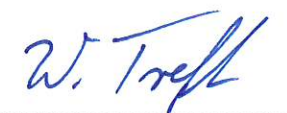


RADIO REPORT FCC 47 CFR Part 15C ISED Canada RSS-247 Digital transmission systems operating within the 902.0 MHz - 928.0 MHz band	
Report Reference No	G0M-2211-1783-TFC247DT-V01
Testing Laboratory	Eurofins Product Service GmbH
Address	Storkower Str. 38c 15526 Reichenwalde Germany
Accreditation	    DAkks - Registration number : D-PL-12092-01-03 (ISED) ISED Testing Laboratory site: 3470A DAkks - Registration number : D-PL-12092-01-04 (FCC) FCC Filed Test Laboratory, Reg.-No.: 96970
Applicant	Kamstrup A/S
Address	Industrivej 28 8660 Skanderborg DENMARK
Test Specification	47 CFR Part 15C RSS-247, Issue 2, 2017-02 RSS-Gen, Issue 5, Amendment 2, 2021-02
Non-Standard Test Method	None
Equipment under Test (EUT):	
Product Description	Ultrasonic water meter
Model(s)	KW2220
Additional Model(s)	None
Brand Name(s)	Kamstrup
Hardware Version(s)	Unit: 620-210-04; RF PCB BOM: 5550-2066; Flow PCB BOM: 5550-2080
Software Version(s)	RF: 50981789; meter: 50981812; Flow: 50981813
FCC ID	OUY-KWMX220
IC	22376-KWMX220
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 °C - 30 °C	
Test Lab Humidity	25 % - 55 %	
Date of receipt of test item	2023-02-20	
Report:		
Compiled by	Odai Qawasmeh	
Tested by (+ signature) (Responsible for Test)	Odai Qawasmeh	
Approved by (+ signature) (Test Lab Engineer)	Wilfried Treffke	
Date of Issue	2023-03-14	
Total number of pages	76	
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:		

ADDITIONAL VARIANTS

Additional Variants (not tested and not evaluated variants)		
Not-tested Variant	Description	
1	Product Type Description	Ultrasonic water meter
	Model name	KWM2220
	Brand name	Kamstrup
	Hardware Version	Unit: 6201-210-01 RF PCB BOM: 5550-2066 Flow PCB BOM: 5550-2080
	Software Version	RF: 50981789 Meter: 50981812 Flow: 50981813
2	Product Type Description	Ultrasonic water meter
	Model name	KWM2220
	Brand name	Kamstrup
	Hardware Version	Unit: 6201-210-02 RF PCB BOM: 5550-2066 Flow PCB BOM: 5550-2080
	Software Version	RF: 50981789 Meter: 50981812 Flow: 50981813
3	Product Type Description	Ultrasonic water meter
	Model name	KWM2220
	Brand name	Kamstrup
	Hardware Version	Unit: 6201-210-03 RF PCB BOM: 5550-2066 Flow PCB BOM: 5550-2080
	Software Version	RF: 50981789 Meter: 50981812 Flow: 50981813
4	Product Type Description	Ultrasonic water meter
	Model name	KWM3220
	Brand name	Kamstrup
	Hardware Version	Unit: 6201-204-01 RF PCB BOM: 5550-2066 Flow PCB BOM: 5550-2094
	Software Version	RF: 50981789 Meter: 50981812 Flow: 50981813
5	Product Type Description	Ultrasonic water meter
	Model name	KWM3220
	Brand name	Kamstrup
	Hardware Version	Unit: 6201-205-01 RF PCB BOM: 5550-2066 Flow PCB BOM: 5550-2094
	Software Version	RF: 50981789 Meter: 50981812 Flow: 50981813

6	Product Type Description	Ultrasonic water meter
	Model name	KWM3220
	Brand name	Kamstrup
	Hardware Version	Unit: 6201-204-02 RF PCB BOM: 5550-2066 Flow PCB BOM: 5550-2094
	Software Version	RF: 50981789 Meter: 50981812 Flow: 50981813
7	Product Type Description	Ultrasonic water meter
	Model name	KWM3220
	Brand name	Kamstrup
	Hardware Version	Unit: 6201-204-03 RF PCB BOM: 5550-2066 Flow PCB BOM: 5550-2094
	Software Version	RF: 50981789 Meter: 50981812 Flow: 50981813
8	Product Type Description	Ultrasonic water meter
	Model name	KWM3220
	Brand name	Kamstrup
	Hardware Version	Unit: 6201-204-04 RF PCB BOM: 5550-2066 Flow PCB BOM: 5550-2094
	Software Version	RF: 50981789 Meter: 50981812 Flow: 50981813
9	Product Type Description	Ultrasonic water meter
	Model name	KWM3220
	Brand name	Kamstrup
	Hardware Version	Unit: 6201-204-05 RF PCB BOM: 5550-2066 Flow PCB BOM: 5550-2094
	Software Version	RF: 50981789 Meter: 50981812 Flow: 50981813
10	Product Type Description	Ultrasonic water meter
	Model name	KWM3220
	Brand name	Kamstrup
	Hardware Version	Unit: 6201-204-06 RF PCB BOM: 5550-2066 Flow PCB BOM: 5550-2094
	Software Version	RF: 50981789 Meter: 50981812 Flow: 50981813
11	Product Type Description	Ultrasonic water meter
	Model name	KWM3220
	Brand name	Kamstrup
	Hardware Version	Unit: 6201-204-07 RF PCB BOM: 5550-2066 Flow PCB BOM: 5550-2094
	Software Version	RF: 50981789 Meter: 50981812 Flow: 50981813

12	Product Type Description	Ultrasonic water meter
	Model name	KWM3220
	Brand name	Kamstrup
	Hardware Version	Unit: 6201-204-08 RF PCB BOM: 5550-2066 Flow PCB BOM: 5550-2094
	Software Version	RF: 50981789 Meter: 50981812 Flow: 50981813
Comment: Those named additional variants above have not been tested. Those additional variants of the series have been declared by the manufacturer. The test report explicitly states that those variants were neither tested nor assessed nor evaluated.		

VERSION HISTORY

Version History			
Version	Issue Date	Remarks	Revised By
01	2023-03-14	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
RMS	Root mean square
VBW	Video bandwidth
V _{NOM}	Nominal supply voltage

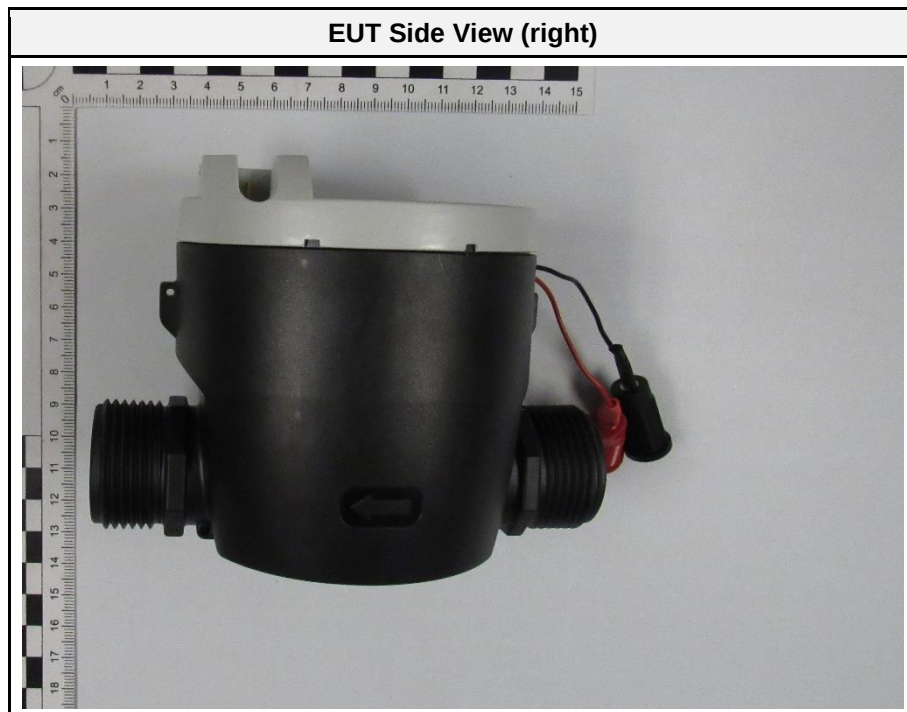
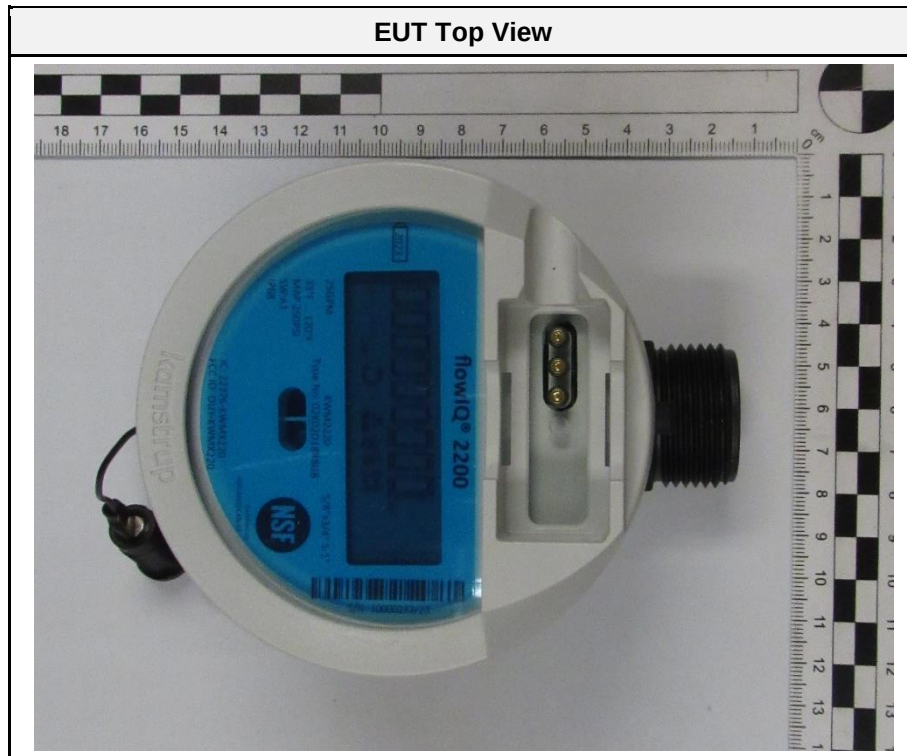
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1 Equipment (Test Item) Under Test

Description	Ultrasonic water meter			
Model	KW2220			
Additional Model(s)	None			
Brand Name(s)	Kamstrup			
Serial Number(s)	10000231/23			
Test Sample Id(s)	43140			
Hardware Version(s)	Unit: 620-210-04; RF PCB BOM: 5550-2066; Flow PCB BOM: 5550-2080			
Software Version(s)	RF: 50981789; meter: 50981812; Flow: 50981813			
PMN	KWM2220			
HVIN	02K02D18R8UB			
FVIN	50981789			
HMN	N/A			
FCC ID	OUY-KWMX220			
IC	22376-KWMX220			
Equipment type	End Product			
Radio type	Transceiver			
Assigned frequency bands	902.0 MHz - 928.0 MHz			
Radio technology	Digital Modulation			
Modulation	2-FSK			
Number of antenna ports	1			
Helix Antenna	Type	External antenna		
	Model	30261216 B1		
	Manufacturer	Kamstrup		
	Gain	-2dBi (920MHz)	-2dBi (915MHz)	-3dBi (928MHz)
Wall Antenna	Type	External antenna		
	Model	6699490		
	Manufacturer	Kamstrup		
	Gain	-1dBi (902MHz)	-1dBi (914MHz)	-3dBi (928MHz)
Pit Antenna	Type	External antenna		
	Model	6697902		
	Manufacturer	Kamstrup		
	Gain	2.2dBi		
Supply Voltage	V _{NOM}	3.66 VDC by internal lithium battery		
Operating Temperature	T _{NOM}	25 °C		
AC/DC-Adaptor	None			
Manufacturer	Kamstrup A/S Industrivej 28 8660 Skanderborg DENMARK			

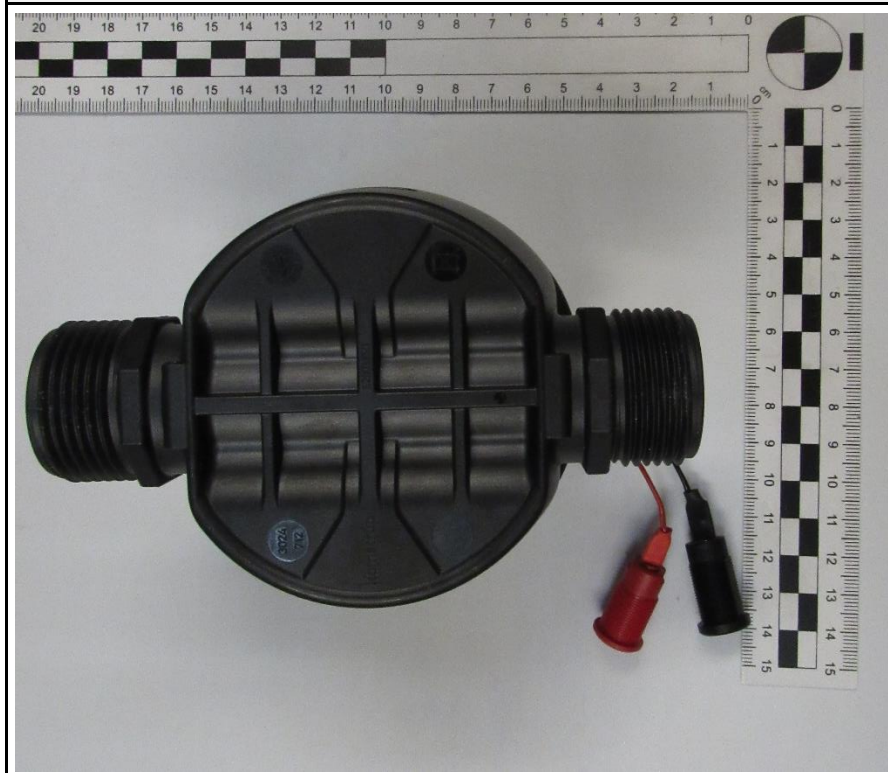
1.1 Photos – Equipment External



EUT Side View (left)



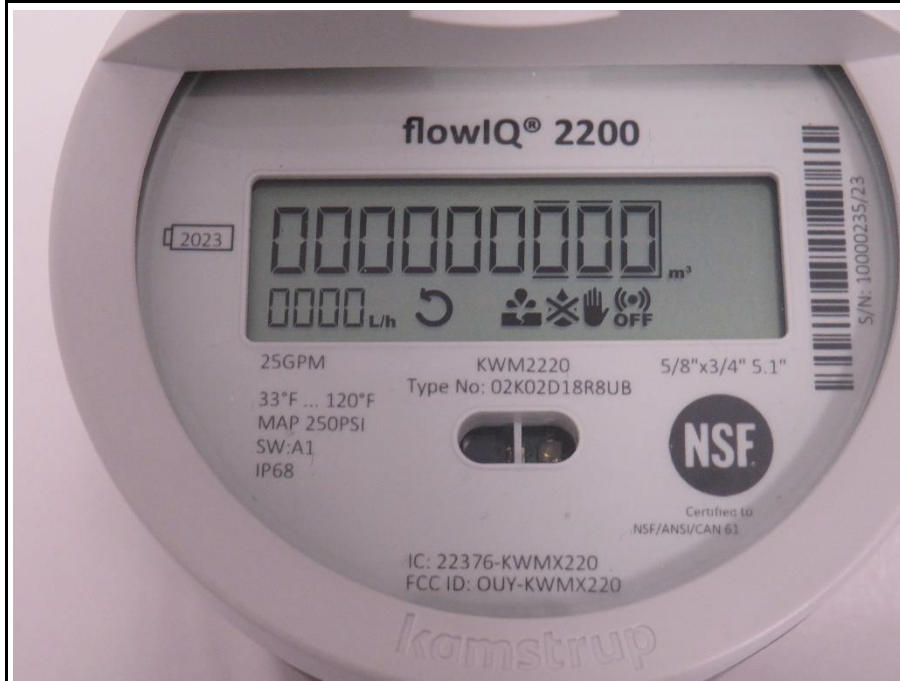
EUT Bottom View



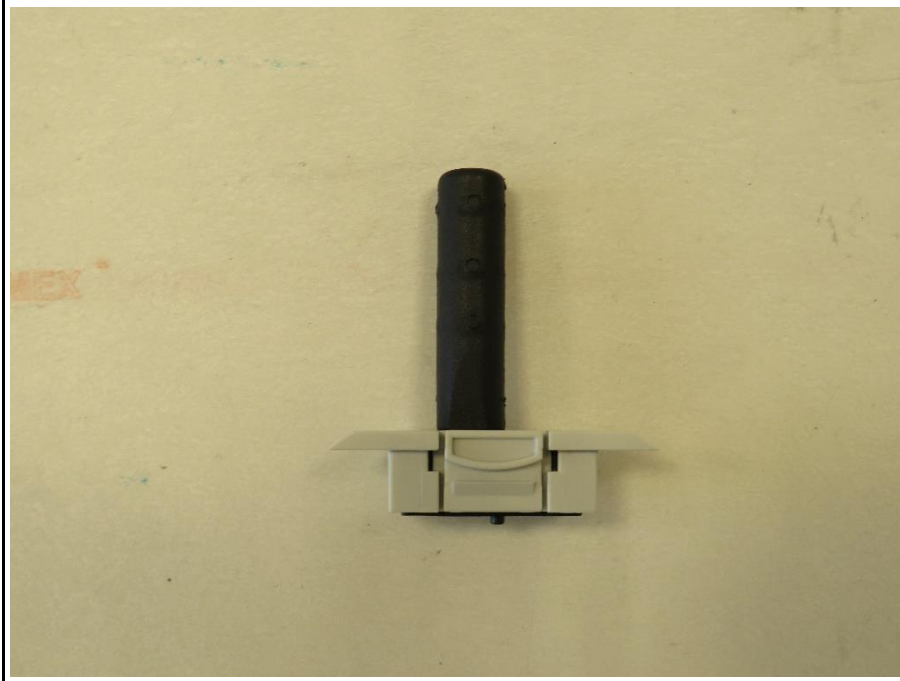
EUT Front View



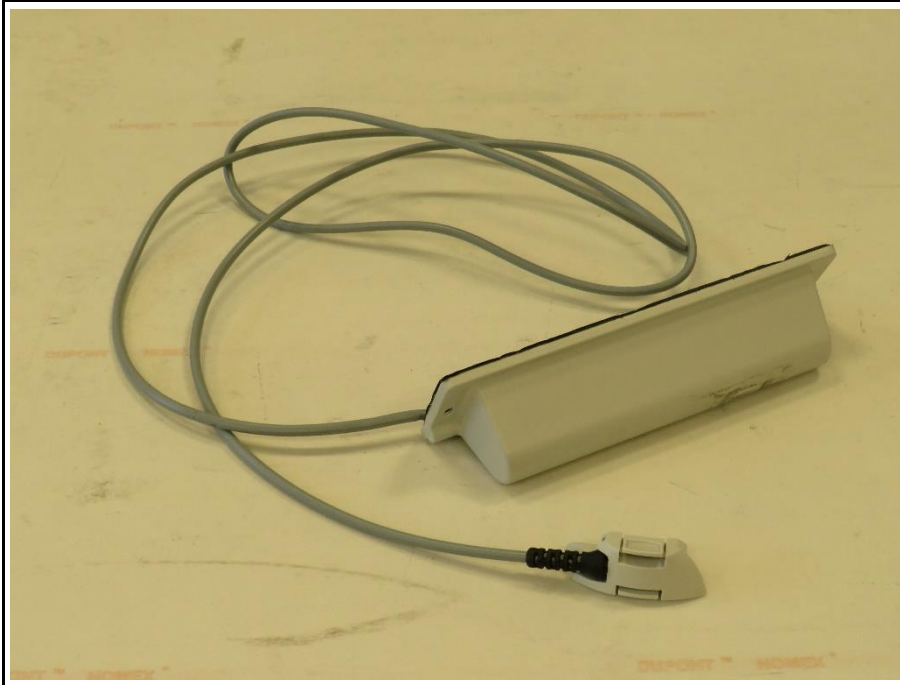
EUT Label



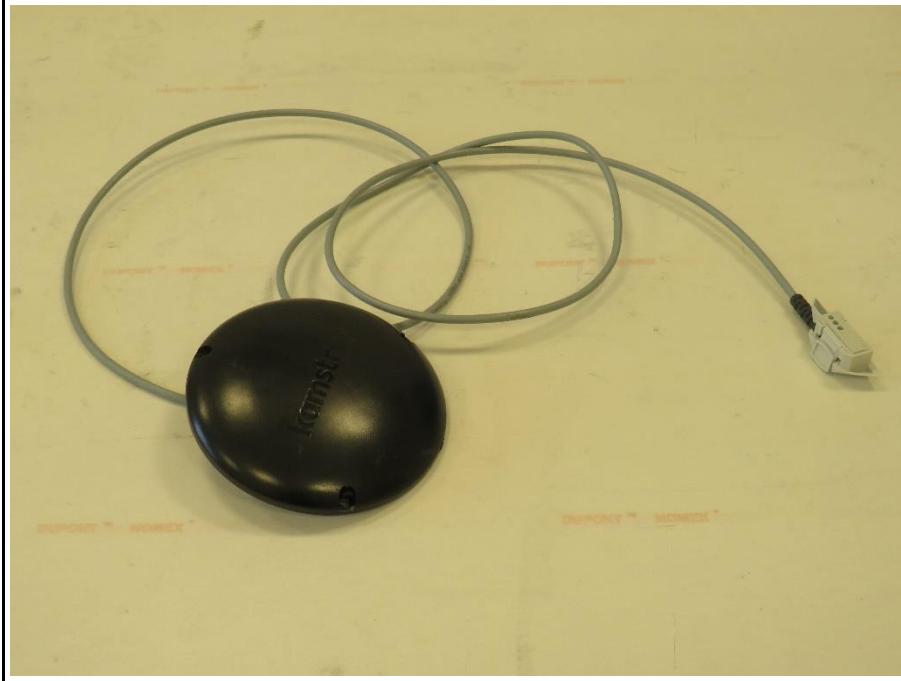
Helix Antenna



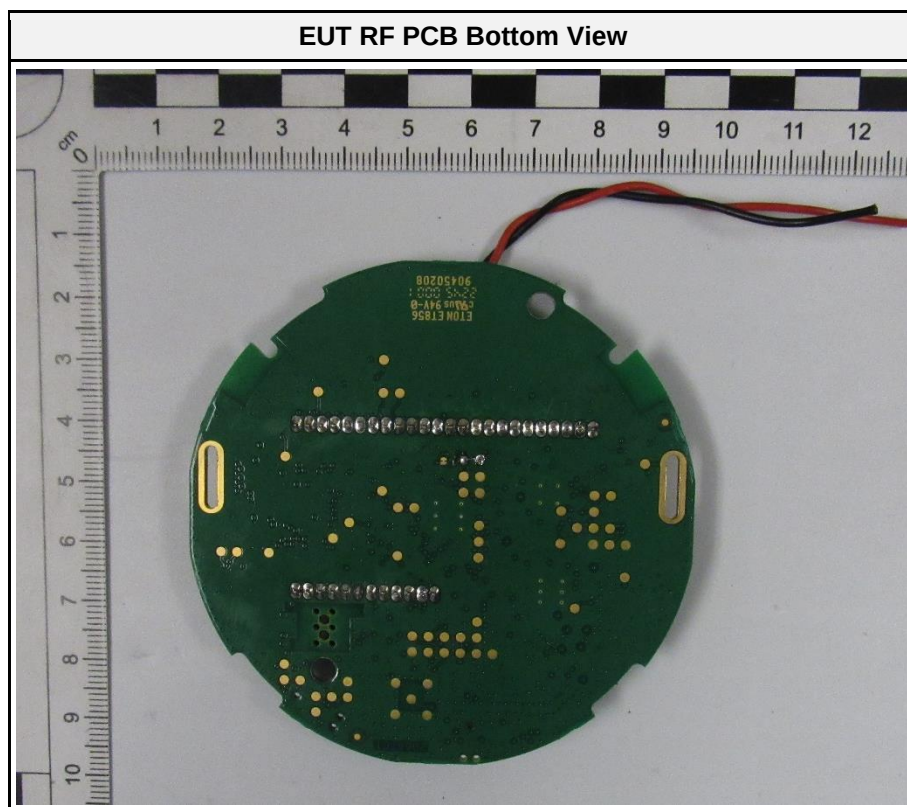
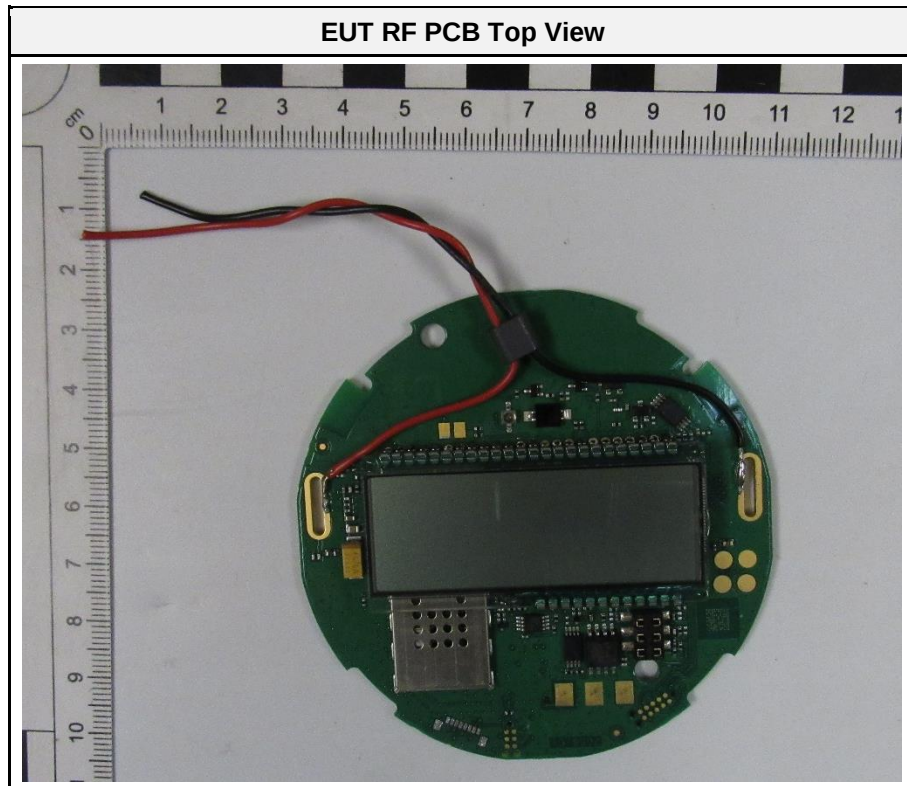
Wall Antenna



