

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

for

NEEDLE & SYRINGE

MODEL: 100-2040

Prepared for

**SONOSIM ,INC.
1738 BERKELEY STREET
SANTA MONIA, CALIFORNIA 90404**

Prepared by: 

EDGAR VALENCIA

Approved by: 

KYLE FUJIMOTO

**COMPATIBLE ELECTRONICS INC.
114 OLINDA DRIVE
BREA, CALIFORNIA 92823
(714) 579-0500**

DATE: SEPTEMBER 13, 2017

	REPORT BODY	APPENDICES					TOTAL
		A	B	C	D	E	
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**Brea Division
114 Olinda Drive
Brea, CA 92823
(714) 579-0500**

**Newbury Park Division
1050 Lawrence Drive
Newbury Park, CA 91320
(805)480-4044**

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

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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: Needle & Syringe
Model: 100-2040
S/N: N/A

Product Description: The EUT is a Needle & syringe which communicates with an ultrasound training program.

Modifications: The EUT was not modified during the testing.

Customer: SonoSim ,Inc.
1738 Berkeley Street
Santa Monica, California 90404

Test Dates: August 22, 23, 24, and 29, 2017; November 6, 2017

Test Specifications: Emissions requirements
CFR Title 47, Part 15, Subpart B; and Subpart C, sections 15.205, 15.209, and 15.247

Test Procedure: ANSI C63.10 and 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 – 30 MHz	This test was not performed because the EUT is battery powered and cannot be connected to the AC public mains.
2	Fundamental and Emissions produced by the intentional radiator in non-restricted bands, 9 kHz – 25 GHz	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.247(d)
3	Emissions produced by the intentional radiator in restricted bands, 9 kHz – 25 GHz	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.205, 15.209, and section 15.247 (d)
4	DTS Bandwidth	Complies with the relevant requirements of FCC Title 47, Part 15, Subpart C, section 15.247 (a)(2)
5	Peak Power Output	Complies with the relevant requirements of FCC Title 47, Part 15, Subpart C, section 15.247 (b)(3)
6	RF Conducted Antenna Test	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.247 (d)
7	Peak Power Spectral Density from the Intentional Radiator to the Antenna	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.247 (e)

1. PURPOSE

This document is a qualification test report based on the emissions tests performed on the Needle & Syringe, Model: 100-2040. The emissions measurements were performed according to the measurement procedure described in ANSI C63.10 and ANSI C63.4. The tests were performed in order to determine whether the electromagnetic emissions from the equipment under test, referred to as EUT hereafter, are within the **Class B** specification limits defined by CFR Title 47, Part 15, Subpart B; and Subpart C, sections 15.205, 15.209, and 15.247.

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

Senior Vice President

Compatible Electronics Inc.

Kyle Fujimoto

Test Engineer

Edgar Valencia

Test Technician

2.4 Date Test Sample was Received

The test sample was received on August, 24 2017.

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

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
ANSI C63.4 2014	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 2013	American National Standard for Testing Unlicensed Wireless Devices
FCC Title 47, Part 15 Subpart B	FCC Rules - Radio frequency devices (including digital devices) – Unintentional Radiators
558074 D01 DTS Meas Guidance v04	Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating under 15.247

4. DESCRIPTION OF TEST CONFIGURATION

4.1 Description of Test Configuration – Emissions

The Needle & Syringe Model: 100-2040 (EUT) was tested as a stand alone unit and continuously transmitting.

The EUT was tested in the X, Y and Z axis. The X orientation is when the EUT is parallel to the ground. The Y orientation is when the EUT is perpendicular to the ground mounted vertically. The Z orientation is when the EUT is perpendicular to the ground mounted horizontally.

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

The EUT had not external cables.

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

EQUIPMENT	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	FCC ID
NEEDLE & SYRINGE (EUT)	SONOSIM,INC.	100-2040	N/A	2AEME-1002040

5.2 Emissions Test Equipment

EQUIPMENT TYPE	MANU-FACTURER	MODEL NUMBER	SERIAL NUMBER	CALIBRATION DATE	CAL. CYCLE
GENERAL TEST EQUIPMENT USED IN LAB D					
TDK TestLab	TDK RF Solutions, Inc.	9.22	700145	N/A	N/A
Computer	Hewlett Packard	p6716f	MXX1030PX0	N/A	N/A
LCD Monitor	Hewlett Packard	52031a	3CQ046N3MG	N/A	N/A
EMI Receiver, 20 Hz – 40 GHz	Rohde & Schwarz	ESIB40	100194	June 14, 2016	2 Year
EMI Receiver, 20 Hz – 40 GHz	Rohde & Schwarz	ESIB40	100194	September 26, 2017	2 Year
EMI Receiver, 20 Hz – 26.5 GHz	Keysight	N9038A	MY51210150	December 29, 2015	2 Year
RF RADIATED EMISSIONS TEST EQUIPMENT					
CombiLog Antenna	Com-Power	AC-220	61060	July 27, 2017	2 Year
Preamplifier	Com-Power	PAM-118A	551024	May 12, 2016	2 Year
Preamplifier	Com-Power	PA-840	711013	May 13, 2016	2 Year
Loop Antenna	Com-Power	AL-130R	121090	February 9, 2017	2 Year
Horn Antenna	Com-Power	AH-826	71957	N/A	N/A
Horn Antenna	Com-Power	AH-118	071175	February 26, 2016	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

6. TEST SITE DESCRIPTION

6.1 Test Facility Description

Please refer to section 2.1 and 7.1 of this report for emissions test location.

6.2 EUT Mounting, Bonding and Grounding

For frequencies 1 GHz and below: The EUT was mounted on a 1.0 by 1.5 meter non-conductive table 0.8 meters above the ground plane.

For frequencies above 1 GHz: The EUT was mounted on a 1.0 by 1.5 meter non-conductive table 1.5 meters above the ground plane.

The EUT was not grounded.

7. CHARACTERISTICS OF THE TRANSMITTER

7.1 Channel Description and Frequencies

The lowest frequency the EUT will use is 2402 MHz and the highest frequency the EUT will use is 2480 MHz. Each channel used by the EUT is 2 MHz apart.

7.2 Antenna Gain

The EUT utilizes an antenna with a 1.1 dBi gain.

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 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 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 is battery powered only and cannot be connected to the AC public mains.

8.1.2 Radiated Emissions (Spurious and Harmonics) Test

The EMI Receiver was used as the measuring meter. Below 1 GHz, 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 frequencies above 1 GHz were averaged by using the RMS detector function on the EMI Receiver.

The measurement bandwidths and transducers used for the radiated emissions 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
30 MHz to 1 GHz	120 kHz	Combilog Antenna
1 GHz to 25 GHz	1 MHz	Horn Antenna

The EMI test chamber of Compatible Electronics, Inc. was used for radiated emissions testing. This test site is in full compliance with 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 gunsight method was used when measuring with the horn antenna in order to ensure accurate results.

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 15.247 (d) for radiated emissions. Please see Appendix E for the data sheets.

8.1.3 RF Emissions Test Results

Table 1.0 RADIATED EMISSION RESULTS
Needle & Syringe, Model: 100-2040

Frequency MHz	Corrected Reading* dBuV/m	Specification Limit dBuV/m	Delta (Cor. Reading – Spec. Limit) dB
88.50 (V)	35.80 (QP)	40.00	-4.20
4960 (X-Axis) (H)	48.71 (Avg)	53.97	-5.26
7440 (Y-Axis) (V)	47.99 (Avg)	53.97	-5.98
7440 (Z-Axis) (H)	47.29 (Avg)	53.97	-6.68
7440 (X-Axis) (H)	46.75 (Avg)	53.97	-7.22
85.90 (V)	32.65 (QP)	40.00	-7.35

Notes:

*	The complete emissions data is given in Appendix E of this report.		
Pk	Peak Reading	Avg	Average Reading
H	Horizontal Polarization	V	Vertical Polarization

8.2 DTS Bandwidth

The EMI Receiver was tuned to the highest point of the maximized fundamental emission based on the procedure used in section 8.1.2. The DTS bandwidth was then obtained by then setting the EMI Receiver to the settings shown below:

1. Set RBW = 100 kHz
2. Set the video bandwidth (VBW) to equal or greater than 3 times the RBW
3. Detector = Peak
4. Trace Mode = Max Hold
5. Sweep = Auto Couple
6. Allow the trace to stabilize
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

Test Results:

The EUT complies with the relevant requirements of FCC Title 47, Part 15, Subpart C section 15.247 (a)(2).

8.3 Peak Output Power

Since antenna conducted tests could not be performed on the EUT due to a lack of an antenna connector on the EUT, the peak power output power was calculated by the following equation:

$$P = [(E \cdot D)^2] / (30 G)$$

P = Power in Watts for which you are solving

E = the measured maximum field strength in V/m utilizing the widest available RBW

G = the numeric gain of the transmitting antenna over an isotropic radiator

.

Test Results:

The EUT complies with the relevant requirements of FCC Title 47, Part 15, Subpart C section 15.247 (b)(3).

8.4 Emissions in Non-Restricted Bands

The emissions in the non-restricted frequency bands measurements were performed via radiated per section 8.1.2. of this test report to maximize the emission. The reference level was established by setting the instrument center frequency to DTS channel center frequency. A peak detector was used with sweep set to auto. A max hold trace was used and allowed to fully stabilize. The peak marker function was used to determine the level and 20 dB below that was the reference level. For emission level measurement, the center frequency and span were set to encompass the frequency range to be measured. A peak detector was used with a sweep time set to auto. The number of measurement points were greater than the span/RBW. A max hold trace was used and allowed to fully stabilize. The peak marker function was used to determine the maximum amplitude level. The final qualification data sheets are located in Appendix E.

The EUT was investigated in both single channel and frequency hopping modes. The worst case was determined to be when the EUT was in single channel mode.

Test Results:

The EUT complies with the relevant requirements of FCC Title 47, Part 15, Subpart C section 15.247 (d).

8.5 RF Band Edges

The RF band edges were taken at 2390 MHz and 2400 MHz when the EUT was on the low channel and 2483.5 MHz when the EUT was on the high channel using the EMI Receiver. A preamplifier was used to boost the signal level, with the plots being taken at a 3 meter test distance. The radiated emissions test procedure as describe in section 8.1.2 of this test report was used to maximize the emission.

The EUT was investigated in both single channel and frequency hopping modes. The worst case was determined to be when the EUT was in single channel mode.

Test Results:

The EUT complies with the relevant requirements of FCC Title 47, Part 15, Subpart C section 15.247 (d). The RF power at the restricted bands closest to the band edges at 2390 MHz and 2483.5 MHz also meet the limits of section 15.209. Please see the data sheets located in Appendix E.

8.6 Spectral Density Test

Since antenna conducted tests could not be performed on the EUT due to a lack of an antenna connector on the EUT, the spectral density was measured as follows:

- A. The EMI Receiver was tuned to the highest point of the maximized fundamental emission based on the procedure used in section 8.1.2. The EMI Receiver was then set to an RBW of 3 kHz, VBW of 10 kHz, frequency span of 1.5*DTS Bandwidth, and a sweep time set to auto. Using these settings, the peak level was obtained.
- B. Using the peak level obtained in step 1, the field strength E, was derived by applying the appropriate antenna factor, cable loss, and pre-amp gain for that frequency
- C. The following equations was then used to calculate the power level for comparison to the +8 dBm limit.

$$P = [(E \cdot D)^2] / (30 \cdot G)$$

P = Power in Watts for which you are solving

E = the measured maximum field strength in V/m utilizing the widest available RBW

G = the numeric gain of the transmitting antenna over an isotropic radiator

Test Results:

The EUT complies with the relevant requirements of FCC Title 47, Part 15, Subpart C section 15.247 (e).

9. CONCLUSIONS

The Needle & Syringe, Model: 100-2040, 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 15.247.



APPENDIX A

LABORATORY ACCREDITATIONS AND RECOGNITIONS

LABORATORY ACCREDITATIONS AND RECOGNITIONS



NVLAP LAB CODE 200528-0



For US, Canada, Australia/New Zealand, Japan, Taiwan, Korea, and the European Union, Compatible Electronics is currently accredited by NVLAP to ISO/IEC 17025. **For the most up-to-date version of our scopes and certificates please visit <http://celectronics.com/quality/scope/>**

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."



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 15.247 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.

The EUT was not modified during the testing.



APPENDIX C

***ADDITIONAL MODELS COVERED
UNDER THIS REPORT***

ADDITIONAL MODELS COVERED UNDER THIS REPORT

USED FOR THE PRIMARY TEST

Needle & Syringe
Model: 100-2040
S/N: N/A

There were no additional models covered under this report.



