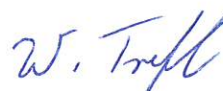


RADIO REPORT FCC 47 CFR Part 15C ISED Canada RSS-210 ISED Canada RSS-Gen Operation within the 13.110 – 14.010 MHz band	
Report Reference No	G0M-2003-8908-TFC225RI-V01
Testing Laboratory	Eurofins Product Service GmbH
Address	Storkower Str. 38c 15526 Reichenwalde Germany
Accreditation	    DAKKS - Registration number : D-PL-12092-01-03 (ISED) ISED Testing Laboratory site: 3470A-2 DAKKS - Registration number : D-PL-12092-01-04 (FCC) FCC Filed Test Laboratory, Reg.-No.: 96970
Applicant	W.O.M. WORLD OF MEDICINE GmbH
Address	Salzufer 8 10587 Berlin GERMANY
Test Specification	47 CFR Part 15C RSS-210, Issue 10, 2019-12 RSS-Gen, Issue 5, Amendment 1, 2019-03
Non-Standard Test Method	None
Equipment under Test (EUT):	
Product Description	Irrigation and Suction Pump for Laparoscopy
Model(s) / Type	LAP SUCT./ IRRIG. PUMP
Additional Model(s)	None
Brand Name(s)	Fluid Control Lap 2216
Hardware Version(s)	2019/12
Software Version(s)	P106_008_A_FREI_03.01
FCC-ID	2AS5K-TSHW42
IC	25004-TSHW42A
Test Result	PASSED

Possible test case verdicts:		
Required by standard but not tested	N/T	
Not required by standard	N/R	
Not applicable to EUT	N/A	
Test object does meet the requirement	P(PASS)	
Test object does not meet the requirement	F(FAIL)	
Testing:		
Test Lab Temperature	20 - 23 °C	
Test Lab Humidity	32 – 38 %	
Date of receipt of test item	2020-03-18	
Report:		
Compiled by	Wilfried Treffke	
Tested by (+ signature) (Responsible for Test)	Wilfried Treffke	
Approved by (+ signature) (Head of Lab)	Toralf Jahn	
Date of Issue	2021-01-25	
Total number of pages	27	
General Remarks:		
The test results presented in this report relate only to the object tested. The results contained in this report reflect the results for this particular model and serial number. It is the responsibility of the manufacturer to ensure that all production models meet the intent of the requirements detailed within this report. This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.		
Additional Comments:		

VERSION HISTORY

Version History			
Version	Issue Date	Remarks	Revised By
01	2021-01-25	Initial Release	

ABBREVIATIONS AND ACRONYMS

Acronyms	
Acronym	Description
EUT	Equipment Under Test
FCC	Federal Communications Commission
ISED	Innovation, Science and Economic Development Canada
RBW	Resolution bandwidth
RFID	Radio Frequency Identification
RMS	Root mean square
VBW	Video bandwidth
V _{NOM}	Nominal supply voltage

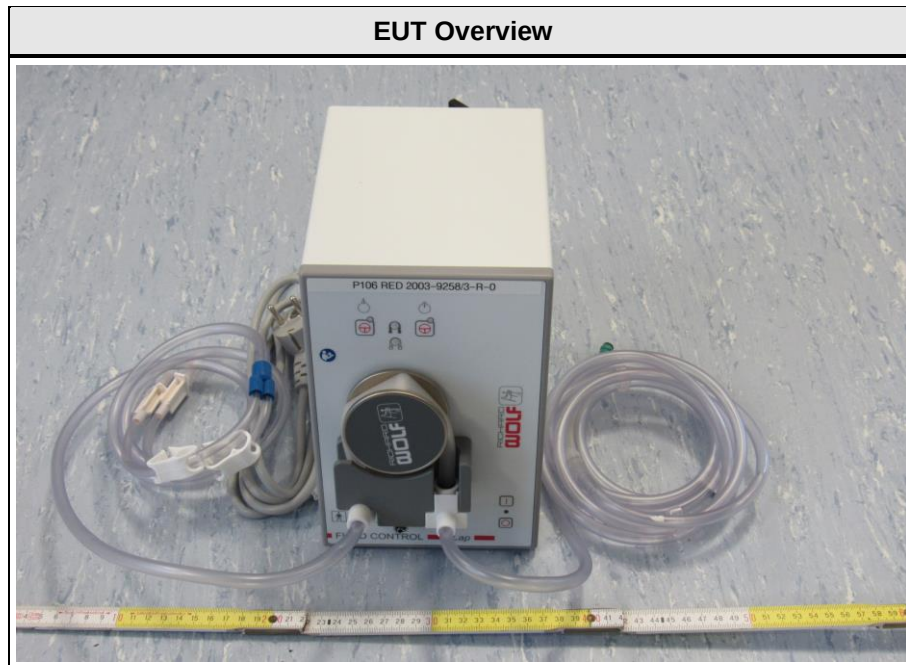
REPORT INDEX

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1 Equipment (Test Item) Under Test

Description	Irrigation and Suction Pump for Laparoscopy	
Model / Type	LAP SUCT./ IRRIG. PUMP	
Additional Model(s)	None	
Brand Name(s)	Fluid Control Lap 2216	
Serial Number(s)	1912CE0011	
Hardware Version(s)	2019/12	
Software Version(s)	P106_008_A_FREI_03.01	
PMN	TS-HW42	
HVIN	1430	
FVIN	N/A	
HMN	P106	
FCC-ID	2AS5K-TSHW42	
IC	25004-TSHW42A	
Equipment type	End Product	
Radio type	Transceiver	
Assigned frequency bands	13.110 - 14.010 MHz	
Radio technology	RFID	
Modulation	ASK	
Antenna	Type	External dedicated
	Model	TS-AH20
	Manufacturer	GiS GmbH
	Gain	not specified
Supply Voltage	V _{NOM}	120 VAC
Operating Temperature	T _{NOM}	25 °C
Radio Module	Type	RFID Module 13.56 MHz
	Model	TS-HW42
	Manufacturer	GiS GmbH
	HW Version	HVIN 1430
	SW Version	unspecified
AC/DC-Adaptor	Model	None
	Vendor	None
	Input	None
	Output	None
Manufacturer	Richard Wolf GmbH Pforzheimer Straße 32 75438 Knittlingen Germany	

