PHOENIX TESTLAB

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Test Report

Report Number:

F240089E4

Equipment under Test (EUT):

Picomag Insertion

Applicant:

Endress+Hauser Flowtec AG

Manufacturer:

Endress+Hauser Flowtec AG

ilac-MRA

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

References

[1] **ANSI C63.4:2014** American National Standard for Methods of Measuring of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.

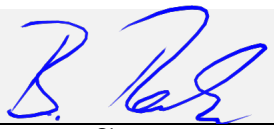
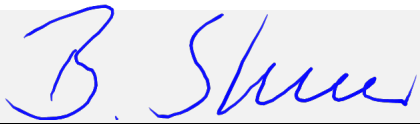
[2] **FCC 47 CFR Part 2:** General Rules and Regulations

[3] **FCC 47 CFR Part 15:** Radio Frequency Devices (Subpart B)

[4] **ICES-003 Issue 7: (October 2020)** Spectrum Management and Telecommunications. Interference-Causing Equipment Standard. Information Technology Equipment (Including Digital Apparatus) —Limits and Methods of Measurement

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 10.2.8.2 of ANSI C63.4 (2014). However, the measurement uncertainty is calculated and shown in this test report.

Tested and written by:		Bernward ROHDE 06.02.2025
	Signature	
Reviewed and approved by:		Bernd STEINER 07.02.2025
	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.

Contents: Page

1 Identification

1.1 Applicant

Name:	Endress+Hauser Flowtec AG
Address:	Kägenstr. 7, 4153 Reinach
Country:	Switzerland
Name for contact purposes:	---
Phone:	+41-61-715-6111
eMail address:	---
Applicant represented during the test by the following person:	---

1.2 Manufacturer

Name:	Endress+Hauser Flowtec AG
Address:	Kägenstr. 7, 4153 Reinach
Country:	Switzerland
Name for contact purposes:	---
Phone:	+41-61-715-6111
eMail address:	---
Manufacturer represented during the test by the following person:	---

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: *	Magnetic flowmeter
Model name: *	Picomag Insertion
Model number: *	DMI-AABEA1
Order number: *	DMI-AABEA1
FCC ID: *	2AIMC-DMI
IC certification number: *	21529-DMI
PMN: *	Picomag Insertion
HVIN: *	DMI
FVIN: *	01.00.00

	EUT number		
	1	2	3
Serial number: *	N/A	-	-
PCB identifier: *	234180013871462120	-	-
Hardware version: *	A	-	-
Software version: *	01.00.00	-	-

* Declared by the applicant

One EUT was 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

General			
Power supply EUT: *	DC		
Supply voltage EUT: *	U_{nom} = 24 V	U_{min} = 18 V	U_{max} = 30 V
Temperature range: *	-10°C to +85°C		

* Declared by the applicant

Bluetooth part	
Fulfils Bluetooth specification: *	Bluetooth Low Energy (BLE) 5.0
Operating frequency range: *	2402 to 2480 MHz
Number of channels: *	BLE: 40
Type of modulation: *	GFSK (1 Mbit/s, 2Mbit/s)
Antenna type: *	Internal PCB antenna
Antenna name: *	N/A
Antenna gain: *	-11 dBi
Antenna connector: *	None

* Declared by the applicant

Ports / Connectors				
Identification	Connector		Length during test	Shielding (Yes / No)
	EUT	Ancillary		
Connection Line	M12	Power Supply and DMM (current measurement)	typical 3m (up to 30m allowed)	No
-	-	-	-	-

Equipment used for testing	
AC adapter *2	PHOENIX CONTACT MINI-PS.100-240AC/24DC/1.3

*2 Provided by the laboratory

1.6 Dates

Date of receipt of test sample:	22.07.2024
Start of test:	04.11.2024
End of test:	20.11.2024

2 Operational States

Description of function of the EUT:

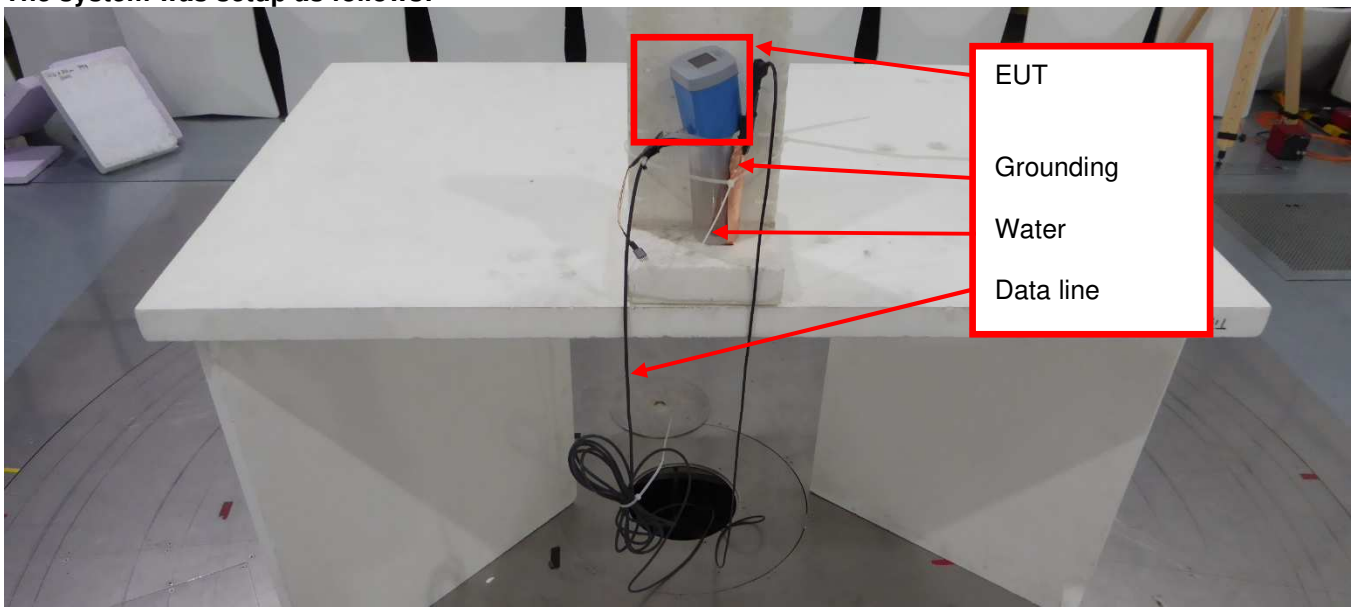
The EUT is an electromagnetic Flowmeter with Bluetooth Low Energy capability. The normal use case is a BTLE connection to a mobile device like a smartphone.

The EUT:

The following states were defined as the operating conditions:

The EUT was supplied by 24 V DC during all tests. The EUT was set into water, the water/container was grounded, the data line was left open as declared by the applicant. During all test the EUT was operating in normal operation mode, Bluetooth was active and in idle mode (advertising/pairing mode).

The system was setup as follows:



3 Additional Information

The EUT was not labeled as required by FCC / IC.

4 Overview

Conducted emissions FCC 47 CFR Part 15 section 15.107 (b) [3] ICES-003 Issue 7 section 3.2.1[4]					
Application	Frequency range	Limits	Reference standard	Tested EUT	Status
AC supply line Class A	0.15 to 0.5 MHz 0.5 to 30 MHz	79 dB(µV) QP 66 dB(µV) AV 73 dB(µV) QP 60 dB(µV) AV	ANSI C63.4	1	Passed
*: Decreases with the logarithm of the frequency					

Radiated emissions FCC 47 CFR Part 15 section 15.109 (b) [3]					
Application	Frequency range	Limits	Reference standard	Tested EUT	Status
Radiated Emission Class A	30 to 88 MHz 88 to 216 MHz 216 to 960 MHz 960 to 1000 MHz above 1000 MHz	39.0 dB(µV/m) QP at 10 m* 43.5 dB(µV/m) QP at 10 m* 46.5 dB(µV/m) QP at 10 m* 49.5 dB(µV/m) QP at 10 m* 49.5 dB(µV/m) CAV at 10 m* and 69.5 dB(µV/m) PK at 10 m*	ANSI C63.4	1	Passed

*as stated in 47 CFR 15.31(f)(1), the measurement was conducted @3m measuring distance with a distance correction factor of 20*log(3m / 10m) = -10.5 dB

Radiated emissions ICES-003 Issue 7 section 3.2.2 [4]					
Application	Frequency range	Limits	Reference standard	Tested EUT	Status
Radiated Emission Class A	30 to 88 MHz 88 to 216 MHz 216 to 230 MHz 230 to 960 MHz 960 to 1000 MHz above 1000 MHz	50.0 dB(µV/m) QP at 3 m 54.0 dB(µV/m) QP at 3 m 56.9 dB(µV/m) QP at 3 m 57.0 dB(µV/m) QP at 3 m 60.0 dB(µV/m) QP at 3 m 60 dB(µV/m) AV at 3 m and 80 dB(µV/m) PK at 3 m	ANSI C63.4	1	Passed

Remark: As declared by the applicant the highest internal clock frequency is 2.48 GHz.
Therefore the radiated emission measurement must be carried out up to 5th of the highest internal clock frequency up to 12.4 GHz, in this case the measurement was carried out up to 13 GHz.

The EUT was classified by the applicant as CLASS A equipment.

