

TEST REPORT

Report Number: 100356542DEN-001B

Project Number: G100356542

Report Issue Date: 3/17/2011

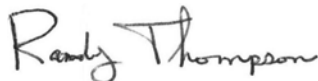
Product Designation: EN1501

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

Tested by:
Intertek Testing Services NA, Inc.
1795 Dogwood St. Suite 200
Louisville, CO 80027

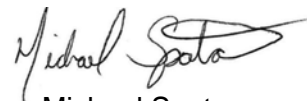
Client:
Inovonics Wireless Corp.
315 CTC Blvd.
Louisville, CO 80027

Report prepared by



Randall Thompson
Senior EMC Project Engineer

Report reviewed by



Michael Spataro
Engineering Team Leader

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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 Passed 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(1)/ A8.5	2/08/2008	Pass
6	Radiated Emissions – Unintentional & Spurious - FCC 15.247(d) / FCC 15.209/109 Covers RSS-210 A8.5/ Section 2.6/ 2.7	3/14/2011	Pass
	20dB Bandwidth – FCC 15.247 (a)(1)(i) [Covers RSS-210, A8.1(c)]	-----	N/A
	Number of Hopping Channels – FCC 15.247(a)(1)(i) [Covers RSS-210, A8.1(c)]	-----	N/A
	Hopping Channel Carrier Separation – FCC 15.247(a)(1) [Covers RSS-210, A8.1(b)]	-----	N/A
	Band Edge Measurements – FCC 15.247(d) / 15.209 [Covers RSS-210, A8.5]	-----	N/A
	Duty Cycle & Duty Cycle Correction Factor	-----	N/A
	AC Conducted Emissions – FCC 15.207 (not applicable – product battery-powered)	-----	N/A

Notes:

- 1) Only the fundamental, harmonics of the fundamental and Spurious emissions are covered in this test report as requested by the customer.
- 2) Only the high channel of the transmitter at 927.58 MHz falls within the frequency band specified in AS/NZS 4268:2008
- 3) 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 per Part 15.31 to find worst case emissions.

3 Description of Equipment Under Test

Equipment Under Test			
Description	Manufacturer	Model Number	Serial Number
902-928MHz wireless transmitter.	Inovonics	EN1501	3356058/90172657

Receive Date:	2/7/2008
Received Condition:	Good
Type:	Production

Description of Equipment Under Test (provided by client)

The Inovonics pulse counting transmitter is used to count the number of pulses generated from a pulse-output device, such as a utility meter.

The pulse counting transmitter is also available in a board only configuration with external header pins for integration into a customer-designed meter or product. Use part number EN1501-XL for 902-928 Mhz North America, 915-928 Mhz Australia, and 922-928 Mhz New Zealand.

Equipment Under Test Power Configuration			
Rated Voltage	Rated Current	Rated Frequency	Number of Phases
3.3 VDC - Battery	-----	-----	-----

Operating modes of the EUT:

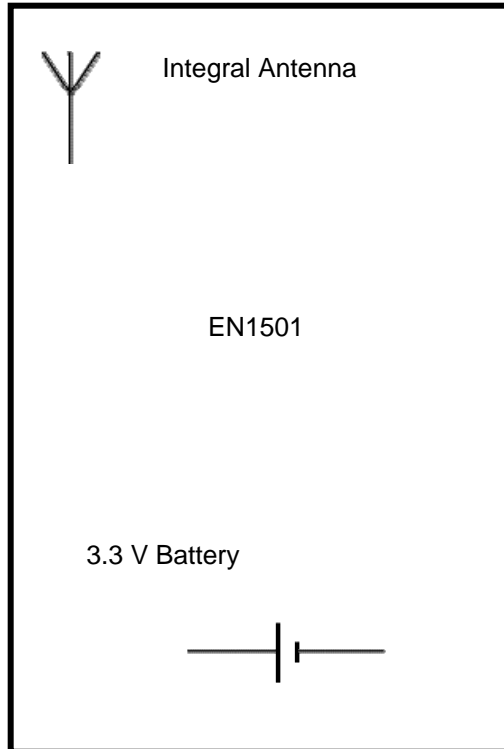
No.	Descriptions of EUT Exercising
1	For section 5 - Fundamental and Harmonics of the fundamental the EUT was placed in an unmodulated, continuous wave mode.
2	For section 6 – Unintentional and Spurious emissions the EUT was placed in normal operating mode.

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:



4.3 Support Data:

ID	Description	Length	Shielding	Ferrites

Support Equipment			
Description	Manufacturer	Model Number	Serial Number

General notes:

1. Product has no I/O or signal cables.
2. Product did not require any support equipment.

5 Radiated Emissions – Intentional Radiators: Output Power - Fundamental & Harmonics of the Fundamental for 15.247

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 Denver's OATS site, located at 40 Meadow Rd. Pinewoods Springs, CO 80540.

5.2 Test Equipment Used:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
18882	Spectrum Analyzer	HP	8566B	2410A00154	11/13/2007	11/13/2008
18887	Horn Antenna 1-18GHz	EMCO	3115	9205-3886	3/6/2008	3/6/2009
18900	RF Pre-Amplifier (4-8 GHz)	Avantek	AFT97-8434-10F	1007	5/1/2007	5/1/2008
18901	RF Pre-Amplifier (8-18 GHz)	Avantek	AWT-18037	1002	5/1/2007	5/1/2008
18906	Pre- Amplifier (1-4GHz)	Mini-Circuits	ZHL-42	N052792-2	5/1/2007	5/1/2008
18808	Log Periodic Antenna	EMCO	3146	9203-3376	10/12/2007	10/12/2008

5.3 Results:

The sample tested was found to Comply.

