



FORCE Technology Test Report



Radio parameter test of CADScor Sensor according to FCC specifications

Performed for Acarix A/S

Project no.: 120-25441-1

Page 1 of 60

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Title	Radio parameter test of CADScor Sensor according to FCC specifications
Test object	CADScor Sensor
Project no.	120-25441-1
Test period	22 February 2021 to 19 March 2021
Client	Acarix A/S Ryvangs Allé 81-83 2900 Hellerup DENMARK Tel.: +45 29 72 44 11
Contact person	Claus BV Christensen E-mail: claus.christensen@acarix.com
Manufacturer	Acarix A/S
Specifications	47 CFR Part 15, Subpart B and C (Specific rule part §15.225)
Results	The test object was found to be in compliance with the specifications as listed in Section 1
Test personnel	Peter Wolf Frandsen
Test site	FORCE Technology, Venlighedsvej 4, 2970 Hørsholm, DENMARK

Date 12 April 2021

A handwritten signature in blue ink, appearing to read "Peter Wolf Frandsen".

Project Manager

Peter Wolf Frandsen
Specialist EMC
FORCE Technology

A handwritten signature in blue ink, appearing to read "K. K. Jensen".

Responsible

Karsten Kruse Jensen
Head of Department
FORCE Technology

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1. Summary of tests

Tests	Test methods	Rule Section	Results
Measurement of radiated emission / field strength of harmonics	ANSI C63.10:2013	47 CFR Part 15 B + C Subpart 15.109 & 15.209 47 CFR Part 15.225	Passed
Measurement of 20 dB bandwidth	ANSI C63.10:2013	47 CFR Part 15.215(c)	Passed
Measurement of band edge compliance	ANSI C63.10:2013	47 CFR Part 15.209&15.225	Passed
Measurement of field strength of fundamental	ANSI C63.10:2013	47 CFR Part 15.225	Passed
Measurement of Frequency stability	ANSI C63.10:2013	47 CFR Part 15.225	Passed
Measurement of Conducted limits	ANSI C63.10:2013	47 CFR Part 15 B + C Subpart 15.107 & 15.207	Note 1

Note 1 (No AC mains port -> not applicable)

The given result is based on a shared risk principle with respect to the measurement uncertainty.

Conclusion

The test objects mentioned in this report meet the requirements of the standards stated below with respect to the test listed above.

- 47 CFR Part 15, Subpart B and C (Specific rule part §15.225)

The test results relate only to the objects tested.

2. Test objects and auxiliary equipment

2.1 Test object



Photo 2.1.1 Test object. Front



Photo 2.1.2 Test object. Rear

Test object 2.1.1

Name of test object	CADScor Sensor
Model / type	Sensor
Part no.	ASE-1401
Serial no.	S19-10 - 0030
FCC ID	2AYXI-ASE1401
Manufacturer	Acarix A/S
Supply voltage	Internal battery
Software version	1.3.19
Hardware version	R3
Cycle time	Continually
Highest frequency generated or used	600 MHz
Comment	Special Radio test software
Received	Date: 16 February 2021 Status: Test object sampled and provided by customer

Test object 2.1.2

Name of test object	CADScor Sensor
Model / type	Sensor
Part no.	ASE-1401
Serial no.	S19-10 - 0012
FCC ID	2AYXI-ASE1401
Manufacturer	Acarix A/S
Supply voltage	Internal battery
Software version	1.3.19
Hardware version	R3
Cycle time	Continually
Highest frequency generated or used	600 MHz
Comment	Special Radio test software
Received	Date: 16 February 2021 Status: Test object sampled and provided by customer

2.2 Auxiliary equipment



Photo 2.2.1 Auxiliary equipment.



Photo 2.2.2 Auxiliary equipment.

Auxiliary equipment 2.2.1

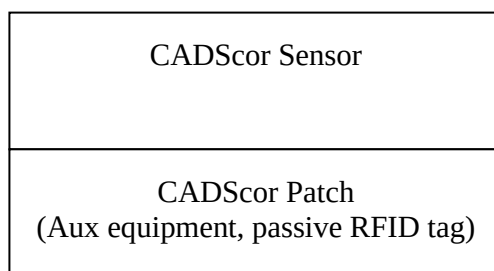
Name of auxiliary equipment	CADScor Patch
Model / type	Patch
Part no.	ACP-1401
Serial no.	Lot/Batch O14250
FCC ID	-
Manufacturer	Acarix A/S
Supply voltage	N/A
Highest frequency generated or used	N/A
Comment	Auxiliary equipment supplied by the client, who is also responsible for its correct function and set-up. Contains RFID tag

Auxiliary equipment 2.2.2

Name of auxiliary equipment	CADScor Docking station with power adaptor
Model / type	ADS-1401
Part no.	-
Serial no.	19-10-0030
FCC ID	-
Manufacturer	Acarix A/S
Supply voltage	100-240 VAC 50/60 Hz
Highest frequency generated or used	-
Comment	Auxiliary equipment supplied by the client, who is also responsible for its correct function and set-up. Used for charging the test object. Not part of the testing

3. General test conditions

3.1 Test set-up during test



RFID running, tag attached to CADScor Sensor. CADScor Sensor is battery powered.

Figure 3.1.1 Block diagram of test object and auxiliary equipment.

3.1.1 Description of test set-up

The test object was tested Stand-alone with internal re-chargeable battery, and with special test software for radio specification. For radiated emission measurement a RFID tag was attached.

3.1.2 Description and intended use of test object

It is a medical device and the intended use of the CADScor® System is to record heart sounds, murmurs and vibration for calculation of a patient specific score, indicating the risk of presence of coronary stenosis, as an aid in cardiac analysis and diagnosis. The intended environment of use is hospitals, clinics and similar (Professional healthcare environment).

The CADScor is an end-device incorporating RF-ID short range radio transceivers

3.1.3 Test modes during emission tests

The test object is not transmitting in the CADScor Docking station and the CADScor Docking station with power adaptor with and without the test object is authorised according to the FDA requirement and is not part of this test report.

All functions are operational.

RFID communication is running continuously. Initial investigations performed by manual, visual inspection, show that write-mode without a tag is the mode in which the RFID radio has the highest field strength of the radio emission. Hence, write-mode without tag is used for “Transmitter spurious and out of band emissions”.

Write-mode, both with and without tag, is used for “Permitted range of operating frequencies”, “Limits for transmitters” and “Limits for permitted range of modulation bandwidth”.

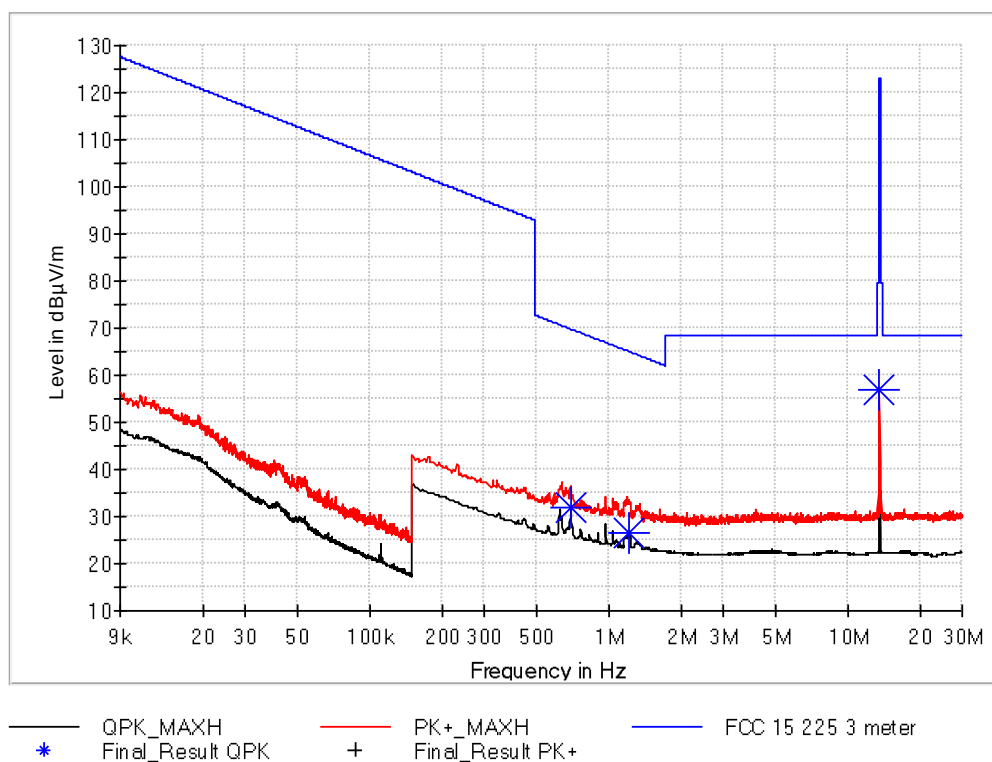
4. Test results

4.1 Measurement of radiated emission (below 30 MHz), No tag

Test object	CADScor Sensor	Sheet	RE_Spur-1
Type	Sensor	Project no.	120-25441-1
Serial no.	S19-10 - 0030	Date	23 Feb. 2021
Client	Acarix A/S	Initials	PWF
Specification	47 CFR Part 15, Subpart B and C (Specific rule part §15.225)	Frequency	0.009-30 MHz

Test method	ANSI C63.10:2013	Temperature	23 °C
Characteristics	Complete search, antenna distance 3 m	Humidity	39 % RH
Detector	Peak and quasi peak	Bandwidth	0.2/9 kHz
Test equipm.	EMI room Hørsholm 49971 49704 49590 49817 49949 29953 49999	Uncertainty	2.7 dB

Full Spectrum



Comments

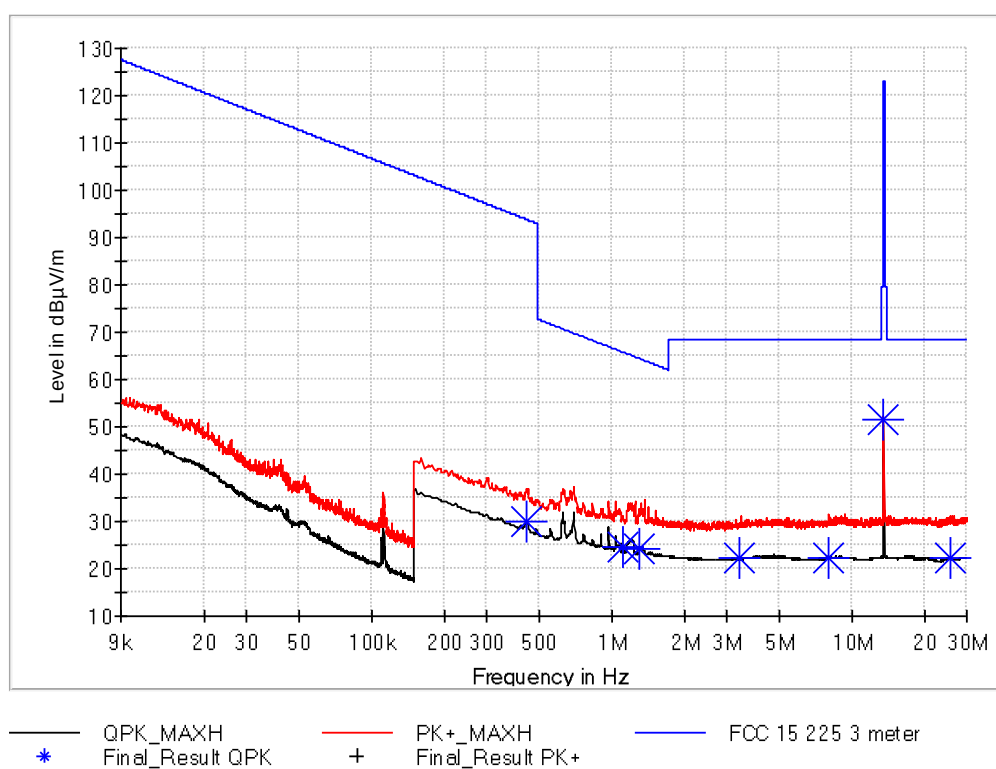
Continuous Tx - normal modulation

X-Axis

Test object	CADScor Sensor	Sheet	RE_Spur-2
Type	Sensor	Project no.	120-25441-1
Serial no.	S19-10 - 0030	Date	23 Feb. 2021
Client	Acarix A/S	Initials	PWF
Specification	47 CFR Part 15, Subpart B and C (Specific rule part §15.225)	Frequency	0.009-30 MHz

Test method	ANSI C63.10:2013	Temperature	23 °C
Characteristics	Complete search, antenna distance 3 m	Humidity	39 % RH
Detector	Peak and quasi peak	Bandwidth	0.2/9 kHz
Test equipm.	EMI room Hørsholm 49971 49704 49590 49817 49949 29953 49999	Uncertainty	2.7 dB

Full Spectrum



Comments

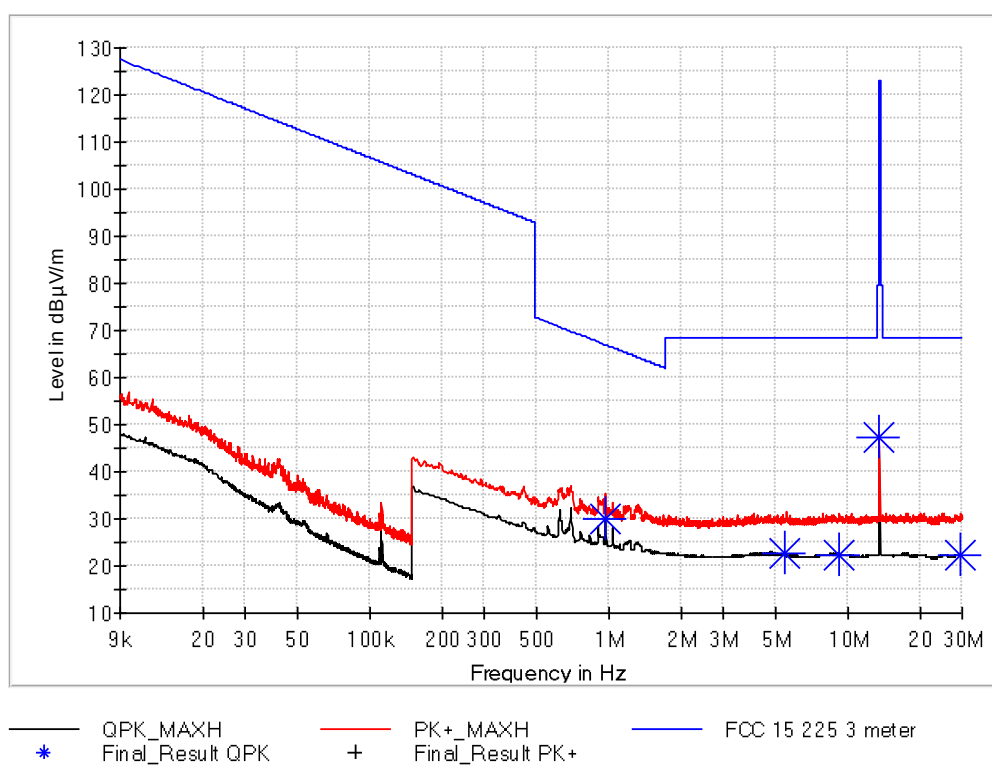
Continuous Tx - normal modulation

Y-Axis

Test object	CADScor Sensor	Sheet	RE_Spur-3
Type	Sensor	Project no.	120-25441-1
Serial no.	S19-10 - 0030	Date	23 Feb. 2021
Client	Acarix A/S	Initials	PWF
Specification	47 CFR Part 15, Subpart B and C (Specific rule part §15.225)	Frequency	0.009-30 MHz

