FCC PART 15, SUBPART B & SUBPART C
TEST REPORT

For
RF SWITCH
Model: S0311010

Prepared for

BUDDERFLY LLC
2 TRAP FALLS RD., SUITE 507
SHELTON, CT 06484

Prepared by:_____

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DATE: MAY 8, 2013

	REPORT BODY	APPENDICES					TOTAL
		A	***B***	***C***	***D***	***E***	
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1	Conducted Emissions Test Setup
2	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:	RF Switch Model: S0311010 S/N: None
Product Description:	The EUT is a Switch that replaces ordinary light switches and is capable of communicating with a Budderfly RF Outlet in proximity using the MiWi RF Protocol.
Modifications:	The EUT was modified in order to comply with specifications. Please see the list of modifications in Appendix B.
Manufacturer:	Budderfly LLC 2 Trap Falls Rd., Suite 507 Shelton, CT 06484
Test Date:	February 15, 2013
Test Specifications:	EMI requirements CFR Title 47, Part 15 Subpart B section 15.107 and 15.109 CFR Title 47, Part 15 Subpart C Sections 15.205, 15.207, 15.209 and 15.249 Test Procedure: ANSI C63.4 and ANSI 63.10.

SUMMARY OF TEST RESULTS

TEST	DESCRIPTION	RESULTS
1	Conducted RF Emissions, 150 kHz - 30 MHz.	The EUT is a battery power device; therefore this test was not performed.
2	Radiated RF Emissions & Harmonics, 9 kHz – 10,000 MHz.	Complies with the limits of CFR Title 47 Part 15 subpart B section 15.109 and subpart C Section 15.205, 15.209 and 15.249.
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 RF Switch Model: S0311010. The EMI measurements were performed according to the measurement procedure described in ANSI C63.4 and C63.10. 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 section 15.109, 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

Budderfly LLC

Daniel Riscalla	Vice President of Engineering

Compatible Electronics Inc.

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

2.4 Date Test Sample was Received

The test sample was received on February 12, 2013.

2.5 Disposition of the Test Sample

The test sample was returned to Budderfly LLC.

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
NVLAP	National Voluntary Laboratory Accreditation Program
CFR	Code of Federal Regulations
PCB	Printed Circuit Board
TX	Transmit
RX	Receive

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

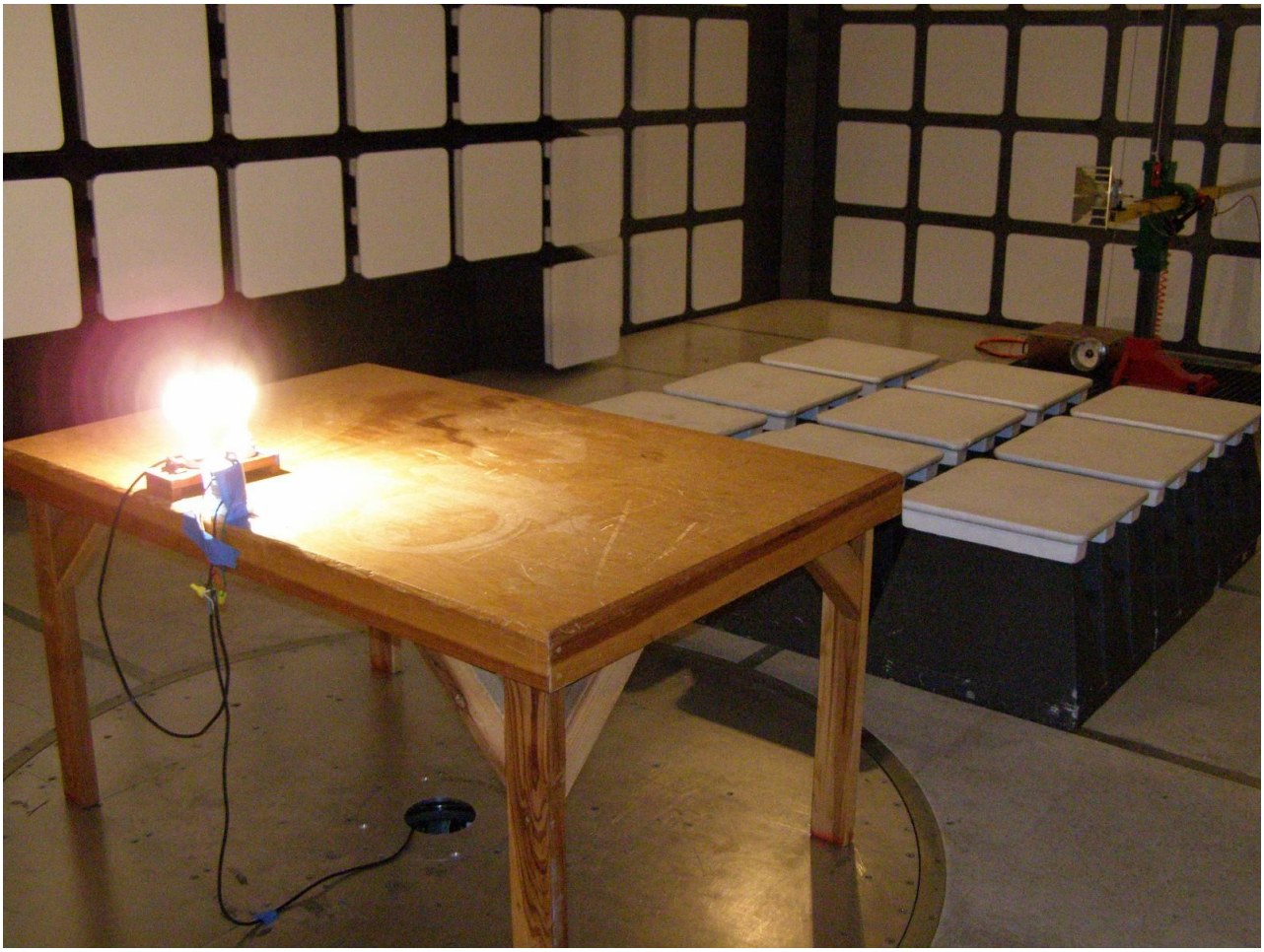
4. DESCRIPTION OF TEST CONFIGURATION

4.1 Description of Test Configuration - EMI

The EUT was tested in a tabletop configuration. The EUT was connected to the AC mains and a double bulb light fixture. The EUT was continuously transceiving throughout all the tests.

The highest emissions were found when the EUT was running in the above configuration. The cables were moved to maximize the emissions. The final radiated and conducted data was taken in this mode of operation. All initial investigations were performed with the EMI receiver in manual mode scanning the frequency range continuously. The cables were and routed as shown in the photographs in Appendix D.

