps	< 1.00	17.90	61.66
161	6 Mbps	< 1.00	17.50	56.23

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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	-52.84	32.82
	24 Mbps	< -20	-51.00	31.00
	54 Mbps	< -20	-52.17	32.17
48	6 Mbps	< -20	-22.17	2.17
	24 Mbps	< -20	-23.34	3.34
	54 Mbps	< -20	-23.83	3.83
52	6 Mbps	< -20	-22.17	2.17
	24 Mbps	< -20	-23.34	3.34
	54 Mbps	< -20	-25.17	5.17
64	6 Mbps	< -20	-46.16	26.16
	24 Mbps	< -20	-51.83	31.83
	54 Mbps	< -20	-53.34	33.34
149	6 Mbps	< -20	-35.33	15.33
	24 Mbps	< -20	-42.33	22.33
	54 Mbps	< -20	-46.33	26.33
161	6 Mbps	< -20	-39.83	19.83
	24 Mbps	< -20	-36.83	16.83
	54 Mbps	< -20	-36.17	16.17

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	23ºC
Pressure	1012 mb
Relative Humidity	23%

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802.11a RF Conducted Emission Test Results cont'd

Figure 5-10: Band Edge Compliance
802.11a, Channel 36, 6 Mbps

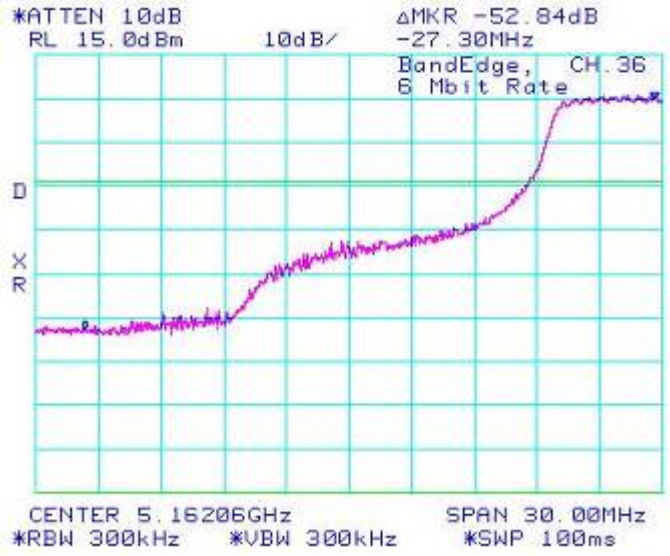


Figure 5-11: Band Edge Compliance
802.11a, Channel 48, 6 Mbps

Figure 5-12: Band Edge Compliance
802.11a, Channel 52, 6 Mbps

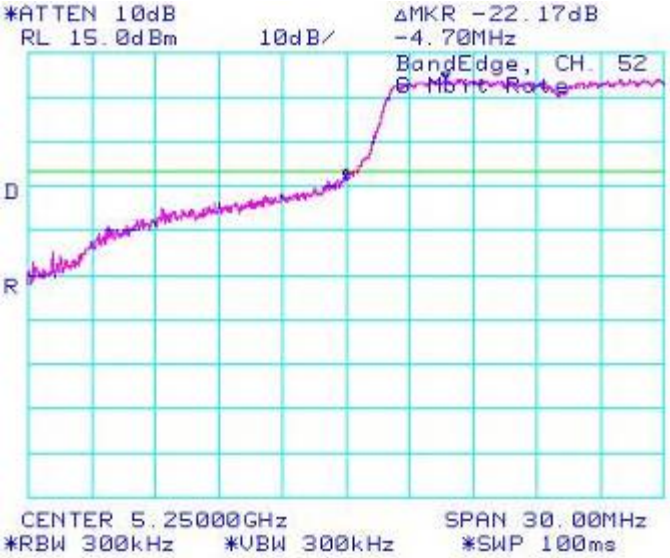
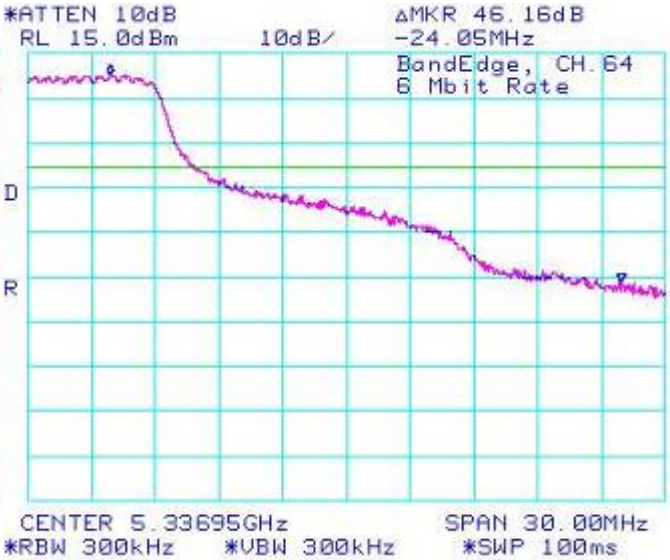


Figure 5-13: Band Edge Compliance
802.11a, Channel 64, 6 Mbps



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802.11a RF Conducted Emission Test Results cont'd

