Excellence in Compliance Testing

Certification Test Report

FCC ID: T2K-ACTAE1000
IC: 11123A-AE1000

FCC Rule Part: 15.247
IC Radio Standards Specification: RSS-210

ACS Report Number: 12-0550.W06.1A

Manufacturer: Aeronix, Inc.
Model: AE1000

Test Begin Date: April 11, 2013
Test End Date: April 16, 2013

Report Issue Date: July 31, 2013

FOR THE SCOPE OF ACCREDITATION UNDER LAB Code 200612-0

This report is not be used to claim certification, approval, or endorsement by NVLAP, NIST or any government agency.

Reviewed by:
Kirby Munroe
Director, Wireless Certifications
ACS, Inc.

This report contains 22 pages

TABLE OF CONTENTS

1 GENERAL

1.1 Purpose

The purpose of this report is to demonstrate compliance with Part 15 Subpart C of the FCC's Code of Federal Regulations and Industry Canada's Radio Standards Specification RSS-210 Certification for modular approval.

1.2 Product description

The AE1000 is a general purpose, wireless connectivity platform module which connects sensors to a web-based management system. It provides several standards-based sensor interfaces including serial, GPIO, ADC, and 1-wire. All sensor data stored locally on the device and then periodically transmitted to a remote web-based server via a cellular data link for analysis and storage.

The AE1000 incorporates a certified U-Blox LISA U200 GSM module (FCC ID: XPYLISAU200, IC: 8595A-LISAU200), a GPS receiver and 900 MHz transceiver.

This report addresses the 900 MHz transceiver only.

Technical Details:

Frequency Range:	902.40 MHz - 925.92 MHz
Channel Spacing:	480 kHz
Number of Channels:	50
Rated Maximum Power:	20 dBm
Modulation Format:	GFSK
Antenna Type / Gain:	Pulse PCB W3538B0200, 2.8 dBi
	WP Wireless Whip WPANT30076-RA, 2.0 dBi
Operating Voltage:	3.7 VDC Li-Polymer rechargeable battery, 5.0 VDC USB

Manufacturer Information:
Aeronix, Inc.
1775 West Hibiscus Boulevard, Suite 200
Melbourne, FL 32901

EUT Serial Numbers: ACS#1

Test Sample Condition: The test samples were provided in good working order with no visible defects.

1.3 Test Methodology and Considerations

The EUT was evaluated for radiated emissions in three orthogonal orientations corresponding to the X, Y and Z planes.

As declared by the manufacturer, the 900 MHz LAN radio and the cellular radio cannot transmit simultaneously therefore radiated inter-modulation products were not evaluated.

Radiated emissions were performed on two antennas identified in section 1.2.

2 TEST FACILITIES

2.1 Location

The radiated and conducted emissions test sites are located at the following address:

Advanced Compliance Solutions
5015 B.U. Bowman Drive
Buford, GA 30518
Phone: (770) 831-8048
Fax: (770) 831-8598

2.2 Laboratory Accreditations/Recognitions/Certifications

ACS is accredited to ISO/IEC 17025 by the National Institute of Standards and Technology under their National Voluntary Laboratory Accreditation Program (NVLAP), Lab Code 200612-0. Unless otherwise specified, all tests methods described within this report are covered under the ISO/IEC 17025 scope of accreditation.

The Semi-Anechoic Chamber Test Site, Open Area Test Site (OATS) and Conducted Emissions Site have been fully described, submitted to, and accepted by the FCC, Industry Canada and the Japanese Voluntary Control Council for Interference by information technology equipment.

FCC Registration Number: 511277
Industry Canada Lab Code: IC 4175A-1
VCCI Member Number: 1831

- VCCI OATS Registration Number R-1526
- VCCI Conducted Emissions Site Registration Number: C-1608

2.3 Radiated Emissions Test Site Description

2.3.1 Semi-Anechoic Chamber Test Site

The Semi-Anechoic Chamber Test Site consists of a 20' x 30' x 18' shielded enclosure. The chamber is lined with Toyo Ferrite Grid Absorber, model number FFG-1000. The ferrite tile grid is 101 x 101 x 19mm thick and weighs approximately 550 grams. These tiles are mounted on steel panels and installed directly on the inner walls of the chamber.

The turntable is 150cm in diameter and is located 160cm from the back wall of the chamber. The chamber is grounded via 1 – 8' copper ground rod, installed at the center of the back wall, it is bound to the ground plane using 3/4" stainless steel braided cable.

The turntable is all steel, flush mounted table installed in an all steel frame. The table is remotely operated from inside the control room located 25' from the range. The turntable is electrically bonded to the surrounding ground plane via steel fingers installed on the edge of the turn table. The steel fingers make constant contact with the ground plane during operation.

Behind the turntable is a 3' x 6' x 4' deep shielded pit used for support equipment if necessary. The pit is equipped with 1 – 4" PVC chases from the turntable to the pit that allow for cabling to the EUT if necessary. The underside of the turntable can be accessed from the pit so cables can be supplied to the EUT from the pit.

A diagram of the Semi-Anechoic Chamber Test Site is shown in Figure 2.3-1 below:

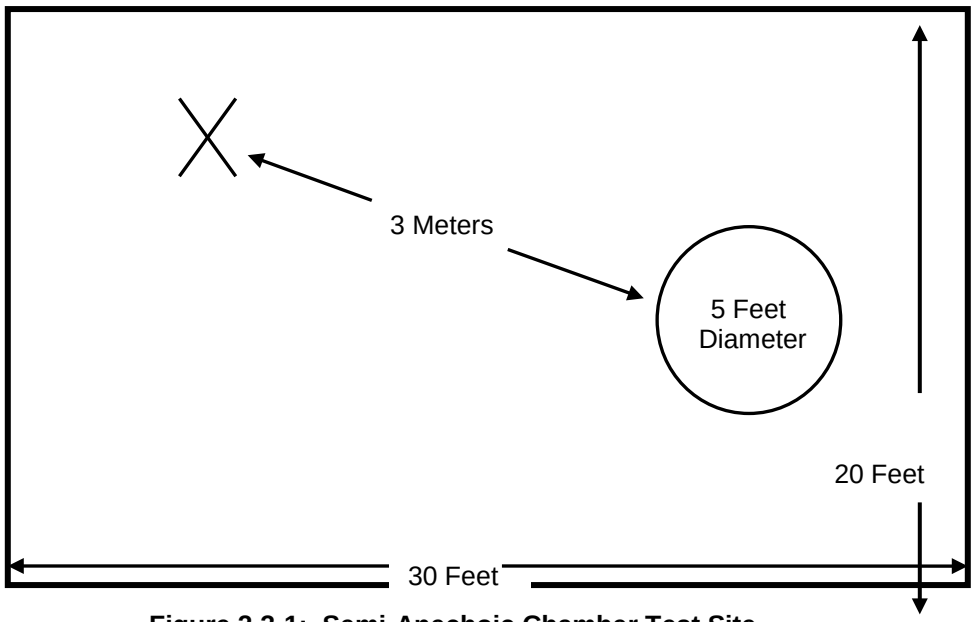


Figure 2.3-1: Semi-Anechoic Chamber Test Site

2.3.2 Open Area Tests Site (OATS)

The open area test site consists of a 40' x 66' concrete pad covered with a perforated electro-plated galvanized sheet metal. The perforations in the sheet metal are 1/8" holes that are staggered every 3/16". The individual sheets are placed to overlap each other by 1/4" and are riveted together to provide a continuous seam. Rivets are spaced every 3" in a 3 x 20 meter perimeter around the antenna mast and EUT area. Rivets in the remaining area are spaced as necessary to properly secure the ground plane and maintain the electrical continuity.

