Engineering and Testing for EMC and Safety Compliance

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

Test Lab:	Applicant:
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FCC ID/ IC ID:	RNW-MD-FH-09-01/ 5110A-MDFH0901	**Test Report Date:**	December 20, 2006
Platform:	N/A	**RTL Work Order Number:**	2006167
Model Name/ Model Number:	Generation 2 FHSS Radio / G1-011024 (Base Station), G1-011029 (Remote – Subset Of Base Station)	**RTL Quote Number:**	QRTL06-405
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:	DSS – Part 15 Spread Spectrum Transmitter		
FCC Rule Part(s):	FCC Rules Part 15.247: Operation within the bands 920-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz Direct Sequence System 10-01-06		
Industry Canada:	RSS-210: 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
903-927	0.006	N/A	280KFXD

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: December 20, 2006

Typed/Printed Name: Desmond A. Fraser Position: President

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1 General Information

1.1 Scope

Applicable Standards:

- FCC Rules Part 15.247: 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: Low Power License-Exempt Communications Devices

1.2 Description of EUT

Equipment Under Test	Generation 2 FHSS Radio	
Model	G1-011024 (Base Station) G1-011029 (Remote – Subset Of Base Station)	
Power Supply	9V DC	
Modulation Type	FHSS	
Frequency Range	903 – 927 MHz	
Antenna Connector Type	None	
Antenna Types	Wire (AQL Tabletop)	-2.8 dBi
	Straight Monopole (Base Station)	0.6 dBi
	Planar Inverted-F (Aqua Pod)	1.2 dBi

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 application for certification for **Goldline Controls, Inc.** Model Name: Generation 2 FHSS Radio, Model #: G1-011024 (Base Station), G1-011029 (Remote – subset of Base Station), FCC ID: RNW-MD-FH-09-01, IC: 5110A-MDFH0901.

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 for FHSS

Channel	Frequency
0	903
37	915
74	927

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.

2.3 Test Result Summary

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

Standard	Test	Pass/Fail or N/A
FCC 15.207	AC Power Conducted Emissions	Pass
FCC 15.209	Radiated Emissions	Pass
FCC 15.247(b)	Maximum Peak Power Output	Pass
FCC 15.247(d)	Antenna Conducted Spurious Emissions	Pass
FCC 15.247(d)	Band Edge Measurement	Pass
FCC 15.247(a)(1)	Carrier Frequency Separation	Pass
FCC 15.247(a)(1)(i)	20 dB Bandwidth	Pass
FCC 15.247(a)(1)(i)	Hopping Characteristics	Pass
FCC 15.247(a)(1)(i)	Average Time of Occupancy	Pass

2.4 Test System Details

The test sample was received on October 26, 2006. The FCC identifiers for all applicable equipment, plus descriptions of all cables used in the tested system, are identified in the following tables.

Table 2-3: Equipment Under Test

Part	Manufacturer	Model	Serial Number	FCC ID	Cable Description	RTL Bar Code
Aqua Pod Radio Hopping	Goldline Controls, Inc.	G1-011029	N/A	RNW-MD-FH-09-01	N/A	17603
AQL Tabletop Hopping	Goldline Controls, Inc.	G1-011029	N/A	RNW-MD-FH-09-01	N/A	17604
Base Station Hopping	Goldline Controls, Inc.	G1-011024	173	N/A	N/A	17606
Base Station Non-hopping	Goldline Controls, Inc.	G1-011024	181	N/A	N/A	17608
AQL Tabletop Non-hopping	Goldline Controls, Inc.	G1-011029	N/A	N/A	N/A	17609
Aqua Pod Radio Non-hopping	Goldline Controls, Inc.	G1-011029	N/A	N/A	N/A	17605
Base Station Non-hopping	Goldline Controls, Inc.	G1-011024	174	N/A	N/A	17607
Serial/Power Adapter	Goldline Controls, Inc.	N/A	N/A	N/A	1 m unshielded	17600
9VDC AC Adapter	CUI, Inc.	DPD090020-P5P-TKW	N/A	N/A	1.95 m unshielded power	17601

2.5 Configuration of Tested System

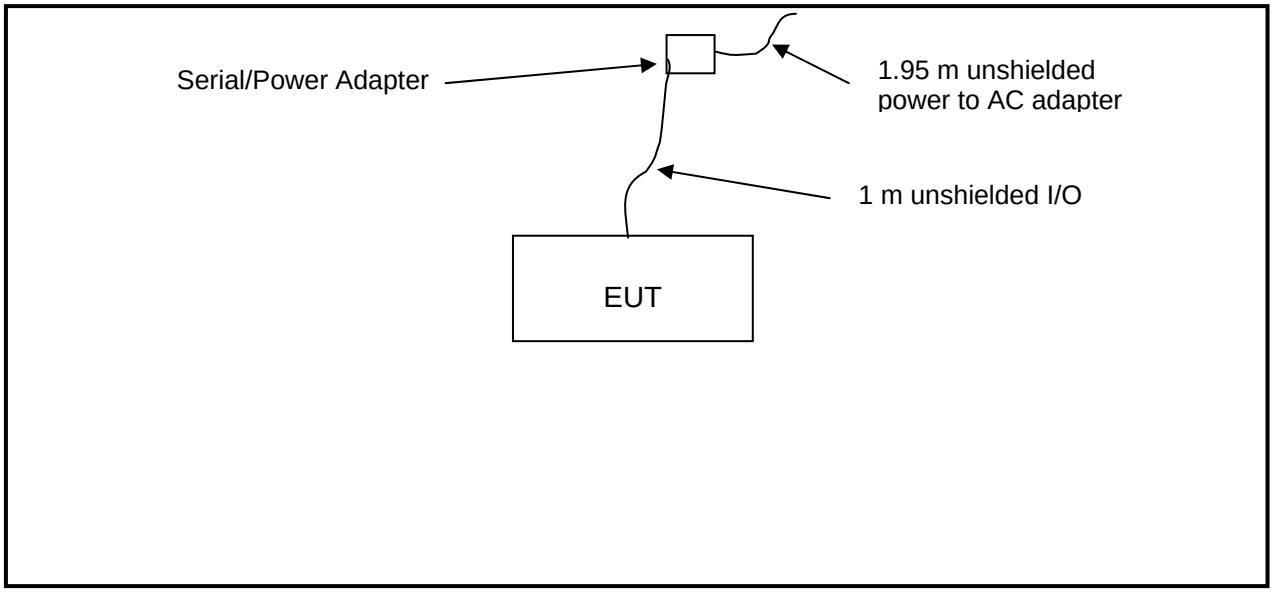


Figure 2-1: Configuration of System Under Test

3 Peak Output Power – FCC §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

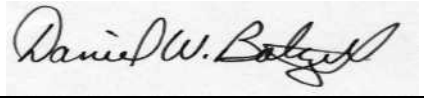
RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901184	Agilent Technologies	E4416A	EPM-P Power Meter, single channel	GB41050573	10/3/07
901356	Agilent	E9323A	Power Sensor	31764-264	10/3/07

3.2 Power Output Test Data

Table 3-2: Power Output Test Data – FHSS

Channel	Frequency (MHz)	Peak Power Conducted Output (dBm)
0	903	7.73
37	915	7.21
74	927	6.67

Test Personnel:



Daniel W. Baltzell		October 27, 2006
Test Engineer	Signature	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
900878	Rhein Tech Labs	AM3-1197-0005	3 meter antenna mast, polarizing	Outdoor Range 1	Not Required
901425	Insulated Wire, Inc.	KPS-1503-2400-KPS	RF Cable, 20'	NA	12/12/06
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
900791	Chase	CBL6111B	Bilog Antenna (30 MHz – 2000 MHz)	N/A	6/12/07
900930	Hewlett Packard	85662A	Spectrum Analyzer Display Section	3144A20839	9/13/07
900931	Hewlett Packard	8566B	Spectrum Analyzer (100 Hz - 22 GHz)	3138A07771	9/13/07

4.2 Restricted Band Edge Test Results

4.2.1 Calculation of Lower Band Edge for Base Station with Straight Monopole Antenna

106.8 dBuV/m is the peak field strength measurement, from which the delta measurement of 69.4 dB is subtracted (reference plots), resulting in a level of 37.4 dB. This level has a margin of 16.6 dB below the limit of 54 dBuV/m.

Calculation: 106.8 dBuV/m – 69.4 dB – 54 dBuV/m = -16.6 dB

Peak Field Strength of Upper Band Edge (1 MHz RBW/1 MHz VBW) = 106.8 dBuV/m
Average Field Strength of Upper Band Edge (1 MHz RBW/10 Hz VBW) = 104.3 dBuV/m
Delta measurement = 69.4 dB

4.2.2 Calculation of Lower Band Edge for AQL Tabletop with Wire Antenna

104.7 dBuV/m is the peak field strength measurement, from which the delta measurement of 69.4 dB is subtracted (reference plots), resulting in a level of 35.3 dB. This level has a margin of 18.7 dB below the limit of 54 dBuV/m.

Calculation: 104.7 dBuV/m – 69.4 dB – 54 dBuV/m = -18.7 dB

Peak Field Strength of Upper Band Edge (1 MHz RBW/1 MHz VBW) = 104.7 dBuV/m
Average Field Strength of Upper Band Edge (1 MHz RBW/10 Hz VBW) = 102.8 dBuV/m
Delta measurement = 69.4 dB

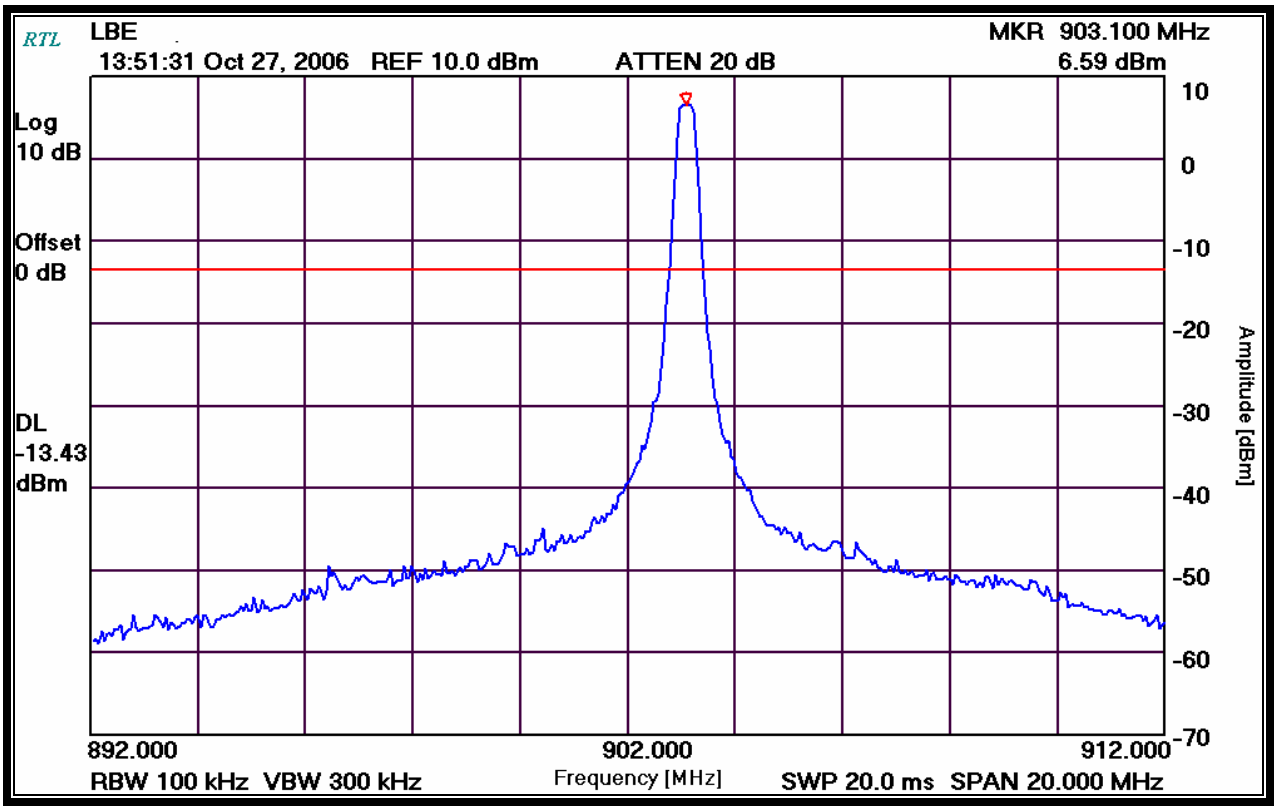
4.2.3 Calculation of Lower Band Edge for Aqua Pod with Planar Inverted-F Antenna

103.2 dBuV/m is the peak field strength measurement, from which the delta measurement of 69.4 dB is subtracted (reference plots), resulting in a level of 33.8 dB. This level has a margin of 20.2 dB below the limit of 54 dBuV/m.