Figure 5-14: Band Edge Compliance
802.11a, Channel 149, 6 Mbps

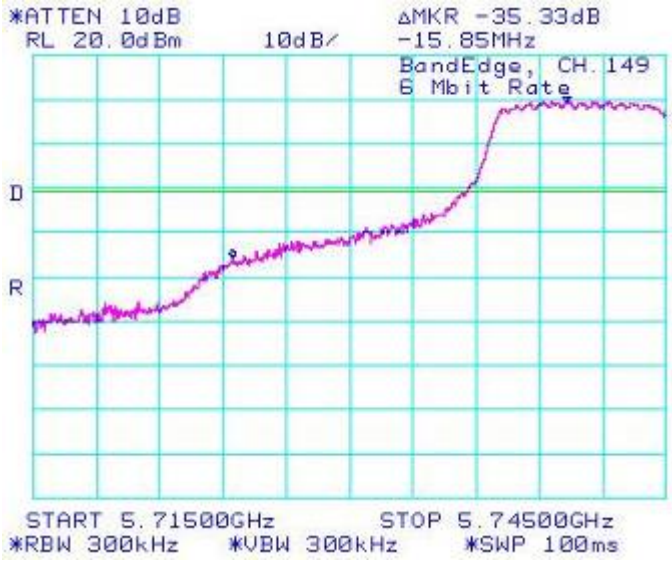
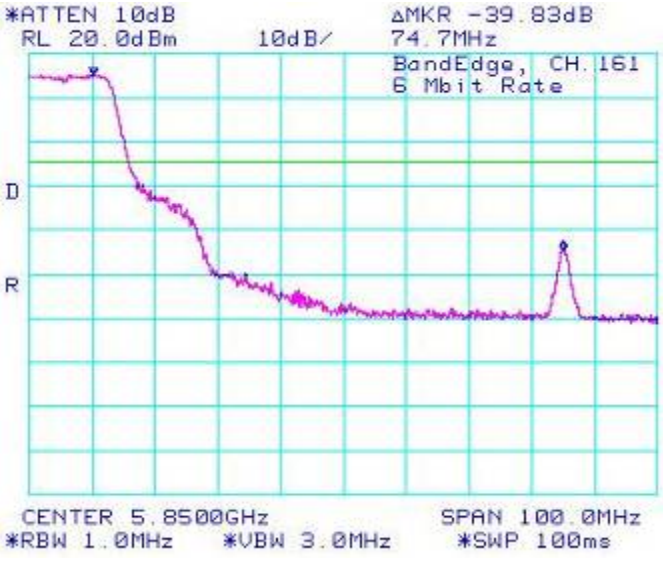


Figure 5-15: Band Edge Compliance
802.11a, Channel 161, 6 Mbps



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802.11a RF Conducted Emission Test Results cont'd

Peak Power Spectral Density

The EUT met the requirements of the peak power spectral density as per 47 CFR 15.407 and RSS-210. Channels 36, 44, 48, 52, 60, 64, 149, 157, and 161 were measured at 6 Mbps, 24 Mbps, and 54 Mbps each for 802.11a mode.

Channel	Data Rate	Limit (dBm)	Measured Level (dBm)	Margin (dBm)
36	6 Mbps	< 8.00	-10.50	18.50
	24 Mbps	< 8.00	-9.00	17.00
	54 Mbps	< 8.00	-11.17	19.17
44	6 Mbps	< 8.00	-9.00	17.00
	24 Mbps	< 8.00	-10.17	18.17
	54 Mbps	< 8.00	-12.50	20.50
48	6 Mbps	< 8.00	-8.50	16.50
	24 Mbps	< 8.00	-10.17	18.17
	54 Mbps	< 8.00	-12.50	20.50
52	6 Mbps	< 8.00	-6.17	14.17
	24 Mbps	< 8.00	-9.00	17.00
	54 Mbps	< 8.00	-11.17	19.17
60	6 Mbps	< 8.00	-6.83	14.83
	24 Mbps	< 8.00	-9.00	17.00
	54 Mbps	< 8.00	-11.33	19.33
64	6 Mbps	< 8.00	-7.67	15.67
	24 Mbps	< 8.00	-10.67	18.67
	54 Mbps	< 8.00	-12.67	20.67
149	6 Mbps	< 8.00	-6.67	14.67
	24 Mbps	< 8.00	-9.33	17.33
	54 Mbps	< 8.00	-11.67	19.67
157	6 Mbps	< 8.00	-6.67	14.67
	24 Mbps	< 8.00	-9.33	17.33
	54 Mbps	< 8.00	-11.83	19.83
161	6 Mbps	< 8.00	-7.00	16.00
	24 Mbps	< 8.00	-9.83	17.83
	54 Mbps	< 8.00	-12.33	20.33

See figures 5-16 to 5-23 for the plots of the peak power spectral density for Channel 36, 44, 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

The environmental test conditions were:

Temperature	23ºC
Pressure	1012 mb
Relative Humidity	23%

Figure 5-16: Peak Power Spectral Density
802.11a, Channel 36, 6 Mbps

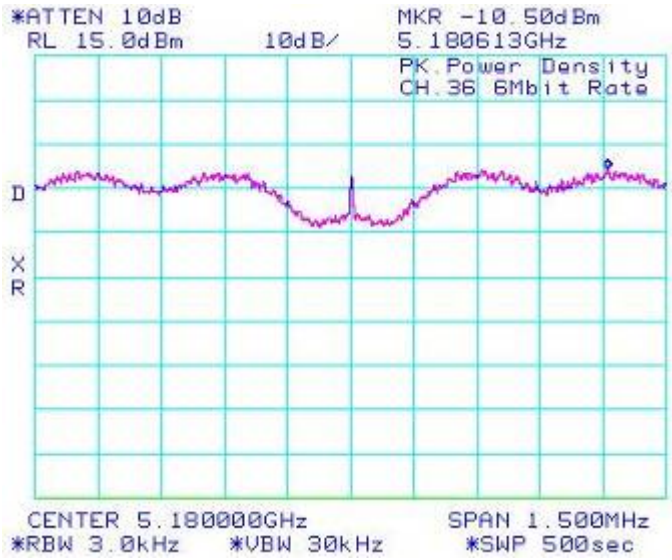


Figure 5-17: Peak Power Spectral Density
802.11a, Channel 44, 6 Mbps

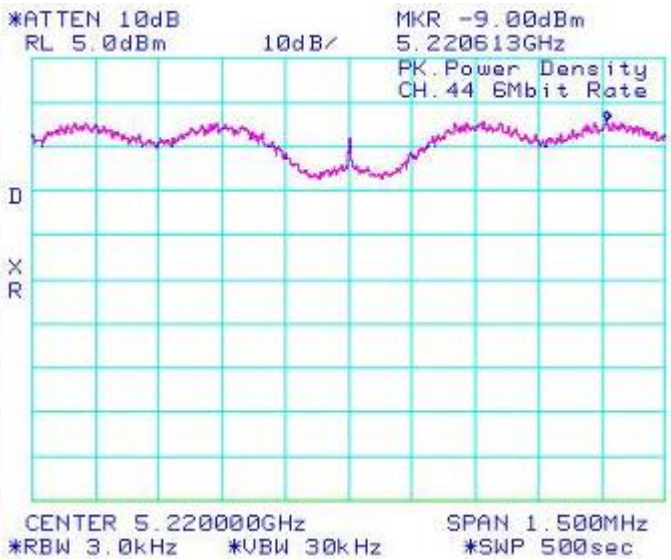


Figure 5-18: Peak Power Spectral Density
802.11a, Channel 52, 6 Mbps

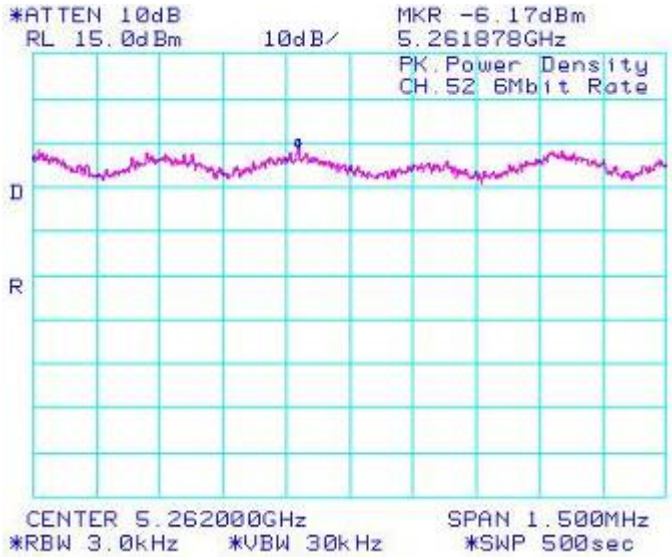
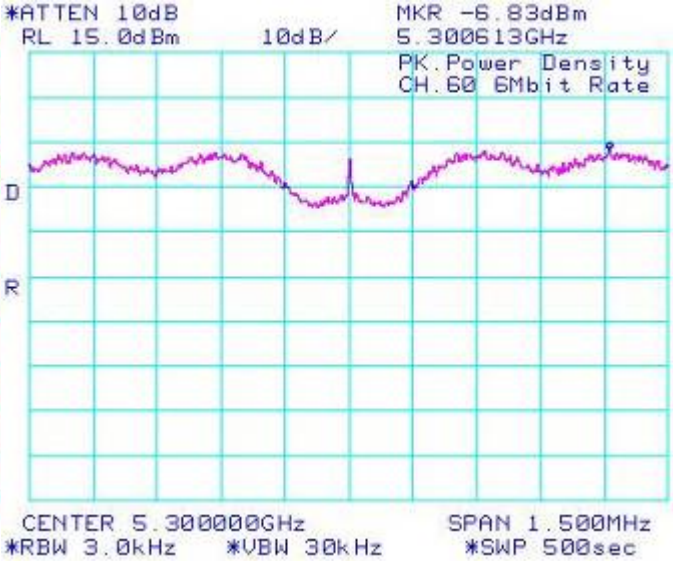


Figure 5-19: Peak Power Spectral Density
802.11a, Channel 60, 6 Mbps



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802.11a RF Conducted Emission Test Results cont'd

