



# EMI - TEST REPORT

- FCC Part 15.225, RSS 210-

Type / Model Name : CC300

Product Description : Industrial HMI with RFID

Applicant : Kontron Europe GmbH

Address : Lise-Meitner Straße 3 - 5

86156 Augsburg

Germany

Manufacturer : Kontron Europe GmbH

Address : Lise-Meitner Straße 3 - 5

86156 Augsburg

Germany

Test Result according to the standards listed in clause 1 test standards:	<b>POSITIVE</b>
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Test Report No. : <b>80088613-00 Rev_0</b>	22. July 2021 Date of issue
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Deutsche  
Akkreditierungsstelle  
D-PL-12030-01-03  
D-PL-12030-01-04

# Contents

<b>1</b>	<b><u>TEST STANDARDS</u></b>	<b>3</b>
<b>2</b>	<b><u>EQUIPMENT UNDER TEST</u></b>	<b>4</b>
2.1	Information provided by the Client	4
2.2	Sampling	4
2.3	Photo documentation of the EUT – Detailed photos see ATTACHMENT A and B	4
2.4	Short description of the equipment under test (EUT)	4
2.5	Power supply system utilised	6
3.1	<b>FINAL ASSESSMENT</b>	<b>7</b>
<b>4</b>	<b><u>TEST ENVIRONMENT</u></b>	<b>8</b>
4.1	Address of the test laboratory	8
4.2	Environmental conditions	8
4.3	Statement of the measurement uncertainty	8
4.4	Conformity Decision Rule	9
4.5	Measurement Protocol for FCC	9
<b>5</b>	<b><u>TEST CONDITIONS AND RESULTS</u></b>	<b>12</b>
5.1	Conducted emissions	12
5.2	Field strength of the fundamental wave	15
5.3	Spurious emissions	16
5.4	Frequency tolerance	19
5.5	Bandwidth	20
5.6	Transmitter spectrum mask	22
<b>6</b>	<b><u>USED TEST EQUIPMENT AND ACCESSORIES</u></b>	<b>24</b>

## **1 TEST STANDARDS**

The tests were performed according to following standards:

### **FCC Rules and Regulations Part 15, Subpart A - General (September 2020)**

Part 15, Subpart A, Section 15.31	Measurement standards
Part 15, Subpart A, Section 15.33	Frequency range of radiated measurements
Part 15, Subpart A, Section 15.35	Measurement detector functions and bandwidths

### **FCC Rules and Regulations Part 15, Subpart C - Intentional Radiators (September 2020)**

Part 15, Subpart C, Section 15.207	Conducted limits
Part 15, Subpart C, Section 15.209	Radiated emission limits, general requirements
Part 15, Subpart C, Section 15.225	Operation within the band 13.110 - 14.010 MHz

### **RSS-Gen Issue 5, March 2019**

General Requirements and Information for the Certification of Radiocommunication Equipment

### **RSS-210, Issue 10, December 2019**

Licence-Exempt Radio Apparatus: Category I Equipment

### **ANSI C63.10: 2013**

Testing Unlicensed Wireless Devices

## 2 EQUIPMENT UNDER TEST

### 2.1 Information provided by the Client

Please note, we do not take any responsibility for information provided by the client or his representative which may have an influence on the validity of the test results.

### 2.2 Sampling

The customer is responsible for the choice of sample. Sample configuration, start-up and operation is carried out by the customer or according his/her instructions.

### 2.3 Photo documentation of the EUT – Detailed photos see ATTACHMENT A and B

(ATTACHMENT A\_80088613-00 Rev\_0)

(ATTACHMENT B\_80088613-00 Rev\_0)

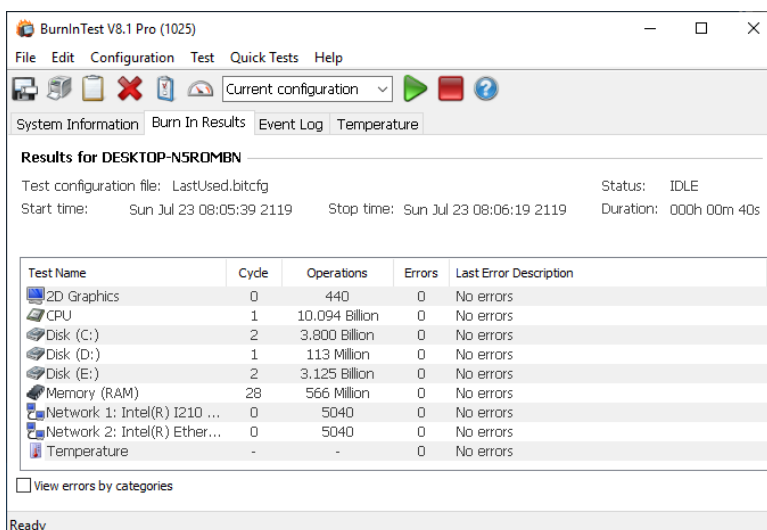
### 2.4 Short description of the equipment under test (EUT)

The EUT is a operator panel (Human Machine Interface) designed for demanding industrial applications. The EUT incorporates a RFID reader for contactless identification of the user.

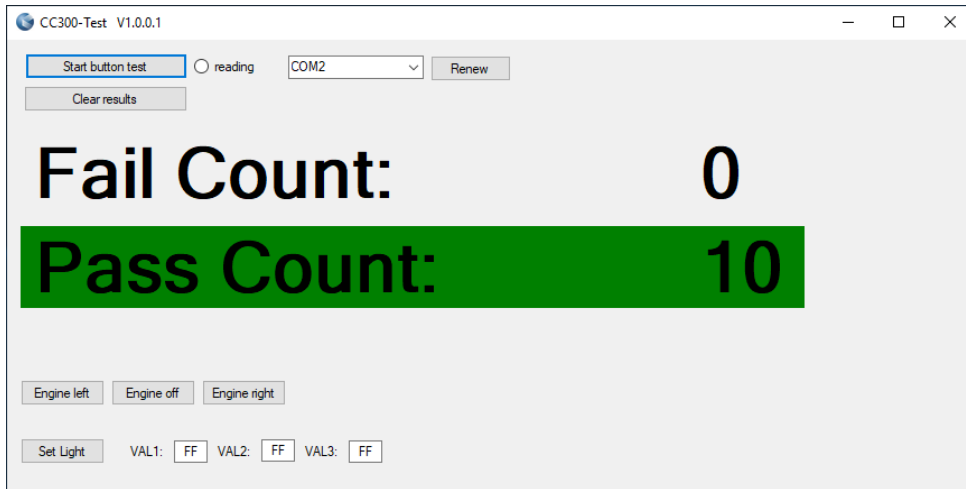
Number of tested samples: 1  
 Serial number: 439922002  
 HVIN: CC300-RFIDB  
 PMN: CC300