APPENDIX D

DIAGRAMS AND CHARTS

FIGURE 1: LAYOUT OF THE SEMI-ANECHOIC TEST CHAMBER

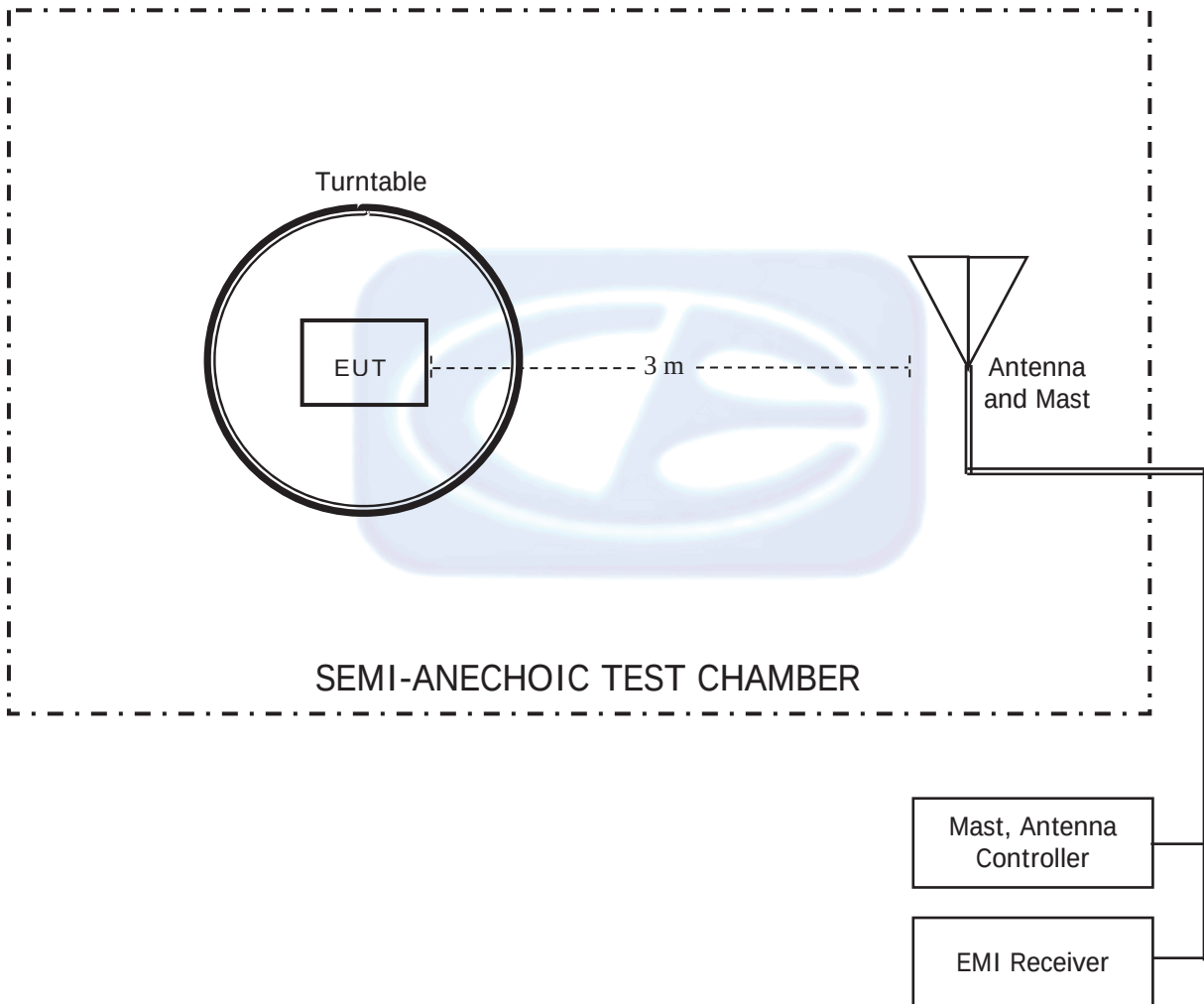
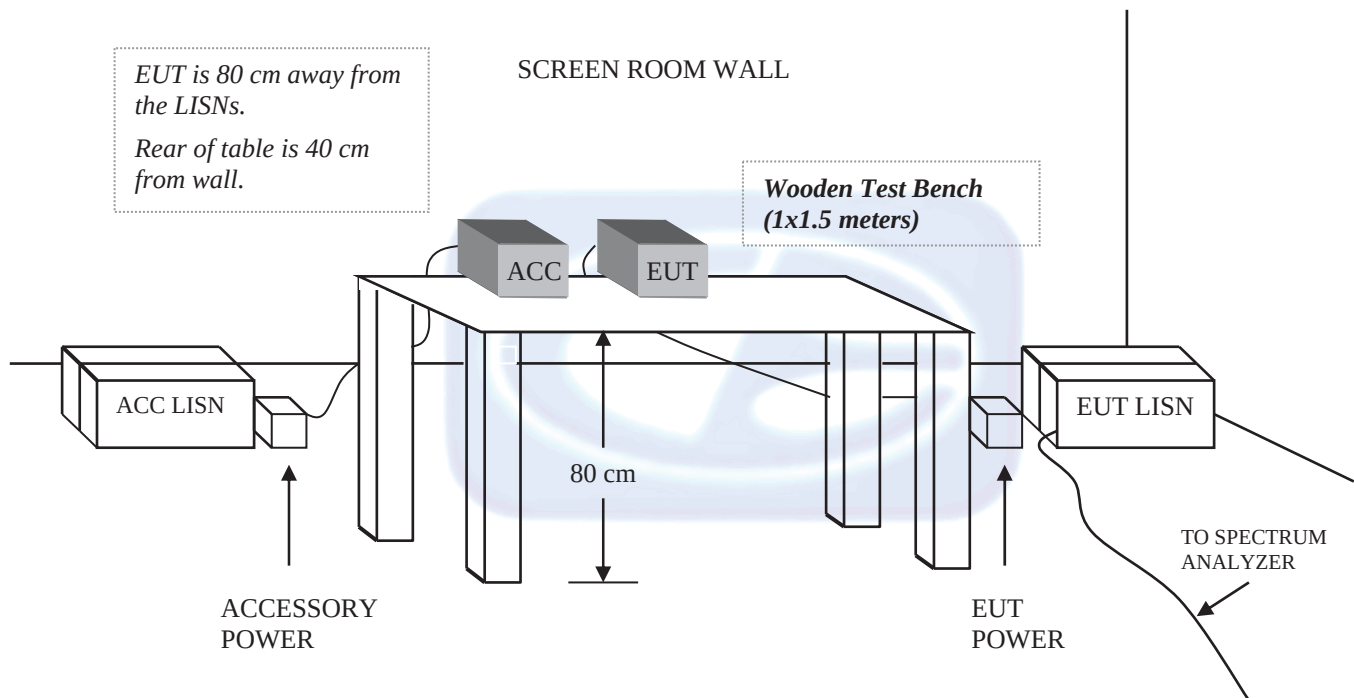


FIGURE 2: CONDUCTED EMISSIONS TEST SETUP



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

S/N: 121090

CALIBRATION DATE: FEBRUARY 9, 2017

FREQUENCY (MHz)	MAGNETIC (dB/m)	ELECTRIC (dB/m)
0.009	-36.17	15.33
0.01	-35.86	15.64
0.02	-37.30	14.20
0.03	-36.58	14.92
0.04	-36.99	14.51
0.05	-37.66	13.84
0.06	-37.53	13.97
0.07	-37.64	13.86
0.08	-37.52	13.98
0.09	-37.62	13.88
0.1	-37.59	13.91
0.2	-37.79	13.71
0.3	-37.80	13.70
0.4	-37.70	13.80
0.5	-37.79	13.71
0.6	-37.79	13.71
0.7	-37.69	13.81
0.8	-37.49	14.01
0.9	-37.39	14.11
1	-37.39	14.11
2	-37.09	14.41
3	-37.09	14.41
4	-37.19	14.31
5	-36.98	14.52
6	-37.17	14.33
7	-37.05	14.45
8	-36.85	14.65
9	-36.84	14.66
10	-36.75	14.75
15	-37.16	14.34
20	-36.44	15.06
25	-37.88	13.62
30	-39.14	12.36

COM-POWER AC-220

COMBILOG ANTENNA

S/N: 61060

CALIBRATION DATE: JULY 27, 2017

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30	23.80	200	14.10
35	24.00	250	15.30
40	24.70	300	17.70
45	22.90	350	17.70
50	22.10	400	19.00
60	17.60	450	21.30
70	12.70	500	21.00
80	11.20	550	22.30
90	13.10	600	23.40
100	14.40	650	22.90
120	15.30	700	24.60
125	15.00	750	24.50
140	12.80	800	25.40
150	16.50	850	26.40
160	12.90	900	27.20
175	14.30	950	27.80
180	14.50	1000	26.80

COM POWER AH-118**HORN ANTENNA****S/N: 071175****CALIBRATION DATE: FEBRUARY 26, 2016**

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
1.0	23.93	10.0	39.33
1.5	25.54	10.5	39.64
2.0	28.09	11.0	41.04
2.5	30.21	11.5	44.29
3.0	30.15	12.0	41.22
3.5	30.17	12.5	41.50
4.0	31.90	13.0	41.62
4.5	33.51	13.5	40.63
5.0	33.87	14.0	39.94
5.5	35.08	14.5	41.84
6.0	34.81	15.0	42.69
6.5	34.26	15.5	39.03
7.0	36.33	16.0	39.07
7.5	37.03	16.5	41.40
8.0	37.56	17.0	43.18
8.5	40.07	17.5	47.01
9.0	38.92	18.0	46.48
9.5	38.21		

COM-POWER PAM-118A**PREAMPLIFIER****S/N: 551024****CALIBRATION DATE: MAY 12, 2016**

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
1.0	39.84	6.0	39.05
1.1	39.40	6.5	38.94
1.2	39.58	7.0	39.25
1.3	39.68	7.5	39.09
1.4	39.91	8.0	39.01
1.5	39.78	8.5	38.60
1.6	39.50	9.0	38.64
1.7	39.81	9.5	39.67
1.8	39.89	10.0	39.30
1.9	39.94	11.0	39.15
2.0	39.57	12.0	39.24
2.5	40.39	13.0	39.49
3.0	40.63	14.0	39.44
3.5	40.80	15.0	39.94
4.0	40.86	16.0	40.09
4.5	39.94	17.0	40.06
5.0	34.47	18.0	39.76
5.5	39.32		

COM-POWER AH-826**HORN ANTENNA****S/N: 71957**

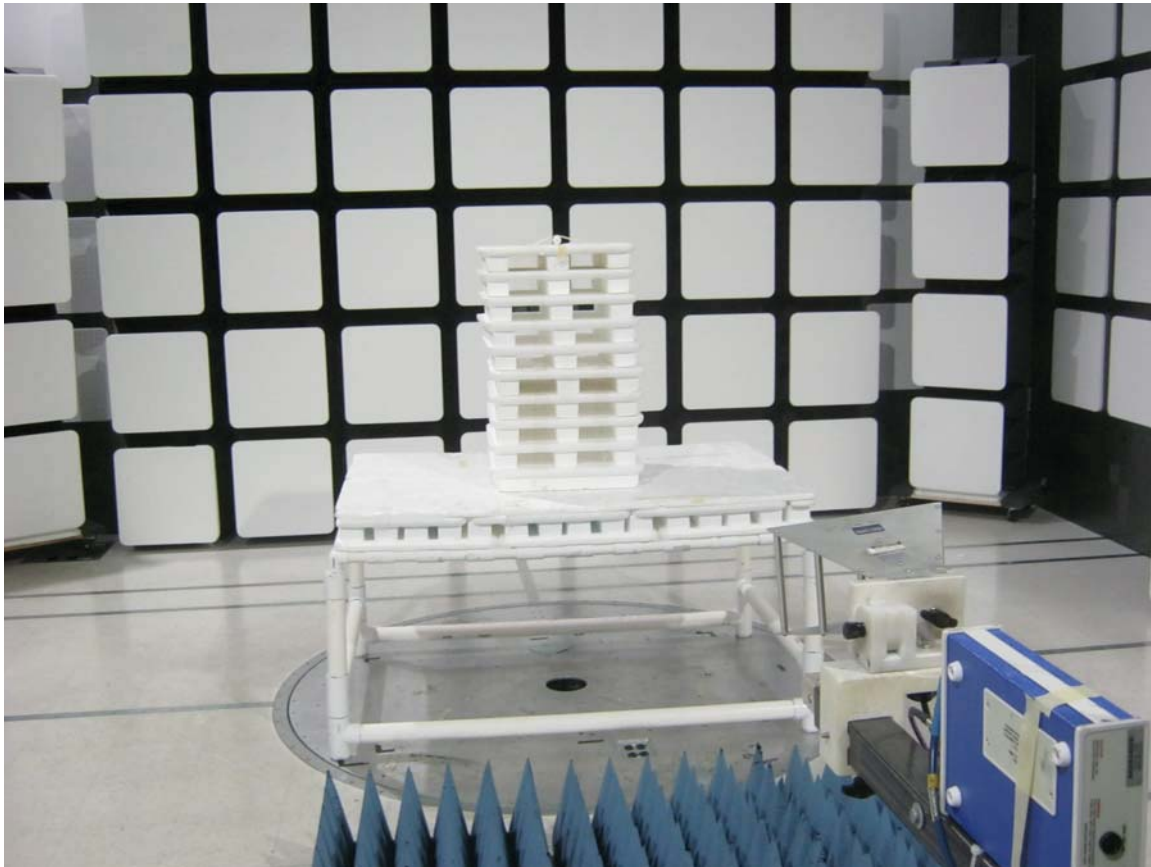
FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
18.0	33.5	22.5	35.5
18.5	33.5	23.0	35.9
19.0	34.0	23.5	35.7
19.5	34.0	24.0	35.6
20.0	34.3	24.5	36.0
20.5	34.9	25.0	36.2
21.0	34.7	25.5	36.1
21.5	35.0	26.0	36.2
22.0	35.0	26.5	35.7

