

*FCC PART 15, SUBPART B & C SECTION 15.249
CLASS B TEST REPORT*

For
ANALYZER
Model: NITROXBUDY

Prepared for

DIVENAV, INC.
4311 JAMBOREE ROAD, SUITE #178
NEWPORT BEACH, CA 92660

Prepared by:_____

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DATE: OCTOBER 15, 2013

	REPORT BODY	APPENDICES					TOTAL
		A	B	C	D	E	
PAGES	17	2	2	2	16	17	56

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1	Plot Map And Layout of Test Site

GENERAL REPORT SUMMARY

This electromagnetic emission report is generated by Compatible Electronics Inc., which is an independent testing and consulting firm. The test report is based on testing performed by Compatible Electronics personnel according to the measurement procedures described in the test specifications given below and in the "Test Procedures" section of this report.

The measurement data and conclusions appearing herein relate only to the sample tested and this report may not be reproduced in any form except in full, without the written permission of Compatible Electronics.

This report must not be used to claim product endorsement by NVLAP, NIST or any other agency of the U.S. Government.

Device Tested: Analyzer
Model: Nitroxbuddy
S/N: None

Product Description: The EUT is a wireless Oxygen Analyzer for the connected scuba diver.

Modifications: The EUT was not modified during the testing.

Manufacturer: DiveNav, Inc.
4311 Jamboree Road Suite 178
Newport Beach, CA 92660

Test Date: October 15, 2013

Test Specifications: EMI requirements
CFR Title 47, Part 15 Subpart C Sections 15.205, 15.209 and 15.249
FCC Part 15 Subpart B section 15.109
Test Procedure: ANSI C63.10 and ANSI C63.4

SUMMARY OF TEST RESULTS

TEST	DESCRIPTION	RESULTS
1	Conducted RF Emissions, 150 kHz - 30 MHz.	The EUT is battery operated; therefore this test was not performed.
2	Radiated RF Emissions & Harmonics, 9 kHz – 25,000 MHz	Complies with the limits of CFR Title 47 Part 15Subpart B section 15.109 and Subpart C Sections 15.205 and 15.209.
3	Fundamental Field Strength	Complies with CFR Title 47 Part 15 Subpart C Section 15.249(a)
4	Emissions Radiated Outside of the Fundamental Frequency Band	Complies with CFR Title 47 Part 15 Subpart C Section 15.249(d) and 15.205

1. PURPOSE

This document is a qualification test report based on the Electromagnetic Interference (EMI) tests performed on the Analyzer Model: Nitroxbuddy. The EMI measurements were performed according to the measurement procedure described in ANSI C63.10 and ANSI C63.4. The tests were performed in order to determine whether the electromagnetic emissions from the equipment under test, referred to as EUT (equipment under test) hereafter, are within the specification limits defined by the Code of Federal Regulations Title 47, Part 15 subpart B sections 15.109, Part 15 Subpart C sections 15.205, 15.209 and 15.249.

2. ADMINISTRATIVE DATA

2.1 Location of Testing

The EMI tests described herein were performed at the test facility of Compatible Electronics, 20621 Pascal Way Lake Forest, California 92630.

2.2 Traceability Statement

The calibration certificates of all test equipment used during the test are on file at the location of the test. The calibration is traceable to the National Institute of Standards and Technology (NIST).

2.3 Cognizant Personnel

DiveNav, Inc.

Albert Mantovani President & CEO

Compatible Electronics, Inc.

Matt Harrison	Test Technician
Joey Madlangbayan	Test Engineer
Josh Hansen	Lab Manager

2.4 Date Test Sample was Received

The test sample was received on October 15, 2013.

2.5 Disposition of the Test Sample

The test sample was not returned to DiveNav, Inc. as of the date of this test report.

2.6 Abbreviations and Acronyms

The following abbreviations and acronyms may be used in this document.

RF	Radio Frequency
EMI	Electromagnetic Interference
EUT	Equipment Under Test
P/N	Part Number
S/N	Serial Number
HP	Hewlett Packard
ITE	Information Technology Equipment
CML	Corrected Meter Limit
LISN	Line Impedance Stabilization Network

3. APPLICABLE DOCUMENTS

The following documents are referenced or used in the preparation of this EMI Test Report.

SPEC	TITLE
CFR Title 47, Part 15	FCC Rules – Radio frequency devices (including digital devices)
ANSI C63.4 2009	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	Methods of measurement of radio-noise emissions from low-voltage electrical and electronic equipment in the range of 9 kHz to 40 GHz

4. DESCRIPTION OF TEST CONFIGURATION

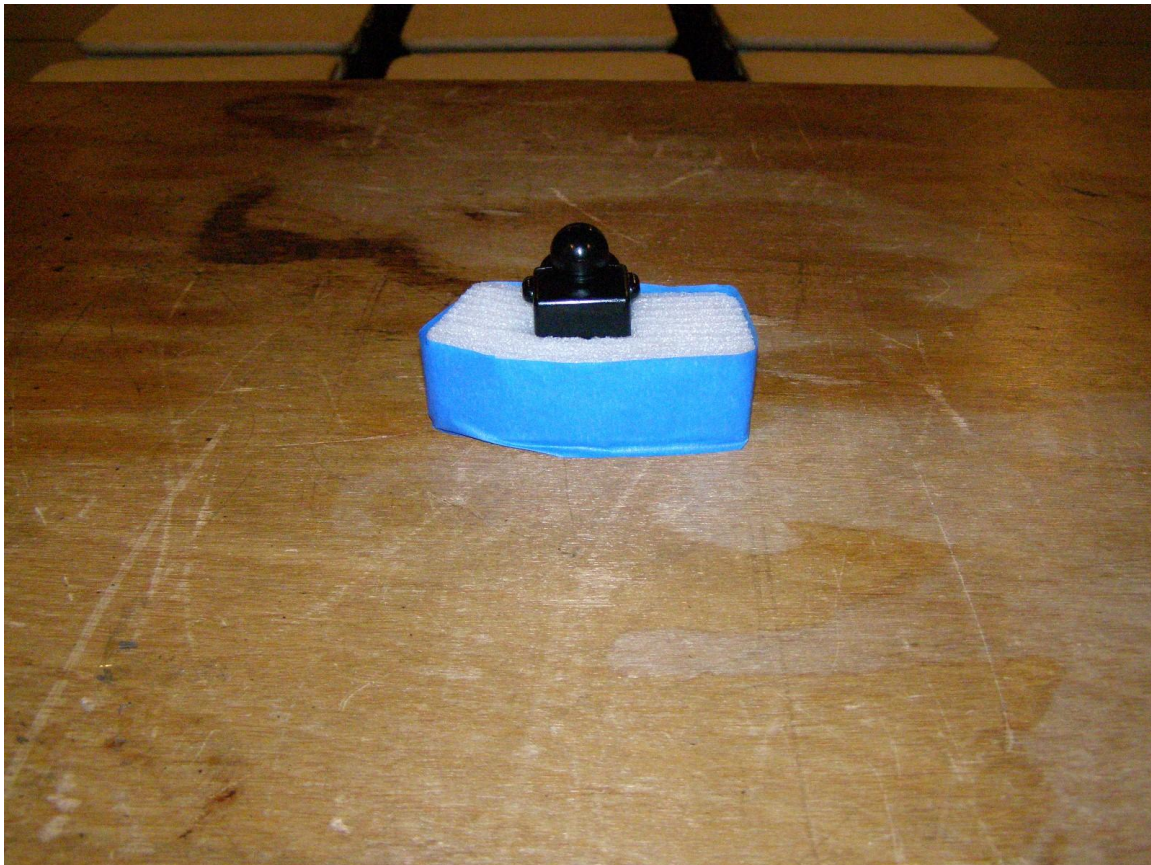
4.1 Description of Test Configuration - EMI

The Analyzer Model: Nitroxbuddy (EUT) was set up in a table top configuration. The EUT was explored in 3 orthogonal axes (X-axis, Y-axis and Z-axis). A new battery was installed prior to each test.