### Test software/settings

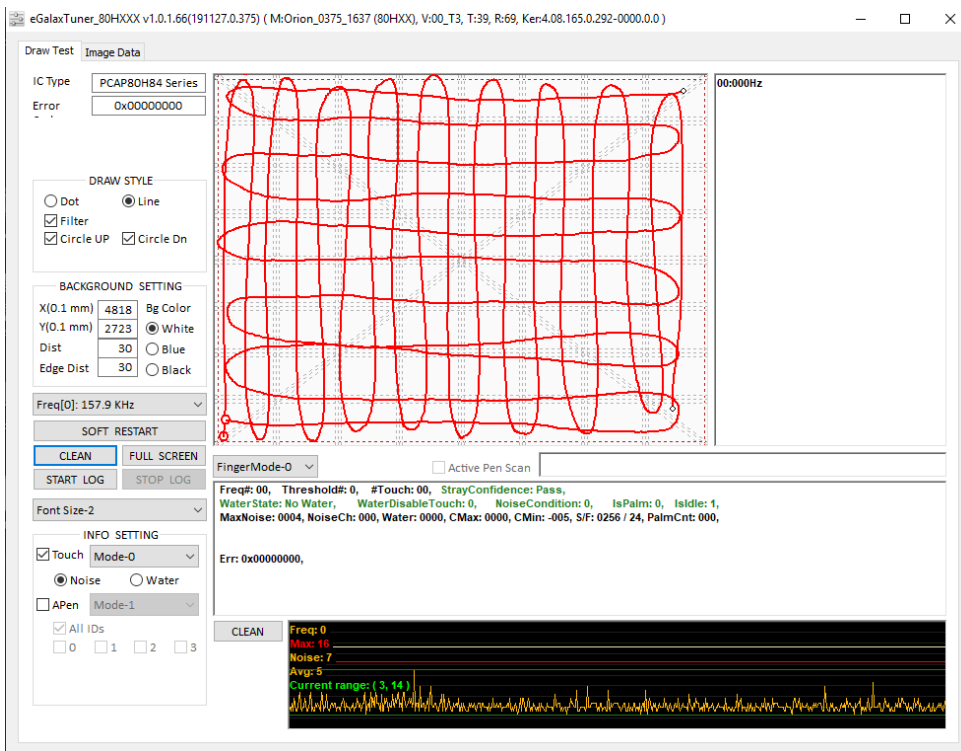
- Windows 10 LTSC
- Passmark BurnInTest V8.1 Pro (EMC Test Software)



- “CC300-Test V1.0.0.1” for testing of Touch-Buttons-Input functionality and backlight color

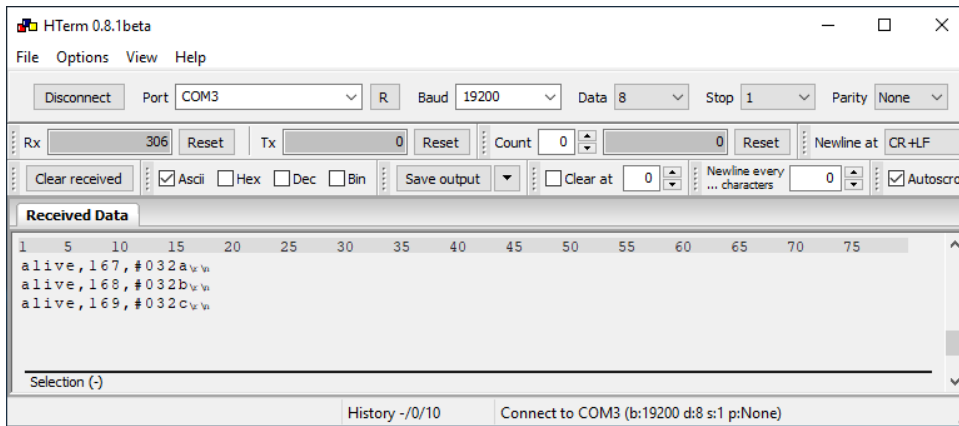
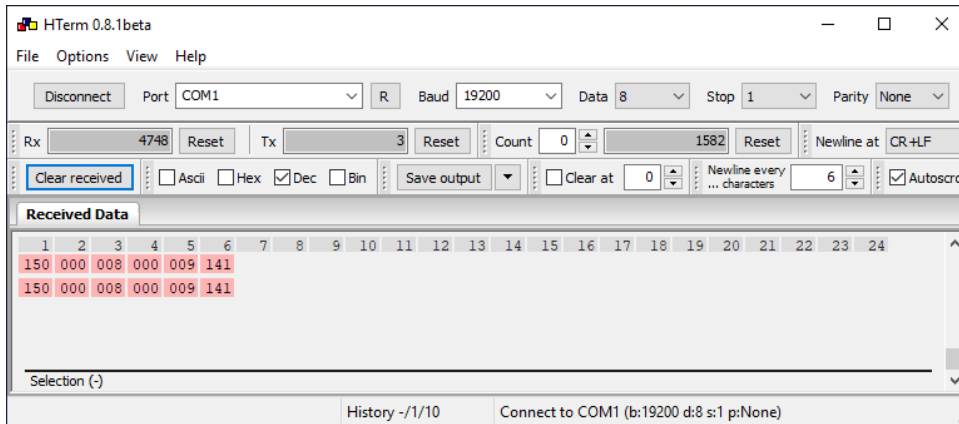


- “eGalaxTuner\_80HXXX v1.0.1.66” for testing of touch inputs



The test report merely corresponds to the test sample. It is not permitted to copy extracts of these test results without the written permission of the test laboratory.

- HTerm 0.8.1 beta for testing of “rotary knob” movements and RFID access



**EUT operation mode:**

The equipment under test was operated during the measurement under the following conditions:

- tag reading mode at 13.56 MHz

**EUT configuration:**

The following peripheral devices and interface cables were connected during the measurements:

- RFID Tag Model : Supplied by client
- AC/DC Power Supply Model : TDK-Lambda, DSP100-24/C2
- 2x USB TEST PLUG #24 Model : KEU - RDVA

**2.5 Power supply system utilised**

Power supply voltage : 24V DC

### 3 TEST RESULT SUMMARY

FCC Rule Part	RSS Rule Part	Description	Result
15.207	RSS Gen, 8.8	AC power line conducted emissions	passed
15.225	RSS-210, B.6	Field strength of fundamental	passed
15.209	RSS Gen, 8.9	Spurious emissions	passed
15.225	RSS-210, B.6	Frequency tolerance	passed
15.215	RSS-Gen, 6.7	Occupied bandwidth	passed
15.225	RSS-210, B.6	Transmitter spectrum mask	passed

The mentioned RSS Rule Parts in the above table are related to:  
 RSS-Gen, Issue 5 + Amendment 1, March 2019  
 RSS-210, Issue 10, December 2019

#### 3.1 FINAL ASSESSMENT

The equipment under test fulfills the EMI requirements cited in clause 1 test standards.

Date of receipt of test sample : 14 June 2021

Testing commenced on : 17 June 2021

Testing concluded on : 30 June 2021

Checked by:

Tested by:

\_\_\_\_\_  
 Klaus Gegenfurtner  
 Teamleader Radio

\_\_\_\_\_  
 Markus Friedl  
 Radio Team

## 4 TEST ENVIRONMENT

### 4.1 Address of the test laboratory

**CSA Group Bayern GmbH**  
**Ohmstrasse 1-4**  
**94342 STRASSKIRCHEN**  
**GERMANY**

### 4.2 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature: 15 - 35 ° C

Humidity: 30 - 60 %

Atmospheric pressure: 86 - 106 kPa

### 4.3 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. It is noted that the expanded measurement uncertainty corresponds to the measurement results from the standard measurement uncertainty multiplied by the coverage factor  $k = 2$ . The true value is located in the corresponding interval with a probability of 95 % The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16-4-2 / 2011 + A1 / 2014 „Uncertainties, statistics and limit modelling – Uncertainty in EMC measurements“ and is documented in the quality system acc. to DIN EN ISO/IEC 17025. For all measurements shown in this report, the measurement uncertainty of the test laboratory, CSA Group Bayern GmbH, is below the measurement uncertainty as defined by CISPR. Therefore, no special measures must be taken into consideration with regard to the limits according to CISPR. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Measurement Type	Range	Confidence Level (%)	Calculated Uncertainty
AC Conducted Spurious Emissions	0.15 MHz to 30 MHz	95%	± 3.29 dB
20 dB Bandwidth	Center frequency of EuT	95%	± 2.5 x 10 <sup>-7</sup>
99% Occupied Bandwidth	Center frequency of EuT	95%	± 2.5 x 10 <sup>-7</sup>
Radiated Spurious Emissions	9 kHz to 30 MHz	95%	± 3.53 dB
Radiated Spurious Emissions	30 MHz to 1000 MHz	95%	± 3.71 dB
Radiated Spurious Emissions	1000 MHz to 10000 MHz	95%	± 2.34 dB
Peak conducted output power	902 MHz to 928 MHz	95%	± 0.35 dB
Conducted Spurious Emissions	9 kHz to 10000 MHz	95%	± 2.15 dB



**4.4 Conformity Decision Rule**

The conformity decision rule is based on the ILAC G8 published at the time of reporting.