COM-POWER PA-840
MICROWAVE PREAMPLIFIER

S/N: 711013

CALIBRATION DATE: MAY 13, 2016

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
18.0	25.19	31.0	25.69
19.0	24.48	31.5	25.74
20.0	24.39	32.0	26.35
21.0	24.73	32.5	26.64
22.0	23.49	33.0	25.98
23.0	24.23	33.5	24.68
24.0	24.59	34.0	24.61
25.0	25.32	34.5	23.78
26.0	25.66	35.0	24.74
26.5	25.99	35.5	24.39
27.0	26.26	36.0	23.46
27.5	25.33	36.5	23.71
28.0	24.49	37.0	26.35
28.5	24.74	37.5	23.49
29.0	25.93	38.0	25.42
29.5	26.28	38.5	24.87
30.0	26.17	39.0	22.60
30.5	26.11	39.5	20.57
		40.0	19.15

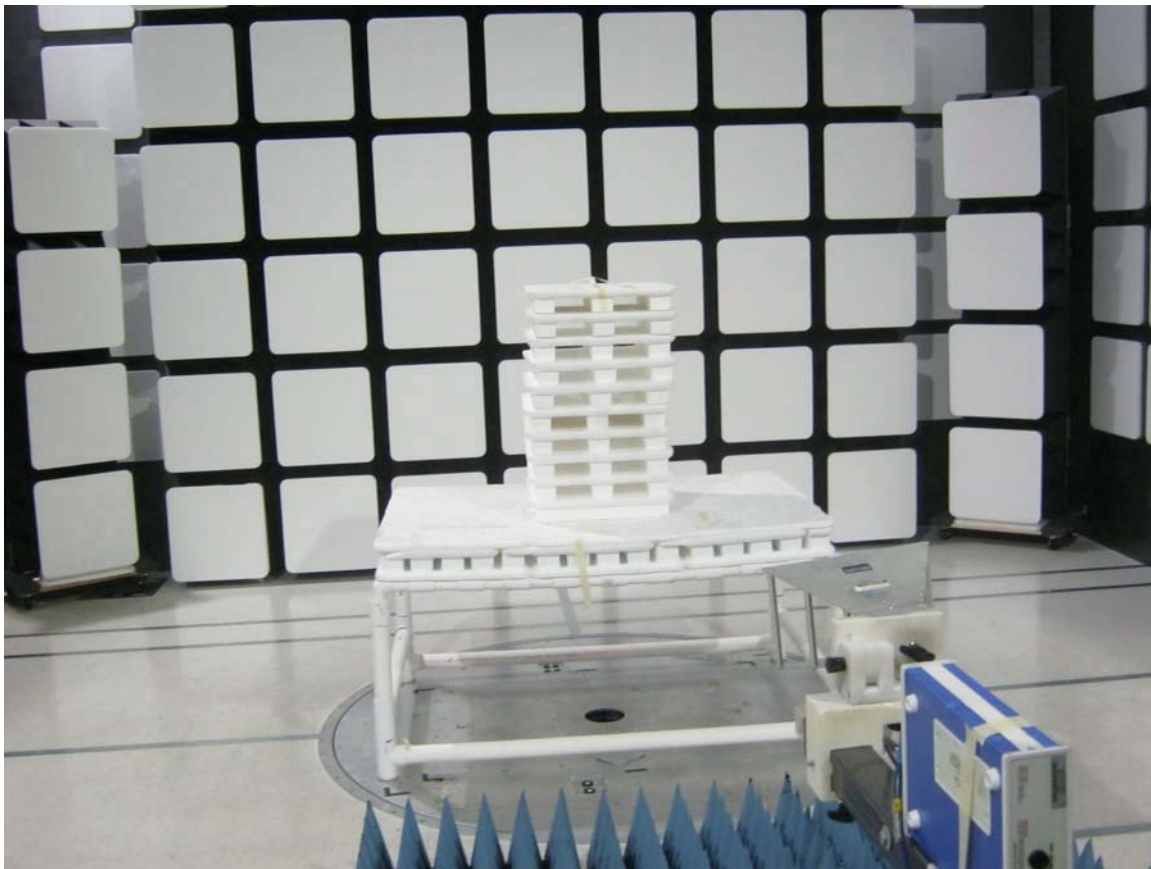


FRONT VIEW

SONOSIM, INC.
NEEDLE & SYRINGE
MODEL: 100-2040

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

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

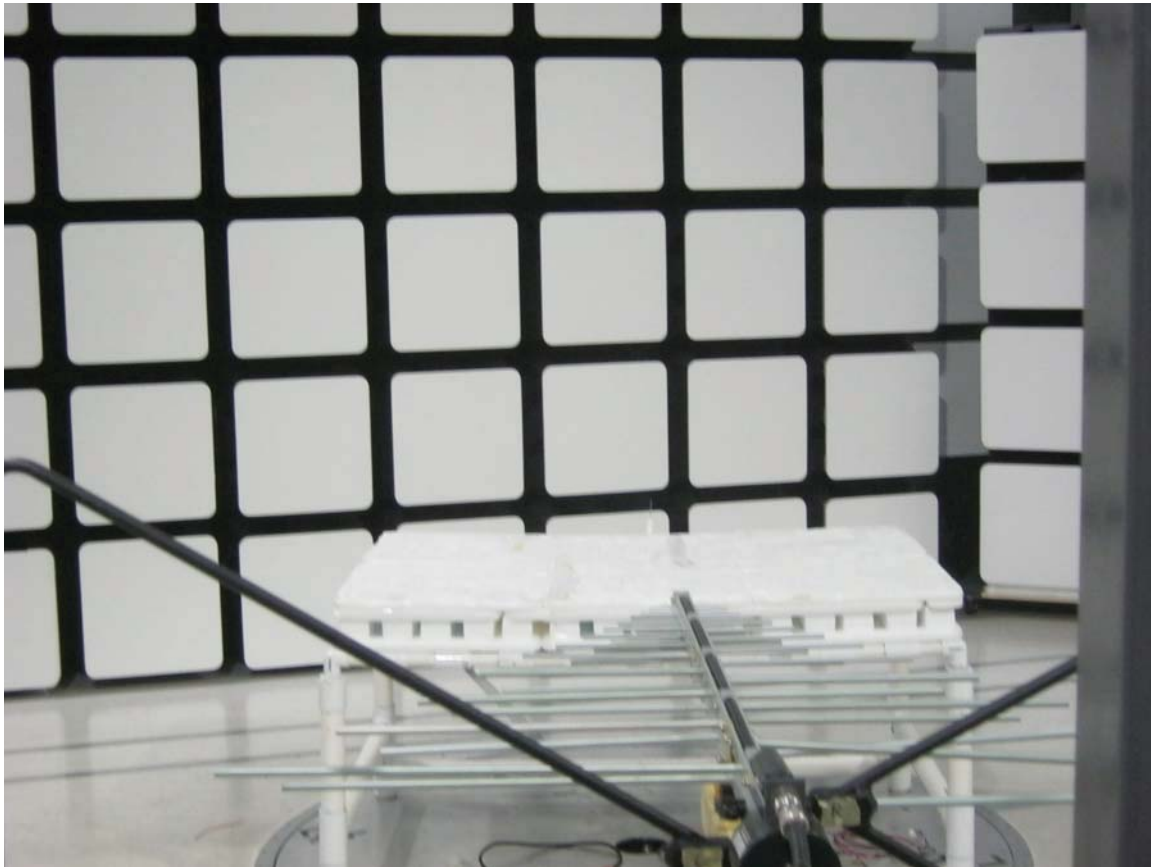


REAR VIEW

SONOSIM, INC.
NEEDLE & SYRINGE
MODEL: 100-2040

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

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

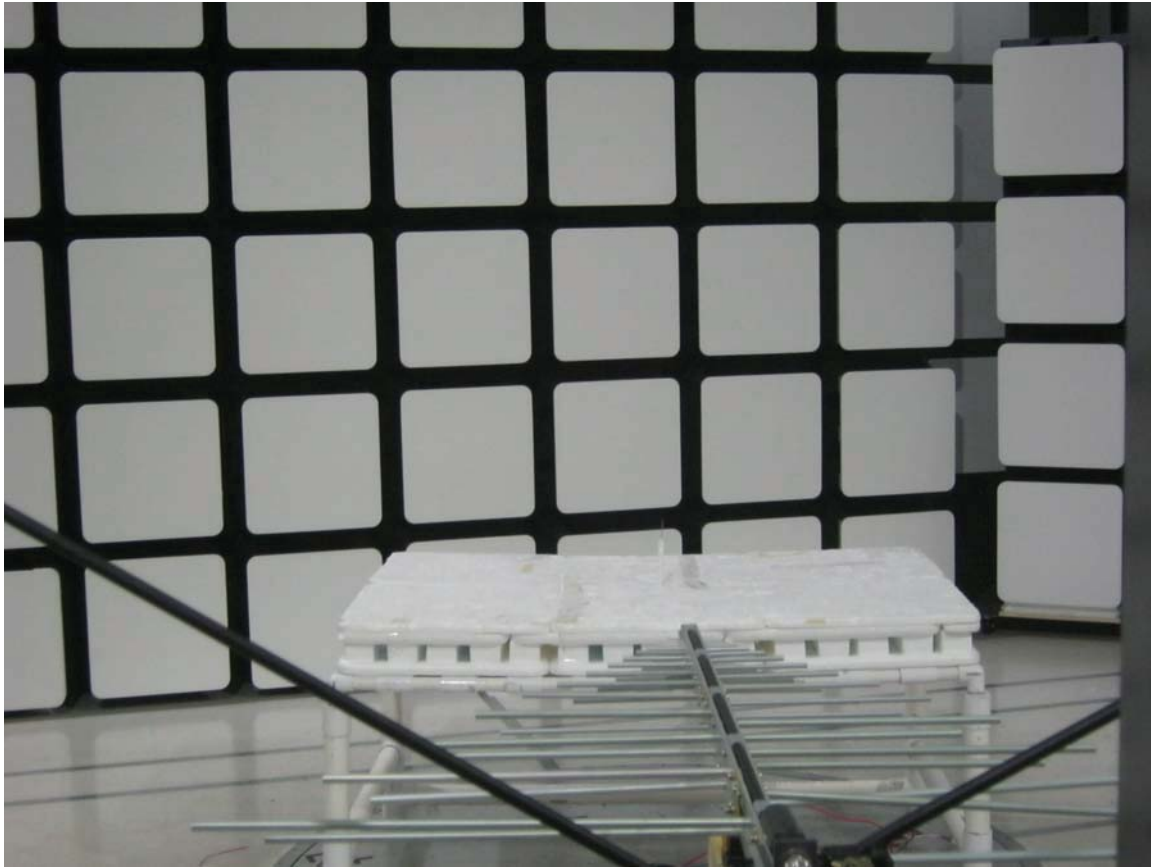


FRONT VIEW

SONOSIM, INC.
NEEDLE & SYRINGE
MODEL: 100-2040

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

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



REAR VIEW

SONOSIM, INC.
NEEDLE & SYRINGE
MODEL: 100-2040

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

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

APPENDIX E

DATA SHEETS

***RADIATED EMISSIONS
DATA SHEETS***

FCC 15.247SonoSim, Inc.
Needle & Syringe
Model: 100-2040Date: 08/23/2017
Lab: D
Tested By: Kyle Fujimoto**Harmonics - Low Channel
Transmit Mode - X-Axis**

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4804.00	44.60	V	73.97	-29.37	Peak	280.25	187.01	
4804.00	34.77	V	53.97	-19.20	Avg	280.25	187.01	
7206.00	45.03	V	73.97	-28.94	Peak	34.25	190.00	
7206.00	35.73	V	53.97	-18.24	Avg	34.25	190.00	
9608.00								No Emission
9608.00								Detected
12010.00								No Emission
12010.00								Detected
14412.00								No Emission
14412.00								Detected
16814.00								No Emission
16814.00								Detected
19216.00								No Emission
19216.00								Detected
21618.00								No Emission
21618.00								Detected
24020.00								No Emission
24020.00								Detected

