



Engineering and Testing for EMC and Safety Compliance

**Certification Application Report
FCC Part 15.247 & Industry Canada RSS-210**

| | | | |
|--|---|--|----------------------------|
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| FCC ID/IC: | URZ-WF10011/ 6827A-WF10011 | Test Report Date: | November 10, 2006 |
| Platform: | N/A | RTL Work Order Number: | 2006180 |
| Model Name/ Model Number: | WF-100/ WF-100-1-1 | RTL Quote Number: | QRTL06-340 |
| American National Standard Institute: | ANSI C63.4-2003: Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz | | |
| FCC Classification: | DTS – Part 15 Digital Transmission System | | |
| FCC Rule Part(s): | FCC Rules Part 15.247 (10-01-05): Operation within the bands 920-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz Direct Sequence System, October 1, 2006 | | |
| Industry Canada: | RSS-210, Issue 6 September 2005: Low Power License-Exempt Communications Devices | | |
| Digital Interface Information | Digital Interface was found to be compliant | | |
| Frequency Range (MHz) | Output Power (W) | Frequency Tolerance | Emission Designator |
| 2412-2462 | 0.089 | N/A | 9M90G7D |

I, the undersigned, hereby declare that the equipment tested and referenced in this report conforms to the identified standard(s) as described in this test report. No modifications were made to the equipment during testing in order to achieve compliance with these standards. Furthermore, there was no deviation from, additions to, or exclusions from, the applicable parts of FCC Part 2, FCC Part 15, FCC 97-114, ANSI C63.4, and Industry Canada RSS-210.

Signature: 

Date: November 10, 2006

Typed/Printed Name: Desmond A. Fraser

Position: President

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The test results relate only to the item(s) tested.*

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1 General Information

1.1 Scope

Applicable Standards:

- FCC Rules Part 15.247 (August 14, 2006): Frequency Hopping, Direct Spread Spectrum and Hybrid Systems that are in operation within the bands of 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz.
- Industry Canada RSS-210 (Issue 6 September 2005): Low Power License-Exempt Communications Devices

1.2 Description of EUT

| | |
|------------------------|----------------------|
| Equipment Under Test | 802.11b Wi-Fi Module |
| Model Name/Number | WF-100/WF-100-1-1 |
| Power Supply | 3.1 to 3.6 VDC |
| Modulation Type | DSSS |
| Frequency Range | 2412-2462 MHz |
| Antenna Connector Type | w.fl |
| Antenna Types | SMD |

1.3 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data is located at 360 Herndon Parkway, Suite 1400, Herndon, Virginia 20170. This site has been fully described in a report and approved by the Federal Communications Commission to perform AC line conducted and radiated emissions testing (ANSI C63.4 2003).

1.4 Related Submittal(s)/Grant(s)

This is an original certification application for FCC and Industry Canada Modular Approval for Model # WF-100-1-1, 802.11b Wi-Fi Module, FCC ID: URZ-WF10011 and IC: 6827A-WF10011, based on the guidelines in FCC Publication DA 00-1407 and IC RSS-GEN.

1.5 Modifications

No modifications were required for compliance.

2 Test Information

2.1 Description of Test Modes

In accordance with FCC 15.31(m), and because the EUT utilizes an operating band greater than 10 MHz, the following frequencies were tested:

Table 2-1: Channels Tested

| Channel | Frequency |
|---------|-----------|
| 1 | 2412 |
| 6 | 2436 |
| 11 | 2462 |

2.2 Exercising the EUT

The EUT was tested in all three orthogonal planes in order to determine worst-case emissions. The EUT was provided with software to continuously transmit during testing. The carrier was also checked to verify that information was being transmitted. There were no deviations from the test standard(s) and/or methods. The test results reported relate only to the item tested. Although normally battery operated, for AC conducted testing, an off-the-shelf AC adapter was provided for AC conducted emissions testing.

2.3 Test Result Summary

Table 2-2: Test Result Summary – FCC Part 15, Subpart C (Section 15.247)

| Standard | Test | Pass/Fail or N/A |
|------------------|--------------------------------------|------------------|
| FCC 15.207 | AC Power Conducted Emissions | Pass |
| FCC 15.209 | Radiated Emissions | Pass |
| FCC 15.247(a)(2) | 6 dB Bandwidth | Pass |
| FCC 15.247(b) | Maximum Peak Power Output | Pass |
| FCC 15.247(d) | Antenna Conducted Spurious Emissions | Pass |
| FCC 15.247(e) | Power Spectral Density | Pass |
| FCC 15.247(d) | Band Edge Measurement | Pass |

2.4 Test System Details

The test sample was received on November 6, 2006. The FCC identifiers for all applicable equipment, plus descriptions of all cables used in the tested system, are identified in the following table.

Table 2-3: Equipment Under Test

| Part | Manufacturer | Model | Serial Number | FCC ID | Cable Description | RTL Bar Code |
|----------------|--------------------------|-------------|---------------|-------------|-----------------------|--------------|
| 802.11b Module | HandEra, Inc. | WF-100 | 093 | URZ-WF10011 | N/A | 17619 |
| 802.11b Module | HandEra, Inc. | WF-100 | 274 | URZ-WF10011 | N/A | 17618 |
| 802.11b Module | HandEra, Inc. | WF-100 | 081 | URZ-WF10011 | N/A | 17616 |
| 5V AC Adapter | CINCON Electronics, Inc. | TR1505 | N/A | N/A | 1.8m unshielded Power | 17615 |
| Test Fixture | HandEra, Inc | N/A | N/A | N/A | 2m unshielded I/O | 17617 |
| 3.7V Battery | HandEra, Inc. | Li-1750-010 | N/A | N/A | N/A | 17620 |

2.5 Configuration of Tested System

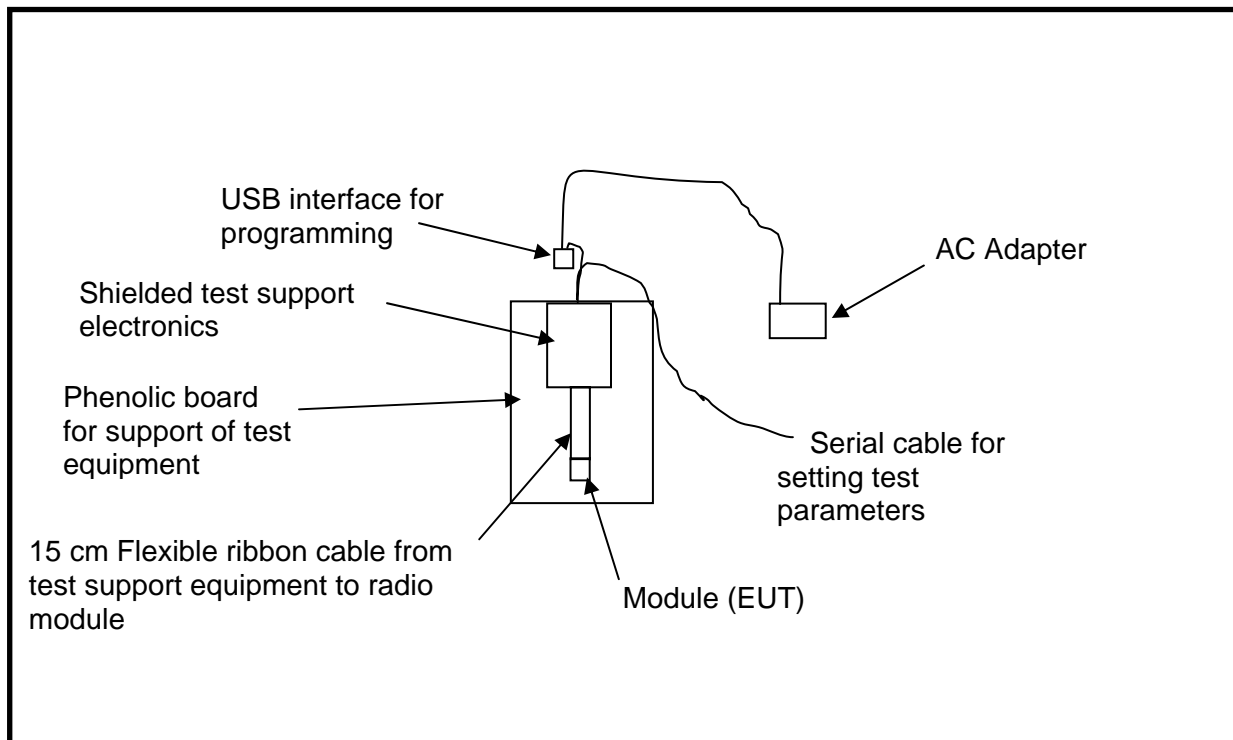


Figure 2-1: Configuration of System under Test

3 Peak Output Power - §15.247(b)(1); RSS-210 §A8.4(4)

3.1 Power Output Test Procedure

A conducted power measurement of the EUT was taken using an Agilent 4416A EPM-P Series Power Meter with an E9323A Peak and Average Power Sensor.

