RHEIN TECH LABORATORIES, INC.

Engineering Solutions & Electromagnetic Compatibility Services

FCC Part 15.247 Certification Report

Test Lab:	Applicant:
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FCC ID	SP8-FAP4215-050	**Test Report Date**	January 21, 2013
Platform	N/A	**RTL Work Order Number**	2012367
Model #	FAP4215-050	**RTL Quote Number**	QRTL12-367A
American National Standards Institute	ANSI C63.4-2003: Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz; ANSI C63.10-2009: American National Standard for Testing Unlicensed Wireless Devices		
FCC Classification	DTS – Part 15 Digital Transmission System		
FCC Rule Part(s)	FCC Rules Part 15.247: Operation within the bands 920-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz Direct Sequence System (10-01-12)		

Frequency Range (MHz)	Output Power (W)	Frequency Tolerance	Emission Designator
903 – 927	0.019	N/A	N/A

I, the undersigned, hereby declare that the equipment tested and referenced in this report conforms to the identified standard(s) as described in this test report. No modifications were made to the equipment during testing in order to achieve compliance with these standards. Furthermore, there was no deviation from, additions to, or exclusions from, the applicable parts of FCC Part 2, FCC Part 15, and ANSI C63.4 & C63.10.

Signature: _____ Date: January 21, 2013

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

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

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1 General Information

1.1 Scope

FCC Rules Part 15.247: Frequency Hopping, Direct Spread Spectrum and Hybrid Systems that are in operation within the bands of 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz.

1.2 Description of EUT

Equipment Under Test	Portable Mesh Node (PMN)
Model #	FAP4215-050
Power Supply	External AC adapter or internal battery operation
Modulation Type	2-FSK
Frequency Range	903 – 927 MHz
Antenna Connector Type	N
Antenna Types	2.1 dBi Omni, 11 dBi Yagi

1.3 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data is located at 360 Herndon Parkway, Suite 1400, Herndon, Virginia 20170. This site has been fully described in a report and approved by the Federal Communications Commission to perform AC line conducted and radiated emissions testing (ANSI C63.4 2003).

1.4 Related Submittal(s)/Grant(s)

This is an original application for certification for Innovative Wireless Technologies, Inc. Model # FAP4215-050, Portable Mesh Node (PMN), FCC ID: SP8-FAP4215-050.

1.5 Modifications

No modifications were required for compliance.

2 Test Information

2.1 Description of Test Modes

In accordance with FCC 15.31(m), and because the EUT utilizes an operating band greater than 10 MHz, the following frequencies were tested:

Table 2-1: Frequencies Tested

Channel	Frequency
Low	903.0
Mid	915.0
High	927.0

2.2 Exercising the EUT

The EUT was tested in all three orthogonal planes in order to determine worst-case emissions. The EUT was provided with software to continuously transmit during testing. The carrier was also checked to verify that information was being transmitted. There were no deviations from the test standard(s) and/or methods. The test results reported relate only to the item tested.

2.3 Test Result Summary

Table 2-2: Test Result Summary – FCC Part 15, Subpart C (Section 15.247)

FCC Reference	C63.10 Procedure	Test	Pass/Fail or N/A
FCC 15.207	6.2	AC Power Conducted Emissions	Pass
FCC 15.209	6.5, 6.6	Radiated Emissions	Pass
FCC 15.247(b)	6.10	Maximum Peak Power Output	Pass
FCC 15.247(d)	6.7	Antenna Conducted Spurious Emissions	Pass
FCC 15.247(d)	6.9.2	Band Edge	Pass
FCC 15.247(a)(2)	6.9.1	6 dB Bandwidth	Pass
FCC 15.247(e)	6.11	Power Spectral Density	Pass

2.4 Test System Details

The test samples were received on January 11, 2013. The FCC identifiers for all applicable equipment, plus descriptions of all cables used in the tested system, are identified in the following tables.

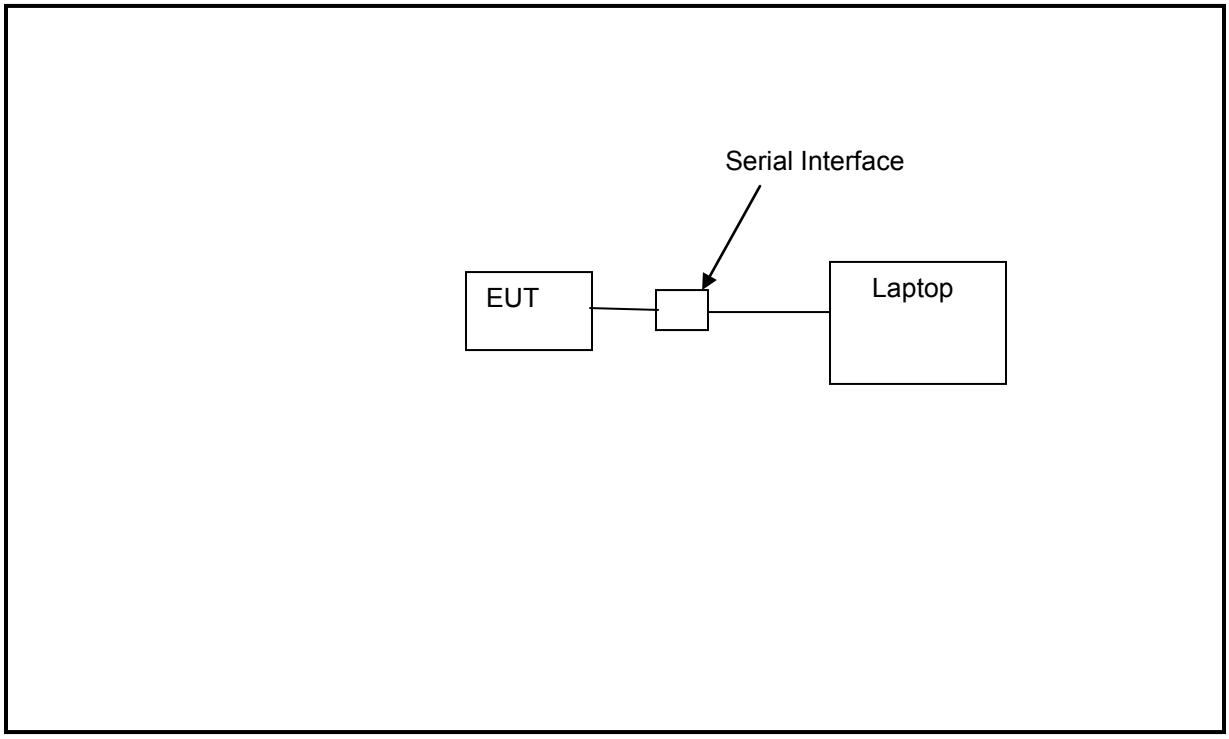
Table 2-3: Equipment Under Test

Part	Manufacturer	Model #	Serial Number	FCC ID	RTL Bar Code
Portable Mesh Node (PMN)	Innovative Wireless Technologies, Inc.	FAP4215-050	N/A	SP8-FAP4215-050	20965
Dual Yagi Antenna/Dual Combiner (PD2021) (20' shielded cable)	N/A	N/A	N/A	N/A	20966
Omni Antenna	N/A	N/A	N/A	N/A	20967
AC Adapter (11' unshielded power)	Empower	JA-64-08	A140451501-0000	N/A	20970

Table 2-4: Associated Auxiliary Equipment

Part	Manufacturer	Model #	Serial Number	FCC ID	RTL Bar Code
Serial Cable/Ribbon Adapter (11' unshielded)	N/A	N/A	N/A	N/A	20968
Laptop	Dell	Inspiron 600M	OG5152-48643-485-4200	N/A	20969
Laptop AC Adapter	Dell	PA-1900-0103	ODF266-71615-76L-1578	N/A	20971

2.5 Configuration of Tested System



3 Peak Output Power – FCC 15.247(b)(3)

3.1 Power Output Test Procedure

A conducted power measurement of the EUT was taken using an Agilent spectrum analyzer.