4.1.1 Photograph of Test Configuration - EMI



4.1.2 Cable Construction and Termination

Cable 1

This is a 1-meter, unshielded, round cable connecting the EUT to the light fixture. The cable is hardwired into the EUT and into the light fixture as well.

5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT

5.1 EUT and Accessory List

#	EQUIPMENT TYPE	MANUFACTURER	MODEL	SERIAL NUMBER
1	BUDDERFLY RF SWITCH (EUT)	BUDDERFLY LLC	S0311010	NONE
2	LIGHT FIXTURE WITH BULBS	GENERIC	NONE	NONE

5.2 EMI Test Equipment

EQUIPMENT TYPE	MANU-FACTURER	MODEL NUMBER	SERIAL NUMBER	CAL. DATE	CAL. DUE DATE
Computer	Compatible Electronics	NONE	NONE	N/A	N/A
EMI Receiver	Rohde & Schwarz	ESIB40	100219	9/26/2012	9/26/2013
Antenna, Loop	Com Power	AL-130	17085	01/29/2012	01/29/2015
Antenna, CombiLog	Com Power	AC-220	25857	05/25/2012	05/25/2013
Antenna, Horn 1-18GHz	Com Power	AH-118	071225	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	N/A	N/A	N/A
Turntable	Sunol Science Corporation	FM 2001	N/A	N/A	N/A
Mast and Turntable Controller	Sunol Science Corporation	SC104V	N/A	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 grounded through the power cord.

7. CHARACTERISTICS OF THE TRANSMITTER

7.1 Channel Number and Frequencies

There are a total of 16 channels. The low channel is at 915.38 MHz and the high channel is at 921.51 MHz. There is a 400 kHz separation between each channel. There are 16 channels.

0 = 915.38 MHz
1 = 915.82 MHz
2 = 916.18 MHz
3 = 916.54 MHz
4 = 916.91 MHz
5 = …

7.2 Antenna

The antenna is made up of one 8cm wire antenna which is connected and soldered to the PCB.

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 battery operated; 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.

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

For the Fundamental and Harmonic emissions a RMS Average was used.

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

FREQUENCY RANGE (MHz)	TRANSDUCER	EFFECTIVE MEASUREMENT BANDWIDTH
.009 to .150	Active Loop Antenna	200 kHz
.150 to 30	Active Loop Antenna	9 kHz
30 to 1000	Combilog Antenna	120 kHz
1000 to 10000	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.

8.2 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 final qualification data sheets are located in Appendix E.

Test Results:

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

8.3 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 frequency was tuned to the lowest and highest frequency if the EUT transmits more than one frequency. The final qualification data sheets are located in Appendix E.

Test Results:

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

8.4 Voltage Fluctuations

The supply voltage fluctuation test was performed using the EMI Receiver. The EUT input power was varied between 85% and 115% of the nominal rated supply voltage. The carrier frequency was monitored for any change in amplitude.

Test Results:

The EUT is battery powered therefore this test was not performed.

8. TEST PROCEDURE DEVIATIONS

There were no deviations from the test procedures.

9. CONCLUSIONS

The RF Switch Model: S0311010 meets all of the relevant specification requirements defined in the Code of Federal Regulations Title 47, Part 15 Subpart B sections 15.109 Subpart C sections 15.205, 15.209 and 15.249.

APPENDIX A

LABORATORY ACCREDITATIONS

LABORATORY ACCREDITATIONS AND RECOGNITIONS

NVLAP CODES 200063-0, 200528-0, 200527-0

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

World Wide Market Access with Nemko

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.

Industry Canada Industrie Canada

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

The following modifications were made to the EUT during the test in order to comply with FCC Subpart B Section 15.249 limits. The modifications were made in such a way that they could be reproduced during manufacturing.

1. EUT transmit power was set to 4dBm in order to pass Field Strength Emissions.

APPENDIX C

ADDITIONAL MODELS COVERED UNDER THIS REPORT

ADDITIONAL MODELS COVERED UNDER THIS REPORT

USED FOR THE PRIMARY TEST	RF SWITCH Model: S0311010 S/N: None

There were no additional models covered under this report.

