

*FCC PART 15, SUBPART B & C
CLASS B TEST REPORT
TEST METHOD: ANSI C63.4*

For
DATA LOGGER
Model: BLUEBUDDY

Prepared for

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

Prepared by: _____

JOEY MADLANGBAYAN

Approved by: _____

JOSH HANSEN

COMPATIBLE ELECTRONICS INC.
20621 PASCAL WAY
LAKE FOREST, CALIFORNIA 92630
(949) 587-0400

DATE: APRIL 5, 2013

	REPORT BODY	APPENDICES					TOTAL
		A	B	C	D	E	
PAGES	17	2	2	2	12	17	52

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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: Data Logger
Model: Bluebuddy
S/N: 001

Product Description: The EUT is a data logger for recreational SCUBA divers. When submerged, the EUT measures the pressure and temperature of the water and stores the data in its internal memory. At the end of the dive, the user can retrieve the stored data using a smartphone equipped with Bluetooth 4.0 Low Energy technology.

Modifications: The EUT was not modified during the testing.

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

Test Date: February 27, 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 – 24,800 MHz	Complies with the limits of CFR Title 47 Part 15 Subpart 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 DATA LOGGER Model: BLUEBUDDY. 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 February 27, 2013.

2.5 Disposition of the Test Sample

The test sample was returned to DiveNav, Inc.

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 data logger Model: Bluebuddy (EUT) was set up in a table top configuration. The transmit antenna of the EUT is a Trace integrated onto the PCB, which is contained inside the plastic housing. The EUT was explored in 3 orthogonal axes (X-axis, Y-axis and Z-axis).

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 radio testing and the Z-axis produced the worst case emissions for spurious emissions. The EUT was continuously transmitting throughout the tests. All initial investigations were performed with the spectrum analyzer in manual 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	DATA LOGGER (EUT)	DIVENAV, INC.	BLUEBUDDY	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	100219	09/26/2012	09/26/2013
Antenna, Loop	Com Power	AL-130	17085	01/29/2013	01/29/2015
Antenna, CombiLog	Com Power	AC-220	25857	05/25/2012	05/25/2013
Antenna, Horn 1-18GHz	Com Power	AH-118	071250	07/03/2012	07/03/2013
Pre-Amp, 1-18GHz	Com Power	PAM-118	443013	03/12/2012	03/12/2013
Pre-Amp, 1-18GHz	Com Power	PAM-118	443011	06/11/2012	06/11/2013
High Pass Filter	AMTI Microwave Circuits	H3G020G4	481230	06/07/2012	06/07/2013
Mast, Antenna Positioner	Sunol Science Corporation	TWR 95-4	020808-3	N/A	N/A
Antenna Mast	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 Antenna

The antenna is made up of a "F" style PCB trace antenna.

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 above 1 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	120 kHz
1000 to 24800	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.

8.1.6 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

$$389\mu\text{s} \times 1 = 389\mu\text{s}$$

$$389\mu\text{s} = 0.389\text{ms}$$

$$0.389\text{ms} / 25\text{ms} = 0.015$$

$$20 \log (0.015) = -36.47 \text{ dB (Maximum correction factor allowed} = -20\text{dB)}$$

8. TEST PROCEDURE DEVIATIONS

There were no deviations from the test procedures.

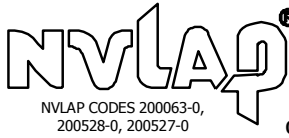
9. CONCLUSIONS

The DATA LOGGER Model: BLUEBUDDY 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

DATA LOGGER
Model: BLUEBUDDY
S/N: None

There were no additional models covered under this report.