Figure 5-20: Peak Power Spectral Density
802.11a, Channel 64, 6 Mbps

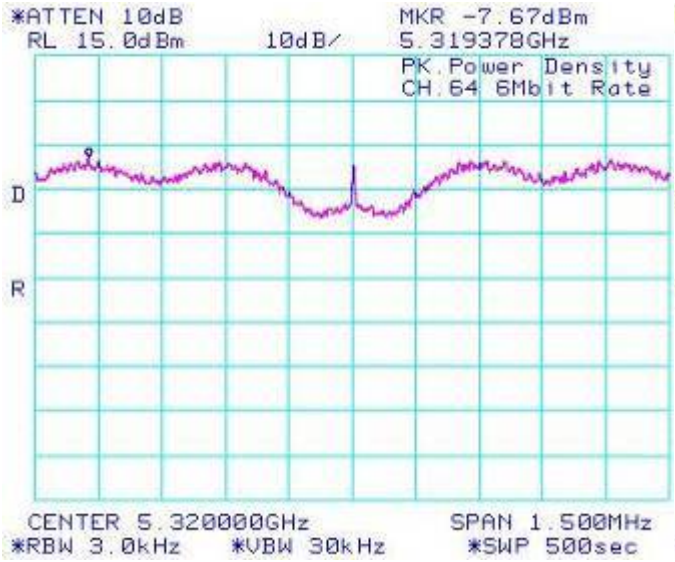


Figure 5-21: Peak Power Spectral Density
802.11a, Channel 149, 6 Mbps

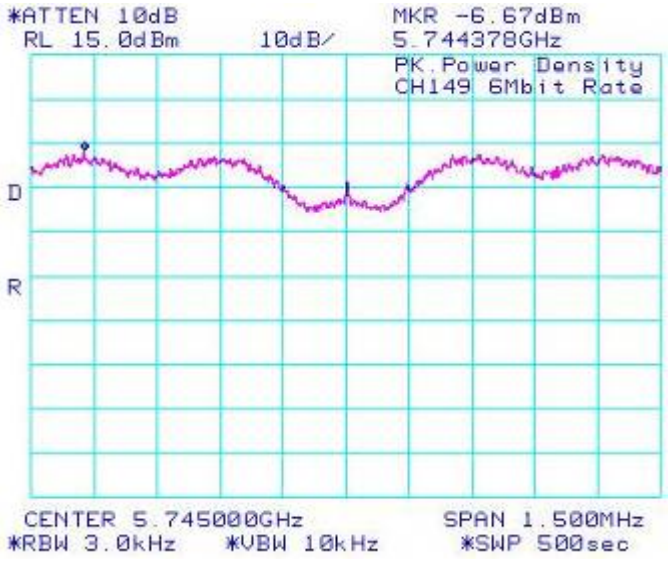


Figure 5-22: Peak Power Spectral Density
802.11a, Channel 157, 6 Mbps

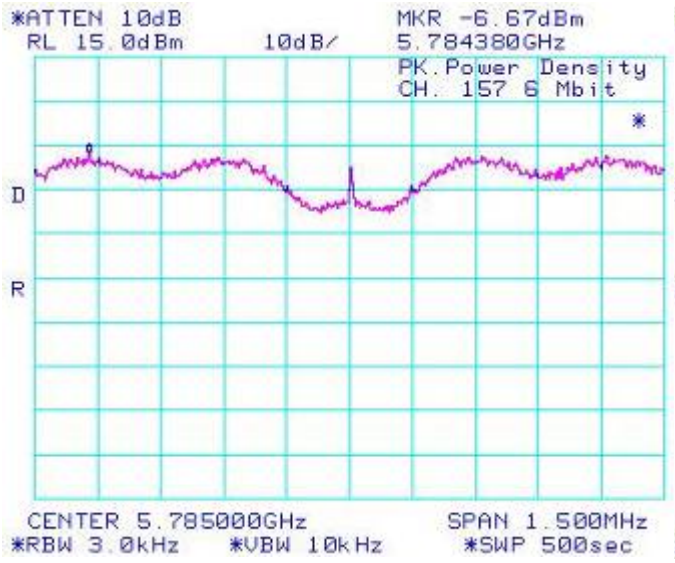
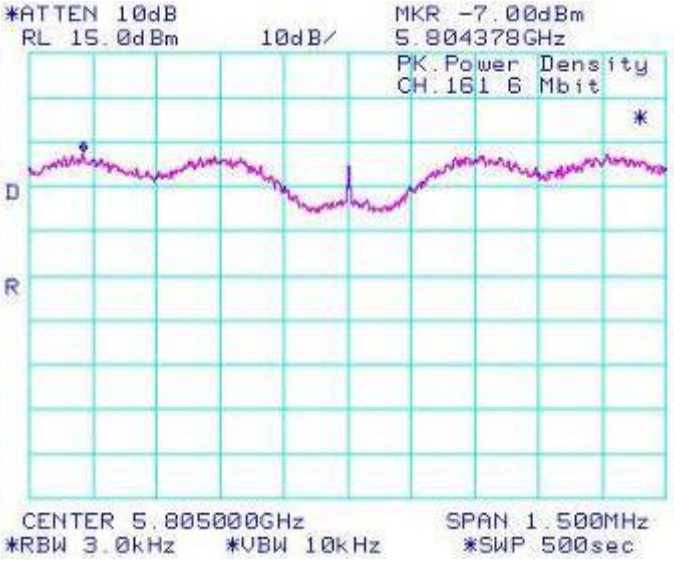


Figure 5-23: Peak Power Spectral Density
802.11a, Channel 161, 6 Mbps



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802.11a RF Conducted Emission Test Results cont'd

Spurious RF Conducted Emissions

The EUT met the requirements of the spurious RF conducted emissions as per 47 CFR 15.407 and RSS-210. Channels 44, 60, and 157 were measured at 6 Mbps each for 802.11a mode. Peak Power was measured with the spectrum analyzer. 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	Peak Power (dBm)	Max. Measured Level (dBm)	Max. Measured Level from Carrier (dBc)	Limit (dBc)
44	6 Mbps	18.17	-31.23	-49.40	-20
60	6 Mbps	20.67	-30.59	-51.26	-20
157	6 Mbps	20.00	-30.81	-50.81	-20

See figures 5-24 to 5-26 for the plots of the spurious RF conducted emissions for Channel 36.