APPENDIX D

DIAGRAMS, CHARTS AND PHOTOS

FIGURE 1: PLOT MAP & LAYOUT OF TEST SITE BELOW 1GHz

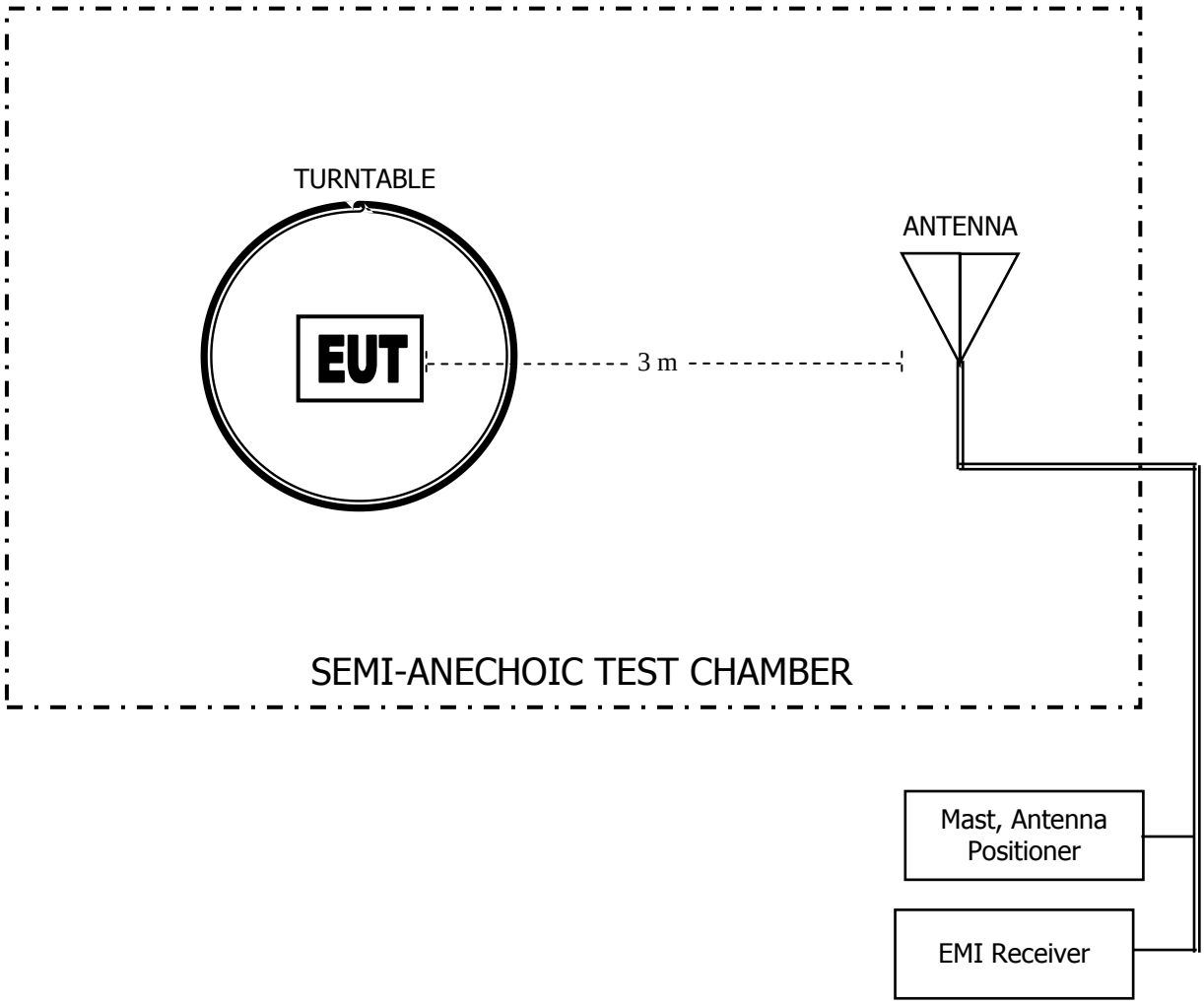
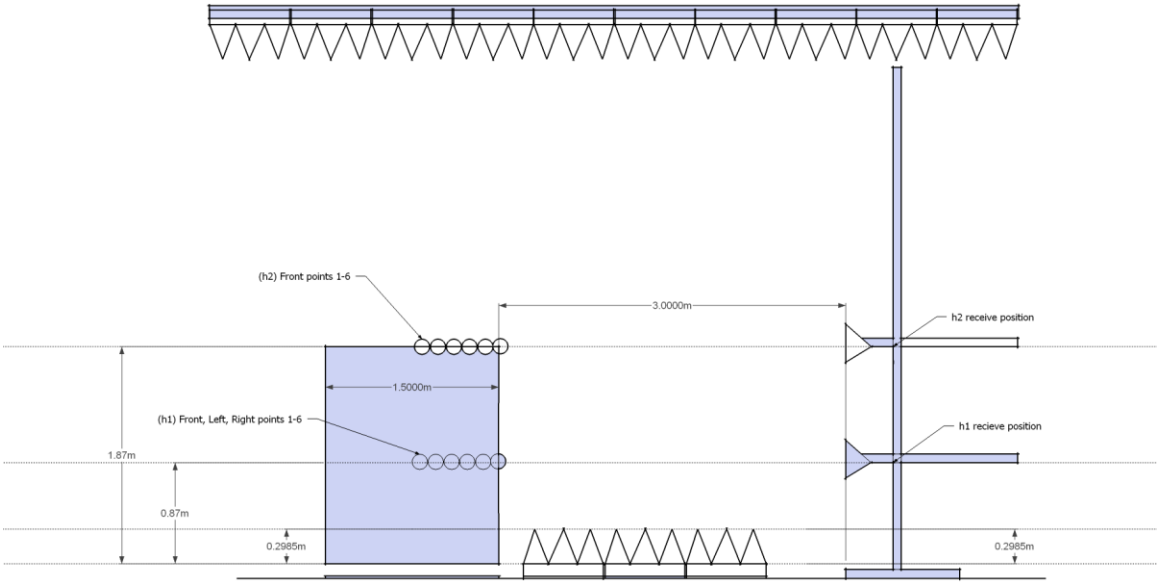


FIGURE 2: PLOT MAP & LAYOUT OF TEST SITE ABOVE 1 GHz



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 R - COMBILOG ANTENNA

S/N: 25857

CALIBRATION DUE: MAY 25, 2013

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30	17.8	**160**	8.3
35	18.4	**180**	9.4
40	19.2	**200**	9.0
45	17.2	**250**	12.0
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

COM-POWER AH-118

HORN ANTENNA

S/N: 071225

CALIBRATION DUE: JULY 3, 2014

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

BUDDERFLY LLC
RF SWITCH
Model: S0311010
FCC Part 15 Subpart B & C - RADIATED EMISSIONS

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

REAR VIEW

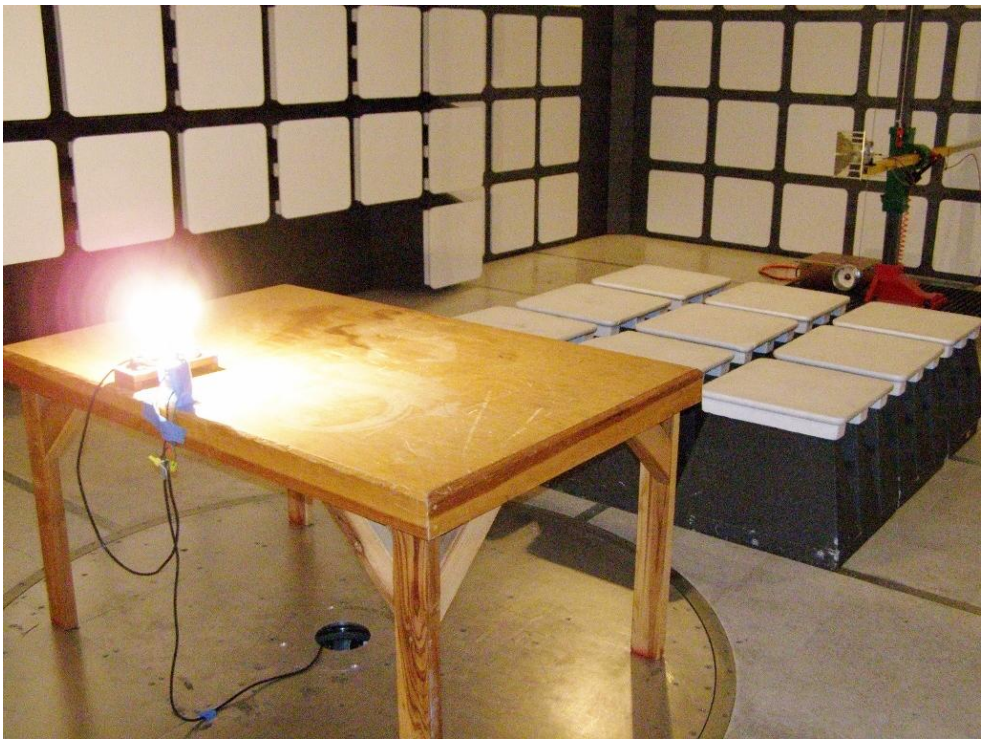
BUDDERFLY LLC
RF SWITCH
Model: S0311010
FCC Part 15 Subpart B & C - RADIATED EMISSIONS