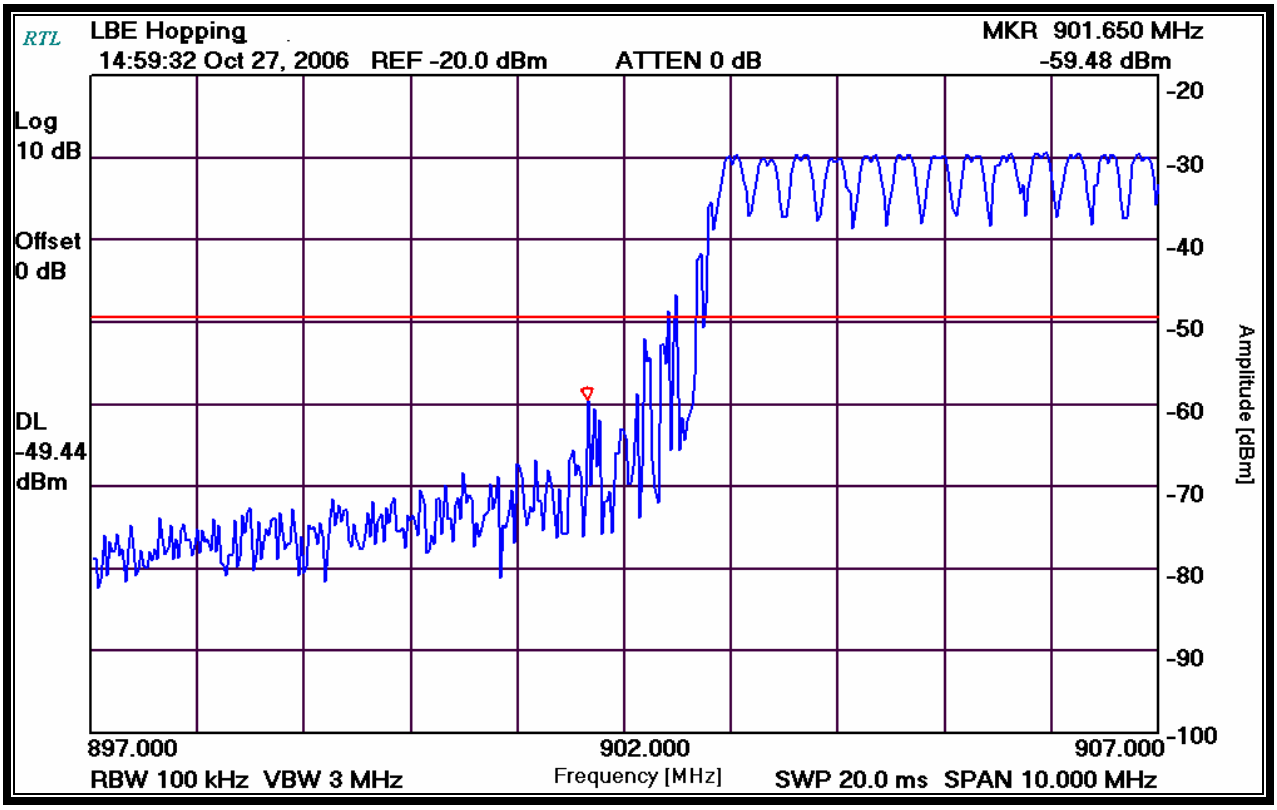
Calculation: 103.2 dBuV/m – 69.4 dB – 54 dBuV/m = -20.2 dB

Peak Field Strength of Upper Band Edge (1 MHz RBW/1 MHz VBW) = 103.2 dBuV/m
Average Field Strength of Upper Band Edge (1 MHz RBW/10 Hz VBW) = 101.0 dBuV/m
Delta measurement = 69.4 dB

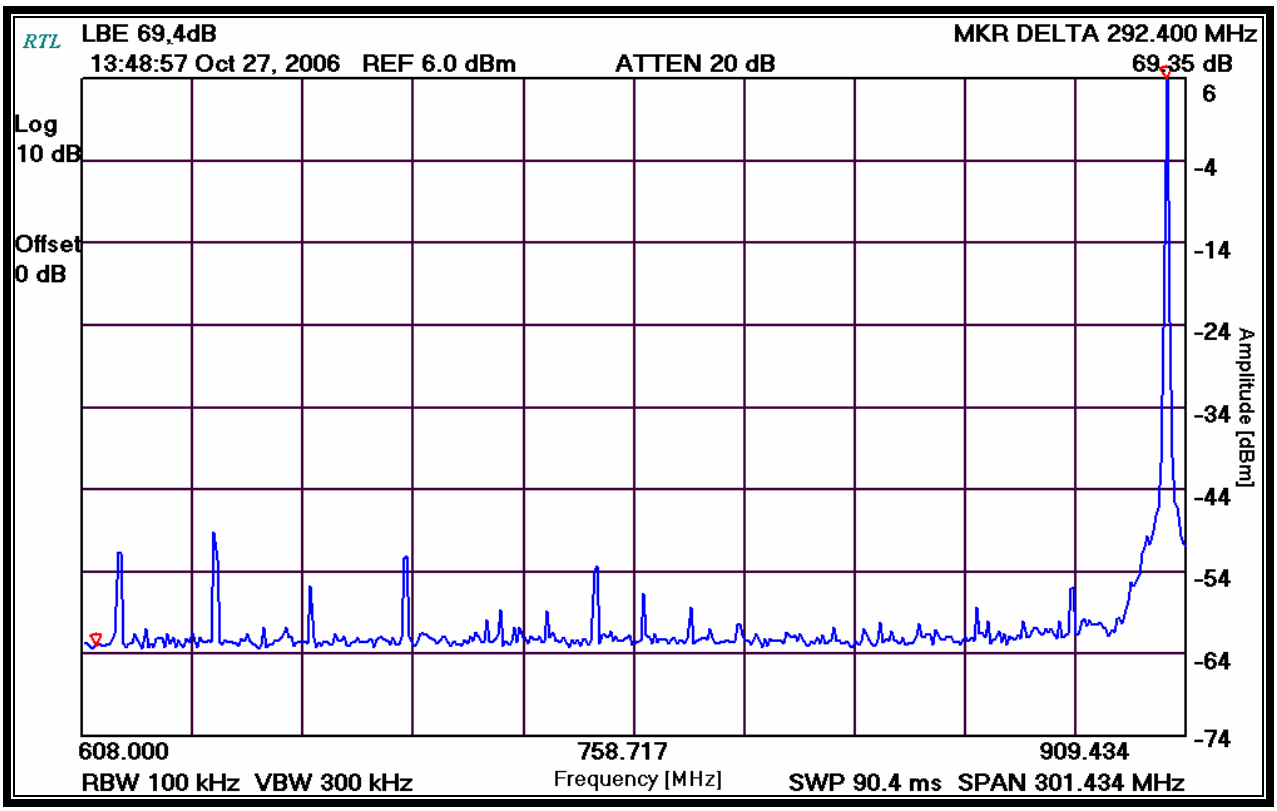
Plot 4-1: Lower Band Edge: Channel 0 (TX Frequency: 903 MHz)



Plot 4-2: Lower Band Edge: Hopping Channel 0 (TX Frequency: 903 MHz)



Plot 4-3: Lower Band Edge: Restricted Band Channel 0 (TX Frequency: 903 MHz)



4.2.4 Calculation of Upper Band Edge for Base Station with Straight Monopole Antenna

99.4 dBuV/m is the peak field strength measurement, from which the delta measurement of 65.8 dB is subtracted (reference plot to restricted band peak), resulting in a level of 33.6 dB. This level has a margin of 20.4 dB below the restricted band limit of 54 dBuV/m.

Calculation: 99.4 dBuV/m – 65.8 dB – 54 dBuV/m = -20.4 dB

Peak Field Strength of Upper Band Edge (1 MHz RBW/1 MHz VBW) = 99.4 dBuV/m
Average Field Strength of Upper Band Edge (1 MHz RBW/10 Hz VBW) = 95.9 dBuV/m
Delta measurement = 65.8 dB

4.2.5 Calculation of Upper Band Edge for AQL Tabletop with Wire Antenna

105.2 dBuV/m is the peak field strength measurement, from which the delta measurement of 65.8 dB is subtracted (reference plot to restricted band peak), resulting in a level of 39.4 dB. This level has a margin of 14.6 dB below the restricted band limit of 54 dBuV/m.

Calculation: 105.2 dBuV/m – 65.8 dB – 54 dBuV/m = -14.6 dB

Peak Field Strength of Upper Band Edge (1 MHz RBW/1 MHz VBW) = 105.2 dBuV/m
Average Field Strength of Upper Band Edge (1 MHz RBW/10 Hz VBW) = 103.3 dBuV/m
Delta measurement = 65.8 dB

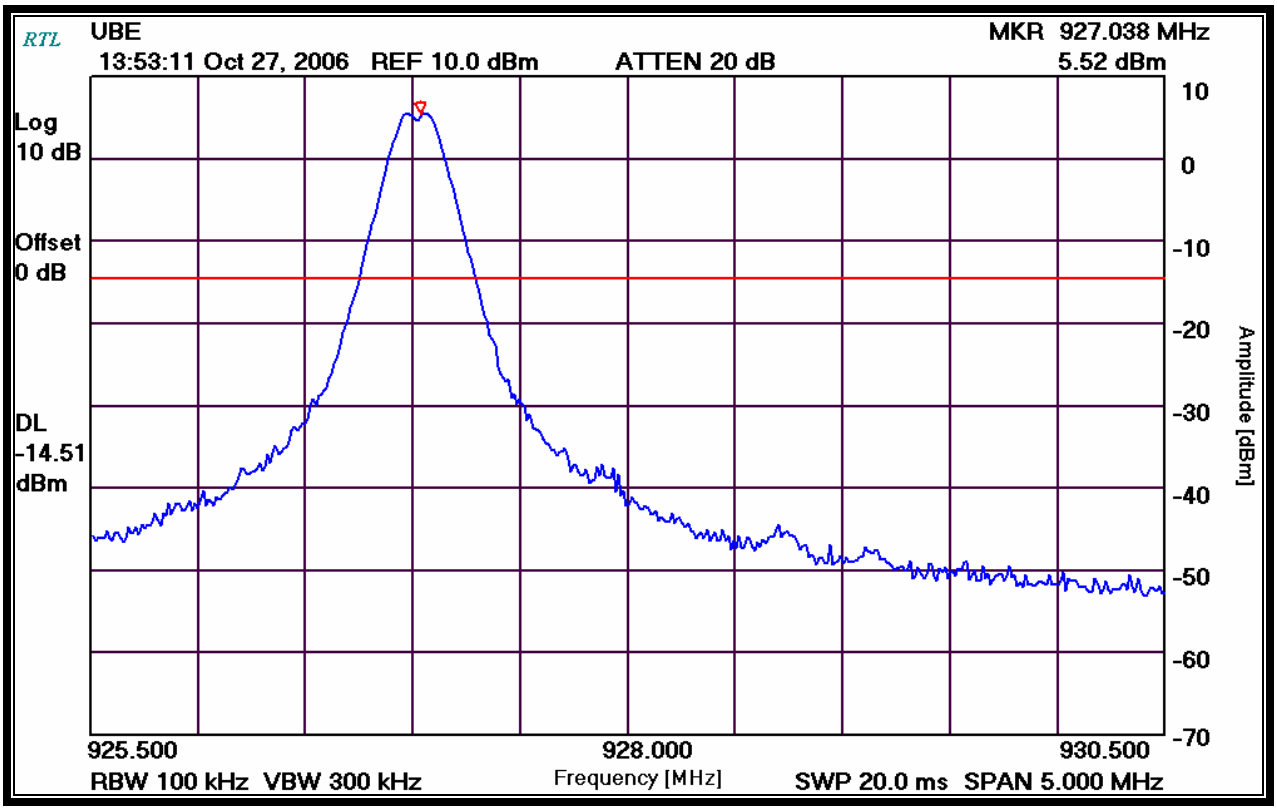
4.2.6 Calculation of Upper Band Edge for Aqua Pod with Planar Inverted-F Antenna

102.9 dBuV/m is the peak field strength measurement, from which the delta measurement of 65.8 dB is subtracted (reference plot to restricted band peak), resulting in a level of 37.1 dB. This level has a margin of 16.9 dB below the restricted band limit of 54 dBuV/m.

