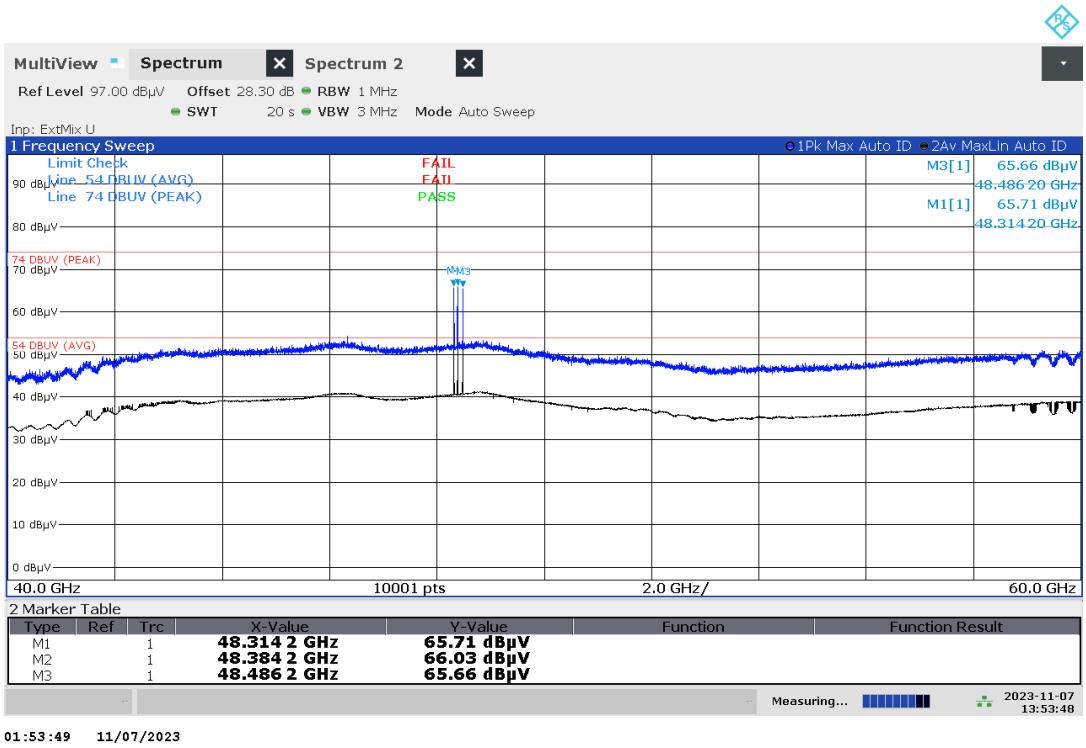
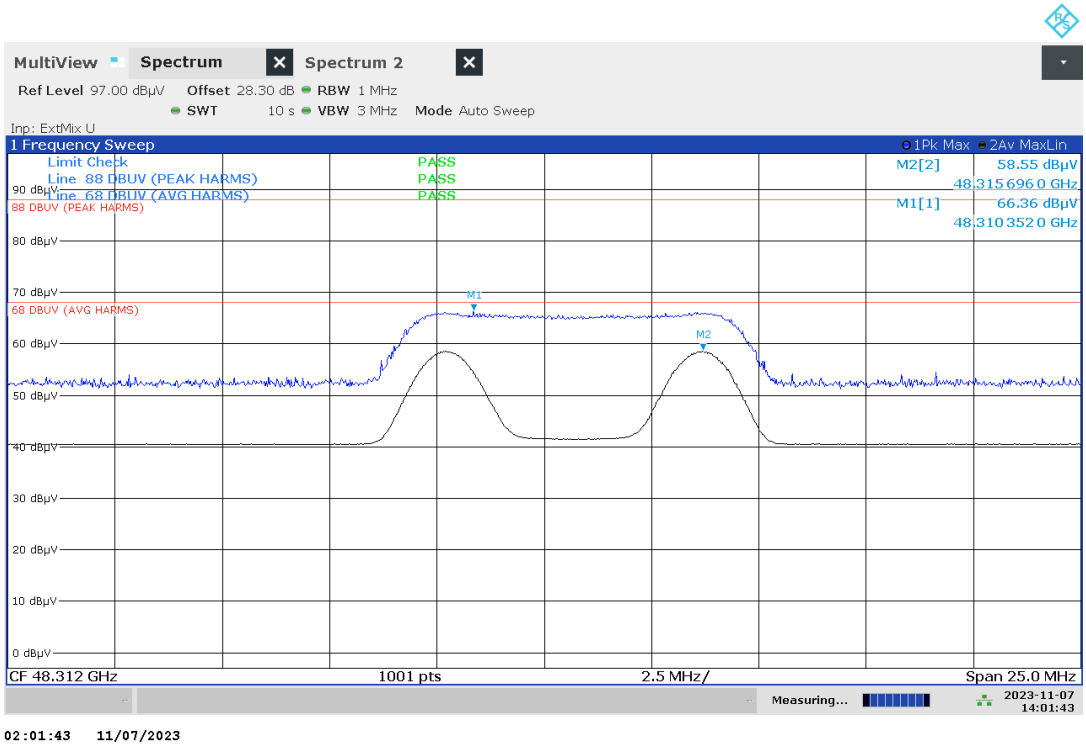
Plot no. 42: radiated emissions 40 GHz – 60 GHz, hor./vert. polarization, normal operation, f1 & f4 & f8

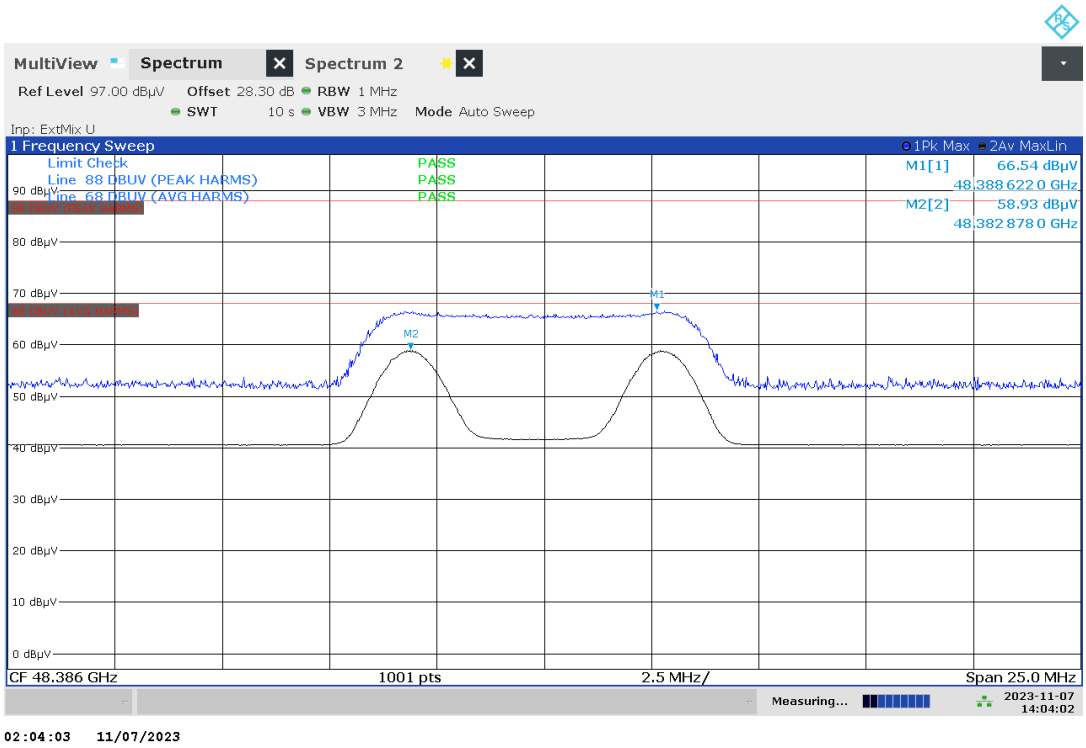


Note: Plot shows 2nd harmonics, see next plots!

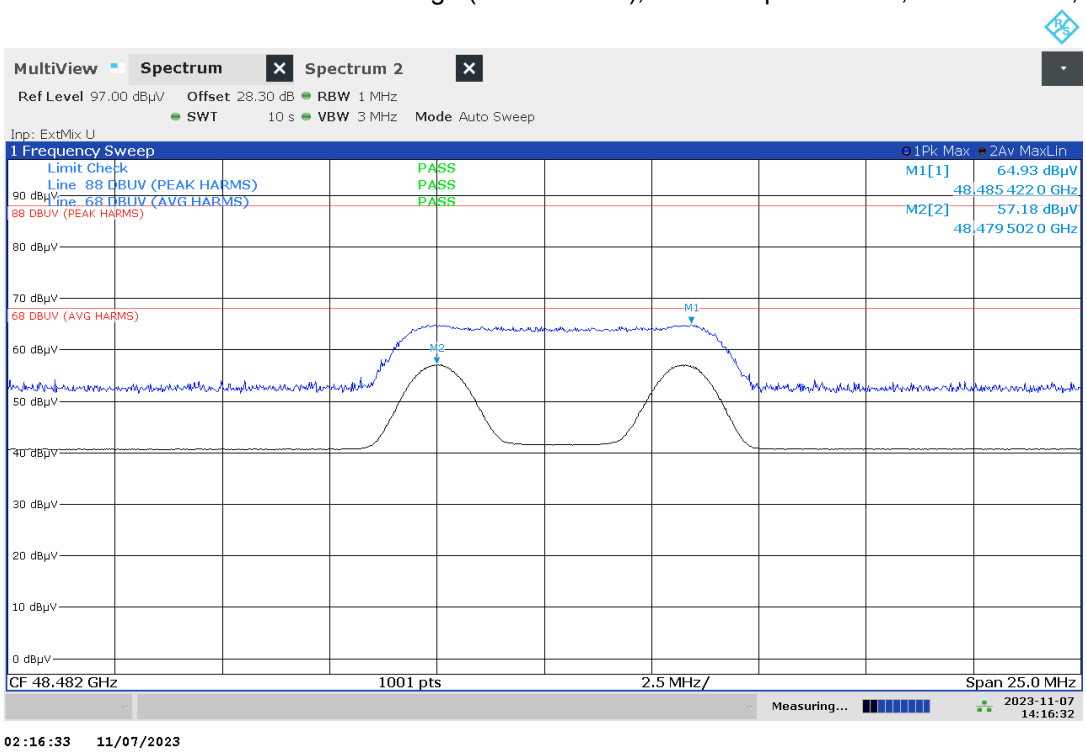
Plot no. 43: radiated emissions 48.312 GHz range (2nd harmonic), hor./vert. polarization, normal mode, f1



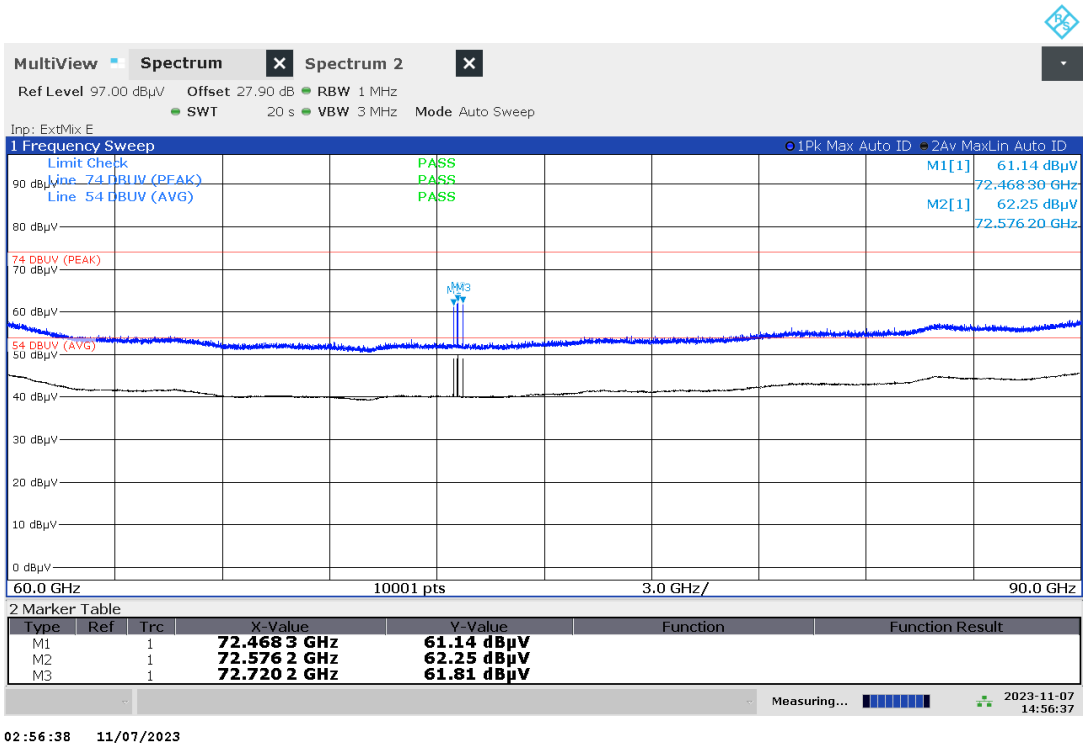
Plot no. 44: radiated emissions 48.386 GHz range (2nd harmonic), hor./vert. polarization, normal mode, f4