Procedure: C63.10-2009 6.10

Table 3-1: Power Output Test Equipment

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901583	Agilent Technologies	N9010A	EXA Signal Analyzer (10 Hz-26.5 GHz)	MY51250846	3/13/13
901594	Insulated Wire Inc.	KPS-1503-360-KPR	SMK RF Cables 36”	NA	8/16/13
901522	Harris Corporation	2082-6174-20	20 dB Attenuator (2W, DC-4GHz)	N/A	12/14/13

3.2 Power Output Test Data

Table 3-2: Power Output Test Data

Frequency (MHz)	Peak Conducted Power (dBm)
903.0	11.8
915.0	12.7
927.0	12.8

*control software setting = 13

Test Personnel:

Daniel W. Baltzell		January 16, 2013
EMC Test Engineer	Signature	Date of Test

4 Band Edge Compliance of RF Conducted Emissions – FCC 15.247(d)

4.1 Band Edge Test Procedure

Procedure: C63.10-2009 6.9.2, 6.9.3

The EUT was connected to the spectrum analyzer through suitable attenuation. The span was set wide enough to capture the peak level of the emission operating on the channel closest to the band edge, as well as any modulation products which fall outside of the authorized band of operation. The spectrum analyzer was set to the following:

RBW > = 1% of the span
VBW > = RBW
Sweep = auto
Detector function = peak
Trace = max hold

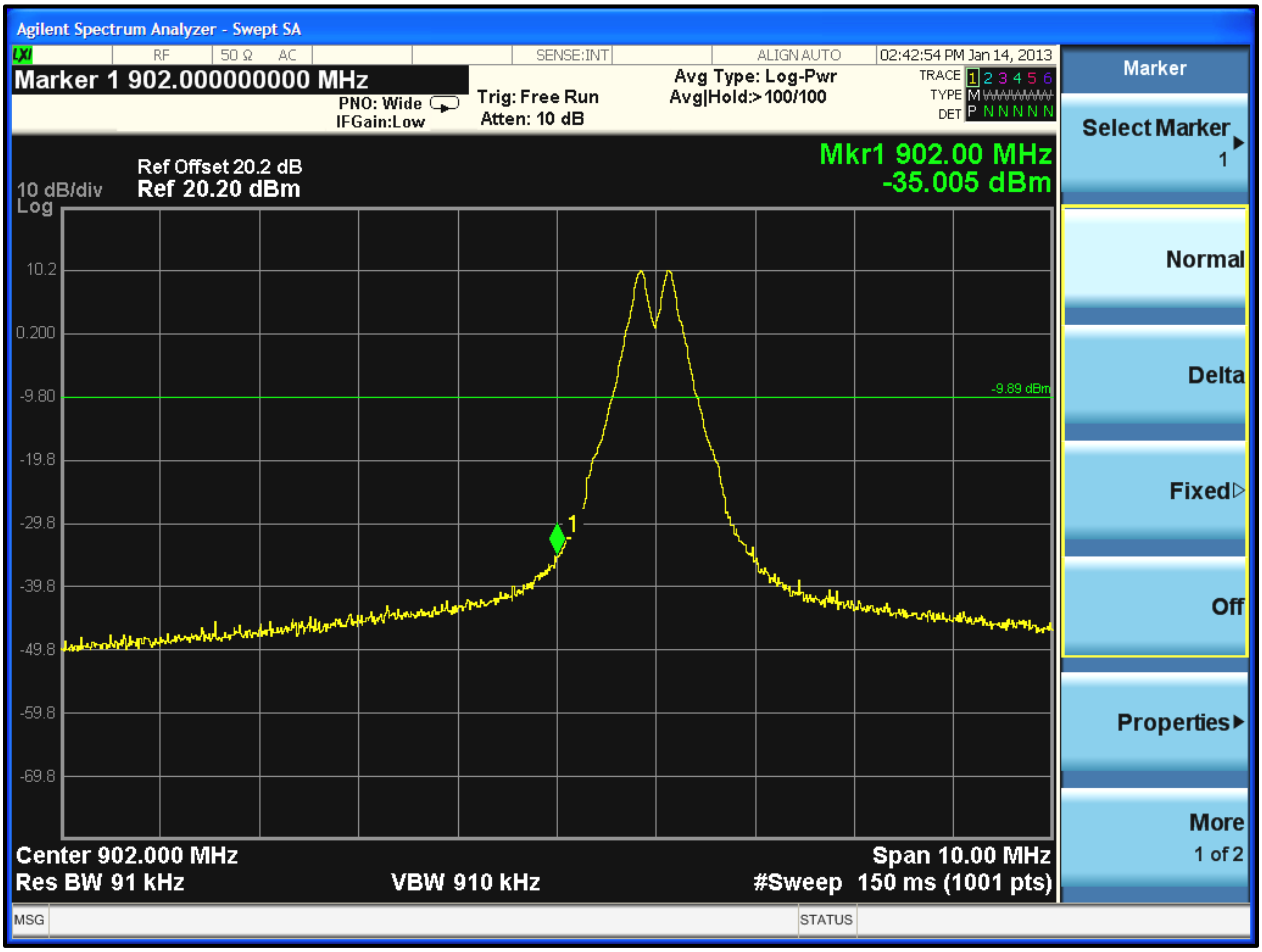
The trace was allowed to stabilize. The marker was set on the emission at the band edge. The marker-delta was used to show the delta between the maximum in-band emission and the emission at the band edge, and was compared to the 20 dBc requirement of 15.247(d) (when using peak emissions).

Table 4-1: Band Edge Test Equipment

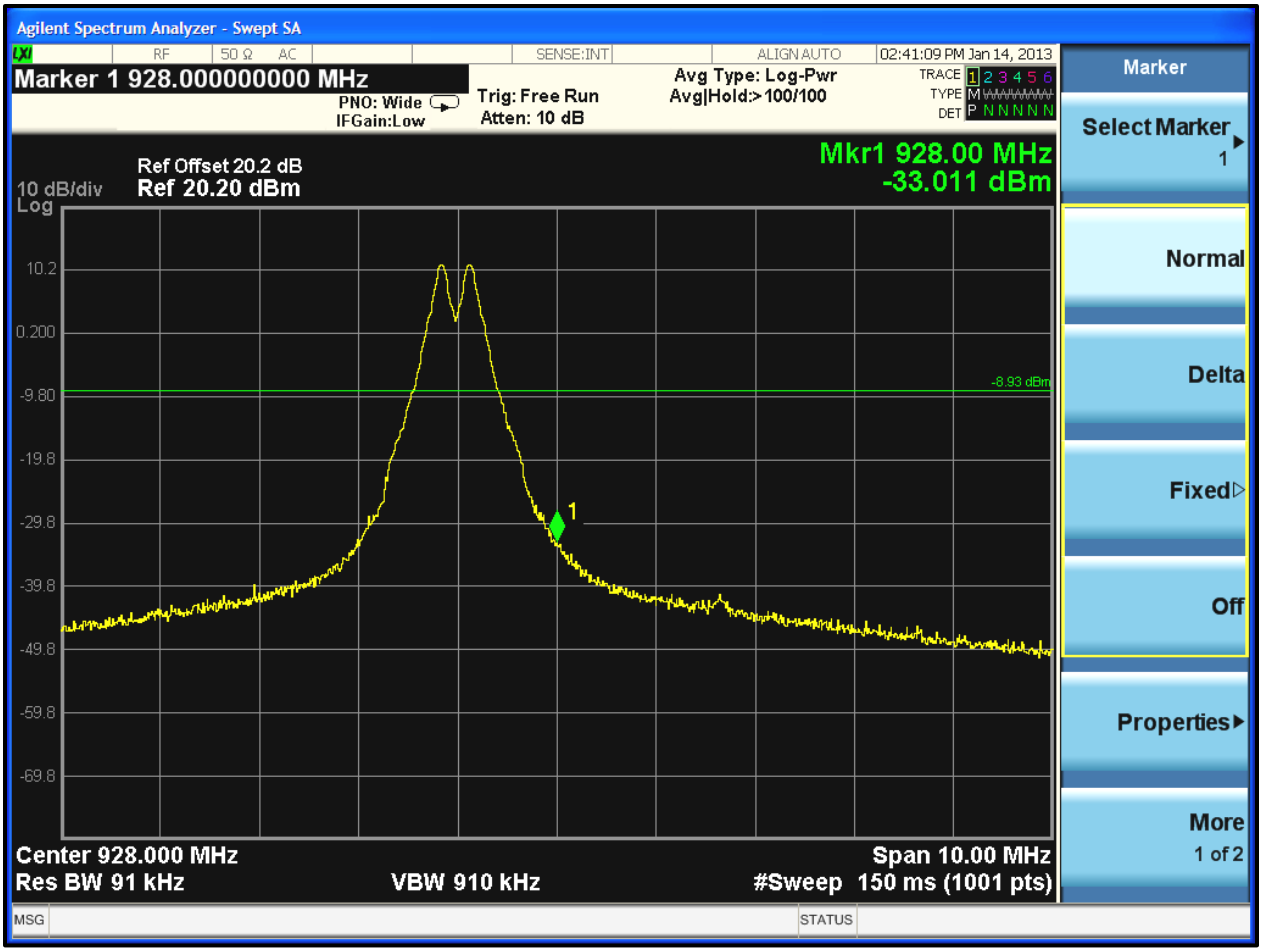
RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901583	Agilent Technologies	N9010A	EXA Signal Analyzer (10 Hz-26.5 GHz)	MY51250846	3/13/13
901594	Insulated Wire Inc.	KPS-1503-360-KPR	SMK RF Cables 36”	NA	8/16/13
901522	Harris Corporation	2082-6174-20	20 dB Attenuator (2W, DC-4GHz)	N/A	12/14/13

