



EMI – TEST REPORT

- FCC Part 15.225, RSS 210-

Type / Model Name : HVIN 5E904029

Product Description : Transponder Reader MIFARE USB
RFID 13.56 MHz

Applicant : B&R Industrial Automation GmbH

Address : B&R Straße 1
A- 5142 Eggelsberg

Manufacturer : B&R Industrial Automation GmbH

Address : B&R Straße 1
A- 5142 Eggelsberg

Test Result according to the standards
listed in clause 1 test standards:

POSITIVE

Test Report No. : **80268456-04 Rev_2**

07. August 2026
Date of issue



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1 TEST STANDARDS

The tests were performed according to following standards:

FCC Rules and Regulations Part 15, Subpart A - General (September 2025)

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 2025)

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 Rules and Regulations

RSS-Gen Issue 5, March 2018
Amendment 1 (March 2019)
Amendment 2 (February 2021)General Requirements and Information for the Certification of
Radiocommunication Equipment

RSS-210 Issue 11, June 2024

Low Power Licence – Exempt Radiocommunication Devices (All
Frequency Bands): Category I EquipmentANSI C63.10-2020+Cor. 1-2023
+C63.10a-2024 + Errata to C63.10a-2024

Testing Unlicensed Wireless Devices

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.

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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 to his/her instructions.

2.3 Photo documentation of the EUT

Detailed photos see ATTACHMENT A and ATTACHMENT B

ATTACHMENT A: External views

ATTACHMENT B: Internal views

2.4 Short description of the equipment under test (EUT)

The EUT is a transponder reader which will be powered over USB - Port.
RFID technology 13.56 MHz

The EUT is tested together with a TAG.

Number of tested samples: 1
Serial number: 367A0168429

EUT operation mode:

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

- Continuous reading mode (13.56 MHz) with TAG

EUT configuration:

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

- HP Laptop	Model: CSA-ID.: 02-01/01-15-009
- Power adapter Laptop	Model: HP Part No.: 677774-003
- TAG	Model: B&R Industrial Automation GmbH

2.5 Power supply system utilised

Power supply voltage : 5 V DC $\pm$ 20% (powered over USB)

All tests were carried out with a supply voltage of 5 V DC unless otherwise stated. Exceptions are described in the detailed test conditions.

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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

3.1 Revision history of test report

Test report No	Rev.	Issue Date	Changes
80268456-04	0	12 November 2025	Initial test report
80268456-04	1	05 May 2026	Page 17 of 24: New measurement "Frequency tolerance" (chapter 5.4) 5 V DC at input to device Page 23 of 24: Calibration data updated for correct period
80268456-04	2	07 August 2026	Change Type/Model Name: HVIN 5E904029

The test report with the highest revision number replaces the previous test reports.

3.2 FINAL ASSESSMENT

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

Date of receipt of test sample : acc. to storage records

Testing commenced on : 22 October 2025

Testing concluded on : 22 April 2026

Checked by:


**Klaus
Gegenfurtner**
 2026.08.07
 12:42:15 +02'00'

 Klaus Gegenfurtner
 Team Lead Radio

Tested by:


 Digital signiert von Markus
 Friedl
 DN: cn=Markus Friedl
 Grund: I am the author of
 this document
 Datum: 2026.08.07
 12:04:17 +02'00'

 Markus Friedl
 Radio Team

4 TEST ENVIRONMENT

4.1 Address of the test laboratory

**CSA Group Bayern GmbH
Straubinger Straße 100
94447 PLATTLING
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 on basis of the ETSI Technical Report TR 100 028 Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 1 and Part 2. The results are documented in the quality system acc. to DIN EN ISO/IEC 17025. 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%	$\pm 3.29 \text{ dB}$
20 dB Bandwidth	Center frequency of EuT	95%	$\pm 2.5 \cdot 10^{-7}$
99% Occupied Bandwidth	Center frequency of EuT	95%	$\pm 2.5 \cdot 10^{-7}$
Radiated Spurious Emissions	9 kHz to 30 MHz	95%	$\pm 3.53 \text{ dB}$
Radiated Spurious Emissions	30 MHz to 1000 MHz	95%	$\pm 3.71 \text{ dB}$
Radiated Spurious Emissions	1000 MHz to 10000 MHz	95%	$\pm 2.34 \text{ dB}$
Peak conducted output power	902 MHz to 928 MHz	95%	$\pm 0.35 \text{ dB}$
Conducted Spurious Emissions	9 kHz to 10000 MHz	95%	$\pm 2.15 \text{ dB}$

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4.4 Conformity Decision Rule

The applied conformity decision rule is based on ILAC G8:09/2019 clause 4.2.1 Binary Statement for Simple Acceptance Rule ($w = 0$).

Details can be found in the procedure CSA_B_V50_29.

4.5 Measurement protocol for FCC and ISED

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".

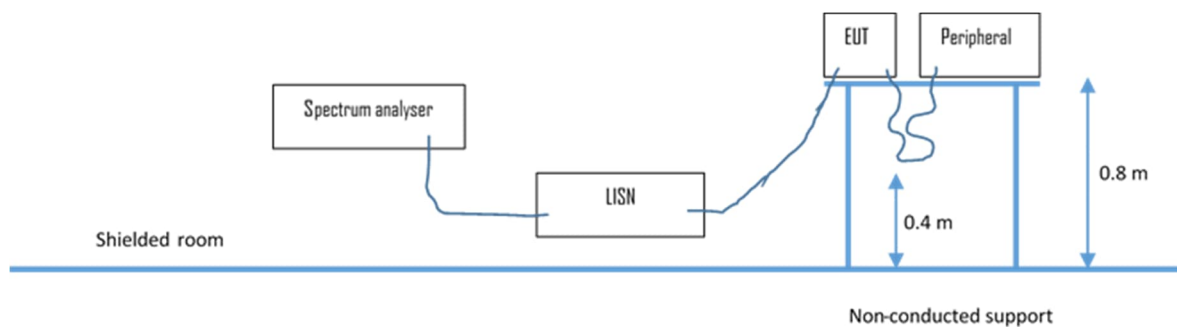
4.5.2.1 Justification

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 μ V, is arrived at by taking the reading directly from the Spectrum analyser. This level is compared to the limit.