Plot no. 45: radiated emissions 48.482 GHz range (2nd harmonic), hor./vert. polarization, normal mode, f8

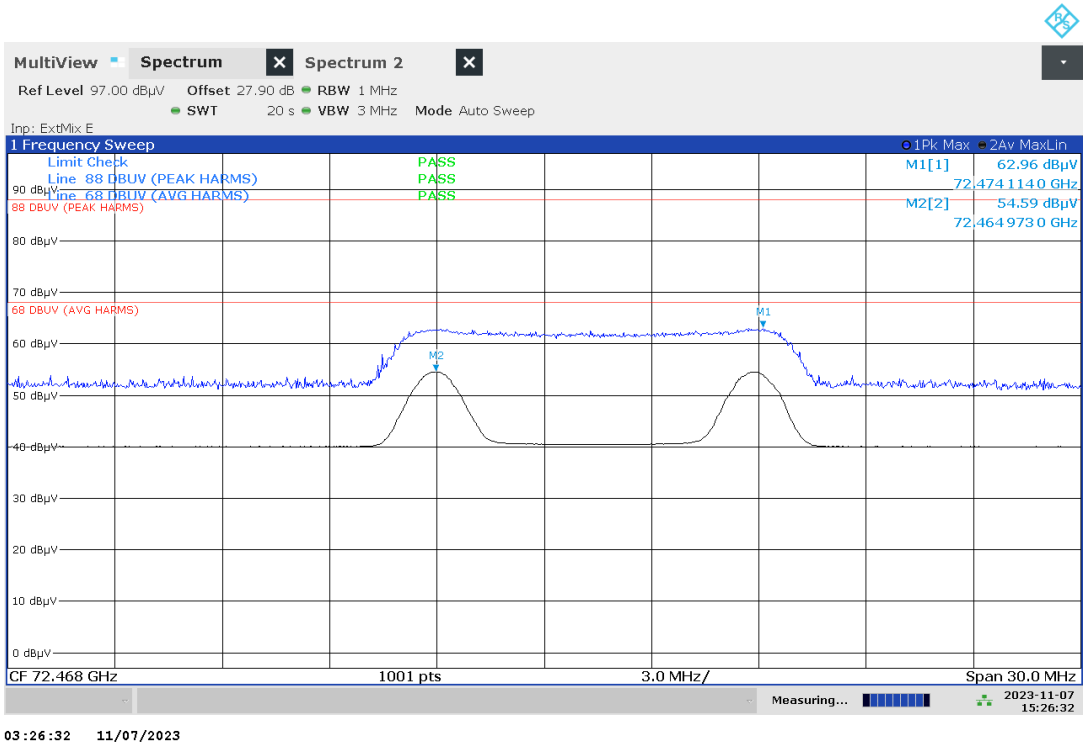


Plot no. 46: radiated emissions 60 GHz – 90 GHz, hor./vert. polarization, normal mode, f1 & f4 & f8

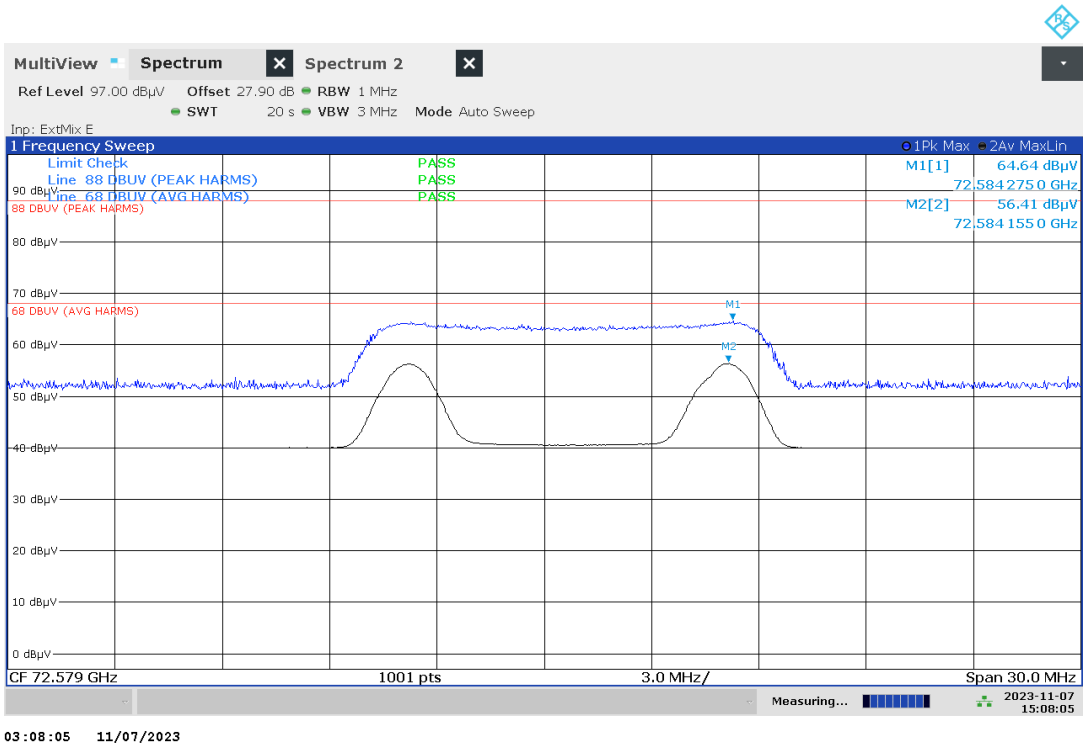


Note: Plot shows 3rd harmonics, see next plots!

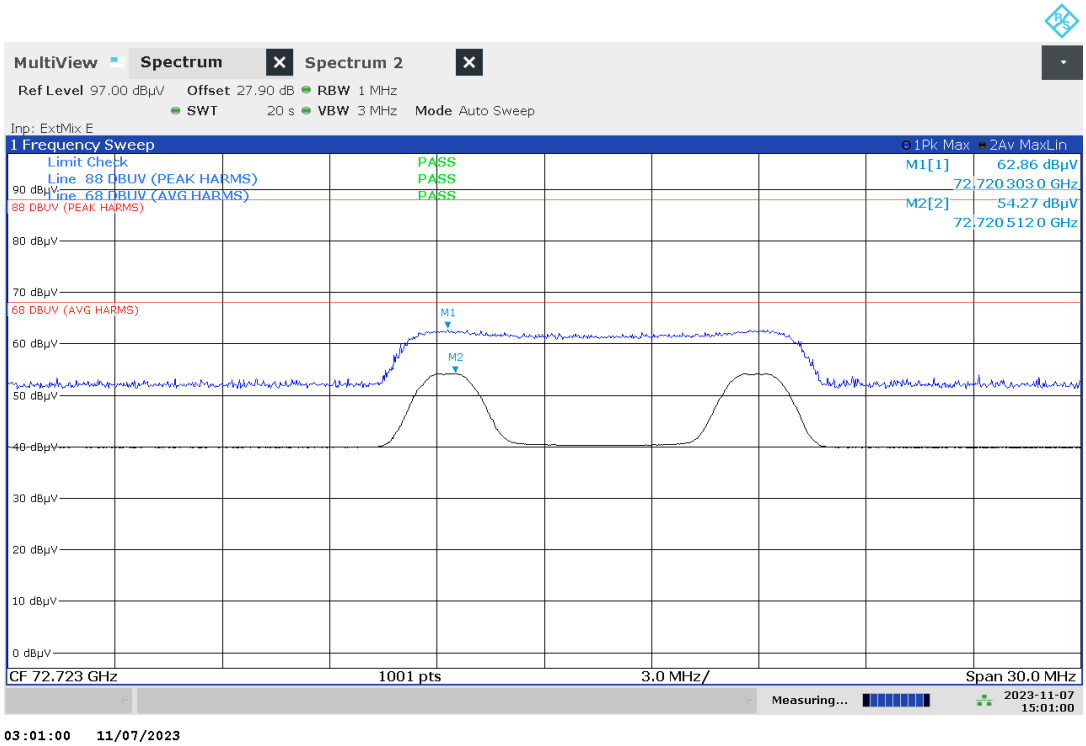
Plot no. 47: radiated emissions 72.468 GHz range (3rd harmonic), hor./vert. polarization, normal mode, f1



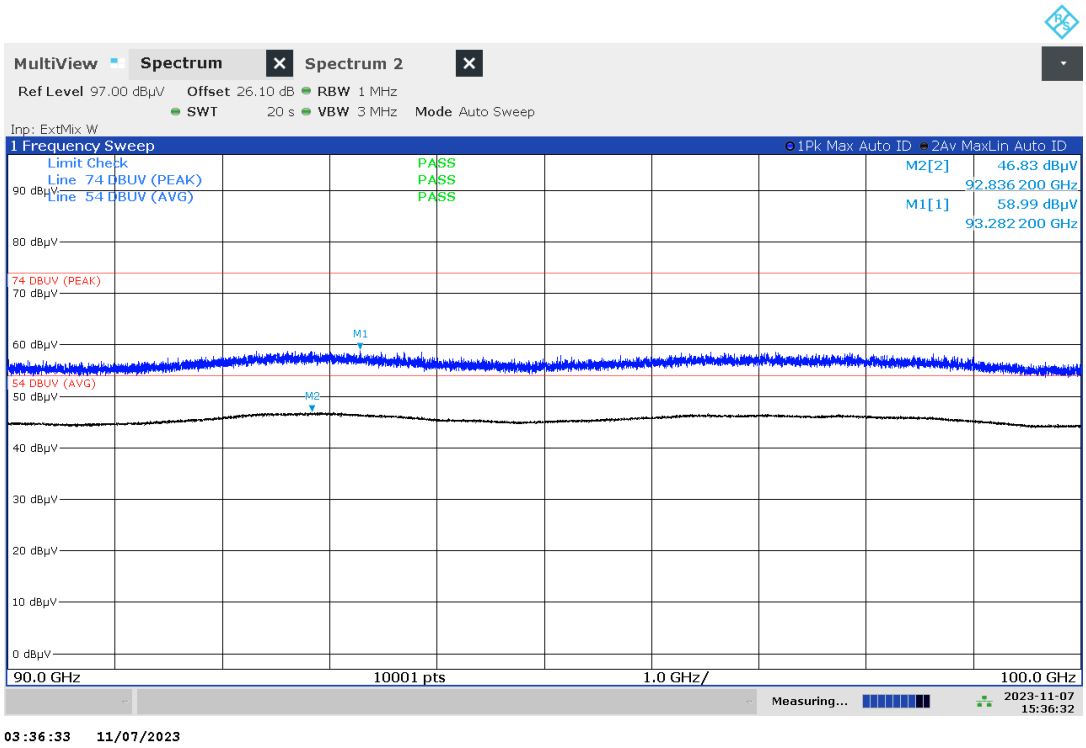
Plot no. 48: radiated emissions 72.579 GHz range (3rd harmonic), hor./vert. polarization, normal mode, f4



Plot no. 49: radiated emissions 72.723 GHz range (3rd harmonic), hor./vert. polarization, normal mode, f8



Plot no. 50: radiated emissions 90 GHz – 100 GHz, hor./vert. polarization, f1 & f4 & f8



7.5 AC Conducted Emissions

Description / Limits

§15.207 (a) Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 µH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency of emission [MHz]	Conducted limit [dBµV]	
	Quasi-Peak	Average
0.15 – 0.5	66 to 56*	56 to 46*
0.5 – 5.0	56	46
5.0 – 30	60	50
*Decreases with the logarithm of the frequency.		

§15.207 (c) Measurements to demonstrate compliance with the conducted limits are not required for devices which only employ battery power for operation and which do not operate from the AC power lines or contain provisions for operation while connected to the AC power lines. Devices that include, or make provisions for, the use of battery chargers which permit operating while charging, AC adapters or battery eliminators or that connect to the AC power lines indirectly, obtaining their power through another device which is connected to the AC power lines, shall be tested to demonstrate compliance with the conducted limits.

Test setup: see 8.5

Test results

See next pages!

Plot no. 51: conducted emissions, line L1

Spectrum Overview

EMI Final Results

Rg	Frequency [MHz]	QPK Level [dBµV]	QPK Limit [dBµV]	QPK Margin [dB]	AVG Level [dBµV]	AVG: CAV Limit [dBµV]	AVG Margin [dB]	Correction [dB]	Line	Meas. BW [kHz]	Meas. Time [s]
1	0.150	34.77	66.00	31.23	13.41	56.00	42.59	10.79	L1	9.000	15.000
1	0.258	33.03	61.49	28.46	12.31	51.49	39.18	9.73	L1	9.000	15.000
1	0.650	21.03	56.00	34.97	5.34	46.00	40.66	10.04	L1	9.000	15.000
1	0.937	20.66	56.00	35.34	12.11	46.00	33.89	9.94	L1	9.000	15.000
1	6.068	9.20	60.00	50.80	1.19	50.00	48.81	10.03	L1	9.000	15.000
1	7.624	11.97	60.00	48.03	2.54	50.00	47.46	10.08	L1	9.000	15.000

Plot no. 52: conducted emissions, neutral N

Spectrum Overview

EMI Final Results

Rg	Frequency [MHz]	QPK Level [dBµV]	QPK Limit [dBµV]	QPK Margin [dB]	AVG Level [dBµV]	AVG: CAV Limit [dBµV]	AVG Margin [dB]	Correction [dB]	Line	Meas. BW [kHz]	Meas. Time [s]
1	0.258	31.89	61.49	29.60	15.57	51.49	35.92	9.73	N	9.000	15.000
1	0.389	27.15	58.09	30.93	17.42	48.09	30.67	10.04	N	9.000	15.000
1	0.919	25.98	56.00	30.02	13.76	46.00	32.24	9.95	N	9.000	15.000
1	2.486	11.23	56.00	44.77	1.60	46.00	44.40	9.89	N	9.000	15.000
1	3.971	10.88	56.00	45.12	1.86	46.00	44.14	9.95	N	9.000	15.000
1	7.542	11.66	60.00	48.34	3.18	50.00	46.82	10.09	N	9.000	15.000

8 Test Setup Description

Typically, the calibrations of the test apparatus are commissioned to and performed by an accredited calibration laboratory. The calibration intervals are determined in accordance with the DIN EN ISO/IEC 17025. In addition to the external calibrations, the laboratory executes comparison measurements with other calibrated test systems or effective verifications. Cyclic chamber inspections and range calibrations are performed. Where possible, RF generating and signalling equipment as well as measuring receivers and analysers are connected to an external high-precision 10 MHz reference (GPS-based or rubidium frequency standard).