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

FRONT VIEW

BUDDERFLY LLC
RF SWITCH
Model: S0311010
FCC Part 15 Subpart B & C - RADIATED EMISSIONS - > 1GHz

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS



REAR VIEW

BUDDERFLY LLC
RF SWITCH
Model: S0311010
FCC Part 15 Subpart B & C - RADIATED EMISSIONS - > 1GHz

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

APPENDIX E

DATA SHEETS

FUNDAMENTAL & HARMONICS

DATA SHEETS

FCC 15.249

Butterfly
RF Switch
Model: S0311010

Date: 2-12-2013
Lab: P
Tested By: Matt Harrison

Fundamental Field Strength

Freq (MHZ)	Polarity (H/V)	Peak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Table Angle (deg)	Ant. Height (m)	Comments
915.38	H	90.33	93.98	-3.65	148.00	1.00	Low Channel, 4dBm
915.38	V	92.00	93.98	-1.98	190.00	1.30	Low Channel, 4dBm
918.66	H	91.01	93.98	-2.97	200.00	1.00	Mid Channel, 4dBm
918.66	V	84.67	93.98	-9.31	360.00	1.00	Mid Channel, 4dBm
921.51	H	88.50	93.98	-5.48	190.00	1.22	High Channel, 4dBm
921.51	V	88.72	93.98	-5.26	190.00	1.45	High Channel, 4dBm

LOW CHANNEL HARMONIC EMISSIONS

FCC 15.249
Budderfly
902-928MHz RF Switch
Model: S0311010

Date: 2/13/2013
Lab: P
Tested By: Matt Harrison

Harmonics - Tx @ 915.38 MHz

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1831	56.36	V	--	--	Peak	1	0	
1831	39.40	V	53.98	-14.58	Avg	1	0	
2746	40.46	V	--	--	Peak	1	340	**In Restricted Band**
2746	26.15	V	53.98	-27.83	Avg	1	340	**In Restricted Band**
3662		V	--	--	Peak			**No Emissions Found**
3662		V	--	--	Avg			**In Restricted Band**
4577		V	--	--	Peak			**No Emissions Found**
4577		V	--	--	Avg			**In Restricted Band**
5492		V	--	--	Peak			**No Emissions Found**
5492		V	--	--	Avg			**No Emissions Found**
6408		V	--	--	Peak			**No Emissions Found**
6408		V	--	--	Avg			**No Emissions Found**
7323		V	--	--	Peak			**No Emissions Found**
7323		V	--	--	Avg			**In Restricted Band**
8238		V	--	--	Peak			**No Emissions Found**
8238		V	--	--	Avg			**In Restricted Band**
9154		V	--	--	Peak			**No Emissions Found**
9154		V	--	--	Avg			**No Emissions Found**

Test distance
3 meter

LOW CHANNEL HARMONIC EMISSIONS

FCC 15.249
Budderfly
902-928MHz RF Switch
Model: S0311010

Date: 2/13/2013
Lab: P
Tested By: Matt Harrison

Harmonics - Tx @ 915.38 MHz

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1831	60.10	H	--	--	Peak	1.1	225	
1831	43.00	H	53.98	-10.98	Avg	1.1	225	
2746	49.77	H	--	--	Peak	1	170	**In Restricted Band**
2746	34.23	H	53.98	-19.75	Avg	1	170	**In Restricted Band**
3662		H	--	--	Peak			**No Emissions Found**
3662		H	--	--	Avg			**In Restricted Band**
4577		H	--	--	Peak			**No Emissions Found**
4577		H	--	--	Avg			**In Restricted Band**
5492		H	--	--	Peak			**No Emissions Found**
5492		H	--	--	Avg			**No Emissions Found**
6408		H	--	--	Peak			**No Emissions Found**
6408		H	--	--	Avg			**No Emissions Found**
7323		H	--	--	Peak			**No Emissions Found**
7323		H	--	--	Avg			**In Restricted Band**
8238		H	--	--	Peak			**No Emissions Found**
8238		H	--	--	Avg			**In Restricted Band**
9154		H	--	--	Peak			**No Emissions Found**
9154		H	--	--	Avg			**No Emissions Found**

Test distance
3 meter

MID CHANNEL HARMONIC EMISSIONS

FCC 15.249
Budderfly
902-928MHz RF Switch
Model: S0311010

Date: 2/13/2013
Lab: P
Tested By: Matt Harrison

Harmonics - Tx @ 918.66 MHz

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1837	61.19	V	--	--	Peak	2.26	175	
1837	44.71	V	53.98	-9.27	Avg	2.26	175	
2756	45.71	V	--	--	Peak	1	170	**In Restricted Band**
2756	32.62	V	53.98	-21.36	Avg	1	170	**In Restricted Band**
3675		V	--	--	Peak			**No Emissions Found**
3675		V	--	--	Avg			**In Restricted Band**
4593		V	--	--	Peak			**No Emissions Found**
4593		V	--	--	Avg			**In Restricted Band**
5512		V	--	--	Peak			**No Emissions Found**
5512		V	--	--	Avg			**No Emissions Found**
6431		V	--	--	Peak			**No Emissions Found**
6431		V	--	--	Avg			**No Emissions Found**
7349		V	--	--	Peak			**No Emissions Found**
7349		V	--	--	Avg			**In Restricted Band**
8268		V	--	--	Peak			**No Emissions Found**
8268		V	--	--	Avg			**In Restricted Band**
9187		V	--	--	Peak			**No Emissions Found**
9187		V	--	--	Avg			**In Restricted Band**

Test distance
3 meter

MID CHANNEL HARMONIC EMISSIONS

FCC 15.249

Budderfly
902-928MHz RF Switch
Model: S0311010

Date: 2/13/2013
Lab: P
Tested By: Matt Harrison

Harmonics - Tx @ 918.66 MHz

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1837	63.86	H	--	--	Peak	1.05	225	
1837	47.80	H	53.98	-6.18	Avg	1.05	225	
2756	44.48	H	--	--	Peak	1.05	175	**In Restricted Band**
2756	29.57	H	53.98	-24.41	Avg	1.05	175	**In Restricted Band**
3675		H	--	--	Peak			**No Emissions Found**
3675		H	--	--	Avg			**In Restricted Band**
4593		H	--	--	Peak			**No Emissions Found**
4593		H	--	--	Avg			**In Restricted Band**
5512		H	--	--	Peak			**No Emissions Found**
5512		H	--	--	Avg			**No Emissions Found**
6431		H	--	--	Peak			**No Emissions Found**
6431		H	--	--	Avg			**No Emissions Found**
7349		H	--	--	Peak			**No Emissions Found**
7349		H	--	--	Avg			**In Restricted Band**
8268		H	--	--	Peak			**No Emissions Found**
8268		H	--	--	Avg			**In Restricted Band**
9187		H	--	--	Peak			**No Emissions Found**
9187		H	--	--	Avg			**In Restricted Band**

