

*FCC PART 15, SUBPART B and C
TEST REPORT*

for

ULTRASOUND TRAINING SOLUTIONS DEVICE

MODEL: 504221

Prepared for

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1738 BERKELEY STREET
SANTA MONICA, CALIFORNIA 90404

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Approved by: *James Ross*

JAMES ROSS

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DATE: MAY 4, 2015

	REPORT BODY	APPENDICES					TOTAL
		A	B	C	D	E	
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GENERAL REPORT SUMMARY

This electromagnetic emission test 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 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: Ultrasound Training Solutions Device
 Model: 504221
 S/N: N/A

Product Description: See Expository Statement.

Modifications: The EUT was modified during the testing. Please see the list located in Appendix B of this test report.

Customer: SonoSim, Inc.
 1738 Berkeley Street
 Santa Monica California, 90401

Test Dates: February 16, 2015; and March 6, 2015

Test Specifications: Emissions requirements
 CFR Title 47, Part 15, Subpart B; and Subpart C, sections 15.205, 15.209, and 15.225

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	Spurious Radiated RF Emissions, 10 kHz – 1000 MHz (Transmitter and Digital portion)	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, section 15.205, 15.209 and 15.225
2	Conducted RF Emissions, 150 kHz to 30 MHz	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, section 15.207

1. PURPOSE

This document is a qualification test report based on the emissions tests performed on the Ultrasound Training Solutions Device, Model: 504221. 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; and Subpart C, sections 15.205, 15.207, 15.209, and 15.225.



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 92823.

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

SonoSim, Inc.

Nicole Durden Director of Operations

Compatible Electronics Inc.

Kyle Fujimoto Test Engineer
James Ross Test Engineer

2.4 Date Test Sample was Received

The test sample was received prior to the initial test date.

2.5 Disposition of the Test Sample

The test sample has not been returned to SonoSim, Inc. as of the date of this test report.

2.6 Abbreviations and Acronyms

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

RF	Radio Frequency
EMI	Electromagnetic Interference
EUT	Equipment Under Test
P/N	Part Number
S/N	Serial Number
HP	Hewlett Packard
ITE	Information Technology Equipment
CML	Corrected Meter Limit
LISN	Line Impedance Stabilization Network
N/A	Not Applicable
BLE	Bluetooth Low Energy
USB	Universal Serial Bus

3. APPLICABLE DOCUMENTS

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

SPEC	TITLE
FCC Title 47, Part 15 Subpart C	FCC Rules - Radio frequency devices (including digital devices) – Intentional Radiators
FCC Title 47, Part 15 Subpart B	FCC Rules - Radio frequency devices (including digital devices) – Unintentional Radiators
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

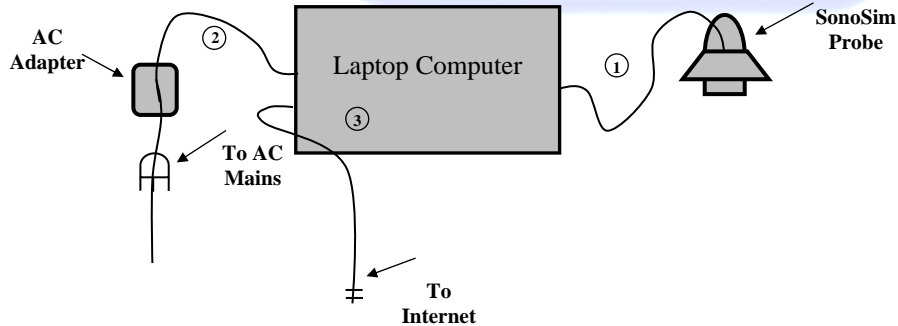
4. DESCRIPTION OF TEST CONFIGURATION

4.1 Description of Test Configuration - Emissions

The Ultrasound Training Solutions Device (EUT) was a system consisting of a SonoSim Sensor and a laptop computer with external AC adapter. The SonoSim Sensor connected to the USB port of the laptop computer, while the external AC adapter connected to the power input port of the laptop computer. During the tests, the laptop computer, which required an internet connection, ran a SonoSim simulation program that activated, monitored, and visually displayed the activity of the SonoSim sensor.

The SonoSim sensor transmitted at 13.559 MHz on a continuous basis and was tested in the X, Y and Z-axis.

The final radiated data for the EUT as was taken in the mode described above. Please see Appendix E for the data sheets.



4.1.1 Cable Construction and Termination

Cable 1

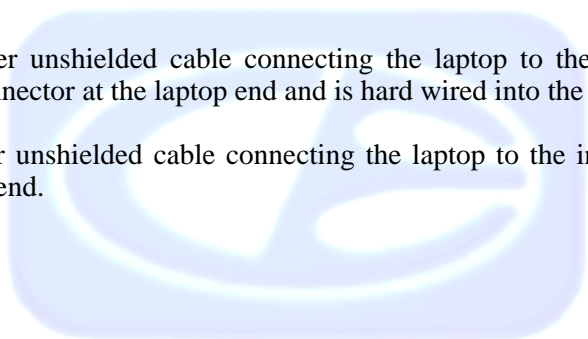
This is a 1-meter braid shielded cable connecting the SonoSim Sensor to the laptop. The cable has a USB type 'A' connector at the laptop end and is hard wired into the SonoSim Sensor. The cable was grounded to the chassis via the connector. The cable has a ferrite at the USB end of the cable.

Cable 2

This is a 1.5-meter unshielded cable connecting the laptop to the AC Adapter. The cable has a metallic barrel connector at the laptop end and is hard wired into the AC Adapter.

Cable 3

This is a 30-meter unshielded cable connecting the laptop to the internet. The cable has an RJ-45 connector at each end.



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

EQUIPMENT	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	FCC ID
ULTRASOUND TRAINING SOLUTIONS DEVICE (EUT)	SONOSIM, INC.	504221	N/A	2AEMESSLS
LAPTOP COMPUTER (EUT)	HEWLETT PACKARD	PROBOOK	N/A	DoC
AC ADAPTER (LAPTOP) (EUT)	HEWLETT PACKARD	PPP009L-E	CNXA0C3U6SCY4	N/A

5.2 Emissions Test Equipment

EQUIPMENT TYPE	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	CALIBRATION DATE	CAL. CYCLE
GENERAL TEST EQUIPMENT USED IN LAB A					
Computer	Compaq	CQ5210F	CNX9360CF9	N/A	N/A
Monitor	Hewlett Packard	HPs2031a	3CQ046N3MD	N/A	N/A
Spectrum Analyzer – Main Section	Hewlett Packard	8566B	3638A08784	May 20, 2014	1 Year
Spectrum Analyzer – Display Section	Hewlett Packard	85662A	2648A14530	May 20, 2014	1 Year
Quasi-Peak Adapter	Hewlett Packard	85650A	2811A01363	May 20, 2014	1 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, 20 Hz – 26.5 GHz	Agilent Technologies	N9038A	MY51100115	March 6, 2014	2 Year
RF RADIATED EMISSIONS TEST EQUIPMENT					
TDK TestLab	TDK RF Solutions, Inc.	9.22	700145	N/A	N/A
CombiLog Antenna	Com-Power	AC-220	61060	May 20, 2014	1 Year
Loop Antenna	Com-Power	AL-130	17089	February 6, 2015	2 Year
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

