

TEST REPORT

Report Number: 100860883DEN-002

Project Number: G100860883

Report Issue Date: 9/11/2012

Product Designation: Model: AXS-900TXD

**Standards: FCC 47CFR Part 15C
RSS-210 - Issue 8: 2010
RSS-GEN - Issue 3: 2010**

Tested by:

Intertek Testing Services NA, Inc.
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Louisville, CO 80027

Client:

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TABLE OF CONTENTS

1	<i>Introduction and Conclusion.....</i>	3
2	<i>Test Summary</i>	3
3	<i>Description of Equipment Under Test</i>	5
4	<i>System setup including cable interconnection details, support equipment and simplified block diagram</i>	9
5	<i>Radiated Unintentional & Tx Spurious Emissions</i>	11
6	<i>Band Edge</i>	36
7	<i>AC Mains Conducted Emissions.....</i>	52
8	<i>Occupied Bandwidth (OBW).....</i>	59
9	<i>Product Modifications required to pass</i>	64
10	<i>Measurement Uncertainty.....</i>	68
11	<i>Revision History</i>	69

1 Introduction and Conclusion

The tests indicated in section 2.0 were performed on the product constructed as described in section 3.0. The remaining test sections are the verbatim text from the actual data sheets used during the investigation. These test sections include the test name, the specified test Method, a list of the actual Test Equipment Used, documentation Photos, Results and raw Data. No additions, deviations, or exclusions have been made from the standard(s) unless specifically noted.

Based on the results of our investigation, we have concluded the **product tested complies with the requirements of the standard(s) indicated**. The results obtained in this test report pertain only to the item(s) tested.

2 Test Summary

Section	Test full name	Test date	Result
5	Radiated Unintentional Spurious Emissions - FCC 15.249(d)/ 15.209 [Covers IC RSS-210 A2.9(b)/ RSS-Gen 7.2.5]	08/10/2012 08/17/2012	Pass(3)
6	Band Edge – FCC 15.249(d)/ 15.209 [Covers IC RSS-210 A2.9(b)/ RSS-Gen 7.2.5]	08/17/2012	Pass
7	Tx Radiated Emissions - FCC 15.249(a) [Covers IC RSS-210 A2.9(a)]	08/16/2012 03/21/2013	Pass
8	AC Conducted Emissions - FCC 15.207 [Covers RSS-Gen 7.2.4]	08/28/2012	Pass
9	Occupied Bandwidth Measurement - RSS-Gen 4.6.1 [Covers FCC 15.215(c)]	08/17/2012 04/05/2013	Pass

General Notes:

- The testing in this report covers the following product models: 900MHz Radio mode of operation (902MHz to 928MHz band of operation). All models are electrically identical:
 - AXS-900TRXD
 - AXS-900TXD
 - AXS-98FMTD
 - CT-900TD
- Product is RSS-210 Category 1 equipment.
- Product modifications were required to pass Radiated Spurious/Un-Intentional Emissions. Refer to Section 10 for details.

Radio Notes:

- FCC CFR47 Part 15.31: Measurement Standards: In any case where the device is powered off a battery, a fresh battery was used during test. In cases where the device is powered off an AC supply, voltage was varied to find worst case emissions.
- FCC CFR47 Part 15.35 and IC RSS-Gen 7.2.1: Measurement Detector Functions and Bandwidths were utilized when performing the measurements within this report.
- Testing of the product included (3) axes (product orientations). Note the product can be in used sitting flat on a surface as well as mounted on a wall or ceiling.
- FCC 15.31(m) and IC RSS-Gen 4.3: Testing of the product included (3) Tx channels (low, mid, high). All high-channel measurements were taken at 927.95MHz except occupied bandwidth. Note the actual upper-channel to be qualified is 927.50MHz.
- FCC 15.35(c) and IC RSS-Gen 4.5: No Duty Cycle Correction Factor for pulsed signals was utilized in this report.

Intertek	
Report Number: 100860883DEN-002	Issued: 9/11/2012

2.1 Test Facility

Intertek Denver's testing facilities are located at 1795 Dogwood St. Suite 200 Louisville, CO 80027. The testing facility is ISO17025:2005 accredited by A2LA, our lab code is 2506.02, our VCCI registration numbers are. R-1643, C-1752 and T-1558, our FCC designation no. US1121 and our IC lab no. 2042N.

Testing contained in this test report may not be covered under the laboratories scope of accreditation. A note will be placed in the specific test section for testing not covered under the laboratories scope.

Intertek	
Report Number: 100860883DEN-002	Issued: 9/11/2012

3 Description of Equipment Under Test

Equipment Under Test			
Description	Manufacturer	Model Number	Serial Number
Broadcastvision Entertainment BVE Transmitter	WAIO, Inc.	AXS-900TXD	002

Receive Date:	08/07/2012
Received Condition:	Good
Type:	Production Sample

Description of Equipment Under Test (provided by client)
The BVE Transmitter takes an audio signal (either analog stereo or optical/coax digital) and transmits via stereo FM-modulated signal (same as analog broadcast FM). The "FM" version of the product transmits within the FM band only. The "900MHz" version of the product transmits within the 900MHz ISM band using the same analog FM modulation, simply up-converted into the ISM band. Specific product mode tested in this report: 900MHz ISM Band Transmitter Clock Frequencies: 7.6MHz, 27MHz, 32MHz Radio: Tx Frequency ISM Band: 903.60MHz to 927.50MHz (extendable antenna fully retracted) Product will marketed in the US and Canada.

Equipment Under Test Power Configuration			
Rated Voltage	Rated Current	Rated Frequency	Number of Phases
AC-DC Adapter Input: 120VAC	10W	60	1
AC-DC Adapter Output: 12VDC	300mA	----	----

Operating modes of the EUT:

No.	Descriptions of EUT Exercising
1	Product tuned to specific 900Hz channel (low, mid, high).
2	Transmitting audio continuously via FM-modulated signal.
3	Volume level (modulation level) set to maximum recommended by the manufacturer during testing – determined by internal VU meter on the product LCD display.

3.1 Photo: Product Under Test

Model: AXS-900TXD



Shown with antenna fully retracted – 900MHz operation

Photo: Product Under Test

There are 3 Audio connectors, choose only one to connect to an audio source – **do not use more than one of these connectors at any time:**

Optical Connect this to an optical digital audio output on a TV, CD/DVD player, etc., using a standard optical cable

3.5 mm Connect this to a line-level or headphone-level stereo signal source on a TV, CD/DVD player, Receiver, etc., using an appropriate cable

RCA Connect this to a coax digital audio output on a TV, CD/DVD player, etc.

Photo: Product Under Test

AC-DC Adapter

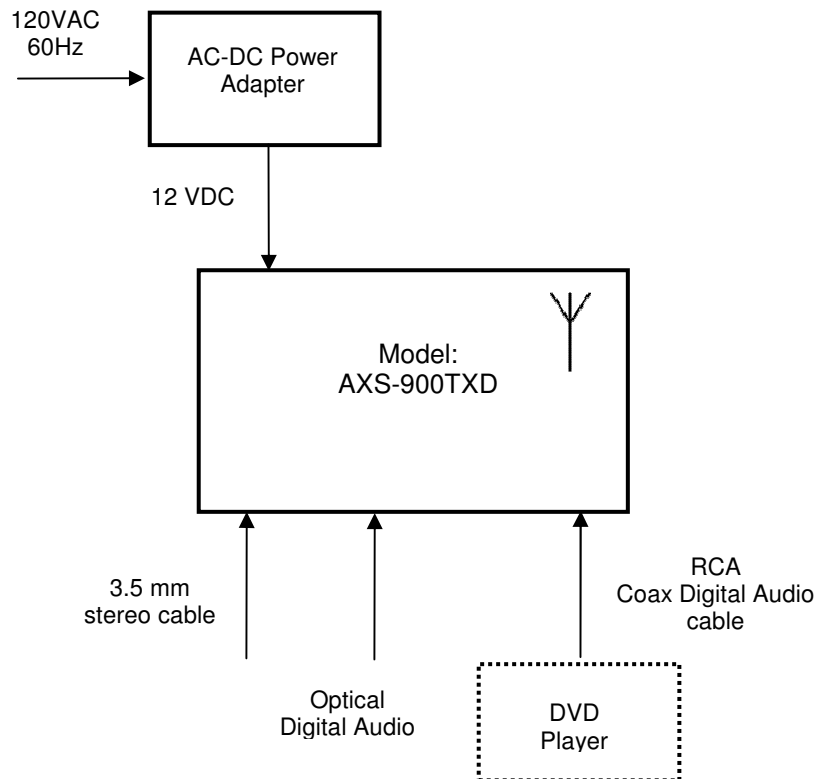


4 System setup including cable interconnection details, support equipment and simplified block diagram

4.1 Method:

Record the details of EUT cabling, document the support equipment, and show the interconnections in a block diagram.

4.2 EUT Block Diagram:



Notes:

1. Items in dashed line are support equipment – not directly tested.

4.3 Support Data:

ID	Description/ Function	Shield	Length	Connector	Connection	Ferrites
1	AC-DC Adapter Cable	no	1.5-meters	Dc power	Model AXS9FMT	no
2	RCA Coax Digital Audio Cable	yes	3-meters	RCA	DVD Player	no
3	3.5mm Analog Stereo Audio Cable	no	1-meter	3.5mm	none	no
4	Optical Digital Audio Cable	N/A	1-meter	optical	none	N/A

Support Equipment			
Description	Manufacturer	Model Number	Serial Number
DVD Player	Unknown	Unknown	Unknown

Notes: DVD player located outside the test chamber.

Intertek	
Report Number: 100860883DEN-002	Issued: 9/11/2012

5 Radiated Unintentional & Tx Spurious Emissions

5.1 Method

Unless otherwise stated no deviations were made from FCC 15.249(d)/ 15.209 [RSS-210 A2.9(b)/ RSS-Gen 7.2.5].

This testing was performed at Intertek Denver, located at 1795 Dogwood St. Suite 200, Louisville, CO 80027.

5.2 Test Equipment Used:

<u>Asset ID:</u>	<u>Description:</u>	<u>Manufacturer:</u>	<u>Model:</u>	<u>Serial:</u>	<u>Cal Date</u>	<u>Cal Due</u>
DEN-073	EMI Receiver	RHODE & SCHWARZ	ESU 26	100265	01/11/2012	01/11/2013
18912	9 kHz- 1.3GHz Pre Amp	Hewlett-Packard	8447F	3113A05545	06/06/2012	06/06/2013
18906	RF Pre-Amp (1-4GHz)	Mini-Circuits Lab	ZHL-42	N052792-2	06/06/2012	06/06/2013
18900	RF Pre-Amplifier (4-8 GHz)	Avantek	AFT97-8434-10F	1007	06/06/2012	06/06/2013
18901	RF Pre-Amp (8-18GHz)	Avantek	AWT-18037	1002	06/06/2012	06/06/2013
18897	Active Magnetic Loop Antenna	EMCO	6502	9205-2738	11/22/2011	11/22/2012
19936	Bilog Antenna 30MHz – 6GHz	Sunol Sciences	JB6	A050707-1	11/15/2011	11/15/2012
18887	Horn Antenna 1-18GHz	EMCO	3115	9205-3886	02/29/2012	02/29/2013
SW-6	Software application for Radiated and Conducted Emissions	Intertek	OATS_Vba	V003	VBU	VBU

5.3 Results:

The sample tested was found to Comply.

5.4 Setup Photographs: Product Configuration – 900MHz Mode

Test setup – Front view

(Axis 2 – Worst Case)



(Axis 2)



Photo:

Test setup – Rear view

Axis 2 (Worst-Case)



Axis 2



Photo: Antenna Setup

Antenna Setup: Active Loop Antenna - 10kHz to 30MHz



Antenna Setup: BiLog Antenna - 30MHz to 1000MHz



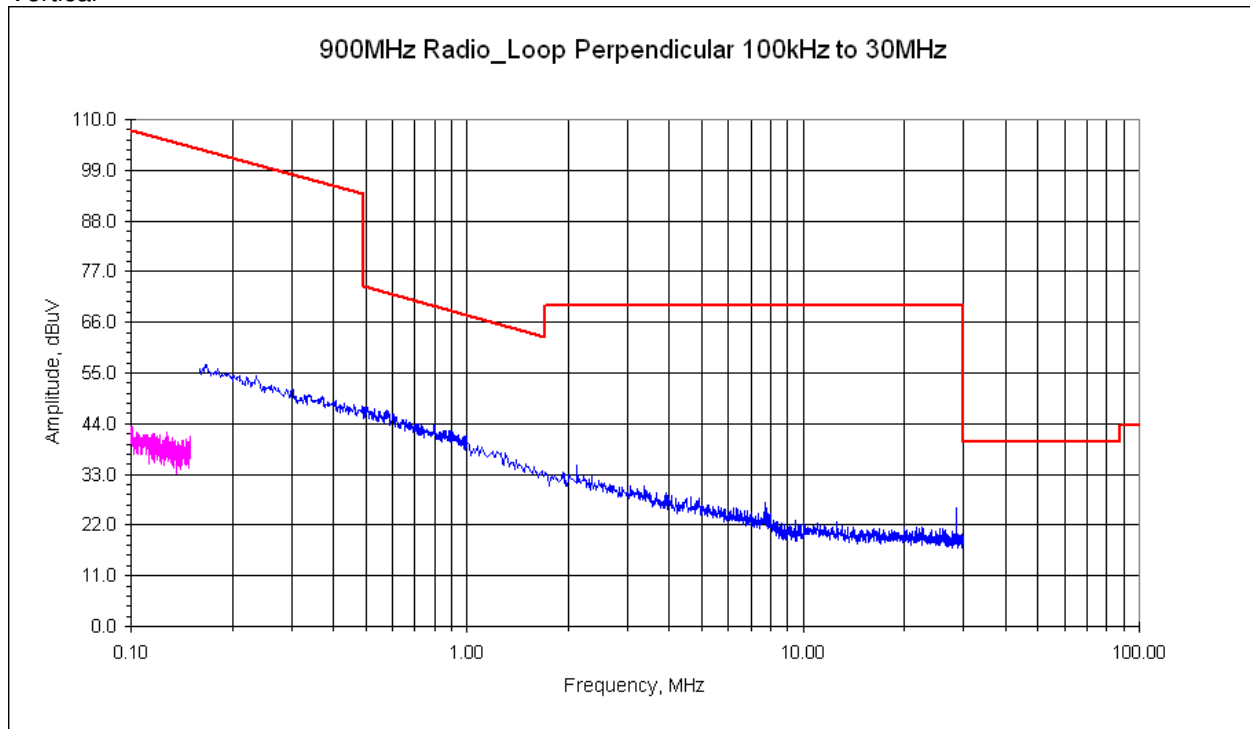
Antenna Setup: Ridged Guide Horn Antenna – Above 1GHz



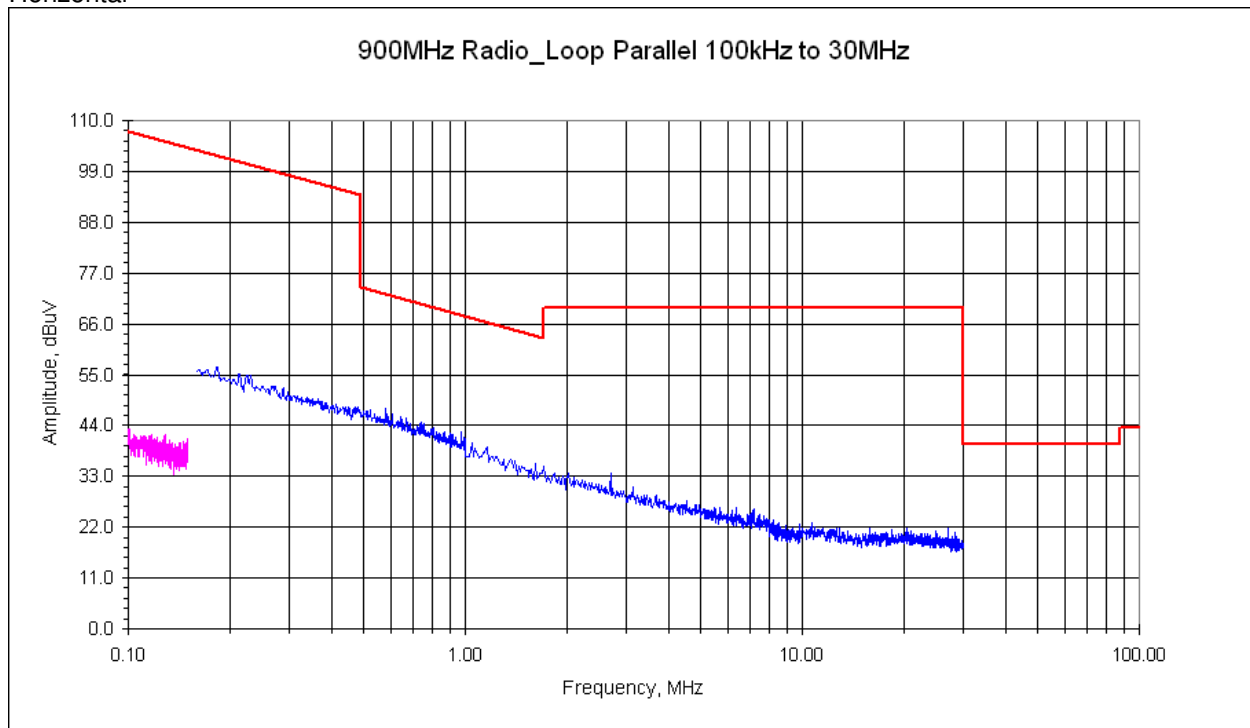
5.5 Pre-scan Plots: Reference Only – Not Final Data: 900MHz Mode (Mid Channel)

Radiated Emissions – FCC 15.249(d)/15.209 [IC RSS-210 A2.9(b)/ RSS-Gen 7.2.5] - (100kHz to 30MHz)

Vertical



Horizontal

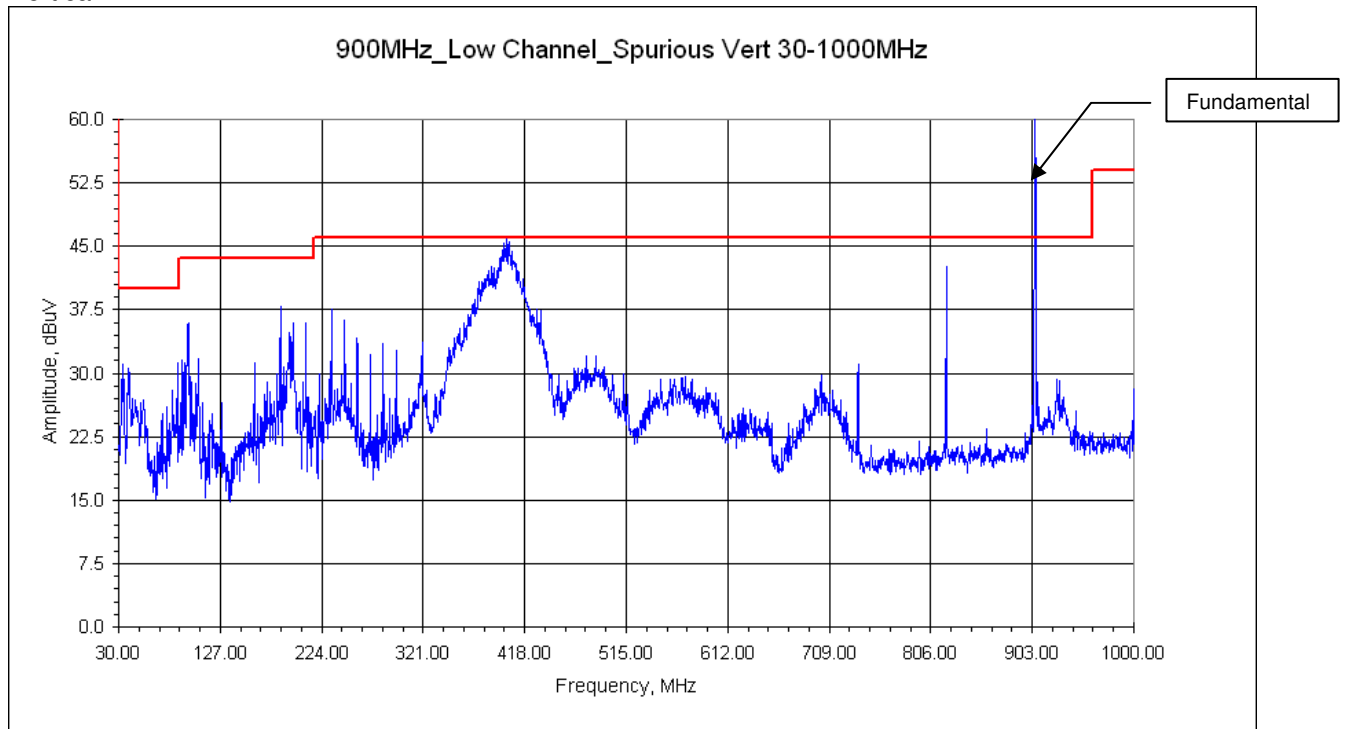


Note: Peak detector max hold measurements plotted against quasi-peak limits

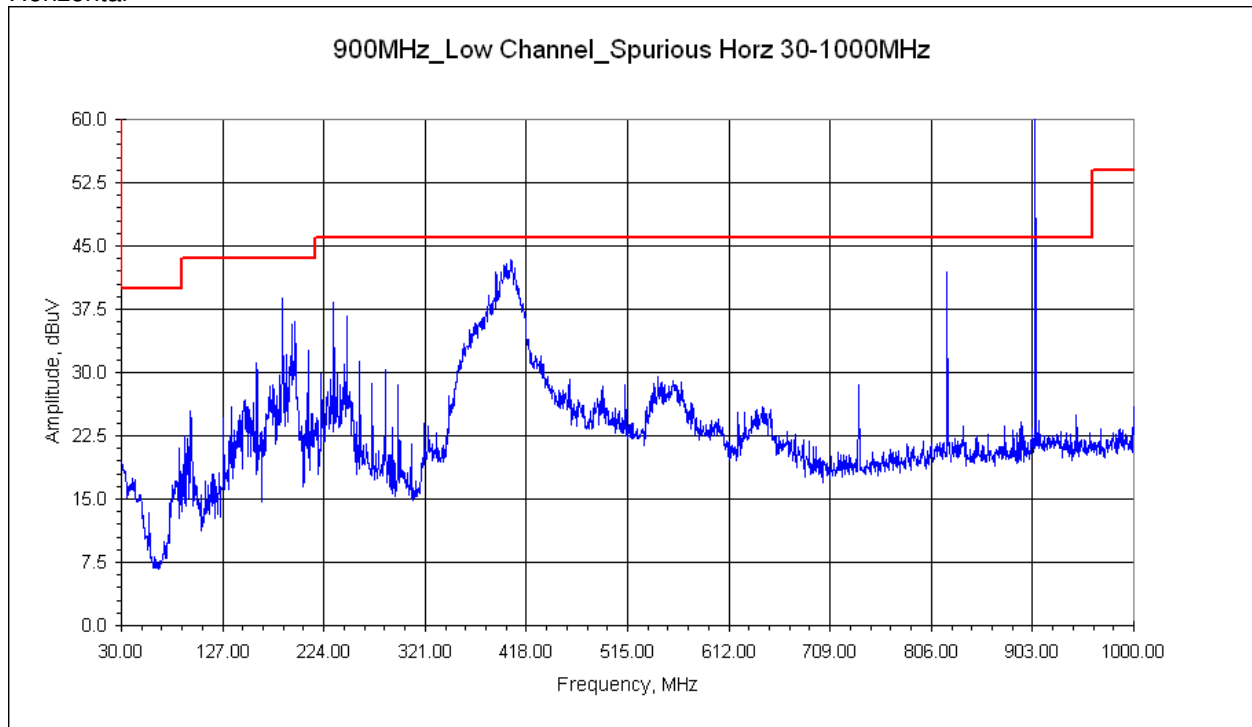
5.6 Pre-scan Plots: Reference Only – Not Final Data: 900MHz Mode (Low Channel)

Radiated Emissions – FCC 15.249(d)/15.209 [IC RSS-210 A2.9(b)/ RSS-Gen 7.2.5] - (30MHz to 1000MHz)

Vertical



Horizontal

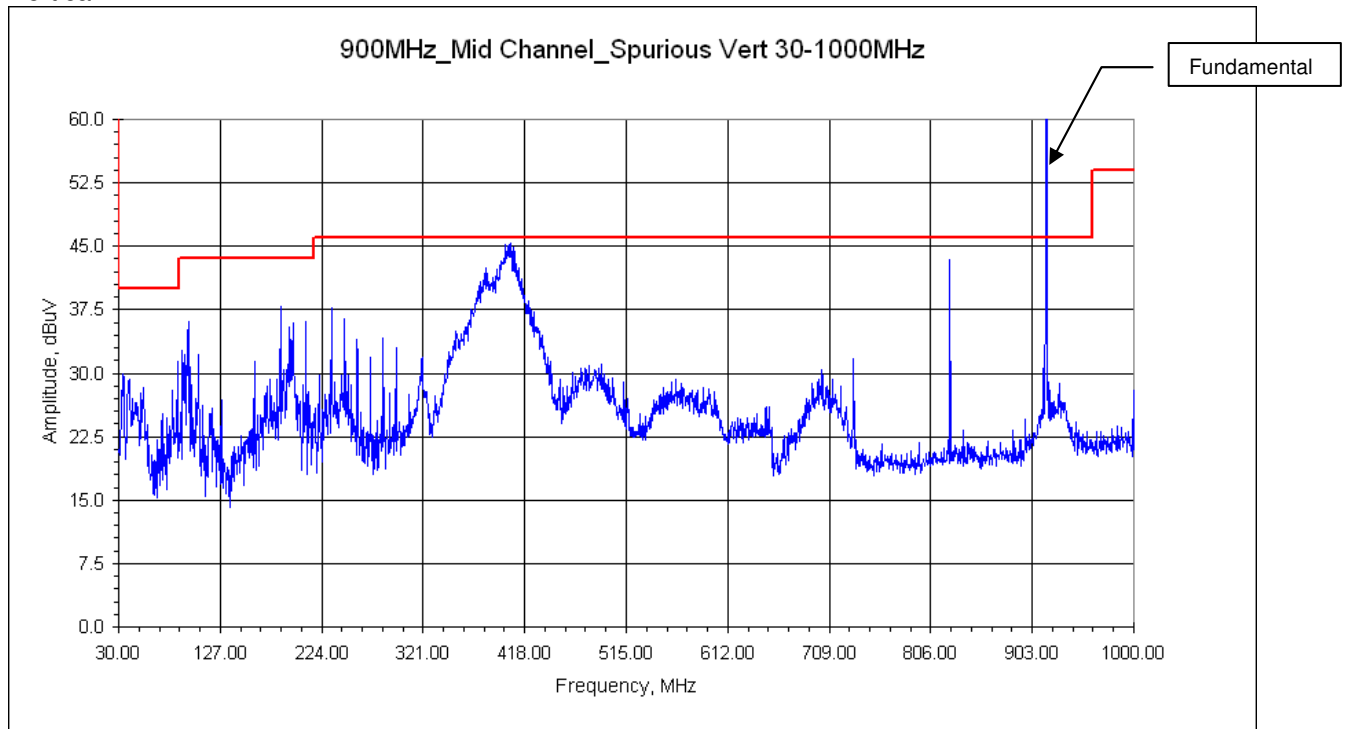


Note: Peak detector max hold measurements plotted against quasi-peak limits

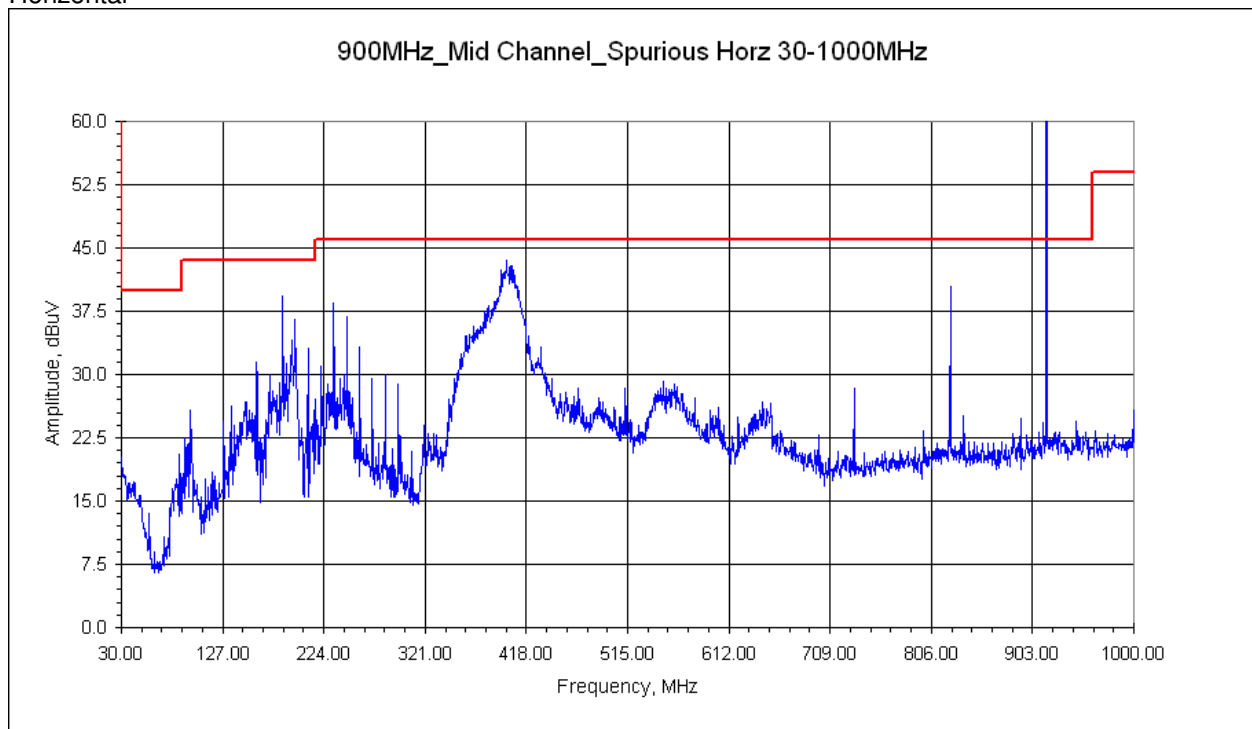
5.7 Pre-scan Plots: Reference Only – Not Final Data: 900MHz Mode (Mid Channel)

