



166 South Carter, Genoa City, WI 53128

Company:	Dabir Surfaces
Model Tested:	C2-1001
Report Number:	24318
Project Number:	10097

Code of Federal Regulations 47 Part 15 – Radio Frequency Devices

Subpart C – Intentional Radiators

Section 15.225

Operation within the band 13.110 – 14.010 MHz

THE FOLLOWING **MEETS** THE ABOVE TEST SPECIFICATION

FCC ID: 2ACRH-110025

Formal Name:	Dabir Surfaces Gen II Controller
Kind of Equipment:	Pneumatic controller with a therapeutic surface / 13.56 MHz RFID
Frequency Range:	13.56 MHz
Test Configuration:	Table Top, Three orthogonal axis
Model Number(s):	C2-1001
Model(s) Tested:	C2-1001
Serial Number(s):	11190100016F
Date of Tests:	February 11-12, 2019
Test Conducted For:	Dabir Surfaces 447 W. Wilson Ave Harwood Heights, IL, 60706, USA

NOTICE: “This test report relates only to the items tested and must not be used by the client to claim product endorsement by NVLAP or any agency of the U.S. Government”. Please see the "Description of Test Sample" page listed inside of this report.

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Company:
Model Tested:
Report Number:
Project Number:

Dabir Surfaces
C2-1001
24318
10097

SIGNATURE PAGE

Tested By:

Craig Brandt
Senior Test Engineer

Reviewed By:

William Stumpf
OATS Manager

Approved By:

Brian Mattson
General Manager



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United States Department of Commerce
National Institute of Standards and Technology



Certificate of Accreditation to ISO/IEC 17025:2005

NVLAP LAB CODE: 100276-0

D.L.S. Electronic Systems, Inc.
Wheeling, IL

*Is accredited by the National Voluntary Laboratory Accreditation Program for specific services,
listed on the Scope of Accreditation, for:*

Electromagnetic Compatibility & Telecommunications

*This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005.
This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality
management system (refer to joint ISO-ILAC-IAF Communique dated January 2009).*

2018-09-19 through 2019-09-30
Effective Dates



For the National Voluntary Laboratory Accreditation Program

**ELECTROMAGNETIC
COMPATIBILITY &
TELECOMMUNICATIONS**

NVLAP LAB CODE 100276-0

Emissions

Designation

Off-site test location

Description

D.L.S. Electronics performs radiated emissions testing at an additional location, 166 South Carter Street, Genoa City, WI 53128.



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1.0 Summary of Test Report

It was determined that the Dabir Surfaces Gen II Controller, Model C2-1001 complies with the requirements of CFR 47 Part 15 Subpart C Section 15.225.

Subpart C Section 15.225 Applicable Technical Requirements Tested:

Section	Description	Procedure	Note	Compliant?
FCC 15.215(c)	20 dB Emission Bandwidth	ANSI C63.10-2013 Section 6.9.2	1	Yes
FCC 15.225 & 15.209	Radiated Emissions	ANSI C63.4-2014 & ANSI C63.10-2013	1	Yes
FCC 15.225(e)	Frequency Stability	ANSI C63.10-2013 Section 6.8	3	Yes
FCC 15.207	AC Line Conducted Emissions	ANSI C63.4-2014, ANSI C63.10-2013	2	Yes
FCC 15.31(e)	Supply Voltage Statement	N/A		Yes
15.203	Antenna Requirement Statement	N/A		Yes

Note 1: Radiated emission measurement.

Note 2: AC Line Conducted emission measurement.

Note 3: Tested using Near Field Probe as test fixture.

2.0 Introduction

During February 11-12, 2019 the Dabir Surfaces Gen II Controller, Model C2-1001, as provided from Dabir Surfaces was tested to the requirements of CFR 47 Part 15 Subpart C Section 15.225. To meet these requirements, the procedures contained within this report were performed by personnel of D.L.S Electronic Systems, Inc.



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3.0 Test Facilities

D.L.S. Electronic Systems, Inc. is a full service EMC/Safety Testing Laboratory accredited to ISO 17025. NVLAP Certificate and Scope can be viewed at <http://www.dlsemc.com/certificate>. Our facilities are registered with the FCC, ISED Canada, and VCCI.

Wisconsin Test Facility:

D.L.S. Electronic Systems, Inc.
166 S. Carter Street
Genoa City, Wisconsin 53128

Wheeling Test Facility:

D.L.S. Electronic Systems, Inc.
1250 Peterson Drive
Wheeling, IL 60090

FCC Registration #90531

4.0 Description of Test Sample

Description:

Dabir Surfaces system helps in preventing a creation of pressure ulcers for patients in hospitals and other healthcare facilities. The controller contains an air pump that delivers alternating inflation pressure to 2-zone therapeutic surface. An electronic circuit board controls the pump operation, surface pressure, and provides a user interface.

Software versions used: main PCB 255.01.44, UI PCB 0.2.12.

Type of Equipment / Frequency Range:

RFID / 13.56 MHz

Physical Dimensions of Equipment Under Test:

13 in. L x 5.5 in. W x 4 in. H

Power Source:

120 V 60 Hz AC mains.



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4.0 Description of Test Sample (continued)

Internal Frequencies:

Power supply: PFC 70 - 130 kHz, PWM 50 - 80 kHz

48 MHz, 27.12 MHz, 8 MHz, 32.768 kHz

Transmit / Receive Frequencies Used For Test Purpose:

13.56 MHz

Type of Modulation(s) / Antenna Type:

100% ASK, subcarrier load modulation / 51.6 Ohm PCB loop antenna

Description of Circuit Board(s) / Part Number:

Main controller PCBA	R02-0002-00021-D
User Interface PCBA	P33800X4Z

5.0 Test Equipment

A list of the equipment used can be found in the table below. All primary equipment was calibrated against known reference standards with a verified traceable path to NIST.

D.L.S. Wisconsin – AC Line Conducted (Screen Room)

Description	Manufacturer	Model Number	Serial Number	Frequency Range	Cal Dates	Cal Due Dates
Receiver	Narda	9010F	020WW40102	10 Hz - 50 MHz	4-12-18	4-12-19
LISN	Com-Power	LI-220A	192036	9 kHz – 30 MHz	8-23-18	8-23-19
Filter- High-Pass	Solar Electronics	7930-120	090702	120 kHz – 30 MHz	10-16-18	10-16-19
Limiter	Electro-Metrics	EM-7600	705	9 kHz – 30 MHz	10-16-18	10-16-19
Cable	Beldin	9914	CBL-043	9 kHz – 30 MHz	4-9-18	4-9-19
Cable	Manhattan/CDT	RG223/U	CBL-045	9 kHz – 30 MHz	4-9-18	4-9-19
Test Software	Narda	PMM Emission Suite	V2.1.7	N/A	N/A	N/A



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5.0 Test Equipment (continued)

RADIATED EMISSIONS TEST 9 kHz – 30 MHz (Site 2)

Description	Manufacturer	Model Number	Serial Number	Frequency Range	Cal Dates	Cal Due Dates
Receiver	Rohde & Schwarz	ESI 40	837808/006	20 Hz – 40 GHz	4-11-18	4-11-19
Loop Antenna	Electro-Metrics	6502	1027	9 kHz – 30 MHz	8-22-17	8-22-19
Cable	Beldin	9914	CBL-004	9 kHz – 1 GHz	11-8-18	11-8-19
Cable	Beldin	9273	CBL-028	9 kHz – 1 GHz	11-8-18	11-8-19
Cable	Manhattan/CDT	RG-223/U	CBL-051	9 kHz – 1 GHz	11-8-18	11-8-19
Test Software	Rohde & Schwarz	ESK-1	V1.7.1	N/A	N/A	N/A

RADIATED EMISSIONS TEST 30 – 1000 MHz (Site 2)

Description	Manufacturer	Model Number	Serial Number	Frequency Range	Cal Dates	Cal Due Dates
Receiver	Rohde & Schwarz	ESI 40	837808/006	20 Hz – 40 GHz	4-11-18	4-11-19
Preamplifier	Rohde & Schwarz	TS-PR10	032001/004	9 kHz – 1 GHz	11-8-18	11-8-19
Antenna	EMCO	3104C	9701-4785	20 MHz – 200 MHz	3-1-18	3-1-20
Antenna	Electro-Metrics	LPA-25	1205	200 MHz – 1 GHz	4-9-18	4-9-20
Cable	Beldin	9914	CBL-005	9 kHz – 1 GHz	11-8-18	11-8-19
Cable	Beldin	9273	CBL-028	9 kHz – 1 GHz	11-8-18	11-8-19
Cable	Manhattan/CDT	RG-223/U	CBL-051	9 kHz – 1 GHz	11-8-18	11-8-19
Test Software	Rohde & Schwarz	ESK-1	V1.7.1	N/A	N/A	N/A



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5.0 Test Equipment (continued)

Frequency Stability

Description	Manufacturer	Model Number	Serial Number	Range	Cal Dates	Cal Due Dates
Receiver	Rohde & Schwarz	ESI 40	837808/005	20 Hz – 40 GHz	4-12-18	4-12-19
Near Field Probe	EMCO	7405	9711-4024	9 kHz – 1 GHz	N/A	N/A
Temperature Chamber	Test Equity	1007C	R035716	-73° C to +175° C	N/A	N/A
Multimeter	Fluke	87V	98560141	N/A	7-6-18	7-6-19
Digital Thermometer	Tenma	72-2060	723662	-50 to + 130 deg C	1-9-19	1-9-20
Cable	Manhattan/CDT	RG-223/U	CBL-064	9 kHz – 1 GHz	5-7-18	5-7-19

6.0 Test Arrangements

Emissions Measurement Arrangement:

All radiated emission measurements were performed at D.L.S. Electronic Systems, Inc. and set up according to ANSI C63.10-2013 and ANSI C63.4-2014 unless otherwise noted. Description of procedures and measurements can be found in Section B – Measurement Data. See Section A for additional photos of the test set up. See Section C for Measurement Uncertainty.

Unless otherwise noted, the bandwidth of the measuring receiver / analyzer used during testing is shown below.

Frequency Range	Bandwidth (-6 dB)
10 to 150 kHz	200 Hz
150 kHz to 30 MHz	9 kHz
30 MHz to 1 GHz	120 kHz
Above 1 GHz	1 MHz



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7.0 Test Conditions

Normal Test Conditions:

Temperature and Humidity: 20° C at 25% R.H. or as noted on test data

Voltage: 120 Volts, 60 Hz

Extreme Test Conditions

Temperature range tested: -20° C to + 50° C

Voltages: 102 Volts, 138 Volts

8.0 Modifications Made To EUT For Compliance

None

9.0 Additional Descriptions

The EUT was in operational mode with an RFID tag in place. The was continuously transmitting during testing.

For radiated emissions, the EUT was tested in three orthogonal axis of rotation. Worst-case data is reported.



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10.0 FCC 15.31 (e) Supply Voltage Requirement statement

FCC 15.31 (e) - For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage.

