

RADIO REPORT FCC 47 CFR Part 90I ISED Canada RSS-119 Issue 12	
Report Reference No	G0M-2311-2314-TFC090PMR-V02
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	Kamstrup A/S
Address	Industrivej 28 8660 Skanderborg DENMARK
Test Specification	47 CFR Part 90I ISED RSS-119, Issue 12: 2015-05
Non-Standard Test Method	None
Equipment under Test (EUT):	
Product Description	Ultrasonic water meter
Model(s)	KWM4220
Additional Model(s)	None
Brand Name(s)	Kamstrup
Hardware Version(s)	Type number: 02E02G1FR8UB Assembly: 6202-006-06 RF PCB BOM: 55502066, rev. C4 Flow PCB BOM: 55502116, rev. B3
Software Version(s)	RF: 50981789 rev. C Meter: 50981812 rev. E Flow: 50981829 rev. A
FCC-ID	OUI-KWM4220
IC	22376-KWM4220
Test Result	PASSED

Test Report No.: G0M-2311-2314-TFC090PMR-V02

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

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 – 23 °C	
Test Lab Humidity	32 % – 38 %	
Date of receipt of test item	2024-01-09	
Report:		
Compiled by	Md Abu Bakar Siddique	
Tested by (+ signature) (Responsible for Test)	Md Abu Bakar Siddique	
Approved by (+ signature) (Test Lab Engineer)	Wilfried Treffke	
Date of Issue	2024-06-25	
Total number of pages	51	
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:		
None		

VERSION HISTORY

Version History			
Version	Issue Date	Remarks	Revised By
01	2024-05-06	Initial Release	--
02	2024-06-25	Replaced document: G0M-2311-2314-TFC090PMR-V01 Replaced by: G0M-2311-2314-TFC090PMR-V02 Changes: Update results	St. Liebich

ADDITIONAL VARIANTS

Additional Variants (not tested and not evaluated variants)		
Not-tested Variant	Description	
1	Product Type Description	Ultrasonic water meter
	Model name	KWM4220
	Brand name	Kamstrup
	Hardware Version	Type number: 02E02G1FR8FM Assembly: 6202-006-06 RF PCB BOM: 55502066, rev. C4 Flow PCB BOM: 55502116, rev. B3
	Software Version	RF: 50981789 rev. C Meter: 50981812 rev. E Flow: 50981829 rev. A
	PMN	KWM4220
	HVIN	02E02G1FR8FM
	FVIN	50981336
	HMN	N/A
2	Product Type Description	Ultrasonic water meter
	Model name	KWM4220
	Brand name	Kamstrup
	Hardware Version	Type number: 02E02G1GA8UB Assembly: 6202-006-07 RF PCB BOM: 55502066, rev. C4 Flow PCB BOM: 55502116, rev. B3
	Software Version	RF: 50981789 rev. C Meter: 50981812 rev. E Flow: 50981829 rev. A
	PMN	KWM4220
	HVIN	02E02G1GA8UB
	FVIN	50981336
	HMN	N/A
3	Product Type Description	Ultrasonic water meter
	Model name	KWM4220
	Brand name	Kamstrup
	Hardware Version	Type number: 02E02G1GA8FM Assembly: 6202-006-07 RF PCB BOM: 55502066, rev. C4 Flow PCB BOM: 55502116, rev. B3
	Software Version	RF: 50981789 rev. C Meter: 50981812 rev. E Flow: 50981829 rev. A
	PMN	KWM4220
	HVIN	02E02G1GA8FM
	FVIN	50981336
	HMN	N/A
4	Product Type Description	Ultrasonic water meter
	Model name	KWM4220
	Brand name	Kamstrup
	Hardware Version	Type number: 02E02G1GJ8UB Assembly: 6202-006-08

Test Report No.: G0M-2311-2314-TFC090PMR-V02

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

		RF PCB BOM: 55502066, rev. C4 Flow PCB BOM: 55502116, rev. B3
	Software Version	RF: 50981789 rev. C Meter: 50981812 rev. E Flow: 50981829 rev. A
	PMN	KWM4220
	HVIN	02E02G1GJ8UB
	FVIN	50981336
	HMN	N/A
5	Product Type Description	Ultrasonic water meter
	Model name	KWM4220
	Brand name	Kamstrup
	Hardware Version	Type number: 02E02G1GJ8FM Assembly: 6202-006-08 RF PCB BOM: 55502066, rev. C4 Flow PCB BOM: 55502116, rev. B3
	Software Version	RF: 50981789 rev. C Meter: 50981812 rev. E Flow: 50981829 rev. A
	PMN	KWM4220
	HVIN	02E02G1GJ8FM
	FVIN	50981336
	HMN	N/A
6	Product Type Description	Ultrasonic water meter
	Model name	KWM4220
	Brand name	Kamstrup
	Hardware Version	Type number: 02E02G1GS8UB Assembly: 6202-006-09 RF PCB BOM: 55502066, rev. C4 Flow PCB BOM: 55502116, rev. B3
	Software Version	RF: 50981789 rev. C Meter: 50981812 rev. E Flow: 50981829 rev. A
	PMN	KWM4220
	HVIN	02E02G1GS8UB
	FVIN	50981336
	HMN	N/A
7	Product Type Description	Ultrasonic water meter
	Model name	KWM4220
	Brand name	Kamstrup
	Hardware Version	Type number: 02E02G1GS8FM Assembly: 6202-006-09 RF PCB BOM: 55502066, rev. C4 Flow PCB BOM: 55502116, rev. B3
	Software Version	RF: 50981789 rev. C Meter: 50981812 rev. E Flow: 50981829 rev. A
	PMN	KWM4220
	HVIN	02E02G1GS8FM
	FVIN	50981336
	HMN	N/A

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
V_{MIN}	Miminal supply voltage
V_{MAX}	Maximal supply voltage
T_{NOM}	Nominal temperature
T_{MIN}	Miminal temperature
T_{MAX}	Maximal temperature
N/A	Not Applicable

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1 Equipment (Test Item) Under Test

Description	Ultrasonic water meter		
Model	KWM4220		
Additional Model(s)	None		
Brand Name(s)	Kamstrup		
Sample Identification	EUT #	Sample-ID	Serial Number
	EUT 1 (conducted)	47280	23821457/23
	EUT 2 (radiated)	47281	10000168/22
Hardware Version(s)	Type number: 02E02G1FR8UB Assembly: 6202-006-06 RF PCB BOM: 55502066, rev. C4 Flow PCB BOM: 55502116, rev. B3		
Software Version(s)	RF: 50981789 rev. C Meter: 50981812 rev. E Flow: 50981829 rev. A		
PMN	KWM4220		
HVIN	02E02G1FR8UB		
FVIN	50981336		
HMN	N/A		
IC	OUY-KWM4220		
FCC-ID	22376-KWM4220		
Equipment type	End Product		
Radio type	Transceiver		
Radio technologies	PMR		
Assigned frequency band	450 - 470 MHz		
Operating frequency range	450.25 - 469.9875 MHz		
Channels	Low: : Frequency 450.25 MHz Mid: : Frequency 460.11875 MHz High: : Frequency 469.9875 MHz		
Modulation(s)	4GFSK, 4.8 ksps, 3.6 kHz deviation		
Emission designator	F1D		
Channel bandwidth	12.5 kHz		
Authorized bandwidth	11.25 kHz		
Channel spacing	11.25 kHz		
Number of antennas	3		
Antenna 1	Type	external, helix antenna	
	Model	30261216 B1	
	Manufacturer	Kamstrup A/S	
	Gain	-2 dBi	
Antenna 2	Type	external, wall antenna 2 meters cable length	
	Model	6699490	
	Manufacturer	Kamstrup A/S	
	Gain	1 dBi	
Antenna 3	Type	external, pit antenna 0.6 meters cable length	
	Model	6697916	
	Manufacturer	Kamstrup A/S	
	Gain	-9 dBi	

Supply Voltage	V _{NOM}	3.66 V
Operating Temperature	T _{NOM}	25 °C
Battery supply	Yes	
AC/DC-Adaptor	None	
Manufacturer	Kamstrup A/S Industrivej 28 8660 Skanderborg DENMARK	

1.3 Support Equipment

Product Type	Device	Manufacturer	Model	Comment
AE	Laboratory power supply	Statron	2224.7	The EUT battery does not last to perform the tests. Therefore an external power supply was necessary.
AE	Optical readout head	Kamstrup	6699-099	For Programming the EUT
CBL	Auxillary cable	-	-	To connect EUT and power supply.
SFT	Device Control Tool	Kamstrup	ver. 0.15	Tool for controlling RF modules and meters
Description:				
AE	Auxiliary Equipment			
SIM	Simulator			
CBL	Connecting Cable			
SFT	Software			
Comment: --				