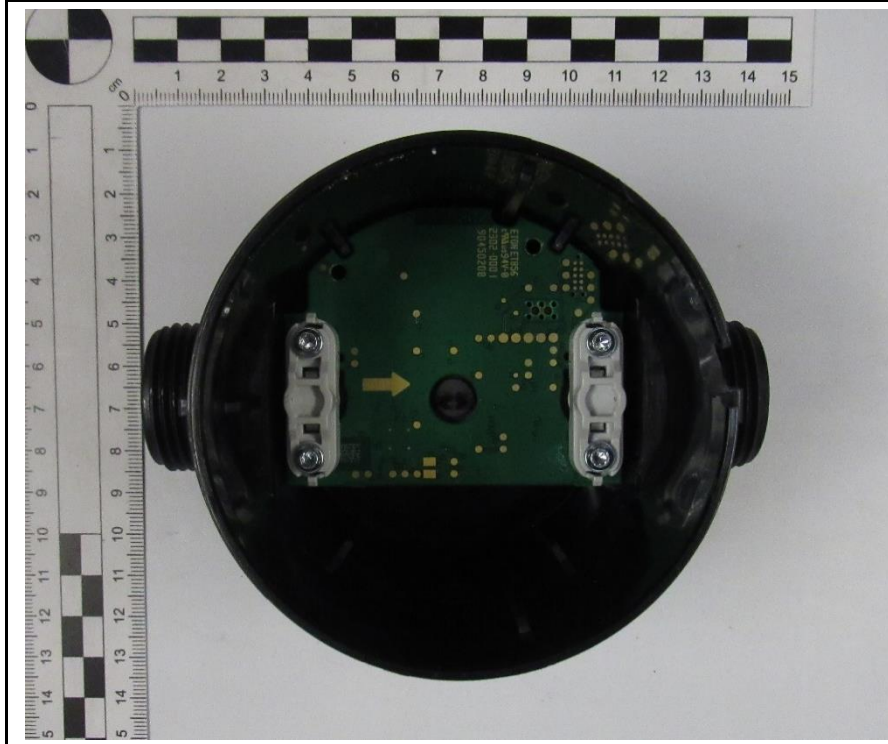
Pit Antenna



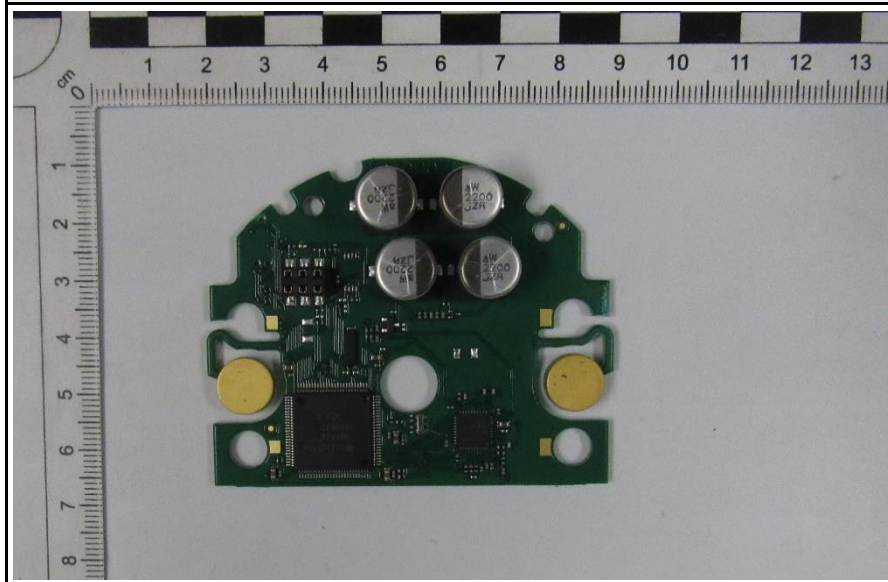
1.2 Photos – Equipment Internal

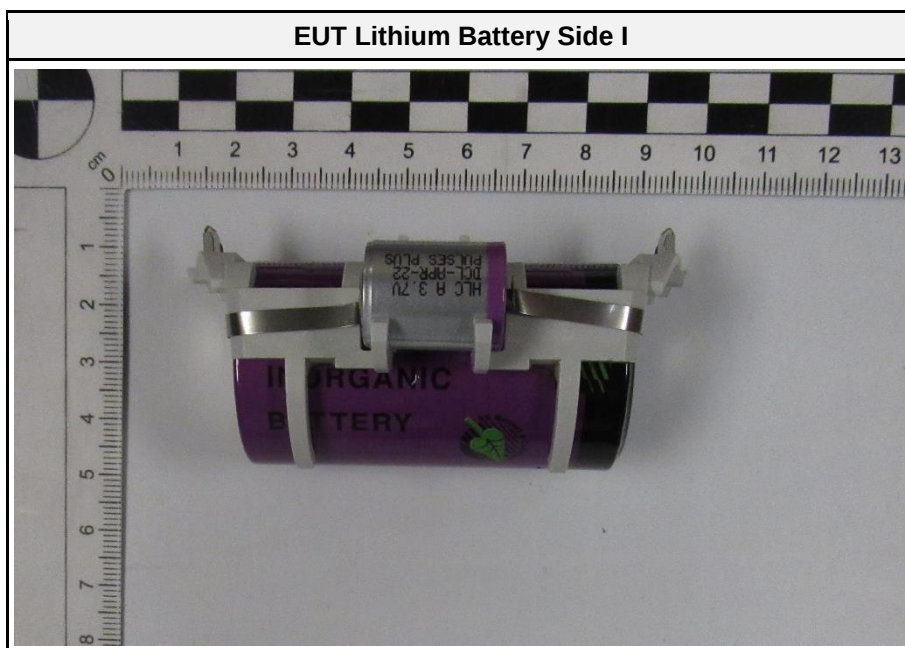
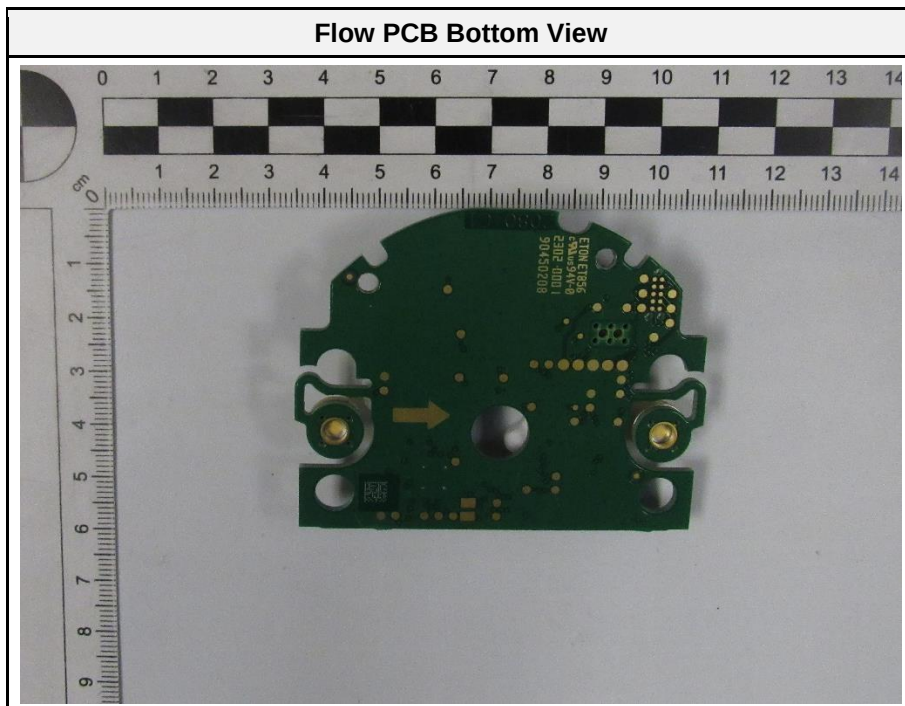


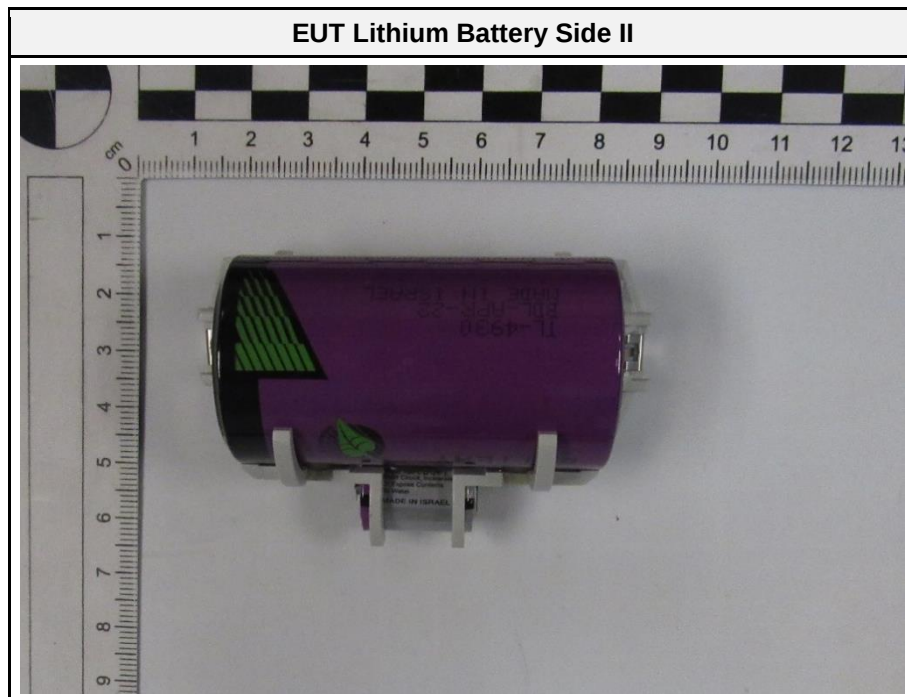
EUT without main RF PCB



Flow PCB Top View







1.3 Support Equipment

Product Type	Device	Manufacturer	Model	Comment
AE	Customer Notebook	---	---	For configuring test modes
AE	Optical readout head	Kamstrup	14071	Programming interface
CBL	Banana plugs	---	---	To connect EUT to power supply.
SFT	Device Control Tool	Kamstrup	---	Tool for controlling RF module and parameters
Description:				
AE	Auxiliary Equipment			
SIM	Simulator			
CBL	Connecting Cable			
SFT	Software			
Comment:				

1.4 Test Modes

Mode	Description
Transmit 915 MHz	Mode = Transmit Modulation = 2-FSK Duty cycle = 100 %
Receive 915 MHz	Mode = Receive Modulation = 2-FSK
Comment: Worst case was found in module test report number G0M-2002-8859-TFC247DT-V02 issued by Eurofins Product Service GmbH on 2020-07-28.	

1.5 Test Frequencies

Designator	Mode	Channel	Frequency [MHz]
F1	Tx / Rx	1	915

1.6 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 dB μ V. 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).

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.

Field strength limit:

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

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

Example only for radiated field strength:

Reading + AF	= Net Reading	:	Net reading	- Field strength limit	= Margin
+21.5 dB μ V	+ 26 dB/m	:	47.5 dB μ V/m	- 57.0 dB μ V/m	= -9.5

2 Result Summary

FCC 47 CFR Part 15C, ISED RSS-247				
Product Standard Reference	Requirement	Reference Method	Result	Remarks
ISED RSS-Gen, Issue 5 A2 (section 6.7)	Occupied Bandwidth	ANSI C63.10-2013	N/R	Informational only
FCC § 15.247(a)(2) ISED RSS-247, Issue 2 (section 5.2)	6 dB Bandwidth	ANSI C63.10-2013	N/T	
FCC § 15.247(b) ISED RSS-247, Issue 2 (section 5.4)	Maximum peak conducted power	ANSI C63.10-2013	PASS	Note 1
FCC § 15.247(e) ISED RSS-247, Issue 2 (section 5.2)	Power spectral density	ANSI C63.10-2013	N/T	
FCC § 15.207 ISED RSS-247, Issue 2 (section 3.1)	AC power line conducted emissions	ANSI C63.10-2013	N/R	No direct or indirect connection to AC mains
FCC § 15.247(d) ISED RSS-247, Issue 2 (section 5.5)	Band edge compliance	ANSI C63.10-2013	PASS	Note 1
FCC § 15.247(d) ISED RSS-247, Issue 2 (section 5.5)	Conducted spurious emissions	ANSI C63.10-2013	N/T	
FCC § 15.247(d) FCC § 15.209 ISED RSS-Gen, Issue 5 A2 (section 6.13)	Transmitter radiated spurious emissions	ANSI C63.10-2013	PASS	
ISED RSS-247, Issue 2 (section 3.1)	Receiver radiated spurious emissions	ANSI C63.4-2014	PASS	
Note 1: Due to the integration of a pre-certified module, only partial and spot check tests according RSS-247 were performed with reference to the original test report G0M-2002-8859-TFC247DT-V02 issued by Eurofins Product Service GmbH on 2020-07-28.				
Comment: The Decision Rule is applied on the basis of ETSI TR 102 273 and ETSI TR 100 028. These standards provide guidance on how to calculate and apply measurement uncertainty whilst providing maximum uncertainties allowance. In all cases due consideration will be given to ILAC-G8:09/2019. Where a result is considered conditional in respect of its proximity to the limit line, the customer would be made aware of situation so that they can make an informed decision on how to proceed.				

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 - Maximum peak conducted output power

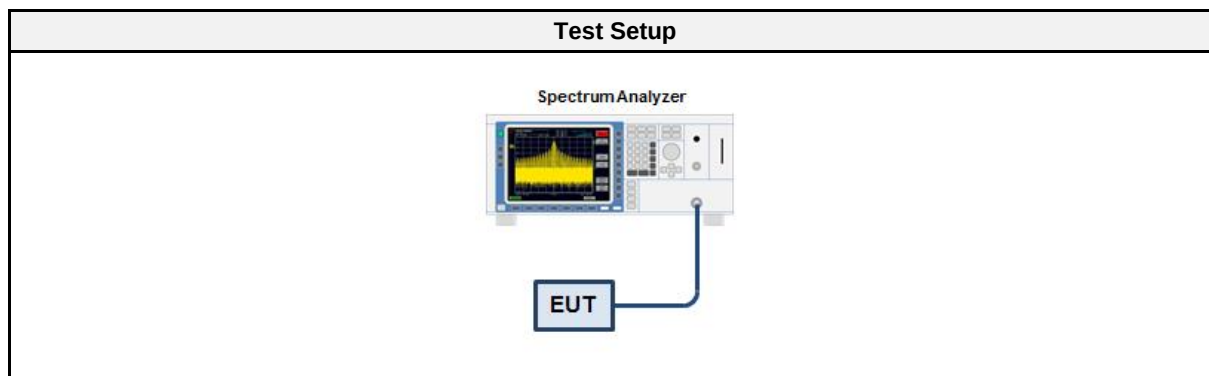
3.1.1 Information

Test Information	
Reference	FCC § 15.247(b); ISED RSS-247, Issue 2 (section 5.4)
Measurement Method	ANSI C63.10 11.9.1
Measurement Uncertainty	± 2.86 dB
Operator	Toralf Jahn
Date	2020-06-03

3.1.2 Limits

Limits
1 W (30 dBm)
The conducted output power limit specified above is based on the use of antennas with directional gains that do not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in the table, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

3.1.3 Setup



3.1.4 Equipment

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum analyzer	R&S	FSU43	EF01631	2019-12	2020-12

3.1.5 Procedure

Test Procedure
1. EUT set to test mode (Communication tester is used if needed) 2. Analyzer resolution bandwidth is set ≥ DTS bandwidth 3. Detector set to peak and max hold 4. Sweep time is set to auto 5. After the trace has stabilized a marker is set to peak of envelope

3.1.6 Results

Test Results				
Channel [MHz]	Power [dBm]	Power [W]	Limit [W]	Verdict
912.5	13.104	0.0204	1.0	PASS
915.0	13.121	0.0205	1.0	PASS
918.5	13.105	0.0204	1.0	PASS

3.2 Test Conditions and Results - Band-edge compliance

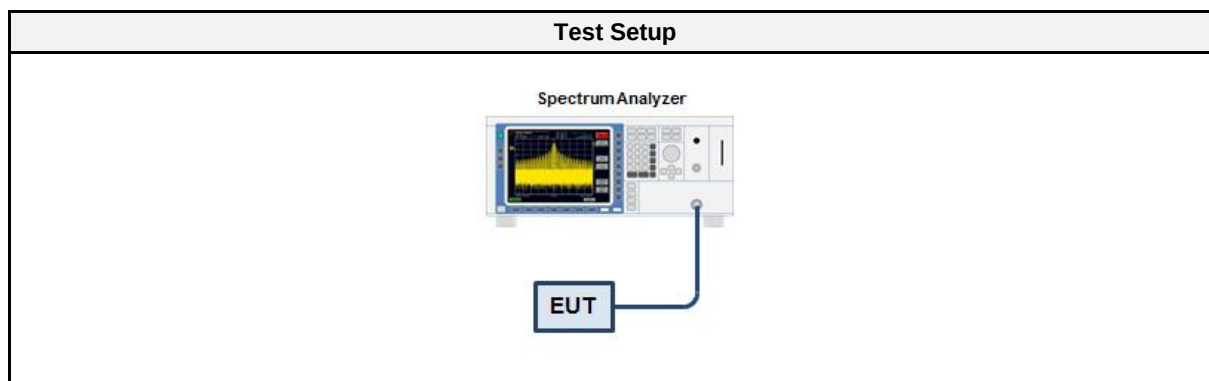
3.2.1 Information

Test Information	
Reference	FCC § 15.247(d); ISED RSS-247, Issue 2 (section 5.5)
Measurement Uncertainty	± 3.64 dB
Measurement Method	ANSI C63.10 11.13
Operator	Toralf Jahn
Date	2020-06-03

3.2.2 Limits

Limits	
Power Measurement	Out-of-band attenuation [dB]
Peak	20
RMS	30

3.2.3 Setup



3.2.4 Equipment

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum analyzer	R&S	FSU43	EF01631	2019-12	2020-12

3.2.5 Procedure

Test Procedure
1. EUT set to test mode (Communication tester is used if needed) 2. Span set around lower band edge and detector is set to peak and max hold 3. Resolution bandwidth is set to 100 kHz 4. Markers are set to peak emission levels within frequency band and outside frequency band 5. Band edge attenuation is determined from level difference

3.2.6 Results

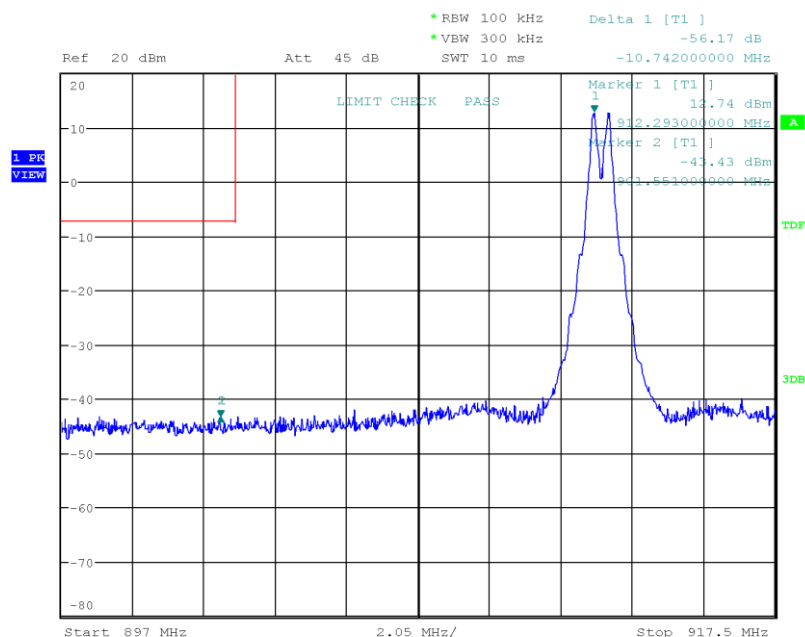
Test Results				
Mode	Channel [MHz]	Out-of-band Attenuation [dB]	Limit [dB]	Verdict
Transmit	912.5	-56.17	-20	PASS
Transmit	918.5	-54.98	-20	PASS

Test Report No.: G0M-2211-1783-TFC247DT-V01

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

Emissions in nonrestricted frequency bands at the Band-edge

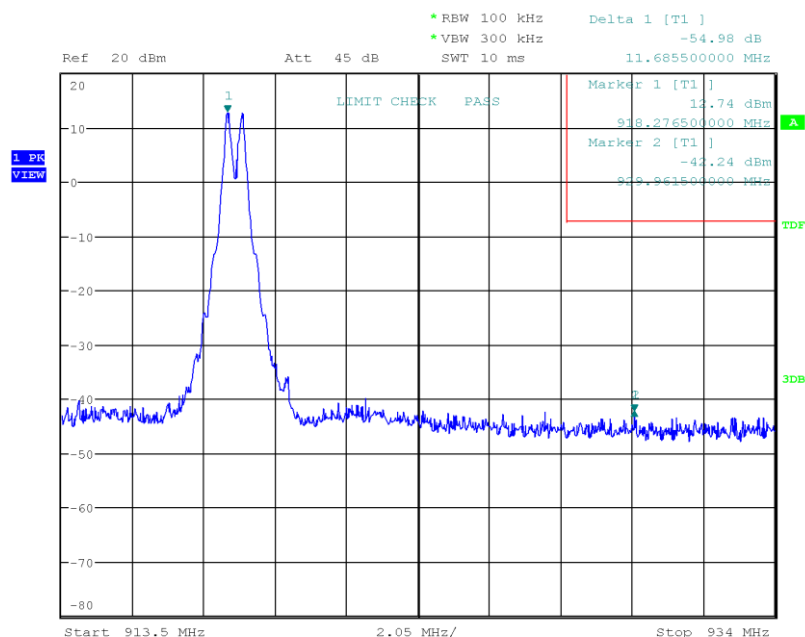
Project Number:	G0M-2002-8859
Applicant:	Kamstrup A/S
Model Description:	Ultrasonic water meter
Model:	KWM2220
Test Sample ID:	29577
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 6.10
Operational Mode:	single frequency, Channel: 912.5 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Toralf Jahn
Test Site:	Eurofins Product Service GmbH
Test Date:	2020-06-03
Band-edge	Lower
In-band Frequency [MHz]:	912.293
Max. in-band Level [dBm/100 kHz]:	12.741
Out-of-band Frequency [MHz]:	901.551
Max. out-of-band Level [dBm/100 kHz]:	-43.429
Attenuation [dB]:	-56.17



Date: 3.JUN.2020 10:38:09

Emissions in nonrestricted frequency bands at the Band-edge

Project Number: G0M-2002-8859
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM2220
 Test Sample ID: 29577
 Reference Standards: FCC 15.247, RSS-247
 Reference Method: ANSI C63.10:2013, Section 6.10
 Operational Mode: single frequency, Channel: 918.5 MHz
 Operating Conditions: Tnom/Vnom
 Operator: Toralf Jahn
 Test Site: Eurofins Product Service GmbH
 Test Date: 2020-06-03
 Band-edge: Upper
 In-band Frequency [MHz]: 918.277
 Max. in-band Level [dBm/100 kHz]: 12.742
 Out-of-band Frequency [MHz]: 929.962
 Max. out-of-band Level [dBm/100 kHz]: -42.238
 Attenuation [dB]: -54.98



Date: 3.JUN.2020 10:56:58

3.3 Test Conditions and Results - Transmitter radiated emissions

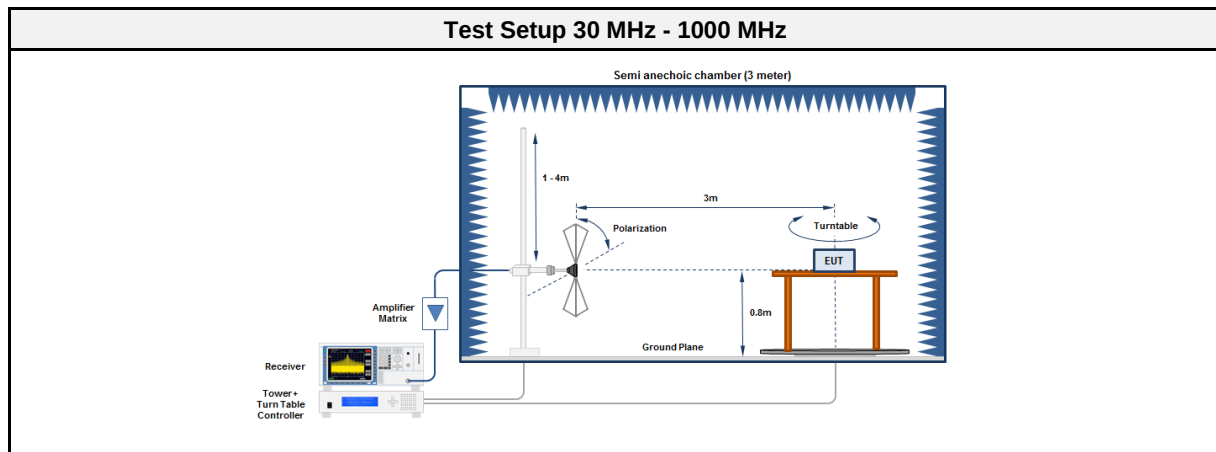
3.3.1 Information

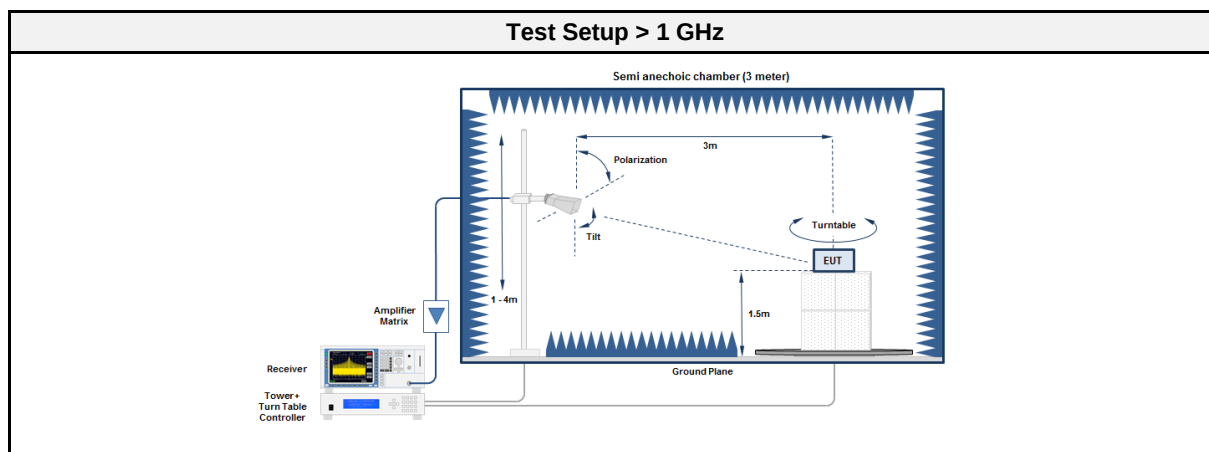
Test Information	
Reference	FCC § 15.247(d); FCC § 15.209; ISSED RSS-Gen, Issue 5 A2 (section 6.13)
Measurement Uncertainty	± 5.95 dB
Measurement Method	ANSI C63.10 6.4, 6.5, 6.6, 11.12
Operator	Odai Qawasmeh
Date	2023-02-20 + 2023-02-21

3.3.2 Limits

Limits			
Frequency range [MHz]	Detector	Field strength [μV/m]	Measurement distance [m]
0.009 - 0.09	Average	2400/F[kHz]	300
0.09 - 0.110	Quasi-Peak	2400/F[kHz]	300
0.110 - 0.490	Average	2400/F[kHz]	300
0.490 - 1.705	Quasi-Peak	24000/F[kHz]	30
1.705 - 30.0	Quasi-Peak	30	30
30 - 88	Quasi-Peak	100	3
88 - 216	Quasi-Peak	150	3
216 - 960	Quasi-Peak	200	3
960 - 1000	Quasi-Peak	500	3
>1000	Average	500	3

3.3.3 Setup





3.3.4 Equipment

Test Software			
Description	Manufacturer	Name	Version
EMC Software	DARE Instruments	RadiMation	2020.1.8

Test Equipment 30 MHz - 1000 MHz					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Anechoic Chamber	Frankonia	AC1	EF00062	2022-11	2025-11
Antenna	Schwarzbeck	VULB 9168	EF01824	2022-10	2023-10
EMI Test Receiver	R&S	ESU8	EF00379	2022-10	2023-10