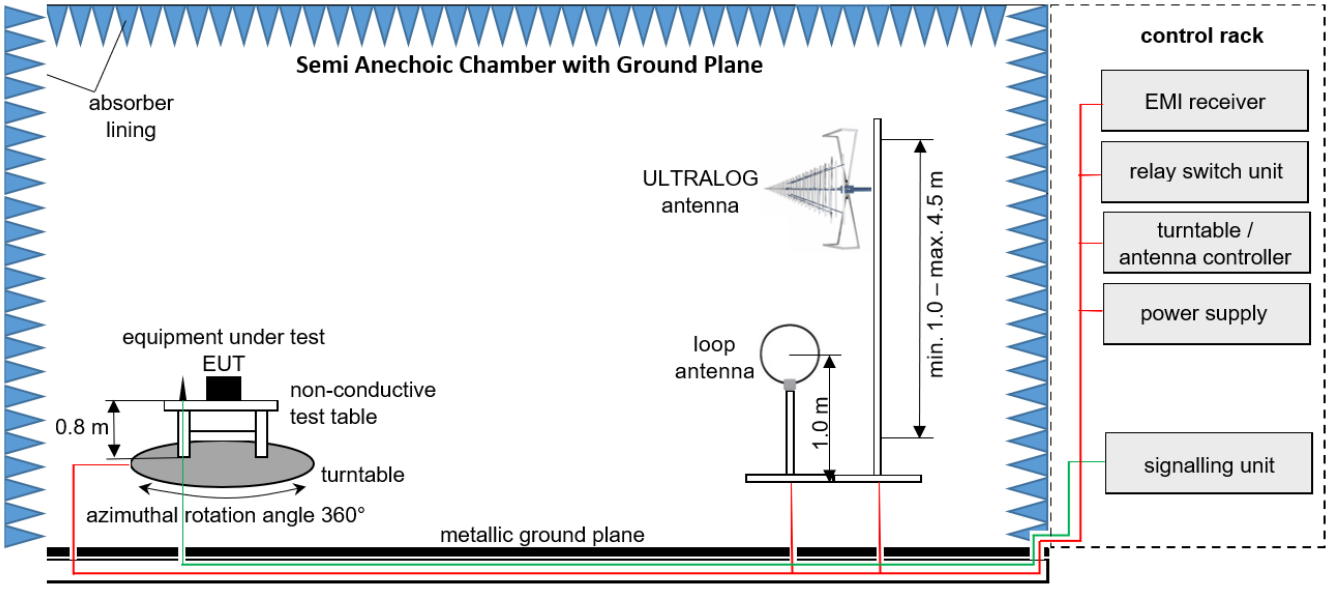
In order to simplify the identification of the equipment used at some special tests, some items of test equipment and ancillaries can be provided with an identifier or number in the equipment list below (Lab/Item).

Kind of calibration (abbreviations):

C = calibrated
CM = cyclic maintenance
NR = not required
L = locked

8.1 Semi Anechoic Chamber with Ground Plane

Radiated measurements are performed in vertical and horizontal plane in the frequency range 30 MHz to 1 GHz in a Semi Anechoic Chamber with a metallic ground plane. The EUT is positioned on a non-conductive test table with a height of 0.80 m above the metallic ground plane that covers the whole chamber. The receiving antennas conform to specification ANSI C63.10-2013, American National Standard for Testing Unlicensed Wireless Devices. These antennas can be moved over the height range between 1.0 m and 4.5 m in order to search for maximum field strength emitted from the EUT. The measurement distances between EUT and receiving antennas are indicated in the test setups for the various frequency ranges. For each measurement, the EUT is rotated in all three axes until the maximum field strength is received. The wanted and unwanted emissions are received by a spectrum analyzer where the detector modes and resolution bandwidths over various frequency ranges are set according to requirement ANSI C63.



Measurement distance: ULTRALOG antenna at 3 m; loop antenna at 3 m
EMC32 software version: 11.20.00

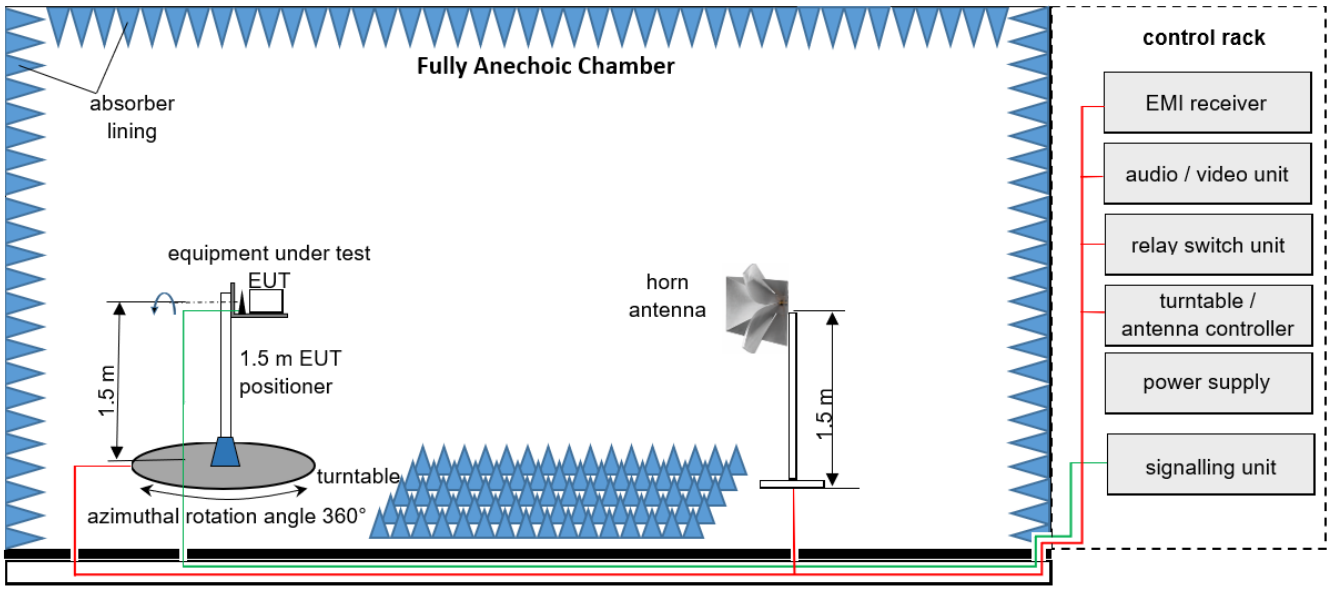
FS = UR + CL + AF
(FS-field strength; UR-voltage at the receiver; CL-loss of the cable; AF-antenna factor)

Example calculation:
FS [dBµV/m] = 12.35 [dBµV/m] + 1.90 [dB] + 16.80 [dB/m] = 31.05 [dBµV/m] (35.69 µV/m)

List of test equipment used:

No.	Equipment	Manufacturer	Type	Serial No.	IBL No.	Kind of Calibration	Last / Next Calibration
1	Power Supply	Rohde & Schwarz	IN 600	101554	LAB000824	NR	–
2	Antenna	Rohde & Schwarz	HL562E	102173	LAB000673	C	2022-10-17 → 36M → 2025-10-17
3	Power Supply	Chroma	61602		LAB000507	NR	–
4	Power Supply	Elektro-Automatik GmbH & Co. KG	EA-PSI 9080-40 T	2000230001	LAB000313	NR	–
5	Test table	innco systems GmbH	PT1208-080-RH	-	LAB000306	NR	–
6	Antenna Mast	Berlebach	Tripod HFH2-Z8 & -Z9	101762	LAB000292	NR	–
7	Positioner	maturo GmbH	TD 1.5-10KG		LAB000258	NR	–
8	Compressed Air	Implotex	1-850-30	-	LAB000256	NR	–
9	EMI Test Receiver	Rohde & Schwarz	ESW26	101481	LAB000236	C	2023-07-04 → 12M → 2024-07-04
10	Semi/Fully Anechoic Chamber	Albatross Projects GmbH	Babylon 5 (SAC 5)	20168.PRB	LAB000235	C	2022-01-31 → 36M → 2025-01-31
11	Measurement Software	Rohde & Schwarz	EMC32 V11.20		LAB000226	NR	–
12	Turntable	maturo GmbH	TT2.0-2t	TT2.0-2t/921	LAB000225	NR	–
13	Antenna Mast	maturo GmbH	CAM4.0-P	CAM4.0-P/316	LAB000224	NR	–
14	Antenna Mast	maturo GmbH	BAM4.5-P	BAM4.5-P/272	LAB000223	NR	–
15	Controller	maturo GmbH	FCU 3.0	10082	LAB000222	NR	–
16	Power Supply	Elektro-Automatik GmbH & Co. KG	EA-PS 2042-10 B	2878350292	LAB000191	NR	–
17	Pre-Amplifier	Schwarzbeck Mess-Elektronik OHG	BBV 9718 C	84	LAB000169	CM	2022-05-31 → 36M → 2025-05-31
18	Antenna	Rohde & Schwarz	HF907	102899	LAB000151	C	2023-05-15 → 36M → 2026-05-15
19	Antenna	Rohde & Schwarz	HL562E	102005	LAB000150	C	2022-12-22 → 36M → 2025-12-22
20	Open Switch and Control Platform	Rohde & Schwarz	OSP220 Base Unit 2HU	101748	LAB000149	NR	–
21	Antenna	Rohde & Schwarz	HFH2-Z2E	100954	LAB000108	C	2023-05-05 → 36M → 2026-05-05

8.2 Fully Anechoic Chamber



Measurement distance: horn antenna at 3 m
EMC32 software version: 11.20.00

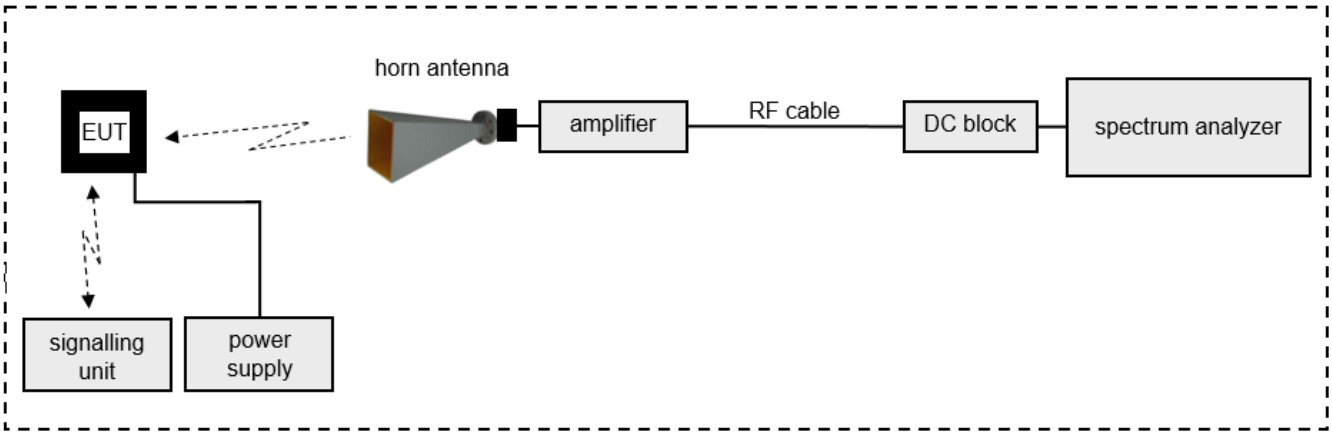
FS = UR + CA + AF
(FS-field strength; UR-voltage at the receiver; CA-loss of the signal path; AF-antenna factor)

Example calculation:
FS [dBµV/m] = 40.0 [dBµV/m] + (-35.8) [dB] + 32.9 [dB/m] = 37.1 [dBµV/m] (71.61 µV/m)

