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Test report no.:

250335-AU01+W01

for:

HBC-radiomatic GmbH
IMU transmitter unit
CSIT0100

according to:

47 CFR Part 15, §15.247
RSS-247



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1 Summary of test results

System type: Frequency hopping spread spectrum system (FHSS)

47 CFR part and section	Test	Equivalent to IC radio standard(s)	Result	Note(s)	Page
15.207	AC power line conducted emissions 150 kHz to 30 MHz	RSS-Gen, section 8.8	Not performed	2	---
---	20 dB bandwidth	---	Recorded	---	30
---	Occupied bandwidth	RSS-Gen, section 6.7	For reference only	---	34
---	Duty cycle	---	Recorded	---	
15.247(b)(1) 15.247(b)(4)	Conducted output power and EIRP	RSS-247, section 6.2.3.2(a)(b)	Passed	---	41
15.247(a)(1)	Carrier frequency separation	RSS-247, section 6.2.1(b) RSS-247, section 6.2.3.1(a)	Passed	---	45
15.247(a)(1)(iii)	Number of hopping frequencies	RSS-247, section 6.2.3.1(b)	Passed	---	47
15.247(a)(1)(iii)	Time of occupancy (dwell time)	RSS-247, section 6.2.3.1(b)	Passed	---	49
15.247(d)	Band-edge measurements	RSS-247, section 6.6	Passed	---	52
15.247(d)	Antenna-port conducted measurements	RSS-247, section 6.6	Passed	3	57
15.247(d)	Radiated emissions below 30 MHz	RSS-247, section 6.6	Passed	---	72
15.247(d)	Radiated emissions from 30 MHz to 1 GHz	RSS-247, section 6.6	Passed	---	75
15.247(d)	Radiated emissions from 1 GHz to 25 GHz (10th harmonic)	RSS-247, section 6.6	Passed	---	78
15.247(i)	Radio frequency radiation exposure	RSS-Gen, Section 3.4	Not performed	4	---

Note(s):

- 1 For information about EUT see clause 2.1.
- 2 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.
- 3 If antenna port conducted tests cannot be performed (e.g. for portable or handheld devices with integral antenna), then radiated tests are performed for demonstrating compliance to the conducted emission requirements (see "Spurious radiated emissions 9 kHz to 10th harmonic").
- 4 Radio frequency radiation exposure is in consideration in another test report.

Straubing, July 8, 2026



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Approved by
Konrad Graßl
Reviewer

2 Referenced publications

2.1 FCC

<i>Publication</i>	<i>Title</i>
CFR 47 Part 2 October 2025	Code of Federal Regulations, Title 47 (Telecommunication), Part 2 (Frequency allocation and radio treaty matters; General rules and regulations) of the Federal Communication Commission (FCC)
CFR 47 Part 15 October 2025	Code of Federal Regulations, Title 47 (Telecommunication), Part 15 (Radio Frequency Devices) of the Federal Communication Commission (FCC)
ANSI C63.10 September 2020	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices
ANSI/USEMCSC C63.10-2020/Cor 1-2023 (Corrigendum to ANSI C63.10-2020)	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices Corrigendum 1
KDB Publication no. 558074 April 02, 2019	Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS), Frequency Hopping Spread Spectrum System, and Hybrid System Devices Operating Under §15.247 of the FCC Rules

Note: Where ANSI C63.10 is referred to in combination with FCC Rules (47 CFR), this is equivalent to

- ANSI C63.10-2020
- + ANSI/USEMCSC C63.10-2020/Cor 1-2023 (Corrigendum to ANSI C63.10-2020)

2.2 ISED

<i>Publication</i>	<i>Title</i>
RSS-247, Issue 4 July 2025	Spectrum Management and Telecommunications - Radio Standards Specification - Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices
RSS-Gen Issue 5 April 2018 Amendment 1 (March 2019) Amendment 2 (February 2021)	Spectrum Management and Telecommunications - Radio Standards Specification - General Requirements for Compliance of Radio Apparatus
ANSI C63.10 September 2020	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices
ANSI/USEMCSC C63.10- 2020/Cor 1-2023 (Corrigendum to ANSI C63.10-2020)	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices Corrigendum 1
ANSI/USEMCSC C63.10a-2024 (Amendment to ANSI C63.10-2020)	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices Amendment 1
ANSI/USEMCSC C63.10a-2024 (Amendment to ANSI C63.10-2020)	Errata to American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices Amendment 1
KDB Publication no. 558074 April 02, 2019	Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS), Frequency Hopping Spread Spectrum System, and Hybrid System Devices Operating Under §15.247 of the FCC Rules

Note: Where ANSI C63.10 is referred to in combination with Canadian standards (RSS), this is equivalent to

- ANSI C63.10-2020
- + ANSI/USEMCSC C63.10-2020/Cor 1-2023 (Corrigendum to ANSI C63.10-2020)
- + ANSI/USEMCSC C63.10a-2024 (Amendment to ANSI C63.10-2020), Amendment
- + ANSI/USEMCSC C63.10a-2024 (Amendment to ANSI C63.10-2020), Errata

3 Equipment under test (EUT)

All Information in this clause is declared by customer.

3.1 General information

Product type:	IMU transmitter unit		
Model name:	CSIT0100		
Serial number(s):	250807014		
Manufacturer:	HBC-radiomatic GmbH		
Hardware version:	MS0010		
Software version:	SG0502		
Short description:	EUT is a radio remote transmitter for Inertial Measurement Unit system.		
Additional modifications:	None		
FCC ID:	NO9IMU		
IC registration number:	2977A-IMU		
Designation of emissions:	897KF7D--		
Power supply:	Battery supply		
	Nominal voltage:	3.6 V	
Device type:	☐ Portable	☒ Mobile	☐ Fixed

3.2 Radio specifications

System type:	Frequency hopping spread spectrum system (FHSS)		
Radio technology:	2.4 GHz FHSS proprietary		
Application frequency band:	2400.0 MHz - 2483.5 MHz		
Number of RF channels:	79		
Nominal bandwidth:	1 MHz		
Modulation(s):	GFSK		
Antenna:	Type:	PCB antenna	
	Gain:	4.7 dBi (maximum)	
	Model:	N/A	
	Manufacturer:	HBC radiomatic	
	Connector:	☐ external	☒ internal
		☐ temporary	☐ none (integral antenna)

Note(s):

1. The final device has only an integrated antenna. The EUT was equipped with a temporary antenna port which was used for all tests.

Channel no.	Operating frequency (MHz)	Channel no.	Operating frequency (MHz)
01	2402	41	2442
02	2403	42	2443
03	2404	43	2444
04	2405	44	2445
05	2406	45	2446
06	2407	46	2447
07	2408	47	2448
08	2409	48	2449
09	2410	49	2450
10	2411	50	2451
11	2412	51	2452
12	2413	52	2453
13	2414	53	2454
14	2415	54	2455
15	2416	55	2456
16	2417	56	2457
17	2418	57	2458
18	2419	58	2459
19	2420	59	2460
20	2421	60	2461
21	2422	61	2462
22	2423	62	2463
23	2424	63	2464
24	2425	64	2465
25	2426	65	2466
26	2427	66	2467
27	2428	67	2468
28	2429	68	2469
29	2430	69	2470
30	2431	70	2471
31	2432	71	2472
32	2433	72	2473
33	2434	73	2474
34	2435	74	2475
35	2436	75	2476
36	2437	76	2477
37	2438	77	2478
38	2439	78	2479
39	2440	79	2480
40	2441		

Table 1: Radio specifications

3.3 Photo documentation

Photos taken during testing including EUT positions can be found in annex A.
For external photos of the EUT see annex B, for internal ones see annex C.

4 Test configuration and mode of operation

4.1 Test configuration

<i>Device</i>	<i>Type designation</i>	<i>Serial or inventory no.</i>	<i>Manufacturer</i>
IMU transmitter unit	CSIT0100	250807014	HBC-radiomatic GmbH

Table 2: EUT used for testing

<i>Device</i>	<i>Type designation</i>	<i>Serial or inventory no.</i>	<i>Manufacturer</i>
Laptop	Latitude 3410	9BDY103	DELL
Power supply for laptop	LA65NS2-01	---	DELL

Table 3: Support equipment used for testing

4.2 Mode of operation

- The EUT was powered by a battery.
- The test mode of the EUT was enabled via a serial connection with the software “HTerm”.
- The EUT was set in the appropriated test modes by the software “Blue Test 3”.
- The laptop was disconnected from the EUT after the configuration of each test mode.

<i>Channel</i>	<i>Frequency (MHz)</i>	<i>Packet</i>	<i>Packet type</i>	<i>Packet size</i>	<i>Power (Ext, Int)</i>
Low	2402	DH5	15	339	255/58
Middle	2440	DH5	15	339	255/58
High	2480	DH5	15	339	255/58

Table 4: Tested channels in non-hopping mode

5 Test procedures

5.1 General specifications

5.1.1 Test setups

Tabletop devices are placed on a non-conductive table with a height of 0.8 m. In case of AC power-line conducted emissions test, the rear of the EUT is located 40 cm to the vertical wall of the RF-shielded (screened) room which is used as vertical conducting plane. For radiated emission measurements above 1 GHz, tabletop devices are placed at a height of 1.5 m above the floor using a support made of styrene placed on top of the non-conductive table.

All other surfaces of tabletop or floor-standing EUTs are at least 80 cm from any other grounded conducting surface. This includes the case or cases of one or more LISNs when performing an AC power-line conducted emissions test.

Radiated emission measurements of equipment that can be used in multiple orientations (e.g. portable or handheld devices) are performed with the EUT in each of three orthogonal axis positions.

5.1.2 Conversion to conducted test results

If test procedures described herein are based on the use of an antenna-port conducted test configuration, but the EUT cannot provide such a configuration (e.g., portable or handheld devices with integral antenna), radiated tests are performed for demonstrating compliance to the conducted requirements.

If a radiated test configuration has to be used, then the measured power or field strength levels are converted to equivalent conducted power levels for comparison to the applicable limit. For this purpose, at first the radiated field strength or power levels are converted to EIRP as described in annex G of ANSI C63.10 and KDB Publication 412172, document D01. The equivalent conducted power is then determined by subtracting the EUT transmit antenna gain from the EIRP (assuming logarithmic representation).

For devices utilizing multiple antenna technologies, KDB Publication 662911 applies.

5.2 Antenna-port conducted measurements

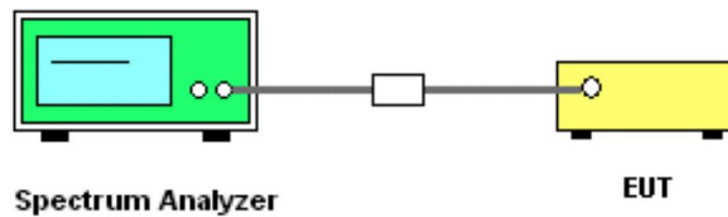


Figure 1: Setup for antenna-port conducted measurements

The RF signal of the EUT is measured conducted at the antenna port. In case of no permanent antenna connector available, a temporary antenna connector should be supplied by the manufacturer. The specific insertion loss of the signal path, which is matched to 50 Ohm, is determined. The test receiver is set to analyzer mode with pre-selector activated. The measurement readings on the test receiver are corrected by the signal path loss.

For frequency hopping systems (FHSS) and digital transmission systems (DTS) the settings as specified by KDB Publication 558074, document D01, are used.

If a radiated test configuration has to be used, conversion to conducted test results is performed according to clause 5.1.2.

5.3 AC powerline conducted emissions

AC power-line conducted emissions are measured according to clause 6.2 of ANSI C63.10 over the frequency range from 150 kHz to 30 MHz to determine the line-to-ground radio-noise voltage that is conducted from all of the EUT current-carrying power input terminals that are directly (or indirectly via separate transformers or power supplies) connected to a public power network. The tests are performed in a shielded room.

If the EUT normally receives power from another device that in turn connects to the public utility ac power lines, measurements are made on that device with the EUT in operation to demonstrate that the device continues to comply with the appropriate limits while providing the EUT with power. If the EUT is operated only from internal or dedicated batteries, with no provisions for connection to the public utility ac power lines (600 VAC or less) to operate the EUT (such as an adapter), then ac power-line conducted measurements are not required.

For direct current (dc) powered devices where the ac power adapter is not supplied with the device, an “off-the-shelf” unmodified ac power adapter is used. If the device is supposed to be installed in a host (e.g., the device is a module or PC card), then it is tested in a typical compliant host.

Frequency (<i>f</i>)	Measurement receiver bandwidth	Step size	Detector type		
			Prescan	Prescan with FFT	Final scan
150 kHz ≤ <i>f</i> < 30 MHz	9 kHz	≤ 4.5 kHz	Peak, Average	Quasi-peak, Average	Quasi-peak, Average

Table 5: Bandwidth and detector type for AC power-line conducted emissions test

The AC power-line conducted emissions test is performed in the following steps:

- The EUT is arranged as tabletop or floor-standing equipment, as applicable, and connected to a line impedance stabilization network (LISN) with 50 μH / 50 Ω. If required, a second LISN of the same type and terminated by 50 Ω is used for peripheral devices. The EUT is switched on.
- The measurement equipment is connected to the LISN for the EUT and set-up according to the specifications of the test (see table 5). At the LISN, the neutral line is selected to be tested.

- c) The prescan is performed with both detectors activated at the same time. If the test receiver is capable of FFT analysis, it is used for prescan, but not for final scan.
- d) When the prescan is completed, maximum levels with less margin than 10 dB or exceeding the limit are determined and collected in a list.
- e) With the first frequency of the list selected, a frequency zoom over a range of ten times of the measurement receiver bandwidth around this frequency is performed. If the EUT has no significant drift in frequency, the frequency zoom can be skipped.
- f) For final scan, the emission level is measured and the maximum is recorded.
- g) Steps e) to f) are repeated for all other frequencies in the list. At least the six highest EUT emissions relative to the limit have to be recorded.
- h) Steps c) to g) are repeated for all current-carrying conductors of all of the power cords of EUT, i.e. all phase and (if used) neutral line(s).

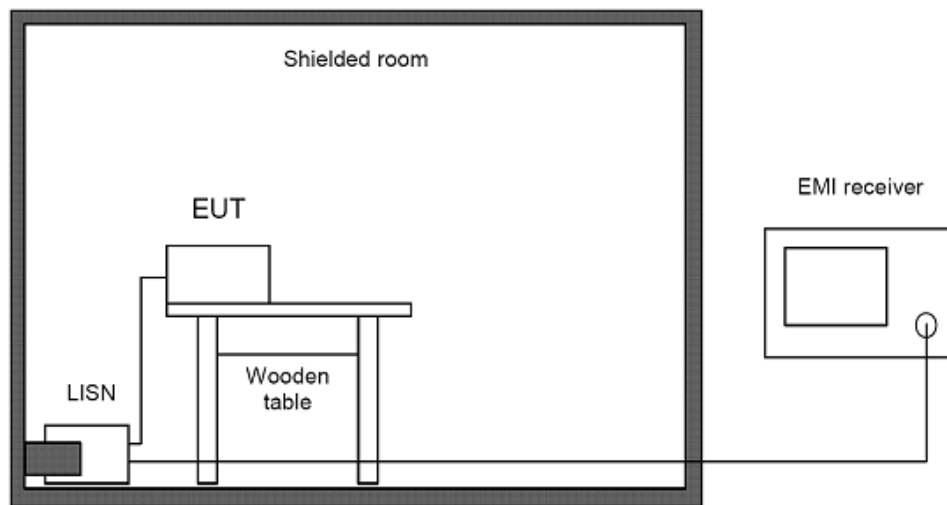


Figure 2: Setup for AC power-line conducted emissions test from 150 kHz to 30 MHz

Phase	Frequency (MHz)	Reading value (dB μ V)	AMN correction (dB)	Cable attenuation + 10 dB attenuator (dB)	Correction factor (Corr.) (dB)	Level (dB μ V)
L 1	10	10	0.6	10.9	11.5	21.5
N	10	10	1.0	10.9	11.9	21.9

Table 6: Sample calculation

Correction factor = Artificial mains network correction + Cable attenuation + 10 dB

Level = Reading value + Correction factor = 10 dB μ V + 11.5 dB = 21.5 dB μ V

Prescans are performed with all detectors activated at the same time. If the test receiver is capable of FFT analysis, it is used for prescans, but not for final scans. If no limit is specified for certain detectors, final scan measurement with these detectors may be omitted.

5.4 Radiated emissions below 30 MHz

Radiated emissions below 30 MHz are measured according to clause 6.4 of ANSI C63.10 using an inductive shielded loop antenna. As this antenna measures the magnetic field only, its antenna factors are converted to electric field strength values assuming a free space impedance of 377Ω as described in clause 4.3.1 of ANSI C63.10. This results in an additional correction of 51.53 dB.

According to clause 6.4.3 of ANSI C63.10, at frequencies below 30 MHz, measurements may be performed at a distance closer than that specified in the requirements. In this case, the results are extrapolated to the specified distance by using a recalculation factor determined according to one of the methods described in clause 6.4.4 of ANSI C63.10, provided that the maximum dimension of the device is equal to or less than 0.625 times the wavelength at the frequency being measured. As the minimum wavelength is 10 meters corresponding to the maximum frequency of 30 MHz, this requirement is fulfilled if the maximum dimension of the device is equal to or less than 6.25 meters.

Unless otherwise stated, the recalculation factor is determined according to clause 6.4.4.2 “Extrapolation from the measurement of a single point” of ANSI C63.10:

$$\begin{aligned} d_{\text{near field}} &= 47.77 / f_{\text{MHz}}, \text{ or} \\ f_{\text{MHz}} &= 47.77 / d_{\text{near field}} \end{aligned}$$

The frequency f_{MHz} at which the near field distance is equal to the limit and/or test distance is important for selection of the right formula to determine the recalculation factor:

$$\begin{aligned} f_{\text{MHz}}(300 \text{ m}) &\approx 0.159 \text{ MHz} \\ f_{\text{MHz}}(30 \text{ m}) &\approx 1.592 \text{ MHz} \\ f_{\text{MHz}}(3 \text{ m}) &\approx 15.923 \text{ MHz} \end{aligned}$$

Based on the test distances for the general radiated emission limits as specified in §15.209 of 47 CFR Part 15 or RSS-Gen, the following formulas are used to determine the recalculation factor:

Frequency (f)	d_{limit}	d_{measure}	Formula for recalculation factor	Recalculation factor (dB)
$9 \text{ kHz} \leq f \leq 159 \text{ kHz}$	300 m	3 m	$-40 \log(d_{\text{limit}} / d_{\text{measure}})$	-80.0
$159 \text{ kHz} < f \leq 490 \text{ kHz}$	300 m	3 m	$-40 \log(d_{\text{near field}} / d_{\text{measure}}) - 20 \log(d_{\text{limit}} / d_{\text{near field}})$	-80.0 to -70.2
$490 \text{ kHz} < f \leq 1.592 \text{ MHz}$	30 m	3 m	$-40 \log(d_{\text{limit}} / d_{\text{measure}})$	-40.0
$1.592 \text{ MHz} < f \leq 15.923 \text{ MHz}$	30 m	3 m	$-40 \log(d_{\text{near field}} / d_{\text{measure}}) - 20 \log(d_{\text{limit}} / d_{\text{near field}})$	-40.0 to -20.0
$f > 15.923 \text{ MHz}$	30 m	3 m	$-20 \log(d_{\text{limit}} / d_{\text{measure}})$	-20.0

Table 7: Recalculation factors for extrapolation

The radiated measurements below 30 MHz are performed in a semi-anechoic chamber (called “SAC”). The measurement distance is 3 meters. The emissions of the EUT are recorded with an EMI test receiver configured as described in table 8.

<i>Frequency (f)</i>	<i>Measurement receiver bandwidth</i>	<i>Step size</i>	<i>Detector type</i>
$9 \text{ kHz} \leq f < 90 \text{ kHz}$	200 Hz	$\leq 100 \text{ Hz}$	Peak Average
$90 \text{ kHz} \leq f < 110 \text{ kHz}$	200 Hz	$\leq 100 \text{ Hz}$	Quasi-peak
$110 \text{ kHz} \leq f < 150 \text{ kHz}$	200 Hz	$\leq 100 \text{ Hz}$	Peak Average
$150 \text{ kHz} \leq f < 490 \text{ kHz}$	9 kHz	$\leq 4.5 \text{ kHz}$	Peak Average
$490 \text{ kHz} \leq f < 30 \text{ MHz}$	9 kHz	$\leq 4.5 \text{ kHz}$	Quasi-peak

Table 8: Bandwidth and detector type for radiated emissions test below 30 MHz

<i>Frequency (MHz)</i>	<i>Reading value (dBμV) at 30 m</i>	<i>Recalculation factor (dB)</i>	<i>Antenna correction (dB/m)</i>	<i>Cable attenuation (dB)</i>	<i>Correction factor (Corr.) (dB)</i>	<i>Level (dBμV/m) at 3 m</i>
10	20.00	-24.04	19.59	0.33	19.92	15.88

Table 9: Sample calculation

Correction factor = Recalculation factor + Antenna correction + Cable attenuation

Level = Reading value + Correction factor = 20 dBμV + 19.92 dB = 39.92 dBμV/m

The radiated emissions test below 30 MHz is performed in the following steps:

5.4.1 Automatic test method

- a) The loop antenna is positioned with its plane perpendicular to the ground with the lowest height of the antenna 1 m above the ground.
- b) The EUT is placed in its standard position on a turntable capable of rotation through 360° in the horizontal plane and arranged as tabletop or floor-standing equipment, as applicable. The EUT is switched on.
- c) The measurement equipment is connected to the loop antenna and set-up according to the specifications of the test (see table 8).
- d) The table position is set to 0°. The table step is defined as 20°.
- e) The loop antenna is aligned along the test axis (in line).
- f) Then the EUT is rotated in a horizontal plane through 360° in steps as defined in step d). Starting at 0°, at each table position the spectrum for the full frequency range is recorded. If the emission at a certain frequency is higher than the levels already recorded, the current table position is noted as the maximum position.
- g) The loop antenna is aligned orthogonal to the test axis (parallel).
- h) Then the EUT is rotated in a horizontal plane through 360° in steps as defined in step d). Starting at 0°, at each table position the spectrum for the full frequency range is recorded. If the emission at a certain frequency is higher than the levels already recorded, the current table position is noted as the maximum position.
- i) After the last prescan, the significant maximum emissions, the antenna position and their table positions are determined and collected in a list.
- j) For maximization, the EUT is rotated clockwise and counterclockwise by the table step as defined in step d) while measuring the emission level continuously.
- k) The worst case positions of the table and the maximum emission levels are recorded.
- l) Steps j) to k) are repeated for all other frequencies in the list.

If the EUT may be used in various positions, steps d) to l) are repeated in two other orthogonal positions.

5.4.2 Manual test method

- a) The loop antenna is positioned with its plane perpendicular to the ground with the lowest height of the antenna 1 m above the ground.
- b) The EUT is placed in its standard position on a turntable capable of rotation through 360° in the horizontal plane and arranged as tabletop or floor-standing equipment, as applicable. The EUT is switched on.
- c) The measurement equipment is connected to the loop antenna and set-up according to the specifications of the test (see table 8).
- d) The table position is set to 0°.
- e) The loop antenna is aligned along the test axis (in line).
- f) Then the EUT is rotated in a horizontal plane through 360° continuously. The scan table method in receiver mode of the measurement instrument is used for pre-measurements. The max hold function is used. The significant maximum emissions are determined and collected in a list.
- g) The loop antenna is aligned orthogonal to the test axis (parallel).
- h) Then the EUT is rotated in a horizontal plane through 360° continuously. The scan table method in receiver mode of the measurement instrument is used for pre-measurements. The max hold function is used. The significant maximum emissions are determined and collected in a list.
- i) Final scan: the test receiver is set in the bargraph max hold function and is set to the first frequency of the list, the EUT is rotated by 360° while measuring the emission level continuously. The worst-case table position and the maximum emission level is recorded.
- j) Step i) is repeated for all other frequencies in the list.

If the EUT may be used in various positions, steps d) to j) are repeated in two other orthogonal positions.

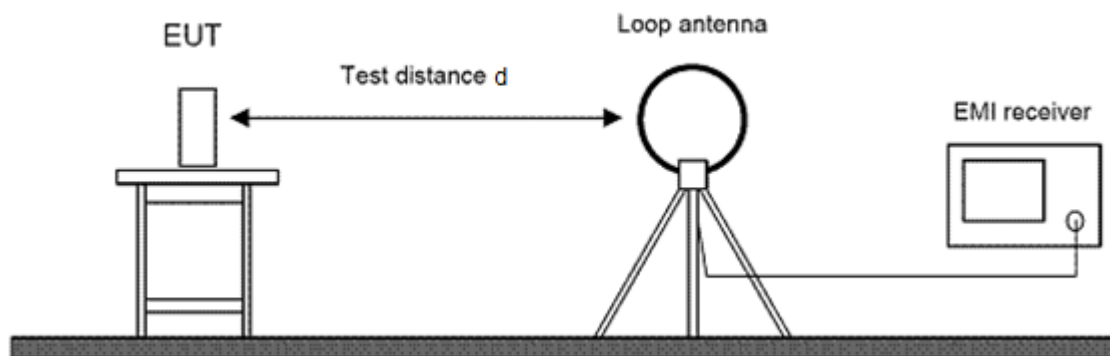


Figure 3: Setup for radiated emissions test below 30 MHz

5.5 Radiated emissions from 30 MHz to 1 GHz

Radiated emissions in the frequency range 30 MHz to 1 GHz are measured according to clause 6.5 of ANSI C63.10 using a semi-anechoic chamber (SAC) with a ground plane on the floor. The measurement distance is 3 meters. The emissions of the EUT are recorded with an EMI test receiver configured as described in table 10.

<i>Frequency (f)</i>	<i>Measurement receiver bandwidth</i>	<i>Step size</i>	<i>Detector type</i>		
			<i>Prescan</i>	<i>Prescan with FFT</i>	<i>Final scan</i>
30 MHz ≤ f ≤ 1 GHz	120 kHz	≤ 60 kHz	Peak	Quasi-peak	Quasi-peak

Table 10: Bandwidth and detector type for radiated emissions test from 30 MHz to 1 GHz

<i>Frequency</i> (MHz)	<i>Reading value</i> (dBμV)	<i>Antenna correction</i> (dB/m)	<i>Cable attenuation</i> (dB)	<i>Correction factor (Corr.)</i> (dB)	<i>Level</i> (dBμV/m)
100	30.00	11.71	1.06	12.77	42.77

Table 11: Sample calculation

Correction factor = Antenna correction + Cable attenuation

Level = Reading value + Correction factor = 30 dBμV + 12.77 dB = 42.77 dBμV/m

The measurement antenna is a combination of a biconical antenna and a logarithmic-periodic dipole array antenna. It is mounted on a support capable of allowing the antenna to be used in either horizontal or vertical polarization and in a height between 1 m and 4 m above the ground plane.

If the test receiver is capable of FFT analysis, it is used for prescans, but not for final scans.

The radiated emissions test from 30 MHz to 1 GHz is performed in the following steps:

5.5.1 Automatic test method

- a) The measurement antenna is oriented initially for vertical polarization.
- b) The EUT is placed in its standard position on a turntable capable of rotation through 360° in the horizontal plane and arranged as tabletop or floor-standing equipment, as applicable. The EUT is switched on.
- c) The measurement equipment is connected to the measurement antenna and set-up according to the specifications of the test (see table 10).
- d) The table position is set to 0°. The table step is defined as 20°.
- e) The antenna height is set to 1 m. The antenna step is defined as 50 cm.
- f) The spectrum for the full frequency range is recorded. If the emission at a certain frequency is higher than the levels already recorded, the polarization and height of the measurement antenna as well as the current table position are noted as the maximum position.
- g) The antenna height is increased to 4 m in antenna steps as defined in step e). At each height, step f) is repeated.
- h) The polarization of the measurement antenna is changed to horizontal.
- i) The antenna height is decreased from 4 m to 1 m in antenna steps as defined in step e). At each height, step f) is repeated.
- j) The EUT is rotated in a horizontal plane through 360° in table steps as defined in step d). At each table position, steps e) to i) are repeated.
- k) After the last prescan, the significant maximum emissions with their polarizations and heights of the measurement antenna as well as their table positions are determined and collected in a list.
- l) With the test receiver set to the first frequency of the list, the measurement antenna is set to the polarization and height and the table is moved to the position as determined during prescans.
- m) For maximization, the antenna is moved up and down by the antenna step as defined in step e) and the EUT is rotated clockwise and counterclockwise by the table step as defined in step d) while measuring the emission level continuously.
- n) The worst-case positions of antenna and table and the maximum emission level are recorded.
- o) Steps l) to n) are repeated for all other frequencies in the list.