**4.5 Measurement Protocol for FCC**

**4.5.1 GENERAL INFORMATION**

CSA Group Bayern GmbH is recognized as wireless testing laboratory under the CAB identifier:

**FCC: DE 0011**  
**ISED: DE0009**

**4.5.2 General Standard information**

The test methods used comply with ANSI C63.10 - "Testing Unlicensed Wireless Devices".

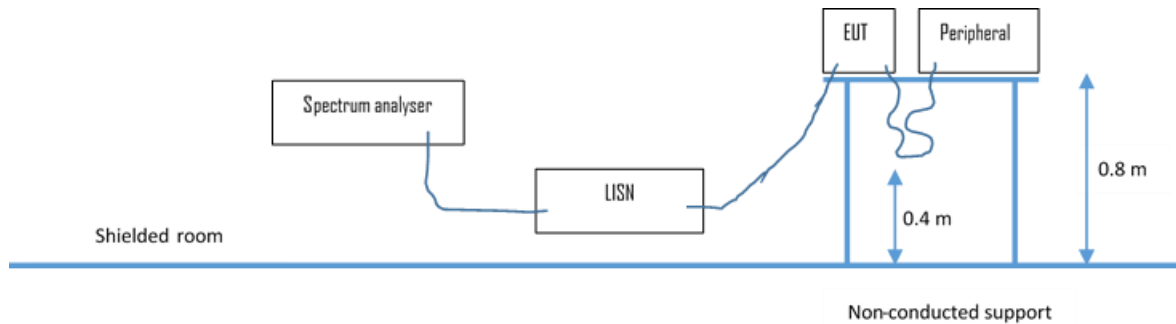
**4.5.2.1 Justification**

The equipment under test (EUT) is configured in a typical user arrangement in accordance with the manufacturer's instructions.

**4.5.3 Details of test procedures**

**4.5.3.1 Conducted emission**

Test setup according ANSI C63.10



The final level, expressed in dB $\mu$ V, is arrived at by taking the reading directly from the Spectrum analyser. This level is compared to the limit.

To convert between dB $\mu$ V and  $\mu$ V, the following conversions apply:

$$\text{dB}\mu\text{V} = 20(\log \mu\text{V})$$

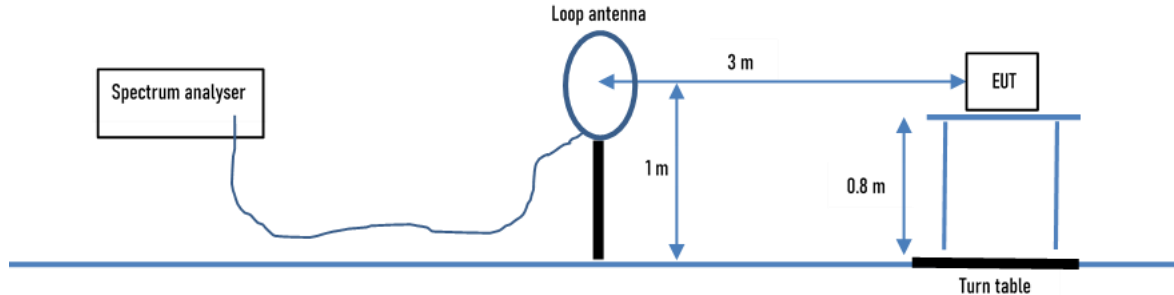
$$\mu\text{V} = \text{Inverse log}(\text{dB}\mu\text{V}/20)$$

Conducted emissions on the 50 Hz and/or 60 Hz power interface of the EUT are measured in the frequency range of 150 kHz to 30 MHz. The measurements are performed using a receiver, which has CISPR characteristic bandwidth and quasi-peak detection and a Line Impedance Stabilization Network (LISN) with 50  $\Omega$  / 50  $\mu$ H (CISPR 16) characteristics. The receiver is protected by means of an impedance matched pulse limiter connected directly to the RF input. Table top equipment is placed on a non-conducting table 80 centimetres above the floor and is positioned 40 centimetres from the vertical ground plane (wall) of the screen room. If the minimum limit margin appears to be less than 20 dB with a peak mode measurement, the emission is re-measured using a tuned receiver with quasi-peak and average detection and recorded on the data sheets.

4.5.3.2 Radiated emission

4.5.3.2.1 **OATS1 test site (9 kHz - 30 MHz):**

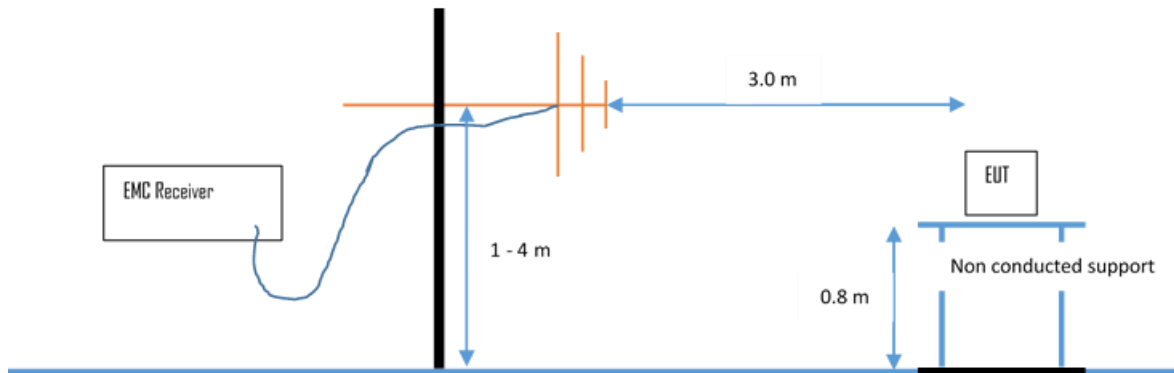
Test setup according ANSI C63.10



Emissions from the EUT are measured in the frequency range of 9 MHz to 30 MHz using a tuned receiver and a calibrated loop antenna. Table top equipment is placed on a 1.0 X 1.5 m non-conducting table 80 centimetres above the ground plane. Cables to simulators/testers (if used in this test) are routed through the center of the table and to a screened room located outside the test area. The antenna is positioned 3, 10 or 30 metres horizontally from the EUT and is repeated vertically. To locate maximum emissions from the test sample the antenna is varied along the site axis and the EUT is rotated 360 degrees.

4.5.3.2.2 **OATS1 test site (30 MHz - 1 GHz):**

Test setup according ANSI C63.10.



Spurious emissions from the EUT are measured in the frequency range of 30 MHz to 1000 MHz using a tuned receiver and appropriate broadband linearly polarised antennas. Measurements between 30 MHz and 1000 MHz are made with 120 kHz/6 dB bandwidth and quasi-peak detection. Table top equipment is placed on a 1.0 X 1.5 m non-conducting table 80 centimetres above the ground plane. Floor standing equipment is placed directly on the turntable/ground plane. Cables to simulators/testers (if used in this test) are routed through the center of the table and to a screened room located outside the test area. To locate maximum emissions from the test sample the antenna is varied in height from 1 to 4 metres and the EUT is rotated 360 degrees. The final level in dBµV/m is calculated by taking the reading from the EMI receiver (Level dBµV) and adding the correction factors and cable loss factor (dB). The FCC limit is subtracted from this result in order to provide the limit margin listed in the measurement protocol.