5 Results

5.1 Test setups

5.1.1 Radiated: 30 MHz to 1 GHz

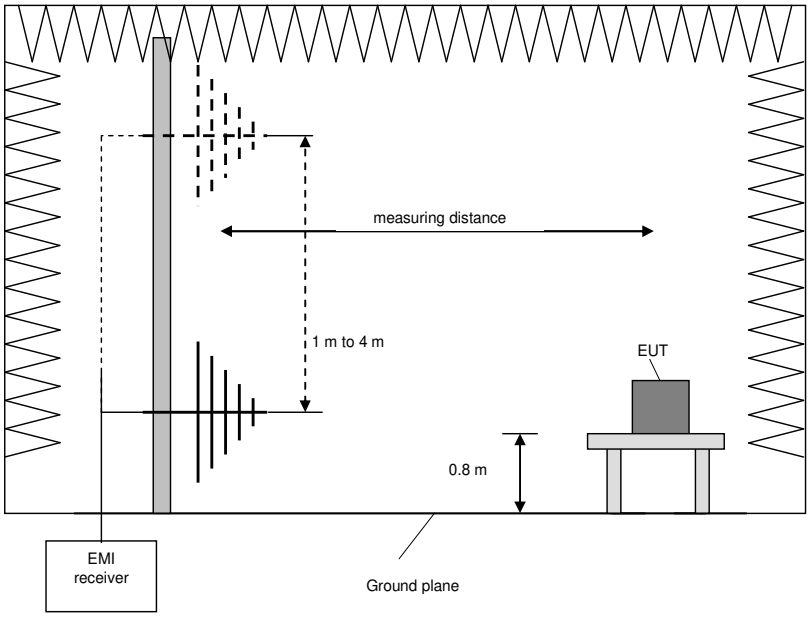
5.1.1.1 Preliminary and final measurement 30 MHz to 1 GHz

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.

5.1.2 Radiated: 1 GHz to 40 GHz

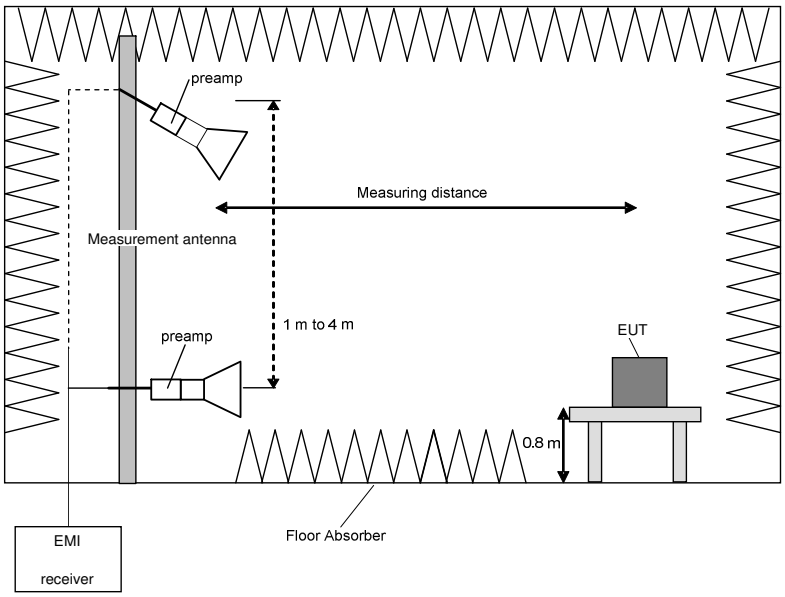
5.1.2.1 Preliminary and final measurement 1 to 40 GHz

The preliminary and final measurements are performed in a semi-anechoic chamber at a measuring distance of 3 meters, with floor absorbers between EUT and measuring antenna. 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. While changing the height, the measuring antenna gets tilted so that it is always aiming at the EUT.

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	1 - 40 GHz	250 kHz	1 MHz	-	Peak Average
Frequency peak search	+ / - 1 MHz	50 kHz	1 MHz	100 ms	Peak
Final measurement	1 - 40 GHz	-	1 MHz	100 ms	Peak Average



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:

