

RADIO TEST REPORT – 453568TRFWL

Type of assessment:

Transmitters co-location

Applicant:

Eurotech Spa

Via Fratelli Solari, 3/A – 33020 Amaro (UD) – Italy

Model:

BTAIR 20-31-11

FCC ID:

UKM-BTA2031

Variant:

BTAIR 20-31-00

IC Registration number:

21442-BTA2031

Specifications:

- ◆ **FCC 47 CFR Part 15 Subpart C, §15.209**

Radiated emission limits; general requirements.

- ◆ **RSS-GEN, Issue 5, Apr. 2018, Amendment 1 (March 2019), Amendment 2 (February 2021), section 8.9**

Transmitter Emission Limits

Date of issue: January 28, 2022

D. Guarnone

Tested by

P. Barbieri

Reviewed by



Signature



Signature

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Doc. n. TRF001; Rev. 0; Date: 2020-11-30

Test location(s)

Company name	Nemko Spa
Address	Via del Carroccio, 4
City	Biassono
Province	MB
Postal code	20853
Country	Italy
Telephone	+39 039 220 12 01
Facsimile	+39 039 220 12 21
Website	www.nemko.com
Site number	FCC: 682159; IC: 9109A (10 m semi anechoic chamber)

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 contained 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	Eurotech SpA
Address	Via Fratelli Solari 3/a – 33020 Amaro (UD) – Italy

1.2 Test specifications

FCC 47 CFR Part 15 Subpart C, §15.209	Radiated emission limits; general requirements.
RSS-GEN, Issue 5, Apr. 2018, Amendment 1 (March 2019), Amendment 2 (February 2021), section 8.9	Transmitter Emission Limits for Licence-Exempt Radio Apparatus

1.3 Test methods

ANSI C63.10 v2013	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices
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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

As per quote, the purpose of this report is verification of transmitters colocation. Only inter-modulation products within restricted bands were assessed, other requirements were excluded from the scope of this report.

1.6 Test report revision history

Revision #	Date of issue	Details of changes made to test report
453568TRFWL	2022-01-28	Original report issued

Section 2. Summary of test results

2.1 FCC Part 15 Subpart C, general requirements test results

Part	Test description	Verdict
§15.209	Radiated emission limits; general requirements.	Pass

2.2 ISED RSS-GEN, Issue 5, Apr. 2018, Amendment 1 (March 2019), Amendment 2 (February 2021) test results

Part	Test description	Verdict
8.9	Transmitter Emission Limits for Licence-Exempt Radio Apparatus	Pass

Section 3. Equipment under test (EUT) details

3.1 Sample information

Receipt date	2021-12-27
Nemko sample ID number	4534050007

3.2 EUT information

Model	BTAIR 20-31-11
Serial number	A121DP50040

3.3 Technical information

RSS number and Issue number	RSS-GEN, Issue 5, Apr. 2018, section 8.9																																
Frequency band	WIFI / BT / BLE: 2400 – 2483.5 MHz band WIFI: 5150–5250 MHz, 5725–5850 MHz bands GSM / PCS / WCDMA / LTE North America Bands																																
Type of modulation	GFSK, 802.11a/n, OFDM																																
Emission classification (F1D, G1D, D1D)	F1D, W7D																																
EUT power requirements	5 V DC 15 W																																
Antenna information	The EUT uses two set of antennas ad following: SET A <table><tr><td>Type</td><td>Manufacturer</td><td>Model</td></tr><tr><td>WIFI antenna</td><td>Linx</td><td>ANT-DB1-RAF-RPS</td></tr><tr><td>WIFI antenna</td><td>Linx</td><td>ANT-DB1-RAF-RPS</td></tr><tr><td>GPS antenna</td><td>2J antenna</td><td>2J4301MPGF</td></tr><tr><td>Cellular antenna</td><td>2J antenna</td><td>2JW0124-C868B</td></tr><tr><td>Cellular antenna</td><td>2J antenna</td><td>2JW0124-C868B</td></tr></table> SET B <table><tr><td>Type</td><td>Manufacturer</td><td>Model</td></tr><tr><td>WIFI antenna</td><td>2J antenna</td><td>2J4802P</td></tr><tr><td>WIFI antenna</td><td>2J antenna</td><td>2J4802P</td></tr><tr><td>Cellular antenna</td><td>2J antenna</td><td>2J6983MPa</td></tr></table>			Type	Manufacturer	Model	WIFI antenna	Linx	ANT-DB1-RAF-RPS	WIFI antenna	Linx	ANT-DB1-RAF-RPS	GPS antenna	2J antenna	2J4301MPGF	Cellular antenna	2J antenna	2JW0124-C868B	Cellular antenna	2J antenna	2JW0124-C868B	Type	Manufacturer	Model	WIFI antenna	2J antenna	2J4802P	WIFI antenna	2J antenna	2J4802P	Cellular antenna	2J antenna	2J6983MPa
Type	Manufacturer	Model																															
WIFI antenna	Linx	ANT-DB1-RAF-RPS																															
WIFI antenna	Linx	ANT-DB1-RAF-RPS																															
GPS antenna	2J antenna	2J4301MPGF																															
Cellular antenna	2J antenna	2JW0124-C868B																															
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WIFI antenna	2J antenna	2J4802P																															
WIFI antenna	2J antenna	2J4802P																															
Cellular antenna	2J antenna	2J6983MPa																															

3.4 EUT setup diagram

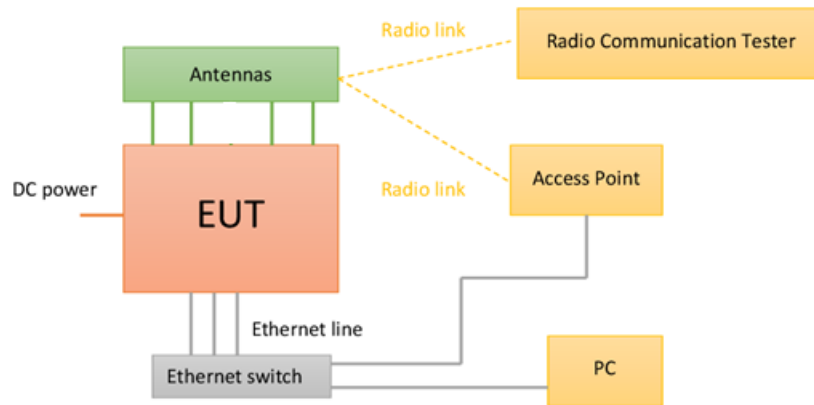


Figure 3.4-1: Setup diagram

3.5 Product description and theory of operation

The EUT is a modular IoT Edge Gateway system which addresses the challenges of the next-generation applications for smart transportation by combining hardware and software for Edge processing and Cloud connectivity. The EUT is a stand-alone gateway that can be expanded with a family of Modules that provide a wide range of additional features. The EUT and its Expansion Modules can be combined to create a flexible system that suits any use case with the ideal solution. The EUT is based on the Intel® Atom™ E3900 processor, with up to 8GB of ECC RAM, up to 32GB of eMMC, and an optional SSD storage module. Interfaces include up to 3x GbE, 2x USB 3.0, Serial, and Display ports; security features include TPM 2.0 A railway certified power supply offers an ultra-wide input voltage range: 24 to 110VDC. The power is distributed by the EUT to the Expansion Modules.

3.6 EUT exercise details

The EUT has been forced in transmission mode using a radio communication tester R&S CMW 290 and an access point Eurotech DYNAGATE-10-12-GS03.

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

The EUT has WIFI and Bluetooth in 2.4 GHz band, WIFI is chosen to be the representative worst-case due to higher output power.

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.
Data logger con diagnosi in campo	Testo	175-H2	20012380/305	2020-12	2022-12
Data logger con diagnosi in campo	Testo	175-H2	38203337/703	2020-12	2022-12
Barometer	Castle	GPB 3300	072015	2021-07	2022-07

5.2 Power supply range

The normal test voltage for equipment to be connected to the mains shall be the nominal mains voltage. For the purpose of the present document, the nominal voltage shall be the declared voltage, or any of the declared voltages $\pm 5\%$, for which the equipment was designed.

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 and other specific test standard and is documented in Nemko Spa working manual WML1002.

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:

Test	Range	Measurement Uncertainty	Notes
Radiated Disturbance	Antenna distance 1 m, 3 m, 10 m 0.009 ÷ 200 MHz	5.0 dB	(1)
	Antenna distance 1 m, 3 m, 10 m 200 ÷ 1000 MHz	5.2 dB	(1)
	Antenna distance 1 m, 3 m, 10 m 1 ÷ 6 GHz	5.2 dB	(1)
	Antenna distance 1 m, 3 m 6 ÷ 18 GHz	5.5 dB	(1)
	Antenna distance 1 m, 3 m 18 ÷ 40 GHz	7.2 dB	(1)
Radiated Disturbance with large loop antenna system (LLAS)	0.009 ÷ 30 MHz	3.3 dB	(1)
Conducted Disturbance	0.02 ÷ 150 kHz with AMN	3.8 dB	(1)
	150 kHz ÷ 30 MHz with AMN	3.4 dB	(1)
	150 kHz ÷ 30 MHz with AAN	4.6 dB	(1)
	9 kHz ÷ 30 MHz with voltage probe	2.9 dB	(1)
	150 kHz ÷ 30 MHz with current probe	2.9 dB	(1)
Frequency	10 Hz ÷ 1 kHz	0.2 %	(1)
	1 kHz ÷ 40 GHz	10 ⁻⁶	(1)
Electromagnetic fields (EMF)	Magnetic, Electric and Electromagnetic fields: 0 Hz ÷ 40 GHz	25 %	(1)
Electrical quantities (voltage, current, resistance)	AC/DC Voltage 10 mV ÷ 1000 V 0÷100 kHz AC/DC Current 0.1 mA ÷ 400 A 0÷1 kHz Resistance 100 mΩ ÷ 10 MΩ	2.5 %	(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 %

(2) The instruments used for this immunity test is according to the tolerances requested by the applicable standard

(3) The reported expanded uncertainty of measurement is related to the stimulus quantity

Section 7. Test equipment

7.1 Test equipment list

Table 7.1-1: Equipment list

Description	Manufacturer	Model	Identifier	Cal Date	Due Date
EMI Receiver	Rohde & Schwarz	ESW44	101620	2021-08	2022-08
Antenna Trilog 25-2000 MHz	Schwarzbeck Mess-Elektronik	VULB9168	9168-242	2021-06	2024-06
Antenna 1 - 18 GHz	Schwarzbeck Mess-Elektronik	STLP9148	STLP 9148-152	2021-09	2024-09
Double Ridge Horn Antenna	RFSpin	DRH40	061106A40	2020-04	2023-04
Broadband Amplifier	Schwarzbeck Mess-Elektronik	BBV9718C	00121	2021-01	2022-01
Preamplifier	Schwarzbeck Mess-Elektronik	BBV9718	BBV9718-137	2021-04	2022-04
Semi-anechoic chamber	Nemko S.p.a.	10m semi-anechoic chamber	530	2021-09	2023-09

Section 8. Testing data

8.1 FCC 15.209 and RSS-GEN section 8.9 Radiated emission limits; general requirements

8.1.1 Definitions and limits

FCC:

(f) In accordance with §15.33(a), in some cases the emissions from an intentional radiator must be measured to beyond the tenth harmonic of the highest fundamental frequency designed to be emitted by the intentional radiator because of the incorporation of a digital device. If measurements above the tenth harmonic are so required, the radiated emissions above the tenth harmonic shall comply with the general radiated emission limits applicable to the incorporated digital device, as shown in §15.109 and as based on the frequency of the emission being measured, or, except for emissions contained in the restricted frequency bands shown in §15.205, the limit on spurious emissions specified for the intentional radiator, whichever is the higher limit. Emissions which must be measured above the tenth harmonic of the highest fundamental frequency designed to be emitted by the intentional radiator and which fall within the restricted bands shall comply with the general radiated emission limits in §15.109 that are applicable to the incorporated digital device.

ISED:

Except when the requirements applicable to a given device state otherwise, emissions from licence-exempt transmitters shall comply with the field strength limits shown in Table below. Additionally, the level of any transmitter emission shall not exceed the level of the transmitter's fundamental emission.

Table 8.1-1: FCC §15.209 and RSS-Gen – Radiated emission limits

Frequency, MHz	Field strength of emissions		Measurement distance, m
	µV/m	dBµV/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.

For frequencies above 1 GHz the limit on peak RF emissions is 20 dB above the maximum permitted average emission limit applicable to the equipment under test

Table 8.1-2: ISED restricted frequency bands

MHz	MHz	MHz	GHz
0.090–0.110	12.57675–12.57725	399.9–410	7.25–7.75
0.495–0.505	13.36–13.41	608–614	8.025–8.5
2.1735–2.1905	16.42–16.423	960–1427	9.0–9.2
3.020–3.026	16.69475–16.69525	1435–1626.5	9.3–9.5
4.125–4.128	16.80425–16.80475	1645.5–1646.5	10.6–12.7
4.17725–4.17775	25.5–25.67	1660–1710	13.25–13.4
4.20725–4.20775	37.5–38.25	1718.8–1722.2	14.47–14.5
5.677–5.683	73–74.6	2200–2300	15.35–16.2
6.215–6.218	74.8–75.2	2310–2390	17.7–21.4
6.26775–6.26825	108–138	2483.5–2500	22.01–23.12
6.31175–6.31225	149.9–150.05	2655–2900	23.6–24.0
8.291–8.294	156.52475–156.52525	3260–3267	31.2–31.8
8.362–8.366	156.7–156.9	3332–3339	36.43–36.5
8.37625–8.38675	162.0125–167.17	3345.8–3358	
8.41425–8.41475	167.72–173.2	3500–4400	
12.29–12.293	240–285	4500–5150	Above 38.6
12.51975–12.52025	322–335.4	5350–5460	

Note: Certain frequency bands listed in Table 8.1-2 and above 38.6 GHz are designated for licence-exempt applications. These frequency bands and the requirements that apply to related devices are set out in the 200 and 300 series of RSSs.

Table 8.1-3: FCC restricted frequency bands

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			

8.1.2 Test summary

Verdict	Pass
Tested by	D. Guarnone

8.1.3 Observations, settings and special notes

The spectrum was searched from 30 MHz to 40 GHz.

EUT's LTE and WIFI transmitters were set to transmit continuously, different channel setting has been investigated as per provided by client's setup, only the worst-case is presented. Radiated measurements were performed at a distance of 3 m. No inter-modulation products emissions were detected within 6 dB below the limit.

Receiver settings for radiated measurements within restricted bands 30 MHz to 1 GHz:

Resolution bandwidth:	120 kHz
Detector mode:	Quasi-Peak

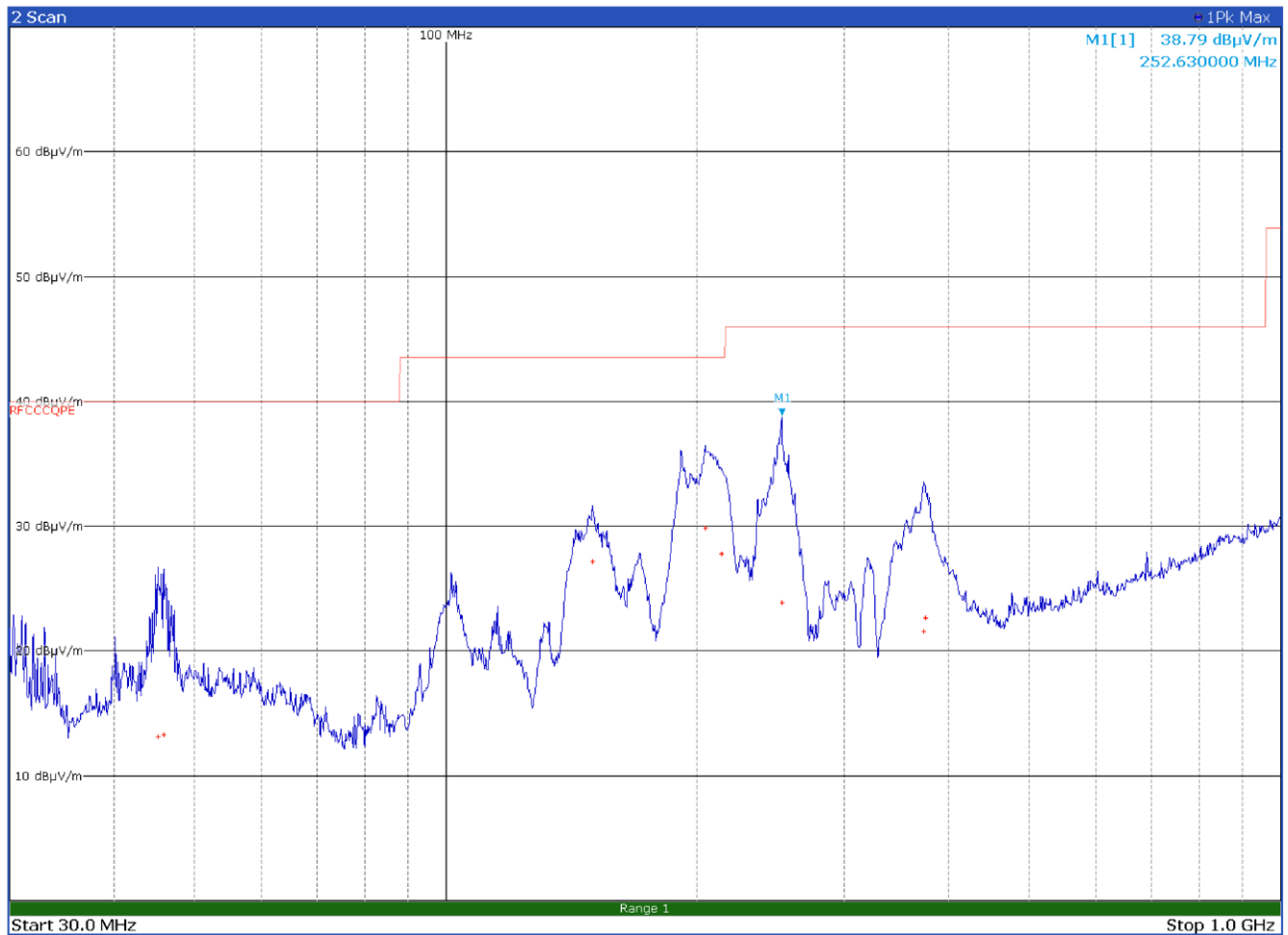
Receiver settings for peak radiated measurements within restricted bands above 1 GHz:

Resolution bandwidth:	1 MHz
Detector mode:	Peak

Receiver settings for average radiated measurements within restricted bands above 1 GHz:

Resolution bandwidth:	1 MHz
Detector mode:	Average

8.1.4 Test data for ANTENNA SET A – PCS 1900 at 1880 MHz and WIFI 802.11g at 2437 MHz

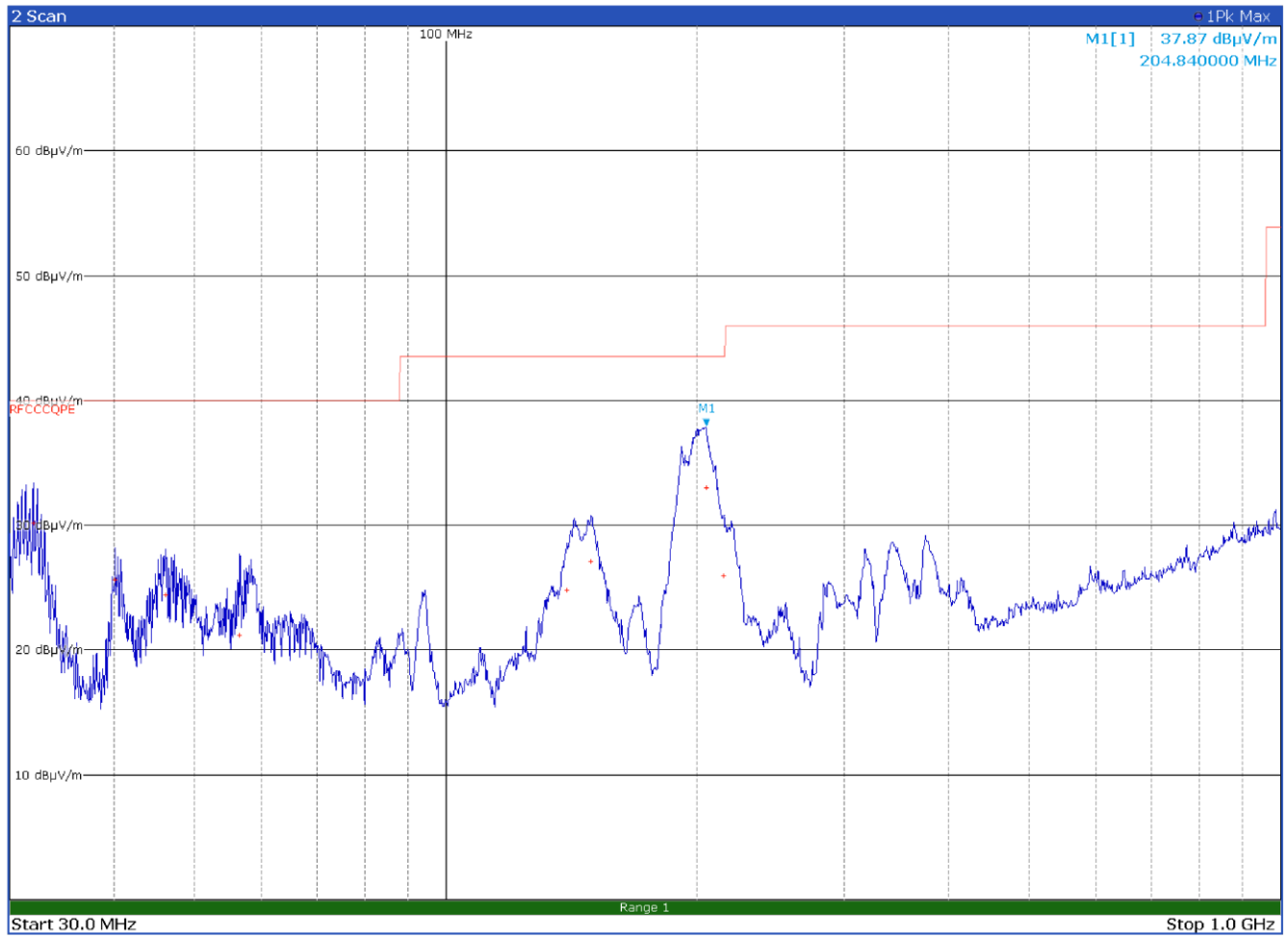


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Antenna in horizontal polarization

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
45.1800	13.2	40.0	-26.8	QP
45.8400	13.3	40.0	-26.7	QP
149.6700	27.2	43.5	-16.3	QP
204.5400	29.9	43.5	-13.6	QP
213.8700	27.8	43.5	-15.7	QP
252.6300	23.9	46.0	-22.1	QP
373.5000	21.6	46.0	-24.4	QP
375.4500	22.7	46.0	-23.3	QP