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APPENDIX D

DIAGRAMS, CHARTS AND PHOTOS

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

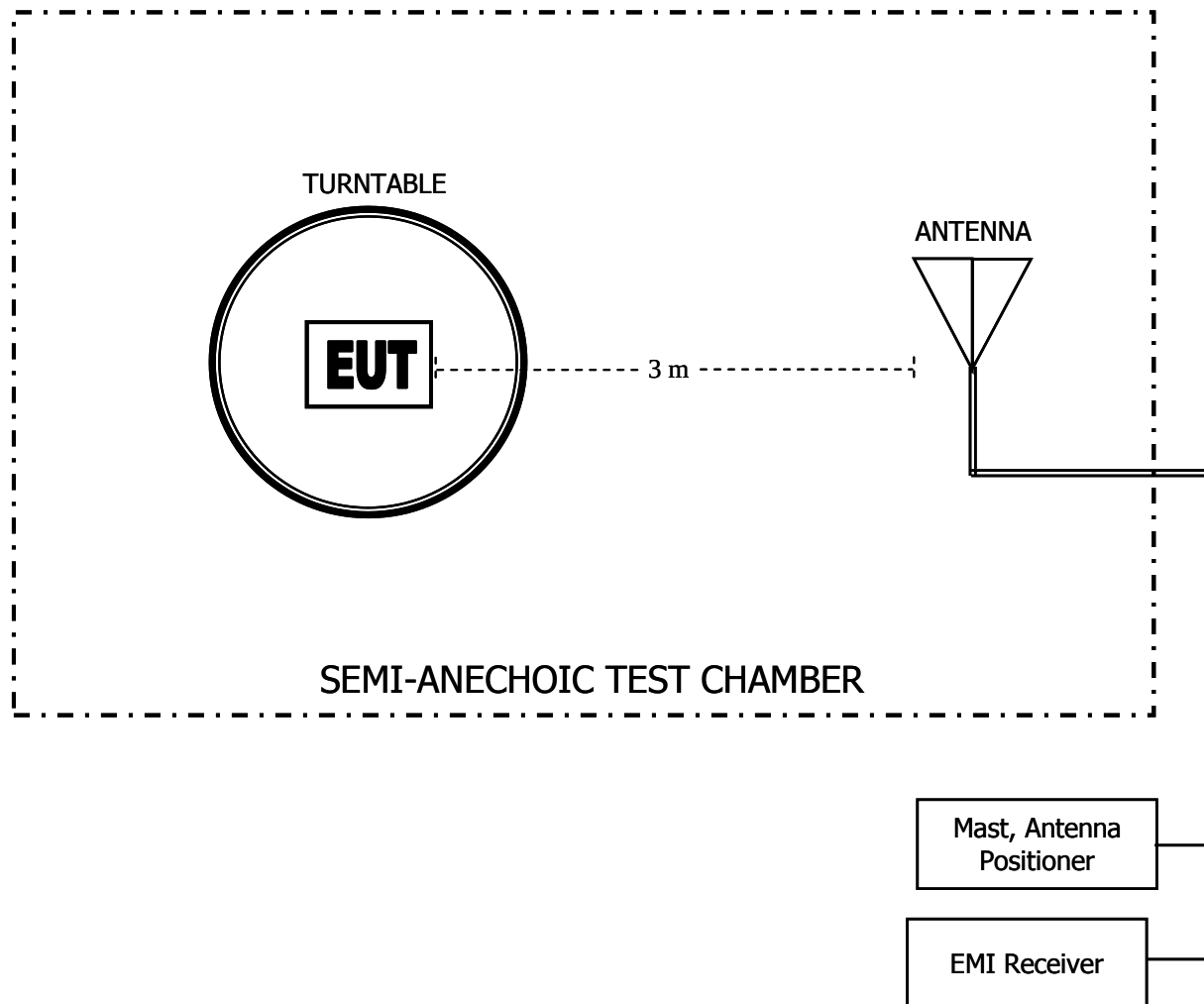
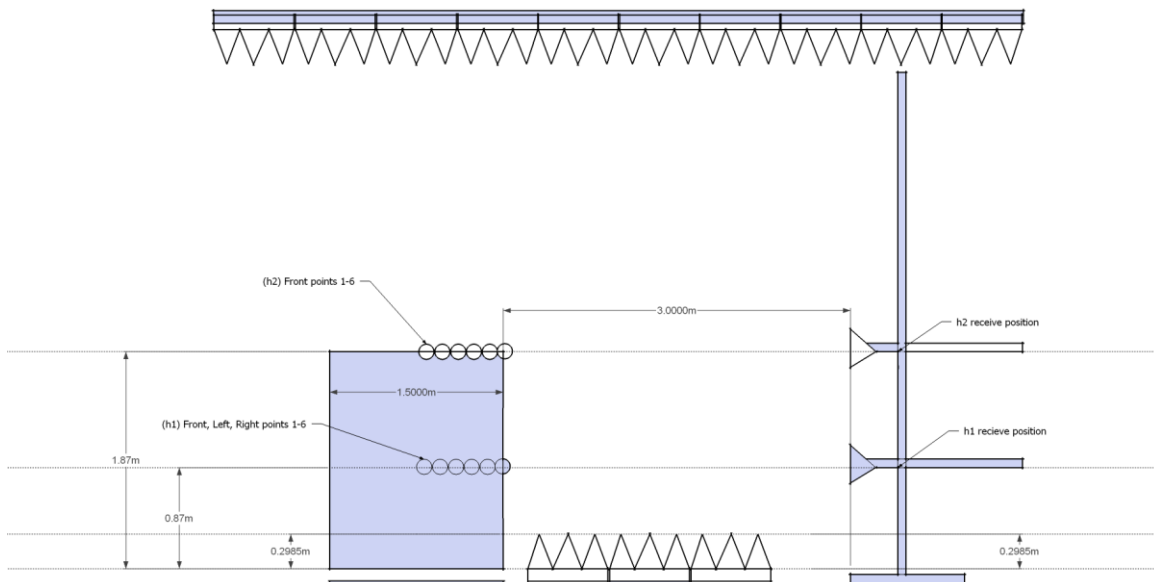


FIGURE 2: RADIATED EMISSIONS 3-METER SEMI-ANECHOIC TEST CHAMBER ABOVE 1 GHz



COM-POWER AL-130

LOOP ANTENNA

S/N: 17085

CALIBRATION DUE: JANUARY 29, 2013

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 R - COMBILOG ANTENNA

S/N: 25857

CALIBRATION DUE: MAY 25, 2013

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30	17.8	180	9.4
35	18.4	200	9.0
40	19.2	250	12.0
45	17.2	300	13.4
50	17.2	300	13.4
60	13.5	400	15.0
70	8.9	500	17.3
80	6.0	600	17.8
90	7.1	700	20.0
100	8.0	800	20.5
120	9.2	900	20.8
140	7.5	1000	22.4
160	8.3		