Test method	ANSI C63.10:2013	Temperature	23 °C
Characteristics	Complete search, antenna distance 3 m	Humidity	39 % RH
Detector	Peak and quasi peak	Bandwidth	0.2/9 kHz
Test equipm.	EMI room Hørsholm 49971 49704 49590 49817 49949 29953 49999	Uncertainty	2.7 dB

Full Spectrum



Comments

Continuous Tx - normal modulation

Z-Axis

Test object	CADScor Sensor	Sheet	RE_Spur-4
Type	Sensor	Project no.	120-25441-1
Serial no.	S19-10 - 0030	Date	23 Feb. 2021
Client	Acarix A/S	Initials	PWF
Specification	47 CFR Part 15, Subpart B and C (Specific rule part §15.225)	Frequency	0.009-30 MHz

Test method	ANSI C63.10:2013	Temperature	23 °C
Characteristics	Complete search, antenna distance 3 m	Humidity	39 % RH
Detector	Quasi peak	Bandwidth	0.2/9 kHz
Test equipm.	EMI room Hørsholm 49971 49704 49590 49817 49949 29953 49999	Uncertainty	2.7 dB

X-Axis

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
0.69	32.01	69.8	37.8	15000	9	100.0	V	91	20.4
1.22	26.43	65.0	38.6	15000	9	100.0	V	-1	20.5
13.56	56.86	124.0	67.1	15000	9	100.0	V	324	20.8

Y-Axis

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
0.44	30.14	93.8	63.7	15000	9	100.0	V	-44	20.4
1.11	24.60	65.8	41.2	15000	9	100.0	V	46	20.4
1.29	24.30	64.5	40.2	15000	9	100.0	V	181	20.5
3.41	22.38	68.6	46.2	15000	9	100.0	V	149	20.5
8.03	22.41	68.6	46.2	15000	9	100.0	V	90	20.7
13.56	51.42	124.0	72.6	15000	9	100.0	V	2	20.8
25.64	22.14	68.6	46.5	15000	9	100.0	V	58	20.9

Z-Axis

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
0.97	30.04	66.9	36.9	15000	9	100.0	V	91	20.4
5.47	22.59	68.6	46.0	15000	9	100.0	V	62	20.6
9.18	22.42	68.6	46.2	15000	9	100.0	V	174	20.7
13.56	47.49	124.0	76.5	15000	9	100.0	V	144	20.8
29.70	22.40	68.6	46.2	15000	9	100.0	V	0	21.0

Test result	The measured field strengths are below the limit
Test Port	Enclosure
Test frequency	13.56 MHz
Test mode	Continuous Tx - normal modulation
Condition	Normal
Compliant	Yes
Comments	Final maximal measurements by variation of turntable azimuth. Test voltage: Internal battery The calculation of the correction of the limit lines from 30/300 meter to 3 meters: $\text{Limit2} = \text{Limit1} + 40 * \text{Log} (D1 / D2)$ This is done according to FCC Part 15, Section 31.



Photo 4.1.1 Test set-up regarding measurement of radiated emission (below 30 MHz).



Photo 4.1.2 Test set-up regarding measurement of radiated emission (below 30 MHz).

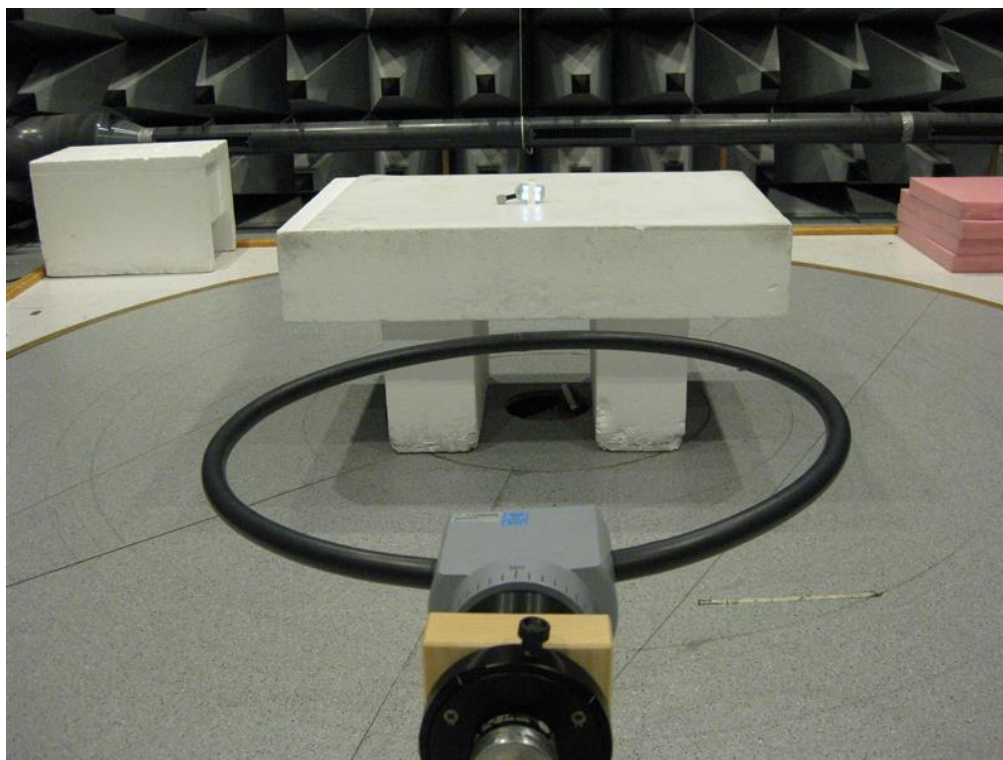


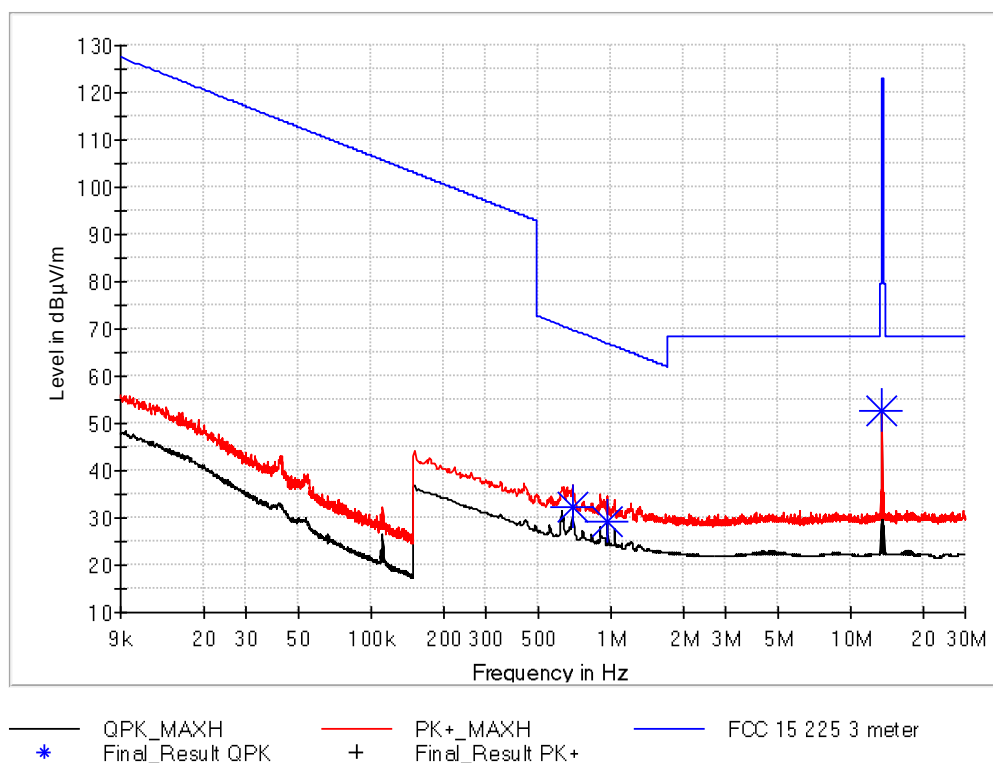
Photo 4.1.3 Test set-up regarding measurement of radiated emission (below 30 MHz).

4.2 Measurement of radiated emission (below 30 MHz), with Tag

Test object	CADScor Sensor	Sheet	RE_Spur-5
Type	Sensor	Project no.	120-25441-1
Serial no.	S19-10 - 0030	Date	23 Feb. 2021
Client	Acarix A/S	Initials	PWF
Specification	47 CFR Part 15, Subpart B and C (Specific rule part §15.225)	Frequency	0.009-30 MHz

Test method	ANSI C63.10:2013	Temperature	23 °C
Characteristics	Complete search, antenna distance 3 m	Humidity	39 % RH
Detector	Peak and quasi peak	Bandwidth	0.2/9 kHz
Test equipm.	EMI room Hørsholm 49971 49704 49590 49817 49949 29953 49999	Uncertainty	2.7 dB

Full Spectrum



Comments

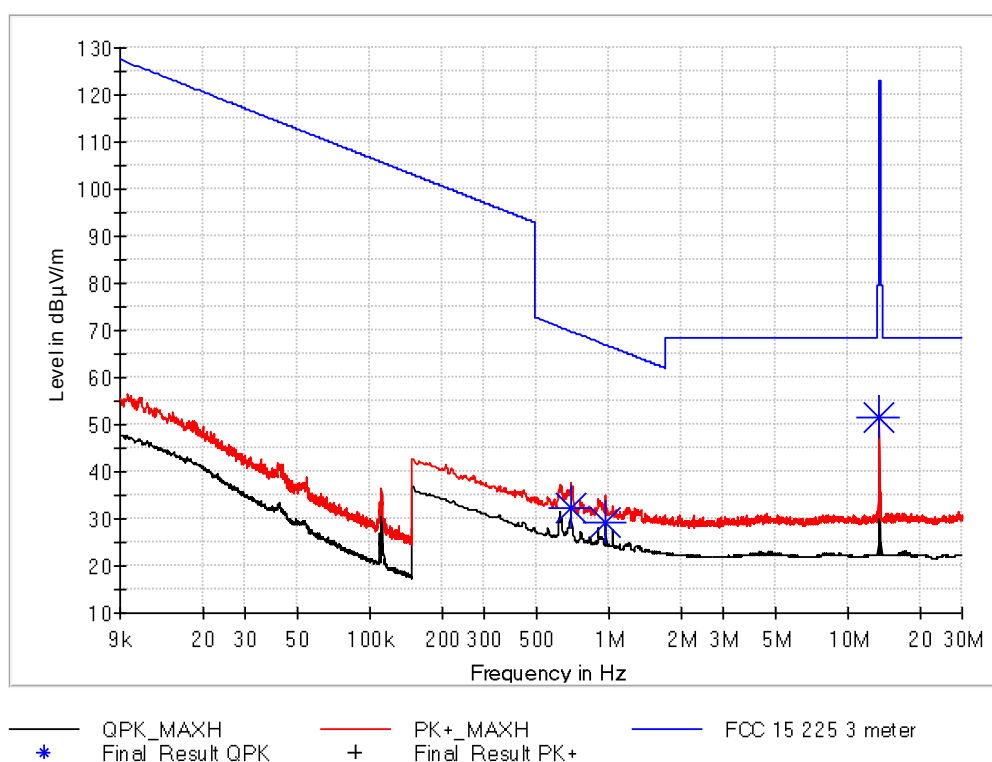
Continuous Tx - normal modulation

X-Axis

Test object	CADScor Sensor	Sheet	RE_Spur-6
Type	Sensor	Project no.	120-25441-1
Serial no.	S19-10 - 0030	Date	23 Feb. 2021
Client	Acarix A/S	Initials	PWF
Specification	47 CFR Part 15, Subpart B and C (Specific rule part §15.225)	Frequency	0.009-30 MHz

Test method	ANSI C63.10:2013	Temperature	23 °C
Characteristics	Complete search, antenna distance 3 m	Humidity	39 % RH
Detector	Peak and quasi peak	Bandwidth	0.2/9 kHz
Test equipm.	EMI room Hørsholm 49971 49704 49590 49817 49949 29953 49999	Uncertainty	2.7 dB