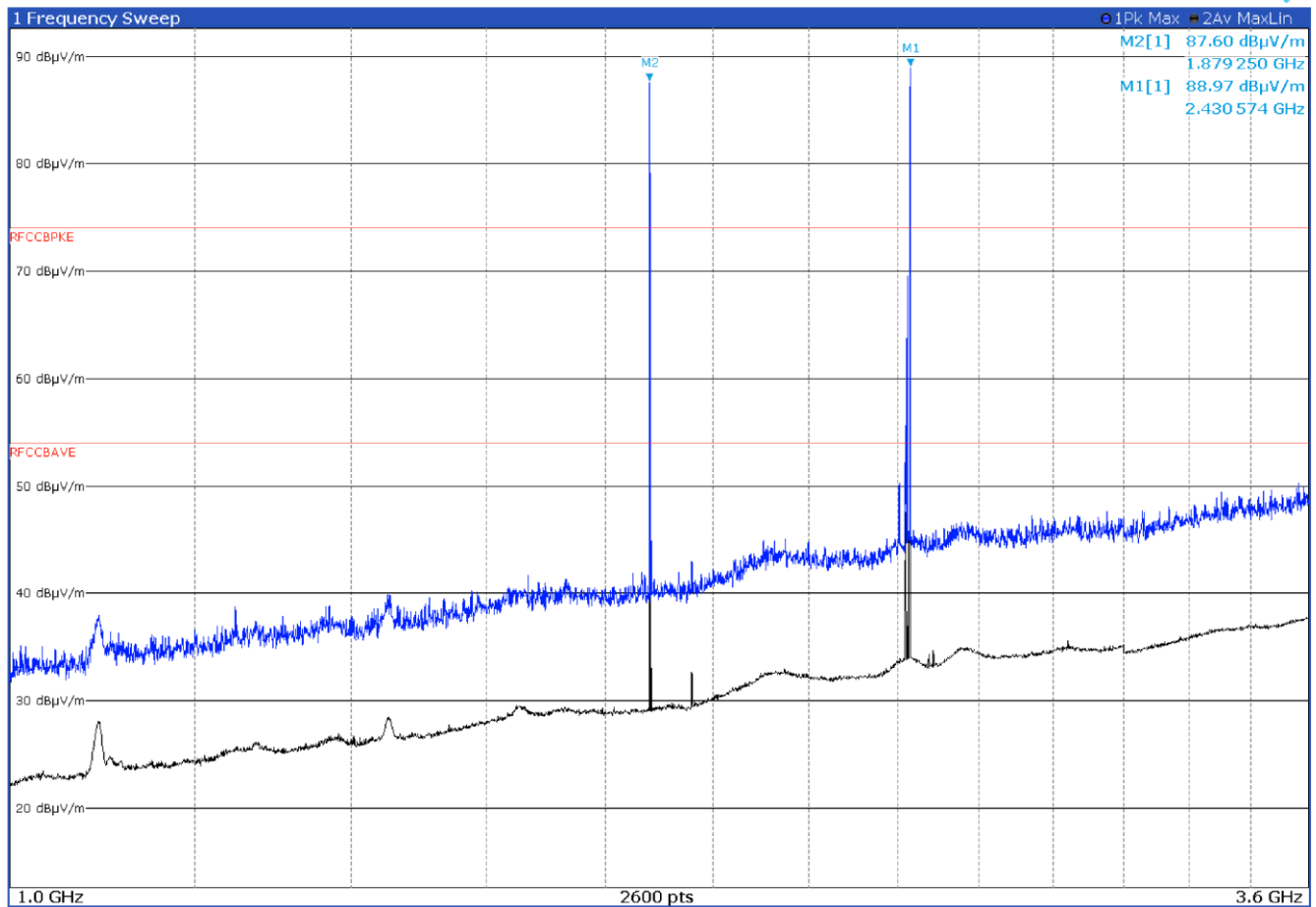


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Antenna in vertical polarization

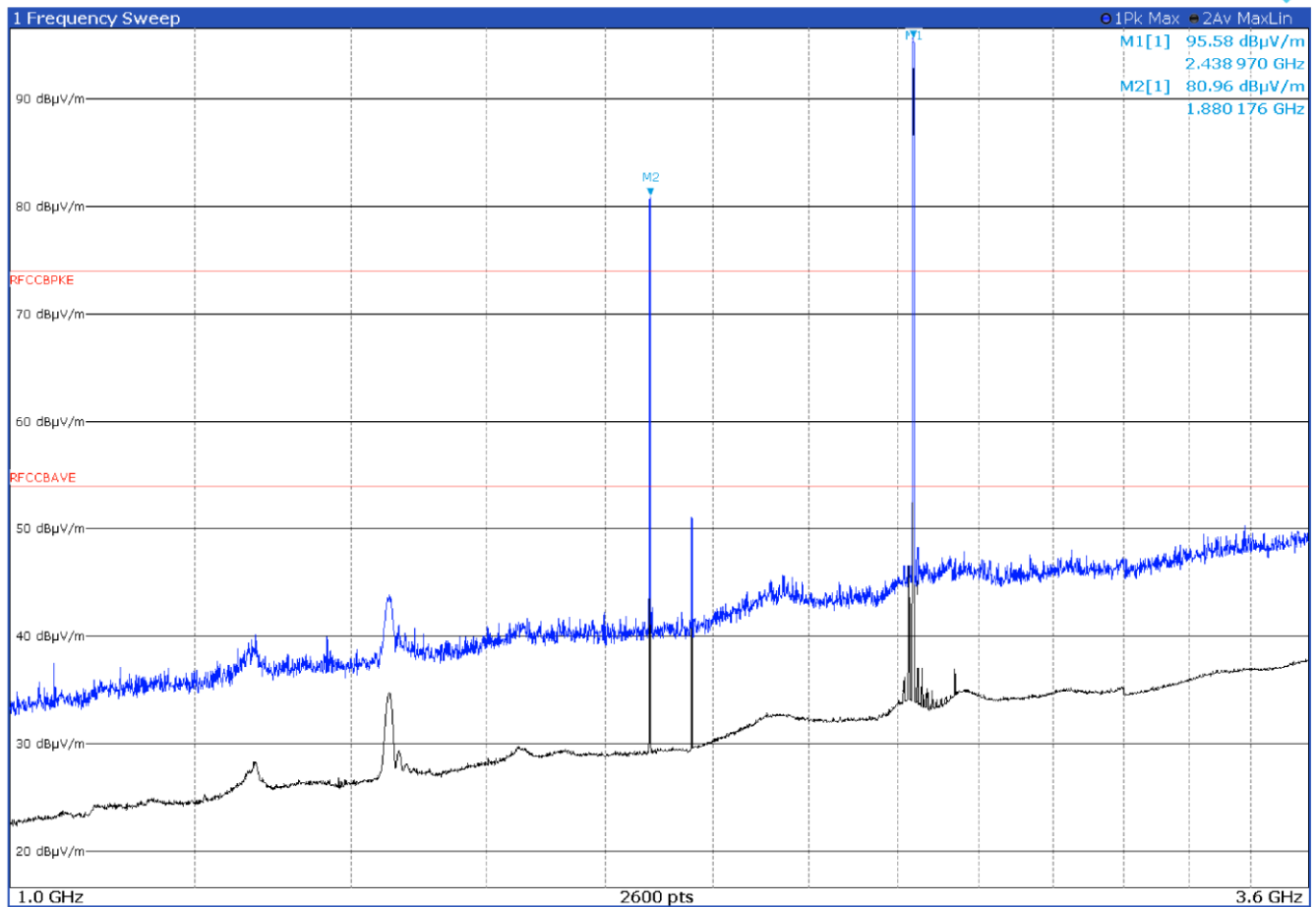
Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
32.0400	30.2	40.0	-9.8	QP
40.1100	25.7	40.0	-14.3	QP
46.1700	24.5	40.0	-15.5	QP
56.6100	21.2	40.0	-18.8	QP
139.5300	24.8	43.5	-18.7	QP
148.9800	27.2	43.5	-16.3	QP
204.8400	33.0	43.5	-10.5	QP
215.3100	26.0	43.5	-17.5	QP



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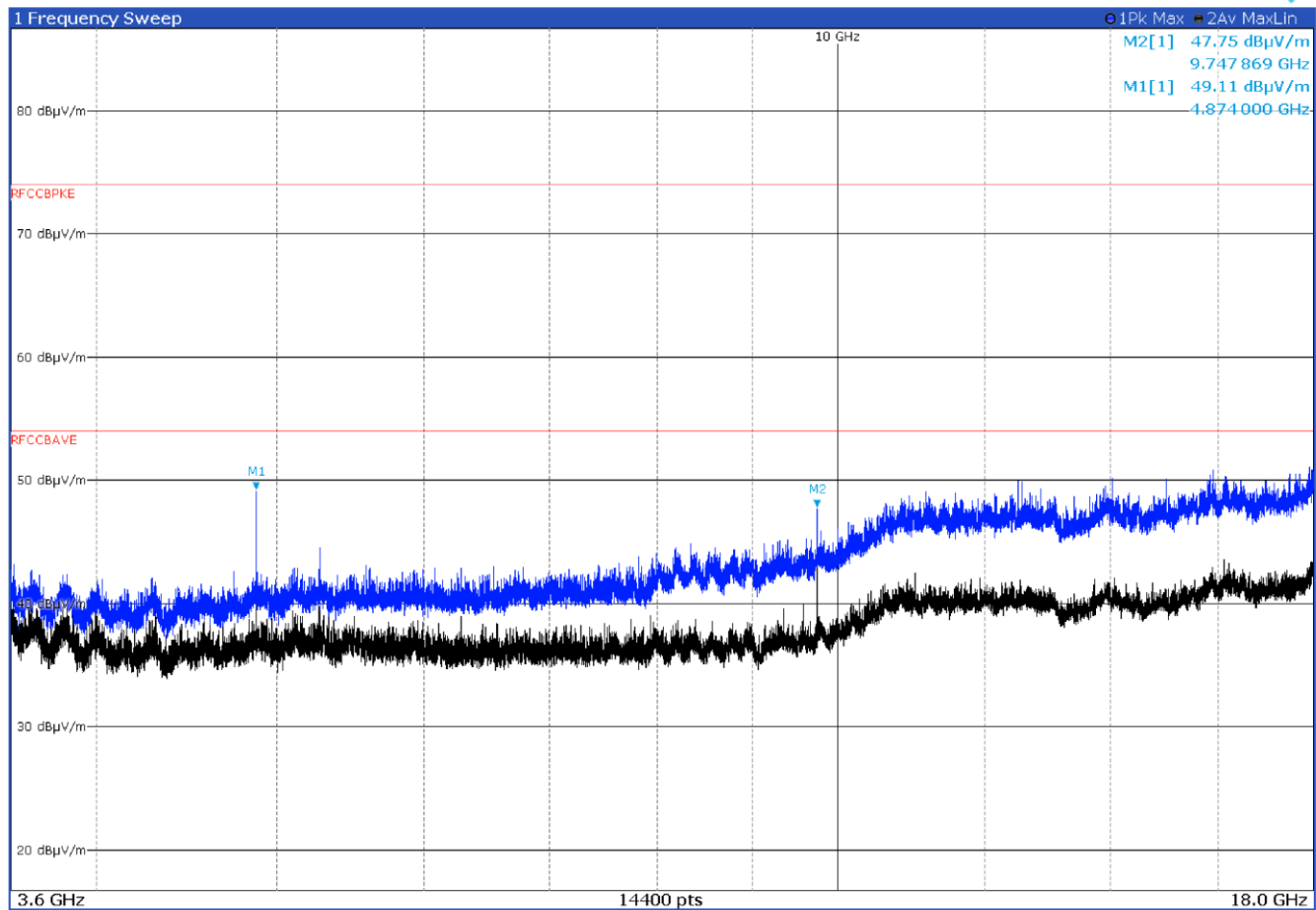
Antenna in horizontal polarization – No inter-modulation product founds
Limit exceeded by carrier – All the peak found are below the average limit



18:27:18 21.01.2022

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Antenna in vertical polarization – No inter-modulation product founds
Limit exceeded by carrier – All the peak found are below the average limit



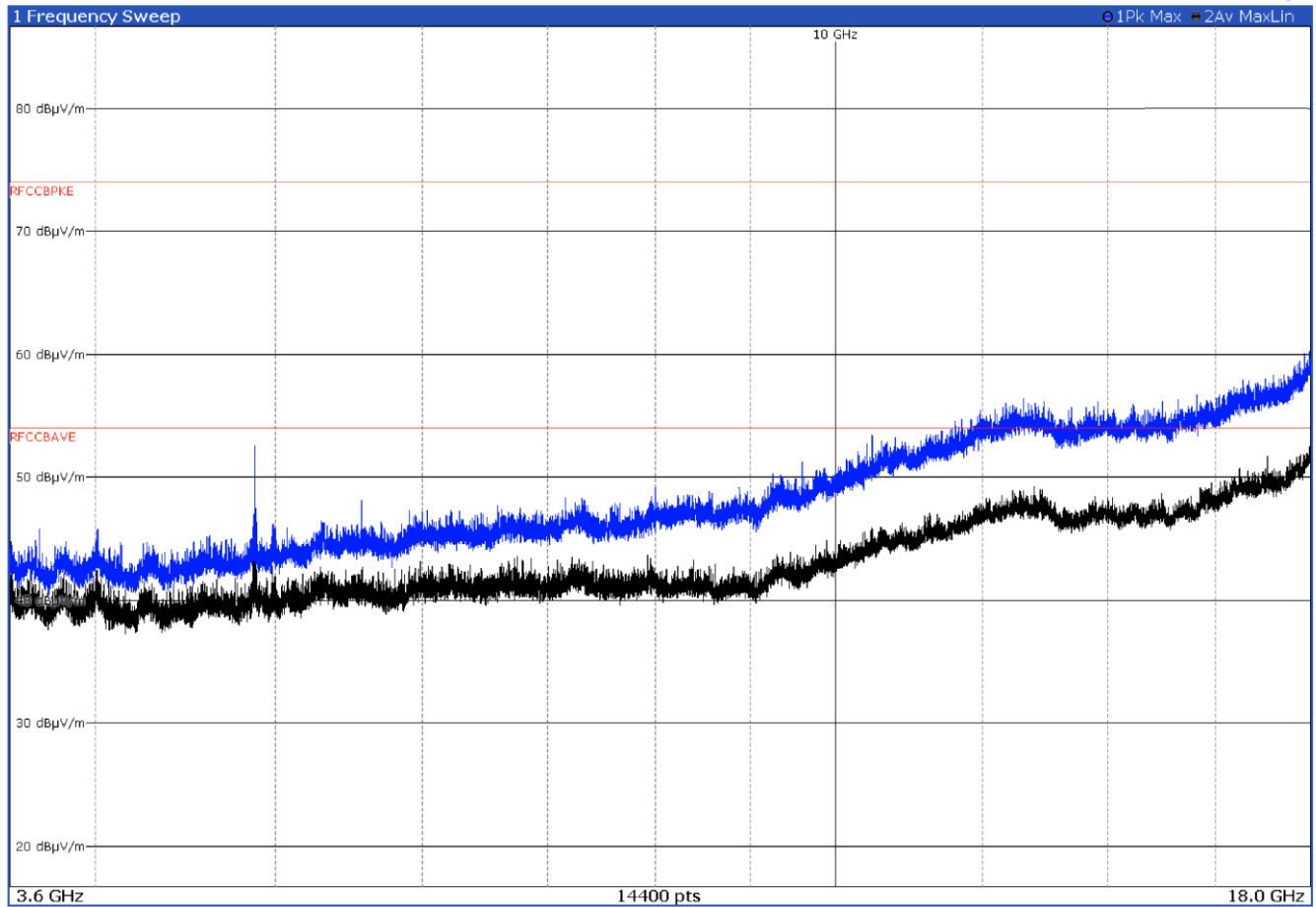
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Page 1/1

Antenna in horizontal polarization

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
--	--	--	--	--

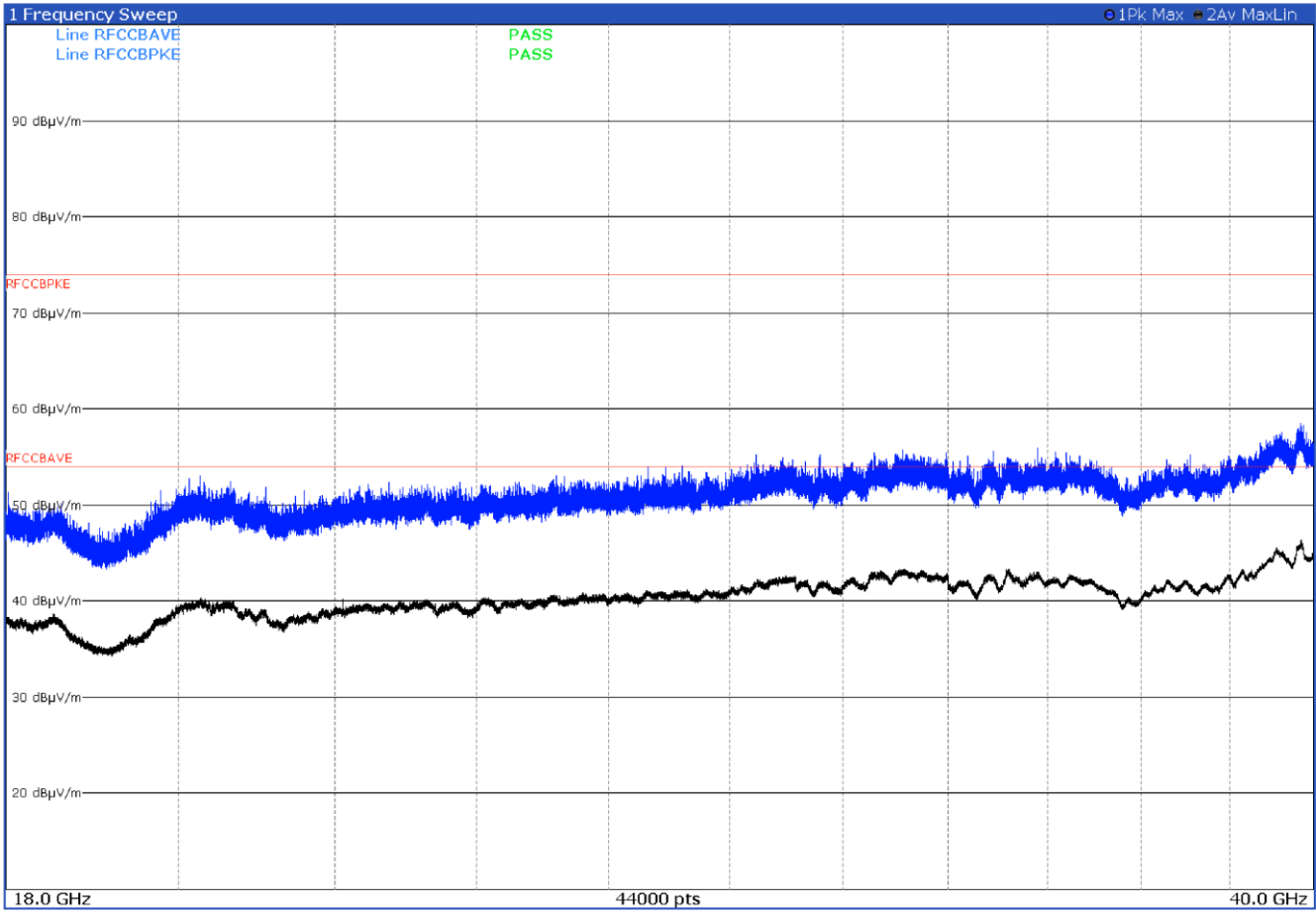
No inter-modulation product founds – All the other peak found are below the average limit



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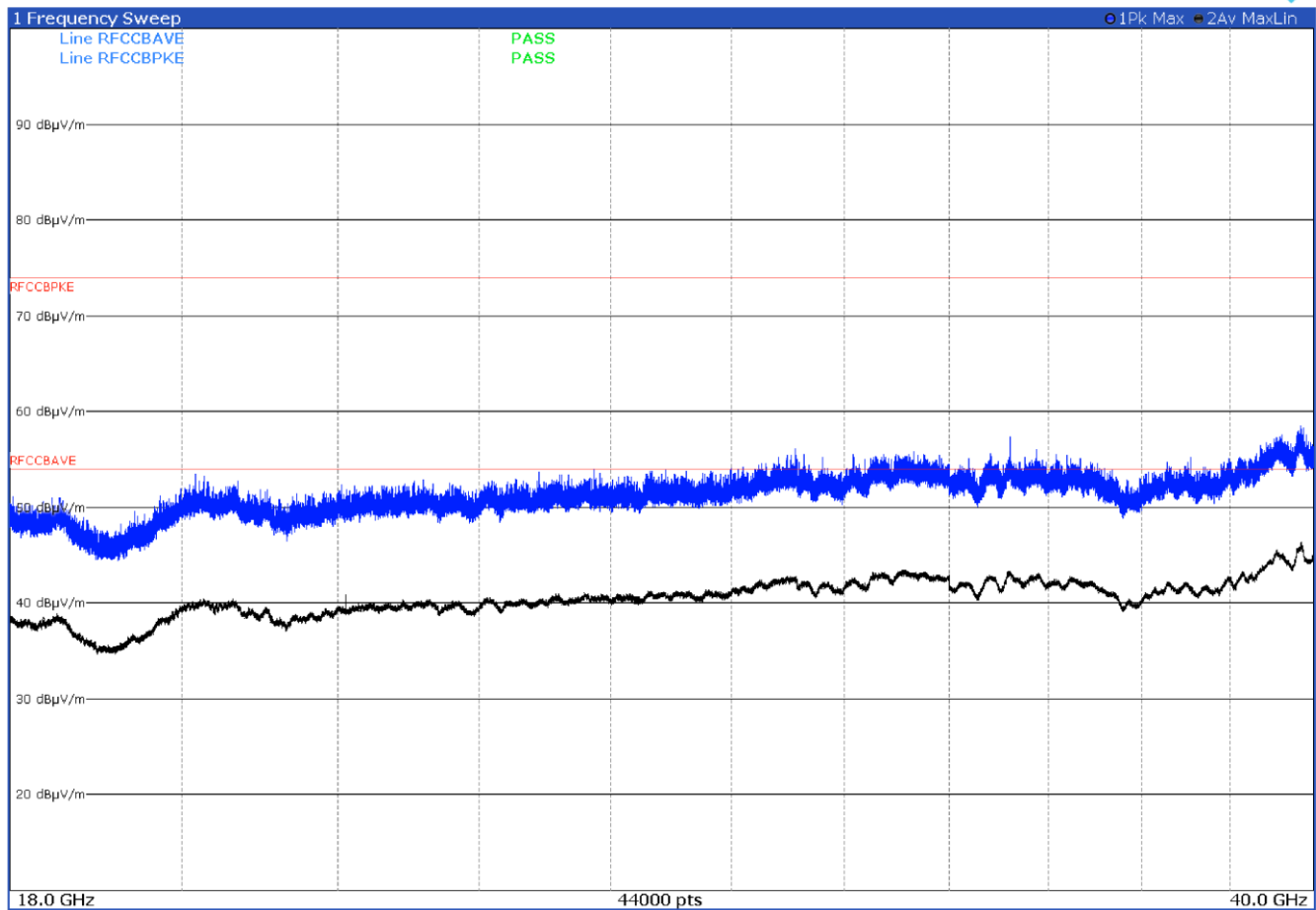
Page 1/1

Antenna in vertical polarization – No inter-modulation product founds – All the peak found are below the average limit