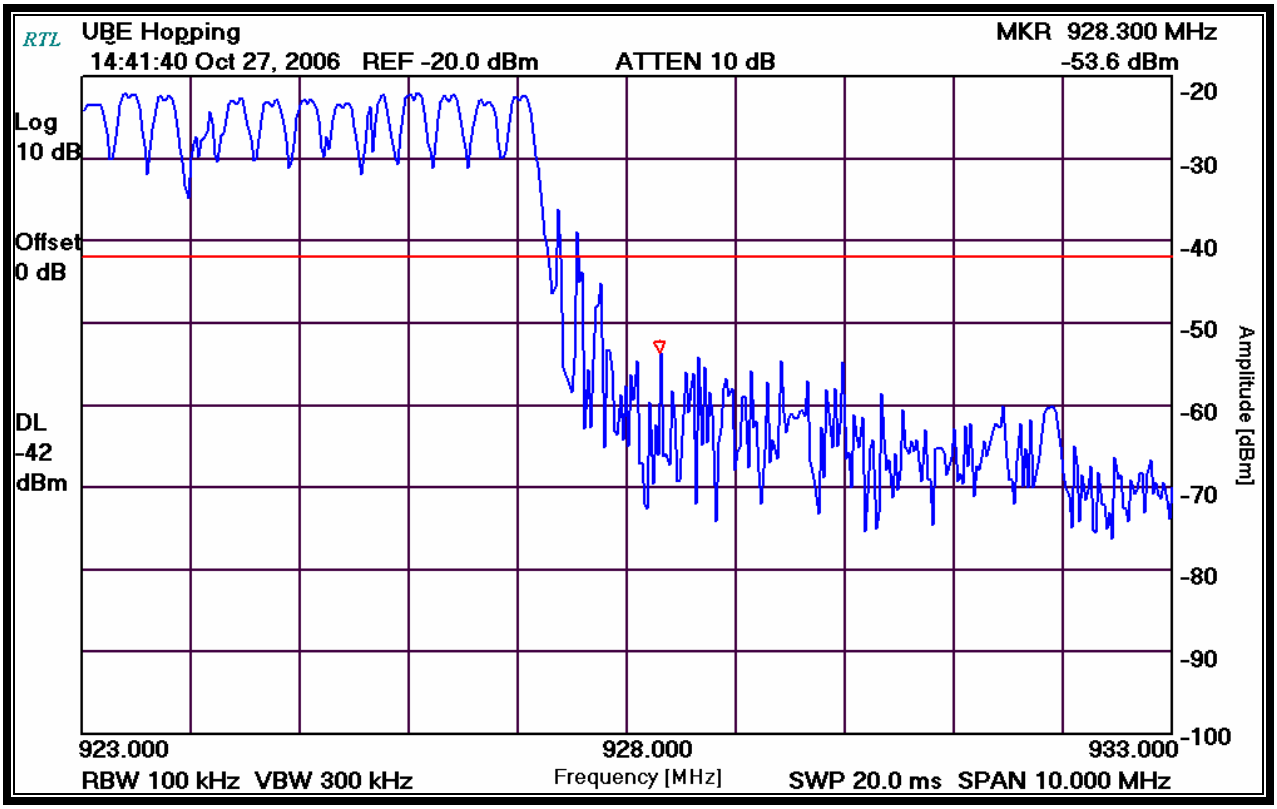
Calculation: 102.9 dBuV/m – 65.8 dB – 54 dBuV/m = -16.9 dB

Peak Field Strength of Upper Band Edge (1 MHz RBW/1 MHz VBW) = 102.9 dBuV/m
Average Field Strength of Upper Band Edge (1 MHz RBW/10 Hz VBW) = 100.7 dBuV/m
Delta measurement = 65.8 dB

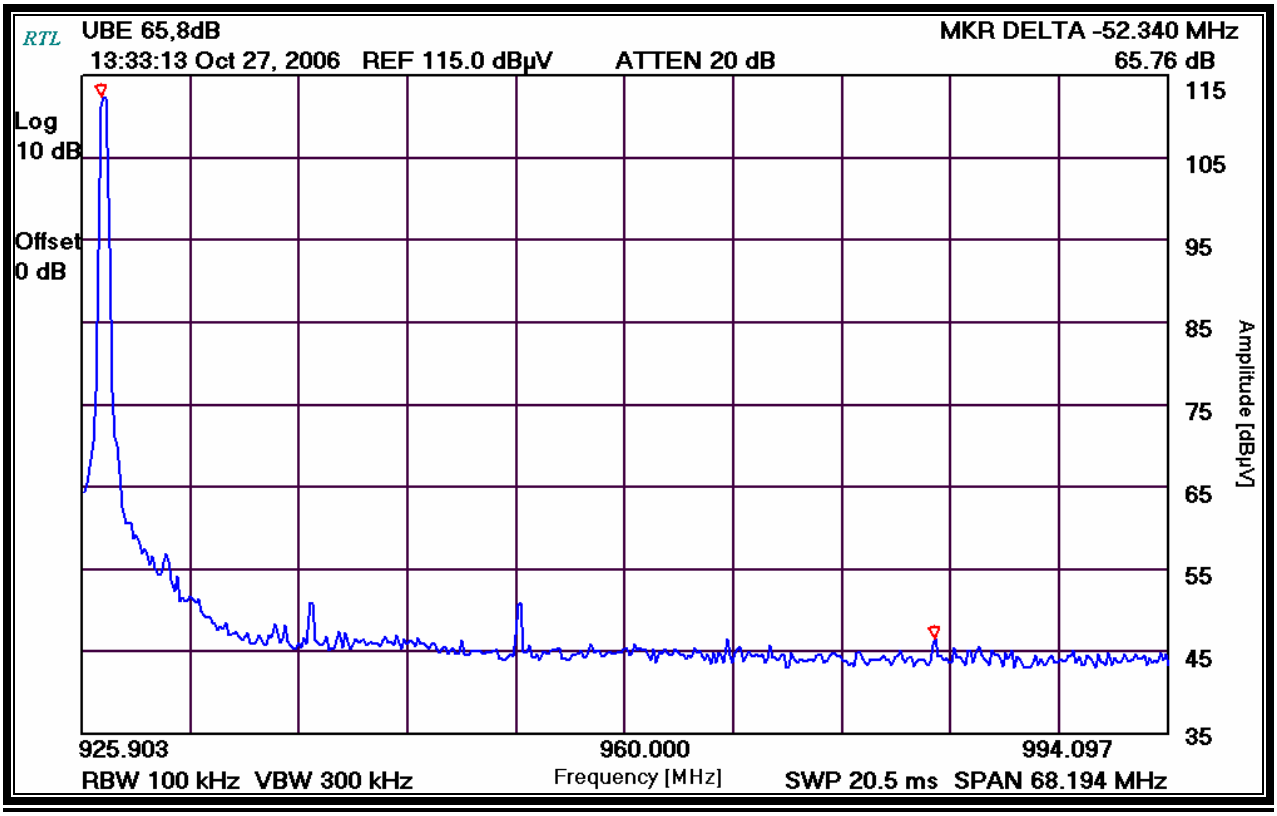
Plot 4-4: Upper Band Edge: Channel 74 (TX Frequency: 927MHz)



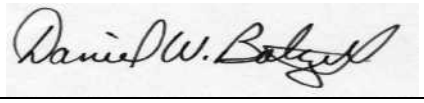
Plot 4-5: Upper Band Edge: Hopping Channel 74 (TX Frequency: 927 MHz)



Plot 4-6: Upper Band Edge: Restricted Band Channel 74 (TX Frequency: 927 MHz)



Test Personnel:

Daniel W. Baltzell		October 27, 2006
Test Engineer	Signature	Date Of Tests

5 Antenna Conducted Spurious Emissions – FCC §15.247(d); 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 100 kHz. The modulated carrier was identified at the following frequencies: 903 MHz, 915 MHz and 927 MHz.

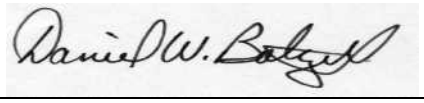
5.2 Antenna Conducted Spurious Emissions Test Results

No harmonics or spurs were found within 20 dB (note that we are reporting power as peak) of the carrier level from the carrier to the 10th harmonic of the carrier frequency. Per FCC 15.31(o), no data is being reported.

Table 5-1: Antenna Conducted Spurious Emissions 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

Test Personnel:



Daniel W. Baltzell		October 27, 2006
Test Engineer	Signature	Date Of Test

6 20 dB Bandwidth – FCC §15.247(a)(1)(i); IC RSS-210 A8.1(1)

6.1 20 dB Bandwidth Test Procedure

The minimum 20 dB bandwidths per RSS-210 were measured using a 50 ohm spectrum analyzer. The carrier was adjusted on the analyzer so that it was displayed entirely on the spectrum analyzer. The sweep time was set to auto and allowed through several sweeps with the max hold function used in peak detector mode. The resolution bandwidth was set to 30 kHz, and the video bandwidth set at 3 MHz. The minimum 20 dB bandwidths were measured using the spectrum analyzer delta marker set 20 dB down from the peak of the carrier and modulated. The table below contains the bandwidth measurement results.

Table 6-1 20 dB Bandwidth Test Equipment

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
900913	Hewlett Packard	85462A	Spectrum Analyzer (9 kHz – 6.5 GHz)	3325A00159	2/28/07