Compliance Statement: This device complies with the requirements of Part 15.31(e):

- ☐ This device is battery operated. All tests were performed using a new (or fully charged) battery.
- ☒ This device provides a constant regulated voltage to the RF circuitry regardless of supply voltage (see schematic diagrams).
- ☐ This device does not provide a constant regulated voltage to the RF circuitry regardless of supply voltage. Data has been supplied in this test report that supports compliance. Details:

11.0 FCC 15.203 Antenna Requirement statement

SECTION 15.203 ANTENNA REQUIREMENT

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.... This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221.

Statement: This wireless device (Intentional Radiator) meets the requirements of FCC Part 15.203:

- ☒ The antenna is permanently attached.
- ☐ The antenna has a unique coupling to the intentional radiator.
Description of coupling:
- ☐ This intentional radiator is professionally installed.
- ☐ This intentional radiator, in accordance with Section 15.31(d), must be measured at the installation site.



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12.0 Results

Measurements were performed in accordance with ANSI C63.10-2013 and ANSI C63.4-2014. Graphical and tabular data can be found in Section B at the end of this report. Measurement Uncertainty can be found in Section C.

13.0 Conclusion

The Dabir Surfaces Gen II Controller, Model C2-1001, as provided from Dabir Surfaces tested during February 11-12, 2019 **meets** the requirements of CFR 47 Part 15 Subpart C Section 15.225.



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Section A – Test Photos

Photo Information and Test Setup:

Item 0:	Dabir Surfaces Gen II Controller
Item 1:	AC power cord; 4.5 meters long; unshielded
Item 2:	18" x 18" therapeutic surface (with RFID tag); Model: D2-101818-05-1L

Radiated Emissions – 30 MHz to 1000 MHz – Position 1 – Front



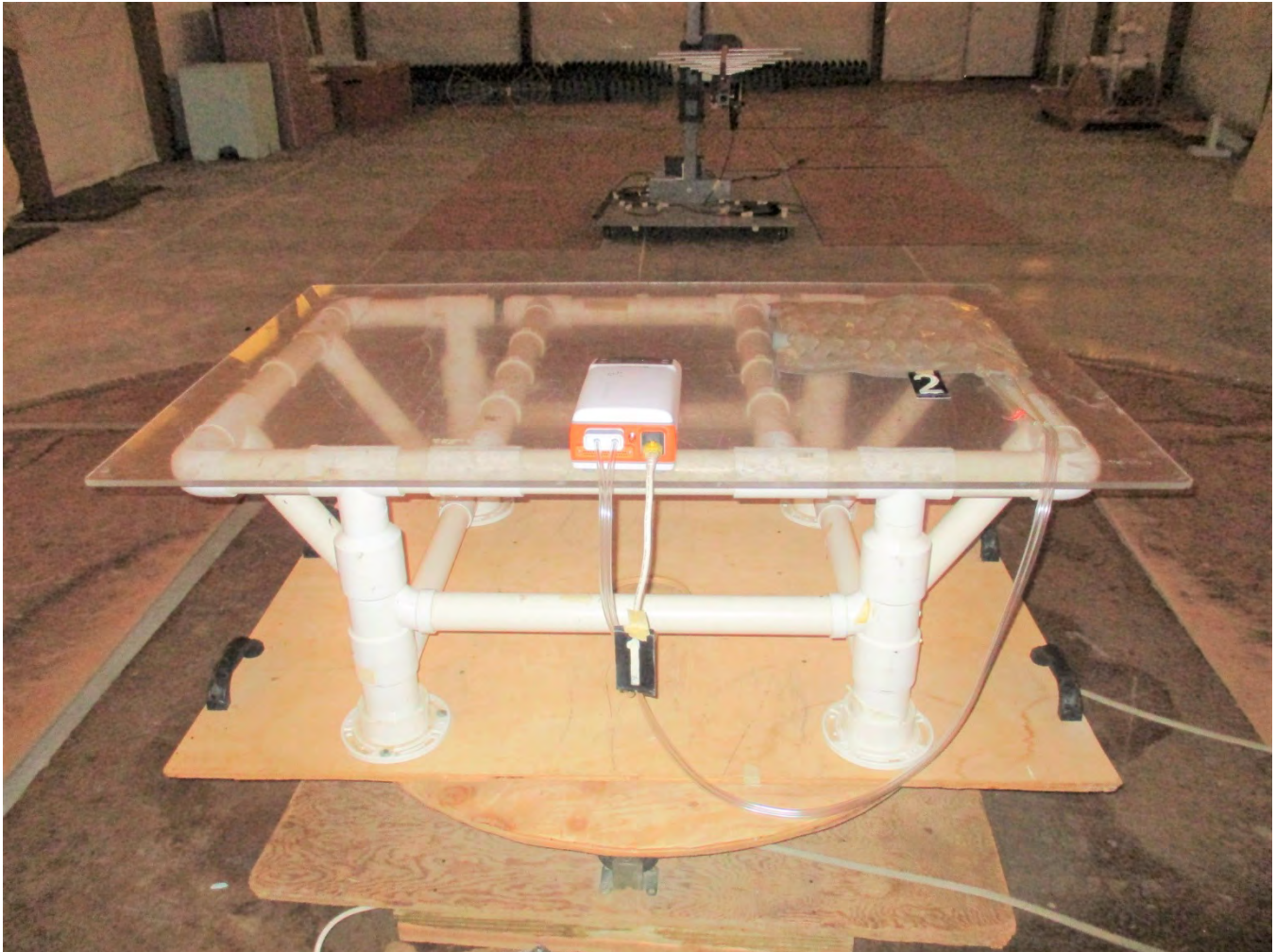


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Section A

Radiated Emissions – 30 MHz to 1000 MHz – Position 1 – Back



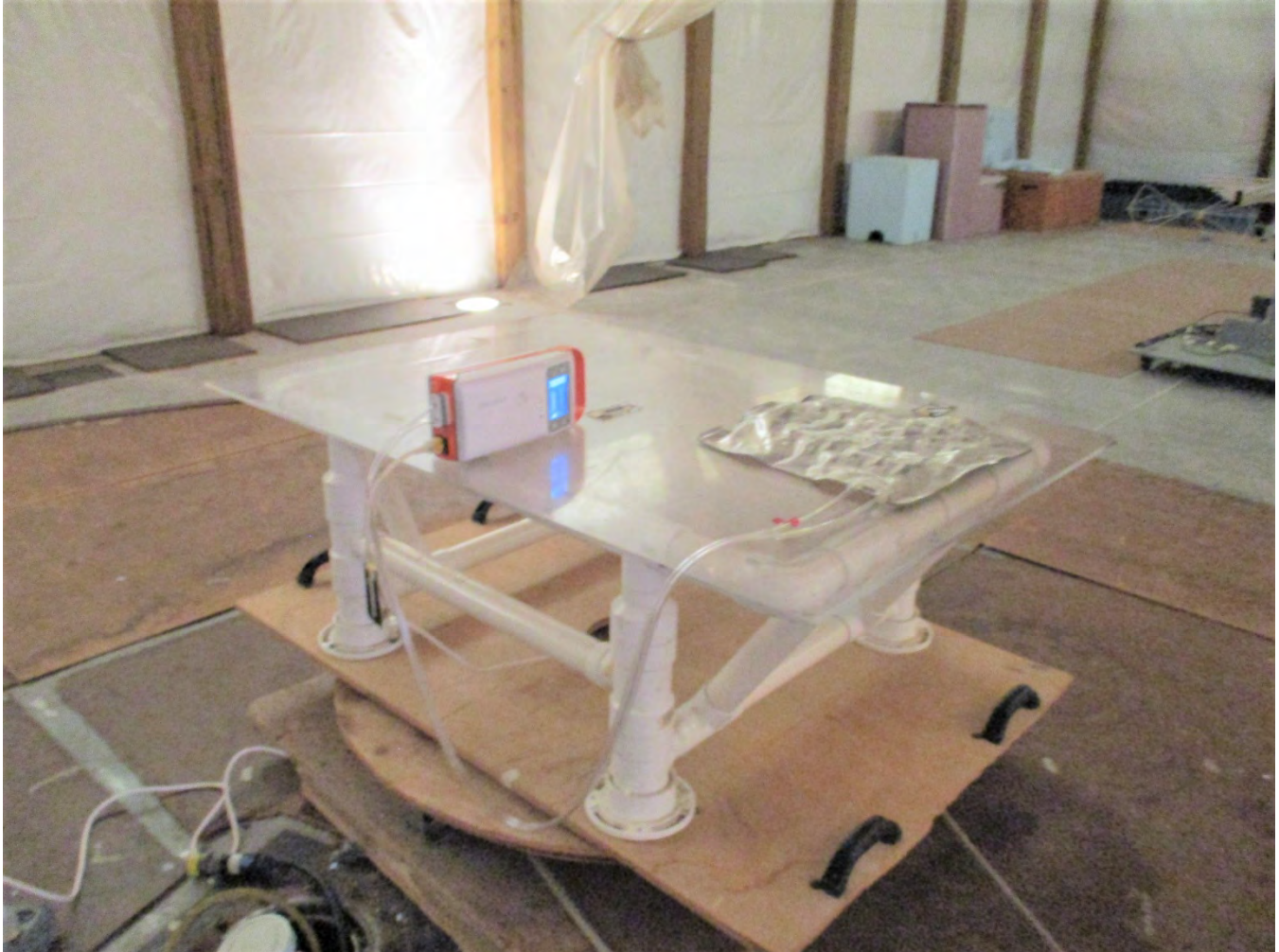


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Section A

Radiated Emissions – 30 MHz to 1000 MHz – Position 2





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Section A

Radiated Emissions – 30 MHz to 1000 MHz – Position 3 – Front





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Section A

Radiated Emissions – 9 kHz to 30 MHz – Position 1





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Section A

Radiated Emissions – 9 kHz to 30 MHz – Position 2





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Section A

Radiated Emissions – 9 kHz to 30 MHz – Position 3





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Section A

AC line conducted – Front





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Company:
Model Tested:
Report Number:
Project Number:

Dabir Surfaces
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Section A

AC line Conducted Emissions – Back





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Company:	Dabir Surfaces
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Section A

Frequency Stability - In Temperature Chamber





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Section B – Measurement Data

B1.0 20 dB Emission Bandwidth

Rule Part: FCC 15.215(c)

Test Procedure: ANSI C63.10:2013 Section 6.9.2

Limits: 20 dB bandwidth must be contained within the 13.110 - 14.010 MHz band

Results: Compliant

Sample Equations: N/A

Notes: The EUT was set to transmit continuously with an RFID tag (located in Air Pad connector) in place.



