

**FCC PART 15 SUBPART B and FCC PART 15 SUBPART C
TEST REPORT***for***WIRELESS PRESENTATION MOUSE****MODEL: AS04024**

Prepared for

SMK-LINK ELECTRONICS
3601-B CALLE TECATE
CAMARILLO, CALIFORNIA 93012

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DATE: APRIL 28, 2014

	REPORT BODY	APPENDICES					TOTAL
		A	B	C	D	E	
PAGES	16	2	2	2	14	31	67

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GENERAL REPORT SUMMARY

Compatible Electronics Inc. generates this electromagnetic emission test report, 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 without the written permission of Compatible Electronics, unless done so in full.

This report must not be used to claim product certification, approval or endorsement by NVLAP, NIST or any agency of the federal government.

Device Tested: Wireless Presentation Mouse
Model: AS04024
S/N: N/A

Product Description: See Expository Statement

Modifications: The EUT was not modified in order to meet the specifications.

Manufacturer: SMK-Link Electronics
3601-B Calle Tecate
Camarillo, California 93012

Test Date(s): March 13, 2014

Test Specifications: Emissions requirements
CFR Title 47, Part 15, Subpart B and Subpart C, Sections 15.205, 15.209, and 15.249

Test Procedure: ANSI C63.4

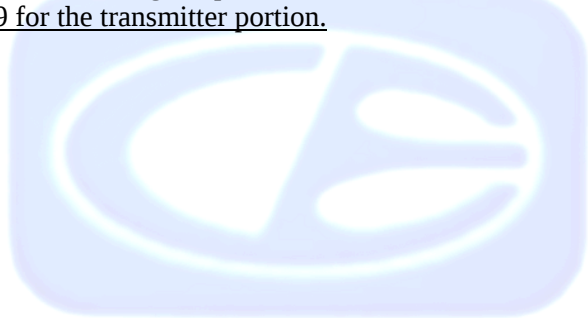
Test Deviations: The test procedure was not deviated from during the testing.

SUMMARY OF TEST RESULTS

TEST	DESCRIPTION	RESULTS
1	Conducted RF Emissions 150 kHz to 30 MHz	This test was not performed because the EUT operates on battery power and does not connect to the AC mains.
2	Radiated RF Emissions 10 kHz to 25000 MHz (Transmitter and Digital Portion)	Complies with the Class B limits of CFR Title 47, Part 15, Subpart B; and Subpart C, sections 15.205, 15.209, and 15.249.

1. PURPOSE

This document is a qualification test report based on the emissions tests performed on the Wireless Presentation Mouse, Model: AS04024 (EUT). The Emissions measurements were performed according to the measurement procedure described in ANSI C63.4. The tests were performed in order to determine whether the electromagnetic emissions from the equipment under test, referred to as EUT hereafter, are within the **Class B** specification limits defined by CFR Title 47, Part 15, Subpart B for the digital portion; and the limits defined in Subpart C, sections 15.205, 15.209, and 15.249 for the transmitter portion.



2. ADMINISTRATIVE DATA

2.1 Location of Testing

The Emissions tests described herein were performed at the test facility of Compatible Electronics, 114 Olinda Drive, Brea, California.

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

SMK-Link Electronics

Massoud Niakan
Daniel Grieder

G.M. Engineering & Program Management
RF/HW Engineer

Compatible Electronics Inc.

James Ross Test Engineer
Kyle Fujimoto Test Engineer

2.4 Date Test Sample was Received

The test sample was received prior to the initial test date of March 13, 2014.

2.5 Disposition of the Test Sample

The test sample has not been returned to SMK-Link Electronics as of the date of the test report.

2.6 Abbreviations and Acronyms

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

FCC	Federal Communications Commission
RF	Radio Frequency
EMI	Electromagnetic Interference
EUT	Equipment Under Test
P/N	Part Number
S/N	Serial Number
ITE	Information Technology Equipment
LISN	Line Impedance Stabilization Network
NVLAP	National Voluntary Laboratory Accreditation Program
CFR	Code of Federal Regulations
N/A	Not Applicable
Ltd.	Limited
Inc.	Incorporated
NCR	No Calibration Required
URC	Universal Remote Control

3. APPLICABLE DOCUMENTS

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

SPEC	TITLE
CFR Title 47, Part 15	FCC Rules – Radio frequency devices (including digital devices)
ANSI C63.4: 2009	American National Standard for 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 – Emissions

The Wireless Presentation Mouse, Model: AS04024 (EUT) was tested as a stand alone unit. The EUT had a special test program that allowed the low, middle, or high channels, to be tested while continuously transmitting.

It was determined that the emissions were at their highest level when the EUT was operating in the above configuration. The final emissions data was taken in this mode of operation and any cables were maximized. All initial investigations were performed with the measurement receiver in manual mode scanning the frequency range continuously. Photographs of the test setup are in Appendix D of this report.

4.1.1 Cable Construction and Termination

There were no external cables connected to the EUT.

5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT**5.1 EUT and Accessory List**

EQUIPMENT	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	FCC ID
WIRELESS PRESENTATION MOUSE (EUT)	SMK-LINK ELECTRONICS	AS04024	N/A	IE3GAME14

5.2 Emissions Test Equipment

EQUIPMENT TYPE	MANU-FACTURER	MODEL NUMBER	SERIAL NUMBER	CALIBRATION DATE	CAL. CYCLE
GENERAL TEST EQUIPMENT USED IN LAB B					
Computer	Compaq	CQ5210F	CNX9360CF9	N/A	N/A
Monitor	Hewlett Packard	HPs2031a	3CQ046N3MD	N/A	N/A
EMI Receiver	Rohde & Schwarz	ESIB40	100194	November 19, 2012	2 Year
GENERAL TEST EQUIPMENT USED IN LAB D					
Computer	Hewlett Packard	p6716f	MXX1030PX0	N/A	N/A
LCD Monitor	Hewlett Packard	52031a	3CQ046N3MG	N/A	N/A
EMI Receiver	Rohde & Schwarz	ESIB40	100194	November 19, 2012	2 Year
RF RADIATED EMISSIONS TEST EQUIPMENT					
CombiLog Antenna	Com-Power	AC-220	61060	May 29, 2013	1 Year
Preamplifier	Com-Power	PA-118	181656	January 13, 2014	1 Year
Preamplifier	Com-Power	PA-840	711013	May 17, 2012	2 Year
Loop Antenna	Com-Power	AL-130	17089	January 29, 2013	2 Year
Horn Antenna	Com-Power	AH-118	071175	February 26, 2014	2 Year
Horn Antenna	Com-Power	AH-826	0071957	N/A	N/A
Antenna Mast	Com Power	AM-100	N/A	N/A	N/A
System Controller	Sunol Sciences Corporation	SC110V	112213-1	N/A	N/A
Turntable	Sunol Sciences Corporation	2011VS	N/A	N/A	N/A
Antenna-Mast	Sunol Sciences Corporation	TWR95-4	112213-3	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 Emissions 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.

6.3 Facility Environmental Characteristics

When applicable refer to the data sheets in Appendix E for the relative humidity, air temperature, and barometric pressure.

7. TEST PROCEDURES

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

7.1 RF Emissions

7.1.1 Conducted Emissions Test

The measurement receiver was used as a measuring meter. The data was collected with the measurement receiver in the peak detect mode with the "Max Hold" feature activated. The quasi-peak was used only where indicated in the data sheets. A transient limiter was used for the protection of the measurement receiver's input stage, and the offset was adjusted accordingly to read the actual data measured. The LISN output was measured using the measurement 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 was powered through the LISN, which was bonded to the ground plane. The LISN power was filtered and the filter was bonded to the ground plane. The EUT was set up with the minimum distances from any conductive surfaces as specified in ANSI C63.4. 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 Compatible Electronics conducted emissions software in several overlapping sweeps by running the spectrum analyzer at a minimum scan rate of 10 seconds per octave. The final qualification data is located in Appendix E.

Test Results:

This test was not performed because the EUT operates on battery power and does not connect to the AC mains.

7.1.2 Radiated Emissions (Spurious and Harmonics) Test – Lab B

The EMI Receiver was used as a measuring meter. A preamplifier was used to increase the sensitivity of the instrument. The Com Power Microwave Preamplifier M/N: PA-118 was used for frequencies from 1 GHz to 18 GHz, and the M/N: PA-840 was used for frequencies above 18 GHz. The EMI Receiver was used in the peak detect mode with the "Max Hold" feature activated. In this mode, the EMI Receiver records the highest measured reading over all the sweeps.

The frequencies above 1 GHz were averaged manually by narrowing the video filter down to 1/T where T is the time of the pulse in seconds and putting the sweep time on AUTO on the EMI Receiver to keep the amplitude reading calibrated.