The entire ground plane extends 12' beyond the turntable edge and 16' beyond the antenna mast when set to a 10 meter measurement distance. The ground plane is grounded via 4 – 8' copper ground rods, each installed at a corner of the ground plane and bound to the ground plane using 3/4" stainless steel braided cable.

The turntable is an all aluminum 10' flush mounted table installed in an all aluminum frame. The table is remotely operated from inside the control room located 40' from the range. The turntable is electrically bonded to the surrounding ground plane via steel fingers installed on the edge of the turn table. The steel fingers make constant contact with the ground plane during operation.

Adjacent to the turntable is a 7' x 7' square and 4' deep concrete pit used for support equipment if necessary. The pit is equipped with 5 – 4" PVC chases from the pit to the control room that allow for cabling to the EUT if necessary. The underside of the turntable can be accessed from the pit so cables can be supplied to the EUT from the pit. The pit is covered with 2 sheets of 1/4" diamond style re-enforced steel sheets. The sheets are painted to match the perforated steel ground plane; however the underside edges have been masked off to maintain the electrical continuity of the ground plane. All reflecting objects are located outside of the ellipse defined in ANSI C63.4.

A diagram of the Open Area Test Site is shown in Figure 2.3-2 below:

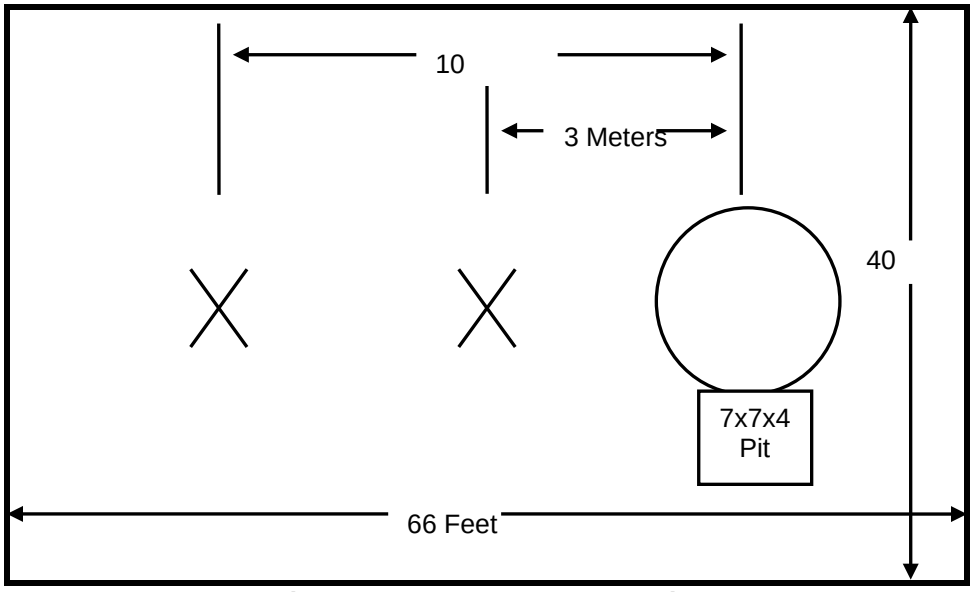


Figure 2.3-2: Open Area Test Site

2.4 Conducted Emissions Test Site Description

The AC mains conducted EMI site is located in the main EMC lab. It consists of an 8' x 8' solid aluminum horizontal ground reference plane (GRP) bonded every 3" to an 8' X 8' vertical ground plane.

The site is of sufficient size to test table top and floor standing equipment in accordance with section 6.1.4 of ANSI C63.4.

A diagram of the room is shown below in figure 2.4-1:

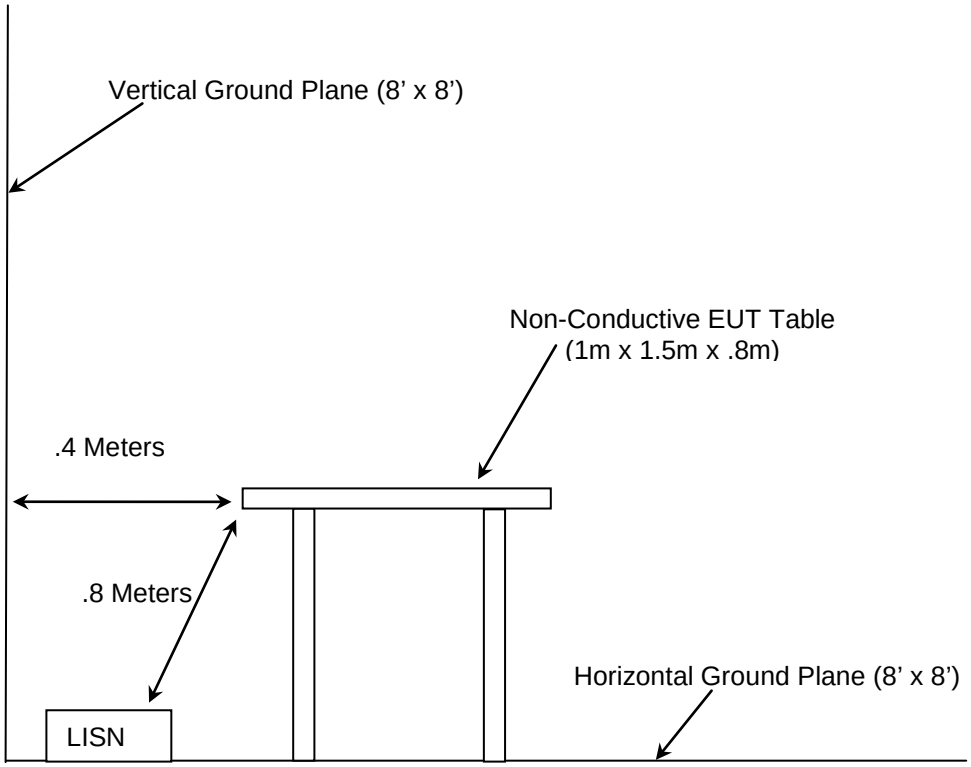


Figure 2.4-1: AC Mains Conducted EMI Site

3 APPLICABLE STANDARD REFERENCES

The following standards were used:

- ANSI C63.4-2003: Method of Measurements of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the 9KHz to 40GHz
- ANSI C63.10-2009: American National Standard for Testing Unlicensed Wireless Devices
- US Code of Federal Regulations (CFR): Title 47, Part 2, Subpart J: Equipment Authorization Procedures, 2013
- US Code of Federal Regulations (CFR): Title 47, Part 15, Subpart C: Radio Frequency Devices, Intentional Radiators, 2013
- FCC Public Notice DA 00-705 – Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems, March 30, 2000
- Industry Canada Radio Standards Specification: RSS-210 – Low-power License-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment, Issue 8, December 2010
- Industry Canada Radio Standards Specification: RSS-GEN – General Requirements and Information for the Certification of Radiocommunication Equipment, Issue 3, December 2010.

4 LIST OF TEST EQUIPMENT

The calibration interval of test equipment is annually or the manufacturer's recommendations. Where the calibration interval deviates from the annual cycle based on the instrument manufacturer's recommendations, it shall be stated below.