COM-POWER AH-118

LAB R - HORN ANTENNA

S/N: 071250

CALIBRATION DUE: JULY 3, 2013

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
1000	26.5	9500	40.4
1500	27.2	10000	40.3
2000	31.5	10500	41.7
2500	31.9	11000	42.1
3000	32.7	11500	42.3
3500	34.0	12000	42.6
4000	33.5	12500	41.4
4500	34.9	13000	42.7
5000	36.2	13500	43.6
5500	36.6	14000	42.4
6000	36.8	14500	42.7
6500	37.4	15000	45.4
7000	39.4	15500	45.1
7500	39.6	16000	42.9
8000	42.4	16500	44.0
8500	40.3	17000	46.8
9000	39.6	17500	47.5
		18000	46.6

COM-POWER PAM-118**1-18GHz - PREAMPLIFIER****S/N: 443013****CALIBRATION DUE: MARCH 12, 2013**

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
0500	27.20	9500	26.30
1000	26.20	10000	26.70
1500	27.00	10500	26.60
2000	26.90	11000	26.20
2500	26.80	11500	25.90
3000	26.90	12000	25.60
3500	26.90	12500	25.50
4000	27.10	13000	25.30
4500	26.70	13500	25.00
5000	26.40	14000	25.30
5500	26.00	14500	25.50
6000	25.70	15000	25.50
6500	25.30	15500	25.70
7000	25.10	16000	26.10
7500	25.00	16500	26.10
8000	25.20	17000	25.70
8500	25.50	17500	25.30
		18000	25.90

COM-POWER PAM-118

1-18GHz - PREAMPLIFIER

S/N: 443011

CALIBRATION DUE: JUNE 11, 2013

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
0.500	27.61	7.000	23.72
1.000	26.44	7.500	23.80
1.500	27.28	8.000	24.28
2.000	27.20	8.500	24.29
2.500	27.26	9.500	26.07
3.000	27.30	10.000	25.91
3.500	26.93	11.000	25.93
4.000	27.44	12.000	26.47
4.500	26.89	13.000	25.32
5.000	26.47	14.000	24.93
5.500	26.20	15.000	25.71
6.000	25.64	16.000	24.96
6.500	25.18	17.000	23.8
		18.000	26.27



FRONT VIEW

DIVENAV, INC.
DATA LOGGER
Model: BLUEBUDDY
FCC PART 15 SUBPART B & C - RADIATED EMISSIONS

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



REAR VIEW

DIVENAV, INC.
DATA LOGGER

Model: BLUEBUDDY

FCC PART 15 SUBPART B & C - RADIATED EMISSIONS

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



FRONT VIEW

DIVENAV, INC.
DATA LOGGER

Model: BLUEBUDDY

FCC PART 15 SUBPART B & C - RADIATED EMISSIONS

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



REAR VIEW

DIVENAV, INC.

DATA LOGGER

Model: BLUEBUDDY

FCC PART 15 SUBPART B & C - RADIATED EMISSIONS

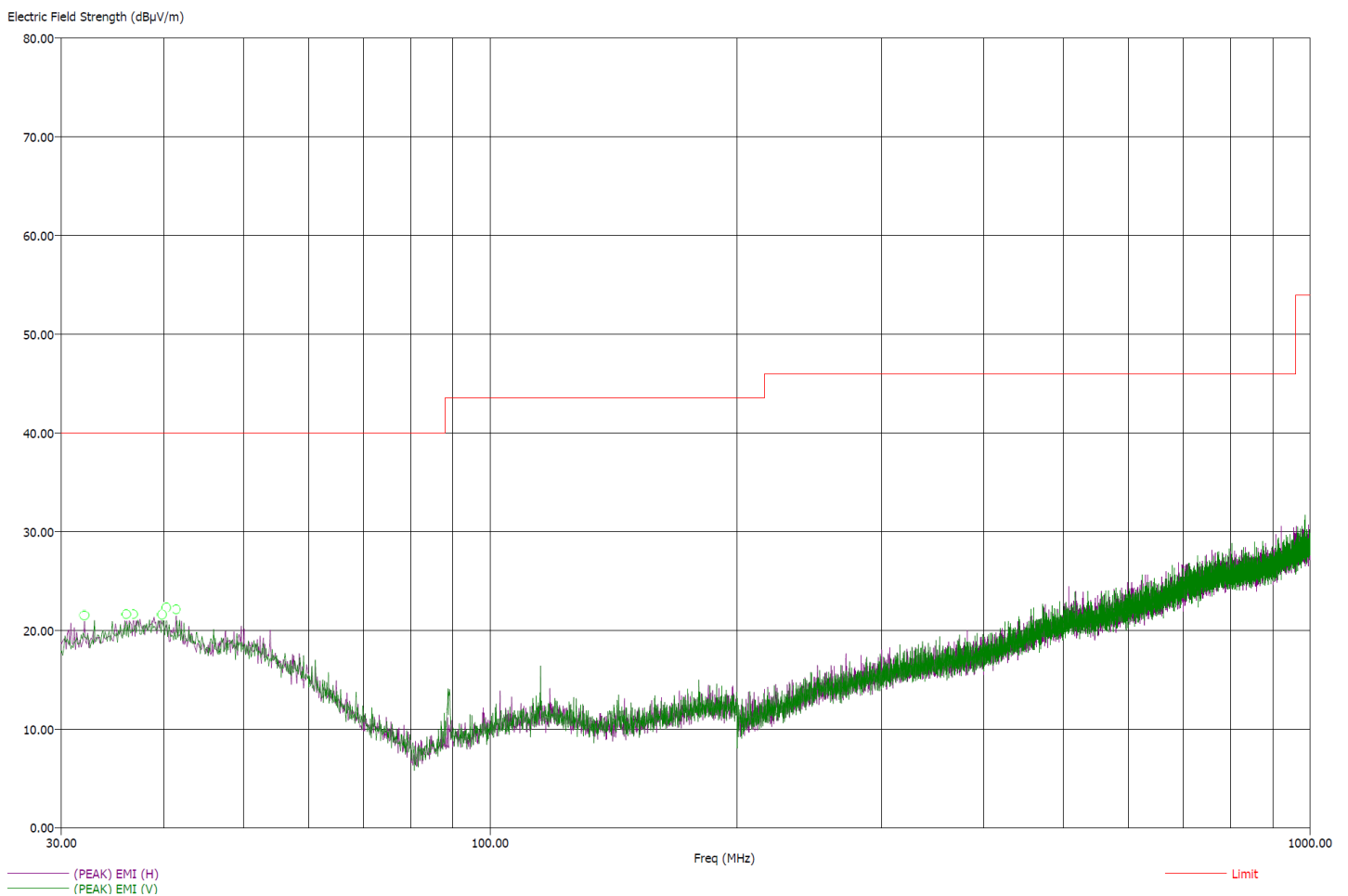
**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**