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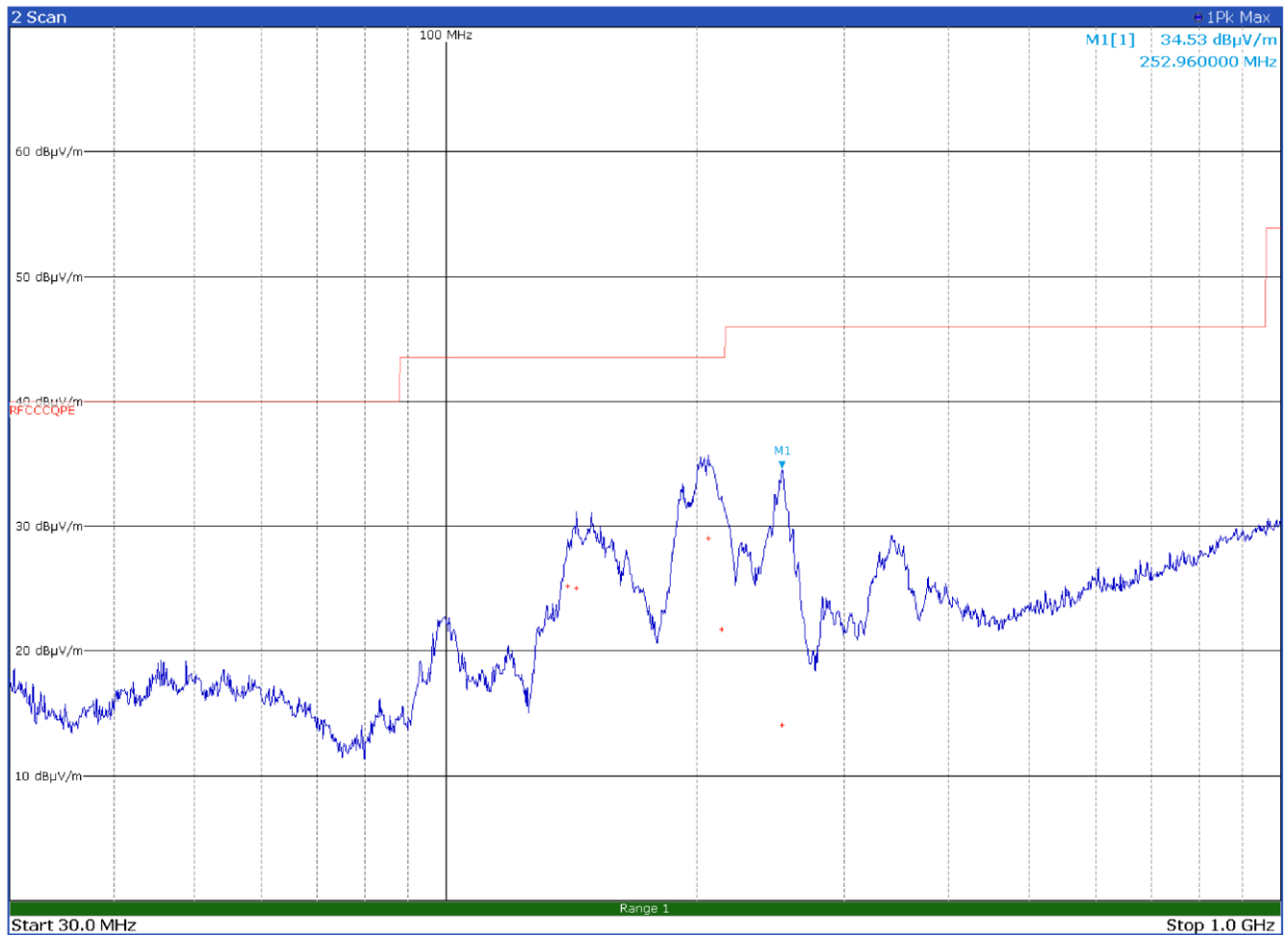
Antenna in horizontal polarization – No inter-modulation product founds



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Antenna in vertical polarization – No inter-modulation product founds

8.1.5 Test data for ANTENNA SET A – PCS 1900 at 1880 MHz and WIFI 802.11a at 5300 MHz

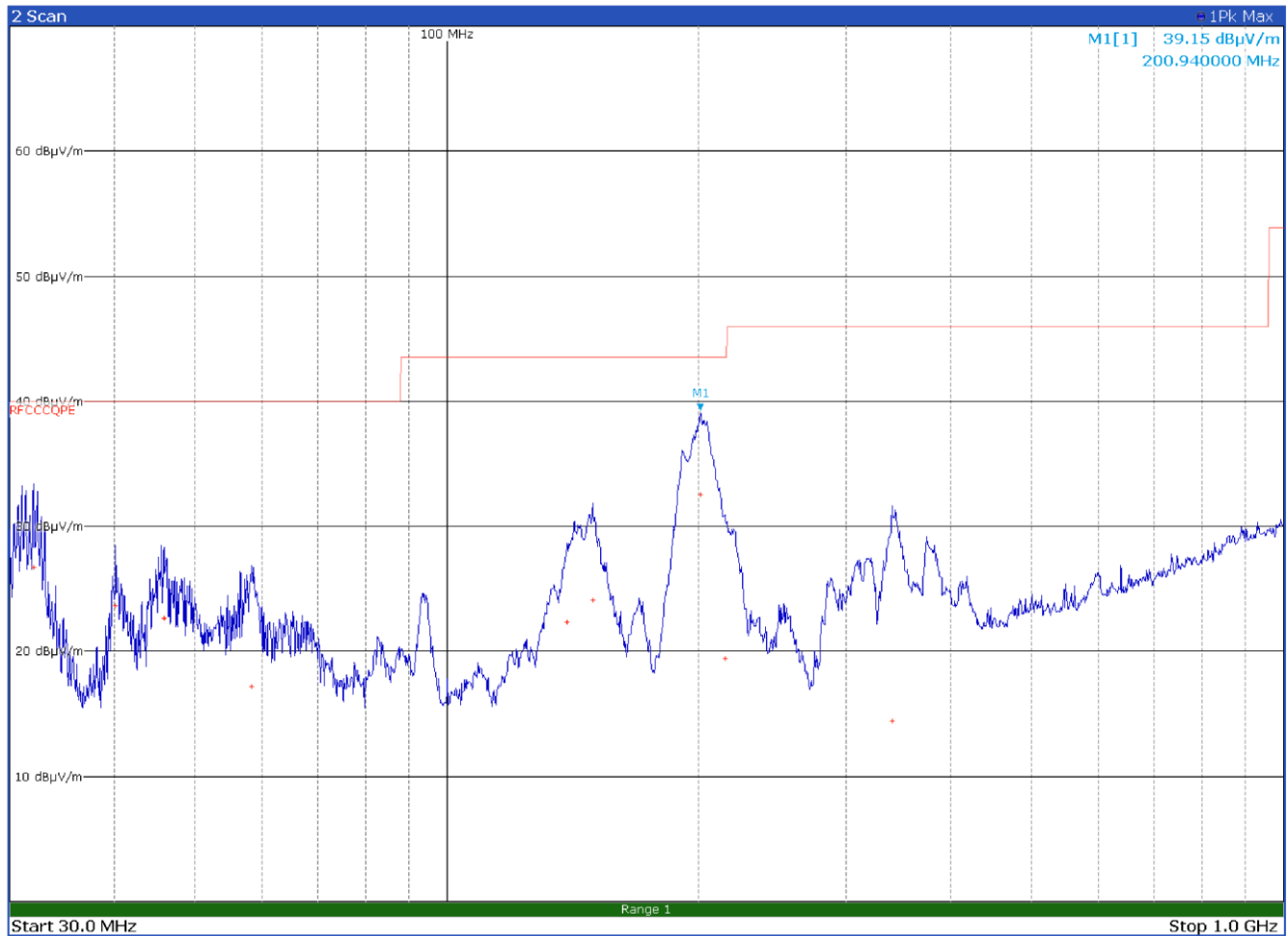


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Antenna in horizontal polarization

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
139.9200	25.3	43.5	-18.2	QP
143.2500	25.1	43.5	-18.4	QP
206.3100	29.0	43.5	-14.5	QP
214.0500	21.8	43.5	-21.7	QP
252.9600	14.1	46.0	-31.9	QP

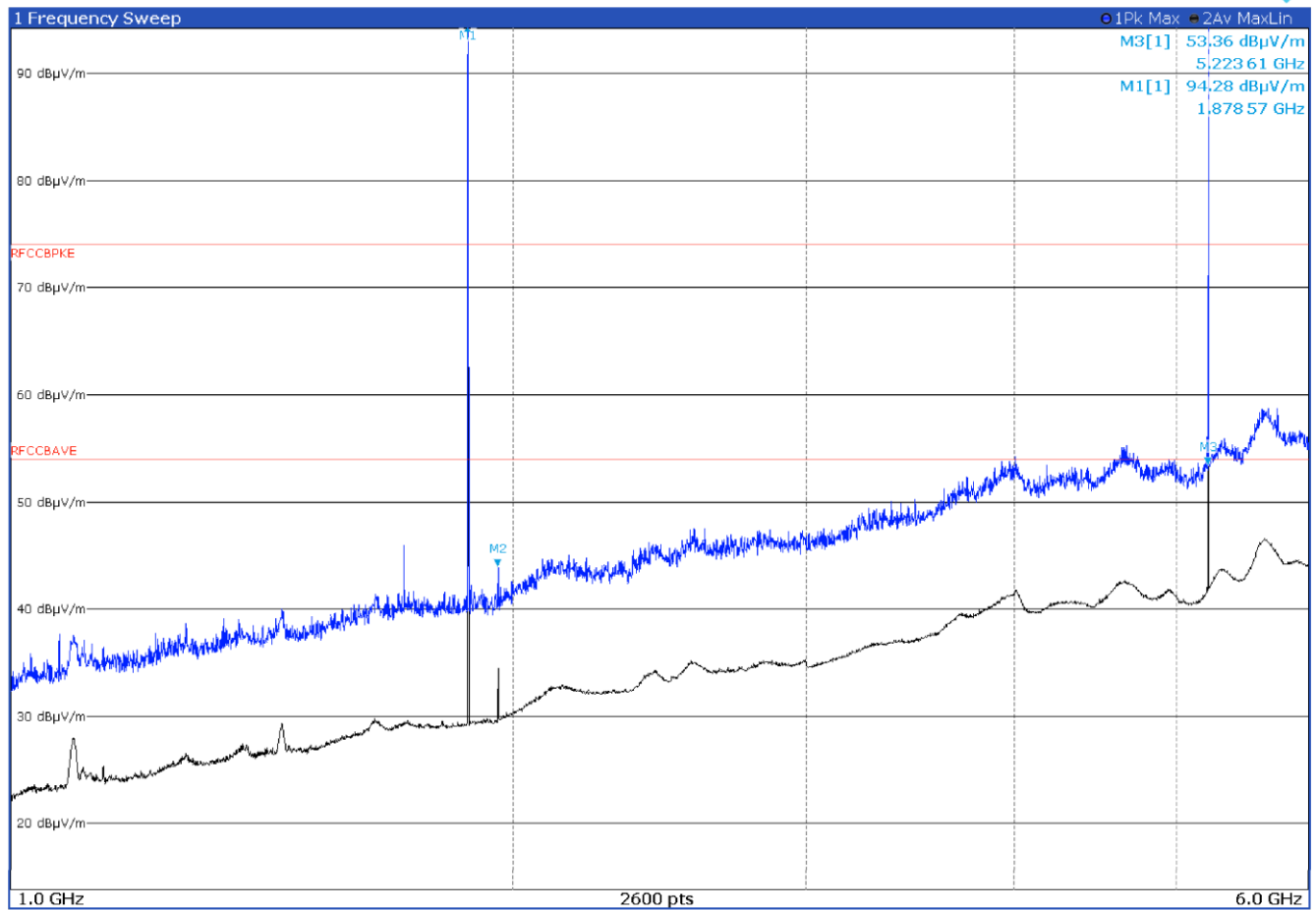


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Antenna in vertical polarization

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
32.0400	26.7	40.0	-13.3	QP
40.1400	23.7	40.0	-16.3	QP
45.8400	22.7	40.0	-17.3	QP
58.3200	17.2	40.0	-22.8	QP
139.2300	22.3	43.5	-21.2	QP
149.3100	24.1	43.5	-19.4	QP
200.9400	32.6	43.5	-10.9	QP
214.9200	19.4	43.5	-24.1	QP
340.1400	14.4	46.0	-31.6	QP



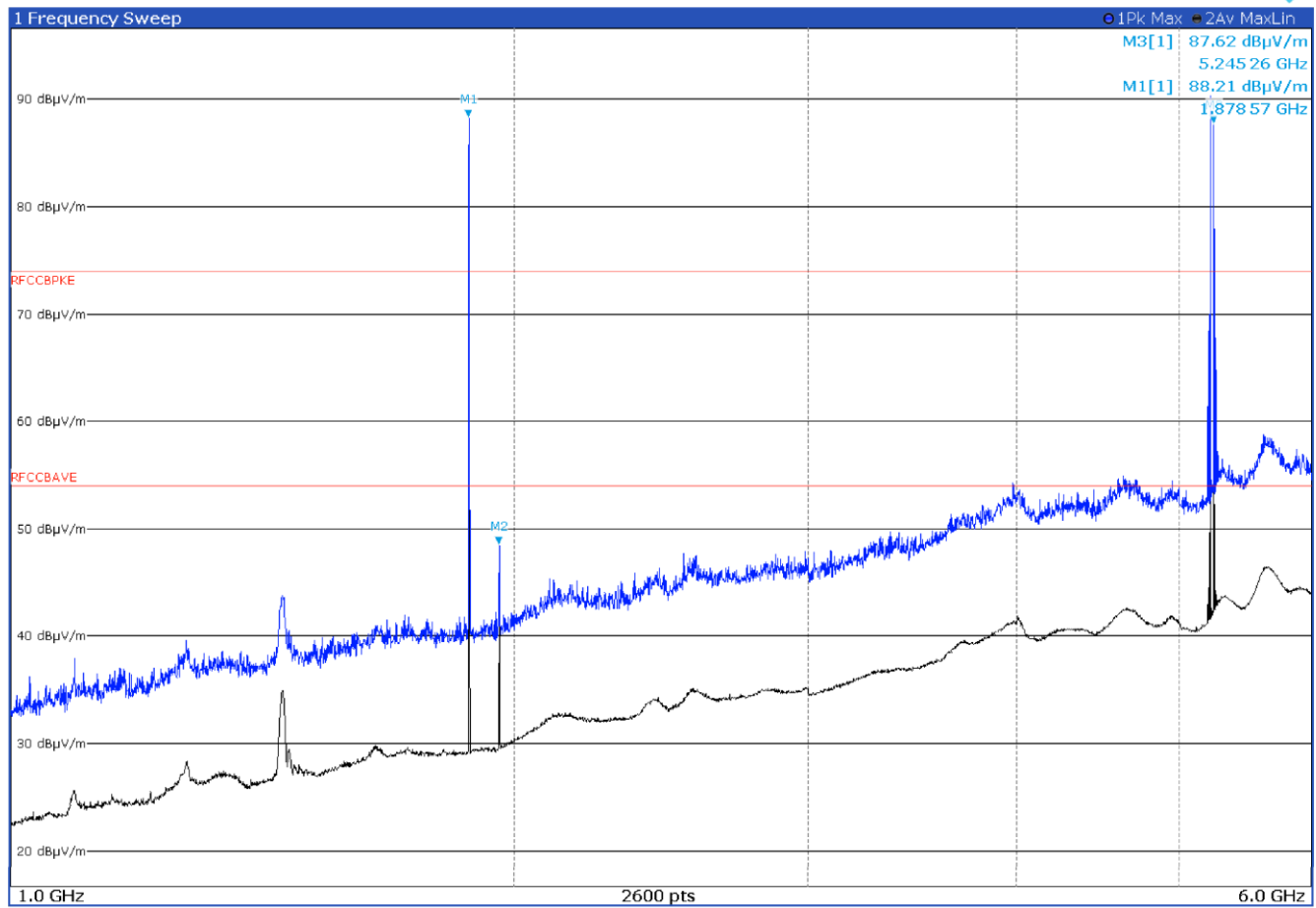
17:23:19 21.01.2022

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Antenna in horizontal polarization – Limit exceeded by carrier

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
--	--	--	---	Peak

No inter-modulation product founds – All the other peak found are below the average limit



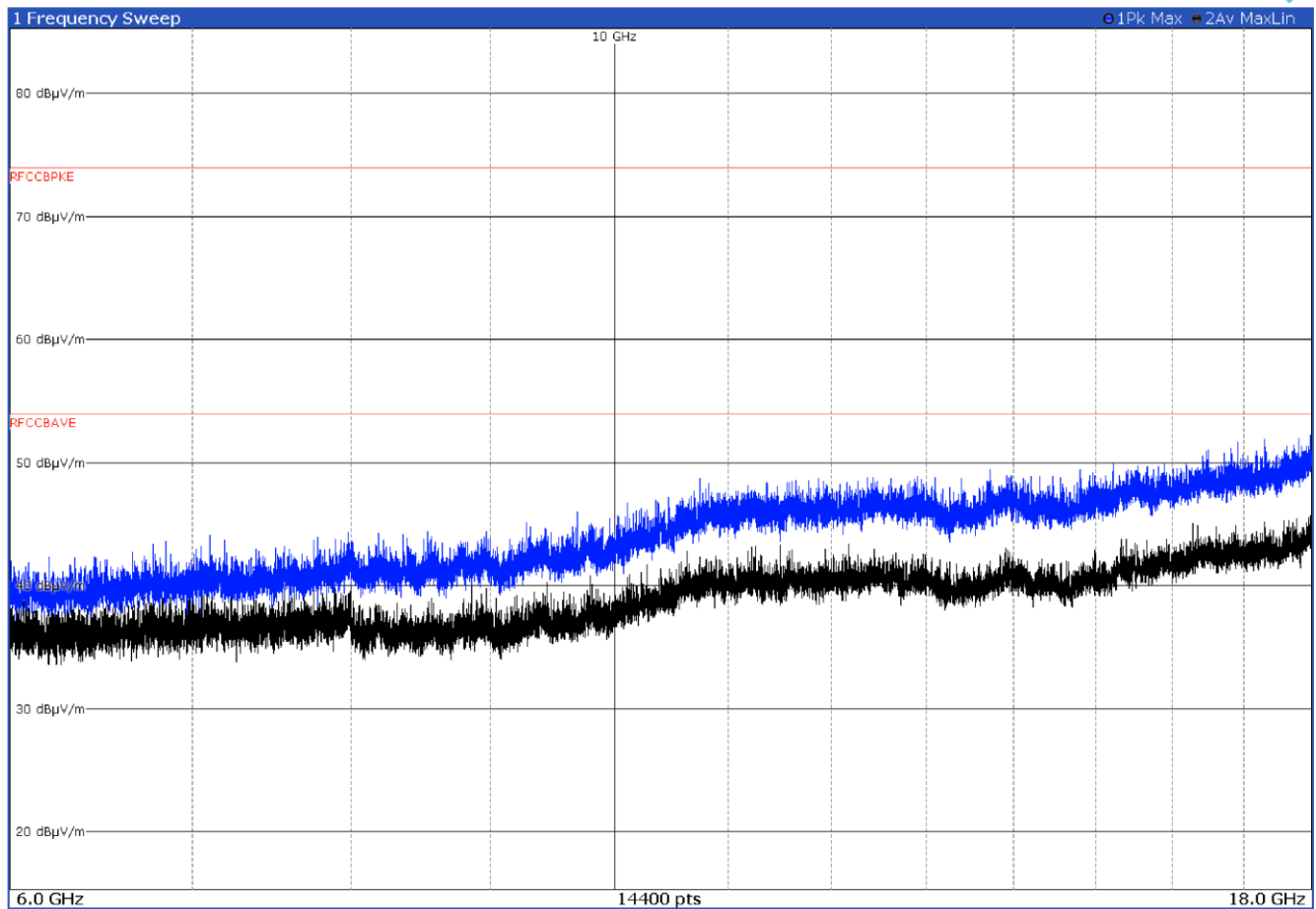
17:21:30 21.01.2022

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Antenna in vertical polarization – Limit exceeded by carrier

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
---	--	--	--	Peak

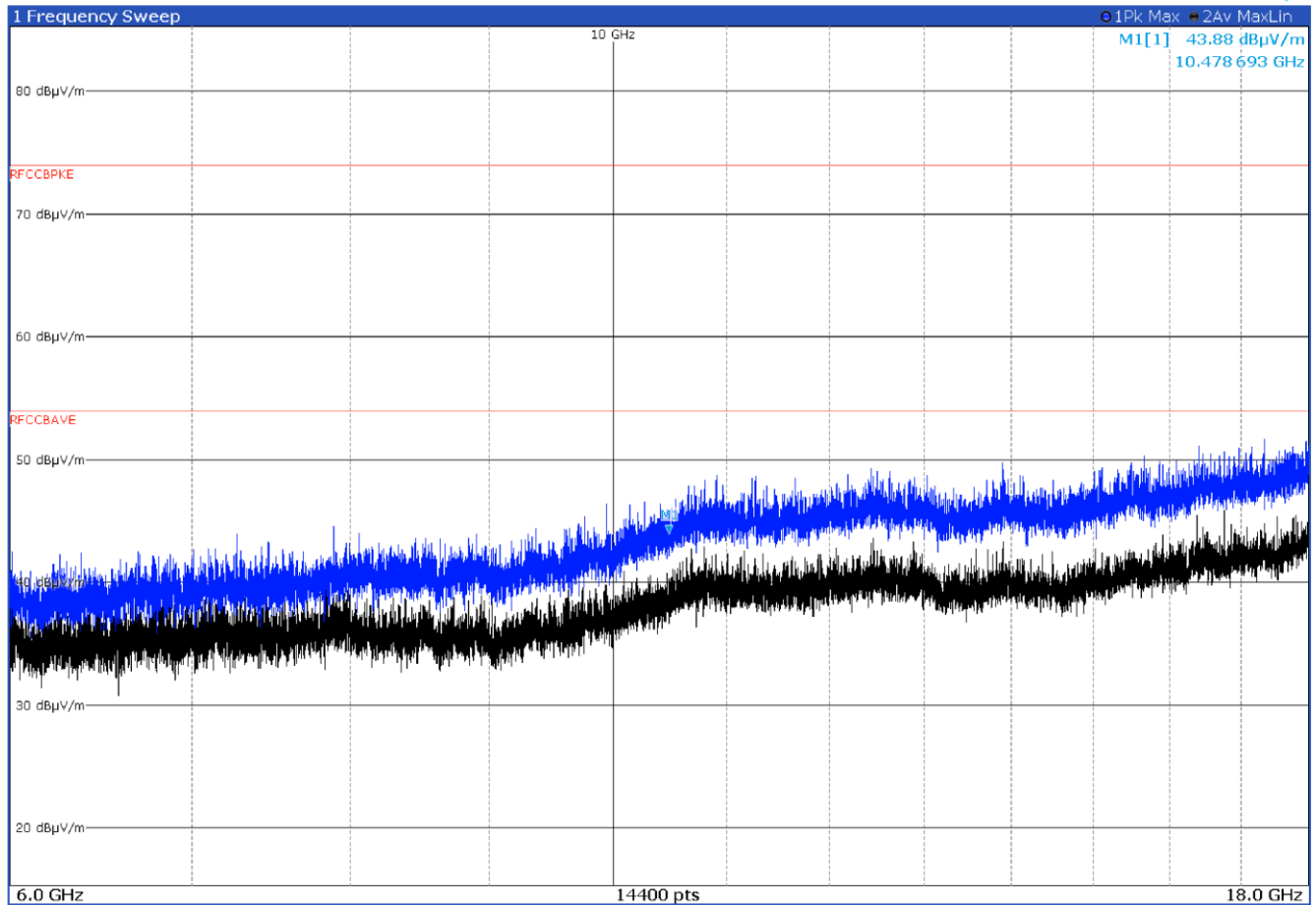
No inter-modulation product founds – All the other peak found are below the average limit