The duty cycle of the EUT was investigated while communicating/paired and while advertising to determine the worst case duty cycle. It was determined that communication/paired produced a worst case duty cycle. Please see appendix E for data sheets.

It was determined that the Y-axis produced the worst case emissions for all testing. The EUT was continuously transmitting throughout the tests. All initial investigations were performed with the emi receiver in spectrum analyzer mode scanning the frequency range continuously. Please see Appendix E for the data sheets.

4.1.1 Photograph of Test Configuration - EMI



4.1.2 Cable Construction and Termination

The EUT did not have any external signal cables.

5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT

5.1 EUT and Accessory List

#	EQUIPMENT TYPE	MANUFACTURER	MODEL	SERIAL NUMBER
1	ANALYZER (EUT)	DIVENAV, INC.	NITROXBUDDY	NONE

5.2 EMI Test Equipment

EQUIPMENT TYPE	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	CAL. DATE	CAL. DUE DATE
Computer	Compatible Electronics	NONE	NONE	N/A	N/A
EMI Receiver	Rohde & Schwarz	ESIB40	100172	2/22/2013	2/22/2014
Antenna, Loop	Com Power	AL-130	17085	1/29/2013	01/29/2015
Antenna, CombiLog	Com Power	AC-220	003	4/16/2013	4/16/2014
Antenna, Horn 1-18GHz	Com Power	AH-118	071250	7/03/2012	7/3/2014
Antenna, Horn 18-26GHz	Com Power	AH-826	081033	N.C.R.	N.C.R.
Pre-Amp, 1-18GHz	Com Power	PAM-118	443013	4/8/2013	4/8/2014
Pre-Amp, 1-18GHz	Com Power	PAM-118	443011	4/8/2013	4/8/2014
Pre-Amp, 18-40GHz	Com Power	PA-840	181289	6/13/2013	6/13/2014
High Pass Filter	AMTI Microwave Circuits	H3G020G4	481230	6/7/2013	6/7/2014
Mast, Antenna Positioner	Sunol Science Corporation	TWR 95-4	020808-3	N/A	N/A
Turntable	Sunol Science Corporation	FM 2001	N/A	N/A	N/A
Mast and Turntable Controller	Sunol Science Corporation	SC104V	020808-1	N/A	N/A

6. TEST SITE DESCRIPTION**6.1 Test Facility Description**

Please refer to section 2.1 and 7.1.2 of this report for EMI test location.

6.2 EUT Mounting, Bonding and Grounding

The EUT was mounted on a 1.0 by 1.5 meter non-conductive table 0.8 meters above the ground plane.

The EUT was not grounded.

7. CHARACTERISTICS OF THE TRANSMITTER

7.1 Channel Number and Frequencies

There are a total of 40 channels. The low channel is at 2402.0 MHz and the high channel is at 2480.0 MHz. There is a 2 MHz separation between each channel.

1 = 2402 MHz
2 = 2404 MHz
3 = 2406 MHz
4 = 2408 MHz
5 = ...

7.2 Modulation

The modulation used is GFSK.

7.3 Antenna

The antenna is made up of a "F" trace on the PCB tuned in the 2.4GHz - 2.48GHz band contained inside the plastic enclosure.

8. TEST PROCEDURES

The following sections describe the test methods and the specifications for the tests. Test results are also included in this section.

8.1 RF Emissions

8.1.1 Conducted Emissions Test

The EMI receiver was used as a measuring meter. A quasi-peak and/or average reading was taken only where indicated in the data sheets. The LISN output was measured using the EMI receiver. The output of the second LISN was terminated by a 50-ohm termination. The effective measurement bandwidth used for this test was 9 kHz.

Please see section 6.2 of this report for mounting, bonding, and grounding of the EUT. The EUT received its power through the LISN, which was bonded to the ground plane. The EUT was set up with the minimum distances from any conductive surfaces as specified in ANSI 63.4. The excess power cord was wrapped in a figure eight pattern to form a bundle not exceeding 0.4 meters in length.

The conducted emissions from the EUT were maximized for operating mode as well as cable placement. The final data was collected under program control by the computer software.

Test Results:

The EUT is a battery operated device; therefore this test was not performed.

8.1.2 Radiated Emissions (Spurious and Harmonics) Test

The EMI receiver was used as a measuring meter. The receiver was used in the peak detect mode with the "Max Hold" feature activated. In this mode, the receiver records the highest measured reading over all the sweeps. Preamplifiers were used to increase the sensitivity of the instrument. There were two Microwave Preamplifiers used for frequencies from 1-18 GHz, and one Microwave Preamplifier was used for frequencies above 18 GHz.

The quasi-peak detector was used for frequencies below 1GHz and the average detector was used for frequencies above 1 GHz.

A duty-cycle average was used for fundamental and fundamental harmonic emissions.

The measurement bandwidths and transducers used for the radiated emissions test were:

FREQUENCY RANGE (MHz)	TRANSDUCER	EFFECTIVE MEASUREMENT BANDWIDTH
0.009 to 0.150	Active Loop Antenna	200 kHz
0.150 to 30	Active Loop Antenna	9 kHz
30 to 1000	Combilog Antenna	100 kHz
1000 to 25000	Horn Antenna	1 MHz

The TDK FAC-3 shielded test chamber of Compatible Electronics, Inc. was used for radiated emissions testing. This test site is in full compliance with ANSI 63.10, ANSI C63.4, EN 50147-2, and CISPR 22. Please see section 6.2 of this report for mounting, bonding and grounding of the EUT. The turntable supporting the EUT is remote controlled using a motor. The turntable permits EUT rotation of 360 degrees in order to maximize emissions. Also, the antenna mast allows height variation of the antenna from 1 meter to 4 meters. Data was collected in the worst case (highest emission) configuration of the EUT. At each reading, the EUT was rotated 360 degrees and the antenna height was varied from 1 to 4 meters in both vertical and horizontal polarizations (for E field radiated field strength).

Test Results:

The EUT complies with the limits of CFR Title 47 Part 15 Subpart B section 15.109, Subpart C sections 15.205, 15.209 and 15.249.

8.1.3 Fundamental Field Strength

The Peak Transmit EMI was measured using the EMI Receiver at a 3-meter test distance to obtain the final test data. The low, mid and high channels were measured. The final qualification data sheets are located in Appendix E.

Test Results:

The EUT complies with Part 15 Subpart C Section 15.249.

8.1.4 Emissions Radiated Outside of the Fundamental Frequency Band

The Band Edge measurement was measured using the EMI Receiver at a 3-meter test distance to obtain the final test data. The low and high channels were tuned during the low and high band edge tests respectively. The final qualification data sheets are located in Appendix E.

Test Results:

The EUT complies with Part 15 Subpart C, Section 15.205 and 15.249.

8.1.5 Duty Cycle

Duty Cycle Correction Factor = -20dB

$$\delta(\text{dB}) = 20 \log \left[\frac{\sum (nt_1 + mt_2 + \dots + \xi t_x)}{T} \right]$$

Where:

n is the number of pulses of duration t_1

m is the number of pulses of duration t_2

ξ is the number of pulses of duration t_x

T is the period of the pulse train or 100 ms if the pulse train length is greater than 100 ms

$$380.759519 \mu\text{s} \times 5 = 1903.797595 \mu\text{s}$$

$$1903.797595 \mu\text{s} = 1.903797595 \text{ms}$$

$$1.903797595 \text{ms} / 100 \text{ms} = 0.01903797595$$

$$20 \log (0.01903797595) = -34.4075845228884 \text{dB} \quad (\text{Maximum correction factor allowed} = -20 \text{dB})$$

9. TEST PROCEDURE DEVIATIONS

There were no deviations from the test procedures.

10. CONCLUSIONS

The Analyzer Model: Nitroxbuddy meets all of the relevant specification requirements defined in the Code of Federal Regulations Title 47, Part 15 subpart B section 15.109 Subpart C sections 15.205, 15.209 and 15.249.