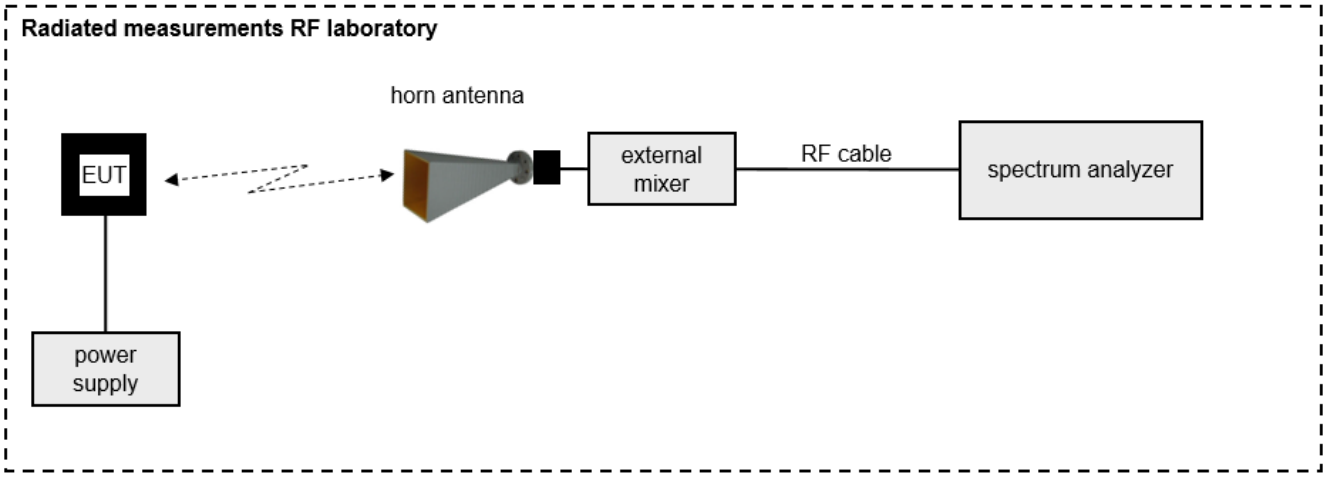
List of test equipment used:

No.	Equipment	Manufacturer	Type	Serial No.	IBL No.	Kind of Calibration	Last / Next Calibration
1	Power Supply	Rohde & Schwarz	IN 600	101554	LAB000824	NR	–
2	Antenna	Rohde & Schwarz	HL562E	102173	LAB000673	C	2022-10-17 → 36M → 2025-10-17
3	Power Supply	Chroma	61602		LAB000507	NR	–
4	Power Supply	Elektro-Automatik GmbH & Co. KG	EA-PSI 9080-40 T	2000230001	LAB000313	NR	–
5	Test table	innco systems GmbH	PT1208-080-RH	-	LAB000306	NR	–
6	Antenna Mast	Berlebach	Tripod HFH2-Z8 & -Z9	101762	LAB000292	NR	–
7	Positioner	maturo GmbH	TD 1.5-10KG		LAB000258	NR	–
8	Compressed Air	Implotex	1-850-30	-	LAB000256	NR	–
9	EMI Test Receiver	Rohde & Schwarz	ESW26	101481	LAB000236	C	2023-07-04 → 12M → 2024-07-04
10	Semi/Fully Anechoic Chamber	Albatross Projects GmbH	Babylon 5 (SAC 5)	20168.PRB	LAB000235	C	2022-01-31 → 36M → 2025-01-31
11	Measurement Software	Rohde & Schwarz	EMC32 V11.20		LAB000226	NR	–
12	Turntable	maturo GmbH	TT2.0-2t	TT2.0-2t/921	LAB000225	NR	–
13	Antenna Mast	maturo GmbH	CAM4.0-P	CAM4.0-P/316	LAB000224	NR	–
14	Antenna Mast	maturo GmbH	BAM4.5-P	BAM4.5-P/272	LAB000223	NR	–
15	Controller	maturo GmbH	FCU 3.0	10082	LAB000222	NR	–
16	Power Supply	Elektro-Automatik GmbH & Co. KG	EA-PS 2042-10 B	2878350292	LAB000191	NR	–
17	Pre-Amplifier	Schwarzbeck Mess-Elektronik OHG	BBV 9718 C	84	LAB000169	CM	2022-05-31 → 36M → 2025-05-31
18	Antenna	Rohde & Schwarz	HF907	102899	LAB000151	C	2023-05-15 → 36M → 2026-05-15
19	Antenna	Rohde & Schwarz	HL562E	102005	LAB000150	C	2022-12-22 → 36M → 2025-12-22
20	Open Switch and Control Platform	Rohde & Schwarz	OSP220 Base Unit 2HU	101748	LAB000149	NR	–
21	Antenna	Rohde & Schwarz	HFH2-Z2E	100954	LAB000108	C	2023-05-05 → 36M → 2026-05-05

8.3 Radiated measurements > 18 GHz



8.4 Radiated measurements > 50 GHz



Measurement distance: horn antenna e.g. 50 cm

FS = UR + CA + AF
(FS-field strength; UR-voltage at the receiver; CA-loss signal path & distance correction; AF-antenna factor)

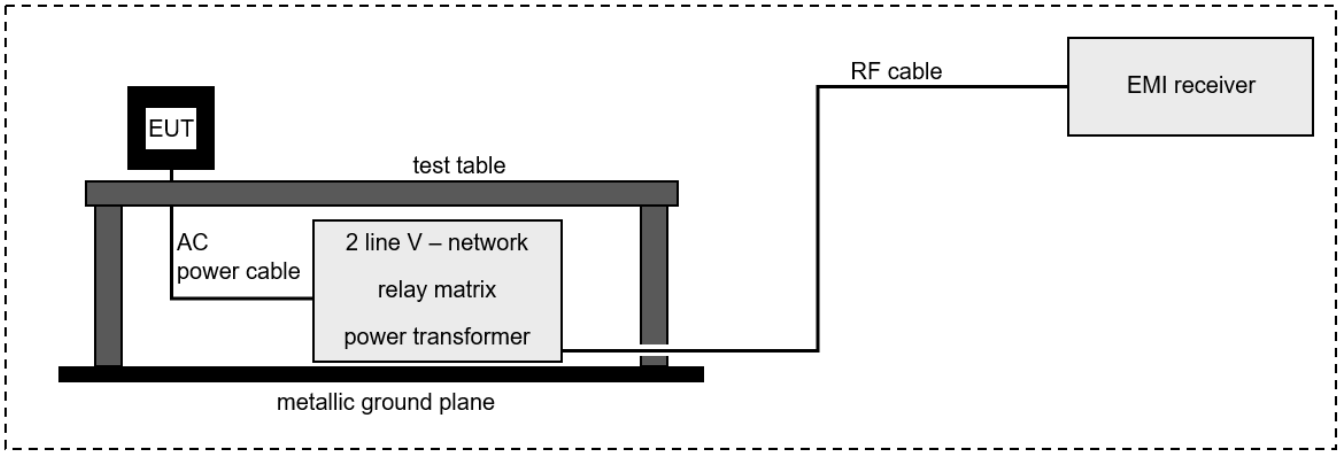
Example calculation:
FS [dBµV/m] = 40.0 [dBµV/m] + (-60.1) [dB] + 36.74 [dB/m] = 16.64 [dBµV/m] (6.79 µV/m)

Note: conversion loss of mixer is already included in analyzer value.

List of test equipment used:

No.	Equipment	Manufacturer	Type	Serial No.	IBL No.	Kind of Calibration	Last / Next Calibration
1	Antenna	Flann Microwave Ltd	24240-20	275176	LAB000376	CM	2023-08-24 → 36M → 2024-08-24
2	Harmonic Mixer	Rohde & Schwarz	FS-Z060	101350	LAB000375	C	2023-04-13 → 12M → 2024-04-13
3	Absorber	Telemeter Electronic	EPP 12	-	LAB000327	NR	–
4	Test table	innco systems GmbH	PT0707-RH light	-	LAB000303	NR	–
5	Filter (Coax/WG, LPF, HPF, Band)	TTE	10-WHPF-84.5-UG387	-	LAB000299	NR	–
6	Antenna	Flann Microwave Ltd	570240-20	226025	LAB000228	CM	2023-08-24 → 36M → 2024-08-24
7	Power Supply	Elektro-Automatik GmbH & Co. KG	EA-PS 2042-10 B	2878350255	LAB000189	NR	–
8	WG-Coax-Adapter	Flann Microwave Ltd	23373-TF30 UG383/U	273384	LAB000184	CM	2023-08-24 → 36M → 2024-08-24
9	WG-Coax-Adapter	Flann Microwave Ltd	22093-TF30 UG599/U	273263	LAB000183	CM	2023-08-24 → 36M → 2024-08-24
10	WG-Coax-Adapter	Flann Microwave Ltd	20093-TF30 UBR220	273373	LAB000180	CM	2023-08-24 → 36M → 2024-08-24
11	Antenna	Flann Microwave Ltd	28240-20	273371	LAB000176	CM	2023-08-24 → 36M → 2024-08-24
12	Coaxial Cable	Huber & Suhner	SF101/1.0m	503989/1	LAB000163	CM	2023-07-17 → 12M → 2024-07-17
13	Coaxial Cable	Rosenberger	LU7-022-1000	34	LAB000154	CM	2023-07-17 → 12M → 2024-07-17
14	Coaxial Cable	Rosenberger	LU7-022-1000	33	LAB000153	CM	2023-07-17 → 12M → 2024-07-17
15	Antenna	Flann Microwave Ltd	27240-20	273367	LAB000137	CM	2023-08-24 → 36M → 2024-08-24
16	Antenna	Flann Microwave Ltd	26240-20	273417	LAB000135	CM	2023-08-24 → 36M → 2024-08-24
17	Antenna	Flann Microwave Ltd	25240-20	272860	LAB000133	CM	2023-08-24 → 36M → 2024-08-24
18	Antenna	Flann Microwave Ltd	23240-20	273431	LAB000131	CM	2023-08-24 → 36M → 2024-08-24
19	Antenna	Flann Microwave Ltd	22240-20	270448	LAB000130	CM	2023-07-17 → 12M → 2024-07-17
20	Antenna	Flann Microwave Ltd	20240-20	266402	LAB000127	CM	2023-07-17 → 12M → 2024-07-17
21	Harmonic Mixer	Rohde & Schwarz	FS-Z140	101144	LAB000115	C	2023-05-23 → 12M → 2024-05-23
22	Harmonic Mixer	Rohde & Schwarz	FS-Z110	102000	LAB000114	C	2023-05-02 → 12M → 2024-05-02
23	Harmonic Mixer	Rohde & Schwarz	FS-Z090	102020	LAB000113	C	2023-04-06 → 12M → 2024-04-06
24	Harmonic Mixer	Rohde & Schwarz	FS-Z075	102015	LAB000112	C	2023-05-03 → 12M → 2024-05-03
25	Spectrum Analyser	Rohde & Schwarz	FSW50	101450	LAB000111	C	2023-07-26 → 12M → 2024-07-26
26	Climatic Chamber	CTS GmbH	T-65/50	204002	LAB000110	CM	2023-05-11 → 12M → 2024-05-11
27	Antenna Mast	Schwarzbeck Mess-Elektronik OHG	AM 9104	99	LAB000109	NR	–
28	Multimeter	Keysight	U1242B	MY59110034	LAB000009	C	2022-06-20 → 24M → 2023-06-20

8.5 AC conducted emissions



FS = UR + CF + VC
(FS-field strength; UR-voltage at the receiver; CR-loss of the cable and filter; VC-correction factor of the ISN)

Example calculation:
FS [dBµV/m] = 37.62 [dBµV/m] + 9.90 [dB] + 0.23 [dB] = 47.75 [dBµV/m] (244.06 µV/m)

List of test equipment used:

No.	Equipment	Manufacturer	Type	Serial No.	IBL No.	Kind of Calibration	Last / Next Calibration
1	EMI Test Receiver	Rohde & Schwarz	ESR3 EMI Test Receiver 3.6GHz	103068	LAB000737	C	2023-02-09 → 12M → 2024-02-09
2	Shielded room	Albatross Projects GmbH	Sputnik 1 (Schirmkabine)		LAB000257	NR	–
3	Open Switch and Control Platform	Rohde & Schwarz	OSP-B200S2	101443	LAB000239	NR	–
4	Two-Line V-Network	Rohde & Schwarz	ENV216	102597	LAB000220	C	0000-00-00 → 24M → 2024-09-07

9 MEASUREMENT PROCEDURES

9.1 Radiated spurious emissions from 9 kHz to 30 MHz

Test setup

- The EUT is set up according to its intended use, as described in the user manual or as defined by the manufacturer.
- In case of floor standing equipment, it is placed in the middle of the turn table.
  In case of tabletop equipment it is placed on a non-conductive table with a height of 80 cm.
- Additional equipment, cables, … necessary for testing, are positioned like under normal operation.
- Interface cables, e.g. power supply, network, … are connected to the connection box in the turn table.
- EUT is powered on and set into operation.

Pre-scan

- Turntable performs an azimuthal rotation from 0° to 360° continuously.
- For each turntable position the EMI-receiver/spectrum analyser performs a positive-peak/max-hold sweep (=worst-case). Data is transferred to EMI-software and recorded. EMI-software will show the maximum level of all single sweeps as the final result for the pre-scan.

Final measurement

- Significant emissions found during the pre-scan will be maximized by the EMI-software by rotating the turntable from 0° to 360°.
- Loop antenna is rotated with special 3D adapter set to find maximum level of emissions.
- Plot of the pre-scan with frequencies of identified emissions including levels, correction factors, turn table position and settings of measuring equipment is recorded.