Full Spectrum



Comments

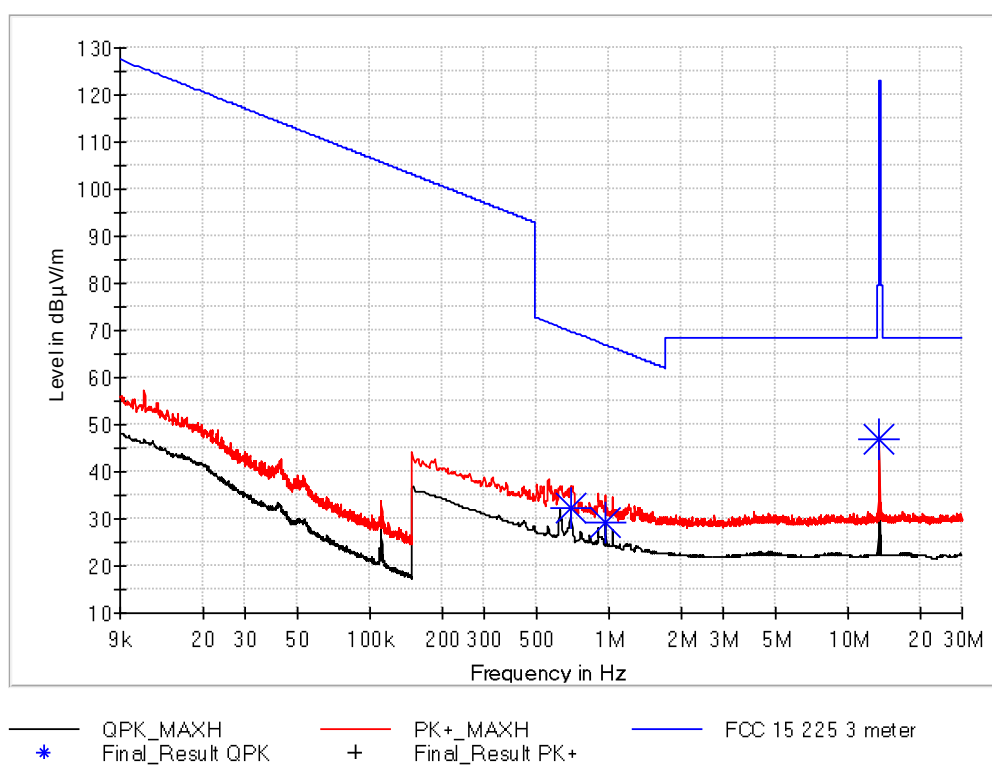
Continuous Tx - normal modulation

Y-Axis

Test object	CADScor Sensor	Sheet	RE_Spur-7
Type	Sensor	Project no.	120-25441-1
Serial no.	S19-10 - 0030	Date	23 Feb. 2021
Client	Acarix A/S	Initials	PWF
Specification	47 CFR Part 15, Subpart B and C (Specific rule part §15.225)	Frequency	0.009-30 MHz

Test method	ANSI C63.10:2013	Temperature	23 °C
Characteristics	Complete search, antenna distance 3 m	Humidity	39 % RH
Detector	Peak and quasi peak	Bandwidth	0.2/9 kHz
Test equipm.	EMI room Hørsholm 49971 49704 49590 49817 49949 29953 49999	Uncertainty	2.7 dB

Full Spectrum



Comments

Continuous Tx - normal modulation

Z-Axis

Test object	CADScor Sensor	Sheet	RE_Spur-8
Type	Sensor	Project no.	120-25441-1
Serial no.	S19-10 - 0030	Date	23 Feb. 2021
Client	Acarix A/S	Initials	PWF
Specification	47 CFR Part 15, Subpart B and C (Specific rule part §15.225)	Frequency	0.009-30 MHz

Test method	ANSI C63.10:2013	Temperature	23 °C
Characteristics	Complete search, antenna distance 3 m	Humidity	39 % RH
Detector	Quasi peak	Bandwidth	0.2/9 kHz
Test equipm.	EMI room Hørsholm 49971 49704 49590 49817 49949 29953 49999	Uncertainty	2.7 dB

X-Axis

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
0.69	32.34	69.8	37.5	15000	9	100.0	V	46	20.4
0.97	29.29	66.9	37.7	15000	9	100.0	V	136	20.4
13.56	52.54	124.0	71.5	15000	9	100.0	V	334	20.8

Y-Axis

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
0.69	32.27	69.8	37.6	15000	9	100.0	V	136	20.4
0.97	29.23	66.9	37.7	15000	9	100.0	V	181	20.4
13.56	51.41	124.0	72.6	15000	9	100.0	V	269	20.8

Z-Axis

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
0.69	32.37	69.8	37.5	15000	9	100.0	V	271	20.4
0.97	29.42	66.9	37.5	15000	9	100.0	V	46	20.4
13.56	46.90	124.0	77.1	15000	9	100.0	V	149	20.8

Test result	The measured field strengths are below the limit
Test Port	Enclosure
Test frequency	13.56 MHz
Test mode	Continuous Tx - normal modulation
Condition	Normal

Compliant	Yes
Comments	Final maximal measurements by variation of turntable azimuth. Test voltage: Internal battery The calculation of the correction of the limit lines from 30/300 meter to 3 meters: $\text{Limit2} = \text{Limit1} + 40 * \text{Log} (\text{D1} / \text{D2})$ This is done according to FCC Part 15, Section 31.

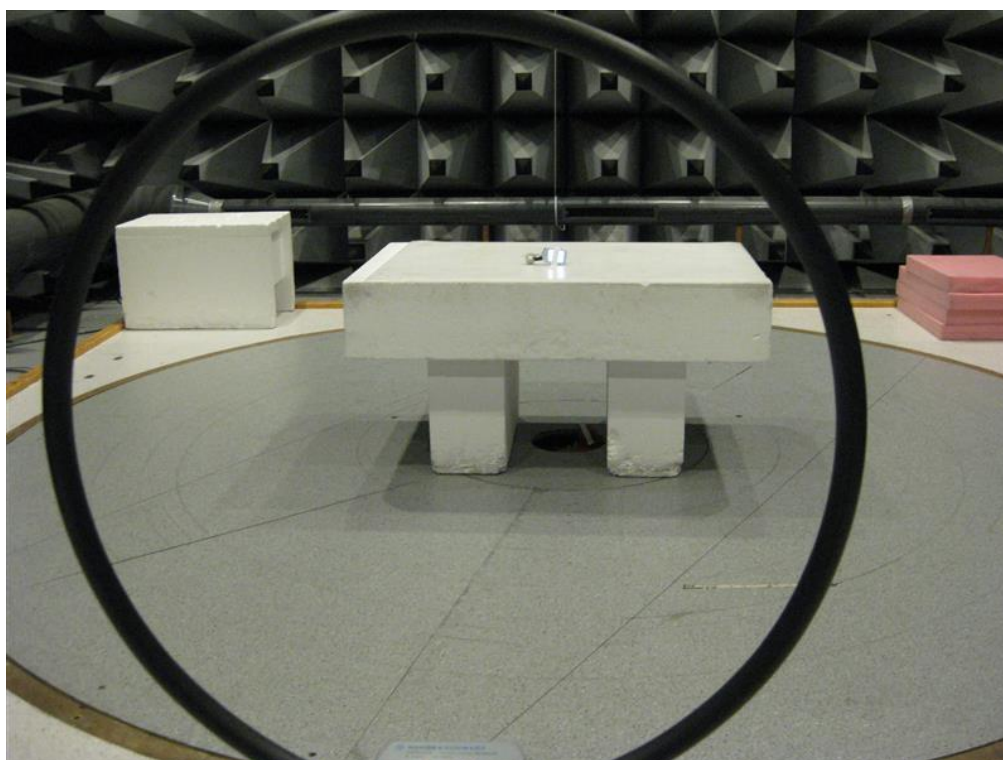


Photo 4.2.1 Test set-up regarding measurement of radiated emission (below 30 MHz).



Photo 4.2.2 Test set-up regarding measurement of radiated emission (below 30 MHz).

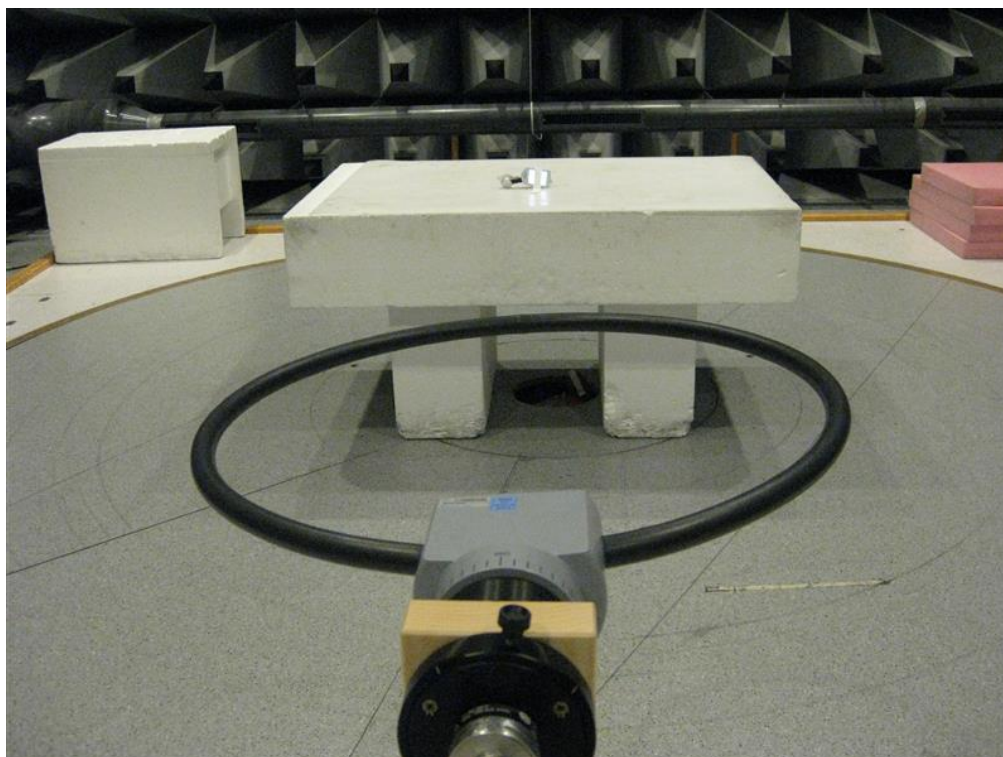


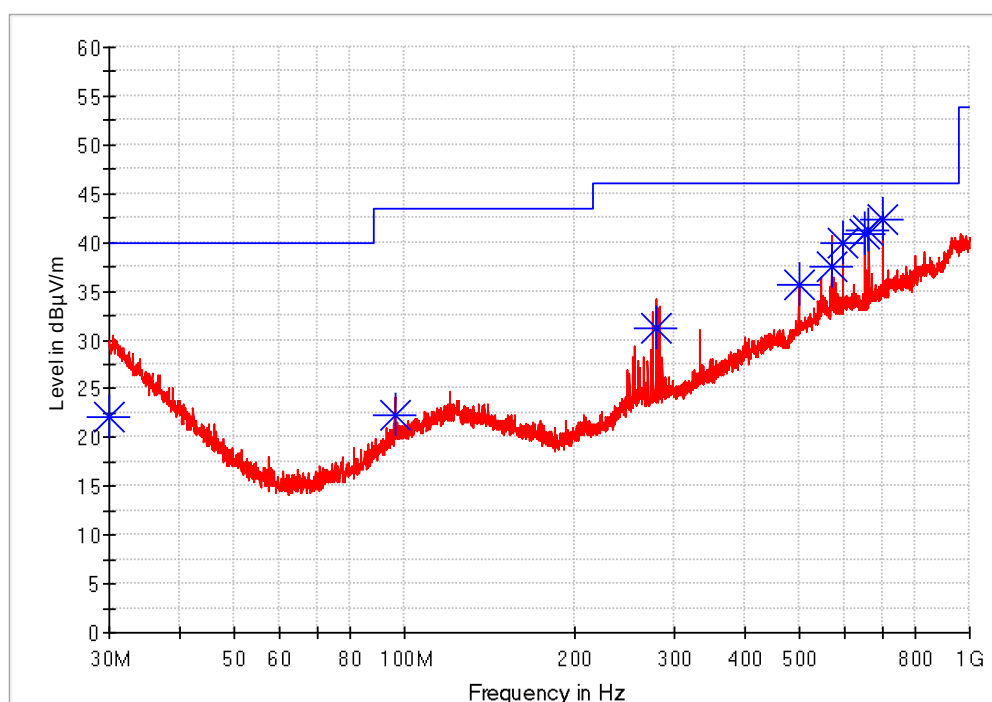
Photo 4.2.3 Test set-up regarding measurement of radiated emission (below 30 MHz).

4.3 Measurement of radiated emission (below 1 GHz)

Test object	Combination of 2.1.1: CADScor Sensor, No tag 2.1.2: CADScor Sensor, With tag	Sheet	RE_Spur-9
Type	See Section 2	Project no.	120-25441-1
Serial no.	See Section 2	Date	23 Feb. 2021
Client	Acarix A/S	Initials	PWF
Specification	47 CFR Part 15, Subpart B and C (Specific rule part §15.225)	Frequency	30-1000 MHz

Test method	ANSI C63.10:2013	Temperature	23 °C
Characteristics	Complete search, antenna distance 3 m	Humidity	39 % RH
Detector	Peak and quasi peak	Bandwidth	120 kHz
Test equipm.	EMI room Hørsholm 29797 49704 49590 49817 49999 49674 29953 49808 49971	Uncertainty	6.3 dB

Full Spectrum



— Preview Result 1-PK+ — FCC Part 15C QP 3 m * Final_Result QPK

Comments

Continuous Tx - normal modulation

Test object	Combination of 2.1.1: CADScor Sensor, No tag 2.1.2: CADScor Sensor, With tag	Sheet	RE_Spur-10
Type	See Section 2	Project no.	120-25441-1
Serial no.	See Section 2	Date	23 Feb. 2021
Client	Acarix A/S	Initials	PWF
Specification	47 CFR Part 15, Subpart B and C (Specific rule part §15.225)	Frequency	30-1000 MHz

Test method	ANSI C63.10:2013	Temperature	23 °C
Characteristics	Complete search, antenna distance 3 m	Humidity	39 % RH
Detector	Quasi peak	Bandwidth	120 kHz
Test equipm.	EMI room Hørsholm 29797 49704 49590 49817 49999 49674 29953 49808 49971	Uncertainty	6.3 dB

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
30.00	22.05	40.0	18.0	15000	103.0	H	92	26.7
96.00	22.36	43.5	21.1	15000	104.0	V	261	18.2
277.95	31.25	46.0	14.7	15000	100.0	H	206	22.0
497.82	35.58	46.0	10.4	15000	179.0	H	166	28.0
569.49	37.56	46.0	8.4	15000	281.0	H	-2	29.9
597.99	39.90	46.0	6.1	15000	128.0	H	-18	30.2
650.01	40.92	46.0	5.1	15000	105.0	H	9	30.8
663.78	41.16	46.0	4.8	15000	100.0	H	2	30.9
702.00	42.40	46.0	3.6	15000	100.0	H	8	32.0

Test result	The measured field strengths are below the limit
Test Port	Enclosure
Test frequency	13.56 MHz
Test mode	Continuous Tx - normal modulation
Condition	Normal
Compliant	Yes
Comments	Final maximal measurements by variation of turntable azimuth, antenna height, and antenna polarisation. Test voltage: Internal battery

The calculation of the correction of the limit lines from 30/300 meter to 3 meters: $\text{Limit2} = \text{Limit1} + 40 * \text{Log} (D1 / D2)$ This is done according to FCC Part 15, Section 31.



