Excellence in Compliance Testing

Certification Test Report

FCC ID: P2SNTGPRFV3
IC: 4171B-NTGRFV3

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

ACS Report Number: 11-2068.W04.11.A

Manufacturer: **Neptune Technology Group, Inc.**
Model: **R900V3**

Test Begin Date: **August 9, 2011**
Test End Date: **September 29, 2011**

Report Issue Date: September 29, 2011

ACCREDITED TESTING

FOR THE SCOPE OF ACCREDITATION UNDER CERTIFICATE NUMBER AT-1533

This report must not be used by the client to claim product certification, approval, or endorsement by ACLASS, ANSI, or any agency of the Federal Government.

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This report contains 30 pages

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1 GENERAL

1.1 Purpose

The purpose of this report is to demonstrate compliance with Part 15 Subpart C of the FCC's Code of Federal Regulations and Industry Canada's Radio Standards Specification RSS-210 for a class II permissive change. The purpose of the class II permissive change is to implement a new filter and layout changes such as wider ground traces and 0805 ferrite beads instead of 0603 ferrite beads.

1.2 Manufacturer Information

Neptune Technology Group, Inc.
1600 Alabama Highway 229
Tallassee, AL 36078

1.3 Product description

The R900V3 Frequency Hopping Spread-Spectrum transmitter is designed for operation in water meter RF telemetry under part 15-247 FCC. Two version of R900V3 are designed to be manufactured from the same Printed Circuit Board (PCB). One for mounting in water-utility Pits, and the second for mounting above the ground, on walls and posts. The difference between these versions is only in type of antenna used. Also, for moisture protection, all PITs transmitters are potted, and WALL transmitters are conformal coated. Transmitter has 3-wire connection with water-meter's register. The main responsibility for the transmitter is to transmit the readings of the water meter, which is attached.

Mode of Operation	Frequency Range (MHz)	Number of Channels	Channel Separation (kHz)	Data Rates Supported (kbps)
OOK	911.0– 920	50	131.072	32

Test Sample Serial Number(s): N/A

Test Sample Condition: The EUT was functioning properly and did not protray any physical damages.

1.4 Test Methodology and Considerations

The Model R900V3 wall and pit mount variants differ in the antennas and installation therefore each variant was evaluated for all available antenna types and installation configurations.

The R900V3 is a battery operated device and is therefore exempted from power line conducted emissions.

The unintentional emissions evaluations are covered separately in a Verification Report.

2 TEST FACILITIES

2.1 Location

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

Advanced Compliance Solutions, Inc.
3998 FAU Blvd, Suite 310
Boca Raton, Florida 33431
Phone: (561) 961-5585
Fax: (561) 961-5587
www.acstestlab.com

FCC Test Firm Registration #: 587595
Industry Canada Lab Code: 4175C

2.2 Laboratory Accreditations/Recognitions/Certifications

ACS is accredited to ISO/IEC 17025 by ANSI-ASQ National Accreditation Board under their ACLASS program and has been issued certificate number AT-1533 in recognition of this accreditation. Unless otherwise specified, all test methods described within this report are covered under the ISO/IEC 17025 scope of accreditation.

2.3 Radiated & Conducted Emissions Test Site Description

2.3.1 Semi-Anechoic Chamber Test Site

The EMC radiated test facility consists of an RF-shielded enclosure. The interior dimensions of the indoor semi-anechoic chamber are approximately 48 feet (14.6 m) long by 36 feet (10.8 m) wide by 24 feet (7.3 m) high and consist of rigid, 1/8 inch (0.32 cm) steel-clad, wood core modular panels with steel framing. In the shielded enclosure, the faces of the panels are galvanized and the chamber is self-supporting. 8-foot RF absorbing cones are installed on 4 walls and the ceiling. The steel-clad ground plane is covered with vinyl floor.

The turntable is driven by pneumatic motor, which is capable of supporting a 2000 lb. load. The turntable is flushed with the chamber floor which it is connected to, around its circumference, with a continuous metallic loaded spring. An EMCO Model 1050 Multi-device Controller controls the turntable position.

A pneumatic motor is used to control antenna polarizations and height relative to the ground. The height information is displayed on the control unit EMCO Model 1050.

The control room is an RF shielded enclosure attached to the semi-anechoic chamber with two bulkhead panels for connecting RF, and control cables. The dimension of the room is 7.3 m x 4.9 m x 3 m high and the entrance doors of both control and conducted rooms are 3 feet (0.91 m) by 7 feet (2.13 m).

A diagram of the Semi-Anechoic Chamber Test Site is shown in Figure 2.3.1-1 below:

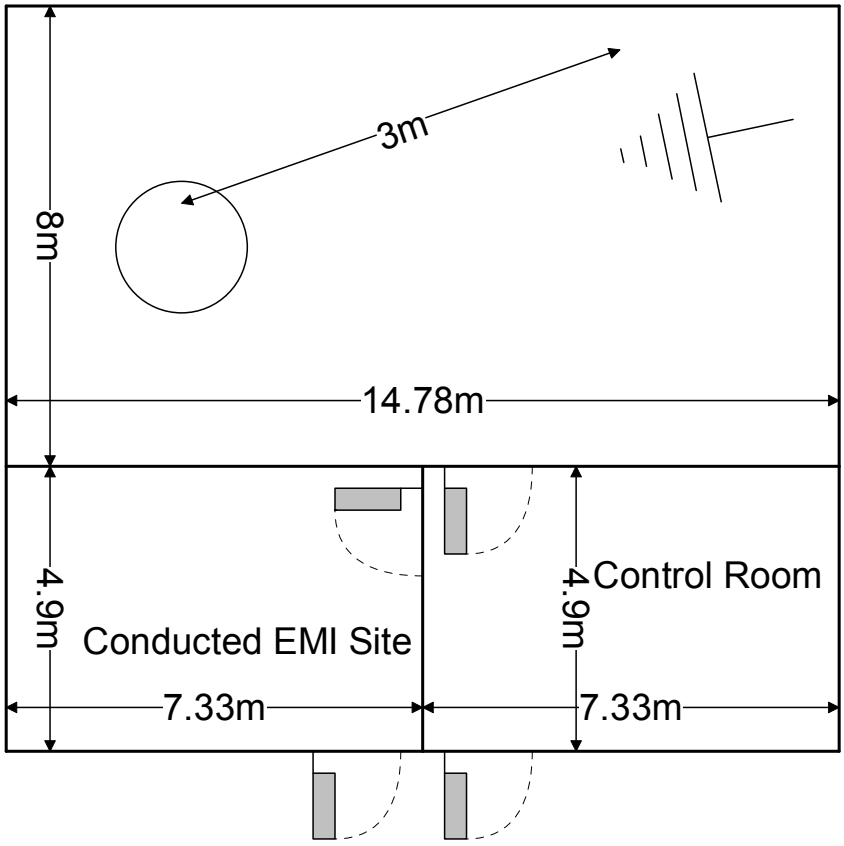


Figure 2.3.1-1: Semi-Anechoic Chamber Test Site

2.3.2 Conducted Emissions Test Site Description

The dimensions of the shielded conducted room are 7.3 x 4.9 x 3 m^3. As per ANSI C63.4 2003 requirements, the data were taken using two LISNs; a Solar Model 8028-50 50 Ω/50 µH and an EMCO Model 3825, which are installed as shown in Photograph 3. For 220 V, 50 Hz, a Polarad LISN (S/N 879341/048) is used in conjunction with a 1 kVA, 50 Hz/220 V EDGAR variable frequency generator, Model 1001B, to filter conducted noise from the generator.