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

FREQUENCY RANGE	EFFECTIVE MEASUREMENT BANDWIDTH	TRANSDUCER
1 GHz to 25 GHz	1 MHz	Horn Antenna

The open field test site of Compatible Electronics, Inc. was used for radiated emission testing. This test site is set up according to ANSI C63.4: 2009. 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 by the Radiated Emission Manual Test software. At each reading, the EUT was rotated 360 degrees and the antenna height was varied from 1 to 4 meters (for E field radiated field strength). The gunsight method was used when measuring with the horn antenna in order to ensure accurate results.

The presence of ambient signals was verified by turning the EUT off. In case an ambient signal was detected, the measurement bandwidth was reduced temporarily and verification was made that an additional adjacent peak did not exist. This ensures that the ambient signal does not hide any emissions from the EUT. The EUT was tested at a 3 meter test distance from 1 GHz to 25 GHz to obtain the final test data.

Test Results:

The EUT complies with the **Class B** limits of CFR Title 47, Part 15, Subpart B; and the limits of CFR Title 47, Part 15, Subpart C, Sections 15.209 and 15.249.

7.1.3 Radiated Emissions (Spurious and Harmonics) Test – Lab D

The EMI Receiver was used as the measuring meter. A built-in, internal preamplifier was used to increase the sensitivity of the instrument. The EMI Receiver was initially used in the Analyzer mode feature activated. In this mode, the EMI receiver can then record the actual frequency to be measured. This final reading is then taken accurately in the EMI Receiver mode, which takes into account the cable loss, amplifier gain and antenna factors, so that a true reading is compared to the true limit. A quasi-peak reading was taken only for those readings, which are marked accordingly on the data sheets.

The TDK FAC-3 shielded test chamber of Compatible Electronics, Inc. was used for radiated emissions testing. This test site is set up according to ANSI C63.4: 2009. 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 (for E field radiated field strength).

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

FREQUENCY RANGE	EFFECTIVE MEASUREMENT BANDWIDTH	TRANSDUCER
10 kHz to 150 kHz	200 Hz	Active Loop Antenna
150 kHz to 30 MHz	9 kHz	Active Loop Antenna
30 MHz to 1 GHz	120 kHz	CombiLog Antenna

The EUT was tested at a 3 meter test distance. The six highest emissions are listed in Table 1.0.

Test Results:

The EUT complies with the **Class B** limits of CFR Title 47, Part 15, Subpart B; and the limits of CFR Title 47, Part 15, Subpart C, Sections 15.209 and 15.249.

7.1.4 RF Emissions Test ResultsTable 1.0 RADIATED EMISSION RESULTS
Wireless Presentation Mouse, Model: AS04024

Frequency MHz	Corrected Reading* dBuV	Specification Limit dBuV	Delta (Cor. Reading – Spec. Limit) dB
4808 (H) (Y-Axis)	52.58 (A)	54.00	-1.42
4808 (H) (X-Axis)	51.81 (A)	54.00	-2.19
4960 (H) (X-Axis)	51.35 (A)	54.00	-2.65
4960 (H) (Y-Axis)	50.97 (A)	54.00	-3.03
4880 (H) (X-Axis)	50.92 (A)	54.00	-3.08
4808 (H) (Z-Axis)	50.91 (A)	54.00	-3.09

Notes:

- * The complete emissions data is given in Appendix E of this report.
- (H) Horizontal
- (V) Vertical
- (A) Average

8. CONCLUSIONS

The Wireless Presentation Mouse, Model: AS04024 (EUT), as tested, meets all of the **Class B** specification limits defined in CFR Title 47, Part 15, Subpart B for the digital portion; and the limits defined in Subpart C, sections 15.205, 15.209, and 15.249 for the transmitter portion.



APPENDIX A

LABORATORY ACCREDITATIONS AND RECOGNITIONS

LABORATORY ACCREDITATIONS AND RECOGNITIONS

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

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

NVLAP listing links

[Agoura Division](#) / [Brea Division](#) / [Silverado/Lake Forest Division](#)

.Quote from ISO-ILAC-IAF Communiqué on 17025:

"A laboratory's fulfillment of the requirements of ISO/IEC 17025:2005 means the laboratory meets both the technical competence requirements and management system requirements that are necessary for it to consistently deliver technically valid test results and calibrations. The management system requirements in ISO/IEC 17025:2005 (Section 4) are written in language relevant to laboratory operations and meet the principles of ISO 9001:2008 Quality Management Systems — Requirements."

ANSI listing [CETCB](#)

Compatible Electronics has been nominated as a Conformity Assessment Body (CAB) for EMC under the US/EU Mutual Recognition Agreement (MRA).

US/EU MRA list [NIST MRA site](#)

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).

APEC MRA list [NIST MRA site](#)

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

VCCI Support member: Please visit http://www.vcci.jp/vcci_e/

FCC Listing, from FCC OET site

[FCC test lab search](#) <https://fjallfoss.fcc.gov/oetcf/eas/reports/TestFirmSearch.cfm>

Compatible Electronics IC listing can be found at:

<http://www.ic.gc.ca/eic/site/ic1.nsf/eng/home>

APPENDIX B

MODIFICATIONS TO THE EUT

MODIFICATIONS TO THE EUT

The modifications listed below were made to the EUT to pass FCC 15.249 and/or FCC **Class B** specifications.

All the rework described below was implemented during the test in a method that could be reproduced in all the units by the manufacturer.

No modifications were made to the EUT during the testing.



APPENDIX C

ADDITIONAL MODELS

ADDITIONAL MODELS COVERED UNDER THIS REPORT

USED FOR THE PRIMARY TEST

Wireless Presentation Mouse
Model: AS04024
S/N: N/A

No additional models covered under this report.



APPENDIX D

DIAGRAMS, CHARTS, AND PHOTOS

FIGURE 1: CONDUCTED EMISSIONS TEST SETUP

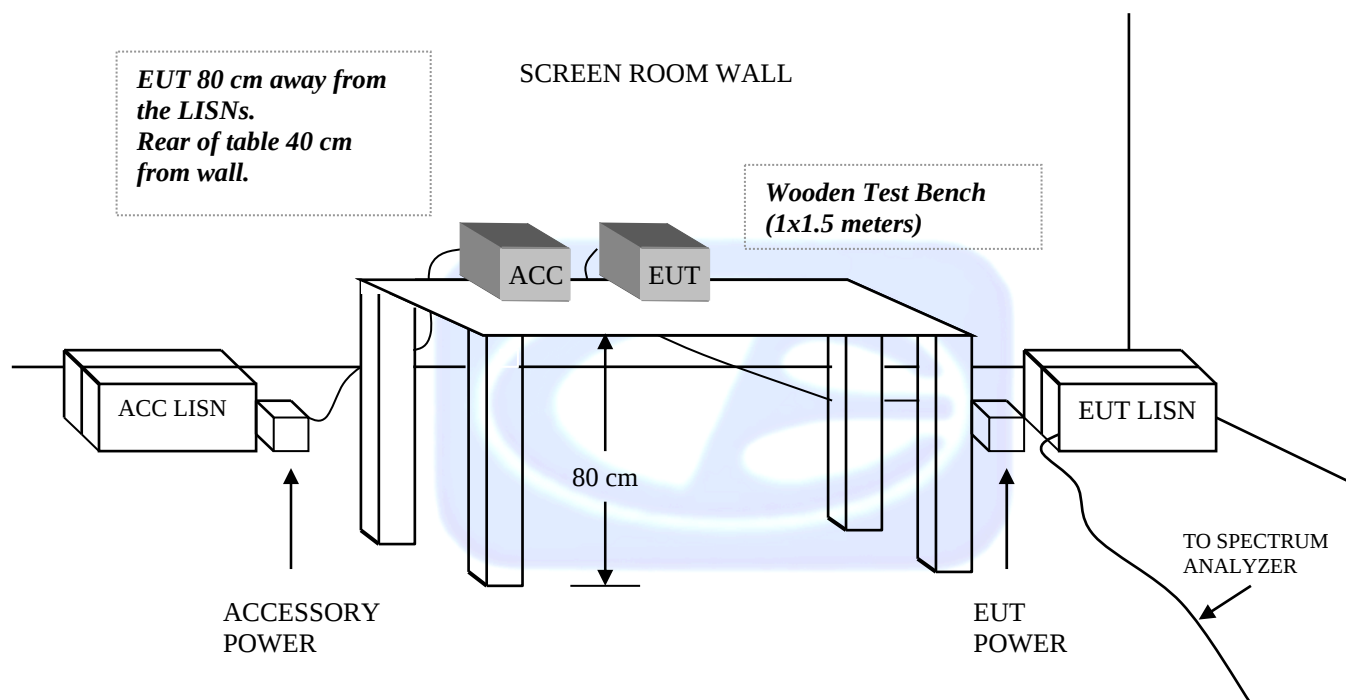
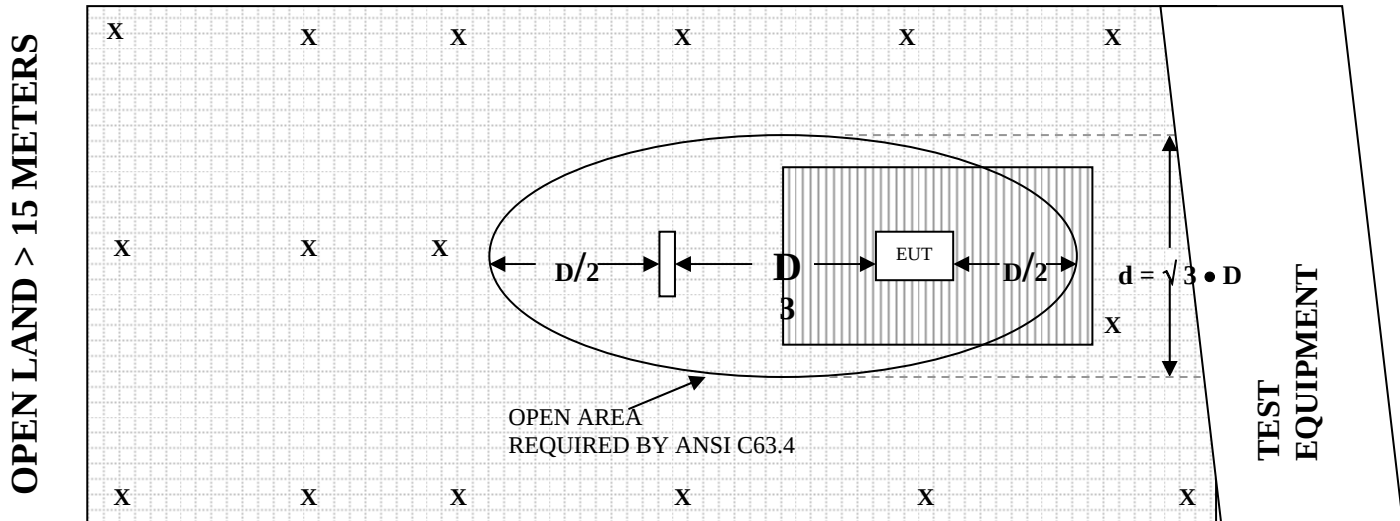