1.4 Test Modes

Mode	Description
Unmodulated CW	Mode = Transmit Modulation = None
Receive	Mode = Receive

1.5 Test Frequencies

Designator	Mode	Frequency [MHz]
F1	Tx / Rx	450.25
F2	Tx / Rx	460.11875
F3	Tx / Rx	469.9875

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 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:

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

Net:

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

Limit:

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 = 47.5 dBμV/m	:	47.5 dBμV/m	- 57.0 dBμV/m	= -9.5 dB

Radiated power:

$$\text{EIRP (dBm)} = \text{E (dB}\mu\text{V/m)} + 20\log(\text{D}) - 104.8 \quad (\text{D is the measurement distance in m})$$

$$\text{ERP (dBm)} = \text{EIRP (dBm)} - 2.15$$

2 Result Summary

Test Summary				
Product Standard Reference	Requirement	Reference Method	Result	Remarks
FCC 90.205 FCC 2.1046 RSS-119 5.4	Power	ANSI C63.26:2015 5.2	N/T	Note 1
FCC 90.209 FCC 90.210 FCC 2.1049 RSS-119 4.2,5.5,5.8	Authorized bandwidth Emission masks Occupied bandwidth	FCC 90.210 ANSI C63.26:2015 5.4	N/T	Note 1
FCC 90.210 FCC 2.1051 RSS-119 4.2,6.13	Spurious emissions at antenna terminal	FCC 90.210 ANSI C63.26:2015 5.7	N/T	Note 1
FCC 90.210 FCC 2.1053 RSS-119 4.2,6.13	Spurious emissions radiated	FCC 90.210 ANSI C63.26:2015 5.7	PASS	--
RSS-Gen 7.1	Receiver spurious emissions	ANSI C63.26:2015 5.7	PASS	--
FCC 90.213 FCC 2.1055 RSS-119 5.3	Frequency Stability	ANSI C63.26:2015 5.6	N/T	Note 1
FCC 90.214 RSS-119 5.9	Transient Frequency behavior	ANSI C63.26:2015 6.5	N/T	Note 1
Note 1: A class II permissive change for the already existing FCC-ID: OUY-KWM4220 /IC: 22376-KWM4220				

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 - Transmitter radiated emissions

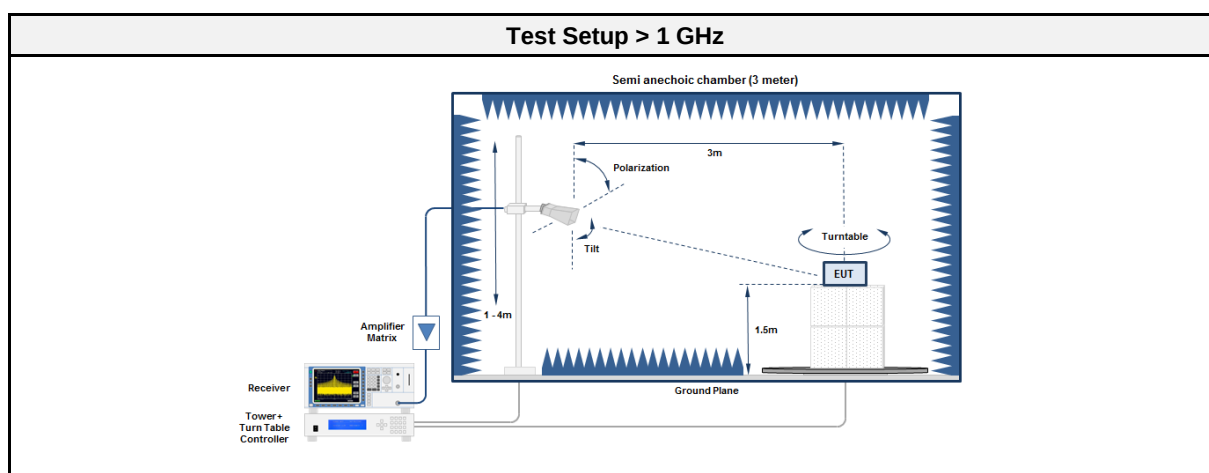
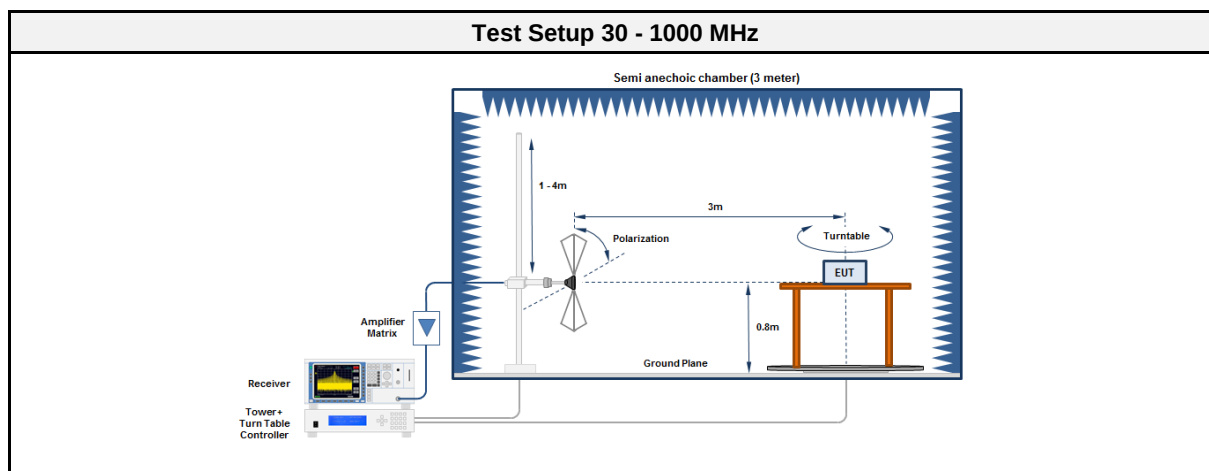
3.1.1 Information

Test Information	
Reference	FCC 90.210 FCC 2.1053 ISED RSS-119, Issue 12 (Sections 4.2,6.13)
Measurement Method	FCC 90.210 ANSI C63.26:2015 5.7
Test Method	Radiated
Test Mode	Unmodulated
Test Range	30 MHz to 10th Harmonic
Measurement Uncertainty:	± 5.7 dB
Operator	Md Abu Bakar Siddique
Date	2024-01-11

3.1.2 Limits

Limits
-20 dBm

3.1.3 Setup



Test Report No.: G0M-2311-2314-TFC090PMR-V02

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

3.1.4 Equipment

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

Test Equipment 30 - 1000 MHz					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Anechoic Chamber	Frankonia	AC1	EF00062	2022-11	2025-11
Measurement Receiver	R&S	ESU8	EF00379	2023-08	2024-08
Antenna	Schwarzbeck	VULB 9168	EF01824	2022-10	2025-10

Test Equipment > 1 GHz					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Anechoic Chamber	Frankonia	AC2	EF01616	2023-12	2024-22
Spectrum analyzer	R&S	FSW43	EF00896	2023-08	2024-08
Antenna	Schwarzbeck	BBHA 9120B	EF01678	2021-03	2024-03
Antenna	Schwarzbeck	HWRD 650	EF01679	2021-03	2024-03

3.1.5 Procedure

Test Procedure 30 - 1000 MHz	
1. EUT is placed on a non conducting support at the center of a turn table 0.8 m above the ground 2. EUT 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	

Test Procedure > 1 GHz	
1. EUT is placed on a non conducting support at the center of a turn table 1.5 m above the ground 2. EUT 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	

3.1.6 Results

Test Results – 50 ohms load						
Channel [MHz]	Emission [MHz]	Level [dBm]	Det.	Pol.	Limit [dBm]	Margin [dB]
450.25	2251	-45.30	pk	ver	-20.00	-25.27
450.25	2701	-52.40	pk	ver	-20.00	-32.41
450.25	3602	-51.60	pk	ver	-20.00	-31.55
460.11875	2301	-46.40	pk	ver	-20.00	-26.36
460.11875	2761	-53.30	pk	ver	-20.00	-33.33
460.11875	3681	-51.70	pk	ver	-20.00	-31.65
469.9875	2350	-48.70	pk	ver	-20.00	-28.68
469.9875	3760	-50.20	pk	ver	-20.00	-30.15

