Engineering and Testing for EMC and Safety Compliance

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

Test Lab:	Applicant:
Rhein Tech Laboratories, Inc. Phone: 703-689-0368 360 Herndon Parkway Fax: 703-689-2056 Suite 1400 Web: www.rheintech.com Herndon, VA 20170 E-Mail: atcbinfo@rheintech.com	Vocollect, Inc. Phone: 412-349-2580 Contact: Joe Lesik Fax: 412-829-1063 703 Rodi Road Pittsburgh, PA 15235

FCC ID/ IC:	MQO-TT-800-1-1/ 2570A-TT80011	**Test Report Date:**	October 25, 2010
Platform:	N/A	**RTL Work Order Number:**	2010175-1
Model Name/ Model Number:	A500/TT-800-1-1	**RTL Quote Number:**	QRTL10-396

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 (10-01-09)
Industry Canada:	RSS-210 Issue 7: 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
2402-2480	0.003	N/A	1M14FXD

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: October 25, 2010

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

These tests are accredited and meet the requirements of ISO/IEC 17025 as verified by ANSI-ASQ National Accreditation Board/ACLASS. Refer to certificate and scope of accreditation AT-1445.

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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	Body Worn Terminal
Model Name	A500
Power Supply	Battery
Modulation Type	FHSS – Bluetooth
Transfer Rate	1, 2, 3 Mb/s
Frequency Range	2402–2480 MHz
Antenna Connector Type	Internal
Antenna Type	Internal

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 Vocollect, Inc. Model: A500, Model # TT-800-1-1, FCC ID: MQO-TT-800-1-1, IC: 2570A-TT80011.

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 – 1 Mbps

Channel	Frequency (MHz)
0	2402
39	2441
78	2480

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 Bluetooth

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)(ii)	20 dB Bandwidth	Pass
FCC 15.247(a)(1)(iii)	Hopping Characteristics	Pass
FCC 15.247(a)(1)(iii)	Average Time of Occupancy	Pass

2.4 Test System Details

The test sample was received on September 20, 2010. 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 (EUT)

Part	Manufacturer	Model #	Serial Number	FCC ID	Cable Description	RTL Bar Code
A500 Talkman WLAN/Bluetooth Terminal	Vocollect, Inc.	TT-800-1-1	30100051	MQO-TT-800-1-1	N/A	19876
A500 Talkman WLAN/Bluetooth Terminal	Vocollect, Inc.	TT-800-1-1	30100030	MQO-TT-800-1-1	N/A	19877
Battery	Vocollect, Inc.	BT-700 (730037)	3501904392	N/A	N/A	19883
Battery	Vocollect, Inc.	BT-700 (730037)	3500201661	N/A	N/A	19884

Table 2-4: Support Equipment

Part	Manufacturer	Model	Serial Number	FCC ID	Cable Description	RTL Bar Code
Battery Charger	Vocollect, Inc.	CM-700-2	166300020A	N/A	9' unshielded	19879
Headset	Vocollect, Inc.	N/A	N/A	N/A	N/A	19869

2.5 Configuration of Tested System

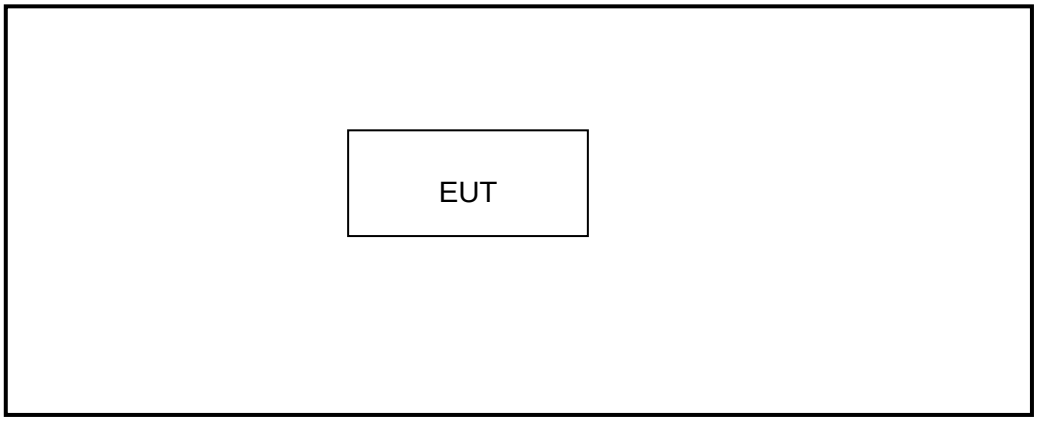


Figure 2-1: Configuration of System Under Test

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

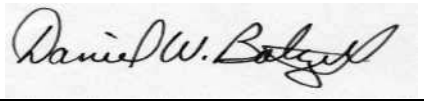
RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901184	Agilent Technologies	E4416A	EPM-P Power Meter, single channel	GB41050573	11/18/10
901356	Agilent Technologies	E9323A	Power Sensor	31764-264	11/18/10

3.2 Power Output Test Data

Table 3-2: Power Output Test Data – FHSS Bluetooth

Channel	Frequency (MHz)	Peak Power Conducted Output (dBm)
0	2402	3.3
39	2441	3.7
78	2480	3.9

Test Personnel:



Daniel W. Baltzell		September 20, 2010
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
901413	Agilent Technologies	E4448A	Spectrum Analyzer	US44020346	11/11/10
900878	Rhein Tech Laboratories	AM3-1197-0005	3 meter antenna mast, polarizing	Outdoor Range 1	Not Required
901517	Insulated Wire Inc.	KPS-1503-360-KPS-09302008	RF cable 36"	N/A	10/19/10
901242	Rhein Tech Laboratories	WRT-000-0003	Wood rotating table	N/A	Not Required
900772	EMCO	3161-02	Horn Antenna (2 - 4 GHz)	9804-1044	6/13/11