Photo 4.3.1 Test set-up regarding measurement of radiated emission (below 1 GHz).

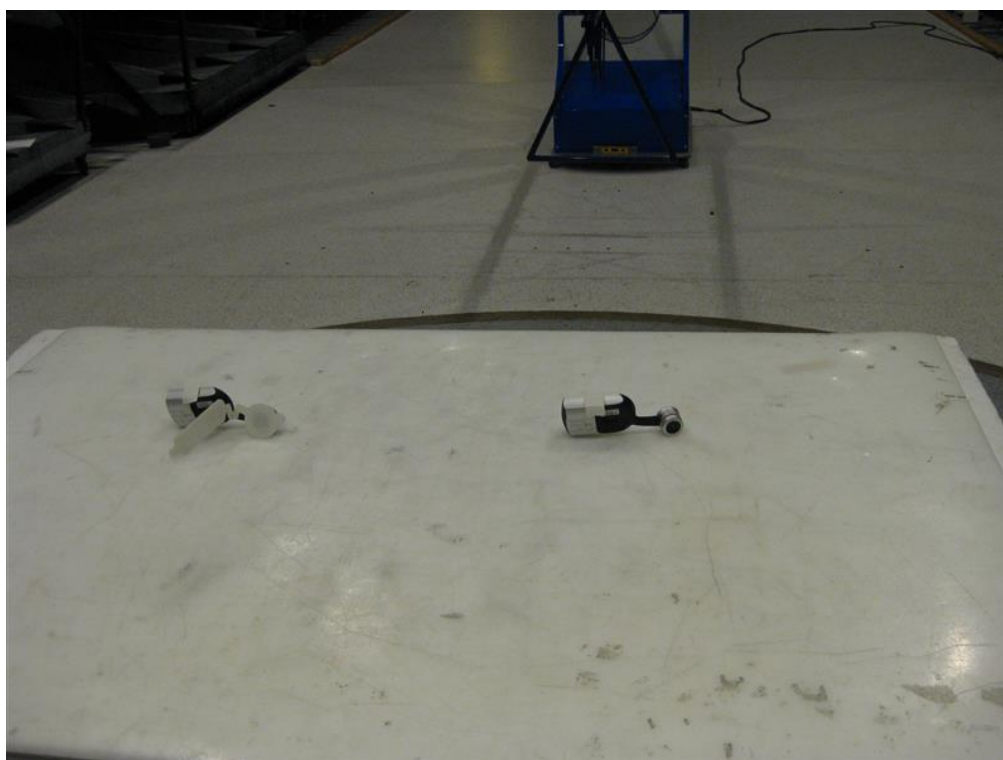


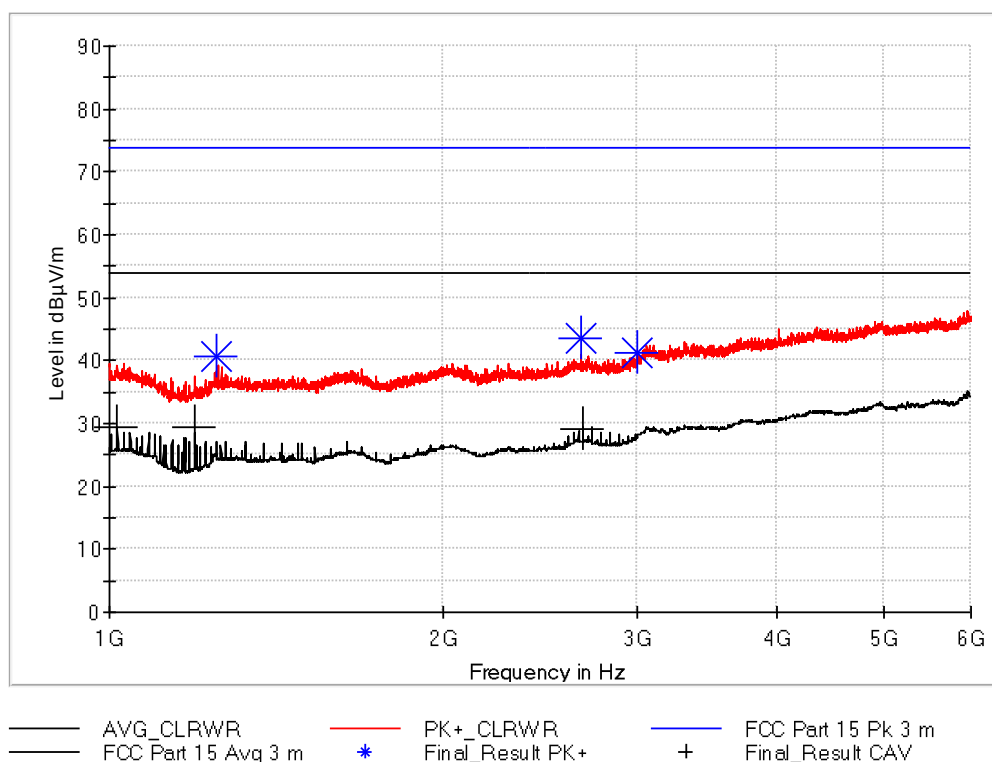
Photo 4.3.2 Test set-up regarding measurement of radiated emission (below 1 GHz).

4.4 Measurement of radiated emission (above 1 GHz)

Test object	Combination of 2.1.1: CADScor Sensor, No tag 2.1.2: CADScor Sensor, With tag	Sheet	RE_Spur-11
Type	See Section 2	Project no.	120-25441-1
Serial no.	See Section 2	Date	23 Feb. 2021
Client	Acarix A/S	Initials	PWF
Specification	47 CFR Part 15, Subpart B and C (Specific rule part §15.225)	Frequency	1-6 GHz

Test method	ANSI C63.10:2013	Temperature	23 °C
Characteristics	Complete search, antenna distance 3 m.	Humidity	39 % RH
Detector	Peak and CISPR average	Bandwidth	1 MHz
Test equipm.	EMI room Hørsholm 49971 49704 49590 49817 49741 49730 49674 29953 49999	Uncertainty	4.9 dB

Full Spectrum



Comments

Continuous Tx - normal modulation

Test object	Combination of 2.1.1: CADScor Sensor, No tag 2.1.2: CADScor Sensor, With tag	Sheet	RE_Spur-12
Type	See Section 2	Project no.	120-25441-1
Serial no.	See Section 2	Date	23 Feb. 2021
Client	Acarix A/S	Initials	PWF
Specification	47 CFR Part 15, Subpart B and C (Specific rule part §15.225)	Frequency	1-6 GHz

Test method	ANSI C63.10:2013	Temperature	23 °C
Characteristics	Complete search, antenna distance 3 m	Humidity	39 % RH
Detector	Peak and CISPR average	Bandwidth	1 MHz
Test equipm.	EMI room Hørsholm 49971 49704 49590 49817 49741 49730 49674 29953 49999	Uncertainty	4.9 dB

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Height (cm)	Pol	Azi-muth (deg)	Corr. (dB/m)
1017.00	---	29.46	53.9	24.4	15000	133.0	H	180	-1.8
1193.25	---	29.29	53.9	24.6	15000	124.0	H	162	-2.5
1249.25	40.70	---	73.9	33.2	15000	173.0	H	329	-2.3
2669.50	43.58	---	73.9	30.3	15000	103.0	H	135	5.0
2678.00	---	29.22	53.9	24.7	15000	123.0	H	181	5.0
2998.75	41.21	---	73.9	32.7	15000	157.0	H	274	6.2

Test result	The measured field strengths are below the limit
Test Port	Enclosure
Test frequency	13.56 MHz
Test mode	Continuous Tx - normal modulation
Condition	Normal
Compliant	Yes
Comments	Final maximal measurements by variation of turntable azimuth, antenna height, and antenna polarisation. Test voltage: Internal battery The calculation of the correction of the limit lines from 30/300 meter to 3 meters: $\text{Limit2} = \text{Limit1} + 40 * \log(D1 / D2)$ This is done according to FCC Part 15, Section 31.

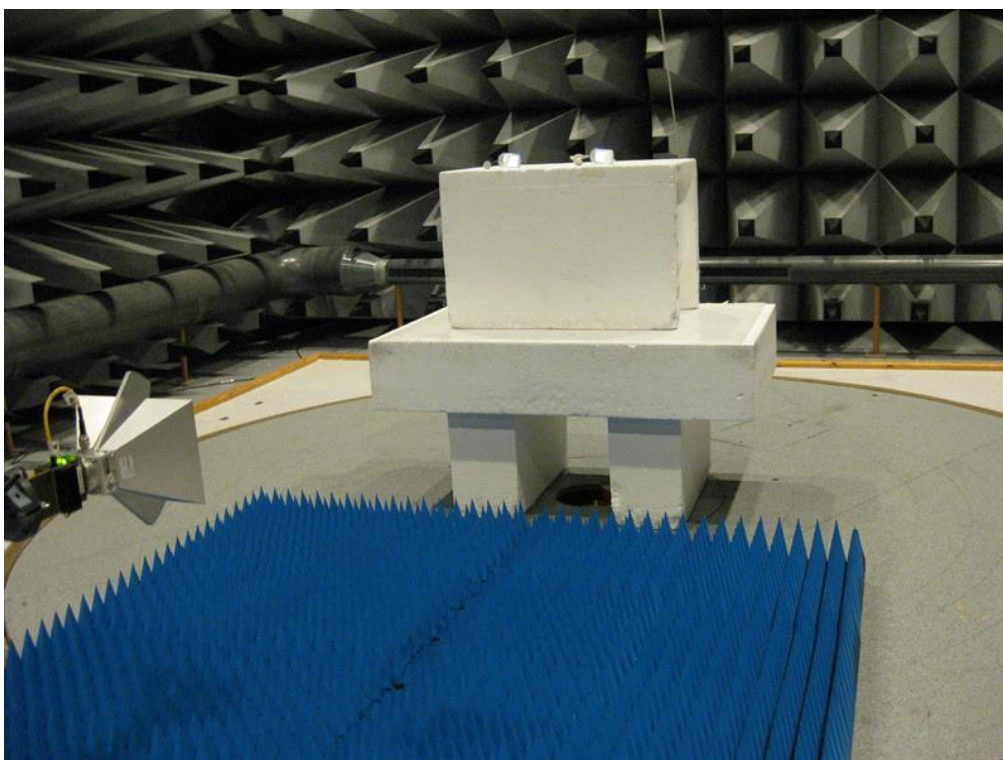


Photo 4.4.1 Test set-up regarding measurement of radiated emission (above 1 GHz)

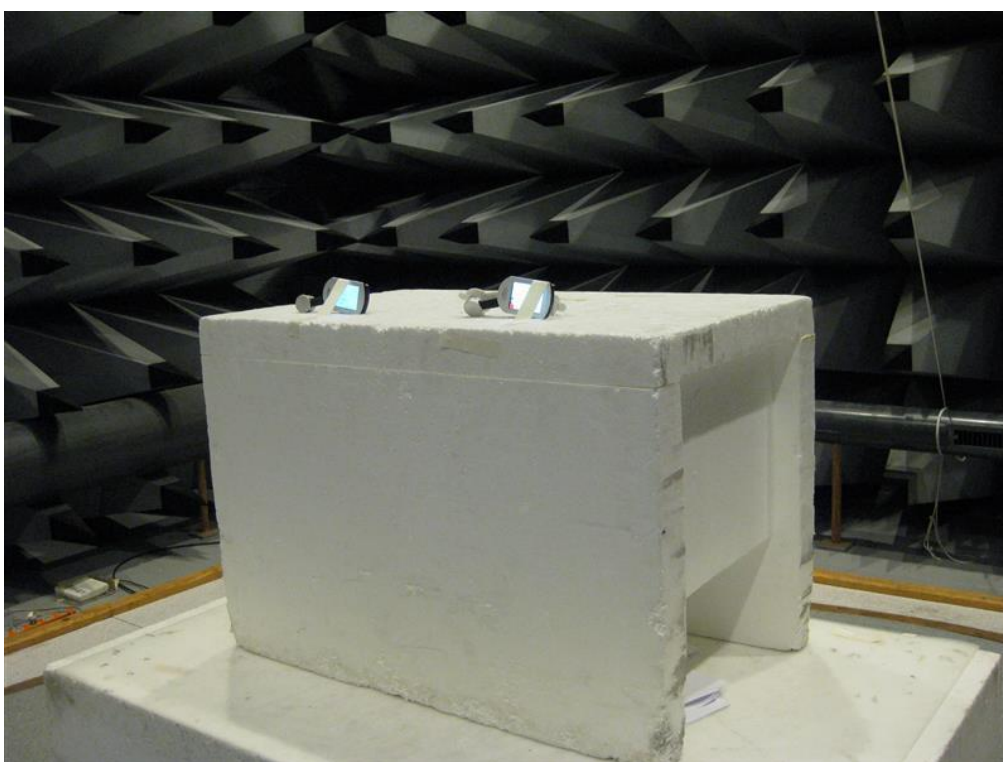
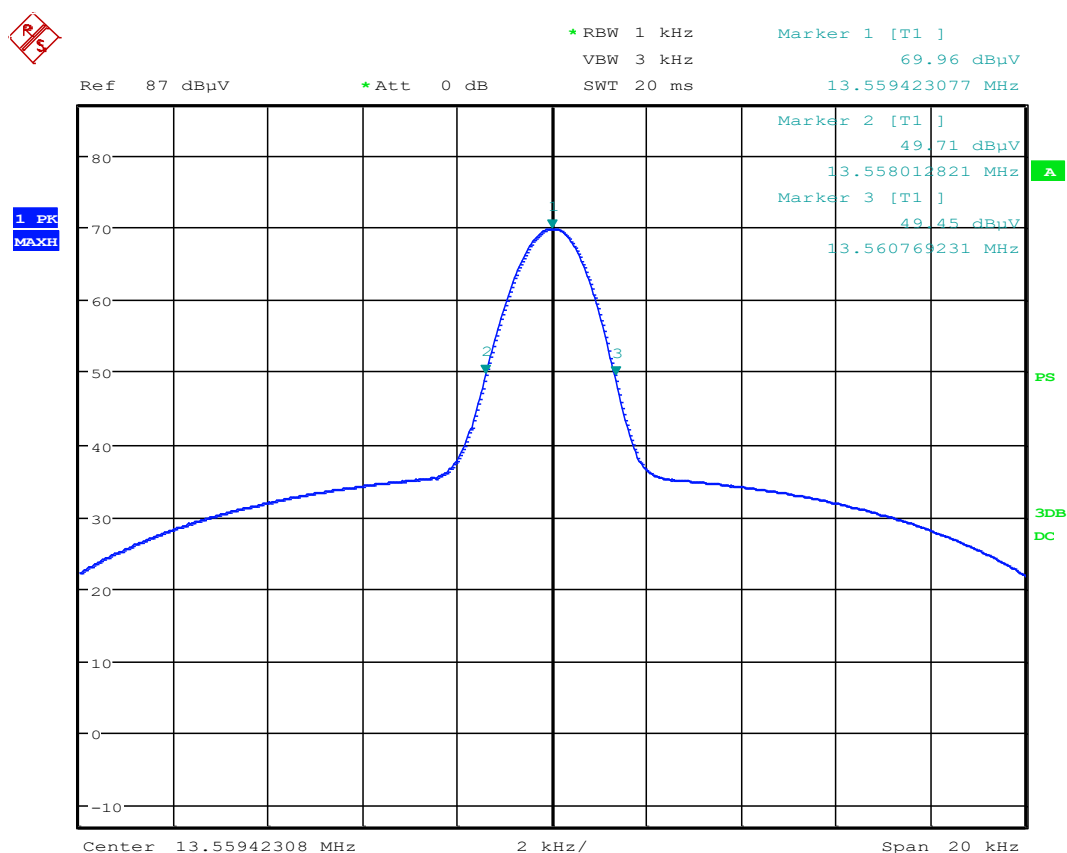