FIGURE 2: PLOT MAP AND LAYOUT OF RADIATED SITE

OPEN LAND > 15 METERS



OPEN LAND > 15 METERS

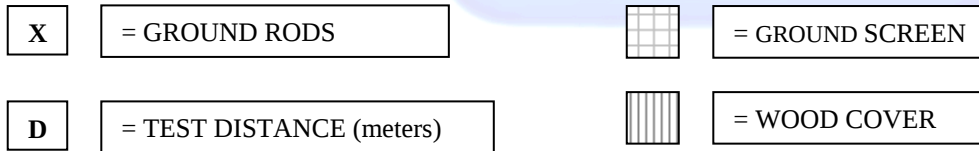
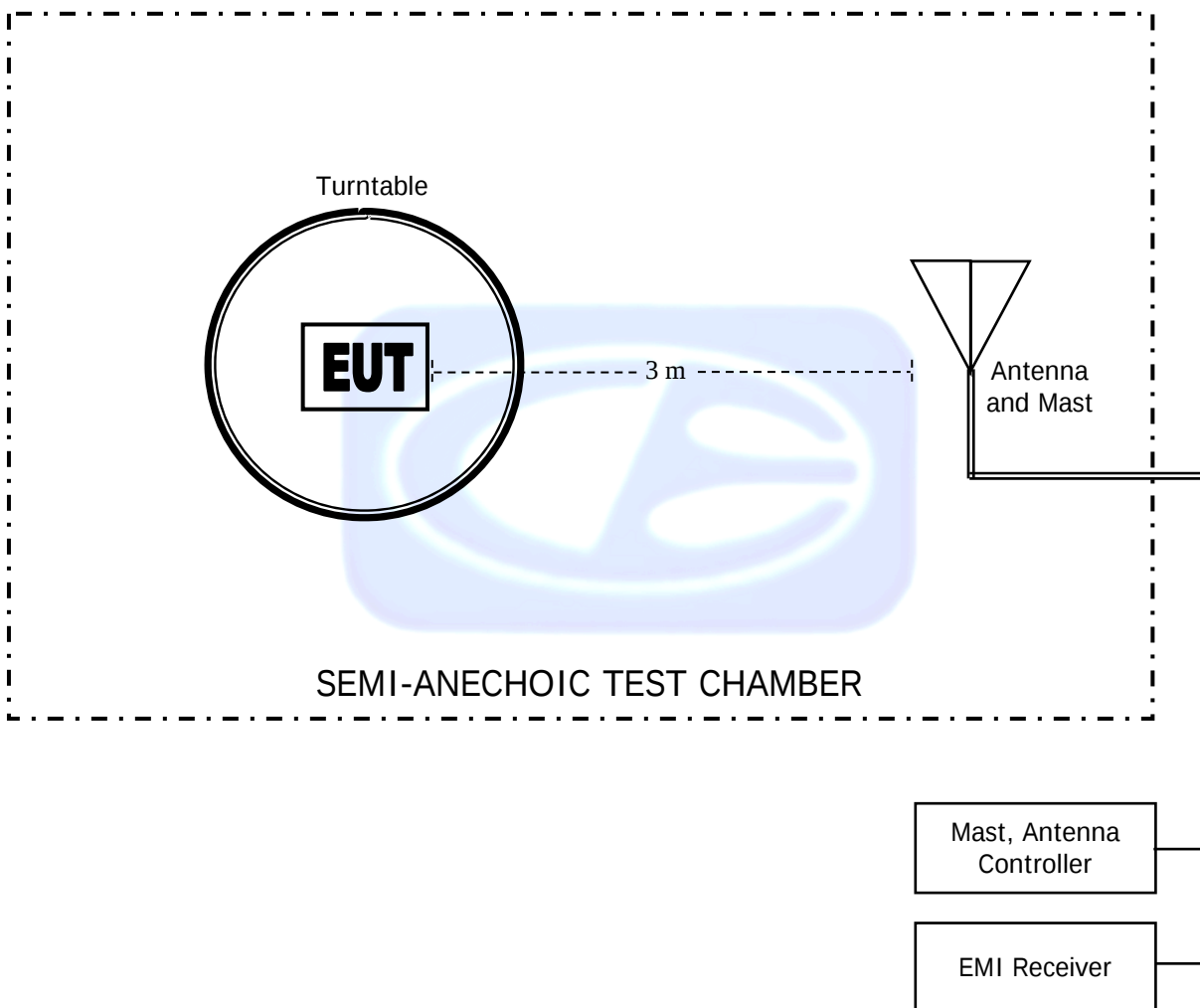


FIGURE 3: LAYOUT OF THE SEMI-ANECHOIC TEST CHAMBER



COM-POWER AL-130**LOOP ANTENNA**

S/N: 17089

CALIBRATION DATE: JANUARY 29, 2013

FREQUENCY (MHz)	MAGNETIC (dB/m)	ELECTRIC (dB/m)
0.009	-42.5	9
0.01	-42.3	9.2
0.02	-42.1	9.4
0.03	-41.4	10.1
0.04	-41.8	9.7
0.05	-42.4	9.1
0.06	-42.3	9.2
0.07	-42.5	9
0.08	-42.4	9.1
0.09	-42.5	9
0.1	-42.5	9
0.2	-42.7	8.8
0.3	-42.6	8.9
0.4	-42.5	9
0.5	-42.7	8.8
0.6	-42.7	8.8
0.7	-42.5	9
0.8	-42.3	9.2
0.9	-42.2	9.3
1	-42.2	9.3
2	-41.8	9.7
3	-41.7	9.8
4	-41.7	9.8
5	-41.5	10
6	-41.6	9.9
7	-41.4	10.1
8	-41	10.5
9	-40.8	10.7
10	-41.3	10.2
15	-41.4	10.1
20	-41.2	10.3
25	-42.6	8.9
30	-41.7	9.8

COM-POWER AC-220

COMBILOG ANTENNA

S/N: 61060

CALIBRATION DATE: MAY 29, 2013

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30	19.40	200	9.10
35	19.10	250	11.40
40	19.70	300	11.90
45	18.00	350	14.20
50	16.80	400	15.20
60	12.50	450	16.50
70	7.30	500	17.10
80	4.40	550	16.20
90	8.00	600	17.70
100	8.80	650	19.10
120	10.50	700	20.00
125	10.60	750	21.50
140	8.60	800	21.50
150	11.20	850	21.70
160	8.90	900	22.70
175	9.60	950	22.10
180	8.50	1000	22.90

COM POWER AH-118**HORN ANTENNA****S/N: 071175****CALIBRATION DATE: FEBRUARY 26, 2014**

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
1.0	24.23	10.0	38.43
1.5	25.84	10.5	40.19
2.0	28.14	11.0	40.49
2.5	29.51	11.5	41.39
3.0	31.20	12.0	42.02
3.5	32.17	12.5	43.30
4.0	31.40	13.0	42.77
4.5	31.86	13.5	40.18
5.0	34.82	14.0	42.59
5.5	34.38	14.5	41.74
6.0	36.31	15.0	41.84
6.5	34.81	15.5	38.48
7.0	37.48	16.0	39.52
7.5	36.98	16.5	37.85
8.0	36.66	17.0	41.33
8.5	38.47	17.5	44.96
9.0	37.22	18.0	48.50
9.5	37.86		