APPENDIX E

DATASHEETS

Title: FCC 15.209
File: Radiated Pre-Scan 30-1000Mhz.set
Operator: Matt Harrison
EUT Type: Data Logger (Bluebuddy)
EUT Condition: Tx Frequency Hopping.
Comments: Z-Axis.
Temp: 70f
Hum: 26%
Battery Powered

2/27/2013 9:15:44 AM
Sequence: Preliminary Scan

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

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

Title: FCC 15.209
File: Radiated Final 30-1000Mhz.set
Operator: Matt Harrison
EUT Type: Data Logger (Bluebuddy)
EUT Condition: Tx Frequency Hopping.
Comments: Z-Axis.
Temp: 70f
Hum: 26%
Battery Powered

2/27/2013 9:44:07 AM
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)
32.00	-25.55	14.45	19.79	40.00	H	292.75	194.17	18.06	0.52
36.00	-24.62	15.38	20.55	40.00	H	360.00	354.29	18.58	0.56
36.70	-24.60	15.40	20.56	40.00	H	100.75	399.94	18.67	0.57
39.80	-24.06	15.94	21.34	40.00	V	12.25	382.82	19.18	0.60
40.30	-24.11	15.89	21.56	40.00	V	161.25	283.58	19.06	0.60
41.40	-24.38	15.62	20.80	40.00	H	33.50	321.82	18.65	0.60

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

FUNDAMENTAL & HARMONICS

DATASHEETS

FCC 15.249

DiveNav

Data Logger

Model: Bluebuddy

Duty Cycle: -20.00

Date: 2/27/2013

Lab: P

Tested By: Matt Harrison

Fundamental Field Strength

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Tower Height (m)	Comments
2402	90.89	H	--	--	Peak	5.00	1.90	Channel 0, Y-Axis
2402	70.89	H	93.97	-23.08	AVG	5.00	1.90	Channel 0, Y-Axis
2402	99.19	V	--	--	Peak	280.00	1.00	Channel 0, Y-Axis
2402	79.19	V	93.97	-14.78	AVG	280.00	1.00	Channel 0, Y-Axis
2440	88.14	H	--	--	Peak	23.00	1.10	Channel 19, Y-Axis
2440	68.14	H	93.97	-25.83	AVG	23.00	1.10	Channel 19, Y-Axis
2440	98.86	V	--	--	Peak	202.00	1.16	Channel 19, Y-Axis
2440	78.86	V	93.97	-15.11	AVG	202.00	1.16	Channel 19, Y-Axis
2480	89.34	H	--	--	Peak	3.00	1.44	Channel 39, Y-Axis
2480	69.34	H	93.97	-24.63	AVG	3.00	1.44	Channel 39, Y-Axis
2480	97.16	V	--	--	Peak	251.00	1.00	Channel 39, Y-Axis
2480	77.16	V	93.97	-16.81	AVG	251.00	1.00	Channel 39, Y-Axis

Test distance

3 meter

FCC 15.249

DiveNav
Data Logger
Model: Bluebuddy
Duty Cycle: -20.00

Date: 2/27/2013
Lab: P
Tested By: Matt Harrison

Low Channel: Harmonic Emissions

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4804		H	--	--	Peak			No Emission Found
4804		H	53.98	--	Avg			In Restricted Band
7206		H	--	--	Peak			No Emission Found
7206		H	53.98	--	Avg			No Emission Found
9608		H	--	--	Peak			No Emission Found
9608		H	53.98	--	Avg			No Emission Found
12010		H	--	--	Peak			No Emission Found
12010		H	53.98	--	Avg			In Restricted Band
14412		H	--	--	Peak			No Emission Found
14412		H	53.98	--	Avg			No Emission Found
16814		H	--	--	Peak			No Emission Found
16814		H	53.98	--	Avg			No Emission Found
19216		H	--	--	Peak			No Emission Found
19216		H	53.98	--	Avg			In Restricted Band
21618		H	--	--	Peak			No Emission Found
21618		H	53.98	--	Avg			No Emission Found
24020		H	--	--	Peak			No Emission Found
24020		H	53.98	--	Avg			No Emission Found