A diagram of the room is shown below in figure 2.3.2-1:

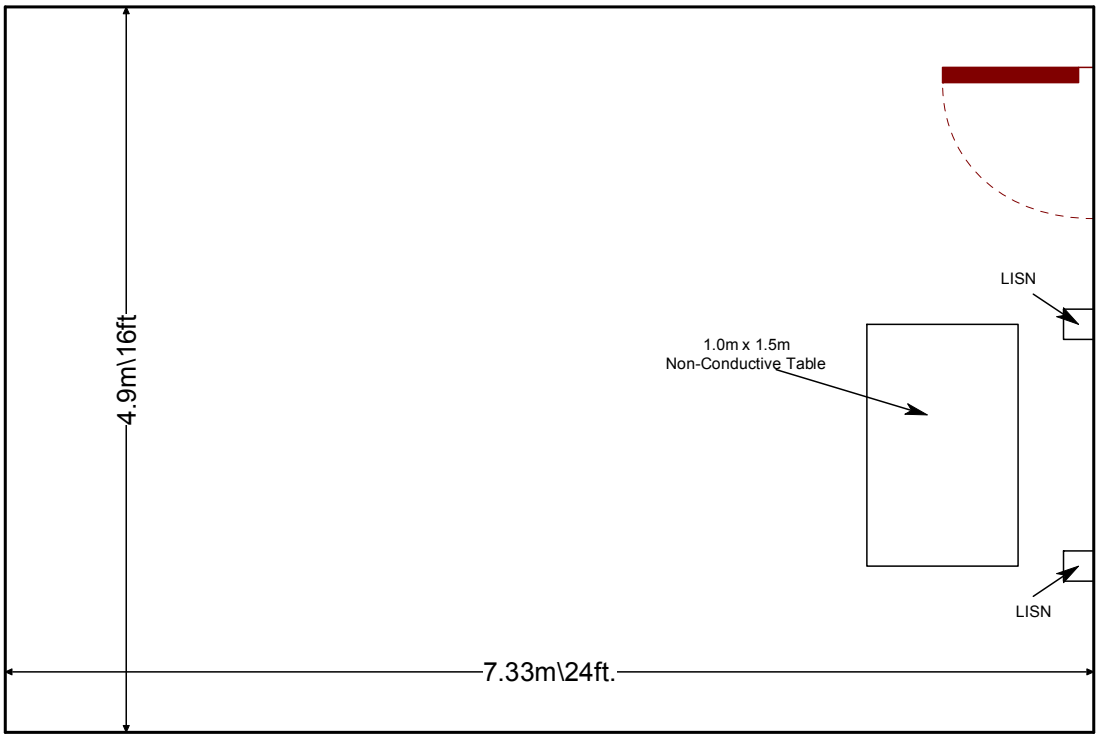


Figure 2.3.2-1: AC Mains Conducted EMI Site

3 APPLICABLE STANDARD REFERENCES

The following standards were used:

- ANSI C63.4-2003: Method of Measurements of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the 9KHz to 40GHz
- US Code of Federal Regulations (CFR): Title 47, Part 2, Subpart J: Equipment Authorization Procedures, 2011
- US Code of Federal Regulations (CFR): Title 47, Part 15, Subpart C: Radio Frequency Devices, Intentional Radiators, 2011
- FCC Public Notice DA 00-705 - Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems, March 30, 2000
- Industry Canada Radio Standards Specification: RSS-210 - Low-power License-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment, Issue 8 December 2010
- Industry Canada Radio Standards Specification: RSS-GEN – General Requirements and Information for the Certification of Radiocommunication Equipment, Issue 3, December 2010.

4 LIST OF TEST EQUIPMENT

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

Table 4-1: Test Equipment

AssetID	Manufacturer	Model #	Equipment Type	Serial #	Last Calibration Date	Calibration Due Date
523	Agilent	E7405	Spectrum Analyzers	MY45103293	1/5/2011	1/5/2013
524	Chase	CBL6111	Antennas	1138	1/7/2011	1/7/2013
2006	EMCO	3115	Antennas	2573	3/2/2011	3/2/2013
2011	Hewlett-Packard	HP 8447D	Amplifiers	2443A03952	1/3/2011	1/3/2012
2012	Hewlett-Packard	HP83017A	Amplifiers	3123A00324	2/25/2011	2/25/2012
2013	Hewlett Packard	HP8566B	Spectrum Analyzers	2407A03233	8/5/2010	8/5/2012
2014	Hewlett Packard	HP 85650A	Quasi Peak Adapter	2430A00559	8/5/2010	8/5/2012
2037	ACS Boca	Chamber EMI Cable Set	Cable Set	2037	1/7/2011	1/7/2012
2044	QMI	N/A	Cables	2044	1/7/2011	1/7/2012
2069	Trilithic, Inc.	7NM867/122-X1-AA	Notch Filter	200315126	2/3/2011	2/3/2012
2071	Trilithic, Inc.	4HC1400-1-KK	Filter	9643263	2/3/2011	2/3/2012
2075	Hewlett Packard	8495B	Attenuators	2626A11012	12/10/2010	12/10/2011
2076	Hewlett Packard	HP5061-5458	Cables	2076	2/2/2011	2/2/2012
2082	Teledyne Storm Products	90-010-048	Cables	2082	6/6/2011	6/6/2012

NCR=No Calibration Required

5 SUPPORT EQUIPMENT

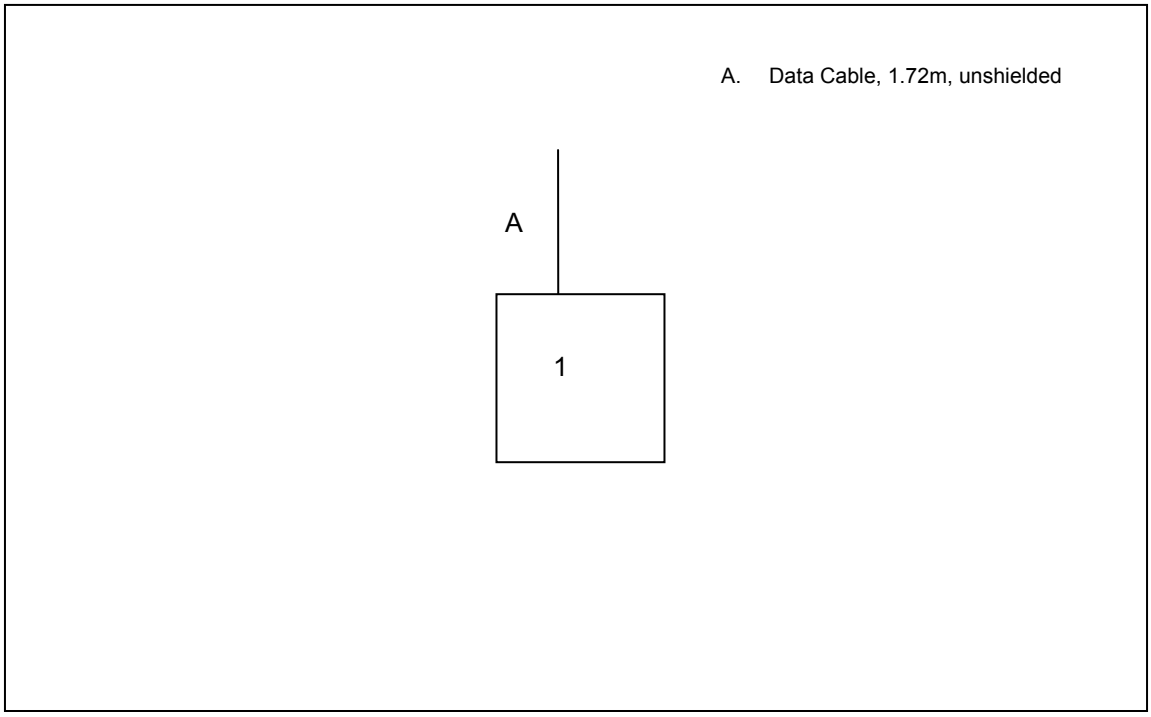
Table 5-1: Support Equipment – EUT with Internal Antenna

Item	Equipment Type	Manufacturer	Model Number	Serial Number
1	EUT	Neptune	R900V3	N/A

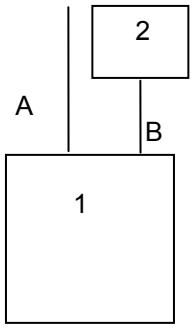
Table 5-2: Support Equipment – EUT with External Antenna

Item	Equipment Type	Manufacturer	Model Number	Serial Number
1	EUT	Neptune	R900V3	N/A
2	Antenna	Neptune	12527-000	N/A

6 EQUIPMENT UNDER TEST SETUP BLOCK DIAGRAM



A. Data Cable, 1.72m, unshielded
B. Coaxial Cable, 0.6m, shielded



7 SUMMARY OF TESTS

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

7.1 Antenna Requirement – FCC: Section 15.203

The R900V3 uses an external antenna as well as PCB antennas.

