

*Testing Tomorrow's Technology*

## **Application**

**For**

**Part 2, Subpart J, Paragraph 2.907 Equipment Authorization of Certification for an Intentional Radiator per Part 15, Subpart C, paragraphs 15.207, 15.209 and 15.249**

**And**

**Innovation Science and Economic Development Canada  
Certification per IC RSS-Gen, General Requirements for Radio Apparatus and  
RSS-210, License-Exempt Radio Apparatus**

**For the**

**Neptune Technology Group, Inc.**

**Model: Advantage II**

**FCC ID: P2SNTGADV1201**

**IC: 4171B-12004**

**UST Project: 20-0256**

**Issue Date: September 30, 2020**

**Total Pages in This Report: 27**

**3505 Francis Circle Alpharetta, GA 30004**

**PH: 770-740-0717 Fax: 770-740-1508**


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I certify that I am authorized to sign for the Test Agency and that all of the statements in this report and in the Exhibits attached hereto are true and correct to the best of my knowledge and belief:

US TECH (Agent Responsible For Test):

By: Alan Ghasiani

Name: 

Title: Compliance Engineer – President

Date: September 30, 2020



TESTING  
NVLAP LAB CODE 200162-0

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## MEASUREMENT TECHNICAL REPORT

**COMPANY NAME:** Neptune Technology Group, Inc.  
**MODEL:** Advantage II  
**FCC ID:** P2SNTGADV12O1  
**IC ID:** 4171B-120O4  
**DATE:** September 30, 2020

This report concerns (check one): ☒ Original grant ☐ Class II Permissive Change

Equipment type: 914 MHz Low Power Transmitter

Transmitter details:

Frequency of operation: 914 MHz

Type of modulation: Bi-Phase

Data/Bit Rate: 1200 bps

Antenna Gain: 0.0 dBi

Maximum Output Power: 85.30 dBuV/m @ 3 m

Software used to program EUT: N/A

EUT firmware number: 0.1.2075.86

Power setting: -10 dBm

Collocated Transmitter:

19.2 kHz Near Field Inductive Coil – FCC ID: P2SNTGADV12O1 (pending approval) IC: 4171B-120O4 (pending approval)

Summary of Test Results

FCC & ISSED Rule	Description of Test	Result
15.249(a), RSS-210 B.10	Radiated Emissions	PASS
15.249(d)	Band Edges	PASS
15.249(a) & RSS-210 B.10	Fundamental/Harmonic limits	PASS
RSS-Gen 6.7	99% Occupied Bandwidth	PASS
15.209 & RSS-Gen 6.13	Spurious Radiated Emissions	PASS
15.207 & RSS-Gen 8.8	Power line Conducted Emissions	PASS

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### **List of Attachments**

FCC Agency Agreement	ISED Agency Agreement
Application Forms	Internal Photographs
Letter of Confidentiality	External Photographs
Equipment Label(s)	Antenna Photographs
Block Diagram(s)	Theory of Operation
Schematic(s)	RF Exposure
Test Configuration Photographs	Installation Manual
FCC to ISED Cross Reference	
Canadian Rep Letter	

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## **1 General Information**

### **1.1 Purpose of this Report**

This report is prepared as a means of conveying test results and information concerning the suitability of this exact product for public distribution according to the FCC Rules and Regulations Part 15, Section 249 and Industry Canada RSS-210.

### **1.2 Characterization of Test Sample**

The sample used for testing was received by US Tech on September 8, 2020 in good operating condition.

### **1.3 Product Description**

The equipment under test (EUT) is the Neptune Technology Group, Inc. model Advantage II. It is a handheld probe used to interrogate and read water meter encoders. The EUT includes a 19.2 kHz transmitter (pending approval) that's mounted on the partially extendable rod of the EUT and is designed to read a water meter by interrogating it with a 1200 baud, 19.2 kHz clock. It also includes a low power transmitter programmed to operate at 914 MHz and is designed to transmit the data allowing the data to be read remotely. The operating power of the EUT is 3.65 VDC and is powered by a rechargeable NiCd battery. This report reflects test data for the 914 MHz transmitter. Test data for the 19.2 kHz transmitter will be included in a separate test report.

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## **1.4 Configuration of Tested System**

The Test Sample was tested per *ANSI C63.4:2014, Methods of Measurement of Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz (2014)* for FCC subpart A Digital equipment Verification requirements. Also, *ANSI C63.10:2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices* was used as a test procedure guide.

A list of the EUT and Peripherals is found in Table 1 below. A block diagram of the tested system is shown in Figure 1. Test configuration photographs are provided in separate Appendices.

## **1.5 Test Facility**

Testing was performed at US Tech's measurement facility at 3505 Francis Circle, Alpharetta, GA 30004. This site has been fully described and registered with the FCC under designation number US5301. Additionally, this site has been fully described and submitted to Industry Canada (IC), and has been approved under file number 9900A-1.

## **1.6 Related Submittals**

The Equipment under Test (EUT) is subject to the following additional FCC/IC authorizations:

- a) Certification under section 15.207/209 as a Low Power Transmitter General Field Limits (9 kHz-30 MHz)
- b) SDoC under 15 Subpart B as an Unintentional Radiator device

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## 1.7 Test Results

It is our opinion that the EUT meets the applicable requirements of FCC and IC including FCC Parts 2.902, 15.207, 15.209, 15.249, RSS GEN, and RSS-210 when tested in the test configuration as described in this report. This opinion is based on the test results presented herein.