1.1 Photos – Equipment External



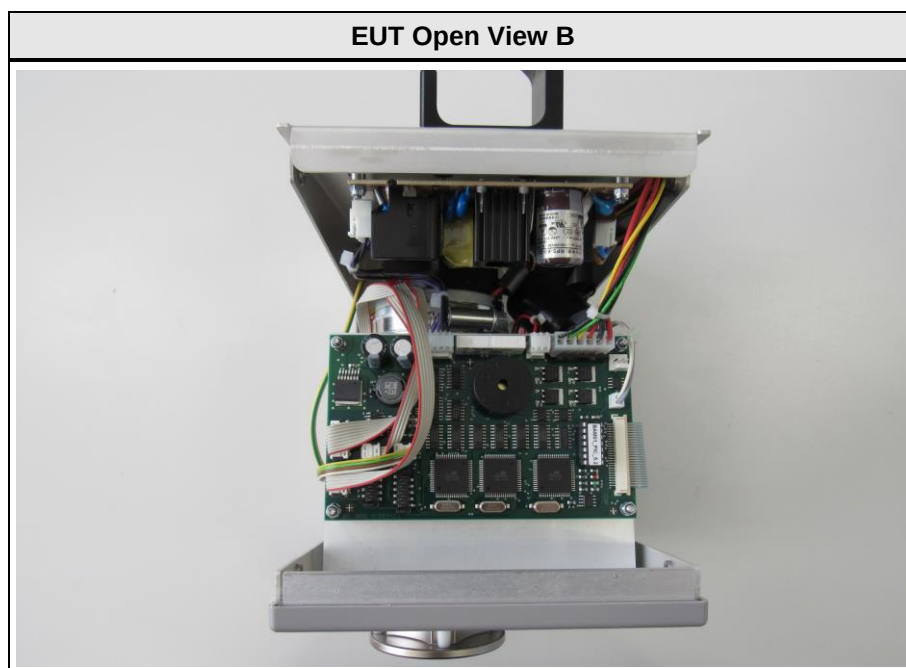
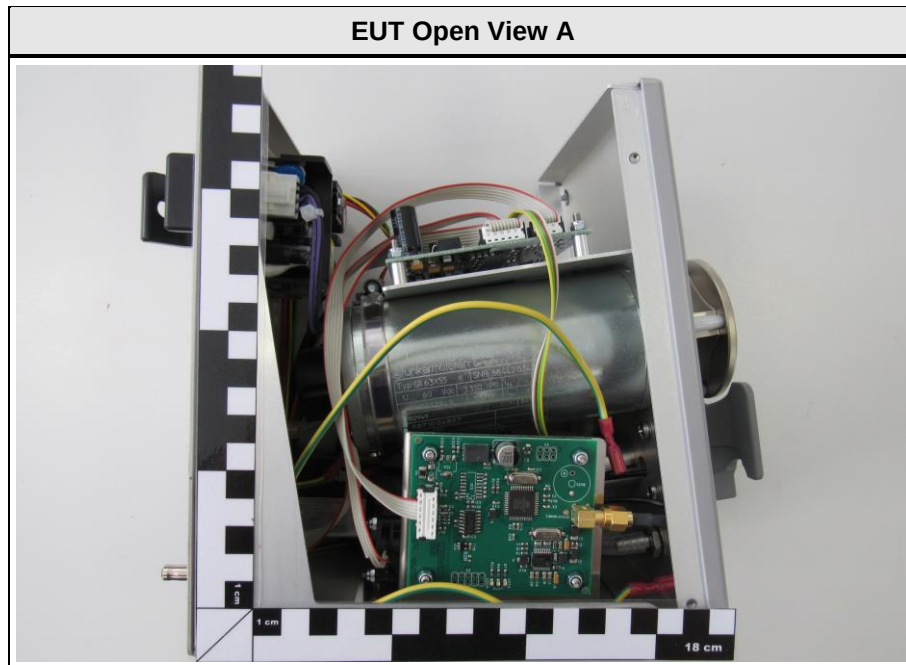
EUT Rear View