Test distance
3 meter

HIGH CHANNEL HARMONIC EMISSIONS

FCC 15.249
Budderfly
902-928MHz RF Switch
Model: S0311010

Date: 2/13/2013
Lab: P
Tested By: Matt Harrison

Harmonics - Tx @ 921.51 MHz

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1843	69.36	V	--	--	Peak	1	194	
1843	53.06	V	53.98	-0.92	Avg	1	194	
2765	52.89	V	53.98	-1.09	Peak	1	150	**In Restricted Band**
2765		V	--	--	Avg			
3686		V	--	--	Peak			**No Emissions Found**
3686		V	--	--	Avg			**In Restricted Band**
4608		V	--	--	Peak			**No Emissions Found**
4608		V	--	--	Avg			**In Restricted Band**
5529		V	--	--	Peak			**No Emissions Found**
5529		V	--	--	Avg			**No Emissions Found**
6451		V	--	--	Peak			**No Emissions Found**
6451		V	--	--	Avg			**No Emissions Found**
7372		V	--	--	Peak			**No Emissions Found**
7372		V	--	--	Avg			**In Restricted Band**
8294		V	--	--	Peak			**No Emissions Found**
8294		V	--	--	Avg			**In Restricted Band**
9215		V	--	--	Peak			**No Emissions Found**
9215		V	--	--	Avg			**No Emissions Found**

Test distance
3 meter

HIGH CHANNEL HARMONIC EMISSIONS

FCC 15.249
Budderfly
902-928MHz RF Switch
Model: S0311010

Date: 2/13/2013
Lab: P
Tested By: Matt Harrison

Harmonics - Tx @ 921.51 MHz

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1843	70.40	H	--	--	Peak	1	140	
1843	52.38	H	53.98	-1.60	Avg	1	140	
2765	56.12	H	--	--	Peak	1	180	**In Restricted Band**
2765	40.90	H	53.98	-13.08	Avg	1	180	**In Restricted Band**
3686		H	--	--	Peak			**No Emissions Found**
3686		H	--	--	Avg			**In Restricted Band**
4608		H	--	--	Peak			**No Emissions Found**
4608		H	--	--	Avg			**In Restricted Band**
5529		H	--	--	Peak			**No Emissions Found**
5529		H	--	--	Avg			**No Emissions Found**
6451		H	--	--	Peak			**No Emissions Found**
6451		H	--	--	Avg			**No Emissions Found**
7372		H	--	--	Peak			**No Emissions Found**
7372		H	--	--	Avg			**In Restricted Band**
8294		H	--	--	Peak			**No Emissions Found**
8294		H	--	--	Avg			**In Restricted Band**
9215		H	--	--	Peak			**No Emissions Found**
9215		H	--	--	Avg			**No Emissions Found**

Test distance
3 meter

EMISSIONS RADIATED OUTSIDE OF THE FUNDAMENTAL FREQUENCY BAND

DATA SHEETS

FCC 15.249

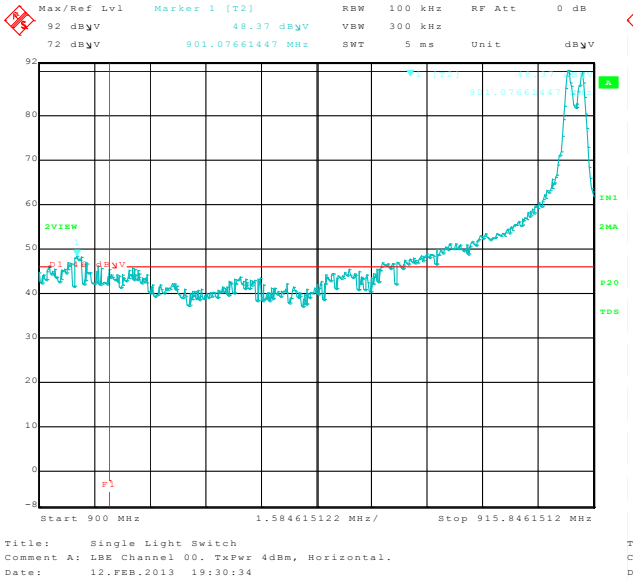
Butterfly
RF Switch
Model: S0311010

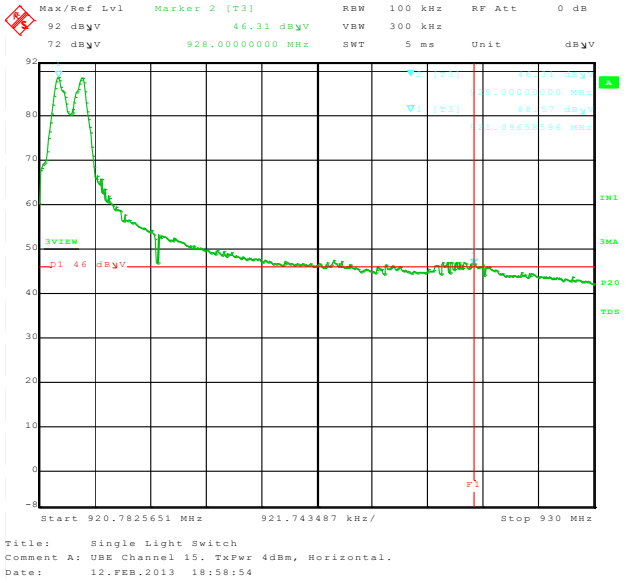
Date: 2/12/2013
Lab: P
Tested By: Matt Harrison

Band Edge

Freq. (MHz)	Level (dBµV)	Pol (v/h)	Limit (dBµV)	Margin (dB)	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
915.38	90.25	H	--	--	Peak	1.00	148	Low Channel Fundamental
								@ 3 meters
901.07	48.37	H			Peak	1.00	148	No Marker Delta
901.07	38.51	H	46.00	-7.49	QP	1.00	148	Method Used
921.51	88.57	H	--	--	Peak	1.45	190	High Channel Fundamental
								@ 3 meters
928.00	46.31	H			Peak	1.45	190	No Marker Delta
928.00	39.76	H	46.00	-6.24	QP	1.45	190	Method Used