Photo 4.4.2 Test set-up regarding measurement of radiated emission (above 1 GHz)

4.5 Measurement of 20 dB bandwidth

Test object	CADScor Sensor	Sheet	PROF-1
Type	Sensor	Project no.	120-25441-1
Serial no.	S19-10 - 0030	Date	22 Feb. 2021
Client	Acarix A/S	Initials	PWF
Specification	47 CFR Part 15, Subpart B and C (Specific rule part §15.225)		

Test method	ANSI C63.10:2013	Temperature	23 °C
Characteristics	6.9.2 Occupied bandwidth—relative measurement procedure	Humidity	32 % RH
Test equipm.	EMC room 1 Hørsholm 49600 29246	Uncertainty	1.1 dB
SA Settings	RBW: 1 kHz VBW: 3 kHz SPAN: 20 kHz DET: Peak CF: Operating freq. Trace: Max. hold		



Comments

Operating frequency: 13.56 MHz

Test object	CADScor Sensor	Sheet	PROF-2
Type	Sensor	Project no.	120-25441-1
Serial no.	S19-10 - 0030	Date	22 Feb. 2021
Client	Acarix A/S	Initials	PWF
Specification	47 CFR Part 15, Subpart B and C (Specific rule part §15.225)		

Test method	ANSI C63.10:2013	Temperature	23 °C
Characteristics	6.9.2 Occupied bandwidth—relative measurement procedure	Humidity	32 % RH
Test equipm.	EMI room Hørsholm 49600 29246	Uncertainty:	1.1 dB
SA Settings	RBW: 1 kHz VBW: 3 kHz SPAN: 20 DET: Peak CF: Operating freq. Trace: Max. hold		

Operating frequency [MHz]	Low frequency [MHz]	High frequency [MHz]	20 dB bandwidth (20 dBc) [kHz]	Remarks
13.5594	13.5580	13.5608	2.8	Note 1
Note 1: No tag				

Band edge criteria	20 dB bandwidth
Test result	The measured 20 dBc bandwidth was within the limit
Test port	Enclosure
Test frequency	13.56 MHz
Test mode	Continuous Tx - normal modulation
Condition	Normal
Compliant	Yes
Comments	Test voltage: Internal power supply



Photo 4.5.1 Test set-up regarding measurement of 20 dB bandwidth

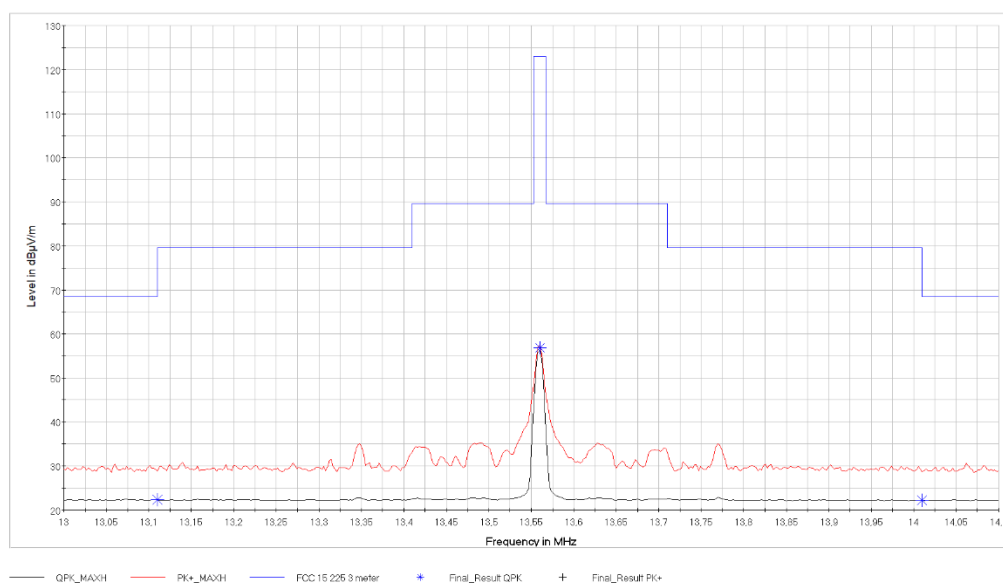


Photo 4.5.2 Test set-up regarding measurement of 20 dB bandwidth

4.6 Measurement of radiated band edge compliance

Test object	CADScor Sensor	Sheet	RE_Spur-13
Type	Sensor	Project no.	120-25441-1
Serial no.	S19-10 - 0030	Date	23 Feb. 2021
Client	Acarix A/S	Initials	PWF
Specification	47 CFR Part 15, Subpart B and C (Specific rule part §15.225)	Frequency	0.009-30 MHz

Test method	ANSI C63.10:2013	Temperature	23 °C
Characteristics	Complete search, antenna distance 3 m.	Humidity	39 % RH
Detector	Peak and quasi peak	Bandwidth	9 kHz
Test equipm.	EMI room Hørsholm 49971 49704 49590 49817 49949 29953 49999	Uncertainty	2.7 dB

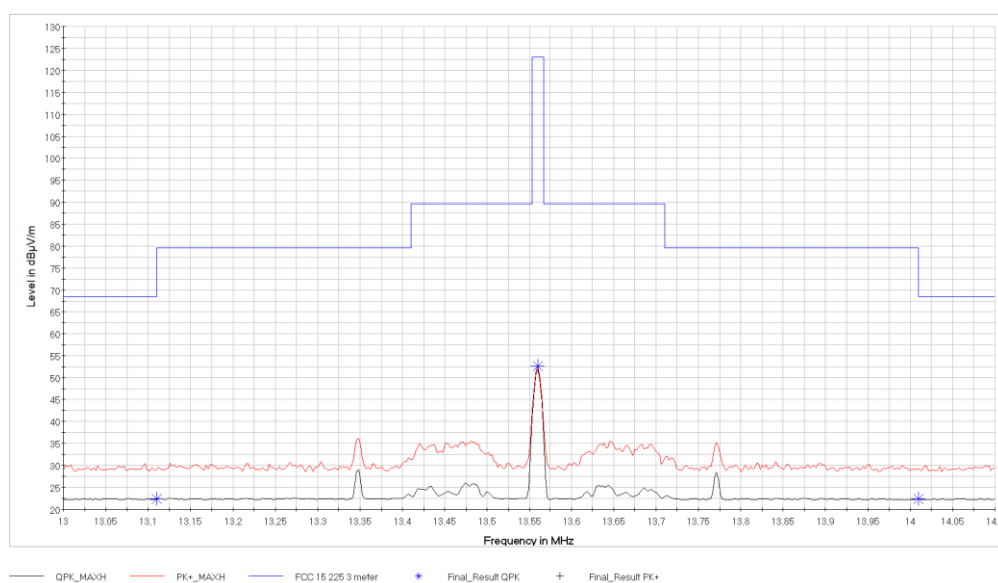


Comments

Operating frequency: 13.56 MHz Without Tag

Test object	CADScor Sensor	Sheet	RE_Spur-14
Type	Sensor	Project no.	120-25441-1
Serial no.	S19-10 - 0030	Date	23 Feb. 2021
Client	Acarix A/S	Initials	PWF
Specification	47 CFR Part 15, Subpart B and C (Specific rule part §15.225)	Frequency	0.009-30 MHz

Test method	ANSI C63.10:2013	Temperature	23 °C
Characteristics	Complete search, antenna distance 3 m.	Humidity	39 % RH
Detector	Peak and quasi peak	Bandwidth	9 kHz
Test equipm.	EMI room Hørsholm 49971 49704 49590 49817 49949 29953 49999	Uncertainty	2.7 dB



Comments

Operating frequency: 13.56 MHz with Tag

Test object	CADScor Sensor	Sheet	RE_Spur-15
Type	Sensor	Project no.	120-25441-1
Serial no.	S19-10 - 0030	Date	23 Feb. 2021
Client	Acarix A/S	Initials	PWF
Specification	47 CFR Part 15, Subpart B and C (Specific rule part §15.225)	Frequency	0.009-30 MHz

Test method	ANSI C63.10:2013	Temperature	23 °C
Characteristics	Complete search, antenna distance 3 m	Humidity	39 % RH
Detector	Quasi peak	Bandwidth	9 kHz
Test equipm.	EMI room Hørsholm 49971 49704 49590 49817 49949 29953 49999	Uncertainty	2.7 dB

Without Tag

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
13.56	56.86	124.0	67.1	15000	9	100.0	V	324	20.8
13.11	22.33	68.6	46.3	15000	9	100.0	V	324	20.8
14.01	22.19	68.6	46.4	15000	9	100.0	V	324	20.8

With Tag

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
13.56	52.54	124.0	71.5	15000	9	100.0	V	334	20.8
13.11	22.42	68.6	46.2	15000	9	100.0	V	324	20.8
14.01	22.32	68.6	46.3	15000	9	100.0	V	324	20.8

Test result The measured band edge was below the limit

Test Port Enclosure

Test frequency 13.56 MHz

Test mode Continuous Tx - normal modulation

Condition Normal

Compliant Yes

Comments Final maximal measurements by variation of turntable azimuth, antenna height, and antenna polarisation.

Test voltage: Internal power supply

The calculation of the correction of the limit lines from
30/300 meter to 3 meters: $\text{Limit2} = \text{Limit1} + 40 * \text{Log} (\text{D1} / \text{D2})$

This is done according to FCC Part 15, Section 31



Photo 4.6.1 Test set-up regarding measurement of radiated band edge compliance

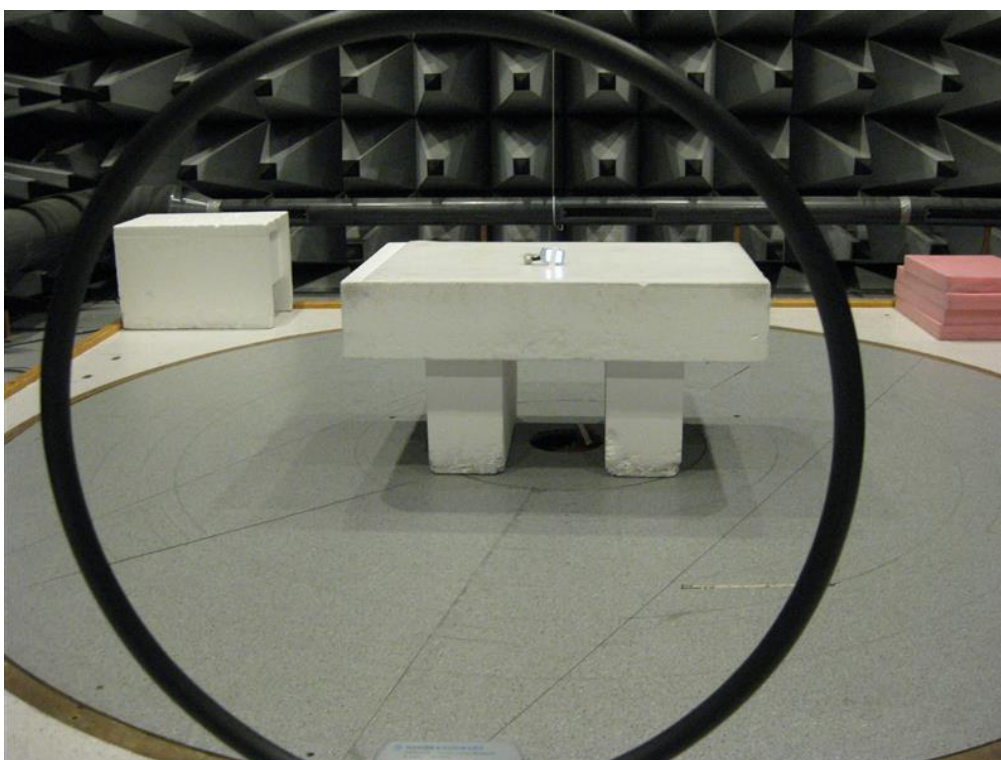
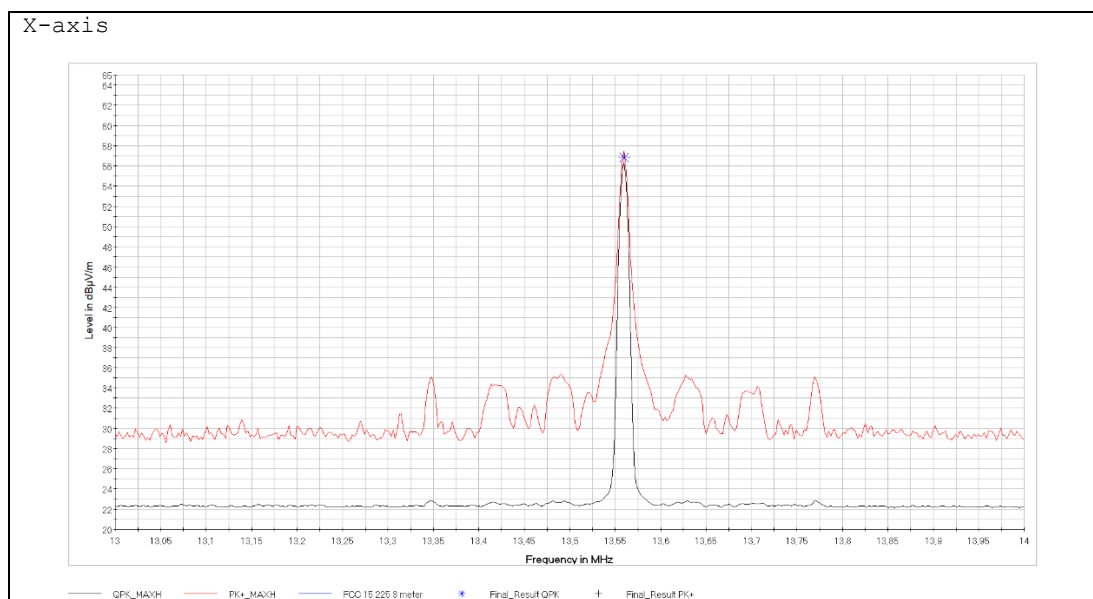


