

Wireless test report – 431198-1TRFWL

Type of assessment:

Transmitters co-location

Applicant:

Cassina Spa

Via L. Busnelli,1 20036 Meda MB Italy

Product:

Wireless Audio Module

Model:

RADIO842

FCC ID:

2A3CQ-RADIO842

IC Registration number:

27763-RADIO842

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

Radiated emission limits

Date of issue: August 9, 2021

D. Guarnone

Tested by



Signature

P. Barbieri

Reviewed by



Signature

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.

Copyright notification

Nemko Spa authorizes the applicant to reproduce this report provided it is reproduced in its entirety and for use by the company's employees only. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. Nemko Spa accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

Table of contents

Table of contents	3
Section 1. Report summary	4
1.1 Applicant and manufacturer	4
1.2 Test specifications	4
1.3 Test methods	4
1.4 Statement of compliance	4
1.5 Exclusions	4
1.6 Test report revision history	4
Section 2. Summary of test results	5
2.1 FCC Part 15 Subpart C, general requirements test results	5
2.2 ISED RSS-GEN, Issue 5, test results	Errore. Il segnalibro non è definito.
Section 3. Equipment under test (EUT) details	6
3.1 Sample information	6
3.2 EUT information	6
3.3 Technical information	6
3.4 EUT setup diagram	6
3.5 Product description and theory of operation	7
3.6 EUT exercise details	8
Section 4. Engineering considerations	9
4.1 Modifications incorporated in the EUT	9
4.2 Technical judgment	9
4.3 Deviations from laboratory tests procedures	9
Section 5. Test conditions	10
5.1 Atmospheric conditions	10
5.2 Power supply range	10
Section 6. Measurement uncertainty	11
6.1 Uncertainty of measurement	11
Section 7. Test equipment	12
7.1 Test equipment list	12
Section 8. Testing data	13
8.1 FCC 15.209 and RSS-GEN section 8.9 Radiated emission limits; general requirements	13
Section 9. Block diagrams of test set-ups	31
9.1 Radiated emissions set-up for frequencies below 1 GHz	31
9.2 Radiated emissions set-up for frequencies above 1 GHz	31
Section 10. Photos	32
10.1 Photos of the test set-up	32
10.2 Photos of the EUT	33

Section 1. Report summary

1.1 Applicant and manufacturer

Company name	Cassina Spa
Address	Via L. Busnelli,1 20036 Meda MB 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
-------------------	--

1.4 Statement of compliance

In the configuration tested, the EUT was found non-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
431198-1TRFWL	August 9, 2021	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 RSS-Gen, Issue 5, general requirements 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	August 3, 2021
Nemko sample ID number	4311980000

3.2 EUT information

Product name	Wireless Audio Module
Model	RADIO842
Serial number	4311980000

3.3 Technical information

Frequency band	BLE: 2400–2483.5 MHz Wireless MD8530P10: 2400–2483.5 MHz FM: 76 – 108 MHz Band-3: 174 – 240 MHz
EUT power requirements	110 Vac
Antenna information	The EUT uses a unique antenna coupling/ non-detachable antenna to the intentional radiator.

3.4 EUT setup diagram

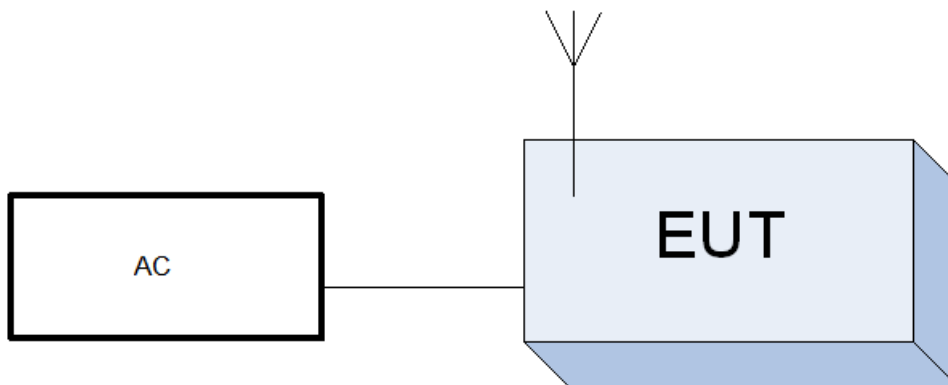


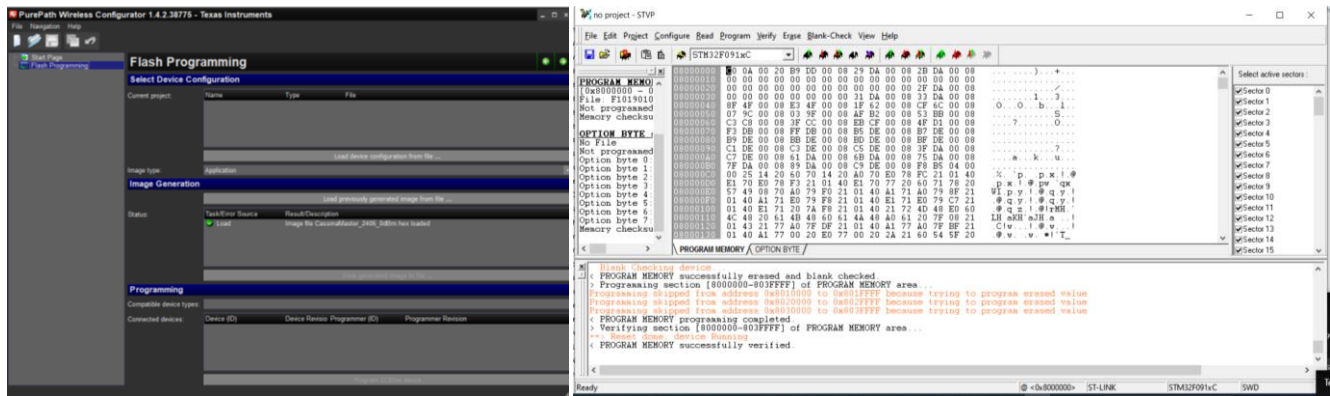
Figure 3.4-1: Setup diagram

3.5 Product description and theory of operation

The EUT is a Radio receiver FM, DAB and pairing Bluetooth provided with the following radio module:

- MD8530P1 modulo wireless RAYTAC
- T4B modulo DAB-FM T4B KEYSTONE.
- WT32i modulo Bluetooth BLUEGIGA

3.6 EUT exercise details



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

--

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

When it is impracticable to carry out tests under these conditions, a note to this effect stating the ambient temperature and relative humidity during the tests shall be recorded and stated.

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	12/2020	12/2022
Thermo-hygrometer data loggers	Testo	175-H2	38203337/703	12/2020	12/2022
Barometer	Castle	GPB 3300	072015	03/2021	03/2022

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:

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. 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	2020-09	2021-09
Antenna Trilog 25MHz - 8GHz	Schwarzbeck Mess-Elektronik	VULB9162	9162-025	2021-07	2024-07
Antenna Trilog 25-2000 MHz	Schwarzbeck Mess-Elektronik	VULB9168	9168-242	2021-06	2024-06
Antenna 1 - 18 GHz	Schwarzbeck Mess-Elektronik	STLP9148	STPL 9148-123	2021-06	2024-06
Double Ridge Horn Antenna	RFSpin	DRH40	061106A40	2020-04	2023-04
Broadband Bench Top Amplifier	Sage	STB-1834034030-KFKF-L1	18490-01	2021-04	2022-04
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	2019-09	2021-09
Common Mode Absorption Device	Schwarzbeck Mess-Elektronik	CMAD1614	00041	2021-05	2022-05
LISN	Rohde & Schwarz	ESH2-Z5	881 362/006	2021-03	2022-03
Oscilloscope	Agilent	54846A	MY40000254	2020-11	2022-11
Multimeter	Rohde & Schwarz	HMC8012	101577	2021-06	2022-06
Barometer	Castle	GBP 3300	072015	2021-04	2022-04
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
Attenuator	Aeroflex / Weinschel	2	CC8577	2021-07	2022-07

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

Test start date	August 3, 2021
Test engineer	D. Guarnone

8.1.3 Observations, settings and special notes

The spectrum was searched from 30 MHz to 25.0 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 for frequency range below 18 GHz, and 1 m for frequency range above 18 GHz. No inter-modulation products emissions were detected above 18 GHz within 6 dB below the limit.

Spectrum analyzer settings for frequencies below 30 MHz:

Detector mode	Quasi-Peak
Resolution bandwidth	9 kHz
Video bandwidth	30 kHz
Trace mode	Max Hold
Measurement time	100 ms

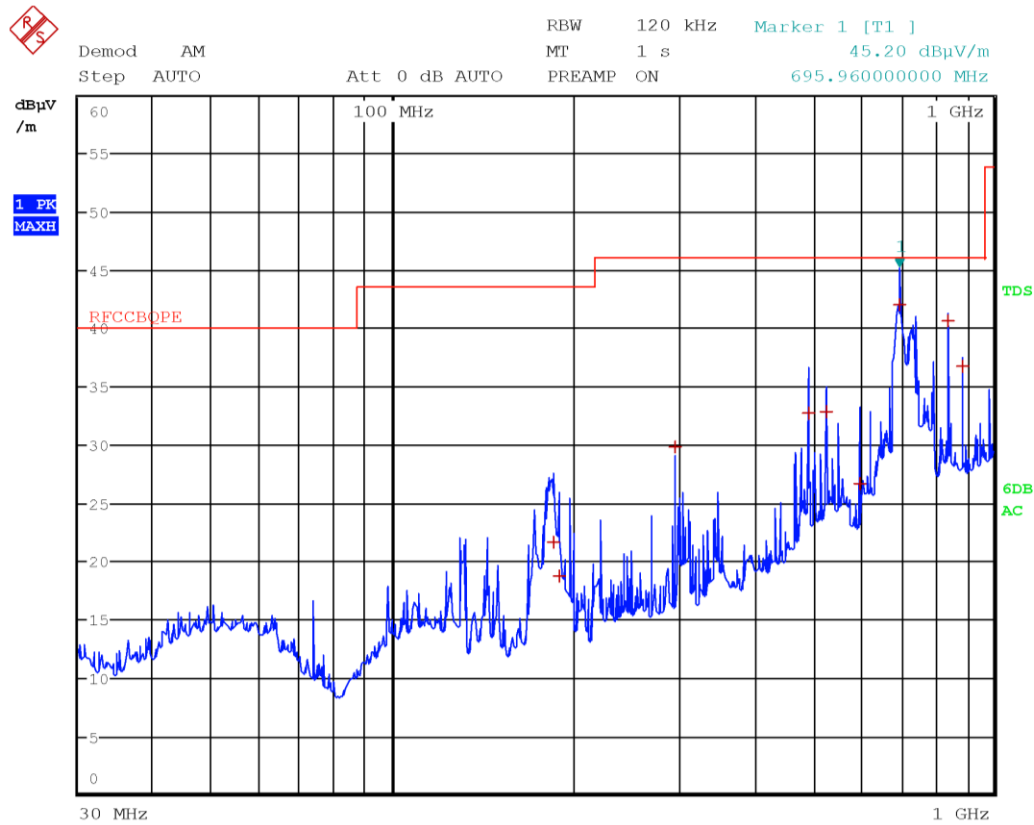
Spectrum analyser settings for radiated measurements within restricted bands 30 MHz to 1 GHz:

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

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

Resolution bandwidth:	1 MHz
Video bandwidth:	10 Hz
Detector mode:	Peak
Trace mode:	Max Hold

8.1.4 Test data



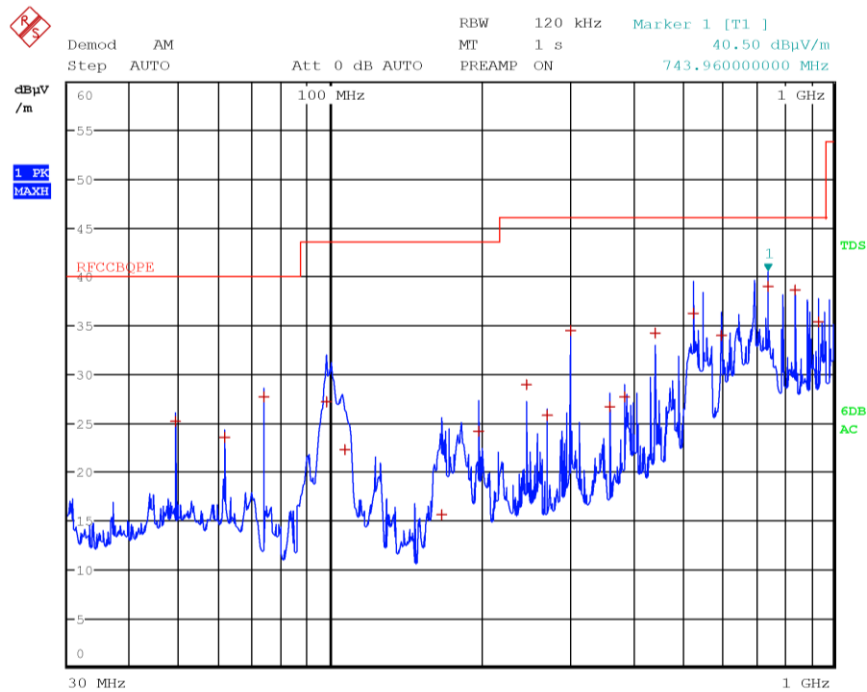
Date: 3.AUG.2021 18:53:35

Figure 8.1-1: Radiated spurious emissions with Bluetooth at 2402 MHz and Wireless MD853081 AT 2406 MHz – antenna in horizontal polarization

Note:

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
185.3200	21.7	43.5	-21.8	QP
189.4400	18.7	43.5	-24.8	QP
294.9200	29.9	46.0	-16.1	QP
491.5200	32.8	46.0	-13.2	QP
527.9600	32.8	46.0	-13.2	QP
599.9600	26.7	46.0	-19.3	QP
695.9600	42.0	46.0	-4.0	QP
839.9600	40.7	46.0	-5.3	QP
887.9600	36.8	46.0	-9.2	QP

Notes: Field strength includes correction factor of antenna, cable loss, amplifier, and attenuators where applicable.



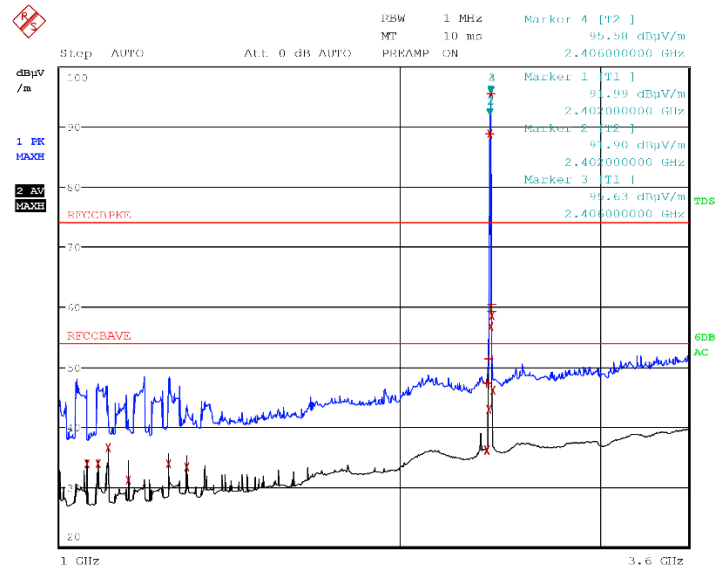
Date: 3.AUG.2021 18:37:07

Figure 8.1-2: Radiated spurious emissions with Bluetooth at 2402 MHz and Wireless MD853081 AT 2406 MHz— antenna in vertical polarization

Note: Emissions above the limit were from intentional emissions. No intermodulation emissions were detected

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
49.1600	25.2	40.0	-14.8	QP
61.4400	23.6	40.0	-16.4	QP
73.7200	27.7	40.0	-12.3	QP
98.2800	27.2	43.5	-16.3	QP
106.6800	22.3	43.5	-21.2	QP
166.7600	15.7	43.5	-27.8	QP
196.6000	24.2	43.5	-19.3	QP
245.7600	28.9	46.0	-17.1	QP
270.3200	25.8	46.0	-20.2	QP
300.0000	34.5	46.0	-11.5	QP
360.0000	26.7	46.0	-19.3	QP
384.0000	27.7	46.0	-18.3	QP
442.3600	34.3	46.0	-11.7	QP
528.0000	36.3	46.0	-9.7	QP
599.9600	34.0	46.0	-12.0	QP
743.9600	39.0	46.0	-7.0	QP
839.9600	38.7	46.0	-7.3	QP
935.9600	35.4	46.0	-10.6	QP

Notes: Field strength includes correction factor of antenna, cable loss, amplifier, and attenuators where applicable.



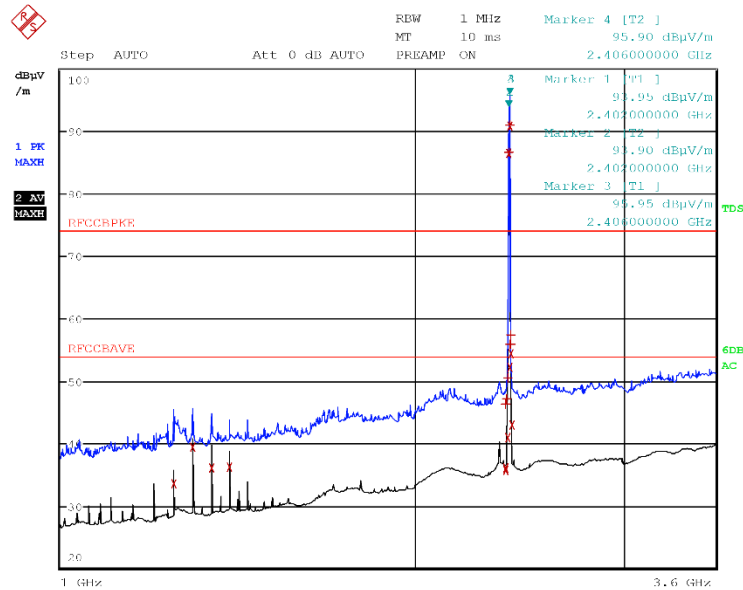
Date: 4.AUG.2021 18:16:23

Figure 8.1-3: Radiated spurious emissions with Bluetooth at 2402 MHz and Wireless MD853081 AT 2406 MHz – antenna in horizontal polarization

Note: Emissions above the limit were intentional. No intermodulation emissions were detected

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1056.0000	33.8	54.0	-20.2	AV
1080.0000	33.8	54.0	-20.2	AV
1104.0000	36.6	54.0	-17.4	AV
1150.0000	31.1	54.0	-22.9	AV
1248.0000	33.9	54.0	-20.1	AV
1296.0000	33.4	54.0	-20.6	AV
2386.0000	47.4	74.0	-26.6	QP
2386.0000	36.1	54.0	-17.9	AV
2390.0000	47.3	74.0	-26.7	QP
2390.0000	36.3	54.0	-17.7	AV
2398.0000	42.9	--	--	AV
2398.0000	51.4	--	--	QP
2402.0000	88.9	--	--	QP
2402.0000	88.8	--	--	AV
2406.0000	95.6	--	--	QP
2406.0000	95.5	--	--	AV
2408.8000	56.6	--	--	AV
2409.2000	59.2	--	--	QP
2412.0000	60.4	--	--	QP
2412.0000	58.5	--	--	AV

Notes: Field strength includes correction factor of antenna, cable loss, amplifier, and attenuators where applicable.