Table 3-1: Power Output Test Equipment

| RTL Asset # | Manufacturer | Model | Part Type | Serial Number | Calibration Due Date |
|-------------|----------------------|--------|-----------------------------------|---------------|----------------------|
| 901184 | Agilent Technologies | E4416A | EPM-P Power Meter, single channel | GB41050573 | 9/21/07 |
| 901356 | Agilent Technologies | E9323A | Power Sensor | 31764-264 | 9/21/07 |

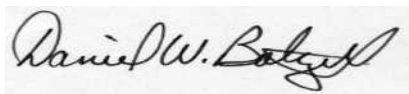
3.2 Power Output Test Data

Table 3-2: Power Output Test Data

| Channel | Frequency (MHz) | Peak Power Conducted Output (dBm) |
|---------|-----------------|-----------------------------------|
| 1 | 2412 | 19.5 |
| 6 | 2436 | 19.5 |
| 11 | 2462 | 19.4 |

Test Personnel:

Daniel W. Baltzell
Test Engineer



Signature

November 8, 2006
Date Of Test

4 Compliance with the Band Edge – FCC §15.247(d); RSS-210 §2.2

4.1 Band Edge Test Procedure

The transmitter output was connected to its appropriate antenna. Peak (1 MHz RBW/VBW) and average (1 MHz RBW/10 Hz VBW) radiated measurements were taken with a suitable span to encompass the peak of the fundamental. A delta measurement was performed from the highest peak in the restricted band to the peak of the fundamental, and subtracted from the field strength; the result was compared to the limit in the restricted band (54 dBuV/m).

Table 4-1: Band Edge Test Equipment

| RTL Asset # | Manufacturer | Model | Part Type | Serial Number | Calibration Due Date |
|-------------|---------------------|------------------|-------------------------------------|-----------------|----------------------|
| 900931 | Hewlett Packard | 8566B | Spectrum Analyzer (100 Hz - 22 GHz) | 3138A07771 | 9/13/07 |
| 900878 | Rhein Tech Labs | AM3-1197-0005 | 3 meter antenna mast, polarizing | Outdoor Range 1 | Not Required |
| 901424 | Insulated Wire Inc. | KPS-1503-360-KPS | RF cable 36" | NA | 12/12/06 |
| 901242 | Rhein Tech Labs | WRT-000-0003 | Wood rotating table | N/A | Not Required |
| 900772 | EMCO | 3161-02 | Horn Antenna (2 - 4 GHz) | 9804-1044 | 5/20/07 |

4.2 Restricted Band Edge Test Results

4.2.1 Calculation of Lower Band Edge

96.8 dBuV/m is the field strength measurement, from which the delta measurement of 53.5 dB is subtracted (reference plots), resulting in a level of 43.3 dB. This level has a margin of 10.7 dB below the limit of 54 dBuV/m.

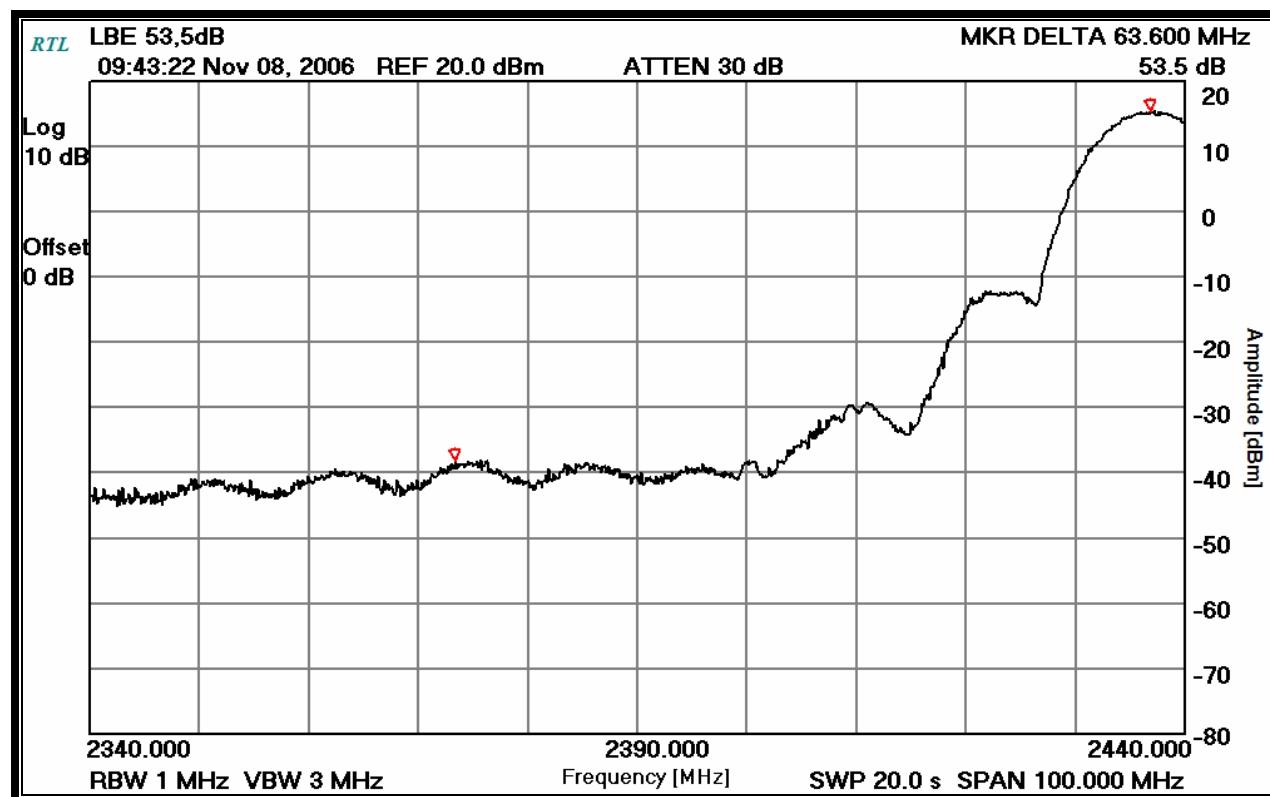
Calculation: $96.8 \text{ dBuV/m} - 53.5 \text{ dB} - 54 \text{ dBuV/m} = -10.7 \text{ dB}$

Peak Field Strength of Lower Band Edge (1 MHz RBW/1 MHz VBW) = 105.8 dBuV/m

Average Field Strength of Lower Band Edge (Pk less duty cycle -6.6 dB) = 96.8 dBuV/m

Delta measurement = 53.5 dB

Plot 4-1: Lower Band Edge: Average Measurement Channel 1 (TX Frequency: 2412 MHz)



4.2.2 Calculation of Upper Band Edge

97.6 dBuV/m is the field strength measurement, from which the delta measurement of 50.5 dB is subtracted (reference plots), resulting in a level of 47.1 dB. This level has a margin of 6.9 dB below the limit of 54 dBuV/m.

