

TEST REPORT
FCC Part 15, Subpart C Par. 15.247
Radio frequency devices – Intentional Radiators

Applicant:	Empatica S.r.l. Via Stendhal 36 - 20144 Milano (MI – ITALY)		
Test item:	Wearable Actigraphy		
Identification / Type No.:	EMBRACEMINI		
FCC ID:	2AGGH-MINI		
Order content:	Full testing according to the following standard(s):		
Test specification:	FCC Part 15, Subpart C (par. 15.247)		
Date of receipt:	03/09/2025		
Internal storage No.:	A004083685-001 (sampled by the customer)		
Testing period:	02/10/2025		
Place of testing:	TÜV Rheinland Italia S.r.l. Via E. Mattei, 3 20005 Pogliano Milanese (MI) - IT		
Testing laboratory:	TÜV Rheinland Italia S.r.l. Via E. Mattei, 3 20005 Pogliano Milanese (MI) - IT		
Test result:	Pass		
Tested by:	Zaccaria Piazza	Authorized by:	Riccardo Pfeiffer
Date:	20/10/2025	Date:	20/10/2025
	 (Laboratory technician)		(Reviewer)
Position	Sachverständige(r)/Expert	Position	Sachverständige(r)/Expert
Other:	---		
The test results reported in this test report shall refer only to the samples tested as received. TÜV Rheinland Italia is not responsible for the sampling phase. This report may not be partially reproduced, except with the prior written permission of the issuing Laboratory TÜV Rheinland refuses any responsibility about information supplied by the customer contained in this test report (# Test sample(s), as well sample information, description, product details and intended usage was provided by customer.			

1	The equipment used during the specified testing period was calibrated according to our test laboratory calibration program. The equipment fulfils the requirements included in the relevant standards. The traceability of the test equipment used is ensured by compliance with the regulations of our management system. Detailed information regarding test conditions, equipment and measurement uncertainty is available in the test laboratory and could be provided on request.
2	As contractually agreed, this document has been signed digitally only. TUV Rheinland has not verified and unable to verify which legal or other pertaining requirements are applicable for this document. Such verification is within the responsibility of the user of this document. Upon request by its client, TUV Rheinland can confirm the validity of the digital signature by a separate document. Such request shall be addressed to our Sales department. An environmental fee for such additional service will be charged.
3	Test clauses with remark of * are subcontracted to qualified subcontractors and described under the respective test clause in the report. Deviations of testing specification(s) or customer requirements are listed in specific test clause in the report.
4	Unless otherwise agreed with the customer, a conformity assessment is always carried out based on the applied standards. At the customer's request, the statement on the conformity of the product tested in this test report is carried out according to the criteria/requirements of the applied standards. Evaluation conditions deviating from these are documented separately in the respective chapters.

0. Table of Contents

0.	Table of Contents	3
1.	General description of test item(s)	4
2.	Reference standards	5
3.	Equipment used during test.....	6
4.	Radio type identification	7
5.	Input/Output ports.....	8
6.	Operating modes	9
7.	Channel list.....	9
8.	Climatic conditions	10
9.	Modification during tests.....	11
10.	Statement of the measurement uncertainty	12
11.	Example for interpretation of measuring results	12
12.	Measurement uncertainty	13
13.	EUT configuration	14
14.	Field strenght calculation	14
15.	Change history	15
16.	Result summary section.....	16
17.	Emission Test.....	17
18.	List of test equipment.....	72

1. General description of test item(s)	
Identification / Type No.:	EMBRACEMINI
Serial number	3YMC4YY143
Manufacturer	Empatica S.r.l.
Trade Mark	
Rated voltage / frequency	Battery equipment 5Vdc
Rated current / power	Battery equipment 3A max
Equipment type	☐ Single-modular transmitter ☐ Limited single-modular transmitter ☐ Split-modular transmitter ☐ Limited split-modular transmitter
Number of phases	N/A
Hardware version	Not provided by the customer
Software version	Not provided by the customer
Dimensions	43 x 14 x 22 mm
Weight	15 g
Other	---
Test sample obtaining:	☒ Sampling by customer ☐ Sampling by TÜV Rheinland Group ☐ others:

2. Reference standards

Reference document		
47 CFR Part 15	Last edition	Radio Frequency Device
Title 47 Part 15 Subpart C § 15.203	Last edition	Radio frequency devices – Intentional Radiators Antenna requirement
Title 47 Part 15 Subpart C § 15.205	Last edition	Radio frequency devices – Intentional Radiators Restricted bands of operation
Title 47 Part 15 Subpart C § 15.207	Last edition	Radio frequency devices – Intentional Radiators Conducted Limits
Title 47 Part 15 Subpart C § 15.209	Last edition	Radio frequency devices – Intentional Radiators Radiated Emissions Limits
Title 47 Part 15 Subpart C § 15.247	Last edition	Operation within the bands 902 - 928 MHz, 2400 - 2483.5 MHz, and 5725 - 5850 MHz.
ANSI C63.4	2014	Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
ANSI C63.10	2020	American National Standard for Testing Unlicensed Wireless Devices
558074 D01 DTS Meas Guidance	v05r02 - April 02,2019	Guidance for performing compliance measurements on digital transmission systems (DTS) operating under §15.247

Note: The following referenced documents are indispensable for the application of this document.
For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

3. Equipment used during test

Equipment under test

No.	Product type	Manufacturer	Model	Comments
1	Wearable Actigraphy	Empatica S.r.l.	EMBRACEMINI	—

Auxiliary Equipment / Peripherals

No.	Product type	Manufacturer	Model	Comments
1	—	—	—	—

4. Radio type identification												
Brand name and model of radio module	Renesas Electronics model DA1469x											
Antenna model and Gain	Sheet Antenna designed by Empatica Antenna Maximum Gain: <table border="1" data-bbox="571 611 1469 674"> <tr> <td>Frequency (MHz)</td> <td>2402</td> <td>2440</td> <td>2480</td> </tr> <tr> <td>Gain (dBi)</td> <td>-13.34</td> <td>-12.35</td> <td>-13.87</td> </tr> </table>				Frequency (MHz)	2402	2440	2480	Gain (dBi)	-13.34	-12.35	-13.87
Frequency (MHz)	2402	2440	2480									
Gain (dBi)	-13.34	-12.35	-13.87									
Antenna type	☐ External antenna ☐ Dedicated antenna ☒ Integral antenna											
Type of equipment	☐ stand-alone equipment ☒ combined equipment ☐ multi-radio equipment											
Modulation	GFSK											
Maximum set power	0dBm											
Type of technology	BLE											
Nominal voltage of stand-alone or combined equipment	3.0Vdc											
Operatig frequency range	2402MHz to 2480MHz											
Nominal channel bandwidth	2MHz											
Type of wideband data transmission equipment	DTS											
Number of channels	40											
Transmit operating mode	☒ single antenna ☐ multiple antennas, no beamforming ☐ multiple antennas, with beamforming											

5. Input/Output ports

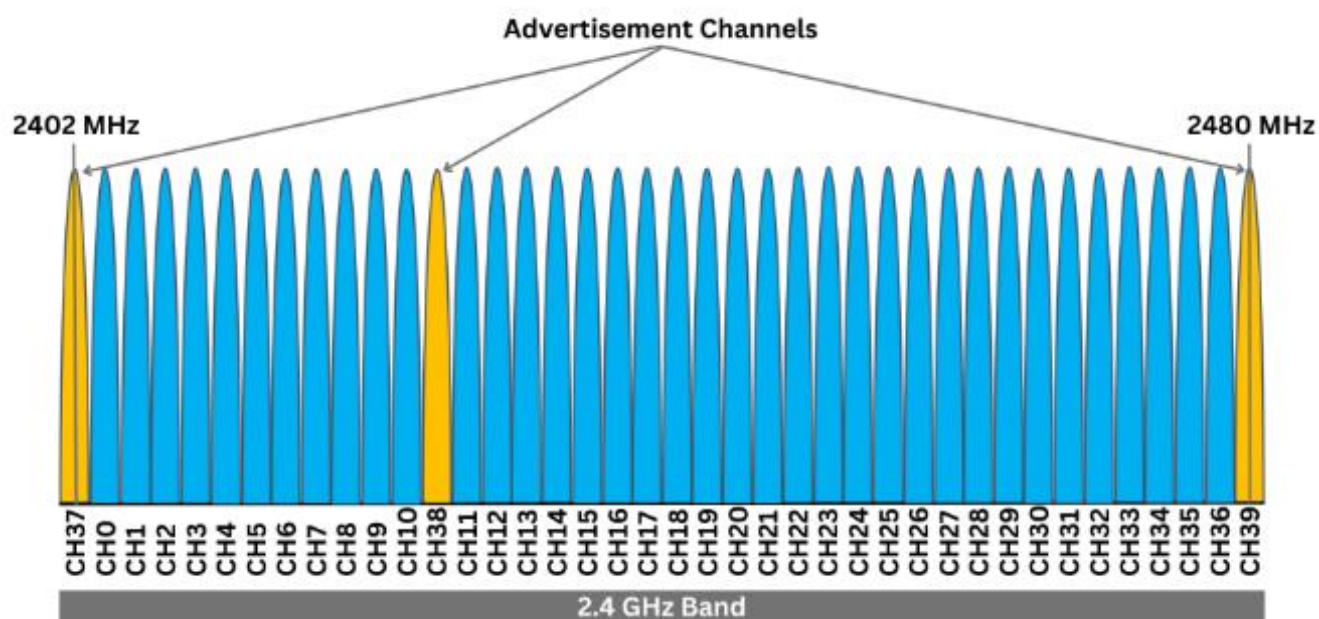
Nr.	Name	Type	Cable length	Cable shielded	Comments
1	Enclosure port	Both conductive and non-conductive	—	—	—
2	AC power port	—	—	—	—
3	DC power port	Charging	—	—	3Vdc
4	Signal/control port	—	—	—	—
5	Wired Network port	—	—	—	—
6	Antenna port	Dedicated	—	—	—

6. Operating modes

No. Description

- 1 EUT transmitting continuously at channels 0; 19; 39 unmodulated (1Mbps)
- 2 EUT transmitting continuously at channels 0; 19; 39 modulated (GFSK; 1Mbps)

7. Channel list



8. Climatic conditions

Ambient Temperature 10 - 40 °C

Relative Humidity 10 - 90 %

Air pressure Not specified

According to ANSI C63.4

Ambient Temperature Humidity Sensor (used to control climatic conditions)	Type: 6152C (ID: 2782344; manufacturer: Davis Instruments) • Semi-Anechoic Chamber FACT 3	Calibration due date 01/2026
	Type: T3511 (ID: 2782075; manufacturer: Comet system) • Semi-Anechoic Chamber SAC 5	Calibration due date 01/2026
	Type: T3511 (ID: 2782070; manufacturer: Comet system) • Transitory phenomena area	Calibration due date 01/2026
	Type: T3511 (ID: 2781962; manufacturer: Comet system) • ESD room	Calibration due date 01/2026

9. Modification during tests

- ☒ No modifications done during testing
- ☐ Modifications done during testing (see details below)

No.	Description of modification	Date of modification
1	---	---
Supplementary information: ---		

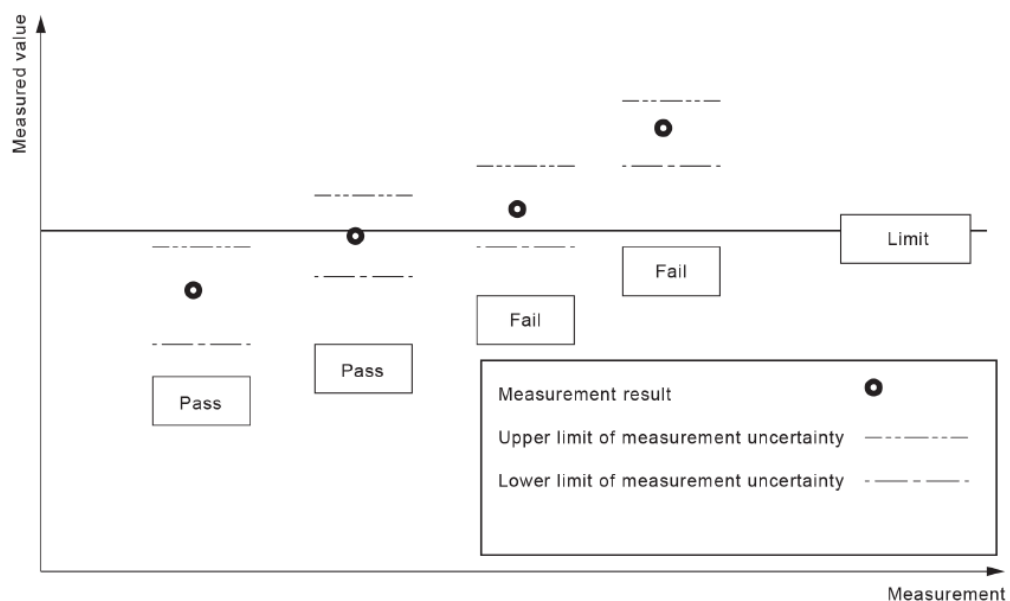
10. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16-4 "Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements" and is documented in the quality system acc. to ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation.

The manufacturer has the sole responsibility of continued compliance of the device.

11. Example for interpretation of measuring results

The decision rule for statements of conformity in this test report is based on the "Zero Guard Band Rule" and "Simple Acceptance" in accordance to and ILAC-G8:09/2019 and IEC Guide 115:2023, unless otherwise specified in the applied standard mentioned on Page 1 of this report or requested by the customer. This means that measurement uncertainty is not taken in account and hence also not declared in the test report."



Decision Rule

Statements of conformity (PASS or FAIL) to specifications are made in this report without taking measurement uncertainty into account.

Where statements of conformity are made in this report, the following decision rules are applied:

Test result complies with test specification.	P	= passed
Test result does not comply with test specification.	F	= failed
Requirement not applicable	N/A	= not applicable
Requirement not tested	N/T	= not tested

12. Measurement uncertainty

Test Method	Uncertainty (95%)	Coverage factor k
RF Conducted continuous emissions - range (150 kHz - 30MHz)	3.3 dB	2.0
RF Radiated emissions – range (30 – 1000) MHz	4.9 dB	2.0
RF Radiated emissions – range (1 – 8) GHz	5.1 dB	2.0
RF Radiated emissions – range (8 – 40) GHz	5.4 dB	2.0
Carrier Power (conducted) (1 – 8) GHz	1.5 dB	2.0
Occupied Bandwidth (OBW) (conducted)	514.4 x 1.00 ⁻⁹	2.0
Power Spectral Density (PSD) (conducted)	1.5 dB	2.0
Transmitter unwanted emissions (conducted) range (0 – 1) GHz	0.92 dB	2.0
Transmitter unwanted emissions (conducted) range (1 – 8) GHz	1.5 dB	2.0
Transmitter unwanted emissions (conducted) range (8 – 40) GHz	2.4 dB	2.0
Measurement of Normalised Site Attenuation and VSWR	6.0 dB	2.0

13. EUT configuration

The test setup was made in accordance with mentioned FF standards.

Measurements and tests were executed under "worst case" conditions. Typical EUT arrangements or operating modes were chosen or assumed which let suspect maximum emission or susceptibility (a so called "unfavourable configuration").

Details of test setup or adjustments are (particularly) shown inside the photo documentation.
As far as not mentioned otherwise these statements are valid for all following tests.

14. Field strenght calculation

The field strength is calculated by subtracting the Amplifier Gain and adding the Cable Loss and Antenna Correction Factor to the measured reading. The basic equation is as follows:

$$\text{Field Strength (dB}\mu\text{V/m)} = \text{RAW} - \text{AMP} + \text{CBL} + \text{ACF}$$

Where: RAW = Measured level before correction (dBμV)

AMP = Amplifier Gain (dB)

CBL = Cable Loss (dB)

ACF = Antenna Correction Factor (dB/m)

$$\mu\text{V/m} = 10^{\frac{\text{dB}\mu\text{V/m}}{20}}$$

Sample radiated emissions calculation @ 30 MHz

Measurement +Antenna Factor–Amplifier Gain+Cable loss=Radiated Emissions (dBuV/m)

$$25 \text{ dBuV/m} + 17.5 \text{ dB} - 20 \text{ dB} + 1.0 \text{ dB} = 23.5 \text{ dBuV/m}$$

15. Change history

Test report number	List of revisions	Date
IT25BAIT 001	First edition	21/10/2025

16. Result summary section

Clause	Requirement – Test case	Port	Operating condition	Result
§15.205; §15.209; §15.247	Radiated emission 9KHz to 10th harmonic of RF module fundamental frequency	Enclosure	#1	P
§15.207	Conducted emission	AC mains power	#1	P
§15.203	Antenna requirement	Enclosure	N/A	P
§15.247 (b)	RF power output (conducted)	Enclosure	#1	P
§15.247 (a)	6 dB Bandwidth	Enclosure	#2	P
§15.247 (a)	20 dB maximum Bandwidth	Enclosure		N/A
§15.247 (e)	Power Spectral Density	Enclosure	#2	P
§15.247 (d)	Out-of-band emissions	Enclosure	#2	P
§15.247 (d)	100 kHz Bandwidth of Frequency Band Edges	Enclosure	#2	P
§15.247 (a)	Carrier frequency (Hopping Channel) Separation	Enclosure	---	N/A
§15.247 (a)	Number of Hopping Channels Used	Enclosure	---	N/A
§15.247 (a)	Time occupancy (Dwell Time) of Each Ch. within a 0,4 x N.ch (sec) Period	Enclosure	---	N/A
§15.215	Additional provisions to the general radiated emission limitations	Enclosure	#2	P

Note: Test performed on the enclosure of the EUT instead of the antenna connector according to customer request.

17. Emission Test	
Conducted emission test	
Test date	02/10/2025
Applied Standard	Title 47 Part 15 Subpart C §15.207
Test method	Par. 6.2 Conducted emission measurements of ANSI C63.10)
Temperature	23,5° C
Humidity	44%
Voltage/Frequency used during the test	120V ~ 60Hz
Tested by	Zaccaria Piazza
Model	EMBRACEMINI
Internal Storage No.	A004083685-001
Operating mode	1
Tested terminals	AC Mains input port
Remarks	Test performed on the AC port of an auxiliary device not supplied by the manufacturer

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

Frequency of Emission (MHz)	Conducted Limit (dB μ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

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 provision for, the use of battery chargers which permit operating while charging, AC adaptors or battery eliminators or that connect to the AC power lines indirectly, obtaining their power through another device which is connected to the AC power lines, shall be tested to demonstrate compliance with the conducted limits.