6.2 20 dB Modulated Bandwidth Test Data

Table 6-2 20 dB Modulated Bandwidth Test Data

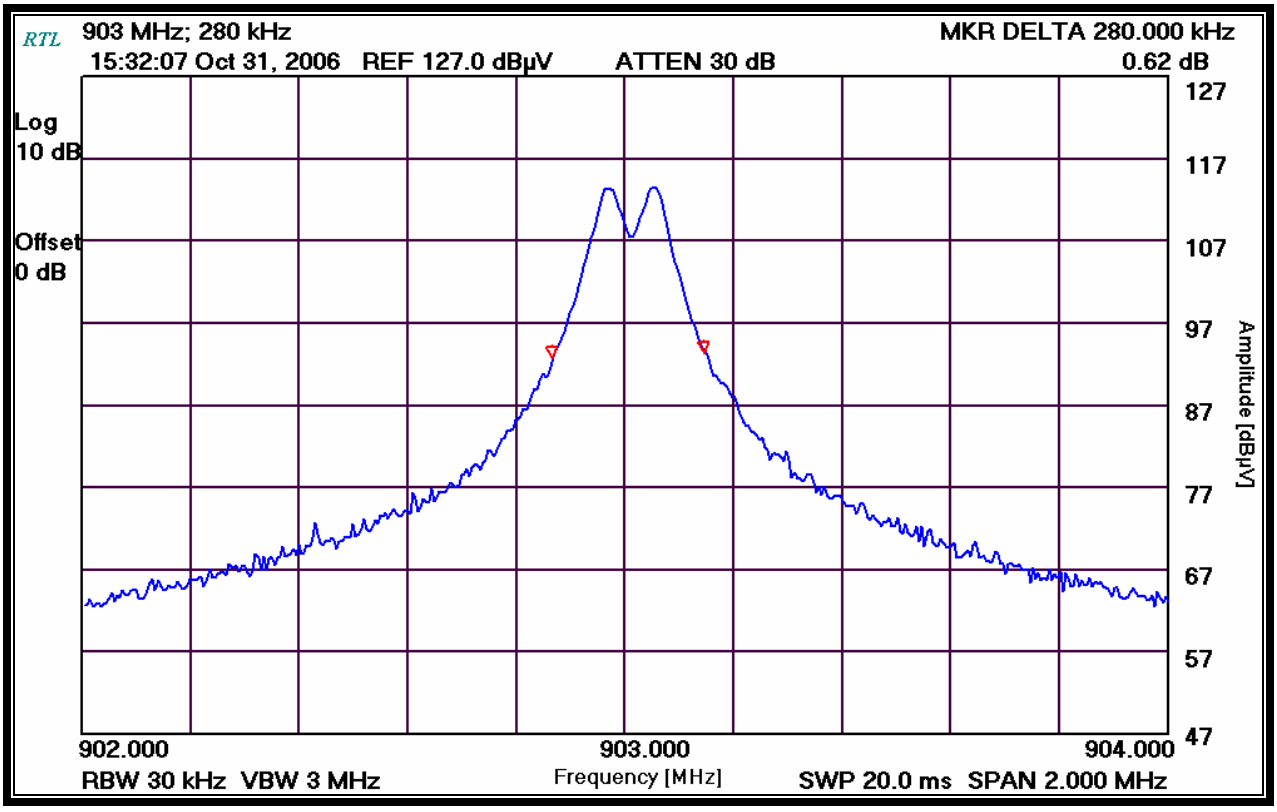
Minimum 20 dB bandwidths

Channel	20 dB Bandwidth (kHz)
0	280
37	280
74	280

6.3 20 dB Bandwidth Plots

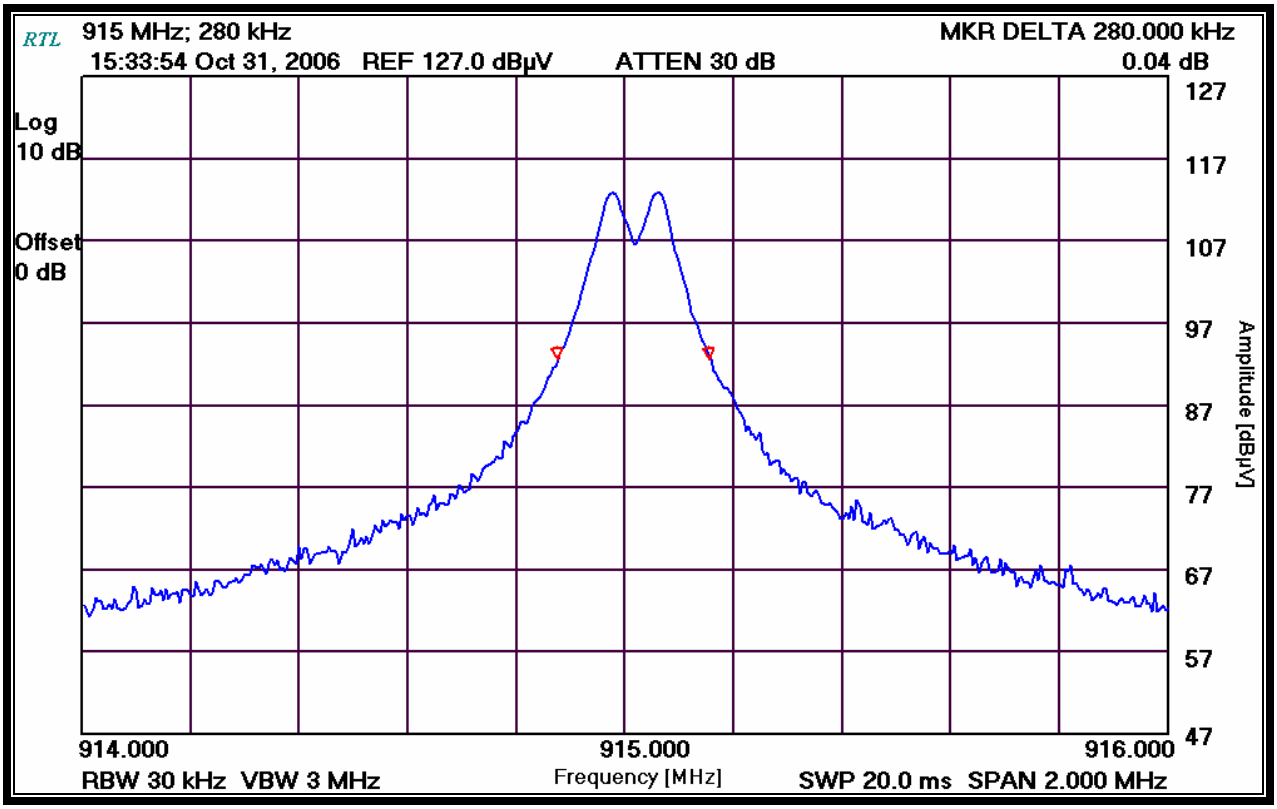
Channel:	0
Channel Frequency (MHz):	903
Resolution Bandwidth (kHz):	30
Video Bandwidth (MHz):	3

Plot 6-1: 20 dB Bandwidth Channel 0



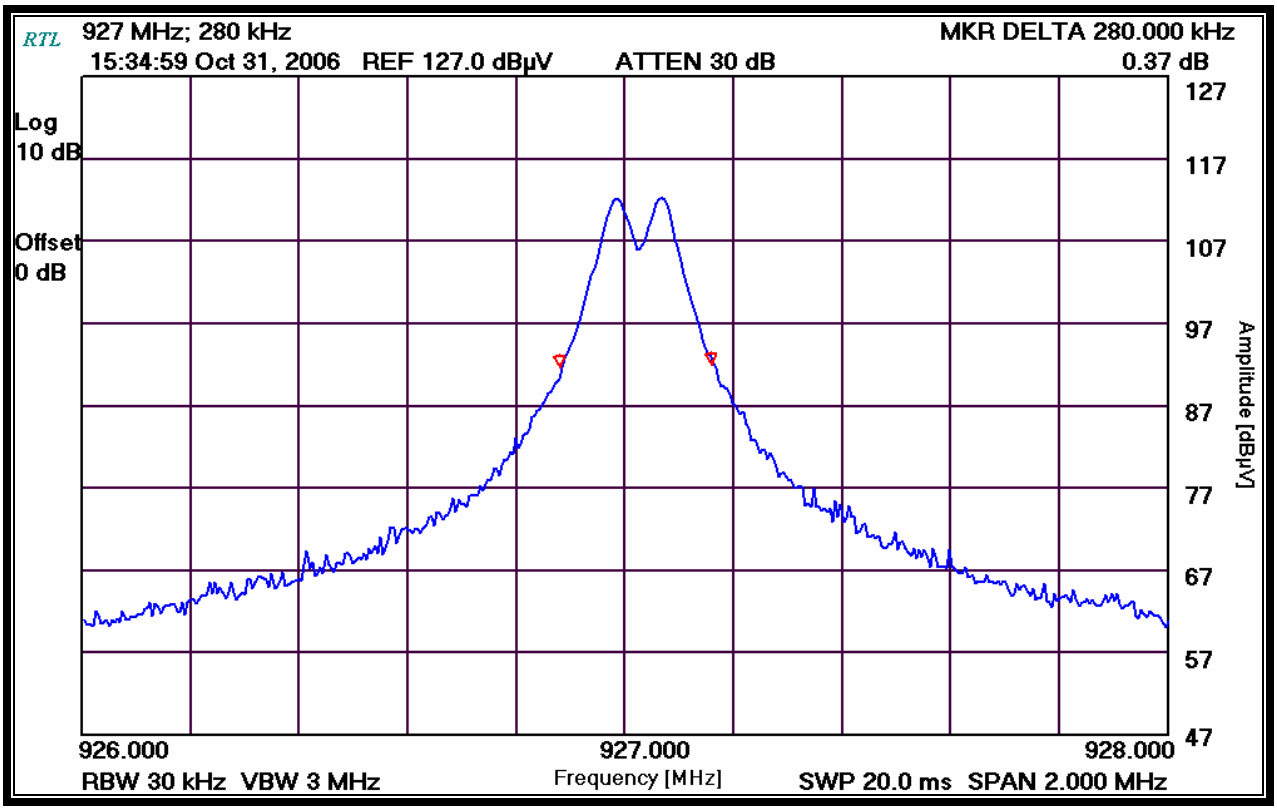
Channel:	37
Channel Frequency (MHz):	915
Resolution Bandwidth (kHz):	30
Video Bandwidth (MHz):	3

Plot 6-2: 20 dB Bandwidth Channel 37

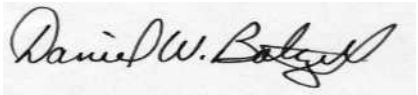


Channel:	74
Channel Frequency (MHz):	927
Resolution Bandwidth (kHz):	30
Video Bandwidth (MHz):	3

Plot 6-3: 20 dB Bandwidth Channel 74



Test Personnel:

Daniel W. Baltzell		October 31, 2006
Test Engineer	Signature	Date Of Tests

7 Carrier Frequency Separation – FCC §15.247(a)(1); IC RSS-210 A8.1(2)

7.1 Carrier Frequency Separation Test Procedure

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

Measured frequency separation = 325 kHz

7.2 Carrier Frequency Separation Test Data

Plot 7-1: Carrier Frequency Separation

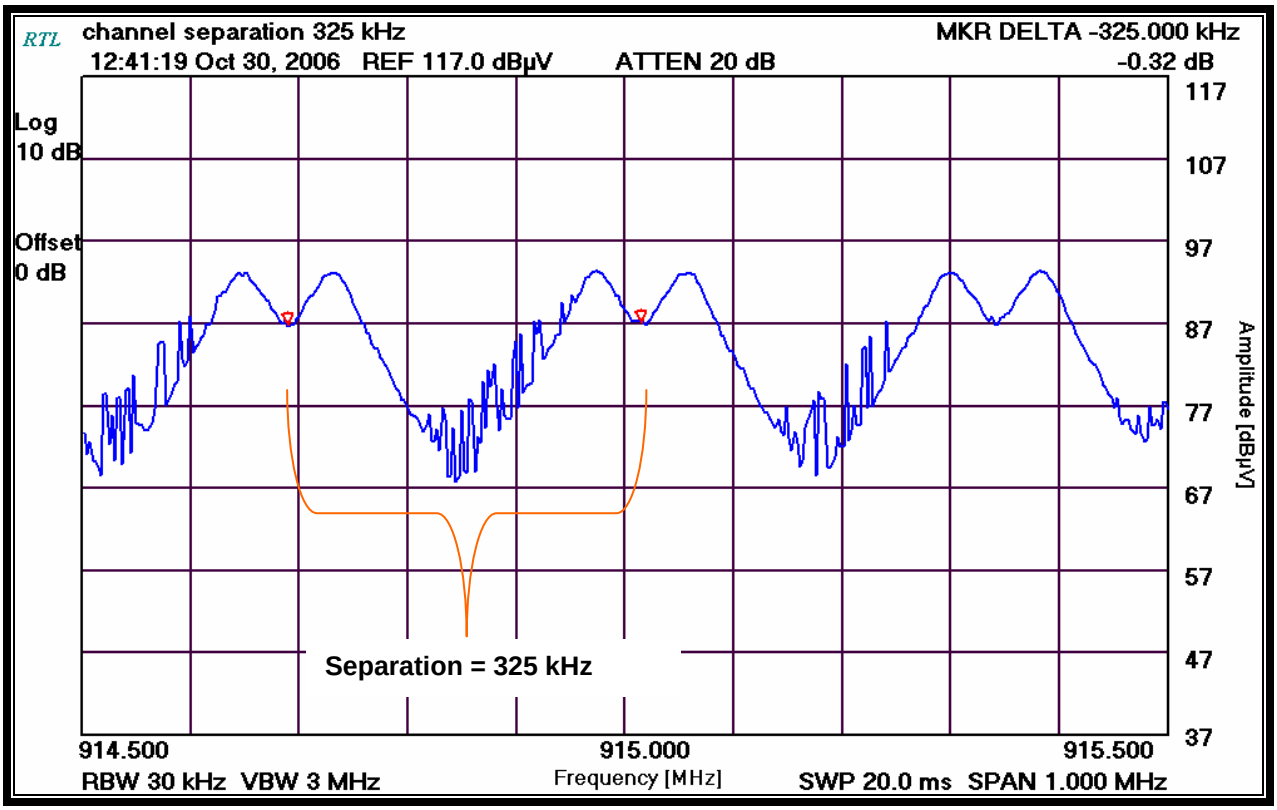
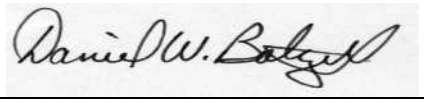


Table 7-1 Channel Separation Test Equipment

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
900913	Hewlett Packard	85462A	Spectrum Analyzer (9 kHz – 6.5 GHz)	3325A00159	2/28/07

Test Personnel:



Daniel W. Baltzell		October 30, 2006
Test Engineer	Signature	Date Of Test

8 Hopping Characteristics – FCC §15.247(a)(1)(i); IC RSS-210 A8.1(4)

8.1 Hopping Characteristics Test Procedure

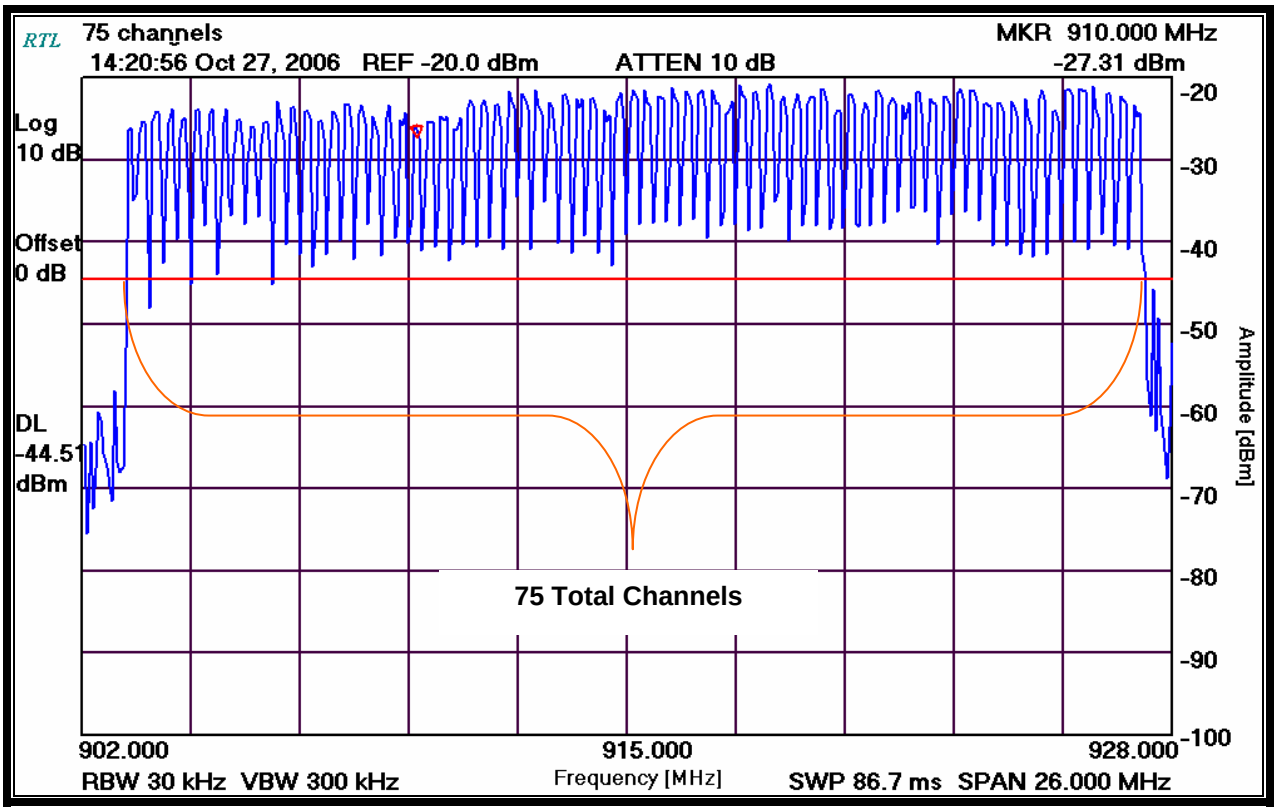
For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

The hopping channels are divided into three groups of 50 channels (low, mid and high group).