APPENDIX A

LABORATORY ACCREDITATIONS

LABORATORY ACCREDITATIONS AND RECOGNITIONS



For US, Canada, Australia/New Zealand, Taiwan and the European Union, Compatible Electronics is currently accredited by NVLAP to ISO/IEC 17025 an ISO 9002 equivalent. Please follow the link to the NIST site for each of our facilities NVLAP certificate and scope of accreditation.

Silverado/Lake Forest Division: <http://ts.nist.gov/ts/htdocs/210/214/scopes/2005270.htm>

Brea Division: <http://ts.nist.gov/ts/htdocs/210/214/scopes/2005280.htm>

Agoura Division: <http://ts.nist.gov/ts/htdocs/210/214/scopes/2000630.htm>



Compatible Electronics has been accredited by ANSI and appointed by the FCC to serve as a Telecommunications Certification Body (TCB). Compatible Electronics ANSI TCB listing can be found at: http://www.ansi.org/public/ca/ansi_cp.html



Compatible Electronics has been nominated as a Conformity Assessment Body (CAB) for EMC under the US/EU Mutual Recognition Agreement (MRA). Compatible Electronics NIST US/EU CAB listing can be found at: <http://ts.nist.gov/ts/htdocs/210/gsig/emc-cabs-mar02.pdf>



Compatible Electronics has been nominated as a Conformity Assessment Body (CAB) for Taiwan/BSMI under the US/APEC (Asia-Pacific Economic Cooperation) Mutual Recognition Agreement (MRA). Compatible Electronics NIST US/APEC CAB listing can be found at: <http://ts.nist.gov/ts/htdocs/210/gsig/apec/bsmi-cabs-may02.pdf>



Compatible Electronics has been validated by NEMKO against ISO/IEC 17025 under the NEMKO EMC Laboratory Authorization (ELA) program to all EN standards required by the European Union (EU) EMC Directive 89/336/EEC. Please follow the link to the Compatible Electronics' web site for each of our facilities NEMKO ELA certificate and scope of accreditation. <http://www.celectronics.com/certs.htm>

We are also certified/listed for IT products by the following country/agency:



Compatible Electronics VCCI listing can be found at: http://www.vcci.or.jp/vcci_e/member/tekigo/setsubi_index_id.html

Just type "Compatible Electronics" into the Keyword search box.



Compatible Electronics FCC listing can be found at: https://gullfoss2.fcc.gov/prod/oet/index_ie.html

Just type "Compatible Electronics" into the Test Firms search box.



Compatible Electronics IC listing can be found at: http://spectrum.ic.gc.ca/~cert/labs/oats_lab_c_e.html

APPENDIX B

MODIFICATIONS TO THE EUT

MODIFICATIONS TO THE EUT

There were no modifications made to the EUT during the test.

APPENDIX C

ADDITIONAL MODELS COVERED UNDER THIS REPORT

ADDITIONAL MODELS COVERED UNDER THIS REPORT

USED FOR THE PRIMARY TEST

ANALYZER
MODEL: NITROXBUDY
S/N: NONE

There were no additional models covered under this report.

APPENDIX D

DIAGRAMS, CHARTS AND PHOTOS

**FIGURE 1: RADIATED EMISSIONS 3-METER
SEMI-ANECHOIC TEST CHAMBER BELOW 1GHz**

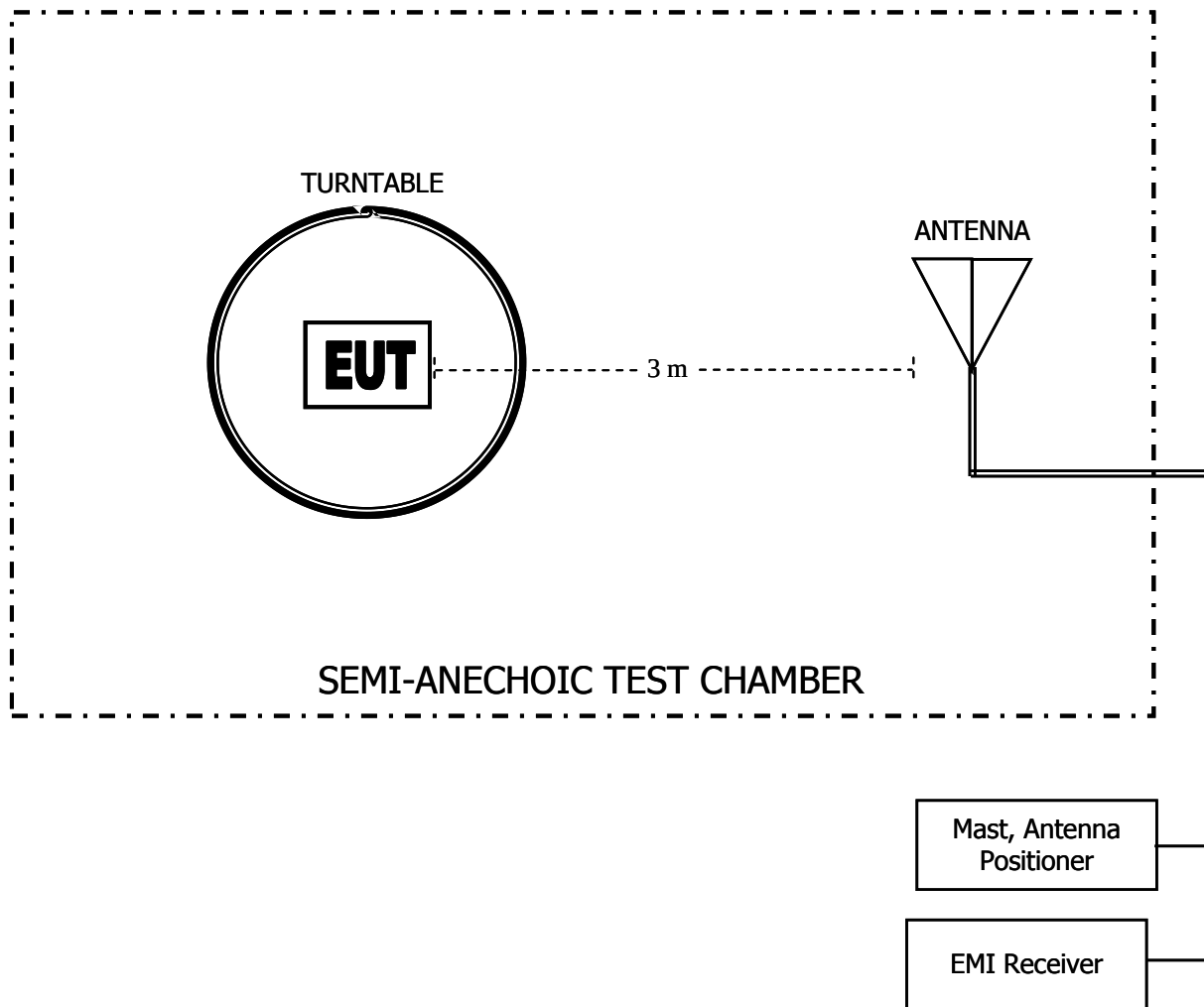
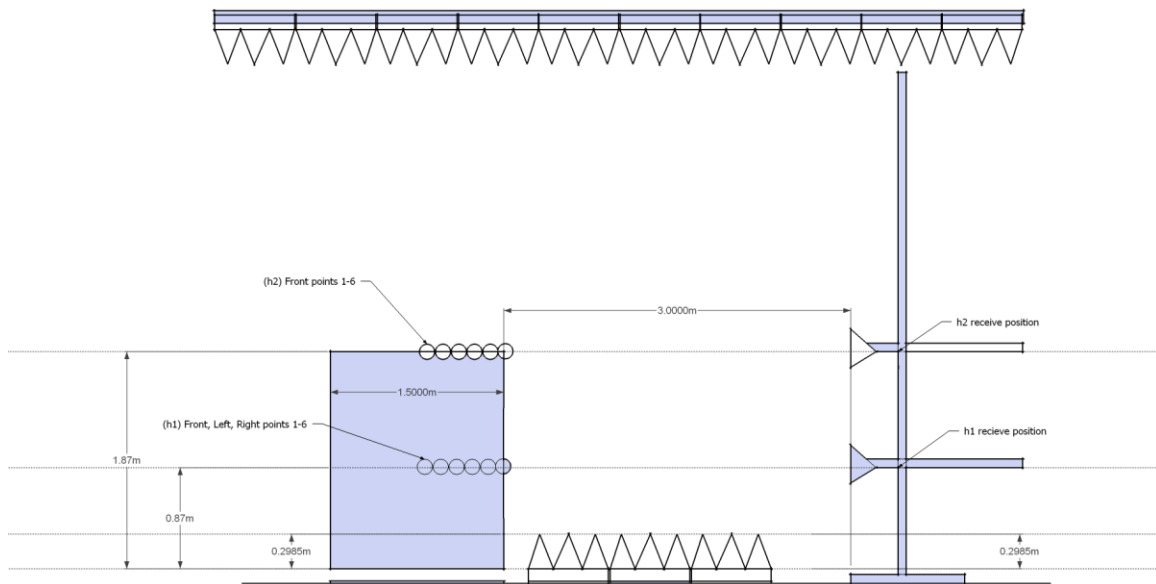