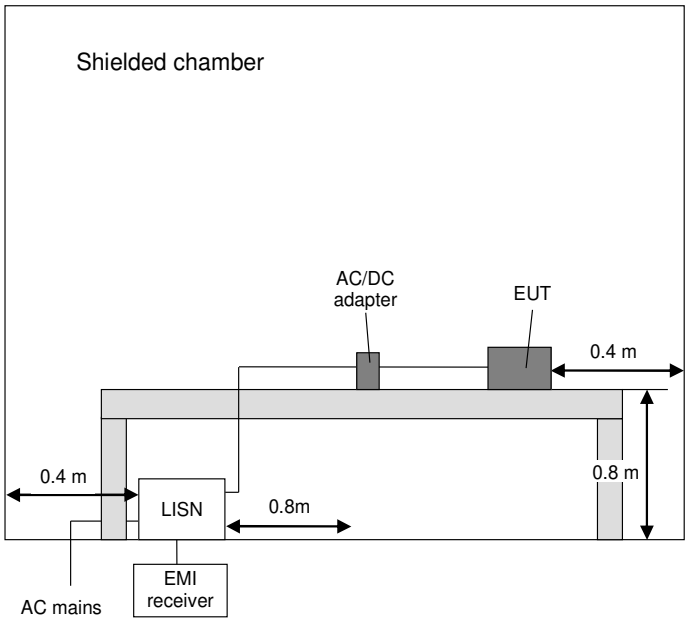
1) Select the highest frequency peaks (lowest margin to the limit) for the final measurement.
2) The software determines the exact peak frequencies by doing a partial scan with reduced step size of the pre-scan of the selected peaks.
3) If the EUT is portable or ceiling mounted, find the worst-case EUT 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.

5.1.3 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



5.2 Radiated emissions

5.2.1 Test setup (Maximum unwanted emissions)

Test setup (Maximum unwanted emissions)			
Used	Setup	See sub-clause	Comment
☒	Radiated: 30 MHz to 1 GHz / 1 GHz to 40 GHz	5.1.1 / 5.1.2	-

5.2.2 Test method (Maximum unwanted emissions)

☒ Test method (radiated) see sub-clause 5.1.1 / 5.1.2 as described herein

5.2.3 Test results (Maximum unwanted emissions)

5.2.3.1 Test results (30 MHz – 1 GHz)

Ambient temperature:	22 °C
Relative humidity:	35 %

Date:	20.11.2024
Tested by:	B. ROHDE

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 detail information of test set-up and the cable guide refer to the pictures in the annex A in the test report.

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

Remark: Only nominal position was tested

Calculations:

Result [dBµV/m] = Reading [dBµV] + Correction [dB/m] + DCF* [dB] (if applicable)

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

Distance correction* [dB] DCF* [dB]

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

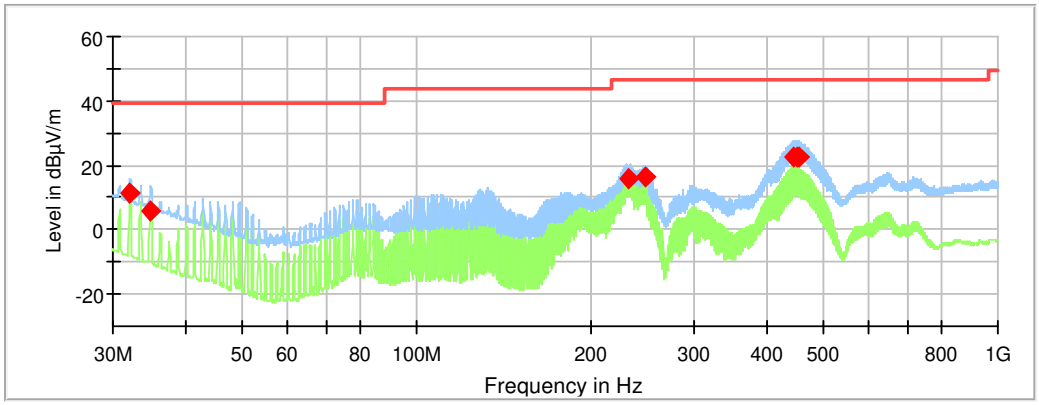
*as stated in 47 CFR 15.31(f)(1), the measurement was conducted @3m measuring distance with a distance correction factor of 20*log(3m / 10m) = -10.5 dB

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:

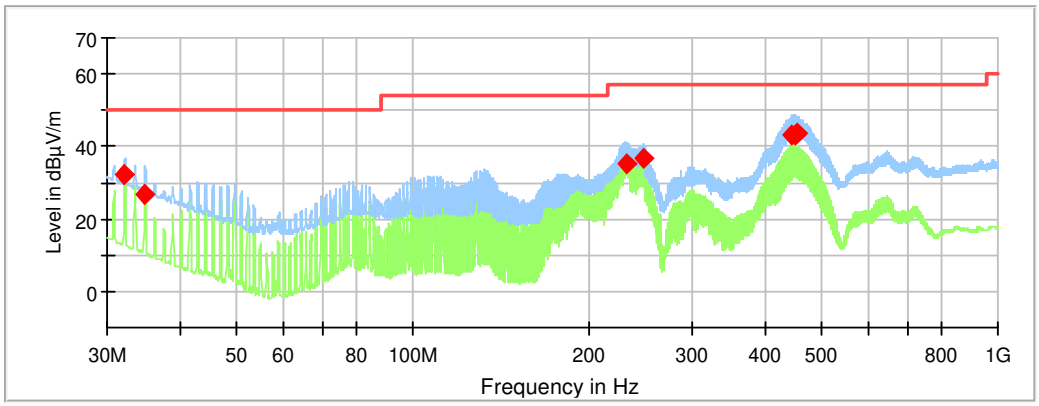
Spurious emissions from 30 MHz to 1 GHz (operation mode 1 – nominal position):