The resolution bandwidth setting:

30 MHz – 1000 MHz:            RBW: 120 kHz

Example:

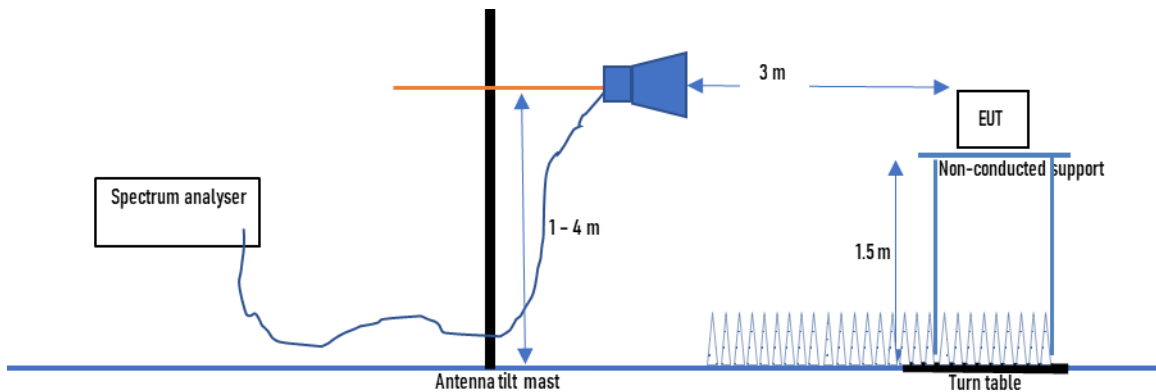
Frequency (MHz)	Level (dBµV)	+	Factor (dB)	=	Level (dBµV/m)	-	Limit (dBµV/m)	=	Delta (dB)
719.0	75.0	+	32.6	=	107.6	-	110.0	=	-2.4

**FCC ID: 2AATH-CC300RFIDB**

**IC: 9927C-CC300RFIDB**

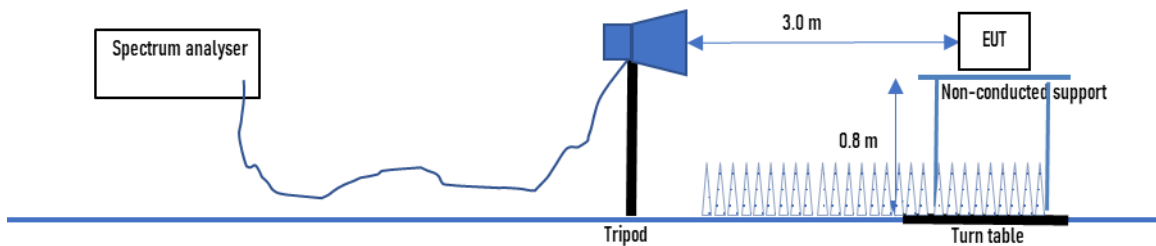
**4.5.3.2.3 Anechoic chamber 1 (1000 MHz – 18000 MHz)**

Test setup according ANSI C63.10.



Radiated emissions from the EUT are measured in the frequency range 1 GHz up to 18 GHz as specified in 47 CFR Part 15, Subpart A, Section 15.33, using a spectrum analyser and appropriate linearly polarized antennas. Table top equipment is placed on a non-conducting table, 1.5 metre above the ground plane. The turntable is fully covered with the appropriate absorber (Type VHP-12). Any controlling device is positioned such that it does not significantly influence the measurement results. Interconnecting cables that hang closer than 40 cm to the ground plane are folded back and forth in the centre, forming a bundle 30 cm to 40 cm long. Measurements are made in in three orientations of the EUT and the horizontal and vertical polarization planes of measurement antenna in a fully anechoic room. The measurement antenna is adjusted and the EUT orientated to permit the measurement of the maximum emission from the EUT. The conditions determined as worst-case will then be used for the final measurements.

**4.5.3.2.4 Anechoic chamber 1 (18 GHz – 40 GHz)**



Emissions from the EUT are measured in the frequency range 18 GHz up to 40 GHz as specified in 47 CFR Part 15, Subpart A, Section 15.33, using a spectrum analyser and appropriate linearly polarized antennas. Table top equipment is placed on a non-conducting table, 0.8 metre above the ground plane. The turntable is fully covered with the appropriate absorber (Type VHP-12). Any controlling device is positioned such that it does not significantly influence the measurement results. Interconnecting cables that hang closer than 40 cm to the ground plane are folded back and forth in the centre, forming a bundle 30 cm to 40 cm long. Measurements are made in in three orientations of the EUT and the horizontal and vertical polarization planes of measurement antenna in a fully anechoic room. The measurement antenna is adjusted and the EUT orientated to permit the measurement of the maximum emission from the EUT. The conditions determined as worst-case will then be used for the final measurements. Where appropriate, the test distance may be reduced in order to detect emissions under better uncertainty. The limit is adopted.

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## 5 TEST CONDITIONS AND RESULTS

### 5.1 Conducted emissions

For test instruments and accessories used, see section 6 Part A 4.

#### 5.1.1 Description of the test location

Test location: Shielded Room S2

#### 5.1.2 Photo documentation of the test set-up

See attachment C to this report

#### 5.1.3 Applicable standard

FCC Part 15, Section 15.207 and RSS-Gen clause 8.8

#### 5.1.4 Test result

Frequency range: 0.15 MHz - 30 MHz

Min. limit margin 5.81 dB at 0.28 MHz

Limit according to FCC Part 15, Section 15.207 and RSS-Gen clause 8.8

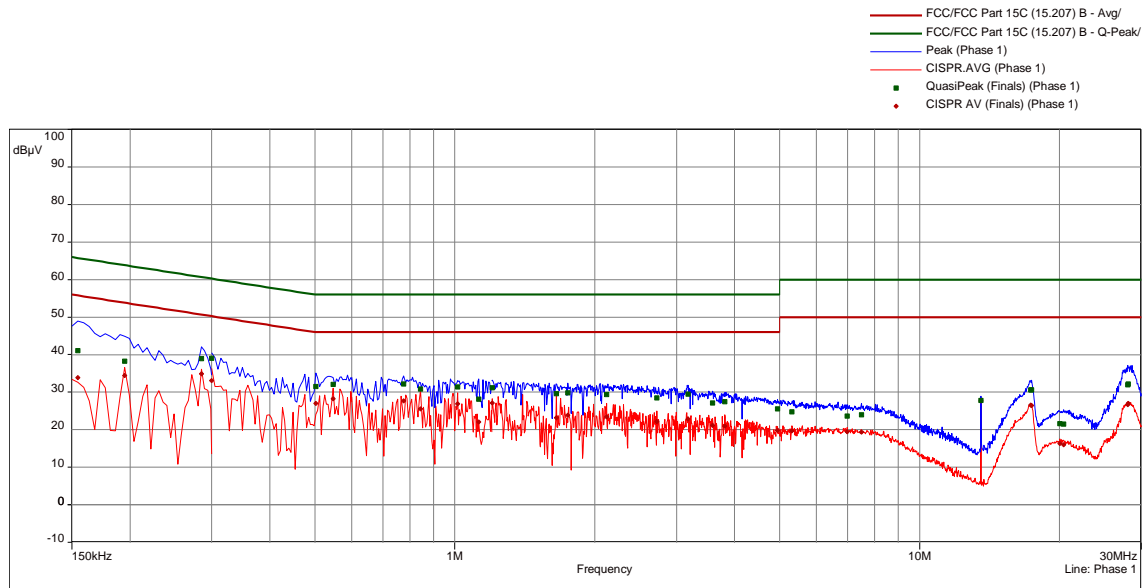
Frequency of Emission (MHz)	Conducted Limit (dB $\mu$ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
0.5-5	56	46
5-30	60	50

\* Decreases with the logarithm of the frequency

The requirements are **FULFILLED**.