4.2 Band Edge Test Results

Plot 4-1: Lower Band Edge - 902 MHz Band Edge, 903.0 MHz Carrier



Plot 4-2: Upper Band Edge - 928 MHz Band Edge, 927.0 MHz Carrier



Test Personnel:

Daniel W. Baltzell		January 14, 2013
EMC Test Engineer	Signature	Date of Test

5 Antenna Conducted Spurious Emissions – FCC 15.247(d)

5.1 Antenna Conducted Spurious Emissions Test Procedures

Procedure: C63.10-2009 6.7

Antenna spurious emissions per FCC 15.247(d) were measured from the EUT antenna port using a 50-ohm spectrum analyzer with the resolution bandwidth set at 100 kHz, and the video bandwidth set at 100 kHz. The modulated carrier was identified at the following frequencies: 903.0 MHz, 915 MHz and 927.0 MHz. The carrier to the 10th harmonic of the carrier frequency was investigated.

5.2 Antenna Conducted Spurious Emissions Test Results

All spurious emissions were greater than 20 dB below the limit (note that we are reporting power as peak). Per FCC 15.31(o), no data is being reported.

Table 5-1: Antenna Conducted Spurious Emissions Test Equipment

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901583	Agilent Technologies	N9010A	EXA Signal Analyzer (10 Hz-26.5 GHz)	MY51250846	3/13/13
901594	Insulated Wire Inc.	KPS-1503-360-KPR	SMK RF Cables 36”	NA	8/16/13
901522	Harris Corporation	2082-6174-20	20 dB Attenuator (2W, DC-4GHz)	N/A	12/14/13

Test Personnel:

Daniel W. Baltzell		January 14, 2013
EMC Test Engineer	Signature	Date of Test

6 6 dB Bandwidth – FCC 15.247(a)(2)

6.1 6 dB Bandwidth Test Procedure – Minimum 6 dB Bandwidth

Procedure: C63.10-2009 6.9

The minimum 6 dB bandwidths per FCC 15.247(a)(2) were measured using a 50-ohm spectrum analyzer with the resolution bandwidth set at 100 kHz, and the video bandwidth set at 300 kHz. The device was modulated. The minimum 6 dB bandwidths are presented below.

Table 6-1: 6 dB Bandwidth Test Equipment

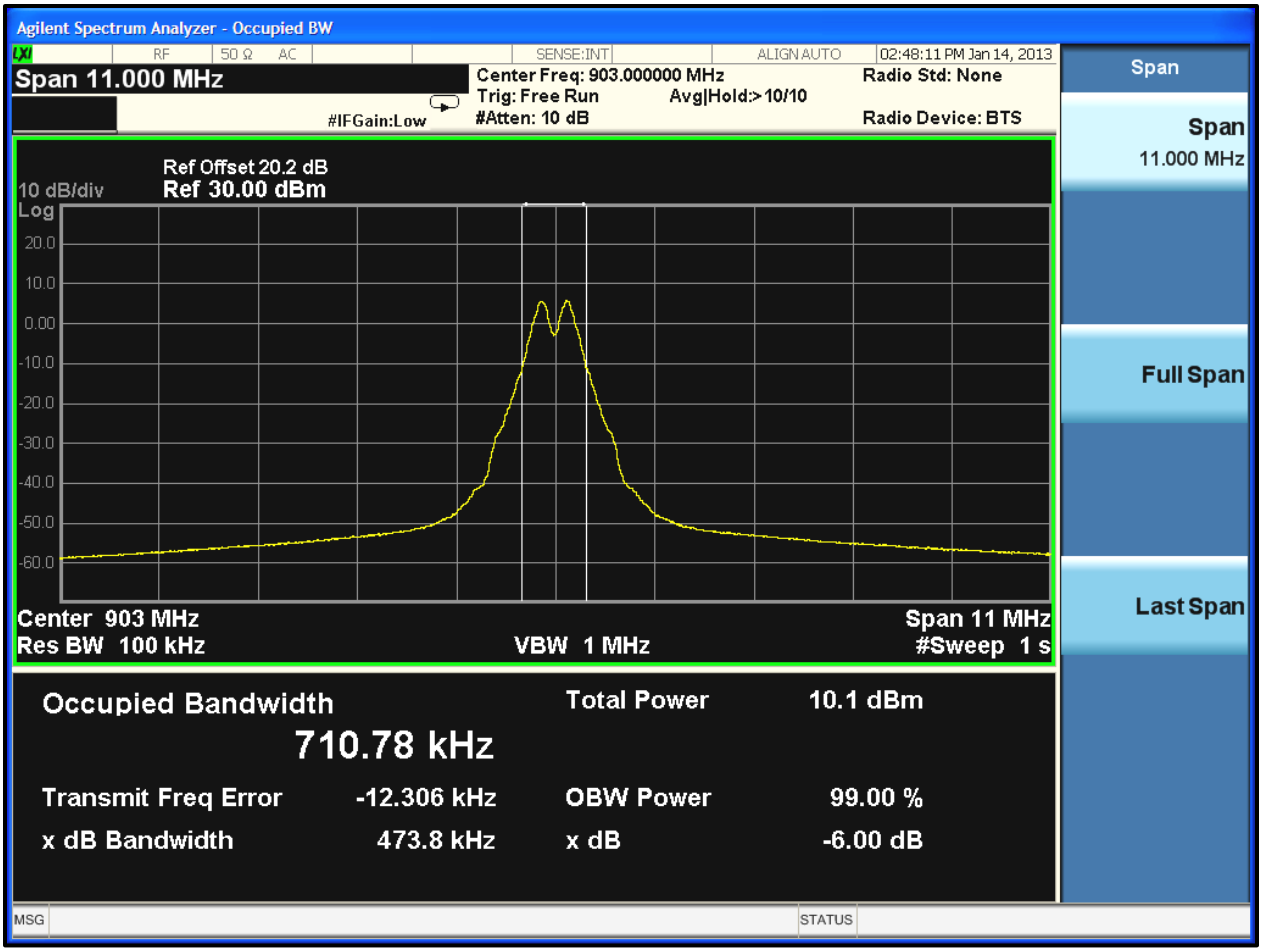
RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901583	Agilent Technologies	N9010A	EXA Signal Analyzer (10 Hz-26.5 GHz)	MY51250846	3/13/13
901594	Insulated Wire Inc.	KPS-1503-360-KPR	SMK RF Cables 36”	NA	8/16/13
901522	Harris Corporation	2082-6174-20	20 dB Attenuator (2W, DC-4GHz)	N/A	12/14/13