Radiated Emissions – FCC 15.249(d)/15.209 [IC RSS-210 A2.9(b)/ RSS-Gen 7.2.5] - (30MHz to 1000MHz)

Vertical



Horizontal

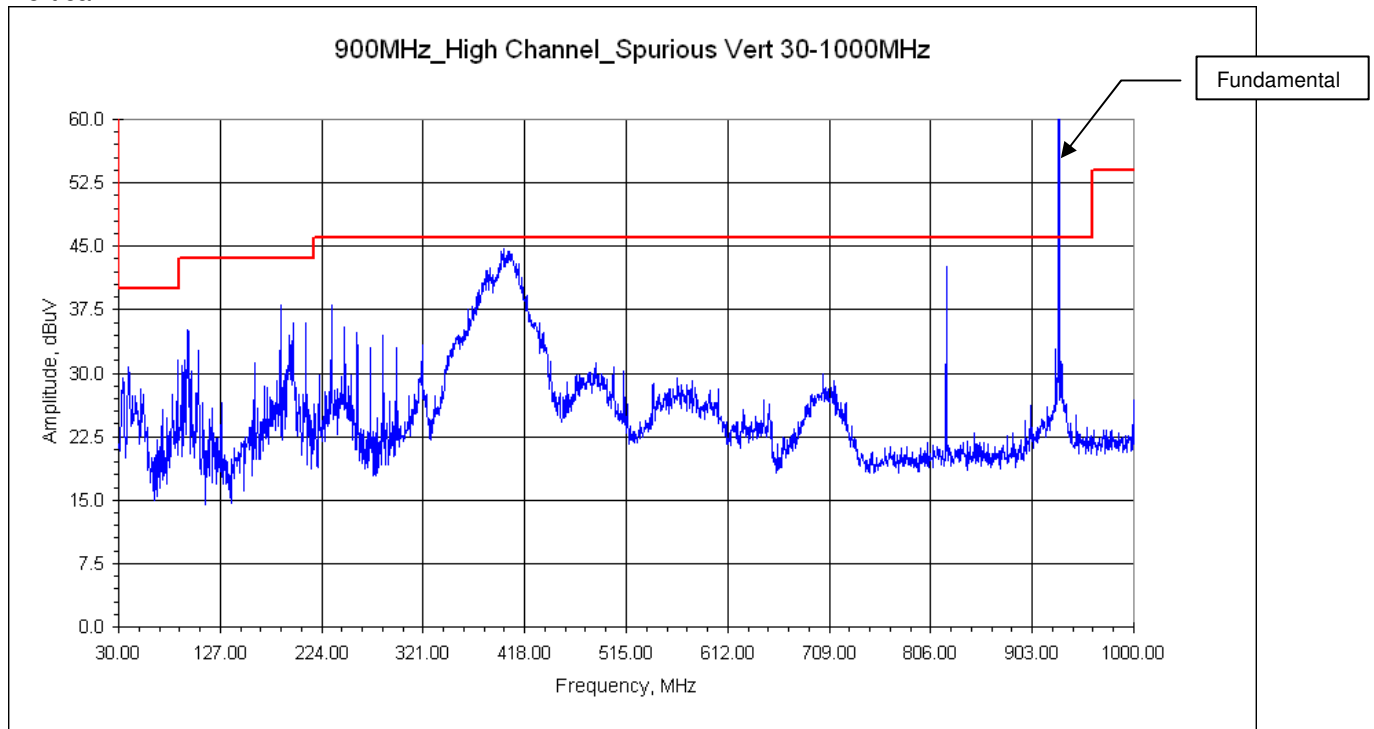


Note: Peak detector max hold measurements plotted against quasi-peak limits

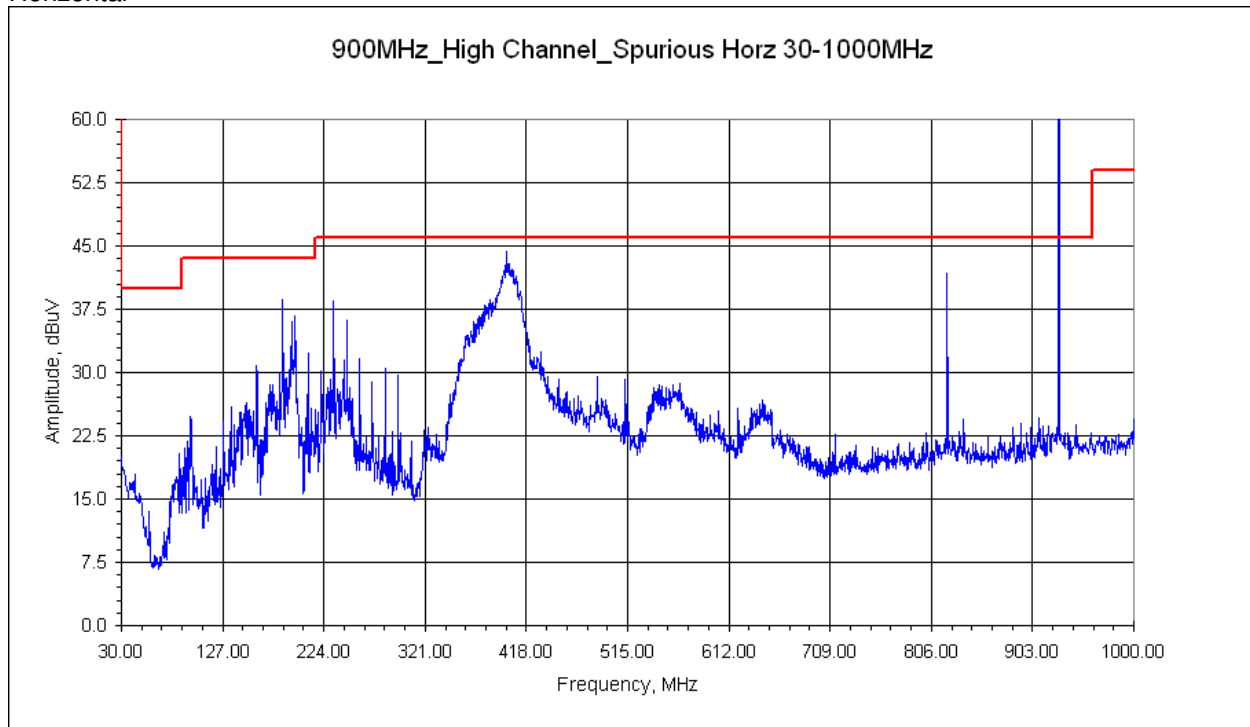
5.8 Pre-scan Plots: Reference Only – Not Final Data: 900MHz Mode (High Channel)

Radiated Emissions – FCC 15.249(d)/15.209 [IC RSS-210 A2.9(b)/ RSS-Gen 7.2.5] - (30MHz to 1000MHz)

Vertical



Horizontal

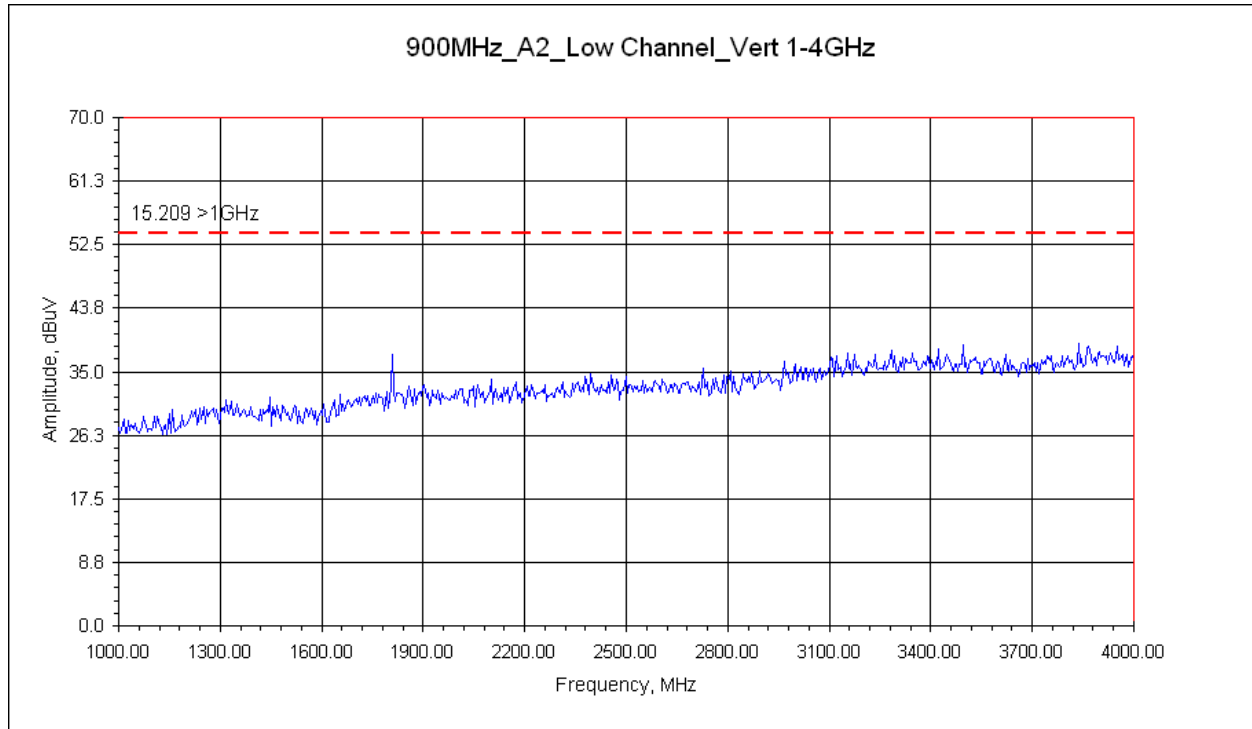


Note: Peak detector max hold measurements plotted against quasi-peak limits

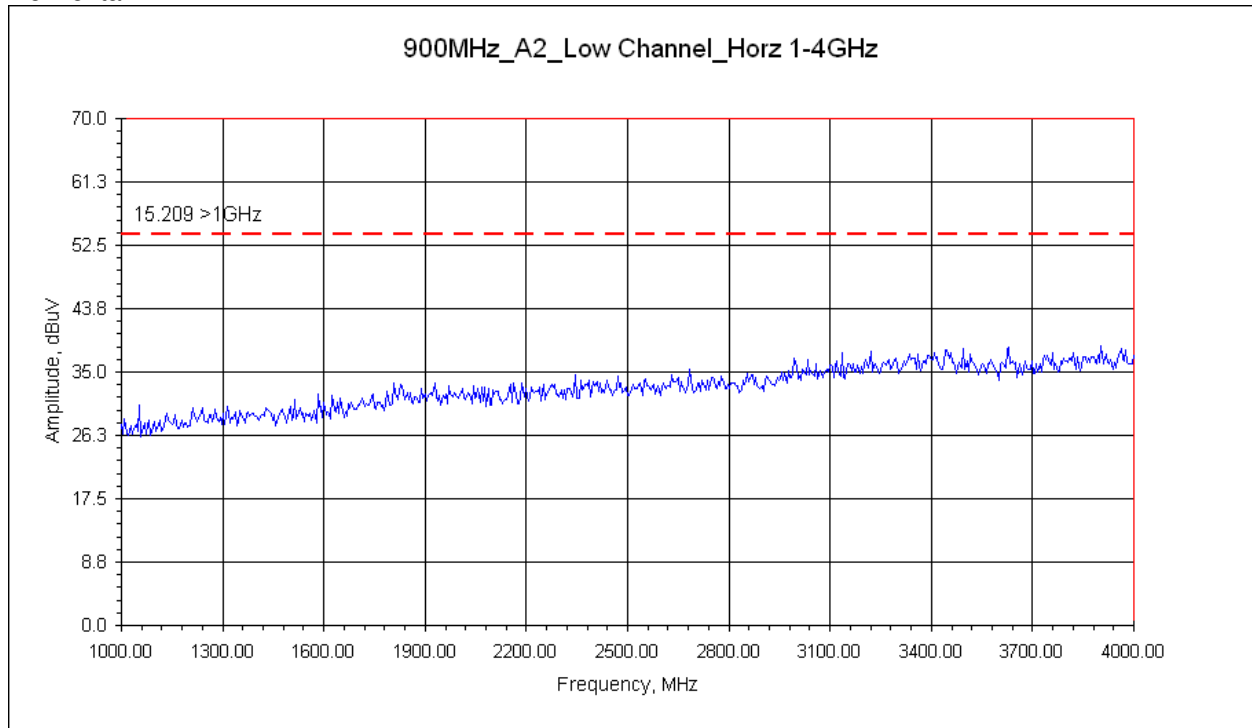
5.9 Pre-scan Plots: Reference only – Not Final Data: 900MHz Mode (Low Channel)

Radiated Emissions – FCC 15.249(d)/15.209 [IC RSS-210 A2.9(b)/ RSS-Gen 7.2.5] - (1GHz to 4GHz)

Vertical



Horizontal

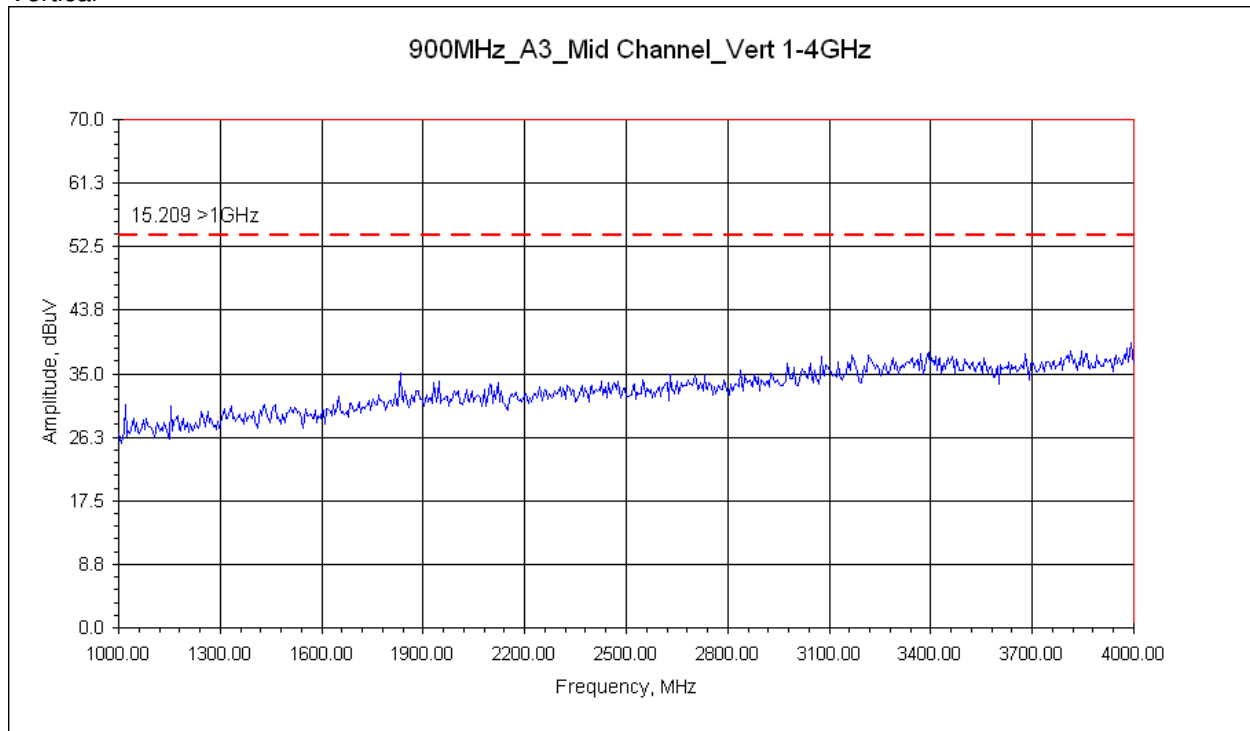


Note: Peak detector max hold measurements plotted against average limits

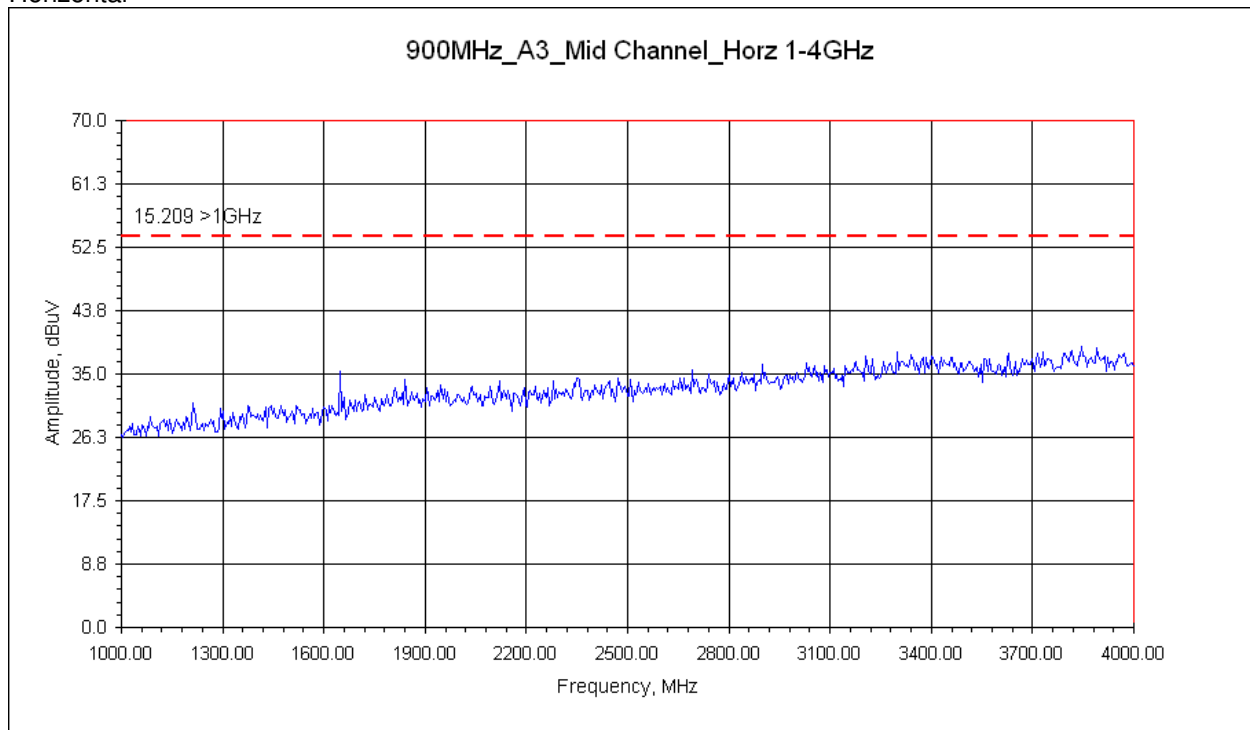
5.10 Pre-scan Plots: Reference only – Not Final Data: 900MHz Mode (Mid Channel)

Radiated Emissions – FCC 15.249(d)/15.209 [IC RSS-210 A2.9(b)/ RSS-Gen 7.2.5] - (1GHz to 4GHz)

Vertical



Horizontal

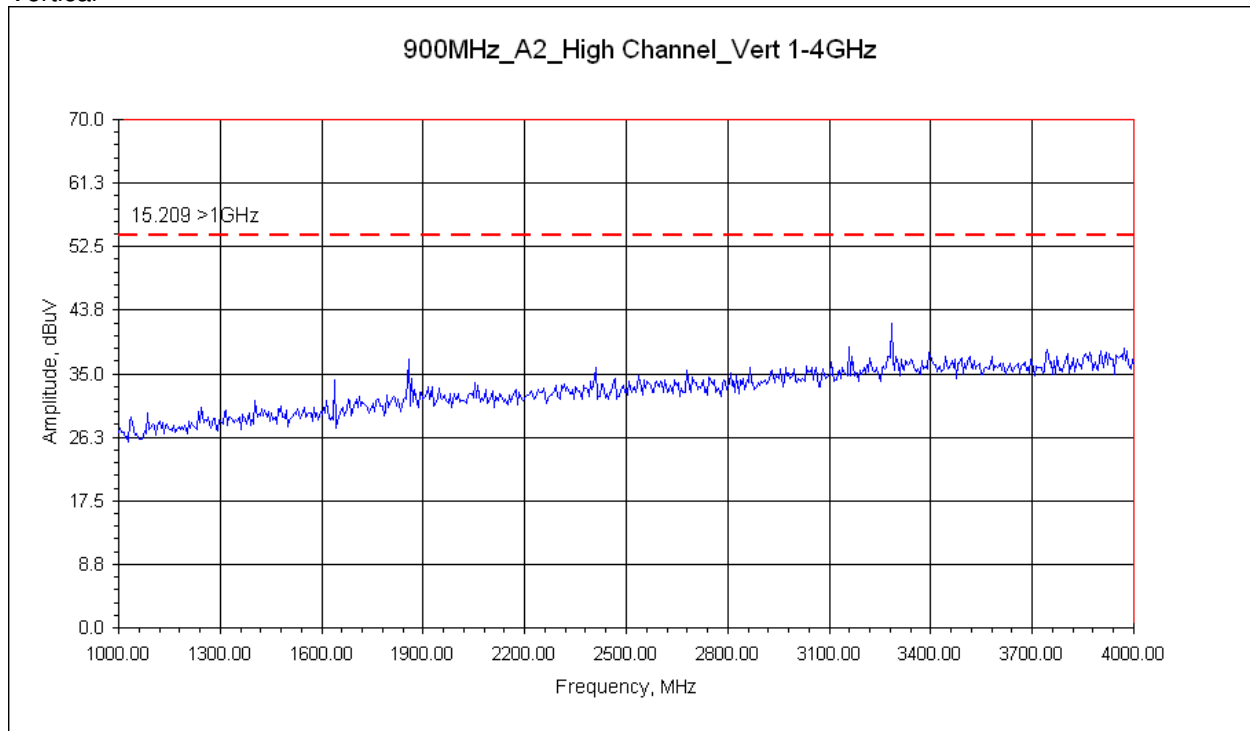


Note: Peak detector max hold measurements plotted against average limits

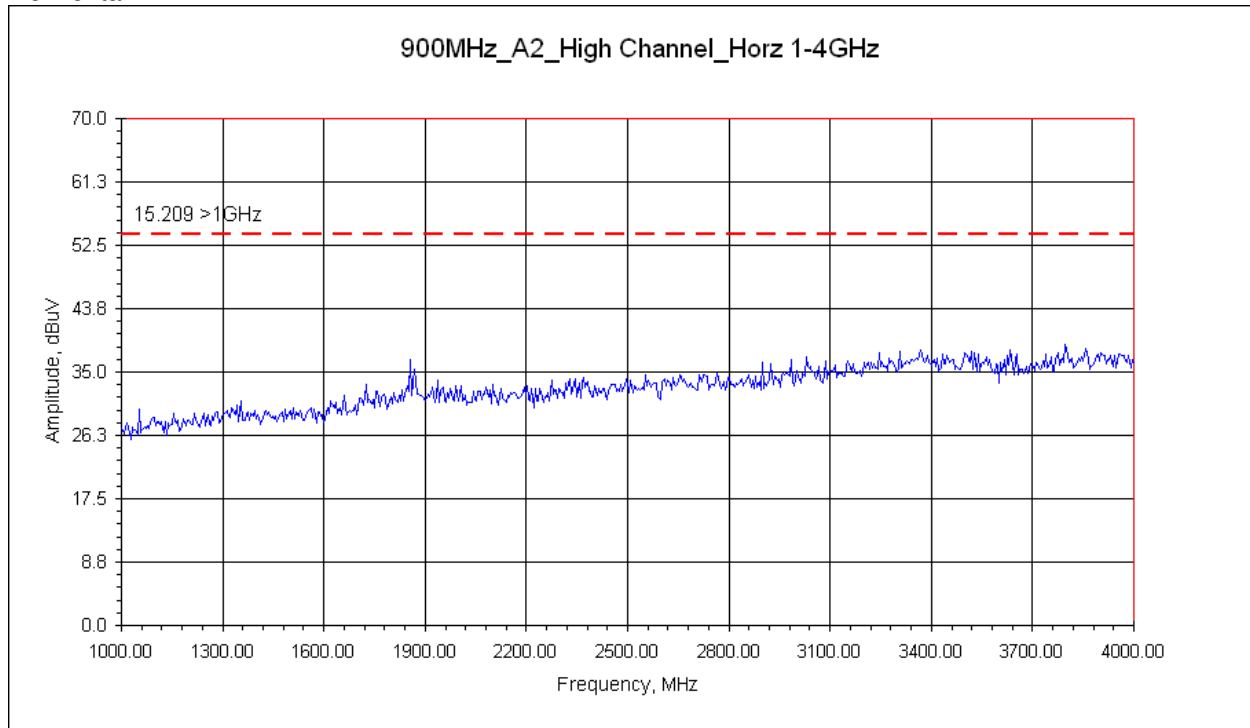
5.11 Pre-scan Plots: Reference only – Not Final Data: 900MHz Mode (High Channel)

Radiated Emissions – FCC 15.249(d)/15.209 [IC RSS-210 A2.9(b)/ RSS-Gen 7.2.5] - (1GHz to 4GHz)