3.2 Test Conditions and Results - Receiver spurious emissions

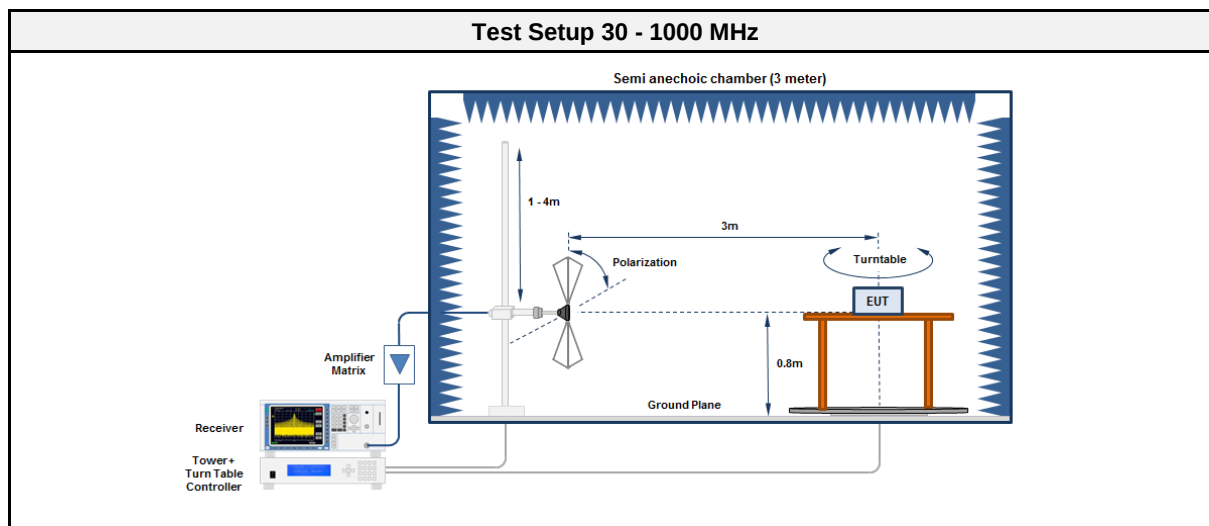
3.2.1 Information

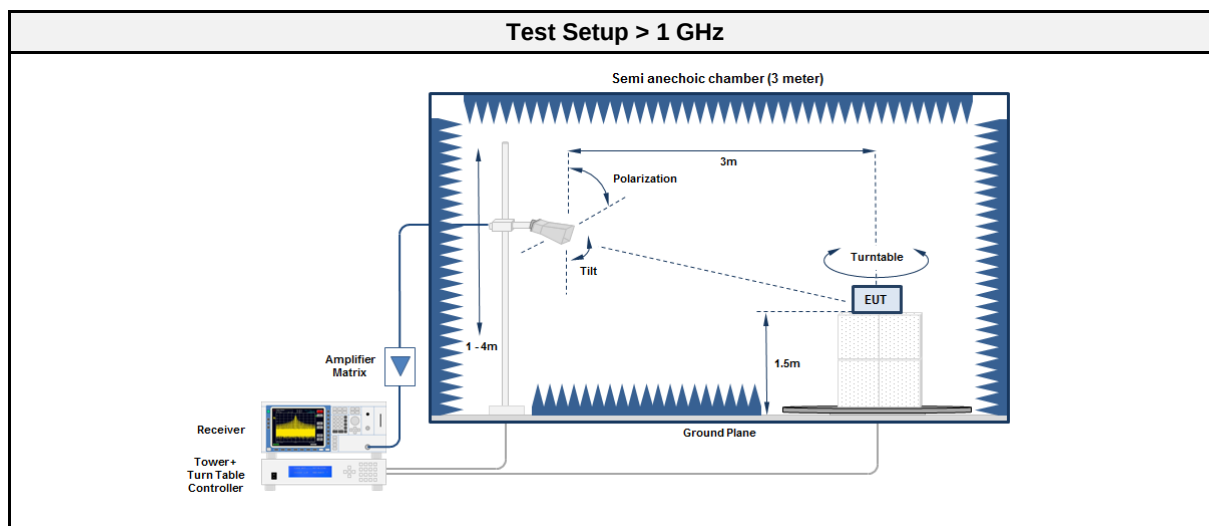
Test Information	
Reference	ISED RSS-Gen, Issue 5 (Sections 7.1)
Measurement Method	ANSI C63.26:2015 5.7
Test Method	Radiated
Test Mode	Receive
Test Range	30 MHz to 5th Harmonic
Measurement Uncertainty:	± 5.3 dB
Operator	Md Abu Bakar Siddique
Date	2024-01-11

3.2.2 Limits

Limits			
Frequency [MHz]	Detector	Field strength [$\mu\text{V}/\text{m}$]	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

3.2.3 Setup





3.2.4 Equipment

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

Test Equipment 30 - 1000 MHz					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Anechoic Chamber	Frankonia	AC1	EF00062	2021-02	2024-02
Measurement Receiver	Agilent	N9038A-526/WXP	EF01070	2021-07	2022-07
Antenna	R&S	HK 116	EF00030	2021-05	2024-05
Antenna	R&S	HL 223	EF00187	2019-05	2022-05

Test Equipment > 1 GHz					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Anechoic Chamber	Frankonia	AC1	EF00062	2021-02	2024-02
Measurement Receiver	Agilent	N9038A-526/WXP	EF01070	2021-07	2022-07
Antenna	Schwarzbeck	BBHA 9120D	EF00018	2019-10	2022-10

3.2.5 Procedure

Test Procedure 30 - 1000 MHz	
1.	EUT is placed on a non conducting support at the center of a turn table 0.8 m above the ground
2.	EUT 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

Test Procedure > 1 GHz	
1.	EUT is placed on a non conducting support at the center of a turn table 1.5 m above the ground
2.	EUT 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

3.2.6 Results

Test Results—Helix antenna						
Channel [MHz]	Emission [MHz]	Level [dBμV/m]	Det.	Pol.	Limit [dBμV/m]	Margin [dB]
No significant spurious emission was observed						

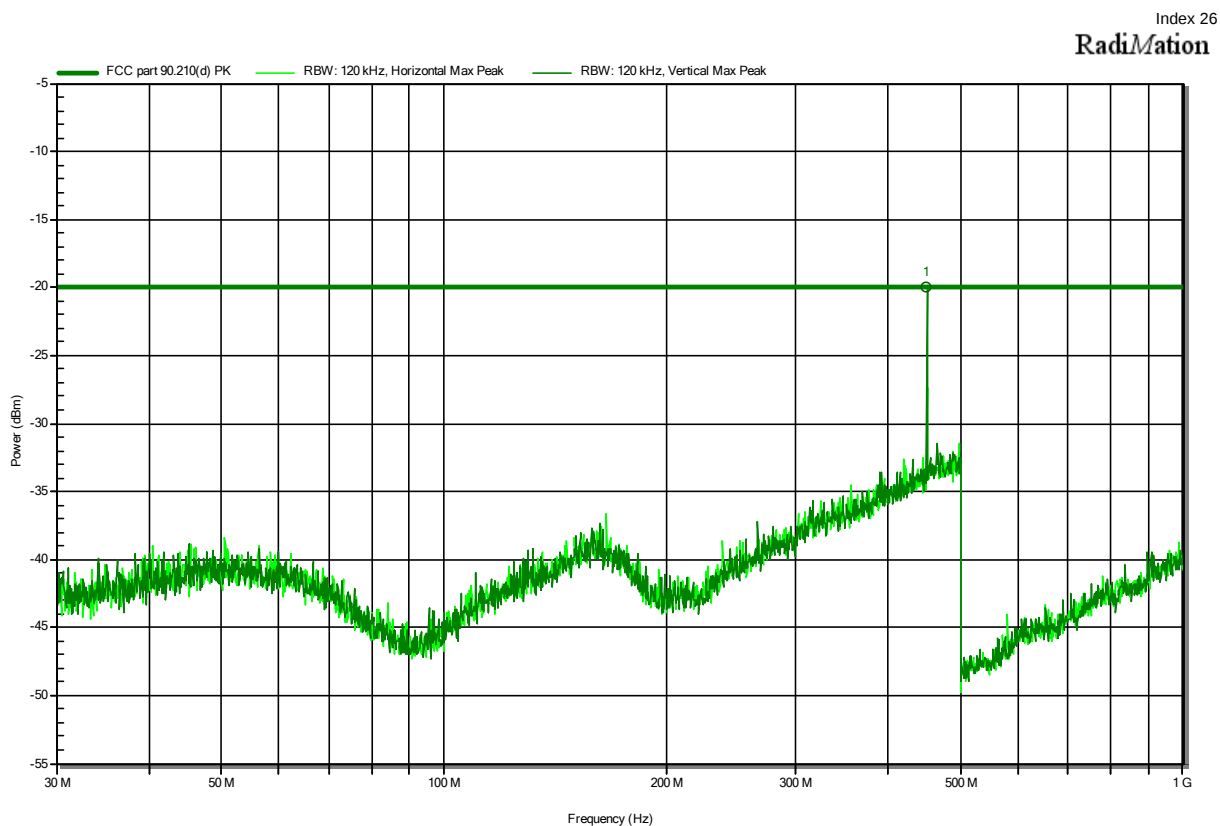
Test Results—Pit antenna						
Channel [MHz]	Emission [MHz]	Level [dBμV/m]	Det.	Pol.	Limit [dBμV/m]	Margin [dB]
No significant spurious emission was observed						