6.2 6 dB Bandwidth Test Results

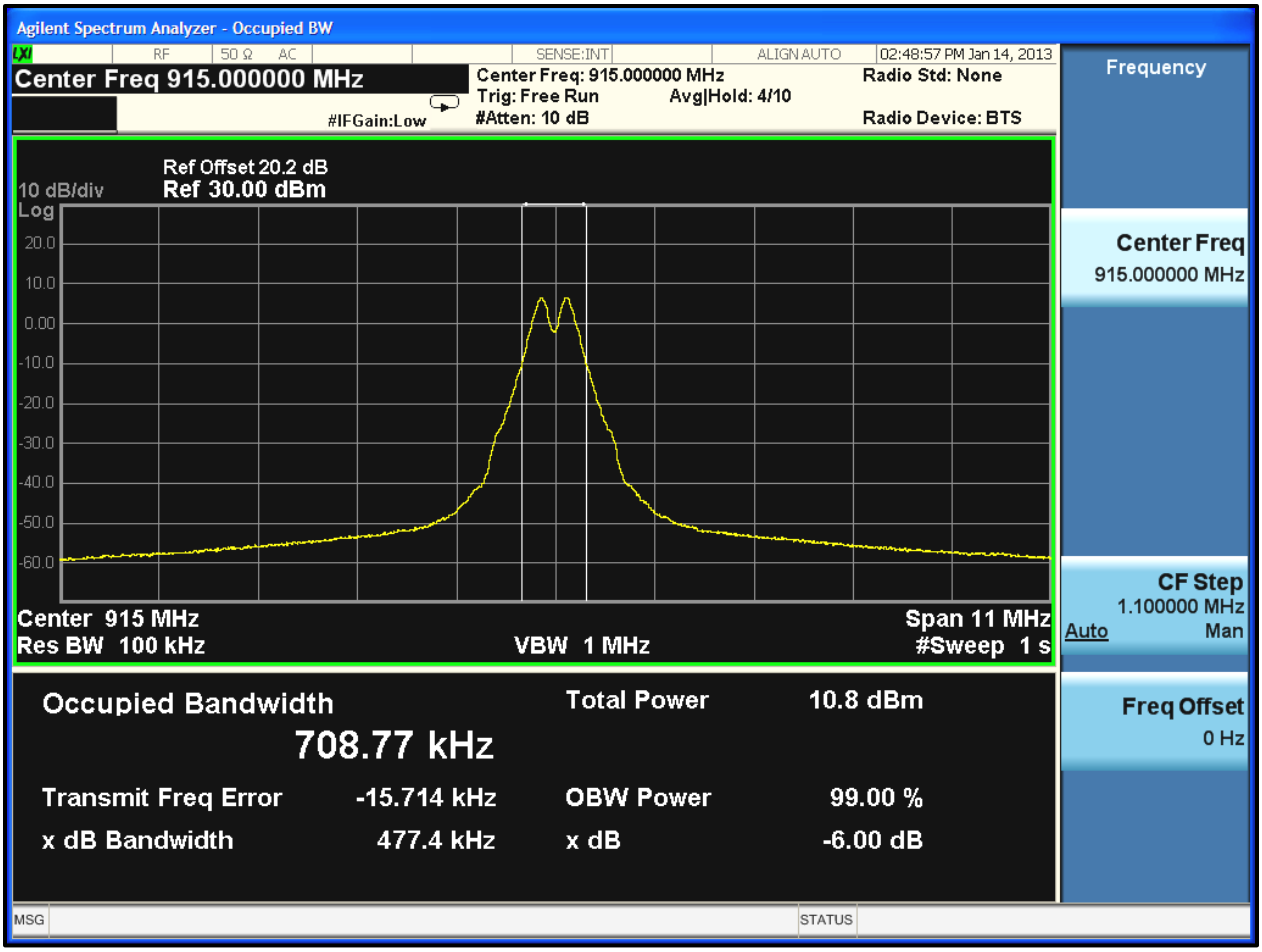
Table 6-2: 6 dB Bandwidth Test Data

Frequency (MHz)	6 dB Bandwidth (kHz)	Minimum Limit (kHz)	Pass/Fail
903.0	473.8	500	Pass
915.0	477.4	500	Pass
927.0	470.6	500	Pass

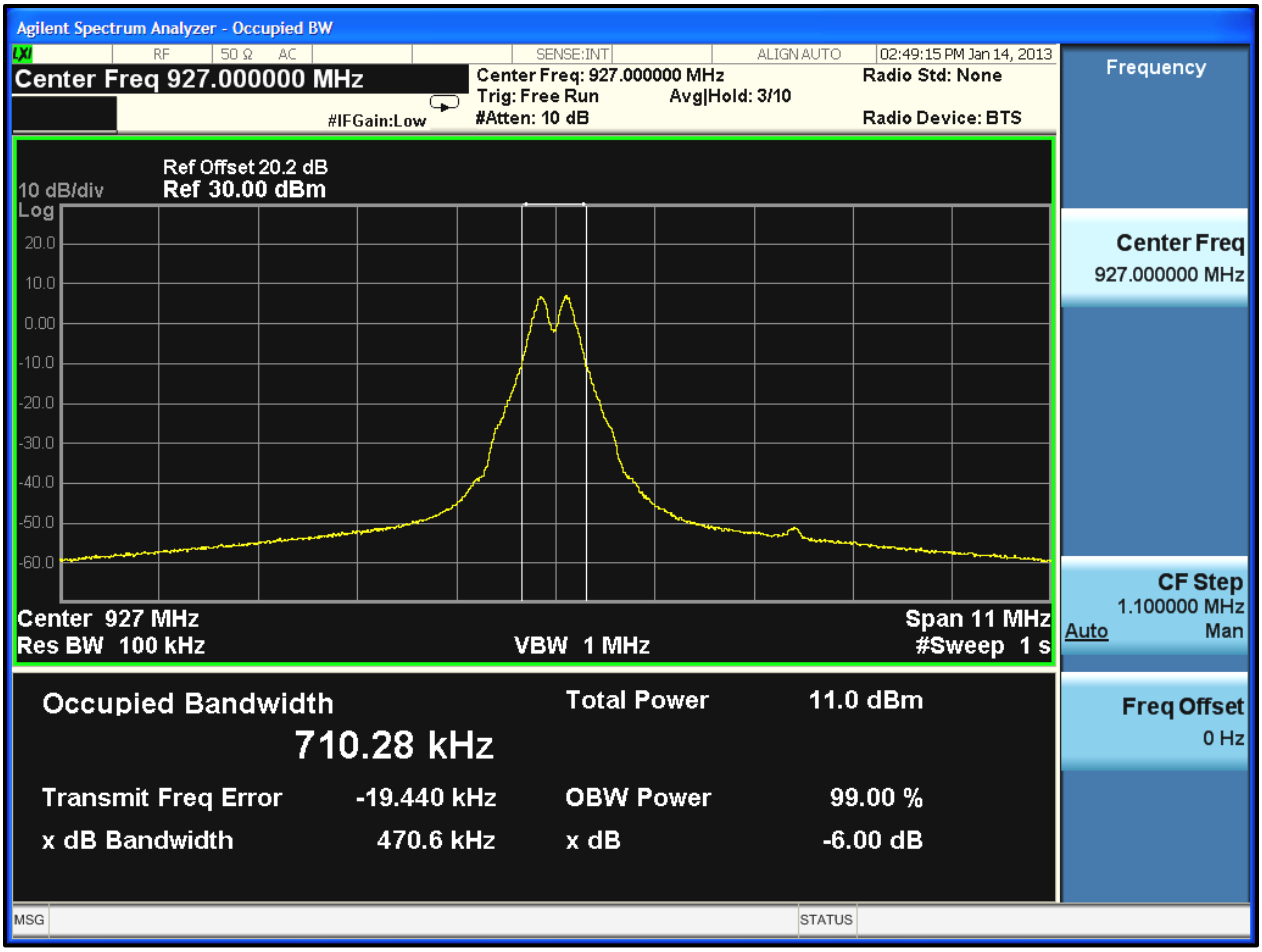
Plot 6-1: 6 dB Bandwidth – 903.0 MHz



Plot 6-2: 6 dB Bandwidth – 915.0 MHz



Plot 6-3: 6 dB Bandwidth – 927.0 MHz



Test Personnel:

Daniel W. Baltzell	Daniel W. Baltzell	January 14, 2013
EMC Test Engineer	Signature	Date of Test

7 Power Spectral Density – FCC 15.247(e)

7.1 Power Spectral Density Test Procedure

Procedure: C63.10-2009 6.11.2

The power spectral density per FCC 15.247(d) was measured using a 50-ohm spectrum analyzer with the resolution bandwidth set at 3 kHz, the video bandwidth set at 10 kHz, and the sweep time set at 100 seconds. The spectral lines were resolved for the modulated carriers at 903.0, 915.0 and 927.0 MHz. These levels are below the +8 dBm limit. See the power spectral density table and plots that follow.

Table 7-1: Power Spectral Density Test Equipment

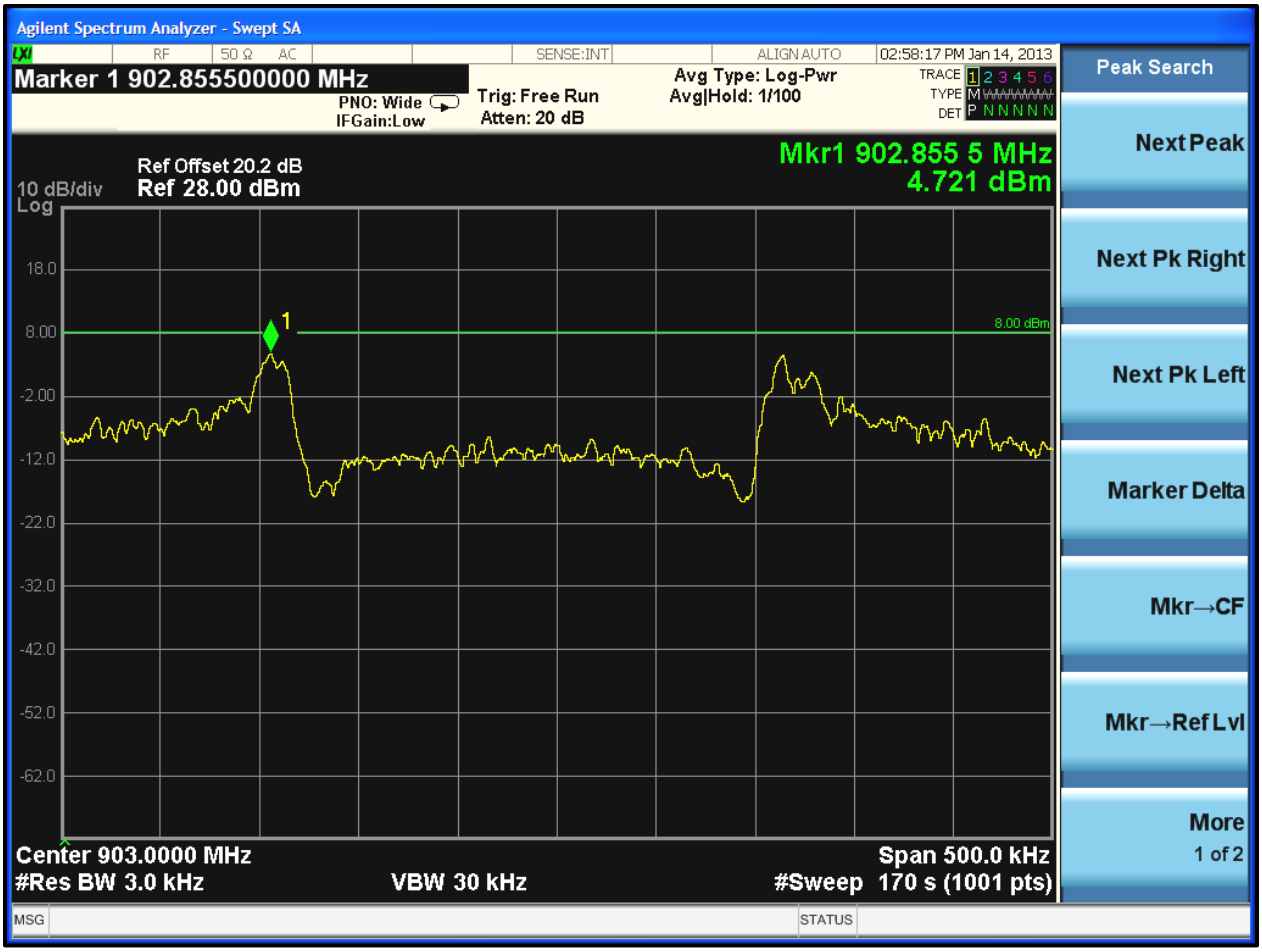
RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901583	Agilent Technologies	N9010A	EXA Signal Analyzer (10 Hz-26.5 GHz)	MY51250846	3/13/13
901594	Insulated Wire Inc.	KPS-1503-360-KPR	SMK RF Cables 36”	NA	8/16/13
901522	Harris Corporation	2082-6174-20	20 dB Attenuator (2W, DC-4GHz)	N/A	12/14/13

7.2 Power Spectral Density Test Data

Table 7-2: Power Spectral Density Test Data

Frequency (MHz)	RF Power Level (dBm)	Maximum Limit +8 dBm	Pass/Fail
903.0	4.7	8	Pass
915.0	5.5	8	Pass
927.0	5.7	8	Pass

Plot 7-1: Power Spectral Density – 903.0 MHz



Plot 7-2: Power Spectral Density – 915.0 MHz

Plot 7-3: Power Spectral Density – 927.0 MHz

Test Personnel:

Daniel W. Baltzell		January 14, 2013
EMC Test Engineer	Signature	Date of Test

8 Conducted Emissions Measurement Limits – FCC 15.207

8.1 Test Methodology for Conducted Line Emissions Measurements

The power line conducted emission measurements were performed in a Series 81 type shielded enclosure manufactured by Rayproof. The EUT was assembled on a wooden table 80 centimeters high. Power was fed to the EUT through a 50 ohm / 50 microhenry Line Impedance Stabilization Network (EUT LISN). The EUT LISN was fed power through an A.C. filter box on the outside of the shielded enclosure. The filter box and EUT LISN housing are bonded to the ground plane of the shielded enclosure. A second LISN, the peripheral LISN, provides isolation for the EUT test peripherals. This peripheral LISN was also fed A.C. power. A metal power outlet box, which is bonded to the ground plane and electrically connected to the peripheral LISN, powers the EUT host peripherals.

The spectrum analyzer was connected to the A.C. line through an isolation transformer. The 50-ohm output of the EUT LISN was connected to the spectrum analyzer input through a Solar high-pass filter. The filter is used to prevent overload of the spectrum analyzer from noise below 100 kHz. Conducted emission levels were measured on each current-carrying line with the spectrum analyzer operating in the CISPR quasi-peak mode (or peak mode if applicable). The analyzer's 6 dB bandwidth was set to 9 kHz. No video filter less than 10 times the resolution bandwidth was used. Average measurements are performed in linear mode using a 10 kHz resolution bandwidth, a 1 Hz video bandwidth, and by increasing the sweep time in order to obtain a calibrated measurement. The emission spectrum was scanned from 150 kHz to 30 MHz. The highest emission amplitudes relative to the appropriate limit were measured and have been recorded in this report.