FCC 15.109



Preview Result 2-AVG
Preview Result 1-PK+
47 CFR §15.109 30 MHz - 1 GHz Class A (10m) Quasi-peak
Final_Result QPK

ICES-003



Preview Result 2-AVG
Preview Result 1-PK+
ICES-003 Issue 7 30 MHz - 1 GHz Class A (3m) Quasi-peak
Final_Result QPK

Result tables:

(Operation mode 1):

Results according to FCC 47 CFR Part 15 section 15.109 (b) [3] @10m

Frequency [MHz]	Result (QP) [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Readings [dBµV]	Correction [dB/m]	DCF [dB]	Height [cm]	Azimuth [deg]	Pol. (H/V)	Position #
32.010	21.8	40.0	18.2	7.8	24.4	-10.5	101	1	V	1
34.710	16.4	40.0	23.6	4.1	22.8	-10.5	103	9	V	1
231.234	14.7	46.0	31.3	8.6	16.6	-10.5	216	262	V	1
247.518	14.2	46.0	31.8	7.8	16.9	-10.5	214	76	V	1
445.350	32.9	46.0	13.1	20.8	22.6	-10.5	115	52	V	1
450.630	32.8	46.0	13.2	20.5	22.8	-10.5	116	59	V	1
454.638	33.0	46.0	13.0	20.5	22.9	-10.5	100	50	V	1

Results according to ICES-003 Issue 7 section 3.2.2 [4] @3m

Frequency [MHz]	Result (QP) [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Readings [dBµV]	Correction [dB/m]	Height [cm]	Azimuth [deg]	Pol. (H/V)	Position #
32.0	32.2	50.0	17.8	7.8	24.4	101	1	V	1
34.7	26.9	50.0	23.1	4.1	22.8	103	9	V	1
231.2	25.2	57.0	31.9	8.6	16.6	216	262	V	1
247.5	24.7	57.0	32.3	7.8	16.9	214	76	V	1
445.4	43.4	57.0	13.6	20.8	22.6	115	52	V	1
450.6	43.3	57.0	13.8	20.5	22.8	116	59	V	1
454.6	43.4	57.0	13.6	20.5	22.9	100	50	V	1

Test result: Passed

Test equipment (please refer to chapter 7 for details)
1 - 8

5.2.3.2 Test results (radiated 1 to 13 GHz)

Ambient temperature:	22 °C
Relative humidity:	35 %

Date:	04.11.2024
Tested by:	B. ROHDE

Position of EUT: For tests for f between 1 GHz and the 5th harmonic, 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 detail information of test set-up and the cable guide refer to the pictures in the annex A in the test report.

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

Remark: Only nominal position was tested

Calculation:

Max Peak [dBµV/m] = Reading [dBµV] + Correction [dB/m]

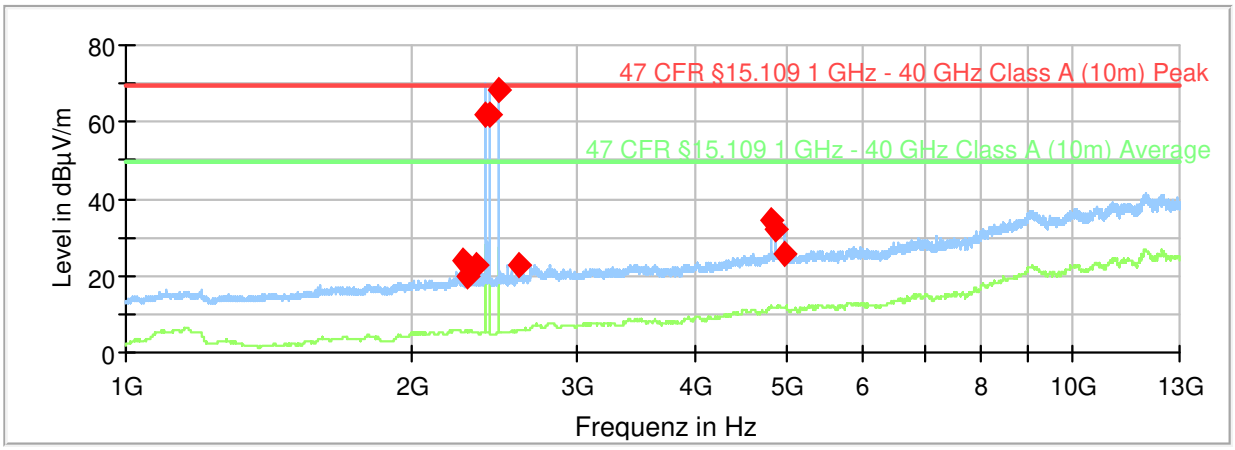
Average [dBµV/m] = Reading [dBµV] + Correction [dB/m]