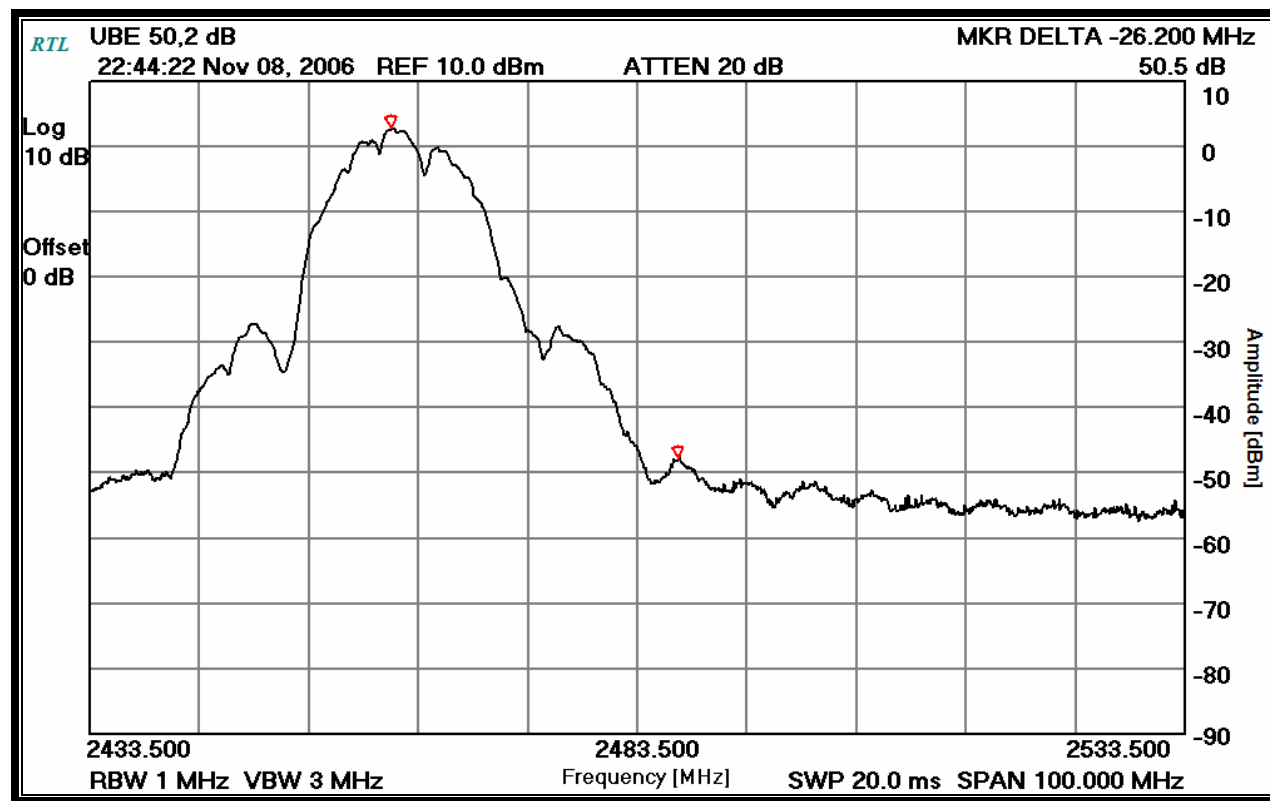
Calculation: $97.6 \text{ dBuV/m} - 50.5 \text{ dB} - 54 \text{ dBuV/m} = -6.9 \text{ dB}$

Peak Field Strength of Lower Band Edge (1 MHz RBW/1 MHz VBW) = 107.4 dBuV/m

Average Field Strength of Lower Band Edge (Pk less duty cycle -6.6 dB) = 97.6 dBuV/m

Delta measurement = 50.5 dB

Plot 4-2: Upper Band Edge: Average Measurement Channel 11 (TX Frequency: 2462 MHz)



Test Personnel:

Daniel W. Baltzell
EMC Test Engineer

Daniel W. Baltzell

Signature

November 8, 2006
Date Of Test

5 Antenna Conducted Spurious Emissions - §15.247(d); RSS-210 RSS-Gen

5.1 Antenna Conducted Spurious Emissions Test Procedures

Antenna spurious emissions per FCC 15.247(c) were measured from the EUT antenna port using a 50-ohm spectrum analyzer with the resolution bandwidth set at 100 kHz, and the video bandwidth set at 1 MHz. The modulated carrier was identified at the following frequencies: 2412 MHz, 2436 MHz and 2462 MHz.

Table 5-1: Antenna Conducted Spurious Test Equipment

| RTL Asset # | Manufacturer | Model | Part Type | Serial Number | Calibration Due Date |
|-------------|-----------------|-------|--|---------------|----------------------|
| 900931 | Hewlett Packard | 8566B | Spectrum Analyzer (100 Hz - 22 GHz) | 3138A07771 | 9/13/07 |

5.2 Antenna Conducted Spurious Emissions Test Results

Table 5-2: Antenna Conducted Spurious Emissions (2412 MHz)

| Frequency (MHz) | Amplitude Measured (dBm) | Limit (20 dBc) | Margin (dB) |
|-----------------|--------------------------|----------------|-------------|
| 2412.0 | 7.6 | | Fundamental |
| 4824.0 | -46.5 | -13.1 | -33.4 |
| 7236.0 | -41.3 | -13.1 | -28.2 |
| 9648.0 | -45.0 | -13.1 | -31.9 |
| 12060.0 | -60.1 | -13.1 | -47.0 |
| 14472.0 | -55.9 | -13.1 | -42.8 |
| 16884.0 | -74.4 | -13.1 | -61.3 |
| 19296.0 | -73.1 | -13.1 | -60.0 |
| 21708.0 | -72.3 | -13.1 | -59.2 |
| 24120.0 | -72.5 | -13.1 | -59.4 |

Table 5-3: Antenna Conducted Spurious Emissions (2436 MHz)

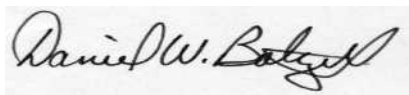
| Frequency (MHz) | Amplitude Measured (dBm) | Limit (20 dBc) | Margin (dB) |
|-----------------|--------------------------|----------------|-------------|
| 2436.0 | 6.9 | | Fundamental |
| 4872.0 | -42.5 | -13.1 | -29.4 |
| 7308.0 | -41.5 | -13.1 | -28.4 |
| 9744.0 | -35.5 | -13.1 | -22.4 |
| 12180.0 | -63.1 | -13.1 | -50.0 |
| 14616.0 | -55.6 | -13.1 | -42.5 |
| 17052.0 | -74.2 | -13.1 | -61.1 |
| 19488.0 | -72.9 | -13.1 | -59.8 |
| 21924.0 | -73.4 | -13.1 | -60.3 |
| 24360.0 | -72.9 | -13.1 | -59.8 |

Table 5-4: Antenna Conducted Spurious Emissions (2462 MHz)

| Frequency (MHz) | Amplitude Measured (dBm) | Limit (20 dBc) | Margin (dB) |
|-----------------|--------------------------|----------------|-------------|
| 2462.0 | 6.9 | | Fundamental |
| 4924.0 | -52.2 | -13.1 | -39.1 |
| 7386.0 | -41.4 | -13.1 | -28.3 |
| 9848.0 | -47.8 | -13.1 | -34.7 |
| 12310.0 | -67.4 | -13.1 | -54.3 |
| 14772.0 | -58.3 | -13.1 | -45.2 |
| 17234.0 | -75.2 | -13.1 | -62.1 |
| 19696.0 | -72.3 | -13.1 | -59.2 |
| 22158.0 | -72.7 | -13.1 | -59.6 |
| 24620.0 | -72.5 | -13.1 | -59.4 |

Test Personnel:

Daniel W. Baltzell
EMC Test Engineer



Signature

November 8, 2006
Date Of Test

6 6 dB Bandwidth - §15.247(a)(2); RSS-210 §A8.2

6.1 6 dB Bandwidth Test Procedure – Minimum 6 dB Bandwidth

The minimum 6 dB bandwidths per FCC 15.247(a)(2) were measured using a 50-ohm spectrum analyzer with the resolution bandwidth set at 100 kHz, and the video bandwidth set at 1 MHz. The device was modulated. The minimum 6 dB bandwidths are presented below.

