



TEST REPORT – EMC Emissions

Report Number: 100619930DEN-001

Project Number: G100619930

Report Issue Date: 2/17/2012

Product Designation: EN6080

Standards: FCC title 47 CFR part 15 subpart C
RSS-210:2010 Issue 8
AS/NZS 4268:2008

Tested by:

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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 Emissions – Output power of the Fundamental & Harmonics of the Fundamental - FCC 247(b)(2) (d)/15.205 [Covers RSS-210, A8.4/ A8.5]	01/11/2012 02/09/2012	Pass
6	Radiated Emissions – Unintentional and Spurious of the Transmitter - FCC 15.209/15.247(d)/15.205 (Covers RSS-210 A8.5, & RSS-GEN 7.2.2)	02/07/2012 02/09/2012	Pass
7	Radiated Emissions – Unintentional and Spurious of the Receiver - FCC 5.209/15.247(d)/15.205 (Covers RSS-GEN Section 6)	01/12/2012	Pass
8	20 dB Bandwidth – FCC 15.247 (a)(1)(i) [Covers RSS-210, A8.1(c)]	N/A	N/A
9	Number of Hopping Channels – FCC 15.247(a)(1)(i) [Covers RSS-210, A8.1(c)]	N/A	N/A
10	Hopping Channel Carrier Separation – FCC 15.247(a)(1) [Covers RSS-210, A8.1(b)]	N/A	N/A
11	Channel Time of Occupancy (On/Off Time) – FCC 15.247(a)(1)(i) [Covers RSS-210, A8.1(c)]	N/A	N/A
12	Band Edge Measurements – FCC 15.247(d) / 15.209 [Covers RSS-210, A8.5]	N/A	N/A
13	Occupied Bandwidth (OBW) – RSS-GEN, Section 4.6.1	N/A	N/A
14	Duty Cycle & Duty Cycle Correction Factor – FCC 15.35 [Covers RSS-GEN, Section 4.5]	N/A	N/A
15	AC Conducted Emissions – FCC 15.207 (Covers RSS-GEN Section 7.2.4)	01/27/2012	Pass

Notes:

- 1) The product tested has (2) integral antennas – therefore, all measurements are radiated field strength. Both antennas were evaluated.
- 2) Only the high channel of the transmitter at 927.62 MHz falls within the frequency band specified in AS/NZS 4268:2008

General Remarks:

Testing was performed in 3 different orthogonal axes to determine the worst-case emissions from the device. The worst-case axis and emissions are shown in this report.

Whenever possible, the approved test procedures specified in FCC DA 00-705 for Frequency Hopping Spread Spectrum devices was used for testing.

The product tested was configured with an integral antenna – therefore all measurements are radiated field strength measurements. If antenna conducted port tests cannot be performed, radiated field strength measurements may be taken to demonstrate compliance with the various conducted port power requirements of FCC 15.247. When applicable, the following equation was utilized to convert measurements from conducted port power to radiated field strength for a given test distance.

Limit Calculation:

$$P = (E \times d)^2 / (30 \times G)$$

Whereby:

P = Power in watts

E= measured maximum field strength in Volts/meter

d = test distance in meters from which the field strength was measured

G = numeric gain of the transmitting antenna over an isotropic radiator

If the antenna gain is not known (or declared by the client) at the time of testing, a maximum antenna gain of 6dBi was utilized per FCC 15.247(b)(4).

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3 Description of Equipment Under Test

Equipment Under Test			
Description	Manufacturer	Model Number	Serial Number
IP Enabled Transceiver	Inovonics	EN6080	90607221

Receive Date:	01/27/2012 to 02/09/2012
Received Condition:	Good
Type:	BETA Sample

Description of Equipment Under Test (provided by client)

The EN6080 is a device that bridges the data and control of an Inovonics EchoStream wireless sensor network to an IEEE 802.3 compliant Ethernet network and ultimately to an Area Controller application. It is intended for use where Mobile Duress systems are deployed and in traditional physical security environments to relay sensor data to an Area Controller and also provide control of the wireless network from said Area Controller. The EN6080 has a 900MHz transceiver with two built-in antennas, 24 hour battery back of critical memory and operates using either IEEE 802.3at-2009 Power over Ethernet or an external 14VAC or 14VDC external power supply. Internal sensors will detect the removal of the top cover and the removal of mounted device from its mounting surface generating alarms in either condition. A built-in expansion connector provides for a daughter card that can contain future features and communications links.

Equipment Under Test Power Configuration			
Rated Voltage	Rated Current	Rated Frequency	Number of Phases
AC Adapter Output: 14 VAC	1429 mA	60	1
POE 802.3af: 44V-57V	350 mA	-----	-----

Operating modes of the EUT:

No.	Descriptions of EUT Exercising
1	Fundamental & Harmonics of the Fundamental: Product configured for transmit operation at full power, un-modulated continuous wave (CW) mode. (not normal operation – testing purposes only)
2	Receive Mode Unintentional/Spurious emissions: Product configured in a normal “standby” or “idle” mode – (normal receive mode with frequency hopping function enabled)
3	Transmit Mode Unintentional/Spurious emissions: Product configured in a special transmit mode – intermittent transmit “chirping”. (normal operation with modulation enabled and frequency hopping function disabled)
4	20dB Bandwidth & OBW: hopping function disabled, modulated signal, maximum data rate
5	Number of Hopping Channels: normal operation with hopping function enabled
6	Hopping Channel Carrier Separation: normal operation with hopping function enabled
7	Time of Occupancy (On/Off Time): normal operation with hopping function enabled
8	Band Edge: normal operation with modulation enabled
9	Duty Cycle: normal operation with modulation and hopping function enabled

Clock Frequencies of the EUT:

No.	Descriptions of Product Clocks
1	Transmit Frequency: 902.4 MHz, 914.8 MHz and 927.6 MHz (Low, Mid and High Channels)
2	Lowest Frequency Utilized in Device: 32 kHz
3	Other Clock Frequencies in Device: 16MHz, 25MHz, 30MHz, 50MHz

3.1 Photo – Product Tested:



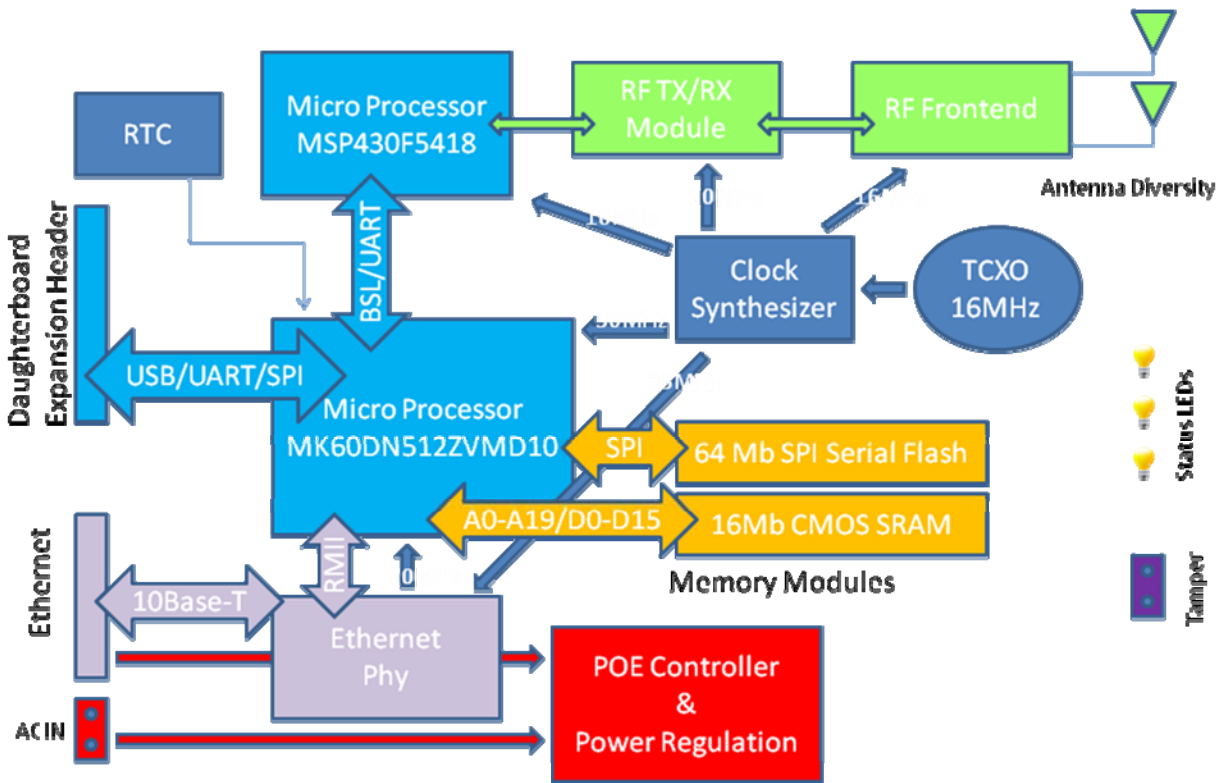
4 System setup including cable interconnection details, support equipment and simplified block diagram

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:

IBEX IX9-NCU Rev A Block Diagram



4.3 Data:

ID	Cable Description	Length	Shielding	Ferrites
1	AC-to-DC Power Adapter Ethernet	3 feet	none	none

Support Equipment			
Description	Manufacturer	Model Number	Serial Number
AC Adapter Class 2 Transformer	SL Power Inc.	W48A-K1429-2T	----
POE Switch	Trendnet	TPE-S44	----

General notes:

5 Radiated Emissions – Output Power of the Fundamental & Harmonics of the Fundamental

5.1 Method

Unless otherwise stated, no deviations were made from ANSI C63.10 and FCC public notice DA 00-705.

This testing was performed at Intertek Louisville, located at 1795 Dogwood Street, 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>
18913	Spectrum Analyzer	Hewlett-Packard	E7405A	My44211889	06/28/2011	06/28/2012
18886	Ridged Guide Antenna 1-18GHz	TENSOR	4105	2020	11/16/2011	11/16/2012
18900	RF Pre-Amplifier (4-8 GHz)	Avantek	AFT97-8434-10F	1007	06/03/2011	06/03/2012
18906	Amplifier (1-4 GHz)	Mini-Circuits Lab	ZHL-42	N052792-2	06/03/2011	06/03/2012
18912	9 kHz- 1.3GHz Pre Amp	Hewlett-Packard	8447F	3113A05545	06/03/2011	06/03/2012
18901	RF Pre-Amplifier (8-18 GHz)	Avantek	AWT-18037	1002	06/03/2011	06/03/2012
19937	Bilog Antenna 30MHz - 6GHz	Sunol Sciences	JB6	A050707-2	01/31/2011	01/31/2012
SW-6	Software for Radiated and Conducted emissions.	Intertek	OATS cvi	V. 1.0	VBU	VBU

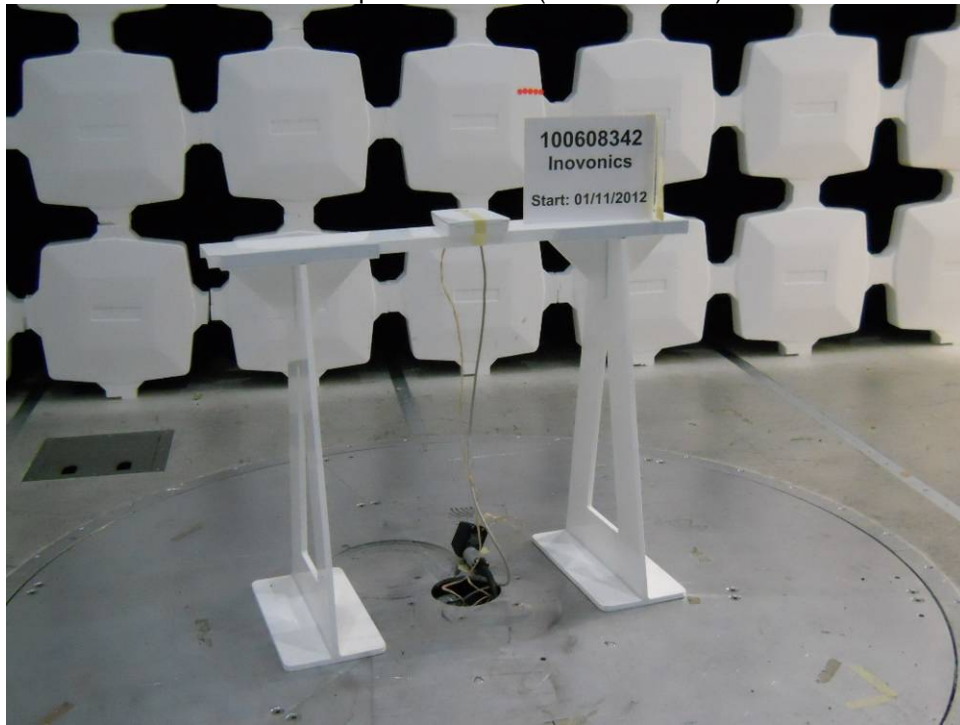
5.3 Results:

The sample tested was found to Comply.

5.4 Setup Photographs

Photo:

Test setup – Front View (CC1 Louisville)

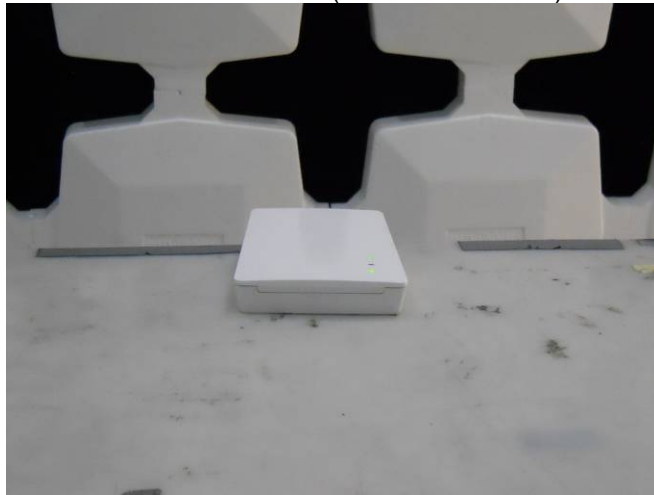


Test setup – Rear View (CC1 Louisville)



Photo:

Worst-Case Axis 1 (EUT Flat on Table)



Axis 2 (EUT Vertical)

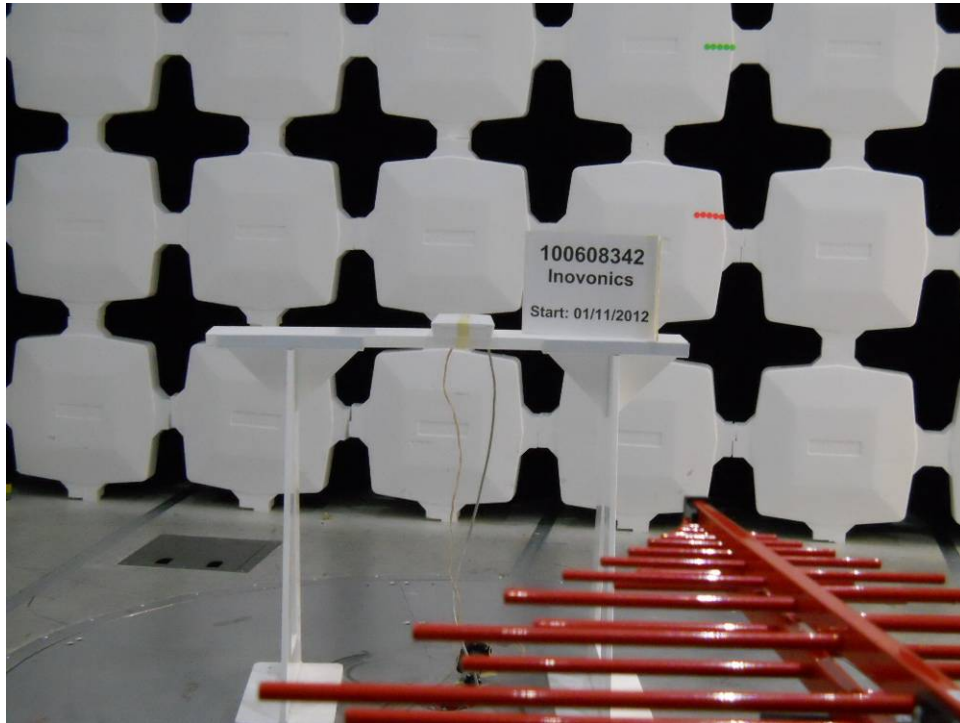


Axis 3 (EUT Vertical & Rotated 90 degrees)

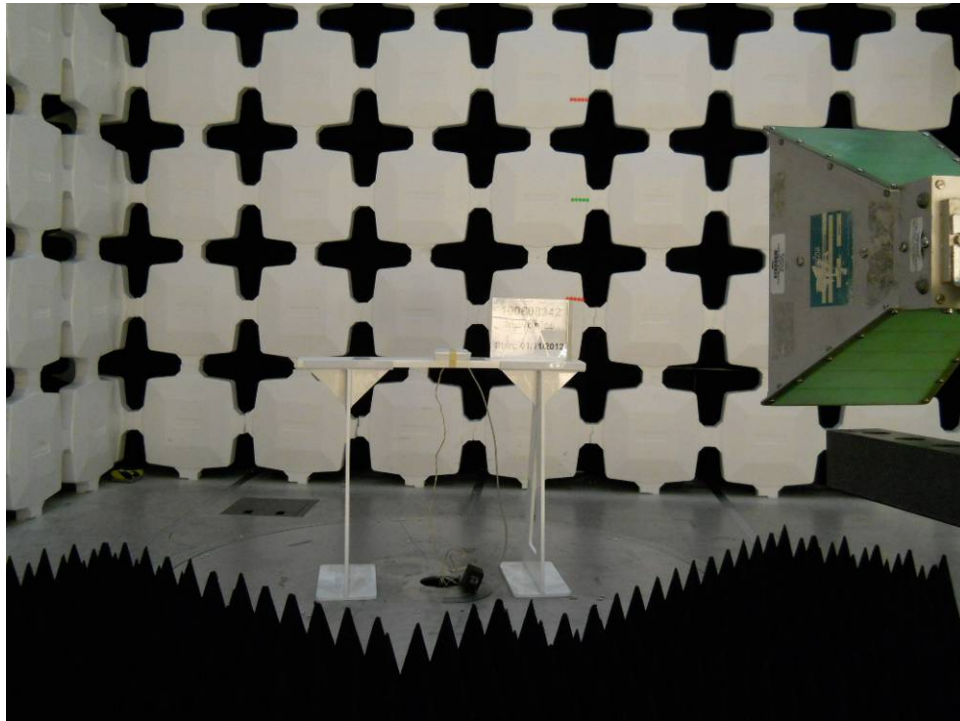


Photo:

Antenna Setups – CC1
30 – 1000MHz



1 – 10 GHz



5.5 Test Data: AC Variation – Fundamental Frequency

Radiated Electromagnetic Emissions

Test Report #: 100608342 Run 06	Test Area: CC1 Radiated	Temperature: 23.1 °C
Test Method: FCC Part 15.209	Test Date: 09-Feb-2012	Relative Humidity: 19.2 %
EUT Model #: EN6080	EUT Power: 120V / 50Hz	Air Pressure: 83.67 kPa
EUT Serial #: 90607221		
Manufacturer: Inovonics		
EUT Description: Access Control Gateway		
Notes: _____		

Level Key	
Pk – Peak	Nb – Narrow Band
Qp – QuasiPeak	Bb – Broad Band
Av - Average	

FREQ (MHz)	LEVEL (dBuV)	CABLE / ANT / PREAMP (dB) (dB/m) (dB)	FINAL (dBuV)	POL / HGT / AZ (m) (DEG)
AC Voltage Fluctuation Measurements				
Antenna 1				
120V / 60Hz				
914.84	89.1 Pk	2.1 / 21.8 / 10.4	102.6	H / 1.0 / 0.0
914.84	78.3 Pk	2.1 / 21.8 / 10.4	91.8	V / 1.0 / 0.0
138V / 60Hz				
914.84	88.6 Pk	2.1 / 21.8 / 10.4	102.1	H / 1.0 / 0.0
914.84	78.3 Pk	2.1 / 21.8 / 10.4	91.8	V / 1.0 / 0.0
102V / 60Hz				
914.84	88.6 Pk	2.1 / 21.8 / 10.4	102.1	H / 1.0 / 0.0
914.84	78.3 Pk	2.1 / 21.8 / 10.4	91.8	V / 1.0 / 0.0
Antenna 2				
120V / 60Hz				
914.84	89.2 Pk	2.1 / 21.8 / 10.4	102.7	H / 1.0 / 0.0
914.84	82.7 Pk	2.1 / 21.8 / 10.4	96.2	V / 1.0 / 0.0
138V / 60Hz				
914.84	88.7 Pk	2.1 / 21.8 / 10.4	102.2	H / 1.0 / 0.0
914.84	82.6 Pk	2.1 / 21.8 / 10.4	96.1	V / 1.0 / 0.0
102V / 60Hz				
914.84	88.8 Pk	2.1 / 21.8 / 10.4	102.3	H / 1.0 / 0.0
914.84	82.7 Pk	2.1 / 21.8 / 10.4	96.2	V / 1.0 / 0.0

Conclusion:

There is no significant difference in the radiated field strength of the fundamental frequency with respect to varying the ac voltage. Therefore, all measurements will be taken using the nominal rated voltage of the product.

5.6 Test Data:

Field Strength Measurements – Fundamental

Test Report #: 100608342 Run 1	Test Area: CC1 Radiated	Temperature: 22.1 °C
Test Method: FCC Part 15.209	Test Date: 11-Jan-2012	Relative Humidity: 21.1 %
EUT Model #: EN6080	EUT Power: Li-Ion Battery Pack, 11V	Air Pressure: 83.36 kPa
EUT Serial #: 90607221		

Manufacturer: Inovonics
 EUT Description: Access Control Gateway

Notes: Cells highlighted in **Yellow** indicate measurement within FCC Restricted Bands
 Testing < 1GHz, Peak detector, RBW 100kHz, VBW 300kHz
 Testing > 1GHz, Peak detector, RBW 1MHz, VBW 1MHz

Level Key	
Pk – Peak	Nb – Narrow Band
Qp – QuasiPeak	Bb – Broad Band
Av - Average	

FREQ	LEVEL	CABLE / ANT / PREAMP	FINAL	POL / HGT / AZ	Duty Cycle Correction	Final Corrected	Limit FCC 15.247	DELTA
(MHz)	(dBuV)	(dB) (dBm) (dB)	(dBuV)	(m) (DEG)	FCC 15.247	(dBuV)	(dBuV/m)	(dB)

Averaging method for pulsed signals and calculation in accordance to FCC CFR47 Part 15.35 utilized to calculate field strength emissions.

The testing performed in accordance to FCC CFR47 Part 15.205 (restricted bands of operation) and 15.247 emissions and delta limits were calculated as follows:

Final Corrected Peak Measurement – Duty Cycle Correction Factor* = Final Calculated Emission

The Final Calculated Emission was then compared to the Limits in CFR47 Part 15.209 and 15.247 and the emission/limit delta was calculated.

DTCF is calculated as follows $20 \cdot \log_{10}(\text{duty cycle in } 100\text{ms})$.

Antenna 1 – Fundamental Measurements

Low Channel

Power Setting - +1dBm

Axis 1

902.42	85.5 Pk	2.1 / 21.9 / 0.0	109.5	V / 1.7 / 73.0	0	109.5	125.2	-15.7
902.42	95.2 Pk	2.1 / 21.9 / 0.0	119.3	H / 1.0 / 309.4	0	119.3	125.2	-5.9

Axis 2

902.42	88.4 Pk	2.1 / 21.9 / 0.0	112.5	H / 1.0 / 12.5	0	112.5	125.2	-12.7
902.42	92.9 Pk	2.1 / 21.9 / 0.0	116.9	V / 1.1 / 289.7	0	116.9	125.2	-8.3

Axis 3

902.42	89.5 Pk	2.1 / 21.9 / 0.0	113.5	V / 1.5 / 97.3	0	113.5	125.2	-11.7
902.42	92.3 Pk	2.1 / 21.9 / 0.0	116.4	H / 1.5 / 179.4	0	116.4	125.2	-8.8

Antenna 1 - Mid Channel

Axis 1

914.82	93.0 Pk	2.1 / 22.2 / 0.0	117.3	H / 1.1 / 135.0	0	117.3	125.2	-7.9
914.82	84.3 Pk	2.1 / 22.2 / 0.0	108.6	V / 1.8 / 0.0	0	108.6	125.2	-16.6

Axis 2

914.82	92.4 Pk	2.1 / 22.2 / 0.0	116.7	V / 1.1 / 95.6	0	116.7	125.2	-8.5
914.82	87.6 Pk	2.1 / 22.2 / 0.0	111.9	H / 1.4 / 333.4	0	111.9	125.2	-13.3

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FREQ	LEVEL	CABLE / ANT / PREAMP	FINAL	POL / HGT / AZ	Duty Cycle Correction	Final Corrected	Limit FCC 15.247	DELTA
(MHz)	(dBuV)	(dB) (dBm) (dB)	(dBuV)	(m) (DEG)	FCC 15.247	(dBuV)	(dBuV/m)	(dB)
Axis 3								
914.82	90.9 Pk	2.1 / 22.2 / 0.0	115.2	H / 1.5 / 166.7	0	115.2	125.2	-10
914.82	88.3 Pk	2.1 / 22.2 / 0.0	112.7	V / 1.5 / 283.8	0	112.7	125.2	-12.5
Antenna 1 - High Channel								
Axis 1								
927.62	83.1 Pk	2.1 / 22.5 / 0.0	107.8	V / 1.8 / 0.0	0	107.8	125.2	-17.4
927.62	91.5 Pk	2.1 / 22.5 / 0.0	116.1	H / 1.0 / 132.9	0	116.1	125.2	-9.1
Axis 2								
927.62	86.0 Pk	2.1 / 22.5 / 0.0	110.6	H / 1.5 / 195.8	0	110.6	125.2	-14.6
927.62	90.6 Pk	2.1 / 22.5 / 0.0	115.2	V / 1.1 / 85.8	0	115.2	125.2	-10
Axis 3								
927.62	87.5 Pk	2.1 / 22.5 / 0.0	112.1	V / 1.5 / 251.5	0	112.1	125.2	-13.1
927.62	89.6 Qp	2.1 / 22.5 / 0.0	114.2	H / 1.5 / 354.0	0	114.2	125.2	-11
Antenna 1 – Worst Case Axis - Axis 1								
Antenna 2 – Fundamental Measurements								
Low Channel								
Axis 1								
902.42	94.8 Pk	2.1 / 21.9 / 0.0	118.8	H / 1.0 / 312.1	0	118.8	125.2	-6.4
902.42	84.5 Pk	2.1 / 21.9 / 0.0	108.6	V / 1.7 / 346.9	0	108.6	125.2	-16.6
Axis 2								
902.42	91.3 Pk	2.1 / 21.9 / 0.0	115.4	V / 1.2 / 0.0	0	115.4	125.2	-9.8
902.42	90.1 Pk	2.1 / 21.9 / 0.0	114.2	H / 1.4 / 180.7	0	114.2	125.2	-11
Axis 3								
902.42	92.2 Pk	2.1 / 21.9 / 0.0	116.3	H / 1.5 / 188.2	0	116.3	125.2	-8.9
902.42	90.9 Pk	2.1 / 21.9 / 0.0	114.9	V / 1.4 / 81.8	0	114.9	125.2	-10.3
Antenna 2 Mid Channel								
Axis 1								
914.83	82.8 Pk	2.1 / 22.2 / 0.0	107.1	V / 1.6 / 0.0	0	107.1	125.2	-18.1
914.83	93.8 Pk	2.1 / 22.2 / 0.0	118.1	H / 1.0 / 306.6	0	118.1	125.2	-7.1
Axis 2								
914.83	89.5 Pk	2.1 / 22.2 / 0.0	113.8	H / 1.4 / 181.9	0	113.8	125.2	-11.4
914.83	91.5 Pk	2.1 / 22.2 / 0.0	115.8	V / 1.1 / 339.8	0	115.8	125.2	-9.4
Axis 3								
914.83	91.6 Pk	2.1 / 22.2 / 0.0	115.9	V / 1.3 / 79.7	0	115.9	125.2	-9.3
914.83	92.7 Pk	2.1 / 22.2 / 0.0	117	H / 1.6 / 7.1	0	117	125.2	-8.2

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FREQ	LEVEL	CABLE / ANT / PREAMP	FINAL	POL / HGT / AZ	Duty Cycle Correction	Final Corrected	Limit FCC 15.247	DELTA
(MHz)	(dBuV)	(dB) (dBm) (dB)	(dBuV)	(m) (DEG)	FCC 15.247	(dBuV)	(dBuV/m)	(dB)
Antenna 2 - High Channel								
Axis 1								
927.62	93.5 Pk	2.1 / 22.5 / 0.0	118.1	H / 1.0 / 308.6	0	118.1	125.2	-7.1
927.62	85.5 Pk	2.1 / 22.5 / 0.0	110.1	V / 1.7 / 218.4	0	110.1	125.2	-15.1
Axis 2								
927.62	90.3 Pk	2.1 / 22.5 / 0.0	114.9	V / 1.1 / 275.6	0	114.9	125.2	-10.3
927.62	89.8 Pk	2.1 / 22.5 / 0.0	114.4	H / 1.4 / 181.9	0	114.4	125.2	-10.8
Axis 3								
927.62	91.2 Pk	2.1 / 22.5 / 0.0	115.8	H / 1.5 / 186.6	0	115.8	125.2	-9.4
927.62	90.3 Pk	2.1 / 22.5 / 0.0	115	V / 1.2 / 71.7	0	115	125.2	-10.2
Antenna 2 – Low Channel, Axis 1 found to be worst for both Antennas								

Notes:

Worst case fundamental:

1. Antenna 1, Axis 1 - 119.3 dBuV/m (5.9 dB below the FCC 15.247 limit)
2. Antenna 2, Axis 1 - 118.8 dBuV/m (6.4 dB below the FCC 15.247 limit)

Example calculation:

Measured Level	+	Transducer, Cable Loss Pre-Amplifier	=	Corrected Reading	-	Duty Cycle Correction	=	FINAL Measurement	-	Specification Limit	=	Delta from Specification Limit
(dB μ V)		(dB)		(dB μ V/m)		(dB μ V/m)		(dB μ V/m)		(dB μ V/m)		
24.0		14.9		38.9		10.0		28.9		40.0		-11.1

Conversion of RF Port Output Power of the Fundamental Limit to Radiated Field Strength Limit

When limits are defined as conducted port power measurements and the product has an integral antenna, radiated field strength tests to demonstrate compliance are acceptable per FCC 15.247.