If the EUT may be used in various positions, steps a) to o) are repeated in two other orthogonal positions.

5.5.2 Manual test method

- a) The measurement antenna is oriented initially for vertical polarization.
- b) The EUT is placed in its standard position on a turntable capable of rotation through 360° in the horizontal plane and arranged as tabletop or floor-standing equipment, as applicable. The EUT is switched on.
- c) The measurement equipment is connected to the measurement antenna and set-up according to the specifications of the test (see table 10).
- d) The table position is set to 0°.
- e) The antenna height is set to 1 m.
- f) The spectrum for the full frequency range is recorded while the EUT is rotated in a horizontal plane through 360° continuously. The measurement is performed with peak detector and max hold.
- g) The antenna height is increased to 4 m in steps of 50 cm. At each height, step f) is repeated.
- h) The polarization of the measurement antenna is changed to horizontal.
- i) The antenna height is decreased from 4 m to 1 m in steps of 50 cm. At each height, step f) is repeated.
- j) After the last prescan, the significant maximum emissions with their polarizations and heights of the measurement antenna are determined and collected in a list.
- k) For the final scan the test receiver is set to the first frequency of the list. By using the bargraph max hold function of the measurement receiver the emission in consideration is maximised by rotating the EUT in the horizontal plane through 360° and moving the antenna from 1 m to 4 m.
- l) The worst-case positions of antenna and table and the maximum emission level are recorded.
- m) Steps k) to l) are repeated for all other frequencies in the list.

If the EUT may be used in various positions, steps a) to m) are repeated in two other orthogonal positions.

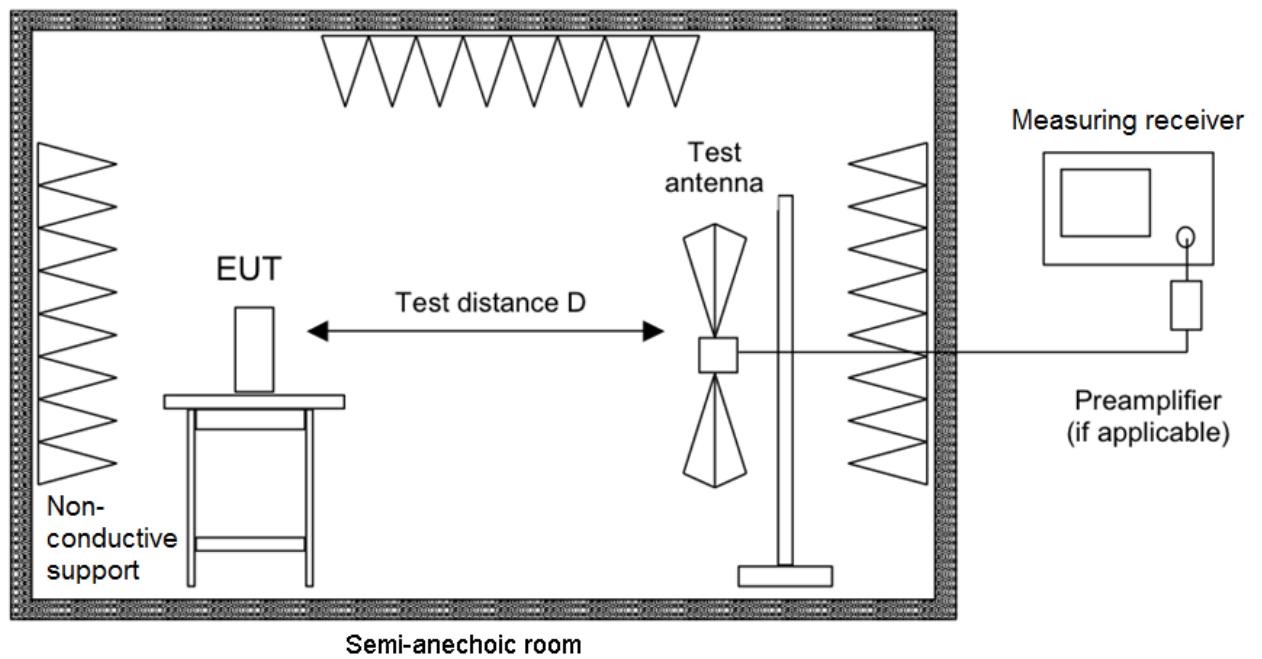


Figure 4: Setup for radiated emissions test from 30 MHz to 1 GHz

5.6 Radiated emissions above 1 GHz

Radiated emissions above 1 GHz are measured according to clause 6.6 of ANSI C63.10 by conducting exploratory and final radiated emission tests. According to clause 6.6.4.1 of ANSI C63.10, measurements may be performed at a distance closer than that specified in the requirements. However, an attempt shall be made to avoid making final measurements in the near field of both the measurement antenna and the EUT.

For measurement of radiated emissions above 1 GHz, horn antennas are used.

Test chamber	Frequency (MHz)	Reading value (dBμV)	Antenna correction (dB/m)	Correction pre-amplifier (dB)	Cable attenuation (dB)	Correction factor (Corr.) (dB)	Level (dBμV/m)
SAC3	2400	50.00	27.76	-47.91	5.24	-14.92	35.08
FS-SAC	2400	50.00	27.76	-34.57	3.51	-3.30	46.70

Table 12: Sample calculation

Correction factor = Antenna correction + Correction pre-amplifier + Cable attenuation

SAC3:

Level = Reading value + Correction factor = 50.00 dBμV - 14.92 dB/m = 35.08 dBμV/m

FS-SAC:

Level = Reading value + Correction factor = 50.00 dBμV - 3.30 dB/m = 46.70 dBμV/m

5.6.1 Exploratory radiated emissions measurements

Exploratory radiated emissions above 1 GHz are measured in a semi-anechoic chamber with RF absorbing material on the floor or a fully anechoic room. They are performed by moving the receiving antenna over all sides of the EUT at a closer distance (e.g. 0.5 or 1 m) while observing the display of the test receiver to find the emissions to be re-tested during final radiated emission measurements.

According to clause 5.3.3 of ANSI C63.10, when performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade of distance (inverse of linear distance for field-strength measurements). To simplify testing and documentation, the limits are increased accordingly instead of decreasing the results.

The emissions of the EUT are displayed and recorded with an EMI test receiver operating in the spectrum analyzer mode using the settings as described in table 13.

Frequency (f)	Resolution bandwidth	Video bandwidth	Sweep time	Trace detector(s)
f ≥ 1 GHz	1 MHz	3 MHz	AUTO	Max Peak, Average

Table 13: Bandwidth and trace settings for exploratory radiated emissions test above 1 GHz

If during exploratory radiated emissions measurements no levels to be re-tested are found, the final radiated emissions measurement may be omitted. In this case, the chart of the exploratory radiated emissions measurements has to be reported.

5.6.2 Final radiated emissions measurements

Final radiated emissions above 1 GHz are measured in the semi-anechoic chamber (SAC3) or Free space semi-anechoic chamber (FS-SAC) with RF absorbing material on the floor between measurement antenna and EUT. The measurement distance is 3 meters in the semi-anechoic chamber (SAC3) or 1.5 m in the Free space semi-anechoic chamber (FS-SAC). The emissions of the EUT are recorded with an EMI test receiver configured as described in table 14.

<i>Frequency (f)</i>	<i>Measurement receiver bandwidth</i>	<i>Step size</i>	<i>Detector type</i>	
			<i>Prescan</i>	<i>Final scan</i>
$f \geq 1 \text{ GHz}$	1 MHz	$\leq 500 \text{ kHz}$	Peak, Average	Peak, Average

Table 14: Bandwidth and detector type for final radiated emissions test above 1 GHz

Prescans are performed with both detectors activated at the same time. If the test receiver is capable of FFT analysis, it is used for prescans, but not for final scans.

The horn antenna is mounted on a support capable of allowing the antenna to be used in either horizontal or vertical polarization and to be moved in a scan height range between 1 m and the scan height upper range defined in clause 6.6.3.3 of ANSI C63.10. When the EUT is manipulated through three different orientations, the scan height upper range for the measurement antenna is limited to 2.5 m above the ground plane.or 0.5 m above the top of the EUT, whichever is higher. Otherwise, the scan height upper range is 4 m above the ground plane.

To keep the emission signal within the illumination area of the 3 dB beamwidth of the measurement antenna, the automatic tilt function of the antenna support device is used to point the antenna at an angle toward the source of the emission.

The final radiated emissions test above 1 GHz is performed in the following steps:

5.6.2.1 Automatic measurement method

- a) The measurement antenna is oriented initially for vertical polarization.
- b) The EUT is placed in its standard position on a turntable capable of rotation through 360° in the horizontal plane and arranged as tabletop or floor-standing equipment, as applicable. The EUT is switched on.
- c) The measurement equipment is connected to the measurement antenna and set-up according to the specifications of the test (see table 14).
- d) The table position is set to 0° . The table step is defined as 20° .
- e) The antenna height is set to 1 m. The antenna step is defined as 50 cm.
- f) The spectrum for the full frequency range is recorded. If the emission at a certain frequency is higher than the levels already recorded, the polarization and height of the measurement antenna as well as the current table position are noted as the maximum position.
- g) The antenna height is increased to the scan height upper range in antenna steps as defined in step e). At each height, step f) is repeated.
- h) The polarization of the measurement antenna is changed to horizontal.
- i) The antenna height is decreased from the scan height upper range to 1 m in antenna steps as defined in step e). At each height, step f) is repeated.
- j) The EUT is rotated in a horizontal plane through 360° in table steps as defined in step d). At each table position, steps e) to i) are repeated.
- k) After the last prescan, the significant maximum emissions with their polarizations and heights of the measurement antenna as well as their table positions are determined and collected in a list.
- l) With the test receiver set to the first frequency of the list, the measurement antenna is set to the polarization and height and the table is moved to the position as determined during prescans.
- m) For maximization, the antenna is moved up and down by the antenna step as defined in step e) and the EUT is rotated clockwise and counterclockwise by the table step as defined in step d) while measuring the emission level continuously.
- n) The worst-case positions of antenna and table and the maximum emission level are recorded.
- o) Steps l) to n) are repeated for all other frequencies in the list.

If the EUT may be used in various positions, steps a) to o) are repeated in two other orthogonal positions.

5.6.2.2 Manual measurement method

- a) The measurement antenna is oriented initially for vertical polarization.
- b) The EUT is placed in its standard position on a turntable capable of rotation through 360° in the horizontal plane and arranged as tabletop or floor-standing equipment, as applicable. The EUT is switched on.
- c) The measurement equipment is connected to the measurement antenna and set-up according to the specifications of the test (see table 14).
- d) The table position is set to 0°.
- e) The antenna height is set to 1 m.
- f) The spectrum for the full frequency range is recorded while the EUT is rotated in a horizontal plane through 360° continuously. The measurement is performed with peak detector and max hold.
- g) The antenna height is increased to the scan height upper range in steps of 50 cm. At each height, step f) is repeated.
- h) The polarization of the measurement antenna is changed to horizontal.
- i) The antenna height is decreased from the scan height upper range to 1 m in steps of 50 cm. At each height, step f) is repeated.
- j) After the last prescan, the significant maximum emissions with their polarizations are determined and collected in a list.
- k) For the final scan the test receiver is set to the first frequency of the list. By using the bargraph max hold function of the measurement receiver the emission in consideration is maximised by rotating the EUT in the horizontal plane through 360° and moving the antenna from 1 m to 4 m (2.5 m).
- l) The worst-case positions of antenna and table and the maximum emission level are recorded.
- m) Steps k) to l) are repeated for all other frequencies in the list.

If the EUT may be used in various positions, steps a) to m) are repeated in two other orthogonal positions.

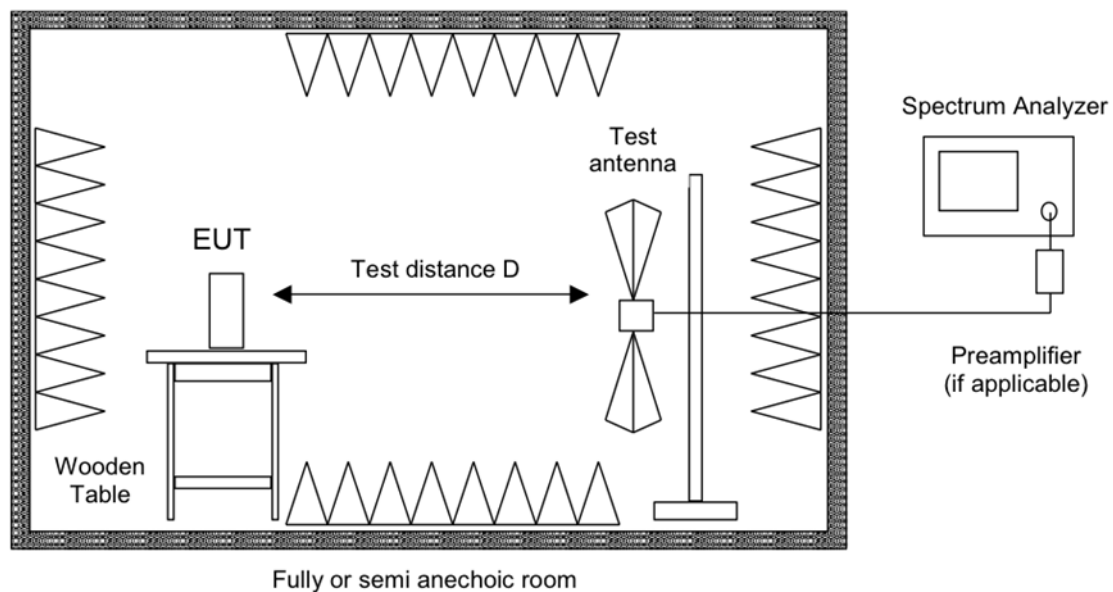


Figure 5: Setup for radiated emissions test above 1 GHz

5.7 Bandwidth measurements

5.7.1 20 dB bandwidth

The 20 dB bandwidth is measured according to clause 6.9.2 of ANSI C63.10, using the following settings:

- a) The spectrum analyser center frequency is set to the nominal EUT channel center frequency. The span range for the EMI receiver or spectrum analyser shall be between two times and five 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 video bandwidth (VBW) shall be approximately three times 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 $[10 \log (\text{OBW}/\text{RBW})]$ below the reference level. Specific guidance is given in 4.1.6.2 of ANSI C63.10.
- d) Steps a) through c) might require iteration to adjust within the specified tolerances.
- e) The dynamic range of the instrument at the selected RBW shall be more than 10 dB below the target “-xx dB down” requirement; that is, if the requirement calls for measuring the -20 dB OBW, the instrument noise floor at the selected RBW shall be at least 30 dB below the reference value.
- f) Set detection mode to peak and trace mode to max hold.
- g) Determine the reference value: Set the EUT to transmit an unmodulated carrier or modulated signal, as applicable. Allow the trace to stabilize. Set the spectrum analyser marker to the highest level of the displayed trace (this is the reference value).
- h) Determine the “-xx dB down amplitude” using $[(\text{reference value}) - \text{xx}]$. Alternatively, this calculation may be made by using the marker-delta function of the instrument.
- i) If the reference value is determined by an unmodulated carrier, then turn the EUT modulation ON, and either clear the existing trace or start a new trace on the spectrum analyser and allow the new trace to stabilize. Otherwise, the trace from step g) shall be used for step j).
- j) Place two markers, one at the lowest frequency and the other at the highest frequency of the envelope of the spectral display, such that each marker is at or slightly below the “-xx dB down amplitude” determined in step h). If a marker is below this “-xx dB down amplitude” value, then it shall be as close as possible to this value. The occupied bandwidth is the frequency difference between the two markers. Alternatively, set a marker at the lowest frequency of the envelope of the spectral display, such that the marker is at or slightly below the “-xx dB down amplitude” determined in step h). Reset the marker-delta function and move the marker to the other side of the emission until the delta marker amplitude is at the same level as the reference marker amplitude. The marker-delta frequency reading at this point is the specified emission bandwidth.
- k) The occupied bandwidth shall be reported by providing plot(s) of the measuring instrument display; the plot axes and the scale units per division shall be clearly labeled. Tabular data may be reported in addition to the plot(s).

5.7.2 99 % occupied bandwidth

According to section 6.7 of RSS-Gen, the occupied bandwidth (OBW) is defined as the 99 % emission bandwidth.

The span of the spectrum analyser is set large enough to capture all products of the modulation process, including the emission skirts, around the carrier frequency, but small enough to avoid having other emissions (e.g. on adjacent channels) within the span.

The resolution bandwidth is in the range of 1 % to 5 % of the occupied bandwidth and the video bandwidth is not smaller than three times the resolution bandwidth. Video averaging is not permitted.

If possible, the detector of the spectrum analyzer is set to "Sample". However, if the device is not transmitting continuously, a peak, or peak hold is used in place of the sampling detector since this usually produces a wider bandwidth than the actual bandwidth (worst-case measurement).

To measure the 99 % emission bandwidth, the OBW function of the test receiver is used with the power bandwidth set to 99 %. This function indicates the lowest frequency (starting from the left side of the span) and the highest frequency (starting from the right side of the span) where 0.5% of the total sum is reached. The difference between the two frequencies is the 99 % occupied bandwidth.

5.8 Maximum peak conducted output power

In case of antenna-port conducted tests as described in clause 5.2 cannot be performed, according to section 3.0 of KDB 558074 D01, results of radiated tests are used for demonstrating compliance to the conducted emission requirements. For details about conversion see clause 5.1.2

The maximum conducted output power test method for frequency-Hopping devices refers to clause 7.8.5 of ANSI C63.10.

The spectrum analyzer settings are as follows:

- a) Span: Approximately five times the 20 dB bandwidth, centered on a hopping channel
- b) RBW > 20 dB bandwidth of the emission being measured
- c) VBW $\geq$ RBW
- d) Sweep time = auto coupled
- e) Detector function = peak
- f) Trace mode = max hold

After the trace is stabilized, the marker-to-peak function is used to set the marker to the peak of the emission. The indicated level is the maximum peak conducted output power.

6 Test results

This clause gives details about the test results as collected in the summary of test results on page 6.

For information about measurement uncertainties see page 83.

The climatic conditions are recorded during the tests. It is ensured that the climatic conditions are within the following ranges:

<i>Ambient temperature</i>	<i>Ambient humidity</i>	<i>Ambient pressure</i>
15°C to 35°C	30 % to 75 %	86 kPa to 106 kPa

6.1 20 dB bandwidth

Section(s) in 47 CFR Part 15: Requirement(s): N/A
Reference(s): ANSI C63.10, clause 6.9

Section(s) in RSS: Requirement(s): N/A
Reference(s): ANSI C63.10, clause 6.9

Performed by:	Patricio Montenegro, M.Sc.-Ing.	Date(s) of test:	March 11, 2026
Result:	☒ Result recorded		

6.1.1 Test equipment

Description	Designation	Manufacturer	Inventory number	Last check	Next check	Check type
EMI test receiver	ESR7	Rohde & Schwarz	E00739	2025-05-12	2026-05-12	C
Attenuator (20 dB)	R411.820.121	---	W00708	2026-03-11	2027-09-11	V

Note(s)

1. C = Calibration
2. V = Verification

6.1.2 Limits

There is no limit.

6.1.3 Test procedure

The 20 dB bandwidth is measured using the test procedure as described in clause 5.7.1 and referring to the

- ☒ test method for conducted measurements as described in clause 5.2.
- ☐ test method for radiated measurements as described in clause 5.5.
- ☐ test method for radiated measurements as described in clause 5.6.

6.1.4 Test results

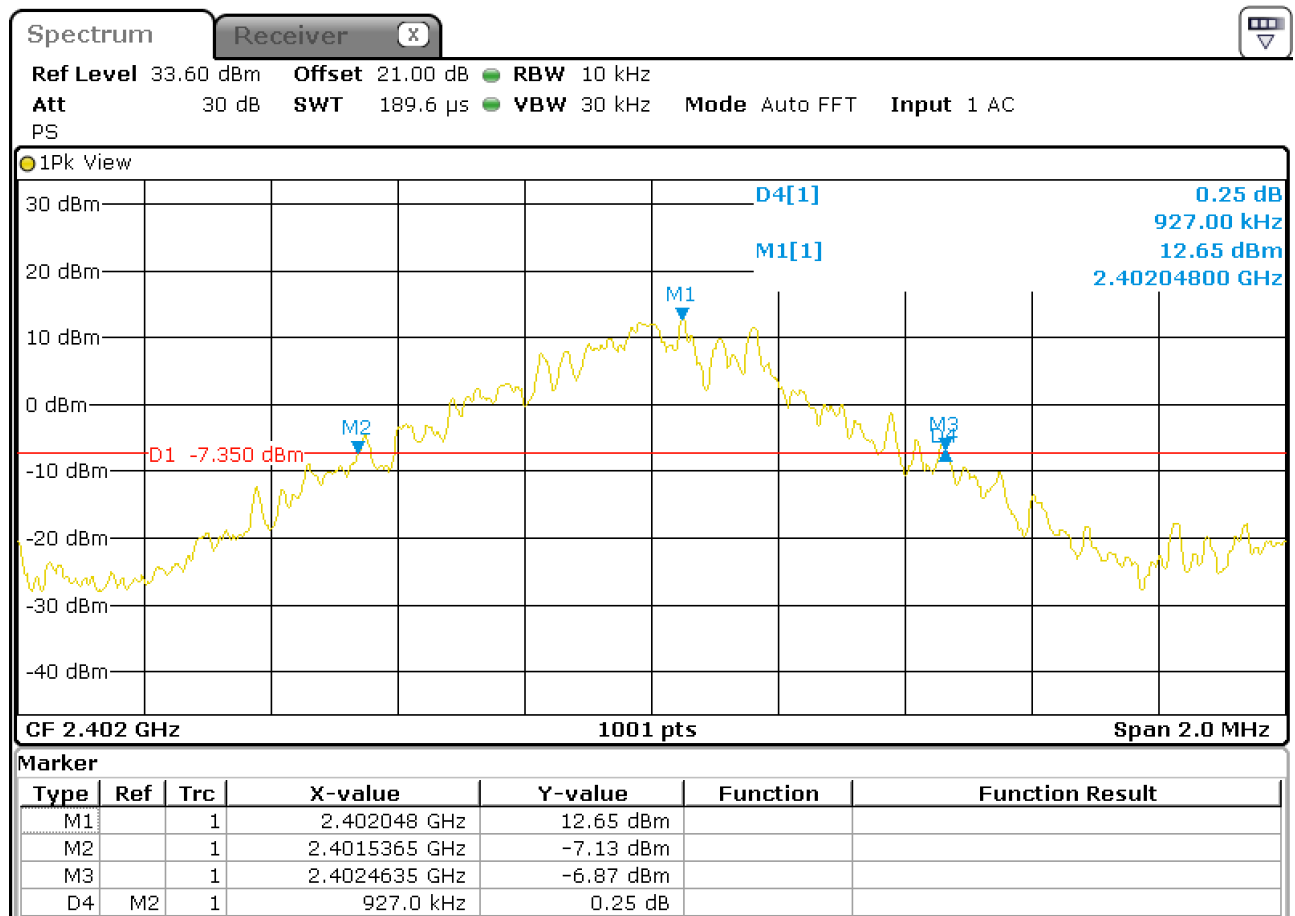


Figure 6: Chart of 20 dB bandwidth test on lowest channel

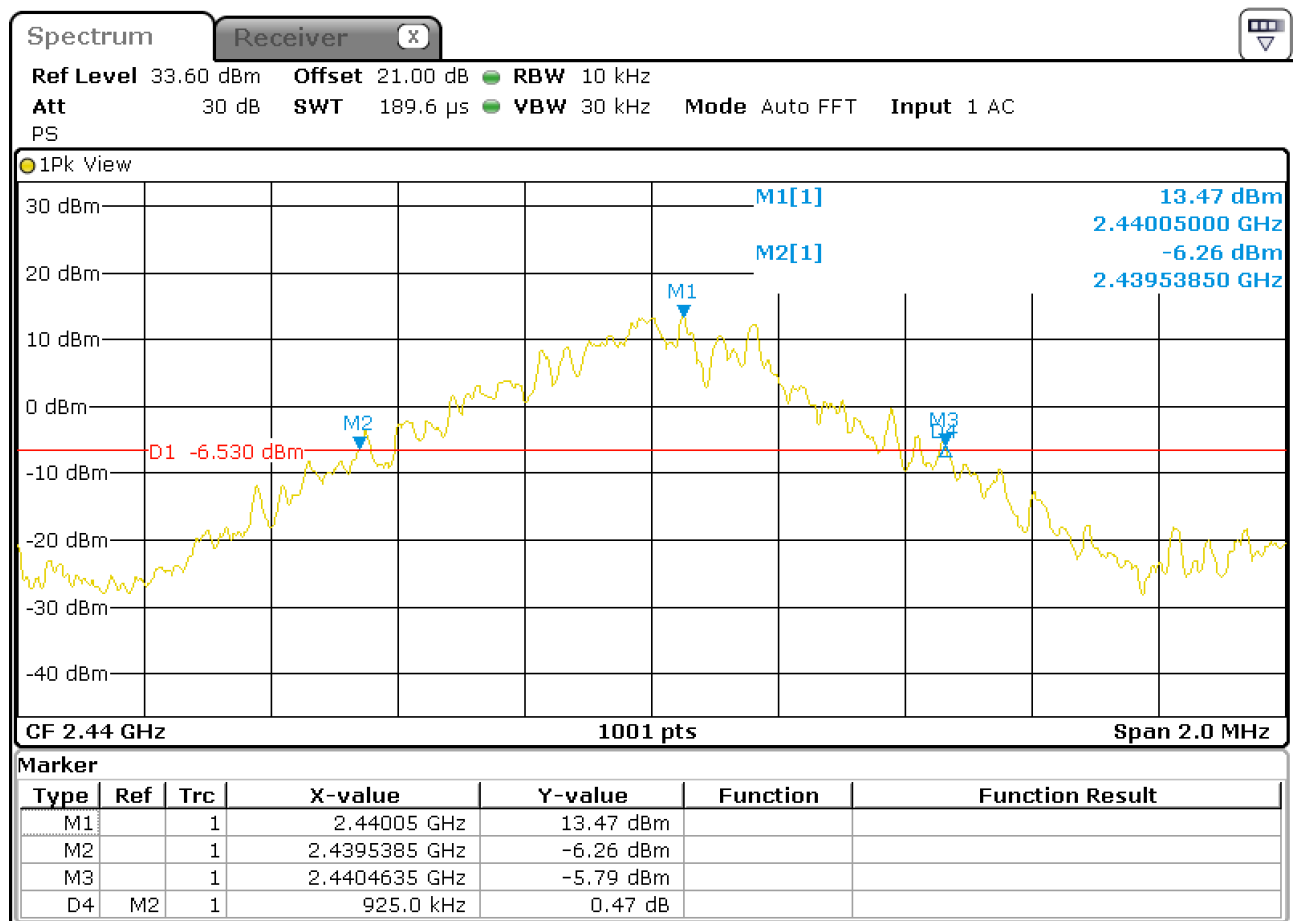


Figure 7: Chart of 20 dB bandwidth test on middle channel

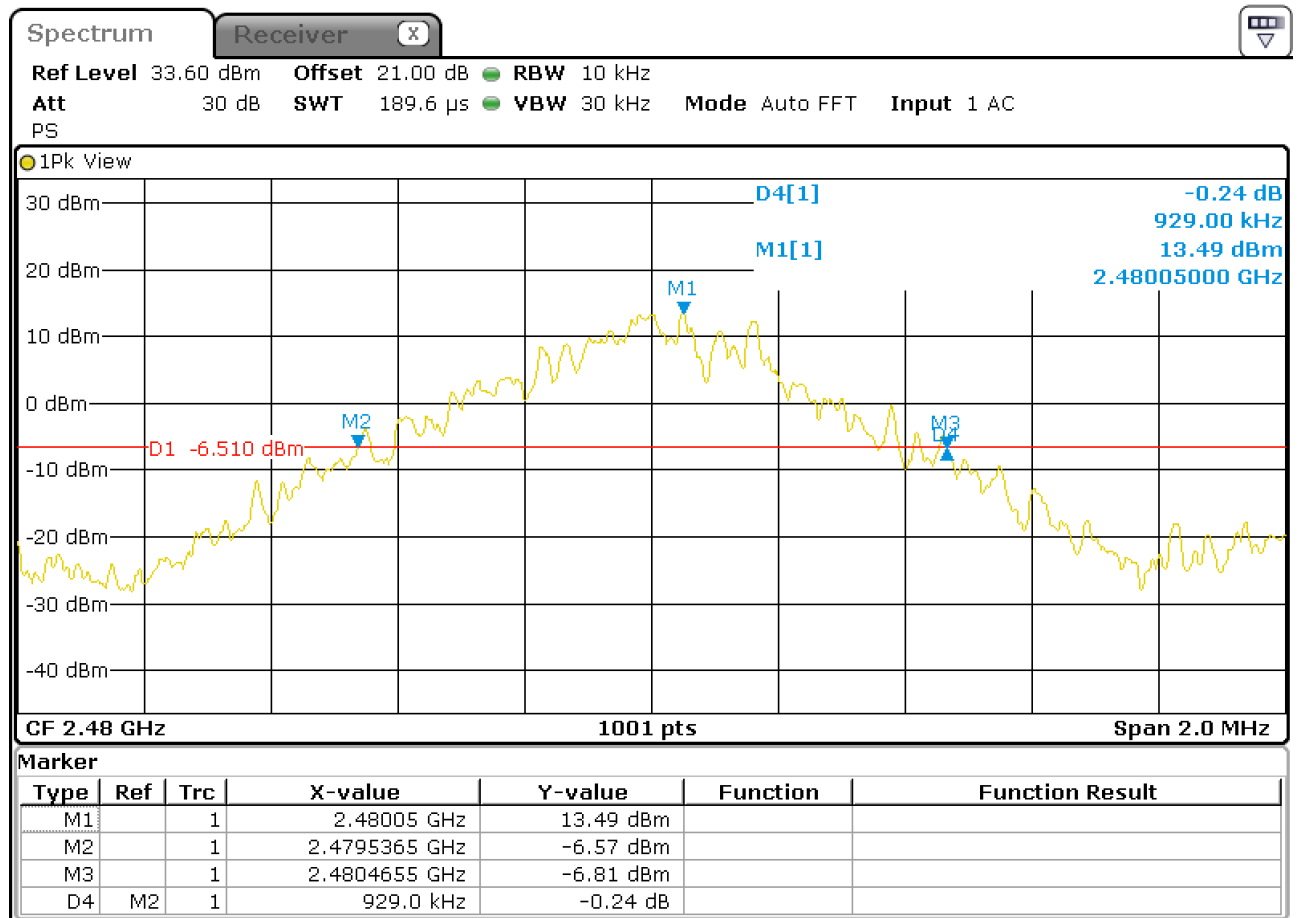


Figure 8: Chart of 20 dB bandwidth test on highest channel

Channel	20 dB bandwidth (kHz)	Bandwidth limit (kHz)	Lower frequency of bandwidth (MHz)	Lower frequency of designated band (MHz)	Upper frequency of bandwidth (MHz)	Upper frequency of designated band (MHz)	Result
low	927.0	≥ 500.0	2401.5365	2400.0000	2402.4635	2483.50000	Recorded
middle	925.0	≥ 500.0	2439.5385	2400.0000	2440.4635	2483.50000	Recorded
high	929.0	≥ 500.0	2479.5365	2400.0000	2480.4655	2483.50000	Recorded

Table 15: Results of 20 dB bandwidth test

6.2 Occupied bandwidth

Section(s) in 47 CFR Part 15:	Requirement(s): Reference(s):	N/A N/A
Section(s) in RSS:	Requirement(s): Reference(s):	RSS-Gen, section 6.7 ANSI C63.10, clause 6.9

Performed by:	Patricio Montenegro, M.Sc.-Ing.	Date(s) of test:	March 12, 2026
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Result:	☒ Result recorded
---------	---

6.2.1 Test equipment

Description	Designation	Manufacturer	Inventory number	Last check	Next check	Check type
EMI test receiver	ESR7	Rohde & Schwarz	E00739	2025-05-12	2026-05-12	C
Attenuator (20 dB)	R411.820.121	---	W00708	2026-03-11	2027-09-11	V

Note(s)

1. C = Calibration
2. V = Verification

6.2.2 Limits

According to RSS-Gen, section 6.7:

The occupied bandwidth or the “99% emission bandwidth” has to be reported for all equipment in addition to the specified bandwidth required in RSS-247.

