

Wireless test report

Type of assessment:

Modular approval

Report Reference No.:

REP092260

Applicant:

Advanced Microwave Engineering Srl
Via Lucca, 44 – 50142 Firenze (FI) – Italy

Product name:

UWB Radio Module

Model:

UWBTRPHA02

FCC ID:

UKOUWBTRPHA02

Specifications:

- ◆ **FCC 47 CFR Part 15 Subpart C, §15.250**
Intentional radiator

Date of issue: **April 18, 2025**

Tested by

P. Barbieri

Signature:

Reviewed by

O. Frau

Signature:

Test location(s)

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Limits of responsibility

Note that the results contained in this report relate only to the items tested and were obtained in the period between the date of initial receipt of samples and the date of issue of the report. This test report has been completed in accordance with the requirements of ISO/IEC 17025. All results contain in this report are within Nemko Spa ISO/IEC 17025 accreditation.

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Section 1. Report summary

1.1 Applicant and manufacturer

Company name	Advanced Microwave Engineering Srl
Address	Via Lucca, 44 – 50142 Firenze (FI) – Italy

1.2 Test specifications

FCC 47 CFR Part 15, Subpart C, §15.250	Intentional Radiators, operation of wideband systems within the band 5925 - 7250 MHz.
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1.3 Test methods

ANSI C63.10-2020	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices
ANSI C63.10a-2024	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices Amendment 1
KDB 393764 D01 v02r01 April 2022	Ultra-Wide Band (UWB) Devices – Frequently asked questions

1.4 Statement of compliance

In the configuration tested, the EUT was found compliant.

Testing was performed against all relevant requirements of the test standard except as noted in section 1.5 below. Results obtained indicate that the product under test complies in full with the requirements tested. The test results relate only to the items tested.

See “Summary of test results” for full details.

1.5 Exclusions

None

1.6 Test report revision history

Revision #	Date of issue	Details of changes made to test report
REP092260	April 18, 2025	Original report issued

Section 2. Summary of test results

2.1 FCC Part 15 Subpart C test results

Table 2.1-1: FCC test results

Part	Test description	Verdict
§15.203	Antenna requirement	Pass
§15.207	Conducted emission	Not applicable ¹
§15.209	Radiated emission	Pass
§15.250(a)(b)	10 dB Bandwidth	Pass
§15.250(c)	Operational limitations	Pass ¹
§15.250(d)(1)	Radiated emission	Pass
§15.250(d)(2)	Radiated emission in GPS band	Pass
§15.250(d)(3)	EIRP	Pass
§15.250(d)(4)	Radiated emission below 960 MHz	Pass
§15.250(d)(5)	Radiated emission below from digital circuitry	Pass

Note 1: the EUT is used inside an hosting device supplied by a vehicle battery.

Section 3. Equipment under test (EUT) details

3.1 Sample information

Receipt date	April 7, 2025
Testing start date	April 10, 2025
Testing termination date	April 18, 2025
Nemko sample ID number	PRJ0077480002

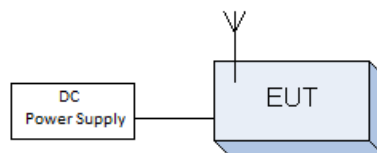
3.2 EUT information

Product name	UWB Radio Module
Model	UWBTRPHA02

3.3 Technical information

Frequency	6240 to 6739.2 GHz
RF power Max (dBm)	-1.4 dBm
Measured BW (MHz) (10 dB)	591.9 MHz
Measured BW (MHz) (99%)	703.7 MHz
Type of modulation	UWB
Emission classification (F1D, G1D, D1D)	W7D
Power requirements	12 / 24 V DC
Antenna information	The EUT uses a unique antenna coupling/ non-detachable antenna to the intentional radiator.

3.4 EUT setup diagram



3.5 Product description and theory of operation

The EUT is a radio module that uses UWB type signals to detect the spatial position of a nearby tag. The device is typically used on mobile means such as lift trucks but can also be installed in a fixed position near static machines.

3.6 EUT exercise details

The EUT has been modified by the manufacturer to transmit in continuous mode.

Section 4. Engineering considerations

4.1 Modifications incorporated in the EUT

There were no modifications performed to the EUT during this assessment.

4.2 Technical judgment

No technical judgment

4.3 Deviations from laboratory tests procedures

No deviations were made from laboratory procedures.

Section 5. Test conditions

5.1 Atmospheric conditions

In the laboratory, the following ambient conditions are respected for each test reported below:

Temperature	18 – 33 °C
Relative humidity	25 – 70 %
Air pressure	860 – 1060 mbar

The following instruments are used to monitor the environmental conditions:

Equipment	Manufacturer	Model no.	Asset no.	Cal date	Next cal.
Thermo-hygrometer data loggers	Testo	175-H2	20012380/305	2025-01	2027-01
Thermo-hygrometer data loggers	Testo	175-H2	20013013/305	2025-01	2027-01
Barometer	Castle	GPB 3300	072015	2025-03	2026-03

5.2 Power supply range

For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. For battery operated equipment, the equipment tests shall be performed using a new battery.

EUT Power requirements:

If EUT is an AC or a DC powered, was the noticeable output power variation observed?

If EUT is battery operated, was the testing performed using fresh batteries?

If EUT is rechargeable battery operated, was the testing performed using fully charged batteries?

☐ AC	☒ DC	☐ Battery
☐ YES	☒ NO	☐ N/A
☐ YES	☐ NO	☒ N/A
☐ YES	☐ NO	☒ N/A

Section 6. Measurement uncertainty

6.1 Uncertainty of measurement

The measurement uncertainty was calculated for each test and quantity listed in this test report, according to CISPR 16-4-2, ETSI TR 100 028-1, ETSI TR 100 028-2 and other specific test standards and is documented in Nemko Spa working manuals WML1002 and WML0078.

The assessment of conformity for each test performed on the equipment is performed not taking into account the measurement uncertainty. The two following possible verdicts are stated in the report:

P (Pass) - The measured values of the equipment respect the specification limit at the points tested. The specific risk of false accept is up to 50% when the measured result is close to the limit.

F (Fail) - One or more measured values of the equipment do not respect the specification limit at the points tested. The specific risk of false reject is up to 50% when the measured result is close to the limit.

Hereafter Nemko's measurement uncertainties are reported:

EUT	Type	Test	Range	Measurement Uncertainty	Notes
Transmitter	Conducted	Frequency error	0.001 MHz ÷ 40 GHz	0.08 ppm	(1)
		Carrier power RF Output Power	0.009 MHz ÷ 30 MHz	1.1 dB	(1)
			30 MHz ÷ 18 GHz	1.5 dB	(1)
			18 MHz ÷ 40 GHz	3.0 dB	(1)
			40 MHz ÷ 140 GHz	5.0 dB	(1)
		Adjacent channel power	1 MHz ÷ 18 GHz	1.4 dB	(1)
		Conducted spurious emissions	0.009 MHz ÷ 18 GHz	3.0 dB	(1)
			18 GHz ÷ 40 GHz	4.2 dB	(1)
			40 GHz ÷ 220 GHz	6.0 dB	(1)
		Intermodulation attenuation	1 MHz ÷ 18 GHz	2.2 dB	(1)
		Attack time – frequency behaviour	1 MHz ÷ 18 GHz	2.0 ms	(1)
		Attack time – power behaviour	1 MHz ÷ 18 GHz	2.5 ms	(1)
		Release time – frequency behaviour	1 MHz ÷ 18 GHz	2.0 ms	(1)
		Release time – power behaviour	1 MHz ÷ 18 GHz	2.5 ms	(1)
		Transient behaviour of the transmitter– Transient frequency behaviour	1 MHz ÷ 18 GHz	0.2 kHz	(1)
		Transient behaviour of the transmitter – Power level slope	1 MHz ÷ 18 GHz	9%	(1)
		Frequency deviation - Maximum permissible frequency deviation	0.001 MHz ÷ 18 GHz	1.3%	(1)
		Frequency deviation - Response of the transmitter to modulation frequencies above 3 kHz	0.001 MHz ÷ 18 GHz	0.5 dB	(1)
		Dwell time	-	3%	(1)
		Hopping Frequency Separation	0.01 MHz ÷ 18 GHz	1%	(1)
		Occupied Channel Bandwidth	0.01 MHz ÷ 18 GHz	2%	(1)
		Modulation Bandwidth	0.01 MHz ÷ 18 GHz	2%	(1)
	Radiated	Radiated spurious emissions	0.009 MHz ÷ 26.5 GHz	6.0 dB	(1)
			26.5 GHz ÷ 66 GHz	8.0 dB	(1)
			66 GHz ÷ 220 GHz	10 dB	(1)
		Effective radiated power transmitter	10 kHz ÷ 26.5 GHz	6.0 dB	(1)
			26.5 GHz ÷ 66 GHz	8.0 dB	(1)
			66 GHz ÷ 220 GHz	10 dB	(1)

NOTES:

(1) The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor $k = 2$, which for a normal distribution corresponds to a coverage probability of approximately 95 %

Section 7. Testing data

7.1 Antenna requirement

7.1.1 Definitions and limits

FCC 15.203

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 §§15.211, 15.213, 15.217, 15.219, 15.221, or §15.236. 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 §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.

FCC 15.250

(c) Operation on board an aircraft or a satellite is prohibited. Devices operating under this section may not be employed for the operation of toys. Except for operation onboard a ship or a terrestrial transportation vehicle, the use of a fixed outdoor infrastructure is prohibited. A fixed infrastructure includes antennas mounted on outdoor structures, e.g., antennas mounted on the outside of a building or on a telephone pole.

7.1.2 Test date

Start date April 10, 2025

7.1.3 Observations, settings and special notes

The EUT use permanently attached antenna.

7.1.4 Test data

Must the EUT be professionally installed? ☐ YES ☒ NO
 Does the EUT have detachable antenna(s)? ☐ YES ☒ NO
 If detachable, is the antenna connector(s) non-standard? ☐ YES ☐ NO ☒ N/A



7.2 10 dB Bandwidth

7.2.1 Definitions and limits

FCC 15.250

(a) The -10 dB bandwidth of a device operating under the provisions of this section must be contained within the 5925-7250 MHz band under all conditions of operation including the effects from stepped frequency, frequency hopping or other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage.

(d) The -10 dB bandwidth of the fundamental emission shall be at least 50 MHz. For transmitters that employ frequency hopping, stepped frequency or similar modulation types, measurement of the -10 dB minimum bandwidth specified in this paragraph shall be made with the frequency hop or step function disabled and with the transmitter operating continuously at a fundamental frequency following the provisions of § 15.31(m).

7.2.1 Test date

Start date April 11, 2025

7.2.2 Observations, settings and special notes

Spectrum analyzer settings:

Resolution bandwidth: 1 MHz

Video bandwidth: 3 MHz

Span: 1.5 GHz

Detector mode: Peak

7.2.3 Test equipment list

Table 7.2-1: Equipment list

Equipment	Manufacturer	Model no.	Asset no.	Cal cycle	Next cal.
EMI Receiver	Rohde & Schwarz	ESW44	101620	2024-09	2025-09
Antenna 1 - 18 GHz	Schwarzbeck Mess-Elektronik	STLP9148	STPL 9148-123	2024-08	2027-08
Preamplifier (1 ÷ 18 GHz)	Schwarzbeck	BBV9718C	00121	2025-01	2026-01
Controller	Maturo	FCU3.0	10041	NCR	NCR
Tilt antenna mast	Maturo	TAM4.0-E	10042	NCR	NCR
Turntable	Maturo	TT4.0-5T	2.527	NCR	NCR
Software turntable and mast	Maturo	mcApp	8.1.0.5410	NCR	NCR
Semi-anechoic chamber	Comtest	SAC-3	1711-150	2024-09	2026-09
Cable set	Rosenberger and Huber + Suhner	RE01+RE02	1.654+1.655	2025-01	2026-01
Coaxial cable	Rosenberger	ST.ALO-05	1.669	2025-03	2026-03

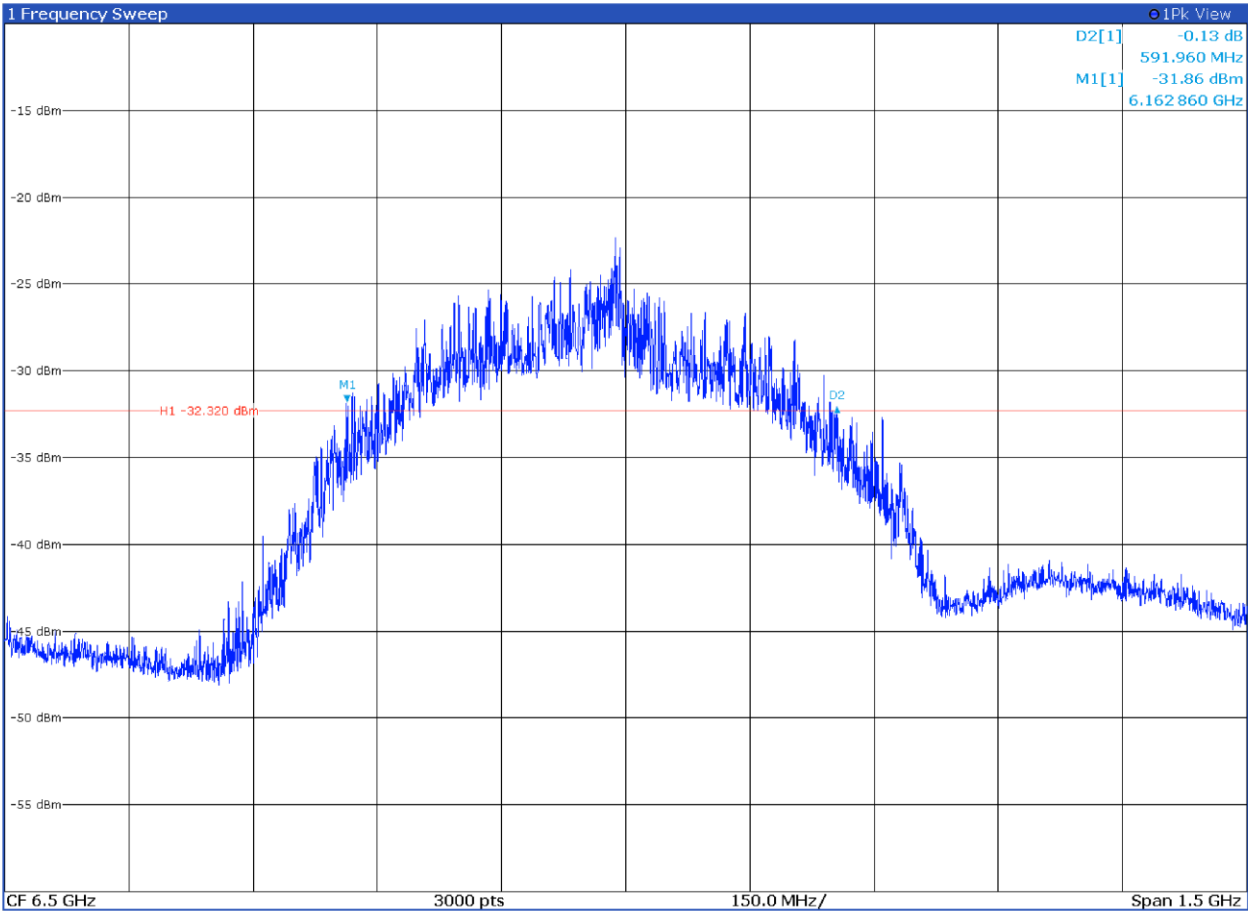
Note: NCR - no calibration required, VOU - verify on use