Test Equipment > 1 GHz					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Anechoic Chamber	Frankonia	AC2	EF01616	2022-10	2023-10
Antenna	Schwarzbeck	BBHA 9120D	EF01678	2021-03	2024-03
Antenna	Schwarzbeck	HWRD 650	EF01679	2021-03	2024-03
Antenna	Amplifier Research	AT4560	EF00302	2021-06	2023-06
Spectrum analyzer	R&S	FSW43	EF00896	2022-08	2023-08

3.3.5 Procedure

Test Procedure 30 MHz - 1000 MHz	
- EUT is placed on a non conducting support at the center of a turn table 0.8 m above the ground - EUT set to test mode - The receiver is set to peak detection with max hold - The EUT is rotated through 360° and the height of the antenna is varied from 1 m to 4 m - All significant emissions are measured again using the corresponding final detector	

Test Procedure > 1 GHz	
- EUT is placed on a non conducting support at the center of a turn table 1.5 m above the ground - EUT set to test mode - The receiver is set to peak detection with max hold - The EUT is rotated through 360° and the height of the antenna is varied from 1 m to 4 m - All significant emissions are measured again using the corresponding final detector	

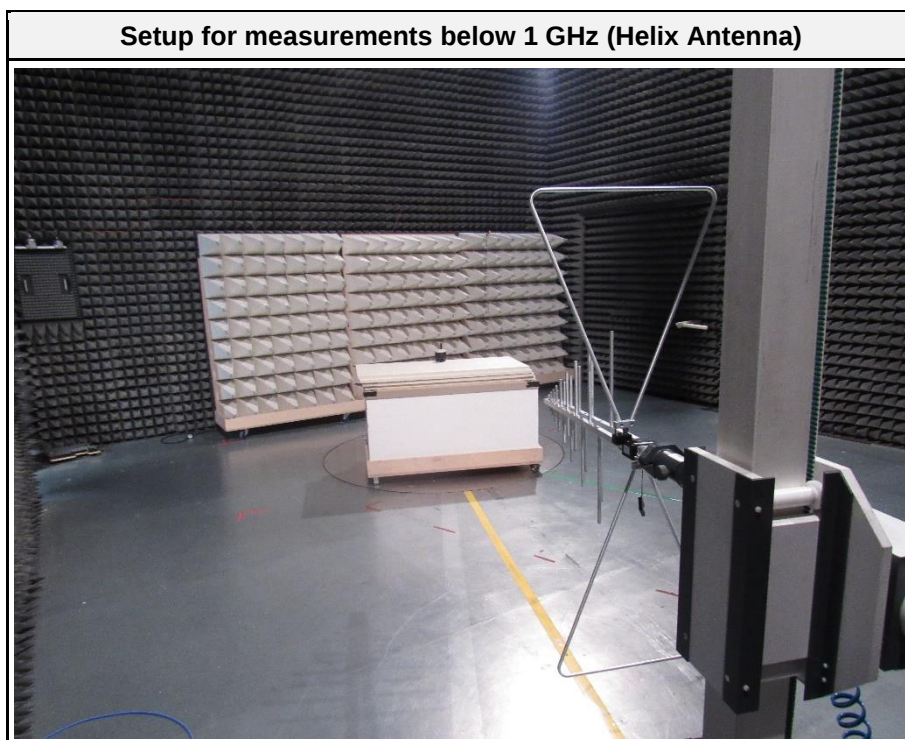
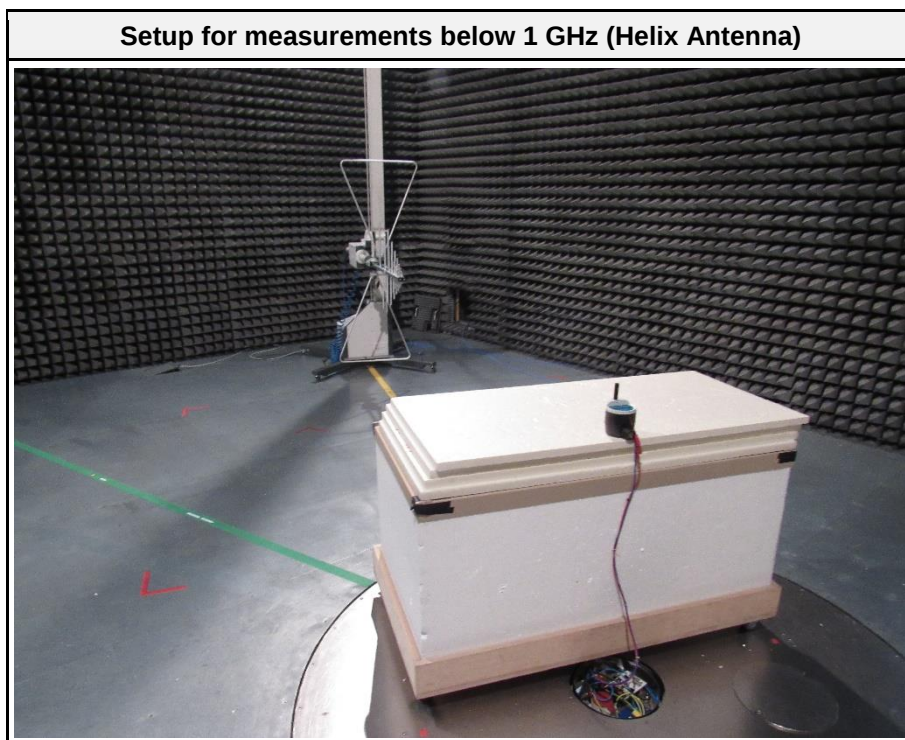
3.3.6 Results

Test Results – Wall Antenna						
Channel [MHz]	Emission [MHz]	Level [dBμV/m]	Det.	Pol.	Limit [dBμV/m]	Margin [dB]
915	1074.8	41.46	pk	hor	74.00	-32.54
915	1074.8	32.88	avg	hor	54.00	-21.12
915	2744.4	40.89	pk	hor	74.00	-33.11
915	2744.4	37.32	avg	hor	54.00	-16.68
915	17859	44.35	pk	hor	74.00	-29.65
915	17859	32.17	avg	hor	54.00	-21.83
915	18144	47.91	pk	hor	74.00	-26.09
915	18144	35.41	avg	hor	54.00	-18.59

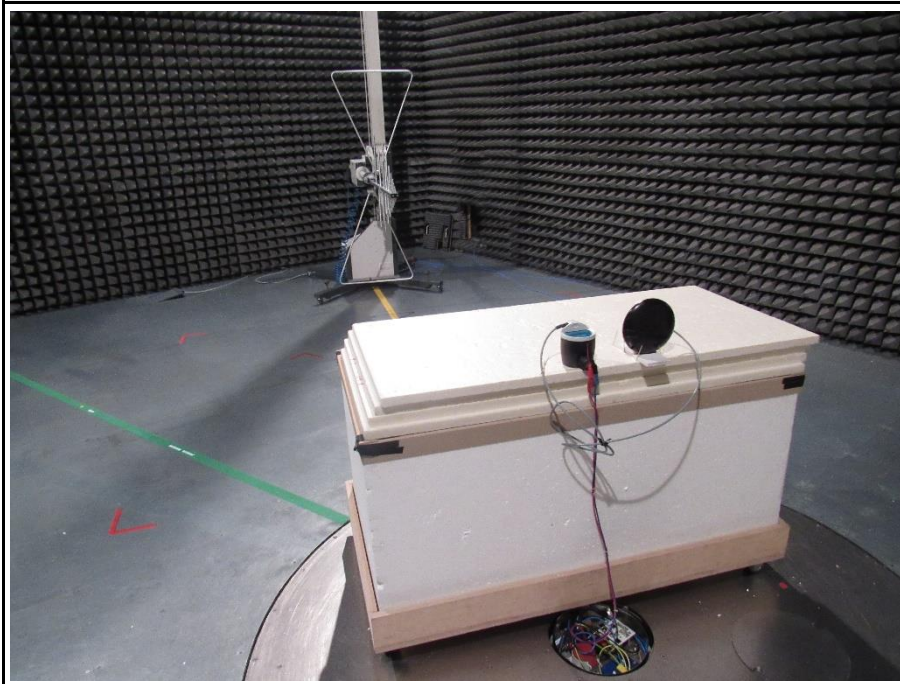
Test Results – Pit Antenna						
Channel [MHz]	Emission [MHz]	Level [dBμV/m]	Det.	Pol.	Limit [dBμV/m]	Margin [dB]
915	282.685	34.50	pk	hor	46.00	-11.45
915	1181.6	45.10	pk	hor	74.00	-28.90
915	1181.6	36.01	avg	hor	54.00	-17.99
915	2744.5	38.16	pk	hor	74.00	-35.84
915	2744.5	33.12	avg	hor	54.00	-20.88
915	17835	43.33	pk	ver	74.00	-30.67
915	17835	31.45	avg	ver	54.00	-22.55
915	18131	48.17	pk	hor	74.00	-25.83
915	18131	35.85	avg	hor	54.00	-18.15

Test Results – Helix Antenna						
Channel [MHz]	Emission [MHz]	Level [dBμV/m]	Det.	Pol.	Limit [dBμV/m]	Margin [dB]
915	2744.3	42.49	pk	hor	74.00	-31.51
915	2744.3	38.74	avg	hor	54.00	-15.26
915	17841	43.16	pk	ver	74.00	-30.84
915	17841	32.10	avg	ver	54.00	-21.90
915	18592	46.72	pk	ver	74.00	-27.28
915	18592	36.60	avg	ver	54.00	-17.40

3.3.7 Setup Photos



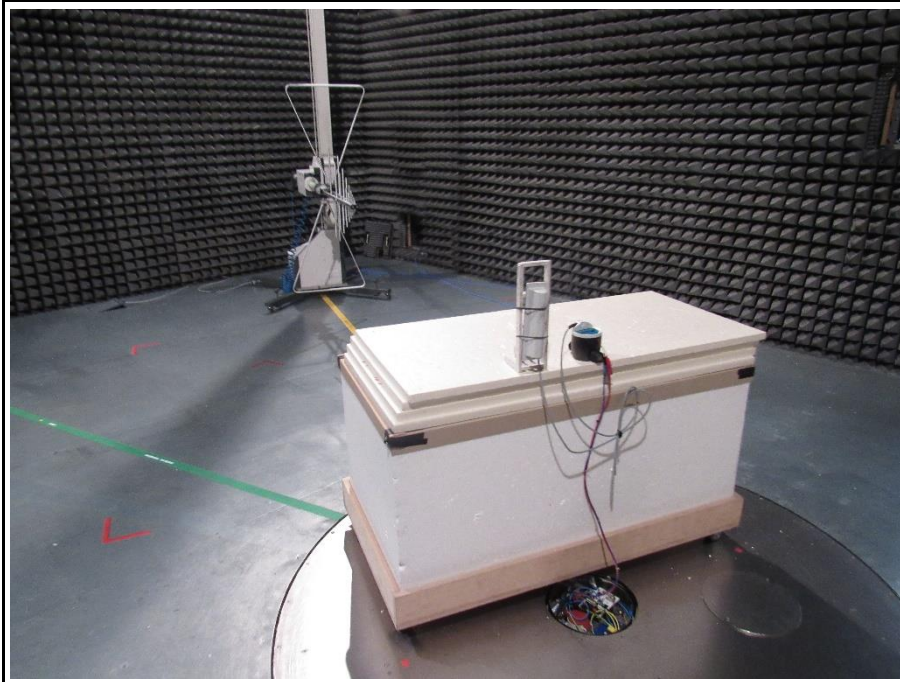
Setup for measurements below 1 GHz (Pit Antenna)



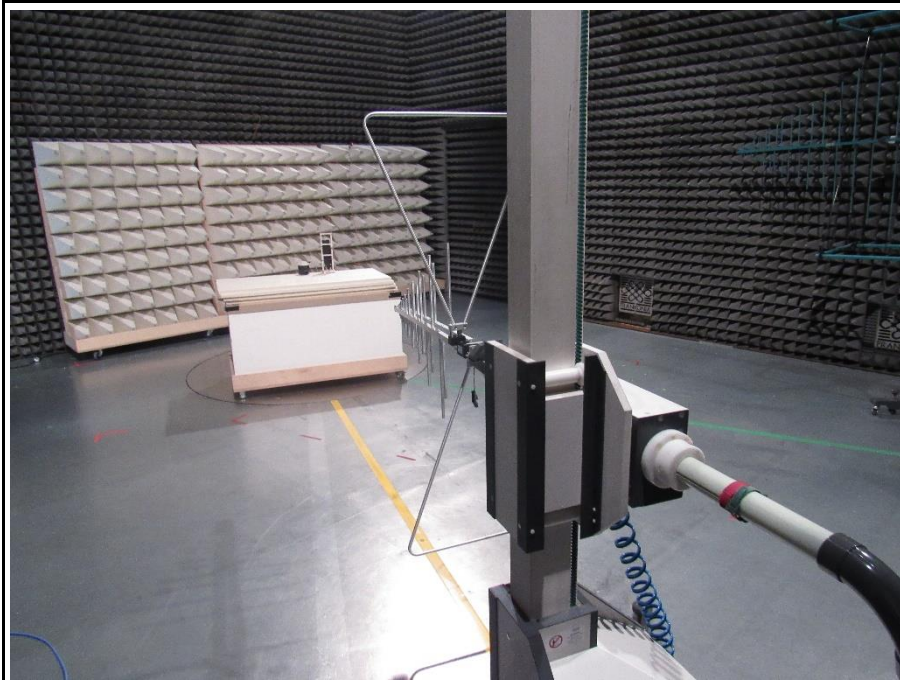
Setup for measurements below 1 GHz (Pit Antenna)



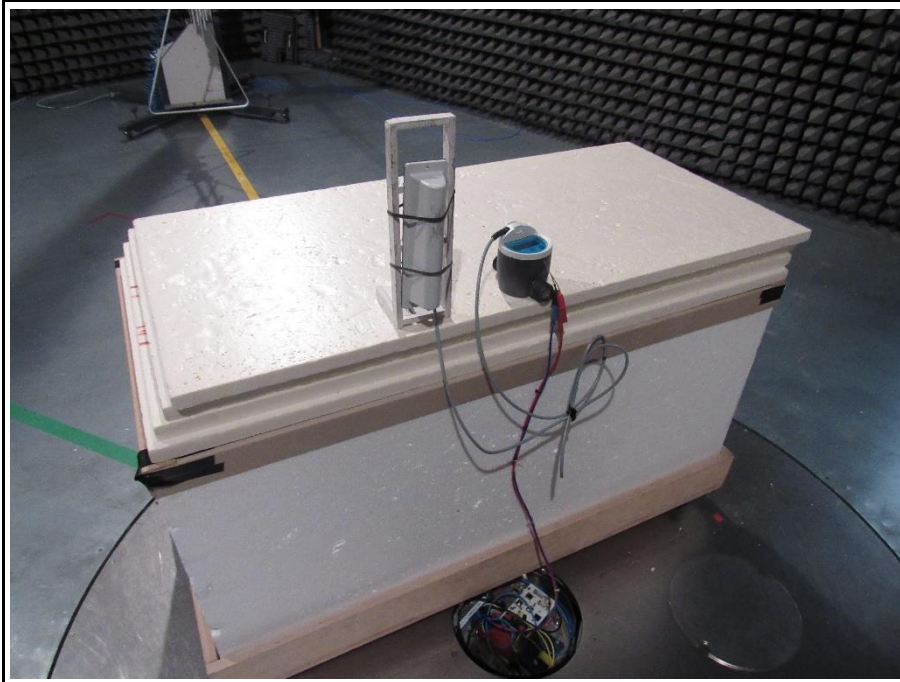
Setup for measurements below 1 GHz (Wall Antenna)



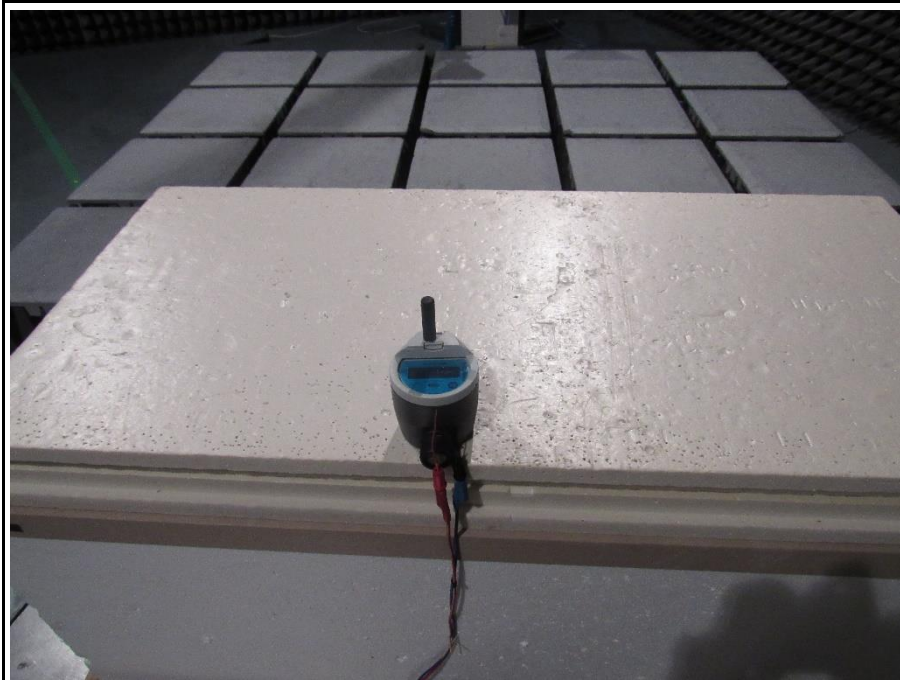
Setup for measurements below 1 GHz (Wall Antenna)



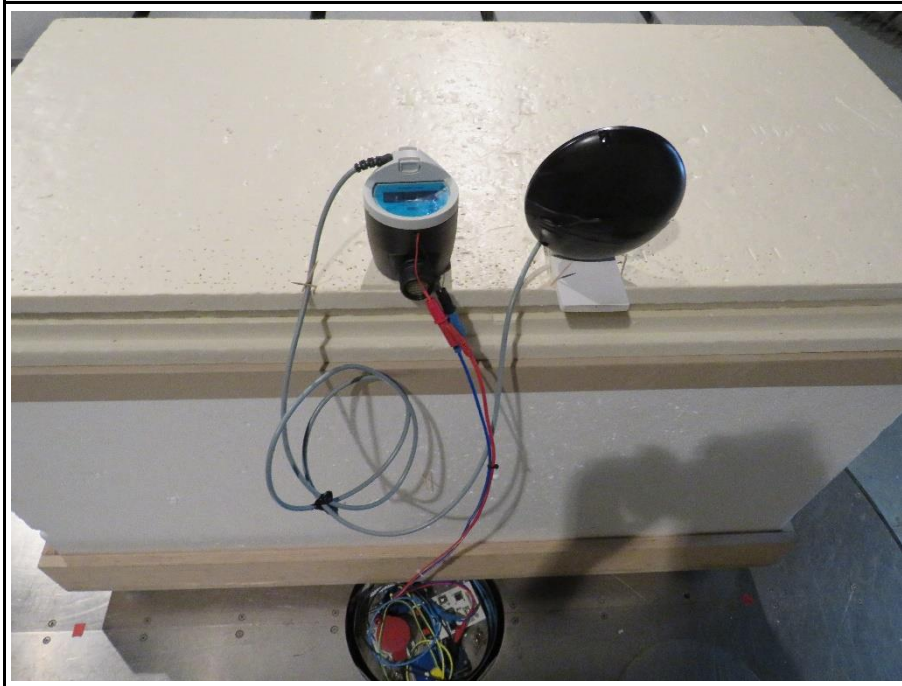
Test Setup for measurements below 1 GHz (Wall Antenna)



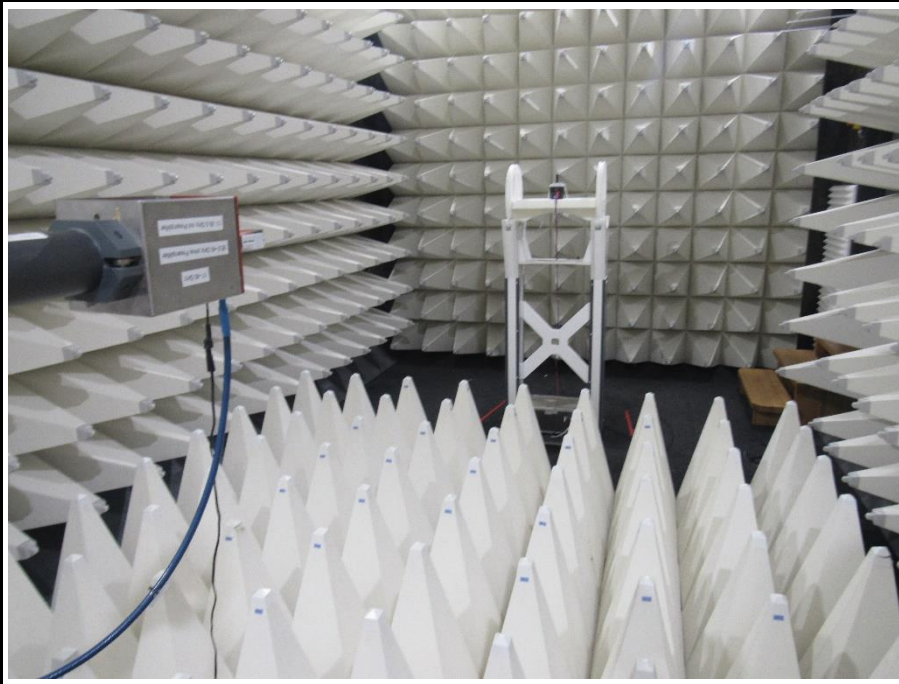
EUT Test Setup (Helix Antenna)



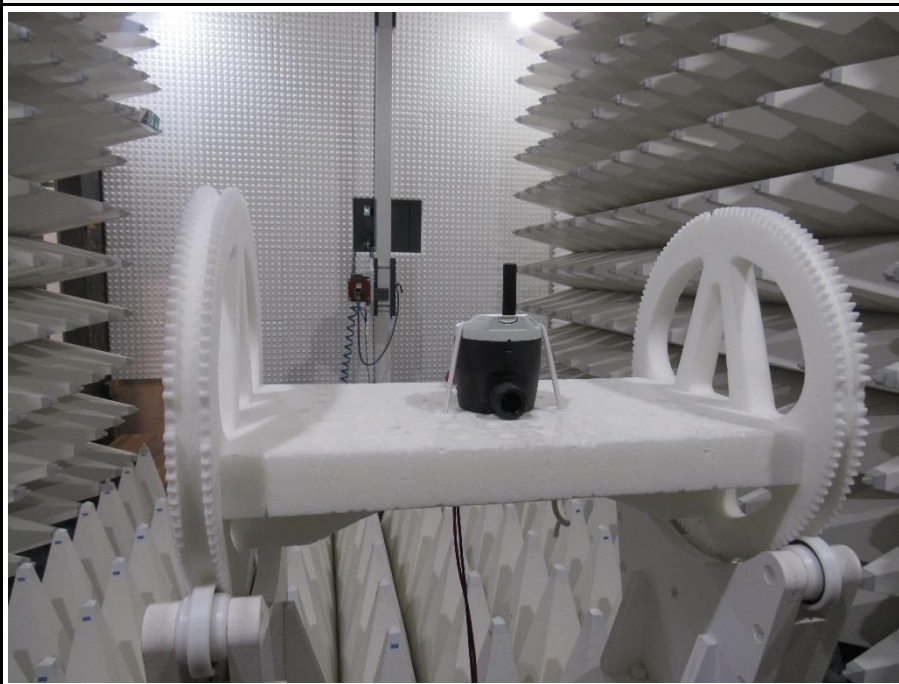
EUT Test Setup (Pit Antenna)



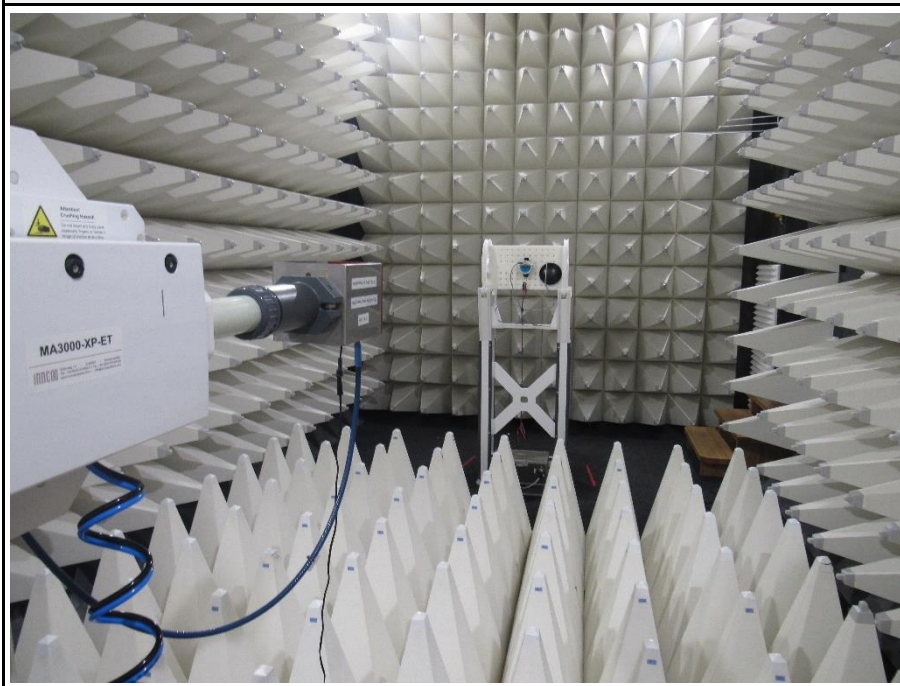
Setup for measurements above 1 GHz (Helix Antenna)



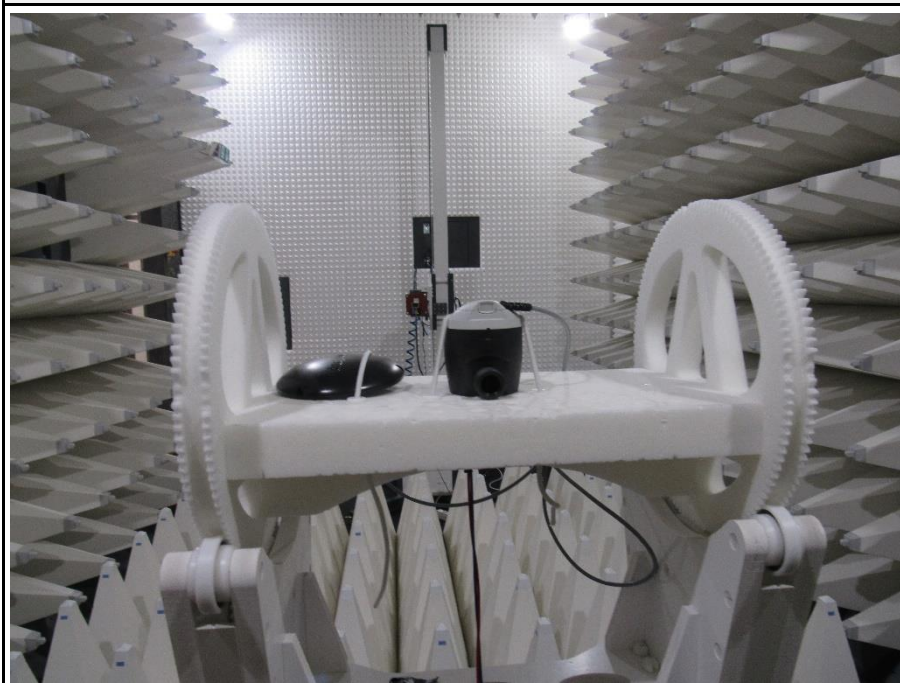
Setup for measurements above 1 GHz (Helix Antenna)



