

RADIO REPORT FCC 47 CFR Part 15C ISED Canada RSS-247 Digital transmission systems operating within the 2400 – 2483.5 MHz band	
Report Reference No	G0M-1911-8589-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-2 DAkkS - Registration number : D-PL-12092-01-04 (FCC) FCC Filed Test Laboratory, Reg.-No.: 96970
Applicant	UAB Axioma Metering
Address	Veterinaru str. 52, Biruliskes, Kaunas county 54469 Kaunas Lithuania
Test Specification	According to FCC/ISED rules
Standard	47 CFR Part 15C RSS-247, Issue 2, 2017-02 RSS-Gen, Issue 5, Amendment 1, 2019-03
Non-Standard Test Method	None
Equipment under Test (EUT):	
Product Description	Ultrasonic water meter
Model(s)	Qalcosonic W1
Additional Model(s)	None
Brand Name(s)	None
Hardware Version(s)	v19
Software Version(s)	v1.02
FCC-ID	2AU8N-QW1
IC	25675-QW1
Test Result	PASSED

Possible test case verdicts:		
Required by standard but not tested	N/T	
Not required by standard	N/R	
Not applicable to EUT	N/A	
Test object does meet the requirement	P(PASS)	
Test object does not meet the requirement	F(FAIL)	
Testing:		
Test Lab Temperature	20 - 23 °C	
Test Lab Humidity	32 – 38 %	
Date of receipt of test item	2020-02-19	
Report:		
Compiled by	Wilfried Treffke	
Tested by (+ signature) (Responsible for Test)	Wilfried Treffke	
Approved by (+ signature) (Deputy Head of Lab)	Toralf Jahn	
Date of Issue	2020-03-12	
Total number of pages	84	
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	2020-03-12	Initial Release	

ABBREVIATIONS AND ACRONYMS

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

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1 Equipment (Test Item) Under Test

Description	Ultrasonic water meter	
Model	Qalcosonic W1	
Additional Model(s)	None	
Brand Name(s)	None	
Serial Number(s)	Conducted test sample: 05064295 Radiated test sample: 05064301	
Hardware Version(s)	v19	
Software Version(s)	v1.02	
PMN	Qalcosonic W1	
HVIN	QW1	
FVIN	1.02	
HMN	N/A	
FCC-ID	2AU8N-QW1	
IC	25675-QW1	
Equipment type	End Product	
Radio type	Transceiver	
Assigned frequency bands	902.0 - 928.0 MHz	
Radio technology	Digital Modulation	
Modulation	Spread Spectrum (LoRa)	
Number of channels	72	
Number of antenna ports	1	
Antenna	Type	Integrated
	Model	ifa
	Manufacturer	UAB Axioma Metering
	Gain	-5 dBi (manufacturer declaration)
Supply Voltage	V _{NOM}	3.3 VDC
Operating Temperature	T _{NOM}	25 °C
AC/DC-Adaptor	Model	None
	Vendor	None
	Input	None
	Output	None
Manufacturer	UAB Axioma Metering Veterinaru str. 52, Biruliskes, Kaunas county 54469 Kaunas Lithuania	

1.1 Photos – Equipment External

EUT Top View radiated Sample



EUT Top View conducted Sample



EUT Left Side



EUT Rear Side



EUT Right Side



1.2 Photos – Equipment Internal

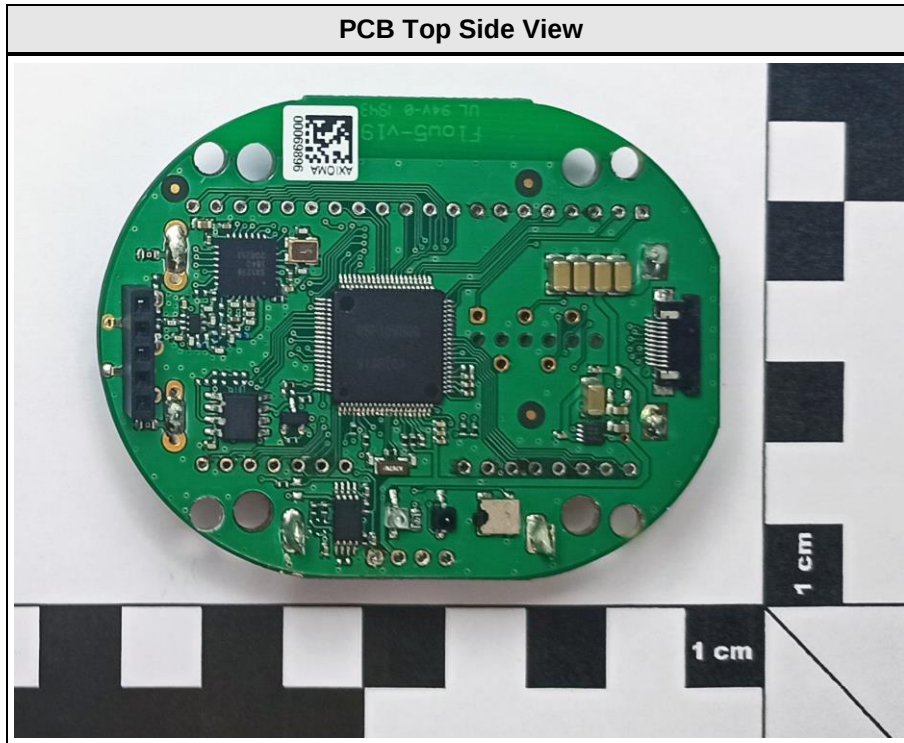
EUT Housing Open, antenna View



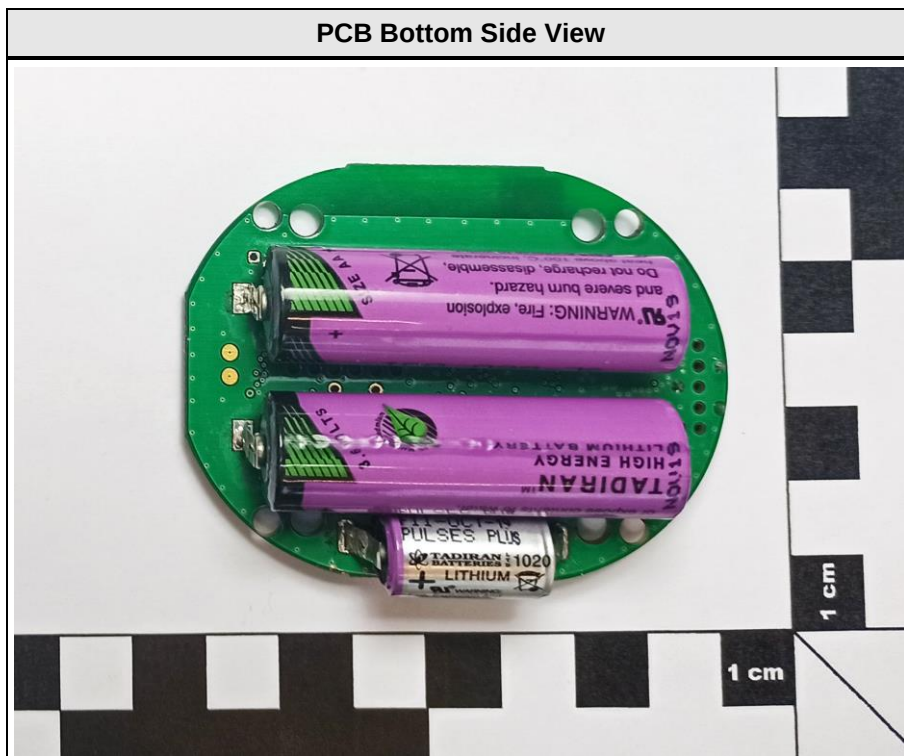
EUT Housing Open, Display View



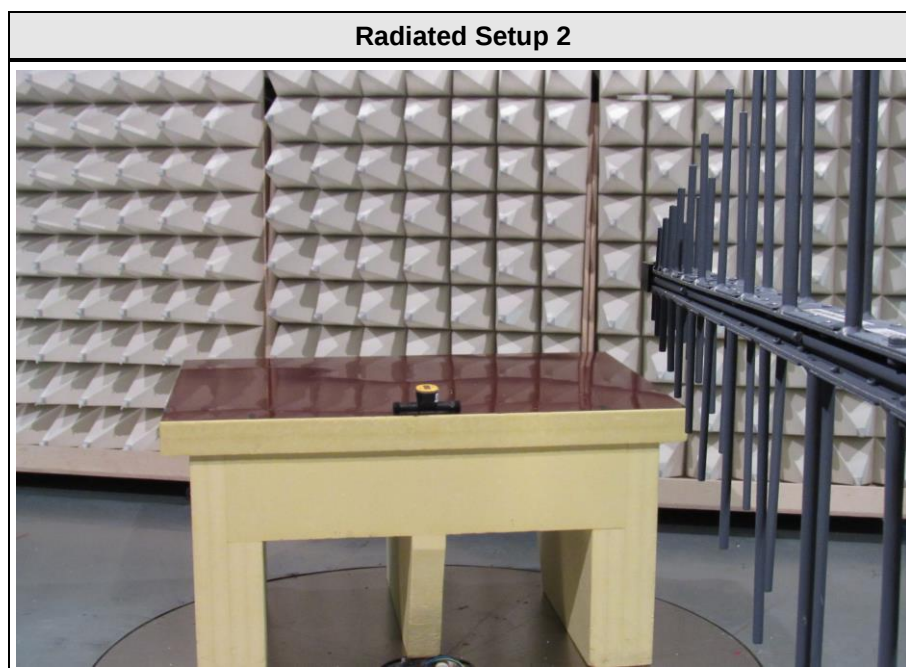
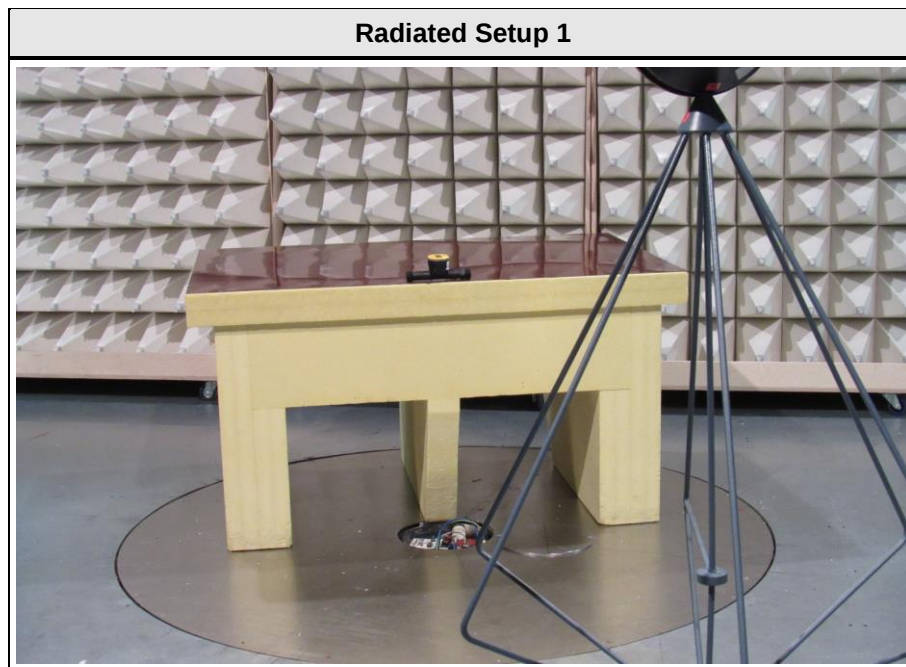
PCB Top Side View



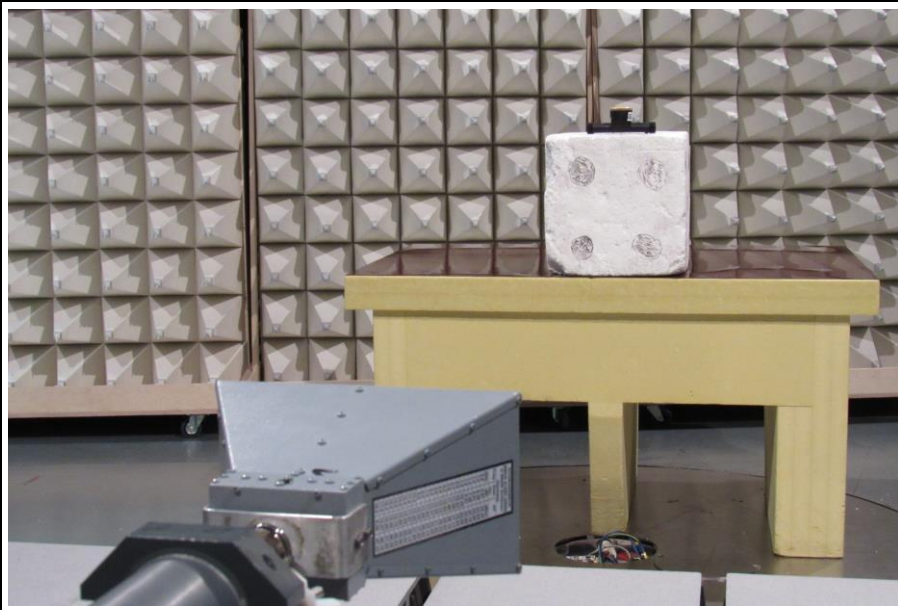
PCB Bottom Side View



1.3 Photos – Test Setup



Radiated Setup 3



Radiated Near View



1.4 Support Equipment

Product Type	Device	Manufacturer	Model	Comment
AE	Optical communication interface	UAB Axioma Metering	OG-1-USB	For parameters configuration
Description:				
AE	Auxiliary Equipment			
SIM	Simulator			
CBL	Connecting Cable			
SFT	Software			
Comment:				

1.5 Test mode duty cycle

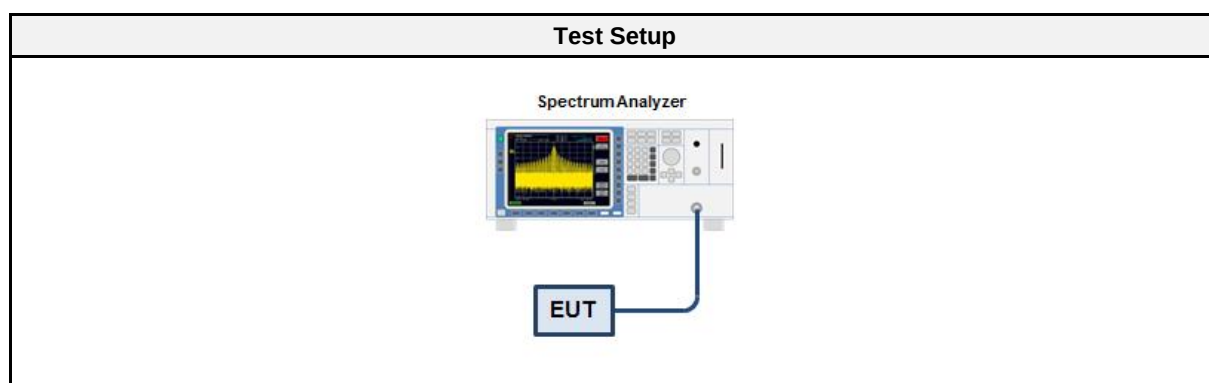
1.5.1 Information

Test Information	
Measurement Method	ANSI C63.10 11.6

1.5.2 Requirements

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

1.5.3 Setup



1.5.4 Equipment

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyzer	R&S	FSU 26	EF01407	2019-07	2020-07

1.5.5 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 $DC = 10 \times \log_{10}(T_{ON} / (T_{ON} + T_{OFF}))$

1.5.6 Results

Duty Cycle Results		
Mode	Duty Cycle	Correction Factor [dB]
Transmit	1 (100%)	0

1.6 Test Modes

Mode	Description
Transmit	Mode = Transmit Modulation = Spread Spectrum (LoRa) Duty cycle = 100 %
Receive	Mode = Receive Modulation = Spread Spectrum (LoRa)
Comment:	

1.7 Test Frequencies

Designator	Mode	Channel	Frequency [MHz]
F1	Tx / Rx	1	903
F2	Tx / Rx	2	915
F3	Tx / Rx	3	927

1.8 Sample emission level calculation

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

Reading:

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

A.F.:

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

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

Net:

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

Limit:

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

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

Margin:

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

Example only:

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

2 Result Summary

FCC 47 CFR Part 15C, ISED RSS-247				
Product Standard Reference	Requirement	Reference Method	Result	Remarks
ISED RSS-Gen, Issue 5 (section 6.6)	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)(1) 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	Not powered (directly or indirectly) via 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 (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 C63.10-2013	PASS	
Comment:				

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

3 Test Conditions and Results

3.1 Test Conditions and Results - Occupied bandwidth

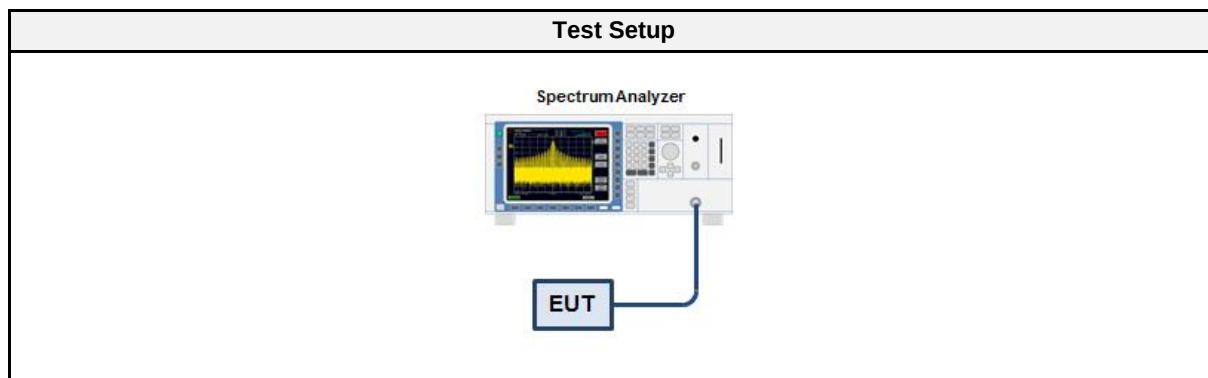
3.1.1 Information

Test Information	
Reference	ISED RSS-Gen, Issue 5 (section 6.6)
Measurement Method	ANSI C63.10 6.9.3
Operator	Wilfried Treffke
Date	2020-03-06

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 Analyzer	R&S	FSU 26	EF01407	2019-07	2020-07

3.1.5 Procedure

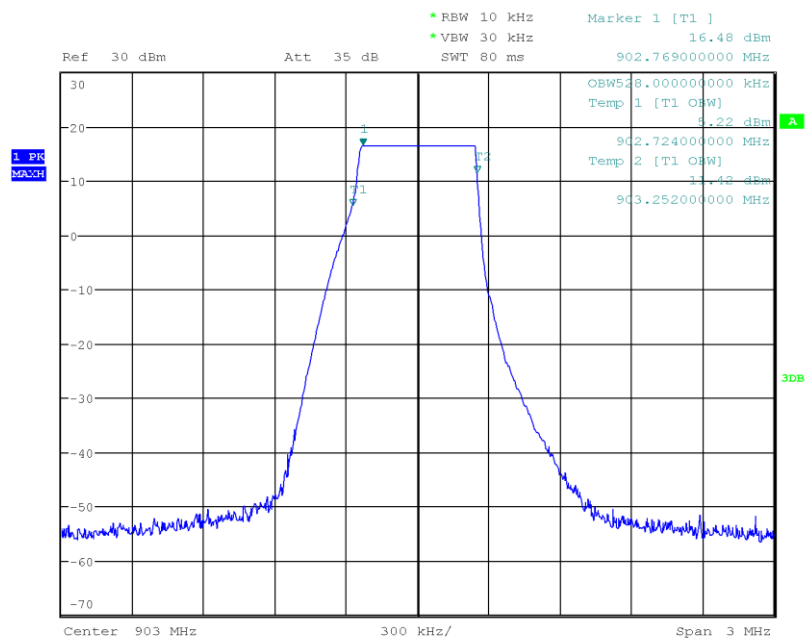
Test Procedure
1. EUT transmitter is activated in test mode under normal conditions 2. The spectrum analyzer is set to peak detection and maximum hold with a span twice the emission spectrum 3. The resolution bandwidth is set to the range of 1 % to 5 % of the occupied bandwidth 4. The occupied bandwidth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

3.1.6 Results

Test Results		
Mode	Frequency [MHz]	Bandwidth [MHz]
Transmit	903	0.528
Transmit	915	0.525
Transmit	927	0.519

Occupied Bandwidth

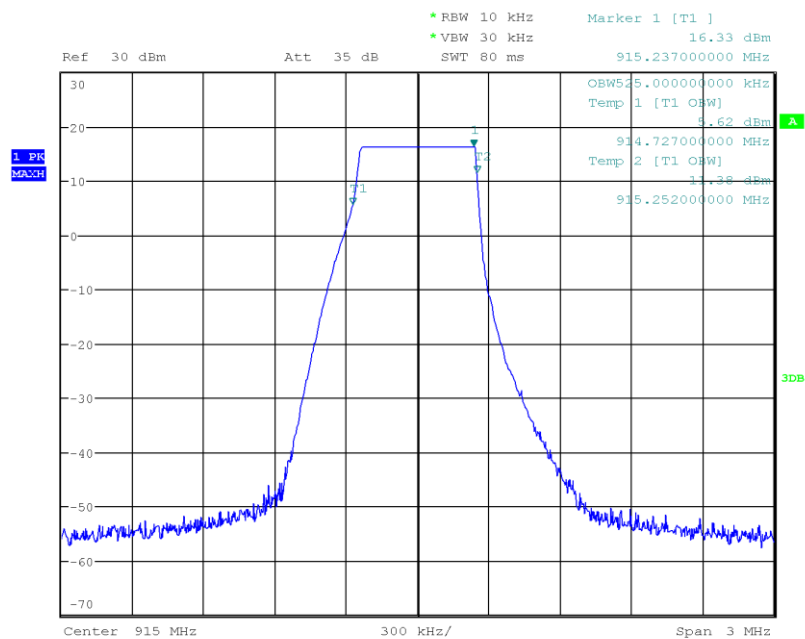
Project Number: G0M-1911-8589
 Applicant: UAB Axioma Metering
 Model Description: Ultrasonic water meter
 Model: Qalcosonic W1
 Test Sample ID: 28143
 Reference Standards: FCC 15.247, RSS-247
 Reference Method: ANSI C63.10:2013, Section 6.9.3
 Operational Mode: LoRa, Channel: 903 MHz
 Operating Conditions: Tnom/Vnom
 Operator: Wilfried Treffke
 Test Site: Eurofins Product Service GmbH
 Test Date: 2020-03-06
 Occupied Bandwidth [MHz]: 0.528



Date: 6.MAR.2020 08:34:35

Occupied Bandwidth

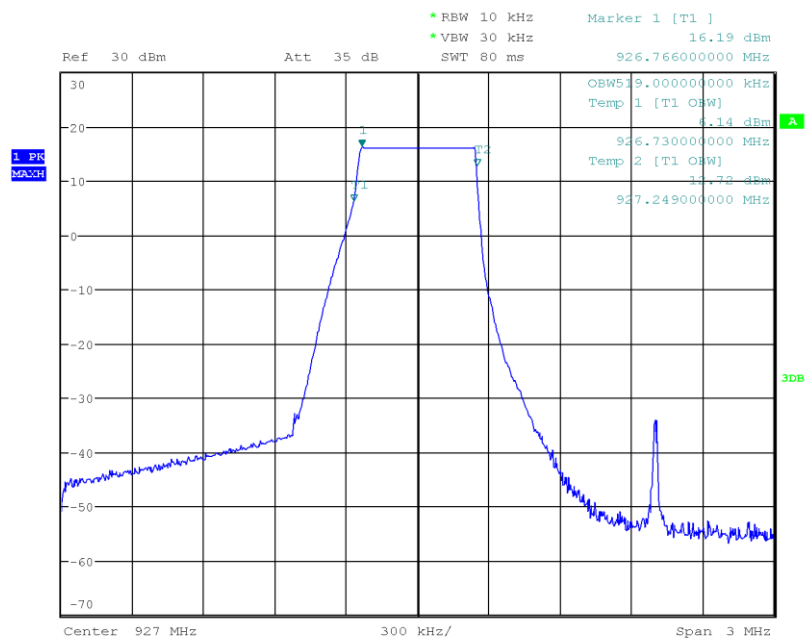
Project Number: G0M-1911-8589
 Applicant: UAB Axioma Metering
 Model Description: Ultrasonic water meter
 Model: Qalcosonic W1
 Test Sample ID: 28143
 Reference Standards: FCC 15.247, RSS-247
 Reference Method: ANSI C63.10:2013, Section 6.9.3
 Operational Mode: LoRa, Channel: 915 MHz
 Operating Conditions: Tnom/Vnom
 Operator: Wilfried Treffke
 Test Site: Eurofins Product Service GmbH
 Test Date: 2020-03-06
 Occupied Bandwidth [MHz]: 0.525