COM-POWER PA-118**PREAMPLIFIER**

S/N: 181656

CALIBRATION DATE: JANUARY 13, 2014

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
1.0	24.90	6.0	25.40
1.1	25.30	6.5	25.20
1.2	26.00	7.0	24.40
1.3	26.20	7.5	24.00
1.4	26.30	8.0	23.90
1.5	26.40	8.5	24.50
1.6	26.50	9.0	25.20
1.7	26.60	9.5	24.80
1.8	26.50	10.0	24.90
1.9	26.60	11.0	25.40
2.0	26.70	12.0	24.50
2.5	26.90	13.0	24.30
3.0	27.00	14.0	25.20
3.5	27.10	15.0	25.90
4.0	26.60	16.0	25.60
4.5	26.10	17.0	23.70
5.0	26.40	18.0	25.80
5.5	25.80		

COM-POWER AH826**HORN ANTENNA****S/N: 71957**

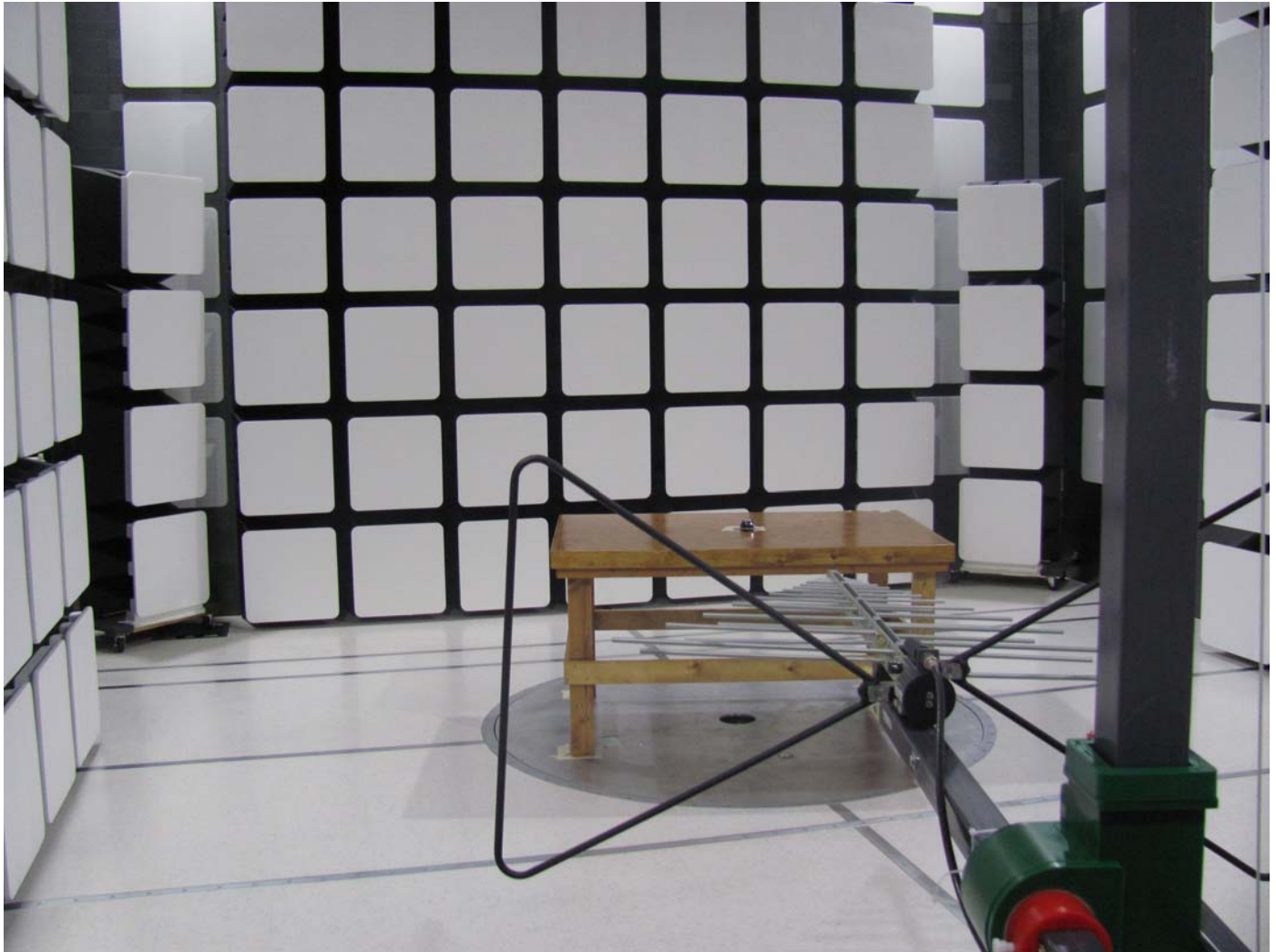
FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
18.0	33.5	22.5	35.5
18.5	33.5	23.0	35.9
19.0	34.0	23.5	35.7
19.5	34.0	24.0	35.6
20.0	34.3	24.5	36.0
20.5	34.9	25.0	36.2
21.0	34.7	25.5	36.1
21.5	35.0	26.0	36.2
22.0	35.0	26.5	35.7

COM-POWER PA-840
MICROWAVE PREAMPLIFIER

S/N: 711013

CALIBRATION DATE: MAY 17, 2012

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
18.0	25.81	31.0	25.77
19.0	24.57	31.5	25.36
20.0	23.46	32.0	25.15
21.0	22.51	32.5	25.13
22.0	23.85	33.0	25.52
23.0	23.31	33.5	25.24
24.0	24.44	34.0	25.08
25.0	25.42	34.5	25.27
26.0	25.71	35.0	23.99
26.5	25.66	35.5	24.67
27.0	25.84	36.5	24.80
27.5	25.29	37.0	26.27
28.0	25.46	37.5	24.86
28.5	25.58	38.0	24.64
29.0	26.16	38.5	23.46
29.5	26.14	39.0	21.29
30.0	26.01	39.5	20.83
30.5	25.67	40.0	19.96



FRONT VIEW

**SMK-LINK ELECTRONICS
WIRELESS PRESENTATION MOUSE
MODEL: AS04024
FCC SUBPART B AND C – RADIATED EMISSIONS – BELOW 1 GHz**

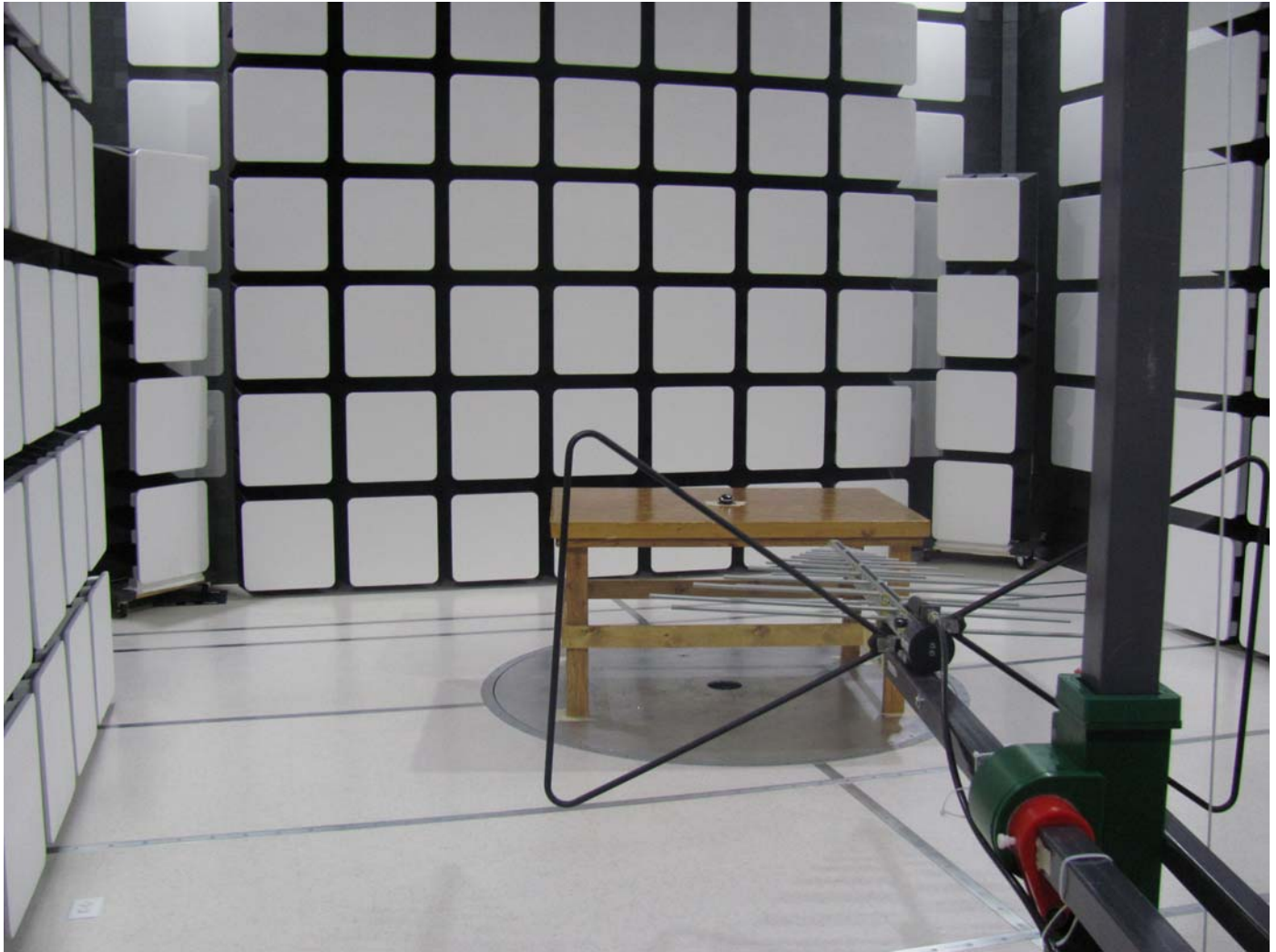
**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**