Test parameter
EMI Auto Test Template: Emi cond lisen ENV 216 - 150kHz-30MHz

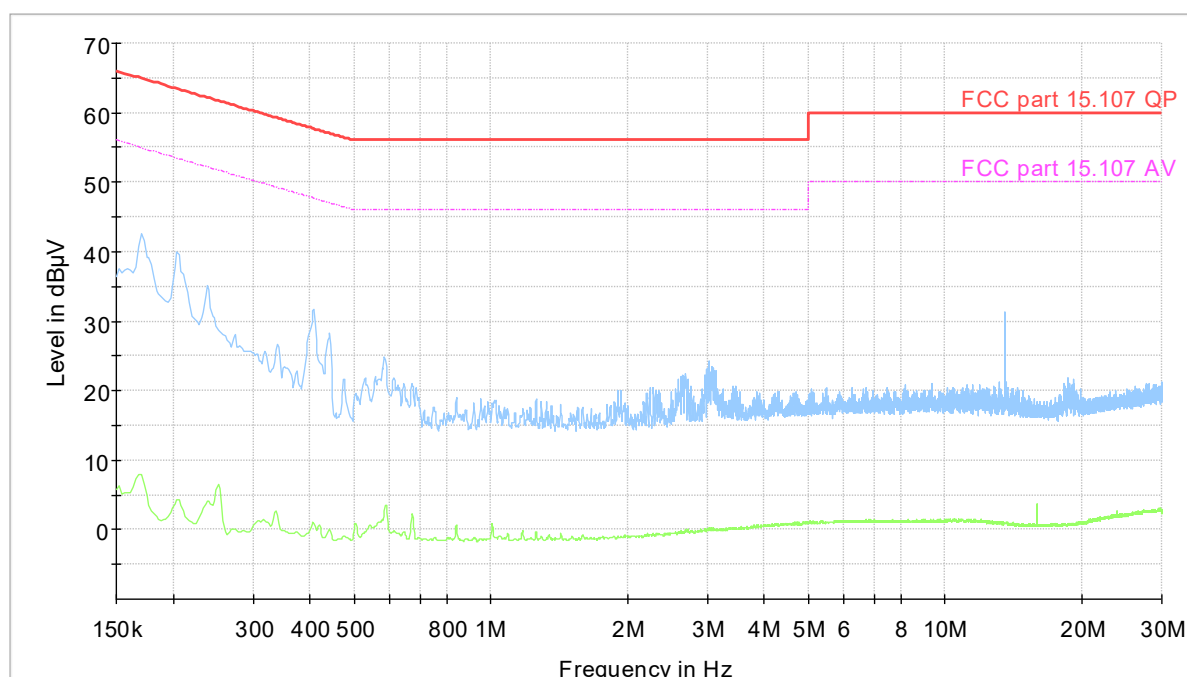
Hardware Setup: Emissione condotta LISN ENV216
Measurement Type: 2 Line LISN
Frequency Range: 150 kHz - 30 MHz
Graphics Level Range: 0 dB μ V - 90 dB μ V

Preview Measurements:
LISN Lines: L1
Scan Test Template: Emissione condotta Lisen ENV 216

Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
Receiver: [ESR 3] 150 kHz - 30 MHz	2.25 kHz	PK+ ; CAV	9 kHz	0,1 s	0 dB

Graphical presentation of
Neutral Line Noise Level (without EUT)

Full Spectrum

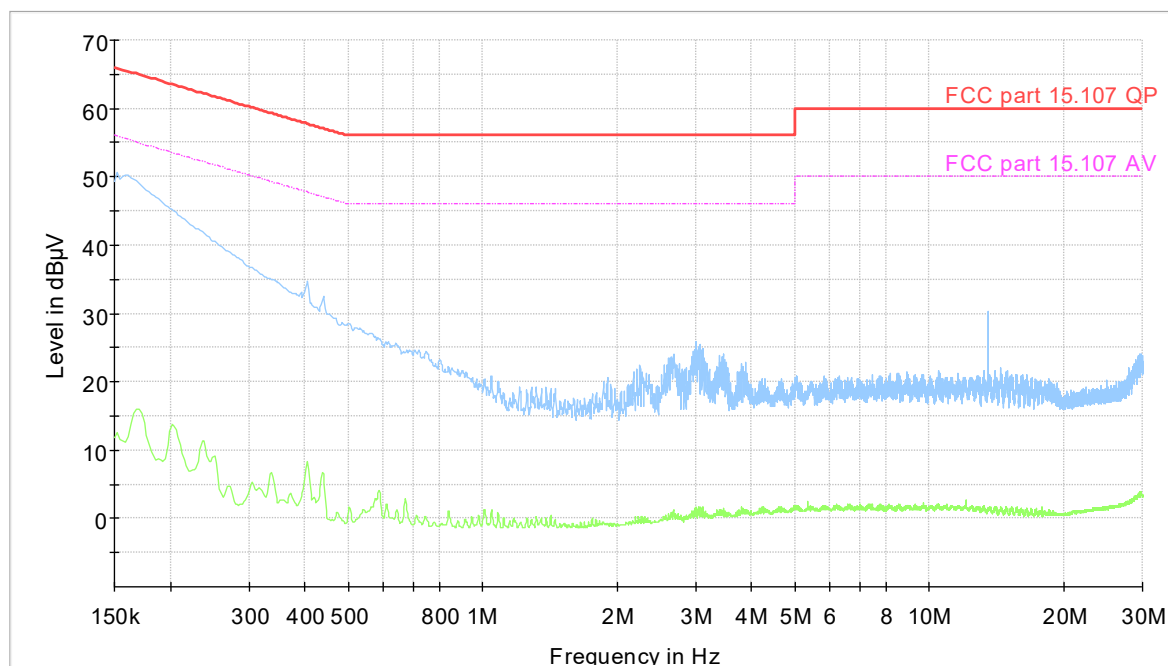


— Preview Result 2-CAV	— Preview Result 1-PK+
— FCC part 15.107 QP	— FCC part 15.107 AV

Graphical presentation of

Phase Line

Full Spectrum

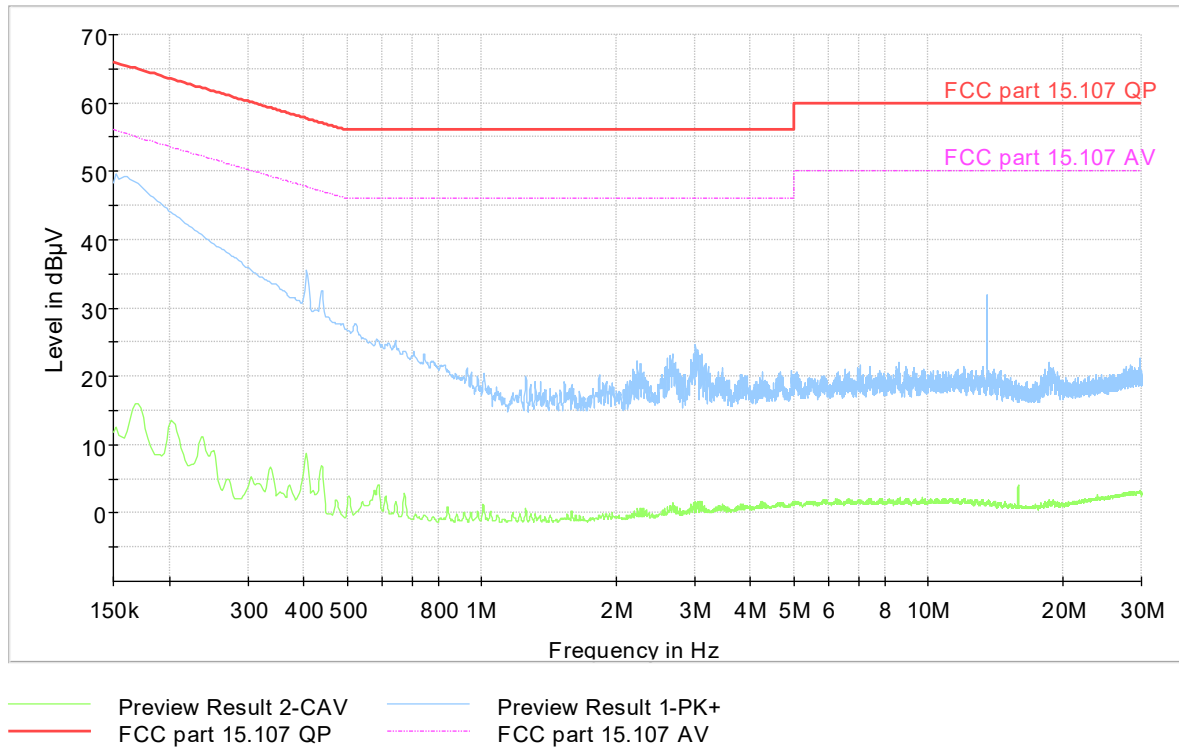


— Preview Result 2-CAV — Preview Result 1-PK+
— FCC part 15.107 QP — FCC part 15.107 AV

Graphical presentation of

Neutral Line

Full Spectrum



Radiated emission test	
Test date	02/10/2025
Applied Standard	Title 47 Part 15 Subpart C §15.205; §15.209; §15.247
Test method	Par. 8.6 of KDB 558074 D01 15.247 Meas Guidance v05r02 (and par. 11.12.1 Radiated emission measurements of ANSI C63.10)
Temperature	23,5° C
Humidity	44%
Voltage/Frequency used during the test	Battery powered
Tested by	Zaccaria Piazza
Model	EMBRACEMINI
Internal Storage No.	A004083685-001
Operating mode	1
Tested terminals	Enclosure
Remarks	Frequency range investigated: 9kHz to 10 th harmonic of RF module.

Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table :

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100**	3
88-216	150**	3
216-960	200**	3
Above 960	500	3

**Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§15.231 and 15.241.

Remark: In accordance with part 15.31 (f) (2), where the measurement distance was specified to be 30 or 300 meters, a correction factor was applied in order to permit measurement to be performed at a separation distance. The applied formula for limits at 3 meter is:

Limit 3m(dBμV/m)=Limit 300m(dBμV/m)+40Log(300m/3m) (Below 30MHz)

Limit 3m(dBμV/m)=Limit 300m(dBμV/m)+40Log(30m/3m) (Below 30MHz)

Test parameter of
Range 9kHz-30MHz
**EMI Auto Test Template: Electric Field Strength with Scans 9kHz-30MHz
HFH2-Z2E - Normal mode**

Hardware Setup: Electric Field Strength 9kHz-30MHz - HFH2-Z2E
Measurement Type: Open-Area-Test-Site (SAC/FAR)
Frequency Range: 9 kHz - 30 MHz
Graphics Level Range: -20 dB μ V/m - 90 dB μ V/m

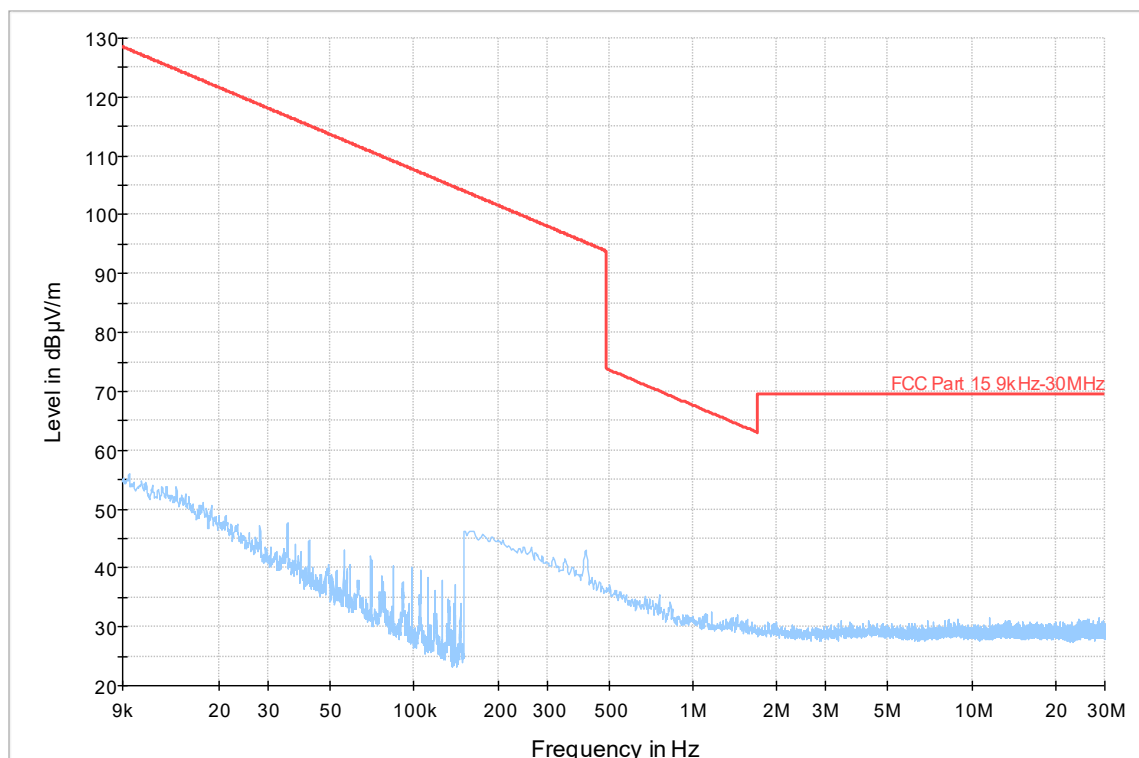
Preview Measurements:
Antenna height: 100 - 200 cm , Step Size = 50 cm , Positioning Speed = 1
Polarization: V
Turntable position: 0 - 270 deg , Step Size = 90 deg , Positioning Speed = 3
Scan Test Template: Electric Field Strength 9kHz-30MHz active Antenna Loop

Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
Receiver: [ESW 44]					
9 kHz - 150 kHz	50 Hz	PK+	200 Hz	0.1 s	0 dB
150 kHz - 30 MHz	2.25 kHz	PK+	9 kHz	0.1 s	0 dB

Graphical presentation of
Range 9kHz-30MHz

Antenna axis: X (worst case axis) Measurement distance: 3m. Channel: 0 Data Rate: 1Mbps

Full Spectrum



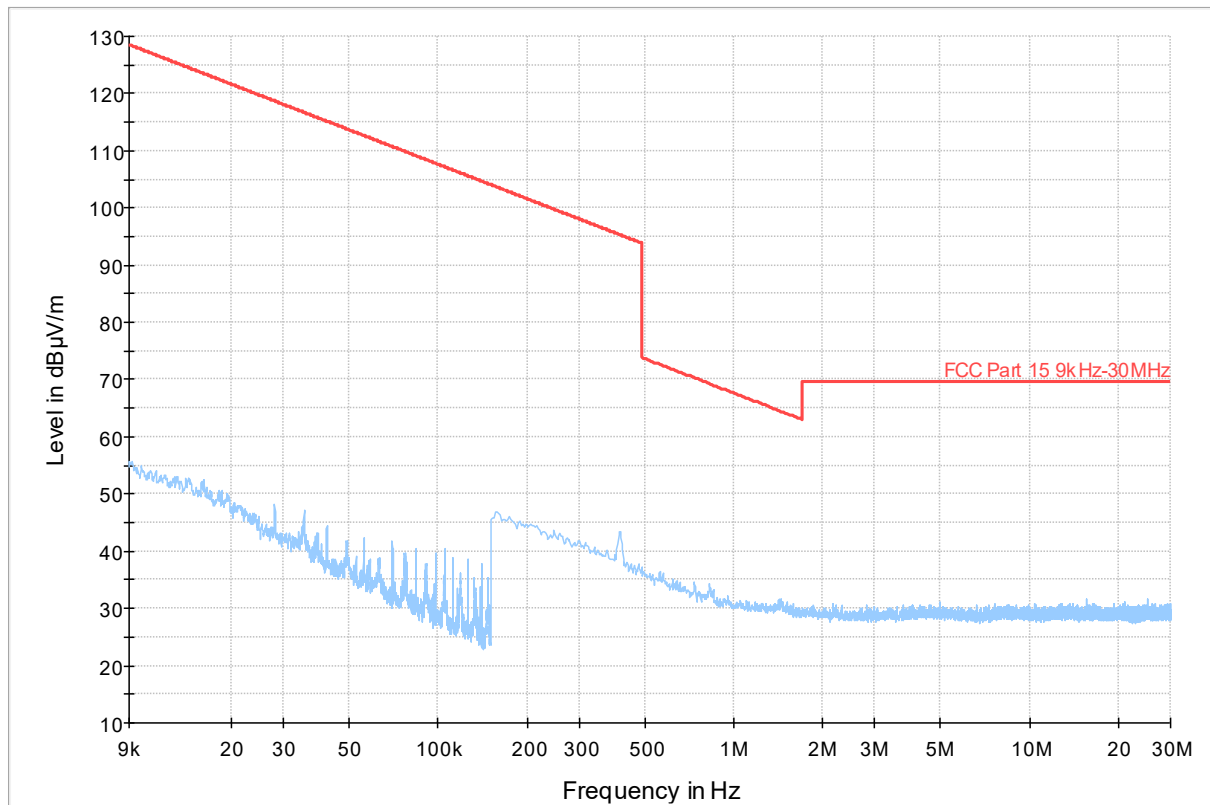
Preview Result 1-PK+ FCC Part 15 9kHz-30MHz

Graphical presentation of

Range 9kHz-30MHz

Antenna axis: X (worst case axis) Measurement distance: 3m. Channel: 19 Data Rate: 1Mbps