FIGURE 2: RADIATED EMISSIONS 3-METER SEMI-ANECHOIC TEST CHAMBER ABOVE 1 GHz



COM-POWER AL-130**LOOP ANTENNA****S/N: 17085****CALIBRATION DUE: JANUARY 29, 2015**

FREQUENCY (MHz)	MAGNETIC (dB/m)	ELECTRIC (dB/m)	FREQUENCY (MHz)	MAGNETIC (dB/m)	ELECTRIC (dB/m)
0.009	-40.70	10.80	0.8	-40.91	10.59
0.01	-40.50	11.00	0.9	-40.80	10.70
0.02	-40.70	10.80	1.0	-40.81	10.69
0.03	-40.10	11.40	2.0	-40.51	10.99
0.04	-40.50	11.00	3.0	-40.54	10.96
0.05	-41.10	10.40	4.0	-40.44	11.06
0.06	-41.00	10.50	5.0	-40.32	11.18
0.07	-41.10	10.40	6.0	-40.69	10.81
0.08	-41.10	10.40	7.0	-40.37	11.13
0.09	-41.20	10.30	8.0	-39.99	11.51
0.1	-41.20	10.30	9.0	-40.00	11.50
0.2	-41.40	10.10	10.0	-40.08	11.42
0.3	-41.30	10.20	15.0	-42.36	9.14
0.4	-41.20	10.30	20.0	-38.75	12.75
0.5	-41.40	10.10	25.0	-40.70	10.80
0.6	-41.40	10.10	30.0	-41.09	10.41
0.7	-41.20	10.30			

COM-POWER AC-220**LAB P - COMBILOG ANTENNA****S/N: 003****CALIBRATION DUE: APRIL 16, 2014**

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30	19.2	160	8.6
35	19.3	180	9.2
40	20.0	200	9.3
45	17.8	250	12.1
50	17.8	300	13.8
60	13.2	400	15.0
70	7.9	500	17.5
80	6.9	600	17.9
90	8.1	700	20.7
100	8.1	800	20.3
120	9.6	900	21.3
140	9.7	1000	22.4

COM-POWER AH-118

HORN ANTENNA

S/N: 071250

CALIBRATION DUE: JULY 3, 2014

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
1000	26.0	9500	40.7
1500	27.3	10000	41.0
2000	31.7	10500	41.5
2500	31.8	11000	42.2
3000	32.4	11500	42.1
3500	33.2	12000	42.4
4000	33.8	12500	41.6
4500	34.8	13000	43.7
5000	36.5	13500	44.3
5500	36.9	14000	43.2
6000	37.1	14500	42.8
6500	37.4	15000	44.7
7000	38.8	15500	44.5
7500	39.5	16000	43.4
8000	42.4	16500	43.5
8500	38.9	17000	46.0
9000	39.4	17500	48.0
		18000	49.0

COM-POWER AH-826

HORN ANTENNA

S/N: 81033

CALIBRATION: N.C.R.

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
18000	32.8	22500	32.7
18500	32.2	23000	32.7
19000	31.9	23500	32.0
19500	31.5	24000	32.9
20000	33.3	24500	33.7
20500	33.2	25000	34.1
21000	32.6	25500	33.6
21500	33.2	26000	35.1
22000	33.0	26500	33.6

COM-POWER PAM-118
1-18GHz - PREAMPLIFIER

S/N: 443013

CALIBRATION DUE: APRIL 8, 2014

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
500	26.32	5500	25.55
1000	24.72	6000	25.54
1100	25.89	6500	24.57
1200	25.41	7000	23.51
1300	26.28	7500	23.59
1400	25.94	8000	23.32
1500	25.59	8500	22.76
1600	26.95	9000	23.15
1700	25.52	9500	24.41
1800	25.75	10000	25.71
1900	26.00	11000	26.07
2000	25.38	12000	26.17
2500	26.06	13000	24.72
3000	26.24	14000	23.19
3500	25.82	15000	25.42
4000	26.04	16000	25.07
4500	25.96	17000	24.24
5000	26.02	18000	24.92

COM-POWER PAM-118**1-18GHz - PREAMPLIFIER****S/N: 443011****CALIBRATION DUE: APRIL 8, 2014**

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
0.500	27.01	7.000	23.96
1.000	25.68	7.500	24.28
1.500	26.55	8.000	24.33
2.000	26.16	8.500	24.42
2.500	27.21	9.500	25.89
3.000	26.46	10.000	27.73
3.500	26.52	11.000	28.36
4.000	27.67	12.000	27.21
4.500	26.32	13.000	27.69
5.000	26.90	14.000	25.94
5.500	26.72	15.000	24.27
6.000	26.48	16.000	27.22
6.500	27.12	17.000	26.12
		18.000	25.96

COM-POWER PA-840**18-40 GHz PREAMPLIFIER****S/N: 181289****CALIBRATION DUE: JUNE 13, 2014**

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
18000	30.33	31500	29.12
19000	29.21	32000	28.84
20000	29.33	32500	28.04
21000	31.35	33000	28.72
22000	30.81	33500	28.09
23000	28.37	34000	27.91
24000	28.77	34500	27.87
25000	29.14	35000	27.82
26000	31.88	35500	27.70
26500	31.08	36000	25.38
27000	31.47	36500	27.82
27500	30.73	37000	27.45
28000	29.87	37500	27.62
28500	30.02	38000	28.40
29000	29.78	38500	29.00
29500	29.81	39000	30.33
30000	28.82	39500	31.43
30500	28.56	39999	29.61
31000	29.78		