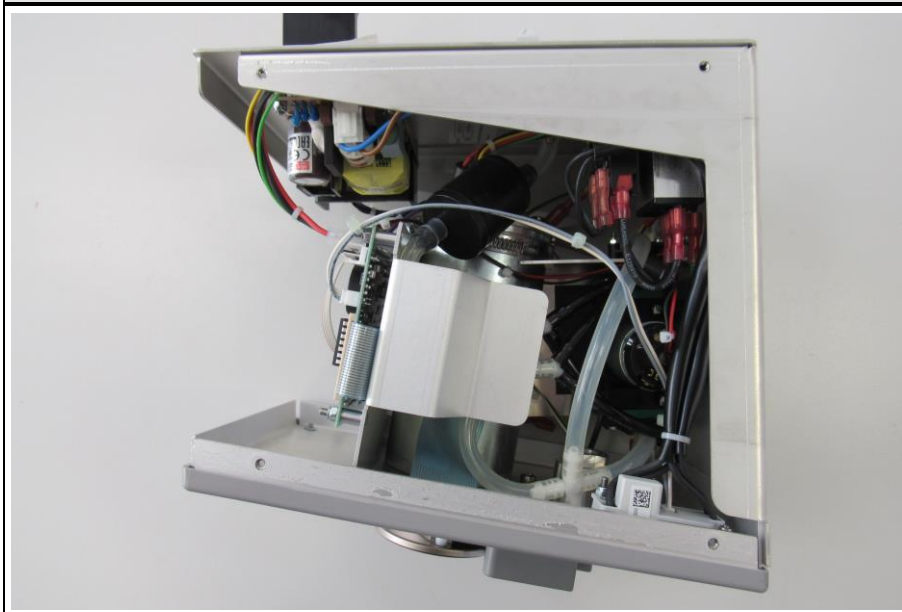
EUT Label View



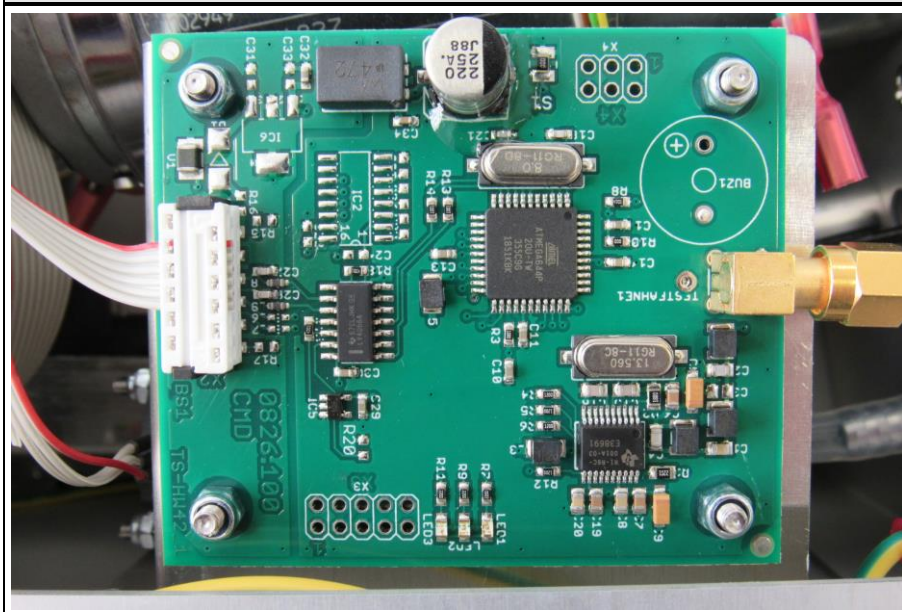
1.2 Photos – Equipment Internal



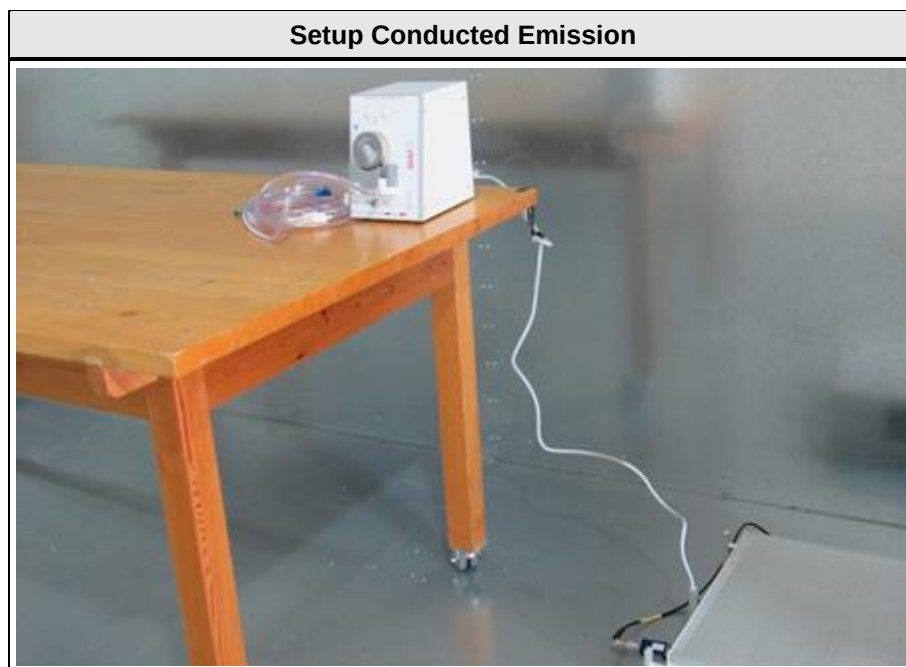
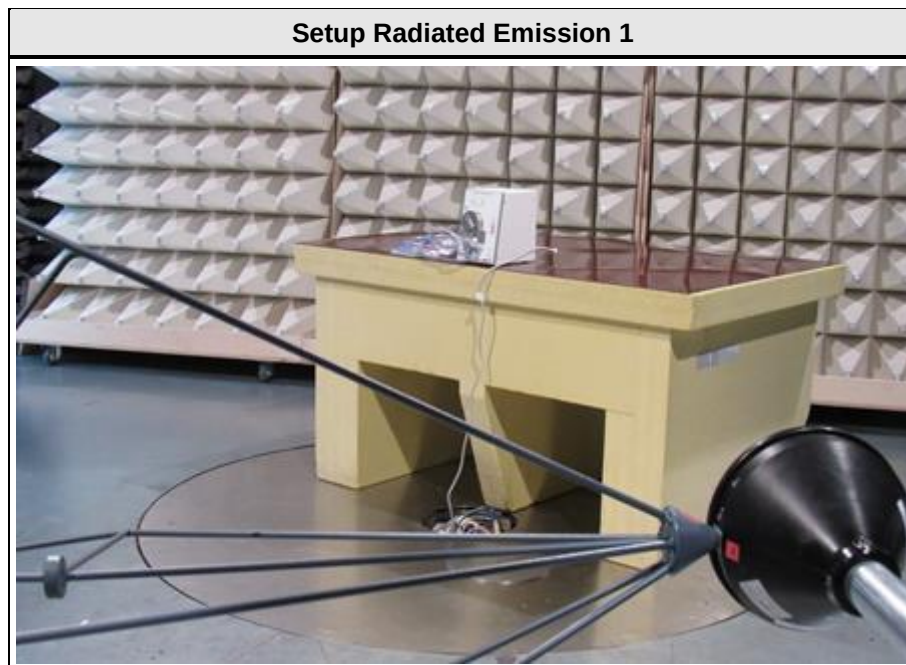
EUT Open View C



RFID Module



1.3 Photos – Test Setup



1.4 Support Equipment

Product Type	Device	Manufacturer	Model	Comment
None				
Description:				
AE	Auxiliary Equipment			
SIM	Simulator			
CBL	Connecting Cable			
SFT	Software			
Comment:				

1.5 Test Modes

Mode	Description
Transmit/Receive	Mode = Transmit Modulation = ASK Duty cycle = 100 %
Comment:	

1.6 Test Frequencies

Designator	Mode	Channel	Frequency [MHz]
F1	Tx / Rx	0	13.5609

1.7 Sample emission level calculation

The following is a description of terms and a sample calculation, as appears in the radiated emissions data table. The numbers used in the calculation are for example only. There is no direct correlation to the specific data taken for the product described in this document:

Reading:

This is the reading obtained on the spectrum analyzer in dBμV. Any external preamplifiers used are taken into account through internal analyzer settings.

A.F.:

This is the antenna factor for the receiving antenna. It is a conversion factor, which converts electric fields strengths to voltages, which can be measured directly on the spectrum analyzer. It is treated as a loss in dB. Cable losses have been included with the A.F. to simplify the calculations. The antenna factor is used in calculations as follows:

$$\text{Reading on Analyzer (dB}\mu\text{V)} + \text{A.F. (dB/m)} = \text{Net field strength (dB}\mu\text{V/m)}$$

Net:

This is the net field strength measurement (as shown above).

Limit:

This is the FCC Class B radiated emission limit (in units of dBμV/m). The FCC limits are given in units of μV/m. The following formula is used to convert the units of μV/m to dBμV/m:

$$\text{Limit (dB}\mu\text{V/m)} = 20 \cdot \log(\mu\text{V/m})$$

Margin:

This is the margin of compliance below the FCC limit. The units are given in dB. A negative margin indicates the emission was below the limit. A positive margin indicates that the emission exceeds the limit.

Example only:

Reading + AF	= Net Reading	:	Net reading - FCC limit	= Margin
+21.5 dBμV + 26 dB/m	= 47.5 dBμV/m	:	47.5 dBμV/m - 57.0 dBμV/m	= -9.5 dB

2 Result Summary

FCC 47 CFR Part 15C, ISED RSS-210, ISED RSS-Gen				
Product Standard Reference	Requirement	Reference Method	Result	Remarks
RSS-Gen 6.7	Occupied Bandwidth	ANSI C63.10-2013	N/T	Informational only
FCC 15.225(a-c) ISED RSS-210 B.6(a)	Fundamental in-band field strength emissions	ANSI C63.10-2013	PASS	
FCC 15.225(d) FCC 15.209 ISED RSS-210 B.6(d)	Emission radiated outside the specified frequency band	ANSI C63.10-2013	PASS	
FCC 15.225(e) ISED RSS-210 B.6	Frequency stability	ANSI C63.10-2013	N/T	Module integration
ISED RSS-Gen 4.10 ISED RSS-Gen 7.1	Receiver radiated spurious emissions	ANSI C63.10-2013	N/A	Permanently co-located transmitter
47 CFR 15.207 RSS-Gen 8.8	AC power line conducted emissions	ANSI C63.10-2013	PASS	
Comment:				

Possible Test Case Verdicts	
PASS	Test object does meet the requirements
FAIL	Test object does not meet the requirements
N/T	Required by standard but not tested
N/R	Not required by standard for the test object