The following equation was used to convert RF Port Power (Watts) limit into a Radiated Field Strength (dBuV/m) limit:

$$P = \frac{(E*d)^2}{30G}$$

Therefore:

$$E = \frac{\sqrt{30PG}}{d}$$

Power Limit Fundamental Frequency = 250mW = 125.2 dBuV/m

Where:

E = Measured Field Strength in V/m (converted to dBuV/m in test data)

P = 250mW Fundamental Limit

G = Numeric Gain of transmitting antenna over an ideal isotropic radiator = 4 (unknown)

d = EUT-to-Antenna Test Distance = 3-meters

Harmonics of the Fundamental

Test Report #: 100608342 Run 1	Test Area: CC1 Radiated	Temperature: 22.1 °C
Test Method: FCC Part 15.209	Test Date: 11-Jan-2012	Relative Humidity: 21.1 %
EUT Model #: EN6080	EUT Power: Li-Ion Battery Pack, 11V	Air Pressure: 83.36 kPa
EUT Serial #: 90607221		

Manufacturer: Inovonics

EUT Description: Access Control Gateway

Notes: Cells highlighted in **Yellow** indicate measurement within FCC Restricted Bands

Testing < 1GHz, Peak detector, RBW 100kHz, VBW 300kHz

Testing > 1GHz, Peak detector, RBW 1MHz, VBW 1MHz

Level Key	
Pk – Peak	Nb – Narrow Band
Qp – QuasiPeak	Bb – Broad Band
Av - Average	

FREQ	LEVEL	CABLE / ANT / PREAMP	FINAL	POL / HGT / AZ	Duty Cycle Correction	Final Corrected	Limit FCC 15.247	DELTA
(MHz)	(dBuV)	(dB) (dBm) (dB)	(dBuV)	(m) (DEG)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
Antenna 1 - Harmonics								
All Axis 1								
Low Channel								
1804.84	66.6 Pk	3.0 / 27.3 / 36.2	60.7	V / 3.5 / 108.8	13.68	47.0	98.8	-51.8
1804.84	66.2 Pk	3.0 / 27.3 / 36.2	60.4	H / 1.0 / 35.8	13.68	46.7	98.8	-52.1
2707.26	54.3 Pk	3.8 / 29.3 / 36.9	50.5	H / 2.9 / 57.0	13.68	36.8	54	-17.2
2707.26	51.4 Pk	3.8 / 29.3 / 36.9	47.6	V / 1.1 / 288.8	13.68	33.9	54	-20.1
3609.68	57.9 Pk	4.4 / 32.0 / 37.3	57	V / 2.1 / 265.3	13.68	43.3	54	-10.7
3609.68	56.9 Pk	4.4 / 32.0 / 37.3	56	H / 2.5 / 278.7	13.68	42.3	54	-11.7
4512.1	44.2 Pk	5.0 / 32.8 / 39.8	42.2	H / 1.3 / 269.0	13.68	28.5	54	-25.5
4512.1	45.3 Pk	5.0 / 32.8 / 39.8	43.3	V / 1.2 / 265.5	13.68	29.6	54	-24.4
5414.52	44.5 Pk	5.5 / 34.6 / 38.5	46.1	V / 2.0 / 266.6	13.68	32.4	54	-21.6
5414.52	40.9 Pk	5.5 / 34.6 / 38.5	42.5	H / 1.1 / 265.3	13.68	28.8	54	-25.2
6316.94	37.0 Pk	5.9 / 35.0 / 39.8	38.2	H / 1.0 / 0.0	13.68	24.5	98.8	-74.3
6316.94	32.7 Pk	5.9 / 35.0 / 39.8	33.8	V / 1.0 / 0.0	13.68	20.1	98.8	-78.7
7219.36	33.2 Pk	6.4 / 36.4 / 39.5	36.6	V / 1.0 / 0.0	13.68	22.9	98.8	-75.9
7219.36	32.3 Pk	6.4 / 36.4 / 39.5	35.6	H / 1.0 / 0.0	13.68	21.9	98.8	-76.9
8121.78	40.8 Pk	6.9 / 36.9 / 46.9	37.7	H / 1.0 / 0.0	13.68	24.0	54	-30.0
8121.78	37.2 Pk	6.9 / 36.9 / 46.9	34.2	V / 1.0 / 0.0	13.68	20.5	54	-33.5
9024.2	40.1 Pk	7.3 / 37.3 / 47.9	36.8	V / 1.0 / 0.0	13.68	23.1	54	-30.9
9024.2	39.3 Pk	7.3 / 37.3 / 47.9	36	H / 1.0 / 0.0	13.68	22.3	54	-31.7
Mid Channel								
1829.56	61.6 Pk	3.0 / 27.4 / 36.2	55.8	H / 1.8 / 56.1	13.68	42.1	97.3	-55.2
1829.56	57.5 Pk	3.0 / 27.4 / 36.2	51.7	V / 3.4 / 299.0	13.68	38.0	97.3	-59.3
2744.34	56.7 Pk	3.8 / 29.4 / 36.8	53	V / 1.7 / 287.2	13.68	39.3	54	-14.7
2744.34	53.3 Pk	3.8 / 29.4 / 36.8	49.6	H / 3.9 / 23.9	13.68	35.9	54	-18.1
3659.12	54.8 Pk	4.4 / 32.1 / 37.4	53.9	H / 1.4 / 0.0	13.68	40.2	54	-13.8
3659.12	53.4 Pk	4.4 / 32.1 / 37.4	52.5	V / 2.5 / 102.9	13.68	38.8	54	-15.2
4573.9	42.0 Pk	5.0 / 32.7 / 38.8	41	V / 2.3 / 159.8	13.68	27.3	54	-26.7
4573.9	41.7 Pk	5.0 / 32.7 / 38.8	40.7	H / 2.1 / 76.9	13.68	27.0	54	-27.0
5488.68	34.9 Pk	5.5 / 34.6 / 37.0	38	H / 1.1 / 290.8	13.68	24.3	97.3	-73.0
5488.68	37.9 Pk	5.5 / 34.6 / 37.0	41	V / 3.1 / 126.2	13.68	27.3	97.3	-70.0
6403.46	37.7 Pk	6.0 / 35.0 / 40.0	38.6	V / 1.3 / 171.9	13.68	24.9	97.3	-72.4

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FREQ	LEVEL	CABLE / ANT / PREAMP	FINAL	POL / HGT / AZ	Duty Cycle Correction	Final Corrected	Limit FCC 15.247	DELTA
(MHz)	(dBuV)	(dB) (dBm) (dB)	(dBuV)	(m) (DEG)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
6403.46	37.6 Pk	6.0 / 35.0 / 40.0	38.5	H / 1.0 / 0.0	13.68	24.8	97.3	-72.5
7318.24	35.5 Pk	6.5 / 36.7 / 39.2	39.5	H / 1.0 / 0.0	13.68	25.8	54	-28.2
7318.24	33.3 Pk	6.5 / 36.7 / 39.2	37.3	V / 1.0 / 0.0	13.68	23.6	54	-30.4
8233.02	40.8 Pk	6.9 / 36.9 / 47.0	37.7	V / 1.0 / 0.0	13.68	24.0	54	-30.0
8233.02	40.7 Pk	6.9 / 36.9 / 47.0	37.6	H / 1.0 / 0.0	13.68	23.9	54	-30.1
9147.8	41.1 Pk	7.4 / 37.3 / 48.1	37.7	H / 1.0 / 0.0	13.68	24.0	54	-30.0
9147.8	42.8 Pk	7.4 / 37.3 / 48.1	39.4	V / 1.0 / 0.0	13.68	25.7	54	-28.3
High Channel								
1855.28	52.9 Pk	3.1 / 27.5 / 36.3	47.2	V / 3.5 / 198.2	13.68	33.5	96.1	-62.6
1855.28	55.9 Pk	3.1 / 27.5 / 36.3	50.2	H / 3.1 / 78.4	13.68	36.5	96.1	-59.6
2782.87	58.6 Pk	3.8 / 29.4 / 36.9	55	H / 1.1 / 278.5	13.68	41.3	54	-12.7
2782.87	60.1 Pk	3.8 / 29.4 / 36.9	56.5	V / 2.4 / 197.6	13.68	42.8	54	-11.2
3710.46	50.9 Pk	4.5 / 32.2 / 37.4	50.2	V / 2.0 / 106.4	13.68	36.5	54	-17.5
3710.46	52.6 Pk	4.5 / 32.2 / 37.4	51.9	H / 2.5 / 0.0	13.68	38.2	54	-15.8
4637.95	44.7 Pk	5.1 / 32.9 / 39.4	43.2	H / 1.0 / 62.8	13.68	29.5	54	-24.5
4637.95	43.3 Pk	5.1 / 32.9 / 39.4	41.8	V / 2.6 / 308.2	13.68	28.1	54	-25.9
5565.54	38.8 Pk	5.6 / 34.5 / 38.7	40.2	V / 3.0 / 80.0	13.68	26.5	96.1	-69.6
5565.54	35.0 Pk	5.6 / 34.5 / 38.7	36.4	H / 1.8 / 42.9	13.68	22.7	96.1	-73.4
6493.13	32.2 Pk	6.0 / 34.9 / 40.0	33.2	H / 1.0 / 0.0	13.68	19.5	96.1	-76.6
6493.13	33.6 Pk	6.0 / 34.9 / 40.0	34.6	V / 1.0 / 0.0	13.68	20.9	96.1	-75.2
7420.72	35.8 Pk	6.5 / 36.8 / 39.2	39.9	V / 1.0 / 0.0	13.68	26.2	54	-27.8
7420.72	36.0 Pk	6.5 / 36.8 / 39.2	40.1	H / 1.0 / 0.0	13.68	26.4	54	-27.6
8348.31	43.0 Pk	7.0 / 37.0 / 47.1	40	H / 1.0 / 0.0	13.68	26.3	54	-27.7
8348.31	41.4 Pk	7.0 / 37.0 / 47.1	38.4	V / 1.0 / 0.0	13.68	24.7	54	-29.3
9275.91	43.8 Pk	7.5 / 37.4 / 48.2	40.4	V / 1.0 / 0.0	13.68	26.7	96.1	-69.4
9275.91	43.1 Pk	7.5 / 37.4 / 48.2	39.8	H / 1.0 / 0.0	13.68	26.1	96.1	-70.0
Antenna 2 - Harmonics								
Axis 1								
Low Channel								
1804.85	66.2 Pk	3.0 / 27.3 / 36.2	60.4	H / 2.5 / 0.0	13.68	46.7	99.3	-52.6
1804.85	61.1 Pk	3.0 / 27.3 / 36.2	55.2	V / 3.4 / 311.6	13.68	41.5	99.3	-57.8
2707.27	50.2 Pk	3.8 / 29.3 / 36.9	46.5	V / 2.3 / 175.9	13.68	32.8	54	-21.2
2707.27	46.8 Pk	3.8 / 29.3 / 36.9	43	H / 3.1 / 96.9	13.68	29.3	54	-24.7
3609.69	53.5 Pk	4.4 / 32.0 / 37.3	52.7	H / 1.7 / 46.5	13.68	39.0	54	-15.0
3609.69	52.5 Pk	4.4 / 32.0 / 37.3	51.6	V / 1.9 / 180.1	13.68	37.9	54	-16.1
4512.11	47.2 Pk	5.0 / 32.8 / 39.8	45.2	V / 2.3 / 69.3	13.68	31.5	54	-22.5
4512.11	44.5 Pk	5.0 / 32.8 / 39.8	42.5	H / 2.0 / 71.3	13.68	28.8	54	-25.2
5414.53	37.0 Pk	5.5 / 34.6 / 38.5	38.7	H / 1.2 / 56.5	13.68	25.0	54	-29.0
5414.53	39.6 Pk	5.5 / 34.6 / 38.5	41.2	V / 1.2 / 154.3	13.68	27.5	54	-26.5
6316.95	35.6 Pk	5.9 / 35.0 / 39.8	36.8	V / 1.0 / 0.0	13.68	23.1	99.3	-76.2
6316.95	33.9 Pk	5.9 / 35.0 / 39.8	35	H / 1.0 / 0.0	13.68	21.3	99.3	-78.0
7219.37	34.5 Pk	6.4 / 36.4 / 39.5	37.8	H / 1.0 / 0.0	13.68	24.1	99.3	-75.2
7219.37	32.4 Pk	6.4 / 36.4 / 39.5	35.7	V / 1.0 / 0.0	13.68	22.0	99.3	-77.3
8121.79	41.0 Pk	6.9 / 36.9 / 46.9	37.9	V / 1.0 / 0.0	13.68	24.2	54	-29.8
8121.79	37.4 Pk	6.9 / 36.9 / 46.9	34.4	H / 1.0 / 0.0	13.68	20.7	54	-33.3
9024.21	42.0 Pk	7.3 / 37.3 / 47.9	38.7	H / 1.0 / 0.0	13.68	25.0	54	-29.0

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FREQ	LEVEL	CABLE / ANT / PREAMP	FINAL	POL / HGT / AZ	Duty Cycle Correction	Final Corrected	Limit FCC 15.247	DELTA
(MHz)	(dBuV)	(dB) (dBm) (dB)	(dBuV)	(m) (DEG)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
9024.21	40.1 Pk	7.3 / 37.3 / 47.9	36.8	V / 1.0 / 0.0	13.68	23.1	54	-30.9
Mid Channel								
1829.61	65.0 Pk	3.0 / 27.4 / 36.2	59.2	V / 2.4 / 276.2	13.68	45.5	98.1	-52.6
1829.61	69.8 Pk	3.0 / 27.4 / 36.2	64.1	H / 2.4 / 333.1	13.68	50.4	98.1	-47.7
2744.41	50.3 Pk	3.8 / 29.4 / 36.8	46.6	H / 1.6 / 153.7	13.68	32.9	54	-21.1
2744.41	48.2 Pk	3.8 / 29.4 / 36.8	44.5	V / 2.3 / 180.2	13.68	30.8	54	-23.2
3659.22	53.6 Pk	4.4 / 32.1 / 37.4	52.7	V / 2.4 / 146.0	13.68	39.0	54	-15.0
3659.22	50.6 Pk	4.4 / 32.1 / 37.4	49.7	H / 2.1 / 198.9	13.68	36.0	54	-18.0
4574.02	45.7 Pk	5.0 / 32.7 / 39.6	43.9	H / 2.2 / 76.7	13.68	30.2	54	-23.8
4574.02	46.5 Pk	5.0 / 32.7 / 39.6	44.7	V / 1.4 / 85.0	13.68	31.0	54	-23.0
5488.83	37.7 Pk	5.5 / 34.6 / 38.6	39.2	V / 1.2 / 159.6	13.68	25.5	98.1	-72.6
5488.83	38.4 Pk	5.5 / 34.6 / 38.6	39.9	H / 2.0 / 143.4	13.68	26.2	98.1	-71.9
6403.64	38.2 Pk	6.0 / 35.0 / 40.0	39.1	H / 1.0 / 0.0	13.68	25.4	98.1	-72.7
6403.64	37.1 Pk	6.0 / 35.0 / 40.0	38	V / 1.0 / 0.0	13.68	24.3	98.1	-73.8
7318.44	38.7 Pk	6.5 / 36.7 / 39.2	42.7	V / 1.5 / 285.2	13.68	29.0	54	-25.0
7318.44	37.5 Pk	6.5 / 36.7 / 39.2	41.5	H / 1.5 / 285.2	13.68	27.8	54	-26.2
8233.25	40.4 Pk	6.9 / 36.9 / 47.0	37.3	H / 1.0 / 0.0	13.68	23.6	54	-30.4
8233.25	38.9 Pk	6.9 / 36.9 / 47.0	35.8	V / 1.0 / 0.0	13.68	22.1	54	-31.9
9148.05	39.5 Pk	7.4 / 37.3 / 48.1	36.1	V / 1.0 / 0.0	13.68	22.4	54	-31.6
9148.05	42.8 Pk	7.4 / 37.3 / 48.1	39.4	H / 1.0 / 0.0	13.68	25.7	54	-28.3
High Channel								
1855.24	71.8 Pk	3.1 / 27.5 / 36.3	66.1	H / 2.5 / 320.0	13.68	52.4	98.1	-45.7
1855.24	70.8 Pk	3.1 / 27.5 / 36.3	65.1	V / 3.3 / 264.4	13.68	51.4	98.1	-46.7
2782.88	50.9 Pk	3.8 / 29.4 / 36.9	47.3	V / 1.0 / 101.6	13.68	33.6	54	-20.4
2782.88	50.5 Pk	3.8 / 29.4 / 36.9	46.9	H / 3.0 / 115.3	13.68	33.2	54	-20.8
3710.52	47.5 Pk	4.5 / 32.2 / 37.4	46.8	H / 2.4 / 110.2	13.68	33.1	54	-20.9
3710.52	52.5 Pk	4.5 / 32.2 / 37.4	51.8	V / 2.4 / 157.7	13.68	38.1	54	-15.9
4638.16	49.5 Qp	5.1 / 32.9 / 39.4	48.1	V / 2.1 / 153.3	13.68	34.4	54	-19.6
4638.16	47.3 Pk	5.1 / 32.9 / 39.4	45.8	H / 3.1 / 47.4	13.68	32.1	54	-21.9
5565.8	33.4 Pk	5.6 / 34.5 / 38.7	34.8	H / 1.0 / 0.0	13.68	21.1	98.1	-77.0
5565.8	36.0 Pk	5.6 / 34.5 / 38.7	37.4	V / 1.6 / 132.3	13.68	23.7	98.1	-74.4
6493.44	37.9 Pk	6.0 / 34.9 / 40.0	38.9	V / 1.0 / 0.0	13.68	25.2	98.1	-72.9
6493.44	34.8 Pk	6.0 / 34.9 / 40.0	35.8	H / 1.0 / 0.0	13.68	22.1	98.1	-76.0
7421.08	34.2 Pk	6.5 / 36.8 / 39.2	38.3	H / 1.0 / 0.0	13.68	24.6	54	-29.4
7421.08	35.8 Pk	6.5 / 36.8 / 39.2	39.9	V / 1.0 / 0.0	13.68	26.2	54	-27.8
8348.72	39.4 Pk	7.0 / 37.0 / 47.1	36.4	V / 1.0 / 0.0	13.68	22.7	54	-31.3
8348.72	41.6 Pk	7.0 / 37.0 / 47.1	38.6	H / 1.0 / 0.0	13.68	24.9	54	-29.1
9276.36	45.3 Pk	7.5 / 37.4 / 48.2	42	H / 1.0 / 0.0	13.68	28.3	98.1	-69.8
9276.36	44.8 Pk	7.5 / 37.4 / 48.2	41.4	V / 1.0 / 0.0	13.68	27.7	98.1	-70.4

Notes:

1. All harmonic measurements made with a RBW=1MHz and VBW=3MHz.
2. All above measurements are Radiated Field Strength measurements.
3. All measurements taken using a peak detector.

Antenna 1:

1. Worst-Case Harmonic in an FCC Restricted Band – Low Channel @ 3609.68 MHz, 43.3 dBuV/m (10.7 dB below Limit). This signal was within the FCC Restricted Band, where the limit is 54dBuV/m.
2. Worst-Case Harmonic outside the FCC Restricted Band – Low Channel @ 1804.84 MHz, 47.0 dBuV/m (- 51.8 dBc). The specification is -20 dBc.

Antenna 2:

1. Worst-Case Harmonic in an FCC Restricted Band – Low Channel @ 3609.69 MHz, 39.0 dBuV/m (15.0 dB below Limit). This signal was within the FCC Restricted Band, where the limit is 54dBuV/m.
2. Worst-Case Harmonic outside the FCC Restricted Band – Mid Channel @ 1829.61 MHz, 50.4 dBuV/m (- 47.7 dBc). The specification is -20 dBc.

Deviations, Additions, or Exclusions: None

6 Radiated Emissions – Unintentional and Spurious of the Transmitter

6.1 Method

The test methods used comply with ANSI C63.10. Unless otherwise stated no deviations were made from **FCC 15.247 & IC RSS-210.**

This testing was performed at Intertek Louisville, located at 1795 Dogwood Street, Louisville, CO 80027.

6.2 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>
18913	Spectrum Analyzer	Hewlett-Packard	E7405A	My44211889	06/28/2011	06/28/2012
18897	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
19937	Bilog Antenna 30MHz - 6GHz	Sunol Sciences	JB6	A050707-2	01/31/2011	01/31/2012
18886	Ridged Guide Antenna 1-18GHz	TENSOR	4105	2020	11/16/2011	11/16/2012
18900	RF Pre-Amplifier (4-8 GHz)	Avantek	AFT97-8434-10F	1007	06/03/2011	06/03/2012
18906	Amplifier (1-4 GHz)	Mini-Circuits Lab	ZHL-42	N052792-2	06/03/2011	06/03/2012
18912	9 kHz- 1.3GHz Pre Amp	Hewlett-Packard	8447F	3113A05545	06/03/2011	06/03/2012
18901	RF Pre-Amplifier (8-18 GHz)	Avantek	AWT-18037	1002	06/03/2011	06/03/2012
SW-6	Software for Radiated and Conducted emissions.	Intertek	OATS cvi	V. 1.0	VBU	VBU

6.3 Results:

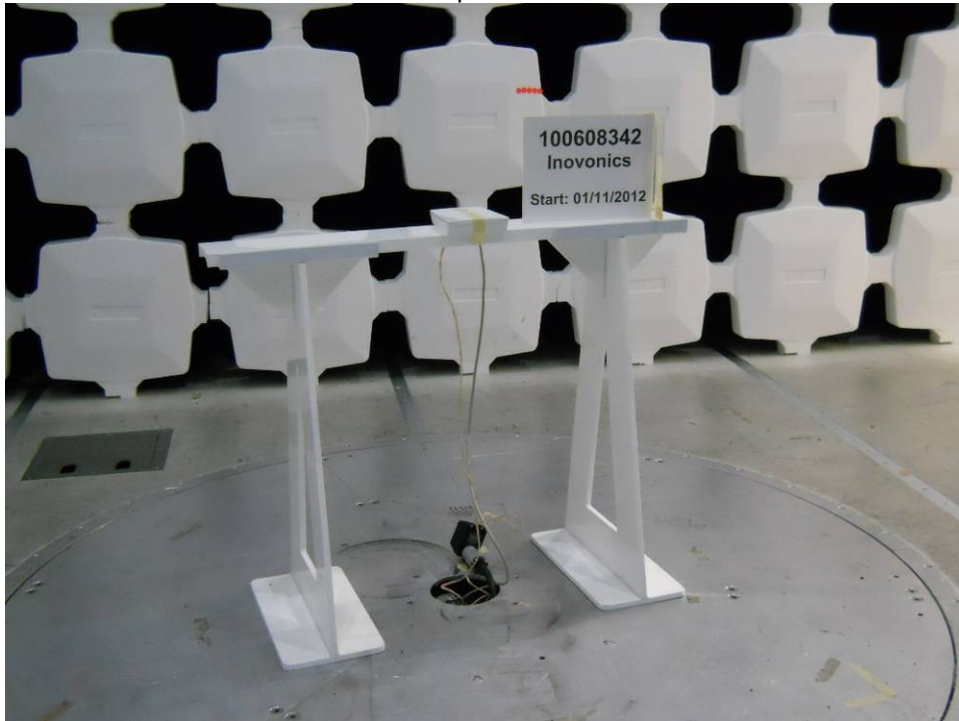
The sample tested was found to Comply.