**Remarks:** For detailed test result please refer to following test protocols. The measurement was made at  
AC input of the used AC/DC power supply.

5.1.5 Test protocol

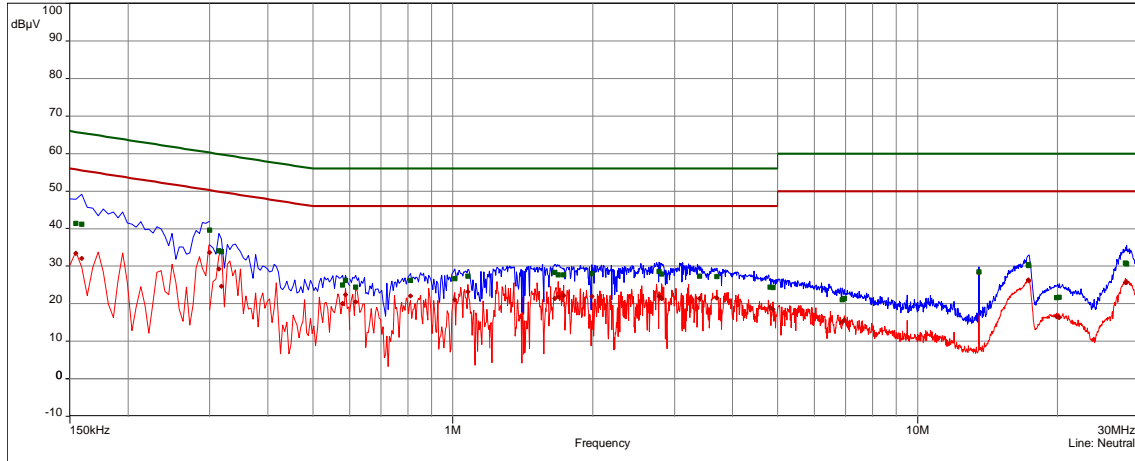


FCC/FCC Part 15C (15.207)B

freq	QP	margin	limit	AV	margin	limit	line
MHz	dBµV	dB	dBµV	dBµV	dB	dBµV	
0.1545	41.12	-24.64	65.75	33.84	-21.92	55.75	Phase 1
0.195	38.21	-25.61	63.82	34.41	-19.41	53.82	Phase 1
0.285	38.89	-21.78	60.67	34.85	-15.81	50.67	Phase 1
0.3	39.01	-21.24	60.24	33.08	-17.16	50.24	Phase 1
0.5025	31.54	-24.46	56.00	27.06	-18.94	46.00	Phase 1
0.5475	32.07	-23.93	56.00	28.23	-17.77	46.00	Phase 1
0.7755	32.23	-23.77	56.00	27.70	-18.30	46.00	Phase 1
0.843	30.85	-25.15	56.00	25.51	-20.49	46.00	Phase 1
1.014	31.37	-24.63	56.00	26.90	-19.10	46.00	Phase 1
1.1265	28.16	-27.84	56.00	22.06	-23.94	46.00	Phase 1
1.2045	31.21	-24.79	56.00	27.09	-18.91	46.00	Phase 1
1.6545	29.63	-26.37	56.00	23.21	-22.79	46.00	Phase 1
1.749	29.84	-26.16	56.00	23.85	-22.15	46.00	Phase 1
2.1225	29.34	-26.66	56.00	23.43	-22.57	46.00	Phase 1
2.7195	28.47	-27.53	56.00	22.19	-23.81	46.00	Phase 1
3.174	29.52	-26.48	56.00	22.81	-23.19	46.00	Phase 1
3.5835	27.18	-28.82	56.00	21.17	-24.83	46.00	Phase 1
3.813	27.42	-28.58	56.00	20.95	-25.05	46.00	Phase 1
4.9485	25.53	-30.47	56.00	19.82	-26.18	46.00	Phase 1
5.3085	24.75	-35.25	60.00	19.65	-30.35	50.00	Phase 1
6.987	23.69	-36.31	60.00	19.46	-30.54	50.00	Phase 1
7.4955	23.94	-36.06	60.00	19.40	-30.60	50.00	Phase 1
13.56	27.85	-32.15	60.00	27.73	-22.27	50.00	Phase 1
17.3355	30.60	-29.40	60.00	26.61	-23.39	50.00	Phase 1
17.403	30.61	-29.39	60.00	26.41	-23.59	50.00	Phase 1
20.0595	21.61	-38.39	60.00	16.29	-33.71	50.00	Phase 1
20.415	21.53	-38.47	60.00	16.04	-33.96	50.00	Phase 1
28.056	31.95	-28.05	60.00	26.73	-23.27	50.00	Phase 1
28.092	32.23	-27.77	60.00	26.97	-23.03	50.00	Phase 1

The test report merely corresponds to the test sample. It is not permitted to copy extracts of these test results without the written permission of the test laboratory.

- FCC/FCC Part 15C (15.207) B - Avg/
- FCC/FCC Part 15C (15.207) B - Q-Peak/
- Peak (Neutral)
- CISPR.AVG (Neutral)
- QuasiPeak (Finals) (Neutral)
- CISPR AV (Finals) (Neutral)



FCC/FCC Part 15C (15.207)B

freq MHz	QP dBµV	margin dB	limit dBµV	AV dBµV	margin dB	limit dBµV	line
0.1545	41.38	-24.37	65.75	33.41	-22.34	55.75	Neutral
0.159	41.22	-24.30	65.52	32.06	-23.46	55.52	Neutral
0.3	39.64	-20.60	60.24	33.70	-16.55	50.24	Neutral
0.3135	34.07	-25.81	59.88	29.24	-20.63	49.88	Neutral
0.318	33.92	-25.84	59.76	24.69	-25.06	49.76	Neutral
0.579	24.95	-31.05	56.00	20.09	-25.91	46.00	Neutral
0.588	26.17	-29.83	56.00	22.34	-23.66	46.00	Neutral
0.618	24.46	-31.54	56.00	20.51	-25.49	46.00	Neutral
0.8115	26.21	-29.79	56.00	22.02	-23.98	46.00	Neutral
1.0095	26.73	-29.27	56.00	21.06	-24.94	46.00	Neutral
1.077	27.40	-28.60	56.00	23.14	-22.86	46.00	Neutral
1.659	28.35	-27.65	56.00	21.38	-24.62	46.00	Neutral
1.686	27.73	-28.27	56.00	21.80	-24.20	46.00	Neutral
1.731	27.64	-28.36	56.00	22.13	-23.87	46.00	Neutral
1.992	28.01	-27.99	56.00	21.95	-24.05	46.00	Neutral
2.778	28.57	-27.43	56.00	21.92	-24.08	46.00	Neutral
2.814	27.96	-28.04	56.00	21.34	-24.66	46.00	Neutral
3.399	27.32	-28.68	56.00	21.34	-24.66	46.00	Neutral
3.7005	27.26	-28.74	56.00	21.50	-24.50	46.00	Neutral
4.8135	24.44	-31.56	56.00	19.05	-26.95	46.00	Neutral
4.8855	24.27	-31.73	56.00	18.47	-27.53	46.00	Neutral
6.8835	21.03	-38.97	60.00	15.06	-34.94	50.00	Neutral
6.951	21.36	-38.64	60.00	15.66	-34.34	50.00	Neutral
13.56	28.50	-31.50	60.00	28.26	-21.74	50.00	Neutral
17.313	30.42	-29.58	60.00	26.36	-23.64	50.00	Neutral
17.3535	30.17	-29.83	60.00	26.13	-23.87	50.00	Neutral
19.9245	21.59	-38.41	60.00	16.56	-33.44	50.00	Neutral
20.1495	21.69	-38.31	60.00	16.33	-33.67	50.00	Neutral
28.0155	30.83	-29.17	60.00	25.63	-24.37	50.00	Neutral
28.2045	30.61	-29.39	60.00	25.67	-24.33	50.00	Neutral

The test report merely corresponds to the test sample. It is not permitted to copy extracts of these test results without the written permission of the test laboratory.

