

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-2201-1256-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	Industrialvej 28, Stilling 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)	KWM4220
Additional Model(s)	None
Brand Name(s)	None
Hardware Version(s)	Assembly: 6202-006-06; RF PCB BOM: 55501900, rev. C1; Flow PCB BOM: 55501931, rev. C2
Software Version(s)	RF: 50981336, rev. P1; Meter: 50981595, rev E1
FCC ID	OUY-KWM4220
IC	22376-KWM4220
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	2022-03-07	
Report:		
Compiled by	Toralf Jahn	
Tested by (+ signature) (Responsible for Test)	Toralf Jahn	
Tested by (+ signature) (Responsible for Test)	Florian Voigt	
Approved by (+ signature) (Test Lab Engineer)	Wilfried Treffke	
Date of Issue	2022-05-10	
Total number of pages	123	
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	2022-05-10	Initial Release	

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 (optional)	Kamstrup
	Hardware Version	Assembly: 6202-006-07 RF PCB BOM: 55501900, rev. C1 Flow PCB BOM: 55501931, rev. C2
	Software Version	RF: 50981336, rev. P1 Meter: 50981595, rev E1
	PMN	KWM4220
	HVIN	02E02G1GA8UB
	FVIN	50981336
	HMN	N/A
2	Product Type Description	Ultrasonic water meter
	Model name	KWM4220
	Brand name (optional)	Kamstrup
	Hardware Version	Assembly: 6202-006-08 RF PCB BOM: 55501900, rev. C1 Flow PCB BOM: 55501931, rev. C2
	Software Version	RF: 50981336, rev. P1 Meter: 50981595, rev E1
	PMN	KWM4220
	HVIN	02E02G1GJ8UB
	FVIN	50981336
	HMN	N/A
3	Product Type Description	Ultrasonic water meter
	Model name	KWM4220
	Brand name (optional)	Kamstrup
	Hardware Version	Assembly: 6202-006-09 RF PCB BOM: 55501900, rev. C1 Flow PCB BOM: 55501931, rev. C2
	Software Version	RF: 50981336, rev. P1 Meter: 50981595, rev E1
	PMN	KWM4220
	HVIN	02E02G1GS8UB
	FVIN	50981336
	HMN	N/A
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.		

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	KWM4220	
Additional Model(s)	None	
Brand Name(s)	None	
Serial Number(s)	Radiated Sample: Prototype Conducted Sample: Prototype	
Test Sample Id(s)	Radiated Sample: 38836 Conducted Sample: 38837	
Hardware Version(s)	Assembly: 6202-006-06; RF PCB BOM: 55501900, rev. C1; Flow PCB BOM: 55501931, rev. C2	
Software Version(s)	RF: 50981336, rev. P1; Meter: 50981595, rev E1	
PMN	KWM4220	
HVIN	02E02G1FR8UB	
FVIN	50981336	
HMN	N/A	
FCC ID	OUY-KWM4220	
IC	22376-KWM4220	
Equipment type	End Product	
Radio type	Transceiver	
Assigned frequency bands	902.0 MHz - 928.0 MHz	
Radio technology	Digital Modulation	
Modulation	2-FSK (data rate 250ksps, deviation 208 kHz)	
Number of antenna ports	1	
Antenna 1 (Helix)	Type	External
	Model	30261216
	Manufacturer	Kamstrup
	Gain	-2.1 dBi
Antenna 2 (Wall)	Type	External
	Model	6699490
	Manufacturer	Kamstrup
	Gain	-1.6 dBi
Antenna 3 (Pit)	Type	External
	Model	6697916
	Manufacturer	Kamstrup
	Gain	1.2 dBi
Supply Voltage	V _{NOM}	3.66 VDC
Operating Temperature	T _{NOM}	25 °C
AC/DC-Adaptor	None	
Manufacturer	Kamstrup A/S Industrialvej 28, Stilling 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.
CBL	Auxillary cable			To connect EUT and power supply.
SFT	Device Control Tool	Kamstrup	ver. 0.10	Tool for controlling RF modules and meters
Description:				
AE	Auxiliary Equipment			
SIM	Simulator			
CBL	Connecting Cable			
SFT	Software			
Comment:				

1.4 Test mode duty cycle

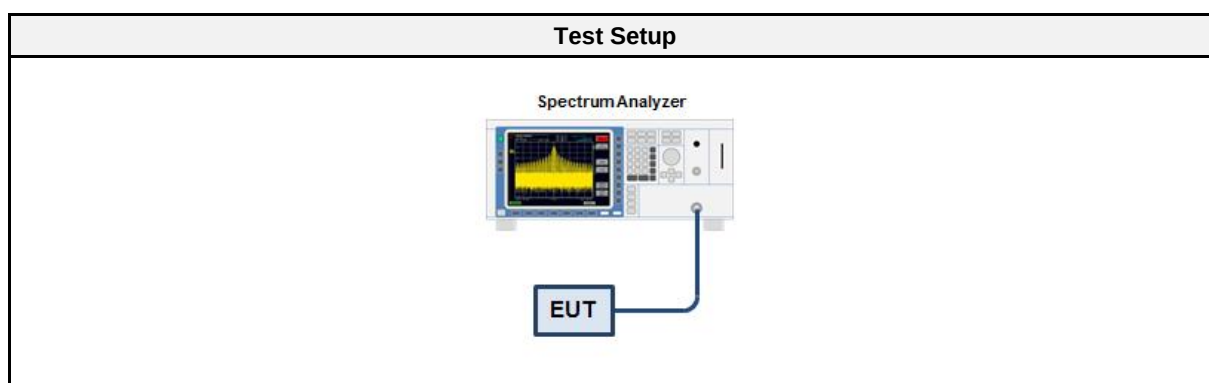
1.4.1 Information

Test Information	
Measurement Method	ANSI C63.10 11.6

1.4.2 Requirements

Requirements	
Duty cycle	Duty cycle correction
$\geq 98 \%$	No correction required
$< 98 \%$	Correction required ($10 \times \log_{10}(1/DC)$)

1.4.3 Setup



1.4.4 Equipment

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyzer	R&S	FSW 43	EF00896	2021-07	2022-07

1.4.5 Procedure

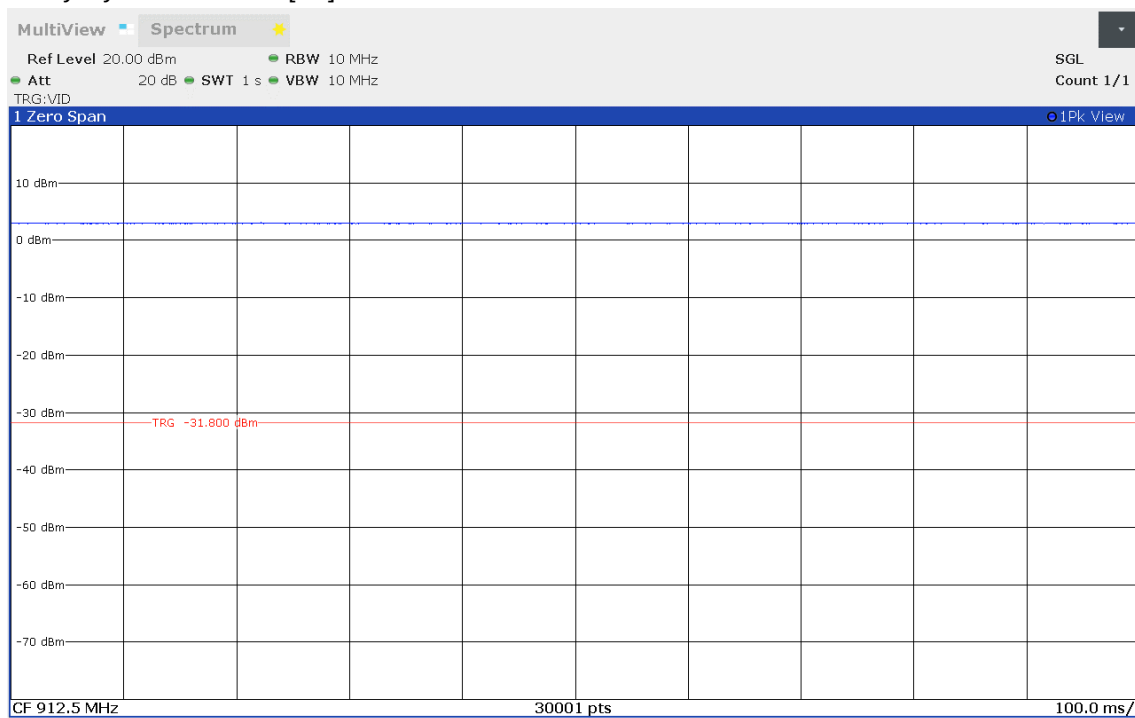
Test Procedure
1. EUT set to test mode 2. Span is set to zero span 3. Detector set to peak 4. Sweep time is set long enough to capture at least 5 bursts 5. Envelope peak value of emission spectrum is selected 6. The maximum burst duration T_{ON} is measured using two markers set to the start and the end of the longest burst 7. The minimum idle duration T_{OFF} is measured using two markers set to the start and the end of the shortest idle period 8. The duty cycle is calculated by $DC = T_{ON} / (T_{ON} + T_{OFF})$ 9. The duty cycle correction is calculated by $DC = 10 \times \log_{10}(T_{ON} / (T_{ON} + T_{OFF}))$

1.4.6 Results

Duty Cycle Results		
Mode	Duty Cycle	Correction Factor [dB]
Transmit FSK	100%	0

Duty Cycle

Project Number: G0M-2201-1256
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 38837
 Reference Standards: ANSI C63.10:2013
 Reference Method: ANSI C63.10:2013, Section 7.5
 Operating Frequency: 912.5 MHz
 Operating Conditions: Tnom/Vnom
 Operator: Toralf Jahn
 Test Site: Eurofins Product Service GmbH
 Test Date: 2022-03-28
 Duty Cycle Period [ms]: 100
 Maximum Duty Cycle: 1.00
 Maximum Duty Cycle [%]: 100
 Duty Cycle Correction [dB]: 0.00



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1.5 Test Modes

Mode	Description
Transmit CW	Mode = Transmit Modulation = CW Duty cycle = 100 %
Transmit FSK	Mode = Transmit Modulation = 2-FSK Duty cycle = 100 %
Receive	Mode = Receive
Comment:	

1.6 Test Frequencies

Designator	Mode	Channel	Frequency [MHz]
F1	Tx	1	912.5
F2	Tx	2	918.5
F3	Rx	3	915.0

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 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).

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:

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

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 dB μ V + 26 dB/m	= 47.5 dB μ V/m	:	47.5 dB μ V/m - 57.0 dB μ V/m	= -9.5 dB

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	PASS	
FCC § 15.247(b) ISED RSS-247, Issue 2 (section 5.4)	Maximum peak conducted power	ANSI C63.10-2013	PASS	
FCC § 15.247(e) ISED RSS-247, Issue 2 (section 5.2)	Power spectral density	ANSI C63.10-2013	PASS	
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	
FCC § 15.247(d) ISED RSS-247, Issue 2 (section 5.5)	Conducted spurious emissions	ANSI C63.10-2013	PASS	
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	
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 - Occupied bandwidth

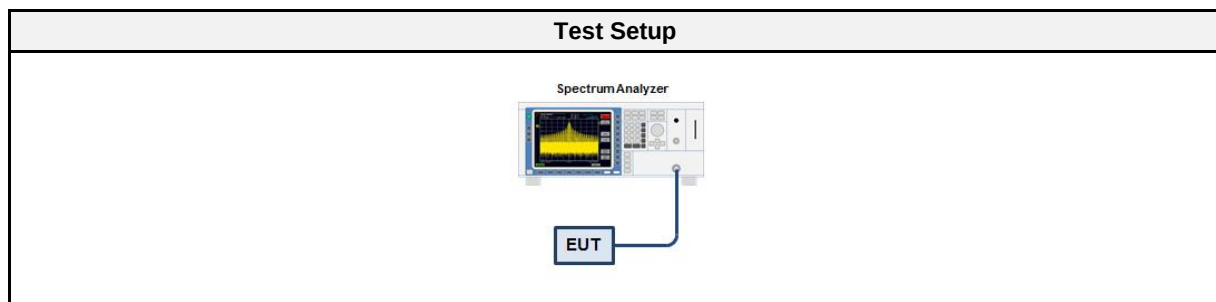
3.1.1 Information

Test Information	
Reference	ISED RSS-Gen, Issue 5 A2 (section 6.7)
Measurement Method	ANSI C63.10 6.9.3
Measurement Uncertainty	$\pm 1.26 \%$
Test Sample ID	38837
Operator	Toralf Jahn
Date	2022-03-28

3.1.2 Limits

Limits
None (Informational only)

3.1.3 Setup



3.1.4 Equipment

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyser	R&S	FSW 43	EF00896	2021-07	2022-07
Attenuator	Radiall GmbH	R416010000	EF01013	Cal before use	Cal before use
Cable	Gigalane	SMS111B	EF00779 CAAZ	2022-02	2023-02

3.1.5 Procedure

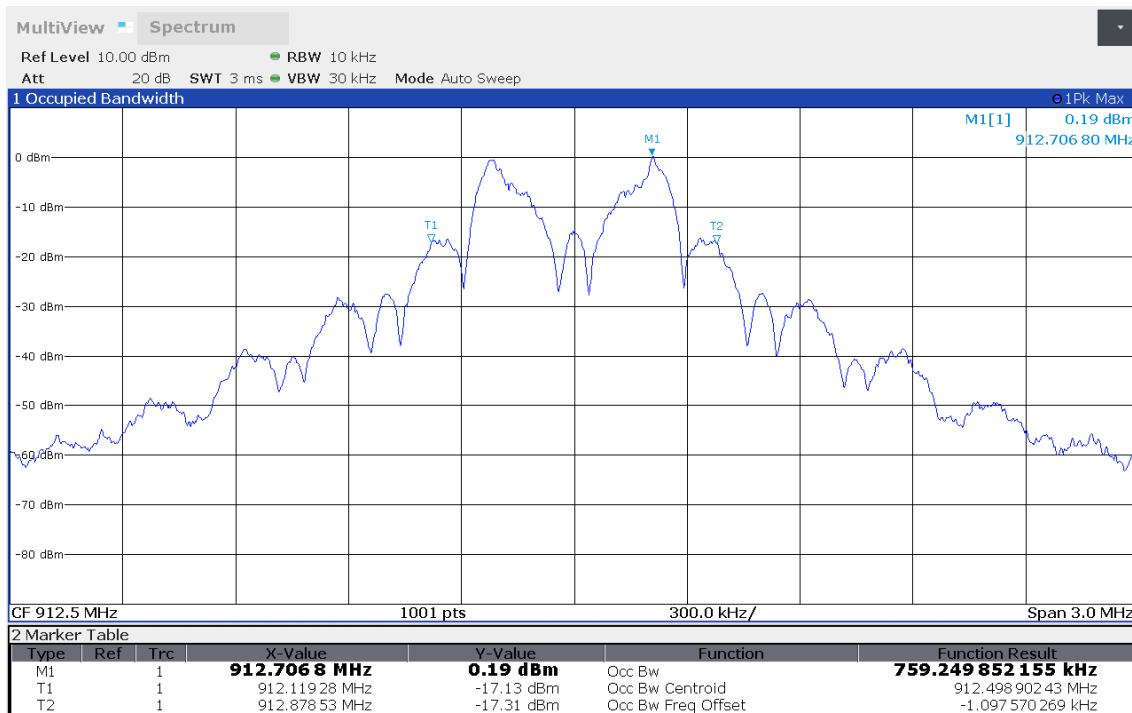
Test Procedure	
1.	EUT transmitter is activated in test mode under normal conditions
2.	The spectrum analyzer is set to peak detection and maximum hold with a span twice the emission spectrum
3.	The resolution bandwidth is set to the range of 1 % to 5 % of the occupied bandwidth
4.	The occupied bandwidth is measured with the build-in analyzer function

3.1.6 Results

Test Results		
Mode	Frequency [MHz]	Bandwidth [MHz]
Transmit FSK	912.5	0.759
Transmit FSK	918.5	0.759

Occupied Bandwidth

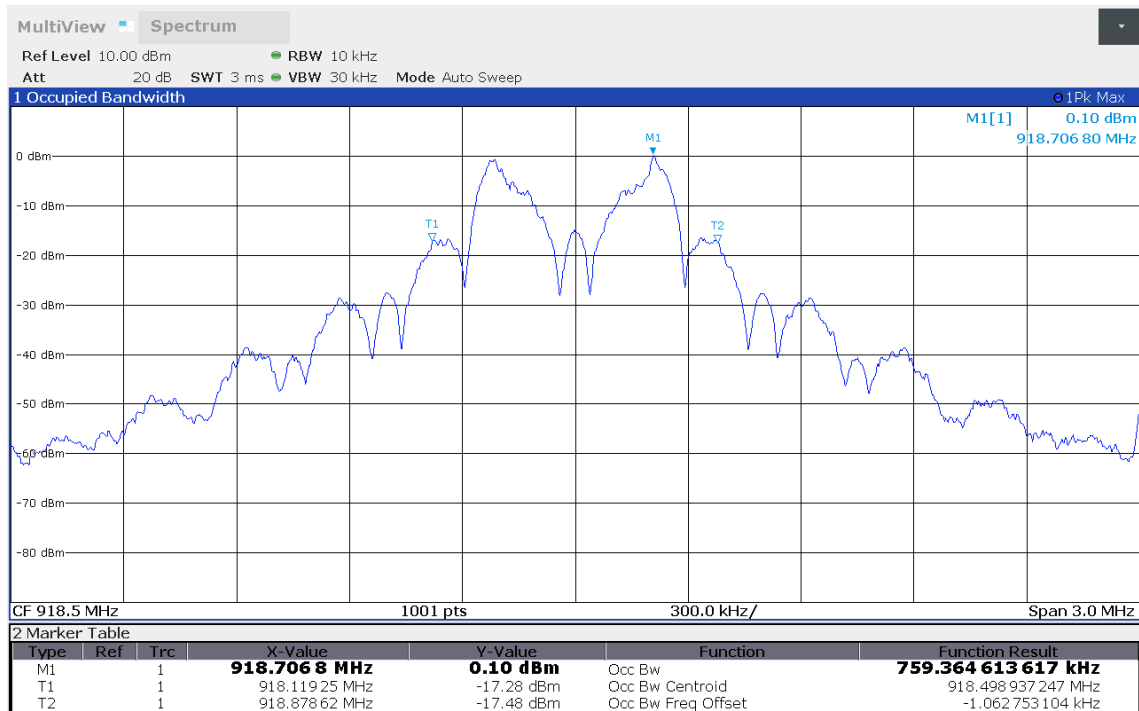
Project Number: G0M-2201-1256
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 38837
 Reference Standards: FCC 15.247, RSS-247
 Reference Method: ANSI C63.10:2013, Section 6.9.3
 Operational Mode: FSK, Channel: 912.5 MHz
 Operating Conditions: Tnom/Vnom
 Operator: Toralf Jahn
 Test Site: Eurofins Product Service GmbH
 Test Date: 2022-03-28
 Occupied Bandwidth [MHz]: 0.759



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Occupied Bandwidth

Project Number: G0M-2201-1256
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 38837
 Reference Standards: FCC 15.247, RSS-247
 Reference Method: ANSI C63.10:2013, Section 6.9.3
 Operational Mode: FSK, Channel: 918.5 MHz
 Operating Conditions: Tnom/Vnom
 Operator: Toralf Jahn
 Test Site: Eurofins Product Service GmbH
 Test Date: 2022-03-28
 Occupied Bandwidth [MHz]: 0.759



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3.2 Test Conditions and Results - 6 dB bandwidth

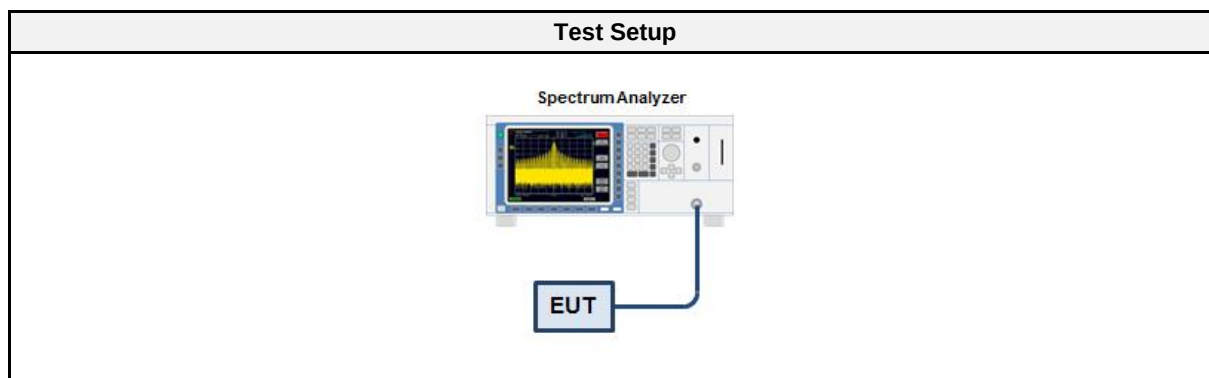
3.2.1 Information

Test Information	
Reference	FCC § 15.247(a)(2); ISED RSS-247, Issue 2 (section 5.2)
Measurement Method	ANSI C63.10 11.8
Measurement Uncertainty	± 1.26 %
Operator	Toralf Jahn
Date	2022-03-28

3.2.2 Limits

Limits
≥ 500kHz

3.2.3 Setup



3.2.4 Equipment

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyser	R&S	FSW 43	EF00896	2021-07	2022-07
Attenuator	Radiall GmbH	R416010000	EF01013	Cal before use	Cal before use
Cable	Gigalane	SMS111B	EF00779 CAAZ	2022-02	2023-02

3.2.5 Procedure

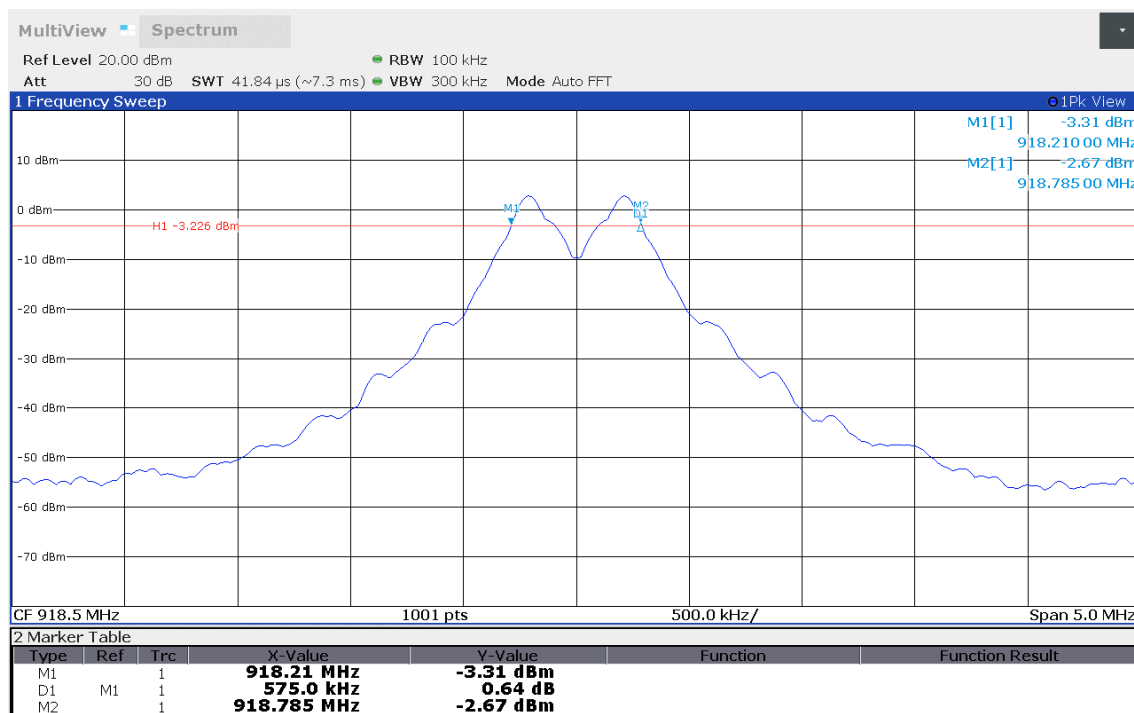
Test Procedure
1. EUT set to test mode 2. Span set to at least twice the emission spectrum 3. Detector set to peak and max hold and RBW is set to 100 kHz 4. Envelope peak value of emission spectrum is selected 5. Marker on envelope of spectrum is set to level of -6 dB to the left of the peak 6. Marker on envelope of spectrum is set to level of -6 dB to the right of the peak 7. 6 dB Bandwidth is determined by marker frequency separation

3.2.6 Results

Test Results				
Mode	Frequency [MHz]	Bandwidth [kHz]	Limit [kHz]	Verdict
Transmit FSK	912.5	575	500	PASS
Transmit FSK	918.5	575	500	PASS

DTS (6 dB) Bandwidth

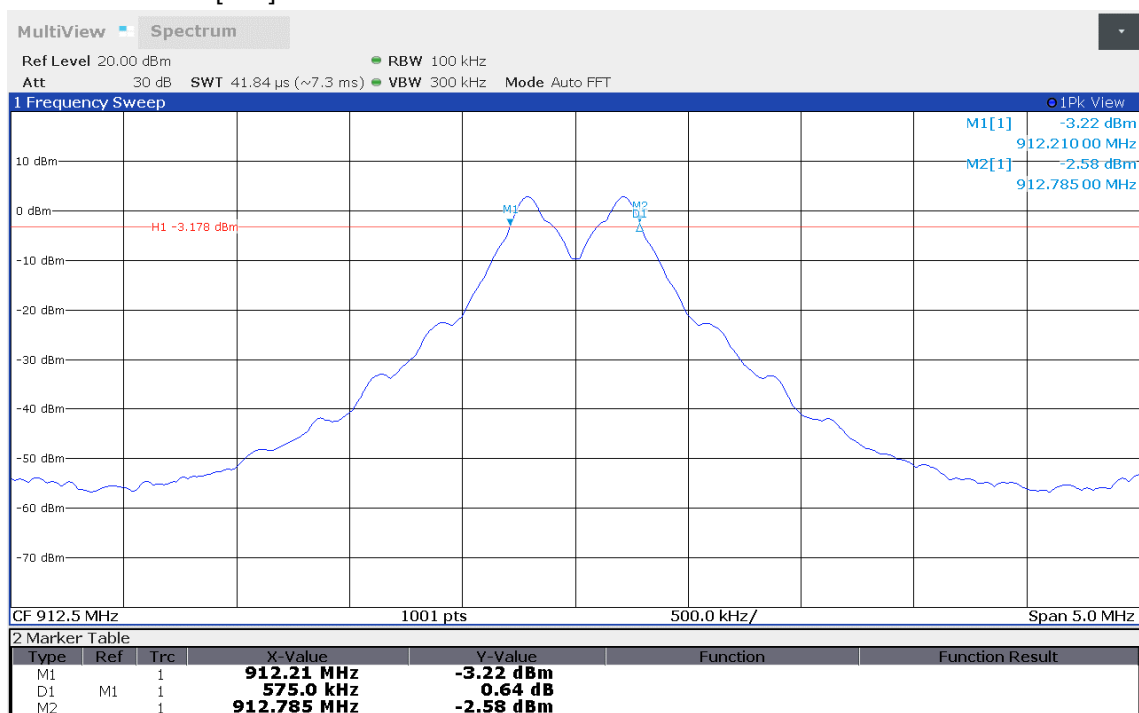
Project Number: G0M-2201-1256
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 38837
 Reference Standards: FCC 15.247, RSS-247
 Reference Method: ANSI C63.10:2013, Section 11.8.1 Option 1
 Operational Mode: FSK, Channel: 918.5 MHz
 Operating Conditions: Tnom/Vnom
 Operator: Toralf Jahn
 Test Site: Eurofins Product Service GmbH
 Test Date: 2022-03-28
 Lower Frequency [MHz]: 918.210
 Upper Frequency [MHz]: 918.785
 6 dB Bandwidth [kHz]: 575



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DTS (6 dB) Bandwidth

Project Number: G0M-2201-1256
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 38837
 Reference Standards: FCC 15.247, RSS-247
 Reference Method: ANSI C63.10:2013, Section 11.8.1 Option 1
 Operational Mode: FSK, Channel: 912.5 MHz
 Operating Conditions: Tnom/Vnom
 Operator: Toralf Jahn
 Test Site: Eurofins Product Service GmbH
 Test Date: 2022-03-28
 Lower Frequency [MHz]: 912.210
 Upper Frequency [MHz]: 912.785
 6 dB Bandwidth [kHz]: 575



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3.3 Test Conditions and Results - Maximum peak conducted output power

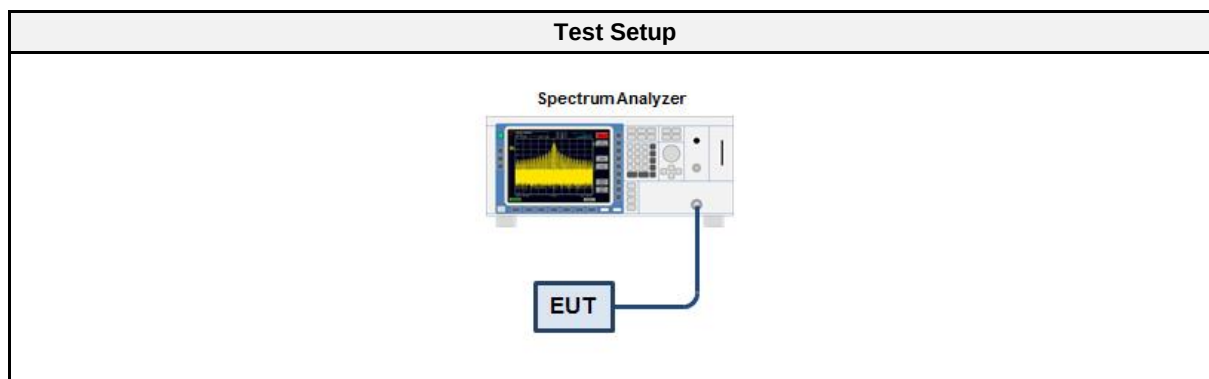
3.3.1 Information

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	2022-03-28

3.3.2 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.