Emissions test equipment (continued)

EQUIPMENT TYPE	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	CALIBRATION DATE	CAL. CYCLE
GENERAL TEST EQUIPMENT USED IN LAB A					
Shield Room Test	Compatible Electronics	11CD	N/A	N/A	N/A
LISN	Com-Power	LI-215	12082	June 12, 2014	1 Year
LISN	Com-Power	LI-215	12090	June 12, 2014	1 Year
Transient Limiter	Com-Power	252A910	1	October 10, 2014	1 Year
Monitor	Hewlett Packard	D5258A	TW74500641	N/A	N/A
Computer	Hewlett Packard	4530	US91912319	N/A	N/A
Spectrum Analyzer – Main Section	Hewlett Packard	8566B	3638A08784	May 20, 2014	1 Year
Spectrum Analyzer – Display Section	Hewlett Packard	85662A	2648A14530	May 20, 2014	1 Year
Quasi-Peak Adapter	Hewlett Packard	85650A	2811A01363	May 20, 2014	1 Year
FREQUENCY TOLERANCE OF CARRIER SIGNAL TEST EQUIPMENT					
Temperature Chamber	Despatch Industries, Inc.	16212A	149857	February 7, 2014	2 Year
Digital Multimeter	Fluke	87	58450372	May 22, 2014	1 Year
AC Power Supply	ELGAR Corp.	1751SX	642810	N/A	N/A
Variable Autotransformer	Superior Electric Company	Type: 11560	Spec. BP142056	N/A	N/A
EMI Receiver	Rohde & Schwarz	ESIB40	100194	December 4, 2014	1 Year

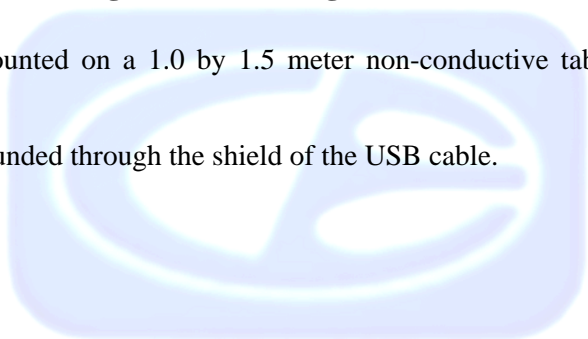
6. TEST SITE DESCRIPTION**6.1 Test Facility Description**

Please refer to section 2.1 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 grounded through the shield of the USB cable.



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 spectrum analyzer was used as a measuring meter. The data was collected with the spectrum analyzer 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 spectrum analyzer input stage, and the offset was adjusted accordingly to read the actual data measured. The LISN output was measured using the spectrum analyzer. 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 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:

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, section 15.207.

7.1.2 Radiated Emissions (Spurious and Harmonics) Test – Lab A**7.1.3 Radiated Emissions Test (Spurious and Harmonics)**

The spectrum analyzer was used as a measuring meter. The measurement meter was used in the peak detect mode with the "Max Hold" feature activated. In this mode, the measurement meter records the highest measured reading over all the sweeps. The following antenna and measurement bandwidths were used as specified in the following table.

The resolution bandwidths and transducers used for this test were:

FREQUENCY RANGE	EFFECTIVE MEASUREMENT BANDWIDTH	TRANSDUCER
9 kHz to 150 kHz	200 Hz	Loop Antenna
150 kHz to 30 MHz	9 kHz	Loop Antenna

An open field, non-ground plane test site of Compatible Electronics, Inc. was used for radiated emission testing. This test site is set up according to ANSI C63.4. Please see section 6.2 of this report for mounting, bonding, and grounding of the EUT. The portable turntable supporting the EUT is remote controlled using a motor. The portable turntable permits EUT rotation of 360 degrees in order to maximize emissions. Data was collected in the worst case (highest emission) configuration of the EUT. At the transmit frequency band, the antenna height was 1 meter; the EUT was rotated 360 degrees; and the antenna was rotated 360 degrees on its vertical axis (for H field radiated field strength).

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. The EUT was tested at a 10-meter test distance to obtain final test data. The EUT was also tested with the modulation on, since it was not possible to turn it off. The final qualification data is located in Appendix E.

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 15.225 for radiated emissions. Please see Appendix E for the data sheets.

7.1.4 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 with 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 EMI test chamber of Compatible Electronics, Inc. was used for radiated emissions testing. This test site is set up according to ANSI C63.4. 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
30 MHz to 1 GHz	120 kHz	CombiLog Antenna

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 15.225 for radiated emissions. Please see Appendix E for the data sheets.

7.1.5 RF Emissions Test Results

Table 1.0 RADIATED EMISSION RESULTS
 Ultrasound Training Solutions Device, Model: 504221

Frequency MHz	Corrected Reading* dBuV	Specification Limit dBuV	Delta (Cor. Reading – Spec. Limit) dB
162.70 (H)	40.59 (QP)	43.50	-2.91
72.00 (H)	37.07 (QP)	40.00	-2.93
162.70 (V)	37.81 (QP)	43.50	-5.69
149.20 (V)	36.42 (QP)	43.50	-7.08
536.80 (V)	37.14 (QP)	46.00	-8.86
176.30 (H)	31.44 (QP)	43.50	-12.06

Table 2.0 CONDUCTED EMISSION RESULTS
 Ultrasound Training Solutions Device, Model: 504221

Frequency MHz	Corrected Reading* dBuV	Specification Limit dBuV	Delta (Cor. Reading – Spec. Limit) dB
0.831 (WL)	42.94	46.00	-3.06
3.547 (WL)	42.24	46.00	-3.76
3.492 (WL)	41.64	46.00	-4.36
0.267 (WL)	46.68	51.20	-4.52
3.260 (WL)	41.44	46.00	-4.56
0.272 (WL)	46.36	51.07	-4.70

Notes:

- (H) Horizontal
- (V) Vertical
- (BL) Black Lead
- (WL) White Lead
- (QP) Quasi Peak

* The complete emissions data is given in Appendix E of this report.

7.2 Frequency Tolerance of Carrier Signal

The EUT was placed in a temperature chamber and set to +50 degrees Celsius. The EUT was exposed to this temperature for a period of 10 minutes. The temperature was subsequently decreased at 10 degree increments down to -20 degrees Celsius with a 30 minute acclimation period between each temperature. At each temperature, the EUT's fundamental emission was measured with an EMI Receiver to determine whether the carrier signal was within 0.01% of the fundamental frequency at startup, 2 minutes, 5 minutes, and 10 minutes after removal from the temperature chamber.

Also, at +20 degrees Celsius, the EUT's input voltage was varied between 85% and 115% using a variable auto transformer and the fundamental of the EUT was measured with an EMI Receiver to determine whether the carrier signal was within 0.01% of the fundamental frequency.

A data sheet of the Frequency Tolerance testing is located in Appendix E.

Test Results:

The EUT complies with the requirements of FCC Title 47, Part 15, Subpart, B, section 15.225 [e]. Please see Appendix E for the data sheets.