6.2.3 Test procedure

The occupied bandwidth is measured using the test procedure as described in clause 5.7.2 and referring to the

- ☒ test method for conducted measurements as described in clause 5.2.
- ☐ test method for radiated measurements as described in clause 5.5.
- ☐ test method for radiated measurements as described in clause 5.6.

6.2.4 Test results

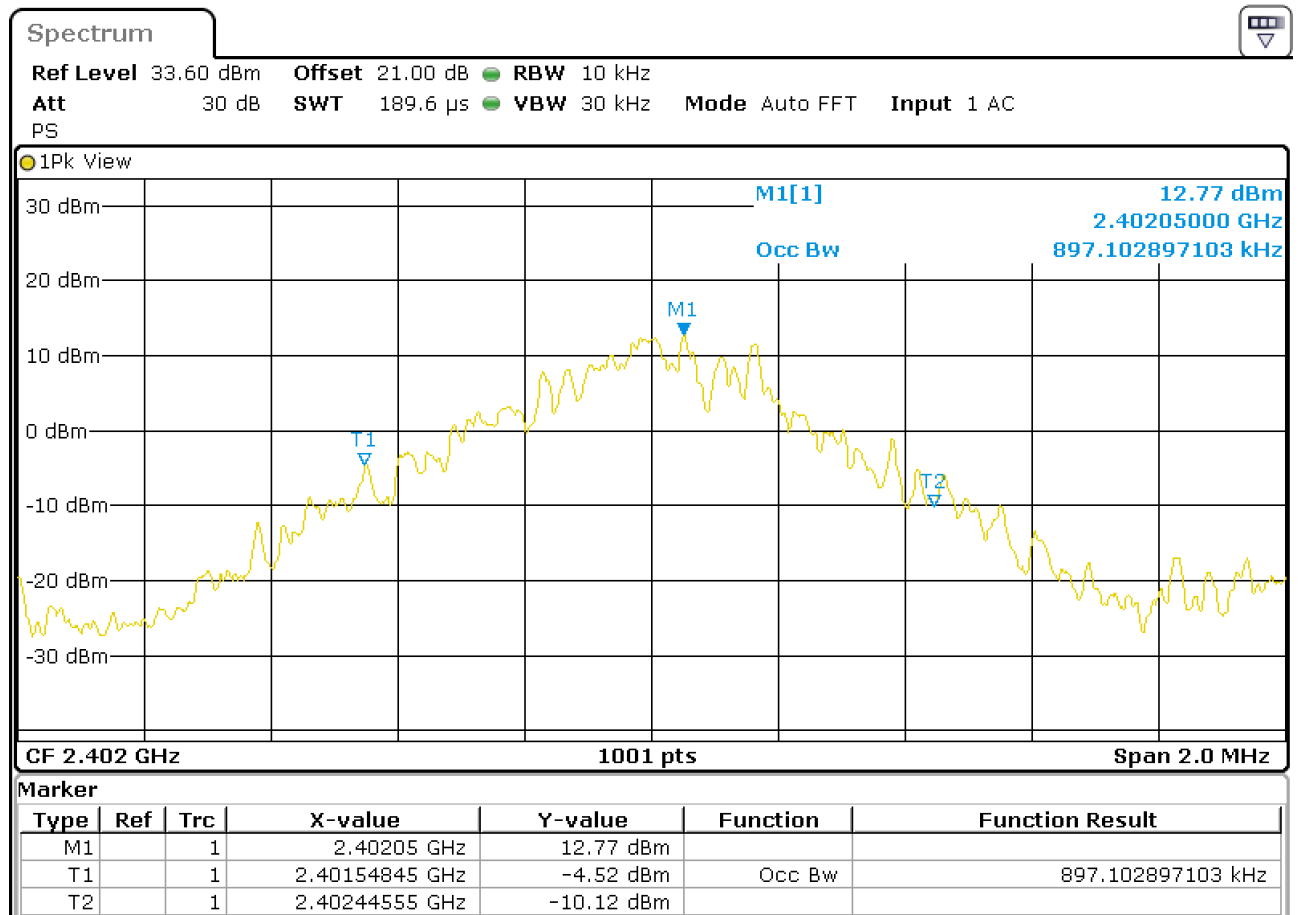


Figure 9: Chart of occupied bandwidth test on lowest channel

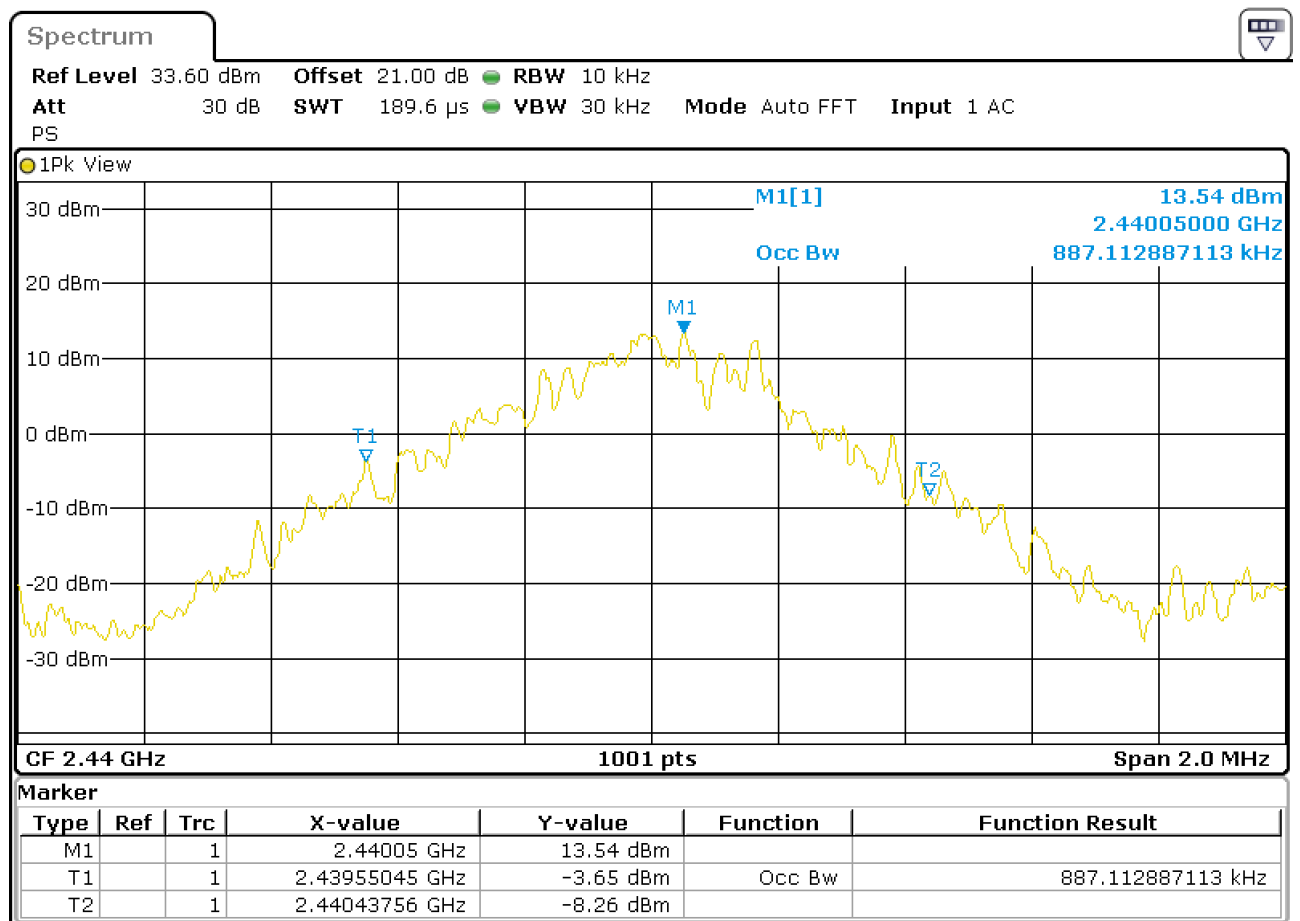


Figure 10: Chart of occupied bandwidth test on middle channel

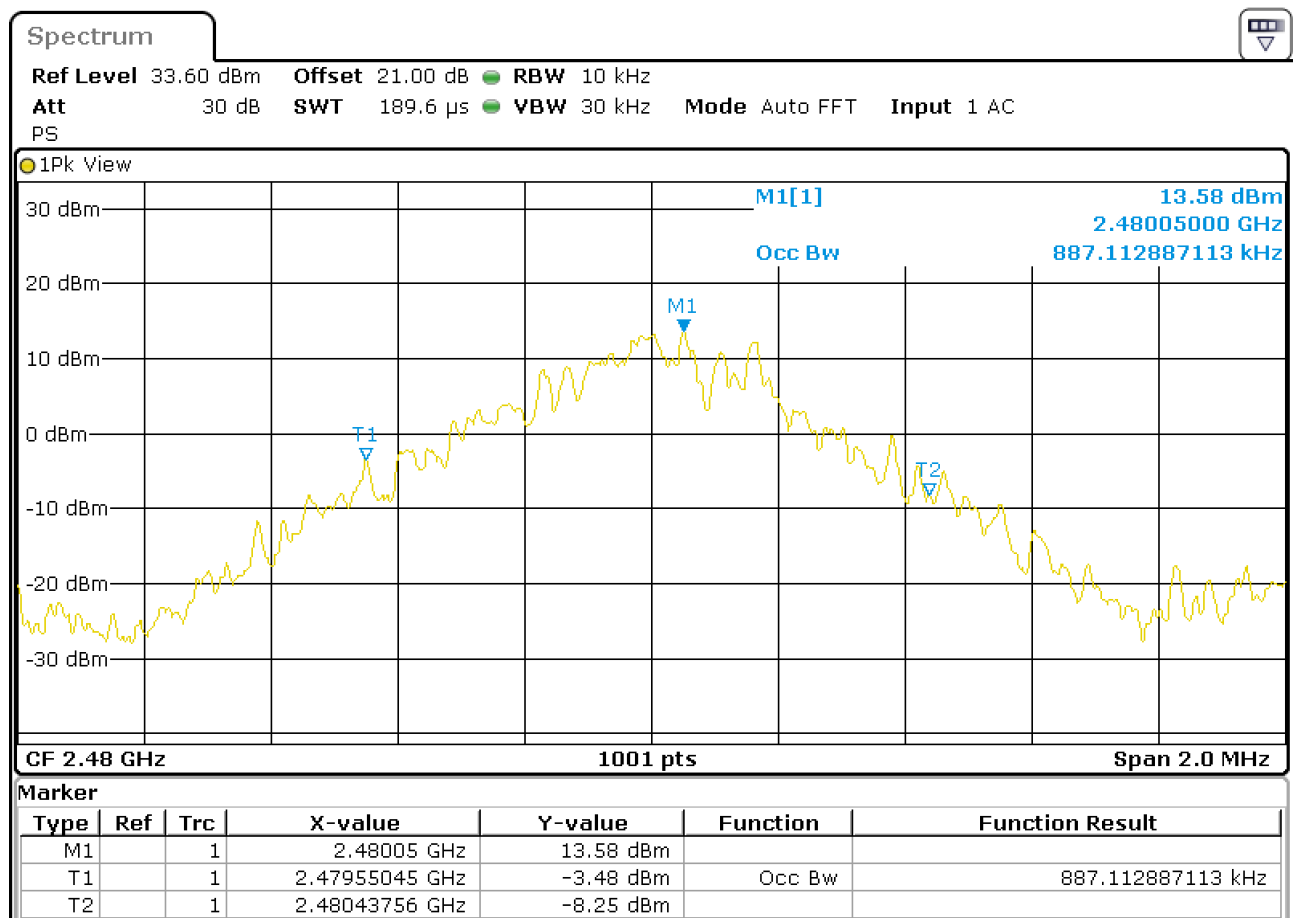


Figure 11: Chart of occupied bandwidth test on highest channel

Channel	Lower frequency of bandwidth (MHz)	Upper frequency of bandwidth (MHz)	99 % occupied bandwidth (MHz)	Result
low	2401.548	2402.446	0.897	Recorded
middle	2439.550	2440.438	0.887	Recorded
high	2479.550	2480.438	0.887	Recorded

Table 16: Results of occupied bandwidth test

6.3 Duty cycle correction

Section(s) in 47 CFR Part 15:	Requirement(s):	N/A
	Reference(s):	ANSI C63.10, clause 7.8.8.2
Section(s) in RSS:	Requirement(s):	N/A
	Reference(s):	ANSI C63.10, clause 7.8.8.2

Performed by:	Patricio Montenegro, M.Sc.-Ing.	Date(s) of test:	March 12, 2026
Result:	☒ Result recorded		

6.3.1 Test equipment

Description	Designation	Manufacturer	Inventory number	Last check	Next check	Check type
EMI test receiver	ESR7	Rohde & Schwarz	E00739	2025-05-12	2026-05-12	C
Attenuator (20 dB)	R411.820.121	---	W00708	2026-03-11	2027-09-11	V

Note(s)

1. C = Calibration
2. V = Verification

6.3.2 Limits

There is no limit for the duty cycle.

6.3.3 Test procedure

The duty cycle is measured using the test procedure as described in clause 6 of KDB 558074 D01 and referring to the

- ☒ test method for conducted measurements as described in clause 5.2.
- ☐ test method for radiated measurements as described in clause 5.5.
- ☐ test method for radiated measurements as described in clause 5.6.

6.3.4 Test results

6.3.4.1 Duty cycle of the provided test signal

Note:

The duty cycle of the provided test signal was measured representatively on the lowest channel in non-hopping mode.

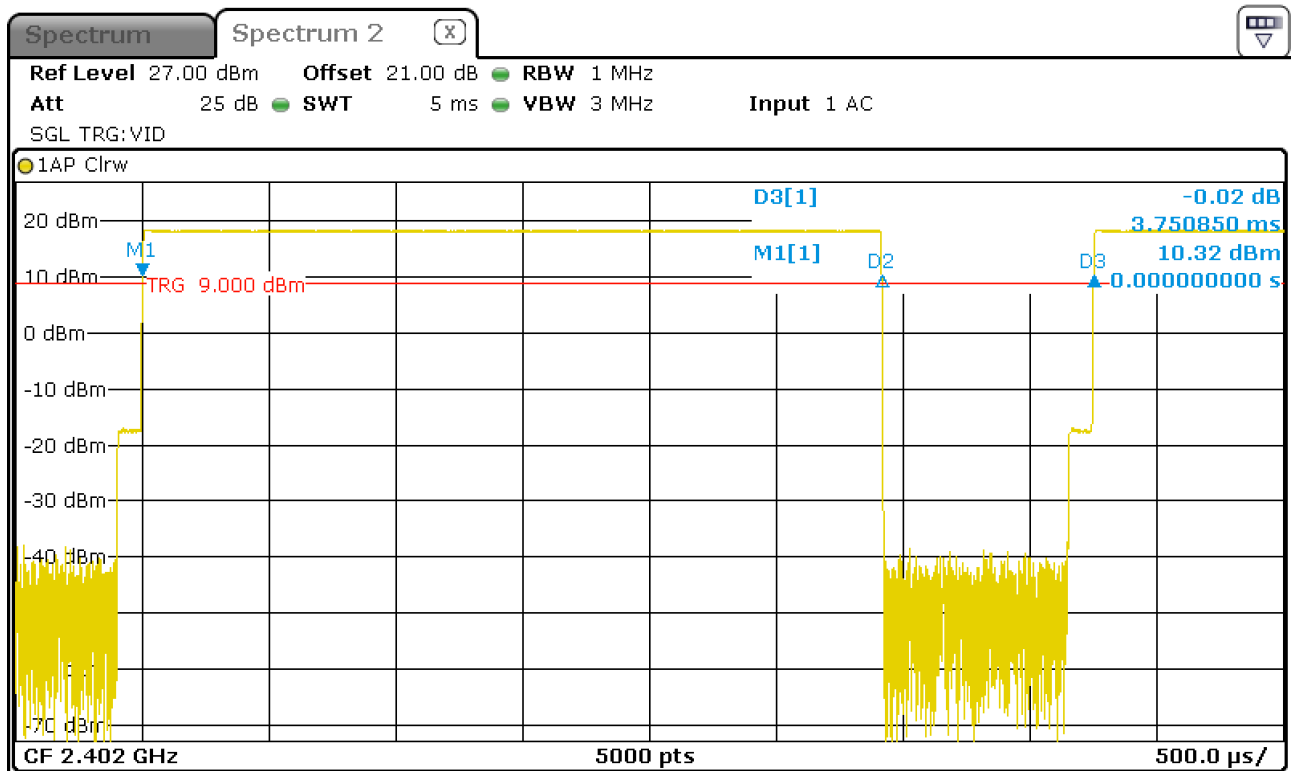


Figure 12: Chart of the duty cycle measurement of 1 transmission interval on the lowest channel

Channel	Transmission time of 1 pulse train (ms)	Idle period of 1 pulse train (ms)	Duty cycle	Duty cycle (%)	Result
Low	2.91	0.84	0.78	78	Recorded

Table 17: Results of duty cycle test of provided test signal

6.3.4.2 Duty cycle correction factor

Dwell time in 31.6 s according to clause 6.7.4: 313.2 ms

Calculated dwell time in 100 ms: 1.0 ms

Channel separation: 1 MHz

Channel separation correction: 1

20 dB bandwidth: < channel separation

Overlapping channel correction: 0

Correction for maximum dwell time per 100 ms

1

According to clause 7.8.8.2 of ANSI C63.10:

The maximum dwell time per 1 MHz does need to account for cases where the channel spacing is less than the 1 MHz measurement bandwidth and for cases where the occupied bandwidth exceeds the channel spacing and the channels overlap. The maximum dwell time per 1 MHz is determined as follows:

Maximum dwell time per 1 MHz = dwell time per 100 ms per channel × (channel separation correction + overlapping channel correction) where:

- Channel separation correction = $[1 / \text{channel separation (MHz)}]$ for channel separation < 1 MHz, and = 1 for channel separation ≥ 1 MHz, as determined using the procedures of 7.8.2. If the average measurements are performed on the Nth harmonic, the channel separation value is N times the separation at the fundamental frequency.
- Overlapping channel correction = 0 when the 20 dB channel bandwidth < channel separation and =1 for when the 20 dB channel bandwidth > channel separation.

According to clause 7.8.8.2 (a) of ANSI C63.10:

The average value may be determined as follows: From the peak value of the emission: The measured peak value in dBuV/m is corrected by $20\log(\text{maximum dwell time in 100 ms} / 100)$.

Channel	Dwell time per 100 ms (ms)	Correction Factor (dB)	Result
low	0.98	-40.2	Recorded

Table 18: Correction factor according to clause 7.8.8.2 (a) of ANSI C63.10

6.4 Conducted output power and EIRP

Section(s) in 47 CFR Part 15:	Requirement(s):	15.247(b)(1) 15.247(b)(4)
	Reference(s):	ANSI C63.10, clause 7.8.5
Section(s) in RSS:	Requirement(s):	RSS-247, section 6.2.3.2(a)(b)
	Reference(s):	ANSI C63.10, clause 7.8.5

Performed by:	Patricio Montenegro, M.Sc.-Ing.	Date(s) of test:	March 12, 2026
Result:	☒ Test passed	☐ Test not passed	

6.4.1 Test equipment

Description	Designation	Manufacturer	Inventory number	Last check	Next check	Check type
EMI test receiver	ESR7	Rohde & Schwarz	E00739	2025-05-12	2026-05-12	C
Attenuator (20 dB)	R411.820.121	---	W00708	2026-03-11	2027-09-11	V

Note(s)

1. C = Calibration
2. V = Verification

6.4.2 Limits

According to §15.247(b)(1):

For frequency hopping systems operating in the 2400 – 2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725 – 5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400 – 2483.5 MHz band: 0.125 watts.

According to §15.247(b)(4):

The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

According to RSS-247, section 6.2.3.2(a):

if the hopset uses 75 or more hopping channels, the maximum peak conducted output power shall not exceed 1.0 W.

According to RSS-247, section 6.2.3.2(b):

if the hopset uses less than 75 hopping channels the maximum peak conducted output power shall not exceed 0.125 W.

According to RSS-247, section 6.2.3.2(c):
the e.i.r.p. shall not exceed 4 W, except as provided in sections 6.5 a) and b) of RSS-247.

6.4.3 Test procedure

The maximum peak conducted output power is measured using the test procedure as described in clause 5.8 and referring to the

- ☒ test method for conducted measurements as described in clause 5.2.
- ☐ test method for radiated measurements as described in clause 5.5.
- ☐ test method for radiated measurements as described in clause 5.6.