5.4 Setup Photographs:



5.5 Plots: None

5.6 Test Data:

Field Strength Measurements Fundamental and Spurious of the Transmitter

Test Report #: 3144931	Test Area: Pinewood Site 1 (3m)	Temperature: 25.4 °C
Test Method: FCC CFR 47 part 15.247	Test Date: 08-Feb-2008	Relative Humidity: 11.8 %
EUT Model #: EN 1501	EUT Power: 3VDC	Air Pressure: 101 kPa
EUT Serial #: 03356058		Page:
Manufacturer: Inovonics		
EUT Description: PMT Transmitter		
Notes:		

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	DELTA
(MHz)	(dBuV)	(dB) (dBm) (dB)	(dBuV)	(m) (DEG)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
The following duty cycle was declared by the manufacturer.								
18.7%								
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.								
The DTCF is calculated as follows $20 \cdot \log_{10}(\text{duty cycle in 100mS})$ "not to exceed 20dB"								
Low Channel								
Axis 1 [laying flat]								
902.43	86.9 Pk	3.6 / 22.7 / 0.0	113.2	H / 1.1 / 305.0	0	113.2	119	-5.8
902.43	75.8 Pk	3.6 / 22.7 / 0.0	102	V / 1.0 / 327.0	0	102	119	-17.0
Axis 2 [standing upright]								
902.43	83.3 Pk	3.6 / 22.7 / 0.0	109.6	V / 1.1 / 248.0	0	109.6	119	-9.4
902.43	80.2 Pk	3.6 / 22.7 / 0.0	106.4	H / 1.1 / 354.0	0	106.4	119	-12.6
Axis 3 [standing up & rotated 90CW]								
902.43	80.2 Pk	3.6 / 22.7 / 0.0	106.4	H / 1.0 / 0.0	0	106.4	119	-12.6
902.43	84.2 Pk	3.6 / 22.7 / 0.0	110.4	V / 1.1 / 102.0	0	110.4	119	-8.6
Mid Channel								
Axis 1								
914.83	75.5 Pk	3.6 / 22.7 / 0.0	101.9	V / 1.0 / 151.0	0	101.9	119	-17.1
914.83	86.5 Pk	3.6 / 22.7 / 0.0	112.8	H / 1.0 / 105.0	0	112.8	119	-6.2
Axis 2								
914.83	85.2 Pk	3.6 / 22.7 / 0.0	111.6	H / 1.5 / 178.0	0	111.6	119	-7.4
914.83	84.0 Pk	3.6 / 22.7 / 0.0	110.4	V / 1.1 / 178.0	0	110.4	119	-8.6
Axis 3								
914.83	85.6 Pk	3.6 / 22.7 / 0.0	112	V / 1.1 / 102.0	0	112	119	-7.0
914.83	81.0 Pk	3.6 / 22.7 / 0.0	107.4	H / 1.0 / 102.0	0	107.4	119	-11.6
High Channel								
Axis 1								
927.63	75.5 Pk	3.6 / 22.8 / 0.0	101.9	V / 1.0 / 327.0	0	101.9	119	-17.1
927.63	88.0 Pk	3.6 / 22.8 / 0.0	114.4	H / 1.0 / 283.0	0	114.4	119	-4.6
Axis 2								
927.63	85.2 Pk	3.6 / 22.8 / 0.0	111.7	H / 1.4 / 176.0	0	111.7	119	-7.3
927.63	83.8 Pk	3.6 / 22.8 / 0.0	110.2	V / 1.1 / 232.0	0	110.2	119	-8.8