4.2 Restricted Band Edge Test Results

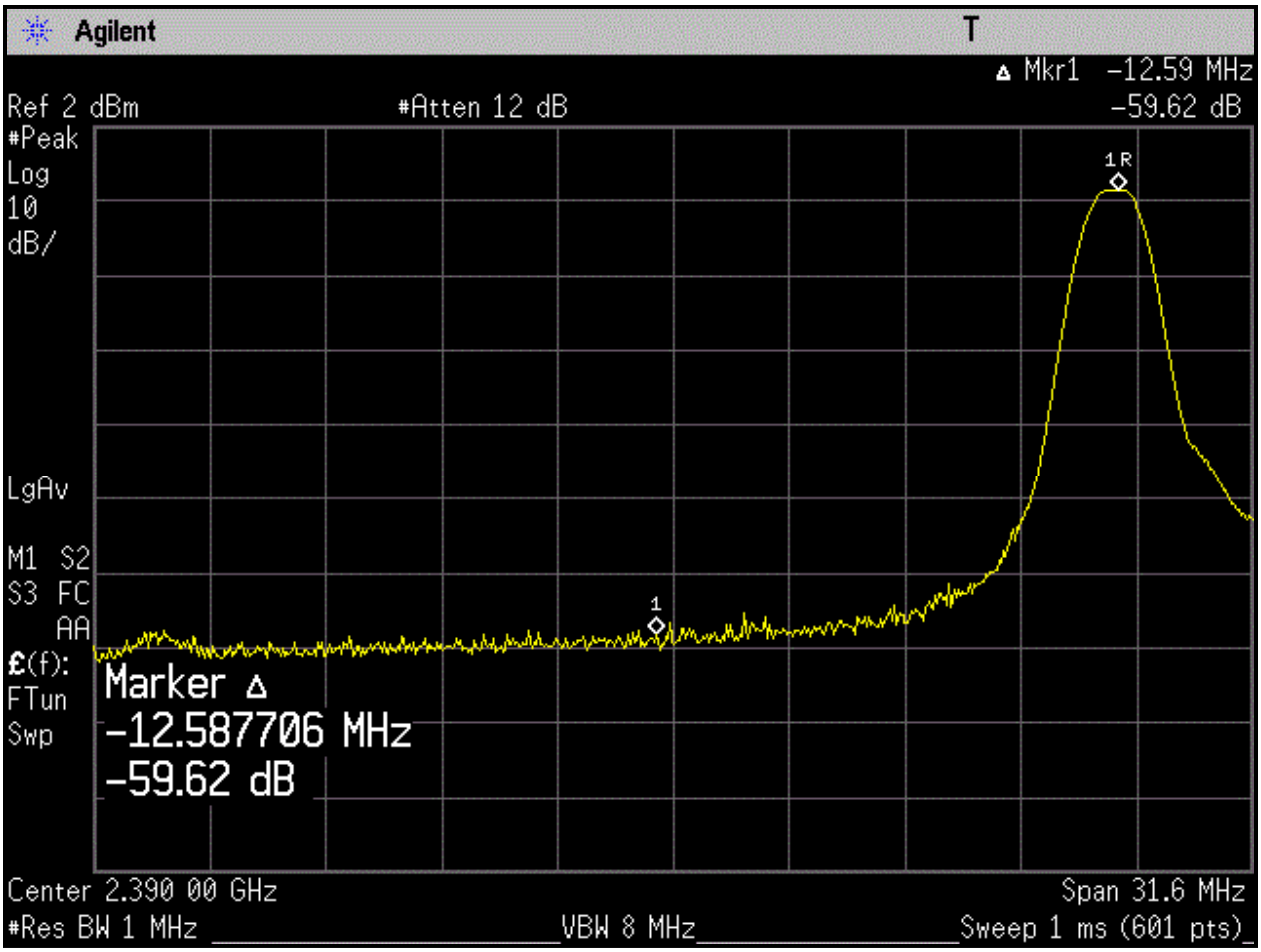
4.2.1 Calculation of Lower Band Edge

93.9 dBuV/m is the peak field strength measurement, from which the delta measurement of 58.2 dB is subtracted (reference plots), resulting in a level of 35.7 dB. This level has a margin 18.3 dB below the limit of 54 dBuV/m.

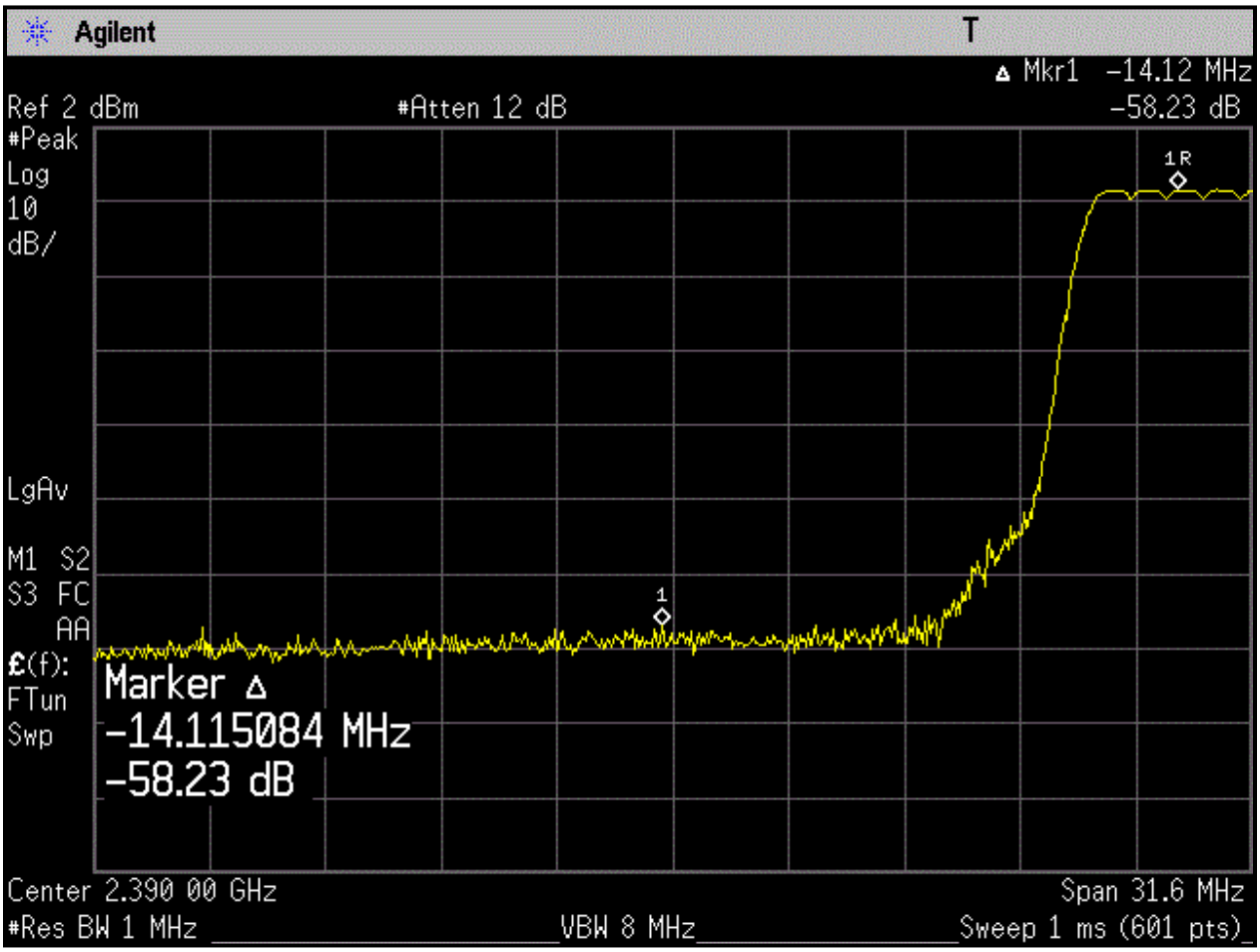
Calculation: 93.9 dBuV/m – 58.2 dB – 54 dBuV/m = -18.3 dB

Peak Field Strength of Upper Band Edge (1 MHz RBW/1 MHz VBW) = 106.0 dBuV/m
Average Field Strength of Upper Band Edge (1 MHz RBW/10 Hz VBW) = 93.9 dBuV/m
Delta measurement = 58.2 dB (note that hopping mode produced worst-case delta)

Plot 4-1: Lower Band Edge: Channel 0 (TX Frequency 2402 MHz)



Plot 4-2: Lower Band Edge: Hopping Channel 0 (TX Frequency 2402 MHz)