6.4.4 Test results

Note(s):

1. The gain of the antenna is below 6 dBi, therefore a reduction of the conducted limit was not applied.

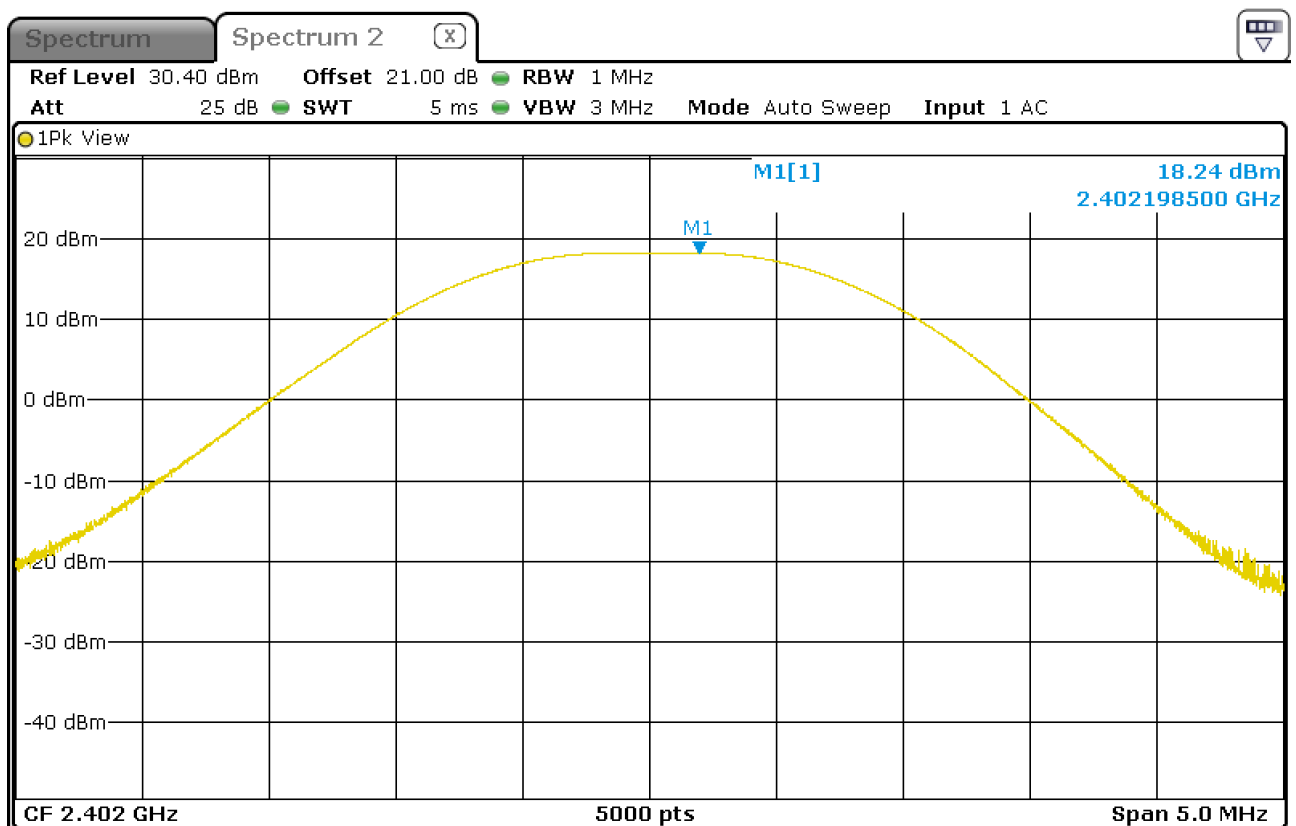


Figure 13: Chart of conducted output power on lowest channel

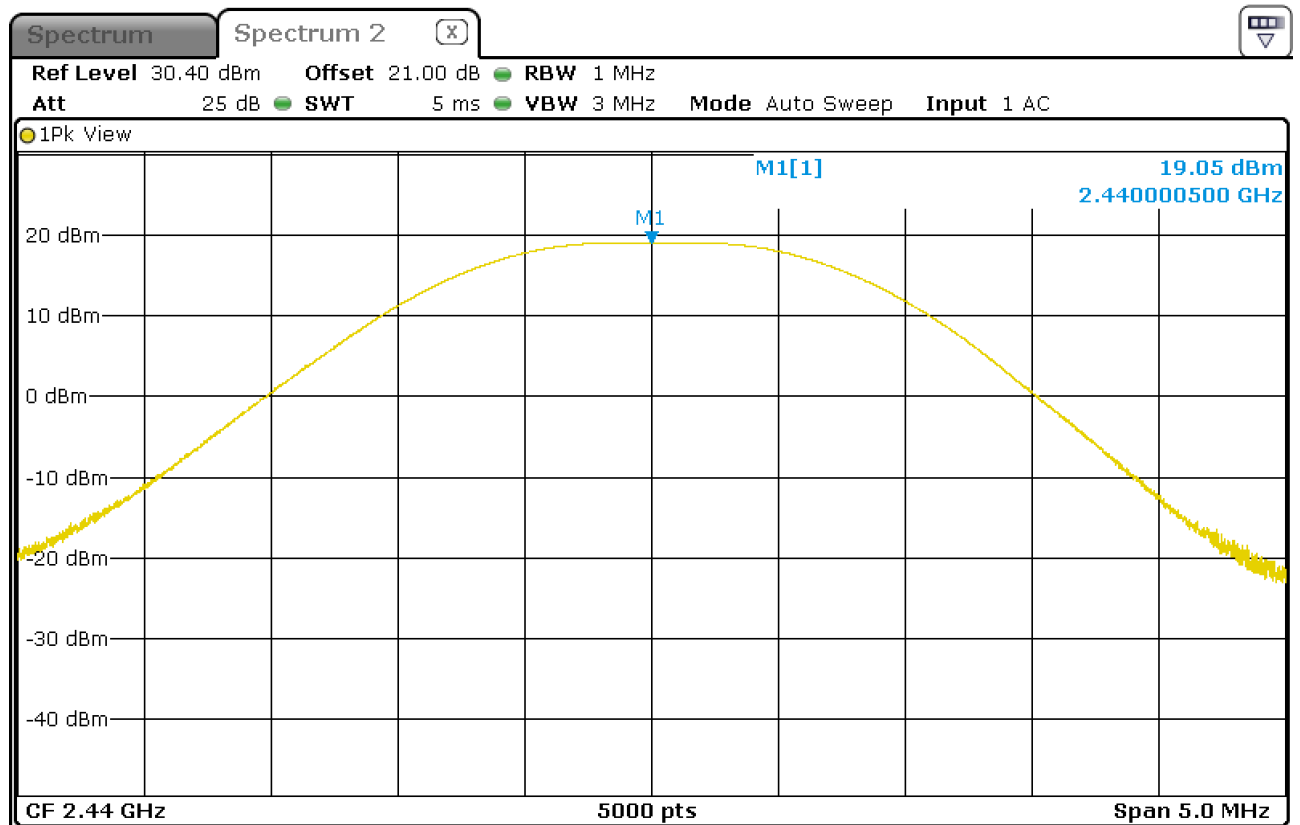


Figure 14: Chart of conducted output power on middle channel

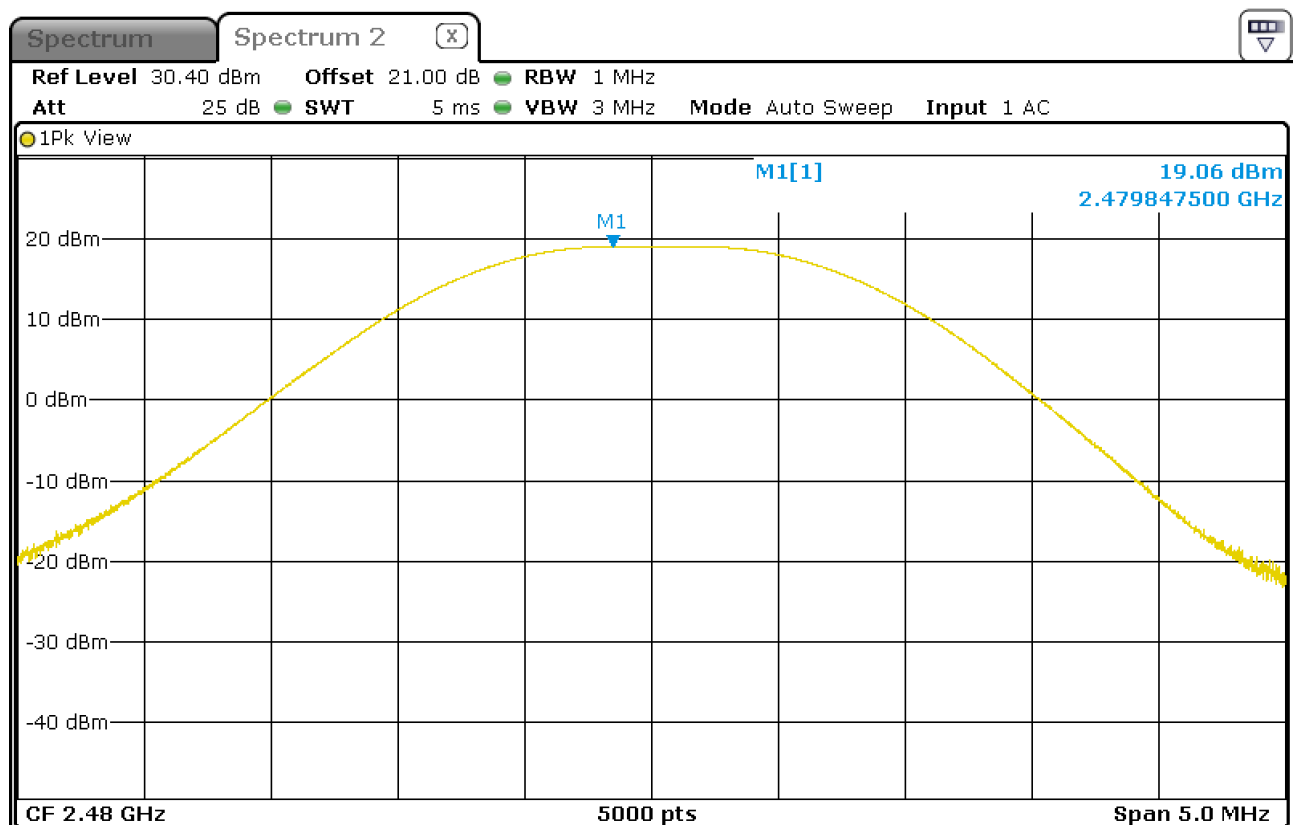


Figure 15: Chart of conducted output power on highest channel

<i>Channel</i>	<i>Conducted output power (dBm)</i>	<i>Limit (dBm)</i>	<i>Margin (dB)</i>	<i>Results</i>
low	18.2	30.0	11.8	Passed
middle	19.1	30.0	10.9	Passed
high	19.1	30.0	10.9	Passed

Table 19: Results of conducted output power

<i>Channel</i>	<i>EIRP (dBm)</i>	<i>Limit (dBm)</i>	<i>Margin (dB)</i>	<i>Results</i>
low	22.9	36.0	13.1	Passed
middle	23.8	36.0	12.2	Passed
high	23.8	36.0	12.2	Passed

Table 20: Results of EIRP according to RSS-247

Note:

EIRP is calculated by adding the gain to the conducted power

6.5 Carrier frequency separation

Section(s) in 47 CFR Part 15:	Requirement(s):	15.247(a)(1)
	Reference(s):	ANSI C63.10, clause 7.8.2
Section(s) in RSS:	Requirement(s):	RSS-247, section 6.2.1(b)
		RSS-247, section 6.2.3.1(a)
	Reference(s):	ANSI C63.10, clause 7.8.2

Performed by:	Patricio Montenegro, M.Sc.-Ing.	Date(s) of test:	March 12, 2026
Result:	☒ Test passed	☐ Test not passed	

6.5.1 Test equipment

Description	Designation	Manufacturer	Inventory number	Last check	Next check	Check type
EMI test receiver	ESR7	Rohde & Schwarz	E00739	2025-05-12	2026-05-12	C
Attenuator (20 dB)	R411.820.121	---	W00708	2026-03-11	2027-09-11	V

Note(s)

1. C = Calibration
2. V = Verification

6.5.2 Limits

According to §15.247(a)(1):

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400–2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo randomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

According to RSS-247, section 6.2.1(b):

the hopping channel carrier frequencies shall be separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

According to RSS-247, section 6.2.3.1(a):

FHS operating in the band 2400–2483.5 MHz may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided that the systems operate with an output power no greater than 0.125 W.

6.5.3 Test procedure

The carrier frequency separation is measured using the test procedure as described in clause 7.8.2 of ANSI C63.10 and referring to the

- ☒ test method for conducted measurements as described in clause 5.2.
- ☐ test method for radiated measurements as described in clause 5.5.
- ☐ test method for radiated measurements as described in clause 5.6.

6.5.4 Test results

Note(s):

1. The worst case 20 dB bandwidth was selected as a limit: 929.0 kHz
2. The measurement was performed representatively on the channels 01 and 02 in hopping mode.

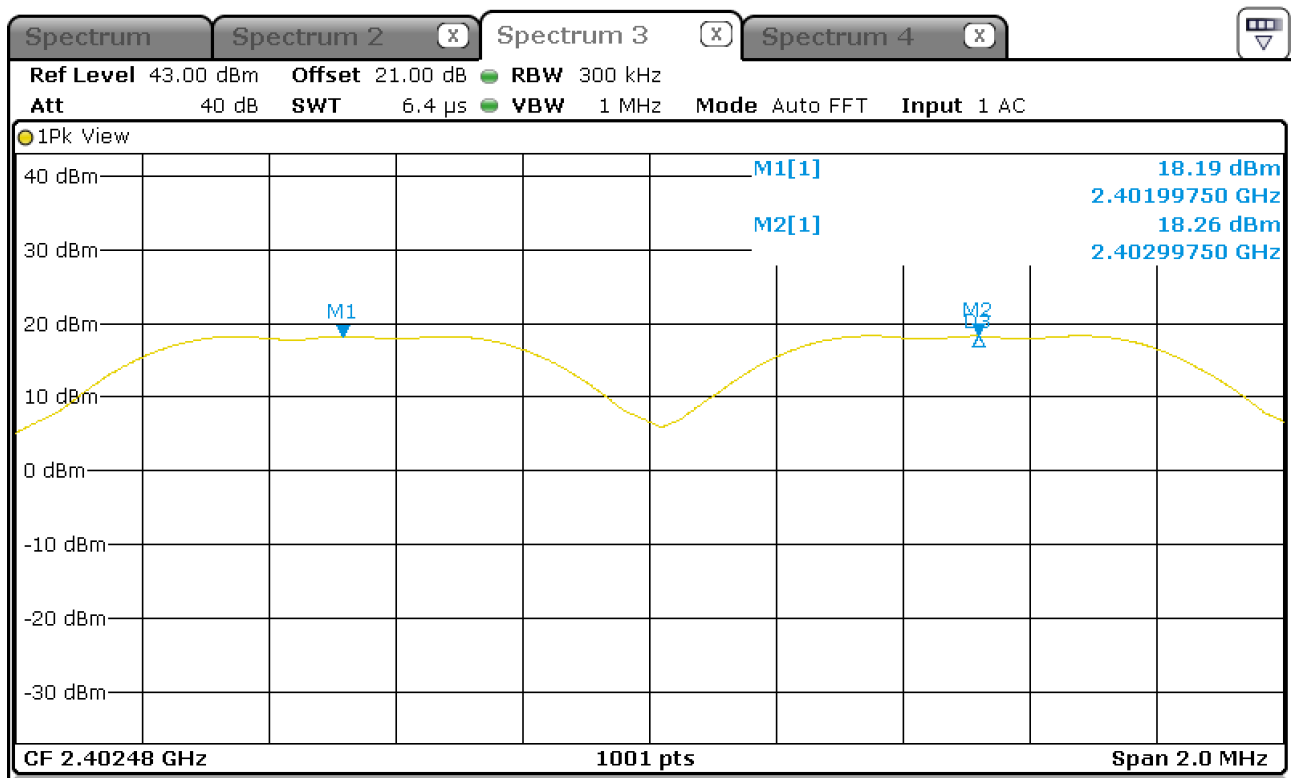


Figure 16: Chart of carrier frequency separation_channels 01and 02

Separation between channels	Carrier frequency separation (kHz)	Limit (kHz)	Margin (kHz)	Results
01 and 02	1000.0	929.9	70.1	Passed

Table 21: Results of conducted power spectral density

6.6 Number of hopping frequencies

Section(s) in 47 CFR Part 15:	Requirement(s): Reference(s):	15.247(a)(1)(iii) ANSI C63.10, clause 7.8.3
Section(s) in RSS:	Requirement(s): Reference(s):	RSS-247, section 6.2.3.1(b) ANSI C63.10, clause 7.8.3

Performed by:	Patricio Montenegro, M.Sc.-Ing.	Date(s) of test:	March 12, 2026
Result:	☒ Test passed ☐ Test not passed		

6.6.1 Test equipment

Description	Designation	Manufacturer	Inventory number	Last check	Next check	Check type
EMI test receiver	ESR7	Rohde & Schwarz	E00739	2024-03-08	2025-03-08	C
Attenuator (20 dB)	R411.820.121	---	W00708	2026-03-11	2027-09-11	V

Note(s)

1. C = Calibration
2. V = Verification

6.6.2 Limits

According to §15.247(a)(1)(iii):

Frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

According to RSS-247, section 6.2.3.1(b):

FHS operating in the band 2400-2483.5 MHz shall use at least 15 hopping channels. The average time of occupancy on any channel shall not be greater than 0.4 s within a period of 0.4 s, multiplied by the number of hopping channels employed. Transmissions on particular hopping frequencies may be avoided or suppressed provided that at least 15 hopping channels are used.

6.6.3 Test procedure

The number of hopping frequencies are measured using the test procedure as described in clause 7.8.3 of ANSI C63.10 and referring to the

- ☒ test method for conducted measurements as described in clause 5.2.
- ☐ test method for radiated measurements as described in clause 5.5.
- ☐ test method for radiated measurements as described in clause 5.6.

6.6.4 Test results

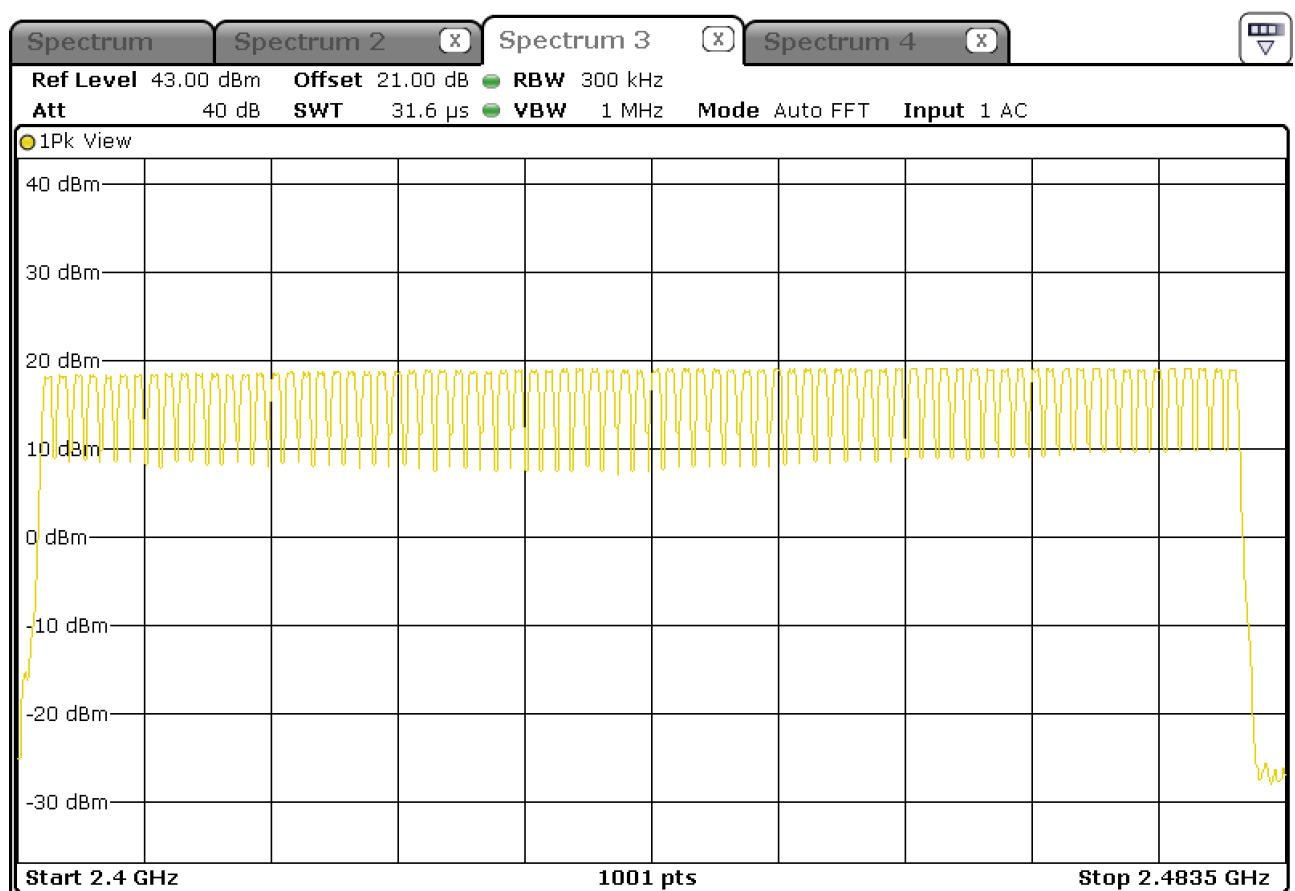


Figure 17: Chart of number of hopping frequencies measurement

Number of hopping channels	Limit	Results
79	≥ 15	Passed

Table 22: Results of number of hopping frequencies measurement

6.7 Time of occupancy (dwell time)

Section(s) in 47 CFR Part 15:	Requirement(s): Reference(s):	15.247(a)(1)(iii) ANSI C63.10, clause 7.8.4
Section(s) in RSS:	Requirement(s): Reference(s):	RSS-247, section 6.2.3.1(b) ANSI C63.10, clause 7.8.4

Performed by:	Patricio Montenegro, M.Sc.-Ing.	Date(s) of test:	March 12, 2026
Result:	☒ Test passed	☐ Test not passed	

6.7.1 Test equipment

Description	Designation	Manufacturer	Inventory number	Last check	Next check	Check type
EMI test receiver	ESR7	Rohde & Schwarz	E00739	2025-05-12	2026-05-12	C
Attenuator (20 dB)	R411.820.121	---	W00708	2026-03-11	2027-09-11	V

Note(s)

1. C = Calibration
2. V = Verification

6.7.2 Limits

According to §15.247(a)(1)(iii):

Frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

According to RSS-247, section 6.2.3.1(b): FHS operating in the band 2400-2483.5 MHz shall use at least 15 hopping channels. The average time of occupancy on any channel shall not be greater than 0.4 s within a period of 0.4 s, multiplied by the number of hopping channels employed. Transmissions on particular hopping frequencies may be avoided or suppressed provided that at least 15 hopping channels are used.

6.7.3 Test procedure

The time of occupancy is measured using the test procedure as described in clause 7.8.4 of ANSI C63.10 and referring to the

- ☒ test method for conducted measurements as described in clause 5.2.
- ☐ test method for radiated measurements as described in clause 5.5.
- ☐ test method for radiated measurements as described in clause 5.6.

6.7.4 Test results

Note(s):

1. The test was performed representatively on the lowest channel.
2. Observation time is 31.6 s.

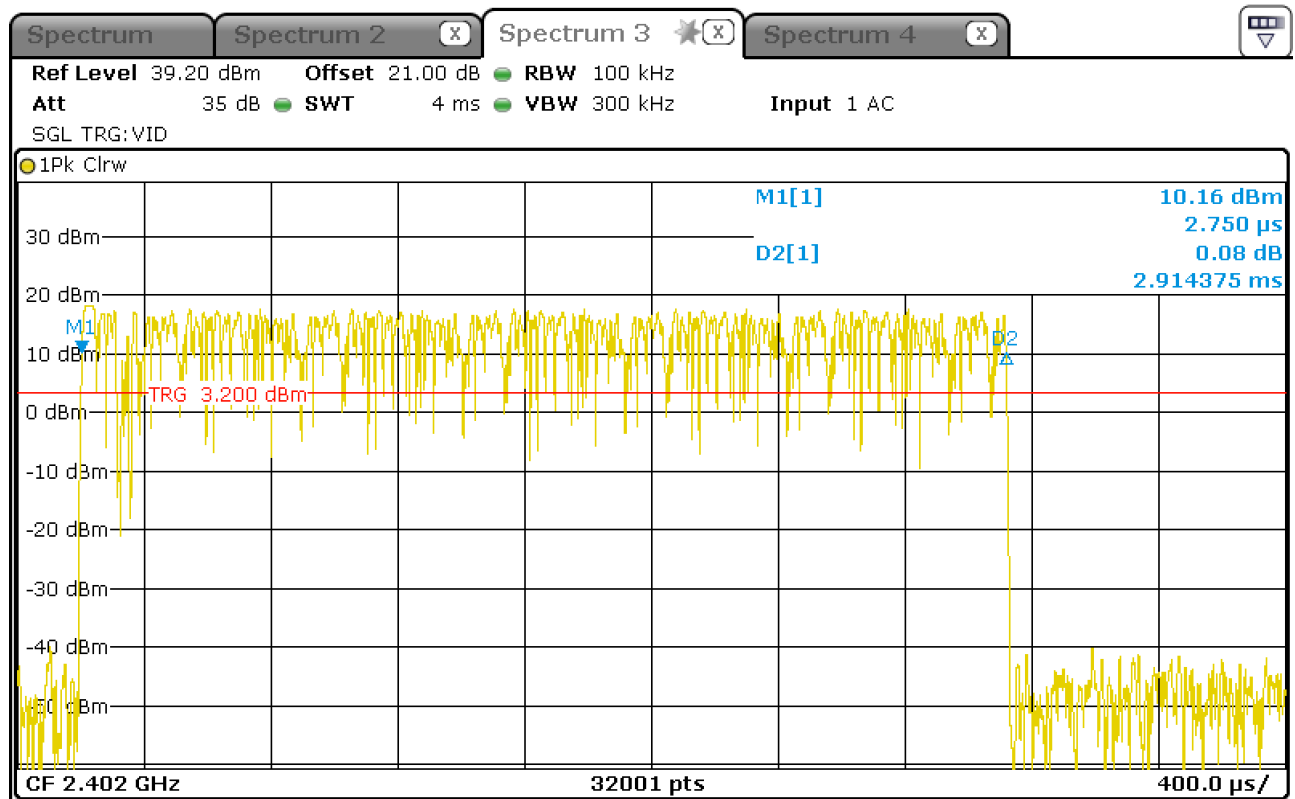


Figure 18: Length of 1 transmission burst on lowest channel

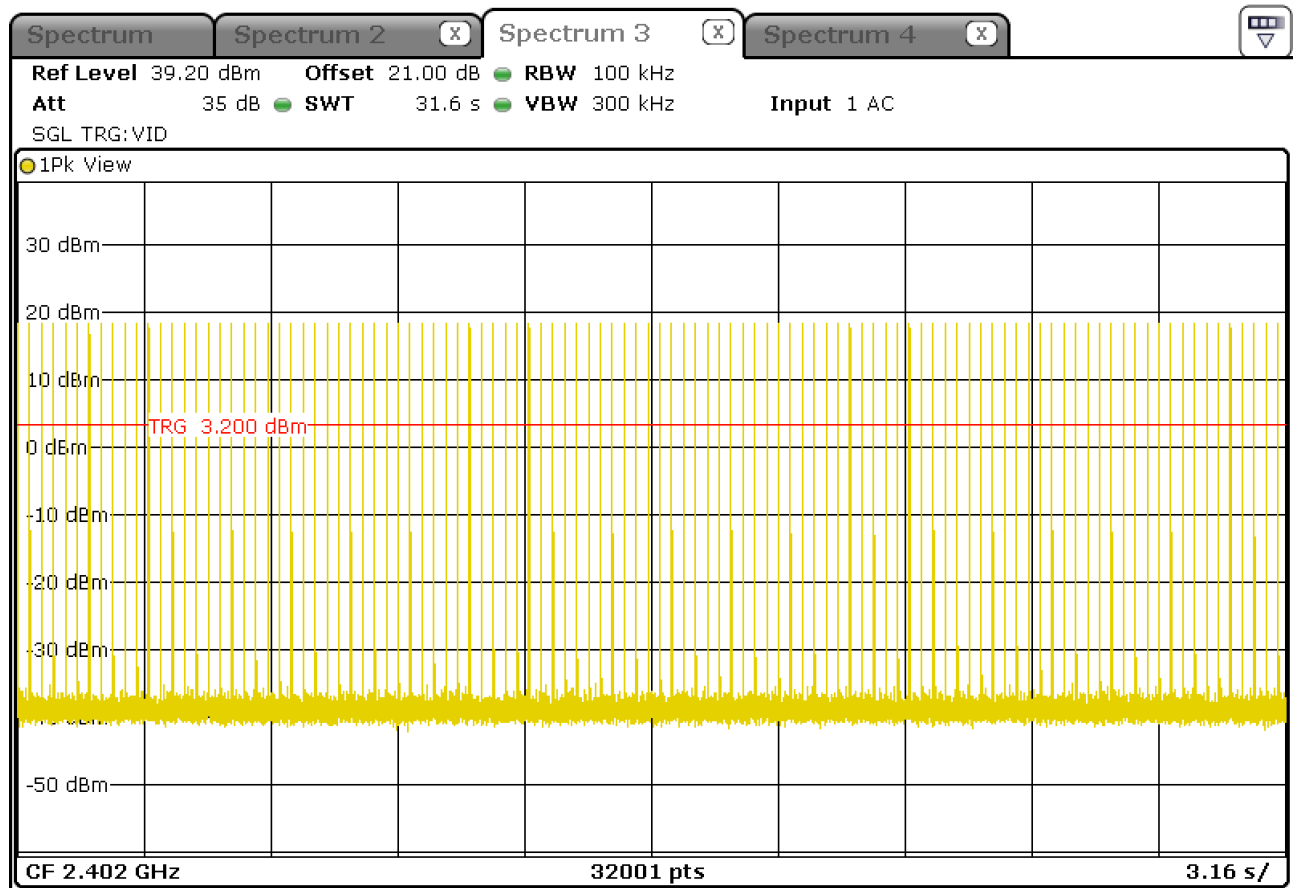


Figure 19: Number of transmission bursts within a 31.6 second period on lowest channel

Channel	Length of 1 transmission burst (ms)	Number of transmission bursts within a 31.6 s period	Time of occupancy within a 31.6 s period (ms)	Limit of time of occupancy within a 31.6 s period (ms)	Results
low	2.9	107	310.3	400.0	Passed

Table 23: Results of time of occupancy

6.8 Band-edge measurements

Section(s) in 47 CFR Part 15:	Requirement(s):	15.247(d)
	Reference(s):	ANSI C63.10, clauses 7.8.7.2 and 6.10
Section(s) in RSS:	Requirement(s):	RSS-247, section 6.6
	Reference(s):	ANSI C63.10, clauses 7.8.7.2 and 6.10

Performed by:	Patricio Montenegro, M.Sc.-Ing.	Date(s) of test:	March 12, 2026
Result:	☒ Test passed	☐ Test not passed	

6.8.1 Test equipment

Description	Designation	Manufacturer	Inventory number	Last check	Next check	Check type
EMI test receiver	ESR7	Rohde & Schwarz	E00739	2025-05-12	2026-05-12	C
Attenuator (20 dB)	R411.820.121	---	W00708	2026-03-11	2027-09-11	V

Note(s)

1. C = Calibration
2. V = Verification

6.8.2 Limits

According to §15.247(d):

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in § 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

According to RSS-247 section 6.6:

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum device, digitally modulated device, or hybrid system is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power – based on either an RF conducted or a radiated measurement – provided that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under section 6.3.2, the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

According to RSS-Gen section 8.9:

Except where otherwise indicated in the applicable RSS, radiated emissions shall comply with the field

strength limits shown in table 5 and table 6 of RSS-Gen. Additionally, the level of any transmitter unwanted emission shall not exceed the level of the transmitter's fundamental emission

According to RSS-Gen section 8.10:

Restricted frequency bands, identified in table 7 of RSS-Gen, are designated primarily for safety-of-life services (distress calling and certain aeronautical activities), certain satellite downlinks, radio astronomy and some government uses. Except where otherwise indicated, the following conditions related to the restricted frequency bands apply:

- a The transmit frequency, including fundamental components of modulation, of licence-exempt radio apparatus shall not fall within the restricted frequency bands listed in table 7 except for apparatus compliant with RSS-287, Emergency Position Indicating Radio Beacons (EPIRB), Emergency Locator Transmitters (ELT), Personal Locator Beacons (PLB), and Maritime Survivor Locator Devices (MSLD).
- b Unwanted emissions that fall into restricted frequency bands listed in table 7 of RSS-Gen shall comply with the limits specified in table 5 and table 6 of RSS-Gen.
- c Unwanted emissions that do not fall within the restricted frequency bands listed in table 7 of RSS-Gen shall comply either with the limits specified in the applicable RSS or with those specified in table 5 and table 6 of RSS-Gen.