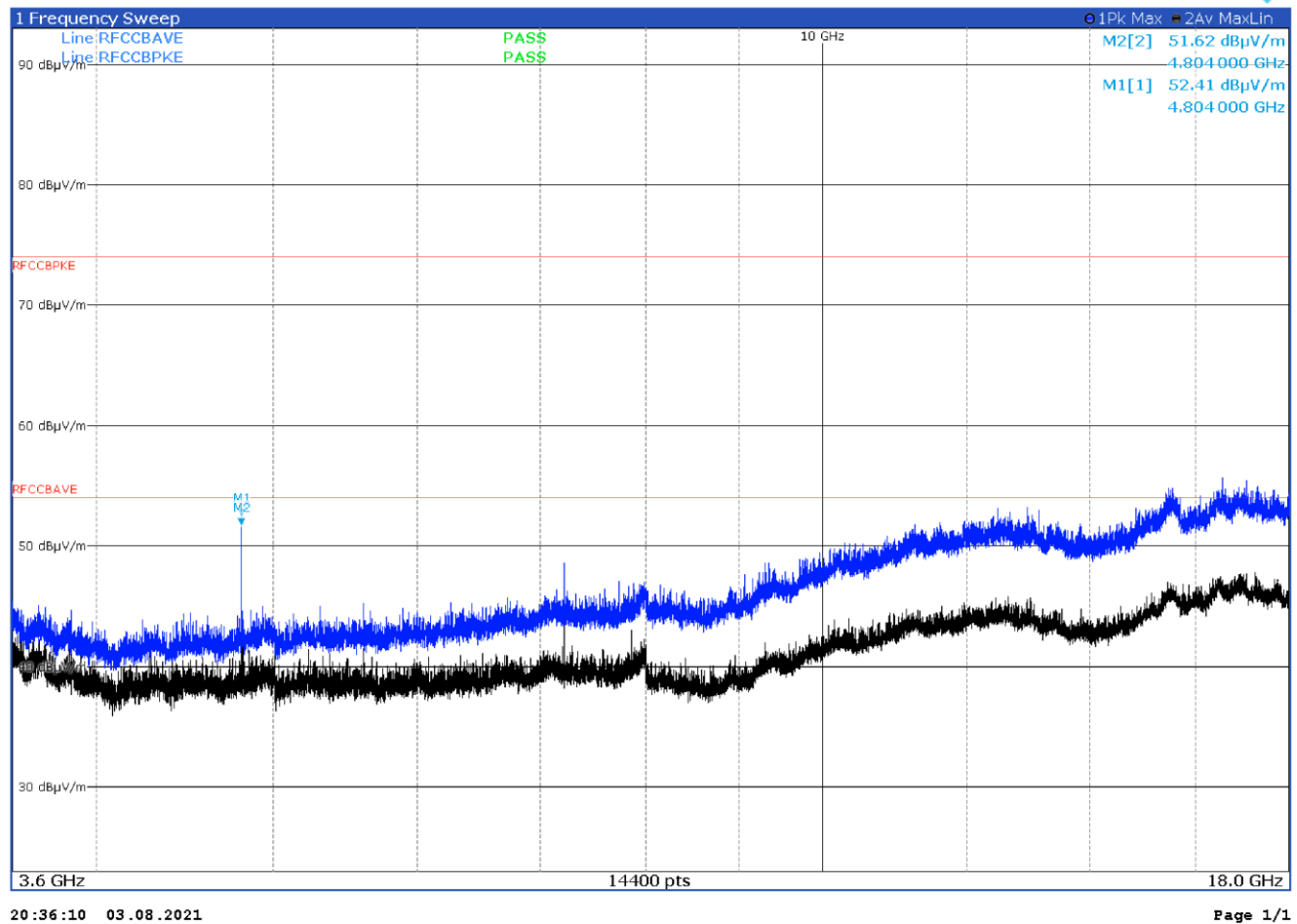
Date: 4.AUG.2021 18:22:51

Figure 8.1-4: Radiated spurious emissions with Bluetooth at 2402 MHz and Wireless MD853081 AT 2406 MHz – antenna in vertical polarization

Note: Emissions above the limit were from intentional emissions.

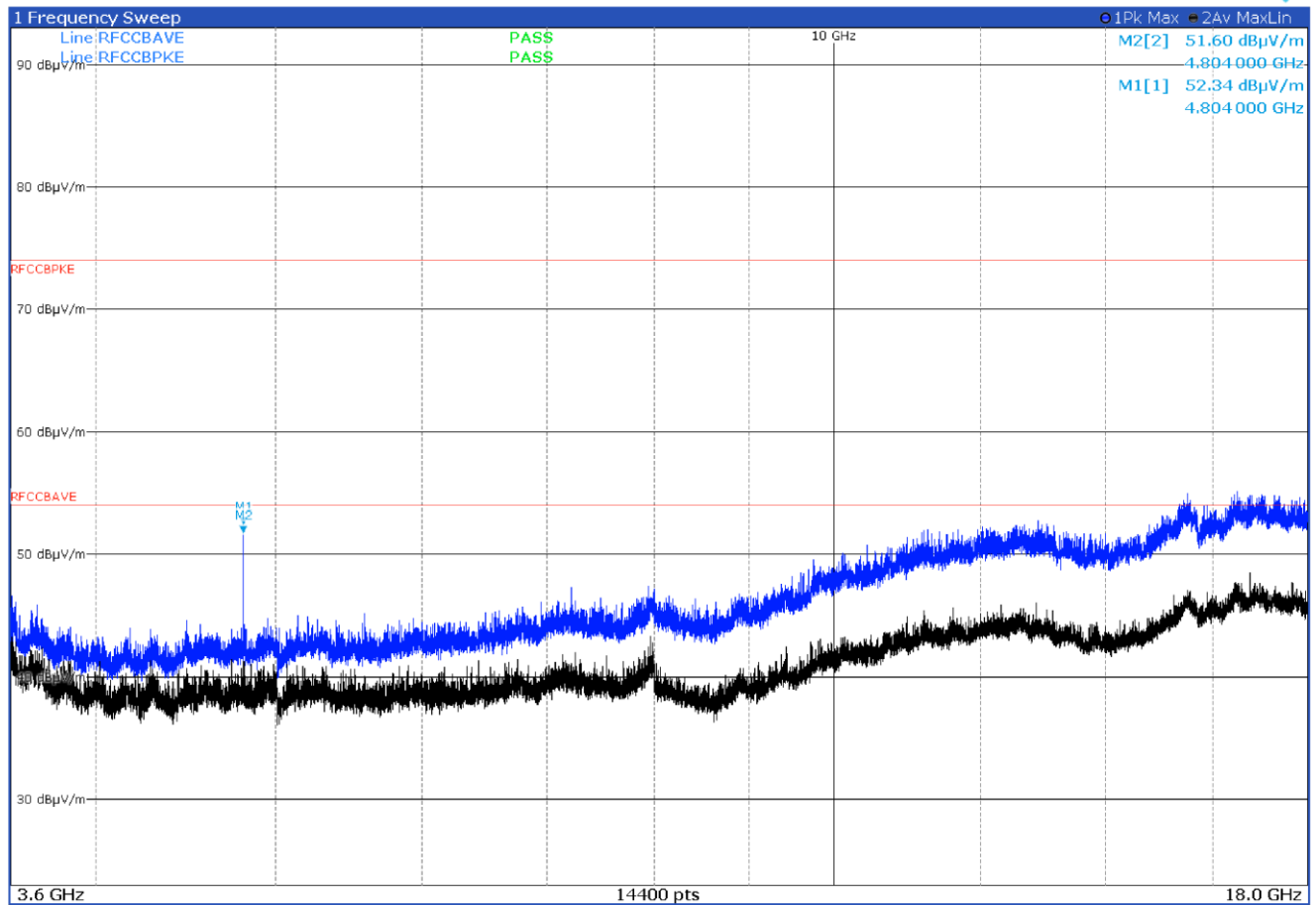
Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1248.0000	33.5	54.0	-20.5	AV
1296.0000	39.3	54.0	-14.7	AV
1344.0000	36.1	54.0	-17.9	AV
1392.0000	36.3	54.0	-17.7	AV
2386.0000	46.3	74.0	-27.7	PK
2386.0000	35.7	54.0	-18.3	AV
2390.0000	47.2	74.0	-26.8	PK
2390.0000	36.0	54.0	-18.0	AV
2398.0000	41.0	54.0	-13.0	AV
2398.0000	50.5	--	--	PK
2402.0000	86.6	--	--	QP
2402.0000	86.5	--	--	AV
2406.0000	90.9	--	--	PK
2406.0000	90.9	--	--	AV
2408.8000	55.9	--	--	PK
2408.8000	52.2	--	--	AV
2409.2000	55.8	--	--	PK
2412.0000	57.4	--	--	PK
2412.0000	54.4	--	--	AV
2418.0000	42.9	--	--	AV

Notes: Field strength includes correction factor of antenna, cable loss, amplifier, and attenuators where applicable.



Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
4804	52.4	74.0	-21.6	PK
4804	51.6	54.0	- 2.4	AV

Figure 8.1-5: Radiated spurious emissions with Bluetooth at 2402 MHz and Wireless MD853081 AT 2406 MHz – antenna in horizontal polarization



20:38:53 03.08.2021

Page 1/1

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
4804	52.3	54.0	--	PK
4804	51.6	54.0	-2.4	AV

Figure 8.1-6: Radiated spurious emissions with with Bluetooth at 2402 MHz and Wireless MD853081 AT 2406 MHz – antenna in vertical polarization

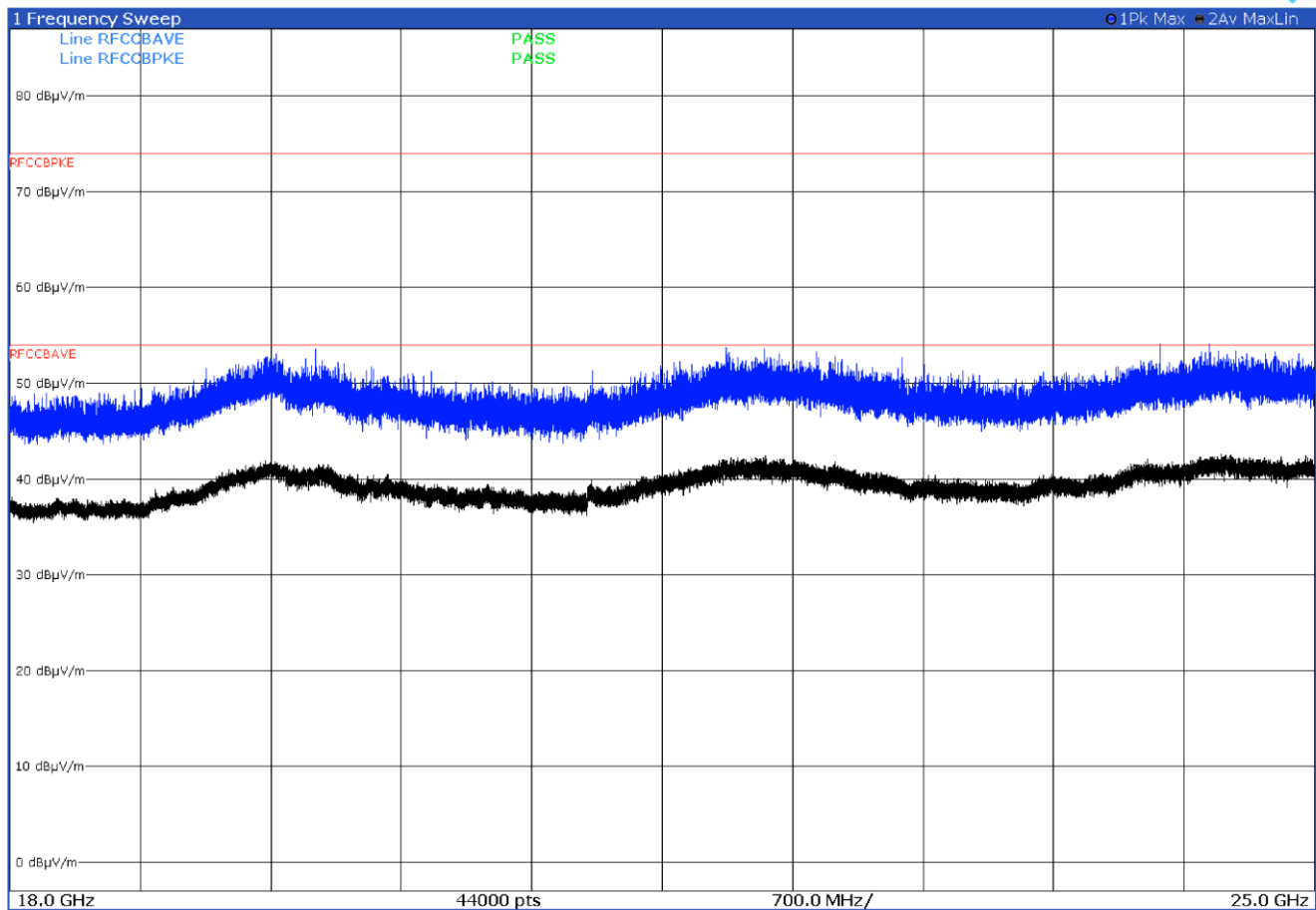


Figure 8.1-7: Radiated spurious emissions with with Bluetooth at 2402 MHz and Wireless MD853081 AT 2406 MHz – antenna in horizontal polarization

Peak level under the average limit – no additional measures need. No intermodulation emissions were detected

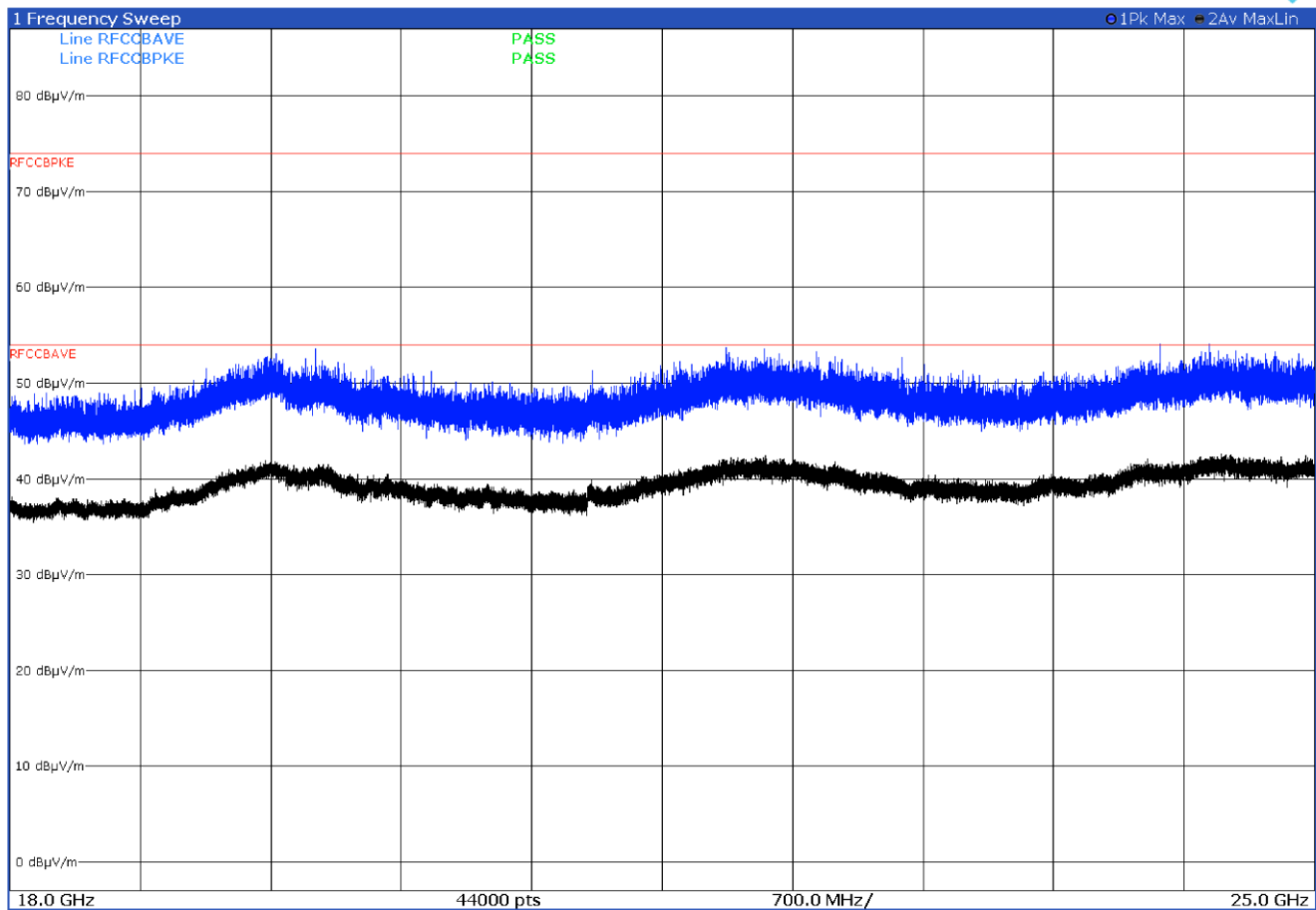
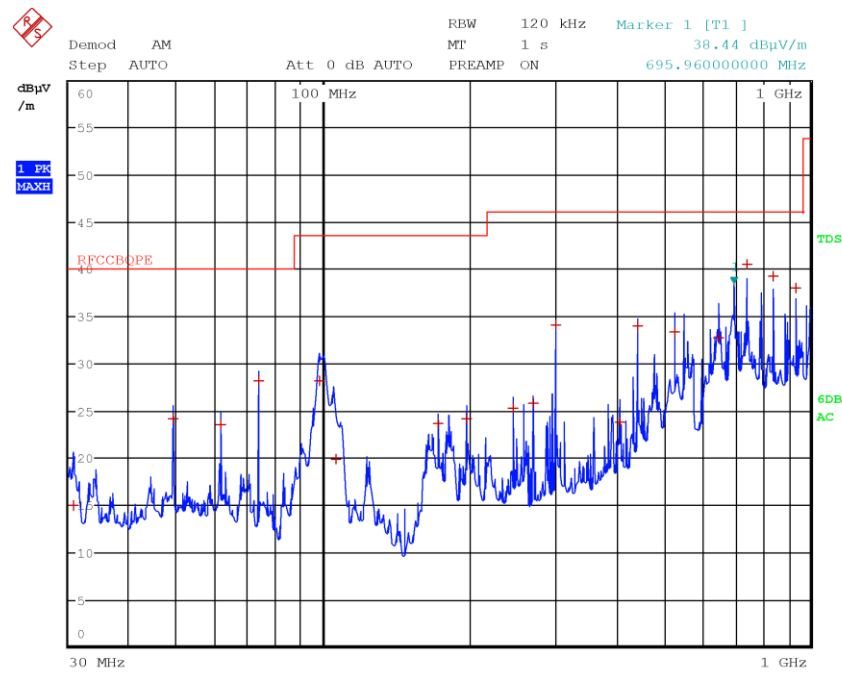


Figure 8.1-8: Radiated spurious emissions with with Bluetooth at 2402 MHz and Wireless MD853081 AT 2406 MHz – antenna in vertical polarization

Peak level under the average limit – no additional measures need. No intermodulation emissions were detected