Axis 3								
927.63	85.2 Pk	3.6 / 22.8 / 0.0	111.6	V / 1.1 / 123.0	0	111.6	119	-7.4
927.63	81.4 Pk	3.6 / 22.8 / 0.0	107.9	H / 1.6 / 9.0	0	107.9	119	-11.1
Axis 1, all harmonics measured with the EUT in this axis.								
Low channel								
1804.85	78.8 Pk	2.8 / 26.3 / 36.4	71.6	V / 1.8 / 105.0	-14.6	57	94.4	-37.4
1804.86	88.8 Pk	2.8 / 26.3 / 36.4	81.6	H / 1.2 / 358.0	-14.6	67	94.4	-27.4
2707.28	59.0 Pk	3.5 / 29.7 / 37.4	54.8	V / 1.6 / 148.0	-14.6	40.2	54	-13.8
2707.29	55.8 Pk	3.5 / 29.7 / 37.4	51.5	H / 1.5 / 218.0	-14.6	36.9	54	-17.1
3609.71	48.2 Pk	4.5 / 31.7 / 38.2	46.2	H / 1.5 / 360.0	-14.6	31.6	54	-22.4
3609.71	55.5 Pk	4.5 / 31.7 / 38.2	53.4	V / 1.6 / 360.0	-14.6	38.8	54	-15.2
4512.11	55.6 Pk	5.3 / 32.3 / 40.4	52.9	V / 1.7 / 309.0	-14.6	38.3	54	-15.7
4512.13	51.2 Pk	5.3 / 32.3 / 40.4	48.4	H / 2.5 / 344.0	-14.6	33.8	54	-20.2
5414.55	55.4 Pk	6.0 / 34.3 / 39.9	55.8	V / 1.7 / 225.0	-14.6	41.2	54	-12.8
5414.56	47.9 Pk	6.0 / 34.3 / 39.9	48.3	H / 2.6 / 206.0	-14.6	33.7	54	-20.3
6316.95	66.5 Pk	6.6 / 35.2 / 40.4	68	V / 1.6 / 214.0	-14.6	53.4	94.4	-41.0
6316.97	65.0 Pk	6.6 / 35.2 / 40.4	66.4	H / 1.5 / 0.0	-14.6	51.8	94.4	-42.6
7219.4	51.2 Pk	7.3 / 36.2 / 40.6	54.2	H / 1.5 / 345.0	-14.6	39.6	94.4	-54.8
7219.4	54.4 Pk	7.3 / 36.2 / 40.6	57.3	V / 1.7 / 210.0	-14.6	42.7	94.4	-51.7
8121.82	46.9 Pk	7.7 / 37.1 / 47.3	44.5	V / 1.8 / 208.0	-14.6	29.9	54	-24.1
8121.82	43.9 Pk	7.7 / 37.1 / 47.3	41.5	H / 1.8 / 12.0	-14.6	26.9	54	-27.1
9024.25	48.4 Pk	8.4 / 37.9 / 48.6	46	V / 1.8 / 213.0	-14.6	31.4	54	-22.6
9024.25	45.6 Pk	8.4 / 37.9 / 48.6	43.3	H / 1.8 / 5.0	-14.6	28.7	54	-25.3
Mid channel								
1829.66	76.2 Pk	2.8 / 26.4 / 36.4	69.1	V / 1.0 / 25.0	-14.6	54.5	94.4	-39.9
1829.66	79.0 Pk	2.8 / 26.4 / 36.4	71.9	H / 1.7 / 358.0	-14.6	57.3	94.4	-37.1
2744.49	61.3 Pk	3.5 / 29.8 / 37.4	57.2	V / 1.0 / 167.0	-14.6	42.6	54	-11.4
2744.49	60.6 Pk	3.5 / 29.8 / 37.4	56.6	H / 1.6 / 170.0	-14.6	42	54	-12.0
3659.32	60.8 Pk	4.5 / 31.8 / 38.3	58.8	V / 1.0 / 292.0	-14.6	44.2	54	-9.8
3659.32	55.2 Pk	4.5 / 31.8 / 38.3	53.2	H / 1.5 / 360.0	-14.6	38.6	54	-15.4
4574.13	58.5 Pk	5.3 / 32.4 / 40.3	55.9	H / 1.8 / 351.0	-14.6	41.3	54	-12.7
4574.15	59.0 Pk	5.3 / 32.4 / 40.3	56.5	V / 1.9 / 312.0	-14.6	41.9	54	-12.1
5488.95	59.0 Pk	6.1 / 34.5 / 39.9	59.7	H / 2.1 / 322.0	-14.6	45.1	94.4	-49.3
5488.98	62.5 Pk	6.1 / 34.5 / 39.9	63.3	V / 1.9 / 236.0	-14.6	48.7	94.4	-45.7
6403.78	70.8 Pk	6.7 / 35.2 / 40.4	72.4	V / 1.7 / 328.0	-14.6	57.8	94.4	-36.6
6403.78	67.7 Pk	6.7 / 35.2 / 40.4	69.3	H / 1.6 / 0.0	-14.6	54.7	94.4	-39.7
7318.61	58.1 Pk	7.4 / 36.4 / 40.5	61.4	V / 1.7 / 193.0	-14.6	46.8	54	-7.2
7318.61	56.1 Pk	7.4 / 36.4 / 40.5	59.4	H / 1.6 / 0.0	-14.6	44.8	54	-9.2
8233.44	53.5 Pk	7.9 / 37.1 / 47.5	51	H / 1.6 / 351.0	-14.6	36.4	54	-17.6
8233.44	58.0 Pk	7.9 / 37.1 / 47.5	55.6	V / 1.8 / 201.0	-14.6	41	54	-13.0
9148.27	48.1 Pk	8.5 / 38.1 / 48.7	45.9	H / 1.6 / 351.0	-14.6	31.3	54	-22.7
9148.27	49.0 Pk	8.5 / 38.1 / 48.7	46.7	V / 1.6 / 115.0	-14.6	32.1	54	-21.9
High channel								
1855.26	79.5 Pk	2.9 / 26.5 / 36.5	72.5	H / 1.9 / 332.0	-14.6	57.9	94.4	-36.5
1855.27	76.3 Pk	2.9 / 26.5 / 36.5	69.3	V / 1.0 / 20.0	-14.6	54.7	94.4	-39.7
2782.88	51.0 Pk	3.5 / 30.0 / 37.4	47.2	V / 1.1 / 143.0	-14.6	32.6	54	-21.4
2782.88	49.4 Pk	3.5 / 30.0 / 37.4	45.6	H / 1.7 / 5.0	-14.6	31	54	-23.0
3710.51	50.4 Pk	4.5 / 31.9 / 38.2	48.6	H / 1.9 / 317.0	-14.6	34	54	-20.0
3710.51	54.6 Pk	4.5 / 31.9 / 38.2	52.8	V / 1.8 / 275.0	-14.6	38.2	54	-15.8
4638.14	58.1 Pk	5.4 / 32.6 / 40.3	55.8	V / 1.9 / 272.0	-14.6	41.2	54	-12.8
4638.15	58.2 Pk	5.4 / 32.6 / 40.3	55.9	H / 1.8 / 232.0	-14.6	41.3	54	-12.7
5565.77	53.4 Pk	6.1 / 34.6 / 39.8	54.3	H / 1.7 / 339.0	-14.6	39.7	94.4	-54.7
5565.77	53.9 Pk	6.1 / 34.6 / 39.8	54.8	V / 1.9 / 26.0	-14.6	40.2	94.4	-54.2
6493.39	47.0 Pk	6.8 / 35.3 / 40.3	48.7	H / 1.7 / 6.0	-14.6	34.1	94.4	-60.3
6493.39	49.5 Pk	6.8 / 35.3 / 40.3	51.2	V / 1.8 / 339.0	-14.6	36.6	94.4	-57.8
7421.03	40.1 Pk	7.4 / 36.5 / 40.4	43.7	H / 1.7 / 358.0	-14.6	29.1	54	-24.9
7421.03	43.9 Pk	7.4 / 36.5 / 40.4	47.5	V / 1.7 / 207.0	-14.6	32.9	54	-21.1
8348.61	44.0 Pk	8.0 / 37.1 / 47.7	41.5	H / 1.4 / 5.0	-14.6	26.9	54	-27.1
8348.65	45.4 Pk	8.0 / 37.1 / 47.7	42.8	V / 1.9 / 272.0	-14.6	28.2	54	-25.8
9276.29	47.6 Pk	8.5 / 38.2 / 48.8	45.5	V / 1.5 / 343.0	-14.6	30.9	94.4	-63.5
9276.29	46.7 Pk	8.5 / 38.2 / 48.8	44.6	H / 1.4 / 5.0	-14.6	30	94.4	-64.4

Example calculation for Intentional Radiated Emissions:

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

Electric Field to Power Conversion

From DA 00-705 – Alternative Test Procedures.

If antenna conducted tests cannot be performed on this device, radiated tests to show compliance with the peak output power limit specified in Section 15.247(b) and the spurious RF conducted emission limit specified in Section 15.247(c) are acceptable. As stated previously, a pre-amp, and, in the latter case, a high pass filter, are required for the following measurements.