The Pit antenna is a external patch antenna (Neptune Technology Group, Inc. model number of 12527-000). This antenna has an F-type male connector with custom water seal and strain relief bracket.
The PCB antenna is a dipole antenna and is enclosed within the chassis. This antenna has an F-type male connector. The maximum gain is 0dB.

The R900V3 antennas are professionally installed by either the manufacturer or the contractor on-site.

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

7.2.1 Measurement Procedure (Conducted Method)

The RF output port of the EUT was directly connected to the input of the spectrum analyzer. Offset values were input for cable, and attenuation.

7.2.2 Measurement Results

Results are shown below in Table 7.2.2-1 and Figure 7.2.2-1 to Figure 7.2.2-3 below:

Table 7.2.2-1: RF Output Power

Frequency (MHz)	Power (dBm)
911.0815	21.34
915.9311	22.77
919.0769	21.47

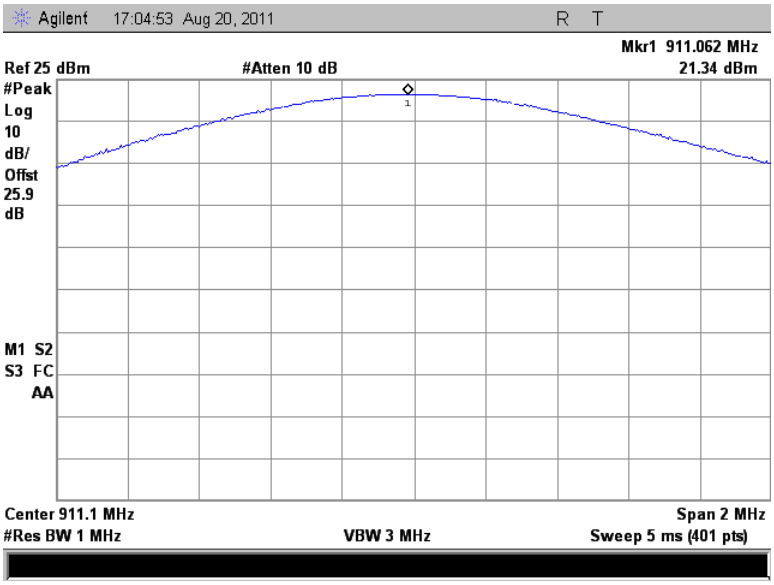


Figure 7.2.2-1: Output Power – Low Channel

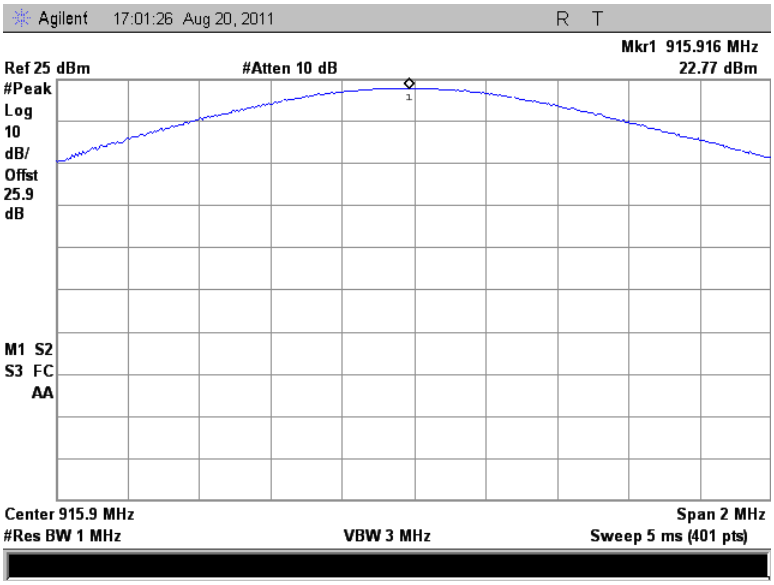


Figure 7.2.2-2: Output Power – Middle Channel

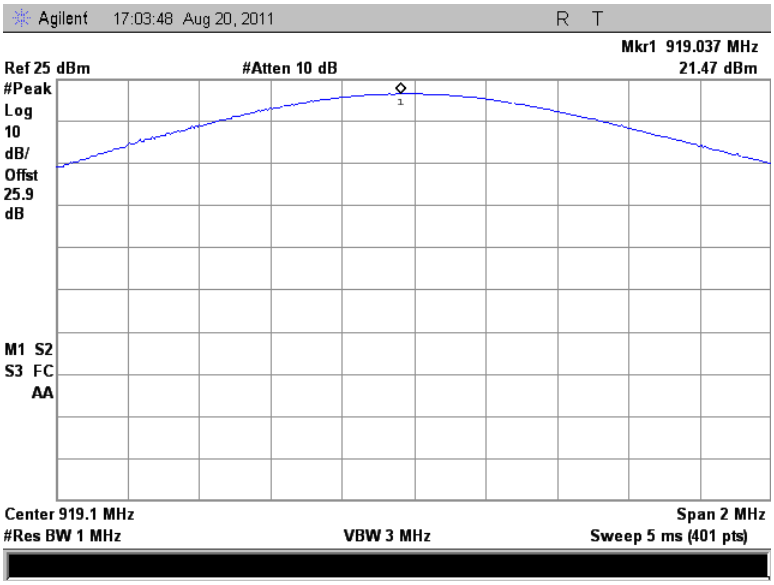


Figure 7.2.2-3: Output Power – High Channel

7.3 Channel Usage Requirements

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

7.3.1.1 Measurement Procedure

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

7.3.1.2 Measurement Results

Results are shown below in Figure 7.3.1.2-1.

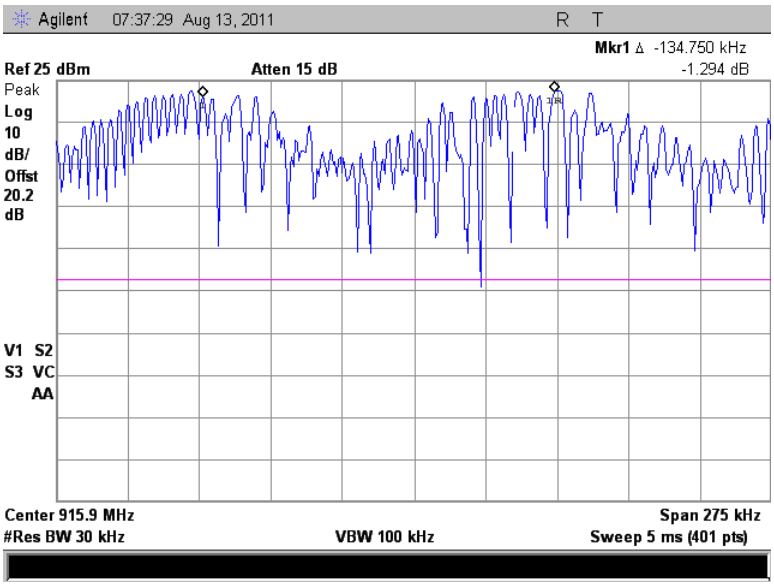


Figure 7.3.1.2-1: Carrier Frequency Separation

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

7.3.2.1 Measurement Procedure

The RF output port of the EUT was directly connected to the input of the spectrum analyzer. The span of the spectrum analyzer was set wide enough to capture the number of hopping channels.