3 Test Conditions and Results

3.1 Test Conditions and Results - Fundamental in-band field strength emissions

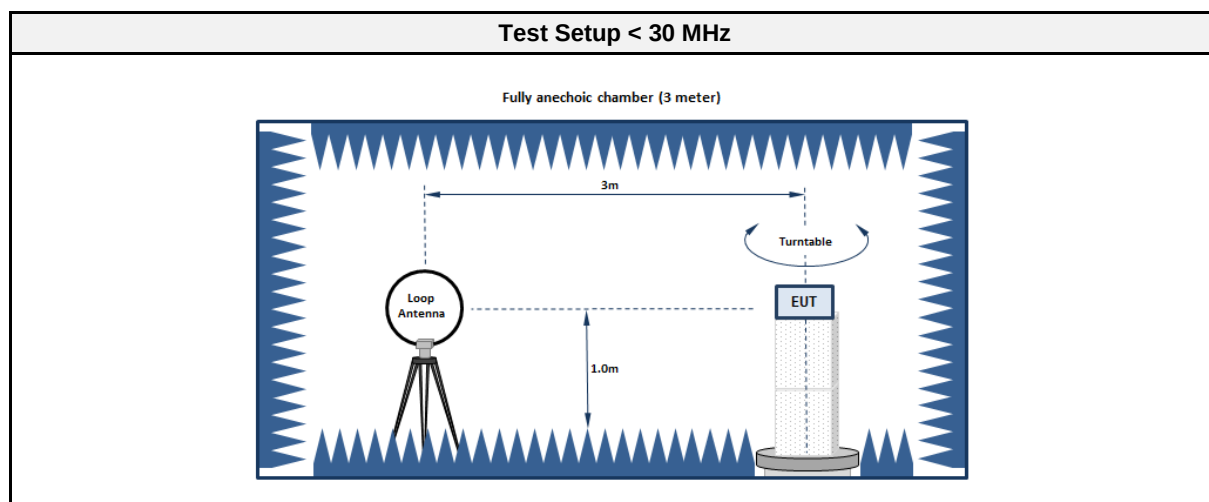
3.1.1 Information

Test Information	
Product Standard Reference	FCC 47 CFR 15.225(a-c) / ISED RSS-210 B.6(a)
Measurement Method	Radiated
Operator	Wilfried Treffke
Measurement Uncertainty	± 5.95 dB
Date	2020-04-06

3.1.2 Limits

Limits			
Frequency range [MHz]	Limit [$\mu\text{V/m}$]	Limit [dB $\mu\text{V/m}$]	Limit Distance [m]
13.553 - 13.567	15848	84	30
13.410 - 13.553 13.567 - 13.710	334	50.5	30
13.110 - 13.410 13.710 - 14.010	106	40.5	30

3.1.3 Setup



3.1.4 Equipment

Test Software			
Description	Manufacturer	Name	Version
EMC Software	DARE Instruments	RadiMation	2016.1.10

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Semi-Anechoic Chamber	Frankonia	AC2	EF00196	-	-
EMI Test Receiver	Rohde & Schwarz Vertriebs GmbH	ESCS 30	EF00295	2019-07	2020-07
Antenna	R&S	HFH2-Z2	EF00184	2017-12	2020-12

3.1.5 Procedure

Test Procedure	
1.	EUT set to test mode
2.	Span it set according to measurement range
3.	Resolution bandwidth below 1 GHz is set according to CISPR 16 with peak/quasi-peak detector
4.	Below 30MHz an extrapolation according ANSI 63.10; 6.4.4.2 is used.

3.1.6 Results

Test Results						
Channel [MHz]	Emission [MHz]	Level @ 30 m [dB μ V/m]	Detector	Polarization	Limit @ 30 m [dB μ V/m]	Margin
13.5609	13.56	26	pk	ver	84	-57.96

3.2 Test Conditions and Results - Emissions radiated outside the specified frequency band

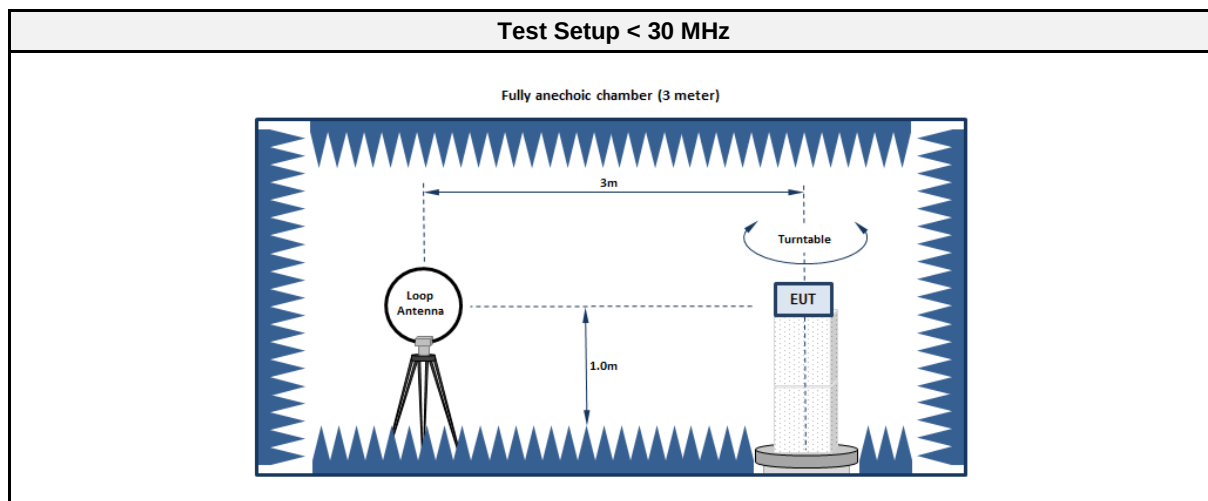
3.2.1 Information

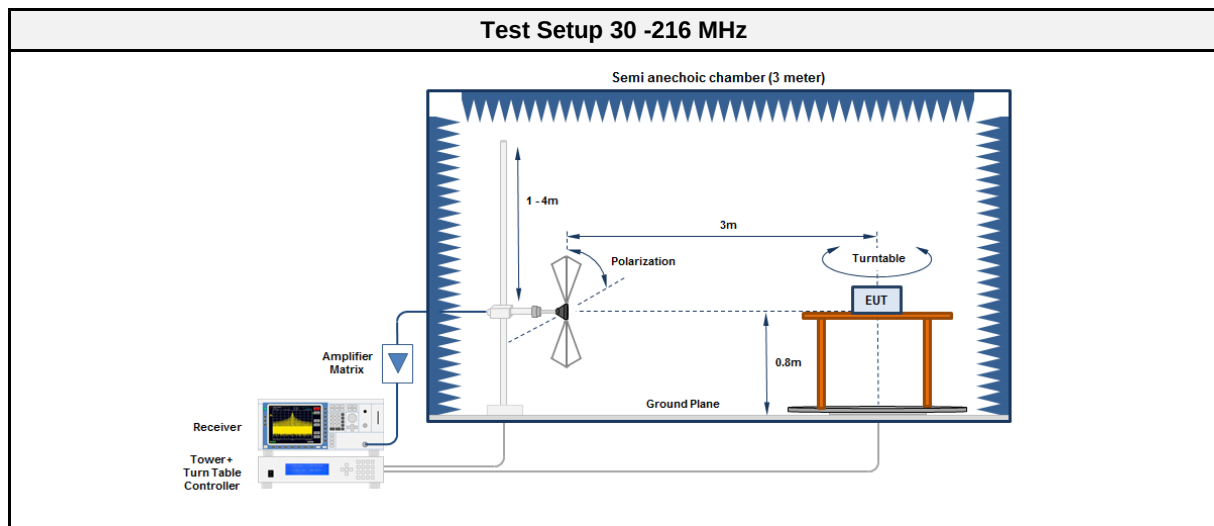
Test Information	
Product Standard Reference	FCC 47 CFR 15.225(d) / ISED RSS-210 B.6(d)
Measurement Method	Radiated
Measurement Uncertainty	± 5.95 dB
Operator	Wilfried Treffke
Date	2020-04-06