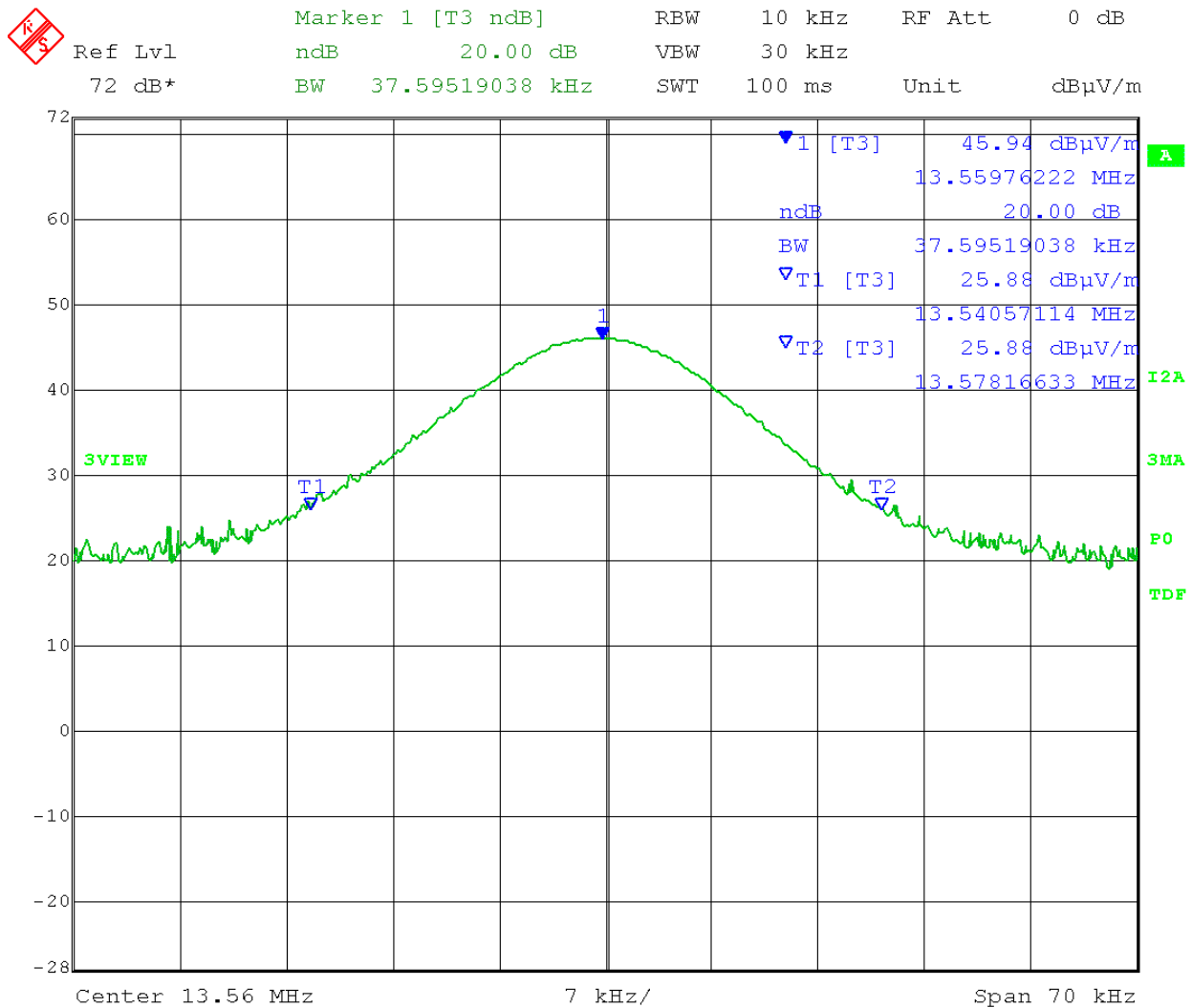
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Company: Dabir Surfaces
Model Tested: C2-1001
Report Number: 24318
Project Number: 10097

Test Date: 02-11-2019
Company: Dabir Surfaces
EUT: Dabir Patient Support System REV 2 Design
Test: 20 dB Bandwidth
Operator: Craig B
Comment: Frequency: 13.56 MHz
Test distance: 10 meters

20 dB Bandwidth = 37.6 kHz

NOTE: The RBW setting was 10 kHz because a value between 1% and 3% of OBW could not be achieved due to the carrier being more than 20 dB above the modulation products.



Date: 11.FEB.2019 09:14:16



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Section B

B2.0 Radiated Emissions

Rule Part: FCC Part 15.225 and FCC Part 15.209

Test Procedure: ANSI C63.10-2013

Limits: 15,848 $\mu\text{V/m}$ at 30 meters: 13.553-13.567 MHz
334 $\mu\text{V/m}$ at 30 meters: 13.410-13.553 & 13.567-13.710 MHz
106 $\mu\text{V/m}$ at 30 meters: 13.110-13.410 & 13.710-14.010 MHz
15.209 general emission limits: outside 13.110-14.010 MHz

Results: Compliant

Sample Equations: Limit at 10 meters:
Fundamental limit at 30 meters = 15,848 $\mu\text{V/m}$
 $20 \text{ Log } (15,848) = 84 \text{ dB}\mu\text{V/m}$ at 30 meters
Using a 40 dB/decade distance extrapolation factor as per Part 15.31(f)(2):
 $40 \text{ Log } (30 \text{ m} / 10 \text{ m}) = 19.08 \text{ dB}$
 $84 \text{ dB}\mu\text{V/m} + 19.08 \text{ dB} = \mathbf{103.08 \text{ dB}\mu\text{V/m}}$ at 10 meter distance

Notes: The EUT was set to transmit continuously with an RFID tag (located in Air Pad connector) in place.

Field Strength measurements were taken at a distance of 10 meters from 9 kHz to 30 MHz, and a distance of 3 meters from 30 MHz to 1000 MHz.

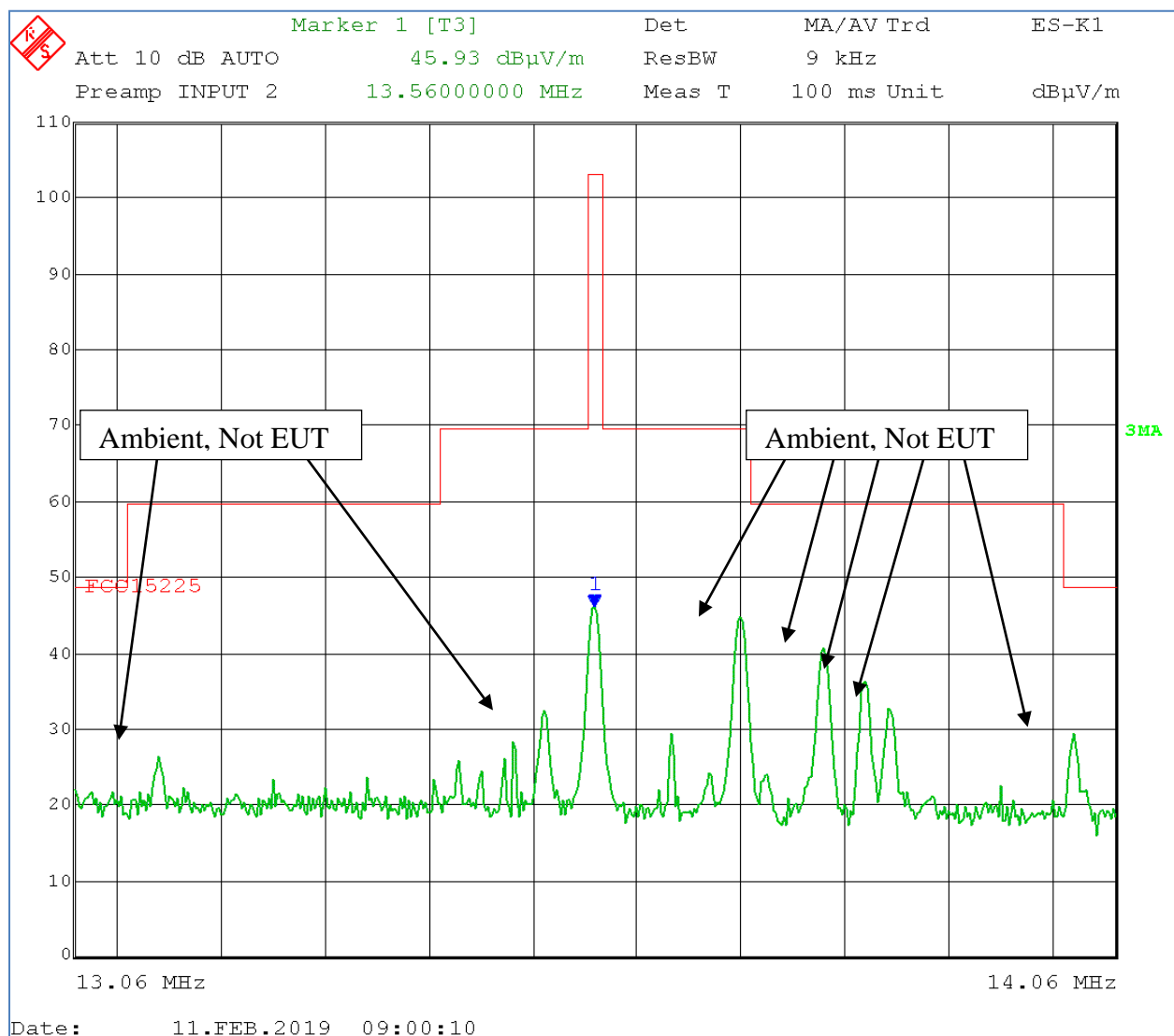


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B2.1 Emissions Mask

Test Date: 02-11-2019
Company: Dabir Surfaces
EUT: Dabir Patient Support System REV 2 Design
Test: Emission Mask – Radiated; Peak
Operator: Craig B
Comment: Frequency: 13.56 MHz
Test distance: 10 meters



Electric Field Strength

EUT: Dabir Patient Support System REV 2 Design
Manufacturer: Dabir Surfaces
Operating Condition: 64 deg F ; 25% R.H.
Test Site: D.L.S. O.F. Site 2
Operator: Craig B #10097
Test Specification: Radiated emissions
Comment: Continuous Transmit at 13.56 MHz
Date: 02-11-2019