Test distance
3 meter

FCC 15.249

DiveNav

Data Logger

Model: Bluebuddy

Duty Cycle: -20.00

Date: 2/27/2013

Lab: P

Tested By: Matt Harrison

Low Channel: Harmonic Emissions

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4804	44.43	V	--	--	Peak	1.36	360	
4804	24.43	V	53.98	-29.55	Avg	1.36	360	In Restricted Band
7206		V	--	--	Peak			No Emission Found
7206		V	53.98	--	Avg			No Emission Found
9608		V	--	--	Peak			No Emission Found
9608		V	53.98	--	Avg			No Emission Found
12010		V	--	--	Peak			No Emission Found
12010		V	53.98	--	Avg			In Restricted Band
14412		V	--	--	Peak			No Emission Found
14412		V	53.98	--	Avg			No Emission Found
16814		V	--	--	Peak			No Emission Found
16814		V	53.98	--	Avg			No Emission Found
19216		V	--	--	Peak			No Emission Found
19216		V	53.98	--	Avg			In Restricted Band
21618		V	--	--	Peak			No Emission Found
21618		V	53.98	--	Avg			No Emission Found
24020		V	--	--	Peak			No Emission Found
24020		V	53.98	--	Avg			No Emission Found

Test distance

3 meter

FCC 15.249

DiveNav

Data Logger

Model: Bluebuddy

Duty Cycle: -20.00

Date: 2/27/2013

Lab: P

Tested By: Matt Harrison

Middle Channel: Harmonic Emissions

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4880		H	--	--	Peak			No Emission Found
4880		H	53.98	--	Avg			In Restricted Band
7320		H	--	--	Peak			No Emission Found
7320		H	53.98	--	Avg			In Restricted Band
9760		H	--	--	Peak			No Emission Found
9760		H	53.98	--	Avg			No Emission Found
12200		H	--	--	Peak			No Emission Found
12200		H	53.98	--	Avg			In Restricted Band
14640		H	--	--	Peak			No Emission Found
14640		H	53.98	--	Avg			No Emission Found
17080		H	--	--	Peak			No Emission Found
17080		H	53.98	--	Avg			No Emission Found
19520		H	--	--	Peak			No Emission Found
19520		H	53.98	--	Avg			In Restricted Band
21960		H	--	--	Peak			No Emission Found
21960		H	53.98	--	Avg			No Emission Found
24400		H	--	--	Peak			No Emission Found
24400		H	53.98	--	Avg			No Emission Found

Test distance

3 meter

FCC 15.249

DiveNav

Data Logger

Model: Bluebuddy

Duty Cycle: -20.00

Date: 2/27/2013

Lab: P

Tested By: Matt Harrison

Middle Channel: Harmonic Emissions

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4880	47.25	V	--	--	Peak	1.00	360	
4880	27.25	V	53.98	-26.73	Avg	1.00	360	In Restricted Band
7320		V	--	--	Peak			No Emission Found
7320		V	53.98	--	Avg			In Restricted Band
9760		V	--	--	Peak			No Emission Found
9760		V	53.98	--	Avg			No Emission Found
12200		V	--	--	Peak			No Emission Found
12200		V	53.98		Avg			In Restricted Band
14640		V	--	--	Peak			No Emission Found
14640		V	53.98	--	Avg			No Emission Found
17080		V	--	--	Peak			No Emission Found
17080		V	53.98	--	Avg			No Emission Found
19520		V	--	--	Peak			No Emission Found
19520		V	53.98		Avg			In Restricted Band
21960		V	--	--	Peak			No Emission Found
21960		V	53.98	--	Avg			No Emission Found
24400		V	--	--	Peak			No Emission Found
24400		V	53.98	--	Avg			No Emission Found

Test distance

3 meter

FCC 15.249

DiveNav

Data Logger

Model: Bluebuddy

Duty Cycle: -20.00

Date: 2/27/2013

Lab: P

Tested By: Matt Harrison

High Channel: Harmonic Emissions

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4960		H	--	--	Peak			No Emission Found
4960		H	53.98	--	Avg			In Restricted Band
7440		H	--	--	Peak			No Emission Found
7440		H	53.98	--	Avg			In Restricted Band
9920		H	--	--	Peak			No Emission Found
9920		H	53.98	--	Avg			No Emission Found
12400		H	--	--	Peak			No Emission Found
12400		H	53.98	--	Avg			In Restricted Band
14880		H	--	--	Peak			No Emission Found
14880		H	53.98	--	Avg			No Emission Found
17360		H	--	--	Peak			No Emission Found
17360		H	53.98	--	Avg			No Emission Found
19840		H	--	--	Peak			No Emission Found
19840		H	53.98	--	Avg			In Restricted Band
22320		H	--	--	Peak			No Emission Found
22320		H	53.98	--	Avg			In Restricted Band
24800		H	--	--	Peak			No Emission Found
24800		H	53.98	--	Avg			No Emission Found