Distance correction (extrapolation)

- When performing measurements on test distances other than defined in the rules, the results shall be extrapolated to the specified distance by conservatively presuming that the field strength decays at 40 dB/decade of distance in the region closer than λ in m divided by 2π (i.e., λ/2π), and at 20 dB/decade of distance beyond that, using the measurement of a single point at the radial angle that produces the maximum emission.
  This correction is already included in the limit line of corresponding measurement plots.

Detailed requirements can be found in e.g. ANSI C63.4 / C63.26

9.2 Radiated spurious emissions from 30 MHz to 1 GHz

Test setup

- The EUT is set up according to its intended use, as described in the user manual or as defined by the manufacturer.
- In case of floor standing equipment, it is placed in the middle of the turn table.
  In case of tabletop equipment it is placed on a non-conductive table with a height of 80 cm.
- Additional equipment, cables, … necessary for testing, are positioned like under normal operation.
- Interface cables, e.g. power supply, network, … are connected to the connection box in the turn table.
- EUT is powered on and set into operation.

Pre-scan

- Turntable performs an azimuthal rotation from 0° to 360° continuously.
- Antenna polarisation is changed (H-V / V-H) and antenna height is changed from 1 meter to 4 meters.
- For each turntable position / antenna polarisation / antenna height the EMI-receiver/spectrum analyser performs a positive-peak/max-hold sweep (=worst-case). Data is transferred to EMI-software and recorded. EMI-software will show the maximum level of all single sweeps as the final result for the pre-scan.

Final measurement

- Significant emissions found during the pre-scan will be maximized by the EMI-software based on evaluated data during the pre-scan by rotating the turntable and changing antenna height and polarisation.
- Final measurement will be performed with measuring equipment settings as defined in the applicable test standards (e.g. ANSI C6.4).
- Plot of the pre-scan with frequencies of identified emissions including levels, correction factors, turn table position, antenna polarisation and settings of measuring equipment is recorded.

Distance correction (extrapolation)

- When performing measurements on test distances other than defined in the rules, the results shall be extrapolated to the specified distance by conservatively presuming that the field strength decays at 20 dB/decade of distance beyond the region λ in m divided by 2π (i.e., λ/2π), using the measurement of a single point at the radial angle that produces the maximum emission.
  This correction is already included in the corresponding measurement plots.

Detailed requirements can be found in e.g. ANSI C63.4 / C63.26

9.3 Radiated spurious emissions from 1 GHz to 18 GHz

Test setup

- The EUT is set up according to its intended use, as described in the user manual or as defined by the manufacturer.
- In case of floor standing equipment, it is placed in the middle of the turn table.
  In case of tabletop equipment it is placed on a non-conductive table with a height of 80 cm.
- Additional equipment, cables, … necessary for testing, are positioned like under normal operation.
- Interface cables, e.g. power supply, network, … are connected to the connection box in the turn table.
- EUT is powered on and set into operation.

Pre-scan

- Turntable performs an azimuthal rotation from 0° to 360° continuously.
- Antenna polarisation is changed (H-V / V-H).
- For each turntable position and antenna polarisation the EMI-receiver/spectrum analyser performs a positive-peak/max-hold sweep (=worst-case). Data is transferred to EMI-software and recorded. EMI-software will show the maximum level of all single sweeps as the final result for the pre-scan.

Final measurement

- Significant emissions found during the pre-scan will be maximized by the EMI-software based on evaluated data during the pre-scan by rotating the turntable and changing antenna height and polarisation.
- Final measurement will be performed with measuring equipment settings as defined in the applicable test standards (e.g. ANSI C6.4).
- Plot of the pre-scan with frequencies of identified emissions including levels, correction factors, turn table position, antenna polarisation and settings of measuring equipment is recorded.

Distance correction (extrapolation)

- When performing measurements on test distances other than defined in the rules, the results shall be extrapolated to the specified distance by conservatively presuming that the field strength decays at 20 dB/decade of distance beyond the region λ in m divided by 2π (i.e., λ/2π), using the measurement of a single point at the radial angle that produces the maximum emission.
  This correction is already included in the corresponding measurement plots.

Detailed requirements can be found in e.g. ANSI C63.4 / C63.26

9.4 Radiated spurious emissions above 18 GHz

Test setup

- The EUT is set up according to its intended use, as described in the user manual or as defined by the manufacturer.
- Additional equipment, cables, … necessary for testing, are positioned like under normal operation.
- EUT is powered on and set into operation.
- Test distance depends on EUT size and test antenna size (farfield conditions shall be met).

Pre-scan

- The test antenna is handheld and moved carefully over the EUT to cover the EUT's whole sphere and for different polarizations of the antenna.

Final measurement

- Significant emissions found during the pre-scan will be maximized, i.e. position and antenna orientation causing the highest emissions with Peak and RMS detector
- Final measurement will be performed with measuring equipment settings as defined in the applicable test standards (e.g. ANSI C63.4 / C63.26).
- Final plot showing measurement data, levels, frequency, measuring time, bandwidth, correction factor, margin to the limit and limit is recorded.

Note

- In case of measurements with external harmonic mixers (e.g. above 50 GHz) special care is taken to avoid possible overloading of the external mixer's input.
- As external harmonic mixers may generate false images, care is taken to ensure that any emission measured by the spectrum analyzer is indeed radiated from the EUT and not internally generated by the external harmonic mixer. Signal identification feature of spectrum analyzer is used to eliminate/reduce images of the external harmonic mixer.

Distance correction (extrapolation)

- When performing measurements on test distances other than defined in the rules, the results shall be extrapolated to the specified distance by conservatively presuming that the field strength decays at 20 dB/decade of distance beyond the region λ in m divided by 2π (i.e., λ/2π), using the measurement of a single point at the radial angle that produces the maximum emission.
  This correction is already included in the corresponding measurement plots.

Detailed requirements can be found in e.g. ANSI C63.4 / C63.26

10 MEASUREMENT UNCERTAINTIES

Radio frequency	≤ ± 10 ppm
Radiated emission	≤ ± 6 dB
Temperature	≤ ± 1 °C
Humidity	≤ ± 5 %
DC and low frequency voltages	≤ ± 3 %

The indicated expanded measurement uncertainty corresponds to the standard measurement uncertainty for the measurement results multiplied by the coverage factor k = 2. It was determined in accordance with EA-4/02 M:2013. The true value is located in the corresponding interval with a probability of 95 %.

Annex 1 EUT Photographs, external

Photo No. 1:

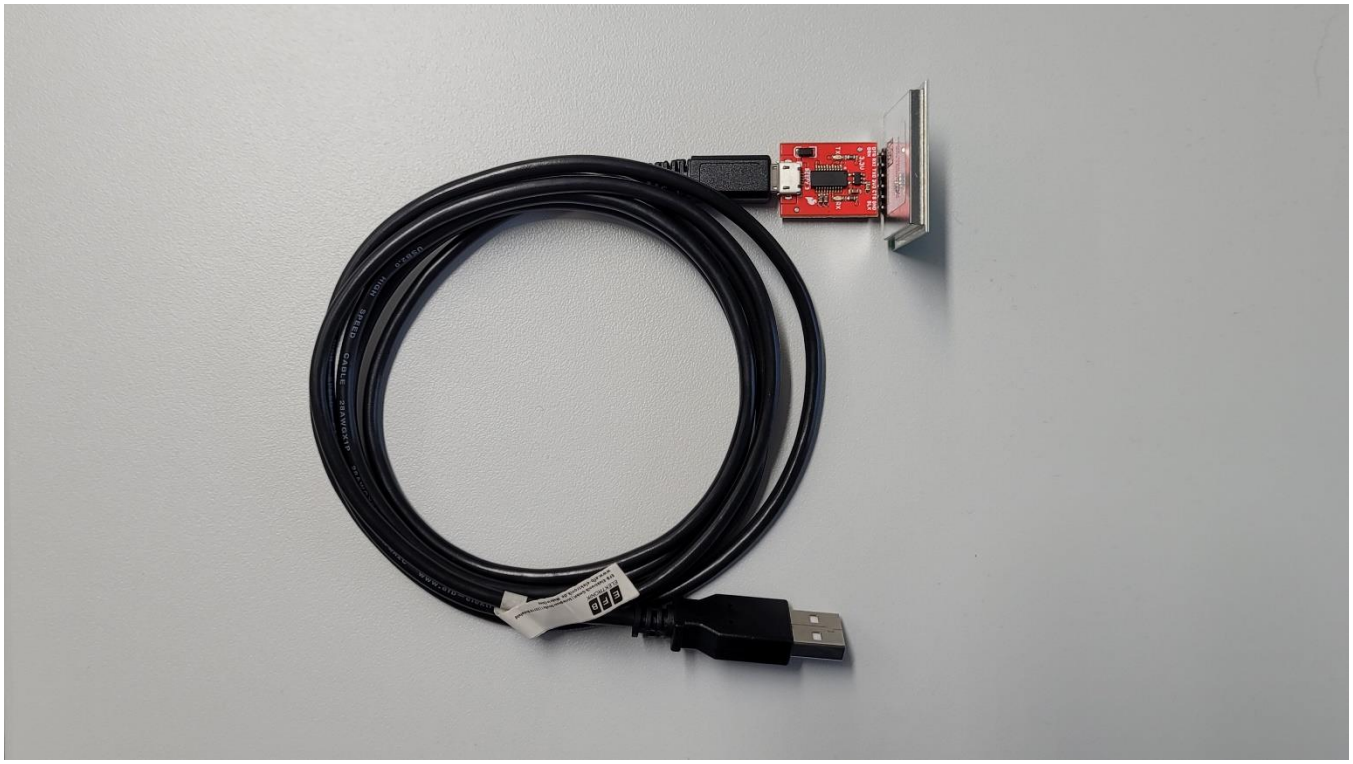


Photo No. 2:

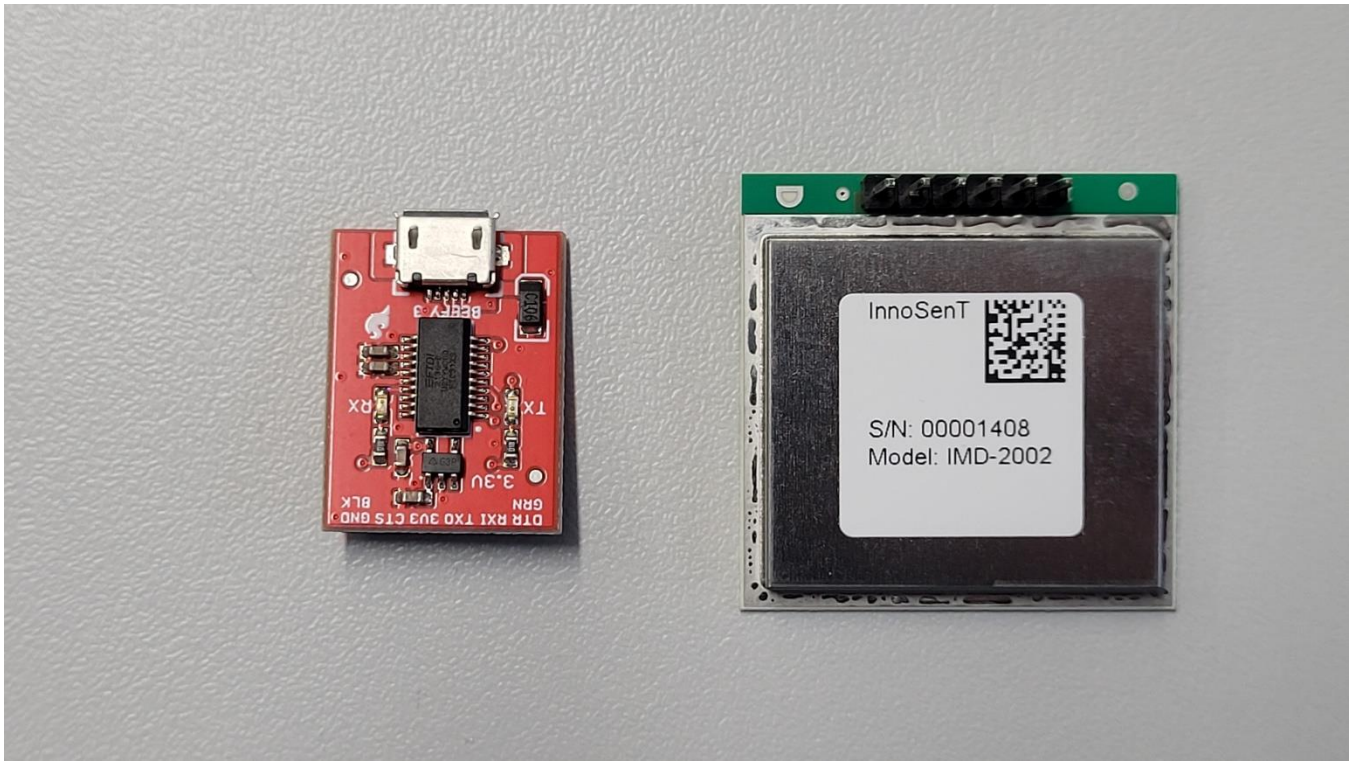


Photo No. 3:

Photo No. 4:

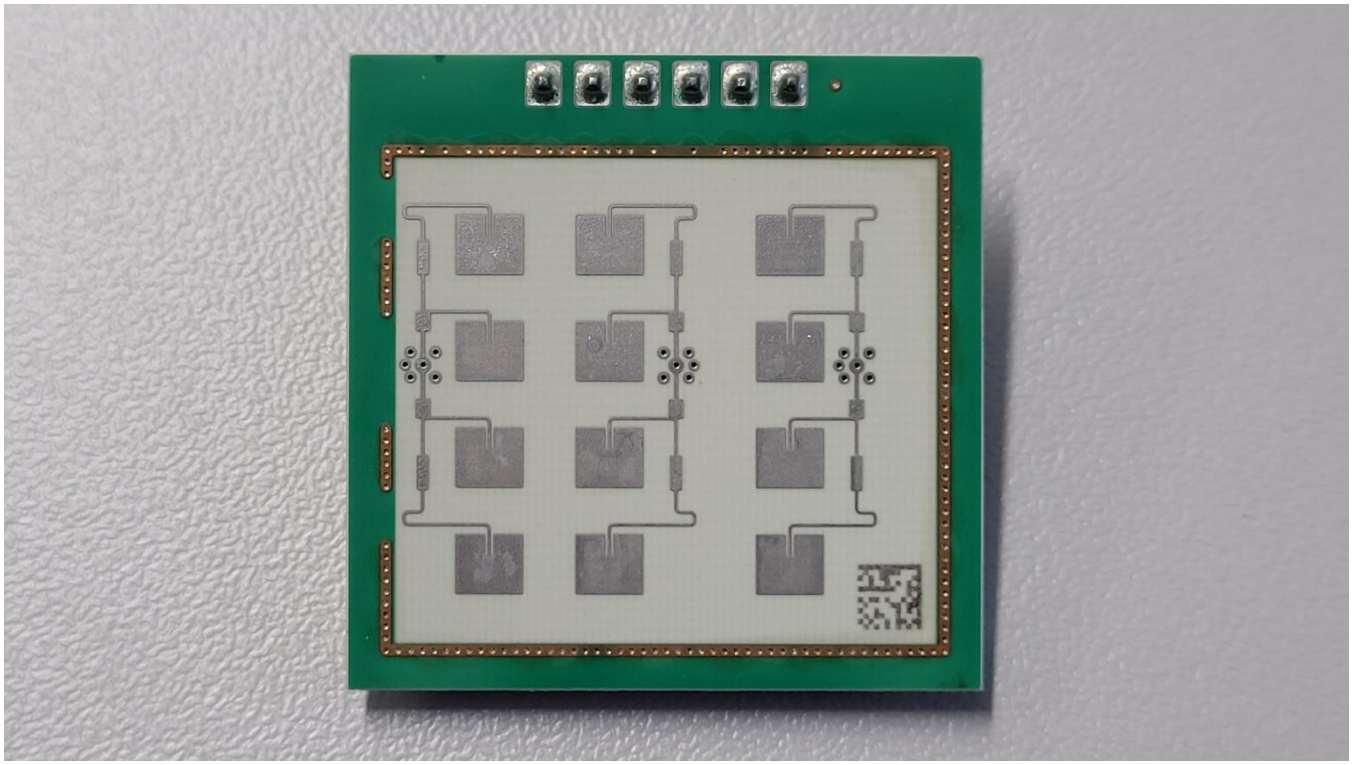


Photo No. 5: USB-Adapter

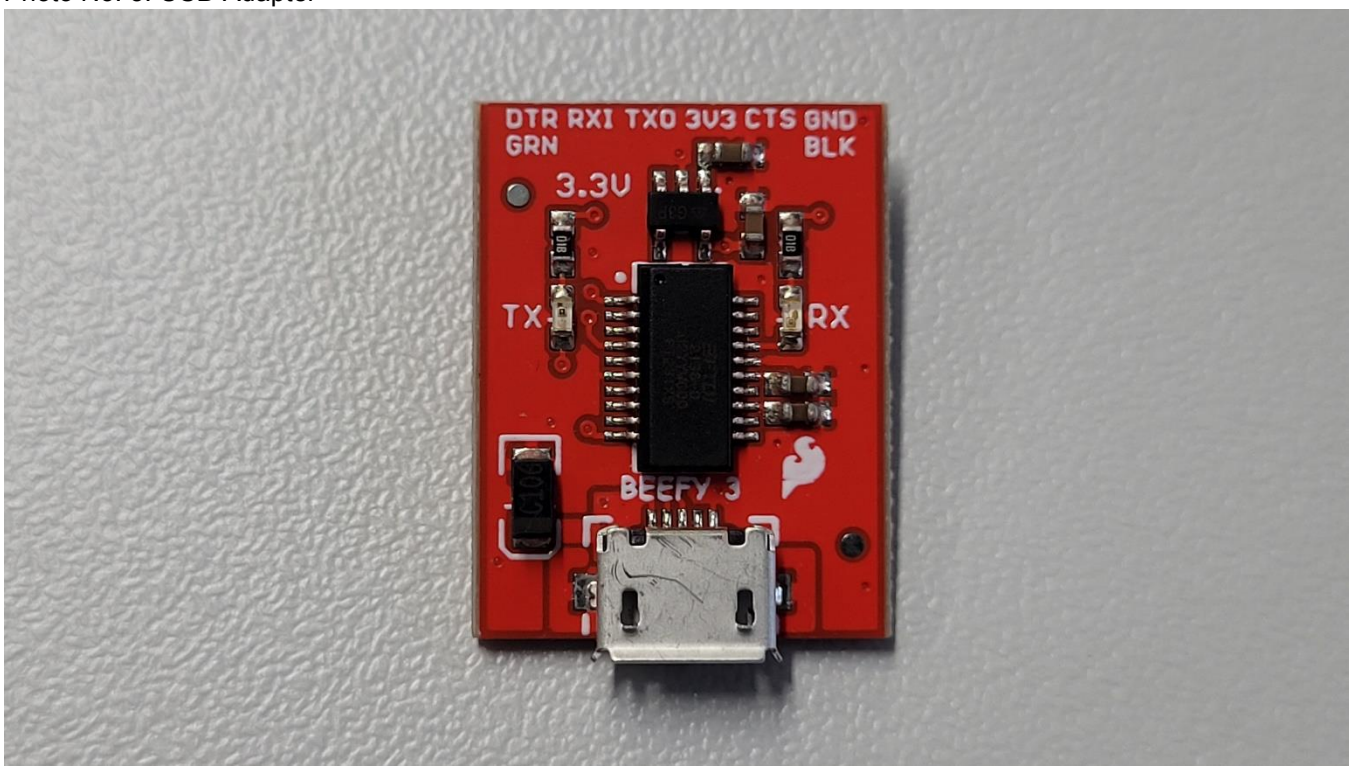
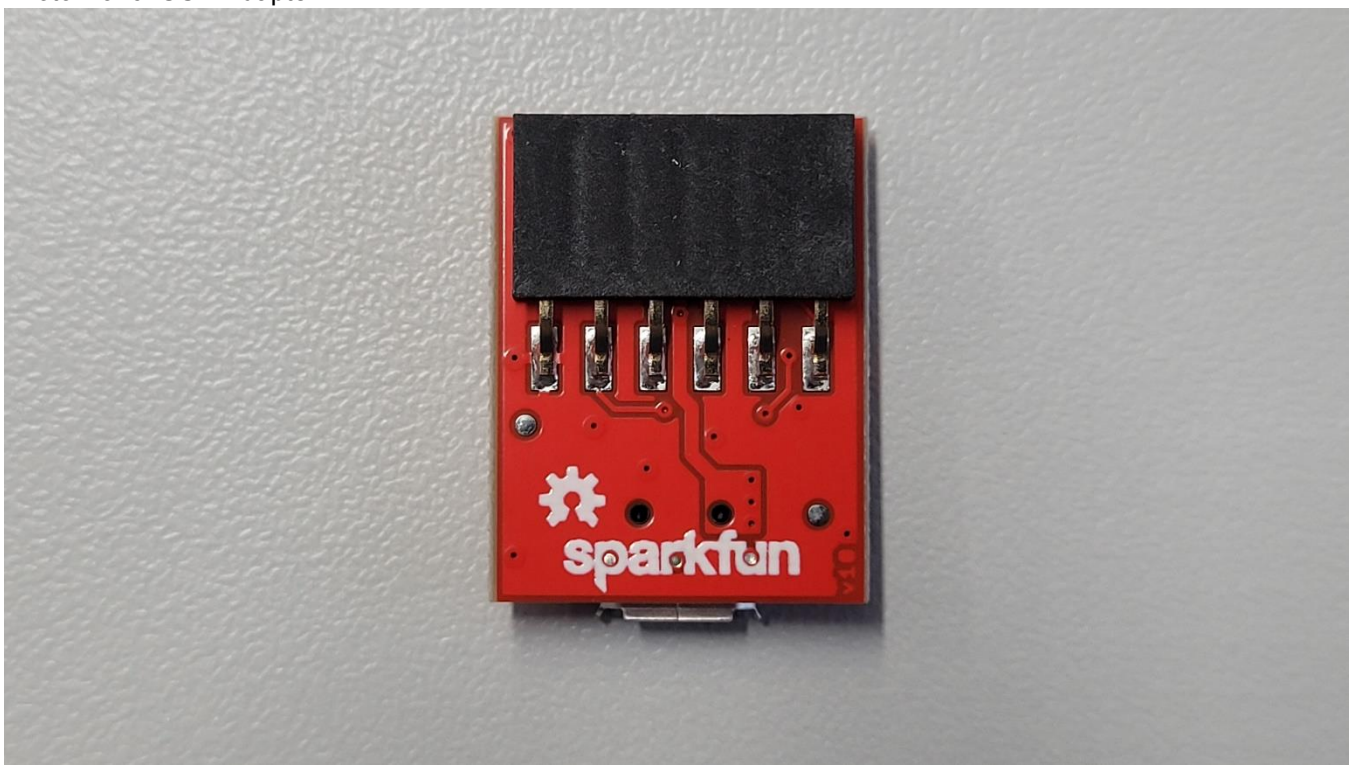
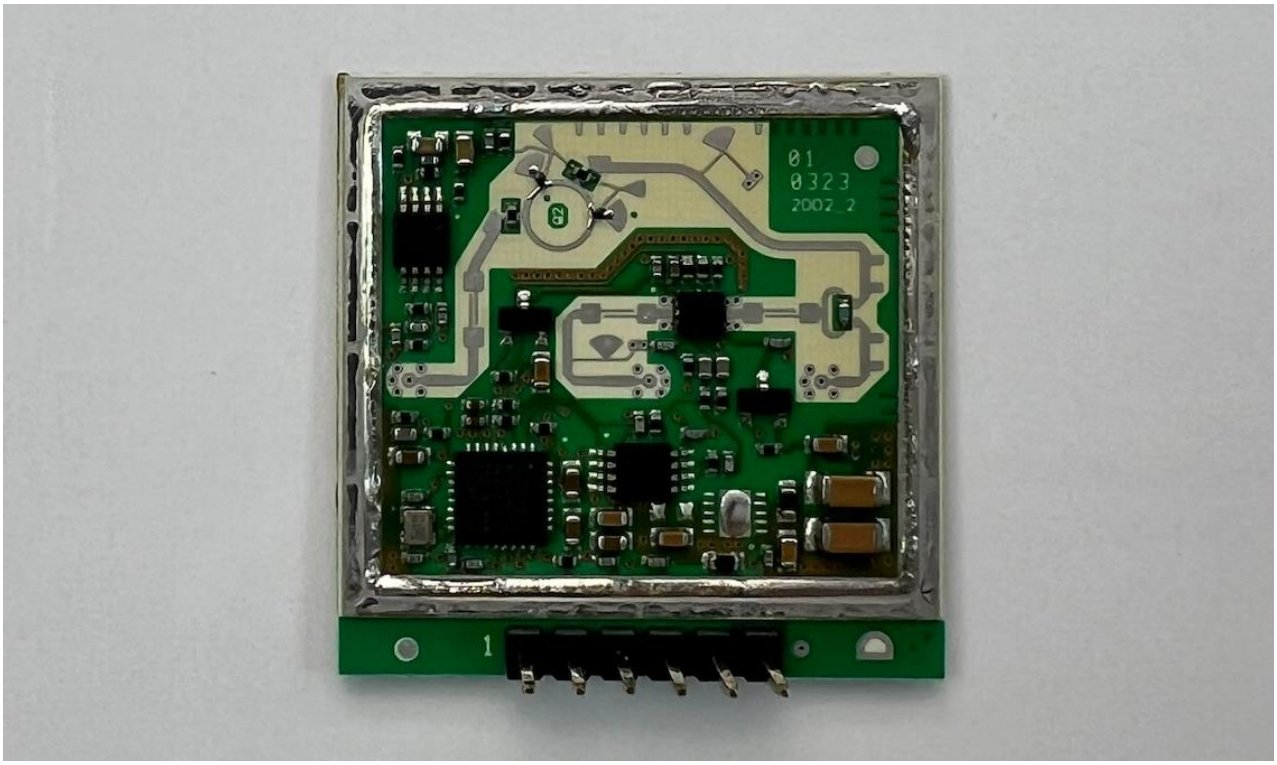


Photo No. 6: USB-Adapter



Annex 2 EUT Photographs, internal

Photo No. 7:



Annex 3 Test Setup Photographs

Photo No. 8:

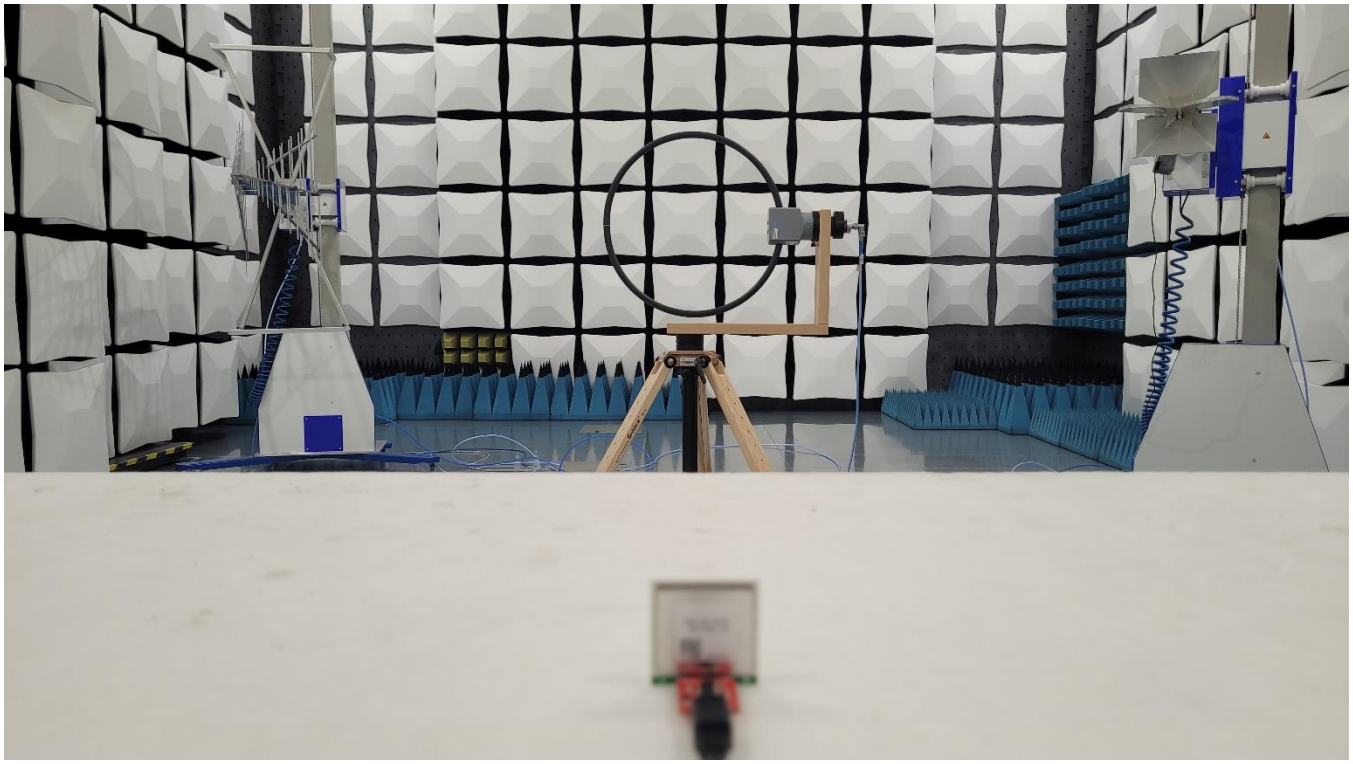


Photo No. 9:

Photo No. 10:

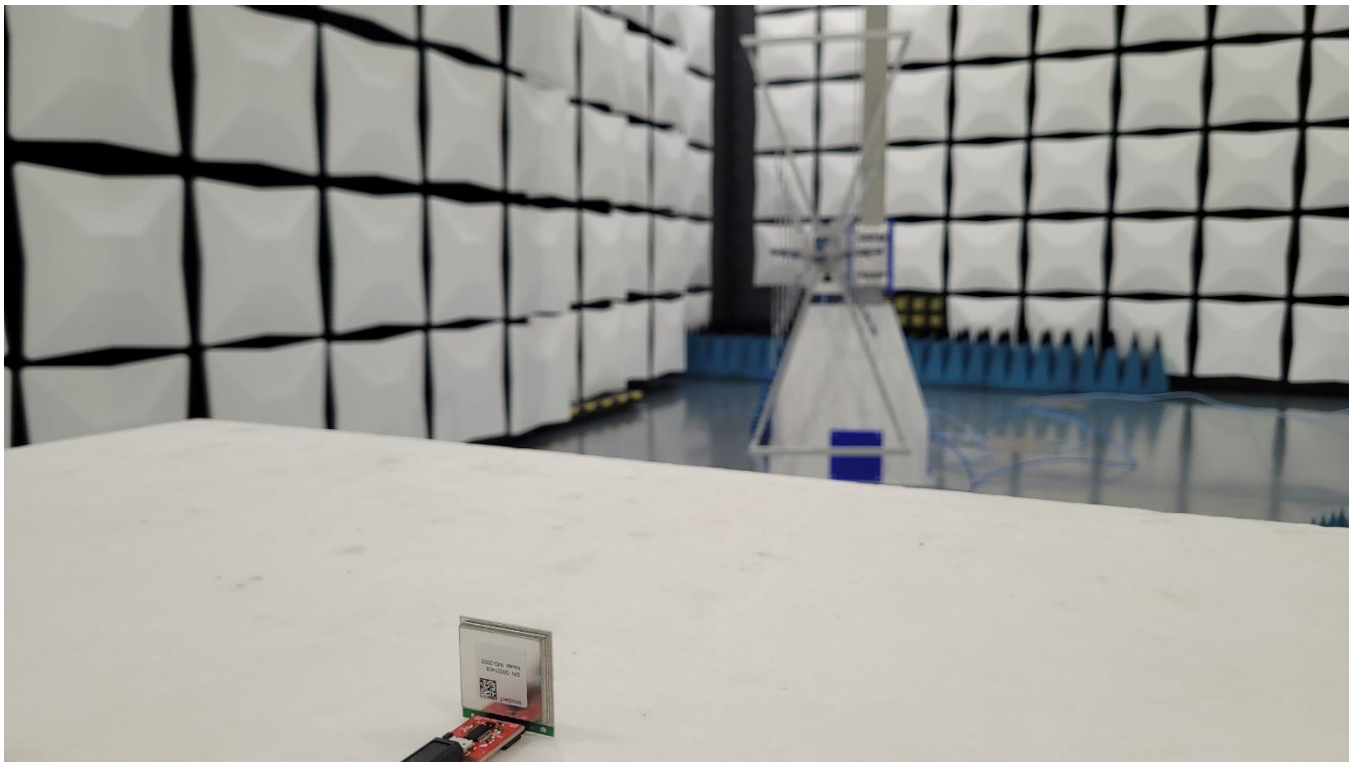


Photo No. 11:

Photo No. 12:

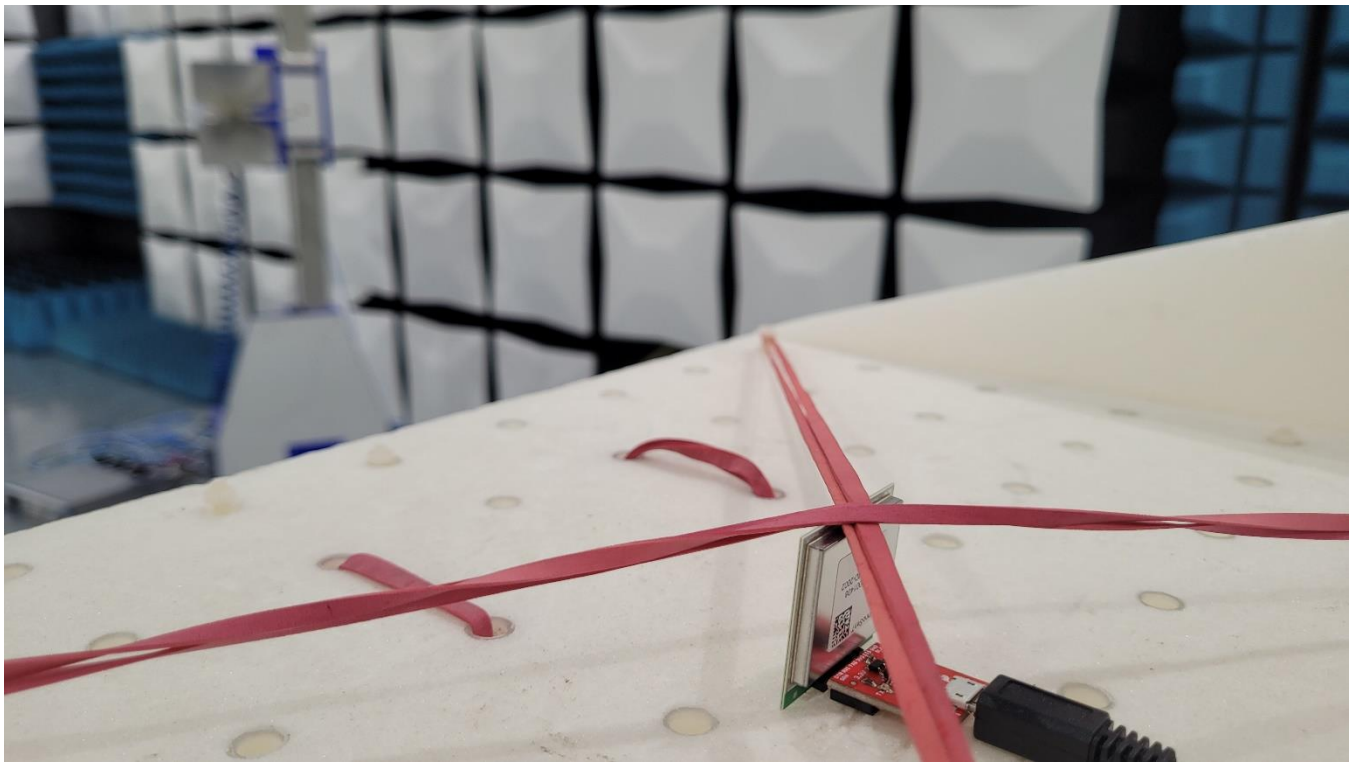


Photo No. 13:

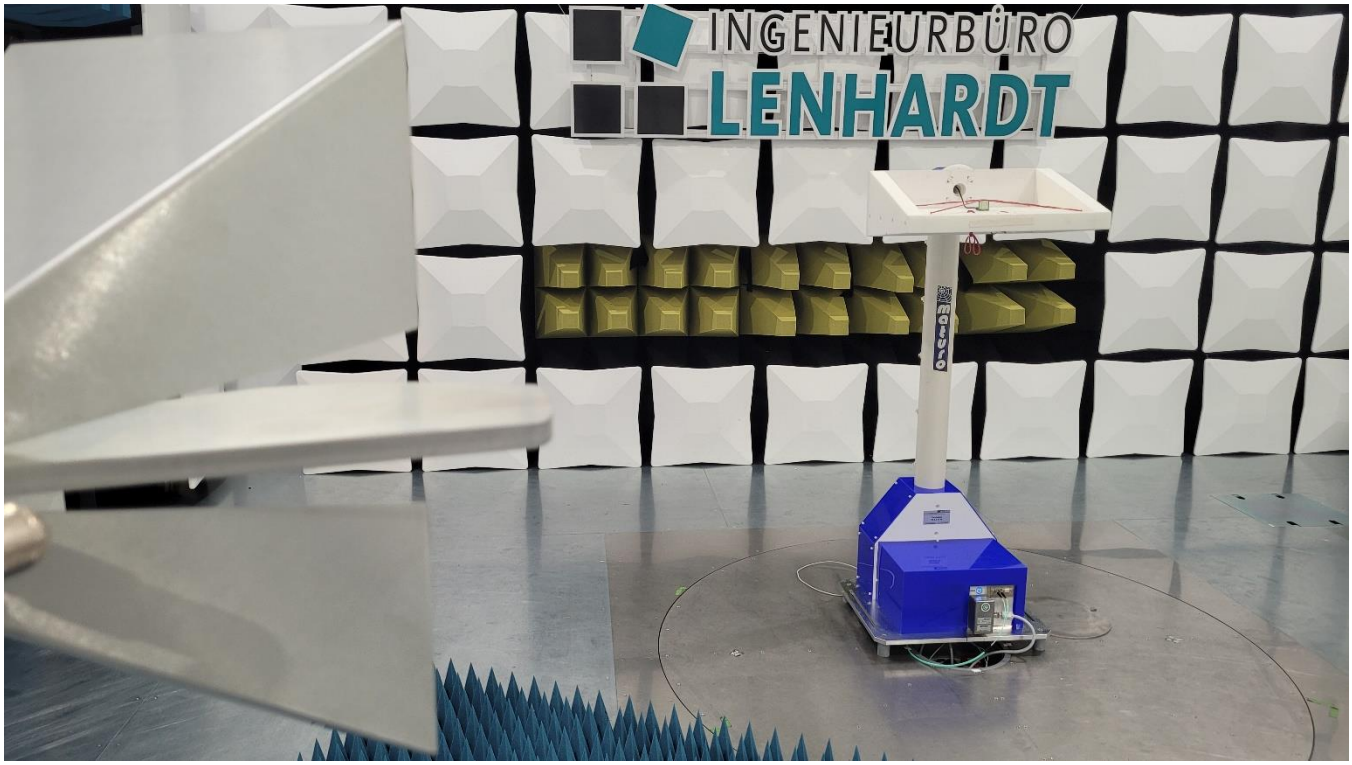


Photo No. 14:

Photo No. 15:

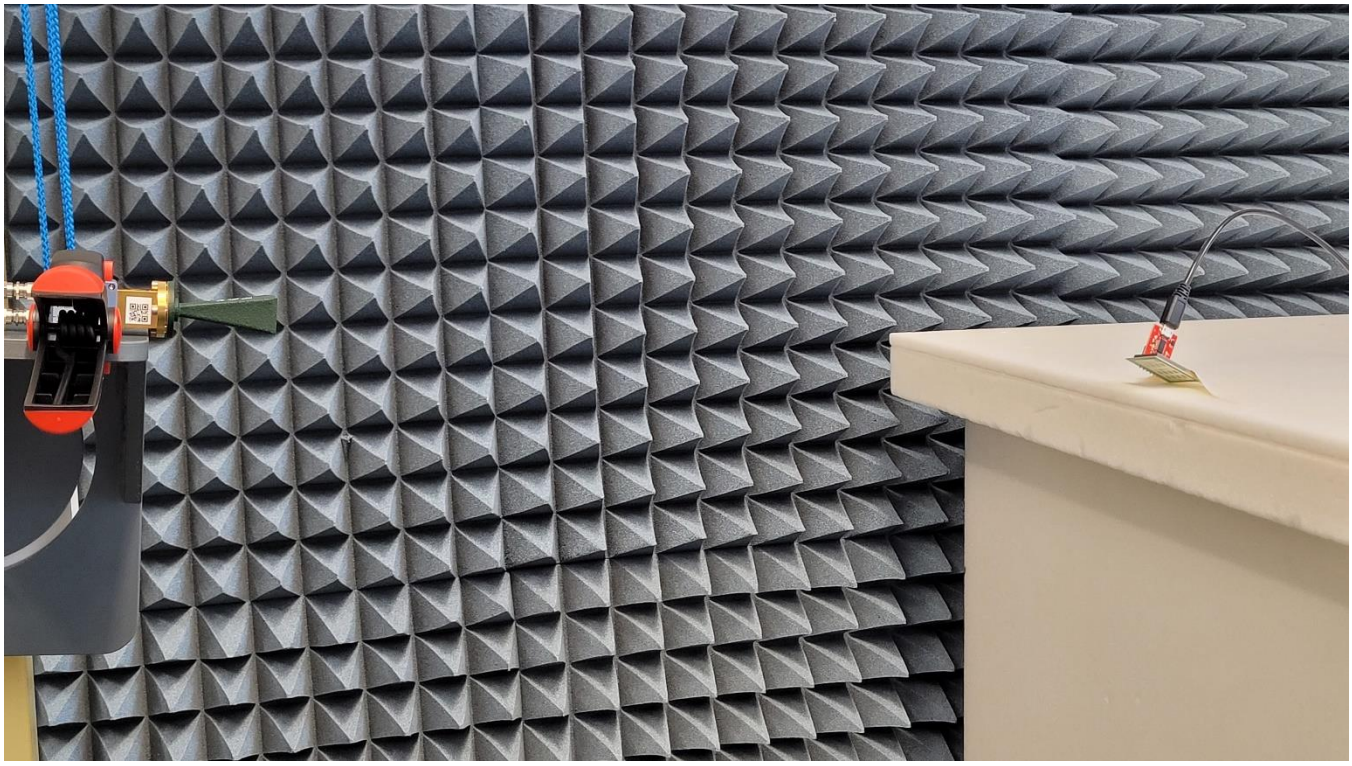


Photo No. 16:

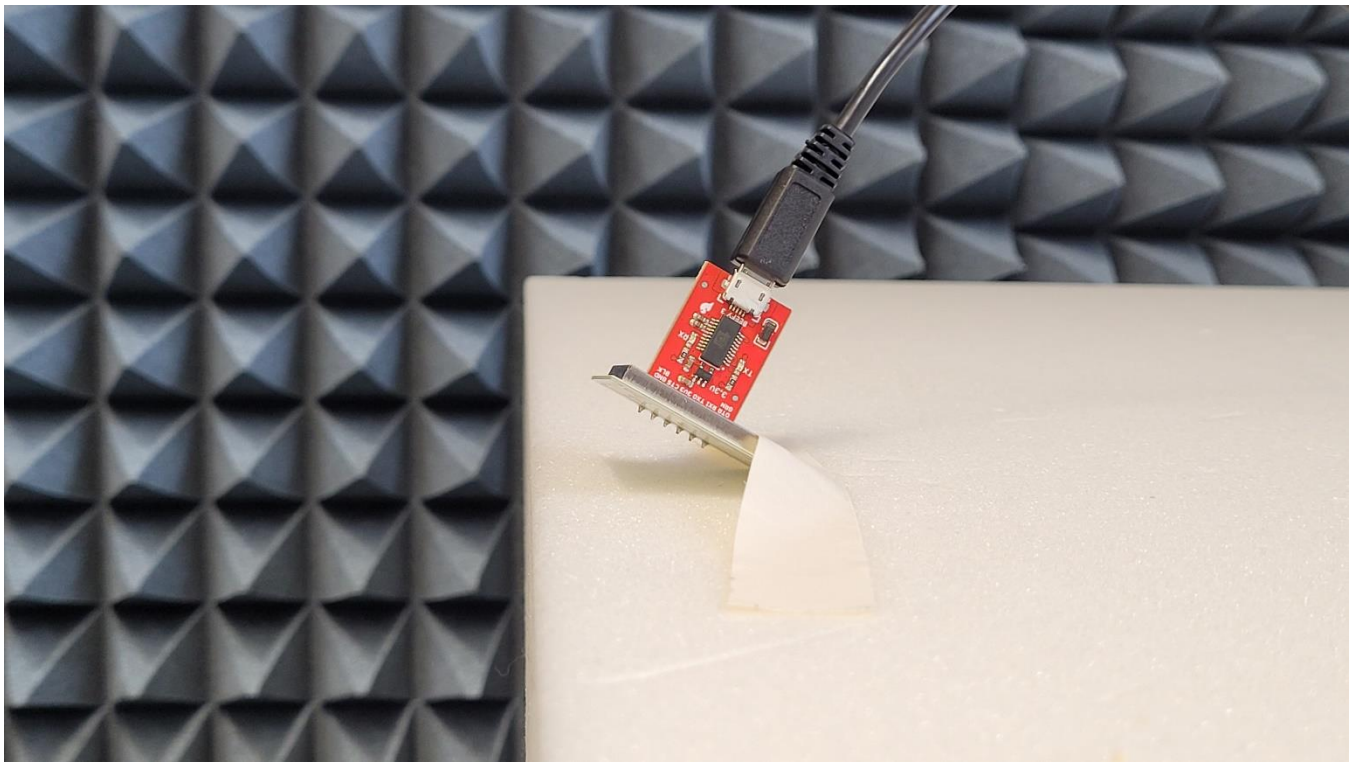


Photo No. 17:

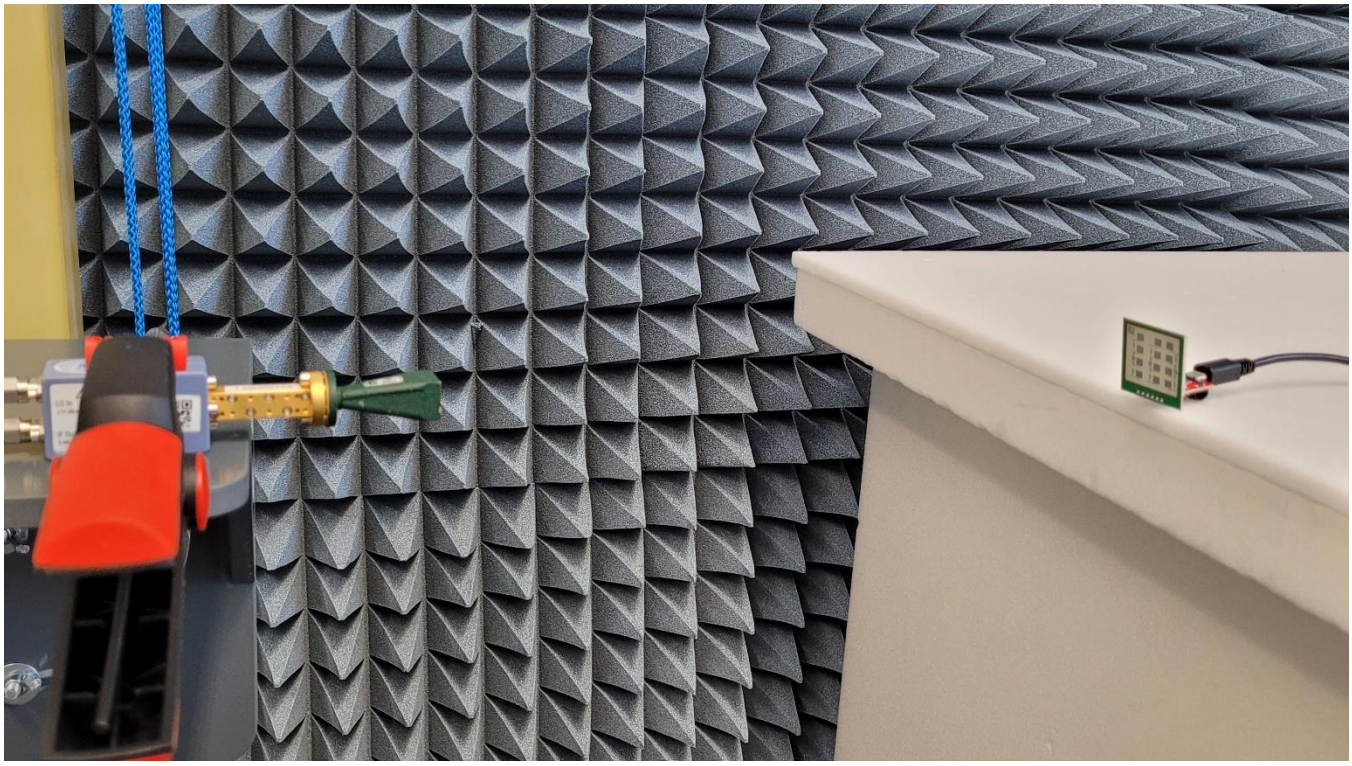
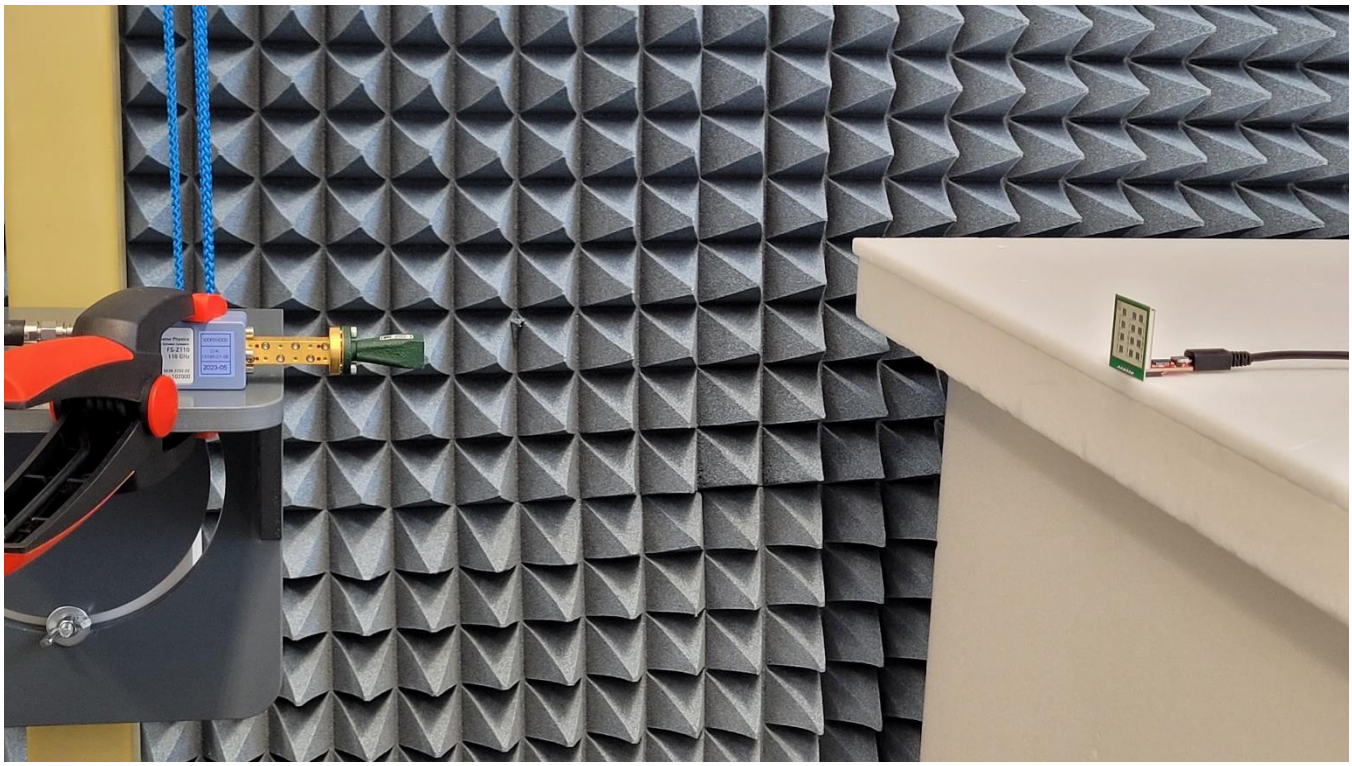


Photo No. 18:



End of Test Report