3.2.2 Limits

Limits				
Frequency range [MHz]	Detector	Limit [$\mu\text{V/m}$]	Limit [$\text{dB}\mu\text{V/m}$]	Limit Distance [m]
0.009 - 0.490	Quasi-Peak	$2400/F[\text{kHz}]$	48.5 - 13.8	300
0.490 - 1.705	Quasi-Peak	$2400/F[\text{kHz}]$	13.8 - 2.97	30
1.705 - 30	Quasi-Peak	30	29.5	30
30 - 88	Quasi-Peak	100	40	3
88 - 216	Quasi-Peak	150	43.5	3

3.2.3 Setup





3.2.4 Equipment

Test Software			
Description	Manufacturer	Name	Version
EMC Software	DARE Instruments	RadiMation	2016.1.10

Test Equipment < 30 MHz					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Semi-Anechoic Chamber	Frankonia	AC2	EF00196	-	-
EMI Test Receiver	Rohde & Schwarz Vertriebs GmbH	ESCS 30	EF00295	2019-07	2020-07
Antenna	R&S	HFH2-Z2	EF00184	2017-12	2020-12

Test Equipment 30 - 216 MHz					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Anechoic Chamber	Frankonia	AC1	EF00062	2018-07	2021-07
Measurement Receiver	R&S	N9038A-526/WXP	EF01070	2019-09	2020-09
Antenna	R&S	HK116	EF00203	2018-06	2020-06

3.2.5 Procedure

Test Procedure
1. EUT set to test mode 2. Span it set according to measurement range 3. Resolution bandwidth below 1 GHz is set according to CISPR 16 with peak/quasi-peak detector and RBW of 1 MHz with peak/average detector is used above 1 GHz 4. Below 30MHz an extrapolation according ANSI 63.10; 6.4.4.2 is used. 5. Markers are set to maximum emission levels

3.2.6 Results

Test Results						
Channel [MHz]	Emission [MHz]	Level [dBμV/m]	Detector	Polarization	Limit [dBμV/m]	Margin [dB]
13.5609	0.104	-54.90	pk	ver	27.30	-82.13

3.3 Test Conditions and Results - AC powerline conducted emissions

3.3.1 Information

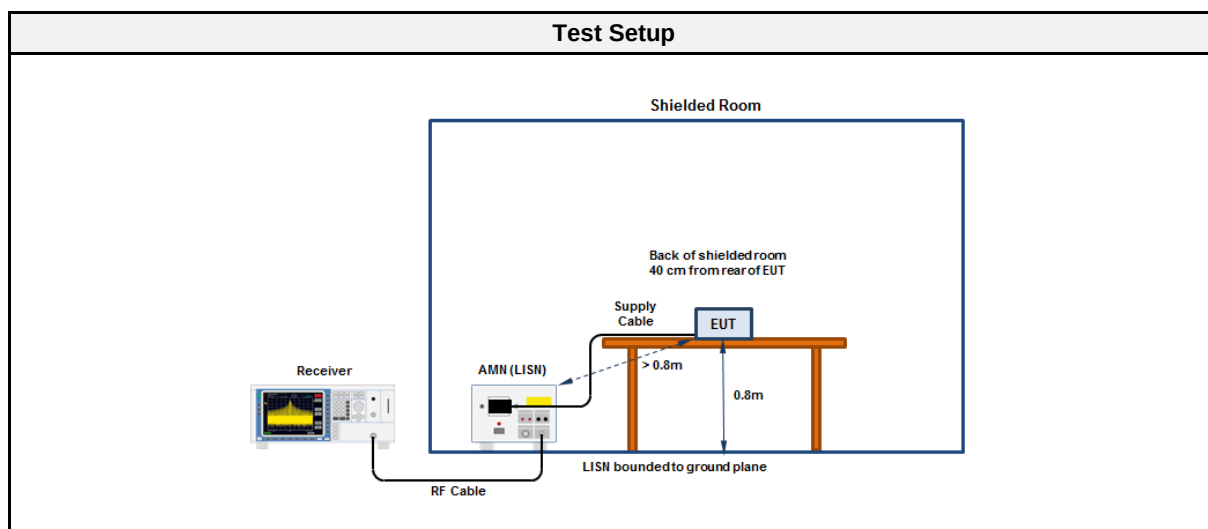
Test Information	
Reference	FCC 47 CFR 15.207; ISSED RSS-Gen, Issue 5
Measurement Method	ANSI C63.10 6.2
Measurement Uncertainty	± 3.82 dB
Operator	Wilfried Treffke
Date	2020-04-07

3.3.2 Limits

Limits		
Frequency [MHz]	Quasi-Peak [dB μ V]	Average [dB μ V]
0.15 - 0.5	66 - 56*	56 - 46*
0.5 - 5	56	46
5 - 30	60	50

* Limit decreases linearly with the logarithm of the frequency

3.3.3 Setup



3.3.4 Equipment

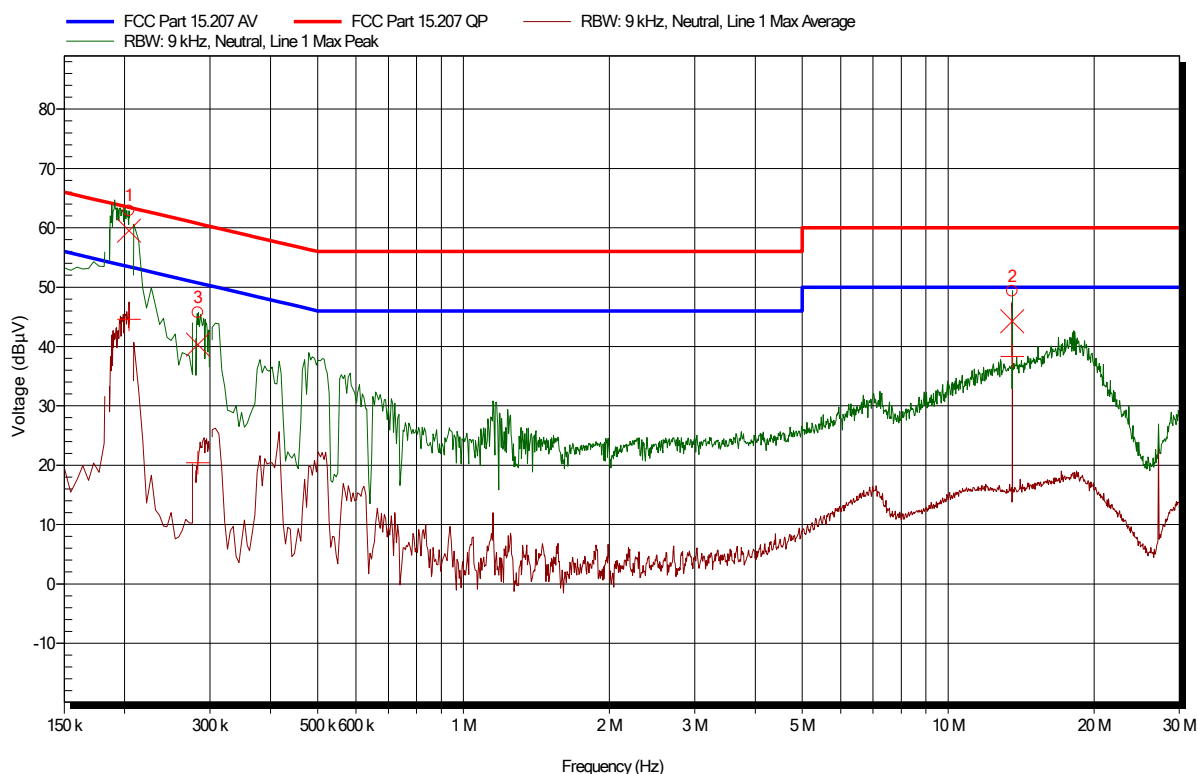
Test Software			
Description	Manufacturer	Name	Version
EMC Software	DARE Instruments	RadiMation	2016.1.10