7.3.2.2 Measurement Results

Results are shown below in Figure 7.3.2.2-1

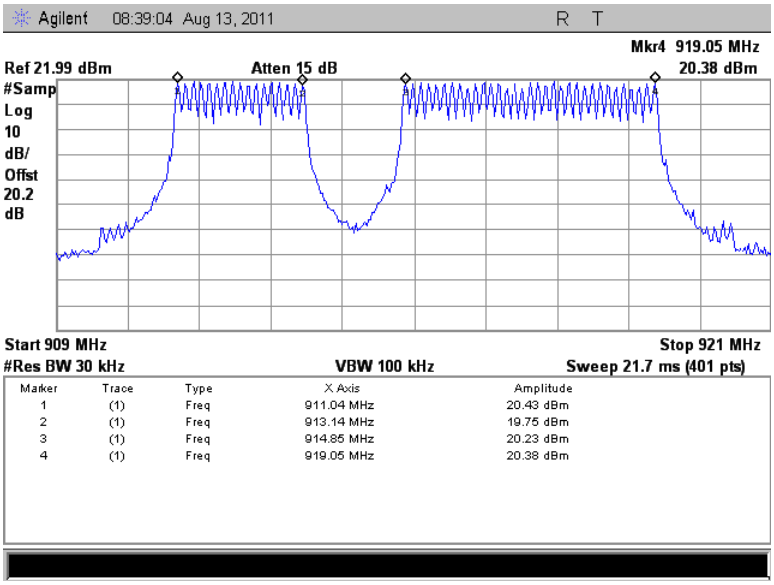


Figure 7.3.2.2-1: Number of Hopping Channels (1 – 50)

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

7.3.3.1 Measurement Procedure

The RF output port of the EUT was directly connected to the input of the spectrum analyzer. The span of the spectrum analyzer was set 0 Hz centered on a hopping channel. The RBW was set to 1 MHz and the sweep time adjusted to capture the entire dwell time per channel with peak detector max hold function.

7.3.3.2 Measurement Results

Results are shown below in Figure 7.3.3.2-1

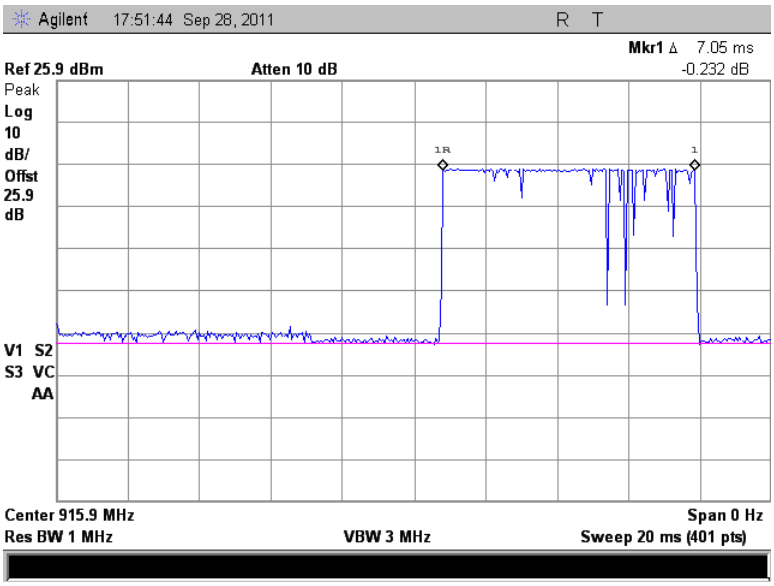


Figure 7.3.3.2-1: Channel Dwell Time

Notes:
Per the customer theory of operation, the PLL programming occurs during 29 us. The duration of the RF transmission is 7.05 ms. There is a 13 second rest period between each transmission and the device hops in a pseudo-random fashion. Therefore, the maximum time occupancy during a 20 second cycle is 7.05 ms.

7.3.4 20dB / 99% Bandwidth - FCC: Section 15.247(a)(1)(i) IC: RSS-210 A8.1(c)

7.3.4.1 Measurement Procedure

The RF output port of the EUT was directly connected to the input of the spectrum analyzer. The spectrum analyzer span was set to 2 to 3 times the estimated bandwidth of the emission. The RBW was to ≥ 1% of the estimated emission bandwidth. The trace was set to max hold with a peak detector active. The Delta function of the analyzer was utilized to determine the 20 dB bandwidth of the emission.

The 99% occupied bandwidth was measured with the spectrum analyzer span set to fully display the emission, including the emissions skirts. The RBW was to 1% of the span. The occupied 99% bandwidth was measured by using a delta marker at the lower and upper frequencies leading to 0.5% of the total power.

7.3.4.2 Measurement Results

Results are shown below in Table 7.3.4.2-1 and Figures 7.3.4.2-1 through 7.3.4.2-6.

Table 7.3.4.2-1: 20dB / 99% Bandwidth

Frequency [MHz]	20dB Bandwidth [kHz]	99% Bandwidth [kHz]
911.0815	117.75	120.00
915.9311	119.25	120.00
919.0769	117.75	119.25