The environmental test conditions were:

Temperature	23ºC
Pressure	1008 mb
Relative Humidity	24%

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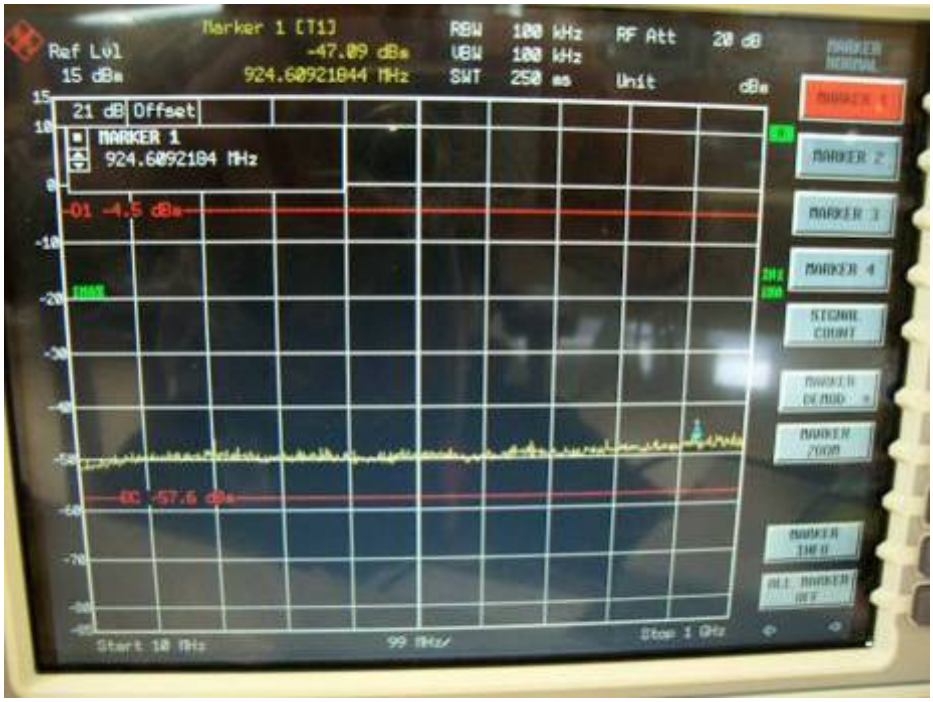
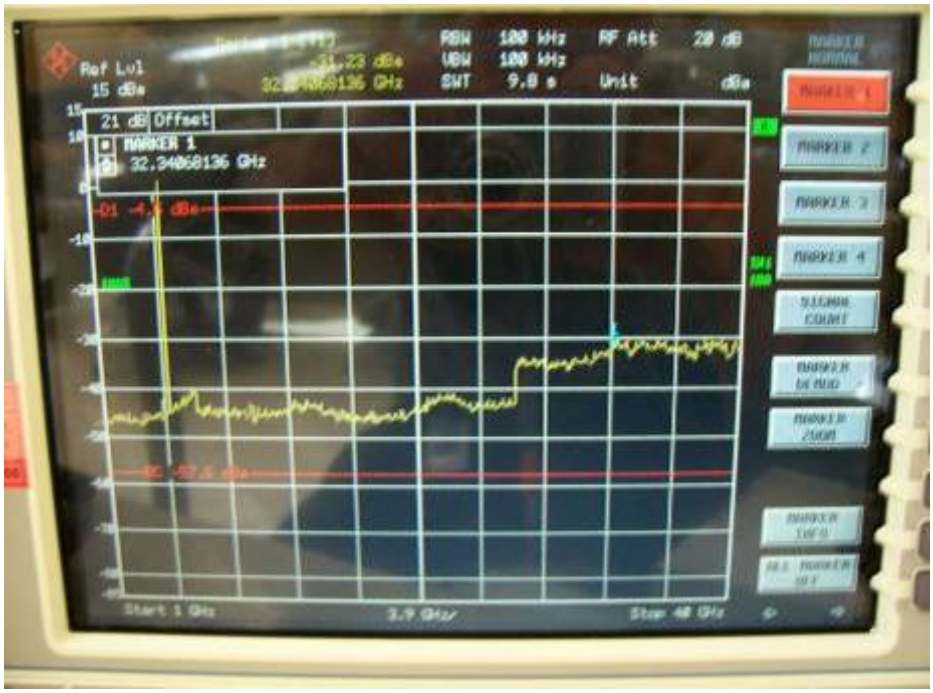
802.11a RF Conducted Emission Test Results cont'd

Figure 5-24: Spurious RF Conducted Emissions, 802.11a Channel 44, 6 Mbps





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802.11a RF Conducted Emission Test Results cont'd

Figure 5-25: Spurious RF Conducted Emissions, 802.11a Channel 60, 6 Mbps

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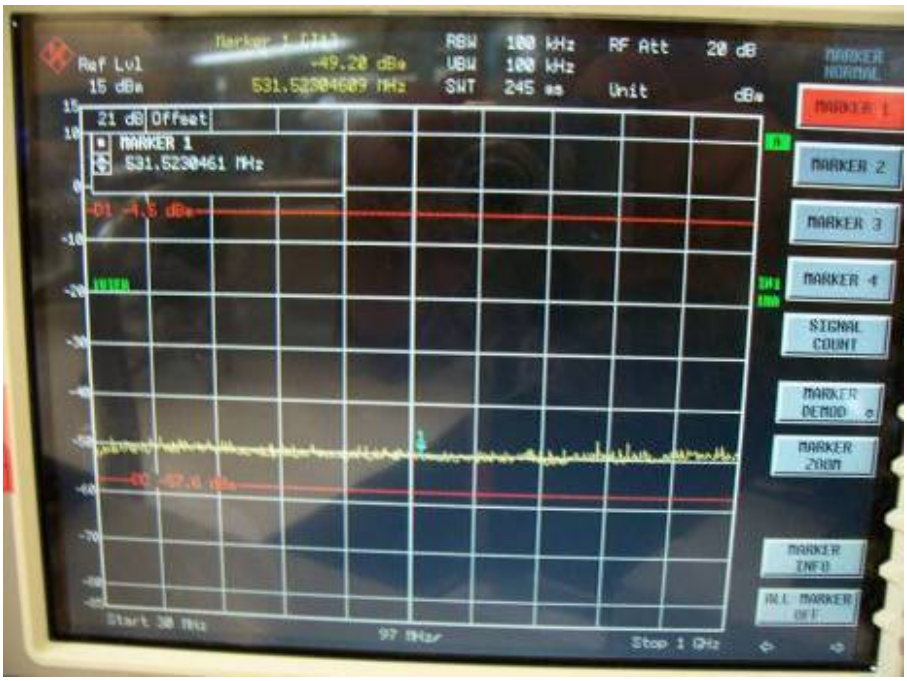
802.11a RF Conducted Emission Test Results cont'd