1) Calculate the transmitter's peak power using the following equation:

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

Where: E is the measured maximum fundamental field strength in V/m, utilizing a RBW \geq the 20 dB bandwidth of the emission, VBW > RBW, peak detector function. Follow the procedures in C63.4-1992 with respect to maximizing the emission.

G is the numeric gain of the transmitting antenna with reference to an isotropic radiator.

d is the distance in meters from which the field strength was measured.

P is the power in watts for which you are solving:

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

In this case:

E = 114.4 dB/uV (from above high channel axis 1) = 0.5248V/m

D = 3 meters

G = 4 unknown

P = 0.0206 W

Limit from 15.247(b)(2) = .25W

Delta = 0.0206 - .25 = -0.2294W

6 Radiated Emissions Unintentional & Spurious

6.1 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 Denver, located at 1795 Dogwood St., Suite 200, Louisville, CO 80027.

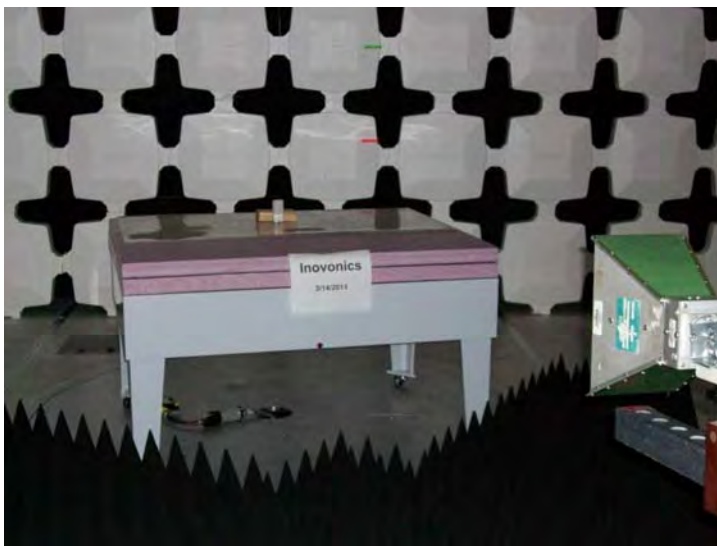
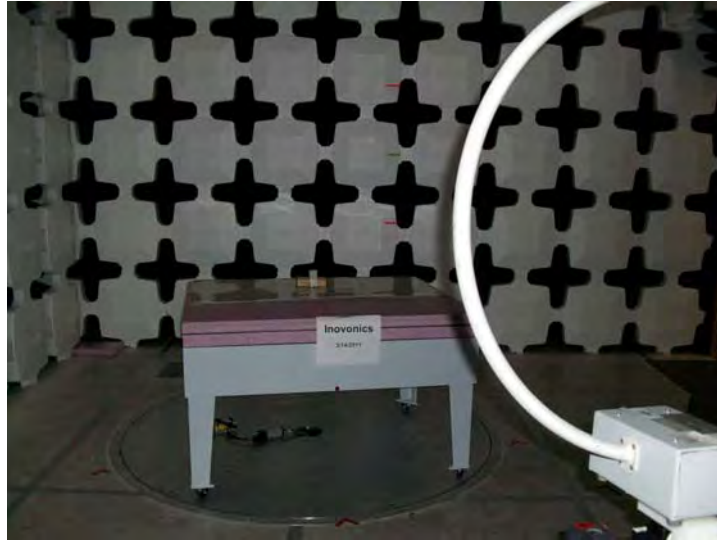
6.2 Test Equipment Used:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
18882	Spectrum Analyzer	HP	8566B	2410A00154	12/06/2010	12/06/2011
18880	Q.P Adapter	HP	85650A	2811A01300	12/06/2010	12/06/2011
18912	9 kHz- 1.3GHz Pre Amp	HP	8447F	3113A05545	06/04/2010	06/04/2011
18906	RF Pre-Amplifier (1-4 GHz)	Mini-Circuits L	ZHL-42	N052792-2	06/11/2010	06/11/2011
18900	RF Pre-Amplifier (4-8 GHz)	Avantek	AFT97-8434-10F	1007	06/07/2010	06/07/2011
18901	RF Pre-Amplifier (8-18 GHz)	Avantek	AWT-18037	1002	06/07/2010	06/07/2011
18897	Magnetic loop antenna	EMCO	6502	9205-2738	11/18/2010	11/18/2011
19936	Bilog Antenna 30MHz - 6GHz	Sunol	JB6	A050707-1	10/11/2010	10/11/2011
18886	Horn Antenna 1-18GHz	TENSOR	4105	2020	10/08/2010	10/08/2011