**Table 1. EUT and Peripherals**

<b>EUT MANUFACTURER</b>	<b>MODEL NUMBER</b>	<b>SERIAL NUMBER</b>	<b>FCC/IC ID</b>	<b>CABLES P/D</b>
Meter Scanner Neptune Technology Group, Inc.	Advantage II	00013 0028 0004	FCC ID: P2SNTGADV12O1 IC: 4171B-120O4	N/A
<b>PERIPHERAL MANUFACTURER</b>	<b>MODEL NUMBER</b>	<b>SERIAL NUMBER</b>	<b>FCC/IC ID</b>	<b>CABLES P/D</b>
Battery Charger PowerStream	3P10-N0508	Engineering Sample	None	P/U

U= Unshielded   S= Shielded   P= Power   D= Data



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## 2 Tests and Measurements

### 2.1 Test Equipment

The table below lists test equipment used to evaluate this product. Model numbers, serial numbers and their calibration status are indicated.

**Table 2. Test Instruments**

TEST INSTRUMENT	MODEL NUMBER	MANUFACTURER	SERIAL NUMBER	CALIBRATION DUE DATE
SPECTRUM ANALYZER	E4407B	AGILENT	US41442935	09/02/2022 2 yr.
LOOP ANTENNA	6502	EMCO	9810-3246	4/06/2022 2 yr
BICONICAL ANTENNA	3110B	EMCO	9306-1708	6/27/2021 2 yr
LOG PERIODIC ANTENNA	3146	EMCO	9305-3600	2/01/2021 2 yr
HORN ANTENNA	3115	EMCO	9107-3723	11/28/2020 2 yr
RF PREAMP 100 kHz to 1.3 GHz	8447D	HEWLETT-PACKARD	1937A02980	5/13/2021
PREAMP 1.0 GHz to 26.0 GHz	8449B	HEWLETT-PACKARD	3008A00480	5/13/2021
HIGH PASS FILTER	VHF-1320 15542	Mini-circuits Inc	3 0843	5/11/2021
8 dB ATTENUATOR	VAT-8 15542	Mini-circuits Inc	3 0519	6/30/2021
LISN x2	9247-50-TS- 50-N	Solar Electronics	955824 and 955825	5/11/2021

Note: The calibration interval of the above test instruments are 12 months unless stated otherwise and all calibrations are traceable to NIST/USA.

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## 2.2 Modifications to EUT Hardware

No modifications were made by US Tech in order to bring the EUT into compliance with FCC Part 15, Subpart C Intentional Radiator Limits for the transmitter portion of the EUT or Subpart B Unintentional Radiator Limits (Receiver and Digital Device) Requirements.

## 2.3 Number of Measurements for Intentional Radiators (CFR 15.31(m), RSS-Gen 6.8)

Measurements of intentional radiators or receivers shall be performed and reported for each band in which the device can be operated with the device operating at the number of frequencies in each band specified in Table 3 below.

**Table 3. Number of Test Frequencies for Intentional Radiators**

Frequency Range over which the device operates	Number of Frequencies	Location in the Range of operation
1 MHz or less	1	Middle
1 to 10 MHz	2	1 near the top 1 near the bottom
Greater than 10 MHz	3	1 near top 1 near middle 1 near bottom

Because the EUT operates at 914 MHz only, one test frequency was used.

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## **2.4 Frequency Range of Radiated Measurements (CFR 15.33, RSS-Gen 6.13)**

### **2.4.1 Intentional Radiator**

The spectrum shall be investigated for the intentional radiator from the lowest RF signal generated in the EUT, without going below 9 kHz to the 10<sup>th</sup> harmonic of the highest fundamental frequency generated or 40 GHz, whichever is the lowest.

### **2.4.2 Unintentional Radiator**

For the digital device, an unintentional radiator, the frequency range shall be 30 MHz to 1000 MHz or to 5 times the highest internal clock frequency.

## **2.5 Measurement Detector Function and Bandwidth (CFR 15.35, RSS-Gen 6.9)**

The radiated and conducted emissions limits shown herein are based on the following:

### **2.5.1 Detector Function and Associated Bandwidth**

For frequencies below 1000 MHz, the limits herein are based upon measuring instruments employing a CISPR Quasi-peak detector function and related measurement bandwidths (i.e. 9 kHz from 150 kHz to 30 MHz and 120 kHz from 30 MHz to 1000 MHz). Alternatively, measurements may be made with equipment employing a peak detector function as long as the same bandwidths specified for the quasi peak device are used.

### **2.5.2 Corresponding Peak and Average Requirements**

For frequencies above 1000 MHz, radiated limits are based upon measuring instruments employing an average detector function. When average radiated emissions are specified there is also a corresponding peak limit requirement of 20 dB greater than the average limit. Peak measurements shall be made using the peak detector function of the measuring instrument. For all measurements above 1000 MHz, the resolution bandwidth shall be at least 1 MHz.

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### 2.5.3 Pulsed Transmitter Averaging

When the radiated emissions limit is expressed as an average value, and the transmitter is pulsed, the measured field strength shall be determined by applying a duty cycle correction factor based upon dividing the total ON time during the first 100 ms period by 100 ms (or by the period if less than 100 ms). The duty cycle may be expressed logarithmically in dB.