Figure 5-26: 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, 3.8 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 +23ºC.

Channel Number	Frequency (MHz)	Input Voltage (Volts)	Temperature (Celsius)	Frequency Error (kHz)
0	2402	3.6	23	13
39	2441	3.6	23	14
78	2480	3.6	23	11
0	2402	3.8	23	13
39	2441	3.8	23	15
78	2480	3.8	23	12
0	2402	4.2	23	12
39	2441	4.2	23	14
78	2480	4.2	23	11

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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 ºC (kHz)	PPM
0	2402	3.6	-20	11	-2	-0.8326
39	2441	3.6	-20	11	-3	-1.2290
78	2480	3.6	-20	9	-2	-0.8065
0	2402	3.6	20	12	-1	-0.4163
39	2441	3.6	20	13	-1	-0.4097
78	2480	3.6	20	10	-1	-0.4032
0	2402	3.6	55	15	2	0.8326
39	2441	3.6	55	14	0	0.0000
78	2480	3.6	55	12	1	0.4032
0	2402	3.8	-20	10	-3	-1.2490
39	2441	3.8	-20	12	-3	-1.2290
78	2480	3.8	-20	9	-3	-1.2097
0	2402	3.8	20	12	-1	-0.4163
39	2441	3.8	20	14	-1	-0.4097
78	2480	3.8	20	10	-2	-0.8065
0	2402	3.8	55	14	1	0.4163
39	2441	3.8	55	15	0	0.0000
78	2480	3.8	55	11	-1	-0.4032
0	2402	4.2	-20	11	-1	-0.4163
39	2441	4.2	-20	11	-3	-1.2290
78	2480	4.2	-20	9	-2	-0.8065
0	2402	4.2	20	13	1	0.4163
39	2441	4.2	20	14	0	0.0000
78	2480	4.2	20	11	0	0.0000
0	2402	4.2	55	15	3	1.2490
39	2441	4.2	55	14	0	0.0000
78	2480	4.2	55	12	1	0.4032

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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. Channel 1 was measured at 6 Mbps at 14.0 dBm for 802.11b/g mode. The input voltage was stepped from 3.6 volts, 3.8 and 4.2 volts. The frequency drift was measured using a Spectrum Analyzer with reference to its value at +20ºC. The temperature was varied from -30ºC to +60ºC in 10º steps.

Channel Number	Frequency (MHz)	Input Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)
1	2411	3.6	20	998.7
1	2411	3.8	20	998.8
1	2411	4.2	20	998.2

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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 ºC (Hz)	PPM
1	2411	3.6	-30	998.8	0.1	0.000041
1	2411	3.6	-20	999.0	0.3	0.000124
1	2411	3.6	-10	998.3	-0.4	-0.000166
1	2411	3.6	0	998.5	-0.2	-0.000083
1	2411	3.6	10	999.3	0.6	0.000249
1	2411	3.6	30	998.8	0.1	0.000041
1	2411	3.6	40	997.5	-1.2	-0.000498
1	2411	3.6	50	997.3	-1.4	-0.000581
1	2411	3.6	60	998.0	-0.7	-0.000290
1	2411	3.8	-30	998.8	0.0	0.000000
1	2411	3.8	-20	998.8	0.0	0.000000
1	2411	3.8	-10	998.8	0.0	0.000000
1	2411	3.8	0	998.5	-0.3	-0.000124
1	2411	3.8	10	999.0	0.2	0.000083
1	2411	3.8	30	999.0	0.2	0.000083
1	2411	3.8	40	997.8	-1.0	-0.000415
1	2411	3.8	50	997.5	-1.3	-0.000539
1	2411	3.8	60	997.8	-1.0	-0.000415
1	2411	4.2	-30	998.8	0.6	0.000249
1	2411	4.2	-20	999.0	0.8	0.000332
1	2411	4.2	-10	998.7	0.5	0.000207
1	2411	4.2	0	998.8	0.6	0.000249
1	2411	4.2	10	998.8	0.6	0.000249
1	2411	4.2	30	998.8	0.6	0.000249
1	2411	4.2	40	997.8	-0.4	-0.000166
1	2411	4.2	50	997.2	-1.0	-0.000415
1	2411	4.2	60	997.8	-0.4	-0.000166

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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 were measured at 14.5 dBm and 6 Mbps each and channels 52, 64, 149, and 161 were measured at 18.0 dBm, 6 Mbps each for 802.11a mode. The input voltage was stepped from 3.6 volts, 3.8 and 4.2 volts. The frequency drift was measured using a Spectrum Analyzer with reference to its value at +20ºC. The temperature was varied from -30ºC to +60ºC in 10º steps.