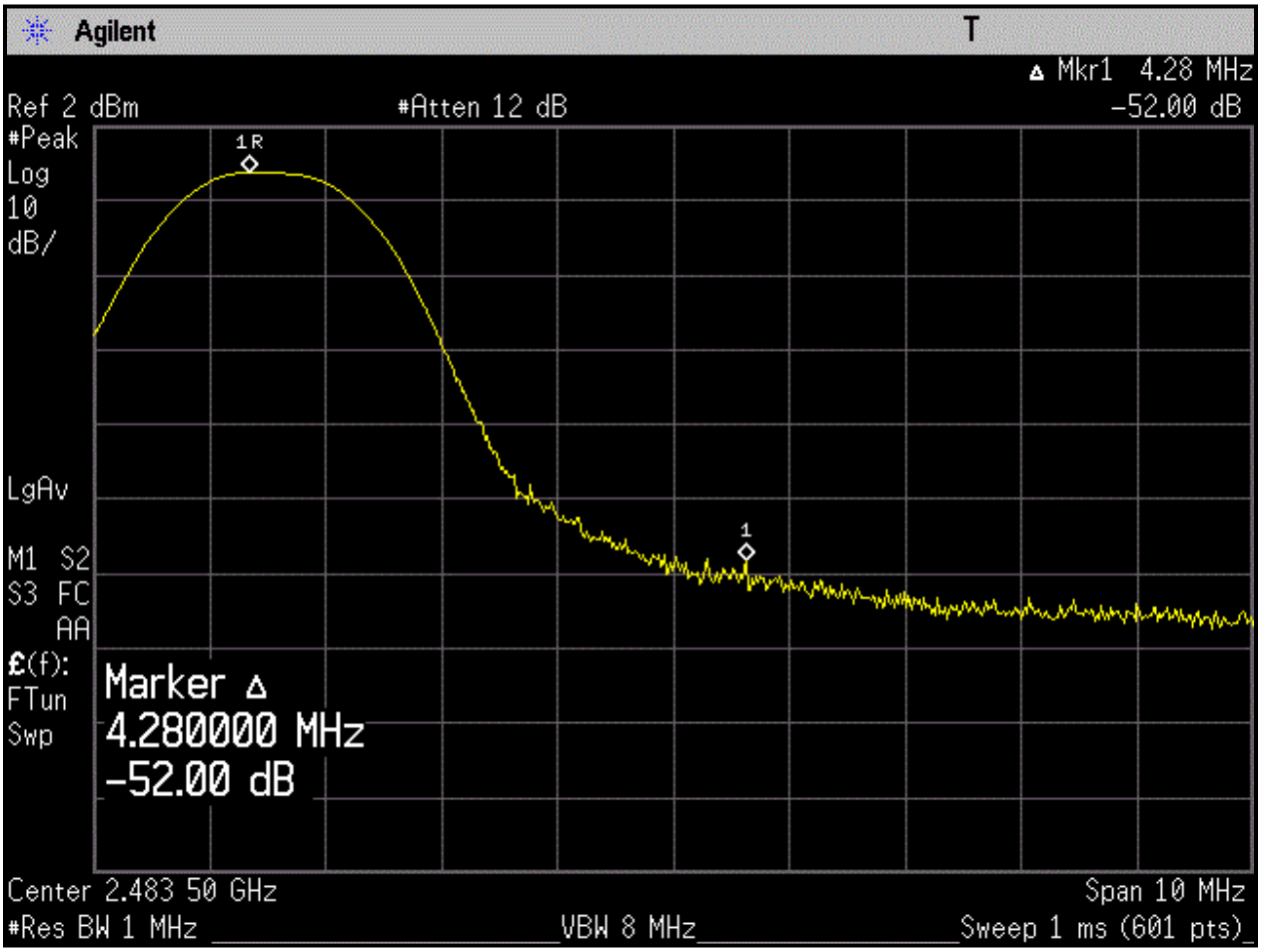
4.2.2 Calculation of Upper Band Edge

94.1 dBuV/m is the peak field strength measurement, from which the delta measurement of 52 dB is subtracted (reference plots), resulting in a level 42.1 dB. This level has a margin of 11.9 dB below the limit of 54 dBuV/m.

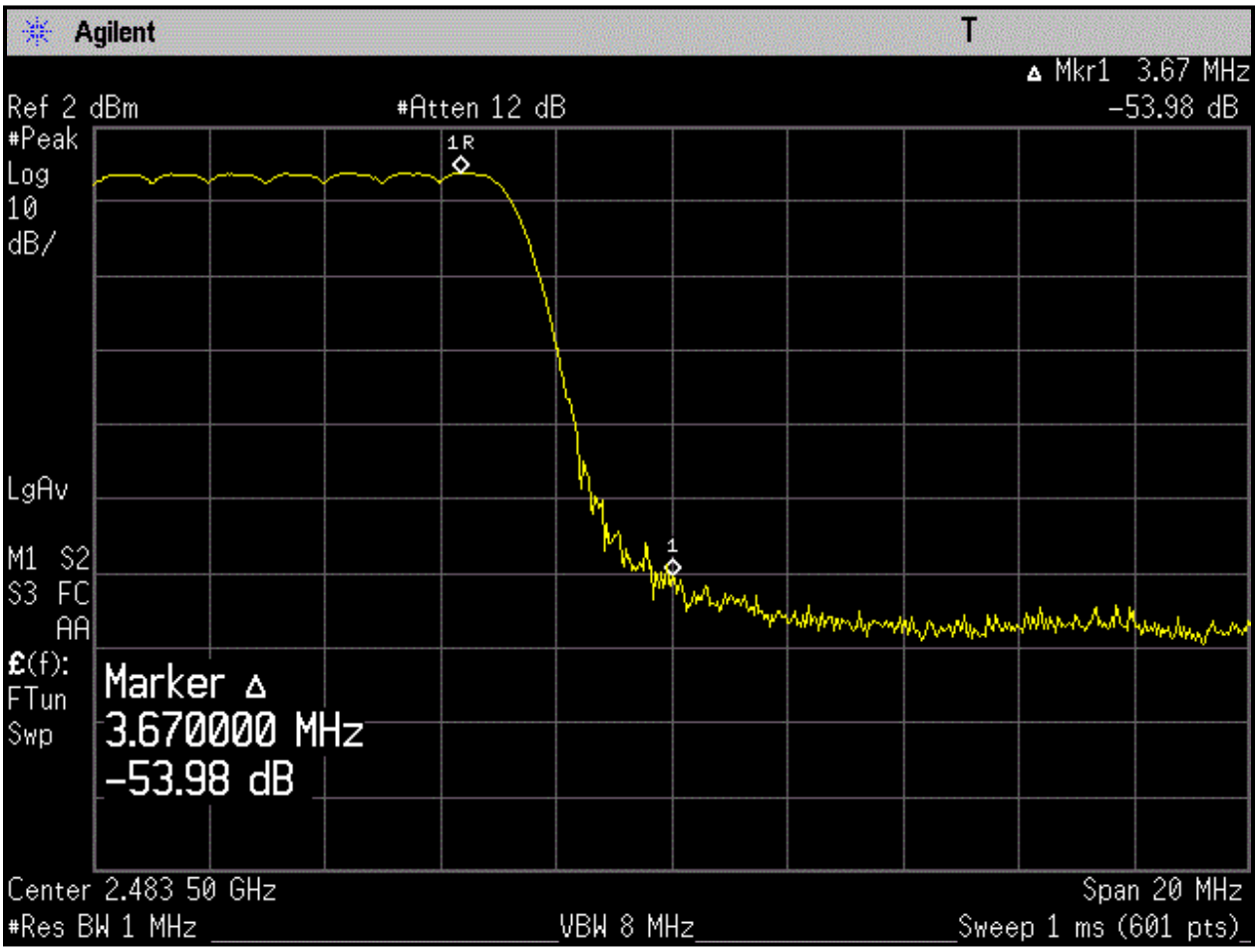
Calculation: 94.1 dBuV/m – 52 dB – 54 dBuV/m = -11.9 dB

Peak Field Strength of Upper Band Edge (1 MHz RBW/1 MHz VBW) = 106.2 dBuV/m
Average Field Strength of Upper Band Edge (1 MHz RBW/10 Hz VBW) = 94.1 dBuV/m
Delta measurement = 52 dB (note that fixed frequency mode produced worst-case delta)

Plot 4-3: Upper Band Edge: Channel 78 (TX Frequency 2480 MHz)



Plot 4-4: Upper Band Edge: Hopping Channel 78 (TX Frequency 2480 MHz)



Test Personnel:

Daniel W. Baltzell	Daniel W. Baltzell	September 21&22, 2010
Test Engineer	Signature	Dates Of Test

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: 2402 MHz, 2440 MHz and 2480 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 Test Equipment

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901413	Agilent Technologies	E4448A	Spectrum Analyzer	US44020346	11/11/10

Test Personnel:

Daniel W. Baltzell		September 21, 2010
Test Engineer	Signature	Date Of Test

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

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 100 kHz, and the video bandwidth set at 300 kHz. 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 with a 1 Mbps data rate. 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
901413	Agilent Technologies	E4448A	Spectrum Analyzer	US44020346	11/11/10