Frequency (MHz)	Field strength		Measurement distance (m)
	($\mu\text{V/m}$)	(dB $\mu\text{V/m}$)	
Above 960	500	54	3

Table 24: General radiated emission limits above 960 MHz according to §15.209 and RSS-Gen

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	above 38.6
13.36-13.41			

Table 25: Restricted bands of operation according to §15.205 and RSS-Gen section 8.10

6.8.3 Test procedure

The band-edge is measured using the test procedure as described in clauses 7.8.7.2 and 6.10 of ANSI C63.10 and referring to the

- ☒ test method for conducted measurements as described in clause 5.2.
- ☐ test method for radiated measurements as described in clause 5.5.
- ☐ test method for radiated measurements as described in clause 5.6.

6.8.4 Test results

6.8.4.1 Lower band edge

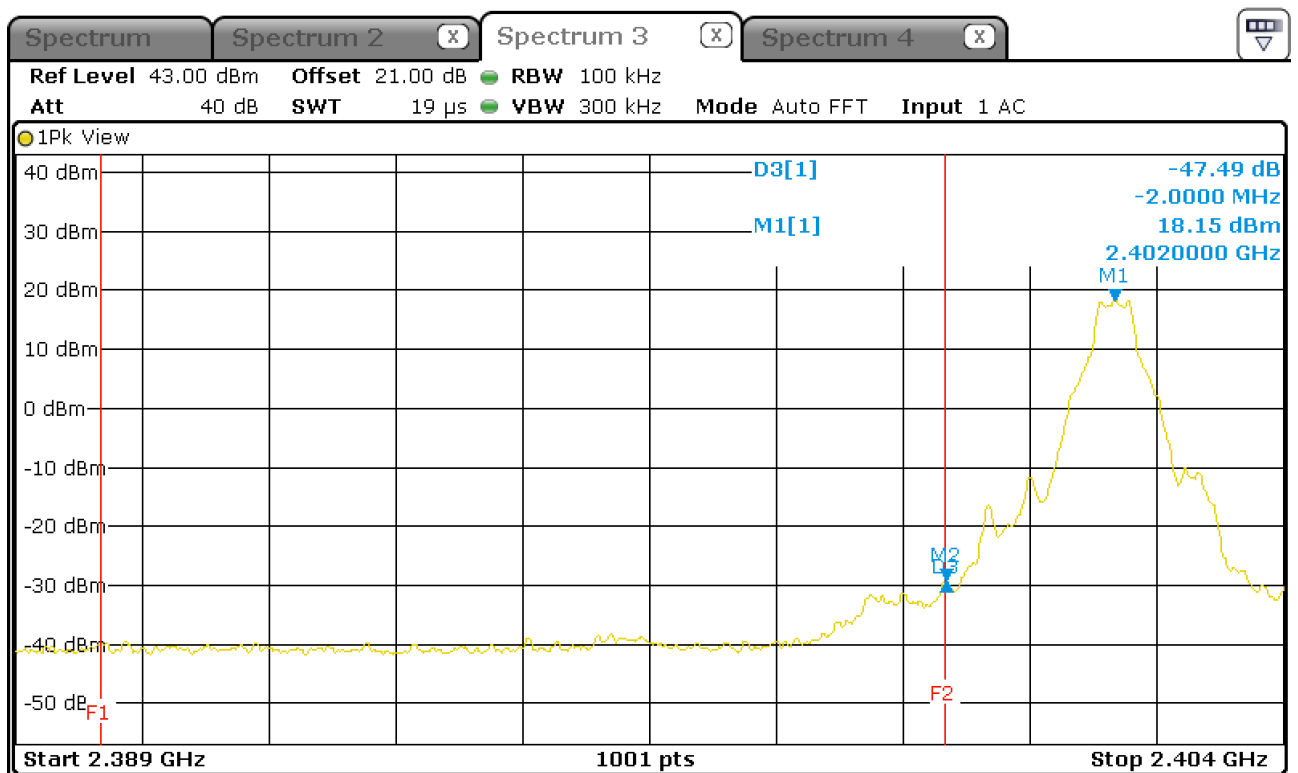


Figure 20: Chart of lower band-edge measurement in non-hopping mode on lowest channel

Frequency (MHz)	Measured Margin (dB)	Limit of minimum margin	Margin dB	Result
2400.000	-47.5	≥ 20	27.5	Passed

Table 26: Result of lower band-edge measurement in non-hopping mode on lowest channel

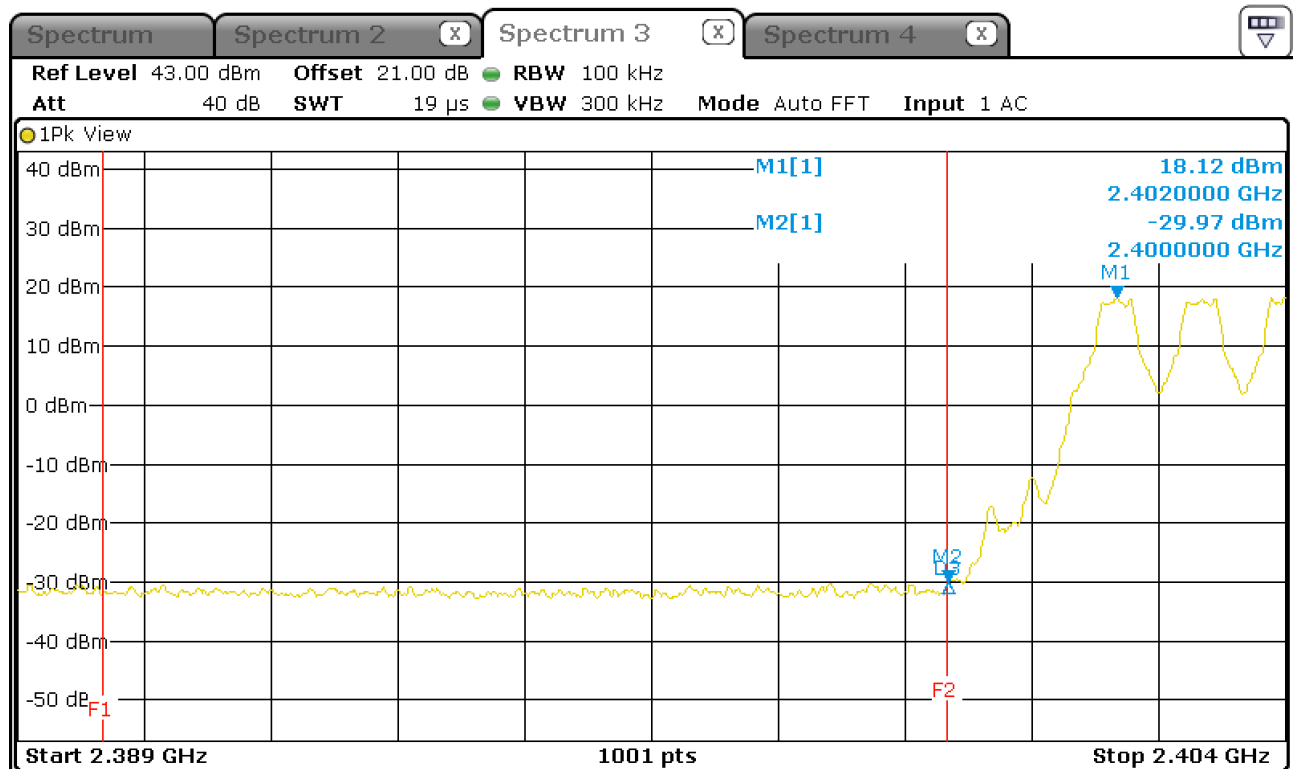


Figure 21: Chart of lower band-edge measurement in hopping mode

Frequency (MHz)	Measured Margin (dB)	Limit of minimum margin	Margin dB	Result
2400.000	48.1	≥ 20	28.1	Passed

Table 27: Result of lower band-edge measurement in hopping mode

6.8.4.2 Upper band edge

Note(s):

1. Conducted limit = Field strength limit - 104.8 + 20log d – antenna gain (Minimum 2 dBi)
2. The field strength of the emissions was calculated as follows:
Field strength limit at 3 m= Measured power (dBm) + 95.2 dB + antenna gain
3. The average value is calculated by subtracting the correction factor (see clause 6.3.4.2) from the calculated peak value in terms of field strength.

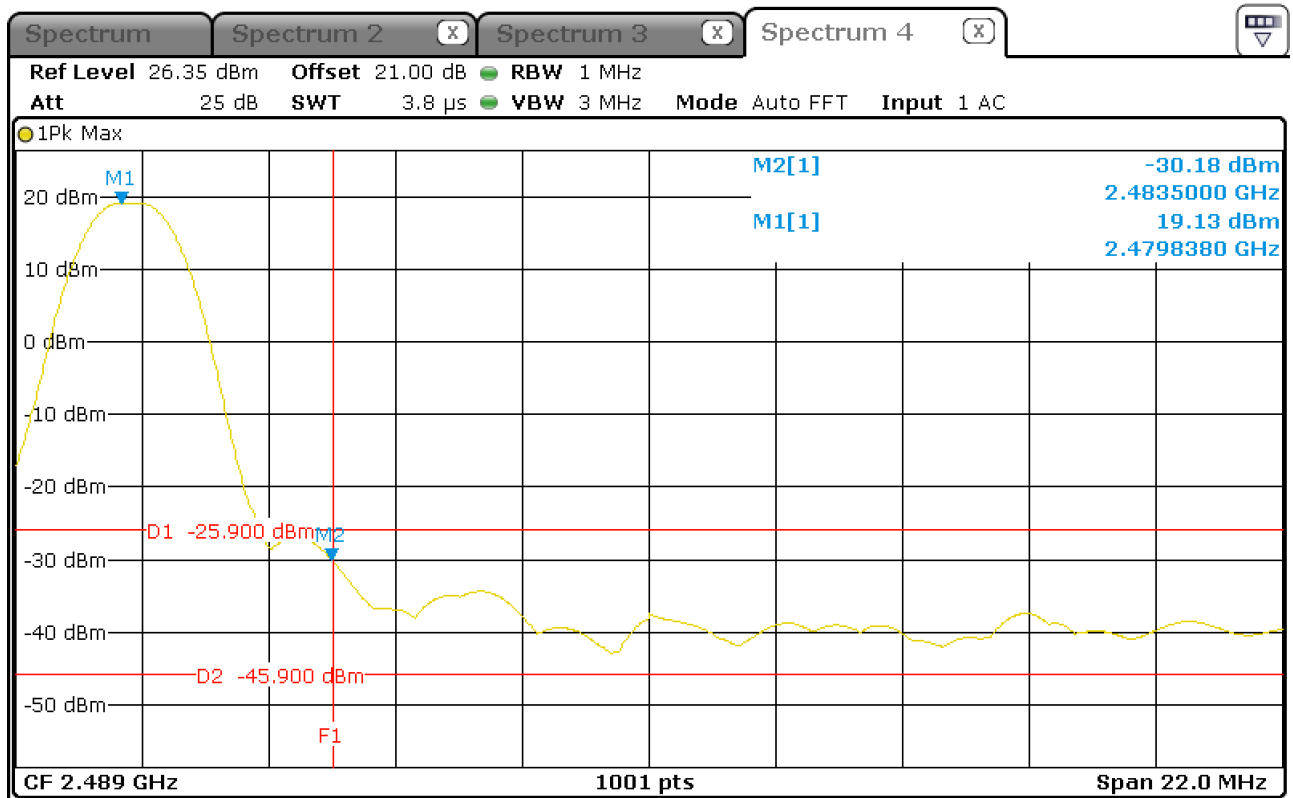


Figure 22: Chart of upper band-edge measurement in non-hopping mode on highest channel (PK)

Frequency (MHz)	Detector	Measured power (dBm)	Peak limit (dBm)	Margin (dB)	Average limit (dBm)	Margin (dB)	Result
2483.500	Pk	-30.2	-25.9	4.3	---	---	Passed

Table 28: Test results of upper band-edge conducted measurements in non-hopping mode on highest channel

Frequency (MHz)	Calculated Peak field strength (dB μ V/m) at 3 m	Peak limit (dB μ V/m) at 3 m	Peak Margin (dB)	Calculated Average field strength (dB μ V/m) at 3 m	Average limit (dB μ V/m) at 3 m	Average Margin (dB)	Result
2483.500	69.7	74.0	4.3	29.5	54.0	24.5	Passed

Table 29: Test results upper band-edge in non-hopping mode in terms of calculated field strength

6.9 Antenna-port conducted measurements

Section(s) in 47 CFR Part 15:	Requirement(s): Reference(s):	15.247(d) ANSI C63.10, clause 6.7
Section(s) in RSS:	Requirement(s): Reference(s):	RSS-247, section 6.6 ANSI C63.10, clause 6.7

Performed by:	Patricio Montenegro, M.Sc.-Ing.	Date(s) of test:	March 20, 2026
Result:	☒ Test passed ☐ Test not passed		

6.9.1 Test equipment

Description	Designation	Manufacturer	Inventory number	Last check	Next check	Check type
EMI test receiver	ESW44	Rohde & Schwarz	E00895	2026-01-19	2027-01-19	C
Attenuator (10 dB)	BW-S10-2W263+	Mini-Circuits	W01390	2026-01-29	2027-07-29	V

Note(s)

1. C = Calibration
2. V = Verification

6.9.2 Limits

According to §15.247(d):

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in § 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

According to RSS-247 section 6.6:

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum device, digitally modulated device, or hybrid system is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power – based on either an RF conducted or a radiated measurement – provided that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under section 6.3.2, the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

According to RSS-Gen section 8.9:

Except where otherwise indicated in the applicable RSS, radiated emissions shall comply with the field

strength limits shown in table 5 and table 6 of RSS-Gen. Additionally, the level of any transmitter unwanted emission shall not exceed the level of the transmitter's fundamental emission

According to RSS-Gen section 8.10:

Restricted frequency bands, identified in table 7 of RSS-Gen, are designated primarily for safety-of-life services (distress calling and certain aeronautical activities), certain satellite downlinks, radio astronomy and some government uses. Except where otherwise indicated, the following conditions related to the restricted frequency bands apply:

- a The transmit frequency, including fundamental components of modulation, of licence-exempt radio apparatus shall not fall within the restricted frequency bands listed in table 7 except for apparatus compliant with RSS-287, Emergency Position Indicating Radio Beacons (EPIRB), Emergency Locator Transmitters (ELT), Personal Locator Beacons (PLB), and Maritime Survivor Locator Devices (MSLD).
- b Unwanted emissions that fall into restricted frequency bands listed in table 7 of RSS-Gen shall comply with the limits specified in table 5 and table 6 of RSS-Gen.
- c Unwanted emissions that do not fall within the restricted frequency bands listed in table 7 of RSS-Gen shall comply either with the limits specified in the applicable RSS or with those specified in table 5 and table 6 of RSS-Gen.

Frequency (MHz)	Field strength		Measurement distance (m)
	($\mu\text{V/m}$)	(dB $\mu\text{V/m}$)	
0.009 – 0.490	2400/F(kHz) (266.67 – 4.90)	48.52 – 13.80	300
0.490 – 1.705	24000/F(kHz) (48.98 – 14.08)	33.80 – 22.97	30
1.705 – 30	30	29.54	30
30 – 88	100	40.00	3
88 – 216	150	43.52	3
216 - 960	200	46.02	3
Above 960	500	53.98	3

Table 30: General radiated emission limits from 9 kHz to 25 GHz according to §15.209

Frequency (MHz)	Magnetic field strength		Measurement distance (m)
	($\mu\text{A/m}$)	(dB $\mu\text{A/m}$)	
0.009 – 0.490	6.37/F(kHz)	-2.999 – -37.721	300
0.490 – 1.705	63.7/F(kHz)	-17.721 – -28.636	30
1.705 – 30	0.08	-21.94	30

Table 31: General radiated emission limits from 9 kHz to 30 MHz according to RSS-Gen section 8.9

Frequency (MHz)	Field strength		Measurement distance (m)
	($\mu\text{V/m}$)	(dB $\mu\text{V/m}$)	
30 – 88	100	40.00	3
88 – 216	150	43.52	3
216 - 960	200	46.02	3
Above 960	500	53.98	3

Table 32: General radiated emission limits from 30 MHz to 25 GHz according to RSS-Gen section 8.9

<i>MHz</i>	<i>MHz</i>	<i>MHz</i>	<i>GHz</i>
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	above 38.6
13.36-13.41			

Table 33: Restricted bands of operation according to §15.205 and RSS-Gen section 8.10

6.9.3 Test procedure

The emissions from 9 kHz to 25 GHz are measured using the test procedure as described in clause 6.7 of ANSI C63.10 and referring to the test method for conducted measurements as described in clause 5.2.

6.9.4 Test results

Note(s):

1. Conducted limit = Field strength limit - 104.8 + 20log d – antenna gain (Minimum 2 dBi)
2. The average value is calculated by subtracting the correction factor (see clause 6.3.4.2) from the calculated peak value.
3. This test shows the emissions outside the band edge frequency range (2390 MHz to 2500 MHz).
4. The frequency range from 2390 MHz to 2500 MHz is documented in clause “Band-edge measurements”.
5. According to clause 6.6.4.3, note 1 of ANSI C63.10, if the maximized peak measured value complies with the average limit, than it is unnecessary to perform an average measurement.
6. According to § 15.247(d) and RSS-247 section 5.5 an attenuation below the general limits specified in § 15.209(a) and RSS-Gen is not required, therefore the measurement was performed with the peak detector and with the calculated general limit.

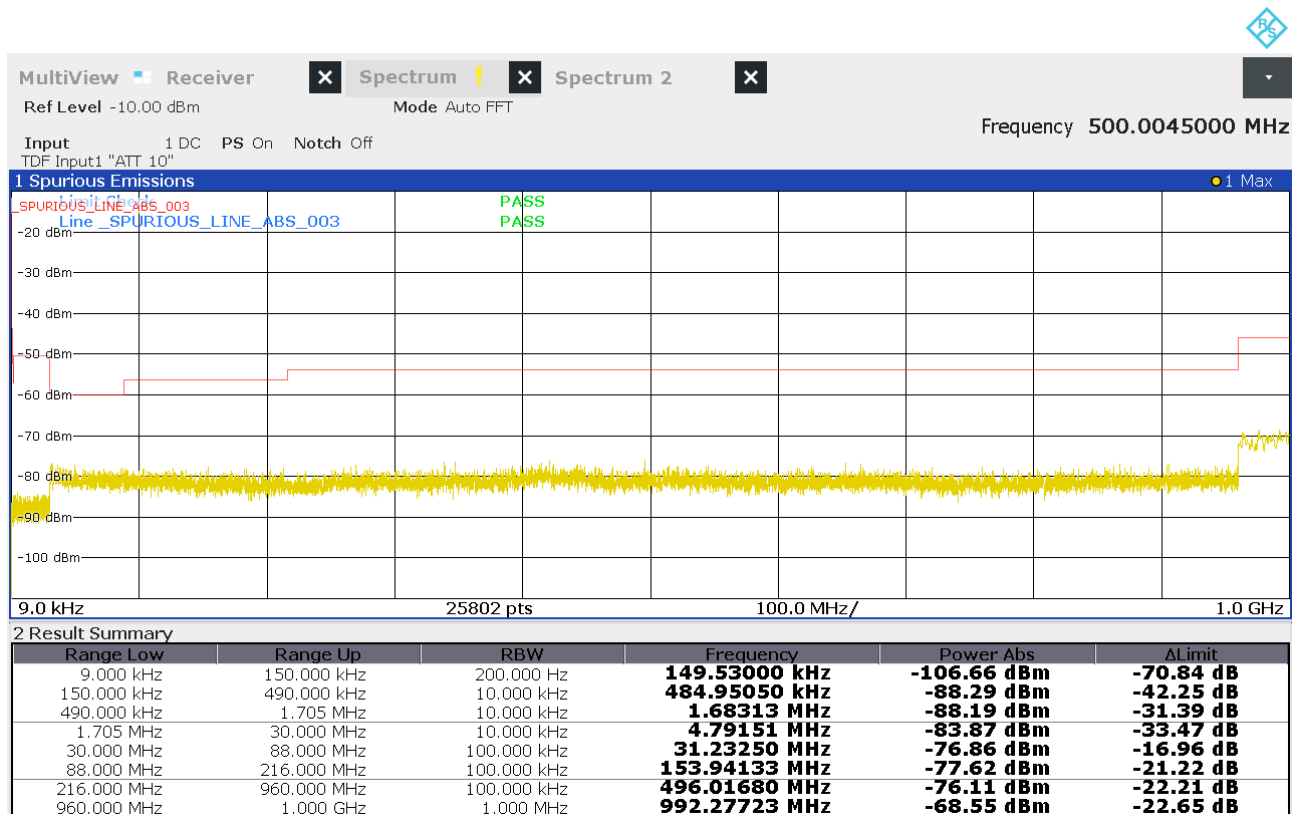


Figure 23: Chart of emissions test from 9 kHz to 1 GHz on lowest channel, Pk

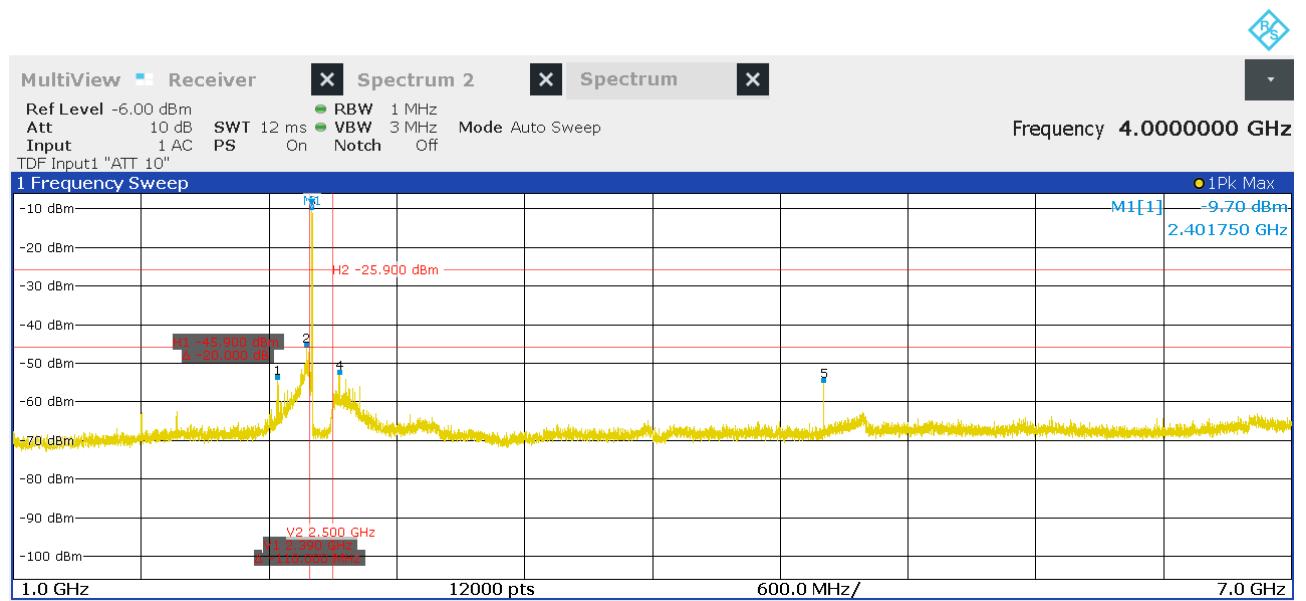


Figure 24: Chart of emissions test from 1 GHz to 7 GHz on lowest channel, Pk

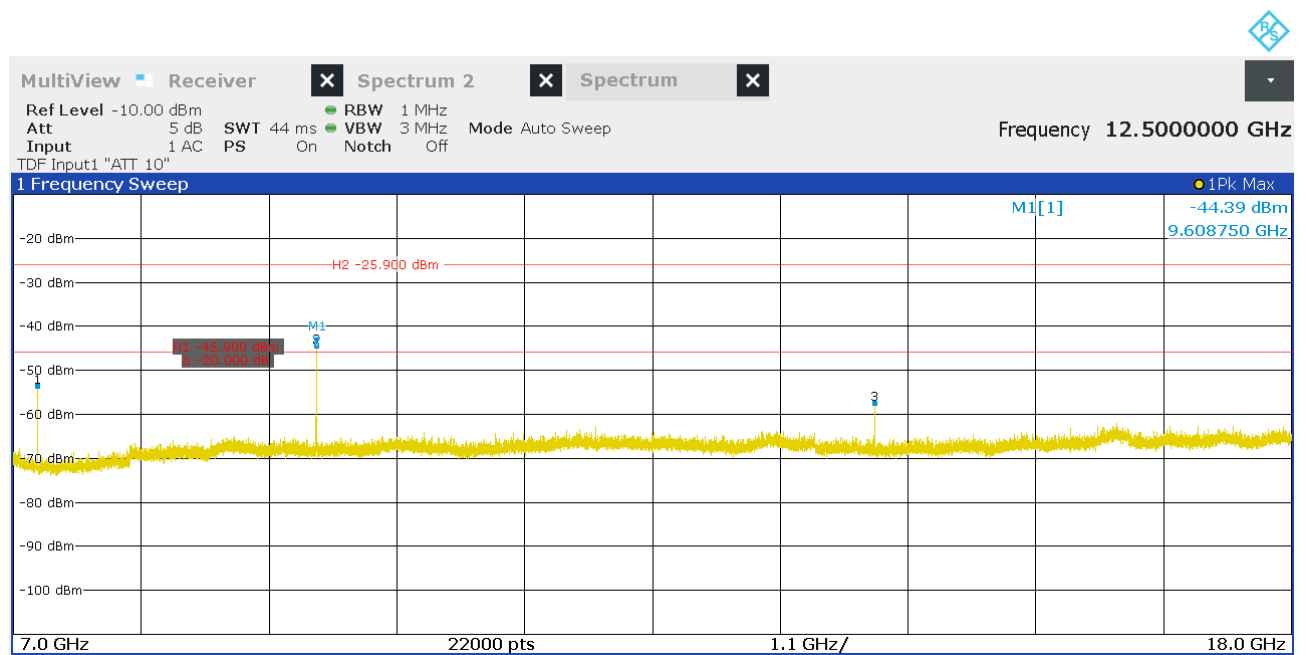


Figure 25: Chart of emissions test from 7 GHz to 18 GHz on lowest channel, Pk

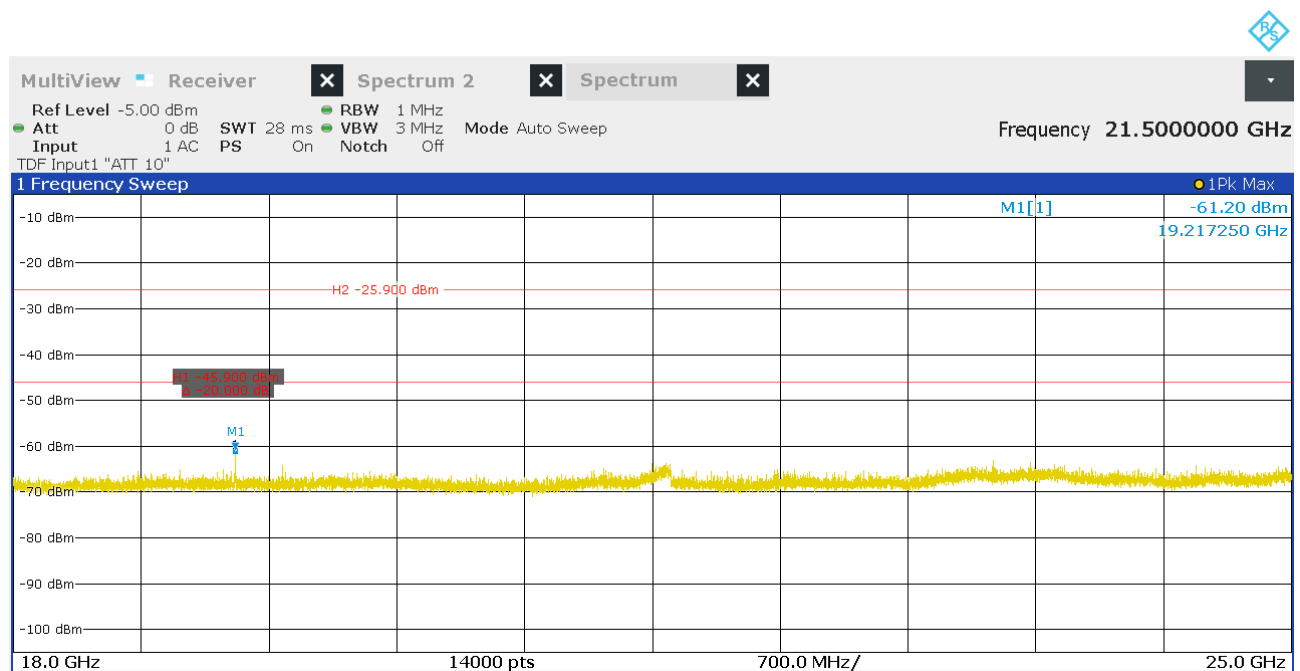


Figure 26: Chart of emissions test from 18 GHz to 25 GHz on lowest channel, Pk

Freq. (MHz)	Peak level (dBm)	Calc. Pk FS	At dist (m)	Pk limit (dBμV/m)	At dist (m)	Pk mar. (dB)	Calc AV FS	At dist (m)	AV limit (dBμV/m)	At dist (m)	AV mar. (dB)	QP limit (dBμV/m)	At dist (m)	QP mar. (dB)	Re s
31.2352	-76.9	23.0	3	---	---	---	---	---	---	---	---	40.0	3	17.0	P

Table 34: Results of emissions test from 9 kHz to 1 GHz on lowest channel, Pk measurement

with:

- Freq.* = Frequency
- Calc. FS.* = Calculated field strength (dBμV/m)
- At dist.* = At distance
- Mar.* = Margin
- Res.* = Result
- P* = Passed
- Np* = Not passed

Notes:

- The peak measurement shows that the calculated peak field strength is below the applicable Pk, AV or QP limit.
- The measured power levels are corrected by adding the gain, the ground reflection factor and by applying the formula: $E = EIRP - 20 \log d + 104.8$.