To convert between dB μ V and μ 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 Ω / 50 μ 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. Floor-standing devices shall be placed either directly on the reference ground-plane or on insulating material as described in ANSI C63.4. All other

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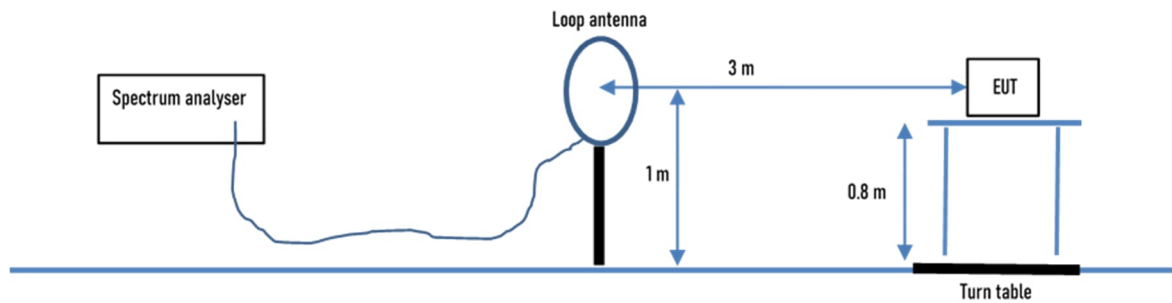
surfaces of tabletop or floor-standing EUTs shall be at least 80 cm from any other grounded conducting surface, including the case or cases of one or more LISNs.

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 Anechoic chamber (9 kHz - 30 MHz):

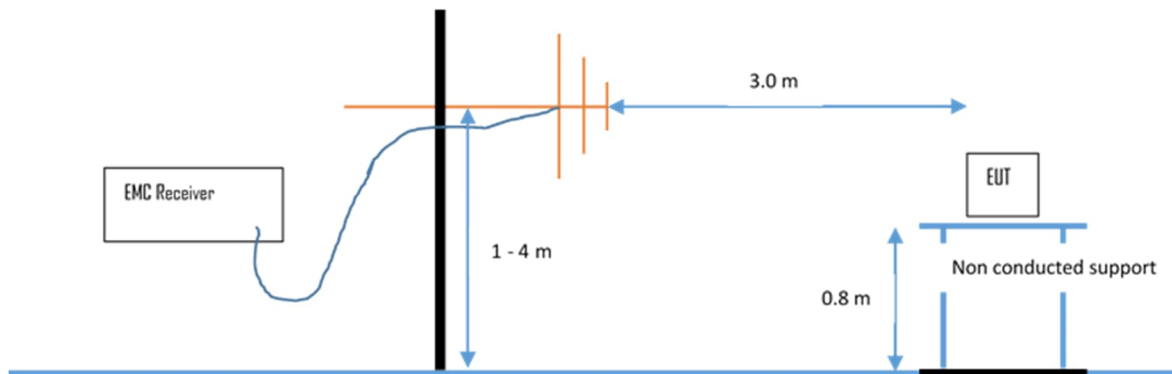
Test setup according ANSI C63.10



Emissions from the EUT are measured in the frequency range of 9 kHz 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. Floor standing equipment is placed directly on the turntable/ground plane. If necessary to prevent direct metallic contact of the EUT and the reference ground plane, insulating material (up to 12 mm thick) shall be placed under the EUT. Cables to simulators/testers (if used in this test) are routed through the centre 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 Anechoic chamber (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. If necessary to prevent direct metallic contact of the EUT and the reference ground plane, insulating material (up to 12 mm thick) shall be placed under the EUT. Cables to simulators/testers (if used in this test) are routed through the centre 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 dB μ V/m is calculated by taking the reading from the EMI receiver (Level dB μ V) and

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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

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.

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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 SR2

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, 8.8.

5.1.4 Description of Measurement

The radiated power of the spurious emission from the EUT is measured in a test setup following the procedures set out in ANSI C63.10.

5.1.5 Test result

Frequency range: 0.15 MHz - 30 MHz

Min. limit margin 13.87 dB at 150 kHz

Limit according to FCC Part 15, Section 15.207:

Frequency of Emission (MHz)	Conducted Limit (dBμV)	
	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**.