7.2.4 Test data

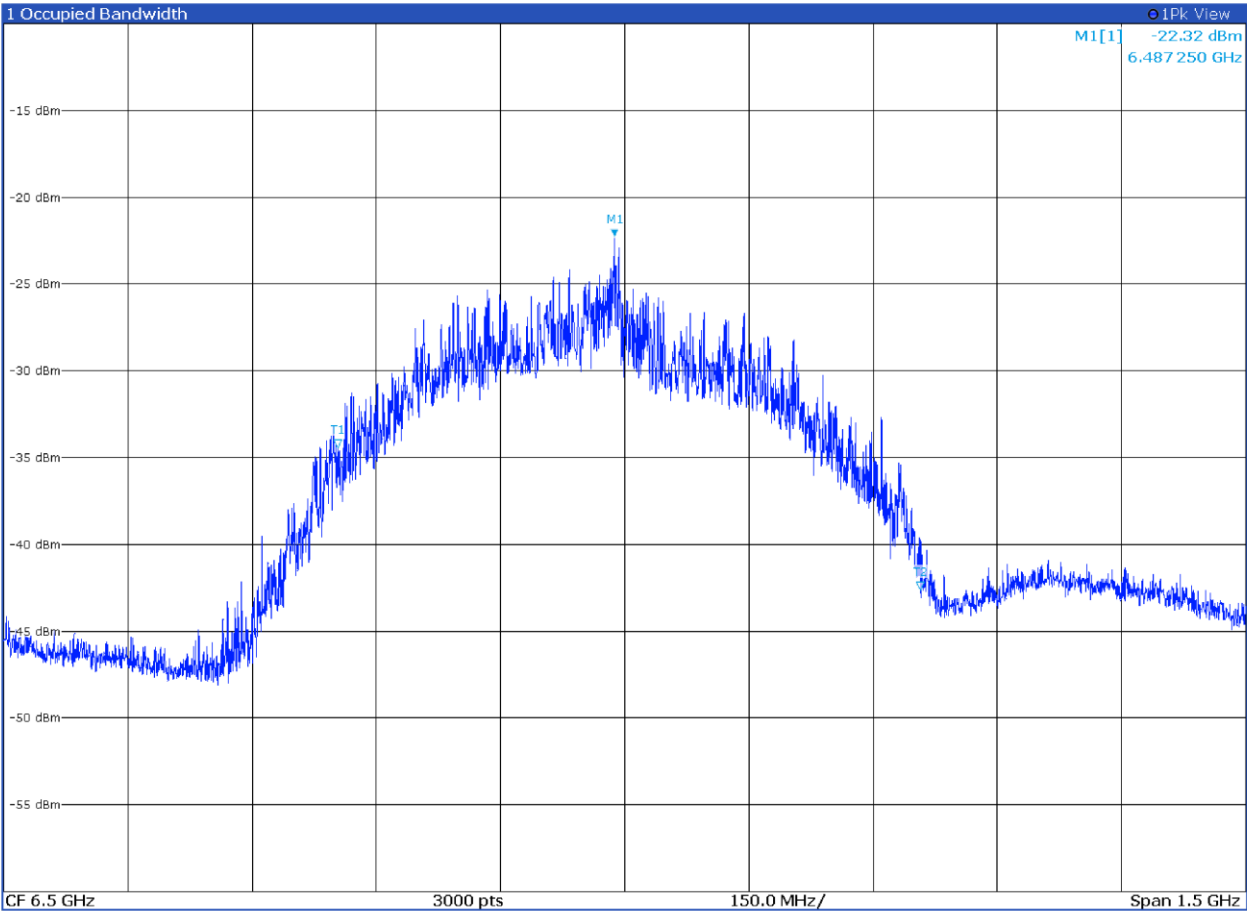
Table 7.2-2: Bandwidth measurements results

Frequency, (MHz)	10 dB Bandwidth (MHz)	99% Bandwidth (MHz)	Limit for 10 dB Bandwidth (MHz)	Margin (MHz)
6500	591.9	703.7	50	541.9

Frequency (MHz)	Lower Frequency (MHz)	Limit (MHz) Lower frequency	Upper frequency (MHz)	Limit (MHz) Upper frequency
6500	6162.8	5925	6754.8	7250



Plot 7.2-1: 10 dB Bandwidth



2 Marker Table						
Type	Ref	Trc	X-Value	Y-Value	Function	Function Result
M1		1	6.487 25 GHz	-22.32 dBm	Occ Bw	703.748 653 592 MHz
T1	1		6.153 4 GHz	-34.45 dBm	Occ Bw Centroid	6.505 274 797 GHz
T2	1		6.857 149 GHz	-42.65 dBm	Occ Bw Freq Offset	5.274 797 083 MHz

Plot 7.2-2: 99 % Bandwidth

7.3 EIRP

7.3.1 Definitions and limits

FCC 15.250

(d)(3) There is a limit on the peak level of the emissions contained within a 50 MHz bandwidth centered on the frequency at which the highest radiated emission occurs and this 50 MHz bandwidth must be contained within the 5925-7250 MHz band. The peak EIRP limit is $20 \log (RBW/50)$ dBm where RBW is the resolution bandwidth in megahertz that is employed by the measurement instrument. RBW shall not be lower than 1 MHz or greater than 50 MHz. The video bandwidth of the measurement instrument shall not be less than RBW. If RBW is greater than 3 MHz, the application for certification filed with the Commission shall contain a detailed description of the test procedure, calibration of the test setup, and the instrumentation employed in the testing.

7.3.2 Test date

Start date	April 11, 2025
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7.3.3 Observations, settings and special notes

Spectrum analyser settings for peak radiated measurements above 1 GHz:

Resolution bandwidth	50 MHz
Video bandwidth	50 MHz
Detector mode	Peak
Trace mode	Max Hold

7.3.4 Test equipment list

Table 7.3-1: Equipment list

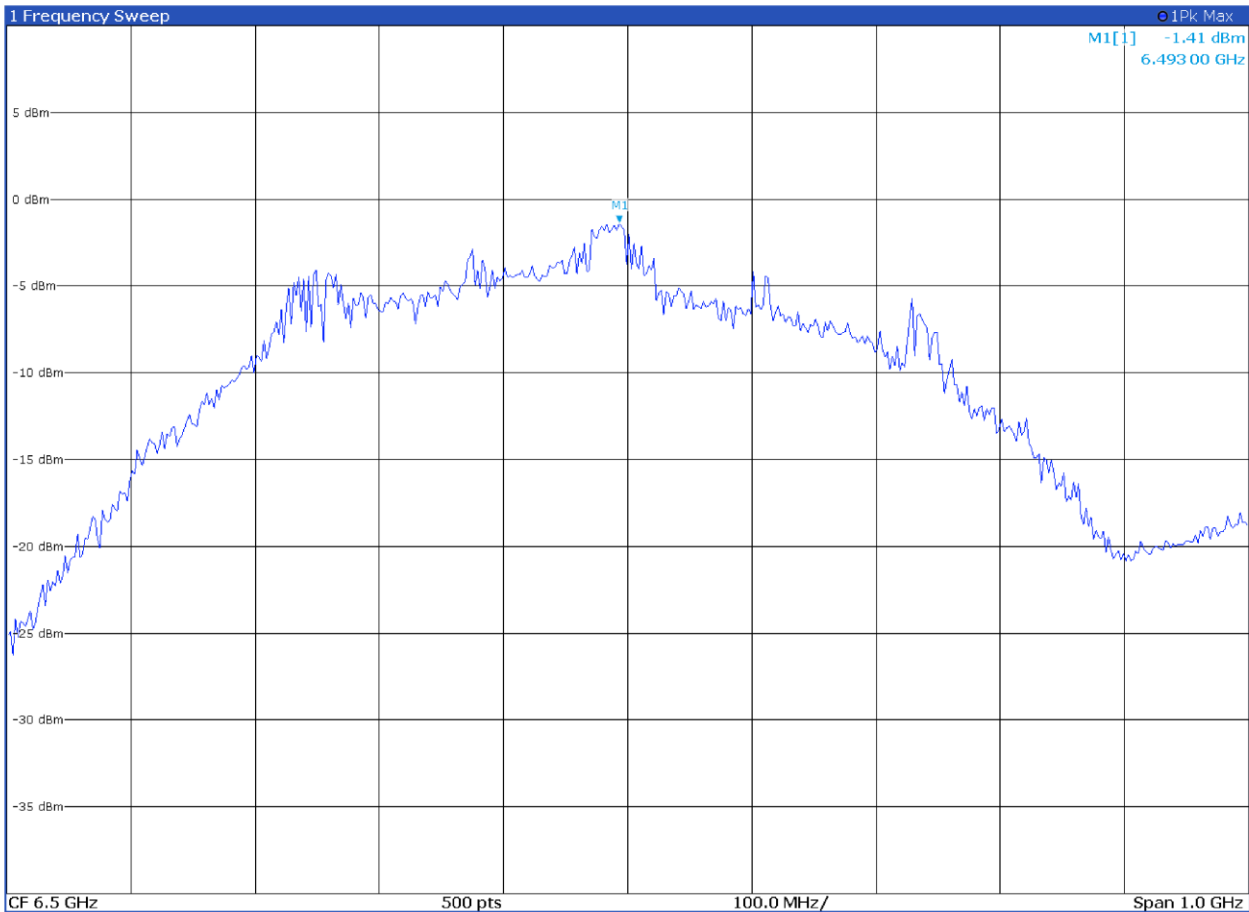
Equipment	Manufacturer	Model no.	Asset no.	Cal cycle	Next cal.
EMI Receiver	Rohde & Schwarz	ESW44	101620	2024-09	2025-09
Antenna 1 - 18 GHz	Schwarzbeck Mess-Elektronik	STLP9148	STPL 9148-123	2024-08	2027-08
Preamplifier (1 ÷ 18 GHz)	Schwarzbeck	BBV9718C	00121	2025-01	2026-01
Controller	Maturo	FCU3.0	10041	NCR	NCR
Tilt antenna mast	Maturo	TAM4.0-E	10042	NCR	NCR
Turntable	Maturo	TT4.0-5T	2.527	NCR	NCR
Software turntable and mast	Maturo	mcApp	8.1.0.5410	NCR	NCR
Semi-anechoic chamber	Comtest	SAC-3	1711-150	2024-09	2026-09
Cable set	Rosenberger and Huber + Suhner	RE01+RE02	1.654+1.655	2025-01	2026-01
Coaxial cable	Rosenberger	ST.ALO-05	1.669	2025-03	2026-03

Note: NCR - no calibration required, VOU - verify on use

7.3.5 Test data

Table 7.3-2: Eirp measurements results

Frequency, GHz	Measure Level dBm	Limit dBm	Margin dB	Detector
6.493	-1.4	0	-1.4	PK



Plot 7.3-1: Peak power

7.4 Radiated emissions

7.4.1 Definitions and limits

FCC 15.250

(d)(1) The radiated emissions above 960 MHz from a device operating under the provisions of this section shall not exceed the following RMS average limits based on measurements using a 1 MHz resolution bandwidth:

Table 7.4-1: Average limits

Frequency in MHz	EIRP in dBm
960 – 1610	-75.3
1610 – 1990	-63.3
1990 – 3100	-61.3
3100 – 5925	-51.3
5925 – 7250	-41.3
7250 – 10600	-51.3
Above 10600	-61.3

Notes: --

(d)(4) Radiated emissions at or below 960 MHz shall not exceed the emission levels in § 15.209.

(d)(5) Emissions from digital circuitry used to enable the operation of the transmitter may comply with the limits in § 15.209 provided it can be clearly demonstrated that those emissions are due solely to emissions from digital circuitry contained within the transmitter and the emissions are not intended to be radiated from the transmitter's antenna. Emissions from associated digital devices, as defined in § 15.3(k), e.g., emissions from digital circuitry used to control additional functions or capabilities other than the operation of the transmitter, are subject to the limits contained in subpart B of this part. Emissions from these digital circuits shall not be employed in determining the -10 dB bandwidth of the fundamental emission or the frequency at which the highest emission level occurs.

Table 7.4-2: FCC §15.209 – Radiated emission limits below 1 GHz

Frequency, MHz	Field strength of emissions		Measurement distance, m
	$\mu\text{V/m}$	$\text{dB}\mu\text{V/m}$	
0.009–0.490	2400/F	$67.6 - 20 \times \log_{10}(F)$	300
0.490–1.705	24000/F	$87.6 - 20 \times \log_{10}(F)$	30
1.705–30.0	30	29.5	30
30–88	100	40.0	3
88–216	150	43.5	3
216–960	200	46.0	3
above 960	500	54.0	3

Notes: In the emission table above, the tighter limit applies at the band edges.

7.4.2 Test date

Start date April 11, 2025

7.4.3 Observations, settings and special notes

The spectrum was searched from 30 MHz to 40 GHz according to §15.33(a)(1)

Spectrum analyzer settings for peak radiated measurements below 1000 MHz pre-scan

Resolution bandwidth:	100 kHz
Video bandwidth:	300 kHz
Detector mode:	Peak
Trace mode:	Max Hold

Spectrum analyzer settings for peak radiated measurements above 1000 MHz pre-scan

Resolution bandwidth:	1 MHz
Video bandwidth:	3 MHz
Detector mode:	Peak
Trace mode:	Max Hold

Spectrum analyzer settings for average radiated measurements above 960 MHz pre-scan

Resolution bandwidth:	1 MHz
Video bandwidth:	3 MHz
Detector mode:	RMS
Trace mode:	Max Hold