Table 6-1: 6 dB Bandwidth Test Equipment

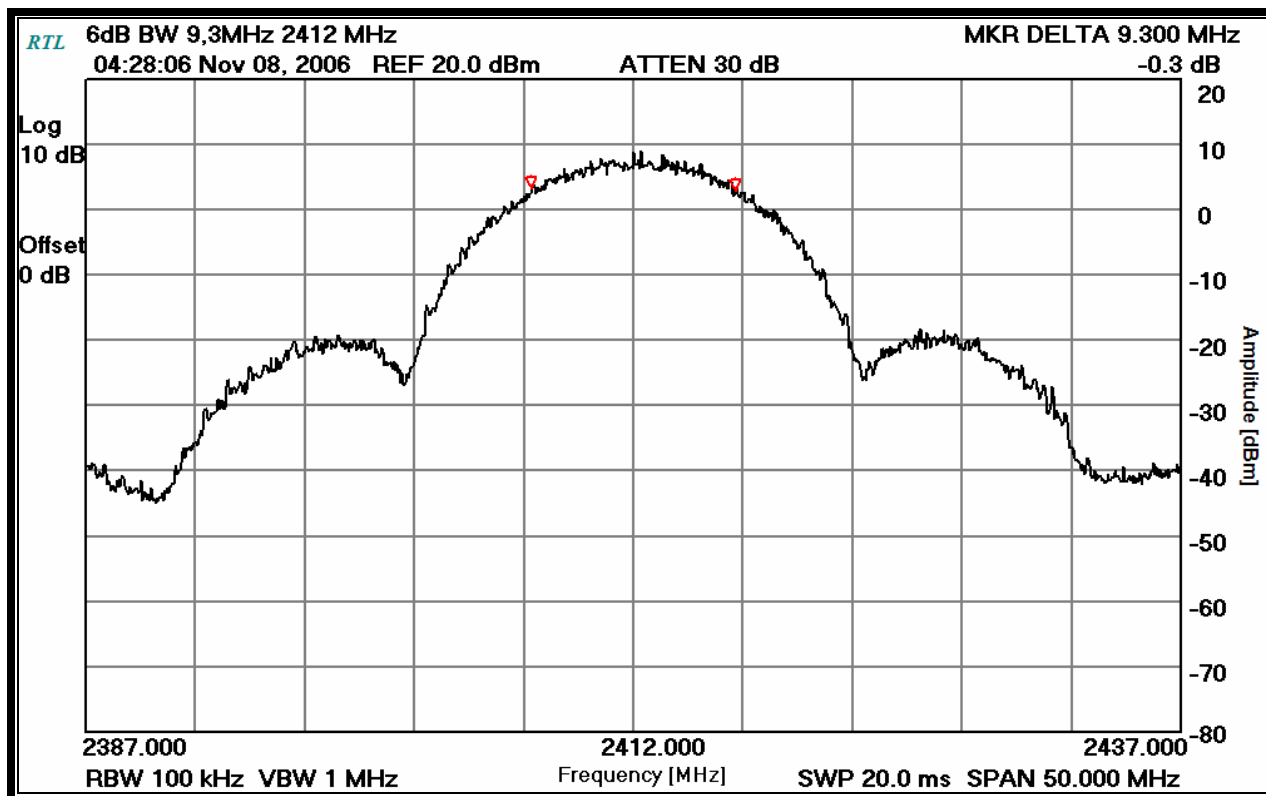
| RTL Asset # | Manufacturer | Model | Part Type | Serial Number | Calibration Due Date |
|-------------|-----------------|-------|--|---------------|----------------------|
| 900931 | Hewlett Packard | 8566B | Spectrum Analyzer (100 Hz - 22 GHz) | 3138A07771 | 9/13/07 |

6.2 6 db Bandwidth Test Results

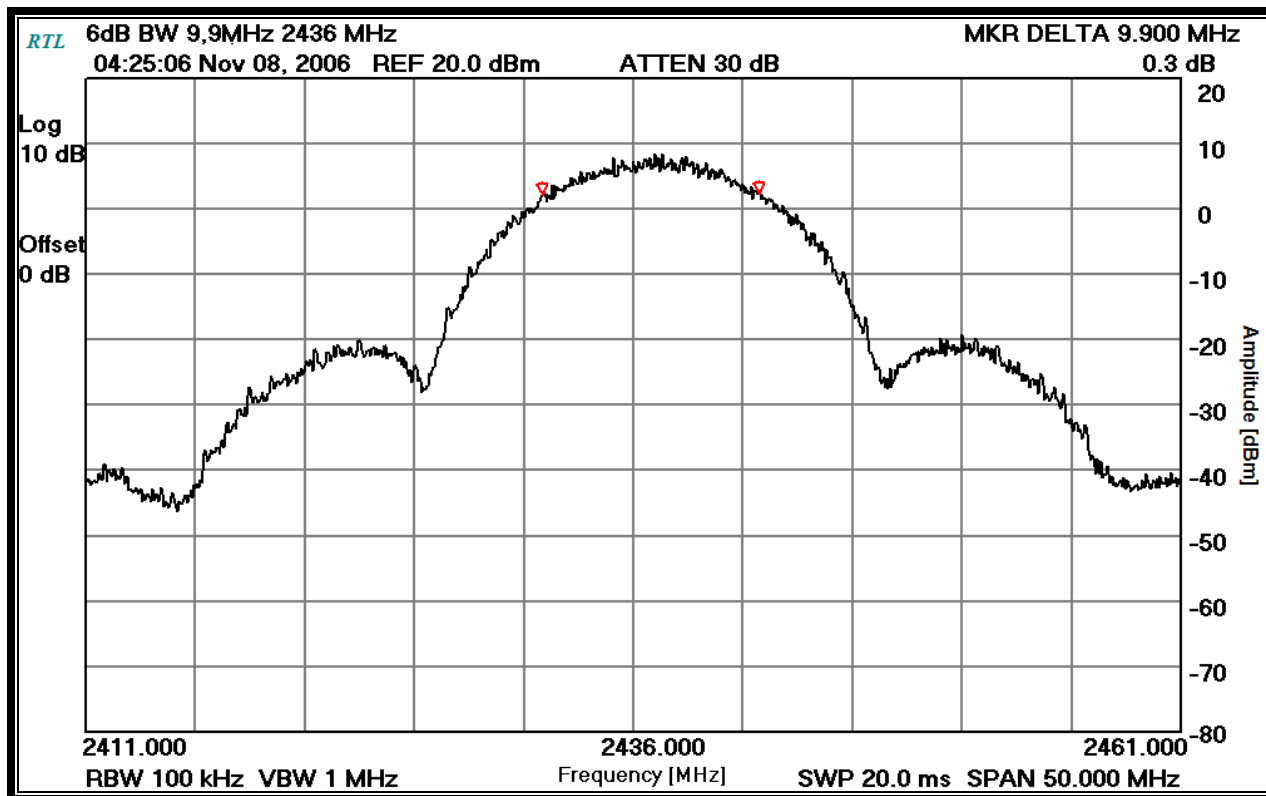
Table 6-2: 6 db Bandwidth Test Data

| Channel | Frequency (MHz) | 6 dB Bandwidth (MHz) | Minimum Limit (MHz) | Pass/Fail |
|---------|-----------------|----------------------|---------------------|-----------|
| 0 | 2412 | 9.3 | 0.5 | Pass |
| 7 | 2436 | 9.9 | 0.5 | Pass |
| 15 | 2462 | 9.8 | 0.5 | Pass |

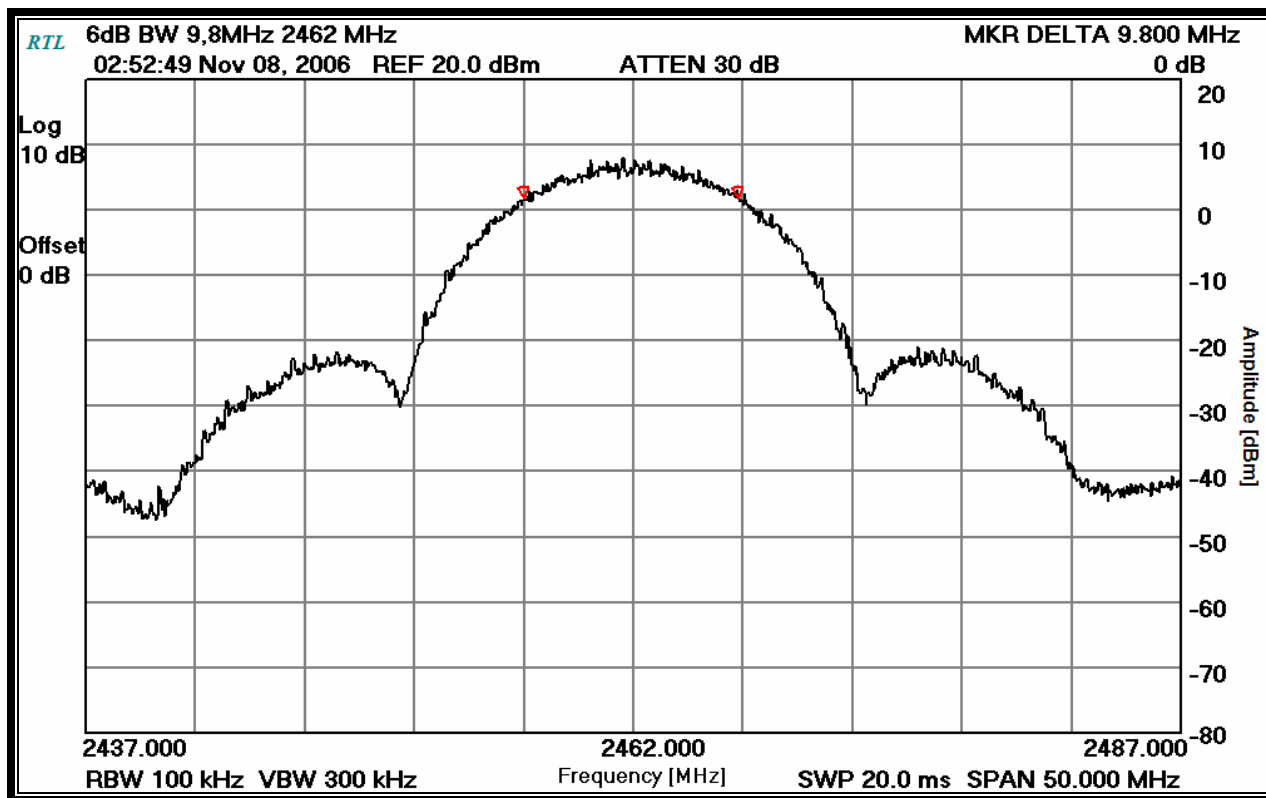
Plot 6-1: 6 dB Bandwidth Channel 1 (TX Frequency: 2412 MHz)