6.4 Setup Photographs:

Test setup – Front View

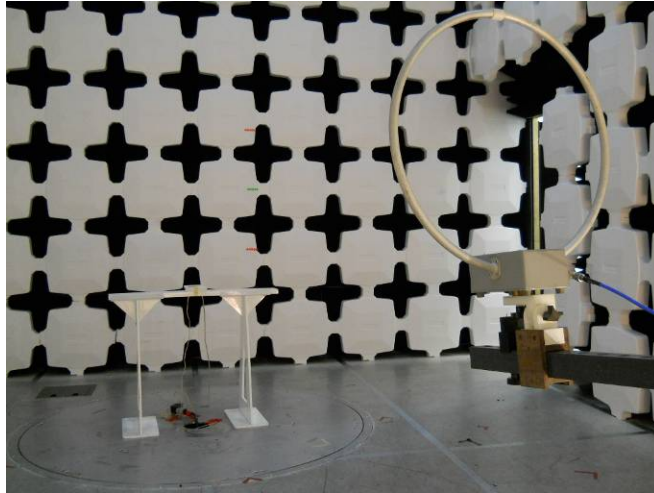


Test setup – Rear View

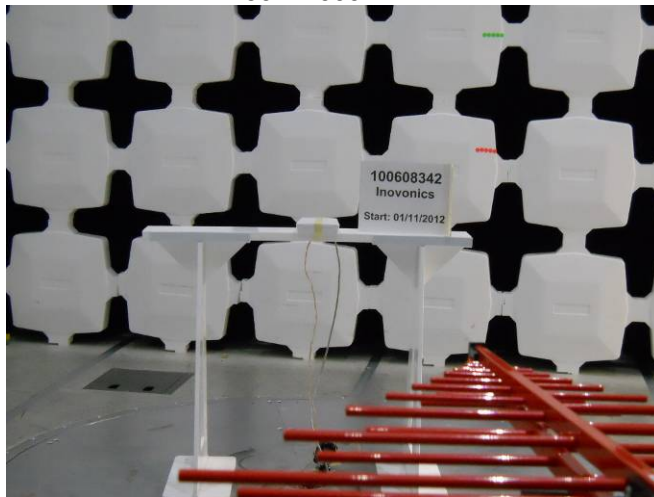


**Photo:
Antenna Setups**

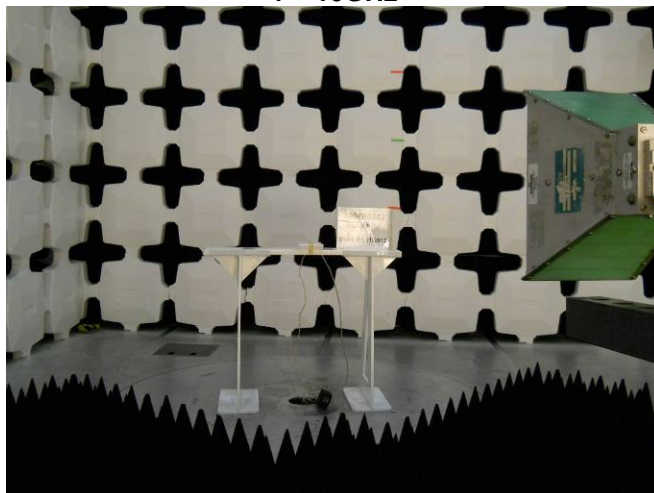
10kHz – 30MHz



30 – 1000 MHz



1 – 10GHz

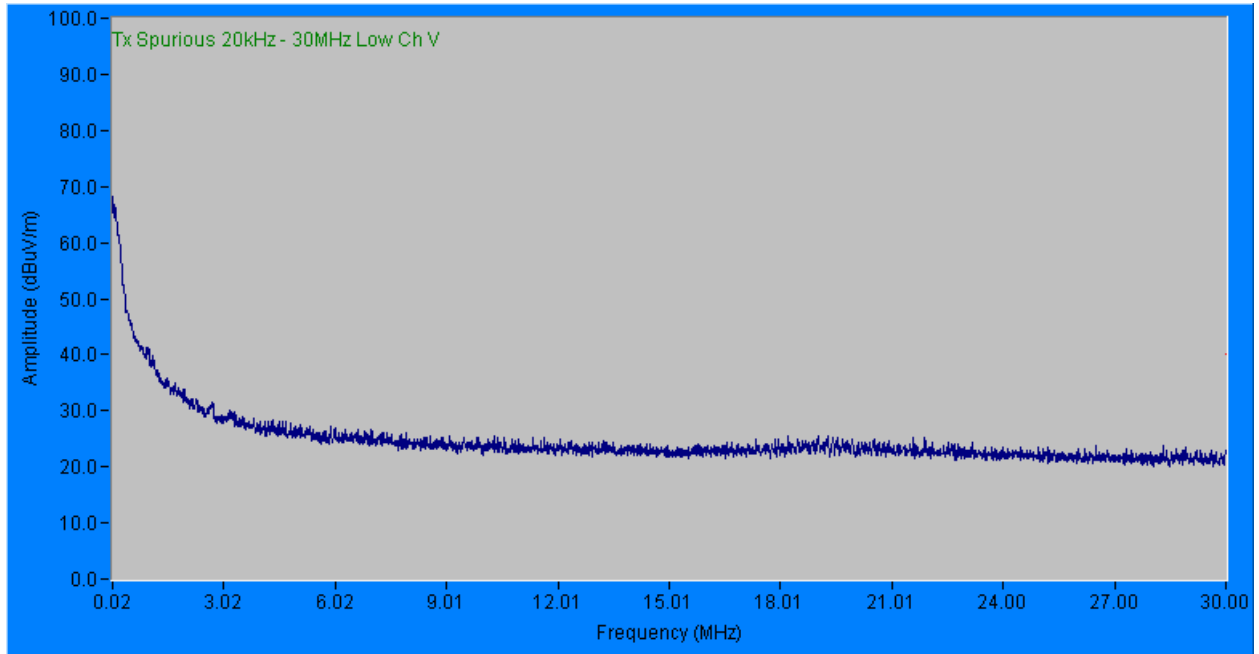


6.5 Plots - Tx Spurious:

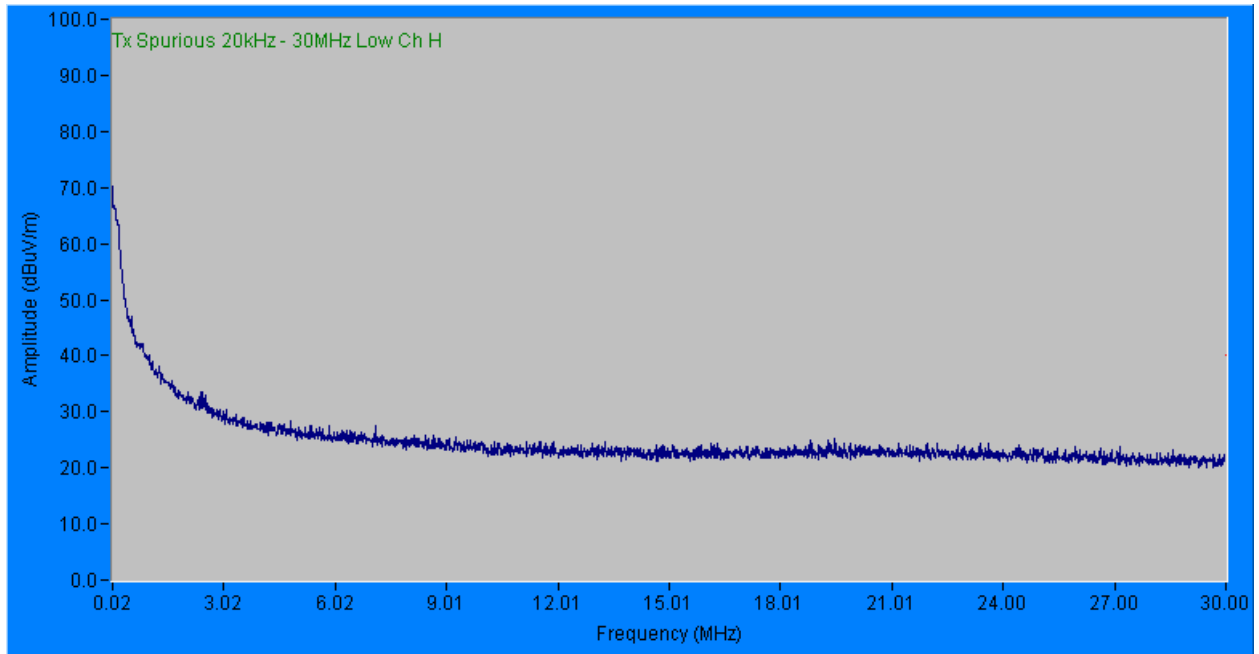
Low Channel

10kHz – 30MHz

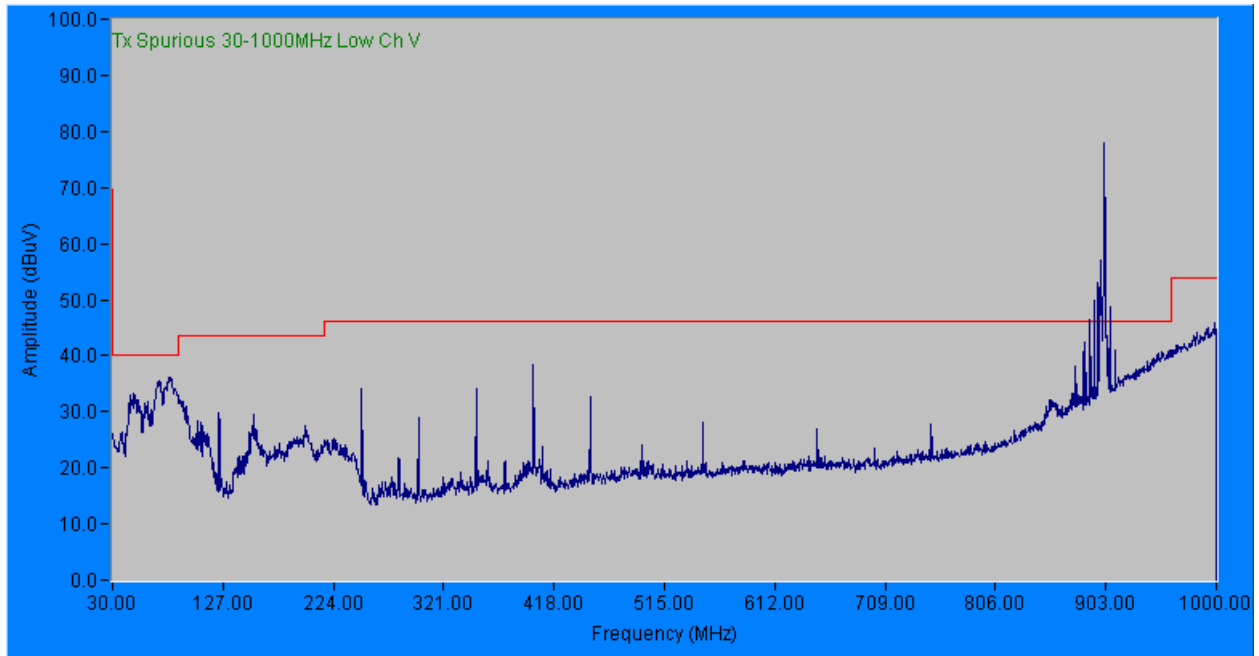
Vertical Polarization



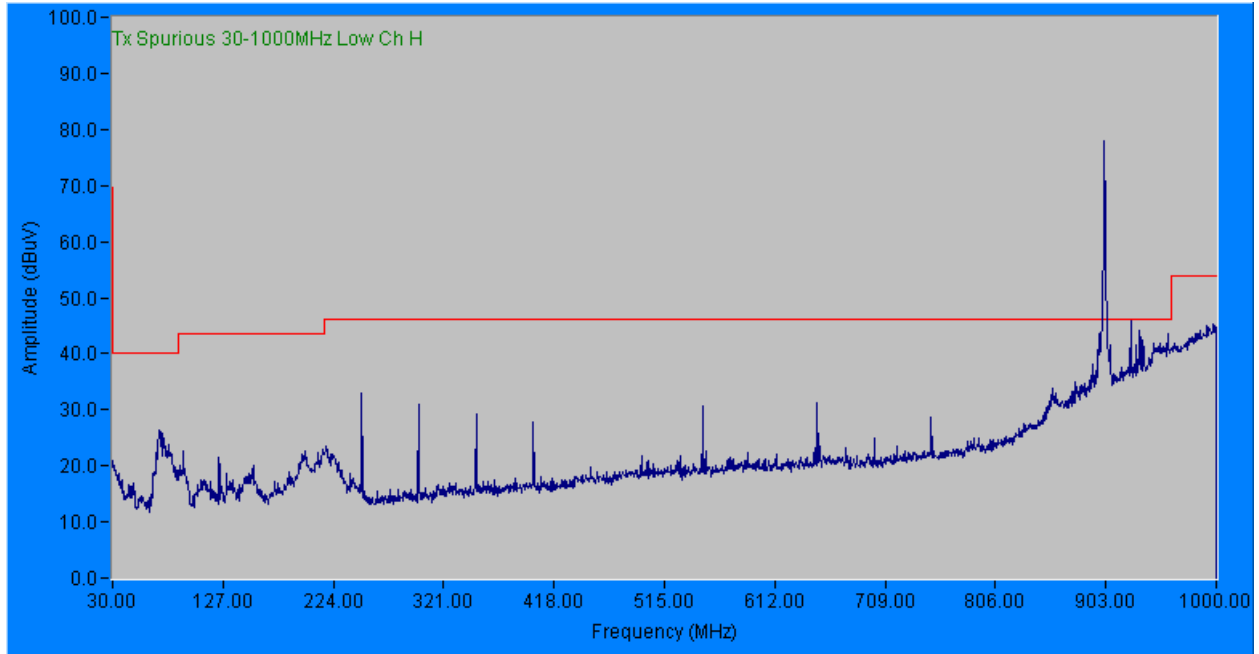
Horizontal Polarization



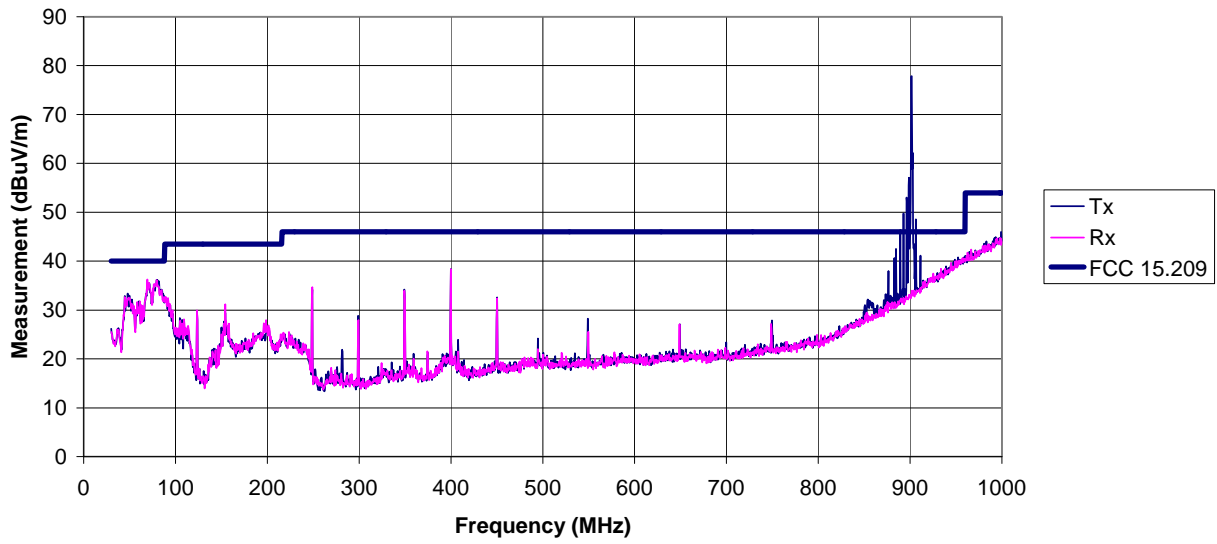
**Low Channel 30MHz – 1GHz
Vertical Polarization**



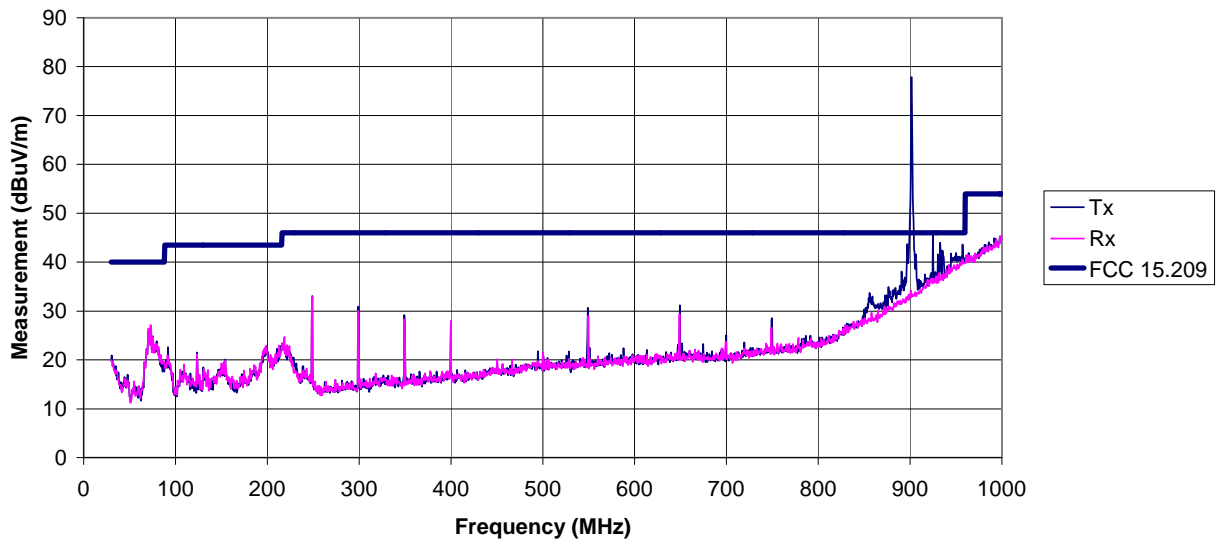
Horizontal Polarization



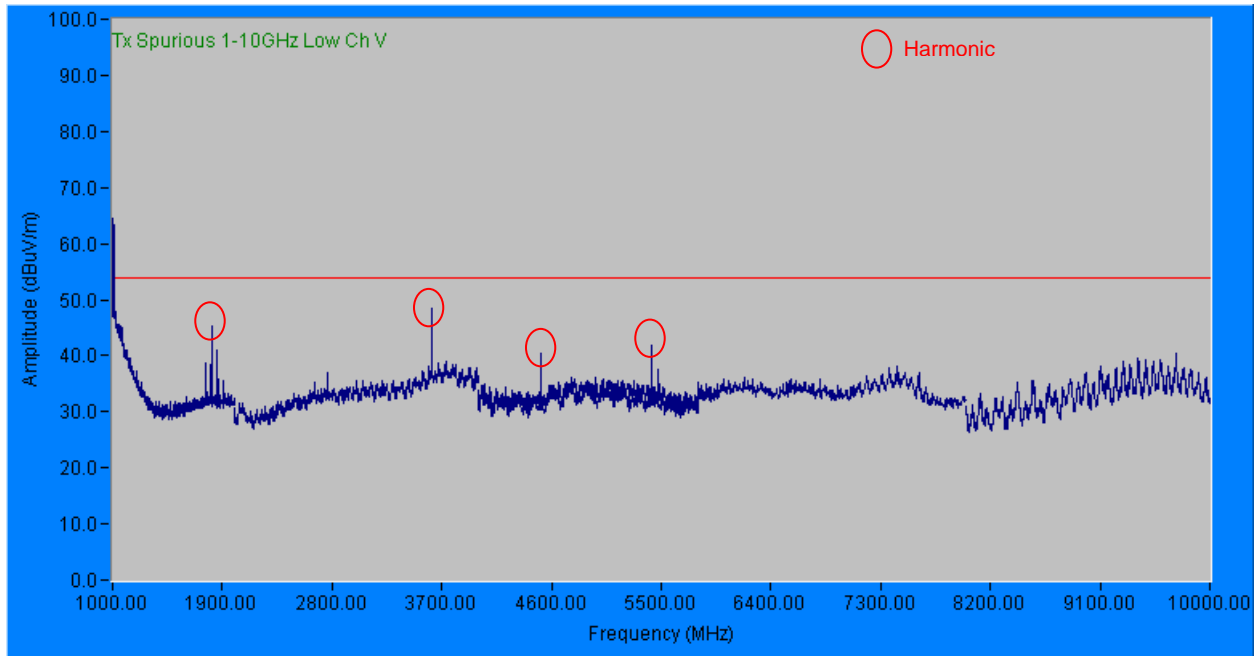
Low Channel 30-1000 MHz Comparison with Receiver Spurious Vertical



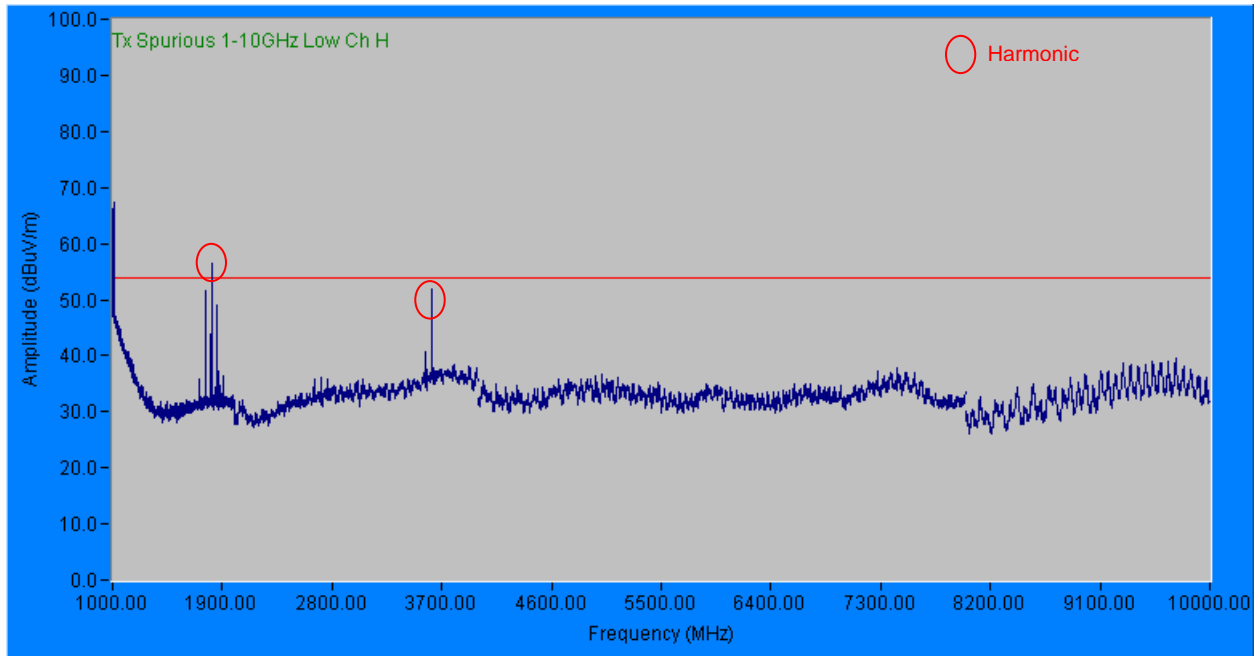
Horizontal



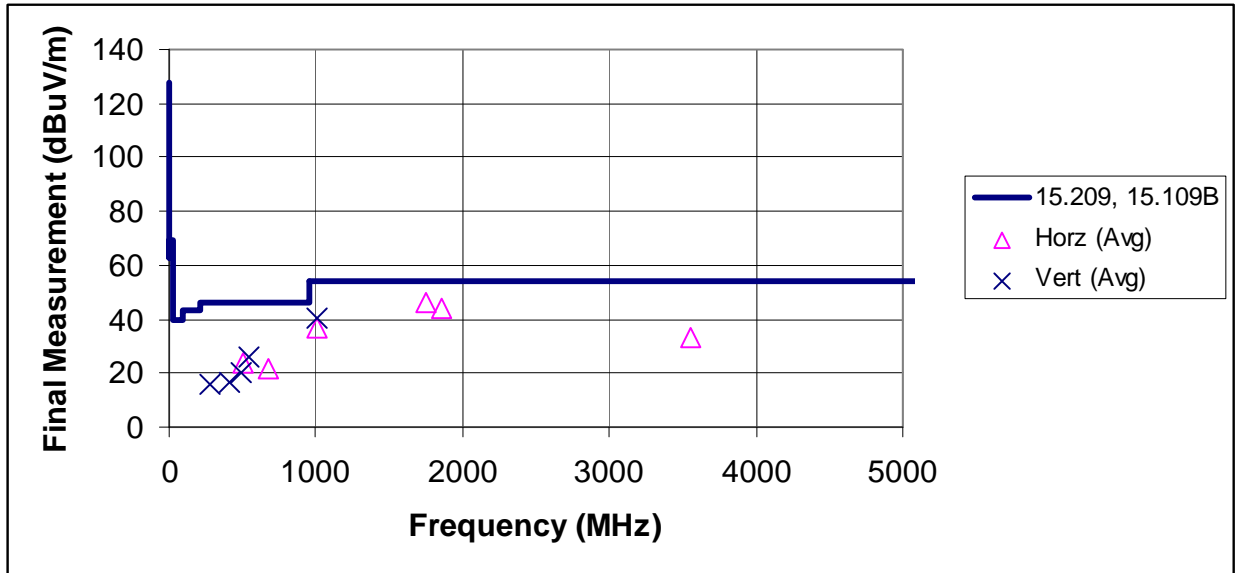
**Low Channel 1GHz – 10GHz
Vertical Polarization**



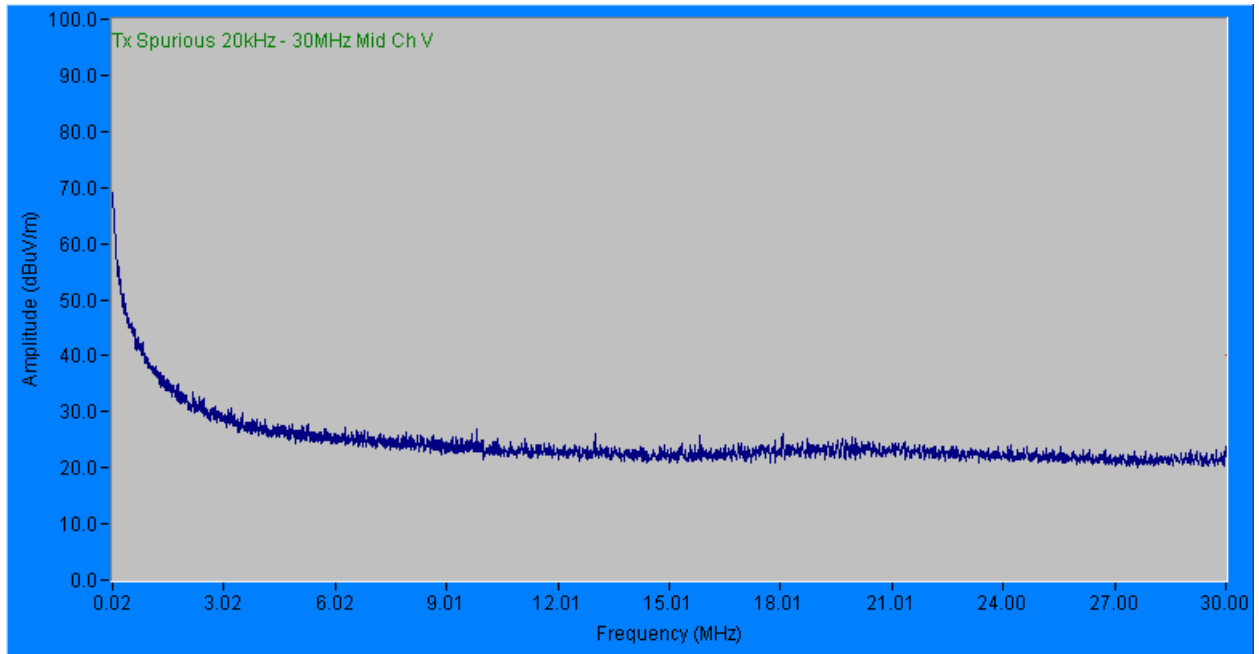
Horizontal Polarization



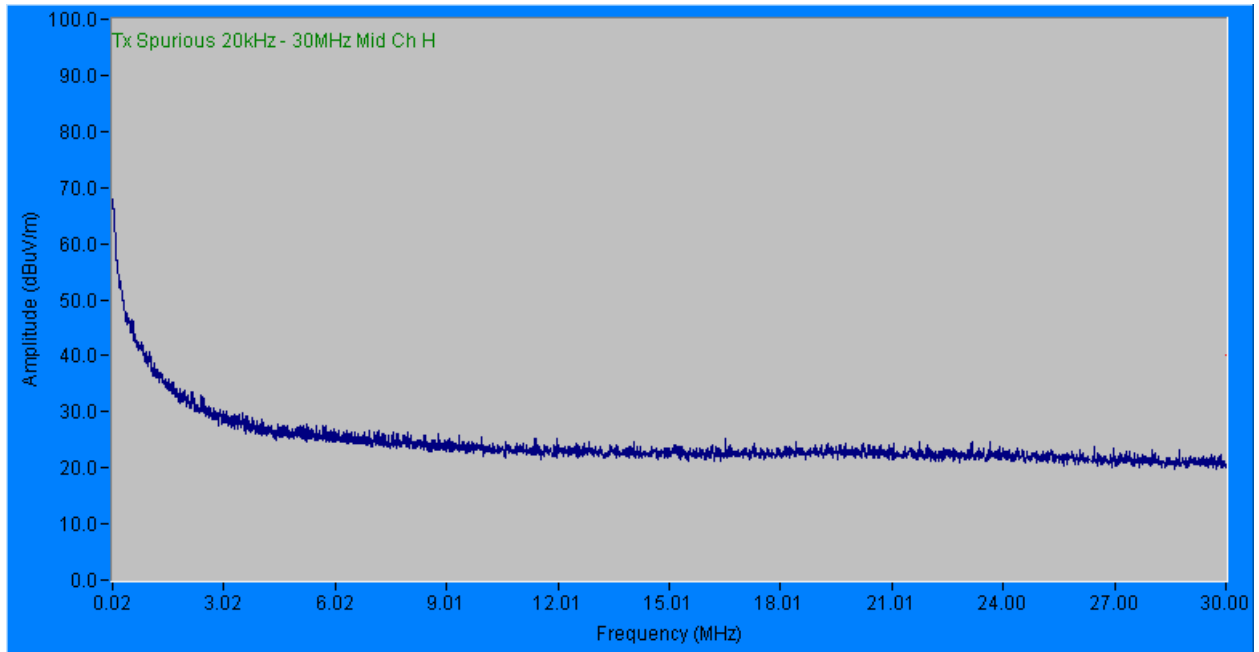
Low Channel; Tx Spurious Final Measurements – Only measurements that were distinct from the Receiver Spurious measurements were taken.