NOTE: If the transmitter was programmed to transmit at >98% duty cycle, then, wherever applicable (where the detection mode was AVG) the duty cycle factor calculated will be applied.

### 2.6 EUT Antenna Requirements (CFR 15.203, RSS-Gen 6.8)

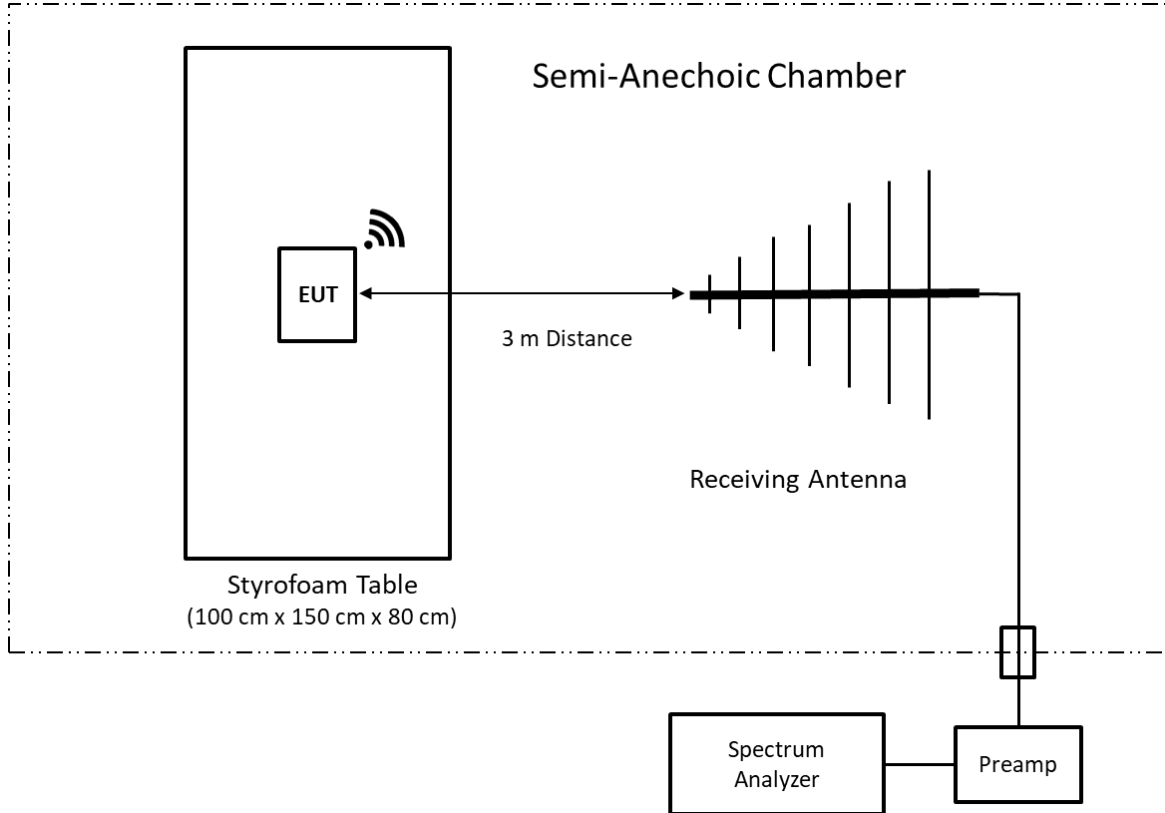
This equipment is not available to the general public and will only be installed by a professional installer working for an approved utility. The equipment therefore meets the intent of the above requirement. Only the antennas listed in Table 4 will be used with this module.

**Table 4. Allowed Antenna(s)**

REPORT REFERENCE	MANUFACTURER	TYPE OF ANTENNA	MODEL	GAIN dB <sub>i</sub>	TYPE OF CONNECTOR
Antenna	Neptune Technologies Group, Inc.	Integrated Printed Circuit Inverted F	N/A	0.0	N/A

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**Figure 1. Block Diagram of Test Configuration**

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## **2.7 Restricted Bands of Operation (CFR 15.205, RSS-Gen 8.10)**

Only spurious emissions can fall in the frequency bands of CFR 15.205. The field strength of these spurious cannot exceed the limits of CFR 15.209. Radiated harmonics and other spurious emissions are examined for this requirement. See paragraph 2.10 of the test report.

## **2.8 Transmitter Duty Cycle (CFR 15.35 (c), RSS-Gen 6.10)**

When the radiated emission limits are expressed in terms of the average value of the emission, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 100 ms. As an alternative (provided the transmitter operates for longer than 100 ms) or in cases where the pulse train exceeds 100 ms, the measured field strength shall be determined from the average absolute voltage during a 100 ms interval during which the field strength is at its maximum value. The exact method of calculating the average field strength shall be submitted with any application for certification.

In this case, no duty cycle correction factor was used.