Vertical



Horizontal

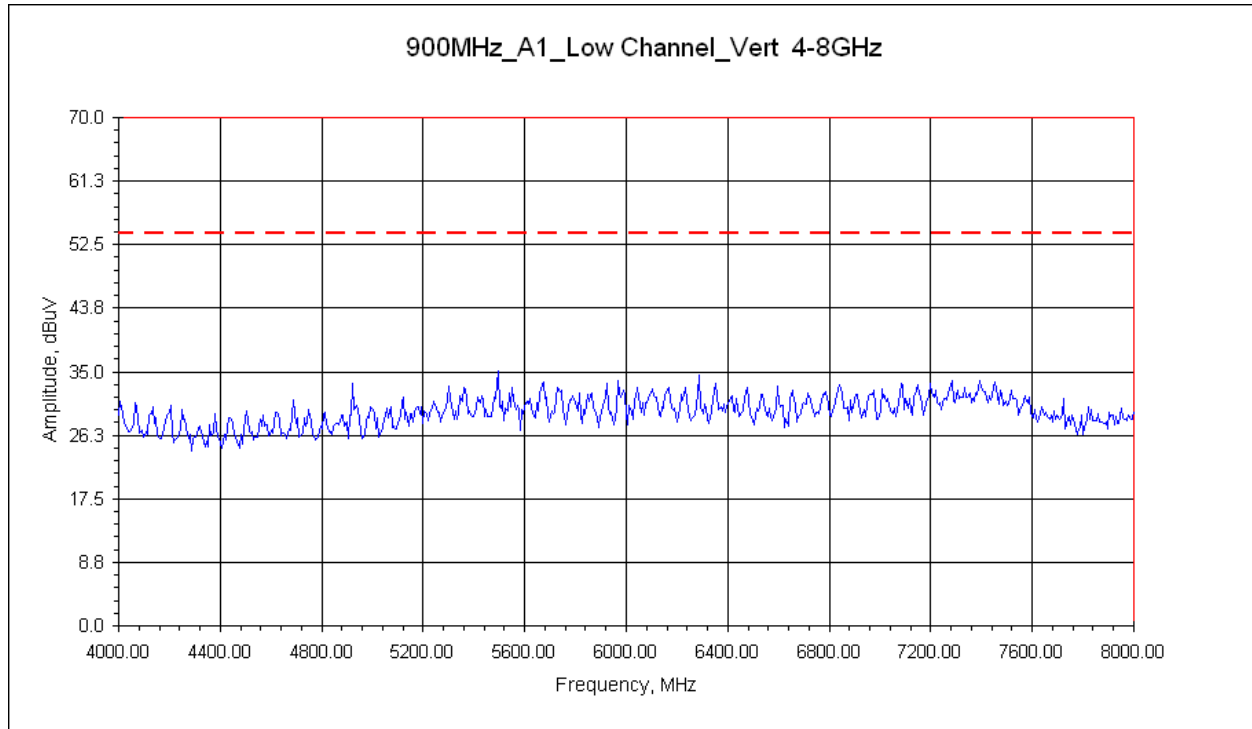


Note: Peak detector max hold measurements plotted against average limits

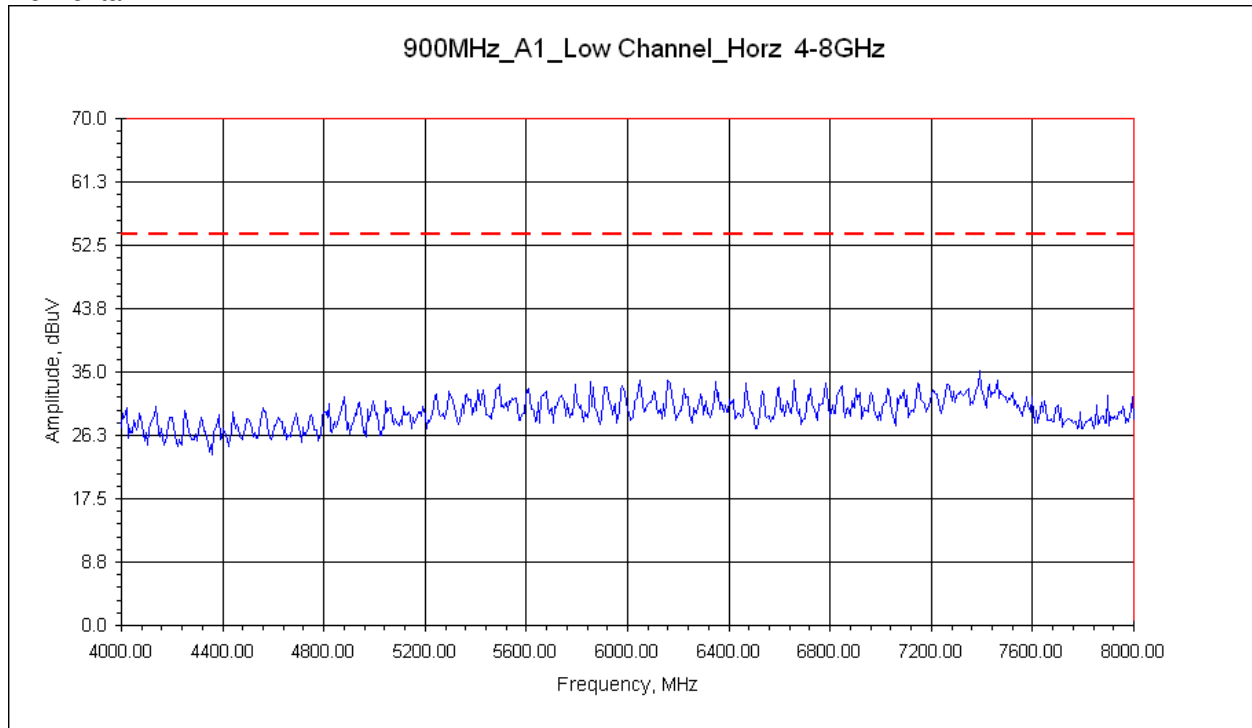
5.12 Pre-scan Plots: Reference only – Not Final Data: 900MHz Mode (Low Channel)

Radiated Emissions – FCC 15.249(d)/15.209 [IC RSS-210 A2.9(b)/ RSS-Gen 7.2.5] - (4GHz to 8GHz)

Vertical



Horizontal

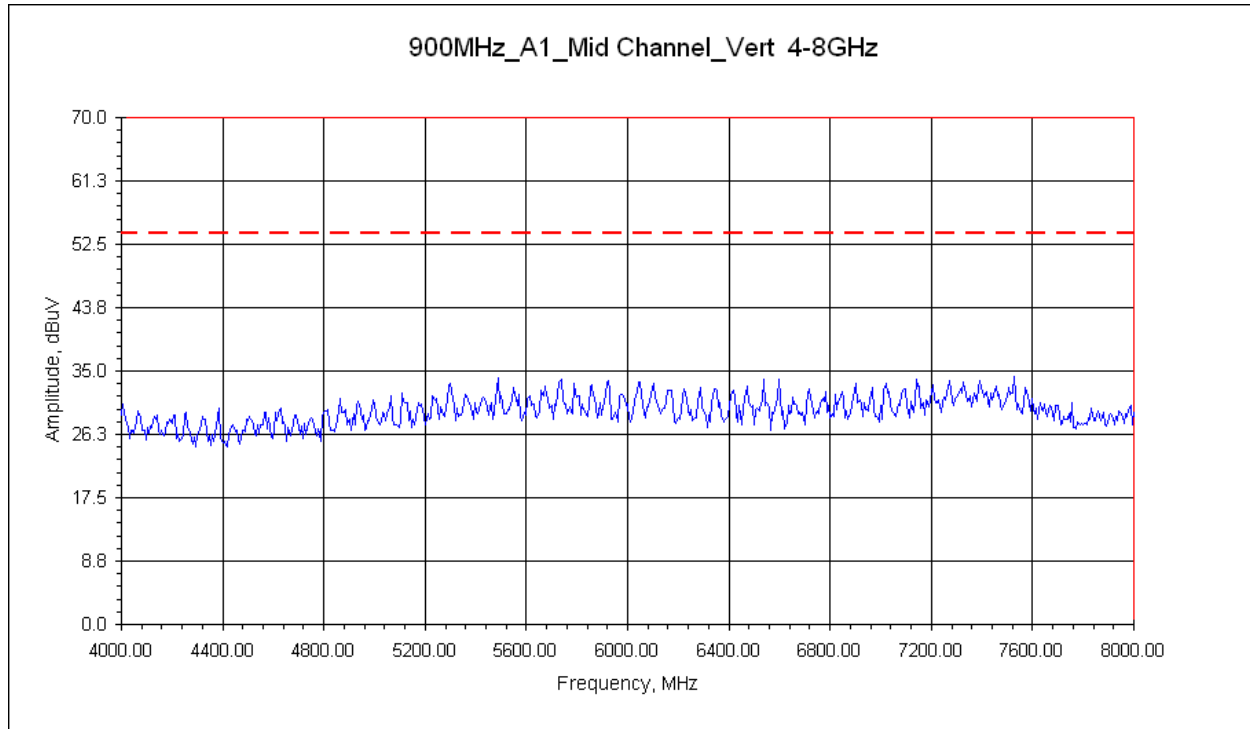


Note: Peak detector max hold measurements plotted against average limits

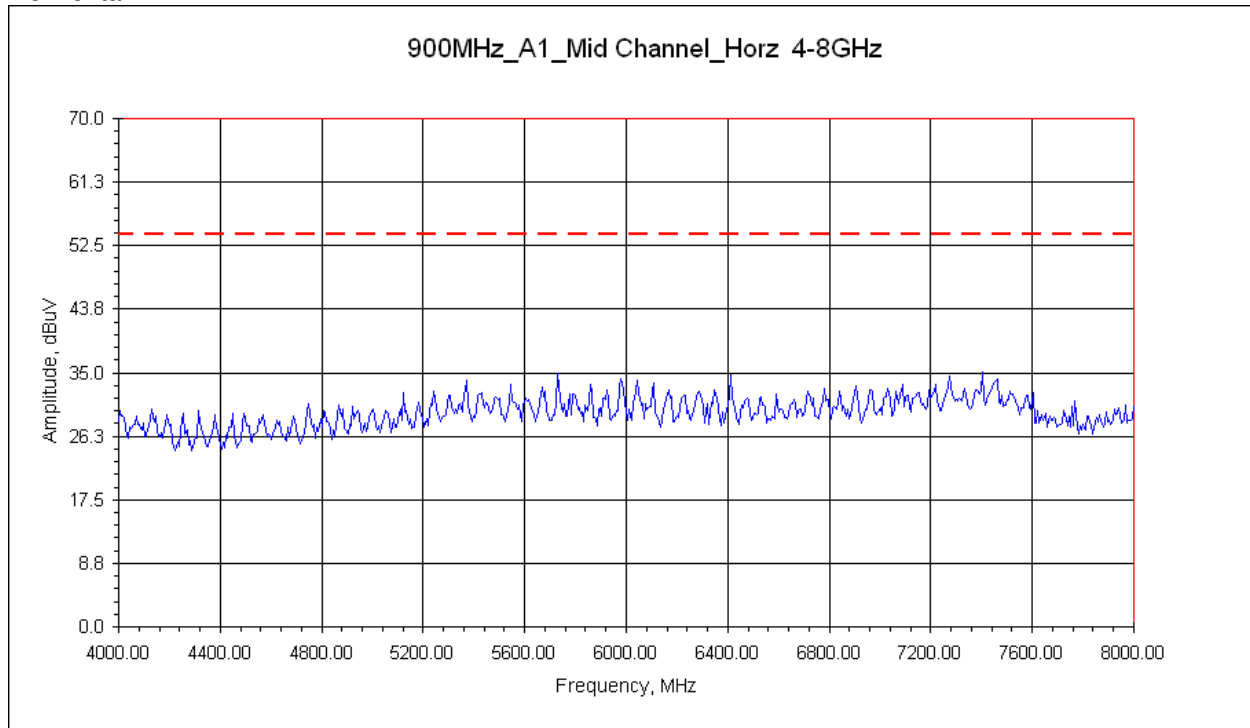
5.13 Pre-scan Plots: Reference only – Not Final Data: 900MHz Mode (Mid Channel)

Radiated Emissions – FCC 15.249(d)/15.209 [IC RSS-210 A2.9(b)/ RSS-Gen 7.2.5] - (4GHz to 8GHz)

Vertical



Horizontal

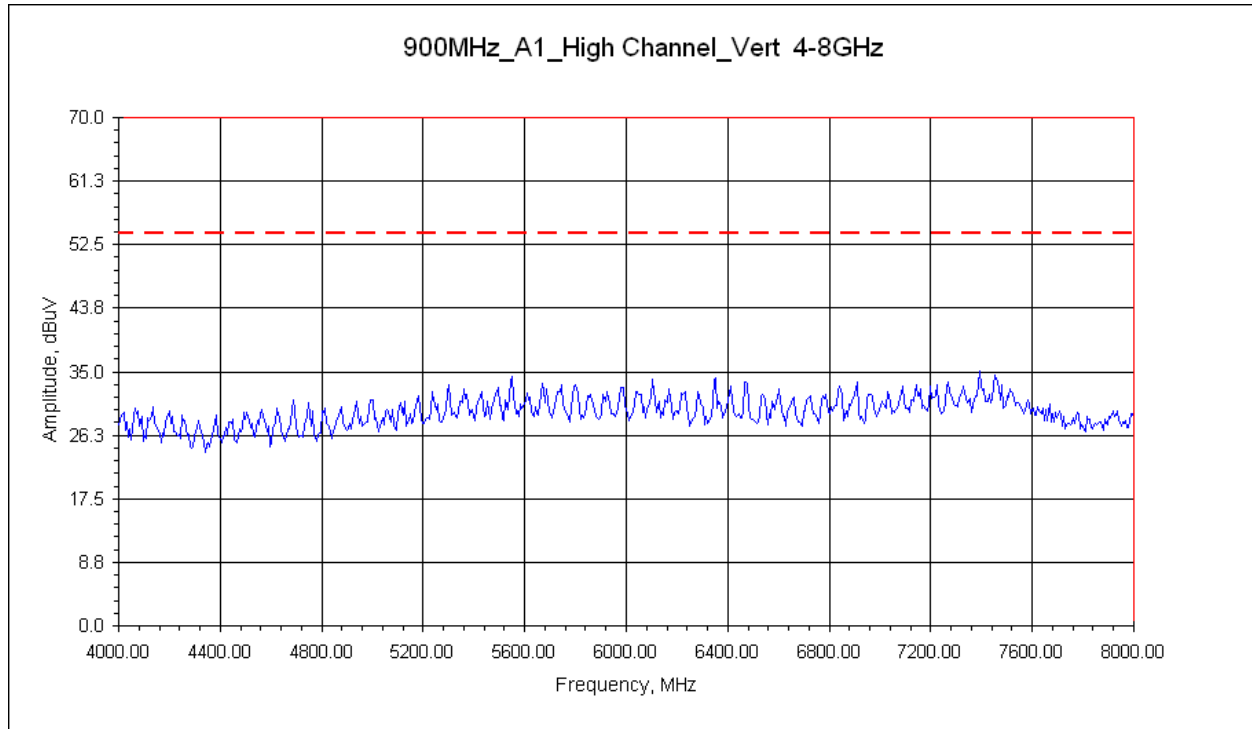


Note: Peak detector max hold measurements plotted against average limits

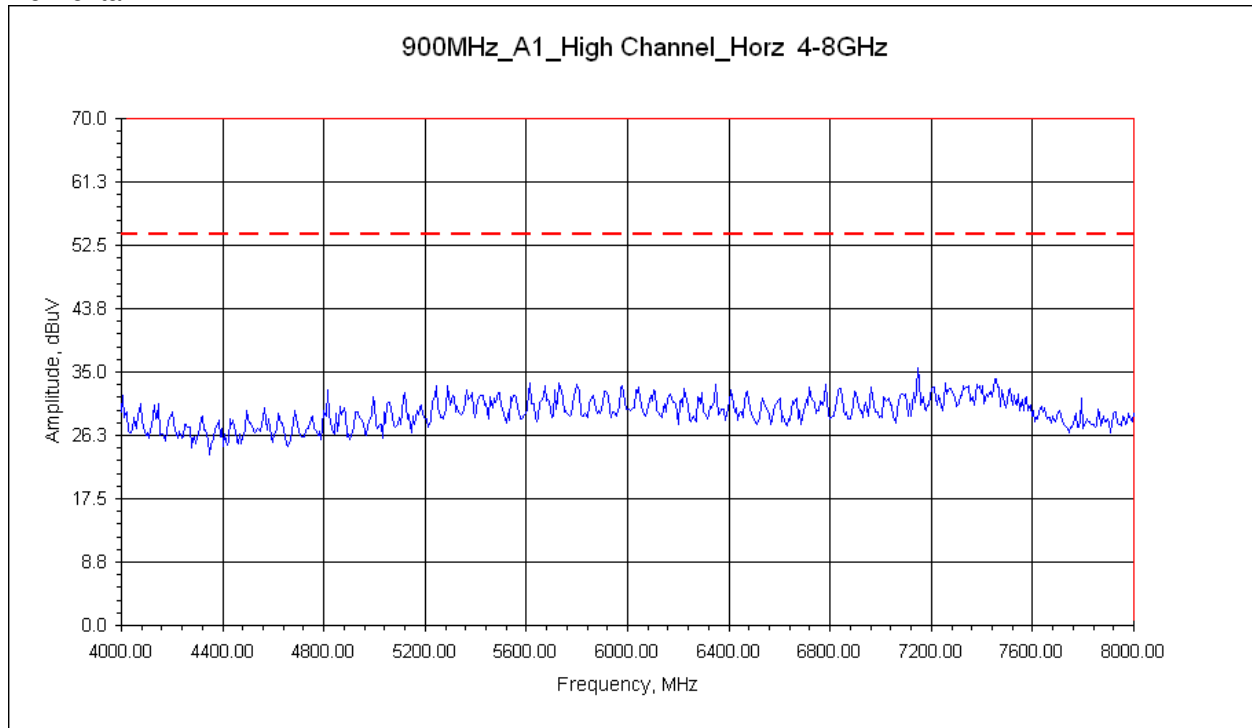
5.14 Pre-scan Plots: Reference only – Not Final Data: 900MHz Mode (High Channel)

Radiated Emissions – FCC 15.249(d)/15.209 [IC RSS-210 A2.9(b)/ RSS-Gen 7.2.5] - (4GHz to 8GHz)

Vertical



Horizontal

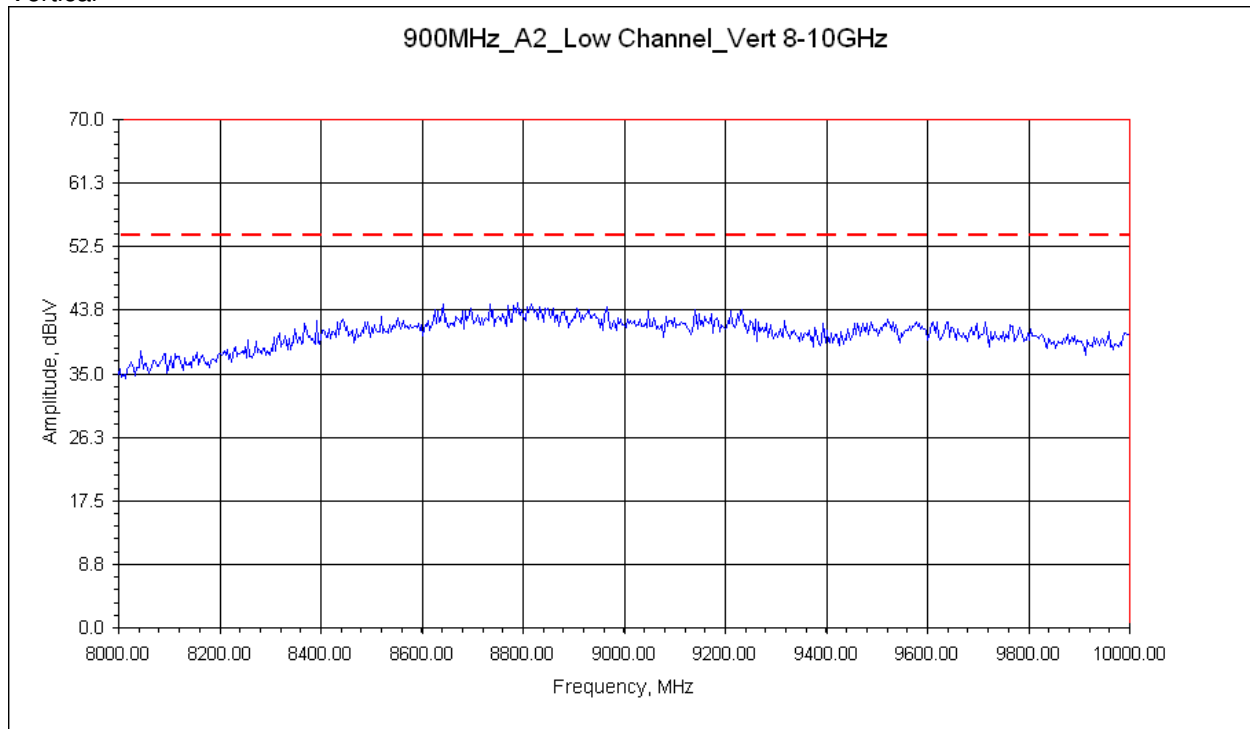


Note: Peak detector max hold measurements plotted against average limits

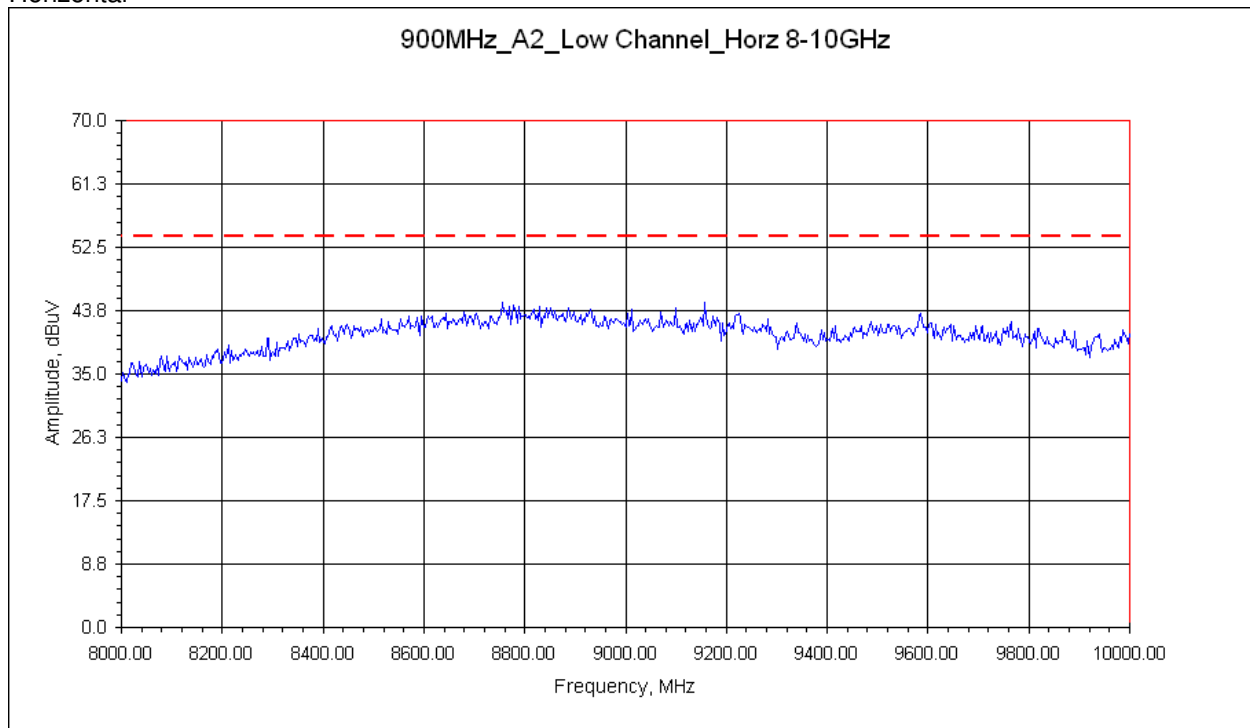
5.15 Pre-scan Plots: Reference only – Not Final Data: 900MHz Mode (Low Channel)

Radiated Emissions – FCC 15.249(d)/15.209 [IC RSS-210 A2.9(b)/ RSS-Gen 7.2.5] - (8GHz to 10GHz)

Vertical



Horizontal

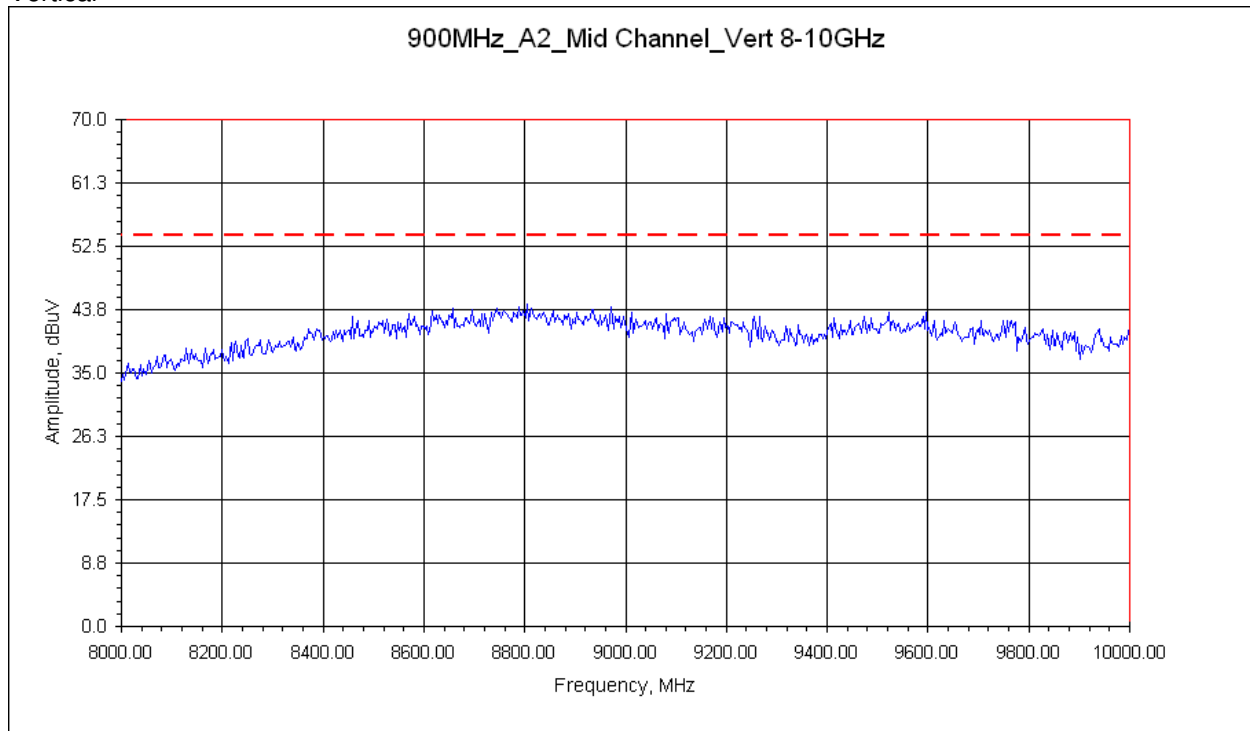


Note: Peak detector max hold measurements plotted against average limits

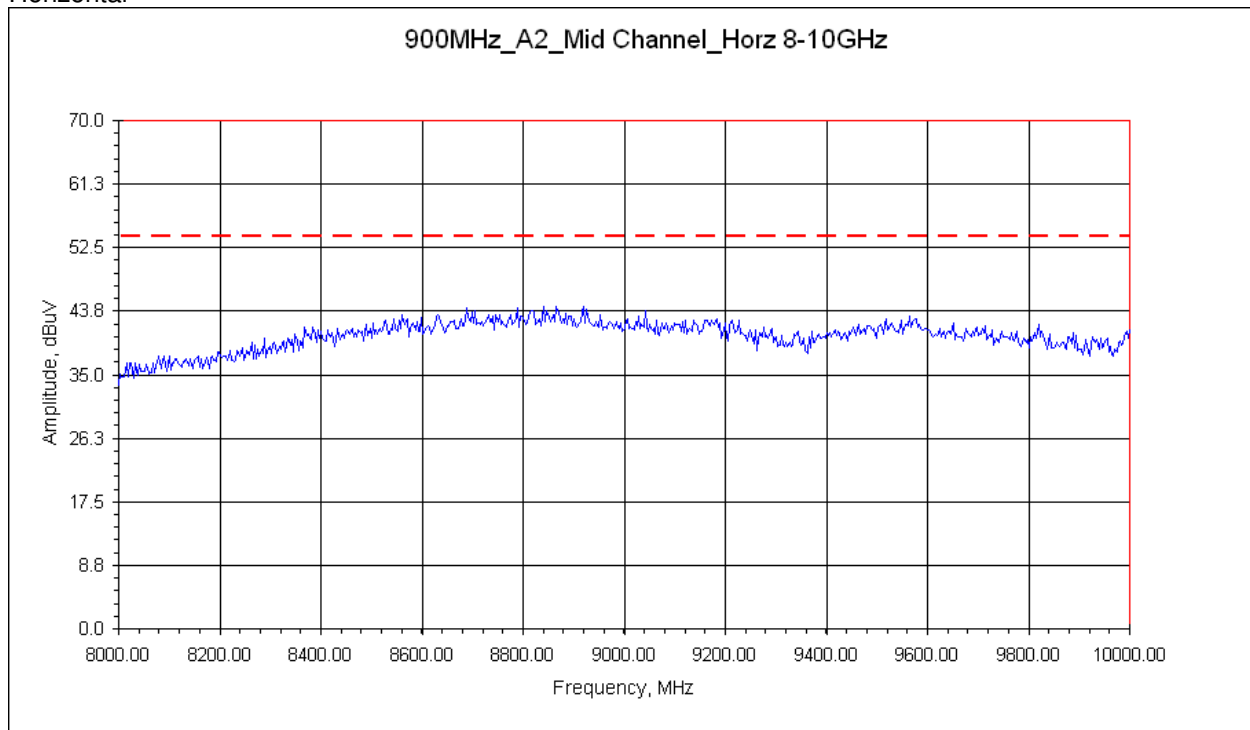
5.16 Pre-scan Plots: Reference only – Not Final Data: 900MHz Mode (Mid Channel)