Channel Number	Frequency (MHz)	Input Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)
36	5180	3.6	20	5.5
48	5240	3.6	20	4.8
52	5260	3.6	20	5.0
64	5320	3.6	20	5.2
149	5745	3.6	20	5.7
161	5805	3.6	20	5.2
36	5180	3.8	20	5.7
48	5240	3.8	20	5.0
52	5260	3.8	20	4.8
64	5320	3.8	20	5.2
149	5745	3.8	20	5.7
161	5805	3.8	20	5.3
36	5180	4.2	20	5.3
48	5240	4.2	20	5.0
52	5260	4.2	20	4.8
64	5320	4.2	20	5.0
149	5745	4.2	20	5.5
161	5805	4.2	20	5.3

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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 ºC (Hz)	PPM
36	5180	3.6	-30	6.5	1.0	0.000193
36	5180	3.6	-20	6.2	0.7	0.000135
36	5180	3.6	-10	5.5	0.0	0.000000
36	5180	3.6	0	5.5	0.0	0.000000
36	5180	3.6	10	6.0	0.5	0.000097
36	5180	3.6	30	4.3	-1.2	-0.000232
36	5180	3.6	40	3.5	-2.0	-0.000386
36	5180	3.6	50	2.7	-2.8	-0.000541
36	5180	3.6	60	4.0	-1.5	-0.000290
36	5180	3.8	-30	6.2	0.5	0.000097
36	5180	3.8	-20	5.8	0.1	0.000019
36	5180	3.8	-10	5.7	0.0	0.000000
36	5180	3.8	0	5.7	0.0	0.000000
36	5180	3.8	10	6.2	0.5	0.000097
36	5180	3.8	30	4.3	-1.4	-0.000270
36	5180	3.8	40	3.2	-2.5	-0.000483
36	5180	3.8	50	2.7	-3.0	-0.000579
36	5180	3.8	60	3.8	-1.9	-0.000367
36	5180	4.2	-30	6.7	1.4	0.000270
36	5180	4.2	-20	6.0	0.7	0.000135
36	5180	4.2	-10	5.2	-0.1	-0.000019
36	5180	4.2	0	5.3	0.0	0.000000
36	5180	4.2	10	6.2	0.9	0.000174
36	5180	4.2	30	4.2	-1.1	-0.000212
36	5180	4.2	40	3.2	-2.1	-0.000405
36	5180	4.2	50	2.5	-2.8	-0.000541
36	5180	4.2	60	3.8	-1.5	-0.000290

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Channel Number	Frequency (MHz)	Input Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	Frequency Error referenced to 20 ºC (Hz)	PPM
48	5240	3.6	-30	7.0	2.2	0.000420
48	5240	3.6	-20	5.7	0.9	0.000172
48	5240	3.6	-10	5.3	0.5	0.000095
48	5240	3.6	0	5.5	0.7	0.000134
48	5240	3.6	10	6.2	1.4	0.000267
48	5240	3.6	30	4.5	-0.3	-0.000057
48	5240	3.6	40	3.7	-1.1	-0.000210
48	5240	3.6	50	2.7	-2.1	-0.000401
48	5240	3.6	60	4.0	-0.8	-0.000153
48	5240	3.8	-30	7.0	2.0	0.000382
48	5240	3.8	-20	5.5	0.5	0.000095
48	5240	3.8	-10	5.3	0.3	0.000057
48	5240	3.8	0	5.7	0.7	0.000134
48	5240	3.8	10	6.2	1.2	0.000229
48	5240	3.8	30	4.7	-0.3	-0.000057
48	5240	3.8	40	3.3	-1.7	-0.000324
48	5240	3.8	50	2.7	-2.3	-0.000439
48	5240	3.8	60	3.5	-1.5	-0.000286
48	5240	4.2	-30	7.2	2.2	0.000420
48	5240	4.2	-20	5.5	0.5	0.000095
48	5240	4.2	-10	5.5	0.5	0.000095
48	5240	4.2	0	5.7	0.7	0.000134
48	5240	4.2	10	6.2	1.2	0.000229
48	5240	4.2	30	0.5	-4.5	-0.000865
48	5240	4.2	40	3.7	-1.3	-0.000248
48	5240	4.2	50	2.8	-2.2	-0.000420
48	5240	4.2	60	3.5	-1.5	-0.000286

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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 ºC (Hz)	PPM
52	5260	3.6	-30	7.0	2.0	0.000380
52	5260	3.6	-20	6.3	1.3	0.000247
52	5260	3.6	-10	5.3	0.3	0.000057
52	5260	3.6	0	5.3	0.3	0.000057
52	5260	3.6	10	6.3	1.3	0.000247
52	5260	3.6	30	4.7	-0.3	-0.000057
52	5260	3.6	40	4.0	-1.0	-0.000190
52	5260	3.6	50	3.0	-2.0	-0.000380
52	5260	3.6	60	3.5	-1.5	-0.000285
52	5260	3.8	-30	6.8	2.0	0.000380
52	5260	3.8	-20	6.2	1.4	0.000266
52	5260	3.8	-10	5.7	0.9	0.000171
52	5260	3.8	0	5.7	0.9	0.000171
52	5260	3.8	10	6.3	1.5	0.000285
52	5260	3.8	30	4.8	0.0	0.000000
52	5260	3.8	40	3.5	-1.3	-0.000247
52	5260	3.8	50	2.7	-2.1	-0.000399
52	5260	3.8	60	3.8	-1.0	-0.000190
52	5260	4.2	-30	6.5	1.7	0.000323
52	5260	4.2	-20	6.2	1.4	0.000266
52	5260	4.2	-10	5.3	0.5	0.000095
52	5260	4.2	0	5.8	1.0	0.000190
52	5260	4.2	10	6.2	1.4	0.000266
52	5260	4.2	30	4.3	-0.5	-0.000095
52	5260	4.2	40	3.8	-1.0	-0.000190
52	5260	4.2	50	3.0	-1.8	-0.000342
52	5260	4.2	60	4.0	-0.8	-0.000152