8. CONCLUSIONS

The Ultrasound Training Solutions Device, Model: 504221, as tested, meets all of the specification limits defined in FCC Title 47, Part 15, Subpart B and Subpart C, sections 15.205, 15.209, and 15.225.



APPENDIX A

LABORATORY ACCREDITATIONS AND RECOGNITIONS

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

LABORATORY ACCREDITATIONS AND RECOGNITIONS



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 fulfilment 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) <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>

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 B

MODIFICATIONS TO THE EUT

MODIFICATIONS TO THE EUT

The modifications listed below were made to the EUT to pass FCC Subpart B and FCC 15.225 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.

Modification:

- A clamp-on ferrite (Fair-Rite, P/N: 0446164281) was placed over the SonoSim Sensor cable at the laptop end.



APPENDIX C



ADDITIONAL MODELS

ADDITIONAL MODELS COVERED UNDER THIS REPORT

USED FOR THE PRIMARY TEST

Ultrasound Training Solutions Device
Model: 504221
S/N: N/A

ADDITIONAL MODELS COVERED UNDER THIS REPORT:

- 510871 – Version for International Distributors (stock SKU)
- 510944 – Version for International Distributors (end user SKU)
- 512661 – Version for Laerdal (larger partner)
- GSA1020 – Version for US Government sales

These different numbers are the same product with the same equipment and components. New numbers are assigned for different segments of customers to track our internal sales revenues.

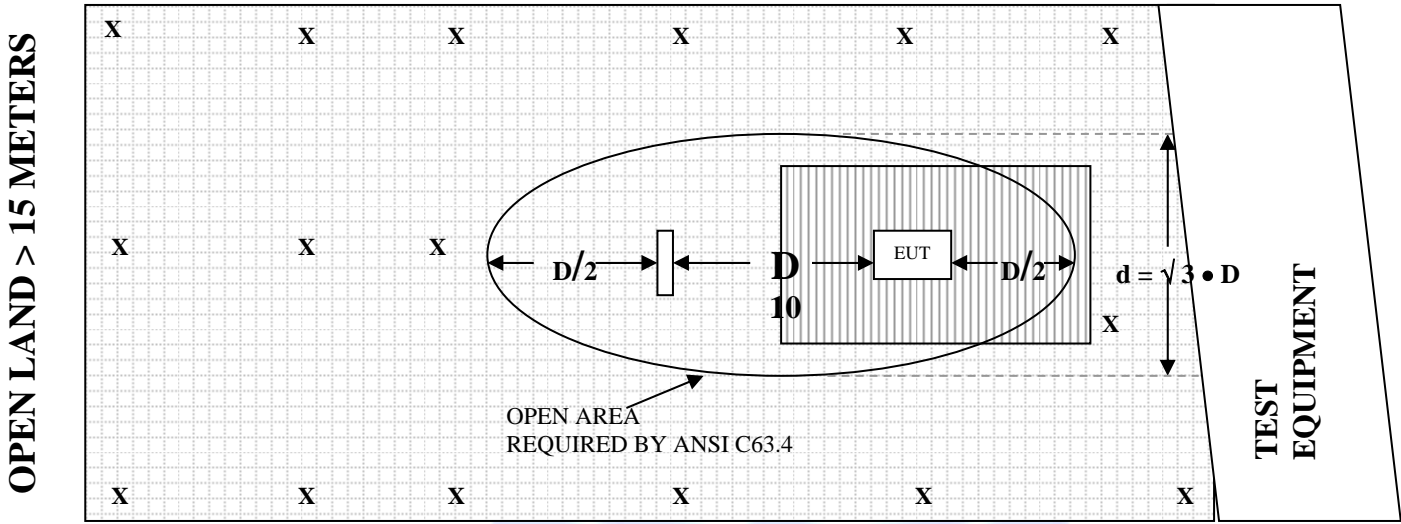


APPENDIX D

DIAGRAMS AND CHARTS

FIGURE 1: PLOT MAP AND LAYOUT OF RADIATED SITE

OPEN LAND > 15 METERS



OPEN LAND > 15 METERS

- | | | | |
|----------|--------------------------|--|-----------------|
| X | = GROUND RODS | | = GROUND SCREEN |
| D | = TEST DISTANCE (meters) | | = WOOD COVER |