Full Spectrum



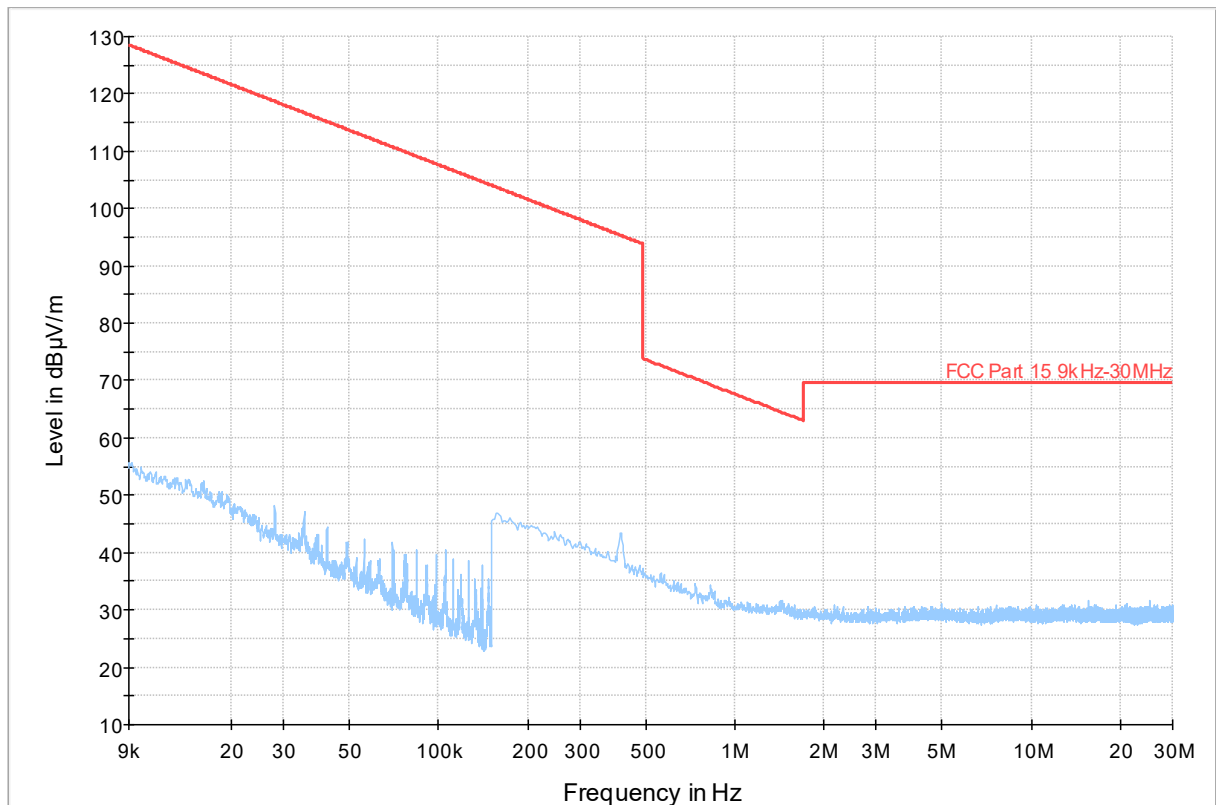
— Preview Result 1-PK+ — FCC Part 15 9kHz-30MHz

Graphical presentation of

Range 9kHz-30MHz

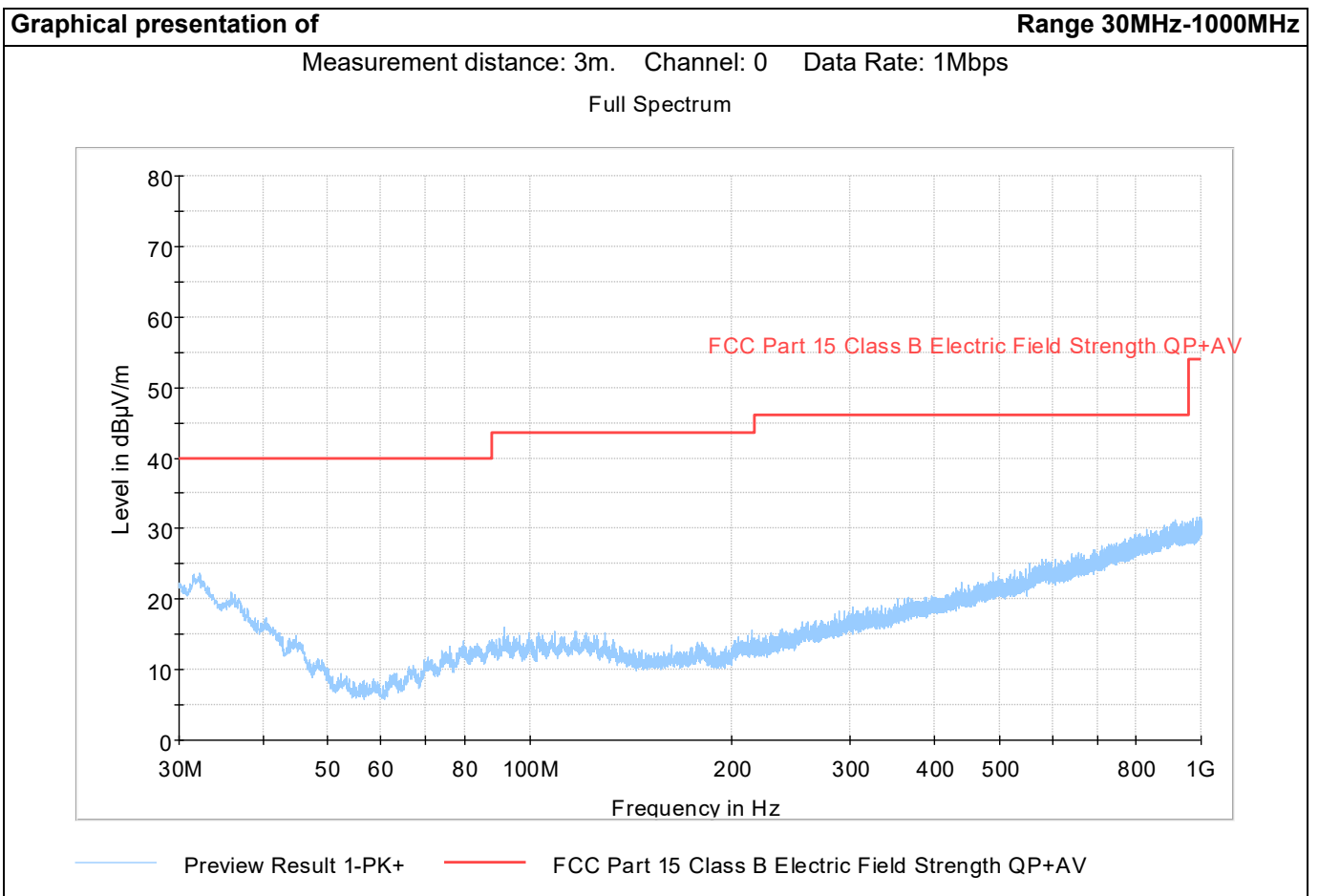
Antenna axis: X (worst case axis) Measurement distance: 3m. Channel: 39 Data Rate: 1Mbps

Full Spectrum



— Preview Result 1-PK+ — FCC Part 15 9kHz-30MHz

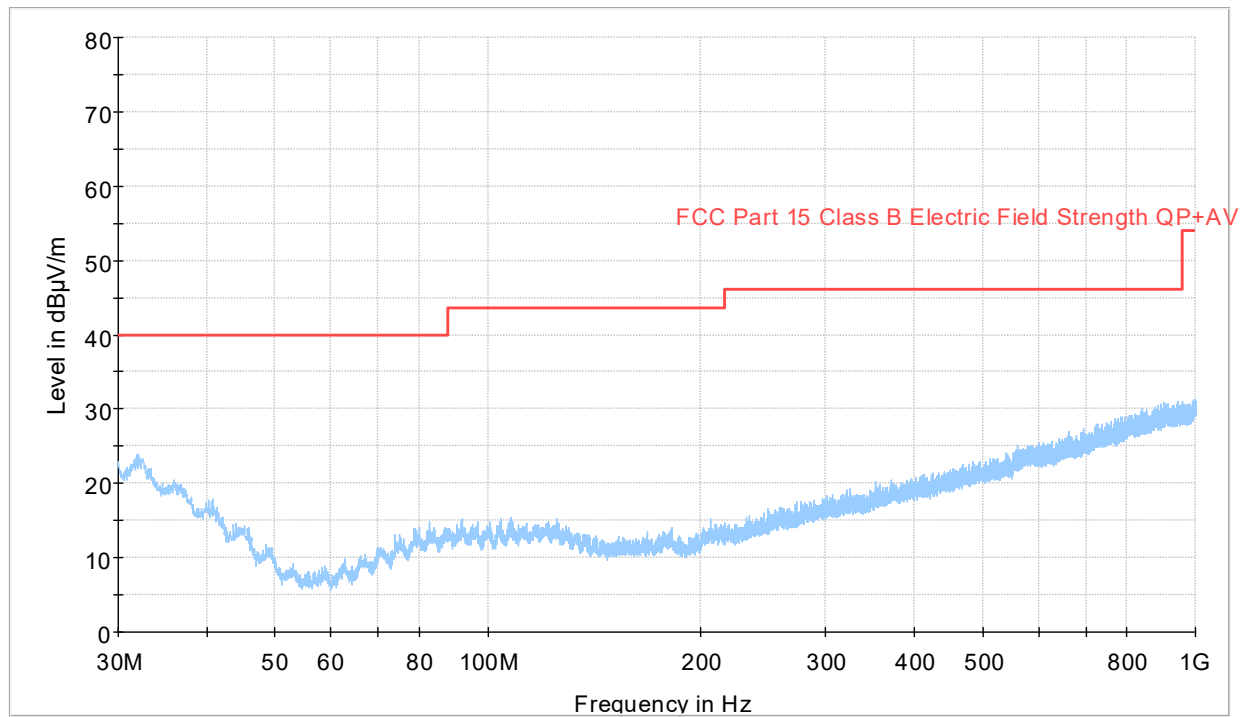
Test parameter of		Range 30MHz-1000MHz				
EMI Auto Test Template: Emi rad 30-1000MHz Antenna HL562E 3meter distance						
Hardware Setup:		Emissione irradiata 30-1000MHz HL562E 3metri				
Measurement Type:		Open-Area-Test-Site (SAC/FAR)				
Frequency Range:		30 MHz - 1 GHz				
Graphics Level Range:		0 dBµV/m - 80 dBµV/m				
Preview Measurements:						
Antenna height:		100 - 400 cm , Step Size = 100 cm , Positioning Speed = 3				
Polarization:		H + V				
Turntable position:		0 - 270 deg , Step Size = 90 deg , Positioning Speed = 3				
Scan Test Template:		Emissione irradiata 30-1000MHz HL562E 3metri				
Subrange		Step Size	Detectors	IF BW	Meas. Time	Preamp
Receiver: [ESR 3]						
30 MHz - 1 GHz		30 kHz	PK+	120 kHz	0,1 s	20 dB



Graphical presentation of **Range 30MHz-1000MHz**

Measurement distance: 3m. Channel: 19 Data Rate: 1Mbps

Full Spectrum



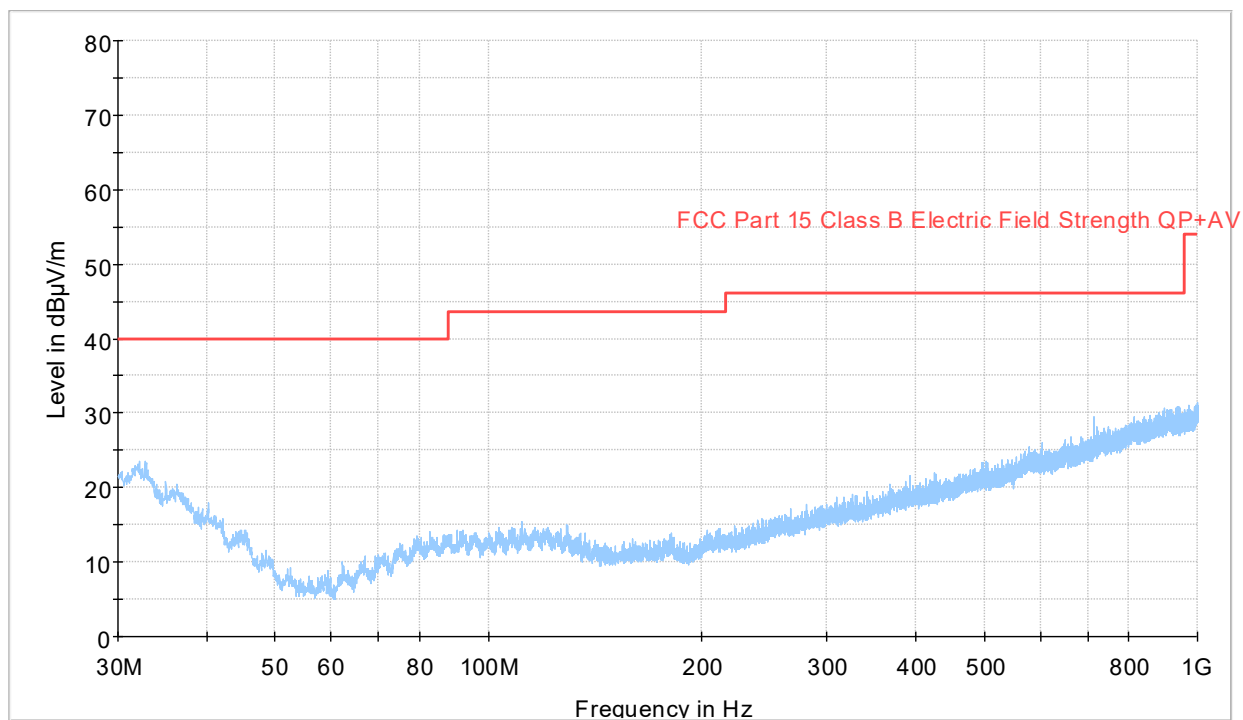
— Preview Result 1-PK+ — FCC Part 15 Class B Electric Field Strength QP+AV

Graphical presentation of

Range 30MHz-1000MHz

Measurement distance: 3m. Channel: 39 Data Rate: 1Mbps

Full Spectrum



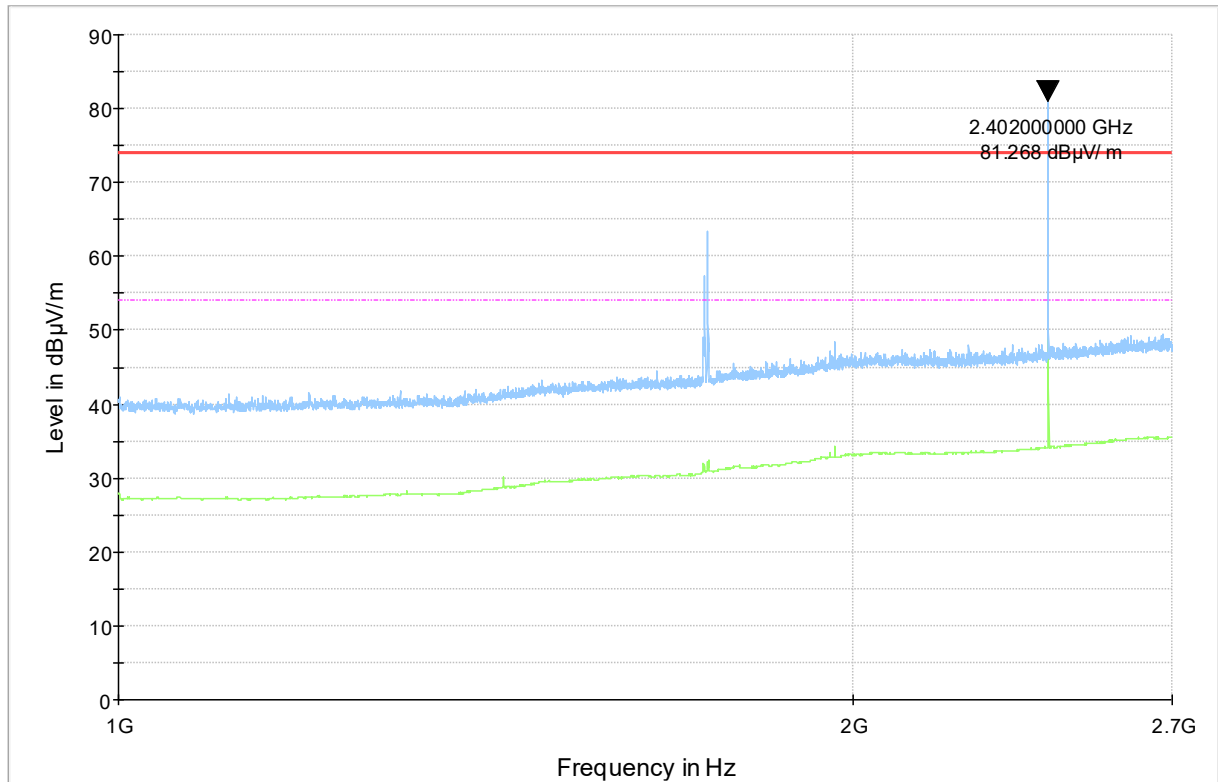
Preview Result 1-PK+ FCC Part 15 Class B Electric Field Strength QP+AV

Test parameter of			Range 1GHz-2,7GHz			
EMI Auto Test Template: Electric Field Strength with Scans 1-2.7GHz ant HF907 senza pre						
Hardware Setup:		Electric Field Strength 1-18GHz_HF907_SENZA_pre				
Measurement Type:		Open-Area-Test-Site (SAC/FAR)				
Frequency Range:		1 GHz - 2.7 GHz				
Graphics Level Range:		0 dBµV/m - 90 dBµV/m				
Preview Measurements:						
Antenna height:		100 - 400 cm , Step Size = 100 cm , Positioning Speed = 3				
Polarization:		H + V				
Turntable position:		0 - 270 deg , Step Size = 90 deg , Positioning Speed = 3				
Scan Test Template:		Electric Field Strength 1-18GHz_HF907_SENZA_pre				
Subrange		Step Size	Detectors	IF BW	Meas. Time	Preamp
Receiver: [ESW 44]						
1 GHz - 6 GHz		250 kHz	PK+; AVG	1 MHz	0.1 s	20 dB

Graphical presentation of **Range 1GHz-2,7GHz**

Measurement distance: 3m. Channel: 0 Data Rate: 1Mbps

Full Spectrum



— Preview Result 2-AVG — Preview Result 1-PK+
— FCC Part 15 Class B 1-40GHz 3 m PK — FCC Part 15 Class B 1-40GHz 3 m AV

Measurement data of

FUNDAMENTAL LEVEL (PK)				
Frequency	Reading value	Antenna Factor	Cable Loss	Correcting reading
(MHz)	(dBµV)	(dB3/m)	(dB)	(dBµV/m)
2402	49.69	28.87	2.71	81.27