FCC 15.247SonoSim, Inc.
Needle & Syringe
Model: 100-2040Date: 08/23/2017
Lab: D
Tested By: Kyle Fujimoto**Harmonics - Low Channel**
Transmit Mode - Y-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4804.00	52.70	V	73.97	-21.27	Peak	51.00	171.79	
4804.00	45.80	V	53.97	-8.17	Avg	51.00	171.79	
7206.00	51.34	V	73.97	-22.64	Peak	0.00	242.59	
7206.00	42.37	V	53.97	-11.61	Avg	0.00	242.59	
9608.00								No Emission
9608.00								Detected
12010.00								No Emission
12010.00								Detected
14412.00								No Emission
14412.00								Detected
16814.00								No Emission
16814.00								Detected
19216.00								No Emission
19216.00								Detected
21618.00								No Emission
21618.00								Detected
24020.00								No Emission
24020.00								Detected

FCC 15.247SonoSim, Inc.
Needle & Syringe
Model: 100-2040Date: 08/23/2017
Lab: D
Tested By: Kyle Fujimoto**Harmonics - Low Channel
Transmit Mode - Z-Axis**

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4804.00	49.31	V	73.97	-24.66	Peak	188.50	147.31	
4804.00	41.02	V	53.97	-12.95	Avg	188.50	147.31	
7206.00	50.68	V	73.97	-23.29	Peak	89.75	114.77	
7206.00	41.86	V	53.97	-12.11	Avg	89.75	114.77	
9608.00								No Emission
9608.00								Detected
12010.00								No Emission
12010.00								Detected
14412.00								No Emission
14412.00								Detected
16814.00								No Emission
16814.00								Detected
19216.00								No Emission
19216.00								Detected
21618.00								No Emission
21618.00								Detected
24020.00								No Emission
24020.00								Detected

FCC 15.247

SonoSim, Inc.
Needle & Syringe
Model: 100-2040

Date: 08/23/2017
Lab: D
Tested By: Kyle Fujimoto

**Harmonics - Low Channel
Transmit Mode - X-Axis**

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4804.00	51.73	H	73.97	-22.24	Peak	240.75	172.86	
4804.00	43.39	H	53.97	-10.58	Avg	240.75	172.86	
7206.00	47.54	H	73.97	-26.43	Peak	180.75	173.28	
7206.00	34.46	H	53.97	-19.51	Avg	180.75	173.28	
9608.00								No Emission
9608.00								Detected
12010.00								No Emission
12010.00								Detected
14412.00								No Emission
14412.00								Detected
16814.00								No Emission
16814.00								Detected
19216.00								No Emission
19216.00								Detected
21618.00								No Emission
21618.00								Detected
24020.00								No Emission
24020.00								Detected

FCC 15.247SonoSim, Inc.
Needle & Syringe
Model: 100-2040Date: 08/23/2017
Lab: D
Tested By: Kyle Fujimoto**Harmonics - Low Channel
Transmit Mode - Y-Axis**

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4804.00	45.55	H	73.97	-28.42	Peak	24.50	141.16	
4804.00	34.67	H	53.97	-19.30	Avg	24.50	141.16	
7206.00	50.06	H	73.97	-23.91	Peak	336.25	167.49	
7206.00	39.37	H	53.97	-14.60	Avg	336.25	167.49	
9608.00								No Emission
9608.00								Detected
12010.00								No Emission
12010.00								Detected
14412.00								No Emission
14412.00								Detected
16814.00								No Emission
16814.00								Detected
19216.00								No Emission
19216.00								Detected
21618.00								No Emission
21618.00								Detected
24020.00								No Emission
24020.00								Detected

FCC 15.247SonoSim, Inc.
Needle & Syringe
Model: 100-2040Date: 08/23/2017
Lab: D
Tested By: Kyle Fujimoto**Harmonics - Low Channel
Transmit Mode - Z-Axis**

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4804.00	51.71	H	73.97	-22.26	Peak	94.50	153.16	
4804.00	44.12	H	53.97	-9.85	Avg	94.50	153.16	
7206.00	52.70	H	73.97	-21.27	Peak	246.00	147.13	
7206.00	43.03	H	53.97	-10.94	Avg	246.00	147.13	
9608.00								No Emission
9608.00								Detected
12010.00								No Emission
12010.00								Detected
14412.00								No Emission
14412.00								Detected
16814.00								No Emission
16814.00								Detected
19216.00								No Emission
19216.00								Detected
21618.00								No Emission
21618.00								Detected
24020.00								No Emission
24020.00								Detected

FCC 15.247SonoSim, Inc.
Needle & Syringe
Model: 100-2040Date: 08/23/2017
Lab: D
Tested By: Kyle Fujimoto**Harmonics - Middle Channel**
Transmit Mode - X-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4884.00	43.38	V	73.97	-30.59	Peak	310.00	158.05	
4884.00	31.11	V	53.97	-22.86	Avg	310.00	158.05	
7326.00	48.37	V	73.97	-25.60	Peak	145.75	178.29	
7326.00	37.58	V	53.97	-16.39	Avg	145.75	178.29	
9768.00								No Emission
9768.00								Detected
12210.00								No Emission
12210.00								Detected
14652.00								No Emission
14652.00								Detected
17094.00								No Emission
17094.00								Detected
19536.00								No Emission
19536.00								Detected
21978.00								No Emission
21978.00								Detected
24420.00								No Emission
24420.00								Detected

FCC 15.247

SonoSim, Inc.
Needle & Syringe
Model: 100-2040

Date: 08/23/2017
Lab: D
Tested By: Kyle Fujimoto

**Harmonics - Middle Channel
Transmit Mode - Y-Axis**

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4884.00	53.22	V	73.97	-20.75	Peak	283.75	170.65	
4884.00	46.05	V	53.97	-7.92	Avg	283.75	170.65	
7326.00	51.99	V	73.97	-21.98	Peak	186.25	236.38	
7326.00	42.41	V	53.97	-11.56	Avg	186.25	236.38	
9768.00								No Emission
9768.00								Detected
12210.00								No Emission
12210.00								Detected
14652.00								No Emission
14652.00								Detected
17094.00								No Emission
17094.00								Detected
19536.00								No Emission
19536.00								Detected
21978.00								No Emission
21978.00								Detected
24420.00								No Emission
24420.00								Detected

FCC 15.247SonoSim, Inc.
Needle & Syringe
Model: 100-2040Date: 08/23/2017
Lab: D
Tested By: Kyle Fujimoto**Harmonics - Middle Channel
Transmit Mode - Z-Axis**

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4884.00	48.95	V	73.97	-25.02	Peak	218.00	147.67	
4884.00	41.63	V	53.97	-12.34	Avg	218.00	147.67	
7326.00	49.90	V	73.97	-24.07	Peak	89.25	150.41	
7326.00	41.17	V	53.97	-12.80	Avg	89.25	150.41	
9768.00								No Emission
9768.00								Detected
12210.00								No Emission
12210.00								Detected
14652.00								No Emission
14652.00								Detected
17094.00								No Emission
17094.00								Detected
19536.00								No Emission
19536.00								Detected
21978.00								No Emission
21978.00								Detected
24420.00								No Emission
24420.00								Detected

FCC 15.247

SonoSim, Inc.
Needle & Syringe
Model: 100-2040

Date: 08/23/2017
Lab: D
Tested By: Kyle Fujimoto

**Harmonics - Middle Channel
Transmit Mode - X-Axis**

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4884.00	51.89	H	73.97	-22.08	Peak	131.00	128.74	
4884.00	44.81	H	53.97	-9.16	Avg	131.00	128.74	
7326.00	52.19	H	73.97	-21.78	Peak	113.75	138.11	
7326.00	43.99	H	53.97	-9.98	Avg	113.75	138.11	
9768.00								No Emission
9768.00								Detected
12210.00								No Emission
12210.00								Detected
14652.00								No Emission
14652.00								Detected
17094.00								No Emission
17094.00								Detected
19536.00								No Emission
19536.00								Detected
21978.00								No Emission
21978.00								Detected
24420.00								No Emission
24420.00								Detected

FCC 15.247SonoSim, Inc.
Needle & Syringe
Model: 100-2040Date: 08/23/2017
Lab: D
Tested By: Kyle Fujimoto**Harmonics - Middle Channel**
Transmit Mode - Y-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4884.00	46.44	H	73.97	-27.53	Peak	191.25	127.49	
4884.00	36.88	H	53.97	-17.09	Avg	191.25	127.49	
7326.00	50.24	H	73.97	-23.73	Peak	217.50	211.55	
7326.00	39.40	H	53.97	-14.57	Avg	217.50	211.55	
9768.00								No Emission
9768.00								Detected
12210.00								No Emission
12210.00								Detected
14652.00								No Emission
14652.00								Detected
17094.00								No Emission
17094.00								Detected
19536.00								No Emission
19536.00								Detected
21978.00								No Emission
21978.00								Detected
24420.00								No Emission
24420.00								Detected

FCC 15.247SonoSim, Inc.
Needle & Syringe
Model: 100-2040Date: 08/23/2017
Lab: D
Tested By: Kyle Fujimoto**Harmonics - Middle Channel
Transmit Mode - Z-Axis**

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4884.00	52.60	H	73.97	-21.38	Peak	93.25	115.85	
4884.00	45.71	H	53.97	-8.27	Avg	93.25	115.85	
7326.00	52.94	H	73.97	-21.03	Peak	239.25	130.35	
7326.00	44.70	H	53.97	-9.27	Avg	239.25	130.35	
9768.00								No Emission
9768.00								Detected
12210.00								No Emission
12210.00								Detected
14652.00								No Emission
14652.00								Detected
17094.00								No Emission
17094.00								Detected
19536.00								No Emission
19536.00								Detected
21978.00								No Emission
21978.00								Detected
24420.00								No Emission
24420.00								Detected

FCC 15.247SonoSim, Inc.
Needle & Syringe
Model: 100-2040Date: 08/23/2017
Lab: D
Tested By: Kyle Fujimoto**Harmonics - High Channel**
Transmit Mode - X-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4960.00	47.13	V	73.97	-26.84	Peak	211.25	180.26	
4960.00	32.94	V	53.97	-21.03	Avg	211.25	180.26	
7440.00	49.23	V	73.97	-24.74	Peak	149.00	118.00	
7440.00	38.31	V	53.97	-15.66	Avg	149.00	118.00	
9920.00								No Emission
9920.00								Detected
12400.00								No Emission
12400.00								Detected
14880.00								No Emission
14880.00								Detected
17360.00								No Emission
17360.00								Detected
19840.00								No Emission
19840.00								Detected
22320.00								No Emission
22320.00								Detected
24800.00								No Emission
24800.00								Detected

FCC 15.247SonoSim, Inc.
Needle & Syringe
Model: 100-2040Date: 08/23/2017
Lab: D
Tested By: Kyle Fujimoto**Harmonics - High Channel**
Transmit Mode - Y-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4960.00	50.39	V	73.97	-23.58	Peak	353.00	139.07	
4960.00	42.57	V	53.97	-11.40	Avg	353.00	139.07	
7440.00	54.45	V	73.97	-19.52	Peak	49.00	199.25	
7440.00	47.99	V	53.97	-5.98	Avg	49.00	199.25	
9920.00								No Emission
9920.00								Detected
12400.00								No Emission
12400.00								Detected
14880.00								No Emission
14880.00								Detected
17360.00								No Emission
17360.00								Detected
19840.00								No Emission
19840.00								Detected
22320.00								No Emission
22320.00								Detected
24800.00								No Emission
24800.00								Detected

FCC 15.247SonoSim, Inc.
Needle & Syringe
Model: 100-2040Date: 08/23/2017
Lab: D
Tested By: Kyle Fujimoto**Harmonics - High Channel**
Transmit Mode - Z-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4960.00	50.11	V	73.97	-23.87	Peak	214.50	155.73	
4960.00	42.03	V	53.97	-11.94	Avg	214.50	155.73	
7440.00	53.42	V	73.97	-20.56	Peak	107.50	110.65	
7440.00	45.55	V	53.97	-8.42	Avg	107.50	110.65	
9920.00								No Emission
9920.00								Detected
12400.00								No Emission
12400.00								Detected
14880.00								No Emission
14880.00								Detected
17360.00								No Emission
17360.00								Detected
19840.00								No Emission
19840.00								Detected
22320.00								No Emission
22320.00								Detected
24800.00								No Emission
24800.00								Detected