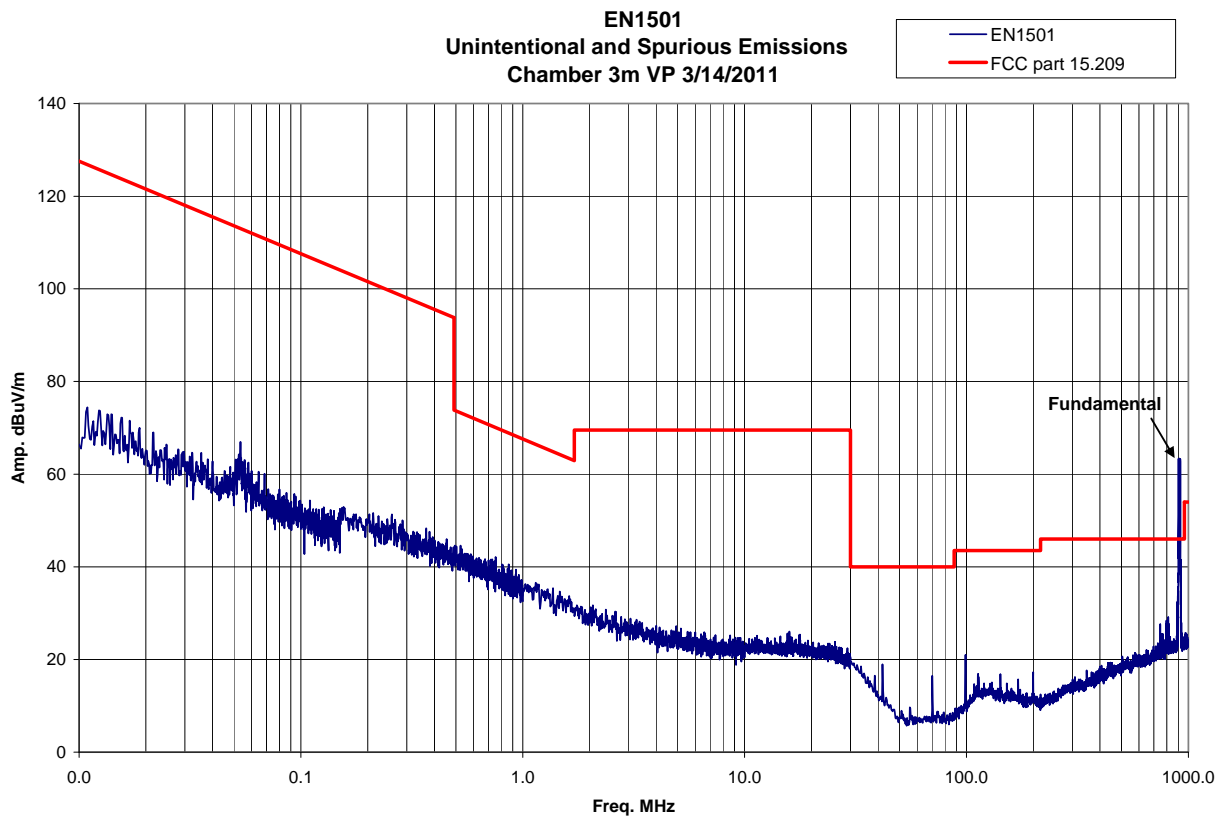
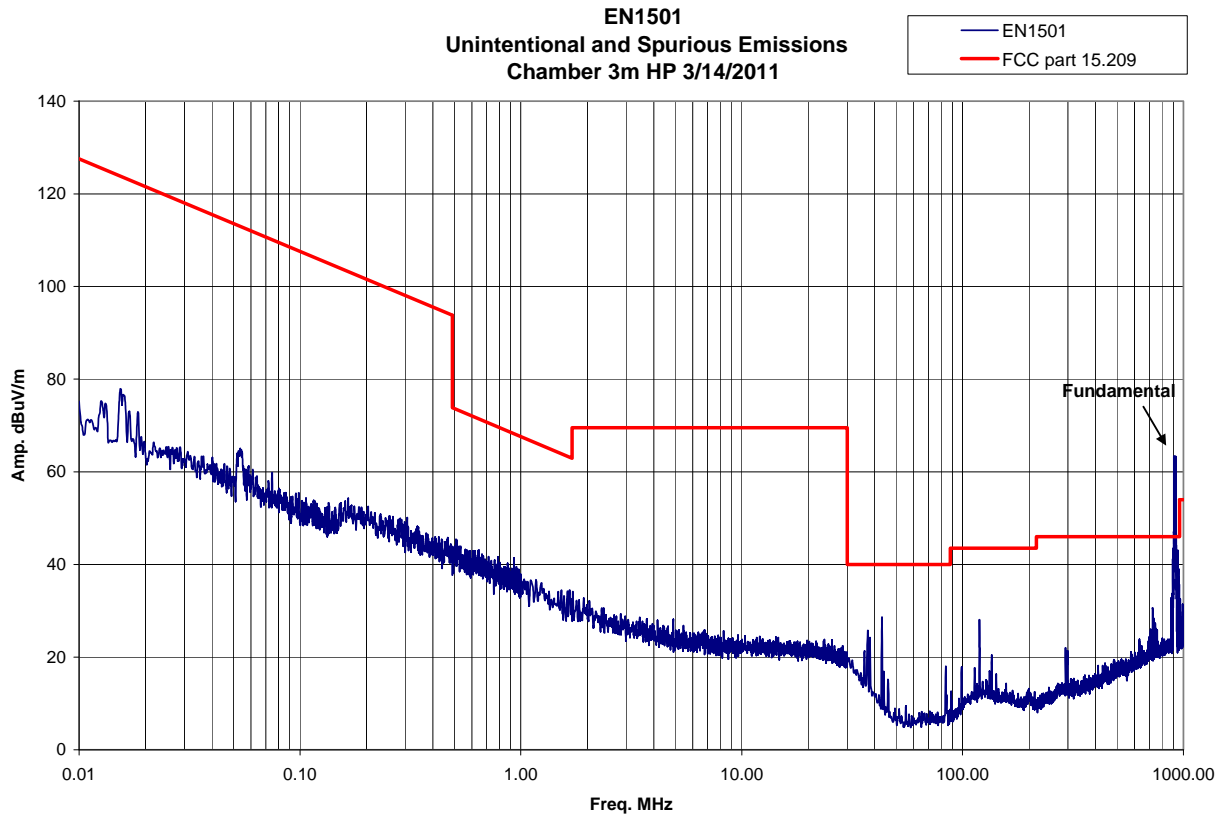
6.3 Results:

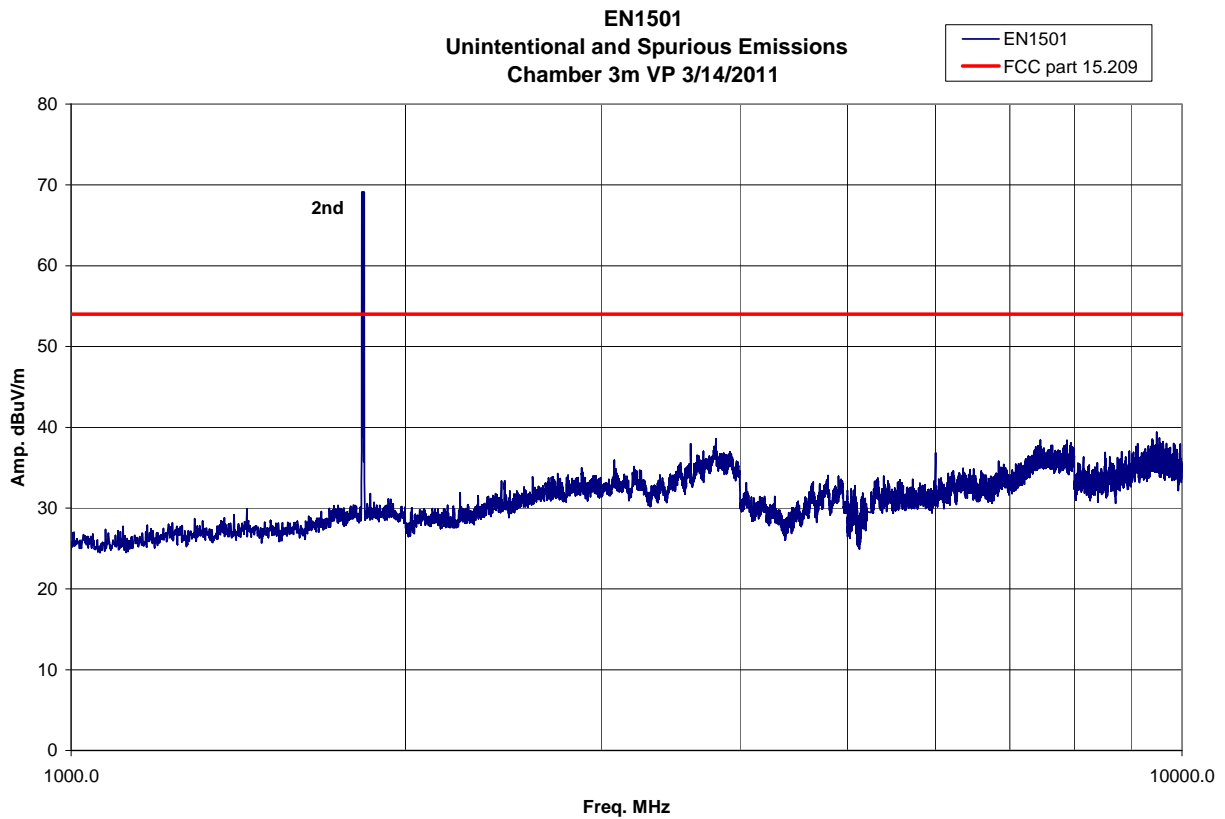
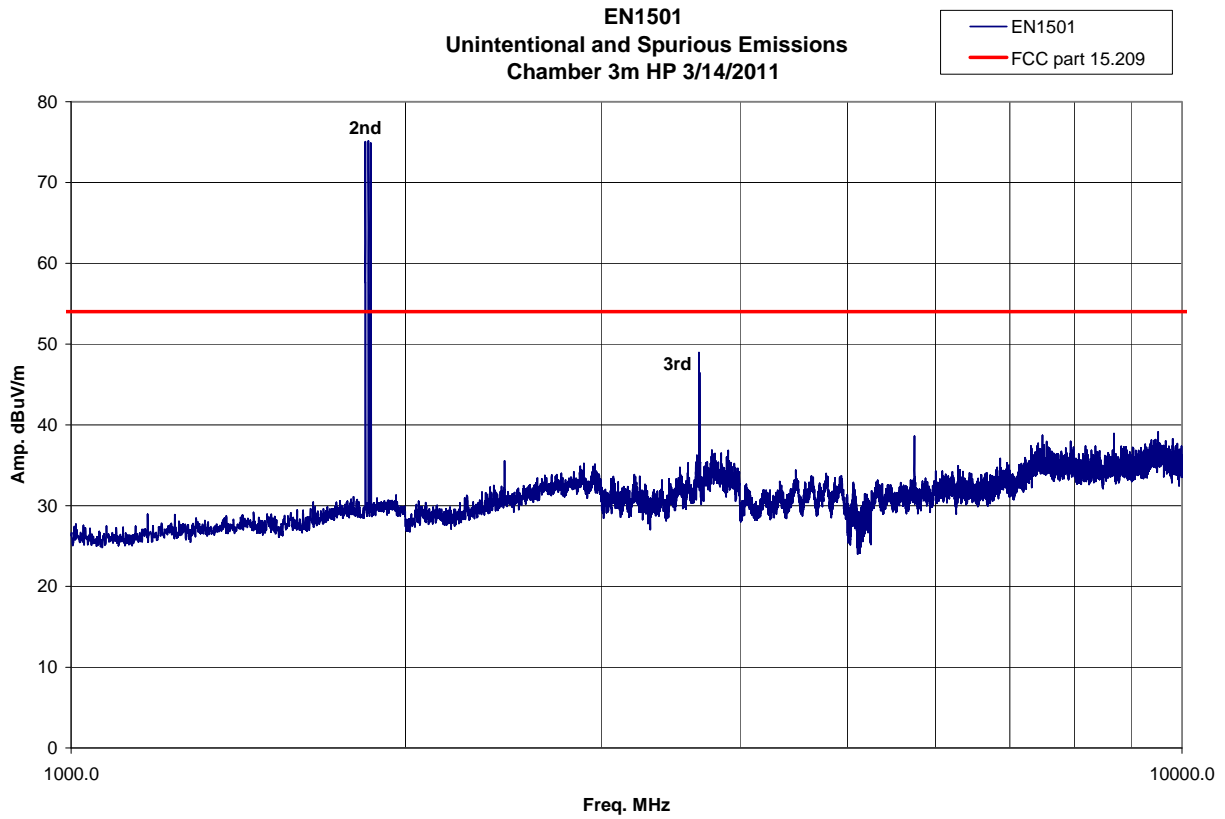
The sample tested was found to Comply.