Date: 6.MAR.2020 08:36:08

Occupied Bandwidth

Project Number: G0M-1911-8589
 Applicant: UAB Axioma Metering
 Model Description: Ultrasonic water meter
 Model: Qalcosonic W1
 Test Sample ID: 28143
 Reference Standards: FCC 15.247, RSS-247
 Reference Method: ANSI C63.10:2013, Section 6.9.3
 Operational Mode: LoRa, Channel: 927 MHz
 Operating Conditions: Tnom/Vnom
 Operator: Wilfried Treffke
 Test Site: Eurofins Product Service GmbH
 Test Date: 2020-03-06
 Occupied Bandwidth [MHz]: 0.519



Date: 6.MAR.2020 08:38:36

3.2 Test Conditions and Results - 6 dB bandwidth

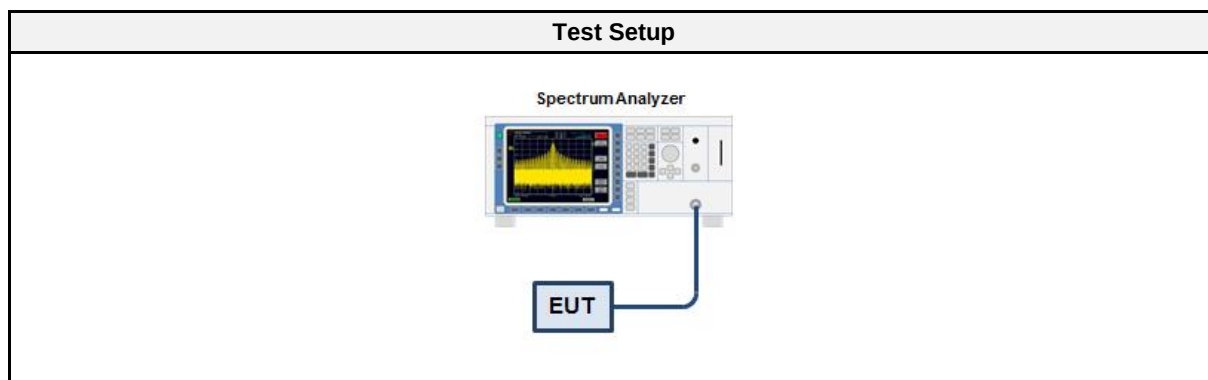
3.2.1 Information

Test Information	
Reference	FCC § 15.247(a)(2); ISED RSS-247, Issue 2 (section 5.2)
Measurement Method	ANSI C63.10 11.8
Operator	Wilfried Treffke
Date	2020-03-06

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 Analyzer	R&S	FSU 26	EF01407	2019-07	2020-07

3.2.5 Procedure

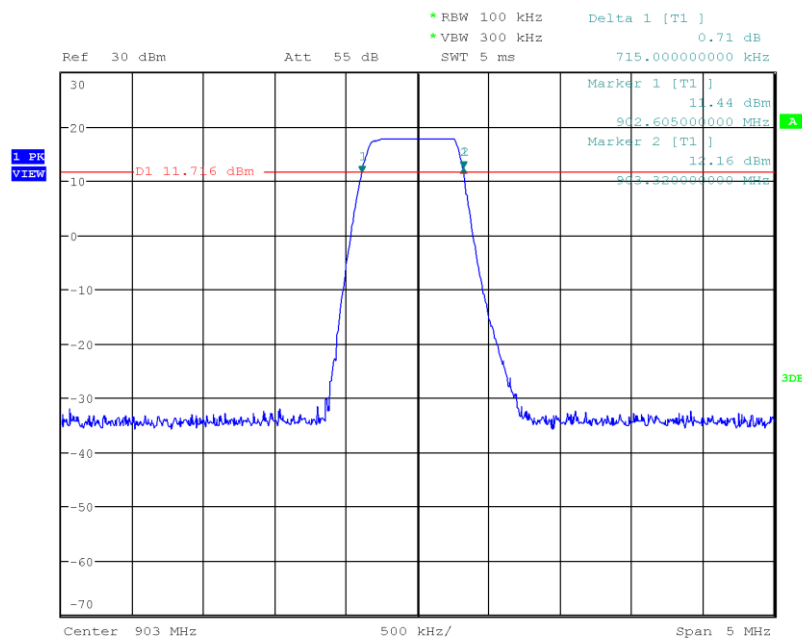
Test Procedure
1. EUT set to test mode 2. Span set to at least twice the emission spectrum 3. Detector set to peak and max hold and RBW is set to 100 kHz 4. Envelope peak value of emission spectrum is selected 5. Marker on envelope of spectrum is set to level of -6 dB to the left of the peak 6. Marker 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	903	715	500	Pass
Transmit	915	710	500	Pass
Transmit	927	710	500	Pass

DTS (6 dB) Bandwidth

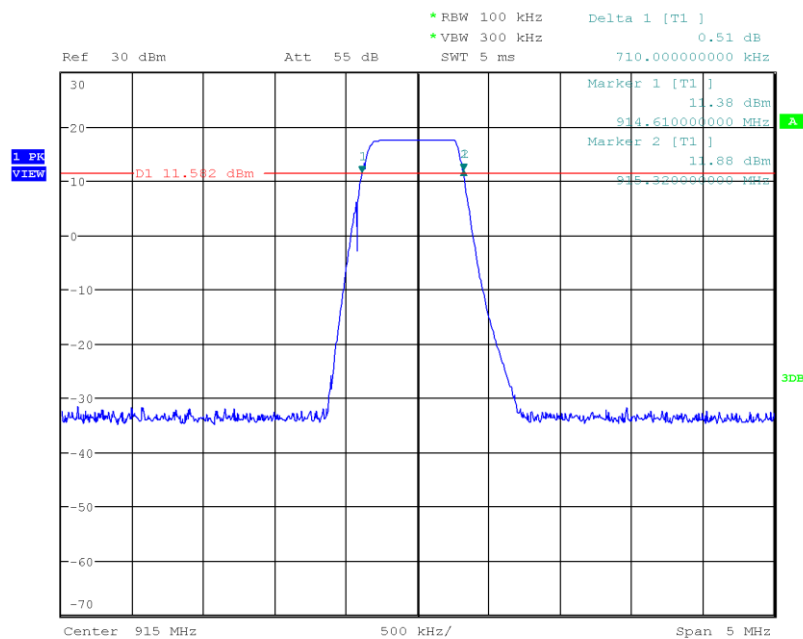
Project Number: G0M-1911-8589
 Applicant: UAB Axioma Metering
 Model Description: Ultrasonic water meter
 Model: Qalcosonic W1
 Test Sample ID: 28143
 Reference Standards: FCC 15.247, RSS-247
 Reference Method: ANSI C63.10:2013, Section 11.8.1 Option 1
 Operational Mode: LoRa, Channel: 903 MHz
 Operating Conditions: Tnom/Vnom
 Operator: Wilfried Treffke
 Test Site: Eurofins Product Service GmbH
 Test Date: 2020-03-06
 Lower Frequency [MHz]: 902.605
 Upper Frequency [MHz]: 903.320
 6 dB Bandwidth [kHz]: 715



Date: 6.MAR.2020 08:45:18

DTS (6 dB) Bandwidth

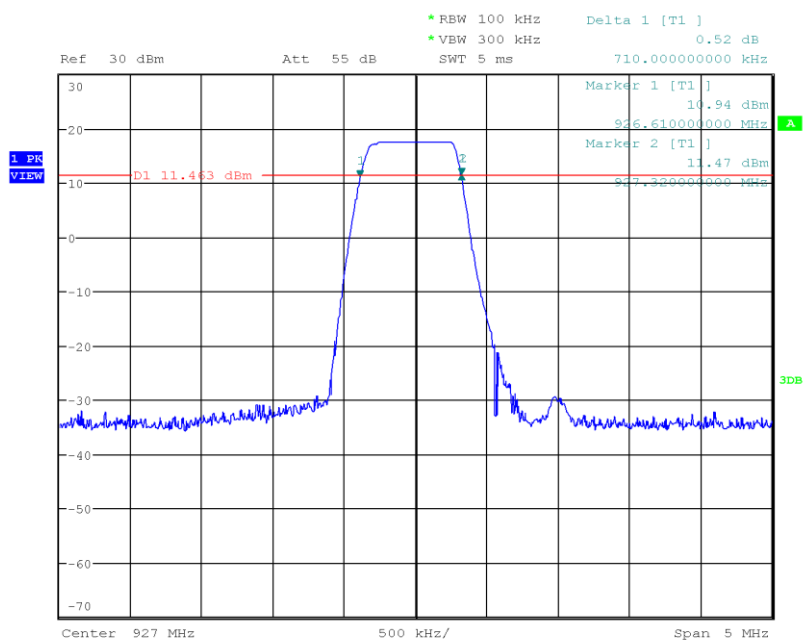
Project Number: G0M-1911-8589
 Applicant: UAB Axioma Metering
 Model Description: Ultrasonic water meter
 Model: Qalcosonic W1
 Test Sample ID: 28143
 Reference Standards: FCC 15.247, RSS-247
 Reference Method: ANSI C63.10:2013, Section 11.8.1 Option 1
 Operational Mode: LoRa, Channel: 915 MHz
 Operating Conditions: Tnom/Vnom
 Operator: Wilfried Treffke
 Test Site: Eurofins Product Service GmbH
 Test Date: 2020-03-06
 Lower Frequency [MHz]: 914.610
 Upper Frequency [MHz]: 915.320
 6 dB Bandwidth [kHz]: 710



Date: 6.MAR.2020 08:53:20

DTS (6 dB) Bandwidth

Project Number: G0M-1911-8589
 Applicant: UAB Axioma Metering
 Model Description: Ultrasonic water meter
 Model: Qalcosonic W1
 Test Sample ID: 28143
 Reference Standards: FCC 15.247, RSS-247
 Reference Method: ANSI C63.10:2013, Section 11.8.1 Option 1
 Operational Mode: LoRa, Channel: 927 MHz
 Operating Conditions: Tnom/Vnom
 Operator: Wilfried Treffke
 Test Site: Eurofins Product Service GmbH
 Test Date: 2020-03-06
 Lower Frequency [MHz]: 926.610
 Upper Frequency [MHz]: 927.320
 6 dB Bandwidth [kHz]: 710



Date: 6.MAR.2020 08:54:51

3.3 Test Conditions and Results - Maximum peak conducted output power

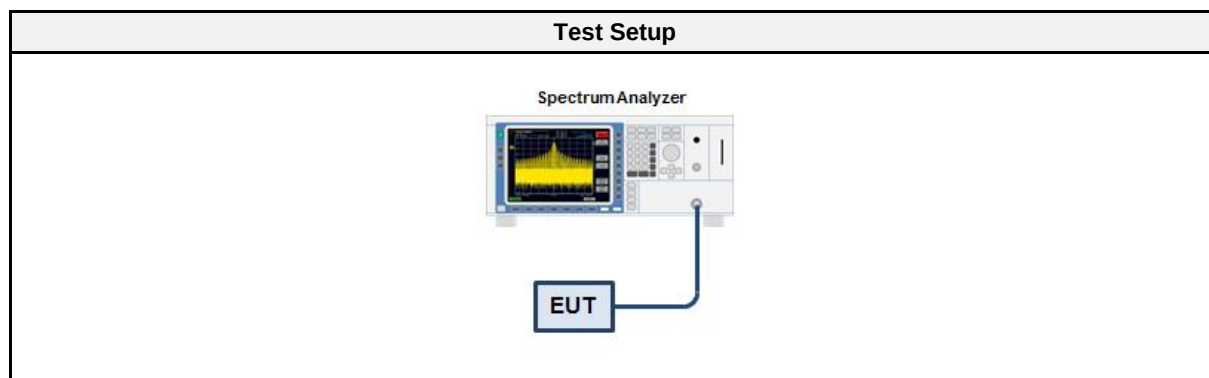
3.3.1 Information

Test Information	
Reference	FCC § 15.247(b)(1); ISED RSS-247, Issue 2 (section 5.4)
Measurement Method	ANSI C63.10 11.9.1
Operator	Wilfried Treffke
Date	2020-03-06

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 Analyzer	R&S	FSU 26	EF01407	2019-07	2020-07

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
903	18.025	0.0635	1.0	PASS
915	17.911	0.0618	1.0	PASS
927	17.812	0.0604	1.0	PASS

3.4 Test Conditions and Results - Power spectral density

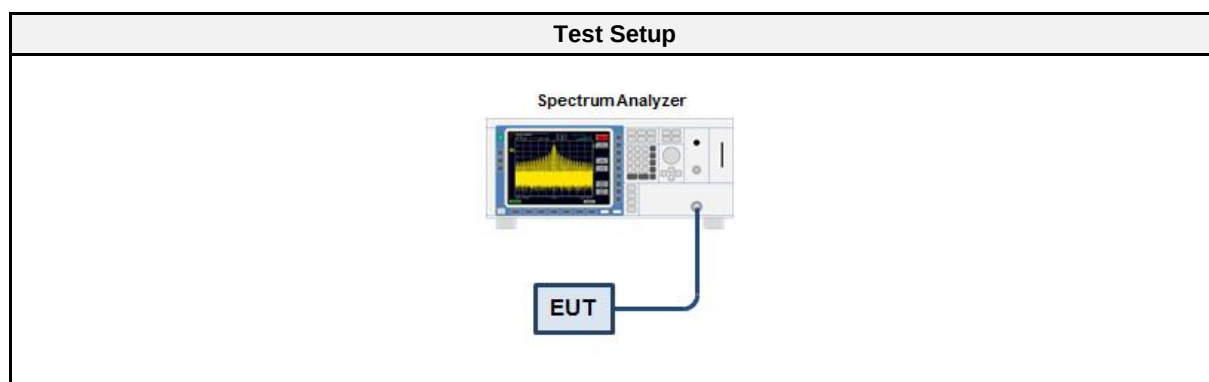
3.4.1 Information

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
Operator	Wilfried Treffke
Date	2020-03-06

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 Analyzer	R&S	FSU 26	EF01407	2019-07	2020-07

3.4.5 Procedure

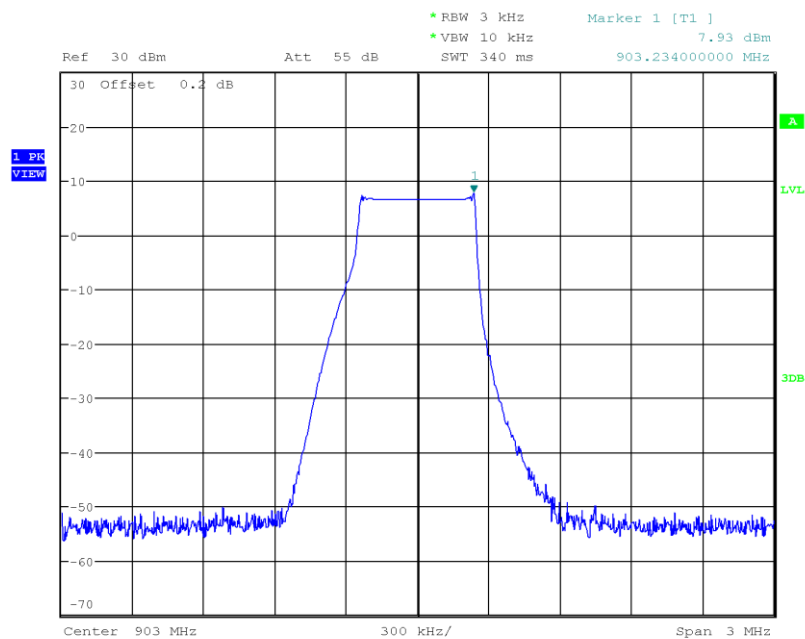
Test Procedure
1. EUT set to test mode 2. The analyzer is set to DTS channel center frequency with a span of 1.5 times the DTS bandwidth 3. The RBW is set to 100 kHz with VBW $\geq$ RBW and the detector is set to peak with max hold 4. After the trace has stabilized a marker is set to the envelope maximum 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
903	7.93	8.0	PASS
915	7.80	8.0	PASS
927	7.76	8.0	PASS
RBW = 3 kHz			

Peak Power Spectral Density

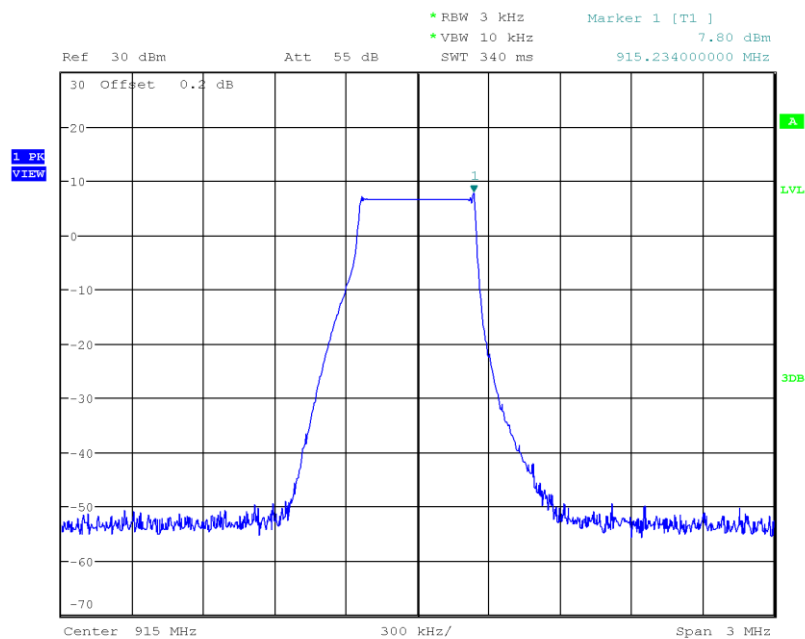
Project Number: G0M-1911-8589
 Applicant: UAB Axioma Metering
 Model Description: Ultrasonic water meter
 Model: Qalcosonic W1
 Test Sample ID: 28143
 Reference Standards: FCC 15.247, RSS-247
 Reference Method: ANSI C63.10:2013, Section 11.10.2
 Operational Mode: LoRa, Channel: 903 MHz
 Operating Conditions: Tnom/Vnom
 Operator: Wilfried Treffke
 Test Site: Eurofins Product Service GmbH
 Test Date: 2020-03-06
 Peak Frequency [MHz]: 903.234
 Spectral Density [dBm/RBW]: 7.931
 Resolution Bandwidth [kHz]: 3 kHz



Date: 6.MAR.2020 09:21:09

Peak Power Spectral Density

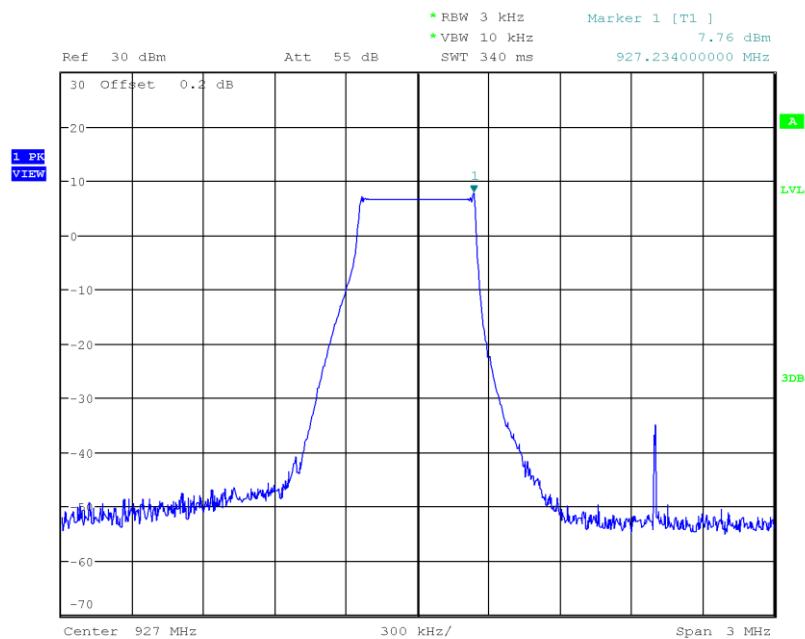
Project Number: G0M-1911-8589
 Applicant: UAB Axioma Metering
 Model Description: Ultrasonic water meter
 Model: Qalcosonic W1
 Test Sample ID: 28143
 Reference Standards: FCC 15.247, RSS-247
 Reference Method: ANSI C63.10:2013, Section 11.10.2
 Operational Mode: LoRa, Channel: 915 MHz
 Operating Conditions: Tnom/Vnom
 Operator: Wilfried Treffke
 Test Site: Eurofins Product Service GmbH
 Test Date: 2020-03-06
 Peak Frequency [MHz]: 915.234
 Spectral Density [dBm/RBW]: 7.800
 Resolution Bandwidth [kHz]: 3 kHz



Date: 6.MAR.2020 09:22:56

Peak Power Spectral Density

Project Number: G0M-1911-8589
 Applicant: UAB Axioma Metering
 Model Description: Ultrasonic water meter
 Model: Qalcosonic W1
 Test Sample ID: 28143
 Reference Standards: FCC 15.247, RSS-247
 Reference Method: ANSI C63.10:2013, Section 11.10.2
 Operational Mode: LoRa, Channel: 927 MHz
 Operating Conditions: Tnom/Vnom
 Operator: Wilfried Treffke
 Test Site: Eurofins Product Service GmbH
 Test Date: 2020-03-06
 Peak Frequency [MHz]: 927.234
 Spectral Density [dBm/RBW]: 7.755
 Resolution Bandwidth [kHz]: 3 kHz



Date: 6.MAR.2020 09:24:24

3.5 Test Conditions and Results - Band-edge compliance

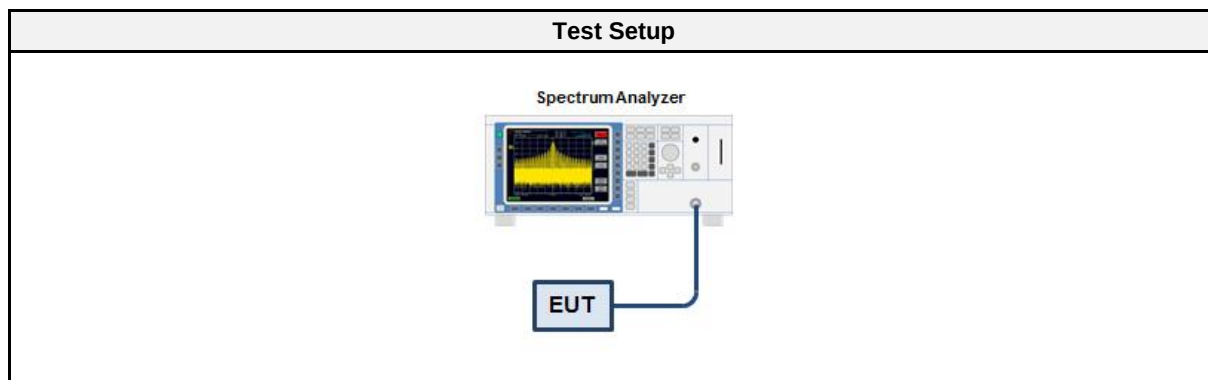
3.5.1 Information

Test Information	
Reference	FCC § 15.247(d); ISSED RSS-247, Issue 2 (section 5.5)
Measurement Method	ANSI C63.10 11.13
Operator	Wilfried Treffke
Date	2020-03-06