FCC 15.247

SonoSim, Inc.
Needle & Syringe
Model: 100-2040

Date: 08/23/2017
Lab: D
Tested By: Kyle Fujimoto

Harmonics - High Channel
Transmit Mode - X-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4960.00	55.50	H	73.97	-18.48	Peak	250.25	160.08	
4960.00	48.71	H	53.97	-5.26	Avg	250.25	160.08	
7440.00	56.58	H	73.97	-17.39	Peak	238.00	152.86	
7440.00	46.75	H	53.97	-7.22	Avg	238.00	152.86	
9920.00								No Emission
9920.00								Detected
12400.00								No Emission
12400.00								Detected
14880.00								No Emission
14880.00								Detected
17360.00								No Emission
17360.00								Detected
19840.00								No Emission
19840.00								Detected
22320.00								No Emission
22320.00								Detected
24800.00								No Emission
24800.00								Detected

FCC 15.247SonoSim, Inc.
Needle & Syringe
Model: 100-2040Date: 08/23/2017
Lab: D
Tested By: Kyle Fujimoto**Harmonics - High Channel**
Transmit Mode - Y-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4960.00	47.54	H	73.97	-26.43	Peak	17.25	105.52	
4960.00	37.74	H	53.97	-16.23	Avg	17.25	105.52	
7440.00	51.89	H	73.97	-22.09	Peak	0.00	175.37	
7440.00	42.97	H	53.97	-11.00	Avg	0.00	175.37	
9920.00								No Emission
9920.00								Detected
12400.00								No Emission
12400.00								Detected
14880.00								No Emission
14880.00								Detected
17360.00								No Emission
17360.00								Detected
19840.00								No Emission
19840.00								Detected
22320.00								No Emission
22320.00								Detected
24800.00								No Emission
24800.00								Detected

FCC 15.247SonoSim, Inc.
Needle & Syringe
Model: 100-2040Date: 08/23/2017
Lab: D
Tested By: Kyle Fujimoto**Harmonics - High Channel**
Transmit Mode - Z-Axis

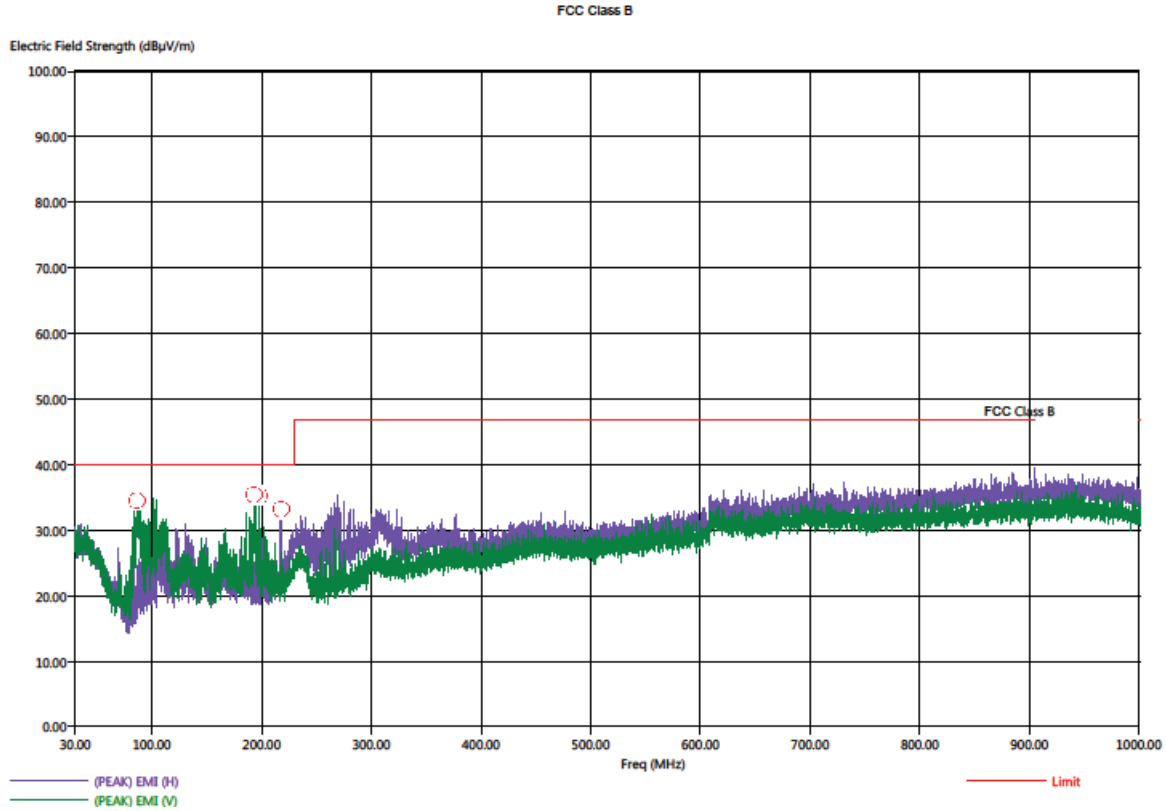
Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4960.00	52.51	H	73.97	-21.46	Peak	252.75	120.26	
4960.00	43.59	H	53.97	-10.38	Avg	252.75	120.26	
7440.00	56.19	H	73.97	-17.79	Peak	109.50	183.19	
7440.00	47.29	H	53.97	-6.68	Avg	109.50	183.19	
9920.00								No Emission
9920.00								Detected
12400.00								No Emission
12400.00								Detected
14880.00								No Emission
14880.00								Detected
17360.00								No Emission
17360.00								Detected
19840.00								No Emission
19840.00								Detected
22320.00								No Emission
22320.00								Detected
24800.00								No Emission
24800.00								Detected

FCC Class B and FCC 15.247SonoSim, Inc.
Needle & Syringe
Model: 100-2040Date: 08/23/2017
Lab: D
Tested By: Kyle Fujimoto**Non Harmonic Emissions from the Tx and Digital Portion - 9 kHz to 30 MHz****Non Harmonic Emissions from the Tx and Digital Portion - 1 GHz to 25 GHz**

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
								No Emissions Detected from 9 kHz to 30 MHz for the digital portion of the EUT
								No Emissions Detected from 9 kHz to 30 MHz for the Non-Harmonic Emissions of the Transmitter for the EUT
								No Emissions Detected from 1 GHz to 25 GHz for the digital portion of the EUT
								No Emissions Detected from 1 GHz to 25 GHz for the Non-Harmonic Emissions of the Transmitter for the EUT
								Investigated in the X-Axis, Y-Axis, and Z-Axis

Title: Pre-Scan - FCC Class B
File: 5 - Agilent - Pre-Scan - EN 55022 Class B - 30 MHz to 1000 MHz - 08-24-2017.set
Operator: Kyle Haag
EUT Type: Needle & Syringe
EUT Condition: The EUT was communicating with its proprietary program.
Comments: Company: SonoSim Inc.
Model: 100-2040
S/N: Sequential

8/24/2017 3:50:57 PM
Sequence: Preliminary Scan



Title: Radiated Final -FCC Class B
File: 5 - Agilent - Final Scan - EN 55022 Class B - 30 MHz to 1000 MHz - 08-24-2017.set
Operator: Kyle Haag
EUT Type: Needle & Syringe
EUT Condition: The EUT was communicating with its proprietary program.
Comments: Company: SonoSim Inc.
Model: 100-2040
S/N: Sequential

8/24/2017 4:01:38 PM
Sequence: Final Measurements

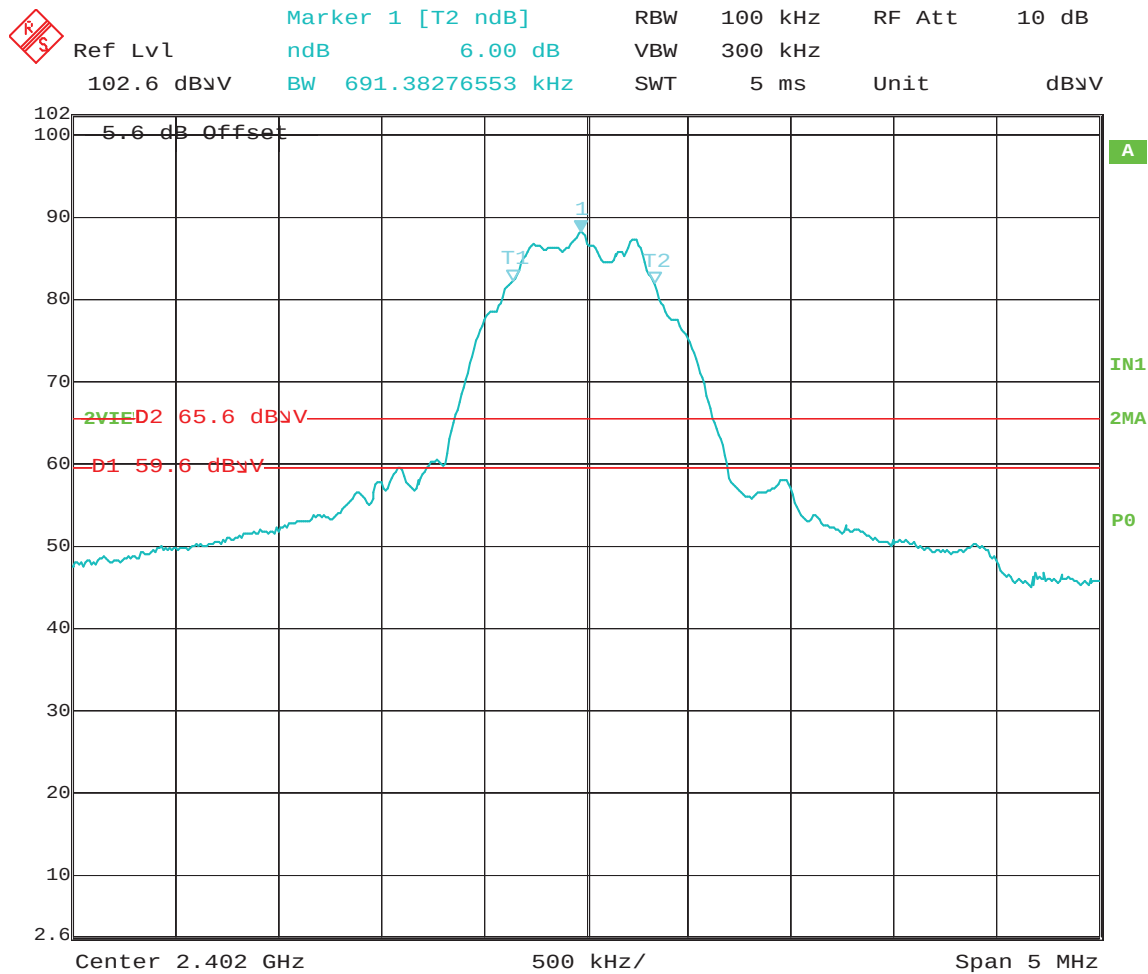
FCC Class B

Freq (MHz)	Pol	(PEAK) EMI (dBμV/m)	(QP) BMI (dBμV/m)	(PEAK) Margin (dB)	(QP) Margin (dB)	Limit (dBμV/m)	Transducer (dB)	Cable (dB)	Ttbl Aql (dca)	Twr Ht (cm)
85.90	V	38.70	32.65	-1.30	-7.35	40.00	12.38	0.70	140.25	111.37
88.00	V	37.88	32.42	-2.12	-7.58	40.00	12.70	0.70	133.00	286.59
88.50	V	41.45	35.80	1.45	-4.20	40.00	12.82	0.70	121.00	159.13
89.30	V	33.33	28.24	-6.67	-11.76	40.00	12.97	0.70	126.25	175.25
192.60	V	34.30	26.27	-5.70	-13.73	40.00	14.24	0.63	348.75	159.25
197.50	V	29.94	22.66	-10.06	-17.34	40.00	14.14	0.61	199.00	254.89
217.40	H	32.33	26.41	-7.67	-13.59	40.00	14.55	0.86	228.75	190.95