Radiated Emissions – FCC 15.249(d)/15.209 [IC RSS-210 A2.9(b)/ RSS-Gen 7.2.5] - (8GHz to 10GHz)

Vertical



Horizontal

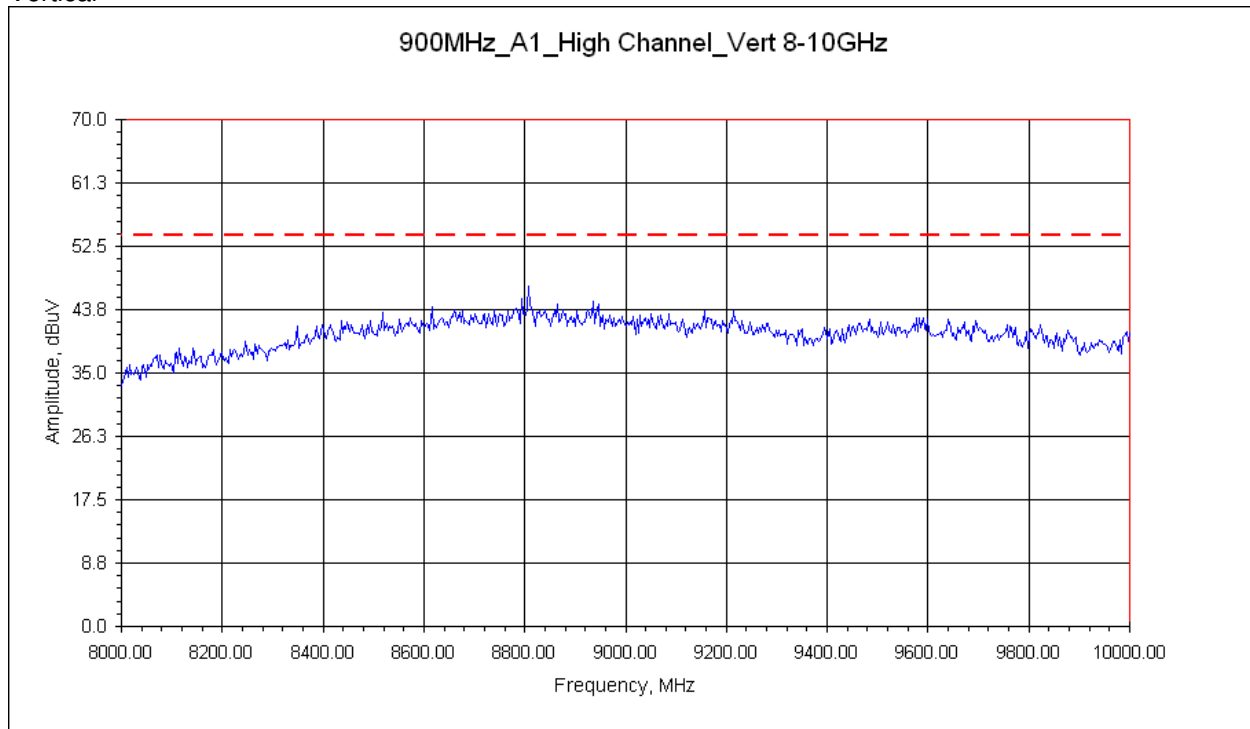


Note: Peak detector max hold measurements plotted against average limits

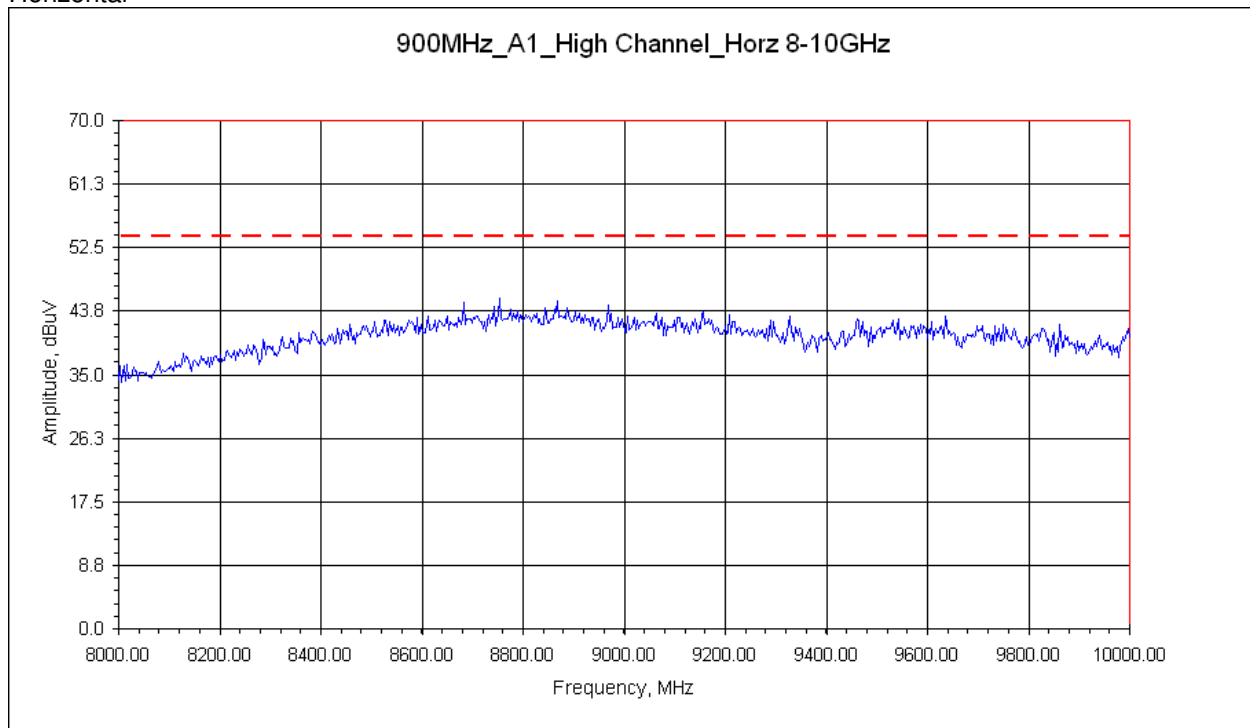
5.17 Pre-scan Plots: Reference only – Not Final Data: 900MHz Mode (High Channel)

Radiated Emissions – FCC 15.249(d)/15.209 [IC RSS-210 A2.9(b)/ RSS-Gen 7.2.5] - (8GHz to 10GHz)

Vertical



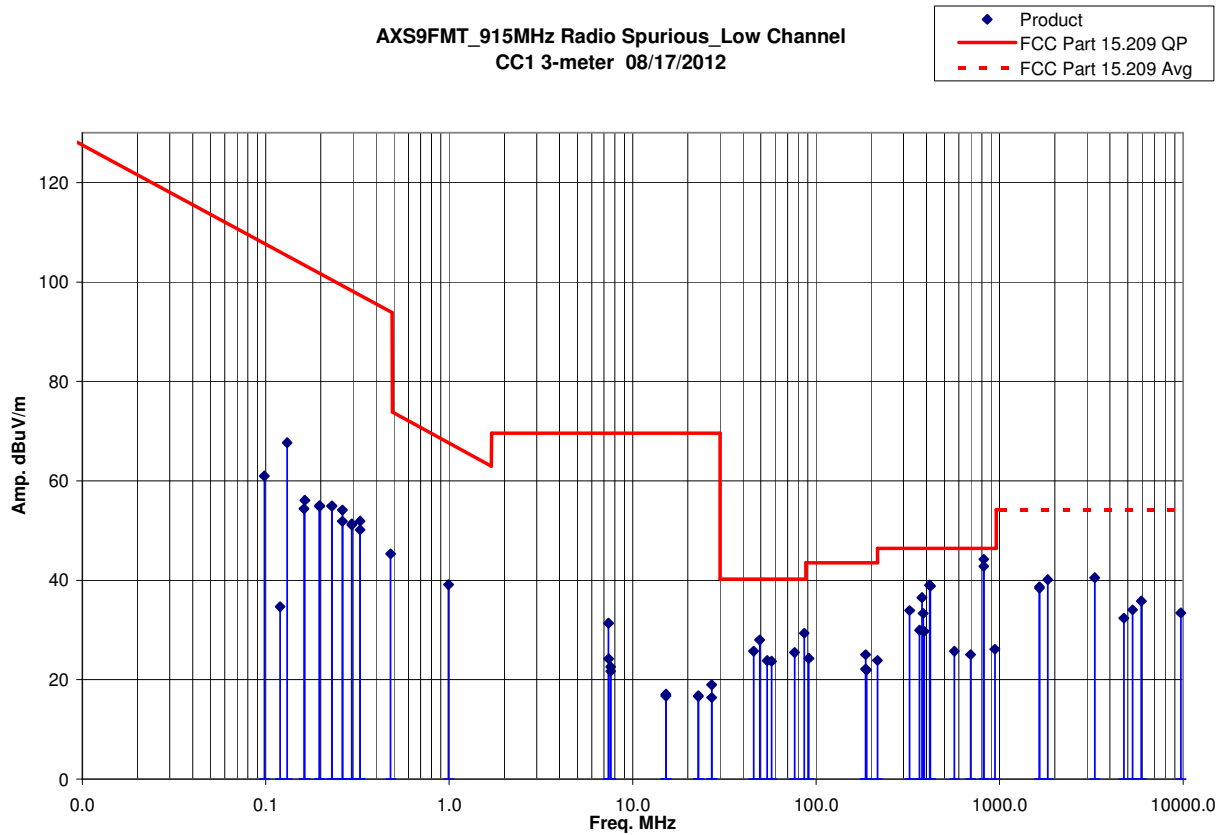
Horizontal



Note: Peak detector max hold measurements plotted against average limits

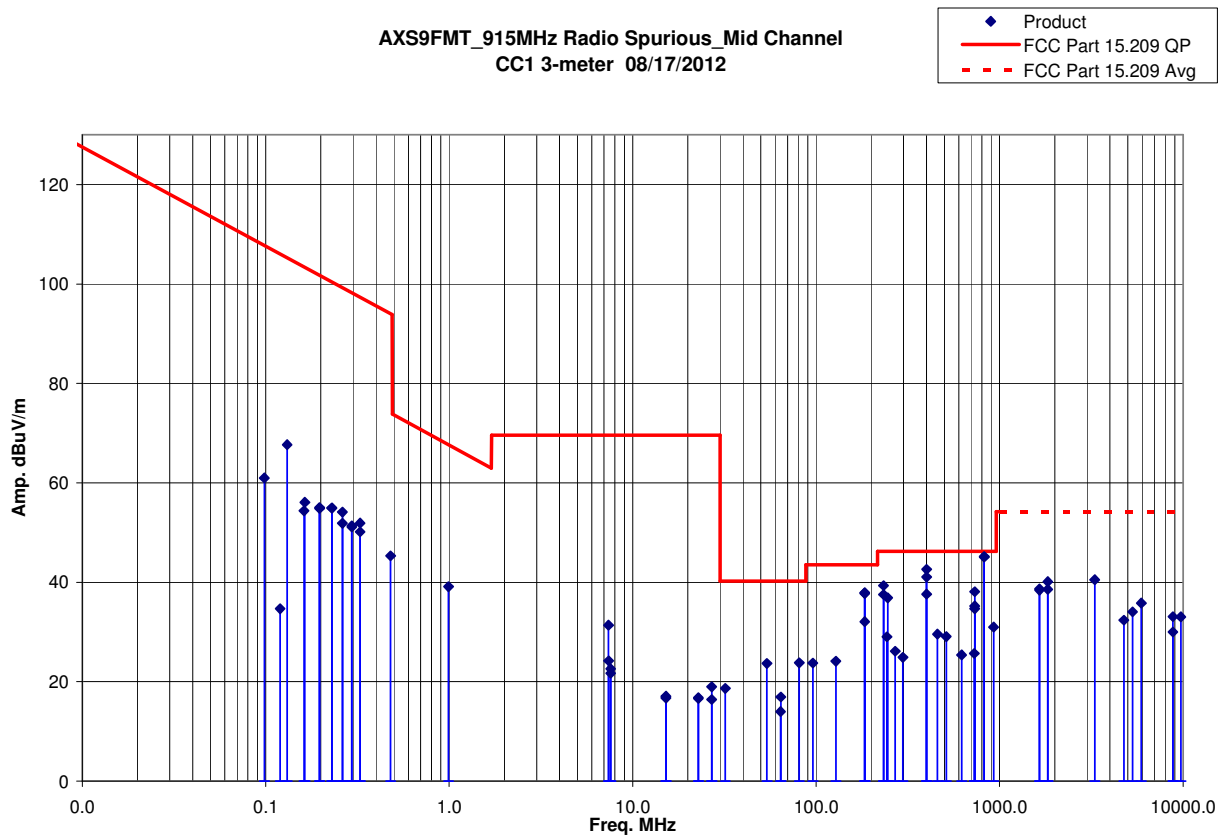
5.18 Final Plots: 900MHz Mode (Low Channel)

Radiated Emissions – FCC 15.249(d)/15.209 [IC RSS-210 A2.9(b)/ RSS-Gen 7.2.5] - (100kHz to 10GHz)



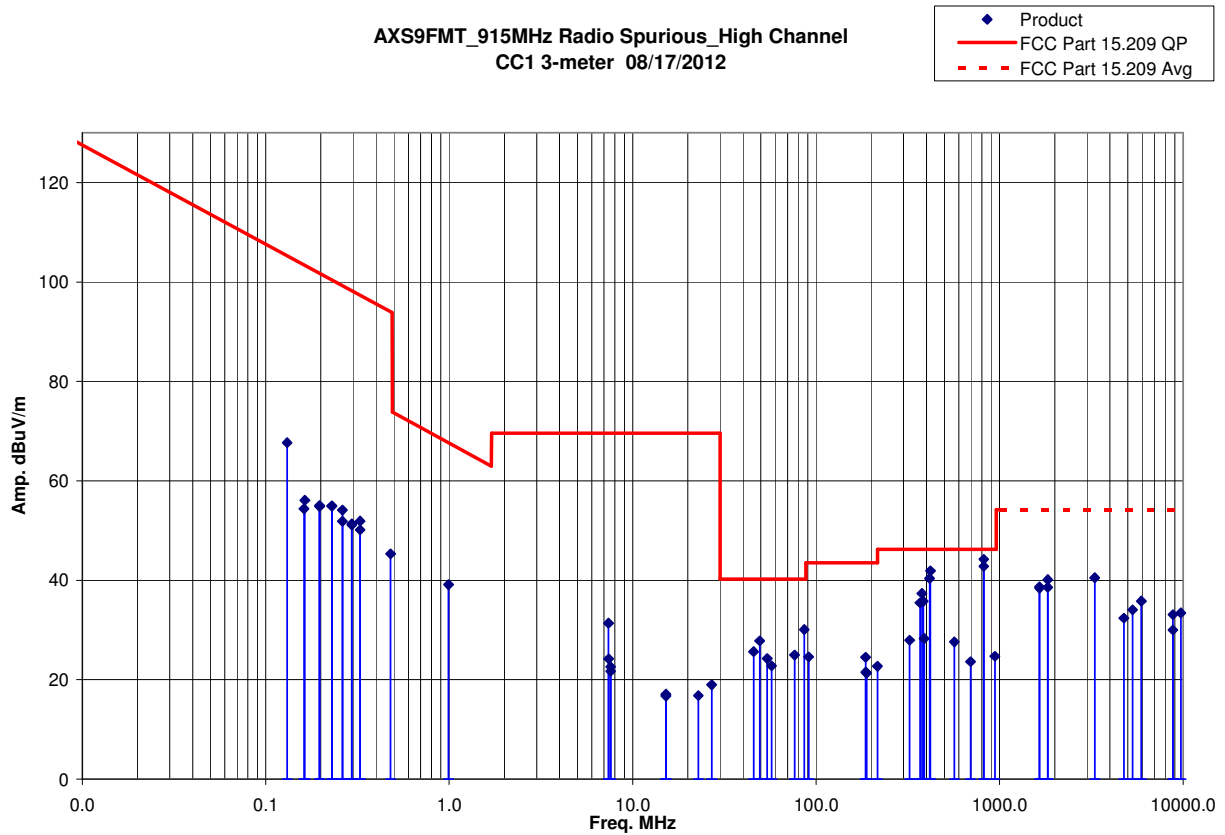
5.19 Final Plots: 900MHz Mode (Mid Channel)

Radiated Emissions – FCC 15.249(d)/15.209 [IC RSS-210 A2.9(b)/ RSS-Gen 7.2.5] - (100kHz to 10GHz)



5.20 Test Data: 900MHz Mode (High Channel)

Radiated Emissions – FCC 15.249(d)/15.209 [IC RSS-210 A2.9(b)/ RSS-Gen 7.2.5] - (100kHz to 10GHz)



Intertek

Report Number: 100860883DEN-002

Issued: 9/11/2012

5.21 Test Data: 900MHz Mode

Radiated Electromagnetic Emissions (Tx Spurious & Unintentional)

Test Report #:	G100860883	Test Area:	CC1 Radiated	Temperature:	22.8 °C
Test Method:	FCC 15.249(d)/15.209 IC RSS-210 A2.9(b)/ RSS-Gen 7.2.5	Test Date:	08/10/2012 08/17/2012	Relative Humidity:	% 34.7
EUT Model #:	AXS9FMT	EUT Power:	120VAC/60Hz	Air Pressure:	kPa 83.3
EUT Serial #:	002				

Manufacturer: Waio, Inc.

EUT Description: Broadcastvision Entertainment (bve) Transmitter – FM & 915MHz

Notes: **Product Tested in the following configuration: 900MHz Radio Active**

Product continuously operating/active during all testing – normal operation

Includes measurements of the local oscillators: 824.10MHz & 820.95MHz

Level Key

Pk – Peak

Qp – Quasi Peak

Av – Average

Freq	Level	Det	Cable	Ant	Preamp	Atten	Final	Pol	Hgt	Az	Delta Limit	Limit	RBW
MHz	dBuV	Qp Av Pk	+ [dB]	+ [dB/m]	- [dB]	+ [dB]	= [dBuV]	(V/H)	(m)	(DEG)	FCC 15.209 RSS-Gen 7.2.5	FCC 15.209 RSS-Gen 7.2.5	(MHz)
900MHz Tx Product Option													
Loop Antenna Perpendicular: 10kHz to 30MHz Data – Mid Channel													
0.1200	24.34	Qp	0.02	10.32	0.00	0.00	34.68	H	1.11	67.0	- 70.98	105.66	0.0002
0.1620	44.00	Qp	0.03	10.36	0.00	0.00	54.39	H	1.11	19.0	- 48.75	103.14	0.009
0.1966	44.37	Qp	0.10	10.40	0.00	0.00	54.87	H	1.00	296.0	- 46.63	101.50	0.009
0.2294	44.44	Qp	0.10	10.37	0.00	0.00	54.91	H	1.00	14.0	- 45.29	100.20	0.009
0.2621	43.67	Qp	0.10	10.34	0.00	0.00	54.11	H	1.00	318.0	- 44.97	99.08	0.009
0.2949	40.91	Qp	0.10	10.31	0.00	0.00	51.32	H	1.00	124.0	- 46.77	98.09	0.009
0.3277	39.82	Qp	0.10	10.24	0.00	0.00	50.16	H	1.00	347.0	- 47.03	97.19	0.009
0.4800	34.80	Qp	0.10	10.42	0.00	0.00	45.32	H	1.19	40.0	- 48.65	93.97	0.009
0.9930	28.39	Qp	0.10	10.60	0.00	0.00	39.09	H	1.19	18.0	- 28.54	67.63	0.009
7.3980	20.29	Qp	0.43	10.66	0.00	0.00	31.38	H	1.00	31.0	- 38.16	69.54	0.009
7.6000	11.74	Qp	0.20	10.64	0.00	0.00	22.58	H	1.24	114.0	- 46.96	69.54	0.009
15.2000	6.39	Qp	0.30	10.02	0.00	0.00	16.71	H	1.24	152.0	- 52.83	69.54	0.009
22.8000	6.47	Qp	0.30	10.04	0.00	0.00	16.81	H	1.24	216.0	- 52.73	69.54	0.009
27.0000	9.46	Qp	0.40	9.08	0.00	0.00	18.94	H	1.31	353.0	- 50.60	69.54	0.009
Loop Antenna Parallel : 10kHz to 30MHz Data – Mid Channel													
0.0983	50.46	Qp	0.10	10.42	0.00	0.00	60.98	H	1.00	357.0	- 46.37	107.35	0.0002
0.1311	57.23	Qp	0.10	10.33	0.00	0.00	67.66	H	1.00	80.0	- 37.26	104.92	0.0002
0.1638	45.65	Qp	0.10	10.36	0.00	0.00	56.11	H	1.00	350.0	- 46.92	103.03	0.009
0.1966	44.55	Qp	0.10	10.40	0.00	0.00	55.05	H	1.00	35.0	- 46.45	101.50	0.009
0.2294	44.47	Qp	0.10	10.37	0.00	0.00	54.94	H	1.00	269.0	- 45.26	100.20	0.009
0.2621	41.45	Qp	0.10	10.34	0.00	0.00	51.89	H	1.00	57.0	- 47.19	99.08	0.009
0.2949	40.70	Qp	0.10	10.31	0.00	0.00	51.11	H	1.00	241.0	- 46.98	98.09	0.009
0.3277	41.58	Qp	0.10	10.24	0.00	0.00	51.92	H	1.00	15.0	- 45.27	97.19	0.009
7.4000	13.09	Qp	0.43	10.66	0.00	0.00	24.18	H	1.00	17.0	- 45.36	69.54	0.009
7.6000	10.85	Qp	0.20	10.64	0.00	0.00	21.69	H	1.27	222.0	- 47.85	69.54	0.009
15.2000	6.73	Qp	0.30	10.02	0.00	0.00	17.05	H	1.18	156.0	- 52.49	69.54	0.009
22.8000	6.27	Qp	0.30	10.04	0.00	0.00	16.61	H	1.26	92.0	- 52.93	69.54	0.009

Intertek

Report Number: 100860883DEN-002

Issued: 9/11/2012

Freq	Level	Det	Cable	Ant	Preamp	Atten	Final	Pol	Hgt	Az	Delta Limit	Limit	RBW
MHz	dBuV	Qp Av Pk	+ [dB]	+ [dB/m]	- [dB]	+ [dB]	= [dBuV]	(V/H)	(m)	DEG	FCC 15.209 RSS-Gen 7.2.5	FCC 15.209 RSS-Gen 7.2.5	(MHz)
900MHz Tx Product Option													
30MHz to 1000MHz Data – Vertical – Low Channel													
45.6000	42.75	Qp	0.77	10.40	28.20	0.00	25.72	V	1.00	211.0	- 14.28	40.00	0.120
49.2700	46.69	Qp	0.77	8.75	28.20	0.00	28.00	V	1.00	291.0	- 12.00	40.00	0.120
54.2200	43.51	Qp	0.77	7.76	28.18	0.00	23.86	V	1.00	119.0	- 16.14	40.00	0.120
57.2800	43.50	Qp	0.77	7.60	28.16	0.00	23.70	V	1.00	283.0	- 16.30	40.00	0.120
76.3600	44.68	Qp	0.77	8.10	28.07	0.00	25.48	V	1.00	107.0	- 14.52	40.00	0.120
86.2400	48.86	Qp	0.77	7.72	28.03	0.00	29.33	V	1.00	83.0	- 10.67	40.00	0.120
91.2700	43.16	Qp	0.77	8.35	28.00	0.00	24.28	V	1.00	99.0	- 19.24	43.52	0.120
186.0000	40.87	Qp	0.91	10.80	27.55	0.00	25.03	V	1.00	294.0	- 18.49	43.52	0.120
189.0000	37.58	Qp	0.92	11.00	27.53	0.00	21.96	V	1.00	287.0	- 21.56	43.52	0.120
216.0000	39.62	Qp	0.98	10.70	27.40	0.00	23.90	V	1.00	276.0	- 22.12	46.02	0.120
324.0000	45.97	Qp	1.24	13.96	27.26	0.00	33.91	V	1.56	330.0	- 12.11	46.02	0.120
366.0000	41.44	Qp	1.31	14.74	27.51	0.00	29.98	V	1.51	314.0	- 16.04	46.02	0.120
378.0000	47.47	Qp	1.33	15.30	27.61	0.00	36.50	V	1.47	109.0	- 9.52	46.02	0.120
384.0000	44.37	Qp	1.34	15.30	27.65	0.00	33.36	V	1.40	315.0	- 12.66	46.02	0.120
416.0000	50.01	Qp	1.40	15.54	27.90	0.00	39.04	V	1.33	199.0	- 6.98	46.02	0.120
420.0000	49.68	Qp	1.40	15.70	27.93	0.00	38.85	V	1.47	185.0	- 7.17	46.02	0.120
567.0000	33.99	Qp	1.64	18.48	28.38	0.00	25.73	V	1.38	130.0	- 20.29	46.02	0.120
696.0000	31.86	Qp	1.85	19.60	28.28	0.00	25.03	V	1.50	161.0	- 20.99	46.02	0.120
945.0000	29.48	Qp	2.15	22.00	27.50	0.00	26.13	V	1.20	156.0	- 19.89	46.02	0.120
30MHz to 1000MHz Data – Horizontal – Low Channel													
186.3600	37.92	Qp	0.91	10.84	27.55	0.00	22.12	H	1.89	302.0	- 21.40	43.52	0.120
388.0000	40.79	Qp	1.35	15.30	27.68	0.00	29.76	H	1.79	271.0	- 16.26	46.02	0.120

Intertek

Report Number: 100860883DEN-002

Issued: 9/11/2012

Freq	Level	Det	Cable	Ant	Preamp	Atten	Final	Pol	Hgt	Az	Delta Limit	Limit	RBW
MHz	dBuV	Qp Av Pk	+ [dB]	+ [dB/m]	- [dB]	+ [dB]	= [dBuV]	(V/H)	(m)	DEG	FCC 15.209 RSS-Gen 7.2.5	FCC 15.209 RSS-Gen 7.2.5	(MHz)
900MHz Tx Product Option													
30MHz to 1000MHz Data – Vertical – Mid Channel													
32.0000	26.67	Qp	0.40	19.80	28.20	0.00	18.67	V	1.00	171.0	- 21.33	40.00	0.120
54.0000	43.28	Qp	0.77	7.80	28.18	0.00	23.67	V	1.00	70.0	- 16.33	40.00	0.120
64.0000	33.36	Qp	0.77	8.00	28.13	0.00	14.00	V	1.00	316.0	- 26.00	40.00	0.120
64.1400	36.29	Qp	0.77	8.00	28.13	0.00	16.93	V	1.00	319.0	- 23.07	40.00	0.120
81.0000	43.27	Qp	0.77	7.80	28.05	0.00	23.79	V	1.00	176.0	- 16.21	40.00	0.120
96.0000	41.55	Qp	0.77	9.40	27.98	0.00	23.74	V	1.00	242.0	- 19.78	43.52	0.120
128.2600	37.82	Qp	0.77	13.35	27.82	0.00	24.11	V	1.00	68.0	- 19.41	43.52	0.120
184.3200	47.94	Qp	0.91	10.80	27.56	0.00	32.09	V	1.00	68.0	- 11.43	43.52	0.120
184.3200	53.59	Qp	0.91	10.80	27.56	0.00	37.74	V	1.05	13.0	- 5.78	43.52	0.120
184.3200	53.67	Qp	0.91	10.80	27.56	0.00	37.82	V	1.05	347.0	- 5.70	43.52	0.120
233.4600	52.45	Qp	1.02	11.37	27.32	0.00	37.52	V	1.05	295.0	- 8.50	46.02	0.120
243.0000	43.85	Qp	1.05	11.40	27.28	0.00	29.02	V	1.00	328.0	- 17.00	46.02	0.120
270.0000	39.38	Qp	1.11	12.80	27.15	0.00	26.15	V	1.00	40.0	- 19.87	46.02	0.120
297.0000	37.47	Qp	1.18	13.40	27.16	0.00	24.88	V	1.63	308.0	- 21.14	46.02	0.120
400.0000	52.16	Qp	1.37	15.30	27.78	0.00	41.05	V	1.23	311.0	- 4.97	46.02	0.120
400.0000	53.69	Qp	1.37	15.30	27.78	0.00	42.58	V	1.23	347.0	- 3.44	46.02	0.120
459.0000	39.56	Qp	1.47	16.72	28.16	0.00	29.58	V	1.39	190.0	- 16.44	46.02	0.120
513.0000	38.12	Qp	1.55	17.76	28.35	0.00	29.08	V	1.08	190.0	- 16.94	46.02	0.120
621.0000	33.54	Qp	1.73	18.46	28.34	0.00	25.39	V	1.66	194.0	- 20.63	46.02	0.120
729.0000	31.91	Qp	1.89	20.10	28.19	0.00	25.71	V	1.62	119.0	- 20.31	46.02	0.120
732.0000	41.43	Qp	1.89	20.10	28.18	0.00	35.24	V	1.45	315.0	- 10.78	46.02	0.120
732.0000	44.30	Qp	1.89	20.10	28.18	0.00	38.11	V	1.23	42.0	- 7.91	46.02	0.120
928.0000	34.47	Qp	2.13	21.92	27.55	0.00	30.97	V	1.12	100.0	- 15.05	46.02	0.120
30MHz to 1000MHz Data – Horizontal – Mid Channel													
184.3300	53.79	Qp	0.91	10.80	27.56	0.00	37.94	H	1.37	117.0	- 5.58	43.52	0.120
233.4700	54.25	Qp	1.02	11.37	27.32	0.00	39.32	H	1.36	274.0	- 6.70	46.02	0.120
245.7600	51.66	Qp	1.05	11.40	27.26	0.00	36.85	H	1.41	238.0	- 9.17	46.02	0.120
400.0000	48.74	Qp	1.37	15.30	27.78	0.00	37.63	H	2.17	255.0	- 8.39	46.02	0.120
732.0000	40.85	Qp	1.89	20.10	28.18	0.00	34.66	H	1.74	140.0	- 11.36	46.02	0.120