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 Analyzer	R&S	FSU 26	EF01407	2019-07	2020-07

3.5.5 Procedure

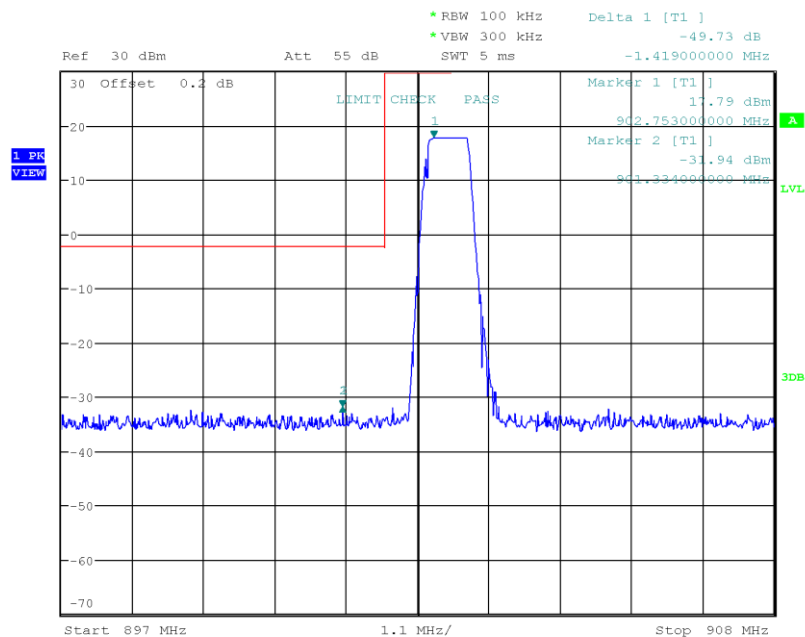
Test Procedure
1. EUT set to test mode (Communication tester is used if needed) 2. Span set around lower band edge and detector is set to peak and max hold 3. Resolution bandwidth is set to 100 kHz 4. Markers are set to peak emission levels within frequency band and outside frequency band 5. Band edge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

3.5.6 Results

Test Results				
Mode	Channel [MHz]	Out-of-band Attenuation [dB]	Limit [dB]	Verdict
Transmit	903	-49.73	-20	PASS
Transmit	927	-49.19	-20	PASS

Emissions in nonrestricted frequency bands at the Band-edge

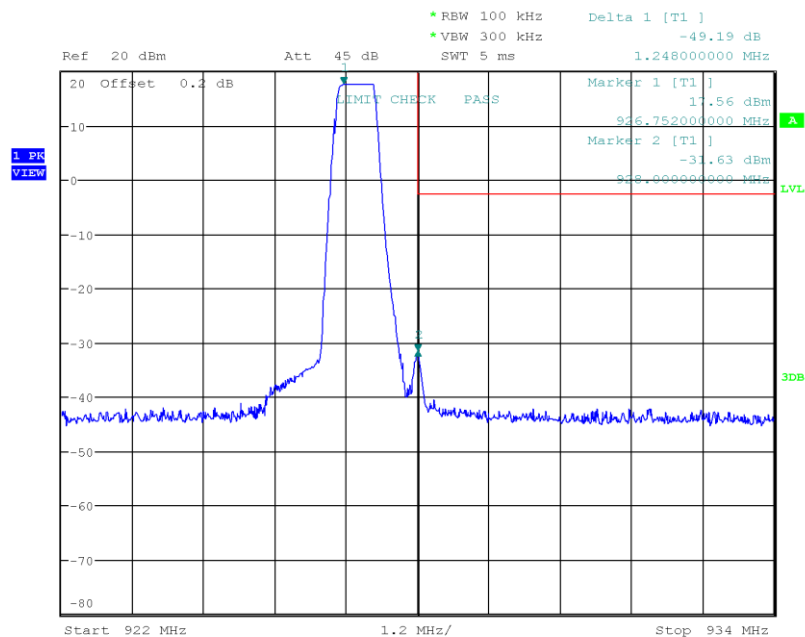
Project Number: GOM-1911-8589
 Applicant: UAB Axioma Metering
 Model Description: Ultrasonic water meter
 Model: Qalcosonic W1
 Test Sample ID: 28143
 Reference Standards: FCC 15.247, RSS-247
 Reference Method: ANSI C63.10:2013, Section 6.10
 Operational Mode: single frequency, Channel: 903.0 MHz
 Operating Conditions: Tnom/Vnom
 Operator: Wilfried Treffke
 Test Site: Eurofins Product Service GmbH
 Test Date: 2020-03-06
 Band-edge: Lower
 In-band Frequency [MHz]: 902.753
 Max. in-band Level [dBm/100 kHz]: 17.791
 Out-of-band Frequency [MHz]: 901.334
 Max. out-of-band Level [dBm/100 kHz]: -31.937
 Attenuation [dB]: -49.73



Date: 6.MAR.2020 09:56:41

Emissions in nonrestricted frequency bands at the Band-edge

Project Number: GOM-1911-8589
 Applicant: UAB Axioma Metering
 Model Description: Ultrasonic water meter
 Model: Qalcosonic W1
 Test Sample ID: 28143
 Reference Standards: FCC 15.247, RSS-247
 Reference Method: ANSI C63.10:2013, Section 6.10
 Operational Mode: single frequency, Channel: 927.0 MHz
 Operating Conditions: Tnom/Vnom
 Operator: Wilfried Treffke
 Test Site: Eurofins Product Service GmbH
 Test Date: 2020-03-06
 Band-edge: Upper
 In-band Frequency [MHz]: 926.752
 Max. in-band Level [dBm/100 kHz]: 17.561
 Out-of-band Frequency [MHz]: 928.0
 Max. out-of-band Level [dBm/100 kHz]: -31.626
 Attenuation [dB]: -49.19



Date: 6.MAR.2020 09:59:44

3.6 Test Conditions and Results - Conducted spurious emissions

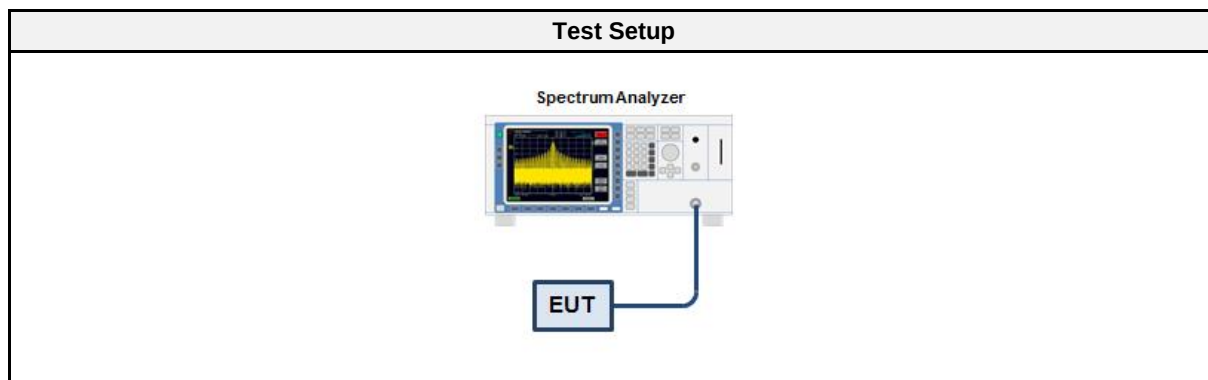
3.6.1 Information

Test Information	
Reference	FCC § 15.247(d); ISED RSS-247, Issue 2 (section 5.5)
Measurement Method	ANSI C63.10 11.11
Operator	Wilfried Treffke
Date	2020-03-06

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 Analyzer	R&S	FSU 26	EF01407	2019-07	2020-07

3.6.5 Procedure

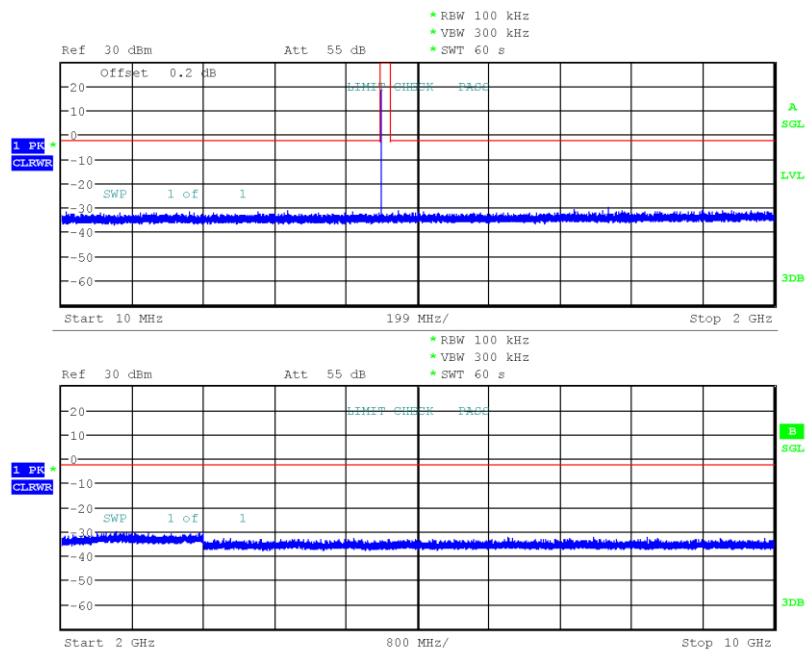
Test Procedure
1. EUT set to test mode (Communication tester is used if needed) 2. Span set around lower band edge and detector is set to peak and max hold 3. Resolution bandwidth is set to 100 kHz 4. Markers are set to peak emission levels within frequency band and outside frequency band 5. Band edge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

3.6.6 Results

Test Results		
Mode	Channel [MHz]	Verdict
Transmit	903	PASS
Transmit	915	PASS
Transmit	927	PASS

Conducted Spurious Emissions

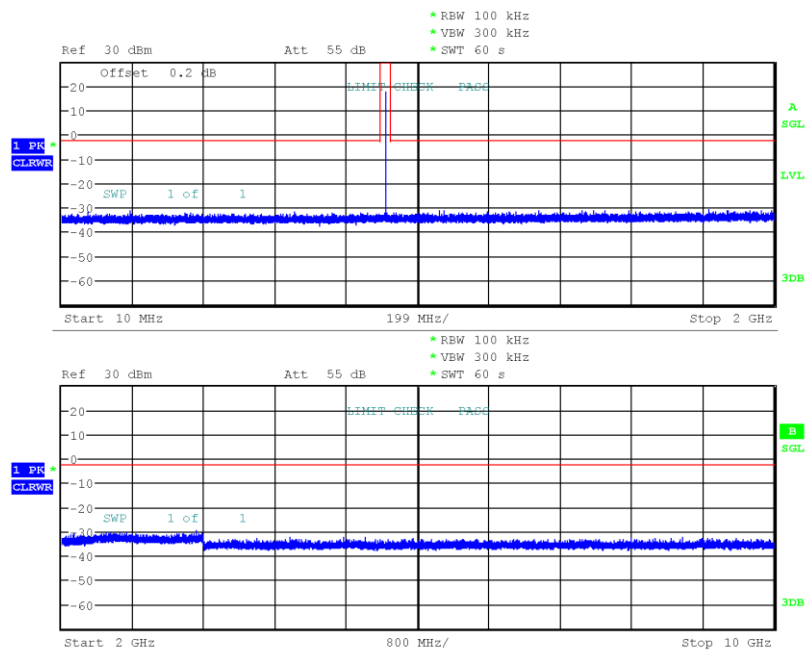
Project Number: G0M-1911-8589
 Applicant: UAB Axioma Metering
 Model Description: Ultrasonic water meter
 Model: Qalcosonic W1
 Test Sample ID: 28143
 Reference Standards: FCC 15.247, RSS-247
 Reference Method: ANSI C63.10:2013, Section 11.11
 Operational Mode: LoRa, Channel: 903 MHz
 Operating Conditions: Tnom/Vnom
 Operator: Wilfried Treffke
 Test Site: Eurofins Product Service GmbH
 Test Date: 2020-03-06
 Max. in-band Frequency [MHz]: 902.8
 Max. in-band Level [dBm/100 kHz]: 17.8
 Out-of-band Limit [dBm/100 kHz]: -2.2



Date: 6.MAR.2020 10:06:22

Conducted Spurious Emissions

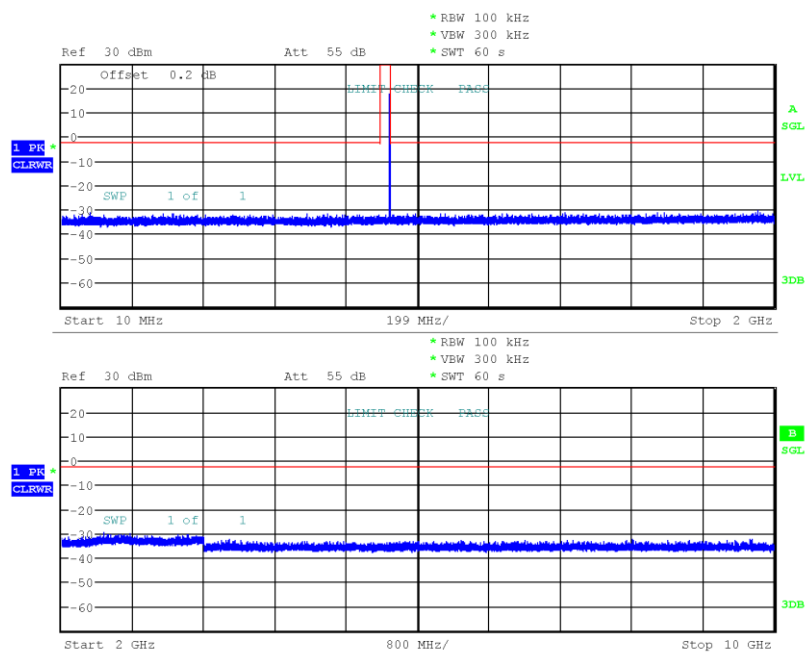
Project Number: G0M-1911-8589
 Applicant: UAB Axioma Metering
 Model Description: Ultrasonic water meter
 Model: Qalcosonic W1
 Test Sample ID: 28143
 Reference Standards: FCC 15.247, RSS-247
 Reference Method: ANSI C63.10:2013, Section 11.11
 Operational Mode: LoRa, Channel: 915 MHz
 Operating Conditions: Tnom/Vnom
 Operator: Wilfried Treffke
 Test Site: Eurofins Product Service GmbH
 Test Date: 2020-03-06
 Max. in-band Frequency [MHz]: 914.8
 Max. in-band Level [dBm/100 kHz]: 17.6
 Out-of-band Limit [dBm/100 kHz]: -2.4



Date: 6.MAR.2020 10:16:57

Conducted Spurious Emissions

Project Number: G0M-1911-8589
 Applicant: UAB Axioma Metering
 Model Description: Ultrasonic water meter
 Model: Qalcosonic W1
 Test Sample ID: 28143
 Reference Standards: FCC 15.247, RSS-247
 Reference Method: ANSI C63.10:2013, Section 11.11
 Operational Mode: LoRa, Channel: 927 MHz
 Operating Conditions: Tnom/Vnom
 Operator: Wilfried Treffke
 Test Site: Eurofins Product Service GmbH
 Test Date: 2020-03-06
 Max. in-band Frequency [MHz]: 926.8
 Max. in-band Level [dBm/100 kHz]: 17.6
 Out-of-band Limit [dBm/100 kHz]: -2.4



Date: 6.MAR.2020 10:21:31

3.7 Test Conditions and Results - Transmitter radiated emissions

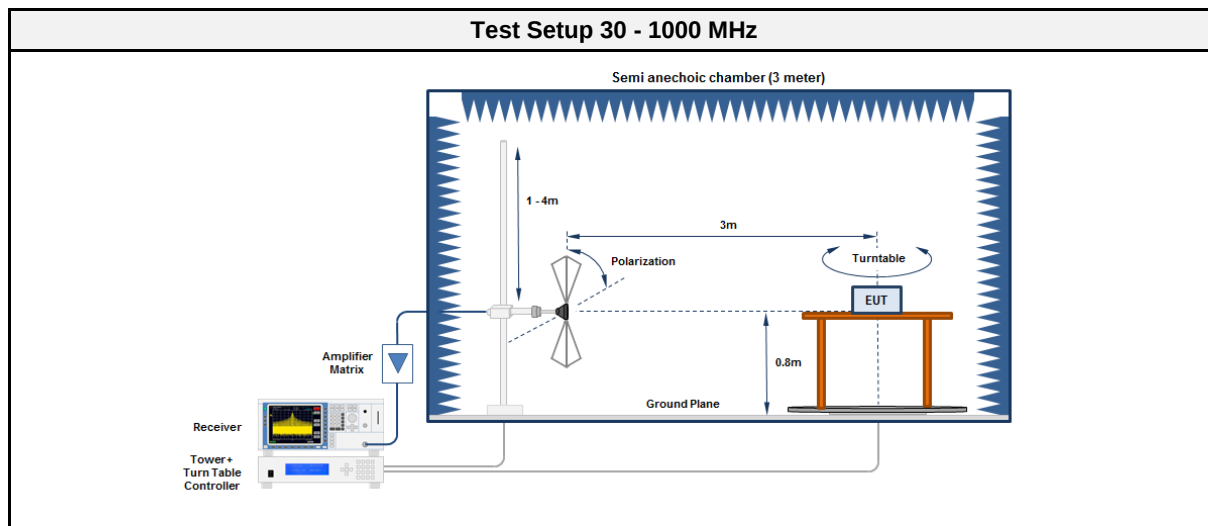
3.7.1 Information

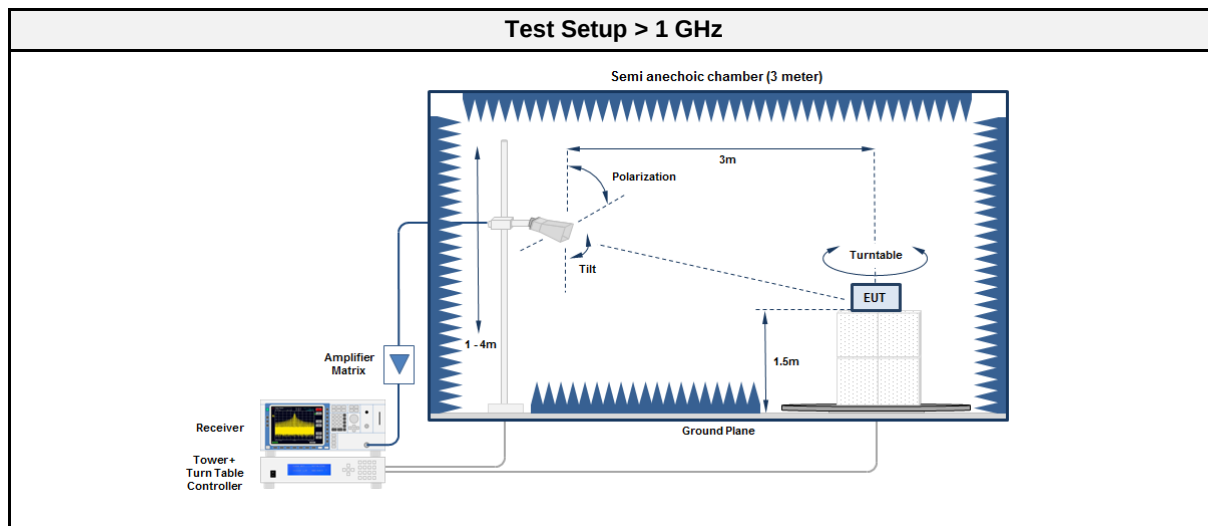
Test Information	
Reference	FCC § 15.247(d); FCC § 15.209; ISSED RSS-Gen, Issue 5 (section 6.13)
Measurement Method	ANSI C63.10 6.4, 6.5, 6.6, 11.12
Operator	Wilfried Treffke
Date	2020-03-05

3.7.2 Limits

Limits			
Frequency [MHz]	Detector	Field strength [$\mu\text{V/m}$]	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	2016.1.10

Test Equipment 30 - 1000 MHz					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Anechoic Chamber	Frankonia	AC1	EF00062	2018-07	2021-07
Measurement Receiver	Agilent	N9038A-526/WXP	EF01070	2019-09	2020-09
Antenna	R&S	HK 116	EF00030	2019-04	2022-04
Antenna	R&S	HL 223	EF00212	2019-05	2022-05

Test Equipment > 1 GHz					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Anechoic Chamber	Frankonia	AC1	EF00062	2018-07	2021-07
Measurement Receiver	Agilent	N9038A-526/WXP	EF01070	2019-09	2020-09
Antenna	Schwarzbeck	BBHA 9120D	EF00018	2019-10	2022-10
Antenna	Amplifier Research	AT4560	EF00302	2019-05	2020-05

3.7.5 Procedure

Test Procedure < 30 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 EUT is rotated through 360° 4. The emissions are measured with peak detector and max hold 5. All significant emissions are measured again using the corresponding final detector	

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

3.7.6 Results

Test Results

Channel [MHz]	Emission [MHz]	Level [dBμV/m]	Det.	Pol.	Limit [dBμV/m]	Margin [dB]
903	2708	56.97	pk	hor	74.00	-17.03
903	2708	51.70	RMS	hor	54.00	-02.30
903	2710	51.96	pk	ver	74.00	-22.04
903	2710	50.40	RMS	ver	54.00	-03.60
903	3611	49.08	pk	ver	74.00	-24.92
903	3611	47.04	RMS	ver	54.00	-06.96
903	3612	48.93	pk	hor	74.00	-25.07
903	3612	44.55	RMS	hor	54.00	-09.45
915	2744	52.48	pk	hor	74.00	-21.52
915	2744	51.90	RMS	hor	54.00	-02.10
915	2745	51.55	pk	ver	74.00	-22.45
915	2745	50.17	RMS	ver	54.00	-03.83
915	3659	48.71	pk	hor	74.00	-25.29
915	3659	48.24	RMS	hor	54.00	-05.76
915	7321	50.35	pk	ver	74.00	-23.65
927	2781	52.23	pk	hor	74.00	-21.77
927	2781	51.82	RMS	hor	54.00	-02.18
927	2781	50.45	pk	ver	74.00	-23.55
927	2781	49.09	RMS	ver	54.00	-04.91
927	3707	49.76	pk	hor	74.00	-24.24
927	3707	48.99	RMS	hor	54.00	-05.01
927	7416	52.26	pk	ver	74.00	-21.74