Table 4-1: Test Equipment

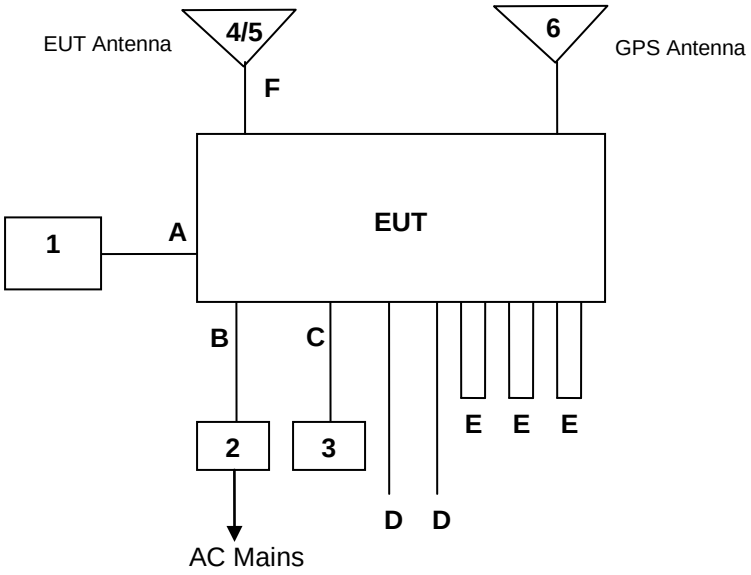
AssetID	Manufacturer	Model #	Equipment Type	Serial #	Last Calibration Date	Calibration Due Date
1	Rohde & Schwarz	ESMI - Display	Spectrum Analyzers	833771/007	8/2/2012	8/2/2014
2	Rohde & Schwarz	ESMI-Receiver	Spectrum Analyzers	839587/003	8/2/2012	8/2/2014
30	Spectrum Technologies	DRH-0118	Antennas	970102	4/27/2011	4/27/2013
40	EMCO	3104	Antennas	3211	2/14/2013	2/14/2015
153	EMCO	3825/2	LISN	9411-2268	7/31/2012	7/31/2014
167	ACS	Chamber EMI Cable Set	Cable Set	167	12/17/2012	12/17/2013
168	Hewlett Packard	11947A	Attenuators	44829	2/1/2013	2/1/2014
267	Agilent	N1911A	Meters	MY45100129	1/23/2012	1/23/2014
268	Agilent	N1921A	Sensors	MY45240184	1/17/2012	1/17/2014
283	Rohde & Schwarz	FSP40	Spectrum Analyzers	1000033	8/1/2012	8/1/2013
291	Florida RF Cables	SMRE-200W-12.0-SMRE	Cables	None	11/20/2012	11/20/2013
292	Florida RF Cables	SMR-290AW-480.0-SMR	Cables	None	3/26/2013	3/26/2014
321	Hewlett Packard	HPC 8447D	Amplifiers	1937A02809	8/27/2012	8/27/2013
324	ACS	Belden	Cables	8214	6/26/2012	6/26/2013
331	Microwave Circuits	H1G513G1	Filters	31417	7/2/2012	7/2/2013
338	Hewlett Packard	8449B	Amplifiers	3008A01111	8/2/2012	8/2/2013
340	Aeroflex/Weinschel	AS-20	Attenuators	7136	8/2/2012	8/2/2013
412	Electro Metrics	LPA-25	Antennas	1241	7/27/2012	7/27/2014
422	Florida RF	SMS-200AW-72.0-SMR	Cables	805	11/20/2012	11/20/2013
RE90	Agilent	E7404A	Analyzers	US40240143	11/28/2012	11/28/2013

5 SUPPORT EQUIPMENT

Table 5-1: Support Equipment

Item	Equipment Type	Manufacturer	Model Number	Serial Number
1	Battery	N/A	N/A	N/A
2	Wall Wart Power Supply	Phihong	PSA05F-050Q	PC35000100A2
3	Serial Termination	N/A	N/A	N/A
4	Antenna	WP Wireless	WPANT30076-RA	N/A
5	Antenna	Pulse	W3538B0200	N/A
6	Antenna	WP Wireless	PANTMG1041105010A	N/A

6 EQUIPMENT UNDER TEST SETUP BLOCK DIAGRAM



A: DC Wires, Non-Shielded, 5 cm
B: USB Cable, Non-Shielded, 100 cm
C: RS-232 Cable, Non-Shielded, 180 cm
D: Thermistor, Non-Shielded, 100 cm
E: Loopback Wires, Non-Shielded, 30 cm
F: RF Cable, Shielded, 12 cm

Figure 6-1: Test Setup Block Diagram

7 SUMMARY OF TESTS

Along with the tabular data shown below, plots were taken of all signals deemed important enough to document.

7.1 Antenna Requirement – FCC: Section 15.203

The EUT utilizes an on-board u.fl connector and therefore meets the requirements of Section 15.203.

7.2 Power Line Conducted Emissions – FCC: Section 15.207 IC: RSS-Gen 7.2.4

7.2.1 Measurement Procedure

ANSI C63.4 sections 6 and 7 were the guiding documents for this evaluation. Conducted emissions were performed from 150kHz to 30MHz with the spectrum analyzer's resolution bandwidth set to 9kHz and the video bandwidth set to 30kHz. The calculation for the conducted emissions is as follows:

Corrected Reading = Analyzer Reading + LISN Loss + Cable Loss
Margin = Applicable Limit - Corrected Reading

7.2.2 Measurement Results

Results of the test are shown below in Tables 7.2.2-1 through 7.2.2-4.

Table 7.2.2-1: Conducted EMI Results Line 1

Frequency (MHz)	Uncorrected Reading		Total Correction Factor (dB)	Corrected Level		Limit		Margin (dB)	
	Quasi-Peak	Average		Quasi-Peak	Average	Quasi-Peak	Average	Quasi-Peak	Average
11.3322	29.778	22.727	10.328	40.105	33.055	60	50	19.895	16.945
11.1177	30.139	22.867	10.319	40.458	33.186	60	50	19.542	16.814
11.024	30.484	23.354	10.315	40.799	33.669	60	50	19.201	16.331
10.6492	30.228	22.433	10.265	40.492	32.698	60	50	19.508	17.302
0.487912	30.321	23.881	9.989	40.31	33.87	56.345	46.345	16.035	12.475
0.159294	33.365	24.609	10.008	43.373	34.618	65.734	55.734	22.362	21.117

Table 7.2.2-2: Conducted EMI Results Line 2

Frequency (MHz)	Uncorrected Reading		Total Correction Factor (dB)	Corrected Level		Limit		Margin (dB)	
	Quasi-Peak	Average		Quasi-Peak	Average	Quasi-Peak	Average	Quasi-Peak	Average
11.7767	28.211	19.468	10.346	38.557	29.814	60	50	21.443	20.186
11.189	30.435	20.716	10.322	40.757	31.038	60	50	19.243	18.962
11.1408	29.689	20.336	10.32	40.009	30.656	60	50	19.991	19.344
10.8999	31.101	20.775	10.3	41.401	31.075	60	50	18.599	18.925
0.616619	25.572	17.513	9.973	35.545	27.487	56	46	20.455	18.513
0.157817	33.16	23.594	10.012	43.172	33.606	65.777	55.777	22.605	22.17

7.3 Peak Output Power - FCC Section 15.247(b)(2) IC: RSS-210 A8.4(1)

7.3.1 Measurement Procedure (Conducted Method)

The RF output port of the EUT was directly connected to the input of a power meter. The device employs >50 channels therefore the power is limited to 1 Watt.