6.2 20 dB Modulated Bandwidth Test Data

Table 6-2: 20 dB Modulated Bandwidth Test Data

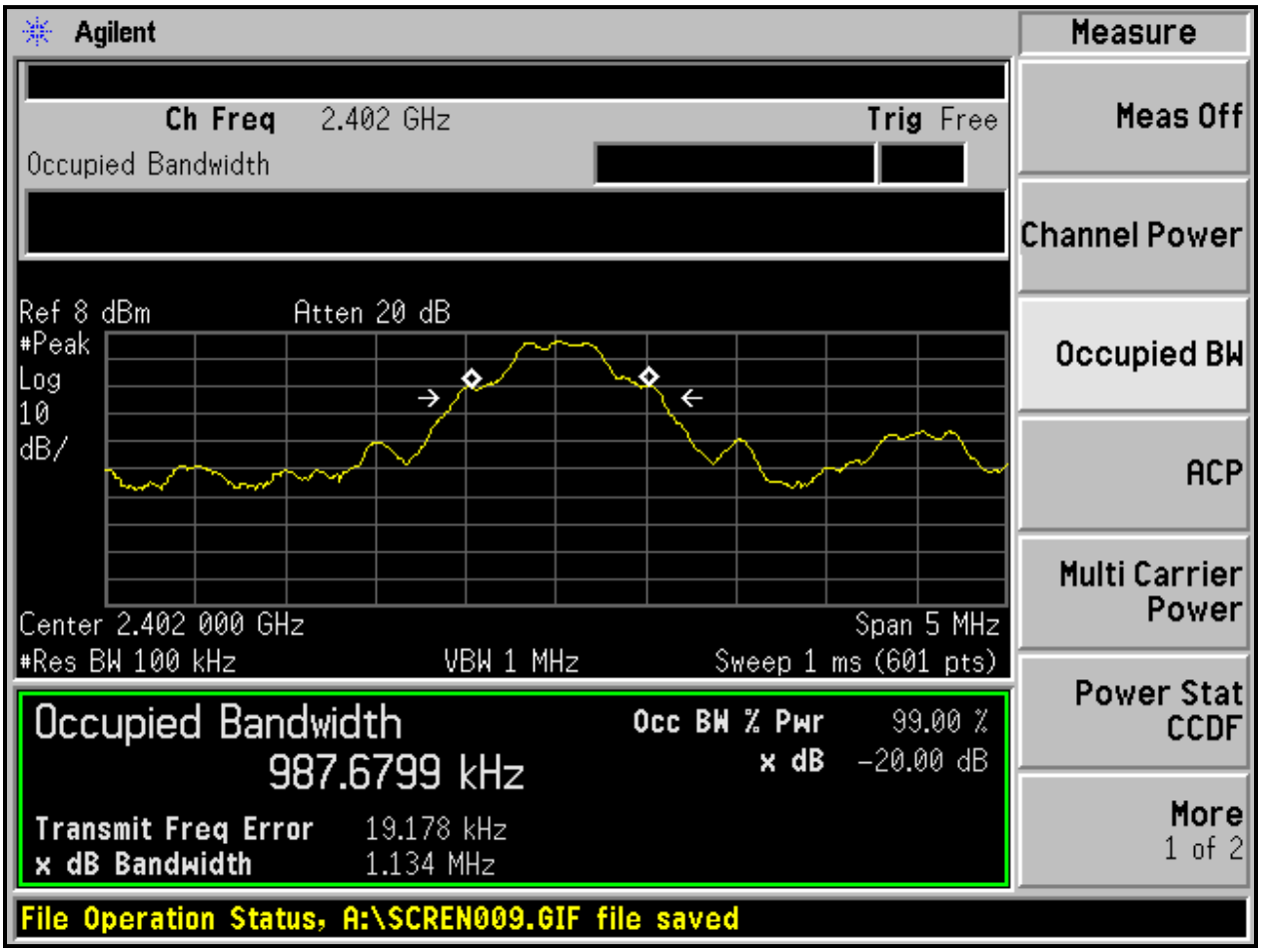
Minimum 20 dB bandwidths

Channel	20 dB Bandwidth (MHz)
0	1.13
39	1.14
78	1.14

6.3 20 dB Bandwidth Plots

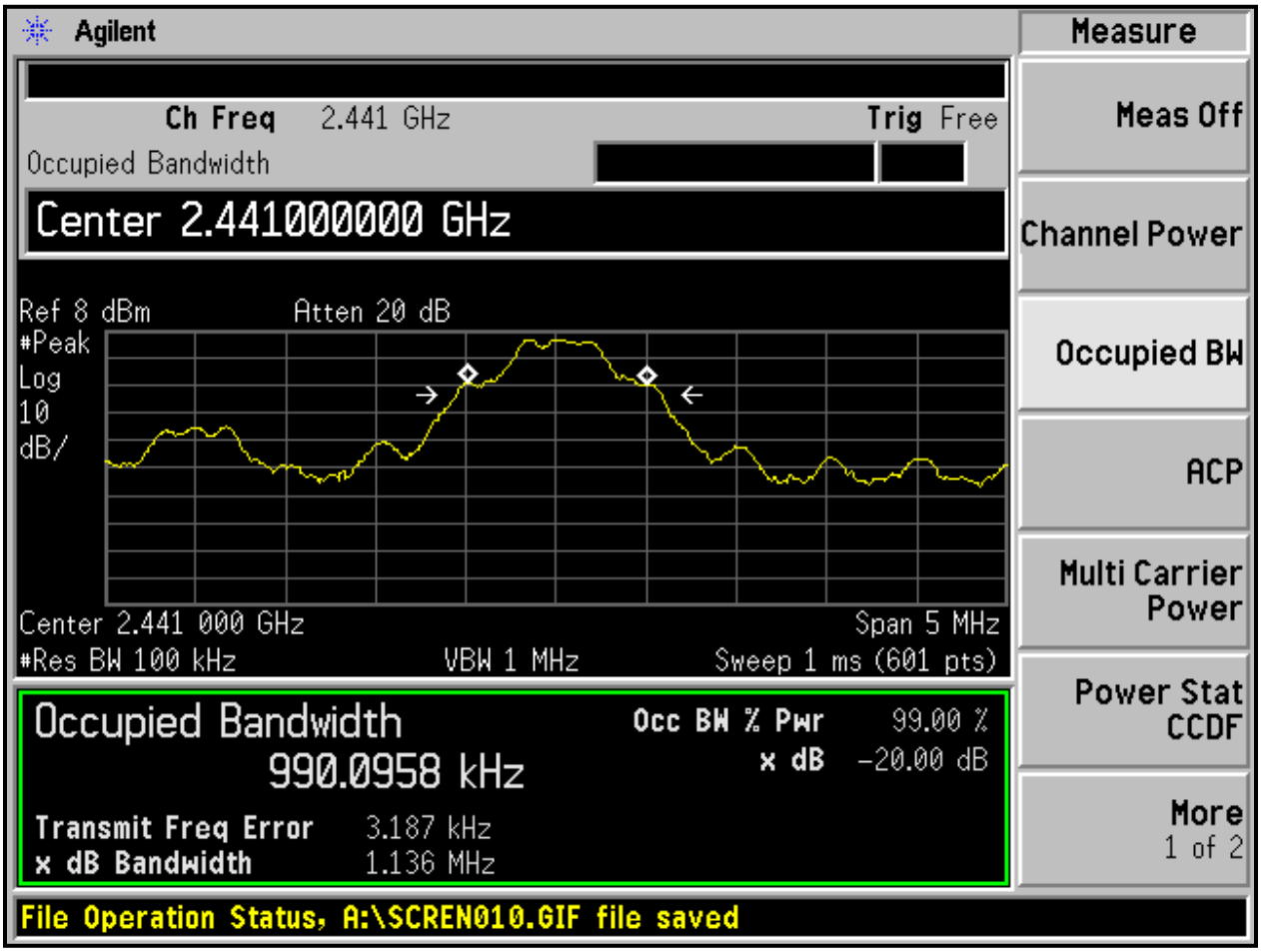
Channel:	0
Channel Frequency (MHz):	2402
Resolution Bandwidth (kHz):	100
Video Bandwidth (MHz):	1