Intertek

Report Number: 100860883DEN-002

Issued: 9/11/2012

Freq	Level	Det	Cable	Ant	Preamp	Atten	Final	Pol	Hgt	Az	Delta Limit	Limit	RBW
MHz	dBuV	Qp Av Pk	+ [dB]	+ [dB/m]	- [dB]	+ [dB]	= [dBuV]	(V/H)	(m)	DEG	FCC 15.209 RSS-Gen 7.2.5	FCC 15.209 RSS-Gen 7.2.5	(MHz)
900MHz Tx Product Option													
30MHz to 1000MHz Data – Vertical – High Channel													
45.6000	42.67	Qp	0.77	10.40	28.20	0.00	25.64	V	1.00	235.0	- 14.36	40.00	0.120
49.2900	46.51	Qp	0.77	8.74	28.20	0.00	27.82	V	1.00	288.0	- 12.18	40.00	0.120
54.2100	43.87	Qp	0.77	7.76	28.18	0.00	24.22	V	1.00	115.0	- 15.78	40.00	0.120
57.2800	42.59	Qp	0.77	7.60	28.16	0.00	22.79	V	1.00	274.0	- 17.21	40.00	0.120
76.4000	44.15	Qp	0.77	8.10	28.07	0.00	24.95	V	1.00	107.0	- 15.05	40.00	0.120
86.2700	49.62	Qp	0.77	7.73	28.03	0.00	30.09	V	1.00	55.0	- 9.91	40.00	0.120
91.1500	43.48	Qp	0.77	8.33	28.00	0.00	24.58	V	1.00	105.0	- 18.94	43.52	0.120
186.0000	40.34	Qp	0.91	10.80	27.55	0.00	24.50	V	1.00	249.0	- 19.02	43.52	0.120
189.0000	36.97	Qp	0.92	11.00	27.53	0.00	21.35	V	1.00	289.0	- 22.17	43.52	0.120
216.0000	38.43	Qp	0.98	10.70	27.40	0.00	22.71	V	1.00	255.0	- 23.31	46.02	0.120
324.0000	40.01	Qp	1.24	13.96	27.26	0.00	27.95	V	1.20	333.0	- 18.07	46.02	0.120
368.0000	46.83	Qp	1.32	14.82	27.53	0.00	35.44	V	1.15	329.0	- 10.58	46.02	0.120
378.0000	48.34	Qp	1.33	15.30	27.61	0.00	37.37	V	1.27	225.0	- 8.65	46.02	0.120
384.0000	46.76	Qp	1.34	15.30	27.65	0.00	35.75	V	1.36	299.0	- 10.27	46.02	0.120
416.0000	51.36	Qp	1.40	15.54	27.90	0.00	40.39	V	1.36	195.0	- 5.63	46.02	0.120
420.0000	52.73	Qp	1.40	15.70	27.93	0.00	41.90	V	1.39	183.0	- 4.12	46.02	0.120
567.0000	35.83	Qp	1.64	18.48	28.38	0.00	27.57	V	1.28	100.0	- 18.45	46.02	0.120
696.0000	30.44	Qp	1.85	19.60	28.28	0.00	23.61	V	1.43	178.0	- 22.41	46.02	0.120
945.0000	28.06	Qp	2.15	22.00	27.50	0.00	24.71	V	1.17	157.0	- 21.31	46.02	0.120
30MHz to 1000MHz Data – Horizontal – High Channel													
186.5500	37.28	Qp	0.91	10.85	27.55	0.00	21.50	H	1.85	285.0	- 22.02	43.52	0.120
388.0000	39.33	Qp	1.35	15.30	27.68	0.00	28.30	H	1.65	257.0	- 17.72	46.02	0.120

Intertek

Report Number: 100860883DEN-002

Issued: 9/11/2012

Freq	Level	Det	Cable	Ant	Preamp	Atten	Final	Pol	Hgt	Az	Delta Limit	Limit	RBW
MHz	dBuV	Qp Av Pk	+ [dB]	+ [dB/m]	- [dB]	+ [dB]	= [dBuV]	(V/H)	(m)	DEG	FCC 15.209 RSS-Gen 7.2.5	FCC 15.209 RSS-Gen 7.2.5	(MHz)
900MHz Tx Product Option													
Measurement of local oscillators													
Low & High Channel Local Oscillators													
820.9500	48.85	Qp	2.00	21.28	27.89	0.00	44.23	V	1.47	42.0	- 1.79	46.02	0.120
820.9500	47.44	Qp	2.00	21.28	27.89	0.00	42.82	H	1.51	229.0	- 3.20	46.02	0.120
Mid Channel LO													
824.1000	50.13	Qp	2.00	21.22	27.88	0.00	45.47	H	1.46	204.0	- 0.55	46.02	0.120
824.1000	50.36	Qp	2.00	21.22	27.88	0.00	45.70	V	1.51	162.0	- 0.32	46.02	0.120
1GHz to 10GHz Data – Mid Channel													
1648.3000	46.47	Av	2.87	25.99	36.68	0.00	38.65	V	1.40	243.0	- 15.35	54.00	1.000
1832.3000	46.57	Av	3.05	27.42	36.93	0.00	40.11	V	1.45	244.0	- 13.89	54.00	1.000
3296.4000	41.41	Av	4.22	31.82	36.92	0.00	40.53	V	1.64	260.0	- 13.47	54.00	1.000
4762.8000	33.00	Av	5.14	33.30	39.08	0.00	32.36	V	1.47	172.0	- 21.64	54.00	1.000
5314.1000	32.49	Av	5.43	34.44	38.32	0.00	34.04	V	1.00	0.0	- 19.96	54.00	1.000
8800.0000	36.00	Av	7.24	37.48	47.63	0.00	33.09	V	1.00	0.0	- 20.91	54.00	1.000
8800.0000	32.90	Av	7.24	37.48	47.63	0.00	29.99	V	1.00	0.0	- 24.01	54.00	1.000
9716.2000	36.17	Av	7.63	37.92	48.71	0.00	33.02	V	1.00	0.0	- 20.98	54.00	1.000
1648.2000	46.23	Av	2.87	25.99	36.68	0.00	38.41	H	1.48	130.0	- 15.59	54.00	1.000
1832.3000	45.03	Av	3.05	27.42	36.93	0.00	38.57	H	1.38	290.0	- 15.43	54.00	1.000
5923.1200	34.42	Av	5.74	34.70	39.07	0.00	35.79	H	1.57	242.0	- 18.21	54.00	1.000

Example calculation:

Measured Level	+	Cable Loss	+	Antenna Factor	-	Pre-Amp	+	Atten	=	Final Corrected Reading	Specification Limit	-	Final Corrected Reading	=	Delta Specification
(dBuV)		(dB)		(dB)		(dB)		(dB)		(dBuV/m)	(dBuV/m)		(dBuV/m)		
20.0		3.0		5.0		10.0		0.0		18.0	40.0		18.0		- 22.0

Notes:

- 1) The following product option was tested: 900MHz Radio mode of operation.
- 2) Per client, the product is never operated in receive/standby-mode only. Therefore, all unintentional radiated emissions testing was performed with the product configured for normal operation – with the transmit function active.
- 3) All measurements taken at a 3-meter test distance (antenna-to-product).

Deviations, Additions, or Exclusions: None

Intertek	
Report Number: 100860883DEN-002	Issued: 9/11/2012

6 Band Edge

6.1 Method

Unless otherwise stated no deviations were made from FCC 15.249(a) [RSS-210 A2.8].

This testing was performed at Intertek Denver, located at 1795 Dogwood St. Suite 200, Louisville, CO 80027.

6.2 Test Equipment Used:

Testing on 08/17/2012

<u>Asset ID:</u>	<u>Description:</u>	<u>Manufacturer:</u>	<u>Model:</u>	<u>Serial:</u>	<u>Cal Date</u>	<u>Cal Due</u>
DEN-073	EMI Receiver	RHODE & SCHWARZ	ESU 26	100265	01/11/2012	01/11/2013
18912	9 kHz- 1.3GHz Pre Amp	Hewlett-Packard	8447F	3113A05545	06/06/2012	06/06/2013
18906	RF Pre-Amp (1-4GHz)	Mini-Circuits Lab	ZHL-42	N052792-2	06/06/2012	06/06/2013
19936	Bilog Antenna 30MHz – 6GHz	Sunol Sciences	JB6	A050707-1	11/15/2011	11/15/2012
18887	Horn Antenna 1-18GHz	EMCO	3115	9205-3886	02/29/2012	02/29/2013
SW-6	Software application for Radiated and Conducted Emissions	Intertek	OATS_Vba	V003	VBV	VBV

Testing on 03/21/2013

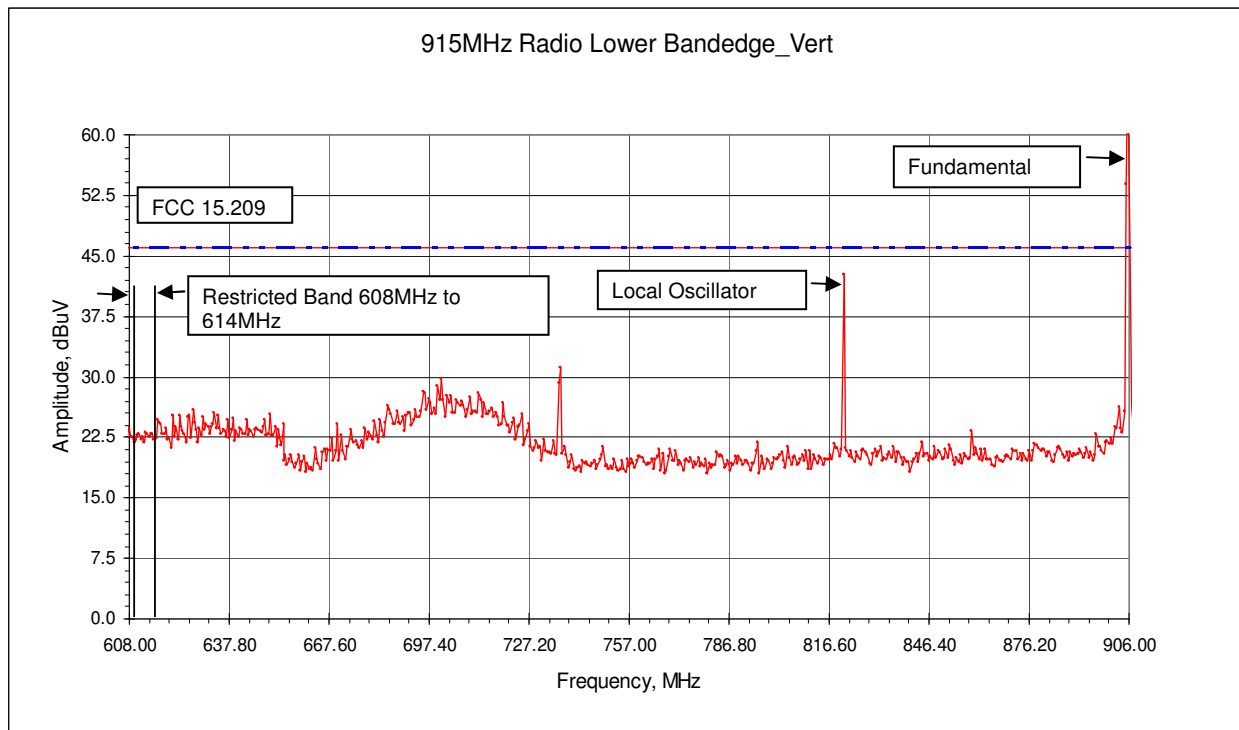
<u>Asset ID</u>	<u>Description</u>	<u>Manufacturer</u>	<u>Model</u>	<u>Serial</u>	<u>Cal Date</u>	<u>Cal Due</u>
DEN-073	EMI Receiver	RHODE & SCHWARZ	ESU 26	100265	1/23/2013	1/23/2014
19936	Bilog Antenna 30MHz - 6GHz	Sunol Sciences	JB6	A050707-1	11/15/2012	11/15/2013
18912	9 kHz- 1.3GHz Pre Amp	Hewlett-Packard	8447F	3113A05545	6/6/2012	6/6/2013
SW-6	Software for Radiated and Conducted emissions.	Intertek	OATS vba	V. 3.0	VBV	VBV

6.3 Results:

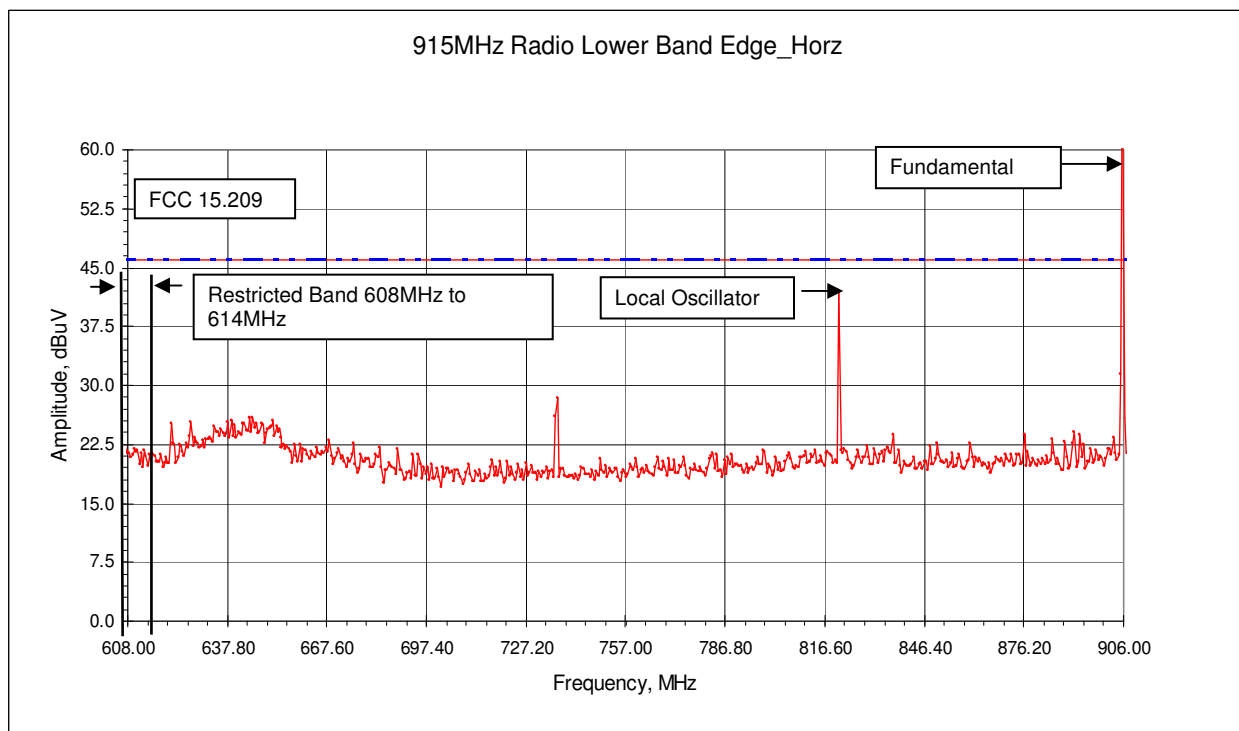
The sample tested was found to Comply.

6.4 Plots: Band Edge – 900MHz Tx Lower Band Edge (Low Channel)

Vertical



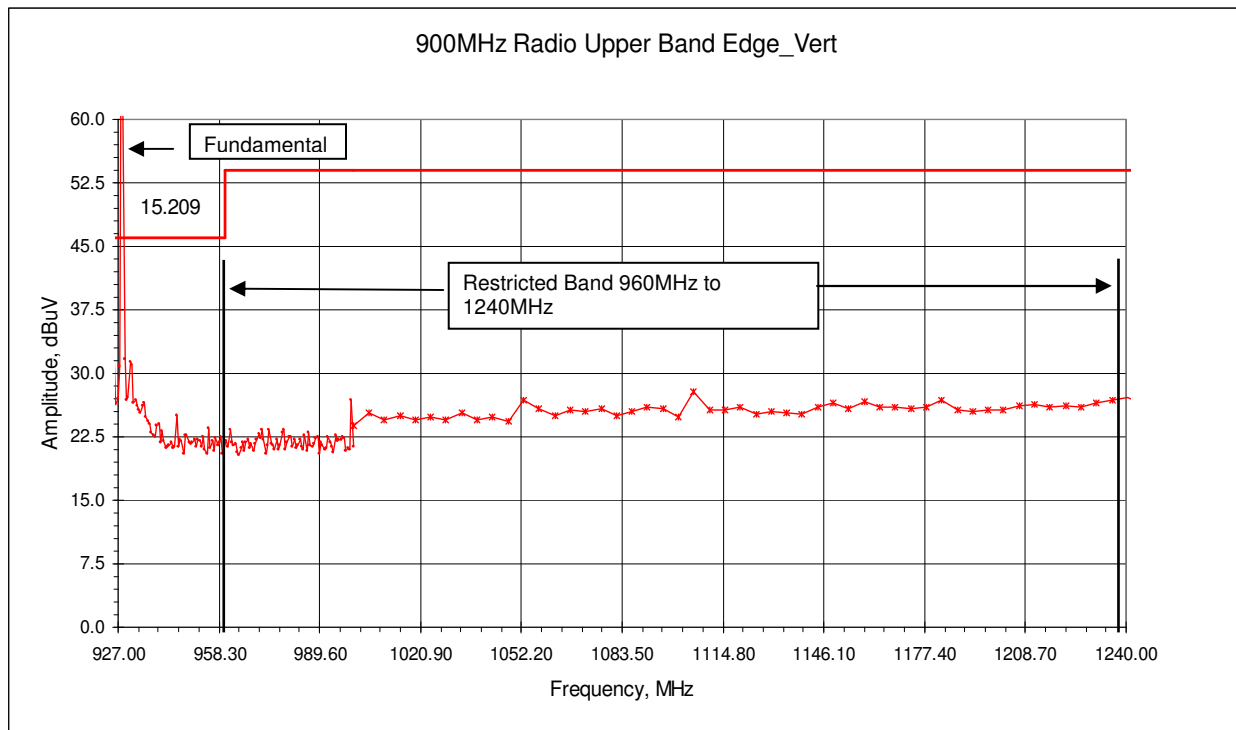
Horizontal



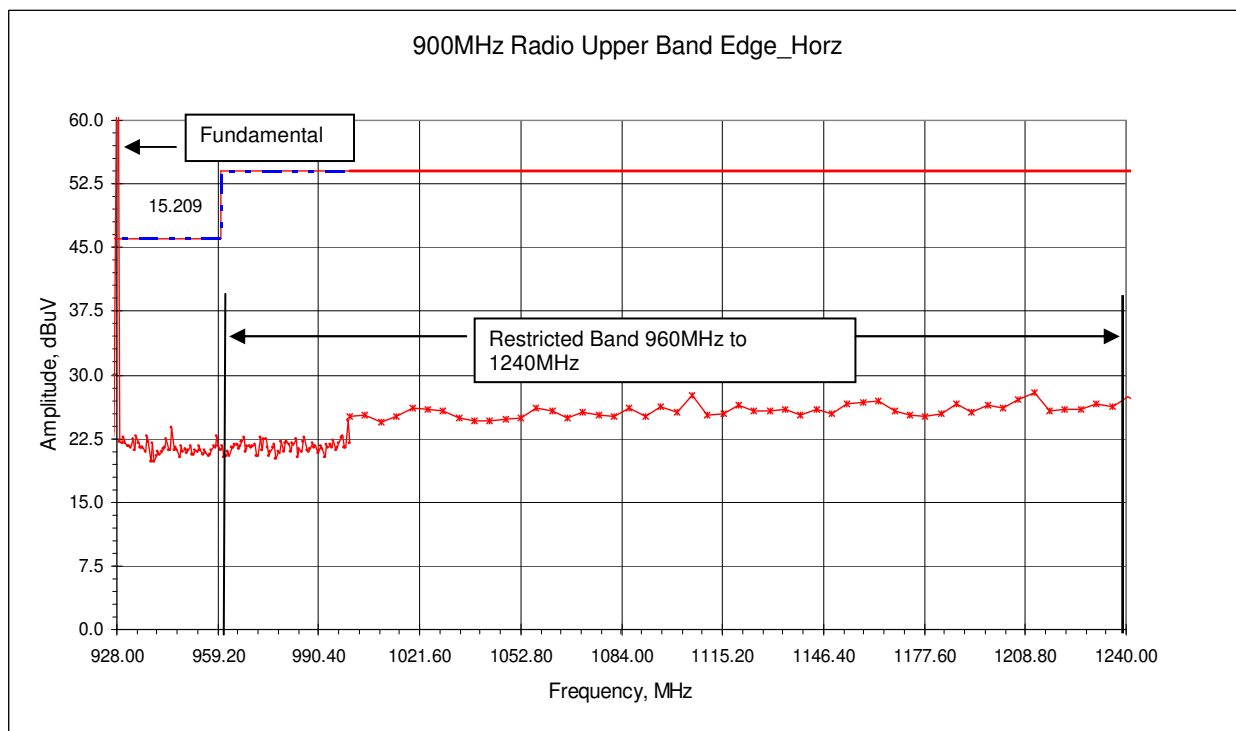
6.5

6.6 Plots: Band Edge – 900MHz Tx Upper Band Edge (High Channel)

Vertical



Horizontal



Intertek

Report Number: 100860883DEN-002

Issued: 9/11/2012

7 Radiated Tx Intentional Emissions – Fundamental & Harmonics of the Fundamental

7.1 Method

Unless otherwise stated no deviations were made from FCC 15.249(a) [IC RSS-210 A2.9(a)].

This testing was performed at Intertek Denver, located at 1795 Dogwood St. Suite 200, Louisville, CO 80027.

7.2 Test Equipment Used:

Testing on 08/16/2012

<u>Asset ID:</u>	<u>Description:</u>	<u>Manufacturer:</u>	<u>Model:</u>	<u>Serial:</u>	<u>Cal Date</u>	<u>Cal Due</u>
DEN-073	EMI Receiver	RHODE & SCHWARZ	ESU 26	100265	01/11/2012	01/11/2013
18912	9 kHz- 1.3GHz Pre Amp	Hewlett-Packard	8447F	3113A05545	06/06/2012	06/06/2013
18906	RF Pre-Amp (1-4GHz)	Mini-Circuits Lab	ZHL-42	N052792-2	06/06/2012	06/06/2013
18900	RF Pre-Amplifier (4-8 GHz)	Avantek	AFT97-8434-10F	1007	06/06/2012	06/06/2013
18901	RF Pre-Amp (8-18GHz)	Avantek	AWT-18037	1002	06/06/2012	06/06/2013
19936	Bilog Antenna 30MHz – 6GHz	Sunol Sciences	JB6	A050707-1	11/15/2011	11/15/2012
18887	Horn Antenna 1-18GHz	EMCO	3115	9205-3886	02/29/2012	02/29/2013
SW-6	Software application for Radiated and Conducted Emissions	Intertek	OATS_Vba	V003	VBV	VBV

Testing on 03/21/2013

<u>Asset ID</u>	<u>Description</u>	<u>Manufacturer</u>	<u>Model</u>	<u>Serial</u>	<u>Cal Date</u>	<u>Cal Due</u>
DEN-073	EMI Receiver	RHODE & SCHWARZ	ESU 26	100265	1/23/2013	1/23/2014
18886	Ridged Guide Antenna 1-18GHz	Tensor	4105	2020	12/11/2012	12/11/2013
18900	RF Pre-Amplifier (4-8 GHz)	Avantek	AFT97-8434-10F	1007	6/7/2012	6/7/2013
DEN-032	6-18GHz LNA	Narda	DBL-0618N615	31	3/7/2013	3/7/2014
18906	Amplifier (1-4 GHz)	Mini-Circuits Lab	ZHL-42	N052792-2	6/7/2012	6/7/2013
18912	9 kHz- 1.3GHz Pre Amp	Hewlett-Packard	8447F	3113A05545	6/6/2012	6/6/2013
19936	Bilog Antenna 30MHz - 6GHz	Sunol Sciences	JB6	A050707-1	11/15/2012	11/15/2013
SW-6	Software for Radiated and Conducted emissions.	Intertek	OATS vba	V. 3.0	VBV	VBV

7.3 Results:

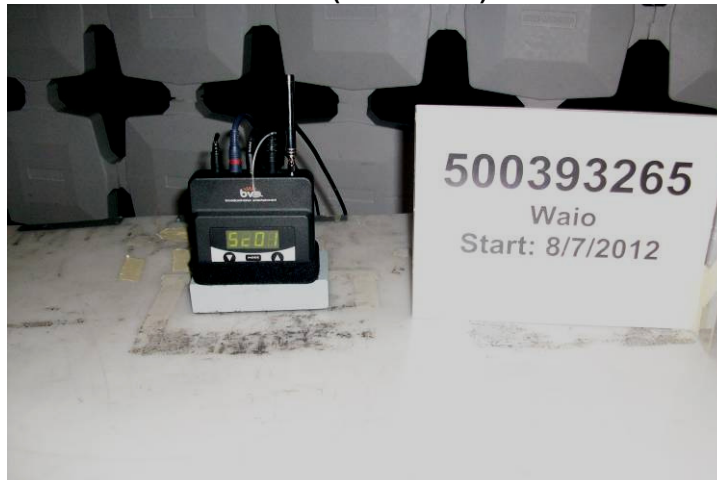
The sample tested was found to Comply.