3.3.3 Setup



3.3.4 Equipment

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyser	R&S	FSW 43	EF00896	2021-07	2022-07
Attenuator	Radiall GmbH	R416010000	EF01013	Cal before use	Cal before use
Cable	Gigalane	SMS111B	EF00779 CAAZ	2022-02	2023-02

3.3.5 Procedure

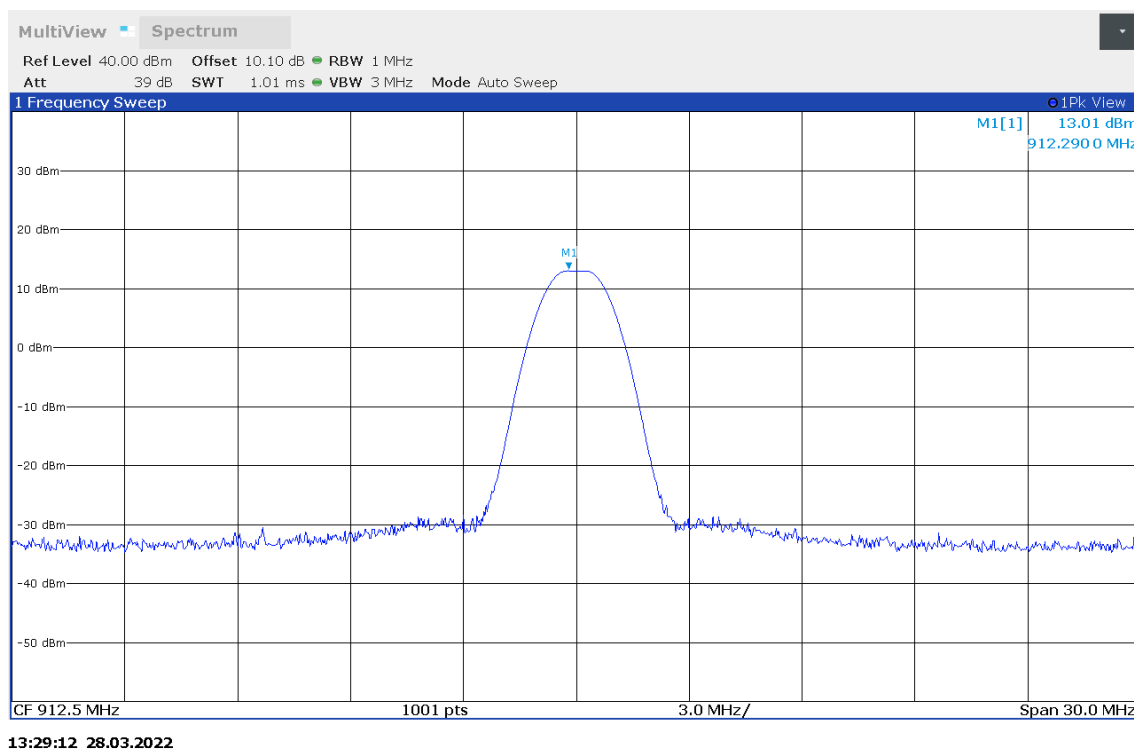
Test Procedure
1. EUT set to test mode (Communication tester is used if needed) 2. Analyzer resolution bandwidth is set $\geq$ DTS bandwidth 3. Detector set to peak and max hold 4. Sweep time is set to auto 5. After the trace has stabilized a marker is set to peak of envelope

3.3.6 Results

Test Results				
Channel [MHz]	Power [dBm]	Power [W]	Limit [W]	Verdict
912.5	13.008	0.0200	1.0	PASS
918.5	12.934	0.0197	1.0	PASS

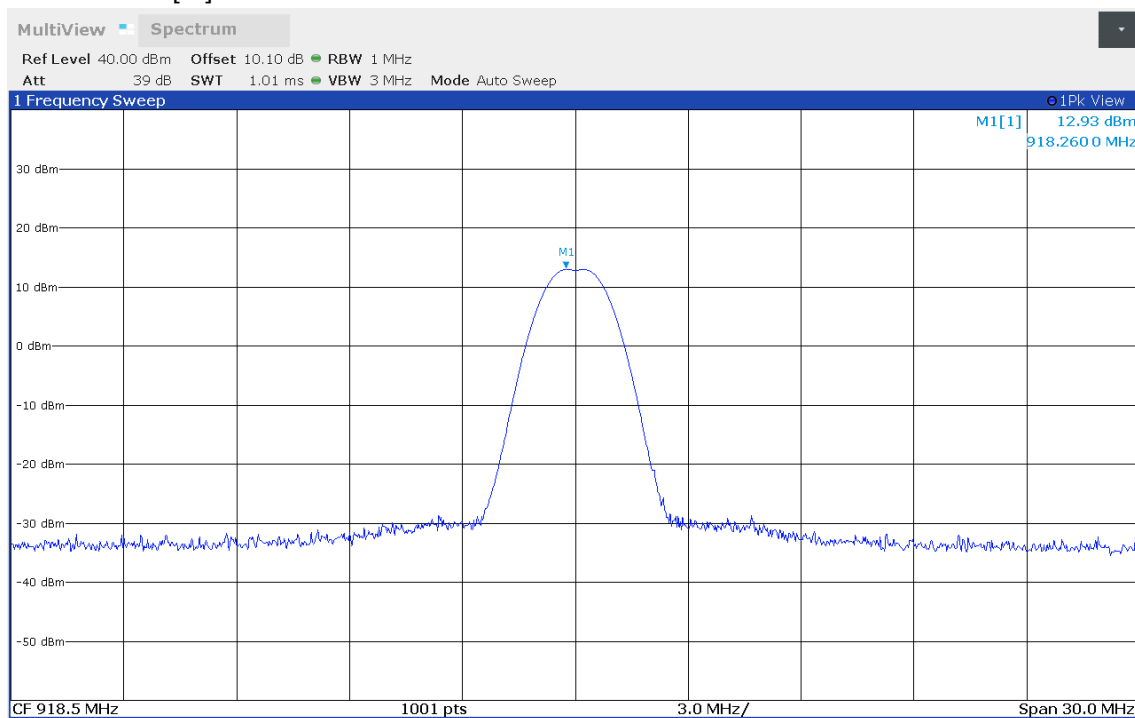
Peak Conducted Output Power

Project Number:	G0M-2201-1256
Applicant:	Kamstrup A/S
Model Description:	Ultrasonic water meter
Model:	KWM4220
Test Sample ID:	38837
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.9.1.1
Operational Mode:	FSK, Channel: 912.5 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Toralf Jahn
Test Site:	Eurofins Product Service GmbH
Test Date:	2022-03-28
Peak Power [dBm]:	13.008
Peak Power [W]:	0.0200



Peak Conducted Output Power

Project Number: G0M-2201-1256
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 38837
 Reference Standards: FCC 15.247, RSS-247
 Reference Method: ANSI C63.10:2013, Section 11.9.1.1
 Operational Mode: FSK, Channel: 918.5 MHz
 Operating Conditions: Tnom/Vnom
 Operator: Toralf Jahn
 Test Site: Eurofins Product Service GmbH
 Test Date: 2022-03-28
 Peak Power [dBm]: 12.934
 Peak Power [W]: 0.0197



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3.4 Test Conditions and Results - Power spectral density

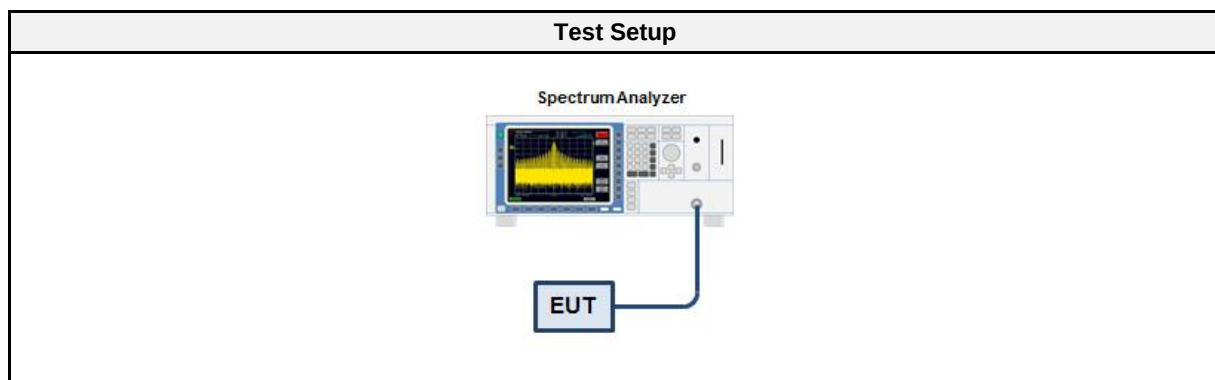
3.4.1 Information

Test Information	
Reference	FCC § 15.247(e); ISSED RSS-247, Issue 2 (section 5.2)
Measurement Method	ANSI C63.10 11.10.2, 14.3.2
Measurement Uncertainty	± 2.86 dB
Operator	Toralf Jahn
Date	2022-03-28

3.4.2 Limits

Limits
8 dBm / 3 kHz

3.4.3 Setup



3.4.4 Equipment

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyser	R&S	FSW 43	EF00896	2021-07	2022-07
Attenuator	Radiall GmbH	R416010000	EF01013	Cal before use	Cal before use
Cable	Gigalane	SMS111B	EF00779 CAAZ	2022-02	2023-02

3.4.5 Procedure

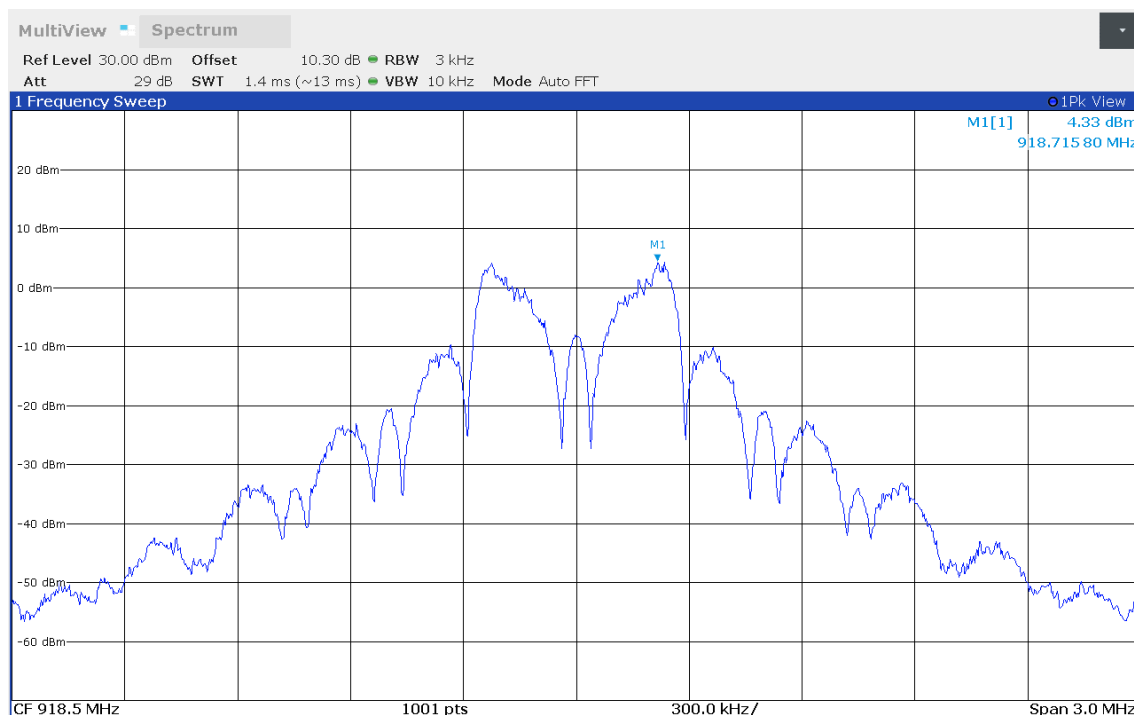
Test Procedure
1. EUT set to test mode 2. The analyzer is set to DTS channel center frequency with a span of 1.5 times the DTS bandwidth 3. The RBW is set to 100 kHz with VBW $\geq$ RBW and the detector is set to peak with max hold 4. After the trace has stabilized a marker is set to the envelope maximum 5. If the power spectral density is above the limit the RBW is reduced (not lower than 3 kHz) and the measurement is repeated 6. If the EUT has more than one transmit chain the procedure is repeated for each transmit chain

3.4.6 Results

Test Results			
Channel [MHz]	PSD [dBm/RBW]	Limit [dBm/3kHz]	Verdict
912.5	4.328	8.0	PASS
918.5	4.386	8.0	PASS
RBW = 3 kHz			

Peak Power Spectral Density

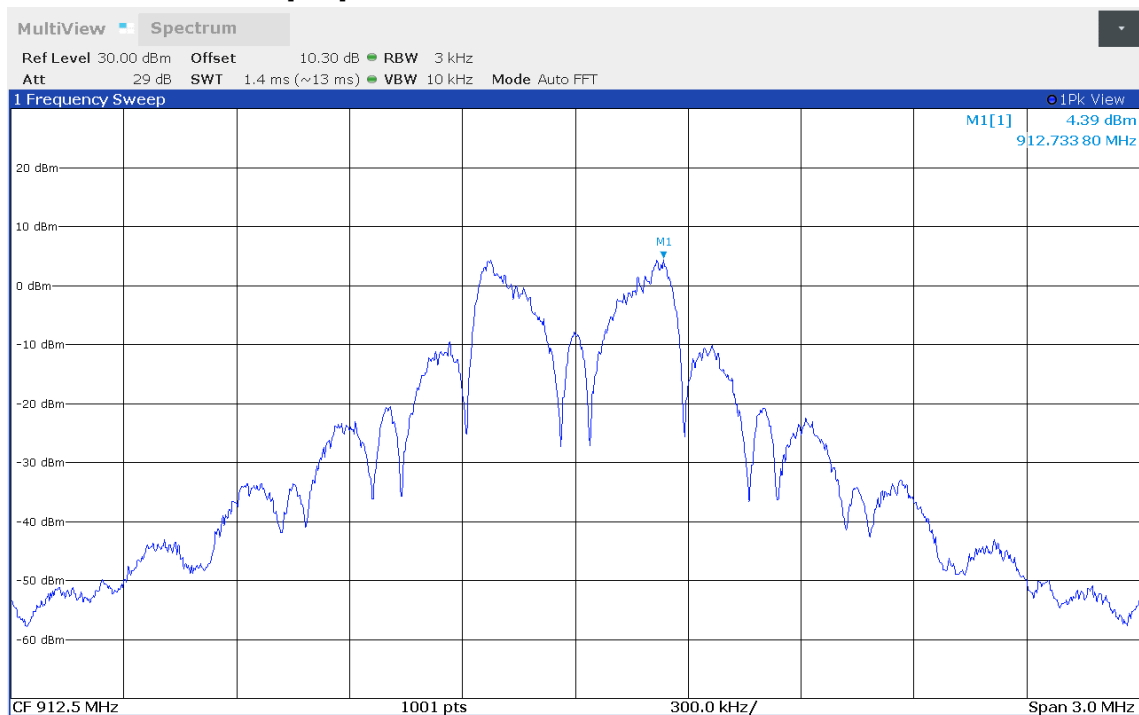
Project Number: G0M-2201-1256
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 38837
 Reference Standards: FCC 15.247, RSS-247
 Reference Method: ANSI C63.10:2013, Section 11.10.2
 Operational Mode: FSK, Channel: 918.5 MHz
 Operating Conditions: Tnom/Vnom
 Operator: Toralf Jahn
 Test Site: Eurofins Product Service GmbH
 Test Date: 2022-03-28
 Peak Frequency [MHz]: 918.716
 Spectral Density [dBm/RBW]: 4.328
 Resolution Bandwidth [kHz]: 3 kHz



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Peak Power Spectral Density

Project Number: G0M-2201-1256
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 38837
 Reference Standards: FCC 15.247, RSS-247
 Reference Method: ANSI C63.10:2013, Section 11.10.2
 Operational Mode: FSK, Channel: 912.5 MHz
 Operating Conditions: Tnom/Vnom
 Operator: Toralf Jahn
 Test Site: Eurofins Product Service GmbH
 Test Date: 2022-03-28
 Peak Frequency [MHz]: 912.734
 Spectral Density [dBm/RBW]: 4.386
 Resolution Bandwidth [kHz]: 3 kHz



13:36:36 28.03.2022

3.5 Test Conditions and Results - Band-edge compliance

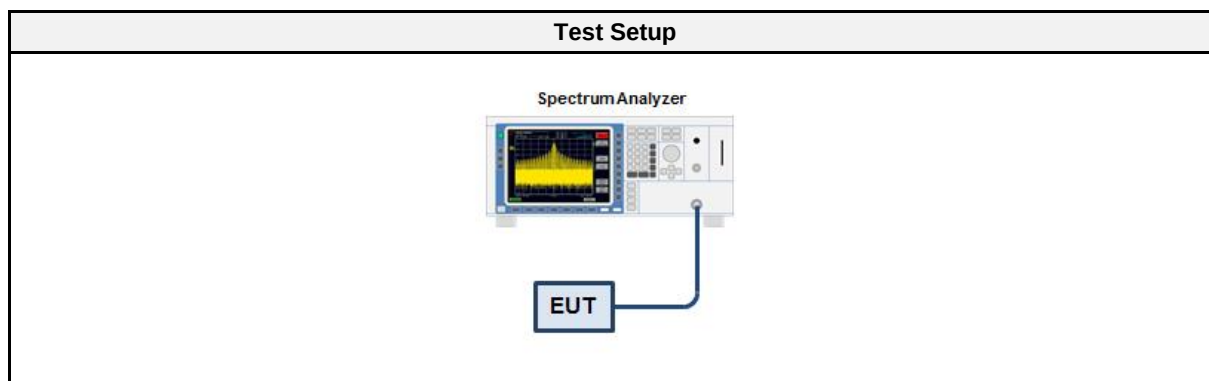
3.5.1 Information

Test Information	
Reference	FCC § 15.247(d); ISSED RSS-247, Issue 2 (section 5.5)
Measurement Uncertainty	± 3.64 dB
Measurement Method	ANSI C63.10 11.13
Operator	Toralf Jahn
Date	2022-03-28

3.5.2 Limits

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

3.5.3 Setup



3.5.4 Equipment

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyser	R&S	FSW 43	EF00896	2021-07	2022-07
Attenuator	Radiall GmbH	R416010000	EF01013	Cal before use	Cal before use
Cable	Gigalane	SMS111B	EF00779 CAAZ	2022-02	2023-02

3.5.5 Procedure

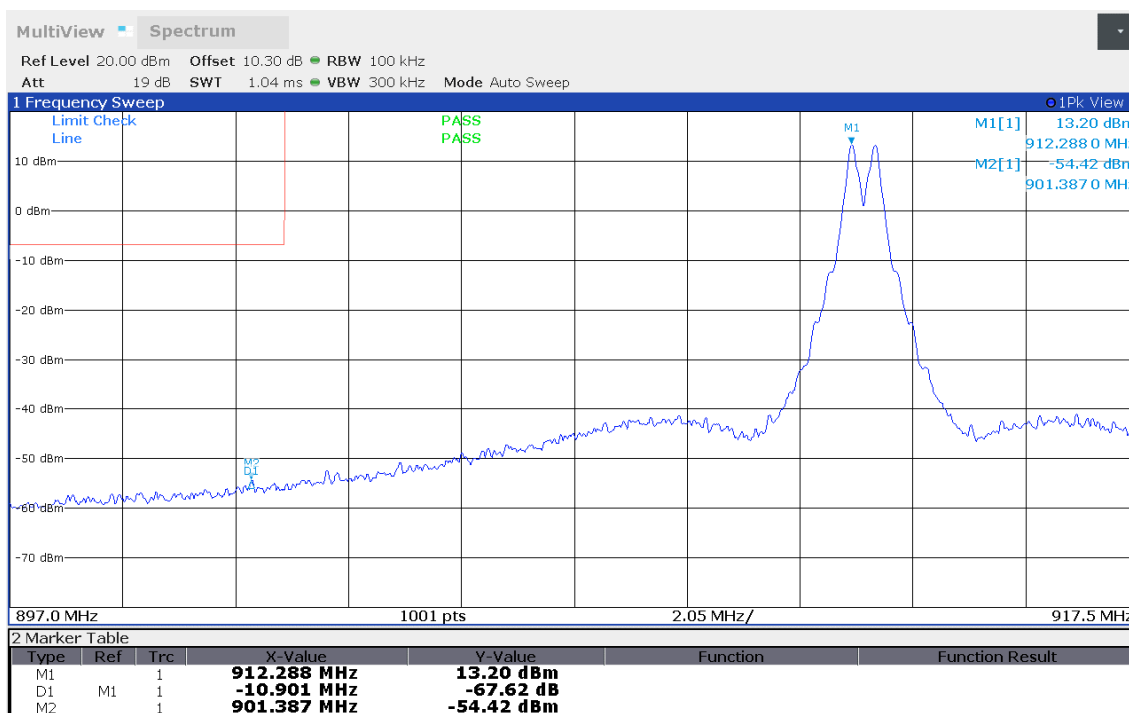
Test Procedure
1. EUT set to test mode (Communication tester is used if needed) 2. Span set around lower band edge and detector is set to peak and max hold 3. Resolution bandwidth is set to 100 kHz 4. Markers are set to peak emission levels within frequency band and outside frequency band 5. Band edge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

3.5.6 Results

Test Results				
Mode	Channel [MHz]	Out-of-band Attenuation [dB]	Limit [dB]	Verdict
Single	912.5	-67.62	-20	PASS
Single	918.5	-66.96	-20	PASS

Emissions in nonrestricted frequency bands at the Band-edge

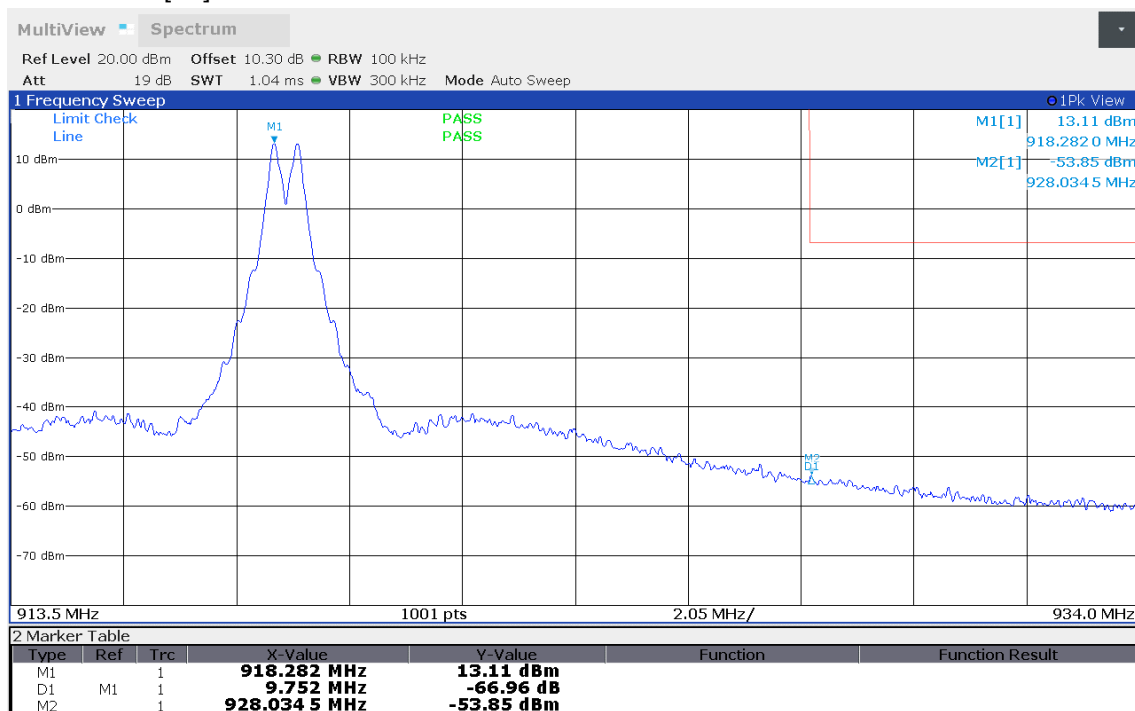
Project Number: G0M-2201-1256
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 38837
 Reference Standards: FCC 15.247, RSS-247
 Reference Method: ANSI C63.10:2013, Section 6.10
 Operational Mode: single frequency, Channel: 912.5 MHz
 Operating Conditions: Tnom/Vnom
 Operator: Toralf Jahn
 Test Site: Eurofins Product Service GmbH
 Test Date: 2022-03-28
 Band-edge: Lower
 In-band Frequency [MHz]: 912.288
 Max. in-band Level [dBm/100 kHz]: 13.201
 Out-of-band Frequency [MHz]: 901.387
 Max. out-of-band Level [dBm/100 kHz]: -54.421
 Attenuation [dB]: -67.62



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Emissions in nonrestricted frequency bands at the Band-edge

Project Number: G0M-2201-1256
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 38837
 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: 2022-03-28
 Band-edge: Upper
 In-band Frequency [MHz]: 918.282
 Max. in-band Level [dBm/100 kHz]: 13.109
 Out-of-band Frequency [MHz]: 928.034
 Max. out-of-band Level [dBm/100 kHz]: -53.851
 Attenuation [dB]: -66.96



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3.6 Test Conditions and Results - Conducted spurious emissions

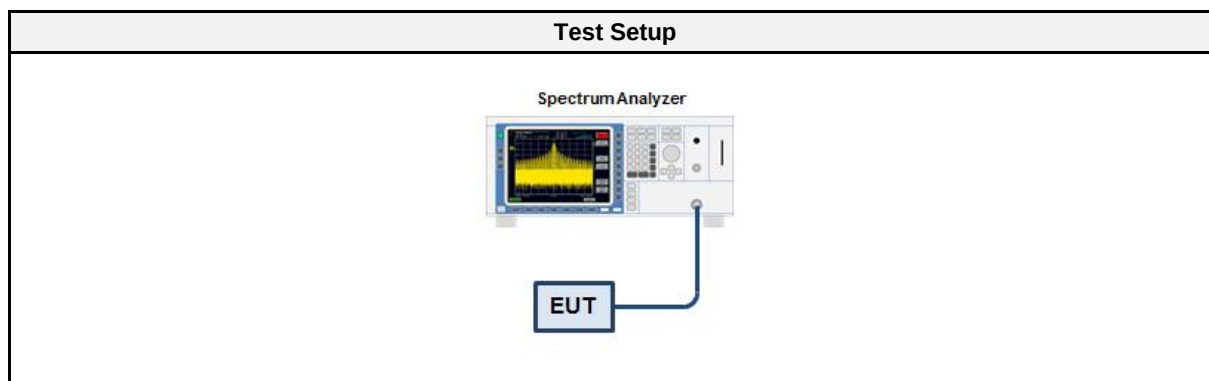
3.6.1 Information

Test Information	
Reference	FCC § 15.247(d); ISED RSS-247, Issue 2 (section 5.5)
Measurement Uncertainty	± 4.25 dB
Measurement Method	ANSI C63.10 11.11
Operator	Toralf Jahn
Date	2022-03-28

3.6.2 Limits

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

3.6.3 Setup



3.6.4 Equipment

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyser	R&S	FSW 43	EF00896	2021-07	2022-07
Cable	Gigalane	SMS111B	EF00779 CAAZ	2022-02	2023-02

3.6.5 Procedure

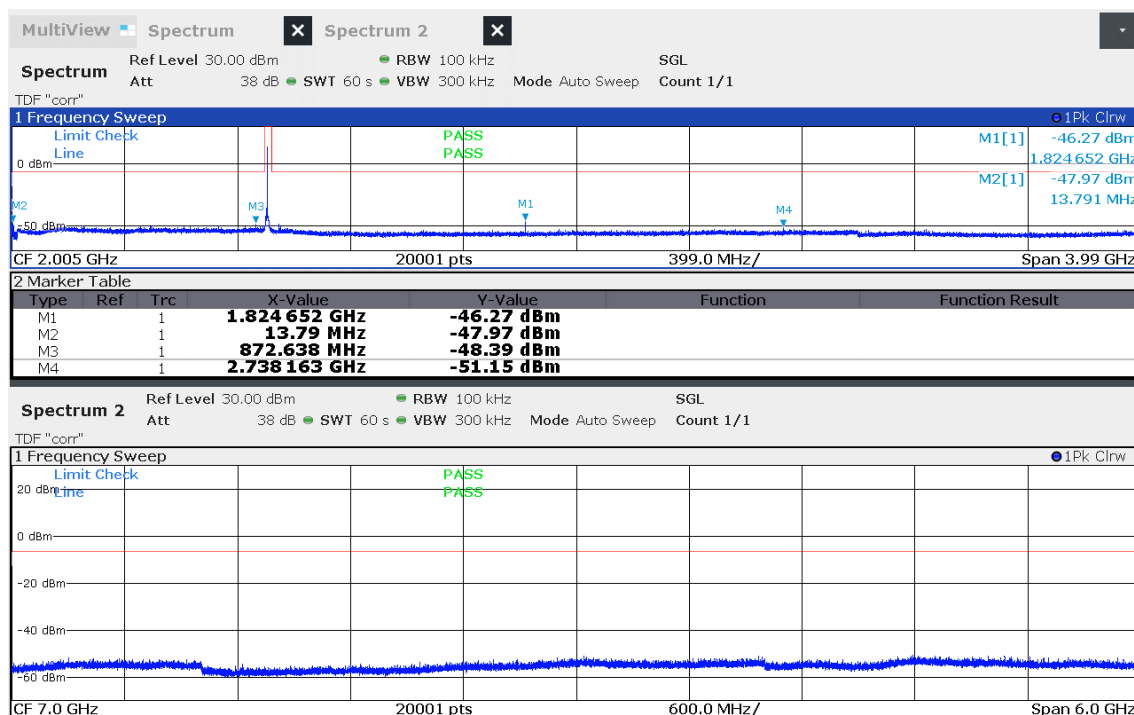
Test Procedure
1. EUT set to test mode (Communication tester is used if needed) 2. Span set around lower band edge and detector is set to peak and max hold 3. Resolution bandwidth is set to 100 kHz 4. Markers are set to peak emission levels outside frequency band

3.6.6 Results

Test Results		
Mode	Channel [MHz]	Verdict
Transmit	912.5	PASS
Transmit	918.5	PASS

Conducted Spurious Emissions

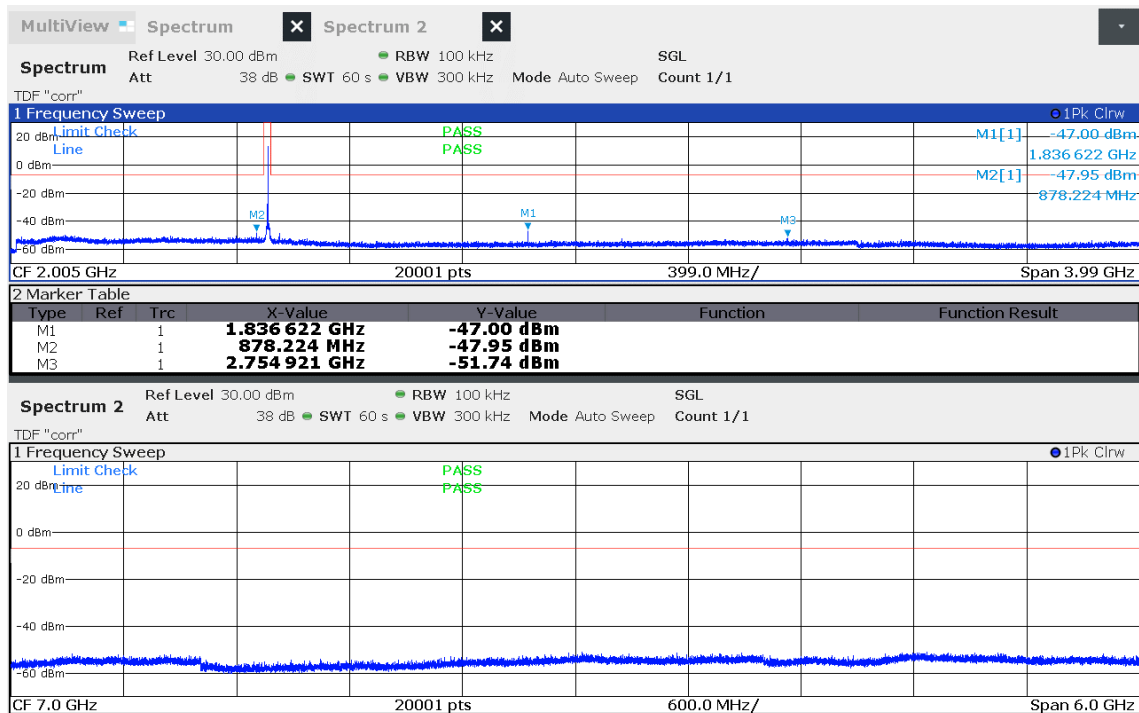
Project Number: G0M-2201-1256
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 38837
 Reference Standards: FCC 15.247, RSS-247
 Reference Method: ANSI C63.10:2013, Section 11.11
 Operational Mode: FSK, Channel: 912.5 MHz
 Operating Conditions: Tnom/Vnom
 Operator: Toralf Jahn
 Test Site: Eurofins Product Service GmbH
 Test Date: 2022-03-28
 Max. in-band Frequency [MHz]: 912.3
 Max. in-band Level [dBm/100 kHz]: 13.5
 Out-of-band Limit [dBm/100 kHz]: -6.5



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Conducted Spurious Emissions