7.4.4 Test equipment list

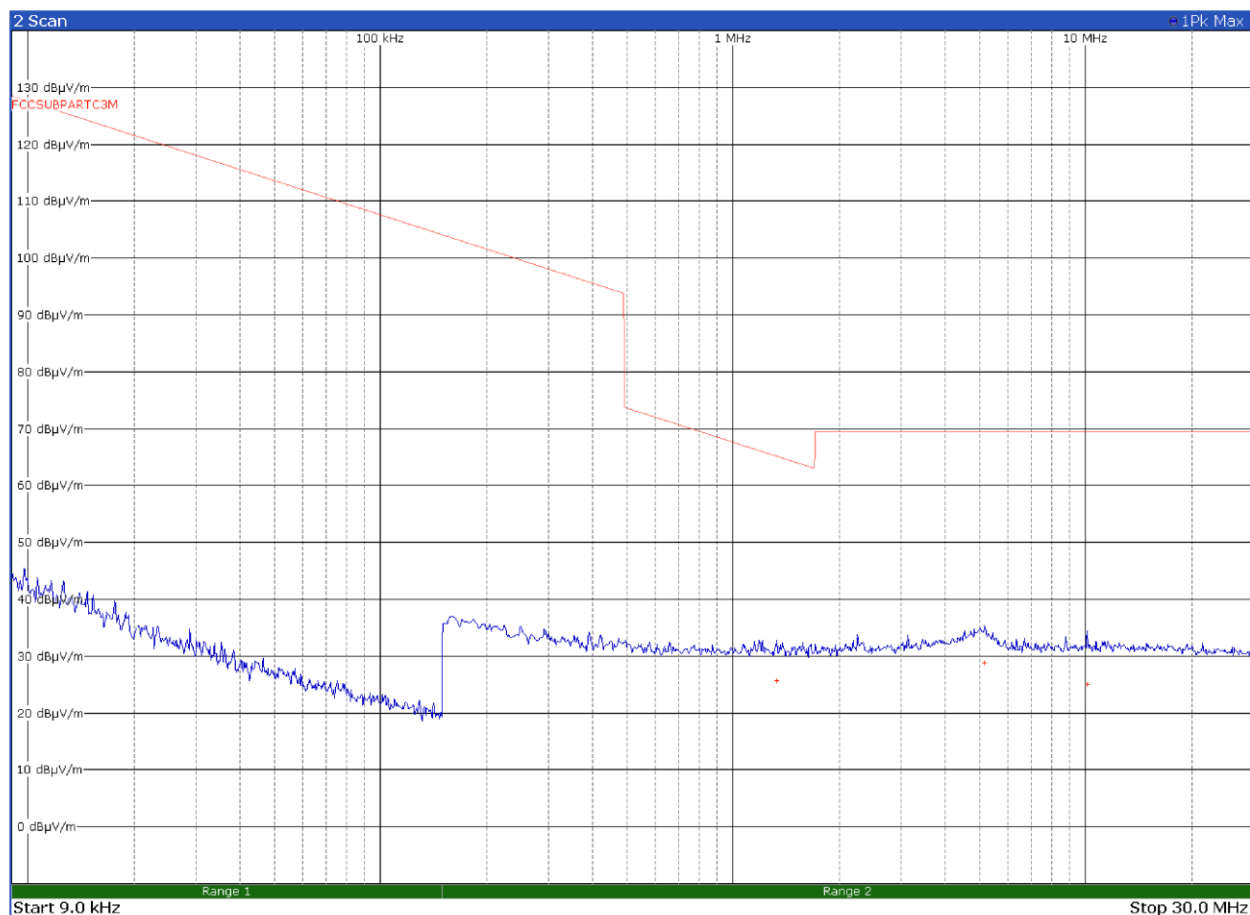
Table 7.4-3: Equipment list

Equipment	Manufacturer	Model no.	Asset no.	Cal cycle	Next cal.
EMI Receiver	Rohde & Schwarz	ESW44	101620	2024-09	2025-09
EMI Receiver	Rohde & Schwarz	ESU8	100202	2024-09	2025-09
Antenna Loop	Teseq	HLA6121+PI6121	45749	2023-08	2026-08
Antenna Trilog 25MHz - 8GHz	Schwarzbeck Mess-Elektronik	VULB9162	9162-025	2024-08	2027-08
Antenna 1 - 18 GHz	Schwarzbeck Mess-Elektronik	STLP9148	STPL 9148-123	2024-08	2027-08
Double Ridge Horn Antenna	RFSpin	DRH40	061106A40	2023-05	2026-05
Preamplifier (1 ÷ 18 GHz)	Schwarzbeck	BBV9718C	00121	2025-01	2026-01
Broadband Bench Top Amplifier	Sage	STB-1834034030-KFKF-L1	18490-01	2024-07	2025-07
Controller	Maturo	FCU3.0	10041	NCR	NCR
Tilt antenna mast	Maturo	TAM4.0-E	10042	NCR	NCR
Turntable	Maturo	TT4.0-5T	2.527	NCR	NCR
Software turntable and mast	Maturo	mcApp	8.1.0.5410	NCR	NCR
3m Semi anechoic chamber	Comtest	SAC-3	1711-150	2024-09	2026-09
Semi-anechoic chamber	Nemko Spa	10m SAC	530	2023-09	2025-09
Cable set	Rosenberger and Huber + Suhner	RE01+RE02	1.654+1.655	2025-01	2026-01
Coaxial cable	Rosenberger	ST.ALO-05	1.669	2025-03	2026-03
Coaxial cable	Rosenberger	ST.ALO-02	1.650	2024-12	2025-12

Note: NCR - no calibration required, VOU - verify on use

7.4.5 Test data

Antenna	Frequency range	Remarks	Verdict
Loop	9 kHz to 30 MHz	FCC §15.209	P



Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1.3290	25.7	65.2	-39.5	QP
5.1630	28.8	69.5	-40.7	QP
10.1018	25.1	69.5	-44.4	QP

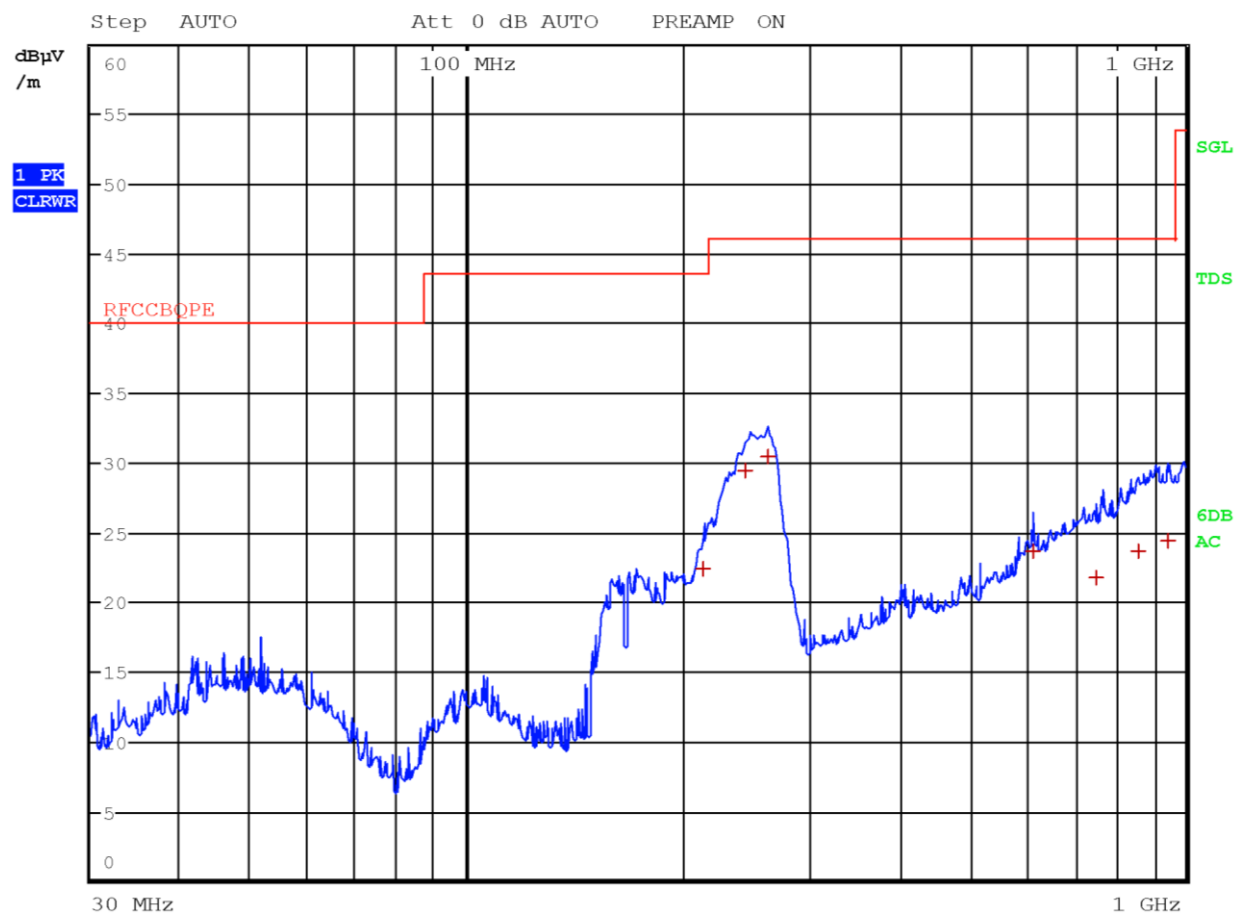
Antenna Polarization	Frequency range	Remarks	Verdict
Horizontal	30 to 1000 MHz	FCC §15.209	P



RBW 120 kHz

MT 1 s

PREAMP ON



Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
213.1600	22.5	43.5	-21.0	QP
244.7600	29.5	46.0	-16.5	QP
261.8400	30.5	46.0	-15.5	QP
614.4000	23.7	46.0	-22.3	QP
748.8800	21.7	46.0	-24.3	QP
860.1200	23.7	46.0	-22.3	QP
944.7200	24.4	46.0	-21.6	QP

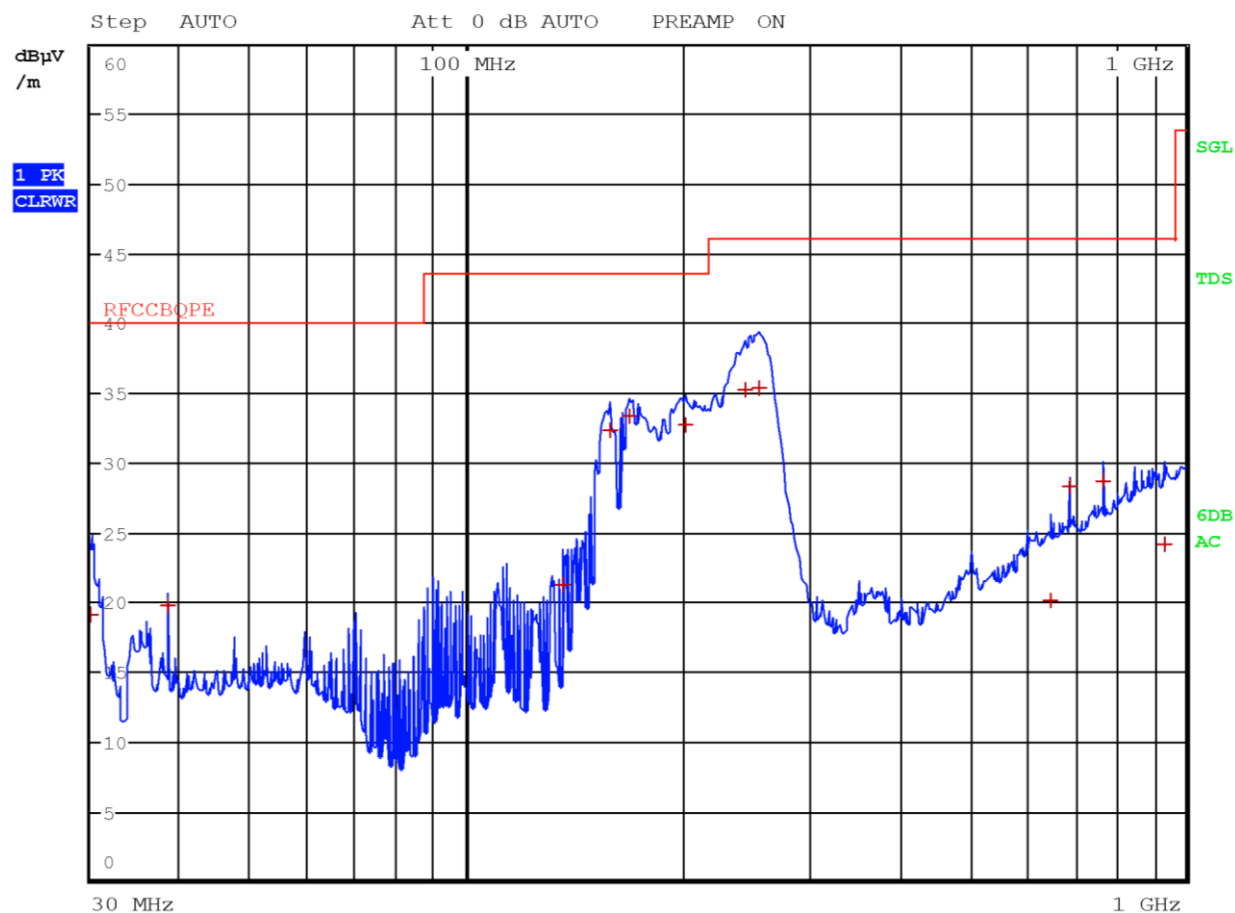
Antenna Polarization	Frequency range	Remarks	Verdict
Vertical	30 to 1000 MHz	FCC §15.209	P