Test distance
3 meter





FCC 15.249

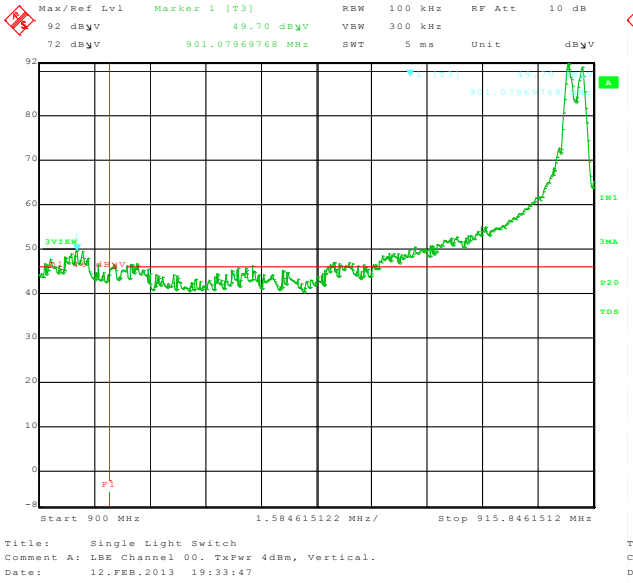
Butterfly
RF Switch
Model: S0311010

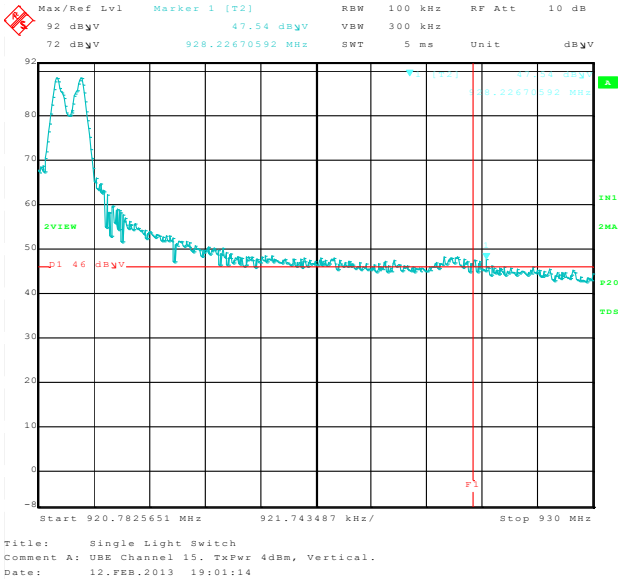
Date: 2/12/2013
Lab: P
Tested By: Matt Harrison

Band Edge

Freq. (MHz)	Level (dBµV)	Pol (v/h)	Limit (dBµV)	Margin (dB)	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
915.38	91.52	V	--	--	Peak	1.30	190	Fundamental of Channel 0
								@ 3 meters
901.07	49.70	V	46.00	--	Peak	1.30	190	No Marker Delta
901.07	39.46	V	46.00	-6.54	QP	1.30	190	Method Used
921.51	88.34	V	--	--	Peak	1.22	190	Fundamental of Channel 15
								@ 3 meters
928.22	47.54	V			Peak	1.22	190	No Marker Delta
928.22	38.81	V	46.00	-7.19	QP	1.22	190	Method Used

Test distance
3 meter

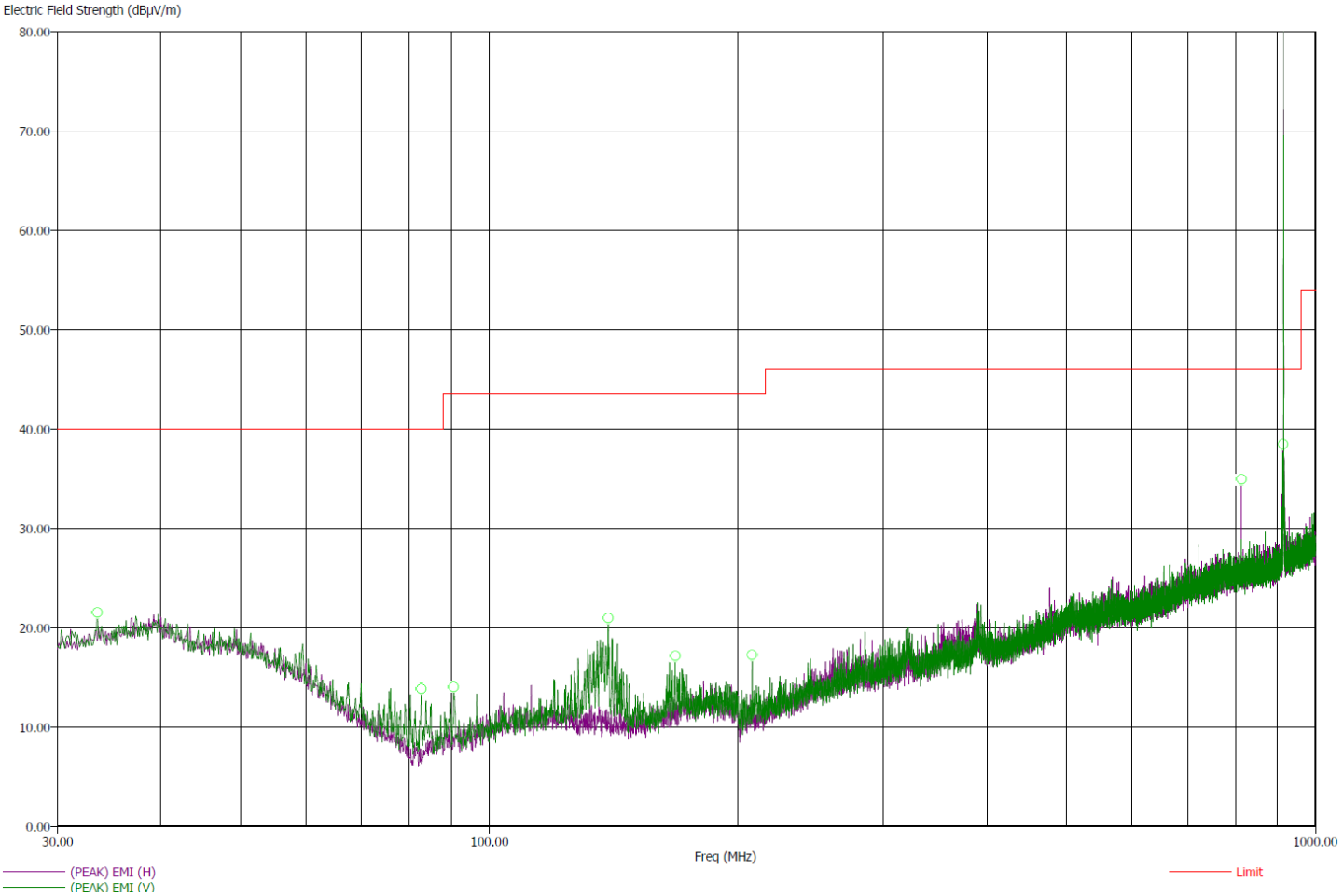




Title: FCC 15.209
File: Radiated Pre-Scan 30-1000Mhz.set
Operator: Eugene Adams
EUT Type: RF SWITCH P/N: S0311010.
EUT Condition: Transceiving 915.38MHz.
Comments:
Temp: 71f
Hum: 37%
Battery Operated

2/14/2013 5:20:50 PM
Sequence: Preliminary Scan

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



There were no spurious radiated emissions found below 30 MHz or above 1000 MHz.