7.3.2 Measurement Results

Results are shown below in Table 7.3.2-1 below:

Table 7.3.2-1: RF Output Power

Frequency [MHz]	Level [dBm]
902.40	19.99
914.40	19.74
925.92	19.45

7.4 Channel Usage Requirements

7.4.1 Carrier Frequency Separation – FCC: Section 15.247(a)(1) IC: RSS-210 A8.1(b)

7.4.1.1 Measurement Procedure

The RF output port of the EUT was directly connected to the input of the spectrum analyzer. The span of the spectrum analyzer was set wide enough to capture two adjacent peaks and the RBW and VBW were set to ≥ 1% of the span.

7.4.1.2 Measurement Results

Results are shown below in Figure 7.4.1.2-1.

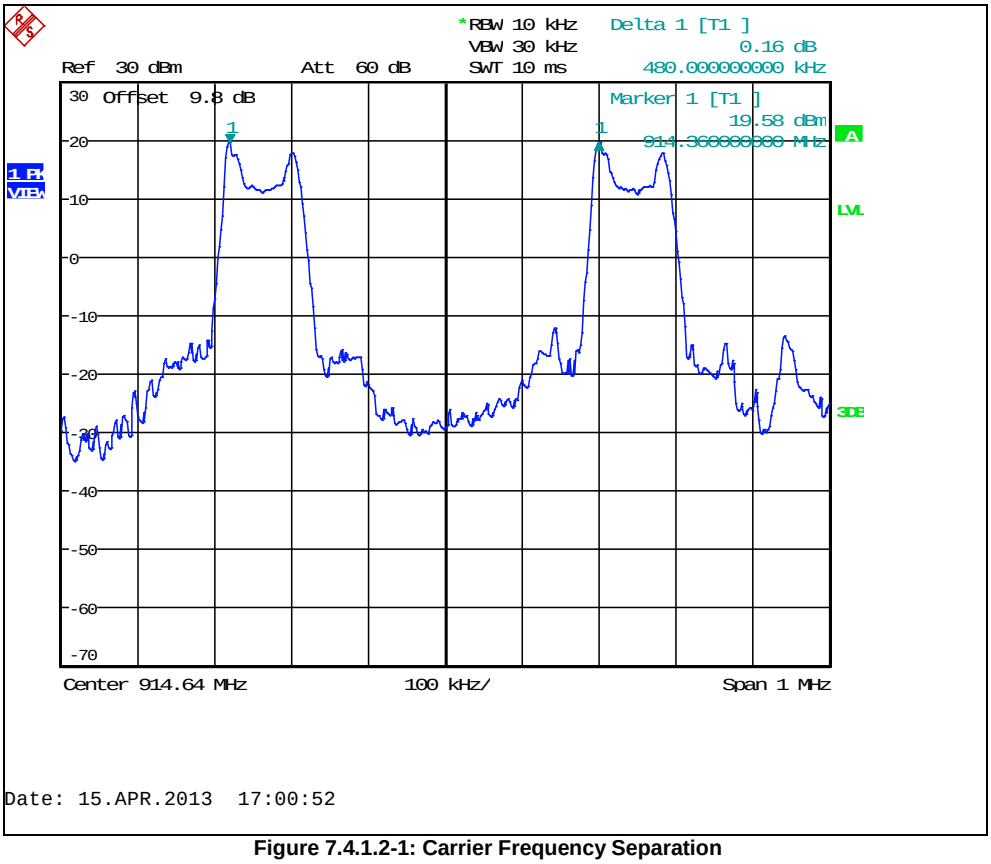


Figure 7.4.1.2-1: Carrier Frequency Separation

7.4.2 Number of Hopping Channels – FCC: Section 15.247(a)(1)(i) IC: RSS-210 A8.1(c)

7.4.2.1 Measurement Procedure

The RF output port of the EUT was directly connected to the input of the spectrum analyzer. The span of the spectrum analyzer was set wide enough to capture the frequency band of operation. The RBW was set to ≥ 1% of the span and VBW set to ≥ RBW.

7.4.2.2 Measurement Results

Results are shown below in Figure 7.4.2.2-1.

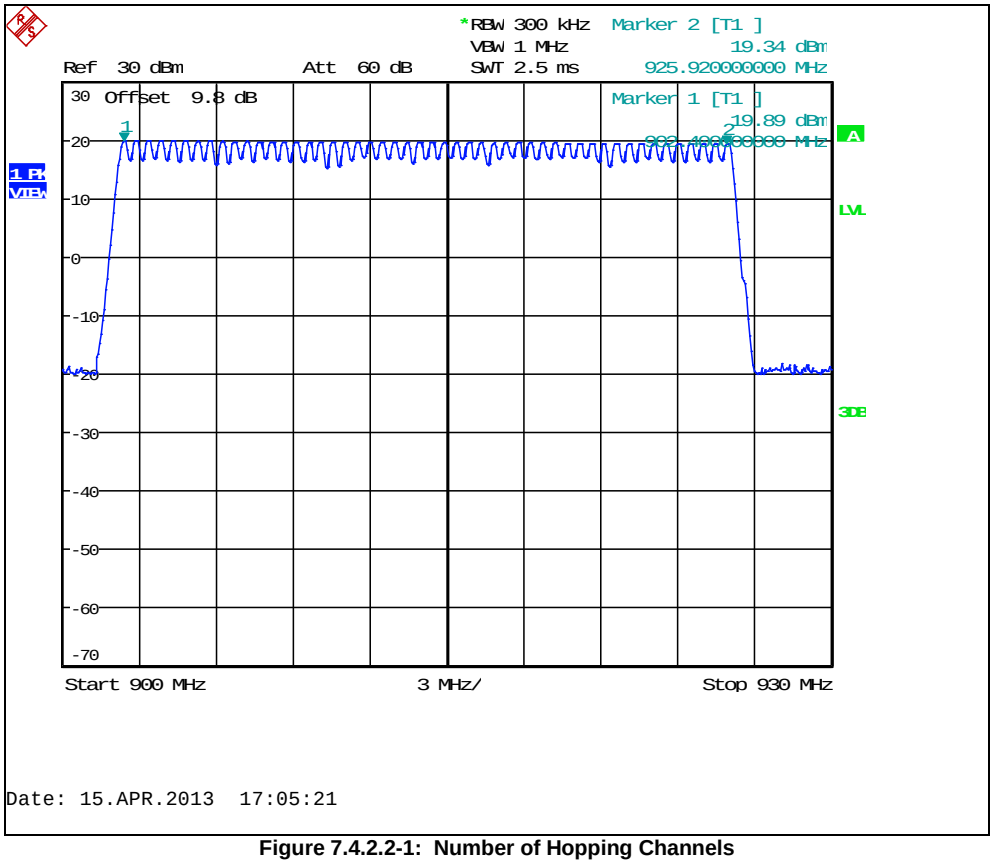


Figure 7.4.2.2-1: Number of Hopping Channels

7.4.3 Channel Dwell Time – FCC: Section 15.247(a)(1)(i) IC: RSS-210 A8.1(c)

7.4.3.1 Measurement Procedure

The RF output port of the EUT was directly connected to the input of the spectrum analyzer. The span of the spectrum analyzer display was set 0 Hz centered on a hopping channel. The RBW of the spectrum analyzer was set to approximately 1 MHz and VBW set to ≥ RBW. The Marker Delta function of the analyzer was utilized to determine the dwell time.