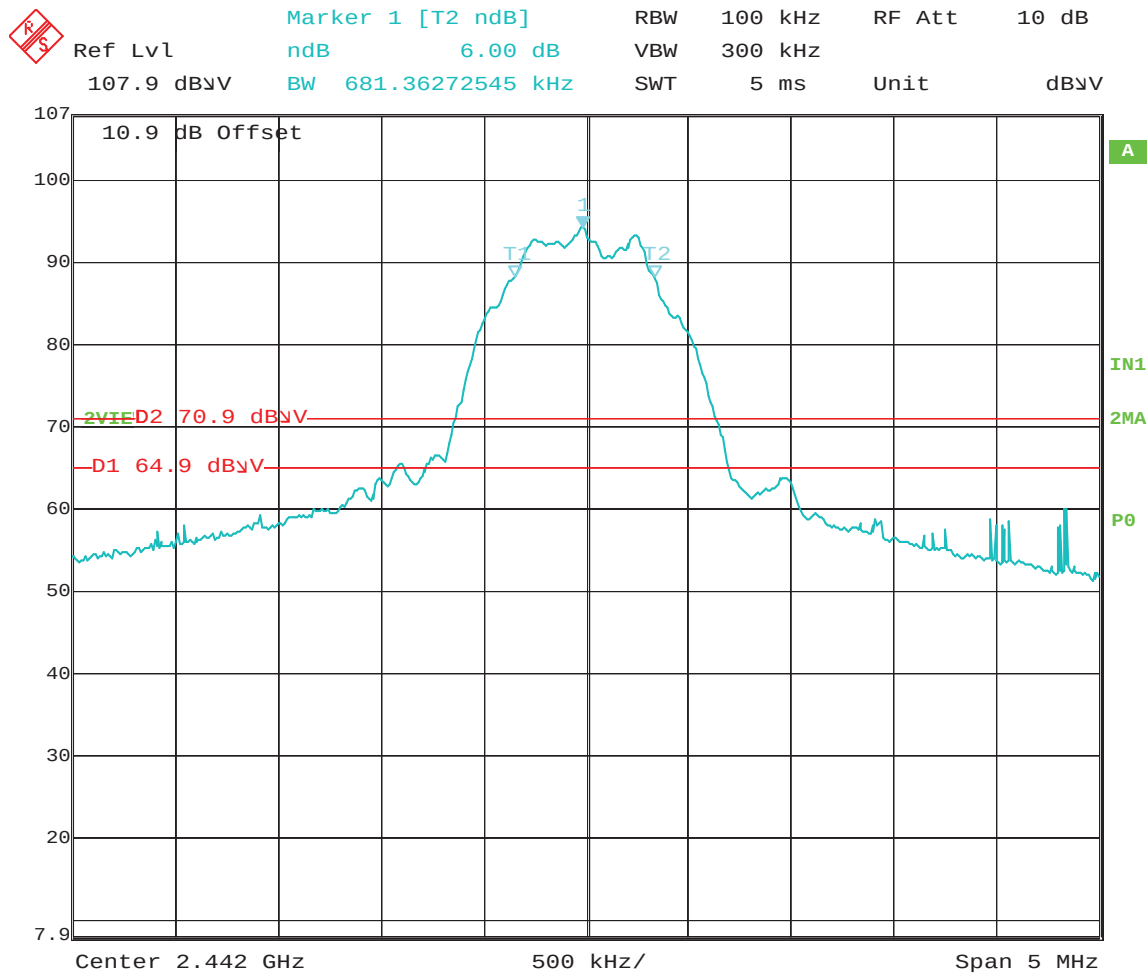
-6 dB BANDWIDTH

DATA SHEETS



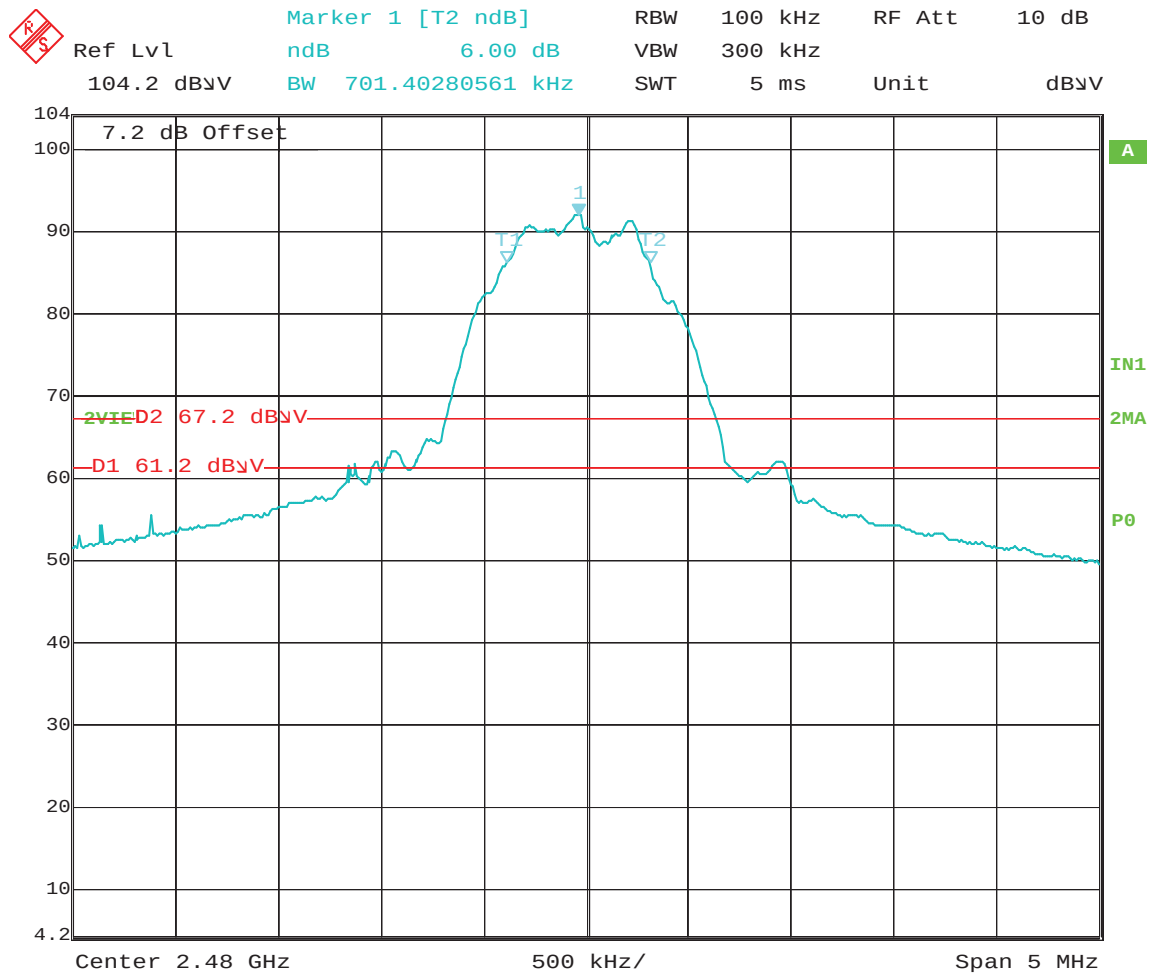
Date: 29.AUG.2017 15:02:06

-6 dB Bandwidth – Low Channel



Date: 29.AUG.2017 15:04:41

-6 dB Bandwidth – Middle Channel



Date: 29.AUG.2017 15:07:36

-6 dB Bandwidth – High Channel

SPECTRAL DENSITY OUTPUT

DATA SHEETS

FCC 15.247

SonoSim, Inc.
 LS Needle/Syringe
 Model: 100-2040

Date: 08/22/2017
 Lab: D
 Tested By: Kyle Fujimoto

Setting = 0 dBm
Spectral Density Output

Freq. (MHz)	Level (dBuV/m)	Level (V/m)	Antenna Gain (dBi)	Numeric Gain	Spectral Density (Watts)	Spectral Density (mW)	Spectral Density (dBm)	Comments
2402	67.51	0.0023741	1.1	1.28825	1.313E-06	0.001313	-28.8188	Vert X-Axis
2442	64.61	0.0017002	1.1	1.28825	6.732E-07	0.000673	-31.7188	Vert X-Axis
2480	67.84	0.002466	1.1	1.28825	1.416E-06	0.001416	-28.4888	Vert X-Axis
2402	72.79	0.0043601	1.1	1.28825	4.427E-06	0.004427	-23.5388	Vert Y-Axis
2442	72.78	0.0043551	1.1	1.28825	4.417E-06	0.004417	-23.5488	Vert Y-Axis
2480	72.77	0.0043501	1.1	1.28825	4.407E-06	0.004407	-23.5588	Vert Y-Axis
2402	70.71	0.0034316	1.1	1.28825	2.742E-06	0.002742	-25.62	Vert. Z-Axis
2442	59.16	0.0009078	1.1	1.28825	1.919E-07	0.000192	-37.17	Vert. Z-Axis
2480	68.59	0.0026884	1.1	1.28825	1.683E-06	0.001683	-27.74	Vert. Z-Axis
2402	74.09	0.0050641	1.1	1.28825	5.972E-06	0.005972	-22.24	Horiz. X-Axis
2442	77.29	0.0073198	1.1	1.28825	1.248E-05	0.012477	-19.04	Horiz. X-Axis
2480	74.87	0.0055399	1.1	1.28825	7.147E-06	0.007147	-21.46	Horiz. X-Axis
2402	67.89	0.0024803	1.1	1.28825	1.433E-06	0.001433	-28.44	Horiz. Y-Axis
2442	67.00	0.0022387	1.1	1.28825	1.167E-06	0.001167	-29.33	Horiz. Y-Axis
2480	69.50	0.0029854	1.1	1.28825	2.075E-06	0.002075	-26.83	Horiz. Y-Axis
2402	70.91	0.0035116	1.1	1.28825	2.872E-06	0.002872	-25.42	Horiz. Z-Axis
2442	74.20	0.0051286	1.1	1.28825	6.125E-06	0.006125	-22.13	Horiz. Z-Axis
2480	73.05	0.0044926	1.1	1.28825	4.7E-06	0.0047	-23.28	Horiz. Z-Axis

Level in dBuV obtained by maximizing fundamental emission then setting the EMI Receiver to
 RBW = 3 kHz, VBW = 10 kHz, Span = 1.5 * DTS BW, Sweep Time = Auto

The Power in Watts is obtained by the following Formula Below:

$$P = [(E \cdot D)^2] / (30 \cdot G)$$

P = Power in Watts

E = The Measured Maximum Field Strength in V/m

G = The Numeric Gain of the Transmitting Antenna over an Isotropic Radiator

PEAK POWER

DATA SHEETS

FCC 15.247

SonoSim, Inc.
LS Needle/Syringe
Model: 100-2040

Date: 08/22/2017
Lab: D
Tested By: Kyle Fujimoto

Setting = 0 dBm
Peak Output Power

Freq. (MHz)	Level (dBuV/m)	Level (V/m)	Antenna Gain (dBi)	Numeric Gain	Power Output (Watts)	Power Output (mW)	Power Output (dBm)	Comments
2402.00	84.95	0.017680722	1.1	1.28825	0.00007280	0.07280	-11.38	Vert. X-Axis
2442.00	84.93	0.017640058	1.1	1.28825	0.00007246	0.07246	-11.40	Vert. X-Axis
2480.00	88.78	0.027478942	1.1	1.28825	0.00017584	0.17584	-7.55	Vert. X-Axis
2402.00	89.99	0.03158639	1.1	1.28825	0.00023234	0.23234	-6.34	Vert. Y-Axis
2442.00	89.56	0.030060763	1.1	1.28825	0.00021044	0.21044	-6.77	Vert. Y-Axis
2480.00	91.61	0.038062736	1.1	1.28825	0.00033738	0.33738	-4.72	Vert. Y-Axis
2402.00	88.03	0.025205772	1.1	1.28825	0.00014795	0.14795	-8.30	Vert. Z-Axis
2442.00	75.89	0.006230171	1.1	1.28825	0.00000904	0.00904	-20.44	Vert. Z-Axis
2480.00	84.83	0.017438134	1.1	1.28825	0.00007081	0.07081	-11.50	Vert. Z-Axis
2402.00	91.55	0.037800714	1.1	1.28825	0.00033275	0.33275	-4.78	Horiz. X-Axis
2442.00	94.07	0.050524264	1.1	1.28825	0.00059446	0.59446	-2.26	Horiz. X-Axis
2480.00	91.16	0.036140986	1.1	1.28825	0.00030417	0.30417	-5.17	Horiz. X-Axis
2402.00	85.23	0.018259967	1.1	1.28825	0.00007765	0.07765	-11.10	Horiz. Y-Axis
2442.00	83.62	0.015170504	1.1	1.28825	0.00005359	0.05359	-12.71	Horiz. Y-Axis
2480.00	86.86	0.022029265	1.1	1.28825	0.00011301	0.11301	-9.47	Horiz. Y-Axis
2402.00	88.95	0.028022056	1.1	1.28825	0.00018286	0.18286	-7.38	Horiz. Z-Axis
2442.00	90.97	0.035359002	1.1	1.28825	0.00029115	0.29115	-5.36	Horiz. Z-Axis
2480.00	92.67	0.043003123	1.1	1.28825	0.00043065	0.43065	-3.66	Horiz. Z-Axis