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## 2.9 Intentional Radiator, Power Line Conducted Emissions (CFR 15.207, RSS-Gen 8.8)

**Table 5. AC Power Line Conducted Emissions Test Data, Phase Line**

150 kHz to 30 MHz						
Test: FCC Part 15, Para 15.207				Client: Neptune Technology Group, Inc.		
Project: 20-0256				Model: Advantage II		
Frequency (MHz)	Test Data (dBuV)	LISN+CL (dB)	Results (dBuV)	AVG Limits (dBuV)	Margin (dB)	Detector PK, QP, or AVG
120 Vac / 60 Hz, Phase						
0.1596	61.26	0.07	61.33	*65.5	4.2	QP
0.1596	33.48	0.07	33.55	55.5	21.9	AVG
0.6070	47.53	0.25	47.78	*56.0	8.2	QP
0.6070	25.34	0.25	25.59	46.0	20.4	AVG
1.3100	46.61	0.32	46.93	*56.0	9.1	QP
1.3100	23.54	0.32	23.86	46.0	22.1	AVG
5.2380	43.61	0.00	43.61	50.0	6.4	PK
10.5800	36.30	0.31	36.61	50.0	13.4	PK
20.4500	26.25	0.88	27.13	50.0	22.9	PK

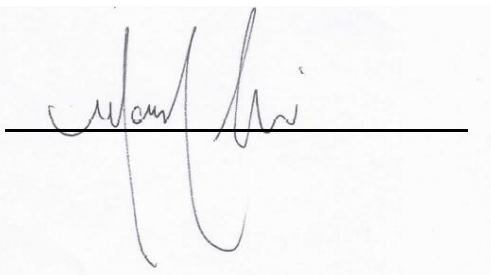
\*QP limits were used.

Sample Calculation at: 0.1596 MHz

Magnitude of Measured Frequency	61.26	dBuV
+ LISN + Cable Loss	0.07	dB
Corrected Result	61.33	dBuV/m

Test Date: September 9, 2020

Tested By

Signature: 

Name: Mark Afroozi

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**Table 6. Transmitter Power Line Conducted Emissions Test Data, Neutral Line**

150 kHz to 30 MHz						
Test: FCC Part 15, Para 15.207				Client: Neptune Technology Group, Inc.		
Project: 20-0256				Model: Advantage II		
Frequency (MHz)	Test Data (dBuV)	LISN+CL (dB)	Results (dBuV)	AVG Limits (dBuV)	Margin (dB)	Detector PK, QP, or AVG
120 Vac / 60 Hz, Neutral						
0.1876	53.57	0.12	53.69	*64.1	10.5	QP
0.1876	44.22	0.12	44.34	54.1	9.8	AVG
0.3749	57.80	0.11	57.91	*58.4	0.5	QP
0.3749	43.90	0.11	44.01	48.4	4.4	AVG
0.5638	55.21	0.53	55.74	*56.0	0.3	QP
0.5638	38.04	0.53	38.57	46.0	7.4	AVG
1.6900	52.21	0.57	52.78	*56.0	3.2	QP
1.6900	21.58	0.57	22.15	46.0	23.9	AVG
5.4630	40.20	0.27	40.47	50.0	9.5	PK
11.3000	34.79	0.56	35.35	50.0	14.7	PK
20.3800	30.66	1.27	31.93	50.0	18.1	PK

\*QP limits were used.

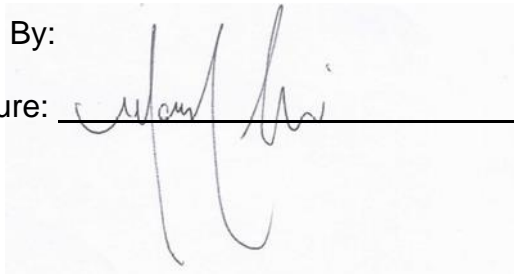
Sample Calculation at: 0.1876 MHz

Magnitude of Measured Frequency	53.57	dBuV
+ LISN + Cable Loss	0.12	dB
Corrected Result	53.69	dBuV/m

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Tested By:

Signature:



Name: Mark Afroozi



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## **2.10 Intentional Radiator, Radiated Emissions (CFR 15.209, 15.249(a), RSS-Gen 8.10)**

For measurements of radiated spurious emissions, the EUT was placed into a continuous transmit mode of operation (>98% or max level possible duty cycle) and tested per ANSI C63.10:2013. The EUT was tested in three orthogonal positions to find the maximum emission (worst case) position.

Radiated emissions were evaluated between the frequency range of 9 kHz (or lowest frequency used/generated by the device) up to the tenth harmonic of the device (not greater than 40 GHz). In the band below 150 kHz, a resolution bandwidth (RBW) of 200 Hz was used. In the band from 150 kHz to 30 MHz, a RBW of 9 kHz was used. Emissions below 1000 MHz were tested with a RBW of 120 kHz and emissions above 1000 MHz were tested with a RBW of 1 MHz. All video bandwidth settings were at least three times the RBW value.

The EUT was investigated per CFR 15.209, general requirements for unwanted spurious emissions.

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## 2.10.1 Fundamental and Harmonic Emissions

**Table 7. Average Radiated Fundamental & Harmonic Emissions**

Test: FCC Part 15, Para 15.209, 15.249(a)(e)				Client: Neptune Technology Group, Inc.			
Project: 20-0256				Model: Advantage II			
Frequency (MHz)	Test Data (dBuV)	AF+CA-AMP (dB/m)	Results (dBuV/m)	Limits (dBuV/m)	Antenna Distance/ Polarization	Margin (dB)	Detector Mode
914.00	86.05	-0.75	85.30	94.0	3.0m./HORZ	8.7	PK*
1828.00	42.15	-8.20	33.95	54.0	3.0m./VERT	20.1	AVG
4570.00	28.68	4.05	32.73	54.0	3.0m./HORZ	21.3	AVG
6398.00	28.81	9.16	28.47	54.0	3.0m./VERT	25.5	AVG
8226.00	28.90	12.42	41.32	54.0	1.0m./HORZ	12.7	AVG

\*Measurements taken above 6 GHz are performed at a distance of 1m (vs. 3m). An additional correction factor of -9.5 dB is applied to the measured results to account for this change.