Plot 6-1: 20 dB Bandwidth Channel 0



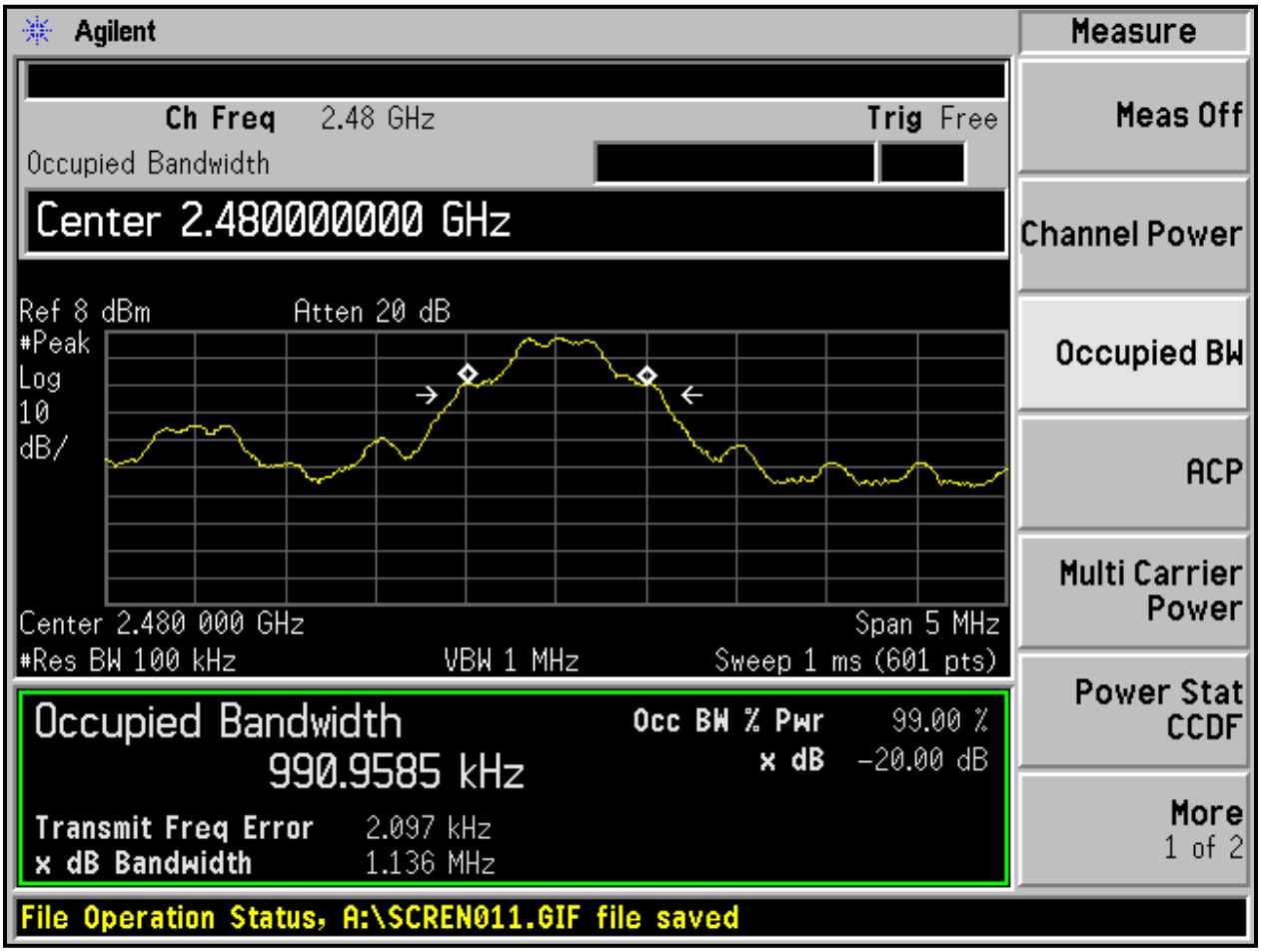
Channel:	39
Channel Frequency (MHz):	2441
Resolution Bandwidth (kHz):	100
Video Bandwidth (MHz):	1

Plot 6-2: 20 dB Bandwidth Channel 39



Channel:	78
Channel Frequency (MHz):	2480
Resolution Bandwidth (kHz):	100
Video Bandwidth (MHz):	1

Plot 6-3: 20 dB Bandwidth Channel 78



Test Personnel:

Daniel W. Baltzell	Daniel W. Baltzell	September 22, 2010
Test Engineer	Signature	Date Of Test

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

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.

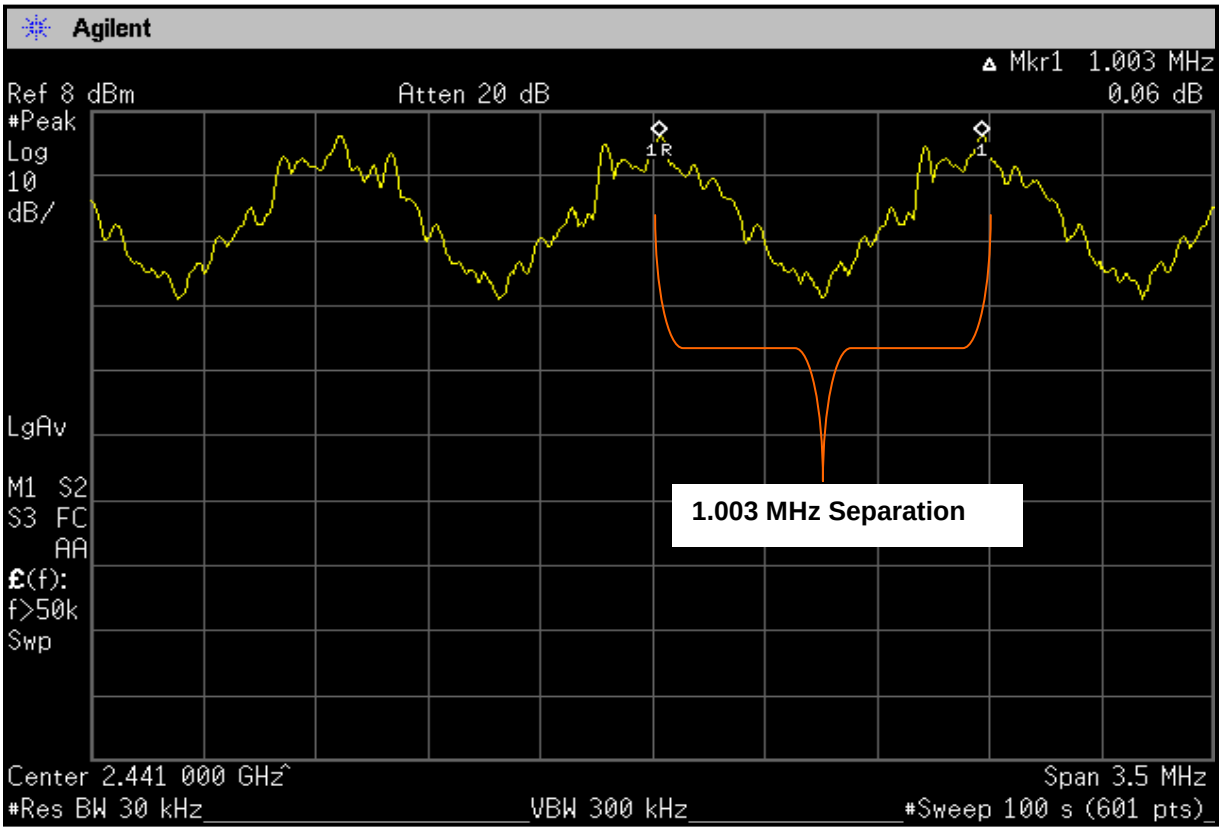
Measured frequency separation = 1.003 MHz

Table 7-1: Carrier Frequency Separation Test Equipment

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901413	Agilent Technologies	E4448A	Spectrum Analyzer	US44020346	11/11/10

7.2 Carrier Frequency Separation Test Data

Plot 7-1: Carrier Frequency Separation - Bluetooth



Test Personnel:

Daniel W. Baltzell	Daniel W. Baltzell	September 22, 2010
Test Engineer	Signature	Date Of Test

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

8.1 Hopping Characteristics Test Procedure

Frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels. 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. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels is used.

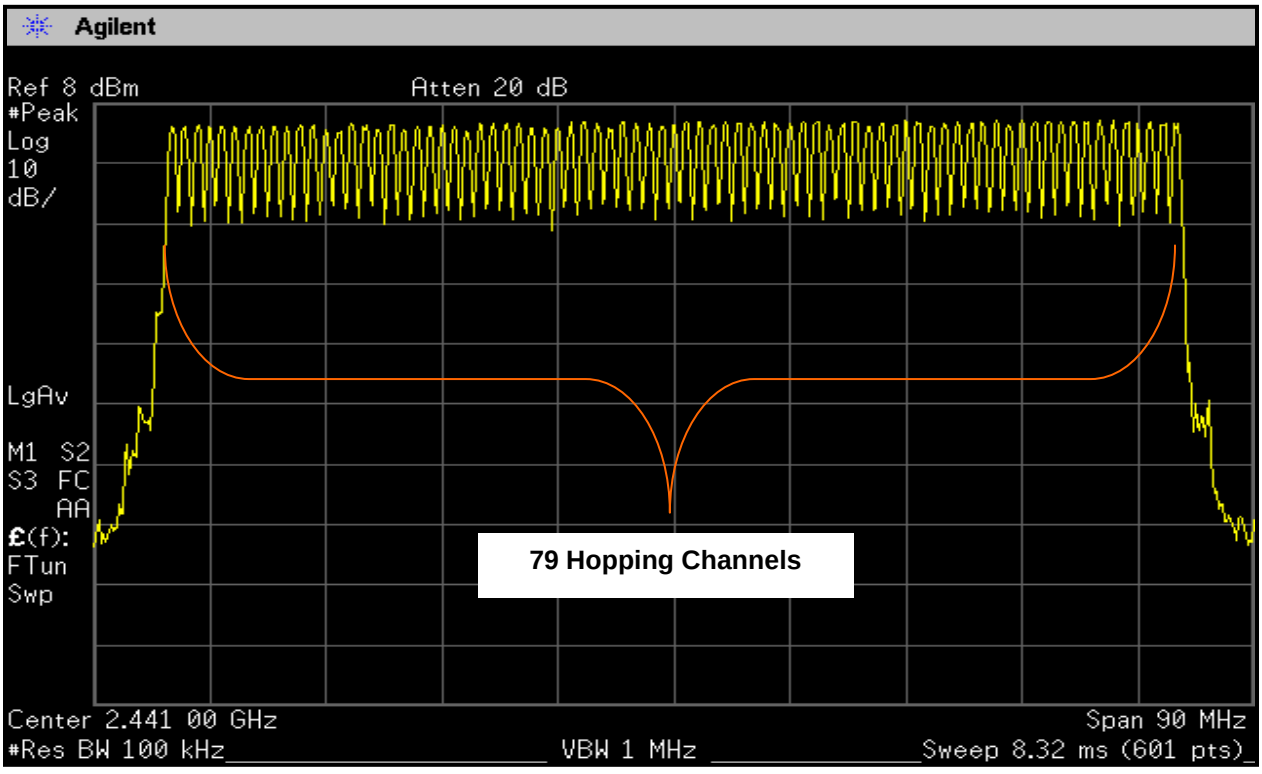
Table 8-1: Hopping Characteristics Test Equipment

