



FCC PART 15C TEST REPORT No.24T04Z101721-003

for

HMD Global Oy

Mobile Phone

TA-1658

FCC ID: 2AJOTTA-1658

with

Hardware Version: V1.0

Software Version: 000T_0_362

Issued Date: 2024-09-05

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.

Test Laboratory:

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REPORT HISTORY

Report Number	Revision	Description	Issue Date
24T04Z101721-003	Rev.0	1st edition	2024-09-05

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

1.3. Testing Environment

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

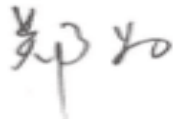
1.4. Project date

Testing Start Date: 2024-07-23
Testing End Date: 2024-09-04

1.5. Signature



Dong Jiaxuan
(Prepared this test report)



Zheng Wei
(Reviewed this test report)



Pang Shuai
(Approved this test report)



2. Client Information

2.1. Applicant Information

Company Name: HMD Global Oy
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Contact: Reza Serafat
Email: reza.serafat@hmdglobal.com
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2.2. Manufacturer Information

Company Name: HMD Global Oy
Address: Bertel Jungin aukio 9, 02600 Espoo, Finland
Contact: Reza Serafat
Email: reza.serafat@hmdglobal.com
Telephone: +491735287964
Fax: /

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

3.1. About EUT

Description	Mobile Phone
Model name	TA-1658
FCC ID	2AJOTTA-1658
With WLAN Function	Yes
Frequency Band	ISM 2400MHz~2483.5MHz
Type of Modulation	DSSS/CCK/OFDM
Number of Channels	11
Antenna	Integral Antenna
MAX Conducted Power	22.77dBm
Nominal Voltage	3.87V

3.2. Internal Identification of EUT

EUT ID*	SN or IMEI	HW Version	SW Version	Date of receipt
UT05a	353401640000108	V1.0	000T_0_362	2024-07-31
	353401640000116			
UT20a	353401640000249	V1.0	000T_0_362	2024-07-31
	353401640000256			

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

UT05a is used for Conduction test, UT20a is used for Radiation test.

3.3. Internal Identification of AE

AE ID*	Description	Note	Manufacturer
AE1-1	Battery	HBA5033AA	Huizhou Highpower Technology Co., Ltd.
AE1-2	Battery	HBA5033AA	HuiZhou GanFeng LiEnergy Battery Technology Co., Ltd.
AE2-1	Charger US	HAD-020U	Shenzhen BaiJunDa Electronic Co.,Ltd.
AE2-2	Charger EU	HAD-020E	Shenzhen BaiJunDa Electronic Co.,Ltd.
AE2-3	Charger UK	HAD-020X	Shenzhen BaiJunDa Electronic Co.,Ltd.
AE2-4	Charger AU	HAD-020A	Shenzhen BaiJunDa Electronic Co.,Ltd.
AE3-1	USB cable	CC-3A	Saibao(jiangxi)Communication industrial Co.,Ltd.
AE3-2	USB cable	CC-3A	Huizhou Juwei Electronics Co.,Ltd

*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 Phone 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

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 Federal Communications Commission Office of Engineering and Technology Laboratory Division	2013
KDB 558074 D01	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

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
Transmitter Spurious Emission - Radiated	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	3.87V
Humidity	44%

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	2025-04-01
3	Test Receiver	ESCI	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	103023	Rohde & Schwarz	1 year	2025-06-06
2	Antenna	HFH2-Z2	829324/007	Rohde & Schwarz	1 year	2025-01-04
3	EMI Antenna	VULB 9163	01223	SCHWARZBECK	2 years	2025-07-18
4	EMI Antenna	VULB 9163	01222	SCHWARZBECK	1 year	2025-07-30
5	EMI Antenna	3115	00167250	ETS-Lindgren	1 year	2025-04-11
6	EMI Antenna	3116	2663	ETS-Lindgren	1 year	2025-02-21

Test software information(HL)

Test Item	Software	Manufacturer
Conducted emission	EMC32 V8.53.0	R&S
Radiated emission	EMC32 V11.50.00	R&S

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)
$30\text{MHz} \leq f \leq 2\text{GHz}$	1.22
$2\text{GHz} \leq f \leq 3.6\text{GHz}$	1.22
$3.6\text{GHz} \leq f \leq 8\text{GHz}$	1.22
$8\text{GHz} \leq f \leq 12.75\text{GHz}$	1.51
$12.75\text{GHz} \leq f \leq 26\text{GHz}$	1.51
$26\text{GHz} \leq f \leq 40\text{GHz}$	1.59

Radiated (k=2)

Frequency Range	Uncertainty(dB)
9kHz-30MHz	4.92
$30\text{MHz} \leq f \leq 1\text{GHz}$	4.72
$1\text{GHz} \leq f \leq 18\text{GHz}$	4.84
$18\text{GHz} \leq f \leq 40\text{GHz}$	5.12

8.6. AC Power-line Conducted Emission

Measurement Uncertainty : 3.08dB,k=2

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

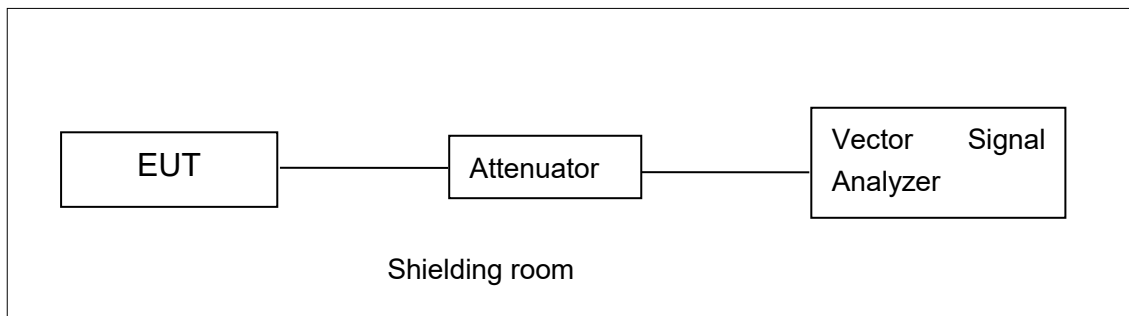


Fig.A.1.1.1: Test Setup Diagram for Conducted Measurements

A.1.2. Radiated Emission Measurements

In the case of radiated emission, the used settings are as follows,

Sweep frequency from 30 MHz to 1GHz, RBW = 100 kHz, VBW = 300 kHz;

Sweep frequency from 1 GHz to 26GHz, RBW = 1MHz, VBW = 3MHz;

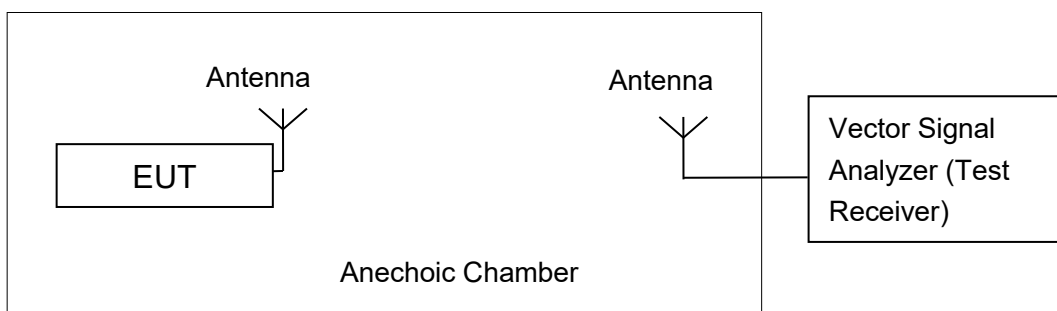


Fig.A.1.2.1: Test Setup Diagram for Radiated Measurements

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. 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	18.74	19.36	20.17
	2	/	/	/
	5.5	/	/	/
	11	/	/	/
802.11g	6	22.54	22.77	21.21
	9	/	/	/
	12	/	/	/
	18	/	/	/
	24	/	/	/
	36	/	/	/
	48	/	/	/
54	/	/	/	

The data rate 1Mbps and 6Mbps are selected as worst condition, and the following cases are performed with this condition.