Project Number: G0M-2201-1256
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 38837
 Reference Standards: FCC 15.247, RSS-247
 Reference Method: ANSI C63.10:2013, Section 11.11
 Operational Mode: FSK, Channel: 918.5 MHz
 Operating Conditions: Tnom/Vnom
 Operator: Toralf Jahn
 Test Site: Eurofins Product Service GmbH
 Test Date: 2022-03-28
 Max. in-band Frequency [MHz]: 918.3
 Max. in-band Level [dBm/100 kHz]: 13.1
 Out-of-band Limit [dBm/100 kHz]: -6.9



14:20:14 28.03.2022

3.7 Test Conditions and Results - Transmitter radiated emissions

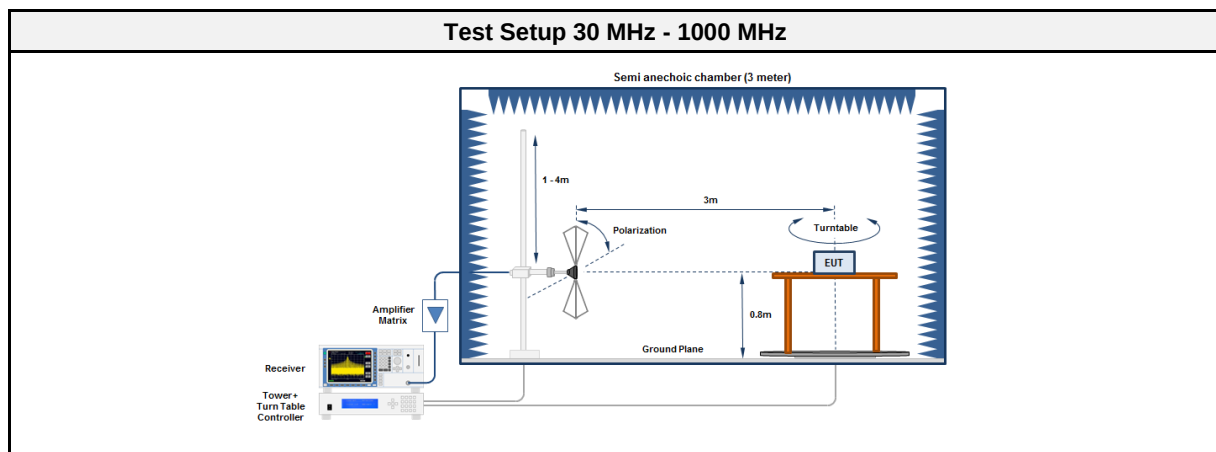
3.7.1 Information

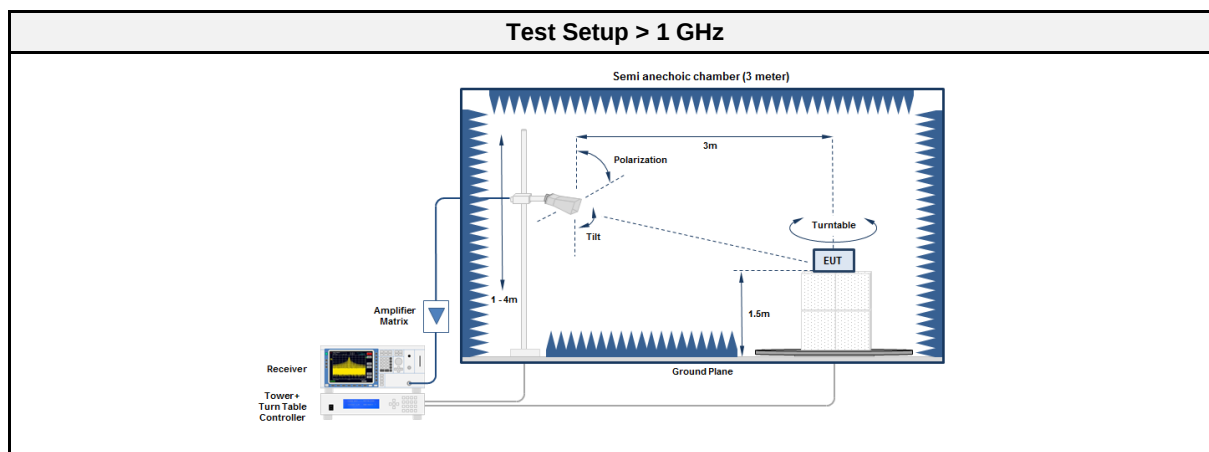
Test Information	
Reference	FCC § 15.247(d); FCC § 15.209; ISSED RSS-Gen, Issue 5 A2 (section 6.13)
Measurement Uncertainty	± 5.95 dB
Measurement Method	ANSI C63.10 6.4, 6.5, 6.6, 11.12
Operator	Florian Voigt, Toralf Jahn
Date	2022-03-21

3.7.2 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

3.7.3 Setup





3.7.4 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
Antenna	Schwarzbeck	HWRD 650	EF01679	2021-03	2022-03

3.7.5 Procedure

Test Procedure 30 MHz - 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	

3.7.6 Results

Test Results – Helix antenna						
Channel [MHz]	Emission [MHz]	Level [dBμV/m]	Det.	Pol.	Limit [dBμV/m]	Margin [dB]
912.5	2737.6	40.47	pk	hor	74.00	-33.53
912.5	2737.6	36.70	avg	hor	54.00	-17.30
918.5	958.54	43.50	pk	ver	95.00	-51.47
918.5	2755.6	40.70	pk	hor	74.00	-33.30
918.5	2755.6	34.81	avg	hor	54.00	-19.19

Test Results – Pit antenna						
Channel [MHz]	Emission [MHz]	Level [dBμV/m]	Det.	Pol.	Limit [dBμV/m]	Margin [dB]
912.5	267.08	38.50	pk	hor	46.00	-07.47
912.5	2737.6	45.59	pk	ver	74.00	-28.41
912.5	2737.6	40.40	avg	ver	54.00	-13.60
918.5	266.12	33.10	qpk	hor	46.00	-12.85
918.5	1220.1	43.02	pk	hor	74.00	-30.98
918.5	1220.1	33.96	avg	hor	54.00	-20.04
918.5	2755.6	44.86	pk	ver	74.00	-29.14
918.5	2755.6	40.19	avg	ver	54.00	-13.81

Test Results – Wall antenna						
Channel [MHz]	Emission [MHz]	Level [dBμV/m]	Det.	Pol.	Limit [dBμV/m]	Margin [dB]
912.5	110.3495	26.30	pk	ver	43.50	-17.22
912.5	262.82	33.70	qpk	hor	46.00	-12.30
912.5	610.94	37.40	pk	ver	46.00	-08.57
912.5	952.48	47.30	pk	ver	95.00	-47.74
912.5	2737.7	41.80	pk	ver	74.00	-32.20
912.5	2737.7	39.01	avg	ver	54.00	-14.99
918.5	111.4896	28.60	pk	ver	43.50	-14.93
918.5	264.2	34.10	qpk	hor	46.00	-11.86
918.5	609.56	38.40	pk	ver	46.00	-07.56
918.5	958.48	47.80	pk	ver	95.00	-47.25
918.5	1077.6	40.16	pk	hor	74.00	-33.84
918.5	1077.6	34.36	avg	hor	54.00	-19.64
918.5	2755.7	41.60	pk	ver	74.00	-32.40
918.5	2755.7	38.15	avg	ver	54.00	-15.85
918.5	7489.7	34.59	pk	ver	74.00	-39.41
918.5	7489.7	24.60	avg	ver	54.00	-29.40

3.8 Test Conditions and Results - Receiver radiated emissions

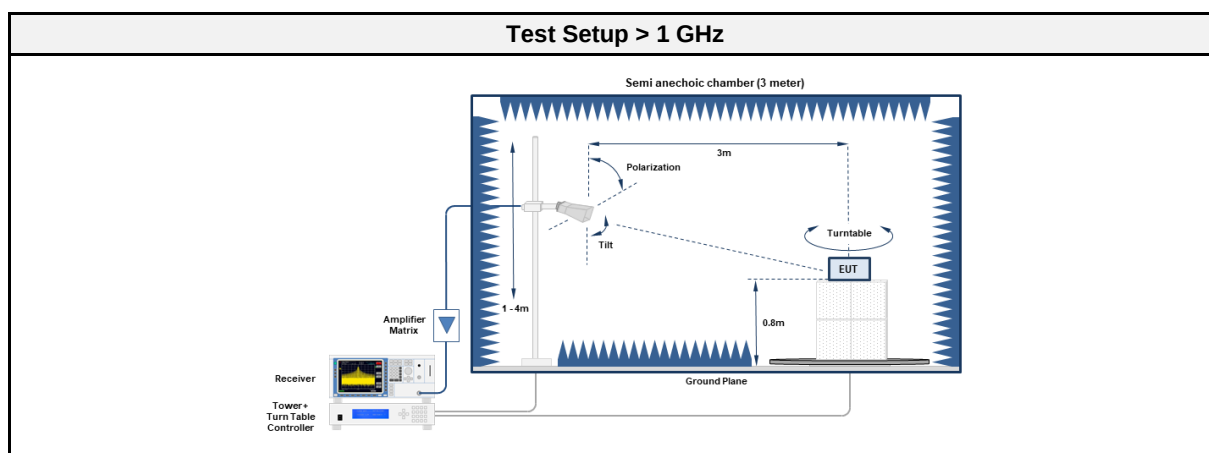
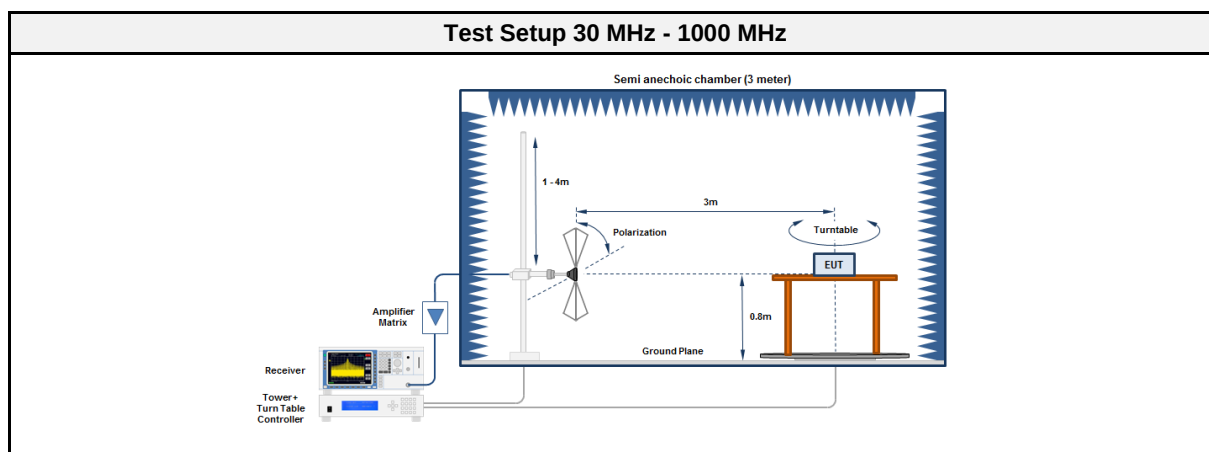
3.8.1 Information

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	Florian Voigt, Toralf Jahn
Date	2022-03-22

3.8.2 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

3.8.3 Setup



3.8.4 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	AC 2	EF01616	2021-09	2022-09
Spectrum analyzer	R&S	FSU43	EF01631	2021-07	2022-07
Horn antenna	Schwarzbeck	BBHA 9120D	EF00018	2019-10	2022-10

3.8.5 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	

3.8.6 Results

Test Results—Helix antenna						
Channel [MHz]	Emission [MHz]	Level [dBμV/m]	Det.	Pol.	Limit [dBμV/m]	Margin [dB]
915.0	665.1316	32.40	pk	hor	46.00	-13.57

Test Results—Pit antenna						
Channel [MHz]	Emission [MHz]	Level [dBμV/m]	Det.	Pol.	Limit [dBμV/m]	Margin [dB]
915.0	5854	46.47	pk	hor	74.00	-27.53
915.0	5854	38.37	avg	hor	53.98	-15.61

Test Results—Wall antenna						
Channel [MHz]	Emission [MHz]	Level [dBμV/m]	Det.	Pol.	Limit [dBμV/m]	Margin [dB]
915.0	5872	48.36	pk	ver	74.00	-25.64
915.0	5872	37.32	avg	ver	53.98	-16.66

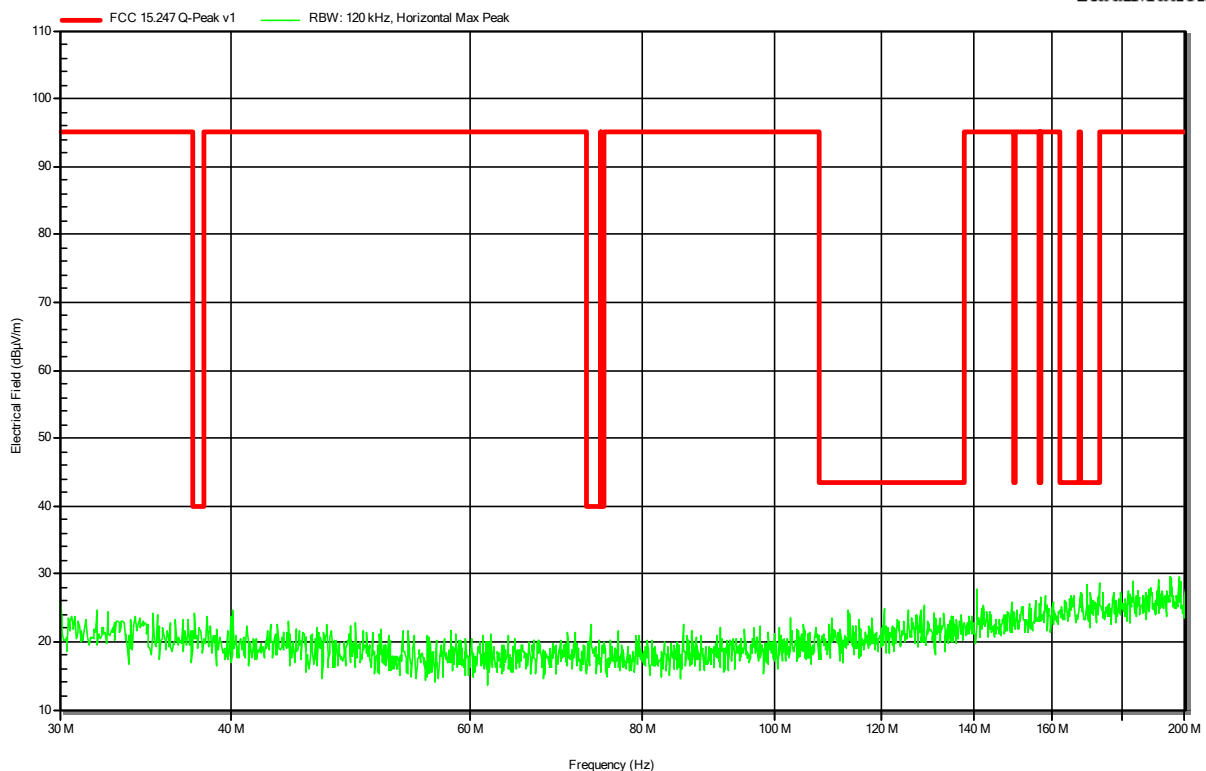
ANNEX A Transmitter spurious emissions

Radiated Spurious Emissions according to FCC 15.247, RSS-247 Issue 2

Project Number: G0M-2201-1256
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 38836
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 23 °Celsius, Vnom: 3.66 VDC
 Antenna: Rohde & Schwarz HK 116, Horizontal
 Measurement distance: 3 m
 Mode: Tx; Helix Antenna 30261216, 912.5 MHz
 Test Date: 2022-03-23
 Note:

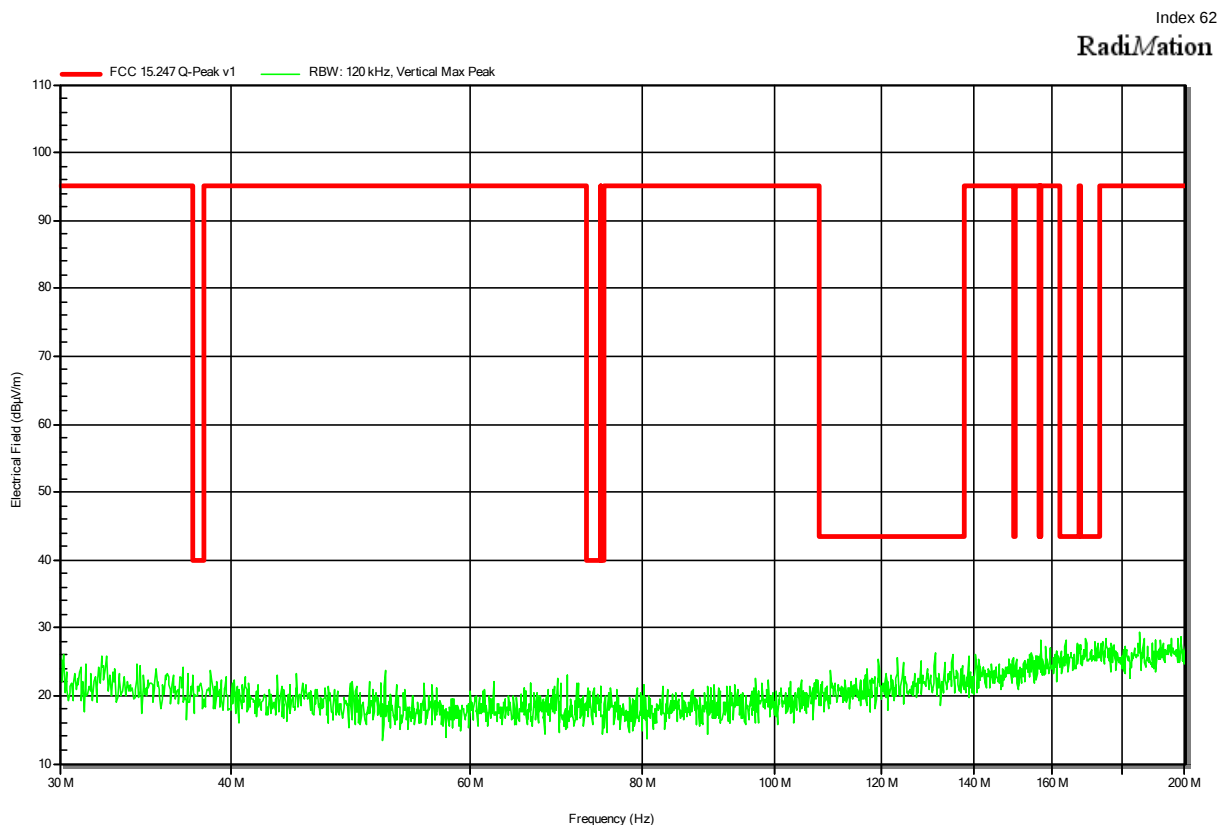
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RadiMation



Radiated Spurious Emissions according to FCC 15.247, RSS-247 Issue 2

Project Number: G0M-2201-1256
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 38836
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 23 °Celsius, Vnom: 3.66 VDC
 Antenna: Rohde & Schwarz HK 116, Vertical
 Measurement distance: 3 m
 Mode: Tx; Helix Antenna 30261216, 912.5 MHz
 Test Date: 2022-03-23
 Note:

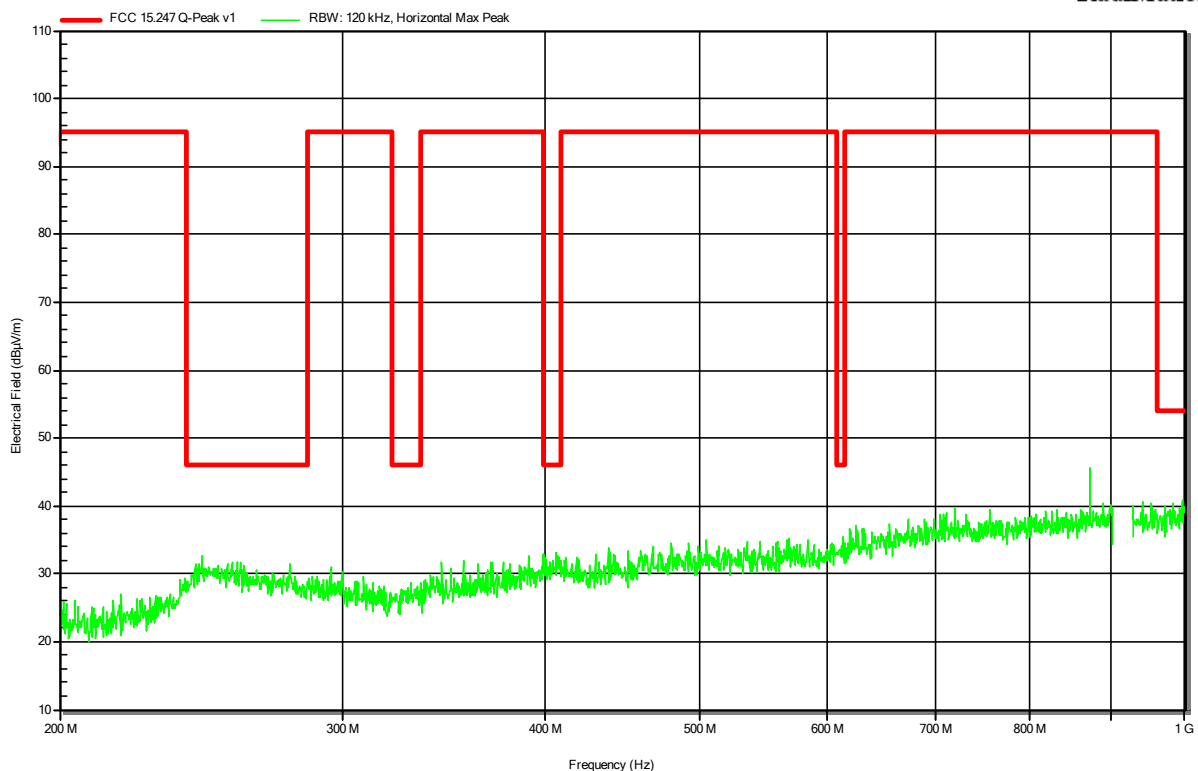


Radiated Spurious Emissions according to FCC 15.247, RSS-247 Issue 2

Project Number: G0M-2201-1256
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 38836
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 23 °Celsius, Vnom: 3.66 VDC
 Antenna: Rohde & Schwarz HL 223, Horizontal
 Measurement distance: 3 m
 Mode: Tx; Helix Antenna 30261216, 912.5 MHz
 Test Date: 2022-03-23
 Note:

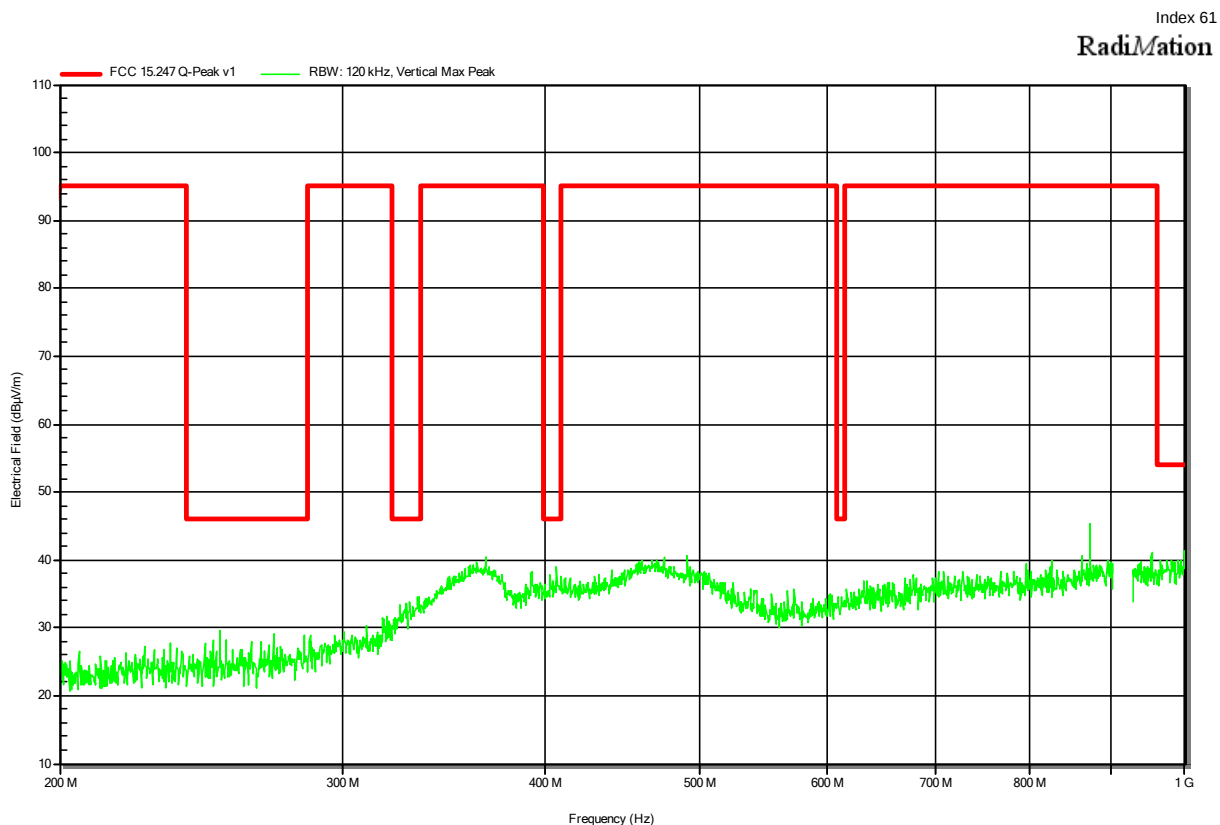
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RadiMation



Radiated Spurious Emissions according to FCC 15.247, RSS-247 Issue 2

Project Number: G0M-2201-1256
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 38836
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 23 °Celsius, Vnom: 3.66 VDC
 Antenna: Rohde & Schwarz HL 223, Vertical
 Measurement distance: 3 m
 Mode: Tx; Helix Antenna 30261216, 912.5 MHz
 Test Date: 2022-03-23
 Note:

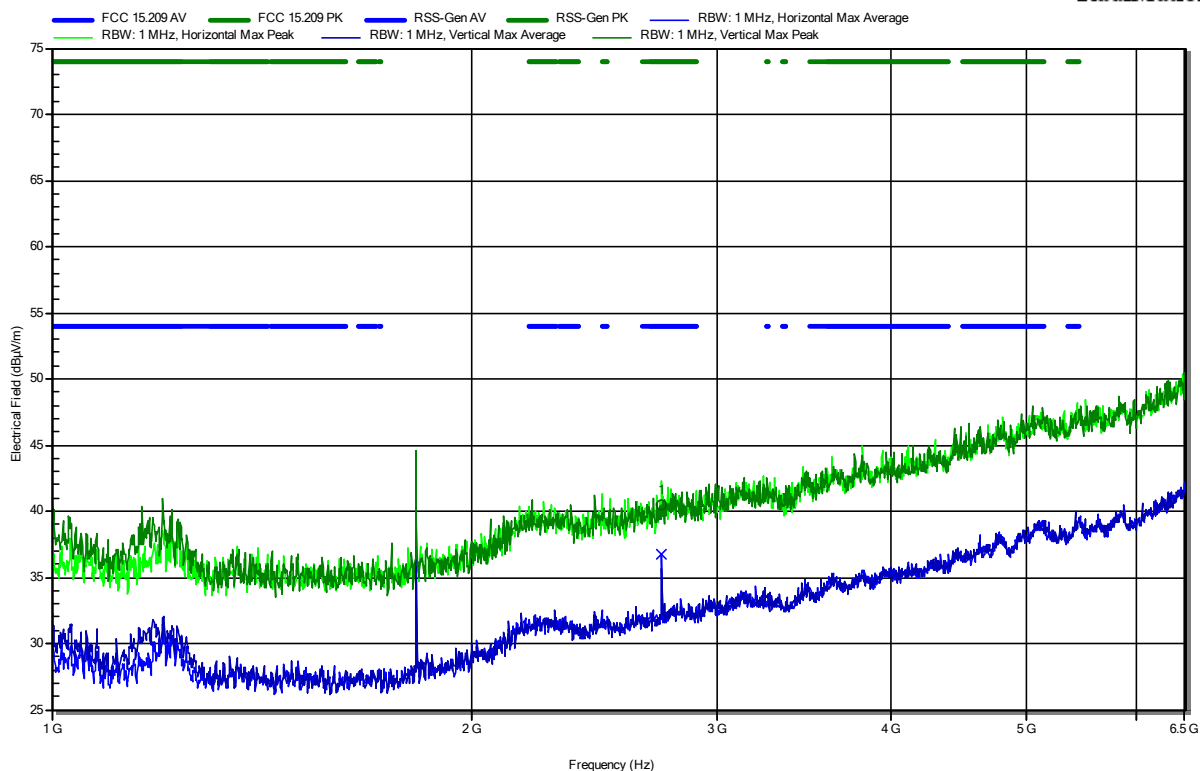


Radiated Spurious Emissions according to FCC 15.247, RSS-247 Issue 2

Project Number: G0M-2201-1256
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 38836
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Voigt
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 23 °Celsius, Vnom: 3.66 VDC
 Antenna: Schwarzbeck BBHA 9120D
 Measurement distance: 3 m
 Mode: Tx; Helix Antenna 30261216, 912.5 MHz
 Test Date: 2022-03-23
 Note:

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RadiMation



Frequency 2.7376 GHz	Peak 40.47 dBμV/m	Peak Limit 74 dBμV/m	Peak Difference -33.53 dB	Peak Status Pass	Polarization Horizontal
Frequency 2.7376 GHz	Average 36.7 dBμV/m	Average Limit 54 dBμV/m	Average Difference -17.3 dB	Average Status Pass	Polarization Horizontal

Test Report No.: G0M-2201-1256-TFC247DT-V01

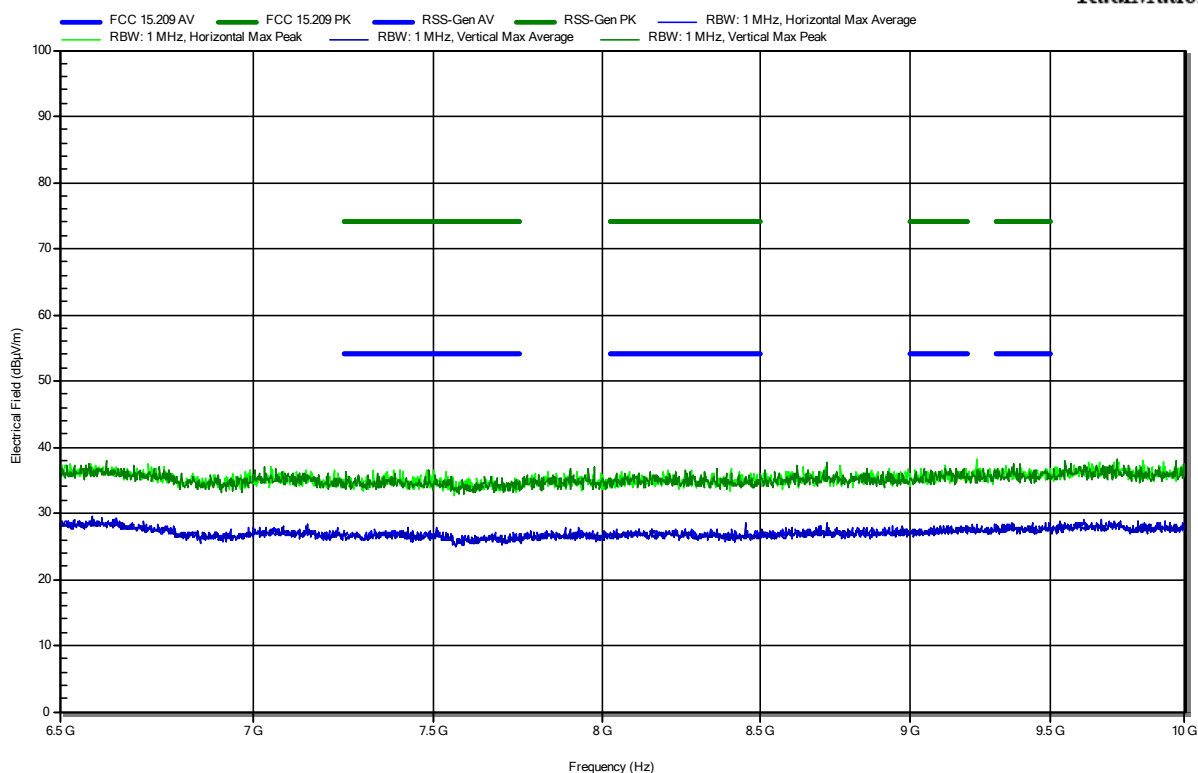
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Radiated Spurious Emissions according to FCC 15.247, RSS-247 Issue 2