<i>Freq.</i> (MHz)	<i>Peak level</i> (dBm)	<i>Calc.</i> <i>Pk</i> <i>FS</i> (dBμV/m) at 3m	<i>Pk limit</i> (dBμV/m) at 3m	<i>Pk mar.</i> (dB)	<i>Calc</i> <i>AV FS</i> (dBμV/m) at 3m	<i>AV limit</i> (dBμV/m) at 3m	<i>AV mar.</i> (dB)	<i>Res</i>
2241.750	-53.6	46.3	74.0	27.7	---	54.0	7.7	P
2375.750	-45.4	54.5	74.0	19.5	14.3	54.0	39.7	P
2529.750	-52.4	47.5	74.0	26.5	---	54.0	6.5	P
4803.750	-54.3	45.6	74.0	28.4	---	54.0	8.4	P
7206.250	-53.6	46.3	74.0	27.7	---	54.0	7.7	P
9608.750	-44.4	55.5	74.0	18.5	15.3	54.0	39.7	P
14412.750	-57.5	42.4	74.0	31.6	---	54.0	11.6	P
19217.250	-61.2	38.7	74.0	35.3	---	54.0	15.3	P

Table 35: Results of emissions test >1 GHz on lowest channel, Pk measurement

with: *Freq.* = Frequency
Calc. Pk FS. = Calculated peak field strength (dBμV/m) at 3 m
Mar. = Margin
Res. = Result
P = Passed
Np = Not passed

Notes:

- The peak measurement shows that the calculated peak field strength is below the applicable Pk or AV limit with the exception of the harmonics or modulation products where the AV field strength is calculated according to clause 7.8.8.2 (a) of ANSI C63.10 and shown in the row "Calc. AV FS" of the table above.
- The measured power levels are corrected by adding the gain, the ground reflection factor and by applying the formula: $E = \text{EIRP} - 20 \log d + 104.8$.

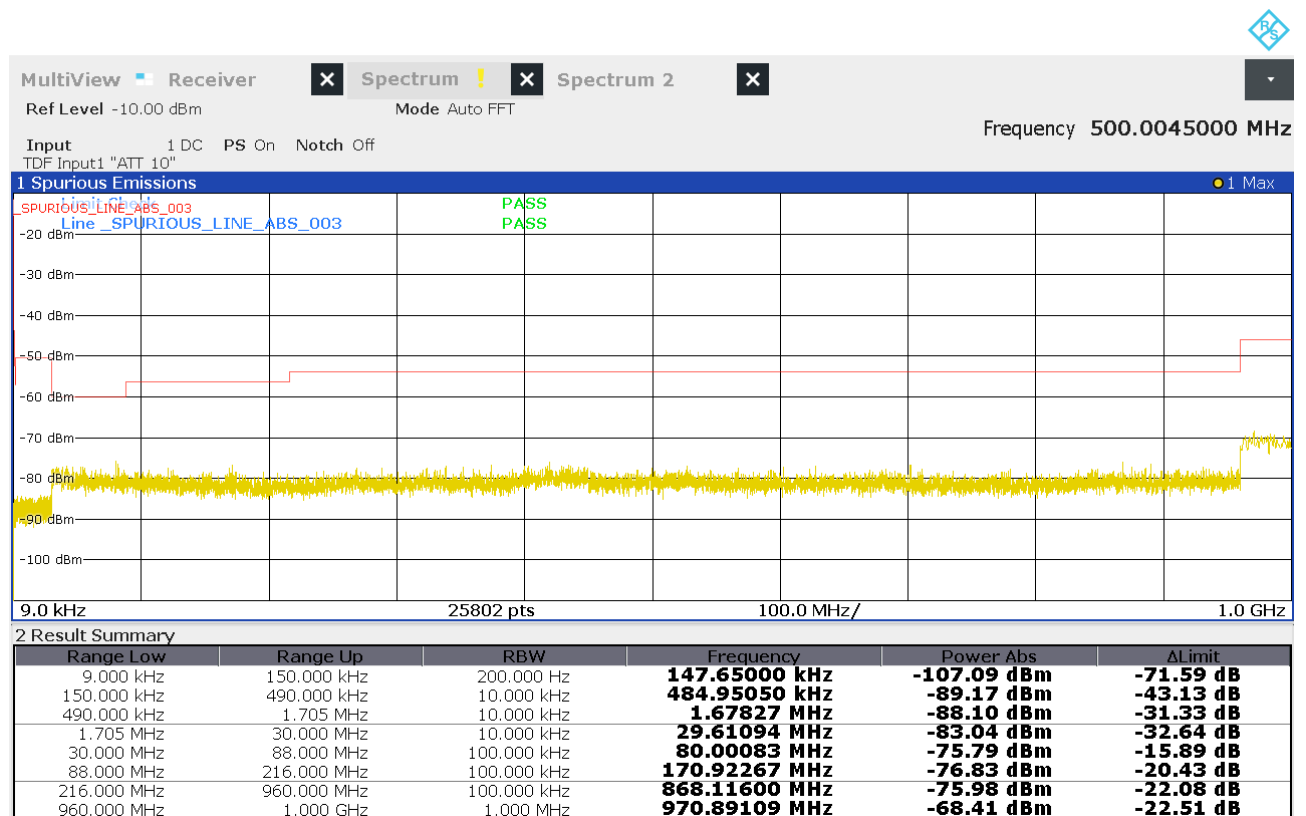


Figure 27: Chart of emissions test from 9 kHz to 1 GHz on middle channel, Pk

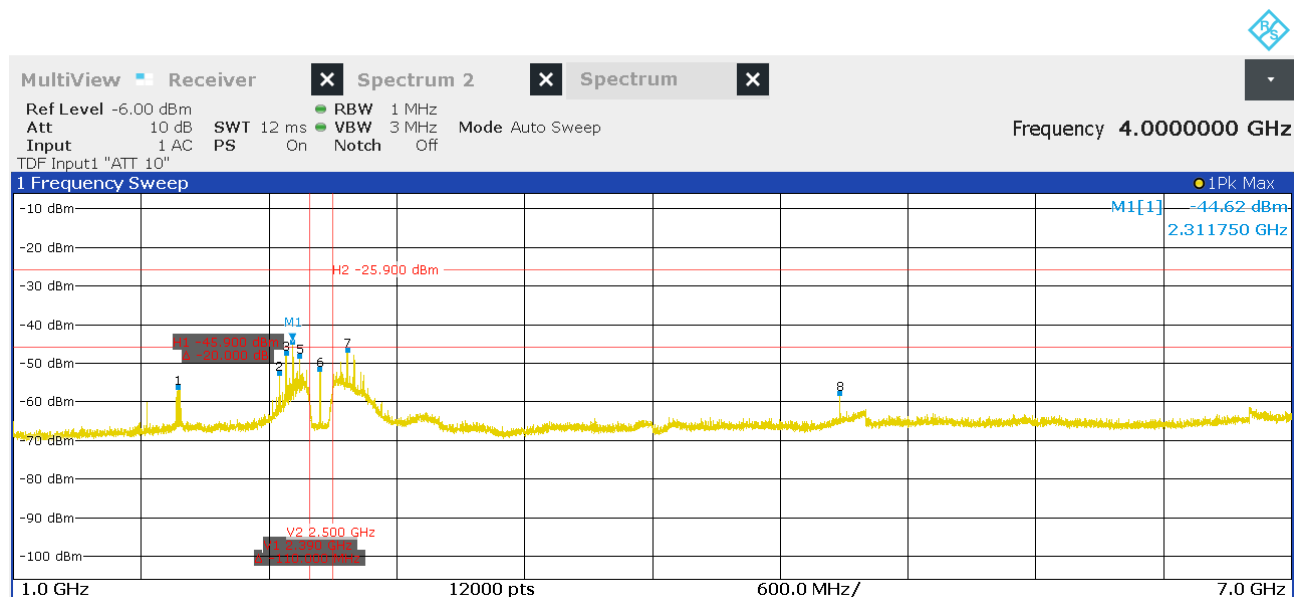


Figure 28: Chart of emissions test from 1 GHz to 7 GHz on middle channel, Pk

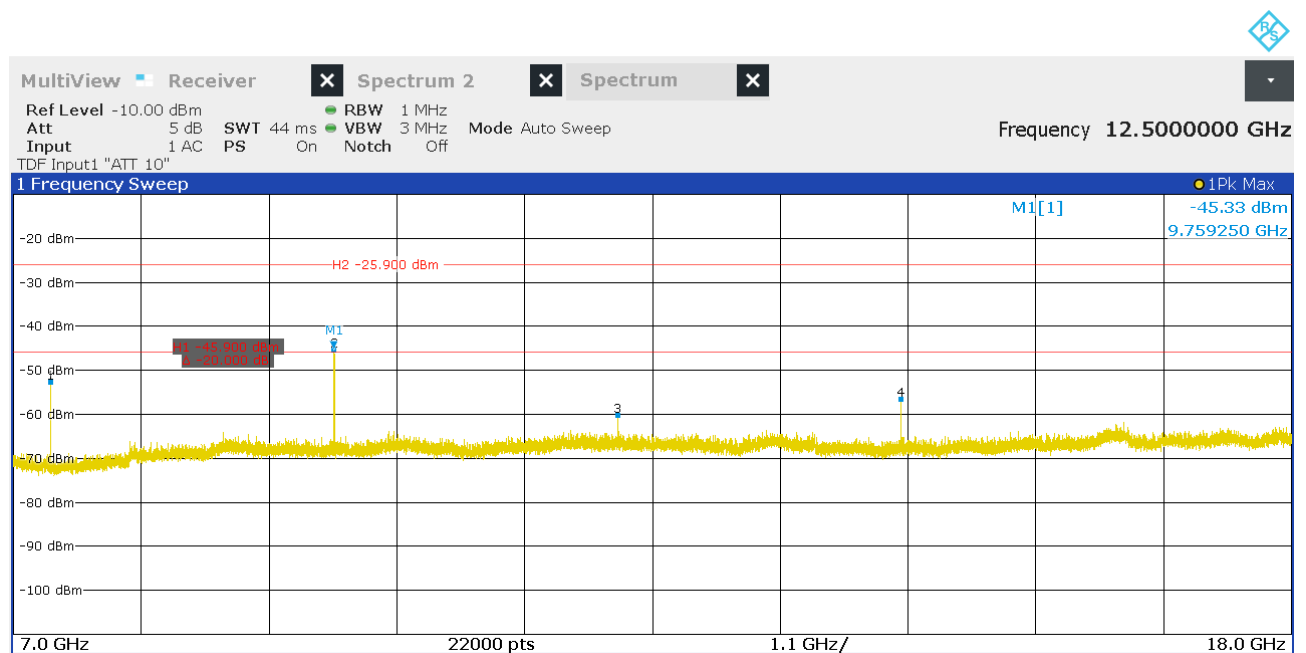


Figure 29: Chart of emissions test from 7 GHz to 18 GHz on middle channel, Pk

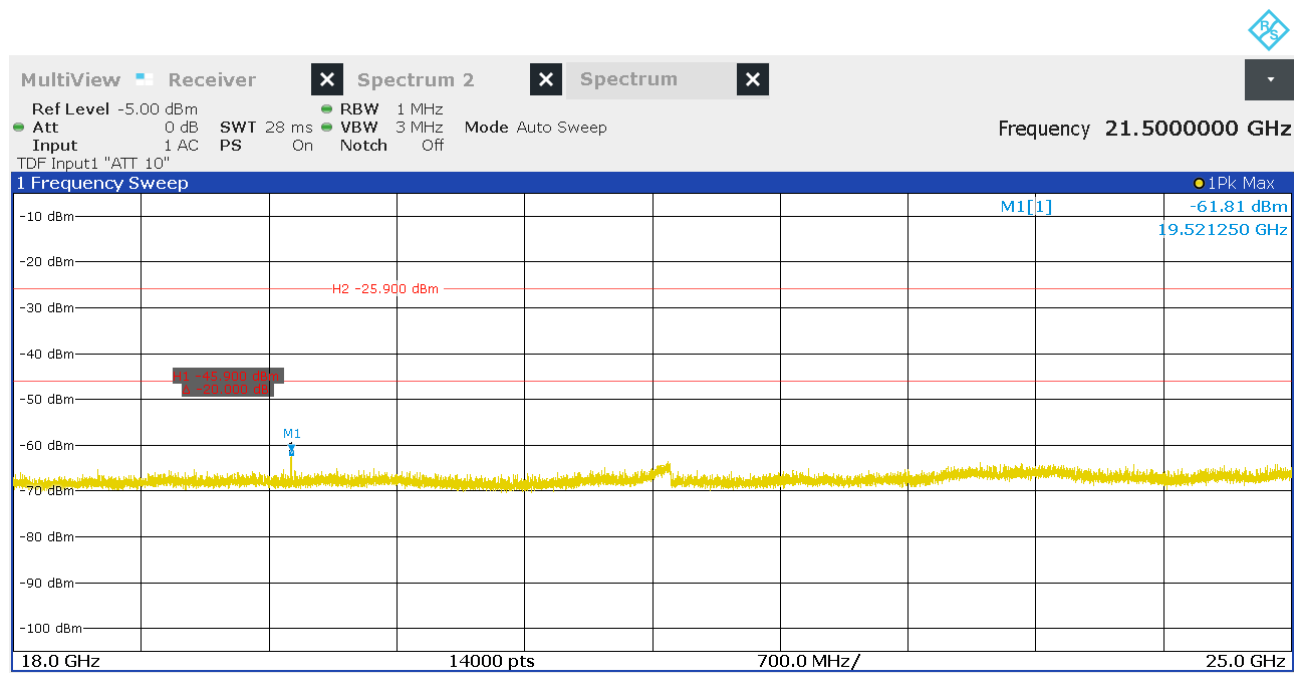


Figure 30: Chart of emissions test from 18 GHz to 25 GHz on middle channel, Pk

<i>Freq.</i> (MHz)	<i>Peak</i> <i>level</i> (dBm)	<i>Calc.</i> <i>Pk</i> <i>FS</i>	<i>At</i> <i>dist</i> (m)	<i>Pk</i> <i>limit</i> (dBμV/m)	<i>At</i> <i>dist</i> (m)	<i>Pk</i> <i>mar.</i> (dB)	<i>Calc</i> <i>AV</i> <i>FS</i>	<i>At</i> <i>dist</i> (m)	<i>AV</i> <i>limit</i> (dBμV/m)	<i>At</i> <i>dist</i> (m)	<i>AV</i> <i>mar.</i> (dB)	<i>QP</i> <i>limit</i> (dBμV/m)	<i>At</i> <i>dist</i> (m)	<i>QP</i> <i>mar.</i> (dB)	<i>Re</i> <i>s</i>
80.0008	-75.8	24.1	3	---	---	---	---	---	---	---	---	40.0	3	15.9	P

Table 36: Results of emissions test from 9 kHz to 1 GHz on middle channel, Pk measurement

with: *Freq.* = Frequency
Calc. FS. = Calculated field strength (dBμV/m)
At dist. = At distance
Mar. = Margin
Res. = Result
P = Passed
Np = Not passed

Notes:

1. The peak measurement shows that the calculated peak field strength is below the applicable Pk, AV or QP limit.
2. The measured power levels are corrected by adding the gain, the ground reflection factor and by applying the formula: $E = EIRP - 20 \log d + 104.8$.

<i>Freq.</i> (MHz)	<i>Peak level</i> (dBm)	<i>Calc.</i> <i>Pk</i> <i>FS</i> (dBμV/m) at 3m	<i>Pk limit</i> (dBμV/m) at 3m	<i>Pk mar.</i> (dB)	<i>Calc</i> <i>AV FS</i> (dBμV/m) at 3m	<i>AV limit</i> (dBμV/m) at 3m	<i>AV mar.</i> (dB)	<i>Res</i>
1775.250	-56.4	43.5	74.0	30.5	---	54.0	10.5	P
2247.750	-52.7	47.2	74.0	26.8	---	54.0	6.8	P
2280.250	-47.4	52.5	74.0	21.5	---	54.0	1.5	P
2311.750	-44.6	55.3	74.0	18.7	15.1	54.0	38.9	P
2343.750	-48.1	51.8	74.0	22.2	---	54.0	2.2	P
2567.750	-46.6	53.3	74.0	20.7	---	54.0	0.7	P
4879.250	-57.8	42.1	74.0	31.9	---	54.0	11.9	P
7319.750	-52.8	47.1	74.0	26.9	---	54.0	6.9	P
9759.250	-45.3	54.6	74.0	19.4	14.4	54.0	39.6	P
12198.750	-60.3	39.6	74.0	34.4	---	54.0	14.4	P
14638.750	-56.5	43.4	74.0	30.6	---	54.0	10.6	P
19521.250	-61.8	38.1	74.0	35.9	---	54.0	15.9	P

Table 37: Results of emissions test >1 GHz on middle channel, Pk measurement

with: *Freq.* = Frequency
Calc. Pk FS. = Calculated peak field strength (dBμV/m) at 3 m
Mar. = Margin
Res. = Result
P = Passed
Np = Not passed

Notes:

- The peak measurement shows that the calculated peak field strength is below the applicable Pk or AV limit with the exception of the harmonics or modulation products where the AV field strength is calculated according to clause 7.8.8.2 (a) of ANSI C63.10 and shown in the row "Calc. AV FS" of the table above.
- The measured power levels are corrected by adding the gain, the ground reflection factor and by applying the formula: $E = EIRP - 20 \log d + 104.8$.