Plot 6-2: 6 dB Bandwidth Channel 6 (TX Frequency: 2436 MHz)



Plot 6-3: 6 dB Bandwidth Channel 11 (TX Frequency: 2462 MHz)



Test Personnel:

Daniel W. Baltzell
 EMC Test Engineer

Signature

November 8, 2006
 Date Of Test

7 Power Spectral Density - §15.247(e); RSS-210 §A8.2

7.1 Power Spectral Density Test Procedure

The power spectral density per FCC 15.247(d) was measured using a 50-ohm spectrum analyzer with the resolution bandwidth set at 3 kHz, the video bandwidth set at 30 kHz, and the sweep time set at 500 seconds. The spectral lines were resolved for the modulated carriers at 2.412 GHz, 2.436 GHz, and 2.462 GHz respectively. These levels are below the +8 dBm limit. See the power spectral density table and plots.

Table 7-1: Power Spectral Density Test Equipment

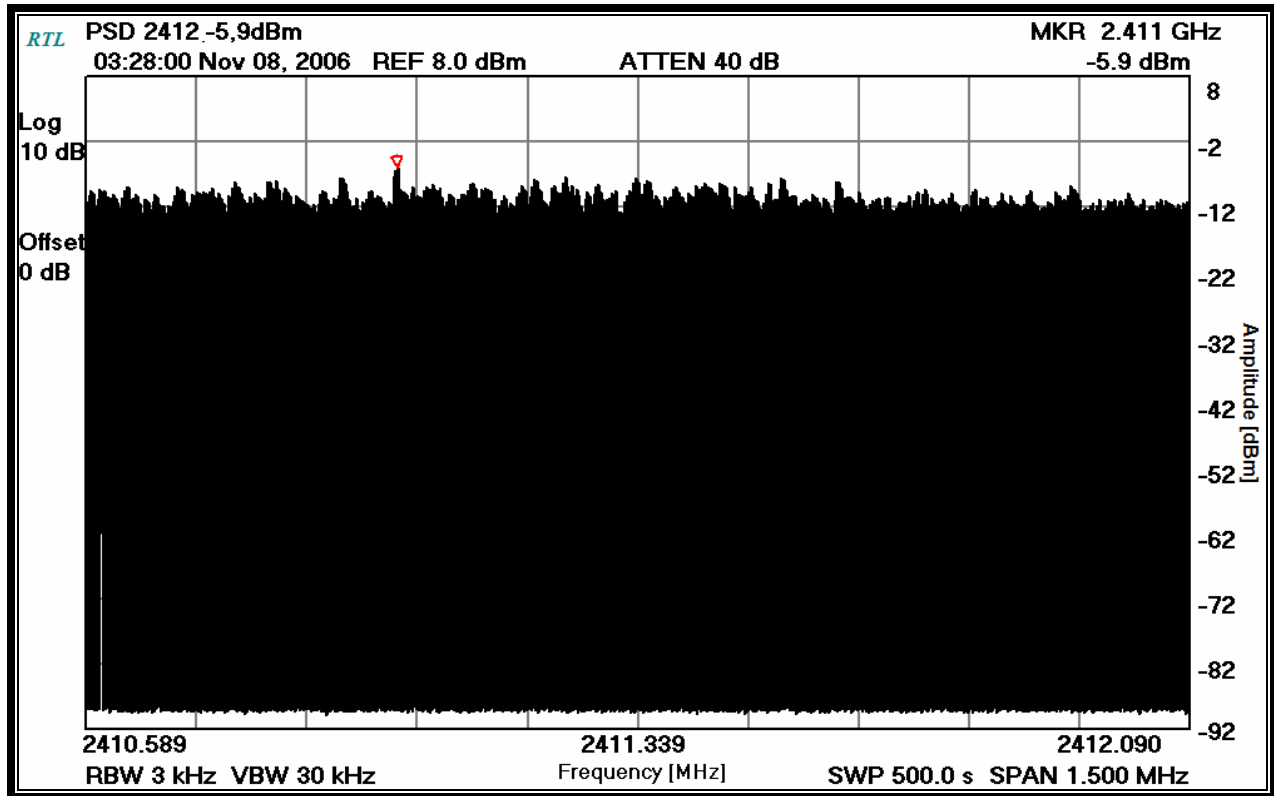
| RTL Asset # | Manufacturer | Model | Part Type | Serial Number | Calibration Due Date |
|-------------|-----------------|-------|--|---------------|----------------------|
| 900931 | Hewlett Packard | 8566B | Spectrum Analyzer (100 Hz - 22 GHz) | 3138A07771 | 9/13/07 |

7.2 Power Spectral Density Test Data

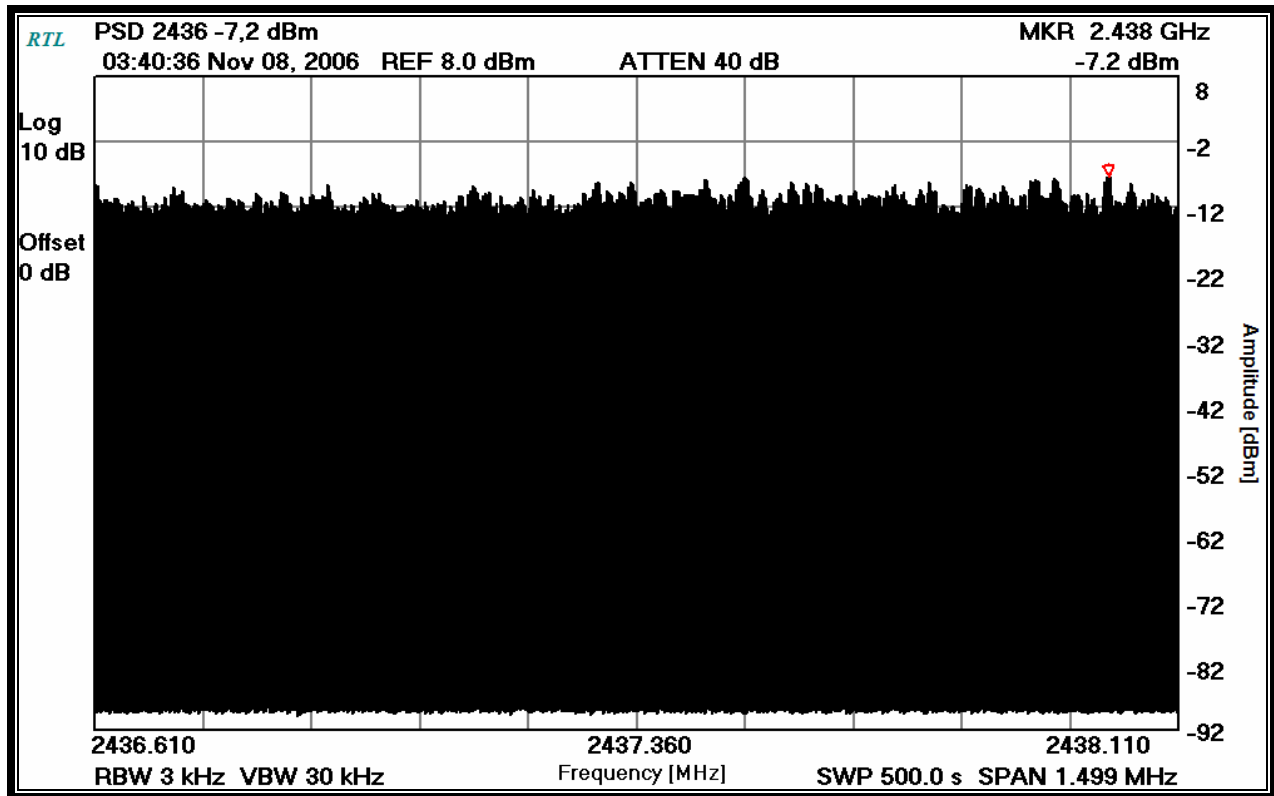
Table 7-2: Power Spectral Density Test Data

| Channel | Frequency (MHz) | RF Power Level (dBm) | Maximum Limit +8dBm | Pass/Fail |
|---------|-----------------|----------------------|---------------------|-----------|
| 1 | 2412 | -5.9 | 8 | Pass |
| 6 | 2436 | -7.2 | 8 | Pass |
| 11 | 2462 | -6.3 | 8 | Pass |