Project Number: G0M-2201-1256
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 38836
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Voigt
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 23 °Celsius, Vnom: 3.66 VDC
 Antenna: Schwarzbeck HWRD 650
 Measurement distance: 3 m
 Mode: Tx; Helix Antenna 30261216, 912.5 MHz
 Test Date: 2022-03-23
 Note:

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RadiMation

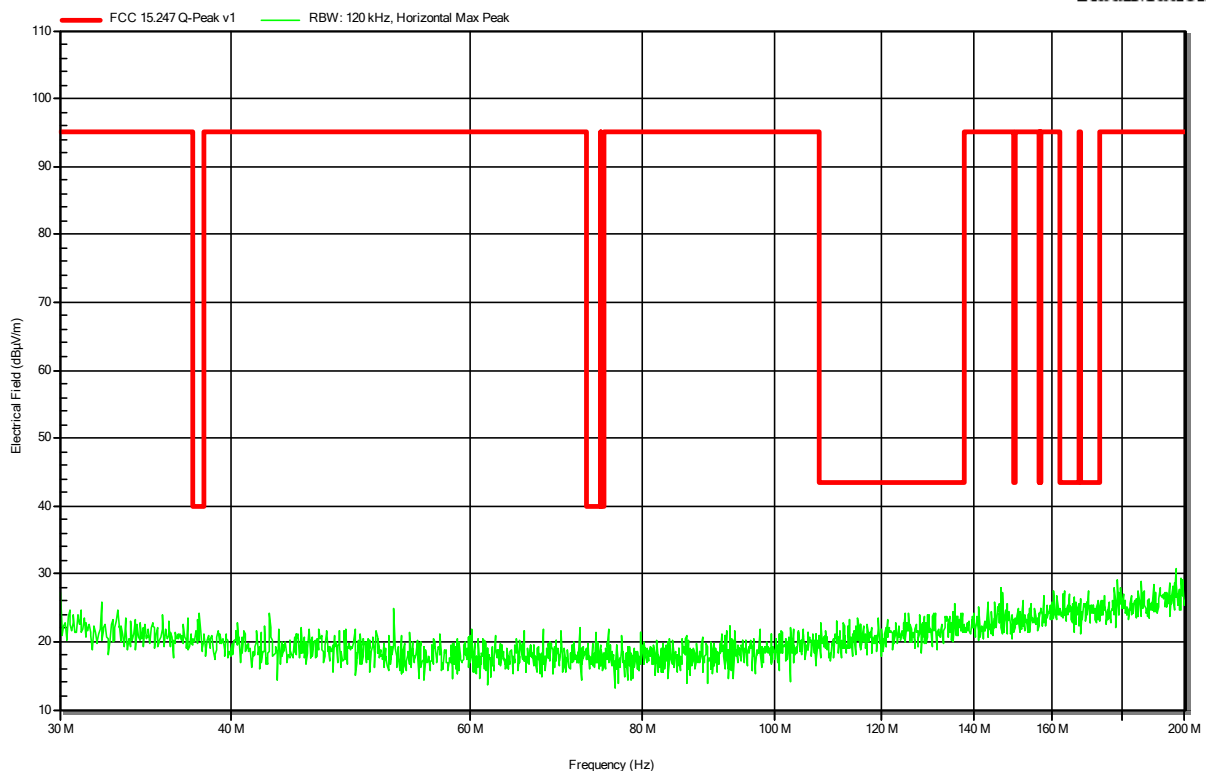


Radiated Spurious Emissions according to FCC 15.247, RSS-247 Issue 2

Project Number: G0M-2201-1256
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 38836
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 23 °Celsius, Vnom: 3.66 VDC
 Antenna: Rohde & Schwarz HK 116, Horizontal
 Measurement distance: 3 m
 Mode: Tx; Helix Antenna 30261216, 918.5 MHz
 Test Date: 2022-03-23
 Note:

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RadiMation

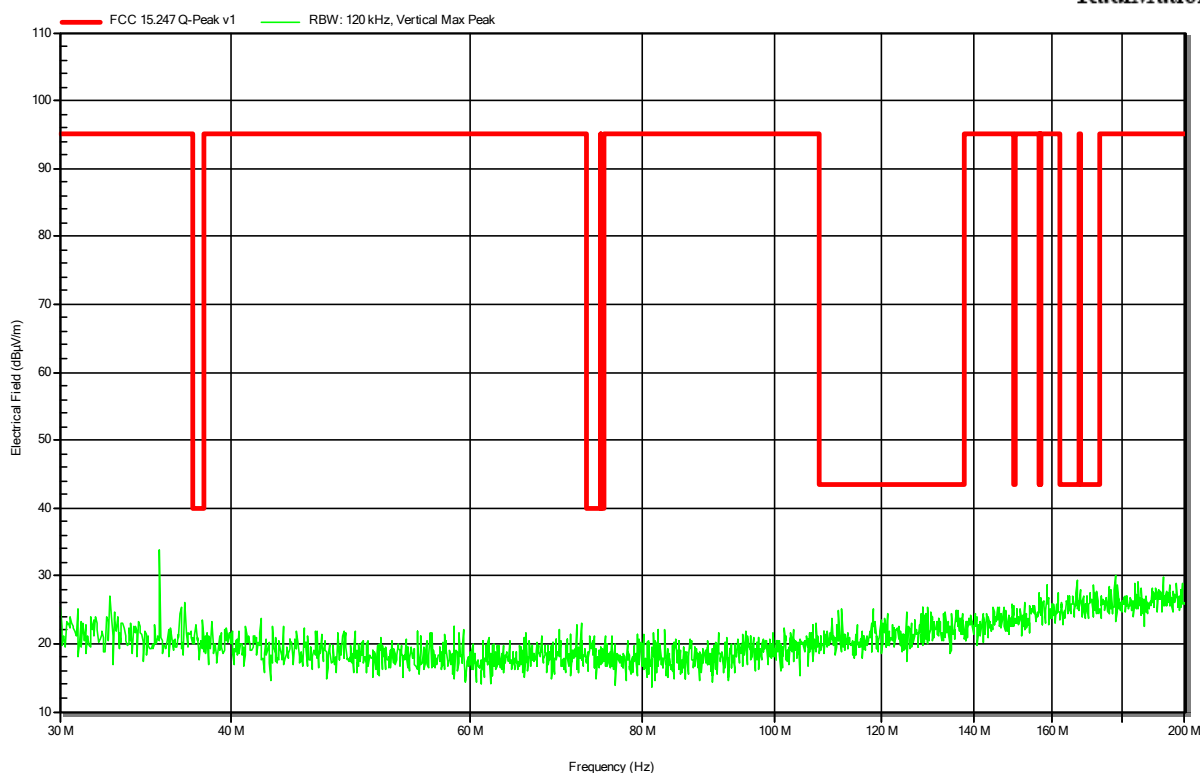


Radiated Spurious Emissions according to FCC 15.247, RSS-247 Issue 2

Project Number: G0M-2201-1256
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 38836
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 23 °Celsius, Vnom: 3.66 VDC
 Antenna: Rohde & Schwarz HK 116, Vertical
 Measurement distance: 3 m
 Mode: Tx; Helix Antenna 30261216, 918.5 MHz
 Test Date: 2022-03-23
 Note:

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RadiMation

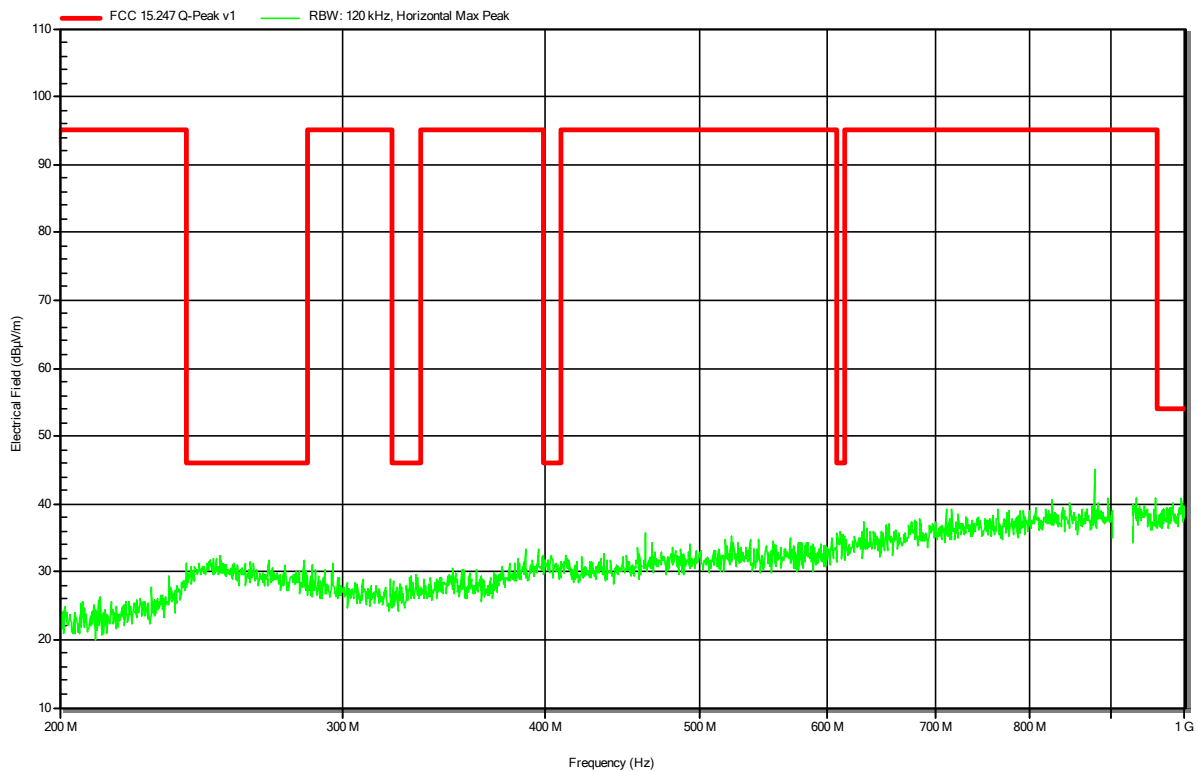


Radiated Spurious Emissions according to FCC 15.247, RSS-247 Issue 2

Project Number: G0M-2201-1256
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 38836
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 23 °Celsius, Vnom: 3.66 VDC
 Antenna: Rohde & Schwarz HL 223, Horizontal
 Measurement distance: 3 m
 Mode: Tx; Helix Antenna 30261216, 918.5 MHz
 Test Date: 2022-03-23
 Note:

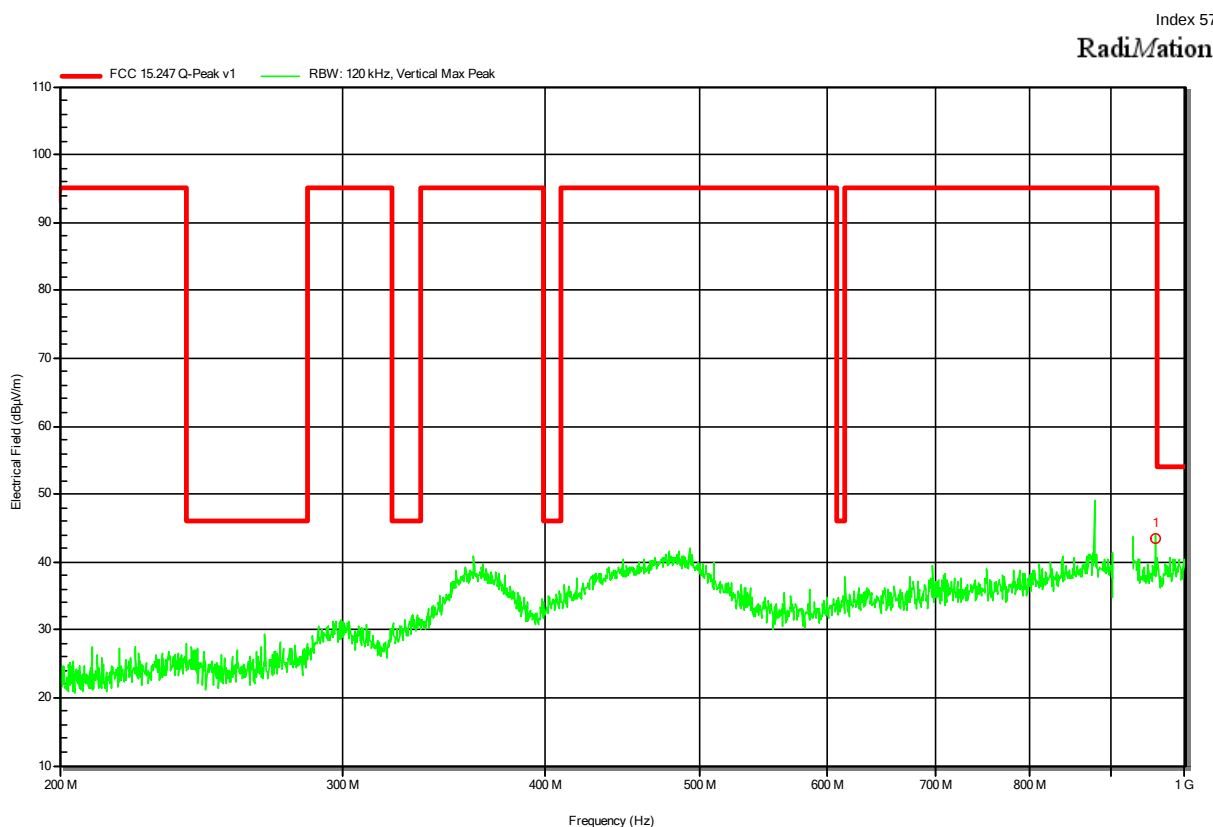
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Radiated Spurious Emissions according to FCC 15.247, RSS-247 Issue 2

Project Number: G0M-2201-1256
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 38836
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 23 °Celsius, Vnom: 3.66 VDC
 Antenna: Rohde & Schwarz HL 223, Vertical
 Measurement distance: 3 m
 Mode: Tx; Helix Antenna 30261216, 918.5 MHz
 Test Date: 2022-03-23
 Note:



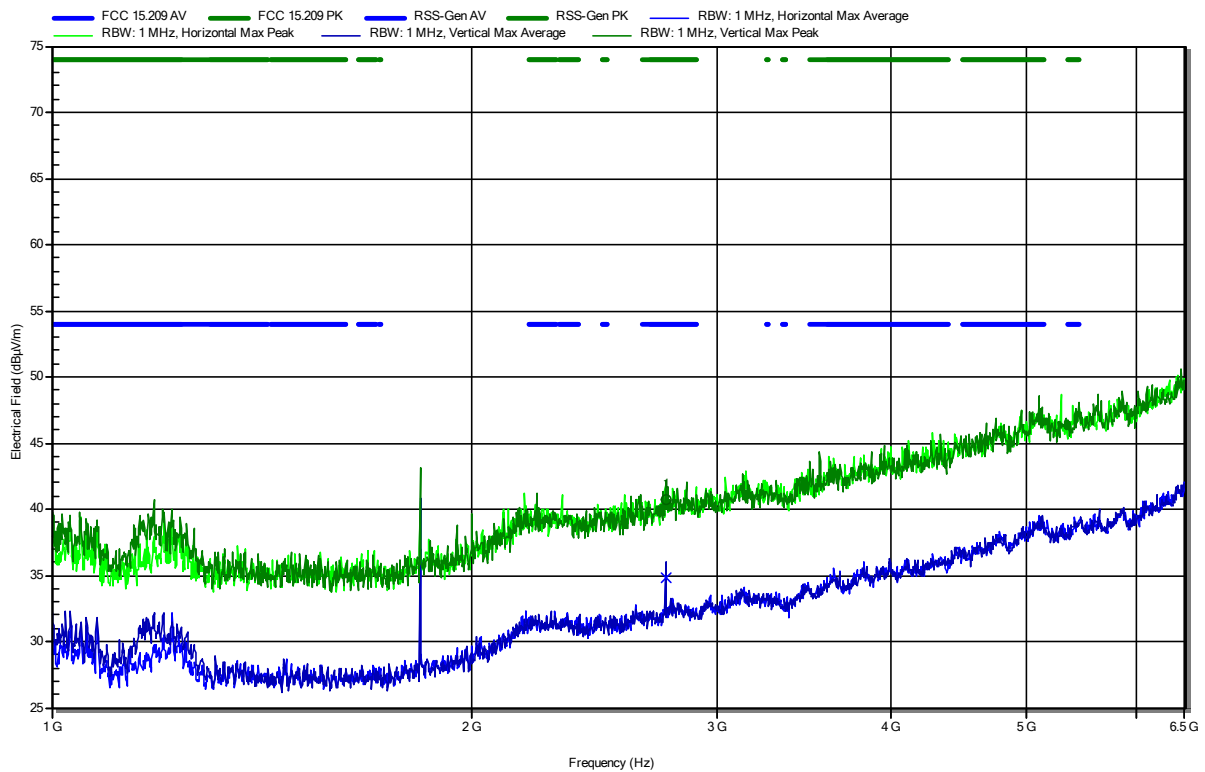
Frequency	Peak	Peak Limit	Peak Difference	Peak Status
958.54 MHz	43.5 dBμV/m	95 dBμV/m	-51.47 dB	Pass

Radiated Spurious Emissions according to FCC 15.247, RSS-247 Issue 2

Project Number: G0M-2201-1256
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 38836
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Voigt
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 23 °Celsius, Vnom: 3.66 VDC
 Antenna: Schwarzbeck BBHA 9120D
 Measurement distance: 3 m
 Mode: Tx; Helix Antenna 30261216, 918.5 MHz
 Test Date: 2022-03-23
 Note:

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Frequency 2.7556 GHz	Peak 40.7 dBμV/m	Peak Limit 74 dBμV/m	Peak Difference -33.3 dB	Peak Status Pass	Polarization Horizontal
Frequency 2.7556 GHz	Average 34.81 dBμV/m	Average Limit 54 dBμV/m	Average Difference -19.19 dB	Average Status Pass	Polarization Horizontal

Test Report No.: G0M-2201-1256-TFC247DT-V01

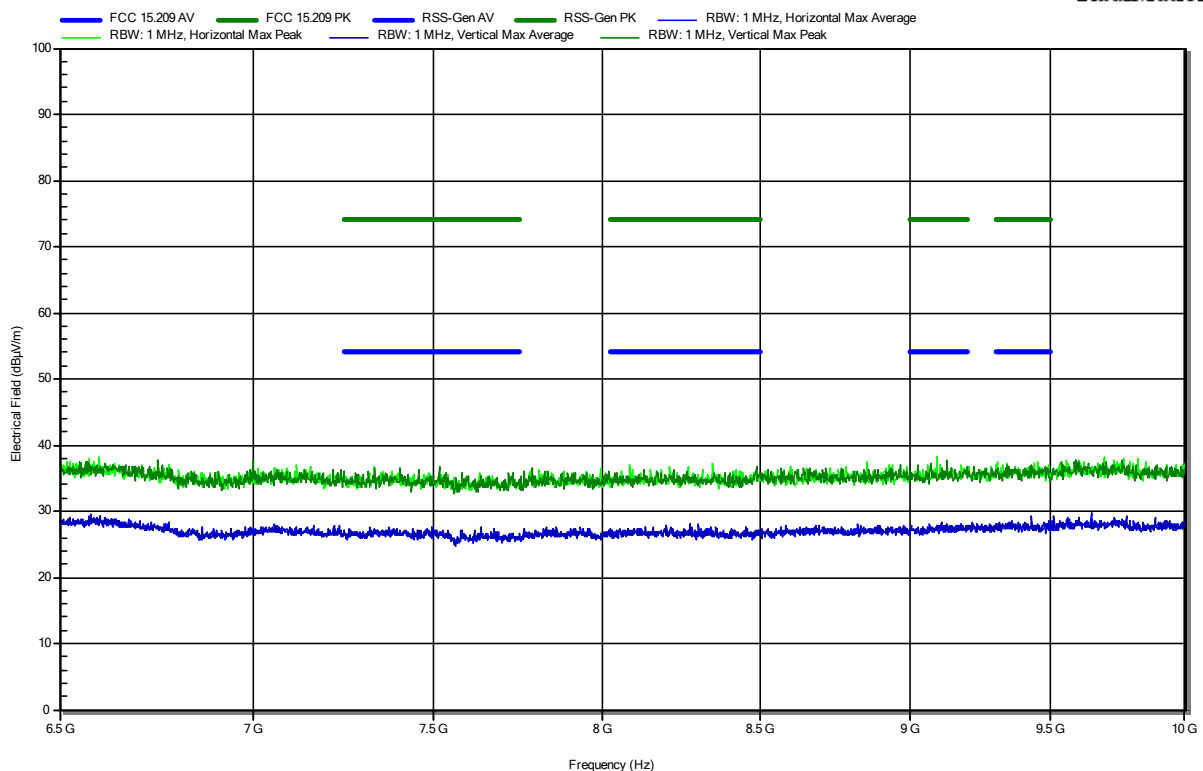
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Radiated Spurious Emissions according to FCC 15.247, RSS-247 Issue 2

Project Number: G0M-2201-1256
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 38836
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Voigt
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 23 °Celsius, Vnom: 3.66 VDC
 Antenna: Schwarzbeck HWRD 650
 Measurement distance: 3 m
 Mode: Tx; Helix Antenna 30261216, 918.5 MHz
 Test Date: 2022-03-23
 Note:

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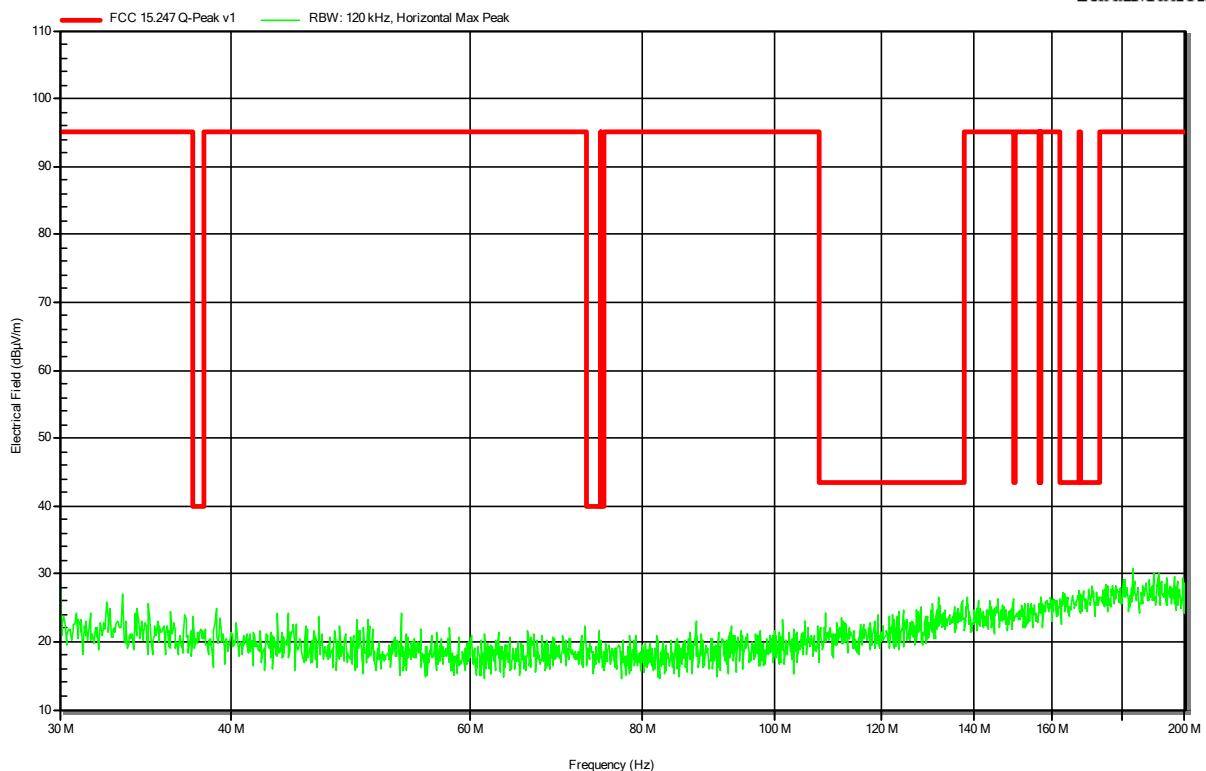


Radiated Spurious Emissions according to FCC 15.247, RSS-247 Issue 2

Project Number: G0M-2201-1256
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 38836
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 23 °Celsius, Vnom: 3.66 VDC
 Antenna: Rohde & Schwarz HK 116, Horizontal
 Measurement distance: 3 m
 Mode: Tx; Pit Antenna 6697916, 912.5 MHz
 Test Date: 2022-03-23
 Note:

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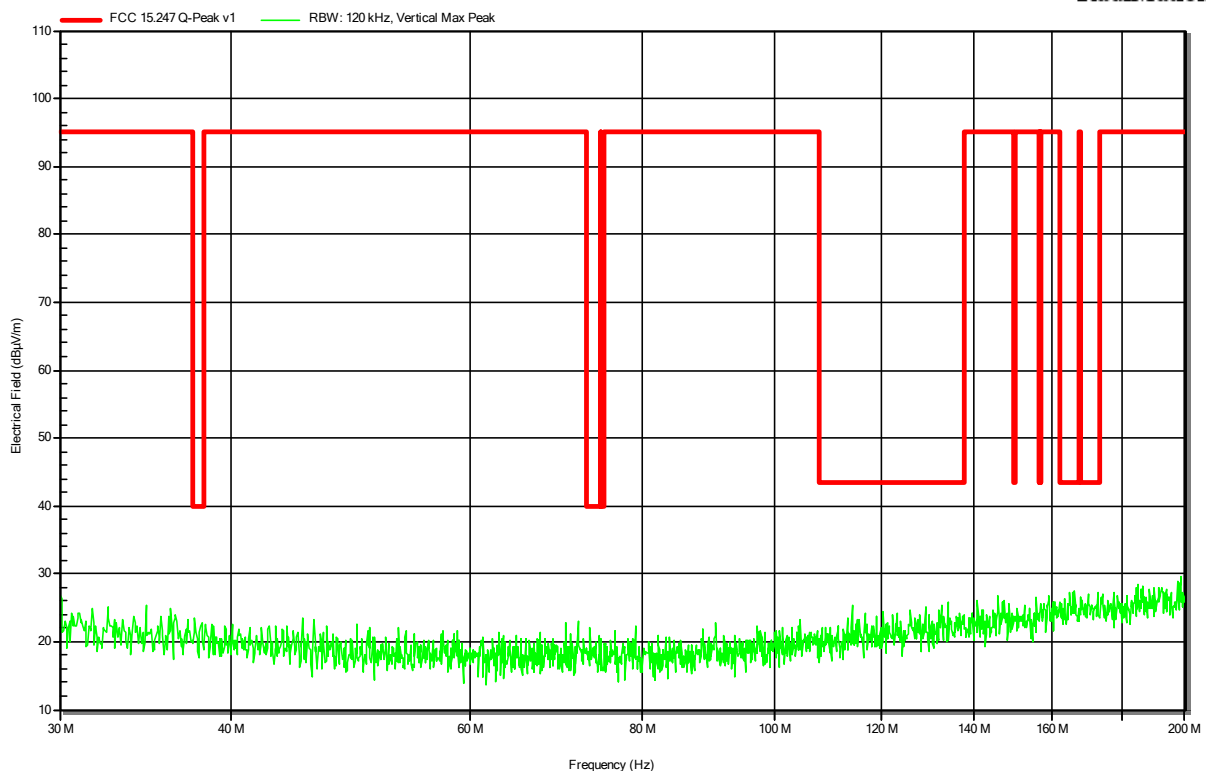


Radiated Spurious Emissions according to FCC 15.247, RSS-247 Issue 2

Project Number: G0M-2201-1256
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 38836
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 23 °Celsius, Vnom: 3.66 VDC
 Antenna: Rohde & Schwarz HK 116, Vertical
 Measurement distance: 3 m
 Mode: Tx; Pit Antenna 6697916, 912.5 MHz
 Test Date: 2022-03-23
 Note:

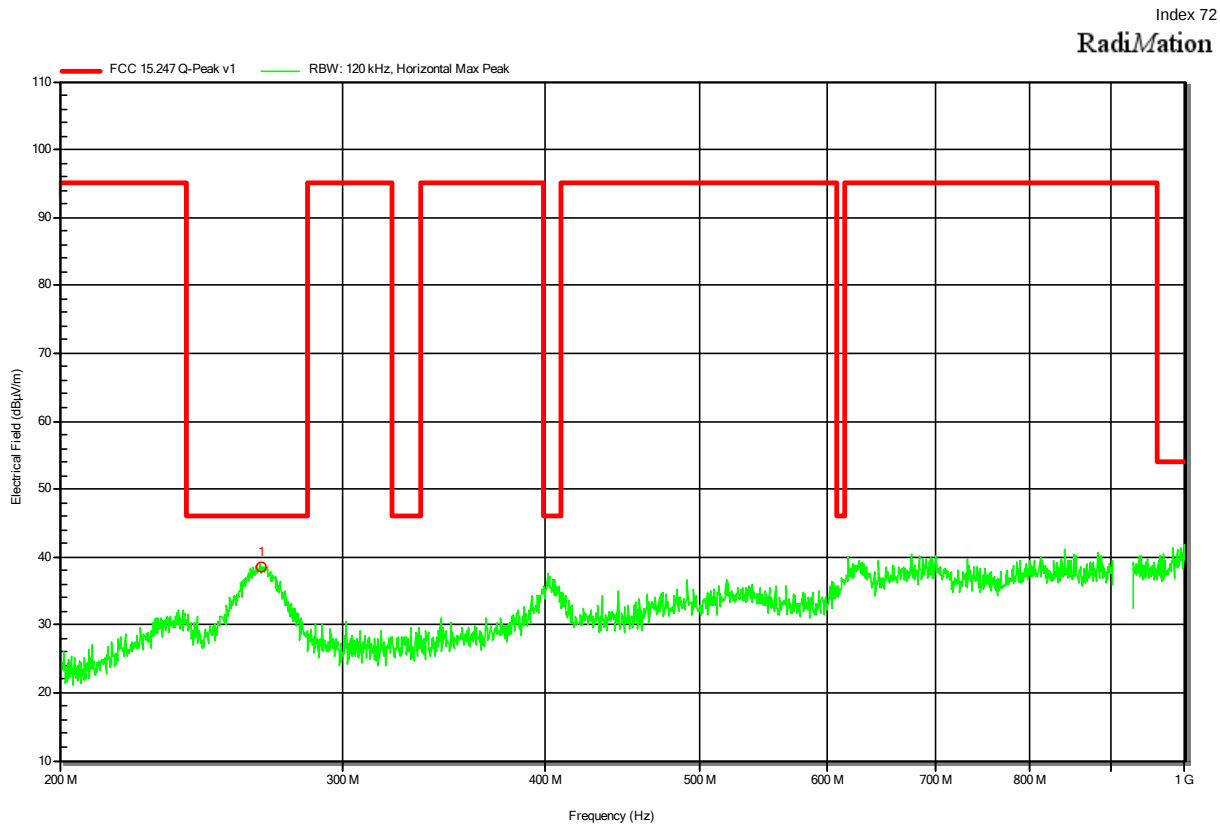
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Radiated Spurious Emissions according to FCC 15.247, RSS-247 Issue 2