Brea Division
114 Olinda Drive
Brea, CA 92823
(714) 579-0500

Agoura Division
2337 Troutdale Drive
Agoura, CA 91301
(818) 597-0600

Silverado Division
19121 El Toro Road
Silverado, CA 92676
(949) 589-0700

Lake Forest Division
20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400



REAR VIEW

SMK-LINK ELECTRONICS
WIRELESS PRESENTATION MOUSE
MODEL: AS04024

FCC SUBPART B AND C – RADIATED EMISSIONS – BELOW 1 GHz

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

Brea Division
114 Olinda Drive
Brea, CA 92823
(714) 579-0500

Agoura Division
2337 Troutdale Drive
Agoura, CA 91301
(818) 597-0600

Silverado Division
19121 El Toro Road
Silverado, CA 92676
(949) 589-0700

Lake Forest Division
20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400



FRONT VIEW

SMK-LINK ELECTRONICS
WIRELESS PRESENTATION MOUSE
MODEL: AS04024

FCC SUBPART B AND C – RADIATED EMISSIONS – ABOVE 1 GHz

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

Brea Division
114 Olinda Drive
Brea, CA 92823
(714) 579-0500

Agoura Division
2337 Troutdale Drive
Agoura, CA 91301
(818) 597-0600

Silverado Division
19121 El Toro Road
Silverado, CA 92676
(949) 589-0700

Lake Forest Division
20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400



REAR VIEW

SMK-LINK ELECTRONICS
WIRELESS PRESENTATION MOUSE
MODEL: AS04024

FCC SUBPART B AND C – RADIATED EMISSIONS – ABOVE 1 GHz

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

Brea Division
114 Olinda Drive
Brea, CA 92823
(714) 579-0500

Agoura Division
2337 Troutdale Drive
Agoura, CA 91301
(818) 597-0600

Silverado Division
19121 El Toro Road
Silverado, CA 92676
(949) 589-0700

Lake Forest Division
20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400

APPENDIX E

DATA SHEETS

RADIATED EMISSIONS

DATA SHEETS

FCC 15.249SMK-Link Electronics
Wireless Presentation Mouse
Model: AS04024Date: 03/13/2014
Lab: B
Tested By: Kyle Fujimoto**Fundamental of the EUT****X-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2404	76.19	V	114	-37.81	Peak	1.75	225	
2404	71.91	V	94	-22.09	Avg	1.75	225	
2404	87.6	H	114	-26.4	Peak	1.25	0	
2404	85.46	H	94	-8.54	Avg	1.25	0	
2440	74.09	V	114	-39.91	Peak	1.25	155	
2440	72.03	V	94	-21.97	Avg	1.25	155	
2440	90.32	H	114	-23.68	Peak	1.25	45	
2440	87.37	H	94	-6.63	Avg	1.25	45	
2480	75.33	V	114	-38.67	Peak	1.25	155	
2480	72.71	V	94	-21.29	Avg	1.25	155	
2480	89.62	H	114	-24.38	Peak	1.25	0	
2480	87.2	H	94	-6.8	Avg	1.25	0	

FCC 15.249

SMK-Link Electronics
Wireless Presentation Mouse
Model: AS04024

Date: 03/13/2014

Lab: B

Tested By: Kyle Fujimoto

Fundamental of the EUT

Y-Axis

[illegible]

FCC 15.249

SMK-Link Electronics
Wireless Presentation Mouse
Model: AS04024

Date: 03/13/2014

Lab: B

Tested By: Kyle Fujimoto

Fundamental of the EUT

Z-Axis

[illegible]

FCC 15.249

SMK-Link Electronics
Wireless Presentation Mouse
Model: AS04024

Date: 03/13/2014
Lab: B
Tested By: Kyle Fujimoto

Harmonics - Low Channel
X-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4808	54.64	V	74	-19.36	Peak	1.25	135	
4808	47.61	V	54	-6.39	Avg	1.25	135	
7212	50.36	V	74	-23.64	Peak	1.5	225	
7212	40.17	V	54	-13.83	Avg	1.5	225	
9616								No Emissions
9616								Detected
12020								No Emissions
12020								Detected
14424								No Emissions
14424								Detected
16828								No Emissions
16828								Detected
19232								No Emissions
19232								Detected
21636								No Emissions
21636								Detected
24040								No Emissions
24040								Detected

FCC 15.249

SMK-Link Electronics
Wireless Presentation Mouse
Model: AS04024

Date: 03/13/2014
Lab: B
Tested By: Kyle Fujimoto

Harmonics - Low Channel

X-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4808	58.89	H	74	-15.11	Peak	1.25	135	
4808	51.81	H	54	-2.19	Avg	1.25	135	
7212	47.02	H	74	-26.98	Peak	2.25	270	
7212	37.58	H	54	-16.42	Avg	2.25	270	
9616								No Emissions
9616								Detected
12020								No Emissions
12020								Detected
14424								No Emissions
14424								Detected
16828								No Emissions
16828								Detected
19232								No Emissions
19232								Detected
21636								No Emissions
21636								Detected
24040								No Emissions
24040								Detected

FCC 15.249

SMK-Link Electronics
Wireless Presentation Mouse
Model: AS04024

Date: 03/13/2014
Lab: B
Tested By: Kyle Fujimoto

Harmonics - Low Channel

Y-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4808	57.47	V	74	-16.53	Peak	1.25	155	
4808	50.88	V	54	-3.12	Avg	1.25	155	
7212	51.59	V	74	-22.41	Peak	1.75	145	
7212	41.58	V	54	-12.42	Avg	1.75	145	
9616								No Emissions
9616								Detected
12020								No Emissions
12020								Detected
14424								No Emissions
14424								Detected
16828								No Emissions
16828								Detected
19232								No Emissions
19232								Detected
21636								No Emissions
21636								Detected
24040								No Emissions
24040								Detected

FCC 15.249

SMK-Link Electronics
Wireless Presentation Mouse
Model: AS04024

Date: 03/13/2014
Lab: B
Tested By: Kyle Fujimoto

Harmonics - Low Channel

Y-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4808	59.96	H	74	-14.04	Peak	1.5	225	
4808	52.58	H	54	-1.42	Avg	1.5	225	
7212	46.28	H	74	-27.72	Peak	1.75	225	
7212	36.98	H	54	-17.02	Avg	1.75	225	
9616								No Emissions
9616								Detected
12020								No Emissions
12020								Detected
14424								No Emissions
14424								Detected
16828								No Emissions
16828								Detected
19232								No Emissions
19232								Detected
21636								No Emissions
21636								Detected
24040								No Emissions
24040								Detected

FCC 15.249

SMK-Link Electronics
Wireless Presentation Mouse
Model: AS04024

Date: 03/13/2014
Lab: B
Tested By: Kyle Fujimoto

**Harmonics - Low Channel
Z-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4808	57.08	V	74	-16.92	Peak	1	135	
4808	49.79	V	54	-4.21	Avg	1	135	
7212	50.61	V	74	-23.39	Peak	1.5	135	
7212	40.05	V	54	-13.95	Avg	1.5	135	
9616								No Emissions
9616								Detected
12020								No Emissions
12020								Detected
14424								No Emissions
14424								Detected
16828								No Emissions
16828								Detected
19232								No Emissions
19232								Detected
21636								No Emissions
21636								Detected
24040								No Emissions
24040								Detected