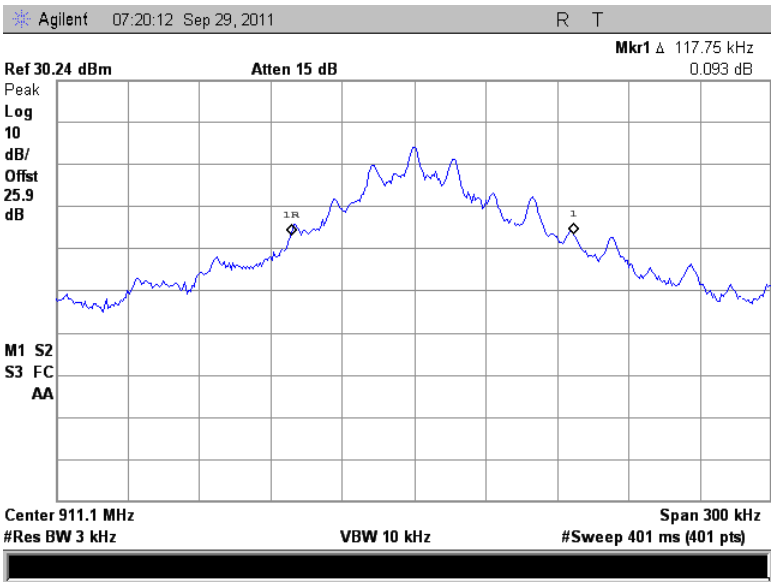


Figure 7.3.4.2-1: 20dB BW - Low Channel

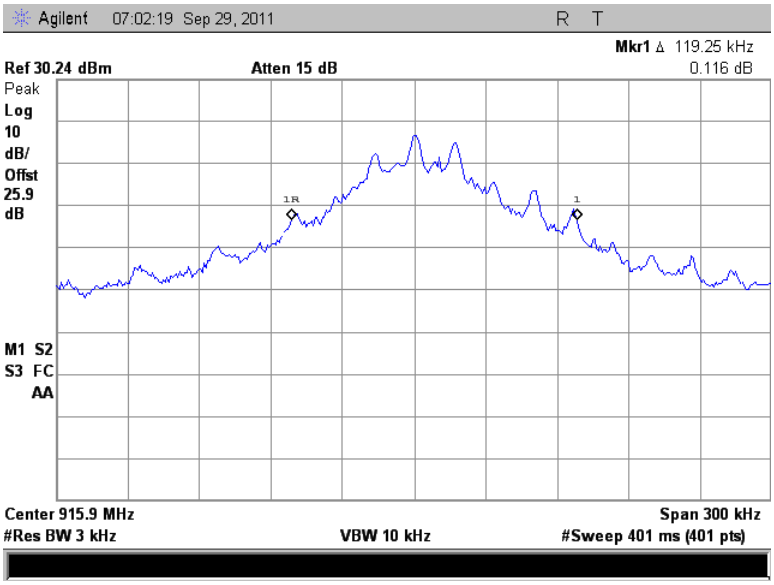


Figure 7.3.4.2-2: 20dB BW - Middle Channel

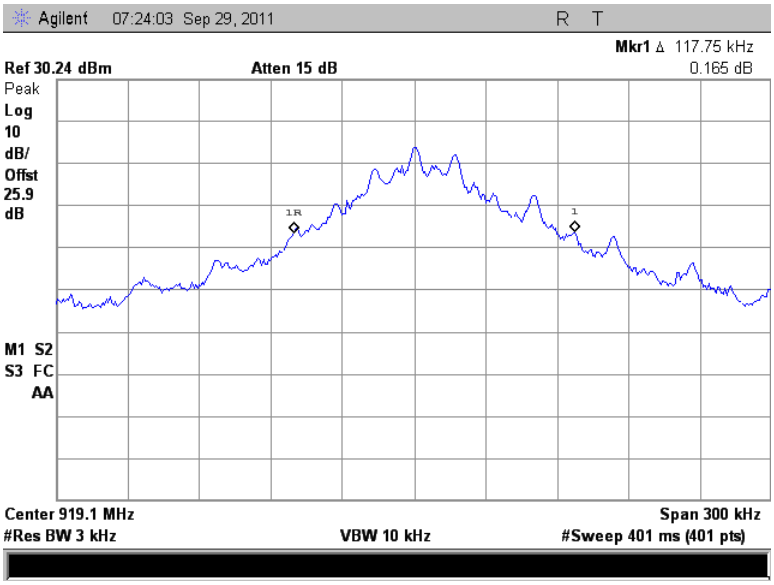


Figure 7.3.4.2-3: 20dB BW - High Channel

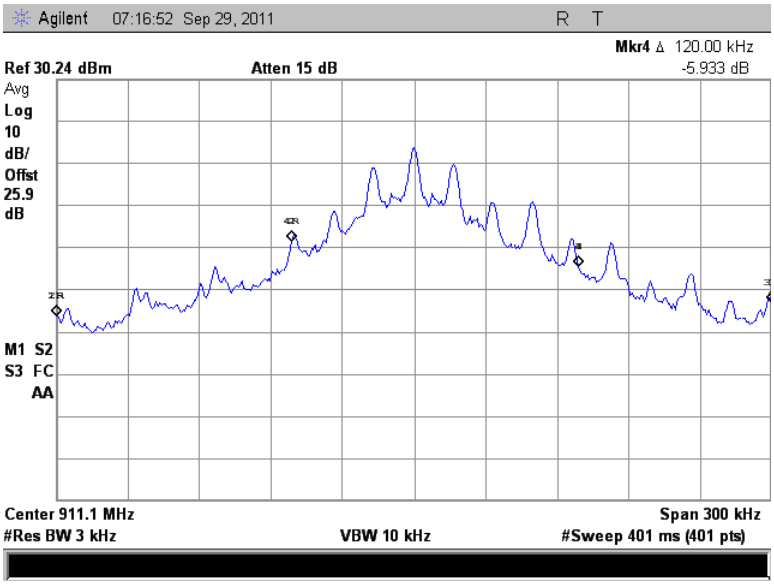


Figure 7.3.4.2-4: 99% OBW - Low Channel

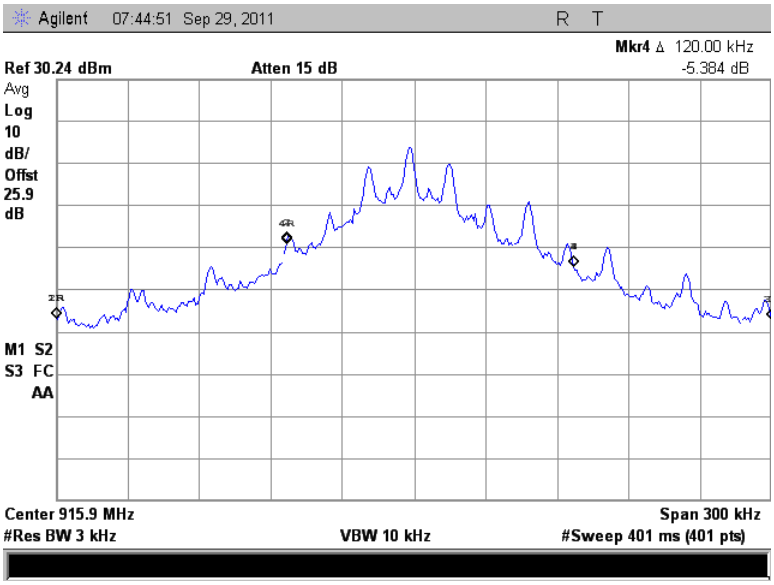


Figure 7.3.4.2-5: 99% OBW - Middle Channel

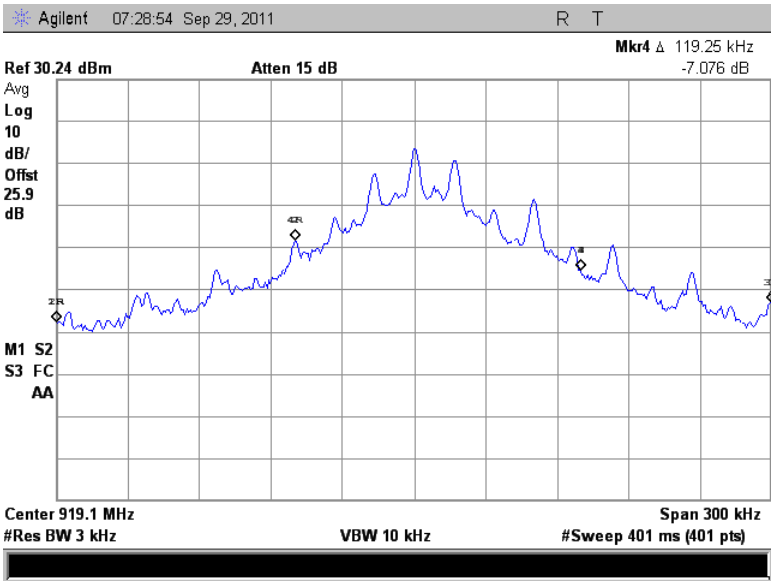


Figure 7.3.4.2-6: 99% OBW - High Channel

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

7.4.1 Band-Edge Compliance of RF Conducted Emissions

7.4.1.1 Measurement Procedure

The RF output port of the EUT was directly connected to the input of the spectrum analyzer. The EUT was investigated at the lowest and highest channel available to determine band-edge compliance. For each measurement the spectrum analyzer's RBW was set to 100 kHz, and the VBW was set to 300 kHz.

7.4.1.2 Measurement Results

Results are shown in Table 7.4.1.2-1 and Figure 7.4.1.2-1 to Figure 7.4.1.2-4 below.

Table 7.4.1.2-1: Conducted Band Edge

	Measured Delta (dB)		Requirements	Band Edge	
	Single TX	Hopping Mode		Single TX	Hopping Mode
Lower Band-Edge	63.58	64.28	>20dB	PASS	PASS
Upper Band-Edge	65.32	64.88	>20dB	PASS	PASS