FIGURE 2: LAYOUT OF THE SEMI-ANECHOIC TEST CHAMBER

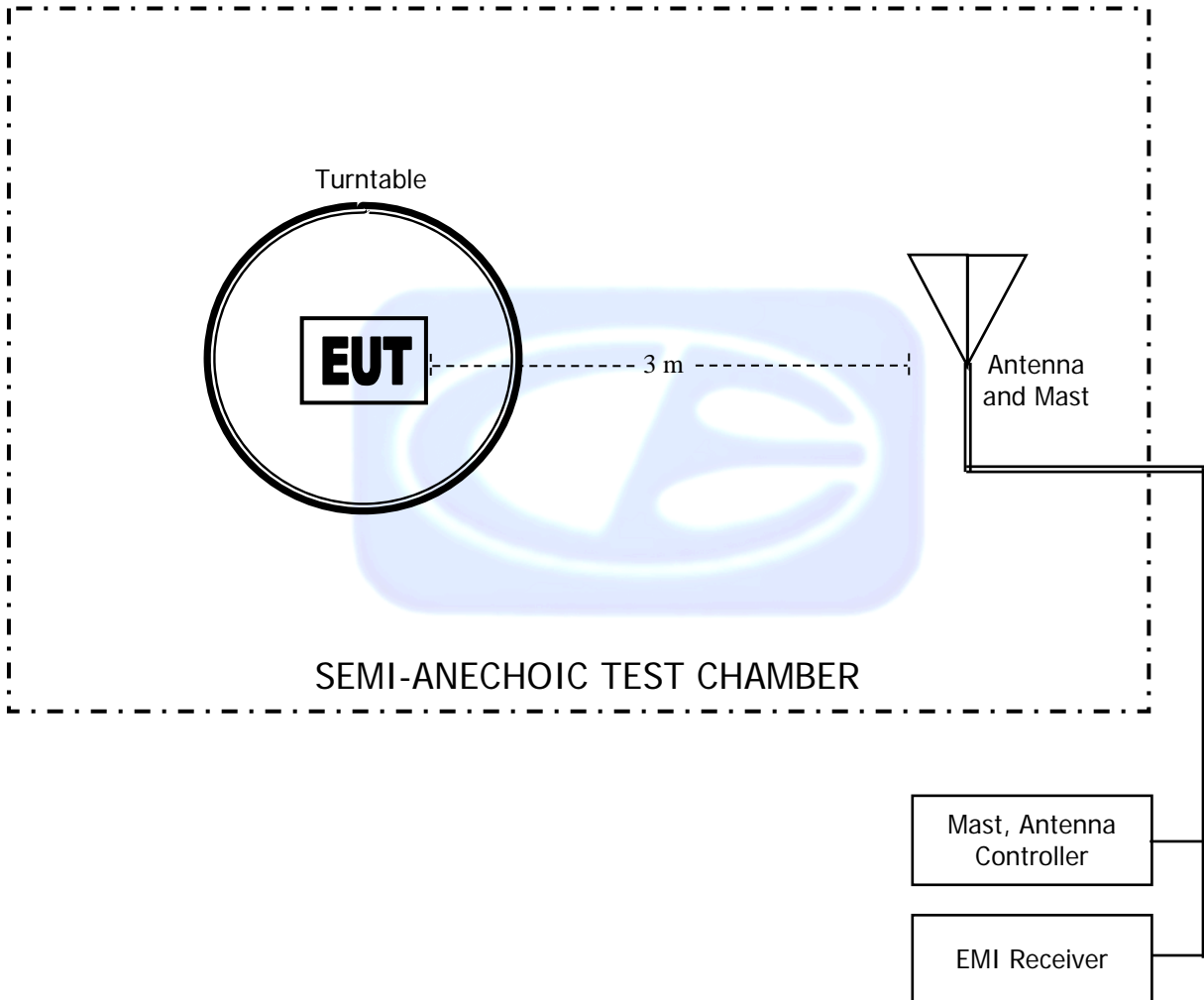
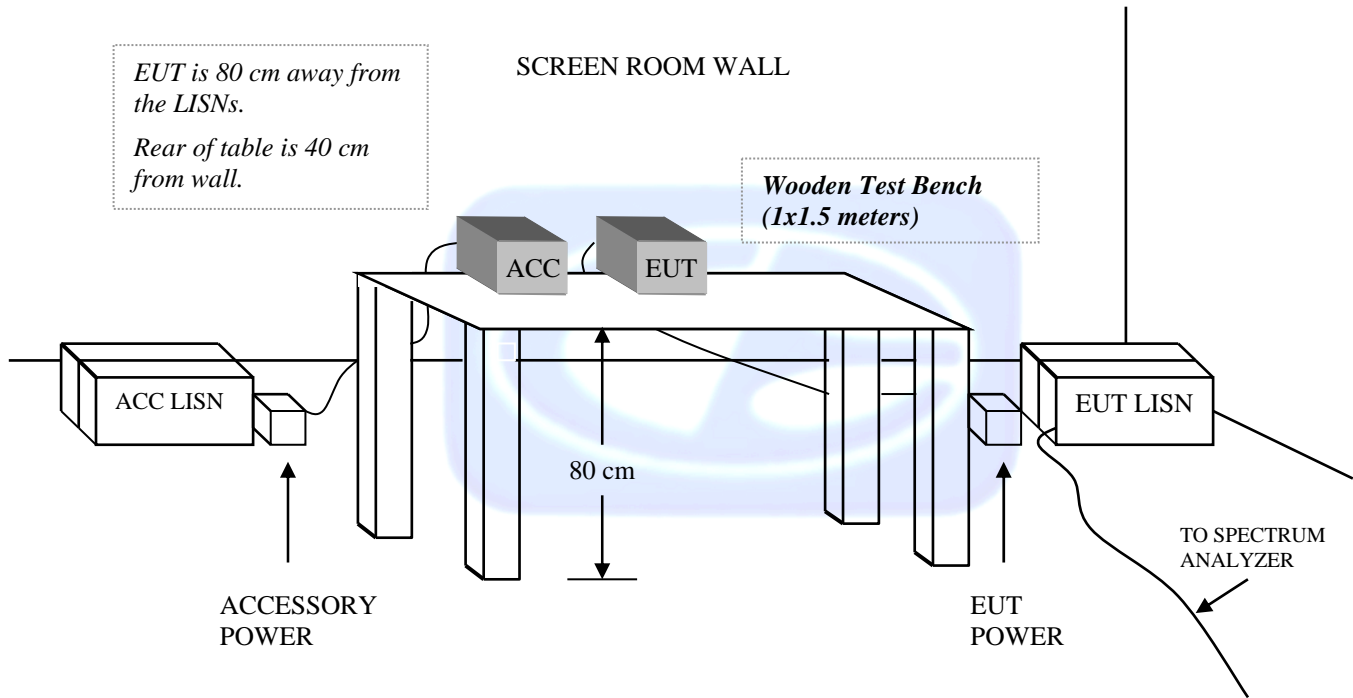


FIGURE 3: CONDUCTED EMISSIONS TEST SETUP



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

S/N: 17089

CALIBRATION DATE: FEBRUARY 6, 2015

FREQUENCY (MHz)	MAGNETIC (dB/m)	ELECTRIC (dB/m)
0.009	-33.18	18.32
0.01	-34.10	17.40
0.02	-38.65	12.85
0.03	-39.28	12.22
0.04	-40.09	11.41
0.05	-40.85	10.65
0.06	-40.88	10.62
0.07	-41.07	10.43
0.08	-41.04	10.46
0.09	-41.19	10.31
0.1	-41.20	10.30
0.2	-41.52	9.98
0.3	-41.53	9.97
0.4	-41.42	10.08
0.5	-41.53	9.97
0.6	-41.53	9.97
0.7	-41.43	10.07
0.8	-41.23	10.27
0.9	-41.13	10.37
1	-41.14	10.36
2	-40.80	10.70
3	-40.66	10.84
4	-40.61	10.89
5	-40.33	11.17
6	-40.53	10.97
7	-40.47	11.03
8	-40.48	11.02
9	-39.93	11.57
10	-39.81	11.69
15	-43.35	8.15
20	-39.16	12.34
25	-40.24	11.26
30	-43.18	8.32

COM-POWER AC-220

COMBILOG ANTENNA

S/N: 61060

CALIBRATION DATE: MAY 20, 2014

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30	23.40	200	14.40
35	23.70	250	16.40
40	24.20	300	17.90
45	22.60	350	15.60
50	22.10	400	19.90
60	17.90	450	20.40
70	12.70	500	21.60
80	11.60	550	21.50
90	12.20	600	22.30
100	13.20	650	23.50
120	15.70	700	23.70
125	15.80	750	25.90
140	13.60	800	25.90
150	16.90	850	26.40
160	14.20	900	27.00
175	14.90	950	27.70
180	15.00	1000	27.50