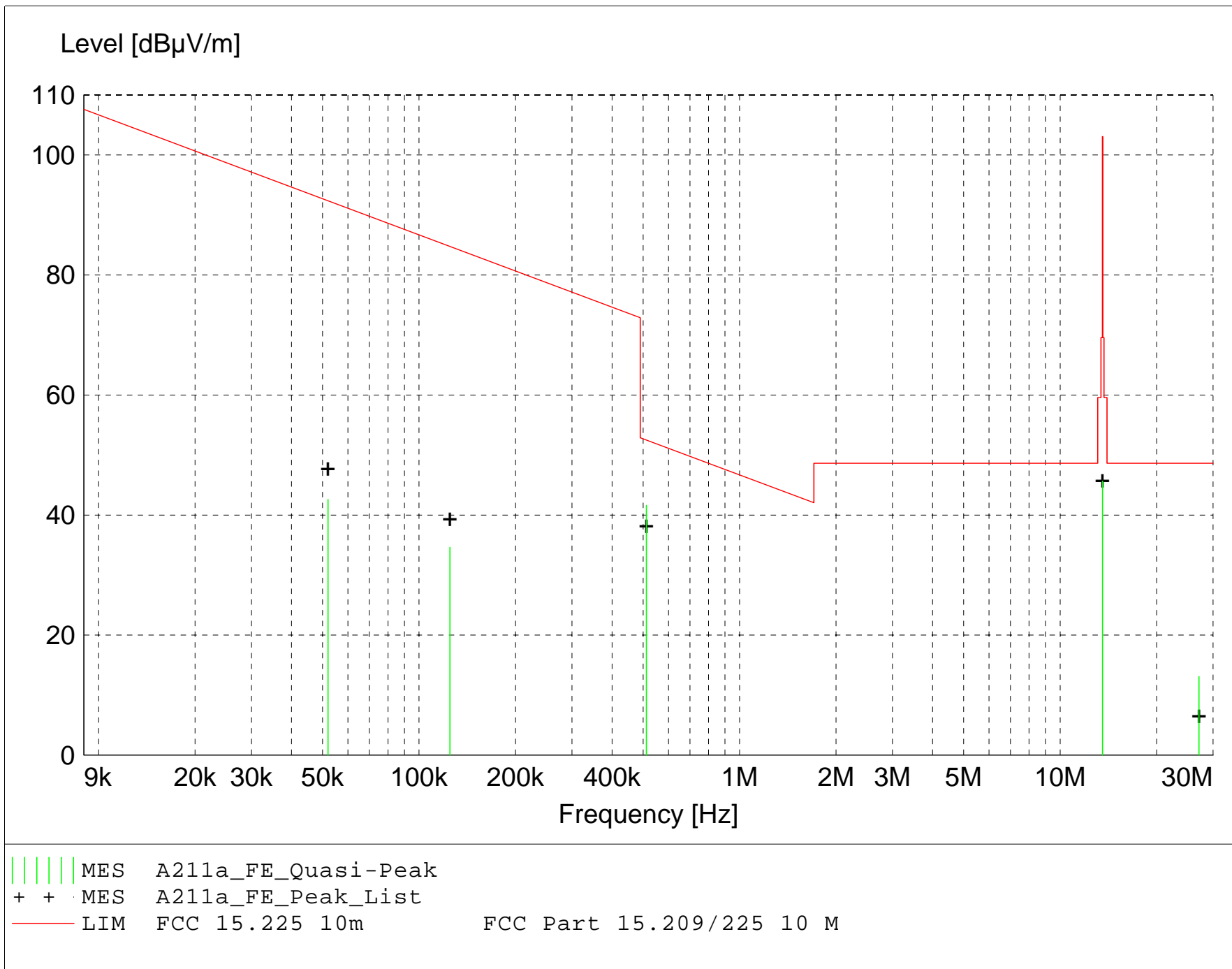
TEXT: "E-Field 10 meters"

Short Description: E-Field

Test Set-up: EUT Measured at 10 Meters with Active Loop Antenna

Sample Equations:
$$\begin{array}{rclcl} \text{Total Level(dB}\mu\text{V/m)} & = & \text{Level(dB}\mu\text{V)} & + & \text{System Loss(dB)} & + & \text{Antenna Factor(dB}\mu\text{V/m)} \\ 24.6 & & = & 35.51 & + & (-22.1) & + & 11.20 \end{array}$$
$$\begin{array}{rcl} \text{Margin(dB)} & = & \text{Limit(dB}\mu\text{V/m)} - \text{Total Level(dB}\mu\text{V/m)} \\ 15.4 & = & 40 - 24.6 \end{array}$$

Graph Markers: + Frequency marker (Level of marker not related to final level)
| Final maximized level using Quasi-Peak detector
X Final maximized level using Average detector
Final maximized level using Peak detector



MEASUREMENT RESULT: "A211a_FE_Final"

2/11/2019 9:57AM

Frequency	Level	Antenna	System	Total	Limit	Margin	Height	EuT	Final	Comment
MHz	dBμV	Factor	Loss	Level			Ant.	Angle	Detector	
		dBμV/m	dB	dBμV/m	dBμV/m	dB	m	deg		
0.512000	31.40	10.10	0.1	41.6	52.5	10.9	1.00	0	QUASI-PEAK	noise floor
27.120000	3.32	8.46	1.3	13.1	48.6	35.5	1.00	0	QUASI-PEAK	noise floor
0.052000	31.41	11.18	0.0	42.6	92.4	49.8	1.00	0	QUASI-PEAK	noise floor
0.124800	24.33	10.25	0.1	34.6	84.8	50.1	1.00	0	QUASI-PEAK	noise floor
13.560000	34.14	10.50	1.0	45.7	103.1	57.4	1.00	0	QUASI-PEAK	Fundamental

Electric Field Strength

EUT: Dabir Patient Support System REV 2 Design
Manufacturer: Dabir Surfaces
Operating Condition: 68 deg F ; 25% R.H.
Test Site: D.L.S. O.F. Site 2
Operator: Craig B #10097
Test Specification: Radiated emissions
Comment: Continuous Transmit at 13.56 MHz
Date: 02-11-2019

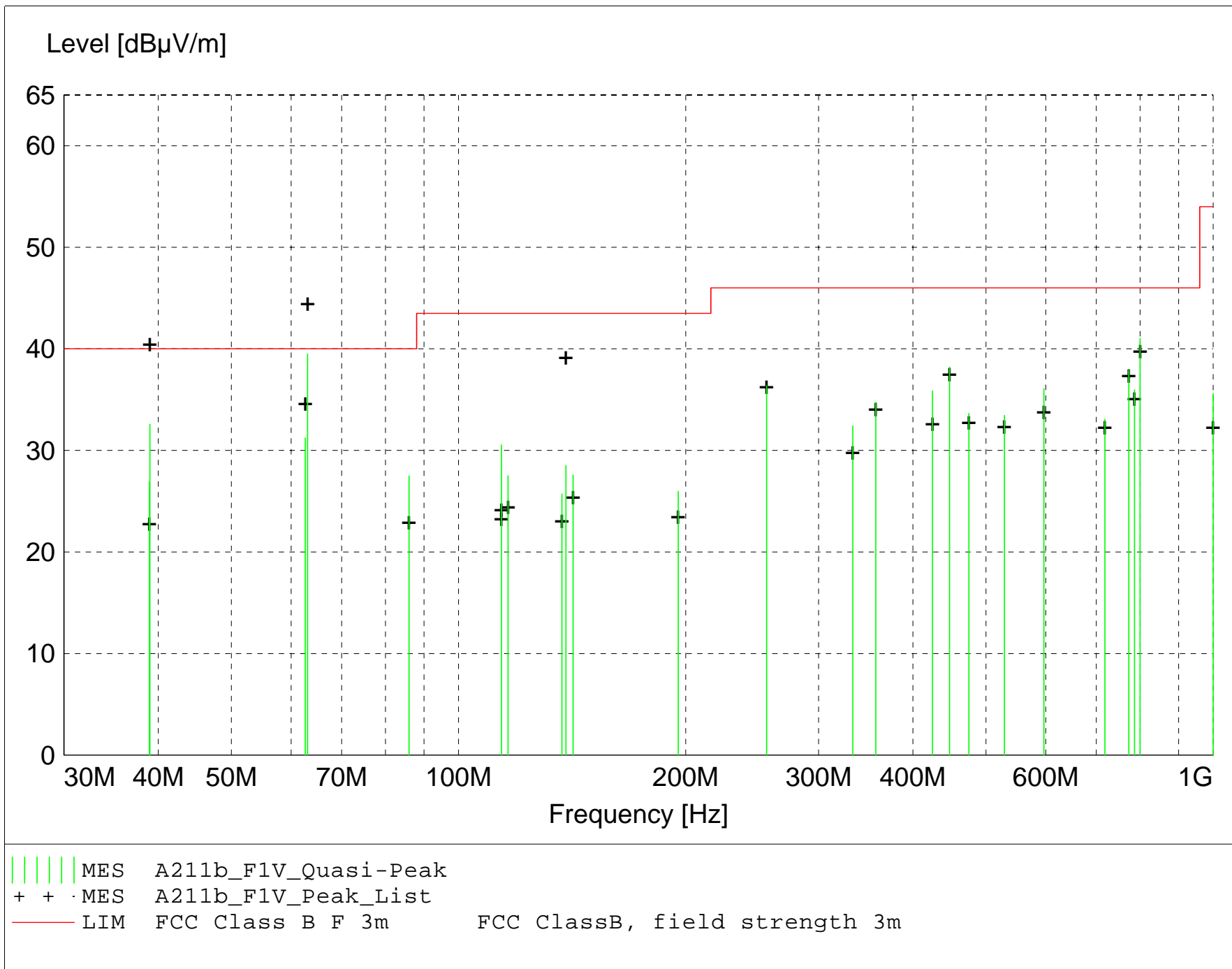
TEXT: "Vert 3 meters"

Short Description: Test Set-up

Test Set-up: EUT Measured at 3 Meters with VERTICAL Antenna Polarization

Equations:
$$\text{Total Level(dB}\mu\text{V/m)} = \text{Level(dB}\mu\text{V)} + \text{System Loss(dB)} + \text{Antenna Factor(dB}\mu\text{V/m)}$$
$$\text{Margin(dB)} = \text{Limit(dB}\mu\text{V/m)} - \text{Total Level(dB}\mu\text{V/m)}$$

Graph Markers: + Frequency marker (Level of marker not related to final level)
| Final maximized level using Quasi-Peak detector
X Final maximized level using Average detector
Final maximized level using Peak detector



MEASUREMENT RESULT: "A211b_F1V_Final"