17:12:28 24.01.2022

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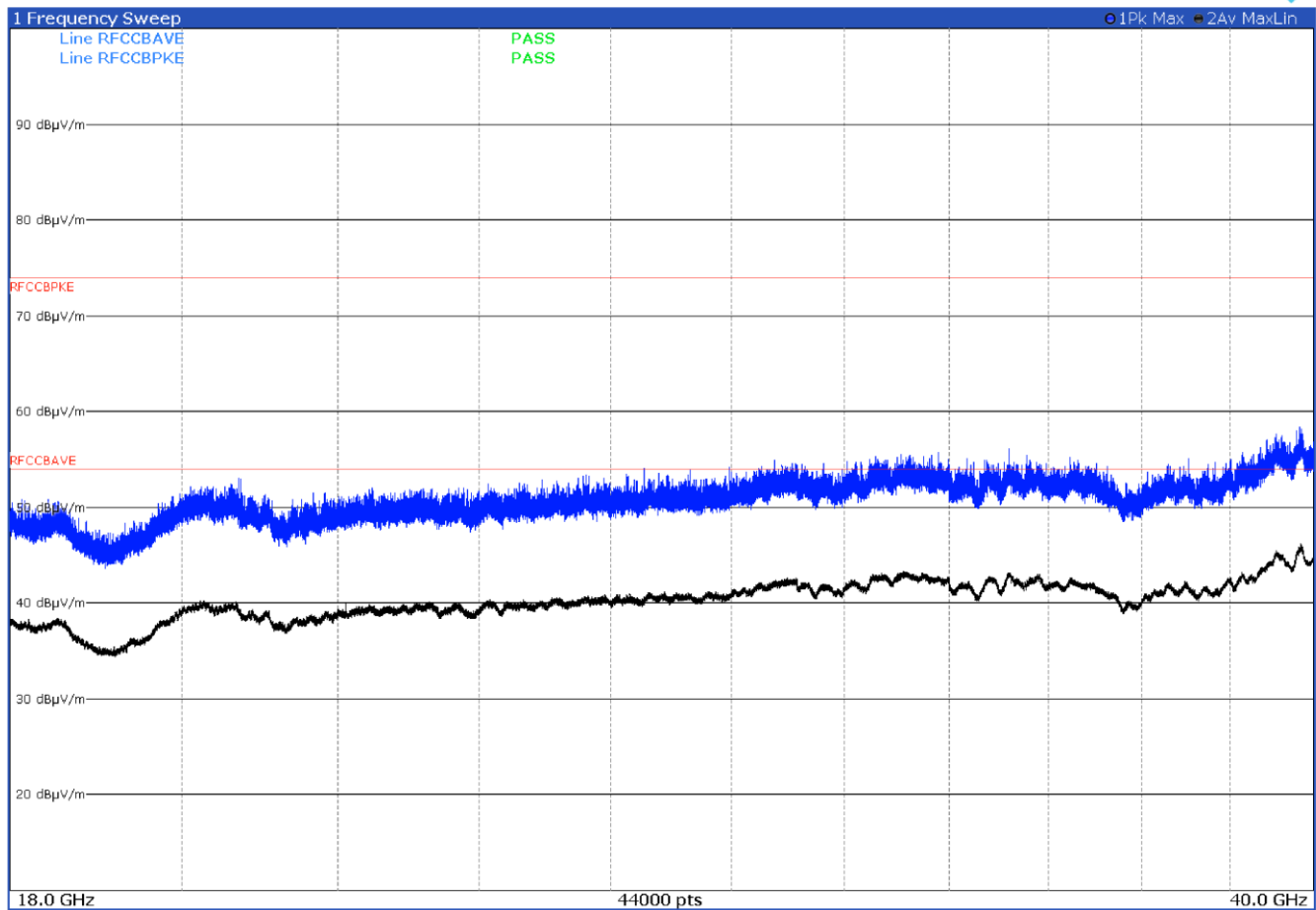
Antenna in horizontal polarization – No inter-modulation product founds



17:09:50 24.01.2022

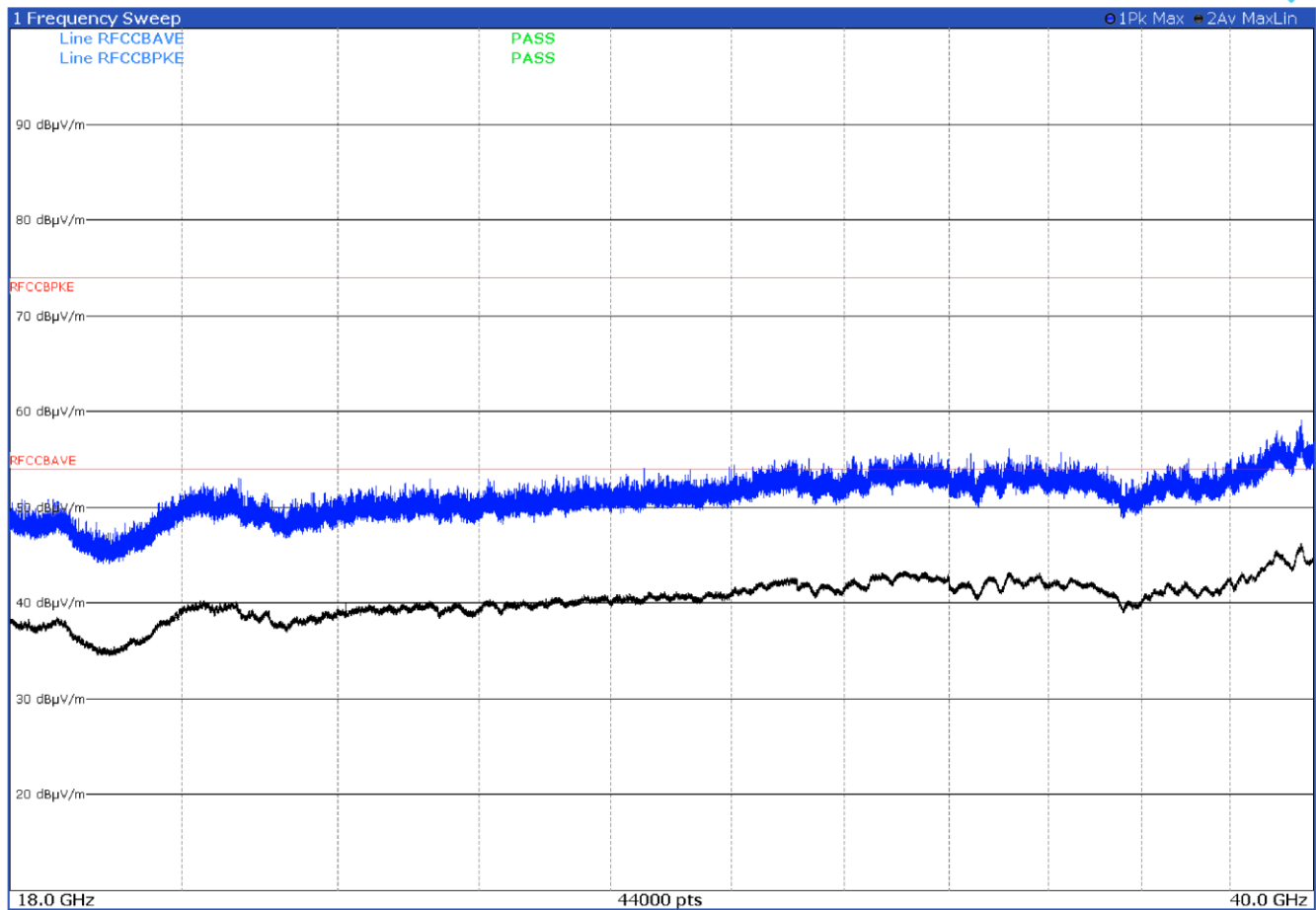
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Antenna in vertical polarization – No inter-modulation product founds



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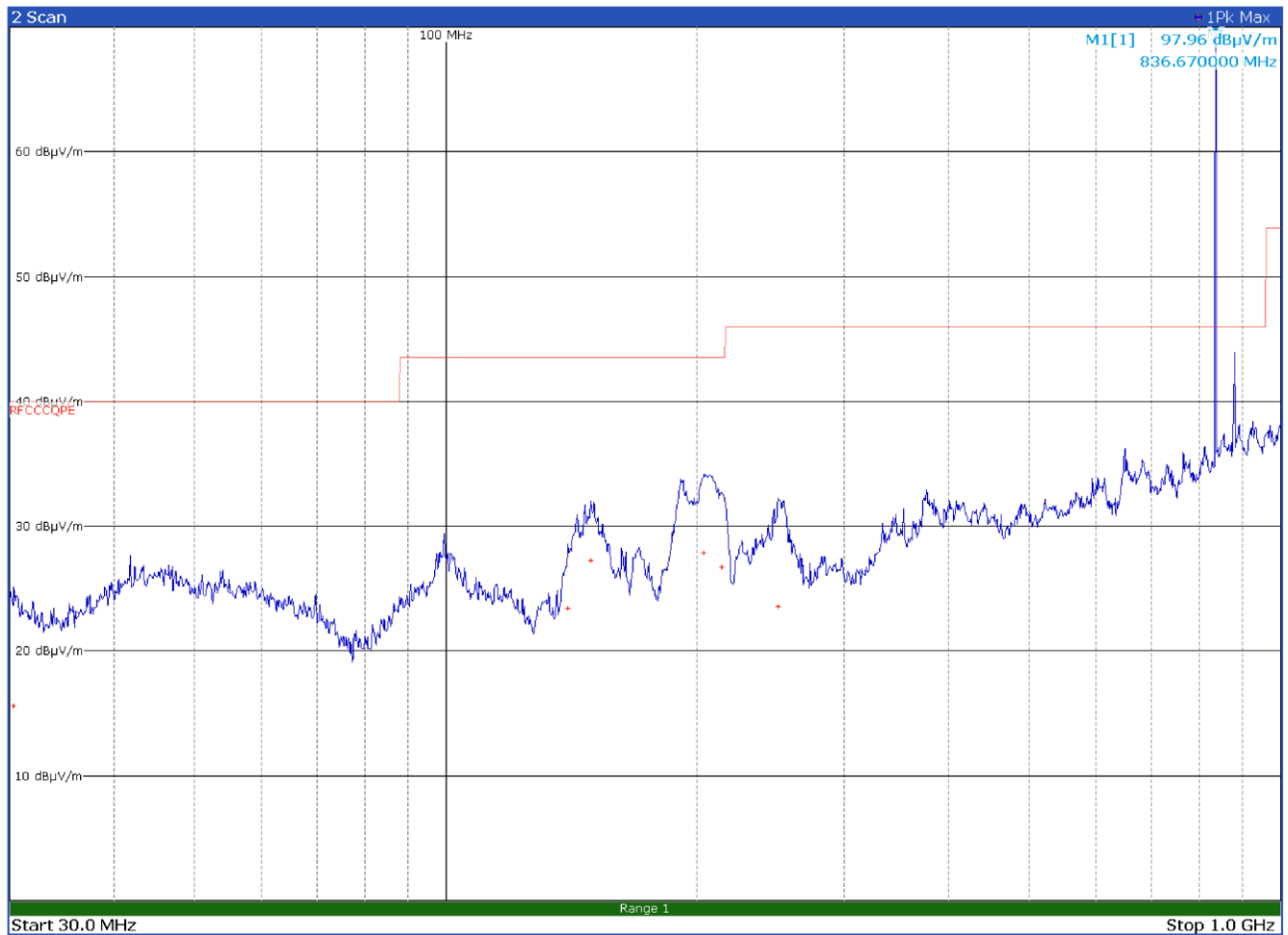
Antenna in horizontal polarization – No inter-modulation product founds



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Antenna in vertical polarization – No inter-modulation product founds

8.1.6 Test data for ANTENNA SET A – GSM 850 at 836.6 MHz and WIFI 802.11g at 2437 MHz

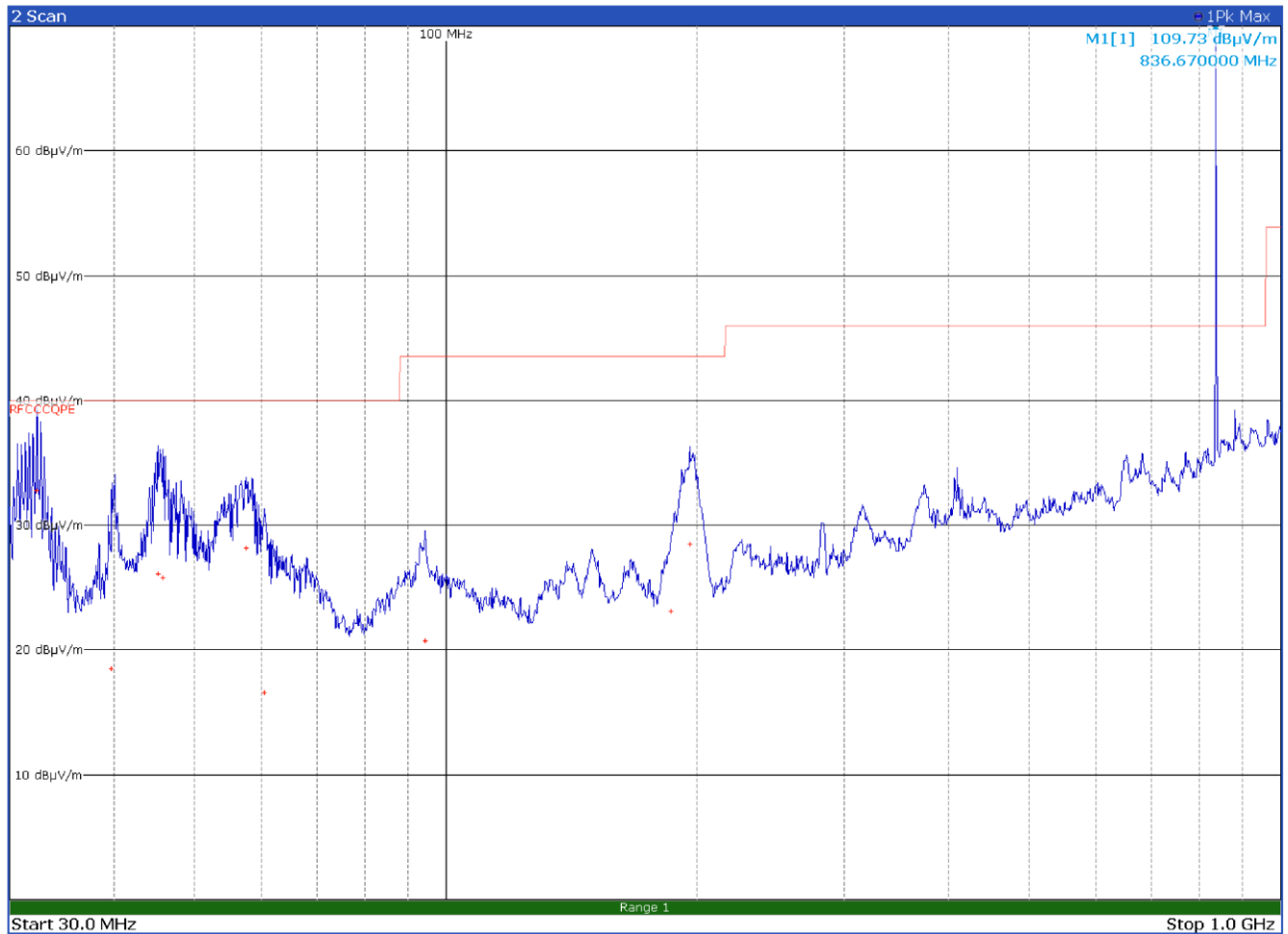


20:35:31 21.01.2022

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Antenna in horizontal polarization– Limit exceeded by carrier

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
30.3300	15.6	40.0	-24.4	QP
139.9200	23.4	43.5	-20.1	QP
149.0100	27.3	43.5	-16.2	QP
203.6100	27.9	43.5	-15.6	QP
213.7800	26.8	43.5	-16.7	QP
249.7800	23.6	46.0	-22.4	QP

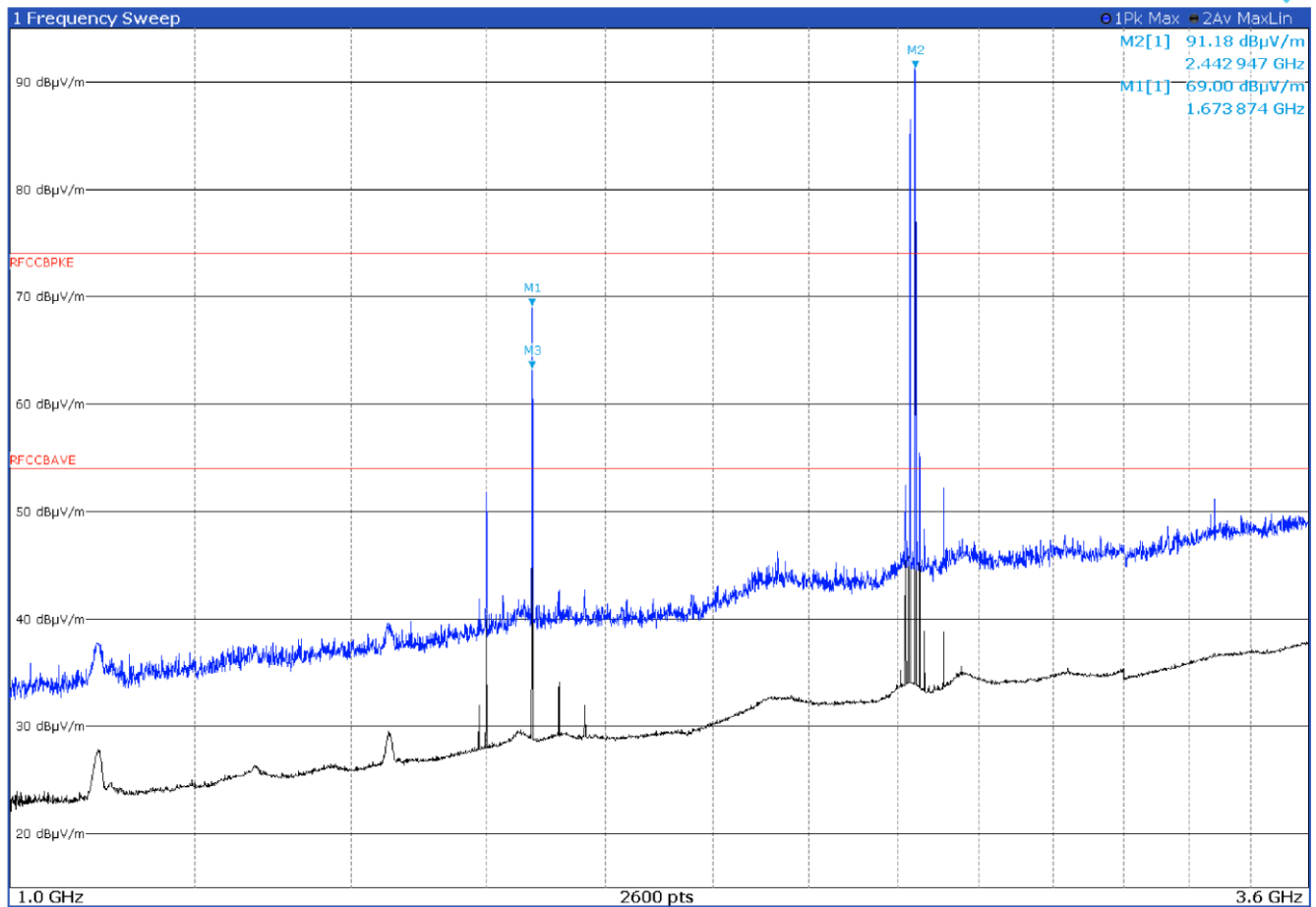


20:31:04 21.01.2022

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Antenna in vertical polarization– Limit exceeded by carrier

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
32.3400	32.8	40.0	-7.2	QP
39.6900	18.5	40.0	-21.5	QP
45.1200	26.2	40.0	-13.8	QP
45.8100	25.9	40.0	-14.1	QP
57.5700	28.2	40.0	-11.8	QP
60.6000	16.6	40.0	-23.4	QP
94.3800	20.8	43.5	-22.7	QP
185.7600	23.2	43.5	-20.3	QP
195.9900	28.5	43.5	-15.0	QP



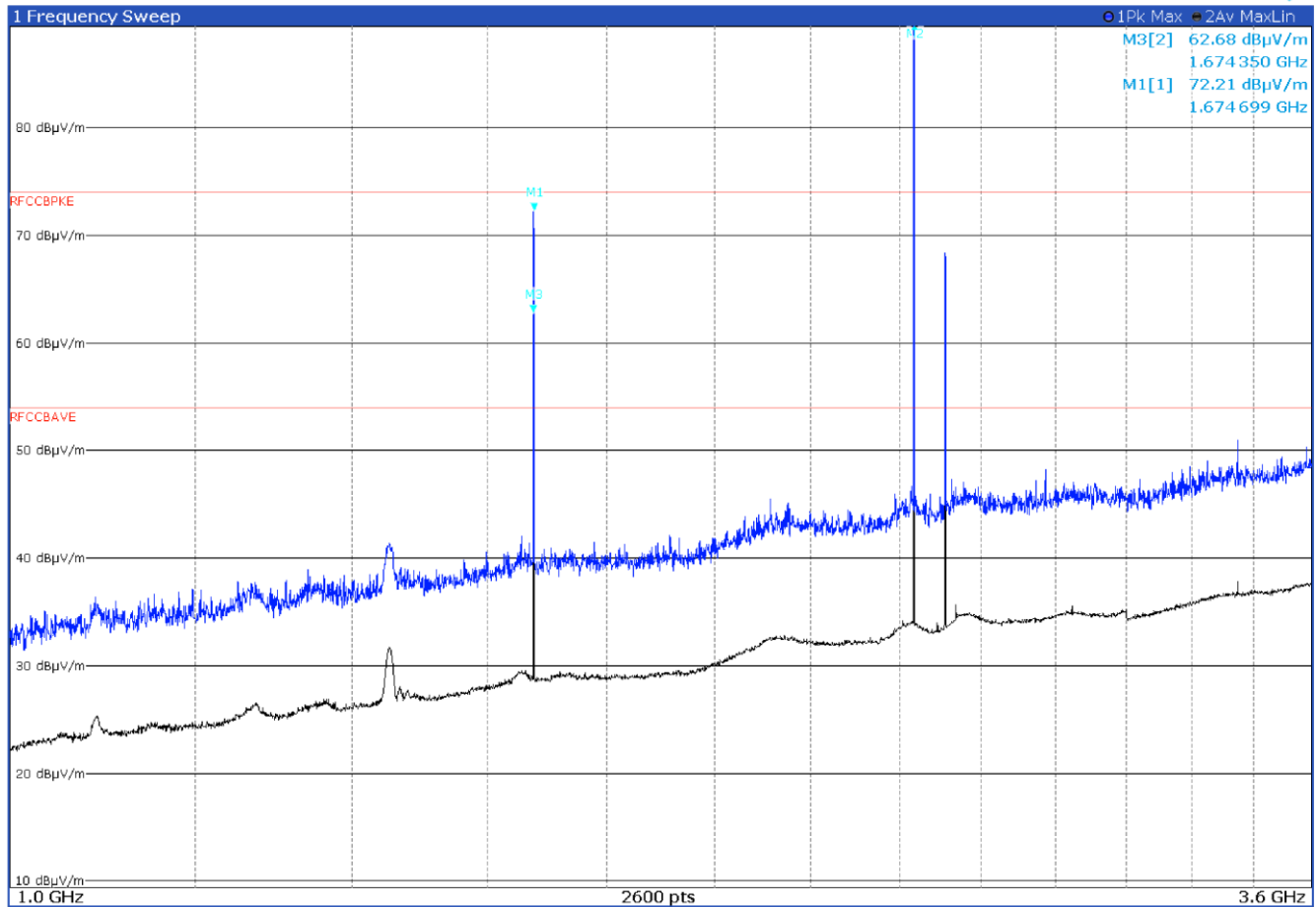
18:12:37 21.01.2022

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Antenna in horizontal polarization – Limit exceeded by carrier