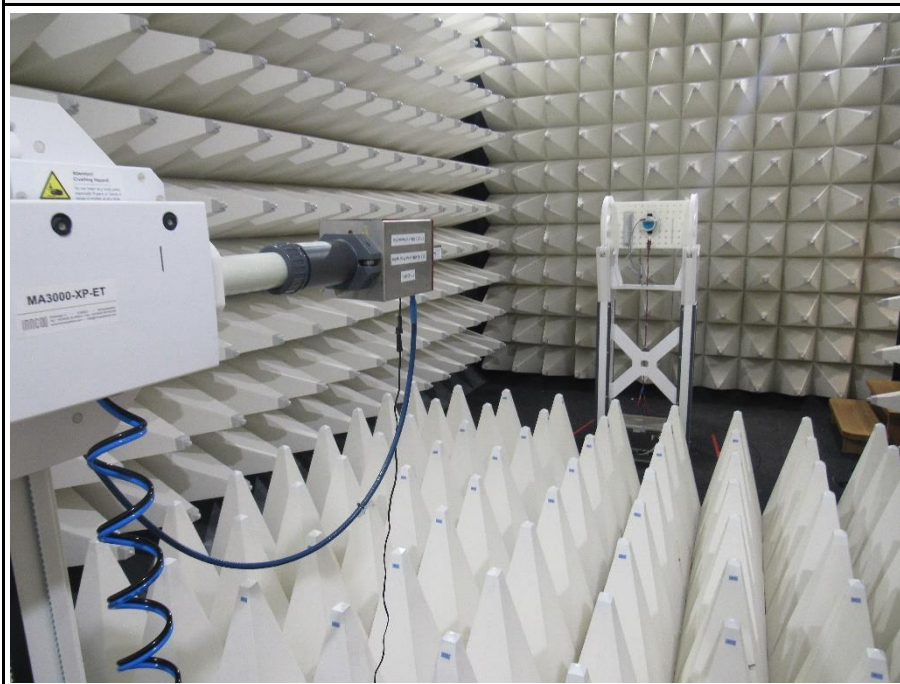
Setup for measurements above 1 GHz (Pit Antenna)



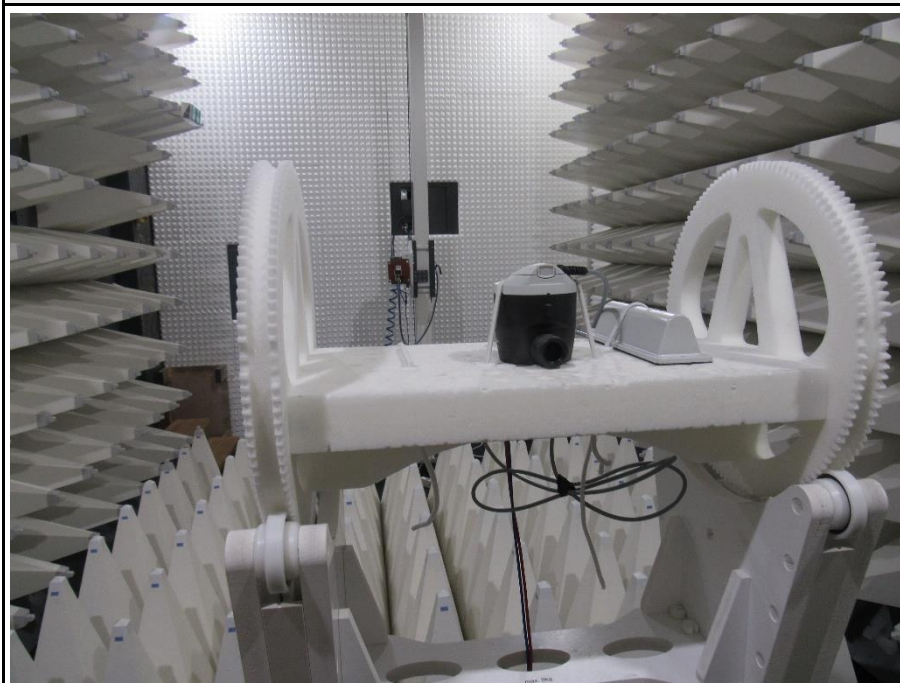
Setup for measurements above 1 GHz (Pit Antenna)



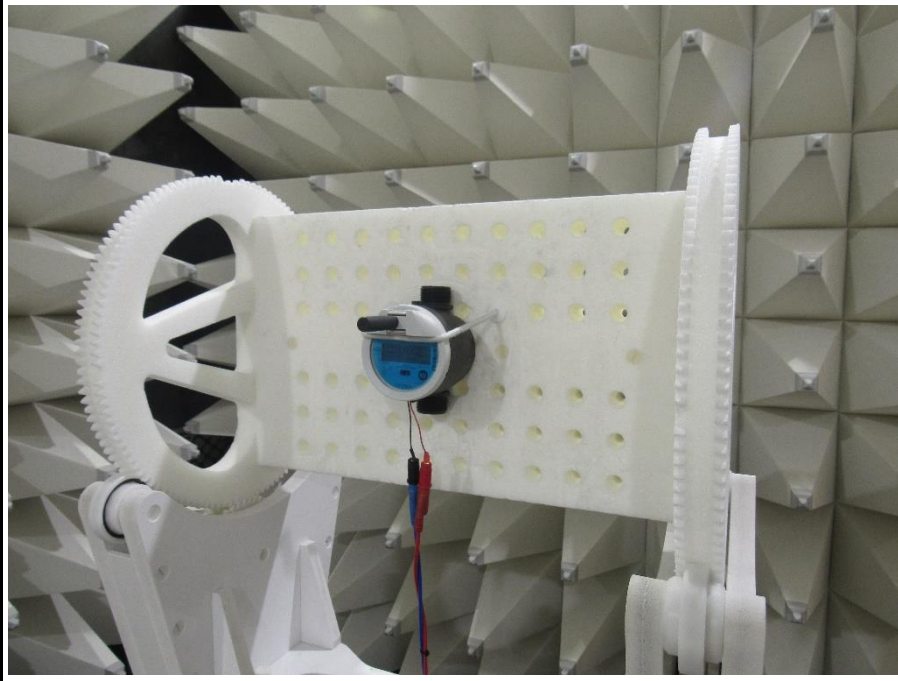
Setup for measurements above 1 GHz (Wall Antenna)



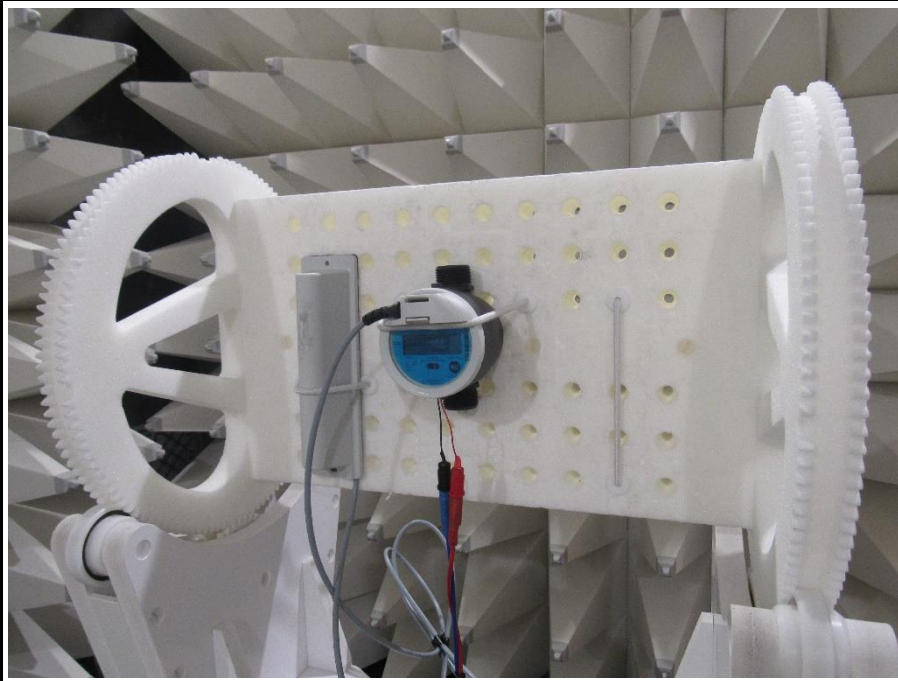
Setup for measurements above 1 GHz (Wall Antenna)



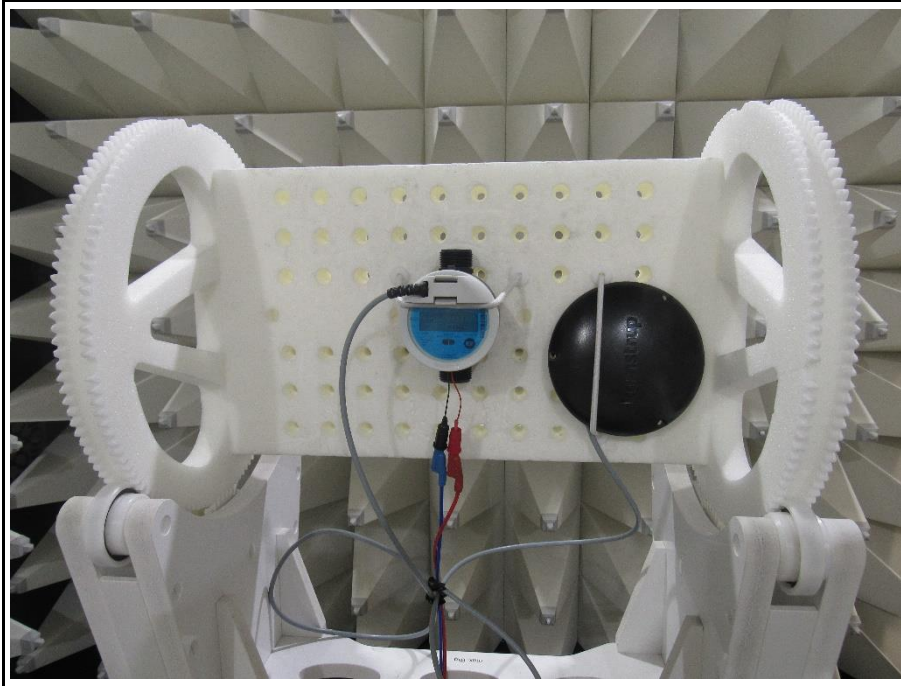
EUT Test Setup (Helix Antenna)



EUT Test Setup (Wall Antenna)



EUT Test Setup (Pit Antenna)



3.4 Test Conditions and Results - Receiver radiated emissions

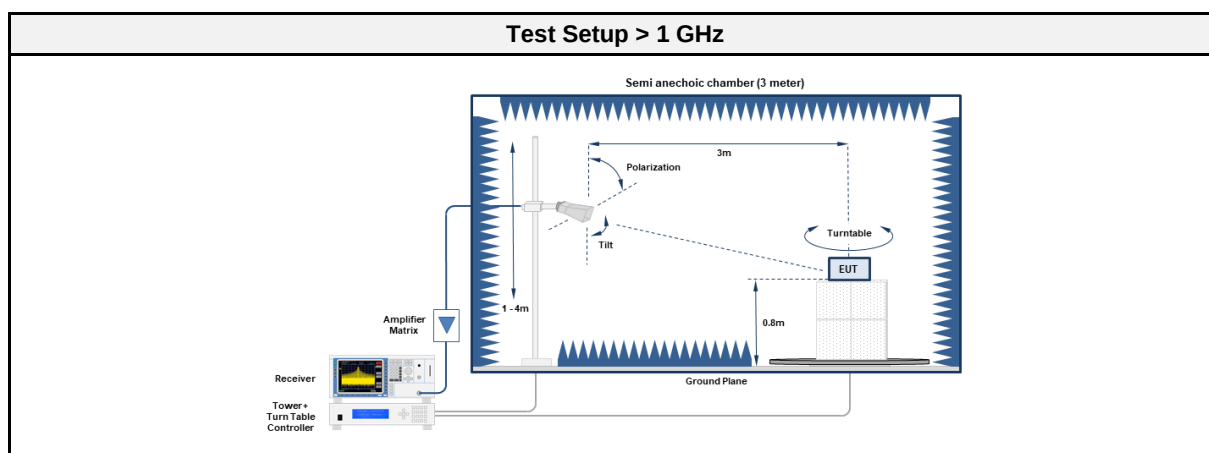
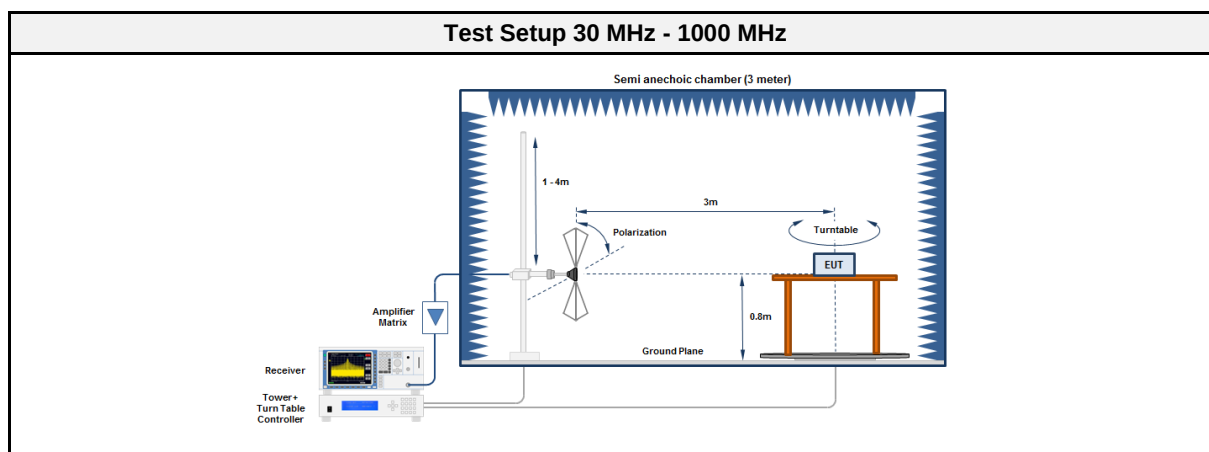
3.4.1 Information

Test Information	
Reference	ISED RSS-247, Issue 2 (section 3.1)
Measurement Uncertainty	± 5.95 dB
Measurement Method	ANSI C63.4-2014 8.1-8.3
Operator	Odai Qawasmeh
Date	2023-02-21

3.4.2 Limits

Limits			
Frequency range [MHz]	Detector	Field strength [$\mu\text{V/m}$]	Measurement distance [m]
30 - 88	Quasi-Peak	100	3
88 - 216	Quasi-Peak	150	3
216 - 960	Quasi-Peak	200	3
960 - 1000	Quasi-Peak	500	3
>1000	Average	500	3

3.4.3 Setup



3.4.4 Equipment

Test Software			
Description	Manufacturer	Name	Version
EMC Software	DARE Instruments	RadiMation	2020.1.8

Test Equipment 30 MHz - 1000 MHz					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Anechoic Chamber	Frankonia	AC1	EF00062	2022-11	2025-11
Antenna	Schwarzbeck	VULB 9168	EF01824	2022-10	2023-10
EMI Test Receiver	R&S	ESU8	EF00379	2022-10	2023-10

Test Equipment > 1 GHz					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Anechoic Chamber	Frankonia	AC1	EF01011	2022-11	2023-11
Antenna	Schwarzbeck	BBHA 9120D	EF01561	2021-11	2024-11
Antenna	Schwarzbeck	HWRD 650	EF01679	2021-03	2024-03
Antenna	Amplifier Research	AT4560	EF00302	2021-06	2023-06
Spectrum analyzer	R&S	FSU26	EF01407	2022-07	2023-07

3.4.5 Procedure

Test Procedure	
1. EUT is placed on a non conducting support at the center of a turn table 0.8 m above the ground 2. EUT is set to test mode 3. The receiver is set to peak detection with max hold 4. The EUT is rotated through 360° and the height of the antenna is varied from 1 m to 4 m 5. All significant emissions are measured again using the corresponding final detector	

3.4.6 Results

Test Results – Wall Antenna						
Channel [MHz]	Emission [MHz]	Level [dBμV/m]	Det.	Pol.	Limit [dBμV/m]	Margin [dB]
915	641.7467	32.10	pk	ver	46.00	-13.88
915	6479	50.92	pk	hor	74.00	-23.08
915	6479	38.93	avg	hor	53.98	-15.05
915	17831	43.31	pk	ver	74.00	-30.69
915	17831	31.46	avg	ver	53.98	-22.52
915	19572	48.55	pk	ver	74.00	-25.45
915	19572	36.22	avg	ver	53.98	-17.76

Test Results – Pit Antenna						
Channel [MHz]	Emission [MHz]	Level [dBμV/m]	Det.	Pol.	Limit [dBμV/m]	Margin [dB]
915	778.3873	35.20	pk	ver	46.00	-10.84
915	6260	49.84	pk	ver	74.00	-24.16
915	6260	38.27	avg	ver	53.98	-15.71
915	17836	42.56	pk	ver	74.00	-31.44
915	17836	30.59	avg	ver	53.98	-23.39
915	19595	47.72	pk	ver	74.00	-26.28
915	19595	37.20	avg	ver	53.98	-16.78

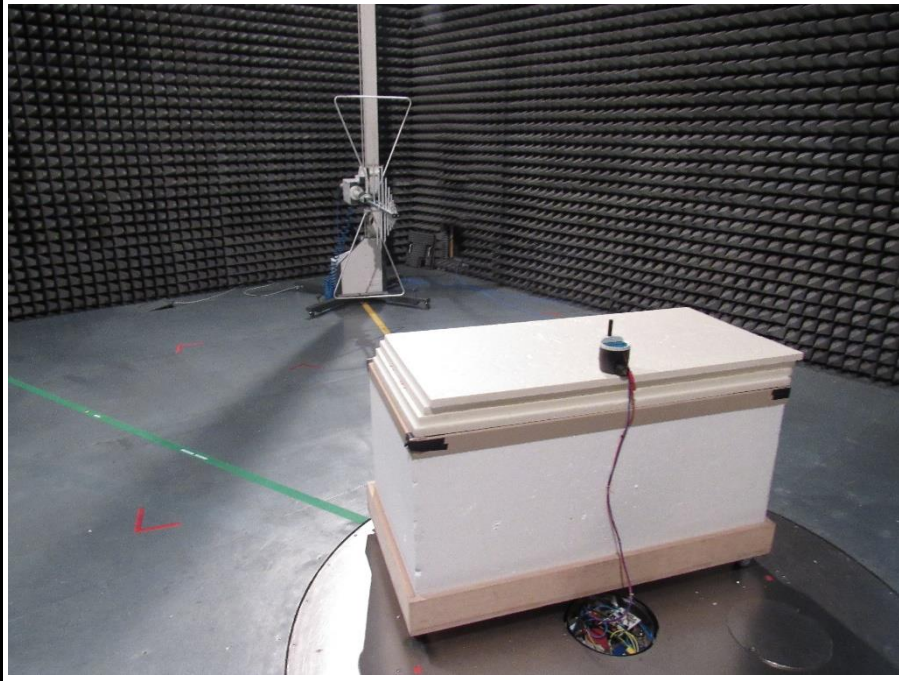
Test Report No.: G0M-2211-1783-TFC247DT-V01

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

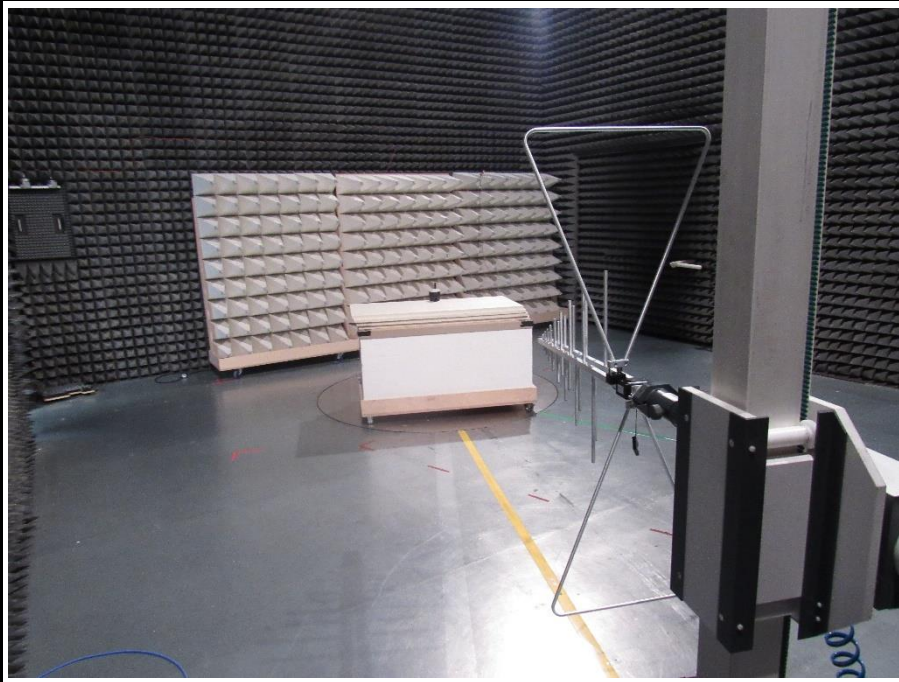
Test Results – Helix Antenna						
Channel [MHz]	Emission [MHz]	Level [dBμV/m]	Det.	Pol.	Limit [dBμV/m]	Margin [dB]
915	844.897	34.90	pk	hor	46.00	-11.14
915	6024	49.47	pk	ver	74.00	-24.53
915	6024	36.79	avg	ver	53.98	-17.19
915	17824	42.51	pk	ver	74.00	-31.49
915	17824	31.47	avg	ver	53.98	-22.51
915	19578	48.03	pk	ver	74.00	-25.97
915	19578	36.59	avg	ver	53.98	-17.39

3.4.7 Setup Photos

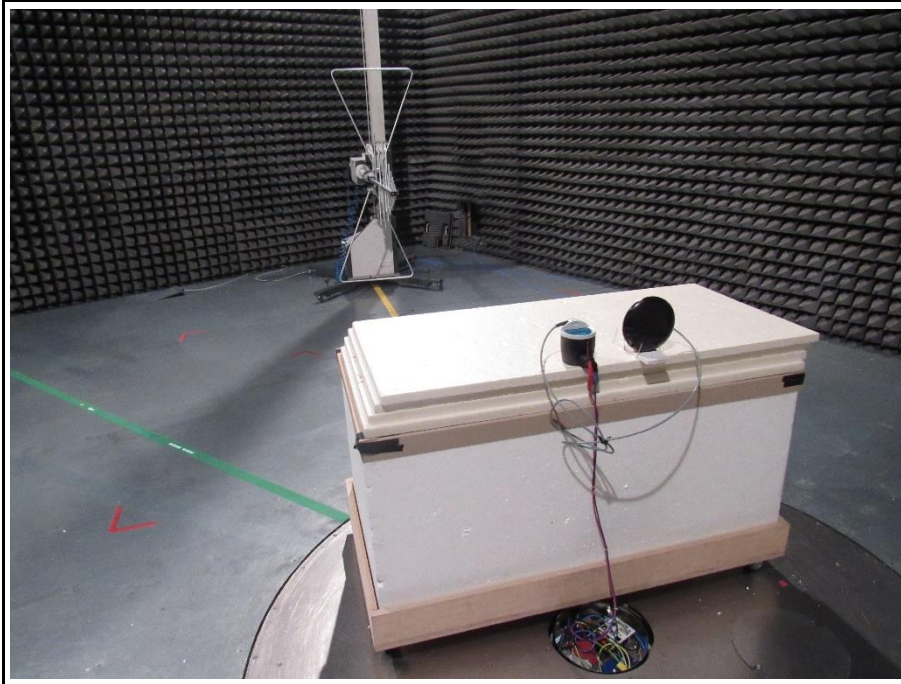
Setup for measurements below 1 GHz (Helix Antenna)



Setup for measurements below 1 GHz (Helix Antenna)



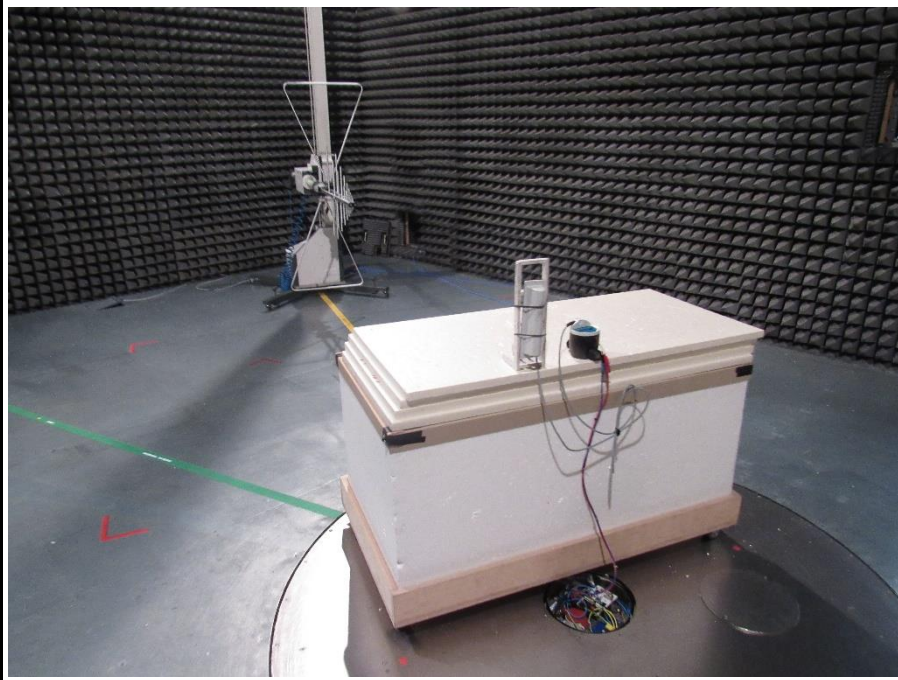
Setup for measurements below 1 GHz (Pit Antenna)



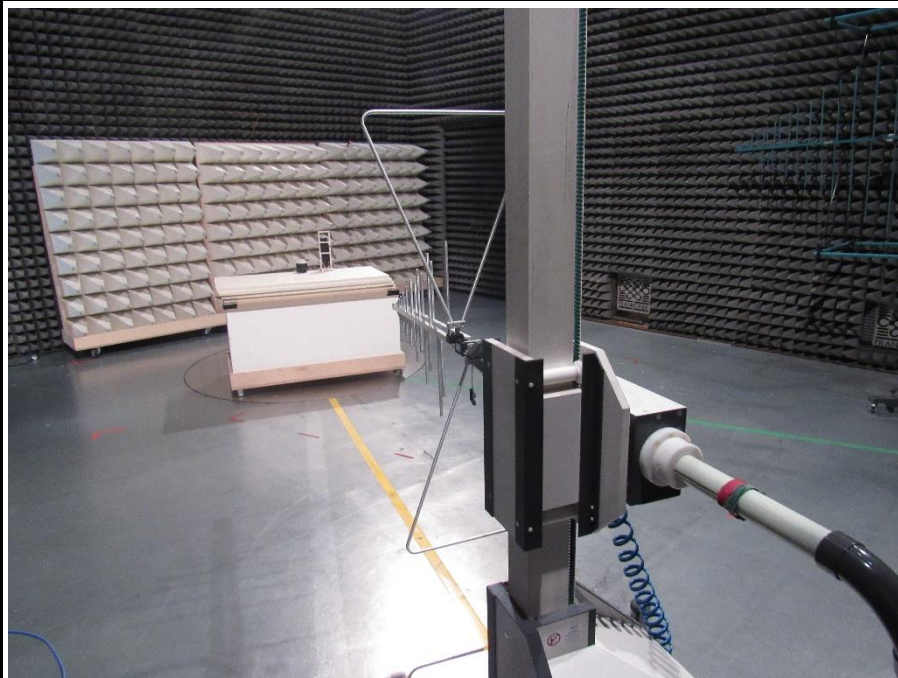
Setup for measurements below 1 GHz (Pit Antenna)