2/11/2019 1:39PM

Frequency	Level	Antenna	System	Total	Limit	Margin	Height	EuT	Final	Comment
MHz	dBμV	Factor	Loss	Level	dBμV/m	dB	Ant.	Angle	Detector	
		dBμV/m	dB	dBμV/m	dBμV/m		m	deg		
63.090000	53.95	9.46	-23.9	39.5	40.0	0.5	1.00	135	QUASI-PEAK	Charging bat
800.030000	38.07	22.00	-19.0	41.0	46.0	5.0	1.00	225	QUASI-PEAK	None
38.990000	45.19	11.70	-24.3	32.6	40.0	7.4	1.00	315	QUASI-PEAK	Charging bat
447.470000	42.37	17.10	-21.3	38.2	46.0	7.8	1.25	270	QUASI-PEAK	None
772.910000	35.55	21.70	-19.4	37.9	46.0	8.1	1.00	225	QUASI-PEAK	None
62.640000	45.58	9.57	-23.9	31.2	40.0	8.8	1.00	135	QUASI-PEAK	None
256.010000	46.04	12.50	-22.2	36.4	46.0	9.6	1.83	280	QUASI-PEAK	None
596.630000	36.99	19.50	-20.4	36.1	46.0	9.9	1.00	345	QUASI-PEAK	None
786.470000	33.41	21.80	-19.2	36.0	46.0	10.0	1.00	225	QUASI-PEAK	None
424.670000	40.86	16.47	-21.5	35.9	46.0	10.1	1.20	75	QUASI-PEAK	None
357.200000	41.45	15.02	-21.7	34.7	46.0	11.3	1.64	90	QUASI-PEAK	None
474.590000	37.10	17.66	-21.1	33.6	46.0	12.4	1.10	300	QUASI-PEAK	None
86.000000	43.72	7.40	-23.6	27.5	40.0	12.5	1.00	350	QUASI-PEAK	None
528.830000	35.91	18.30	-20.8	33.4	46.0	12.6	1.00	110	QUASI-PEAK	None
718.670000	31.68	21.20	-19.8	33.1	46.0	12.9	1.00	200	QUASI-PEAK	None
113.990000	41.32	12.40	-23.2	30.5	43.5	13.0	1.00	0	QUASI-PEAK	None
38.950000	39.48	11.70	-24.3	26.9	40.0	13.1	1.00	225	QUASI-PEAK	None
332.990000	39.15	15.00	-21.7	32.4	46.0	13.6	1.61	270	QUASI-PEAK	None
138.760000	39.45	12.12	-23.1	28.5	43.5	15.0	1.00	120	QUASI-PEAK	Charging bat
141.850000	38.63	12.02	-23.0	27.6	43.5	15.9	1.00	225	QUASI-PEAK	None
116.320000	38.14	12.53	-23.2	27.5	43.5	16.0	1.00	180	QUASI-PEAK	None
114.020000	38.26	12.40	-23.2	27.5	43.5	16.0	1.00	330	QUASI-PEAK	None
195.480000	31.26	17.20	-22.5	26.0	43.5	17.5	1.00	135	QUASI-PEAK	None
137.090000	36.56	12.20	-23.1	25.7	43.5	17.8	1.00	180	QUASI-PEAK	None
1000.000000	27.72	24.40	-16.5	35.6	54.0	18.4	1.00	350	QUASI-PEAK	None

Electric Field Strength

EUT: Dabir Patient Support System REV 2 Design
Manufacturer: Dabir Surfaces
Operating Condition: 68 deg F ; 25% R.H.
Test Site: D.L.S. O.F. Site 2
Operator: Craig B #10097
Test Specification: Radiated emissions
Comment: Continuous Transmit at 13.56 MHz
Date: 02-11-2019

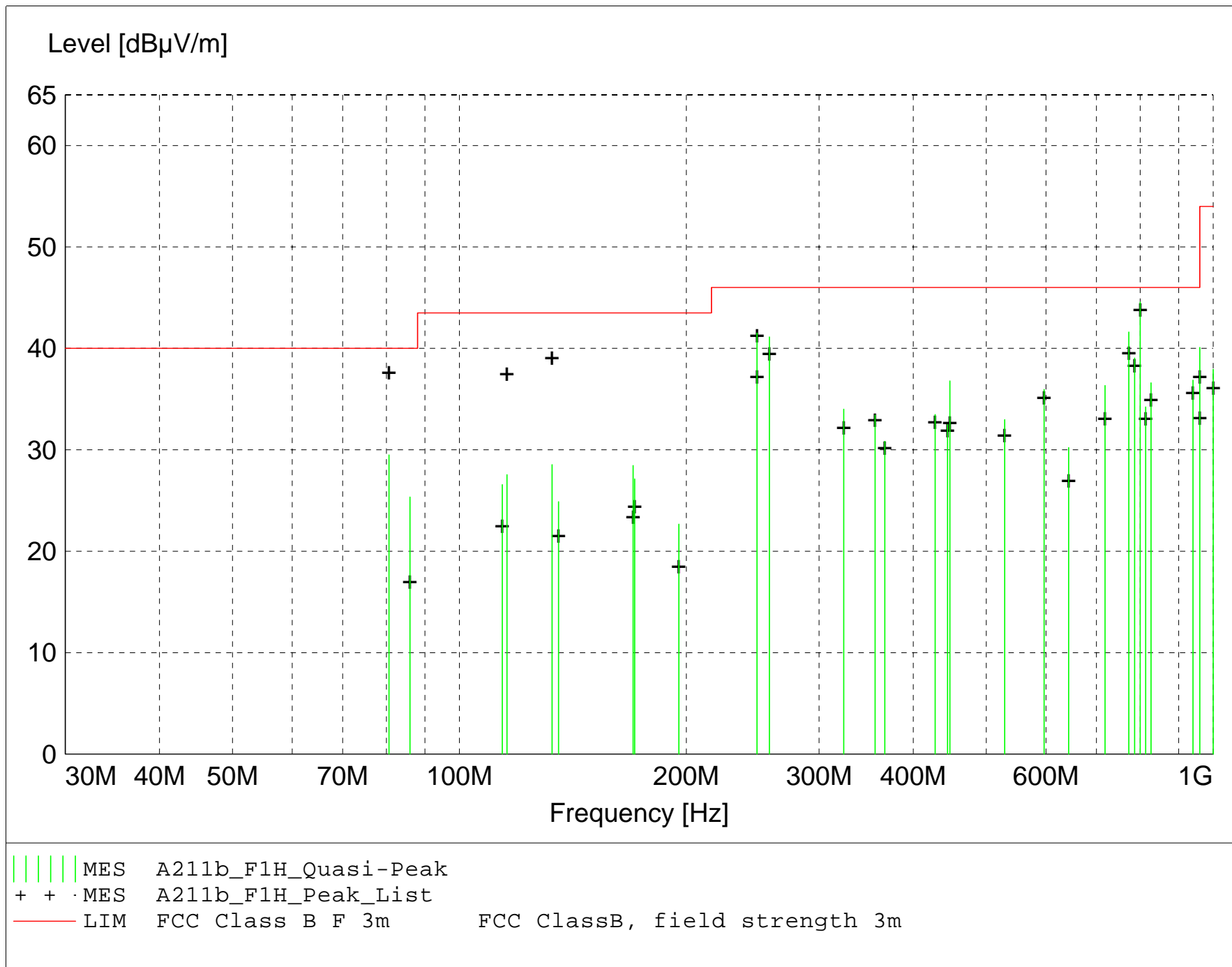
TEXT: "Horz 3 meters"

Short Description: Test Set-up

Test Set-up: EUT Measured at 3 Meters with HORIZONTAL Antenna Polarization

Equations:
$$\text{Total Level(dB}\mu\text{V/m)} = \text{Level(dB}\mu\text{V)} + \text{System Loss(dB)} + \text{Antenna Factor(dB}\mu\text{V/m)}$$
$$\text{Margin(dB)} = \text{Limit(dB}\mu\text{V/m)} - \text{Total Level(dB}\mu\text{V/m)}$$

Graph Markers: + Frequency marker (Level of marker not related to final level)
| Final maximized level using Quasi-Peak detector
X Final maximized level using Average detector
Final maximized level using Peak detector



MEASUREMENT RESULT: "A211b_F1H_Final"

2/11/2019 2:12PM

Frequency	Level	Antenna	System	Total	Limit	Margin	Height	EuT	Final	Comment
MHz	dBμV	Factor	Loss	Level	dBμV/m	dB	Ant.	Angle	Detector	
		dBμV/m	dB	dBμV/m	dBμV/m		m	deg		
800.015000	41.61	22.00	-19.0	44.6	46.0	1.4	1.05	90	QUASI-PEAK	None
772.895000	39.28	21.70	-19.4	41.6	46.0	4.4	1.08	90	QUASI-PEAK	None
248.225000	51.40	12.32	-22.2	41.5	46.0	4.5	1.18	90	QUASI-PEAK	None
257.735000	50.72	12.60	-22.2	41.1	46.0	4.9	1.18	80	QUASI-PEAK	None
959.990000	33.61	23.90	-17.4	40.1	46.0	5.9	1.08	30	QUASI-PEAK	None
786.470000	36.49	21.80	-19.2	39.1	46.0	6.9	1.06	90	QUASI-PEAK	None
959.975000	32.09	23.90	-17.4	38.6	46.0	7.4	1.00	255	QUASI-PEAK	None
248.225000	48.06	12.32	-22.2	38.2	46.0	7.8	2.03	90	QUASI-PEAK	None
939.995000	30.85	23.70	-17.7	36.9	46.0	9.1	1.00	250	QUASI-PEAK	None
447.470000	40.95	17.10	-21.3	36.8	46.0	9.2	2.03	80	QUASI-PEAK	None
827.135000	33.32	22.20	-18.9	36.6	46.0	9.4	1.03	80	QUASI-PEAK	None
718.670000	34.93	21.20	-19.8	36.3	46.0	9.7	1.19	80	QUASI-PEAK	None
596.630000	36.87	19.50	-20.4	36.0	46.0	10.0	1.33	135	QUASI-PEAK	None
80.650000	46.97	6.23	-23.7	29.5	40.0	10.5	2.47	225	QUASI-PEAK	Charging bat
813.575000	31.11	22.10	-19.0	34.2	46.0	11.8	1.06	80	QUASI-PEAK	None
323.480000	40.80	15.00	-21.8	34.0	46.0	12.0	1.00	225	QUASI-PEAK	None
427.685000	38.42	16.50	-21.4	33.5	46.0	12.5	1.00	135	QUASI-PEAK	None
355.910000	40.17	15.00	-21.7	33.4	46.0	12.6	1.00	180	QUASI-PEAK	None
528.830000	35.44	18.30	-20.8	33.0	46.0	13.0	1.57	100	QUASI-PEAK	None
444.125000	36.76	17.00	-21.3	32.5	46.0	13.5	1.92	45	QUASI-PEAK	None
85.990000	41.58	7.40	-23.6	25.4	40.0	14.6	2.16	270	QUASI-PEAK	None
132.690000	39.11	12.50	-23.1	28.5	43.5	15.0	3.61	270	QUASI-PEAK	Charging bat
169.970000	36.76	14.40	-22.7	28.4	43.5	15.1	1.87	225	QUASI-PEAK	None
366.710000	37.41	15.10	-21.7	30.8	46.0	15.2	2.75	75	QUASI-PEAK	None
643.055000	30.41	20.10	-20.3	30.2	46.0	15.8	1.00	0	QUASI-PEAK	None
115.610000	38.21	12.50	-23.2	27.5	43.5	16.0	2.81	100	QUASI-PEAK	Charging bat
1000.000000	30.04	24.40	-16.5	37.9	54.0	16.1	1.85	225	QUASI-PEAK	None
170.810000	35.27	14.56	-22.7	27.1	43.5	16.4	1.97	290	QUASI-PEAK	None
114.000000	37.34	12.40	-23.2	26.6	43.5	16.9	2.59	270	QUASI-PEAK	None
135.360000	35.58	12.36	-23.1	24.9	43.5	18.6	2.36	270	QUASI-PEAK	None
195.460000	27.97	17.20	-22.5	22.7	43.5	20.8	1.68	100	QUASI-PEAK	None



166 South Carter, Genoa City, WI 53128

Company:	Dabir Surfaces
Model Tested:	C2-1001
Report Number:	24318
Project Number:	10097

Section B

B3.0 Frequency Stability

Rule Part: FCC Part 15.225(e)

Test Procedure: ANSI C63.10:2013 Section 6.8

Limits: 0.01% of the center frequency
Limit = +/- 1.356 kHz (0.01% of 13.56 MHz)

Results: Compliant

Sample Equations: N/A

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Notes: The EUT was coupled to a spectrum analyzer using a near-field probe.