FRONT VIEW

SONOSIM, INC.
ULTRASOUND TRAINING SOLUTIONS DEVICE
MODEL: 504221
FCC SUBPART B AND C – RADIATED EMISSIONS – BELOW 30 MHz

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



REAR VIEW

SONOSIM, INC.
ULTRASOUND TRAINING SOLUTIONS DEVICE
MODEL: 504221
FCC SUBPART B AND C – RADIATED EMISSIONS – BELOW 30 MHz

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

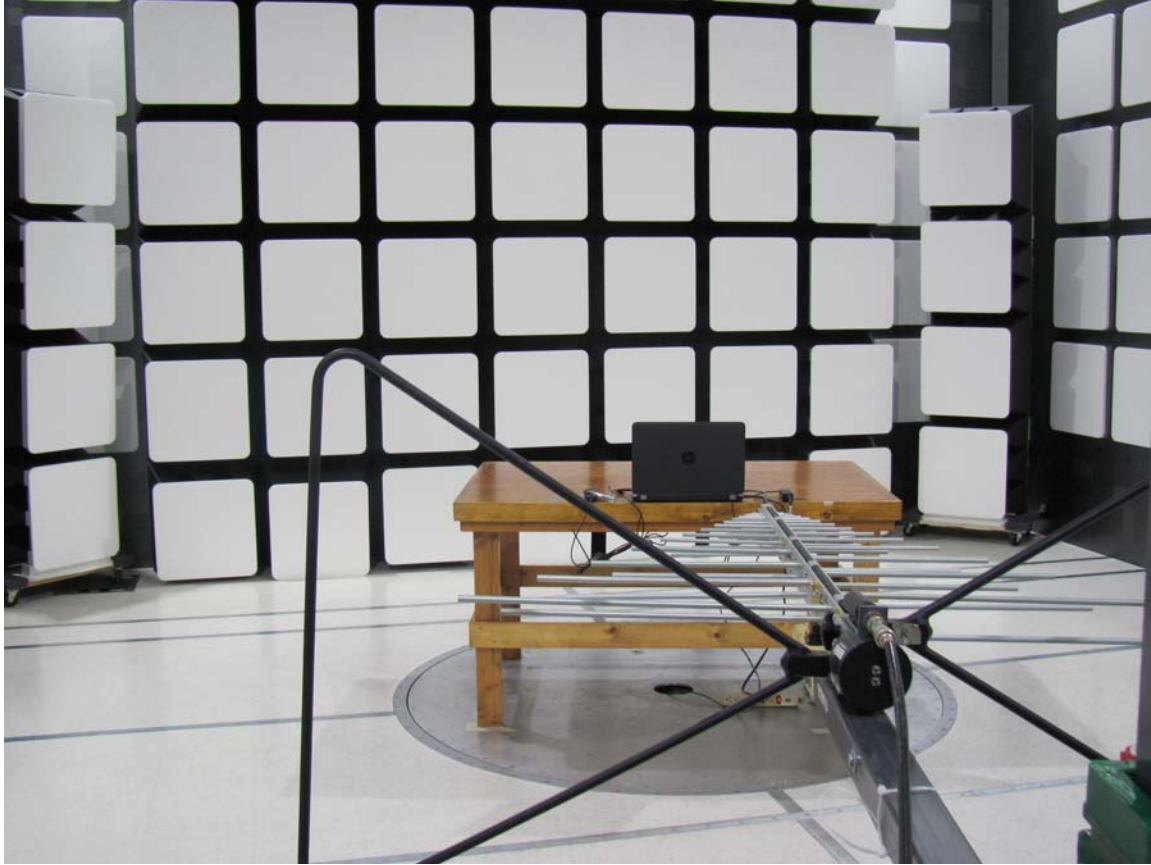


FRONT VIEW

SONOSIM, INC.
ULTRASOUND TRAINING SOLUTIONS DEVICE
MODEL: 504221

FCC SUBPART B AND C – RADIATED EMISSIONS – ABOVE 30 MHz

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



REAR VIEW

SONOSIM, INC.
ULTRASOUND TRAINING SOLUTIONS DEVICE
MODEL: 504221
FCC SUBPART B AND C – RADIATED EMISSIONS – ABOVE 30 MHz

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



FRONT VIEW

SONOSIM, INC.
ULTRASOUND TRAINING SOLUTIONS DEVICE
MODEL: 504221
FCC SUBPART B – CONDUCTED EMISSIONS

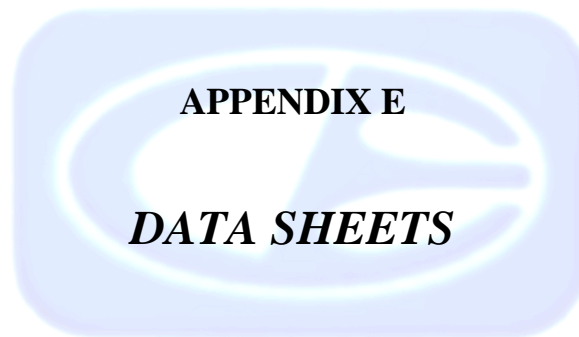
**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**



REAR VIEW

SONOSIM, INC.
ULTRASOUND TRAINING SOLUTIONS DEVICE
MODEL: 504221
FCC SUBPART B AND C – CONDUCTED EMISSIONS

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



RADIATED EMISSIONS

DATA SHEETS

FCC 15.225

 SonoSim, Inc.
 Ultrasound Training Solution Device
 Model: 504221

 Date: 02/16/2015
 Lab: A
 Tested By: Kyle Fujimoto

X-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
13.559	37.50	H	103.07	-65.57	Peak	1	90	
27.118								No Emission Detected

FCC 15.225

 SonoSim, Inc.
 Ultrasound Training Solution Device
 Model: 504221

 Date: 02/16/2015
 Lab: A
 Tested By: Kyle Fujimoto

Y-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
13.559	35.90	H	103.07	-67.17	Peak	1	180	
27.118								No Emission Detected

FCC 15.225

 SonoSim, Inc.
 Ultrasound Training Solution Device
 Model: 504221

 Date: 02/16/2015
 Lab: A
 Tested By: Kyle Fujimoto

Z-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
13.559	35.80	V	103.07	-67.27	Peak	1	90	
27.118								No Emission Detected

FCC 15.225

 SonoSim, Inc.
 Ultrasound Training Solution Device
 Model: 504221

 Date: 02/16/2015
 Lab: A
 Tested By: Kyle Fujimoto

Z-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
13.559	34.30	H	103.07	-68.77	Peak	1	90	
27.118								No Emission Detected