Project Number: G0M-2201-1256
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 38836
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 23 °Celsius, Vnom: 3.66 VDC
 Antenna: Rohde & Schwarz HL 223, Horizontal
 Measurement distance: 3 m
 Mode: Tx; Pit Antenna 6697916, 912.5 MHz
 Test Date: 2022-03-23
 Note:



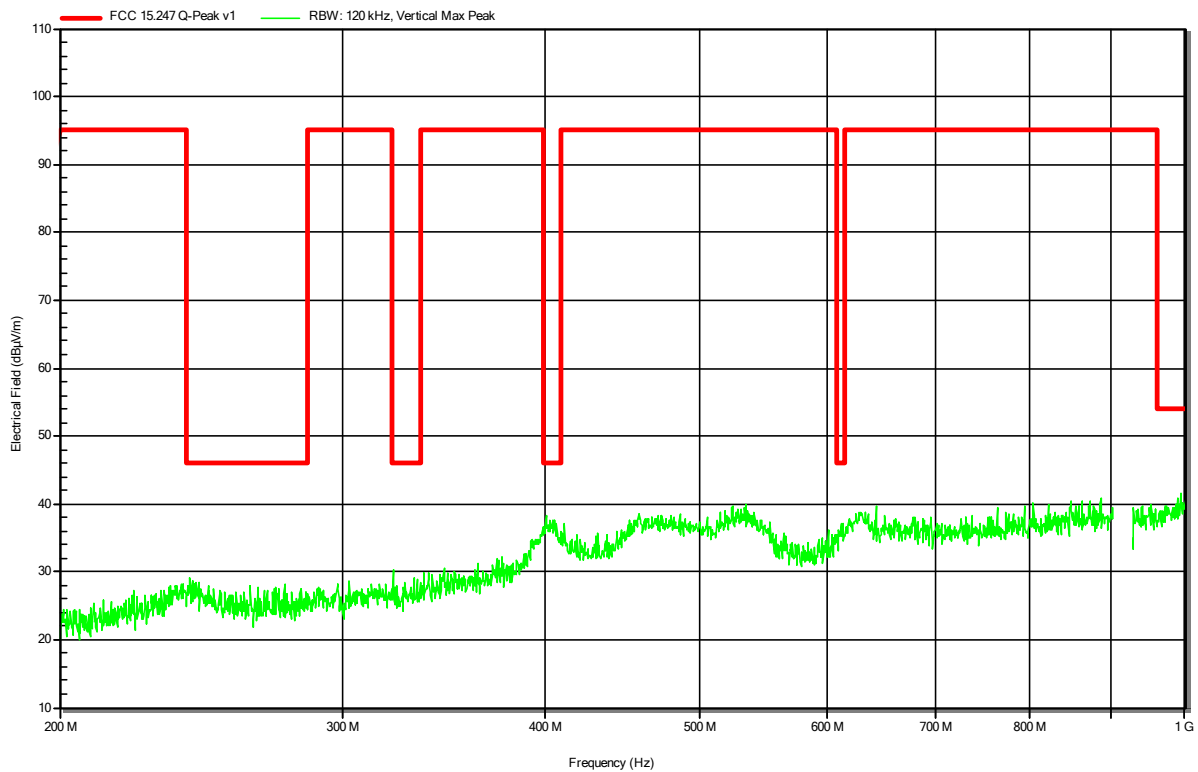
Frequency 267.08 MHz	Peak 38.5 dBμV/m	Peak Limit 46 dBμV/m	Peak Difference -7.47 dB	Peak Status Pass
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Radiated Spurious Emissions according to FCC 15.247, RSS-247 Issue 2

Project Number: G0M-2201-1256
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 38836
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 23 °Celsius, Vnom: 3.66 VDC
 Antenna: Rohde & Schwarz HL 223, Vertical
 Measurement distance: 3 m
 Mode: Tx; Pit Antenna 6697916, 912.5 MHz
 Test Date: 2022-03-23
 Note:

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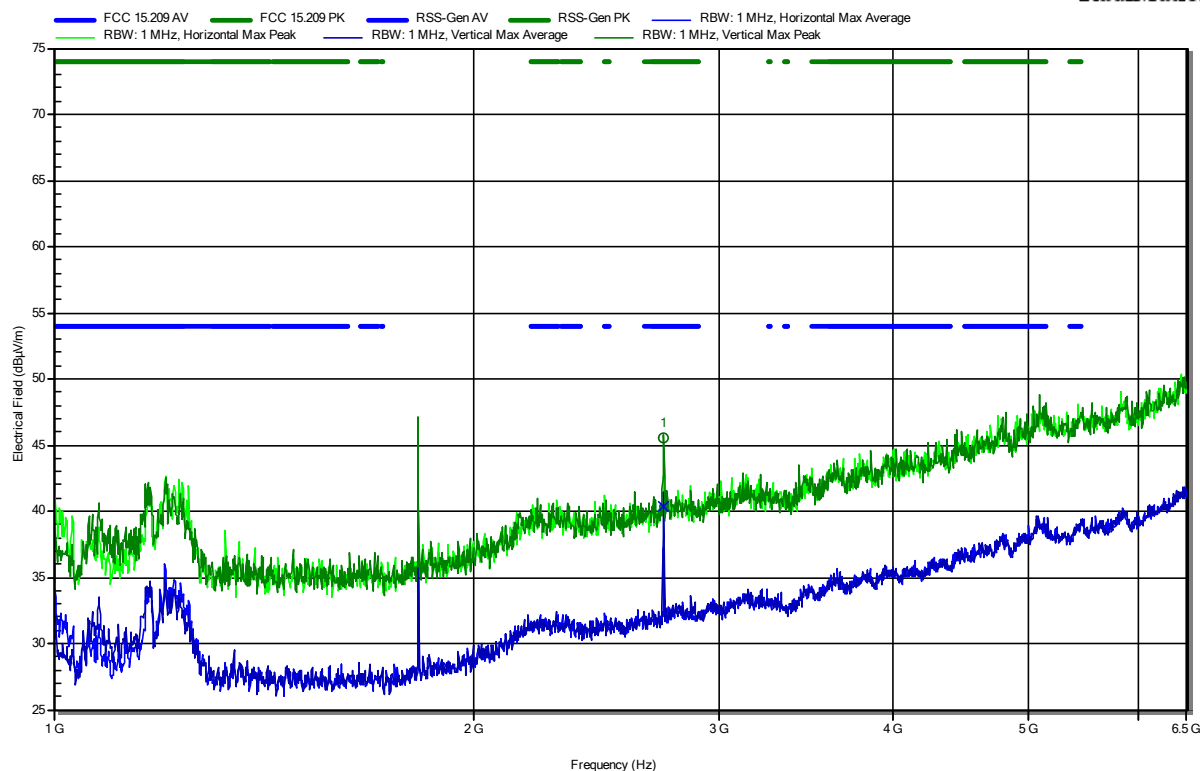


Radiated Spurious Emissions according to FCC 15.247, RSS-247 Issue 2

Project Number: G0M-2201-1256
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 38836
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Voigt
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 23 °Celsius, Vnom: 3.66 VDC
 Antenna: Schwarzbeck BBHA 9120D
 Measurement distance: 3 m
 Mode: Tx; Pit Antenna 6697916, 912.5 MHz
 Test Date: 2022-03-23
 Note:

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Frequency 2.7376 GHz	Peak 45.59 dBμV/m	Peak Limit 74 dBμV/m	Peak Difference -28.41 dB	Peak Status Pass	Polarization Vertical
Frequency 2.7376 GHz	Average 40.4 dBμV/m	Average Limit 54 dBμV/m	Average Difference -13.6 dB	Average Status Pass	Polarization Vertical

Test Report No.: G0M-2201-1256-TFC247DT-V01

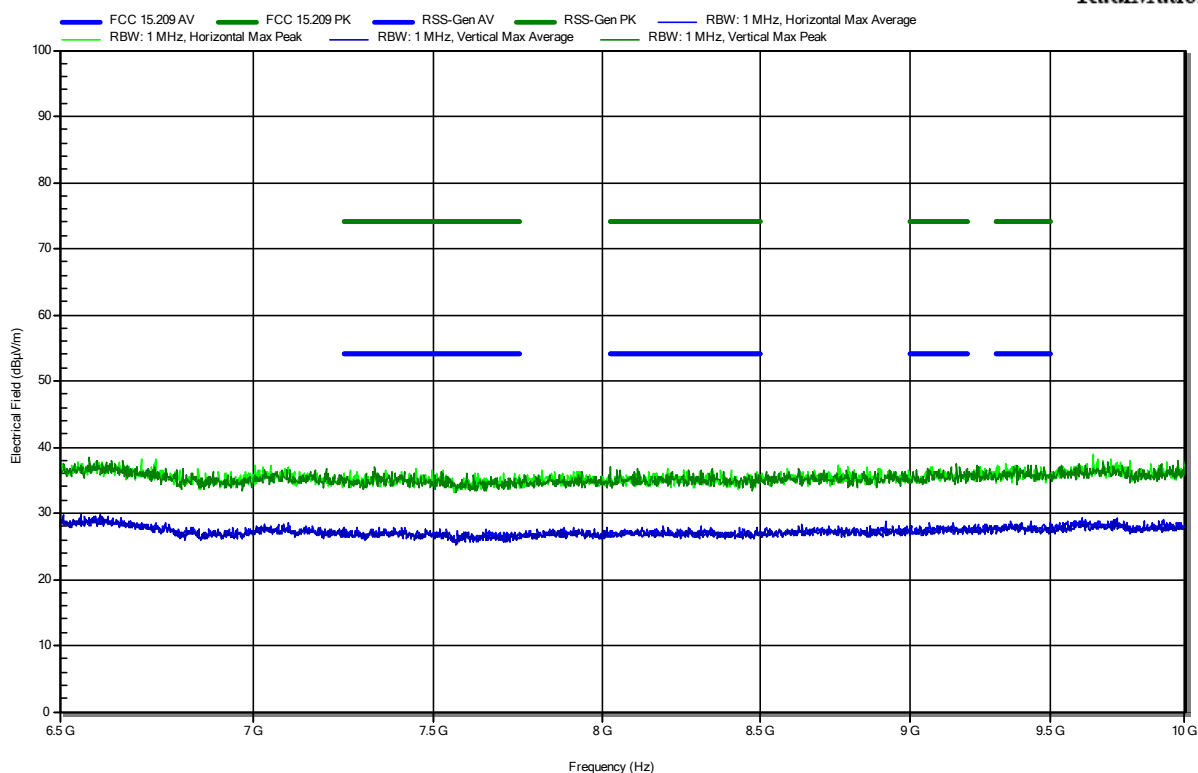
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Radiated Spurious Emissions according to FCC 15.247, RSS-247 Issue 2

Project Number: G0M-2201-1256
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 38836
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Voigt
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 23 °Celsius, Vnom: 3.66 VDC
 Antenna: Schwarzbeck HWRD 650
 Measurement distance: 3 m
 Mode: Tx; Pit Antenna 6697916, 912.5 MHz
 Test Date: 2022-03-23
 Note:

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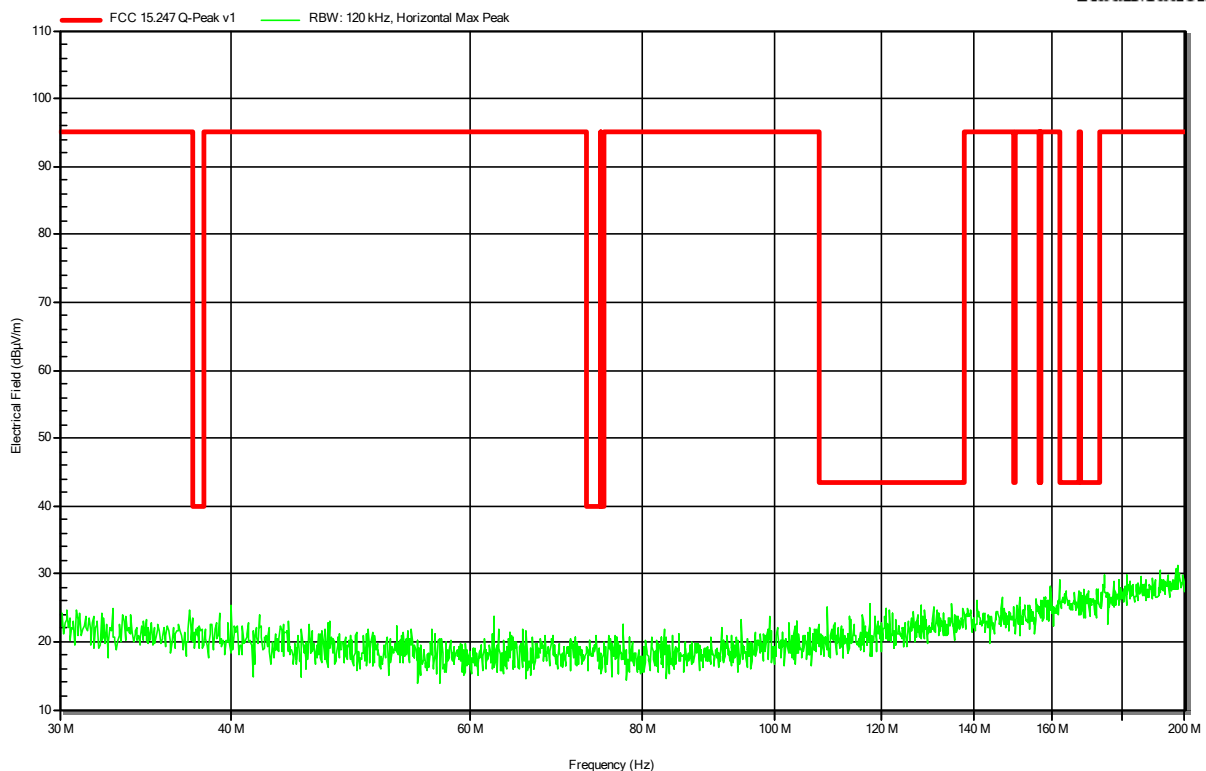


Radiated Spurious Emissions according to FCC 15.247, RSS-247 Issue 2

Project Number: G0M-2201-1256
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 38836
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 23 °Celsius, Vnom: 3.66 VDC
 Antenna: Rohde & Schwarz HK 116, Horizontal
 Measurement distance: 3 m
 Mode: Tx; Pit Antenna 6697916, 918.5 MHz
 Test Date: 2022-03-23
 Note:

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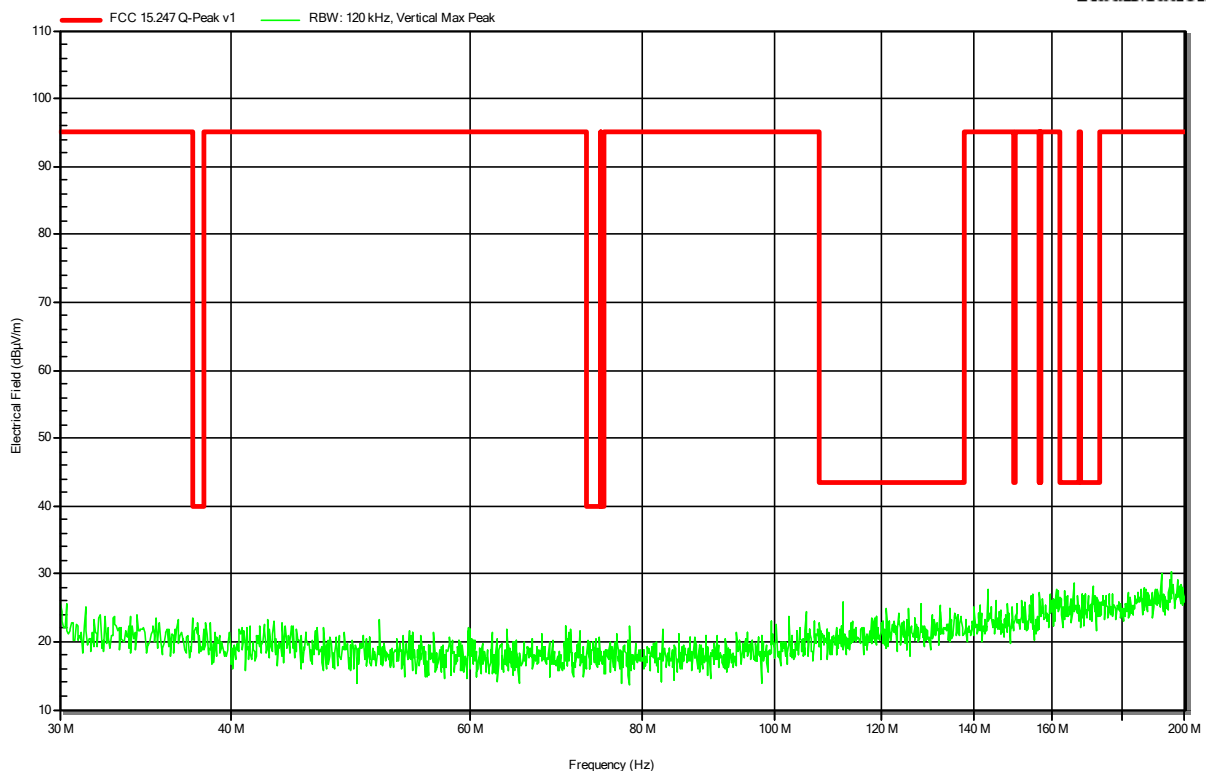


Radiated Spurious Emissions according to FCC 15.247, RSS-247 Issue 2

Project Number: G0M-2201-1256
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 38836
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 23 °Celsius, Vnom: 3.66 VDC
 Antenna: Rohde & Schwarz HK 116, Vertical
 Measurement distance: 3 m
 Mode: Tx; Pit Antenna 6697916, 918.5 MHz
 Test Date: 2022-03-23
 Note:

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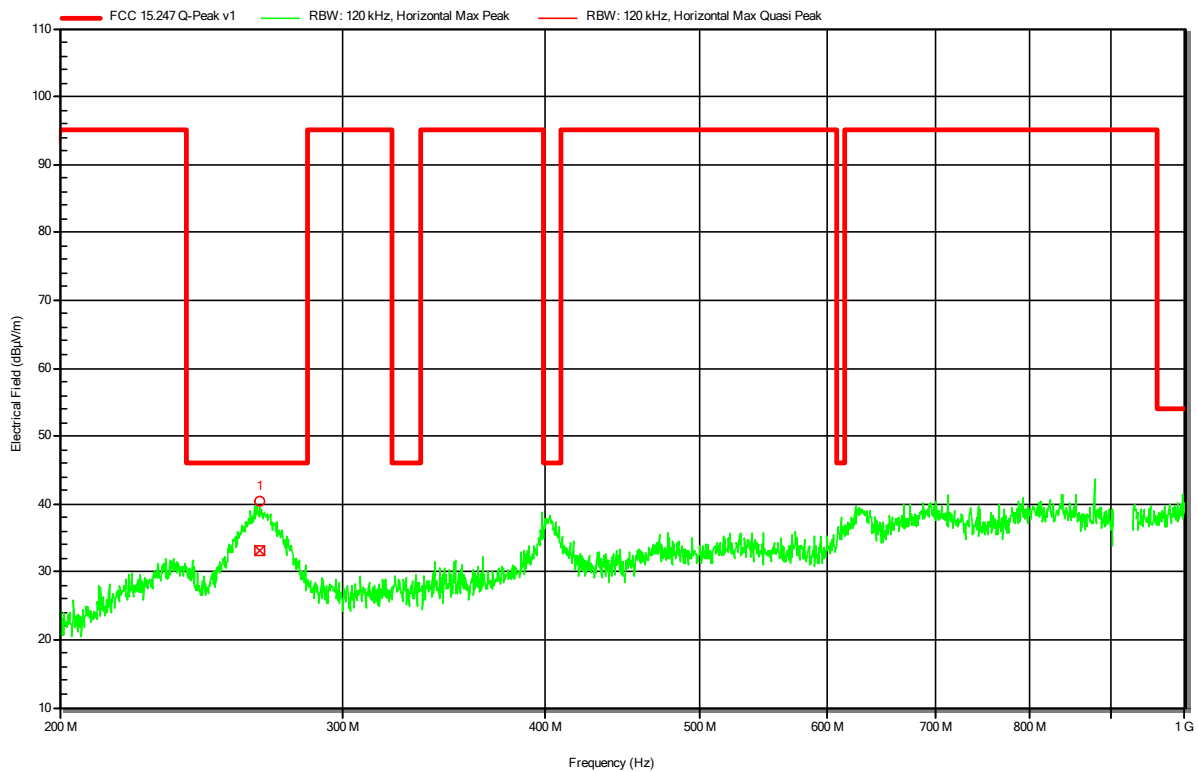


Radiated Spurious Emissions according to FCC 15.247, RSS-247 Issue 2

Project Number: G0M-2201-1256
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 38836
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 23 °Celsius, Vnom: 3.66 VDC
 Antenna: Rohde & Schwarz HL 223, Horizontal
 Measurement distance: 3 m
 Mode: Tx; Pit Antenna 6697916, 918.5 MHz
 Test Date: 2022-03-23
 Note:

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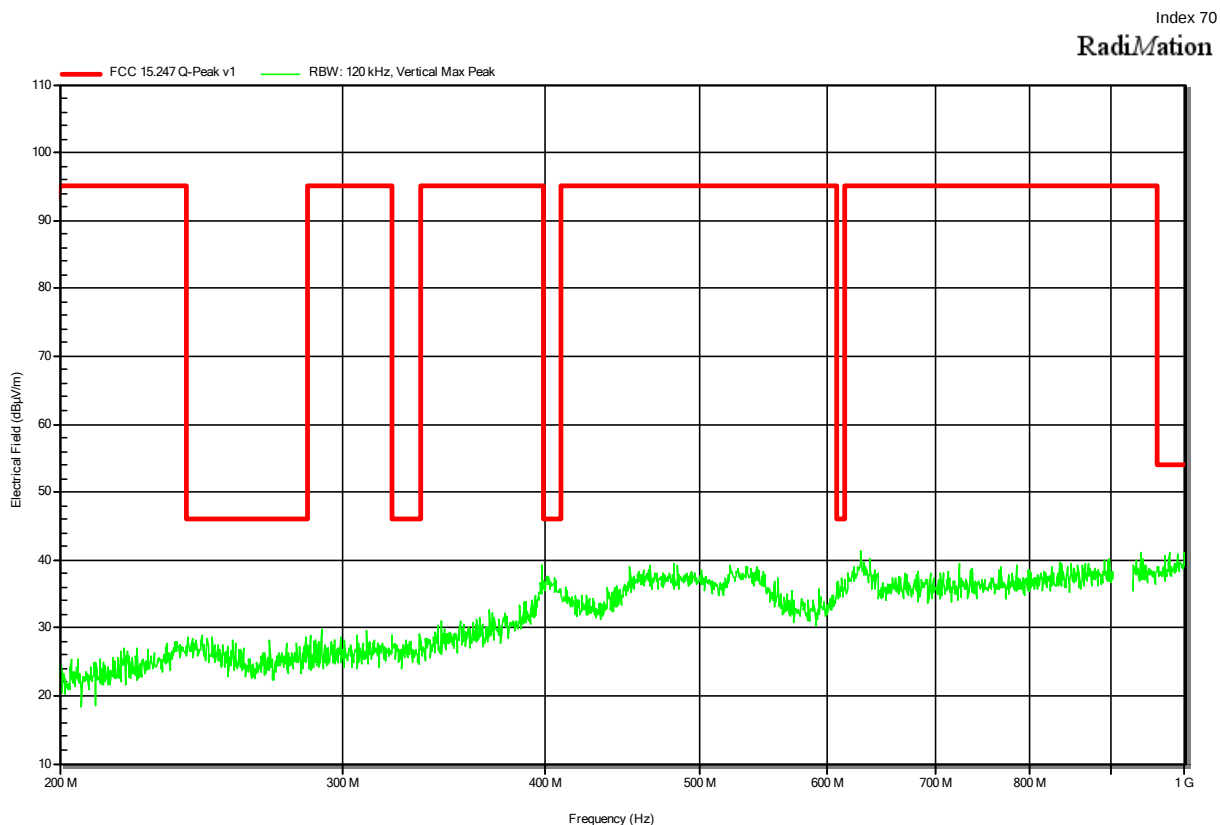
RadiMation



Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status
266.12 MHz	33.1 dBμV/m	46 dBμV/m	-12.85 dB	Pass

Radiated Spurious Emissions according to FCC 15.247, RSS-247 Issue 2

Project Number: G0M-2201-1256
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 38836
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 23 °Celsius, Vnom: 3.66 VDC
 Antenna: Rohde & Schwarz HL 223, Vertical
 Measurement distance: 3 m
 Mode: Tx; Pit Antenna 6697916, 918.5 MHz
 Test Date: 2022-03-23
 Note:

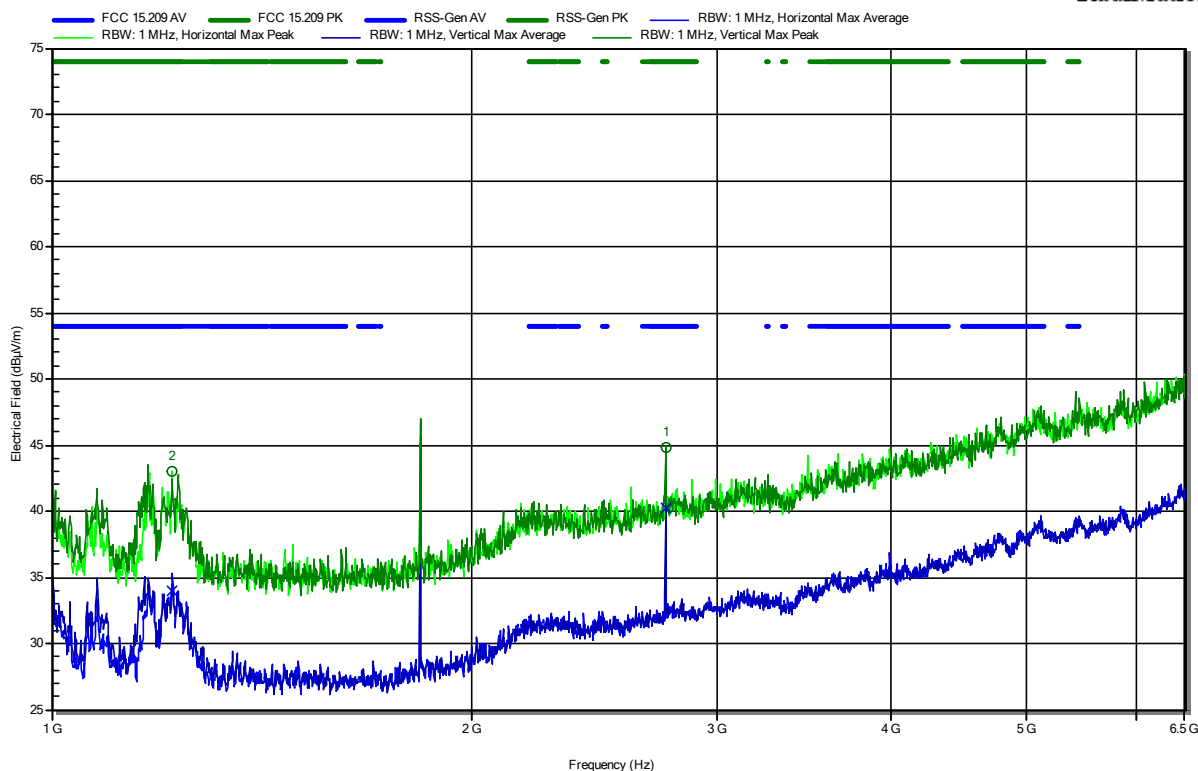


Radiated Spurious Emissions according to FCC 15.247, RSS-247 Issue 2

Project Number: G0M-2201-1256
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 38836
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Voigt
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 23 °Celsius, Vnom: 3.66 VDC
 Antenna: Schwarzbeck BBHA 9120D
 Measurement distance: 3 m
 Mode: Tx; Pit Antenna 6697916, 918.5 MHz
 Test Date: 2022-03-23
 Note:

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Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
1.2201 GHz	43.02 dBµV/m	74 dBµV/m	-30.98 dB	Pass	Horizontal
2.7556 GHz	44.86 dBµV/m	74 dBµV/m	-29.14 dB	Pass	Vertical

Frequency	Average	Average Limit	Average Difference	Average Status	Polarization
1.2201 GHz	33.96 dBµV/m	54 dBµV/m	-20.04 dB	Pass	Horizontal
2.7556 GHz	40.19 dBµV/m	54 dBµV/m	-13.81 dB	Pass	Vertical

Test Report No.: G0M-2201-1256-TFC247DT-V01

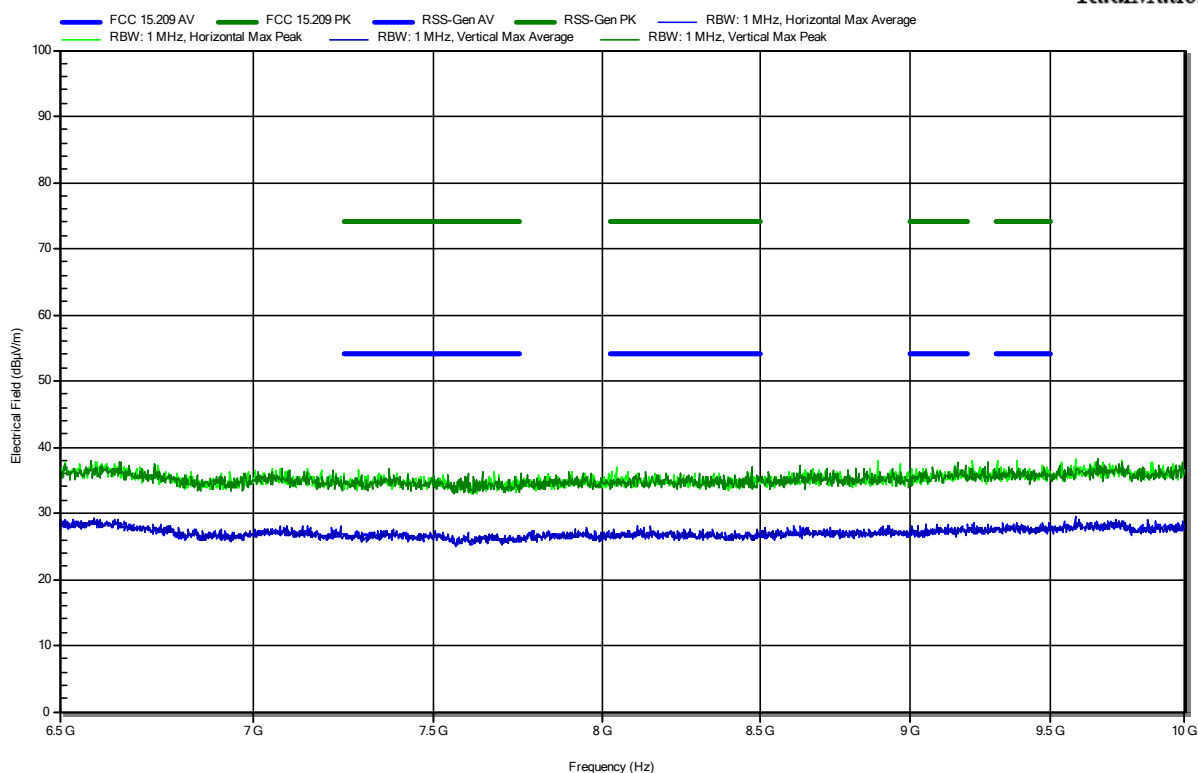
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Radiated Spurious Emissions according to FCC 15.247, RSS-247 Issue 2

Project Number: G0M-2201-1256
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 38836
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Voigt
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 23 °Celsius, Vnom: 3.66 VDC
 Antenna: Schwarzbeck HWRD 650
 Measurement distance: 3 m
 Mode: Tx; Pit Antenna 6697916, 918.5 MHz
 Test Date: 2022-03-23
 Note:

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RadiMation

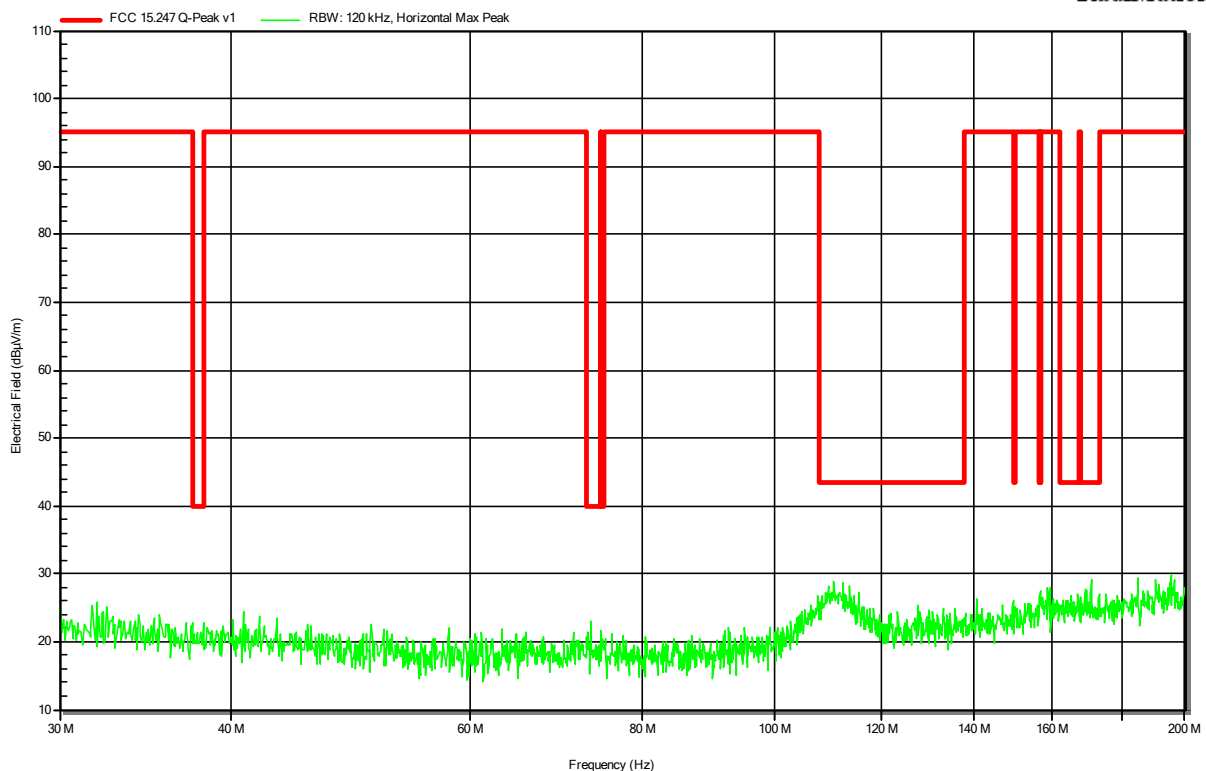


Radiated Spurious Emissions according to FCC 15.247, RSS-247 Issue 2

Project Number: G0M-2201-1256
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 38836
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 23 °Celsius, Vnom: 3.66 VDC
 Antenna: Rohde & Schwarz HK 116, Horizontal
 Measurement distance: 3 m
 Mode: Tx; Wall Antenna 6699490, 912.5 MHz
 Test Date: 2022-03-23
 Note:

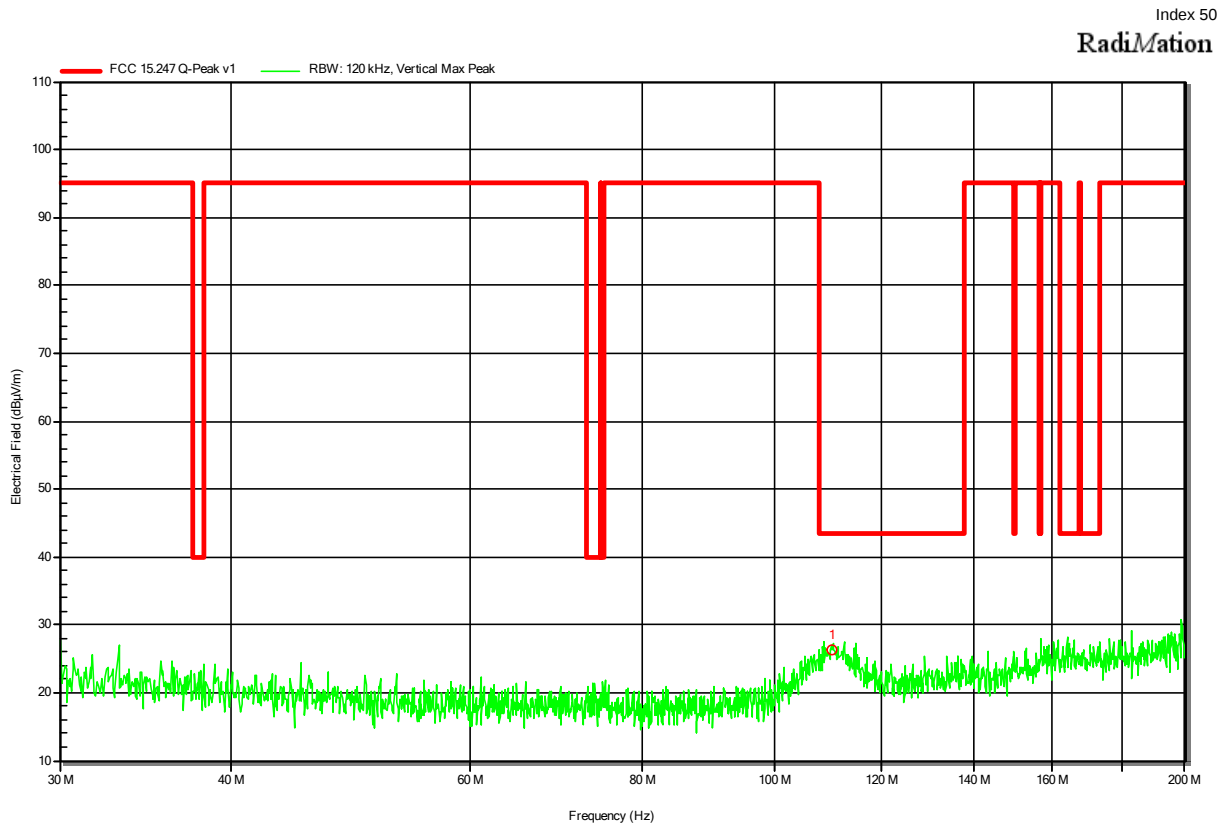
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Radiated Spurious Emissions according to FCC 15.247, RSS-247 Issue 2

Project Number: G0M-2201-1256
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 38836
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 23 °Celsius, Vnom: 3.66 VDC
 Antenna: Rohde & Schwarz HK 116, Vertical
 Measurement distance: 3 m
 Mode: Tx; Wall Antenna 6699490, 912.5 MHz
 Test Date: 2022-03-23
 Note:



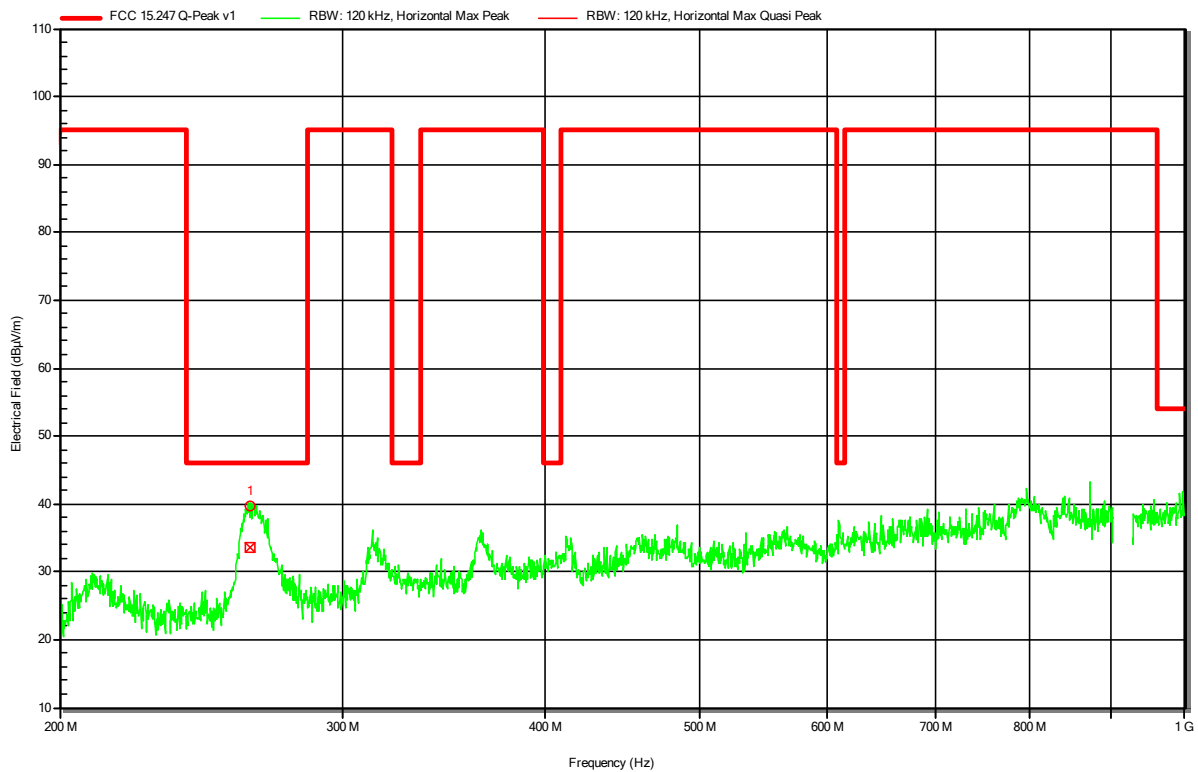
Frequency	Peak	Peak Limit	Peak Difference	Peak Status
110.3495 MHz	26.3 dBµV/m	43.5 dBµV/m	-17.22 dB	Pass

Radiated Spurious Emissions according to FCC 15.247, RSS-247 Issue 2

Project Number: G0M-2201-1256
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 38836
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 23 °Celsius, Vnom: 3.66 VDC
 Antenna: Rohde & Schwarz HL 223, Horizontal
 Measurement distance: 3 m
 Mode: Tx; Wall Antenna 6699490, 912.5 MHz
 Test Date: 2022-03-23
 Note:

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RadiMation



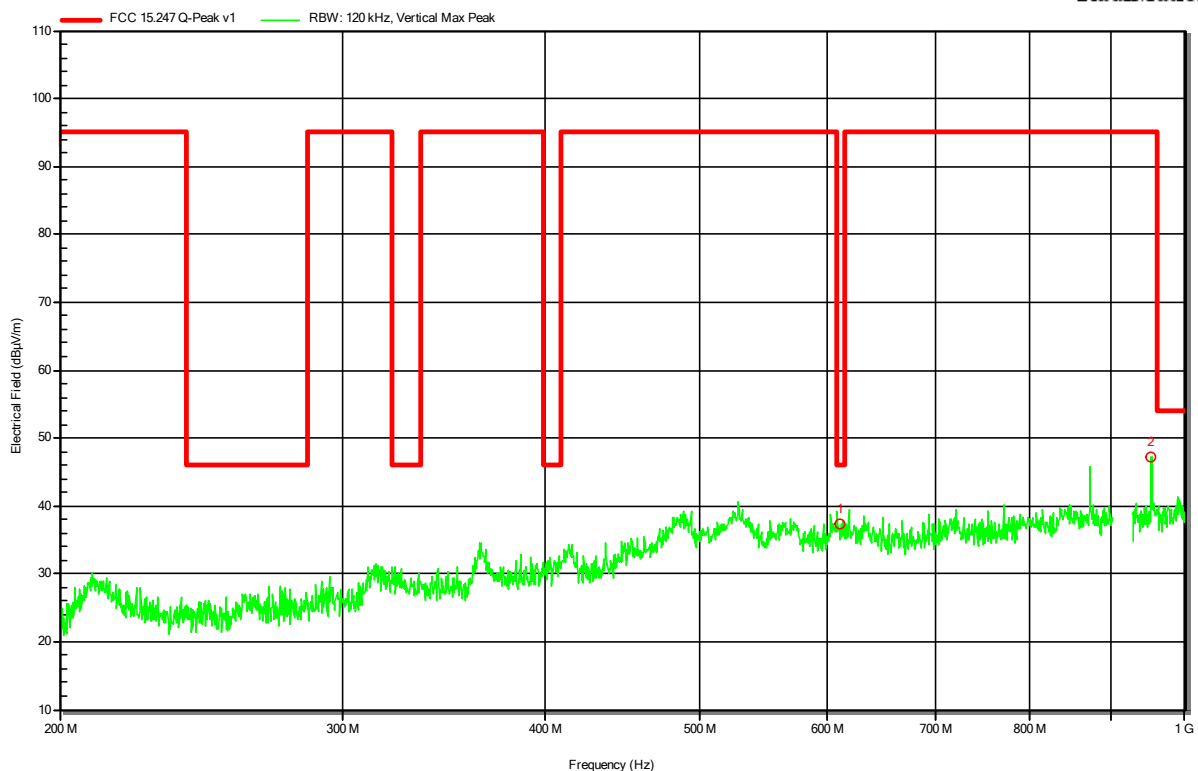
Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status
262.82 MHz	33.7 dBμV/m	46 dBμV/m	-12.3 dB	Pass

Radiated Spurious Emissions according to FCC 15.247, RSS-247 Issue 2

Project Number: G0M-2201-1256
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 38836
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 23 °Celsius, Vnom: 3.66 VDC
 Antenna: Rohde & Schwarz HL 223, Vertical
 Measurement distance: 3 m
 Mode: Tx; Wall Antenna 6699490, 912.5 MHz
 Test Date: 2022-03-23
 Note:

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RadiMation



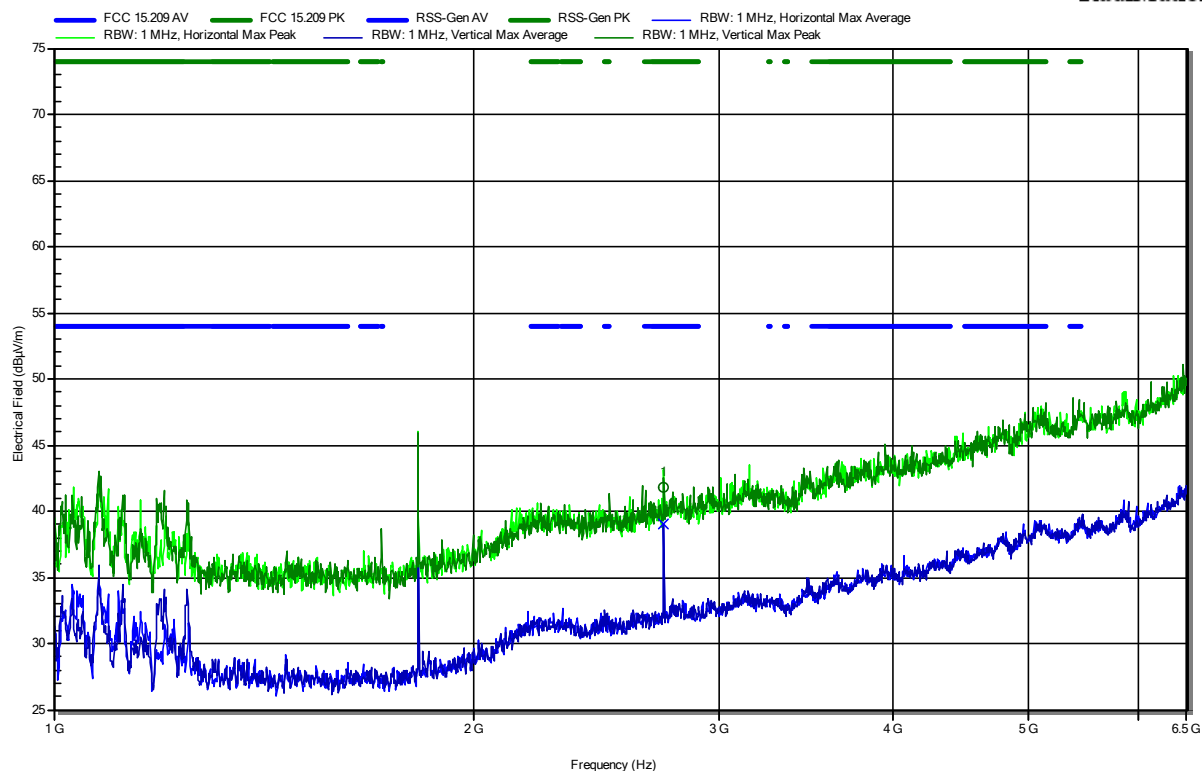
Frequency	Peak	Peak Limit	Peak Difference	Peak Status
610.94 MHz	37.4 dBμV/m	46 dBμV/m	-8.57 dB	Pass
952.48 MHz	47.3 dBμV/m	95 dBμV/m	-47.74 dB	Pass

Radiated Spurious Emissions according to FCC 15.247, RSS-247 Issue 2

Project Number: G0M-2201-1256
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 38836
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Voigt
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 23 °Celsius, Vnom: 3.66 VDC
 Antenna: Schwarzbeck BBHA 9120D
 Measurement distance: 3 m
 Mode: Tx; Wall Antenna 6699490, 912.5 MHz
 Test Date: 2022-03-23
 Note:

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Frequency 2.7377 GHz	Peak 41.8 dBμV/m	Peak Limit 74 dBμV/m	Peak Difference -32.2 dB	Peak Status Pass	Polarization Vertical
Frequency 2.7377 GHz	Average 39.01 dBμV/m	Average Limit 54 dBμV/m	Average Difference -14.99 dB	Average Status Pass	Polarization Vertical

Test Report No.: G0M-2201-1256-TFC247DT-V01

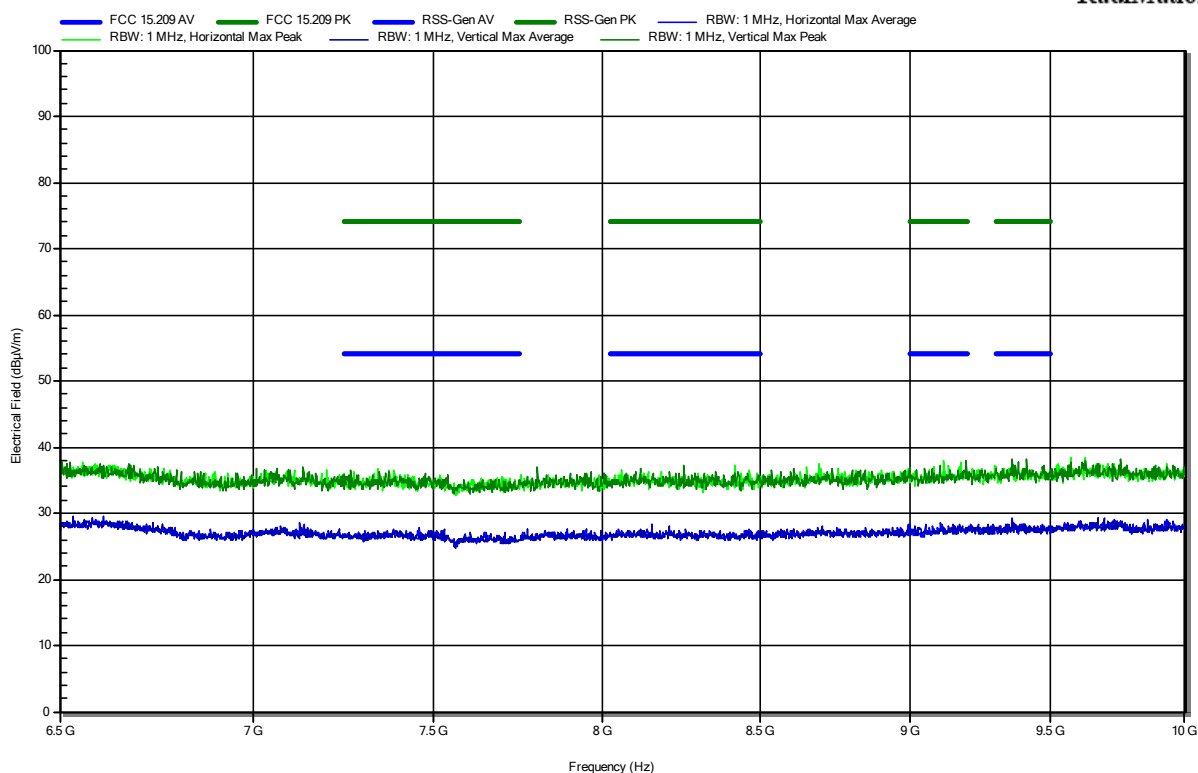
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Radiated Spurious Emissions according to FCC 15.247, RSS-247 Issue 2

Project Number: G0M-2201-1256
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 38836
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Voigt
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 23 °Celsius, Vnom: 3.66 VDC
 Antenna: Schwarzbeck HWRD 650
 Measurement distance: 3 m
 Mode: Tx; Wall Antenna 6699490, 912.5 MHz
 Test Date: 2022-03-23
 Note:

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RadiMation

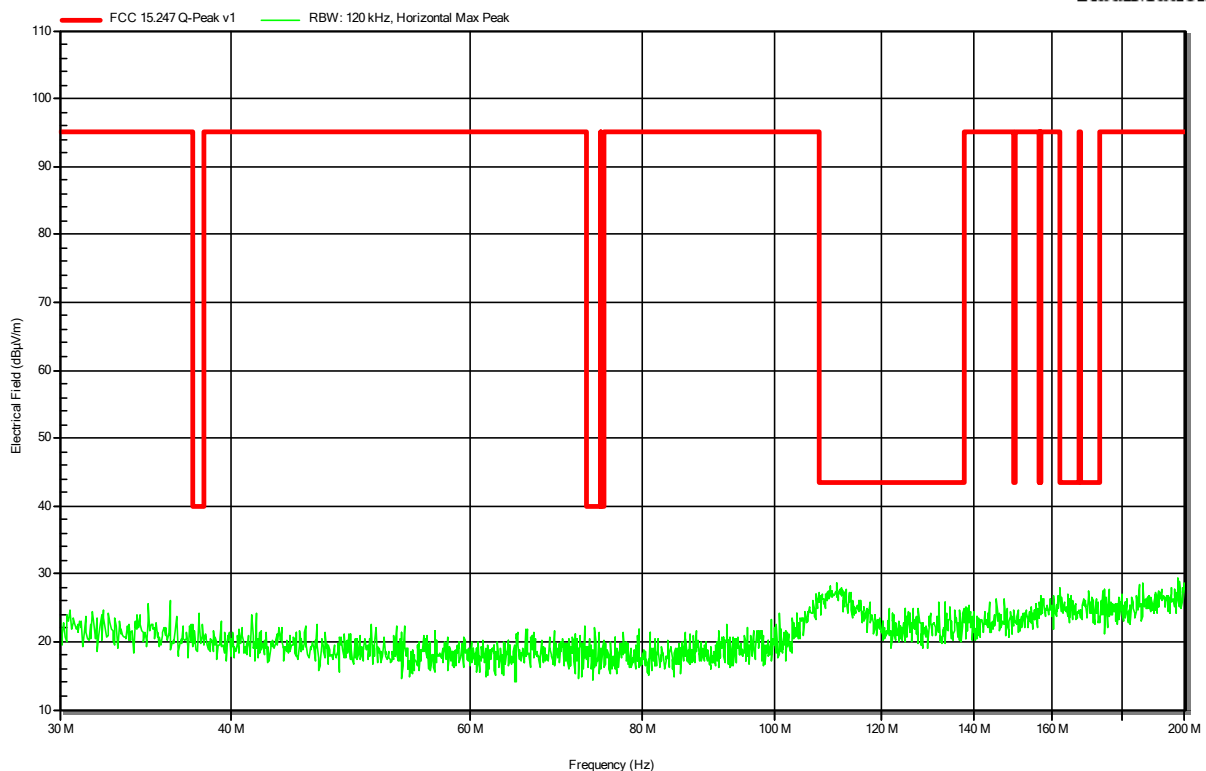


Radiated Spurious Emissions according to FCC 15.247, RSS-247 Issue 2

Project Number: G0M-2201-1256
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 38836
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 23 °Celsius, Vnom: 3.66 VDC
 Antenna: Rohde & Schwarz HK 116, Horizontal
 Measurement distance: 3 m
 Mode: Tx; Wall Antenna 6699490, 918.5 MHz
 Test Date: 2022-03-23
 Note:

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RadiMation

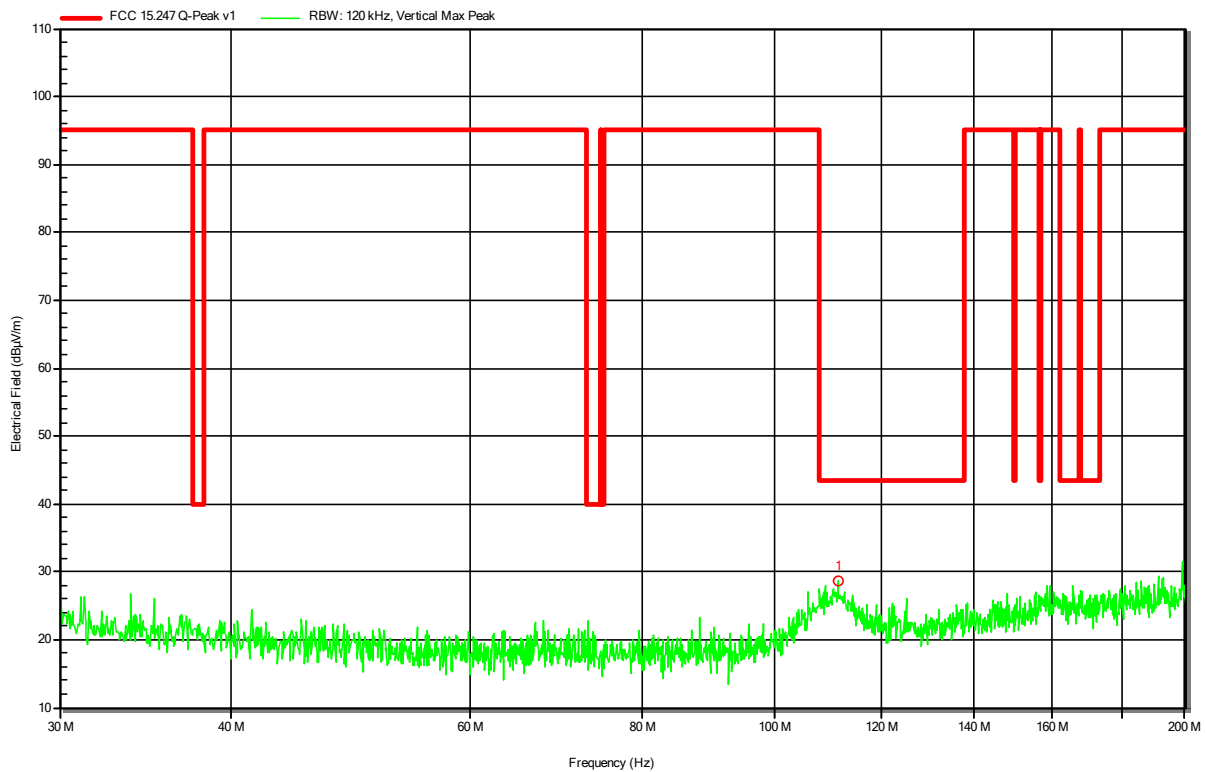


Radiated Spurious Emissions according to FCC 15.247, RSS-247 Issue 2

Project Number: G0M-2201-1256
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 38836
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 23 °Celsius, Vnom: 3.66 VDC
 Antenna: Rohde & Schwarz HK 116, Vertical
 Measurement distance: 3 m
 Mode: Tx; Wall Antenna 6699490, 918.5 MHz
 Test Date: 2022-03-23
 Note:

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RadiMation



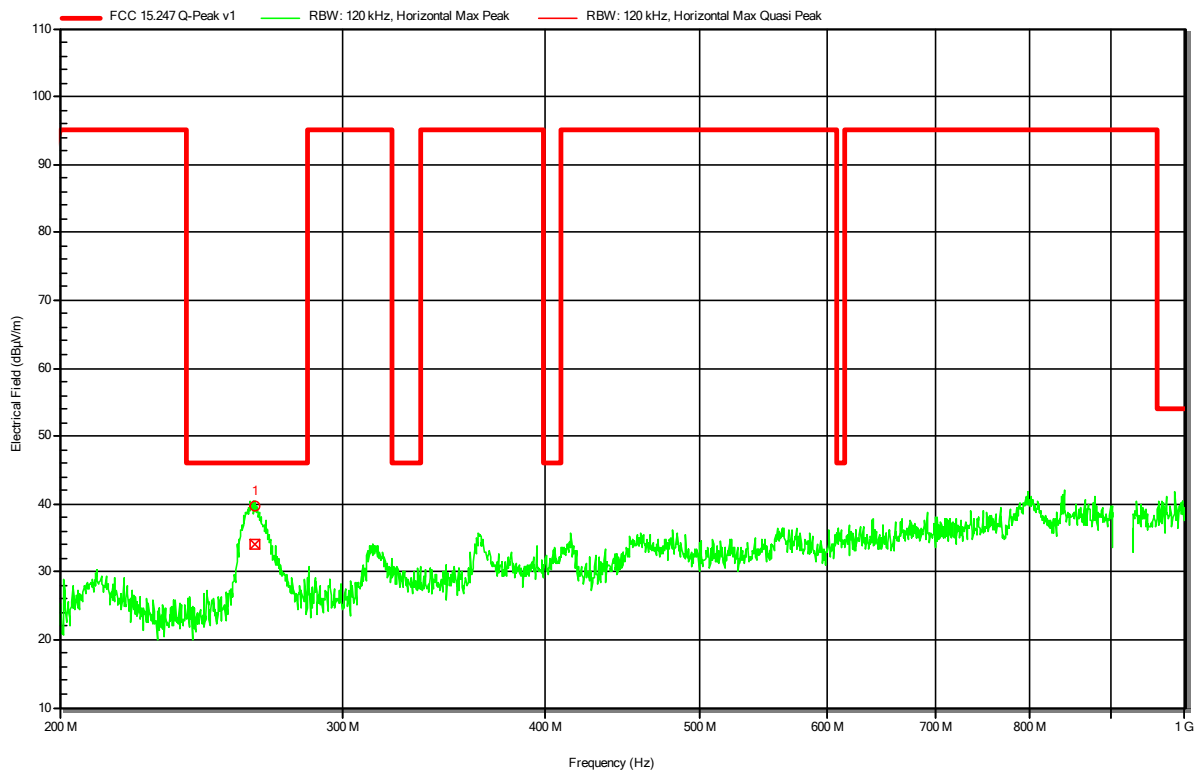
Frequency	Peak	Peak Limit	Peak Difference	Peak Status
111.4896 MHz	28.6 dBμV/m	43.5 dBμV/m	-14.93 dB	Pass

Radiated Spurious Emissions according to FCC 15.247, RSS-247 Issue 2

Project Number: G0M-2201-1256
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 38836
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 23 °Celsius, Vnom: 3.66 VDC
 Antenna: Rohde & Schwarz HL 223, Horizontal
 Measurement distance: 3 m
 Mode: Tx; Wall Antenna 6699490, 918.5 MHz
 Test Date: 2022-03-23
 Note:

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RadiMation



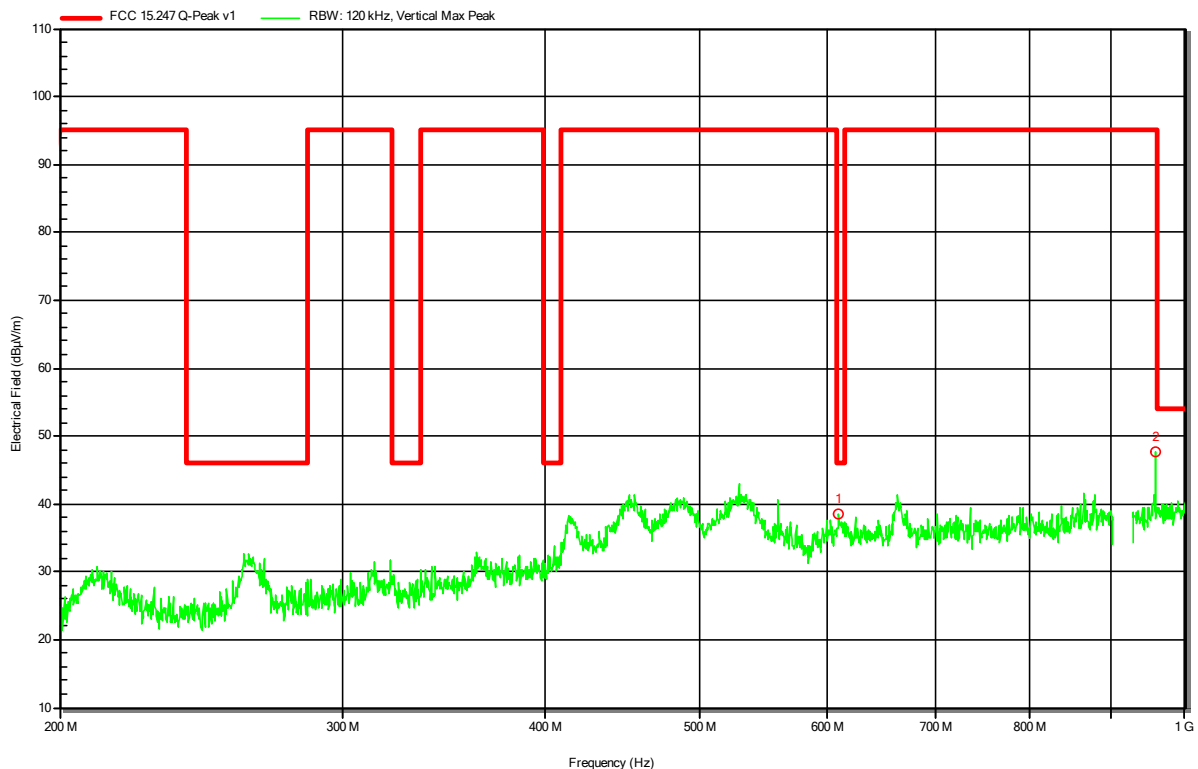
Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status
264.2 MHz	34.1 dBμV/m	46 dBμV/m	-11.86 dB	Pass

Radiated Spurious Emissions according to FCC 15.247, RSS-247 Issue 2

Project Number: G0M-2201-1256
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 38836
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 23 °Celsius, Vnom: 3.66 VDC
 Antenna: Rohde & Schwarz HL 223, Vertical
 Measurement distance: 3 m
 Mode: Tx; Wall Antenna 6699490, 918.5 MHz
 Test Date: 2022-03-23
 Note:

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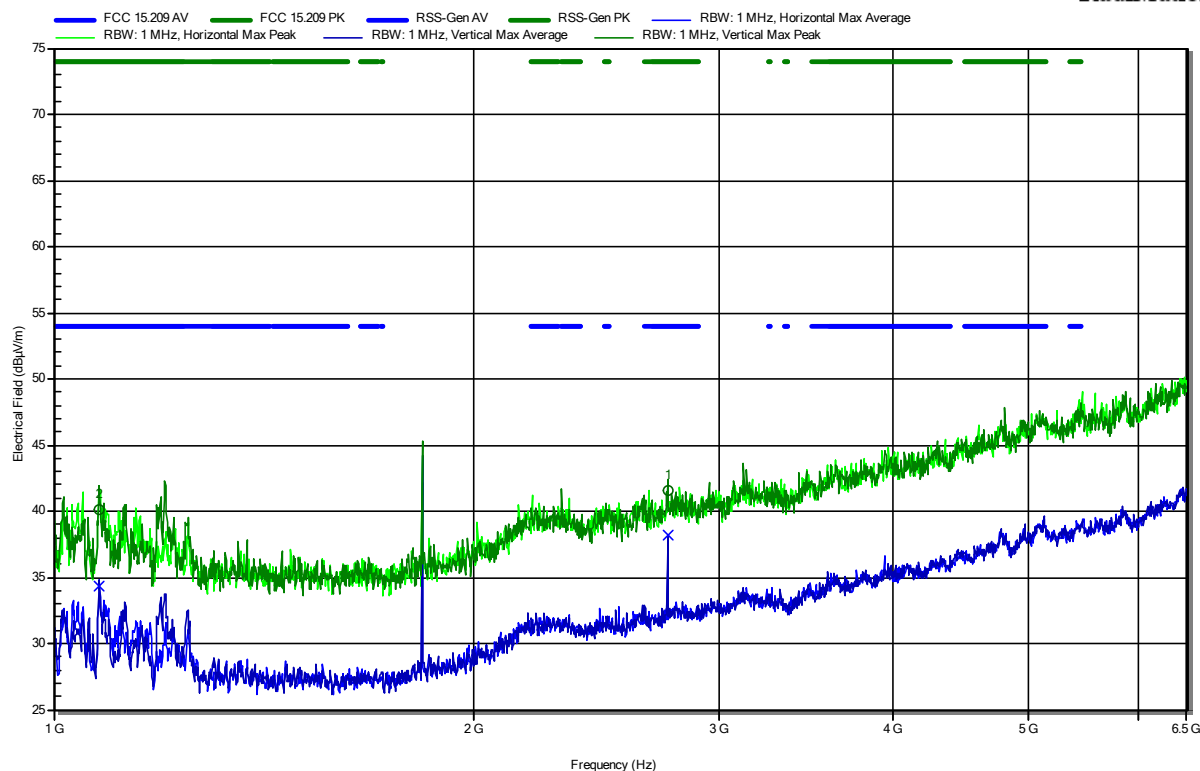
Frequency	Peak	Peak Limit	Peak Difference	Peak Status
609.56 MHz	38.4 dBμV/m	46 dBμV/m	-7.56 dB	Pass
958.48 MHz	47.8 dBμV/m	95 dBμV/m	-47.25 dB	Pass

Radiated Spurious Emissions according to FCC 15.247, RSS-247 Issue 2

Project Number: G0M-2201-1256
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 38836
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Voigt
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 23 °Celsius, Vnom: 3.66 VDC
 Antenna: Schwarzbeck BBHA 9120D
 Measurement distance: 3 m
 Mode: Tx; Wall Antenna 6699490, 918.5 MHz
 Test Date: 2022-03-23
 Note:

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Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
1.0776 GHz	40.16 dBμV/m	74 dBμV/m	-33.84 dB	Pass	Horizontal
2.7557 GHz	41.6 dBμV/m	74 dBμV/m	-32.4 dB	Pass	Vertical

Frequency	Average	Average Limit	Average Difference	Average Status	Polarization
1.0776 GHz	34.36 dBμV/m	54 dBμV/m	-19.64 dB	Pass	Horizontal
2.7557 GHz	38.15 dBμV/m	54 dBμV/m	-15.85 dB	Pass	Vertical

Test Report No.: G0M-2201-1256-TFC247DT-V01

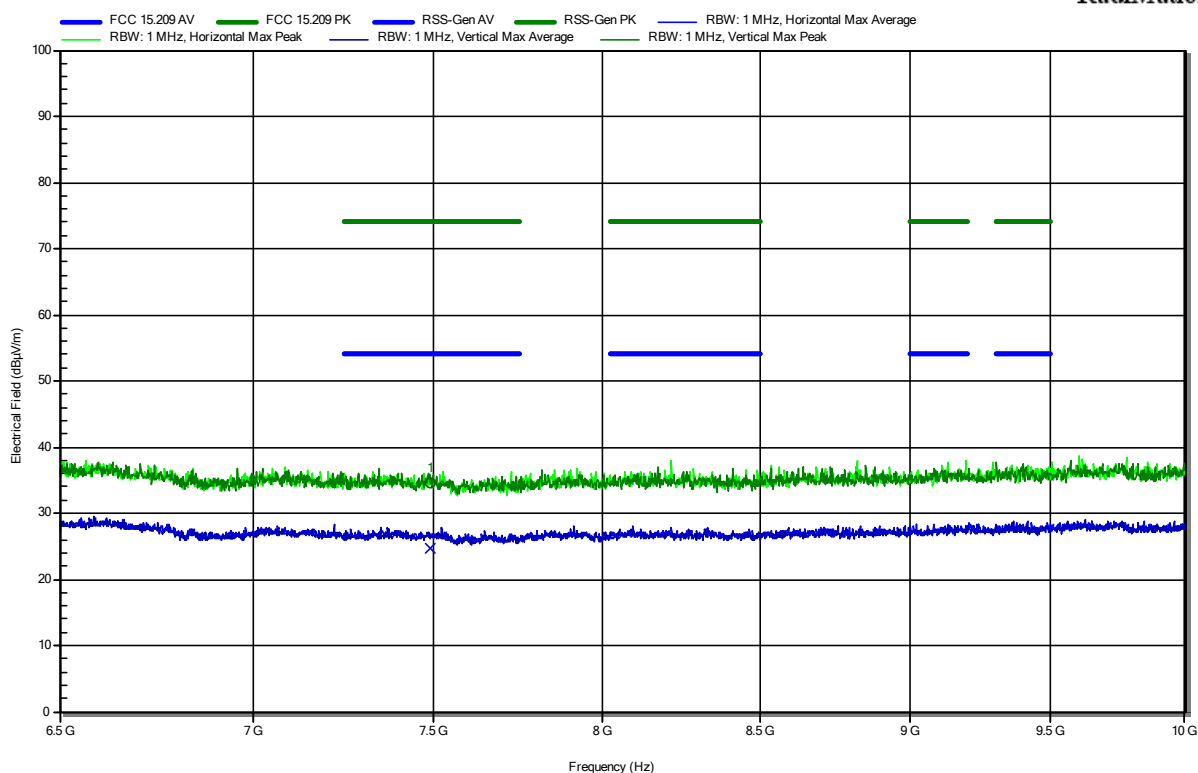
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Radiated Spurious Emissions according to FCC 15.247, RSS-247 Issue 2

Project Number: G0M-2201-1256
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 38836
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Voigt
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 23 °Celsius, Vnom: 3.66 VDC
 Antenna: Schwarzbeck HWRD 650
 Measurement distance: 3 m
 Mode: Tx; Wall Antenna 6699490, 918.5 MHz
 Test Date: 2022-03-23
 Note:

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Frequency 7.4897 GHz	Peak 34.59 dBµV/m	Peak Limit 74 dBµV/m	Peak Difference -39.41 dB	Peak Status Pass	Polarization Vertical
Frequency 7.4897 GHz	Average 24.6 dBµV/m	Average Limit 54 dBµV/m	Average Difference -29.4 dB	Average Status Pass	Polarization Vertical

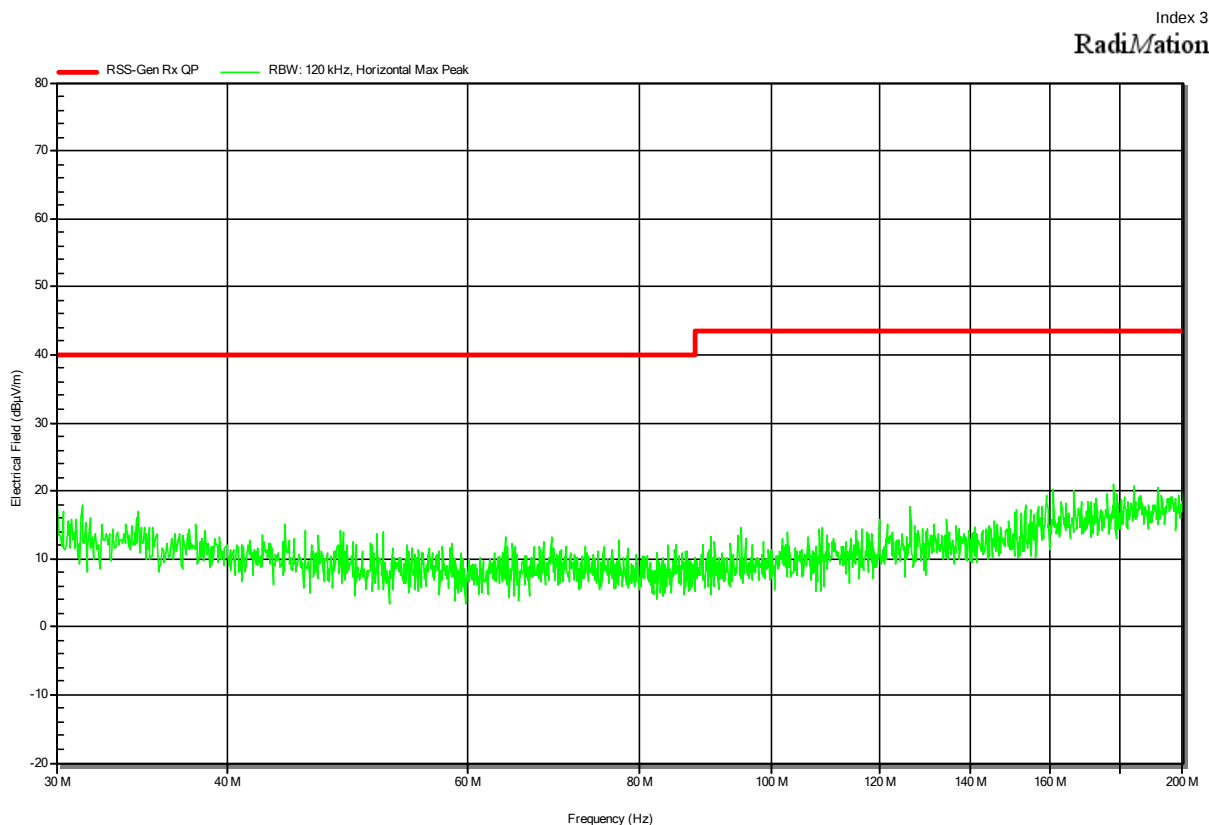
Test Report No.: G0M-2201-1256-TFC247DT-V01

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

ANNEX B Receiver spurious emissions

Radiated Spurious Emissions according to RSS-Gen Issue 5

Project Number: G0M-2201-1256
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 38836
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Voigt
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.66 VDC
 Antenna: Rohde & Schwarz HK 116, Horizontal
 Measurement distance: 3 m
 Mode: Rx; Helix Antenna 30261216, 915.0 MHz
 Test Date: 2022-03-22
 Note:

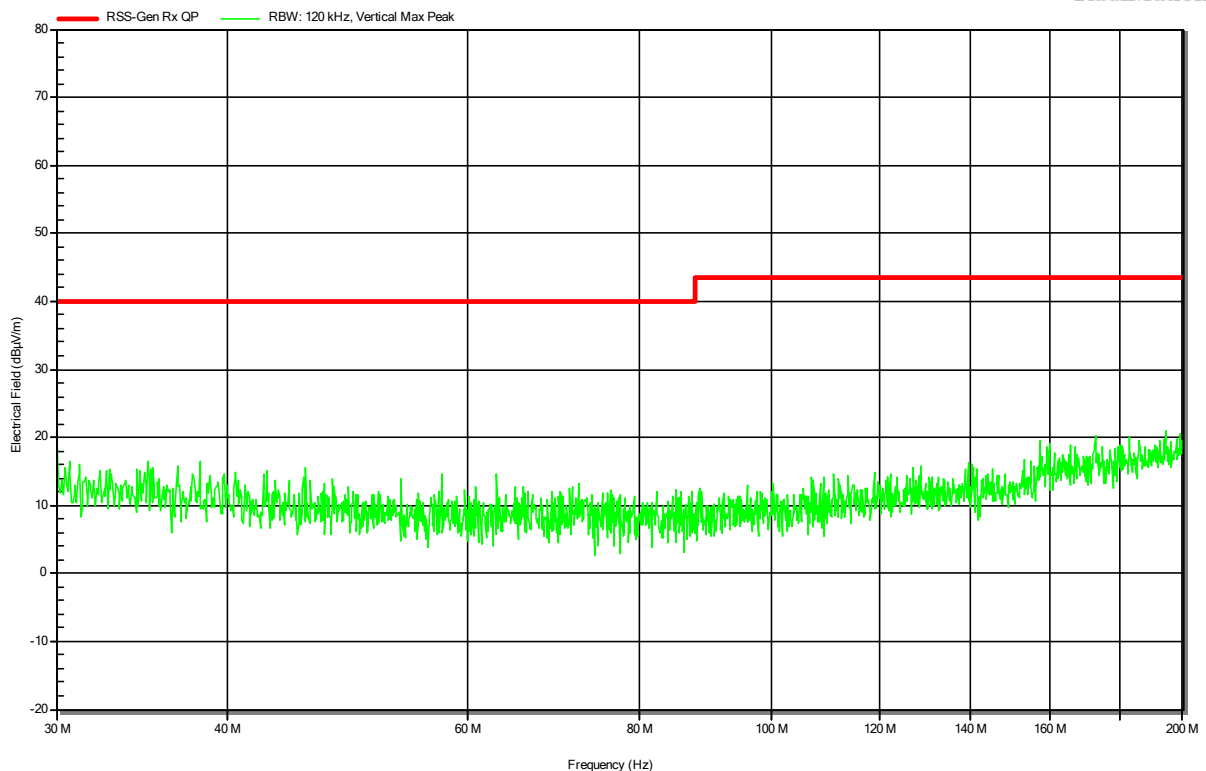


Radiated Spurious Emissions according to RSS-Gen Issue 5

Project Number: G0M-2201-1256
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 38836
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Voigt
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.66 VDC
 Antenna: Rohde & Schwarz HK 116, Vertical
 Measurement distance: 3 m
 Mode: Rx; Helix Antenna 30261216, 915.0 MHz
 Test Date: 2022-03-22
 Note:

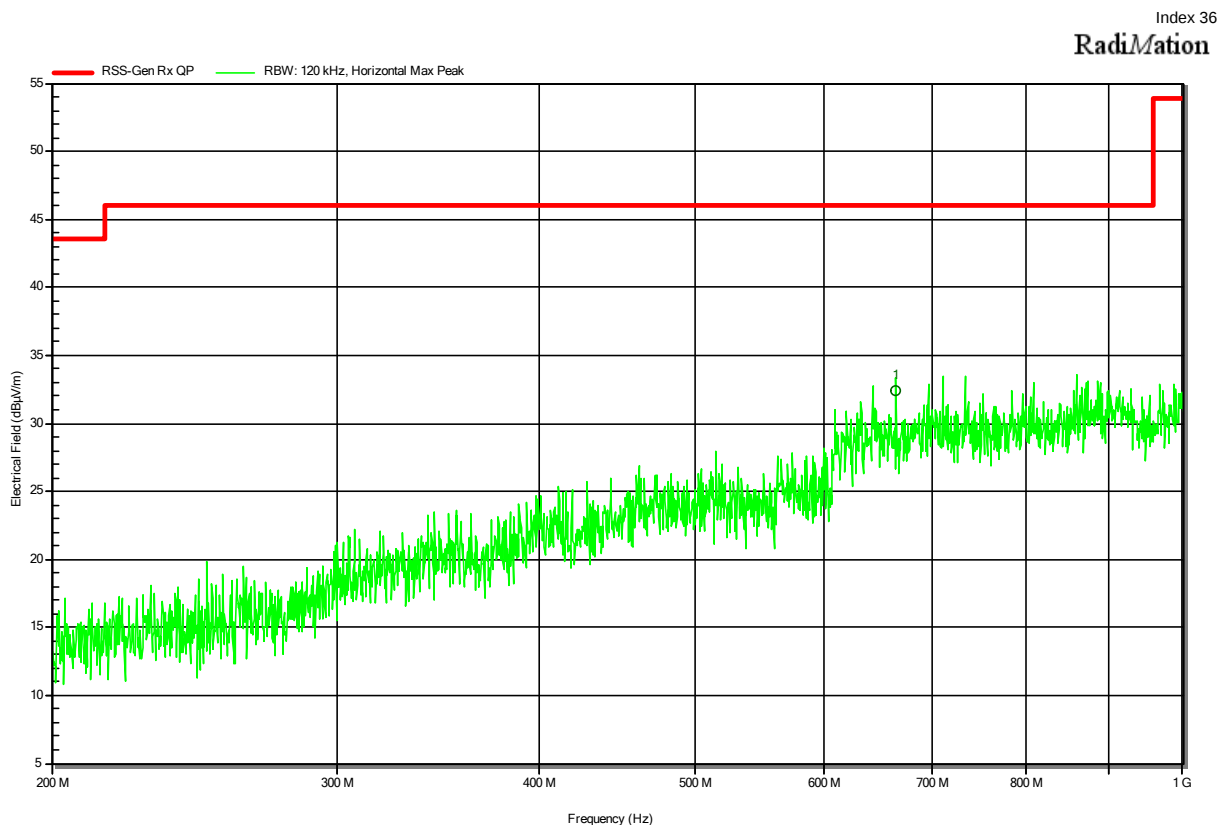
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Radiated Spurious Emissions according to RSS-Gen Issue 5

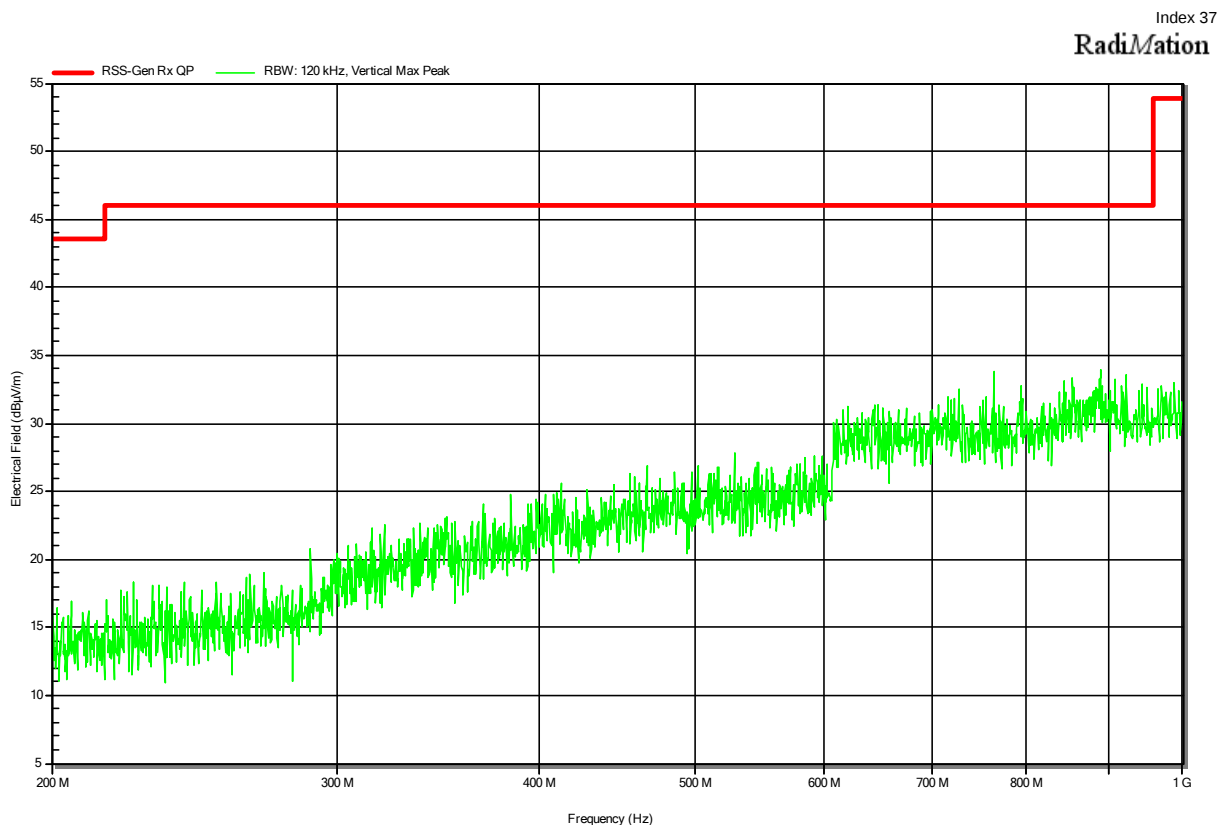
Project Number: G0M-2201-1256
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 38836
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Voigt
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.66 VDC
 Antenna: Rohde & Schwarz HL 223, Horizontal
 Measurement distance: 3 m
 Mode: Rx; Helix Antenna 30261216, 915.0 MHz
 Test Date: 2022-03-22
 Note:



Frequency	Peak	Peak Limit	Peak Difference	Peak Status
665.1316 MHz	32.4 dBµV/m	46 dBµV/m	-13.57 dB	Pass

Radiated Spurious Emissions according to RSS-Gen Issue 5

Project Number: G0M-2201-1256
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 38836
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Voigt
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.66 VDC
 Antenna: Rohde & Schwarz HL 223, Vertical
 Measurement distance: 3 m
 Mode: Rx; Helix Antenna 30261216, 915.0 MHz
 Test Date: 2022-03-22
 Note:

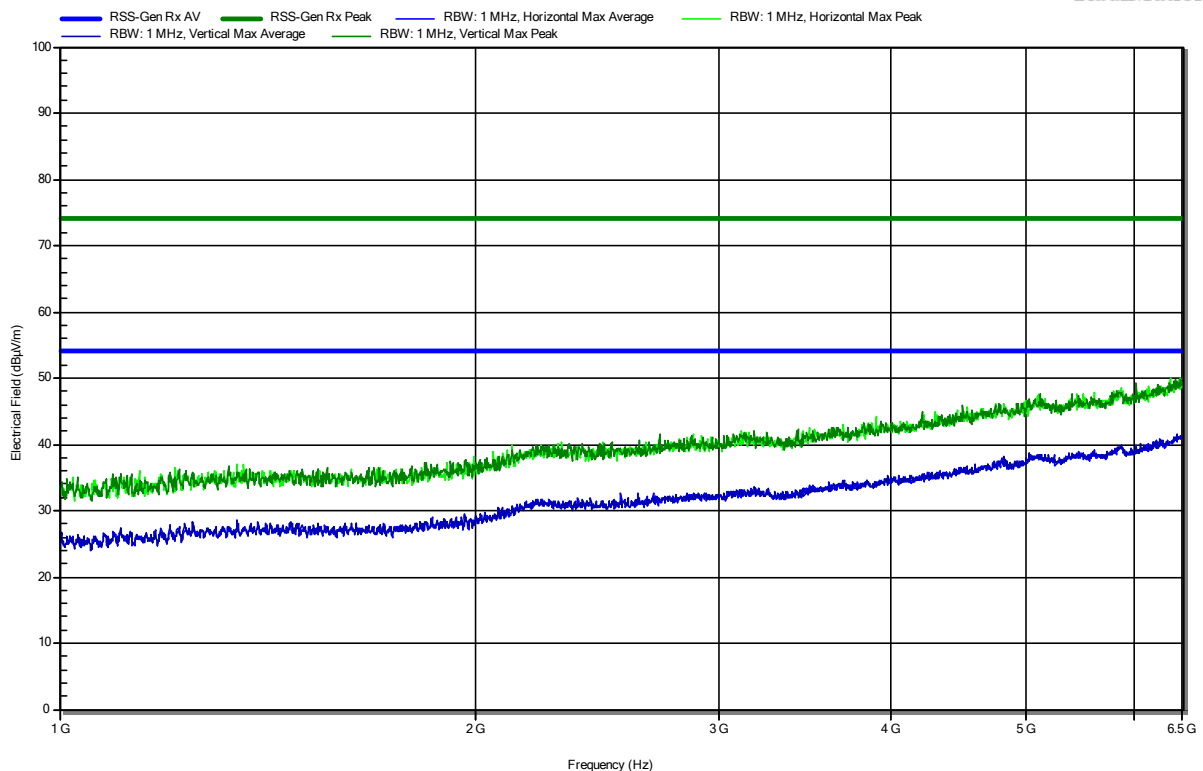


Radiated Spurious Emissions according to RSS-Gen Issue 5

Project Number: G0M-2201-1256
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 38836
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Voigt
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.66 VDC
 Antenna: Schwarzbeck BBHA 9120D
 Measurement distance: 3 m
 Mode: Rx; Helix Antenna 30261216, 915.0 MHz
 Test Date: 2022-03-22
 Note:

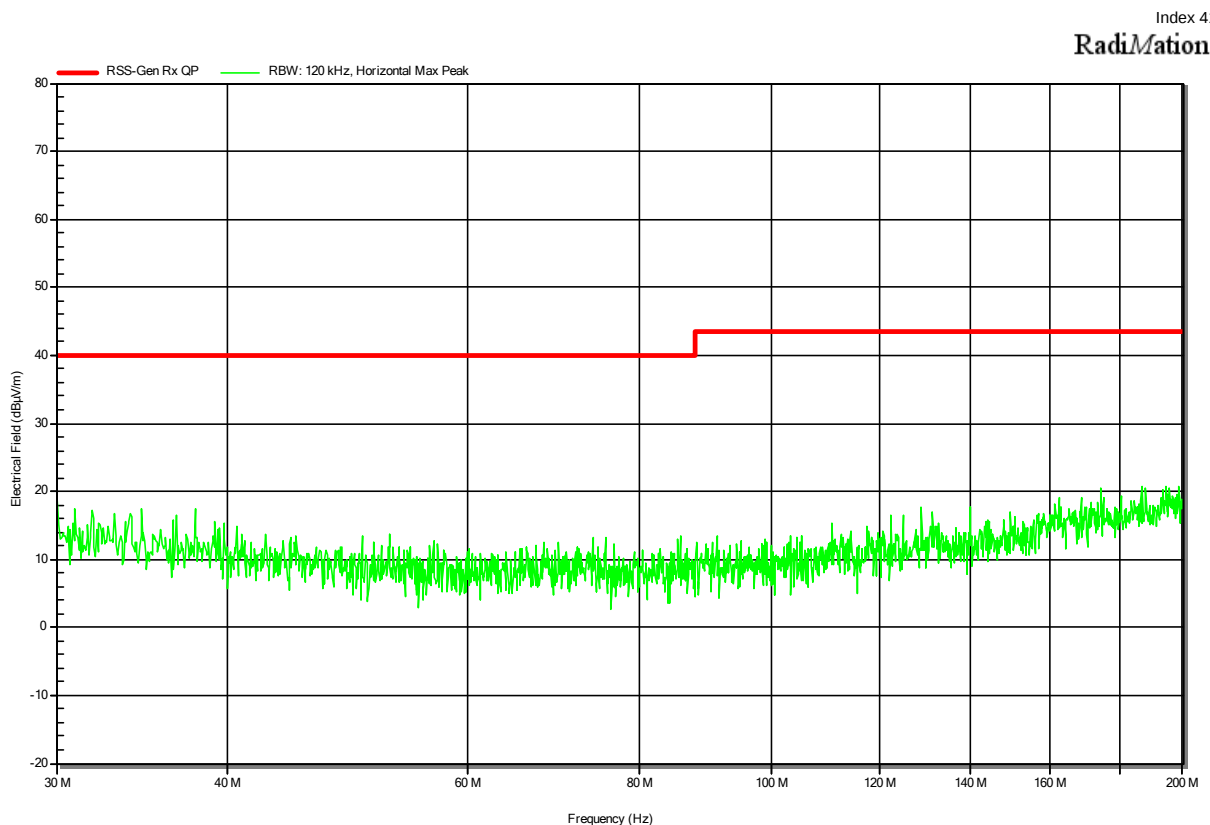
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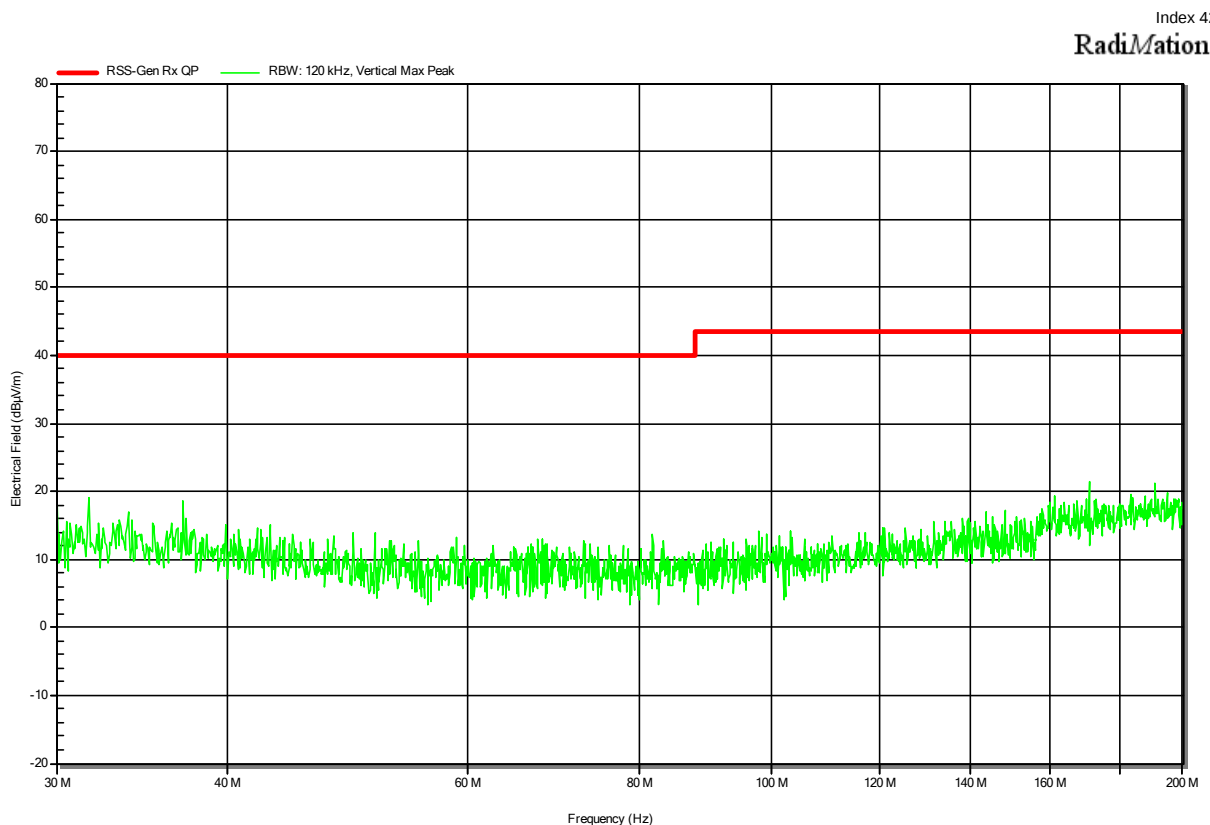
Radiated Spurious Emissions according to RSS-Gen Issue 5