RBW 120 kHz

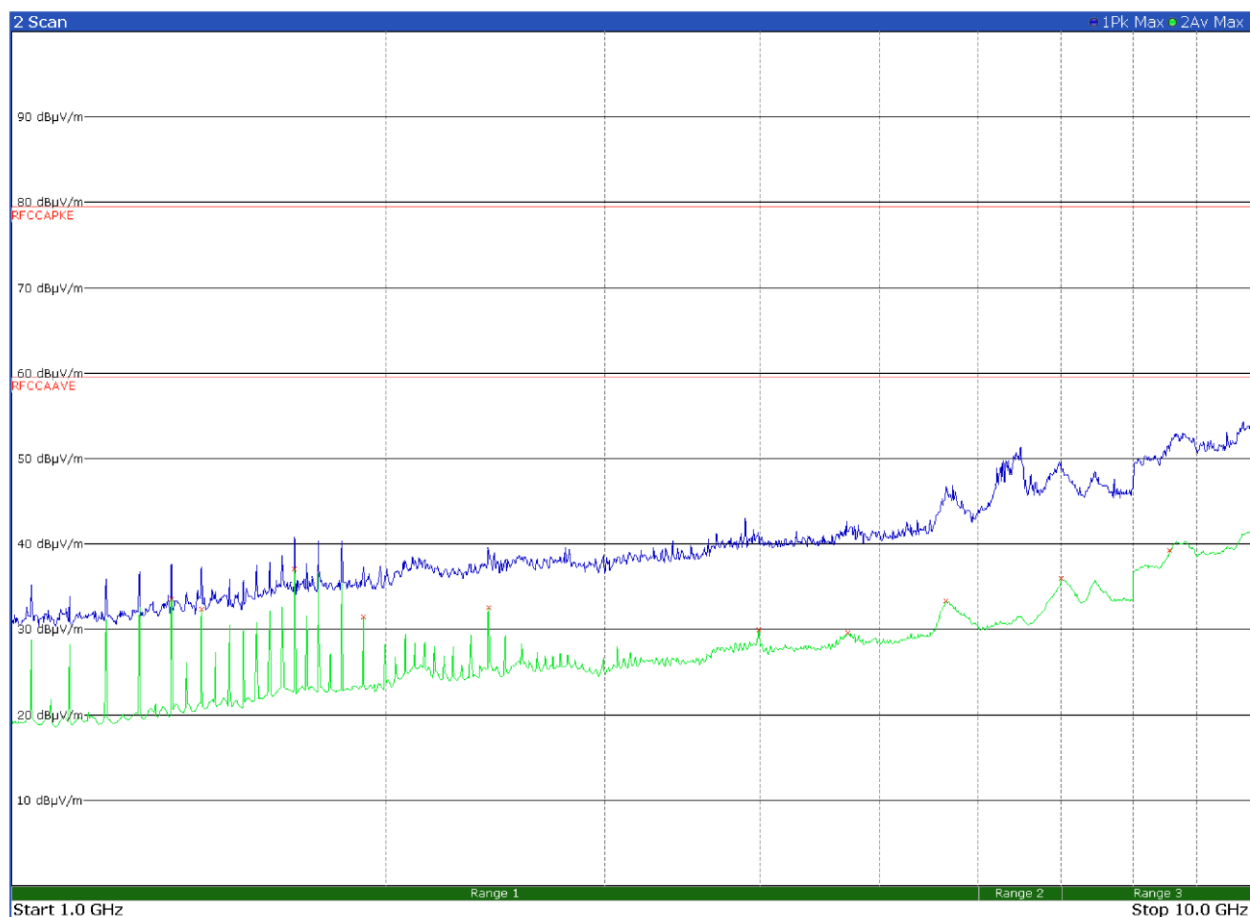
MT 1 s

PREAMP ON



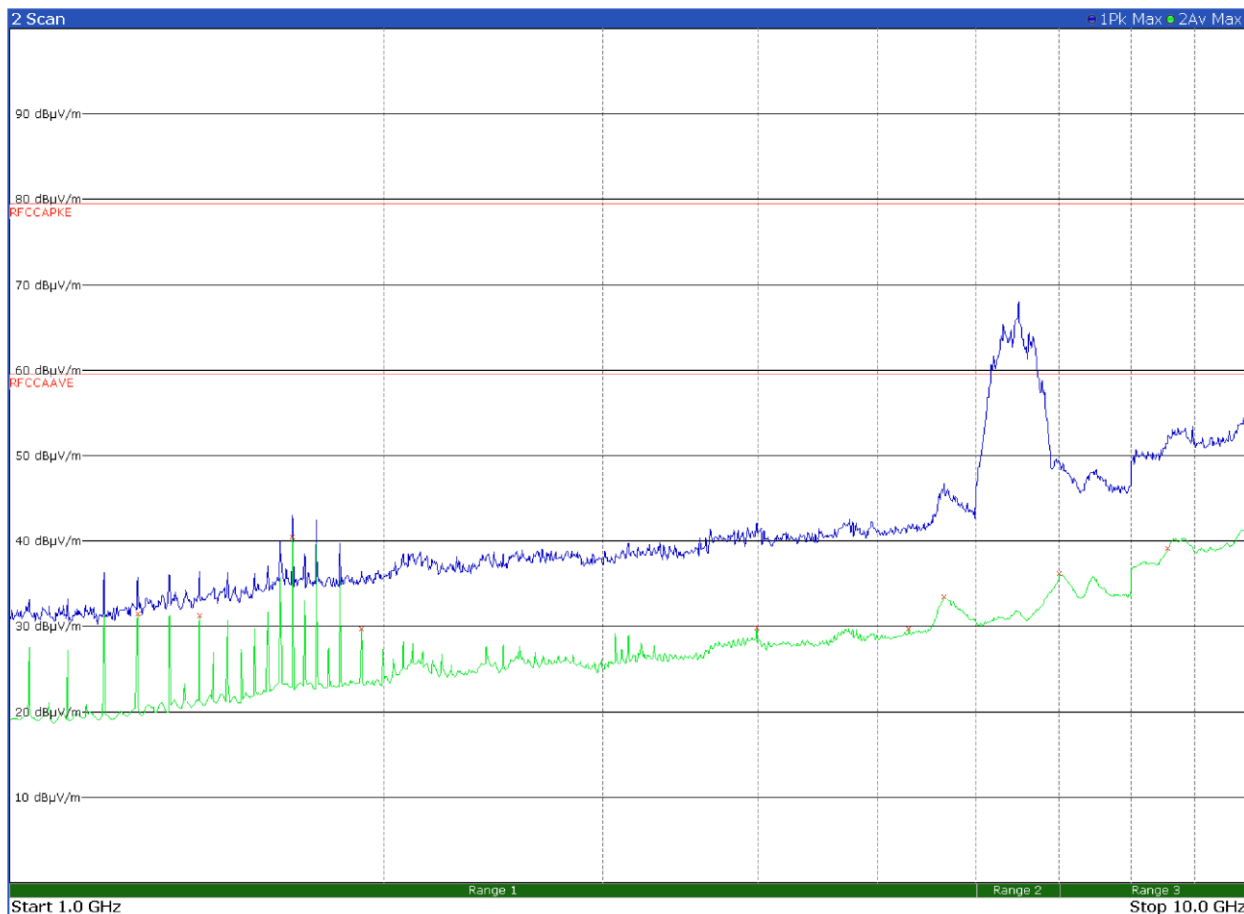
Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
30.0800	19.2	40.0	-20.8	QP
38.4000	19.8	40.0	-20.2	QP
135.8800	21.3	43.5	-22.2	QP
158.2800	32.4	43.5	-11.1	QP
168.7600	33.4	43.5	-10.1	QP
201.8000	32.8	43.5	-10.7	QP
244.0400	35.3	46.0	-10.7	QP
255.8800	35.4	46.0	-10.6	QP
648.6800	20.2	46.0	-25.8	QP
691.2000	28.3	46.0	-17.7	QP
768.0000	28.7	46.0	-17.3	QP
934.0800	24.2	46.0	-21.8	QP

Antenna Polarization	Frequency range	Remarks	Verdict
Horizontal	1 to 10 GHz	FCC §15.209	P



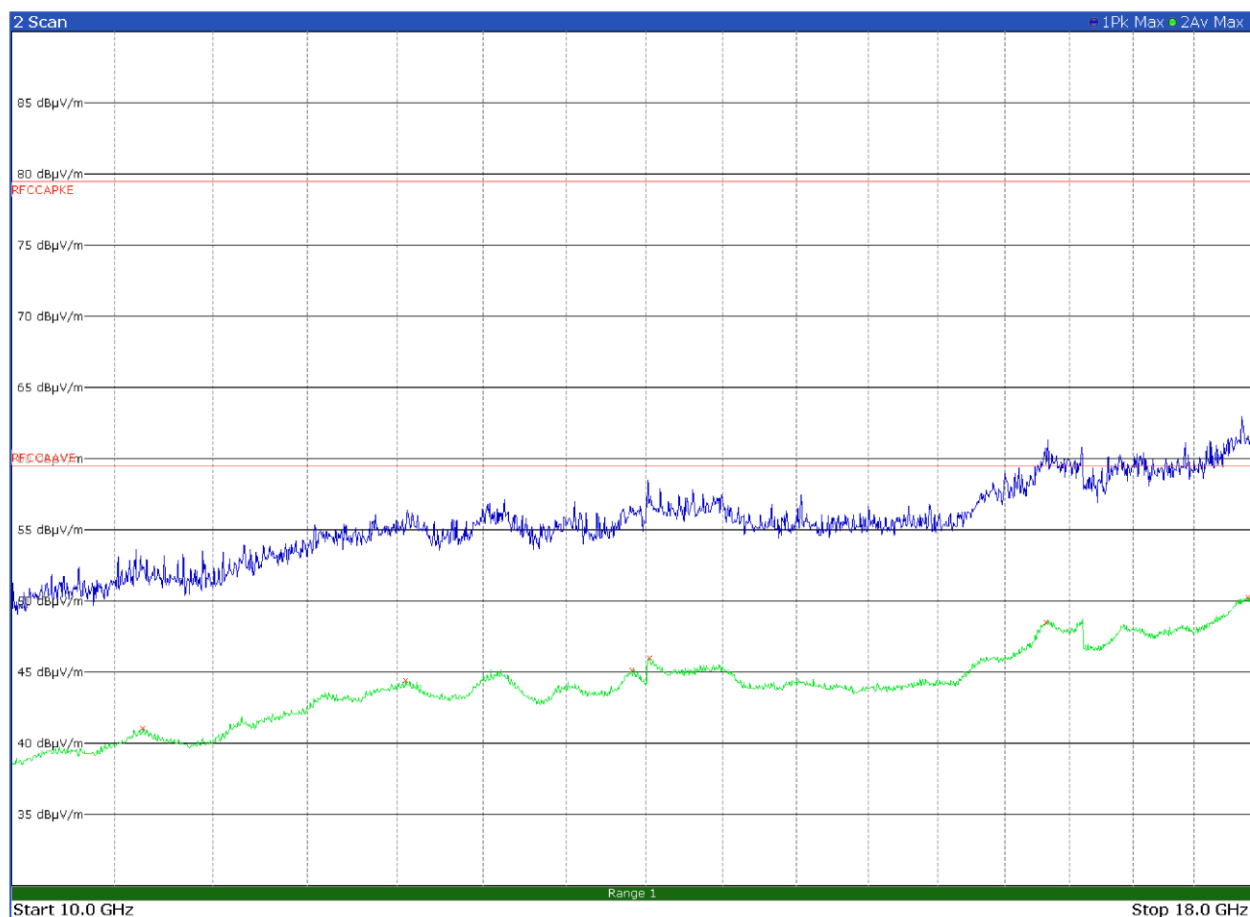
Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1344.0000	33.6	59.5	-25.9	Av
1420.7500	32.4	59.5	-27.1	Av
1689.5000	37.1	59.5	-22.4	Av
1920.0000	31.5	59.5	-28.0	Av
2419.2500	32.6	59.5	-26.9	Av
3993.5000	29.9	59.5	-29.6	Av
4710.0000	29.7	59.5	-29.8	Av
5648.2500	33.4	59.5	-26.1	Av
7000.5000	36.0	59.5	-23.5	Av
8560.2500	39.3	59.5	-20.2	Av
9980.5000	42.1	59.5	-17.4	Av

Antenna Polarization	Frequency range	Remarks	Verdict
Vertical	1 to 10 GHz	FCC §15.209	P



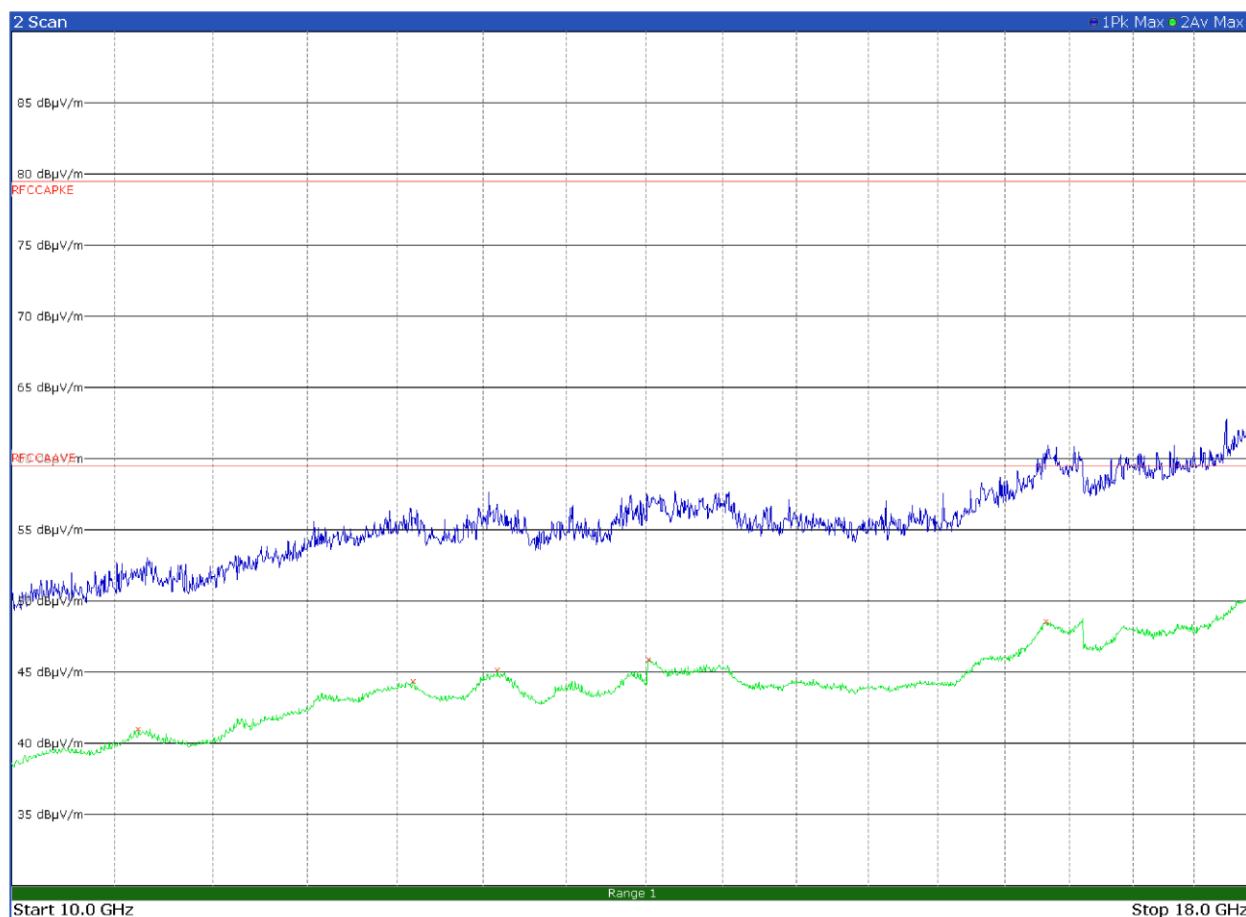
Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1267.2500	31.5	59.5	-28.0	Av
1420.7500	31.3	59.5	-28.2	Av
1689.5000	40.5	59.5	-19.0	Av
1920.0000	29.8	59.5	-29.7	Av
3993.5000	29.8	59.5	-29.7	Av
5293.2500	29.7	59.5	-29.8	Av
5651.5000	33.5	59.5	-26.0	Av
7001.7500	36.2	59.5	-23.3	Av
8560.5000	39.2	59.5	-20.3	Av
9981.5000	42.0	59.5	-17.5	Av

Antenna Polarization	Frequency range	Remarks	Verdict
Horizontal	10 to 18 GHz	FCC §15.209	P



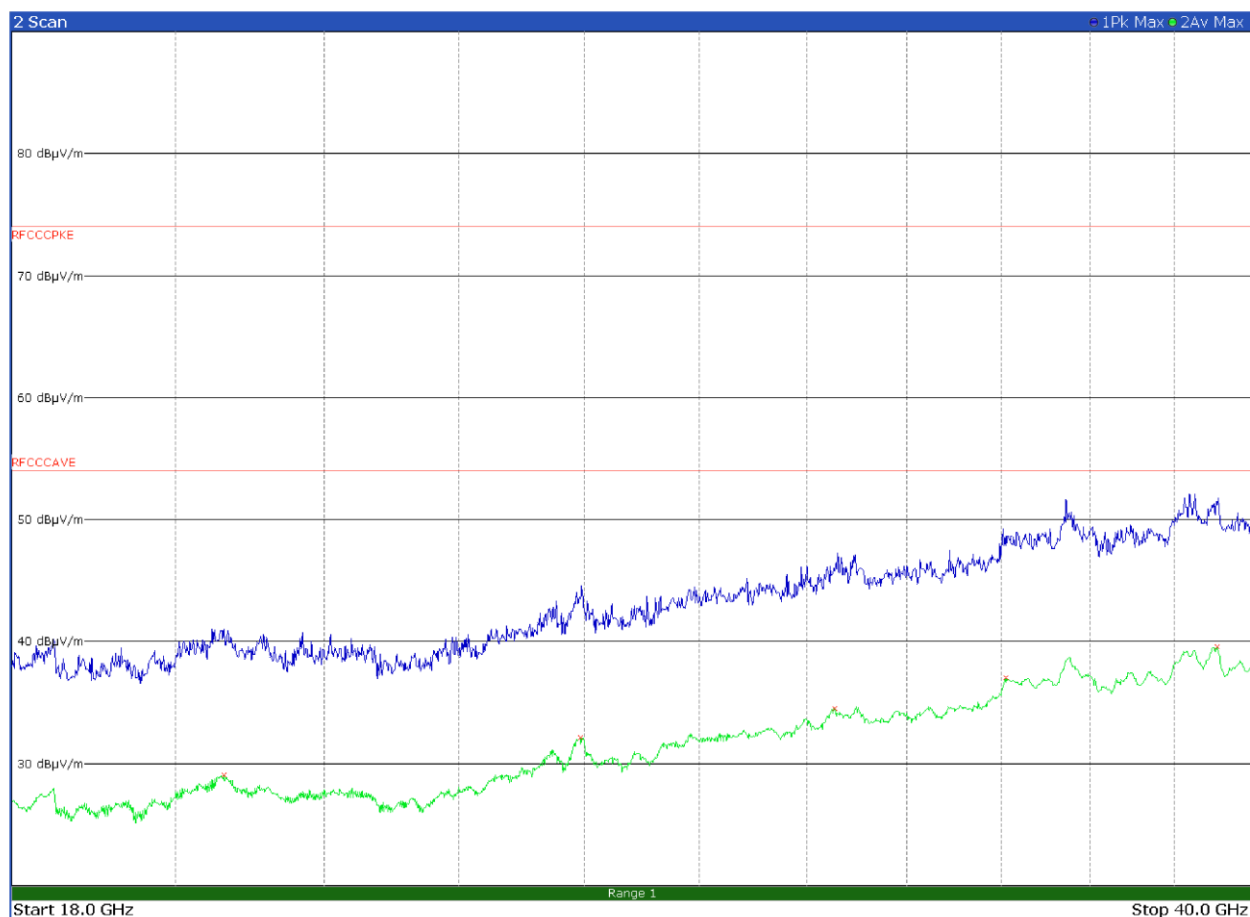
Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
10639.2500	41.1	59.5	-18.4	Av
12050.0000	44.4	59.5	-15.1	Av
13407.7500	45.2	59.5	-14.3	Av
13524.2500	46.1	59.5	-13.4	Av
16312.7500	48.5	59.5	-11.0	Av
17953.0000	50.3	59.5	-9.2	Av

Antenna Polarization	Frequency range	Remarks	Verdict
Vertical	10 to 18 GHz	FCC §15.209	P