FCC 15.225

 SonoSim, Inc.
 Ultrasound Training Solution Device
 Model: 504221

 Date: 02/16/2015
 Lab: A
 Tested By: Kyle Fujimoto

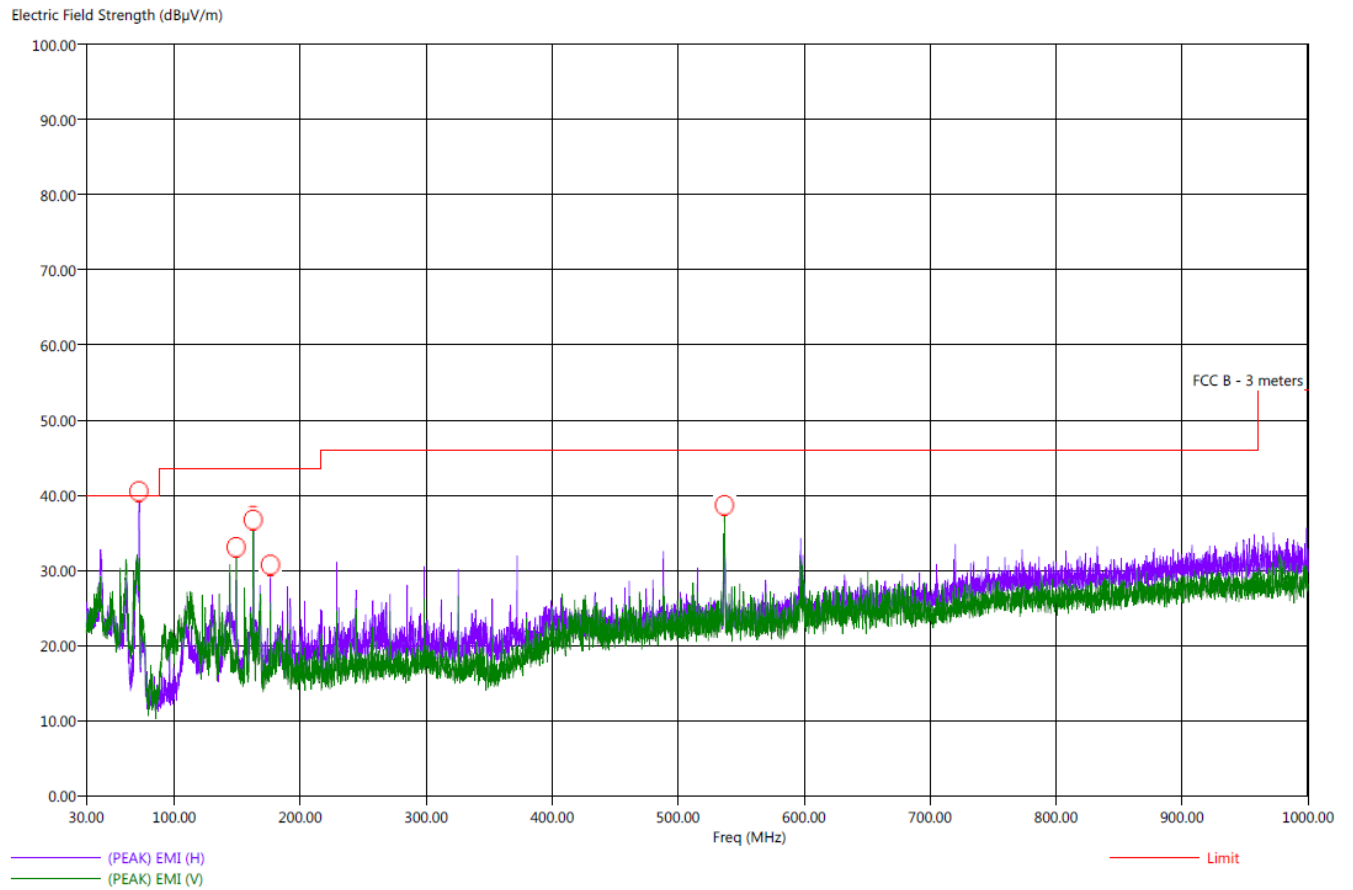
Band Edges

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
								No Frequencies detected from 13.110 to 13.553 MHz
								No Frequencies detected from 13.567 to 14.010 MHz

Title: Pre-Scan - FCC Class B
 File: X-Axis - Radiated Pre-Scan - 30 to 1000 MHz - FCC Class B - Wireless Version - 2-17-2015.set
 Operator: Kyle Fujimoto
 EUT Type: Ultrasound Training Solutions Device
 EUT Condition: The EUT was operating via a sensor simulation program being run from a laptop computer
 Comments: Customer: SonoSim, Inc.
 Model: 504221
 The EUT is continuously transmitting at 13.56 MHz - X-Axis - Worst Case

2/17/2015 8:12:21 AM
 Sequence: Preliminary Scan

Pre-Scan - FCC Class B



Title: Radiated Final - 30-1000 MHz - FCC Class B
 File: X-Axis - Radiated Final Scan - 30 to 1000 MHz - FCC Class B - Wireless Version - 2-17-2015.set
 Operator: Kyle Fujimoto
 EUT Type: Ultrasound Training Solutions Device
 EUT Condition: The EUT was operating via a sensor simulation program being run from a laptop computer
 Comments: Customer: SonoSim, Inc.
 Model: 504221
 The EUT is continuously transmitting at 13.56 MHz - X-Axis - Worst Case

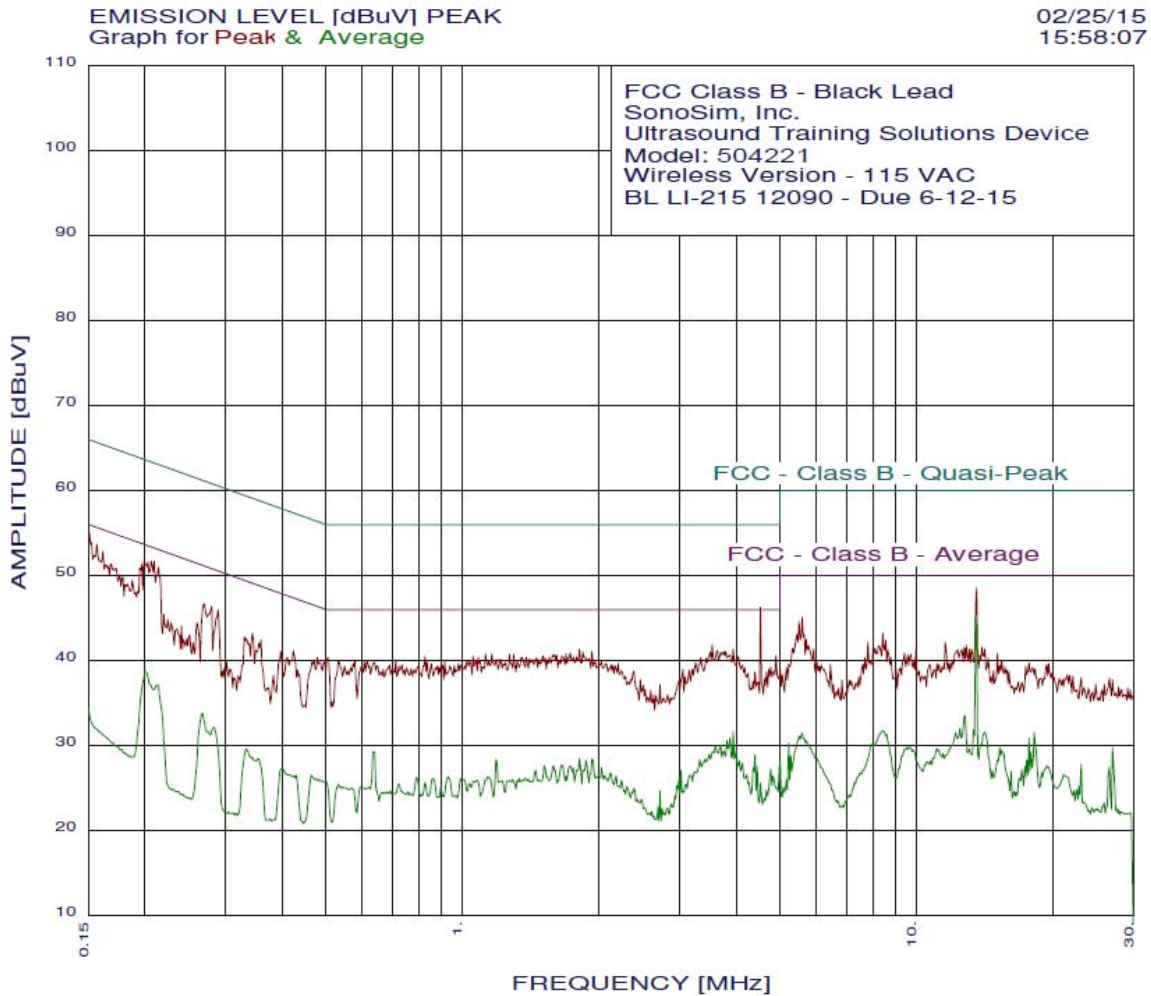
2/17/2015 8:56:18 AM
 Sequence: Final Measurements