6.4 Setup Photographs:



6.5 Plots:





6.6 Data:

Radiated Electromagnetic Emissions

Test Report #: 100356542DEN-001B	Test Area: CC1 Radiated	Temperature: 23.7 °C
Test Method: FCC Part 15.209	Test Date: 14-Mar-2011	Relative Humidity: 27.6 %
EUT Model #: EN1501	EUT Power: 3VDC Battery	Air Pressure: 81.2 kPa
EUT Serial #: 90172657		
Manufacturer: Inovonics		
EUT Description: PMT		
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
Horizontal Antenna - All signals maximized						
85.90	30.1 Qp	0.8 / 7.6 / 27.8	10.7	H / 1.9 / 112.0	-29.3	N/A
100.22	34.0 Qp	0.8 / 10.6 / 27.8	17.5	H / 1.7 / 24.0	-26.0	N/A
114.54	30.1 Qp	0.8 / 13.3 / 27.7	16.4	H / 1.9 / 60.0	-27.1	N/A
128.85	26.2 Qp	0.8 / 13.9 / 27.6	13.3	H / 1.9 / 56.0	-30.2	N/A
143.17	29.9 Qp	0.8 / 12.5 / 27.5	15.6	H / 1.6 / 84.0	-27.9	N/A
282.92	21.4 Qp	1.1 / 13.6 / 27.0	9.2	H / 1.6 / 84.0	-36.8	N/A
474.50	22.4 Qp	1.5 / 17.2 / 28.1	13.0	H / 1.6 / 84.0	-33.0	N/A
686.24	22.1 Qp	1.8 / 20.1 / 28.1	16.0	H / 1.5 / 32.0	-30.0	N/A
938.25	21.1 Qp	2.1 / 22.5 / 27.4	18.4	H / 1.5 / 32.0	-27.6	N/A
Vertical Antenna - All signals maximized						
85.90	25.1 Qp	0.8 / 7.6 / 27.8	5.7	V / 1.2 / 84.0	-34.3	N/A
42.94	32.9 Qp	0.8 / 11.6 / 28.0	17.1	V / 1.2 / 84.0	-22.9	N/A
57.27	27.4 Qp	0.8 / 7.3 / 28.0	7.5	V / 1.1 / 12.0	-32.5	N/A
71.58	34.2 Qp	0.8 / 8.0 / 27.9	15.1	V / 1.1 / 120.0	-24.9	N/A
100.22	37.1 Qp	0.8 / 10.6 / 27.8	20.7	V / 1.1 / 120.0	-22.8	N/A
114.55	27.4 Qp	0.8 / 13.3 / 27.7	13.8	V / 1.1 / 46.0	-29.7	N/A
143.17	28.0 Qp	0.8 / 12.5 / 27.5	13.8	V / 1.1 / 46.0	-29.7	N/A
200.45	30.0 Qp	0.9 / 12.1 / 27.3	15.8	V / 1.1 / 64.0	-27.7	N/A
Loop Antenna Perpendicular to EUT						
0.0320	48.4 Qp	0.0 / 12.6 / 0.0	61.0	H / 1.1 / 60.0	-56.5	N/A
0.0640	46.5 Qp	0.0 / 10.8 / 0.0	57.2	H / 1.1 / 98.0	-54.3	N/A
0.0960	41.8 Qp	0.0 / 10.5 / 0.0	52.3	H / 1.1 / 98.0	-55.7	N/A
0.128	39.8 Qp	0.0 / 10.5 / 0.0	50.3	H / 1.1 / 46.0	-55.2	N/A
0.0531	53.2 Qp	0.0 / 10.8 / 0.0	64.1	H / 1.1 / 116.0	-49.0	N/A
0.554	29.8 Qp	0.1 / 10.3 / 0.0	40.2	H / 1.1 / 12.0	-32.5	N/A
1.11	22.0 Qp	0.1 / 10.4 / 0.0	32.5	H / 1.1 / 98.0	-34.2	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	15.209 >1GHz
10.49	7.5 Qp	0.2 / 10.8 / 0.0	18.5	H / 1.1 / 98.0	-51.0	N/A
15.70	11.8 Qp	0.3 / 10.6 / 0.0	22.7	H / 1.1 / 104.0	-46.8	N/A
27.74	6.8 Qp	0.4 / 8.8 / 0.0	15.9	H / 1.1 / 104.0	-53.6	N/A
Loop Antenna Parallel to EUT						
0.0320	47.5 Qp	0.0 / 12.6 / 0.0	60.1	V / 1.1 / 46.0	-57.4	N/A
0.0531	52.2 Qp	0.0 / 10.8 / 0.0	63.0	V / 1.1 / 78.0	-50.1	N/A
0.0640	45.1 Qp	0.0 / 10.8 / 0.0	55.9	V / 1.1 / 48.0	-55.6	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	15.209 >1GHz
***** Measurement Summary *****						
100.22	37.1 Qp	0.8 / 10.6 / 27.8	20.7	V / 1.1 / 120.0	-22.8	N/A
42.94	32.9 Qp	0.8 / 11.6 / 28.0	17.1	V / 1.2 / 84.0	-22.9	N/A
71.58	34.2 Qp	0.8 / 8.0 / 27.9	15.1	V / 1.1 / 120.0	-24.9	N/A
114.54	30.1 Qp	0.8 / 13.3 / 27.7	16.4	H / 1.9 / 60.0	-27.1	N/A
938.25	21.1 Qp	2.1 / 22.5 / 27.4	18.4	H / 1.5 / 32.0	-27.6	N/A
200.45	30.0 Qp	0.9 / 12.1 / 27.3	15.8	V / 1.1 / 64.0	-27.7	N/A
143.17	29.9 Qp	0.8 / 12.5 / 27.5	15.6	H / 1.6 / 84.0	-27.9	N/A
85.90	30.1 Qp	0.8 / 7.6 / 27.8	10.7	H / 1.9 / 112.0	-29.3	N/A
686.24	22.1 Qp	1.8 / 20.1 / 28.1	16.0	H / 1.5 / 32.0	-30.0	N/A
128.85	26.2 Qp	0.8 / 13.9 / 27.6	13.3	H / 1.9 / 56.0	-30.2	N/A
0.554	29.8 Qp	0.1 / 10.3 / 0.0	40.2	H / 1.1 / 12.0	-32.5	N/A
57.27	27.4 Qp	0.8 / 7.3 / 28.0	7.5	V / 1.1 / 12.0	-32.5	N/A
474.50	22.4 Qp	1.5 / 17.2 / 28.1	13.0	H / 1.6 / 84.0	-33.0	N/A
1.11	22.0 Qp	0.1 / 10.4 / 0.0	32.5	H / 1.1 / 98.0	-34.2	N/A
282.92	21.4 Qp	1.1 / 13.6 / 27.0	9.2	H / 1.6 / 84.0	-36.8	N/A
15.70	11.8 Qp	0.3 / 10.6 / 0.0	22.7	H / 1.1 / 104.0	-46.8	N/A
0.0531	53.2 Qp	0.0 / 10.8 / 0.0	64.1	H / 1.1 / 116.0	-49.0	N/A
10.49	7.5 Qp	0.2 / 10.8 / 0.0	18.5	H / 1.1 / 98.0	-51.0	N/A
27.74	6.8 Qp	0.4 / 8.8 / 0.0	15.9	H / 1.1 / 104.0	-53.6	N/A
0.0640	46.5 Qp	0.0 / 10.8 / 0.0	57.2	H / 1.1 / 98.0	-54.3	N/A
0.128	39.8 Qp	0.0 / 10.5 / 0.0	50.3	H / 1.1 / 46.0	-55.2	N/A
0.0960	41.8 Qp	0.0 / 10.5 / 0.0	52.3	H / 1.1 / 98.0	-55.7	N/A
0.0320	48.4 Qp	0.0 / 12.6 / 0.0	61.0	H / 1.1 / 60.0	-56.5	N/A