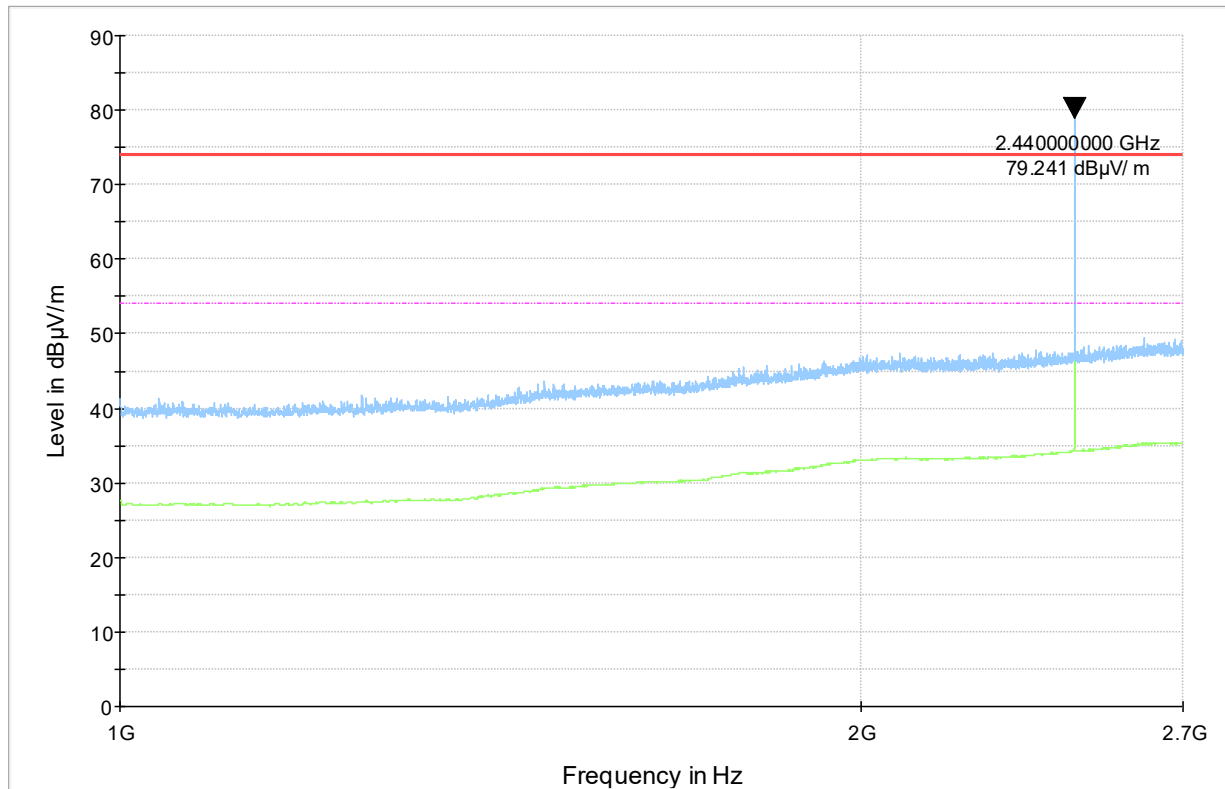
Remarks:

Correcting value = Reading value + Antenna Factor + Cable Loss

Graphical presentation of
Range 1GHz-2,7GHz

Measurement distance: 3m. Channel: 19 Data Rate: 1Mbps

Full Spectrum



— Preview Result 2-AVG — Preview Result 1-PK+
— FCC Part 15 Class B 1-40GHz 3 m PK — FCC Part 15 Class B 1-40GHz 3 m AV

Measurement data of

FUNDAMENTAL LEVEL (PK)				
Frequency	Reading value	Antenna Factor	Cable Loss	Correcting reading
(MHz)	(dBµV)	(dB3/m)	(dB)	(dBµV/m)
2440	47.66	28.87	2.71	79.24

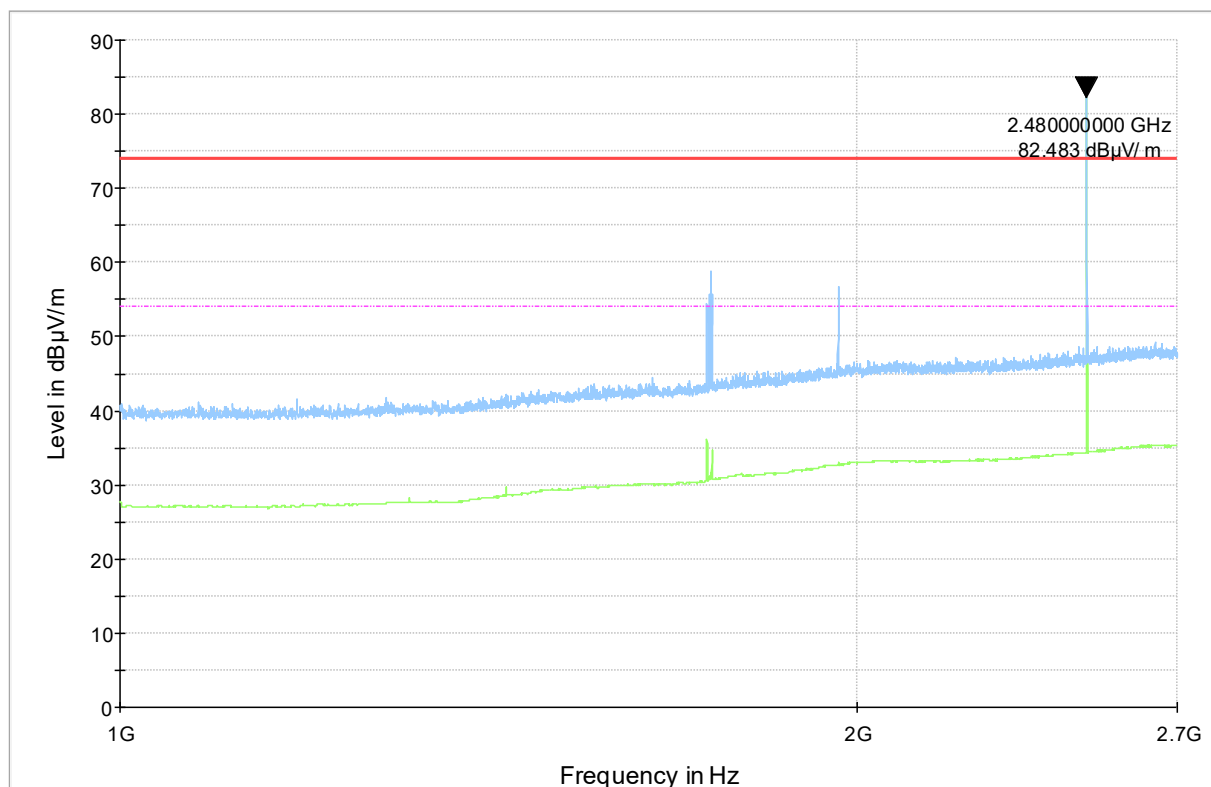
Remarks:

Correcting value = Reading value + Antenna Factor + Cable Loss

Graphical presentation of
Range 1GHz-2,7GHz

Measurement distance: 3m. Channel: 39 Data Rate: 1Mbps

Full Spectrum



— Preview Result 2-AVG — Preview Result 1-PK+
— FCC Part 15 Class B 1-40GHz 3 m PK — FCC Part 15 Class B 1-40GHz 3 m AV

Measurement data of

FUNDAMENTAL LEVEL (PK)				
Frequency	Reading value	Antenna Factor	Cable Loss	Correcting reading
(MHz)	(dBμV)	(dB3/m)	(dB)	(dBμV/m)
2480	56.18	23.59	2.71	82.48

Remarks:

Correcting value = Reading value + Antenna Factor + Cable Loss

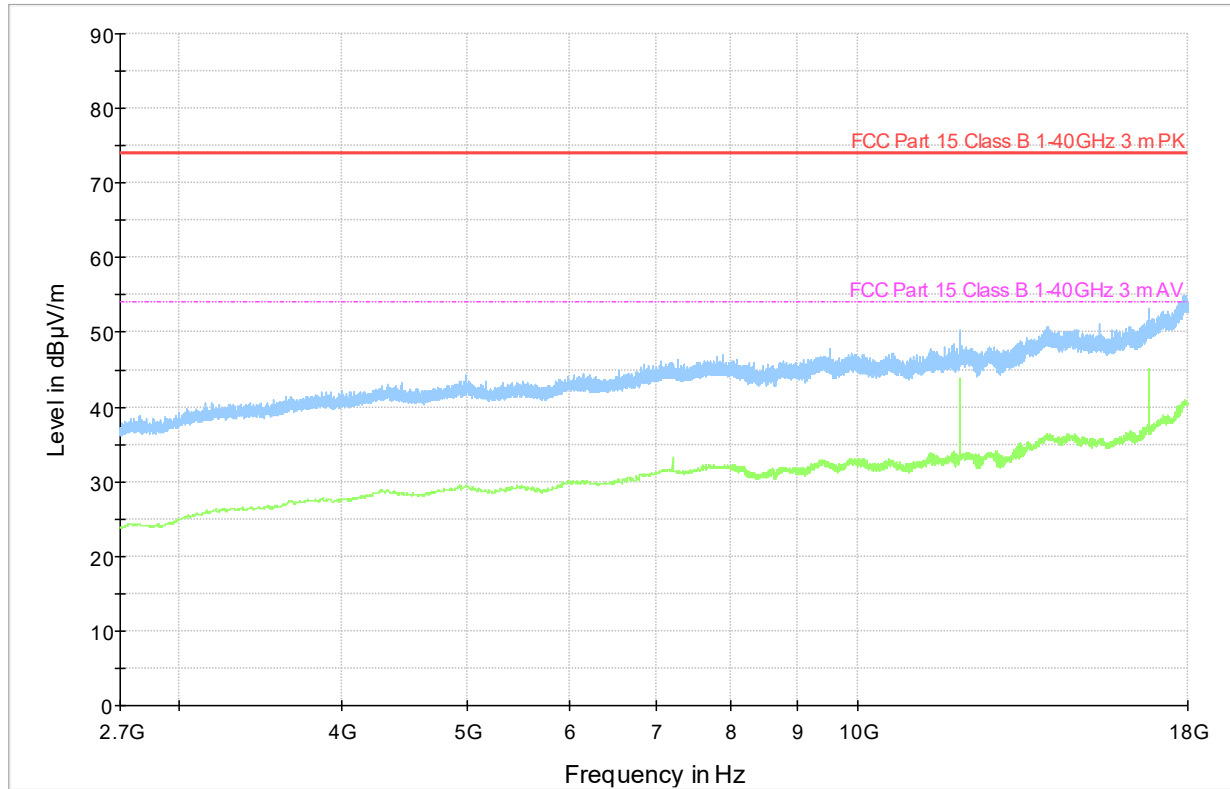
Test parameter of			Range 2,7GHz-18GHz			
EMI Auto Test Template: Electric Field Strength with Scans 1-18GHz ant HF907 con pre FCC						
Hardware Setup:		Electric Field Strength 1-18GHz_HF907_pre				
Measurement Type:		Open-Area-Test-Site (SAC/FAR)				
Frequency Range:		1 GHz - 18 GHz				
Graphics Level Range:		0 dBµV/m - 90 dBµV/m				
Preview Measurements:						
Antenna height:		100 - 400 cm , Step Size = 100 cm , Positioning Speed = 3				
Polarization:		H + V				
Turntable position:		0 - 270 deg , Step Size = 90 deg , Positioning Speed = 3				
Scan Test Template:		Electric Field Strength 1-18GHz_HF907				
Subrange		Step Size	Detectors	IF BW	Meas. Time	Preamp
Receiver: [ESW 44]						
1 GHz - 18 GHz		250 kHz	PK+ ; AVG	1 MHz	0.1 s	0 dB

Graphical presentation of

Range 2,7GHz-18GHz

Measurement distance: 3m. Channel: 0 Data Rate: 1Mbps

Full Spectrum



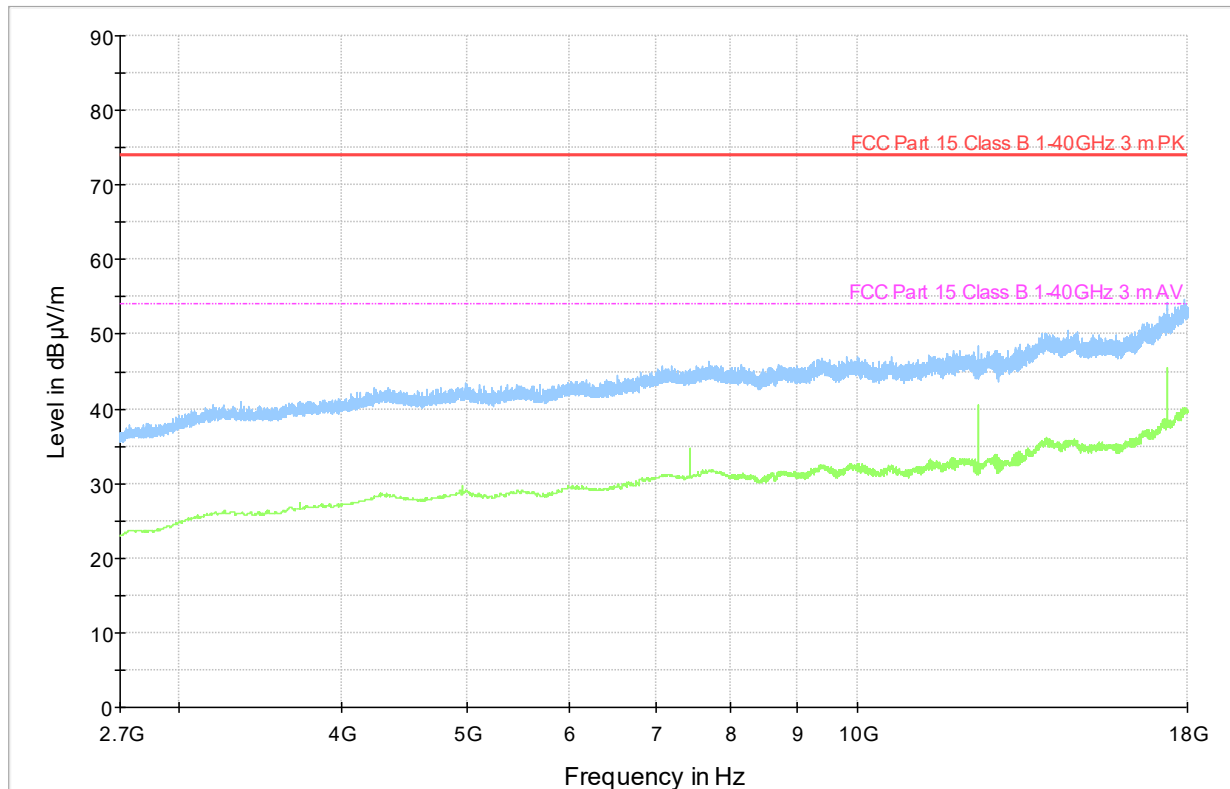
— Preview Result 2-AVG — Preview Result 1-PK+
— FCC Part 15 Class B 1-40GHz 3 m PK — FCC Part 15 Class B 1-40GHz 3 m AV

Graphical presentation of

Range 2,7GHz-18GHz

Measurement distance: 3m. Channel: 19 Data Rate: 1Mbps

Full Spectrum



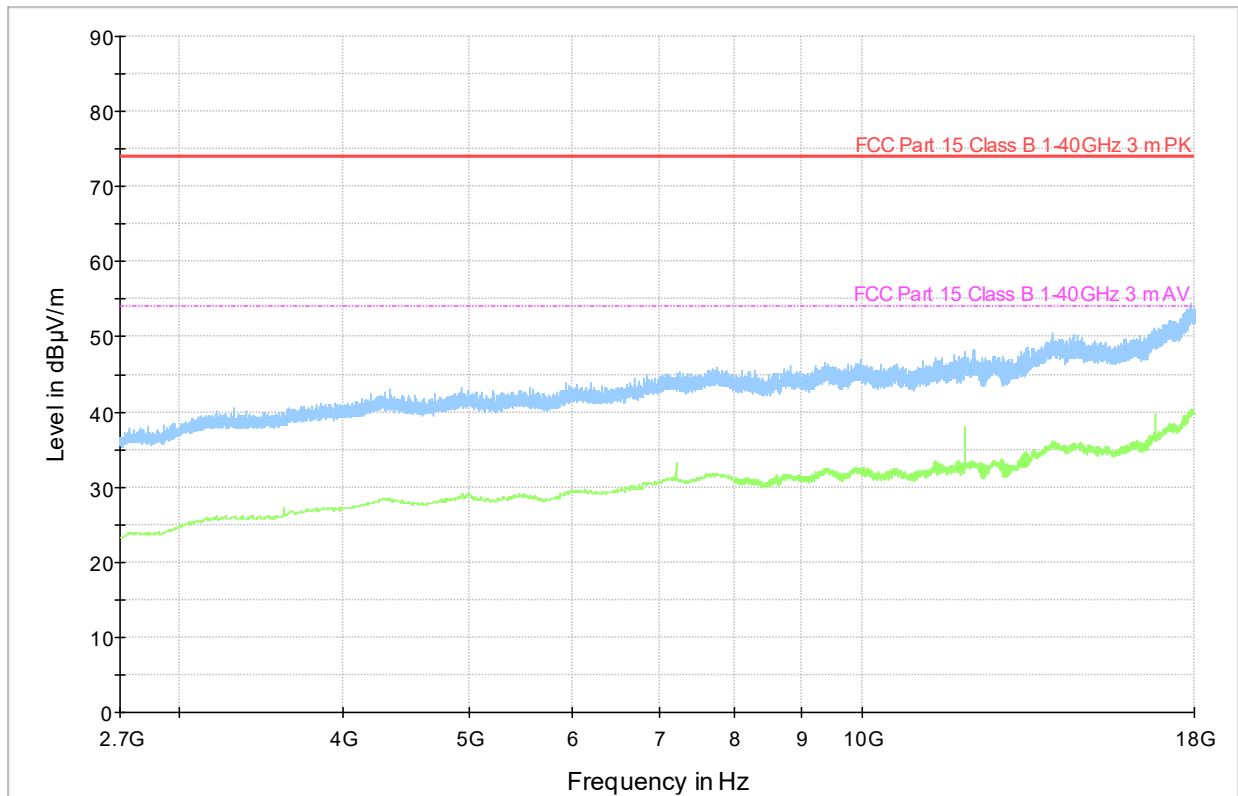
— Preview Result 2-AVG — Preview Result 1-PK+
— FCC Part 15 Class B 1-40GHz 3 m PK — FCC Part 15 Class B 1-40GHz 3 m AV

Graphical presentation of

Range 2,7GHz-18GHz

Measurement distance: 3m. Channel: 39 Data Rate: 1Mbps

Full Spectrum



— Preview Result 2-AVG — Preview Result 1-PK+
— FCC Part 15 Class B 1-40GHz 3 m PK - - - FCC Part 15 Class B 1-40GHz 3 m AV