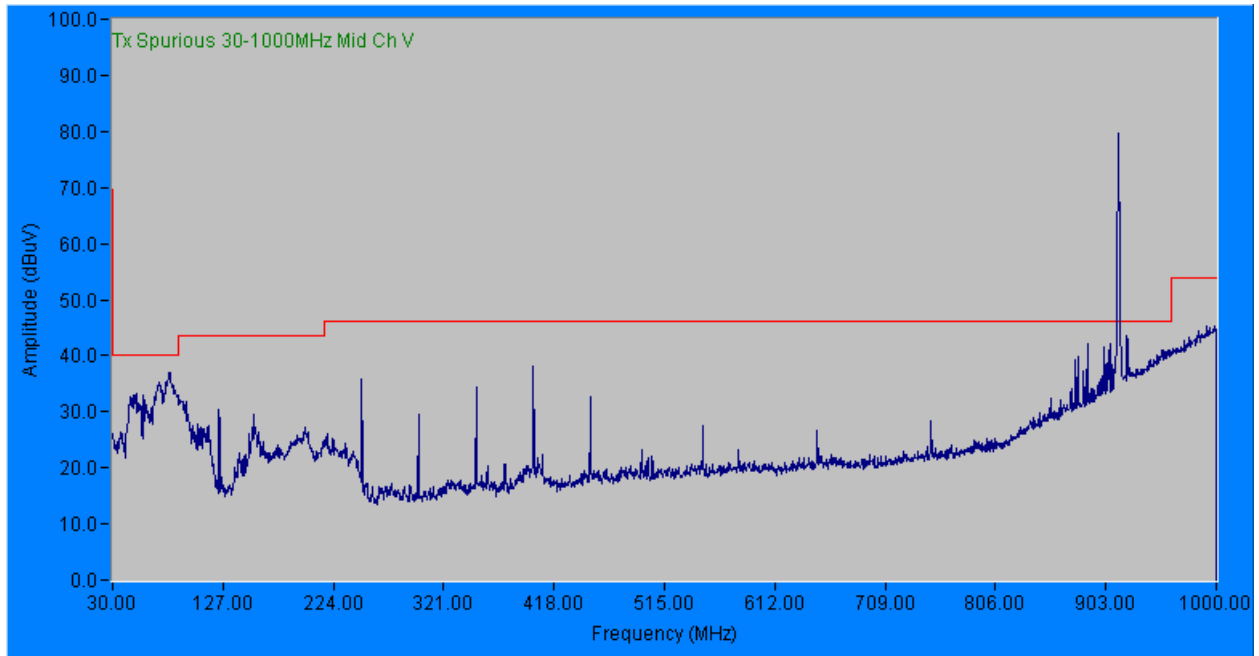
Mid Channel
10kHz – 30MHz
Vertical Polarization



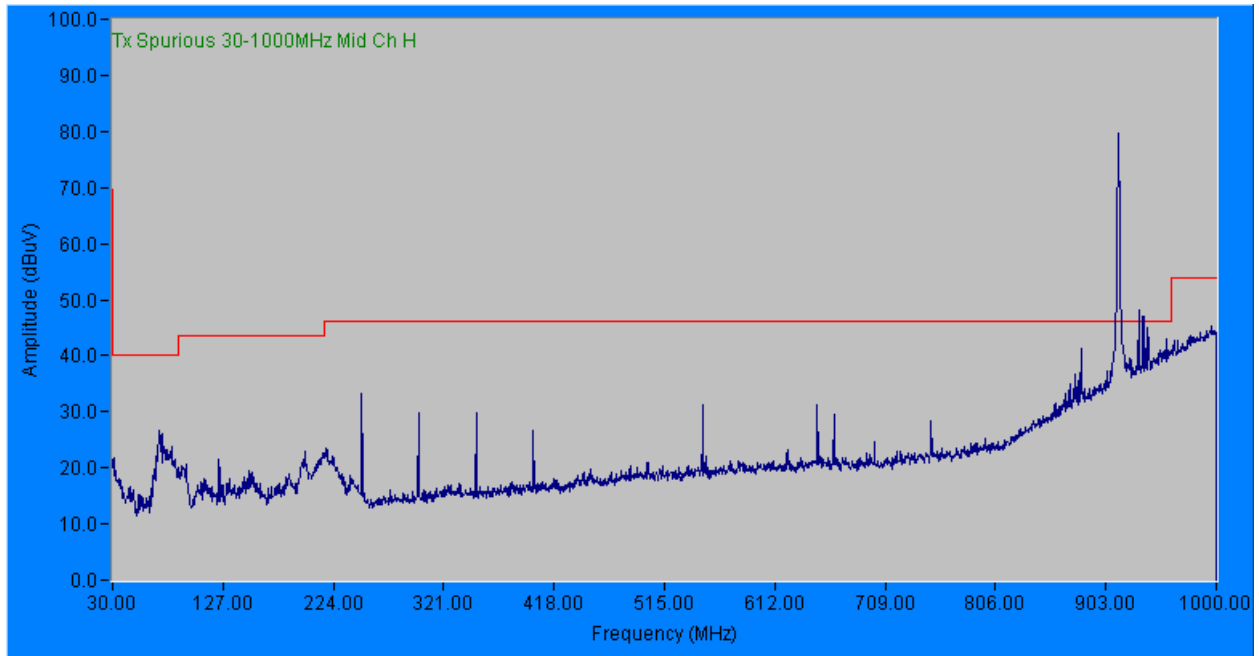
Horizontal Polarization



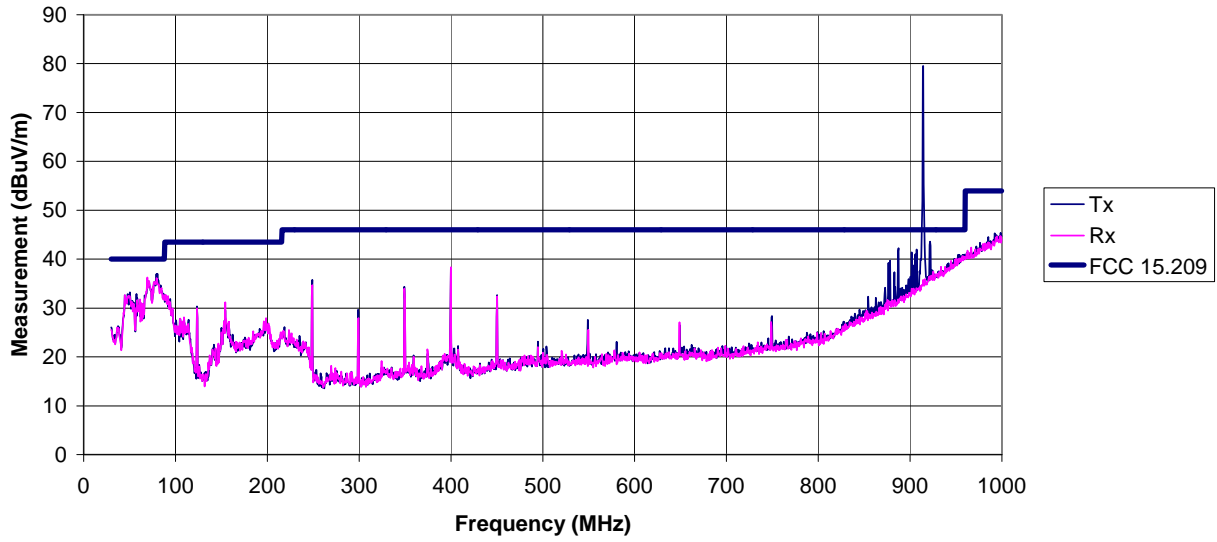
**Mid Channel 30MHz – 1GHz
Vertical Polarization**



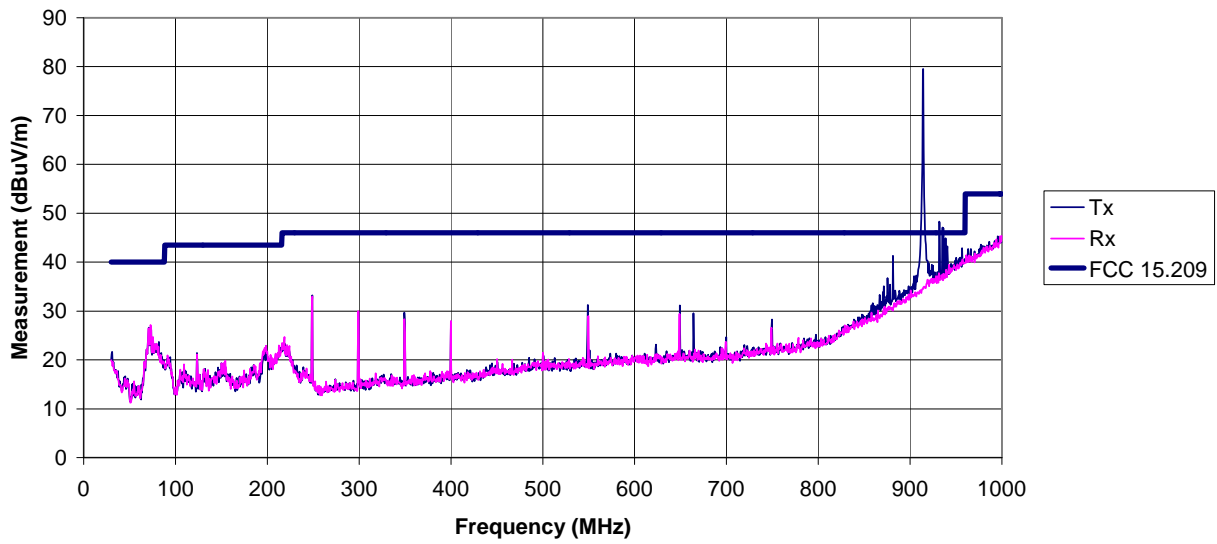
Horizontal Polarization



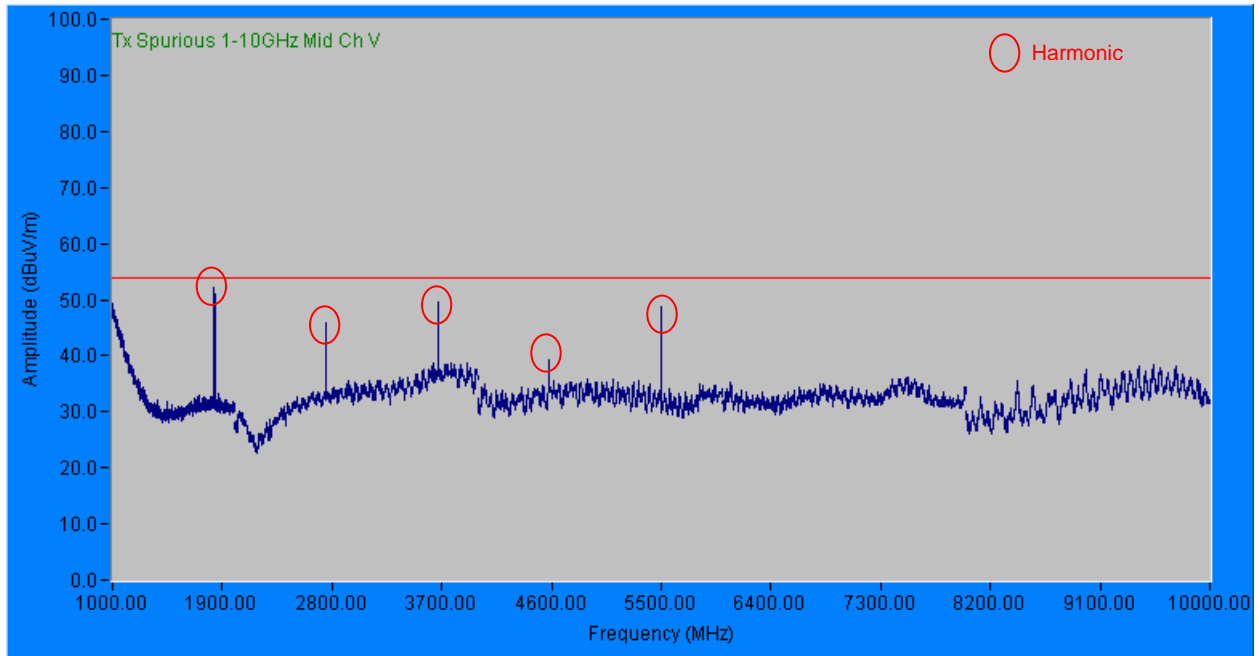
Mid Channel 30-1000 MHz Comparison with Receiver Spurious Vertical



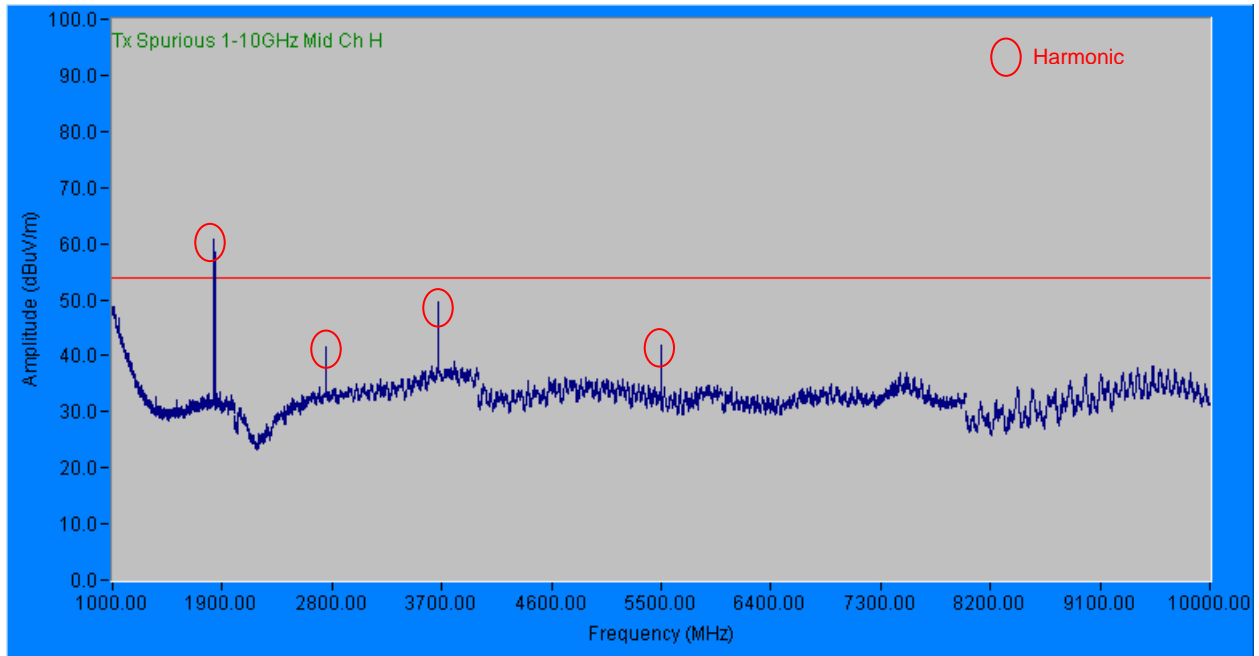
Horizontal



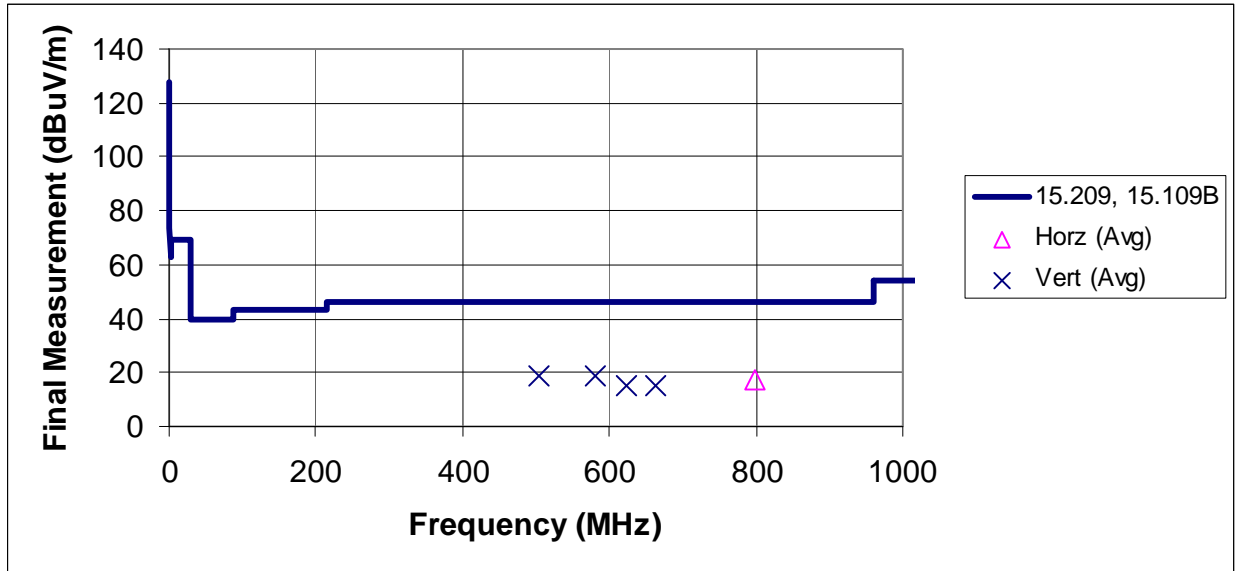
**Mid Channel 1GHz – 10GHz
Vertical Polarization**



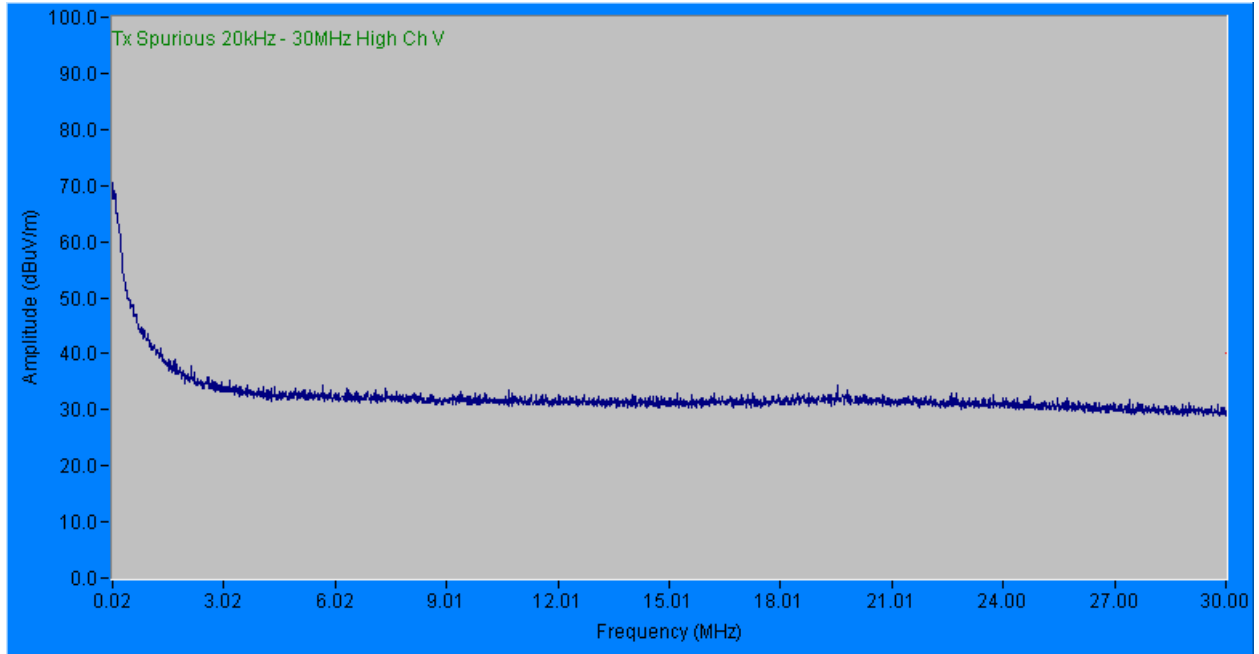
Horizontal Polarization



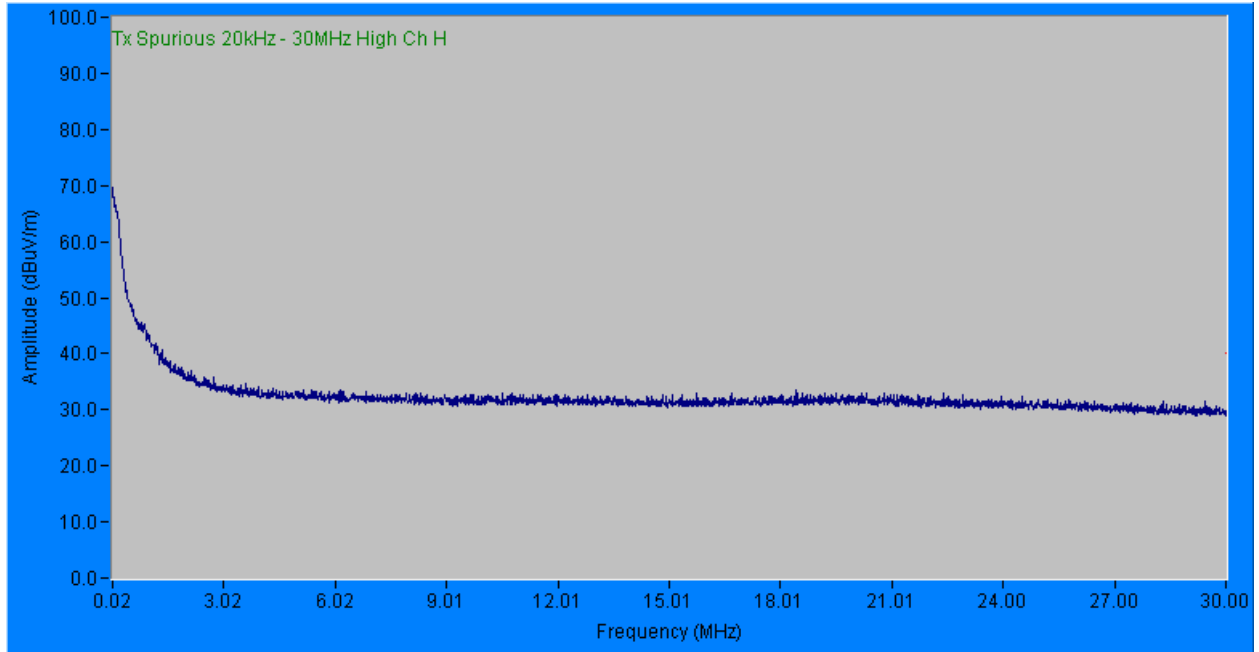
Mid Channel; Tx Spurious Final Measurements – Only measurements that were distinct from the Receiver Spurious measurements were taken.



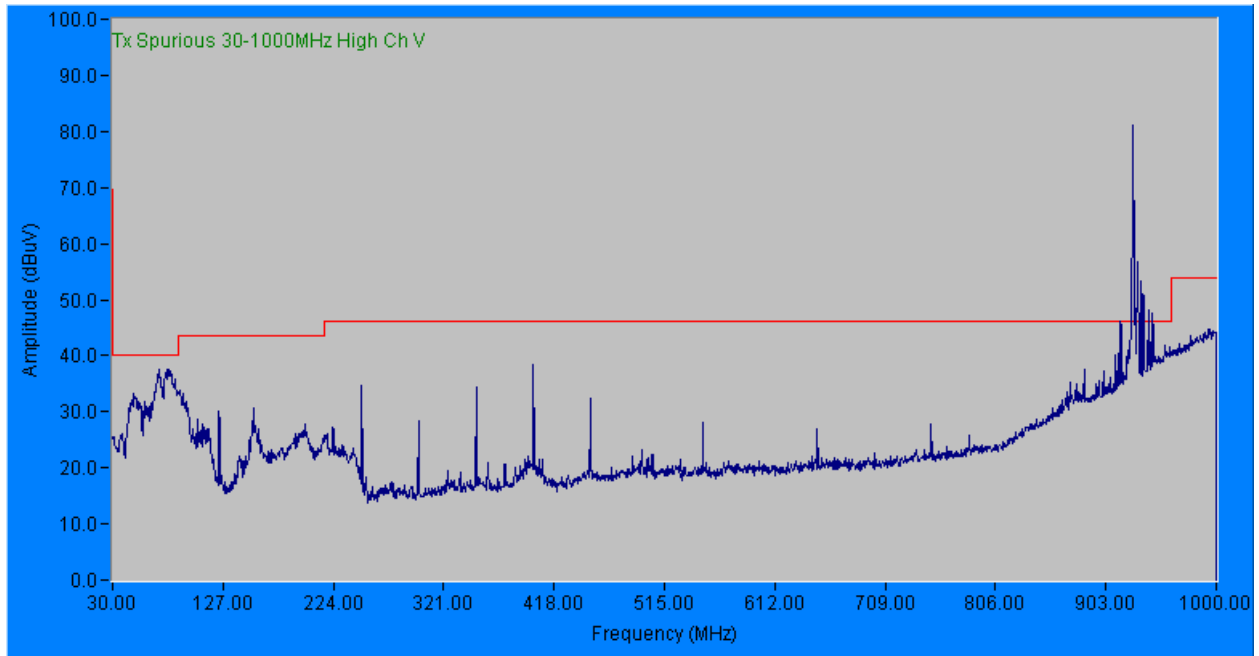
High Channel
10kHz – 30MHz
Vertical Polarization



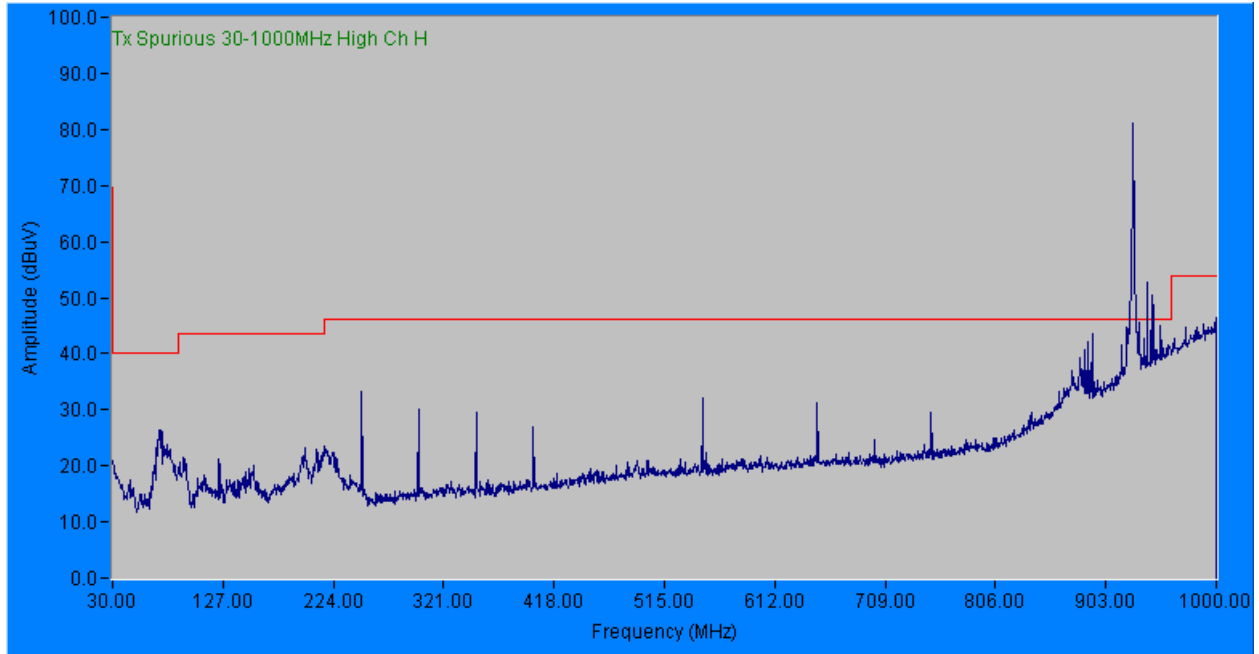
Horizontal Polarization



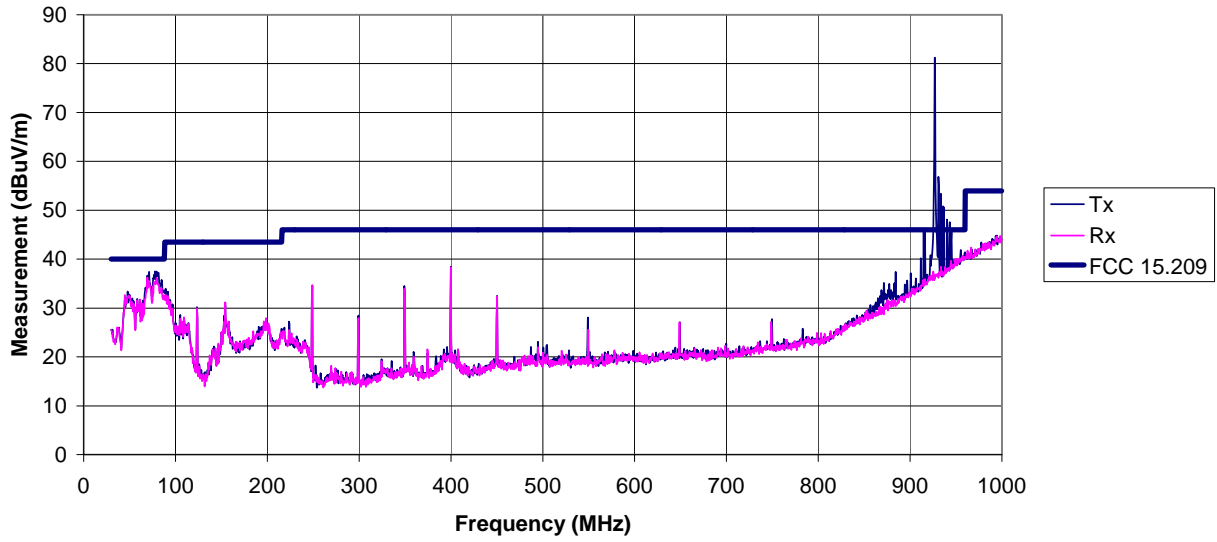
**High Channel 30MHz – 1GHz
Vertical Polarization**