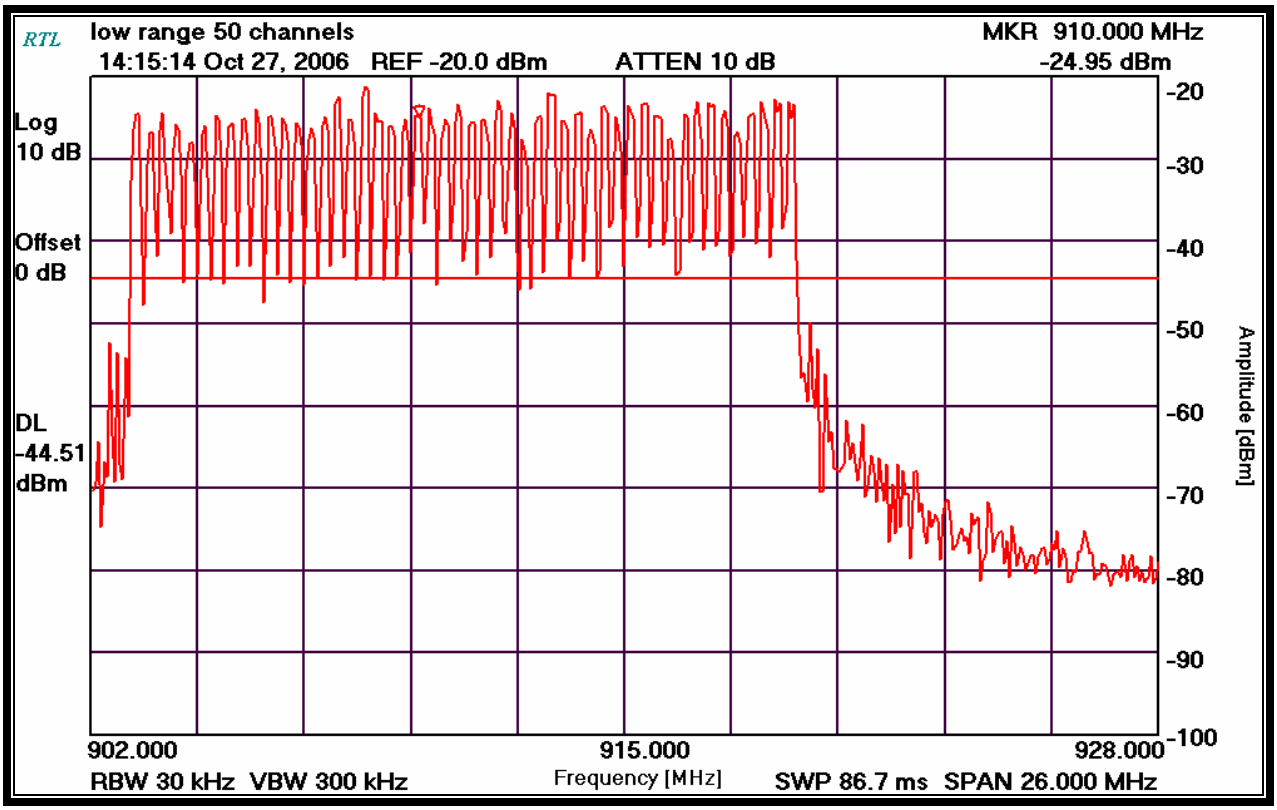
8.2 Number of Hopping Frequencies

Measured number of total hopping frequencies = 75

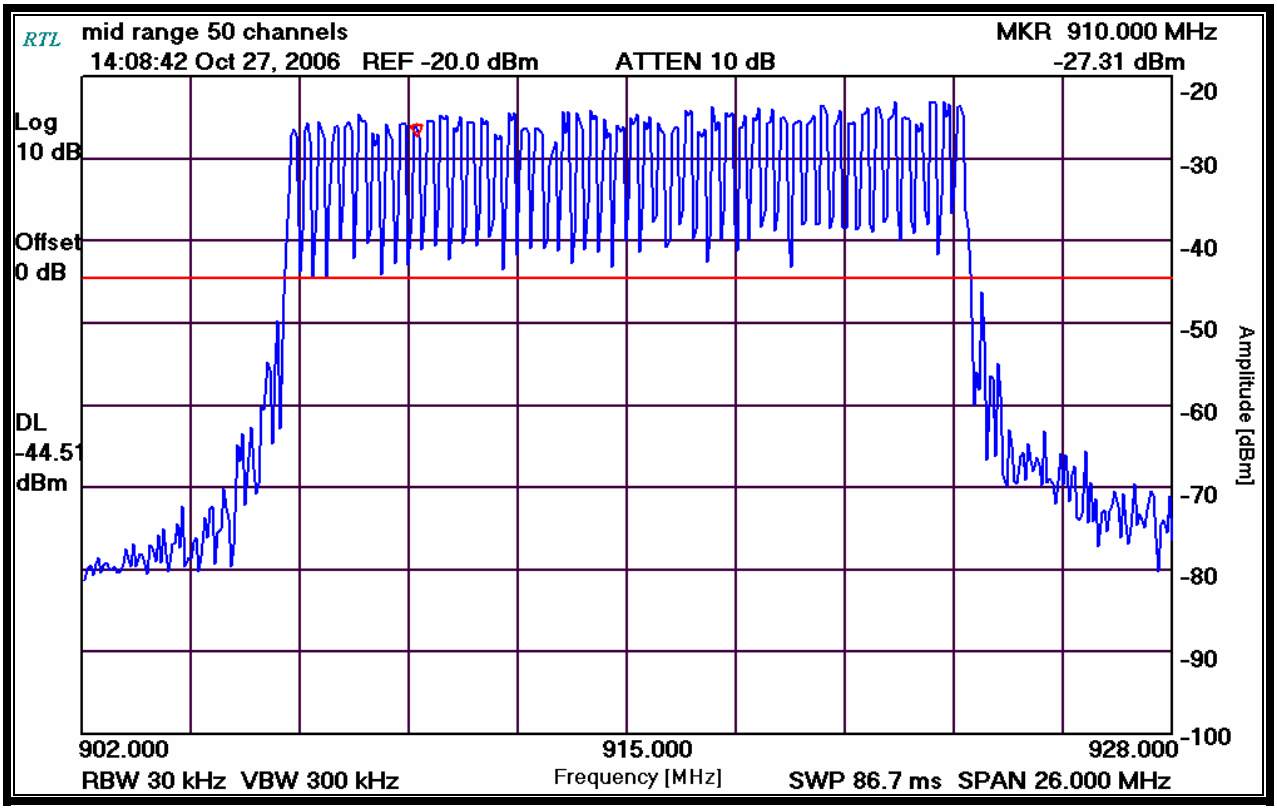
Plot 8-1: Number of Total Hopping Frequencies



Plot 8-2: Number of Total Hopping Frequencies (Low Group) 50 Channels



Plot 8-3: Number of Total Hopping Frequencies (Mid Group) 50 Channels



Plot 8-4: Number of Total Hopping Frequencies (Upper Group) 50 Channels

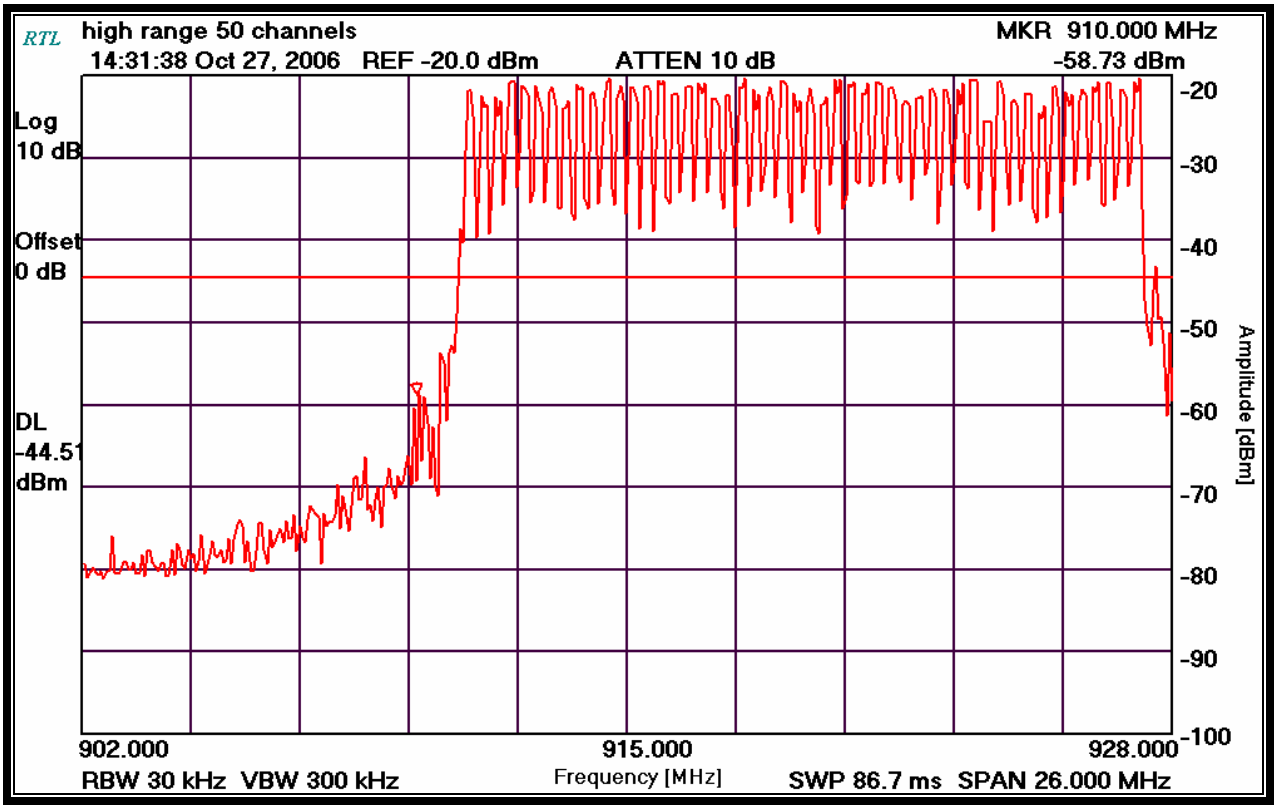
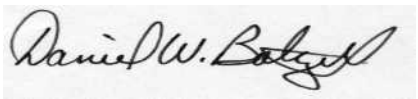


Table 8-1 Number of Hopping Frequencies Test Equipment

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
900913	Hewlett Packard	85462A	Spectrum Analyzer (9 kHz – 6.5 GHz)	3325A00159	2/28/07

Test Personnel:

Daniel W. Baltzell		October 27, 2006
Test Engineer	Signature	Date Of Test

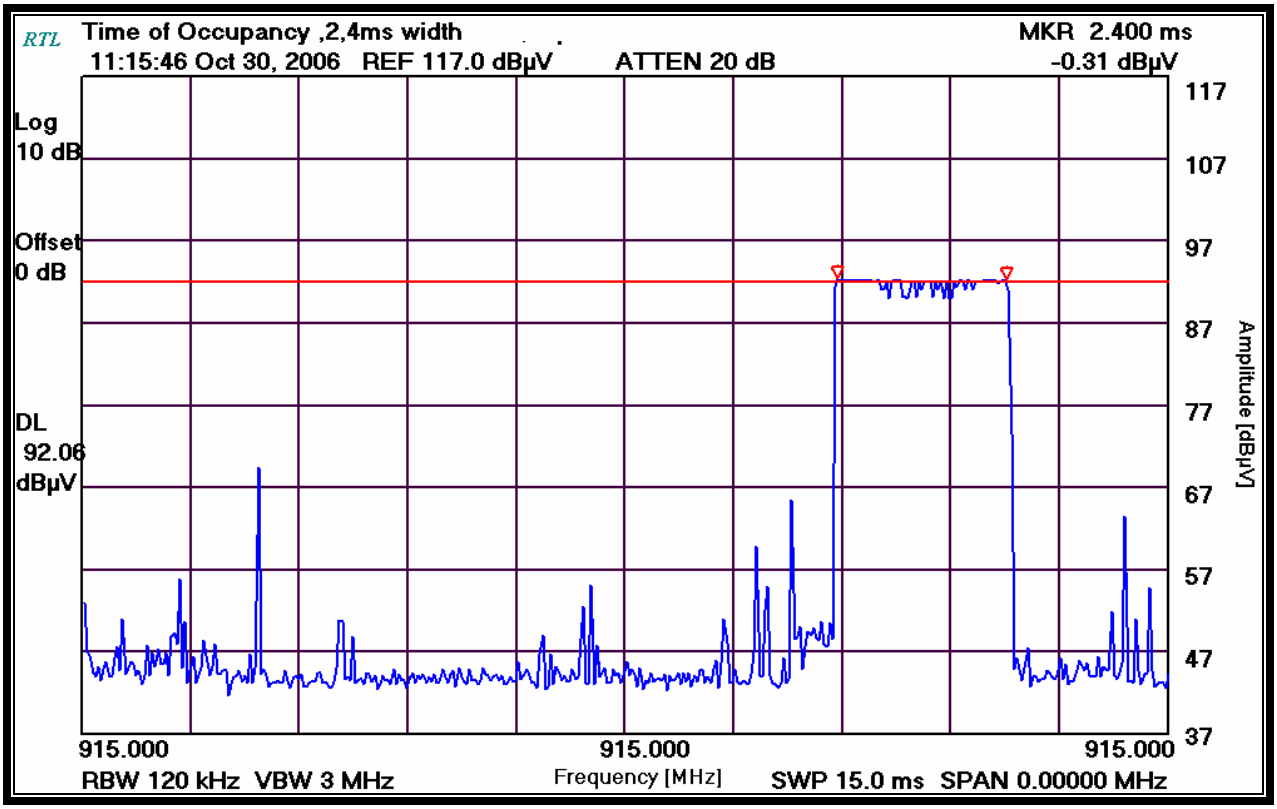
8.3 Average Time of Occupancy

The spectrum analyzer sweep was set to 20 seconds and single sweep, with a zero span and max hold, and the number of pulses were counted. The sweep was changed to 15 ms at zero span and max. hold until a pulse was captured. A marker delta was used to measure the dwell time for this pulse.

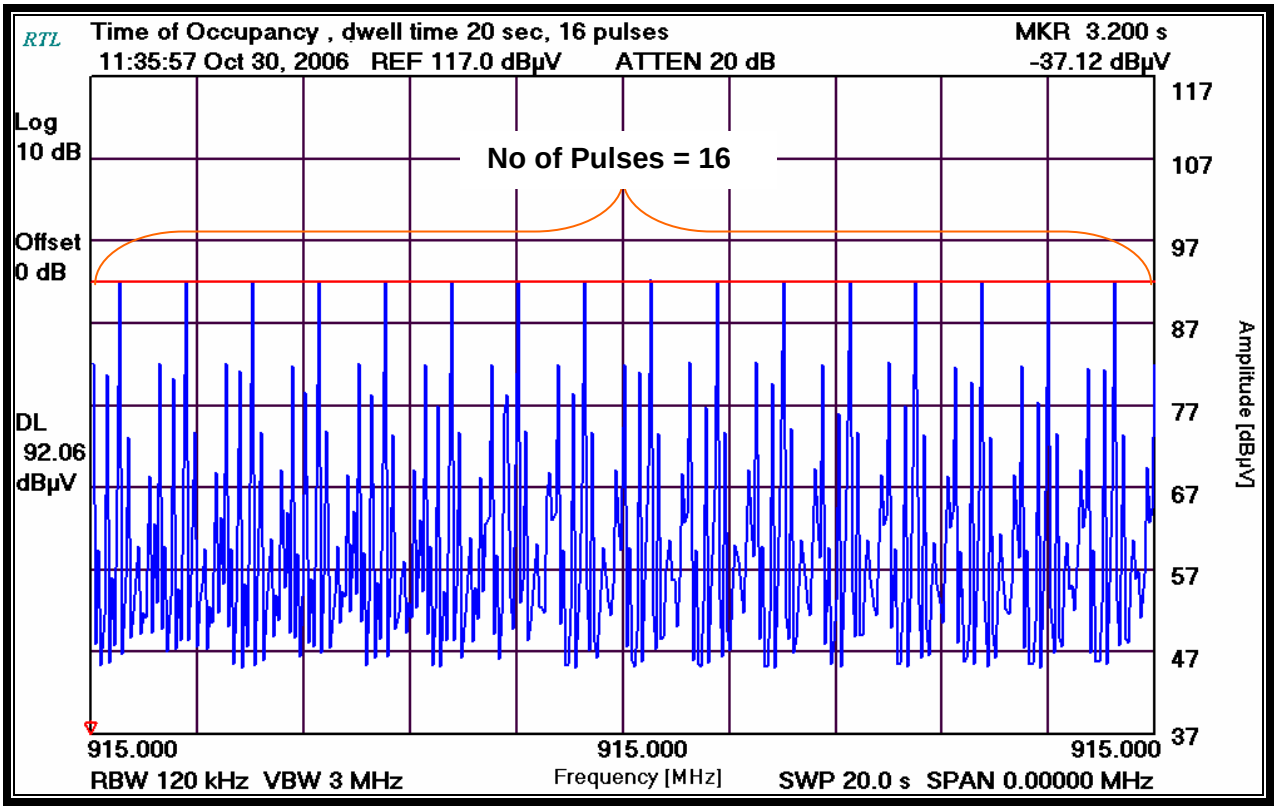
The number of pulses in 10 seconds is 8 pulses.

The average time of occupancy in the above period (10 s) is equal to 8 pulses x 2.4 ms = 19.2 ms, which meets the limit as defined by 15.247(a)(1)(i) of 0.4 seconds.

Plot 8-5: Time of Occupancy (Dwell Time)



Plot 8-6: Time of Occupancy (Dwell Time 20 Second Sweep)



Number of pulses in 20 seconds: 16

Duty Cycle Correction Factor = 20Log(0.0024/0.1) = -32.4dB

Test Personnel:

Daniel W. Baltzell	Daniel W. Baltzell	October 30, 2006
Test Engineer	Signature	Date Of Test

9 Conducted Emissions Measurement Limits – FCC §15.207; RSS-Gen

9.1 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

9.2 Conducted Emissions Measurement Test Procedure

The conducted emissions measurements were performed in a Series 81 type shielded enclosure manufactured by Rayproof. The EUT was assembled on a wooden table 0.8 meters high. Power was fed to the EUT through a 50 Ω/50 μH Line Impedance Stabilization Network (LISN). The EUT LISN was fed power through an AC 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 AC 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 AC line through an isolation transformer. The 50 ohm output of the EUT LISN was connected to the spectrum analyzer input through a Solar 7 kHz high-pass filter. The filter was used to prevent overload of the spectrum analyzer from noise below 7 kHz. Conducted emission levels were measured on each current-carrying line with the spectrum analyzer operating in the CISPR quasi-peak mode (or average 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 were performed in a linear mode using a 10 kHz resolution bandwidth, a 1 Hz video bandwidth, and by decreasing the sweep time in order to obtain a calibrated measurement. The highest emissions amplitudes relative to the appropriate limits were measured and have been recorded in this report.

Table 9-1: Conducted Emissions Test Equipment

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
900969	Hewlett Packard	85650A	Quasi-Peak Adapter	2412A00414	9/13/07
900930	Hewlett Packard	85662A	Spectrum Analyzer Display Section	3144A20839	9/13/07
900931	Hewlett Packard	8566B	Spectrum Analyzer (100 Hz - 22 GHz)	3138A07771	9/13/07
900889	Hewlett Packard	85685A	RF Preselector (20 Hz - 2 GHz)	3146A01309	4/12/07
901083	AFJ International	LS16	16A LISN (110 V)	16010020080	3/28/08
N/A	Rhein Tech Laboratories, Inc.	Automated Emission Tester	Emissions testing software Rev. 14.0.2	N/A	N/A

9.3 Conducted Emissions Test Results

9.3.1 Conducted Emissions Transmit Mid Channel AQL Tabletop with Wire Antenna

Table 9-2: Conducted Emissions Transmit Mid Channel Neutral Side (Line 1)

Temperature: 74°F Humidity: 46%									
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)	Pass/ Fail
0.151	Pk	39.6	0.2	39.8	65.9	-26.1	55.9	-16.1	Pass
0.226	Pk	35.1	0.2	35.3	62.6	-27.3	52.6	-17.3	Pass
0.383	Pk	33.3	0.2	33.5	58.2	-24.7	48.2	-14.7	Pass
12.060	Pk	31.9	2.1	34.0	60.0	-26.0	50.0	-16.0	Pass
16.080	Pk	33.5	2.3	35.8	60.0	-24.2	50.0	-14.2	Pass
23.540	Pk	33.0	2.8	35.8	60.0	-24.2	50.0	-14.2	Pass

Table 9-3: Conducted Emissions Transmit Mid Channel Hot Side (Line 2)

Temperature: 74°F Humidity: 46%									
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)	Pass/ Fail
0.483	Pk	33.6	0.2	33.8	56.3	-22.5	46.3	-12.5	Pass
12.060	Pk	31.2	2.1	33.3	60.0	-26.7	50.0	-16.7	Pass
16.080	Pk	33.1	2.3	35.4	60.0	-24.6	50.0	-14.6	Pass
21.420	Pk	20.5	2.6	23.1	60.0	-36.9	50.0	-26.9	Pass
23.750	Pk	30.7	2.8	33.5	60.0	-26.5	50.0	-16.5	Pass
23.750	Pk	30.7	2.8	33.5	60.0	-26.5	50.0	-16.5	Pass

9.3.2 Conducted Emissions Receive AQL Tabletop with Wire Antenna

Table 9-4: Conducted Emissions Receive Neutral Side (Line 1)

Temperature: 74°F Humidity: 46%									
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)	Pass/ Fail
0.171	Pk	37.3	0.2	37.5	64.9	-27.4	54.9	-17.4	Pass
0.219	Pk	36.3	0.2	36.5	62.9	-26.4	52.9	-16.4	Pass
0.394	Pk	30.2	0.2	30.4	58.0	-27.6	48.0	-17.6	Pass
12.030	Pk	32.5	2.1	34.6	60.0	-25.4	50.0	-15.4	Pass
16.080	Pk	34.1	2.3	36.4	60.0	-23.6	50.0	-13.6	Pass
23.860	Pk	33.4	2.8	36.2	60.0	-23.8	50.0	-13.8	Pass

Table 9-5: Conducted Emissions Receive Hot Side (Line 2)

Temperature: 74°F Humidity: 46%									
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)	Pass/ Fail
0.154	Pk	42.1	0.2	42.3	65.8	-23.5	55.8	-13.5	Pass
0.225	Pk	37.7	0.2	37.9	62.6	-24.7	52.6	-14.7	Pass
0.333	Pk	35.9	0.3	36.2	59.4	-23.2	49.4	-13.2	Pass
12.060	Pk	31.9	2.1	34.0	60.0	-26.0	50.0	-16.0	Pass
16.050	Pk	33.3	2.3	35.6	60.0	-24.4	50.0	-14.4	Pass
23.810	Pk	33.3	2.8	36.1	60.0	-23.9	50.0	-13.9	Pass

9.3.3 Conducted Emissions Transmit Mid Channel for Base Station with Straight Monopole Antenna

Table 9-6: Conducted Emissions Transmit Mid Channel Neutral Side (Line 1)

Temperature: 74°F Humidity: 46%									
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)	Pass/ Fail
0.152	Pk	41.5	0.2	41.7	65.9	-24.2	55.9	-14.2	Pass
0.319	Pk	29.8	0.3	30.1	59.7	-29.6	49.7	-19.6	Pass
0.470	Pk	27.7	0.2	27.9	56.5	-28.6	46.5	-18.6	Pass
12.090	Pk	30.0	2.1	32.1	60.0	-27.9	50.0	-17.9	Pass
16.080	Pk	30.7	2.3	33.0	60.0	-27.0	50.0	-17.0	Pass
22.890	Pk	28.9	2.9	31.8	60.0	-28.2	50.0	-18.2	Pass

Table 9-7: Conducted Emissions Transmit Mid Channel Hot Side (Line 2)