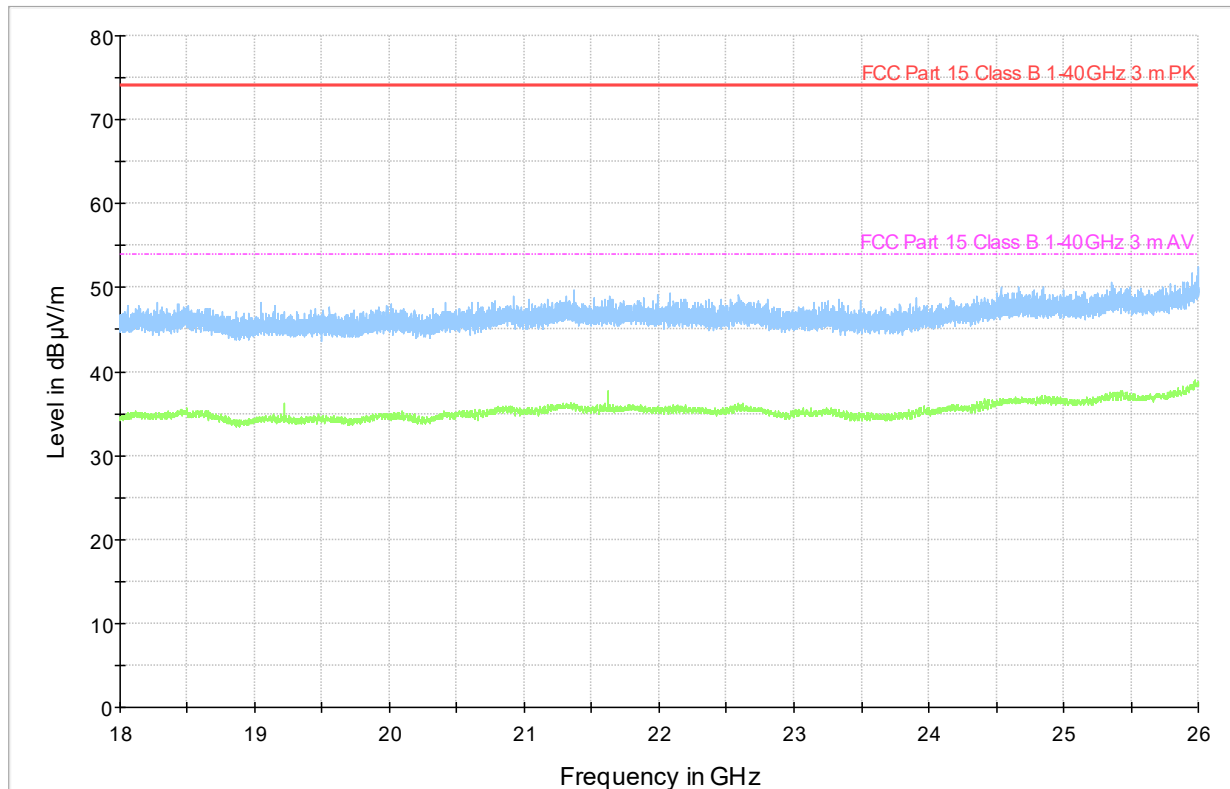
Test parameter of			Range 18GHz-26GHz			
EMI Auto Test Template: Electric Field Strength with Scans 18-26GHz FCC Antenna ETS 114514						
Hardware Setup:		Electric Field Strength 18-26GHz				
Measurement Type:		Open-Area-Test-Site (SAC/FAR)				
Frequency Range:		18 GHz - 26 GHz				
Graphics Level Range:		0 dBµV/m - 80 dBµV/m				
Preview Measurements:						
Antenna height:		150 - 150 cm , Step Size = 0 cm , Positioning Speed = 2				
Polarization:		H + V				
Turntable position:		0 - 270 deg , Step Size = 90 deg , Positioning Speed = 3				
Scan Test Template:		Electric Field Strength 18-26GHz				
Subrange		Step Size	Detectors	IF BW	Meas. Time	Preamp
Receiver: [ESW 44] 18 GHz - 26 GHz		250 kHz	PK+ ; AVG	1 MHz	0.001 s	0 dB
Adjustment:						
Antenna height:		Range = 25 cm , Measuring Speed = 2				
Turntable position:		Range = 45 deg , Measuring Speed = 3				
Template for Single Meas.:		Electric Field Strength 18-26GHz				
Final Measurements:						
Template for Single Meas.:		Electric Field Strength 18-26GHz				
Subrange		Step Size	Detectors	IF BW	Meas. Time	Preamp
Receiver: [ESW 44] 18 GHz - 26 GHz		250 kHz	PK+ ; AVG	1 MHz	0.001 s	0 dB

Graphical presentation of

Range 18GHz-26GHz

Measurement distance: 3m. Channel: 0 Data Rate: 1Mbps

Full Spectrum



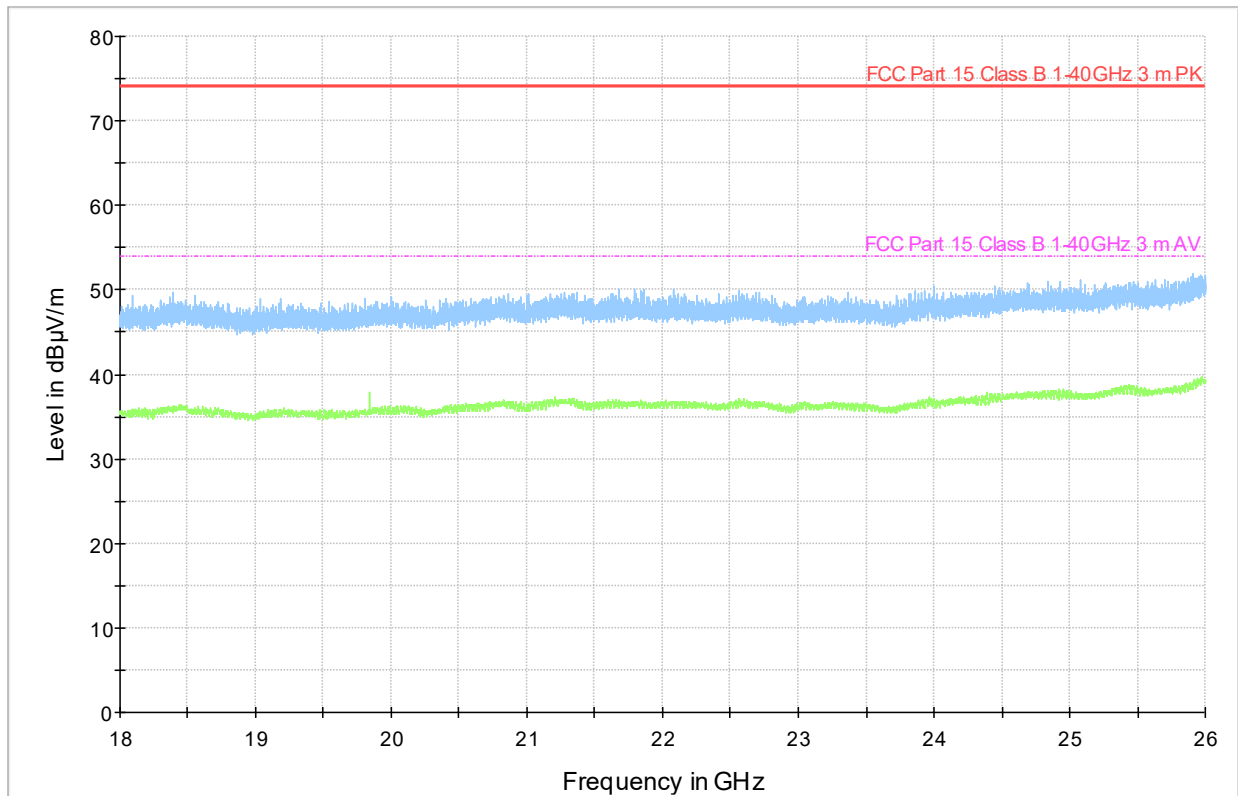
— Preview Result 2-AVG
 — Preview Result 1-PK+
 — FCC Part 15 Class B 1-40GHz 3 m PK
 — FCC Part 15 Class B 1-40GHz 3 m AV

Graphical presentation of

Range 18GHz-26GHz

Measurement distance: 3m. Channel: 19 Data Rate: 1Mbps

Full Spectrum

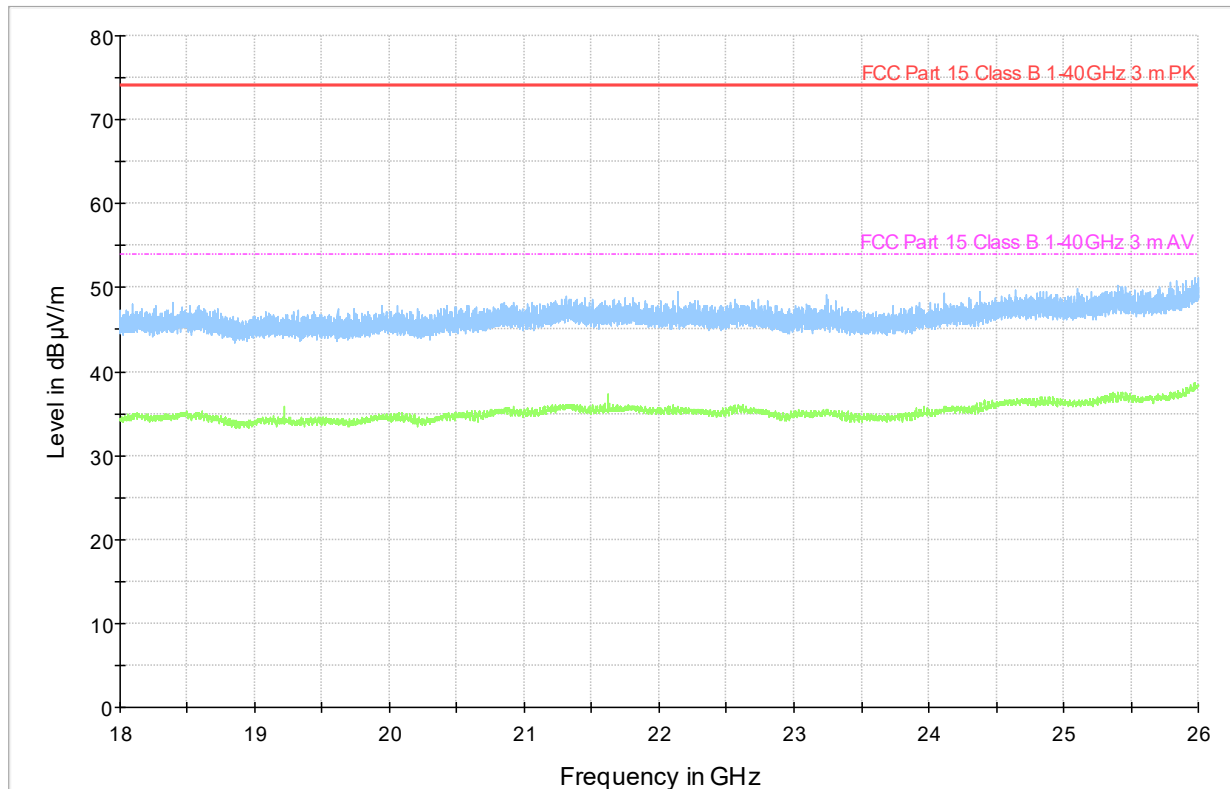


— Preview Result 2-AVG — Preview Result 1-PK+
— FCC Part 15 Class B 1-40GHz 3 m PK — FCC Part 15 Class B 1-40GHz 3 m AV

Graphical presentation of **Range 18GHz-26GHz**

Measurement distance: 3m. Channel: 39 Data Rate: 1Mbps

Full Spectrum



— Preview Result 2-AVG — Preview Result 1-PK+
— FCC Part 15 Class B 1-40GHz 3 m PK — FCC Part 15 Class B 1-40GHz 3 m AV

Antenna requirements	
Test date	02/10/2025
Applied Standard	Title 47 Part 15 Subpart C §15.203
Test method	§ 5.8 of ANSI C63.10
Temperature	23,5° C
Humidity	44%
Tested by	Zaccaria Piazza
Model	EMBRACEMINI
Internal Storage No.	A004083685-001
Operating mode	2
Tested terminals	Enclosure
Remarks	---

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded.

Antenna specifications

N° of authorized antenna types	1		
Antenna type	Integral Antenna		
Maximum total gain	Antenna Maximum Gain:		
	Frequency (MHz)	2402	2440
	Gain (dBi)	-13.34	-12.35
External power amplifiers	Not present		

RF power output, radiated (EIRP)	
Test date	02/10/2025
Applied Standard	Title 47 Part 15 Subpart C §15.247
Test method	According to Par. 8.3.2.2 of KDB 558074 D01 15.247 Meas. Guidance v05r02 (and par. 11.9.1.1 of ANSI C63.10)
Temperature	23,5° C
Humidity	44%
Voltage/Frequency used during the test	Battery powered
Tested by	Zaccaria Piazza
Model	EMBRACEMINI
Internal Storage No.	A004083685-001
Operating mode	2
Tested terminals	Enclosure
Remarks	---

(b) The maximum peak conducted output power of the intentional radiator shall not exceed the following:

(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.

(2) For frequency hopping systems operating in the 902-928 MHz band: 1 watt for systems employing at least 50 hopping channels; and, 0.25 watts for systems employing less than 50 hopping channels, but at least 25 hopping channels, as permitted under paragraph (a)(1)(i) of this section.

(3) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signalling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

(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.

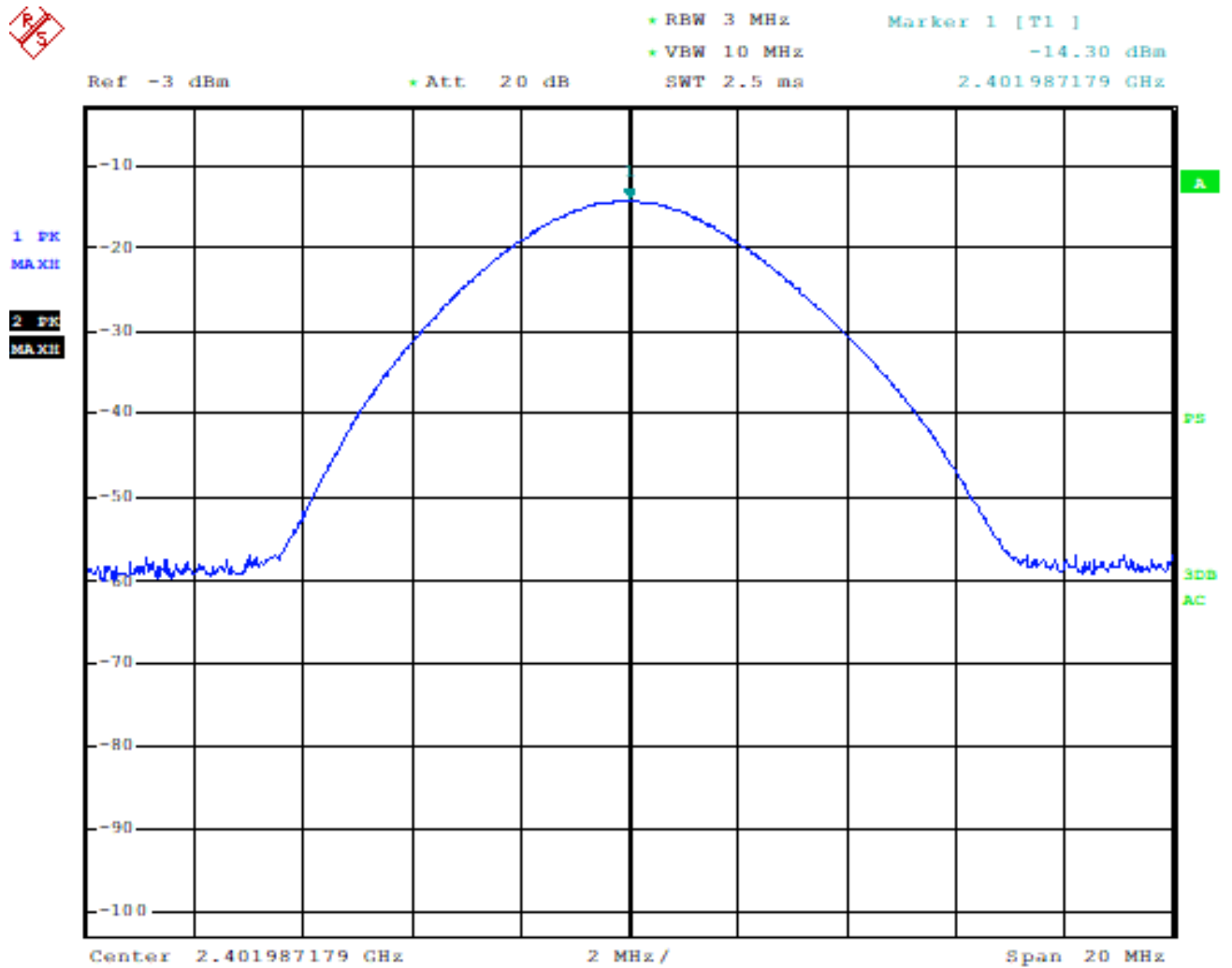
Note: since it was not possible to put in an antenna connector, test was carried out in a radiated manner
According to Par. 2.3 of KDB 412172 D01 Determining ERP and EIRP v01r01

Measurement data of RF power output, radiated measurement

Test conditions			Frequency (MHz)	Ch.	Radiated Output Power		Antenna Gain	Limits (W)		Result
Temperature	Voltage	Modulation			dBm	mW		Conducted	Radiated	
Tnom +25°C	Battery equipment	Bluetooth Low Energy	2402	0	-14,30	0,04	-13.34	1	4	P
Tnom +25°C	Battery equipment	Bluetooth Low Energy	2440	19	-13.99	0,04	-12.35	1	4	P
Tnom +25°C	Battery equipment	Bluetooth Low Energy	2480	39	-15.04	0,03	-13.87	1	4	P