**5.2 Field strength of the fundamental wave**

For test instruments and accessories used see section 6 Part **CPR 1**.

**5.2.1 Description of the test location**

Test location: OATS 1  
 Test distance: 3 metres

**5.2.2 Photo documentation of the test set-up**

See attachment C to this report

**5.2.3 Applicable standard**

FCC Part 15, Section 15.225(a) and RSS-210 clause B.6(a)

**5.2.4 Test result**

a) Result at a measurement distance of 3m

Frequency (MHz)	Level (dBµV)	Ant. factor (dB 1/m)	Field strength dB(µV/m)
13.56	25.9	20.0	45.9

b) Result extrapolated to a distance of 30 m

Frequency (MHz)	Field strength dB(µV/m) @3m	Extrapolation factor (dB)	Field strength dB(µV/m) @30m	Limit dB(µV/m)	Delta (dB)
13.56	45.9	-40	<b>5.9</b>	84.0	-78.1

Limit according to FCC Part 15, Section 15.225(a): and RSS-210 clause B.6(a)

Frequency (MHz)	Field strength of fundamental wave (µV/m)	dB(µV/m)	Measurement distance (metres)
13.553 - 13.567	15848	84.0	30

The requirements are **FULFILLED**.

Remarks: none

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**5.3 Spurious emissions**

For test instruments and accessories used see section 6 Part **SER 1, SER 2, SER 3.**

**5.3.1 Description of the test location**

Test location: OATS 1 / Anechoic Chamber A1  
 Test distance: 3 metres, 1 meter (for 18 GHz to 40 GHz, the limit extrapolated to a distance of 1 m)

**5.3.2 Photo documentation of the test set-up**

See attachment C to this report

**5.3.3 Applicable standard**

FCC Part 15, Section 15.209 and RSS-Gen clause 8.9

The resolution bandwidth during the measurement is as follows:

9 kHz – 150 kHz: RBW: 200 Hz  
 150 kHz – 30 MHz: RBW: 9 kHz  
 30 MHz – 1000 MHz: RBW: 120 kHz  
 1000 MHz – 40 GHz: RBW: 1 MHz

**5.3.4 Test result**

9 kHz - 30MHz

f (MHz)	Level QP@3m (dBµV)	Ant. factor (dB/m)	Field strength QP@3m dB(µV/m)	Distance corr. 3m to 30m (dB)	Corrected level QP@30m dB(µV/m)	Limit QP@30m dB(µV/m)	Delta (dB)
27.12	4.7	20	24.7	-40	-15.3	29.5	-44.8

f (MHz)	Level QP@3m (dBµA)	Ant. factor (dB/m)	Field strength QP@3m dB(µA/m)	Distance corr. 3m to 30m (dB)	Corrected level QP@30m dB(µA/m)	Limit QP@30m dB(µA/m)	Delta (dB)
27.12	-46.8	20	-26.8	-40	-66.8	-22	-44.8

30 MHz - 1 GHz

Frequency (MHz)	Reading Vert. (dBµV)	Reading Hor. (dBµV)	Correct. Vert. (dB)	Correct. Hor. (dB)	Level Vert. (dBµV/m)	Level Hor. (dBµV/m)	Limit (dBµV/m)	Dlimit (dB)
40.68	13.8	7.4	14.1	15.1	27.9	22.5	40.0	-12.1
54.24	9.7	7.4	14.3	15.4	24.0	22.8	40.0	-16.0
67.80	7.5	7.0	13.0	13.6	20.5	20.6	40.0	-19.4
81.36	8.9	8.8	11.1	11.2	20.0	20.0	40.0	-20.0
122.00	8.8	7.0	14.6	14.0	23.4	21.0	43.5	-20.1
149.16	8.1	7.8	16.5	15.7	24.6	23.5	43.5	-18.9
161.54	15.2	11.9	16.6	16.0	31.8	27.9	43.5	-11.7
271.20	12.5	7.8	16.4	16.6	28.9	24.4	46.0	-17.1



1 GHz – 18 GHz

Frequency (MHz)	Reading Vert. (dBµV)	Reading Hor. (dBµV)	Correct. Vert. (dB)	Correct. Hor. (dB)	Level Vert. (dBµV/m)	Level Hor. (dBµV/m)	Limit (dBµV/m)	Dlimit (dB)
1525.00		52.7		-20.1		32.6	54.0	-21.4
1220.80	52.0		-19.1		32.9		54.0	-21.1
1894.00	57.0		-16.7		40.3		54.0	-13.7
2195.90	54.0		-15.3		38.7		54.0	-15.3
2327.00		52.8		-14.7		38.1	54.0	-15.9
3188.00		50.9		-12.4		38.5	54.0	-15.5

18 GHz – 40 GHz

Frequency (MHz)	Reading Vert. (dBµV)	Reading Hor. (dBµV)	Correct. Vert. (dB)	Correct. Hor. (dB)	Level Vert. (dBµV/m)	Level Hor. (dBµV/m)	Limit (dBµV/m)	Dlimit (dB)
26835.55		35.6		12.4		48.0	63.5	-15.5
26792.55	35.9		12.6		48.5		63.5	-15.0
34597.37		35.3		15.2		50.5	63.5	-13.0
34601.87	35.7		15.2		50.9		63.5	-12.6
39100.27		35.3		16.9		52.2	63.5	-11.3
39205.27	35.7		16.6		52.3		63.5	-11.2

Limit according to FCC Part 15 Subpart 15.209(a)

Frequency (MHz)	Field strength of spurious emissions		Measurement distance (metres)
	(µV/m)	dB(µV/m)	
0.009 - 0.490	2400/F(kHz)	--	300
0.490 - 1.705	24000/F (kHz)	--	30
1.705 - 30.0	30	29.5	30
30 - 88	100	40	3
88 - 216	150	43.5	3
216 - 960	200	46	3
Above 960	500	54	3

Limit according to RSS-Gen clause 8.9

Frequency (MHz)	Field strength of spurious emissions		Measurement distance (metres)
	(µA/m)	dB(µA/m)	
0.009 - 0.490	6.37/F(kHz)	--	300
0.490 - 1.705	63.7/F (kHz)	--	30
1.705 - 30.0	0.08	-22	30
Frequency (MHz)	Field strength of spurious emissions		Measurement distance (metres)
	(µV/m)	dB(µV/m)	
30 - 88	100	40	3
88 - 216	150	43.5	3
216 - 960	200	46	3
Above 960	500	54	3

**FCC ID: 2AATH-CC300RFIDB**

**IC: 9927C-CC300RFIDB**

The requirements are **FULFILLED**.

**Remarks:** The measurement was performed in the frequency range 9 kHz to 40 GHz.

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The test report merely corresponds to the test sample. It is not permitted to copy extracts of these test results without the written permission of the test laboratory.

**5.4 Frequency tolerance**

For test instruments and accessories used see section 6 Part FE.