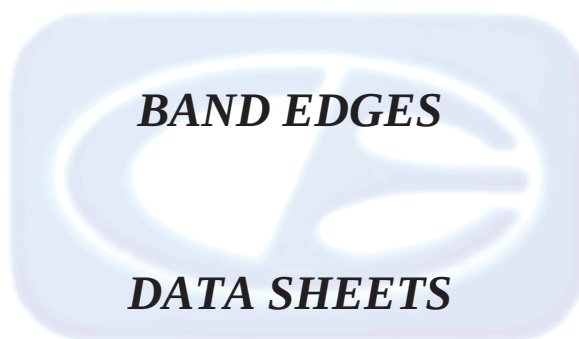
The Power in Watts is obtained by the following Formula Below:

$$P = [(E \cdot D)^2] / (30 \cdot G)$$

P = Power in Watts

E = The Measured Maximum Field Strength in V/m

G = The Numeric Gain of the Transmitting Antenna over an Isotropic Radiator

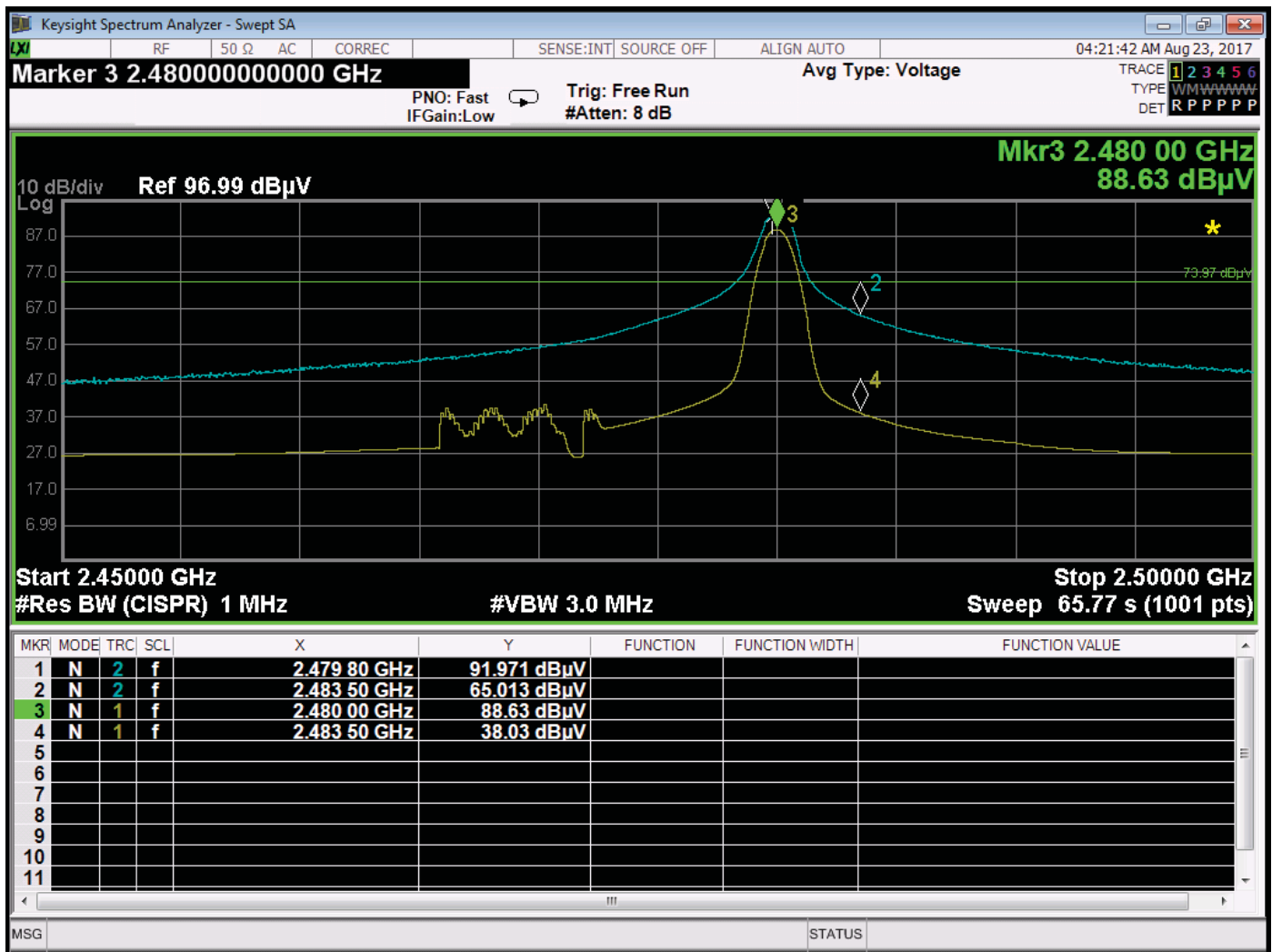


FCC 15.247SonoSim, Inc.
Needle & Syringe
Model: 100-2040Date: 08/22/2017
Lab: D
Tested By: Kyle Fujimoto**Band Edges**

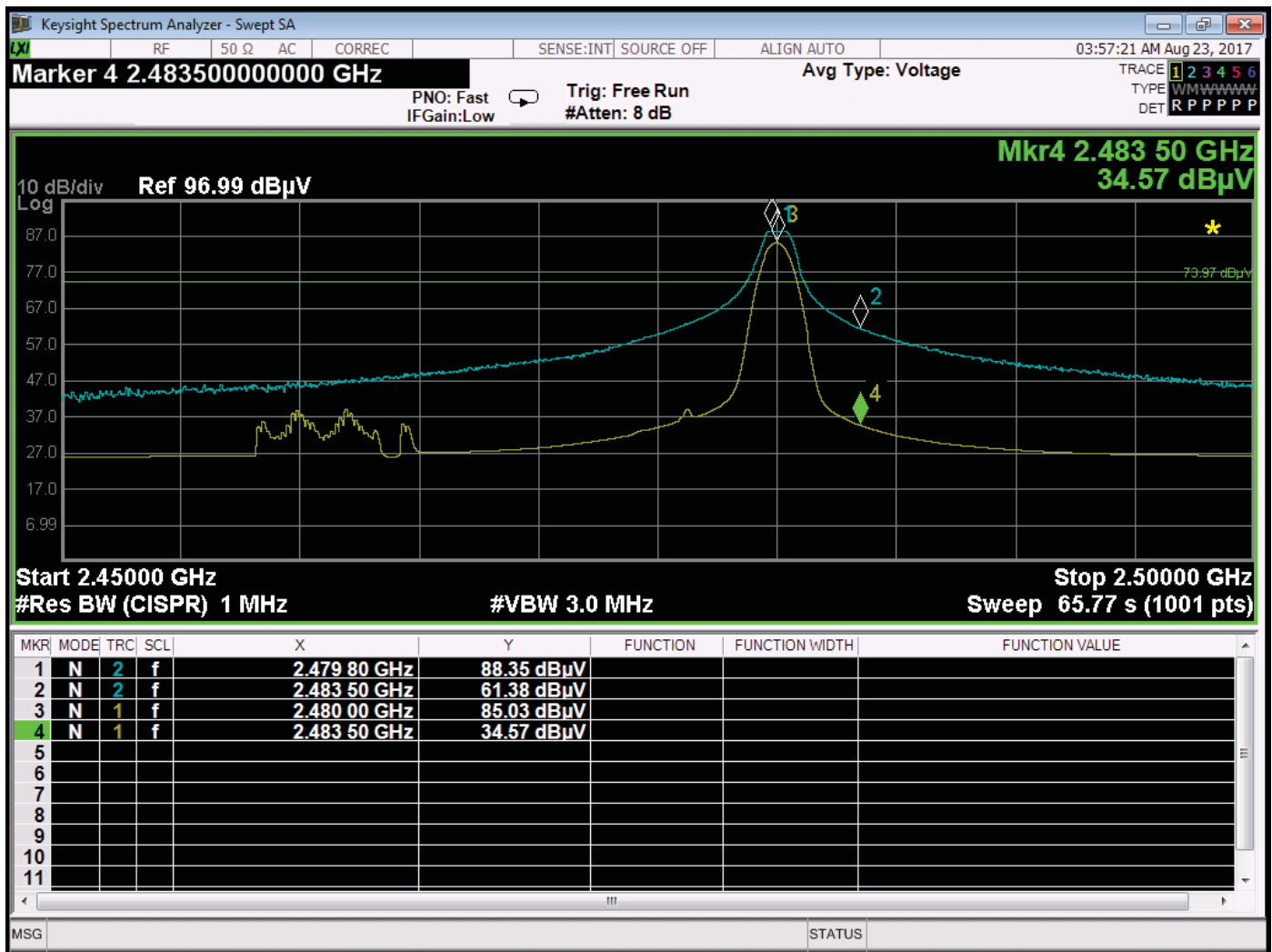
Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
2402.00	90.82	H	--	--	Peak	292.25	161.22	Fundamental - Low Ch.
2402.00	86.79	H	--	--	Avg	292.25	161.22	X-Axis - Worst Case
2390.00	53.06	H	73.97	-20.91	Peak	292.25	161.22	Band Edge
2390.00	28.54	H	53.97	-25.43	Avg	292.25	161.22	X-Axis - Worst Case
2402.00	89.52	V	--	--	Peak	269.50	193.70	Fundamental - Low Ch.
2402.00	86.26	V	--	--	Avg	269.50	193.70	X-Axis - Worst Case
2390.00	51.41	V	73.97	-22.56	Peak	269.50	193.70	Band Edge
2390.00	27.77	V	53.97	-26.20	Avg	269.50	193.70	X-Axis - Worst Case

FCC 15.247SonoSim, Inc.
Needle & Syringe
Model: 100-2040Date: 08/22/2017
Lab: D
Tested By: Kyle Fujimoto**Band Edges**

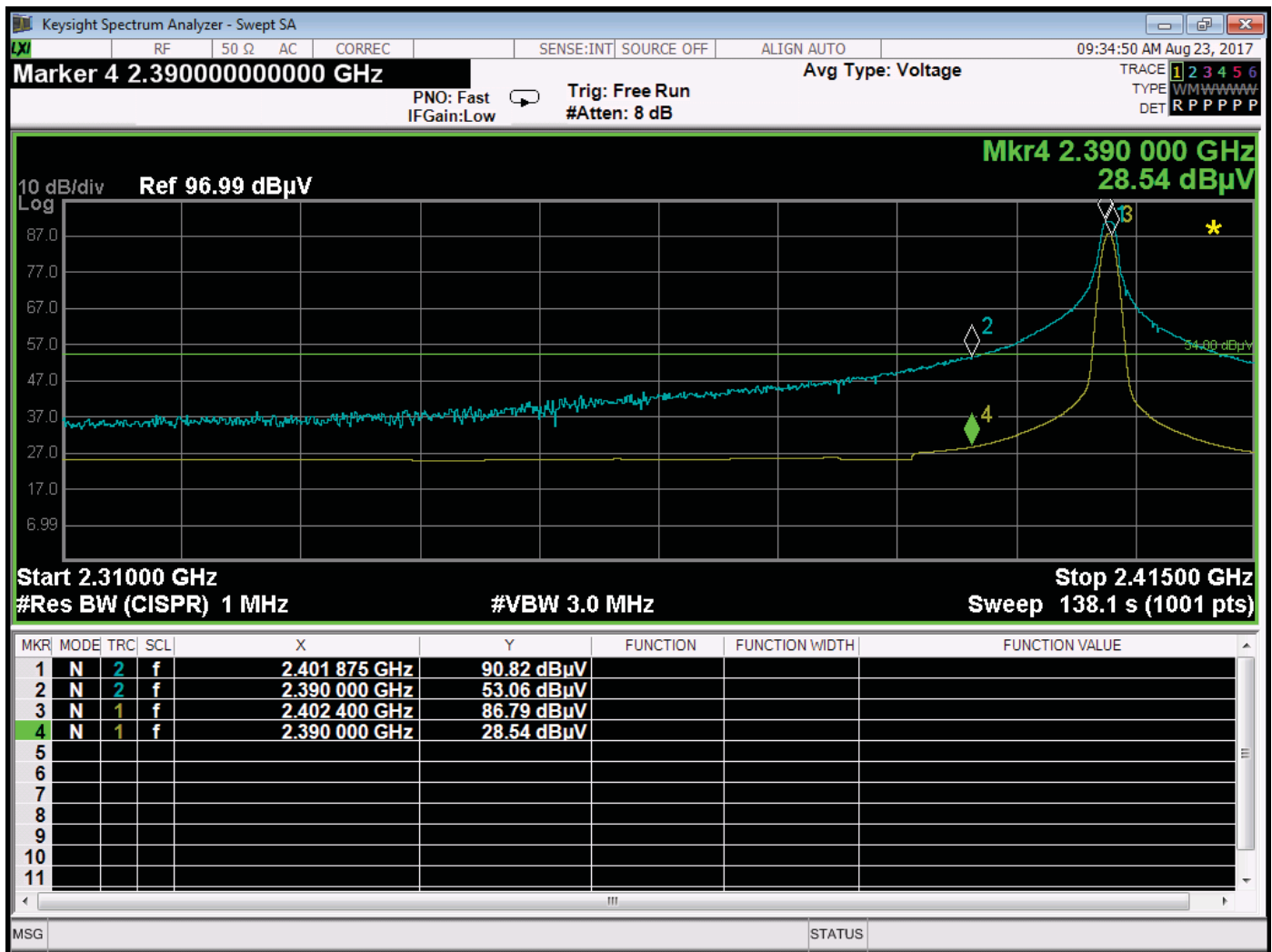
Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
2480.00	91.97	H	--	--	Peak	221.50	132.98	Fundamental - High Ch.
2480.00	88.63	H	--	--	Avg	221.50	132.98	Y-Axis - Worst Case
2483.50	65.01	H	73.97	-8.96	Peak	221.50	132.98	Band Edge
2483.50	38.03	H	53.97	-15.94	Avg	221.50	132.98	Y-Axis - Worst Case
2480.00	88.35	V	--	--	Peak	154.25	120.92	Fundamental - High Ch.
2480.00	85.03	V	--	--	Avg	154.25	120.92	Y-Axis - Worst Case
2483.50	61.38	V	73.97	-12.59	Peak	154.25	120.92	Band Edge
2483.50	34.57	V	53.97	-19.40	Avg	154.25	120.92	Y-Axis - Worst Case