7.4 Product Test Orientations: 900MHz Mode

Axis 1



Axis 2 (worst-case)



Axis 3



7.5 Setup Photographs: 900MHz Mode

Test setup – Front view



Photo: 900MHz Mode

Test setup – Rear view



Photo: Antenna Setup

Antenna Setup: BiLog Antenna – 30MHz to 1000MHz



Antenna Setup: Horn Antenna – Above 1GHz



7.6 Test Data: 900MHz Mode [Low Channel]

Tx Intentional Radiated Electromagnetic Emissions (Fundamental and Harmonics of the Transmitter)

Test Report #: G100860883-004	Test Area: CC1 Radiated	Temperature: <u>22.2</u> °C
Test Method: FCC 15.249(a) IC RSS-210 A2.9(a)	Test Date: <u>03/21/2013</u>	Relative Humidity: <u>26.7</u> %
EUT Model #: AXS-900TXD	EUT Power: <u>120VAC/60Hz</u>	Air Pressure: <u>83.91</u> kPa
EUT Serial #: 002		

Manufacturer: Waio, Inc.	Level Key
EUT Description: Broadcastvision Entertainment – Transmitter – FM & 900MHz	PK – Peak
Notes: Product Tested in the following configuration: 900MHz Radio	Qp – Quasi Peak
Product continuously operating/active during all testing – normal operation	Av - Average
Low Channel	

FREQ	LEVEL	DET	CABLE	ANT	PREAMP	ATTEN	FINAL	POL	HGT	AZ	LIMIT	DELTA	RBW
MHz	dBuV	Qp Av Pk	+ [dB]	+ [dB/m]	- [dB]	+ [dB]	= [dBuV]	(V/H)	(m)	(DEG)	FCC 15.249(a) RSS-210 A2.9(a)	FCC 15.249(a) RSS-210 A2.9(a)	(MHz)

Low Band Fundamental

903.6000	90.99	Pk	2.10	22.40	27.63	0.00	87.86	V	1.87	38.0	94.00	-6.14	0.120
903.6000	90.94	Av	2.10	22.40	27.63	0.00	87.81	V	1.87	38.0	94.00	-6.19	0.120
903.6000	89.51	Pk	2.10	22.40	27.63	0.00	86.38	H	1.54	156.0	94.00	-7.62	0.120
903.6000	89.48	Av	2.10	22.40	27.63	0.00	86.35	H	1.54	156.0	94.00	-7.65	0.120

Low Band Edge - Worst case fundamental polarization

902.0000	35.91	Pk	2.10	22.40	27.63	0.00	32.77	V	1.87	38.0	46.00	-13.23	0.120
902.0000	23.20	Av	2.10	22.40	27.63	0.00	20.06	V	1.87	38.0	46.00	-25.94	0.120

Low Band Harmonics

Vertical Polarization

1807.2000	42.39	Av	3.02	27.16	36.89	0.00	35.68	V	2.30	15.0	54.00	-18.32	1.000
2710.8000	37.12	Av	3.76	29.14	37.35	0.00	32.67	V	1.00	317.0	54.00	-21.33	1.000
3614.4000	39.72	Av	4.42	31.77	37.69	0.00	38.22	V	1.32	0.0	54.00	-15.78	1.000
4518.0000	38.78	Av	4.99	32.63	39.74	0.00	36.67	V	1.00	0.0	54.00	-17.33	1.000
5421.6000	38.58	Av	5.48	34.29	38.48	0.00	39.87	V	1.00	360.0	54.00	-14.13	1.000
6325.2000	38.86	Av	5.95	34.80	39.86	0.00	39.75	V	1.00	0.0	54.00	-14.25	1.000
7228.8000	38.65	Av	6.42	36.22	39.44	0.00	41.84	V	1.00	360.0	54.00	-12.16	1.000
8132.4000	40.92	Av	6.90	36.87	45.68	0.00	39.01	V	1.00	0.0	54.00	-14.99	1.000
9036.0000	41.31	Av	7.35	37.13	47.32	0.00	38.46	V	1.00	360.0	54.00	-15.54	1.000
1807.2000	50.47	Pk	3.02	27.16	36.89	0.00	43.76	V	2.30	15.0	74.00	-30.24	1.000
2710.8000	54.14	Pk	3.76	29.14	37.35	0.00	49.69	V	1.00	317.0	74.00	-24.31	1.000
3614.4000	53.80	Pk	4.42	31.77	37.69	0.00	52.30	V	1.32	0.0	74.00	-21.70	1.000
4518.0000	51.47	Pk	4.99	32.63	39.74	0.00	49.36	V	1.00	0.0	74.00	-24.64	1.000
5421.6000	51.86	Pk	5.48	34.29	38.48	0.00	53.15	V	1.00	360.0	74.00	-20.85	1.000
6325.2000	52.35	Pk	5.95	34.80	39.86	0.00	53.24	V	1.00	0.0	74.00	-20.76	1.000
7228.8000	51.01	Pk	6.42	36.22	39.44	0.00	54.20	V	1.00	360.0	74.00	-19.80	1.000
8132.4000	55.22	Pk	6.90	36.87	45.68	0.00	53.31	V	1.00	0.0	74.00	-20.69	1.000

9036.0000	55.23	Pk	7.35	37.13	47.32	0.00	52.38	V	1.00	360.0	74.00	- 21.62	1.000
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Horizontal Polarization

1807.2000	39.82	Av	3.02	27.16	36.89	0.00	33.11	H	1.46	203.0	54.00	- 26.39	1.000
2710.8000	37.18	Av	3.76	29.14	37.35	0.00	32.73	H	1.00	360.0	54.00	- 26.77	1.000
3614.4000	39.70	Av	4.42	31.77	37.69	0.00	38.20	H	1.00	360.0	54.00	- 21.30	1.000
4518.0000	38.80	Av	4.99	32.63	39.74	0.00	36.69	H	1.56	0.0	54.00	- 22.81	1.000
5421.6000	38.59	Av	5.48	34.29	38.48	0.00	39.88	H	1.00	360.0	54.00	- 19.62	1.000
6325.2000	38.89	Av	5.95	34.80	39.86	0.00	39.78	H	1.00	0.0	54.00	- 19.72	1.000
7228.8000	38.67	Av	6.42	36.22	39.44	0.00	41.86	H	1.00	360.0	54.00	- 17.64	1.000
8132.4000	40.82	Av	6.90	36.87	45.68	0.00	38.91	H	1.00	0.0	54.00	- 20.59	1.000
9036.0000	41.25	Av	7.35	37.13	47.32	0.00	38.40	H	1.00	360.0	54.00	- 21.10	1.000

1807.2000	61.75	Pk	3.02	27.16	36.89	0.00	55.04	H	1.46	203.0	74.00	-20.89	1.000
2710.8000	51.18	Pk	3.76	29.14	37.35	0.00	46.73	H	1.00	360.0	74.00	-21.27	1.000
3614.4000	53.74	Pk	4.42	31.77	37.69	0.00	52.24	H	1.00	360.0	74.00	-15.80	1.000
4518.0000	52.05	Pk	4.99	32.63	39.74	0.00	49.94	H	1.56	0.0	74.00	-17.31	1.000
5421.6000	52.22	Pk	5.48	34.29	38.48	0.00	53.51	H	1.00	360.0	74.00	-14.12	1.000
6325.2000	53.27	Pk	5.95	34.80	39.86	0.00	54.16	H	1.00	0.0	74.00	-14.22	1.000
7228.8000	52.28	Pk	6.42	36.22	39.44	0.00	55.47	H	1.00	360.0	74.00	-12.14	1.000
8132.4000	53.70	Pk	6.90	36.87	45.68	0.00	51.79	H	1.00	0.0	74.00	-15.09	1.000
9036.0000	54.85	Pk	7.35	37.13	47.32	0.00	52.00	H	1.00	360.0	74.00	-15.60	1.000

Example calculation:

Measured Level	+	Cable Loss	+	Antenna Factor	-	Pre-Amp	+	Atten	=	Final Corrected Reading	Specification Limit	-	Final Corrected Reading	=	Delta Specification
(dBμV)		(dB)		(dB)		(dB)		(dB)		(dBμV/m)	(dBμV/m)		(dBμV/m)		
20.0		3.0		5.0		10.0		0.0		18.0	40.0		18.0		- 22.0

Intertek

Report Number: 100860883DEN-002

Issued: 9/11/2012

7.7 Test Data: 900MHz Mode [Mid Channel]

Tx Intentional Radiated Electromagnetic Emissions (Fundamental and Harmonics of the Transmitter)

Test Report #: G100860883	Test Area: CC1 Radiated	Temperature: <u>23.5</u> °C
Test Method: FCC 15.249(a) IC RSS-210 A2.9(a)	Test Date: <u>08/16/2012</u>	Relative Humidity: <u>30.8</u> %
EUT Model #: AXS9FMT	EUT Power: <u>120VAC/60Hz</u>	Air Pressure: <u>84.1</u> kPa
EUT Serial #: 002		

Manufacturer: Waio, Inc.

EUT Description: Broadcastvision Entertainment – Transmitter – FM & 900MHz

Notes: **Product Tested in the following configuration: 900MHz Radio**

Product continuously operating/active during all testing – normal operation

Mid Channel

Level Key

Pk – Peak

Qp – Quasi Peak

Av - Average

Freq	Level	Det	Cable	Ant	Preamp	Atten	Final	Pol	Hgt	Az	Delta1	LIMIT	RBW
MHz	dBuV	Qp Av Pk	+ [dB]	+ [dB/m]	- [dB]	+ [dB]	= [dBuV]	(V/H)	(m)	(DEG)	FCC 15.249(a) RSS-210 A2.9(a)	FCC 15.249(a) RSS-210 A2.9(a)	(MHz)
Tx Fundamental & Harmonics Measurements – Axis 1 – Mid Channel													
Fundamental Measurement													
916.2000	95.32	Pk	2.11	22.27	27.59	0.00	92.12	V	1.12	108.0	- 1.88	94.00	0.120
916.2000	94.62	Pk	2.11	22.27	27.59	0.00	91.42	H	1.14	0.0	- 2.58	94.00	0.120
Harmonics measurements – Vertical Antenna													
1832.4000	49.85	Pk	3.05	27.42	36.93	0.00	43.39	V	1.38	69.0	- 10.61	54.00	1.000
2748.6000	47.84	Pk	3.79	29.37	37.32	0.00	43.68	V	1.44	55.0	- 10.32	54.00	1.000
3664.8000	46.07	Pk	4.45	32.09	37.79	0.00	44.82	V	1.52	72.0	- 9.18	54.00	1.000
4581.0000	43.37	Pk	5.03	32.74	39.57	0.00	41.58	V	1.54	74.0	- 12.42	54.00	1.000
5497.2000	44.46	Pk	5.52	34.60	38.59	0.00	45.99	V	1.47	67.0	- 8.01	54.00	1.000
6413.4000	44.69	Pk	6.00	34.95	40.03	0.00	45.61	V	1.51	60.0	- 8.39	54.00	1.000
7329.6000	43.15	Pk	6.47	36.75	39.19	0.00	47.19	V	1.51	60.0	- 6.81	54.00	1.000
8245.8000	43.87	Pk	6.90	36.94	46.89	0.00	40.82	V	1.27	315.0	- 13.18	54.00	1.000
9162.0000	48.12	Pk	7.36	37.26	47.94	0.00	44.80	V	1.30	331.0	- 9.20	54.00	1.000
Harmonics measurements – Horizontal Antenna													
1832.4000	51.57	Pk	3.05	27.42	36.93	0.00	45.11	H	1.53	62.0	- 8.89	54.00	1.000
2748.6000	47.85	Pk	3.79	29.37	37.32	0.00	43.69	H	1.23	79.0	- 10.31	54.00	1.000
3664.8000	46.90	Pk	4.45	32.09	37.79	0.00	45.65	H	1.24	51.0	- 8.35	54.00	1.000
4581.0000	43.23	Pk	5.03	32.74	39.57	0.00	41.44	H	1.49	84.0	- 12.56	54.00	1.000
5497.2000	43.66	Pk	5.52	34.60	38.59	0.00	45.19	H	1.41	53.0	- 8.81	54.00	1.000
6413.4000	45.25	Pk	6.00	34.95	40.03	0.00	46.17	H	1.37	65.0	- 7.83	54.00	1.000
7329.6000	43.55	Pk	6.47	36.75	39.19	0.00	47.59	H	1.41	84.0	- 6.41	54.00	1.000
8245.8000	43.58	Pk	6.90	36.94	46.89	0.00	40.53	H	1.32	323.0	- 13.47	54.00	1.000
9162.0000	48.91	Pk	7.36	37.26	47.94	0.00	45.59	H	1.28	342.0	- 8.41	54.00	1.000

Intertek

Report Number: 100860883DEN-002

Issued: 9/11/2012

Freq	Level	Det	Cable	Ant	Preamp	Atten	Final	Pol	Hgt	Az	Delta1	LIMIT	RBW
MHz	dBuV	Qp Av Pk	+ [dB]	+ [dB/m]	- [dB]	+ [dB]	= [dBuV]	(V/H)	(m)	(DEG)	FCC 15.249(a) RSS-210 A2.9	FCC 15.249(a) RSS-210 A2.9	(MHz)
Tx Fundamental & Harmonics Measurements – Axis 2 – Mid Channel													
Fundamental Measurement													
916.2000	95.35	Pk	2.11	21.90	27.59	0.00	91.77	V	1.05	107.0	- 2.23	94.00	0.120
916.2000	95.87	Pk	2.11	22.27	27.59	0.00	92.67	H	1.27	172.0	- 1.33	94.00	0.120
Harmonics measurements – Vertical Antenna													
1832.4000	51.28	Pk	3.05	27.42	36.93	0.00	44.82	V	1.19	303.0	- 9.18	54.00	1.000
2748.6000	47.86	Pk	3.79	29.37	37.32	0.00	43.70	V	1.24	324.0	- 10.30	54.00	1.000
3664.8000	46.68	Pk	4.45	32.09	37.79	0.00	45.43	V	1.21	292.0	- 8.57	54.00	1.000
4581.0000	43.60	Pk	5.03	32.74	39.57	0.00	41.81	V	1.69	308.0	- 12.19	54.00	1.000
5497.2000	44.24	Pk	5.52	34.60	38.59	0.00	45.77	V	1.54	307.0	- 8.23	54.00	1.000
6413.4000	45.08	Pk	6.00	34.95	40.03	0.00	46.00	V	1.54	306.0	- 8.00	54.00	1.000
7329.6000	43.48	Pk	6.47	36.75	39.19	0.00	47.52	V	1.60	334.0	- 6.48	54.00	1.000
8245.8000	43.91	Pk	6.90	36.94	46.89	0.00	40.86	V	1.24	315.0	- 13.14	54.00	1.000
9162.0000	48.24	Pk	7.36	37.26	47.94	0.00	44.92	V	1.30	331.0	- 9.08	54.00	1.000
Harmonics measurements – Horizontal Antenna													
1832.4000	51.38	Pk	3.05	27.42	36.93	0.00	44.92	H	1.18	351.0	- 9.08	54.00	1.000
2748.6000	48.21	Pk	3.79	29.37	37.32	0.00	44.05	H	1.26	339.0	- 9.95	54.00	1.000
3664.8000	46.73	Pk	4.45	32.09	37.79	0.00	45.48	H	1.30	347.0	- 8.52	54.00	1.000
4581.0000	43.65	Pk	5.03	32.74	39.57	0.00	41.86	H	1.49	317.0	- 12.14	54.00	1.000
5497.2000	44.79	Pk	5.52	34.60	38.59	0.00	46.32	H	1.49	317.0	- 7.68	54.00	1.000
6413.4000	45.09	Pk	6.00	34.95	40.03	0.00	46.01	H	1.57	345.0	- 7.99	54.00	1.000
7329.6000	43.88	Pk	6.47	36.75	39.19	0.00	47.92	H	1.49	356.0	- 6.08	54.00	1.000
8245.8000	43.64	Pk	6.90	36.94	46.89	0.00	40.59	H	1.32	323.0	- 13.41	54.00	1.000
9162.0000	48.98	Pk	7.36	37.26	47.94	0.00	45.66	H	1.31	342.0	- 8.34	54.00	1.000

Freq	Level	Det	Cable	Ant	Preamp	Atten	Final	Pol	Hgt	Az	Delta1	LIMIT	RBW
MHz	dBuV	Qp Av Pk	+ [dB]	+ [dB/m]	- [dB]	+ [dB]	= [dBuV]	(V/H)	(m)	(DEG)	FCC 15.249(a) RSS-210 A2.9	FCC 15.249(a) RSS-210 A2.9	(MHz)
Tx Fundamental & Harmonics Measurements – Axis 3 – Mid Channel													
Fundamental Measurement													
916.2000	94.87	Pk	2.11	22.27	27.59	0.00	91.67	V	1.24	110.0	- 2.33	94.00	0.120
916.2000	94.17	Pk	2.11	22.27	27.59	0.00	90.97	H	1.21	12.0	- 3.03	94.00	0.120
Harmonics measurements – Vertical Antenna													
1832.4000	52.69	Pk	3.05	27.42	36.93	0.00	46.23	V	1.51	189.0	- 7.77	54.00	1.000
2748.6000	48.15	Pk	3.79	29.37	37.32	0.00	43.99	V	1.49	59.0	- 10.01	54.00	1.000
3664.8000	46.29	Pk	4.45	32.09	37.79	0.00	45.04	V	1.43	59.0	- 8.96	54.00	1.000
4581.0000	43.25	Pk	5.03	32.74	39.57	0.00	41.46	V	1.45	201.0	- 12.54	54.00	1.000
5497.2000	44.84	Pk	5.52	34.60	38.59	0.00	46.37	V	1.53	228.0	- 7.63	54.00	1.000
6413.4000	45.46	Pk	6.00	34.95	40.03	0.00	46.38	V	1.59	209.0	- 7.62	54.00	1.000
7329.6000	43.53	Pk	6.47	36.75	39.19	0.00	47.57	V	1.59	194.0	- 6.43	54.00	1.000
8245.8000	43.75	Pk	6.90	36.94	46.89	0.00	40.70	V	1.27	315.0	- 13.30	54.00	1.000
9162.0000	47.84	Pk	7.36	37.26	47.94	0.00	44.51	V	1.27	331.0	- 9.49	54.00	1.000
Harmonics measurements – Horizontal Antenna													
1832.4000	53.52	Pk	3.05	27.42	36.93	0.00	47.06	H	1.64	18.0	- 6.94	54.00	1.000
2748.6000	47.92	Pk	3.79	29.37	37.32	0.00	43.76	H	1.71	33.0	- 10.24	54.00	1.000
3664.8000	46.49	Pk	4.45	32.09	37.79	0.00	45.24	H	1.65	22.0	- 8.76	54.00	1.000
4581.0000	43.48	Pk	5.03	32.74	39.57	0.00	41.69	H	1.65	235.0	- 12.31	54.00	1.000
5497.2000	44.41	Pk	5.52	34.60	38.59	0.00	45.94	H	1.65	219.0	- 8.06	54.00	1.000
6413.4000	44.91	Pk	6.00	34.95	40.03	0.00	45.83	H	1.58	233.0	- 8.17	54.00	1.000
7329.6001	42.59	Pk	6.47	36.75	39.19	0.00	46.63	H	1.64	219.0	- 7.37	54.00	1.000
8245.8000	43.31	Pk	6.90	36.94	46.89	0.00	40.26	H	1.26	323.0	- 13.74	54.00	1.000
9162.0000	48.13	Pk	7.36	37.26	47.94	0.00	44.80	H	1.32	340.0	- 9.20	54.00	1.000

Example calculation:

Measured Level		Cable Loss		Antenna Factor		Pre-Amp		Atten		Final Corrected Reading	Specification Limit		Final Corrected Reading		Delta Specification
(dBμV)	+	(dB)	+	(dB)	-	(dB)	+	(dB)	=	(dBμV/m)	(dBμV/m)	-	(dBμV/m)	=	
20.0		3.0		5.0		10.0		0.0		18.0	40.0		18.0		- 22.0

7.8 Test Data: 900MHz Mode [High Channel]

Tx Intentional Radiated Electromagnetic Emissions (Fundamental and Harmonics of the Transmitter)

Test Report #: G100860883	Test Area: CC1 Radiated	Temperature: <u>23.5</u> °C
Test Method: FCC 15.249(a) IC RSS-210 A2.9(a)	Test Date: <u>08/16/2012</u>	Relative Humidity: <u>30.8</u> %
EUT Model #: AXS9FMT	EUT Power: <u>120VAC/60Hz</u>	Air Pressure: <u>84.1</u> kPa
EUT Serial #: 002		

Manufacturer: Waio, Inc.	Level Key
EUT Description: Broadcastvision Entertainment – Transmitter – FM & 900MHz	Pk – Peak
Notes: Product Tested in the following configuration: 900MHz Radio	Qp – Quasi Peak
Product continuously operating/active during all testing – normal operation	Av - Average
High Channel	

Freq	Level	Det	Cable	Ant	Preamp	Atten	Final	Pol	Hgt	Az	Delta1	LIMIT	RBW
MHz	dBuV	Qp Av Pk	+ [dB]	+ [dB/m]	- [dB]	+ [dB]	= [dBuV]	(V/H)	(m)	(DEG)	FCC 15.249(a) RSS-210 A2.9(a)	FCC 15.249(a) RSS-210 A2.9(a)	(MHz)
Tx Fundamental & Harmonics Measurements – Axis 1 – High Channel													
Fundamental Measurement													
927.9500	94.98	Pk	2.13	22.46	27.55	0.00	92.02	V	1.14	12.0	- 1.98	94.00	0.120
927.9500	93.12	Pk	2.13	22.46	27.55	0.00	90.16	H	1.12	176.0	- 3.84	94.00	0.120
Harmonics measurements – Vertical Antenna													
1855.9000	50.17	Pk	3.07	27.51	36.96	0.00	43.78	V	1.20	59.0	- 10.22	54.00	1.000
2783.8500	47.30	Pk	3.82	29.42	37.36	0.00	43.18	V	1.32	61.0	- 10.82	54.00	1.000
3711.8000	46.84	Pk	4.48	32.22	37.76	0.00	45.79	V	1.21	59.0	- 8.21	54.00	1.000
4639.7500	43.96	Pk	5.07	32.88	39.41	0.00	42.50	V	1.50	29.0	- 11.50	54.00	1.000
5567.7000	43.73	Pk	5.56	34.53	38.69	0.00	45.13	V	1.46	39.0	- 8.87	54.00	1.000
6495.6500	42.50	Pk	6.04	34.91	39.98	0.00	43.47	V	1.52	44.0	- 10.53	54.00	1.000
7423.6000	43.02	Pk	6.52	36.81	39.23	0.00	47.12	V	1.45	56.0	- 6.88	54.00	1.000
8351.5498	45.12	Pk	7.01	37.02	47.08	0.00	42.07	V	1.23	298.0	- 11.93	54.00	1.000
9279.5000	47.38	Pk	7.46	37.38	48.22	0.00	44.00	V	1.25	323.0	- 10.00	54.00	1.000
Harmonics measurements – Horizontal Antenna													
1855.9000	51.25	Pk	3.07	27.51	36.96	0.00	44.86	H	1.40	65.0	- 9.14	54.00	1.000
2783.8500	47.15	Pk	3.82	29.42	37.36	0.00	43.03	H	1.35	73.0	- 10.97	54.00	1.000
3711.8000	46.64	Pk	4.48	32.22	37.76	0.00	45.59	H	1.40	90.0	- 8.41	54.00	1.000
4639.7500	43.45	Pk	5.07	32.88	39.41	0.00	41.99	H	1.31	25.0	- 12.01	54.00	1.000
5567.7000	42.88	Pk	5.56	34.53	38.69	0.00	44.28	H	1.27	66.0	- 9.72	54.00	1.000
6495.6500	43.05	Pk	6.04	34.91	39.98	0.00	44.02	H	1.36	103.0	- 9.98	54.00	1.000
7423.6000	42.96	Pk	6.52	36.81	39.23	0.00	47.06	H	1.52	91.0	- 6.94	54.00	1.000
8351.5498	45.85	Pk	7.01	37.02	47.08	0.00	42.80	H	1.22	352.0	- 11.20	54.00	1.000
9279.5000	47.02	Pk	7.46	37.38	48.22	0.00	43.64	H	1.30	340.0	- 10.36	54.00	1.000

Intertek

Report Number: 100860883DEN-002

Issued: 9/11/2012

Freq	Level	Det	Cable	Ant	Preamp	Atten	Final	Pol	Hgt	Az	Delta1	LIMIT	RBW
MHz	dBuV	Qp Av Pk	+ [dB]	+ [dB/m]	- [dB]	+ [dB]	= [dBuV]	(V/H)	(m)	(DEG)	FCC 15.249(a) RSS-210 A2.9	FCC 15.249(a) RSS-210 A2.9	(MHz)
Tx Fundamental & Harmonics Measurements – Axis 2 – High Channel													
Fundamental Measurement													
927.9500	96.12	Pk	2.13	21.92	27.55	0.00	92.62	V	1.00	360.0	- 1.38	94.00	0.120
927.9500	94.97	Pk	2.13	22.46	27.55	0.00	92.01	H	1.24	188.0	- 1.99	94.00	0.120
Harmonics measurements – Vertical Antenna													
1855.9000	52.06	Pk	3.07	27.51	36.96	0.00	45.67	V	1.44	288.0	- 8.33	54.00	1.000
2783.8500	47.38	Pk	3.82	29.42	37.36	0.00	43.26	V	1.41	321.0	- 10.74	54.00	1.000
3711.8000	46.33	Pk	4.48	32.22	37.76	0.00	45.28	V	1.37	317.0	- 8.72	54.00	1.000
4639.7500	43.52	Pk	5.07	32.88	39.41	0.00	42.06	V	1.57	328.0	- 11.94	54.00	1.000
5567.7000	43.24	Pk	5.56	34.53	38.69	0.00	44.64	V	1.50	328.0	- 9.36	54.00	1.000
6495.6500	42.59	Pk	6.04	34.91	39.98	0.00	43.56	V	1.44	351.0	- 10.44	54.00	1.000
7423.6000	42.77	Pk	6.52	36.81	39.23	0.00	46.87	V	1.54	338.0	- 7.13	54.00	1.000
8351.5498	45.26	Pk	7.01	37.02	47.08	0.00	42.21	V	1.25	331.0	- 11.79	54.00	1.000
9279.5000	47.38	Pk	7.46	37.38	48.22	0.00	44.00	V	1.28	330.0	- 10.00	54.00	1.000
Harmonics measurements – Horizontal Antenna													
1855.9000	50.64	Pk	3.07	27.51	36.96	0.00	44.25	H	1.13	227.0	- 9.75	54.00	1.000
2783.8500	46.91	Pk	3.82	29.42	37.36	0.00	42.79	H	1.29	333.0	- 11.21	54.00	1.000
3711.8000	46.17	Pk	4.48	32.22	37.76	0.00	45.12	H	1.24	304.0	- 8.88	54.00	1.000
4639.7500	43.58	Pk	5.07	32.88	39.41	0.00	42.12	H	1.48	315.0	- 11.88	54.00	1.000
5567.7000	43.05	Pk	5.56	34.53	38.69	0.00	44.45	H	1.55	297.0	- 9.55	54.00	1.000
6495.6500	43.05	Pk	6.04	34.91	39.98	0.00	44.02	H	1.68	330.0	- 9.98	54.00	1.000
7423.6000	42.52	Pk	6.52	36.81	39.23	0.00	46.62	H	1.64	319.0	- 7.38	54.00	1.000
8351.5498	45.87	Pk	7.01	37.02	47.08	0.00	42.82	H	1.26	337.0	- 11.18	54.00	1.000
9279.5000	47.23	Pk	7.46	37.38	48.22	0.00	43.85	H	1.32	310.0	- 10.15	54.00	1.000

Intertek

Report Number: 100860883DEN-002

Issued: 9/11/2012

Freq	Level	Det	Cable	Ant	Preamp	Atten	Final	Pol	Hgt	Az	Delta1	LIMIT	RBW
MHz	dBuV	Qp Av Pk	+ [dB]	+ [dB/m]	- [dB]	+ [dB]	= [dBuV]	(V/H)	(m)	(DEG)	FCC 15.249(a) RSS-210 A2.9	FCC 15.249(a) RSS-210 A2.9	(MHz)
Tx Fundamental & Harmonics Measurements – Axis 3 – High Channel													
Fundamental Measurement													
927.9500	95.02	Pk	2.13	22.46	27.55	0.00	92.06	V	1.22	354.0	- 1.94	94.00	0.120
927.9500	93.37	Pk	2.13	22.46	27.55	0.00	90.41	H	1.18	13.0	- 3.59	94.00	0.120
Harmonics measurements – Vertical Antenna													
1855.9000	51.58	Pk	3.07	27.51	36.96	0.00	45.19	V	1.47	187.0	- 8.81	54.00	1.000
2783.8500	46.87	Pk	3.82	29.42	37.36	0.00	42.75	V	1.55	200.0	- 11.25	54.00	1.000
3711.8000	46.02	Pk	4.48	32.22	37.76	0.00	44.97	V	1.58	196.0	- 9.03	54.00	1.000
4639.7500	43.42	Pk	5.07	32.88	39.41	0.00	41.96	V	1.52	189.0	- 12.04	54.00	1.000
5567.7000	43.01	Pk	5.56	34.53	38.69	0.00	44.41	V	1.56	190.0	- 9.59	54.00	1.000
6495.6500	42.50	Pk	6.04	34.91	39.98	0.00	43.47	V	1.48	213.0	- 10.53	54.00	1.000
7423.6000	42.62	Pk	6.52	36.81	39.23	0.00	46.72	V	1.48	187.0	- 7.28	54.00	1.000
8351.5498	45.88	Pk	7.01	37.02	47.08	0.00	42.83	V	1.23	295.0	- 11.17	54.00	1.000
9279.5000	47.94	Pk	7.46	37.38	48.22	0.00	44.56	V	1.25	323.0	- 9.44	54.00	1.000
Harmonics measurements – Horizontal Antenna													
1855.9000	52.91	Pk	3.07	27.51	36.96	0.00	46.52	H	1.68	315.0	- 7.48	54.00	1.000
2783.8500	47.84	Pk	3.82	29.42	37.36	0.00	43.72	H	1.64	192.0	- 10.28	54.00	1.000
3711.8000	46.63	Pk	4.48	32.22	37.76	0.00	45.58	H	1.52	210.0	- 8.42	54.00	1.000
4639.7500	43.71	Pk	5.07	32.88	39.41	0.00	42.25	H	1.53	198.0	- 11.75	54.00	1.000
5567.7000	43.04	Pk	5.56	34.53	38.69	0.00	44.44	H	1.57	171.0	- 9.56	54.00	1.000
6495.6500	42.49	Pk	6.04	34.91	39.98	0.00	43.46	H	1.62	163.0	- 10.54	54.00	1.000
7423.6000	42.59	Pk	6.52	36.81	39.23	0.00	46.69	H	1.55	160.0	- 7.31	54.00	1.000
8351.5498	45.93	Pk	7.01	37.02	47.08	0.00	42.88	H	1.22	352.0	- 11.12	54.00	1.000
9279.5000	47.42	Pk	7.46	37.38	48.22	0.00	44.04	H	1.30	338.0	- 9.96	54.00	1.000

Example calculation:

Measured Level	+	Cable Loss	+	Antenna Factor	-	Pre-Amp	+	Atten	=	Final Corrected Reading	Specification Limit	-	Final Corrected Reading	=	Delta Specification
(dBμV)		(dB)		(dB)		(dB)		(dB)		(dBμV/m)	(dBμV/m)		(dBμV/m)		
20.0		3.0		5.0		10.0		0.0		18.0	40.0		18.0		- 22.0

Notes:

- 1) The product was fully tested in (3) Axes. Refer to photos for details.
Axis 2 Low Channel was worst-case for both the fundamental and harmonics of the fundamental.
- 2) The product was tested in the following product option: 900MHz Radio mode of operation.
- 3) All measurements were taken at 3-meter test distance (antenna-to-product). Measurements of both the fundamental and harmonics of the fundamental were taken with a peak detector. No duty cycle correction for pulsed signals was utilized in this report.