**5.4.1 Description of the test location**

Test location: AREA4

**5.4.2 Photo documentation of the test set-up**

See attachment C to this report

**5.4.3 Applicable standard**

According to FCC Part 15, Section 15.225(e) and RSS-210 clause B.6

**5.4.4 Test result**

Test conditions		Test result	Tolerance	Limit
		Frequency (MHz)	(kHz)	(kHz)
$T_{min} (-20)^{\circ}C$	$V_{nom} (24.0 V)$	13.559800	-0.20	$\pm 1.356$
$T (-10)^{\circ}C$	$V_{nom} (24.0 V)$	13.559900	-0.10	$\pm 1.356$
$T (0)^{\circ}C$	$V_{nom} (24.0 V)$	13.559900	-0.10	$\pm 1.356$
$T (10)^{\circ}C$	$V_{nom} (24.0 V)$	13.559950	-0.05	$\pm 1.356$
$T_{nom} (20)^{\circ}C$	$V_{min} (20.4 V)$	13.559950	-0.05	$\pm 1.356$
	$V_{nom} (24.0 V)$	13.559950	-0.05	$\pm 1.356$
	$V_{max} (27.6 V)$	13.559950	-0.05	$\pm 1.356$
$T (30)^{\circ}C$	$V_{nom} (24.0 V)$	13.559000	-0.10	$\pm 1.356$
$T (40)^{\circ}C$	$V_{nom} (24.0 V)$	13.559000	-0.10	$\pm 1.356$
$T_{max} (50)^{\circ}C$	$V_{nom} (24.0 V)$	13.559000	-0.10	$\pm 1.356$
Measurement uncertainty		$\pm 10 \text{ Hz}$		

Limit Calculation:

Carrier frequency:  $f_c = 13.56 \text{ MHz}$

Max. tolerance:  $\pm 0.01 \% \text{ of } 13.56 \text{ MHz} = \pm 1.356 \text{ kHz}$

Limit according to FCC Part 15, Section 15.225(e) and RSS-210 clause B.6:

The frequency tolerance of the carrier signal shall be maintained within  $\pm 0.01 \%$  of the operating frequency.

The requirements are **FULFILLED**.

**Remarks:** none

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FCC ID: 2AATH-CC300RFIDB

IC: 9927C-CC300RFIDB

## 5.5 Bandwidth

For test instruments and accessories used see section 6 Part MB.

### 5.5.1 Description of the test location

Test location: AREA4

### 5.5.2 Photo documentation of the test set-up

See attachment C to this report

### 5.5.3 Applicable standard

According to FCC Part 15, Section 15.215(c) and RSS-Gen 6.7

### 5.5.4 Test result

Measured Bandwidth	result (kHz)	Limit (kHz)
20dB	2.82	--
99%	2.52	--

The requirements are **FULFILLED**.

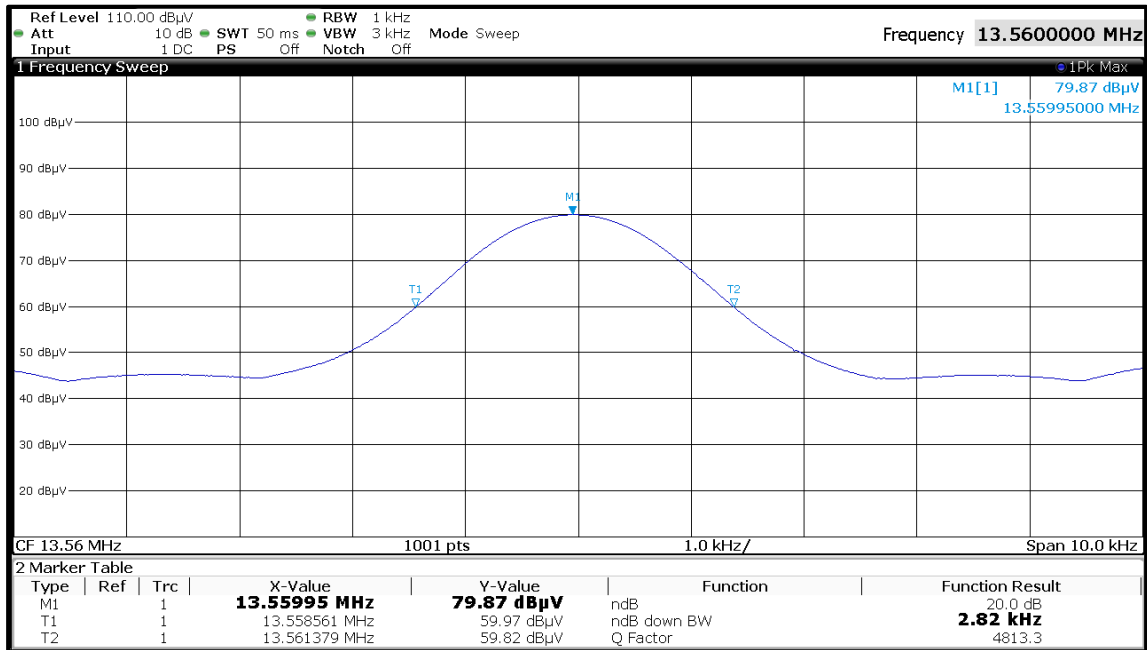
**Remarks:** For detailed test result please refer to following test protocol.

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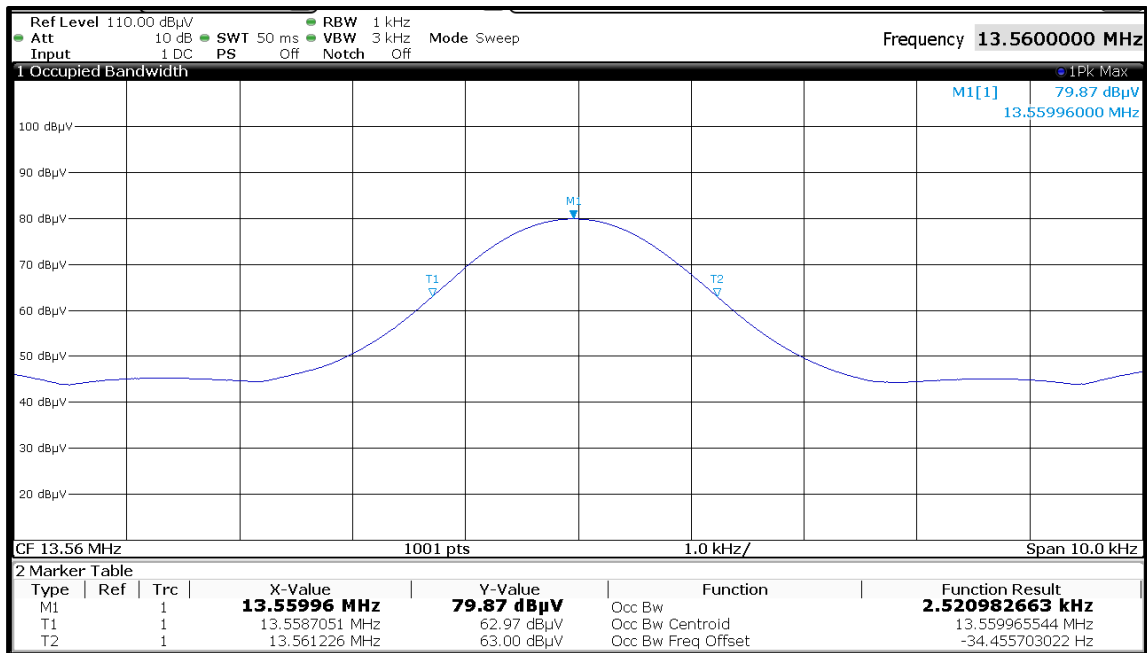
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5.5.5 Test protocol

20 dB bandwidth



99% Bandwidth



### 5.6 Transmitter spectrum mask

For test instruments and accessories used see section 6 Part MB.