Correction [dB/m] = AF [dB/m] + Cable attenuation [dB] + optional preamp gain [dB]+DCCF* [dB]
* (if applicable – only for Average values, that are fundamental related)

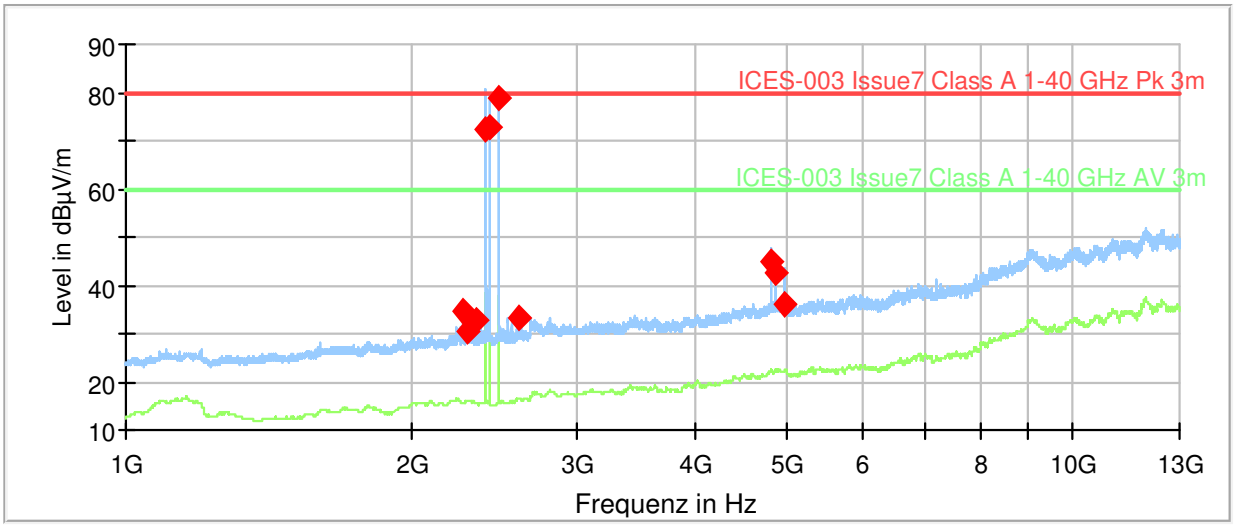
Margin [dB] = Limit [dBµV/m] – Max Peak | Average [dBµV/m]

The curves in the diagram only represent the maximum measured value for each frequency point of all preliminary measurements, which were carried out with various EUT and antenna positions.
The top measured curve represents the peak measurement. The measured points marked with "◆" are frequency points for the final peak detector measurement. These values are indicated in the following table. The bottom measured curve represents the average measurement. The measured points marked with "◆" are frequency points for the final average detector measurement.

Worst case plots:



Preview Result 2-AVG
Preview Result 1-PK+
47 CFR §15.109 1 GHz - 40 GHz Class A (10m) Peak
47 CFR §15.109 1 GHz - 40 GHz Class A (10m) Average
Final_Result PK+
Final_Result AVG



Preview Result 2-AVG
ICES-003 Issue7 Class A 1-40 GHz Pk 3m
Final_Result PK+

Preview Result 1-PK+
ICES-003 Issue7 Class A 1-40 GHz AV 3m
Final_Result AVG

Result tables:

Operation mode 1:

Results according to FCC 47 CFR Part 15 section 15.109 (b) [3] @10m

Frequency [MHz]	MaxPeak [dB(µV/m)]	Average [dB(µV/m)]	Limit [dB(µV/m)]	Margin [dB(µV/m)]	Height [cm]	Pol [H/V]	Azimuth [deg]	Corr. [dB/m]	DCF [dB]
2274.000	24.0	---	69.5	45.5	400	V	191	-2.7	-10.5
2297.750	19.9	---	69.5	49.6	282	H	208	-2.4	-10.5
2352.000	22.5	---	69.5	47.0	201	V	208	-2.2	-10.5
2402.250	61.7	---	69.5	7.8	200	H	201	-1.9	-10.5
2425.750	62.1	---	69.5	7.4	200	H	209	-1.7	-10.5
2479.750	68.2	---	69.5	1.3	161	V	214	-1.7	-10.5
2608.000	22.6	---	69.5	46.9	262	V	192	-0.9	-10.5
4804.500	34.5	---	69.5	35.0	248	V	210	7.7	-10.5
4851.500	31.9	---	69.5	37.6	285	V	188	7.6	-10.5
4959.500	25.6	---	69.5	43.9	109	H	191	7.7	-10.5