Title: FCC 15.209
File: Radiated Final 30-1000Mhz.set
Operator: Eugene Adams
EUT Type: RF SWITCH P/N: S0311010.
EUT Condition: Transceiving 915.23MHz.
Comments:
Temp: 71f
Hum: 37%
Battery Operated

2/14/2013 5:42:36 PM
Sequence: Final Measurements

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

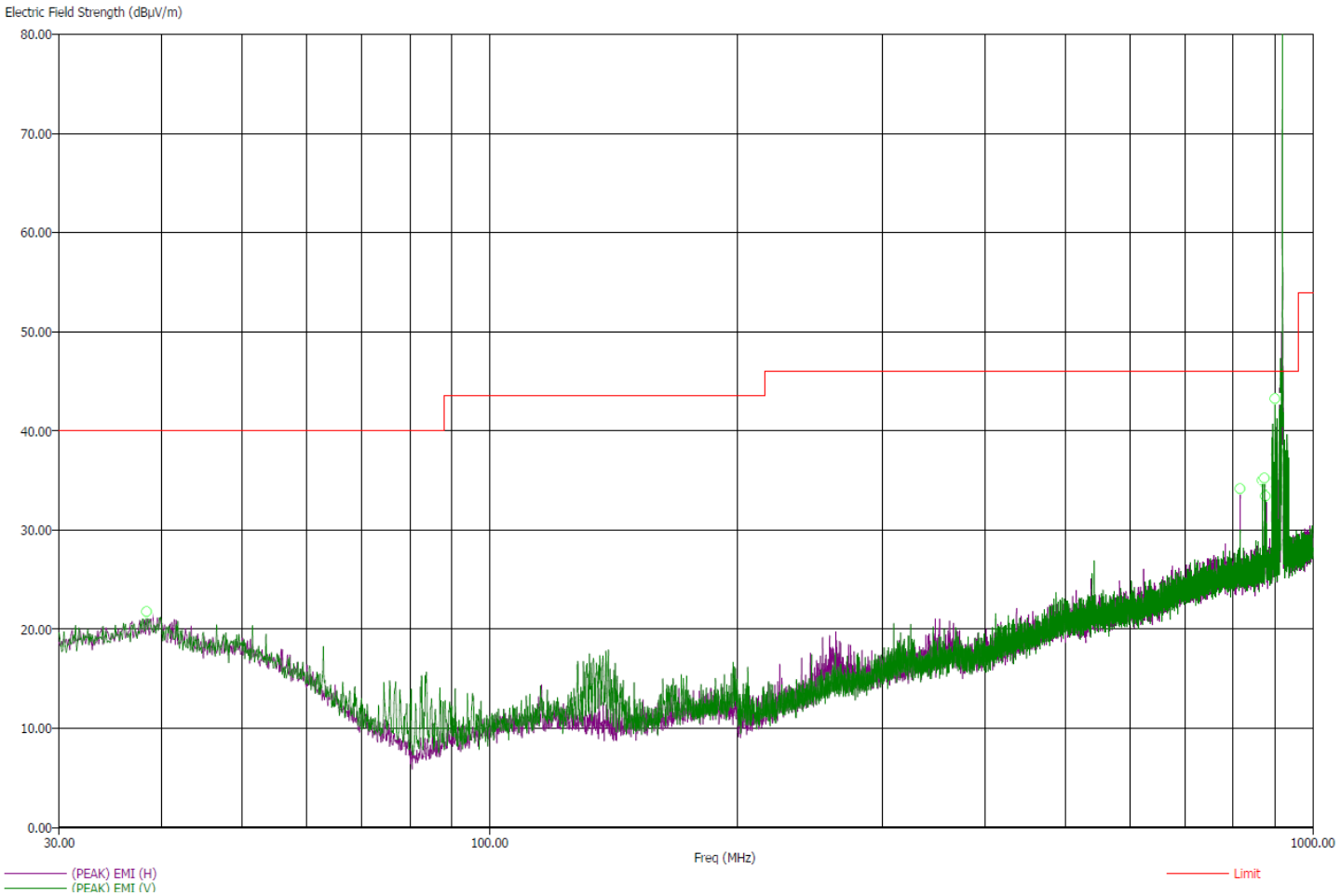
Freq (MHz)	(QP) Margin (dB)	(QP) EMI (dBµV/m)	(PEAK) EMI (dBµV/m)	Limit (dBµV/m)	Pol	Ttbl Agl (deg)	Twr Ht (cm)	Transducer (dB)	Cable(dB)
33.50	-25.73	14.27	19.88	40.00	V	108.75	400.11	18.24	0.54
82.70	-28.55	11.45	16.31	40.00	V	218.50	147.58	6.30	0.75
90.50	-33.84	9.68	15.79	43.52	V	260.00	128.29	7.15	0.90
139.20	-29.64	13.88	20.66	43.52	V	133.50	110.47	7.56	1.26
167.80	-32.04	11.48	18.79	43.52	V	166.75	104.29	8.74	1.30
208.00	-34.22	9.30	16.69	43.52	V	15.00	101.64	9.52	1.53
813.30	-10.90	35.10	37.01	46.00	H	81.50	122.52	20.54	3.63
914.00	-7.71	38.29	40.74	46.00	H	38.00	100.05	21.03	3.93

There were no spurious radiated emissions found below 30 MHz or above 1000 MHz.

Title: FCC 15.209
File: Radiated Pre-Scan 30-1000Mhz_Mid.set
Operator: Matt Harrison
EUT Type: RF SWITCH P/N: S0311010.
EUT Condition: Constantly Transceiving 918.53MHz.
Comments: Connected to Load.
Temp: 71f
Hum: 23%
Battery Operated

2/13/2013 8:35:32 PM
Sequence: Preliminary Scan

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



There were no spurious radiated emissions found below 30 MHz or above 1000 MHz.