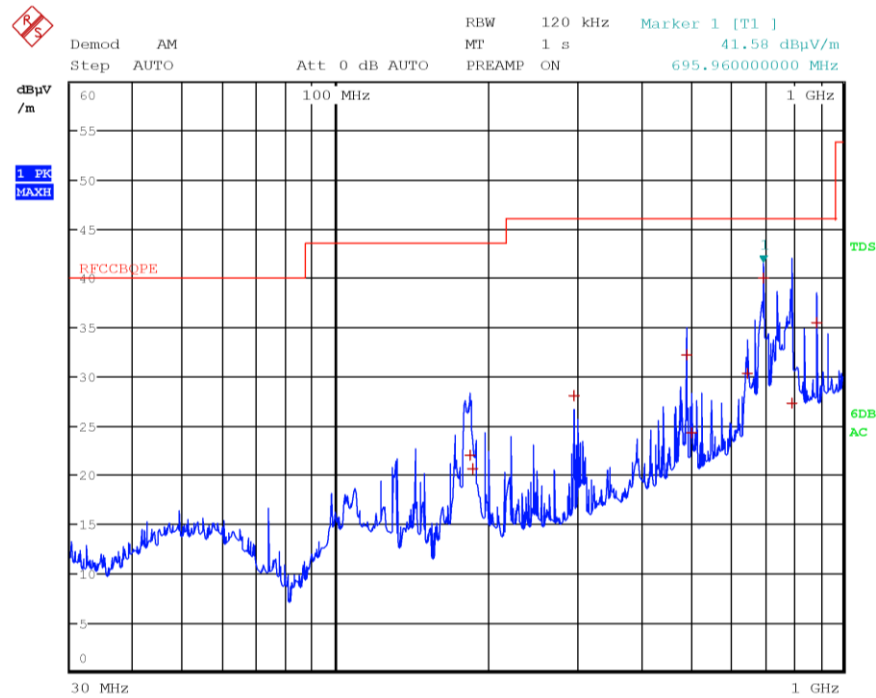
Date: 3.AUG.2021 19:11:01

Figure 8.1-9: Radiated spurious emissions with Bluetooth at 2480MHz and Wireless MD853081 AT 2474 MHz – antenna in vertical polarization

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
30.5600	15.0	40.0	-25.0	QP
49.1600	24.2	40.0	-15.8	QP
61.4400	23.6	40.0	-16.4	QP
73.7200	28.3	40.0	-11.7	QP
98.3200	28.3	43.5	-15.2	QP
106.0400	20.0	43.5	-23.5	QP
172.0400	23.7	43.5	-19.8	QP
196.6000	24.2	43.5	-19.3	QP
245.7600	25.3	46.0	-20.7	QP
270.3200	25.8	46.0	-20.2	QP
300.0000	34.2	46.0	-11.8	QP
408.0000	23.9	46.0	-22.1	QP
442.3600	34.1	46.0	-11.9	QP
527.9600	33.4	46.0	-12.6	QP
647.9600	32.7	46.0	-13.3	QP
743.9600	40.5	46.0	-5.5	QP
839.9600	39.3	46.0	-6.7	QP
935.9600	38.1	46.0	-7.9	QP

Notes: Field strength includes correction factor of antenna, cable loss, amplifier, and attenuators where applicable.

No intermodulation emissions were detected



Date: 3.AUG.2021 19:04:12

Figure 8.1-10: Radiated spurious emissions with Bluetooth at 2480MHz and Wireless MD853081 AT 2474 MHz – antenna in horizontal polarization

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
184.2400	22.0	43.5	-21.5	QP
186.5200	20.7	43.5	-22.8	QP
294.9200	28.1	46.0	-17.9	QP
491.5200	32.3	46.0	-13.7	QP
503.8000	24.3	46.0	-21.7	QP
648.0000	30.4	46.0	-15.6	QP
695.9600	40.0	46.0	-6.0	QP
791.9600	27.3	46.0	-18.7	QP
887.9600	35.6	46.0	-10.4	QP

Notes: Field strength includes correction factor of antenna, cable loss, amplifier, and attenuators where applicable.

No intermodulation emissions were detected

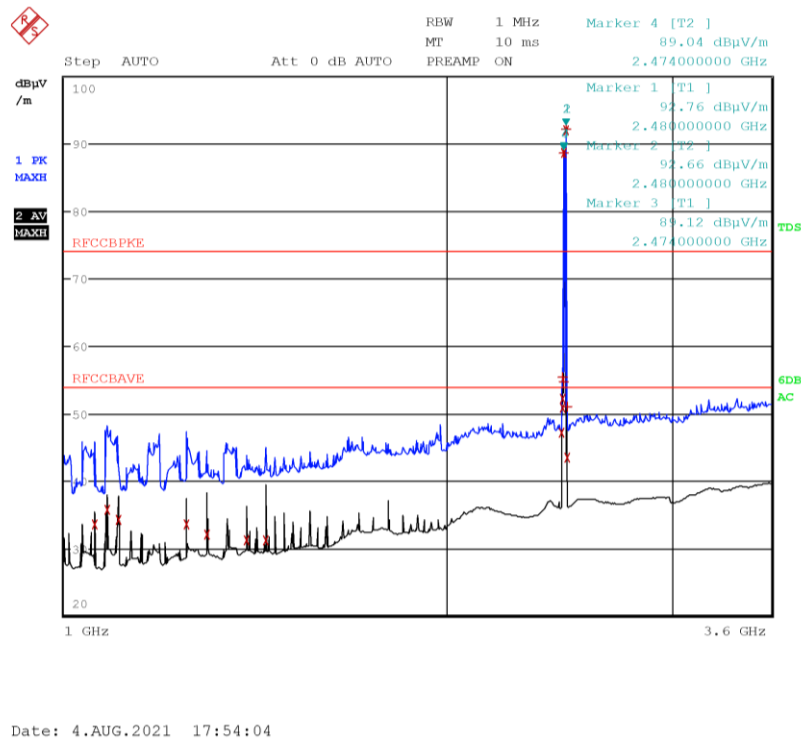
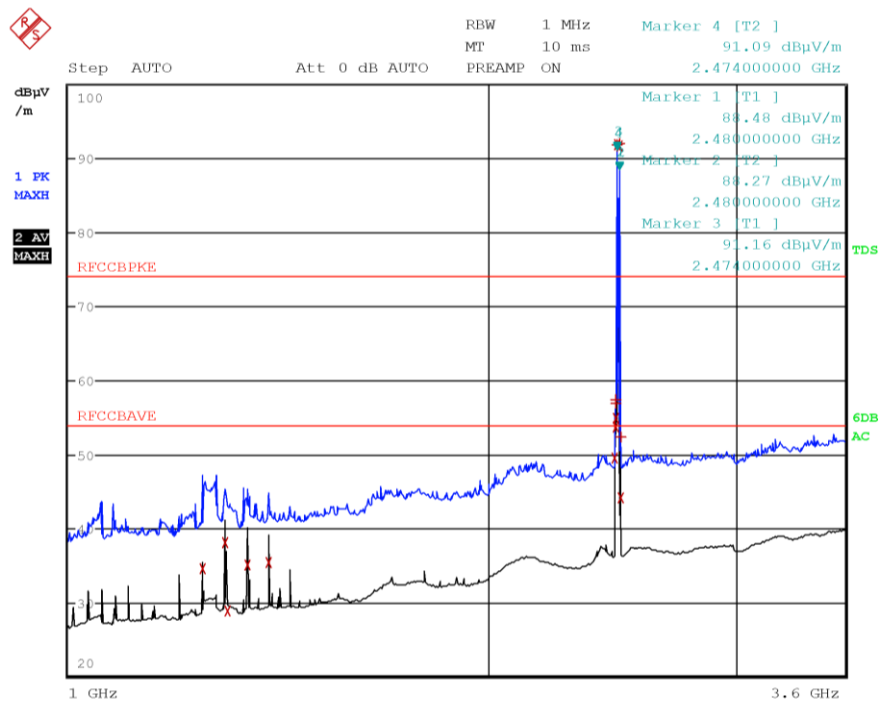


Figure 8.1-11: Radiated spurious emissions with Bluetooth at 2480MHz and Wireless MD853081 AT 2474 MHz – antenna in horizontal polarization

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1056.0000	33.6	54.0	-20.4	AV
1080.0000	35.8	54.0	-18.2	AV
1104.0000	34.1	54.0	-19.9	AV
1248.0000	33.5	54.0	-20.5	AV
1296.0000	32.1	54.0	-21.9	AV
1392.0000	31.2	54.0	-22.8	AV
1440.0000	31.1	54.0	-22.9	AV
2462.0000	47.1	--	--	AV
2468.0000	55.4	--	--	PK
2468.0000	52.3	--	--	AV
2470.8000	50.8	--	--	AV
2471.2000	54.7	--	--	PK
2474.0000	88.7	--	--	PK
2474.0000	88.6	--	--	AV
2480.0000	92.2	--	--	PK
2480.0000	92.1	--	--	AV
2486.0000	43.5	54.0	-10.5	AV
2486.0000	51.0	74.0	-23.0	PK
2480.0000	92.0	--	--	AV
2486.0000	43.9	54.0	-10.1	AV

Notes: Field strength includes correction factor of antenna, cable loss, amplifier, and attenuators where applicable.

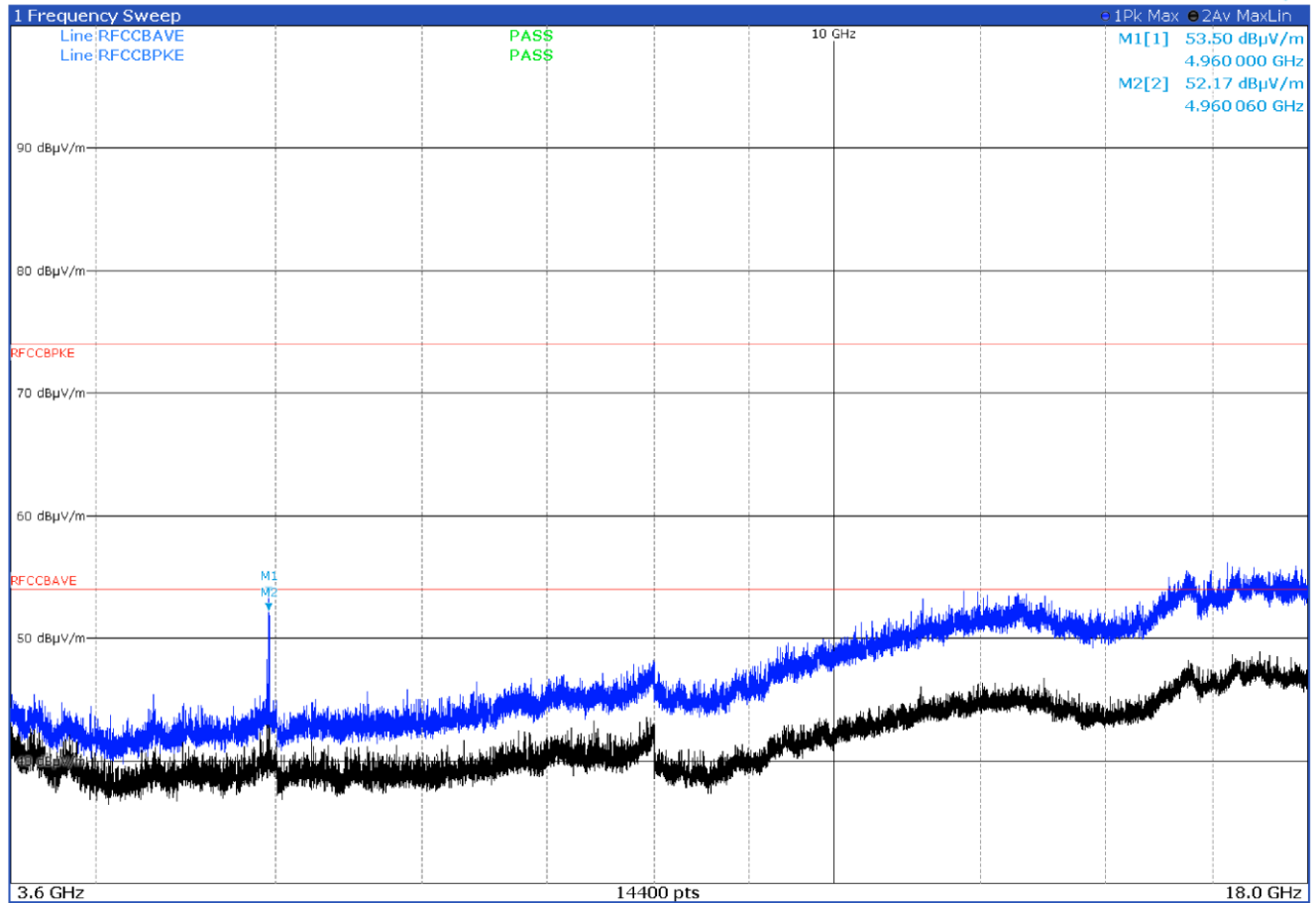


Date: 4.AUG.2021 17:42:03

Figure 8.1-12: Radiated spurious emissions with Bluetooth at 2480MHz and Wireless MD853081 AT 2474 MHz – antenna in vertical polarization

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1248.0000	34.5	54.0	-19.5	AV
1296.0000	38.1	54.0	-15.9	AV
1300.0000	28.9	54.0	-25.1	AV
1344.0000	35.1	54.0	-18.9	AV
1392.0000	35.3	54.0	-18.7	AV
2462.0000	53.9	--	--	PK
2462.0000	49.5	--	--	AV
2468.0000	57.5	--	--	PK
2468.0000	54.9	--	--	AV
2470.8000	56.8	--	--	PK
2470.8000	53.7	--	--	AV
2474.0000	91.9	--	--	PK
2474.0000	91.8	--	--	AV
2480.0000	91.9	--	--	PK
2480.0000	91.8	--	--	AV
2486.0000	52.3	74.0	-21.7	PK
2486.0000	44.2	54.0	-9.8	AV

Notes: Field strength includes correction factor of antenna, cable loss, amplifier, and attenuators where applicable.

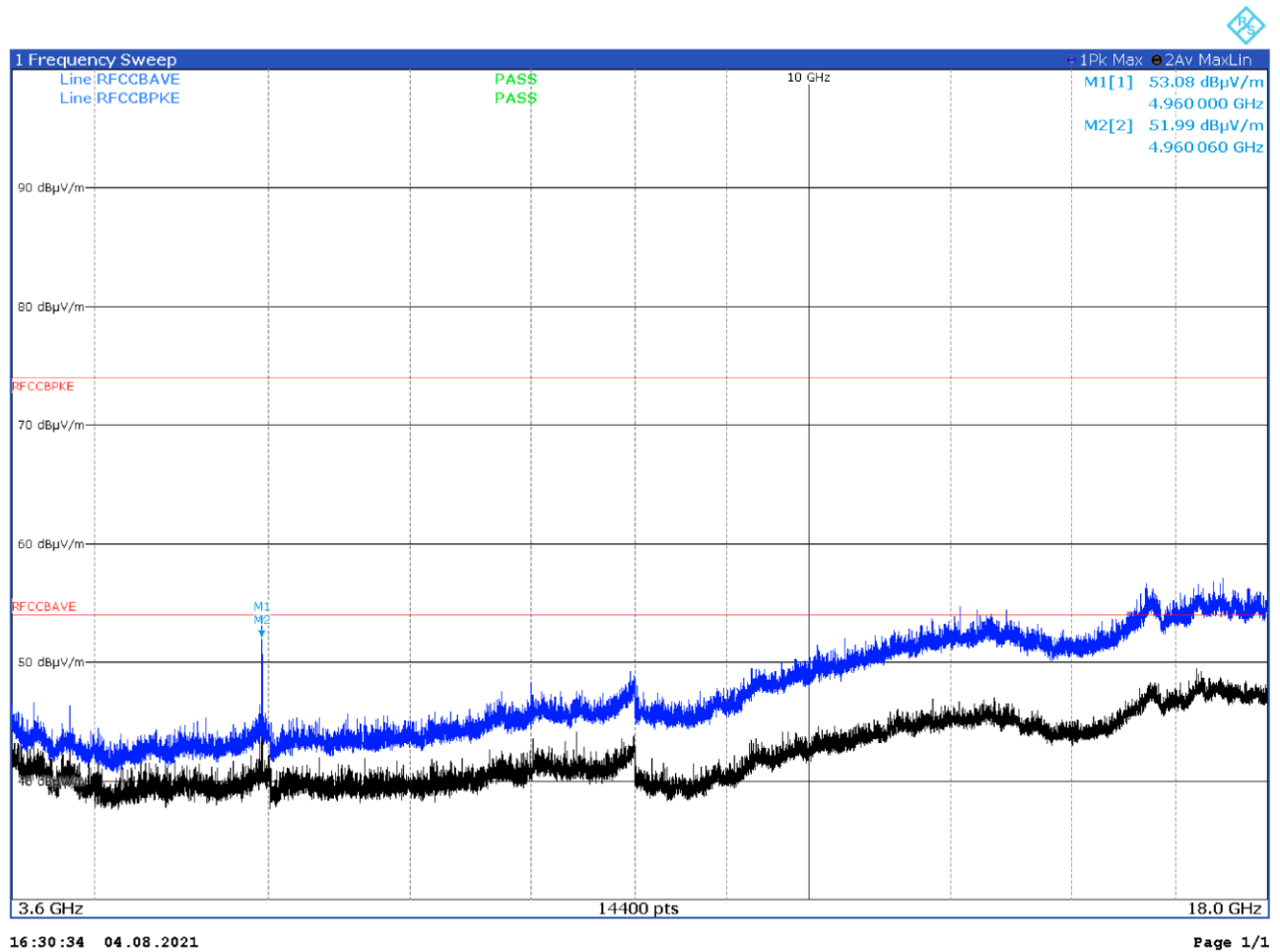


16:21:58 04.08.2021

Page 1/1

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
4960	53.5	74.0	-21.5	PK
4960	52.2	54.0	-1.8	Av

Figure 8.1-13: Radiated spurious emissions with Bluetooth at 2480MHz and Wireless MD853081 AT 2474 MHz – antenna in horizontal polarization



Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
4960	53.1	74.0	-20.9	PK
4960	52.0	54.0	-2.0	Av

Figure 8.1-14: Radiated spurious emissions with Bluetooth at 2480MHz and Wireless MD853081 AT 2474 MHz – antenna in vertical polarization

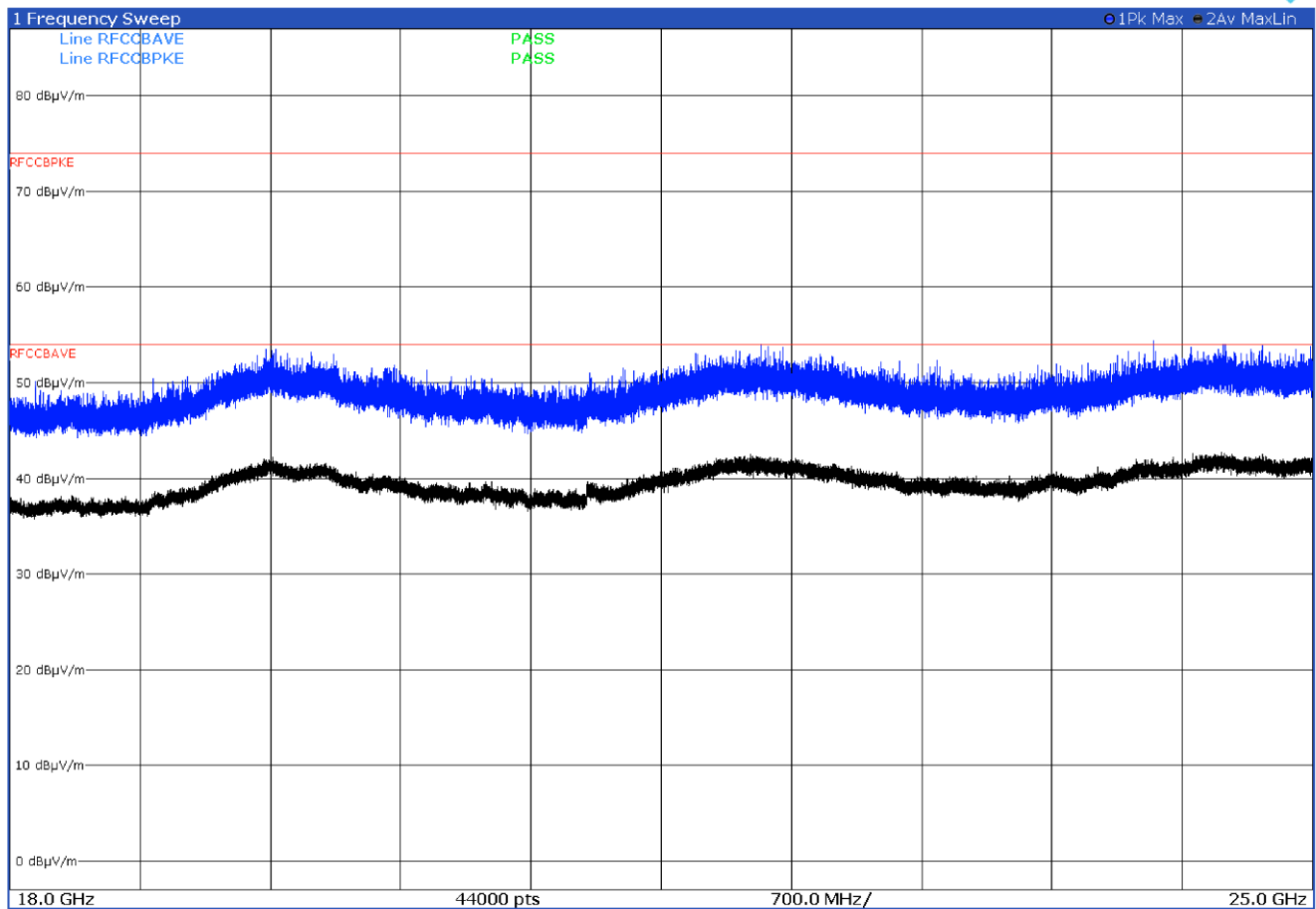


Figure 8.1-15: Radiated spurious emissions with Bluetooth at 2480MHz and Wireless MD853081 AT 2474 MHz – antenna in horizontal polarization

Peak level under the average limit – no additional measures need. No intermodulation emissions were detected

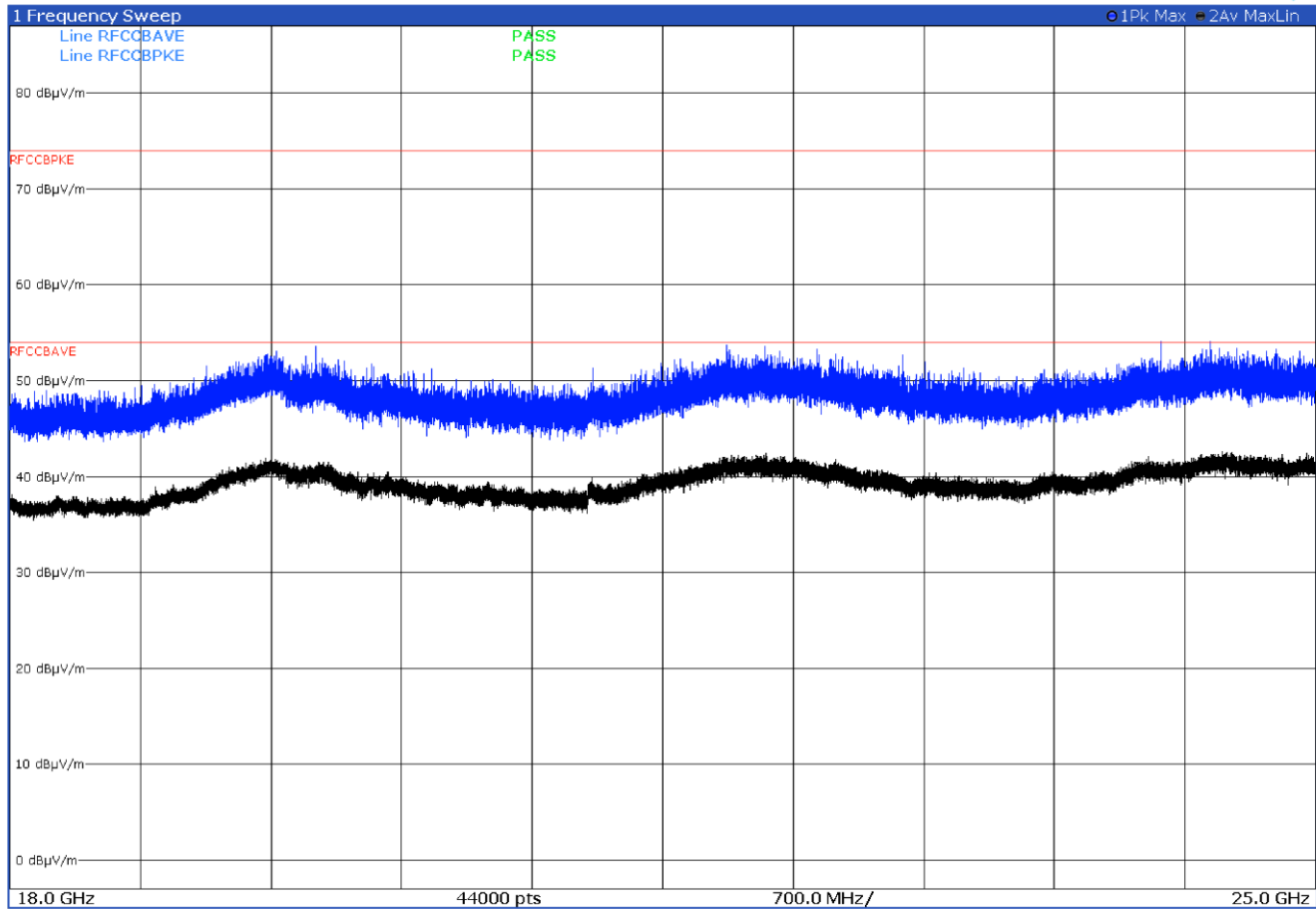
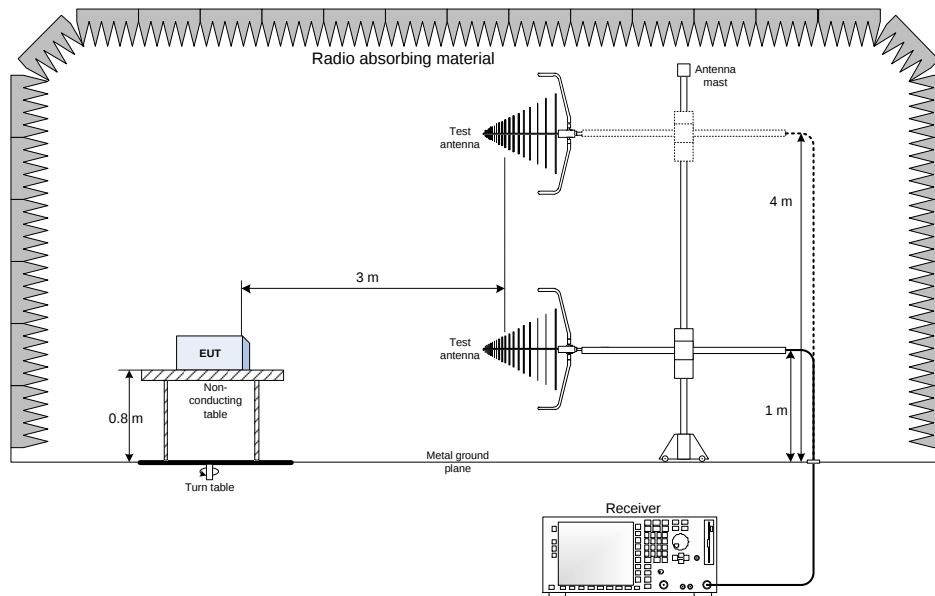


Figure 8.1-16: Radiated spurious emissions with Bluetooth at 2480MHz and Wireless MD853081 AT 2474 MHz – antenna in vertical polarization

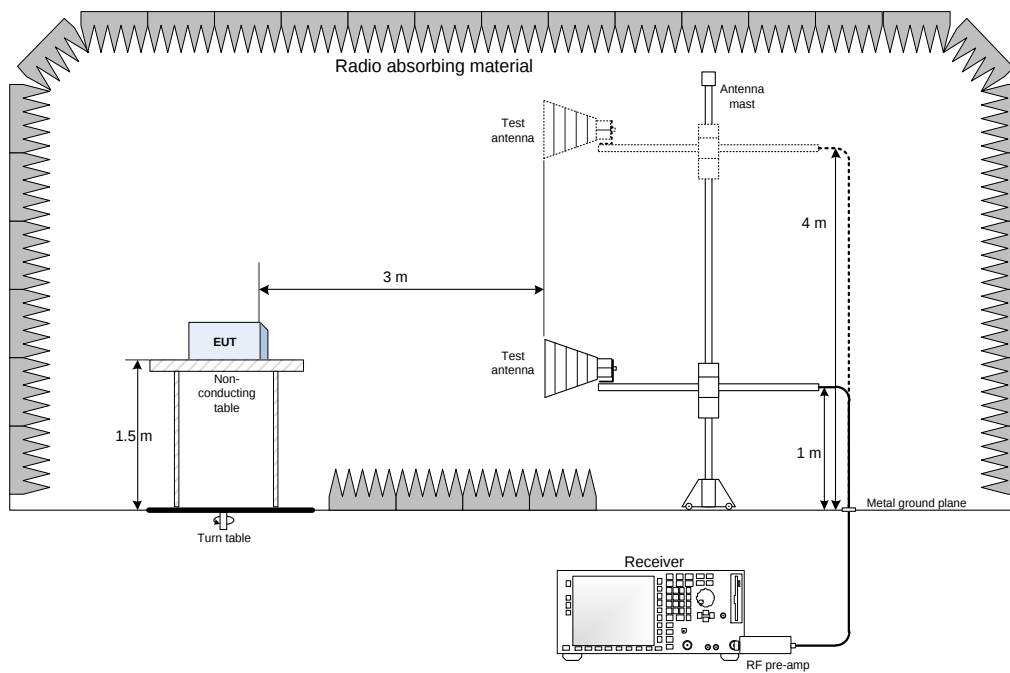
Peak level under the average limit – no additional measures need. No intermodulation emissions were detected

Section 9. Block diagrams of test set-ups

9.1 Radiated emissions set-up for frequencies below 1 GHz

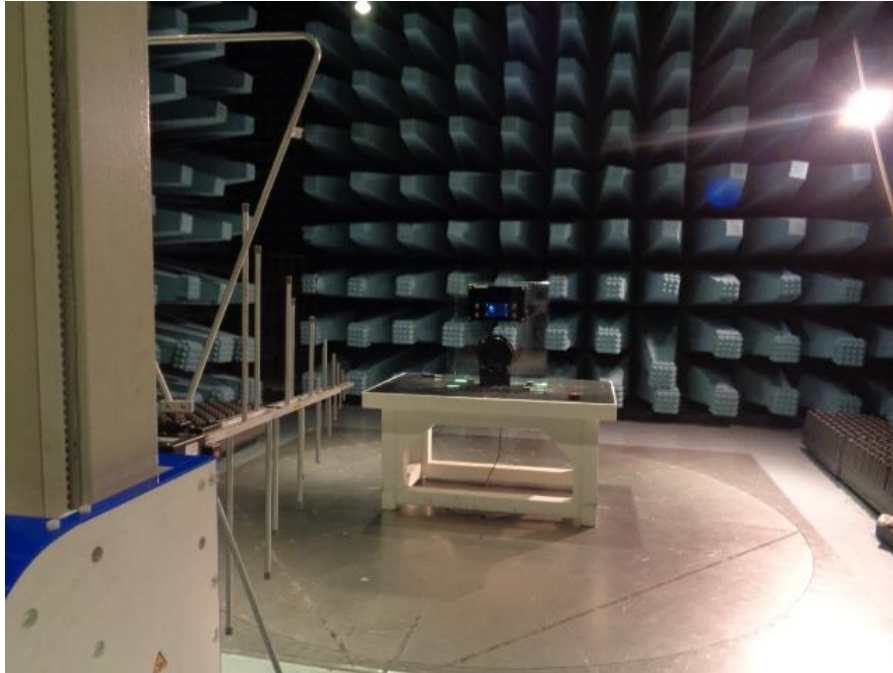


9.2 Radiated emissions set-up for frequencies above 1 GHz



Section 10. Photos

10.1 Photos of the test set-up

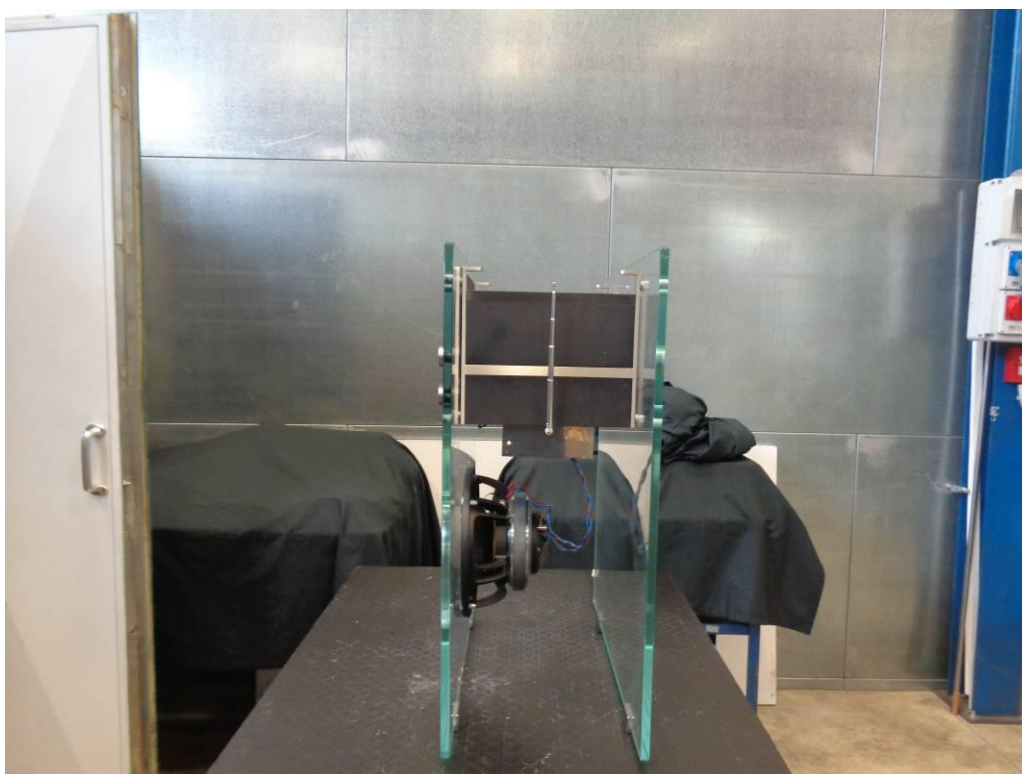


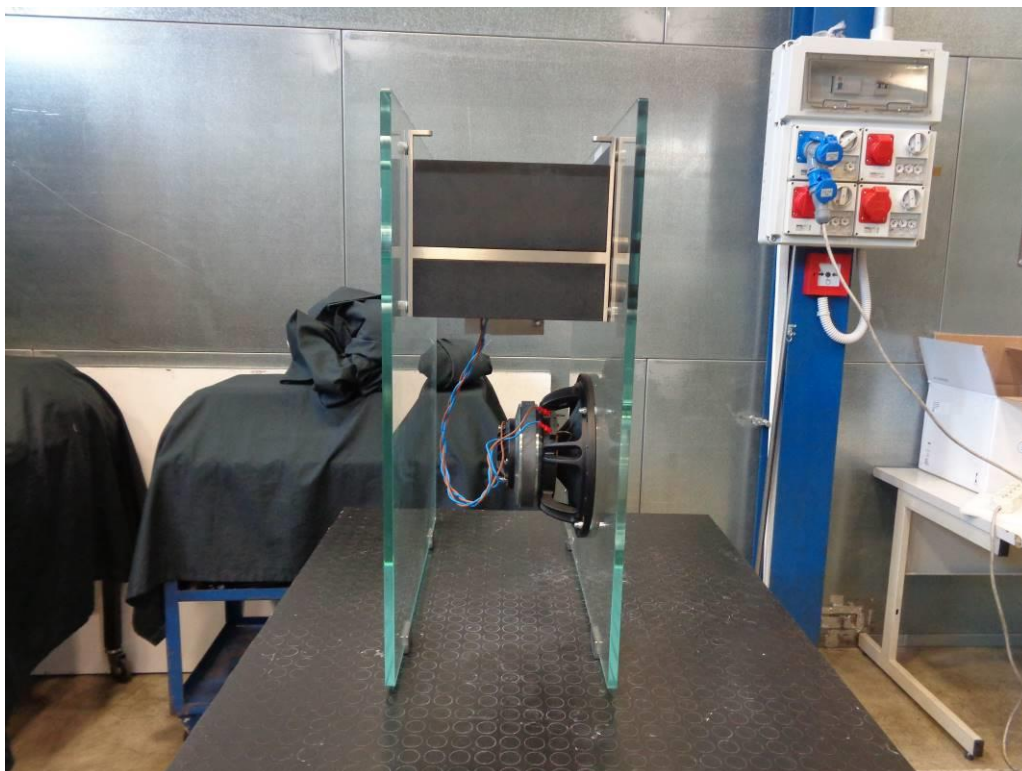
Radiated emission below 1 GHz

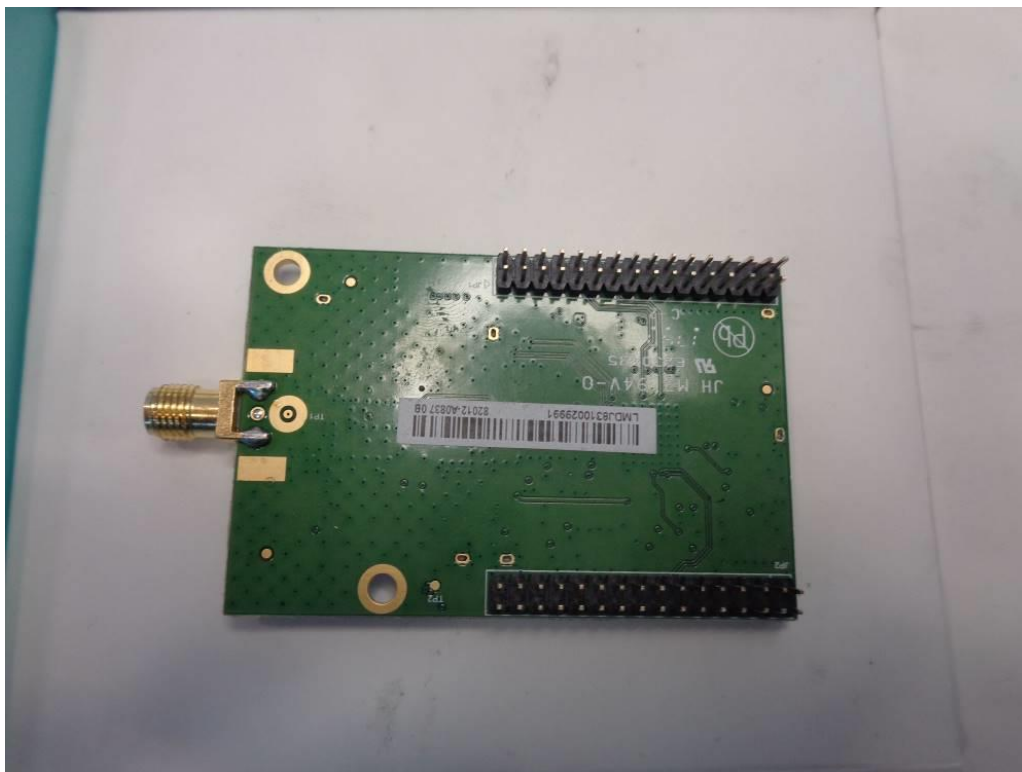


Radiated emission above 1 GHz

10.2 Photos of the EUT







End of report