Test Results—Wall antenna						
Channel [MHz]	Emission [MHz]	Level [dBμV/m]	Det.	Pol.	Limit [dBμV/m]	Margin [dB]
No significant spurious emission was observed						

ANNEX A Transmitter spurious emissions

Radiated Spurious Emissions according to FCC 90.210, ISED RSS-119, Issue 12

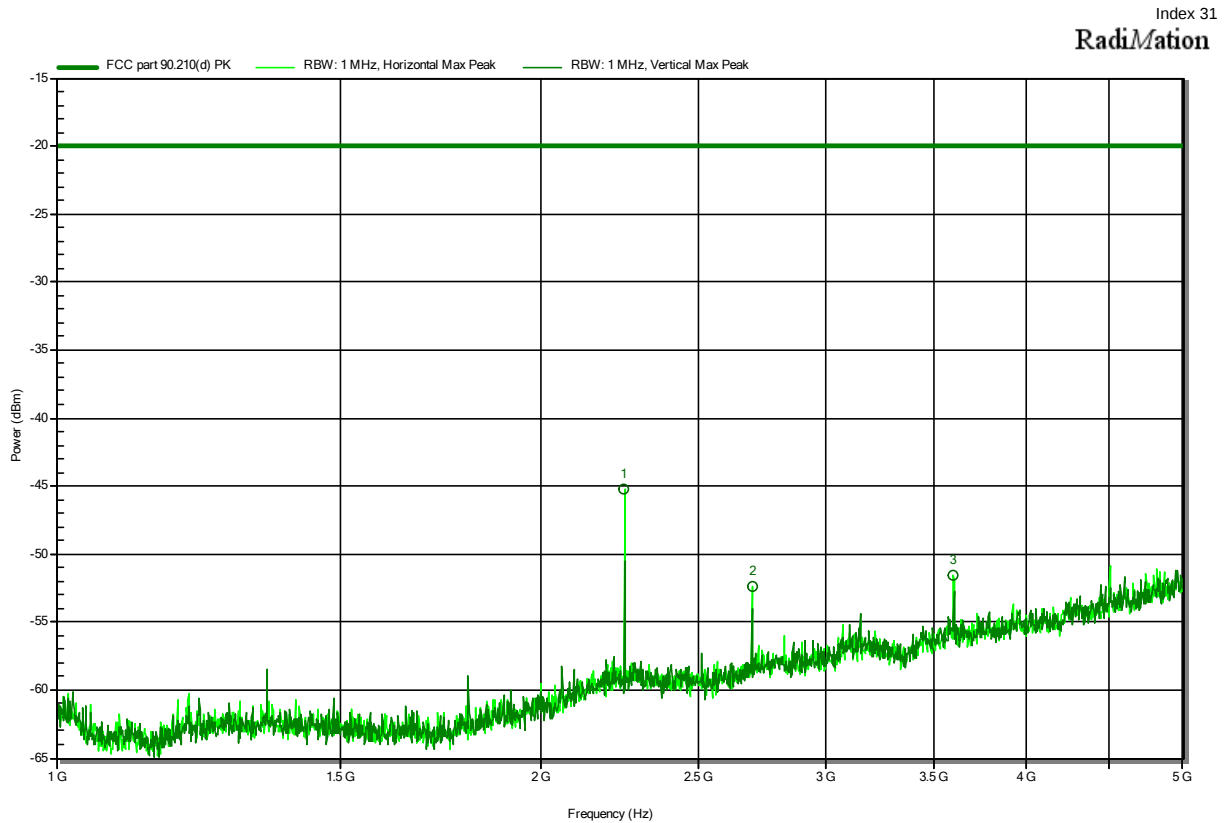
Project Number: G0M-2311-2314
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 47281
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Siddique
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.6 VDC
 Antenna: Schwarzbeck VULB 9168, Vertical
 Measurement distance: 3 m
 Mode: Tx; 50 Ohm Load, 450.25 MHz
 Test Date: 2024-01-11



Frequency	Peak	Peak Limit	Peak Difference	Peak Status
450.258 MHz	-19.9 dBm			Carrier

Radiated Spurious Emissions according to FCC 90.210, ISED RSS-119, Issue 12

Project Number: G0M-2311-2314
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 47281
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Siddique
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.6 VDC
 Antenna: Schwarzbeck BBHA 9120D, Vertical
 Measurement distance: 3 m
 Mode: Tx; 50 Ohm Load, 450.25 MHz
 Test Date: 2024-01-11



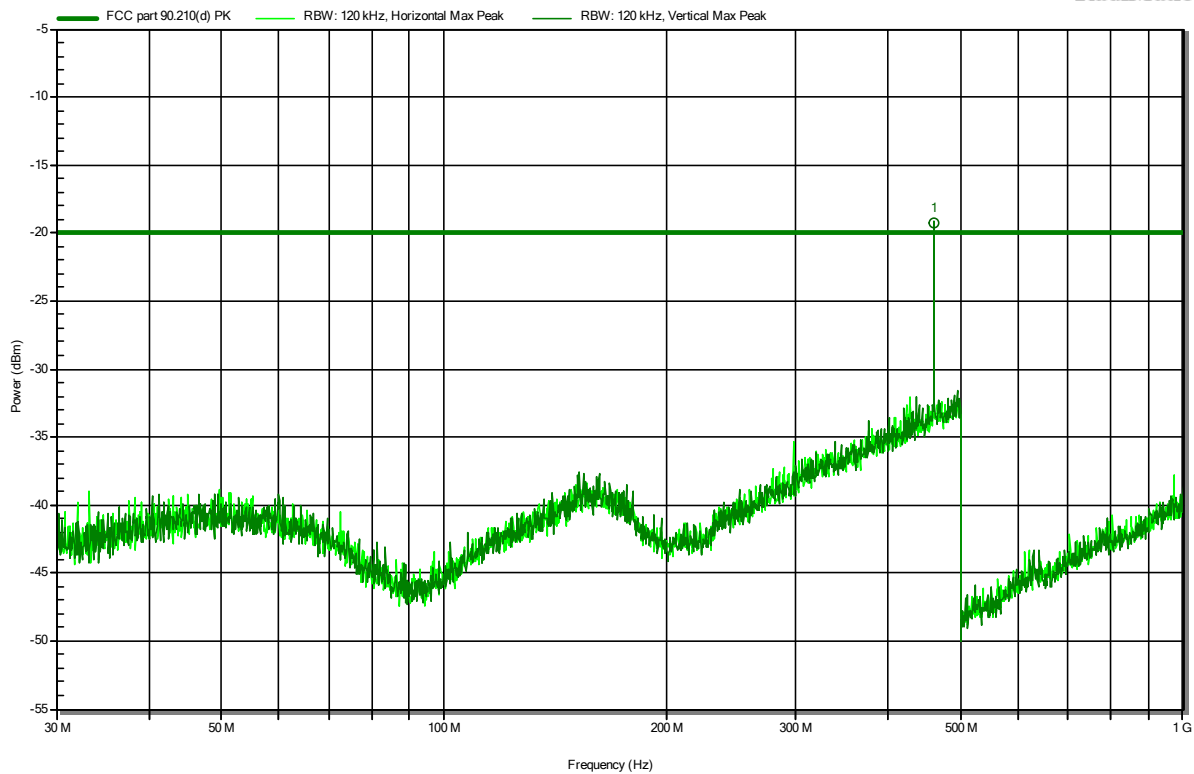
Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.251 GHz	-45.3 dBm	-20 dBm	-25.27 dB	Pass
2.701 GHz	-52.4 dBm	-20 dBm	-32.41 dB	Pass
3.602 GHz	-51.6 dBm	-20 dBm	-31.55 dB	Pass