802.11n-HT20 mode

Mode	Data Rate (Index)	Test Result (dBm)		
		2412MHz (Ch1)	2437MHz (Ch6)	2462 MHz (Ch11)
802.11n (20MHz)	MCS0	21.53	22.66	20.31
	MCS1	/	/	/
	MCS2	/	/	/
	MCS3	/	/	/
	MCS4	/	/	/
	MCS5	/	/	/
	MCS6	/	/	/
	MCS7	/	/	/

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

802.11n-HT40 mode

Mode	Data Rate (Index)	Test Result (dBm)		
		2422MHz (Ch3)	2437MHz (Ch6)	2452 MHz (Ch9)
802.11n (40MHz)	MCS0	17.66	21.02	17.05
	MCS1	/	/	/
	MCS2	/	/	/
	MCS3	/	/	/
	MCS4	/	/	/
	MCS5	/	/	/
	MCS6	/	/	/
	MCS7	/	/	/

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

Duty cycle

TestMode	Antenna	Frequency[MHz]	Duty Cycle [%]
11B	Ant1	2412	98.71
11G	Ant1	2412	97.84
11N20SISO	Ant1	2412	97.92
11N40SISO	Ant1	2422	94.85

Conclusion: Pass

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

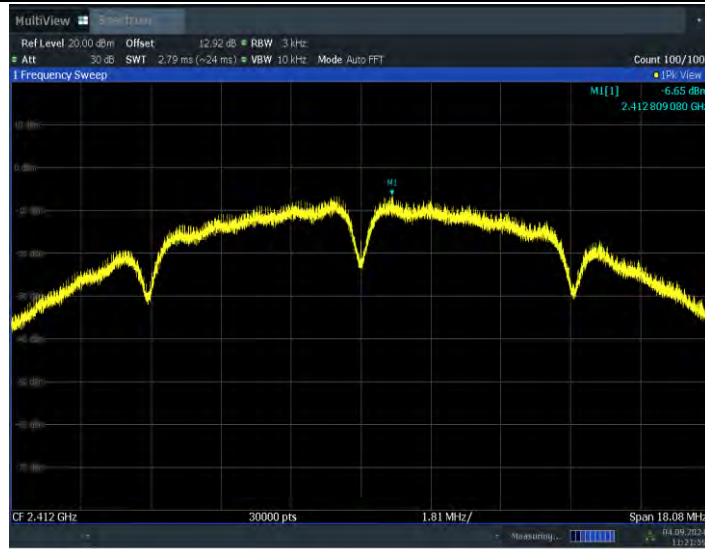
EUT ID: UT05a

Measurement Results:

TestMode	Antenna	Frequency[MHz]	Result[dBm/3-100kHz]	Limit[dBm/3kHz]	Verdict
11B	Ant1	2412	-6.65	≤8.00	PASS
		2437	-6.70	≤8.00	PASS
		2462	-5.11	≤8.00	PASS
11G	Ant1	2412	-7.86	≤8.00	PASS
		2437	-8.09	≤8.00	PASS
		2462	-8.33	≤8.00	PASS
11N20SISO	Ant1	2412	-8.44	≤8.00	PASS
		2437	-7.98	≤8.00	PASS
		2462	-10.29	≤8.00	PASS
11N40SISO	Ant1	2422	-14.95	≤8.00	PASS
		2437	-10.46	≤8.00	PASS
		2452	-13.60	≤8.00	PASS

Test graphs as below:

11B_Ant1_2412



11B_Ant1_2437



11B_Ant1_2462



11G_Ant1_2412



11G_Ant1_2437



11G_Ant1_2462



11N20SISO_Ant1_2412



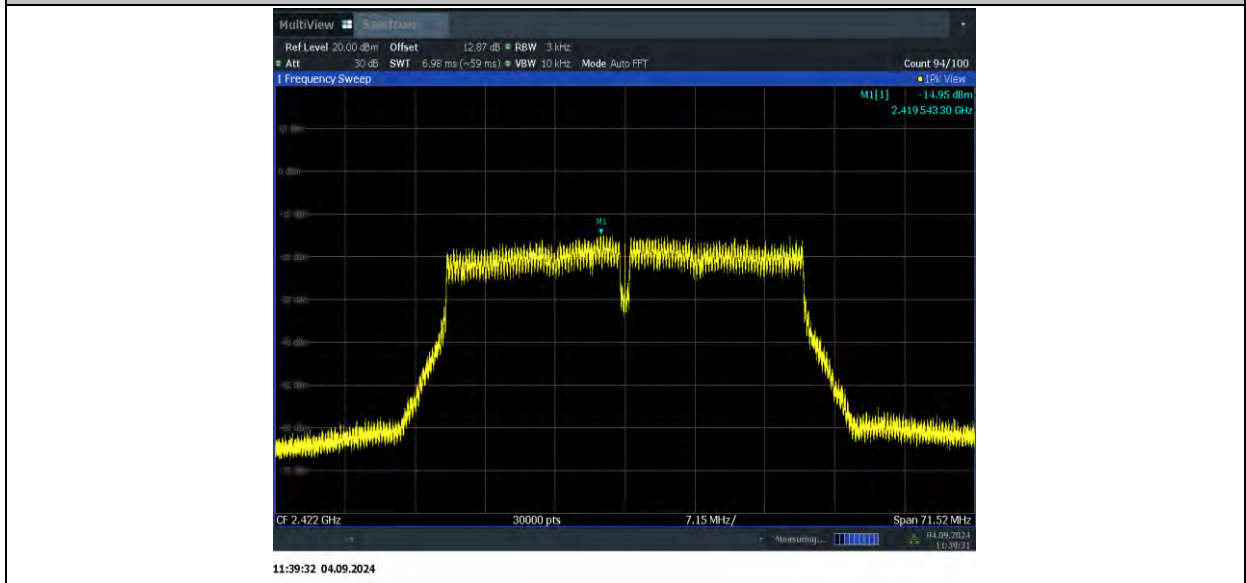
11N20SISO_Ant1_2437



11N20SISO_Ant1_2462



11N40SISO_Ant1_2422



11N40SISO_Ant1_2437



11N40SISO_Ant1_2452



Conclusion: Pass

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:

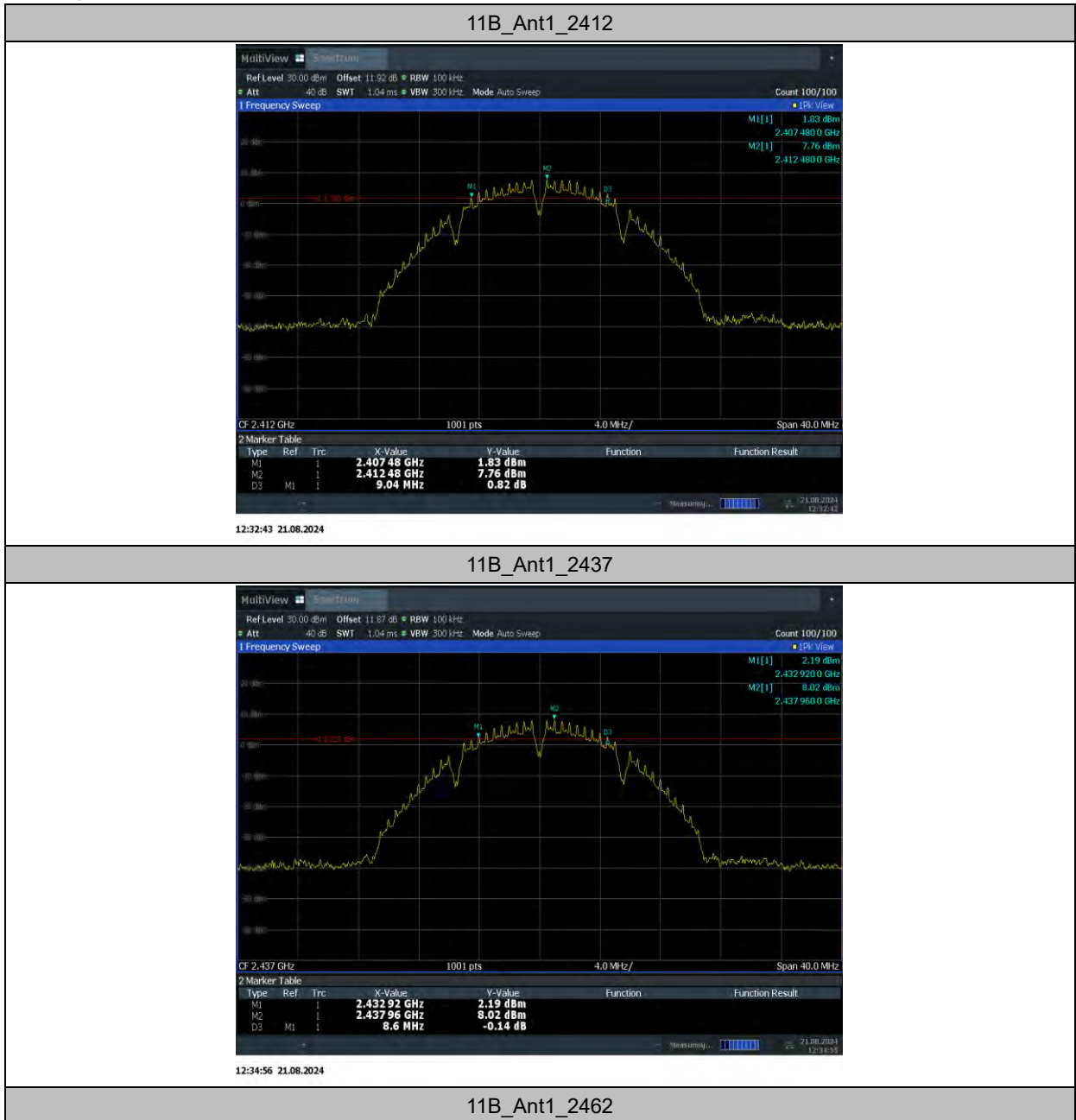
Standard	Limit (kHz)
FCC 47 CFR Part 15.247 (a)	≥ 500

EUT ID: UT05a

Measurement Result:

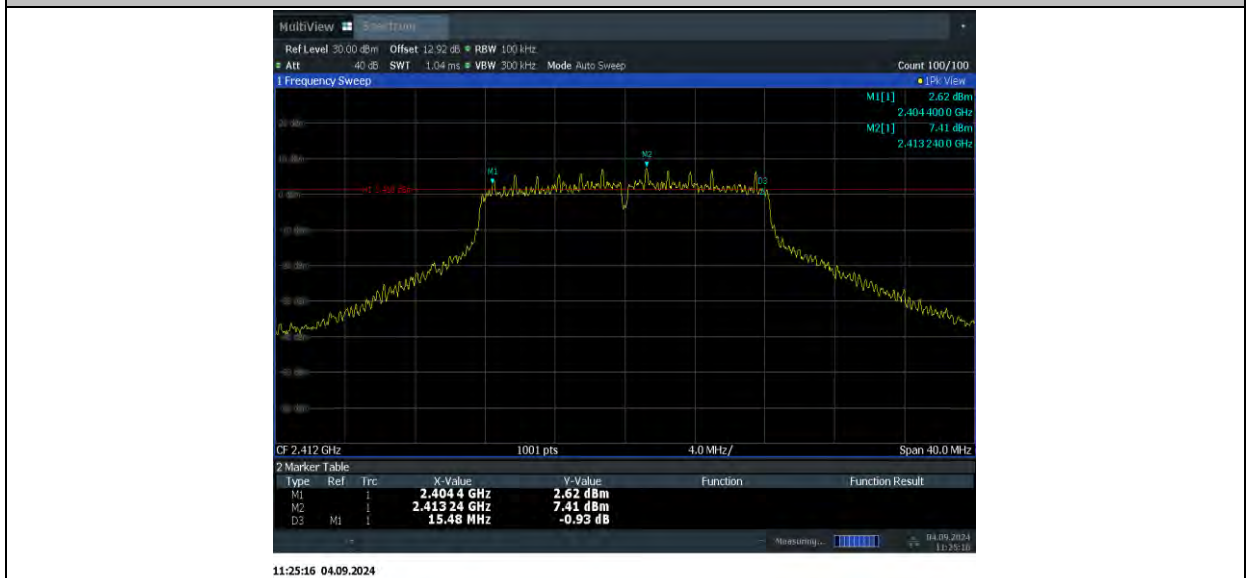
TestMode	Antenna	Frequency[MHz]	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	9.04	2407.48	2416.52	0.5	PASS
		2437	8.60	2432.92	2441.52	0.5	PASS
		2462	8.08	2457.92	2466.00	0.5	PASS
11G	Ant1	2412	15.48	2404.40	2419.88	0.5	PASS
		2437	15.72	2429.40	2445.12	0.5	PASS
		2462	15.32	2454.20	2469.52	0.5	PASS
11N20SISO	Ant1	2412	15.56	2404.56	2420.12	0.5	PASS
		2437	16.08	2429.40	2445.48	0.5	PASS
		2462	16.28	2453.60	2469.88	0.5	PASS
11N40SISO	Ant1	2422	35.76	2404.40	2440.16	0.5	PASS
		2437	35.76	2419.40	2455.16	0.5	PASS
		2452	35.36	2434.40	2469.76	0.5	PASS

Test graphs as below:

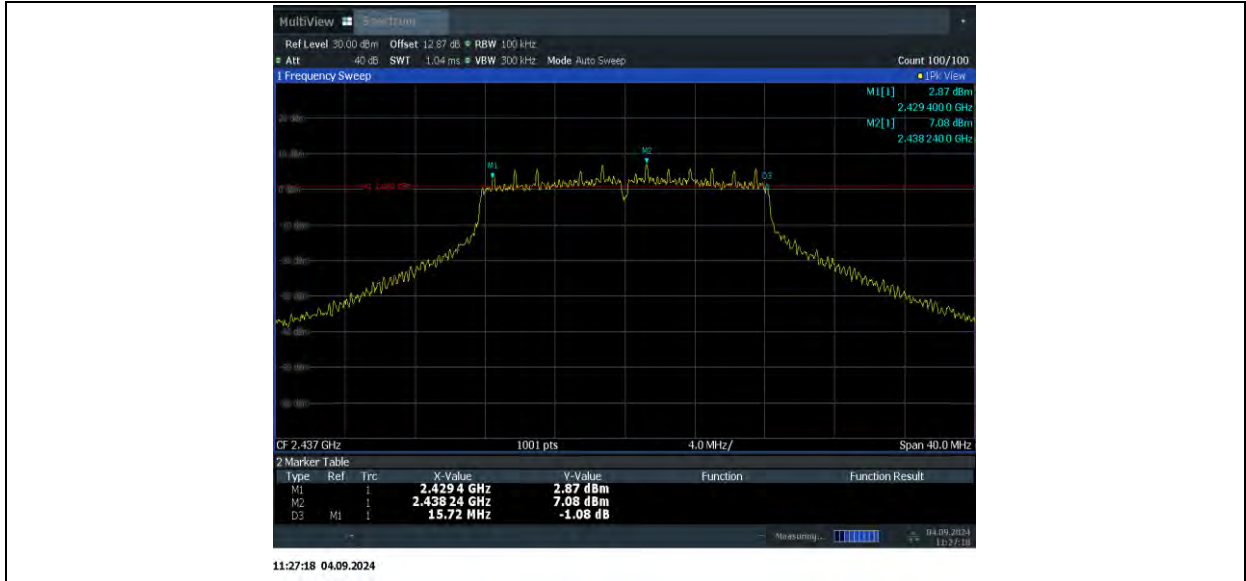




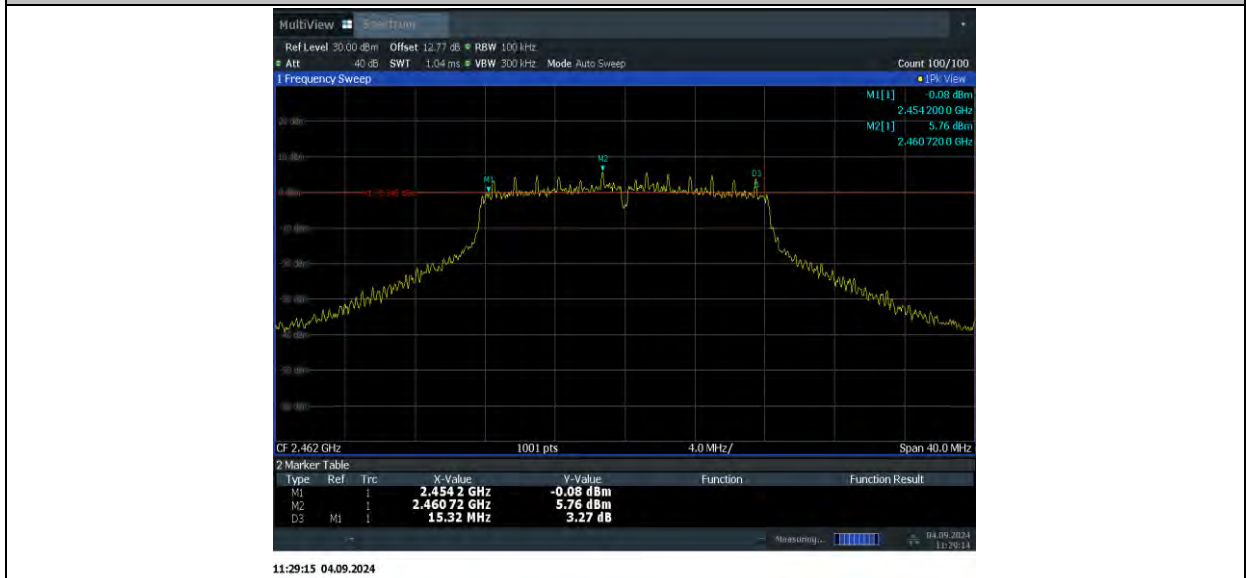
11G_Ant1_2412



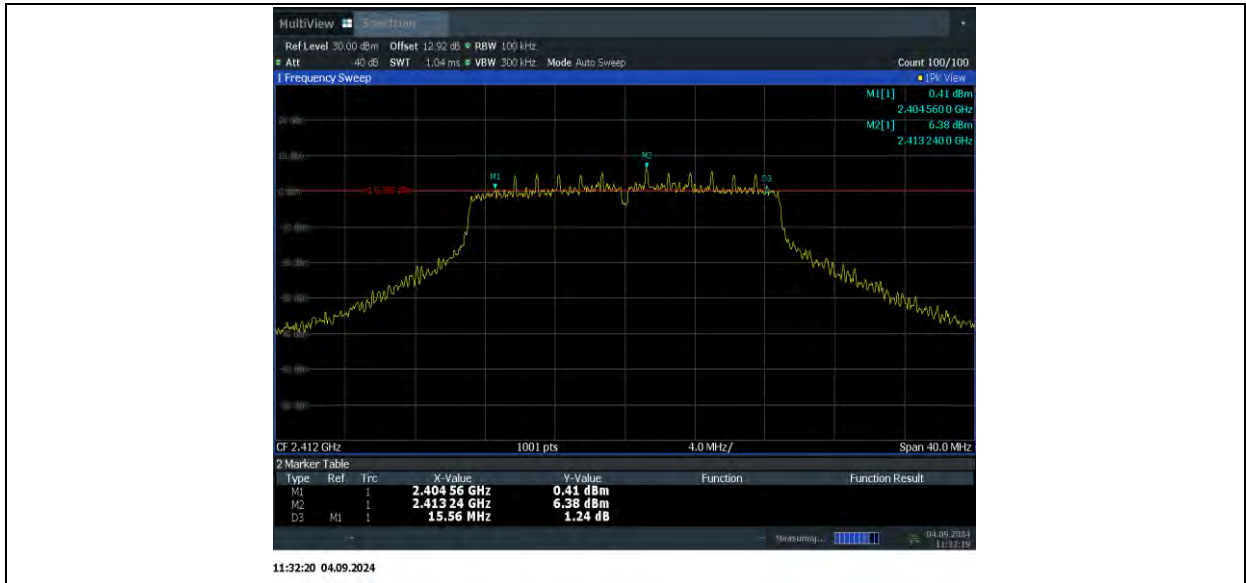
11G_Ant1_2437



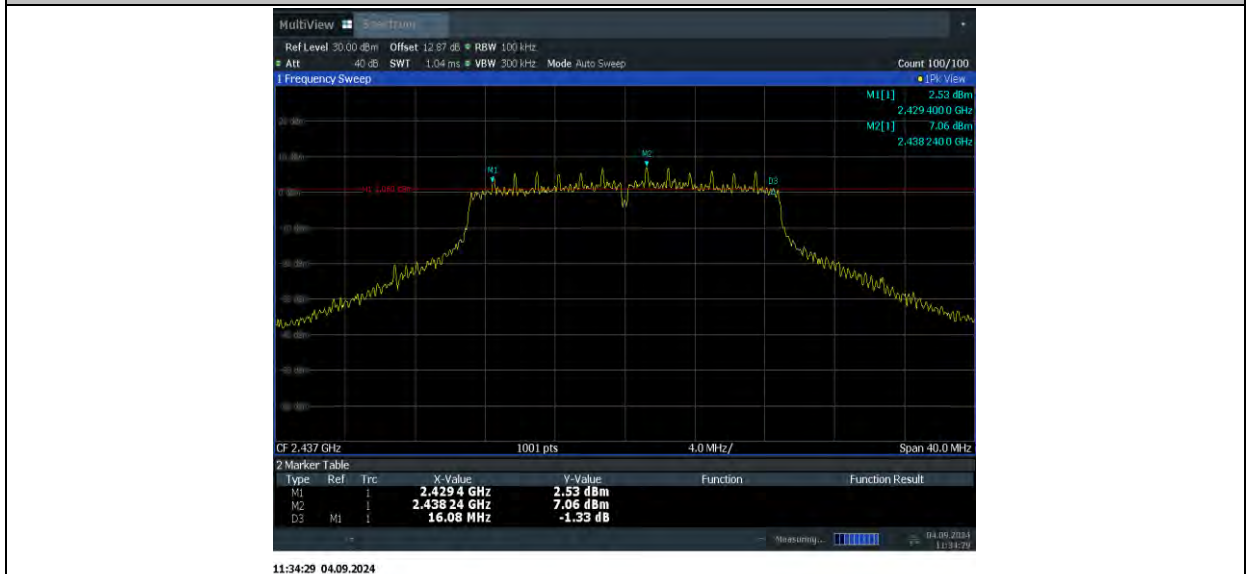
11G_Ant1_2462



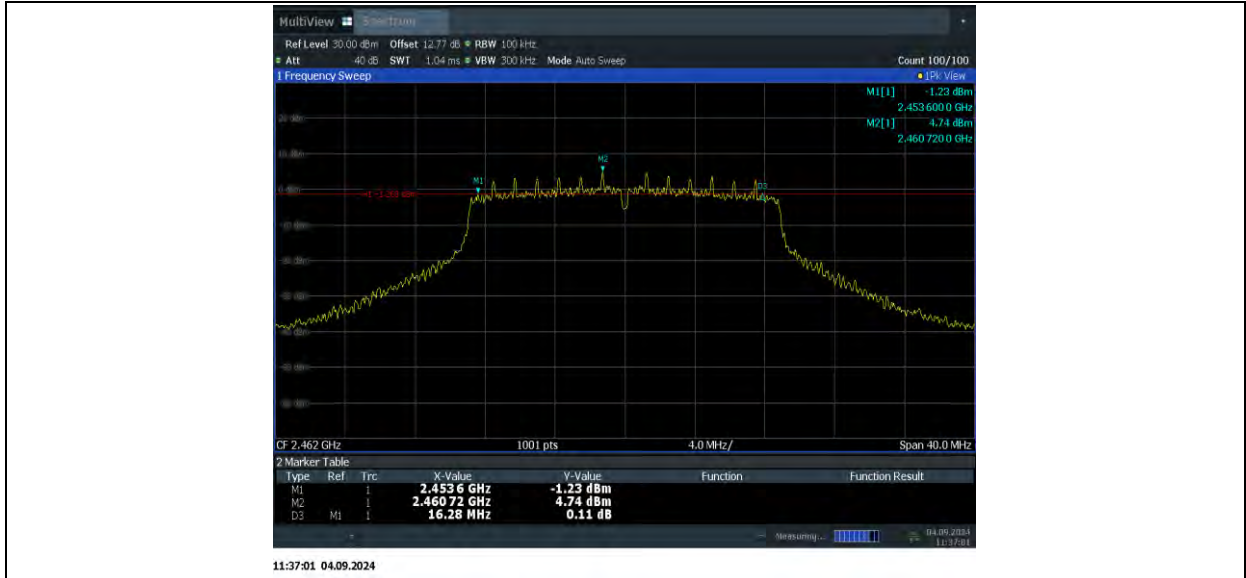
11N20SISO_Ant1_2412



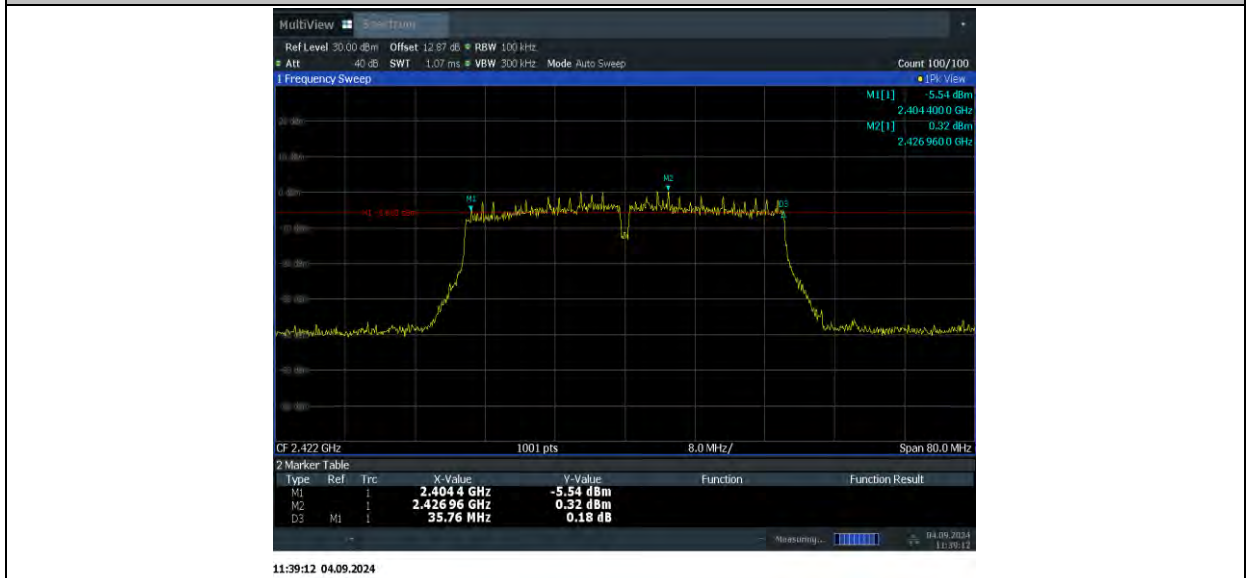
11N20SISO_Ant1_2437



11N20SISO_Ant1_2462



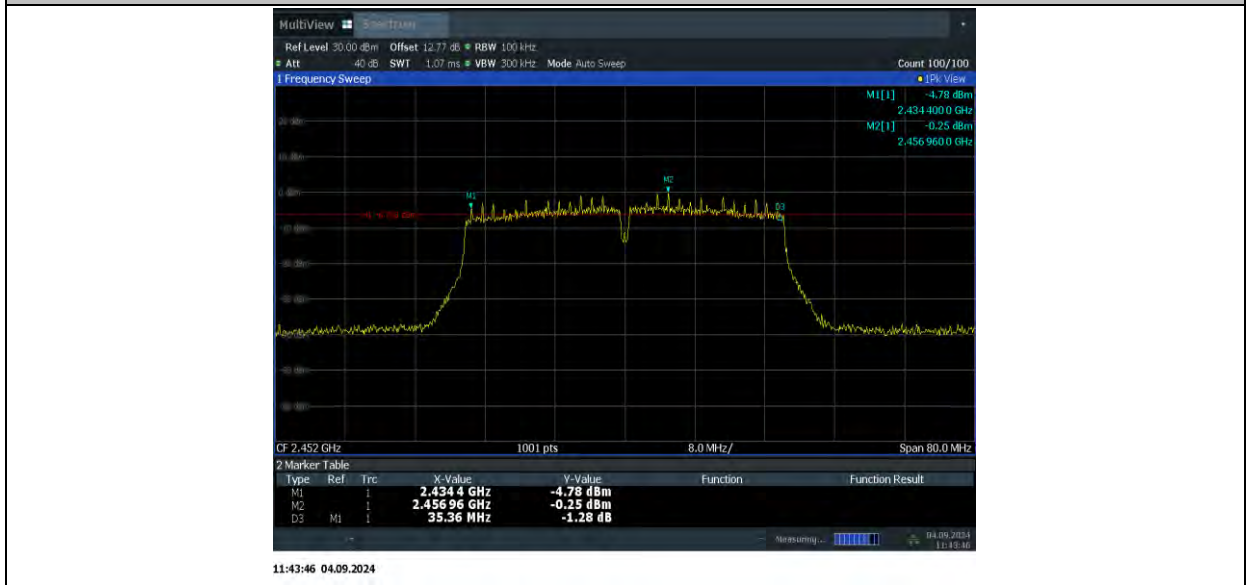