\*Peak result at 914 MHz (fundamental) falls under the Average limit. See Table 8 below.

1. No other signals detected within 20 dB of specification limit. Harmonics investigated up to the 10<sup>th</sup> harmonic
2. The EUT was placed in its normal operating position and the transmitter was in constant broadcast mode, with a duty cycle of greater than 98% or max level possible. The emissions were measured with the receive antenna in vertical and horizontal polarizations. The data listed in the table above represents worst case emissions.

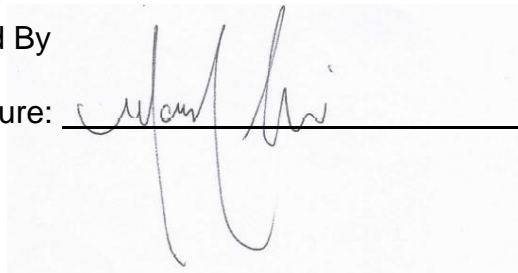
### Sample Calculation at 1828 MHz:

Magnitude of Measured Frequency	42.15	dBuV
+ Antenna Factor + Cable Loss - Amplifier Gain	-8.20	dB/m
Corrected Result	33.95	dBuV/m

Test Date: September 8, 2020

Tested By

Signature:



Name: Mark Afroozi

US Tech Test Report:  
 FCC ID:  
 IC:  
 Test Report Number:  
 Issue Date:  
 Customer:  
 Model:

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 Neptune Technology Group, Inc.  
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**Table 8. Peak Radiated Fundamental & Harmonic Emissions**

Test: FCC Part 15, Para 15.209, 15.249(a)(e)				Client: Neptune Technology Group, Inc.			
Project: 20-0256				Model: Advantage II			
Frequency (MHz)	Test Data (dBuV)	AF+CA-AMP (dB/m)	Results (dBuV/m)	Limits (dBuV/m)	Antenna Distance/ Polarization	Margin (dB)	Detector Mode
914.00	86.05	-0.75	85.30	114.0	3.0m./HORZ	28.7	PK
1828.00	56.72	-8.20	48.52	74.0	3.0m./VERT	25.5	PK
4570.00	50.54	4.05	54.59	74.0	3.0m./HORZ	19.4	PK
6398.00	49.92	9.16	49.58	74.0	3.0m./VERT	24.4	PK
8226.00	51.37	12.42	63.79	74.0	1.0m./HORZ	10.2	PK

\*Measurements taken above 6 GHz are performed at a distance of 1m (vs. 3m). An additional correction factor of -9.5 dB is applied to the measured results to account for this change.

1. No other signals detected within 20 dB of specification limit. Harmonics investigated up to the 10<sup>th</sup> harmonic
2. The EUT was placed in its normal operating position and the transmitter was in constant broadcast mode, with a duty cycle of greater than 98% or max level possible. The emissions were measured with the receive antenna in vertical and horizontal polarizations. The data listed in the above table was worst case.

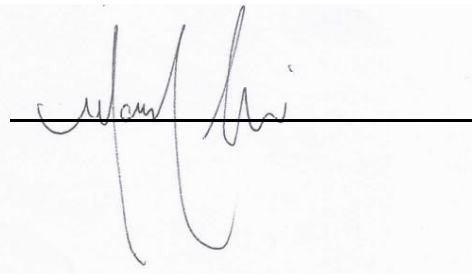
Sample Calculation at 914 MHz:

Magnitude of Measured Frequency	86.05	dBuV
+ Antenna Factor + Cable Loss - Amplifier Gain	-0.75	dB/m
Corrected Result	85.30	dBuV/m

Test Date: September 8, 2020

Tested By

Signature:



Name: Mark Afroozi

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## 2.10.2 Spurious Emissions other than Fundamental and Harmonics (CFR 15.209, RSS-Gen 6.13)

The EUT was placed into a mode representative of normal operation and spurious emissions measurements were performed.

**Table 9. Intentional Spurious Radiated Emissions, 9 kHz to 30 MHz**

9 kHz to 30 MHz							
Test: FCC Part 15, Para 15.209				Client: Neptune Technology Group, Inc.			
Project: 20-0256				Model: Advantage II			
Frequency (MHz)	Test Data (dBuV)	AF+CA-AMP (dB/m)	Results (dBuV/m)	QP Limits (dBuV/m)	Antenna Distance/ Polarization	Margin (dB)	Detector PK, or QP
No emissions were detected							

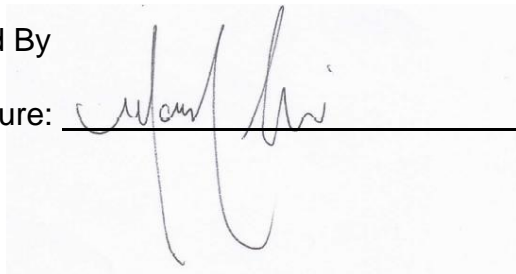
SAMPLE CALCULATION at N/A:

Magnitude of Measured Frequency	N/A	dBuV
+ Antenna Factor + Cable Loss - Amp Gain	N/A	dB
Corrected Result	N/A	dBuV