3.8 Test Conditions and Results - Receiver radiated emissions

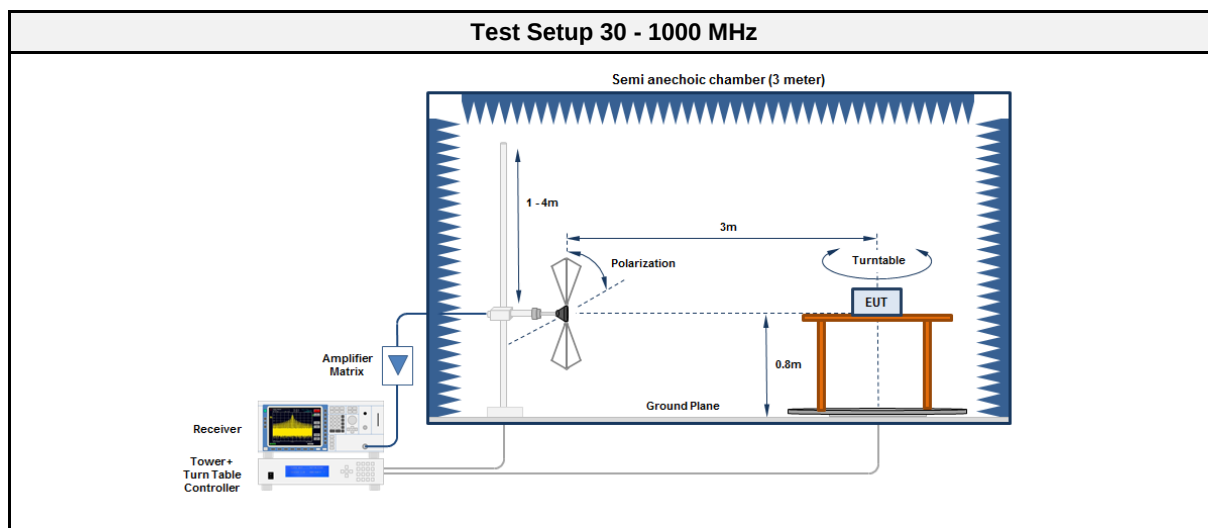
3.8.1 Information

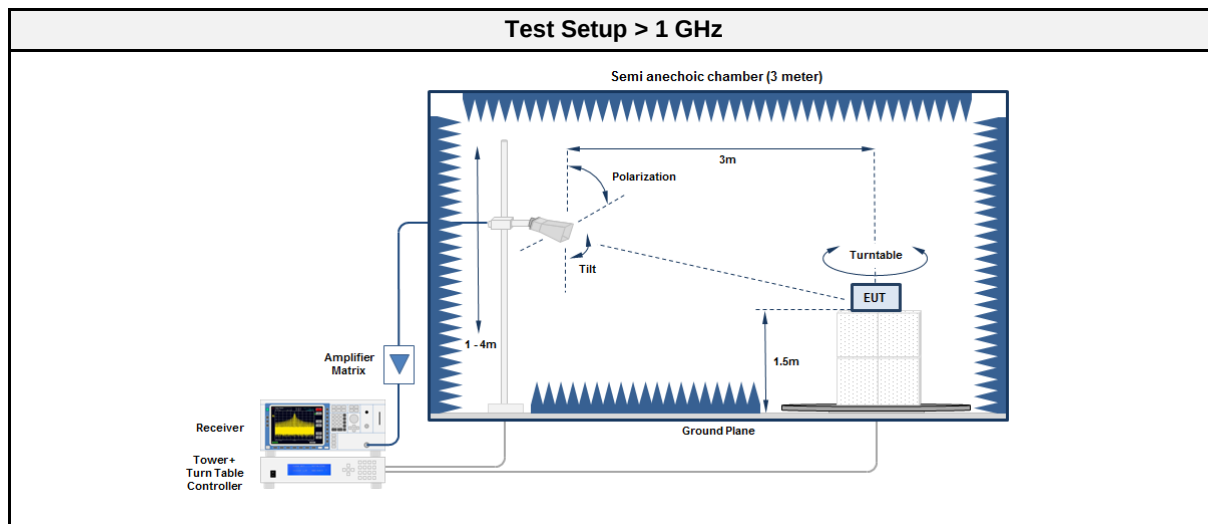
Test Information	
Reference	ISED RSS-247, Issue 2 (section 3.1)
Measurement Method	ANSI C63.10 6.5, 6.6, 11.12
Operator	Wilfried Treffke
Date	2020-03-06

3.8.2 Limits

Limits			
Frequency [MHz]	Detector	Field strength [dB μ 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	2016.1.10

Test Equipment 30 - 1000 MHz					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Anechoic Chamber	Frankonia	AC1	EF00062	2018-07	2021-07
Measurement Receiver	Agilent	N9038A-526/WXP	EF01070	2019-09	2020-09
Antenna	R&S	HK 116	EF00030	2019-04	2022-04
Antenna	R&S	HL 223	EF00212	2019-05	2022-05

Test Equipment > 1 GHz					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Anechoic Chamber	Frankonia	AC1	EF00062	2018-07	2021-07
Measurement Receiver	Agilent	N9038A-526/WXP	EF01070	2019-09	2020-09
Antenna	Schwarzbeck	BBHA 9120D	EF00018	2019-10	2022-10

3.8.5 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	

3.8.6 Results

Test Results						
Channel [MHz]	Emission [MHz]	Level [dBμV/m]	Det.	Pol.	Limit [dBμV/m]	Margin [dB]
915	2274	27.53	pk	hor	53.98	-26.45
915	3817	29.61	pk	ver	53.98	-24.37
915	7705	39.38	pk	hor	53.98	-14.60
915	7968	40.40	pk	ver	53.98	-13.58

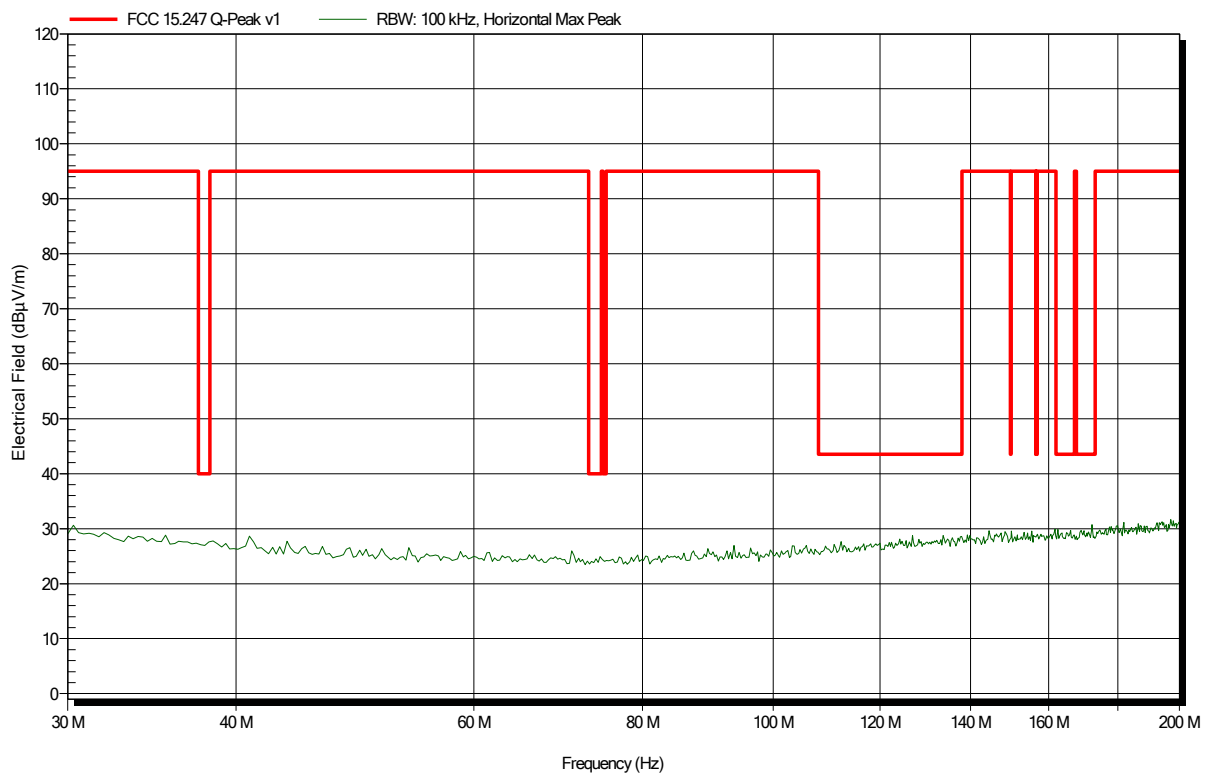
ANNEX A Transmitter spurious emissions

Spurious emissions according to FCC 47 e-CFR §15.247

Project number: G0M-1911-8589

Applicant: UAB Axioma Metering
EUT Name: Ultrasonic water meter
Model: Qalcosonic W1
Test Site: Eurofins Product Service GmbH
Operator: Wilfried Treffke
Test Conditions: Tnom: 24°C, Vnom: 3.3 VDC (lithium battery)
Antenna: Rohde & Schwarz HK 116, Horizontal
Measurement distance: 3 m
Mode: TX; LoRa; 903 MHz
Test Date: 2020-03-05
Note:

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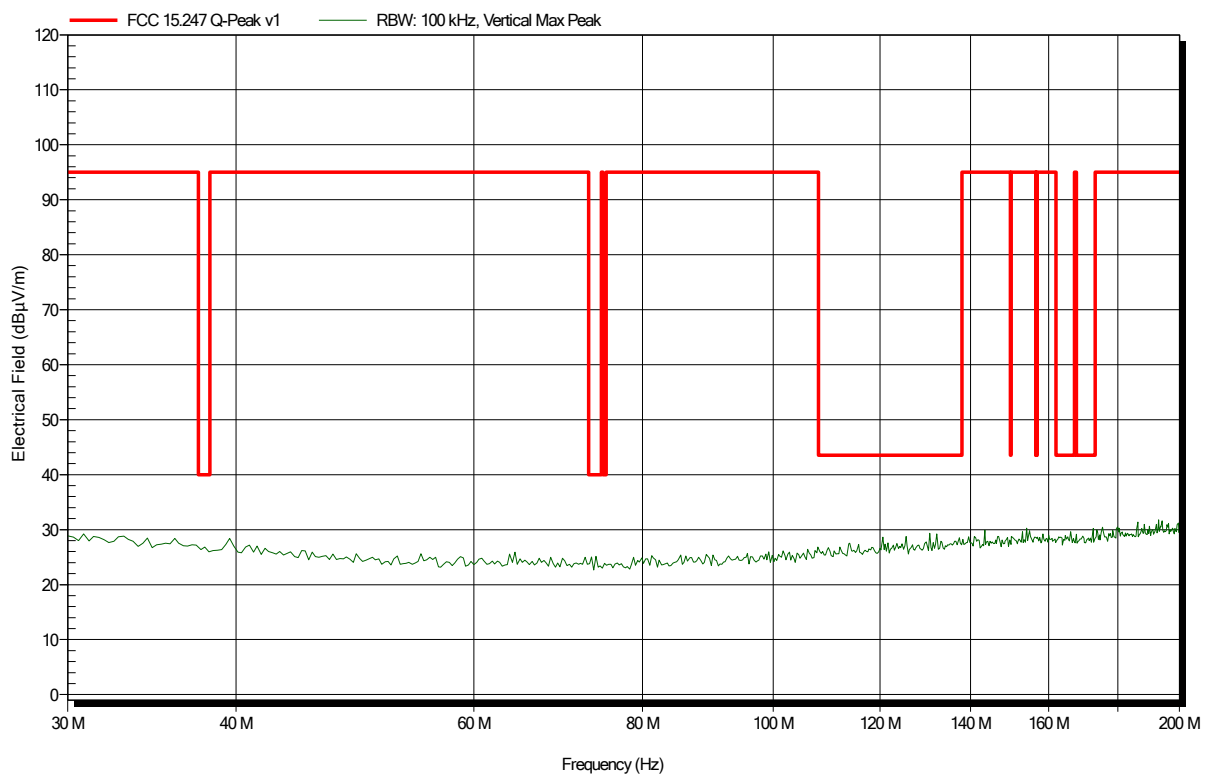


Spurious emissions according to FCC 47 e-CFR §15.247

Project number: G0M-1911-8589

Applicant: UAB Axioma Metering
EUT Name: Ultrasonic water meter
Model: Qalcosonic W1
Test Site: Eurofins Product Service GmbH
Operator: Wilfried Treffke
Test Conditions: Tnom: 24°C, Vnom: 3.3 VDC (lithium battery)
Antenna: Rohde & Schwarz HK 116, Vertical
Measurement distance: 3 m
Mode: TX; LoRa; 903 MHz
Test Date: 2020-03-05
Note:

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Spurious emissions according to FCC 47 e-CFR §15.247

Project number: G0M-1911-8589

Applicant: UAB Axioma Metering

EUT Name: Ultrasonic water meter

Model: Qalcosonic W1

Test Site: Eurofins Product Service GmbH

Operator: Wilfried Treffke

Test Conditions: Tnom: 24°C, Vnom: 3.3 VDC (lithium battery)

Antenna: Schwarzbeck BBHA 9120D, Horizontal

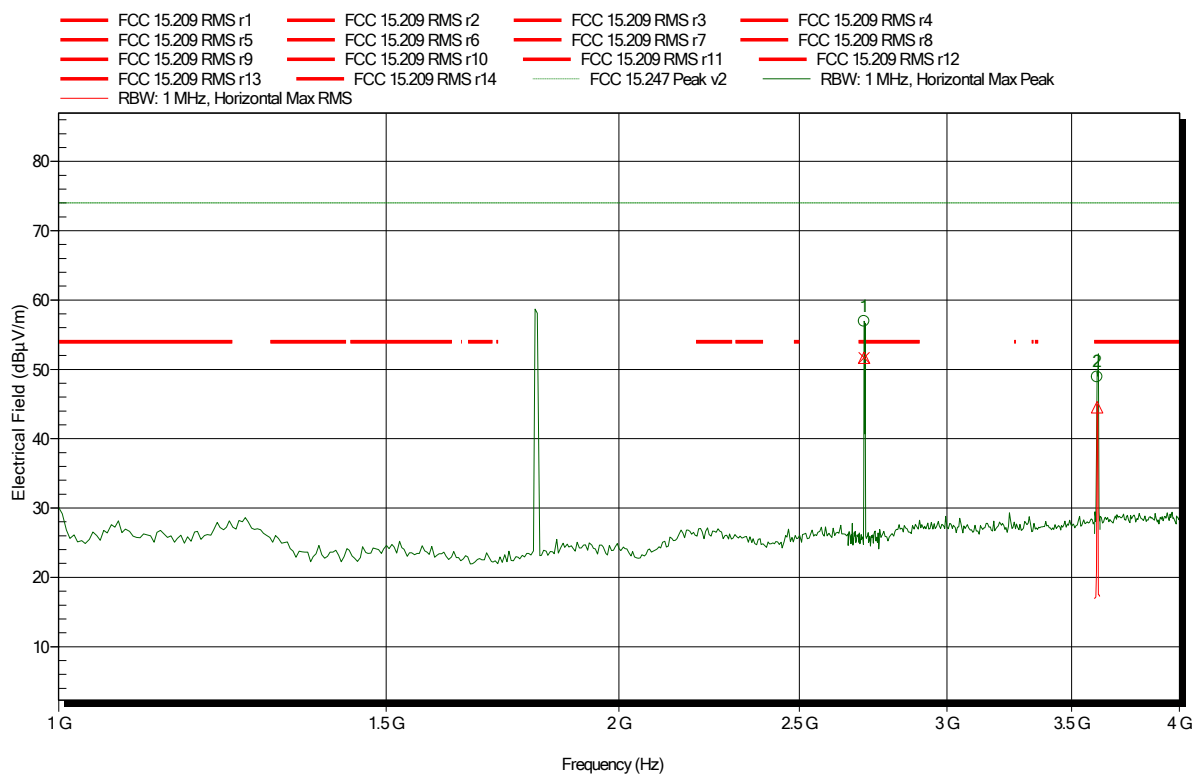
Measurement distance: 1 m converted to 3m

Mode: TX; LoRa; 903 MHz

Test Date: 2020-03-05

Note:

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Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.708 GHz	56.97 dBμV/m	74 dBμV/m	-17.03 dB	Pass
3.612 GHz	48.93 dBμV/m	74 dBμV/m	-25.07 dB	Pass

Frequency	RMS	RMS Limit	RMS Difference	RMS Status
2.708 GHz	51.7 dBμV/m	54 dBμV/m	-2.3 dB	Pass
3.612 GHz	44.55 dBμV/m	54 dBμV/m	-9.45 dB	Pass

Spurious emissions according to FCC 47 e-CFR §15.247

Project number: G0M-1911-8589

Applicant: UAB Axioma Metering

EUT Name: Ultrasonic water meter

Model: Qalcosonic W1

Test Site: Eurofins Product Service GmbH

Operator: Wilfried Treffke

Test Conditions: Tnom: 24°C, Vnom: 3.3 VDC (lithium battery)

Antenna: Schwarzbeck BBHA 9120D, Vertical

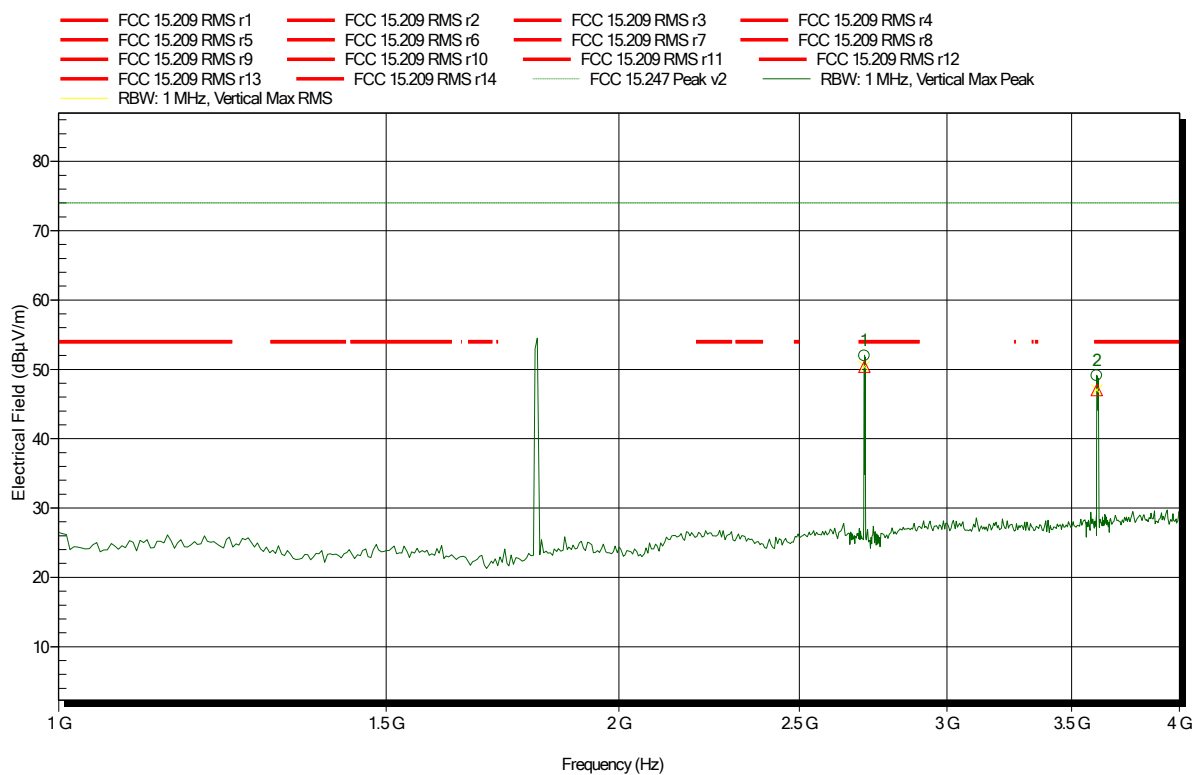
Measurement distance: 1 m converted to 3m

Mode: TX; LoRa; 903 MHz

Test Date: 2020-03-05

Note:

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Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.71 GHz	51.96 dBμV/m	74 dBμV/m	-22.04 dB	Pass
3.611 GHz	49.08 dBμV/m	74 dBμV/m	-24.92 dB	Pass

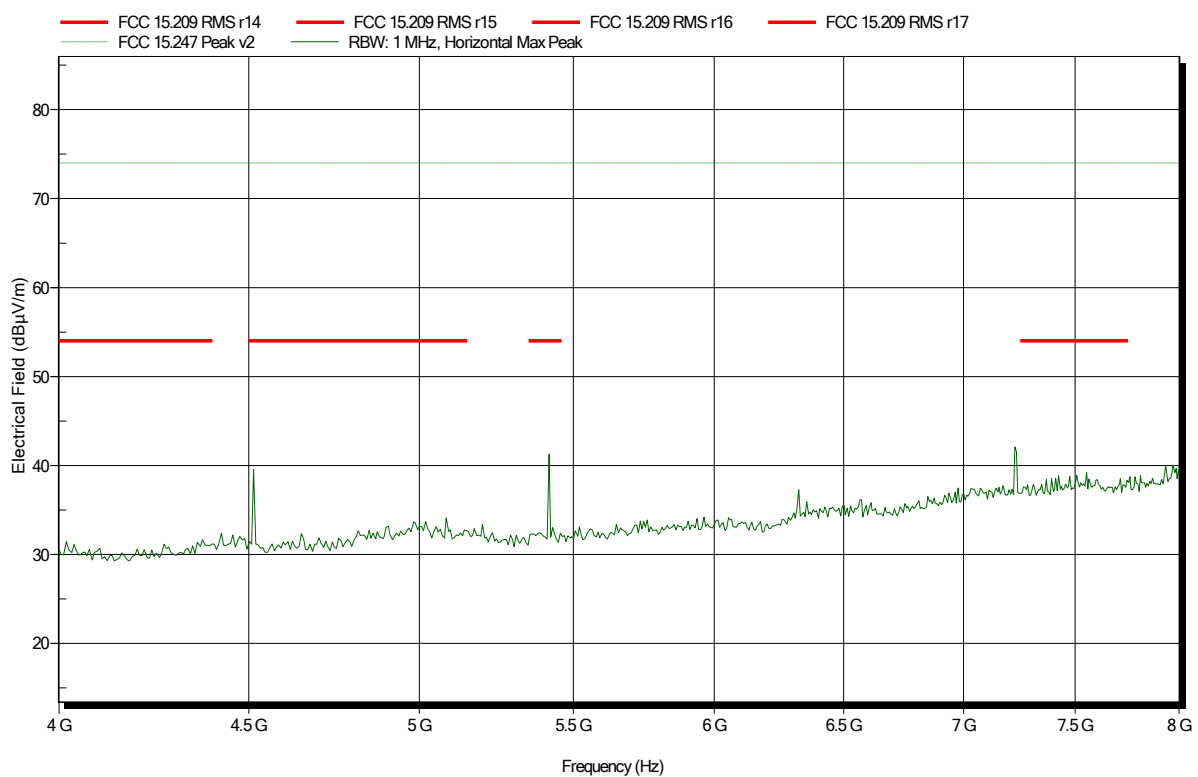
Frequency	RMS	RMS Limit	RMS Difference	RMS Status
2.71 GHz	50.4 dBμV/m	54 dBμV/m	-3.6 dB	Pass
3.611 GHz	47.04 dBμV/m	54 dBμV/m	-6.96 dB	Pass

Spurious emissions according to FCC 47 e-CFR §15.247

Project number: G0M-1911-8589

Applicant: UAB Axioma Metering
 EUT Name: Ultrasonic water meter
 Model: Qalcosonic W1
 Test Site: Eurofins Product Service GmbH
 Operator: Wilfried Treffke
 Test Conditions: Tnom: 24°C, Vnom: 3.3 VDC (lithium battery)
 Antenna: Schwarzbeck BBHA 9120D, Horizontal
 Measurement distance: 1 m converted to 3m
 Mode: TX; LoRa; 903 MHz
 Test Date: 2020-03-05
 Note:

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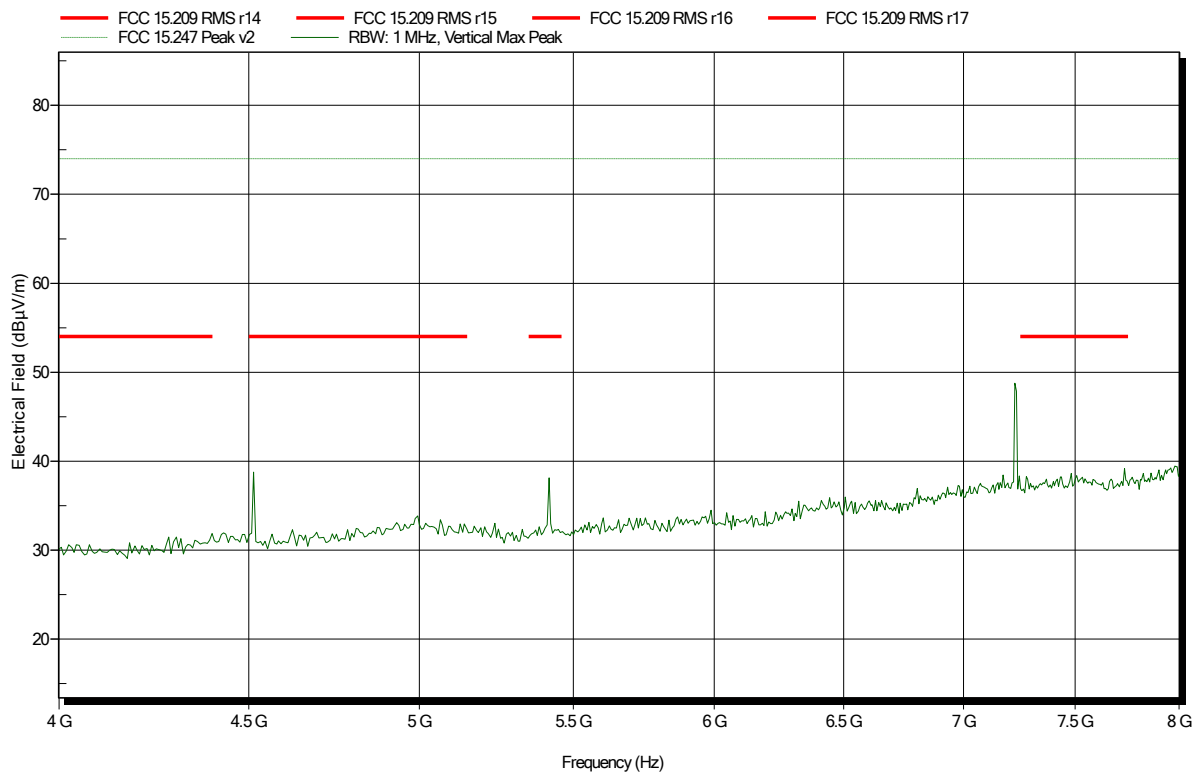