FCC 15.249

SMK-Link Electronics
Wireless Presentation Mouse
Model: AS04024

Date: 03/13/2014
Lab: B
Tested By: Kyle Fujimoto

Harmonics - Low Channel Z-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4808	57.76	H	74	-16.24	Peak	1.25	90	
4808	50.91	H	54	-3.09	Avg	1.25	90	
7212	45.52	H	74	-28.48	Peak	1.5	185	
7212	38.26	H	54	-15.74	Avg	1.5	185	
9616								No Emissions
9616								Detected
12020								No Emissions
12020								Detected
14424								No Emissions
14424								Detected
16828								No Emissions
16828								Detected
19232								No Emissions
19232								Detected
21636								No Emissions
21636								Detected
24040								No Emissions
24040								Detected

FCC 15.249

SMK-Link Electronics
Wireless Presentation Mouse
Model: AS04024

Date: 03/13/2014
Lab: B
Tested By: Kyle Fujimoto

Harmonics - Middle Channel

X-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4880	54.52	V	74	-19.48	Peak	1.25	180	
4880	47.34	V	54	-6.66	Avg	1.25	180	
7320	46.52	V	74	-27.48	Peak	1.25	155	
7320	37.28	V	54	-16.72	Avg	1.25	155	
9760								No Emissions
9760								Detected
12200								No Emissions
12200								Detected
14640								No Emissions
14640								Detected
17080								No Emissions
17080								Detected
19520								No Emissions
19520								Detected
21960								No Emissions
21960								Detected
24400								No Emissions
24400								Detected

FCC 15.249

SMK-Link Electronics
Wireless Presentation Mouse
Model: AS04024

Date: 03/13/2014
Lab: B
Tested By: Kyle Fujimoto

Harmonics - Middle Channel

X-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4880	57.77	H	74	-16.23	Peak	1.25	135	
4880	50.92	H	54	-3.08	Avg	1.25	135	
7320	46.54	H	74	-27.46	Peak	1.25	155	
7320	37.15	H	54	-16.85	Avg	1.25	155	
9760								No Emissions
9760								Detected
12200								No Emissions
12200								Detected
14640								No Emissions
14640								Detected
17080								No Emissions
17080								Detected
19520								No Emissions
19520								Detected
21960								No Emissions
21960								Detected
24400								No Emissions
24400								Detected

FCC 15.249

SMK-Link Electronics
Wireless Presentation Mouse
Model: AS04024

Date: 03/13/2014
Lab: B
Tested By: Kyle Fujimoto

Harmonics - Middle Channel

Y-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4880	53.11	V	74	-20.89	Peak	1.25	135	
4880	46.09	V	54	-7.91	Avg	1.25	135	
7320	47.64	V	74	-26.36	Peak	1.45	155	
7320	36.85	V	54	-17.15	Avg	1.45	155	
9760								No Emissions
9760								Detected
12200								No Emissions
12200								Detected
14640								No Emissions
14640								Detected
17080								No Emissions
17080								Detected
19520								No Emissions
19520								Detected
21960								No Emissions
21960								Detected
24400								No Emissions
24400								Detected

FCC 15.249

SMK-Link Electronics
Wireless Presentation Mouse
Model: AS04024

Date: 03/13/2014
Lab: B
Tested By: Kyle Fujimoto

Harmonics - Middle Channel

Y-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4880	58.95	H	74	-15.05	Peak	1.25	155	
4880	49.44	H	54	-4.56	Avg	1.25	155	
7320	49.39	H	74	-24.61	Peak	1.35	225	
7320	37.23	H	54	-16.77	Avg	1.35	225	
9760								No Emissions
9760								Detected
12200								No Emissions
12200								Detected
14640								No Emissions
14640								Detected
17080								No Emissions
17080								Detected
19520								No Emissions
19520								Detected
21960								No Emissions
21960								Detected
24400								No Emissions
24400								Detected

FCC 15.249

SMK-Link Electronics
Wireless Presentation Mouse
Model: AS04024

Date: 03/13/2014
Lab: B
Tested By: Kyle Fujimoto

Harmonics - Middle Channel Z-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4880	55.61	V	74	-18.39	Peak	1.25	225	
4880	48.66	V	54	-5.34	Avg	1.25	225	
7320	49.43	V	74	-24.57	Peak	1.25	155	
7320	37.05	V	54	-16.95	Avg	1.25	155	
9760								No Emissions
9760								Detected
12200								No Emissions
12200								Detected
14640								No Emissions
14640								Detected
17080								No Emissions
17080								Detected
19520								No Emissions
19520								Detected
21960								No Emissions
21960								Detected
24400								No Emissions
24400								Detected

FCC 15.249

SMK-Link Electronics
Wireless Presentation Mouse
Model: AS04024

Date: 03/13/2014
Lab: B
Tested By: Kyle Fujimoto

**Harmonics - Middle Channel
Z-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4880	53.22	H	74	-20.78	Peak	1.25	155	
4880	46.05	H	54	-7.95	Avg	1.25	155	
7320	45.73	H	74	-28.27	Peak	1.25	225	
7320	36.66	H	54	-17.34	Avg	1.25	225	
9760								No Emissions
9760								Detected
12200								No Emissions
12200								Detected
14640								No Emissions
14640								Detected
17080								No Emissions
17080								Detected
19520								No Emissions
19520								Detected
21960								No Emissions
21960								Detected
24400								No Emissions
24400								Detected

FCC 15.249

SMK-Link Electronics
Wireless Presentation Mouse
Model: AS04024

Date: 03/13/2014
Lab: B
Tested By: Kyle Fujimoto

Harmonics - High Channel
X-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4960	56.03	V	74	-17.97	Peak	1.25	180	
4960	48.46	V	54	-5.54	Avg	1.25	180	
7440	48.07	V	74	-25.93	Peak	1.35	155	
7440	37.07	V	54	-16.93	Avg	1.35	155	
9920								No Emission
9920								Detected
12400								No Emission
12400								Detected
14880								No Emission
14880								Detected
17360								No Emission
17360								Detected
19840								No Emission
19840								Detected
22320								No Emission
22320								Detected
24800								No Emission
24800								Detected

FCC 15.249

SMK-Link Electronics
Wireless Presentation Mouse
Model: AS04024

Date: 03/13/2014
Lab: B
Tested By: Kyle Fujimoto

Harmonics - High Channel

X-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4960	58.33	H	74	-15.67	Peak	1	135	
4960	51.35	H	54	-2.65	Avg	1	135	
7440	51.14	H	74	-22.86	Peak	1.25	155	
7440	37.52	H	54	-16.48	Avg	1.25	155	
9920								No Emission
9920								Detected
12400								No Emission
12400								Detected
14880								No Emission
14880								Detected
17360								No Emission
17360								Detected
19840								No Emission
19840								Detected
22320								No Emission
22320								Detected
24800								No Emission
24800								Detected

FCC 15.249

SMK-Link Electronics
Wireless Presentation Mouse
Model: AS04024

Date: 03/13/2014
Lab: B
Tested By: Kyle Fujimoto

Harmonics - High Channel

Y-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4960	54.89	V	74	-19.11	Peak	1.25	135	
4960	47.48	V	54	-6.52	Avg	1.25	135	
7440	48.67	V	74	-25.33	Peak	1.25	135	
7440	38.47	V	54	-15.53	Avg	1.25	135	
9920								No Emission
9920								Detected
12400								No Emission
12400								Detected
14880								No Emission
14880								Detected
17360								No Emission
17360								Detected
19840								No Emission
19840								Detected
22320								No Emission
22320								Detected
24800								No Emission
24800								Detected

FCC 15.249

SMK-Link Electronics
Wireless Presentation Mouse
Model: AS04024

Date: 03/13/2014
Lab: B
Tested By: Kyle Fujimoto

Harmonics - High Channel

Y-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4960	58.06	H	74	-15.94	Peak	1.25	135	
4960	50.97	H	54	-3.03	Avg	1.25	135	
7440	50.12	H	74	-23.88	Peak	1.25	225	
7440	39.74	H	54	-14.26	Avg	1.25	225	
9920								No Emission
9920								Detected
12400								No Emission
12400								Detected
14880								No Emission
14880								Detected
17360								No Emission
17360								Detected
19840								No Emission
19840								Detected
22320								No Emission
22320								Detected
24800								No Emission
24800								Detected

FCC 15.249

SMK-Link Electronics
Wireless Presentation Mouse
Model: AS04024

Date: 03/13/2014
Lab: B
Tested By: Kyle Fujimoto

Harmonics - High Channel Z-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4960	55.19	V	74	-18.81	Peak	1.25	155	
4960	47.81	V	54	-6.19	Avg	1.25	155	
7440	50.36	V	74	-23.64	Peak	1.25	155	
7440	38.69	V	54	-15.31	Avg	1.25	155	
9920								No Emission
9920								Detected
12400								No Emission
12400								Detected
14880								No Emission
14880								Detected
17360								No Emission
17360								Detected
19840								No Emission
19840								Detected
22320								No Emission
22320								Detected
24800								No Emission
24800								Detected