The supply voltage was varied from 102 Volts to 138 Volts. Carrier frequency measurements were performed and recorded at nominal temperature.

The temperature was varied from -20 °C to + 50 °C in increments of 10 degrees. Carrier frequency measurements were performed and recorded at transmitter startup, and at 2 minutes, 5 minutes, and 10 minutes after startup. No significant drifting was observed.



166 South Carter, Genoa City, WI 53128

Company: Dabir Surfaces
 Model Tested: C2-1001
 Report Number: 24318
 Project Number: 10097

DLS Electronic Systems, Inc.

Company: Dabir Surfaces
 Operator: Craig B
 Date of test: 02-12-2019
 Model: Dabir Patient Support System REV 2 Design

Limit = +/- 0.01% (+/- 1,356 Hz)

Frequency Stability FCC Part 15.225

Time after turn ON	Nominal Frequency (MHz)	Measured Frequency (at 120 V)									
		+50 deg. C	Error (Hz)	+40 deg. C	Error (Hz)	+30 deg. C	Error (Hz)	+20 deg. C	Error (Hz)	+10 deg. C	Error (Hz)
immediate	13.560	13.559713	-286.570	13.559729	-270.540	13.559762	-238.480	13.559782	-218.440	13.559806	-194.390
2 min.	13.560	13.559709	-290.580	13.559721	-278.560	13.559750	-250.500	13.559774	-226.450	13.559802	-198.400
5 min.	13.560	13.559709	-290.580	13.559721	-278.560	13.559745	-254.510	13.559770	-230.460	13.559798	-202.400
10 min.	13.560	13.559709	-290.580	13.559713	-286.570	13.559737	-262.530	13.559770	-230.460	13.559798	-202.400

Frequency Stability FCC Part 15.225

Time after turn ON	Nominal Frequency (MHz)	Measured Frequency (at 120 V)									
		0 deg. C	Error (Hz)	-10 deg. C	Error (Hz)	-20 deg. C	Error (Hz)				
immediate	13.560	13.559814	-186.370	13.559798	-202.400	13.559758	-242.480				
2 min.	13.560	13.559814	-186.370	13.559806	-194.390	13.559778	-222.440				
5 min.	13.560	13.559810	-190.380	13.559810	-190.380	13.559782	-218.440				
10 min.	13.560	13.559810	-190.380	13.559810	-190.380	13.559786	-214.430				

Frequency Stability FCC Part 15.225

	Nominal Frequency (MHz)	Measured Frequency (at 20 deg. C)									
		102 V	Error (Hz)	120 V	Error (Hz)	138 V	Error (Hz)				
	13.560	13.559782	-218.440	13.559786	-214.430	13.559782	-218.440				



166 South Carter, Genoa City, WI 53128

Company:	Dabir Surfaces
Model Tested:	C2-1001
Report Number:	24318
Project Number:	10097

Section B

B4.0 AC Line Conducted Emissions

Rule Part: FCC Part 15.207

Test Procedure: ANSI C63.10-2013, Section 6.2

Limit: 15.207(a)

Results: Compliant

Notes: This was an AC Conducted emissions measurement.

The EUT was set to transmit continuously with the antenna connected and an RFID tag (located in Air Pad connector) in place.



Report issuing date : 02-11-2019

Standard : FCC Part 15.207
Test Type : Voltage Mains Test
Test Site : DLS Screen Room
Temperature : 70 °F
Humidity : 23 %
Test Specs : Line 1; Quasi-Peak detector
Operator : Craig B
DLS Project # : 10097
Result : Pass

EUT

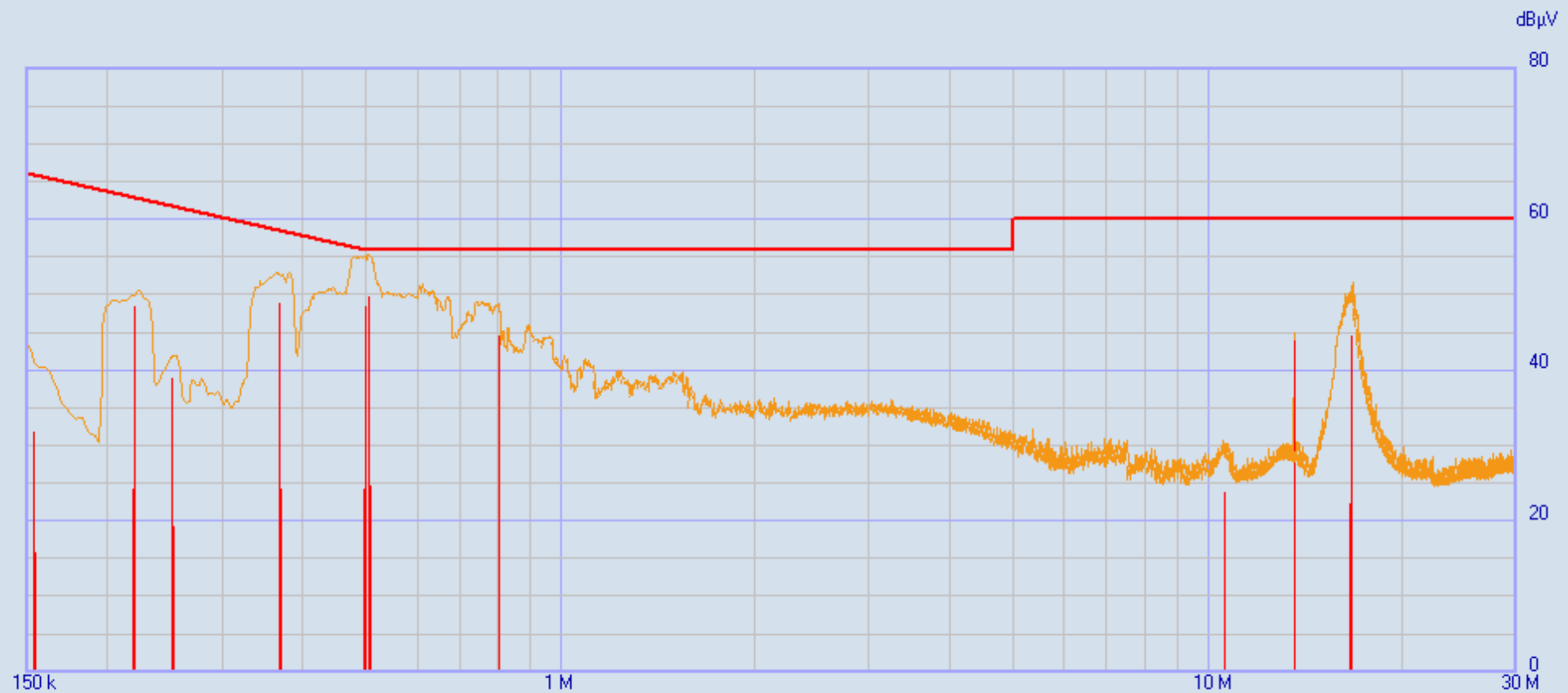
Manufacturer : Dabir Surfaces
Model : Dabir Patient Support System REV 2 Design
Product : Air Pad for medical beds to prevent bed sores
Notes : 120 V 60 Hz
Comments : Turned ON; Continuous transmit at 13.56 MHz
: With antenna connected

Testing Company : DLS Electronic Systems
Tel./Fax : 262-279-0210
Web site : <http://www.dlsemc.com>

Receiver Details

Model : PMM 9010F
Brand : Narda
S/N : 020WW40102
Last Calibration : 04/17/2018

NOTE: The column in the table that is labeled "delta" shows the margin in dB with respect to the limit. A negative number indicates the level of the emission is under the limit by the given value, while a positive number indicates the emission level is above the limit by the given value.



10097 Dabir Surfaces - with ant - L1_000

	Start [MHz]	Stop [MHz]	Step	Detector	Hold Time	RBW	Min Att	Pre Amp	Pre Sel	Prompt start	Ancillary
1	0.15	30	AUTO (2.045 kHz)	P Q	1500 ms	9 kHz	10	OFF	ON

Ancillary = General
Nr. of Worst = Infinite (3)

Limits:
Class B V QP

Factors:
LISN DLS#665
Cables 43 & 45
DLS #507 w- CBL-035
DLS #592

Peak ———
QPeak ———

10097 Dabir Surfaces - with ant - Ll_000 11/02/2019 15:11:26

Rel. SW 2.22 (August 2015)

Rel. FW 1.82 03/12/18

Margin: 100 dB

	Frequency	QPeak	Limit	Delta	Factor	Factor	Factor	Factor
	[MHz]	[dBµV]	Class B V..	[dB]	LISN DLS#..	Cables 43..	DLS #507 ..	DLS #592
			[dBµV]		[dB]	[dB]	[dB]	[dB]
1	0.15	34.82	66.00	-31.18	0.10	0.21	9.74	2.23
2	0.15409	31.72	65.78	-34.06	0.10	0.19	9.75	2.18
3	0.21953	48.27	62.84	-14.57	0.08	0.14	9.79	1.66
4	0.25225	38.85	61.68	-22.83	0.08	0.23	9.75	1.48
5	0.368815	48.79	58.53	-9.74	0.07	0.25	9.72	1.14
6	0.499695	48.32	56.01	-7.69	0.07	0.31	9.73	0.83
7	0.507875	49.67	56.00	-6.33	0.07	0.32	9.73	0.82
8	0.802355	44.45	56.00	-11.55	0.07	0.38	9.73	0.54
9	10.55905	23.81	60.00	-36.19	0.07	0.78	9.78	0.11
10	13.56111	43.75	60.00	-16.25	0.07	0.91	9.75	0.18
11	16.606115	44.43	60.00	-15.57	0.06	0.99	9.82	0.22



Report issuing date : 02-11-2019

Standard : FCC Part 15.207
Test Type : Voltage Mains Test
Test Site : DLS Screen Room
Temperature : 70 °F
Humidity : 23 %
Test Specs : Line 1; AVERAGE detector
Operator : Craig B
DLS Project # : 10097
Result : Pass