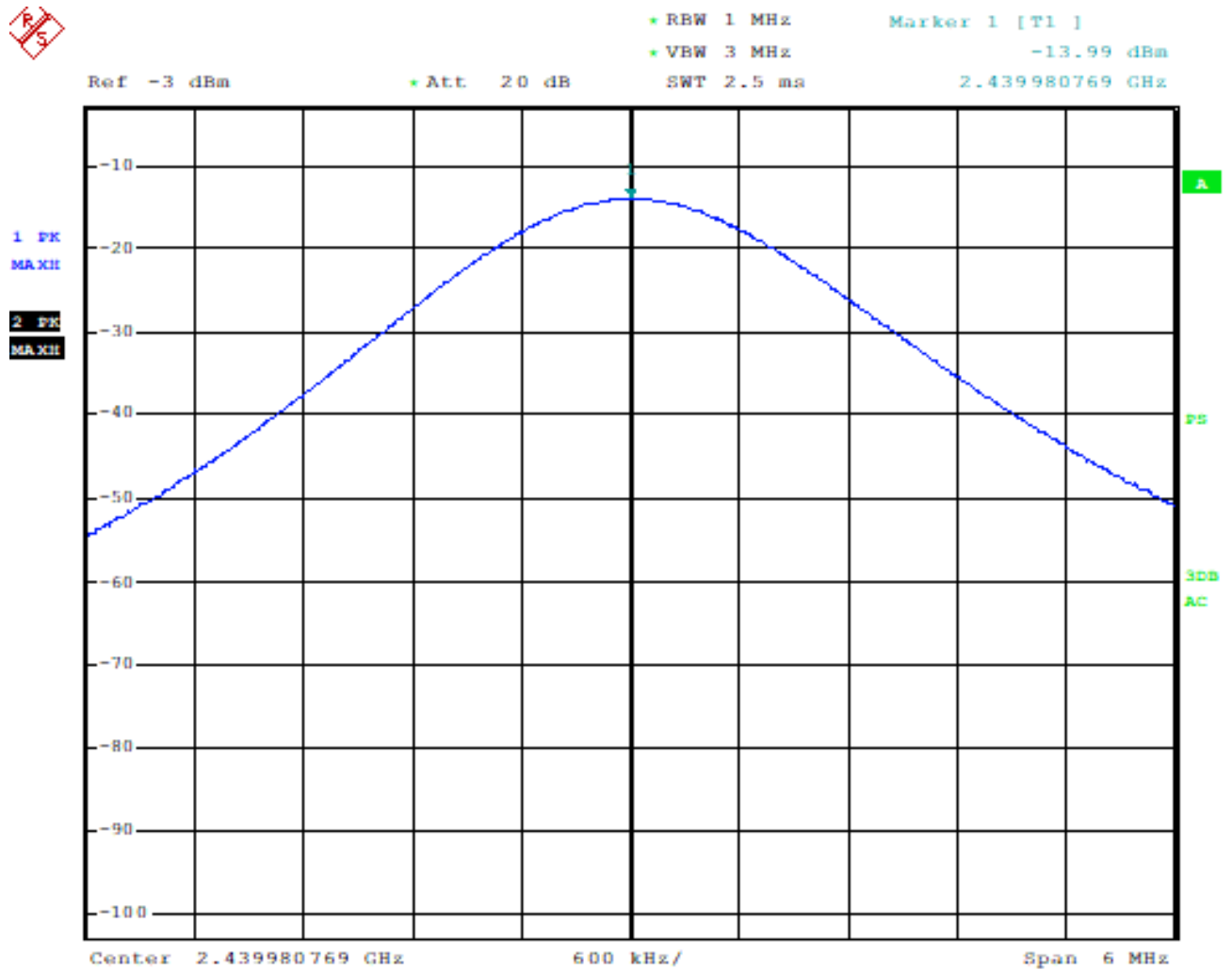
Graphical Results of RF power output, radiated measurement

Channel 0 (2402MHz)



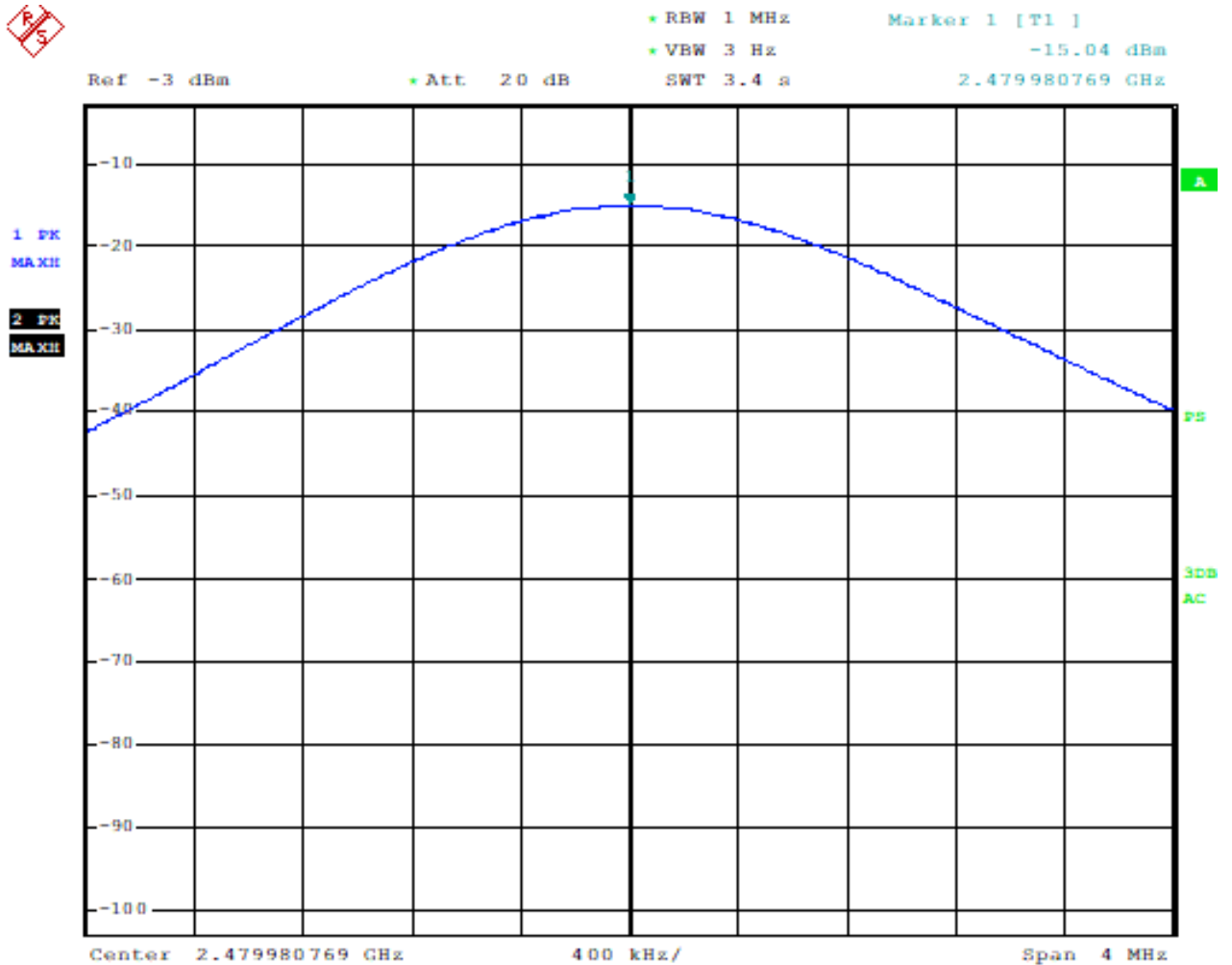
Graphical Results of RF power output, radiated measurement

Channel 19 (2440MHz)



Graphical Results of RF power output, radiated measurement

Channel 39 (2480MHz)



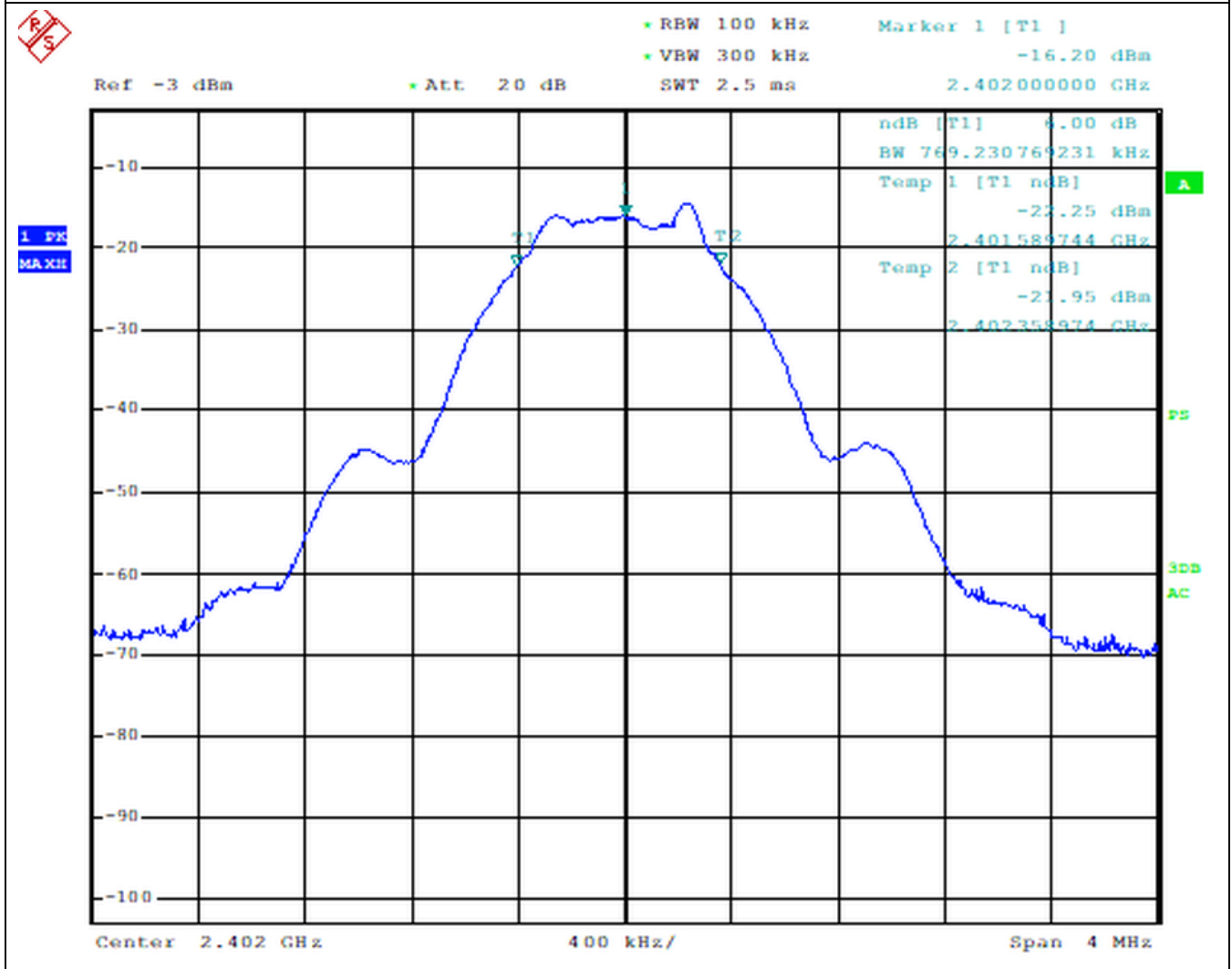
6 dB Bandwidth	
Test date	02/10/2025
Applied Standard	Title 47 Part 15 Subpart C §15.247
Test method	According to Par. 8.2 of KDB 558074 D01 15.247 Meas. Guidance v05r02 (and par. 11.8.1 Option 2 of ANSI C63.10)
Temperature	23,5° C
Humidity	44%
Tested by	Zaccaria Piazza
Model	EMBRACEMINI
Internal Storage No.	A004083685-001
Operating mode	2
Tested terminals	Enclosure
Remarks	---

Systems using digital modulation techniques may operate in the 902 - 928 MHz, 2400 - 2483.5 MHz, and 5725 - 5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

Measurement data of 6dB bandwidth				
Operating condition #2				
Channel (No.)	Frequency (MHz)	Data rate	Channel Bandwidth at - 6dB (kHz)	Limit (kHz)
0	2402	1Mbps	769.23	>500
19	2440	1Mbps	769.23	>500
39	2480	1Mbps	769.23	>500

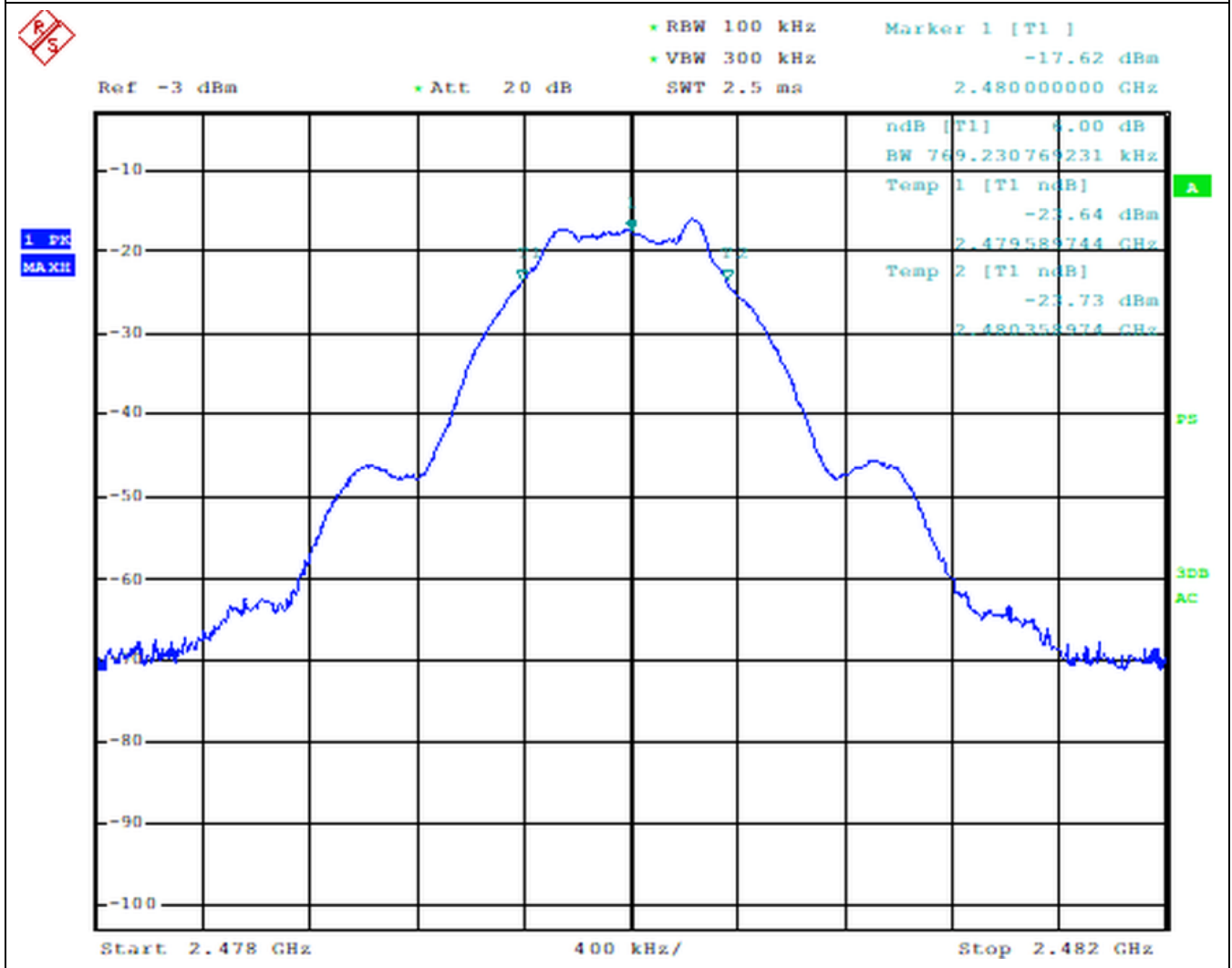
Graphical presentation of 6dB Bandwidth radiated measurement

Channel 0 (2402 MHz)



Graphical presentation of 6dB Bandwidth radiated measurement

Channel 39 (2480 MHz)



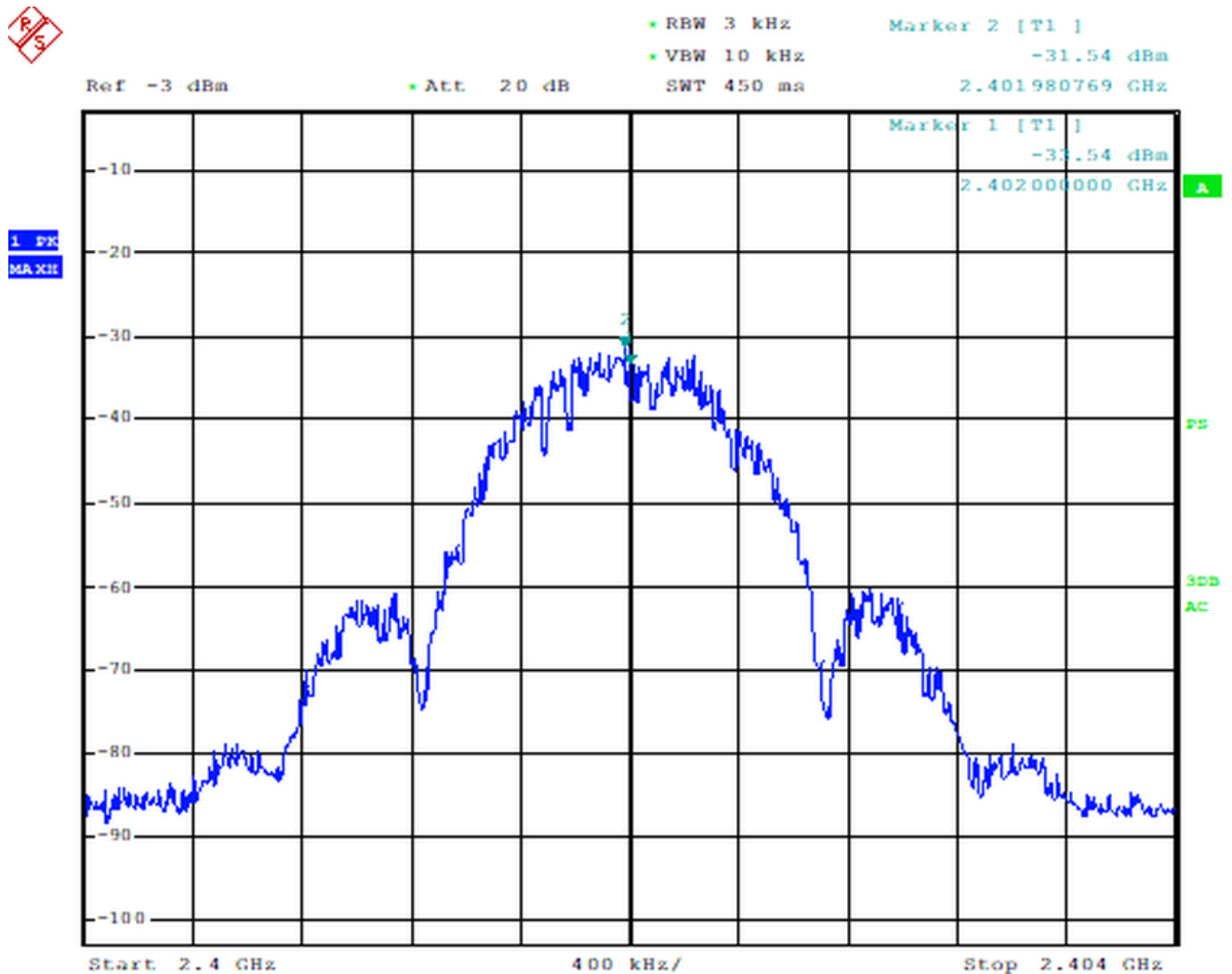
Power Spectral Density	
Test date	02/10/2025
Applied Standard	Title 47 Part 15 Subpart C §15.247
Test method	According to Par. 8.4 of KDB 558074 D01 15.247 Meas Guidance v05r02 (and par. 11.10 of ANSI C63.10)
Temperature	23,5° C
Humidity	44%
Voltage/Frequency used during the test	Battery powered
Tested by	Zaccaria Piazza
Model	EMBRACEMINI
Internal Storage No.	A004083685-001
Operating mode	2
Tested terminals	Enclosure
Remarks	---