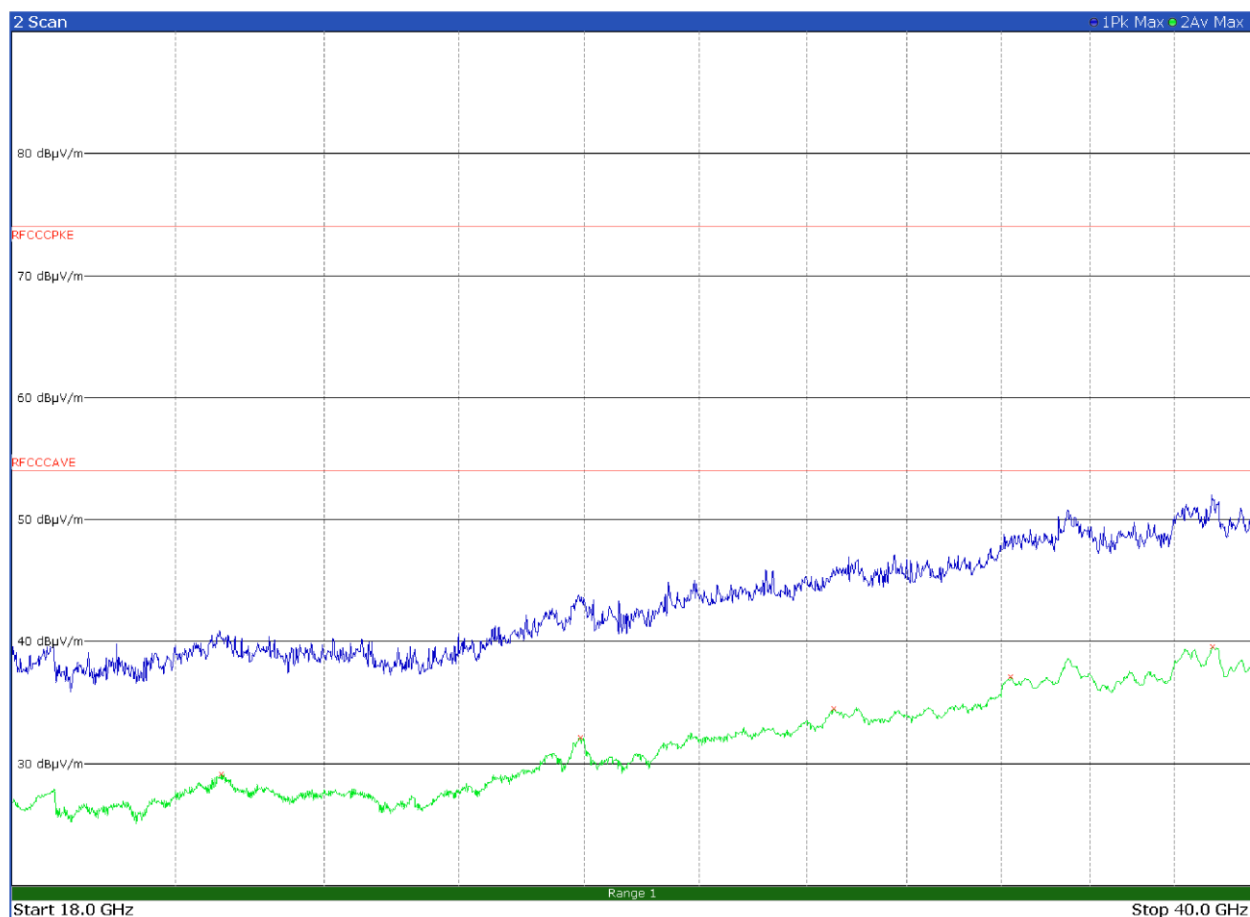
Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
10615.0000	41.0	59.5	-18.5	Av
12091.5000	44.4	59.5	-15.1	Av
12584.7500	45.2	59.5	-14.3	Av
13520.2500	45.9	59.5	-13.6	Av
16313.7500	48.6	59.5	-10.9	Av
17972.7500	50.5	59.5	-9.0	Av

Antenna Polarization	Frequency range	Remarks	Verdict
Horizontal	18 to 40 GHz	FCC §15.209	P



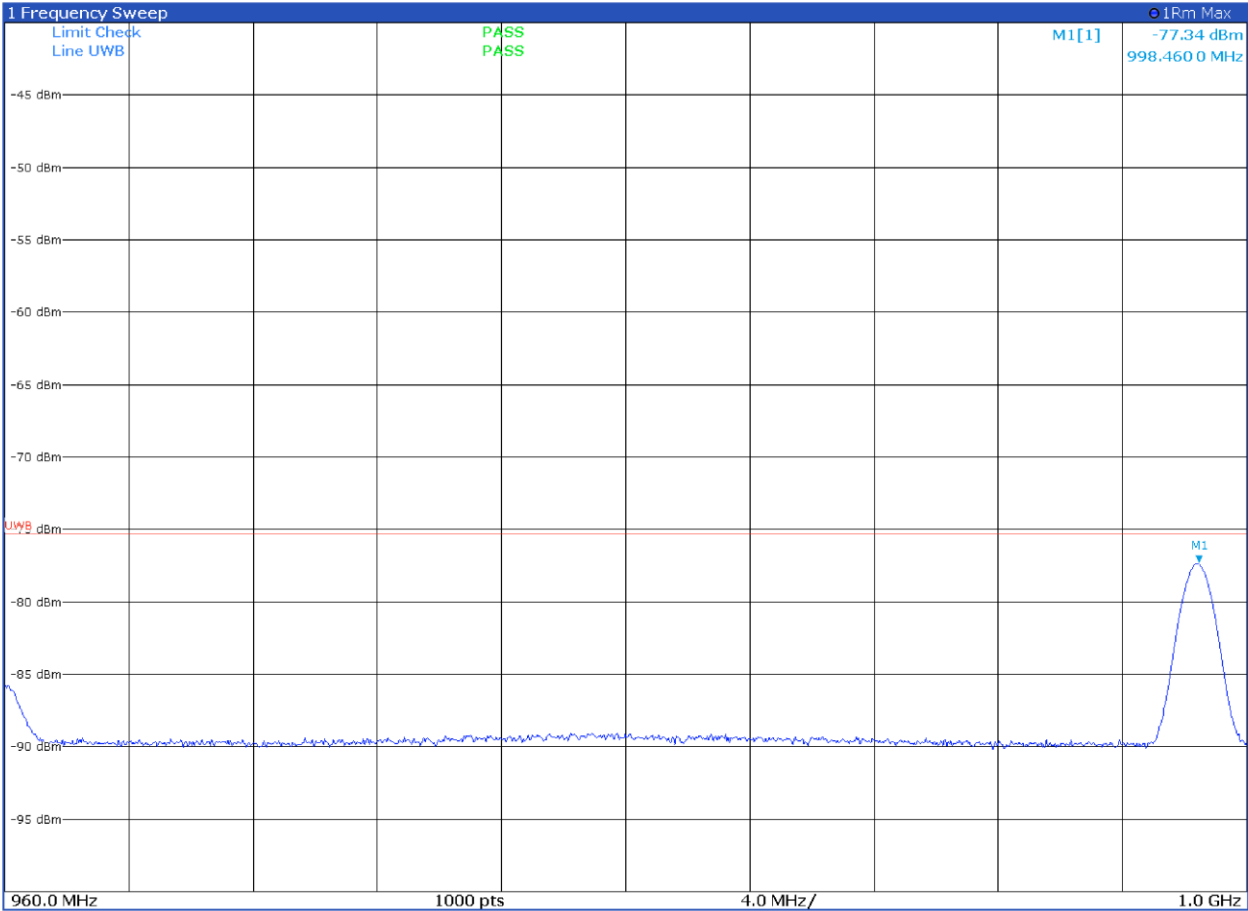
Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
20628.7500	29.1	54.0	-24.9	Av
25940.0000	32.2	54.0	-21.8	Av
30554.2500	34.6	54.0	-19.4	Av
34101.5000	37.1	54.0	-16.9	Av
39080.0000	39.6	54.0	-14.4	Av

Antenna Polarization	Frequency range	Remarks	Verdict
Vertical	18 to 40 GHz	FCC §15.209	P



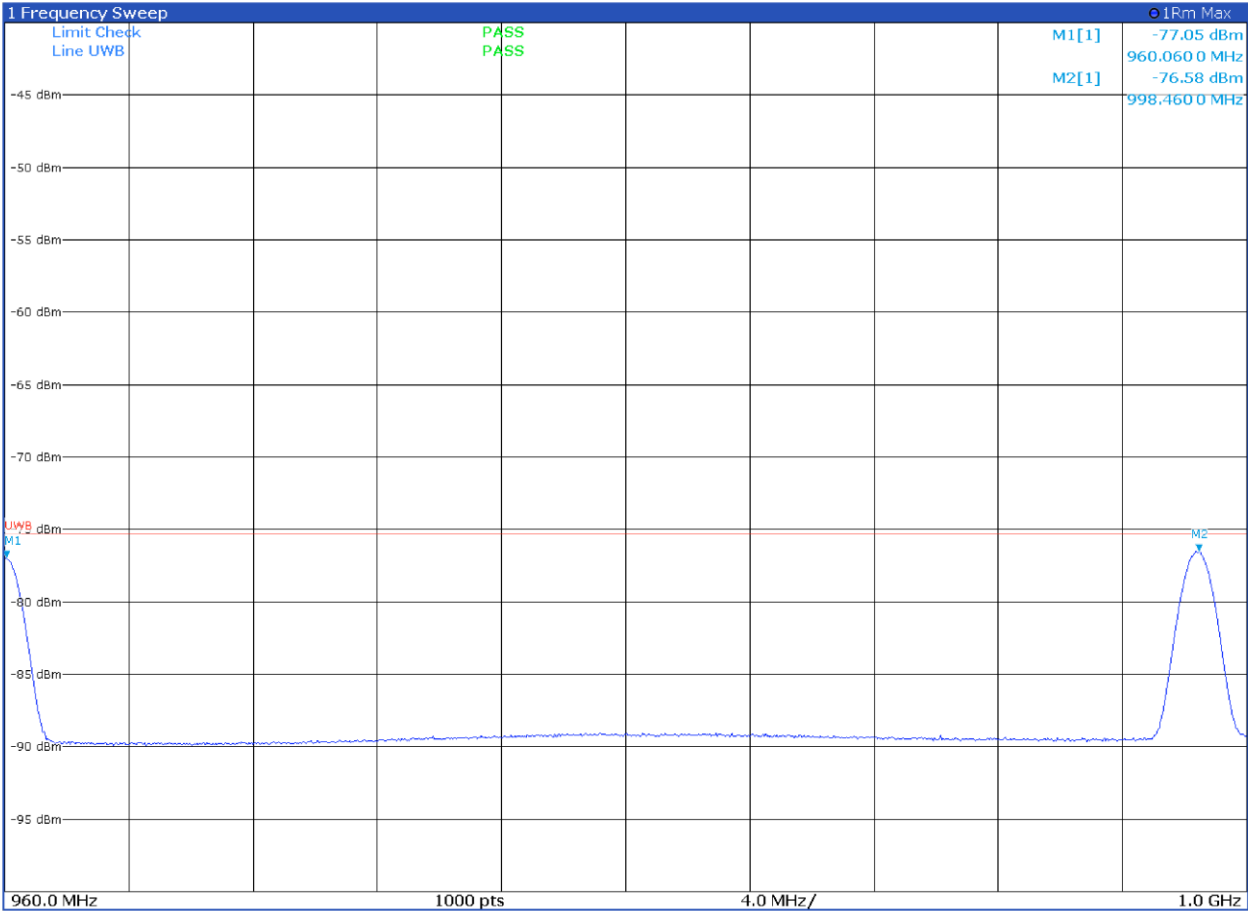
Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
20599.2500	29.2	54.0	-24.8	Av
25937.7500	32.2	54.0	-21.8	Av
30529.0000	34.6	54.0	-19.4	Av
34220.7500	37.2	54.0	-16.8	Av
38959.2500	39.6	54.0	-14.4	Av

Antenna Polarization	Frequency range	Remarks	Verdict
Horizontal	960 to 1000 MHz	UWB emission FCC §15.250 (average)	P



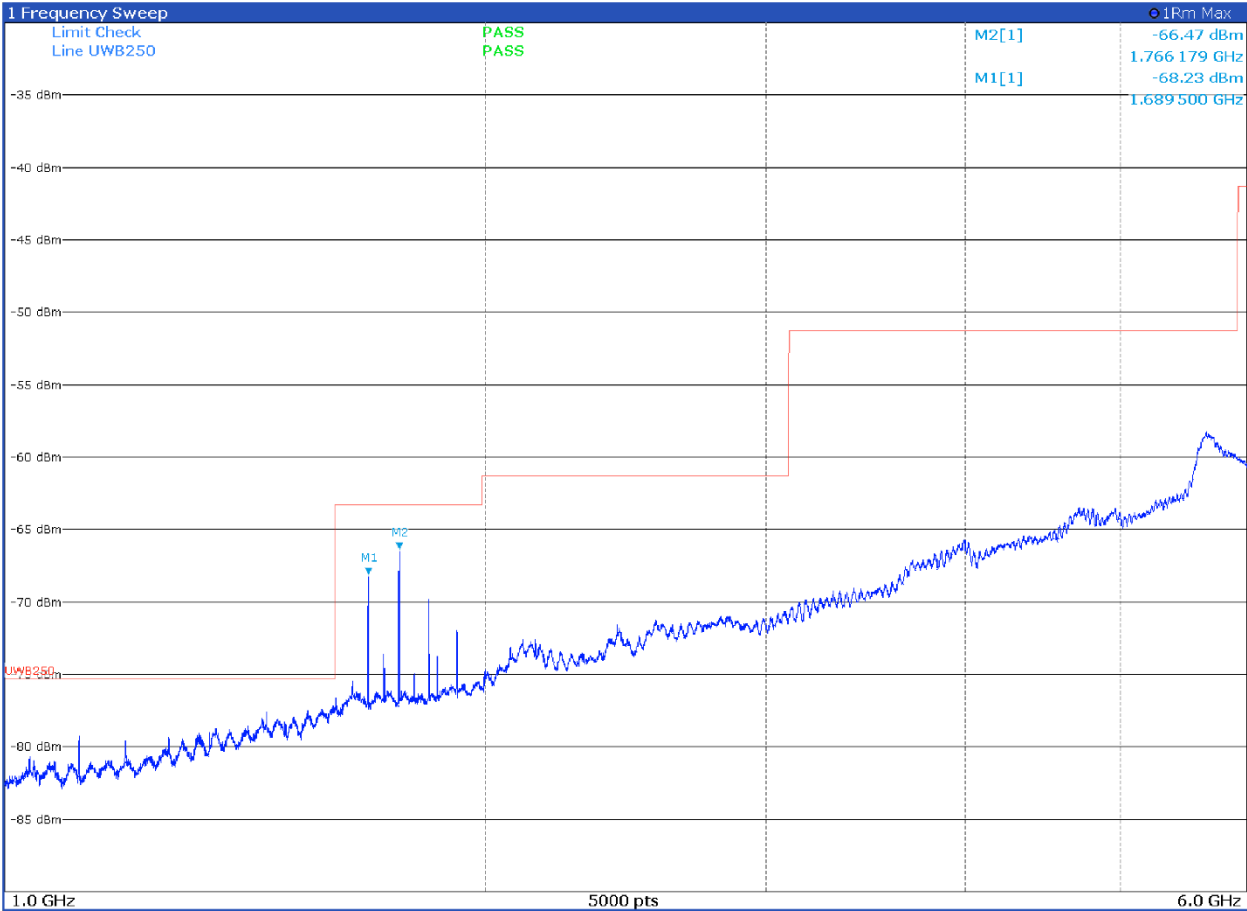
The radiated emissions found un this range are not generated by the UWB radio module

Antenna Polarization	Frequency range	Remarks	Verdict
Vertical	960 to 1000 MHz	UWB emission FCC §15.250 (average)	P