7.4.3.2 Measurement Results

Results are shown below in Table 7.4.3.2-1 and Figures 7.4.3.2-1 through 7.4.3.2-2.

Table 7.4.3.2-1: Channel Dwell Time

Single Occurrence (ms)	Number of Occurrences / 20s	Total Dwell Time (ms)
160	1	160

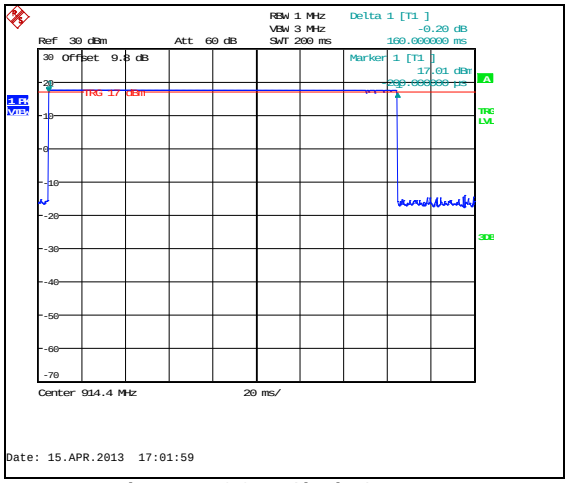


Figure 7.4.3.2-1: Single Occurrence

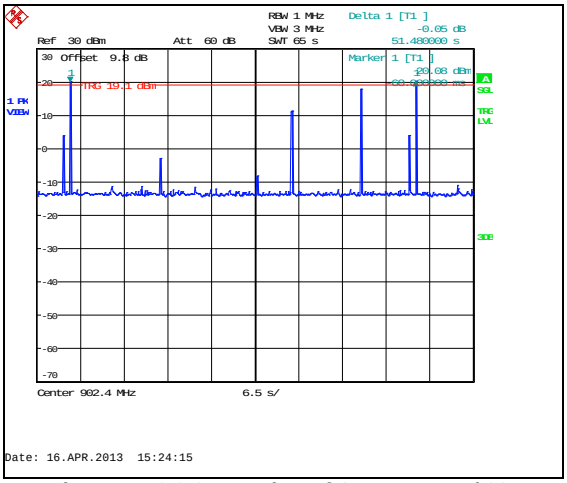


Figure 7.4.3.2-2: Number of Occurrences / 20s

7.4.4 20dB / 99% Bandwidth - FCC: Section 15.247(a)(1)(i) IC: RSS-210 A8.1(c)

7.4.4.1 Measurement Procedure

The RF output port of the EUT was directly connected to the input of the spectrum analyzer. The span of the spectrum analyzer display was set between two times and five times the occupied bandwidth (OBW) of the emission. The RBW of the spectrum analyzer was set to approximately 1 % to 5 % of the OBW. The trace was set to max hold with a peak detector active. The Delta function of the analyzer was utilized to determine the 20 dB bandwidth of the emission.

The 99% occupied bandwidth was measured with the spectrum analyzer span set to fully display the emission and side bands. The RBW was to 1% of the span. The trace was set to max hold with a sample detector. The occupied bandwidth measurement function of the analyzer was used for the 99% bandwidth.

7.4.4.2 Measurement Results

Results are shown below in Table 7.4.4.2-1 and Figures 7.4.4.2-1 through 7.4.4.2-6.

Table 7.4.4.2-1: 20dB / 99% Bandwidth

Frequency [MHz]	20dB Bandwidth [kHz]	99% Bandwidth [kHz]
902.40	105.0	100.8
914.40	104.4	100.2
925.92	104.4	100.2