#### 5.6.1 Description of the test location

Test location: AREA4

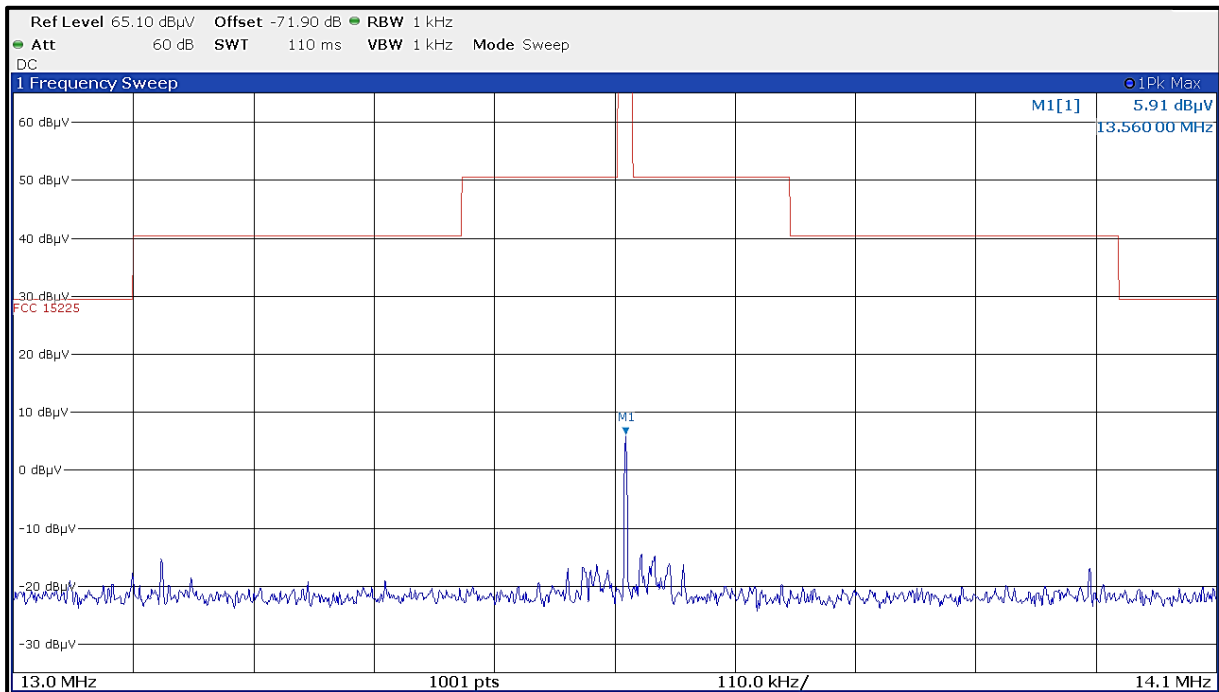
#### 5.6.2 Photo documentation of the test set-up

See attachment C to this report

#### 5.6.3 Applicable standard

According to FCC Part 15, Section 15.225 (a-d) and RSS-210 clause B.6 (i-iv)

#### 5.6.4 Test result



The test report merely corresponds to the test sample. It is not permitted to copy extracts of these test results without the written permission of the test laboratory.

**FCC ID: 2AATH-CC300RFIDB**
**IC: 9927C-CC300RFIDB**

Limits according to FCC Part 15, Section 15.225(a-d) and RSS-210 clause B.6 (i-iv)

Frequency band (MHz)	Emission level limit at 30 m ( $\mu\text{V/m}$ )	Emission level limit at 30 m ( $\text{dB}\mu\text{V/m}$ )
13.110 – 13.410	106	40.5
13.410 - 13.553	334	50.5
13.553 - 13.567	15.848	84.0
13.567 – 13.710	334	50.5
13.710 – 14.010	106	40.5
outside of 13.110 – 14.010	30	29.5

 The requirements are **FULFILLED**.

 Remarks: none

**6 USED TEST EQUIPMENT AND ACCESSORIES**

All test instruments used are calibrated and verified regularly. The calibration history is available on request.

Test ID	Model Type	Equipment No.	Next Calib.	Last Calib.	Next Verif.	Last Verif.
A 4	BAT-EMC 3.20.0.23	01-02/68-13-001				
	ESCI	02-02/03-15-001	21/06/2022	21/06/2021		
	ESH 2 - Z 5	02-02/20-05-004	31/10/2021	31/10/2019	26/10/2021	26/04/2021
	N-4000-BNC	02-02/50-05-138				
	N-1500-N	02-02/50-05-140				
	ESH 3 - Z 2	02-02/50-05-155	13/11/2022	13/11/2019	26/10/2021	26/04/2021
CPR 1	ESCI	02-02/03-05-005	24/11/2021	24/11/2020		
	HFH 2 - Z 2	02-02/24-15-001	30/03/2022	30/03/2021		
	NW-2000-NB	02-02/50-05-113				
	KK-EF393/U-16N-21N20 m	02-02/50-12-018				
	KK-SD_7/8-2X21N-33,0M	02-02/50-15-028				
FE	FSW43	02-02/11-21-001	08/04/2022	08/04/2021		
	HFRAE 5161 _ 50 kHz-120	02-02/24-11-004				
	WK-340/40	02-02/45-05-001	15/08/2021	15/08/2020		
	EA-PS 3032-10B	02-02/50-10-013				
	SF104/11SMA/11N/1500MM	02-02/50-13-017				
MB	FSW43	02-02/11-21-001	08/04/2022	08/04/2021		
	ESW26	02-02/03-17-002	10/02/2022	10/02/2021		
	HFRAE 5161 _ 50 kHz-120	02-02/24-11-004				
	EA-PS 3032-10B	02-02/50-10-013				
	SF104/11SMA/11N/1500MM	02-02/50-13-017				
SER 1	ESCI	02-02/03-05-005	24/11/2021	24/11/2020		
	HFH 2 - Z 2	02-02/24-15-001	30/03/2022	30/03/2021		
	NW-2000-NB	02-02/50-05-113				
	KK-EF393/U-16N-21N20 m	02-02/50-12-018				
	KK-SD_7/8-2X21N-33,0M	02-02/50-15-028				
SER 2	ESVS 30	02-02/03-05-003	03/09/2021	03/09/2020		
	VULB 9168	02-02/24-05-005	18/12/2021	18/12/2020		
	NW-2000-NB	02-02/50-05-113				
	KK-EF393/U-16N-21N20 m	02-02/50-12-018				
	KK-SD_7/8-2X21N-33,0M	02-02/50-15-028				
SER 3	FSW43	02-02/11-21-001	08/04/2022	08/04/2021		
	AMF-6D-01002000-22-10P	02-02/17-15-004				
	LNA-40-18004000-33-5P	02-02/17-20-002				
	3117	02-02/24-05-009	18/06/2021	18/06/2020		
	BBHA 9170	02-02/24-05-013	19/05/2023	19/05/2020	04/02/2022	04/02/2021
	HFRAE 5161 _ 50 kHz-120	02-02/24-11-004				
	R1 _ 18 - 40 GHz	02-02/30-09-002			17/09/2021	17/09/2020
	WK-340/40	02-02/45-05-001	15/08/2021	15/08/2020		
	EA-PS 3032-10B	02-02/50-10-013				
	SF104/11SMA/11N/1500MM	02-02/50-13-017				
	BAM 4.5-P	02-02/50-17-024				
	NCD	02-02/50-17-025				
	KK-SF106-2X11N-6,5M	02-02/50-18-016				
KMS116-GL140SE-KMS116-	02-02/50-20-026					

The test report merely corresponds to the test sample. It is not permitted to copy extracts of these test results without the written permission of the test laboratory.