Test Date: September 9, 2020

Tested By

Signature:



Name: Mark Afroozi

US Tech Test Report:  
 FCC ID:  
 IC:  
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 Customer:  
 Model:

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**Table 10. Intentional Spurious Radiated Emissions, 30 MHz to 1000 MHz**

30 MHz to 1000 MHz with Class B Limits							
<b>Test:</b> FCC Part 15, Para 15.209				<b>Client:</b> Neptune Technology Group, Inc.			
<b>Project:</b> 20-0256				<b>Model:</b> Advantage II			
Frequency (MHz)	Test Data (dBuV)	AF+CA-AMP (dB/m)	Results (dBuV/m)	QP Limits (dBuV/m)	Antenna Distance/ Polarization	Margin (dB)	Detector PK, or QP
115.85	50.37	-15.02	35.35	43.5	3m./HORZ	8.1	QP
177.05	54.35	-12.18	42.17	43.5	3m./HORZ	1.3	QP
214.00	55.07	-14.28	40.79	43.5	3m./HORZ	2.7	PK
404.00	48.25	-9.35	38.90	46.0	3m./VERT	7.1	PK

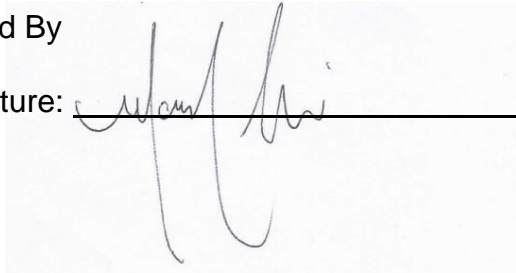
SAMPLE CALCULATION at 115.85 MHz:

Magnitude of Measured Frequency	50.37	dBuV
+ Antenna Factor + Cable Loss - Amp Gain	-15.02	dB
Corrected Result	35.35	dBuV

Test Date: September 9, 2020

Tested By

Signature:



Name: Mark Afroozi

US Tech Test Report:  
FCC ID:  
IC:  
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Customer:  
Model:

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**Table 11. Intentional Spurious Radiated Emissions, 1000 MHz to 6000 MHz**

1000 MHz to 6000 MHz with Class B Limits							
Test: FCC Part 15, Para 15.209				Client: Neptune Technology Group, Inc.			
Project: 20-0256				Model: Advantage II			
Frequency (MHz)	Test Data (dBuV)	AF+CA-AMP (dB/m)	Results (dBuV/m)	AVG Limits (dBuV/m)	Antenna Distance/ Polarization	Margin (dB)	Detector PK, or AVG
No emissions were detected.							

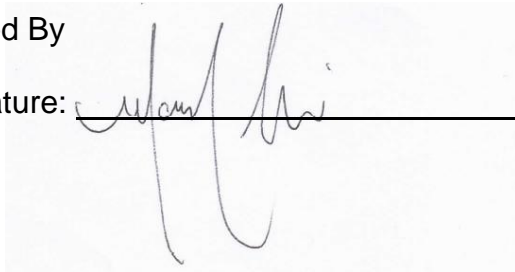
SAMPLE CALCULATION at N/A MHz:

Magnitude of Measured Frequency	N/A	dBuV
+ Antenna Factor + Cable Loss - Amp Gain	N/A	dB
Corrected Result	N/A	dBuV

Test Date: September 9, 2020

Tested By

Signature:



Name: Mark Afroozi

US Tech Test Report:  
FCC ID:  
IC:  
Test Report Number:  
Issue Date:  
Customer:  
Model:

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## 2.11 99% Occupied Bandwidth (RSS-Gen 6.7)

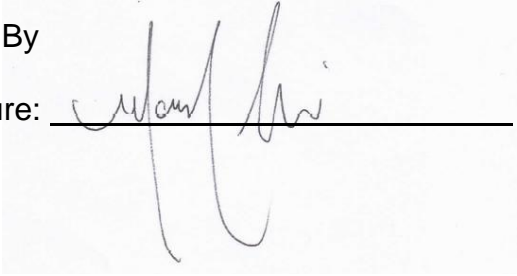
These measurements were performed while the EUT was in a constant transmit mode. The RBW was set to 10 kHz and with the VBW  $\geq$  RBW. The results of this test are given in Table and Figures following.