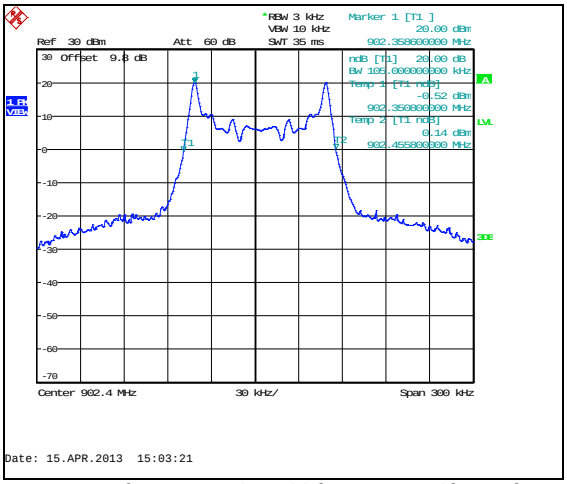


Figure 7.4.4.2-1: 20dB BW Low Channel

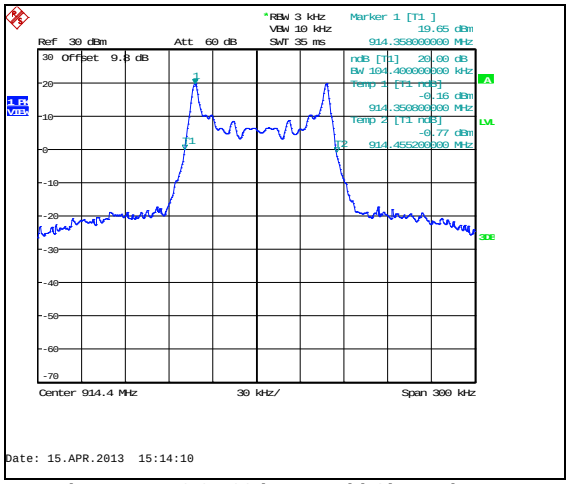


Figure 7.4.4.2-2: 20dB BW Mid Channel

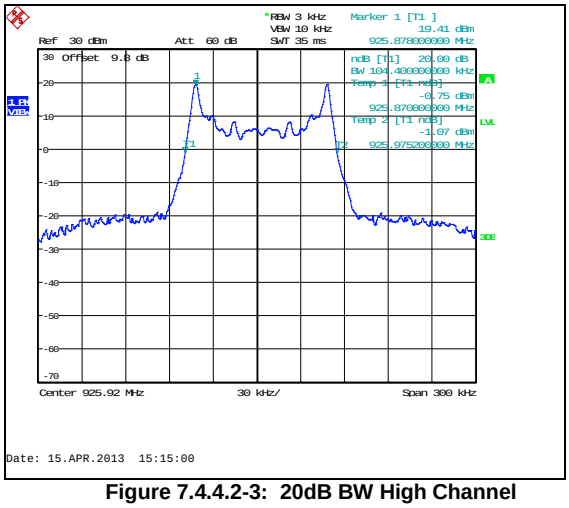


Figure 7.4.4.2-3: 20dB BW High Channel

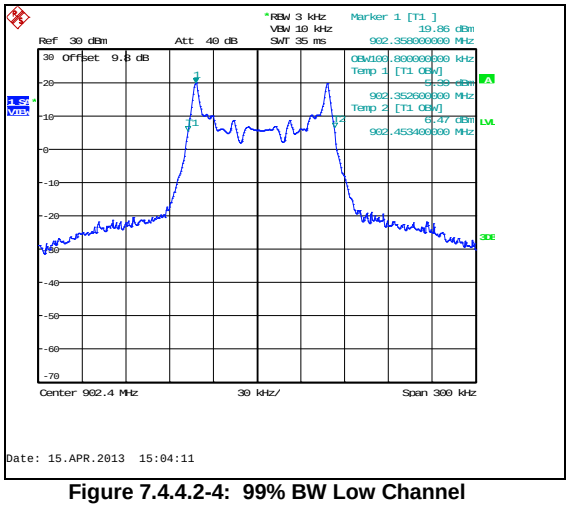


Figure 7.4.4.2-4: 99% BW Low Channel

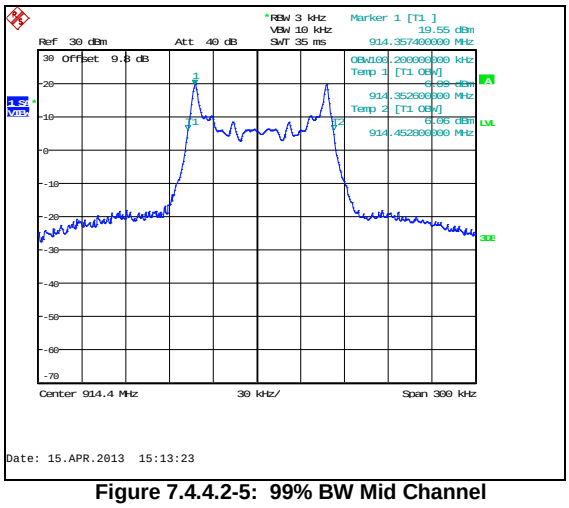


Figure 7.4.4.2-5: 99% BW Mid Channel

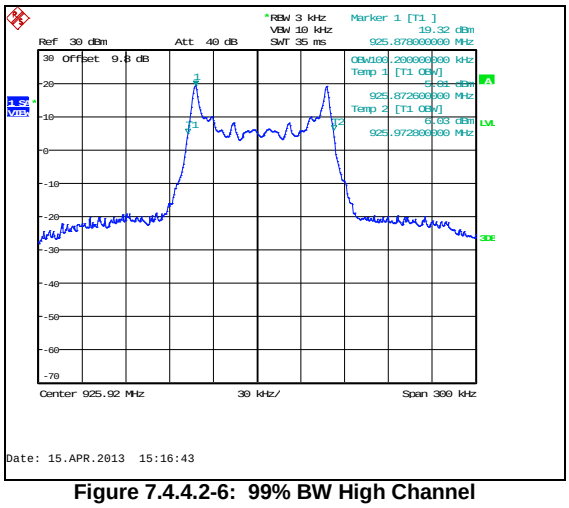


Figure 7.4.4.2-6: 99% BW High Channel

7.5 Band-Edge Compliance and Spurious Emissions-FCC 15.247(d) IC: RSS-210 A8.5

7.5.1 Band-Edge Compliance of RF Conducted Emissions

7.5.1.1 Measurement Procedure

The RF output port of the EUT was directly connected to the input of the spectrum analyzer. The EUT was investigated at the lowest and highest channel available to determine band-edge compliance. For each measurement the spectrum analyzer's RBW was set to ≥ 1% of the span, and the VBW was set to >> RBW.

7.5.1.2 Measurement Results

Results are shown in the figures 7.5.1.2-1 to 7.5.1.2-4 below.

NON-HOPPING MODE:

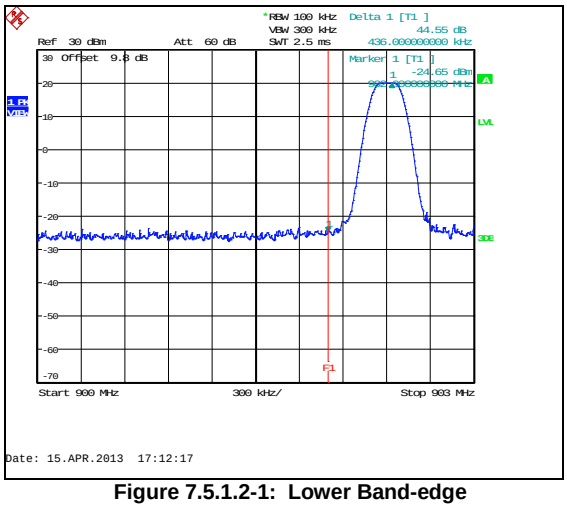


Figure 7.5.1.2-1: Lower Band-edge

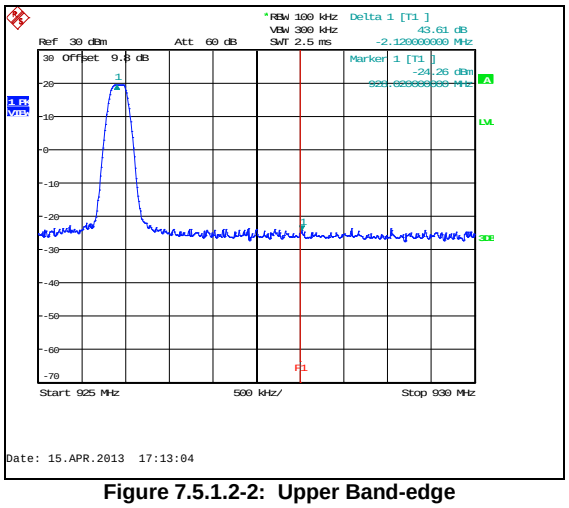


Figure 7.5.1.2-2: Upper Band-edge

HOPPING MODE:

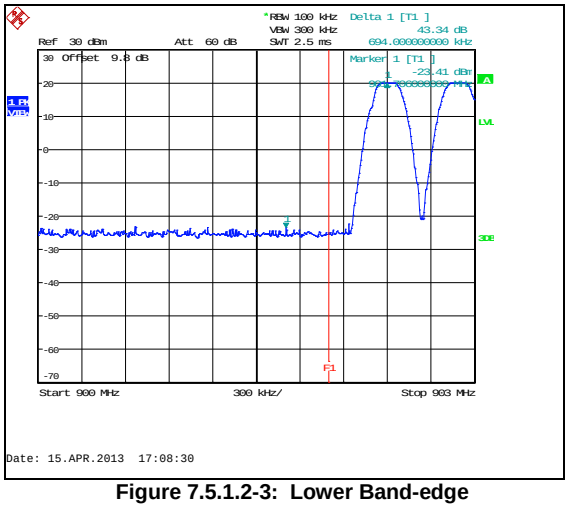


Figure 7.5.1.2-3: Lower Band-edge

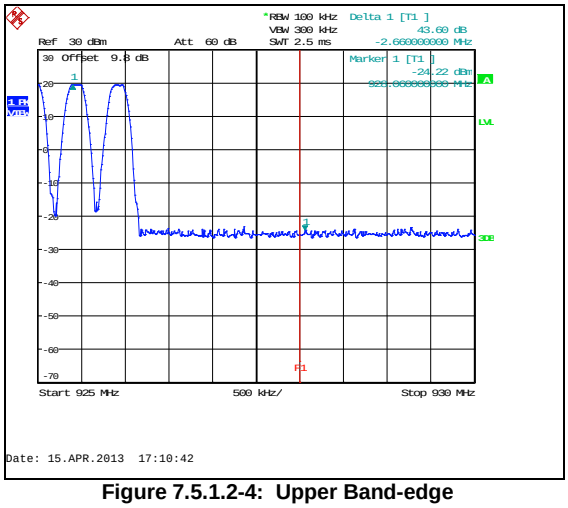


Figure 7.5.1.2-4: Upper Band-edge

7.5.2 RF Conducted Spurious Emissions

7.5.2.1 Measurement Procedure

The RF output port of the EUT was directly connected to the input of the spectrum analyzer. The EUT was investigated for conducted spurious emissions from 30MHz to 10GHz, 10 times the highest fundamental frequency. Measurements were made at the low, center and high channels of the EUT. For each measurement, the spectrum analyzer's RBW was set to 100kHz. A peak detector function was used with the trace set to max hold.