Photo 4.6.2 Test set-up regarding measurement of radiated band edge compliance

4.7 Measurement of field strength of fundamental, No tag

Test object	CADScor Sensor	Sheet	RE_Spur-16
Type	Sensor	Project no.	120-25441-1
Serial no.	S19-10 - 0030	Date	22 Feb. 2021
Client	Acarix A/S	Initials	PWF
Specification	47 CFR Part 15, Subpart B and C (Specific rule part §15.225)		

Test method	ANSI C63.10:2013	Temperature	23 °C
Characteristics	Complete search, antenna distance 3 m.	Humidity	32 % RH
Detector	Peak and average	Bandwidth	9 kHz
Test equipm.	EMI room Hørsholm 49971 49704 49590 49817 49999 49949 29953	Uncertainty	2.7 dB

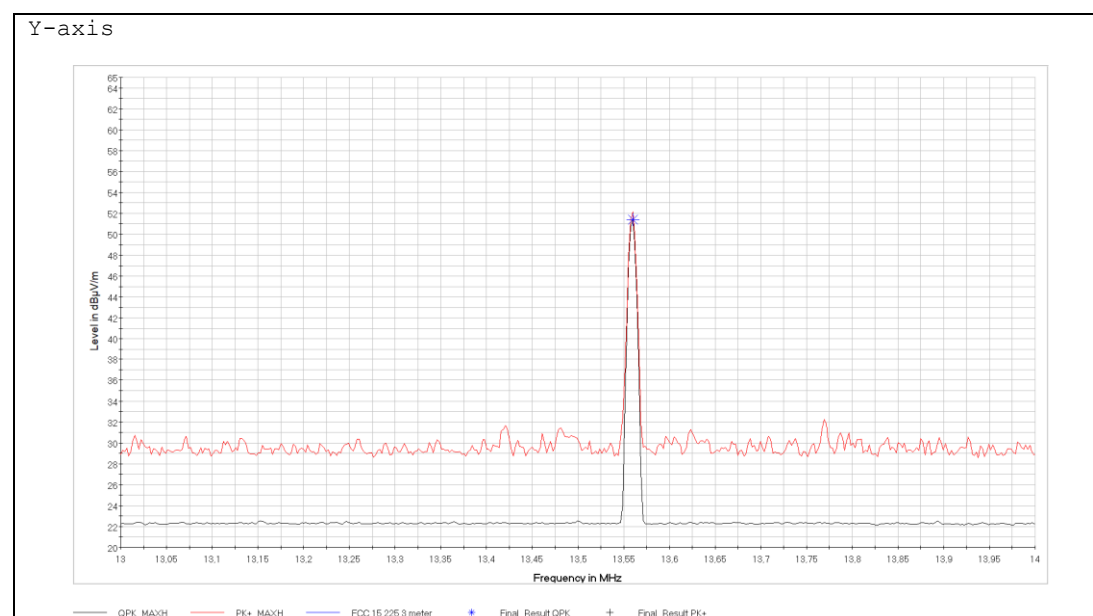


Comments

Continuous Tx - normal modulation

Test object	CADScor Sensor	Sheet	RE_Spur-17
Type	Sensor	Project no.	120-25441-1
Serial no.	S19-10 - 0030	Date	22 Feb. 2021
Client	Acarix A/S	Initials	PWF
Specification	47 CFR Part 15, Subpart B and C (Specific rule part §15.225)		

Test method	ANSI C63.10:2013	Temperature	23 °C
Characteristics	Complete search, antenna distance 3 m.	Humidity	32 % RH
Detector	Peak and average	Bandwidth	9 kHz
Test equipm.	EMI room Hørsholm 49971 49704 49590 49817 49999 49949 29953	Uncertainty	2.7 dB

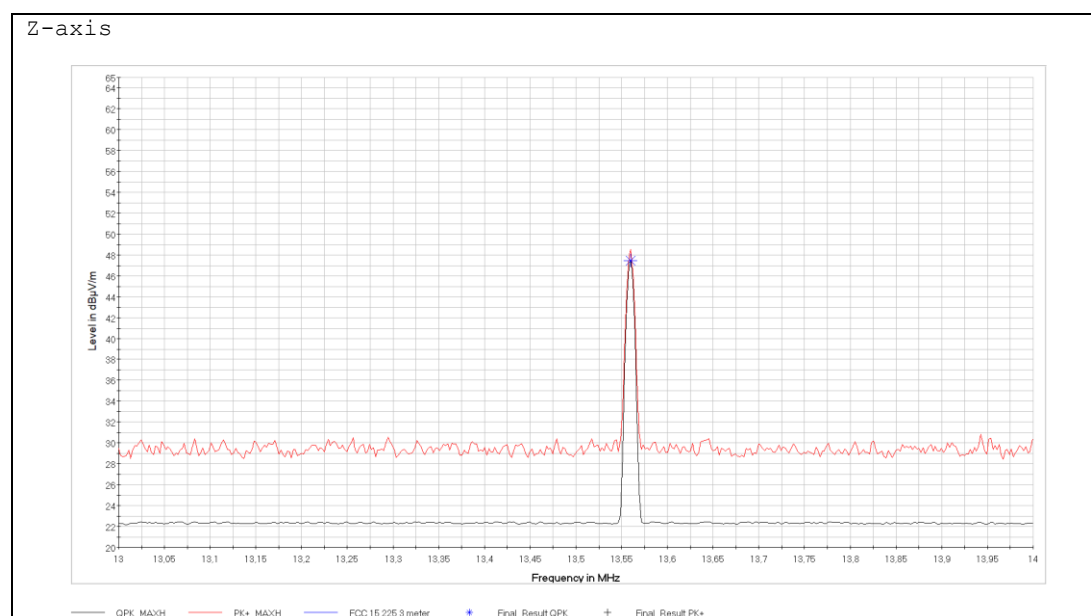


Comments

Continuous Tx - normal modulation

Test object	CADScor Sensor	Sheet	RE_Spur-18
Type	Sensor	Project no.	120-25441-1
Serial no.	S19-10 - 0030	Date	22 Feb. 2021
Client	Acarix A/S	Initials	PWF
Specification	47 CFR Part 15, Subpart B and C (Specific rule part §15.225)		

Test method	ANSI C63.10:2013	Temperature	23 °C
Characteristics	Complete search, antenna distance 3 m.	Humidity	32 % RH
Detector	Peak and average	Bandwidth	9 kHz
Test equipm.	EMI room Hørsholm 49971 49704 49590 49817 49999 49949 29953	Uncertainty	2.7 dB



Comments

Continuous Tx - normal modulation

Test object	CADScor Sensor	Sheet	RE_Spur-19
Type	Sensor	Project no.	120-25441-1
Serial no.	S19-10 - 0030	Date	22 Feb. 2021
Client	Acarix A/S	Initials	PWF
Specification	47 CFR Part 15, Subpart B and C (Specific rule part §15.225)		

Test method	ANSI C63.10:2013	Temperature	23 °C
Characteristics	Complete search, antenna distance 3 m	Humidity	32 % RH
Detector	Quasi peak	Bandwidth	9 kHz
Test equipm.	EMI room Hørsholm 49971 49704 49590 49817 49999 49949 29953	Uncertainty	2.7 dB

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
13.56	56.86	124.0	67.1	15000	100.0	X	324	20.8
13.56	51.42	124.0	72.6	15000	100.0	Y	2	20.8
13.56	47.49	124.0	76.5	15000	100.0	Z	144	20.8

Test result	The measured field strengths are below the limit
Test Port	Enclosure
Test frequency	13.56 MHz
Test mode	Continuous Tx - normal modulation
Condition	Normal
Compliant	Yes
Comments	Final maximal measurements by variation of turntable azimuth. Test voltage: Internal power supply The calculation of the correction of the limit lines from 30/300 meter to 3 meters: $\text{Limit2} = \text{Limit1} + 40 * \log(D1 / D2)$ This is done according to FCC Part 15, Section 31



Photo 4.7.1 Test set-up regarding measurement of field strength of fundamental

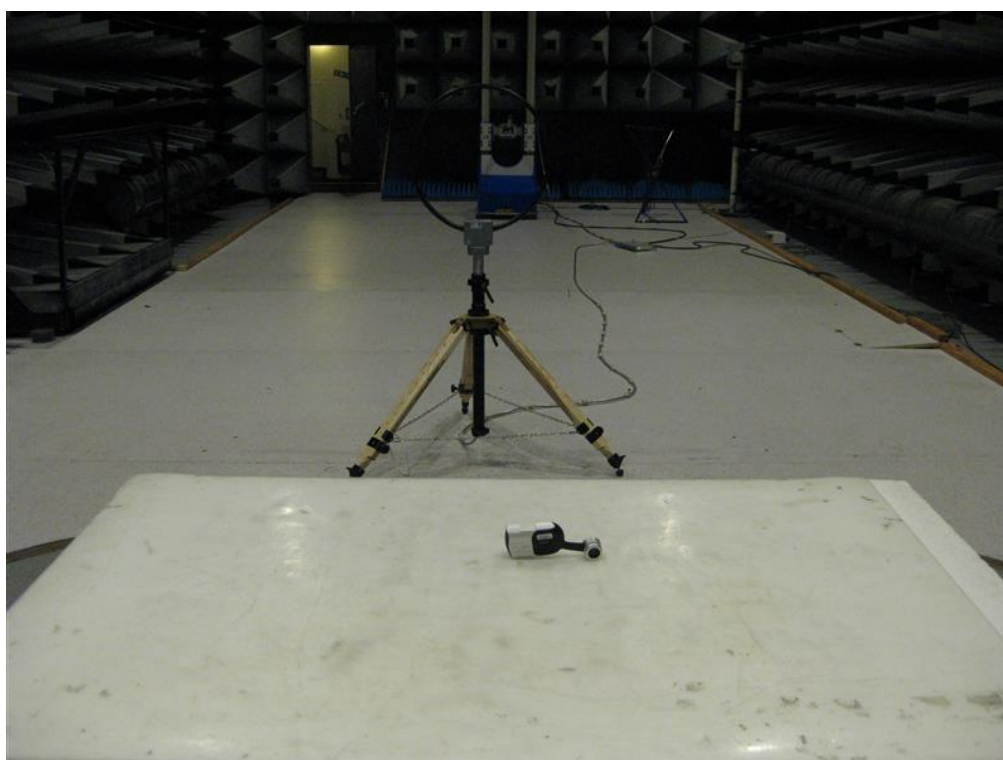


Photo 4.7.2 Test set-up regarding measurement of field strength of fundamental

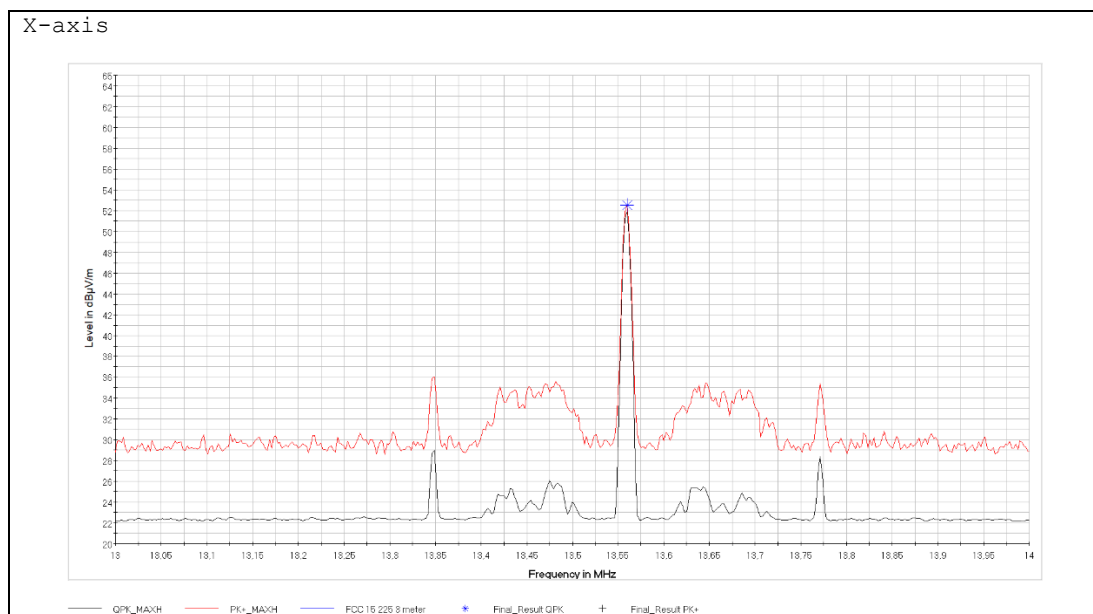


Photo 4.7.3 Test set-up regarding measurement of field strength of fundamental

4.8 Measurement of field strength of fundamental, with tag

Test object	CADScor Sensor	Sheet	RE_Spur-20
Type	Sensor	Project no.	120-25441-1
Serial no.	S19-10 - 0030	Date	22 Feb. 2021
Client	Acarix A/S	Initials	PWF
Specification	47 CFR Part 15, Subpart B and C (Specific rule part §15.225)		