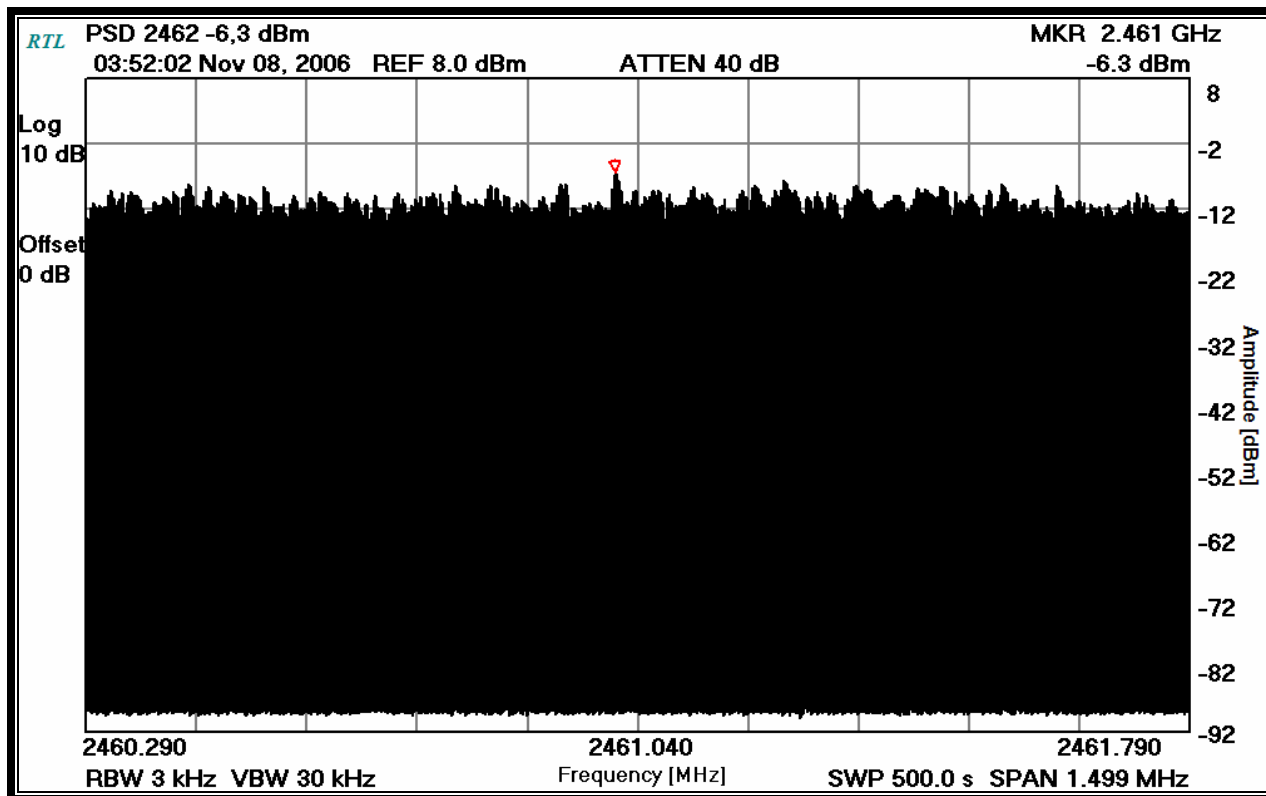
Plot 7-1: Power Spectral Density: Channel 1 (2412 MHz)



Plot 7-2: Power Spectral Density: Channel 6 (2436 MHz)



Plot 7-3: Power Spectral Density: Channel 11 (2462 MHz)



Test Personnel:

Daniel W. Baltzell
 EMC Test Engineer

Signature

November 8, 2006
 Date Of Test

8 Conducted Limits - §15.207; RSS-Gen

The conducted test was performed with the EUT exercised in center channel transmit and receive modes, and the emissions were scanned between 150 kHz to 30 MHz on the NEUTRAL SIDE and PHASE SIDE.

8.1 Limits of Conducted Emissions Measurement

| Frequency of Emission (MHz) | Conducted Limit (dBuV) | |
|-----------------------------|------------------------|---------|
| | Quasi-peak | Average |
| 0.15-0.5 | 66-56 | 56-46 |
| 0.5-5.0 | 56 | 46 |
| 5.0-30.0 | 60 | 50 |

8.2 Conducted Emissions Measurement Test Procedure

The power line conducted emission measurements were performed in a Series 81 type shielded enclosure manufactured by Rayproof. The EUT was assembled on a wooden table 80 centimeters high. Power was fed to the EUT through a 50 ohm / 50 microhenry Line Impedance Stabilization Network (EUT LISN). The EUT LISN was fed power through an A.C. filter box on the outside of the shielded enclosure. The filter box and EUT LISN housing are bonded to the ground plane of the shielded enclosure. A second LISN, the peripheral LISN, provides isolation for the EUT test peripherals. This peripheral LISN was also fed A.C. power. A metal power outlet box, which is bonded to the ground plane and electrically connected to the peripheral LISN, powers the EUT host peripherals.

The spectrum analyzer was connected to the A.C. line through an isolation transformer. The 50-ohm output of the EUT LISN was connected to the spectrum analyzer input through a Solar high-pass filter. The filter is used to prevent overload of the spectrum analyzer from noise below 100 kHz. Conducted emission levels were measured on each current-carrying line with the spectrum analyzer operating in the CISPR quasi-peak mode (or peak mode if applicable). The analyzer's 6 dB bandwidth was set to 9 kHz. No video filter less than 10 times the resolution bandwidth was used. Average measurements are performed in linear mode using a 10 kHz resolution bandwidth, a 1 Hz video bandwidth, and by increasing the sweep time in order to obtain a calibrated measurement. The emission spectrum was scanned from 150 kHz to 30 MHz. The highest emission amplitudes relative to the appropriate limit were measured and have been recorded in this report.

Note: Rhein Tech Laboratories, Inc. has implemented procedures to minimize errors that occur from test instruments, calibration, procedures, and test setups. Test instrument and calibration errors are documented from the manufacturer or calibration lab. Other errors have been defined and calculated within the Rhein Tech Quality Manual, Section 6.1. Rhein Tech implements the following procedures to minimize errors that may occur: yearly as well as daily calibration methods, technician training, and emphasis to employees on avoiding error.

Table 8-1: Conducted Line Test Equipment

| RTL Asset # | Manufacturer | Model | Part Type | Serial Number | Calibration Due Date |
|-------------|-------------------|--------|--|---------------|----------------------|
| 900897 | Hewlett Packard | 8567A | HP Spectrum Analyzer (10 KHz - 1.5 GHz) | 2727A00535 | 3/3/07 |
| 900901 | Hewlett Packard | 85650A | Quasi-Peak Adapter (30 Hz - 1 GHz) | 3145A01599 | 3/3/07 |
| 901084 | AFJ International | LS16 | 16A LISN | 16010020082 | 1/23/07 |