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901413	Agilent Technologies	E4448A	Spectrum Analyzer	US44020346	11/11/10

8.2 Number of Hopping Frequencies

Measured number of hopping frequencies = 79

Plot 8-1: Number of Hopping Frequencies



Test Personnel:

Daniel W. Baltzell	Daniel W. Baltzell	September 22, 2010
Test Engineer	Signature	Date Of Test

8.3 Average Time of Occupancy

The spectrum analyzer sweep was set to 0.00052 second, with a zero span with video trigger to capture a pulse from the device under test. A marker delta was used to measure the dwell time for this pulse. The sweep was then set to single sweep for 5 s (it was not possible to get a suitable display with a sweep time of 31.6 s).

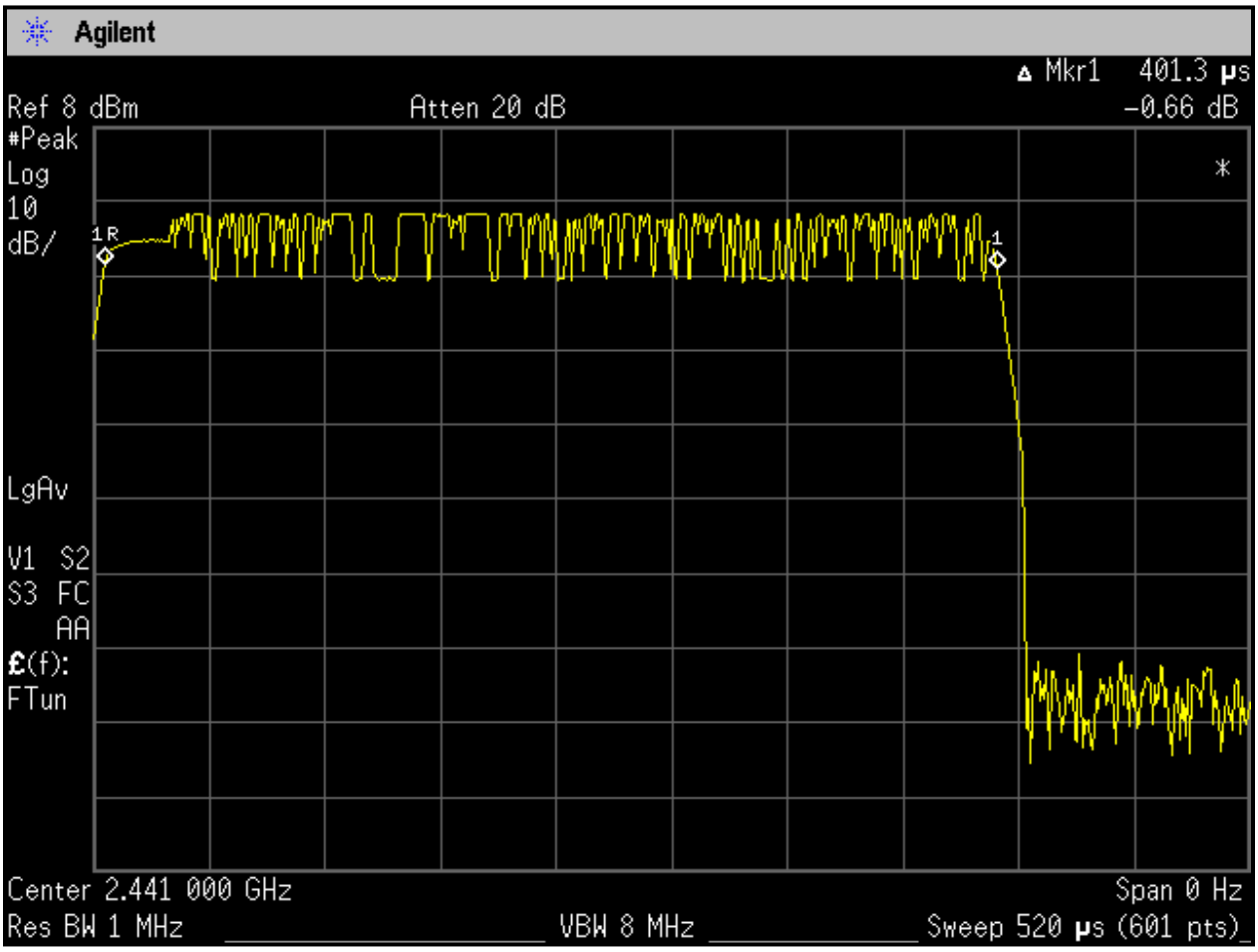
The number of pulses in 5 s was 50. Therefore, the number of pulses in a period of 0.4 seconds x 79 hopping channels (31.6 s) would be 316 pulses.

The average time of occupancy in the above period (31.6 s) is equal to 316 pulses x 0.4013 ms = 127 ms, which meets the limit as defined by 15.247(a)(1)(iii) of 0.4 seconds.

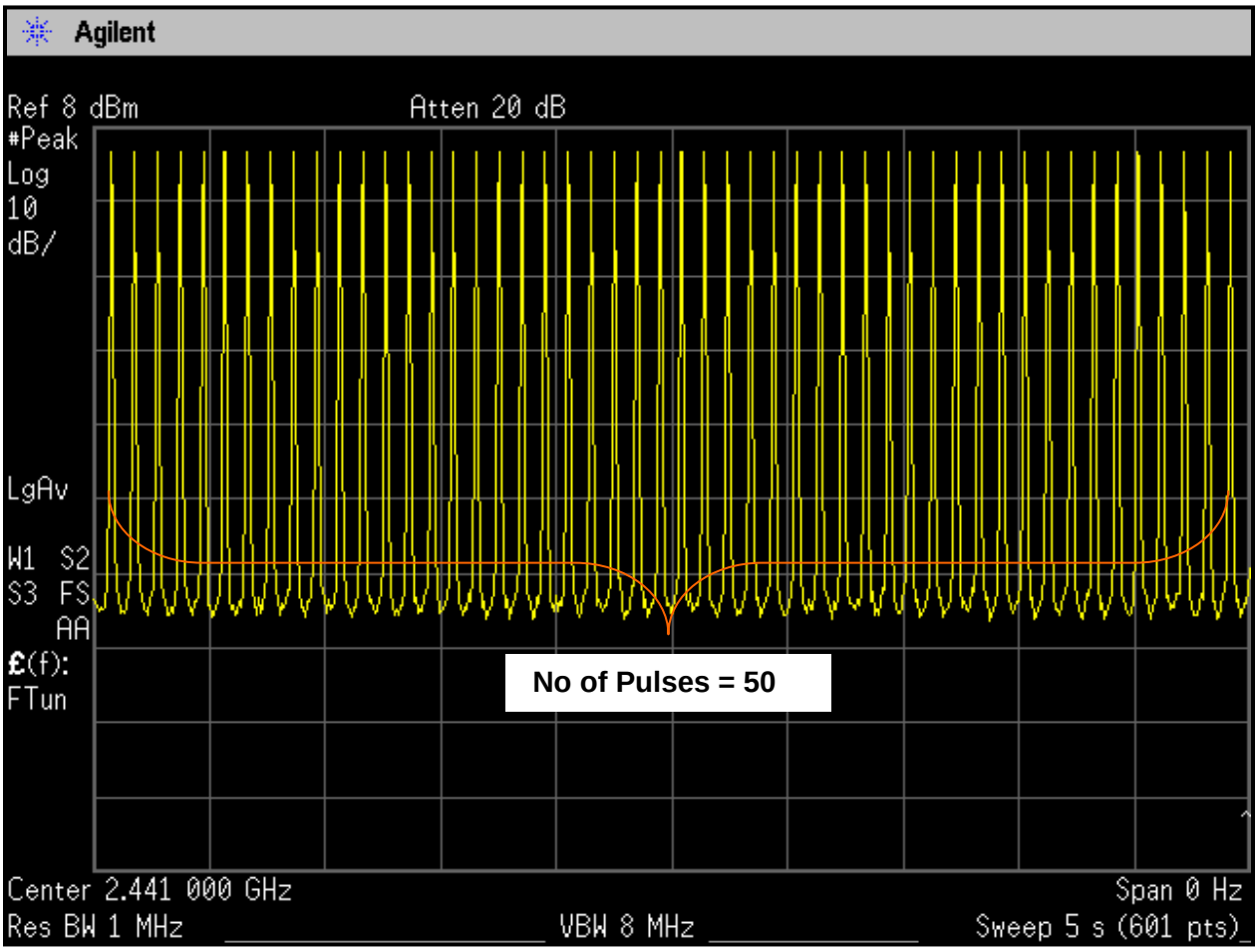
Table 8-2: Average Time of Occupancy Test Equipment