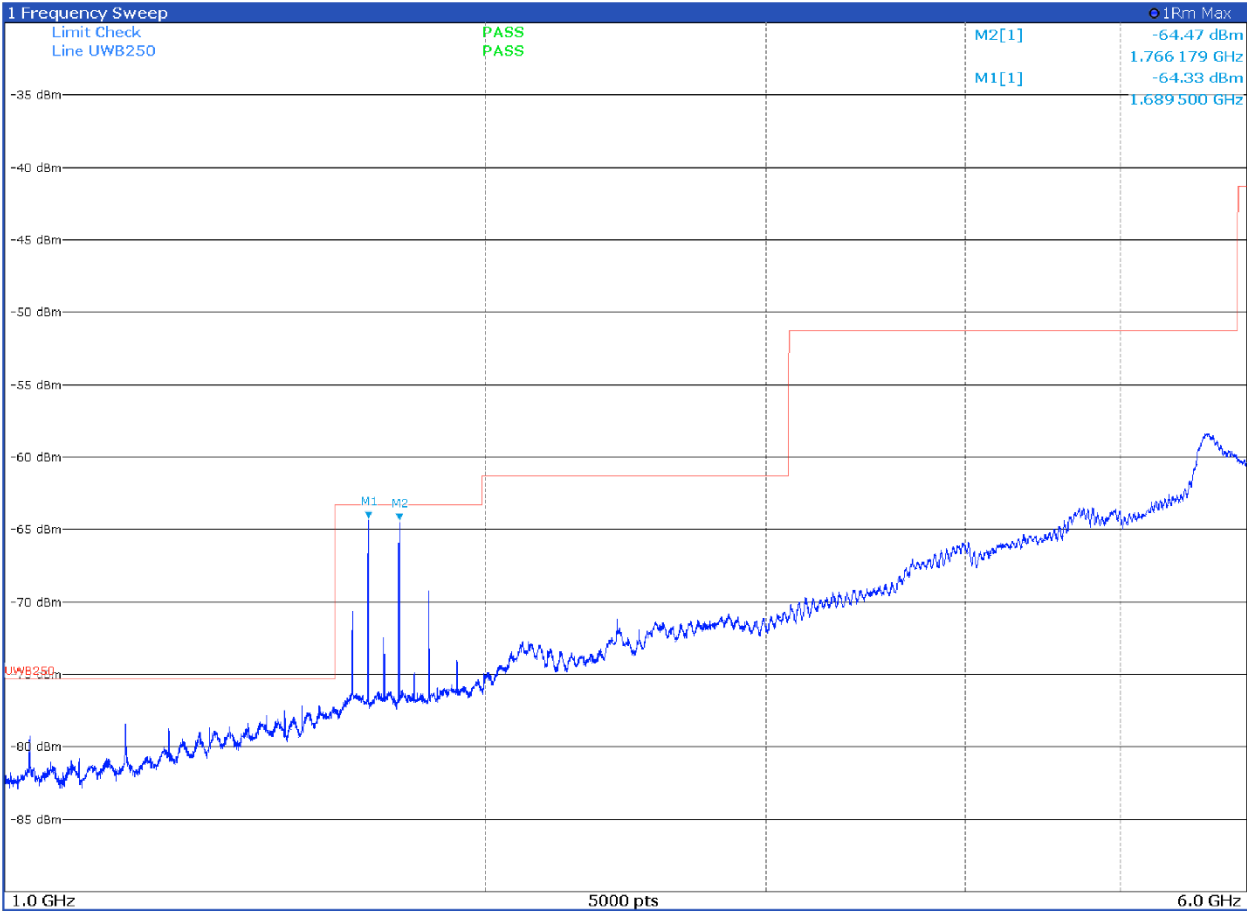
The radiated emissions found un this range are not generated by the UWB radio module

Antenna Polarization	Frequency range	Remarks	Verdict
Horizontal	1 to 6 GHz	UWB emission FCC §15.250 (average)	P



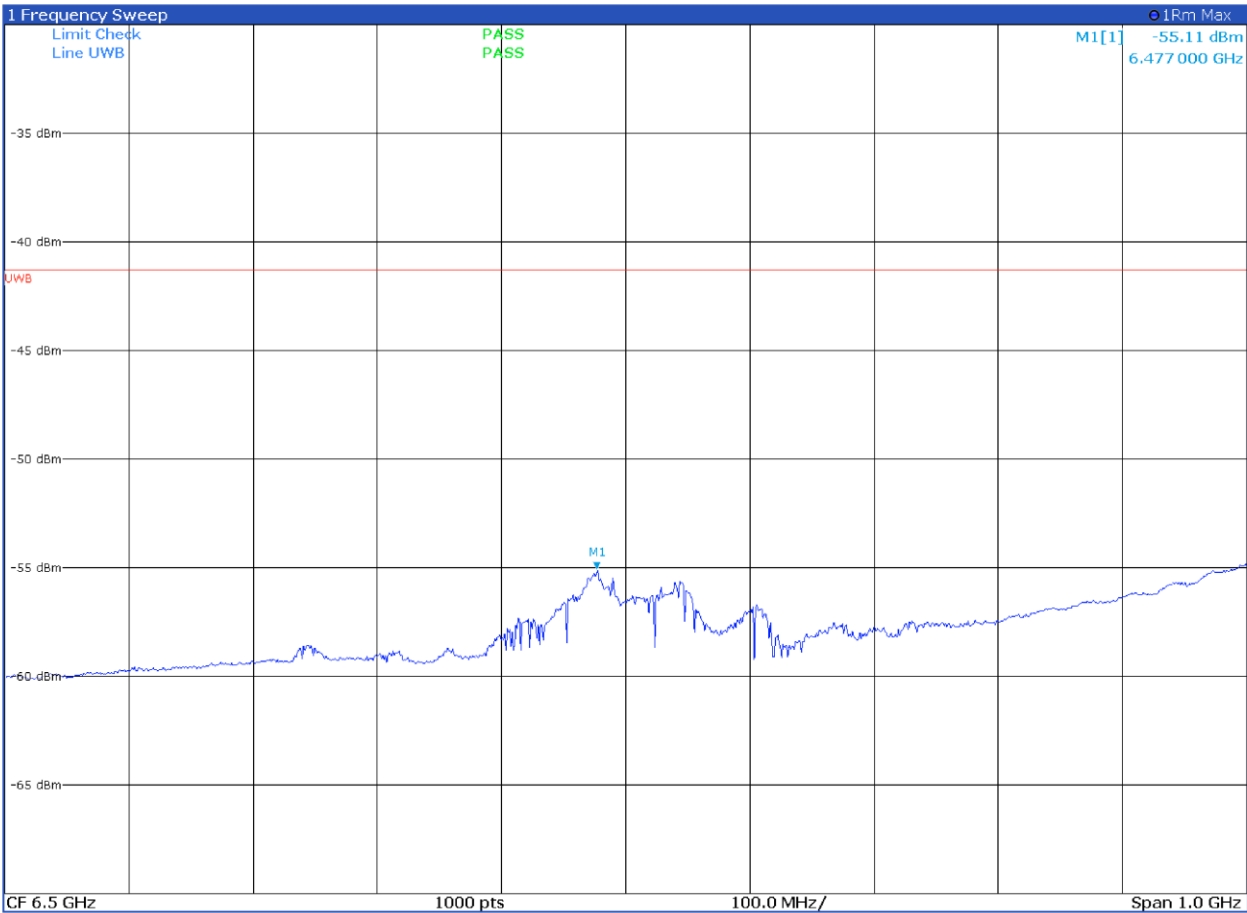
The radiated emissions found un this range are not generated by the UWB radio module

Antenna Polarization	Frequency range	Remarks	Verdict
Vertical	1 to 6 GHz	UWB emission FCC §15.250 (average)	P

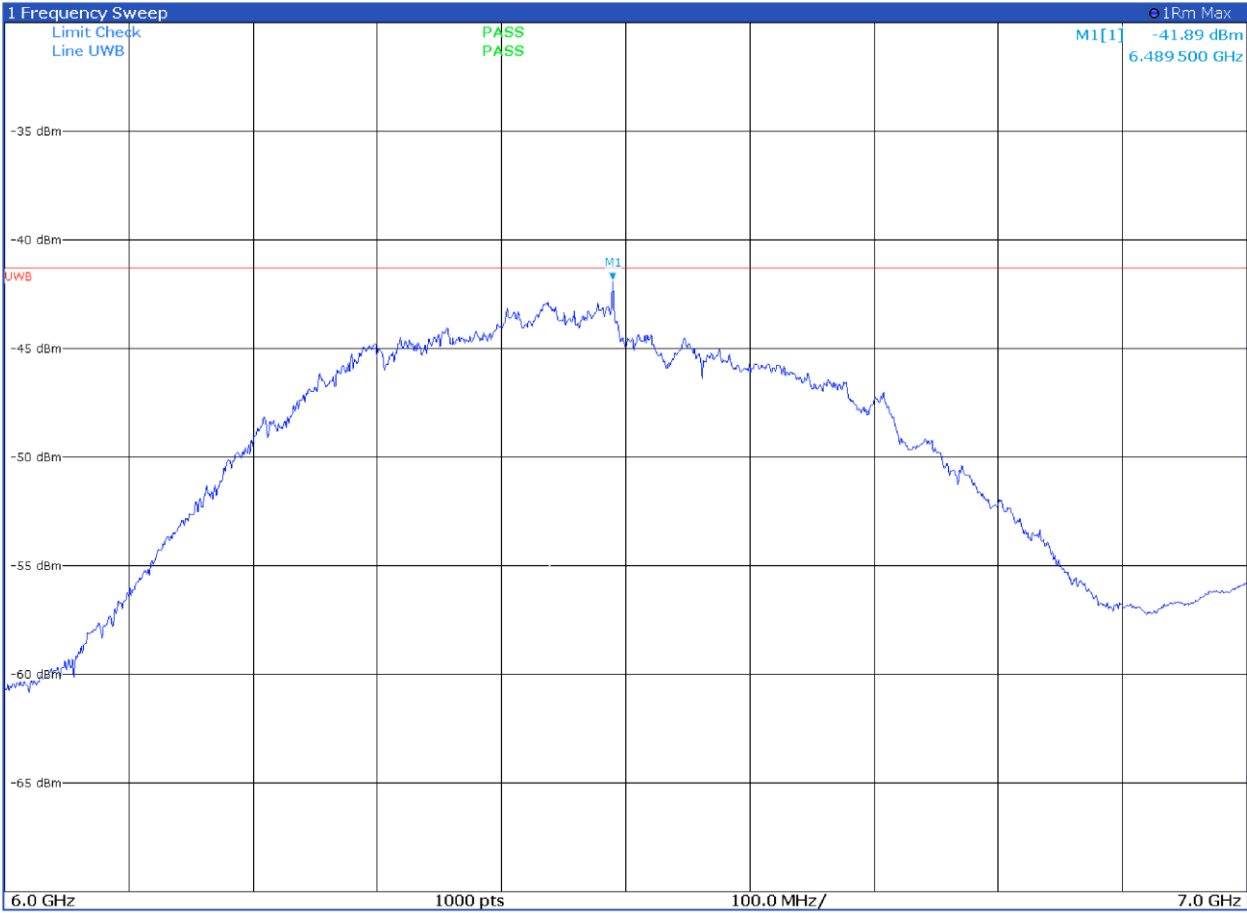


The radiated emissions found un this range are not generated by the UWB radio module

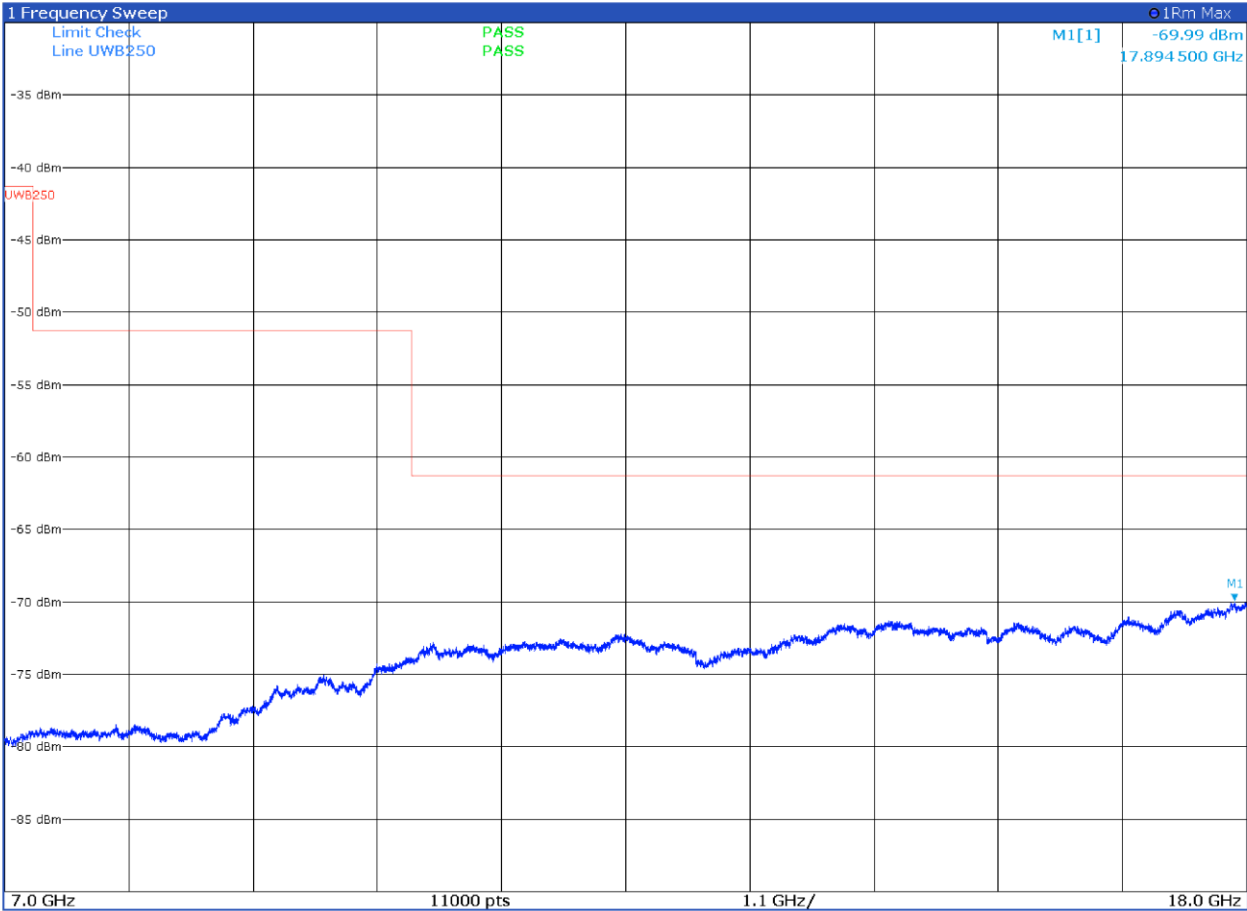
Antenna Polarization	Frequency range	Remarks	Verdict
Horizontal	6 to 7 GHz	UWB emission FCC §15.250 (average)	P