Radiated Spurious Emissions according to FCC 90.210, ISSED RSS-119, Issue 12

Project Number: G0M-2311-2314
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 47281
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Siddique
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.6 VDC
 Antenna: Schwarzbeck VULB 9168, Vertical
 Measurement distance: 3 m
 Mode: Tx; 50 Ohm Load, 460.11875 MHz
 Test Date: 2024-01-11

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RadiMation



Frequency
460.128 MHz

Peak
-19.2 dBm

Peak Limit

Peak Difference

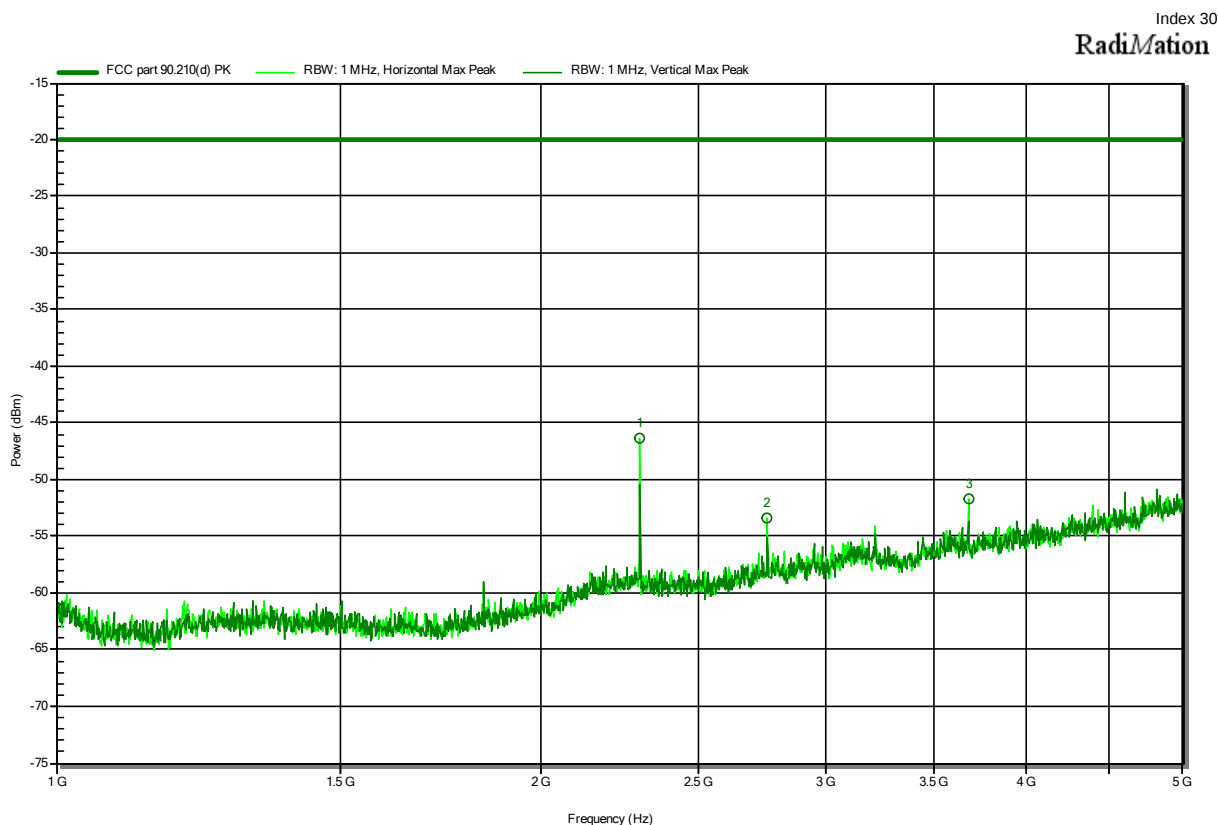
Peak Status
Carrier

Test Report No.: G0M-2311-2314-TFC090PMR-V02

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

Radiated Spurious Emissions according to FCC 90.210, ISSED RSS-119, Issue 12

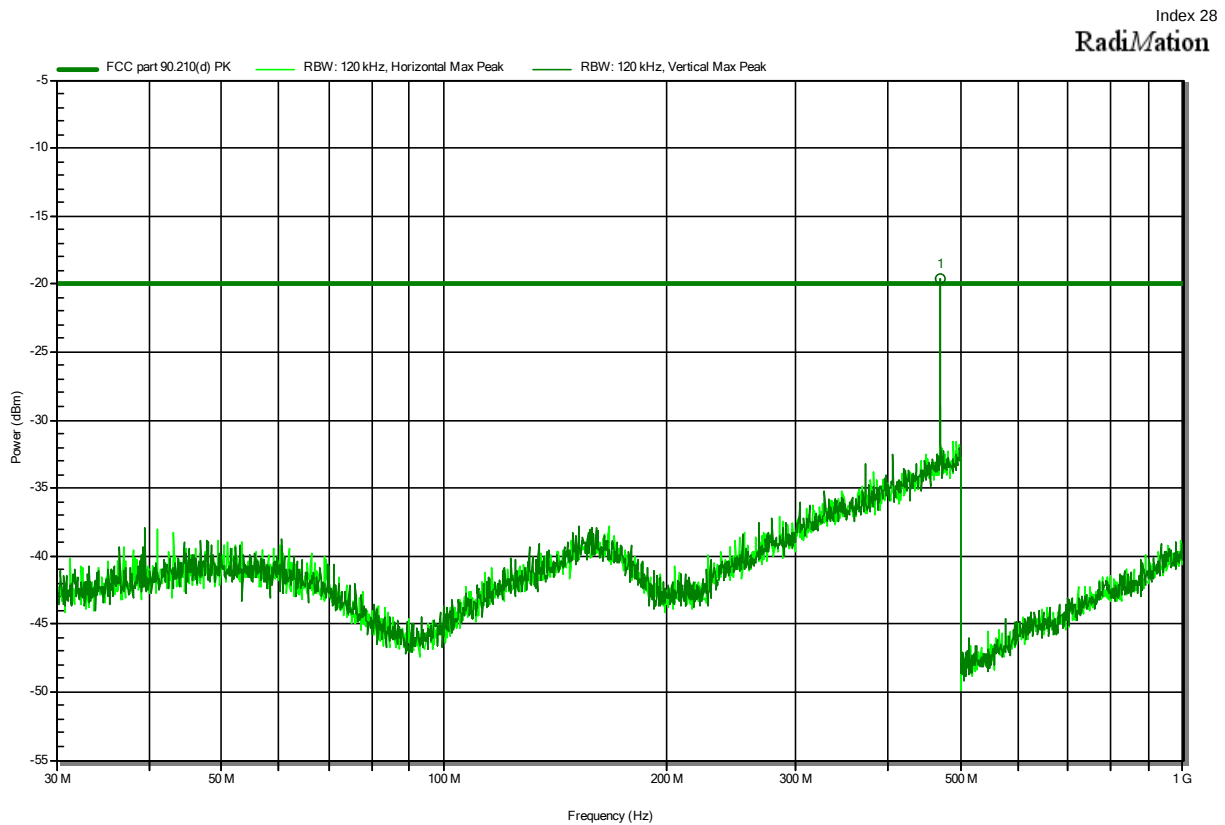
Project Number: G0M-2311-2314
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 47281
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Siddique
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.6 VDC
 Antenna: Schwarzbeck BBHA 9120D, Vertical
 Measurement distance: 3 m
 Mode: Tx; 50 Ohm Load, 460.11875 MHz
 Test Date: 2024-01-11



Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.301 GHz	-46.4 dBm	-20 dBm	-26.36 dB	Pass
2.761 GHz	-53.3 dBm	-20 dBm	-33.33 dB	Pass
3.681 GHz	-51.7 dBm	-20 dBm	-31.65 dB	Pass

Radiated Spurious Emissions according to FCC 90.210, ISSED RSS-119, Issue 12

Project Number: G0M-2311-2314
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 47281
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Siddique
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.6 VDC
 Antenna: Schwarzbeck VULB 9168, Vertical
 Measurement distance: 3 m
 Mode: Tx; 50 Ohm Load, 469.9875 MHz
 Test Date: 2024-01-11