8.2 Conducted Line Emissions Test Procedure

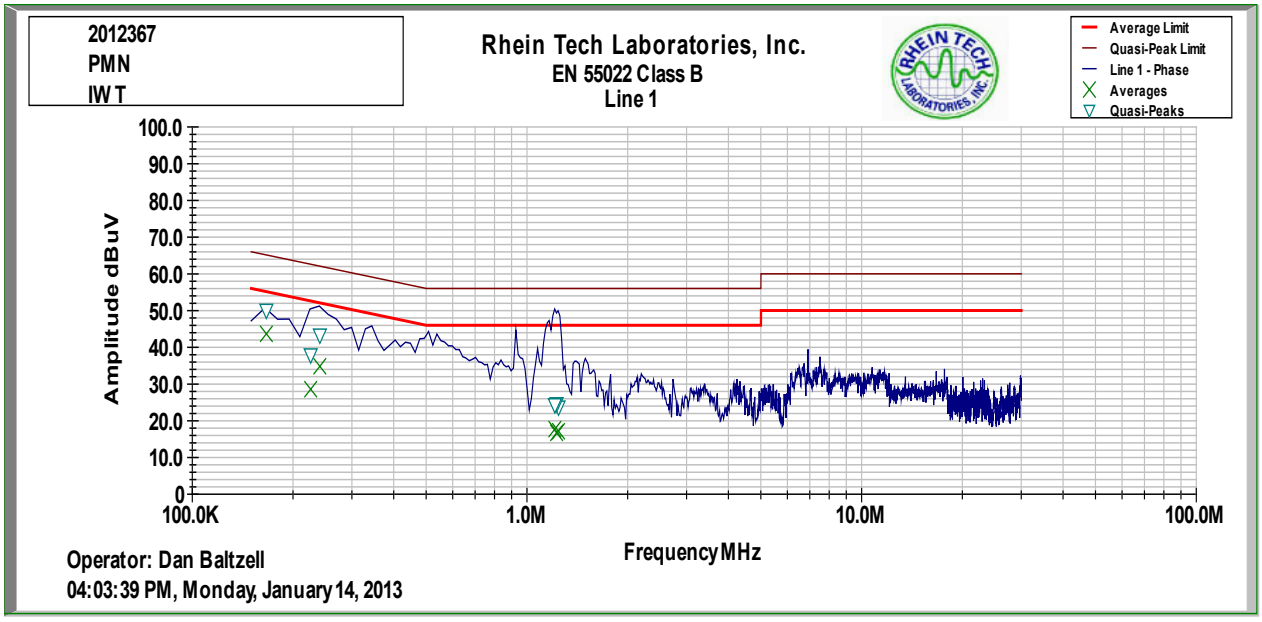
The conducted test was performed with the EUT exercise program loaded, and the emissions were scanned between 150 kHz to 30 MHz on the NEUTRAL SIDE and PHASE SIDE.

Table 8-1: Conducted Line Emissions Test Equipment

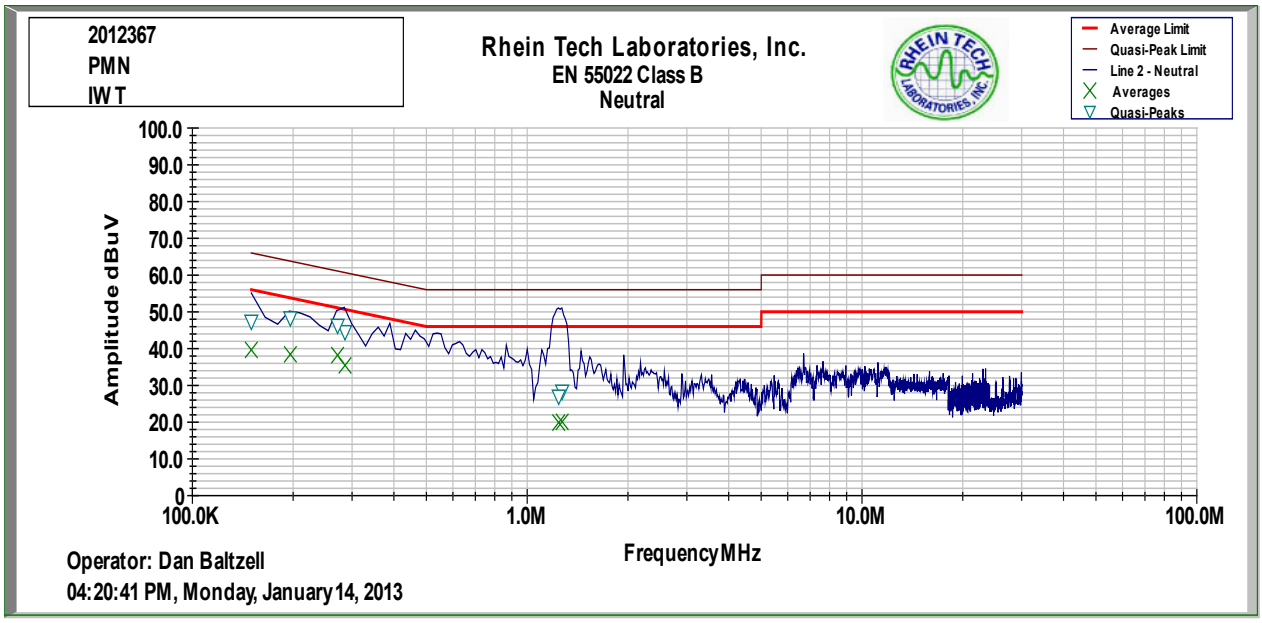
RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901083	AFJ international	LS16	16A LISN	16010020080	4/18/13
900968	Hewlett Packard	8567A	Spectrum Analyzer (10 kHz-1.5 GHz)	2602A00160	2/7/14
900339	Hewlett Packard	85650A	Quasi-Peak Adapter (30 Hz-1 GHz)	2521A00743	2/7/14
900970	Hewlett Packard	85662A	Spectrum Analyzer Display	2542A11239	2/7/14

8.3 Conducted Line Emissions Test Data

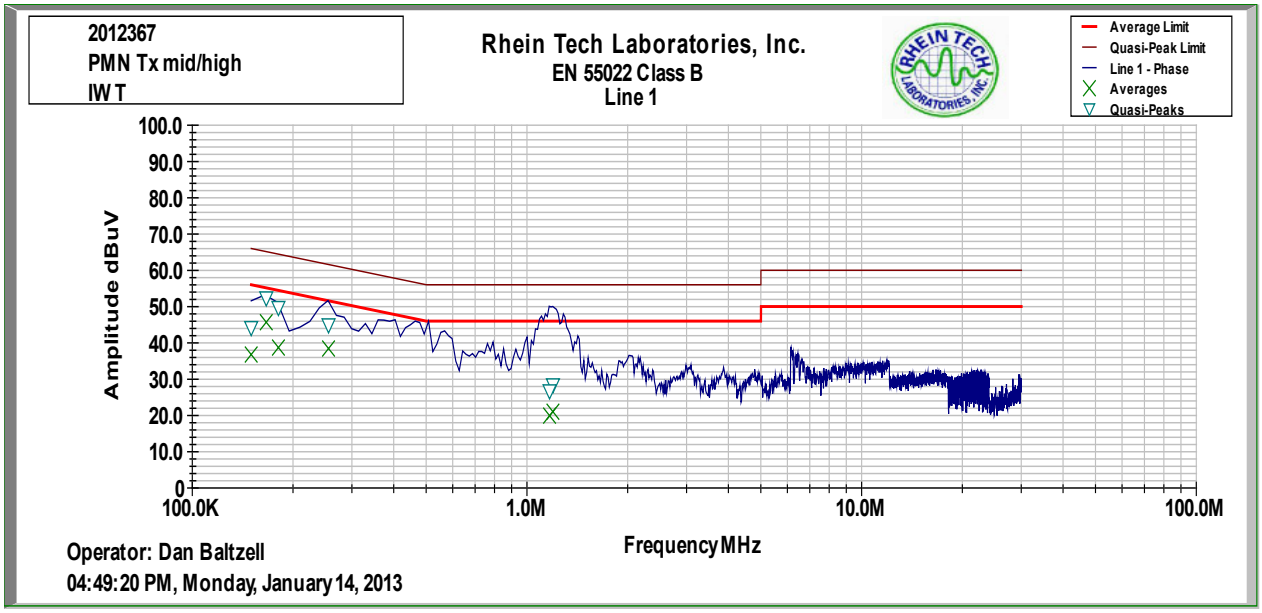
Plot 8-1: Conducted Emissions (Phase Side); Mode: Transmit Omni Antenna