Test distance

3 meter

FCC 15.249

DiveNav
Data Logger
Model: Bluebuddy
Duty Cycle: -20.00

Date: 2/27/2013
Lab: P
Tested By: Matt Harrison

High Channel: Harmonic Emissions

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4960	47.23	V	--	--	Peak	2.10	360	
4960	27.23	V	53.98	-26.75	Avg	2.10	360	In Restricted Band
7440		V	--	--	Peak			No Emission Found
7440		V	53.98	--	Avg			In Restricted Band
9920		V	--	--	Peak			No Emission Found
9920		V	53.98	--	Avg			No Emission Found
12400		V	--	--	Peak			No Emission Found
12400		V	53.98	--	Avg			In Restricted Band
14880		V	--	--	Peak			No Emission Found
14880		V	53.98	--	Avg			No Emission Found
17360		V	--	--	Peak			No Emission Found
17360		V	53.98	--	Avg			No Emission Found
19840		V	--	--	Peak			No Emission Found
19840		V	53.98	--	Avg			In Restricted Band
22320		V	--	--	Peak			No Emission Found
22320		V	53.98	--	Avg			In Restricted Band
24800		V	--	--	Peak			No Emission Found
24800		V	53.98	--	Avg			No Emission Found

Test distance
3 meter

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

FCC 15.249

DiveNav

Data Logger

Model: Bluebuddy

Duty Cycle: -20.00

Date: 3-27-2012

Lab: P

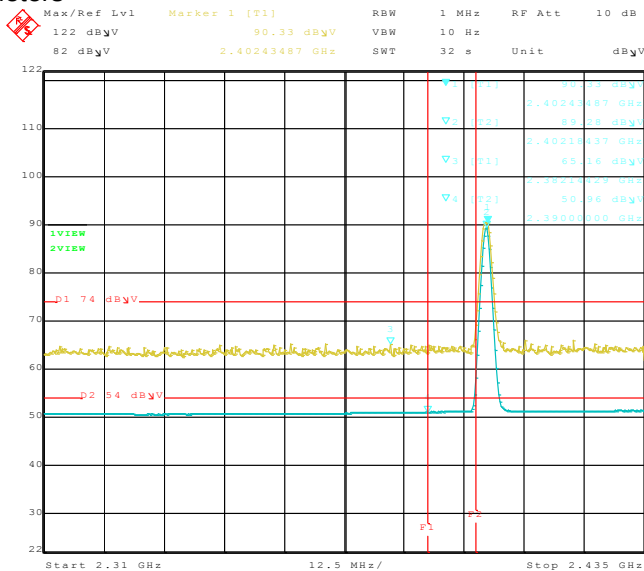
Tested By: Matt Harrison

Low Channel Band Edge

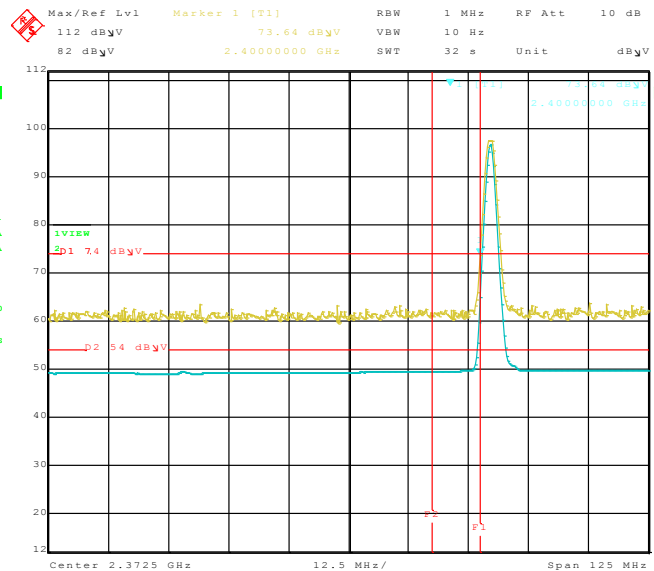
Freq. (MHz)	Level (dBμV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2400	72.31	H	73.98	-1.67	Peak	1.65	340.00	No Marker Delta Method Used
2400	52.31	H	53.98	-1.67	AVG	1.65	340.00	Duty Cycle Average
2400	73.64	V	73.98	-0.34	Peak	1.65	340.00	No Marker Delta Method Used
2400	53.64	V	53.98	-0.34	AVG	1.65	340.00	Duty Cycle Average