(e) For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

Measurement data of Power Spectral Density, Radiated measurement									
Test conditions			Frequency (MHz)	Ch.	Radiated Spectral Density	Antenna Gain	Conducted Spectral Density	Limits (dBm)	Result
Temperature	Voltage	Data rate (worst case)			Radiated	dBi	Conducted	Conducted	
Tnom +22°C	Battery Operated	1Mbps	2402	0	-31,54	-13.34	-16,04	8	P
Tnom +22°C	Battery Operated	1Mbps	2440	19	-32,40	-12.35	-23,40	8	P
Tnom +22°C	Battery Operated	1Mbps	2480	39	-35,04	-13.87	-29,04	8	P

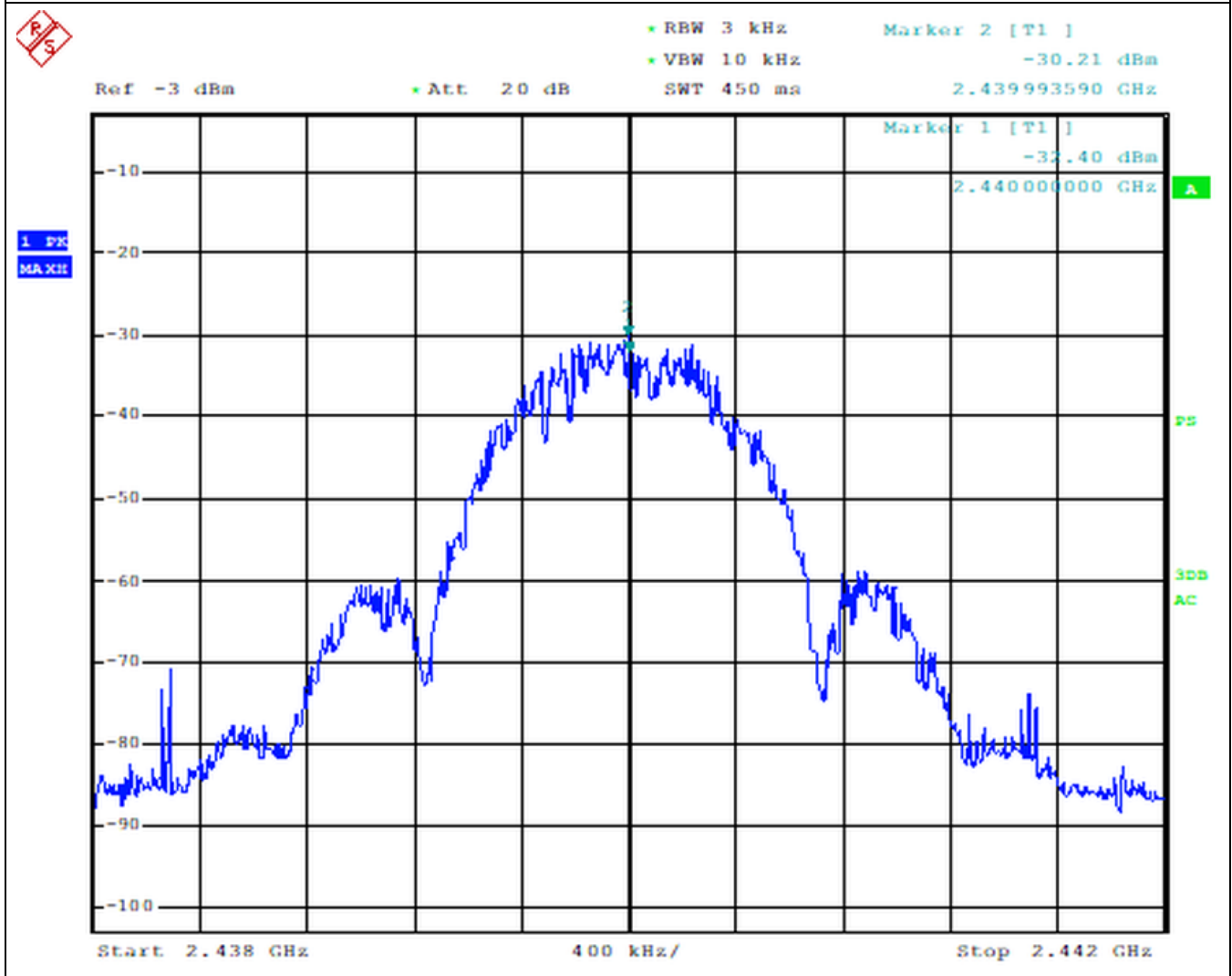
Graphical Results of Power Spectral Density, radiated measurement

Channel 0 (2402MHz)



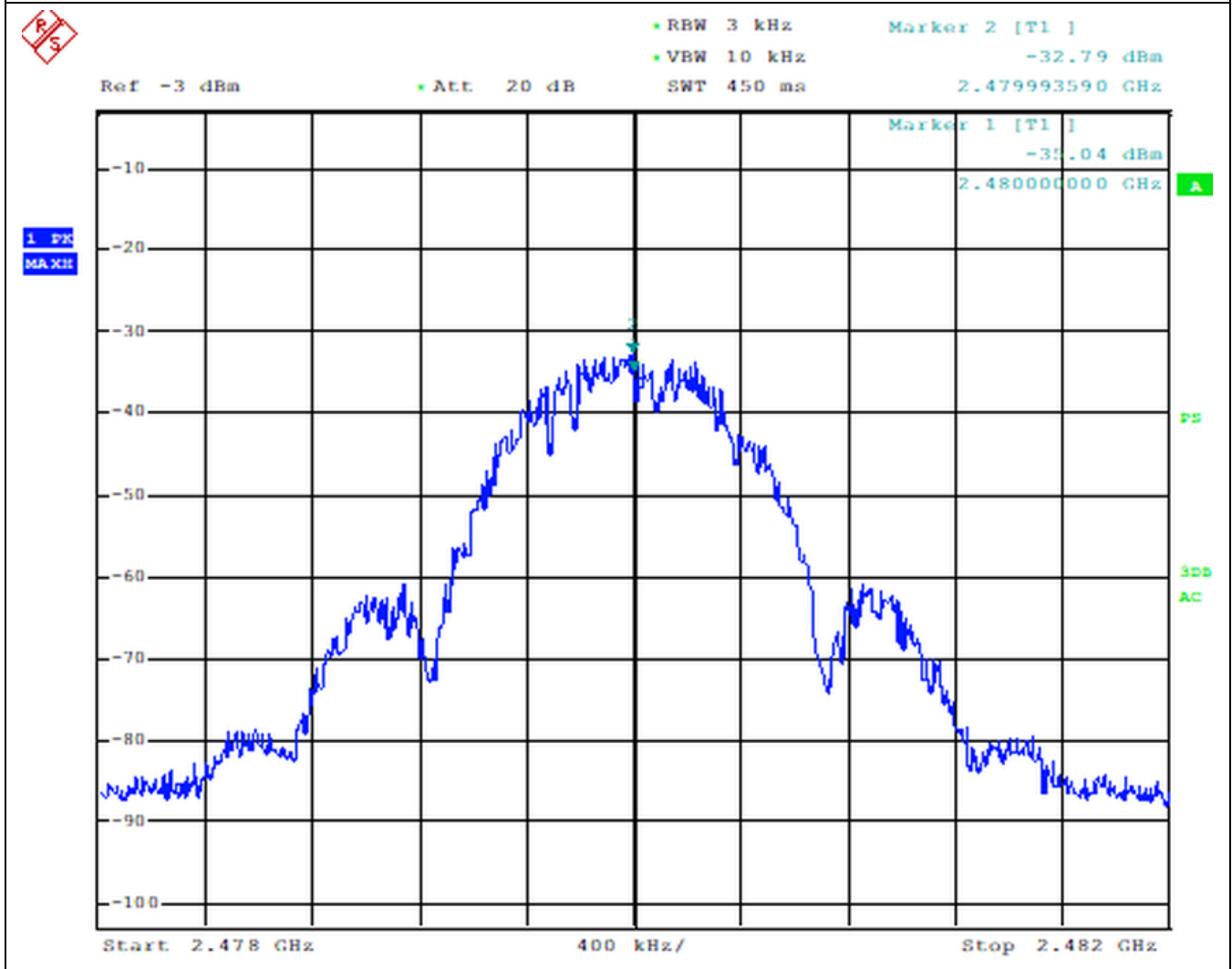
Graphical Results of Power Spectral Density, radiated measurement

Channel 19 (2440MHz)



Graphical Results of Power Spectral Density, radiated measurement

Channel 39 (2480MHz)



Out-of-band emissions	
Test date	02/10/2025
Applied Standard	Title 47 Part 15 Subpart C §15.247
Test method	According to Par. 8.5 of KDB 558074 D01 15.247 Meas. Guidance v05r02 (and par. 11.11 of ANSI C63.10)
Temperature	23,5° C
Humidity	44%
Voltage/Frequency used during the test	Battery powered
Tested by	Zaccaria Piazza
Model	EMBRACEMINI
Internal Storage No.	A004083685-001
Operating mode	2
Tested terminals	Enclosure
Remarks	---

(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)).

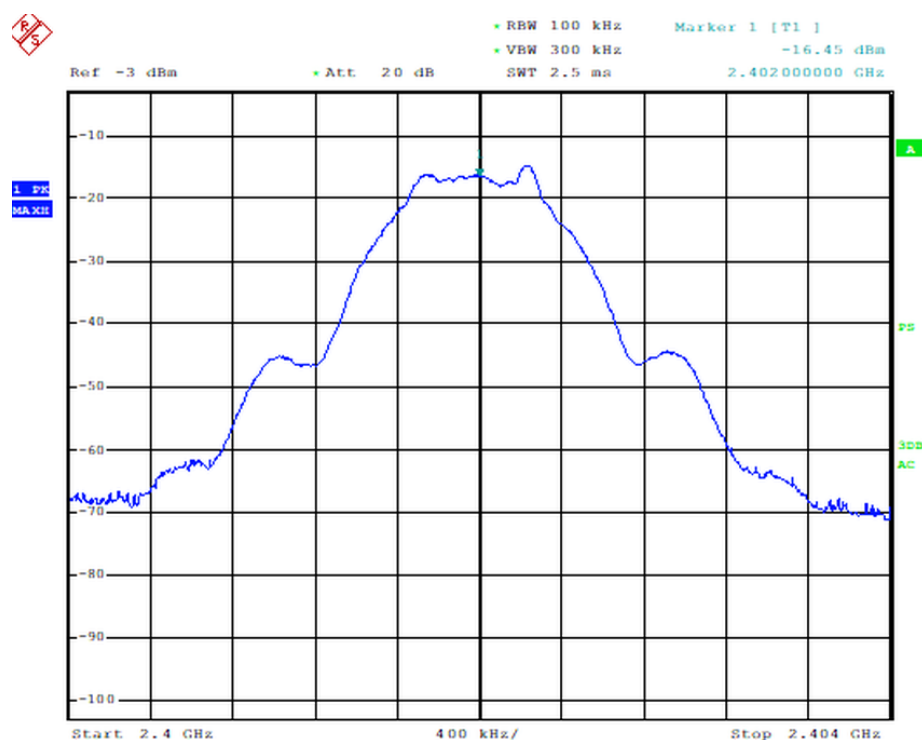
Graphical presentation of spurious emission

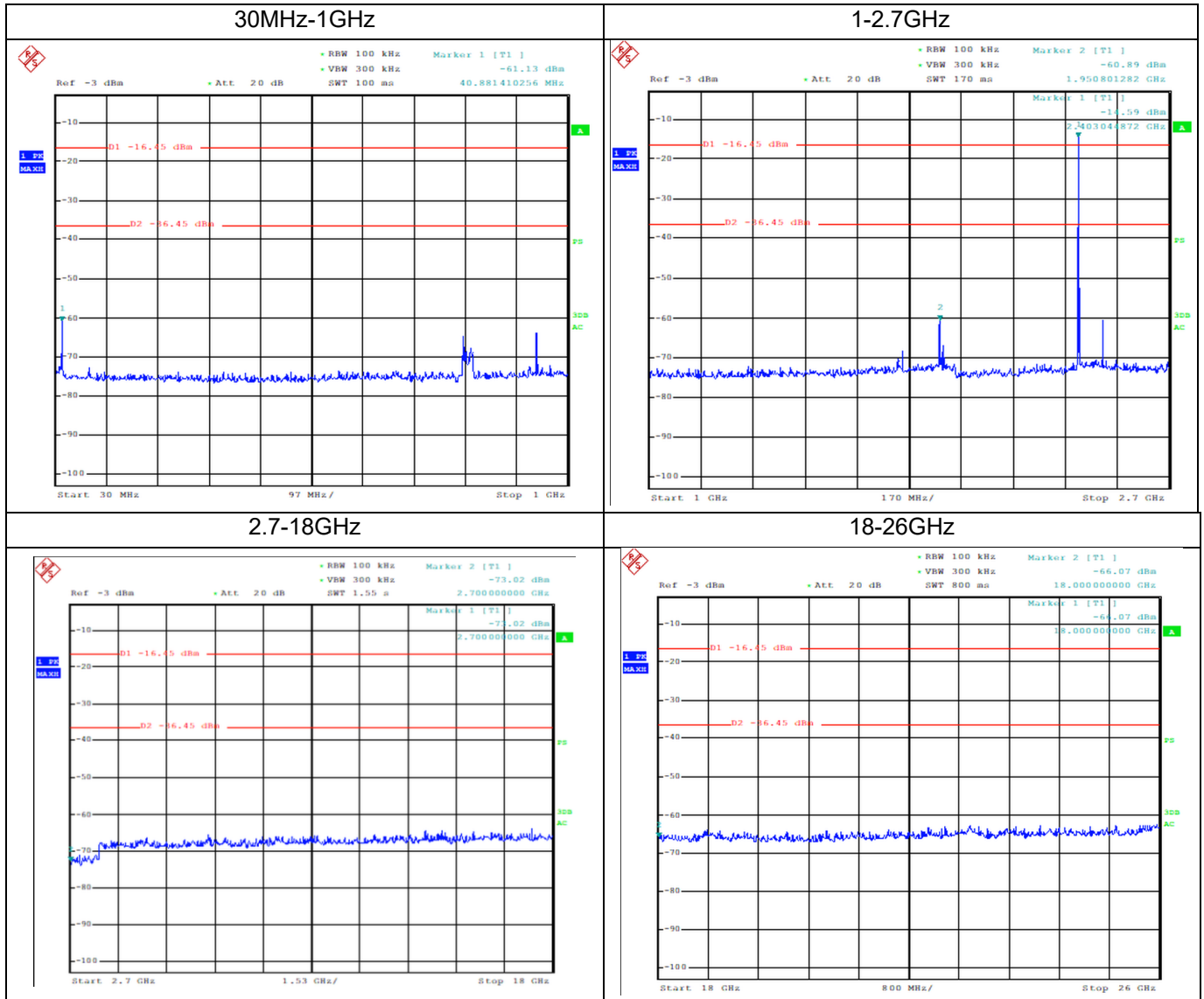
Operation mode: 2

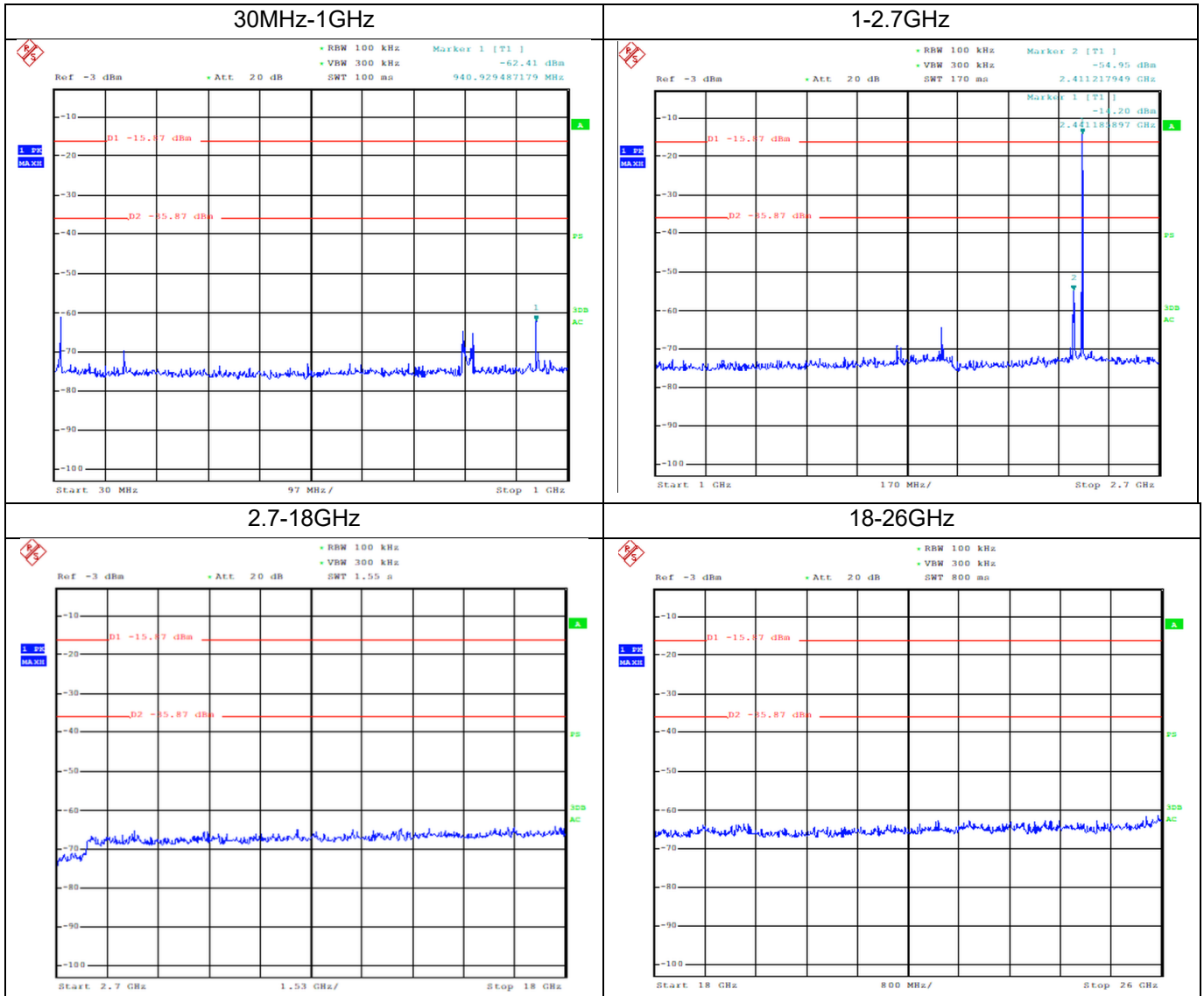
Channel 0 (2402MHz)