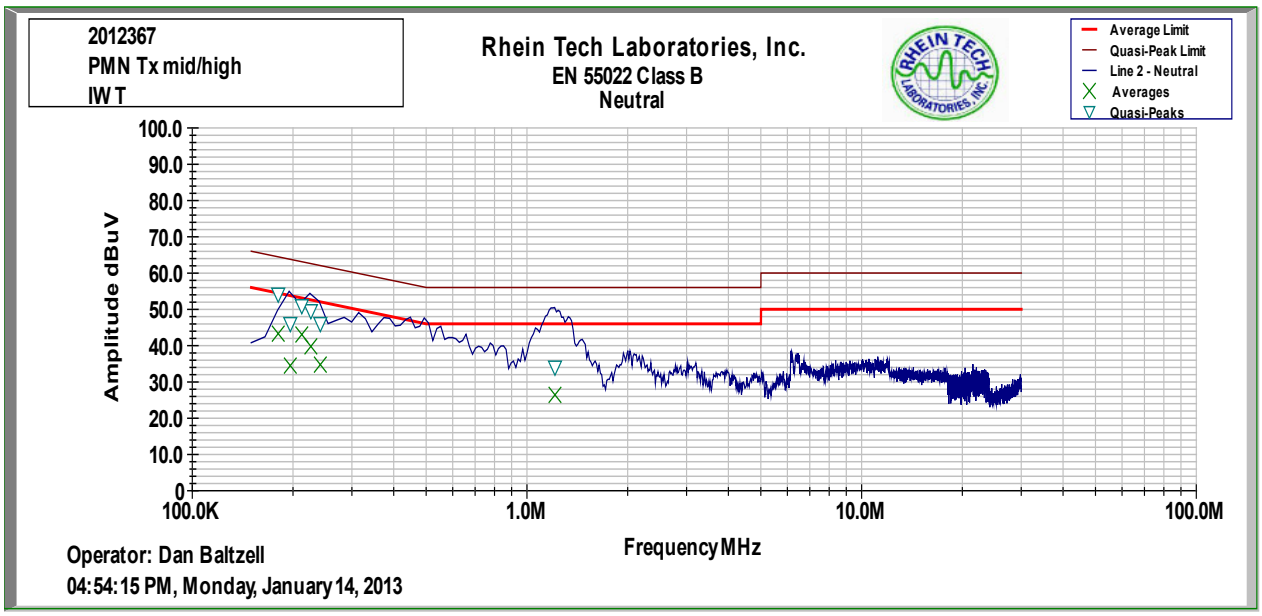
Plot 8-2: Conducted Emissions (Neutral Side); Mode: Transmit Omni Antenna



Plot 8-3: Conducted Emissions (Phase Side); Mode: Transmit Yagi Antenna



Plot 8-4: Conducted Emissions (Neutral Side); Mode: Transmit Yagi Antenna



Test Personnel:

Daniel W. Baltzell	Daniel W. Baltzell	January 14, 2013
EMC Test Engineer	Signature	Date of Test

9 Radiated Emissions – FCC 15.209

9.1 Limits of Radiated Emissions Measurement

Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
0.009-0.490	2400/f (kHz)	300
0.490-1.705	2400/f (kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

As shown in 15.35(b), for frequencies above 1000 MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20 dB under any circumstances of modulation.

9.2 Radiated Emissions Measurement Test Procedure

Procedure: C63.10-2009 6.5, 6.6

Before final measurements of radiated emissions were made on the open-field three/ten meter range, the EUT was scanned indoors at one and three meter distances. This was done in order to determine its emissions spectrum signature. The physical arrangement of the test system and associated cabling was varied in order to determine the effect on the EUT's emissions in amplitude, direction and frequency. This process was repeated during final radiated emissions measurements on the open-field range, at each frequency, in order to ensure that maximum emission amplitudes were attained.

Final radiated emissions measurements were made on the three/ten-meter, open-field test site. The EUT was placed on a nonconductive turntable 0.8 meters above the ground plane. The spectrum was examined from 9 kHz to the 10^{th} harmonic of the highest fundamental transmitter frequency (10 GHz).

At each frequency, the EUT was rotated 360°, and the antenna was raised and lowered from 1 to 4 meters in order to determine the emission's maximum level. Measurements were taken using both horizontal and vertical antenna polarizations. For frequencies between 30 and 1000 MHz, the spectrum analyzer's 6 dB bandwidth was set to 120 kHz, and the analyzer was operated in the CISPR quasi-peak detection mode. For emissions above 1,000 MHz, emissions are measured using the average detector function with a minimum resolution bandwidth of 1 MHz. No video filter less than 10 times the resolution bandwidth was used. The highest emission amplitudes relative to the appropriate limit were measured and recorded in this report.

Table 9-1: Radiated Emissions Test Equipment

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
900932	Hewlett Packard	8499B	Amplifier, 0.1-26 GHz, 30dB gain	N/A	8/10/13
900878	Rhein Tech Laboratories	AM3-1197-0005	3 meter antenna mast, polarizing	Outdoor Range 1	Not Required
901592	Insulated Wire Inc.	KPS-1503-3600-KPR	SMK RF Cables 20’	NA	8/16/13
901593	Insulated Wire Inc.	KPS-1503-360-KPR	SMK RF Cables 36”	NA	8/16/13
901242	Rhein Tech Laboratories	WRT-000-0003	Wood rotating table	N/A	Not Required
900772	EMCO	3161-02	Horn Antenna (2-4 GHz)	9804-1044	4/19/14
900321	EMCO	3161-03	Horn Antennas (4-8,2 GHz)	9508-1020	4/19/14
900323	EMCO	3160-7	Horn Antennas (8,2-12,4 GHz)	9605-1054	4/19/14
901581	Rohde & Schwarz	1166.1660.50	Spectrum Analyzer	2001006	6/3/13
900913	Hewlett Packard	85462A	EMI Receiver RF Section (9 kHz–6.5 GHz)	3325A00159	9/20/13
900914	Hewlett Packard	8546OA	RF Filter Section (100 kHz-6.5 GHz)	3330A00107	9/20/13
900905	Rhein Tech Laboratories	PR-1040	OATS 1 Preamplifier 40dB (30 MHz–2 GHz)	1006	8/20/13

9.3 Radiated Emissions Test Results

9.3.1 Radiated Emissions Unintentional - Yagi Antenna

Table 9-2: Radiated Emissions Unintentional – Yagi Antenna

Temperature: 46°F Humidity: 95%										
Emission Frequency (MHz)	Test Detector	Antenna Polarity (H/V)	Turntable Azimuth (deg)	Antenna Height (m)	Analyzer Reading (dBuV)	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pass/ Fail
104.450	Qp	H	0	3.0	56.7	-20.8	35.9	43.5	-7.6	Pass
137.000	Qp	H	120	1.0	45.4	-20.8	24.6	43.5	-18.9	Pass
217.536	Qp	H	160	1.4	43.8	-21.8	22.0	46.0	-24.0	Pass
294.906	Qp	H	180	1.0	37.8	-17.4	20.4	46.0	-25.6	Pass
298.592	Qp	H	180	1.0	55.9	-17.3	38.6	46.0	-7.4	Pass
497.663	Qp	H	190	1.0	43.0	-12.5	30.5	46.0	-15.5	Pass
995.303	Qp	H	100	1.0	37.5	-4.8	32.7	54.0	-21.3	Pass
1094.835	Av	H	260	1.0	34.9	-3.6	31.3	54.0	-22.7	Pass