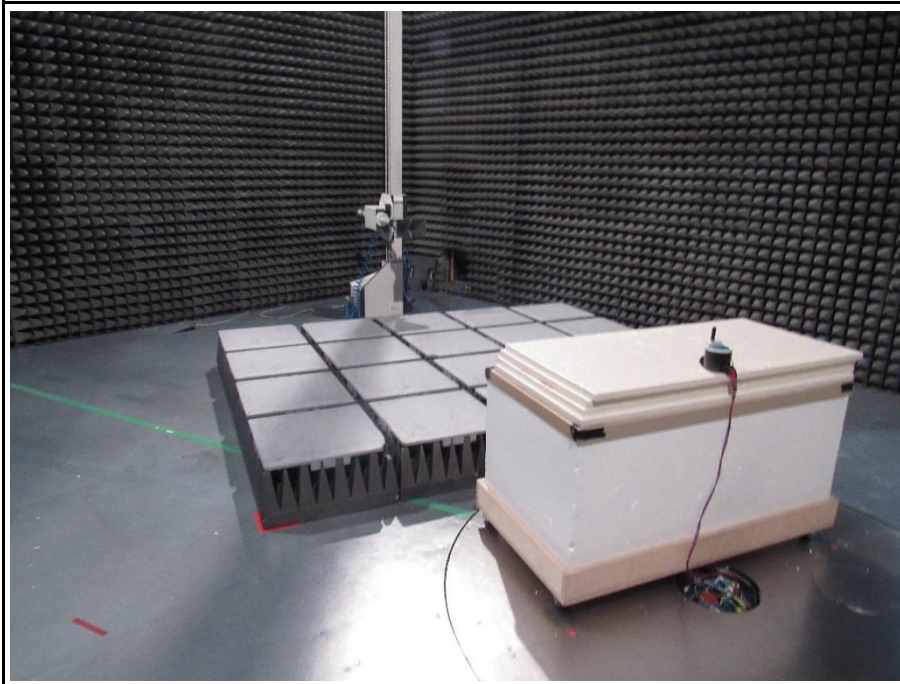
Setup for measurements below 1 GHz (Wall Antenna)



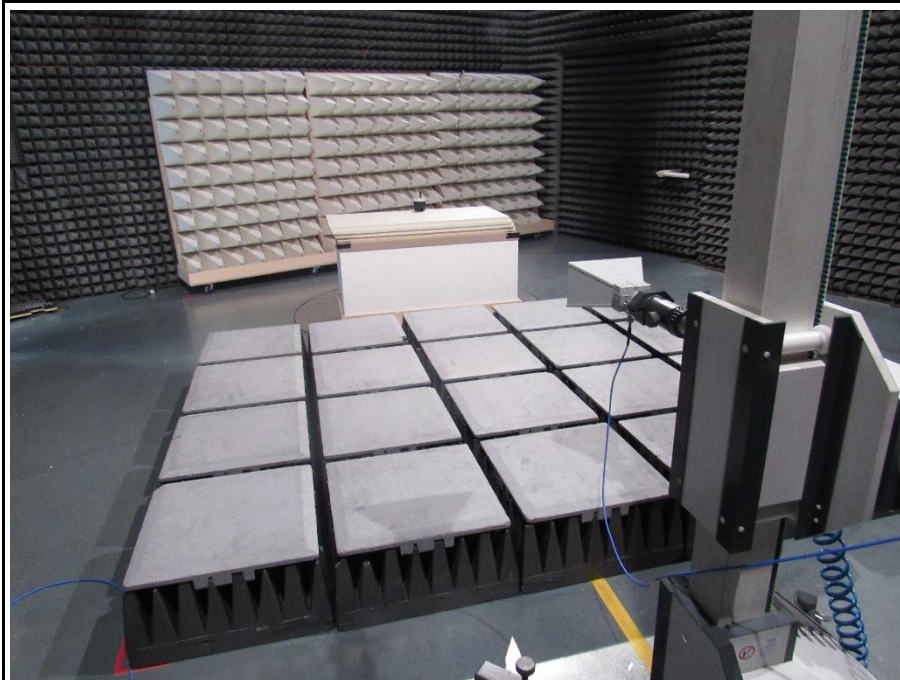
Setup for measurements below 1 GHz (Wall Antenna)



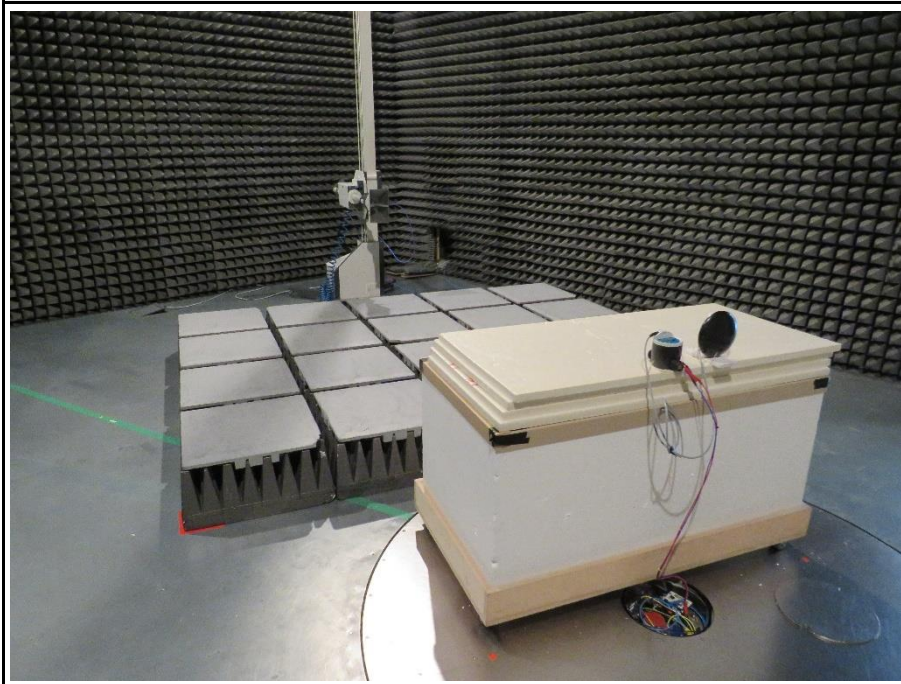
Setup for measurements above 1 GHz (Helix Antenna)



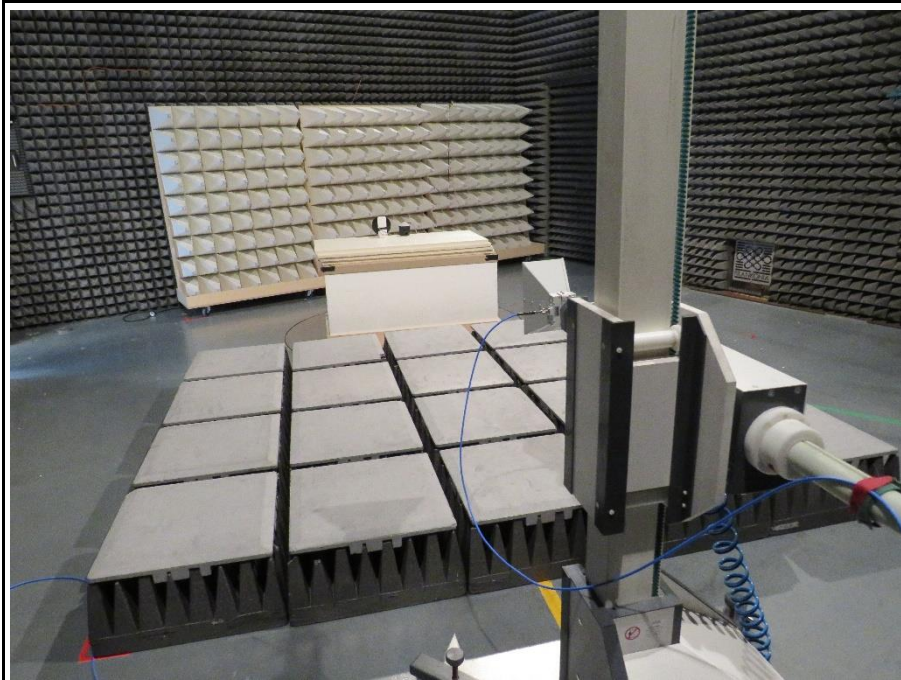
Setup for measurements above 1 GHz (Helix Antenna)



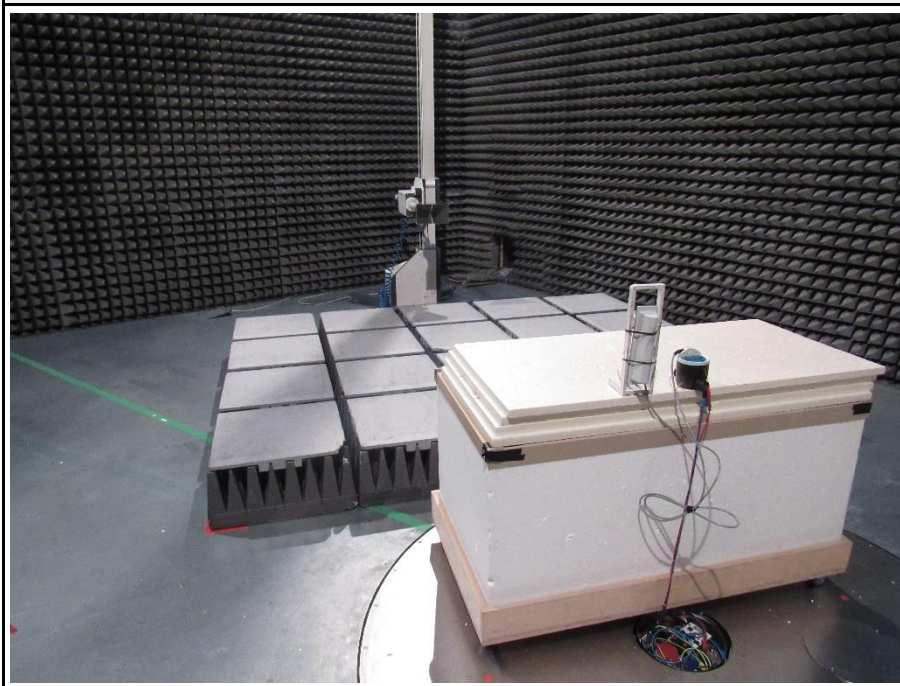
Setup for measurements above 1 GHz (Pit Antenna)



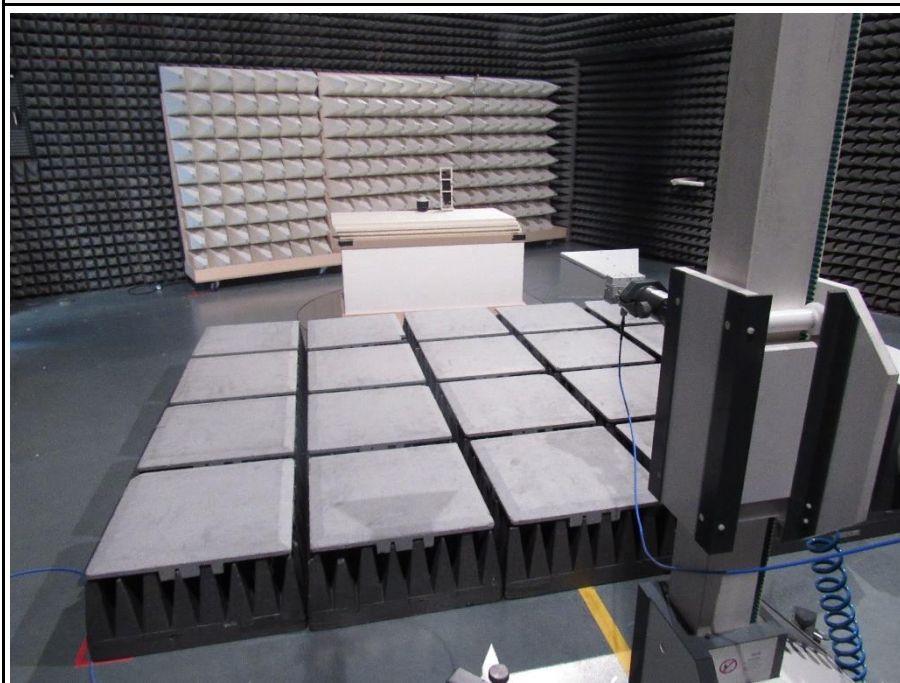
Setup for measurements above 1 GHz (Pit Antenna)



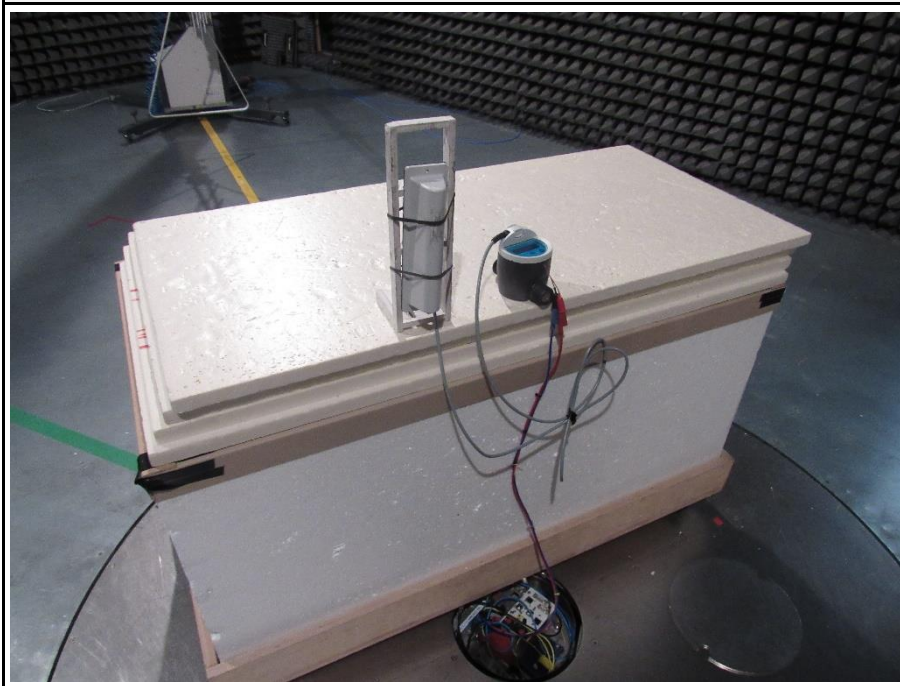
Setup for measurements above 1 GHz (Wall Antenna)



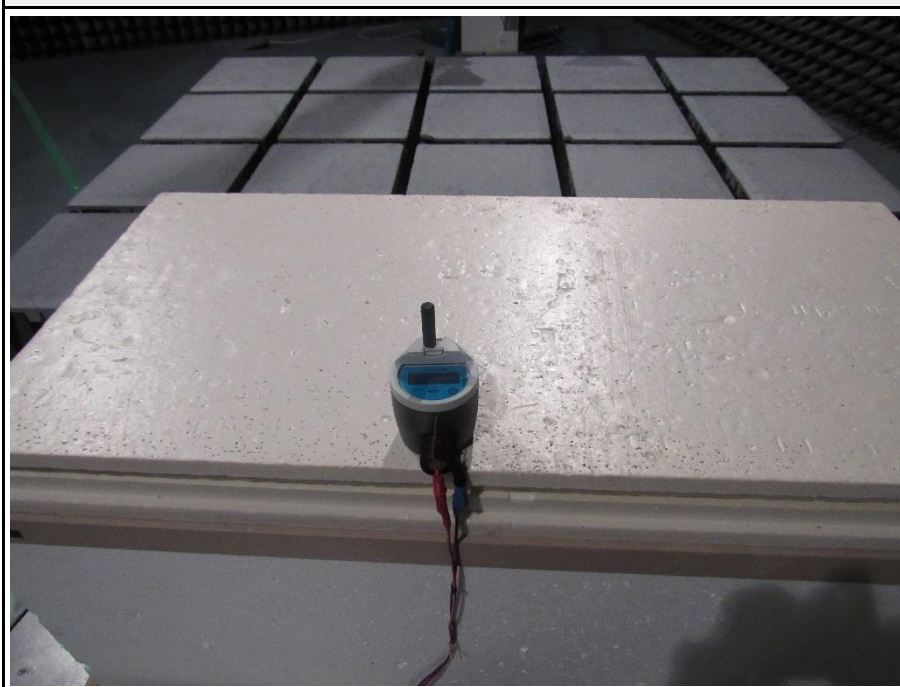
Setup for measurements above 1 GHz (Wall Antenna)



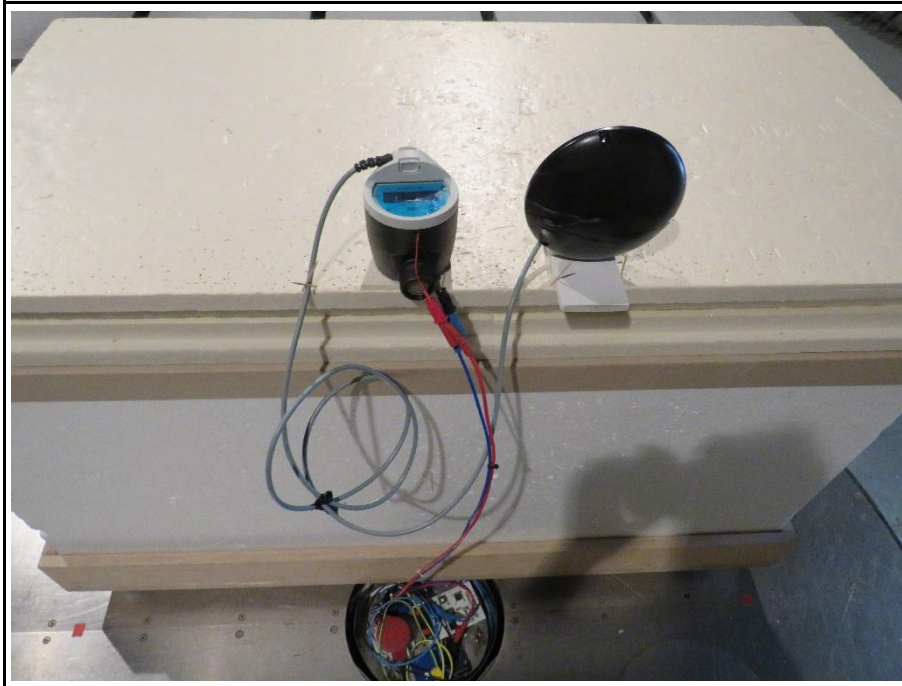
EUT Test Setup (Wall Antenna)



EUT Test Setup (Helix Antenna)



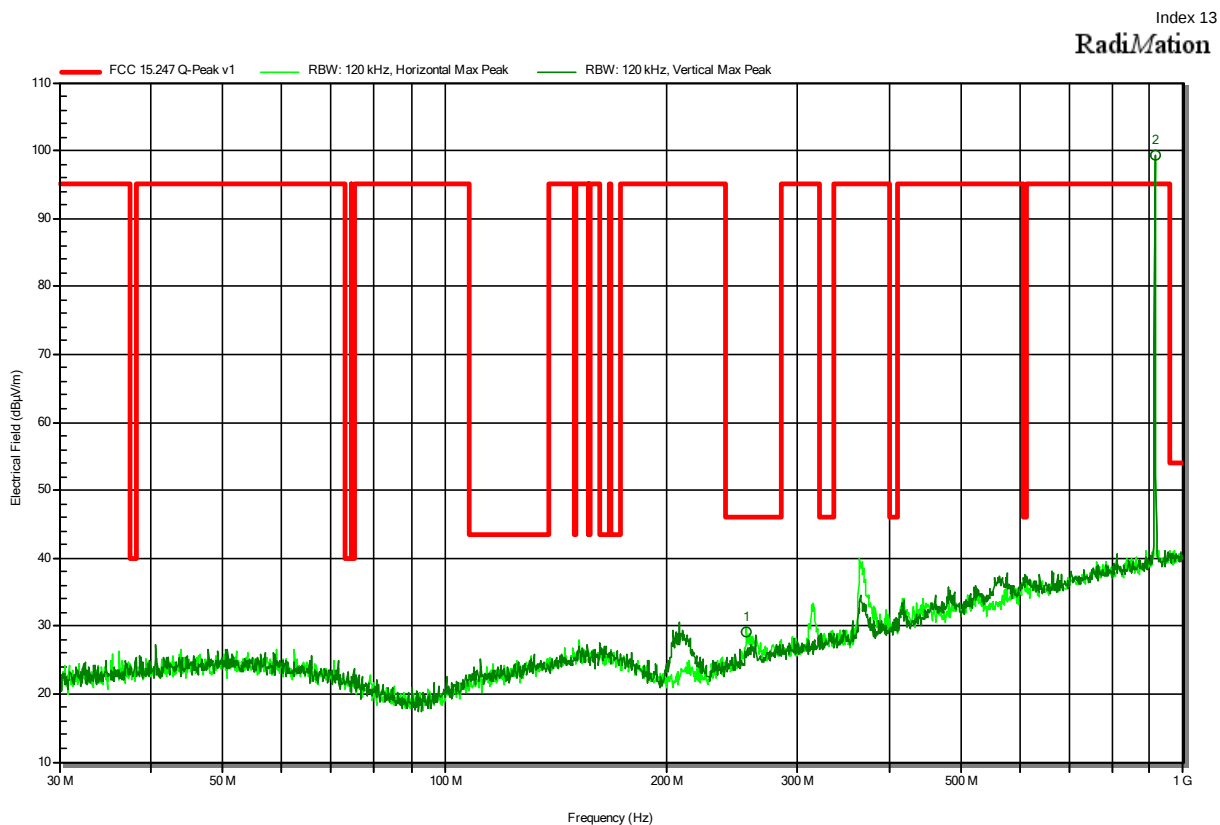
EUT Test Setup (Pit Antenna)



ANNEX A Transmitter spurious emissions

Radiated Spurious Emissions according to 47 CFR Part 15.247, RSS-247

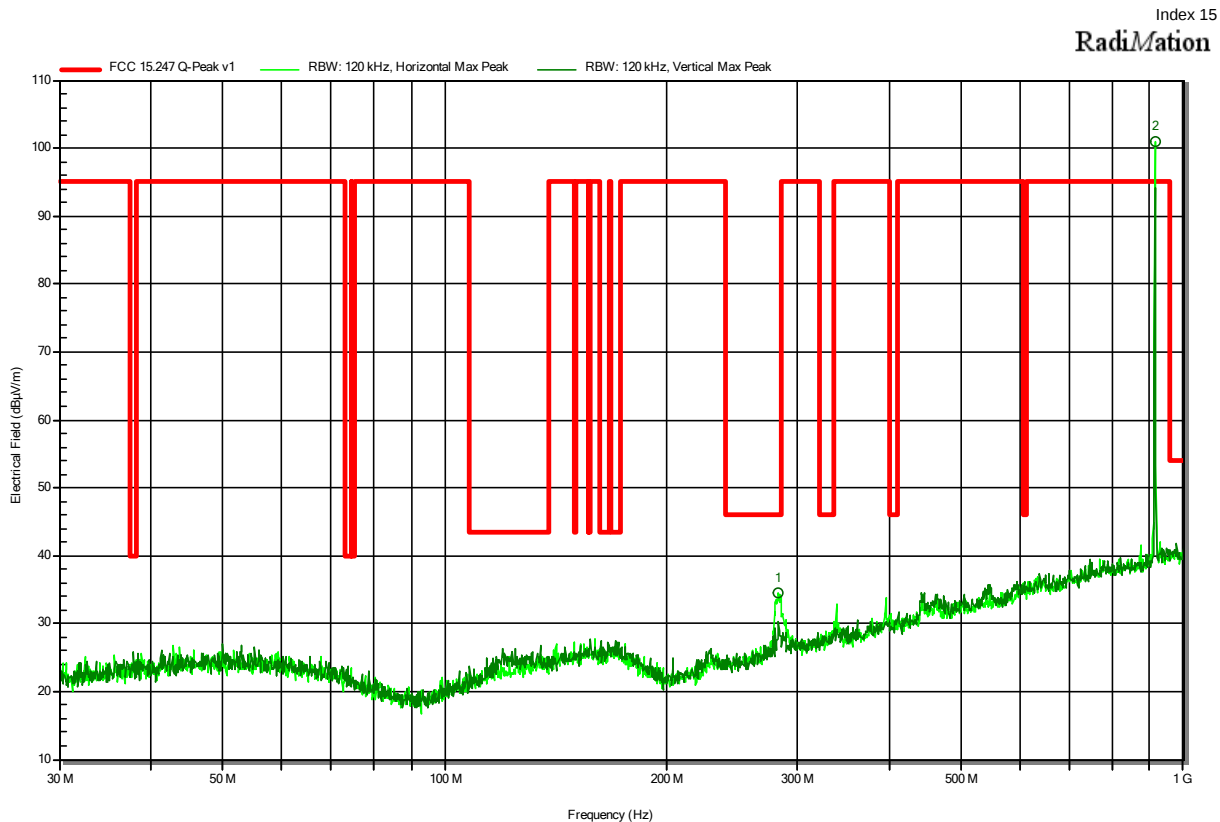
Project Number: G0M-2211-1783
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KW2220
 Test Sample ID: 43140
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Qawasmeh
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 21 °Celsius, Vnom: 3.6 VDC
 Antenna: Schwarzbeck VULB 9168
 Measurement distance: 3 m
 Mode: Tx; SRD 915 MHz, 2-FSK, wall antenna
 Test Date: 2023-02-21
 Note: Marker 2 = Carrier signal



Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
256.0423 MHz	29 dBμV/m	46 dBμV/m	-16.98 dB	Pass	Horizontal
915.222 MHz	99.3 dBμV/m	---	---	Carrier	Vertical