* emissions are the wanted radio signal and are not part of this test report, for details see F240089E3 by PHOENIX TESTLAB GmbH

Results according to ICES-003 Issue 7 section 3.2.2 [4] @3m

Frequency [MHz]	MaxPeak [dB(µV/m)]	Average [dB(µV/m)]	Limit [dB(µV/m)]	Margin [dB(µV/m)]	Height [cm]	Pol [H/V]	Azimuth [deg]	Corr. [dB/m]
2274.000	34.5	---	80.0	45.5	400	V	191	-2.7
2297.750	30.4	---	80.0	49.6	282	H	208	-2.4
2352.000	33.0	---	80.0	47.0	201	V	208	-2.2
2402.250	72.2	---	80.0	7.8	200	H	201	-1.9
2425.750	72.6	---	80.0	7.4	200	H	209	-1.7
2479.750	78.7	---	80.0	1.3	161	V	214	-1.7
2608.000	33.1	---	80.0	46.9	262	V	192	-0.9
4804.500	45.0	---	80.0	35.0	248	V	210	7.7
4851.500	42.4	---	80.0	37.6	285	V	188	7.6
4959.500	36.1	---	80.0	43.9	109	H	191	7.7

Test result: Passed

Test equipment (please refer to chapter 7 for details)
3 - 10

5.3 AC power-line conducted emissions

5.3.1 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	5.1.3	-
☐	Not applicable, because …	-	-

5.3.2 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
☒	7.3; 11.5; 11.8	Tabletop equipment testing	5.1.3	AC switching power adaptor of the shelf
☐	7.3; 11.6; 11.8	Floor-standing equipment testing	-	-

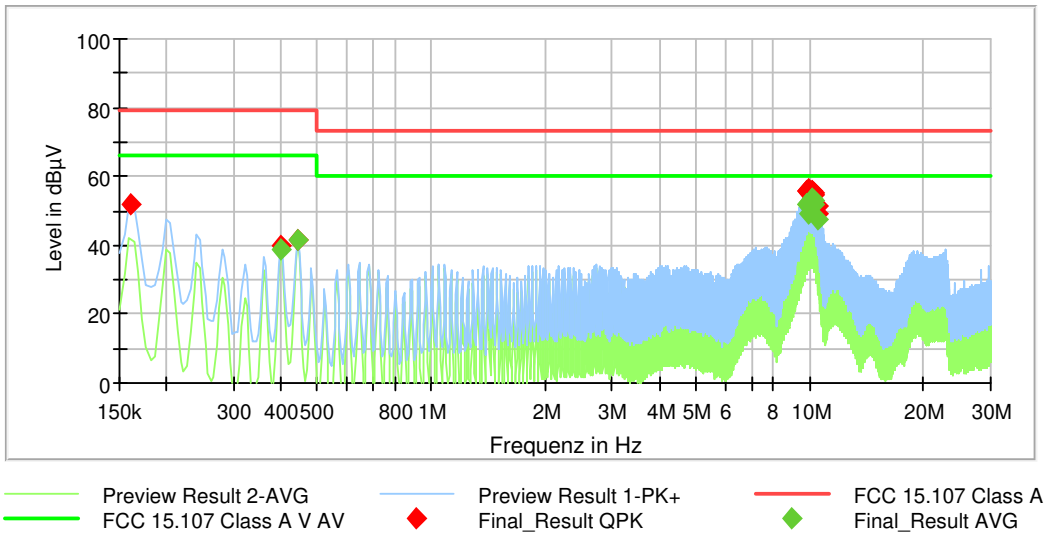
The AC power adaptor provided by the applicant was used for the tests:
PHOENIX CONTACT MINI-PS.100-240AC/24DC/1.3
The power adaptor itself was supplied by 120V_{AC} 60Hz.

5.3.3 Test results (Conducted emissions on power supply lines)

Ambient temperature:	22 °C
Relative humidity:	28 %

Date:	04.11.2024
Tested by:	B. ROHDE

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 ▼.