Title: FCC 15.209
File: Radiated Final 30-1000Mhz_Mid.set
Operator: Matt Harrison
EUT Type: RF SWITCH P/N: S0311010.
EUT Condition: Constantly Transceiving 918.53MHz.
Comments: Connected to Load.
Temp: 71f
Hum: 23%
Battery Operated

2/13/2013 8:56:35 PM
Sequence: Final Measurements

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

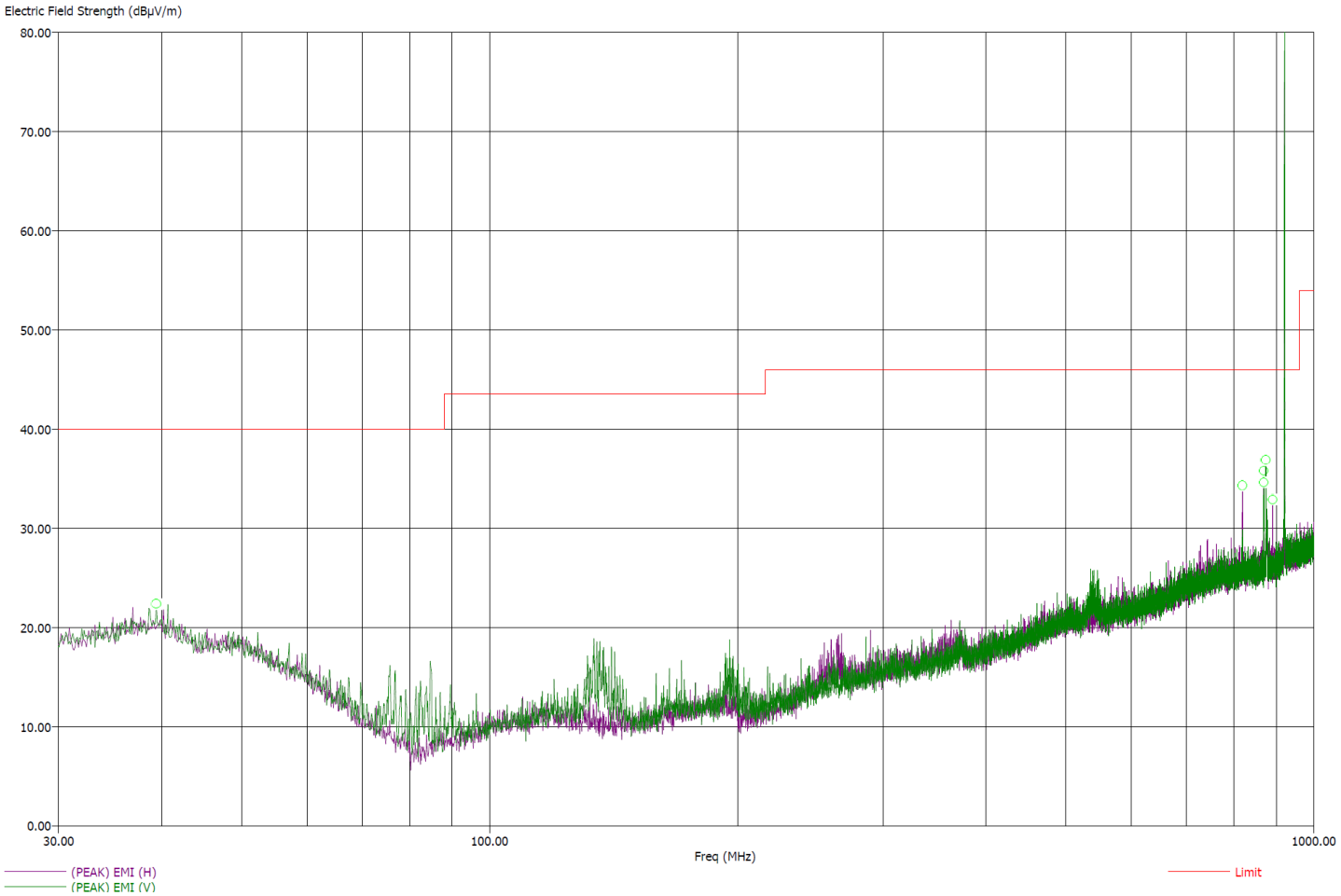
Freq (MHz)	(QP) Margin (dB)	(QP) EMI (dBµV/m)	(PEAK) EMI (dBµV/m)	Limit (dBµV/m)	Pol	Ttbl Agl (deg)	Twr Ht (cm)	Transducer (dB)	Cable(dB)
38.30	-24.60	15.40	20.17	40.00	V	168.50	212.52	18.94	0.58
816.40	-9.64	36.36	38.59	46.00	H	143.00	166.29	20.55	3.63
869.40	-11.55	34.45	36.84	46.00	H	46.50	135.23	20.71	3.78
874.50	-23.18	22.82	40.23	46.00	V	10.50	232.82	20.73	3.80
877.40	-18.69	27.31	34.22	46.00	H	240.75	287.88	20.73	3.81
899.10	-9.10	36.90	46.68	46.00	V	348.00	99.64	20.80	3.90

There were no spurious radiated emissions found below 30 MHz or above 1000 MHz.

Title: FCC 15.209
File: Radiated Pre-Scan 30-1000Mhz_Hi.set
Operator: Matt Harrison
EUT Type: RF SWITCH P/N: S0311010.
EUT Condition: Constantly Transceiving 921.33MHz.
Comments: Connected to Load.
Temp: 71f
Hum: 23%
Battery Operated

2/13/2013 7:58:24 PM
Sequence: Preliminary Scan

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



There were no spurious radiated emissions found below 30 MHz or above 1000 MHz.

Title: FCC 15.209
File: Radiated Final 30-1000Mhz_Hi.set
Operator: Matt Harrison
EUT Type: RF SWITCH P/N: S0311010.
EUT Condition: Constantly Transceiving 921.33MHz.
Comments: Connected to Load.
Temp: 71f
Hum: 23%
Battery Operated

2/13/2013 8:19:00 PM
Sequence: Final Measurements

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

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)
39.40	-24.52	15.48	21.09	40.00	V	60.75	321.76	19.09	0.59
819.00	-11.28	34.72	37.11	46.00	H	160.50	99.88	20.56	3.64
869.40	-12.84	33.16	35.80	46.00	H	288.00	325.00	20.71	3.78
869.40	-12.77	33.23	35.72	46.00	V	12.25	99.88	20.71	3.78
874.40	-15.51	30.49	38.10	46.00	V	84.75	284.58	20.73	3.80
891.30	-23.01	22.99	29.03	46.00	H	113.75	356.05	20.78	3.87

There were no spurious radiated emissions found between 9kHz-30 MHz as well as the range from 1-10GHz.