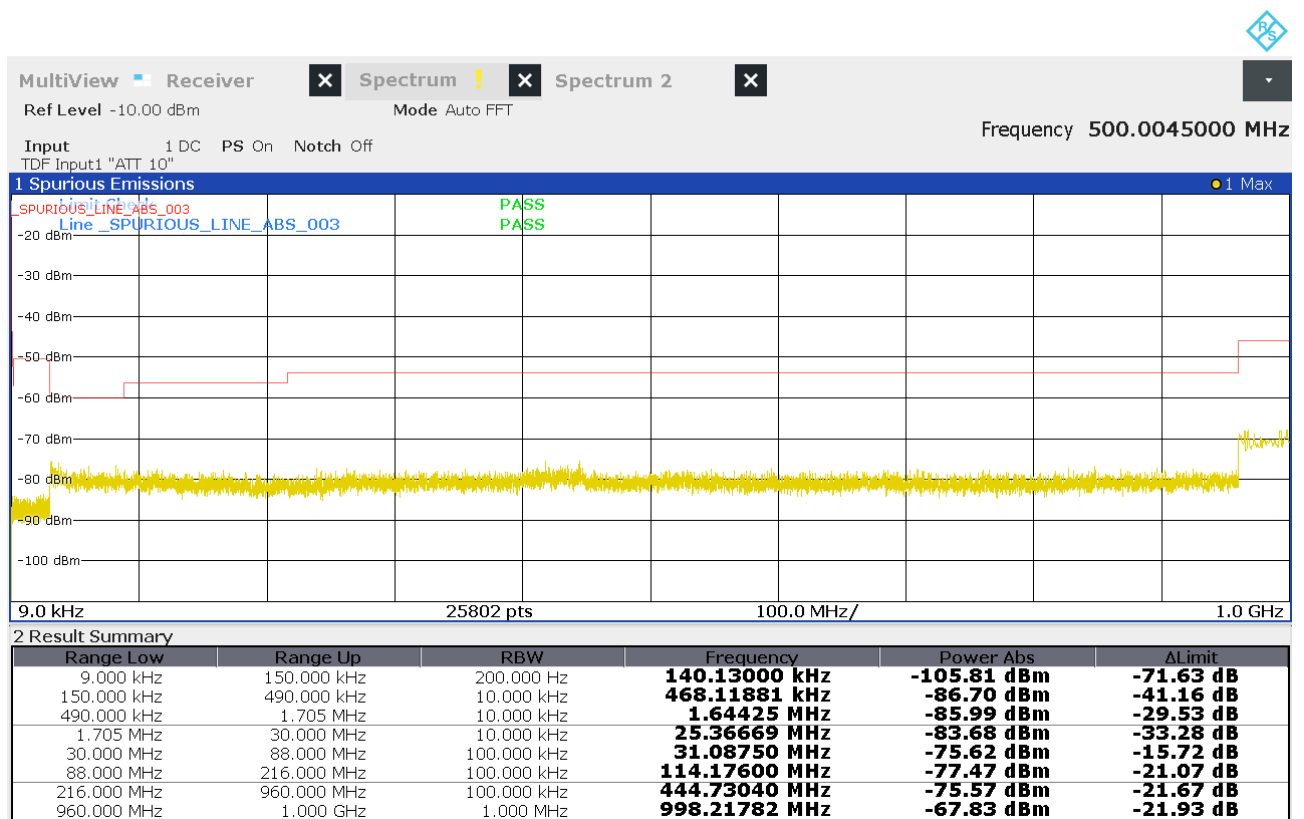


Figure 31: Chart of emissions test from 9 kHz to 1 GHz on highest channel, Pk

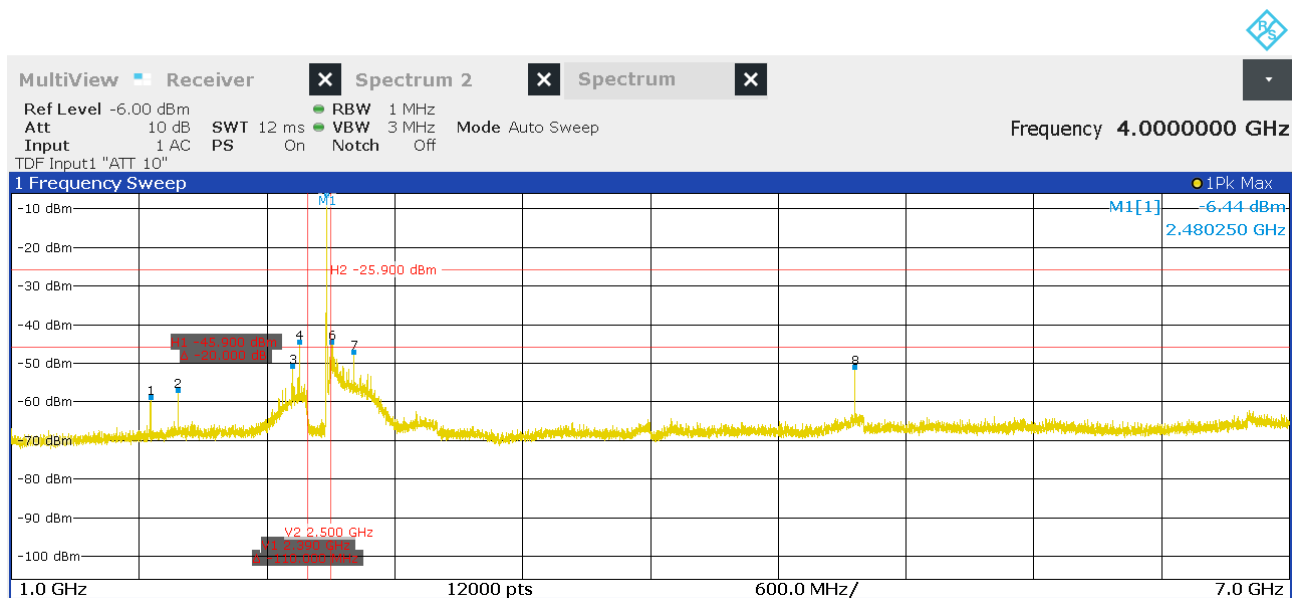


Figure 32: Chart of emissions test from 1 GHz to 7 GHz on highest channel, Pk

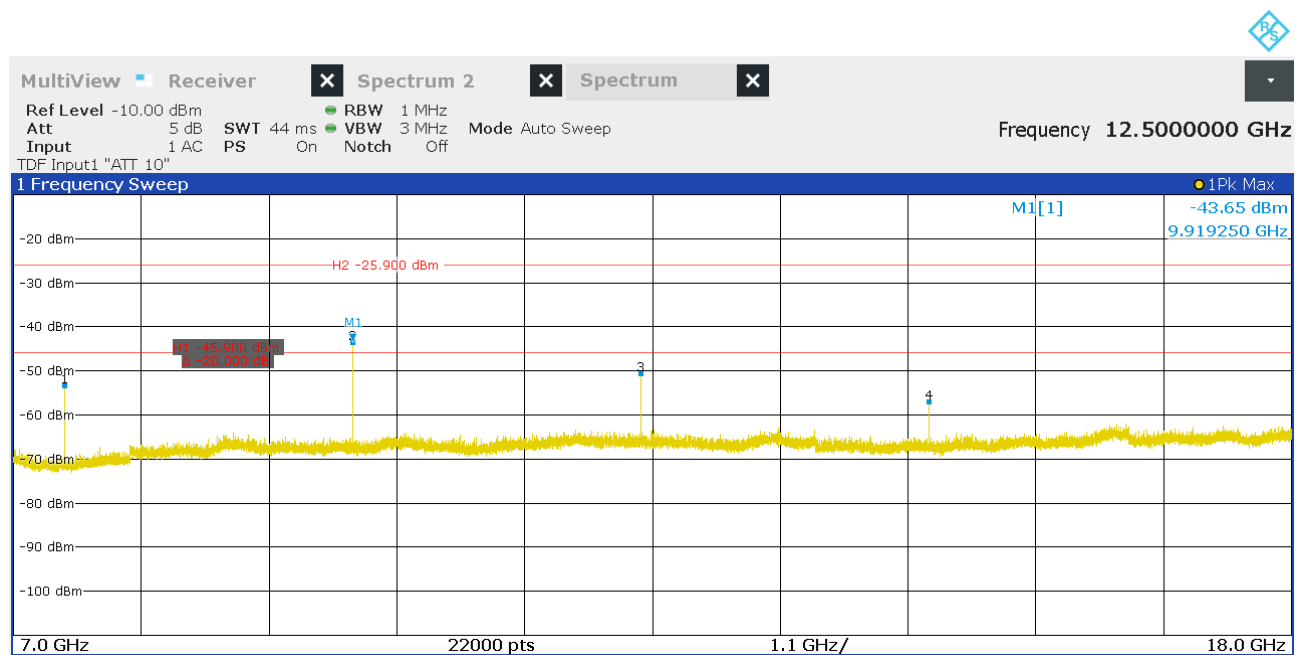


Figure 33: Chart of emissions test from 7 GHz to 18 GHz on highest channel, Pk

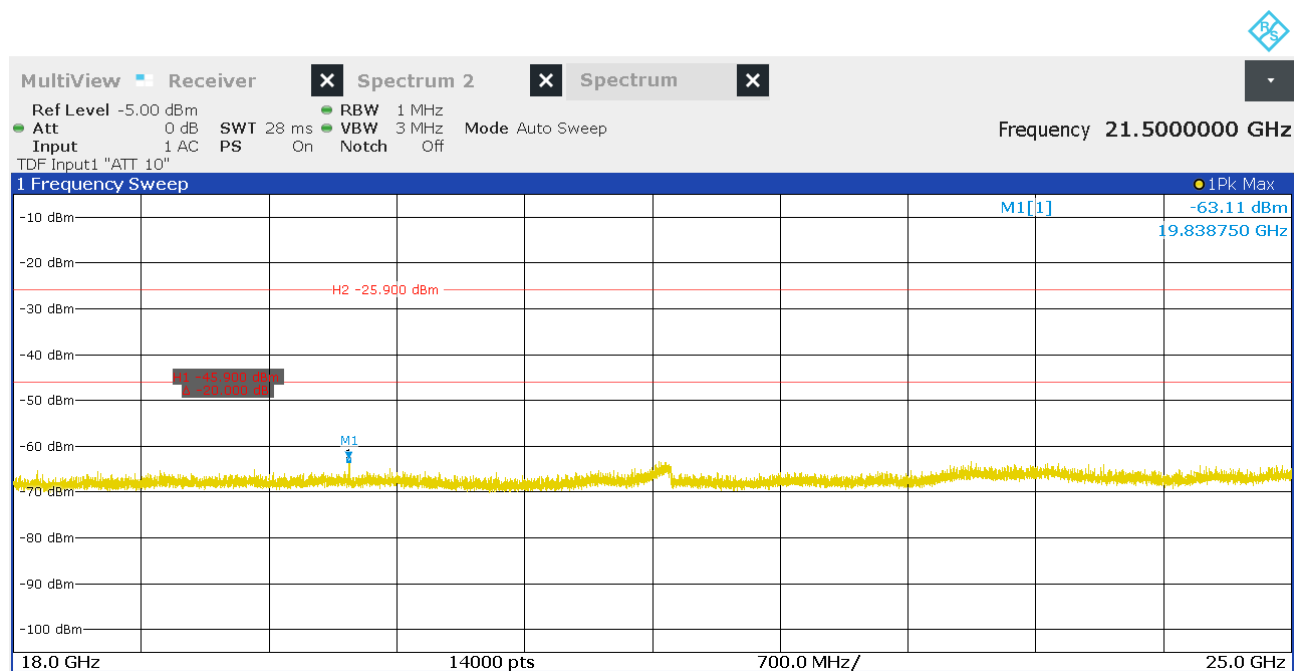


Figure 34: Chart of emissions test from 18 GHz to 25 GHz on highest channel, Pk

<i>Freq.</i> (MHz)	<i>Peak</i> <i>level</i> (dBm)	<i>Calc.</i> <i>Pk</i> <i>FS</i>	<i>At</i> <i>dist</i> (m)	<i>Pk</i> <i>limit</i> (dBμV/m)	<i>At</i> <i>dist</i> (m)	<i>Pk</i> <i>mar.</i> (dB)	<i>Calc</i> <i>AV</i> <i>FS</i>	<i>At</i> <i>dist</i> (m)	<i>AV</i> <i>limit</i> (dBμV/m)	<i>At</i> <i>dist</i> (m)	<i>AV</i> <i>mar.</i> (dB)	<i>QP</i> <i>limit</i> (dBμV/m)	<i>At</i> <i>dist</i> (m)	<i>QP</i> <i>mar.</i> (dB)	<i>Re</i> <i>s</i>
31.0875	-75.6	24.3	3	---	---	---	---	---	---	---	---	40.0	3	15.7	P

Table 38: Results of emissions test from 9 kHz to 1 GHz on highest channel, Pk measurement

with: *Freq.* = Frequency
Calc. FS. = Calculated field strength (dBμV/m)
At dist. = At distance
Mar. = Margin
Res. = Result
P = Passed
Np = Not passed

Notes:

1. The peak measurement shows that the calculated peak field strength is below the applicable Pk, AV or QP limit.
2. The measured power levels are corrected by adding the gain, the ground reflection factor and by applying the formula: $E = EIRP - 20 \log d + 104.8$.

<i>Freq.</i> (MHz)	<i>Peak level</i> (dBm)	<i>Calc.</i> <i>Pk</i> <i>FS</i> (dBμV/m) at 3m	<i>Pk limit</i> (dBμV/m) at 3m	<i>Pk mar.</i> (dB)	<i>Calc</i> <i>AV FS</i> (dBμV/m) at 3m	<i>AV limit</i> (dBμV/m) at 3m	<i>AV mar.</i> (dB)	<i>Res</i>
1653.750	-58.9	41.0	74.0	33.0	---	54.0	13.0	P
1781.250	-57.0	42.9	74.0	31.1	---	54.0	11.1	P
2319.750	-50.9	49.0	74.0	25.0	---	54.0	5.0	P
2351.750	-44.6	55.3	74.0	18.7	15.1	54.0	38.9	P
2505.750	-44.4	55.5	74.0	18.5	15.3	54.0	38.7	P
2608.250	-47.3	52.6	74.0	21.4	---	54.0	1.4	P
4959.750	-51.1	48.8	74.0	25.2	---	54.0	5.2	P
7439.250	-53.5	46.4	74.0	27.6	---	54.0	7.6	P
9919.250	-43.7	56.2	74.0	17.8	16.0	54.0	38.0	P
12399.250	-50.6	49.3	74.0	24.7	---	54.0	4.7	P
14879.250	-57.0	42.9	74.0	31.1	---	54.0	11.1	P
19838.750	-63.1	36.8	74.0	37.2	---	54.0	17.2	P

Table 39: Results of emissions test >1 GHz on highest channel, Pk measurement

with: *Freq.* = Frequency
Calc. Pk FS. = Calculated peak field strength (dBμV/m) at 3 m
Mar. = Margin
Res. = Result
P = Passed
Np = Not passed

Notes:

- The peak measurement shows that the calculated peak field strength is below the applicable Pk or AV limit with the exception of the harmonics or modulation products where the AV field strength is calculated according to clause 7.8.8.2 (a) of ANSI C63.10 and shown in the row "Calc. AV FS" of the table above.
- The measured power levels are corrected by adding the gain, the ground reflection factor and by applying the formula: $E = EIRP - 20 \log d + 104.8$.

6.10 Radiated emissions below 30 MHz

Section(s) in 47 CFR Part 15:	Requirement(s): Reference(s):	15.247(d) ANSI C63.10, clause 6.4
Section(s) in RSS:	Requirement(s): Reference(s):	RSS-247, section 6.6 ANSI C63.10, clause 6.4

Performed by:	Patricio Montenegro, M.Sc.-Ing.	Date(s) of test:	March 24, 2026
Result:	☒ Test passed ☐ Test not passed		

6.10.1 Test equipment

Description	Designation	Manufacturer	Inventory number	Last check	Next check	Check type
Semi-anechoic chamber (SAC)	SAC3	Albatross Projects	E00716	2024-02-20	2027-02-20	V
EMI test receiver	ESW26	Rohde & Schwarz	E01775	2026-03-13	2027-03-13	C
Loop antenna	HFH2-Z2	Rohde & Schwarz	E00060	2026-01-07	2027-01-07	C
Cable set no. 1 for semi-anechoic chamber SAC3 (9 kHz to 30 MHz)	RG 223/U - 350cm	AME HF-Technik	E01527	2025-09-23	2027-03-23	V
	RG 214/U - 500cm	AME HF-Technik	E01736	2025-09-23	2027-03-23	V
Test software	ELEKTRA ELEMI-EAS (V5.20.1)	Rohde & Schwarz	E01776	---	---	N/A

Note(s)

1. C = Calibration
2. V = Verification

6.10.2 Limits

According to §15.247(d):

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in § 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

Frequency (MHz)	Field strength		Measurement distance (m)
	($\mu\text{V/m}$)	($\text{dB}\mu\text{V/m}$)	
0.009 – 0.490	2400/F(kHz) (266.67 – 4.90)	48.52 – 13.80	300
0.490 – 1.705	24000/F(kHz) (48.98 – 14.08)	33.80 – 22.97	30
1.705 – 30	30	29.54	30

Table 40: General radiated emission limits up to 30 MHz according to §15.209

According to RSS-247 section 6.6:

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum device, digitally modulated device, or hybrid system is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power – based on either an RF conducted or a radiated measurement – provided that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under section 6.3.2, the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

According to RSS-Gen section 8.9:

Except where otherwise indicated in the applicable RSS, radiated emissions shall comply with the field strength limits shown in table 5 and table 6 of RSS-Gen. Additionally, the level of any transmitter unwanted emission shall not exceed the level of the transmitter's fundamental emission

According to RSS-Gen section 8.10:

Restricted frequency bands, identified in table 7 of RSS-Gen, are designated primarily for safety-of-life services (distress calling and certain aeronautical activities), certain satellite downlinks, radio astronomy and some government uses. Except where otherwise indicated, the following conditions related to the restricted frequency bands apply:

- a The transmit frequency, including fundamental components of modulation, of licence-exempt radio apparatus shall not fall within the restricted frequency bands listed in table 7 except for apparatus compliant with RSS-287, Emergency Position Indicating Radio Beacons (EPIRB), Emergency Locator Transmitters (ELT), Personal Locator Beacons (PLB), and Maritime Survivor Locator Devices (MSLD).
- b Unwanted emissions that fall into restricted frequency bands listed in table 7 of RSS-Gen shall comply with the limits specified in table 5 and table 6 of RSS-Gen.
- c Unwanted emissions that do not fall within the restricted frequency bands listed in table 7 of RSS-Gen shall comply either with the limits specified in the applicable RSS or with those specified in table 5 and table 6 of RSS-Gen.

<i>Frequency (MHz)</i>	<i>Magnetic field strength</i>		<i>Measurement distance (m)</i>
	<i>($\mu\text{A/m}$)</i>	<i>(dB$\mu\text{A/m}$)</i>	
0.009 – 0.490	6.37/F(kHz)	-2.999 – -37.721	300
0.490 – 1.705	63.7/F(kHz)	-17.721 – -28.636	30
1.705 – 30	0.08	-21.94	30

Table 41: General radiated emission limits from 9 kHz to 30 MHz according to section 8.9 of RSS-Gen

Note:

1. In case of measurements are performed at other distances than that specified in the requirements, the limits in the charts and tables reported with the test results are derived from the general radiated emission limits as listed in table 40 using the recalculation factor as described in clause 5.3.

6.10.3 Test procedure

The radiated emissions below 30 MHz are measured using the test procedure as described in clause 6.4 of ANSI C63.10 and referring to the

- ☒ test procedure for automatic radiated measurements as described in clause 5.4.
- ☐ test procedure for manual radiated measurements as described in clause 5.4.

6.10.4 Test results

Test distance:	☒ 3 m	☐ 10 m	☐ m
Antenna alignment:	☒ in parallel	☒ in line	☐ angle °
EUT position:	☒ Position X	☒ Position Y	☐ Position Z

Note(s):

- 1 Pre-measurements were performed to declare the worst case which is documented below.
- 2 The measurement is performed at 3 m, the chart is corrected to a distance of 300 m in the frequency range 9 kHz to 490 kHz and to a distance of 30 m in the frequency range 490 kHz to 30 MHz.
- 3 Pre-measurements have shown that there are no differences between the tested channels below 30 MHz, so the final measurement was only performed on channel middle.
- 4 All emissions were greater than 20 dB below the limit.

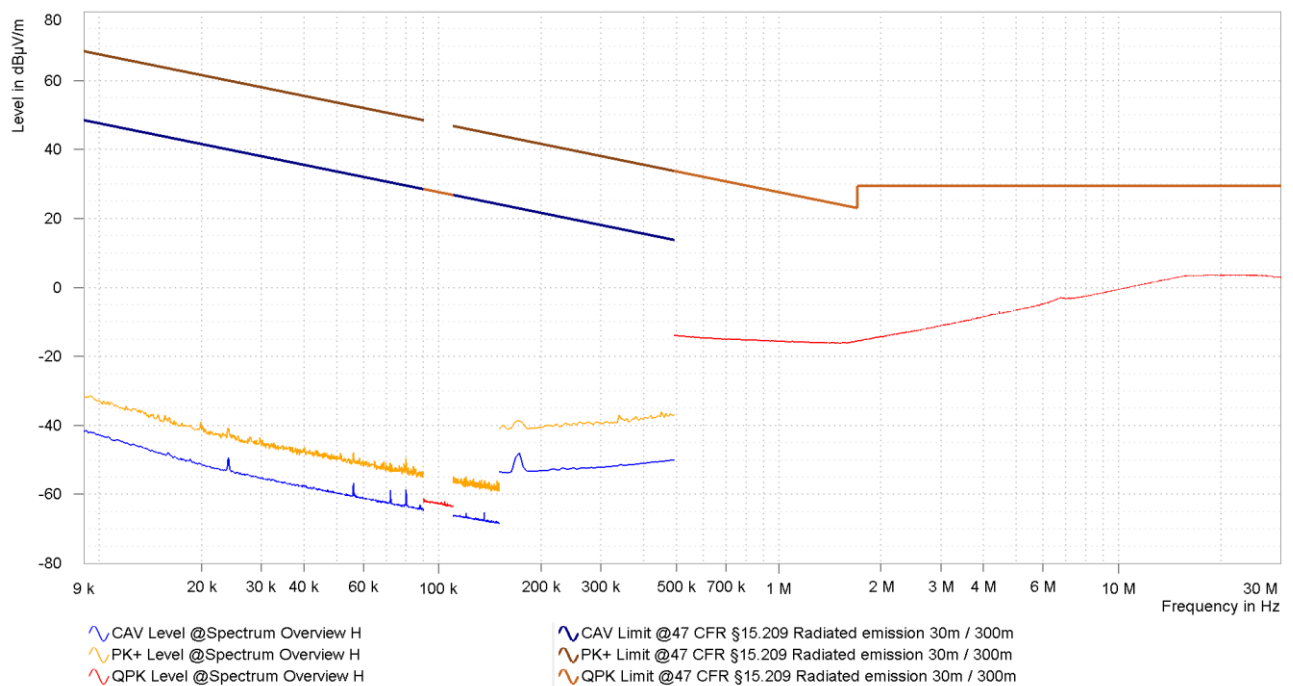


Figure 35: Chart of emissions test below 30 MHz on middle channel, EUT position X, antenna parallel

6.11 Radiated emissions from 30 MHz to 1 GHz

Section(s) in 47 CFR Part 15:	Requirement(s): Reference(s):	15.247(d) ANSI C63.10, clause 6.5
Section(s) in RSS:	Requirement(s): Reference(s):	RSS-247, section 6.6 ANSI C63.10, clause 6.5

Performed by:	Patricio Montenegro, M.Sc.-Ing.	Date(s) of test:	March 23, 2026
Result:	☒ Test passed ☐ Test not passed		

6.11.1 Test equipment

Description	Designation	Manufacturer	Inventory number	Last check	Next check	Check type
Semi-anechoic chamber (SAC)	SAC3	Albatross Projects	E00716	2024-02-20	2027-02-20	V
EMI test receiver	ESW26	Rohde & Schwarz	E01775	2026-03-13	2027-03-13	C
Attenuator (6 dB)	DGA 9552 N	Schwarzbeck Mess-Elektronik	E00849	2026-01-26	2027-07-26	V
TRILOG broadband antenna	VULB 9162	Schwarzbeck Mess-Elektronik	E00643	2024-04-17	2027-04-17	C
Cable set no. 2 for semi-anechoic chamber SAC3 (30 MHz to 18 GHz)	S04272B - 200cm	AME HF-Technik	E01285	2026-02-23	2027-08-23	V
	SF104E/11PC35/11PC35/2000 mm	HUBER+SUHNER	E01749	2026-01-26	2027-07-26	V
	SF104EA/11PC35/11PC35/1000MM	HUBER+SUHNER	E01439	2025-11-05	2027-05-05	V
Test software	ELEKTRA ELEMI-EAS (V5.20.1)	Rohde & Schwarz	E01776	---	---	N/A

Note(s)

1. C = Calibration
2. V = Verification

6.11.2 Limits

According to §15.247(d):

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the

desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in § 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

According to RSS-247 section 6.6:

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum device, digitally modulated device, or hybrid system is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power – based on either an RF conducted or a radiated measurement – provided that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under section 6.3.2, the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

According to RSS-Gen section 8.9:

Except where otherwise indicated in the applicable RSS, radiated emissions shall comply with the field strength limits shown in table 5 and table 6 of RSS-Gen. Additionally, the level of any transmitter unwanted emission shall not exceed the level of the transmitter's fundamental emission

According to RSS-Gen section 8.10:

Restricted frequency bands, identified in table 7 of RSS-Gen, are designated primarily for safety-of-life services (distress calling and certain aeronautical activities), certain satellite downlinks, radio astronomy and some government uses. Except where otherwise indicated, the following conditions related to the restricted frequency bands apply:

- a The transmit frequency, including fundamental components of modulation, of licence-exempt radio apparatus shall not fall within the restricted frequency bands listed in table 7 except for apparatus compliant with RSS-287, Emergency Position Indicating Radio Beacons (EPIRB), Emergency Locator Transmitters (ELT), Personal Locator Beacons (PLB), and Maritime Survivor Locator Devices (MSLD).
- b Unwanted emissions that fall into restricted frequency bands listed in table 7 of RSS-Gen shall comply with the limits specified in table 5 and table 6 of RSS-Gen.
- c Unwanted emissions that do not fall within the restricted frequency bands listed in table 7 of RSS-Gen shall comply either with the limits specified in the applicable RSS or with those specified in table 5 and table 6 of RSS-Gen.

Frequency (MHz)	Field strength		Measurement distance (m)
	($\mu\text{V/m}$)	(dB $\mu\text{V/m}$)	
30 – 88	100	40.0	3
88 – 216	150	43.5	3
216 - 960	200	46.0	3
Above 960	500	54.0	3

Table 42: General radiated emission limits $\geq$ 30 MHz according to §15.209 and RSS-Gen section 8.9

6.11.3 Test procedure

The radiated emissions from 30 MHz to 1 GHz are measured using the test procedure as described in clause 6.5 of ANSI C63.10 and referring to the

- ☒ test procedure for automatic radiated measurements as described in clause 5.5.
- ☐ test procedure for manual radiated measurements as described in clause 5.5.

6.11.4 Test results

Test distance:	☒ 3 m	☐ 10 m	☐ m
Polarization:	☒ horizontal	☒ vertical	
EUT position:	☒ Position X	☒ Position Y	☐ Position Z

Note(s)

- 1 Premeasurements were performed to declare the worst case which is documented below.
- 2 Premeasurements have shown that there are no differences between the tested channels in the range of 30 MHz to 1 GHz, so the final measurement was only performed on the middle channel.
- 3 Apart from the documented emissions, all other emissions were greater than 20 dB below the limit.

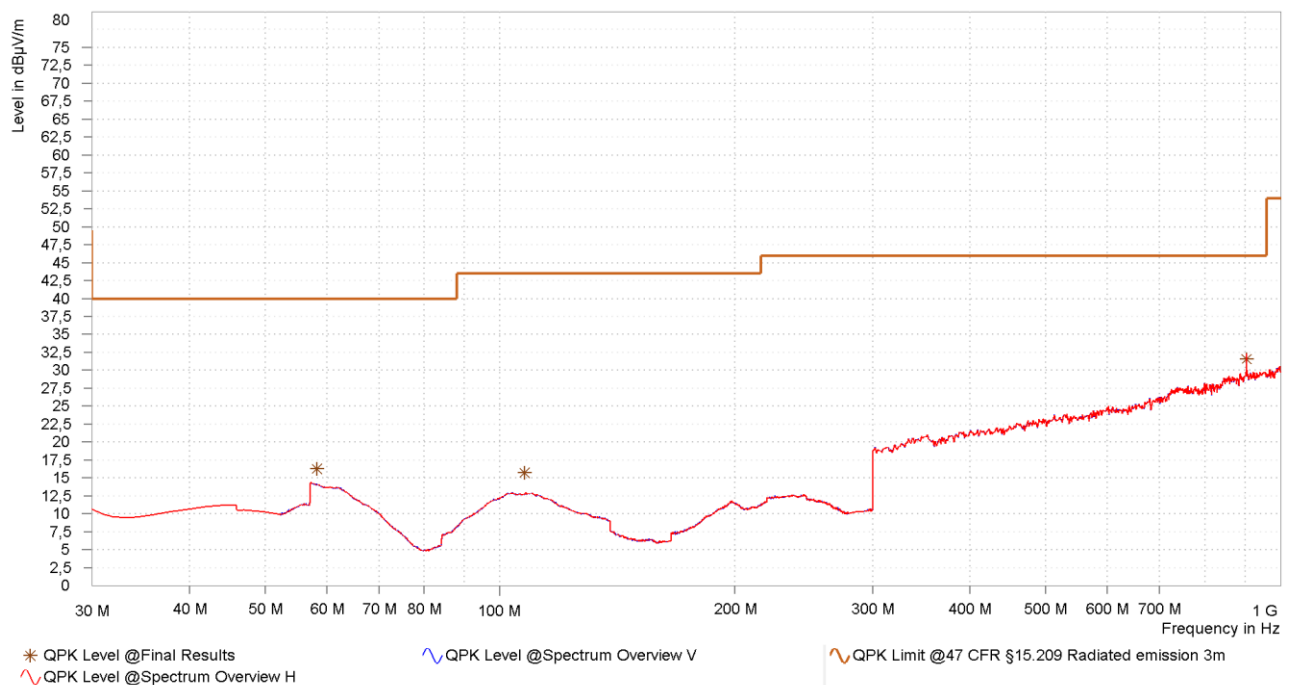


Figure 36: Chart of radiated emissions test from 30 MHz to 1 GHz on middle channel, EUT position X, antenna polarization horizontal and vertical

<i>Freq.</i> (MHz)	<i>EUT</i> <i>Pos.</i>	<i>QP Field</i> <i>strength</i> (dB μ V/m at 3 m)	<i>QP Limit</i> (dB μ V/m at 3 m)	<i>QP Margin</i> (dB)	<i>Corr.</i> (dB/m)	<i>Pol.</i>	<i>Azim.</i> (deg)	<i>Height</i> (m)	<i>Result</i>
58.260	Y	16.3	40.0	23.7	19.7	H	-25	1.09	Passed
107.520	Y	15.7	43.5	27.8	18.6	H	206	1.17	Passed
904.200	Y	31.6	46.0	14.4	31.8	H	350	1.12	Passed

Table 43: Results of radiated emissions test from 30 MHz to 1 GHz on middle channel

with: *Freq.* = Frequency
EUT Pos. = EUT Position
Pol. = Polarization of the measurement antenna
Azim. (deg) = Azimuth (degree)
Corr. = Correction factor

6.12 Radiated emissions from 1 GHz to 25 GHz (10th harmonic)

Section(s) in 47 CFR Part 15:	Requirement(s): Reference(s):	15.247(d) ANSI C63.10, clause 6.6
Section(s) in RSS:	Requirement(s): Reference(s):	RSS-247, section 6.6 ANSI C63.10, clause 6.6

Performed by:	Patricio Montenegro, M.Sc.-Ing.	Date(s) of test:	March 27, 2026 March 30, 2026
Result:	☒ Test passed ☐ Test not passed		

6.12.1 Test equipment

Description	Designation	Manufacturer	Inventory number	Last check	Next check	Check type
Semi-anechoic chamber (SAC)	SAC3	Albatross Projects	E00716	2024-02-20	2027-02-20	V
EMI test receiver	ESW26	Rohde & Schwarz	E01775	2026-03-13	2027-03-13	C
Preamplifier (1 GHz to 18 GHz)	ALS05749	Aldetec	W01007	2025-06-12	2026-06-12	V
Preamplifier (18 GHz to 40 GHz)	BBV 9721	Schwarzbeck Mess-Elektronik	W01350	2025-11-05	2026-11-05	V
Double ridged broadband horn antenna	BBHA 9120D	Schwarzbeck Mess-Elektronik	W00053	2025-10-01	2028-10-01	C
Broadband Horn Antenna	BBHA 9170	Schwarzbeck Mess-Elektronik	W00055	2025-09-02	2028-09-02	C
Cable set no. 2 for semi-anechoic chamber SAC3 (30 MHz to 18 GHz)	S04272B - 200cm	AME HF-Technik	E01285	2026-02-23	2027-08-23	V
	SF104E/11PC35/11PC35/2000mm	HUBER+SUHNER	E01749	2026-01-26	2027-07-26	V
	SF104EA/11PC35/11PC35/1000MM	HUBER+SUHNER	E01439	2025-11-05	2027-05-05	V
Cable set no. 3 for semi-anechoic chamber SAC3 (17 GHz to 26.5 GHz)	SF104E/11PC35/11PC35/2000mm	HUBER+SUHNER	E01749	2026-01-26	2027-07-26	V
	SF104EA/11PC35/11PC35/5000MM	HUBER+SUHNER	E01437	2025-03-24	2026-09-24	V
Test software	ELEKTRA ELEMI-EAS (V5.20.1)	Rohde & Schwarz	E01776	---	---	N/A

Note(s)

1. C = Calibration
2. V = Verification

6.12.2 Limits

According to §15.247(d):

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in § 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

According to RSS-247 section 6.6:

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum device, digitally modulated device, or hybrid system is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power – based on either an RF conducted or a radiated measurement – provided that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under section 6.3.2, the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

According to RSS-Gen section 8.9:

Except where otherwise indicated in the applicable RSS, radiated emissions shall comply with the field strength limits shown in table 5 and table 6 of RSS-Gen. Additionally, the level of any transmitter unwanted emission shall not exceed the level of the transmitter's fundamental emission

According to RSS-Gen section 8.10:

Restricted frequency bands, identified in table 7 of RSS-Gen, are designated primarily for safety-of-life services (distress calling and certain aeronautical activities), certain satellite downlinks, radio astronomy and some government uses. Except where otherwise indicated, the following conditions related to the restricted frequency bands apply:

- a The transmit frequency, including fundamental components of modulation, of licence-exempt radio apparatus shall not fall within the restricted frequency bands listed in table 7 except for apparatus compliant with RSS-287, Emergency Position Indicating Radio Beacons (EPIRB), Emergency Locator Transmitters (ELT), Personal Locator Beacons (PLB), and Maritime Survivor Locator Devices (MSLD).
- b Unwanted emissions that fall into restricted frequency bands listed in table 7 of RSS-Gen shall comply with the limits specified in table 5 and table 6 of RSS-Gen.
- c Unwanted emissions that do not fall within the restricted frequency bands listed in table 7 of RSS-Gen shall comply either with the limits specified in the applicable RSS or with those specified in table 5 and table 6 of RSS-Gen.

Frequency (MHz)	Field strength		Measurement distance (m)
	($\mu\text{V/m}$)	($\text{dB}\mu\text{V/m}$)	
Above 960	500	54	3

Table 44: General radiated emission limits above 960 MHz according to §15.209 and RSS-Gen

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	above 38.6
13.36-13.41			

Table 45: Restricted bands of operation according to §15.205 and RSS-Gen section 8.10

6.12.3 Test procedure

The radiated emissions from 1 GHz to 25 GHz are measured using the test procedure as described in clause 6.6 of ANSI C63.10 and referring to the

- ☒ test procedure for automatic radiated measurements as described in clause 5.6.
- ☐ test procedure for manual radiated measurements as described in clause 5.6.