Test Distance

3 Meters



Title: bluebuddy.
Comment A: LBE, Horizontal.
Date: 27.FEB.2013 15:48:45



Title: BlueBuddy.
Comment A: Band Edge, Vertical.
Date: 11.APR.2013 17:44:50

FCC 15.249

DiveNav

Data Logger

Model: Bluebuddy

Duty Cycle: -20.00

Date: 5-8-2012

Lab: P

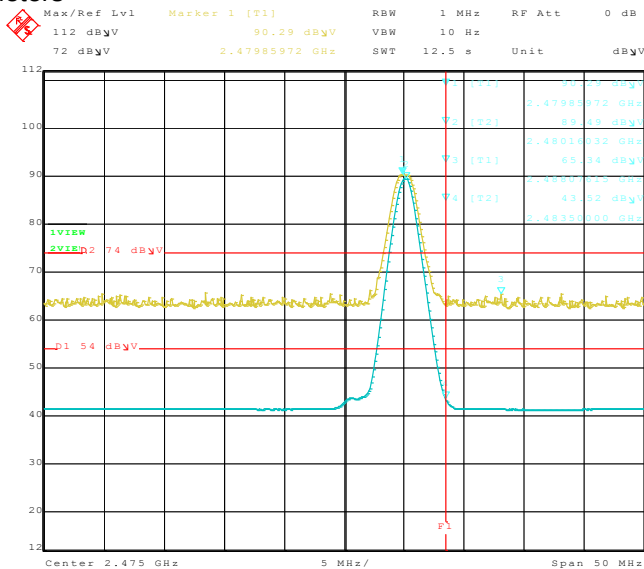
Tested By: Matt Harrison

High Channel Band Edge

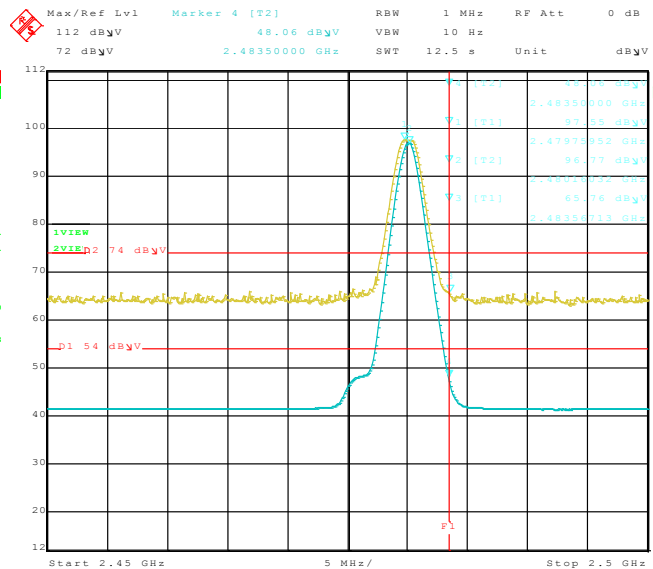
Freq. (MHz)	Level (dBμV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2488	65.34	H	73.98	-8.64	Peak	1.65	340.00	No Marker Delta Method Used
2488	45.34	H	53.98	-8.64	AVG	1.65	340.00	Duty Cycle Average
2483	65.76	V	73.98	-8.22	Peak	1.65	340.00	No Marker Delta Method Used
2483	45.76	V	53.98	-8.22	AVG	1.65	340.00	Duty Cycle Average