Test method	ANSI C63.10:2013	Temperature	23 °C
Characteristics	Complete search, antenna distance 3 m.	Humidity	32 % RH
Detector	Peak and average	Bandwidth	9 kHz
Test equipm.	EMI room Hørsholm 49971 49704 49590 49817 49999 49949 29953	Uncertainty	2.7 dB

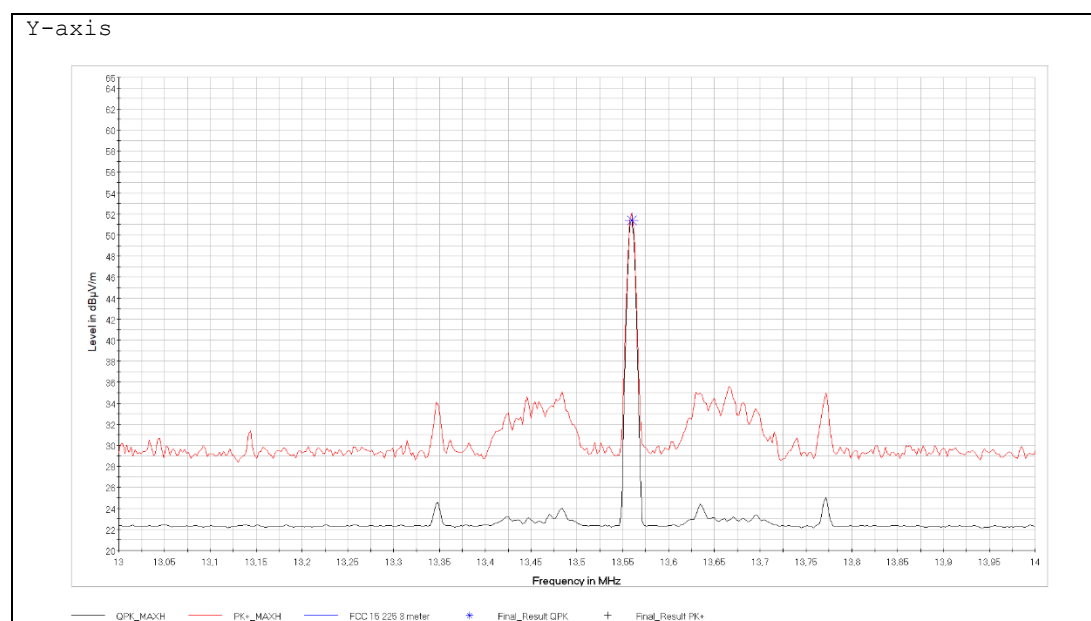


Comments

Continuous Tx - normal modulation

Test object	CADScor Sensor	Sheet	RE_Spur-21
Type	Sensor	Project no.	120-25441-1
Serial no.	S19-10 - 0030	Date	22 Feb. 2021
Client	Acarix A/S	Initials	PWF
Specification	47 CFR Part 15, Subpart B and C (Specific rule part §15.225)		

Test method	ANSI C63.10:2013	Temperature	23 °C
Characteristics	Complete search, antenna distance 3 m.	Humidity	32 % RH
Detector	Peak and average	Bandwidth	9 kHz
Test equipm.	EMI room Hørsholm 49971 49704 49590 49817 49999 49949 29953	Uncertainty	2.7 dB

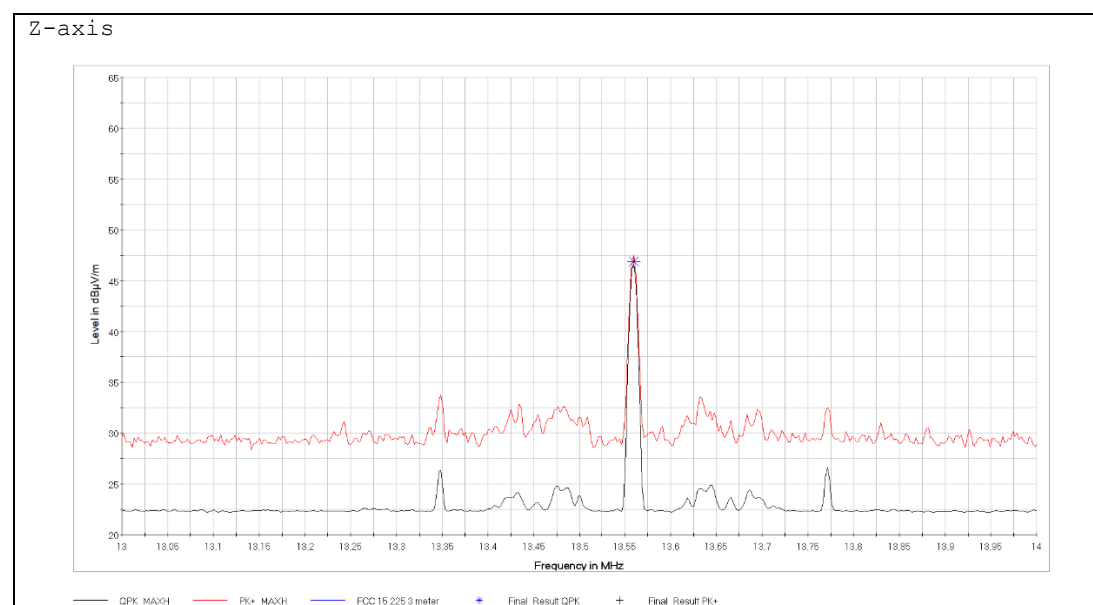


Comments

Continuous Tx - normal modulation

Test object	CADScor Sensor	Sheet	RE_Spur-22
Type	Sensor	Project no.	120-25441-1
Serial no.	S19-10 - 0030	Date	22 Feb. 2021
Client	Acarix A/S	Initials	PWF
Specification	47 CFR Part 15, Subpart B and C (Specific rule part §15.225)		

Test method	ANSI C63.10:2013	Temperature	23 °C
Characteristics	Complete search, antenna distance 3 m.	Humidity	32 % RH
Detector	Peak and average	Bandwidth	9 kHz
Test equipm.	EMI room Hørsholm 49971 49704 49590 49817 49999 49949 29953	Uncertainty	2.7 dB



Comments

Continuous Tx - normal modulation

Test object	CADScor Sensor	Sheet	RE_Spur-23
Type	Sensor	Project no.	120-25441-1
Serial no.	S19-10 - 0030	Date	22 Feb. 2021
Client	Acarix A/S	Initials	PWF
Specification	47 CFR Part 15, Subpart B and C (Specific rule part §15.225)		

Test method	ANSI C63.10:2013	Temperature	23 °C
Characteristics	Complete search, antenna distance 3 m	Humidity	32 % RH
Detector	Quasi peak	Bandwidth	9 kHz
Test equipm.	EMI room Hørsholm 49971 49704 49590 49817 49999 49949 29953	Uncertainty	2.7 dB

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
13.56	52.54	124.0	71.5	15000	100.0	X	334	20.8
13.56	51.41	124.0	72.6	15000	100.0	Y	269	20.8
13.56	46.90	124.0	77.1	15000	100.0	Z	149	20.8

Test result	The measured field strengths are below the limit
Test Port	Enclosure
Test frequency	13.56 MHz
Test mode	Continuous Tx - normal modulation
Condition	Normal
Compliant	Yes
Comments	Final maximal measurements by variation of turntable azimuth. Test voltage: Internal power supply The calculation of the correction of the limit lines from 30/300 meter to 3 meters: $\text{Limit2} = \text{Limit1} + 40 * \log(D1 / D2)$ This is done according to FCC Part 15, Section 31

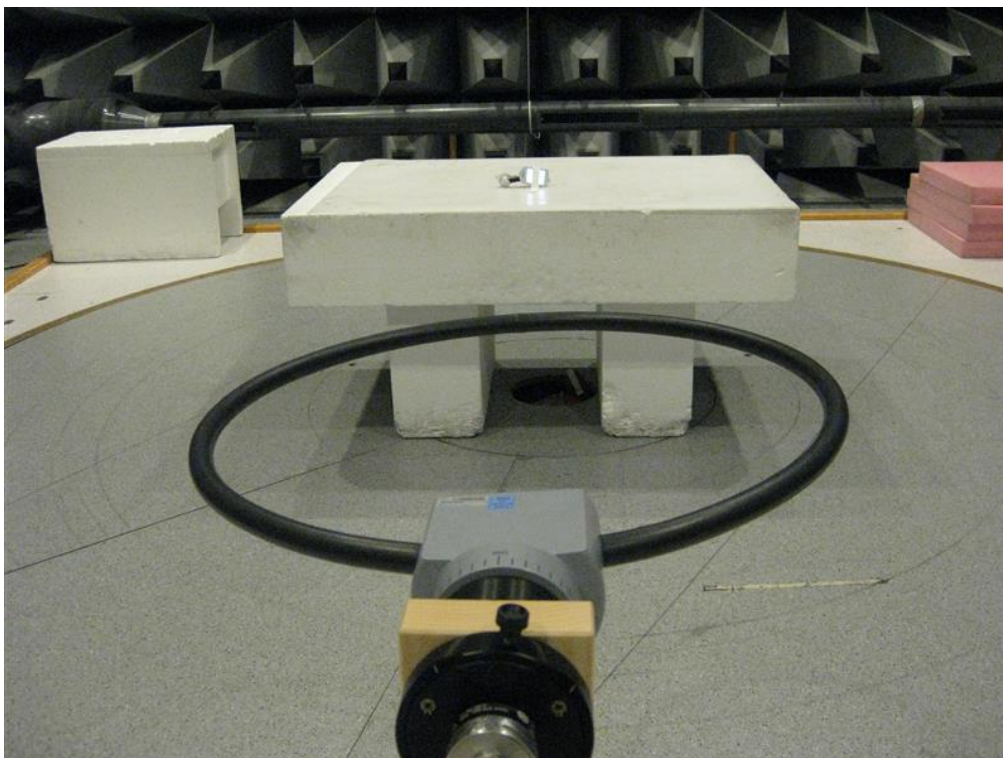


Photo 4.8.1 Test set-up regarding measurement of field strength of fundamental, no tag

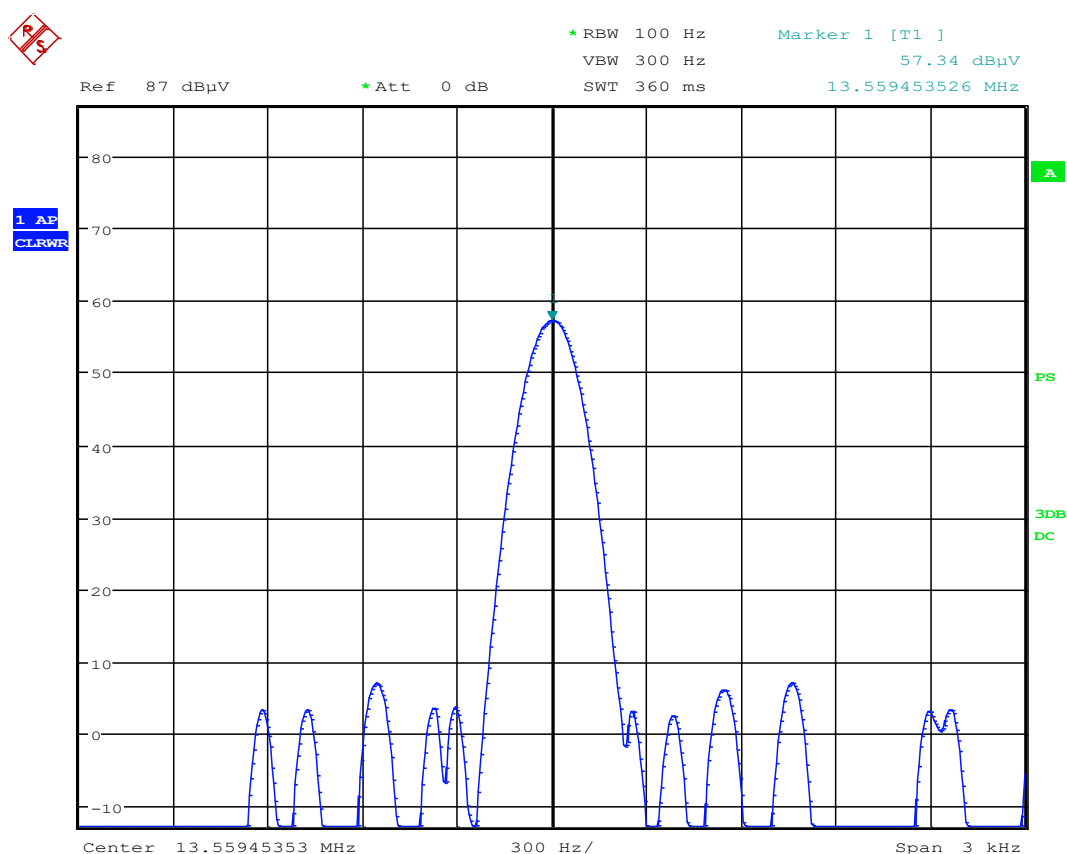


Photo 4.8.2 Test set-up regarding measurement of field strength of fundamental, with tag

4.9 Measurement of Frequency stability

Test object	CADScor Sensor	Sheet	PROF-3
Type	Sensor	Project no.	120-25441-1
Serial no.	S19-10 - 0030	Date	19 Mar. 2021
Client	Acarix A/S	Initials	PWF
Specification	47 CFR Part 15, Subpart B and C (Specific rule part §15.225)		

Test method	ANSI C63.10:2013	Temperature	-10 °C
Characteristics	6.8.1 Frequency stability with respect to ambient temperature		
Test equipm.	VKF875-3 49600 29246	Uncertainty	1.1 dB
SA Settings	RBW: 100 Hz VBW: 300 Hz SPAN: 3 kHz DET: Peak CF: - Trace: Clear Write		