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1674.0	69.0	82.2	-12.3	Peak

No inter-modulation product founds – All the other peak found are below the average limit



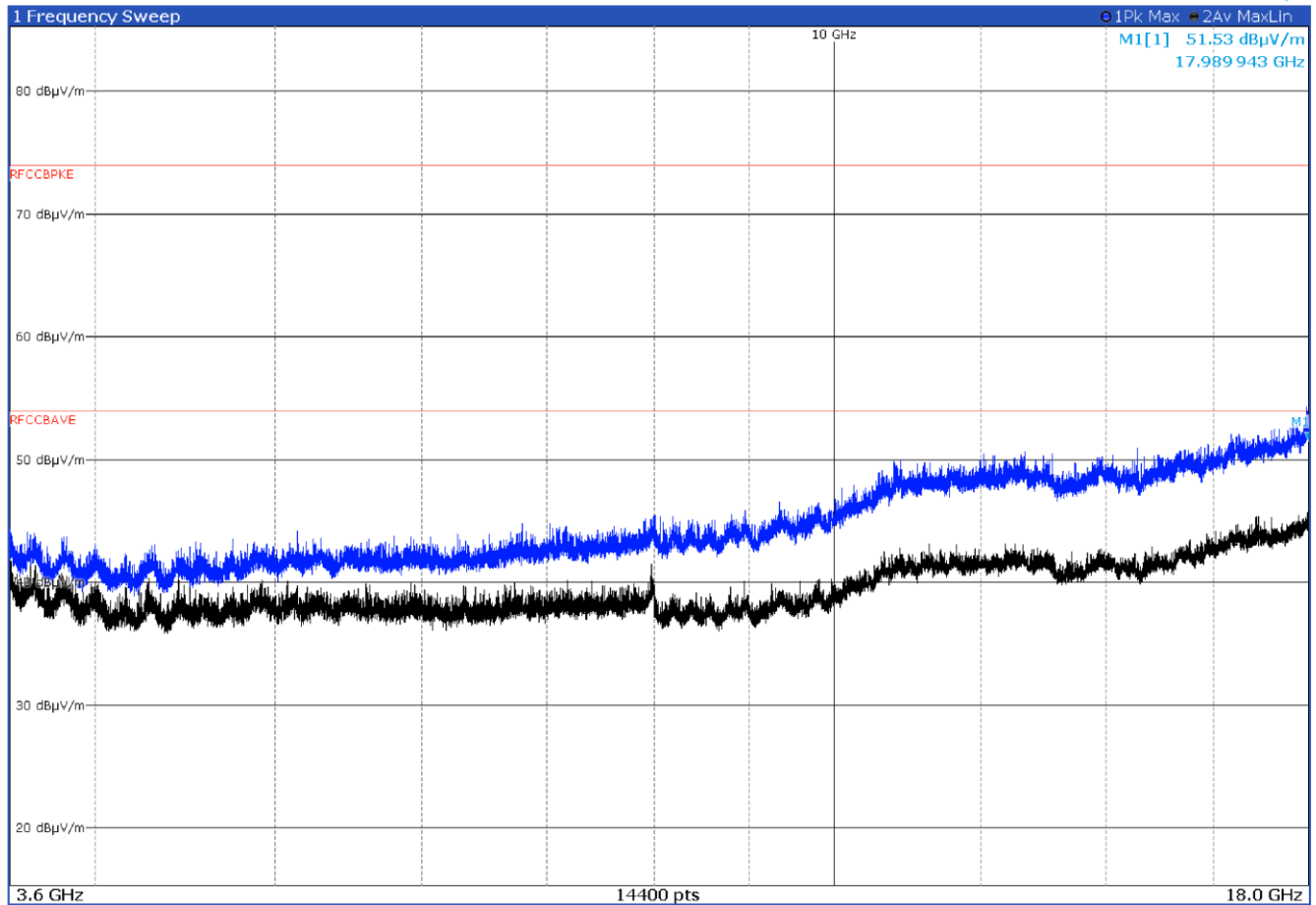
18:10:14 21.01.2022

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Antenna in vertical polarization – Limit exceeded by carrier

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1674.0	72.2	82.2	-10.0	Peak

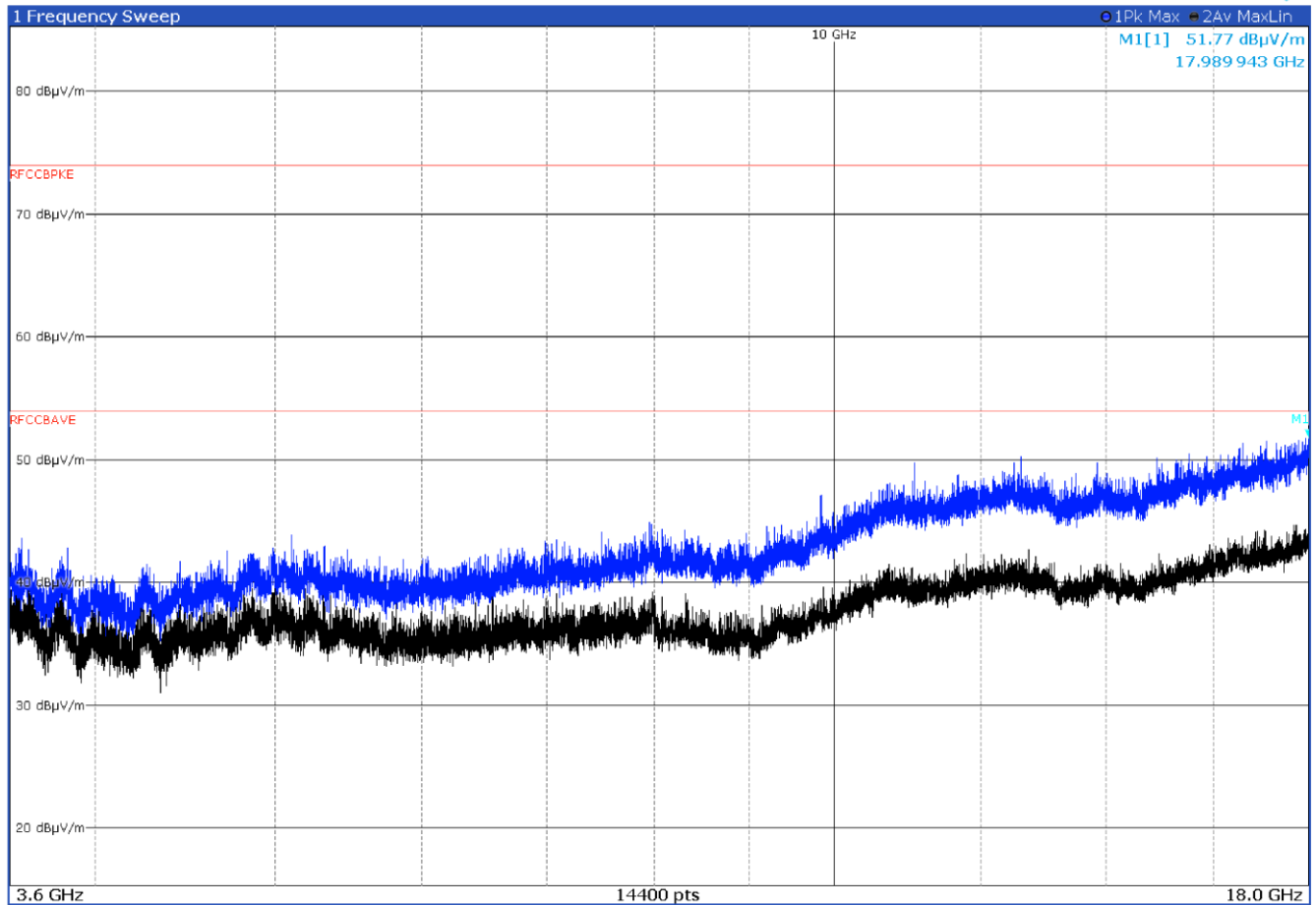
No inter-modulation product founds – All the other peak found are below the average limit



19:00:00 24.01.2022

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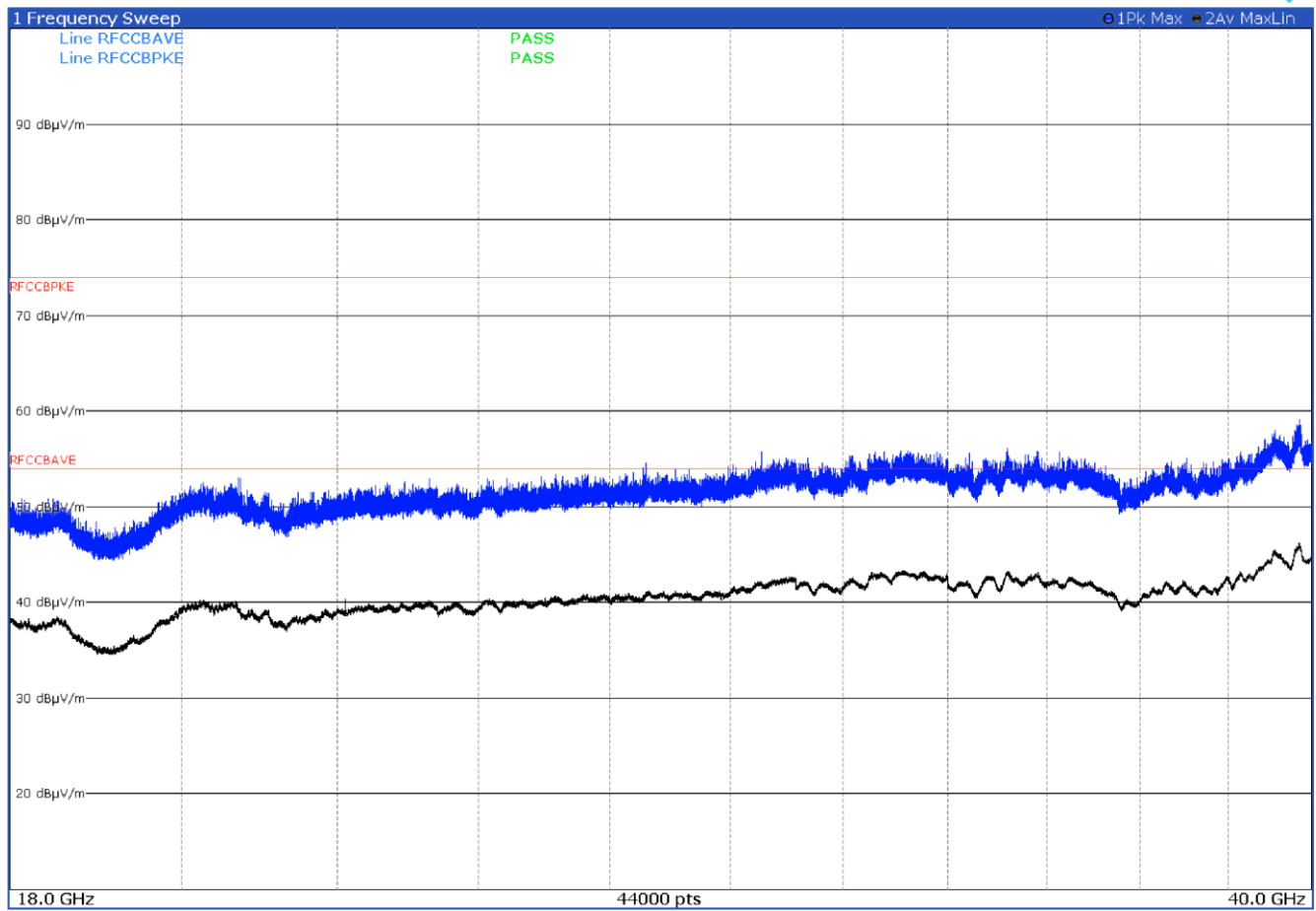
Antenna in horizontal polarization – No inter-modulation product founds – All the peak found are below the average limit



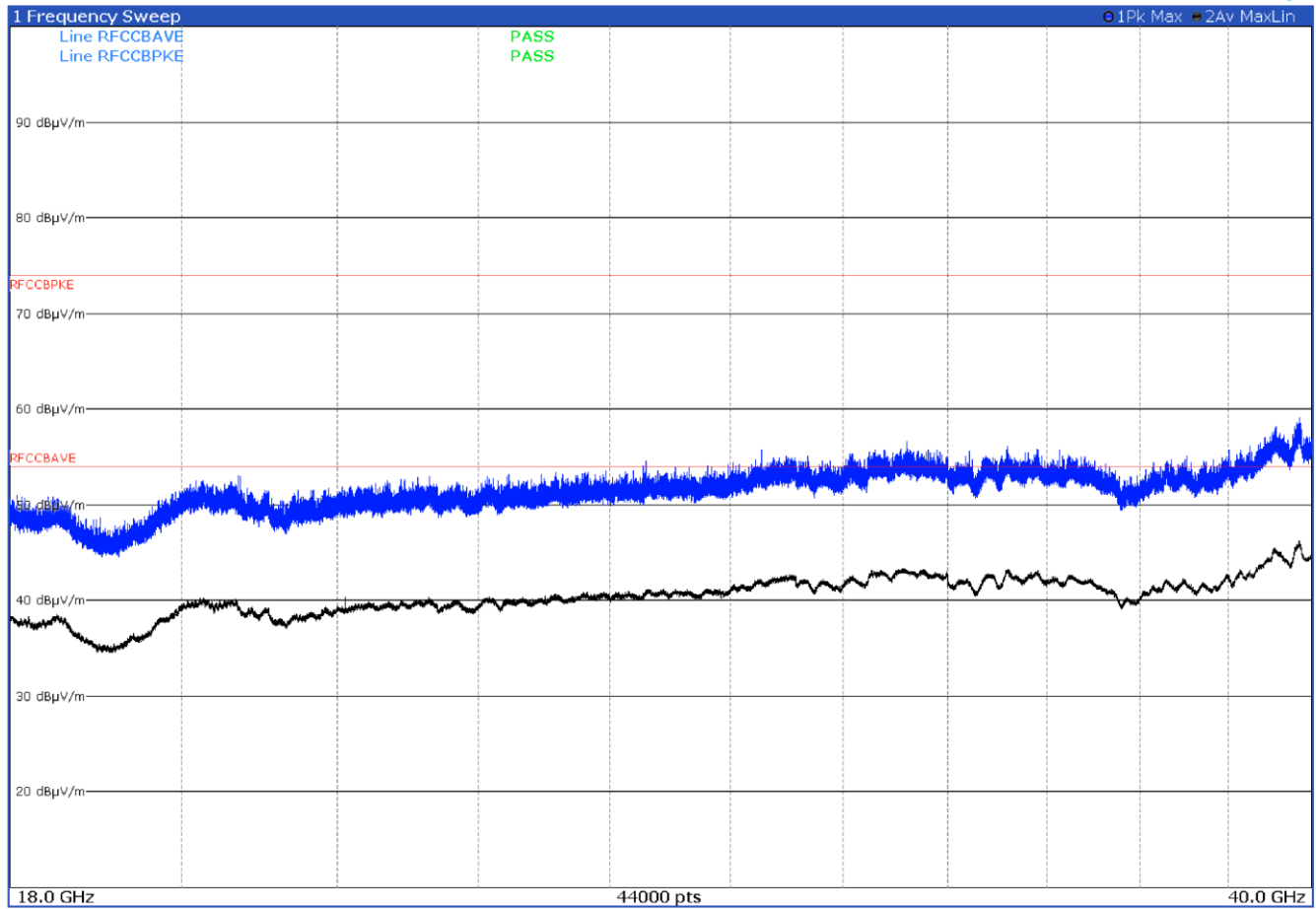
18:51:45 24.01.2022

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Antenna in vertical polarization – No inter-modulation product founds – All the peak found are below the average limit

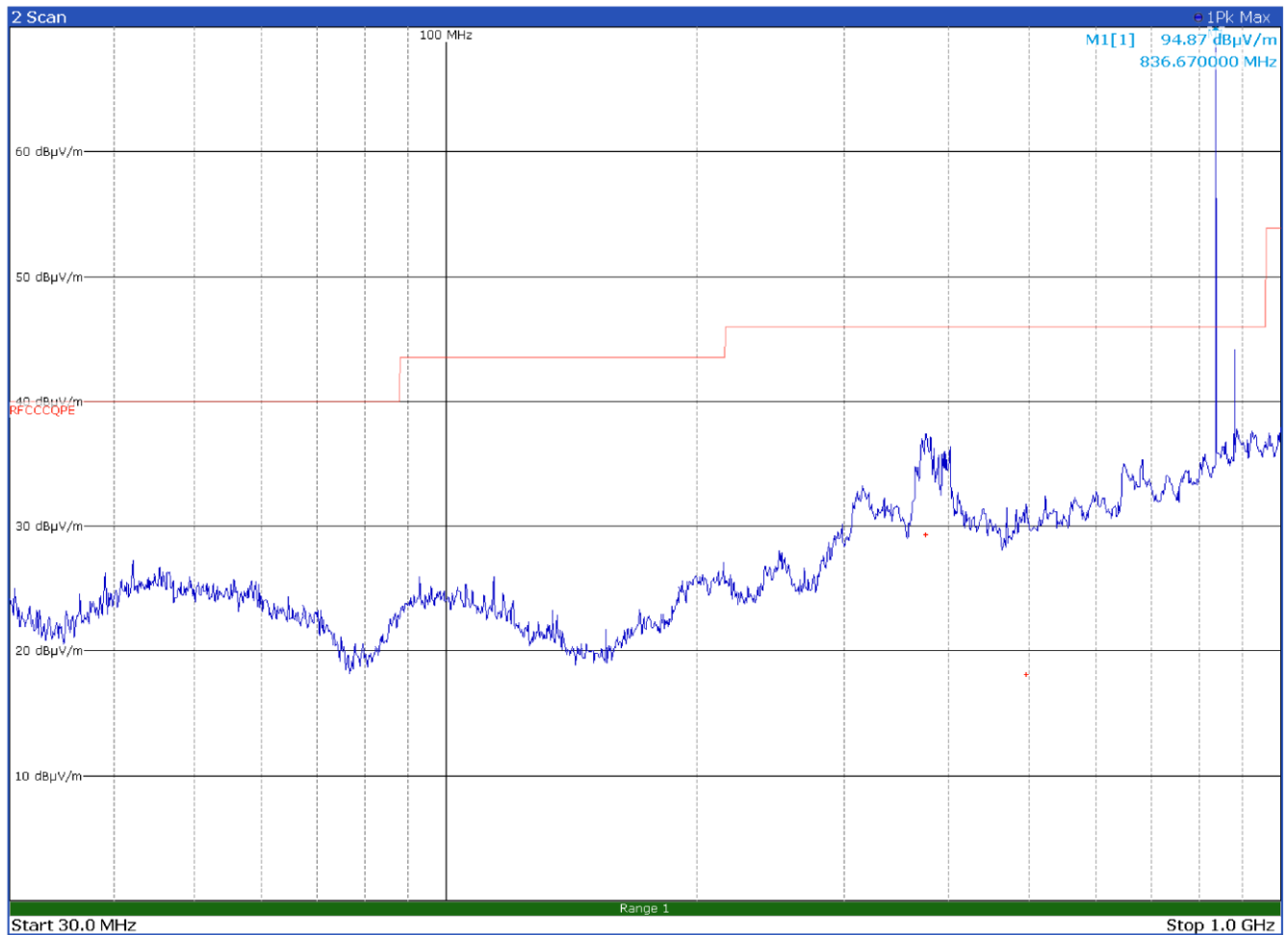


Antenna in horizontal polarization – No inter-modulation product founds



Antenna in vertical polarization – No inter-modulation product founds

8.1.7 Test data for ANTENNA SET A – GSM 850 at 836.6 MHz and WIFI 802.11a at 5300 MHz

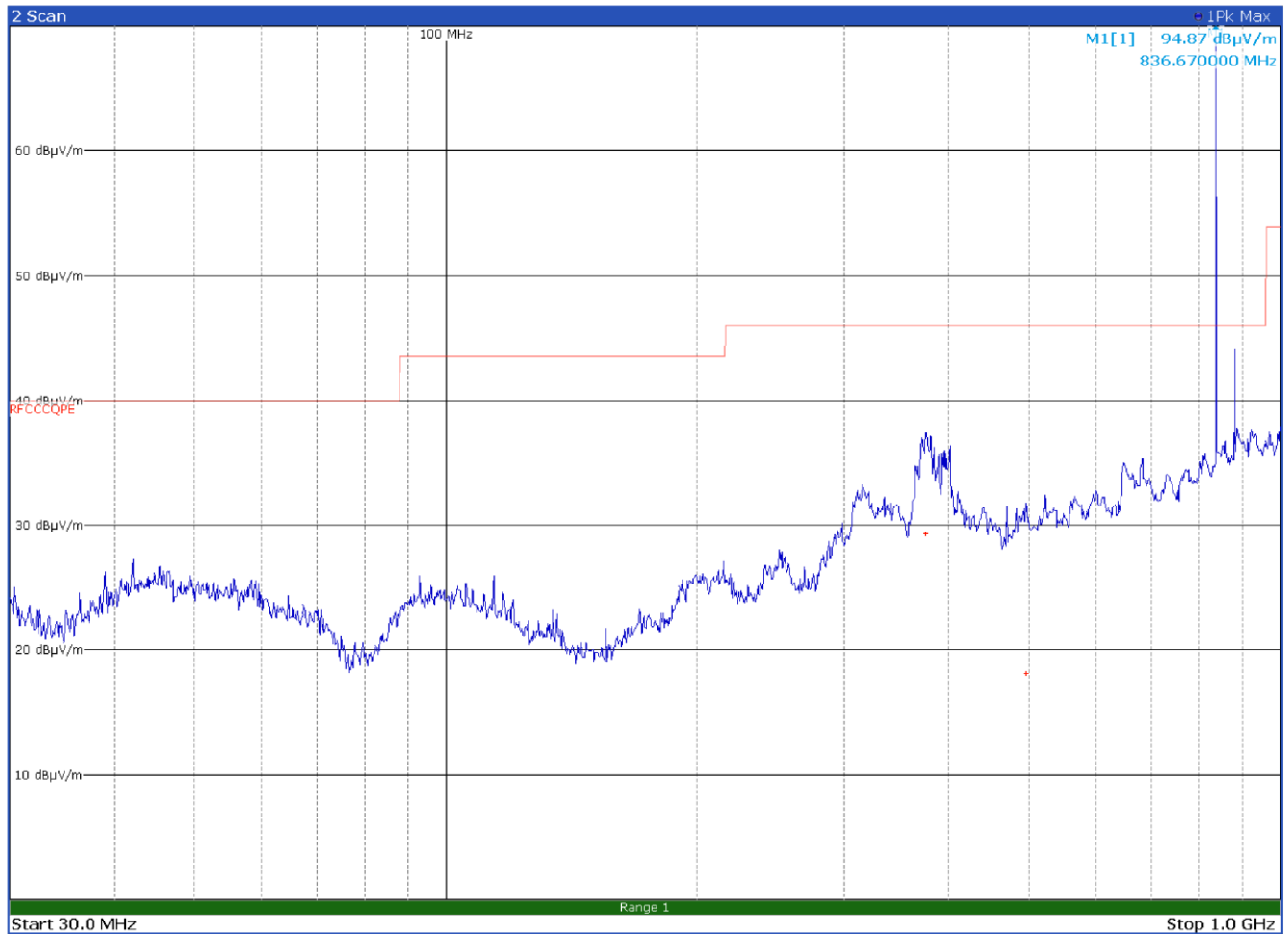


16:42:26 25.01.2022

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Antenna in horizontal polarization – Limit exceeded by carrier