Deviations, Additions, or Exclusions: None

Intertek	
Report Number: 100860883DEN-002	Issued: 9/11/2012

8 AC Mains Conducted Emissions

8.1 Method

Unless otherwise stated no deviations were made from FCC 15.207 [IC RSS-Gen 7.2.4].

This testing was performed at Intertek Denver, located at 1795 Dogwood St. Suite 200, Louisville, CO 80027.

8.2 Test Equipment Used:

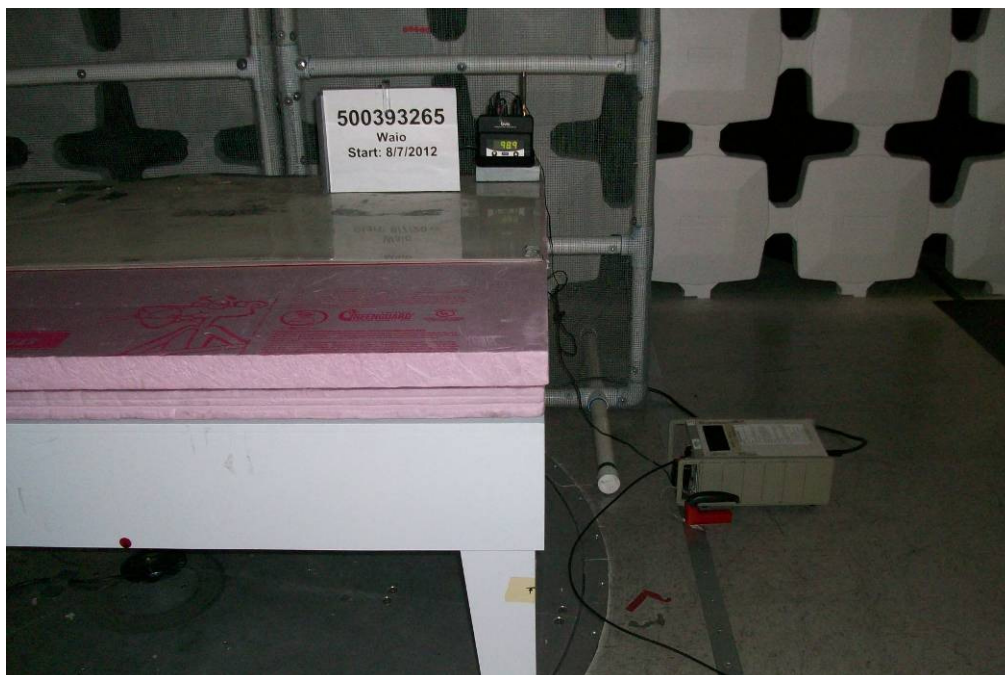
<u>Asset ID:</u>	<u>Description:</u>	<u>Manufacturer:</u>	<u>Model:</u>	<u>Serial:</u>	<u>Cal Date</u>	<u>Cal Due</u>
DEN-073	EMI Receiver	RHODE & SCHWARZ	ESU 26	100265	01/11/2012	01/11/2013
18885	Transient Limiter	Hewlett-Packard	11947A	3107A00700	05/03/2012	05/03/2013
18914	Single Phase LISN	EMCO	3816/NM	9408-1003	04/05/2012	04/05/2013
SW-6	Software application for Radiated and Conducted Emissions	Intertek	OATS_Vba	V002	VBV	VBV

8.3 Results:

The product tested was found to comply.

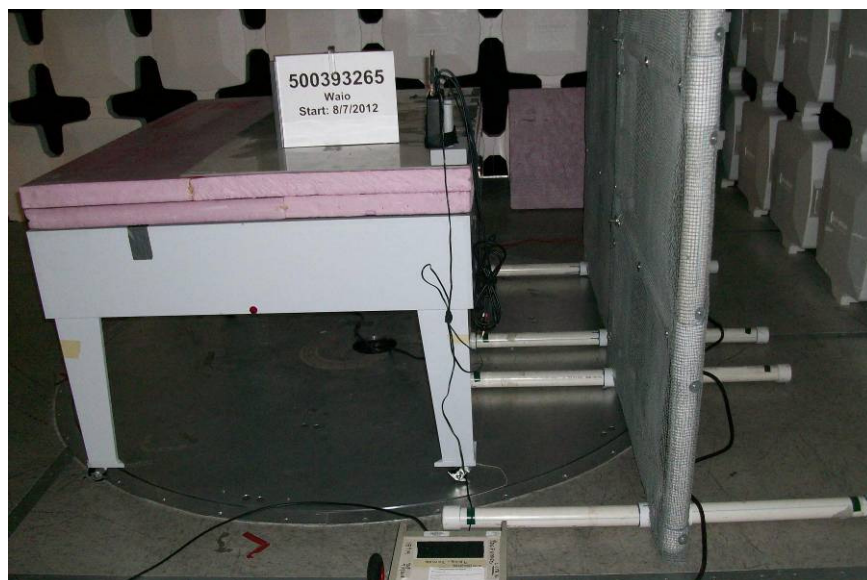
8.4 Setup Photographs: 900MHz Mode

Test Setup (Front View)



Setup Photographs: 900MHz Mode

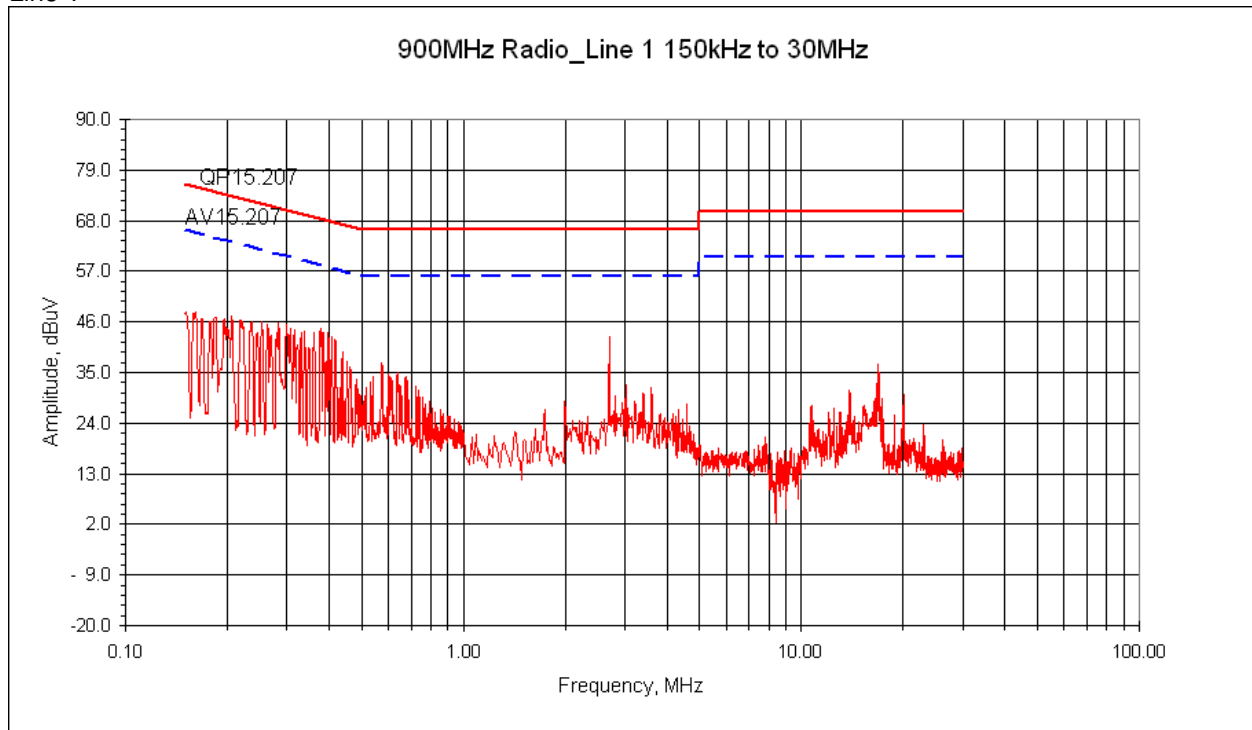
Test Setup (Side View)



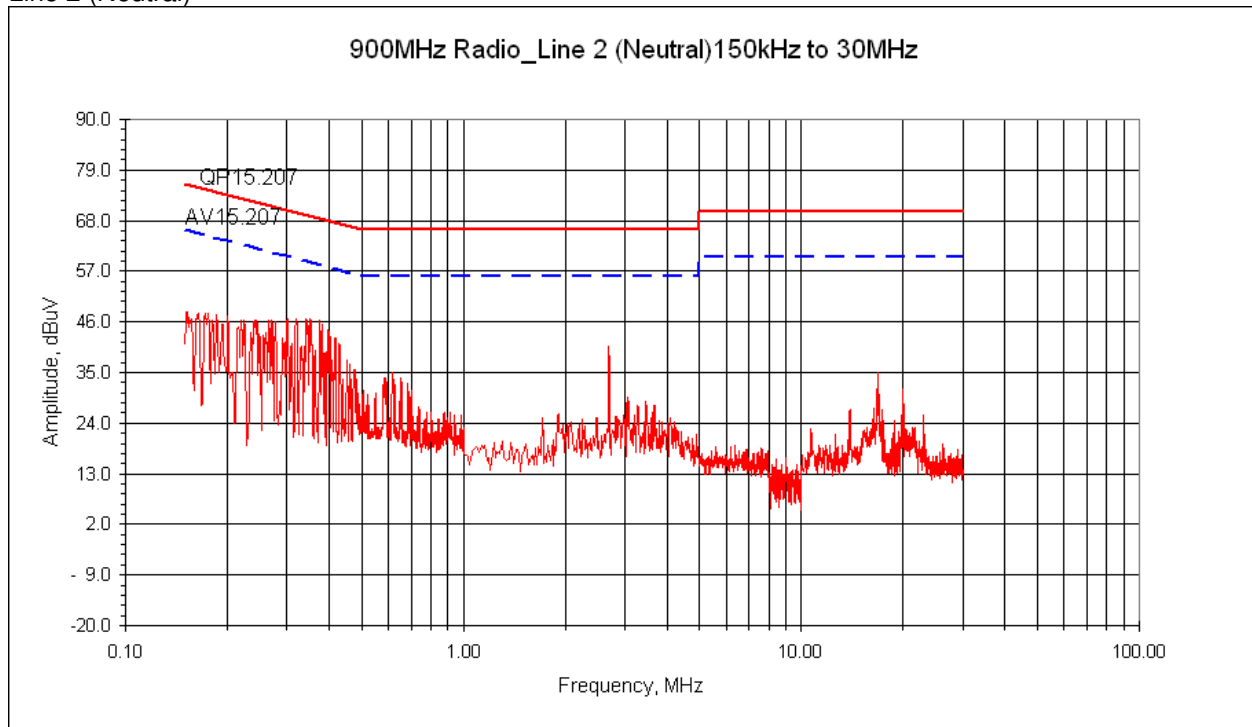
8.5 Pre-scan Plots: Reference Only – Not Final Data: 900MHz Mode

Radiated Emissions – FCC 15.207 [IC RSS-Gen 7.2.4] - (150kHz to 30MHz)

Line 1



Line 2 (Neutral)

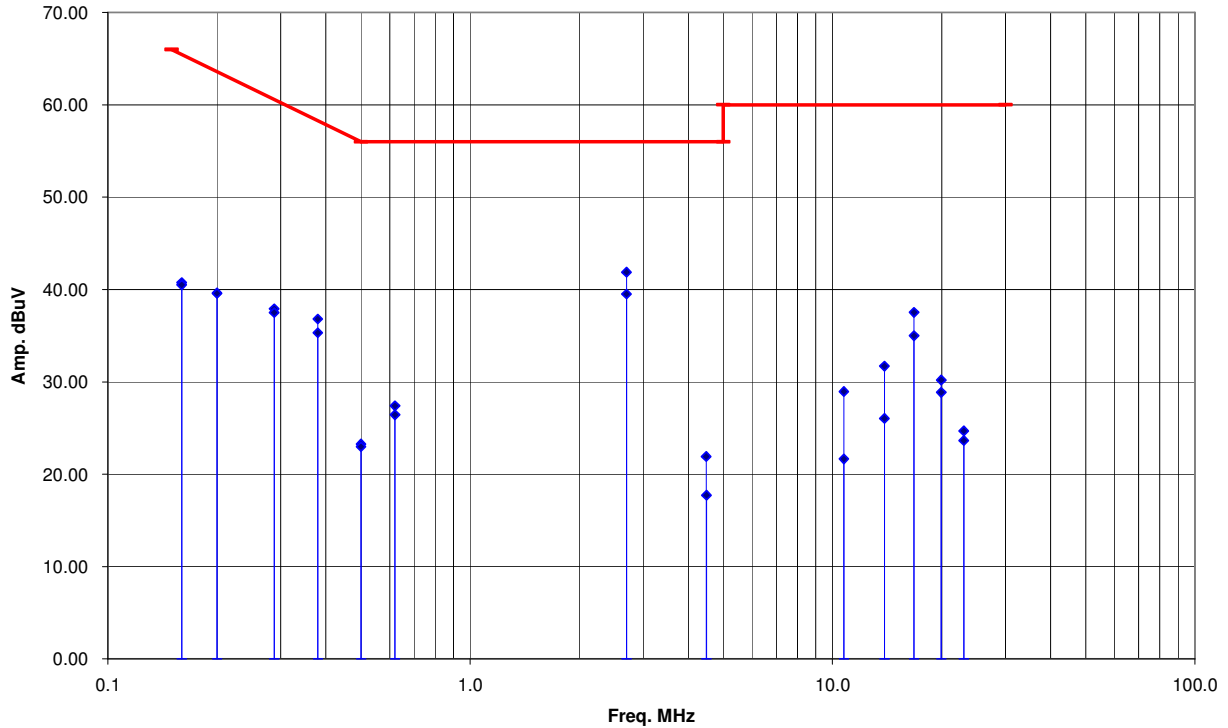


Note: Peak measurements plotted against Average and QP limits

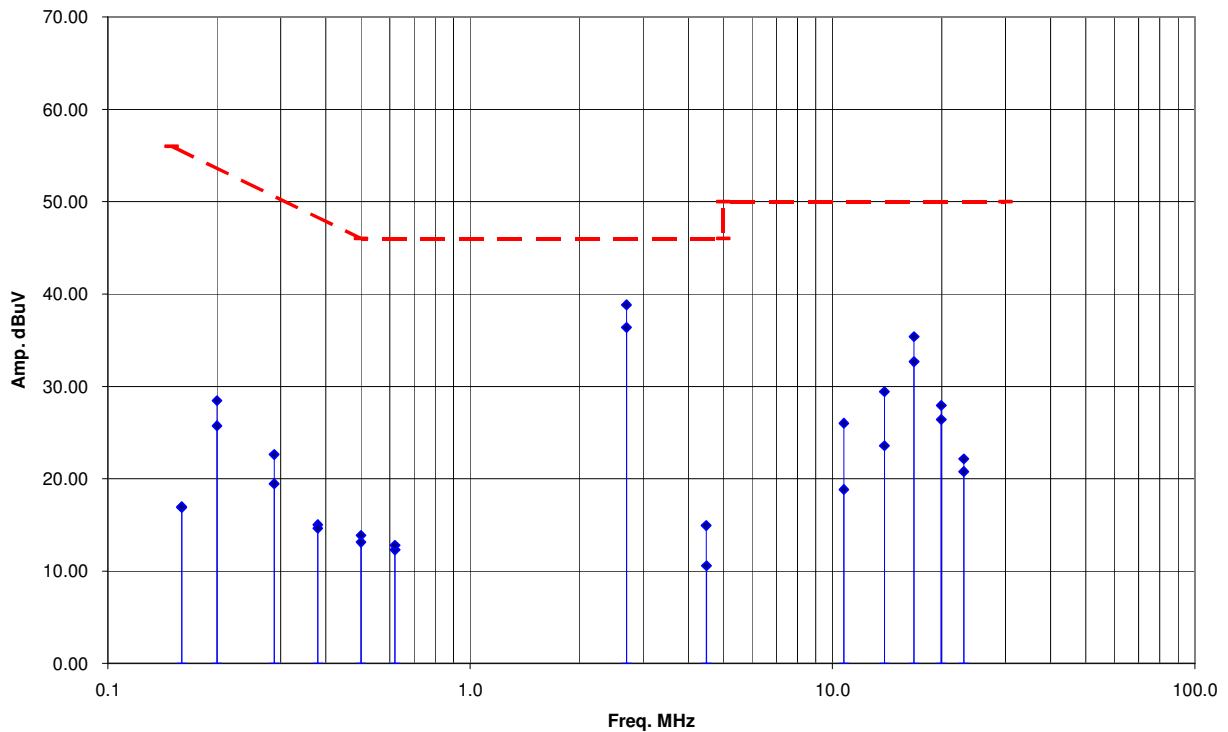
8.6 Final Plots: 900MHz Mode

Conducted Emissions – FCC 15.207 [IC RSS-Gen 7.2.4] - (150kHz to 30MHz)

AXS9FMT_900MHz Radio
Line and Neutral Conducted Emission Summary
CC1 08/28/2012



AXS9FMT_900MHz Radio
Line and Neutral Conducted Emission Summary
CC1 08/28/2012



8.7 Test Data: 900MHz Mode

AC Conducted Electromagnetic Emissions

Test Report #:	G100860883	Test Area:	CC1 Conducted	Temperature:	23.9	C
Test Method:	FCC 15.207/ RSS-Gen, Section 7.2.2	Test Date:	28-Aug 2012	Relative Humidity:	29.1	%
EUT Model #:	AXS9FMT	EUT Power:	115VAC/60Hz	Air Pressure:	83.2	kPa
EUT Serial #:	002					
Manufacturer:	Waio					
EUT Description:	Broadcastvision Entertainment (bve) Transmitter [900MHz & FM]					
Notes:	Product continuously active during testing – normal operation					
	Product Configuration: 900MHz Tx mode of operation					

FREQ	LEVEL	DET	CABLE	LISN	PREAMP	ATTEN	FINAL	TEST POINT	DELTA1	DELTA2	RBW
MHz	dBuV	Qp Av Pk	+ [dB]	+ [dB/m]	- [dB]	+ [dB]	= [dBuV]	Line 1 Line 2 (Neutral)	FCC15.207 RSS-Gen Average	FCC15.207 RSS-Gen QP	(MHz)
AXS9FMT – 900MHz Mode of operation @ 115VAC/60Hz											
Line 1 Data											
0.160	6.79	Av	0.10	0.04	0.00	9.95	16.88	Line 1	- 48.59	NA	0.009
0.160	30.66	Qp	0.10	0.04	0.00	9.95	40.75	Line 1	NA	- 34.72	0.009
0.200	15.65	Av	0.10	0.03	0.00	9.95	25.73	Line 1	- 37.88	NA	0.009
0.200	29.54	Qp	0.10	0.03	0.00	9.95	39.62	Line 1	NA	- 33.99	0.009
0.288	9.37	Av	0.10	0.03	0.00	9.96	19.45	Line 1	- 41.13	NA	0.009
0.288	27.83	Qp	0.10	0.03	0.00	9.96	37.91	Line 1	NA	- 32.67	0.009
0.380	4.93	Av	0.10	0.03	0.00	9.96	15.02	Line 1	- 43.26	NA	0.009
0.380	26.73	Qp	0.10	0.03	0.00	9.96	36.82	Line 1	NA	- 31.46	0.009
0.500	3.04	Av	0.10	0.02	0.00	9.96	13.13	Line 1	- 42.87	NA	0.009
0.500	13.18	Qp	0.10	0.02	0.00	9.96	23.27	Line 1	NA	- 42.73	0.009
0.620	2.21	Av	0.10	0.02	0.00	9.97	12.30	Line 1	- 43.70	NA	0.009
0.620	16.35	Qp	0.10	0.02	0.00	9.97	26.44	Line 1	NA	- 39.56	0.009
2.700	26.17	Av	0.20	0.03	0.00	9.97	36.38	Line 1	- 19.62	NA	0.009
2.700	29.30	Qp	0.20	0.03	0.00	9.97	39.51	Line 1	NA	- 26.49	0.009
4.486	0.25	Av	0.30	0.04	0.00	9.97	10.56	Line 1	- 45.44	NA	0.009
4.486	7.41	Qp	0.30	0.04	0.00	9.97	17.72	Line 1	NA	- 48.28	0.009
10.750	8.05	Av	0.67	0.12	0.00	9.99	18.83	Line 1	- 41.17	NA	0.009
10.750	10.87	Qp	0.67	0.12	0.00	9.99	21.65	Line 1	NA	- 48.35	0.009
13.920	12.53	Av	0.90	0.13	0.00	10.00	23.56	Line 1	- 36.44	NA	0.009
13.920	15.00	Qp	0.90	0.13	0.00	10.00	26.03	Line 1	NA	- 43.97	0.009
16.800	21.39	Av	1.10	0.16	0.00	10.01	32.66	Line 1	- 27.34	NA	0.009
16.800	23.72	Qp	1.10	0.16	0.00	10.01	34.99	Line 1	NA	- 35.01	0.009
19.968	16.59	Av	1.10	0.22	0.00	10.02	27.93	Line 1	- 32.07	NA	0.009
19.968	18.87	Qp	1.10	0.22	0.00	10.02	30.21	Line 1	NA	- 39.79	0.009
23.038	10.78	Av	1.10	0.22	0.00	10.03	22.14	Line 1	- 37.86	NA	0.009
23.038	13.32	Qp	1.10	0.22	0.00	10.03	24.68	Line 1	NA	- 45.32	0.009

Intertek

Report Number: 100860883DEN-002

Issued: 9/11/2012

AXS9FMT – 900MHz Mode of operation @ 115VAC/60Hz

Line 2 (Neutral) Data

0.160	6.87	Av	0.10	0.04	0.00	9.95	16.96	Line 2	- 48.51	NA	0.009
0.160	30.42	Qp	0.10	0.04	0.00	9.95	40.51	Line 2	NA	- 34.96	0.009
0.200	18.38	Av	0.10	0.03	0.00	9.95	28.46	Line 2	- 35.15	NA	0.009
0.200	29.50	Qp	0.10	0.03	0.00	9.95	39.58	Line 2	NA	- 34.03	0.009
0.288	12.55	Av	0.10	0.03	0.00	9.96	22.63	Line 2	- 37.95	NA	0.009
0.288	27.43	Qp	0.10	0.03	0.00	9.96	37.51	Line 2	NA	- 33.07	0.009
0.380	4.56	Av	0.10	0.02	0.00	9.96	14.64	Line 2	- 43.63	NA	0.009
0.380	25.25	Qp	0.10	0.02	0.00	9.96	35.33	Line 2	NA	- 32.94	0.009
0.500	3.77	Av	0.10	0.02	0.00	9.96	13.86	Line 2	- 42.14	NA	0.009
0.500	12.89	Qp	0.10	0.02	0.00	9.96	22.98	Line 2	NA	- 43.02	0.009
0.620	2.70	Av	0.10	0.02	0.00	9.97	12.79	Line 2	- 43.21	NA	0.009
0.620	17.31	Qp	0.10	0.02	0.00	9.97	27.40	Line 2	NA	- 38.60	0.009
2.700	28.63	Av	0.20	0.03	0.00	9.97	38.83	Line 2	- 17.17	NA	0.009
2.700	31.68	Qp	0.20	0.03	0.00	9.97	41.88	Line 2	NA	- 24.12	0.009
4.480	4.61	Av	0.30	0.04	0.00	9.97	14.92	Line 2	- 41.08	NA	0.009
4.480	11.60	Qp	0.30	0.04	0.00	9.97	21.91	Line 2	NA	- 44.09	0.009
10.752	15.23	Av	0.67	0.12	0.00	9.99	26.02	Line 2	- 33.98	NA	0.009
10.752	18.16	Qp	0.67	0.12	0.00	9.99	28.95	Line 2	NA	- 41.05	0.009
13.920	18.39	Av	0.90	0.14	0.00	10.00	29.43	Line 2	- 30.57	NA	0.009
13.920	20.66	Qp	0.90	0.14	0.00	10.00	31.70	Line 2	NA	- 38.30	0.009
16.800	24.10	Av	1.10	0.17	0.00	10.01	35.38	Line 2	- 24.62	NA	0.009
16.800	26.25	Qp	1.10	0.17	0.00	10.01	37.53	Line 2	NA	- 32.47	0.009
19.968	15.07	Av	1.10	0.22	0.00	10.02	26.41	Line 2	- 33.59	NA	0.009
19.968	17.52	Qp	1.10	0.22	0.00	10.02	28.86	Line 2	NA	- 41.14	0.009
23.040	9.29	Av	1.10	0.35	0.00	10.03	20.78	Line 2	- 39.22	NA	0.009
23.040	12.15	Qp	1.10	0.35	0.00	10.03	23.64	Line 2	NA	- 46.36	0.009

Example calculation:

Measured Level		Transducer, Cable Loss & Amplifier corrections		Corrected Reading	Specification Limit		Corrected Reading		Delta Specification
(dBμV)	+	(dB)	=	(dBμV/m)	(dBμV/m)	-	(dBμV/m)	=	
14.0		14.9		28.9	40.0		28.9		-11.1

Notes:

- 1) The product was tested in the following product option: 900MHz Radio mode of operation.

Deviations, Additions, or Exclusions: None

Intertek	
Report Number: 100860883DEN-002	Issued: 9/11/2012

9 Occupied Bandwidth (OBW)

9.1 Method

Unless otherwise stated no deviations were made from RSS-Gen, Section 4.6.1.

This testing was performed at Intertek Denver, located at 1795 Dogwood St. Suite 200, Louisville, CO 80027.

9.2 Test Equipment Used:

Testing on 08/17/2012

<u>Asset ID:</u>	<u>Description:</u>	<u>Manufacturer:</u>	<u>Model:</u>	<u>Serial:</u>	<u>Cal Date</u>	<u>Cal Due</u>
DEN-073	EMI Receiver	RHODE & SCHWARZ	ESU 26	100265	01/11/2012	01/11/2013
18912	9 kHz- 1.3GHz Pre Amp	Hewlett-Packard	8447F	3113A05545	06/06/2012	06/06/2013
19936	Bilog Antenna 30MHz – 6GHz	Sunol Sciences	JB6	A050707-1	11/15/2011	11/15/2012
SW-6	Software application for Radiated and Conducted Emissions	Intertek	OATS_Vba	V003	VBU	VBU

Testing on 04/05/2013

<u>Asset ID:</u>	<u>Description:</u>	<u>Manufacturer:</u>	<u>Model:</u>	<u>Serial:</u>	<u>Cal Date</u>	<u>Cal Due</u>
DEN-073	EMI Receiver	RHODE & SCHWARZ	ESU 26	100265	01/23/2013	01/23/2014
18912	9 kHz- 1.3GHz Pre Amp	Hewlett-Packard	8447F	3113A05545	06/06/2012	06/06/2013
19936	Bilog Antenna 30MHz – 6GHz	Sunol Sciences	JB6	A050707-1	11/20/2012	11/20/2013
SW-6	Software application for Radiated and Conducted Emissions	Intertek	OATS_Vba	V003	VBU	VBU

9.3 Results:

The product tested was found to comply.