9.3.2 Radiated Emissions Unintentional - Omni Antenna

Table 9-3: Radiated Emissions Unintentional – Omni Antenna

Temperature: 46°F Humidity: 95%										
Emission Frequency (MHz)	Test Detector	Antenna Polarity (H/V)	Turntable Azimuth (deg)	Antenna Height (m)	Analyzer Reading (dBuV)	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pass/ Fail
63.786	Qp	V	0	1.0	37.5	-25.8	11.7	40.0	-28.3	Pass
64.933	Qp	V	90	1.5	42.6	-25.8	16.8	40.0	-23.2	Pass
91.064	Qp	V	270	1.0	41.5	-22.7	18.8	43.5	-24.7	Pass
98.220	Qp	V	90	1.0	34.9	-21.4	13.5	43.5	-30.0	Pass
104.600	Qp	V	350	1.0	50.1	-20.8	29.3	43.5	-14.2	Pass
136.075	Qp	V	170	1.0	40.7	-20.7	20.0	43.5	-23.5	Pass
159.850	Qp	V	225	1.0	39.1	-21.8	17.3	43.5	-26.2	Pass
298.600	Qp	H	225	1.0	50.4	-17.3	33.1	46.0	-12.9	Pass
497.651	Qp	H	0	1.4	37.6	-12.5	25.1	46.0	-20.9	Pass
1094.835	Av	H	180	1.0	31.1	-3.6	27.5	54.0	-26.5	Pass

9.3.3 Radiated Emissions Harmonics/Spurious

Table 9-4: Radiated Emissions Harmonics/Spurious TX Frequency – 903.0 MHz - Yagi Antenna

Emission Frequency (MHz)	Peak Analyzer Reading (dBuV) (1 MHz RBW/VBW)	Average Analyzer Reading (dBuV) (1 MHz RBW/ 10 Hz VBW)	Site Correction Factor (dB/m)	Average Emission Level (dBuV/m)	Average Limit (dBuV/m)	Average Margin (dB)
2709.0	46.3	42.9	-12.3	30.6	54.0	-23.4
3612.0	43.0	32.1	-11.4	20.7	54.0	-33.3
4515.0	34.2	34.1	-5.1	29.0	54.0	-25.0
5418.0	46.6	39.1	-4.1	35.0	54.0	-19.0
8127.0	44.1	33.7	1.6	35.3	54.0	-18.7
9030.0	44.1	33.1	1.5	34.6	54.0	-19.4

Table 9-5: Radiated Emissions Harmonics/Spurious TX Frequency – 915.0 MHz - Yagi Antenna

Emission Frequency (MHz)	Peak Analyzer Reading (dBuV) (1 MHz RBW/VBW)	Average Analyzer Reading (dBuV) (1 MHz RBW/ 10 Hz VBW)	Site Correction Factor (dB/m)	Average Emission Level (dBuV/m)	Average Limit (dBuV/m)	Average Margin (dB)
2745.0	48.7	45.1	-12.4	32.7	54.0	-21.3
3660.0	42.5	32.6	-10.7	21.9	54.0	-32.1
4575.0	44.6	33.9	-5.4	28.5	54.0	-25.5
7320.0	43.4	33.0	-3.1	29.9	54.0	-24.1
8235.0	45.0	34.0	1.9	35.9	54.0	-18.1
9150.0	43.6	32.9	1.1	34.0	54.0	-20.0

Table 9-6: Radiated Emissions Harmonics/Spurious TX Frequency – 927.0 MHz - Yagi Antenna

Emission Frequency (MHz)	Peak Analyzer Reading (dBuV) (1 MHz RBW/VBW)	Average Analyzer Reading (dBuV) (1 MHz RBW/ 10 Hz VBW)	Site Correction Factor (dB/m)	Average Emission Level (dBuV/m)	Average Limit (dBuV/m)	Average Margin (dB)
2781.0	49.9	46.9	-12.5	34.4	54.0	-19.6
3708.0	45.6	33.9	-10.0	23.9	54.0	-30.1
4635.0	45.0	34.6	-5.7	28.9	54.0	-25.1
7416.0	43.9	33.6	-3.5	30.1	54.0	-23.9
8343.0	44.8	33.7	1.6	35.3	54.0	-18.7
9270.0	43.4	32.5	1.7	34.2	54.0	-19.8

Table 9-7: Radiated Emissions Harmonics/Spurious TX Frequency – 903.0 MHz - Omni Antenna

Emission Frequency (MHz)	Peak Analyzer Reading (dBuV) (1 MHz RBW/VBW)	Average Analyzer Reading (dBuV) (1 MHz RBW/ 10 Hz VBW)	Site Correction Factor (dB/m)	Average Emission Level (dBuV/m)	Average Limit (dBuV/m)	Average Margin (dB)
2709.0	49.4	46.4	-12.3	34.1	54.0	-19.9
3612.0	42.2	30.9	-11.4	19.5	54.0	-34.5
4515.0	45.2	34.0	-5.1	28.9	54.0	-25.1
5418.0	47.3	40.3	-4.1	36.2	54.0	-17.8
8127.0	44.6	33.4	1.6	35.0	54.0	-19.0
9030.0	43.9	33.5	1.5	35.0	54.0	-19.0

Table 9-8: Radiated Emissions Harmonics/Spurious TX Frequency – 915.0 MHz - Omni Antenna

Emission Frequency (MHz)	Peak Analyzer Reading (dBuV) (1 MHz RBW/VBW)	Average Analyzer Reading (dBuV) (1 MHz RBW/ 10 Hz VBW)	Site Correction Factor (dB/m)	Average Emission Level (dBuV/m)	Average Limit (dBuV/m)	Average Margin (dB)
2745.0	49.8	47.1	-12.4	34.7	54.0	-19.3
3660.0	42.9	32.9	-10.7	22.2	54.0	-31.8
4575.0	46.1	34.0	-5.4	28.6	54.0	-25.4
7320.0	43.4	32.9	-3.1	29.8	54.0	-24.2
8235.0	44.4	34.5	1.9	36.4	54.0	-17.6
9150.0	43.0	32.9	1.1	34.0	54.0	-20.0

Table 9-9: Radiated Emissions Harmonics/Spurious TX Frequency – 927.0 MHz - Omni Antenna

Emission Frequency (MHz)	Peak Analyzer Reading (dBuV) (1 MHz RBW/VBW)	Average Analyzer Reading (dBuV) (1 MHz RBW/ 10 Hz VBW)	Site Correction Factor (dB/m)	Average Emission Level (dBuV/m)	Average Limit (dBuV/m)	Average Margin (dB)
2781.0	52.6	49.6	-12.5	37.1	54.0	-16.9
3708.0	45.6	34.8	-10.0	24.8	54.0	-29.2
4635.0	46.4	34.7	-5.7	29.0	54.0	-25.0
7416.0	43.3	33.3	-3.5	29.8	54.0	-24.2
8343.0	43.8	33.7	1.6	35.3	54.0	-18.7
9270.0	42.4	32.1	1.7	33.8	54.0	-20.2

Test Personnel:

Daniel W. Baltzell		January 15, 2013
EMC Test Engineer	Signature	Date of Test

10 Conclusion

The data in this measurement report shows that the Innovative Wireless Technologies, Inc. Model # FAP4215-050, Portable Mesh Node (PMN), FCC ID: SP8-FAP4215-050, complies with all the applicable requirements of Parts 2 and 15 of the FCC rules and regulations.