Spurious emissions according to FCC 47 e-CFR §15.247

Project number: G0M-1911-8589

Applicant: UAB Axioma Metering
EUT Name: Ultrasonic water meter
Model: Qalcosonic W1
Test Site: Eurofins Product Service GmbH
Operator: Wilfried Treffke
Measurement software: RadiMation, version 2016.1.10
Test Conditions: Tnom: 24°C, Vnom: 3.3 VDC (lithium battery)
Antenna: Schwarzbeck BBHA 9120D, Vertical
Measurement distance: 1 m, converted to 3 m
Mode: TX; LoRa; 903 MHz
Test Date: 2020-03-05
Note:

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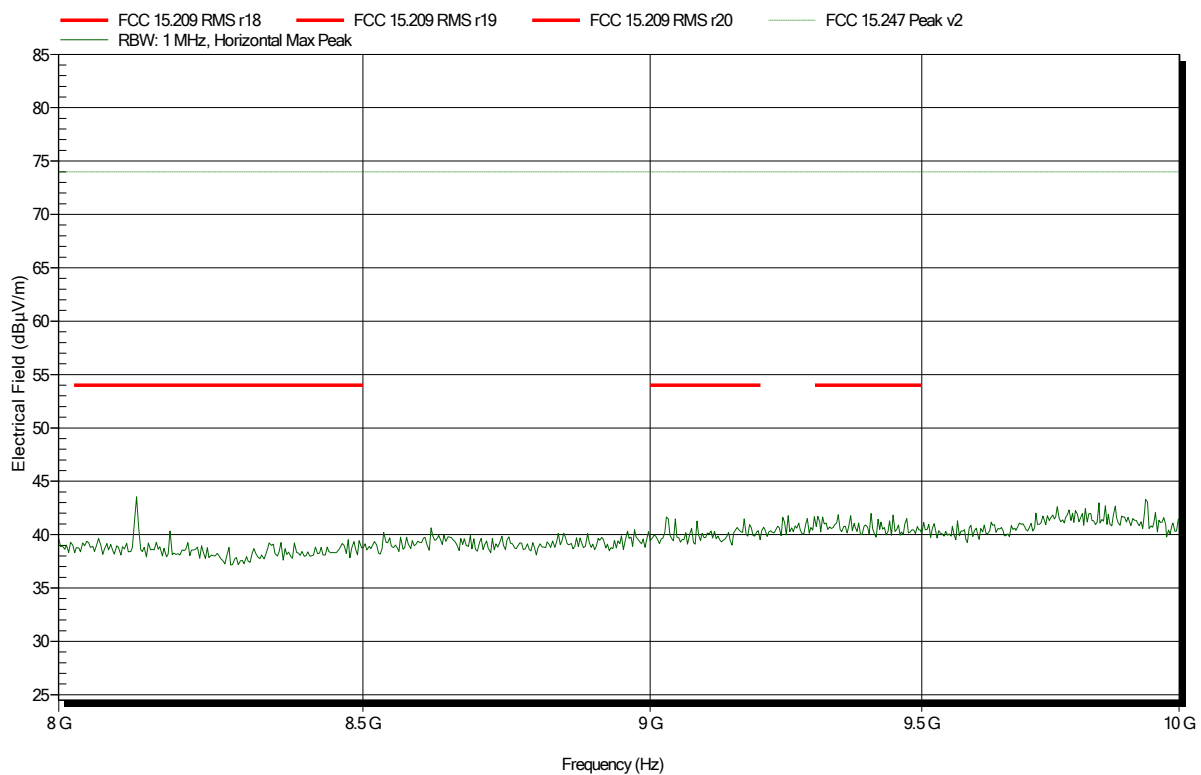


Spurious emissions according to FCC 47 e-CFR §15.247

Project number: G0M-1911-8589

Applicant: UAB Axioma Metering
EUT Name: Ultrasonic water meter
Model: Qalcosonic W1
Test Site: Eurofins Product Service GmbH
Operator: Wilfried Treffke
Test Conditions: Tnom: 24°C, Vnom: 3.3 VDC (lithium battery)
Antenna: Schwarzbeck BBHA 9120D, Horizontal
Measurement distance: 1 m converted to 3m
Mode: TX; LoRa; 903 MHz
Test Date: 2020-03-05
Note:

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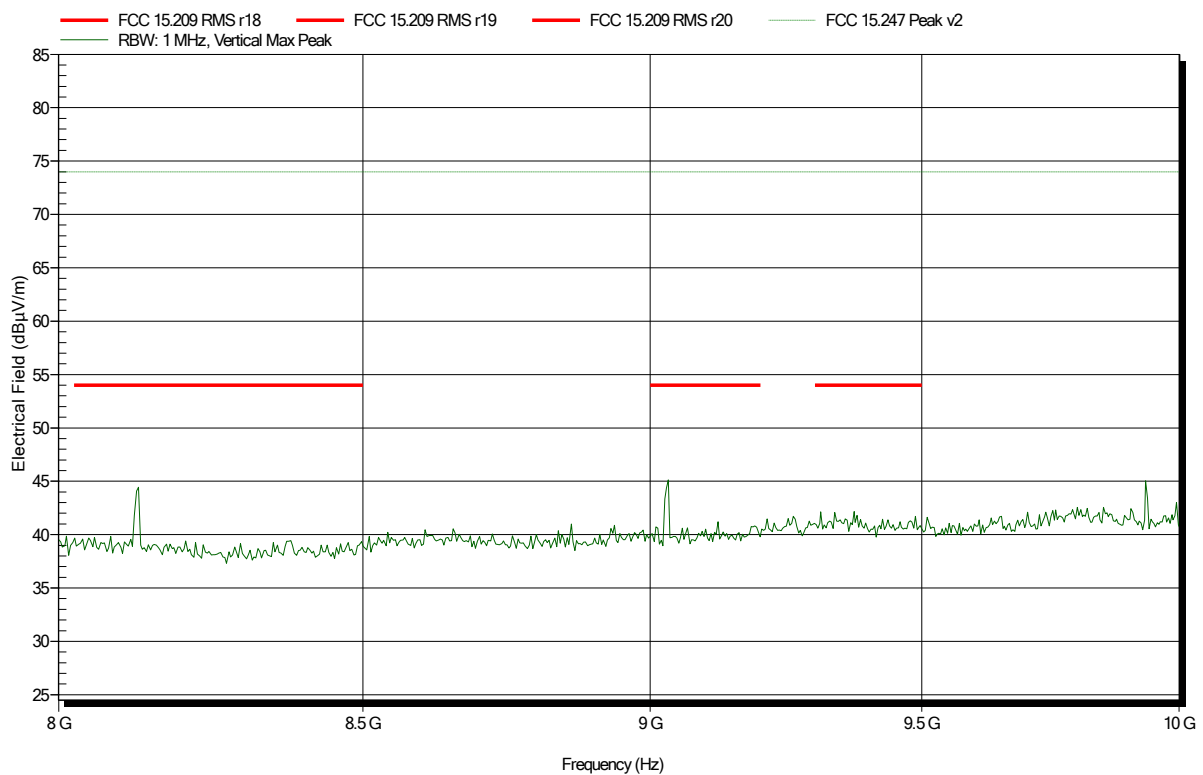


Spurious emissions according to FCC 47 e-CFR §15.247

Project number: G0M-1911-8589

Applicant: UAB Axioma Metering
 EUT Name: Ultrasonic water meter
 Model: Qalcosonic W1
 Test Site: Eurofins Product Service GmbH
 Operator: Wilfried Treffke
 Test Conditions: Tnom: 24°C, Vnom: 3.3 VDC (lithium battery)
 Antenna: Schwarzbeck BBHA 9120D, Vertical
 Measurement distance: 1 m converted to 3m
 Mode: TX; LoRa; 903 MHz
 Test Date: 2020-03-05
 Note:

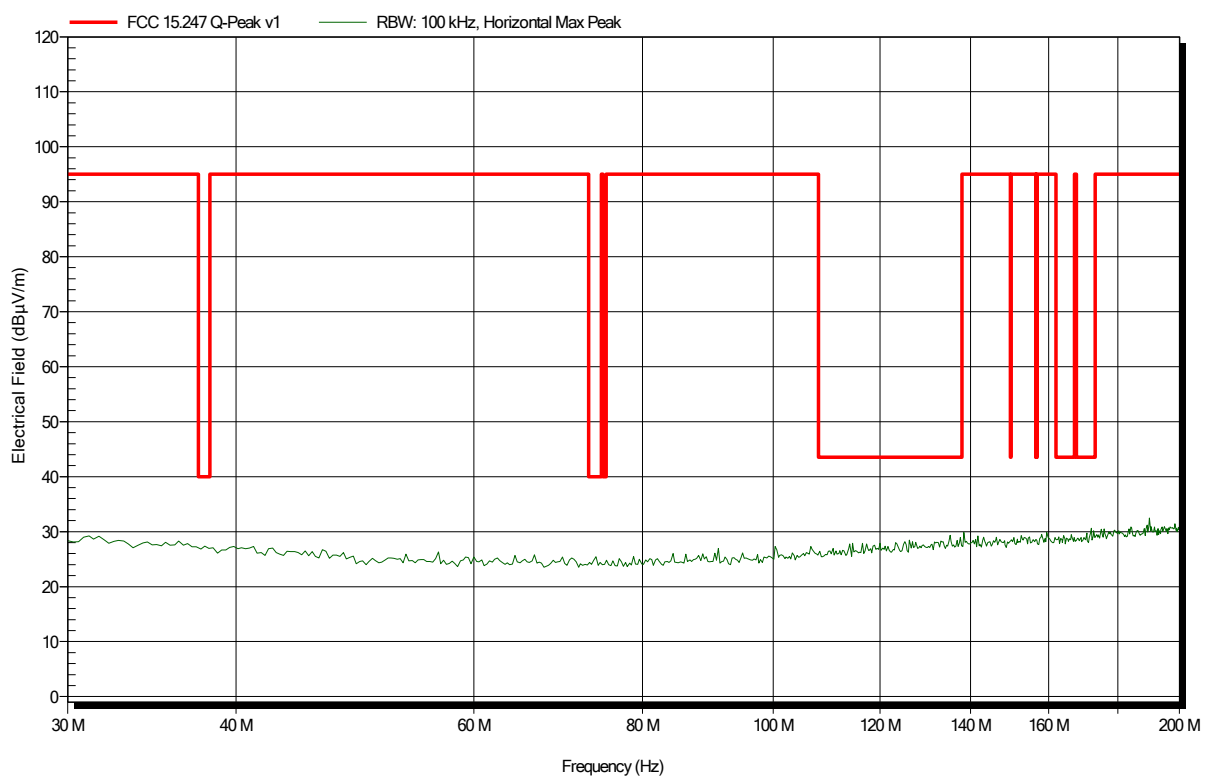
Index 110



Spurious emissions according to FCC 47 e-CFR §15.247

Project number: G0M-1911-8589
 Applicant: UAB Axioma Metering
 EUT Name: Ultrasonic water meter
 Model: Qalcosonic W1
 Test Site: Eurofins Product Service GmbH
 Operator: Wilfried Treffke
 Test Conditions: Tnom: 24°C, Vnom: 3.3 VDC (lithium battery)
 Antenna: Rohde & Schwarz HK 116, Horizontal
 Measurement distance: 3 m
 Mode: TX; LoRa; 915 MHz
 Test Date: 2020-03-05
 Note:

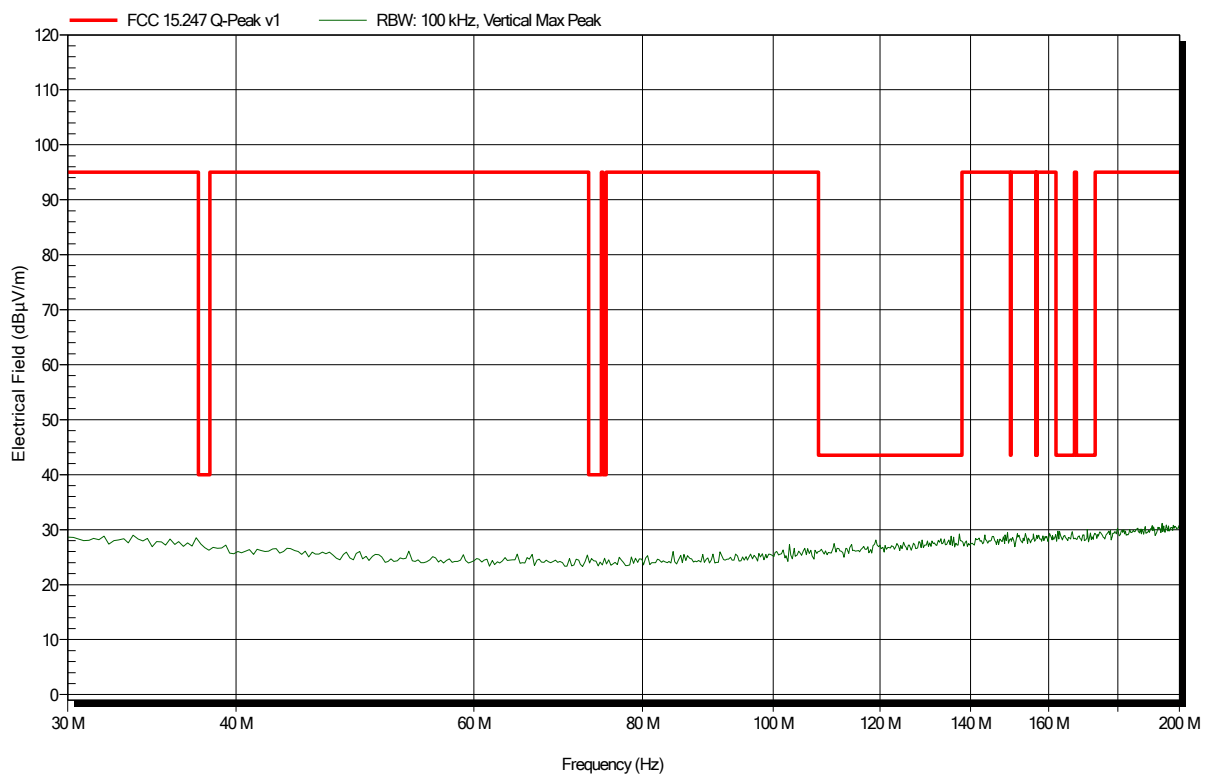
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Spurious emissions according to FCC 47 e-CFR §15.247

Project number: G0M-1911-8589
 Applicant: UAB Axioma Metering
 EUT Name: Ultrasonic water meter
 Model: Qalcosonic W1
 Test Site: Eurofins Product Service GmbH
 Operator: Wilfried Treffke
 Test Conditions: Tnom: 24°C, Vnom: 3.3 VDC (lithium battery)
 Antenna: Rohde & Schwarz HK 116, Vertical
 Measurement distance: 3 m
 Mode: TX; LoRa; 915 MHz
 Test Date: 2020-03-05
 Note:

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Spurious emissions according to FCC 47 e-CFR §15.247

Project number: G0M-1911-8589

Applicant: UAB Axioma Metering

EUT Name: Ultrasonic water meter

Model: Qalcosonic W1

Test Site: Eurofins Product Service GmbH

Operator: Wilfried Treffke

Test Conditions: Tnom: 24°C, Vnom: 3.3 VDC (lithium battery)

Antenna: Schwarzbeck BBHA 9120D, Horizontal

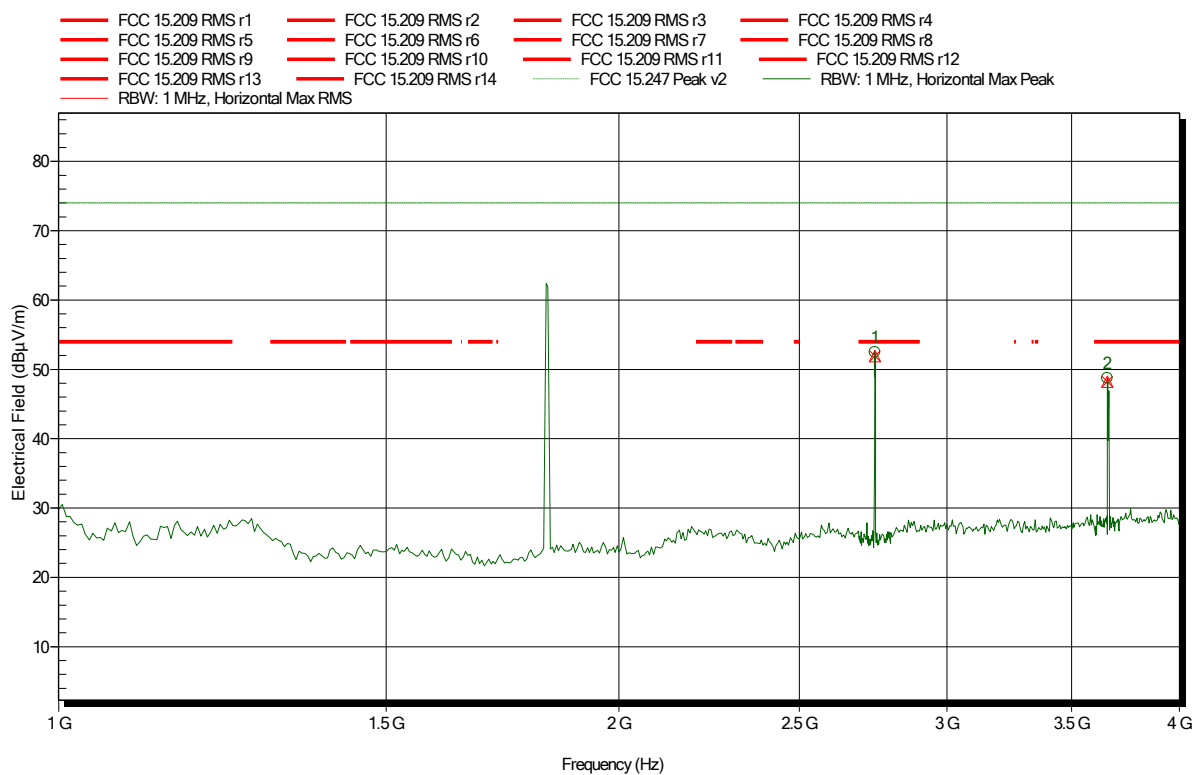
Measurement distance: 1 m converted to 3m

Mode: TX; LoRa; 915 MHz

Test Date: 2020-03-05

Note:

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Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.744 GHz	52.48 dBμV/m	74 dBμV/m	-21.52 dB	Pass
3.659 GHz	48.71 dBμV/m	74 dBμV/m	-25.29 dB	Pass

Frequency	RMS	RMS Limit	RMS Difference	RMS Status
2.744 GHz	51.9 dBμV/m	54 dBμV/m	-2.1 dB	Pass
3.659 GHz	48.24 dBμV/m	54 dBμV/m	-5.76 dB	Pass

Spurious emissions according to FCC 47 e-CFR §15.247

Project number: G0M-1911-8589

Applicant: UAB Axioma Metering

EUT Name: Ultrasonic water meter

Model: Qalcosonic W1

Test Site: Eurofins Product Service GmbH

Operator: Wilfried Treffke

Test Conditions: Tnom: 24°C, Vnom: 3.3 VDC (lithium battery)

Antenna: Schwarzbeck BBHA 9120D, Vertical

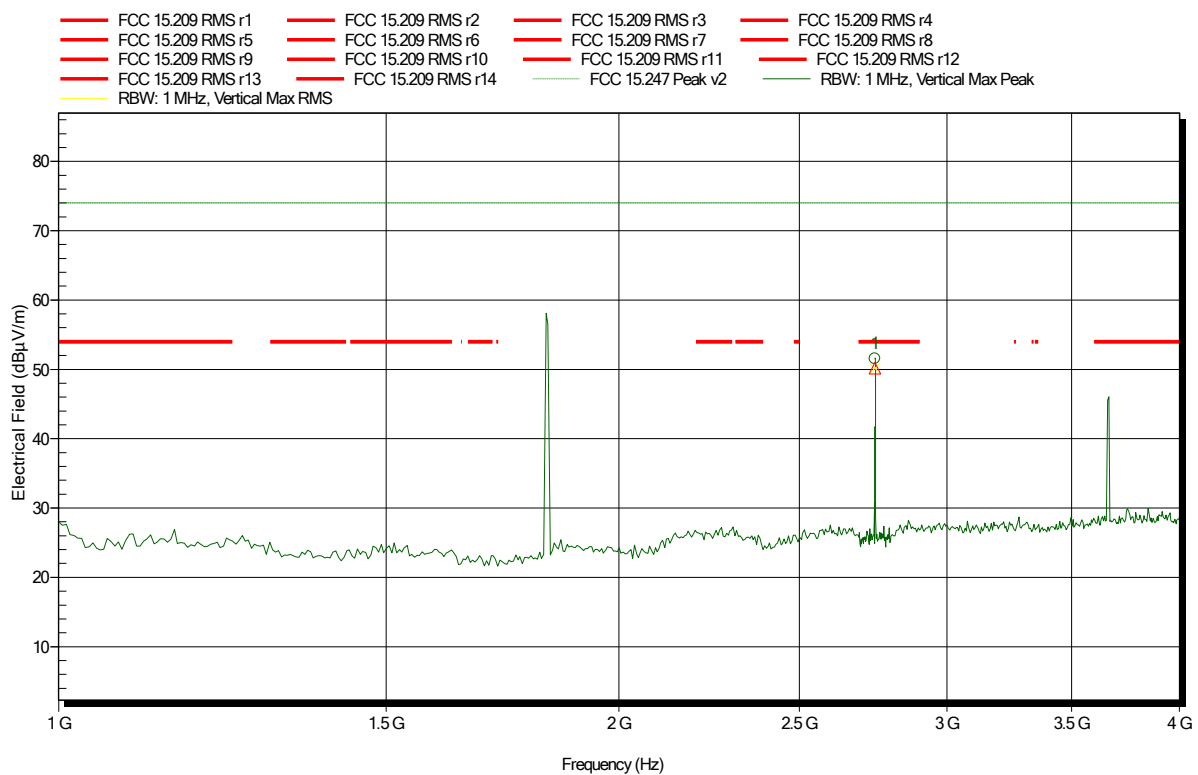
Measurement distance: 1 m converted to 3m

Mode: TX; LoRa; 915 MHz

Test Date: 2020-03-05

Note:

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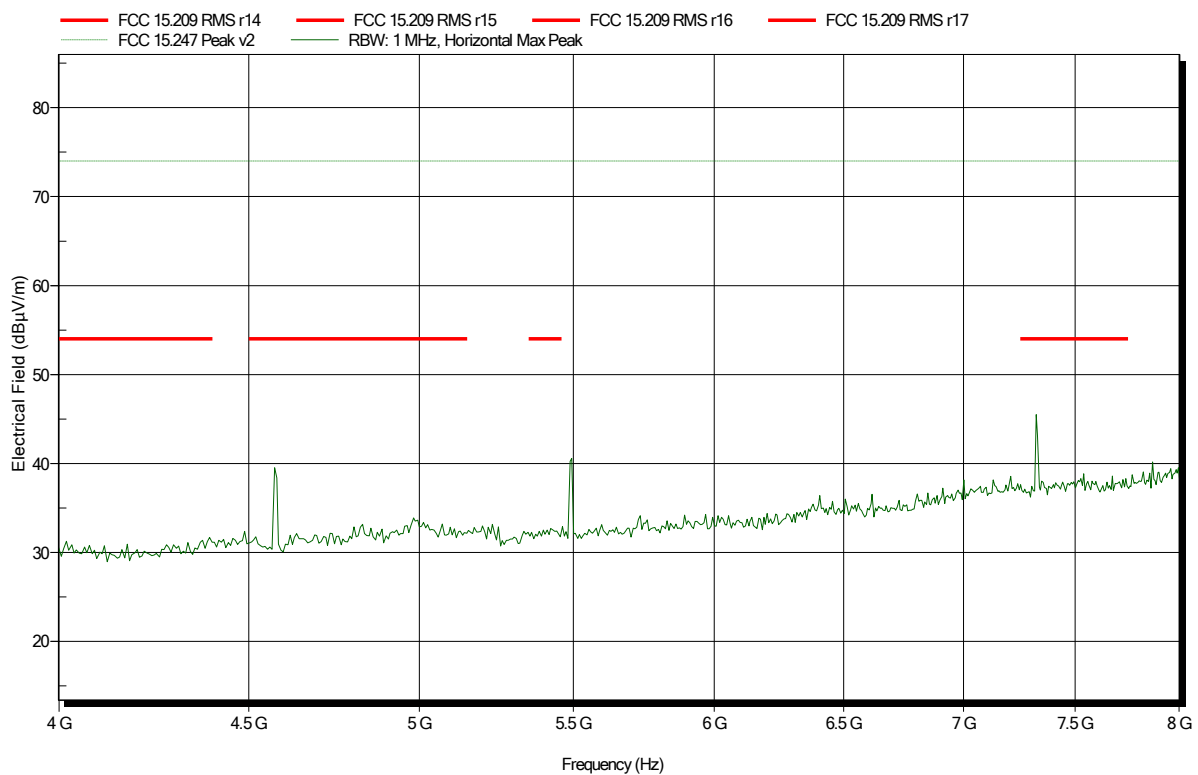
Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.745 GHz	51.55 dBµV/m	74 dBµV/m	-22.45 dB	Pass
Frequency	RMS	RMS Limit	RMS Difference	RMS Status
2.745 GHz	50.17 dBµV/m	54 dBµV/m	-3.83 dB	Pass

Spurious emissions according to FCC 47 e-CFR §15.247

Project number: G0M-1911-8589

Applicant: UAB Axioma Metering
 EUT Name: Ultrasonic water meter
 Model: Qalcosonic W1
 Test Site: Eurofins Product Service GmbH
 Operator: Wilfried Treffke
 Test Conditions: Tnom: 24°C, Vnom: 3.3 VDC (lithium battery)
 Antenna: Schwarzbeck BBHA 9120D, Horizontal
 Measurement distance: 1 m converted to 3m
 Mode: TX; LoRa; 915 MHz
 Test Date: 2020-03-05
 Note:

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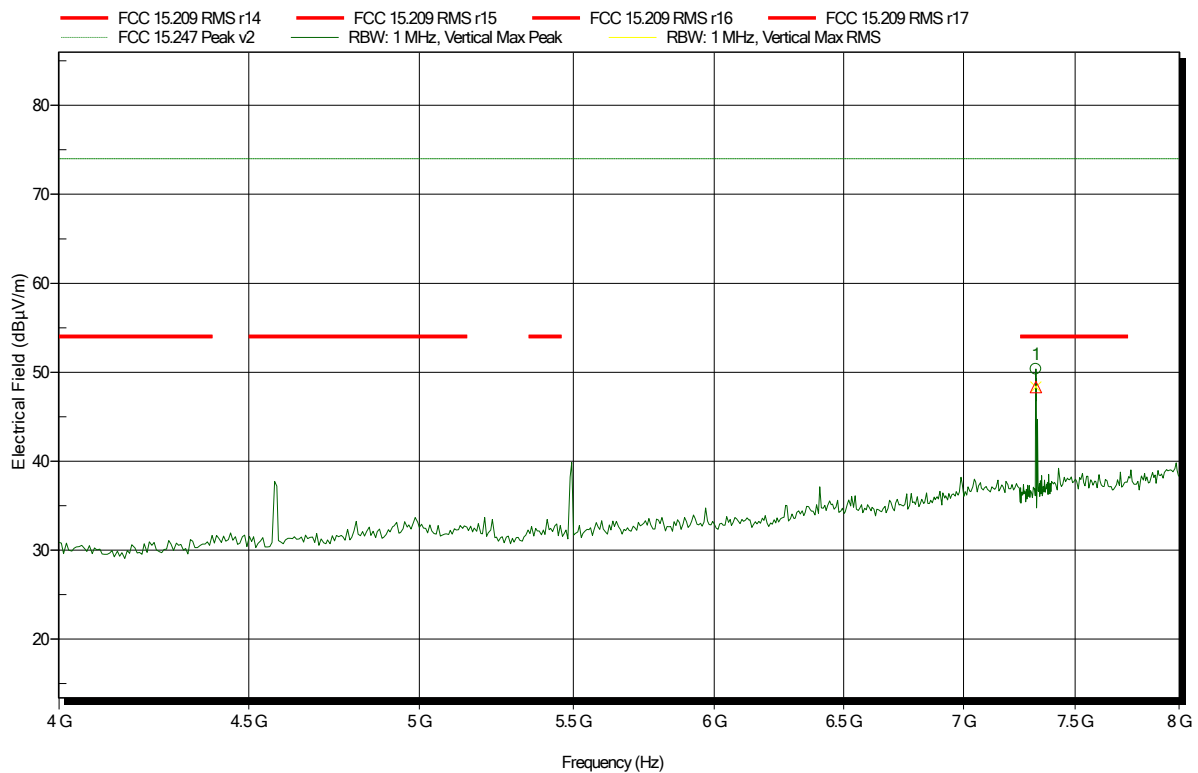


Spurious emissions according to FCC 47 e-CFR §15.247

Project number: G0M-1911-8589

Applicant: UAB Axioma Metering
EUT Name: Ultrasonic water meter
Model: Qalcosonic W1
Test Site: Eurofins Product Service GmbH
Operator: Wilfried Treffke
Measurement software: RadiMation, version 2016.1.10
Test Conditions: Tnom: 24°C, Vnom: 3.3 VDC (lithium battery)
Antenna: Schwarzbeck BBHA 9120D, Vertical
Measurement distance: 1 m, converted to 3 m
Mode: TX; LoRa; 915 MHz
Test Date: 2020-03-05
Note:

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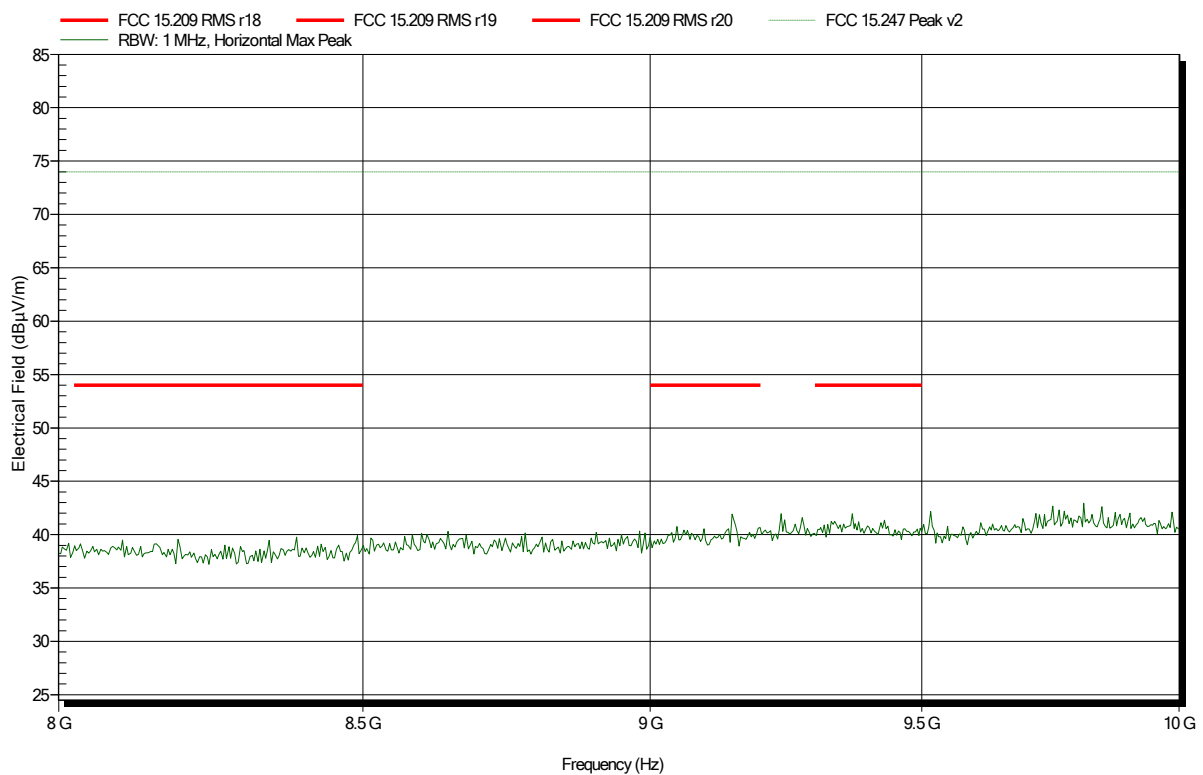
Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Height
7.321 GHz	50.35 dBµV/m	74 dBµV/m	-23.65 dB	Pass	1.2 m
Frequency	RMS	RMS Limit	RMS Difference	RMS Status	Height
7.321 GHz	48.34 dBµV/m	54 dBµV/m	-5.66 dB	Pass	1.2 m

Spurious emissions according to FCC 47 e-CFR §15.247

Project number: G0M-1911-8589

Applicant: UAB Axioma Metering
EUT Name: Ultrasonic water meter
Model: Qalcosonic W1
Test Site: Eurofins Product Service GmbH
Operator: Wilfried Treffke
Test Conditions: Tnom: 24°C, Vnom: 3.3 VDC (lithium battery)
Antenna: Schwarzbeck BBHA 9120D, Horizontal
Measurement distance: 1 m converted to 3m
Mode: TX; LoRa; 915 MHz
Test Date: 2020-03-05
Note:

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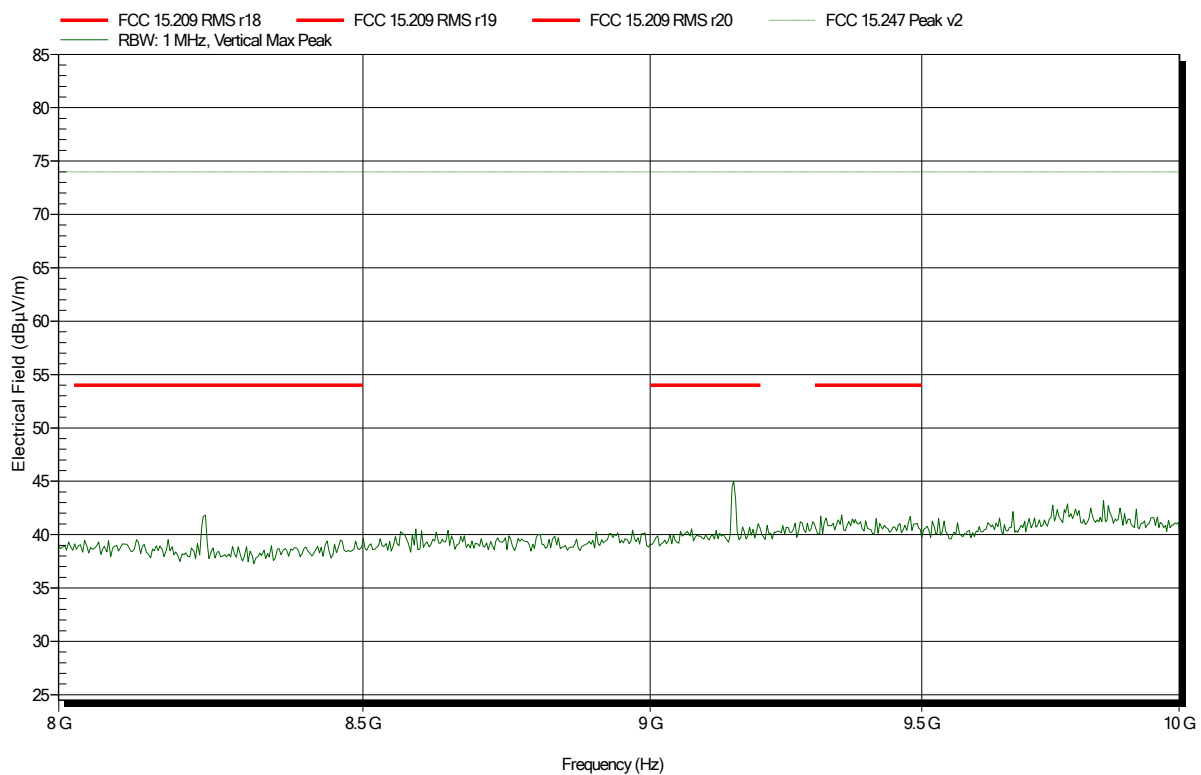


Spurious emissions according to FCC 47 e-CFR §15.247

Project number: G0M-1911-8589

Applicant: UAB Axioma Metering
EUT Name: Ultrasonic water meter
Model: Qalcosonic W1
Test Site: Eurofins Product Service GmbH
Operator: Wilfried Treffke
Test Conditions: Tnom: 24°C, Vnom: 3.3 VDC (lithium battery)
Antenna: Schwarzbeck BBHA 9120D, Vertical
Measurement distance: 1 m converted to 3m
Mode: TX; LoRa; 915 MHz
Test Date: 2020-03-05
Note:

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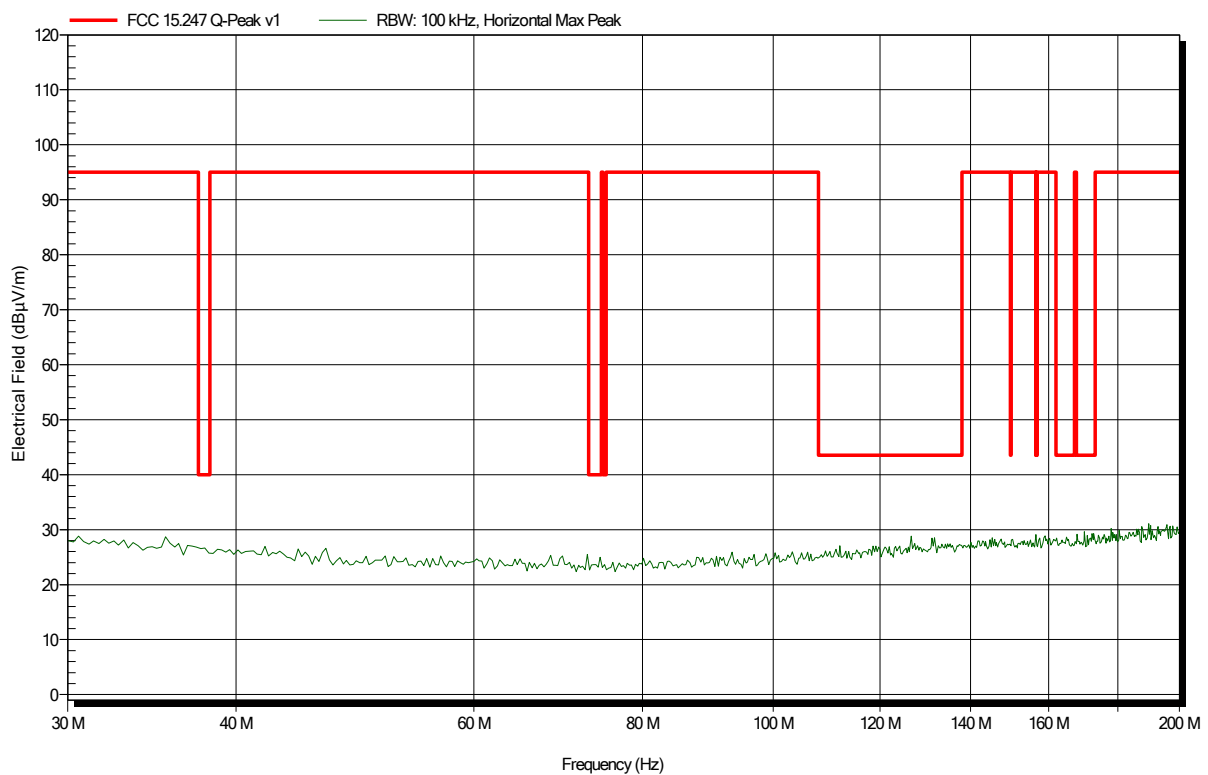


Spurious emissions according to FCC 47 e-CFR §15.247

Project number: G0M-1911-8589

Applicant: UAB Axioma Metering
EUT Name: Ultrasonic water meter
Model: Qalcosonic W1
Test Site: Eurofins Product Service GmbH
Operator: Wilfried Treffke
Test Conditions: Tnom: 24°C, Vnom: 3.3 VDC (lithium battery)
Antenna: Rohde & Schwarz HK 116, Horizontal
Measurement distance: 3 m
Mode: TX; LoRa; 927 MHz
Test Date: 2020-03-05
Note:

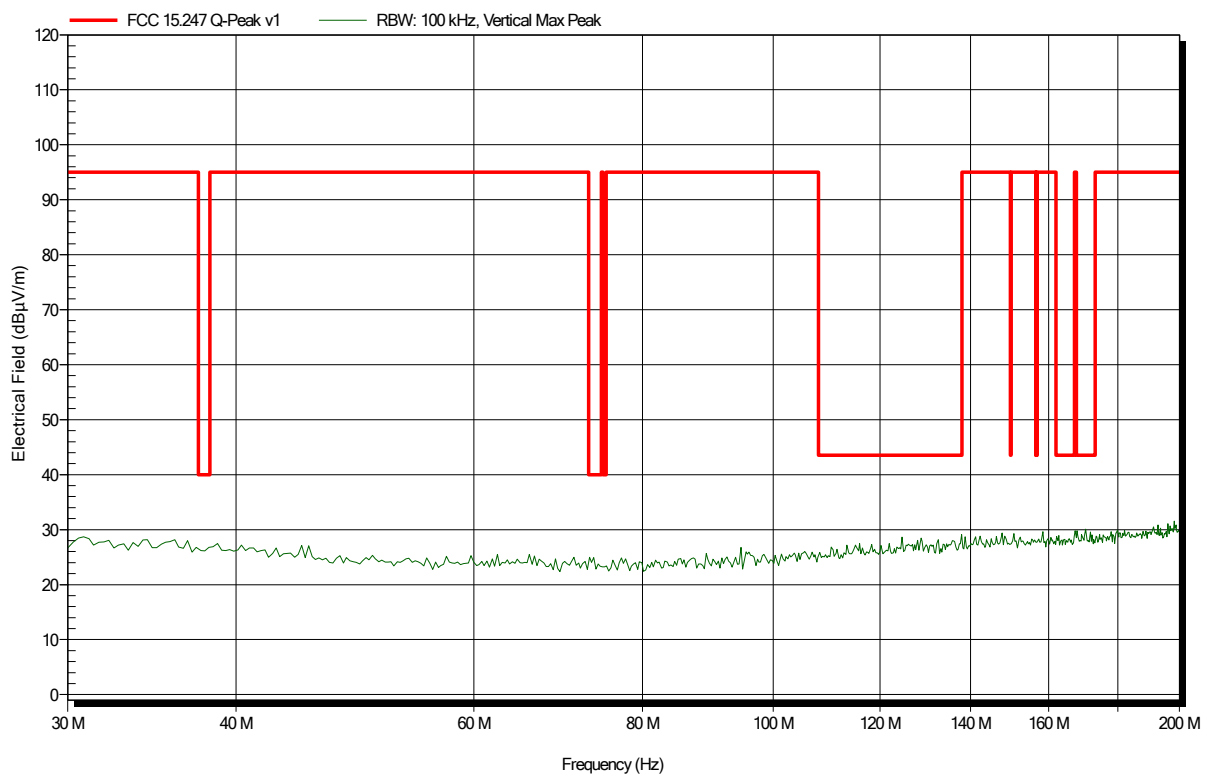
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Spurious emissions according to FCC 47 e-CFR §15.247

Project number: G0M-1911-8589
 Applicant: UAB Axioma Metering
 EUT Name: Ultrasonic water meter
 Model: Qalcosonic W1
 Test Site: Eurofins Product Service GmbH
 Operator: Wilfried Treffke
 Test Conditions: Tnom: 24°C, Vnom: 3.3 VDC (lithium battery)
 Antenna: Rohde & Schwarz HK 116, Vertical
 Measurement distance: 3 m
 Mode: TX; LoRa; 927 MHz
 Test Date: 2020-03-05
 Note:

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Spurious emissions according to FCC 47 e-CFR §15.247

Project number: G0M-1911-8589

Applicant: UAB Axioma Metering

EUT Name: Ultrasonic water meter

Model: Qalcosonic W1

Test Site: Eurofins Product Service GmbH

Operator: Wilfried Treffke

Test Conditions: Tnom: 24°C, Vnom: 3.3 VDC (lithium battery)

Antenna: Schwarzbeck BBHA 9120D, Horizontal

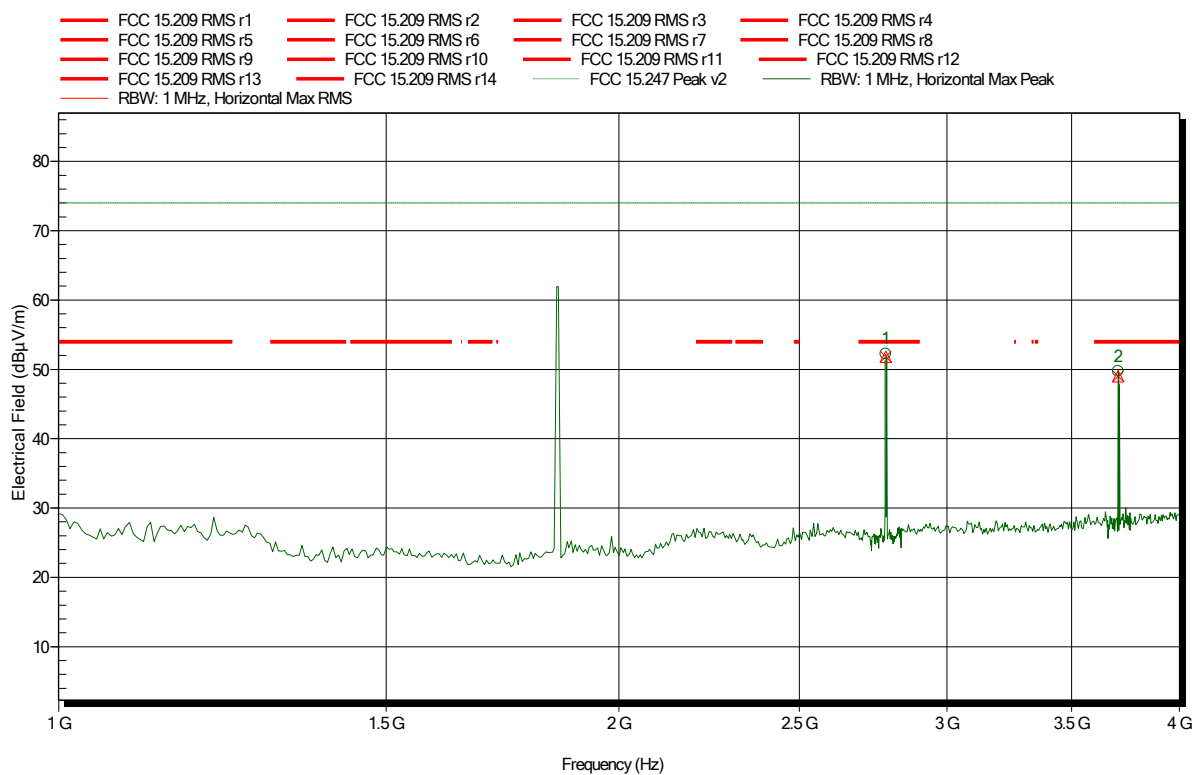
Measurement distance: 1 m converted to 3m