Temperature: 74°F Humidity: 46%									
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)	Pass/ Fail
0.175	Pk	35.0	0.2	35.2	64.7	-29.5	54.7	-19.5	Pass
0.310	Pk	29.0	0.3	29.3	60.0	-30.7	50.0	-20.7	Pass
0.379	Pk	26.4	0.2	26.6	58.3	-31.7	48.3	-21.7	Pass
12.090	Pk	31.7	2.1	33.8	60.0	-26.2	50.0	-16.2	Pass
12.090	Pk	31.7	2.1	33.8	60.0	-26.2	50.0	-16.2	Pass
16.110	Pk	34.7	2.3	37.0	60.0	-23.0	50.0	-13.0	Pass

9.3.4 Conducted Emissions Receive for Base Station with Straight Monopole Antenna

Table 9-8: Conducted Emissions Receive Neutral Side (Line 1)

Temperature: 74°F Humidity: 46%									
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)**	**Pass/ Fail**
0.151	Pk	39.4	0.2	39.6	65.9	-26.3	55.9	-16.3	Pass
0.270	Pk	33.9	0.2	34.1	61.1	-27.0	51.1	-17.0	Pass
0.379	Pk	29.7	0.2	29.9	58.3	-28.4	48.3	-18.4	Pass
12.090	Pk	32.4	2.1	34.5	60.0	-25.5	50.0	-15.5	Pass
16.080	Pk	33.7	2.3	36.0	60.0	-24.0	50.0	-14.0	Pass
22.860	Pk	30.9	2.9	33.8	60.0	-26.2	50.0	-16.2	Pass

Table 9-9: Conducted Emissions Receive Hot Side (Line 2)

Temperature: 74°F Humidity: 46%									
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)**	**Pass/ Fail**
0.304	Pk	30.0	0.3	30.3	60.1	-29.8	50.1	-19.8	Pass
0.469	Pk	27.9	0.2	28.1	56.5	-28.4	46.5	-18.4	Pass
12.090	Pk	30.3	2.1	32.4	60.0	-27.6	50.0	-17.6	Pass
12.090	Pk	30.3	2.1	32.4	60.0	-27.6	50.0	-17.6	Pass
16.110	Pk	32.3	2.3	34.6	60.0	-25.4	50.0	-15.4	Pass
22.920	Pk	30.2	2.9	33.1	60.0	-26.9	50.0	-16.9	Pass

9.3.5 Conducted Emissions Transmit Mid Channel for Aqua Pod with Planar Inverted-F Antenna

Table 9-10: Conducted Emissions Transmit Mid Channel Neutral Side (Line 1)

Temperature: 74°F Humidity: 46%									
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)	Pass/ Fail
0.238	Pk	34.8	0.2	35.0	62.2	-27.2	52.2	-17.2	Pass
0.383	Pk	31.2	0.2	31.4	58.2	-26.8	48.2	-16.8	Pass
0.482	Pk	33.3	0.2	33.5	56.3	-22.8	46.3	-12.8	Pass
0.515	Pk	33.9	0.2	34.1	56.0	-21.9	46.0	-11.9	Pass
16.070	Pk	36.8	2.3	39.1	60.0	-20.9	50.0	-10.9	Pass
23.350	Pk	34.5	2.9	37.4	60.0	-22.6	50.0	-12.6	Pass

Table 9-11: Conducted Emissions Transmit Mid Channel Hot Side (Line 2)

Temperature: 74°F Humidity: 46%									
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)	Pass/ Fail
0.167	Pk	32.3	0.2	32.5	65.1	-32.6	55.1	-22.6	Pass
0.223	Pk	32.3	0.2	32.5	62.7	-30.2	52.7	-20.2	Pass
0.378	Pk	28.1	0.2	28.3	58.3	-30.0	48.3	-20.0	Pass
0.523	Pk	27.4	0.3	27.7	56.0	-28.3	46.0	-18.3	Pass
16.070	Pk	38.0	2.3	40.3	60.0	-19.7	50.0	-9.7	Pass
22.930	Pk	34.8	2.9	37.7	60.0	-22.3	50.0	-12.3	Pass

9.3.6 Conducted Emissions Receive for Base Aqua Pod with Planar Inverted-F Antenna

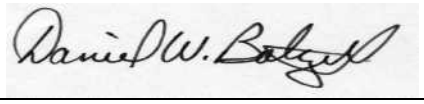
Table 9-12: Conducted Emissions Receive Neutral Side (Line 1)

Temperature: 74°F Humidity: 46%									
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)	Pass/ Fail
0.150	Pk	40.7	0.2	40.9	66.0	-25.1	56.0	-15.1	Pass
0.235	Pk	38.3	0.2	38.5	62.3	-23.8	52.3	-13.8	Pass
0.380	Pk	34.2	0.2	34.4	58.3	-23.9	48.3	-13.9	Pass
0.534	Pk	37.8	0.3	38.1	56.0	-17.9	46.0	-7.9	Pass
16.070	Pk	35.4	2.3	37.7	60.0	-22.3	50.0	-12.3	Pass
22.930	Pk	34.6	2.9	37.5	60.0	-22.5	50.0	-12.5	Pass

Table 9-13: Conducted Emissions Receive Hot Side (Line 2)

Temperature: 74°F Humidity: 46%									
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)	Pass/ Fail
0.161	Pk	36.6	0.2	36.8	65.4	-28.6	55.4	-18.6	Pass
0.239	Pk	33.0	0.2	33.2	62.1	-28.9	52.1	-18.9	Pass
0.386	Pk	32.5	0.2	32.7	58.1	-25.4	48.1	-15.4	Pass
0.511	Pk	28.2	0.2	28.4	56.0	-27.6	46.0	-17.6	Pass
16.070	Pk	39.5	2.3	41.8	60.0	-18.2	50.0	-8.2	Pass
23.420	Pk	33.6	2.9	36.5	60.0	-23.5	50.0	-13.5	Pass

Test Personnel:



Daniel W. Baltzell		October 27, 2006
Test Engineer	Signature	Date Of Test

10 Radiated Emissions – FCC §15.209; RSS-210 §A8.5 and RSS-Gen

10.1 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.

10.2 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 10^{th} 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 10-1: Radiated Emissions Test Equipment

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
900151	Rohde and Schwarz	HFH2-Z2	Antenna (Loop, 9 kHz - 30 MHz)	827525/019	9/15/09
901053	Schaffner Chase	CBL6112B	Bi-Log Antenna (20 MHz - 2 GHz)	2648	11/1/06
901365	Miteq	JS4-00102600-41-5P	Amplifier, 15 V, 0.1-26 GHz, 28 dB gain, power 5 dB	1094152	3/24/07
900905	Rhein Tech Labs	PR-1040	OATS 1 Preamplifier 40 dB (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
901425	Insulated Wire, Inc.	KPS-1503-2400-KPS	RF cable, 20'	NA	12/12/06
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
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
900889	Hewlett Packard	85685A	RF Preselector (20 Hz - 2 GHz)	3146A01309	4/12/07
900969	Hewlett Packard	85650A	Quasi-Peak Adapter	2412A00414	9/13/07
900930	Hewlett Packard	85662A	Spectrum Analyzer Display Section	3144A20839	9/13/07
900931	Hewlett Packard	8566B	Spectrum Analyzer (100 Hz - 22 GHz)	3138A07771	9/13/07

10.3 Radiated Emissions Test Results

10.3.1 Radiated Emissions Digital/Receiver Test Data

Table 10-2: Digital/Receiver Radiated Emissions AQL Tabletop with Wire Antenna

Temperature: 49°F Humidity: 63%										
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**
52.230	Qp	H	0	1.0	30.8	-21.0	9.8	40.0	-30.2	Pass
68.500	Qp	H	0	1.0	30.9	-22.9	8.0	40.0	-32.0	Pass
78.130	Qp	H	0	1.0	39.1	-21.9	17.2	40.0	-22.8	Pass
152.800	Qp	H	0	1.0	31.0	-17.3	13.7	43.5	-29.8	Pass
156.300	Qp	H	0	1.0	31.0	-17.5	13.5	43.5	-30.0	Pass
168.995	Qp	H	9	1.0	31.1	-18.1	13.0	43.5	-30.5	Pass

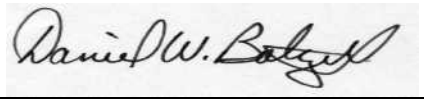
Table 10-3: Digital/Receiver Radiated Emissions for Base Station with Straight Monopole Antenna

Temperature: 49°F Humidity: 63%										
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**
52.230	Qp	H	0	1.0	30.7	-21.0	9.7	40.0	-30.3	Pass
77.983	Qp	H	0	1.0	30.9	-21.9	9.0	40.0	-31.0	Pass
88.084	Qp	H	0	1.0	31.3	-20.0	11.3	43.5	-32.2	Pass
142.995	Qp	H	0	1.0	39.5	-16.7	22.8	43.5	-20.7	Pass
155.988	Qp	H	0	1.0	30.9	-17.4	13.5	43.5	-30.0	Pass
169.003	Qp	H	0	1.0	33.7	-18.1	15.6	43.5	-27.9	Pass

Table 10-4: Digital/Receiver Radiated Emissions for Aqua Pod with Planar Inverted-F Antenna

Temperature: 49°F Humidity: 63%										
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**
32.035	Qp	V	0	1.0	47.8	-11.5	36.3	40.0	-3.7	Pass
36.130	Qp	V	0	1.0	40.4	-13.8	26.6	40.0	-13.4	Pass
76.085	Qp	V	0	1.5	49.2	-21.2	28.0	40.0	-12.0	Pass
92.090	Qp	V	0	1.0	44.8	-17.7	27.1	43.5	-16.4	Pass
200.000	Qp	H	0	1.0	37.5	-18.1	19.4	43.5	-24.1	Pass
494.002	Qp	V	0	1.0	37.3	-8.4	28.9	46.0	-17.1	Pass

Test Personnel:



Daniel W. Baltzell		October 27, 2006
Test Engineer	Signature	Date Of Test

10.3.2 Radiated Emissions Harmonics/Spurious Test Data for AQL Tabletop with Wire Antenna

Table 10-5: Radiated Emissions Harmonics/Spurious Channel 0 (TX Frequency: 903 MHz) AQL Tabletop with Wire Antenna

Emission Frequency (MHz)	Peak Analyzer Reading (dBuV) (1 MHz RBW/VBW)	Average Analyzer Reading (dBuV) (1 MHz RBW/10 Hz VBW)	Site Correction Factor (dB/m)	Average Emission Level (dBuV/m)	Average Limit (dBuV/m)	Average Margin (dB)
903.0113	80.4	78.5	24.3	102.8	fundamental	
1806.023	32.4	24.2	30.8	55.0	82.8	-27.8
2709.034	40.4	32.1	-5.1	27.0	54.0	-27.0
3612.045	41.9	33.7	-4.4	29.3	54.0	-24.7
4515.057	42.8	37.0	2.0	39.0	54.0	-15.0
5418.068	44.1	39.6	2.6	42.2	54.0	-11.8
6321.079	43.3	35.2	3.3	38.5	82.8	-44.3
7224.090	40.9	29.8	3.3	33.1	82.8	-49.7
8127.102	37.7	24.8	3.8	28.6	54.0	-25.4
9030.113	38.7	25.0	9.6	34.6	54.0	-19.4

Table 10-6: Radiated Emissions Harmonics/Spurious Channel 37 (TX Frequency: 915 MHz) AQL Tabletop with Wire Antenna

Emission Frequency (MHz)	Peak Analyzer Reading (dBuV) (1 MHz RBW/VBW)	Average Analyzer Reading (dBuV) (1 MHz RBW/10 Hz VBW)	Site Correction Factor (dB/m)	Average Emission Level (dBuV/m)	Average Limit (dBuV/m)	Average Margin (dB)
915.000	80.3	78.3	24.2	102.5	fundamental	
1830.000	32.7	25.0	31.1	56.1	82.5	-26.4
2745.000	40.5	34.2	-4.8	29.4	54.0	-24.6
3660.000	40.6	34.2	-4.2	30.0	54.0	-24.0
4575.000	43.2	38.4	0.5	38.9	54.0	-15.1
5490.000	48.7	45.8	2.8	48.6	82.5	-33.9
6405.000	44.0	37.0	3.4	40.4	82.5	-42.1
7320.000	41.2	28.8	3.3	32.1	54.0	-21.9
8235.000	39.5	25.2	9.5	34.7	54.0	-19.3
9150.000	35.0	25.2	10.0	35.2	54.0	-18.8

Table 10-7: Radiated Emissions Harmonics/Spurious Channel 74 (TX Frequency: 927 MHz) AQL Tabletop with Wire Antenna

Emission Frequency (MHz)	Peak Analyzer Reading (dBuV) (1 MHz RBW/VBW)	Average Analyzer Reading (dBuV) (1 MHz RBW/10 Hz VBW)	Site Correction Factor (dB/m)	Average Emission Level (dBuV/m)	Average Limit (dBuV/m)	Average Margin (dB)
927.018	80.9	79.0	24.3	103.3	fundamental	
1854.036	31.7	22.9	30.3	53.2	83.3	-30.1
2781.054	39.9	29.5	-5.3	24.2	54.0	-29.8
3708.072	38.9	32.0	-4.2	27.8	54.0	-26.2
4635.090	42.7	35.0	0.9	35.9	54.0	-18.1
5562.108	46.1	42.4	2.8	45.2	83.3	-38.1
6489.126	44.2	32.7	3.7	36.4	83.3	-46.9
7416.144	32.8	31.5	4.0	35.5	54.0	-18.5
8343.162	36.2	25.5	8.8	34.3	54.0	-19.7
9270.180	35.3	25.1	9.0	34.1	83.3	-49.2