FCC 15.249SMK-Link Electronics
Wireless Presentation Mouse
Model: AS04024Date: 03/13/2014
Lab: B
Tested By: Kyle Fujimoto**Harmonics - High Channel
Z-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4960	54.99	H	74	-19.01	Peak	1.25	135	
4960	48.06	H	54	-5.94	Avg	1.25	135	
7440	48.02	H	74	-25.98	Peak	1.25	90	
7440	37.58	H	54	-16.42	Avg	1.25	90	
9920								No Emission
9920								Detected
12400								No Emission
12400								Detected
14880								No Emission
14880								Detected
17360								No Emission
17360								Detected
19840								No Emission
19840								Detected
22320								No Emission
22320								Detected
24800								No Emission
24800								Detected

FCC 15.249 and FCC Class B

SMK-Link Electronics
Wireless Presentation Mouse
Model: AS04024

Date: 03/13/2014
Labs: B and D
Tested By: Kyle Fujimoto

Digital Portion and Non-Harmonic Emissions from the EUT Vertical and Horizontal Polarizations

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
								No Emissions from the Digital
								Portion of the EUT
								from 10 kHz to 1000 MHz
								No Emissions from the
								Non-Harmonic Emissions
								of the EUT
								from 10 kHz to 1000 MHz
								No Emissions from the Digital
								Portion of the EUT
								from 1 GHz to 25 GHz
								No Emissions from the
								Non-Harmonic Emissions
								of the EUT
								from 1 GHz to 25 GHz
								Tested in the X-Axis,
								Y-Axis, and Z-Axis

BAND EDGES

DATA SHEETS

FCC 15.249

SMK-Link Electronics
Wireless Presentation Mouse
Model: AS04024

Date: 03/13/2014

Lab: B

Tested By: Kyle Fujimoto

Band Edges - Low Channel

[illegible]