Radiated Spurious Emissions according to 47 CFR Part 15.247, RSS-247

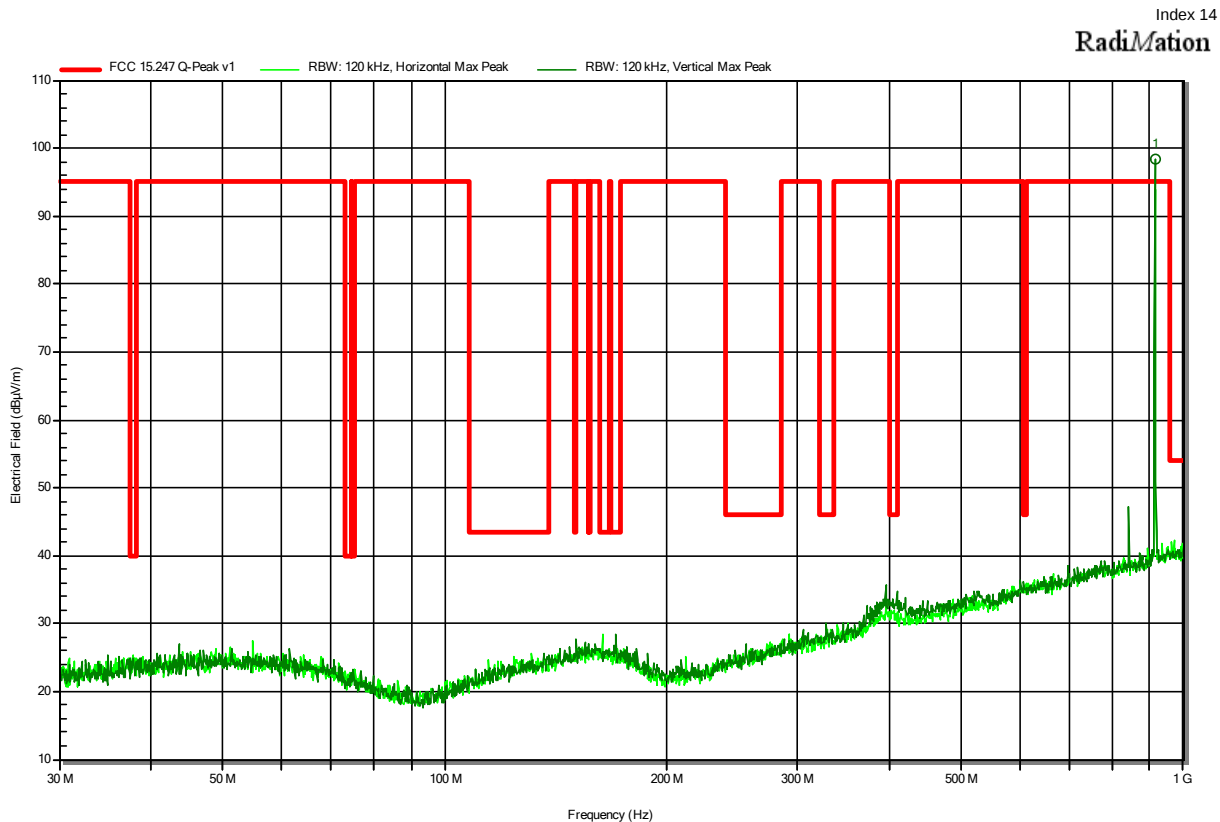
Project Number: G0M-2211-1783
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KW2220
 Test Sample ID: 43140
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Qawasmeh
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 21 °Celsius, Vnom: 3.6 VDC
 Antenna: Schwarzbeck VULB 9168
 Measurement distance: 3 m
 Mode: Tx; SRD 915 MHz, 2-FSK, pit antenna
 Test Date: 2023-02-21
 Note: Marker 2 = Carrier Signal



Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
282.685 MHz	34.5 dBμV/m	46 dBμV/m	-11.45 dB	Pass	Horizontal
915.222 MHz	101 dBμV/m	---	---	Carrier	Horizontal

Radiated Spurious Emissions according to 47 CFR Part 15.247, RSS-247

Project Number: G0M-2211-1783
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KW2220
 Test Sample ID: 43140
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Qawasmeh
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 21 °Celsius, Vnom: 3.6 VDC
 Antenna: Schwarzbeck VULB 9168
 Measurement distance: 3 m
 Mode: Tx; SRD 915 MHz, 2-FSK, helix antenna
 Test Date: 2023-02-21
 Note: Marker 1 = Carrier signal



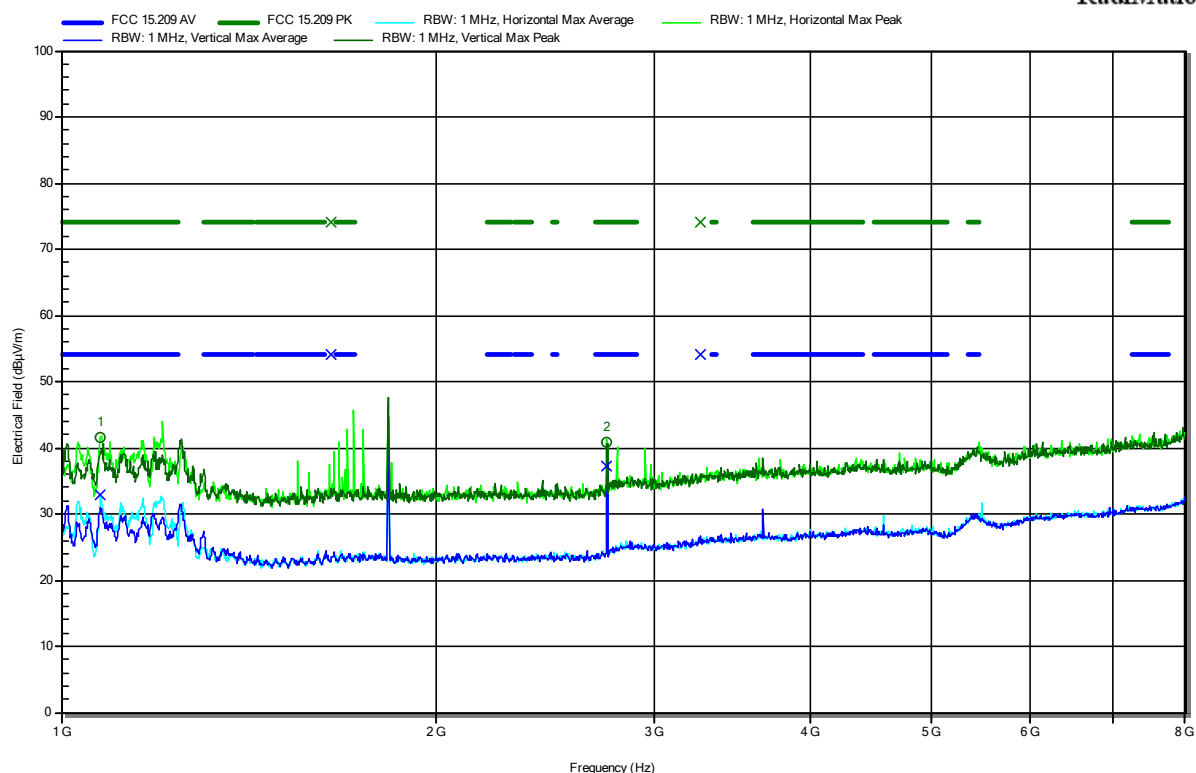
Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
915.222 MHz	98.3 dBµV/m	---	---	Carrier	Vertical

Radiated Spurious Emissions according to 47 CFR Part 15.247, RSS-247

Project Number: G0M-2211-1783
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KW2220
 Test Sample ID: 43140
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Qawasmeh
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.6 VDC
 Antenna: Schwarzbeck BBHA 9120B
 Measurement distance: 3 m
 Mode: Tx; SRD 915 MHz, 2-FSK, wall antenna
 Test Date: 2023-02-20
 Note:

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RadiMation



Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
1.0748 GHz	41.46 dBμV/m	74 dBμV/m	-32.54 dB	Pass	Horizontal
2.7444 GHz	40.89 dBμV/m	74 dBμV/m	-33.11 dB	Pass	Horizontal

Frequency	Average	Average Limit	Average Difference	Average Status	Polarization
1.0748 GHz	32.88 dBμV/m	54 dBμV/m	-21.12 dB	Pass	Horizontal
2.7444 GHz	37.32 dBμV/m	54 dBμV/m	-16.68 dB	Pass	Horizontal

Test Report No.: G0M-2211-1783-TFC247DT-V01

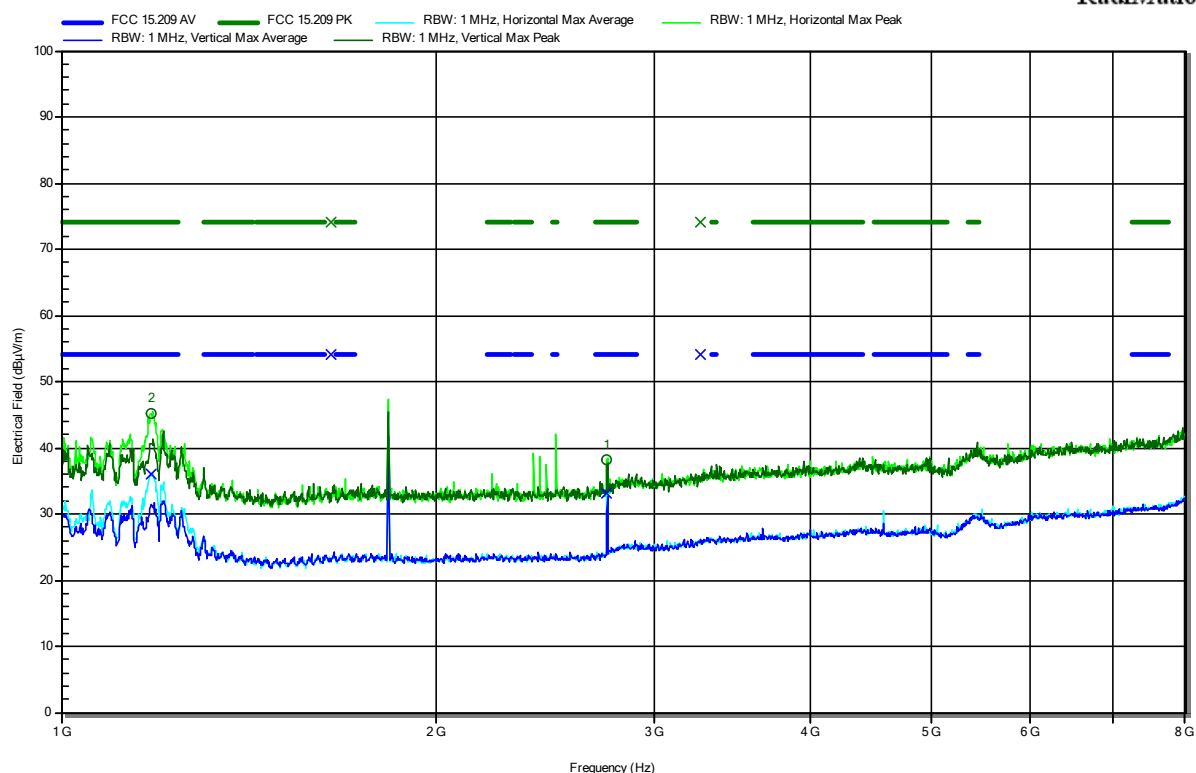
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Radiated Spurious Emissions according to 47 CFR Part 15.247, RSS-247

Project Number: G0M-2211-1783
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KW2220
 Test Sample ID: 43140
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Qawasmeh
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.6 VDC
 Antenna: Schwarzbeck BBHA 9120B
 Measurement distance: 3 m
 Mode: Tx; SRD 915 MHz, 2-FSK, pit antenna
 Test Date: 2023-02-20
 Note:

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RadiMation



Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
1.1816 GHz	45.1 dBµV/m	74 dBµV/m	-28.9 dB	Pass	Horizontal
2.7445 GHz	38.16 dBµV/m	74 dBµV/m	-35.84 dB	Pass	Horizontal

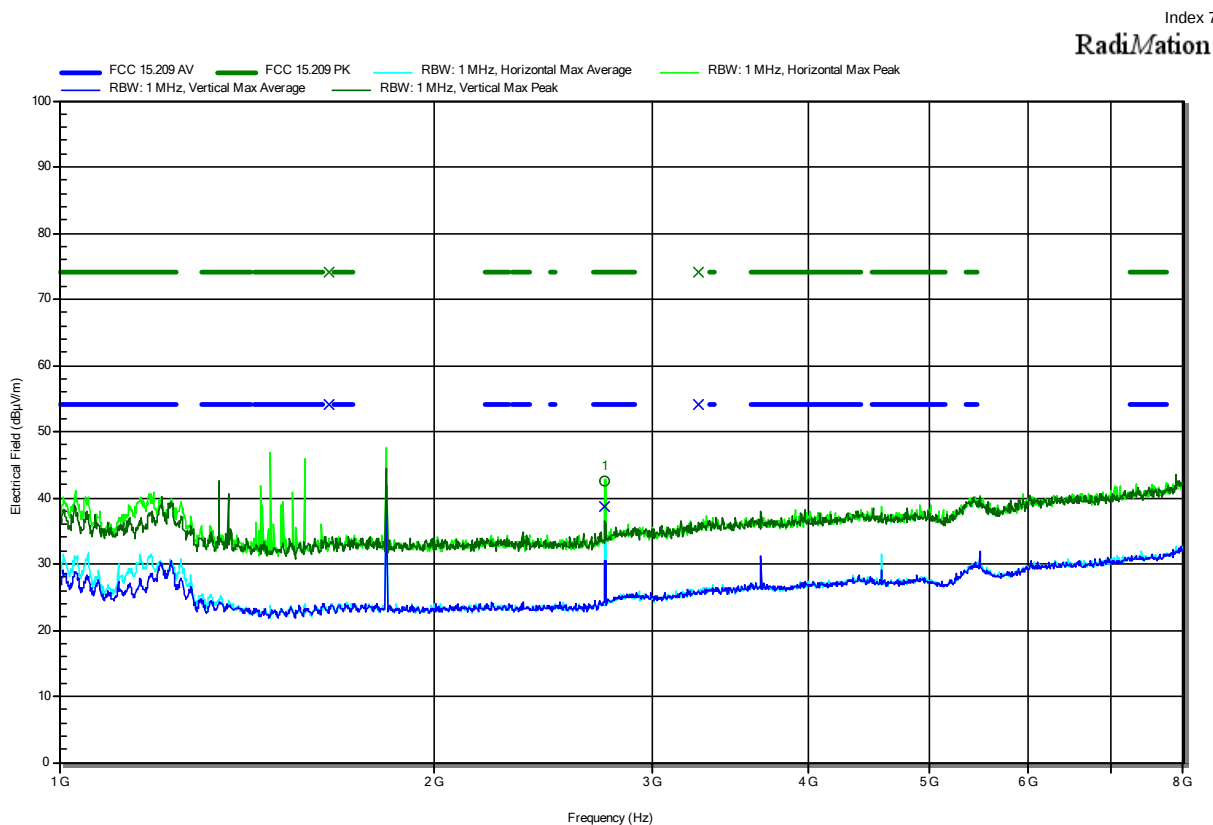
Frequency	Average	Average Limit	Average Difference	Average Status	Polarization
1.1816 GHz	36.01 dBµV/m	54 dBµV/m	-17.99 dB	Pass	Horizontal
2.7445 GHz	33.12 dBµV/m	54 dBµV/m	-20.88 dB	Pass	Horizontal

Test Report No.: G0M-2211-1783-TFC247DT-V01

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

Radiated Spurious Emissions according to 47 CFR Part 15.247, RSS-247

Project Number: G0M-2211-1783
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KW2220
 Test Sample ID: 43140
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Qawasmeh
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.6 VDC
 Antenna: Schwarzbeck BBHA 9120B
 Measurement distance: 3 m
 Mode: Tx; SRD 915 MHz, 2-FSK, helix antenna
 Test Date: 2023-02-20
 Note:



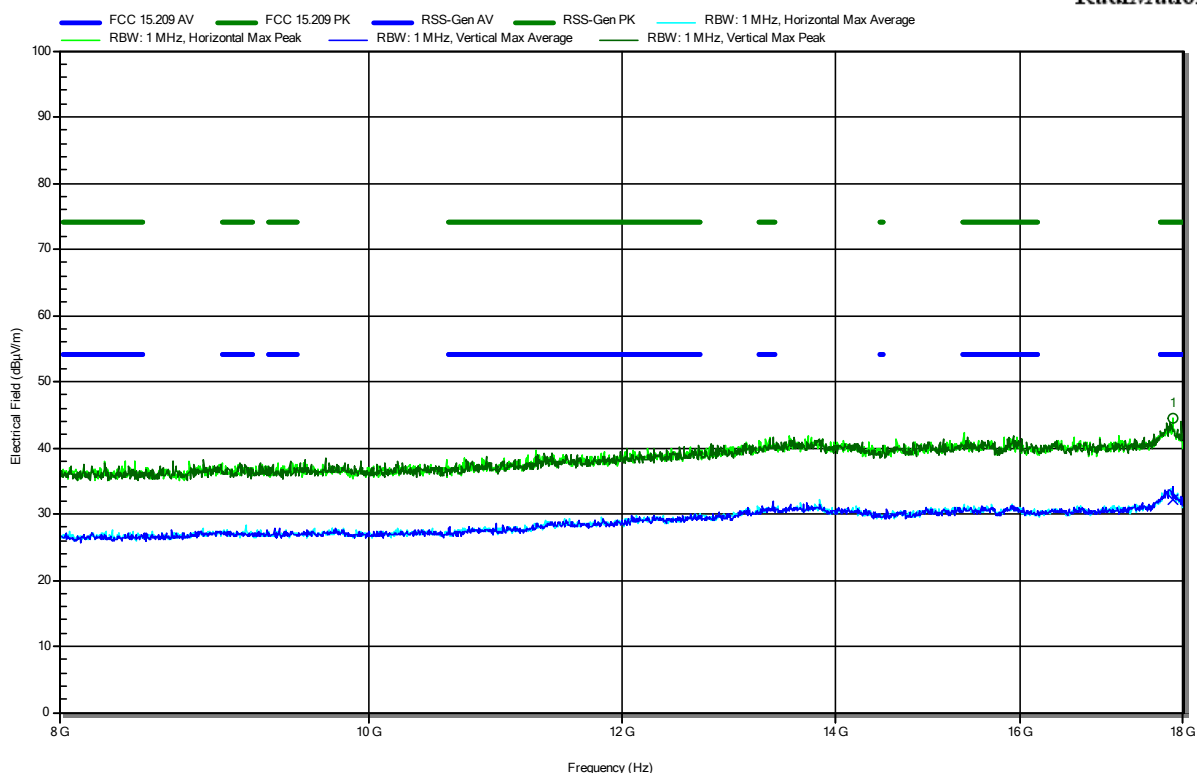
Frequency 2.7443 GHz	Peak 42.49 dBµV/m	Peak Limit 74 dBµV/m	Peak Difference -31.51 dB	Peak Status Pass	Polarization Horizontal
Frequency 2.7443 GHz	Average 38.74 dBµV/m	Average Limit 54 dBµV/m	Average Difference -15.26 dB	Average Status Pass	Polarization Horizontal

Radiated Spurious Emissions according to 47 CFR Part 15.247, RSS-247

Project Number: G0M-2211-1783
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KW2220
 Test Sample ID: 43140
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Qawasmeh
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.6 VDC
 Antenna: Schwarzbeck HWRD 650
 Measurement distance: 3 m
 Mode: Tx; SRD 915 MHz, 2-FSK, wall antenna
 Test Date: 2023-02-20
 Note:

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RadiMation



Frequency 17.859 GHz	Peak 44.35 dBµV/m	Peak Limit 74 dBµV/m	Peak Difference -29.65 dB	Peak Status Pass	Polarization Horizontal
Frequency 17.859 GHz	Average 32.17 dBµV/m	Average Limit 54 dBµV/m	Average Difference -21.83 dB	Average Status Pass	Polarization Horizontal

Test Report No.: G0M-2211-1783-TFC247DT-V01

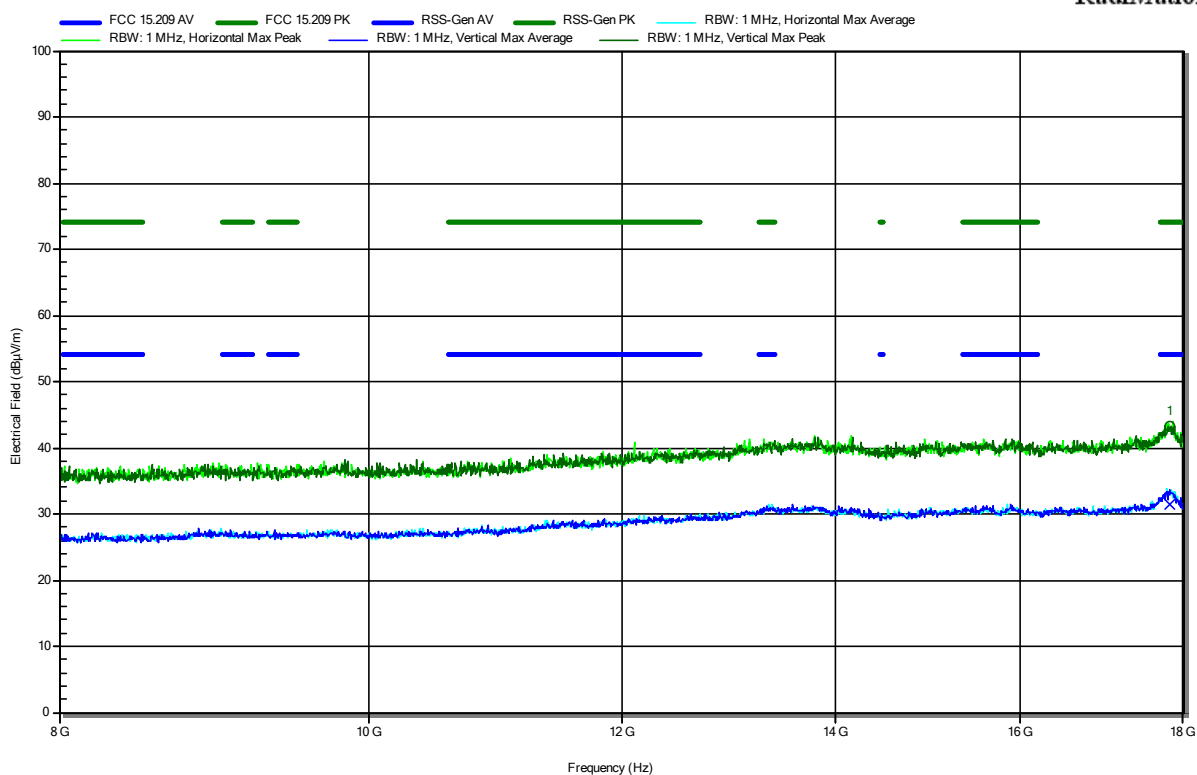
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Radiated Spurious Emissions according to 47 CFR Part 15.247, RSS-247

Project Number: G0M-2211-1783
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KW2220
 Test Sample ID: 43140
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Qawasmeh
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.6 VDC
 Antenna: Schwarzbeck HWRD 650
 Measurement distance: 3 m
 Mode: Tx; SRD 915 MHz, 2-FSK, pit antenna
 Test Date: 2023-02-20
 Note:

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RadiMation



Frequency 17.835 GHz	Peak 43.33 dBµV/m	Peak Limit 74 dBµV/m	Peak Difference -30.67 dB	Peak Status Pass	Polarization Vertical
Frequency 17.835 GHz	Average 31.45 dBµV/m	Average Limit 54 dBµV/m	Average Difference -22.55 dB	Average Status Pass	Polarization Vertical

Test Report No.: G0M-2211-1783-TFC247DT-V01

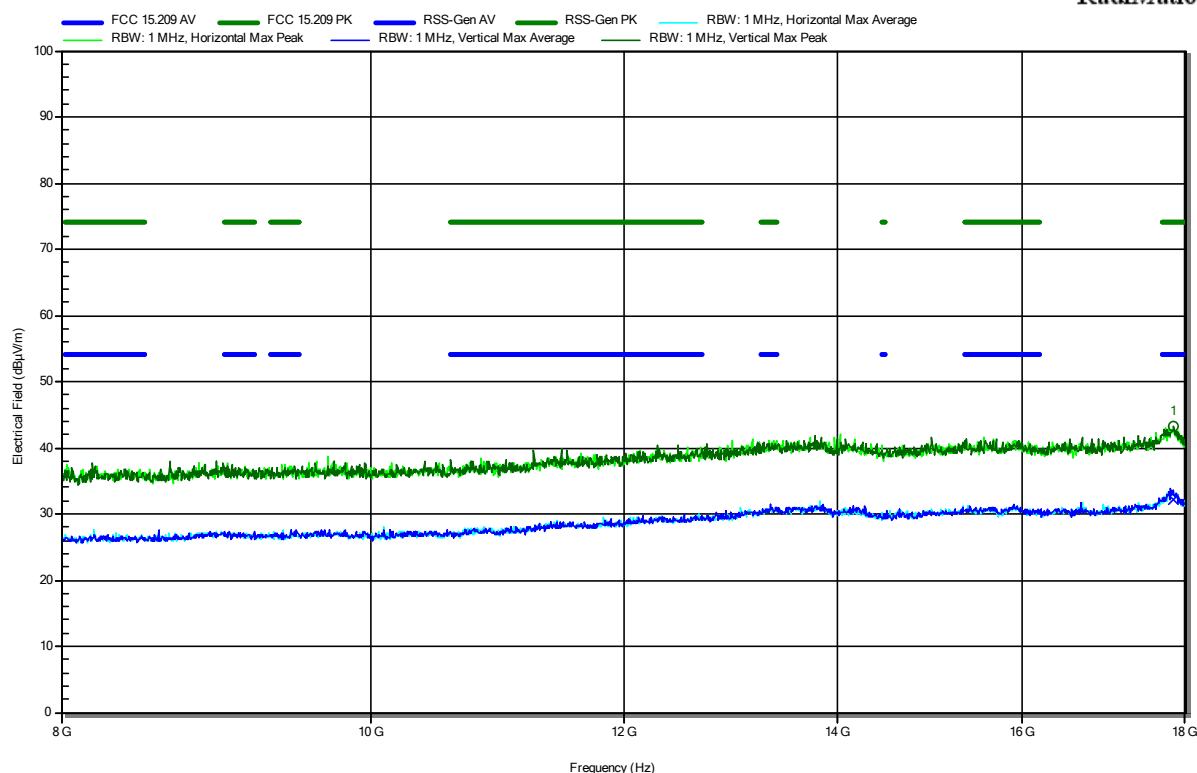
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Radiated Spurious Emissions according to 47 CFR Part 15.247, RSS-247

Project Number: G0M-2211-1783
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KW2220
 Test Sample ID: 43140
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Qawasmeh
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.6 VDC
 Antenna: Schwarzbeck HWRD 650
 Measurement distance: 3 m
 Mode: Tx; SRD 915 MHz, 2-FSK, helix antenna
 Test Date: 2023-02-20
 Note:

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RadiMation



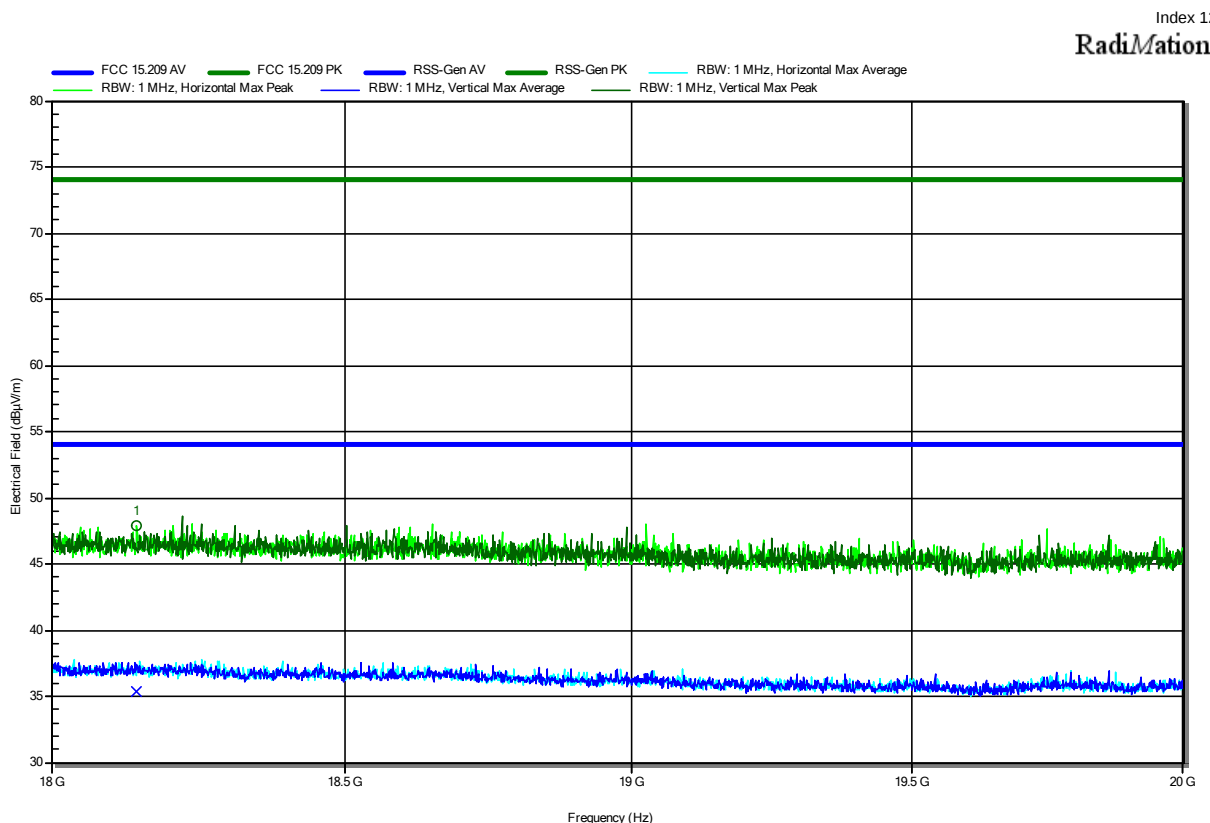
Frequency 17.841 GHz	Peak 43.16 dBµV/m	Peak Limit 74 dBµV/m	Peak Difference -30.84 dB	Peak Status Pass	Polarization Vertical
Frequency 17.841 GHz	Average 32.1 dBµV/m	Average Limit 54 dBµV/m	Average Difference -21.9 dB	Average Status Pass	Polarization Vertical