Test Distance

3 Meters



Title: bluebuddy.
Comment A: USB, Horizontal.
Date: 27.FEB.2013 16:29:03

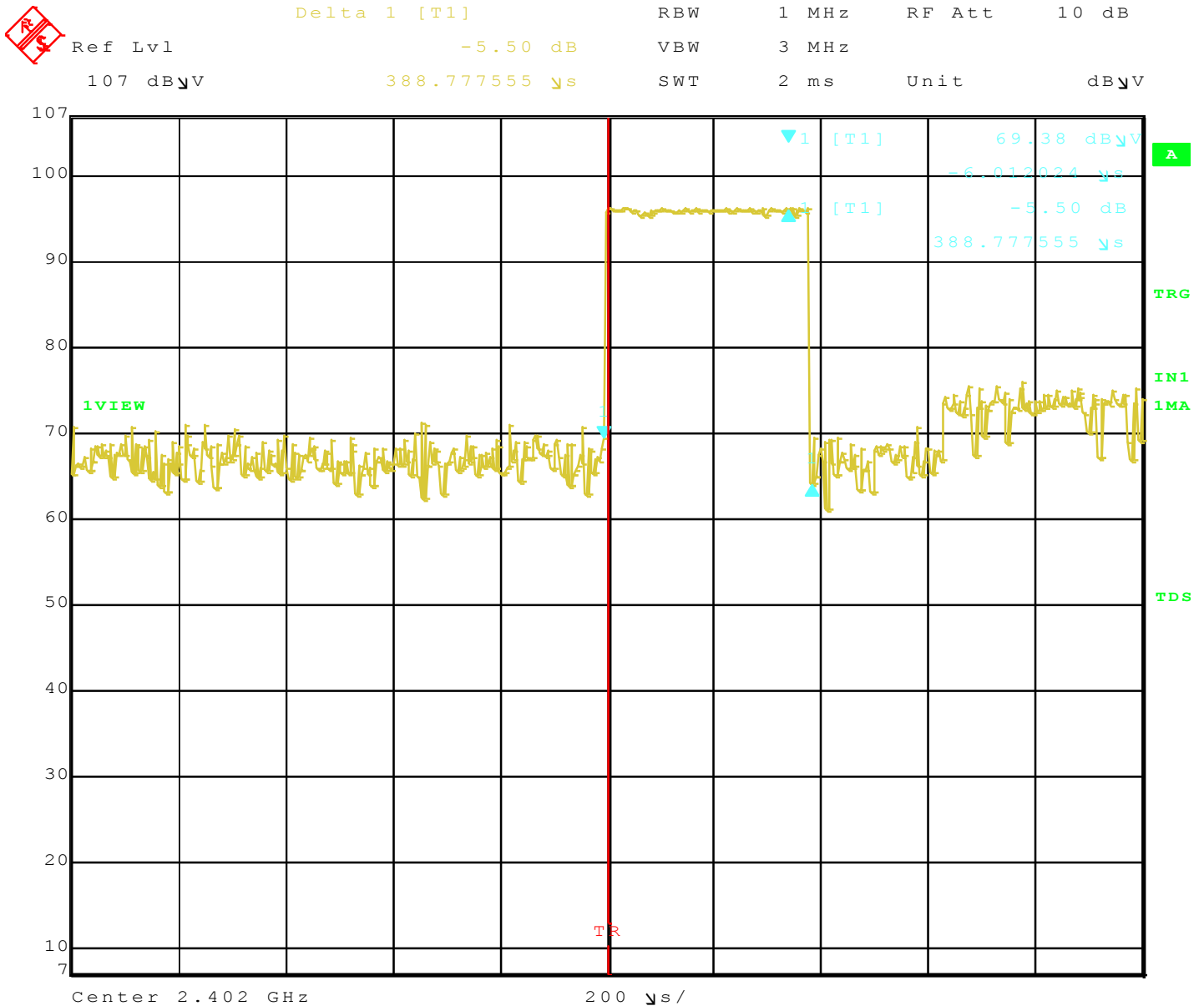


Title: bluebuddy.
Comment A: USB, Vertical.
Date: 27.FEB.2013 16:27:00

DUTY CYCLE

PLOTS

PULSE WIDTH



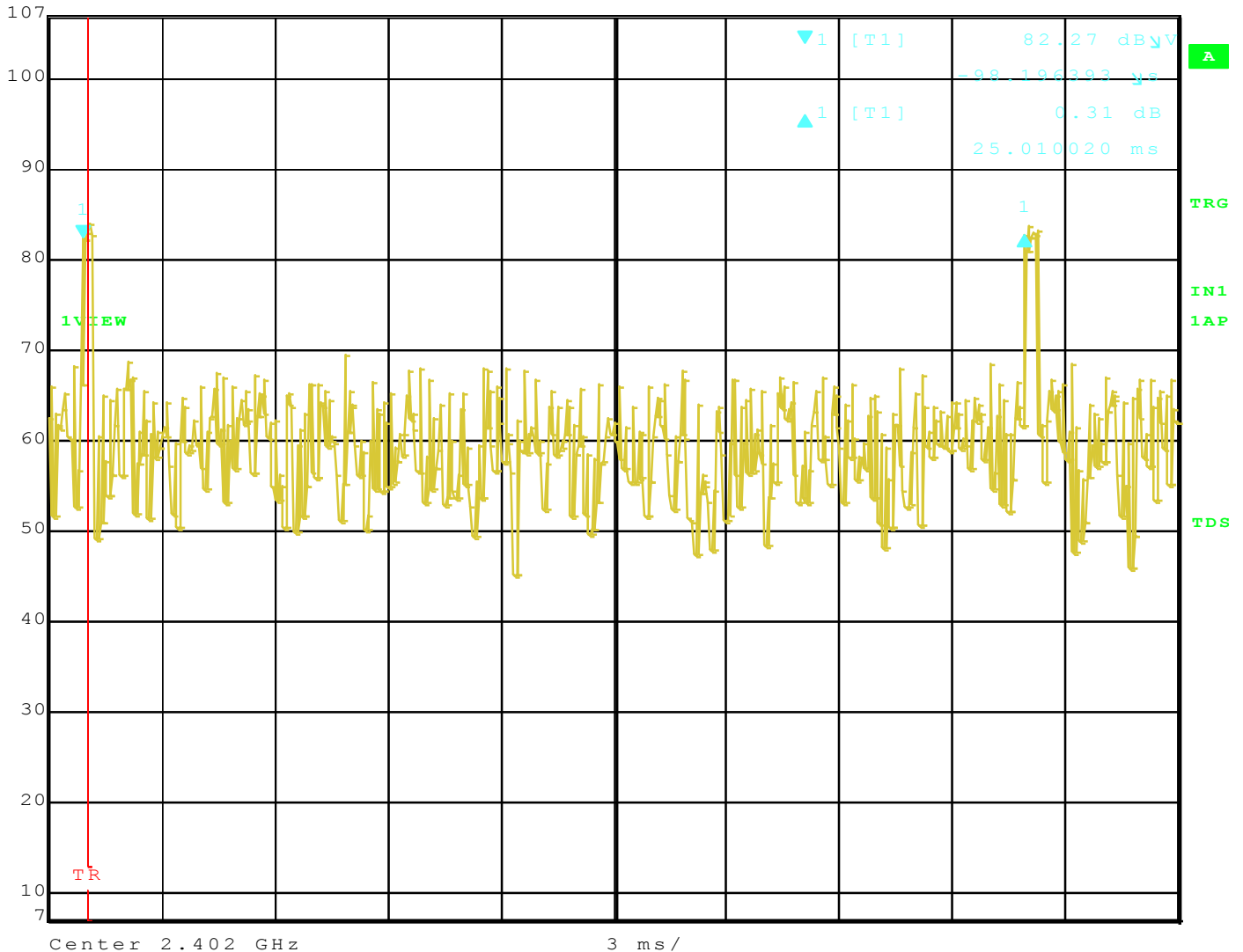
Title: bluebuddy.
 Comment A: Pulse Width.
 Date: 27.FEB.2013 13:09:49

Pulse Width = 388.777555µS

PULSE TRAIN



Ref Lvl	Delta 1 [T1]	RBW	1 MHz	RF Att	10 dB
107 dBμV	0.31 dB	VBW	3 MHz		
	25.010020 ms	SWT	30 ms	Unit	dBμV



Title: bluebuddy.
Comment A: Duty Cycle Period.
Date: 27.FEB.2013 13:40:13

Number of Pulses in 25ms time = 1
total pulse time within 25ms time period
 $0.389 * 1 = 0.389$
 $0.389\text{ms} / 25\text{ms} = 0.015$
Correction factor: $20 * \log 0.015 = -36.47$
Maximum correction factor allowed -20dB