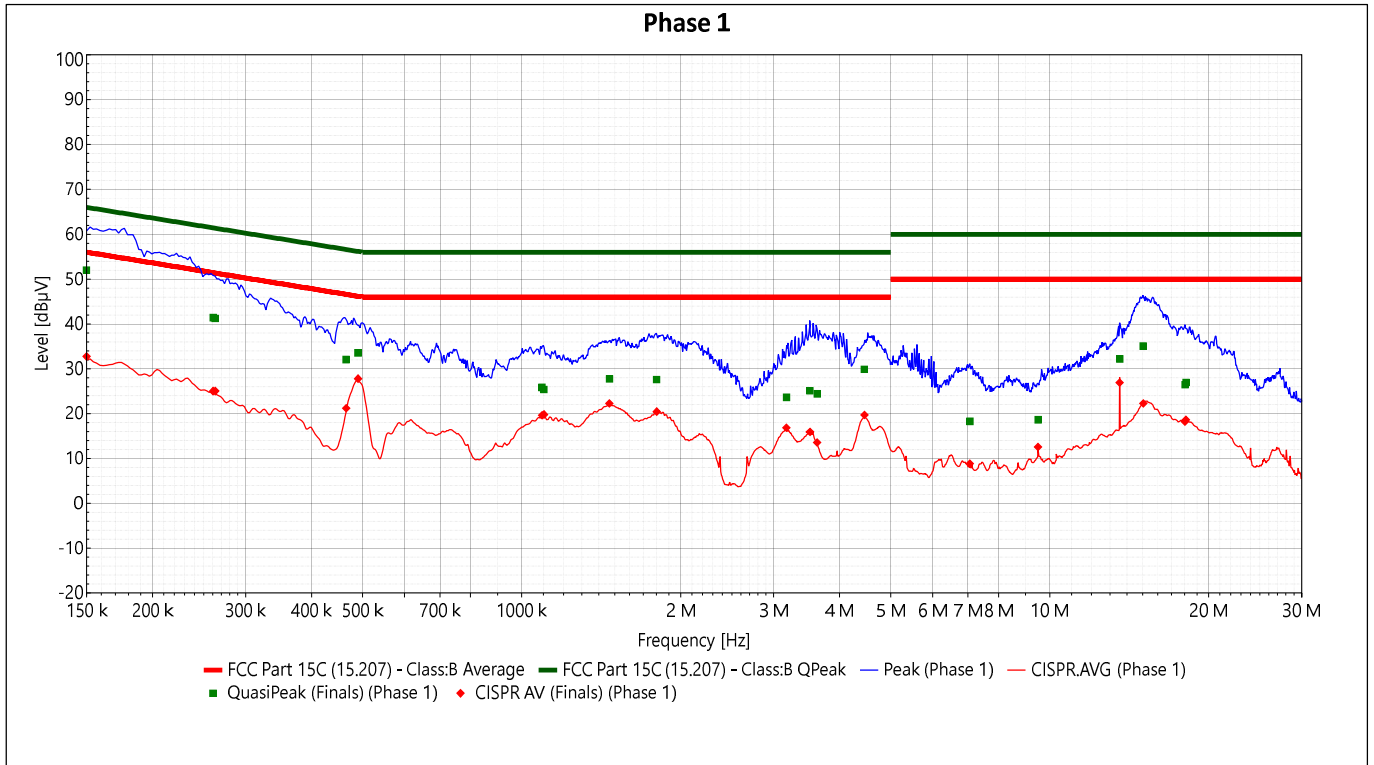
Remarks: The EUT (DC 5V) is powered via USB. The USB port is connected to a laptop for the A4 test.

The measurement was performed at the AC power input of the power adapter laptop.

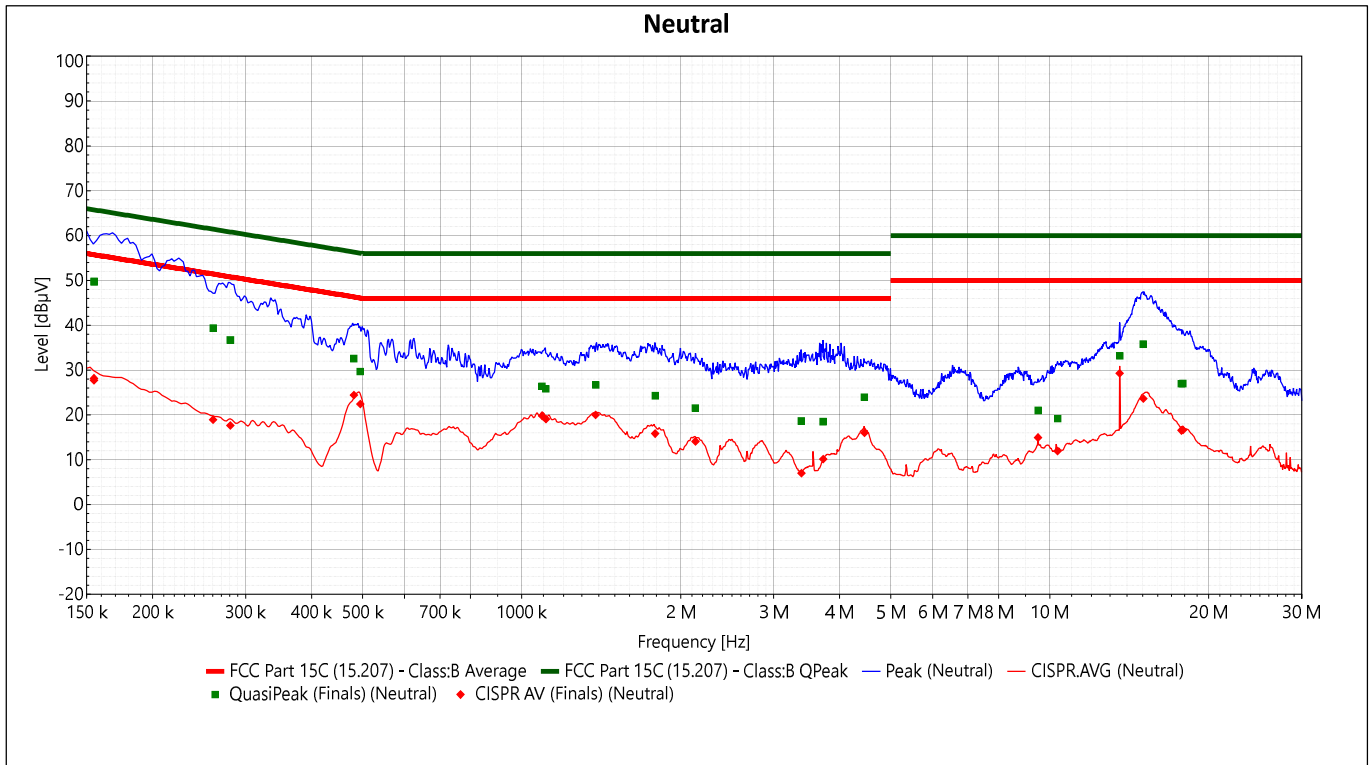
Test voltage: 120 V AC 60 Hz

For detailed test result please refer to following test protocols.