FCC 15.249

SMK-Link Electronics
Wireless Presentation Mouse
Model: AS04024

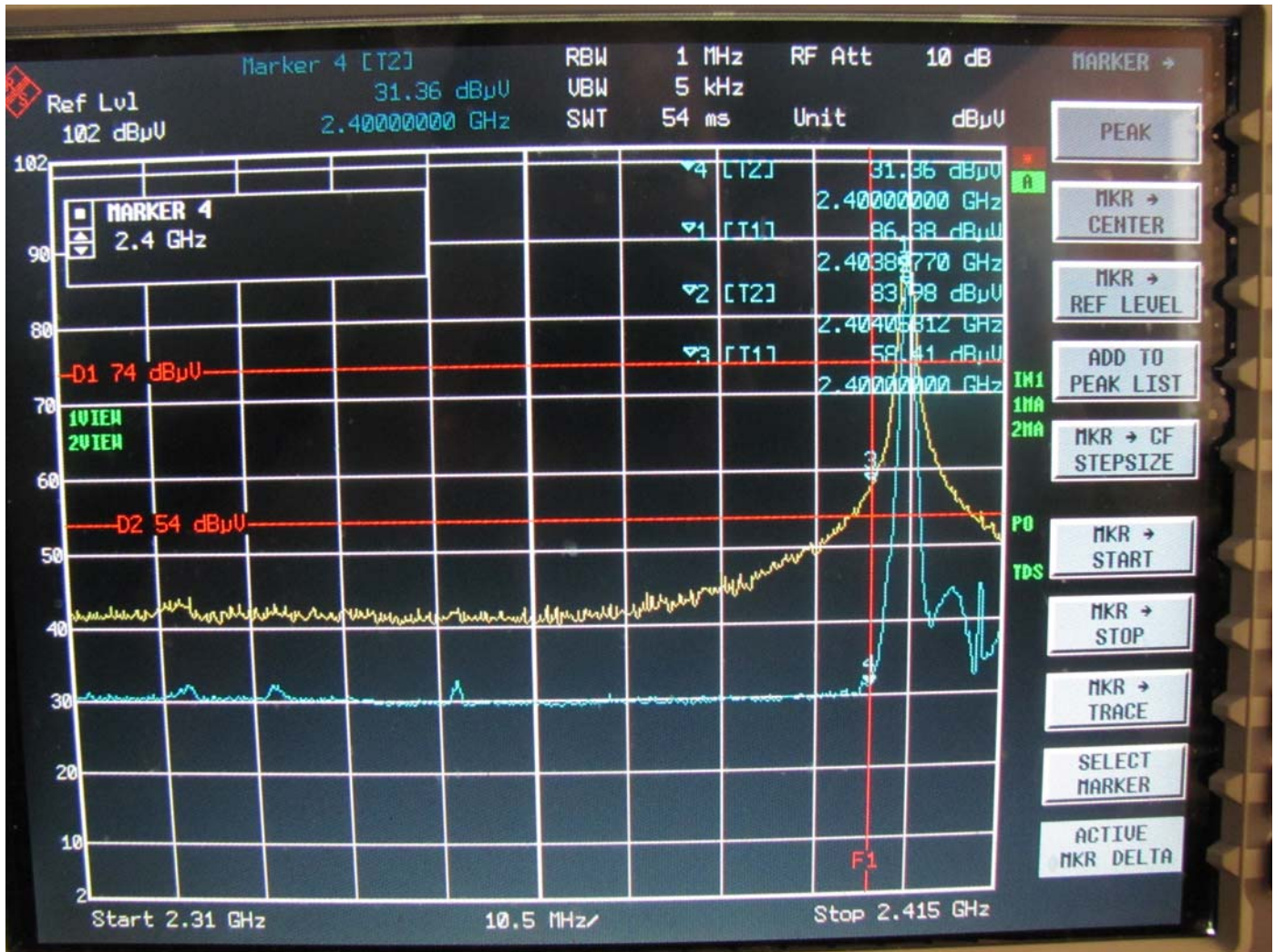
Date: 03/13/2014

Lab: B

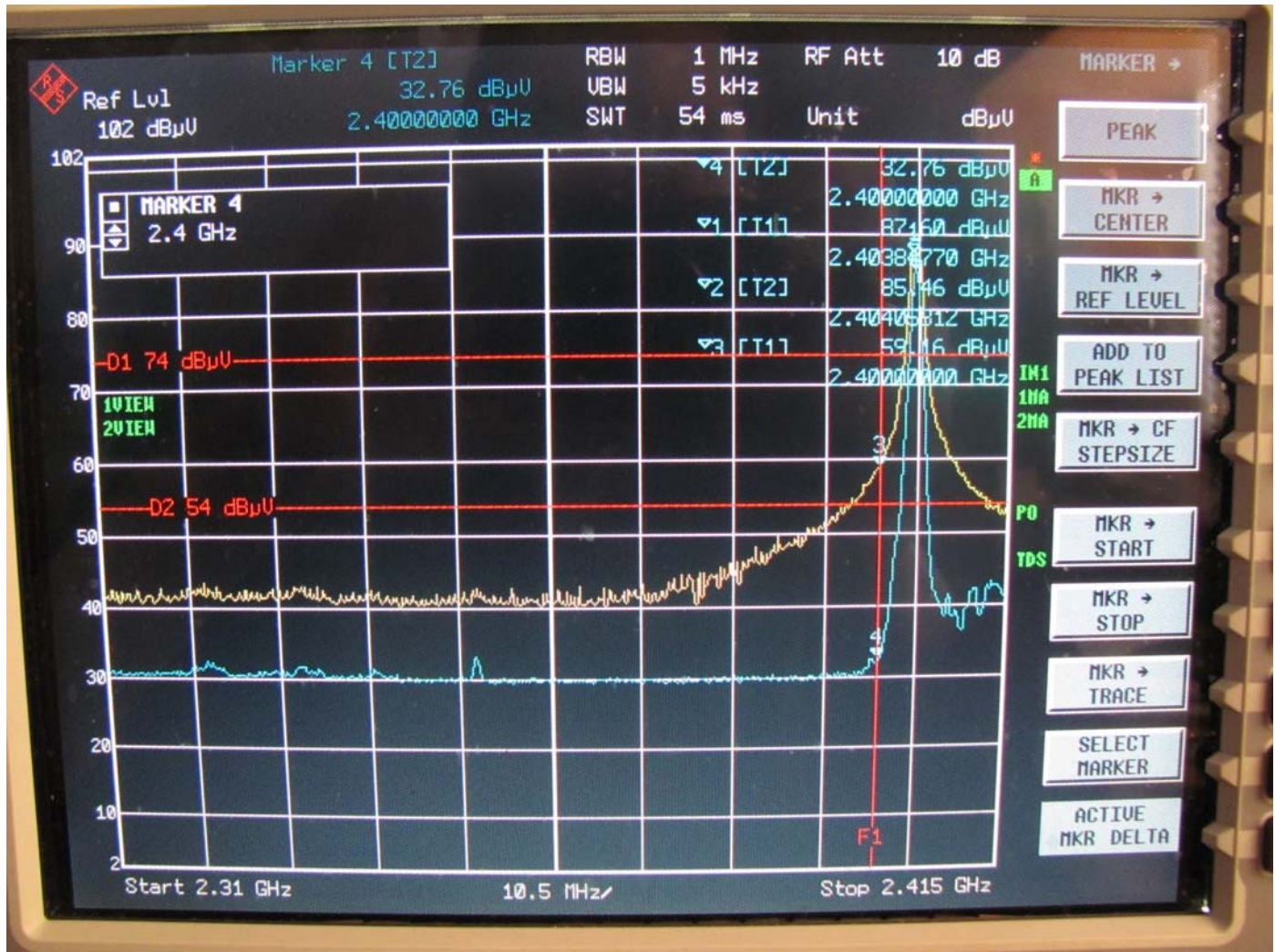
Tested By: Kyle Fujimoto

Band Edge - High Channel

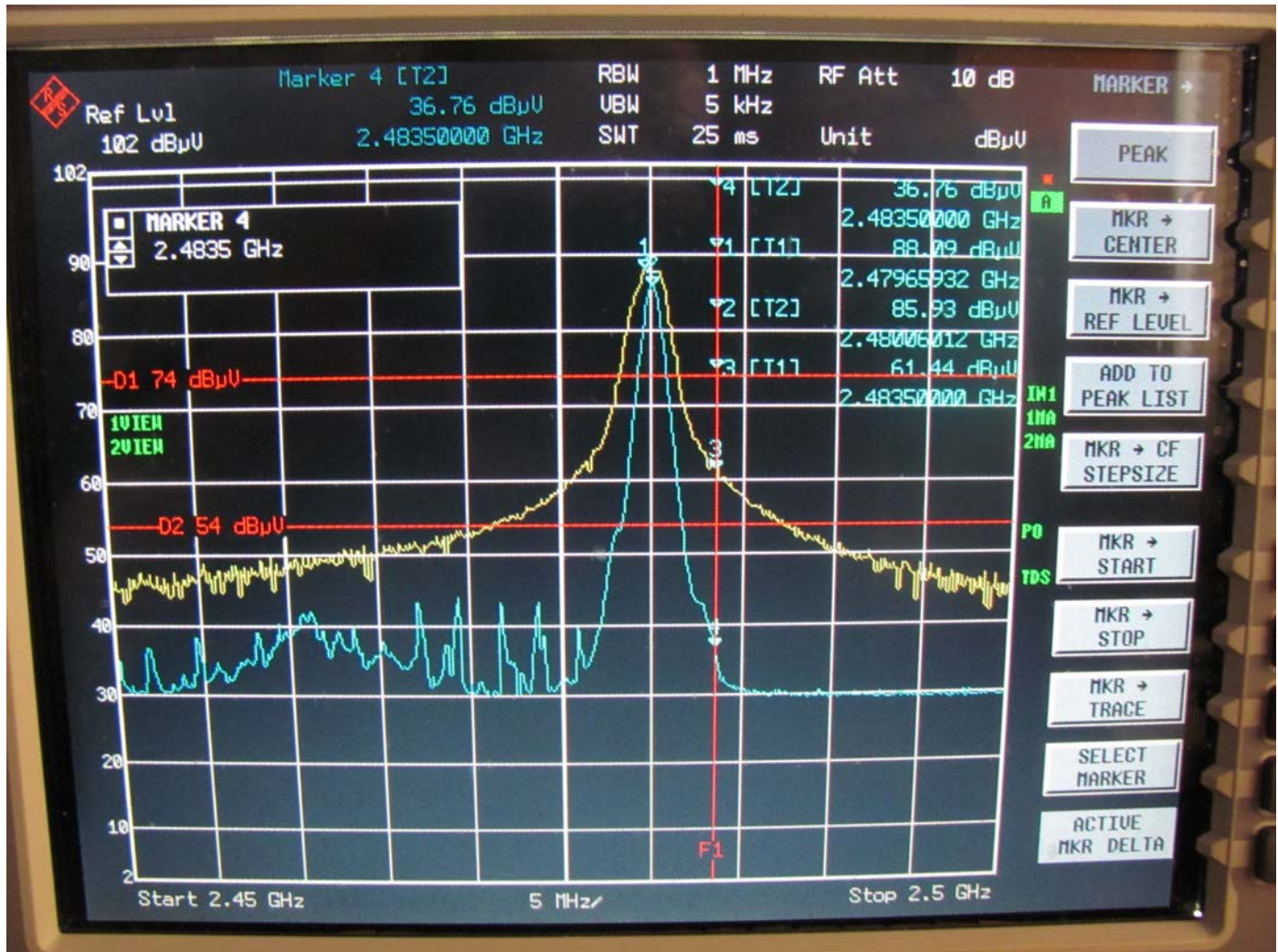
[illegible]



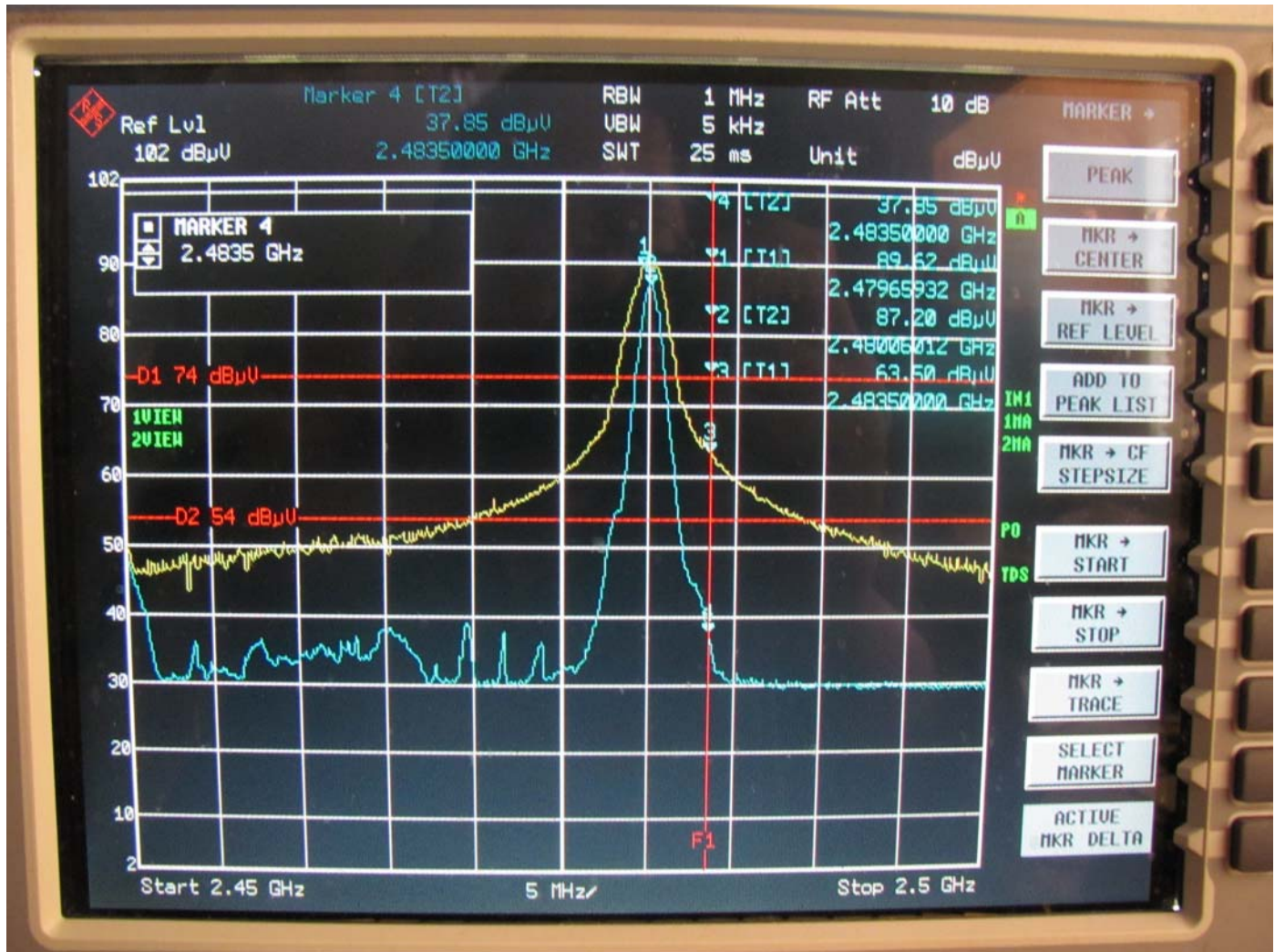
Band Edge – Vertical Polarization – Low Channel – Z-Axis (Worst Case)



Band Edge – Horizontal Polarization – Low Channel – X-Axis (Worst Case)



Band Edge – Vertical Polarization – High Channel – Z-Axis (Worst Case)



Band Edge – Horizontal Polarization – High Channel – X-Axis (Worst Case)