Radiated Electromagnetic Emissions

Test Report #: 100356542DEN-001B	Test Area: CC1 Radiated	Temperature: 22.7 °C
Test Method: FCC Part 15.209	Test Date: 14-Mar-2011	Relative Humidity: 24.9 %
EUT Model #: EN1501	EUT Power: 3VDC Battery	Air Pressure: 81.2 kPa
EUT Serial #: 90172657		
Manufacturer: Inovonics		

EUT Description: PMT

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	N/A
Vertical Antenna - 1GHz to 4GHz						
1099.90	35.0 Av	2.3 / 24.2 / 37.3	24.2	V / 1.4 / 22.0	-29.8	N/A
1559.75	34.5 Av	2.8 / 25.3 / 36.8	25.8	V / 1.4 / 43.0	-28.2	N/A
2312.34	27.6 Av	3.4 / 28.1 / 37.5	21.6	V / 1.3 / 12.0	-32.4	N/A
2437.62	31.1 Av	3.5 / 28.3 / 37.7	25.2	V / 1.3 / 12.0	-28.8	N/A
3591.78	35.1 Av	4.4 / 31.7 / 37.7	33.6	V / 1.2 / 5.0	-20.4	N/A
Horizontal Antenna - 1GHz to 4GHz						
1099.90	35.0 Av	2.3 / 24.2 / 37.3	24.2	H / 1.5 / 38.0	-29.8	N/A
1559.75	34.5 Av	2.8 / 25.3 / 36.8	25.8	H / 1.5 / 49.0	-28.2	N/A
2309.59	27.6 Av	3.4 / 28.1 / 37.5	21.5	H / 1.5 / 49.0	-32.5	N/A
2437.62	30.9 Av	3.5 / 28.3 / 37.7	25.0	H / 1.4 / 23.0	-29.0	N/A
Horizontal Antenna - 4GHz to 8GHz						
4339.30	29.8 Av	4.9 / 32.4 / 38.9	28.2	H / 1.3 / 57.0	-25.8	N/A
5819.09	30.8 Av	5.7 / 34.2 / 39.0	31.6	H / 1.2 / 31.0	-22.4	N/A
Vertical Antenna 4GHz to 8GHz						
4334.20	30.4 Av	4.9 / 32.4 / 38.9	28.8	V / 1.3 / 62.0	-25.2	N/A
4909.66	32.2 Av	5.2 / 33.4 / 39.2	31.7	V / 1.2 / 12.0	-22.3	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 *****						
3591.78	35.1 Av	4.4 / 31.7 / 37.7	33.6	V / 1.2 / 5.0	-20.4	N/A
4909.66	32.2 Av	5.2 / 33.4 / 39.2	31.7	V / 1.2 / 12.0	-22.3	N/A
5819.09	30.8 Av	5.7 / 34.2 / 39.0	31.6	H / 1.2 / 31.0	-22.4	N/A
4334.20	30.4 Av	4.9 / 32.4 / 38.9	28.8	V / 1.3 / 62.0	-25.2	N/A
4339.30	29.8 Av	4.9 / 32.4 / 38.9	28.2	H / 1.3 / 57.0	-25.8	N/A
1559.75	34.5 Av	2.8 / 25.3 / 36.8	25.8	H / 1.5 / 49.0	-28.2	N/A
2437.62	31.1 Av	3.5 / 28.3 / 37.7	25.2	V / 1.3 / 12.0	-28.8	N/A
1099.90	35.0 Av	2.3 / 24.2 / 37.3	24.2	H / 1.5 / 38.0	-29.8	N/A
2312.34	27.6 Av	3.4 / 28.1 / 37.5	21.6	V / 1.3 / 12.0	-32.4	N/A
2309.59	27.6 Av	3.4 / 28.1 / 37.5	21.5	H / 1.5 / 49.0	-32.5	N/A

Example calculation for Unintentional Radiated Emissions:

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

Deviations, Additions, or Exclusions: None

7 Measurement Uncertainty

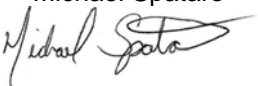
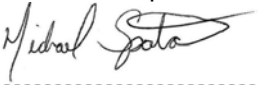
The measured value related to the corresponding limit will be used to decide whether the equipment meets the requirements.

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	
Disturbance Power 30 to 1000 MHz	3.3 dB	
Telecom Port Conducted emissions, Voltage 150 kHz to 30 MHz	TBD	In Process
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	

8 Revision History

Revision Level	Date	Report Number	Notes
1	3/16/2011	100356542DEN-001B	<p>This report is an update of report number: 3144931DEN-004A</p> <p>Additional testing was performed for unintentional and spurious emissions. Also, validation for the latest version of RSS-210 was performed.</p> <p style="text-align: right;">Michael Spataro </p>
2	3/18/2011	100356542DEN-001B	<p>Changed product description on pg. 4 and change duty cycle correction on page 9 to a percentage.</p> <p style="text-align: right;">Michael Spataro </p>