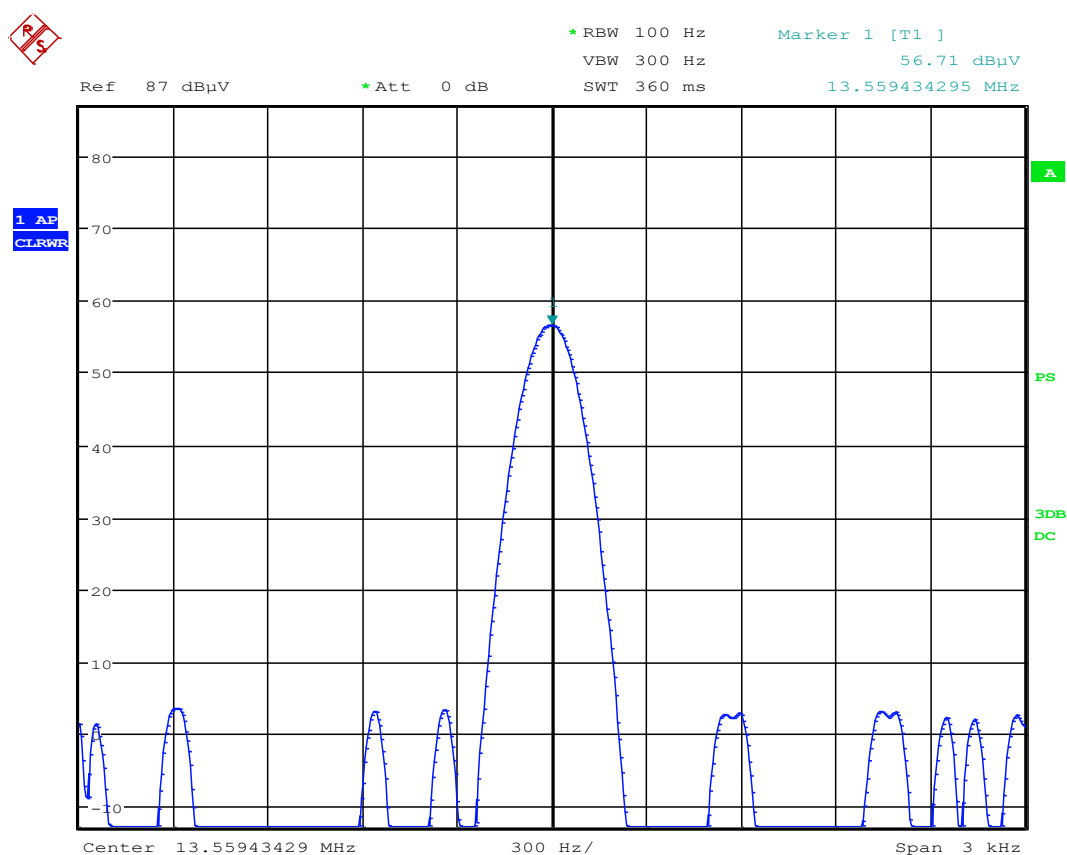


Comments

Operating frequency: 13.56 MHz

Test object	CADScor Sensor	Sheet	PROF-4
Type	Sensor	Project no.	120-25441-1
Serial no.	S19-10 - 0030	Date	19 Mar. 2021
Client	Acarix A/S	Initials	PWF
Specification	47 CFR Part 15, Subpart B and C (Specific rule part §15.225)		

Test method	ANSI C63.10:2013	Temperature	20 °C
Characteristics	6.8.1 Frequency stability with respect to ambient temperature		
Test equipm.	VKF875-3 49600 29246	Uncertainty	1.1 dB
SA Settings	RBW: 100 Hz VBW: 300 Hz SPAN: 3 kHz DET: Peak CF: - Trace: Clear Write		

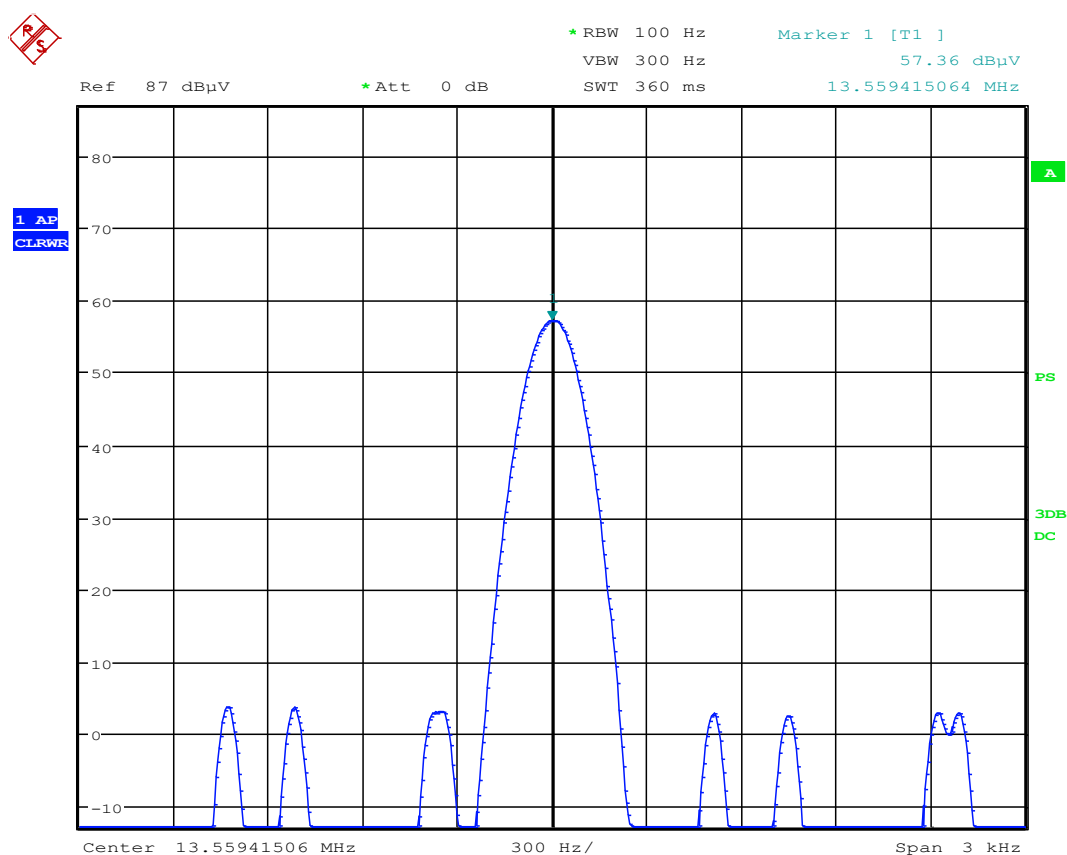


Comments

Operating frequency: 13.56 MHz

Test object	CADScor Sensor	Sheet	PROF-1
Type	Sensor	Project no.	120-25441-1
Serial no.	S19-10 - 0030	Date	18 Mar. 2021
Client	Acarix A/S	Initials	PWF
Specification	47 CFR Part 15, Subpart B and C (Specific rule part §15.225)		

Test method	ANSI C63.10:2013	Temperature	50 °C
Characteristics	6.8.1 Frequency stability with respect to ambient temperature		
Test equipm.	VKF875-3 49600 29246	Uncertainty	1.1 dB
SA Settings	RBW: 100 Hz VBW: 300 Hz SPAN: 3 kHz DET: Peak CF: - Trace: Clear Write		



Comments

Operating frequency: 13.56 MHz

Test object	CADScor Sensor	Sheet	PROF-5
Type	Sensor	Project no.	120-25441-1
Serial no.	S19-10 - 0030	Date	18 Mar. 2021
Client	Acarix A/S	Initials	PWF
Specification	47 CFR Part 15, Subpart B and C (Specific rule part §15.225)		

Test method	ANSI C63.10:2013		
Characteristics	6.8.1 Frequency stability with respect to ambient temperature		
Test equipm.	VKF875-3 49600 29246	Uncertainty:	1.1 dB
SA Settings	RBW: 100 Hz VBW: 300 Hz SPAN: 3 kHz DET: Peak CF: - Trace: Clear Write		

Operating frequency Measurement [MHz]	Frequency Drift [kHz]	Limit [kHz] Note 1	Temperature [°C]	Remarks
-	-	±1.356	-20	Note 2
13.559453	0.019	±1.356	-10	Passed
13.559434	Reference Freq.	-	+20	Passed
13.559415	0.019	±1.356	+50	Passed
Note 1: The limit is ±0.01% of the operating frequency. Limit= ±0.0001*13.559434 MHz ~ ±1.356 kHz				
Note 2: The EUT was not able to start up transmitting – the device could not be activated.				

Test result	The measured frequency stability was within the limit
Test port	Enclosure
Test frequency	13.56 MHz
Test mode	Continuous Tx - normal modulation
Condition	Normal and extreme
Compliant	Yes
Comments	None

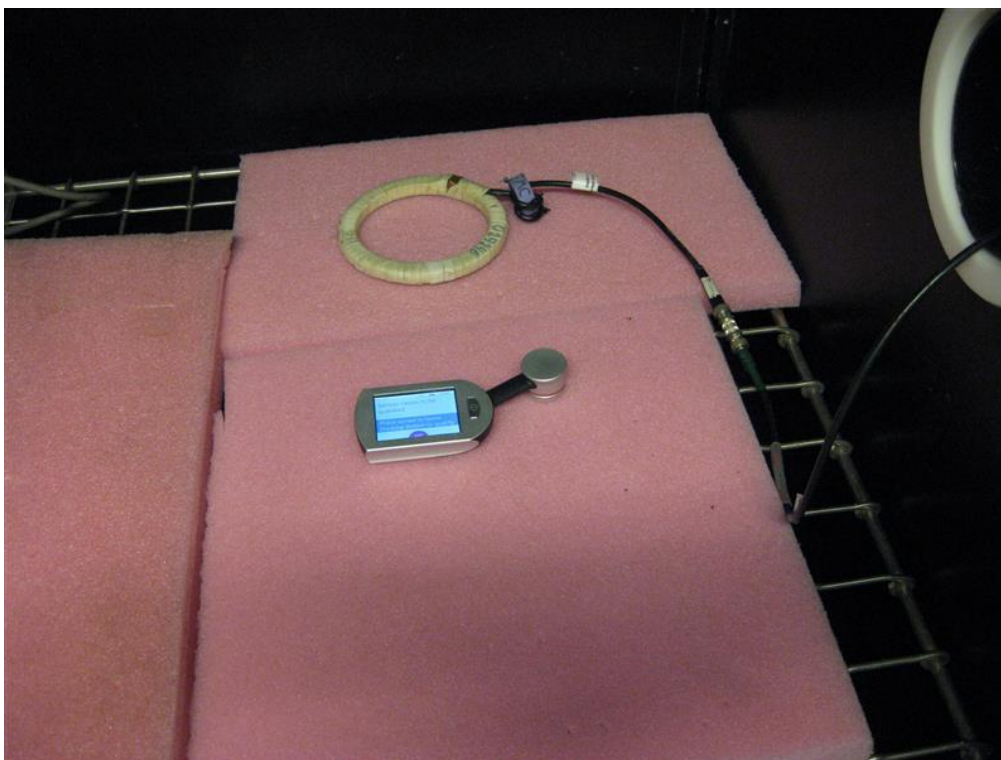


Photo 4.9.1 Test set-up regarding measurement of frequency stability

5. National registrations and accreditations

5.1 DANAK Accreditation

Organization: Danish Accreditation and Metrology Fund - DANAK, see www.danak.dk and www.ilac.org

Registration Number: 19

Area Number: C

DANAK is part of ILAC (International Laboratory Accreditation Cooperation) including its MRA (Mutual Recognition Arrangement). The MRA includes the Australian NATA and Canadian SCC.

5.2 FCC Registrations

Organization: Federal Communications Commission, USA

Registration Number: 913950

Facilities: EMC room 2 Hørsholm (EMC-2)
EMC room 3 Hørsholm (EMC-3)
EMC room 4 Hørsholm (EMC-4)
EMI room Hørsholm (EMC-5)

5.3 VCCI Registrations

Organization: Voluntary Control Council for Interference by Information Technology, Japan

Member Number: 910

Facilities: EMC room 3 Hørsholm (EMC-3): C-12532 and T-11548
EMI room Hørsholm (EMC-5): R-11180, C-10706
T-11550 and G-10470

5.4 IC Registrations

Organization: Industry Canada, Certification and Engineering Bureau

Registration Number: IC4187A-5

Facilities: EMI room Hørsholm (EMC-5)

6. List of instruments

No	Category/Action	Manufacturer	Type no	Cal. date	Cal. exp.
29246	MAGNETIC LOOP ANTENNA	EC	-	N/A	N/A
29797	BILOG ANTENNA, 30-2000 MHz	CHASE ELECTRICS LTD	CBL 6111A	26-07-2019	26-07-2021
29953	ANTENNA TOWER/TURNTABLE CONTROLLER	EMCO	2090	N/A	N/A
49590	CABLE, LOW-LOSS uWAVE CABLE, N-N, 8.0 m "EMI"	SUHNER	SUCOFLEX 104 PB	02-02-2021	02-02-2022
49600	SPECTRUM ANALYZER / MEASUREMENT RECEIVER	ROHDE & SCHWARZ	ESU40	25-02-2021	25-02-2022
49674	MATURO CONTROLLER	MATURO	NCD	N/A	N/A
49704	CABLE 3 M SMA-N	SUHNER	SUCOFLEX104	02-02-2021	02-02-2022
49730	1-18 GHz. HORN ANTENNA.	ROHDE & SCHWARZ	4070.7000.02	27-07-2019	27-07-2021
49741	AMPLIFIER 0.8-18 GHz	MITEQ	AFS4-00501800-40-20P-6	19-02-2021	19-04-2022
49808	ATTENUATOR, DC-12.4GHz, 6 dB	HUBER-SUHNER	6806.17A	26-07-2019	26-07-2021
49817	CABLE, LOW-LOSS uWAVE CABLE, N-N, 8.0 m "EMI"	SUHNER	SUCOFLEX 104 PB	02-02-2021	02-02-2022
49949	ACTIVE LOOP ANTENNA	ROHDE & SCHWARZ	4110.2002.02	09-12-2019	09-12-2021
49971	SPECTRUM ANALYZER / MEASUREMENT RECEIVER	ROHDE & SCHWARZ	ESW44	06-08-2020	06-08-2021
49999	EMC32-SOFTWARE EMIROOM	ROHDE & SCHWARZ	Ver. 10.40.10	N/A	N/A