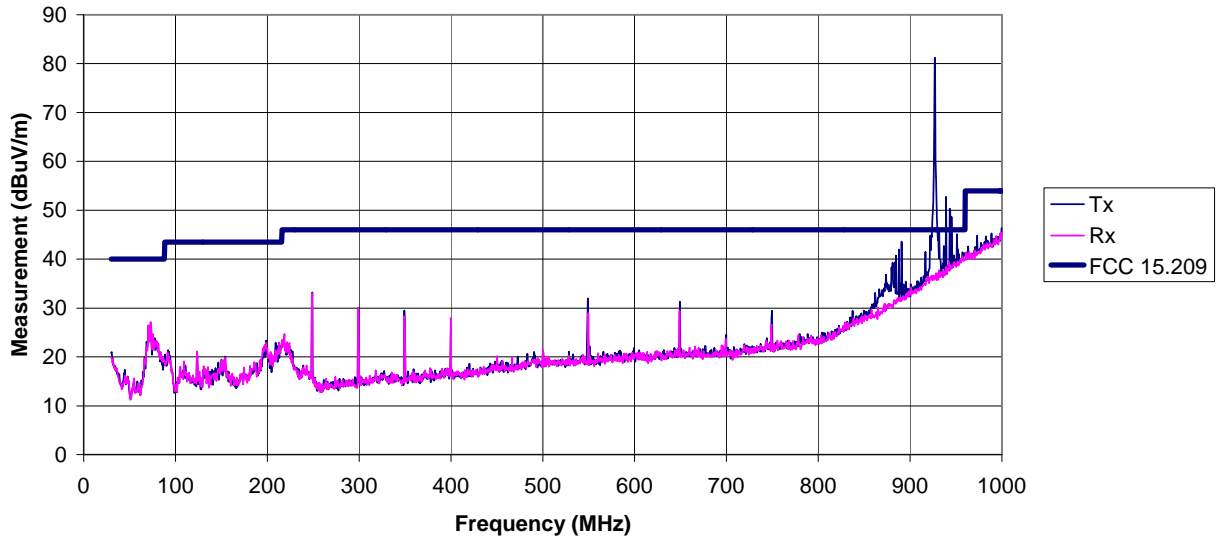
Horizontal Polarization



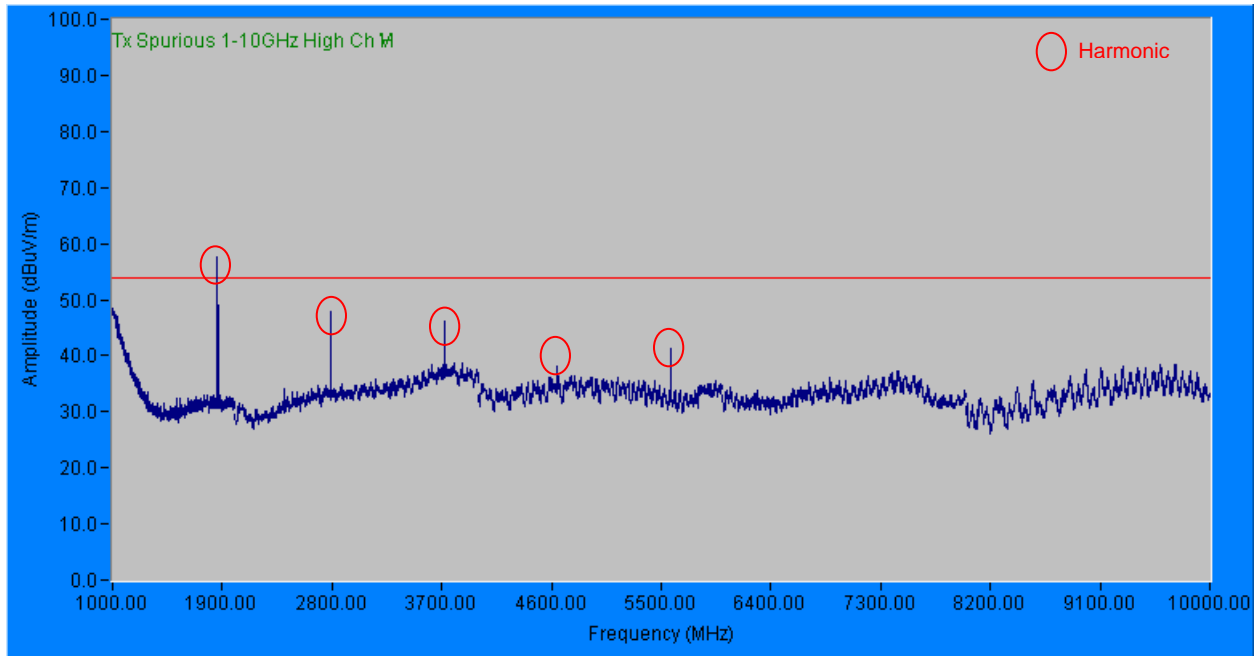
High Channel 30-1000 MHz Comparison with Receiver Spurious Vertical



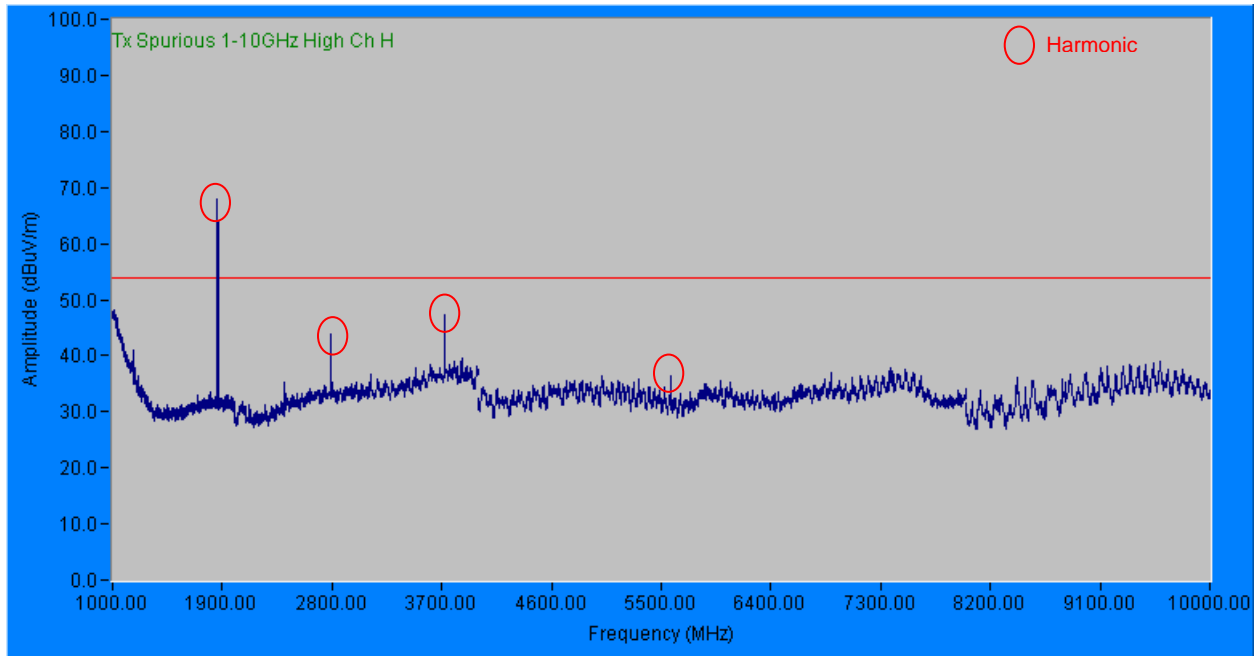
Horizontal



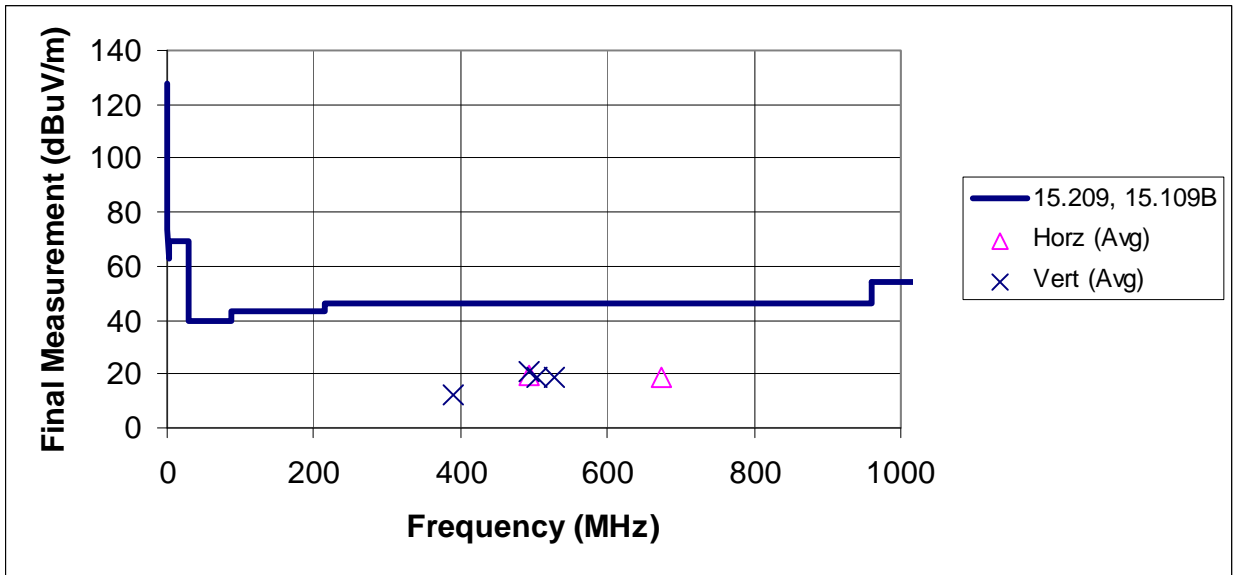
**High Channel 1GHz – 10GHz
Vertical Polarization**



Horizontal Polarization



High Channel; Tx Spurious Final Measurements – Only measurements that were distinct from the Receiver Spurious measurements were taken.



6.6 Test Data:

Radiated Electromagnetic Emissions

Test Report #:	100608342 Run 5	Test Area:	CC1 Radiated	Temperature:	21.8	°C
Test Method:	FCC Part 15.109 Class B	Test Date:	07-Feb-2012	Relative Humidity:	22.5	%
EUT Model #:	EN6080	EUT Power:	120V / 60Hz	Air Pressure:	83.57	kPa
EUT Serial #:	90607221					
Manufacturer:	Inovonics					
EUT Description:	Access Control Gateway					
Notes:	_____					

Level Key	
Pk – Peak	Nb – Narrow Band
Qp – QuasiPeak	Bb – Broad Band
Av - Average	

FREQ (MHz)	LEVEL (dBuV)	CABLE / ANT / PREAMP (dB) (dB/m) (dB)	FINAL (dBuV/m)	POL / HGT / AZ (m) (DEG)	DELTA1 (dB) FCC 15.209
Low Ch Modulated					
282.00	28.0 Qp	1.1 / 13.4 / 26.9	15.6	V / 1.0 / 0.0	-30.4
407.99	27.1 Qp	1.4 / 15.6 / 27.6	16.5	V / 1.6 / 232.5	-29.5
494.31	28.9 Qp	1.5 / 17.4 / 28.0	19.9	V / 1.0 / 147.0	-26.1
550.00	34.2 Qp	1.6 / 18.0 / 28.0	25.8	V / 2.8 / 295.6	-20.2
500.00	33.0 Qp	1.5 / 17.2 / 28.0	23.7	H / 1.9 / 314.7	-22.3
674.70	28.6 Qp	1.8 / 19.3 / 27.7	22.0	H / 1.0 / 0.0	-24.0
Only Low Ch measured above 1GHz. Other channels didn't show signals other than the harmonics of the fundamental.					
1001.77	46.5 Av	2.2 / 25.3 / 37.1	37.0	H / 1.5 / 18.7	-17.0
1002.14	50.0 Av	2.2 / 25.3 / 37.1	40.4	V / 1.9 / 0.0	-13.6
1754.98	51.3 Av	3.0 / 28.0 / 36.1	46.2	H / 2.0 / 0.0	-7.8
1854.59	48.8 Av	3.1 / 28.2 / 36.3	43.8	H / 2.4 / 0.0	-10.2
3559.69	33.1 Av	4.4 / 32.9 / 37.1	33.3	H / 1.0 / 0.0	-20.7
Mid Ch Modulated					
580.40	26.6 Qp	1.7 / 18.8 / 28.0	19.1	V / 1.0 / 0.0	-26.9
503.99	27.6 Qp	1.5 / 17.4 / 28.0	18.5	V / 1.3 / 69.7	-27.5
664.23	21.9 Qp	1.8 / 19.4 / 27.8	15.4	H / 1.0 / 0.0	-30.6
623.31	22.4 Qp	1.7 / 18.6 / 27.9	14.8	H / 1.0 / 0.0	-31.2
797.46	18.8 Qp	2.0 / 20.6 / 23.7	17.6	H / 1.0 / 0.0	-28.4
High Ch Modulated					
504.00	28.2 Qp	1.5 / 17.4 / 28.0	19.1	V / 1.4 / 49.1	-26.9
528.50	27.2 Qp	1.6 / 17.8 / 28.1	18.6	V / 1.0 / 0.0	-27.4
388.97	23.0 Qp	1.4 / 15.3 / 27.5	12.2	V / 1.5 / 112.5	-33.8
494.31	30.1 Qp	1.5 / 17.4 / 28.0	21.0	V / 1.3 / 244.3	-25.0
675.00	25.6 Qp	1.8 / 19.3 / 27.7	18.9	H / 1.5 / 55.4	-27.1
494.29	28.9 Qp	1.5 / 17.4 / 28.0	19.8	H / 2.5 / 284.2	-26.2

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Issued: 2/17/2012

FREQ	LEVEL	CABLE / ANT / PREAMP	FINAL	POL / HGT / AZ	DELTA1 (dB)
(MHz)	(dBuV)	(dB) (dB/m) (dB)	(dBuV/m)	(m) (DEG)	FCC 15.209
***** Measurement Summary *****					
1754.98	51.3 Av	3.0 / 28.0 / 36.1	46.2	H / 2.0 / 0.0	-7.8
1854.59	48.8 Av	3.1 / 28.2 / 36.3	43.8	H / 2.4 / 0.0	-10.2
1002.14	50.0 Av	2.2 / 25.3 / 37.1	40.4	V / 1.9 / 0.0	-13.6
1001.77	46.5 Av	2.2 / 25.3 / 37.1	37	H / 1.5 / 18.7	-17
550	34.2 Qp	1.6 / 18.0 / 28.0	25.8	V / 2.8 / 295.6	-20.2
3559.69	33.1 Av	4.4 / 32.9 / 37.1	33.3	H / 1.0 / 0.0	-20.7
500	33.0 Qp	1.5 / 17.2 / 28.0	23.7	H / 1.9 / 314.7	-22.3
674.7	28.6 Qp	1.8 / 19.3 / 27.7	22	H / 1.0 / 0.0	-24
494.31	30.1 Qp	1.5 / 17.4 / 28.0	21	V / 1.3 / 244.3	-25
494.31	28.9 Qp	1.5 / 17.4 / 28.0	19.9	V / 1.0 / 147.0	-26.1
580.4	26.6 Qp	1.7 / 18.8 / 28.0	19.1	V / 1.0 / 0.0	-26.9
504	28.2 Qp	1.5 / 17.4 / 28.0	19.1	V / 1.4 / 49.1	-26.9
528.5	27.2 Qp	1.6 / 17.8 / 28.1	18.6	V / 1.0 / 0.0	-27.4
503.99	27.6 Qp	1.5 / 17.4 / 28.0	18.5	V / 1.3 / 69.7	-27.5
797.46	18.8 Qp	2.0 / 20.6 / 23.7	17.6	H / 1.0 / 0.0	-28.4
407.99	27.1 Qp	1.4 / 15.6 / 27.6	16.5	V / 1.6 / 232.5	-29.5
282	28.0 Qp	1.1 / 13.4 / 26.9	15.6	V / 1.0 / 0.0	-30.4
664.23	21.9 Qp	1.8 / 19.4 / 27.8	15.4	H / 1.0 / 0.0	-30.6
623.31	22.4 Qp	1.7 / 18.6 / 27.9	14.8	H / 1.0 / 0.0	-31.2
388.97	23.0 Qp	1.4 / 15.3 / 27.5	12.2	V / 1.5 / 112.5	-33.8

Example Unintentional Radiated Emissions calculation:

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

Notes:

- (1) All measurements are field strength measurements taken at 3-meter product-to-antenna.
- (2) Quasi-peak detector measurements up to 1GHz – Average detector measurements above 1 GHz.

Deviations, Additions, or Exclusions: None

7 Radiated Emissions – Unintentional and Spurious of the Receiver

7.1 Method

The test methods used comply with ANSI C63.4 and CISPR 16. Unless otherwise stated no deviations were made from **FCC CFR47 15.247(d)15.209/15.109/RSS-GEN Section 6.**

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

7.2 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>
18913	Spectrum Analyzer	Hewlett-Packard	E7405A	My44211889	06/28/2011	06/28/2012
18897	Magnetic loop antenna	EMCO	6502	9205-2738	11/22/2011	11/22/2012
19937	Bilog Antenna 30MHz - 6GHz	Sunol Sciences	JB6	A050707-2	01/31/2011	01/31/2012
18886	Ridged Guide Antenna 1-18GHz	TENSOR	4105	2020	11/16/2011	11/16/2012
18900	RF Pre-Amplifier (4-8 GHz)	Avantek	AFT97-8434-10F	1007	06/03/2011	06/03/2012
18906	Amplifier (1-4 GHz)	Mini-Circuits Lab	ZHL-42	N052792-2	06/03/2011	06/03/2012
18912	9 kHz- 1.3GHz Pre Amp	Hewlett-Packard	8447F	3113A05545	06/03/2011	06/03/2012
18901	RF Pre-Amplifier (8-18 GHz)	Avantek	AWT-18037	1002	06/03/2011	06/03/2012
SW-6	Software for Radiated and Conducted emissions.	Intertek	OATS cvi	V. 1.0	VBV	VBV

7.3 Results:

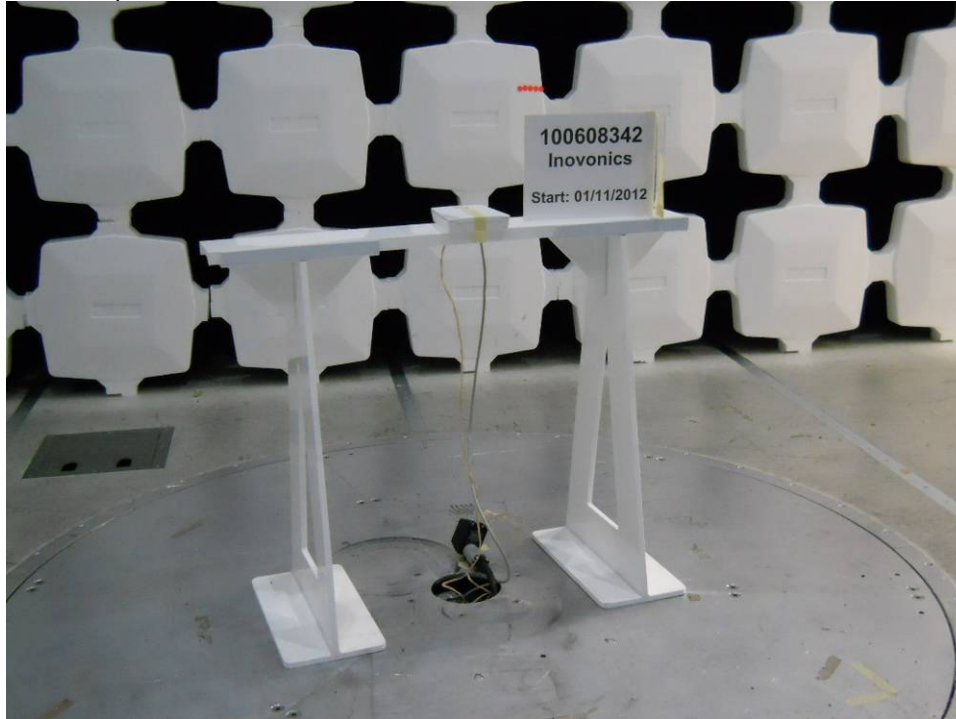
The sample tested was found to Comply.

7.4 Setup Photographs:

Test setup – Front View

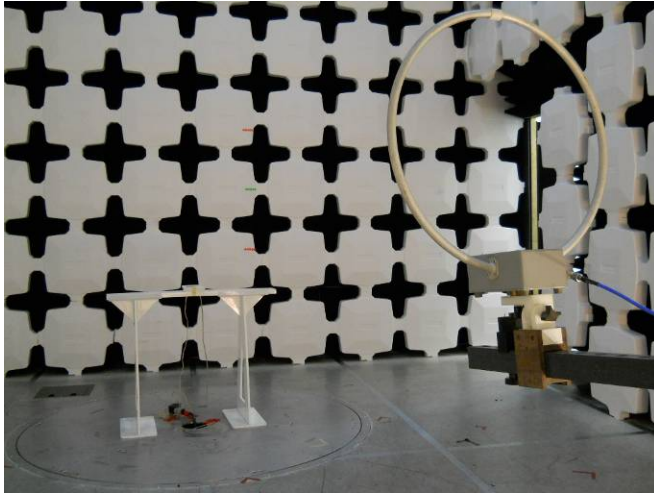


Test setup – Rear View

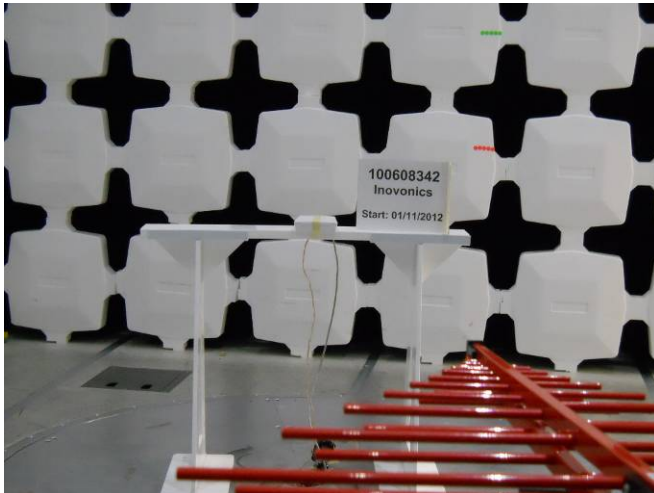


**Photo:
Antenna Setups**

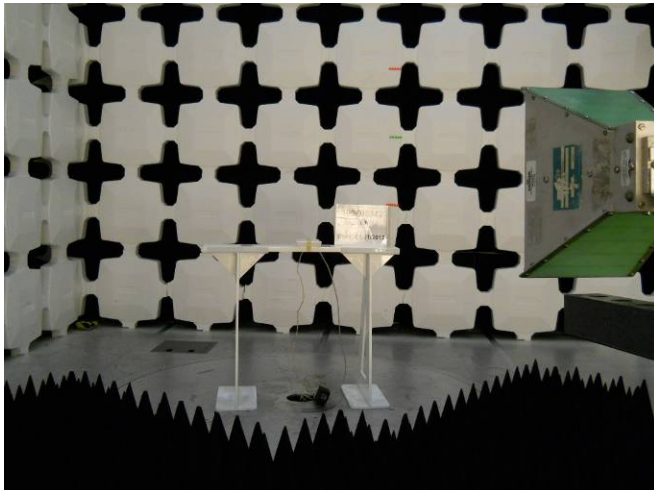
10 kHz – 30 MHz



30 – 1000 MHz



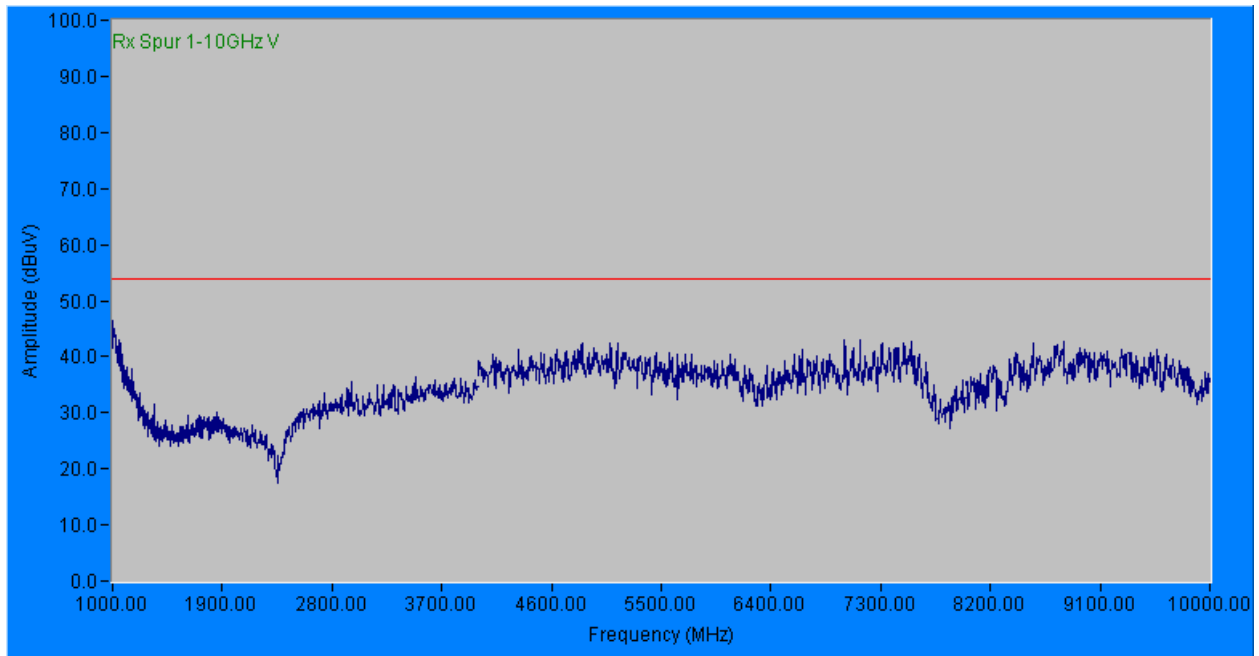
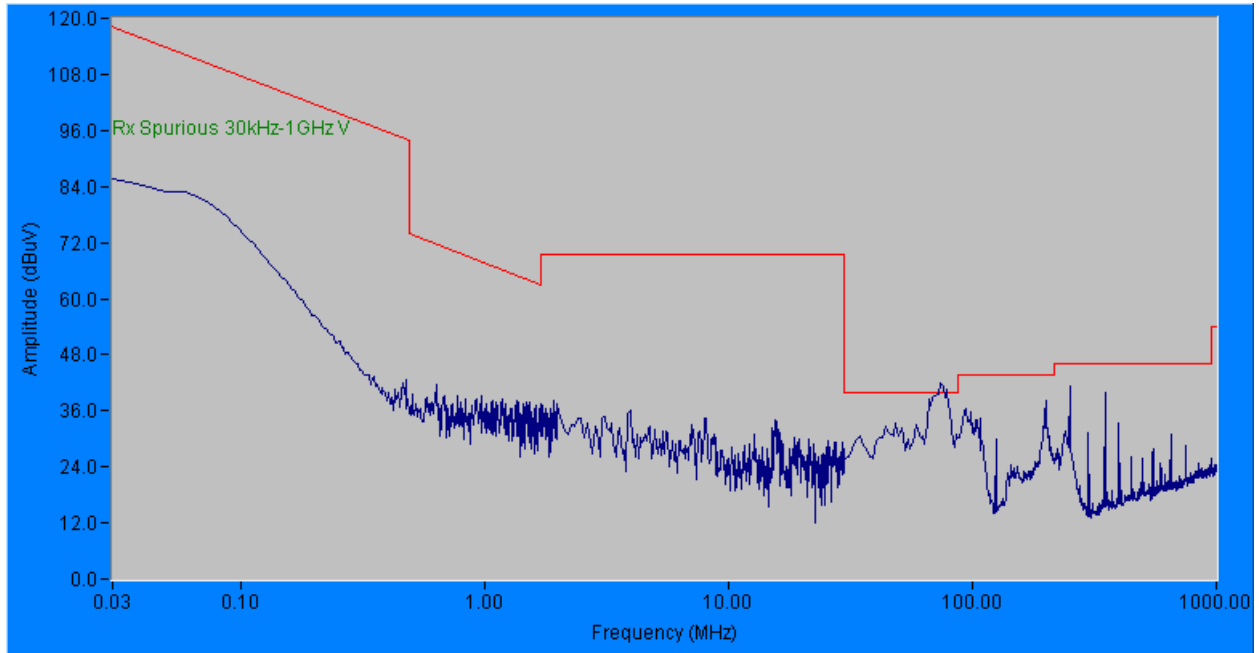
1 – 10 GHz