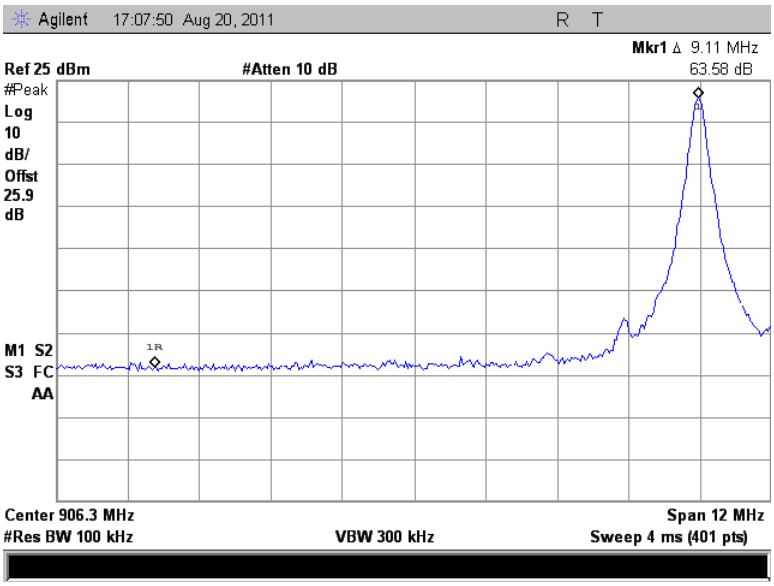


Figure 7.4.1.2-1: Lower Band-edge

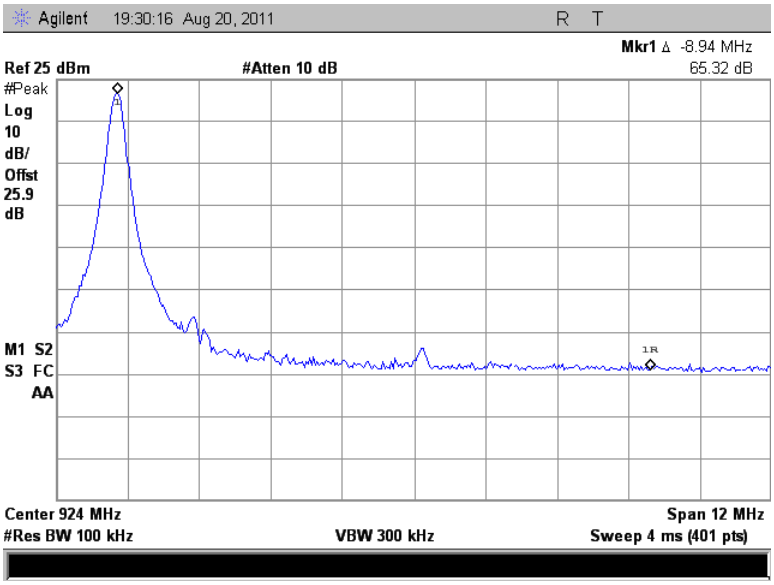


Figure 7.4.1.2-2: Upper Band-edge

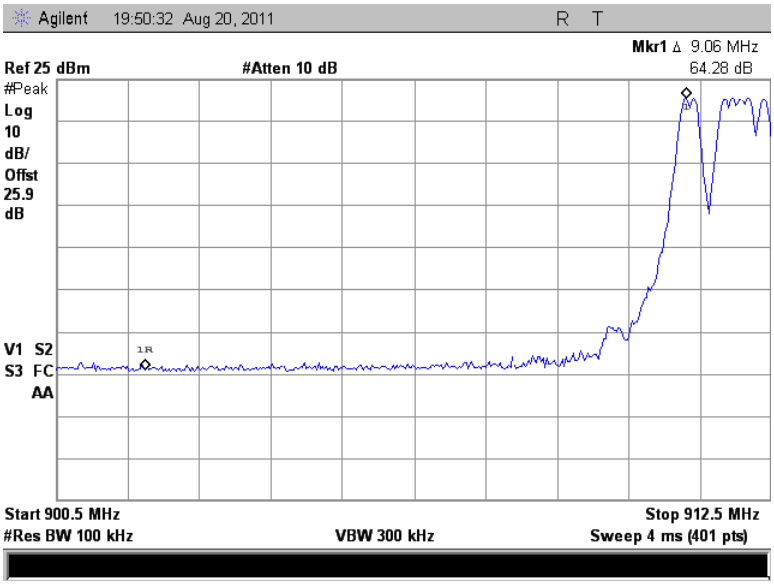


Figure 7.4.1.2-3: Lower Band-edge – Hopping Mode

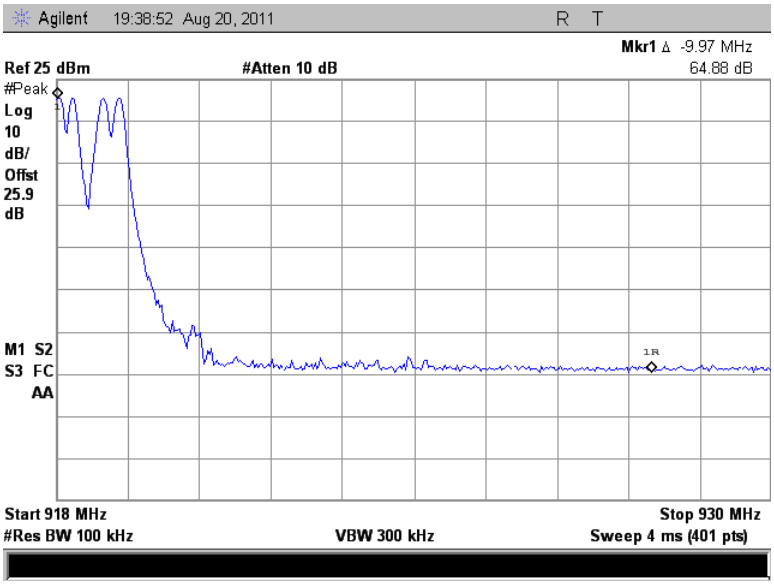


Figure 7.4.1.2-4: Upper Band-edge – Hopping Mode

7.4.2 RF Conducted Spurious Emissions

7.4.2.1 Measurement Procedure

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

7.4.2.2 Measurement Results

Results are shown below in Figures 7.4.2.2-1 to 7.4.2.2-6:

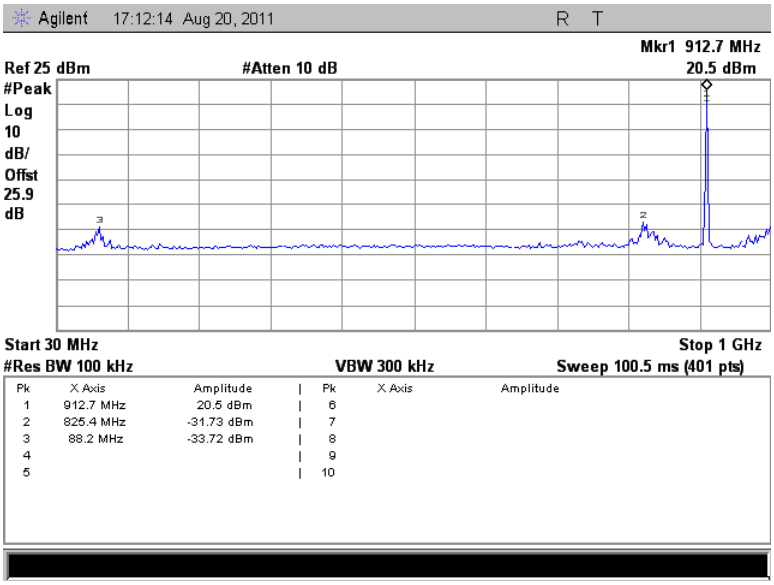


Figure 7.4.2.2-1: 30 MHz – 1 GHz – Low Channel

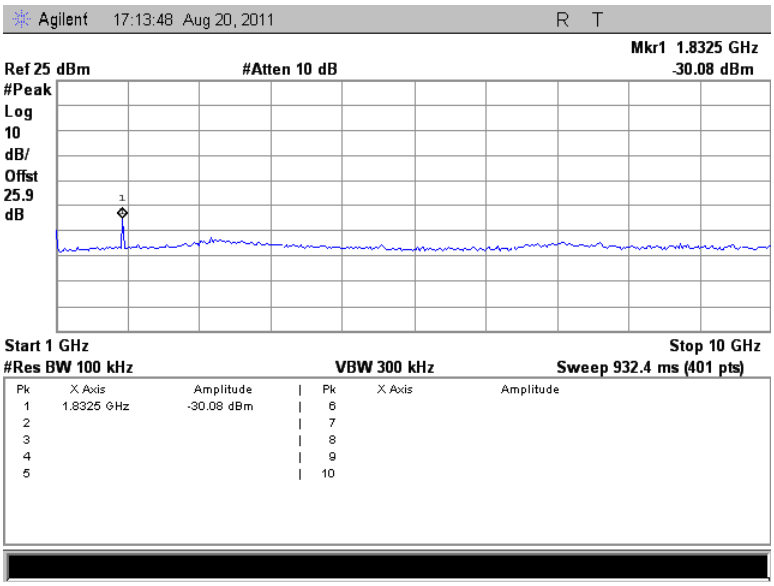


Figure 7.4.2.2-2: 1 GHz – 10 GHz – Low Channel

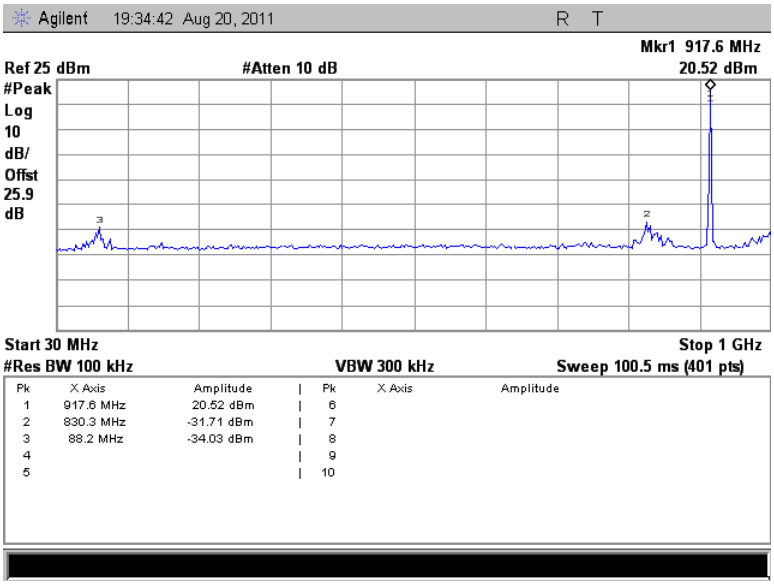


Figure 7.4.2.2-3: 30 MHz – 1 GHz –Middle Channel

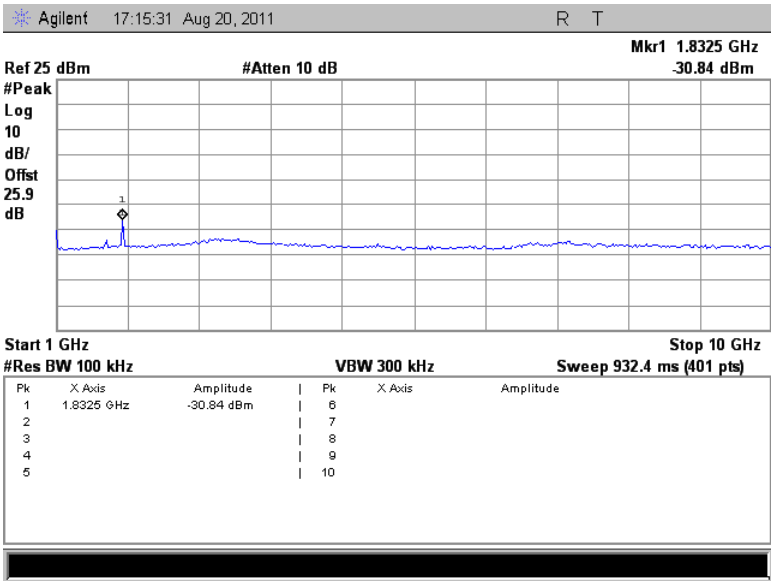


Figure 7.4.2.2-4: 1 GHz – 10 GHz – Middle Channel

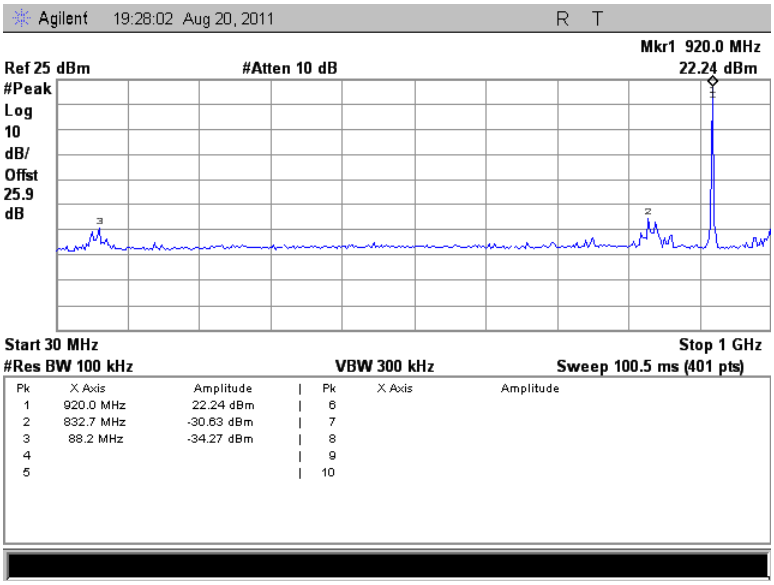


Figure 7.4.2.2-5: 30 MHz – 1 GHz – High Channel

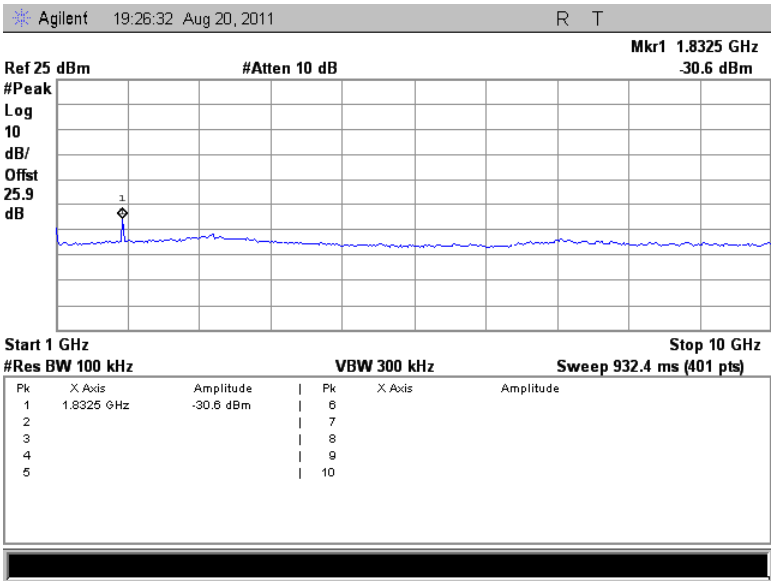


Figure 7.4.2.2-6: 1 GHz – 10 GHz –High Channel

7.4.3 Radiated Spurious Emissions - FCC Section 15.205 IC: RSS-GEN 7.2.5

7.4.3.1 Measurement Procedure

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

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

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

7.4.3.2 Measurement Results

Radiated spurious emissions found in the band of 30MHz to 10GHz are reported in the Table 7.4.3.2-1 to Table 7.4.3.2-2 below.

