FCC PART 15C
TEST REPORT
No.24T04Z101463-019

for

POINTMOBILE CO., LTD

Mobile Computer

PM452

FCC ID: V2X-PM452

with

Hardware Version: MP

Software Version: 452.00.XX

Issued Date: 2024-08-26

Note:

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of CTTL.

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REPORT HISTORY

Report Number	Revision	Description	Issue Date
24T04Z101463-019	Rev.0	1st edition	2024-08-16
24T04Z101463-019	Rev.1	2nd edition 1.Modified antenna gain. 2.Modified power supply information. 3.Added modulation types for OFDMA. 4.Added A.9 Antenna Requirement.	2024-08-26

Note: the latest revision of the test report supersedes all previous version.

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1. Test Laboratory

1.1. Introduction & Accreditation

Telecommunication Technology Labs, CAICT is an ISO/IEC 17025:2017 accredited test laboratory under American Association for Laboratory Accreditation (A2LA) with lab code 7049.01, and is also an FCC accredited test laboratory (CN1349), and ISED accredited test laboratory (CAB identifier:CN0066). The detail accreditation scope can be found on A2LA website.

1.2. Testing Location

Location 1:CTTL(Huayuan North Road)

Address: No. 52, Huayuan North Road, Haidian District, Beijing, P. R. China100191

Location 2:CTTL(huayuan North Road)

Address: No. 52, Huayuan North Road, Haidian District, Beijing, 100191, P. R. China

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1.3. Testing Environment

Normal Temperature: 15-35°C
Relative Humidity: 20-75%

1.4. Project date

Testing Start Date: 2024-06-21
Testing End Date: 2024-08-15

1.5. Signature

Dong Jiaxuan

(Prepared this test report)

Zheng Wei

(Reviewed this test report)

Pang Shuai

(Approved this test report)

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2. Client Information

2.1. Applicant Information

Company Name:	POINTMOBILE CO., LTD
Address/Post:	A-26F, Building Gasan Publik 178, Digital-ro, Geumcheon-gu Seoul, 08513 Republic of Korea
Contact:	Hanna Chae
Email:	certi.manager@pointmobile.com
Tel.:	+82 10 7773 8827
Fax:	+82 2-3397-7872

2.2. Manufacturer Information

Company Name:	POINTMOBILE CO., LTD
Address/Post:	A-26F, Building Gasan Publik 178, Digital-ro, Geumcheon-gu Seoul, 08513 Republic of Korea
Contact:	Hanna Chae
Email:	certi.manager@pointmobile.com
Tel.:	+82 10 7773 8827
Fax:	+82 2-3397-7872

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3. Equipment Under Test (EUT) and Ancillary Equipment (AE)

3.1. About EUT

Description	Mobile Computer
Model name	PM452
FCC ID	V2X-PM452
With WLAN Function	Yes
Frequency Band	ISM 2400MHz~2483.5MHz
Type of Modulation	DSSS/CCK/OFDM/OFDMA
Number of Channels	11
Antenna	Integral Antenna
MAX Conducted Power	23.12dBm
Nominal Voltage	3.63V

3.2. Internal Identification of EUT

EUT ID*	SN or IMEI	HW Version	SW Version	Date of receipt
UT14a	356658610001989	MP	452.00.XX	2024-06-21
UT05a	356658610000338	MP	452.00.XX	2024-06-21

*EUT ID: is used to identify the test sample in the lab internally.

UT05a is used for Conduction test, UT14a is used for Radiation test.

3.3. Internal Identification of AE

AE ID*	Description	Model	Manufacturer
AE1-1	Battery1	451-BTEC	ZhuHai Gushine Electronic Technology Co.,Ltd
AE1-2	Battery2	451-BTSC/BP19-002770	ETI CA Battery Inc.

*AE ID: is used to identify the test sample in the lab internally.

3.4. General Description

The Equipment under Test (EUT) is a model of Mobile Computer with integrated antenna and inbuilt battery.

It consists of normal options: travel charger, USB cable.

Manual and specifications of the EUT were provided to fulfil the test.

Samples undergoing test were selected by the client.

3.5. Interpretation of the Test Environment

For the test methods, the test environment uncertainty figures correspond to an expansion factor k=2.

Measurement Uncertainty

Parameter	Uncertainty
temperature	0.48°C
humidity	2 %
DC voltages	0.003V

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4. Reference Documents

4.1. Documents supplied by applicant

EUT feature information is supplied by the applicant or manufacturer, which is the basis of testing.

4.2. Reference Documents for testing

The following documents listed in this section are referred for testing.

Reference	Title	Version
FCC Part15	FCC CFR 47, Part 15, Subpart C: 15.205 Restricted bands of operation; 15.209 Radiated emission limits, general requirements; 15.247 Operation within the bands 902-928MHz, 2400-2483.5 MHz, and 5725-5850 MHz.	2021
ANSI C63.10	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices	2013
KDB 558074 D01	Federal Communications Commission Office of Engineering and Technology Laboratory Division GUIDANCE FOR COMPLIANCE MEASUREMENTS ON DIGITAL TRANSMISSION SYSTEM, FREQUENCY HOPPING SPREAD SPECTRUM SYSTEM, AND HYBRID SYSTEM DEVICES OPERATING UNDER SECTION 15.247 OF THE FCC RULES	2019

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5. LABORATORY ENVIRONMENT

Conducted RF performance testing is performed in shielding room.

EMC performance testing is performed in Semi-anechoic chamber.

6. Test Results

6.1. Summary of Test Results

SUMMARY OF MEASUREMENT RESULTS	Sub-clause of Part15C	Sub-clause of IC	Verdict
Maximum Peak Output Power	15.247 (b)	/	**P**
Peak Power Spectral Density	15.247 (e)	/	**P**
Occupied 6dB Bandwidth	15.247 (a)	/	**P**
Band Edges Compliance	15.247 (d)	/	**P**
Transmitter Spurious Emission - Conducted	15.247 (d)	/	**P**
Radiated Unwanted Emission	15.247, 15.205, 15.209	/	**P**
AC Powerline Conducted Emission	15.107, 15.207	/	**P**

Please refer to **ANNEX A** for detail.

Terms used in Verdict column

P	Pass, The EUT complies with the essential requirements in the standard.
NP	Not Perform, The test was not performed by CTTL
NA	Not Applicable, The test was not applicable
F	Fail, The EUT does not comply with the essential requirements in the standard

6.2. Statements

CTTL has evaluated the test cases as listed in section 6.1 of this report for the EUT specified in section 3 according to the standards or reference documents listed in section 4.

This report only deals with the WLAN function among the features described in section 3.

6.3. Test Conditions

For this report, all the test cases are tested under normal temperature and normal voltage, and also under norm humidity, the specific condition is shown as follows:

Temperature	26°C
Voltage	3.63V
Humidity	44%

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7. Test Facilities Utilized

Conducted test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Period	Calibration Due date
1	Vector Signal Analyzer	FSQ40	200089	Rohde & Schwarz	1 year	2025-07-04
2	Vector Signal Analyzer	FSW67	104051	Rohde & Schwarz	1 year	2025-04-06
3	Test Receiver	ESCI 3	100344	R&S	1 year	2025-04-01
4	LISN	ENV216	101200	R&S	1 year	2025-05-16
5	Attenuator	10dB/2W	/	Rosenberger	/	/
6	Shielding Room	S81	/	ETS-Lindgren	/	/

Radiated emission test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Period	Calibration Due date
1	Test Receiver	ESW44	103144	R&S	1 year	2024-11-26
2	EMI Antenna	VULB 9163	01223	SCHWARZBECK	1 year	2024-08-18
3	EMI Antenna	3115	00167250	ETS-Lindgren	1 year	2025-05-11

Test Software

Test Item	Test Software and Version	Software Vendor
Radiated Continuous Emission	EMC32 V10.60.20	R&S
Conducted Emission	EMC32 V8.53.0	R&S

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8. Measurement Uncertainty

8.1. Maximum Output Power

Measurement Uncertainty: 0.387dB,k=1.96

8.2. Peak Power Spectral Density

Measurement Uncertainty: 0.705dB,k=1.96

8.3. DTS 6-dB Signal Bandwidth

Measurement Uncertainty: 60.80Hz,k=1.96

8.4. Band Edges Compliance

Measurement Uncertainty : 0.62dB,k=1.96

8.5. Transmitter Spurious Emission

Conducted (k=1.96)

Frequency Range	Uncertainty(dB)
30MHz ≤ f ≤ 2GHz	1.22
2GHz ≤ f ≤3.6GHz	1.22
3.6GHz ≤ f ≤8GHz	1.22
8GHz ≤ f ≤12.75GHz	1.51
12.75GHz ≤ f ≤26GHz	1.51
26GHz ≤ f ≤40GHz	1.59

8.6. Radiated Unwanted Emission

Radiated (k=2)

Frequency Range	Uncertainty(dB)
9kHz-30MHz	/
30MHz ≤ f ≤ 1GHz	4.72
1GHz ≤ f ≤18GHz	4.84
18GHz ≤ f ≤40GHz	5.12

8.7. AC Power-line Conducted Emission

Measurement Uncertainty : 3.08dB,k=2

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ANNEX A: Detailed Test Results

A.1. Measurement Method

A.1.1. Conducted Measurements

Connect the EUT to the test system as Fig.A.1.1.1 shows.
Set the EUT to the required work mode.
Set the EUT to the required channel.
Set the Vector Signal Analyzer and start measurement.
Record the values. Vector Signal Analyzer

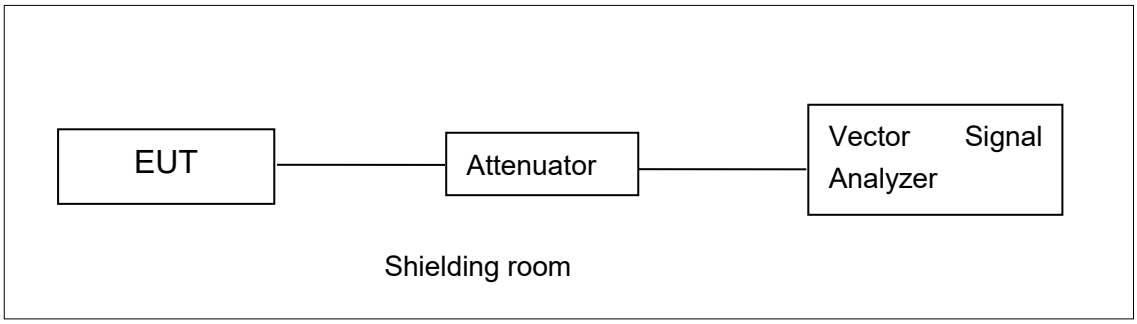

Fig.A.1.1.1: Test Setup Diagram for Conducted Measurements

A.1.2. Radiated Emission Measurements

The measurement is made according to ANSI C63.10

The radiated emission test is performed in semi-anechoic chamber. The EUT was placed on a non-conductive table with 80cm above the ground plane for measurement below 1GHz and 1.5m above the ground plane for measurement above 1GHz. The measurement antenna was placed at a distance of 3 meters from the EUT. The test is carried out on both vertical and horizontal polarization and only maximization result of both polarizations is kept. During the test, the turntable is rotated from 0° to 360°and the measurement antenna is moved from 1m to 4m to get the maximization result. The maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.

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A.2. Maximum Output Power

Method of Measurement: See ANSI C63.10-2013-clause 11.9.1.3

The maximum peak conducted output power may be measured using a broadband peak RF power meter. The power meter shall have a video bandwidth that is greater than or equal to the DTS bandwidth and shall use a fast-responding diode detector.

Measurement Limit:

Standard	Limit (dBm)
FCC CRF Part 15.247(b)	< 30

A.2.1 Antenna Gain

Antenna gain is -3.2dBi and the value is supplied by the applicant or manufacturer.

A.2.2. Peak Output Power-conducted

EUT ID: UT05a

Measurement Results:

802.11b/g mode

Mode	Data Rate (Mbps)	Test Result (dBm)		
		2412MHz (Ch1)	2437MHz (Ch6)	2462 MHz (Ch11)
802.11b	1	20.31	20.41	20.83
802.11g	54	22.68	22.15	23.12

The data rate 1Mbps and 54Mbps are selected as worst condition, and the following cases are performed with this condition.

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802.11n-HT20 mode

Mode	Data Rate (Index)	Test Result (dBm)		
		2412MHz (Ch1)	2437MHz (Ch6)	2462 MHz (Ch11)
802.11n (20MHz)	MCS0	21.57	21.38	21.35

The data rate MCS0 is selected as worst condition, and the following cases are performed with this condition.

802.11ax-HE20 mode

Mode	Data Rate (Index)	Test Result (dBm)		
		2412MHz (Ch1)	2437MHz (Ch6)	2462 MHz (Ch11)
802.11ax (20MHz)	MCS11	20.72	20.54	20.49

The data rate MCS11 is selected as worst condition, and the following cases are performed with this condition.

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802.11ax-HE20 RU26-L mode

Mode	Data Rate (Index)	Test Result (dBm)		
		2412MHz (Ch1)	2437MHz (Ch6)	2462 MHz (Ch11)
802.11ax RU26-L (20MHz)	MCS11	19.15	19.23	19.45

The data rate MCS11 is selected as worst condition, and the following cases are performed with this condition.

802.11ax-HE20 RU26-R mode

Mode	Data Rate (Index)	Test Result (dBm)		
		2412MHz (Ch1)	2437MHz (Ch6)	2462 MHz (Ch11)
802.11ax RU26-R (20MHz)	MCS11	19.89	19.38	18.92

The data rate MCS11 is selected as worst condition, and the following cases are performed with this condition.

802.11ax-HE20 RU52-L mode

Mode	Data Rate (Index)	Test Result (dBm)		
		2412MHz (Ch1)	2437MHz (Ch6)	2462 MHz (Ch11)
802.11ax RU52-L (20MHz)	MCS11	21.38	21.33	21.47

The data rate MCS11 is selected as worst condition, and the following cases are performed with this condition.

802.11ax-HE20 RU52-R mode

Mode	Data Rate (Index)	Test Result (dBm)		
		2412MHz (Ch1)	2437MHz (Ch6)	2462 MHz (Ch11)
802.11ax RU52-R (20MHz)	MCS11	21.79	21.44	21.14

The data rate MCS11 is selected as worst condition, and the following cases are performed with this condition.

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802.11ax-HE20 RU106-L mode

Mode	Data Rate (Index)	Test Result (dBm)		
		2412MHz (Ch1)	2437MHz (Ch6)	2462 MHz (Ch11)
802.11ax RU106-L (20MHz)	MCS11	21.26	21.10	21.15

The data rate MCS11 is selected as worst condition, and the following cases are performed with this condition.

802.11ax-HE20 RU106-R mode

Mode	Data Rate (Index)	Test Result (dBm)		
		2412MHz (Ch1)	2437MHz (Ch6)	2462 MHz (Ch11)
802.11ax RU106-R (20MHz)	MCS11	21.51	21.18	20.94

The data rate MCS11 is selected as worst condition, and the following cases are performed with this condition.

Conclusion: Pass

Duty Cycle

Mode	11b
Duty Cycle	96%

Mode	11g	11n-20	11ax-20	11ax-20 RU
Duty Cycle	32%	98%	98%	53%

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A.3. Peak Power Spectral Density

Method of Measurement: See ANSI C63.10-2013-clause 11.10.2

a) Set analyzer center frequency to DTS channel center frequency.
b) Set the span to 1.5 times the DTS bandwidth.
c) Set the RBW to RBW = 3 kHz.
d) Set the VBW = 10 kHz.
e) Detector = peak.
f) Sweep time = auto couple.
g) Trace mode = max hold.
h) Allow trace to fully stabilize.
i) Use the peak marker function to determine the maximum amplitude level within the RBW.

Measurement Limit:

Standard	Limit
FCC CRF Part 15.247(e)	< 8 dBm/3 kHz

EUT ID: UT05a

Measurement Results:

TestMode	Antenna	Frequency[MHz]	Result[dBm/3-100kHz]	Limit[dBm/3kHz]	Verdict
11B	Ant2	2412	-6.45	≤8.00	PASS
		2437	-6.20	≤8.00	PASS
		2462	-6.56	≤8.00	PASS
11G	Ant2	2412	-11.01	≤8.00	PASS
		2437	-11.96	≤8.00	PASS
		2462	-11.40	≤8.00	PASS
11AX20SISO	Ant2	2412	-15.22	≤8.00	PASS
		2437	-15.55	≤8.00	PASS
		2462	-15.46	≤8.00	PASS

Test graphs as below:

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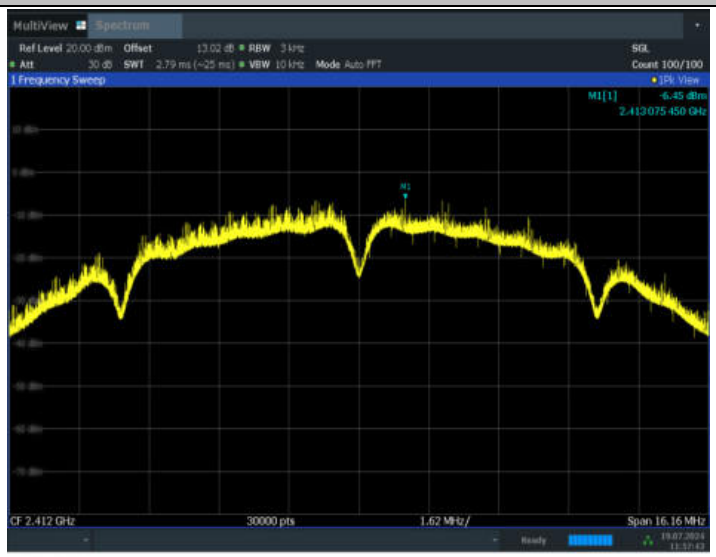
11B_Ant2_2412
 11:57:44 19.07.2024
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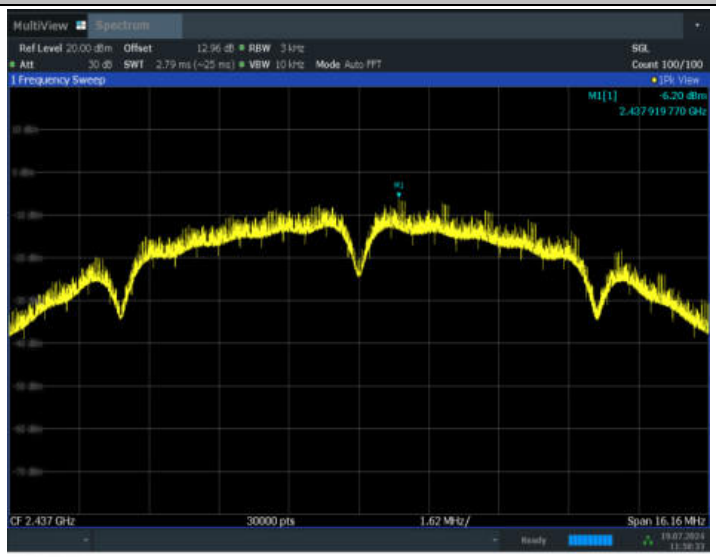 11:58:33 19.07.2024
11B_Ant2_2462

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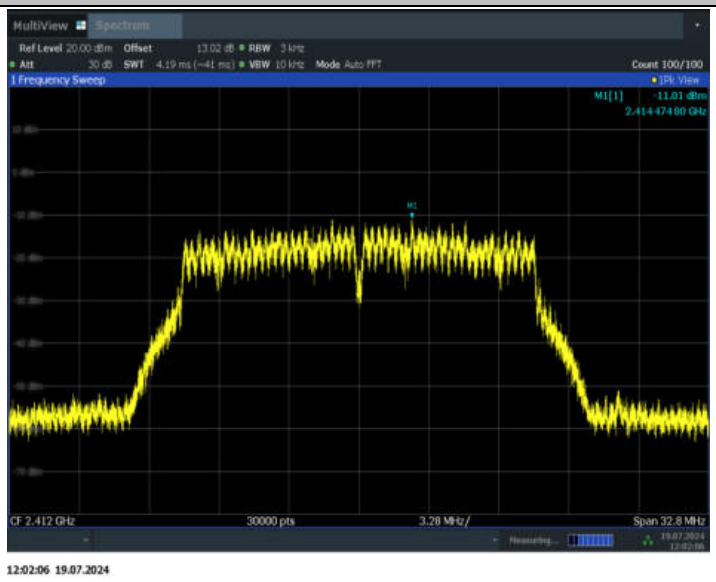
11G_Ant2_2412



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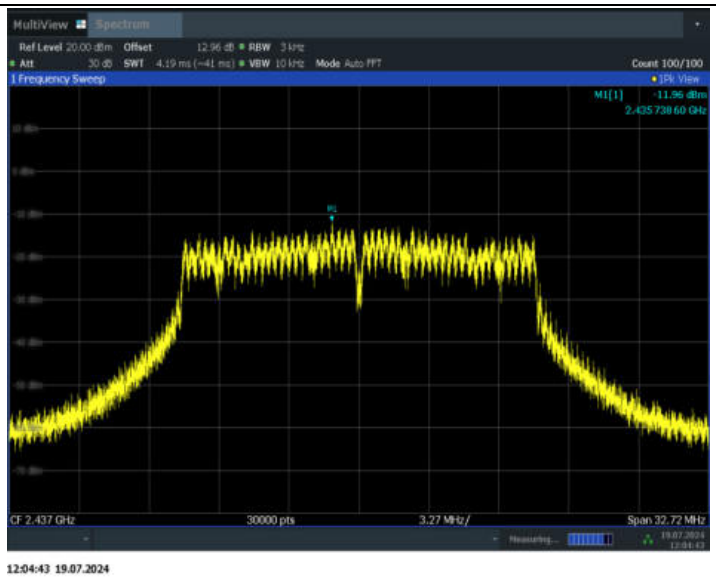

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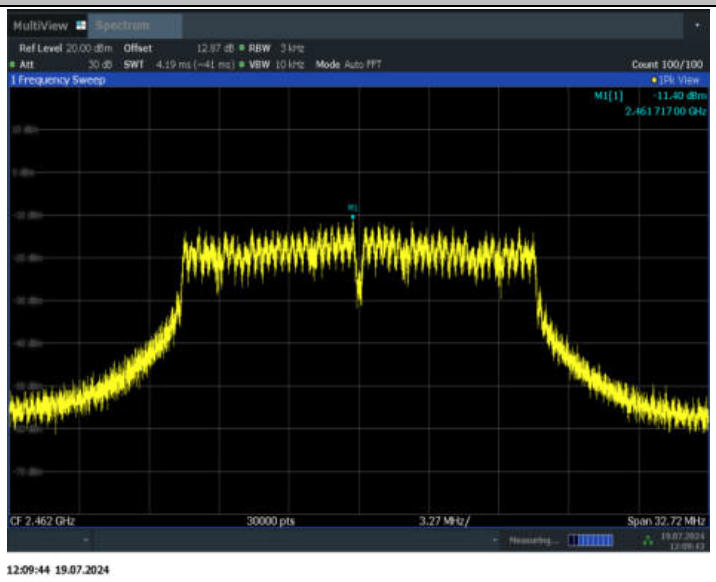

11AX20SISO_Ant2_2412

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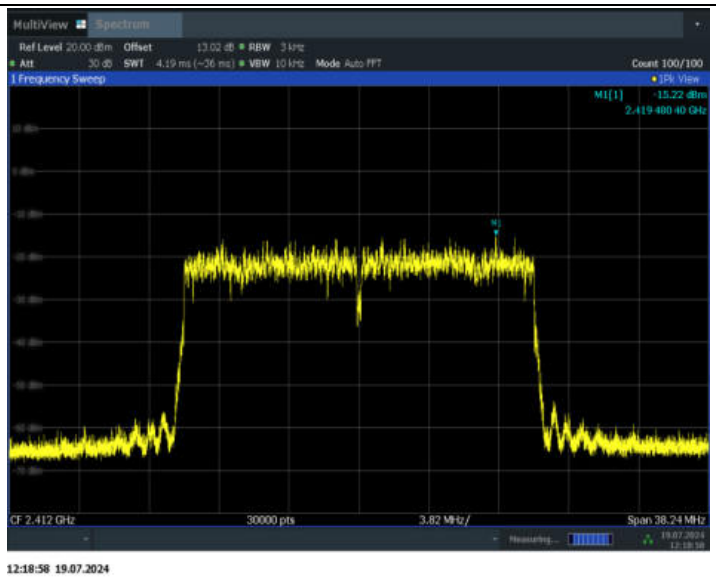

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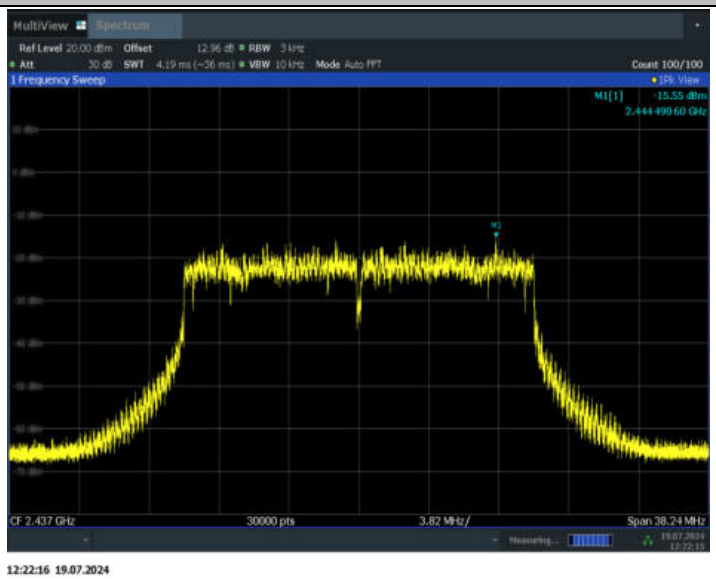

11AX20SISO_Ant2_2462

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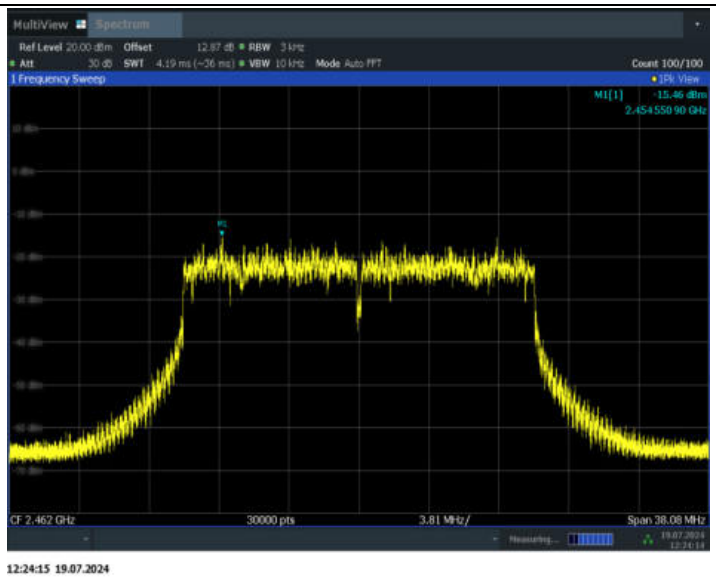

Conclusion: Pass

11ax-RU

TestMode	Antenna	Frequency[MHz]	RuSize	RuIndex	Result [dBm/3kHz]	Limit [dBm/3kHz]	Verdict
11AX20SISO	Ant2	2412	26Tone	RU0		≤8.00	PASS
				RU8		≤8.00	PASS
			52Tone	RU37	-8.97	≤8.00	PASS
				RU40	-8.14	≤8.00	PASS
			106Tone	RU53	-10.84	≤8.00	PASS
				RU54	-10.10	≤8.00	PASS
		2437	26Tone	RU0		≤8.00	PASS
				RU8		≤8.00	PASS
			52Tone	RU37	-8.16	≤8.00	PASS
				RU40	-8.41	≤8.00	PASS
			106Tone	RU53	-10.70	≤8.00	PASS
				RU54	-11.60	≤8.00	PASS

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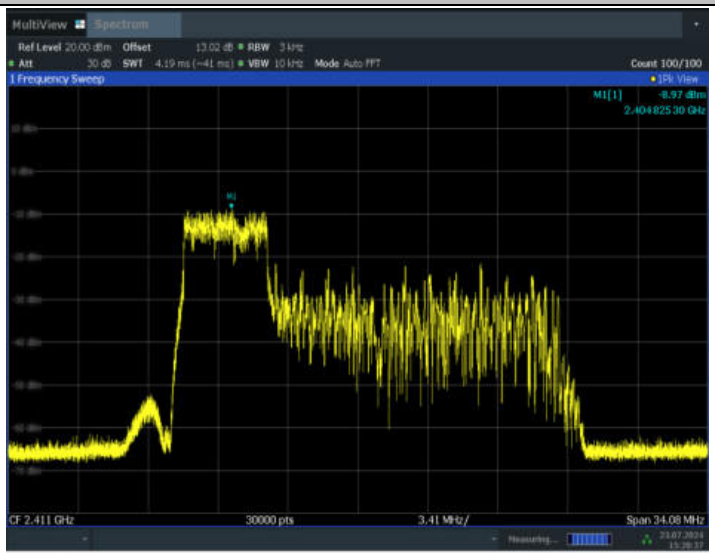
		2462	26Tone	RU0		≤8.00	PASS
				RU8		≤8.00	PASS
			52Tone	RU37	-8.49	≤8.00	PASS
				RU40	-9.25	≤8.00	PASS
			106Tone	RU53	-11.06	≤8.00	PASS
				RU54	-11.55	≤8.00	PASS

11AX20SISO_Ant2_2412_26Tone_RU0

11AX20SISO_Ant2_2412_26Tone_RU8

11AX20SISO_Ant2_2412_52Tone_RU37



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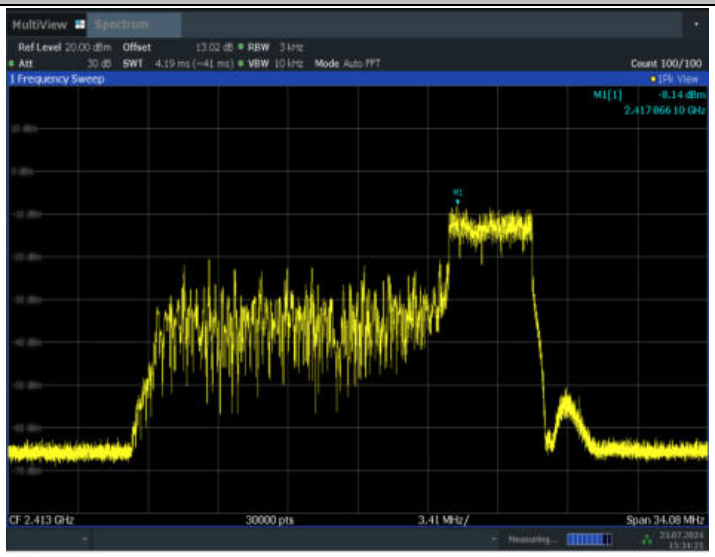

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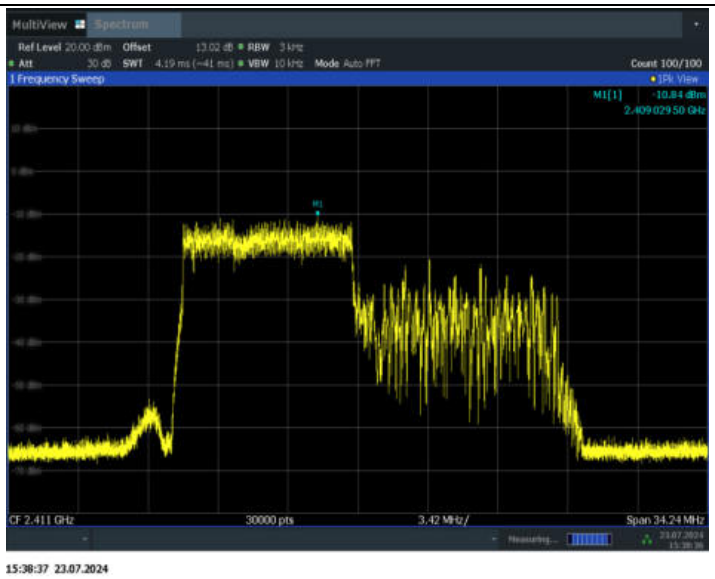
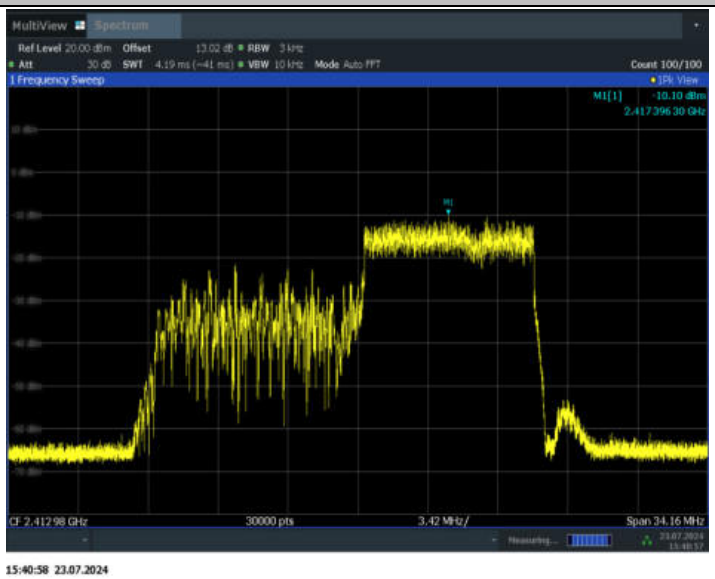


11AX20SISO_Ant2_2412_106Tone_RU54



11AX20SISO_Ant2_2437_26Tone_RU0

11AX20SISO_Ant2_2437_26Tone_RU8

11AX20SISO_Ant2_2437_52Tone_RU37

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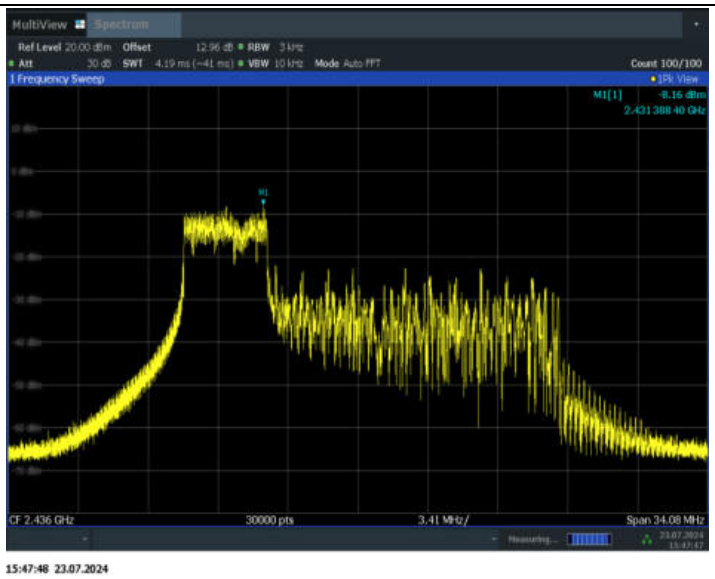
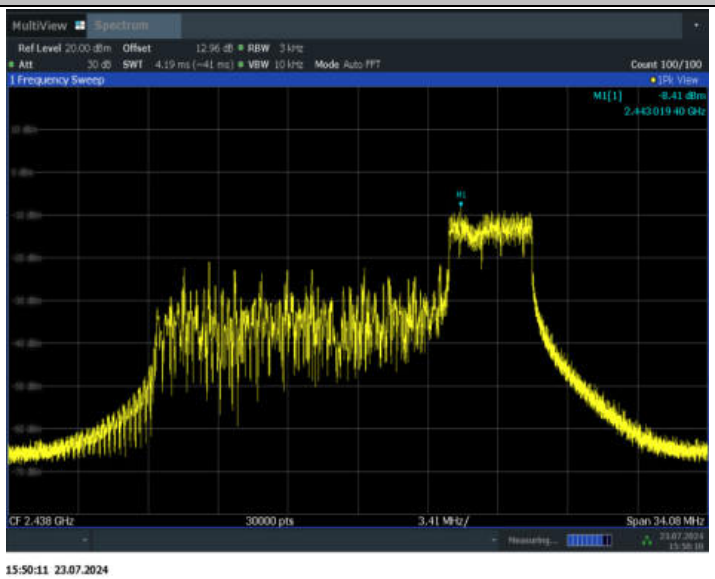


11AX20SISO_Ant2_2437_52Tone_RU40



11AX20SISO_Ant2_2437_106Tone_RU53

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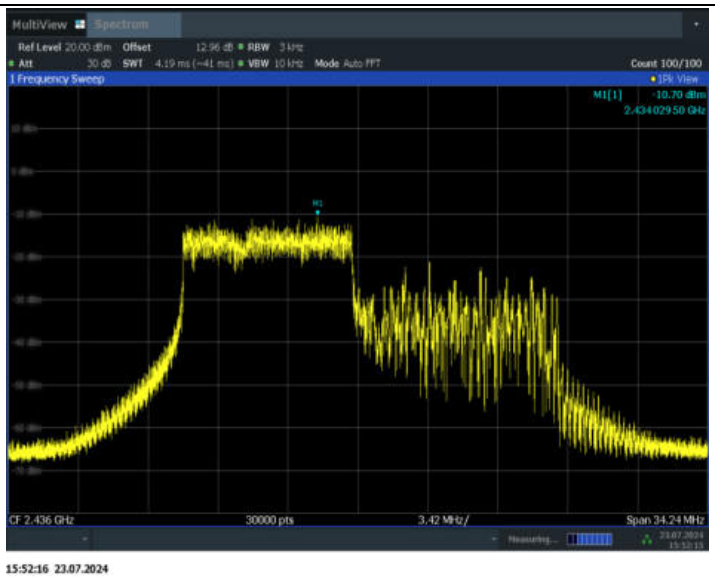
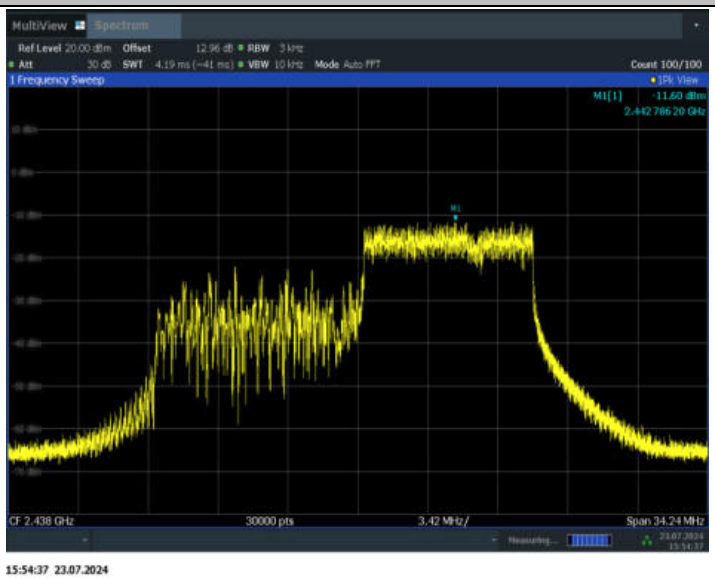


11AX20SISO_Ant2_2437_106Tone_RU54



11AX20SISO_Ant2_2462_26Tone_RU0

11AX20SISO_Ant2_2462_26Tone_RU8

11AX20SISO_Ant2_2462_52Tone_RU37

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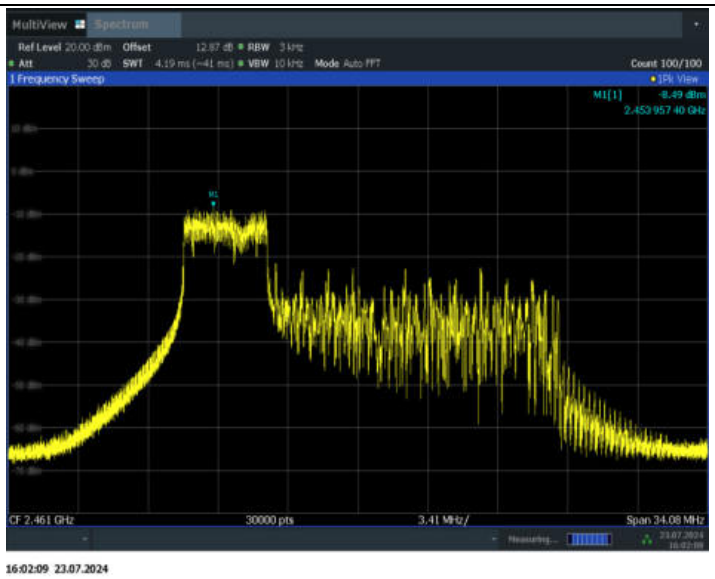
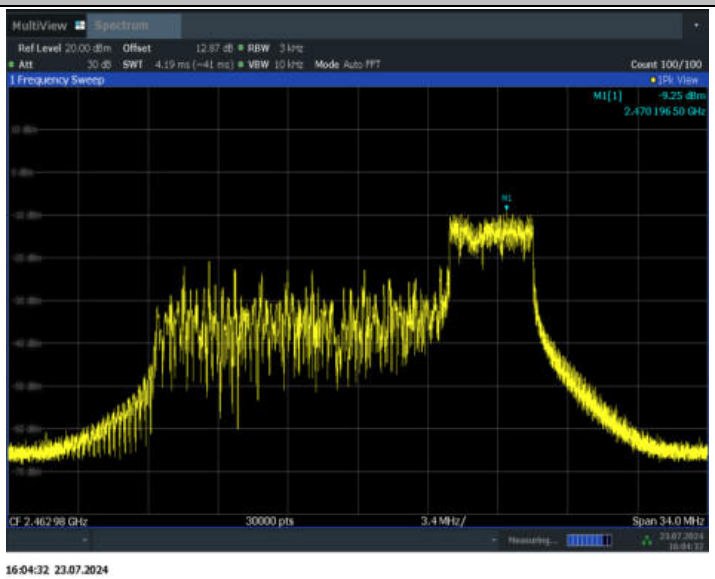


11AX20SISO_Ant2_2462_52Tone_RU40



11AX20SISO_Ant2_2462_106Tone_RU53

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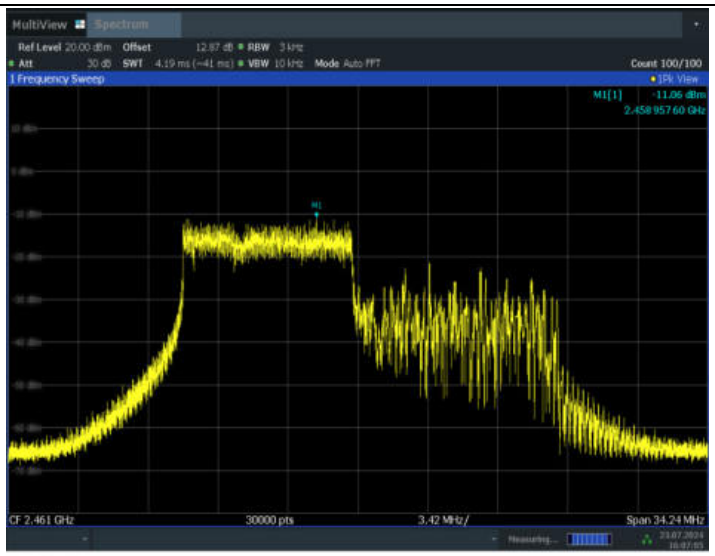
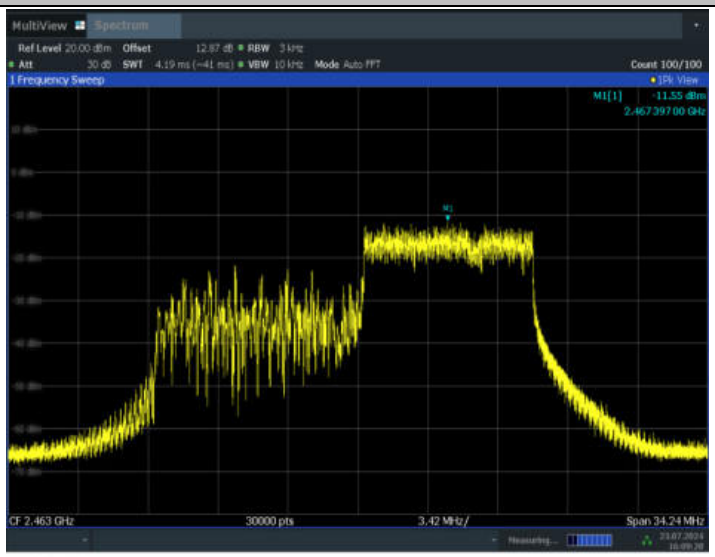


16:07:05 23.07.2024

11AX20SISO_Ant2_2462_106Tone_RU54



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A.4. DTS 6-dB Signal Bandwidth

Method of Measurement: See ANSI C63.10-2013 section 11.8.1.

a) Set RBW = 100 kHz.

b) Set the video bandwidth (VBW) = 300 kHz.

c) Detector = Peak.

d) Trace mode = max hold.

e) Sweep = auto couple.

f) Allow the trace to stabilize.

g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

Measurement Limit:

Standard	Limit (kHz)
FCC 47 CFR Part 15.247 (a)	≥ 500

EUT ID: UT05a

Measurement Result:

TestMode	Antenna	Frequency[MHz]	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant2	2412	8.08	2407.96	2416.04	0.5	PASS
		2437	8.08	2432.96	2441.04	0.5	PASS
		2462	8.12	2457.92	2466.04	0.5	PASS
11G	Ant2	2412	16.40	2403.76	2420.16	0.5	PASS
		2437	16.36	2428.80	2445.16	0.5	PASS
		2462	16.36	2453.80	2470.16	0.5	PASS
11N20SISO	Ant2	2412	15.08	2404.48	2419.56	0.5	PASS
		2437	15.12	2429.44	2444.56	0.5	PASS
		2462	15.12	2454.44	2469.56	0.5	PASS
11AX20SISO	Ant2	2412	19.12	2402.44	2421.56	0.5	PASS
		2437	19.12	2427.44	2446.56	0.5	PASS
		2462	19.04	2452.44	2471.48	0.5	PASS

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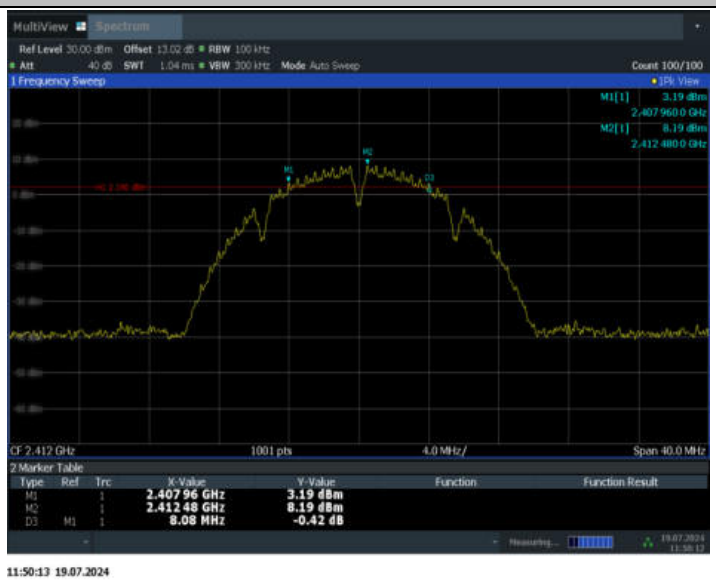
Test graphs as below:

11B_Ant2_2412


11B_Ant2_2437

11B_Ant2_2462

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11G_Ant2_2412

11G_Ant2_2437

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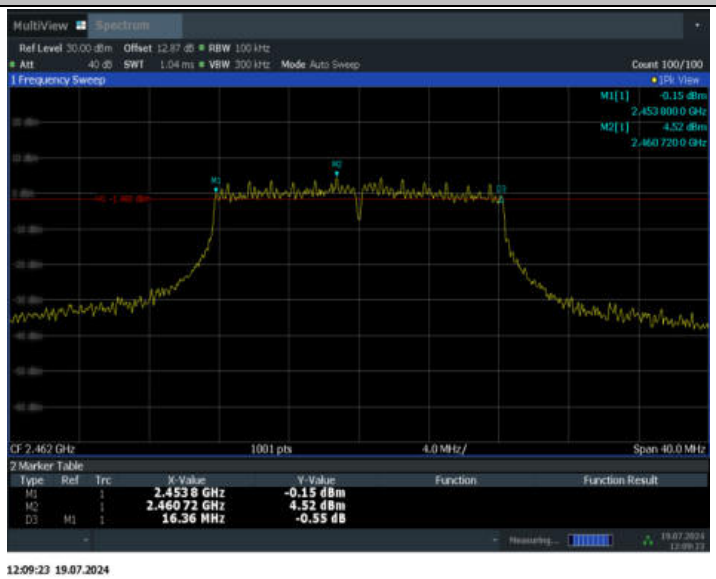
11G_Ant2_2462



11AX20SISO_Ant2_2412

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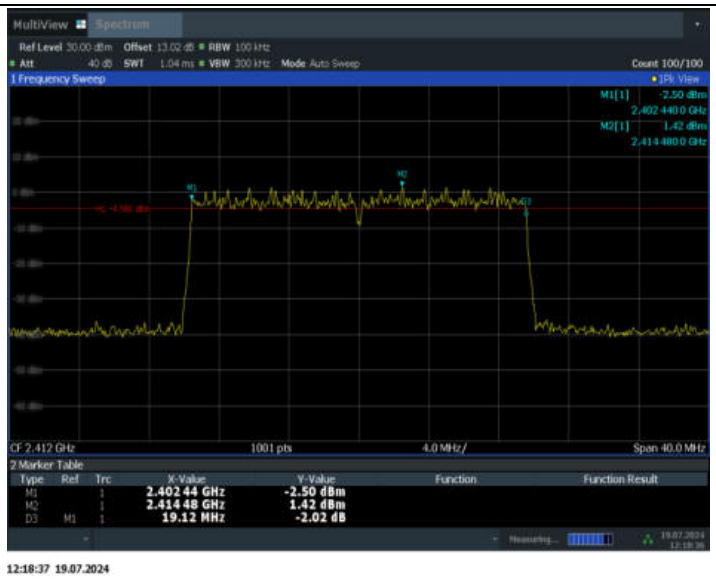
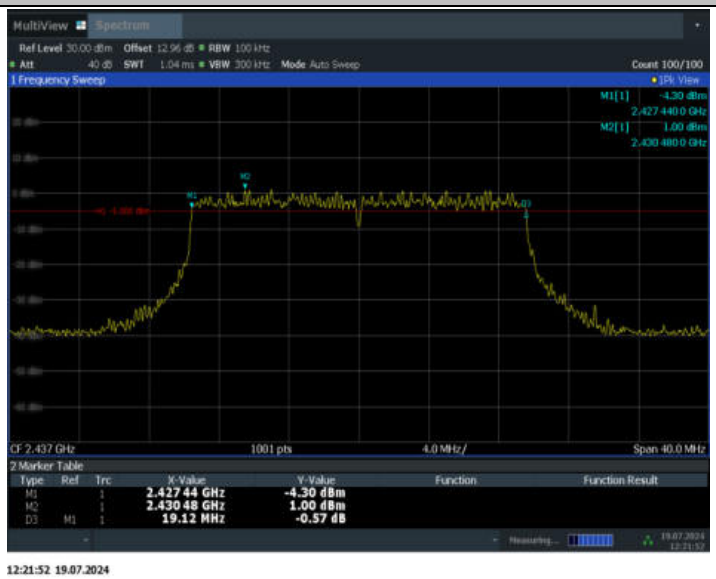


11AX20SISO_Ant2_2437



11AX20SISO_Ant2_2462

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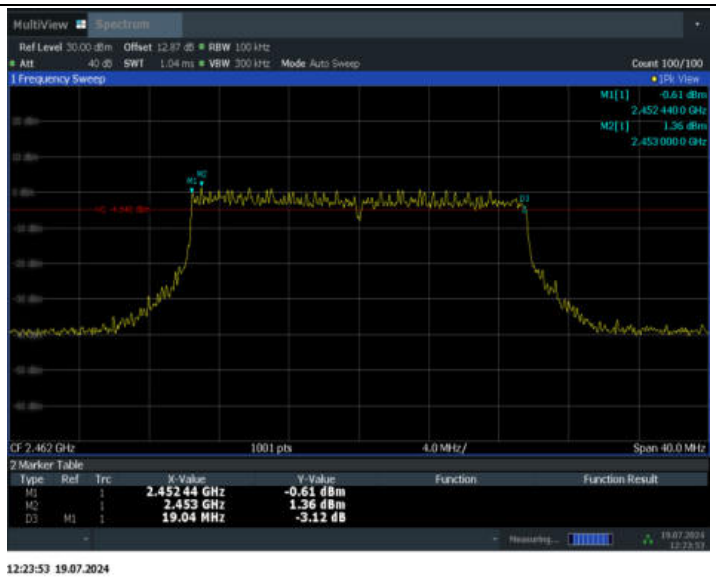

Conclusion: Pass

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A.5. Band Edges Compliance

Method of Measurement: See ANSI C63.10-2013-clause 6.10.4

Connect the spectrum analyzer to the EUT using an appropriate RF cable connected to the EUT output. Configure the spectrum analyzer settings as described below.

a) Set Span = 100MHz
b) Sweep Time: coupled
c) Set the RBW= 100 kHz
c) Set the VBW= 300 kHz
d) Detector: Peak
e) Trace: Max hold

Measurement Limit:

Standard	Limit (dBc)
FCC 47 CFR Part 15.247 (d)	> 20

EUT ID: UT05a

Measurement Result:

TestMode	Antenna	ChName	Frequency[MHz]	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
11B	Ant2	Low	2412	8.69	-41.37	≤-11.31	PASS
		High	2462	8.64	-41.42	≤-11.36	PASS
11G	Ant2	Low	2412	3.68	-32.55	≤-16.32	PASS
		High	2462	4.51	-39.1	≤-15.49	PASS
11AX20SISO	Ant2	Low	2412	1.77	-39.36	≤-18.23	PASS
		High	2462	1.10	-46.65	≤-18.9	PASS

Test graphs as below:

11B_Ant2_Low_2412

11B_Ant2_High_2462

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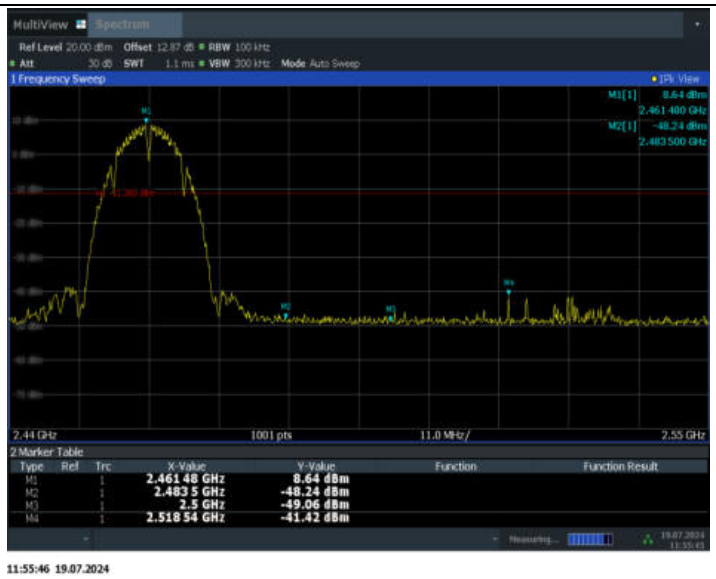

11G_Ant2_Low_2412

11G_Ant2_High_2462

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11AX20SISO_Ant2_Low_2412

11AX20SISO_Ant2_High_2462

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11ax-RU

TestMode	Antenna	ChName	Frequency[MHz]	Ru Size	Ru Index	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
11AX20SISO	Ant2	Low	2412	26Tone	RU0	9.32	-36.22	≤-10.68	PASS
					RU8	7.58	-46.77	≤-12.42	PASS
				52Tone	RU37	5.02	-39.39	≤-14.98	PASS
					RU40	4.76	-46.31	≤-15.24	PASS
				106Tone	RU53	3.16	-42.75	≤-16.84	PASS
					RU54	3.72	-46.51	≤-16.28	PASS
		High	2462	26Tone	RU0	8.47	-38.07	≤-11.53	PASS
					RU8	7.87	-42.84	≤-12.13	PASS
				52Tone	RU37	5.03	-40.93	≤-14.97	PASS
					RU40	4.83	-45.28	≤-15.17	PASS
				106Tone	RU53	3.19	-35.14	≤-16.81	PASS
					RU54	2.91	-36.31	≤-17.09	PASS

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11AX20SISO_Ant2_Low_2412_26Tone_RU0

15:17:28 23.07.2024

11AX20SISO_Ant2_Low_2412_26Tone_RU8

15:24:58 23.07.2024

11AX20SISO_Ant2_Low_2412_52Tone_RU37

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11AX20SISO_Ant2_Low_2412_52Tone_RU40

11AX20SISO_Ant2_Low_2412_106Tone_RU53

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11AX20SISO_Ant2_Low_2412_106Tone_RU54

11AX20SISO_Ant2_High_2462_26Tone_RU0

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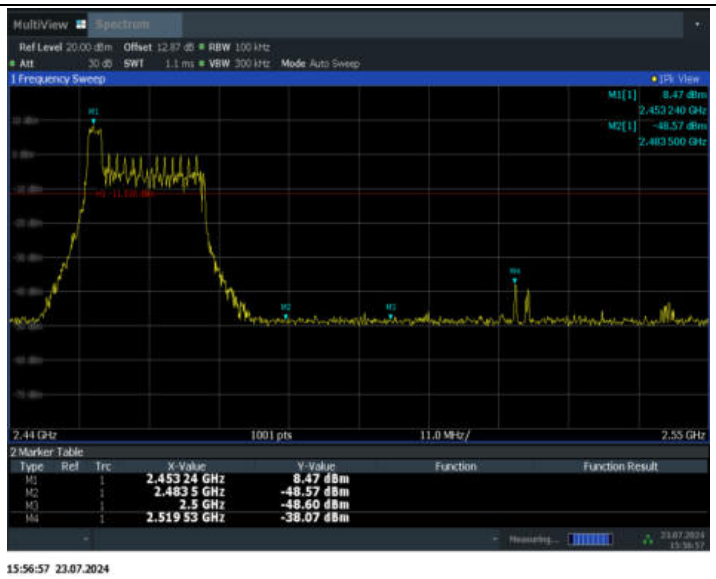

11AX20SISO_Ant2_High_2462_26Tone_RU8

11AX20SISO_Ant2_High_2462_52Tone_RU37

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11AX20SISO_Ant2_High_2462_52Tone_RU40

11AX20SISO_Ant2_High_2462_106Tone_RU53

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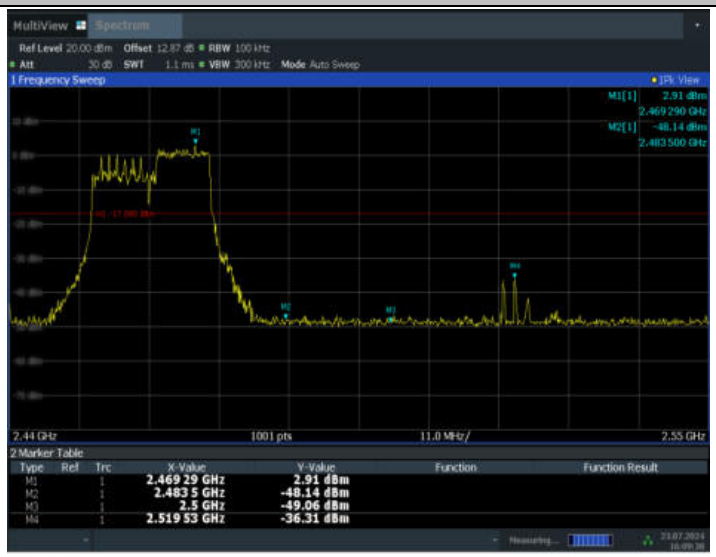
16:07:16 23.07.2024

11AX20SISO_Ant2_High_2462_106Tone_RU54



16:09:38 23.07.2024

Conclusion: Pass

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A.6. Transmitter Spurious Emission

A.6.1 Transmitter Spurious Emission – Conducted

Method of Measurement: See ANSI C63.10-2013-clause 11.11

Establish a reference level by using the following procedure:

a) Set instrument center frequency to DTS channel center frequency
b) Set the span to ≥ 1.5 times the DTS bandwidth
c) Set the RBW= 100 kHz
d) Set the VBW= 300 kHz
e) Detector = Peak
f) Sweep time = auto couple
g) Trace mode = max hold
h) Allow trace to fully stabilize
i) Use the peak marker function to determine the maximum PSD level

Note that the channel found to contain the maximum PSD level can be used to establish the reference level.

Establish an emission level by using the following procedure:

a) Set the center frequency and span to encompass frequency range to be measured.
b) Set the RBW = 100 kHz.
c) Set the VBW = 300 kHz.
d) Detector = peak.
e) Sweep time = auto couple.
f) Trace mode = max hold.
g) Allow trace to fully stabilize.
h) Use the peak marker function to determine the maximum amplitude level.

Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) is attenuated by at least the minimum requirements specified in 11.11. Report the three highest emissions relative to the limit.

Measurement Limit:

Standard	Limit
FCC 47 CFR Part 15.247 (d)	20dB below peak output power in 100 kHz bandwidth

EUT ID: UT05a

Measurement Results:

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TestMode	Antenna	Frequency[MHz]	FreqRange [Mhz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
11B	Ant2	2412	Reference	9.60	9.60	---	PASS
			30~1000	9.60	-56.54	≤-10.4	PASS
			1000~26500	9.60	-43.86	≤-10.4	PASS
		2437	Reference	8.37	8.37	---	PASS
			30~1000	8.37	-56.95	≤-11.63	PASS
			1000~26500	8.37	-43.76	≤-11.63	PASS
		2462	Reference	9.29	9.29	---	PASS
			30~1000	9.29	-56.66	≤-10.71	PASS
			1000~26500	9.29	-43.85	≤-10.71	PASS
11G	Ant2	2412	Reference	4.05	4.05	---	PASS
			30~1000	4.05	-56.58	≤-15.95	PASS
			1000~26500	4.05	-44.45	≤-15.95	PASS
		2437	Reference	3.78	3.78	---	PASS
			30~1000	3.78	-54.23	≤-16.22	PASS
			1000~26500	3.78	-43.72	≤-16.22	PASS
		2462	Reference	4.66	4.66	---	PASS
			30~1000	4.66	-57.14	≤-15.34	PASS
			1000~26500	4.66	-44.35	≤-15.34	PASS
11AX20SISO	Ant2	2412	Reference	1.38	1.38	---	PASS
			30~1000	1.38	-56.13	≤-18.62	PASS
			1000~26500	1.38	-43.55	≤-18.62	PASS
		2437	Reference	2.31	2.31	---	PASS
			30~1000	2.31	-56.19	≤-17.69	PASS
			1000~26500	2.31	-44.5	≤-17.69	PASS
		2462	Reference	1.83	1.83	---	PASS
			30~1000	1.83	-56.35	≤-18.17	PASS
			1000~26500	1.83	-35.55	≤-18.17	PASS

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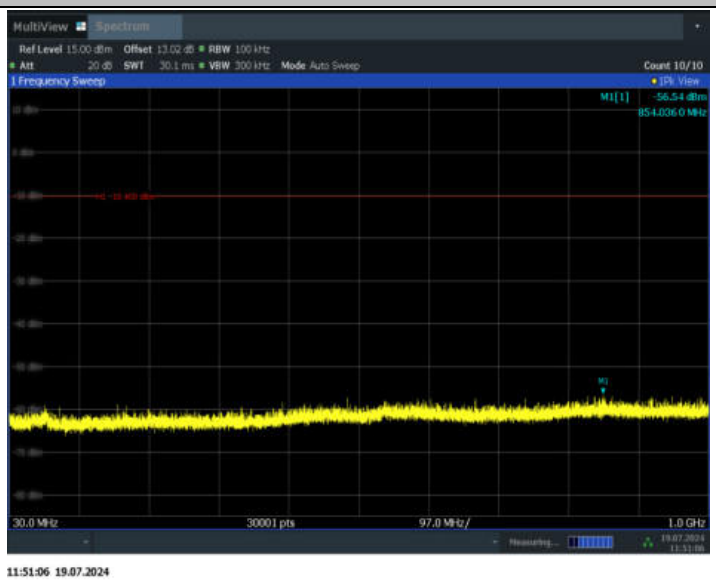
Test graphs as below:

11B_Ant2_2412_0~Reference
11B_Ant2_2412_30~1000

11B_Ant2_2412_1000~26500

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11B_Ant2_2437_0~Reference

11B_Ant2_2437_30~1000

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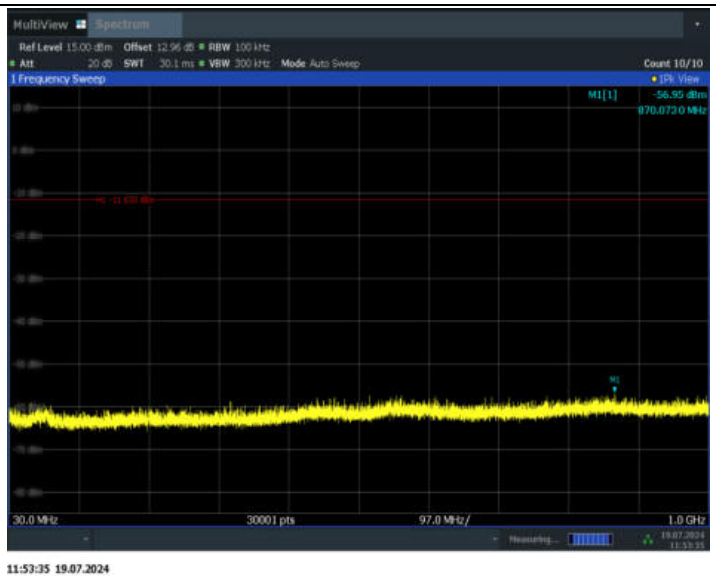

11B_Ant2_2437_1000~26500

11B_Ant2_2462_0~Reference

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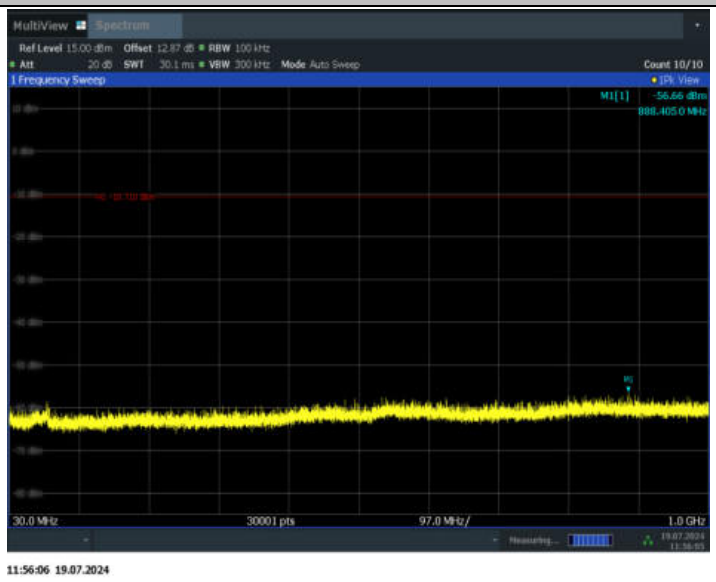
11B_Ant2_2462_30~1000



11B_Ant2_2462_1000~26500

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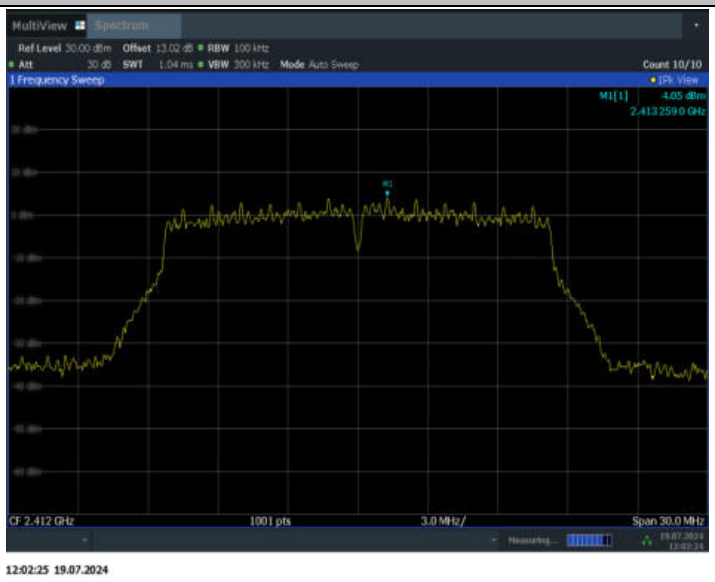
11G_Ant2_2412_0~Reference



11G_Ant2_2412_30~1000

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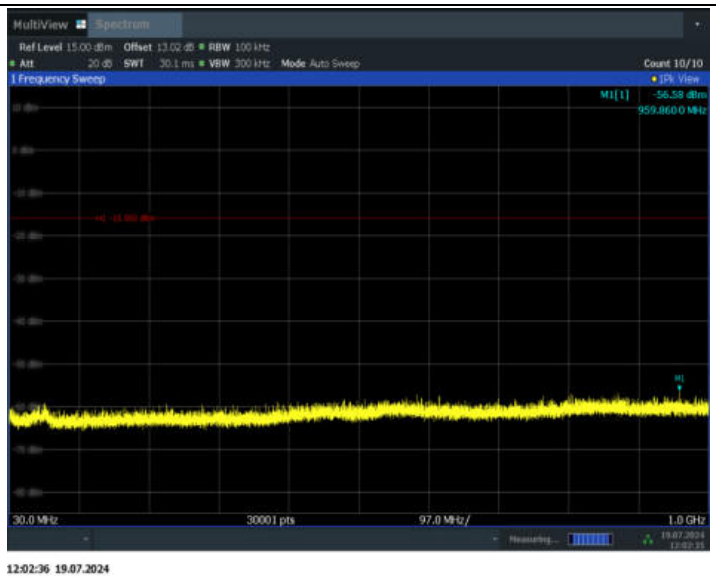

11G_Ant2_2412_1000~26500

11G_Ant2_2437_0~Reference

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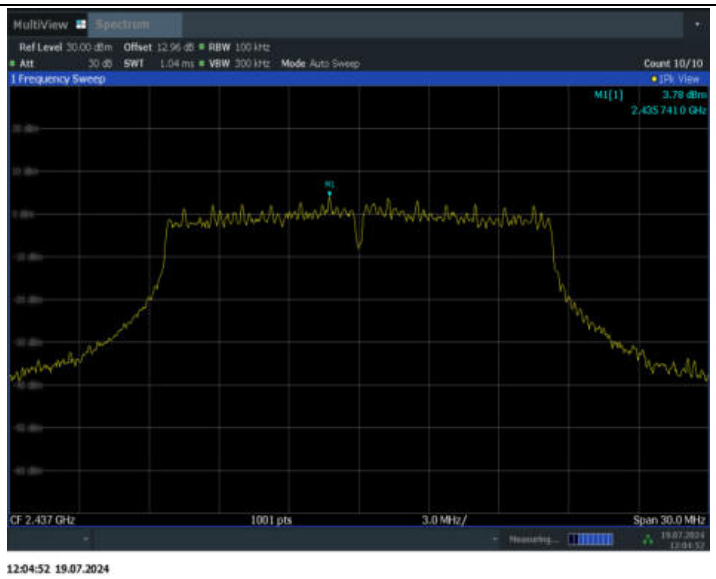
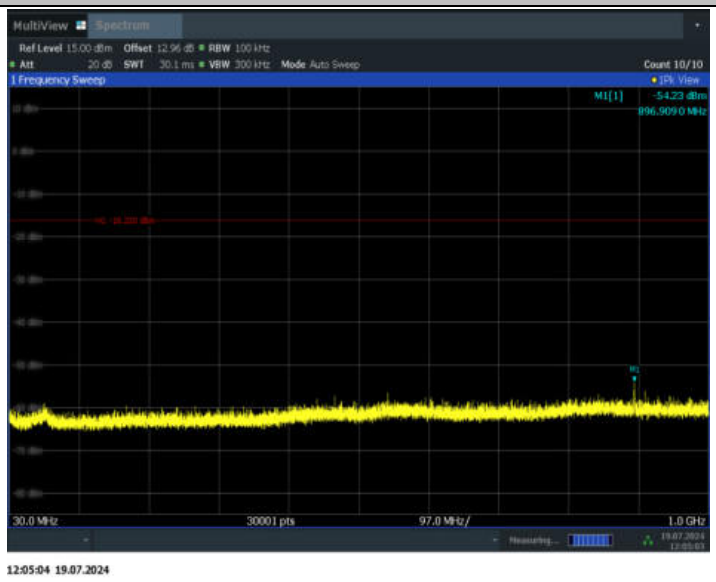


11G_Ant2_2437_30~1000



11G_Ant2_2437_1000~26500

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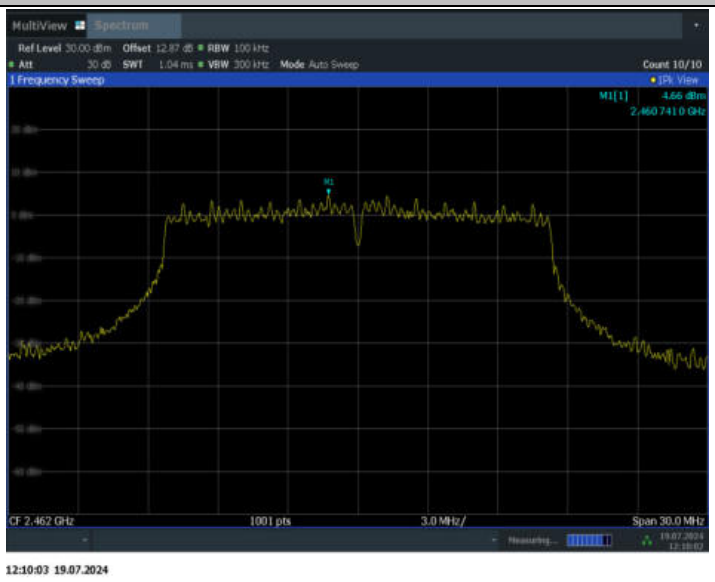
11G_Ant2_2462_0~Reference



11G_Ant2_2462_30~1000

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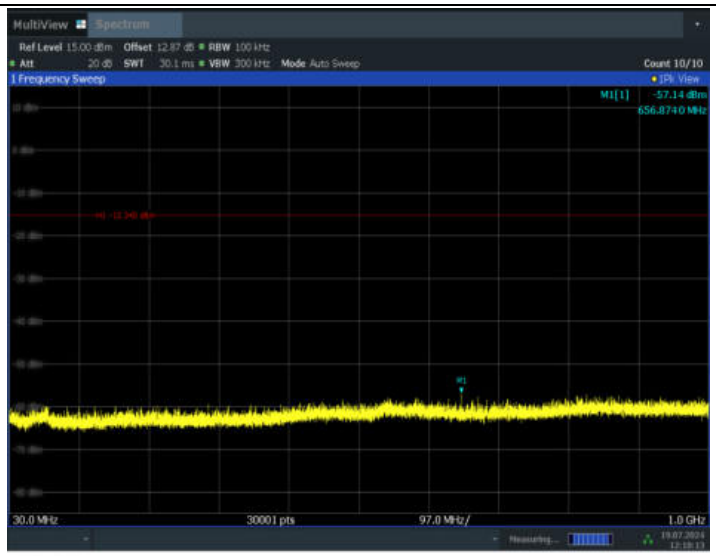
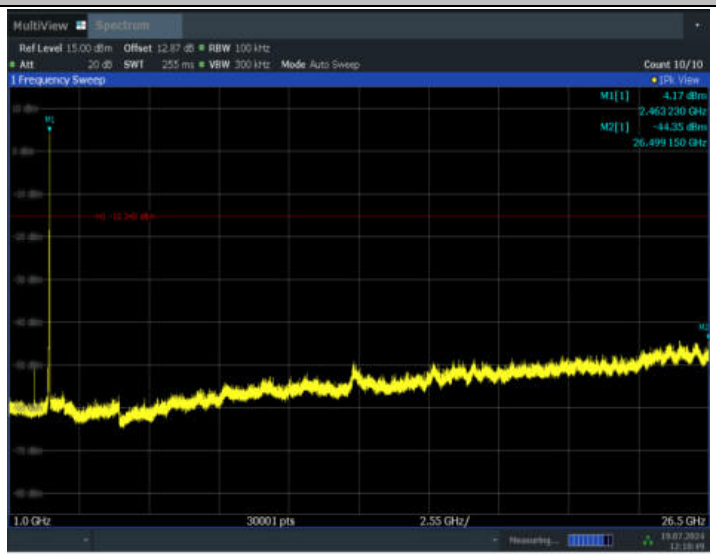


12:10:14 19.07.2024

11G_Ant2_2462_1000~26500



12:10:50 19.07.2024

11AX20SISO_Ant2_2412_0~Reference

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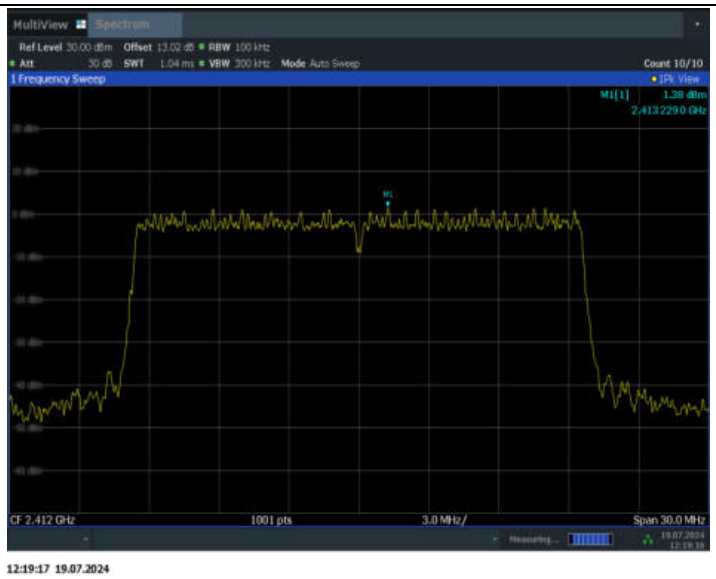
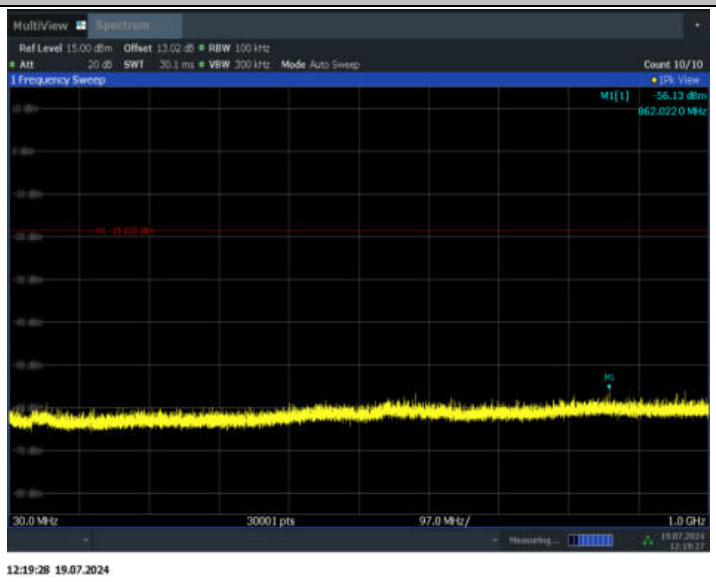


11AX20SISO_Ant2_2412_30~1000



11AX20SISO_Ant2_2412_1000~26500

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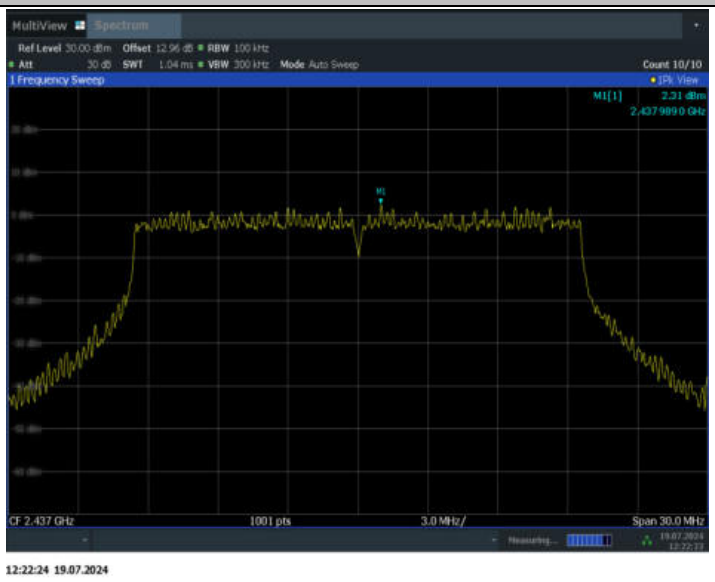
11AX20SISO_Ant2_2437_0~Reference



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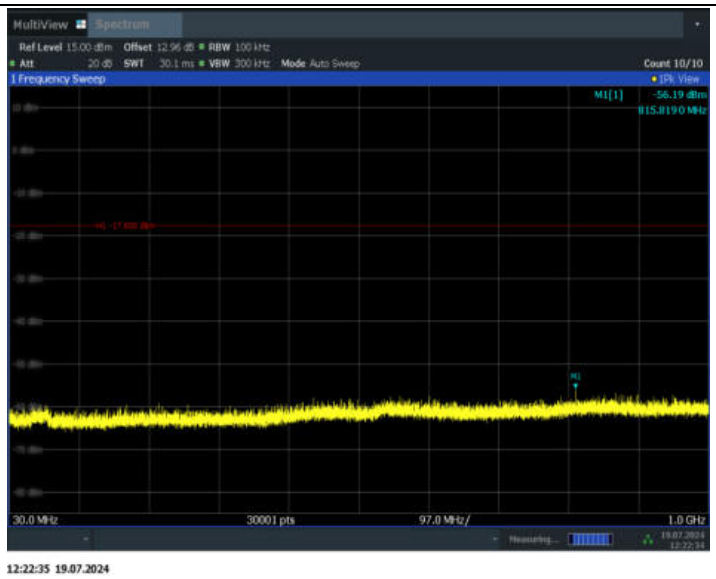

11AX20SISO_Ant2_2437_1000~26500

11AX20SISO_Ant2_2462_0~Reference

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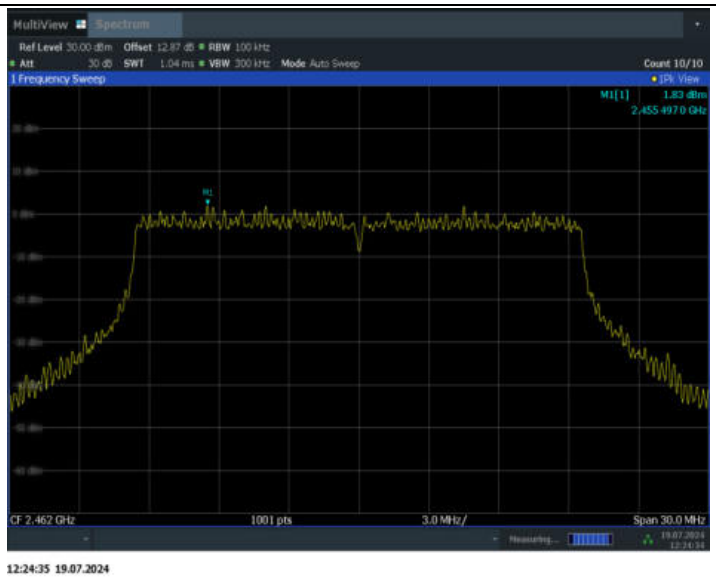

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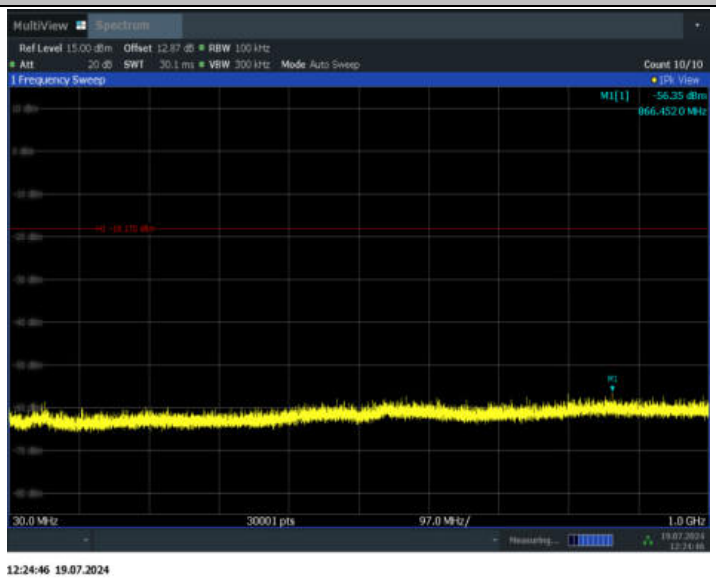

11AX20SISO_Ant2_2462_1000~26500

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11ax-RU

TestMode	Antenna	Frequency[MHz]	Ru Size	Ru Index	FreqRange [Mhz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
11AX20SISO	Ant2	2412	26Tone	RU0	Reference	8.53	8.53	---	PASS
				RU0	30~1000	8.53	-56.35	≤-11.47	PASS
				RU0	1000~26500	8.53	-43.20	≤-11.47	PASS
				RU8	Reference	8.42	8.42	---	PASS
				RU8	30~1000	8.42	-55.87	≤-11.58	PASS
				RU8	1000~26500	8.42	-43.85	≤-11.58	PASS
			52Tone	RU37	Reference	5.37	5.37	---	PASS
				RU37	30~1000	5.37	-55.99	≤-14.63	PASS
				RU37	1000~26500	5.37	-44.17	≤-14.63	PASS
				RU40	Reference	5.77	5.77	---	PASS
				RU40	30~1000	5.77	-56.68	≤-14.23	PASS
				RU40	1000~26500	5.77	-40.26	≤-14.23	PASS
			106Tone	RU53	Reference	4.69	4.69	---	PASS
				RU53	30~1000	4.69	-56.17	≤-15.31	PASS
				RU53	1000~26500	4.69	-43.67	≤-15.31	PASS
				RU54	Reference	4.22	4.22	---	PASS
				RU54	30~1000	4.22	-46.88	≤-15.78	PASS
				RU54	1000~26500	4.22	-44.05	≤-15.78	PASS
		2437	26Tone	RU0	Reference	10.41	10.41	---	PASS
				RU0	30~1000	10.41	-56.62	≤-9.59	PASS
				RU0	1000~26500	10.41	-41.98	≤-9.59	PASS
				RU8	Reference	8.72	8.72	---	PASS
				RU8	30~1000	8.72	-56.66	≤-11.28	PASS
				RU8	1000~26500	8.72	-41.98	≤-11.28	PASS

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			52Tone	RU37	Reference	4.77	4.77	---	PASS
				RU37	30~1000	4.77	-57.21	≤-15.23	PASS
				RU37	1000~26500	4.77	-37.05	≤-15.23	PASS
				RU40	Reference	5.51	5.51	---	PASS
				RU40	30~1000	5.51	-56.59	≤-14.49	PASS
				RU40	1000~26500	5.51	-35.42	≤-14.49	PASS
			106Tone	RU53	Reference	4.41	4.41	---	PASS
				RU53	30~1000	4.41	-56.75	≤-15.59	PASS
				RU53	1000~26500	4.41	-37.95	≤-15.59	PASS
				RU54	Reference	3.60	3.60	---	PASS
				RU54	30~1000	3.60	-56.38	≤-16.4	PASS
				RU54	1000~26500	3.60	-44.60	≤-16.4	PASS
		2462	26Tone	RU0	Reference	8.63	8.63	---	PASS
				RU0	30~1000	8.63	-56.60	≤-11.37	PASS
				RU0	1000~26500	8.63	-44.13	≤-11.37	PASS
				RU8	Reference	8.07	8.07	---	PASS
				RU8	30~1000	8.07	-56.31	≤-11.93	PASS
				RU8	1000~26500	8.07	-40.38	≤-11.93	PASS
			52Tone	RU37	Reference	5.77	5.77	---	PASS
				RU37	30~1000	5.77	-57.14	≤-14.23	PASS
				RU37	1000~26500	5.77	-43.71	≤-14.23	PASS
				RU40	Reference	5.51	5.51	---	PASS
				RU40	30~1000	5.51	-56.99	≤-14.49	PASS
				RU40	1000~26500	5.51	-44.19	≤-14.49	PASS
			106Tone	RU53	Reference	4.65	4.65	---	PASS
				RU53	30~1000	4.65	-55.83	≤-15.35	PASS
				RU53	1000~26500	4.65	-43.55	≤-15.35	PASS
				RU54	Reference	4.37	4.37	---	PASS
				RU54	30~1000	4.37	-56.81	≤-15.63	PASS
				RU54	1000~26500	4.37	-41.49	≤-15.63	PASS

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11AX20SISO_Ant2_2412_26Tone_RU0_0~Reference

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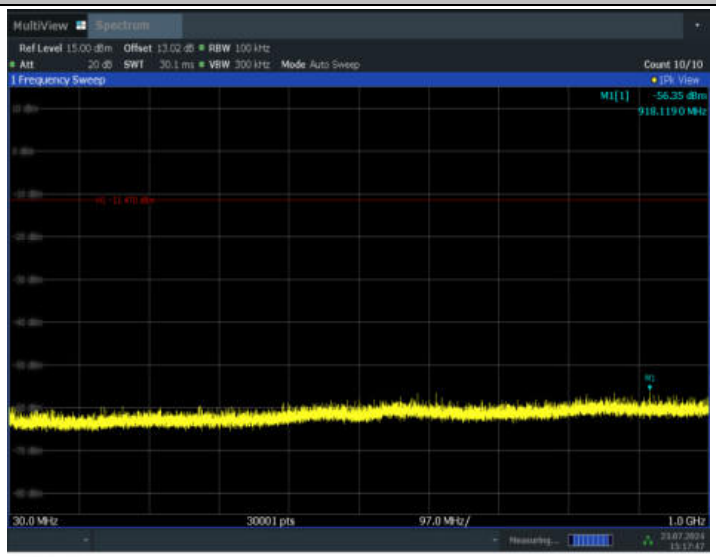

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11AX20SISO_Ant2_2412_26Tone_RU8_0~Reference

11AX20SISO_Ant2_2412_26Tone_RU8_30~1000

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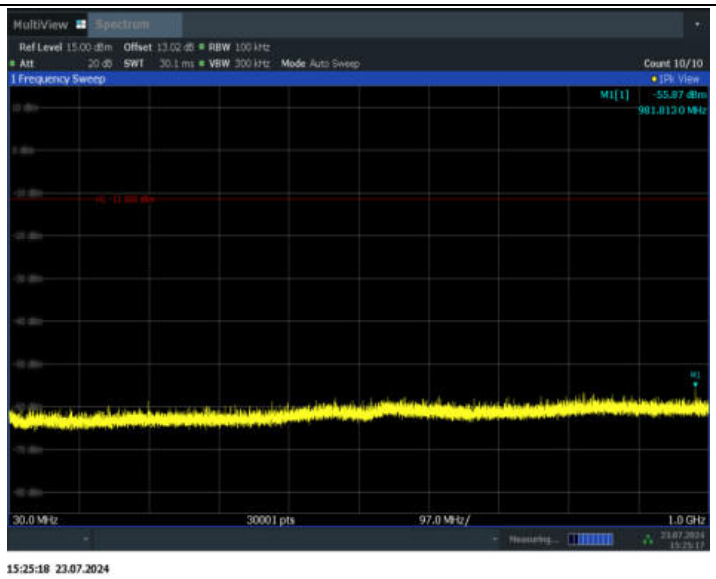

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11AX20SISO_Ant2_2412_52Tone_RU37_0~Reference

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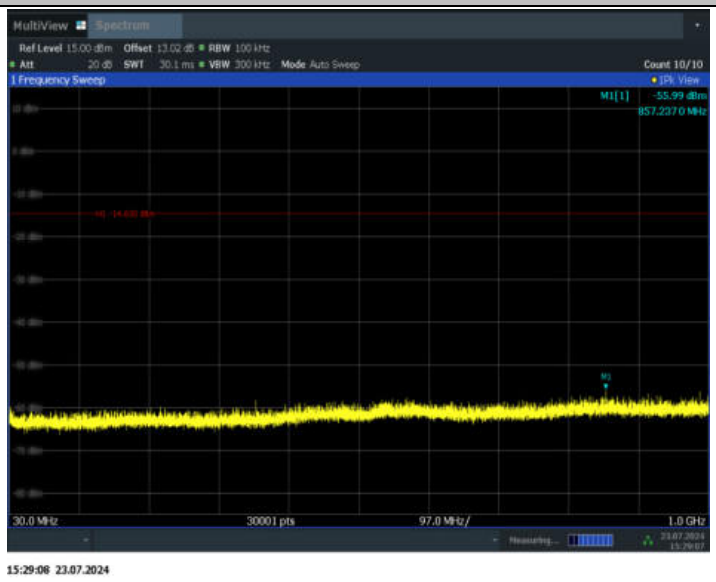
11AX20SISO_Ant2_2412_52Tone_RU37_30~1000



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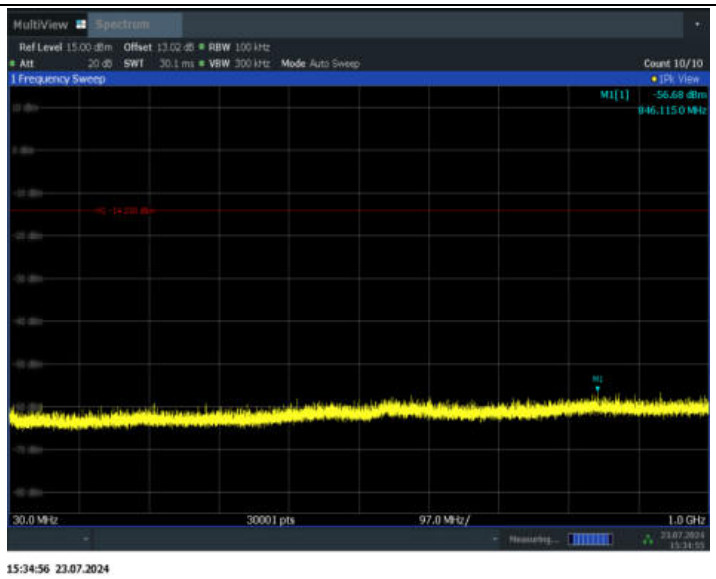

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11AX20SISO_Ant2_2412_106Tone_RU53_0~Reference

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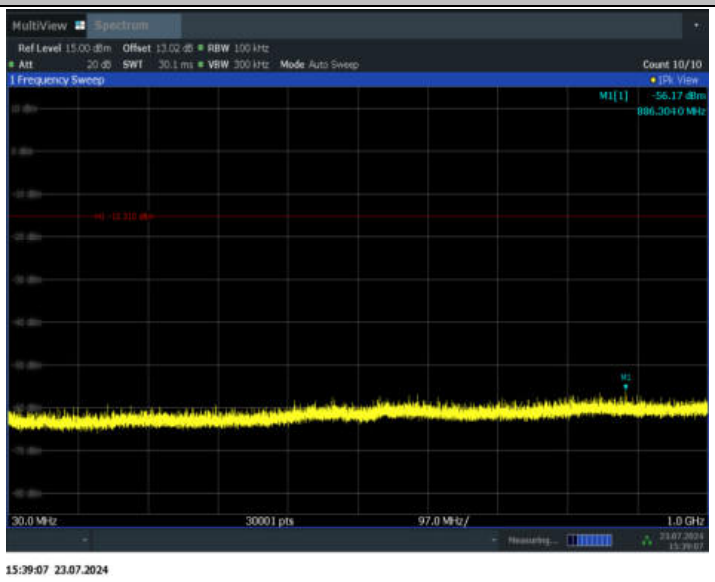

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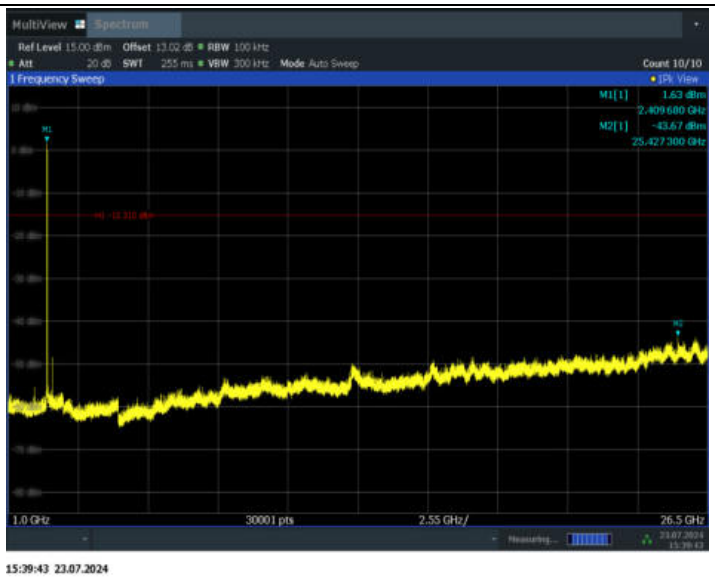

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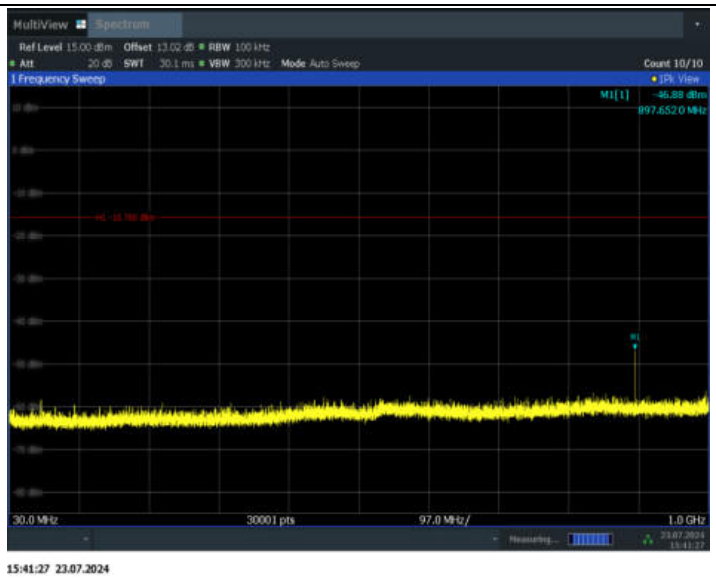

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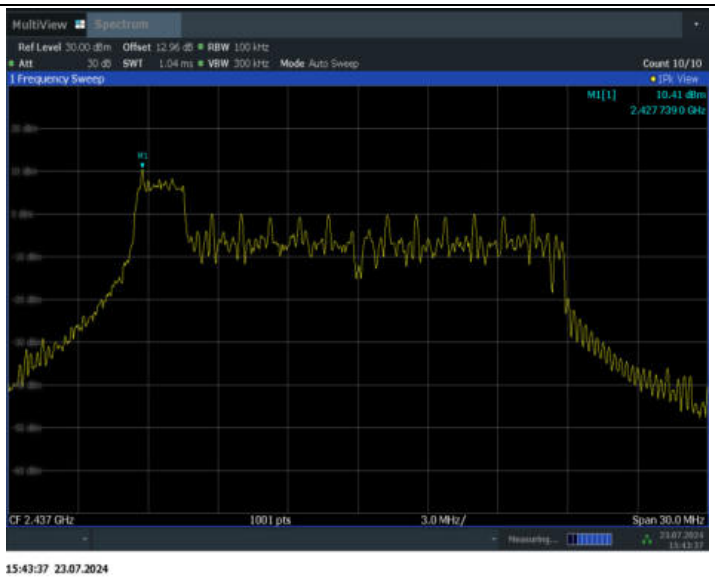

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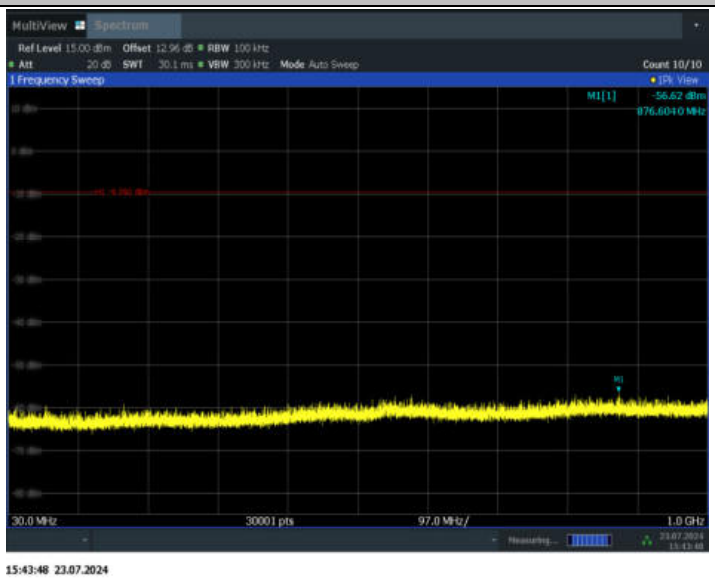

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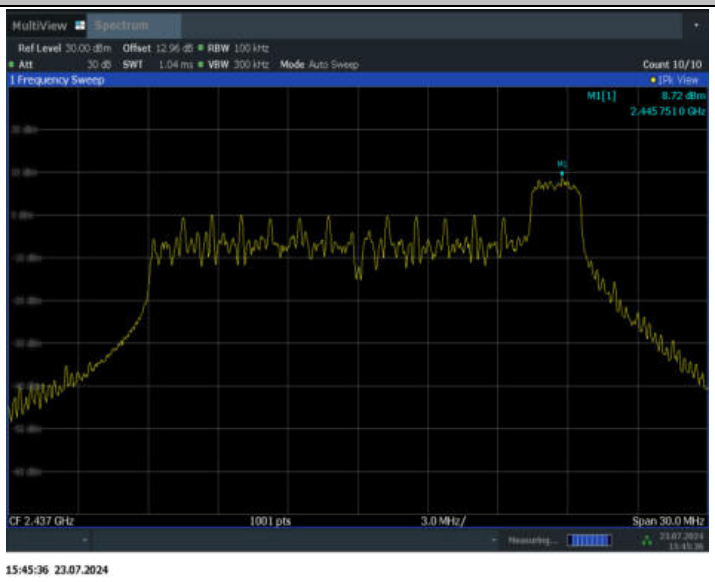

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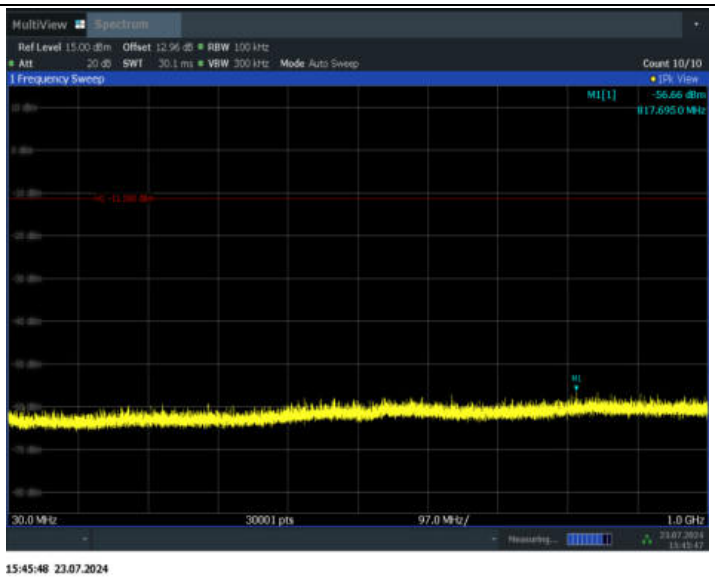

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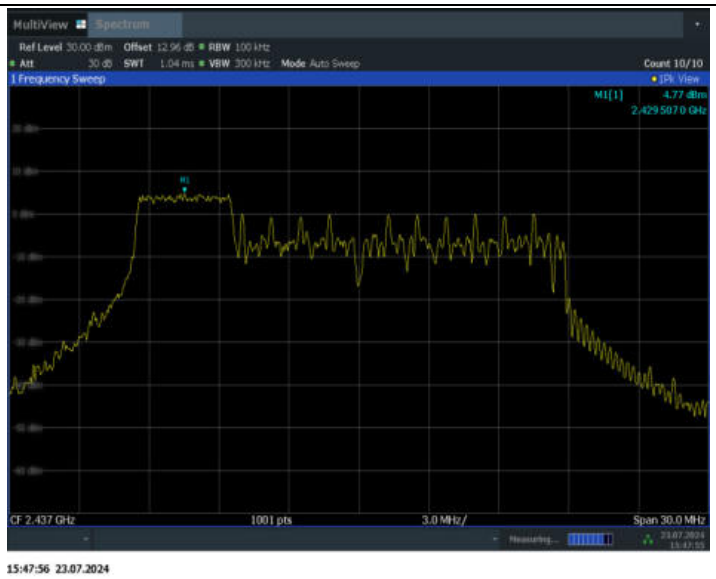

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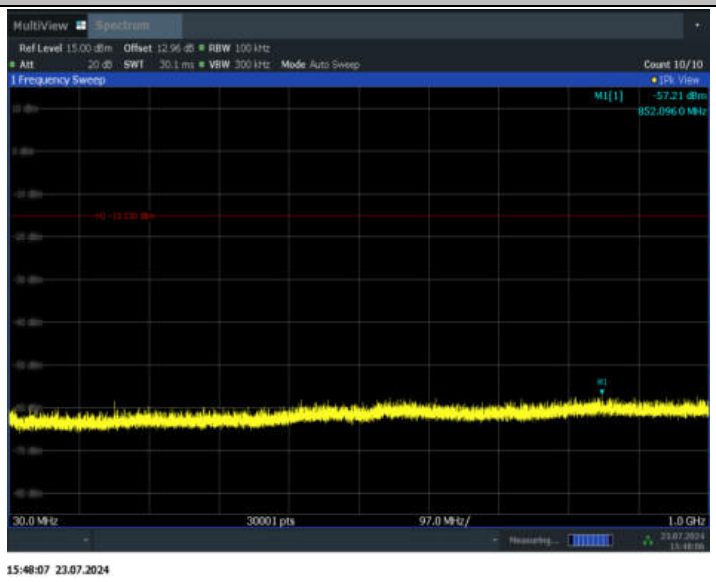

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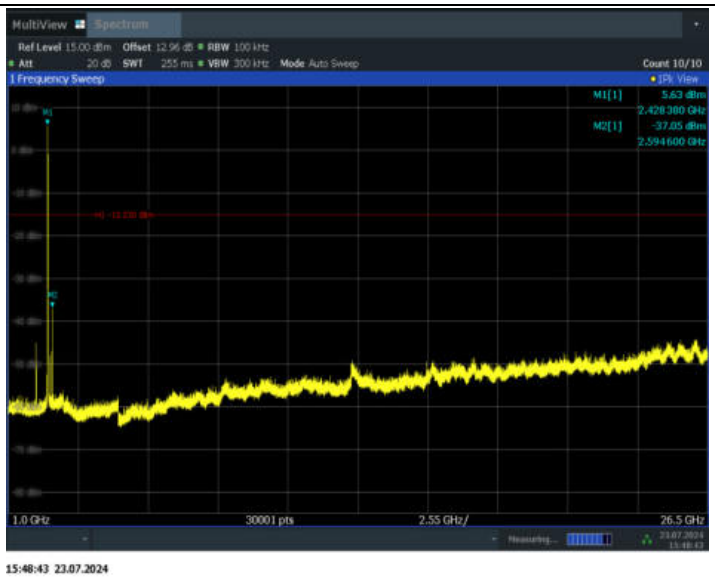

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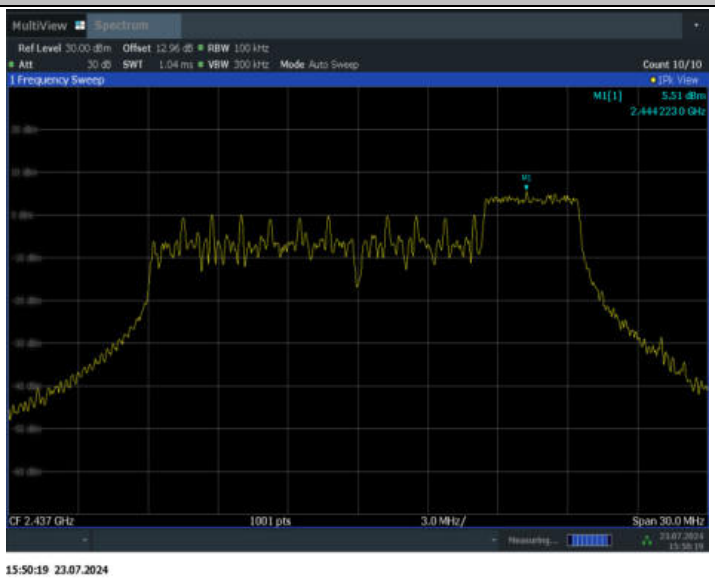

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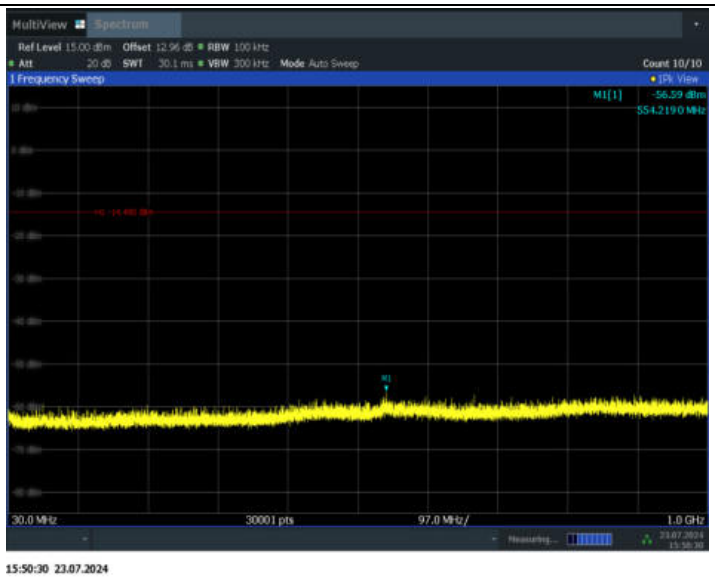

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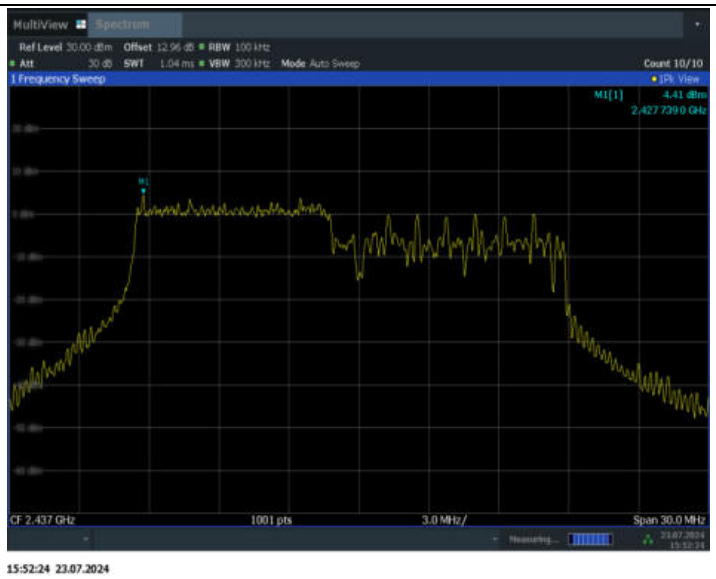

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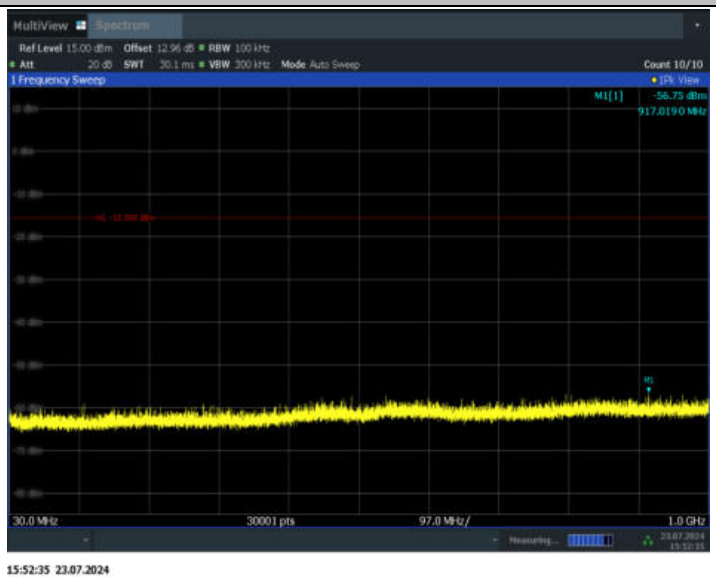

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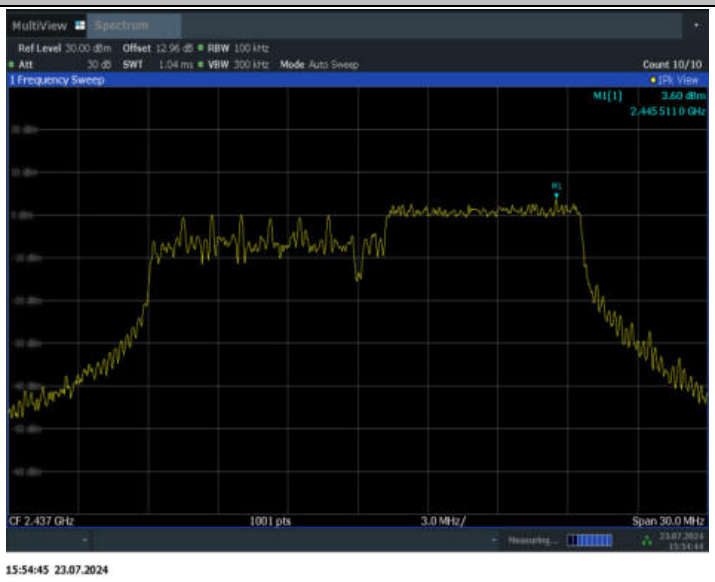

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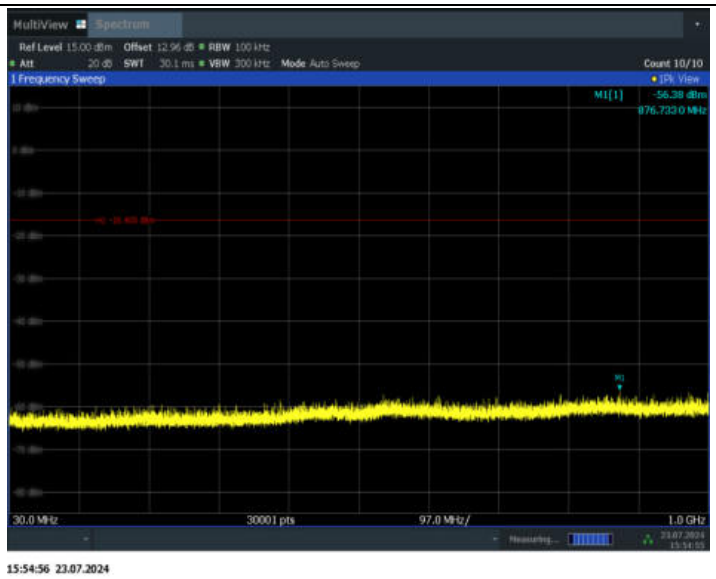

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11AX20SISO_Ant2_2462_26Tone_RU0_0~Reference

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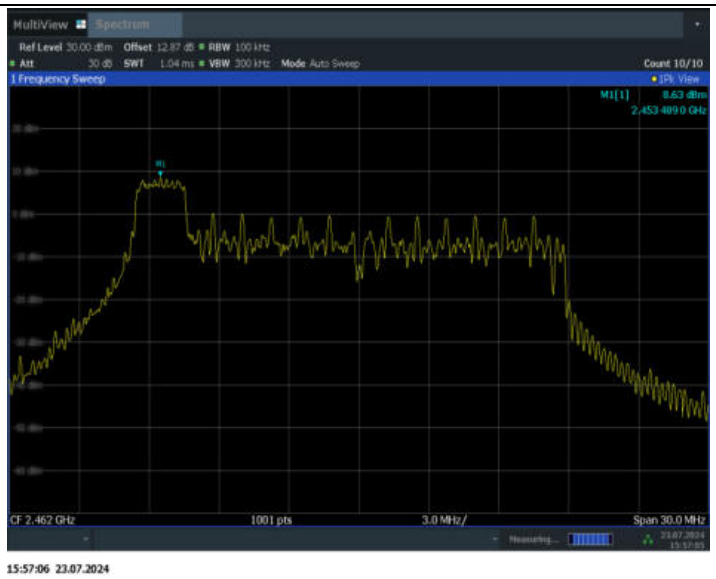

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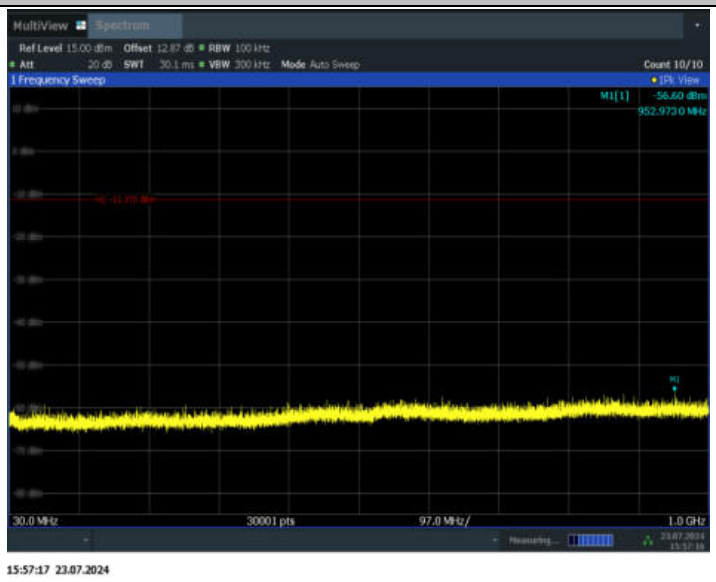

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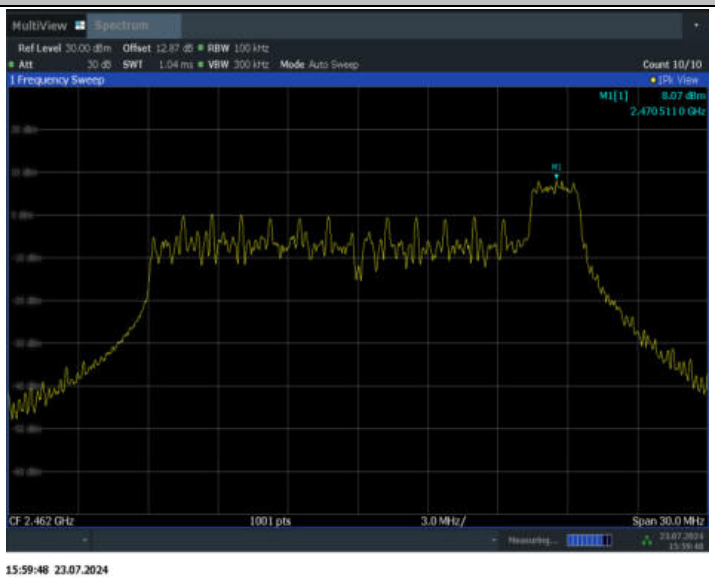

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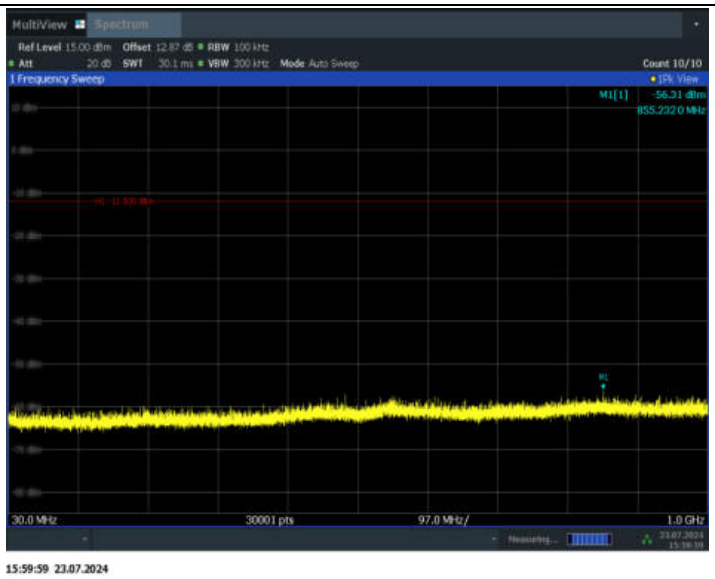

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11AX20SISO_Ant2_2462_52Tone_RU37_0~Reference

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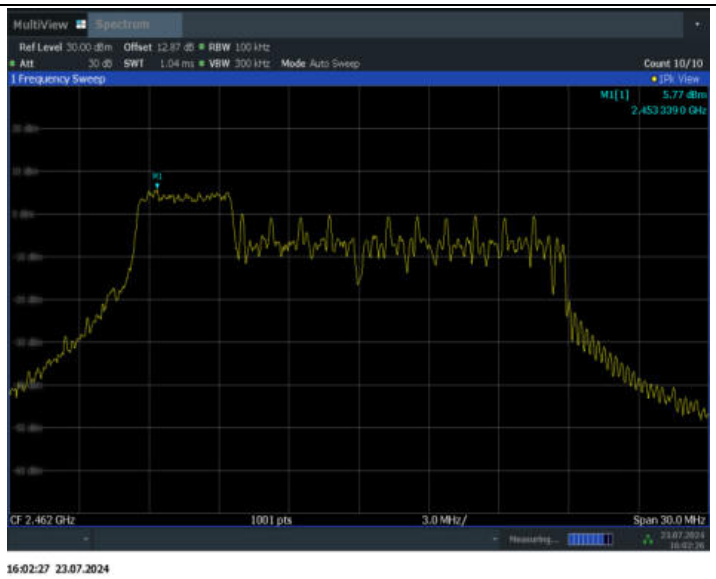

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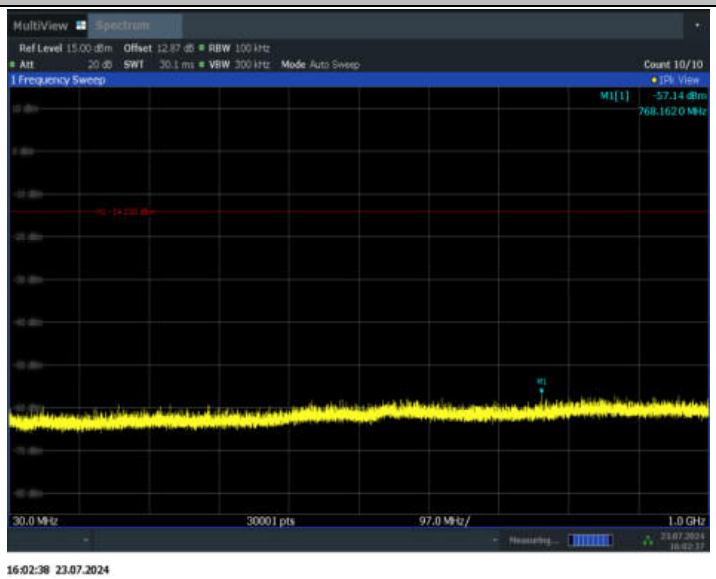

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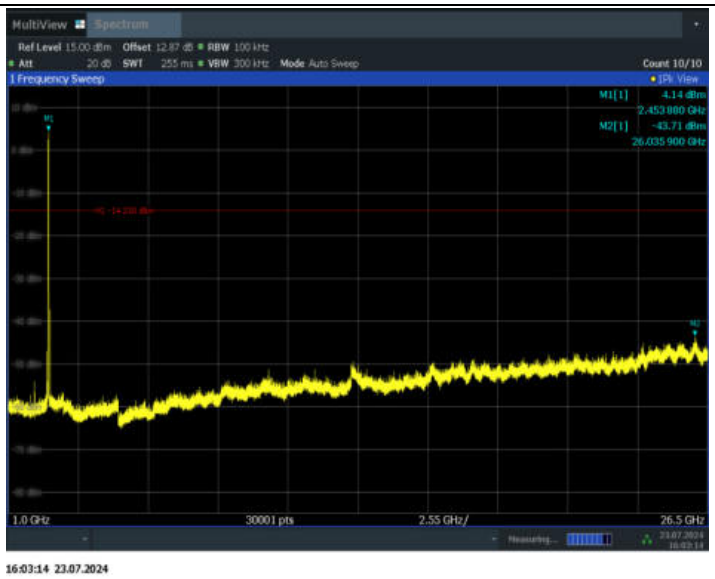

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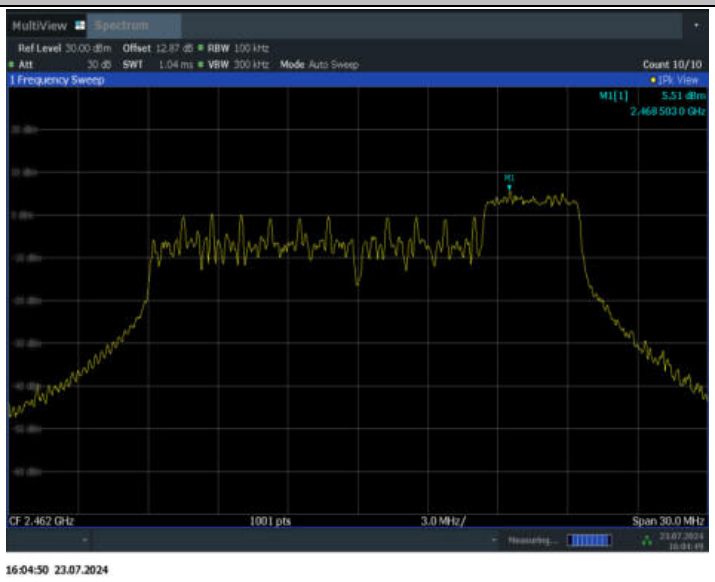

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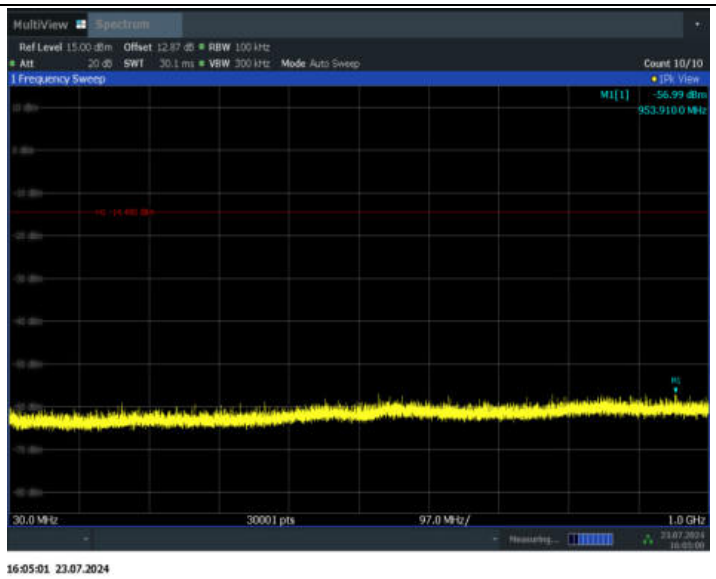

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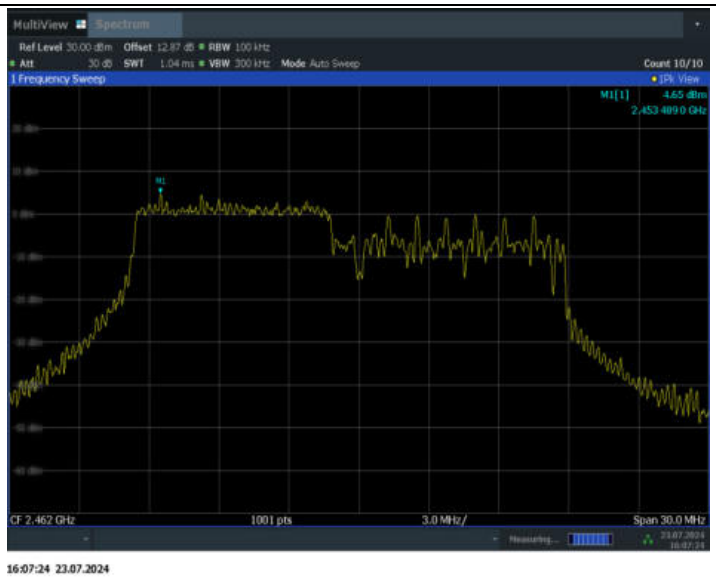

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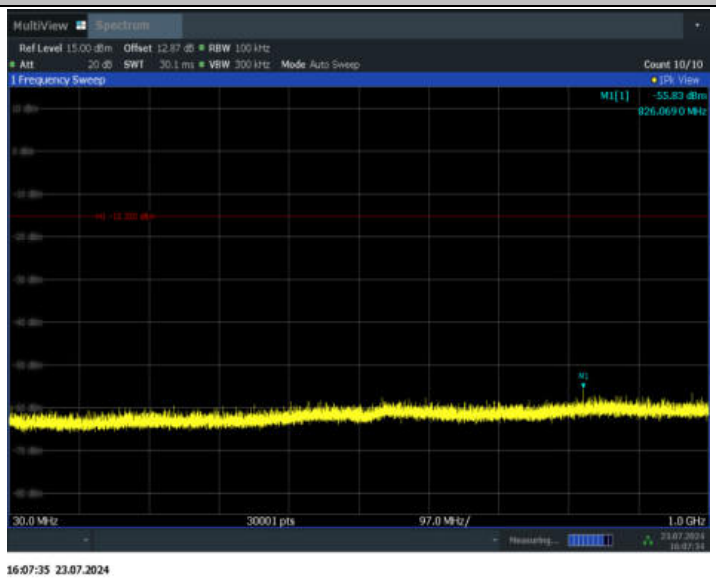

11AX20SISO_Ant2_2462_106Tone_RU53_1000~26500

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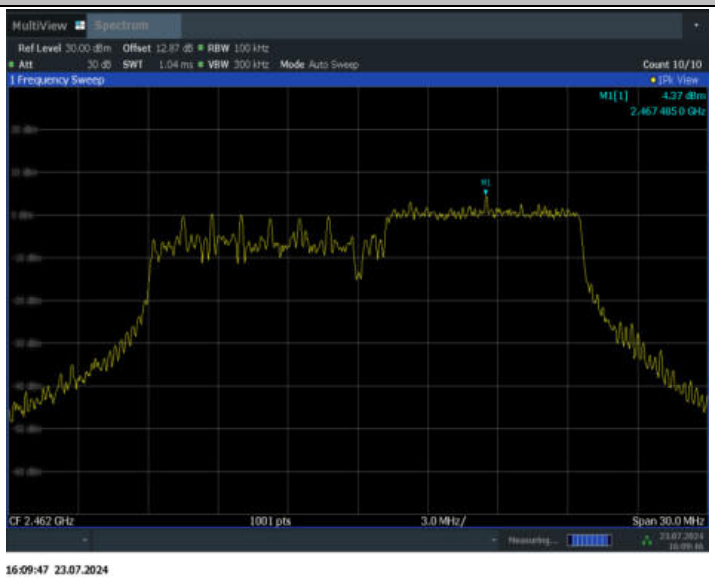
11AX20SISO_Ant2_2462_106Tone_RU54_0~Reference



11AX20SISO_Ant2_2462_106Tone_RU54_30~1000

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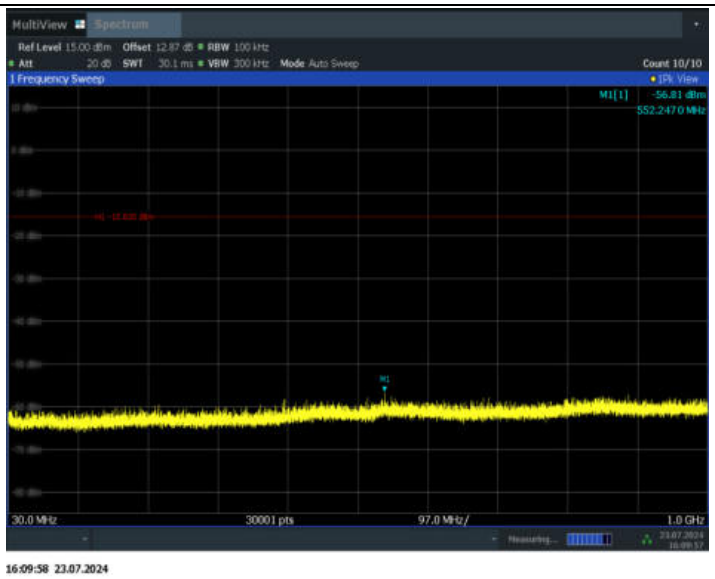

11AX20SISO_Ant2_2462_106Tone_RU54_1000~26500

Conclusion: Pass

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A.7. Radiated Unwanted Emission

Limits

Measurement Limit

Standard	Limit
FCC 47 CFR Part 15.247, 15.205, 15.209	20dB below peak output power

In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

Limit in restricted band

Frequency (MHz)	Field strength(μV/m)	Measurement distance (m)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30

Frequency of emission (MHz)	Field strength (uV/m)	Field strength (dBuV/m)	Measurement distance (m)
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
Above 960	500	54	3

Note: When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor.

Test setup

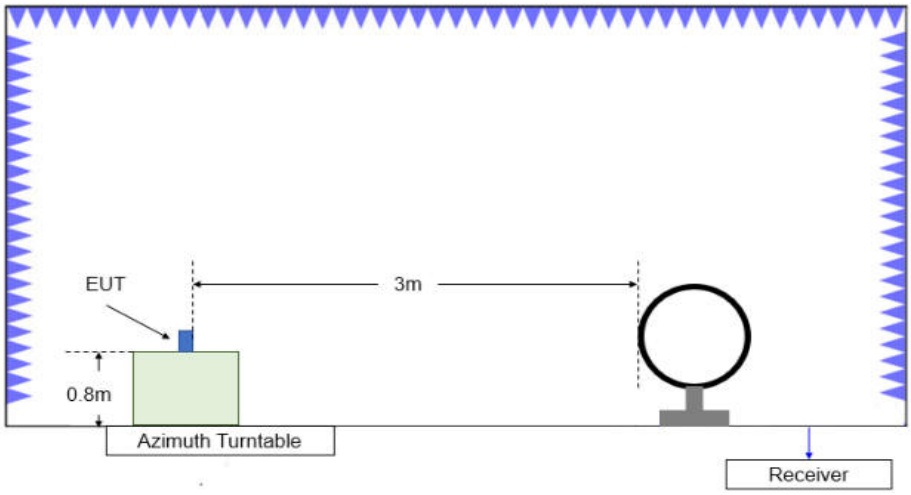

Figure A.2.1. Test Site Diagram (9kHz-30MHz)

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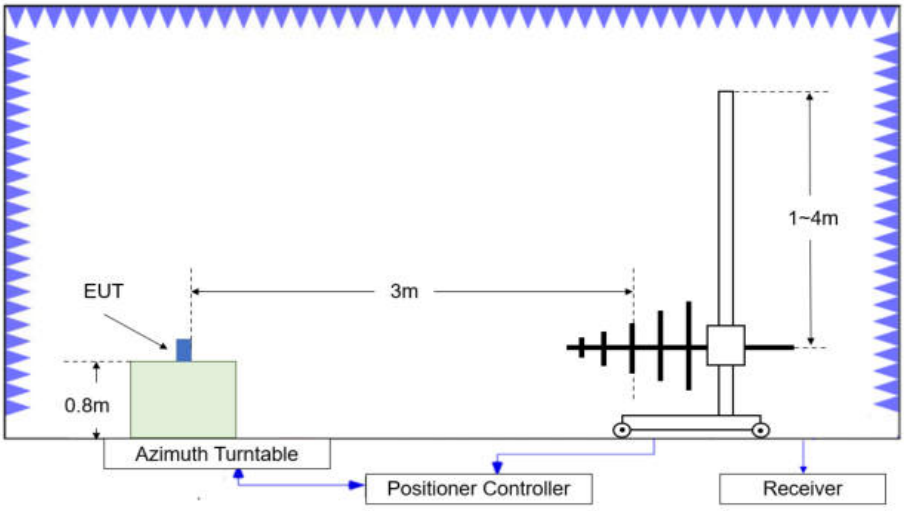

Figure A.2.2. Test Site Diagram (30MHz-1GHz)

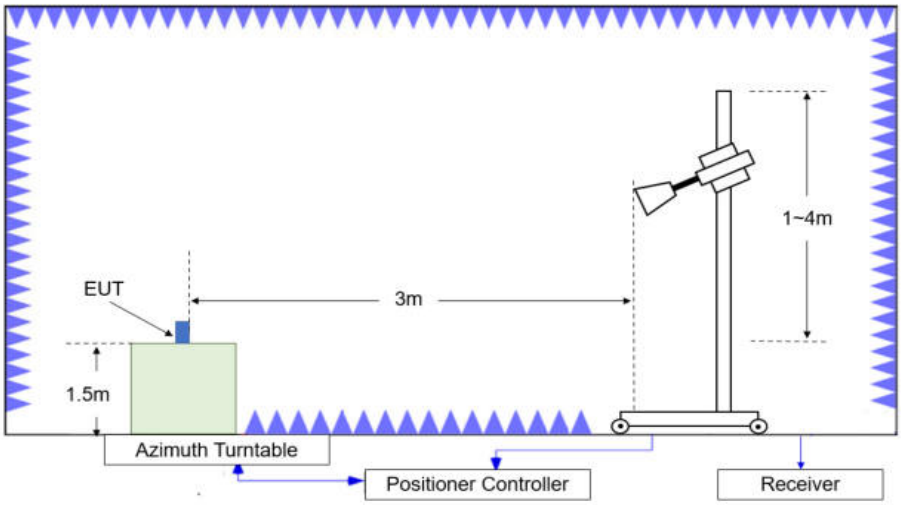

Figure A.2.3. Test Site Diagram (1GHz-40GHz)

Test Procedures

Radiated unwanted emissions from the EUT were measured according to ANSI C63.10.

Test setting

Frequency of emission (MHz)	RBW/VBW	Sweep Time(s)
30-1000	100kHz/300kHz	5
1000-3000	1MHz/3MHz	15
3000-18000	1MHz/3MHz	40
18000-26500	1MHz/3MHz	20

Sample Calculation

A "reference path loss" is established and the A_{Rpl} is the attenuation of “reference path loss”, and including the gain of receive antenna, the gain of the preamplifier, the cable loss.

P_{Mea} is the field strength recorded from the instrument.

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The measurement results are obtained as described below:
Result=P_{Mea}+$A_{Rpl=}$ P_{Mea}+Cable Loss+Antenna Factor

Test note

1. The EUT is operating at its maximum duty cycle and its maximum power control level.
2. Investigation has been done on all modes and modulations/data rates. Only the radiated emissions of the configuration that produced the worst case emissions are reported in this section.
3. Spurious emissions for all channels were investigated and almost the same below 1GHz. According to FCC 47 CFR §15.31, emission levels are not report much lower than the limit by over 20dB
4. Measurement frequencies were performed from 9 kHz to the 10th harmonic of highest fundamental frequency or 40GHz, whichever is lower.
5. No spurious emissions were detected within 20dBof the limit below 30MHz. OFS and semi-chamber comparison testing had been performed and the result came out very similar. (KDB 414788)
6.The low/mid/high channels of all working mode with different bandwidths were all tested, only the worst ones were reported.

Test Result

Peak

802.11b

Ch1

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17857.000	50.64	-29.40	42.40	37.64	74.00	23.36	H
13573.500	47.21	-31.30	40.60	37.91	74.00	26.79	V
12756.500	43.66	-31.80	39.50	35.96	74.00	30.34	V
9404.500	42.14	-34.10	38.10	38.14	74.00	31.86	V
7207.500	40.31	-35.40	37.40	38.31	74.00	33.69	V
2355.000	54.48	-19.60	27.30	46.78	74.00	19.52	V

Ch6

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17402.000	50.70	-29.50	42.10	38.10	74.00	23.30	V
13729.500	46.88	-31.00	40.80	37.08	74.00	27.12	V
12659.000	44.02	-31.80	39.30	36.52	74.00	29.98	H
8721.000	42.11	-34.80	37.80	39.11	74.00	31.89	H
7309.500	40.57	-35.40	37.50	38.47	74.00	33.43	H
4897.000	36.58	-37.50	32.80	41.28	74.00	37.42	V

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Ch11

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17527.500	50.84	-29.20	42.20	37.84	74.00	23.16	H
13599.500	47.21	-31.30	40.60	37.91	74.00	26.79	V
12997.000	44.46	-31.90	39.80	36.56	74.00	29.54	H
9770.500	41.89	-33.80	38.00	37.69	74.00	32.11	V
7314.500	41.36	-35.40	37.50	39.26	74.00	32.64	H
2486.500	54.20	-19.70	27.90	46.00	74.00	19.80	H

802.11g

Ch1

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17957.500	51.66	-29.40	42.40	38.66	74.00	22.34	H
13787.000	47.62	-30.90	40.90	37.62	74.00	26.38	V
12669.000	44.24	-31.80	39.30	36.74	74.00	29.76	V
8993.500	42.47	-34.70	37.60	39.57	74.00	31.53	V
7192.000	41.07	-35.40	37.40	39.07	74.00	32.93	H
2390.000	63.17	-19.80	27.50	55.47	74.00	10.83	V

Ch6

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17987.500	52.26	-29.40	42.40	39.26	74.00	21.74	H
13736.000	46.94	-31.00	40.80	37.14	74.00	27.06	V
11881.000	44.04	-32.80	38.80	37.94	74.00	29.96	H
9397.500	42.21	-34.10	38.10	38.21	74.00	31.79	V
7203.000	41.49	-35.40	37.40	39.49	74.00	32.51	H
4612.000	36.73	-37.70	32.30	42.13	74.00	37.27	H

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Ch11

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17611.000	51.15	-29.60	42.30	38.45	74.00	22.85	V
13866.500	47.48	-31.10	40.90	37.68	74.00	26.52	V
12778.000	44.63	-31.50	39.60	36.53	74.00	29.37	V
9512.500	42.06	-33.80	38.00	37.86	74.00	31.94	V
7941.000	41.25	-35.40	37.10	39.55	74.00	32.75	H
2498.100	57.41	-19.70	27.90	49.21	74.00	16.59	H

802.11n-HT20

Ch1

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17953.000	51.03	-29.40	42.40	38.03	74.00	22.97	H
14078.000	47.03	-30.20	40.50	36.73	74.00	26.97	H
12620.000	44.20	-32.20	39.20	37.20	74.00	29.80	V
8458.000	42.42	-35.10	37.40	40.12	74.00	31.58	V
7315.500	42.10	-35.40	37.50	40.00	74.00	31.90	H
2390.000	66.58	-19.80	27.50	58.88	74.00	7.42	V

Ch6

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17598.000	50.63	-29.60	42.30	37.93	74.00	23.37	V
13703.500	47.00	-31.00	40.70	37.30	74.00	27.00	H
12932.500	44.31	-31.40	39.80	36.01	74.00	29.69	V
8975.500	42.97	-34.70	37.60	40.07	74.00	31.03	V
7313.000	41.82	-35.40	37.50	39.72	74.00	32.18	H
4740.000	37.14	-37.80	32.50	42.44	74.00	36.86	V

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Ch11

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17851.500	50.57	-29.40	42.40	37.57	74.00	23.43	V
13761.000	47.42	-31.00	40.80	37.62	74.00	26.58	V
11284.000	44.17	-33.20	38.90	38.57	74.00	29.83	V
8999.500	41.94	-34.70	37.60	39.04	74.00	32.06	V
7533.000	41.40	-35.50	37.40	39.50	74.00	32.60	V
2491.800	57.34	-19.70	27.90	49.14	74.00	16.66	V

802.11ax-HT20

Ch1

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17497.000	51.02	-29.20	42.20	38.02	74.00	22.98	H
13743.000	47.10	-31.00	40.80	37.30	74.00	26.90	V
12605.500	44.17	-32.20	39.20	37.17	74.00	29.83	H
9509.500	42.45	-33.80	38.00	38.25	74.00	31.55	H
7022.000	41.56	-35.50	36.70	40.36	74.00	32.44	H
2389.700	67.67	-19.80	27.50	59.97	74.00	6.33	V

Ch6

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17607.500	51.05	-29.60	42.30	38.35	74.00	22.95	V
13631.500	47.37	-31.30	40.70	37.97	74.00	26.63	H
12844.500	44.26	-31.90	39.70	36.56	74.00	29.74	H
9489.500	42.60	-34.60	38.10	39.10	74.00	31.40	H
7217.000	41.13	-35.40	37.40	39.13	74.00	32.87	V
4905.500	36.99	-37.60	32.90	41.69	74.00	37.01	H

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Ch11

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17417.000	50.72	-29.50	42.10	38.12	74.00	23.28	V
13767.000	47.40	-30.90	40.90	37.40	74.00	26.60	V
12766.500	44.23	-31.80	39.50	36.53	74.00	29.77	H
9504.500	43.03	-34.60	38.10	39.53	74.00	30.97	H
7718.500	41.60	-35.90	37.10	40.40	74.00	32.40	V
2486.100	57.32	-19.70	27.90	49.12	74.00	16.68	V

Average

802.11b

Ch1

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17602.500	41.21	-29.60	42.30	28.51	54.00	12.79	H
13759.000	37.34	-31.00	40.80	27.54	54.00	16.66	V
12636.500	34.35	-31.80	39.30	26.85	54.00	19.65	V
9484.500	32.39	-34.60	38.10	28.89	54.00	21.61	H
7301.500	30.87	-35.40	37.50	28.77	54.00	23.13	V
2389.600	41.29	-19.80	27.50	33.59	54.00	12.71	H

Ch6

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17596.000	41.62	-29.60	42.30	28.92	54.00	12.38	V
13696.500	37.58	-31.00	40.70	27.88	54.00	16.42	H
12734.000	34.36	-31.80	39.50	26.66	54.00	19.64	V
9502.500	32.17	-34.60	38.10	28.67	54.00	21.83	H
7337.500	31.10	-35.90	37.50	29.50	54.00	22.90	H
4874.000	29.80	-37.50	32.80	34.50	54.00	24.20	V

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Ch11

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17587.000	41.30	-29.60	42.30	28.60	54.00	12.70	V
13714.500	37.69	-31.00	40.80	27.89	54.00	16.31	H
11884.000	34.56	-32.40	38.80	28.16	54.00	19.44	H
9503.000	32.29	-34.60	38.10	28.79	54.00	21.71	V
7417.000	31.62	-35.10	37.50	29.22	54.00	22.38	V
2485.600	42.56	-19.70	27.90	34.36	54.00	11.44	H

802.11g

Ch1

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17593.500	41.15	-29.60	42.30	28.45	54.00	12.85	H
13743.500	38.06	-31.00	40.80	28.26	54.00	15.94	H
12649.500	34.42	-31.80	39.30	26.92	54.00	19.58	H
9499.000	32.51	-34.60	38.10	29.01	54.00	21.49	V
7525.500	31.14	-35.50	37.40	29.24	54.00	22.86	H
2390.000	47.87	-19.80	27.50	40.17	54.00	6.13	V

Ch6

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17595.000	41.45	-29.60	42.30	28.75	54.00	12.55	H
14078.500	37.98	-30.20	40.50	27.68	54.00	16.02	H
12650.000	34.28	-31.80	39.30	26.78	54.00	19.72	V
9508.000	32.65	-33.80	38.00	28.45	54.00	21.35	H
7315.000	31.45	-35.40	37.50	29.35	54.00	22.55	V
4952.000	27.42	-37.40	32.90	31.92	54.00	26.58	H

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Ch11

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17594.500	40.98	-29.60	42.30	28.28	54.00	13.02	V
14162.500	37.23	-30.20	40.40	27.03	54.00	16.77	H
12995.000	34.49	-31.90	39.80	26.59	54.00	19.51	H
9406.000	32.31	-33.60	38.10	27.81	54.00	21.69	H
7308.000	31.24	-35.40	37.50	29.14	54.00	22.76	V
2488.300	45.58	-19.70	27.90	37.38	54.00	8.42	H

802.11n-HT20

Ch1

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17606.000	41.30	-29.60	42.30	28.60	54.00	12.70	V
13758.500	37.38	-31.00	40.80	27.58	54.00	16.62	H
12805.500	34.67	-31.50	39.60	26.57	54.00	19.33	V
9197.000	32.52	-34.70	37.90	29.32	54.00	21.48	H
7619.000	31.94	-35.60	37.40	30.14	54.00	22.06	V
2389.700	50.81	-19.80	27.50	43.11	54.00	3.19	V

Ch6

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17612.500	41.59	-29.60	42.30	28.89	54.00	12.41	V
13706.500	37.51	-31.00	40.70	27.81	54.00	16.49	V
11919.500	34.42	-32.40	38.80	28.02	54.00	19.58	H
9409.500	32.99	-33.60	38.10	28.49	54.00	21.01	V
7418.500	31.77	-35.10	37.50	29.37	54.00	22.23	V
4771.500	27.62	-37.50	32.50	32.62	54.00	26.38	V

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Ch11

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17524.000	41.46	-29.20	42.20	28.46	54.00	12.54	V
13718.000	37.70	-31.00	40.80	27.90	54.00	16.30	V
12778.000	34.53	-31.50	39.60	26.43	54.00	19.47	V
9873.500	32.61	-33.90	38.10	28.41	54.00	21.39	V
7504.500	31.55	-35.10	37.50	29.15	54.00	22.45	V
2485.900	45.28	-19.70	27.90	37.08	54.00	8.72	H

802.11ax-HT20

Ch1

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17511.500	41.49	-29.20	42.20	28.49	54.00	12.51	V
14080.500	37.54	-30.20	40.50	27.24	54.00	16.46	V
11881.500	34.46	-32.40	38.80	28.06	54.00	19.54	V
9393.500	32.86	-34.10	38.10	28.86	54.00	21.14	V
7511.000	31.90	-35.10	37.50	29.50	54.00	22.10	V
2390.000	49.39	-19.80	27.50	41.69	54.00	4.61	V

Ch6

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17987.000	41.56	-29.40	42.40	28.56	54.00	12.44	H
13698.500	37.54	-31.00	40.70	27.84	54.00	16.46	V
12846.500	34.41	-31.90	39.70	26.71	54.00	19.59	H
9394.500	32.50	-34.10	38.10	28.50	54.00	21.50	V
7424.500	31.63	-35.10	37.50	29.23	54.00	22.37	V
4883.500	27.42	-37.50	32.80	32.12	54.00	26.58	V

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Ch11

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17960.000	41.50	-29.40	42.40	28.50	54.00	12.50	V
13611.500	37.65	-31.30	40.60	28.35	54.00	16.35	V
11877.500	34.60	-32.80	38.80	28.50	54.00	19.40	V
8995.500	32.90	-34.70	37.60	30.00	54.00	21.10	V
7293.500	32.06	-35.40	37.50	29.96	54.00	21.94	V
2486.700	45.48	-19.70	27.90	37.28	54.00	8.52	V

Band edge compliance

802.11b mode

Mode	Channel	Test Results	Conclusion
802.11b	1	Fig.A.6.2.1	**P**
	11	Fig.A.6.2.2	**P**

802.11g mode

Mode	Channel	Test Results	Conclusion
802.11g	1	Fig.A.6.2.3	**P**
	11	Fig.A.6.2.4	**P**

802.11n-HT20 mode

Mode	Channel	Test Results	Conclusion
802.11n (HT20)	1	Fig.A.6.2.5	**P**
	11	Fig.A.6.2.6	**P**

802.11ax-HT20 mode full RU

Mode	Channel	Test Results	Conclusion
802.11ax (HT20)	1	Fig.A.6.2.7	**P**
	11	Fig.A.6.2.8	**P**

802.11ax-HT20 mode partial RU

Mode	Channel	RU Configuration	Test Results	Conclusion
802.11ax (HT20)	1	26RU index 0	Fig.A.6.2.9	**P**
	11	26RU index 8	Fig.A.6.2.10	**P**

Conclusion: Pass

Note:

A "reference path loss" is established and the A_{Rpl} is the attenuation of “reference path loss”, and including the gain of receive antenna, the gain of the preamplifier, the cable loss.

P_{Mea} is the field strength recorded from the instrument.

The measurement results are obtained as described below:

Result=P_{Mea}+A_{Rpl}= P_{Mea}+Cable Loss+Antenna Factor

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Test graphs as below:

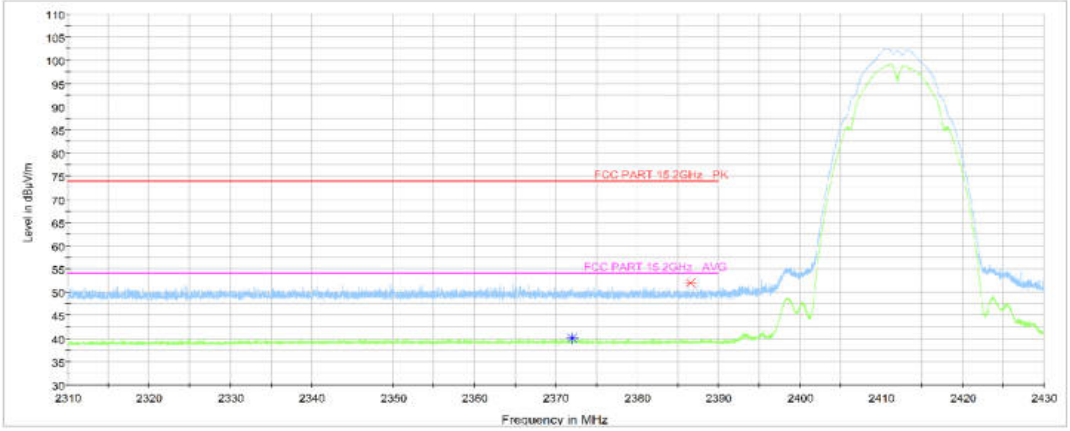

Fig.A.6.2.1 Transmitter Spurious Emission - Radiated (Power): 802.11b, ch1, 2.31 GHz – 2.45GHz

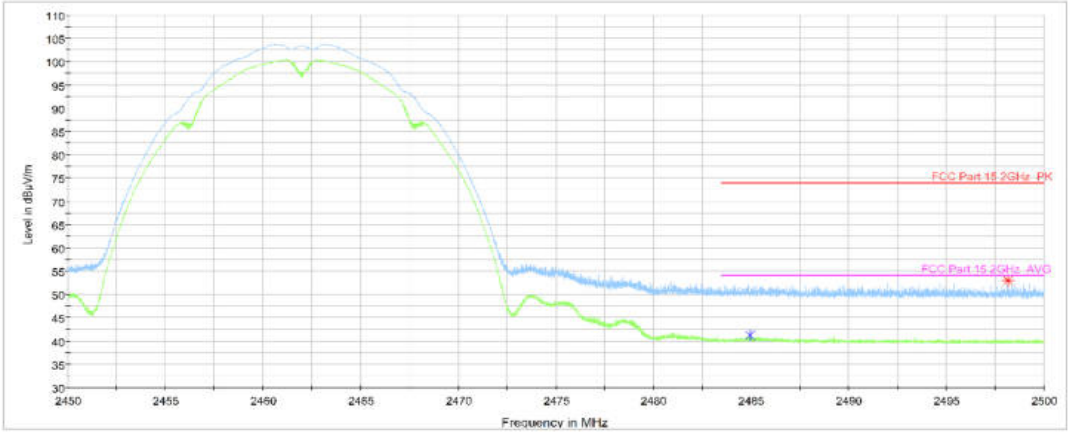

Fig.A.6.2.2 Transmitter Spurious Emission - Radiated (Power): 802.11b, ch11, 2.45 GHz - 2.50GHz

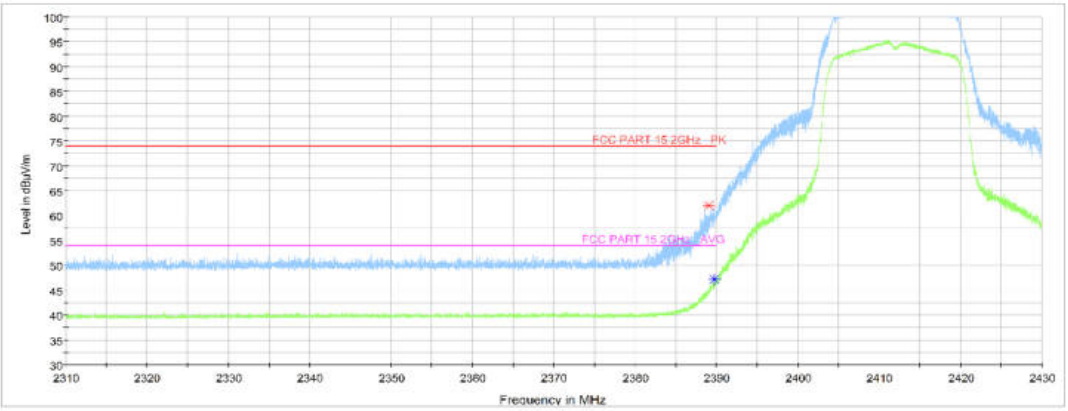

Fig.A.6.2.3 Transmitter Spurious Emission - Radiated (Power): 802.11g, ch1, 2.31 GHz - 2.43GHz

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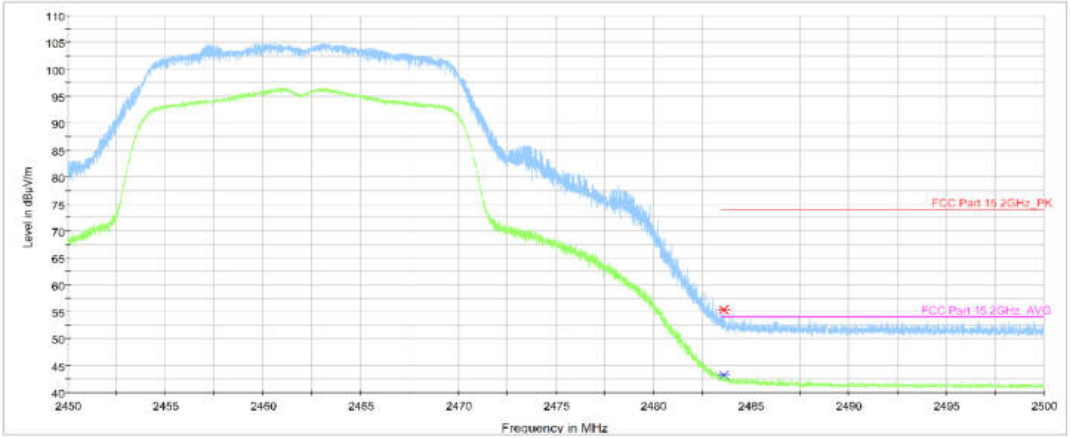

Fig.A.6.2.4 Transmitter Spurious Emission - Radiated (Power): 802.11g, ch11, 2.45 GHz - 2.50GHz

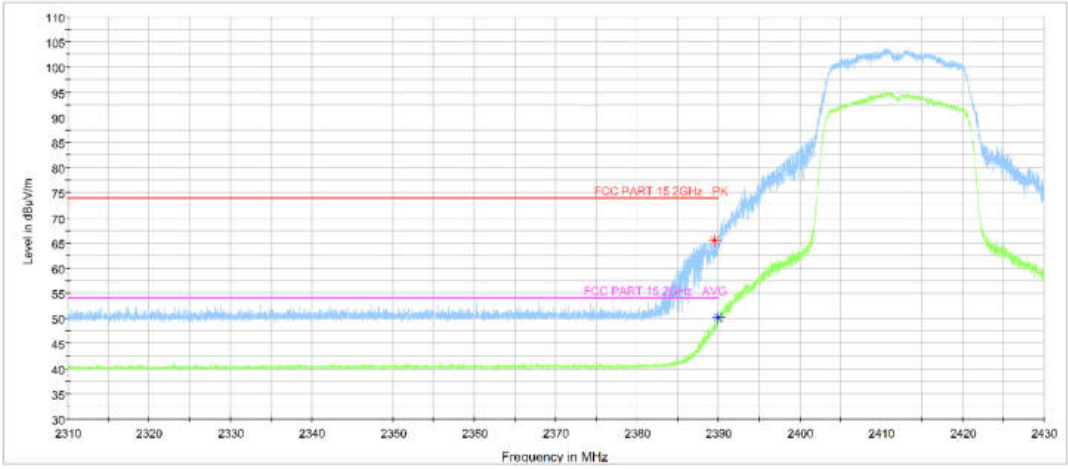

Fig.A.6.2.5 Transmitter Spurious Emission - Radiated (Power): 802.11n-HT20, ch1, 2.31 GHz - 2.43GHz

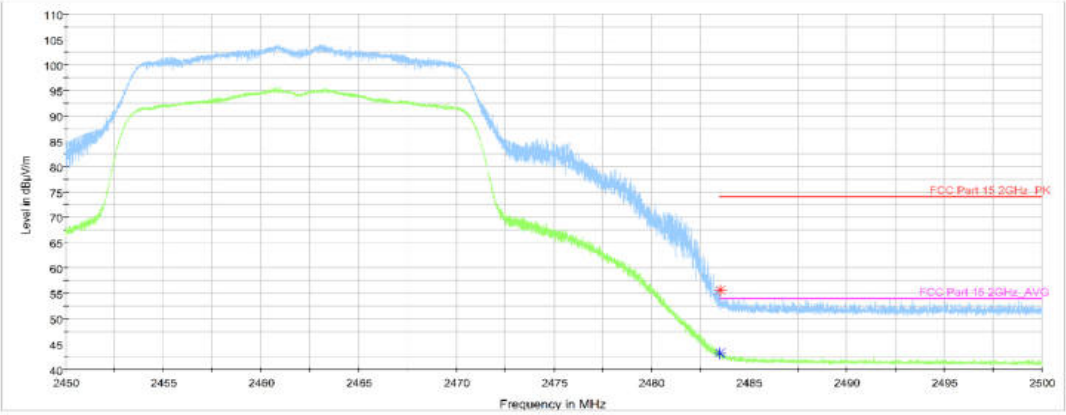

Fig.A.6.2.6 Transmitter Spurious Emission - Radiated (Power): 802.11n-HT20, ch11, 2.45 GHz - 2.50GHz

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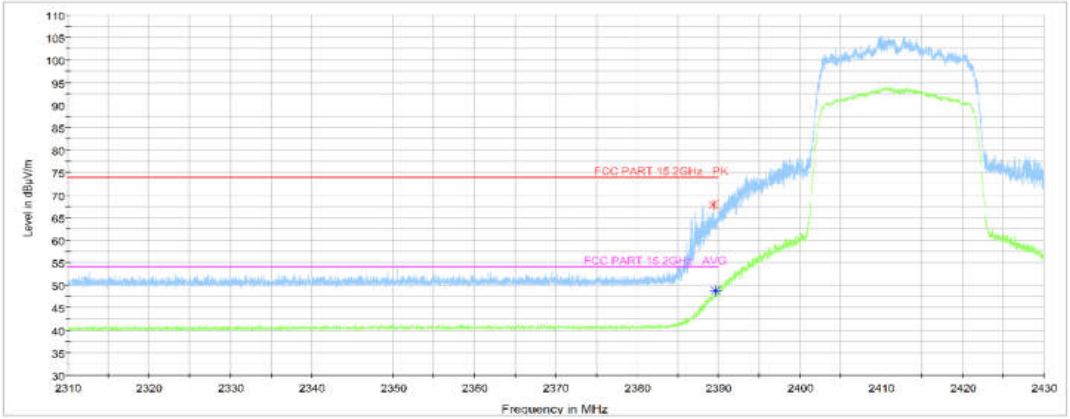

Fig.A.6.2.7 Transmitter Spurious Emission - Radiated (Power): 802.11ax-HT20, ch1, 2.31 GHz - 2.43GHz

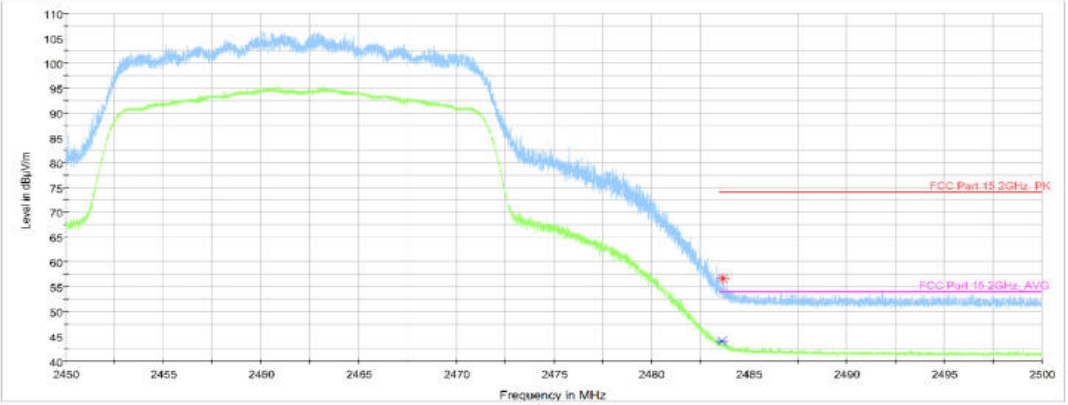

Fig.A.6.2.8 Transmitter Spurious Emission - Radiated (Power): 802.11ax-HT20, ch11, 2.45 GHz - 2.50GHz

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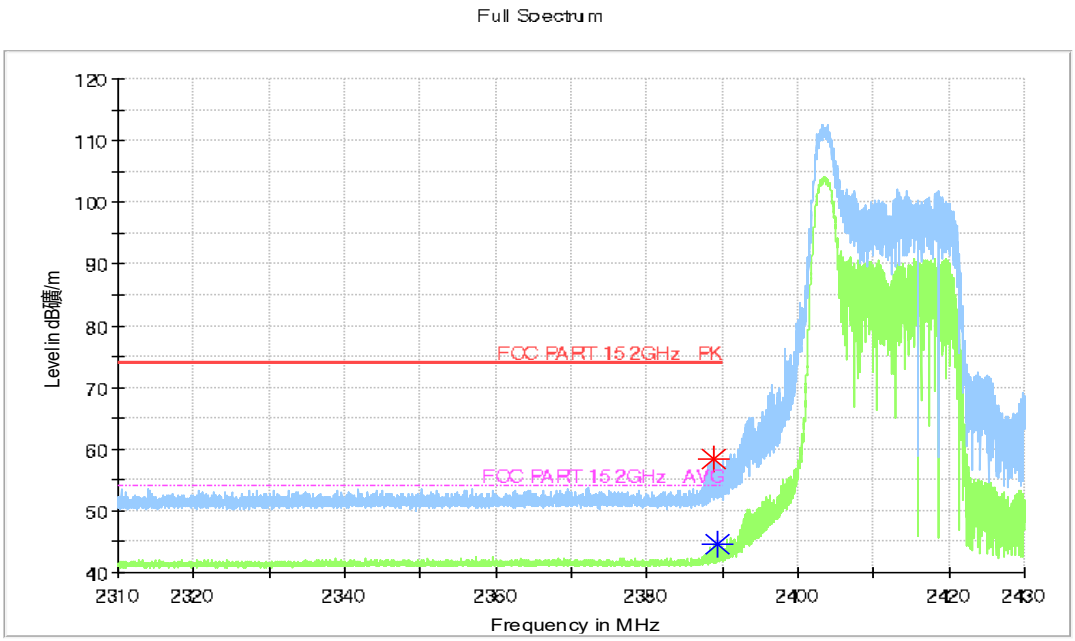

Fig.A.6.2.9 Transmitter Spurious Emission - Radiated (Power): 802.11ax-HT20, ch1, Partial RU, 2.31 GHz - 2.43GHz

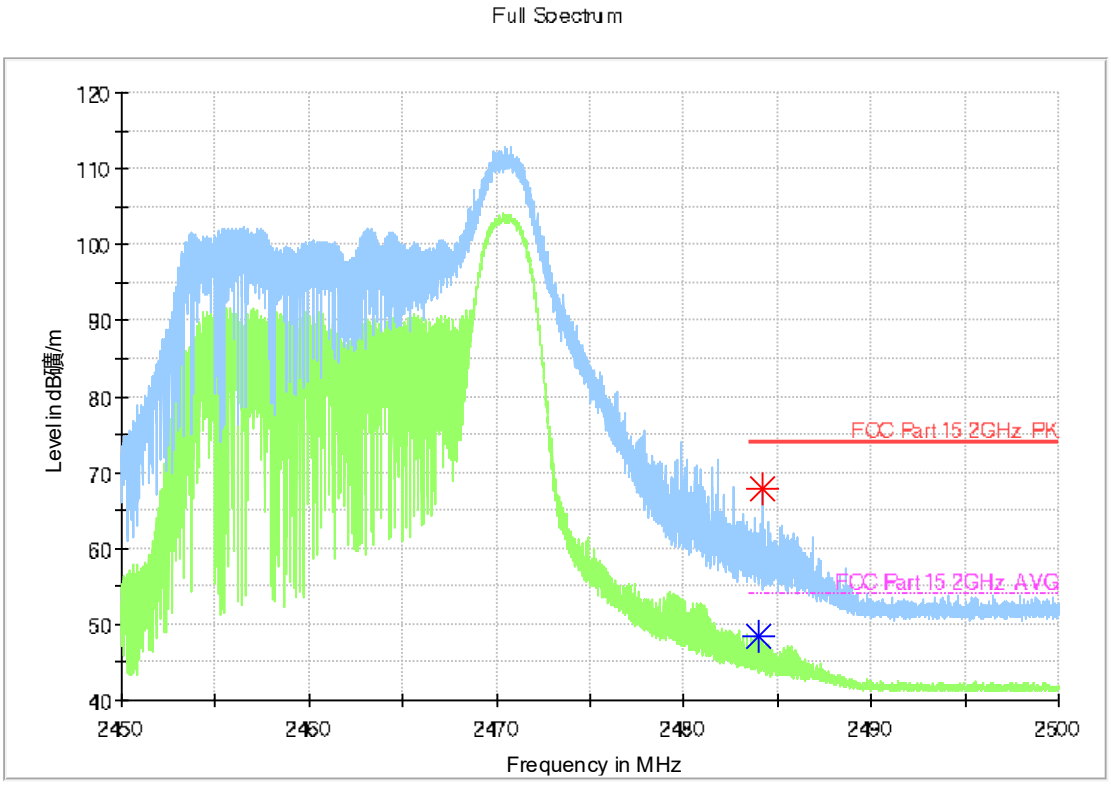

Fig.A.6.2.10 Transmitter Spurious Emission - Radiated (Power): 802.11ax-HT20, ch11, Partial RU,2.45 GHz - 2.50GHz

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A.8. AC Power-line Conducted Emission

Summary

All AC line conducted spurious emissions are measured with a receiver connected to a grounded LISN while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates and modes were investigated for conducted spurious emissions. Only the conducted emissions of the configuration that produced the worst case emissions are reported in this section

Method of Measurement:

See Clause 6.2 of ANSI C63.10 specifically.

See Clause 4 and Clause 5 of ANSI C63.10 generally.

The conducted emissions from the AC port of the EUT are measured in a shielding room. The EUT is connected to a Line Impedance Stabilization Network (LISN). An overview sweep with peak detection was performed. The measurements were performed with a quasi-peak detector and if required, an average detector.

The conducted emission measurements were made with the following detector of the test receiver: Quasi-Peak / Average Detector.

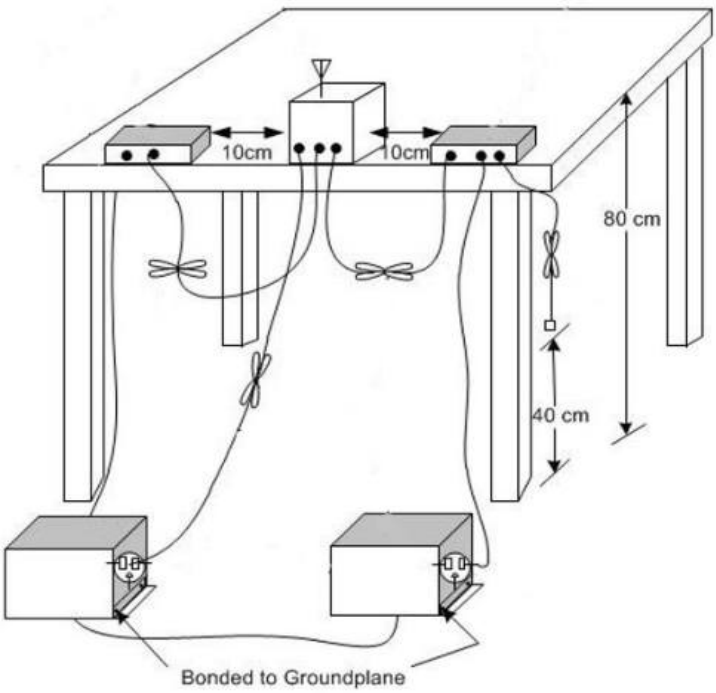
The measurement bandwidth is:

Frequency of Emission (MHz)	RBW/IF bandwidth
0.15-30	9kHz

Test Condition:

Voltage（V）	Frequency（Hz）
120	60

Test setup



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Measurement Result and limit:

WLAN (Quasi-peak Limit)

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Result (dBμV)		Conclusion
		With charger		
		802.11b	Idle	
0.15 to 0.5	66 to 56	Fig.A.8.1	Fig.A.8.2	**P**
0.5 to 5	56			
5 to 30	60			
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.				

WLAN (Average Limit)

Frequency range (MHz)	Average Limit (dBμV)	Result (dBμV)		Conclusion
		With charger		
		802.11b	Idle	
0.15 to 0.5	56 to 46	Fig.A.8.1	Fig.A.8.2	**P**
0.5 to 5	46			
5 to 30	50			
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.				

Conclusion: Pass

Test graphs as below:

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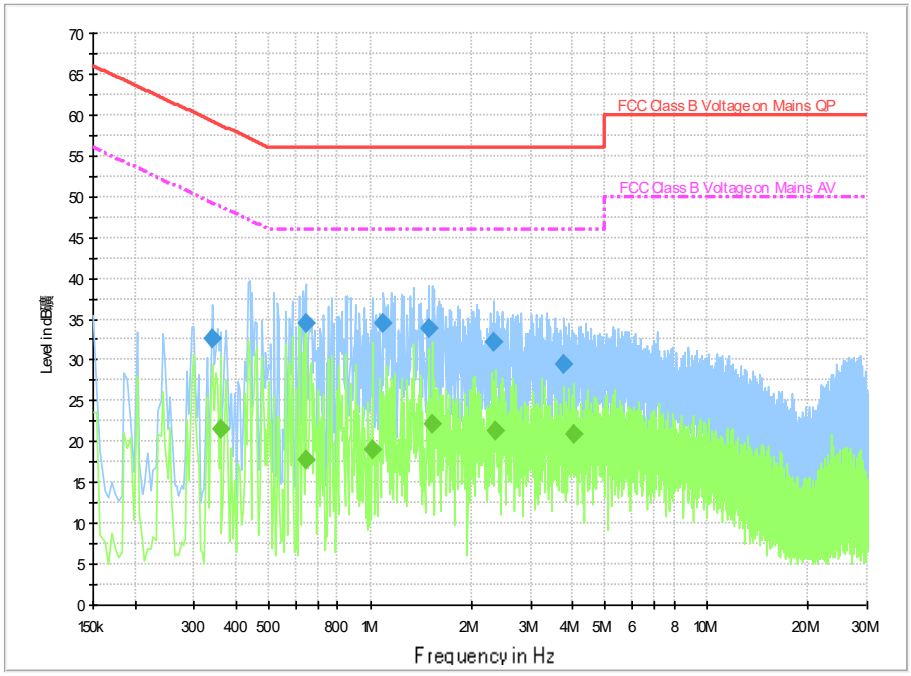

Fig.A.8.1 AC Powerline Conducted Emission-802.11b

Note: The graphic result above is the maximum of the measurements for both phase line and neutral line.

Final Result 1

Frequency (MHz)	QuasiPeak (dBuV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)	Comment
0.338000	32.6	2000.0	9.000	On	L1	19.9	26.6	59.3	
0.642000	34.4	2000.0	9.000	On	N	19.8	21.6	56.0	
1.094000	34.4	2000.0	9.000	On	L1	19.9	21.6	56.0	
1.498000	33.8	2000.0	9.000	On	L1	19.9	22.2	56.0	
2.322000	32.1	2000.0	9.000	On	L1	19.8	23.9	56.0	
3.750000	29.4	2000.0	9.000	On	L1	19.8	26.6	56.0	

Final Result 2

Frequency (MHz)	CAverage (dBuV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)	Comment
0.358000	21.6	2000.0	9.000	On	L1	19.9	27.2	48.8	
0.642000	17.7	2000.0	9.000	On	N	19.8	28.3	46.0	
1.014000	19.1	2000.0	9.000	On	L1	19.9	26.9	46.0	
1.526000	22.1	2000.0	9.000	On	L1	19.9	23.9	46.0	
2.358000	21.4	2000.0	9.000	On	L1	19.8	24.6	46.0	
4.054000	20.8	2000.0	9.000	On	L1	19.8	25.2	46.0	

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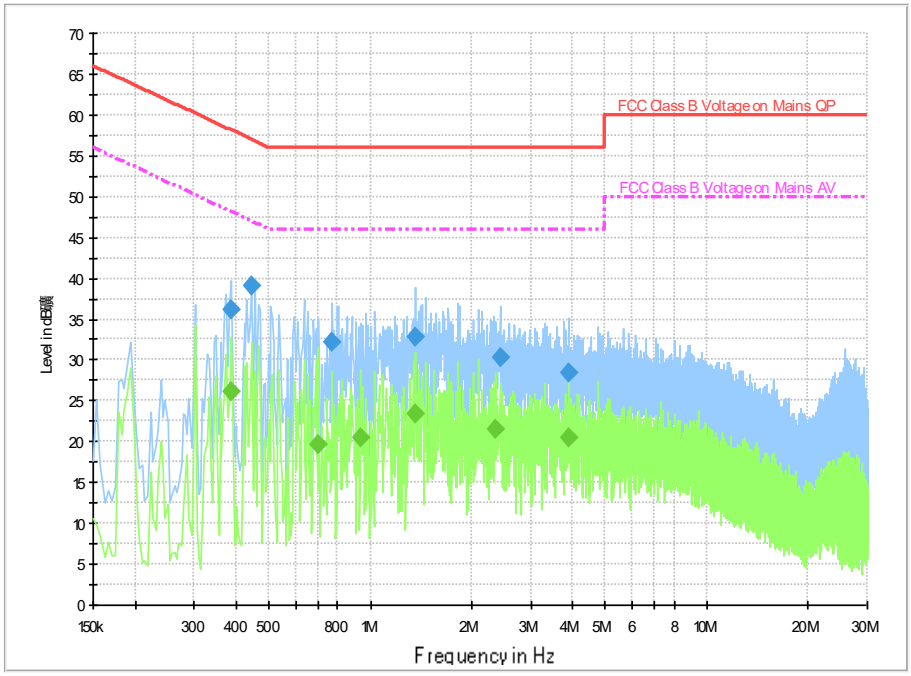

Fig.A.8.2 AC Powerline Conducted Emission-Idle

Note: The graphic result above is the maximum of the measurements for both phase line and neutral line.

Final Result 1

Frequency (MHz)	QuasiPeak (dBuV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)	Comment
0.386000	36.1	2000.0	9.000	On	N	19.8	22.0	58.1	
0.442000	39.2	2000.0	9.000	On	L1	20.0	17.9	57.0	
0.770000	32.2	2000.0	9.000	On	L1	19.9	23.8	56.0	
1.362000	32.8	2000.0	9.000	On	L1	19.9	23.2	56.0	
2.430000	30.3	2000.0	9.000	On	L1	19.8	25.7	56.0	
3.894000	28.5	2000.0	9.000	On	L1	19.8	27.5	56.0	

Final Result 2

Frequency (MHz)	CAverage (dBuV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)	Comment
0.386000	26.2	2000.0	9.000	On	L1	19.9	22.0	48.1	
0.702000	19.7	2000.0	9.000	On	L1	20.0	26.3	46.0	
0.938000	20.4	2000.0	9.000	On	L1	19.9	25.6	46.0	
1.362000	23.3	2000.0	9.000	On	L1	19.9	22.7	46.0	
2.370000	21.5	2000.0	9.000	On	L1	19.8	24.5	46.0	
3.894000	20.5	2000.0	9.000	On	L1	19.8	25.5	46.0	

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A.9. Antenna Requirement

The antenna of the device is permanently attached. There are no provisions for connection to an external antenna.

The unit complies with the requirement of FCC Part 15.203.

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ANNEX B: EUT parameters

Disclaimer: The antenna gain and worse case provided by the client may affect the validity of the measurement results in this report, and the client shall bear the impact and consequences arising therefrom.

ANNEX C: Accreditation Certificate

Accredited Laboratory

A2LA has accredited

TELECOMMUNICATION TECHNOLOGY LABS, CAICT

Beijing, People's Republic of China

for technical competence in the field of

Electrical Testing

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 *General requirements for the competence of testing and calibration laboratories*. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (*refer to joint ISO-ILAC-IAF Communiqué dated April 2017*).

Presented this 23rd day of July 2024.

Mr. Trace McInturff, Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 7049.01
Valid to July 31, 2026

For the tests to which this accreditation applies, please refer to the laboratory's Electrical Scope of Accreditation.

*****END OF REPORT*****

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