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
375.2100	29.4	46.0	-16.6	QP
495.8700	18.1	46.0	-27.9	QP

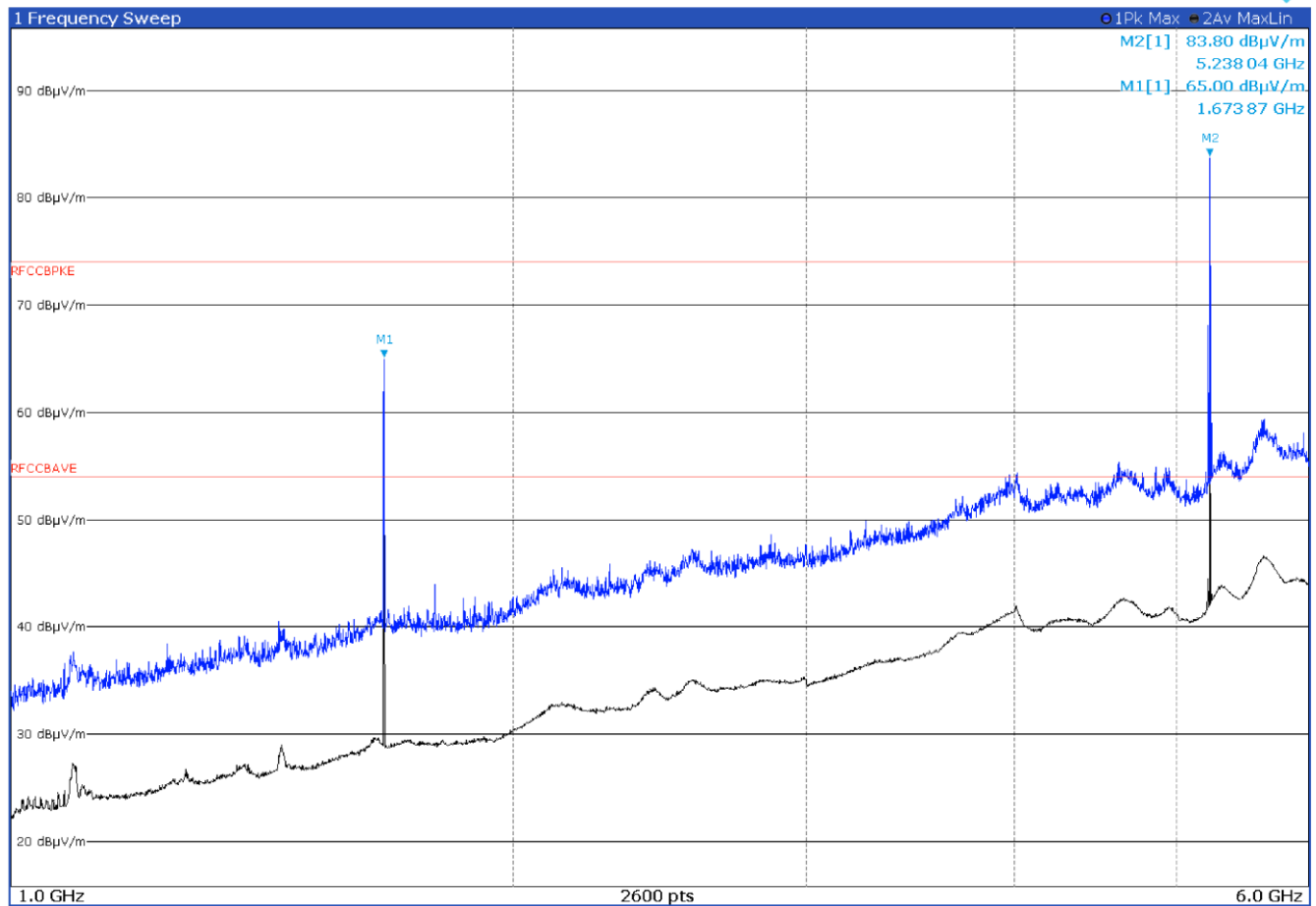


16:42:26 25.01.2022

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Antenna in vertical polarization – Limit exceeded by carrier

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
33.3600	28.7	40.0	-11.3	QP
35.0100	23.7	40.0	-16.3	QP
43.7700	23.3	40.0	-16.7	QP
51.5400	27.8	40.0	-12.2	QP
58.7100	28.9	40.0	-11.1	QP
61.6200	22.1	40.0	-17.9	QP
197.7900	22.3	43.5	-21.2	QP
418.9500	22.5	46.0	-23.5	QP



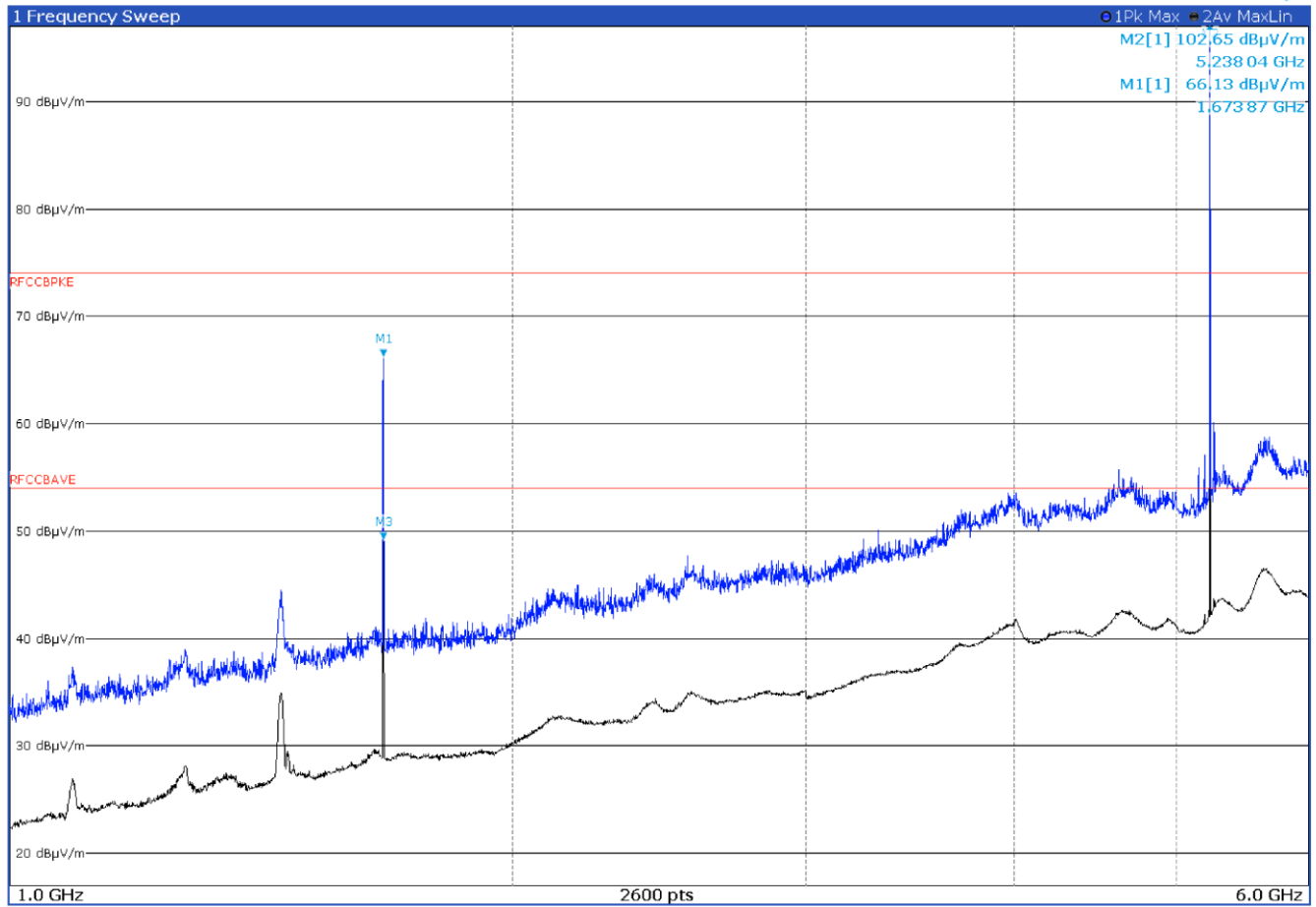
17:48:19 21.01.2022

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Antenna in horizontal polarization – Limit exceeded by carrier

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1674.0	65.0	82.2	-17.2	Peak

No inter-modulation product founds – All the other peak found are below the average limit



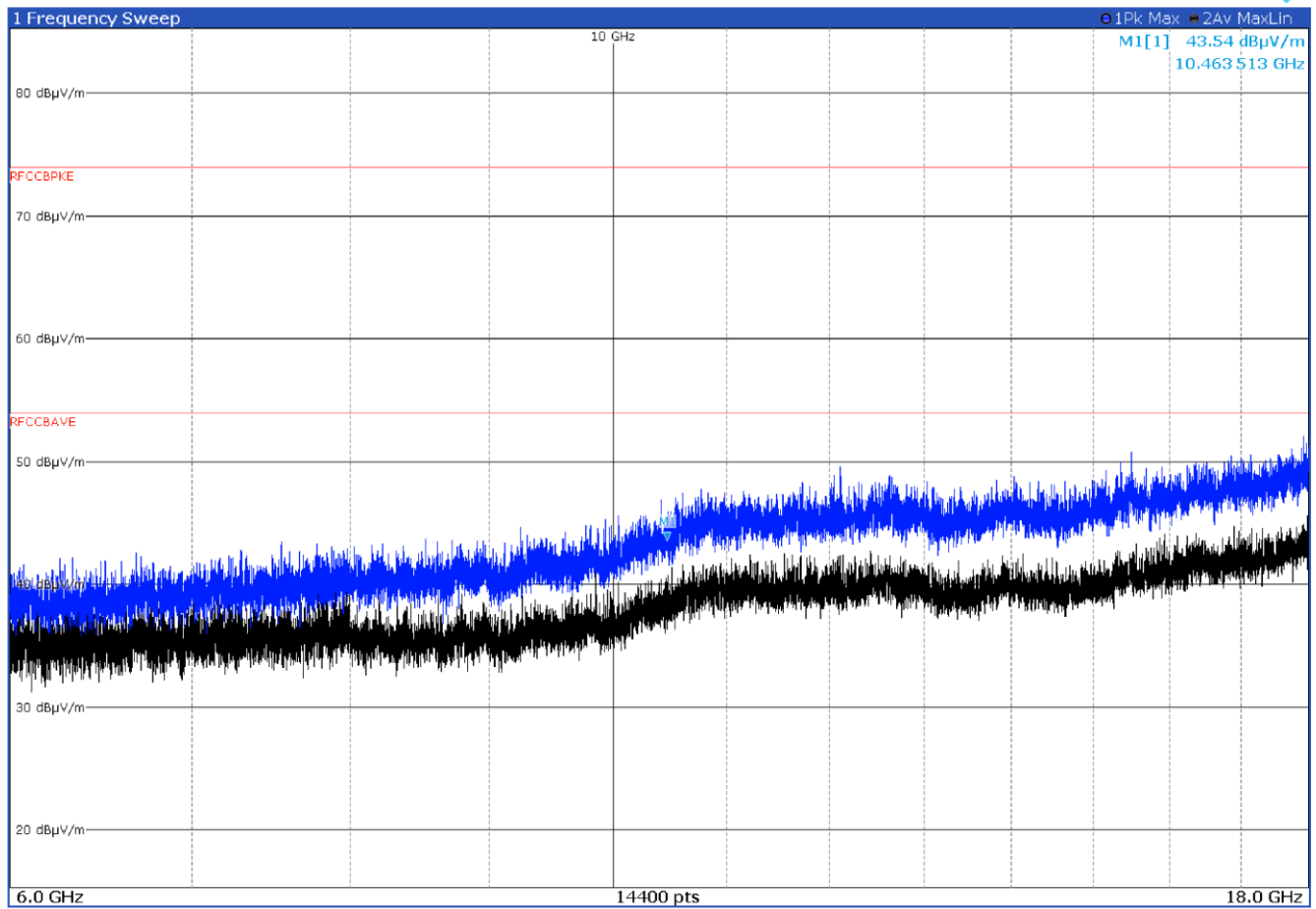
18:02:41 21.01.2022

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Antenna in vertical polarization – Limit exceeded by carrier

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1674.2	66.1	82.2	-16.1	Peak

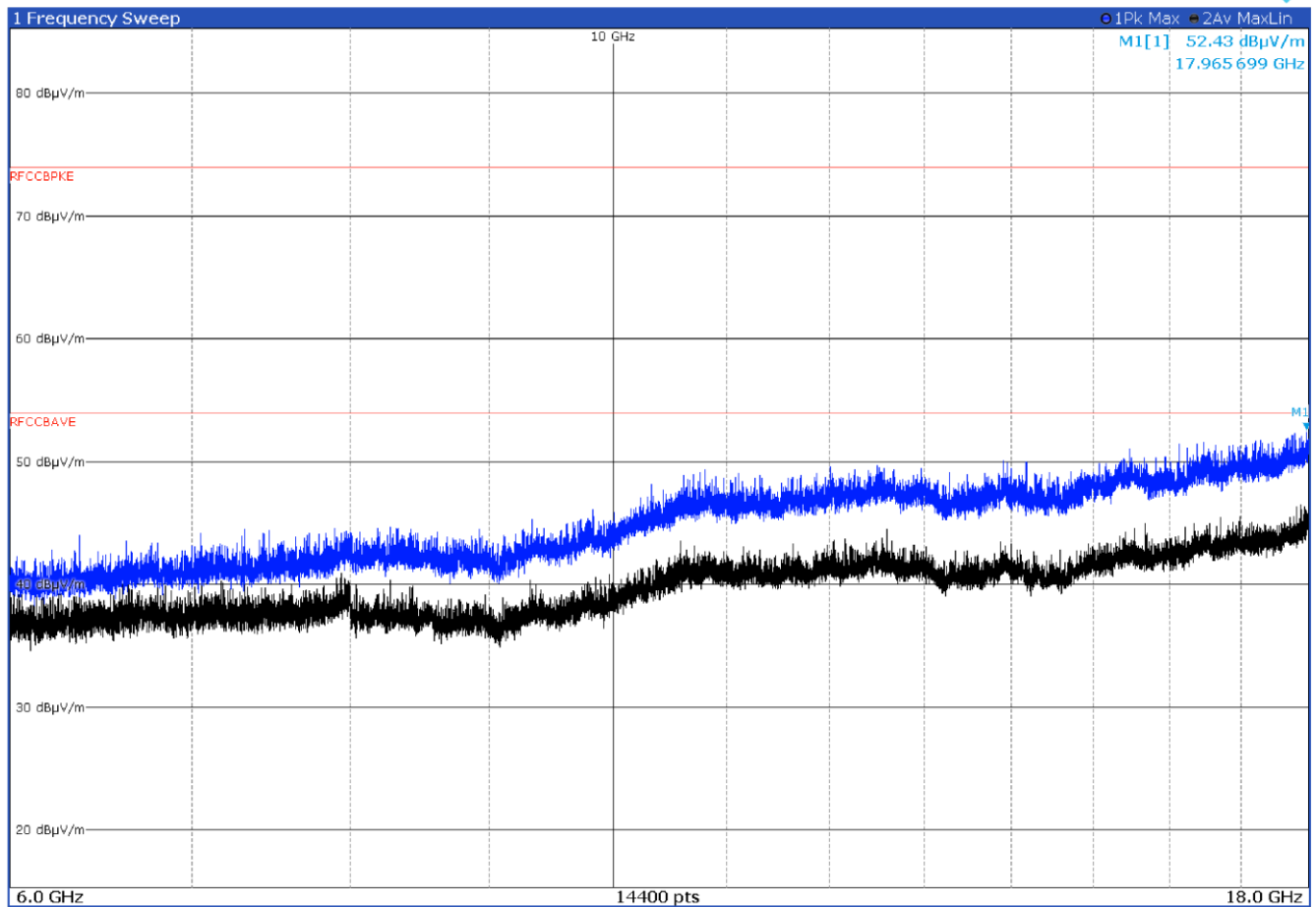
No inter-modulation product founds – All the other peak found are below the average limit



17:17:48 24.01.2022

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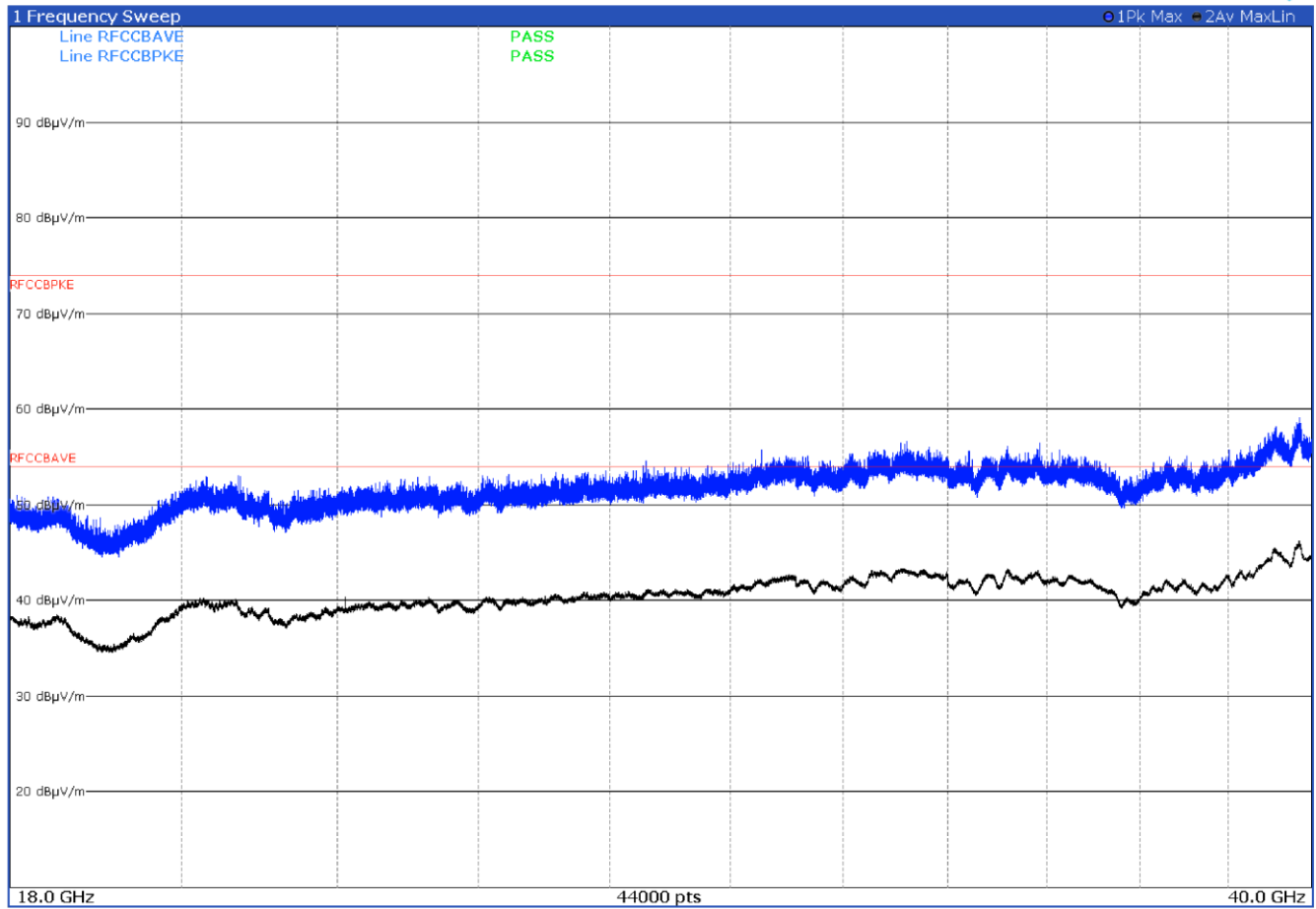
Antenna in horizontal polarization – No inter-modulation product founds



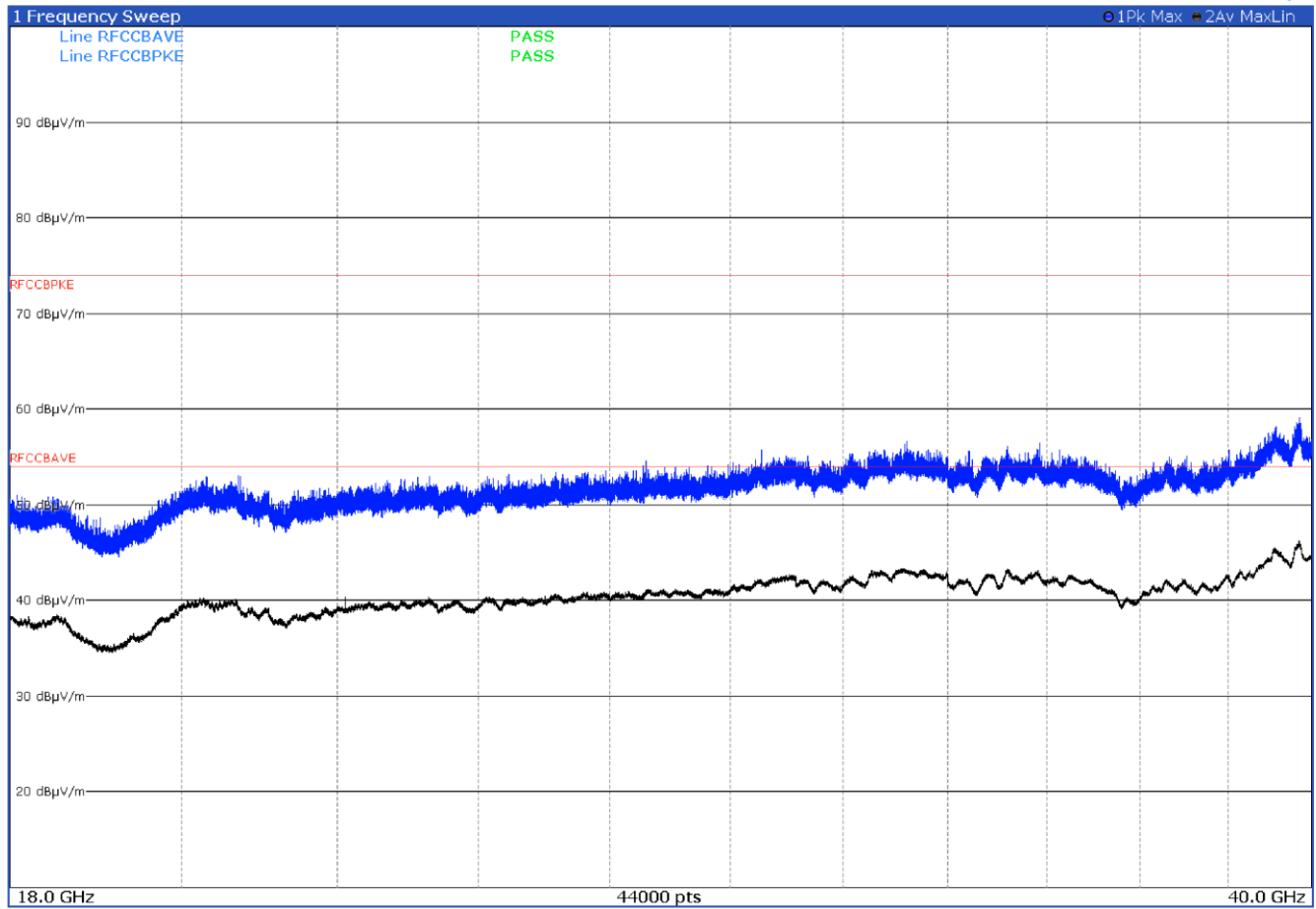
17:18:36 24.01.2022

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Antenna in vertical polarization – No inter-modulation product founds