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
EMI Receiver	R&S	ESU 26	EF00241	2019-07	2021-07
LISN	R&S	NSLK 8127 RC	EF01592	2019-10	2020-10

Conducted emissions at the mains power port according to FCC 47 CFR 15 Subpart C, ISSED RSS-Gen

Project Number: G0M-2003-8908
 Applicant: W.O.M. WORLD OF MEDICINE GmbH
 Model Description: Irrigation and Suction Pump for Laparoscopy
 Model: LAP SUCT./ IRRIG. PUMP
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Treffke
 Test Date: 2020-04-07
 Operating Conditions: ambient temperature: 23°C
 power input: 120 VAC
 LISN: Schwarzbeck NSLK 8127 RC
 Mode: RFID; 13.56 MHz; pump turn on
 Applied to Port: AC-mains

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Peak Number	Frequency	Peak	LISN
1	204 kHz	62.85 dBμV	Neutral
2	13.559 MHz	49.32 dBμV	Line 1
3	283.2 kHz	45.71 dBμV	Line 1

Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	LISN
1	204 kHz	59.55 dBμV	63.45 dBμV	-3.9 dB	Pass	Neutral
2	13.559 MHz	44.27 dBμV	60 dBμV	-15.73 dB	Pass	Line 1
3	283.2 kHz	40.33 dBμV	60.72 dBμV	-20.39 dB	Pass	Line 1

Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	LISN
1	204 kHz	44.58 dBμV	53.45 dBμV	-8.86 dB	Pass	Neutral
2	13.559 MHz	38.32 dBμV	50 dBμV	-11.68 dB	Pass	Line 1
3	283.2 kHz	20.4 dBμV	50.72 dBμV	-30.32 dB	Pass	Line 1

Test Report No.: G0M-2003-8908-TFC225RI-V01

Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

ANNEX A Transmitter in-band emissions

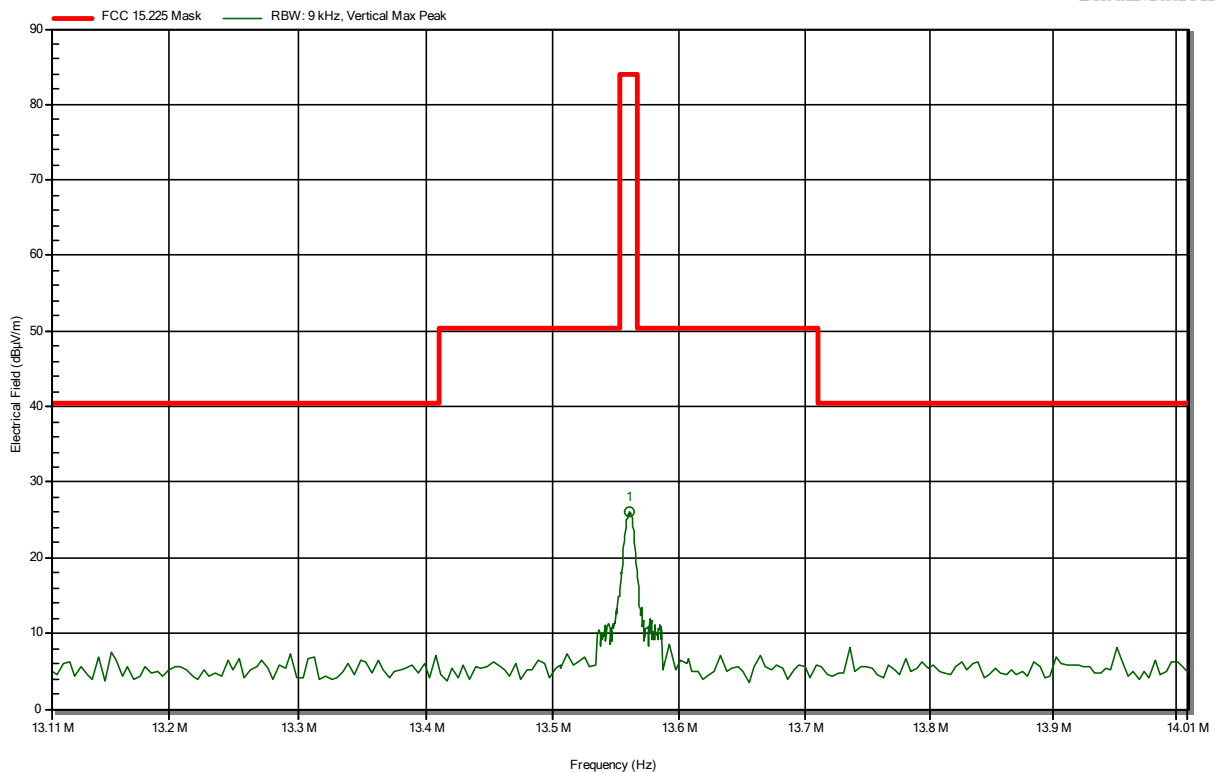
Radiated H-Field strength according to FCC 47 CFR 15.225, ISED RSS-210

Project number: G0M-2003-8908

Applicant: W.O.M. WORLD OF MEDICINE GmbH
EUT Name: Irrigation and Suction Pump for Laparoscopy
Model: LAP SUCT./ IRRIG. PUMP
Test Site: Eurofins Product Service GmbH
Operator: Mr. Treffke
Test Conditions: Tnom: 23 °C, Vnom: 120 VAC
Antenna: HFH2-Z2
Measurement distance: 3 m converted to 30 m
Mode: TX; RFID; 13.56 MHz; pump turn on
Test Date: 2020-04-06
Note:

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RadiMation



Frequency	Peak	Peak Limit	Peak Difference	Peak Status
13.56 MHz	26 dBμV/m	84 dBμV/m	-57.96 dB	Pass