FCC Class B - Final Scan

Freq (MHz)	Pol	(PEAK) EMI (dB μ V/m)	(QP) EMI (dB μ V/m)	(PEAK) Margin (dB)	(QP) Margin (dB)	Limit (dB μ V/m)	Transducer (dB)	Cable (dB)	Ttbl Aql (dea)	Twr Ht (cm)
72.00	H	43.44	37.07	3.44	-2.93	40.00	12.46	0.60	213.50	305.94
149.20	V	37.40	36.42	-6.10	-7.08	43.50	16.63	0.90	56.00	110.95
162.70	H	42.43	40.59	-1.07	-2.91	43.50	14.33	0.93	128.50	111.25
162.70	V	40.40	37.81	-3.10	-5.69	43.50	14.33	0.93	168.50	126.53
176.30	H	32.63	31.44	-10.87	-12.06	43.50	14.93	0.96	142.75	175.43
536.80	V	41.06	37.14	-4.94	-8.86	46.00	21.53	1.84	173.25	111.25



***CONDUCTED EMISSIONS
DATA SHEETS***



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02/25/15 15:58:07

FCC Class B - Black Lead
SonoSim, Inc.
Ultrasound Training Solutions Device
Model: 504221
Wireless Version - 115 VAC
BL LI-215 12090 - Due 6-12-15
Test Engineer : Kyle Fujimoto

39 highest peaks above -50.00 dB of FCC - Class B - Average limit line
Peak criteria : 1.00 dB, Curve : Peak

Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	4.528	46.25	46.00	0.25**
2	13.559	48.53	50.00	-1.47**
3	0.210	51.66	53.23	-1.56**
4	0.206	51.68	53.35	-1.68**
5	0.157	53.69	55.64	-1.96**
6	0.199	51.61	53.67	-2.06**
7	0.214	50.94	53.05	-2.10**
8	0.197	51.31	53.75	-2.44**
9	0.162	52.87	55.38	-2.52**
10	0.168	51.34	55.07	-3.73**
11	3.547	41.84	46.00	-4.16**
12	0.280	46.38	50.81	-4.43**
13	0.269	46.63	51.15	-4.53**
14	0.290	45.94	50.54	-4.59**
15	3.945	41.35	46.00	-4.65**
16	1.810	41.32	46.00	-4.68**
17	0.187	49.45	54.15	-4.69**
18	0.179	49.79	54.54	-4.75**
19	3.644	41.14	46.00	-4.86**
20	5.597	45.06	50.00	-4.94**
21	3.800	41.04	46.00	-4.96**
22	1.929	41.03	46.00	-4.97**
23	1.840	41.02	46.00	-4.98**
24	1.726	40.91	46.00	-5.09**
25	1.690	40.81	46.00	-5.19**
26	1.160	40.76	46.00	-5.24**
27	1.124	40.75	46.00	-5.25**
28	1.594	40.70	46.00	-5.30**
29	1.297	40.67	46.00	-5.33**
30	1.269	40.67	46.00	-5.33**
31	5.508	44.56	50.00	-5.44**
32	4.902	40.55	46.00	-5.45**
33	1.504	40.49	46.00	-5.51**
34	4.050	40.45	46.00	-5.55**
35	1.055	40.44	46.00	-5.56**
36	0.826	40.44	46.00	-5.56**
37	1.382	40.38	46.00	-5.62**
38	1.352	40.38	46.00	-5.62**
39	1.083	40.35	46.00	-5.65**

**Please See the Average Readings on the Next Page and on the Plot

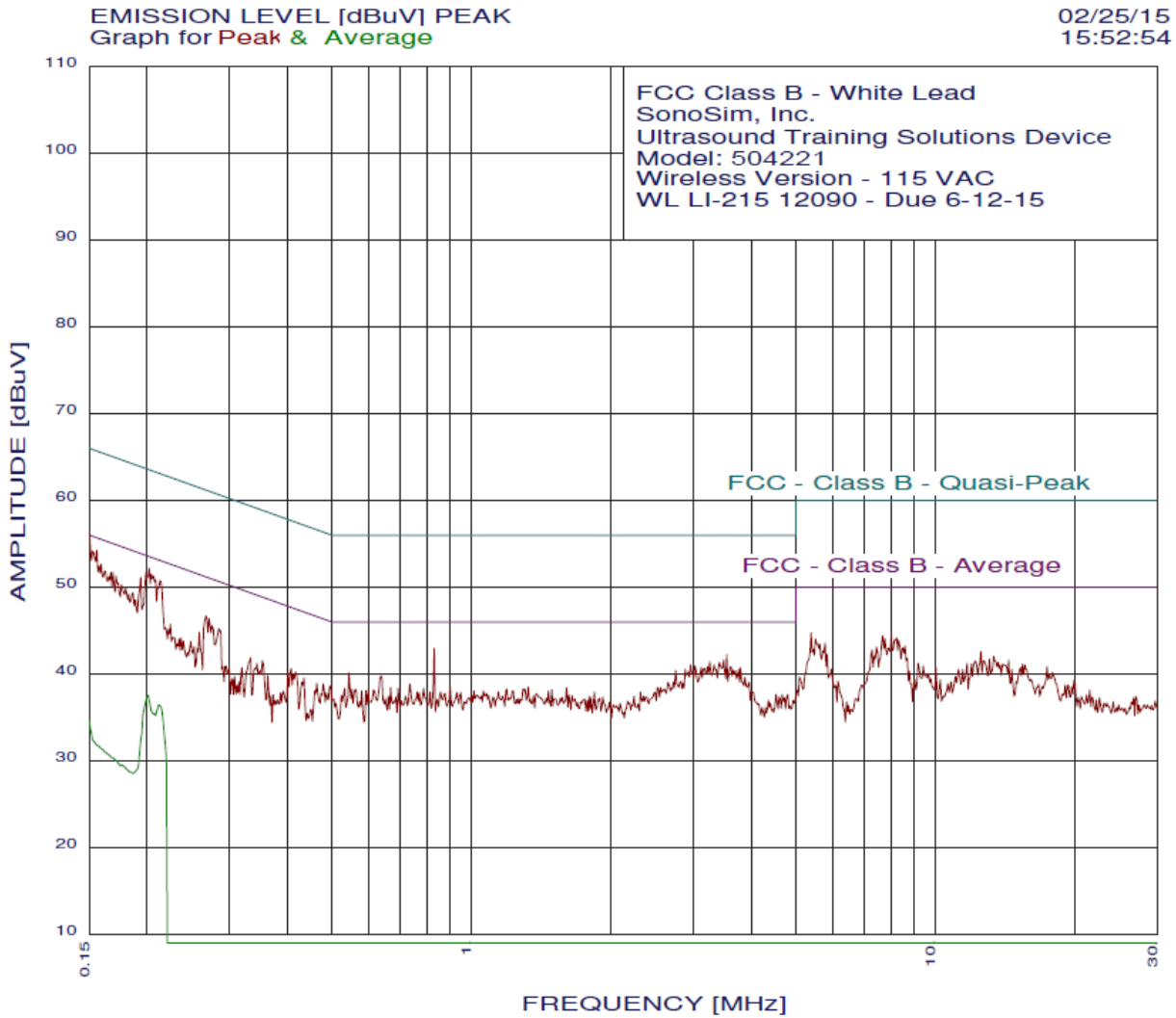
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02/25/15 15:58:07