7.5.2.2 Measurement Results

Results are shown below in Figures 7.5.2.2-1 to 7.5.2.2-6:

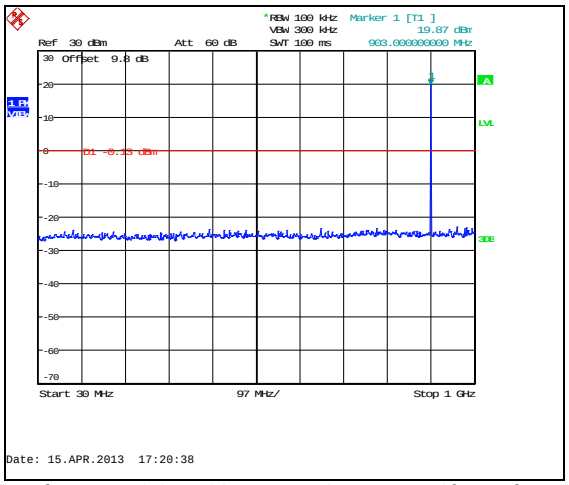


Figure 7.5.2.2-1: 30 MHz – 1 GHz – Low Channel

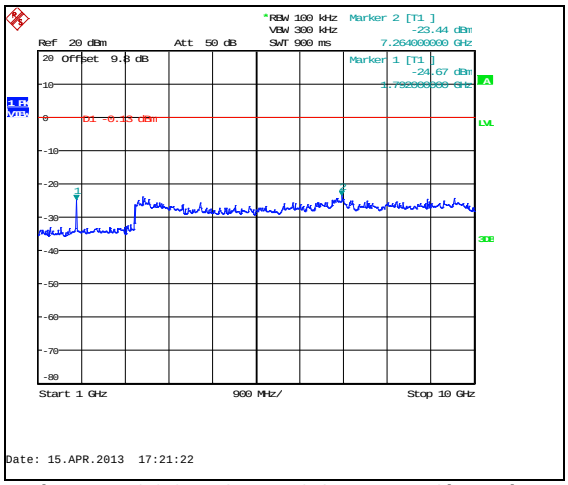


Figure 7.5.2.2-2: 1 GHz – 10 GHz – Low Channel

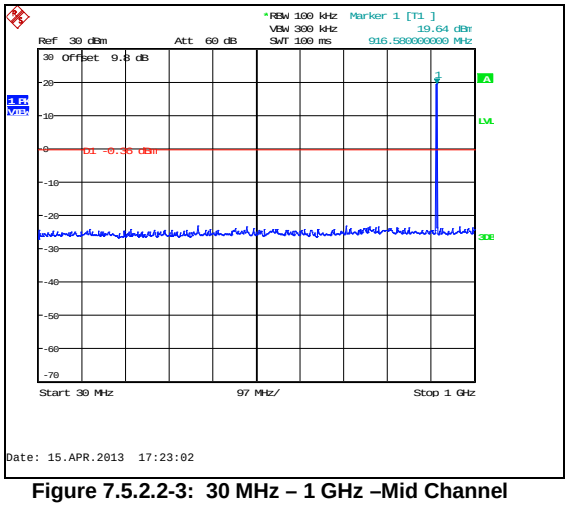


Figure 7.5.2.2-3: 30 MHz – 1 GHz –Mid Channel

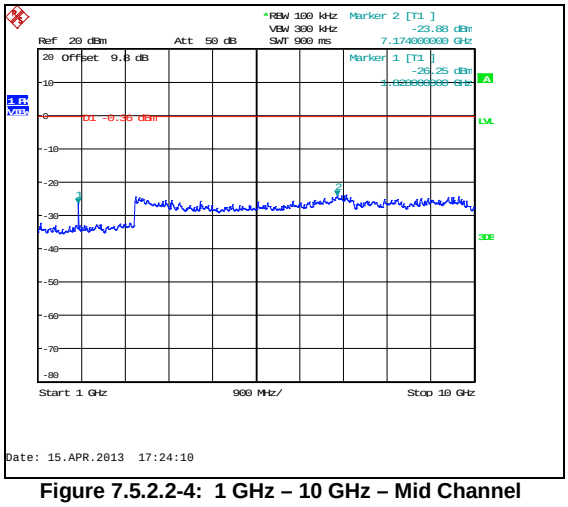


Figure 7.5.2.2-4: 1 GHz – 10 GHz – Mid Channel

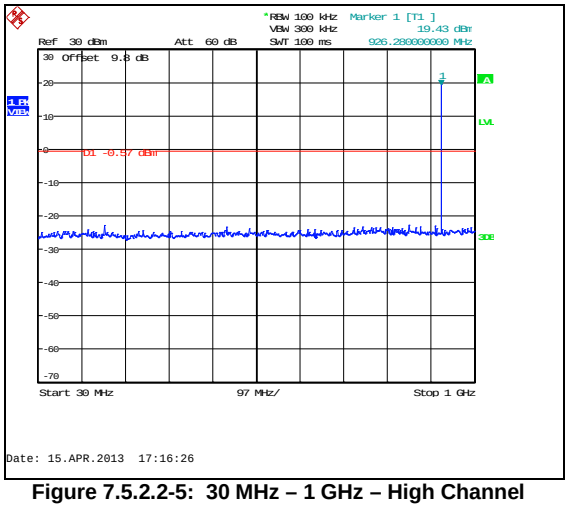


Figure 7.5.2.2-5: 30 MHz – 1 GHz – High Channel

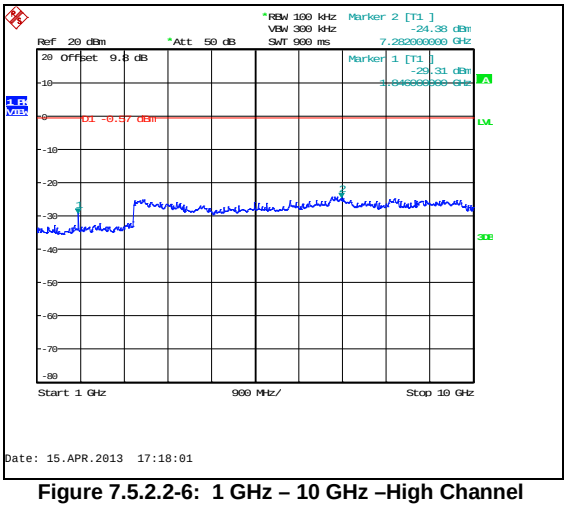


Figure 7.5.2.2-6: 1 GHz – 10 GHz –High Channel

7.5.3 Radiated Spurious Emissions - FCC Section 15.205 IC: RSS-210 2.6

7.5.3.1 Measurement Procedure

Radiated emissions tests were made over the frequency range of 30MHz to 10GHz, 10 times the highest fundamental frequency.

The EUT was rotated through 360° and the receive antenna height was varied from 1m to 4m so that the maximum radiated emissions level would be detected. For frequencies below 1000MHz, quasi-peak measurements were made using a resolution bandwidth RBW of 120 kHz and a video bandwidth VBW of 300 kHz. For frequencies above 1000MHz, peak and average measurements were made with RBW and VBW of 1 MHz and 3MHz respectively.

The EUT was caused to generate a continuous modulated carrier on the hopping channel.