8.3 Conducted Line Emissions Test Data

Table 8-2: Conducted Emissions (Neutral Side); Transmit Mode

| Emission Frequency (MHz) | Test Detector | Analyzer Reading (dBuV) | Site Correction Factor (dB) | Emission Level (dBuV) | QP Limit (dBuV) | QP Margin (dBuV) | AV Limit (dBuV) | AV Margin (dBuV) |
|--------------------------|---------------|-------------------------|-----------------------------|-----------------------|-----------------|------------------|-----------------|------------------|
| 0.165 | Av | 30.1 | 0.2 | 30.3 | | | 55.2 | -24.9 |
| 0.165 | Qp | 49.6 | 0.2 | 49.8 | 65.2 | -15.4 | | |
| 0.241 | Av | 24.8 | 0.2 | 25.0 | | | 52.1 | -27.1 |
| 0.241 | Qp | 46.1 | 0.2 | 46.3 | 62.1 | -15.8 | | |
| 0.303 | Av | 23.3 | 0.3 | 23.6 | | | 50.2 | -26.6 |
| 0.303 | Qp | 42.1 | 0.3 | 42.4 | 60.2 | -17.8 | | |
| 0.356 | Av | 27.8 | 0.3 | 28.1 | | | 48.8 | -20.7 |
| 0.356 | Qp | 44.8 | 0.3 | 45.1 | 58.8 | -13.7 | | |
| 0.648 | Av | 26.8 | 0.2 | 27.0 | | | 46.0 | -19.0 |
| 0.648 | Qp | 43.0 | 0.2 | 43.2 | 56.0 | -12.8 | | |
| 1.067 | Av | 23.2 | 0.4 | 23.6 | | | 46.0 | -22.4 |
| 1.067 | Qp | 38.5 | 0.4 | 38.9 | 56.0 | -17.1 | | |
| 5.094 | Av | 26.2 | 1.6 | 27.8 | | | 50.0 | -22.2 |
| 5.094 | Qp | 40.9 | 1.6 | 42.5 | 60.0 | -17.5 | | |
| 24.060 | Pk | 43.9 | 2.8 | 46.7 | | | 50.0 | -3.3 |

Table 8-3: Conducted Emissions (Phase Side); Transmit Mode

| Emission Frequency (MHz) | Test Detector | Analyzer Reading (dBuV) | Site Correction Factor (dB) | Emission Level (dBuV) | QP Limit (dBuV) | QP Margin (dBuV) | AV Limit (dBuV) | AV Margin (dBuV) |
|--------------------------|---------------|-------------------------|-----------------------------|-----------------------|-----------------|------------------|-----------------|------------------|
| 0.194 | Av | 39.2 | 0.2 | 39.4 | | | 53.9 | -14.5 |
| 0.194 | Qp | 49.9 | 0.2 | 50.1 | 63.9 | -13.8 | | |
| 0.259 | Av | 38.9 | 0.2 | 39.1 | | | 51.5 | -12.4 |
| 0.259 | Qp | 50.2 | 0.2 | 50.4 | 61.5 | -11.1 | | |
| 0.324 | Av | 32.9 | 0.3 | 33.2 | | | 49.6 | -16.4 |
| 0.324 | Qp | 44.6 | 0.3 | 44.9 | 59.6 | -14.7 | | |
| 0.668 | Av | 27.4 | 0.2 | 27.6 | | | 46.0 | -18.4 |
| 0.668 | Qp | 43.7 | 0.2 | 43.9 | 56.0 | -12.1 | | |
| 5.560 | Av | 31.3 | 1.5 | 32.8 | | | 50.0 | -17.2 |
| 5.560 | Qp | 42.7 | 1.5 | 44.2 | 60.0 | -15.8 | | |
| 23.780 | Pk | 44.1 | 2.8 | 46.9 | | | 50.0 | -3.1 |

Table 8-4: Conducted Emissions (Neutral Side); Receive Mode

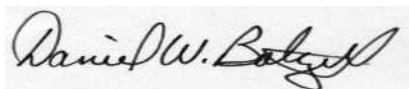
| Emission Frequency (MHz) | Test Detector | Analyzer Reading (dBuV) | Site Correction Factor (dB) | Emission Level (dBuV) | QP Limit (dBuV) | QP Margin (dBuV) | AV Limit (dBuV) | AV Margin (dBuV) |
|--------------------------|---------------|-------------------------|-----------------------------|-----------------------|-----------------|------------------|-----------------|------------------|
| 0.195 | Av | 39.6 | 0.2 | 39.8 | | | 53.8 | -14.0 |
| 0.195 | Qp | 52.1 | 0.2 | 52.3 | 63.8 | -11.5 | | |
| 0.293 | Av | 34.2 | 0.3 | 34.5 | | | 50.4 | -15.9 |
| 0.293 | Qp | 48.0 | 0.3 | 48.3 | 60.4 | -12.1 | | |
| 0.391 | Av | 34.7 | 0.2 | 34.9 | | | 48.0 | -13.1 |
| 0.391 | Qp | 49.2 | 0.2 | 49.4 | 58.0 | -8.6 | | |
| 0.683 | Av | 34.2 | 0.2 | 34.4 | | | 46.0 | -11.6 |
| 0.683 | Qp | 49.8 | 0.2 | 50.0 | 56.0 | -6.0 | | |
| 5.209 | Av | 33.7 | 1.6 | 35.3 | | | 50.0 | -14.7 |
| 5.209 | Qp | 49.4 | 1.6 | 51.0 | 60.0 | -9.0 | | |
| 23.250 | Pk | 44.5 | 2.9 | 47.4 | | | 50.0 | -2.6 |

Table 8-5: Conducted Emissions (Phase Side); Receive Mode

| Emission Frequency (MHz) | Test Detector | Analyzer Reading (dBuV) | Site Correction Factor (dB) | Emission Level (dBuV) | QP Limit (dBuV) | QP Margin (dBuV) | AV Limit (dBuV) | AV Margin (dBuV) |
|--------------------------|---------------|-------------------------|-----------------------------|-----------------------|-----------------|------------------|-----------------|------------------|
| 0.162 | Av | 29.4 | 0.2 | 29.6 | | | 55.4 | -25.8 |
| 0.162 | Qp | 46.6 | 0.2 | 46.8 | 65.4 | -18.6 | | |
| 0.230 | Av | 31.3 | 0.2 | 31.5 | | | 52.4 | -20.9 |
| 0.230 | Qp | 45.9 | 0.2 | 46.1 | 62.4 | -16.3 | | |
| 0.390 | Av | 29.5 | 0.2 | 29.7 | | | 48.1 | -18.4 |
| 0.390 | Qp | 43.4 | 0.2 | 43.6 | 58.1 | -14.5 | | |
| 1.304 | Av | 28.3 | 0.6 | 28.9 | | | 46.0 | -17.1 |
| 1.304 | Qp | 40.8 | 0.6 | 41.4 | 56.0 | -14.6 | | |
| 5.177 | Av | 26.4 | 1.6 | 28.0 | | | 50.0 | -22.0 |
| 5.177 | Qp | 41.5 | 1.6 | 43.1 | 60.0 | -16.9 | | |
| 23.500 | Pk | 44.5 | 2.8 | 47.3 | | | 50.0 | -2.7 |

Test Personnel:

Daniel W. Baltzell
EMC Test Engineer



Signature

November 9, 2006
Date Of Test

9 Radiated Emissions - §15.209; RSS-210 §A8.5 and RSS-Gen

9.1 Limits of Radiated Emissions Measurement

| Frequency (MHz) | Field Strength (uV/m) | Measurement Distance (m) |
|-----------------|-----------------------|--------------------------|
| 0.009-0.490 | 2400/f (kHz) | 300 |
| 0.490-1.705 | 2400/f (kHz) | 30 |
| 1.705-30.0 | 30 | 30 |
| 30-88 | 100 | 3 |
| 88-216 | 150 | 3 |
| 216-960 | 200 | 3 |
| Above 960 | 500 | 3 |

As shown in 15.35(b), for frequencies above 1000 MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20 dB under any circumstances of modulation.

9.2 Radiated Emissions Measurement Test Procedure

Before final measurements of radiated emissions were made on the open-field three/ten meter range, the EUT was scanned indoors at one and three meter distances. This was done in order to determine its emissions spectrum signature. The physical arrangement of the test system and associated cabling was varied in order to determine the effect on the EUT's emissions in amplitude, direction and frequency. This process was repeated during final radiated emissions measurements on the open-field range, at each frequency, in order to ensure that maximum emission amplitudes were attained.

Final radiated emissions measurements were made on the three/ten-meter, open-field test site. The EUT was placed on a nonconductive turntable 0.8 meters above the ground plane. The spectrum was examined from 9 kHz to the 10th harmonic of the highest fundamental transmitter frequency (24.8 GHz).

At each frequency, the EUT was rotated 360°, and the antenna was raised and lowered from 1 to 4 meters in order to determine the emission's maximum level. Measurements were taken using both horizontal and vertical antenna polarizations. For frequencies between 30 and 1000 MHz, the spectrum analyzer's 6 dB bandwidth was set to 120 kHz, and the analyzer was operated in the CISPR quasi-peak detection mode. For emissions above 1000 MHz, emissions are measured using the average detector function with a minimum resolution bandwidth of 1 MHz. No video filter less than 10 times the resolution bandwidth was used. The highest emission amplitudes relative to the appropriate limit were measured and recorded in this report.