11N40SISO_Ant1_2422



11N40SISO_Ant1_2437



11N40SISO_Ant1_2452



Conclusion: Pass

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]	Verdict
11B	Ant1	Low	2412	PASS
		High	2462	PASS
11G	Ant1	Low	2412	PASS
		High	2462	PASS
11N20SISO	Ant1	Low	2412	PASS
		High	2462	PASS
11N40SISO	Ant1	Low	2422	PASS
		High	2452	PASS

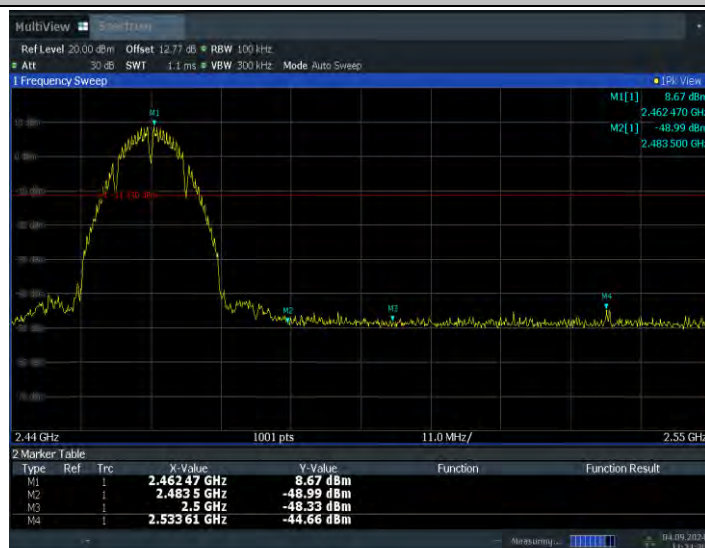
Test graphs as below:

11B_Ant1_Low_2412



11:22:11 04.09.2024

11B_Ant1_High_2462

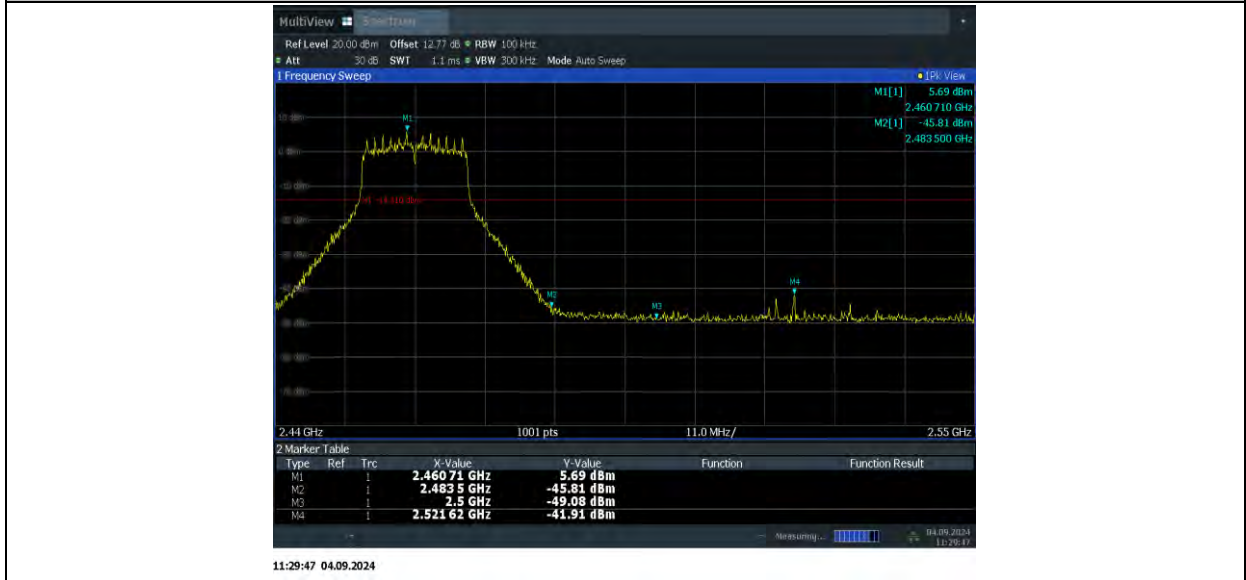


11:24:31 04.09.2024

11G_Ant1_Low_2412



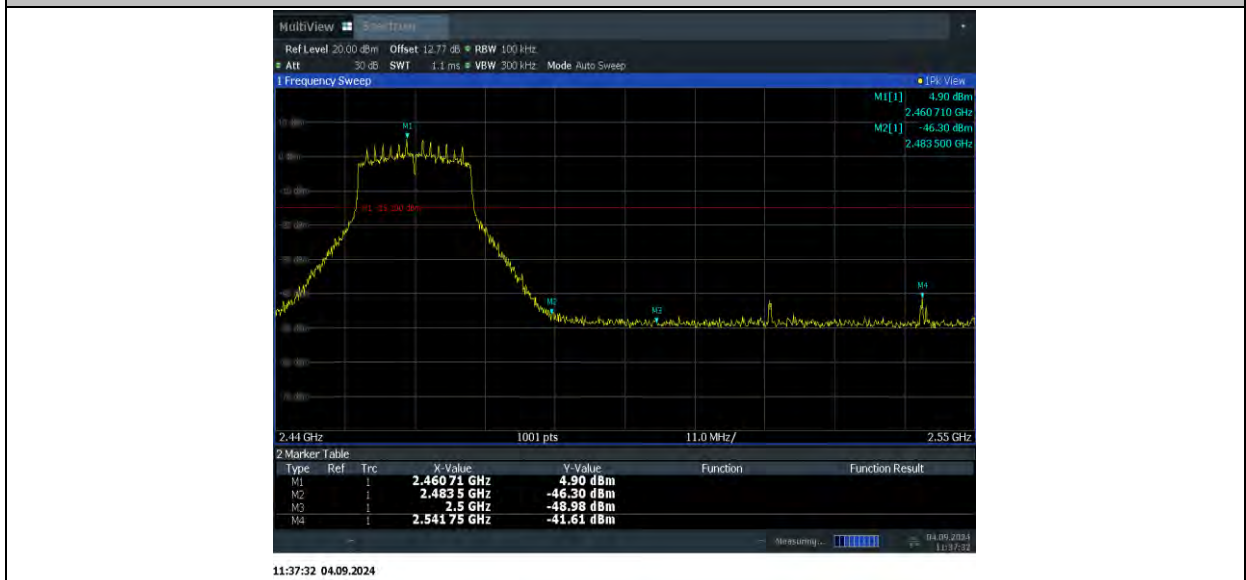
11G_Ant1_High_2462



11N20SISO_Ant1_Low_2412



11N20SISO_Ant1_High_2462



11N40SISO_Ant1_Low_2422



11N40SISO_Ant1_High_2452



Conclusion: Pass

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:

TestMode	Antenna	Frequency[MHz]	FreqRange [Mhz]	Verdict
11B	Ant1	2412	Reference	PASS
			30~1000	PASS
			1000~26500	PASS
		2437	Reference	PASS
			30~1000	PASS

			1000~26500	PASS
		2462	Reference	PASS
			30~1000	PASS
			1000~26500	PASS
11G	Ant1	2412	Reference	PASS
			30~1000	PASS
			1000~26500	PASS
		2437	Reference	PASS
			30~1000	PASS
			1000~26500	PASS
		2462	Reference	PASS
			30~1000	PASS
			1000~26500	PASS
11N20SISO	Ant1	2412	Reference	PASS
			30~1000	PASS
			1000~26500	PASS
		2437	Reference	PASS
			30~1000	PASS
			1000~26500	PASS
		2462	Reference	PASS
			30~1000	PASS
			1000~26500	PASS
11N40SISO	Ant1	2422	Reference	PASS
			30~1000	PASS
			1000~26500	PASS
		2437	Reference	PASS
			30~1000	PASS
			1000~26500	PASS
		2452	Reference	PASS
			30~1000	PASS
			1000~26500	PASS

Test graphs as below:

11B_Ant1_2412_0~Reference



11B_Ant1_2412_30~1000



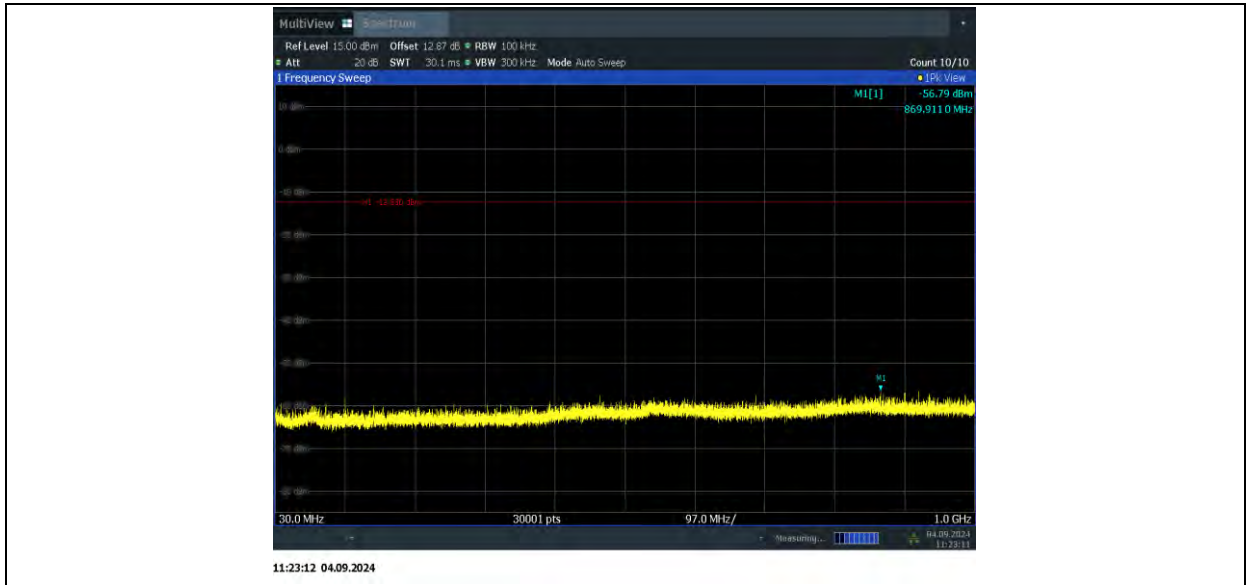
11B_Ant1_2412_1000~26500



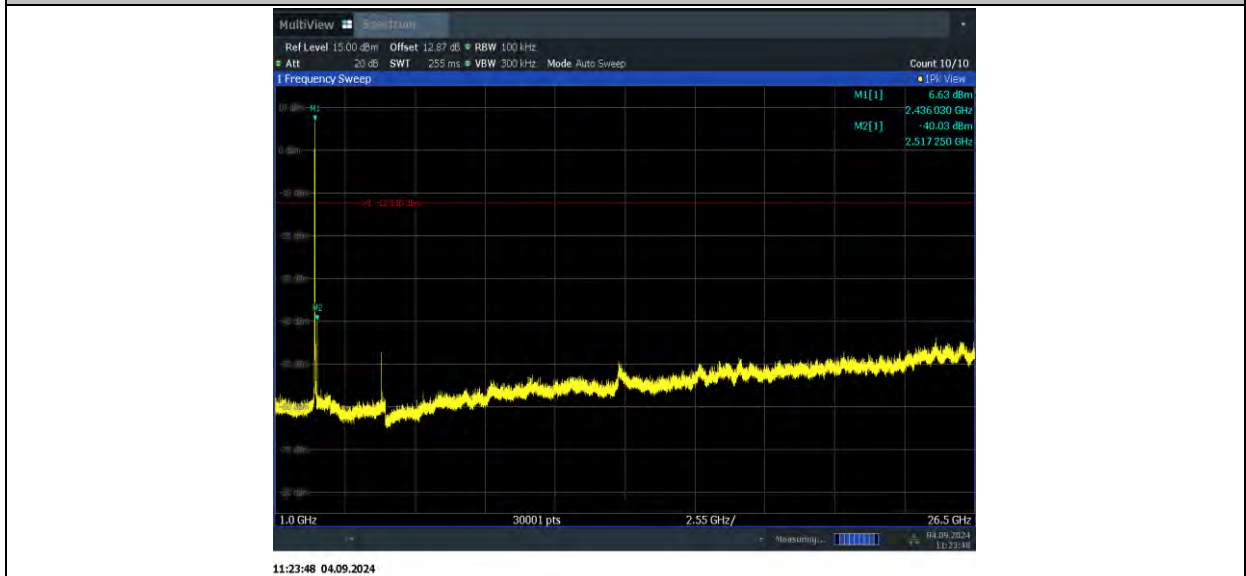
11B_Ant1_2437_0~Reference



11B_Ant1_2437_30~1000



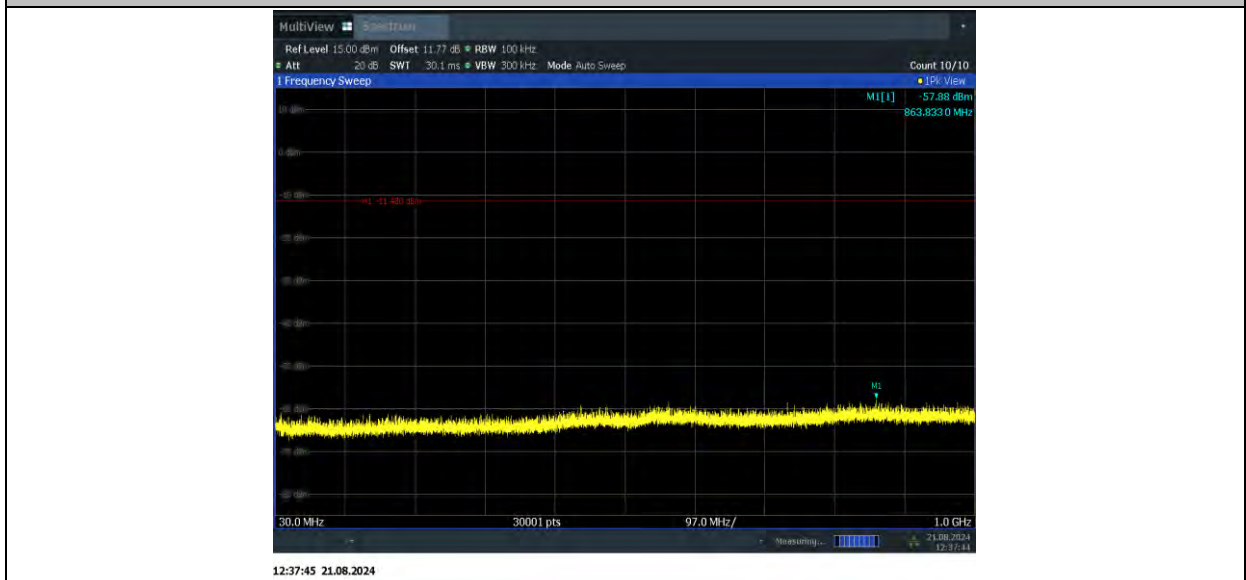