EUT

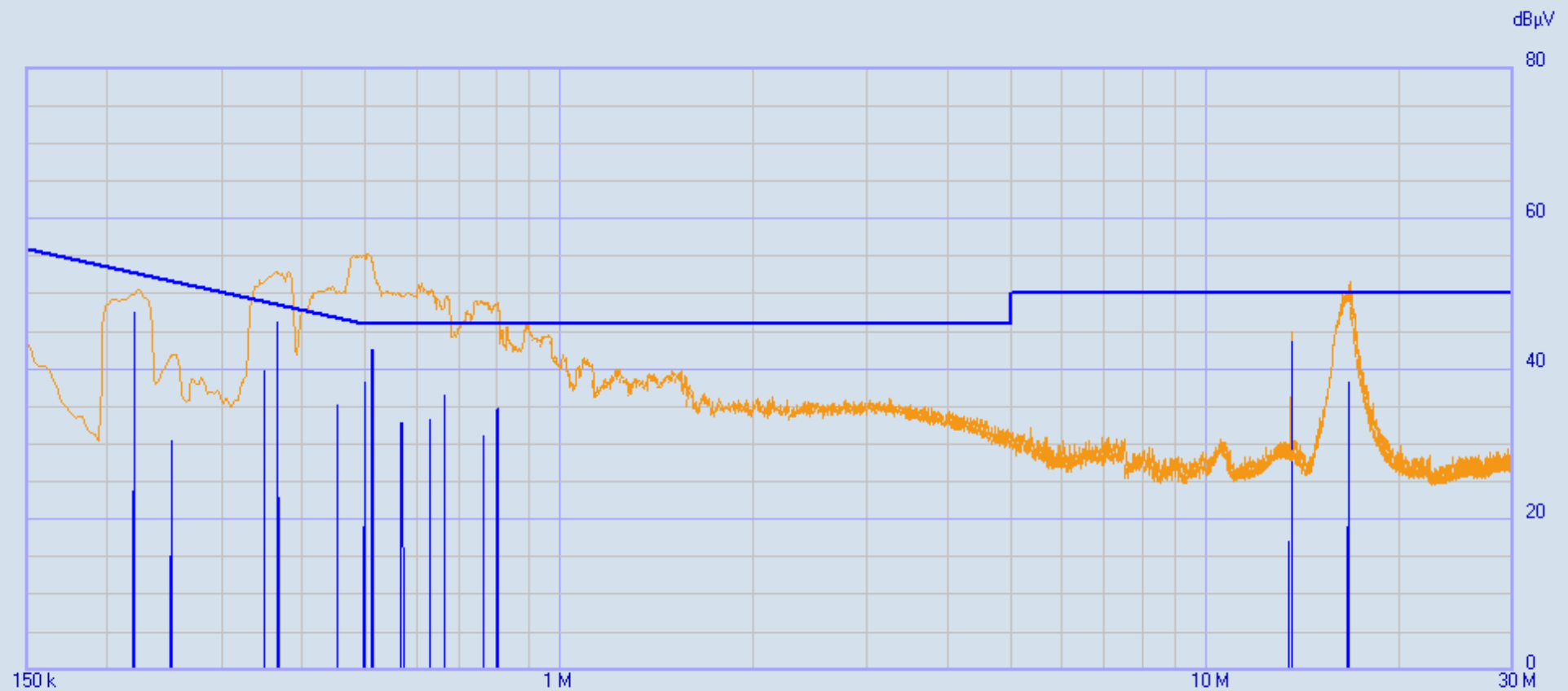
Manufacturer : Dabir Surfaces
Model : Dabir Patient Support System REV 2 Design
Product : Air Pad for medical beds to prevent bed sores
Notes : 120 V 60 Hz
Comments : Turned ON; Continuous transmit at 13.56 MHz
: With antenna connected

Testing Company : DLS Electronic Systems
Tel./Fax : 262-279-0210
Web site : <http://www.dlsemc.com>

Receiver Details

Model : PMM 9010F
Brand : Narda
S/N : 020WW40102
Last Calibration : 04/17/2018

NOTE: The column in the table that is labeled "delta" shows the margin in dB with respect to the limit. A negative number indicates the level of the emission is under the limit by the given value, while a positive number indicates the emission level is above the limit by the given value.



10097 Dabir Surfaces - with ant - L1_001

	Start [MHz]	Stop [MHz]	Step	Detector	Hold Time	RBW	Min Att	Pre Amp	Pre Sel	Prompt start	Ancillary
1	0.15	30	AUTO (2.045 kHz)	P C	1500 ms	9 kHz	10	OFF	ON

Ancillary = General
Nr. of Worst = Infinite (3)

Limits:
Class B V AV

Factors:
LISN DLS#665
Cables 43 & 45
DLS #507 w- CBL-035
DLS #592

Peak ———
C-Avg ———

10097 Dabir Surfaces - with ant - Ll_001 11/02/2019 15:13:51
 Rel. SW 2.22 (August 2015)
 Rel. FW 1.82 03/12/18
 Margin: 100 dB

	Frequency	C-Avg	Limit	Delta	Factor	Factor	Factor	Factor
	[MHz]	[dBμV]	Class B V..	[dB]	LISN DLS#..	Cables 43..	DLS #507 ..	DLS #592
			[dBμV]		[dB]	[dB]	[dB]	[dB]
1	0.15	29.63	56.00	-26.37	0.10	0.21	9.74	2.23
2	0.21953	47.49	52.84	-5.35	0.08	0.14	9.79	1.66
3	0.250205	30.49	51.75	-21.26	0.08	0.22	9.76	1.50
4	0.35041	39.78	48.95	-9.17	0.07	0.25	9.72	1.20
5	0.36677	46.11	48.57	-2.46	0.07	0.25	9.72	1.15
6	0.454705	35.26	46.79	-11.53	0.07	0.29	9.73	0.92
7	0.499695	38.29	46.01	-7.72	0.07	0.31	9.73	0.83
8	0.51401	42.50	46.00	-3.50	0.07	0.32	9.73	0.81
9	0.57127	32.81	46.00	-13.19	0.07	0.34	9.73	0.73
10	0.630575	33.33	46.00	-12.67	0.07	0.35	9.73	0.67
11	0.663295	36.48	46.00	-9.52	0.07	0.36	9.73	0.66
12	0.761455	31.14	46.00	-14.86	0.07	0.37	9.73	0.58
13	0.80031	34.73	46.00	-11.27	0.07	0.37	9.73	0.55
14	13.403645	16.99	50.00	-33.01	0.07	0.89	9.75	0.17
15	13.56111	43.53	50.00	-6.47	0.07	0.91	9.75	0.18
16	16.618385	38.22	50.00	-11.78	0.06	0.99	9.82	0.22



Report issuing date : 02-11-2019

Standard : FCC Part 15.207
Test Type : Voltage Mains Test
Test Site : DLS Screen Room
Temperature : 70 °F
Humidity : 23 %
Test Specs : Line 2; Quasi-Peak detector
Operator : Craig B
DLS Project # : 10097
Result : Pass

EUT

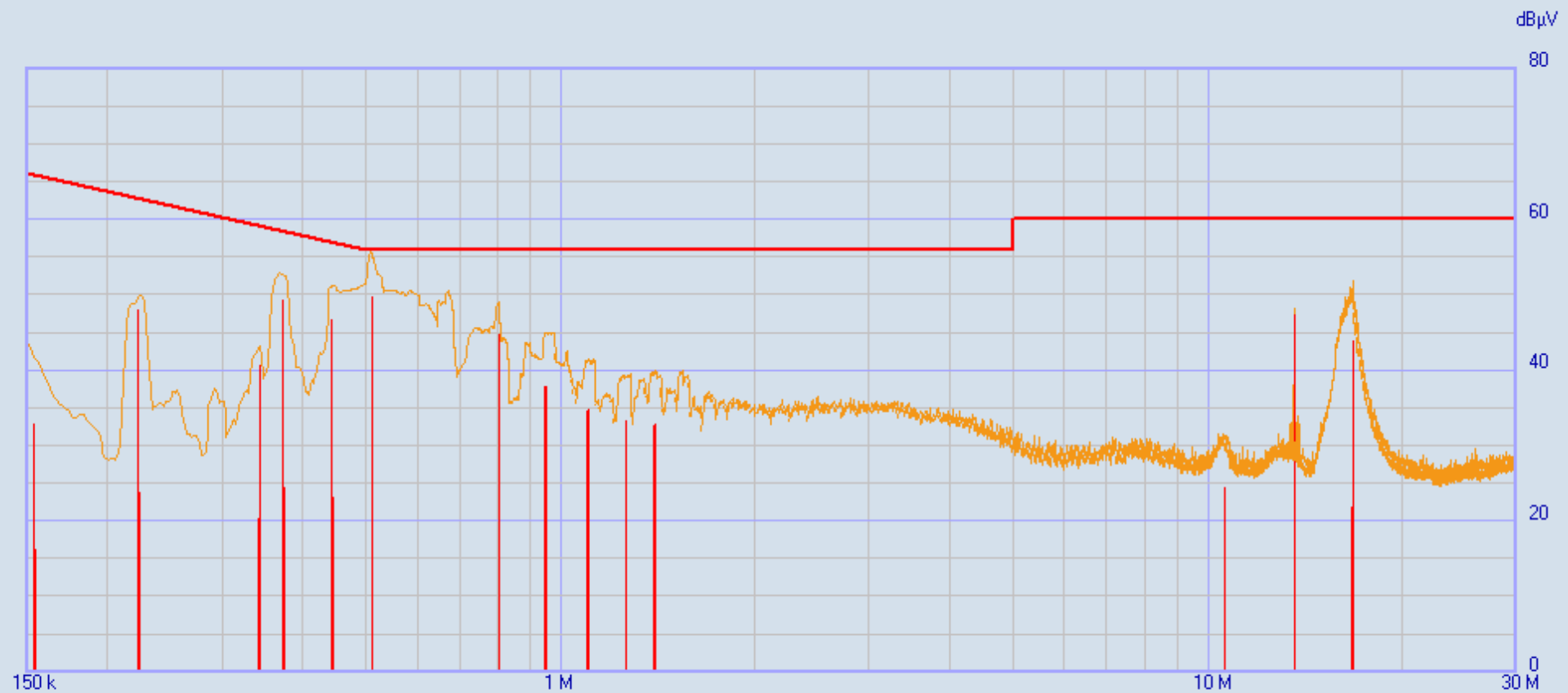
Manufacturer : Dabir Surfaces
Model : Dabir Patient Support System REV 2 Design
Product : Air Pad for medical beds to prevent bed sores
Notes : 120 V 60 Hz
Comments : Turned ON; Continuous transmit at 13.56 MHz
: With antenna connected

Testing Company : DLS Electronic Systems
Tel./Fax : 262-279-0210
Web site : <http://www.dlsemc.com>

Receiver Details

Model : PMM 9010F
Brand : Narda
S/N : 020WW40102
Last Calibration : 04/17/2018

NOTE: The column in the table that is labeled "delta" shows the margin in dB with respect to the limit. A negative number indicates the level of the emission is under the limit by the given value, while a positive number indicates the emission level is above the limit by the given value.