Table 9-1: Radiated Emissions Test Equipment

| RTL Asset # | Manufacturer | Model | Part Type | Serial Number | Calibration Due Date |
|-------------|----------------------|--------------------|---|-----------------|----------------------|
| 900151 | Rohde and Schwarz | HFH2-Z2 | Antenna (Loop antenna, 9 kHz - 30 MHz) | 827525/019 | 9/15/09 |
| 901365 | MITEQ | JS4-00102600-41-5P | Amplifier, 15 V, 0.1-26 GHz, 28 dB gain, power 5 dB | 1094152 | 3/24/07 |
| 900931 | Hewlett Packard | 8566B | Spectrum Analyzer (100 Hz - 22 GHz) | 3138A07771 | 9/13/07 |
| 900905 | Rhein Tech Labs | PR-1040 | OATS 1 Preamplifier 40dB (30 MHz – 2 GHz) | 1006 | 3/15/07 |
| 900878 | Rhein Tech Labs | AM3-1197-0005 | 3 meter antenna mast, polarizing | Outdoor Range 1 | Not Required |
| 901426 | Insulated Wire Inc. | KPS-1503-3600-KPS | RF cable, 30' | NA | 12/12/06 |
| 901425 | Insulated Wire, Inc. | KPS-1503-2400-KPS | RF cable, 20' | NA | 12/12/06 |
| 901242 | Rhein Tech Labs | WRT-000-0003 | Wood rotating table | N/A | Not Required |
| 900772 | EMCO | 3161-02 | Horn Antenna (2 - 4 GHz) | 9804-1044 | 5/20/07 |
| 900321 | EMCO | 3161-03 | Horn Antennas (4 - 8,2 GHz) | 9508-1020 | 5/20/07 |
| 900323 | EMCO | 3160-7 | Horn Antennas (8,2 - 12,4 GHz) | 9605-1054 | 5/20/07 |
| 900356 | EMCO | 3160-08 | Horn Antenna (12.4 - 18 GHz) | 9607-1044 | 5/20/07 |
| 900325 | EMCO | 3160-9 | Horn Antennas (18 - 26.5 GHz) | 9605-1051 | 5/20/07 |
| 901218 | EMCO | 3301B | Horn Antenna (18 - 26.5 GHz) | 960281-003 | 5/20/07 |
| 900392 | Hewlett Packard | 1197OK | Harmonic Mixer (18 – 26.5 GHz) | 3525A00159 | 11/27/07 |
| 900889 | Hewlett Packard | 85685A | RF Preselector (20 Hz - 2 GHz) | 3146A01309 | 4/12/07 |

9.3 Radiated Emissions Test Results

9.3.1 Radiated Emissions – Digital Test Data

Table 9-2: Digital Radiated Emissions

| Temperature: 68°F Humidity: 48% | | | | | | | | | | |
|---------------------------------|---------------|------------------------|-------------------------|--------------------|-------------------------|-------------------------------|-------------------------|----------------|-------------|-----------|
| Emission Frequency (MHz) | Test Detector | Antenna Polarity (H/V) | Turntable Azimuth (deg) | Antenna Height (m) | Analyzer Reading (dBuV) | Site Correction Factor (dB/m) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Pass/Fail |
| 181.000 | Qp | H | 0 | 1.0 | 38.5 | -18.6 | 19.9 | 43.5 | -23.6 | Pass |
| 207.000 | Qp | H | 90 | 1.0 | 38.5 | -17.3 | 21.2 | 43.5 | -22.3 | Pass |
| 220.000 | Qp | H | 0 | 1.0 | 33.9 | -17.3 | 16.6 | 46.0 | -29.4 | Pass |
| 286.000 | Qp | V | 90 | 1.5 | 52.4 | -14.1 | 38.3 | 46.0 | -7.7 | Pass |
| 440.000 | Qp | V | 180 | 1.0 | 31.2 | -9.4 | 21.8 | 46.0 | -24.2 | Pass |
| 528.000 | Qp | V | 0 | 1.0 | 33.7 | -7.4 | 26.3 | 46.0 | -19.7 | Pass |

9.3.2 Radiated Emissions Harmonics/Spurious Test Data

Table 9-3: Radiated Emissions Harmonics/Spurious Channel 1 (TX Frequency: 2412 MHz)

| Emission Frequency (MHz) | Peak Analyzer Reading (dBuV) (1 MHz RBW/VBW) | Average Analyzer Reading (dBuV) (less duty cycle -6.6dB) | Site Correction Factor (dB/m) | Average Emission Level (dBuV/m) | Average Limit (dBuV/m) | Average Margin (dB) |
|--------------------------|--|--|-------------------------------|---------------------------------|------------------------|---------------------|
| 4824.0 | 33.9 | 28.7 | 0.5 | 29.2 | 54.0 | -24.8 |
| 7236.0 | 44.9 | 37.1 | 3.3 | 40.4 | 76.8 | -36.4 |
| 9648.0 | 39.0 | 29.3 | 8.4 | 37.7 | 76.8 | -39.1 |
| 12060.0 | 36.0 | 24.5 | 11.3 | 35.8 | 54.0 | -18.2 |
| 14472.0 | 40.7 | 27.5 | 15.3 | 42.8 | 54.0 | -11.2 |
| 16884.0 | 40.6 | 26.5 | 16.3 | 42.8 | 76.8 | -34.0 |

Table 9-4: Radiated Emissions Harmonics/Spurious Channel 6 (TX Frequency: 2436 MHz)

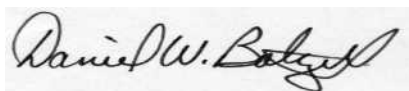
| Emission Frequency (MHz) | Peak Analyzer Reading (dBuV) (1 MHz RBW/VBW) | Average Analyzer Reading (dBuV) (less duty cycle -6.6dB) | Site Correction Factor (dB/m) | Average Emission Level (dBuV/m) | Average Limit (dBuV/m) | Average Margin (dB) |
|--------------------------|--|--|-------------------------------|---------------------------------|------------------------|---------------------|
| 4872.0 | 33.1 | 26.5 | 0.1 | 26.6 | 54.0 | -27.4 |
| 7308.0 | 43.0 | 33.6 | 2.8 | 36.4 | 54.0 | -17.6 |
| 9744.0 | 39.5 | 26.7 | 8.6 | 35.3 | 78.1 | -42.8 |
| 12180.0 | 37.7 | 24.6 | 10.6 | 35.2 | 54.0 | -18.8 |
| 14616.0 | 41.9 | 27.8 | 15.7 | 43.5 | 78.1 | -34.6 |
| 17052.0 | 41.0 | 26.9 | 15.9 | 42.8 | 78.1 | -35.3 |

Table 9-5: Radiated Emissions Harmonics/Spurious Channel 11 (TX Frequency: 2462 MHz)

| Emission Frequency (MHz) | Peak Analyzer Reading (dBuV) (1 MHz RBW/VBW) | Average Analyzer Reading (dBuV) (less duty cycle -6.6dB) | Site Correction Factor (dB/m) | Average Emission Level (dBuV/m) | Average Limit (dBuV/m) | Average Margin (dB) |
|--------------------------|--|--|-------------------------------|---------------------------------|------------------------|---------------------|
| 4924.0 | 31.5 | 22.6 | 0.4 | 23.0 | 54.0 | -31.0 |
| 7386.0 | 42.8 | 32.7 | 4.0 | 36.7 | 54.0 | -17.3 |
| 9848.0 | 40.4 | 27.3 | 9.3 | 36.6 | 77.6 | -41.0 |
| 12310.0 | 38.7 | 24.7 | 10.2 | 34.9 | 54.0 | -19.1 |
| 14772.0 | 41.6 | 27.7 | 14.7 | 42.4 | 77.6 | -35.2 |
| 17234.0 | 40.9 | 27.1 | 16.2 | 43.3 | 77.6 | -34.3 |

Test Personnel:

Daniel W. Baltzell
EMC Test Engineer



Signature

November 9th and 10th, 2006
Dates Of Tests

10 Conclusion

The data in this measurement report shows that the EUT as tested, Model WF-100, Model # WF-100-1-1, 802.11b Wi-Fi Module, FCC ID: URZ-WF10011, IC: 6827A-WF10011, complies with all the applicable requirements of Parts 2 and 15 of the FCC Rules and Regulations, and Industry Canada RSS-210.