FCC Class B - Black Lead
SonoSim, Inc.
Ultrasound Training Solutions Device
Model: 504221
Wireless Version - 115 VAC
BL LI-215 12090 - Due 6-12-15
Test Engineer : Kyle Fujimoto

39 highest peaks above -50.00 dB of FCC - Class B - Average limit line
Peak criteria : 0.00 dB, Curve : Average

Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	13.486	44.98	50.00	-5.02
2	3.945	31.62	46.00	-14.38
3	0.200	38.69	53.62	-14.93
4	3.882	30.87	46.00	-15.13
5	3.820	30.57	46.00	-15.43
6	0.213	37.11	53.09	-15.99
7	3.605	30.00	46.00	-16.00
8	3.702	29.93	46.00	-16.07
9	4.008	29.62	46.00	-16.38
10	12.724	33.45	50.00	-16.55
11	3.761	29.35	46.00	-16.65
12	0.637	29.25	46.00	-16.75
13	3.547	29.24	46.00	-16.76
14	3.492	28.97	46.00	-17.03
15	4.408	28.86	46.00	-17.14
16	0.267	33.80	51.20	-17.40
17	1.810	28.46	46.00	-17.54
18	1.929	28.43	46.00	-17.57
19	3.419	28.40	46.00	-17.60
20	3.328	28.32	46.00	-17.68
21	1.184	28.32	46.00	-17.68
22	4.071	28.20	46.00	-17.80
23	1.869	28.18	46.00	-17.82
24	12.453	32.01	50.00	-17.99
25	3.383	27.97	46.00	-18.03
26	4.137	27.89	46.00	-18.11
27	13.341	31.80	50.00	-18.20
28	8.461	31.71	50.00	-18.29
29	1.654	27.68	46.00	-18.32
30	1.586	27.62	46.00	-18.38
31	1.512	27.61	46.00	-18.39
32	1.726	27.58	46.00	-18.42
33	14.138	31.55	50.00	-18.45
34	18.145	31.55	50.00	-18.45
35	4.456	27.49	46.00	-18.51
36	12.192	31.47	50.00	-18.53
37	5.597	31.43	50.00	-18.57
38	0.283	32.14	50.72	-18.58
39	2.023	27.38	46.00	-18.62



FCC Class B - White Lead
 SonoSim, Inc.
 Ultrasound Training Solutions Device
 Model: 504221
 Wireless Version - 115 VAC
 WL LI-215 12090 - Due 6-12-15
 Test Engineer : Kyle Fujimoto

39 highest peaks above -50.00 dB of FCC - Class B - Average limit line
 Peak criteria : 1.00 dB, Curve : Peak

Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	0.202	52.19	53.53	-1.35**
2	0.156	54.25	55.69	-1.44**
3	0.152	54.16	55.86	-1.70**
4	0.204	51.48	53.44	-1.96**
5	0.213	50.75	53.09	-2.34**
6	0.194	51.12	53.88	-2.77**
7	0.831	42.94	46.00	-3.06
8	0.169	51.70	55.03	-3.32**
9	0.167	51.71	55.11	-3.41**
10	0.171	51.29	54.90	-3.60**
11	3.547	42.24	46.00	-3.76
12	3.492	41.64	46.00	-4.36
13	0.176	50.28	54.68	-4.40**
14	0.267	46.68	51.20	-4.52
15	3.260	41.44	46.00	-4.56
16	0.272	46.36	51.07	-4.70
17	0.186	49.34	54.19	-4.85**
18	3.328	41.04	46.00	-4.96
19	2.963	41.04	46.00	-4.96
20	3.027	40.94	46.00	-5.06
21	3.624	40.84	46.00	-5.16
22	5.390	44.75	50.00	-5.25
23	3.800	40.74	46.00	-5.26
24	3.124	40.74	46.00	-5.26
25	0.285	45.22	50.67	-5.45
26	3.761	40.54	46.00	-5.46
27	8.023	44.50	50.00	-5.50
28	2.751	40.44	46.00	-5.56
29	7.689	44.39	50.00	-5.61
30	8.238	44.20	50.00	-5.80
31	0.544	40.15	46.00	-5.85
32	7.773	44.09	50.00	-5.91
33	5.508	44.05	50.00	-5.95
34	8.327	43.90	50.00	-6.10
35	0.637	39.74	46.00	-6.26
36	3.882	39.64	46.00	-6.36
37	5.774	43.56	50.00	-6.44
38	0.259	44.80	51.47	-6.66
39	8.595	43.21	50.00	-6.79

**Please See the Average Readings on the Next Page and on the Plot

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02/25/15 15:52:54

FCC Class B - White Lead
SonoSim, Inc.
Ultrasound Training Solutions Device
Model: 504221
Wireless Version - 115 VAC
WL LI-215 12090 - Due 6-12-15
Test Engineer : Kyle Fujimoto

4 highest peaks above -50.00 dB of FCC - Class B - Average limit line

Peak criteria : 0.00 dB, Curve : Average

Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	0.201	37.54	53.58	-16.04
2	0.212	36.42	53.14	-16.71
3	0.207	35.43	53.31	-17.88
4	0.177	29.47	54.63	-25.16



FCC 15.225 [e] Testing

COMPANY:	SONOSIM, INC.	DATE:	03-06-2015
EUT:	ULTRASOUND TRAINING SOLUTIONS DEVICE	ENGINEER:	KYLE FUJIMOTO
MODEL:	504221	S/N:	N/A

TEMPERATURE (CELSIUS)	FREQUENCY (MHz) at 0 MINUTES	FREQUENCY (MHz) at 2 MINUTES	FREQUENCY (MHz) at 5 MINUTES	FREQUENCY (MHz) at 10 MINUTES
-20	13.56123450	13.56068337	13.56072345	13.56048297
-10	13.56160521	13.56020060	13.56020060	13.56140481
0	13.56120441	13.56120441	13.56140481	13.56160621
10	13.56120441	13.56100401	13.56100401	13.56022064
20	13.56055311	13.56055311	13.56055311	13.56055311
30	13.56051303	13.56051393	13.56045291	13.56045291
40	13.56043287	13.56045291	13.56039279	13.56035271
50	13.56043287	13.56042387	13.56041283	13.56041283

Baseline = 13.56055311 MHz 20 Degrees Celsius at 100%

Low Limit = 13.55919705 MHz Fundamental -0.01%
 High Limit = 13.56190917 MHz Fundamental +0.01%

85% at 20 Degrees Celsius = 13.56053307 MHz
 115% at 20 Degrees Celsius = 13.56059319 MHz