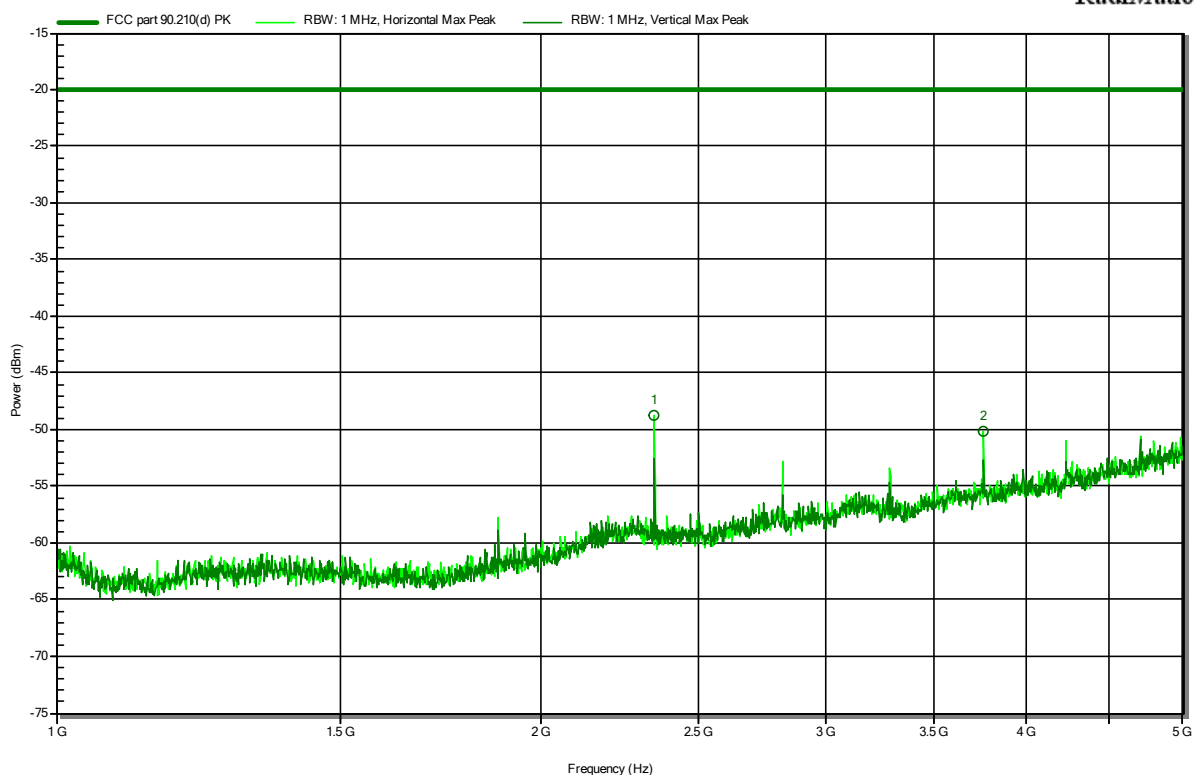
Frequency	Peak	Peak Limit	Peak Difference	Peak Status
469.998 MHz	-19.6 dBm			Carrier

Radiated Spurious Emissions according to FCC 90.210, ISSED RSS-119, Issue 12

Project Number: G0M-2311-2314
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 47281
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Siddique
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.6 VDC
 Antenna: Schwarzbeck BBHA 9120D, Vertical
 Measurement distance: 3 m
 Mode: Tx; 50 Ohm Load, 469.9875 MHz
 Test Date: 2024-01-11

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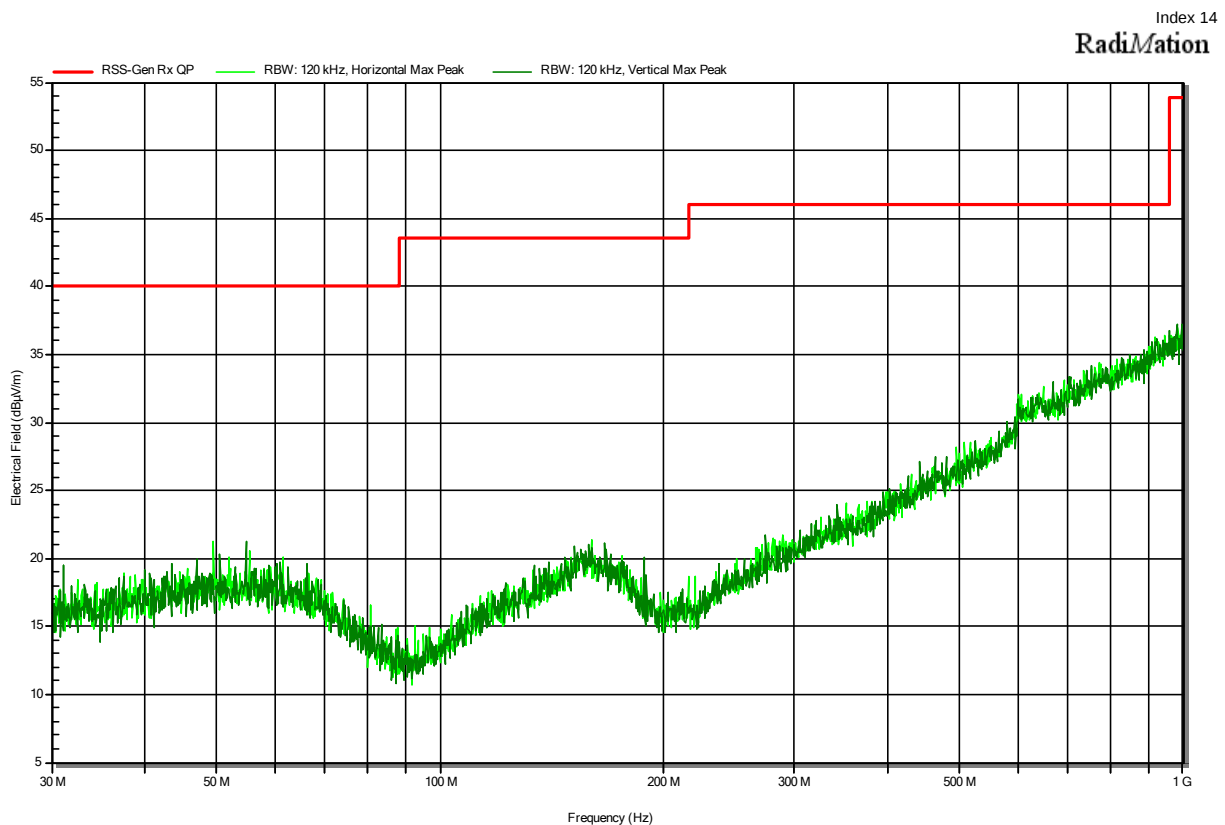


Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.35 GHz	-48.7 dBm	-20 dBm	-28.68 dB	Pass
3.76 GHz	-50.2 dBm	-20 dBm	-30.15 dB	Pass

ANNEX B Receiver spurious emissions

Radiated Spurious Emissions according to FCC 90.210, ISSED RSS-119, Issue 12

Project Number: G0M-2311-2314
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 47281
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Siddique
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.6 VDC
 Antenna: Schwarzbeck VULB 9168
 Measurement distance: 3 m
 Mode: Rx; Helix Antenna 30261216, 460.11875 MHz
 Test Date: 2024-01-11