FRONT VIEW

DIVENAV, INC.
ANALYZER

Model: NITROXBUDDY

FCC PART 15 SUBPART B & C - RADIATED EMISSIONS 30-1000MHz

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**



REAR VIEW

DIVENAV, INC.
ANALYZER

Model: NITROXBUDDY

FCC PART 15 SUBPART B & C - RADIATED EMISSIONS 30-1000MHz

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**



FRONT VIEW

DIVENAV, INC.
ANALYZER

Model: NITROXBUDDY

FCC PART 15 SUBPART B & C - RADIATED EMISSIONS 1-18GHz

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**



REAR VIEW

DIVENAV, INC.
ANALYZER

Model: NITROXBUDDY

FCC PART 15 SUBPART B & C - RADIATED EMISSIONS 1-18GHz

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**



VIEW 1

DIVENAV, INC.
ANALYZER

Model: NITROXBUDDY

FCC PART 15 SUBPART B & C - RADIATED EMISSIONS 18-25GHz

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**



REAR VIEW

DIVENAV, INC.
ANALYZER

Model: NITROXBUDDY

FCC PART 15 SUBPART B & C - RADIATED EMISSIONS 18-25GHz

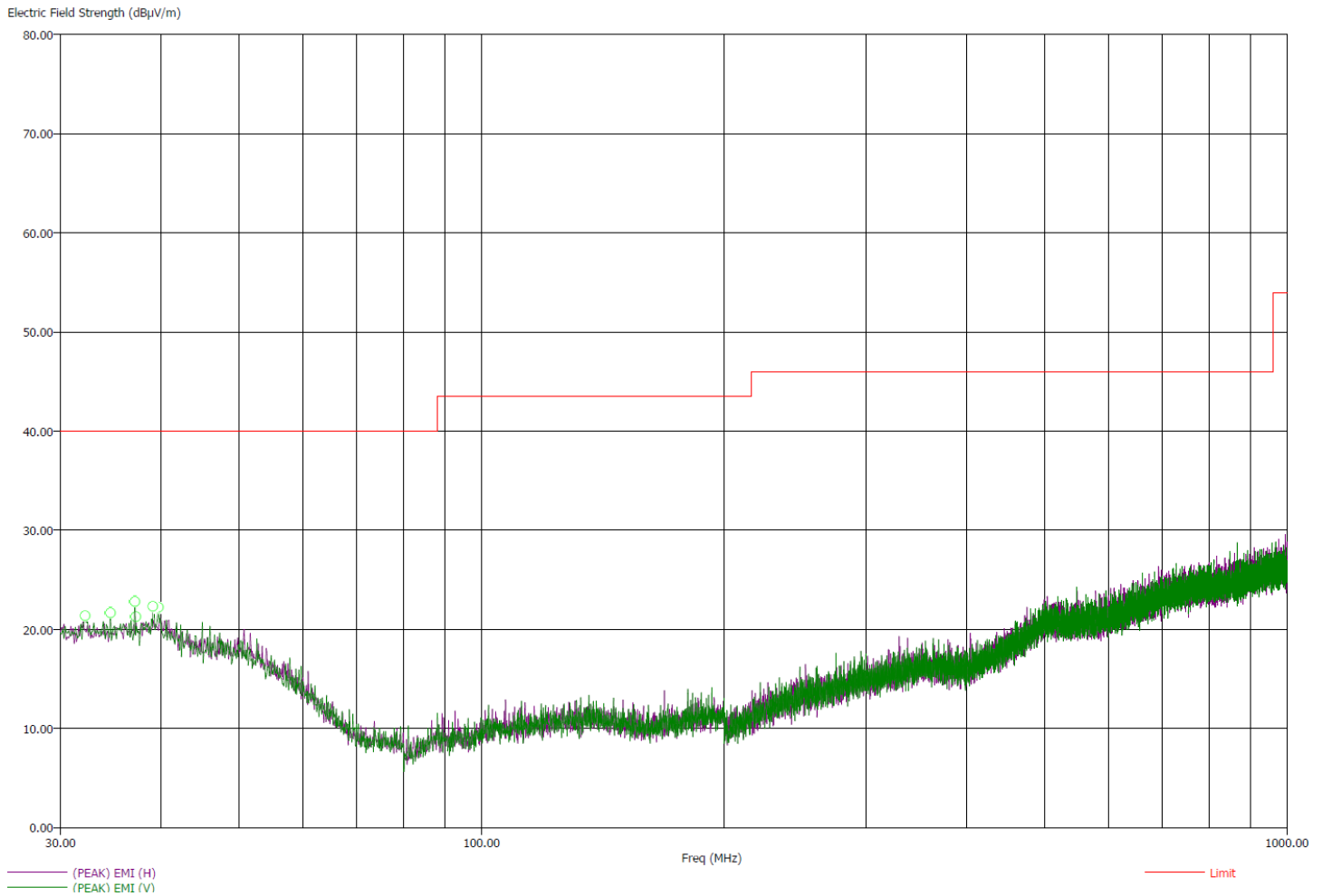
**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**

APPENDIX E

DATASHEETS

Title: FCC 15.209
File: Radiated Pre-Scan 30-1000Mhz.set
Operator: Matt Harrison
EUT Type: Analyzer: Nitroxbuddy.
EUT Condition: Transceiving 2440MHz.
Comments:
Temp: 76f
Hum: 31%
Battery Operated.

10/16/2013 12:06:16 PM
Sequence: Preliminary Scan

Compatible Electronics, Inc. FAC-3 (Lab P)

There were no spurious radiated emissions other than harmonics found below 30 MHz or above 1GHz

Title: FCC 15.209
File: Radiated Final 30-1000Mhz.set
Operator: Matt Harrison
EUT Type: Analyzer: Nitroxbuddy.
EUT Condition: Transceiving 2440MHz.
Comments: Temp: 76f
Hum: 31%
Battery Operated.

10/16/2013 1:18:18 PM
Sequence: Final Measurements

Compatible Electronics, Inc. FAC-3 (Lab P)

Freq (MHz)	(QP) Margin (dB)	(QP) EMI (dBμV/m)	(PEAK) EMI (dBμV/m)	Limit (dBμV/m)	Pol	Ttbl Agl (deg)	Twr Ht (cm)	Transducer (dB)	Cable(dB)
32.20	-24.51	15.49	20.70	40.00	V	38.75	308.41	19.25	0.67
34.60	-24.57	15.43	21.51	40.00	V	256.50	145.52	19.29	0.56
37.10	-24.22	15.78	21.21	40.00	V	283.50	99.35	19.59	0.46
37.20	-24.19	15.81	21.98	40.00	H	184.00	141.52	19.64	0.45
39.10	-23.87	16.13	22.02	40.00	V	360.25	275.76	19.88	0.38
39.70	-23.81	16.19	21.47	40.00	V	244.50	232.70	19.96	0.36

There were no spurious radiated emissions other than harmonics found below 30 MHz or above 1GHz

FUNDAMENTAL & HARMONICS

DATASHEETS

FCC 15.249

Company: DiveNav
EUT: Analyzer
Model: Nitroxbuddy
Duty Cycle Correction Factor: -20.00

Date: 10/15/2013
Lab: P
TestEng: Matt Harrison

Compatible Electronics, Inc. FAC-3 (Lab P)

Freq. (MHz)	Level (dBμV)	Pol (v/h)	Limit (dBμV)	Margin (dB)	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2402	94.13	H	--	--	Peak	2.25	360	Y-Axis
2402	74.13	H	93.97	-19.84	AVG	2.25	360	Y-Axis
2402	103.13	V	--	--	Peak	1	327	Y-Axis
2402	83.13	V	93.97	-10.84	AVG	1	327	Y-Axis
2440	88.09	H	--	--	Peak	1.1	114	Y-Axis
2440	68.09	H	93.97	-25.88	AVG	1.1	114	Y-Axis
2440	100.69	V	--	--	Peak	1	327	Y-Axis
2440	80.69	V	93.97	-13.28	AVG	1	327	Y-Axis
2480	94.35	H	--	--	Peak	2.7	310	Y-Axis
2480	74.35	H	93.97	-19.62	AVG	2.7	310	Y-Axis
2480	98.72	V	--	--	Peak	1	0	Y-Axis
2480	78.72	V	93.97	-15.25	AVG	1	0	Y-Axis

Test distance
3 meter

FCC 15.249

Company: DiveNav
EUT: Analyzer

Date: 10/15/2013
Lab: P
TestEng: Matt Harrison

Model: Nitroxbuddy
Duty Cycle Correction Factor: -20.00

Compatible Electronics, Inc. FAC-3 (Lab P)