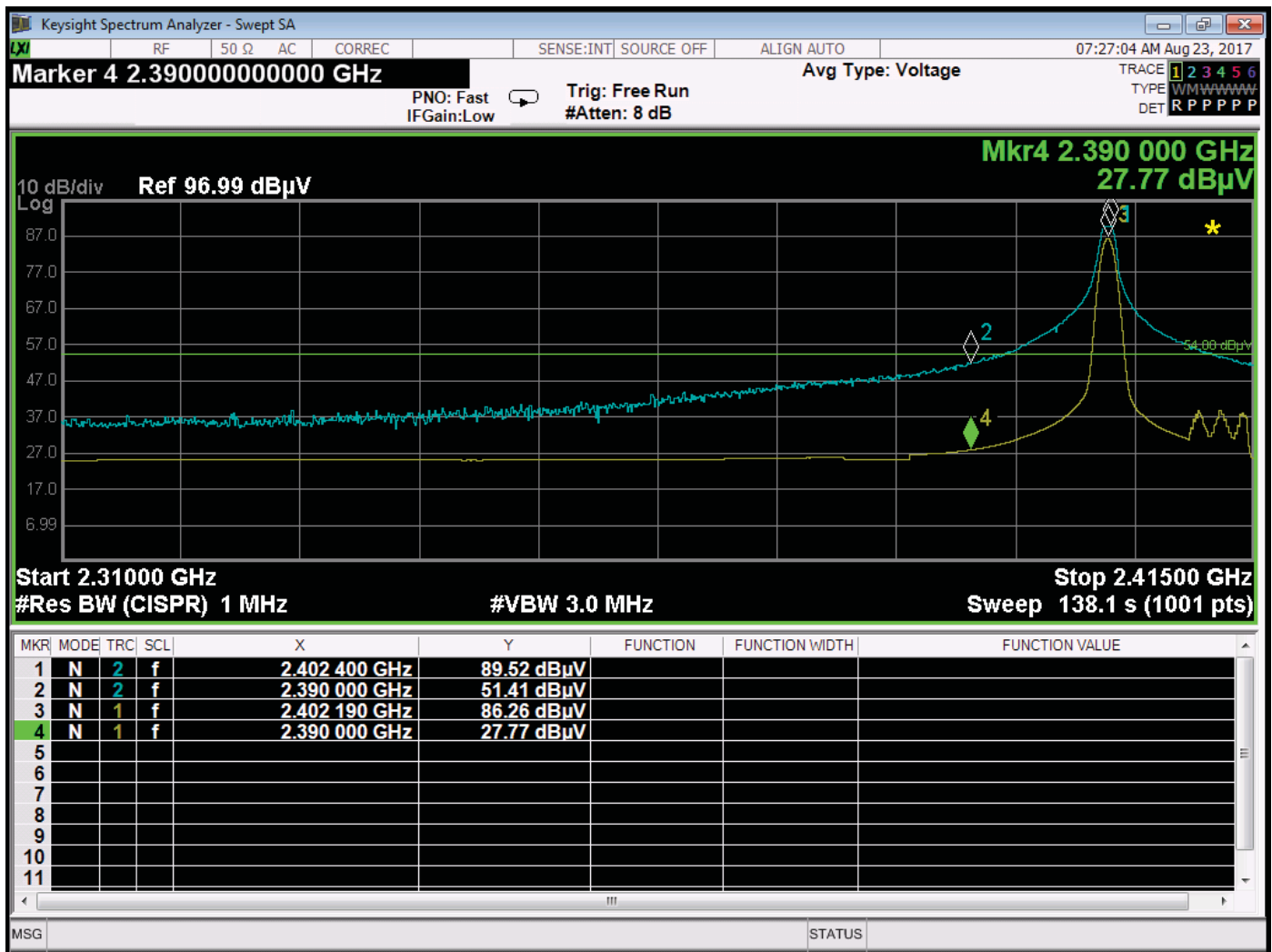
Band Edge – High Channel – Horizontal Polarization – Y-Axis – Worst Case



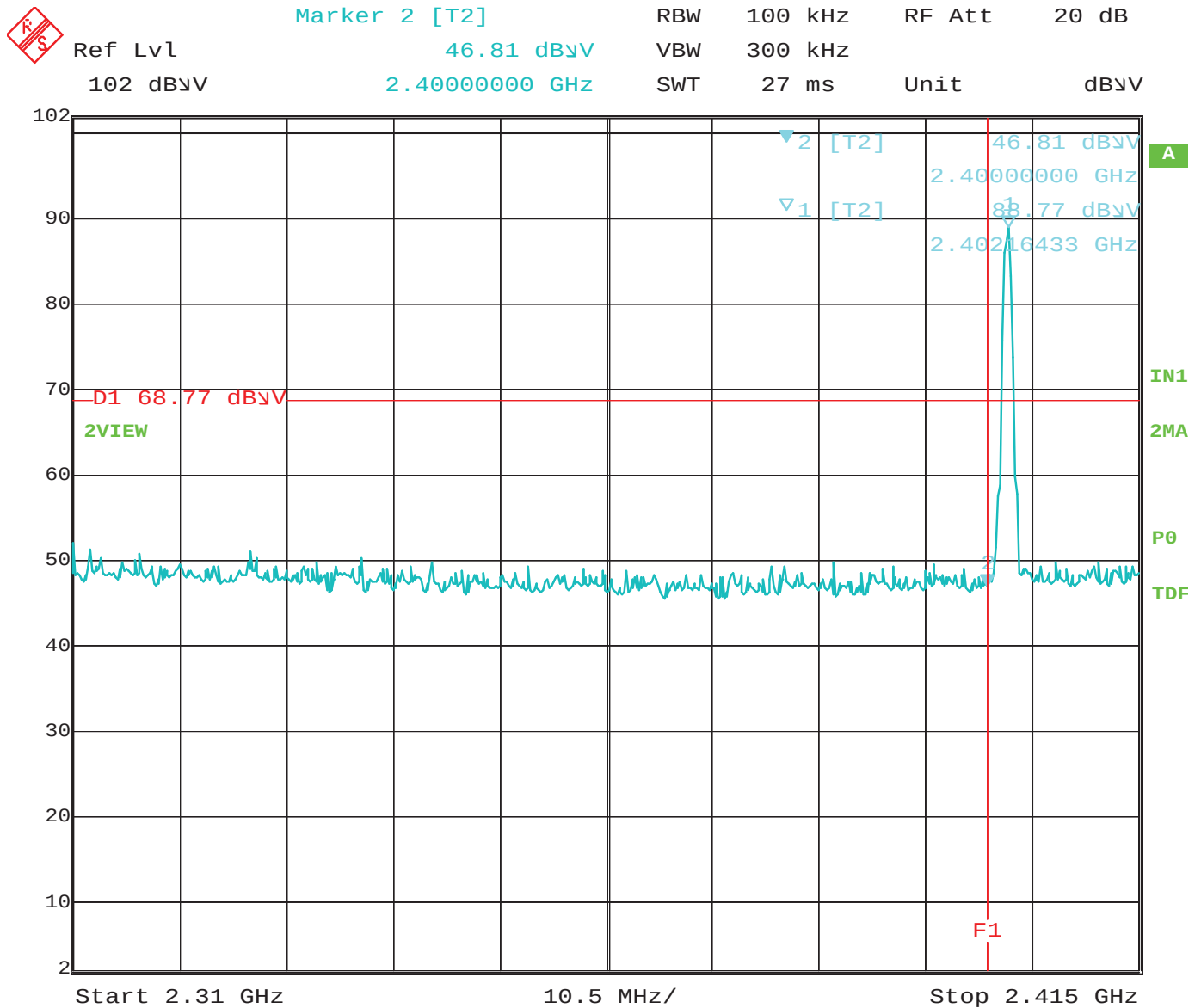
Band Edge – High Channel – Vertical Polarization – Y-Axis – Worst Case



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

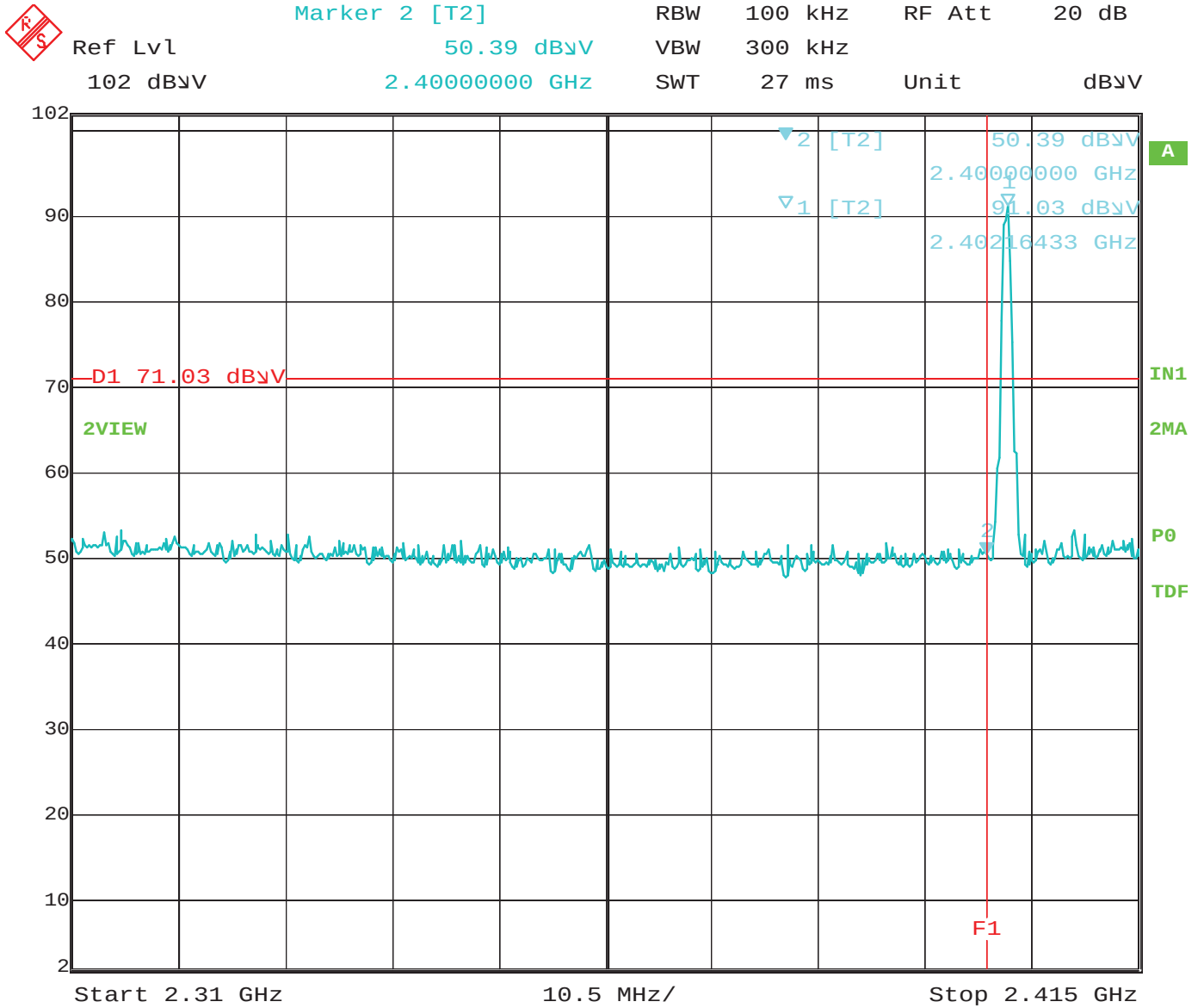


Band Edge – Low Channel– Vertical Polarization – X-Axis – Worst Case.



Date: 6.NOV.2017 14:14:44

Band Edge – 2400 MHz – Low Channel – Vertical Polarization – Y-Axis Worst Case



Date: 6.NOV.2017 14:13:21

Band Edge – 2400 MHz – Low Channel – Horizontal Polarization – X-Axis Worst Case