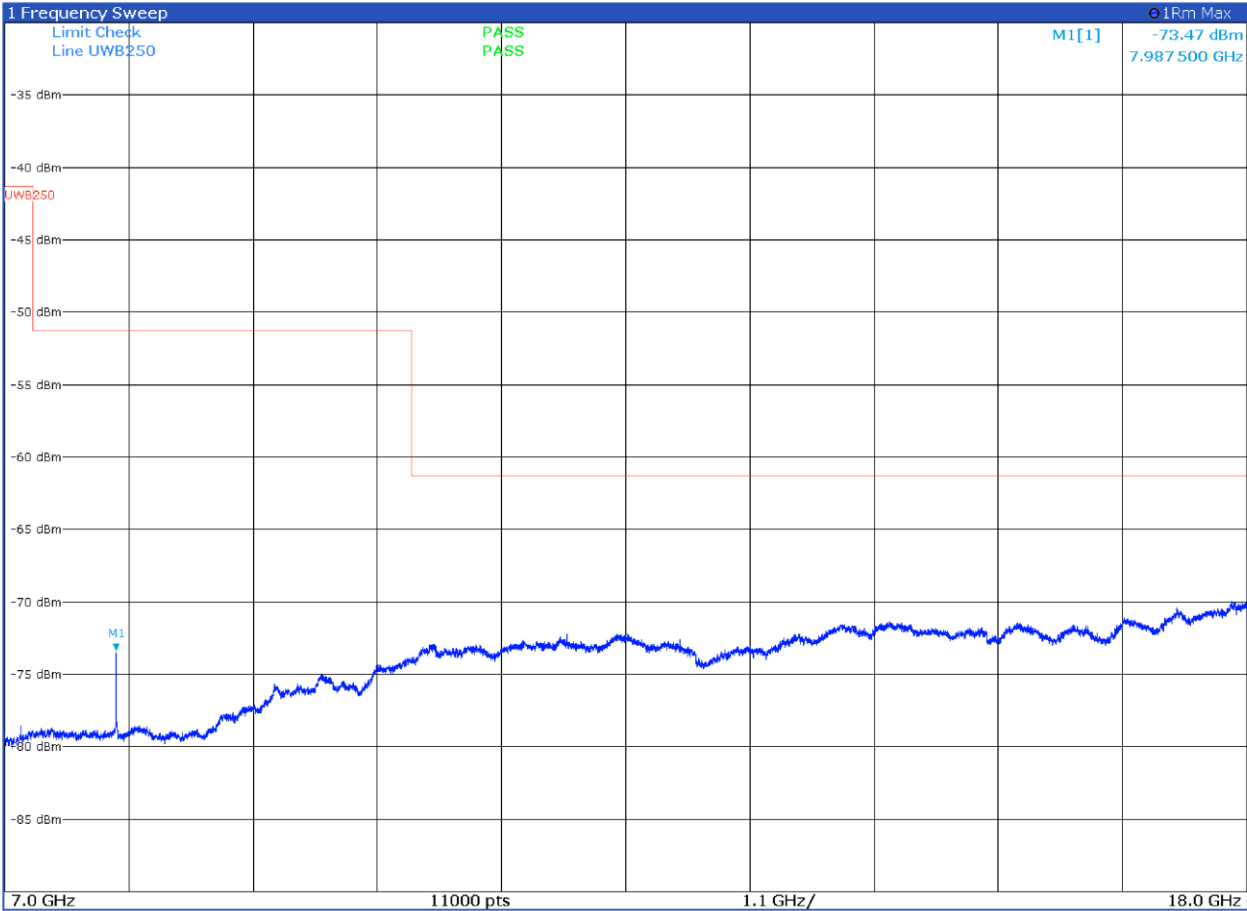
Antenna Polarization	Frequency range	Remarks	Verdict
Vertical	6 to 7 GHz	UWB emission FCC §15.250 (average)	P



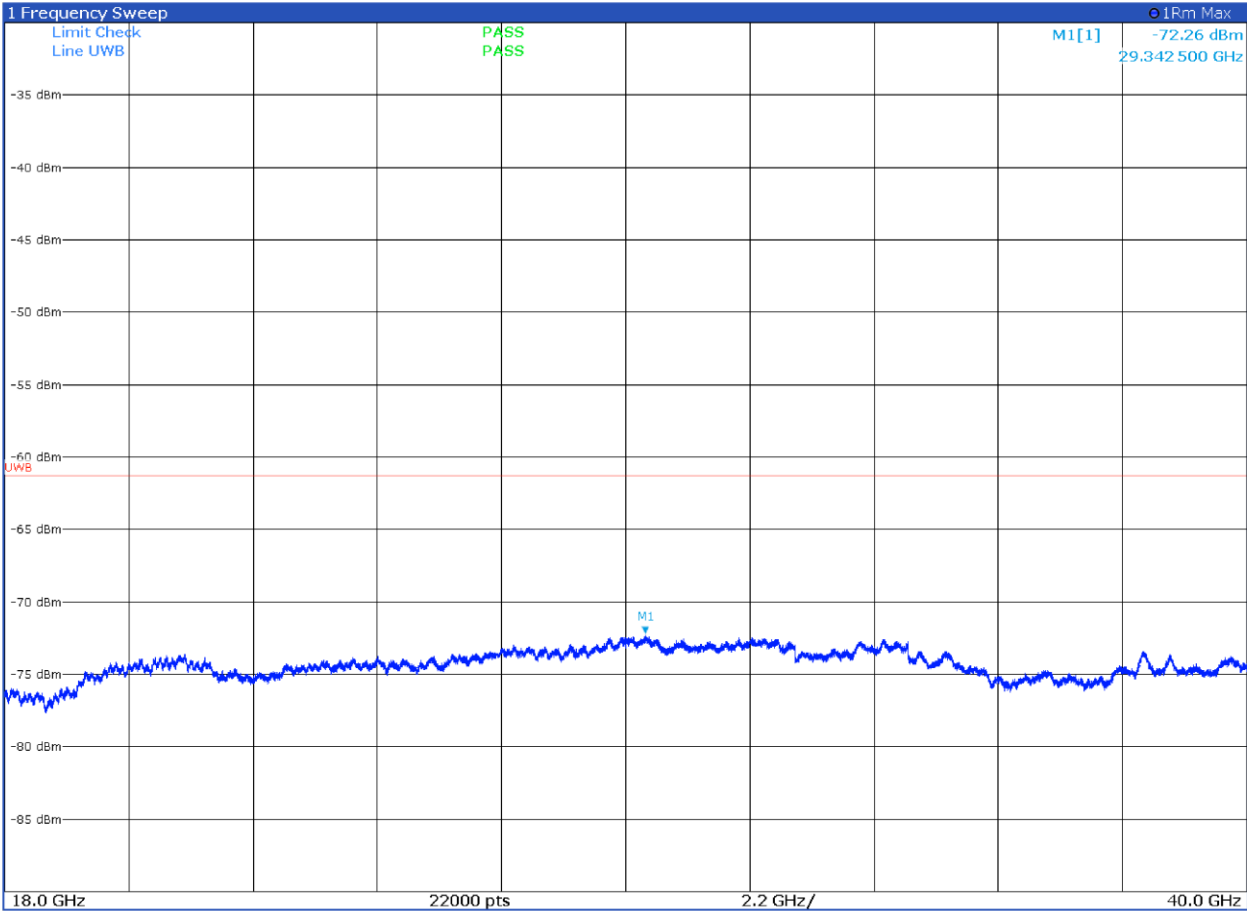
Antenna Polarization	Frequency range	Remarks	Verdict
Horizontal	7 to 18 GHz	UWB emission FCC §15.250 (average)	P



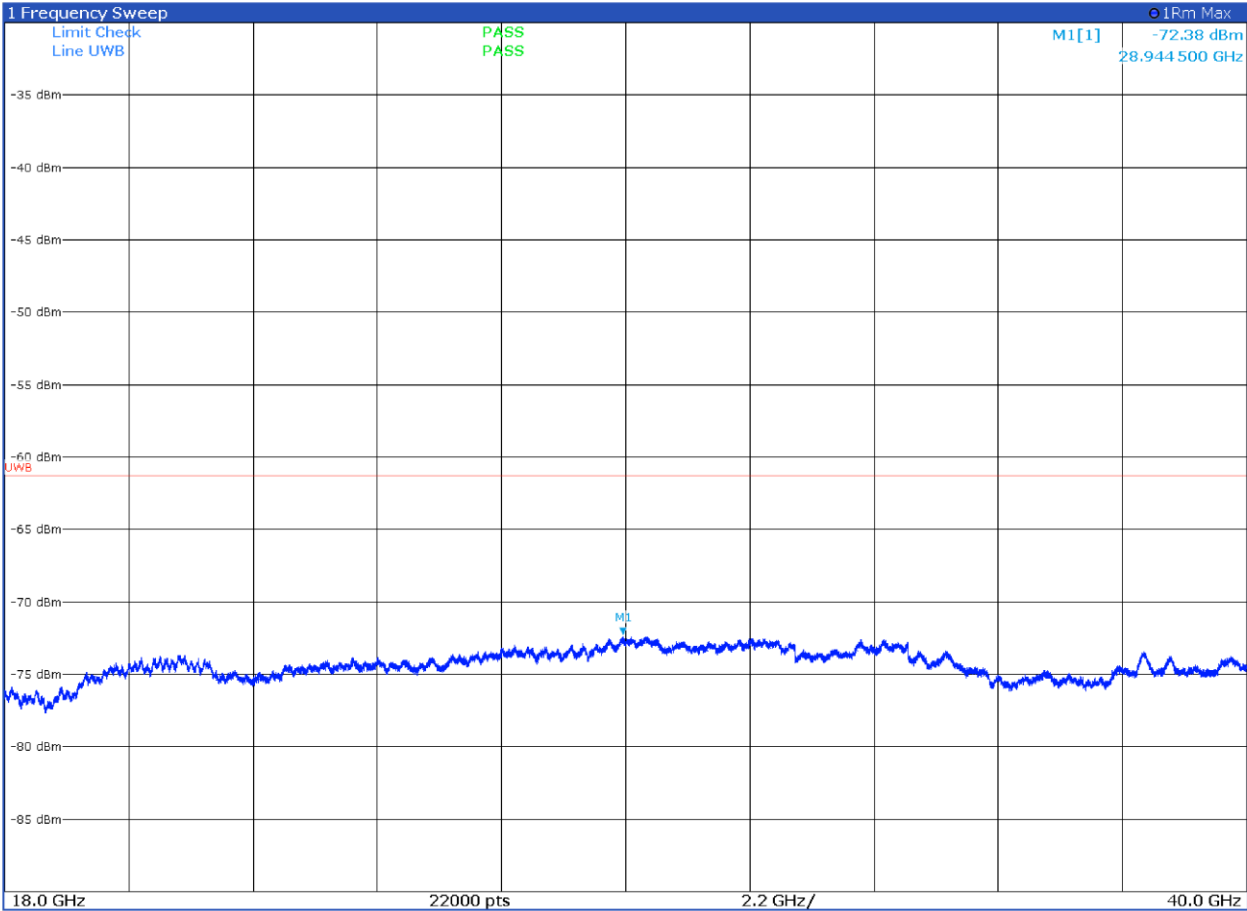
Antenna Polarization	Frequency range	Remarks	Verdict
Vertical	7 to 18 GHz	UWB emission FCC §15.250 (average)	P



Antenna Polarization	Frequency range	Remarks	Verdict
Horizontal	18 to 40 GHz	UWB emission FCC §15.250 (average)	P



Antenna Polarization	Frequency range	Remarks	Verdict
Vertical	18 to 40 GHz	UWB emission FCC §15.250 (average)	P



7.5 Radiated Emissions in GPS band

7.5.1 Definitions and limits

FCC 15.250

(d)(2) In addition to the radiated emission limits specified in the table in paragraph (d)(1) of this section, transmitters operating under the provisions of this section shall not exceed the following RMS average limits when measured using a resolution bandwidth of no less than 1 kHz:

Table 7.5-1: Average limits

Frequency in MHz	EIRP in dBm
1164 – 1240	-85.3
1559 – 1610	-85.3

Notes: --

7.5.2 Test date

Start date April 11, 2025

7.5.3 Observations, settings and special notes

Spectrum analyzer settings:

Resolution bandwidth:	1 kHz
Video bandwidth:	3 kHz
Detector mode Trace 2	RMS
Trace 2 mode :	Max Hold

7.5.4 Test equipment list

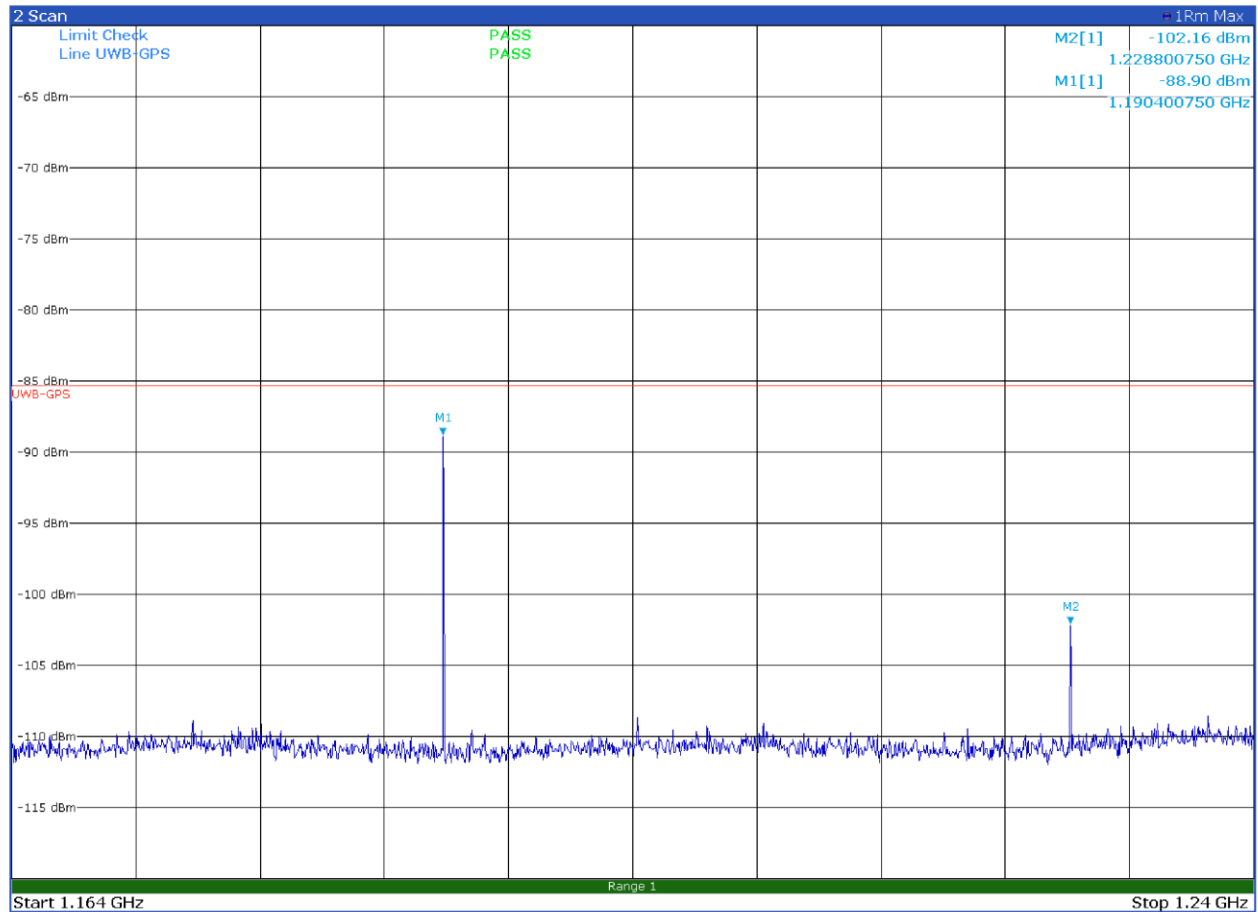
Table 7.5-2: Equipment list

Equipment	Manufacturer	Model no.	Asset no.	Cal cycle	Next cal.
EMI Receiver	Rohde & Schwarz	ESW44	101620	2024-09	2025-09
Antenna 1 - 18 GHz	Schwarzbeck Mess-Elektronik	STLP9148	STPL 9148-123	2024-08	2027-08
Preamplifier (1 ÷ 18 GHz)	Schwarzbeck	BBV9718C	00121	2025-01	2026-01
Controller	Maturo	FCU3.0	10041	NCR	NCR
Tilt antenna mast	Maturo	TAM4.0-E	10042	NCR	NCR
Turntable	Maturo	TT4.0-5T	2.527	NCR	NCR
Software turntable and mast	Maturo	mcApp	8.1.0.5410	NCR	NCR
Semi-anechoic chamber	Comtest	SAC-3	1711-150	2024-09	2026-09
Cable set	Rosenberger and Huber + Suhner	RE01+RE02	1.654+1.655	2025-01	2026-01
Coaxial cable	Rosenberger	ST.ALO-05	1.669	2025-03	2026-03