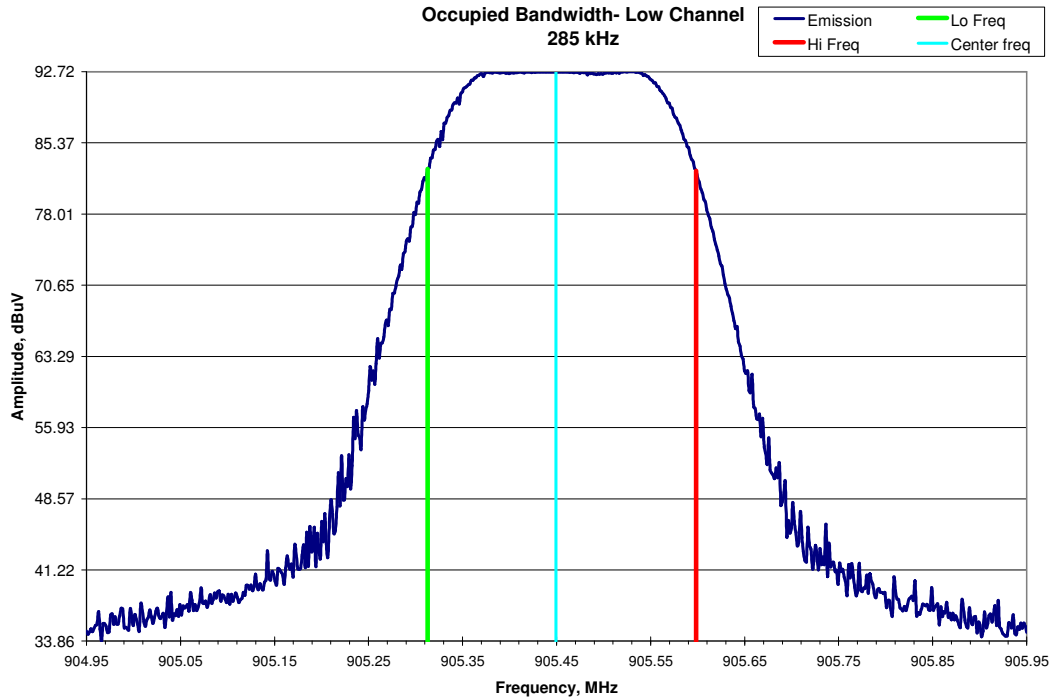
9.4 Setup Photographs: 900MHz Mode

9.5 Final Plots: 900MHz Mode

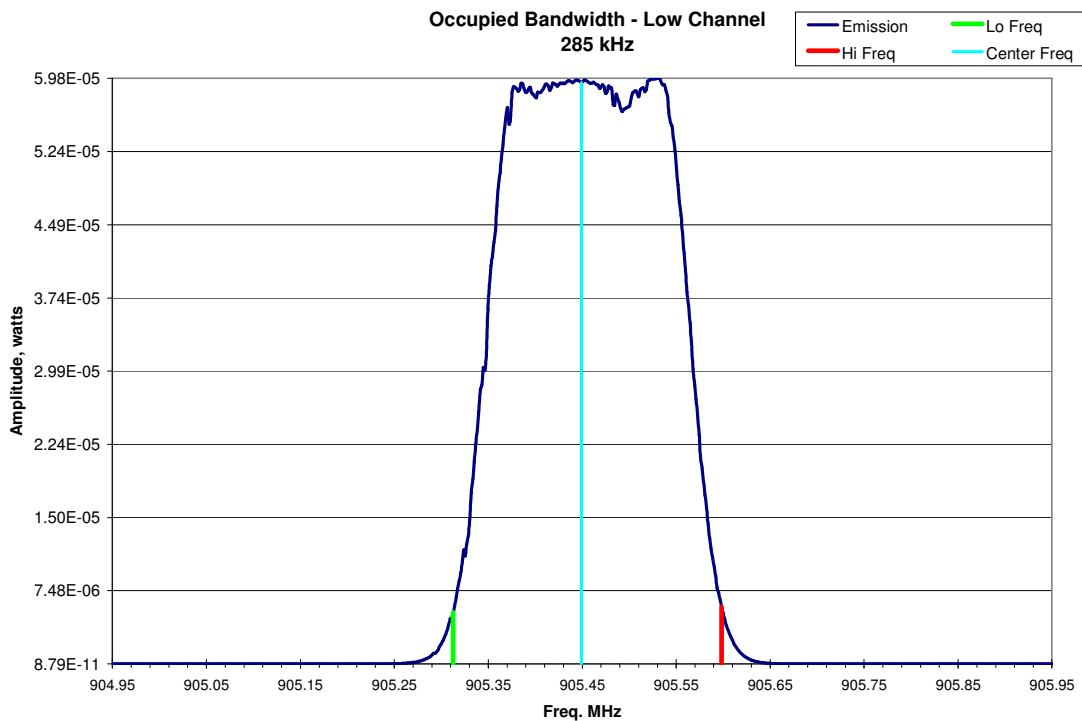
900MHz Tx Occupied Bandwidth - (RSS-GEN, Section 4.6.1)

Low Channel – 905.45 MHz

Field Strength Graph



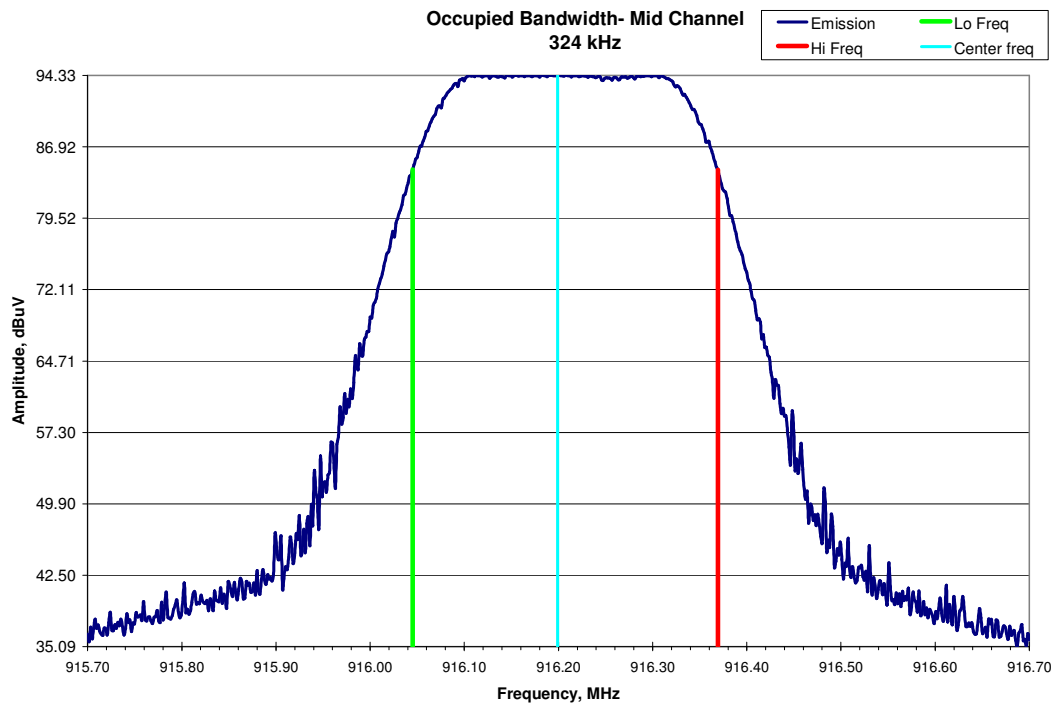
Power Graph



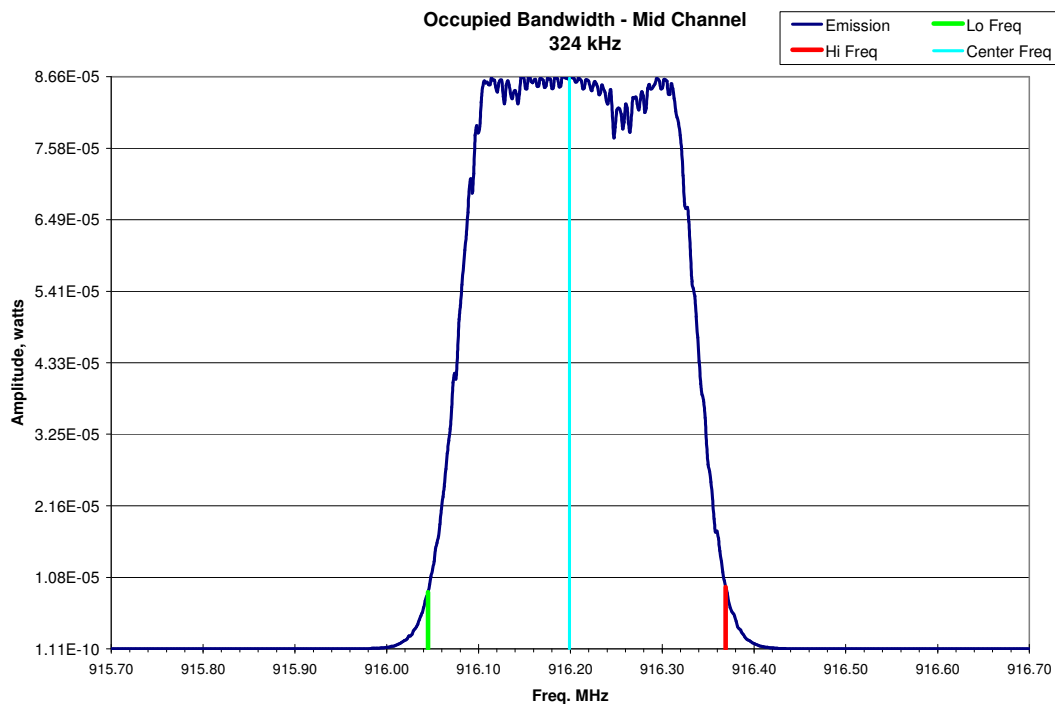
Occupied Bandwidth - (RSS-GEN, Section 4.6.1)

Mid Channel – 916.20 MHz

Field Strength Graph



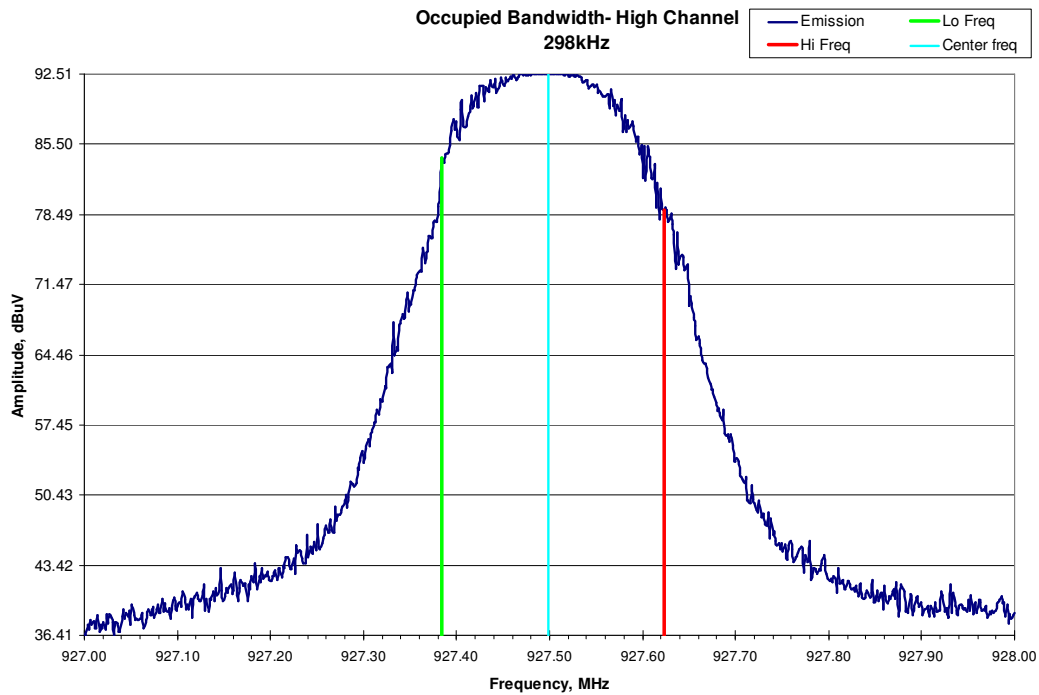
Power Graph



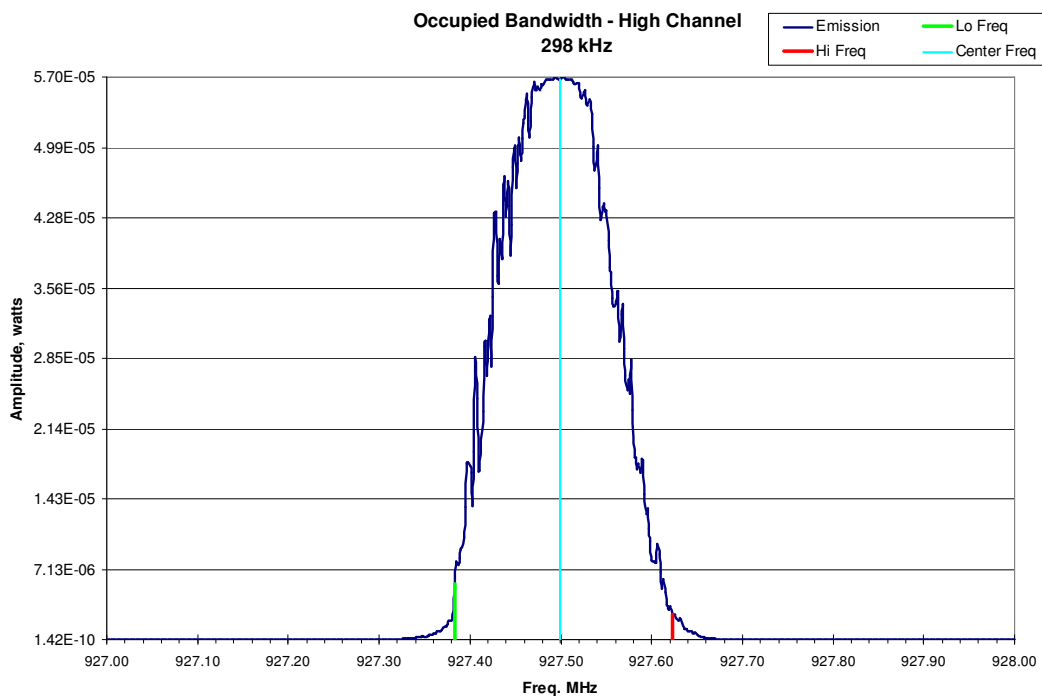
Occupied Bandwidth - (RSS-GEN, Section 4.6.1)

High Channel – 927.50 MHz

Field Strength Graph



Power Graph



Notes: Worst-case Occupied Band Width was Mid Channel (324 kHz)

Intertek	
Report Number: 100860883DEN-002	Issued: 9/11/2012

10 Product Modifications required to pass

The following document describes the product modifications required to pass the Tx Spurious and Unintentional Radiated Emissions testing. Refer to Waio AXS-900TXD – Report on Added Capacitors – document date: 2012-08-14.



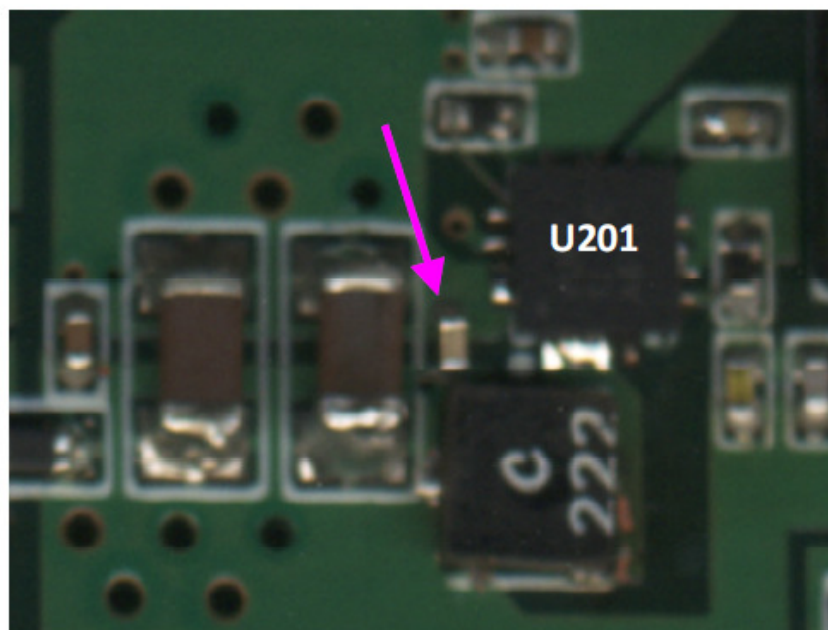
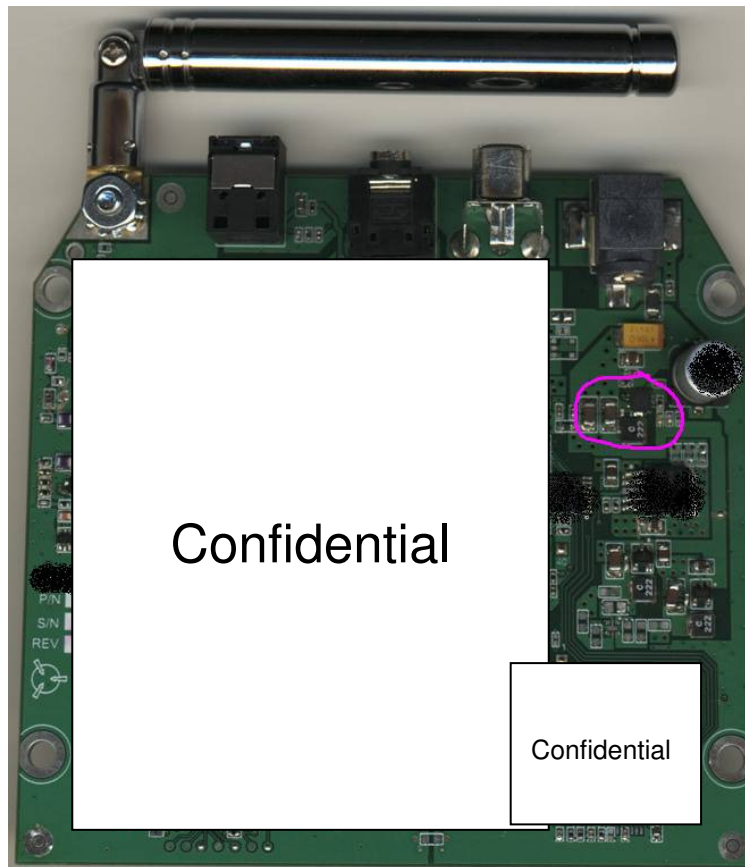
SUMMARY

In FCC testing at Intertek on 2012-08-11, excessive spurious emissions were measured at multiple frequencies near 49MHz and near 365MHz.

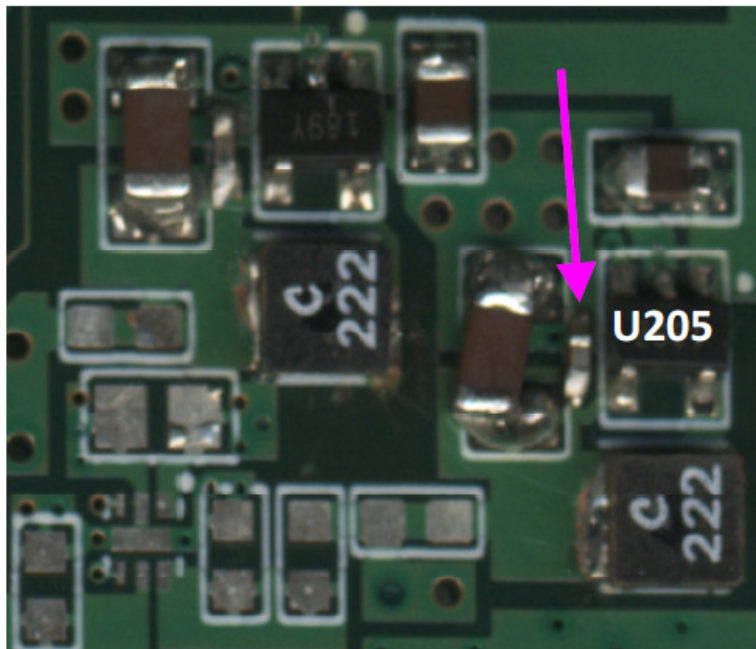
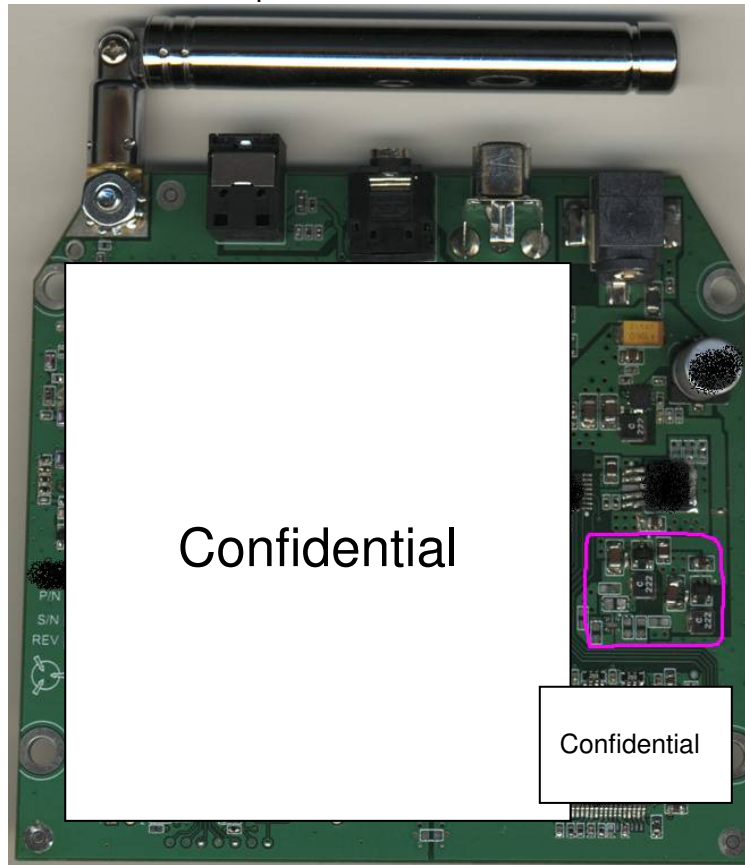
Small-value capacitors were added to the PCB on the outputs of all switching regulators – these caused the emissions to fall below limits with good margin.

DETAILS

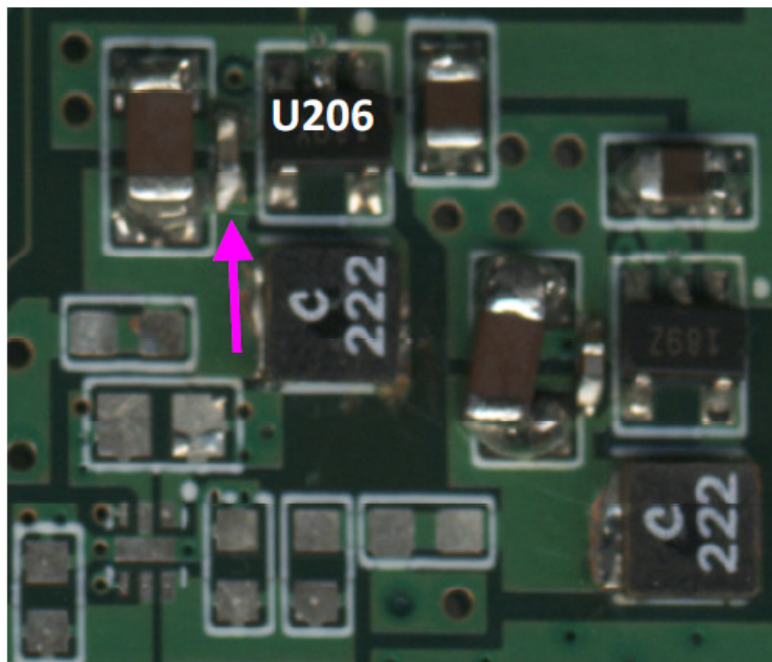
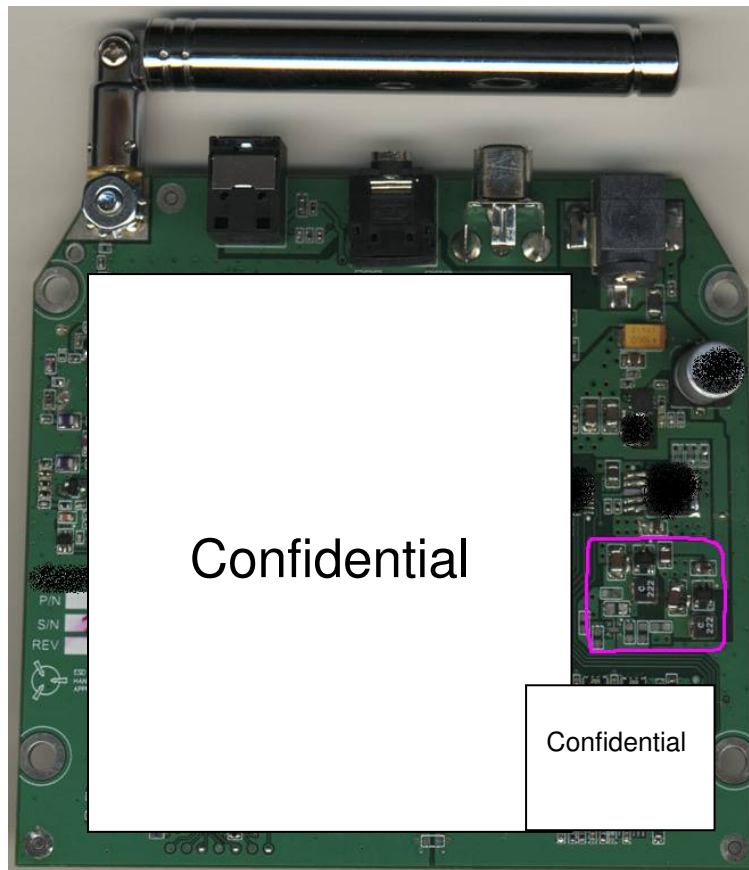
1. 1.0nF 0402 ceramic capacitor added to output of U201 regulator circuit. The capacitor was added in the location indicated in the photos below:



2. 47nF 0402 ceramic capacitor added to output of U205 regulator circuit. The capacitor was added in the location indicated in the photos below:



3. 47nF 0402 ceramic capacitor added to output of U206 regulator circuit. The capacitor was added in the location indicated in the photos below:



11 Measurement Uncertainty

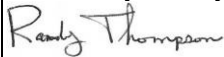
The measured value related to the corresponding limit will be used to decide whether the equipment meets the requirements.

The measurement uncertainty figures were calculated and correspond to a coverage factor of $k = 2$, providing a confidence level of respectively 95.45 % in the case where the distributions characterizing the actual measurement uncertainties are normal (Gaussian).

Measurement uncertainty Table

Parameter	Uncertainty $\pm$	Notes
Radiated emissions, 10kHz to 1000 MHz	4.4 dB	
Radiated emissions, 1 to 18 GHz	4.7 dB	
AC mains Conducted emissions, 9kHz to 30 MHz	3.14 dB	
Disturbance Power 30 to 1000 MHz	3.3 dB	
Telecom Port Conducted emissions, Voltage 150 kHz to 30 MHz	3.11 dB	
Harmonics	-	Meets the requirements specified by the standard.
Flicker	-	Meets the requirements specified by the standard.
ESD	4.4 %	
Radiated RF field immunity 80MHz to 2.7GHz	2.2 dB	
EFT	4.3 %	
Surge	4.3 %	
Conducted RF immunity	2.1 dB	
Power frequency magnetic field immunity	2.3 dB	
Voltage dips / interruptions immunity	0.3 mV	

12 Revision History

Revision Level	Date	Report Number	Notes
0	9/11/2012	100860883DEN-002	Original Issue
1	03/10/2013	100860883DEN-002	1. Added corrected product model numbers declared by client to be identical to the product tested. Update required for TCB review and submittal. Original product model: AXS9FMT Modified product models: AXS-900TRXD, AXS-900TXD, AXS-98FMTD, CT-900TD (page 1 – product designator, Page 3 – general note 1) Revised by: Randy Thompson  Reviewed by: Richard Georgerian
2	04/05/2013	100860883DEN-002	1. updated OBW plot (page 65) 2. updated low-channel fundamental & harmonics of fundamental test data (page 44-45) 3. updated client address (page1) Revised by: Randy Thompson  Reviewed by: Mike Kanda 