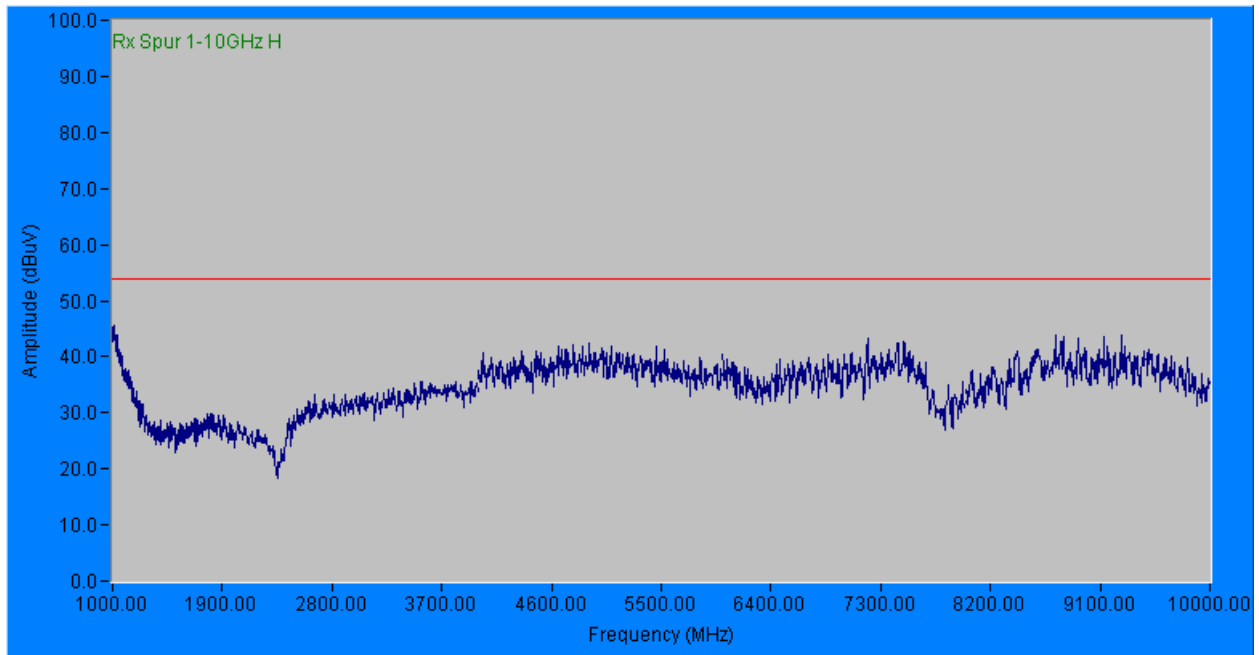
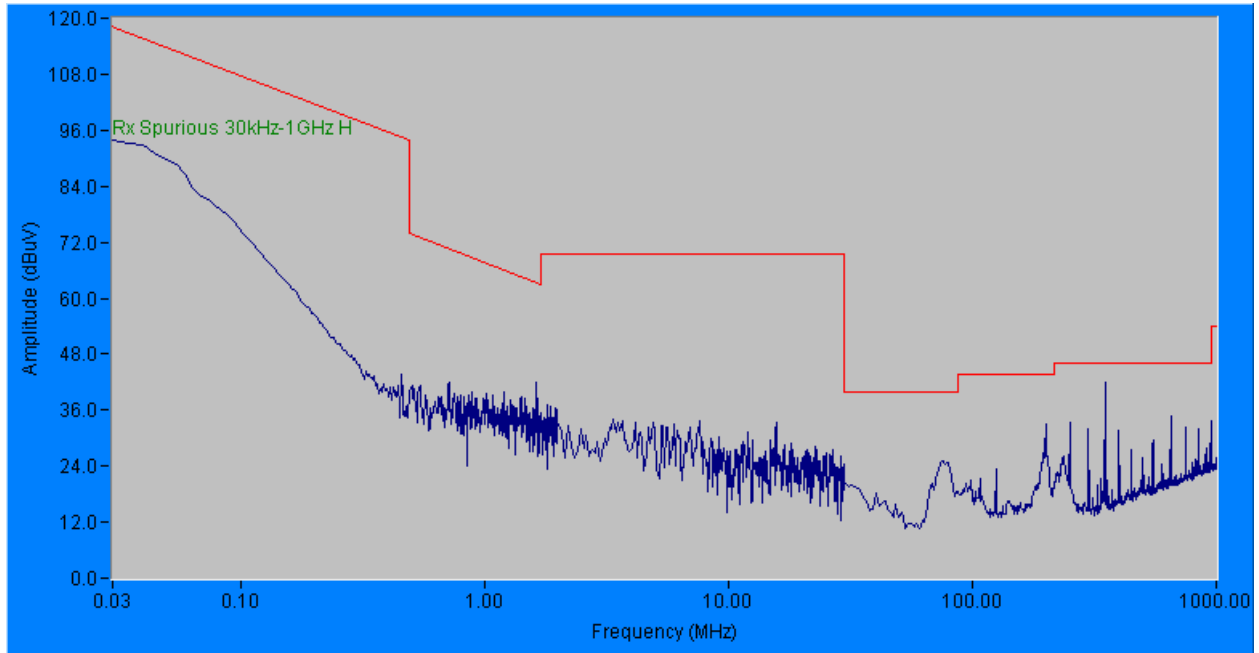
7.5 Plots: Pre-Scan Peak Measurements - Not Final Data

AC Mode

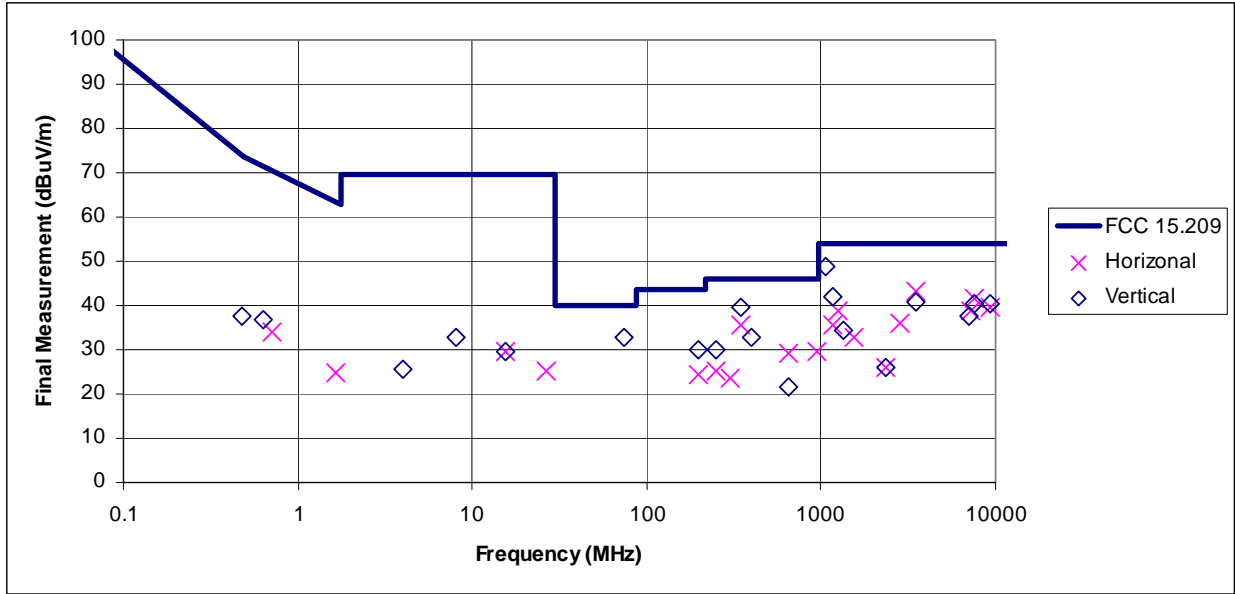
Vertical Polarization



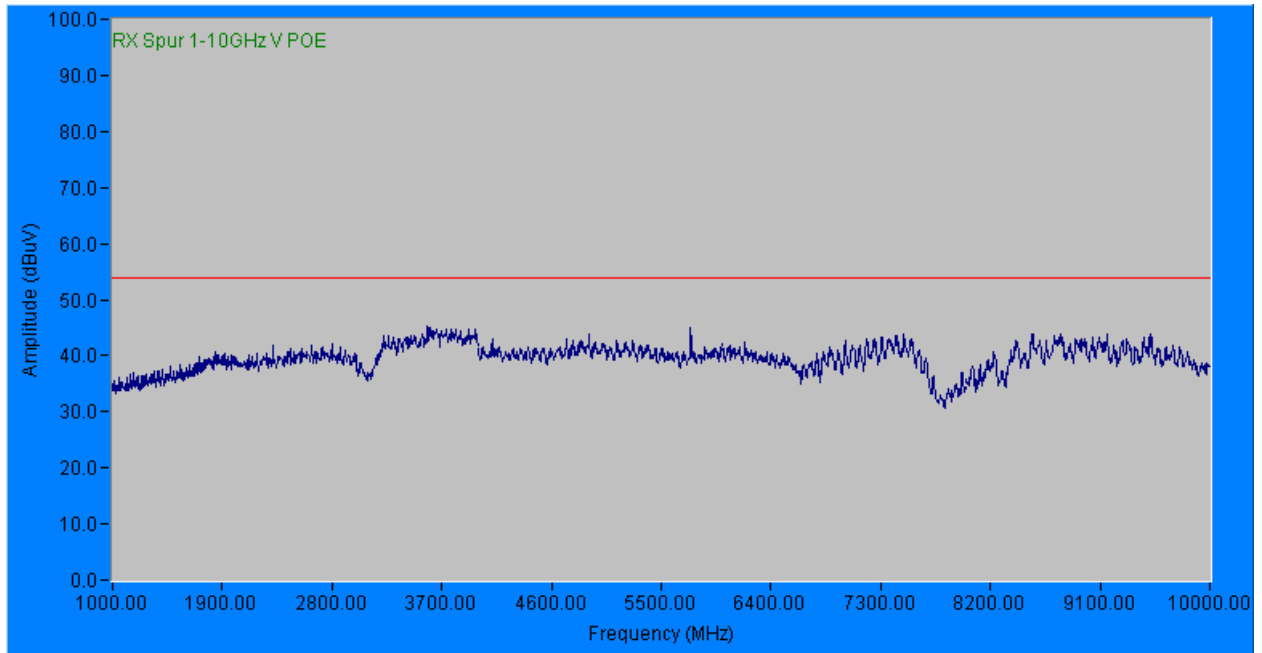
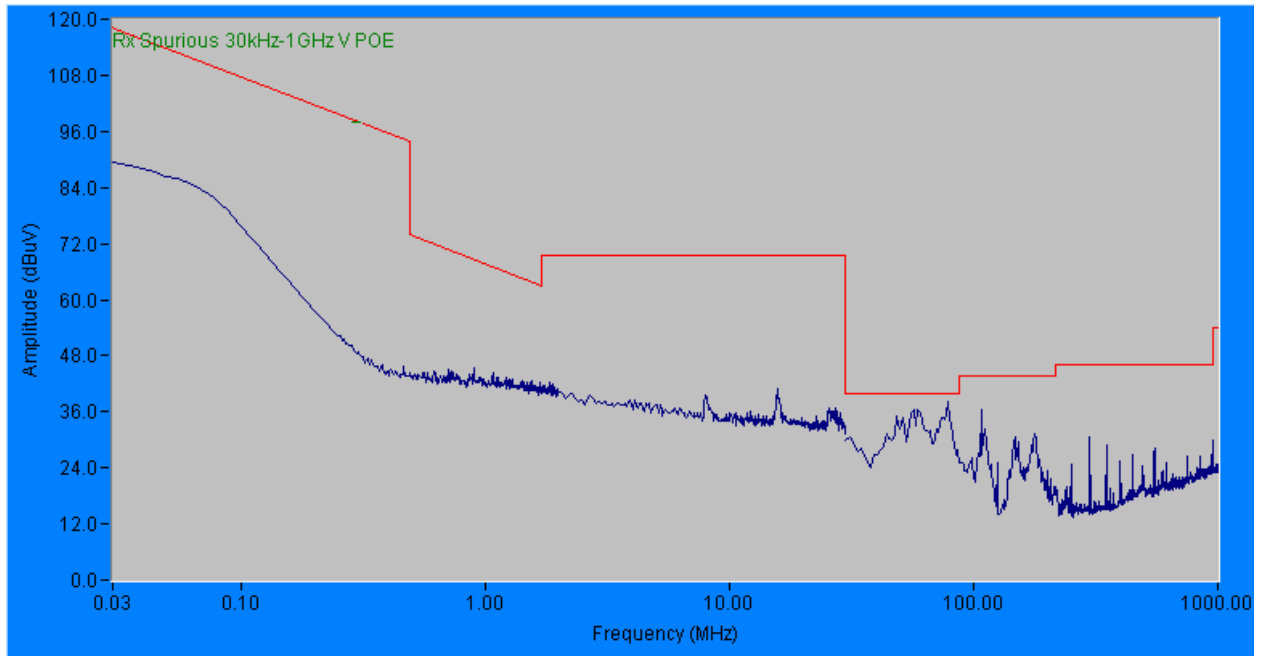
Horizontal Polarization



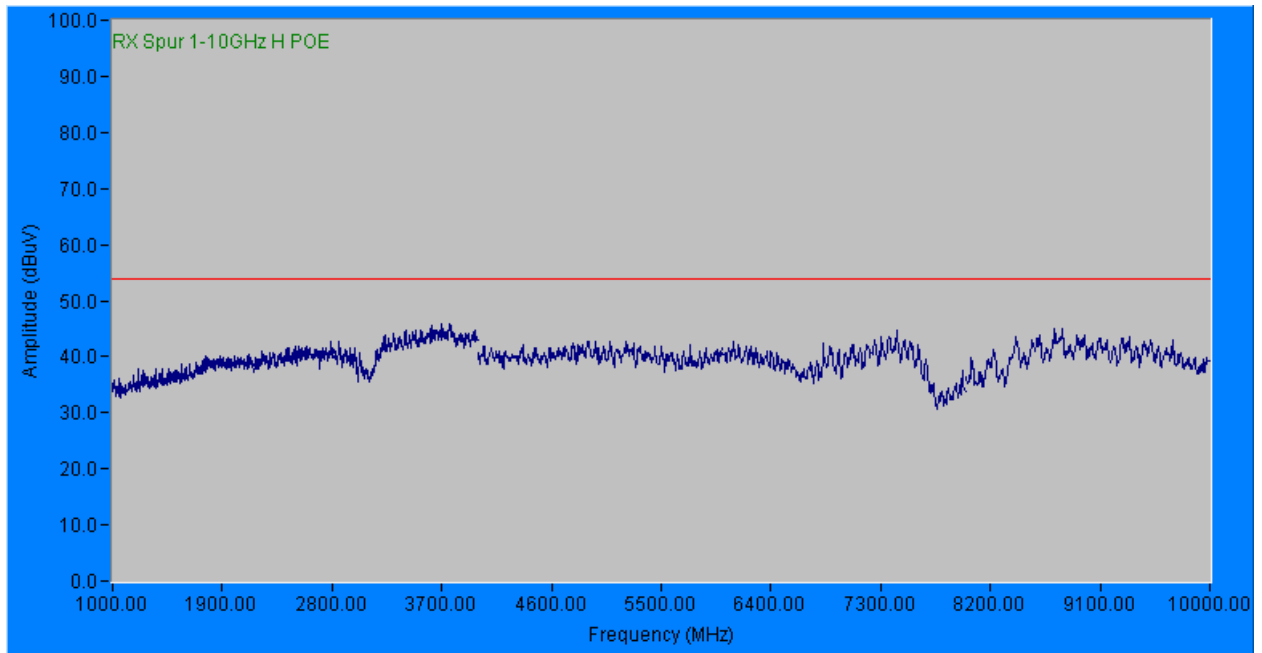
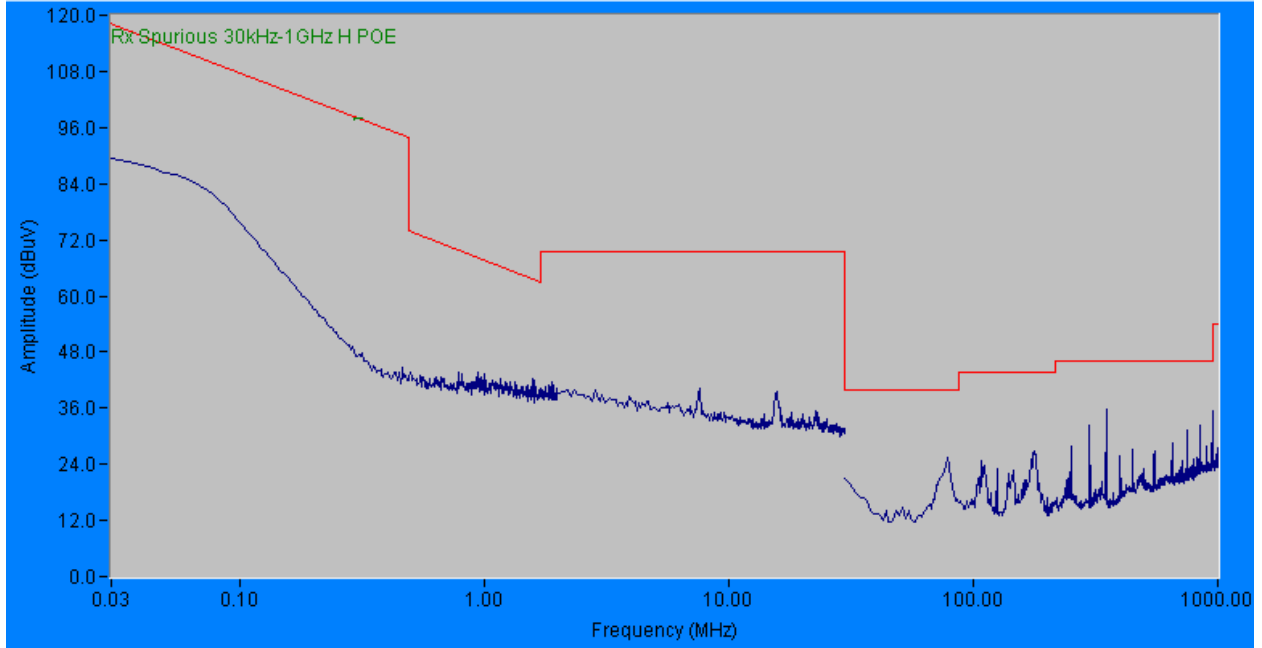
Plots: Rx Mode AC Powered Final Measurements



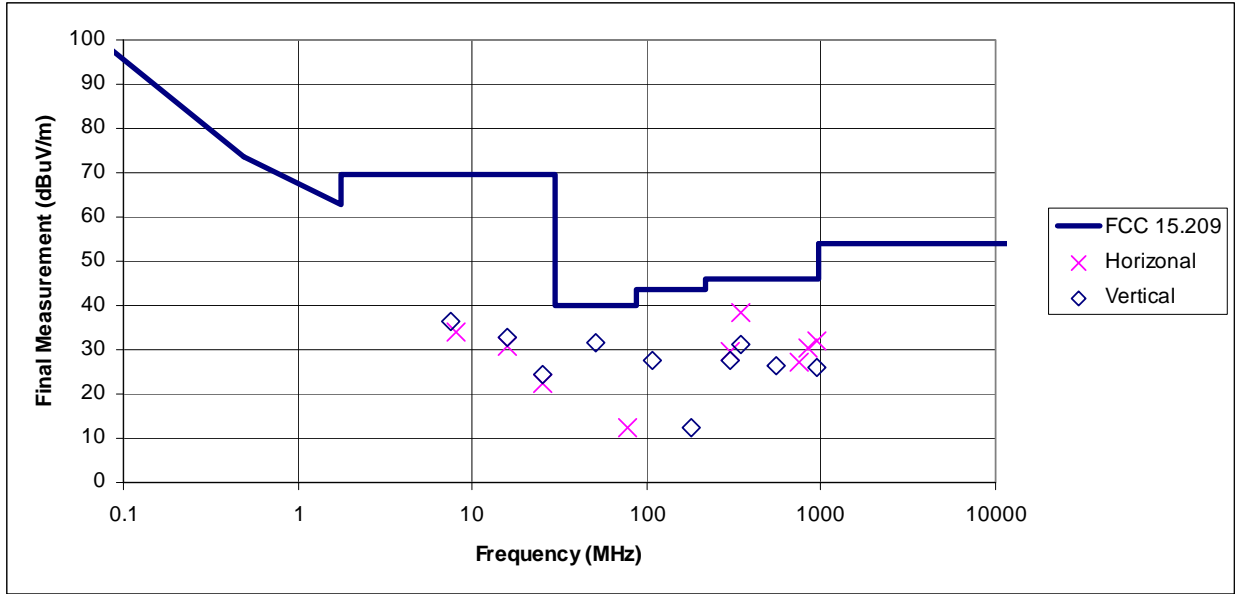
**POE Mode
Vertical Polarization**



Horizontal Polarization



Plots: Rx Mode POE Powered Final Measurements



7.6 Test Data: 30MHz to 10GHz Radiated Electromagnetic Emissions – AC Powered

Test Report #: 100608342 Run 4	Test Area: CC1 Radiated	Temperature: 22.6 °C
Test Method: FCC Part 15.209	Test Date: 12-Jan-2012	Relative Humidity: 20.7 %
EUT Model #: EN6080	EUT Power: Li-Ion Battery Pack, 11V	Air Pressure: 83.28 kPa
EUT Serial #: 90607221		

Manufacturer: Inovonics

EUT Description: Access Control Gateway

Notes:

Level Key	
Pk – Peak	Nb – Narrow Band
Qp – QuasiPeak	Bb – Broad Band
Av - Average	

FREQ	LEVEL	CABLE / ANT / PREAMP	FINAL	POL / HGT / AZ	DELTA1 (dB)	DELTA2 (dB)
(MHz)	(dBuV)	(dB) (dB\m) (dB)	(dBuV)	(m) (DEG)	15.209 <1GHz	15.209 >1GHz
1.64	14.0 Qp	0.1 / 10.5 / 0.0	24.7	H / 1.0 / 0.0	-38.5	N/A
0.718	23.5 Qp	0.1 / 10.3 / 0.0	33.9	H / 1.0 / 0.0	-36.6	N/A
15.57	19.1 Qp	0.3 / 10.1 / 0.0	29.5	H / 1.0 / 0.0	-40.0	N/A
26.72	15.5 Qp	0.4 / 9.2 / 0.0	25.1	H / 1.0 / 0.0	-44.4	N/A
0.477	27.0 Qp	0.1 / 10.4 / 0.0	37.5	V / 1.0 / 0.0	-56.5	N/A
0.634	26.5 Qp	0.1 / 10.4 / 0.0	37.0	V / 1.0 / 0.0	-34.5	N/A
3.96	15.3 Qp	0.1 / 10.4 / 0.0	25.8	V / 1.0 / 0.0	-43.7	N/A
8.03	22.1 Qp	0.2 / 10.6 / 0.0	32.9	V / 1.0 / 0.0	-36.6	N/A
15.58	19.4 Qp	0.3 / 10.1 / 0.0	29.7	V / 1.0 / 0.0	-39.8	N/A
350.00	47.1 Qp	1.3 / 14.6 / 27.4	35.6	H / 1.0 / 141.5	-10.4	N/A
199.95	39.1 Qp	0.9 / 12.1 / 27.5	24.6	H / 2.5 / 119.7	-18.9	N/A
250.00	39.9 Qp	1.1 / 11.7 / 27.2	25.4	H / 1.0 / 266.5	-20.6	N/A
650.02	36.6 Qp	1.8 / 19.3 / 28.3	29.3	H / 1.4 / 330.9	-16.7	N/A
950.00	32.5 Qp	2.2 / 22.4 / 27.5	29.6	H / 1.6 / 80.3	-16.4	N/A
300.00	35.9 Qp	1.2 / 13.7 / 27.2	23.6	H / 1.3 / 279.8	-22.4	N/A
74.54	52.0 Qp	0.8 / 8.2 / 28.1	32.9	V / 1.9 / 30.2	-7.1	N/A
250.00	44.6 Qp	1.1 / 11.7 / 27.2	30.1	V / 1.8 / 252.0	-15.9	N/A
350.01	51.0 Qp	1.3 / 14.6 / 27.4	39.5	V / 1.0 / 248.7	-6.5	N/A
399.99	43.7 Qp	1.4 / 15.7 / 27.8	33.0	V / 1.3 / 169.9	-13.0	N/A
200.00	44.4 Qp	0.9 / 12.1 / 27.5	30.0	V / 1.0 / 230.6	-13.5	N/A
650.00	28.9 Qp	1.8 / 19.3 / 28.3	21.7	V / 1.0 / 170.3	-24.3	N/A
1168.41	36.5 Pk	2.4 / 24.7 / 27.8	35.8	H / 1.0 / 0.0	N/A	-18.2
1249.38	43.6 Pk	2.5 / 25.0 / 32.2	38.9	H / 1.0 / 0.0	N/A	-15.1
1553.62	40.3 Pk	2.8 / 25.5 / 35.8	32.7	H / 1.0 / 0.0	N/A	-21.3
2354.11	31.1 Pk	3.5 / 28.4 / 36.8	26.2	H / 1.0 / 0.0	N/A	-27.8