5.1.6 Test protocol



Frequency (Hz)	QuasiPeak (dBμV)	QP Margin	QP Limit (dBμV)	CISPR AV (dBμV)	CISPR AV Margin	AV Limit (dBμV)	Correction (dB)
150.004 k	52	-13.87	65.88	32.74	-23.13	55.88	10.37
260.496 k	41.4	-20.1	61.5	25.01	-26.48	51.5	10.36
262.746 k	41.23	-20.19	61.42	25.03	-26.4	51.42	10.36
465.246 k	32.05	-24.59	56.64	21.19	-25.45	46.64	10.39
489.996 k	33.56	-22.65	56.21	27.8	-18.41	46.21	10.39
1.093 M	25.84	-30.16	56	19.65	-26.35	46	10.49
1.102 M	25.36	-30.64	56	19.8	-26.2	46	10.49
1.466 M	27.76	-28.24	56	22.29	-23.71	46	10.54
1.802 M	27.58	-28.42	56	20.44	-25.56	46	10.57
3.172 M	23.62	-32.38	56	16.86	-29.14	46	10.65
3.514 M	25.1	-30.9	56	15.94	-30.06	46	10.65
3.626 M	24.41	-31.59	56	13.57	-32.43	46	10.65
4.457 M	29.9	-26.1	56	19.72	-26.28	46	10.63
7.06 M	18.27	-41.73	60	8.85	-41.15	50	10.53
9.501 M	18.65	-41.35	60	12.57	-37.43	50	10.58
13.562 M	32.21	-27.79	60	26.92	-23.08	50	10.73
15.027 M	35.04	-24.96	60	22.28	-27.72	50	10.8
18.031 M	26.45	-33.55	60	18.22	-31.78	50	11
18.11 M	26.95	-33.05	60	18.61	-31.39	50	11.01



Frequency (Hz)	QuasiPeak (dBμV)	QP Margin	QP Limit (dBμV)	CISPR AV (dBμV)	CISPR AV Margin	AV Limit (dBμV)	Correction (dB)
154.996 k	49.77	-16.1	65.88	28.17	-27.71	55.88	10.37
154.996 k	49.67	-16.33	66	27.7	-28.3	56	10.37
260.496 k	39.35	-22.15	61.5	18.94	-32.56	51.5	10.37
280.746 k	36.69	-24.17	60.87	17.64	-33.23	50.87	10.37
480.996 k	32.56	-23.81	56.37	24.41	-21.95	46.37	10.39
494.496 k	29.66	-26.48	56.13	22.43	-23.7	46.13	10.39
1.093 M	26.4	-29.6	56	19.82	-26.18	46	10.49
1.111 M	25.83	-30.17	56	19.05	-26.95	46	10.49
1.381 M	26.69	-29.31	56	20.01	-25.99	46	10.54
1.79 M	24.28	-31.72	56	15.83	-30.17	46	10.58
2.132 M	21.52	-34.48	56	14.11	-31.89	46	10.62
3.386 M	18.65	-37.35	56	7	-39	46	10.67
3.723 M	18.5	-37.5	56	10.13	-35.87	46	10.67
4.457 M	23.95	-32.05	56	16.03	-29.97	46	10.65
9.503 M	21.02	-38.98	60	14.96	-35.04	50	10.68
10.349 M	19.16	-40.84	60	11.92	-38.08	50	10.73
13.562 M	33.19	-26.81	60	29.27	-20.73	50	10.93
15.027 M	35.78	-24.22	60	23.63	-26.37	50	11.03
17.743 M	26.98	-33.02	60	16.55	-33.45	50	11.22
17.864 M	27	-33	60	16.63	-33.37	50	11.23

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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: Anechoic chamber SAC 3
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, B.6 a. i.

5.2.4 Description of Measurement

The radiated power of the spurious emission from the EUT is measured in a test setup following the procedures set out in ANSI C63.10.

5.2.5 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	25.2	20.0	45.2

- 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	45.2	-40	5.2	84.0	78.8

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

Frequency (MHz)	Field strength of fundamental wave (μV/m)	dB(μV/m)	Measurement distance (metres)
13.553 - 13.567	15.848	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**.

5.3.1 Description of the test location

Test location: Anechoic chamber SAC 3
Test distance: 3 metres

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.

5.3.4 Description of Measurement

The radiated power of the spurious emission from the EUT is measured in a test setup following the procedures set out in ANSI C63.10.

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

Detector: QP (In frequency range 9-90 kHz and 110-490 kHz a linear average detector is used)

5.3.5 Test result < 30MHz

FCC

<i>f</i> (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)
27.46	11.70	20	31.70	-40	-8.3	29.5	37.8

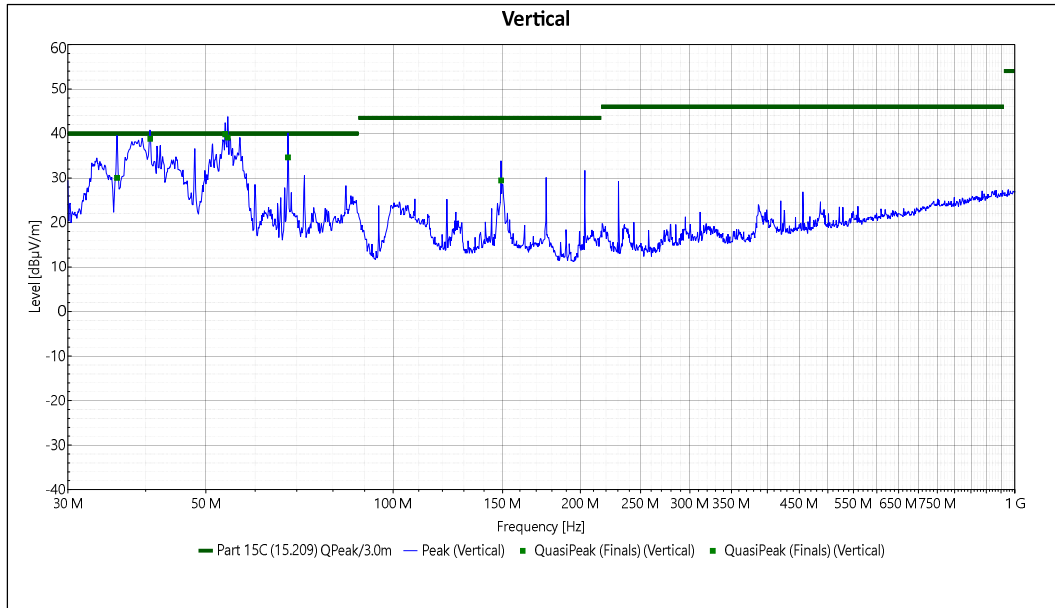
ISED

<i>f</i> (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)
27.46	-39.8	20	-19.80	-40	-59,8	-22	37.8

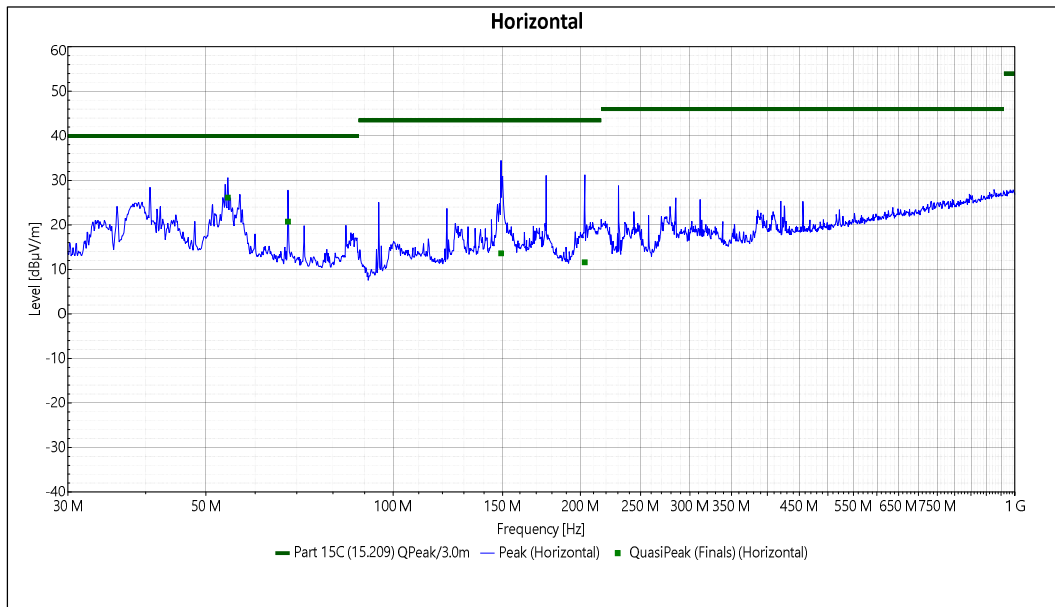
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5.3.6 Test result 30 MHz < f < 1 GHz



Frequency (Hz)	QuasiPeak (dBμV/m)	QP Margin	QP Limit (dBμV/m)	Angle	Height	polarization	Correction (dB)
35.966 M	30.04	-9.96	40	178.12	1.01	Vertical	-11.39
40.679 M	38.79	-1.21	40	254.96	1	Vertical	-10.82
53.727 M	39.84	-0.16	40	164.9	1	Vertical	-10.26
54.249 M	39.07	-0.93	40	181.91	1.01	Vertical	-10.34
67.769 M	34.64	-5.36	40	171.96	1	Vertical	-12.29
149.137 M	29.47	-14.03	43.5	153.23	1	Vertical	-8.9



Frequency (Hz)	QuasiPeak (dBμV/m)	QP Margin	QP Limit (dBμV/m)	Angle	Height	polarization	Correction (dB)
54.248 M	26.14	-13.86	40	232	1.21	Horizontal	-9.52
67.769 M	20.74	-19.26	40	92.8	2.2	Horizontal	-11.67
149.137 M	13.63	-29.87	43.5	113.19	1	Horizontal	-9.77
203.383 M	11.59	-31.91	43.5	272.14	1	Horizontal	-12.05

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Limit according to FCC Part 15 Subpart 15.209(a)

Frequency (MHz)	Field strength of spurious emissions		Measurement distance (metres)
	(μ V/m)	dB(μ V/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

Note 1: The emission limits for the ranges 9-90 kHz and 110-490 kHz are based on measurements employing a linear average detector.

Limit according to RSS-Gen clause 8.9

Frequency (MHz)	Field strength of spurious emissions		Measurement distance (metres)
	(μ A/m)	dB(μ A/m)	
0.009 - 0.490	6.37/F(kHz)	--	300 (Note 1)
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)
	(μ V/m)	dB(μ V/m)	
30 - 88	100	40	3
88 - 216	150	43.5	3
216 - 960	200	46	3
Above 960	500	54	3

Note 1: The emission limits for the ranges 9-90 kHz and 110-490 kHz are based on measurements employing a linear average detector.

The requirements are **FULFILLED**.

Remarks: Measurement has been performed up to 1000 MHz.

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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: AREA 4

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(b).

5.4.4 Description of Measurement

The radiated power of the spurious emission from the EUT is measured in a test setup following the procedures set out in ANSI C63.10.

5.4.5 Test result

The EUT (DC 5V) is powered via USB. Voltage variation $\pm 15\%$ of 5 V DC at input to device

Test conditions		Test result	Tolerance	Limit
		Frequency (MHz)	(kHz)	(kHz)
$T_{min} (-20)^{\circ}\text{C}$	$V_{nom} (5\text{ V})$	13.559869	-0.131	± 1.356
$T (-10)^{\circ}\text{C}$	$V_{nom} (5\text{ V})$	13.559906	-0.094	± 1.356
$T (0)^{\circ}\text{C}$	$V_{nom} (5\text{ V})$	13.559906	- 0.094	± 1.356
$T (10)^{\circ}\text{C}$	$V_{nom} (5\text{ V})$	13.559869	-0.131	± 1.356
$T_{nom} (20)^{\circ}\text{C}$	$V_{min} (4.25\text{ V})$	13.559807	- 0.193	± 1.356
	$V_{nom} (5\text{ V})$	13.559807	- 0.193	± 1.356
	$V_{max} (5.75\text{ V})$	13.559807	- 0.193	± 1.356
$T (30)^{\circ}\text{C}$	$V_{nom} (5\text{ V})$	13.559782	- 0.218	± 1.356
$T (40)^{\circ}\text{C}$	$V_{nom} (5\text{ V})$	13.559756	-0.244	± 1.356
$T_{max} (50)^{\circ}\text{C}$	$V_{nom} (5\text{ V})$	13.559719	-0.281	± 1.356

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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(b):

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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5.5 Bandwidth

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

5.5.1 Description of the test location

Test location: AREA 4

5.5.2 Photo documentation of the test set-up

See attachment C to this report.

5.5.3 Applicable standard

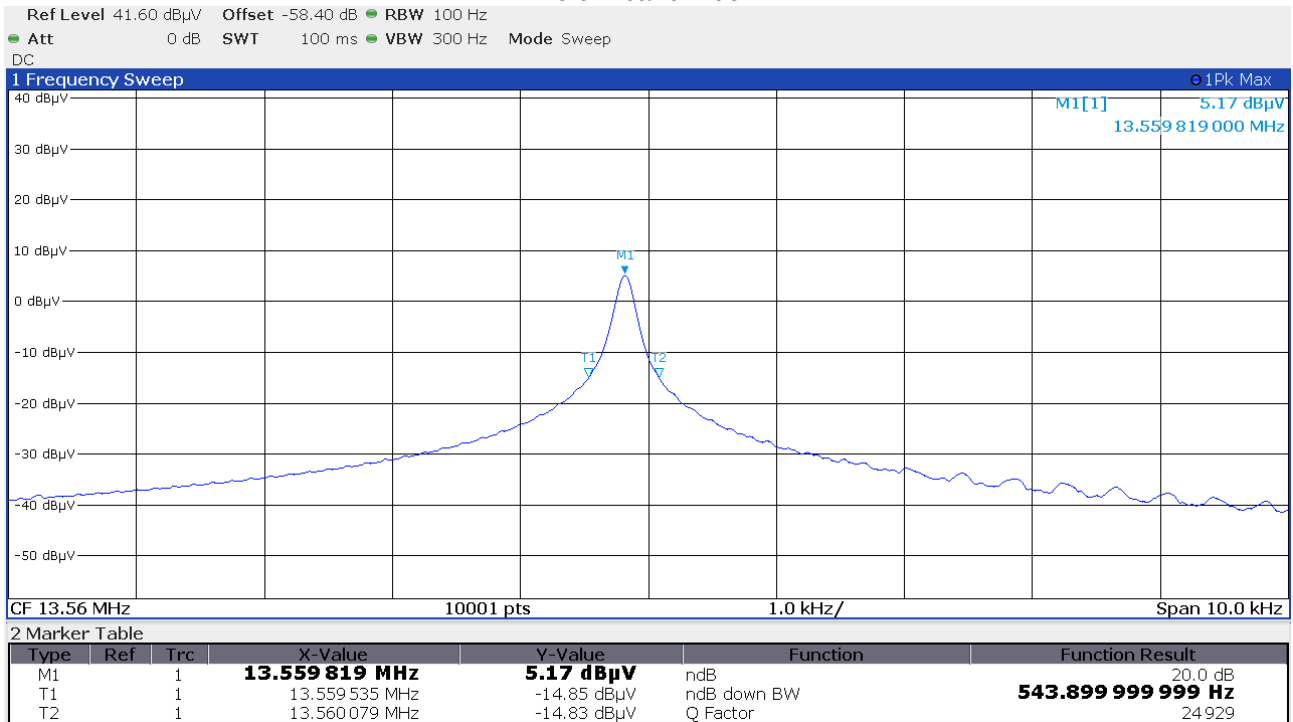
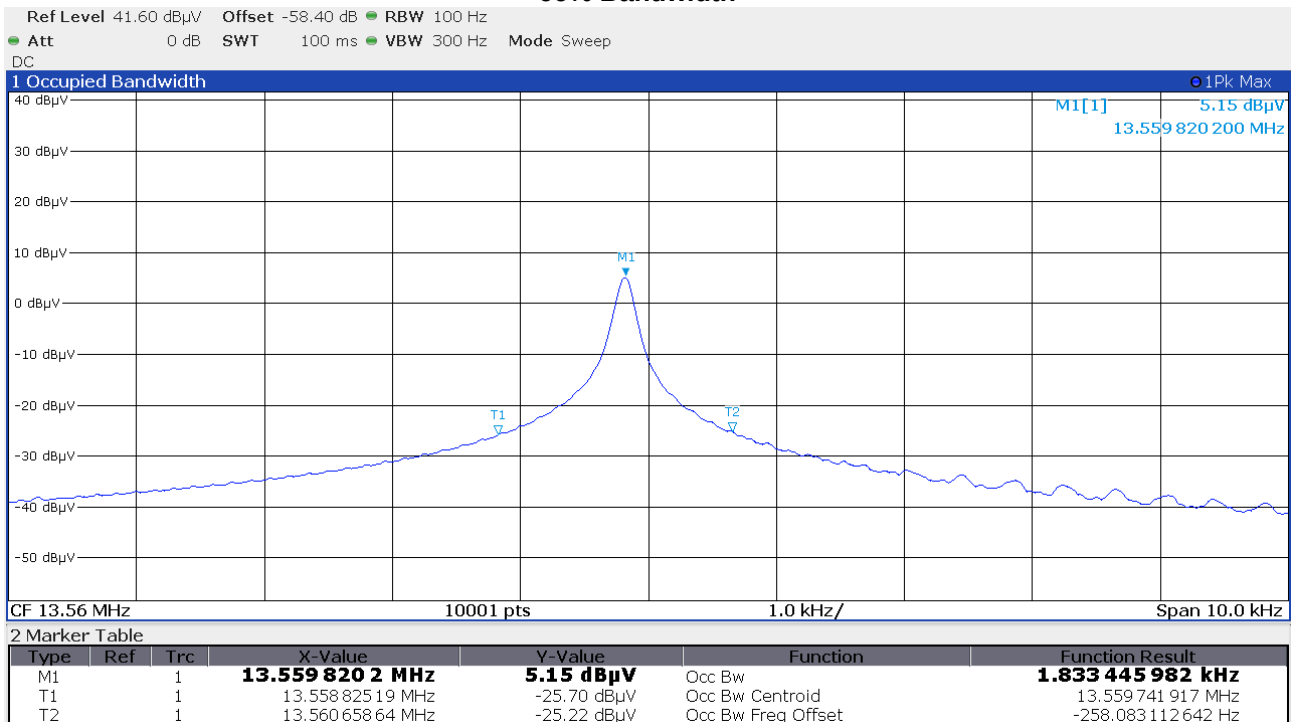
According to FCC Part 15, Section 15.215(c) and RSS-Gen, 6.7.

5.5.4 Test result

Measured Bandwidth	result (kHz)	Limit (kHz)
20dB	0.544	--
99%	1.833	--

The requirements are **FULFILLED**.

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

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5.5.5 Test protocol
20 dB bandwidth

99% Bandwidth


FCC ID: 2ADFFV-5E904029
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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: AREA 4

5.6.2 Photo documentation of the test set-up

See attachment C to this report.

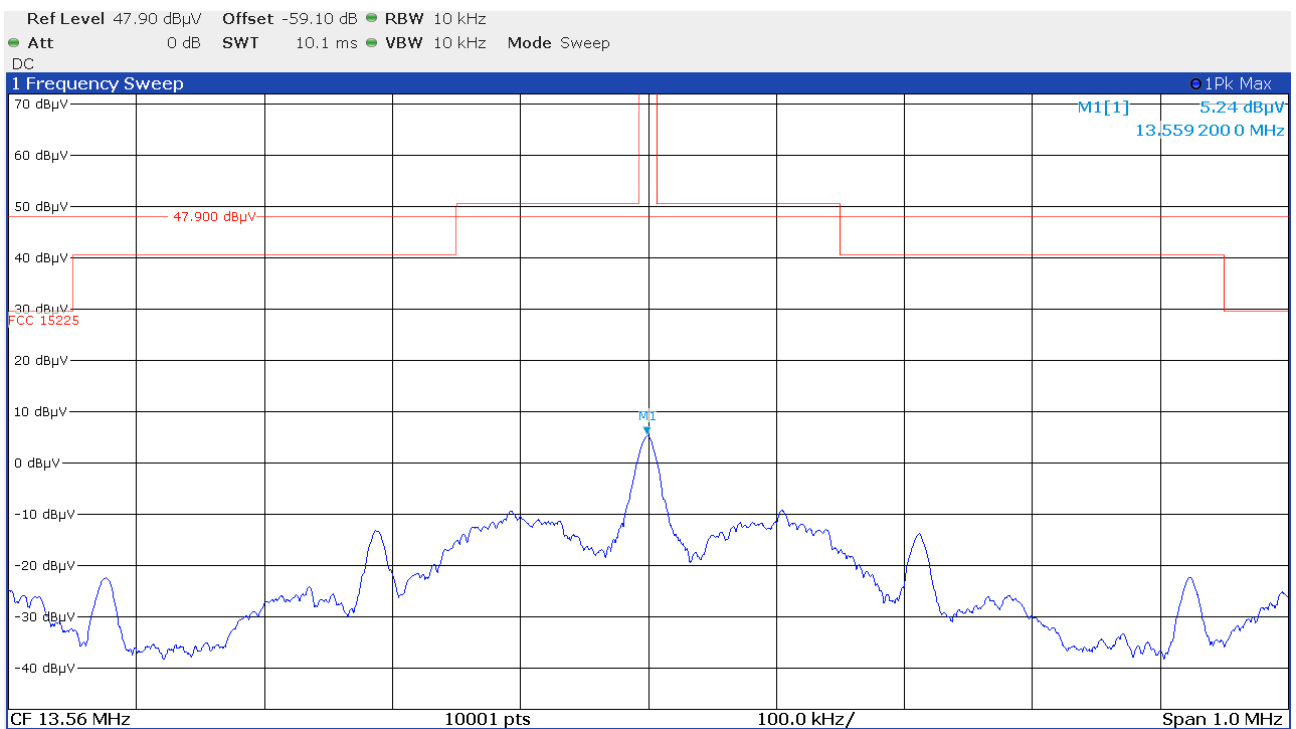
5.6.3 Applicable standard

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

5.6.4 Description of Measurement

The radiated power of the spurious emission from the EUT is measured in a test setup following the procedures set out in ANSI C63.10.

5.6.5 Test result



Red line „47.900 dBμV“ is maximal Ref Level

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Limits according to FCC Part 15, Section 15.225(a-d)

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

Limits according to RSS-210 clause B.6 a. (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
Frequency band (MHz)	Emission level limit at 30 m ($\mu\text{A/m}$)	Emission level limit at 30 m ($\text{dB}\mu\text{A/m}$)
outside of 13.110 – 14.010	0.08	-22

The requirements are **FULFILLED**.

Remarks: None

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6 USED TEST EQUIPMENT AND ACCESSORIES

All test instruments used are calibrated and verified regularly. The calibration history is available on request.
All listed measuring devices were calibrated at the time of use.

Test ID	Model Type	Kind of Equipment	Manufacturer	Equipment No.	Next Calib.	Last Calib.	Next Verif.	Last Verif.
A 4	6430	Programmable AC Source	Power Control Electronic GmbH & Co. KG	02-02/50-13-014				
Test date: 23.10.2025	ESR3	EMI Test Receiver	Rohde & Schwarz Memmingen	09-02/03-21-001	16/07/2026	16/07/2025		
	ENV432	V-Netznachbildung	Rohde & Schwarz Memmingen	09-02/20-21-001	02/09/2026	02/09/2024	30/07/2026	30/07/2025
	KK-SPU195FR01-2X11_N-50-3-64	Kabelkonf. Spuma_195-FR-01	Huber + Suhner	09-02/50-21-031				
	KK-SPU195FR01-2X11N-3,5M	Kabelkonf. Spuma_195-FR-01	Huber + Suhner	09-02/50-21-037				
	CDB-10K-18-50V-NMF-I	DC Blocker	Tactron Elektronik	09-02/50-22-033			04/06/2026	04/06/2025
	BAT-EMC 2024.0.12.0	Nexio Software	EMCO Elektronik GmbH	09-02/68-21-002				
CPR 1	ESR 7	EMI Test Receiver	Rohde & Schwarz München	02-02/03-17-001	27/10/2025	22/10/2024		
Test date: 22.10.2025	SF104/11SMA/11N/1500MM	RF Cable 1.5 m	Huber + Suhner	02-02/50-13-017				
	HFH2-Z2E	Active Loop Antenna	Rohde & Schwarz Memmingen	09-02/24-21-001	05/08/2026	05/08/2025		
	IN600	Bias Unit	Rohde & Schwarz Memmingen	09-02/50-21-015				
	KK-SF118-2X11N-4.0M	RF Cable	Huber + Suhner	09-02/50-23-034				
	KK-SF526S-11PC35-11N-4.0M	RF Cable	Huber + Suhner	09-02/50-23-037				
	KK-SF526S-2X11N-10.0M	RF Cable	Huber + Suhner	09-02/50-23-042				
	KK-SF118-2X11N-7.3M	RF Cable	Tactron Elektronik	09-02/50-24-047				
FE	FSW43	Spectrum Analyser	Rohde & Schwarz München	02-02/11-21-001	09/09/2026	09/09/2025		
Test data: 22.04.2026	HFRAE 5161 _ 50 kHz-120 MHz	Passive Loop Antenna	Schwarzbeck Mess-Elektronik	02-02/24-11-004				
	METRAHIT WORLD	TRMS Multimeter	GOSSSEN-METRAWATT GmbH	02-02/32-15-001	19/11/2026	19/11/2025		
	WK-340/40	Climatic Chamber	Weiss Umwelttechnik GmbH	02-02/45-05-001	04/03/2027	04/03/2026	04/09/2026	04/03/2026
	HM 8143	Power Supply	Hameg GmbH	02-02/50-10-016				

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: 2ADFDV-5E904029
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Test ID	Model Type	Kind of Equipment	Manufacturer	Equipment No.	Next Calib.	Last Calib.	Next Verif.	Last Verif.
MB	EA-PS 3032-10B	Power Supply	EA-Elektro Automatik GmbH & Co. KG	01-05/50-11-012				
Test date: 27.10.2025	FSW43	Spectrum Analyser	Rohde & Schwarz München	02-02/11-21-001	09/09/2026	09/09/2025		
	HFRAE 5161 _ 50 kHz 120 MHz	Passive Loop Antenna	Schwarzbeck Mess-Elektronik	02-02/24-11-004				
	SF104/11SMA/11N/15 00MM	RF Cable 1.5 m	Huber + Suhner	02-02/50-13-017				
SER 1	ESR 7	EMI Test Receiver	Rohde & Schwarz München	02-02/03-17-001	27/10/2025	22/10/2024		
Test date: 22.10.2025	SF104/11SMA/11N/15 00MM	RF Cable 1.5 m	Huber + Suhner	02-02/50-13-017				
	HFH2-Z2E	Active Loop Antenna	Rohde & Schwarz Memmingen	09-02/24-21-001	05/08/2026	05/08/2025		
	IN600	Bias Unit	Rohde & Schwarz Memmingen	09-02/50-21-015				
	KK-SF118-2X11N- 4.0M	RF Cable	Huber + Suhner	09-02/50-23-034				
	KK-SF526S-11PC35- 11N-4.0M	RF Cable	Huber + Suhner	09-02/50-23-037				
	KK-SF526S-2X11N- 10.0M	RF Cable	Huber + Suhner	09-02/50-23-042				
	KK-SF118-2X11N- 7.3M	RF Cable	Tactron Elektronik	09-02/50-24-047				
SER 2	ESR 7	EMI Test Receiver	Rohde & Schwarz München	02-02/03-17-001	27/10/2025	22/10/2024		
Test date: 22.10.2025	VULB 9168	Trilog Broadband Antenna	Schwarzbeck Mess-Elektronik	02-02/24-05-005	08/05/2026	08/05/2025	22/05/2026	22/05/2025
	BBV 9745	Preamplifier	Schwarzbeck Mess-Elektronik	09-02/17-23-002	12/03/2026	12/03/2025		
	SAC3 - NSA 10m	NSA ANSI C63.4	CSA Group Bayern GmbH	09-02/30-24-028			04/08/2026	04/08/2025
	50F-003 N 3dB	Attenuator 3dB	Tactron Elektronik	09-02/50-22-002				
	KK-SF118-2X11N- 6.5M	RF Cable	Huber + Suhner	09-02/50-23-035				
	KK-SF526S-11PC35- 11N-4.0M	RF Cable	Huber + Suhner	09-02/50-23-037				
	KK-SF526S-2X11N- 10.0M	RF Cable	Huber + Suhner	09-02/50-23-042				
	BAT-EMC 2024.0.12.0	Nexio Software	EMCO Elektronik GmbH	09-02/68-21-002				

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