Table 7.4.3.2-1: Radiated Spurious Emissions - R900V3 MIU Large PCB Antenna

Frequency (MHz)	Level (dBuV)		Antenna Polarity	Correction Factors	Corrected Level (dBuV/m)		Limit (dBuV/m)		Margin (dB)	
	pk	Qpk/Avg	(H/V)	(dB)	pk	Qpk/Avg	pk	Qpk/Avg	pk	Qpk/Avg
Low Channel 911.0815 MHz										
2733.2445	66.90	66.90	H	-2.12	64.78	41.68	74.0	54.0	9.2	12.3
2733.2445	63.99	63.99	V	-2.12	61.87	38.77	74.0	54.0	12.1	15.2
3644.326	63.46	63.46	H	1.13	64.59	41.49	74.0	54.0	9.4	12.5
3644.326	64.21	64.21	V	1.13	65.34	42.24	74.0	54.0	8.7	11.8
4555.4075	67.36	67.36	H	3.27	70.63	47.53	74.0	54.0	3.4	6.5
4555.4075	64.09	64.09	V	3.27	67.36	44.26	74.0	54.0	6.6	9.7
7288.652	53.96	53.96	H	8.11	62.07	38.98	74.0	54.0	11.9	15.0
7288.652	53.47	53.47	V	8.11	61.58	38.49	74.0	54.0	12.4	15.5
8199.7335	54.91	54.91	H	9.87	64.78	41.69	74.0	54.0	9.2	12.3
8199.7335	55.24	55.24	V	9.87	65.11	42.02	74.0	54.0	8.9	12.3
9110.815	55.23	55.23	H	10.45	65.68	42.58	74.0	54.0	8.3	12.3
9110.815	52.02	52.02	V	10.45	62.47	39.37	74.0	54.0	11.5	12.3
Middle Channel 915.9311 MHz										
2747.7933	68.02	68.02	H	-2.07	65.95	42.85	74.0	54.0	8.1	11.1
2747.7933	63.27	63.27	V	-2.07	61.20	38.10	74.0	54.0	12.8	15.9
3663.7244	62.74	62.74	H	1.20	63.94	40.84	74.0	54.0	10.1	13.2
3663.7244	65.04	65.04	V	1.20	66.24	43.14	74.0	54.0	7.8	10.9
4579.6555	65.94	65.94	H	3.35	69.29	46.19	74.0	54.0	4.7	7.8
4579.6555	65.09	65.09	V	3.35	68.44	45.34	74.0	54.0	5.6	8.7
7327.4488	52.39	52.39	H	8.21	60.60	37.50	74.0	54.0	13.4	16.5
7327.4488	54.41	54.41	V	8.21	62.62	39.52	74.0	54.0	11.4	14.5
8243.3799	55.24	55.24	H	9.91	65.15	42.05	74.0	54.0	8.9	11.9
8243.3799	55.47	55.47	V	9.91	65.38	42.28	74.0	54.0	8.6	11.7
9159.311	54.60	54.60	H	10.50	65.10	42.00	74.0	54.0	8.9	12.0
9159.311	54.54	54.54	V	10.50	65.04	41.94	74.0	54.0	9.0	12.1
High Channel 919.0769 MHz										
2757.2307	67.80	67.80	H	-2.04	65.76	42.66	74.0	54.0	8.2	11.3
2757.2307	63.07	63.07	V	-2.04	61.03	37.93	74.0	54.0	13.0	16.1
3676.3076	63.34	63.34	H	1.25	64.59	41.49	74.0	54.0	9.4	12.5
3676.3076	64.43	64.43	V	1.25	65.68	42.58	74.0	54.0	8.3	11.4
4595.3845	65.17	65.17	H	3.40	68.57	45.47	74.0	54.0	5.4	8.5
4595.3845	63.60	63.60	V	3.40	67.00	43.90	74.0	54.0	7.0	10.1
7352.6152	52.15	52.15	H	8.27	60.42	37.32	74.0	54.0	13.6	16.7
7352.6152	54.30	54.30	V	8.27	62.57	39.47	74.0	54.0	11.4	14.5
8271.6921	56.12	56.12	H	9.93	66.05	42.95	74.0	54.0	7.9	11.0
8271.6921	56.91	56.91	V	9.93	66.84	43.74	74.0	54.0	7.2	10.3
9190.769	55.41	55.41	H	10.53	65.94	42.84	74.0	54.0	8.1	11.2
9190.769	53.91	53.91	V	10.53	64.44	41.34	74.0	54.0	9.6	12.7

Notes: A 7% duty cycle correction factor was applied for the average measurements.

Table 7.4.3.2-2: Radiated Spurious Emissions - R900V3 MIU External Patch Antenna

Frequency (MHz)	Level (dBuV)		Antenna Polarity	Correction Factors	Corrected Level (dBuV/m)		Limit (dBuV/m)		Margin (dB)	
	pk	Qpk/Avg	(H/V)	(dB)	pk	Qpk/Avg	pk	Qpk/Avg	pk	Qpk/Avg
Low Channel 911.0815 MHz										
2733.2445	61.55	61.55	H	-2.12	59.43	36.33	74.0	54.0	14.6	17.7
2733.2445	61.07	61.07	V	-2.12	58.95	35.85	74.0	54.0	15.0	18.1
3644.326	60.98	60.98	H	1.13	62.11	39.01	74.0	54.0	11.9	15.0
3644.326	59.49	59.49	V	1.13	60.62	37.52	74.0	54.0	13.4	16.5
4555.4075	63.87	63.87	H	3.27	67.14	44.04	74.0	54.0	6.9	10.0
4555.4075	60.98	60.98	V	3.27	64.25	41.15	74.0	54.0	9.8	12.9
7288.652	46.46	46.46	H	8.11	54.57	31.48	74.0	54.0	19.4	22.5
7288.652	49.70	49.70	V	8.11	57.81	34.72	74.0	54.0	16.2	19.3
8199.7335	48.29	48.29	H	9.87	58.16	35.07	74.0	54.0	15.8	18.9
8199.7335	52.70	52.70	V	9.87	62.57	39.48	74.0	54.0	11.4	14.5
9110.815	45.99	45.99	H	10.45	56.44	33.34	74.0	54.0	17.6	20.7
9110.815	48.18	48.18	V	10.45	58.63	35.53	74.0	54.0	15.4	18.5
Middle Channel 915.9311 MHz										
2747.7933	65.73	65.73	H	-2.07	63.66	40.56	74.0	54.0	10.3	13.4
2747.7933	63.36	63.36	V	-2.07	61.29	38.19	74.0	54.0	12.7	15.8
3663.7244	59.94	59.94	H	1.20	61.14	38.04	74.0	54.0	12.9	16.0
3663.7244	59.81	59.81	V	1.20	61.01	37.91	74.0	54.0	13.0	16.1
4579.6555	62.70	62.70	H	3.35	66.05	42.95	74.0	54.0	8.0	11.0
4579.6555	60.57	60.57	V	3.35	63.92	40.82	74.0	54.0	10.1	13.2
7327.4488	43.03	43.03	H	8.21	51.24	28.14	74.0	54.0	22.8	25.9
7327.4488	50.24	50.24	V	8.21	58.45	35.35	74.0	54.0	15.6	18.7
8243.3799	46.96	46.96	H	9.91	56.87	33.77	74.0	54.0	17.1	20.2
8243.3799	54.38	54.38	V	9.91	64.29	41.19	74.0	54.0	9.7	12.8
9159.311	47.21	47.21	H	10.50	57.71	34.61	74.0	54.0	16.3	19.4
9159.311	50.52	50.52	V	10.50	61.02	37.92	74.0	54.0	13.0	16.1
High Channel 919.0769 MHz										
2757.2307	63.74	63.74	H	-2.04	61.70	38.60	74.0	54.0	12.3	15.4
2757.2307	65.84	65.84	V	-2.04	63.80	40.70	74.0	54.0	10.2	13.3
3676.3076	61.81	61.81	H	1.25	63.06	39.96	74.0	54.0	10.9	14.0
3676.3076	61.18	61.18	V	1.25	62.43	39.33	74.0	54.0	11.6	14.7
4595.3845	63.42	63.42	H	3.40	66.82	43.72	74.0	54.0	7.2	10.3
4595.3845	58.89	58.89	V	3.40	62.29	39.19	74.0	54.0	11.7	14.8
7352.6152	46.86	46.86	H	8.27	55.13	32.03	74.0	54.0	18.9	22.0
7352.6152	49.99	49.99	V	8.27	58.26	35.16	74.0	54.0	15.7	18.8
8271.6921	50.58	50.58	H	9.93	60.51	37.41	74.0	54.0	13.5	16.6
8271.6921	55.95	55.95	V	9.93	65.88	42.78	74.0	54.0	8.1	11.2
9190.769	48.37	48.37	H	10.53	58.90	35.80	74.0	54.0	15.1	18.2
9190.769	51.90	51.90	V	10.53	62.43	39.33	74.0	54.0	11.6	14.7

Notes: A 7% duty cycle correction factor was applied for the average measurements.

7.4.3.3 Sample Calculation:

$R_C = R_U + CF_T$

Where:

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

Example Calculation: Peak
Corrected Level: 61.55 - 2.12 = 59.43dBµV/m
Margin: 74dBuV/m – 59.43dBµV/m = 14.6dB

Example Calculation: Average
Corrected Level: 61.55 - 2.12 – 23.1 = 36.33dBµV/m
Margin: 54dBuV/m – 36.33dBµV/m = 17.7dB

8 CONCLUSION

In the opinion of ACS, Inc. the R900V3, manufactured by Neptune Technology Group, Inc. meets the requirements of FCC Part 15 subpart C and Industry Canada's Radio Standards Specification RSS-210.

END REPORT