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FREQ	LEVEL	CABLE / ANT / PREAMP	FINAL	POL / HGT / AZ	DELTA1 (dB)	DELTA2 (dB)
(MHz)	(dBuV)	(dB) (dB\m) (dB)	(dBuV)	(m) (DEG)	15.209 <1GHz	15.209 >1GHz
2817.95	39.8 Pk	3.8 / 29.5 / 36.9	36.2	H / 1.0 / 0.0	N/A	-17.8
3536.16	44.0 Pk	4.4 / 32.0 / 37.0	43.3	H / 1.0 / 0.0	N/A	-10.7
1052.37	42.5 Pk	2.3 / 24.2 / 20.0	49.0	V / 1.0 / 0.0	N/A	-5.0
1157.11	42.1 Pk	2.4 / 24.7 / 27.1	42.1	V / 1.0 / 0.0	N/A	-11.9
1341.65	41.3 Pk	2.6 / 25.2 / 34.8	34.3	V / 1.0 / 0.0	N/A	-19.7
2349.13	31.0 Pk	3.5 / 28.4 / 36.8	26.1	V / 1.0 / 0.0	N/A	-27.9
3481.30	41.1 Pk	4.3 / 32.0 / 36.8	40.7	V / 1.0 / 0.0	N/A	-13.3
7192.02	35.5 Pk	6.4 / 36.3 / 39.5	38.7	H / 1.0 / 0.0	N/A	-15.3
7491.27	37.6 Pk	6.6 / 36.7 / 39.4	41.5	H / 1.0 / 0.0	N/A	-12.5
7002.49	35.7 Pk	6.3 / 35.7 / 40.0	37.7	V / 1.0 / 0.0	N/A	-16.3
7546.14	36.9 Pk	6.6 / 36.7 / 39.5	40.6	V / 1.0 / 0.0	N/A	-13.4
9281.80	42.8 Pk	7.5 / 37.4 / 48.2	39.5	H / 1.0 / 0.0	N/A	-14.5
9281.80	43.8 Pk	7.5 / 37.4 / 48.2	40.4	V / 1.0 / 0.0	N/A	-13.6

FREQ	LEVEL	CABLE / ANT / PREAMP	FINAL	POL / HGT / AZ	DELTA1 (dB)	DELTA2 (dB)
(MHz)	(dBuV)	(dB) (dB\m) (dB)	(dBuV)	(m) (DEG)	15.209 <1GHz	15.209 >1GHz
***** Measurement Summary *****						
350.01	51.0 Qp	1.3 / 14.6 / 27.4	39.5	V / 1.0 / 248.7	-6.5	N/A
74.54	52.0 Qp	0.8 / 8.2 / 28.1	32.9	V / 1.9 / 30.2	-7.1	N/A
350	47.1 Qp	1.3 / 14.6 / 27.4	35.6	H / 1.0 / 141.5	-10.4	N/A
399.99	43.7 Qp	1.4 / 15.7 / 27.8	33	V / 1.3 / 169.9	-13	N/A
200	44.4 Qp	0.9 / 12.1 / 27.5	30	V / 1.0 / 230.6	-13.5	N/A
250	44.6 Qp	1.1 / 11.7 / 27.2	30.1	V / 1.8 / 252.0	-15.9	N/A
950	32.5 Qp	2.2 / 22.4 / 27.5	29.6	H / 1.6 / 80.3	-16.4	N/A
650.02	36.6 Qp	1.8 / 19.3 / 28.3	29.3	H / 1.4 / 330.9	-16.7	N/A
199.95	39.1 Qp	0.9 / 12.1 / 27.5	24.6	H / 2.5 / 119.7	-18.9	N/A
250	39.9 Qp	1.1 / 11.7 / 27.2	25.4	H / 1.0 / 266.5	-20.6	N/A
300	35.9 Qp	1.2 / 13.7 / 27.2	23.6	H / 1.3 / 279.8	-22.4	N/A
650	28.9 Qp	1.8 / 19.3 / 28.3	21.7	V / 1.0 / 170.3	-24.3	N/A
0.634	26.5 Qp	0.1 / 10.4 / 0.0	37	V / 1.0 / 0.0	-34.5	N/A
0.718	23.5 Qp	0.1 / 10.3 / 0.0	33.9	H / 1.0 / 0.0	-36.6	N/A
8.03	22.1 Qp	0.2 / 10.6 / 0.0	32.9	V / 1.0 / 0.0	-36.6	N/A
1.64	14.0 Qp	0.1 / 10.5 / 0.0	24.7	H / 1.0 / 0.0	-38.5	N/A
15.58	19.4 Qp	0.3 / 10.1 / 0.0	29.7	V / 1.0 / 0.0	-39.8	N/A
15.57	19.1 Qp	0.3 / 10.1 / 0.0	29.5	H / 1.0 / 0.0	-40	N/A
3.96	15.3 Qp	0.1 / 10.4 / 0.0	25.8	V / 1.0 / 0.0	-43.7	N/A
26.72	15.5 Qp	0.4 / 9.2 / 0.0	25.1	H / 1.0 / 0.0	-44.4	N/A
0.477	27.0 Qp	0.1 / 10.4 / 0.0	37.5	V / 1.0 / 0.0	-56.5	N/A
1052.37	42.5 Pk	2.3 / 24.2 / 20.0	49.0	V / 1.0 / 0.0	N/A	-5.0
3536.16	44.0 Pk	4.4 / 32.0 / 37.0	43.3	H / 1.0 / 0.0	N/A	-10.7

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FREQ	LEVEL	CABLE / ANT / PREAMP	FINAL	POL / HGT / AZ	DELTA1 (dB)	DELTA2 (dB)
(MHz)	(dBuV)	(dB) (dB\m) (dB)	(dBuV)	(m) (DEG)	15.209 <1GHz	15.209 >1GHz
1157.11	42.1 Pk	2.4 / 24.7 / 27.1	42.1	V / 1.0 / 0.0	N/A	-11.9
7491.27	37.6 Pk	6.6 / 36.7 / 39.4	41.5	H / 1.0 / 0.0	N/A	-12.5
3481.30	41.1 Pk	4.3 / 32.0 / 36.8	40.7	V / 1.0 / 0.0	N/A	-13.3
7546.14	36.9 Pk	6.6 / 36.7 / 39.5	40.6	V / 1.0 / 0.0	N/A	-13.4
9281.80	43.8 Pk	7.5 / 37.4 / 48.2	40.4	V / 1.0 / 0.0	N/A	-13.6
1249.38	43.6 Pk	2.5 / 25.0 / 32.2	38.9	H / 1.0 / 0.0	N/A	-15.1
7192.02	35.5 Pk	6.4 / 36.3 / 39.5	38.7	H / 1.0 / 0.0	N/A	-15.3
7002.49	35.7 Pk	6.3 / 35.7 / 40.0	37.7	V / 1.0 / 0.0	N/A	-16.3
2817.95	39.8 Pk	3.8 / 29.5 / 36.9	36.2	H / 1.0 / 0.0	N/A	-17.8
1168.41	36.5 Pk	2.4 / 24.7 / 27.8	35.8	H / 1.0 / 0.0	N/A	-18.2
1341.65	41.3 Pk	2.6 / 25.2 / 34.8	34.3	V / 1.0 / 0.0	N/A	-19.7
2354.11	31.1 Pk	3.5 / 28.4 / 36.8	26.2	H / 1.0 / 0.0	N/A	-27.8
2349.13	31.0 Pk	3.5 / 28.4 / 36.8	26.1	V / 1.0 / 0.0	N/A	-27.9

Radiated Electromagnetic Emissions – POE Powered

Test Report #: 100608342 Run 5	Test Area: CC1 Radiated	Temperature: 22.6 °C
Test Method: FCC Part 15.209	Test Date: 12-Jan-2012	Relative Humidity: 20.7 %
EUT Model #: EN6080	EUT Power: Li-Ion Battery Pack, 11V	Air Pressure: 83.28 kPa
EUT Serial #: 90607221		

Manufacturer: Inovonics

EUT Description: Access Control Gateway

Notes: POE Mode

Level Key	
Pk – Peak	Nb – Narrow Band
Qp – QuasiPeak	Bb – Broad Band
Av - Average	

FREQ	LEVEL	CABLE / ANT / PREAMP	FINAL	POL / HGT / AZ	DELTA1 (dB)	DELTA2 (dB)
(MHz)	(dBuV)	(dB) (dB\m) (dB)	(dBuV)	(m) (DEG)	15.209 <1GHz	N/A
POE Mode						
Loop Antenna						
8.00	23.2 Qp	0.2 / 10.6 / 0.0	34.0	H / 1.0 / 0.0	-35.5	N/A
15.76	20.5 Qp	0.3 / 10.1 / 0.0	30.9	H / 1.0 / 0.0	-38.6	N/A
25.60	12.7 Pk	0.4 / 9.4 / 0.0	22.6	H / 1.0 / 0.0	-46.9	N/A
25.60	14.8 Pk	0.4 / 9.4 / 0.0	24.6	V / 1.0 / 0.0	-44.9	N/A
7.59	25.4 Qp	0.2 / 10.6 / 0.0	36.3	V / 1.0 / 0.0	-33.2	N/A
15.76	22.4 Pk	0.3 / 10.1 / 0.0	32.8	V / 1.0 / 0.0	-36.7	N/A
50.53	51.3 Qp	0.8 / 7.7 / 28.2	31.6	V / 1.0 / 320.5	-8.4	N/A
107.29	42.7 Qp	0.8 / 12.0 / 27.9	27.5	V / 1.0 / 83.3	-16.0	N/A
178.85	28.1 Qp	0.9 / 11.1 / 27.6	12.5	V / 1.1 / 32.5	-31.0	N/A
300.00	40.0 Qp	1.2 / 13.7 / 27.2	27.7	V / 2.7 / 16.5	-18.3	N/A
350.01	42.6 Qp	1.3 / 14.6 / 27.4	31.1	V / 2.7 / 335.6	-14.9	N/A
550.01	35.5 Qp	1.6 / 17.8 / 28.4	26.5	V / 1.0 / 268.4	-19.5	N/A
950.01	29.0 Qp	2.2 / 22.4 / 27.5	26.1	V / 1.4 / 0.0	-19.9	N/A
77.30	31.3 Qp	0.8 / 8.4 / 28.1	12.4	H / 2.3 / 89.1	-27.6	N/A
349.99	50.1 Qp	1.3 / 14.6 / 27.4	38.6	H / 1.0 / 49.2	-7.4	N/A
300.00	41.9 Qp	1.2 / 13.7 / 27.2	29.6	H / 1.0 / 0.0	-16.4	N/A
749.99	32.7 Qp	1.9 / 20.9 / 28.1	27.4	H / 1.2 / 19.9	-18.6	N/A
850.00	34.1 Qp	2.0 / 22.0 / 27.8	30.4	H / 1.0 / 0.0	-15.6	N/A
950.00	35.1 Qp	2.2 / 22.4 / 27.5	32.2	H / 1.0 / 88.8	-13.8	N/A

FREQ	LEVEL	CABLE / ANT / PREAMP	FINAL	POL / HGT / AZ	DELTA1 (dB)	DELTA2 (dB)
(MHz)	(dBuV)	(dB) (dB\m) (dB)	(dBuV)	(m) (DEG)	15.209 <1GHz	N/A
***** Measurement Summary *****						
349.99	50.1 Qp	1.3 / 14.6 / 27.4	38.6	H / 1.0 / 49.2	-7.4	N/A
50.53	51.3 Qp	0.8 / 7.7 / 28.2	31.6	V / 1.0 / 320.5	-8.4	N/A
950.00	35.1 Qp	2.2 / 22.4 / 27.5	32.2	H / 1.0 / 88.8	-13.8	N/A
850.00	34.1 Qp	2.0 / 22.0 / 27.8	30.4	H / 1.0 / 0.0	-15.6	N/A
107.29	42.7 Qp	0.8 / 12.0 / 27.9	27.5	V / 1.0 / 83.3	-16.0	N/A

FREQ	LEVEL	CABLE / ANT / PREAMP	FINAL	POL / HGT / AZ	DELTA1 (dB)	DELTA2 (dB)
(MHz)	(dBuV)	(dB) (dB\m) (dB)	(dBuV)	(m) (DEG)	15.209 <1GHz	N/A
300.00	41.9 Qp	1.2 / 13.7 / 27.2	29.6	H / 1.0 / 0.0	-16.4	N/A
749.99	32.7 Qp	1.9 / 20.9 / 28.1	27.4	H / 1.2 / 19.9	-18.6	N/A
550.01	35.5 Qp	1.6 / 17.8 / 28.4	26.5	V / 1.0 / 268.4	-19.5	N/A
77.30	31.3 Qp	0.8 / 8.4 / 28.1	12.4	H / 2.3 / 89.1	-27.6	N/A
178.85	28.1 Qp	0.9 / 11.1 / 27.6	12.5	V / 1.1 / 32.5	-31.0	N/A
7.59	25.4 Qp	0.2 / 10.6 / 0.0	36.3	V / 1.0 / 0.0	-33.2	N/A
8.00	23.2 Qp	0.2 / 10.6 / 0.0	34.0	H / 1.0 / 0.0	-35.5	N/A
15.76	22.4 Pk	0.3 / 10.1 / 0.0	32.8	V / 1.0 / 0.0	-36.7	N/A
25.60	14.8 Pk	0.4 / 9.4 / 0.0	24.6	V / 1.0 / 0.0	-44.9	N/A

Example Unintentional Radiated Emissions 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) All measurements are field strength measurements taken at 3-meter product-to-antenna.
- (2) Quasi-peak detector measurements up to 1GHz – Average detector measurements above 1 GHz.

Deviations, Additions, or Exclusions: None

- 8 20dB Bandwidth – Not requested by client**
- 9 Number of Hopping Channels – Not requested by client**
- 10 Hopping Channel Carrier Separation – Not requested by client**
- 11 Time of Occupancy (On/Off Time) – Not requested by client**
- 12 Band Edge Measurements – Not requested by client**
- 13 Duty Cycle & Duty Cycle Correction Factor – Not requested by client**

14 AC Conducted Emissions**14.1 Method**

The test methods used comply with ANSI C63.4 and CISPR 16. Unless otherwise stated no deviations were made from FCC 15.207/RSS-GEN.

This testing was performed at the CC1 Emissions Chamber located at 1795 Dogwood Street, Louisville, CO 80027.

14.2 Test Equipment Used:

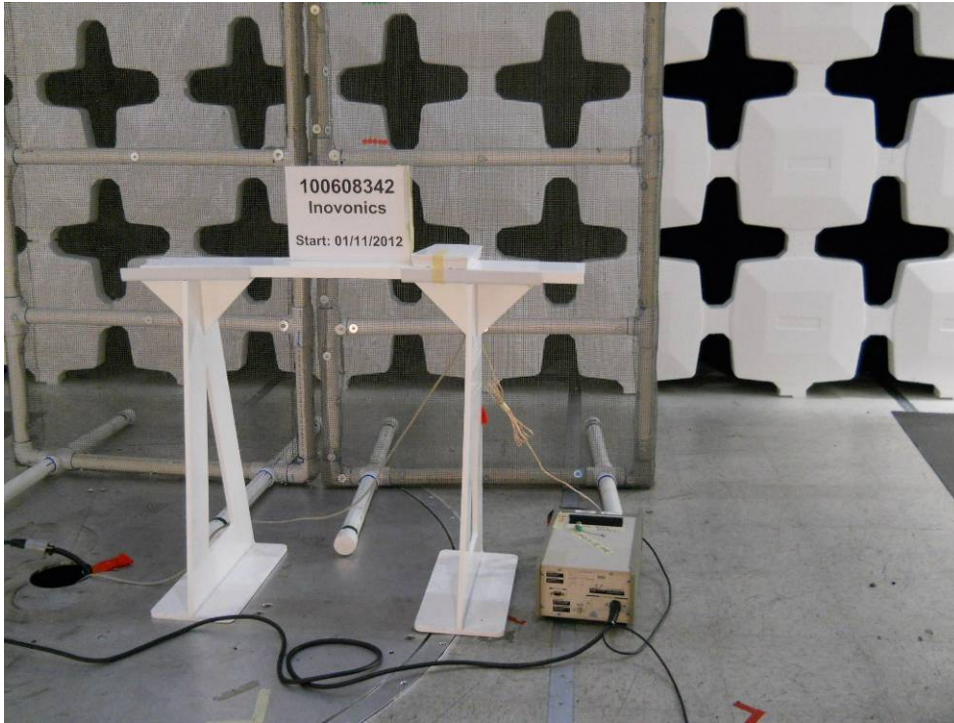
<u>Asset ID</u>	<u>Description</u>	<u>Manufacturer</u>	<u>Model</u>	<u>Serial</u>	<u>Cal Date</u>	<u>Cal Due</u>
18885	Transient Limiter	Hewlett-Packard	11947A	3107A00700	04/28/2011	04/28/2012
18909	EMI Test Receiver	RHODE & SCHWARZ	ESHS 30	842806/001	06/29/2011	06/29/2012
18914	Single Phase LISN	EMCO	3816/NM	9408-1003	03/14/2011	03/14/2012
18913	Spectrum Analyzer	Hewlett-Packard	E7405A	My44211889	06/28/2011	06/28/2012
SW-6	Software for Radiated and Conducted emissions.	Intertek	OATS cvi	V. 1.0	VBU	VBU

14.3 Results:

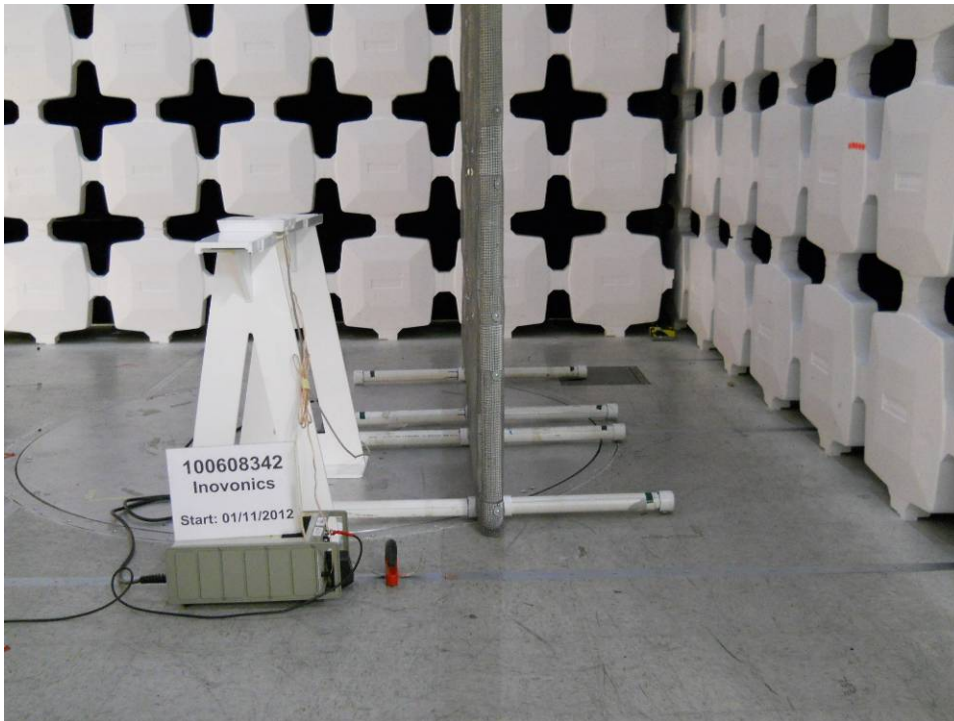
The sample tested was found to Comply.

14.4 Setup Photographs:

Front View



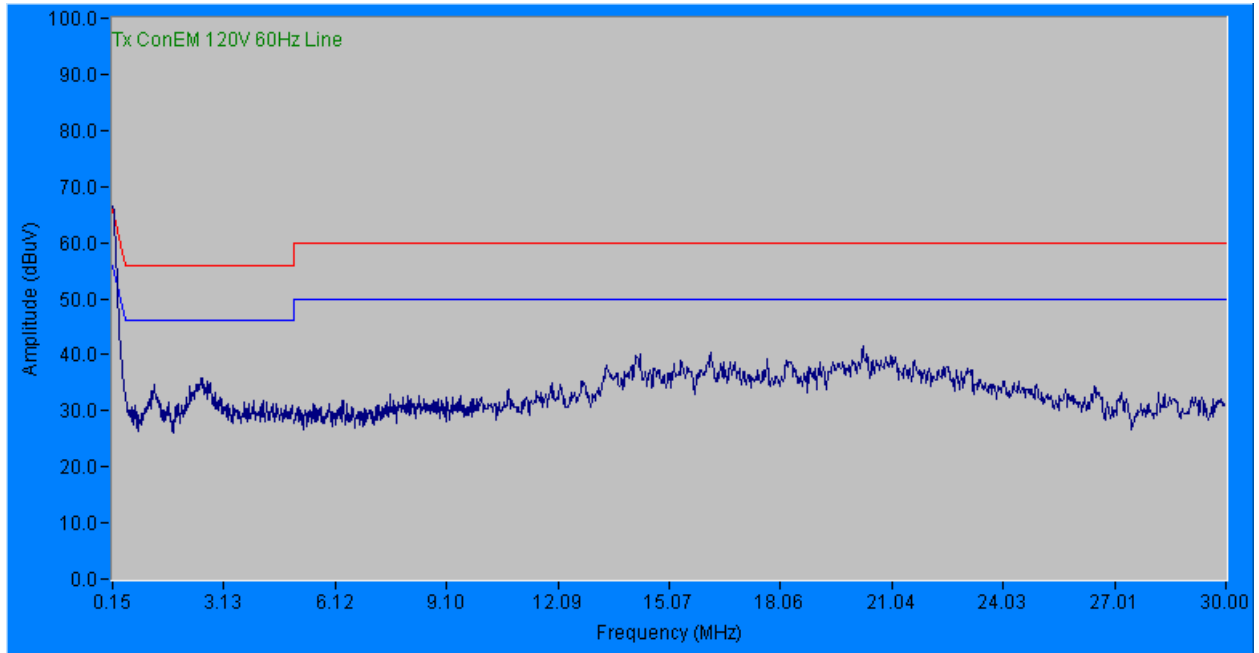
Side View



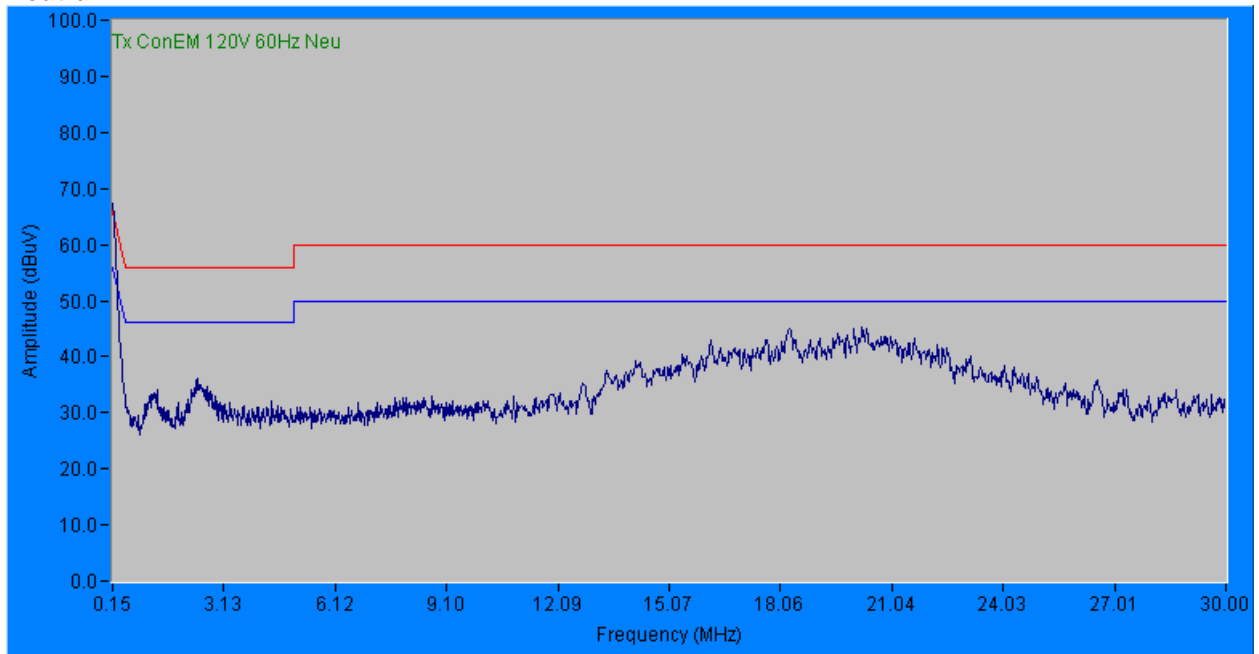
14.5 Plots – AC Conducted Emissions:

Tx Mode

Line

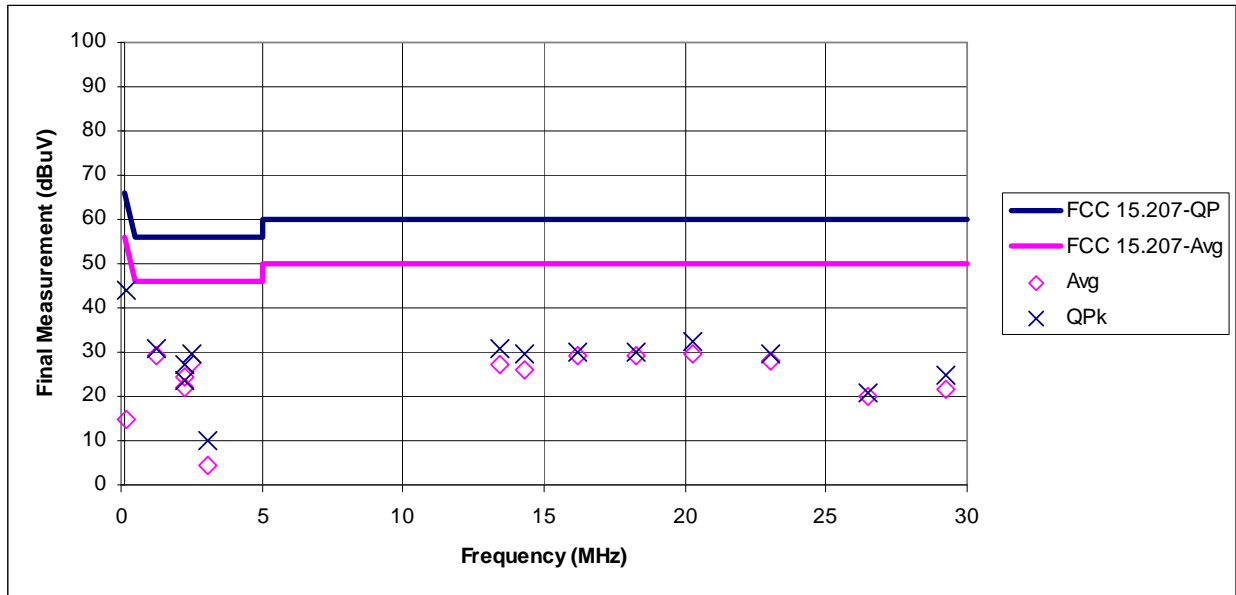


Neutral

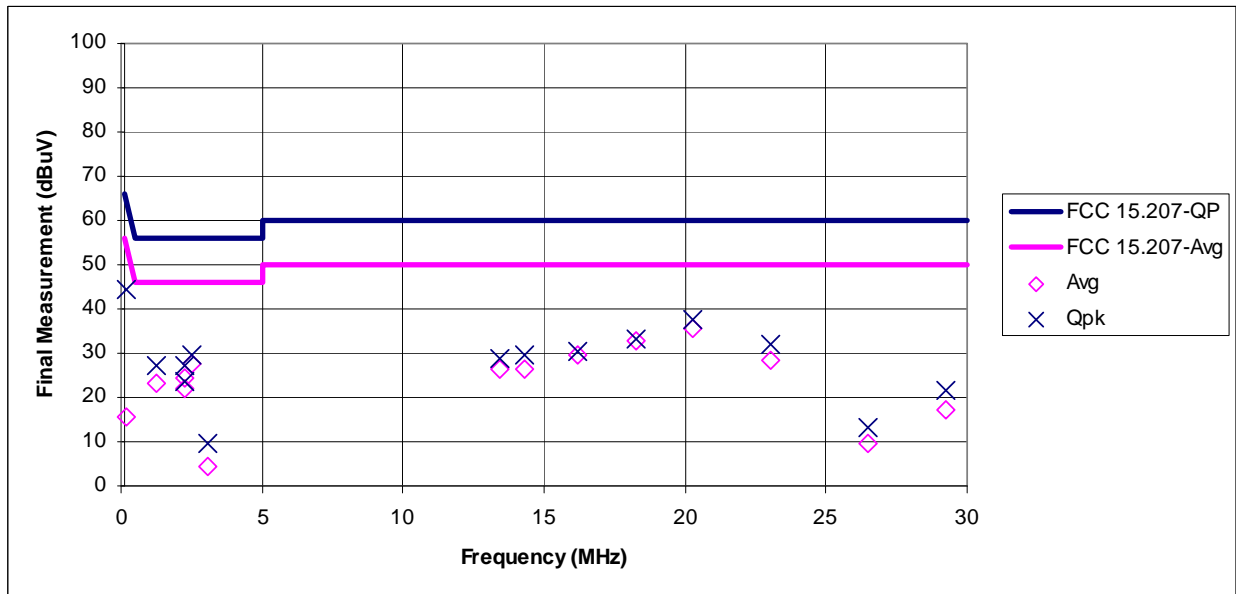


Final Measurements

Line

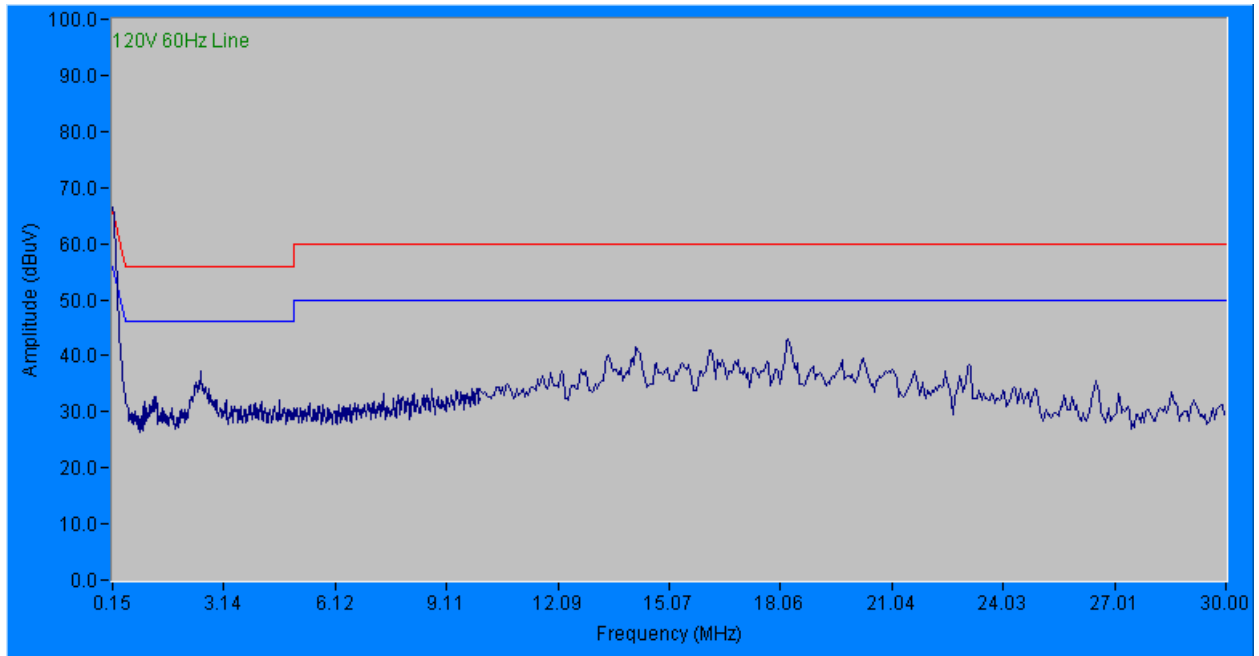


Neutral

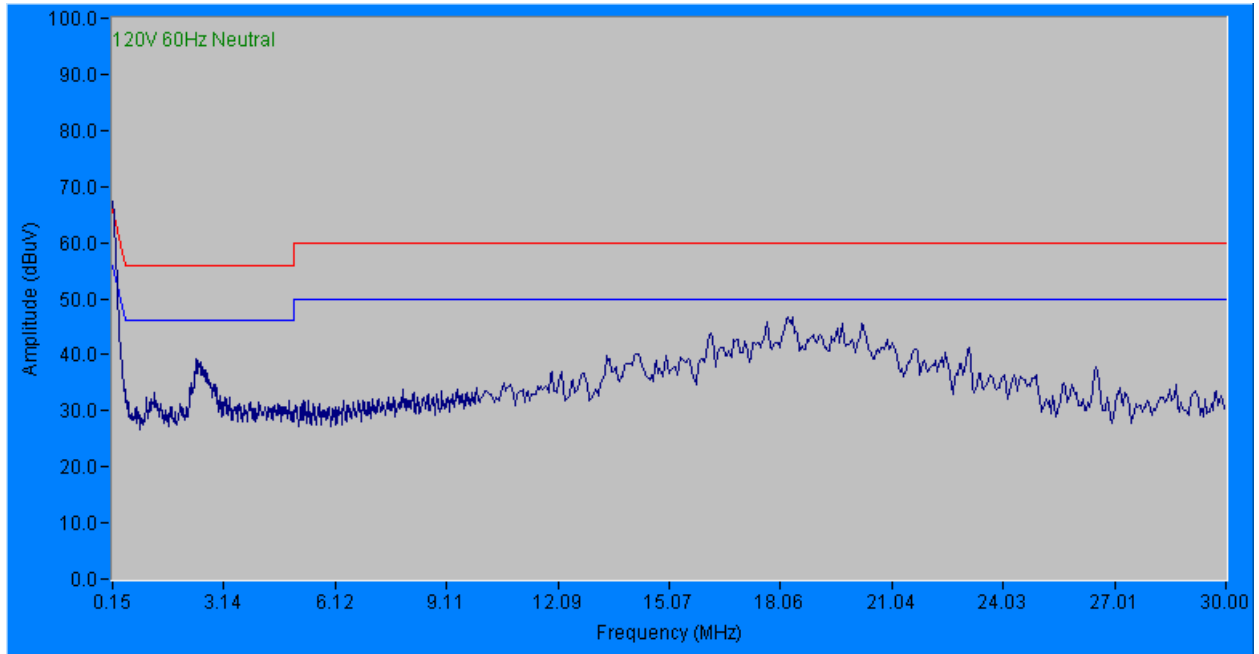


Rx Mode

Line

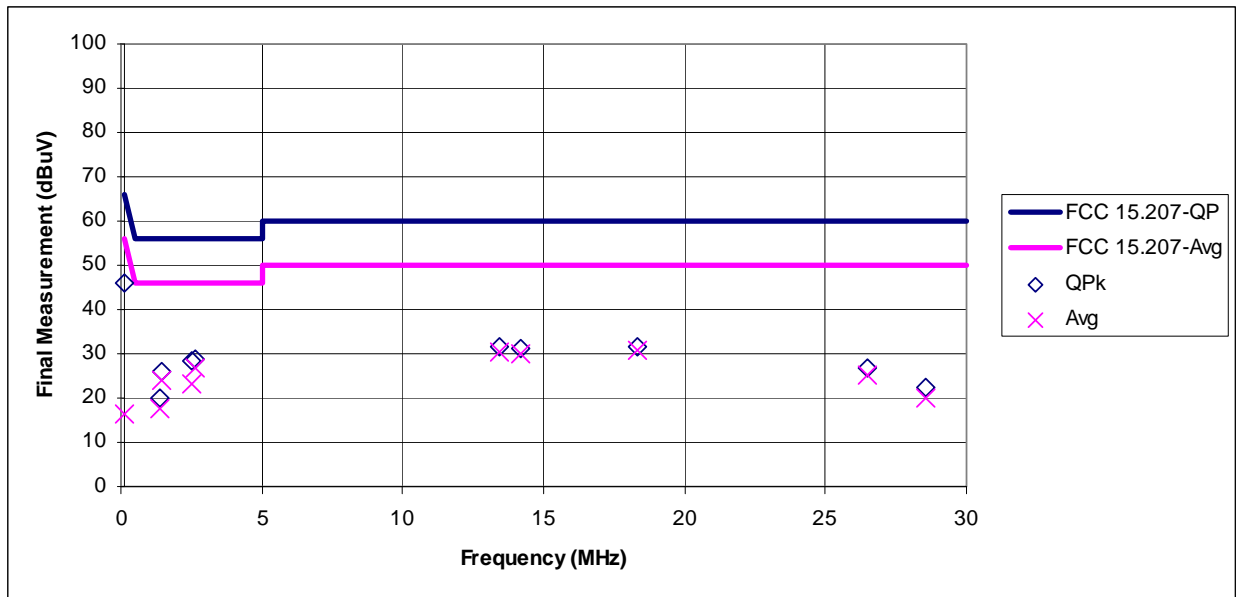


Neutral

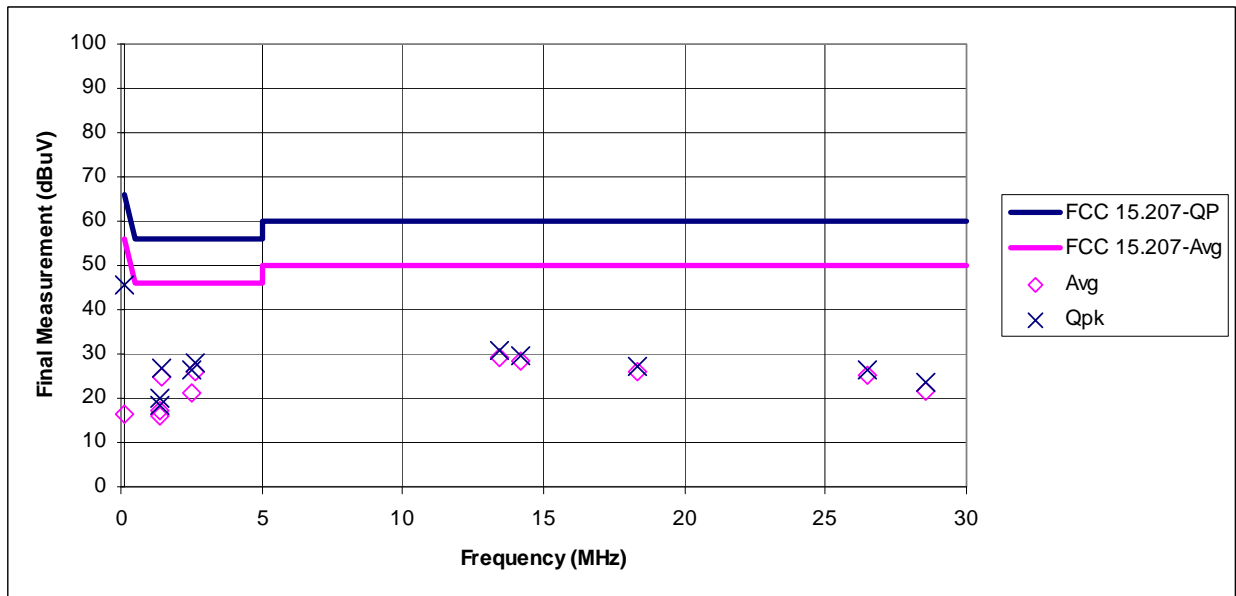


Final Measurements

Line



Neutral



14.6 Test Data – AC Conducted Emissions: Tx Mode Conducted Electromagnetic Emissions

Test Report #:	100608342 Run 02	Test Area:	CC1 Conducted	Temperature:	22.2	°C
Test Method:	FCC Part 15.107 Class B	Test Date:	27-Jan-2012	Relative Humidity:	22.2	%
EUT Model #:	EN6080	EUT Power:	120V / 60Hz	Air Pressure:	83.74	kPa
EUT Serial #:	90607221					

Manufacturer: Inovonics

EUT Description: Access Control Gateway

Notes:

Level Key	
Pk – Peak	Nb – Narrow Band
Qp – QuasiPeak	Bb – Broad Band
Av - Average	

FREQ	LEVEL	CABLE / LISN / ATTEN	FINAL	TEST POINT	DELTA1 (dB)	DELTA2 (dB)
(MHz)	(dBuV)	(dB)	(dBuV)		QP15.107B	AV15.107B
Tx Mode						
Antenna 1 Mid Channel						
0.162	4.9 Av	0.1 / 0.1 / -9.9	15.0	Line 1	N/A	-40.4
0.162	34.0 Qp	0.1 / 0.1 / -9.9	44.1	Line 1	-21.3	N/A
1.27	19.1 Av	0.2 / 0.1 / -10.0	29.4	Line 1	N/A	-16.6
1.27	20.4 Qp	0.2 / 0.1 / -10.0	30.7	Line 1	-25.3	N/A
2.23	11.9 Av	0.2 / 0.1 / -10.0	22.2	Line 1	N/A	-23.8
2.23	13.4 Qp	0.2 / 0.1 / -10.0	23.7	Line 1	-32.3	N/A
2.28	14.1 Av	0.2 / 0.1 / -10.0	24.4	Line 1	N/A	-21.6
2.28	16.8 Qp	0.2 / 0.1 / -10.0	27.1	Line 1	-28.9	N/A
2.53	17.2 Av	0.2 / 0.1 / -10.0	27.5	Line 1	N/A	-18.5
2.53	19.2 Qp	0.2 / 0.1 / -10.0	29.5	Line 1	-26.5	N/A
3.08	-6.0 Av	0.3 / 0.1 / -10.0	4.4	Line 1	N/A	-41.6
3.08	-0.5 Qp	0.3 / 0.1 / -10.0	9.9	Line 1	-46.1	N/A
13.42	16.3 Av	0.9 / 0.1 / -10.0	27.3	Line 1	N/A	-22.7
13.42	20.0 Qp	0.9 / 0.1 / -10.0	31.0	Line 1	-29.0	N/A
14.30	15.2 Av	0.9 / 0.1 / -10.0	26.2	Line 1	N/A	-23.8
14.30	18.8 Qp	0.9 / 0.1 / -10.0	29.8	Line 1	-30.2	N/A
16.17	18.2 Av	1.1 / 0.1 / -10.0	29.4	Line 1	N/A	-20.6
16.17	18.9 Qp	1.1 / 0.1 / -10.0	30.1	Line 1	-29.9	N/A
18.24	18.2 Av	1.1 / 0.1 / -10.0	29.4	Line 1	N/A	-20.6
18.24	18.8 Qp	1.1 / 0.1 / -10.0	30.0	Line 1	-30.0	N/A
20.25	18.5 Av	1.1 / 0.1 / -10.0	29.7	Line 1	N/A	-20.3
20.25	21.1 Qp	1.1 / 0.1 / -10.0	32.3	Line 1	-27.7	N/A
23.03	16.7 Av	1.1 / 0.2 / -10.0	28.0	Line 1	N/A	-22.0
23.03	18.5 Qp	1.1 / 0.2 / -10.0	29.8	Line 1	-30.2	N/A
26.48	8.5 Av	1.2 / 0.2 / -10.0	19.9	Line 1	N/A	-30.1
26.48	9.5 Qp	1.2 / 0.2 / -10.0	20.9	Line 1	-39.1	N/A
29.24	9.9 Av	1.4 / 0.2 / -10.0	21.5	Line 1	N/A	-28.5
29.24	13.1 Qp	1.4 / 0.2 / -10.0	24.7	Line 1	-35.3	N/A

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FREQ	LEVEL	CABLE / LISN / ATTEN	FINAL	TEST POINT	DELTA1 (dB)	DELTA2 (dB)
(MHz)	(dBuV)	(dB)	(dBuV)		QP15.107B	AV15.107B
0.162	5.4 Av	0.1 / 0.1 / -9.9	15.5	Neutral	N/A	-39.9
0.162	34.4 Qp	0.1 / 0.1 / -9.9	44.5	Neutral	-20.9	N/A
1.27	13.1 Av	0.2 / 0.1 / -10.0	23.4	Neutral	N/A	-22.6
1.27	16.9 Qp	0.2 / 0.1 / -10.0	27.2	Neutral	-28.8	N/A
2.23	11.9 Av	0.2 / 0.1 / -10.0	22.2	Neutral	N/A	-23.8
2.23	13.4 Qp	0.2 / 0.1 / -10.0	23.7	Neutral	-32.3	N/A
2.28	14.2 Av	0.2 / 0.1 / -10.0	24.5	Neutral	N/A	-21.5
2.28	17.0 Qp	0.2 / 0.1 / -10.0	27.3	Neutral	-28.7	N/A
2.53	17.3 Av	0.2 / 0.1 / -10.0	27.6	Neutral	N/A	-18.4
2.53	19.4 Qp	0.2 / 0.1 / -10.0	29.7	Neutral	-26.3	N/A
3.08	-6.1 Av	0.3 / 0.1 / -10.0	4.3	Neutral	N/A	-41.7
3.08	-0.8 Qp	0.3 / 0.1 / -10.0	9.6	Neutral	-46.4	N/A
13.42	15.4 Av	0.9 / 0.1 / -10.0	26.4	Neutral	N/A	-23.6
13.42	17.9 Qp	0.9 / 0.1 / -10.0	28.9	Neutral	-31.1	N/A
14.30	15.4 Av	0.9 / 0.1 / -10.0	26.4	Neutral	N/A	-23.6
14.30	18.7 Qp	0.9 / 0.1 / -10.0	29.7	Neutral	-30.3	N/A
16.17	18.4 Av	1.1 / 0.1 / -10.0	29.6	Neutral	N/A	-20.4
16.17	19.1 Qp	1.1 / 0.1 / -10.0	30.3	Neutral	-29.7	N/A
18.24	21.5 Av	1.1 / 0.1 / -10.0	32.7	Neutral	N/A	-17.3
18.24	21.9 Qp	1.1 / 0.1 / -10.0	33.1	Neutral	-26.9	N/A
20.25	24.3 Av	1.1 / 0.1 / -10.0	35.5	Neutral	N/A	-14.5
20.25	26.5 Qp	1.1 / 0.1 / -10.0	37.7	Neutral	-22.3	N/A
23.03	17.0 Av	1.1 / 0.2 / -10.0	28.3	Neutral	N/A	-21.7
23.03	20.6 Qp	1.1 / 0.2 / -10.0	31.9	Neutral	-28.1	N/A
26.48	-1.7 Av	1.2 / 0.2 / -10.0	9.7	Neutral	N/A	-40.3
26.48	1.9 Qp	1.2 / 0.2 / -10.0	13.3	Neutral	-46.7	N/A
29.24	5.5 Av	1.4 / 0.2 / -10.0	17.1	Neutral	N/A	-32.9
29.24	9.9 Qp	1.4 / 0.2 / -10.0	21.5	Neutral	-38.5	N/A

FREQ	LEVEL	CABLE / LISN / ATTEN	FINAL	TEST POINT	DELTA1 (dB)	DELTA2 (dB)
(MHz)	(dBuV)	(dB)	(dBuV)		QP15.107B	AV15.107B
***** Measurement Summary *****						
20.25	24.3 Av	1.1 / 0.1 / -10.0	35.5	Neutral	N/A	-14.5
1.27	19.1 Av	0.2 / 0.1 / -10.0	29.4	Line 1	N/A	-16.6
18.24	21.5 Av	1.1 / 0.1 / -10.0	32.7	Neutral	N/A	-17.3
2.53	17.3 Av	0.2 / 0.1 / -10.0	27.6	Neutral	N/A	-18.4
16.17	18.4 Av	1.1 / 0.1 / -10.0	29.6	Neutral	N/A	-20.4
0.162	34.4 Qp	0.1 / 0.1 / -9.9	44.5	Neutral	-20.9	N/A
2.28	14.2 Av	0.2 / 0.1 / -10.0	24.5	Neutral	N/A	-21.5
23.03	17.0 Av	1.1 / 0.2 / -10.0	28.3	Neutral	N/A	-21.7
13.42	16.3 Av	0.9 / 0.1 / -10.0	27.3	Line 1	N/A	-22.7
14.30	15.4 Av	0.9 / 0.1 / -10.0	26.4	Neutral	N/A	-23.6
2.23	11.9 Av	0.2 / 0.1 / -10.0	22.2	Neutral	N/A	-23.8
1.27	20.4 Qp	0.2 / 0.1 / -10.0	30.7	Line 1	-25.3	N/A

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FREQ	LEVEL	CABLE / LISN / ATTEN	FINAL	TEST POINT	DELTA1 (dB)	DELTA2 (dB)
(MHz)	(dBuV)	(dB)	(dBuV)		QP15.107B	AV15.107B
29.24	9.9 Av	1.4 / 0.2 / -10.0	21.5	Line 1	N/A	-28.5
26.48	8.5 Av	1.2 / 0.2 / -10.0	19.9	Line 1	N/A	-30.1
3.08	-6.0 Av	0.3 / 0.1 / -10.0	4.4	Line 1	N/A	-41.6

Rx Mode Conducted Electromagnetic Emissions

Test Report #: 100608342 Run 01	Test Area: CC1 Conducted	Temperature: 22.5 °C
Test Method: FCC Part 15.107 Class B	Test Date: 13-Jan-2012	Relative Humidity: 17.5 %
EUT Model #: EN6080	EUT Power: 120V / 60Hz	Air Pressure: 83.47 kPa
EUT Serial #: 90607221		

Manufacturer: Inovonics

EUT Description: Access Control Gateway

Notes: _____

Level Key	
Pk – Peak	Nb – Narrow Band
Qp – QuasiPeak	Bb – Broad Band
Av - Average	

FREQ	LEVEL	CABLE / LISN / ATTEN	FINAL	TEST POINT	DELTA1 (dB)	DELTA2 (dB)
(MHz)	(dBuV)	(dB)	(dBuV)		QP15.107B	AV15.107B
0.150	35.9 Qp	0.1 / 0.1 / -9.9	46.0	Line 1	-20.0	N/A
0.150	6.5 Av	0.1 / 0.1 / -9.9	16.6	Line 1	N/A	-39.4
1.40	7.4 Av	0.2 / 0.1 / -10.0	17.7	Line 1	N/A	-28.3
1.40	9.8 Qp	0.2 / 0.1 / -10.0	20.1	Line 1	-35.9	N/A
1.46	13.9 Av	0.2 / 0.1 / -10.0	24.2	Line 1	N/A	-21.8
1.46	15.9 Qp	0.2 / 0.1 / -10.0	26.2	Line 1	-29.8	N/A
2.51	12.8 Av	0.2 / 0.1 / -10.0	23.1	Line 1	N/A	-22.9
2.51	18.2 Qp	0.2 / 0.1 / -10.0	28.5	Line 1	-27.5	N/A
2.65	16.4 Av	0.2 / 0.1 / -10.0	26.7	Line 1	N/A	-19.3
2.65	18.6 Qp	0.2 / 0.1 / -10.0	28.9	Line 1	-27.1	N/A
13.42	19.3 Av	0.9 / 0.1 / -10.0	30.3	Line 1	N/A	-19.7
13.42	20.6 Qp	0.9 / 0.1 / -10.0	31.6	Line 1	-28.4	N/A
14.21	19.0 Av	0.9 / 0.1 / -10.0	30.0	Line 1	N/A	-20.0
14.21	20.3 Qp	0.9 / 0.1 / -10.0	31.3	Line 1	-28.7	N/A
18.31	19.5 Av	1.1 / 0.1 / -10.0	30.7	Line 1	N/A	-19.3
18.31	20.5 Qp	1.1 / 0.1 / -10.0	31.7	Line 1	-28.3	N/A
26.49	14.0 Av	1.2 / 0.2 / -10.0	25.4	Line 1	N/A	-24.6
26.49	15.6 Qp	1.2 / 0.2 / -10.0	27.0	Line 1	-33.0	N/A
28.56	8.7 Av	1.3 / 0.2 / -10.0	20.2	Line 1	N/A	-29.8
28.56	10.9 Qp	1.3 / 0.2 / -10.0	22.4	Line 1	-37.6	N/A
0.150	6.2 Av	0.1 / 0.1 / -9.9	16.3	Neutral	N/A	-39.7
0.150	35.4 Qp	0.1 / 0.1 / -9.9	45.5	Neutral	-20.5	N/A
1.40	6.9 Av	0.2 / 0.1 / -10.0	17.2	Neutral	N/A	-28.8
1.40	8.2 Qp	0.2 / 0.1 / -10.0	18.5	Neutral	-37.5	N/A
1.40	5.9 Av	0.2 / 0.1 / -10.0	16.2	Neutral	N/A	-29.8
1.40	9.8 Qp	0.2 / 0.1 / -10.0	20.1	Neutral	-35.9	N/A
1.45	14.7 Av	0.2 / 0.1 / -10.0	25.0	Neutral	N/A	-21.0
1.45	16.5 Qp	0.2 / 0.1 / -10.0	26.8	Neutral	-29.2	N/A
2.51	11.0 Av	0.2 / 0.1 / -10.0	21.3	Neutral	N/A	-24.7
2.51	16.0 Qp	0.2 / 0.1 / -10.0	26.3	Neutral	-29.7	N/A
2.64	15.6 Av	0.2 / 0.1 / -10.0	25.9	Neutral	N/A	-20.1

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FREQ	LEVEL	CABLE / LISN / ATTEN	FINAL	TEST POINT	DELTA1 (dB)	DELTA2 (dB)
(MHz)	(dBuV)	(dB)	(dBuV)		QP15.107B	AV15.107B
2.64	17.9 Qp	0.2 / 0.1 / -10.0	28.2	Neutral	-27.8	N/A
13.42	18.3 Av	0.9 / 0.1 / -10.0	29.3	Neutral	N/A	-20.7
13.42	19.7 Qp	0.9 / 0.1 / -10.0	30.7	Neutral	-29.3	N/A
14.21	17.3 Av	0.9 / 0.1 / -10.0	28.3	Neutral	N/A	-21.7
14.21	18.7 Qp	0.9 / 0.1 / -10.0	29.7	Neutral	-30.3	N/A
18.31	14.7 Av	1.1 / 0.1 / -10.0	25.9	Neutral	N/A	-24.1
18.31	15.9 Qp	1.1 / 0.1 / -10.0	27.1	Neutral	-32.9	N/A
26.49	13.8 Av	1.2 / 0.2 / -10.0	25.2	Neutral	N/A	-24.8
26.49	15.1 Qp	1.2 / 0.2 / -10.0	26.5	Neutral	-33.5	N/A
28.56	9.9 Av	1.3 / 0.2 / -10.0	21.5	Neutral	N/A	-28.5
28.56	12.0 Qp	1.3 / 0.2 / -10.0	23.5	Neutral	-36.5	N/A

FREQ	LEVEL	CABLE / LISN / ATTEN	FINAL	TEST POINT	DELTA1 (dB)	DELTA2 (dB)
(MHz)	(dBuV)	(dB)	(dBuV)		QP15.107B	AV15.107B

******* Measurement Summary *******

2.65	16.4 Av	0.2 / 0.1 / -10.0	26.7	Line 1	N/A	-19.3
18.31	19.5 Av	1.1 / 0.1 / -10.0	30.7	Line 1	N/A	-19.3
13.42	19.3 Av	0.9 / 0.1 / -10.0	30.3	Line 1	N/A	-19.7
0.150	35.9 Qp	0.1 / 0.1 / -9.9	46.0	Line 1	-20.0	N/A
14.21	19.0 Av	0.9 / 0.1 / -10.0	30.0	Line 1	N/A	-20.0
2.64	15.6 Av	0.2 / 0.1 / -10.0	25.9	Neutral	N/A	-20.1
1.45	14.7 Av	0.2 / 0.1 / -10.0	25.0	Neutral	N/A	-21.0
1.46	13.9 Av	0.2 / 0.1 / -10.0	24.2	Line 1	N/A	-21.8
2.51	12.8 Av	0.2 / 0.1 / -10.0	23.1	Line 1	N/A	-22.9
18.31	14.7 Av	1.1 / 0.1 / -10.0	25.9	Neutral	N/A	-24.1
26.49	14.0 Av	1.2 / 0.2 / -10.0	25.4	Line 1	N/A	-24.6
2.65	18.6 Qp	0.2 / 0.1 / -10.0	28.9	Line 1	-27.1	N/A
1.40	7.4 Av	0.2 / 0.1 / -10.0	17.7	Line 1	N/A	-28.3
28.56	9.9 Av	1.3 / 0.2 / -10.0	21.5	Neutral	N/A	-28.5
1.45	16.5 Qp	0.2 / 0.1 / -10.0	26.8	Neutral	-29.2	N/A
1.40	9.8 Qp	0.2 / 0.1 / -10.0	20.1	Line 1	-35.9	N/A

15 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	4.8 dB	
Radiated emissions, 1 to 18 GHz	4.9 dB	
AC mains Conducted emissions, 150kHz to 30 MHz	3.14 dB	

16 Revision History

Revision Level	Date	Report Number	Notes
0	2/17/2012	100619930DEN-001	Original
1	06/03/2012	100619930DEN-001	<p>(1) The Duty Cycle Correction Factor was changed from -14.6dB to -13.68dB in the Harmonics of the Fundamental Table found on pages 18-20.</p> <p>(2) Worst case harmonics (both in and out of FCC restricted bands) updated on page 21.</p> <p>Revised by: Mike Kanda <i>mk</i></p> <p>Reviewed by: Mike Spataro <i>MAS</i></p>