Frequency [MHz]	QuasiPeak [dB(µV)]	Average [dB(µV)]	Limit [dB(µV)]	Margin [dB]	Line	PE	Corr. [dB]
0.161	51.8	---	79.0	27.2	L1	GND	9.8
0.402	---	38.9	66.0	27.1	L1	GND	9.9
0.402	39.8	---	79.0	39.2	L1	GND	9.9
0.443	---	41.3	66.0	24.7	N	GND	9.9
0.443	41.5	---	79.0	37.5	N	GND	9.9
9.779	---	52.1	60.0	8.0	L1	GND	10.6
9.780	55.8	---	73.0	17.3	L1	GND	10.6
9.820	---	52.0	60.0	8.0	L1	GND	10.6
9.821	56.0	---	73.0	17.0	L1	GND	10.6
9.860	56.0	---	73.0	17.0	L1	GND	10.6
9.860	---	51.2	60.0	8.8	L1	GND	10.6
9.900	55.9	---	73.0	17.1	L1	GND	10.6
9.900	---	49.5	60.0	10.6	L1	GND	10.6
10.100	---	52.0	60.0	8.0	L1	GND	10.6
10.102	55.7	---	73.0	17.3	L1	GND	10.6
10.140	54.9	---	73.0	18.1	L1	GND	10.6
10.141	---	53.5	60.0	6.5	L1	GND	10.6
10.181	---	53.8	60.0	6.2	L1	GND	10.6
10.182	55.5	---	73.0	17.5	L1	GND	10.6
10.222	---	53.3	60.0	6.7	L1	GND	10.6
10.223	55.3	---	73.0	17.7	L1	GND	10.6
10.262	---	51.8	60.0	8.2	L1	GND	10.6
10.263	54.8	---	73.0	18.2	L1	GND	10.6
10.463	51.2	---	73.0	21.8	L1	GND	10.6
10.542	49.2	---	73.0	23.9	L1	GND	10.6
10.544	---	47.4	60.0	12.7	L1	GND	10.6

Test result: Passed

Test equipment (please refer to chapter 7 for details)
11 - 16

6 Measurement Uncertainties

Conducted measurements		
Measurement method	Standard used for calculating measurement uncertainty	Expanded measurement uncertainty (95 %) U_{lab}
Conducted emissions from 150 kHz to 30 MHz with LISN	CISPR 16-4-2	2.8 dB

Radiated measurements		
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

7 Test Equipment used for Tests

No.	Test equipment	Type	Manufacturer	Serial No.	PM. No.	Cal. Date	Cal Due
1	Attenuator 6 dB	WA2-6	Weinschel	--	482793	Calibration not necessary	
2	Ultralog Antenna	HL562E	Rohde & Schwarz	101079	482978	24.04.2024	04.2027
3	RF Switch Matrix	OSP220	Rohde & Schwarz	101391	482976	Calibration not necessary	
4	Turntable	TT3.0-3t	Maturo	825/2612/.01	483224	Calibration not necessary	
5	Antenna support	BAM 4.5-P-10kg	Maturo	222/2612.01	483225	Calibration not necessary	
6	Controller	NCD	Maturo	474/2612.01	483226	Calibration not necessary	
7	Semi Anechoic Chamber M276	SAC5-2	Albatross Projects	C62128-A540-A138-10-0006	483227	Calibration not necessary	
8	EMI Test receiver	ESW44	Rohde & Schwarz	101828	482979	21.02.2024	02.2026
9	Log.-Per. antenna	HL050	Rohde & Schwarz	100908	482977	22.09.2022	09.2025
10	Low Noise Amplifier 100 MHz - 18 GHz	LNA-30-00101800-25-10P	Narda-Miteq	2110917	482967	20.02.2024	02.2026
11	LISN	NSLK8128	Schwarzbeck	8128155	480058	28.02.2024	02.2026
12	AC power supply	AC6803A AC Quelle 2000VA	Keysight	JPVJ002509	482350	Calibration not necessary	
13	Software	EMC32	Rohde & Schwarz	100061	481022	Calibration not necessary	
14	Shielded chamber M4	B83117-S1-X158	Siemens	190075	480088	Calibration not necessary	
15	EMI Receiver / Spectrum Analyser	ESIB 26	Rohde & Schwarz	100292	481182	22.02.2024	02.2026
16	Transient Filter Limiter	CFL 9206A	Teseq GmbH	38268	481982	28.03.2024	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
Semi anechoic chamber M276	483227	30 – 1000 MHz	NSA	ANSI C63.4-2014 ANSI C63.4a-2017	01.03.2023	28.02.2026
Semi anechoic chamber M276	483227	1 -18 GHz	SVSWR	CISPR 16-1-4 + Cor1:2010 + A1:2012 +A2:2017	28.02.2023	27.02.2026

9 Report History

Report Number	Date	Comment
F240089E4	06.02.2025	Initial Test Report
-	-	-
-	-	-

10 List of Annexes

Annex A Test Setup Photos 3 pages

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