Test Report No.: G0M-2211-1783-TFC247DT-V01

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

Radiated Spurious Emissions according to 47 CFR Part 15.247, RSS-247

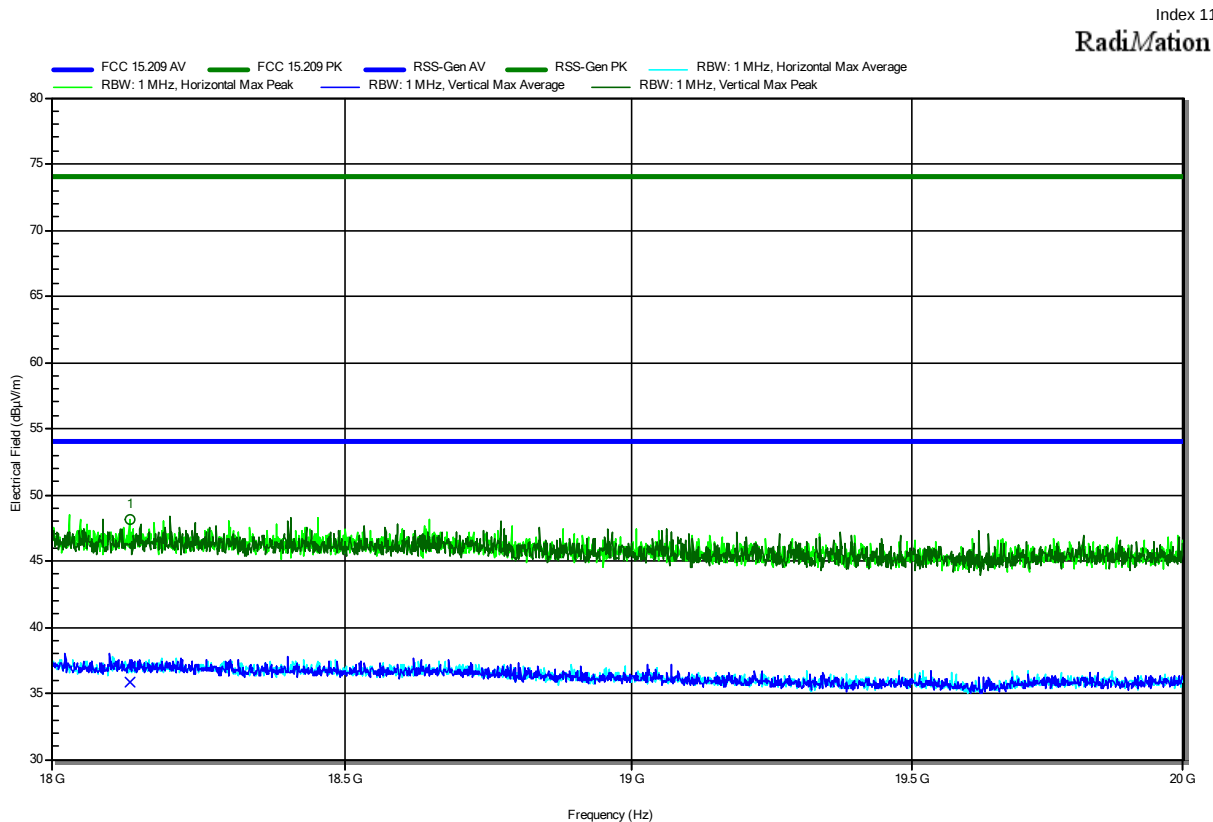
Project Number: G0M-2211-1783
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KW2220
 Test Sample ID: 43140
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Qawasmeh
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.6 VDC
 Antenna: Amplifier Research AT4560
 Measurement distance: 3 m
 Mode: Tx; SRD 915 MHz, 2-FSK, wall antenna
 Test Date: 2023-02-20
 Note:



Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
18.144 GHz	47.91 dBµV/m	74 dBµV/m	-26.09 dB	Pass	Horizontal
Frequency	Average	Average Limit	Average Difference	Average Status	Polarization
18.144 GHz	35.41 dBµV/m	54 dBµV/m	-18.59 dB	Pass	Horizontal

Radiated Spurious Emissions according to 47 CFR Part 15.247, RSS-247

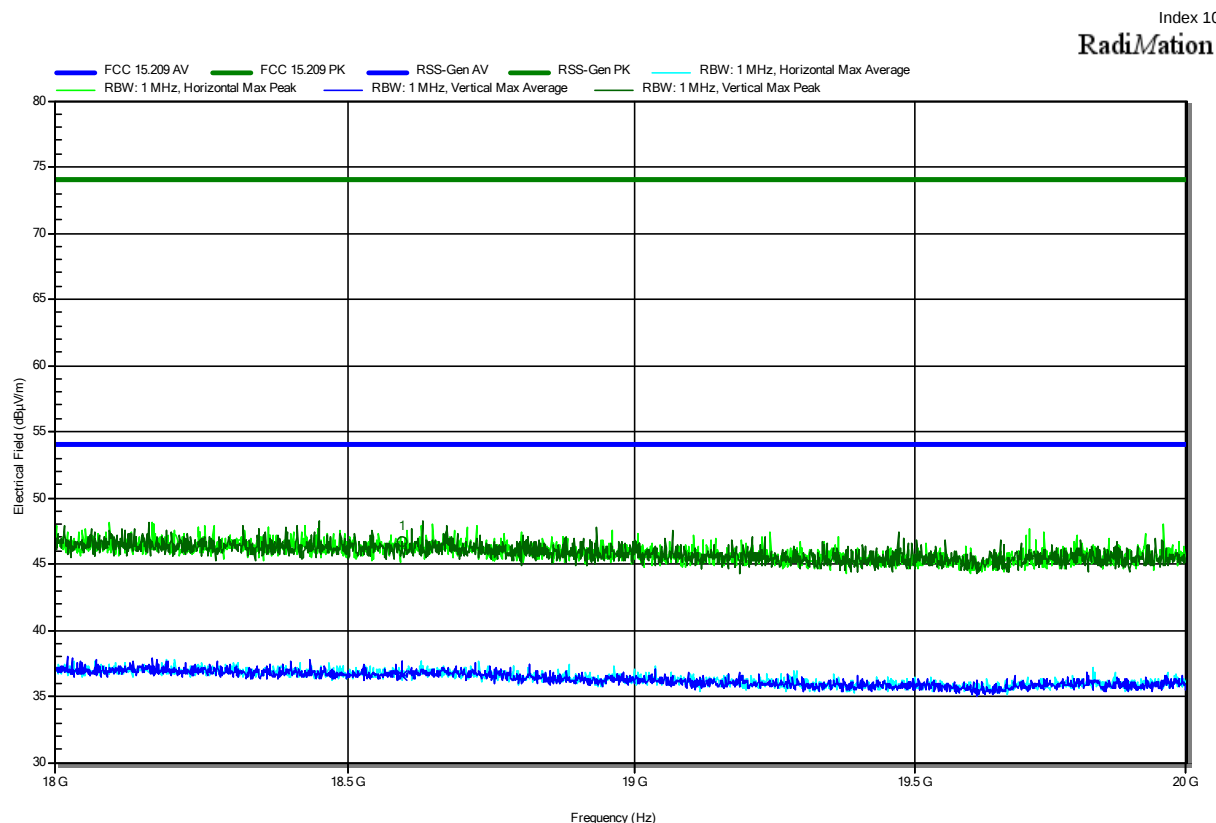
Project Number: G0M-2211-1783
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KW2220
 Test Sample ID: 43140
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Qawasmeh
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.6 VDC
 Antenna: Amplifier Research AT4560
 Measurement distance: 3 m
 Mode: Tx; SRD 915 MHz, 2-FSK, pit antenna
 Test Date: 2023-02-20
 Note:



Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
18.131 GHz	48.17 dBµV/m	74 dBµV/m	-25.83 dB	Pass	Horizontal
Frequency	Average	Average Limit	Average Difference	Average Status	Polarization
18.131 GHz	35.85 dBµV/m	54 dBµV/m	-18.15 dB	Pass	Horizontal

Radiated Spurious Emissions according to 47 CFR Part 15.247, RSS-247

Project Number: G0M-2211-1783
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KW2220
 Test Sample ID: 43140
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Qawasmeh
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.6 VDC
 Antenna: Amplifier Research AT4560
 Measurement distance: 3 m
 Mode: Tx; SRD 915 MHz, 2-FSK, helix antenna
 Test Date: 2023-02-20
 Note:

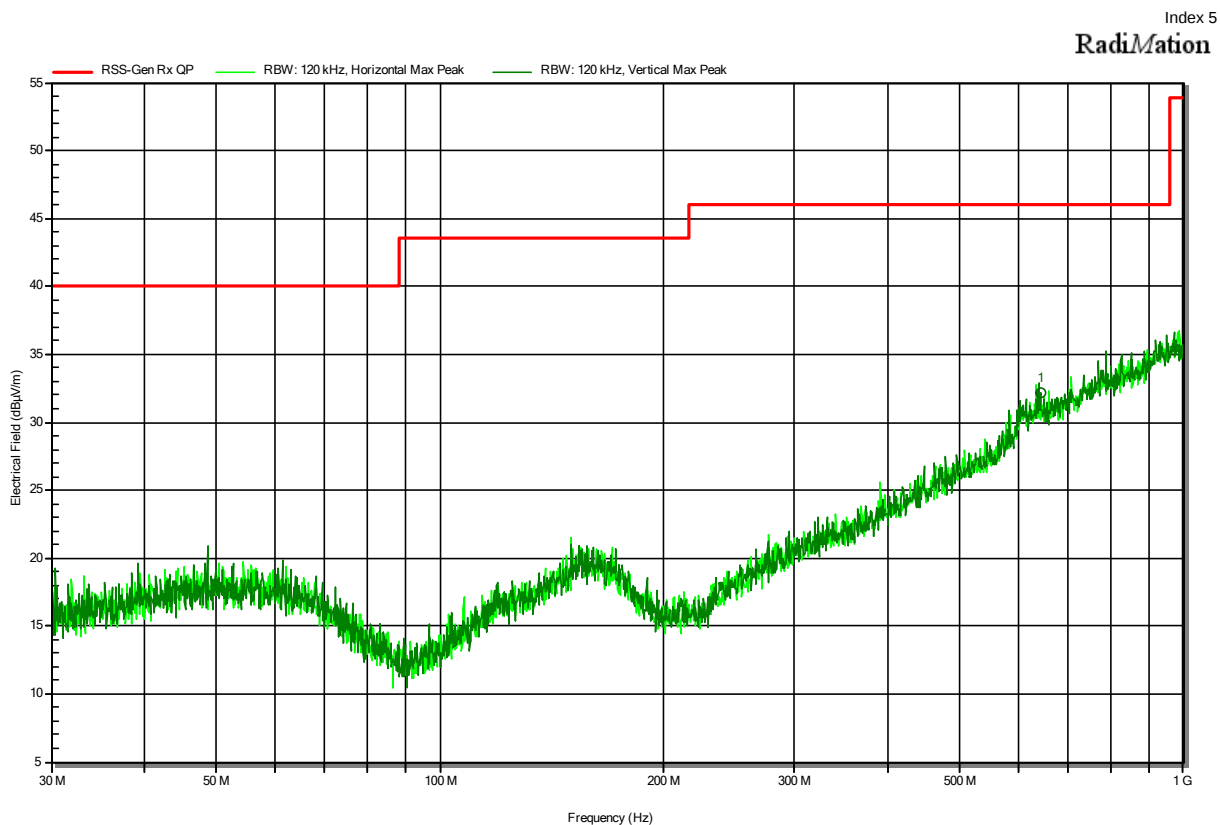


Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
18.592 GHz	46.72 dBµV/m	74 dBµV/m	-27.28 dB	Pass	Vertical
Frequency	Average	Average Limit	Average Difference	Average Status	Polarization
18.592 GHz	36.6 dBµV/m	54 dBµV/m	-17.4 dB	Pass	Vertical

ANNEX B Receiver spurious emissions

Radiated Spurious Emissions according to RSS-247, RSS-Gen, Issue 5

Project Number: G0M-2211-1783
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KW2220
 Test Sample ID: 43140
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Qawasmeh
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 21 °Celsius, Vnom: 3.6 VDC
 Antenna: Schwarzbeck VULB 9168
 Measurement distance: 3 m
 Mode: Rx; SRD 915 MHz, 2-FSK, wall antenna
 Test Date: 2023-02-21
 Note:



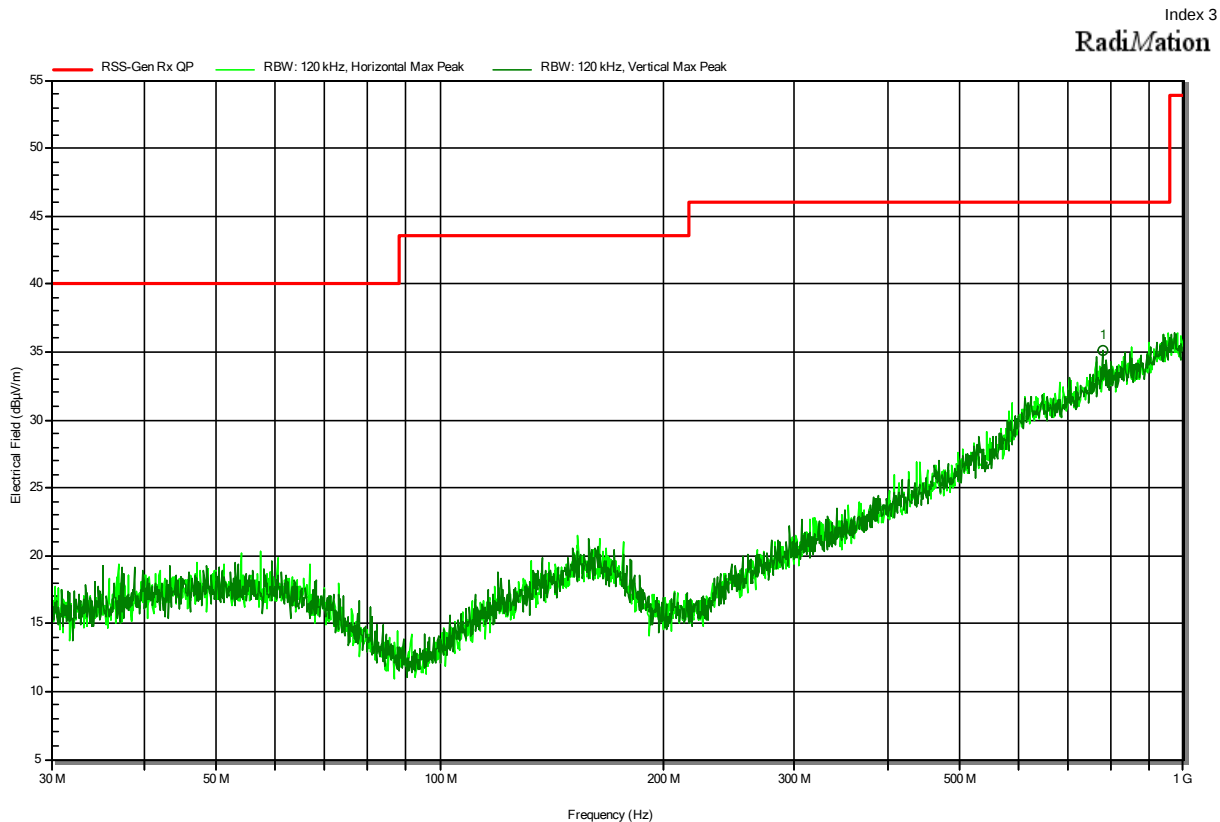
Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
641.7467 MHz	32.1 dBμV/m	46 dBμV/m	-13.88 dB	Pass	Vertical

Test Report No.: G0M-2211-1783-TFC247DT-V01

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

Radiated Spurious Emissions according to RSS-247, RSS-Gen, Issue 5

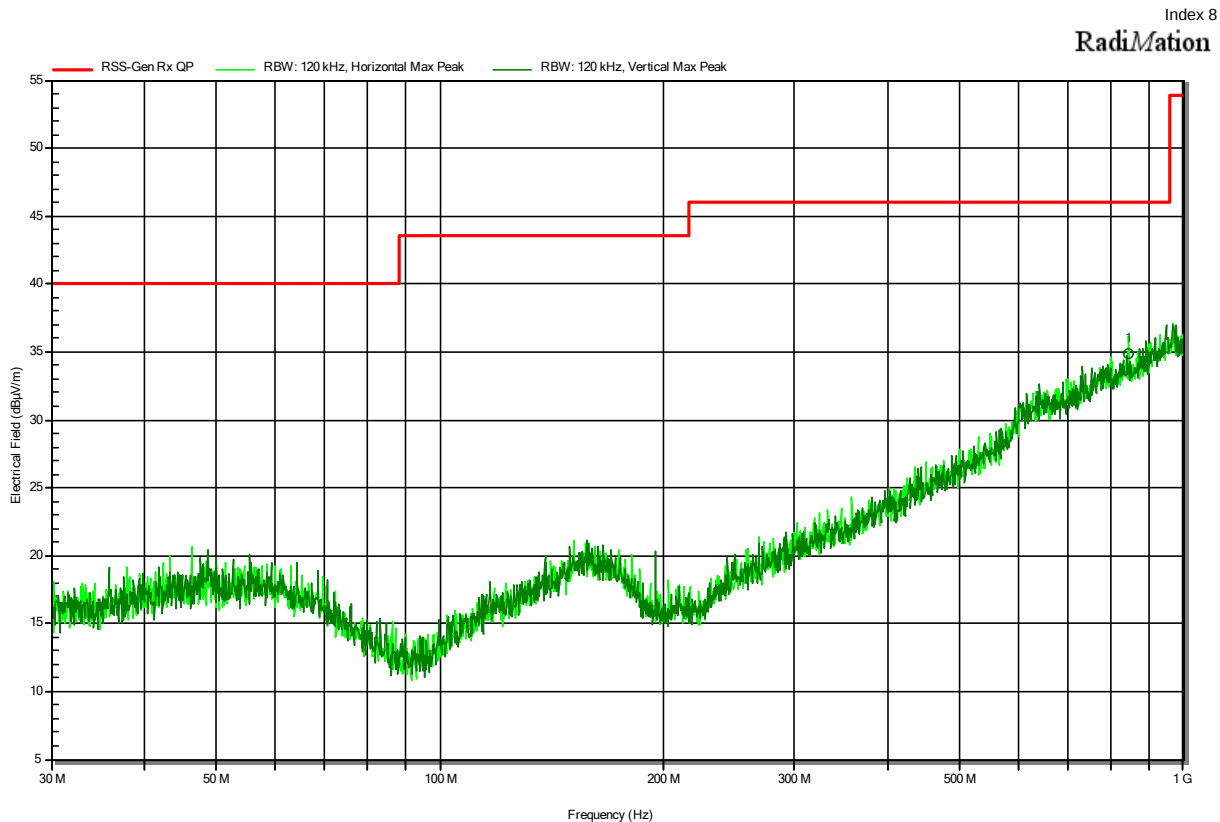
Project Number: G0M-2211-1783
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KW2220
 Test Sample ID: 43140
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Qawasmeh
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 21 °Celsius, Vnom: 3.6 VDC
 Antenna: Schwarzbeck VULB 9168
 Measurement distance: 3 m
 Mode: Rx; SRD 915 MHz, 2-FSK, pit antenna
 Test Date: 2023-02-21
 Note:



Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
778.3873 MHz	35.2 dBµV/m	46 dBµV/m	-10.84 dB	Pass	Vertical

Radiated Spurious Emissions according to RSS-247, RSS-Gen, Issue 5

Project Number: G0M-2211-1783
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KW2220
 Test Sample ID: 43140
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Qawasmeh
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 21 °Celsius, Vnom: 3.6 VDC
 Antenna: Schwarzbeck VULB 9168
 Measurement distance: 3 m
 Mode: Rx; SRD 915 MHz, 2-FSK, helix antenna
 Test Date: 2023-02-21
 Note:



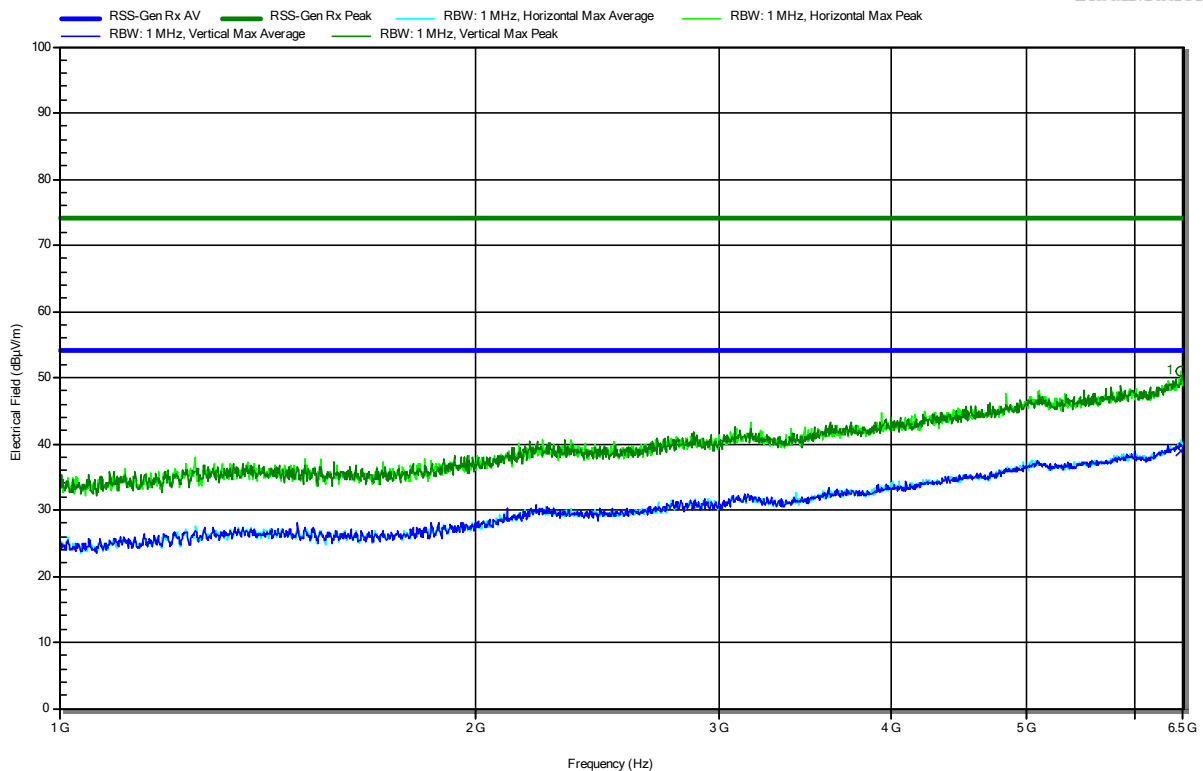
Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
844.897 MHz	34.9 dBµV/m	46 dBµV/m	-11.14 dB	Pass	Horizontal

Radiated Spurious Emissions according to RSS-247, RSS-Gen, Issue 5

Project Number: G0M-2211-1783
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KW2220
 Test Sample ID: 43140
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Qawasmeh
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 21 °Celsius, Vnom: 3.6 VDC
 Antenna: Schwarzbeck BBHA 9120D
 Measurement distance: 3 m
 Mode: Rx; SRD 915 MHz, 2-FSK, wall antenna
 Test Date: 2023-02-21
 Note:

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RadiMation



Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
6.479 GHz	50.92 dBµV/m	74 dBµV/m	-23.08 dB	Pass	Horizontal
Frequency	Average	Average Limit	Average Difference	Average Status	Polarization
6.479 GHz	38.93 dBµV/m	53.98 dBµV/m	-15.05 dB	Pass	Horizontal

Test Report No.: G0M-2211-1783-TFC247DT-V01

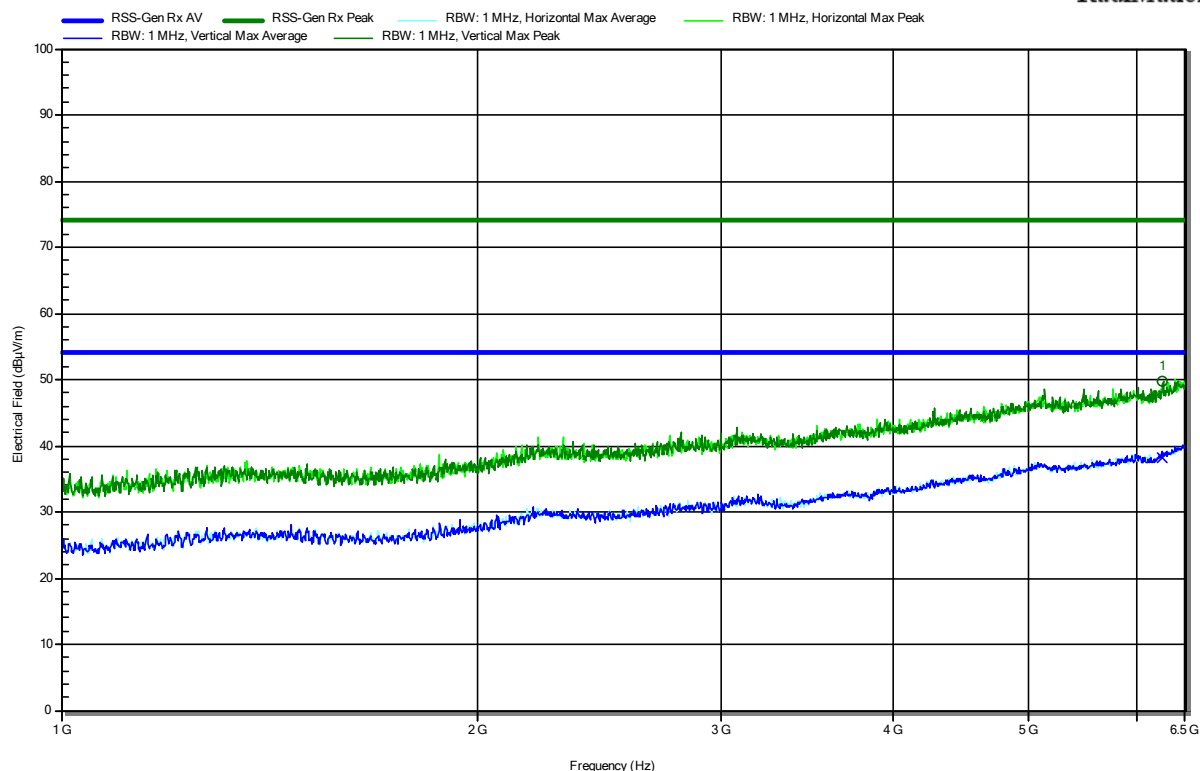
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Radiated Spurious Emissions according to RSS-247, RSS-Gen, Issue 5