10.3.3 Radiated Emissions Harmonics/Spurious Test Data for Base Station with Straight Monopole Antenna

Table 10-8: Radiated Emissions Harmonics/Spurious Channel 0 (TX Frequency: 903 MHz) Base Station with Straight Monopole Antenna

Emission Frequency (MHz)	Peak Analyzer Reading (dBuV) (1 MHz RBW/VBW)	Average Analyzer Reading (dBuV) (1 MHz RBW/10 Hz VBW)	Site Correction Factor (dB/m)	Average Emission Level (dBuV/m)	Average Limit (dBuV/m)	Average Margin (dB)
903.011	82.5	80.0	24.3	104.3	fundamental	
1806.023	26.0	13.7	30.8	44.5	84.3	-39.8
2709.034	40.9	33.3	-5.1	28.2	54.0	-25.8
3612.045	41.3	34.1	-4.4	29.7	54.0	-24.3
4515.057	39.4	29.7	2.0	31.7	54.0	-22.3
5418.068	45.2	41.0	2.6	43.6	54.0	-10.4
6321.079	39.0	28.6	3.3	31.9	84.3	-52.4
7224.090	40.7	28.3	3.3	31.6	84.3	-52.7
8127.102	36.0	25.0	3.8	28.8	54.0	-25.2
9030.113	34.9	24.1	9.6	33.7	54.0	-20.3

Table 10-9: Radiated Emissions Harmonics/Spurious Channel 37 (TX Frequency: 915 MHz) Base Station with Straight Monopole Antenna

Emission Frequency (MHz)	Peak Analyzer Reading (dBuV) (1 MHz RBW/VBW)	Average Analyzer Reading (dBuV) (1 MHz RBW/10 Hz VBW)	Site Correction Factor (dB/m)	Average Emission Level (dBuV/m)	Average Limit (dBuV/m)	Average Margin (dB)
915.000	82.5	79.2	24.2	103.4	fundamental	
1830.000	26.6	16.4	31.1	47.5	83.4	-35.9
2745.000	43.5	37.7	-4.8	32.9	54.0	-21.1
3660.000	41.7	34.5	-4.2	30.3	54.0	-23.7
4575.000	40.1	32.0	0.5	32.5	54.0	-21.5
5490.000	44.3	39.5	2.8	42.3	83.4	-41.1
6405.000	38.4	26.4	3.4	29.8	83.4	-53.6
7320.000	40.4	28.3	3.3	31.6	54.0	-22.4
8235.000	38.4	25.2	9.5	34.7	54.0	-19.3
9150.000	37.0	24.4	10.0	34.4	54.0	-19.6

Table 10-10: Radiated Emissions Harmonics/Spurious Channel 74 (TX Frequency: 927 MHz) Base Station with Straight Monopole Antenna

Emission Frequency (MHz)	Peak Analyzer Reading (dBuV) (1 MHz RBW/VBW)	Average Analyzer Reading (dBuV) (1 MHz RBW/10 Hz VBW)	Site Correction Factor (dB/m)	Average Emission Level (dBuV/m)	Average Limit (dBuV/m)	Average Margin (dB)
927.018	75.1	71.6	24.3	95.9	fundamental	
1854.036	27.8	17.7	30.3	48.0	75.9	-27.9
2781.054	40.3	33.1	-5.3	27.8	54.0	-26.2
3708.072	41.4	35.8	-4.2	31.6	54.0	-22.4
4635.090	40.6	32.6	0.9	33.5	54.0	-20.5
5562.108	43.6	38.3	2.8	41.1	75.9	-34.8
6489.126	40.1	30.2	3.7	33.9	75.9	-42.0
7416.144	40.3	28.9	4.0	32.9	54.0	-21.1
8343.162	37.4	25.2	8.8	34.0	54.0	-20.0
9270.180	37.3	24.2	9.0	33.2	75.9	-42.7

10.3.4 Radiated Emissions Harmonics/Spurious Test Data for Aqua Pod with Planar Inverted-F Antenna

Table 10-11: Radiated Emissions Harmonics/Spurious Channel 0 (TX Frequency: 903 MHz) Aqua Pod with Planar Inverted-F Antenna

Emission Frequency (MHz)	Peak Analyzer Reading (dBuV) (1 MHz RBW/VBW)	Average Analyzer Reading (dBuV) (1 MHz RBW/10 Hz VBW)	Site Correction Factor (dB/m)	Average Emission Level (dBuV/m)	Average Limit (dBuV/m)	Average Margin (dB)
903.011	78.9	76.7	24.3	101.0	fundamental	
1806.023	30.9	17.3	30.8	48.1	81.0	-32.9
2709.034	32.4	19.8	-5.1	14.7	54.0	-39.3
3612.045	29.9	16.9	-4.4	12.5	54.0	-41.5
4515.057	31.4	18.7	2.0	20.7	54.0	-33.3
5418.068	31.7	21.7	2.6	24.3	54.0	-29.7
6321.079	43.8	35.9	3.3	39.2	81.0	-41.8
7224.090	39.9	27.7	3.3	31.0	81.0	-50.0
8127.102	37.9	25.5	3.8	29.3	54.0	-24.7
9030.113	39.1	25.1	9.6	34.7	54.0	-19.3

Table 10-12: Radiated Emissions Harmonics/Spurious Channel 37 (TX Frequency: 915 MHz) Aqua Pod with Planar Inverted-F Antenna

Emission Frequency (MHz)	Peak Analyzer Reading (dBuV) (1 MHz RBW/VBW)	Average Analyzer Reading (dBuV) (1 MHz RBW/10 Hz VBW)	Site Correction Factor (dB/m)	Average Emission Level (dBuV/m)	Average Limit (dBuV/m)	Average Margin (dB)
915.000	77.1	74.5	24.2	98.7	fundamental	
1830.000	61.3	59.6	0.8	60.4	78.7	-18.3
2745.000	33.8	23.1	-4.8	18.3	54.0	-35.7
3660.000	31.6	17.5	-4.2	13.3	54.0	-40.7
4575.000	31.9	19.1	0.5	19.6	54.0	-34.4
5490.000	34.0	23.7	2.8	26.5	78.7	-52.2
6405.000	46.1	38.9	3.4	42.3	78.7	-36.4
7320.000	42.8	31.2	3.3	34.5	54.0	-19.5
8235.000	38.9	25.5	9.5	35.0	54.0	-19.0
9150.000	39.4	25.7	10.0	35.7	54.0	-18.3

Table 10-13: Radiated Emissions Harmonics/Spurious Channel 74 (TX Frequency: 927 MHz) Aqua Pod with Planar Inverted-F Antenna

Emission Frequency (MHz)	Peak Analyzer Reading (dBuV) (1 MHz RBW/VBW)	Average Analyzer Reading (dBuV) (1 MHz RBW/10 Hz VBW)	Site Correction Factor (dB/m)	Average Emission Level (dBuV/m)	Average Limit (dBuV/m)	Average Margin (dB)
927.018	78.6	76.4	24.3	100.7	fundamental	
1854.036	62.8	60.9	1.1	62.0	80.7	-18.7
2781.054	33.3	19.5	-5.3	14.2	54.0	-39.8
3708.072	30.5	17.9	-4.2	13.7	54.0	-40.3
4635.090	30.3	17.4	0.9	18.3	54.0	-35.7
5562.108	32.1	22.4	2.8	25.2	80.7	-55.5
6489.126	44.2	34.8	3.7	38.5	80.7	-42.2
7416.144	44.4	35.9	4.0	39.9	54.0	-14.1
8343.162	40.5	26.1	8.8	34.9	54.0	-19.1
9270.180	39.4	25.8	9.0	34.8	80.7	-45.9

10.3.5 Radiated Emissions Harmonics/Spurious Test Data – Hopping Mode

Table 10-14: Radiated Emissions Harmonics/Spurious Hopping Mode Aqua Pod Planar Inverted-F Antenna

Emission Frequency (MHz)	Peak Analyzer Reading (dBuV) (1 MHz RBW/ VBW)	Average Analyzer Reading (dBuV) (1 MHz RBW/ 10 Hz VBW)	Site Correction Factor (dB/m)	Average Emission Level (dBuV/m)	Average Limit (dBuV/m)	Average Margin (dB)
273.0	41.2	8.8	-6.5	2.3	54.0	-51.7
325.0	33.1	0.7	-5.2	-4.5	54.0	-58.5
611.0	39.1	6.7	0.8	7.5	54.0	-46.5
1838.0	85.3	52.9	14.5	67.4	78.7	-11.3
2738.3	35.3	2.9	-4.9	-2.0	54.0	-56.0
3658.9	38.8	6.4	-4.3	2.1	54.0	-51.9
4570.9	40.4	8.0	1.1	9.1	54.0	-44.9
5502.7	46.1	13.7	2.8	16.5	54.0	-37.5
6405.7	41.7	9.3	3.4	12.7	78.7	-66.0
7383.6	40.6	8.2	2.5	10.7	54.0	-43.3
8233.8	41.2	8.8	9.5	18.3	54.0	-35.7
9157.8	38.9	6.5	9.9	16.4	54.0	-37.6

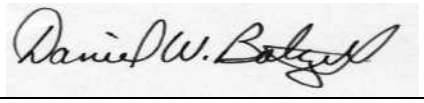
Table 10-15: Radiated Emissions Harmonics/Spurious Hopping Mode Base Station Straight Monopole Antenna

Emission Frequency (MHz)	Peak Analyzer Reading (dBuV) (1 MHz RBW/ VBW)	Average Analyzer Reading (dBuV) (1 MHz RBW/ 10 Hz VBW)	Site Correction Factor (dB/m)	Average Emission Level (dBuV/m)	Average Limit (dBuV/m)	Average Margin (dB)
260.0	40.9	8.5	-13.5	27.4	54.0	-26.6
273.0	33.5	1.1	-13.9	19.6	54.0	-34.4
325.0	41.1	8.7	-12.5	28.6	54.0	-25.4
611.0	33.5	1.1	-5.4	28.1	54.0	-25.9
1830.5	69.5	37.1	9.6	46.7	75.9	-29.2
2712.9	39.3	6.9	-4.9	2.0	54.0	-52.0
3646.9	38.2	5.8	-4.3	1.5	54.0	-52.5
4584.6	36.9	4.5	1.1	5.6	54.0	-48.4
5486.8	43.3	10.9	2.8	13.7	54.0	-40.3
6329.7	33.5	1.1	3.4	4.5	75.9	-71.4
7312.8	34.9	2.5	2.5	5.0	54.0	-49.0
8138.6	29.4	-3.0	9.5	6.5	54.0	-47.5
9068.0	28.8	-3.6	9.9	6.3	54.0	-47.7

Table 10-16: Radiated Emissions Harmonics/Spurious Hopping Mode AQL Tabletop Wire Antenna

Emission Frequency (MHz)	Peak Analyzer Reading (dBuV) (1 MHz RBW/ VBW)	Average Analyzer Reading (dBuV) (1 MHz RBW/ 10 Hz VBW)	Site Correction Factor (dB/m)	Average Emission Level (dBuV/m)	Average Limit (dBuV/m)	Average Margin (dB)
273.0	42.1	9.7	-6.5	3.2	54.0	-50.8
325.0	40.6	8.2	-5.2	3.0	54.0	-51.0
611.0	39.9	7.5	0.8	8.3	54.0	-45.7
1844.4	83.6	51.2	14.5	65.7	82.5	-16.8
2746.3	36.8	4.4	-4.9	-0.5	54.0	-54.5
3640.7	38.0	5.6	-4.3	1.3	54.0	-52.7
4603.5	41.2	8.8	1.1	9.9	54.0	-44.1
5453.6	44.9	12.5	2.8	15.3	54.0	-38.7
6380.8	41.0	8.6	3.4	12.0	82.5	-70.5
7297.4	40.4	8.0	2.5	10.5	54.0	-43.5
8240.3	41.2	8.8	9.5	18.3	54.0	-35.7
9191.9	40.1	7.7	9.9	17.6	54.0	-36.4

Test Personnel:



Daniel W. Baltzell		October 26, 2006
Test Engineer	Signature	Date Of Tests

11 Conclusion

The data in this measurement report shows that the EUT as tested, **Goldline Controls, Inc.** Model #'s G1-011024 and G1-011029, FCC ID: RNW-MD-FH-09-01, IC: 5110A-MDFH0901, complies with all the applicable requirements of Parts 2 and 15 of the FCC Rules and Regulations, and Industry Canada RSS-210.