Note: NCR - no calibration required, VOU - verify on use

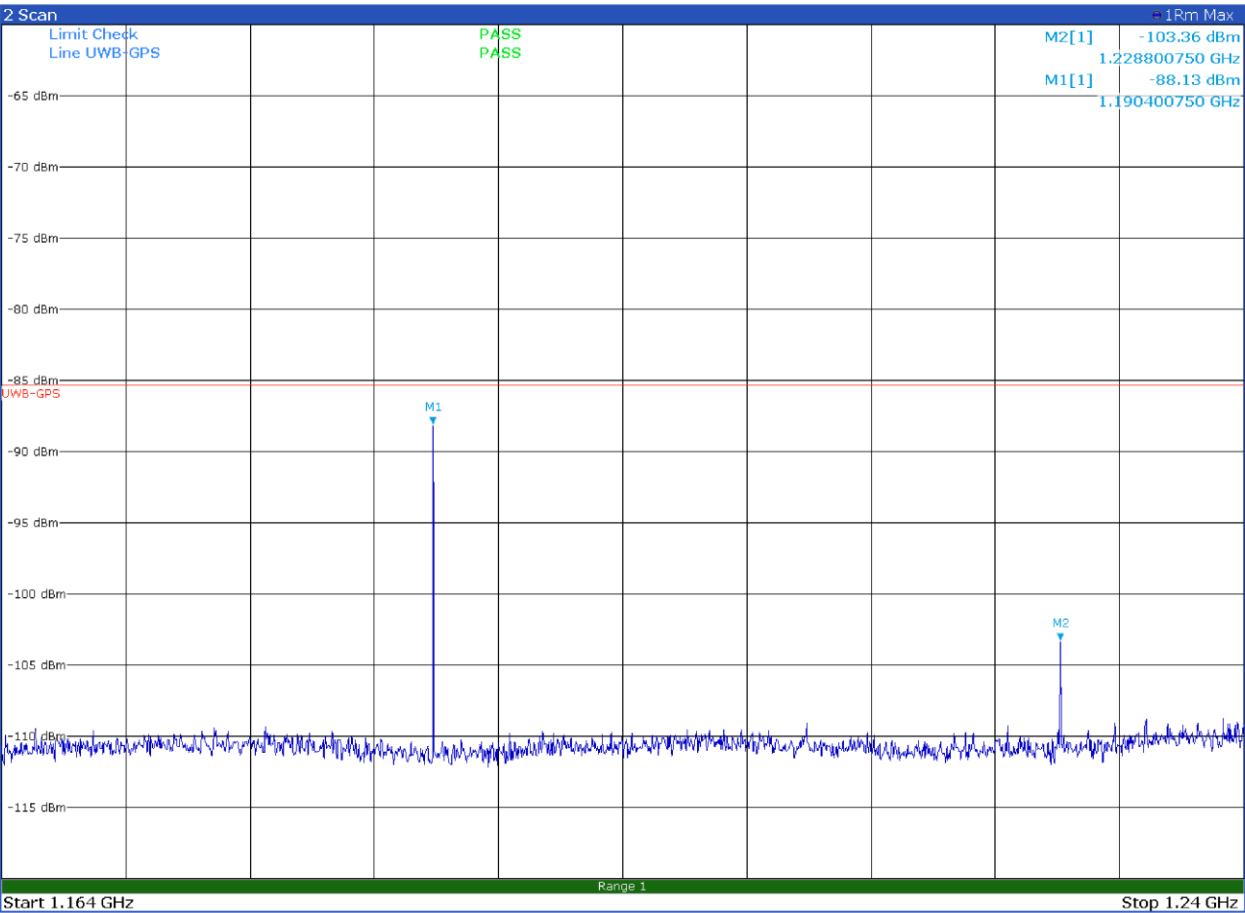
7.5.5 Test data

Antenna Polarization	Frequency range	Remarks	Verdict
Horizontal	1164 to 1240 MHz	UWB emission FCC §15.250 (average)	P



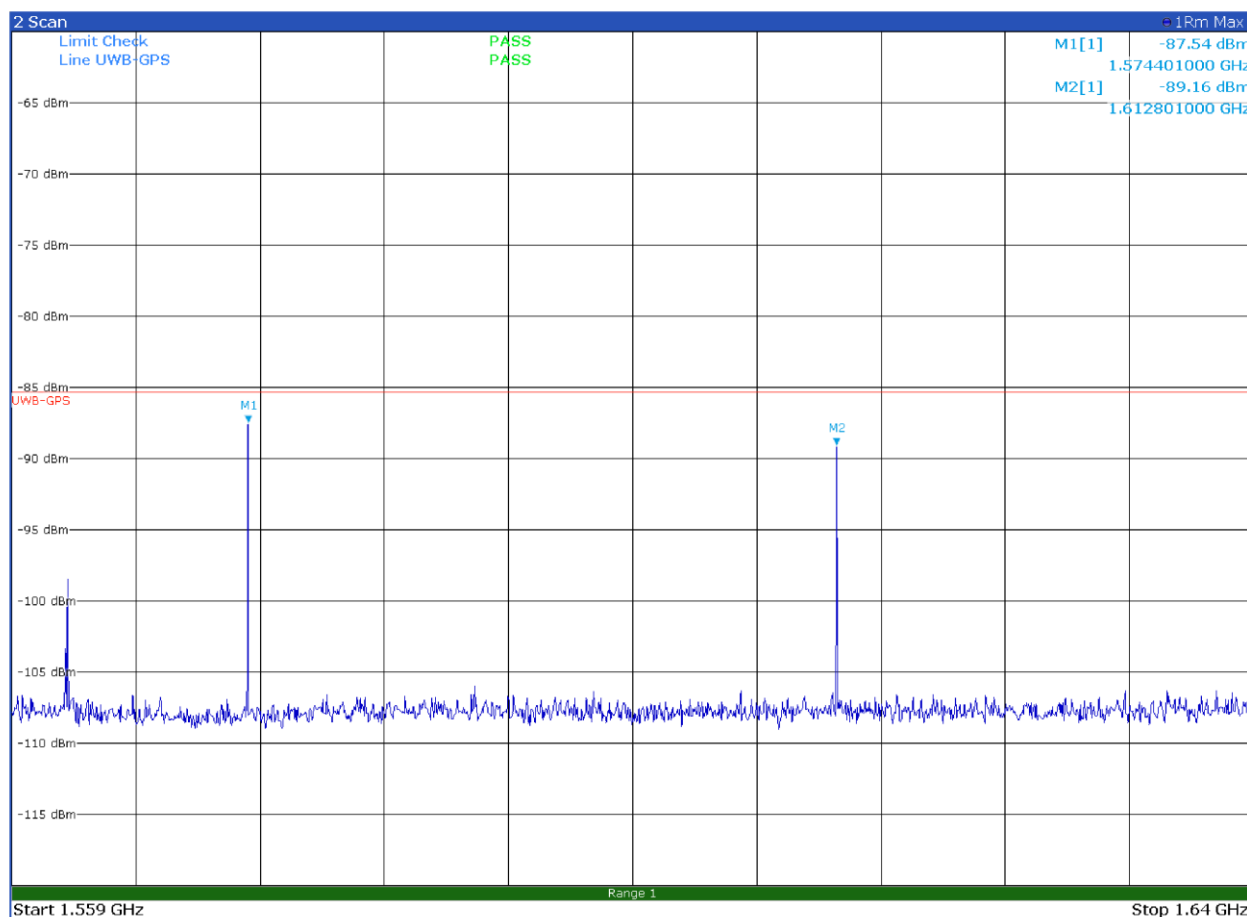
The radiated emissions found un this range are not generated by the UWB radio module

Antenna Polarization	Frequency range	Remarks	Verdict
Vertical	1164 to 1240 MHz	UWB emission FCC §15.250 (average)	P



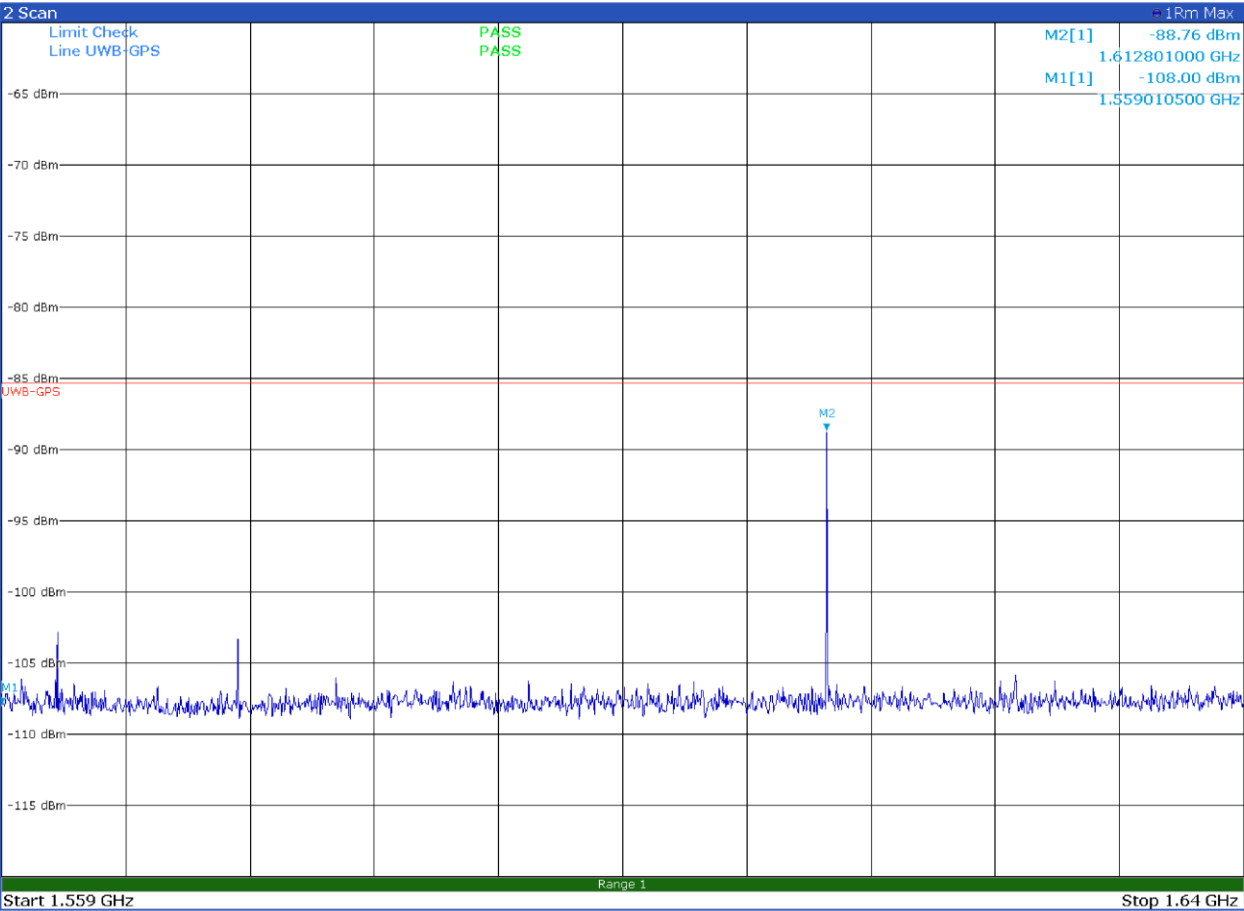
The radiated emissions found un this range are not generated by the UWB radio module

Antenna Polarization	Frequency range	Remarks	Verdict
Horizontal	1559 to 1610 MHz	UWB emission FCC §15.250 (average)	P



The radiated emissions found on this range are not generated by the UWB radio module

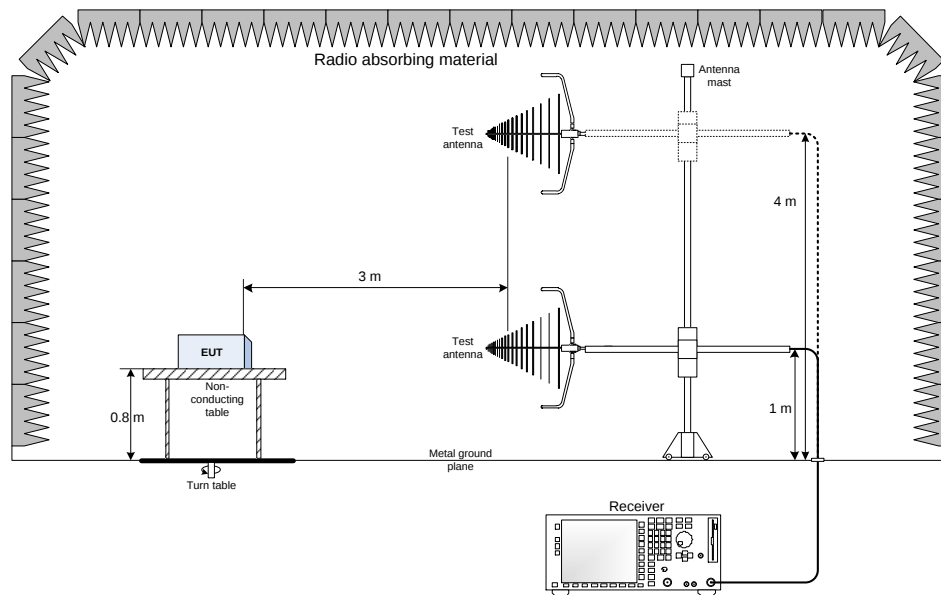
Antenna Polarization	Frequency range	Remarks	Verdict
Vertical	1559 to 1610 MHz	UWB emission FCC §15.250 (average)	P



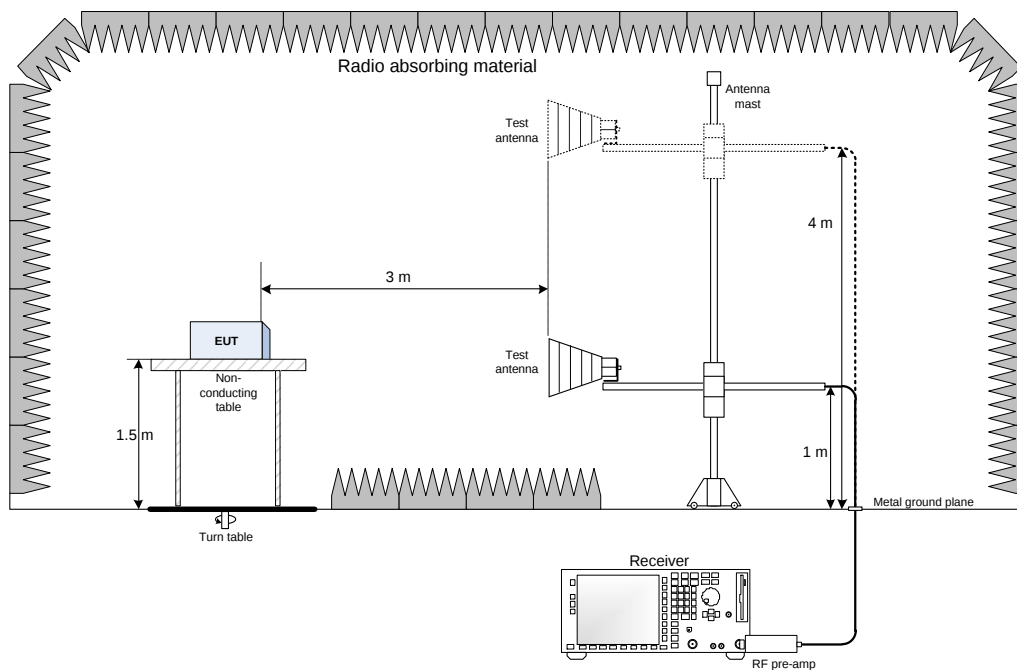
The radiated emissions found un this range are not generated by the UWB radio module

Section 8. Block diagrams of test set-ups

8.1 Radiated emissions set-up for frequencies below 1 GHz



8.2 Radiated emissions set-up for frequencies above 1 GHz



Section 9. Photos

9.1 Photos of the test set-up

See "Annex A" exhibit.

9.2 Photos of the EUT

See "Annex A" exhibit.

End of report