Project Number: G0M-2211-1783
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KW2220
 Test Sample ID: 43140
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Qawasmeh
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 21 °Celsius, Vnom: 3.6 VDC
 Antenna: Schwarzbeck BBHA 9120D
 Measurement distance: 3 m
 Mode: Rx; SRD 915 MHz, 2-FSK, pit antenna
 Test Date: 2023-02-21
 Note:

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RadiMation



Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
6.26 GHz	49.84 dBµV/m	74 dBµV/m	-24.16 dB	Pass	Vertical
Frequency	Average	Average Limit	Average Difference	Average Status	Polarization
6.26 GHz	38.27 dBµV/m	53.98 dBµV/m	-15.71 dB	Pass	Vertical

Test Report No.: G0M-2211-1783-TFC247DT-V01

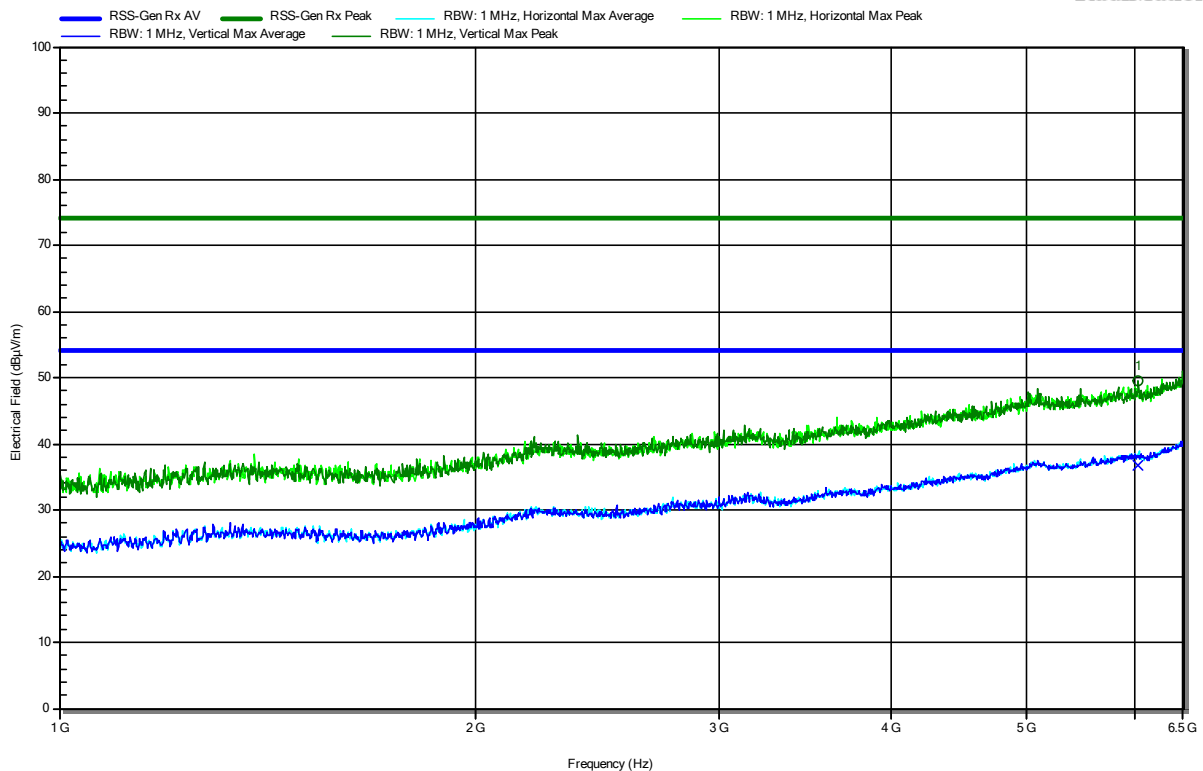
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Radiated Spurious Emissions according to RSS-247, RSS-Gen, Issue 5

Project Number: G0M-2211-1783
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KW2220
 Test Sample ID: 43140
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Qawasmeh
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 21 °Celsius, Vnom: 3.6 VDC
 Antenna: Schwarzbeck BBHA 9120D
 Measurement distance: 3 m
 Mode: Rx; SRD 915 MHz, 2-FSK, helix antenna
 Test Date: 2023-02-21
 Note:

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RadiMation



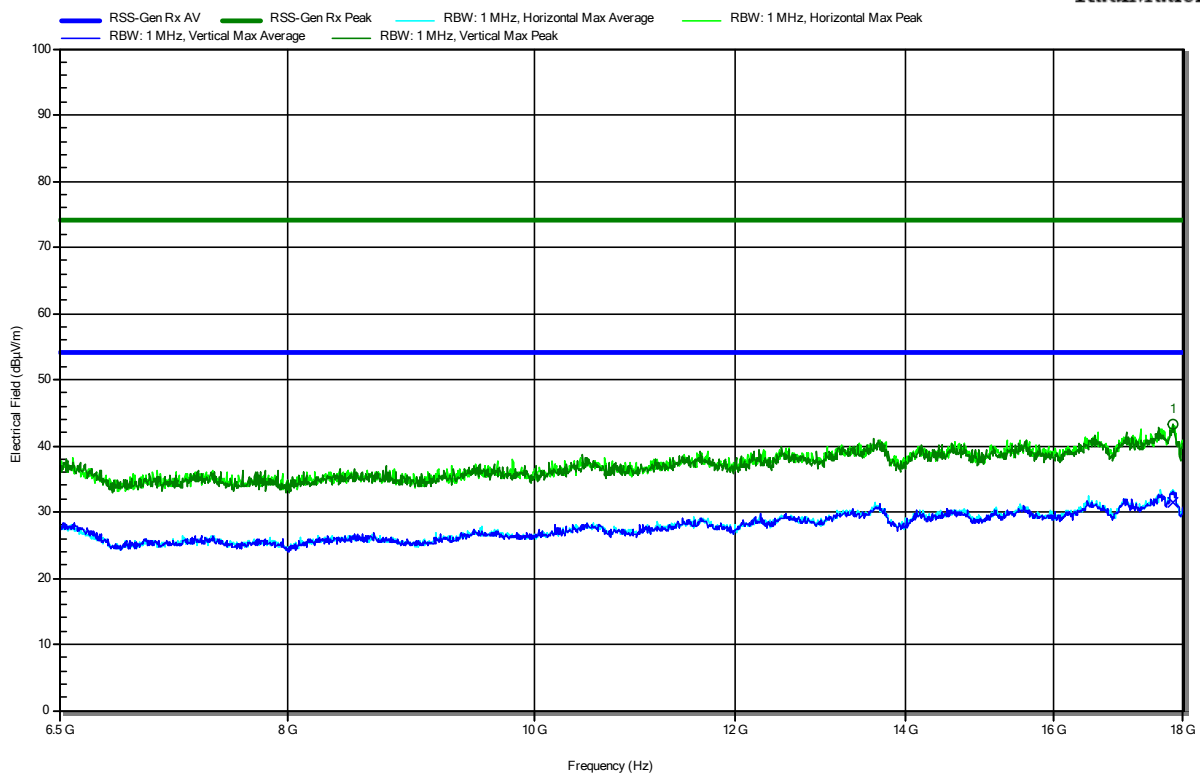
Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
6.024 GHz	49.47 dBµV/m	74 dBµV/m	-24.53 dB	Pass	Vertical
Frequency	Average	Average Limit	Average Difference	Average Status	Polarization
6.024 GHz	36.79 dBµV/m	53.98 dBµV/m	-17.19 dB	Pass	Vertical

Radiated Spurious Emissions according to RSS-247, RSS-Gen, Issue 5

Project Number: G0M-2211-1783
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KW2220
 Test Sample ID: 43140
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Qawasmeh
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 21 °Celsius, Vnom: 3.6 VDC
 Antenna: Schwarzbeck HWRD 650
 Measurement distance: 3 m
 Mode: Rx; SRD 915 MHz, 2-FSK, wall antenna
 Test Date: 2023-02-21
 Note:

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RadiMation



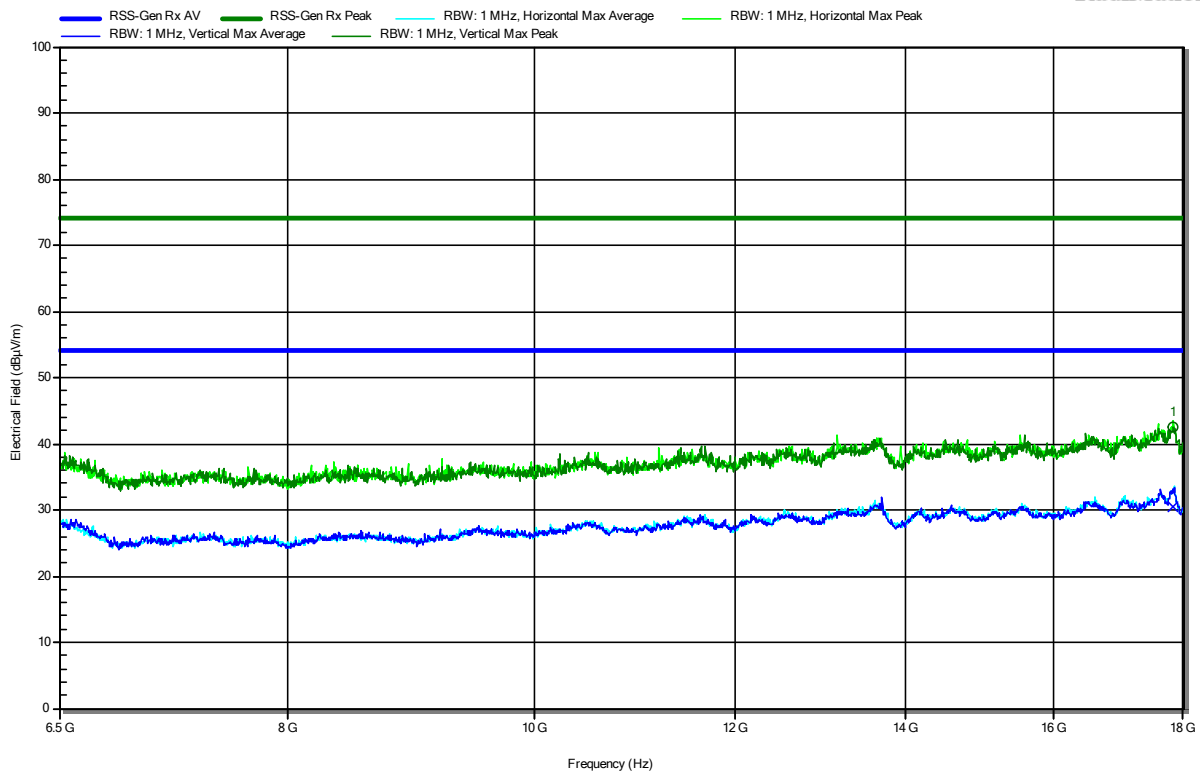
Frequency 17.831 GHz	Peak 43.31 dBµV/m	Peak Limit 74 dBµV/m	Peak Difference -30.69 dB	Peak Status Pass	Polarization Vertical
Frequency 17.831 GHz	Average 31.46 dBµV/m	Average Limit 53.98 dBµV/m	Average Difference -22.52 dB	Average Status Pass	Polarization Vertical

Radiated Spurious Emissions according to RSS-247, RSS-Gen, Issue 5

Project Number: G0M-2211-1783
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KW2220
 Test Sample ID: 43140
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Qawasmeh
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 21 °Celsius, Vnom: 3.6 VDC
 Antenna: Schwarzbeck HWRD 650
 Measurement distance: 3 m
 Mode: Rx; SRD 915 MHz, 2-FSK, pit antenna
 Test Date: 2023-02-21
 Note:

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RadiMation



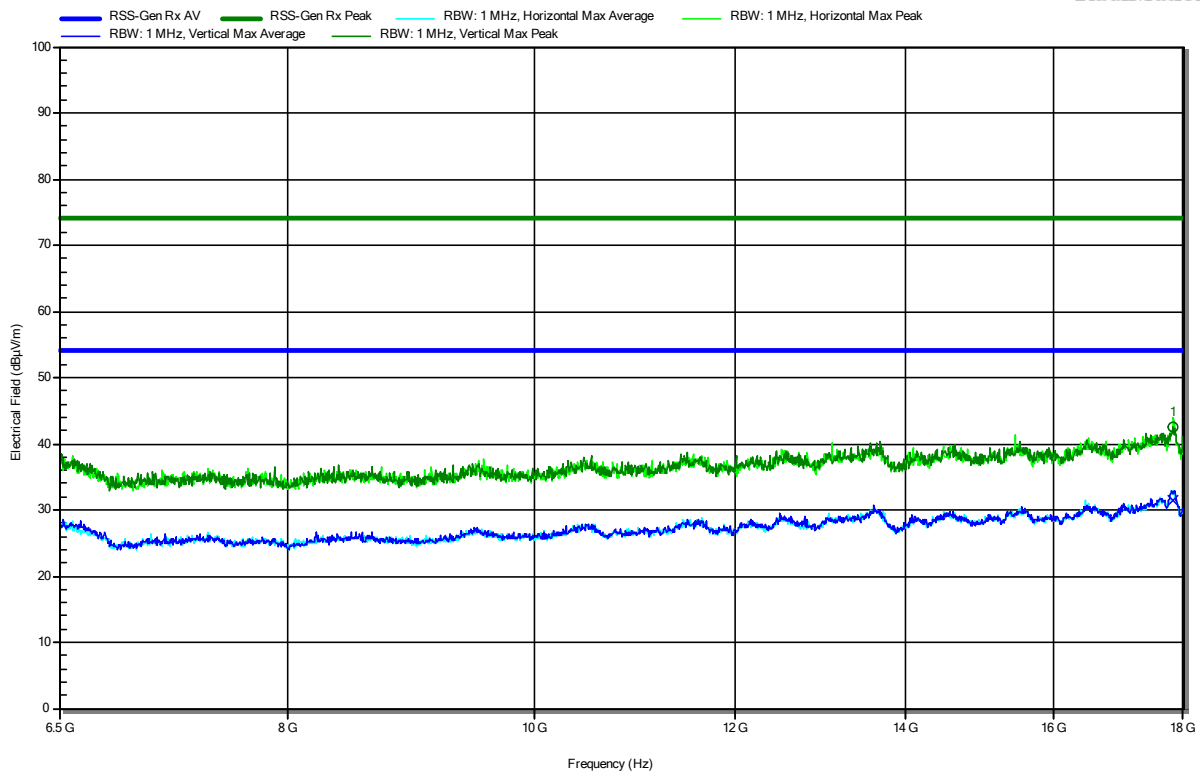
Frequency 17.836 GHz	Peak 42.56 dBµV/m	Peak Limit 74 dBµV/m	Peak Difference -31.44 dB	Peak Status Pass	Polarization Vertical
Frequency 17.836 GHz	Average 30.59 dBµV/m	Average Limit 53.98 dBµV/m	Average Difference -23.39 dB	Average Status Pass	Polarization Vertical

Radiated Spurious Emissions according to RSS-247, RSS-Gen, Issue 5

Project Number: G0M-2211-1783
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KW2220
 Test Sample ID: 43140
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Qawasmeh
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 21 °Celsius, Vnom: 3.6 VDC
 Antenna: Schwarzbeck HWRD 650
 Measurement distance: 3 m
 Mode: Rx; SRD 915 MHz, 2-FSK, helix antenna
 Test Date: 2023-02-21
 Note:

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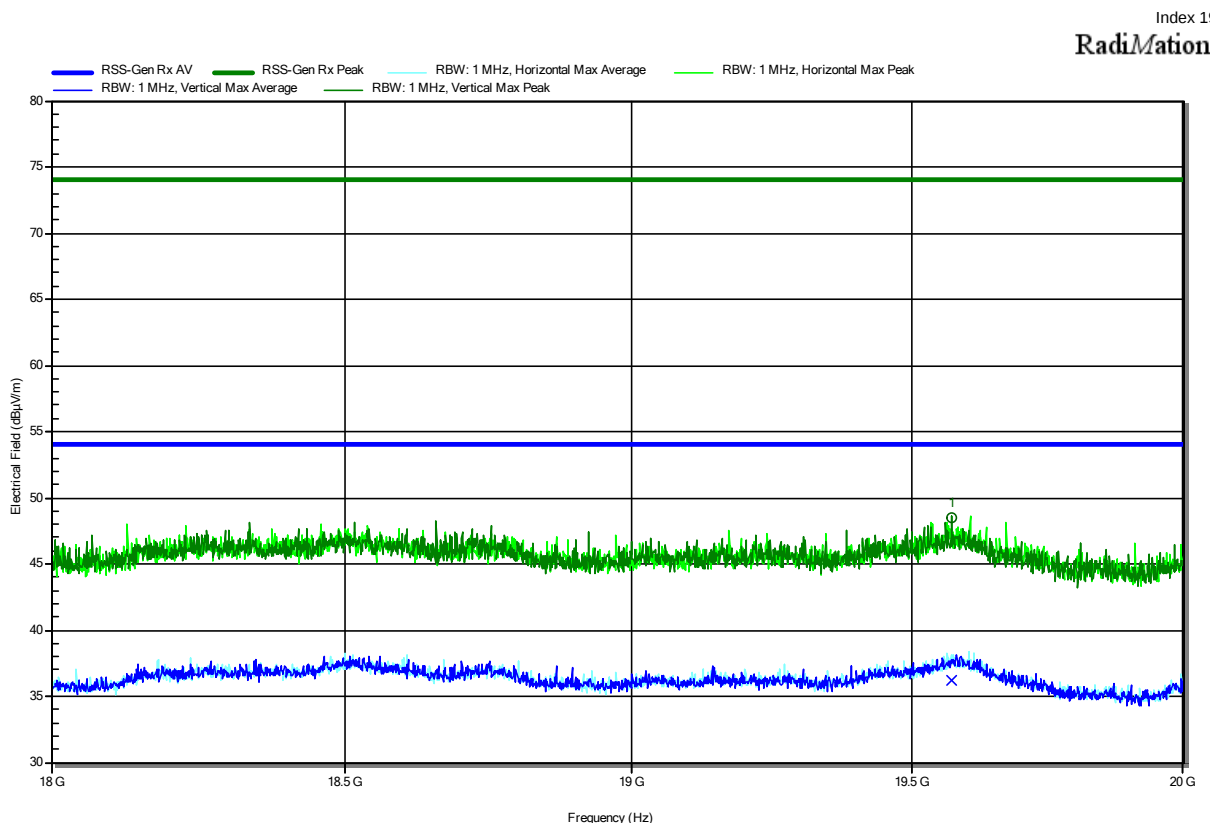
RadiMation



Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
17.824 GHz	42.51 dBµV/m	74 dBµV/m	-31.49 dB	Pass	Vertical
Frequency	Average	Average Limit	Average Difference	Average Status	Polarization
17.824 GHz	31.47 dBµV/m	53.98 dBµV/m	-22.51 dB	Pass	Vertical

Radiated Spurious Emissions according to RSS-247, RSS-Gen, Issue 5

Project Number: G0M-2211-1783
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KW2220
 Test Sample ID: 43140
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Qawasmeh
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 21 °Celsius, Vnom: 3.6 VDC
 Antenna: Amplifier Research AT4560
 Measurement distance: 3 m
 Mode: Rx; SRD 915 MHz, 2-FSK, wall antenna
 Test Date: 2023-02-21
 Note:



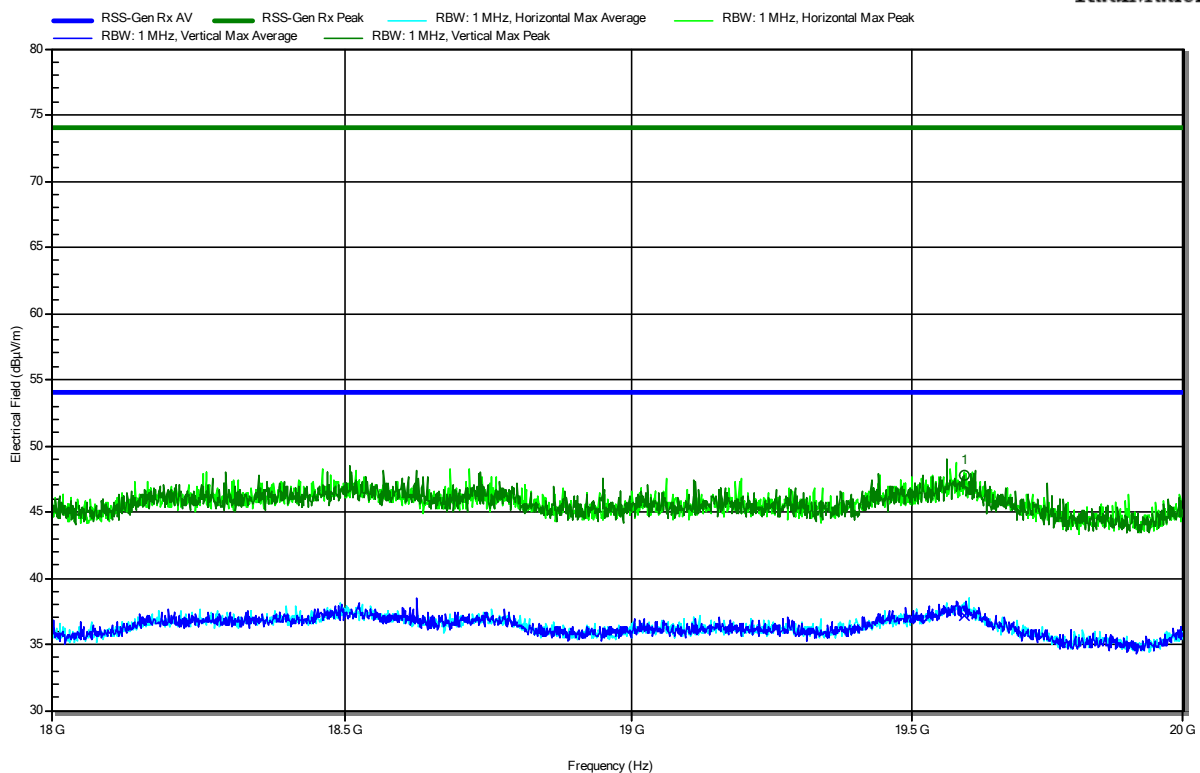
Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
19.572 GHz	48.55 dBµV/m	74 dBµV/m	-25.45 dB	Pass	Vertical
Frequency	Average	Average Limit	Average Difference	Average Status	Polarization
19.572 GHz	36.22 dBµV/m	53.98 dBµV/m	-17.76 dB	Pass	Vertical

Radiated Spurious Emissions according to RSS-247, RSS-Gen, Issue 5

Project Number: G0M-2211-1783
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KW2220
 Test Sample ID: 43140
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Qawasmeh
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 21 °Celsius, Vnom: 3.6 VDC
 Antenna: Amplifier Research AT4560
 Measurement distance: 3 m
 Mode: Rx; SRD 915 MHz, 2-FSK, pit antenna
 Test Date: 2023-02-21
 Note:

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RadiMation



Frequency 19.595 GHz	Peak 47.72 dBµV/m	Peak Limit 74 dBµV/m	Peak Difference -26.28 dB	Peak Status Pass	Polarization Vertical
Frequency 19.595 GHz	Average 37.2 dBµV/m	Average Limit 53.98 dBµV/m	Average Difference -16.78 dB	Average Status Pass	Polarization Vertical

Test Report No.: G0M-2211-1783-TFC247DT-V01

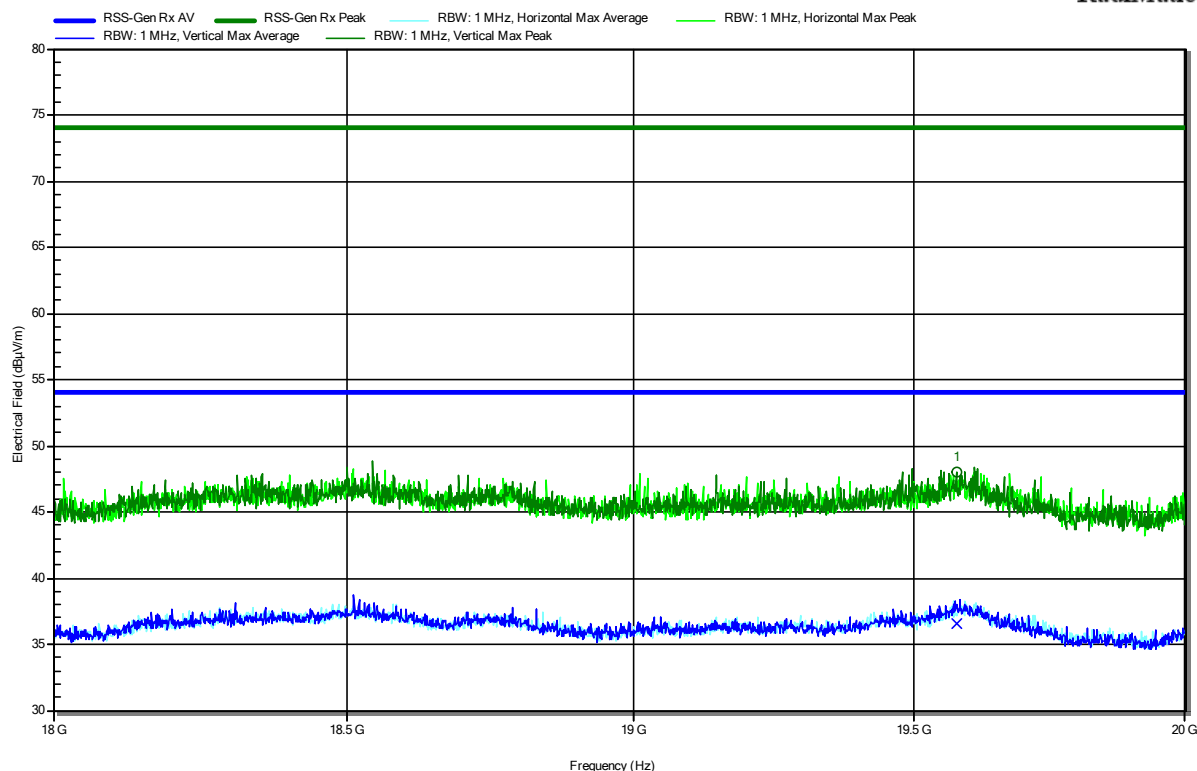
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Radiated Spurious Emissions according to RSS-247, RSS-Gen, Issue 5

Project Number: G0M-2211-1783
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KW2220
 Test Sample ID: 43140
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Qawasmeh
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 21 °Celsius, Vnom: 3.6 VDC
 Antenna: Amplifier Research AT4560
 Measurement distance: 3 m
 Mode: Rx; SRD 915 MHz, 2-FSK, helix antenna
 Test Date: 2023-02-21
 Note:

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RadiMation



Frequency 19.578 GHz	Peak 48.03 dBµV/m	Peak Limit 74 dBµV/m	Peak Difference -25.97 dB	Peak Status Pass	Polarization Vertical
Frequency 19.578 GHz	Average 36.59 dBµV/m	Average Limit 53.98 dBµV/m	Average Difference -17.39 dB	Average Status Pass	Polarization Vertical

== = END OF TEST REPORT == =

Test Report No.: G0M-2211-1783-TFC247DT-V01

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