Each emission found to be in a restricted band was compared to the applicable radiated emission limits.

7.5.3.2 Measurement Results

Radiated spurious emissions found in the band of 30MHz to 10GHz are reported in the Tables 7.5.3.2-1 to 7.5.3.2-2 below.

Table 7.5.3.2-1: Radiated Spurious Emissions Tabulated Data – X Orientation PCB Antenna

Frequency (MHz)	Level (dBuV)		Antenna Polarity	Correction Factors	Corrected Level (dBuV/m)		Limit (dBuV/m)		Margin (dB)	
	pk	Qpk/Avg	(H/V)	(dB)	pk	Qpk/Avg	pk	Qpk/Avg	pk	Qpk/Avg
Low Channel										
2707.2	51.86	46.94	V	-3.85	48.01	43.09	74.0	54.0	26.0	10.9
Middle Channel										
2743.2	49.51	43.23	V	-3.72	45.79	39.51	74.0	54.0	28.2	14.5
High Channel										
2777.76	48.03	40.06	H	-3.60	44.43	36.46	74.0	54.0	29.6	17.5
2777.76	49.02	41.61	V	-3.60	45.42	38.01	74.0	54.0	28.6	16.0

Table 7.5.3.2-2: Radiated Spurious Emissions Tabulated Data – Y Orientation PCB Antenna

Frequency (MHz)	Level (dBuV)		Antenna Polarity	Correction Factors	Corrected Level (dBuV/m)		Limit (dBuV/m)		Margin (dB)	
	pk	Qpk/Avg	(H/V)	(dB)	pk	Qpk/Avg	pk	Qpk/Avg	pk	Qpk/Avg
Low Channel										
2707.2	55.42	52.32	V	-3.85	51.57	48.47	74.0	54.0	22.4	5.5
Middle Channel										
2743.2	49.63	43.00	H	-3.72	45.91	39.28	74.0	54.0	28.1	14.7
2743.2	57.63	55.22	V	-3.72	53.91	51.50	74.0	54.0	20.1	2.5
High Channel										
2777.76	49.48	42.66	H	-3.60	45.88	39.06	74.0	54.0	28.1	14.9
2777.76	57.22	54.69	V	-3.60	53.62	51.09	74.0	54.0	20.4	2.9

Table 7.5.3.2-3: Radiated Spurious Emissions Tabulated Data – Z Orientation
PCB Antenna

Frequency (MHz)	Level (dBuV)		Antenna Polarity	Correction Factors	Corrected Level (dBuV/m)		Limit (dBuV/m)		Margin (dB)	
	pk	Qpk/Avg	(H/V)	(dB)	pk	Qpk/Avg	pk	Qpk/Avg	pk	Qpk/Avg
Low Channel										
2707.2	51.84	46.18	V	-3.85	47.99	42.33	74.0	54.0	26.0	11.7
Middle Channel										
2743.2	51.74	46.15	V	-3.72	48.02	42.43	74.0	54.0	26.0	11.6
High Channel										
2777.76	49.23	42.01	V	-3.60	45.63	38.41	74.0	54.0	28.4	15.6

Table 7.5.3.2-4: Radiated Spurious Emissions Tabulated Data – X Orientation
Whip Antenna

Frequency (MHz)	Level (dBuV)		Antenna Polarity	Correction Factors	Corrected Level (dBuV/m)		Limit (dBuV/m)		Margin (dB)	
	pk	Qpk/Avg	(H/V)	(dB)	pk	Qpk/Avg	pk	Qpk/Avg	pk	Qpk/Avg
Low Channel										
2707.2	50.01	44.02	H	-3.85	46.16	40.17	74.0	54.0	27.8	13.8
2707.2	50.11	44.40	V	-3.85	46.26	40.55	74.0	54.0	27.7	13.4
Middle Channel										
2743.2	48.21	39.02	H	-3.72	44.49	35.30	74.0	54.0	29.5	18.7
2743.2	50.11	43.44	V	-3.72	46.39	39.72	74.0	54.0	27.6	14.3
High Channel										
2777.76	48.11	40.69	H	-3.60	44.51	37.09	74.0	54.0	29.5	16.9
2777.76	49.05	42.09	V	-3.60	45.45	38.49	74.0	54.0	28.5	15.5

Table 7.5.3.2-5: Radiated Spurious Emissions Tabulated Data – Y Orientation
Whip Antenna

Frequency (MHz)	Level (dBuV)		Antenna Polarity	Correction Factors	Corrected Level (dBuV/m)		Limit (dBuV/m)		Margin (dB)	
	pk	Qpk/Avg	(H/V)	(dB)	pk	Qpk/Avg	pk	Qpk/Avg	pk	Qpk/Avg
Low Channel										
2707.2	48.21	39.37	H	-3.85	44.36	35.52	74.0	54.0	29.6	18.5
2707.2	51.26	45.82	V	-3.85	47.41	41.97	74.0	54.0	26.6	12.0
Middle Channel										
2743.2	50.14	44.02	H	-3.72	46.42	40.30	74.0	54.0	27.6	13.7
2743.2	54.81	50.83	V	-3.72	51.09	47.11	74.0	54.0	22.9	6.9
High Channel										
2777.76	52.09	46.69	H	-3.60	48.49	43.09	74.0	54.0	25.5	10.9
2777.76	55.24	52.25	V	-3.60	51.64	48.65	74.0	54.0	22.4	5.3

Table 7.5.3.2-6: Radiated Spurious Emissions Tabulated Data – Z Orientation
Whip Antenna

Frequency (MHz)	Level (dBuV)		Antenna Polarity	Correction Factors	Corrected Level (dBuV/m)		Limit (dBuV/m)		Margin (dB)	
	pk	Qpk/Avg	(H/V)	(dB)	pk	Qpk/Avg	pk	Qpk/Avg	pk	Qpk/Avg
Low Channel										
2707.2	50.44	44.63	H	-3.85	46.59	40.78	74.0	54.0	27.4	13.2
2707.2	50.29	44.10	V	-3.85	46.44	40.25	74.0	54.0	27.6	13.7
Middle Channel										
2743.2	50.09	43.89	H	-3.72	46.37	40.17	74.0	54.0	27.6	13.8
2743.2	49.91	42.60	V	-3.72	46.19	38.88	74.0	54.0	27.8	15.1
High Channel										
2777.76	51.36	45.65	H	-3.60	47.76	42.05	74.0	54.0	26.2	11.9
2777.76	49.35	42.55	V	-3.60	45.75	38.95	74.0	54.0	28.2	15.0

7.5.3.3 Sample Calculation:

$R_C = R_U + CF_T$

Where:

CF_T	=	Total Correction Factor (AF+CA+AG)-DC (Average Measurements Only)
R_U	=	Uncorrected Reading
R_C	=	Corrected Level
AF	=	Antenna Factor
CA	=	Cable Attenuation
AG	=	Amplifier Gain
DC	=	Duty Cycle Correction Factor

Example Calculation: Peak

Corrected Level: 51.86 - 3.85 = 48.01dBuV/m
Margin: 74dBuV/m – 48.01dBuV/m = 26.0dB

Example Calculation: Average

Corrected Level: 46.94 - 3.85 - 0 = 43.09dBuV
Margin: 54dBuV – 43.09dBuV = 10.9dB

8 CONCLUSION

In the opinion of ACS, Inc. AE1000, manufactured by Aeronix, Inc. meets the requirements of FCC Part 15 subpart C and Industry Canada's Radio Standards Specification RSS-210.

END REPORT