**Table 12. 99% Occupied Bandwidth**

Frequency (MHz)	99% Occupied Bandwidth (MHz)
914.00	0.093

Test Date: September 9, 2020

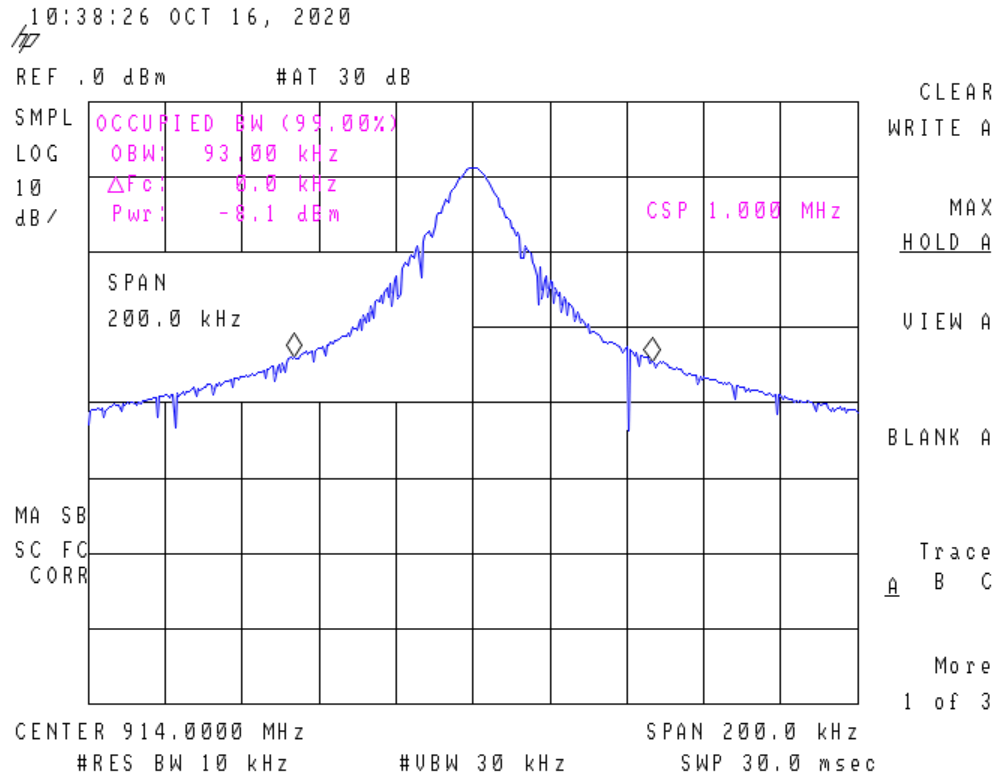
Tested By

Signature: 

Name: Mark Afroozi

US Tech Test Report:  
 FCC ID:  
 IC:  
 Test Report Number:  
 Issue Date:  
 Customer:  
 Model:

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**Figure 2. 99% Occupied Bandwidth**



US Tech Test Report:  
FCC ID:  
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Customer:  
Model:

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## 2.12 Band Edges (CFR 15.249(d))

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in 15.209, whichever is the lesser attenuation.

To capture the band edge, the spectrum analyzer's frequency span was set large enough to capture the peak level of the emission operating on the channel closest to the band edge as well as any modulation products falling outside of the authorized band of operation. Measurements were performed with RBW = 100 kHz and VBW is set  $\geq$  RBW. See figures below.