Data Rate: 1Mbps

Fundamental (100kHz BW)







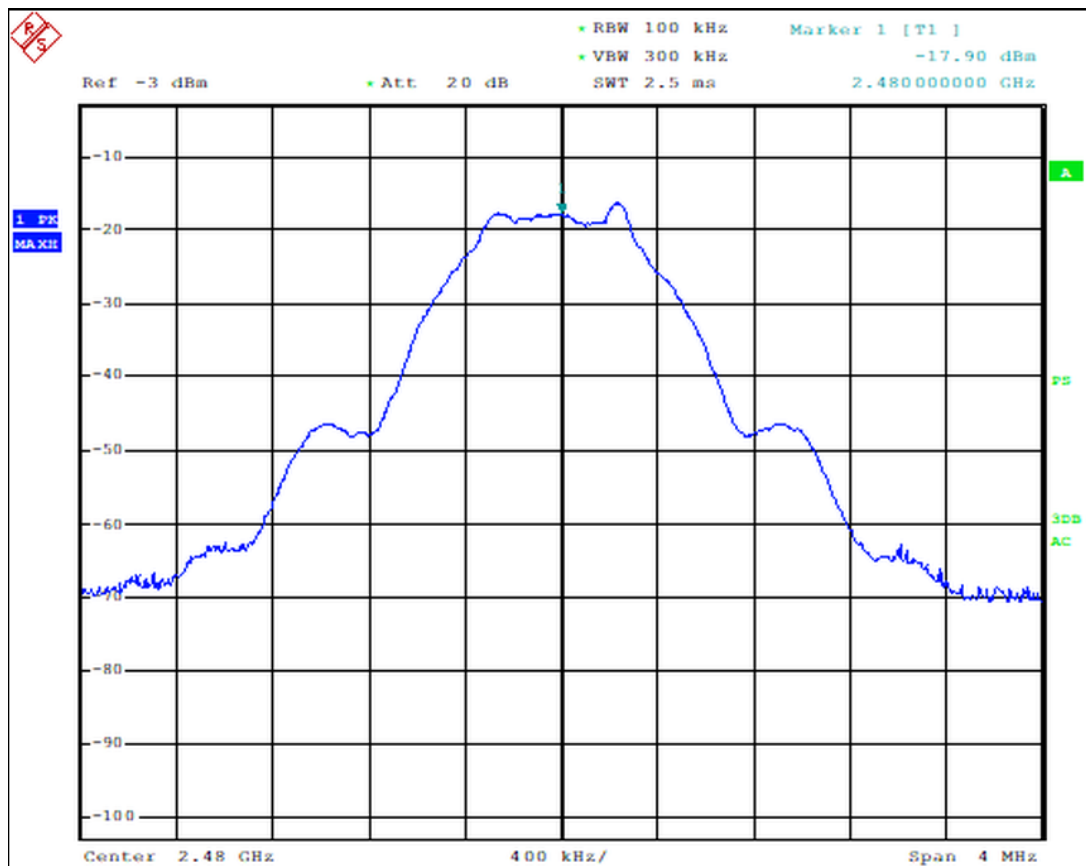
Graphical presentation of spurious emission

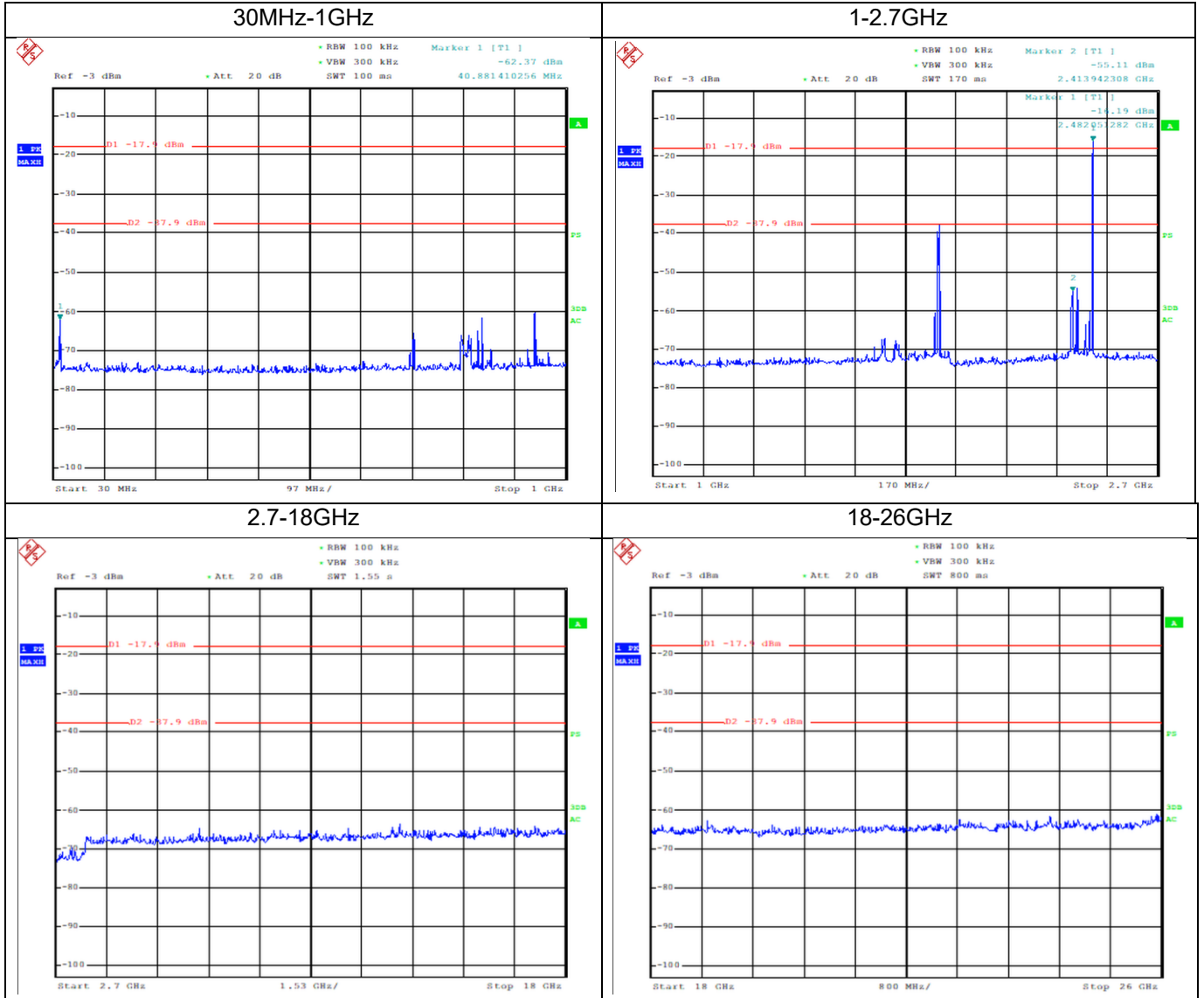
Operation mode: 3

Channel 39 (2480MHz)

Data Rate: 1Mbps

Fundamental (100kHz BW)





100kHz Bandwidth of Frequency Band Edges	
Test date	02/10/2025
Applied Standard	Title 47 Part 15 Subpart C §15.247
Test method	According to Par. 8.7.2 (Marker-Delta method) of KDB 558074 D01 15.247 Meas Guidance v05r02 (and par. 6.10.4 of ANSI C63.10)
Temperature	23,5° C
Humidity	44%
Voltage/Frequency used during the test	Battery powered
Tested by	Zaccaria Piazza
Model	EMBRACEMINI
Internal Storage No.	A004083685-001
Operating mode	2
Tested terminals	Enclosure
Remarks	---

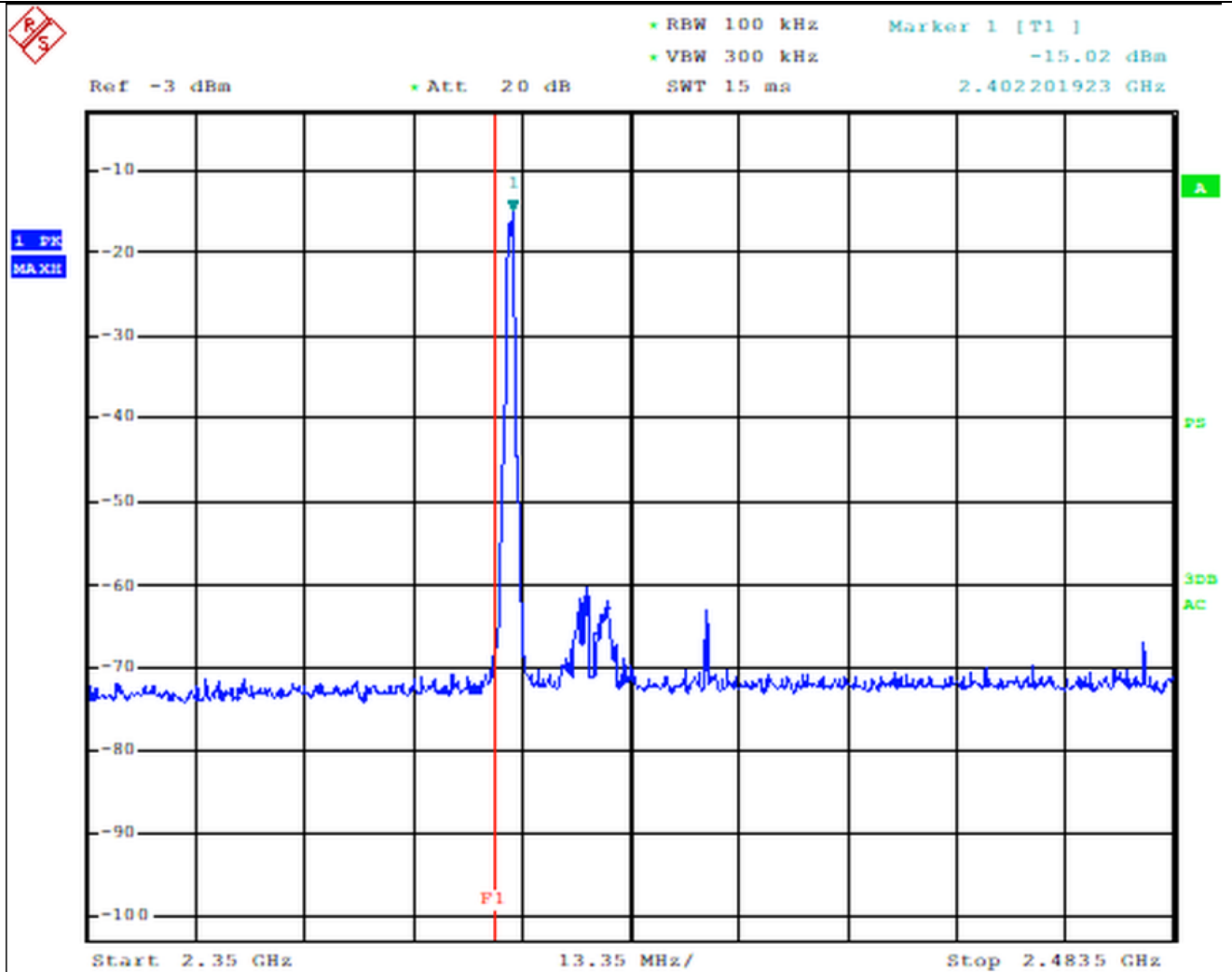
(d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains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

Graphical presentation of Band-Edge measurement

Operation mode: 2

Channel 0 (2402MHz)

Data Rate: 1Mbps

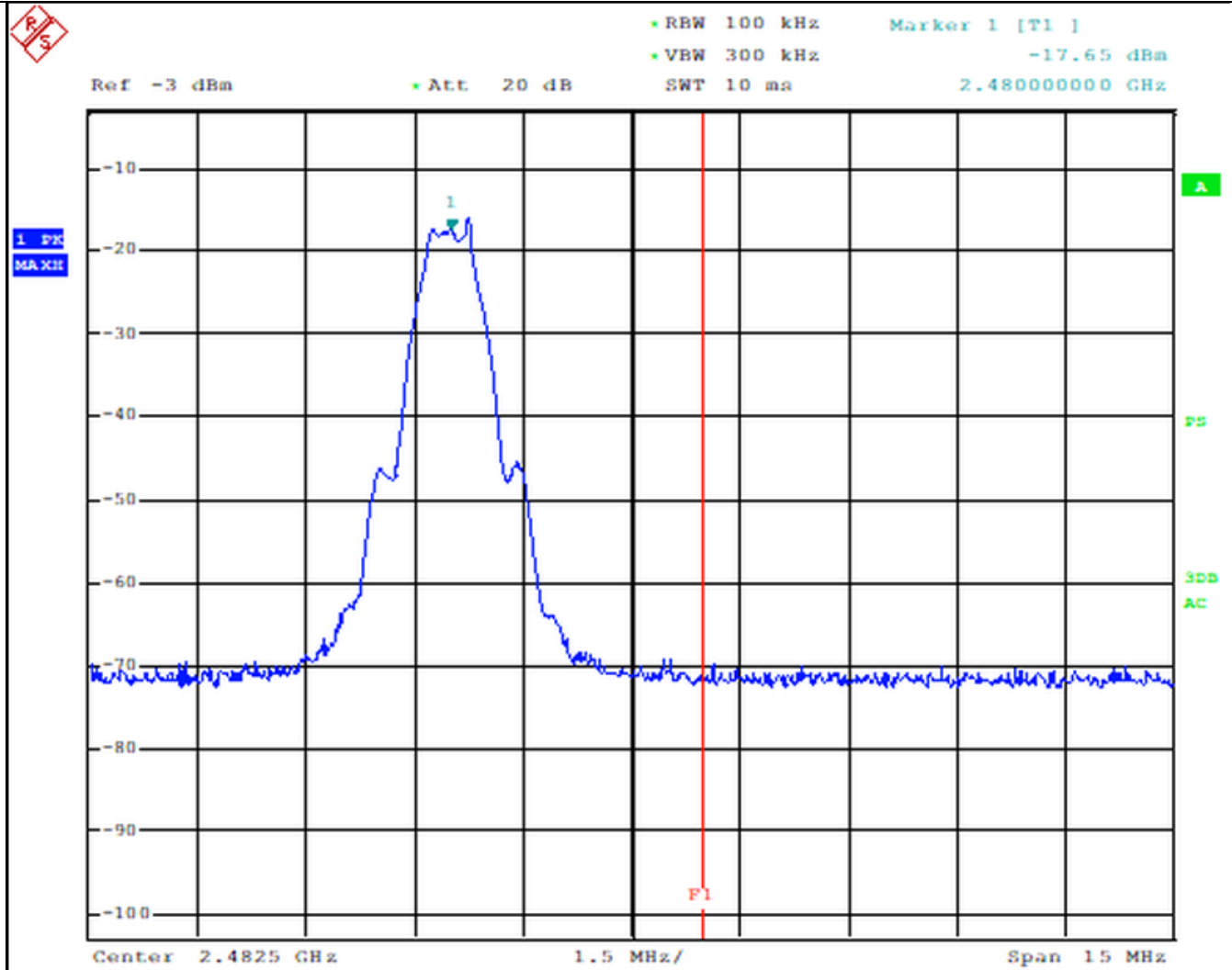


Graphical presentation of Band-Edge measurement

Operation mode: 2

Channel 39 (2480MHz)

Data Rate: 1Mbps



Additional provisions to the general radiated emission limitations.	
Test date	02/10/2025
Applied Standard	Title 47 Part 15 Subpart C §15.215
Test method	---
Temperature	23,5° C
Humidity	44%
Tested by	Zaccaria Piazza
Model	EMBRACEMINI
Internal Storage No.	A004083685-001
Operating mode	2
Tested terminals	Enclosure
Remarks	---

(A) The regulations in §§ 15.217-15.257 provide alternatives to the general radiated emission limits for intentional radiators operating in specified frequency bands. Unless otherwise stated, there are no restrictions as to the types of operation permitted under these sections.	
(B) In most cases, unwanted emissions outside of the frequency bands shown in these alternative provisions must be attenuated to the emission limits shown in Section 15.209. In no case shall the level of the unwanted emissions from an intentional radiator operating under these additional provisions exceed the field strength of the fundamental emission.	VERDICT
	P
(C) Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If a frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.	VERDICT
	P

18. List of test equipment

Equipment	Type	Inventory no.	Manufacturer	Calibration due date
Test stand: Radiated emission				
Semi-anechoic Chamber	FACT3	2782378	ETS Lindgren	06/2026
Active Loop Antenna and power supply	HFH2-Z2E+IN 600	9015215	Rohde&Schwarz	06/2026
BiConiLog Antenna	3142-E	2782348	ETS Lindgren	11/2026
Horn Antenna (1-18) GHz	HF907	9017580	Rohde&Schwarz	03/2026
Preamplifier (1-18) GHz	BLMA 0118-5G	9017808	BONN Elektronik	04/2026
Antenna Horn with external Preamplifier	3160-09	2782350	ETS Lindgren	09/2026
EMI Receiver	ESW44	2782867	Rohde&Schwarz	03/2026
Highpass Filter	WHKX10-2520-2800-180	2782704	Wainwright Instr.	---
Software EMC32	11.40.00	---	Rohde&Schwarz	---
Test stand: Conducted emission on AC Mains Input				
Semi-anechoic Chamber	SAC5	9020567	Albatross project	01/2027
Single-phase LISN 16A	ENV216	2782895	Rohde&Schwarz	07/2026
Stabilized Power Supply	TPS T 30K60S	2782385	Elettrotest	10/2027
EMI Receiver	ESW44	9019591	Rohde&Schwarz	01/2026
Software EMC32	11.40.00	---	Rohde&Schwarz	---

PHOTOGRAPHIC DOCUMENTATION	
See the Annex below:	
IT25CSCB 001 Annex 1	Test Set-up photos

MPE EVALUATION	
See the Annex below:	
IT258LS3 001 Annex 2	MPE Evaluation

---END OF TEST REPORT---