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit (dBuV)	Margin (dB)	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4804.00	68.30	H	--	--	Peak	1.60	213	
4804.00	48.30	H	53.98	-5.68	Avg	1.60	213	
7206.00	54.84	H	--	--	Peak	1.50	180	
7206.00	34.84	H	53.98	-19.14	Avg	1.50	180	
9608.00		H	--	--	Peak			No Emission Found
9608.00		H	53.98	--	Avg			No Emission Found
12010.00		H	--	--	Peak			No Emission Found
12010.00		H	53.98	--	Avg			No Emission Found
14412.00		H	--	--	Peak			No Emission Found
14412.00		H	53.98	--	Avg			No Emission Found
				--				
16814.00		H	--	--	Peak			No Emission Found
16814.00		H	53.98	--	Avg			No Emission Found
19216.00		H	--	--	Peak			No Emission Found
19216.00		H	53.98	--	Avg			No Emission Found
21618.00		H	--	--	Peak			No Emission Found
21618.00		H	53.98	--	Avg			No Emission Found
24020.00		H	--	--	Peak			No Emission Found
24020.00		H	53.98	--	Avg			No Emission Found

Test distance
3 meter

FCC 15.249

Company: DiveNav
EUT: Analyzer
Model: Nitroxbuddy
Duty Cycle Correction Factor: -20.00

Date: 10/15/2013
Lab: P
Test Eng: Matt Harrison

Compatible Electronics, Inc. FAC-3 (Lab P)

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit (dBμV)	Margin (dB)	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4804.00	69.10	V	--	--	Peak	1	145	
4804.00	49.10	V	53.98	-4.88	Avg	1	145	
7206.00		V	--	--	Peak			No Emission Found
7206.00		V	53.98	--	Avg			No Emission Found
9608.00		V	--	--	Peak			No Emission Found
9608.00		V	53.98	--	Avg			No Emission Found
12010.00		V	--	--	Peak			No Emission Found
12010.00		V	53.98	--	Avg			No Emission Found
14412.00		V	--	--	Peak			No Emission Found
14412.00		V	53.98	--	Avg			No Emission Found
16814.00		V	--	--	Peak			No Emission Found
16814.00		V	53.98	--	Avg			No Emission Found
19216.00		V	--	--	Peak			No Emission Found
19216.00		V	53.98	--	Avg			No Emission Found
21618.00		V	--	--	Peak			No Emission Found
21618.00		V	53.98	--	Avg			No Emission Found
24020.00		V	--	--	Peak			No Emission Found
24020.00		V	53.98	--	Avg			No Emission Found

Test distance
3 meter

FCC 15.249

Company: DiveNav
EUT: Analyzer
Model: Nitroxbuddy
Duty Cycle Correction Factor: -20.00

Date: 10/15/2013
Lab: P
Test Eng: Matt Harrison

Compatible Electronics, Inc. FAC-3 (Lab P)

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit (dBμV)	Margin (dB)	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4880.00	70.11	H	--	--	Peak	1.45	190	
4880.00	50.11	H	53.98	-3.87	Avg	1.45	190	
7320.00	54.65	H	--	--	Peak	1.40	180	
7320.00	34.65	H	53.98	-19.33	Avg	1.40	180	
9760.00		H	--	--	Peak			No Emission Found
9760.00		H	53.98	--	Avg			No Emission Found
12200.00		H	--	--	Peak			No Emission Found
12200.00		H	53.98	--	Avg			No Emission Found
14640.00		H	--	--	Peak			No Emission Found
14640.00		H	53.98	--	Avg			No Emission Found
17080.00		H	--	--	Peak			No Emission Found
17080.00		H	53.98	--	Avg			No Emission Found
19520.00		H	--	--	Peak			No Emission Found
19520.00		H	53.98	--	Avg			No Emission Found
21960.00		H	--	--	Peak			No Emission Found
21960.00		H	53.98	--	Avg			No Emission Found
24400.00		H	--	--	Peak			No Emission Found
24400.00		H	53.98	--	Avg			No Emission Found

Test distance
3 meter

FCC 15.249

Company: DiveNav
EUT: Analyzer
Model: Nitroxbuddy
Duty Cycle Correction Factor: -20.00

Date: 10/15/2013
Lab: P
Test Eng: Matt Harrison

Compatible Electronics, Inc. FAC-3 (Lab P)

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit (dBμV)	Margin (dB)	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4880.00	73.48	V	--	--	Peak	1.5	160	
4880.00	53.48	V	53.98	-0.50	Avg	1.5	160	
7320.00		V	--	--	Peak			No Emission Found
7320.00		V	53.98	--	Avg			No Emission Found
9760.00		V	--	--	Peak			No Emission Found
9760.00		V	53.98	--	Avg			No Emission Found
12200.00		V	--	--	Peak			No Emission Found
12200.00		V	53.98	--	Avg			No Emission Found
14640.00		V	--	--	Peak			No Emission Found
14640.00		V	53.98	--	Avg			No Emission Found
17080.00		V	--	--	Peak			No Emission Found
17080.00		V	53.98	--	Avg			No Emission Found
19520.00		V	--	--	Peak			No Emission Found
19520.00		V	53.98	--	Avg			No Emission Found
21960.00		V	--	--	Peak			No Emission Found
21960.00		V	53.98	--	Avg			No Emission Found
24400.00		V	--	--	Peak			No Emission Found
24400.00		V	53.98	--	Avg			No Emission Found

Test distance
3 meter

FCC 15.249

Company: DiveNav
EUT: Analyzer
Model: Nitroxbuddy
Duty Cycle Correction Factor: -20.00

Date: 10/15/2013
Lab: P
Test Eng: Matt Harrison

Compatible Electronics, Inc. FAC-3 (Lab P)

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit (dBμV)	Margin (dB)	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4960.00	69.39	H	--	--	Peak	1.45	190	
4960.00	49.39	H	53.98	-4.59	Avg	1.45	190	
7440.00	56.97	H	--	--	Peak	140	180	
7440.00	36.97	H	53.98	-17.01	Avg	140	180	
9920.00	59.20	H	--	--	Peak	1.45	160	
9920.00	39.20	H	53.98	-14.78	Avg	1.45	160	
12400.00		H	--	--	Peak			No Emission Found
12400.00		H	53.98	--	Avg			No Emission Found
14880.00		H	--	--	Peak			No Emission Found
14880.00		H	53.98	--	Avg			No Emission Found
17360.00		H	--	--	Peak			No Emission Found
17360.00		H	53.98	--	Avg			No Emission Found
19840.00		H	--	--	Peak			No Emission Found
19840.00		H	53.98	--	Avg			No Emission Found
22320.00		H	--	--	Peak			No Emission Found
22320.00		H	53.98	--	Avg			No Emission Found
24800.00		H	--	--	Peak			No Emission Found
24800.00		H	53.98	--	Avg			No Emission Found

Test distance
3 meter

FCC 15.249

Company: DiveNav
EUT: Analyzer
Model: Nitroxbuddy
Duty Cycle Correction Factor: -20.00

Date: 10/15/2013
Lab: P
Test Eng: Matt Harrison

Compatible Electronics, Inc. FAC-3 (Lab P)

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit (dBμV)	Margin (dB)	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4960.00	72.10	V	--	--	Peak	1.5	180	
4960.00	52.10	V	53.98	-1.88	Avg	1.5	180	
7440.00		V	--	--	Peak			No Emission Found
7440.00		V	53.98	--	Avg			No Emission Found
9920.00		V	--	--	Peak			No Emission Found
9920.00		V	53.98	--	Avg			No Emission Found
12400.00		V	--	--	Peak			No Emission Found
12400.00		V	53.98	--	Avg			No Emission Found
14880.00		V	--	--	Peak			No Emission Found
14880.00		V	53.98	--	Avg			No Emission Found
17360.00		V	--	--	Peak			No Emission Found
17360.00		V	53.98	--	Avg			No Emission Found
19840.00		V	--	--	Peak			No Emission Found
19840.00		V	53.98	--	Avg			No Emission Found
22320.00		V	--	--	Peak			No Emission Found
22320.00		V	53.98	--	Avg			No Emission Found
24800.00		V	--	--	Peak			No Emission Found
24800.00		V	53.98	--	Avg			No Emission Found