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901413	Agilent Technologies	E4448A	Spectrum Analyzer	US44020346	11/11/10

Plot 8-2: Time of Occupancy (Dwell Time)



Plot 8-3: Time of Occupancy (Dwell Time 5 Second Sweep)



Number of pulses in 5 seconds: 50

Therefore, the number of pulses in the period of 0.4 s x 79 channels would be 316 pulses.

Test Personnel:

Daniel W. Baltzell	Daniel W. Baltzell	September 22, 2010
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.

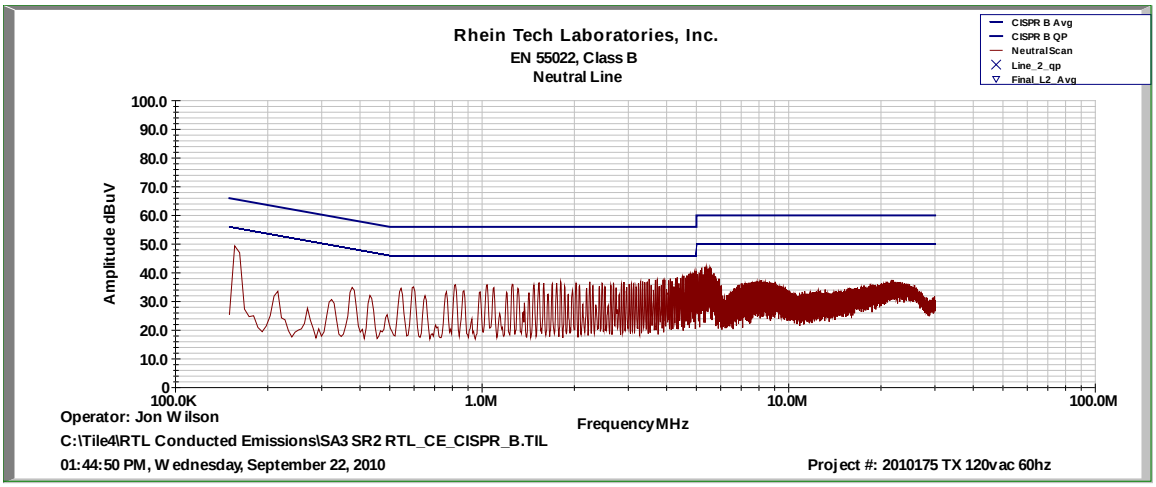
Table 9-1: Conducted Emissions Test Equipment

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
900968	Hewlett Packard	8567A	Spectrum Analyzer (10 kHz - 1.5 GHz)	2602A00160	10/26/10
900969	Hewlett Packard	85650A	Quasi-Peak Adapter	2412A00414	10/26/10
900970	Hewlett Packard	85662A	Spectrum Analyzer Display	2542A11239	10/26/10
901083	AFJ International	LS16	16A LISN (110 V)	16010020080	11/4/10
N/A	Rhein Tech Laboratories, Inc.	Automated Emission Tester	Emissions testing software Rev. 14.0.2	N/A	N/A