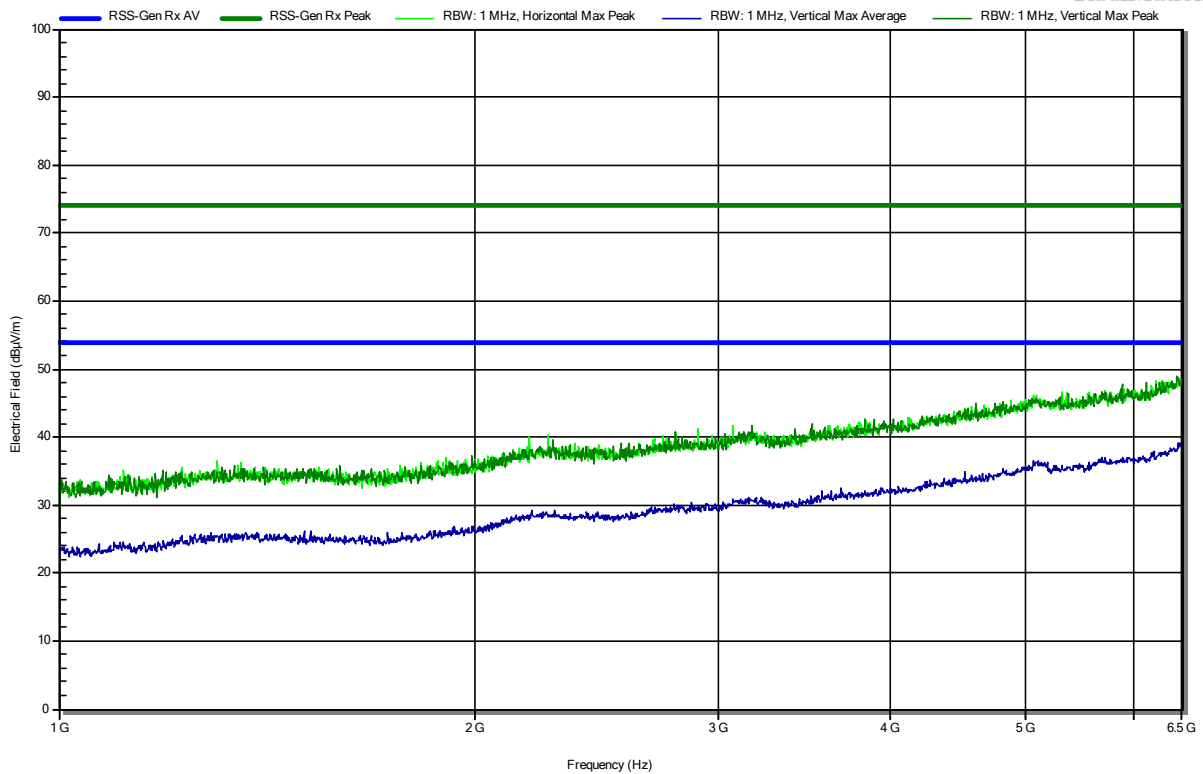


Radiated Spurious Emissions according to FCC 90.210, ISSED RSS-119, Issue 12

Project Number: G0M-2311-2314
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 47281
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Siddique
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.6 VDC
 Antenna: Schwarzbeck BBHA 9120D
 Measurement distance: 3 m
 Mode: Rx; Helix Antenna 30261216, 460.11875 MHz
 Test Date: 2024-01-11

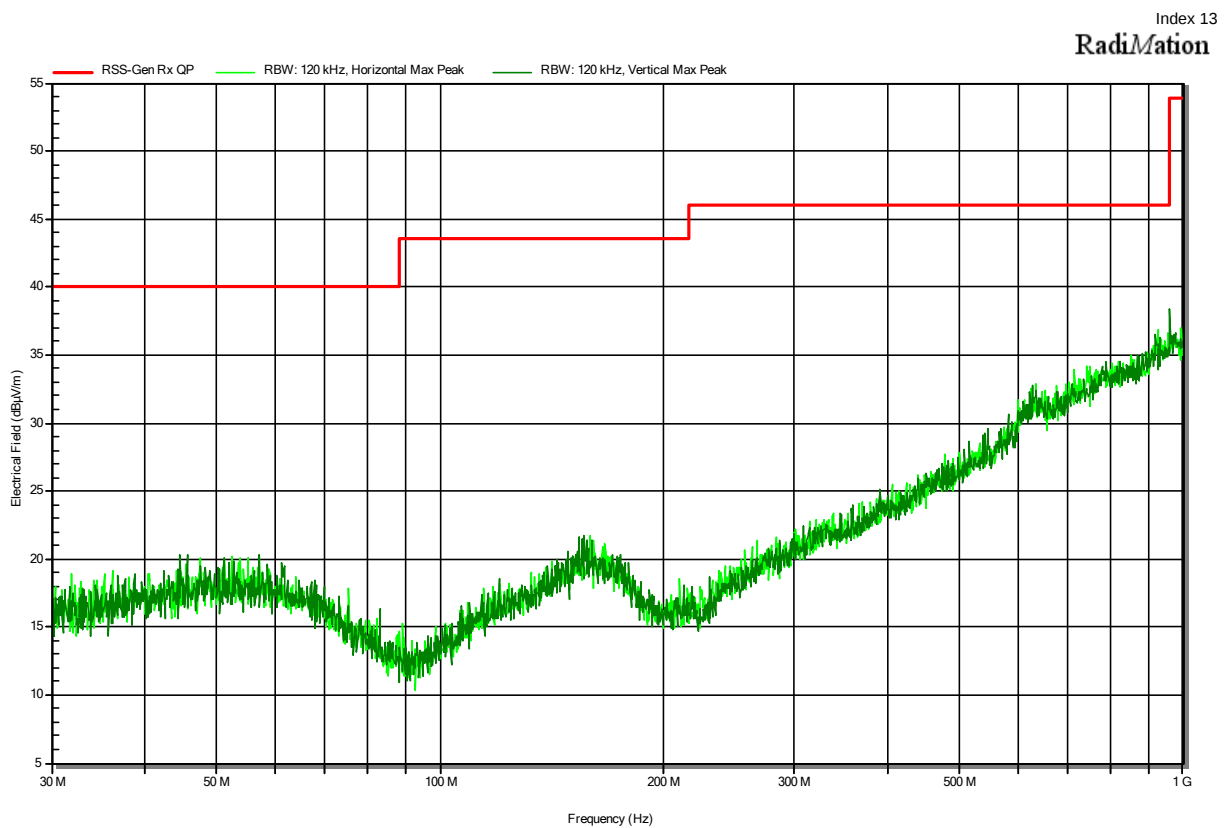
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Radiated Spurious Emissions according to FCC 90.210, ISED RSS-119, Issue 12

Project Number: G0M-2311-2314
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 47281
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Siddique
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.6 VDC
 Antenna: Schwarzbeck VULB 9168
 Measurement distance: 3 m
 Mode: Rx; Pit Antenna 6697916, 460.11875 MHz
 Test Date: 2024-01-11

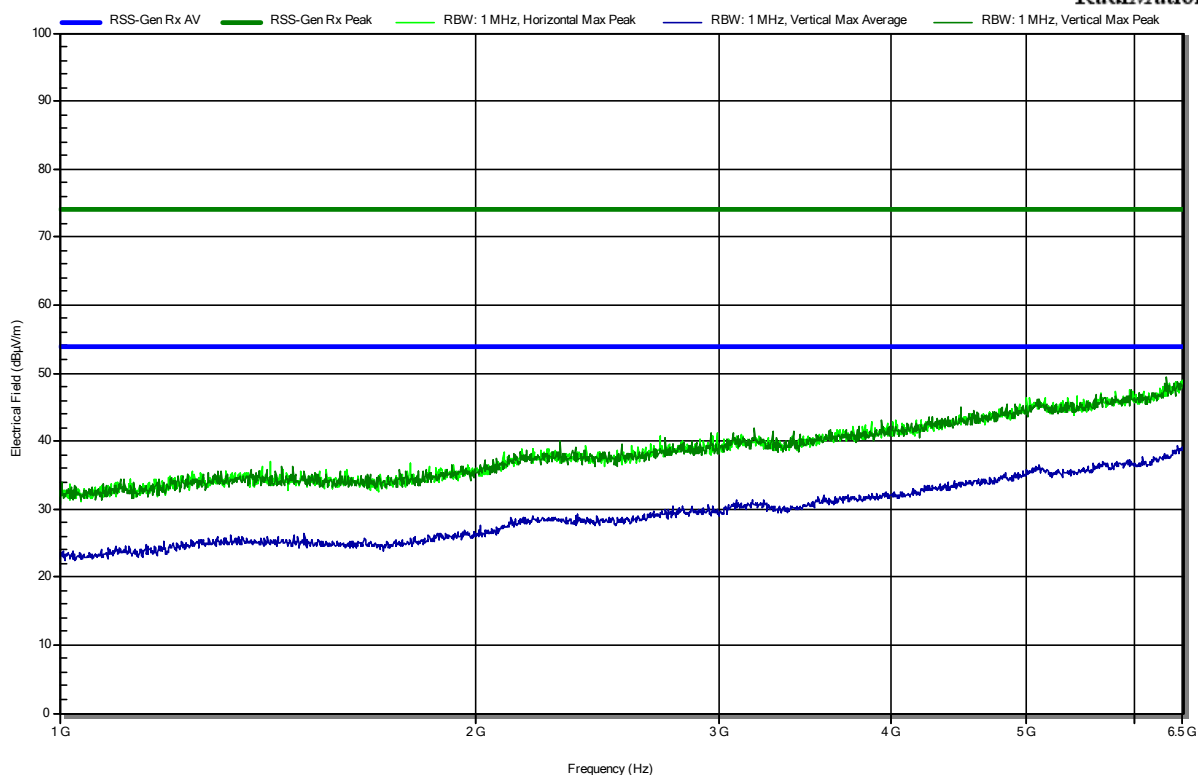


Radiated Spurious Emissions according to FCC 90.210, ISSED RSS-119, Issue 12

Project Number: G0M-2311-2314
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 47281
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Siddique
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.6 VDC
 Antenna: Schwarzbeck BBHA 9120D
 Measurement distance: 3 m
 Mode: Rx; Pit Antenna 6697916, 460.11875 MHz
 Test Date: 2024-01-11