ANNEX B Transmitter radiated spurious emissions

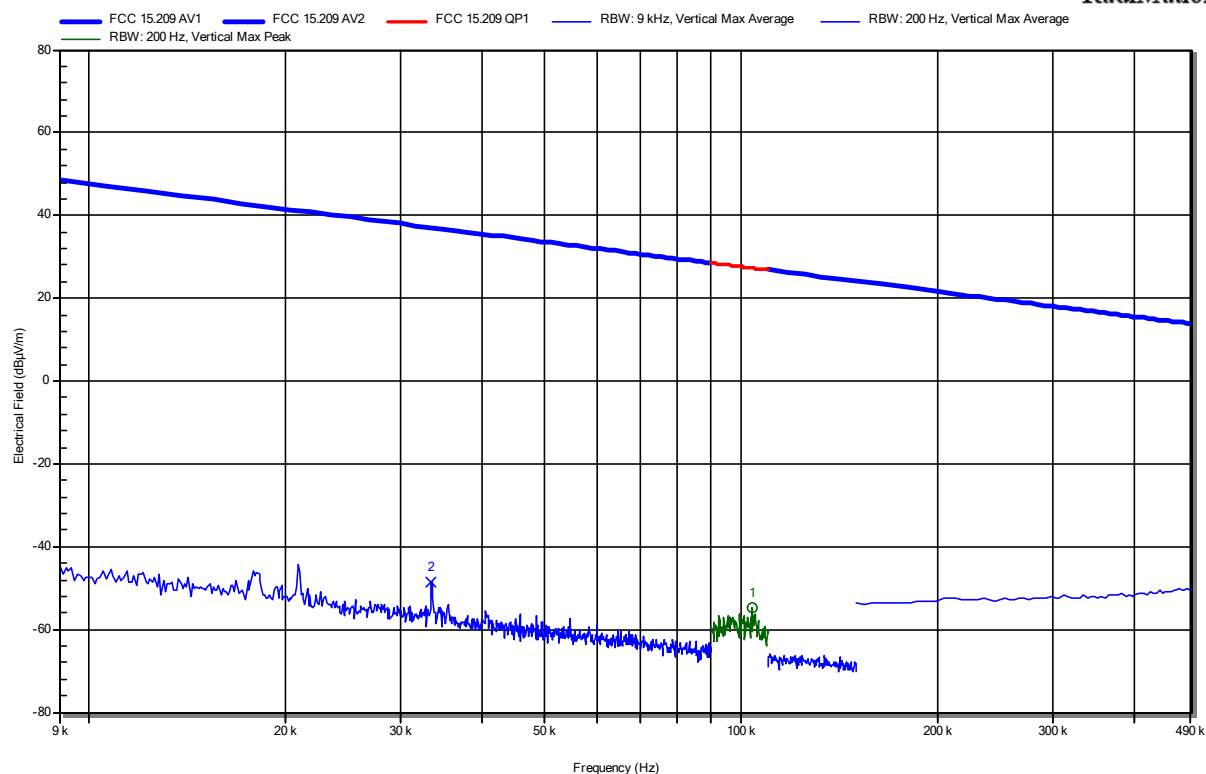
Spurious emissions according to FCC 47 CFR 15.225, ISED RSS-210

Project number: G0M-2003-8908

Applicant: W.O.M. WORLD OF MEDICINE GmbH
EUT Name: Irrigation and Suction Pump for Laparoscopy
Model: LAP SUCT./ IRRIG. PUMP
Test Site: Eurofins Product Service GmbH
Operator: Mr. Treffke
Test Conditions: Tnom: 23°C, Vnom: 120 VAC
Antenna: HFH2-Z2
Measurement distance: 3 m converted to 300 m
Mode: TX; RFID; 13.56 MHz; pump turn on
Test Date: 2020-04-06

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RadiMation



Frequency 104 kHz	Peak -54.9 dBμV/m	Peak Limit 27.3 dBμV/m	Peak Difference -82.13 dB	Peak Status Pass
Frequency 33.5 kHz	Average -48.5 dBμV/m	Average Limit 37.1 dBμV/m	Average Difference -85.61 dB	Average Status Pass

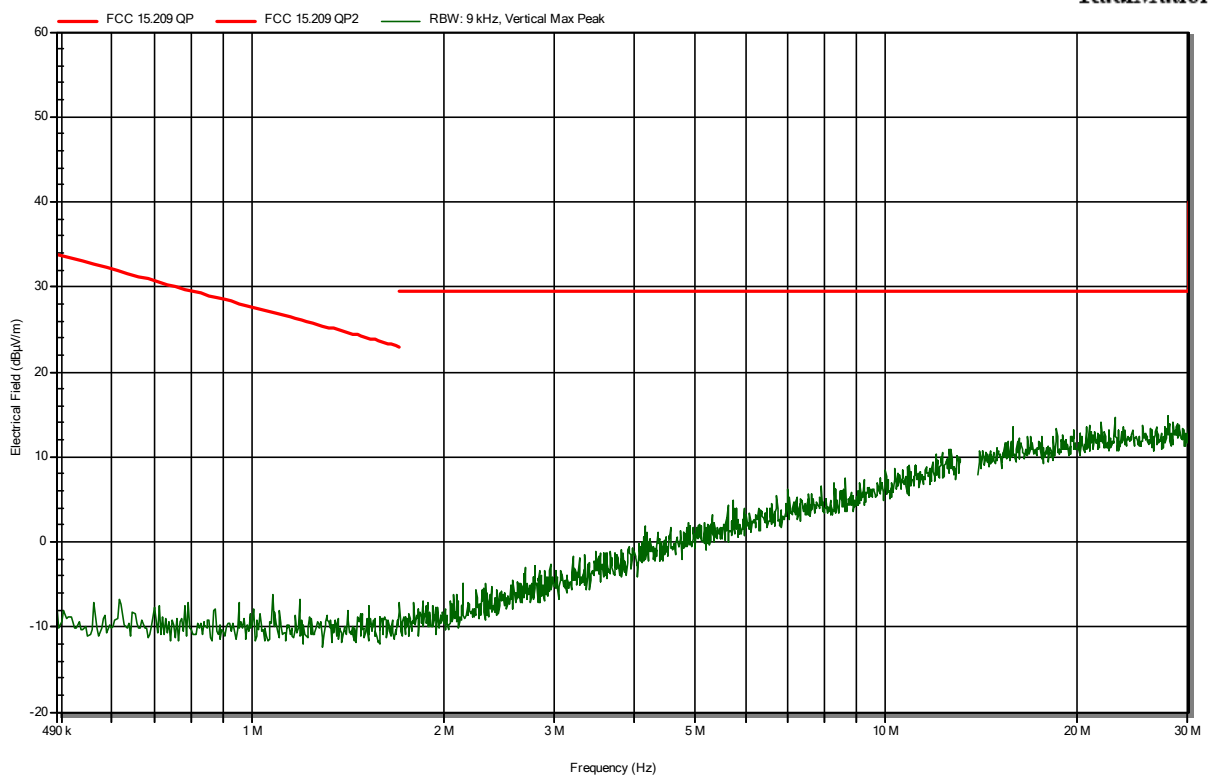
Spurious emissions according to FCC 47 CFR 15.225, ISED RSS-210

Project number: G0M-2003-8908

Applicant: W.O.M. WORLD OF MEDICINE GmbH
 EUT Name: Irrigation and Suction Pump for Laparoscopy
 Model: LAP SUCT./ IRRIG. PUMP
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Treffke
 Test Conditions: Tnom: 23 °Celsius°C, Vnom: 120 VAC
 Antenna: HFH2-Z2
 Measurement distance: 3 m converted to 30 m
 Mode: TX; RFID; 13.56 MHz; pump turn on
 Test Date: 2020-04-06
 Note:

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RadiMation

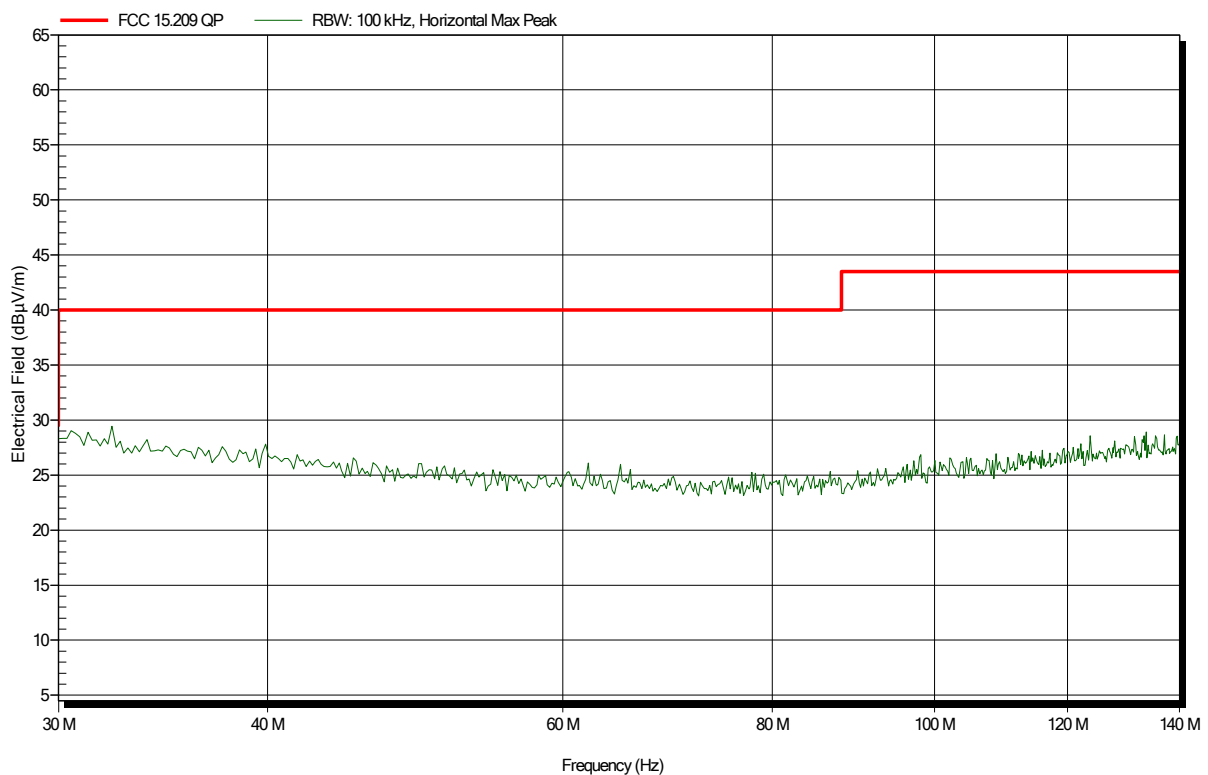


Spurious emissions according to FCC 47 CFR 15.225, ISSED RSS-210

Project number: G0M-2003-8908

Applicant: W.O.M. WORLD OF MEDICINE GmbH
EUT Name: Irrigation and Suction Pump for Laparoscopy
Model: LAP SUCT./ IRRIG. PUMP
Test Site: Eurofins Product Service GmbH
Operator: Mr. Treffke
Test Conditions: Tnom: 23°C, Vnom: 120 VAC
Antenna: Rohde & Schwarz HK 116, Horizontal
Measurement distance: 3 m
Mode: RX; RFID; 13.56 MHz; pump turn on
Test Date: 2020-04-06
Note: worst case

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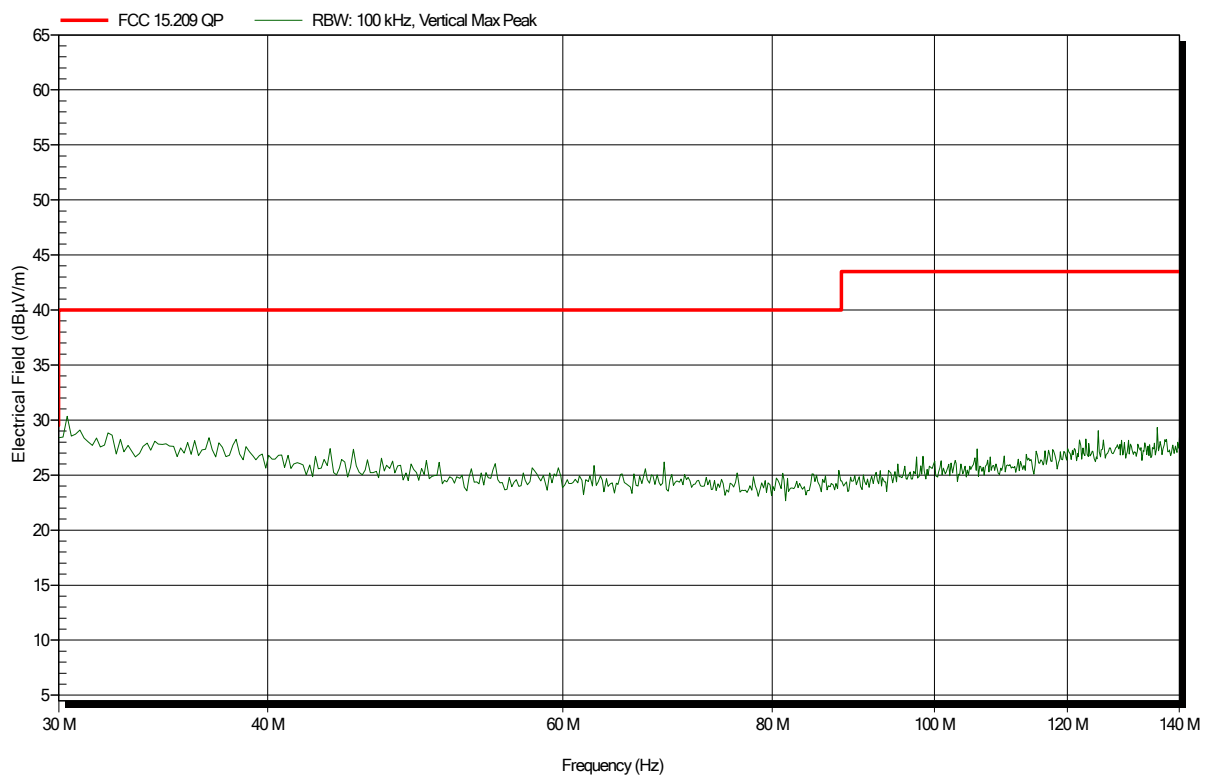


Spurious emissions according to FCC 47 CFR 15.225, ISED RSS-210

Project number: G0M-2003-8908

Applicant: W.O.M. WORLD OF MEDICINE GmbH
 EUT Name: Irrigation and Suction Pump for Laparoscopy
 Model: LAP SUCT./ IRRIG. PUMP
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Treffke
 Test Conditions: Tnom: 23°C, Vnom: 120 VAC
 Antenna: Rohde & Schwarz HK 116, Vertical
 Measurement distance: 3 m
 Mode: RX; RFID; 13.56 MHz; pump turn on
 Test Date: 2020-04-06
 Note: worst case

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== = END OF TEST REPORT == =

Test Report No.: G0M-2003-8908-TFC225RI-V01

Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany