PHOENIX TESTLAB

Königswinkel 10
32825 Blomberg, Germany
Phone: +49 (0) 52 35 / 95 00-0
Fax: +49 (0) 52 35 / 95 00-10
office@phoenix-testlab.de
www.phoenix-testlab.de

Test Report

Report Number:

F230729E10

Equipment under Test (EUT):

MiNexx ® Indicator C

Applicant:

Minebea Intec GmbH

Manufacturer:

Minebea Intec GmbH

ilac-MRA

DAkkS
Deutsche
Akkreditierungsstelle
D-PL-17186-01-00

References

[1] **ANSI C63.10: 2020** American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices

[2] **FCC CFR 47 Part 15** Radio Frequency Devices

[3] **RSS-210 Issue 11 (June 2024)**
Licence-exempt Radio Apparatus (All Frequency Bands): Category I Equipment

[4] **RSS-Gen, Issue 5 Amendment 2 (2021-02)**
General Requirements for Compliance of Radio Apparatus

Test Result

The requirements of the tests performed as shown in the overview (clause 4) were fulfilled by the equipment under test. The complete test results are presented in the following.
“Passed” indicates that the equipment under test conforms with the relevant limits of the testing standard without taking any measurement uncertainty into account as stated in clause 1.4 of ANSI C63.10 (2020). However, the measurement uncertainty is calculated and shown in this test report.

Tested and written by		Sebastian Krehs 14.08.2025
	Signature	
Reviewed and approved by:		Bernd STEINER 14.08.2025
	Signature	

This test report is only valid in its original form.

The test results herein refer only to the tested sample. PHOENIX TESTLAB GmbH is not responsible for any generalisations or conclusions drawn from these test results concerning further samples. Any modification of the tested samples is prohibited and leads to the invalidity of this test report. Each page necessarily contains the PHOENIX TESTLAB Logo and the TEST REPORT NUMBER.

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1 Identification

1.1 Applicant

Name:	Minebea Intec GmbH
Address:	Meiendorfer Str. 205 A, 22145 Hamburg
Country:	Germany
Name for contact purposes:	Mr. Oliver FREITAG
Phone:	+49 (0)40-67960-303
eMail address:	info@minebea-intec.com
Applicant represented during the test by the following person:	N/A

1.2 Manufacturer

Name:	Minebea Intec GmbH
Address:	Meiendorfer Str. 205 A, 22145 Hamburg
Country:	Germany
Name for contact purposes:	Mr. Oliver FREITAG
Phone:	+49 (0)40-67960-303
eMail address:	info@minebea-intec.com
Manufacturer represented during the test by the following person:	N/A

1.3 Test Laboratory

The tests were carried out by:

PHOENIX TESTLAB GmbH
Königswinkel 10
32825 Blomberg
Germany

accredited by Deutsche Akkreditierungsstelle GmbH (DAkkS) according to DIN EN ISO/IEC 17025:2018. The accreditation is only valid for the scope of accreditation listed in the annex of the certificate D-PL-17186-01-00. FCC Test Firm Designation Number DE0004, FCC Test Firm Registration Number 469623, CAB Identifier DE0003 and ISED# 3469A.

1.4 EUT (Equipment under Test)

Test object: *		Weighing Indicator with various I/Os
Model name: *		MiNexx ® Indicator C
Model number: *		NICC
Order number: *		NICC
Contains FCC ID: *		MCQ-CCIMX6UL
Contains IC certification number: *		1846A-CCIMX6UL
FCC ID: *		2BPI4-NICC
IC certification number: *		34282-NICC
PMN: *		Weight indicator MiNexx® C
HVIN: * (EUT1)		NICCL1
HVIN: * (EUT2)		NICCL2
FVIN: *	WLAN and Bluetooth part:	82004060
	RFID part:	10.01.A0

* declared by the applicant

	EUT number		
	1	2	3
Serial number: *	45564012	45664008	-
PCB identifier: *	N/A	N/A	-
Hardware version: *	MB_C_220V, Rev. 08	MB_C_24V, Rev. 08	-
Software version: *	00.02.00-trunk.596860	00.02.00-trunk.596860	-

* declared by the applicant

Two EUTs were used for all tests.

Note: PHOENIX TESTLAB GmbH does not take samples. The samples used for tests are provided exclusively by the applicant.

1.5 Technical Data of Equipment

EUT 1:

General			
Power supply EUT: *	AC		
Supply voltage EUT: *	U_{nom} = 120 V_{AC}	U_{min} = 100 V_{AC}	U_{max} = 240 V_{AC}
Temperature range: *	-10 °C to +40 °C		
Lowest / highest internal frequency: *	32.768 kHz / 5.835 GHz		

* Declared by the applicant

EUT 2:

General			
Power supply EUT: *	DC		
Supply voltage EUT: *	U_{nom} = 24 V_{AC}	U_{min} = 21.6 V_{AC}	U_{max} = 26.4 V_{AC}
Temperature range: *	-10 °C to +40 °C		
Lowest / highest internal frequency: *	32.768 kHz / 5.835 GHz		

* Declared by the applicant

RFID part	
Operating frequency: *	13.56 MHz
Number of channels: *	1
Type of modulation: *	ASK
Data rate: *	106 kbit/s
Duty cycle: *	100 %
Antenna type: *	Flex print type 14 mm x 16 mm
Antenna connector: *	FCC Conector Samtec ZF1-04-01-T-WT

* Declared by the applicant

Ports / Connectors					
	Identification	Connector		Length during test	Shielding (Yes / No)
		EUT	Ancillary		
EUT 1	Power Supply, 100-240 Vac (50/60 Hz) *	Cold appliance plug	Schuko plug	2 m	No
	Analog I/O *	8 pin PCB header	8 pin PCB connector	-	Yes
	Analog I/O *	8 pin PCB header	8 pin PCB connector	-	Yes
	Performance Ex 7195 [C], 10 V *	6 pin PCB header	6 pin PCB connector	-	Yes
	PROFINET-IRT *	Rj45 socket	Rj45 plug	-	Yes
	USB *	USB-A socket	USB-A plug	-	Yes
	Ethernet *	Rj45 socket	Rj45 plug	5 m	Yes
EUT 2	Power Supply, 24 Vdc*	3 pin PCB header	3 pin PCB connector	-	No
	Analog I/O *	8 pin PCB header	8 pin PCB connector	-	Yes
	Analog I/O *	8 pin PCB header	8 pin PCB connector	-	Yes
	Performance Ex 7195 [C], 10 V *	6 pin PCB header	6 pin PCB connector	-	Yes
	PROFINET-IRT *	Rj45 socket	Rj45 plug	-	Yes
	USB *	USB-A socket	USB-A plug	-	Yes
	Ethernet *	Rj45 socket	Rj45 plug	5 m	Yes

* declared by the applicant

Equipment used for testing	
Test laptop *	HP EliteBook 840 G6
-	-
-	-

* Provided by the applicant

Ancillary equipment	
-	-
-	-
-	-

1.6 Dates

Date of receipt of test sample:	14.01.2025
Start of test:	03.02.2025
End of test:	22.07.2025

2 Operational States

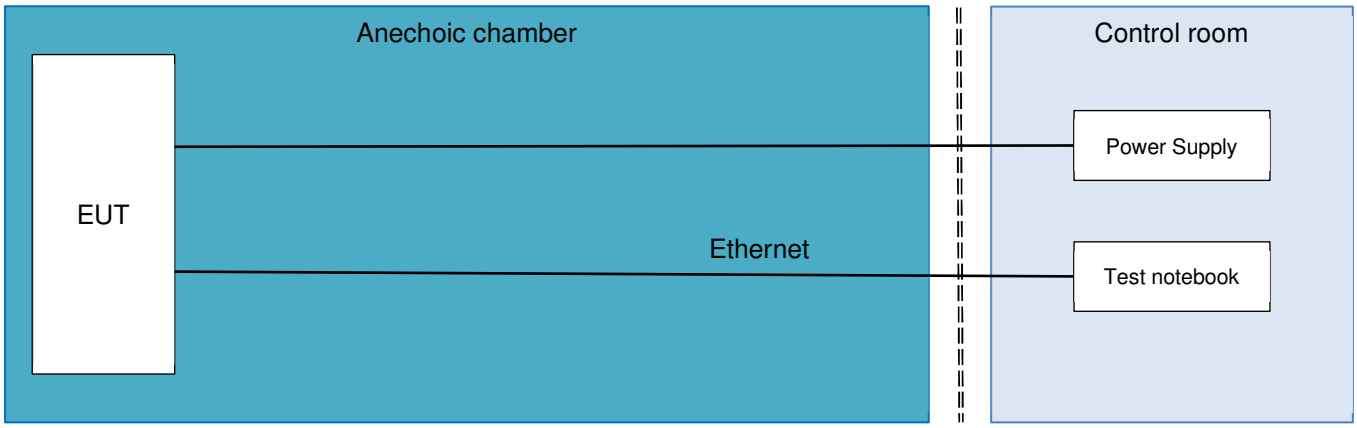
Description of function of the EUT:

The Minexx indicator (NICC) is a weighing controller / indicator for industrial weighing, dosing, batching and other application with NFC application.

The following states were defined as the operating conditions:

EUT 1 was supplied by 120 V / 60 Hz AC during all tests. For the AC power line conducted emissions test the EUT 1 was additionally tested with 240 V / 60 Hz AC.
The NFC part of the EUT was continuously transmitting during all tests at 13.56 MHz.
As pretests have shown the worst case emission of the NFC part was without reading a TAG, therefore all tests were carried out without reading a TAG.

The EUT was set up as follows:



3 Additional Information

The EUT was not labeled as required by FCC / IC.
This report contains only the results for the NFC part built in the EUT.

4 Overview

Application	Frequency range [MHz]	FCC 47 CFR Part 15 section [2]	RSS-Gen, Issue 5 [4] and RSS-210, Issue 11 [3]	Tested EUT	Status
Conducted emissions on supply line	0.15 – 30	15.207 (a)	8.8 [4]	1 & 2	Passed
Radiated emissions	0.009 – 1000 **	15.205 (a) 15.209 (a)	8.9 and 8.10 [4] 8.1 and 8.3 [3]	1	Passed
99 % bandwidth	13.56	-	6.7 [4]	1	Passed
Antenna requirement	-	15.203 [2]	6.8 [4]	-	Passed *

*: Integrated antenna only, requirement fulfilled.

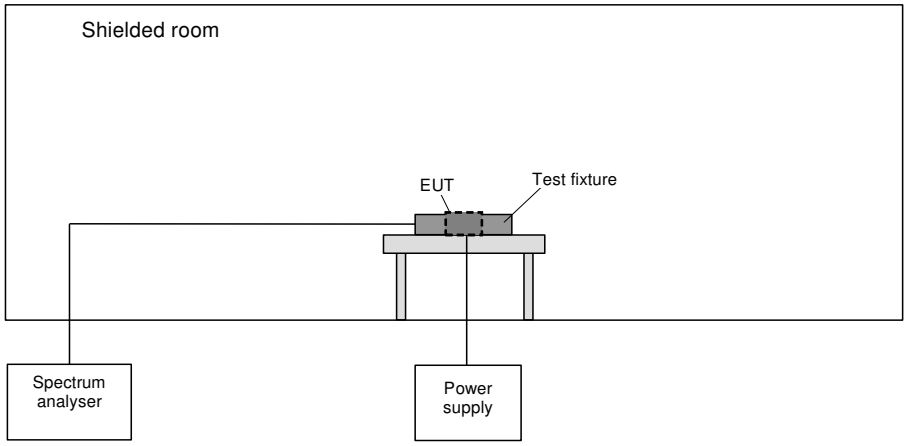
**: As declared by the applicant the highest radio clock frequency is 13.56 MHz.
Therefore the radiated emission measurement must be carried out up to 10th of the highest radio clock frequency in this case 135.6 MHz but was extended to 1 GHz in this report.

5 Results

5.1 Test setups

5.1.1 Radiated: Test fixture

The test is carried out in a shielded chamber. Table-top devices are set up on a table and the spectrum analyser is connected to a test fixture / loop antenna, which is placed around / on top of the EUT.



5.1.2 Radiated: 9 kHz to 30 MHz

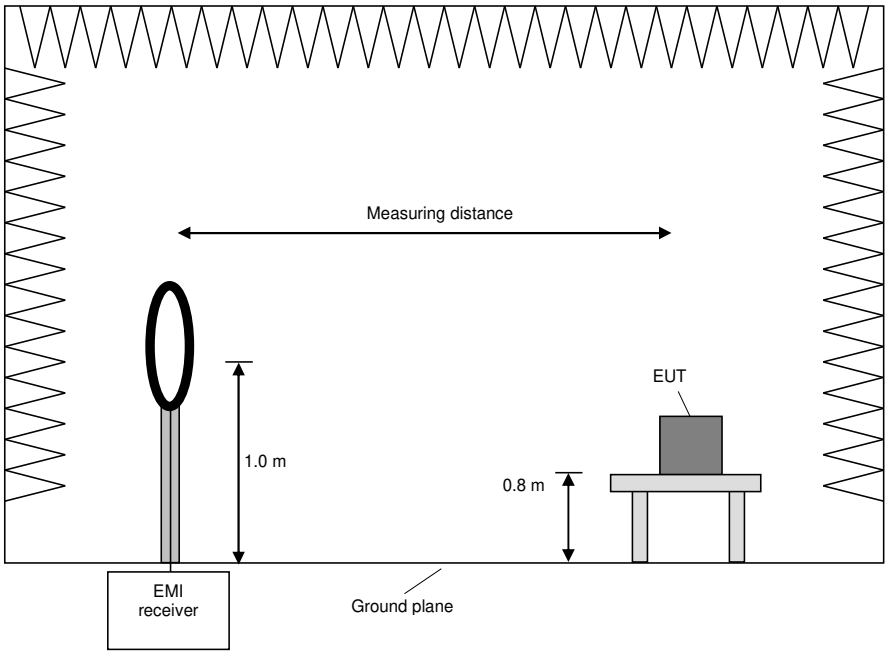
5.1.2.1 Preliminary measurement 9 kHz to 30 MHz

In the first stage a preliminary measurement is performed in a semi-anechoic chamber at a measuring distance of 3 meters. Table-top devices are set up on a non-conducting support with a size of 1 m by 1.5 m and a height of 80 cm. Floor-standing devices are placed directly on the turntable / ground plane. The setup of the equipment under test is in accordance with [1].

The frequency range 9 kHz to 30 MHz is monitored with an EMI receiver while the system and its cables are manipulated to find out the configuration with the maximum emission levels if applicable. The EMI receiver is set to MAX hold mode. The EUT and the measuring antenna are rotated around their vertical axis to find the maximum emission levels.

The resolution bandwidth of the EMI receiver is set to the following values:

Frequency range	Resolution bandwidth
9 kHz to 150 kHz	200 Hz
150 kHz to 30 MHz	9 kHz



Procedure preliminary measurement:

Pre-scans are performed in the frequency range 9 kHz to 150 kHz and 150 kHz to 30 MHz.
The following procedure is used:

1) Monitor the frequency range with the measuring antenna facing the EUT and an EUT / turntable azimuth of 0 °.
2) Manipulate the system cables to produce the maximum levels of emissions.
3) Rotate the EUT by 360 ° to maximize the detected signals.
4) Measure the frequencies of the highest detected emissions with a lower span and resolution bandwidth to increase the accuracy and note the frequency values.
5) If the EUT is portable or ceiling mounted, repeat steps 1 to 4 with other orientations (x,y,z) of the EUT.
6) Rotate the measuring antenna and repeat steps 1 to 5.

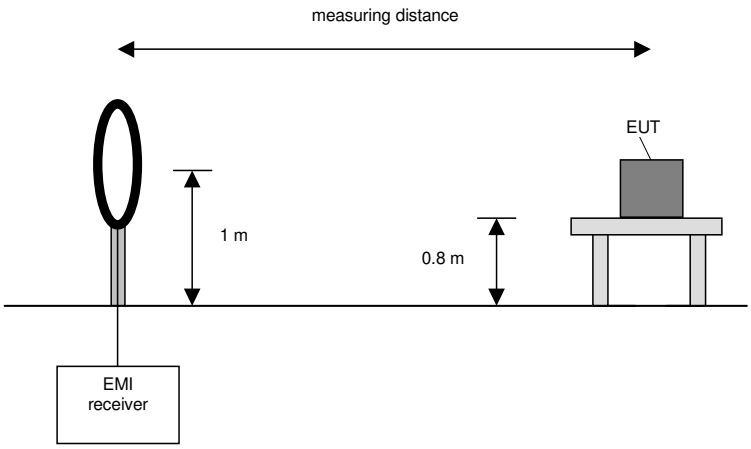
5.1.2.2 Final measurement 9 kHz to 30 MHz

In the second stage a final measurement is performed on an open area test site with no conducting ground plane at a measuring distance of 3 m, 10 m, or 30 m. If the standard requires larger measuring distances for a given frequency, the results are extrapolated according to section 15.31 (f) (2) [2]. The final measurement is performed with an EMI receiver set to Quasi-Peak detector, except for the frequency bands 9 kHz to 90 kHz and 110 kHz to 490 kHz where an Average detector is used according section 15.209 (d) [2].

At the frequencies, which were detected during the preliminary measurements, the final measurement is performed while rotating the EUT and the measuring antenna in the range of 0 ° to 360 ° around their vertical axis until the maximum level value is found.

The resolution bandwidth of the EMI receiver is set to the following values:

Frequency range	Resolution bandwidth	Measuring time
9 kHz to 150 kHz	200 Hz	1 s
150 kHz to 30 MHz	9 kHz	1 s



Procedure final measurement:

The following procedure is used:

1) Monitor the selected frequencies from the preliminary measurement with the measuring antenna facing the EUT and an EUT azimuth of 0 °.
2) Rotate the EUT by 360 ° to maximize the detected signals.
3) Rotate the measuring antenna and repeat steps 1 to 2 until the maximum value is found and note it.
4) If the EUT is portable or ceiling mounted, repeat steps 1 to 3 with other orientations (x,y,z) of the EUT.

5.1.3 Radiated: 30 MHz to 1 GHz

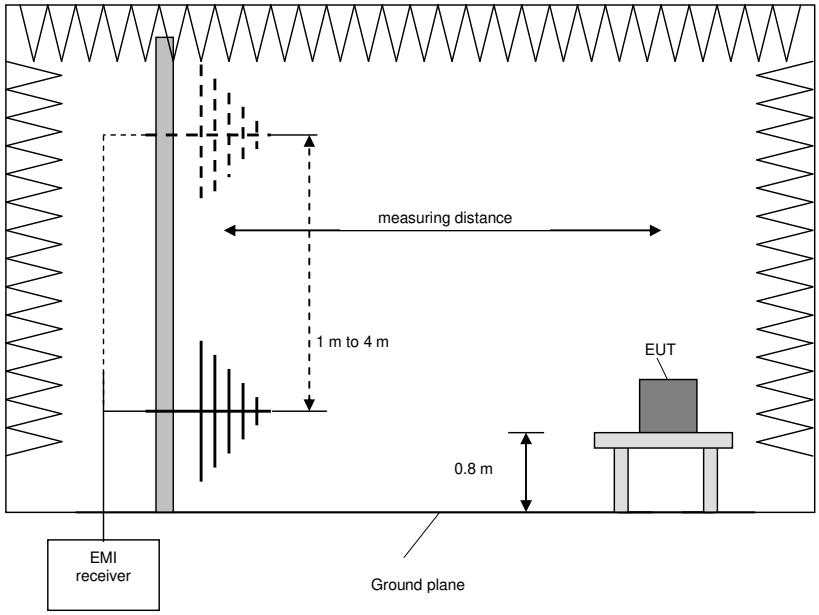
5.1.3.1 Preliminary and final measurement 30 MHz to 1 GHz

The preliminary and final measurements are performed in a semi-anechoic chamber with a metal ground plane at a measuring distance of 3 meters. Table-top devices are set up on a non-conducting support with a size of 1 m by 1.5 m and a height of 80 cm. Floor-standing devices are placed directly on the turntable / ground plane. The setup of the equipment under test is in accordance with [1].

During the tests the EUT is rotated in the range of 0 ° to 360 °, the measuring antenna is set to horizontal and vertical polarization and raised and lowered in the range from 1 m to 4 m to find the maximum level of emissions.

The resolution bandwidth of the EMI receiver is set to the following values:

Test	Frequency range	Step-size	Resolution bandwidth	Measuring time	Detector
Preliminary measurement	30 MHz to 1 GHz	30 kHz	120 kHz	-	Peak Average
Frequency peak search	± 120 kHz	10 kHz	120 kHz	1 s	Peak
Final measurement	30 MHz to 1 GHz	-	120 kHz	1 s	QuasiPeak



Procedure preliminary measurement:

The following procedure is used:

1) Set the measuring antenna to 1 m height.
2) Monitor the frequency range at horizontal polarization of the measuring antenna and an EUT / turntable azimuth of 0 °.
3) Rotate the EUT by 360° to maximize the detected signals.
4) Repeat steps 2 to 3 with the vertical polarization of the measuring antenna.
5) Increase the height of the measuring antenna for 0.5 m and repeat steps 2 to 4 until the final height of 4 m is reached.
6) The highest values for each frequency are saved by the software, including the measuring antenna height and polarization and the turntable azimuth for that value.

Procedure final measurement:

The following procedure is used:

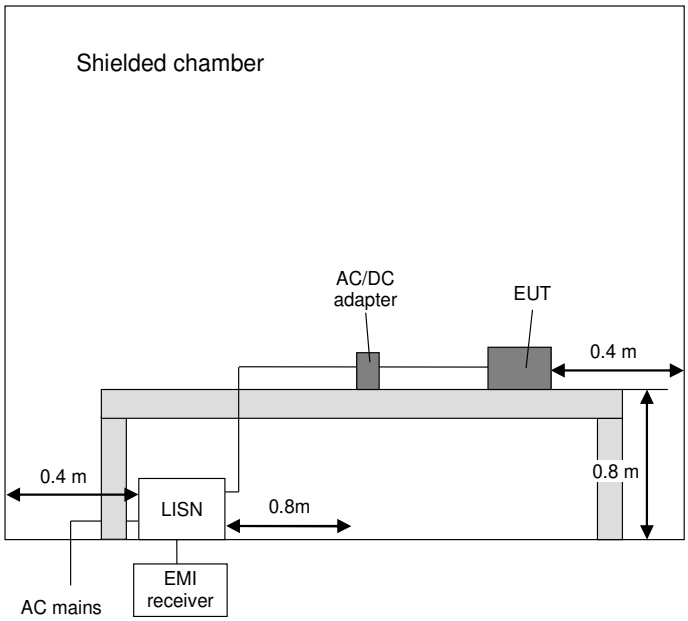
1) Select the highest frequency peaks (lowest margin to the limit) for the final measurement.
2) The software determines the exact peak frequencies by doing a partial scan with reduced step size of the pre-scan of the selected peaks.
3) If the EUT is portable or ceiling mounted, find the worst-case EUT orientation (x,y,z) for the final test.
4) The worst-case measuring antenna height is found via varying the height by +/- 0.5 m from the value obtained in the preliminary measurement while monitoring the emission level.
5) The worst-case turntable position is found via varying the turntable azimuth by +/- 30° from the value obtained in the preliminary measurement while monitoring the emission level.
6) The final measurement is performed at the worst-case measuring antenna height and the worst-case turntable azimuth.
7) Steps 2 to 6 are repeated for each frequency peak selected in step 1.

5.1.4 Conducted: AC power line

The test is carried out in a shielded chamber. Table-top devices are set up on a non-conducting support with a size of 1 m by 1.5 m and a height of 80 cm above the ground plane. Floor-standing devices are placed directly on the ground plane. In case of DC powered equipment, which is not exclusively powered by a battery, it is connected to the LISN via a suitable AC/DC adaptor. The setup of the equipment under test is in accordance with [1].

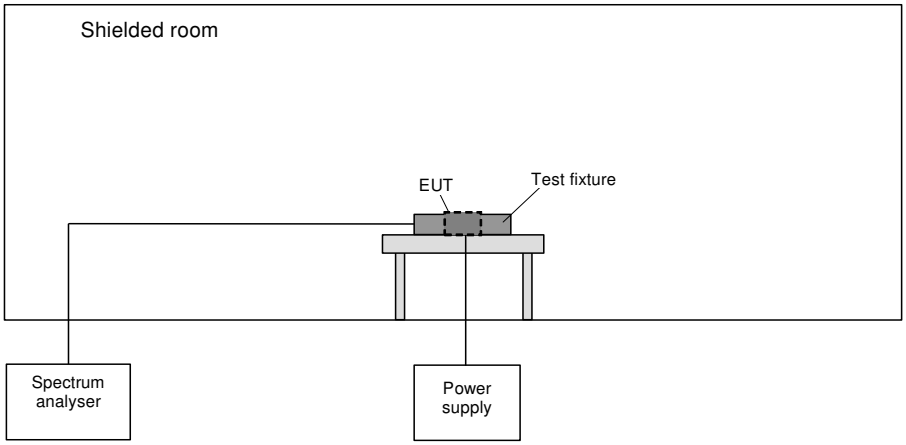
The frequency range 150 kHz to 30 MHz is measured with an EMI receiver set to MAX hold mode with Peak and Average detectors and a resolution bandwidth of 9 kHz. A scan is carried out on the phase and neutral line of the AC mains network. If emissions less than 10 dB below the appropriable limit are detected, these emissions are measured with an Average and Quasi-Peak detector on all lines.

Frequency range	Resolution bandwidth	Measuring time
150 kHz to 30 MHz	9 kHz	5 s



5.1.5 Method 99% bandwidth

The test is carried out in a shielded chamber. Table-top devices are set up on a table and the spectrum analyser is connected to a test fixture / loop antenna, which is placed around / on top of the EUT.



The following procedure will be used for the occupied bandwidth measurement according to [1]:

The occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers are each equal to 0.5% of the total mean power of the given emission. The following procedure shall be used for measuring 99% power bandwidth:

a) The instrument center frequency is set to the nominal EUT channel center frequency. The frequency span for the spectrum analyzer shall be between 1.5 times and 5.0 times the OBW.

b) The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW, and VBW shall be approximately three times the RBW, unless otherwise specified by the applicable requirement.
c) Set the reference level of the instrument as required, keeping the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope shall be more than [10 log (OBW/RBW)] below the reference level. Specific guidance is given in 4.1.5.2.
d) Step a) through step c) might require iteration to adjust within the specified range.

5.2 99 % bandwidth

5.2.1 Test setup (99 % bandwidth)

Test setup (99 % bandwidth)			
Used	Setup	See sub-clause	Comment
☒	Radiated: Test fixture	5.1.1	-
☐	Test setup (antenna port conducted)	-	-

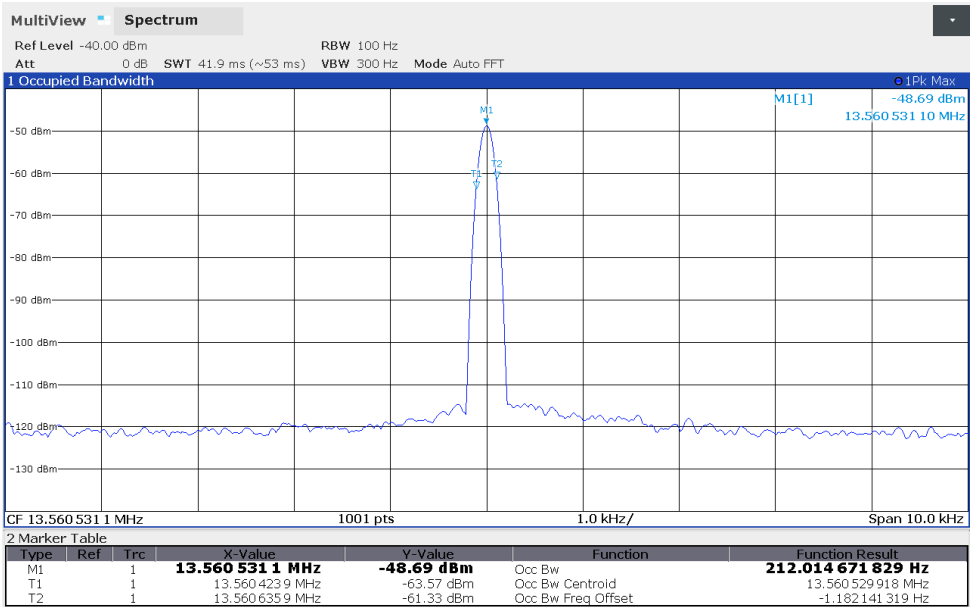
5.2.2 Test method (99 % bandwidth)

Test method (99 % bandwidth)				
Used	Sub-Clause [1]	Name of method	Applicability	Comment
☒	6.9.3	Occupied bandwidth – power bandwidth (99%) measurement procedure	-	-

5.2.3 Test results (99 % bandwidth)

Ambient temperature:	23 °C
Relative humidity:	22 %

Date:	03.03.2025
Tested by:	S. KREHS



F_L	F_U	BW (F_U - F_L)
13.560424 MHz	13.560636 MHz	0.212 kHz

Test result: Passed

Test equipment (please refer to chapter 7 for details)
1 - 2

5.3 Radiated emissions

5.3.1 Test setup (Maximum unwanted emissions)

Test setup (Maximum unwanted emissions)			
Used	Setup	See sub-clause	Comment
☒	Radiated: 9 kHz to 30 MHz / 30 MHz to 1 GHz	5.1.2 / 5.1.3	-

5.3.2 Test method (Maximum unwanted emissions)

☒ Test method (radiated) see sub-clause 5.1.2 / 5.1.3 as described herein.

5.3.3 Test results (Maximum unwanted emissions)

5.3.3.1 Test results preliminary measurement 9 kHz to 30 MHz

Ambient temperature:	21 °C
Relative humidity:	16 %

Date:	03.02.2025
Tested by:	M. DINTER

Position of EUT: For tests for f between 9 kHz to 30 MHz, the EUT was set up on a table with a height of 80 cm. The distance between EUT and antenna was 3 m.

Cable guide: For detailed information of test set-up and the cable guide refer to the pictures in annex A of this test report.

Test record: The measurement value was already corrected by 40 dB/decade as described in 47 CFR 15.31(f)(2) regarding to the measurement distance as requested in 47 CFR 15.209(a)

Remark: The EUT was tested in normal position as shown in Annex A.

Calculations:

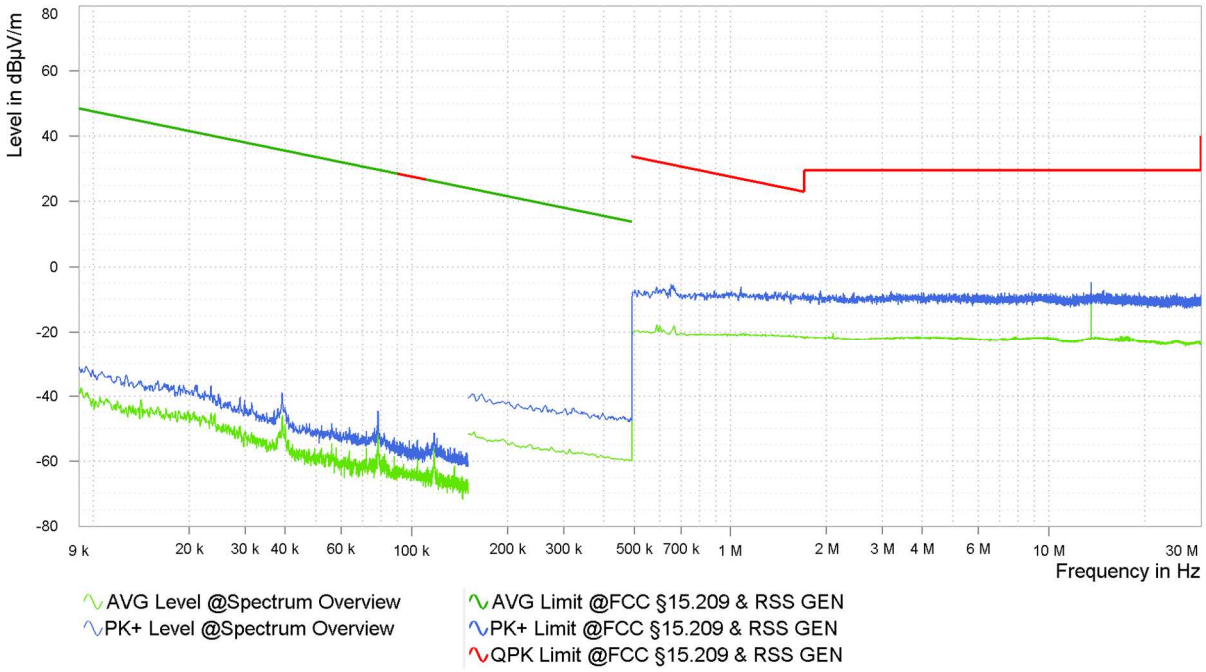
Result @ norm. dist. [dBµV/m] = Reading [dBµV] + AF [dB/m] + Distance corr. fact. [dBµV/m]

Result @ norm. dist. [dBµA/m] = Result @ norm. dist. [dBµV/m] – 20 x $\log_{10}$ (377 Ω)

Margin [dB] = Limit [dB(µV|µA)/m] - Result [dB(µV|µA)/m]

Worst case plot:

Spurious emissions from 9 kHz to 30 MHz (operation mode: Continuously transmit):



Remark: Only the 13.56 MHz fundamental was found for the final measurement. All other emissions are below the noise floor of the outdoor test site and have more than 20 dB margin to the limit at 300 m or 30 m. This frequency must be measured within a final measurement.

5.3.3.2 Test results final measurement 9 kHz to 30 MHz

Ambient temperature:	21 °C
Relative humidity:	16 %

Date:	03.02.2025
Tested by:	M. DINTER

The results of the standard subsequent measurement on the outdoor test site are indicated in the table below. The limits as well as the measured results (levels) refer to the above-mentioned standard while taking account of the specified requirements for a 30 m measuring distance.

Results 9 kHz - 30 MHz												
Frequency [MHz]	Reading @ measuring distance [dB(µV)]	Result @ norm. distance [dB(µV/m)]	Result @ norm. distance [dB(µA/m)]	Limit acc. 15.209 [dB(µV/m)]	Limit acc. RSS-Gen Table 6 [dB(µA/m)]	Margin [dB]	Detector	Antenna factor [dB/m]	Measuring distance [m]	Normative distance [m]	Distance correction factor [dB]	Position #
13.560	7.8	-12.0	-63.5	29.5	-22.0	41.5	QP	20.2	3	30	40	1

Remark:
The limits in CFR 47, Part 15, Subpart C, paragraph 15.209 (a), are identical to those in RSS-GEN Section 8.9, Table 6, since the measurements are performed in terms of magnetic field strength and converted to electric field strength levels (as reported in the table) using the free space impedance of 377 Ω.
For example, the measurement frequency X kHz resulted in the level of Y dBµV/m, which is equivalent to Y - 51.5 = Z dBµA/m, which was the same margin, W dB, to the corresponding RSS-GEN Table 6 as it has to the 15.209(a) limit.

Remark: At 10m measuring distance the signal of the EUT was below the sensitivity of the measuring system.

Test result: Passed

Test equipment (please refer to chapter 7 for details)
3 – 9, 19 - 21

5.3.3.3 Test results (30 MHz – 1 GHz)

Ambient temperature:	21 °C
Relative humidity:	16 %

Date:	03.02.2025
Tested by:	M. DINTER

Position of EUT: For tests for f between 30 MHz to 1 GHz, the EUT was set-up on a table with a height of 80 cm. The distance between EUT and antenna was 3 m.

Cable guide: For detailed information of test set-up and the cable guide refer to the pictures in annex A of this test report.

Test record: Plots for each frequency range are submitted below.

Remark: The EUT was tested in normal position as shown in Annex A.

Calculations:

Result [dBµV/m] = Reading [dBµV] + Correction [dBµV/m]

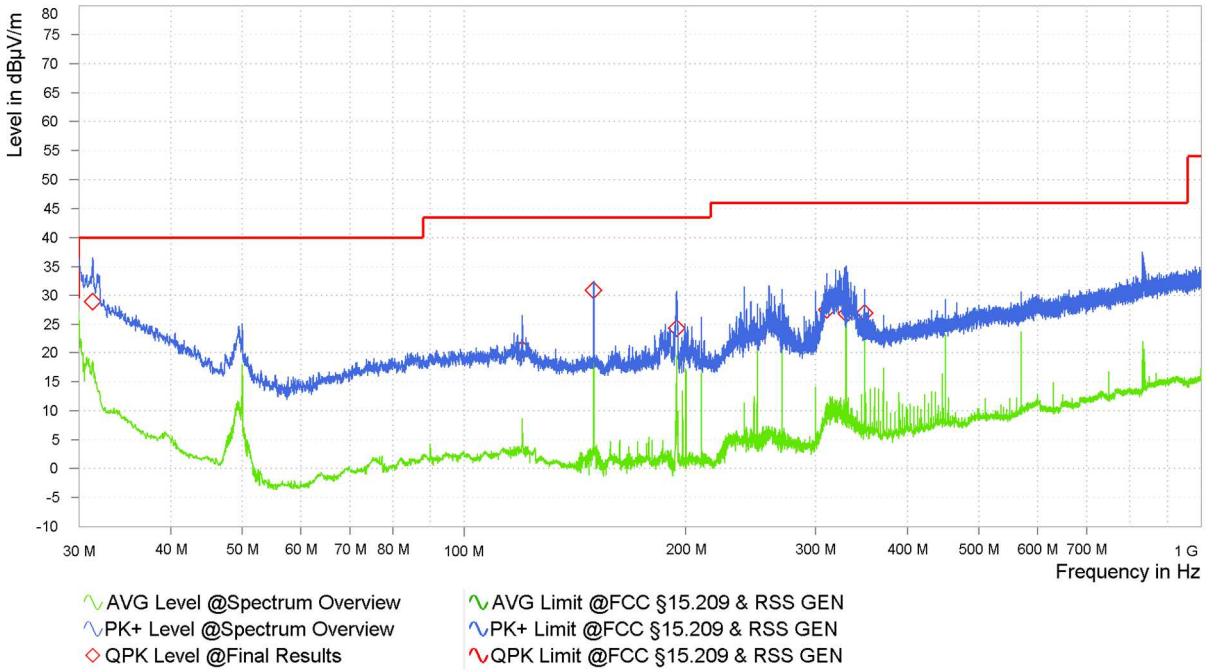
Correction [dBµV/m] = AF [dB/m] + Cable attenuation [dB] + optional preamp gain [dB]

Margin [dB] = Limit [dBµV/m] - Result [dBµV/m]

The measured points and the limit line in the following diagram refer to the standard measurement of the emitted interference in compliance with the above-mentioned standard. The measured points marked with "◇" are the measured results of the standard subsequent measurement in a semi-anechoic chamber.

Worst case plot:

Spurious emissions from 30 MHz to 1 GHz (operation mode: Continuously transmit):



Result tables:

Frequency [MHz]	Result (QP) [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Readings [dBµV]	Correction [dB/m]	Height [cm]	Azimuth [deg]	Pol. (H/V)	Position #
31.330	29.0	40.00	11.0	3.2	25.8	108	334	V	1
119.990	20.6	43.50	22.9	3.1	17.5	246	84	H	1
149.990	30.9	43.50	12.6	15.6	15.3	200	122	H	1
194.320	24.3	43.50	19.2	9.4	14.9	111	343	V	1
310.520	27.5	46.00	18.5	8.3	19.2	100	144	H	1
329.990	26.9	46.00	19.1	7.2	19.7	100	372	H	1
349.990	27.0	46.00	19.0	6.6	20.4	100	126	H	1

Test result: Passed

Test equipment (please refer to chapter 7 for details)
4 - 12

5.4 AC power-line conducted emissions

5.4.1 Test setup (Conducted emissions on power supply lines)

Test setup (Conducted emissions on power supply lines)			
Used	Setup	See sub-clause	Comment
☒	Conducted: AC power line	5.1.4	-
☐	Not applicable, because …	-	-

5.4.2 Test method (Conducted emissions on power supply lines)

Test setup (Conducted emissions on power supply lines)				
Used	Clause [1]	Name of method	Sub-clause	Comment
☒	6.2	Tabletop equipment testing	5.1.4	-
☐	6.2	Floor-standing equipment testing	-	-

EUT 1 was supplied by 120V_{AC} 60Hz and 240V_{AC} 60Hz-
EUT 2 was supplied by 24V_{DC}. The DC power supply MINI-PS-100-240AC/24DC/1.3 by PHOENIX CONTACT was provided by the laboratory.

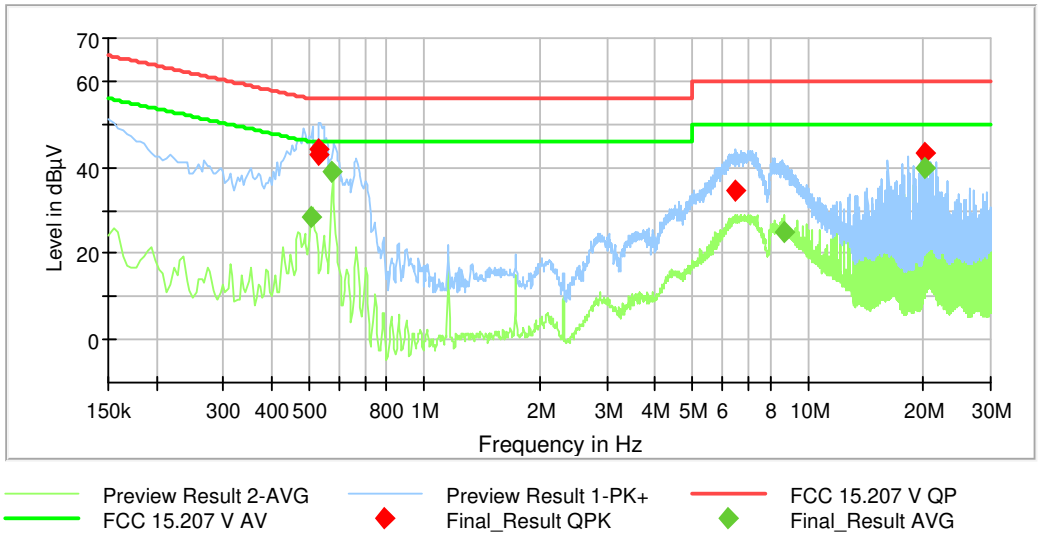
5.4.3 Test results (Conducted emissions on power supply lines)

Ambient temperature:	21.7 °C
Relative humidity:	64 %

Date:	22.07.2025
Tested by:	M. EPPINGER

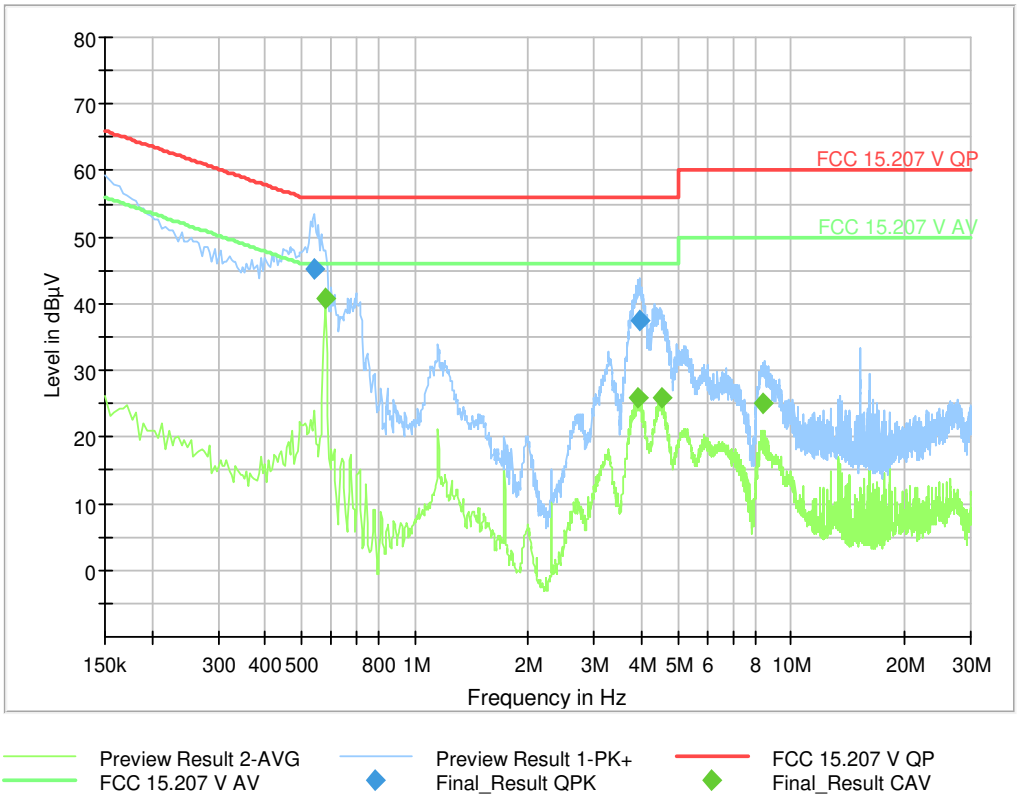
The curves in the diagrams below only represent for each frequency point the maximum measured value of all preliminary measurements which were made for each power supply line. The top measured curve represents the peak measurement and the bottom measured curve the average measurement. The quasi-peak measured points are marked by ◆ and the average measured points by ◆.

EUT 1, 120 V / AC 60 Hz:



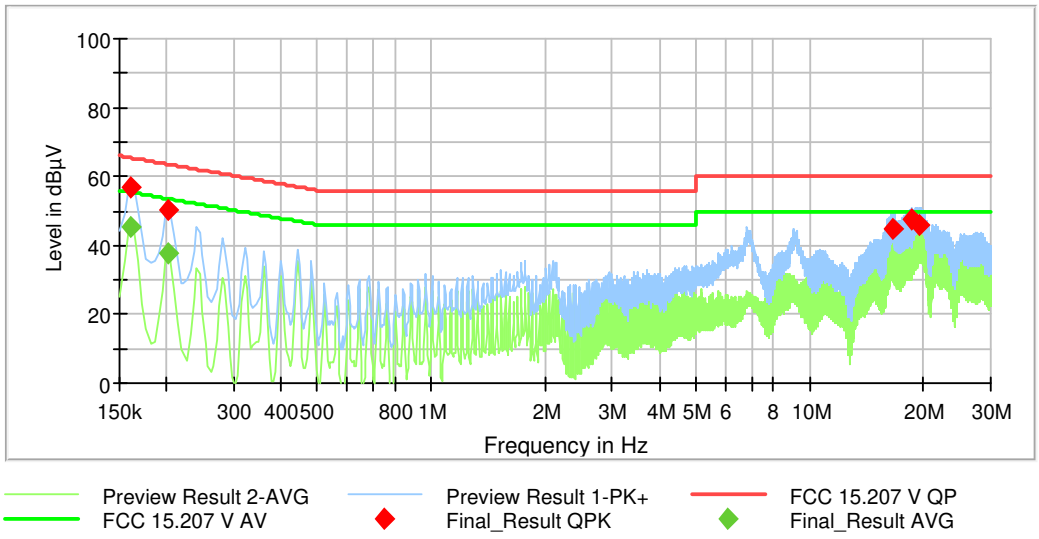
Frequency [MHz]	QuasiPeak [dB(µV)]	Average [dB(µV)]	Limit [dB(µV)]	Margin [dB]	Line	PE	Corr. [dB]
0.509100	---	28.52	46.00	17.48	L1	GND	9.9
0.530700	42.79	---	56.00	13.21	N	GND	9.9
0.532500	44.35	---	56.00	11.65	N	GND	9.9
0.576600	---	38.84	46.00	7.16	L1	GND	9.9
6.505800	34.39	---	60.00	25.61	L1	GND	10.4
8.718000	---	25.08	50.00	24.92	N	GND	10.5
20.257800	43.25	---	60.00	16.75	N	GND	11.0
20.258700	---	39.65	50.00	10.35	N	GND	11.0

EUT 1, 240 V / AC 60 Hz:



Frequency [MHz]	QuasiPeak [dB(µV)]	Average [dB(µV)]	Limit [dB(µV)]	Margin [dB]	Line	PE	Corr. [dB]
0.541000	45.27	---	56.00	10.73	5000.0	9.000	N
0.577500	---	40.69	46.00	5.31	5000.0	9.000	N
3.912500	---	25.78	46.00	20.22	5000.0	9.000	N
3.961500	37.52	---	56.00	18.48	5000.0	9.000	N
4.508500	---	25.79	46.00	20.21	5000.0	9.000	L1
8.382000	---	25.11	50.00	24.89	5000.0	9.000	N

EUT 2:



Frequency [MHz]	QuasiPeak [dB(µV)]	Average [dB(µV)]	Limit [dB(µV)]	Margin [dB]	Line	PE	Corr. [dB]
0.160800	56.57	---	65.42	8.85	N	GND	9.8
0.160800	---	45.34	55.42	10.09	N	GND	9.8
0.201300	---	37.87	53.56	15.69	N	GND	9.8
0.201300	50.02	---	63.56	13.53	N	GND	9.8
16.481400	44.77	---	60.00	15.23	L1	GND	10.8
18.652200	47.27	---	60.00	12.73	N	GND	10.9
19.534200	45.80	---	60.00	14.20	N	GND	10.9

Test result: Passed

Test equipment (please refer to chapter 7 for details)
13 - 18

6 Measurement Uncertainties

Conducted measurements		
Measurement method	Standard used for calculating measurement uncertainty	Expanded measurement uncertainty (95 %) U_{lab}
Frequency error	ETSI TR 100 028	4.5×10^{-8}
Bandwidth measurements	-	9.0×10^{-8}
Conducted emissions from 150 kHz to 30 MHz with LISN	CISPR 16-4-2	2.8 dB

Radiated measurements		
Frequency error		
(Semi-) Anechoic chamber	ETSI TR 100 028	4.5×10^{-8}
OATS	ETSI TR 100 028	4.5×10^{-8}
Test fixture	ETSI TR 100 028	4.5×10^{-8}
Bandwidth measurements		
(Semi-) Anechoic chamber	-	9.0×10^{-8}
OATS	-	9.0×10^{-8}
Test fixture	-	9.1×10^{-8}
Radiated field strength M20		
CBL6112B @ 3 m 30 MHz – 1 GHz	CISPR 16-4-2	5.3 dB
R&S HL050 @ 3 m		
1 – 6 GHz	CISPR 16-4-2	5.1 dB
6 – 18 GHz	CISPR 16-4-2	5.4 dB
Flann Standard Gain Horns 18 – 40 GHz	-	5.9 dB
Radiated field strength M276		
R&S HL562E @ 3 m 30 MHz – 1 GHz	CISPR 16-4-2	4.8 dB
R&S HL050 @ 3 m	-	
1 – 6 GHz	CISPR 16-4-2	5.1 dB
6 – 18 GHz	CISPR 16-4-2	5.4 dB
Flann Standard Gain Horns 18 – 40 GHz	-	5.9 dB
OATS		
Field strength measurements below 30 MHz on OATS without ground plane	-	4.4 dB

7 Test Equipment used for Tests

No.	Test equipment	Type	Manufacturer	Serial No.	PM. No.	Cal. Date	Cal Due
1	Loop antenna	22.5 cm	PHOENIX TESTLAB GmbH	-	410085	Calibration not necessary	
2	Signal & spectrum analyzer	FSW43	Rohde & Schwarz	100586 & 100926	481720	07.05.2024	05.2026
3	Loop antenna	HFH2-Z2	Rohde & Schwarz	832609/014	480059	21.02.2024	02.2026
4	EMC test software	Elektra V5.10.00	Rohde&Schwarz		483755	Calibration not necessary	
5	RF Switch Matrix	OSP220	Rohde & Schwarz	101391	482976	Calibration not necessary	
6	Turntable	TT3.0-3t	Maturo	825/2612/.01	483224	Calibration not necessary	
7	Controller	NCD	Maturo	474/2612.01	483226	Calibration not necessary	
8	Semi Anechoic Chamber M276	SAC5-2	Albatross Projects	C62128-A540-A138-10-0006	483227	Calibration not necessary	
9	EMI receiver / Spectrum analyser	ESW44	Rohde & Schwarz	101828	482979	21.02.2024	02.2026
10	Attenuator 6 dB	WA2-6	Weinschel	8254	410119	Calibration not necessary	
11	Ultralog antenna	HL562E	Rohde & Schwarz	101079	482978	24.04.2024	04.2027
12	Antennasupport	BAM 4.5-P-10kg	Maturo	222/2612.01	483225	Calibration not necessary	
13	AC power supply	AC6803A AC Quelle 2000VA	Keysight	JPVJ002509	482350	Calibration not necessary	
14	Software	EMC32	Rohde & Schwarz	100061	481022	Calibration not necessary	
15	Shielded chamber M4	B83117-S1-X158	Siemens	190075	480088	Calibration not necessary	
16	EMI Receiver / Spectrum Analyser	ESIB 26	Rohde & Schwarz	100292	481182	22.02.2024	02.2026
17	Transient Filter Limiter	CFL 9206A	Teseq GmbH	38268	481982	28.03.2024	03.2026
18	LISN	NSLK8128	Schwarzbeck	8128155	480058	28.02.2024	02.2026
19	Loop antenna	HFH2-Z2	Rohde & Schwarz	100417	481912	21.02.2024	02.2026
20	Outdoor test site	-	PHOENIX TESTLAB GmbH	-	480293	Calibration not necessary	
21	EMI receiver / Spectrum analyser	ESI 40	Rohde & Schwarz	100064/040	480355	20.02.2024	03.2026

8 Test site Verification

Test equipment	PM. No.	Frequency range	Type of validation	According to	Val. Date	Val Due
Shielded chamber M4	480088	9 kHz – 30 MHz	GND-Plane	ANSI C63.4-2014	08.11.2022	07.11.2025
OATS Outdoor	480293	9 kHz – 30 MHz	-	ANSI C63.4-2014	-	-
Semi anechoic chamber M276	483227	30 – 1000 MHz	NSA	ANSI C63.4-2014 ANSI C63.4a-2017	01.03.2023	28.02.2026

9 Report History

Report Number	Date	Comment
F230729E10	14.08.2025	Initial Test Report
-	-	-
-	-	-

10 List of Annexes

Annex A	Test Setup Photos	5 pages
23-110729_External_Photographs_230V_2.pdf	External EUT Photos	5 pages
23-110729_Internal_Photographs_230V.pdf	Internal EUT Photos	6 pages

----- end of test report -----