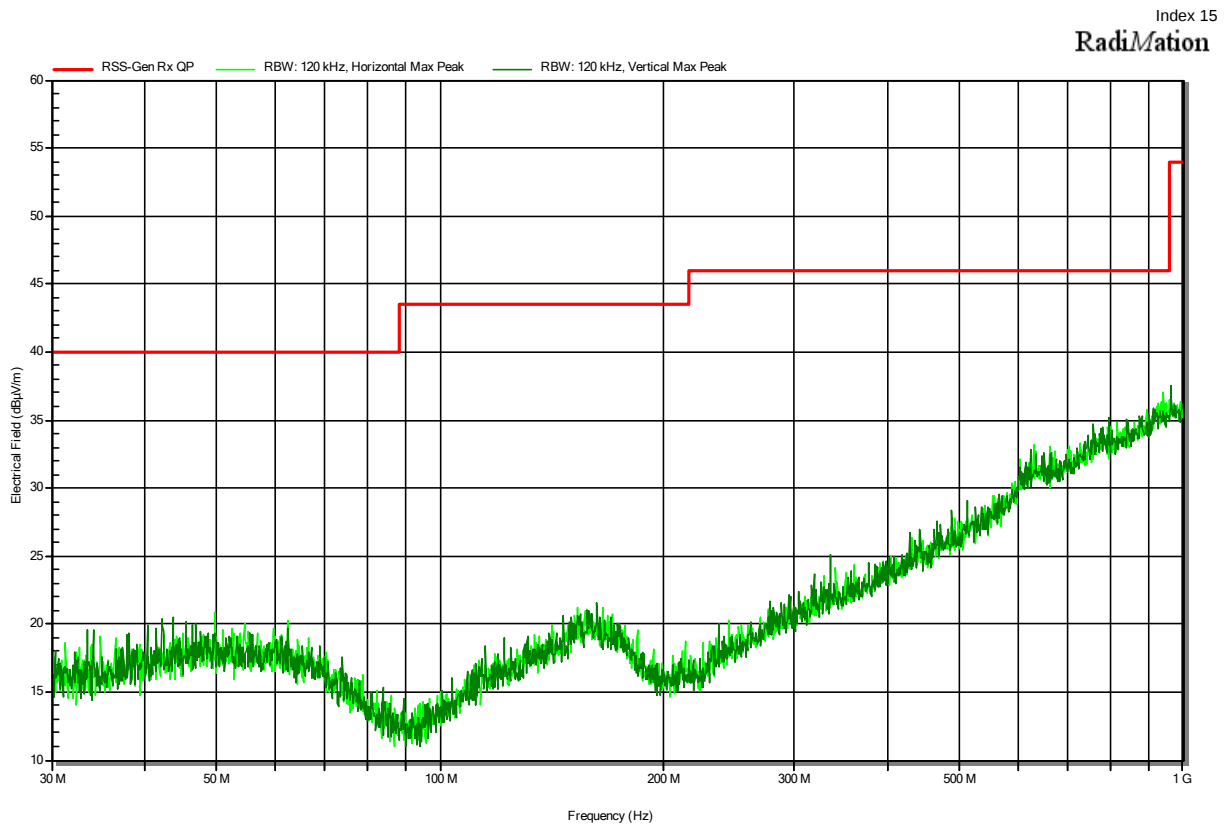
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Radiated Spurious Emissions according to FCC 90.210, ISSED RSS-119, Issue 12

Project Number: G0M-2311-2314
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 47281
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Siddique
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.6 VDC
 Antenna: Schwarzbeck VULB 9168
 Measurement distance: 3 m
 Mode: Rx; Wall Antenna 6699490, 460.11875 MHz
 Test Date: 2024-01-11

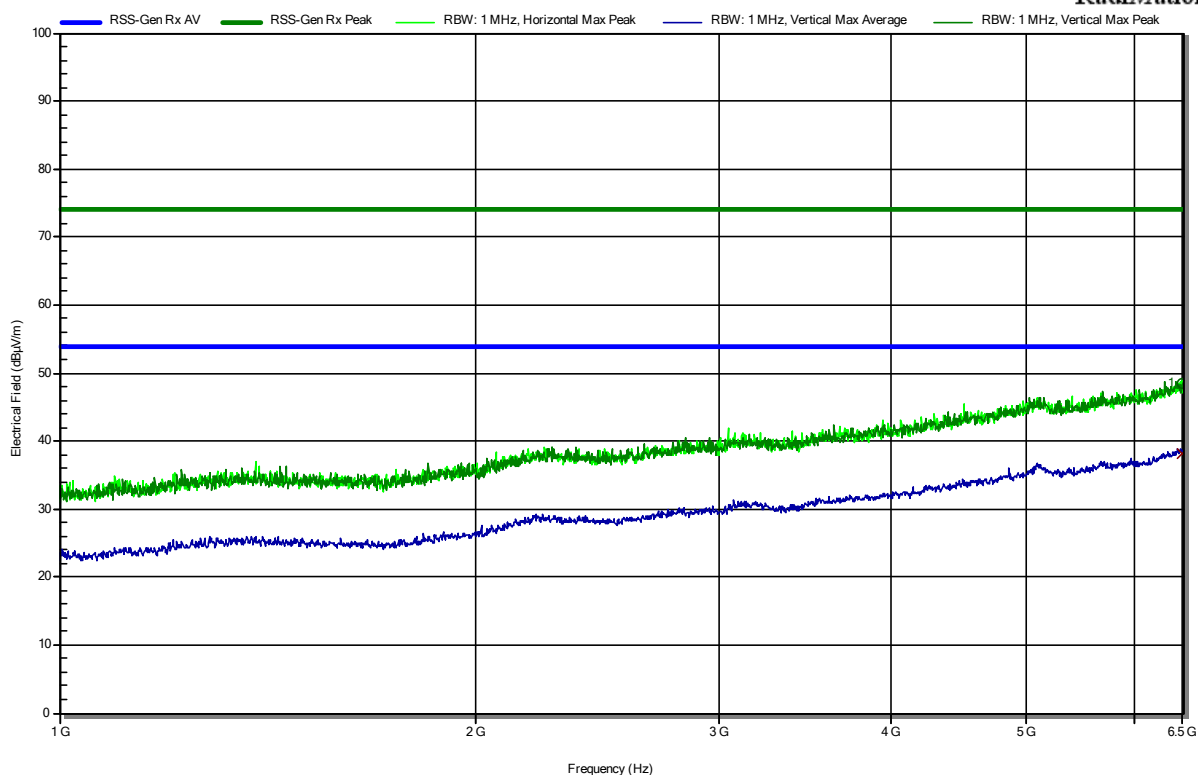


Radiated Spurious Emissions according to FCC 90.210, ISSED RSS-119, Issue 12

Project Number: G0M-2311-2314
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 47281
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Siddique
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.6 VDC
 Antenna: Schwarzbeck BBHA 9120D
 Measurement distance: 3 m
 Mode: Rx; Wall Antenna 6699490, 460.11875 MHz
 Test Date: 2024-01-11

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Frequency 6.499 GHz	Peak 48.37 dBμV/m	Peak Limit 74 dBμV/m	Peak Difference -25.63 dB	Peak Status Pass	Polarization Horizontal
Frequency 6.499 GHz	Average 38.09 dBμV/m	Average Limit 53.98 dBμV/m	Average Difference -15.89 dB	Average Status Pass	Polarization Horizontal

== = END OF TEST REPORT == =

Test Report No.: G0M-2311-2314-TFC090PMR-V02

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