Test distance
3 meter

***EMISSIONS RADIATED OUTSIDE OF THE FUNDAMENTAL
FREQUENCY BAND
DATA SHEETS***

FCC 15.249

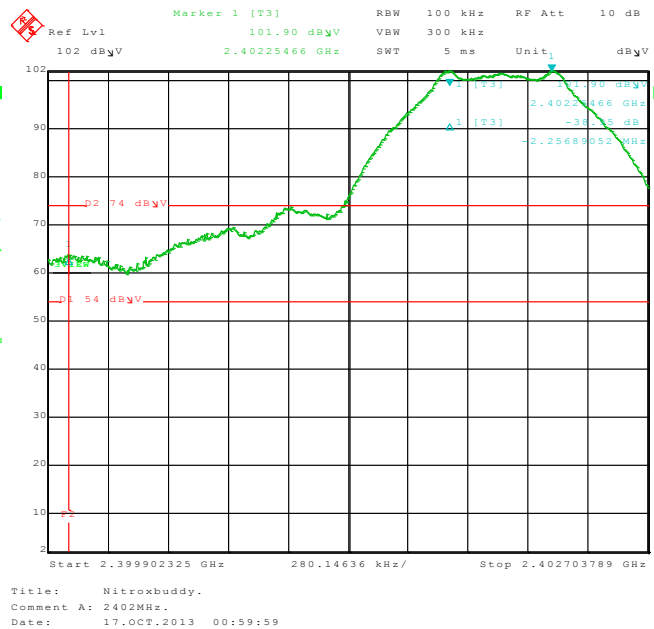
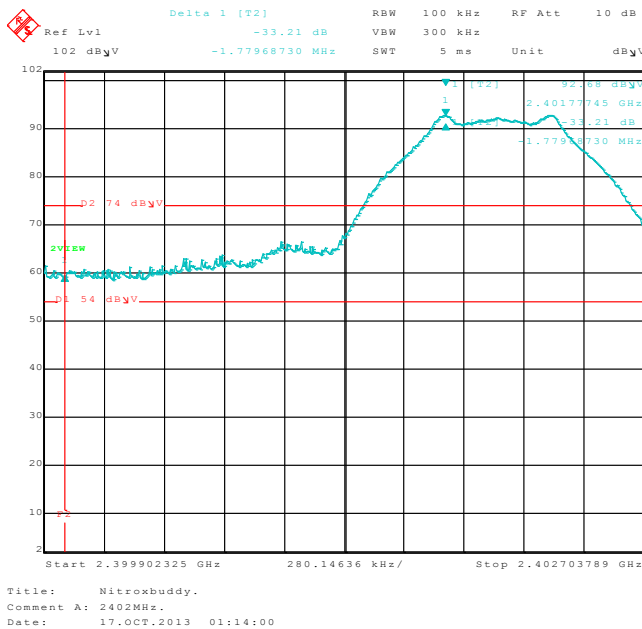
Company: DiveNav
EUT: Analyzer
Model: Nitroxbuddy
Duty Cycle Correction Factor: -20.00

Date: 10/15/2013
Lab: P
TestEng: Matt Harrison

Compatible Electronics, Inc. FAC-3 (Lab R)
Lower Band Edge

Freq. (MHz)	Level (dBμV)	Pol (v/h)	Limit (dBμV)	Margin (dB)	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2402	94.13	H	--	--	Peak	2.25	360	Fundamental
2400	60.92	H	--	--	Peak	2.25	360	Marker Delta Method Used
2400	40.92	H	53.98	-13.06	AVG	2.25	360	Duty Cycle Average
2402	103.13	V	--	--	Peak	1	327	Fundamental
2400	64.18	V	--	--	Peak	1	327	Marker Delta Method Used
2400	44.18	V	53.98	-9.80	AVG	1	327	Duty Cycle Average

Test distance
3 meter


Marker-Delta Plots

FCC 15.249

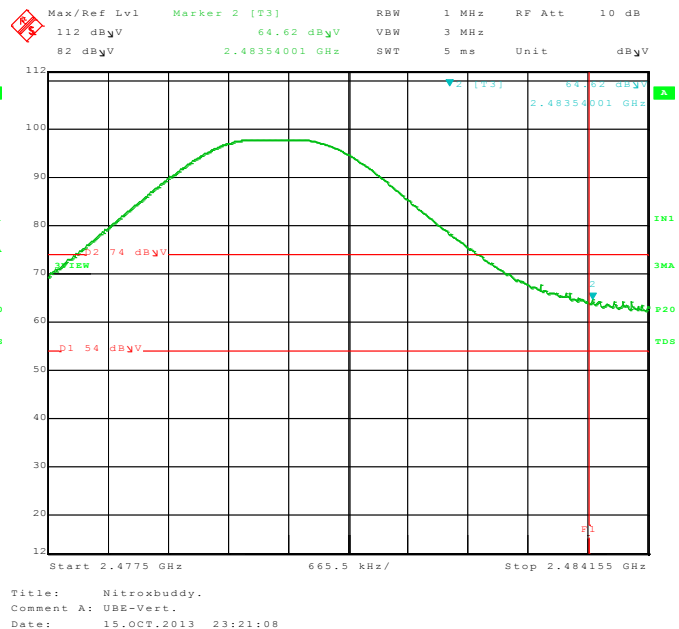
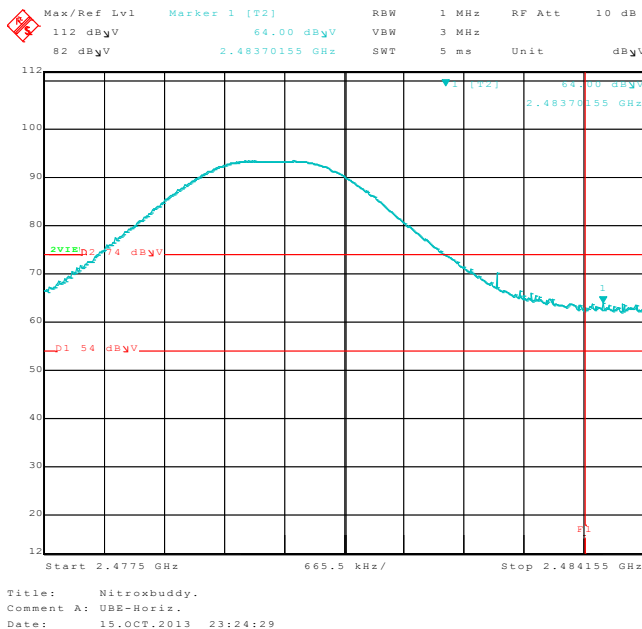
Company: DiveNav
EUT: Analyzer
Model: Nitroxbuddy
Duty Cycle Correction Factor: -20.00

Date: 10/15/2013
Lab: P
TestEng: Matt Harrison

Compatible Electronics, Inc. FAC-3 (Lab R)
Upper Band Edge

Freq. (MHz)	Level (dBμV)	Pol (v/h)	Limit (dBμV)	Margin (dB)	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2483.7	64.00	H	--	--	Peak	2.7	310	No Marker Delta Method Used
2483.7	44.00	H	53.98	-9.98	AVG	2.7	310	Duty Cycle Average
2483.5	64.62	V	--	--	Peak	1	0	No Marker Delta Method Used
2483.5	44.62	V	53.98	-9.36	AVG	1	0	Duty Cycle Average