Mode: TX; LoRa; 927 MHz

Test Date: 2020-03-05

Note:

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Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.781 GHz	52.23 dBμV/m	74 dBμV/m	-21.77 dB	Pass
3.707 GHz	49.76 dBμV/m	74 dBμV/m	-24.24 dB	Pass

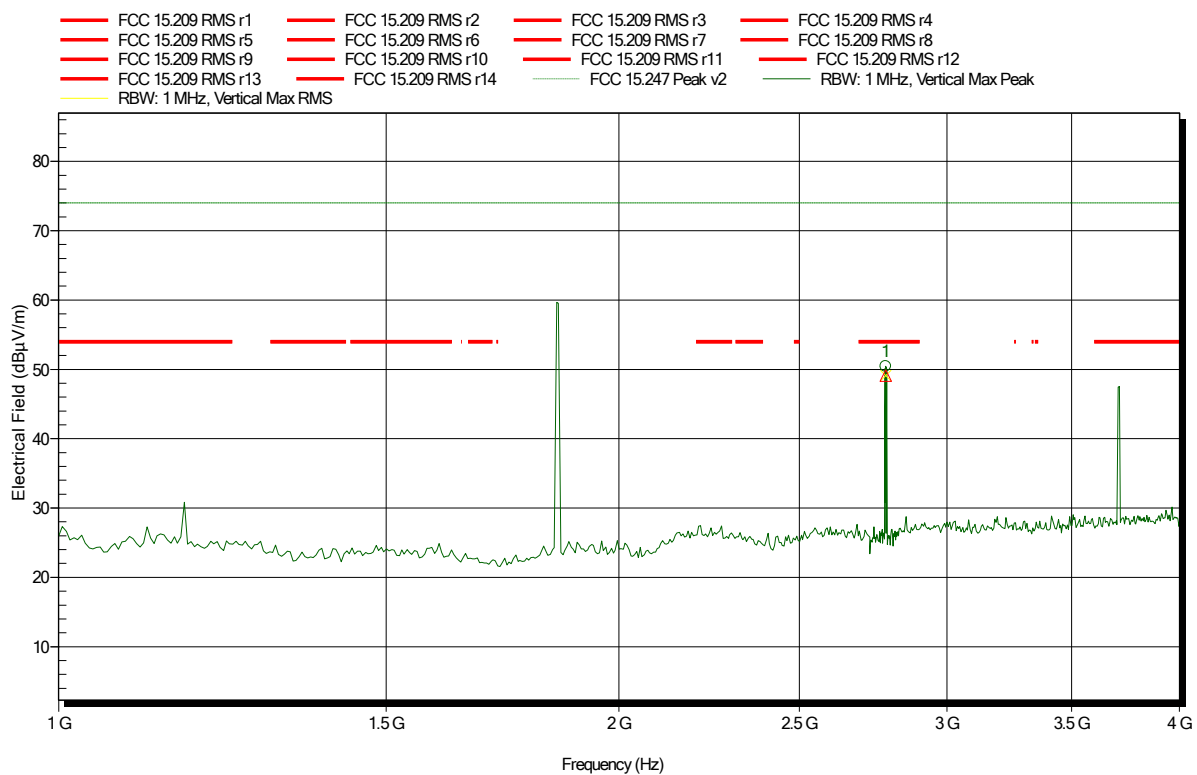
Frequency	RMS	RMS Limit	RMS Difference	RMS Status
2.781 GHz	51.82 dBμV/m	54 dBμV/m	-2.18 dB	Pass
3.707 GHz	48.99 dBμV/m	54 dBμV/m	-5.01 dB	Pass

Spurious emissions according to FCC 47 e-CFR §15.247

Project number: G0M-1911-8589

Applicant: UAB Axioma Metering
EUT Name: Ultrasonic water meter
Model: Qalcosonic W1
Test Site: Eurofins Product Service GmbH
Operator: Wilfried Treffke
Test Conditions: Tnom: 24°C, Vnom: 3.3 VDC (lithium battery)
Antenna: Schwarzbeck BBHA 9120D, Vertical
Measurement distance: 1 m converted to 3m
Mode: TX; LoRa; 927 MHz
Test Date: 2020-03-05
Note:

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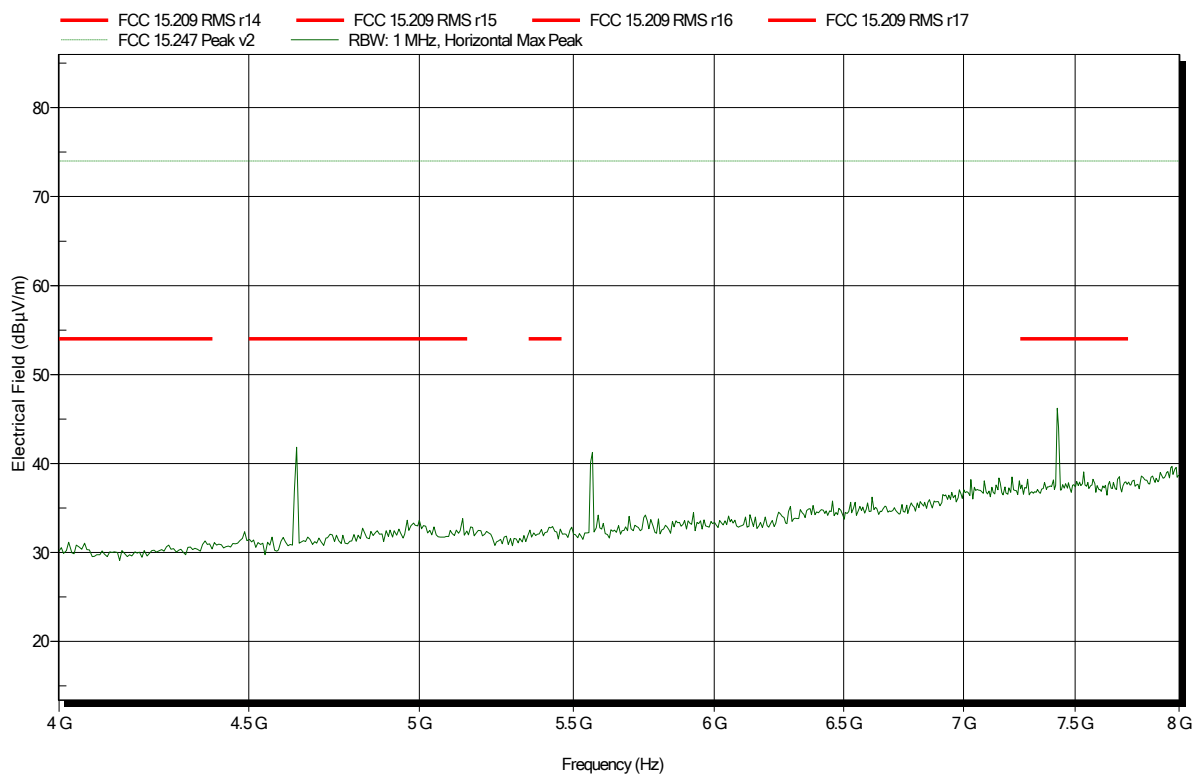
Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.781 GHz	50.45 dBµV/m	74 dBµV/m	-23.55 dB	Pass
Frequency	RMS	RMS Limit	RMS Difference	RMS Status
2.781 GHz	49.09 dBµV/m	54 dBµV/m	-4.91 dB	Pass

Spurious emissions according to FCC 47 e-CFR §15.247

Project number: G0M-1911-8589

Applicant: UAB Axioma Metering
 EUT Name: Ultrasonic water meter
 Model: Qalcosonic W1
 Test Site: Eurofins Product Service GmbH
 Operator: Wilfried Treffke
 Test Conditions: Tnom: 24°C, Vnom: 3.3 VDC (lithium battery)
 Antenna: Schwarzbeck BBHA 9120D, Horizontal
 Measurement distance: 1 m converted to 3m
 Mode: TX; LoRa; 927 MHz
 Test Date: 2020-03-05
 Note:

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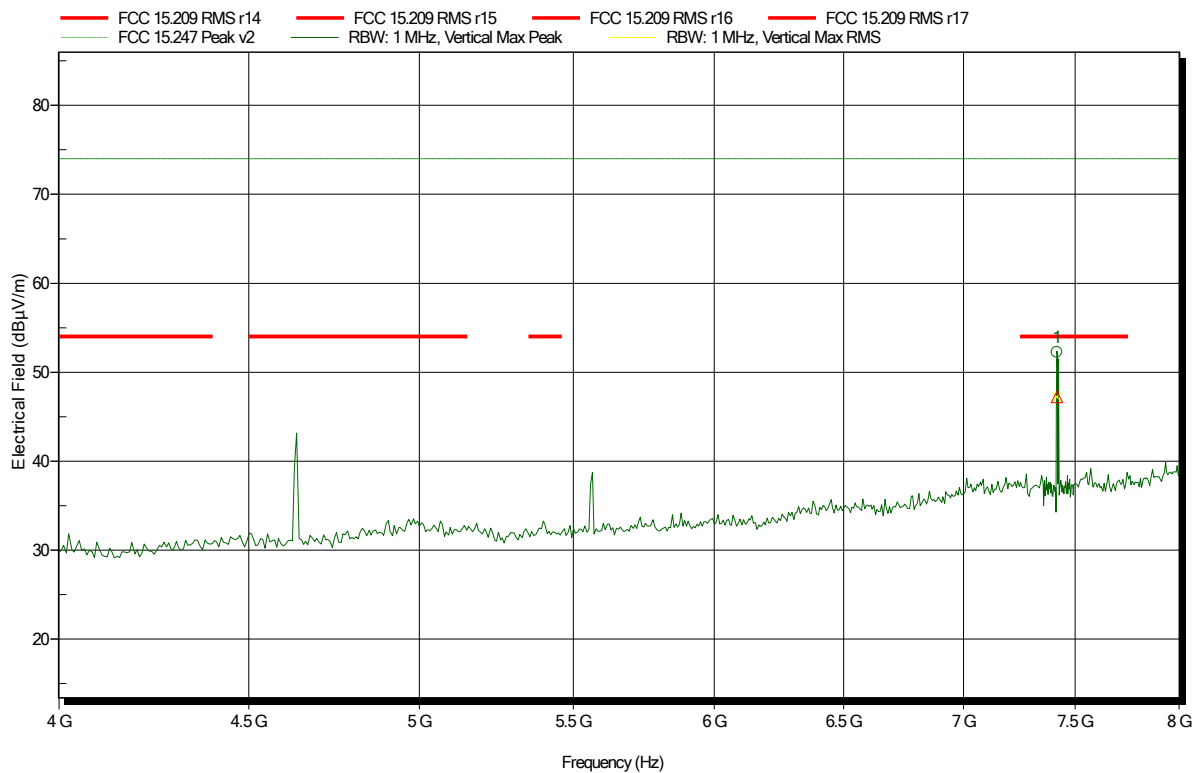


Spurious emissions according to FCC 47 e-CFR §15.247

Project number: G0M-1911-8589

Applicant: UAB Axioma Metering
 EUT Name: Ultrasonic water meter
 Model: Qalcosonic W1
 Test Site: Eurofins Product Service GmbH
 Operator: Wilfried Treffke
 Measurement software: RadiMation, version 2016.1.10
 Test Conditions: Tnom: 24°C, Vnom: 3.3 VDC (lithium battery)
 Antenna: Schwarzbeck BBHA 9120D, Vertical
 Measurement distance: 1 m, converted to 3 m
 Mode: TX; LoRa; 927 MHz
 Test Date: 2020-03-05
 Note:

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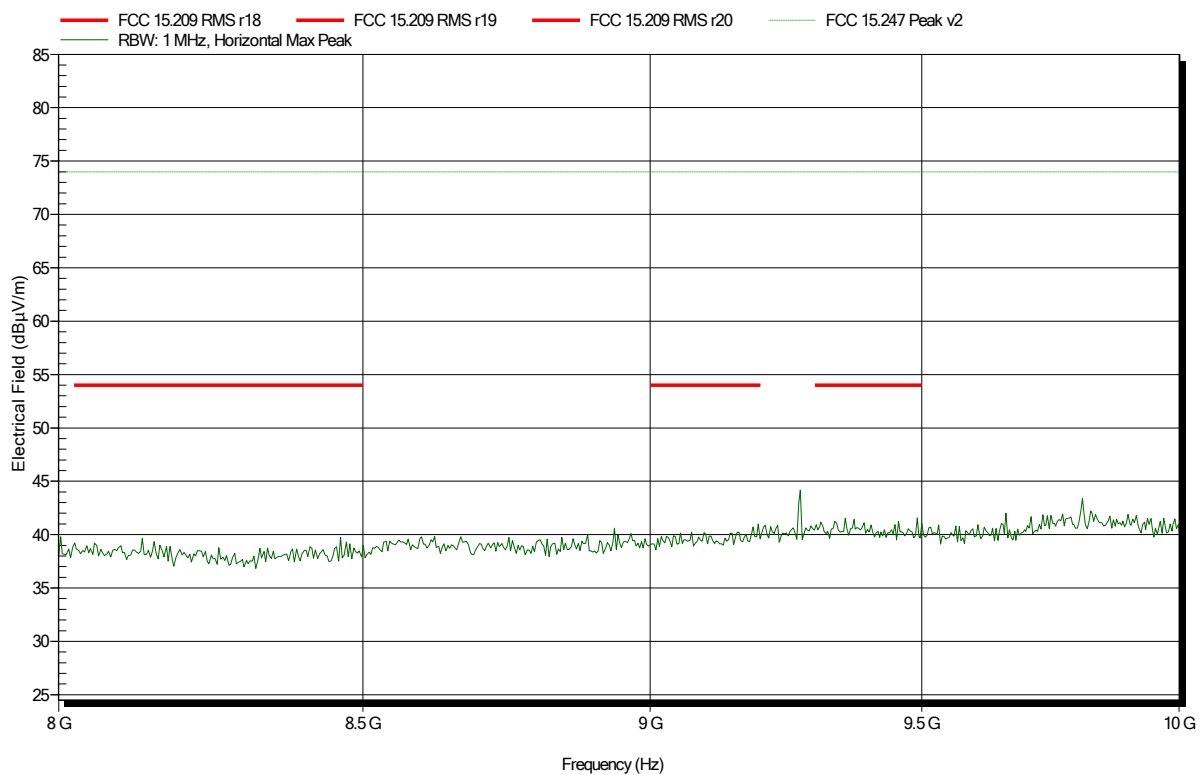
Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Height
7.416 GHz	52.26 dBµV/m	74 dBµV/m	-21.74 dB	Pass	1.2 m
Frequency	RMS	RMS Limit	RMS Difference	RMS Status	Height
7.416 GHz	47.2 dBµV/m	54 dBµV/m	-6.8 dB	Pass	1.2 m

Spurious emissions according to FCC 47 e-CFR §15.247

Project number: G0M-1911-8589

Applicant: UAB Axioma Metering
EUT Name: Ultrasonic water meter
Model: Qalcosonic W1
Test Site: Eurofins Product Service GmbH
Operator: Wilfried Treffke
Test Conditions: Tnom: 24°C, Vnom: 3.3 VDC (lithium battery)
Antenna: Schwarzbeck BBHA 9120D, Horizontal
Measurement distance: 1 m converted to 3m
Mode: TX; LoRa; 927 MHz
Test Date: 2020-03-05
Note:

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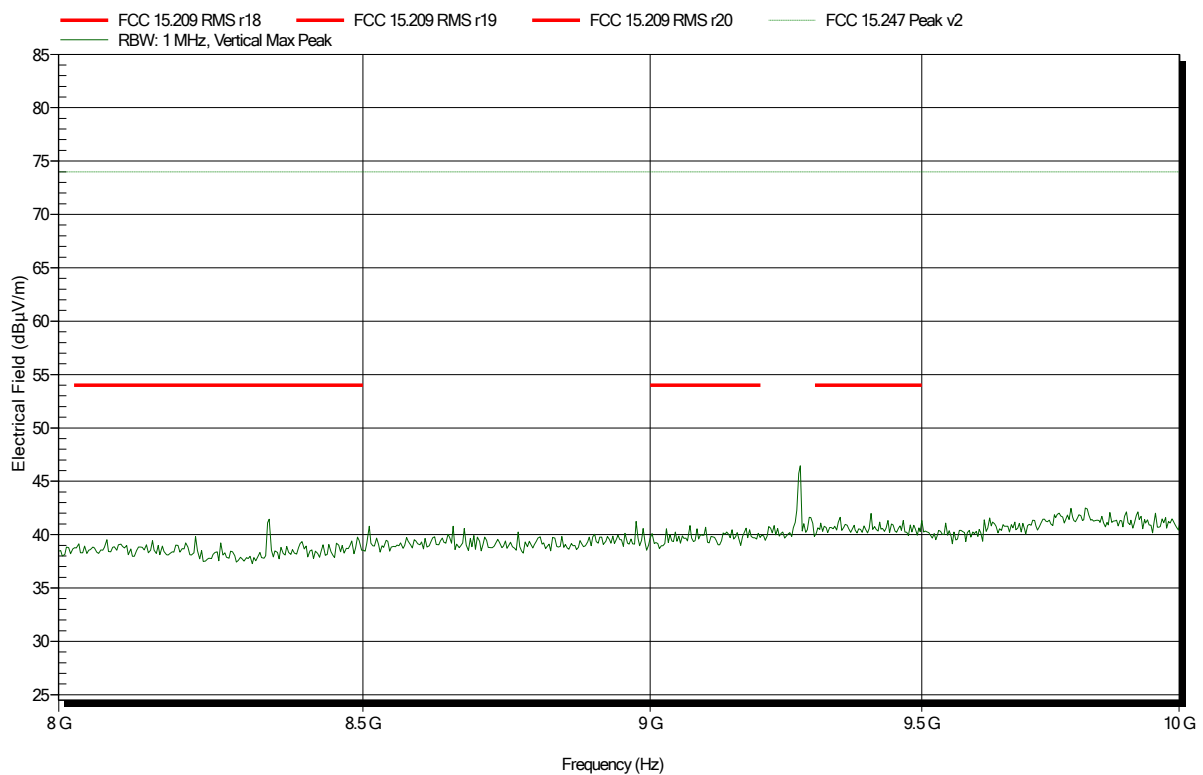


Spurious emissions according to FCC 47 e-CFR §15.247

Project number: G0M-1911-8589

Applicant: UAB Axioma Metering
EUT Name: Ultrasonic water meter
Model: Qalcosonic W1
Test Site: Eurofins Product Service GmbH
Operator: Wilfried Treffke
Test Conditions: Tnom: 24°C, Vnom: 3.3 VDC (lithium battery)
Antenna: Schwarzbeck BBHA 9120D, Vertical
Measurement distance: 1 m converted to 3m
Mode: TX; LoRa; 927 MHz
Test Date: 2020-03-05
Note:

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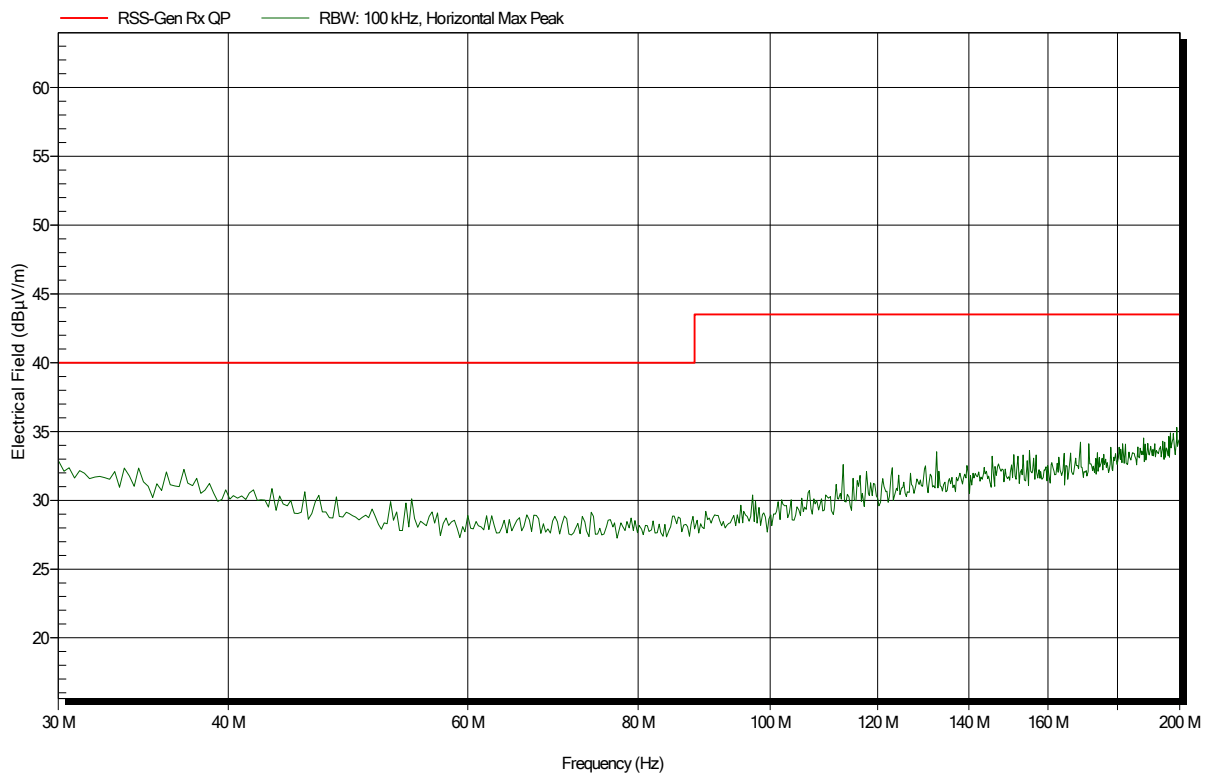
ANNEX B Receiver spurious emissions

Spurious emissions according to ISSED RSS-247 Issue 2 (February 2017)

Project number: G0M-1911-8589

Applicant: UAB Axioma Metering
 EUT Name: Ultrasonic water meter
 Model: Qalcosonic W1
 Test Site: Eurofins Product Service GmbH
 Operator: Wilfried Treffke
 Measurement software: RadiMation, version 2016.1.10
 Test Conditions: Tnom: 24°C, Vnom: 3.3 VDC (lithium battery)
 Antenna: Rohde & Schwarz HK 116, Horizontal
 Measurement distance: 3 m
 Mode: RX; LoRa; 915 MHz
 Test Date: 2020-03-05
 Note:

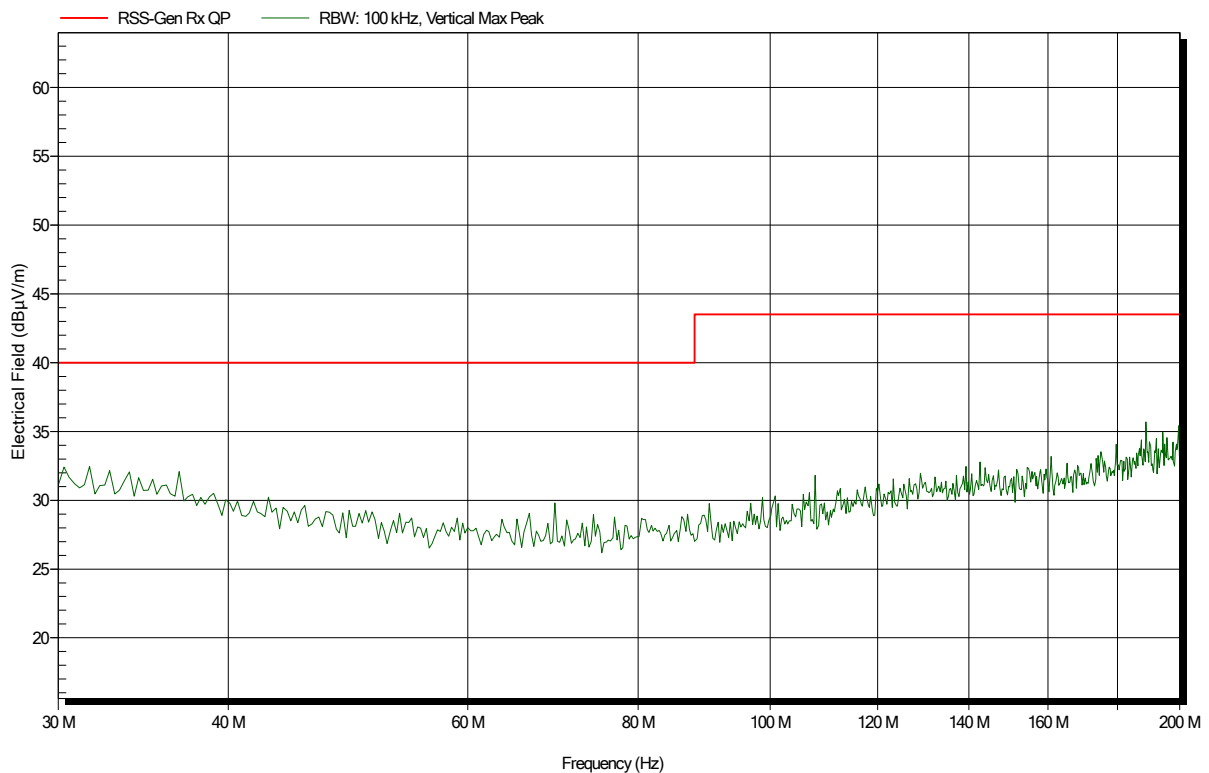
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Spurious emissions according to ISD RSS-247 Issue 2 (February 2017)

Project number: G0M-1911-8589
 Applicant: UAB Axioma Metering
 EUT Name: Ultrasonic water meter
 Model: Qalcosonic W1
 Test Site: Eurofins Product Service GmbH
 Operator: Wilfried Treffke
 Measurement software: RadiMation, version 2016.1.10
 Test Conditions: Tnom: 24°C, Vnom: 3.3 VDC (lithium battery)
 Antenna: Rohde & Schwarz HK 116, Vertical
 Measurement distance: 3 m
 Mode: RX; LoRa; 915 MHz
 Test Date: 2020-03-05
 Note:

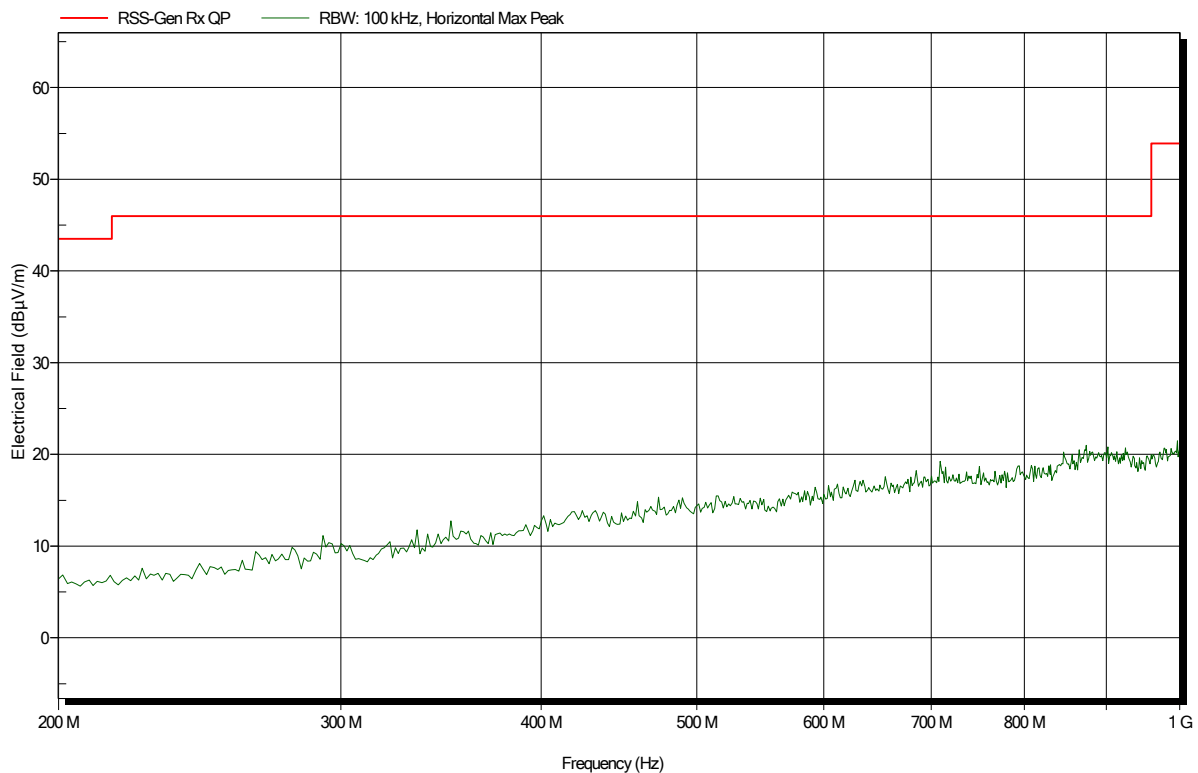
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Spurious emissions according to ISSED RSS-247 Issue 2 (February 2017)

Project number: G0M-1911-8589
 Applicant: UAB Axioma Metering
 EUT Name: Ultrasonic water meter
 Model: Qalcosonic W1
 Test Site: Eurofins Product Service GmbH
 Operator: Wilfried Treffke
 Measurement software: RadiMation, version 2016.1.10
 Test Conditions: Tnom: 24°C, Vnom: 3.3 VDC (lithium battery)
 Antenna: Rohde & Schwarz HL 223, Horizontal
 Measurement distance: 3 m
 Mode: RX; LoRa; 915 MHz
 Test Date: 2020-03-06
 Note:

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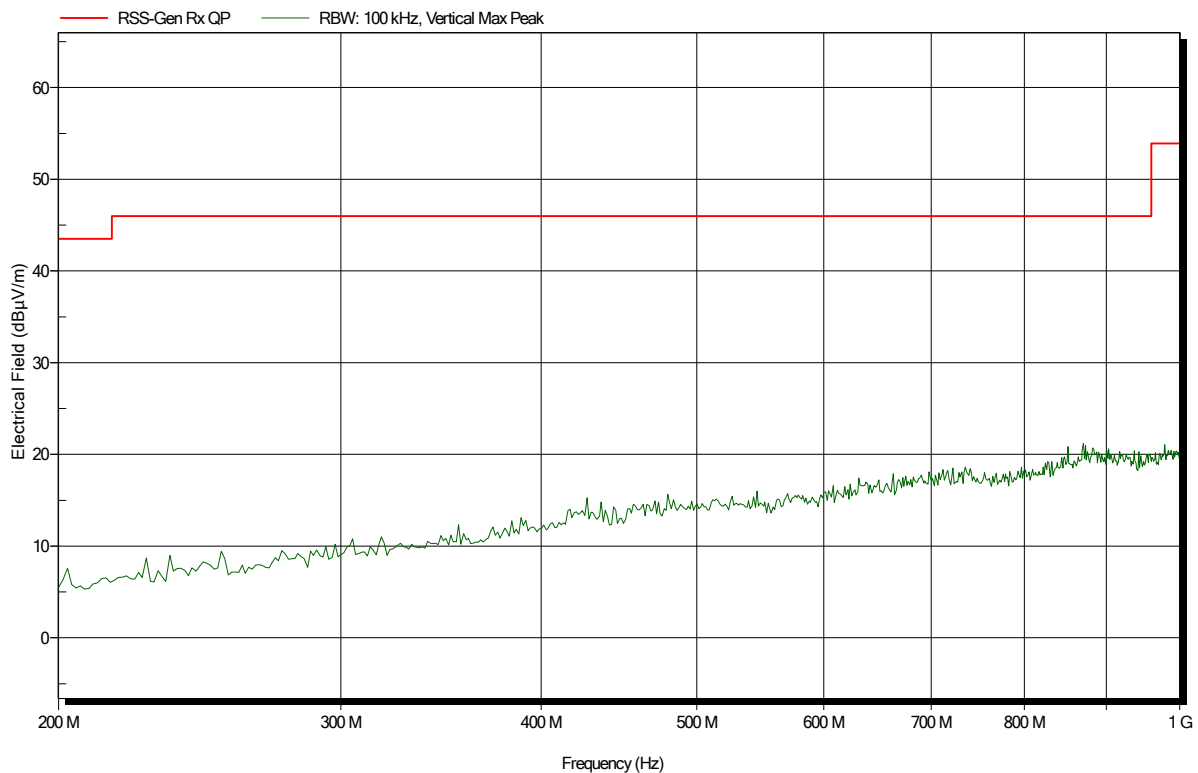


Spurious emissions according to ISCED RSS-247 Issue 2 (February 2017)

Project number: G0M-1911-8589

Applicant: UAB Axioma Metering
 EUT Name: Ultrasonic water meter
 Model: Qalcosonic W1
 Test Site: Eurofins Product Service GmbH
 Operator: Wilfried Treffke
 Measurement software: RadiMation, version 2016.1.10
 Test Conditions: Tnom: 24°C, Vnom: 3.3 VDC (lithium battery)
 Antenna: Rohde & Schwarz HL 223, Vertical
 Measurement distance: 3 m
 Mode: RX; LoRa; 915 MHz
 Test Date: 2020-03-06
 Note:

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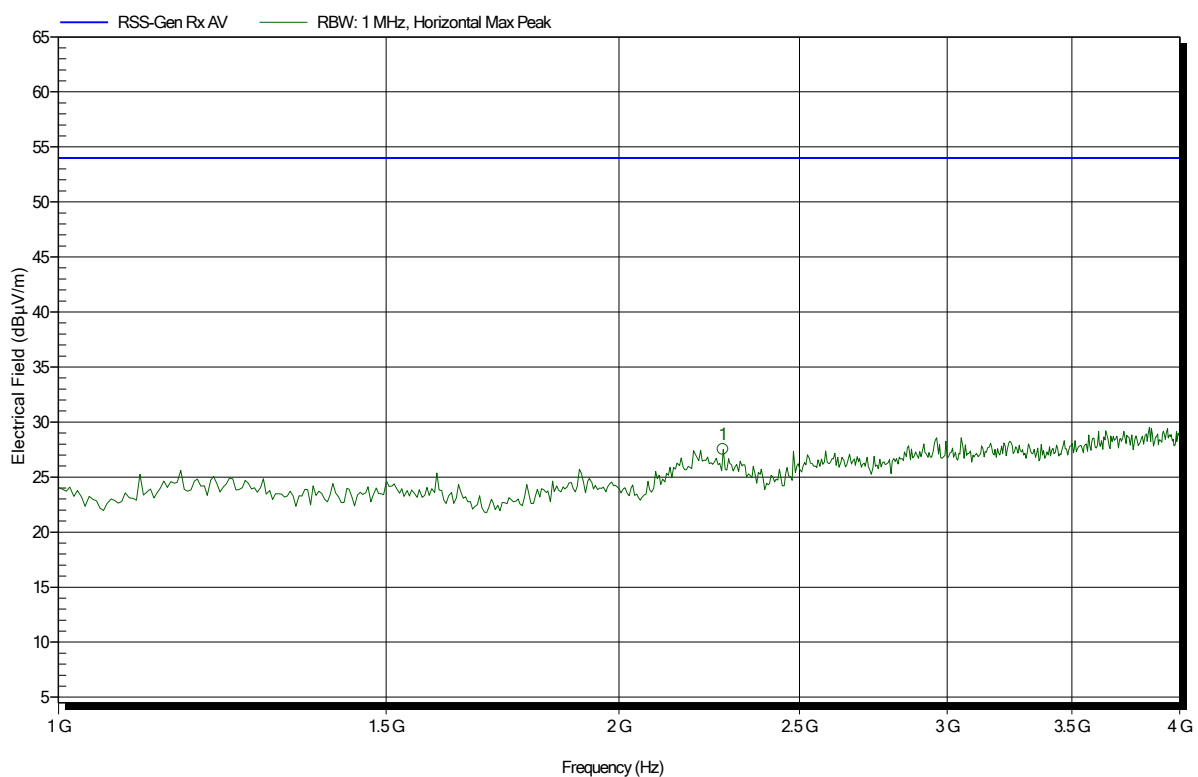


Spurious emissions according to ISED RSS-247 Issue 2 (February 2017)

Project number: G0M-1911-8589

Applicant: UAB Axioma Metering
 EUT Name: Ultrasonic water meter
 Model: Qalcosonic W1
 Test Site: Eurofins Product Service GmbH
 Operator: Wilfried Treffke
 Test Conditions: Tnom: 24°C, Vnom: 3.3 VDC (lithium battery)
 Antenna: Schwarzbeck BBHA 9120D, Horizontal
 Measurement distance: 1 m converted to 3m
 Mode: RX; LoRa; 915 MHz
 Test Date: 2020-03-06
 Note:

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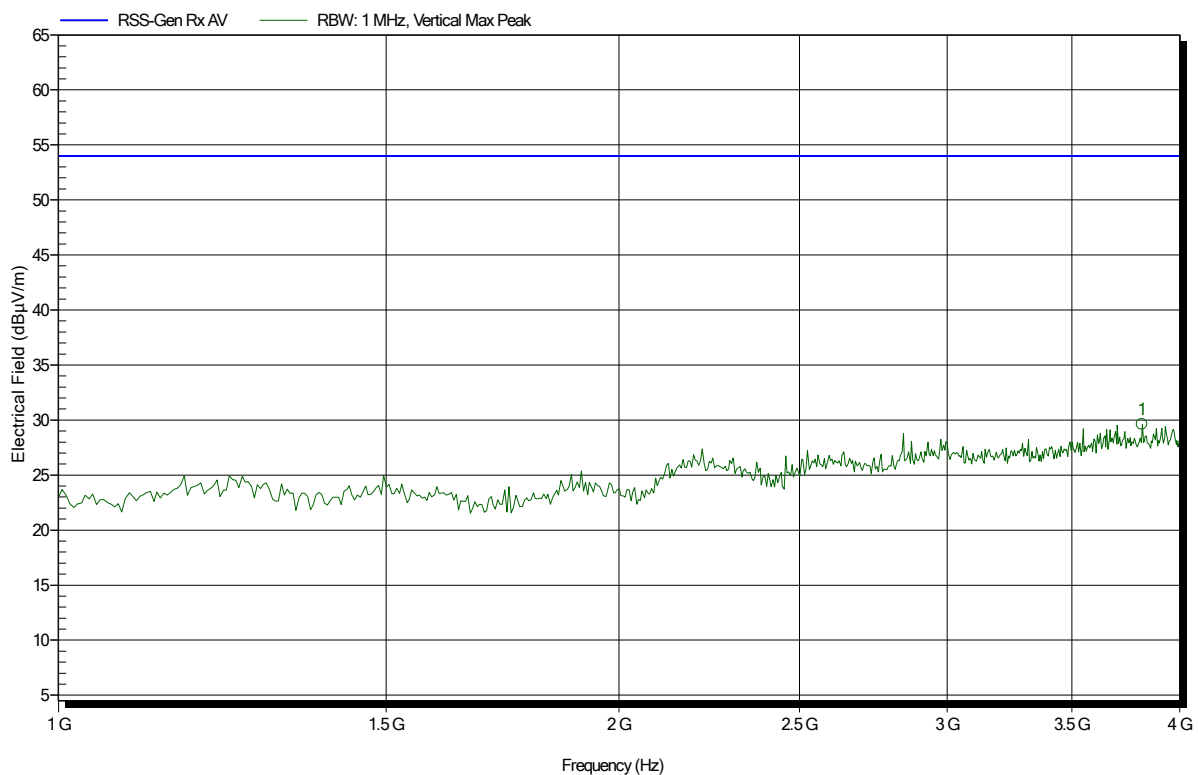
Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.274 GHz	27.53 dBµV/m	53.98 dBµV/m	-26.45 dB	Pass

Spurious emissions according to ISED RSS-247 Issue 2 (February 2017)

Project number: G0M-1911-8589

Applicant: UAB Axioma Metering
EUT Name: Ultrasonic water meter
Model: Qalcosonic W1
Test Site: Eurofins Product Service GmbH
Operator: Wilfried Treffke
Test Conditions: Tnom: 24°C, Vnom: 3.3 VDC (lithium battery)
Antenna: Schwarzbeck BBHA 9120D, Vertical
Measurement distance: 1 m converted to 3m
Mode: RX; LoRa; 915 MHz
Test Date: 2020-03-06
Note:

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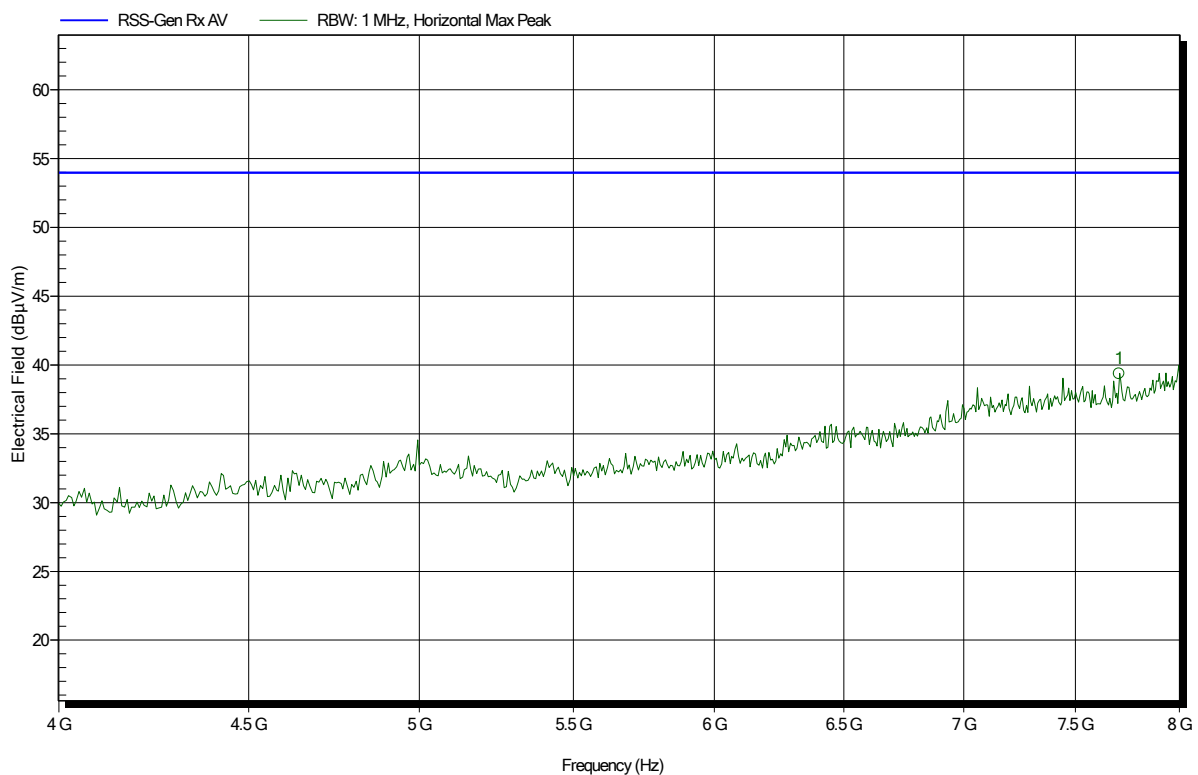


Frequency	Peak	Peak Limit	Peak Difference	Peak Status
3.817 GHz	29.61 dBµV/m	53.98 dBµV/m	-24.37 dB	Pass

Spurious emissions according to ISED RSS-247 Issue 2 (February 2017)

Project number: G0M-1911-8589
 Applicant: UAB Axioma Metering
 EUT Name: Ultrasonic water meter
 Model: Qalcosonic W1
 Test Site: Eurofins Product Service GmbH
 Operator: Wilfried Treffke
 Test Conditions: Tnom: 24°C, Vnom: 3.3 VDC (lithium battery)
 Antenna: Schwarzbeck BBHA 9120D, Horizontal
 Measurement distance: 1 m converted to 3m
 Mode: TX; LoRa; 915 MHz
 Test Date: 2020-03-06
 Note:

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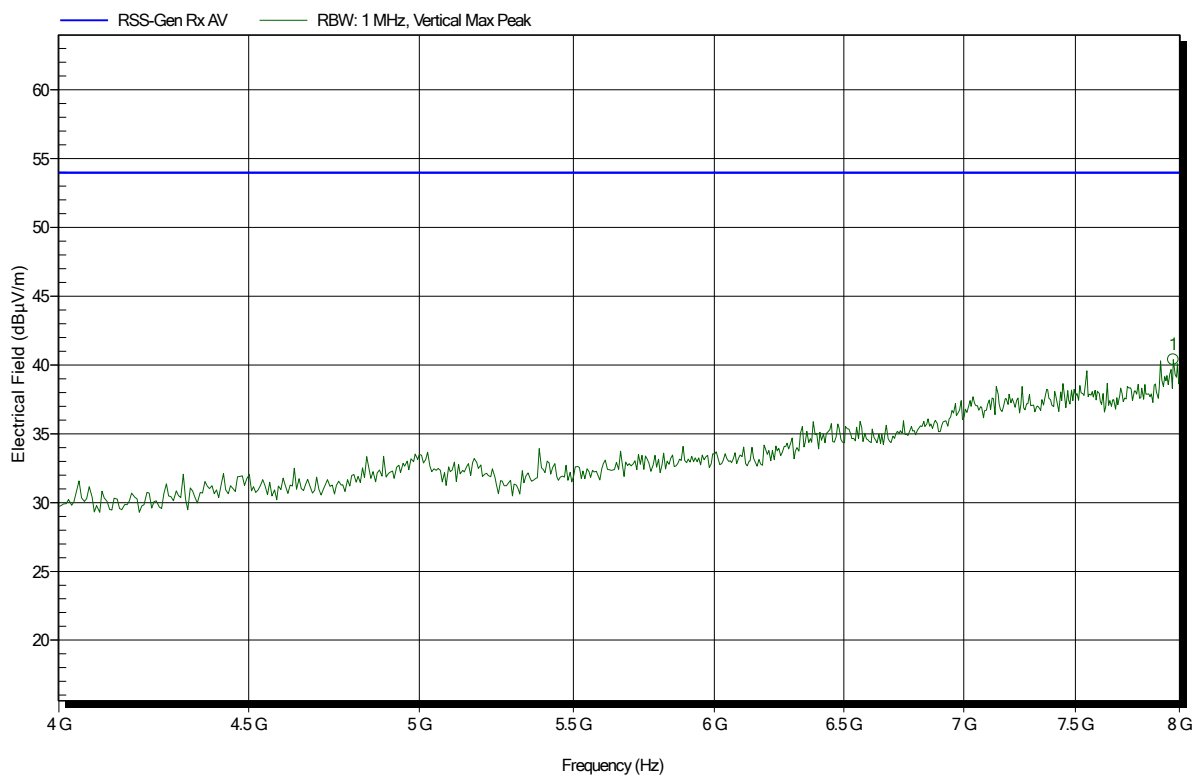
Frequency	Peak	Peak Limit	Peak Difference	Peak Status
7.705 GHz	39.38 dBµV/m	53.98 dBµV/m	-14.6 dB	Pass

Spurious emissions according to ISED RSS-247 Issue 2 (February 2017)

Project number: G0M-1911-8589

Applicant: UAB Axioma Metering
EUT Name: Ultrasonic water meter
Model: Qalcosonic W1
Test Site: Eurofins Product Service GmbH
Operator: Wilfried Treffke
Test Conditions: Tnom: 24°C, Vnom: 3.3 VDC (lithium battery)
Antenna: Schwarzbeck BBHA 9120D, Vertical
Measurement distance: 1 m converted to 3m
Mode: RX; LoRa; 915 MHz
Test Date: 2020-03-06
Note:

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Frequency	Peak	Peak Limit	Peak Difference	Peak Status
7.968 GHz	40.4 dBµV/m	53.98 dBµV/m	-13.58 dB	Pass