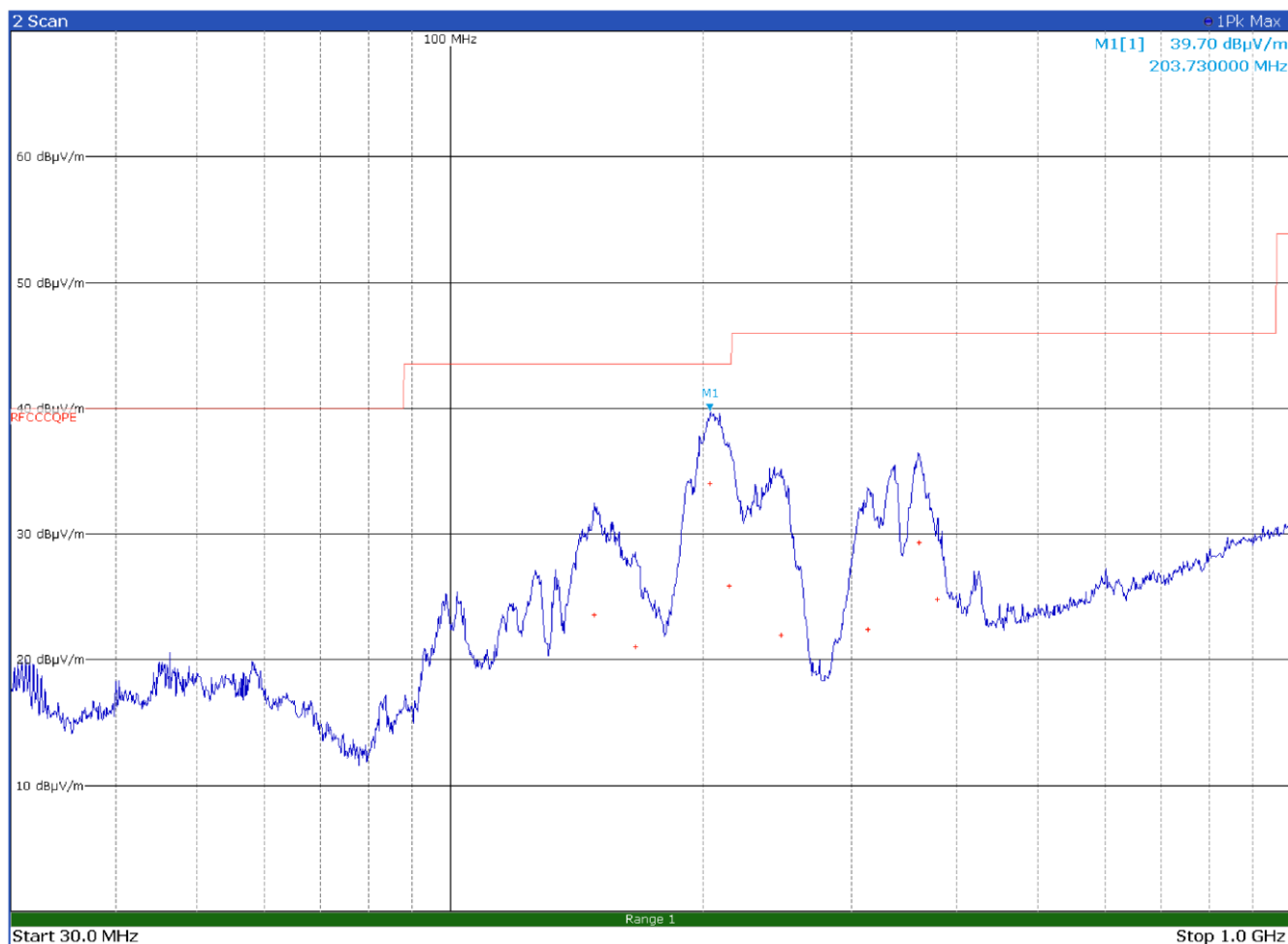


Antenna in horizontal polarization – No inter-modulation product founds



Antenna in vertical polarization – No inter-modulation product founds

8.1.8 Test data for ANTENNA SET A – WCDMA B4 at 1732.6 MHz and WIFI 802.11g at 2437 MHz

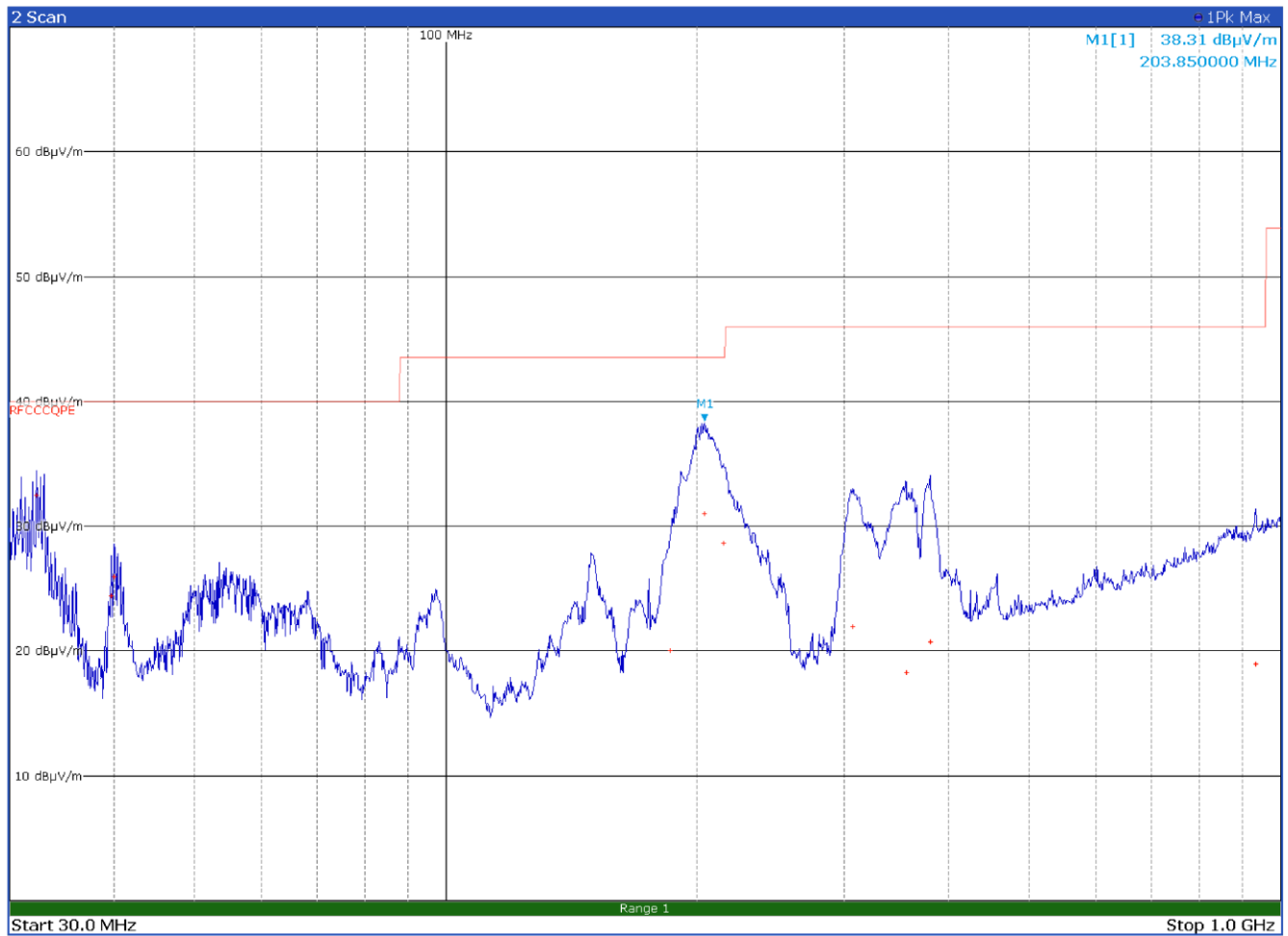


19:14:27 21.01.2022

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Antenna in horizontal polarization

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
148.1700	23.6	43.5	-19.9	QP
166.0200	21.1	43.5	-22.4	QP
203.7300	34.0	43.5	-9.5	QP
214.4100	25.9	43.5	-17.6	QP
247.1700	22.0	46.0	-24.0	QP
313.5300	22.5	46.0	-23.5	QP
360.4200	29.4	46.0	-16.6	QP
379.9200	24.8	46.0	-21.2	QP
148.1700	23.6	43.5	-19.9	QP
166.0200	21.1	43.5	-22.4	QP
203.7300	34.0	43.5	-9.5	QP
214.4100	25.9	43.5	-17.6	QP
247.1700	22.0	46.0	-24.0	QP
313.5300	22.5	46.0	-23.5	QP

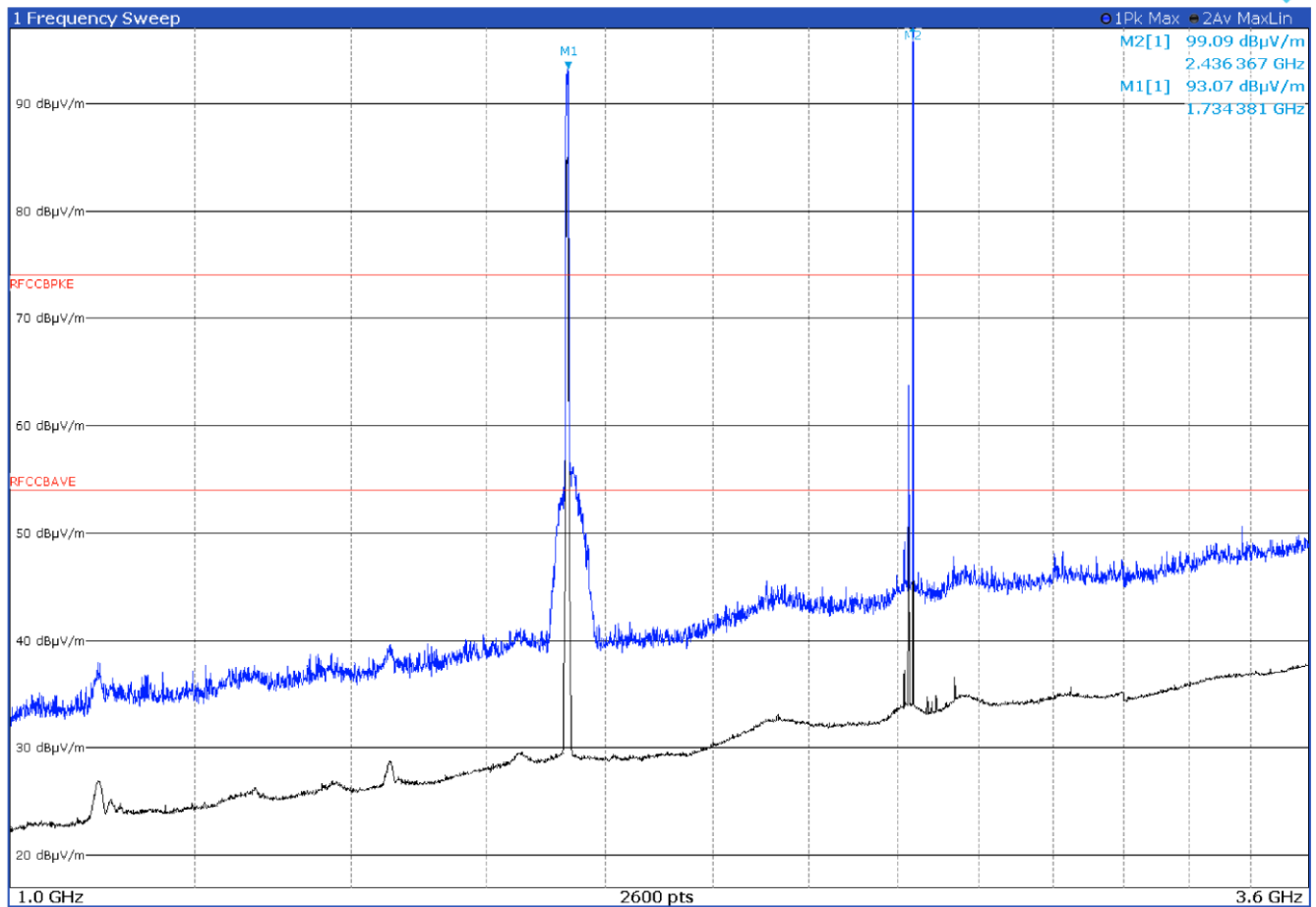


19:19:12 21.01.2022

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Antenna in vertical polarization

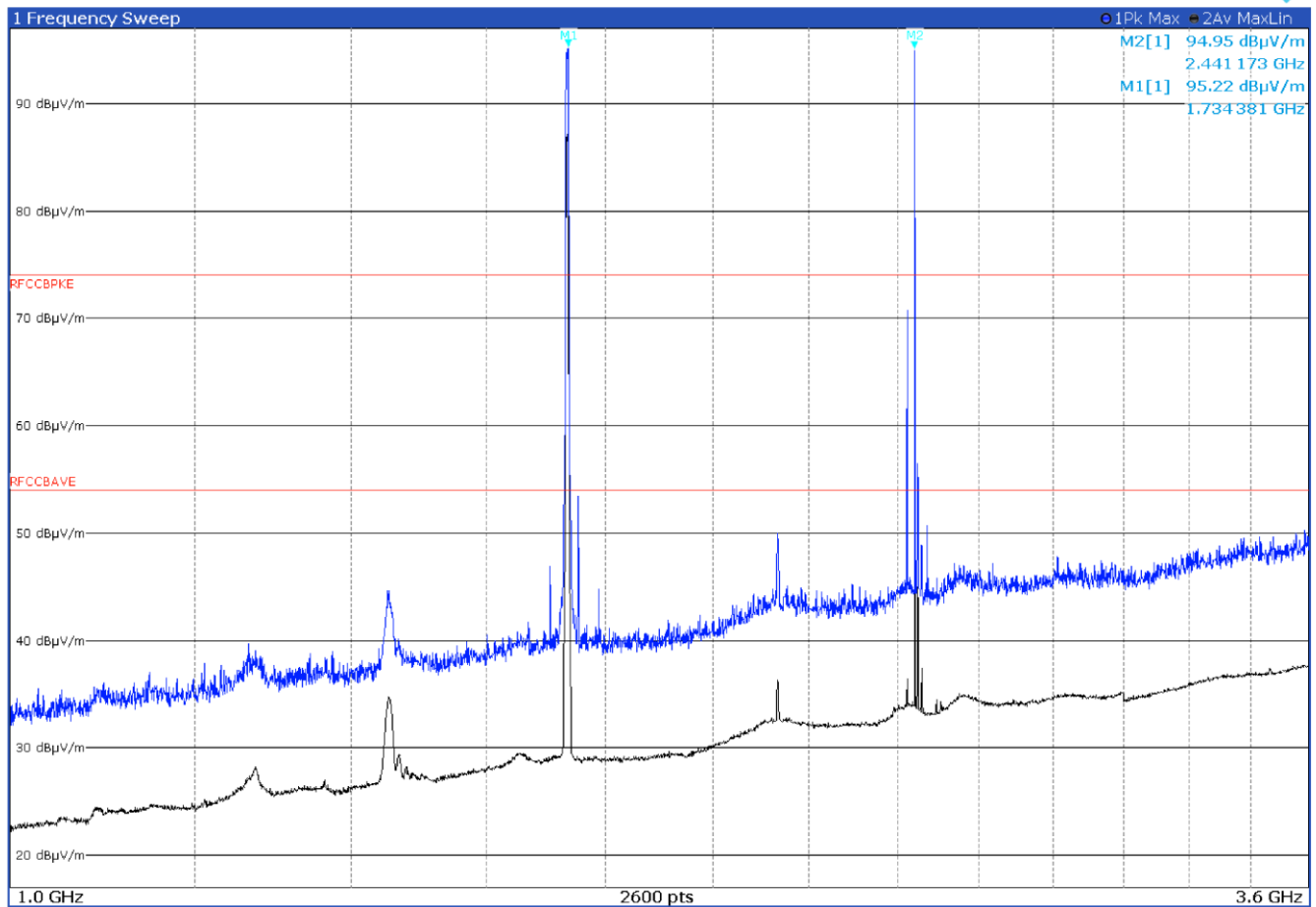
Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
32.3100	32.5	40.0	-7.5	QP
39.6900	24.4	40.0	-15.6	QP
40.0500	26.0	40.0	-14.0	QP
185.7300	20.1	43.5	-23.4	QP
203.8500	31.0	43.5	-12.5	QP
215.2800	28.6	43.5	-14.9	QP
307.4700	22.0	46.0	-24.0	QP
355.6800	18.3	46.0	-27.7	QP
380.2800	20.8	46.0	-25.2	QP
933.1500	19.0	46.0	-27.0	QP
355.6800	18.3	46.0	-27.7	QP



18:37:12 21.01.2022

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Antenna in horizontal polarization – No inter-modulation product founds
Limit exceeded by carrier – All the peak found are below the average limit



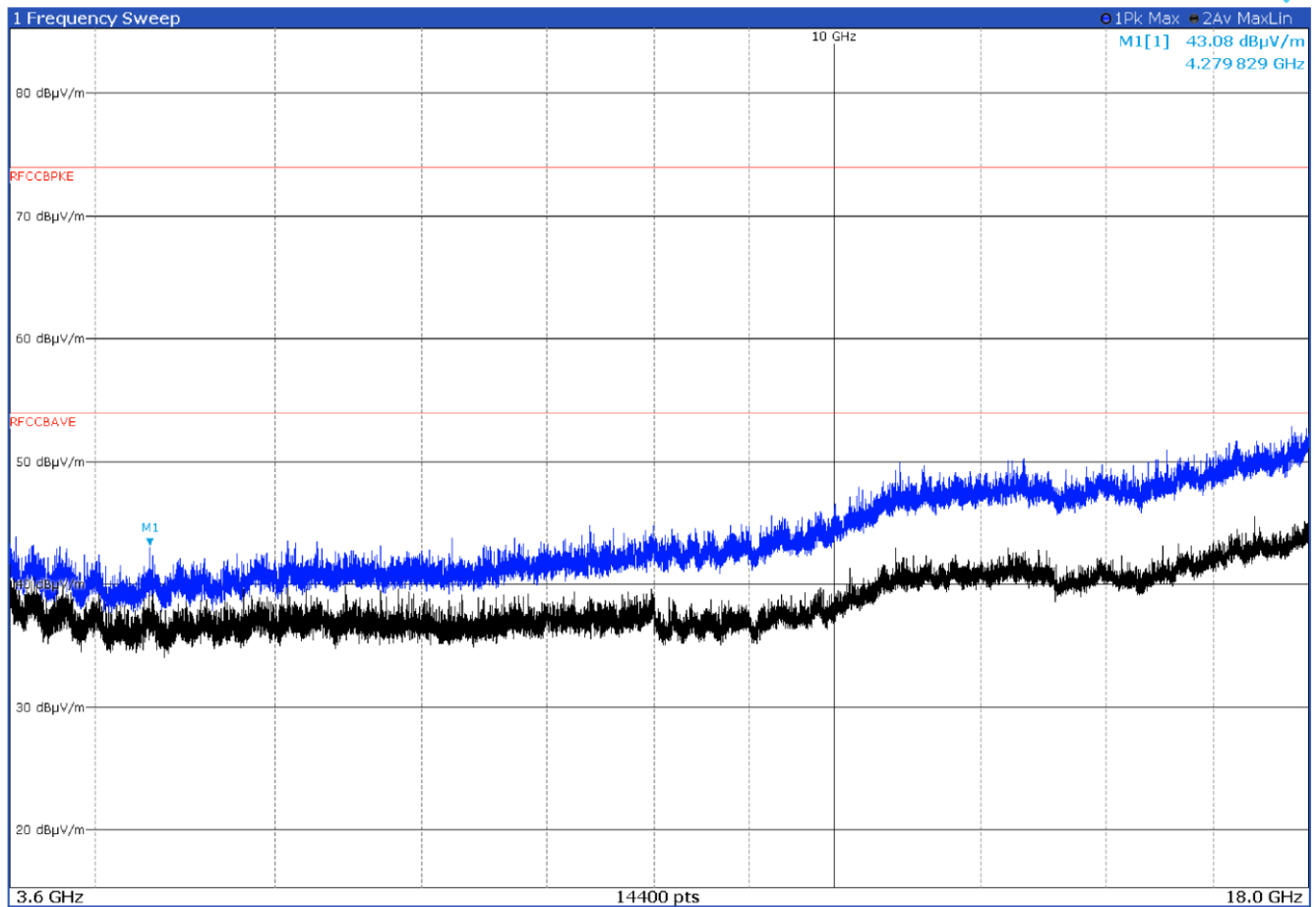
18:35:23 21.01.2022

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Antenna in vertical polarization – Limit exceeded by carrier