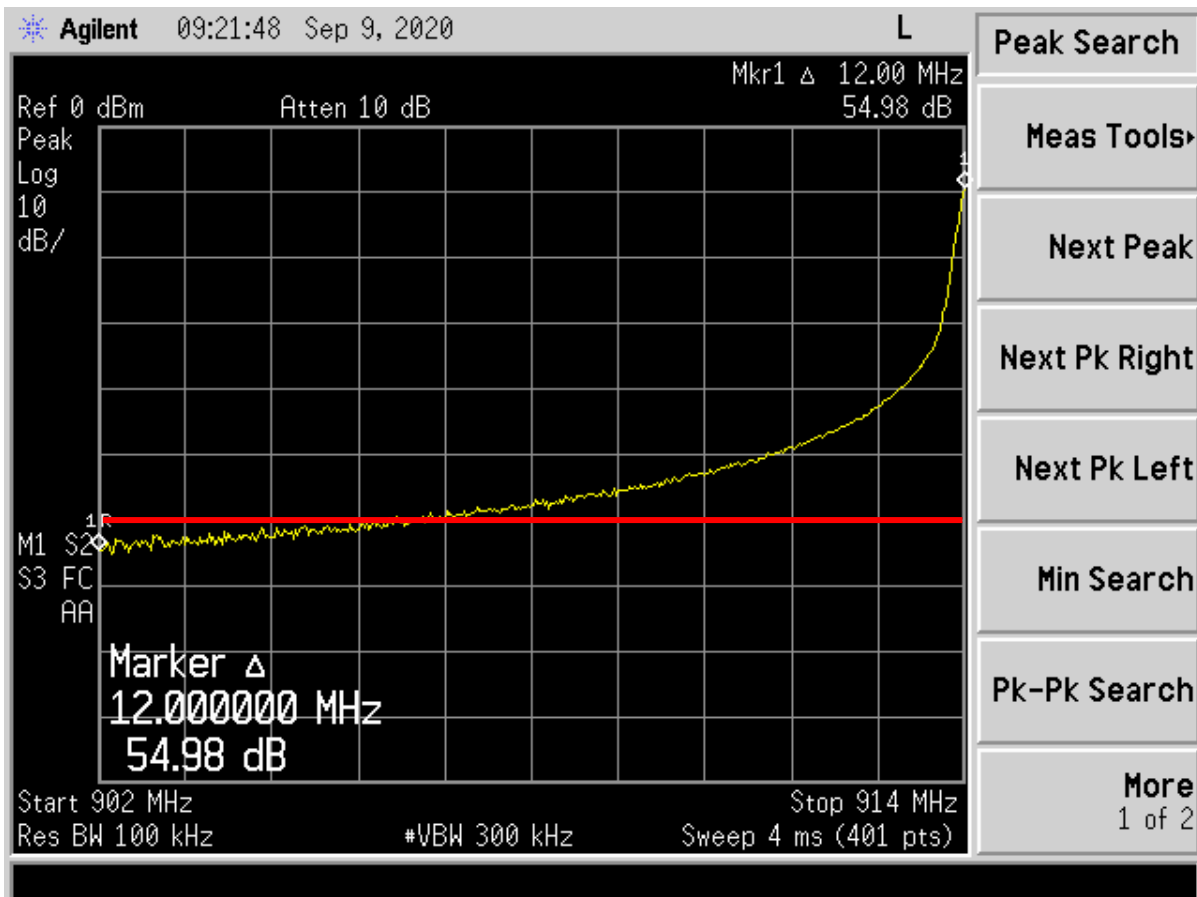


Figure 3. Lower Band Edge

Delta = 54.98 dB, Limit = 50  
Result= PASS

US Tech Test Report:  
FCC ID:  
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Test Report Number:  
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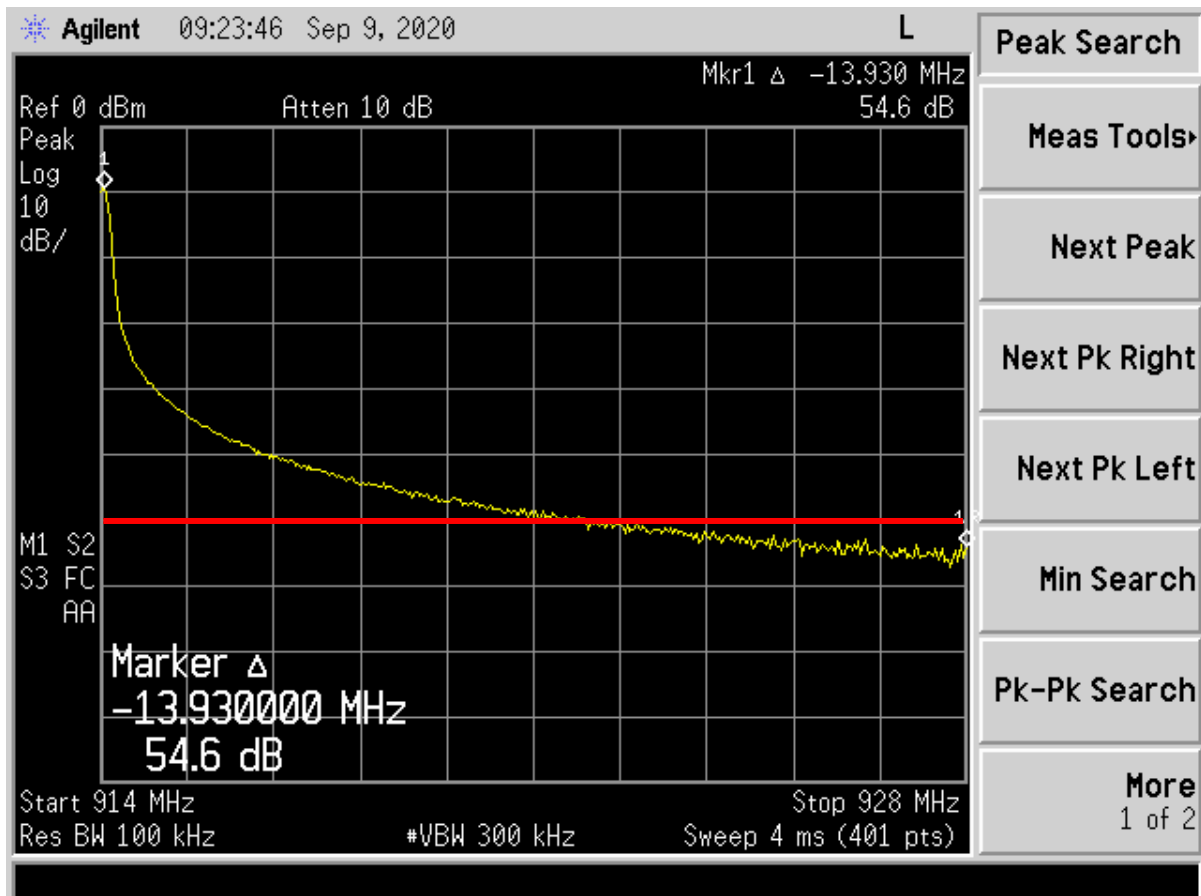


Figure 4. Upper Band Edge

Delta = 54.60 dB, Limit = 50  
Result= PASS

US Tech Test Report:  
FCC ID:  
IC:  
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## **2.13 Measurement Uncertainty**

The measurement uncertainties given were calculated using the method detailed in CISPR 16-4-2. A coverage factor of  $k=2$  was used to give a level of confidence of approximately 95%. This value includes all elements of measurement.

### **2.13.1 Conducted Emissions Measurement Uncertainty**

Measurement Uncertainty (within a 95% confidence level) for this test is  $\pm 2.85$  dB.

### **2.13.2 Radiated Emissions Measurement Uncertainty**

For a measurement distance of 3 m the measurement uncertainty (with a 95% confidence level) for this test using a Biconical Antenna (30 MHz to 200 MHz) is  $\pm 5.40$  dB.

The measurement uncertainty (with a 95% confidence level) for this test using a Log Periodic Antenna (200 MHz to 1000 MHz) is  $\pm 5.19$  dB.

The measurement uncertainty (with a 95% confidence level) for this test using a Horn Antenna is  $\pm 5.08$  dB.

## **3 Conclusions**

The EUT meets the requirements of Part 15.249 of Subpart C and RSS-Gen and RSS-210 based on the test results presented in this test report.