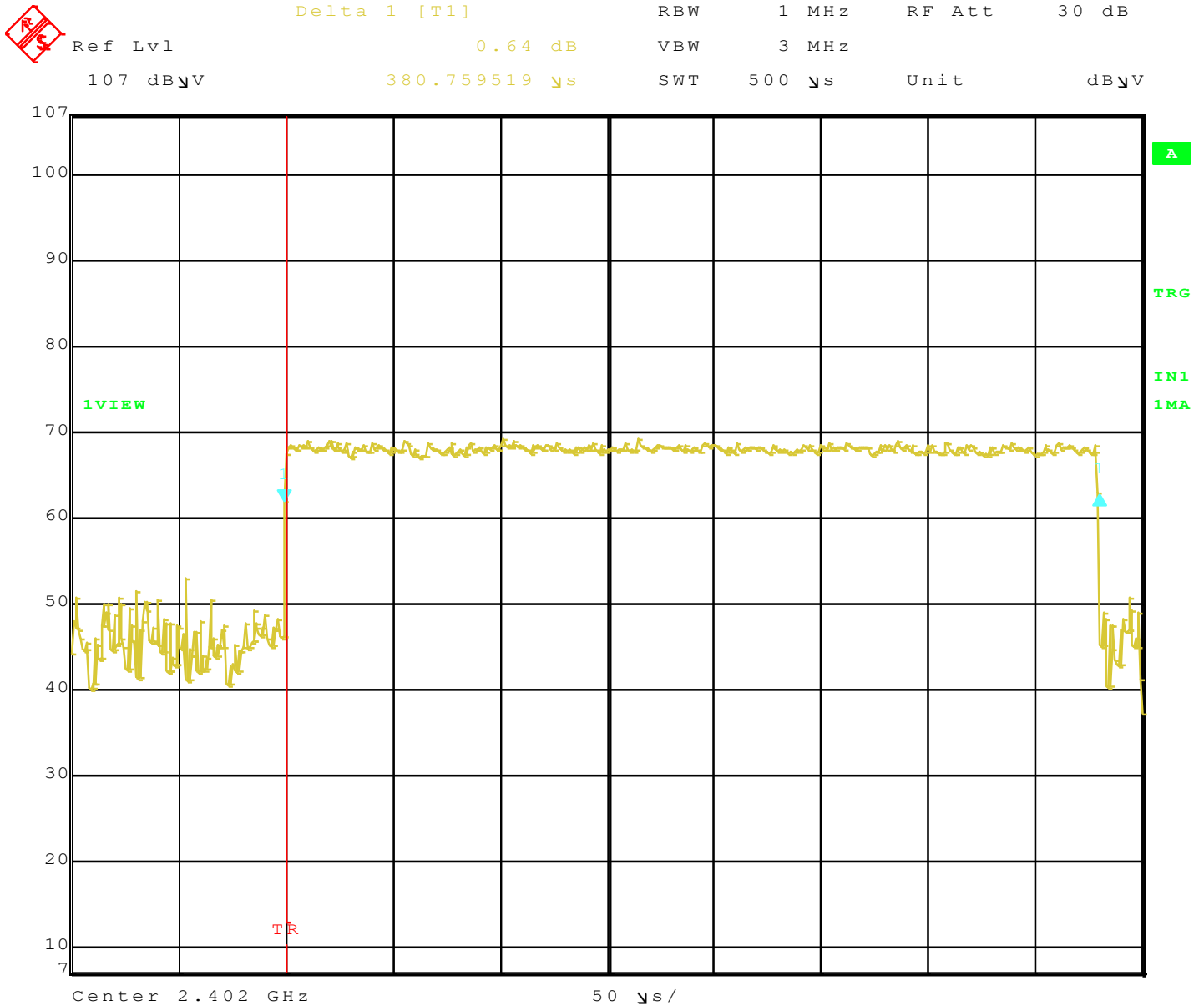
Test distance
3 meter



DUTY CYCLE

PLOTS

PULSE WIDTH



Title: Nitroxbuddy
 Comment A: Hop mode. Pulses.
 Date: 15.OCT.2013 17:56:25

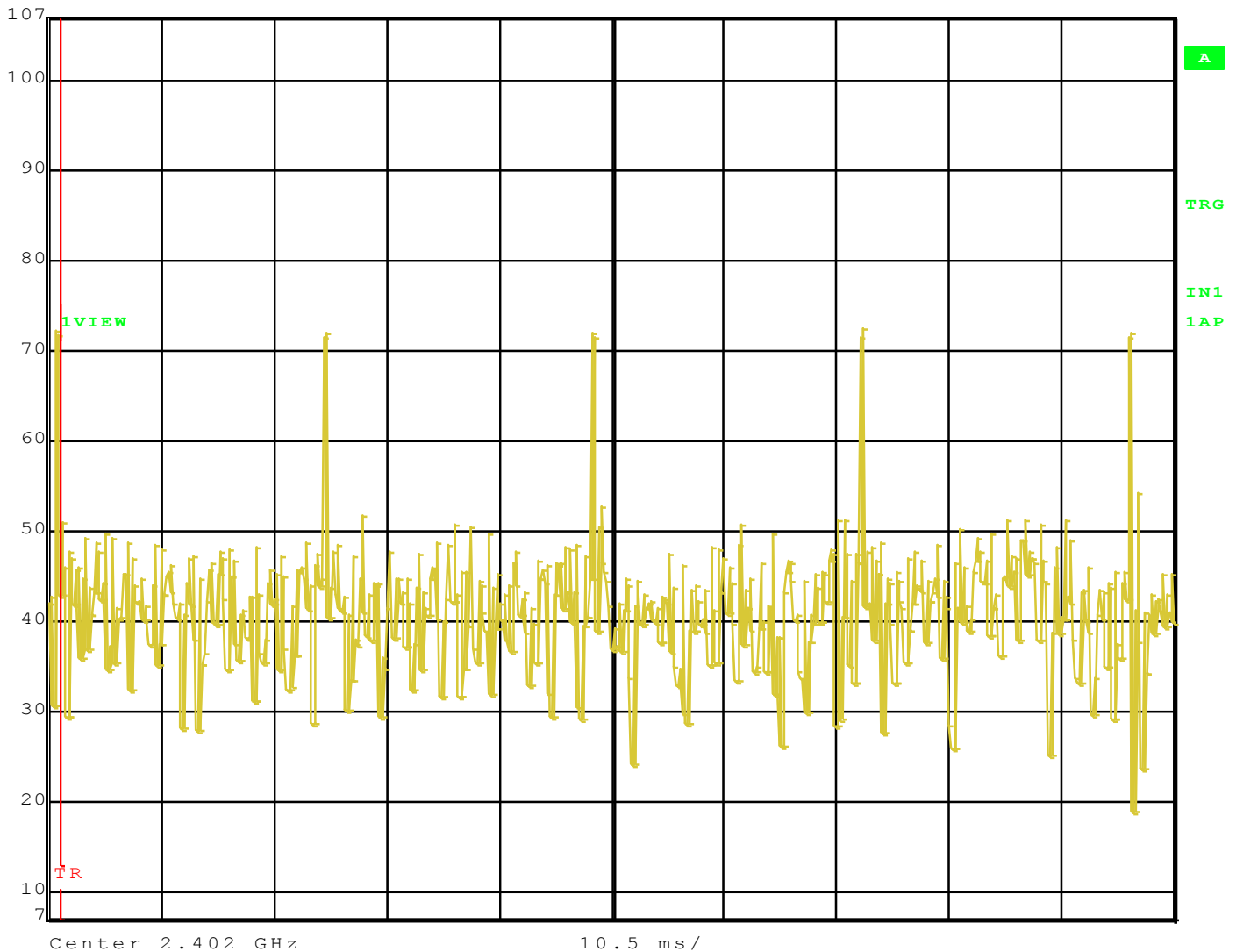
Pulse Width = 380.759519μS

PULSE TRAIN



Ref Lvl
 107 dBμV

RBW 1 MHz RF Att 30 dB
 VBW 3 MHz
 SWT 105 ms Unit dBμV



Title: Nitroxbuddy
 Comment A: Hop mode. Pulses.
 Date: 15.OCT.2013 17:52:15

Number of Pulses in 100ms time = 5
 Total pulse time within 100ms time period
 $0.380759519 \times 5 = 1.903797595\text{ms}$
 $1.903797595\text{ms} / 100\text{ms} = 0.01903797595$
 Correction factor: $20 \times \log 0.01903797595 = -34.4075845228884$

Maximum correction factor allowed -20dB