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
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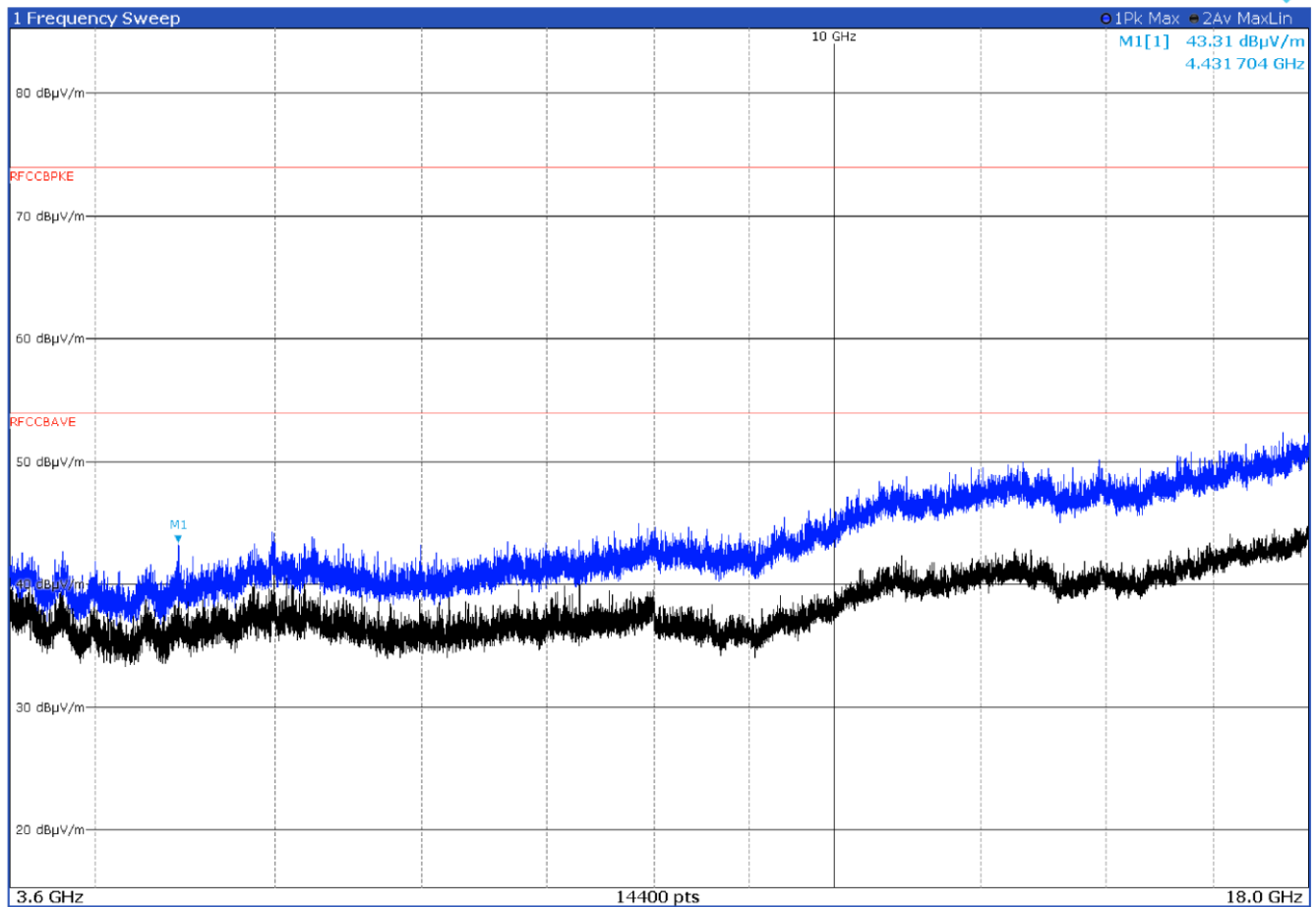
All the other peak found are below the average limit



18:38:22 24.01.2022

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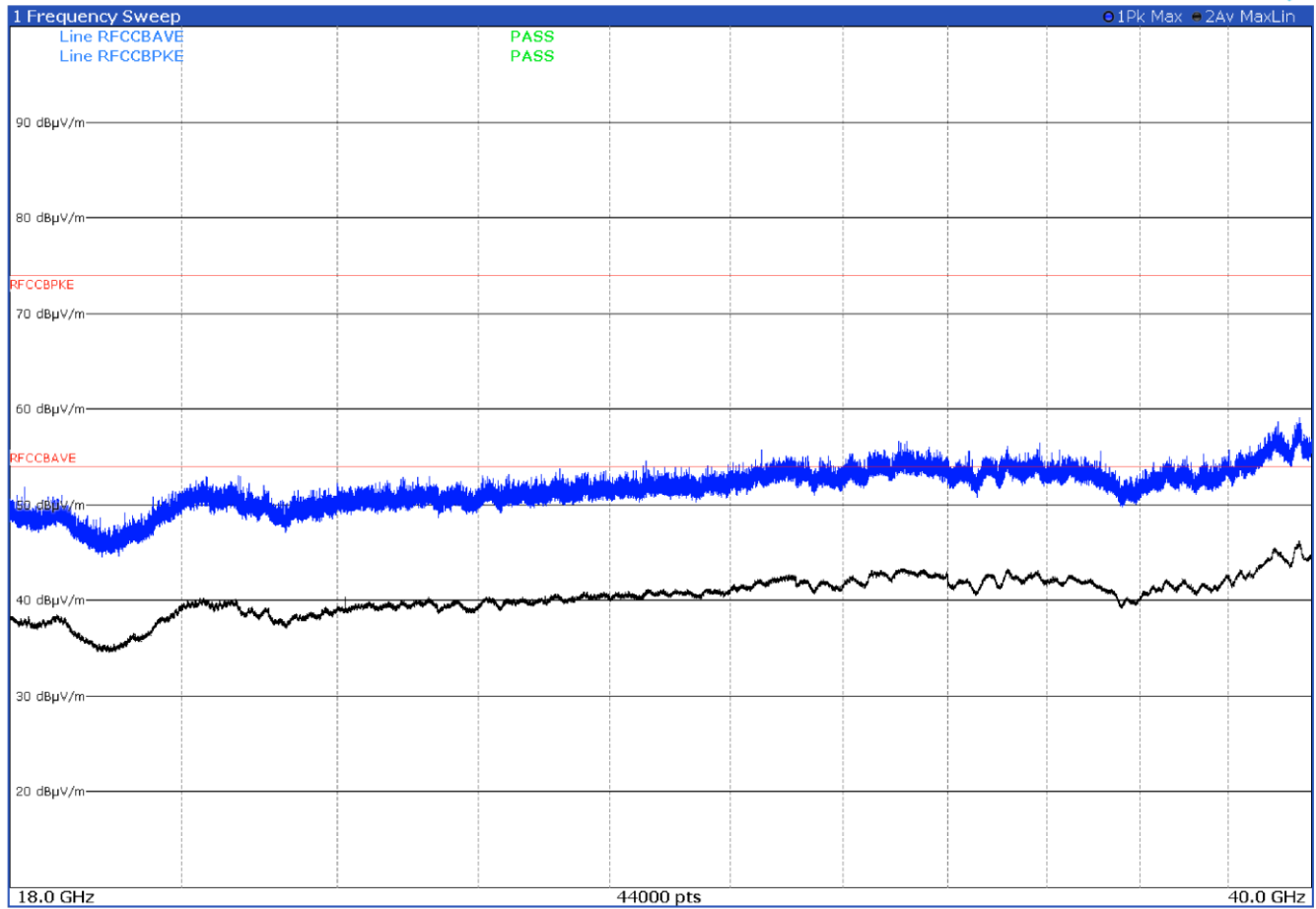
Antenna in horizontal polarization – No inter-modulation product founds – All the peak found are below the average limit



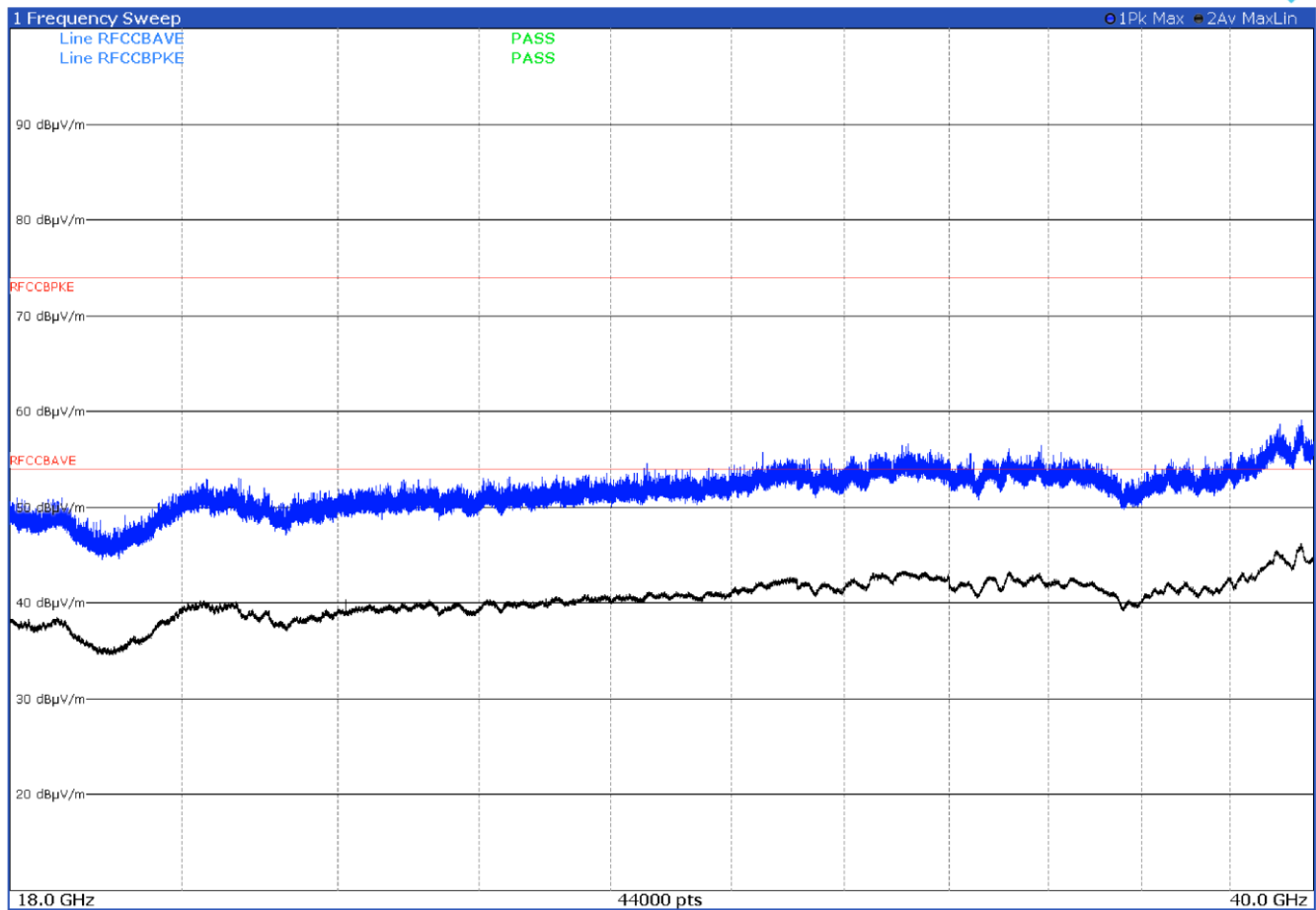
18:40:19 24.01.2022

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Antenna in vertical polarization – No inter-modulation product founds – All the peak found are below the average limit



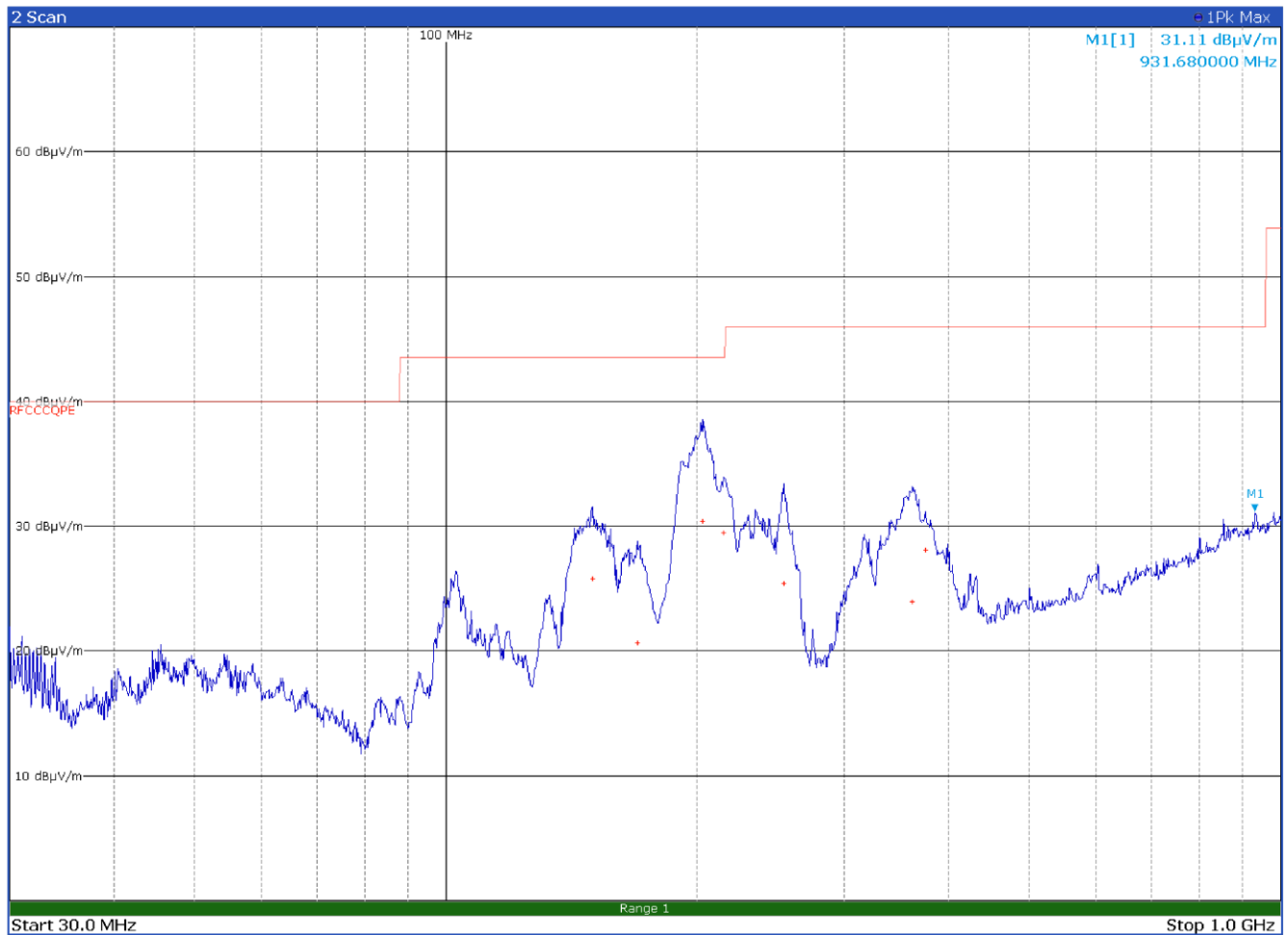
Antenna in horizontal polarization – No inter-modulation product founds



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Antenna in vertical polarization – No inter-modulation product founds

8.1.9 Test data for ANTENNA SET A – WCDMA B4 at 1732.6 MHz and WIFI 802.11a at 5300 MHz

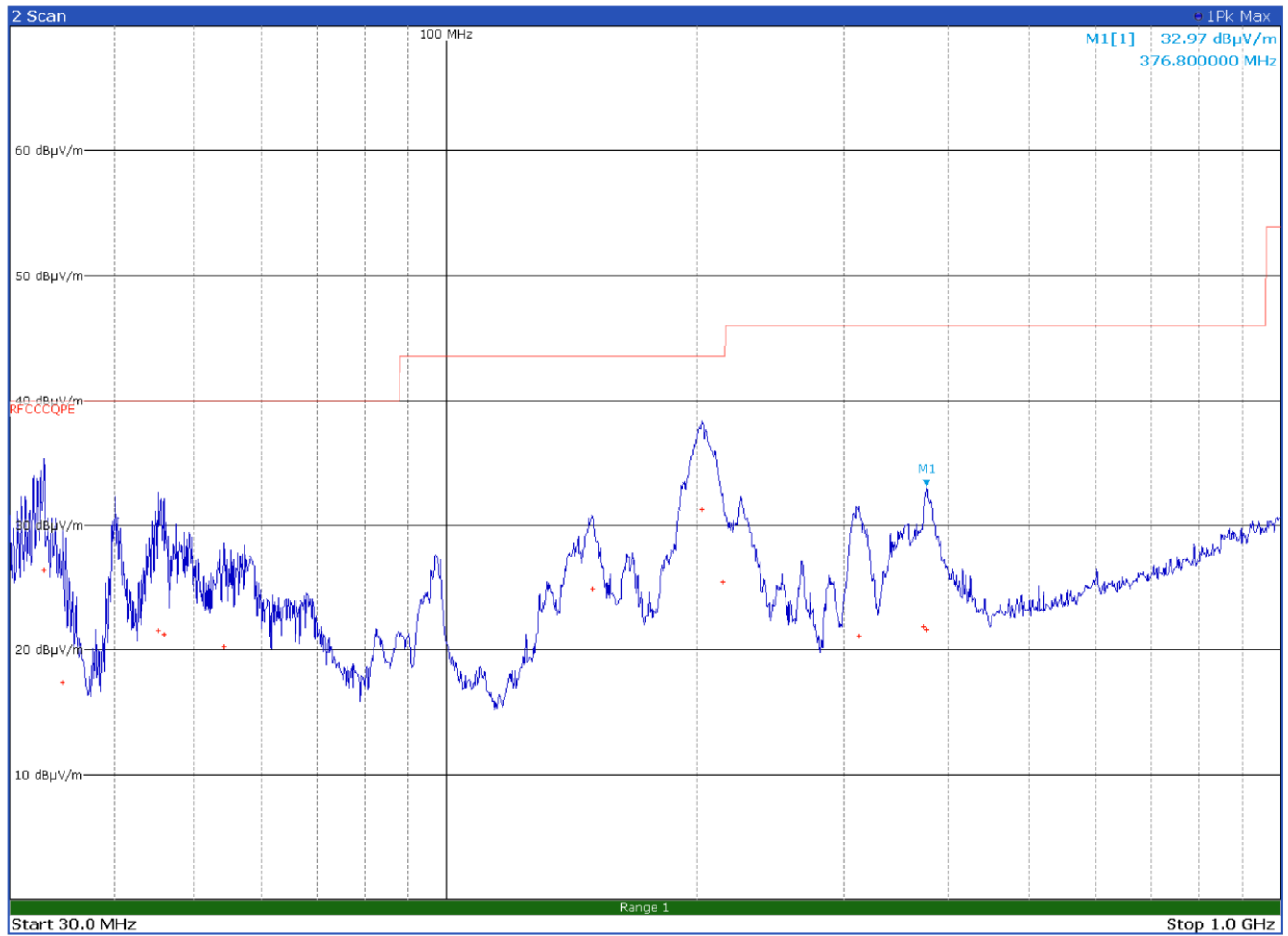


20:06:47 21.01.2022

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Antenna in horizontal polarization

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
149.6100	25.9	43.5	-17.6	QP
169.4700	20.7	43.5	-22.8	QP
203.1600	30.5	43.5	-13.0	QP
214.9800	29.5	43.5	-14.0	QP
253.7700	25.4	46.0	-20.6	QP
362.0700	24.0	46.0	-22.0	QP
375.4200	28.2	46.0	-17.8	QP

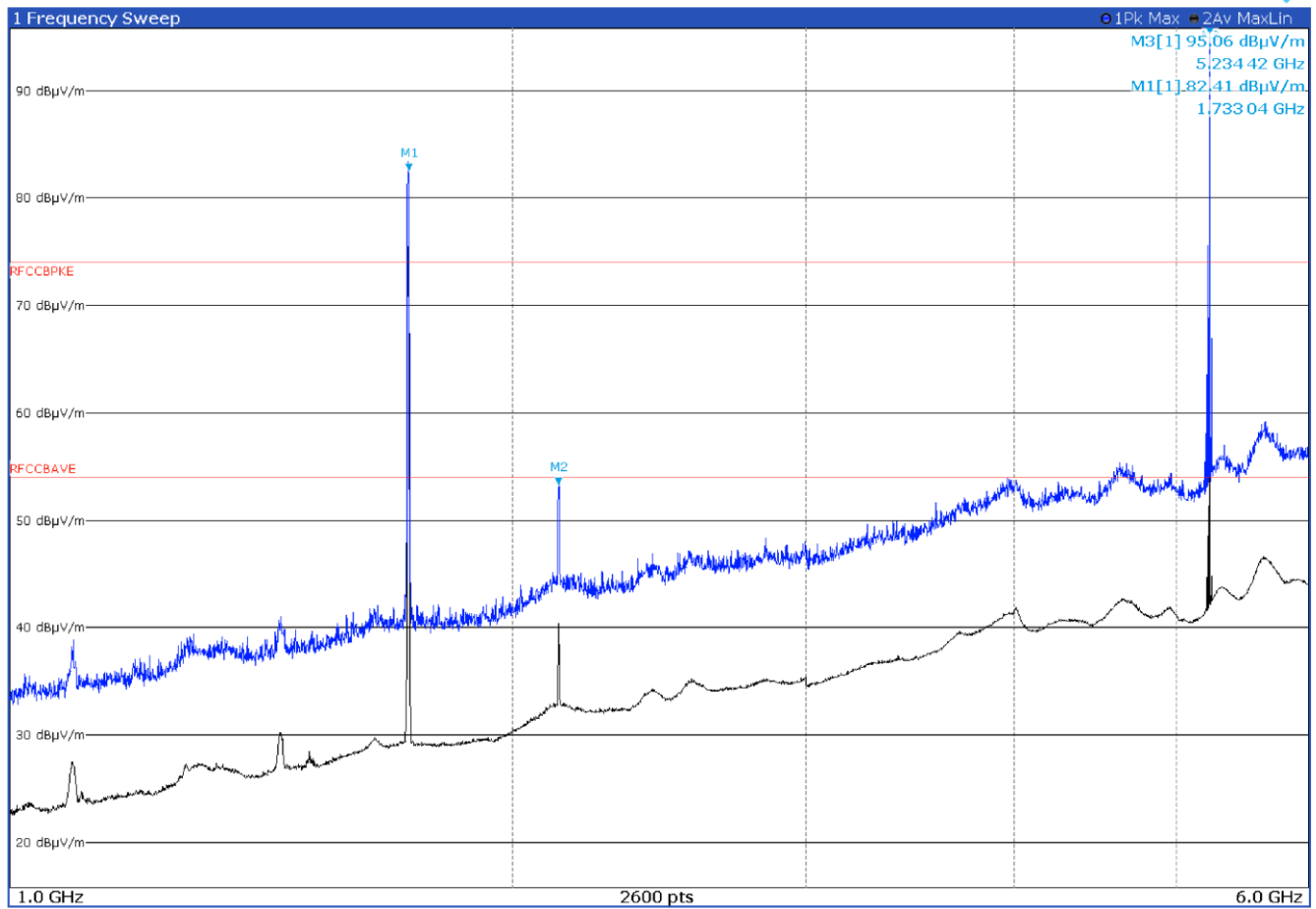


20:03:37 21.01.2022

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Antenna in vertical polarization

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
33.0300	26.4	40.0	-13.6	QP
34.7100	17.5	40.0	-22.5	QP
45.1500	21.6	40.0	-18.4	QP
45.8400	21.3	40.0	-18.7	QP
54.2400	20.3	40.0	-19.7	QP
149.6400	24.9	43.5	-18.6	QP
202.2900	31.3	43.5	-12.2	QP
214.2900	25.6	43.5	-17.9	QP
312.0600	21.2	46.0	-24.8	QP
373.9200	21.9	46.0	-24.1	QP
376.8000	21.7	46.0	-24.3	QP
214.2900	25.6	43.5	-17.9	QP



17:06:04 21.01.2022

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Antenna in horizontal polarization – No inter-modulation product founds
Limit exceeded by carrier – All the peak found are below the average limit