10097 Dabir Surfaces - with ant - L2_000

	Start [MHz]	Stop [MHz]	Step	Detector	Hold Time	RBW	Min Att	Pre Amp	Pre Sel	Prompt start	Ancillary
1	0.15	30	AUTO (2.045 kHz)	P Q	1500 ms	9 kHz	10	OFF	ON

Ancillary = General
Nr. of Worst = Infinite (3)

Limits:
Class B V QP

Factors:
LISN DLS#665
Cables 43 & 45
DLS #507 w- CBL-035
DLS #592

Peak ———
QPeak ———

10097 Dabir Surfaces - with ant - L2_000 11/02/2019 15:18:19
 Rel. SW 2.22 (August 2015)
 Rel. FW 1.82 03/12/18
 Margin: 100 dB

Frequency	QPeak	Limit	Delta	Factor	Factor	Factor	Factor
[MHz]	[dBμV]	Class B V..	[dB]	LISN DLS#..	Cables 43..	DLS #507 ..	DLS #592
		[dBμV]		[dB]	[dB]	[dB]	[dB]
1 0.15	35.70	66.00	-30.30	0.10	0.21	9.74	2.23
2 0.15409	32.80	65.78	-32.98	0.10	0.19	9.75	2.18
3 0.22362	47.95	62.68	-14.73	0.08	0.13	9.81	1.64
4 0.34223	40.60	59.15	-18.55	0.07	0.25	9.72	1.22
5 0.372905	49.32	58.44	-9.12	0.07	0.25	9.72	1.13
6 0.44448	46.70	56.98	-10.28	0.07	0.28	9.73	0.94
7 0.511965	49.67	56.00	-6.33	0.07	0.32	9.73	0.81
8 0.802355	44.57	56.00	-11.43	0.07	0.38	9.73	0.54
9 0.949595	37.85	56.00	-18.15	0.07	0.39	9.73	0.46
10 1.09888	34.76	56.00	-21.24	0.07	0.37	9.73	0.41
11 1.260435	33.22	56.00	-22.78	0.07	0.37	9.72	0.34
12 1.395405	32.70	56.00	-23.30	0.07	0.40	9.71	0.30
13 10.55905	24.43	60.00	-35.57	0.07	0.78	9.78	0.11
14 13.56111	47.29	60.00	-12.71	0.07	0.91	9.75	0.18
15 16.675645	43.74	60.00	-16.26	0.06	0.99	9.82	0.22



Report issuing date : 02-11-2019

Standard : FCC Part 15.207
Test Type : Voltage Mains Test
Test Site : DLS Screen Room
Temperature : 70 °F
Humidity : 23 %
Test Specs : Line 2; AVERAGE detector
Operator : Craig B
DLS Project # : 10097
Result : Pass

EUT

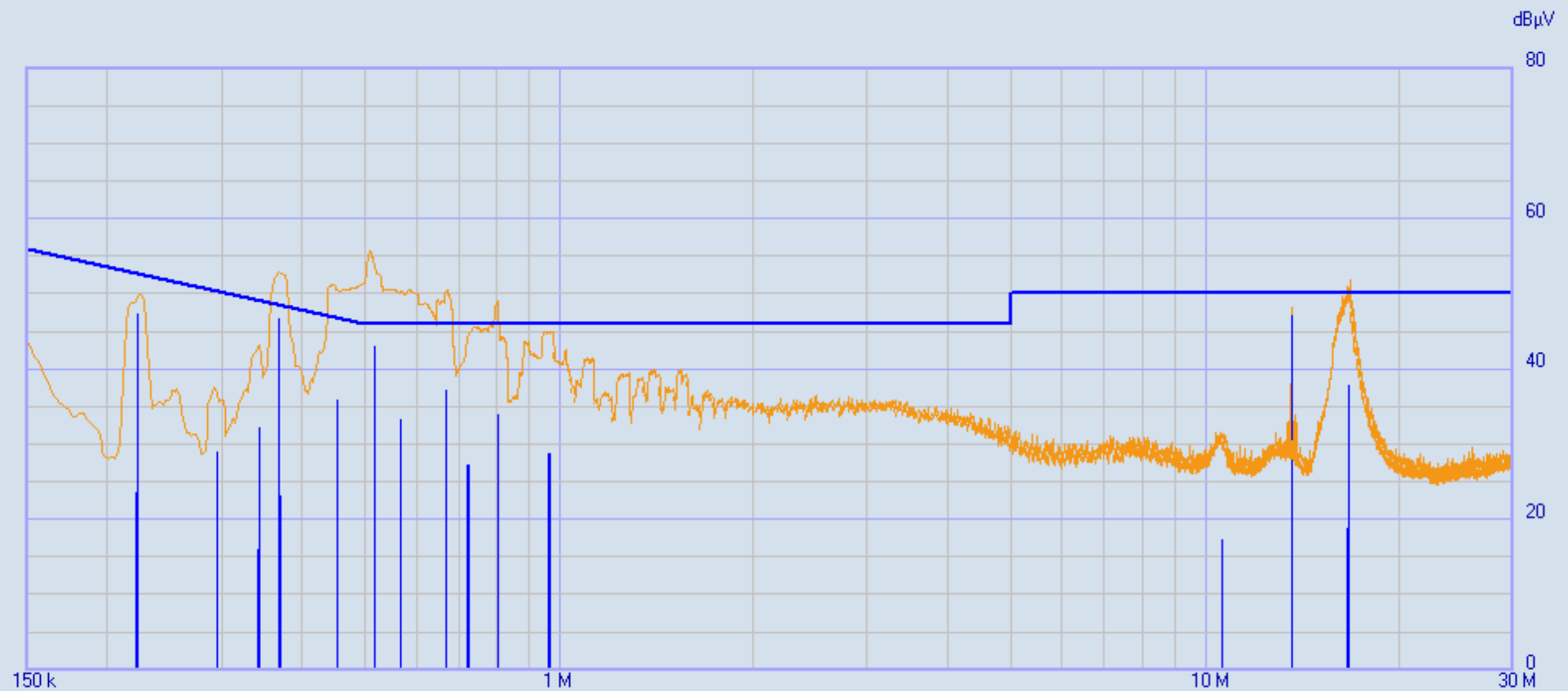
Manufacturer : Dabir Surfaces
Model : Dabir Patient Support System REV 2 Design
Product : Air Pad for medical beds to prevent bed sores
Notes : 120 V 60 Hz
Comments : Turned ON; Continuous transmit at 13.56 MHz
: With antenna connected

Testing Company : DLS Electronic Systems
Tel./Fax : 262-279-0210
Web site : <http://www.dlsemc.com>

Receiver Details

Model : PMM 9010F
Brand : Narda
S/N : 020WW40102
Last Calibration : 04/17/2018

NOTE: The column in the table that is labeled "delta" shows the margin in dB with respect to the limit. A negative number indicates the level of the emission is under the limit by the given value, while a positive number indicates the emission level is above the limit by the given value.



10097 Dabir Surfaces - with ant - L2_001

	Start [MHz]	Stop [MHz]	Step	Detector	Hold Time	RBW	Min Att	Pre Amp	Pre Sel	Prompt start	Ancillary
1	0.15	30	AUTO (2.045 kHz)	P C	1500 ms	9 kHz	10	OFF	ON

Ancillary = General
Nr. of Worst = Infinite (3)

Limits:
Class B VAV

Factors:
LISN DLS#665
Cables 43 & 45
DLS #507 w- CBL-035
DLS #592

Peak ———
C-Avg ———

10097 Dabir Surfaces - with ant - L2_001 11/02/2019 15:20:22
 Rel. SW 2.22 (August 2015)
 Rel. FW 1.82 03/12/18
 Margin: 100 dB

	Frequency	C-Avg	Limit	Delta	Factor	Factor	Factor	Factor
	[MHz]	[dBµV]	Class B V..	[dB]	LISN DLS#..	Cables 43..	DLS #507 ..	DLS #592
			[dBµV]		[dB]	[dB]	[dB]	[dB]
1	0.15	30.25	56.00	-25.75	0.10	0.21	9.74	2.23
2	0.221575	47.17	52.76	-5.59	0.08	0.14	9.80	1.65
3	0.295195	28.95	50.38	-21.43	0.07	0.26	9.73	1.32
4	0.34223	32.18	49.15	-16.97	0.07	0.25	9.72	1.22
5	0.368815	46.67	48.53	-1.86	0.07	0.25	9.72	1.14
6	0.454705	35.90	46.79	-10.89	0.07	0.29	9.73	0.92
7	0.5181	42.90	46.00	-3.10	0.07	0.32	9.73	0.80
8	0.569225	33.19	46.00	-12.81	0.07	0.34	9.73	0.73
9	0.667385	37.09	46.00	-8.91	0.07	0.36	9.73	0.66
10	0.720555	27.20	46.00	-18.80	0.07	0.37	9.73	0.62
11	0.802355	33.77	46.00	-12.23	0.07	0.38	9.73	0.54
12	0.96391	28.79	46.00	-17.21	0.07	0.39	9.73	0.45
13	10.557005	17.13	50.00	-32.87	0.07	0.78	9.78	0.11
14	13.56111	47.04	50.00	-2.96	0.07	0.91	9.75	0.18
15	16.602025	37.66	50.00	-12.34	0.06	0.99	9.82	0.22



166 South Carter, Genoa City, WI 53128

Company: Dabir Surfaces
 Model Tested: C2-1001
 Report Number: 24318
 Project Number: 10097

Section C – Measurement Uncertainty

Compliance with the limits in this standard are based on the results of the compliance measurement. Our calculated measurement uncertainty including the measurement instrumentation, associated connections between the various instruments in the measurement chain, and other contributions, are provided in this section of the test report.

Radiated Emission Uncertainty below 30MHz		Uncertainty (± dB)
Contribution	Probability Distribution	below 30 MHz
Combined Standard Uncertainty	Normal	1.60
Expanded Uncertainty	Normal (k=2)	3.19

Radiated Emission Uncertainty above 30MHz										
		(± dB)	(± dB)	(± dB)	(± dB)	(± dB)	(± dB)	(± dB)	(± dB)	(± dB)
Contribution	Probability Distribution	3M	3M	3M	3M	3M	3M	10M	10M	10M
		30-100 MHz	100-700 MHz	700-1000 MHz	1- 4.5 GHz	4.5 – 7 GHz	7 – 18 GHz	30-100 MHz	100-700 MHz	700-1000 MHz
Combined Standard Uncertainty	Normal	1.70	1.62	1.66	2.13	2.48	2.85	1.64	1.58	1.66
Expanded Uncertainty	Normal (k=2)	3.40	3.23	3.33	4.26	4.95	5.69	3.29	3.16	3.31

Power Line Conducted		Uncertainty (± dB)
Contribution	Probability Distribution	150 kHz - 30 MHz
Combined Standard Uncertainty	Normal	1.05
Expanded Uncertainty	Normal (k=2)	2.10



166 South Carter, Genoa City, WI 53128

Company:
Model Tested:
Report Number:
Project Number:

Dabir Surfaces
C2-1001
24318
10097

END OF REPORT

Revision #	Date	Comments	By
1.0	02-14-2019	Preliminary release	CB
1.1	02-18-2019	Entered product information from Part A form	CB
1.2	02-19-2019	Convert to .pdf and add .pdf test data	CB
1.3	04-12-2019	Corrected a misspelling on page 1	CB