6.12.4 Test results

Test distance:	Exploratory tests:	☐ 1 m	☐ 0.5 m
	Final tests:	☒ 3 m	☐ 1.5 m
Polarization:	☒ horizontal	☒ vertical	
EUT position:	☒ Position X	☒ Position Y	☐ Position Z

Note(s):

- 1 Pre-measurements were performed to declare the worst case which is documented below.
- 2 This test shows the emissions outside the operation band and outside the band edge frequency range (2390 MHz to 2400 MHz and 2483.5 MHz to 2500 MHz).
- 3 According to clause 6.6.4.3, note 1 of ANSI C63.10, if the maximized peak measured value complies with the average limit, than it is unnecessary to perform an average measurement.
- 4 The average value of harmonics is calculated by subtracting the correction factor (see clause 6.3.4.2) from the calculated peak value.

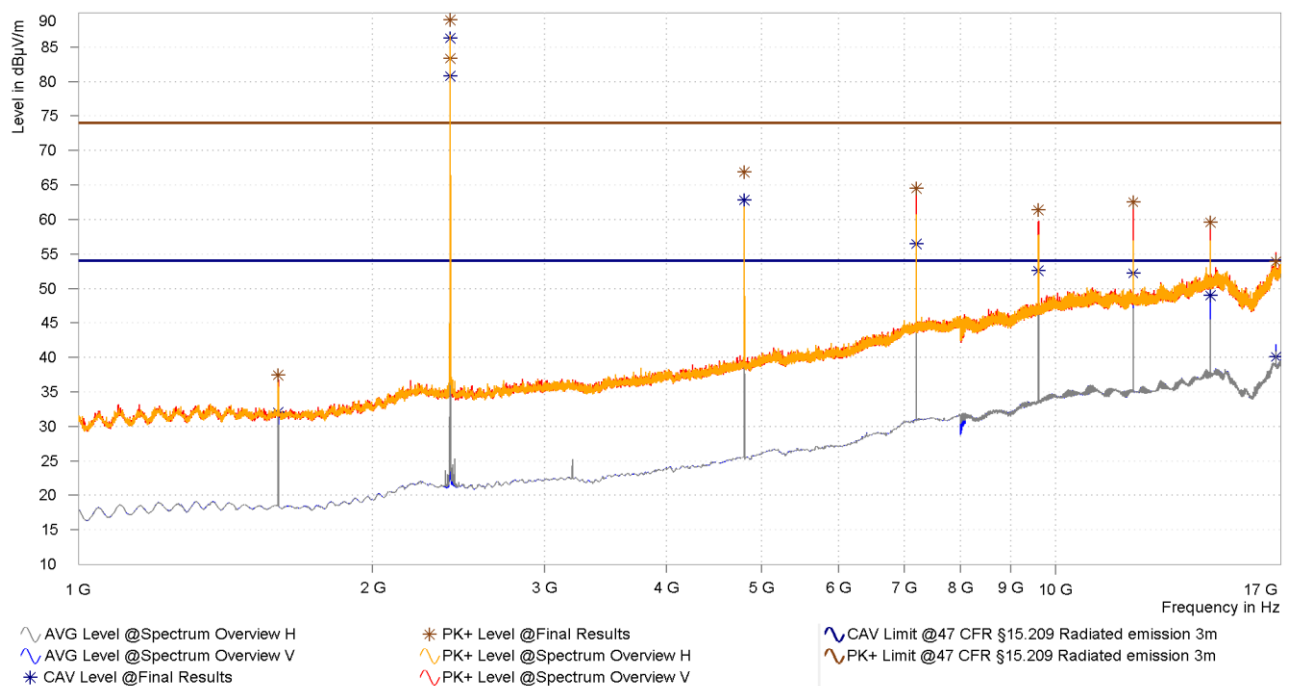


Figure 37: Chart of radiated emissions pre-measurement from 1 GHz to 17 GHz on lowest channel, EUT position X, antenna polarization horizontal and vertical

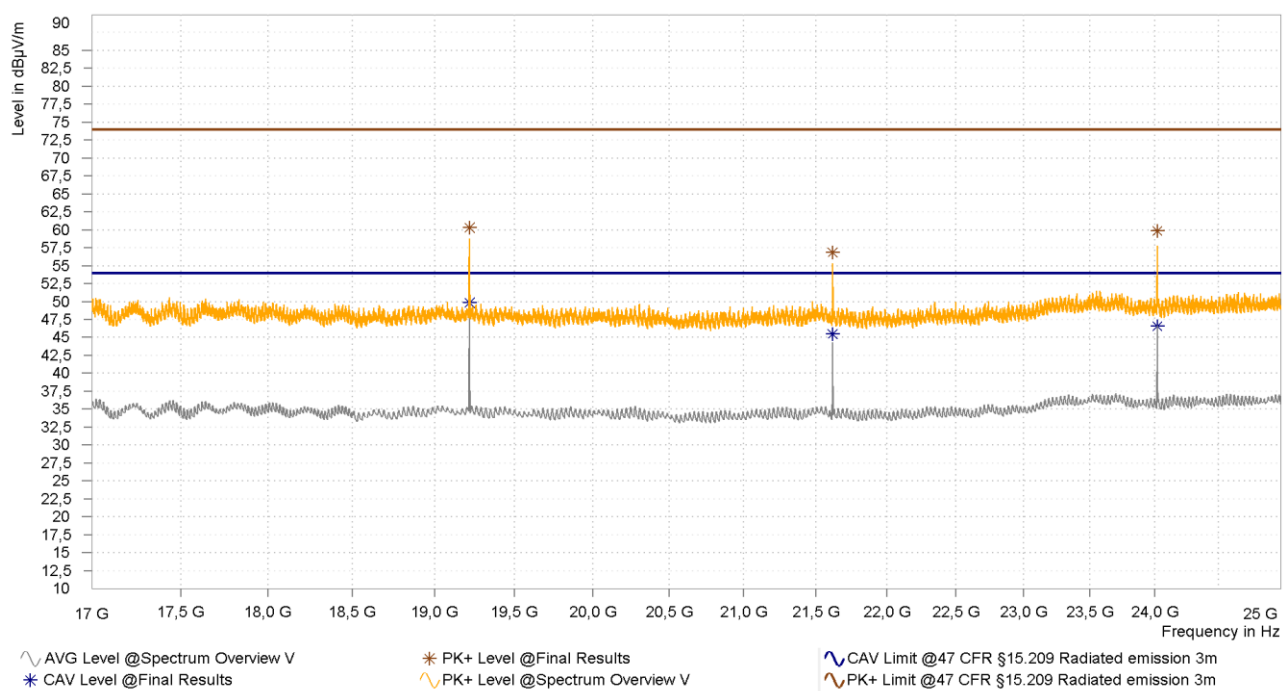


Figure 38: Chart of radiated emissions measurement from 17 GHz to 25 GHz on lowest channel, EUT position X, antenna polarization vertical

<i>Freq.</i> (MHz)	<i>EUT</i> <i>Pos.</i>	<i>Pk</i> <i>level</i> (dB μ V/ m) <i>at 3 m</i>	<i>Pk</i> <i>limit</i> (dB μ V/ m) <i>at 3 m</i>	<i>Pk</i> <i>Mar.</i> (dB)	<i>AV level</i> (dB μ V/ m) <i>at 3 m</i>	<i>AV</i> <i>limit</i> (dB μ V/ m) <i>at 3 m</i>	<i>AV Mar.</i> (dB)	<i>Corr.</i> (dB/m)	<i>Pol.</i>	<i>Azim.</i> (deg)	<i>Height</i> (m)	<i>Res.</i>
1601.50	X	37.5	74.0	36.5	32.1	54.0	21.9	-17.9	V	244	1.97	P
4804.00	X	66.9	74.0	7.1	26.7	54.0	27.3	-6.1	H	73	2.45	P
7205.50	X	64.5	74.0	9.5	24.3	54.0	29.7	0.0	V	60	1.29	P
9608.00	X	61.4	74.0	12.6	21.2	54.0	32.8	5.1	V	177	1.79	P
12009.00	X	62.6	74.0	11.4	22.4	54.0	31.6	6.0	V	241	1.94	P
14411.00	X	59.6	74.0	14.4	19.4	54.0	34.6	9.7	V	224	3.80	P
16814.00	X	53.9	74.0	20.1	13.7	54.0	40.3	11.6	V	244	3.41	P
19217.00	X	60.3	74.0	13.7	20.1	54.0	33.9	10.4	V	8	2.94	P
21616.50	X	56.9	74.0	17.1	16.7	54.0	37.3	10.8	V	306	3.00	P
24019.75	X	59.9	74.0	14.1	19.7	54.0	34.3	12.7	V	275	1.06	P

Table 46: Results of radiated emissions test from 1 GHz to 25 GHz on lowest channel

with: *Freq.* = Frequency
EUT Pos. = EUT Position
Mar. = Margin
Pol. = Polarization of the measurement antenna
Azim. (deg) = Azimuth (degree)
Corr. = Correction factor
Res. = Result
P = Passed
Np = Not passed

Note:

The peak measurement shows that the calculated peak field strength is below the applicable Pk, AV or QP limit with the exception of the harmonics where the AV field strength is calculated according to clause 7.8.8.2 (a) of ANSI C63.10.

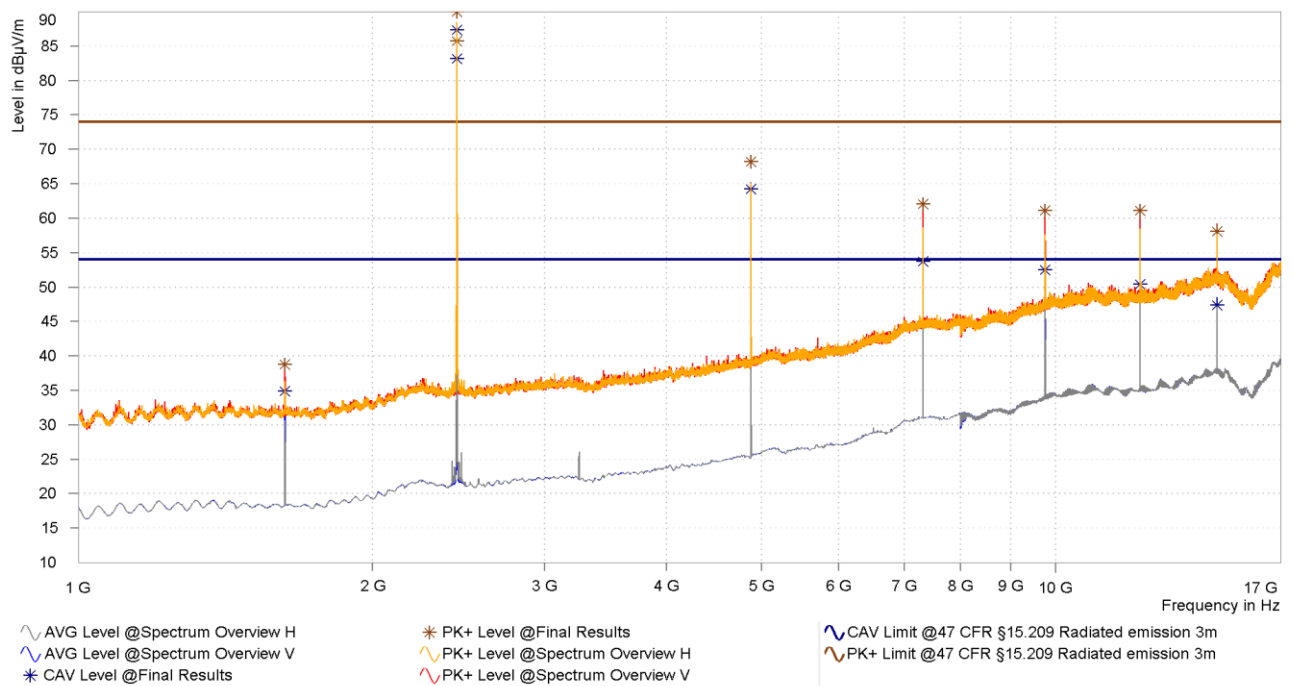


Figure 39: Chart of radiated emissions pre-measurement from 1 GHz to 17 GHz on middle channel, EUT position X, antenna polarization horizontal and vertical

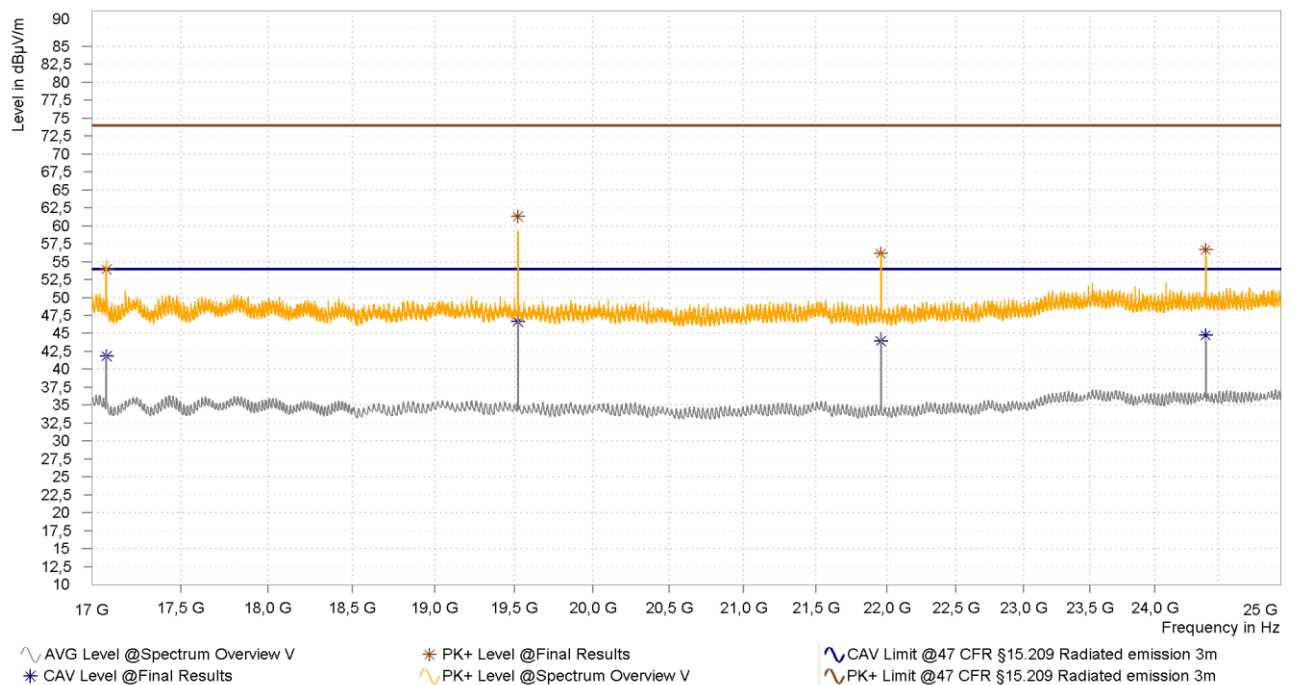


Figure 40: Chart of emissions measurement from 17 GHz to 25 GHz on middle channel, EUT position X, antenna polarization vertical

<i>Freq.</i> (MHz)	<i>EUT</i> <i>Pos.</i>	<i>Pk</i> <i>level</i> (dB μ V /m) <i>at 3 m</i>	<i>Pk</i> <i>limit</i> (dB μ V/ m) <i>at 3 m</i>	<i>Pk</i> <i>Mar.</i> (dB)	<i>AV level</i> (dB μ V/ m) <i>at 3 m</i>	<i>AV</i> <i>limit</i> (dB μ V/ m) <i>at 3 m</i>	<i>AV Mar.</i> (dB)	<i>Corr.</i> (dB/m)	<i>Pol.</i>	<i>Azim.</i> (deg)	<i>Height</i> (m)	<i>Res.</i>
1627.00	X	38.8	74.0	35.2	34.9	54.0	19.1	-17.9	V	121	2.44	P
4880.00	X	68.2	74.0	5.8	28.0	54.0	26.0	-6.1	H	74	2.03	P
7319.50	X	62.1	74.0	11.9	21.9	54.0	32.1	0.3	V	60	1.08	P
9760.50	X	61.2	74.0	12.8	21.0	54.0	33.0	5.6	V	125	2.16	P
12199.00	X	61.1	74.0	12.9	20.9	54.0	33.1	6.2	V	231	3.79	P
14639.50	X	58.1	74.0	15.9	17.9	54.0	36.1	9.8	V	232	4.00	P
17079.75	X	53.9	74.0	20.1	13.7	54.0	40.3	13.1	V	120	2.98	P
19520.00	X	61.3	74.0	12.7	21.1	54.0	32.9	10.3	V	327	2.42	P
21958.25	X	56.2	74.0	17.8	16.0	54.0	38.0	10.9	V	308	2.99	P
24398.25	X	56.7	74.0	17.3	16.5	54.0	37.5	13.0	V	268	2.05	P

Table 47: Results of radiated emissions test from 1 GHz to 25 GHz on middle channel

with: *Freq.* = Frequency
EUT Pos. = EUT Position
Mar. = Margin
Pol. = Polarization of the measurement antenna
Azim. (deg) = Azimuth (degree)
Corr. = Correction factor
Res. = Result
P = Passed
Np = Not passed

Note:

The peak measurement shows that the calculated peak field strength is below the applicable Pk, AV or QP limit with the exception of the harmonics where the AV field strength is calculated according to clause 7.8.8.2 (a) of ANSI C63.10.

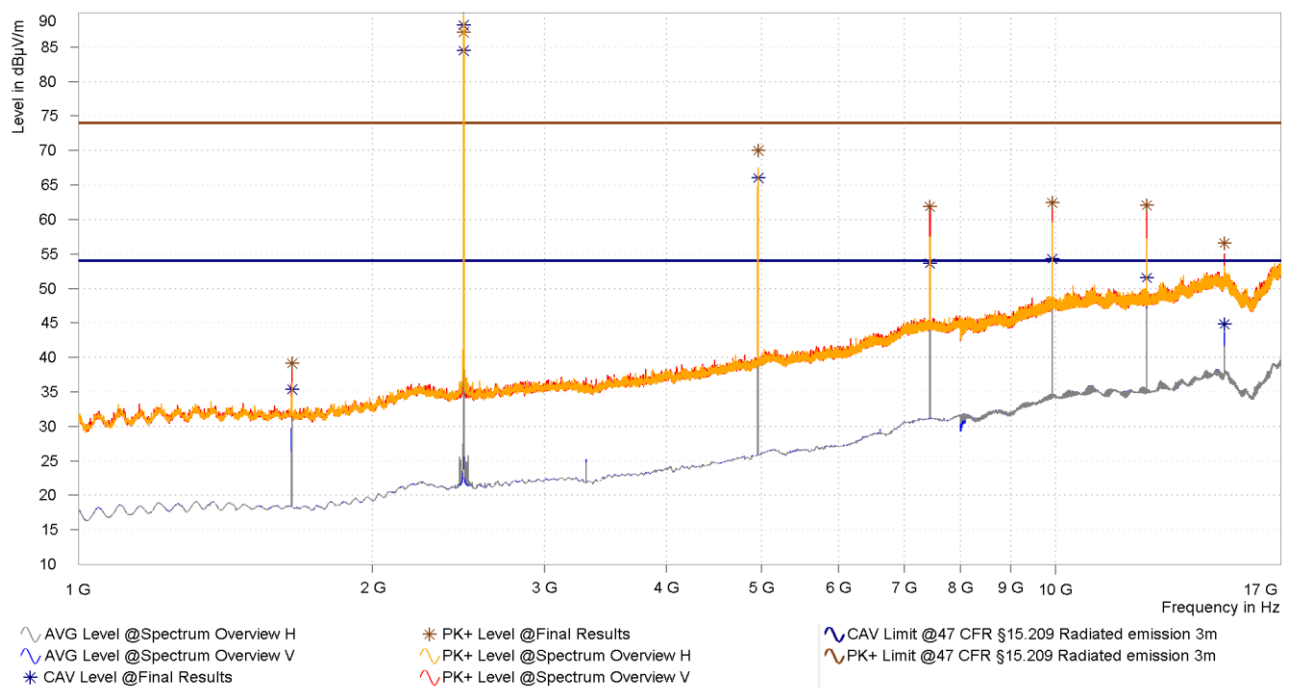


Figure 41: Chart of radiated emissions pre-measurement from 1 GHz to 17 GHz on highest channel, EUT position X, antenna polarization horizontal and vertical

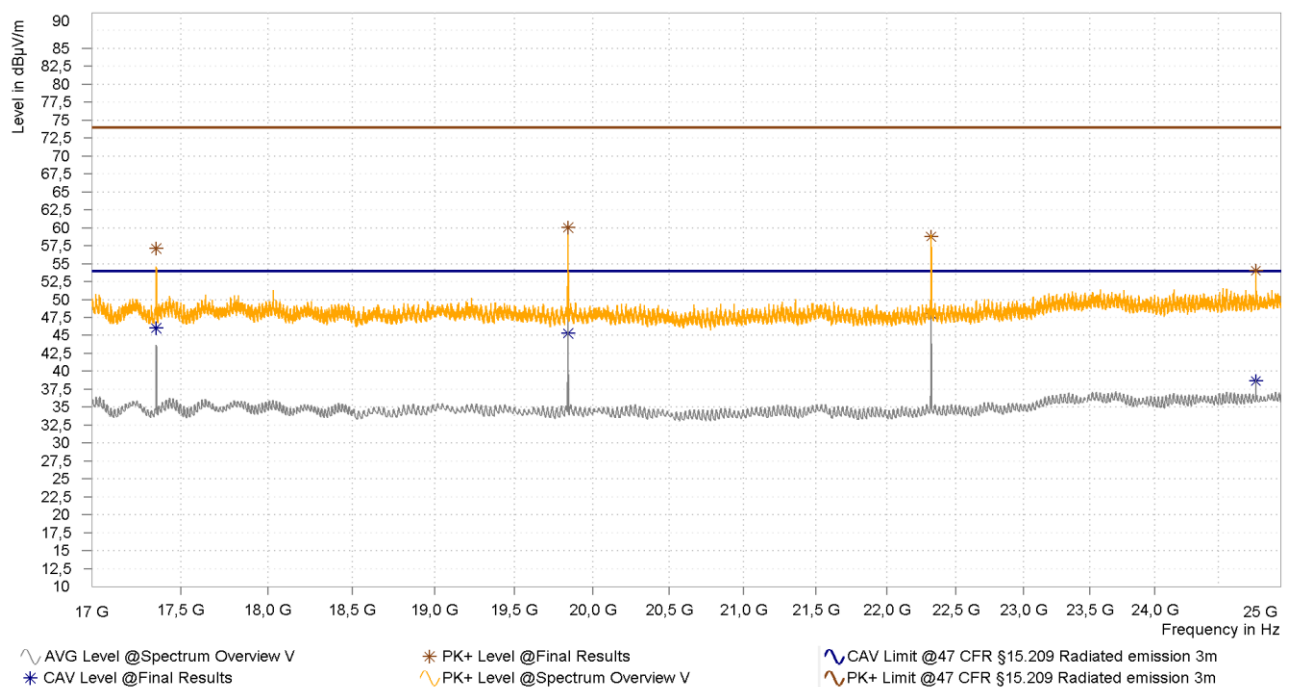


Figure 42: Chart of emissions measurement from 17 GHz to 25 GHz on highest channel, EUT position X, antenna polarization vertical

<i>Freq.</i> (MHz)	<i>EUT</i> <i>Pos.</i>	<i>Pk</i> <i>level</i> (dB μ V /m) <i>at 3 m</i>	<i>Pk</i> <i>limit</i> (dB μ V/ m) <i>at 3 m</i>	<i>Pk</i> <i>Mar.</i> (dB)	<i>AV level</i> (dB μ V/ m) <i>at 3 m</i>	<i>AV</i> <i>limit</i> (dB μ V/ m) <i>at 3 m</i>	<i>AV Mar.</i> (dB)	<i>Corr.</i> (dB/m)	<i>Pol.</i>	<i>Azim.</i> (deg)	<i>Height</i> (m)	<i>Res.</i>
1653.50	X	39.2	74.0	34.8	35.4	54.0	18.6	-17.9	V	87	2.44	P
4960.00	X	70.0	74.0	4.0	29.8	54.0	24.2	-5.9	H	66	2.26	P
7439.50	X	61.9	74.0	12.1	21.7	54.0	32.3	0.5	V	62	1.00	P
9919.50	X	62.5	74.0	11.5	22.3	54.0	31.7	5.8	V	239	1.12	P
12399.00	X	62.1	74.0	11.9	21.9	54.0	32.1	6.0	V	242	3.55	P
14879.00	X	56.6	74.0	17.4	16.4	54.0	37.6	9.3	V	245	3.08	P
17358.75	X	57.2	74.0	16.8	17.0	54.0	37.0	12.1	V	320	2.89	P
19840.00	X	60.0	74.0	14.0	19.8	54.0	34.2	10.1	V	327	2.50	P
22318.50	X	58.8	74.0	15.2	18.6	54.0	35.4	11.0	V	1	2.76	P
24799.75	X	54.1	74.0	19.9	13.9	54.0	40.1	13.3	V	243	1.58	P

Table 48: Results of radiated emissions test from 1 GHz to 25 GHz on highest channel

with: *Freq.* = Frequency
EUT Pos. = EUT Position
Mar. = Margin
Pol. = Polarization of the measurement antenna
Azim. (deg) = Azimuth (degree)
Corr. = Correction factor
Res. = Result
P = Passed
Np = Not passed

Note:

The peak measurement shows that the calculated peak field strength is below the applicable Pk, AV or QP limit with the exception of the harmonics where the AV field strength is calculated according to clause 7.8.8.2 (a) of ANSI C63.10.

7 Measurement uncertainties

Description	Uncertainty	U_{Limit}	Note(s)	k=
AC power line conducted emission	± 3.0 dB	± 3.4 dB	2b), 3b)	2
Carrier frequency separation	± 1.5 %	± 5 %	2a), 3a)	2
Number of hopping frequencies	± 1.5 %	± 5 %	2a), 3a)	2
Time of occupancy (dwell time)	± 1.5 %	± 5 %	2a), 3a)	2
Bandwidth tests	± 2.0 %	± 5 %	2a), 3a)	2
Maximum conducted output power (conducted)	± 2.9 dB	± 3.0 dB	2a), 3a)	2
Power spectral density (conducted)	± 2.9 dB	± 3.0 dB	2a), 3a)	2
Conducted spurious emissions	± 2.9 dB	± 3.0 dB	2a), 3a)	2
Radiated emissions				
from 9 kHz to 30 MHz	± 3.8 dB	± 4.0 dB	2b), 3b)	2
from 30 MHz to 1 GHz	± 6.1 dB	± 6.3 dB	2b), 3b)	2
from 1 GHz to 6 GHz	± 4.6 dB	± 5.2 dB	2b), 3b)	2
from 6 GHz to 18 GHz	± 5.0 dB	± 5.5 dB	2b), 3b)	2
from 18 GHz to 26.5 GHz	± 5.4 dB	± 6.0 dB	2b), 3c)	2
from 26.5 GHz to 40 GHz	± 6.2 dB	± 6.5 dB	2b), 3c)	2

Note(s):

- The uncertainty stated is the expanded uncertainty obtained by multiplying the standard uncertainty by the coverage factor k. For a confidence level of 95 % the coverage factor k is 2.
- The values of the measurement uncertainty as listed above are calculated according to
 - ETSI TR 100 028-1 V1.4.1 and ETSI TR 100 028-2 V1.4.1
 - CISPR 16-4-2:2011-06 + A1:2014-02 + A2:2018-08
- The limits for the measurement uncertainty as listed above are
 - derived from ETSI EN 300 328 V2.1.1
 - equal to U_{CISPR} taken from CISPR 16-4-2:2011-06 + A1:2014-02 + A2:2018-08
 - defined by the test laboratory
- Simple acceptance is applied as the decision rule while keeping the specified limits (U_{Limit}) for the expanded measurement uncertainty (i.e. Test Uncertainty Ratio $TUR \geq 1:1$). That means, compliance is based on the recorded level by the lab irrespective of the expanded measurement uncertainty value but with a limitation to it. For details on simple acceptance and the level of risk (such as false accept, false reject and false statistical assumptions) associated with this decision rule see ISO/IEC Guide 98-4:2012 and ILAC G8:09/2019 "Guidelines on Decision Rules and Statements of Conformity" ("Binary Statement for Simple Acceptance Rule" according to clause 4.2.1).
- All used test instruments as well as the test accessories are calibrated at regular intervals.

8 Revision history

<i>Revision</i>	<i>Date</i>	<i>Issued by</i>	<i>Description of modifications</i>
0	2026-07-08	Patricio Montenegro, M.Sc.-Ing.	First edition

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