Project Number: G0M-2201-1256
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 38836
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Voigt
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.66 VDC
 Antenna: Rohde & Schwarz HK 116, Horizontal
 Measurement distance: 3 m
 Mode: Rx; Pit Antenna 6697916, 915.0 MHz
 Test Date: 2022-03-22
 Note:



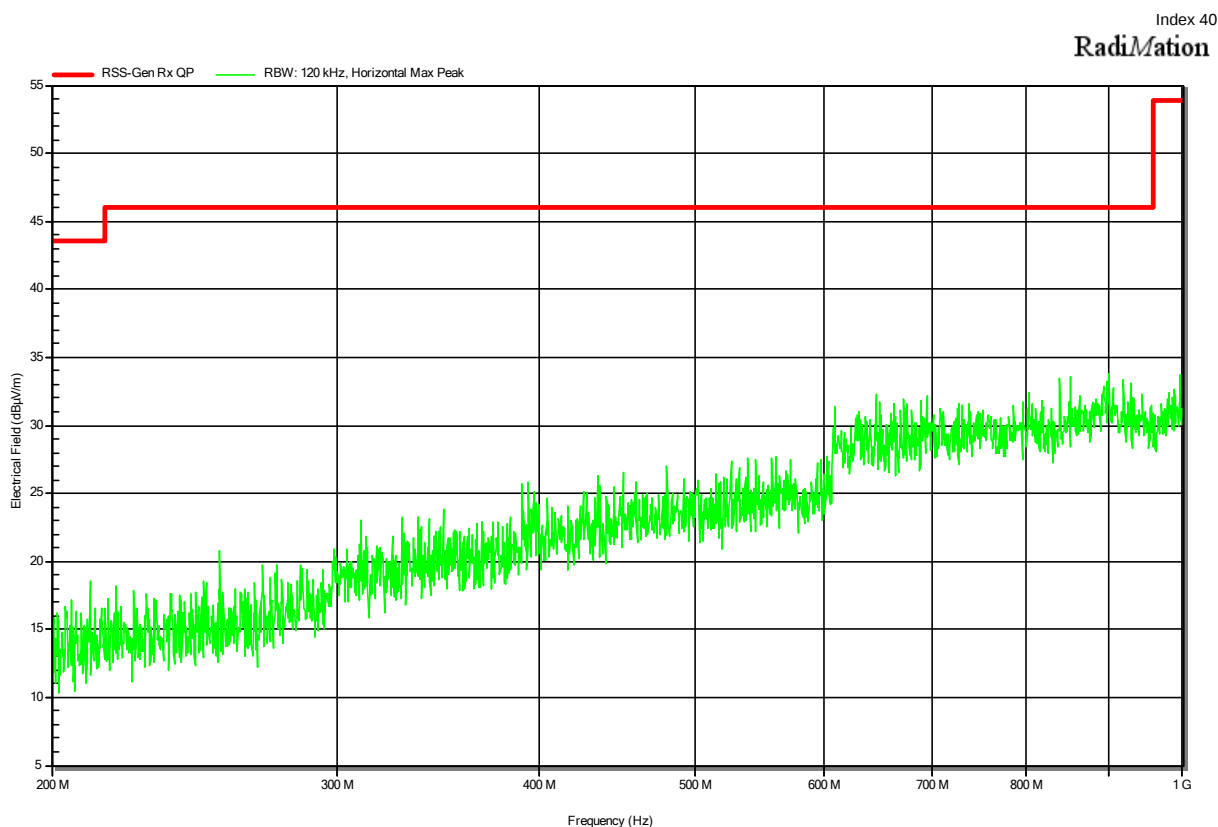
Radiated Spurious Emissions according to RSS-Gen Issue 5

Project Number: G0M-2201-1256
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 38836
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Voigt
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.66 VDC
 Antenna: Rohde & Schwarz HK 116, Vertical
 Measurement distance: 3 m
 Mode: Rx; Pit Antenna 6697916, 915.0 MHz
 Test Date: 2022-03-22
 Note:



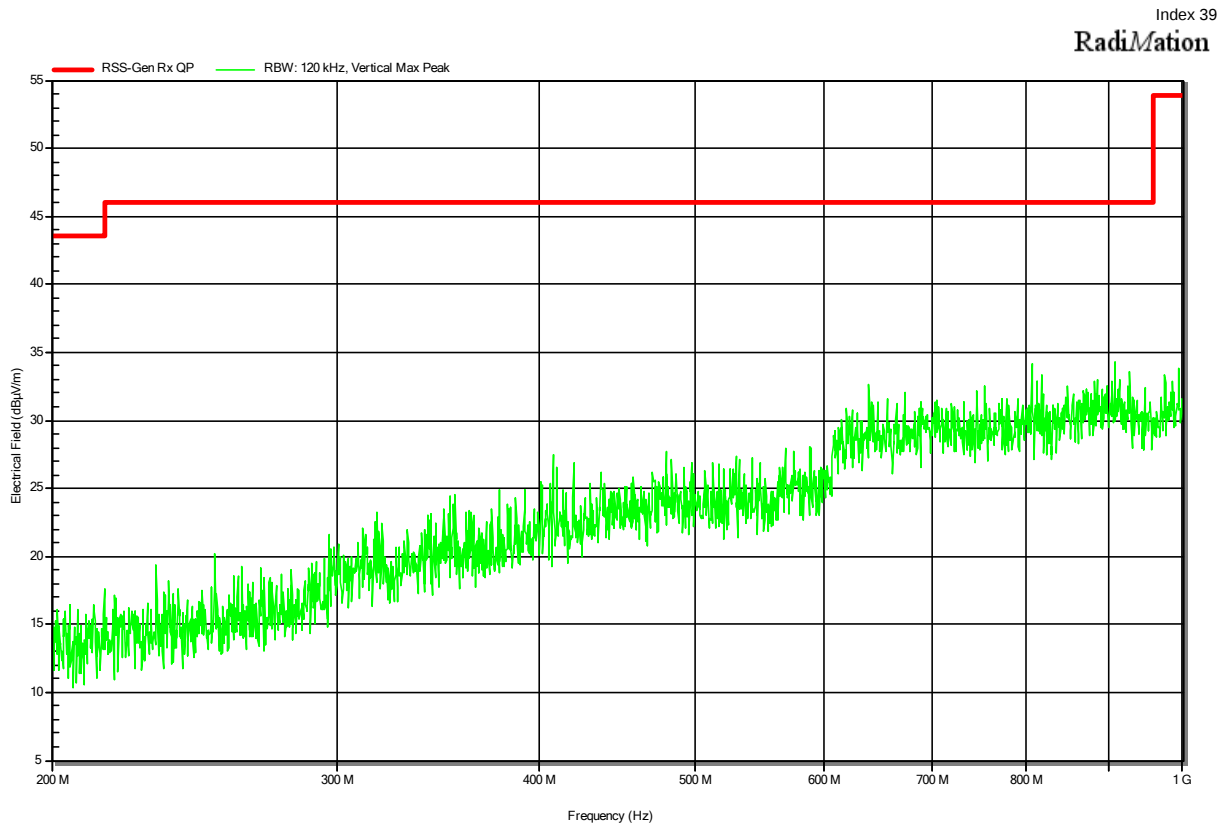
Radiated Spurious Emissions according to RSS-Gen Issue 5

Project Number: G0M-2201-1256
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 38836
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Voigt
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.66 VDC
 Antenna: Rohde & Schwarz HL 223, Horizontal
 Measurement distance: 3 m
 Mode: Rx; Pit Antenna 6697916, 915.0 MHz
 Test Date: 2022-03-22
 Note:



Radiated Spurious Emissions according to RSS-Gen Issue 5

Project Number: G0M-2201-1256
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 38836
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Voigt
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.66 VDC
 Antenna: Rohde & Schwarz HL 223, Vertical
 Measurement distance: 3 m
 Mode: Rx; Pit Antenna 6697916, 915.0 MHz
 Test Date: 2022-03-22
 Note:

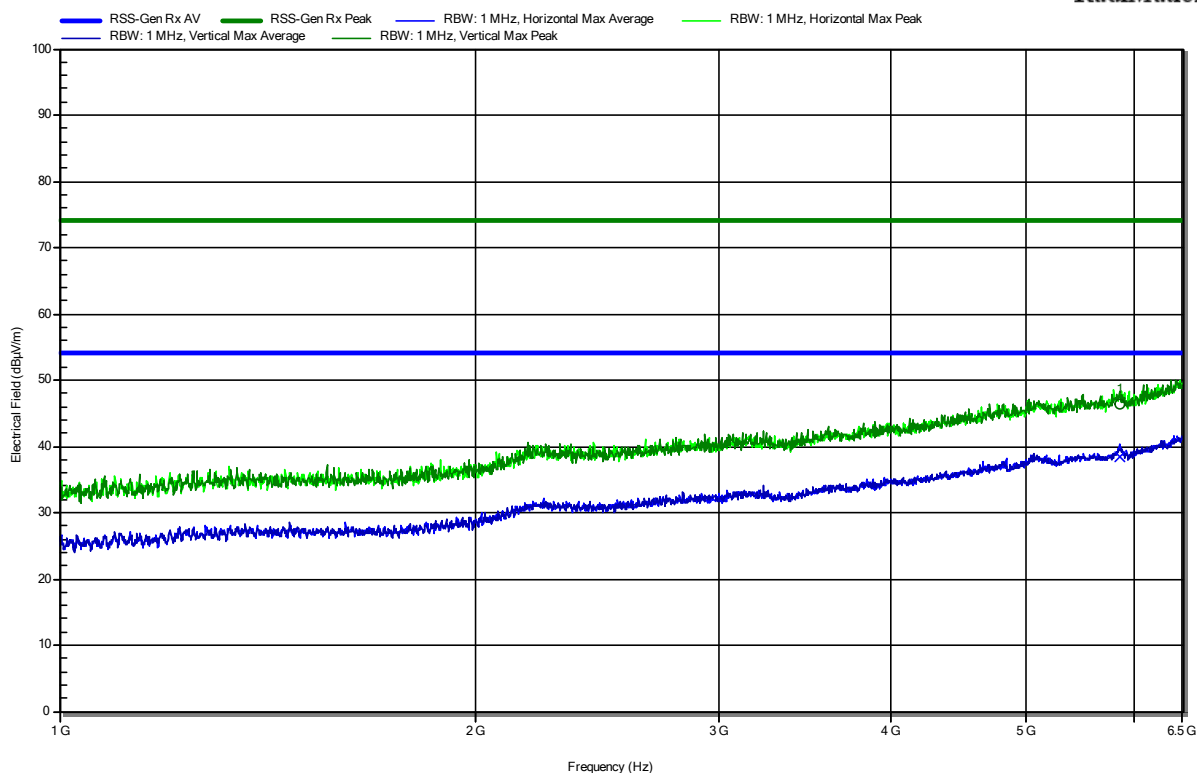


Radiated Spurious Emissions according to RSS-Gen Issue 5

Project Number: G0M-2201-1256
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 38836
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Voigt
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.66 VDC
 Antenna: Schwarzbeck BBHA 9120D
 Measurement distance: 3 m
 Mode: Rx; Pit Antenna 6697916, 915.0 MHz
 Test Date: 2022-03-22
 Note:

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Frequency 5.854 GHz	Peak 46.47 dBµV/m	Peak Limit 74 dBµV/m	Peak Difference -27.53 dB	Peak Status Pass	Polarization Horizontal
Frequency 5.854 GHz	Average 38.37 dBµV/m	Average Limit 53.98 dBµV/m	Average Difference -15.61 dB	Average Status Pass	Polarization Horizontal

Test Report No.: G0M-2201-1256-TFC247DT-V01

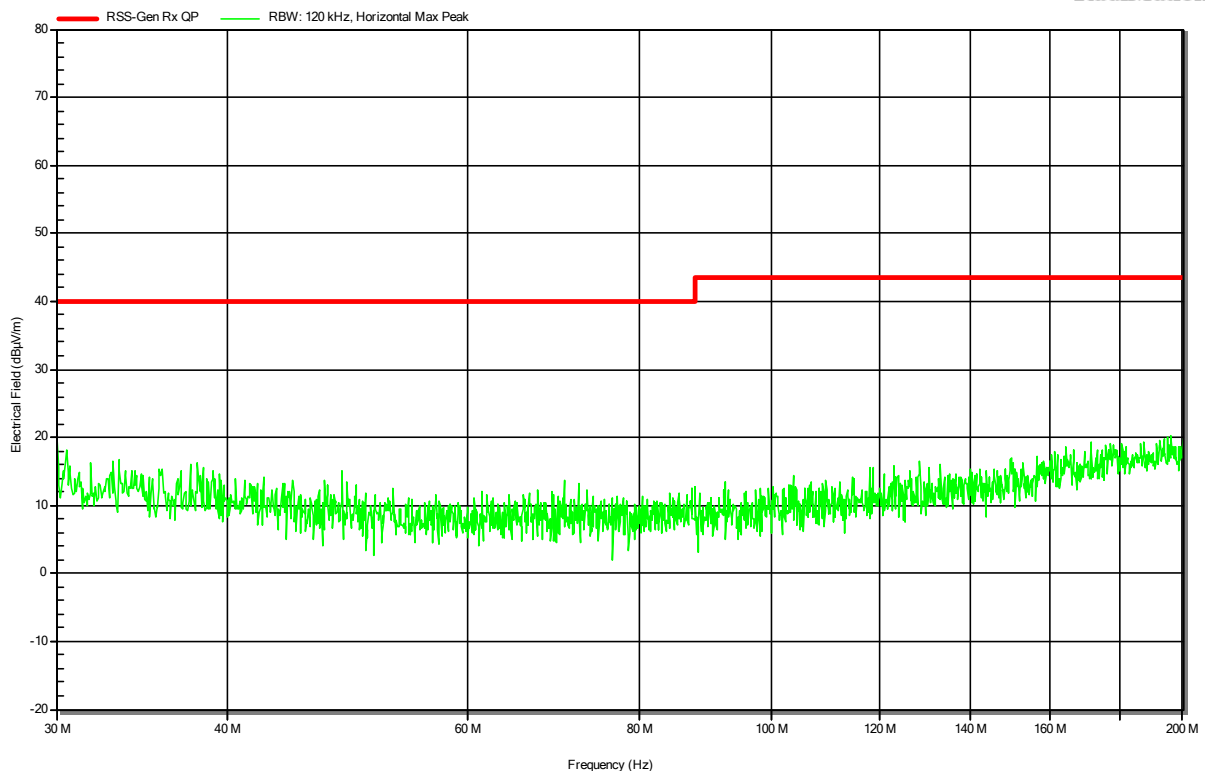
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Radiated Spurious Emissions according to RSS-Gen Issue 5

Project Number: G0M-2201-1256
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 38836
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Voigt
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 23 °Celsius, Vnom: 3.66 VDC
 Antenna: Rohde & Schwarz HK 116, Horizontal
 Measurement distance: 3 m
 Mode: Rx; Wall Antenna 6699490, 915.0 MHz
 Test Date: 2022-03-22
 Note:

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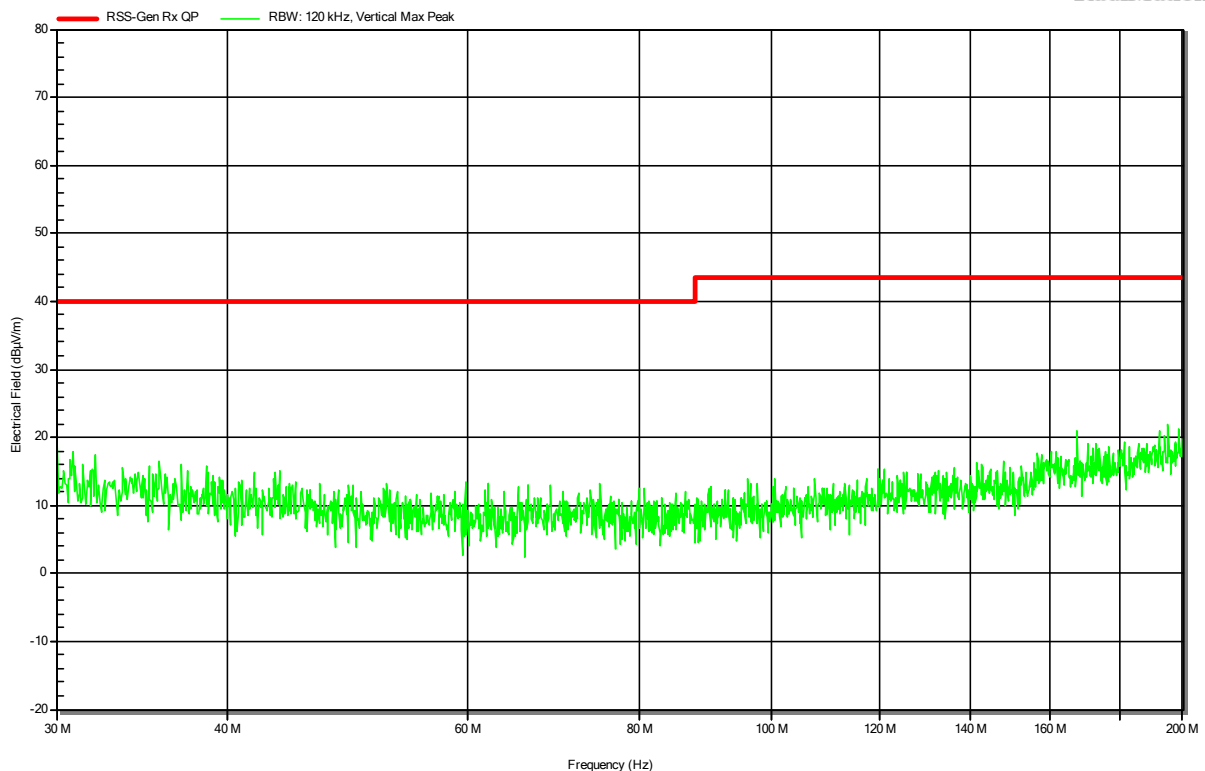


Radiated Spurious Emissions according to RSS-Gen Issue 5

Project Number: G0M-2201-1256
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 38836
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Voigt
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 23 °Celsius, Vnom: 3.66 VDC
 Antenna: Rohde & Schwarz HK 116, Vertical
 Measurement distance: 3 m
 Mode: Rx; Wall Antenna 6699490, 915.0 MHz
 Test Date: 2022-03-22
 Note:

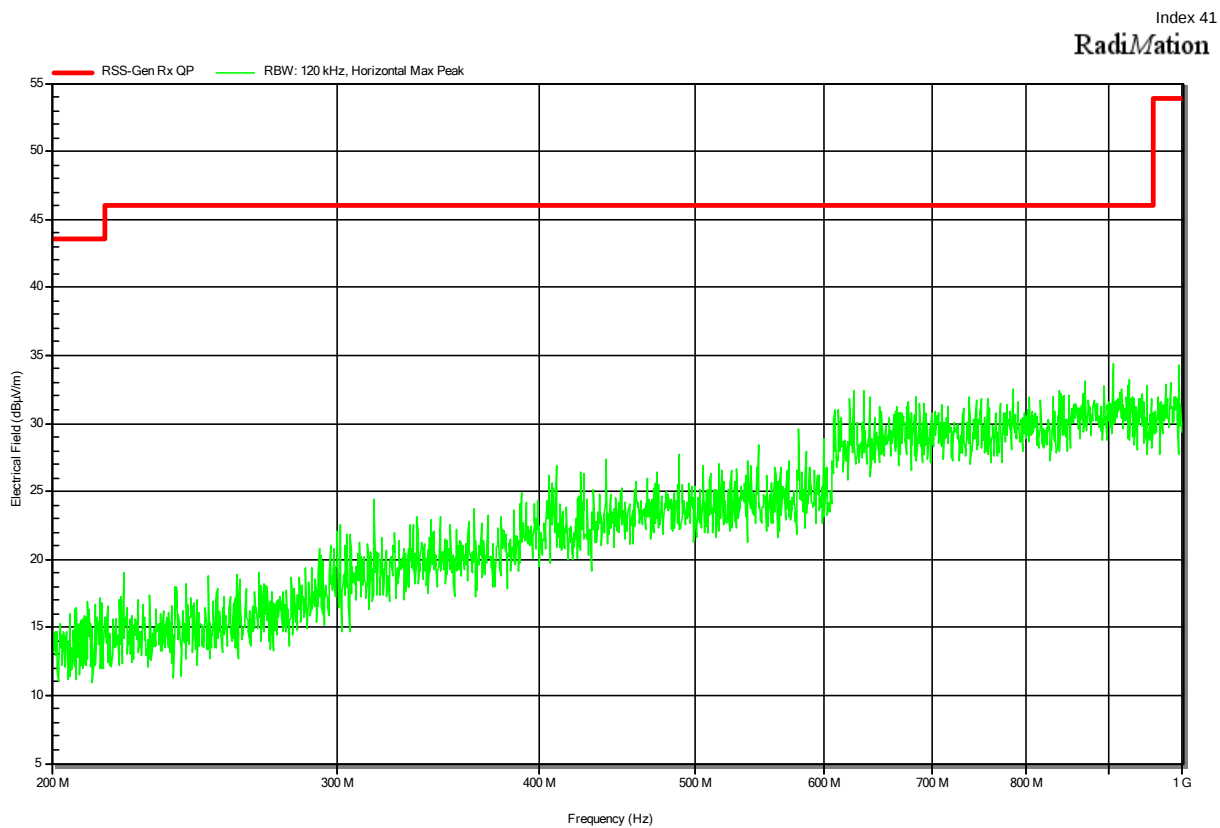
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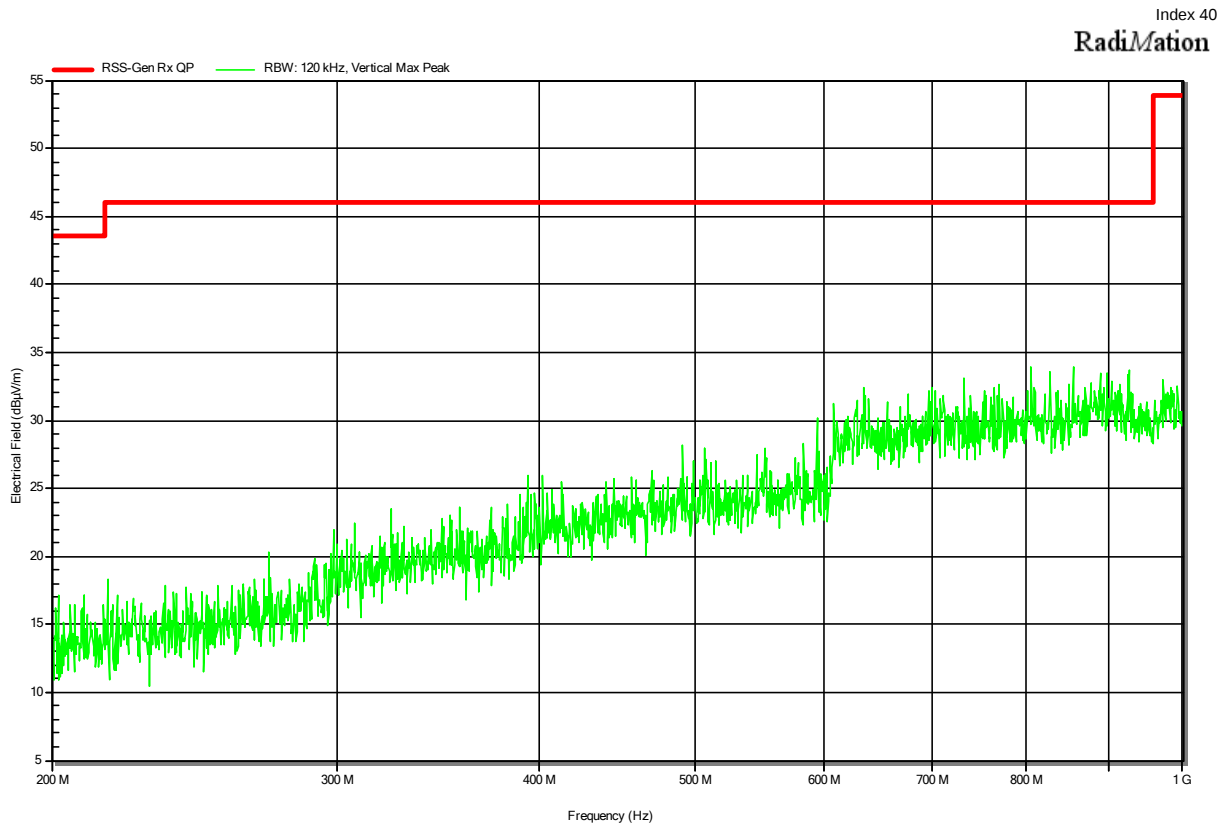
Radiated Spurious Emissions according to RSS-Gen Issue 5

Project Number: G0M-2201-1256
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 38836
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Voigt
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 23 °Celsius, Vnom: 3.66 VDC
 Antenna: Rohde & Schwarz HL 223, Horizontal
 Measurement distance: 3 m
 Mode: Rx; Wall Antenna 6699490, 915.0 MHz
 Test Date: 2022-03-22
 Note:



Radiated Spurious Emissions according to RSS-Gen Issue 5

Project Number: G0M-2201-1256
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 38836
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Voigt
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 23 °Celsius, Vnom: 3.66 VDC
 Antenna: Rohde & Schwarz HL 223, Vertical
 Measurement distance: 3 m
 Mode: Rx; Wall Antenna 6699490, 915.0 MHz
 Test Date: 2022-03-22
 Note:

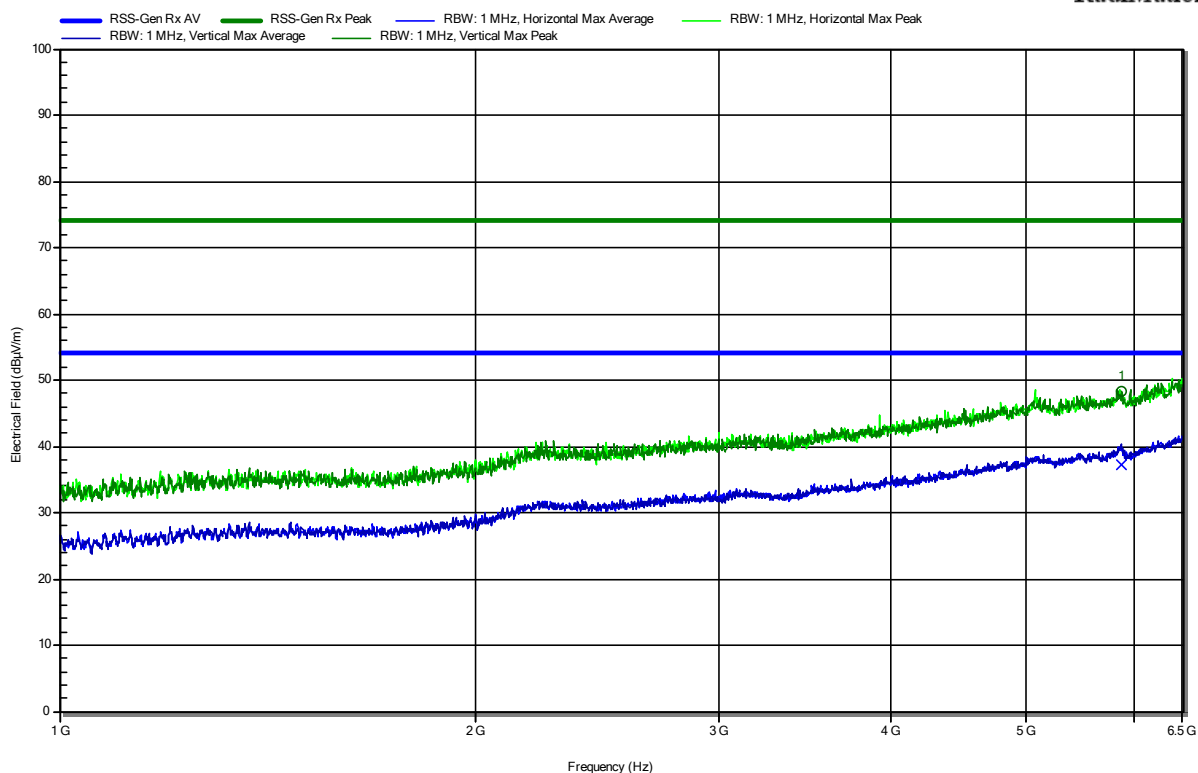


Radiated Spurious Emissions according to RSS-Gen Issue 5

Project Number: G0M-2201-1256
 Applicant: Kamstrup A/S
 Model Description: Ultrasonic water meter
 Model: KWM4220
 Test Sample ID: 38836
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Voigt
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 23 °Celsius, Vnom: 3.66 VDC
 Antenna: Schwarzbeck BBHA 9120D
 Measurement distance: 3 m
 Mode: Rx; Wall Antenna 6699490, 915.0 MHz
 Test Date: 2022-03-22
 Note:

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Frequency 5.872 GHz	Peak 48.36 dBµV/m	Peak Limit 74 dBµV/m	Peak Difference -25.64 dB	Peak Status Pass	Polarization Vertical
Frequency 5.872 GHz	Average 37.32 dBµV/m	Average Limit 53.98 dBµV/m	Average Difference -16.66 dB	Average Status Pass	Polarization Vertical

== = END OF TEST REPORT == =

Test Report No.: G0M-2201-1256-TFC247DT-V01

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