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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 ºC (Hz)	PPM
64	5320	3.6	-30	6.8	1.6	0.000301
64	5320	3.6	-20	6.5	1.3	0.000244
64	5320	3.6	-10	5.5	0.3	0.000056
64	5320	3.6	0	5.8	0.6	0.000113
64	5320	3.6	10	6.2	1.0	0.000188
64	5320	3.6	30	4.5	-0.7	-0.000132
64	5320	3.6	40	4.2	-1.0	-0.000188
64	5320	3.6	50	2.8	-2.4	-0.000451
64	5320	3.6	60	3.2	-2.0	-0.000376
64	5320	3.8	-30	7.3	2.1	0.000395
64	5320	3.8	-20	6.3	1.1	0.000207
64	5320	3.8	-10	0.6	-4.6	-0.000870
64	5320	3.8	0	5.3	0.1	0.000019
64	5320	3.8	10	6.3	1.1	0.000207
64	5320	3.8	30	4.7	-0.5	-0.000094
64	5320	3.8	40	3.7	-1.5	-0.000282
64	5320	3.8	50	2.8	-2.4	-0.000451
64	5320	3.8	60	3.8	-1.4	-0.000263
64	5320	4.2	-30	7.0	2.0	0.000376
64	5320	4.2	-20	6.2	1.2	0.000226
64	5320	4.2	-10	0.5	-4.5	-0.000836
64	5320	4.2	0	5.8	0.8	0.000150
64	5320	4.2	10	6.3	1.3	0.000244
64	5320	4.2	30	4.7	-0.3	-0.000056
64	5320	4.2	40	3.8	-1.2	-0.000226
64	5320	4.2	50	2.8	-2.2	-0.000414
64	5320	4.2	60	4.3	-0.7	-0.000132

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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 ºC (Hz)	PPM
149	5745	3.6	-30	7.3	1.6	0.000279
149	5745	3.6	-20	7.0	1.3	0.000226
149	5745	3.6	-10	5.0	-0.7	-0.000122
149	5745	3.6	0	5.3	-0.4	-0.000070
149	5745	3.6	10	6.2	0.5	0.000087
149	5745	3.6	30	4.3	-1.4	-0.000244
149	5745	3.6	40	3.8	-1.9	-0.000331
149	5745	3.6	50	2.8	-2.9	-0.000505
149	5745	3.6	60	3.7	-2.0	-0.000348
149	5745	3.8	-30	7.2	1.5	0.000261
149	5745	3.8	-20	6.7	1.0	0.000174
149	5745	3.8	-10	5.0	-0.7	-0.000122
149	5745	3.8	0	5.3	-0.4	-0.000070
149	5745	3.8	10	6.2	0.5	0.000087
149	5745	3.8	30	4.7	-1.0	-0.000174
149	5745	3.8	40	3.8	-1.9	-0.000331
149	5745	3.8	50	2.7	-3.0	-0.000522
149	5745	3.8	60	3.2	-2.5	-0.000435
149	5745	4.2	-30	7.2	1.7	0.000296
149	5745	4.2	-20	6.7	1.2	0.000209
149	5745	4.2	-10	5.0	-0.5	-0.000087
149	5745	4.2	0	5.3	-0.2	-0.000035
149	5745	4.2	10	6.0	0.5	0.000087
149	5745	4.2	30	4.5	-1.0	-0.000174
149	5745	4.2	40	3.8	-1.7	-0.000296
149	5745	4.2	50	2.8	-2.7	-0.000470
149	5745	4.2	60	3.0	-2.5	-0.000435

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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 ºC (Hz)	PPM
161	5805	3.6	-30	6.0	0.8	0.000138
161	5805	3.6	-20	6.3	1.1	0.000189
161	5805	3.6	-10	5.5	0.3	0.000052
161	5805	3.6	0	5.8	0.6	0.000103
161	5805	3.6	10	6.5	1.3	0.000224
161	5805	3.6	30	4.7	-0.5	-0.000086
161	5805	3.6	40	3.7	-1.5	-0.000258
161	5805	3.6	50	6.2	1.0	0.000172
161	5805	3.6	60	3.3	-1.9	-0.000327
161	5805	3.8	-30	6.2	0.9	0.000155
161	5805	3.8	-20	6.3	1.0	0.000172
161	5805	3.8	-10	5.8	0.5	0.000086
161	5805	3.8	0	5.7	0.4	0.000069
161	5805	3.8	10	6.2	0.9	0.000155
161	5805	3.8	30	4.8	-0.5	-0.000086
161	5805	3.8	40	4.0	-1.3	-0.000224
161	5805	3.8	50	2.7	-2.6	-0.000448
161	5805	3.8	60	3.3	-2.0	-0.000345
161	5805	4.2	-30	6.5	1.2	0.000207
161	5805	4.2	-20	6.3	1.0	0.000172
161	5805	4.2	-10	5.7	0.4	0.000069
161	5805	4.2	0	5.8	0.5	0.000086
161	5805	4.2	10	6.5	1.2	0.000207
161	5805	4.2	30	4.5	-0.8	-0.000138
161	5805	4.2	40	4.2	-1.1	-0.000189
161	5805	4.2	50	3.0	-2.3	-0.000396
161	5805	4.2	60	3.3	-2.0	-0.000345

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