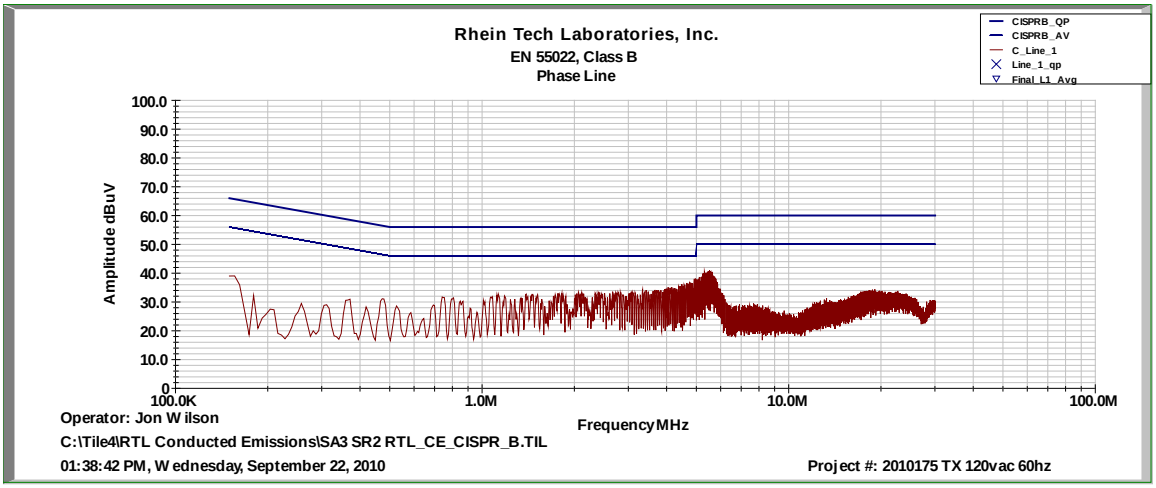
9.3 Conducted Emissions Test Results

9.3.1 Conducted Emissions Transmit Center Channel FHSS/DSSS

Plot 9-1: Conducted Emissions Transmit Center Channel FHSS/DSSS Neutral Side

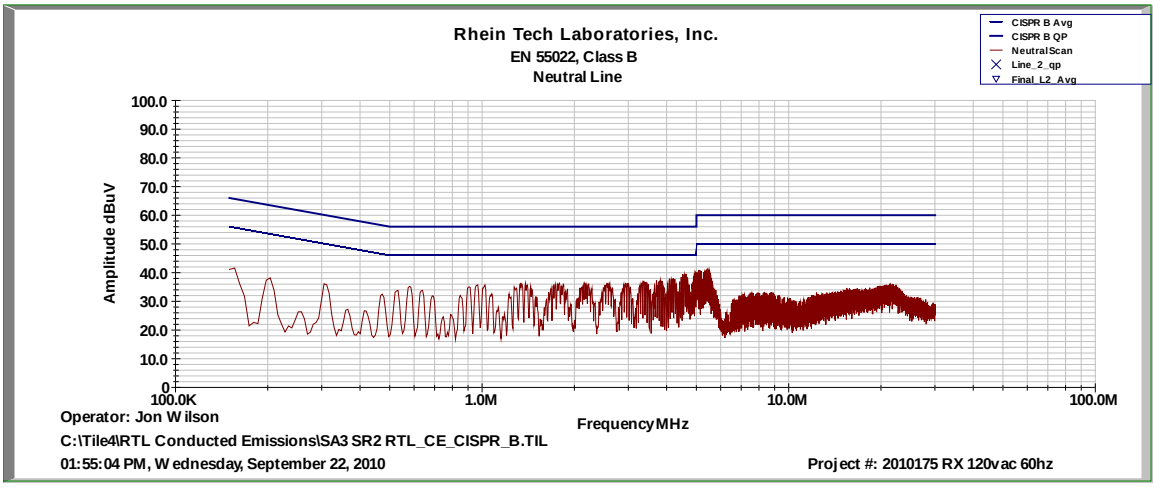


Plot 9-2: Conducted Emissions Transmit Center Channel FHSS/DSSS Hot Side

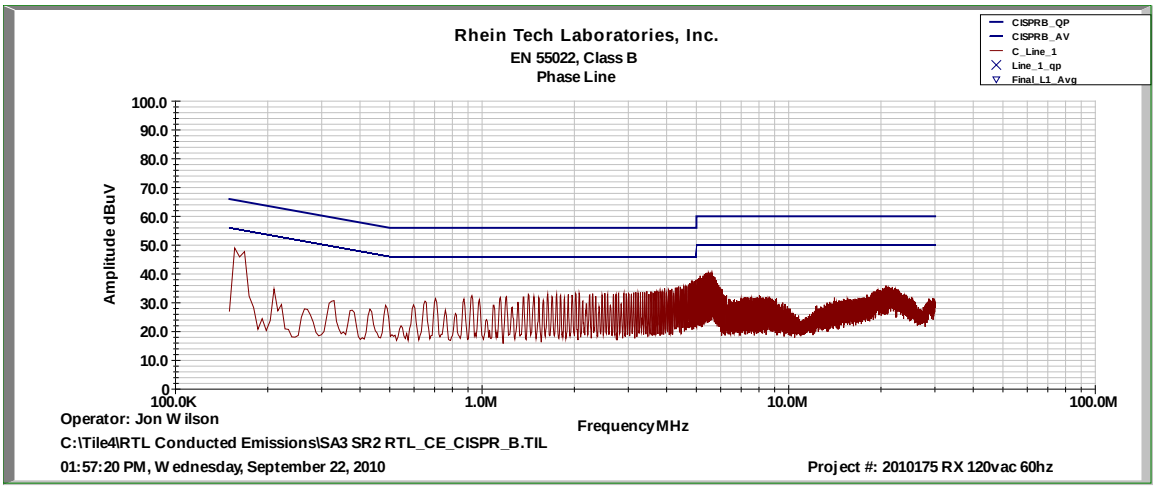


9.3.2 Conducted Emissions Receive Channel 6 DSSS

Plot 9-3: Conducted Emissions Receive Channel 6 DSSS Neutral Side



Plot 9-4: Conducted Emissions Receive Channel 6 FHSS/DSSS Hot Side



Test Personnel:

Jonathan Wilson		September 22, 2010
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	10/1/12
900932	Hewlett Packard	8449B OPT H02	Preamplifier (1 - 26.5 GHz)	3008A00505	2/22/11
901413	Agilent Technologies	E4448A	Spectrum Analyzer	US44020346	11/11/10
900905	Rhein Tech Laboratories	PR-1040	OATS 1 Preamplifier 40 dB (30 MHz – 2 GHz)	1006	4/10/11
900878	Rhein Tech Laboratories	AM3-1197-0005	3 meter antenna mast, polarizing	Outdoor Range 1	Not Required
901516	Insulated Wire, Inc.	KPS-1503-2400-KPS-09302008	RF cable, 20'	NA	10/19/10
901517	Insulated Wire Inc.	KPS-1503-360-KPS-09302008	RF cable 36"	NA	10/19/10
901242	Rhein Tech Laboratories	WRT-000-0003	Wood rotating table	N/A	Not Required
900772	EMCO	3161-02	Horn Antenna (2 - 4 GHz)	9804-1044	6/14/11
900321	EMCO	3161-03	Horn Antennas (4 - 8,2 GHz)	9508-1020	6/14/11
900323	EMCO	3160-7	Horn Antennas (8,2 - 12,4 GHz)	9605-1054	6/14/11
900356	EMCO	3160-08	Horn Antenna (12.4 - 18 GHz)	9607-1044	6/14/11
900325	EMCO	3160-9	Horn Antennas (18 - 26.5 GHz)	9605-1051	6/14/11
900392	Hewlett Packard	1197OK	Harmonic Mixer (18 – 26.5 GHz)	3525A00159	6/14/11
900791	Chase	CBL6111B	Bilog Antenna (30 MHz – 2000 MHz)	N/A	12/12/10

10.3 Radiated Emissions Test Results

10.3.1 Radiated Emissions Digital/Receiver Test Data

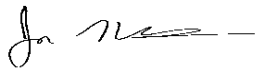
Table 10-2: Digital/Receiver Radiated Emissions

Temperature: 71°F Humidity: 71%										
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**
57.650	Qp	H	160	3.0	44.2	-23.9	20.3	40.0	-19.7	Pass
72.670	Qp	H	80	1.5	41.2	-24.4	16.8	40.0	-23.2	Pass
92.060	Qp	V	355	2.0	44.7	-20.8	23.9	43.5	-19.6	Pass
102.805	Qp	V	35	1.0	37.5	-18.5	19.0	43.5	-24.5	Pass
151.110	Qp	H	70	1.0	40.2	-18.4	21.8	43.5	-21.7	Pass

Table 10-3: Digital/Receiver Radiated Emissions with Headset

Temperature: 71°F Humidity: 71%										
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**
98.130	Qp	H	90	2.5	34.6	-19.3	15.3	43.5	-28.2	Pass
143.600	Qp	H	5	1.0	38.1	-18.2	19.9	43.5	-23.6	Pass
156.390	Qp	H	180	2.8	39.4	-18.2	21.2	43.5	-22.3	Pass
159.000	Qp	H	355	2.2	37.2	-18.3	18.9	43.5	-24.6	Pass
213.980	Qp	V	290	1.0	36.5	-18.9	17.6	43.5	-25.9	Pass
311.955	Qp	V	230	2.0	37.3	-14.5	22.8	46.0	-23.2	Pass
433.935	Qp	H	75	1.8	36.6	-11.0	25.6	46.0	-20.4	Pass

Test Personnel:

Jonathan Wilson		September 23, 2010
Test Engineer	Signature	Date Of Test

10.3.2 Radiated Emissions Harmonics/Spurious Test Data – Fixed Frequency

Table 10-4: Radiated Emissions Harmonics/Spurious Channel 0 (TX Frequency 2402 MHz)

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)
4804.0	42.8	24.9	14.3	10.6	54.0	-43.4
12010.0	35.2	20.6	19.5	1.1	54.0	-52.9

Table 10-5: Radiated Emissions Harmonics/Spurious Channel 39 (TX Frequency 2441 MHz)

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)
4882.0	44.8	27.2	14.5	12.7	54.0	-41.3
7323.0	30.9	19.0	13.1	5.9	54.0	-48.1
12205.0	37.1	24.2	18.4	5.8	54.0	-48.2

Table 10-6: Radiated Emissions Harmonics/Spurious Channel 78 (TX Frequency 2480 MHz)

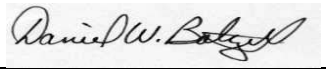
Emission Frequency (MHz)	Peak Analyzer Reading (dBuV) (1 MHz RBW/VBW)	Average Analyzer Reading (dBuV) (1 MHz RBW/10 Hz VBW)	Site Correction Factor (dB/m)	Average Emission Level (dBuV/m)	Average Limit (dBuV/m)	Average Margin (dB)
4960.0	45.3	26.5	26.0	0.5	54.0	-53.5
7440.0	31.8	19.8	13.4	6.4	54.0	-47.6
12400.0	33.4	19.4	22.0	-2.6	54.0	-56.6

10.3.3 Radiated Emissions Harmonics/Spurious Test Data – Hopping

Table 10-7: Radiated Emissions Harmonics/Spurious Hopping Mode

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)
4873.9	37.8	21.7	16.1	37.8	54.0	-16.2
4880.2	41.0	21.7	16.2	37.9	54.0	-16.1
4928.0	41.2	21.5	16.3	37.8	54.0	-16.2
7745.0	34.9	19.9	15.2	35.1	54.0	-18.9
12032.1	34.4	20.6	18.0	38.6	54.0	-15.4

Test Personnel:

Daniel W. Baltzell		September 26, 2010
Test Engineer	Signature	Date Of Test

11 Conclusion

The data in this measurement report shows that the EUT as tested, Vocollect, Inc. Model Name A500, Model # TT-800-1-1, FCC ID: MQO-TT-800-1-1, IC: 2570A-TT80011, complies with all the applicable requirements of Parts 2 and 15 of the FCC Rules and Regulations, and Industry Canada RSS-210.