11B_Ant1_2437_1000~26500



11B_Ant1_2462_0~Reference



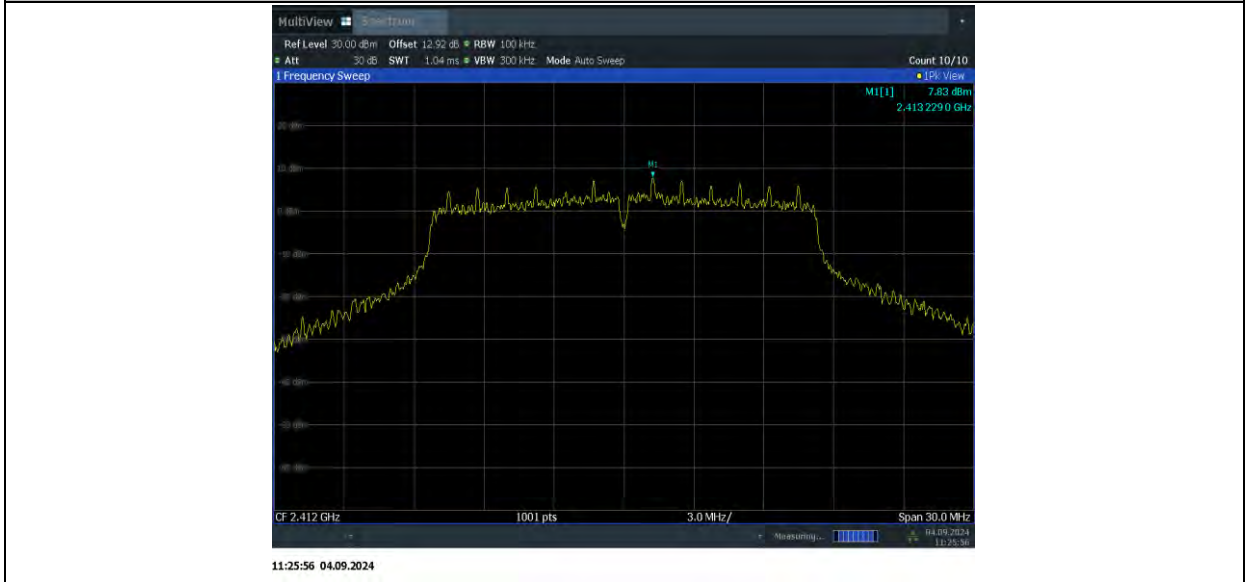
11B_Ant1_2462_30~1000



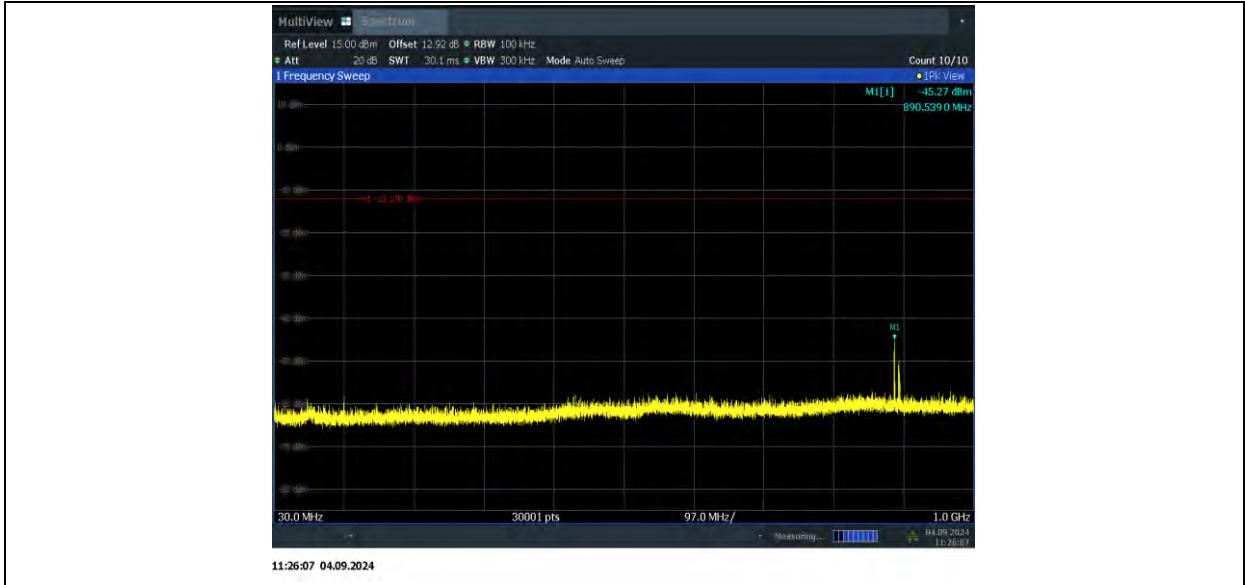
11B_Ant1_2462_1000~26500



11G_Ant1_2412_0~Reference



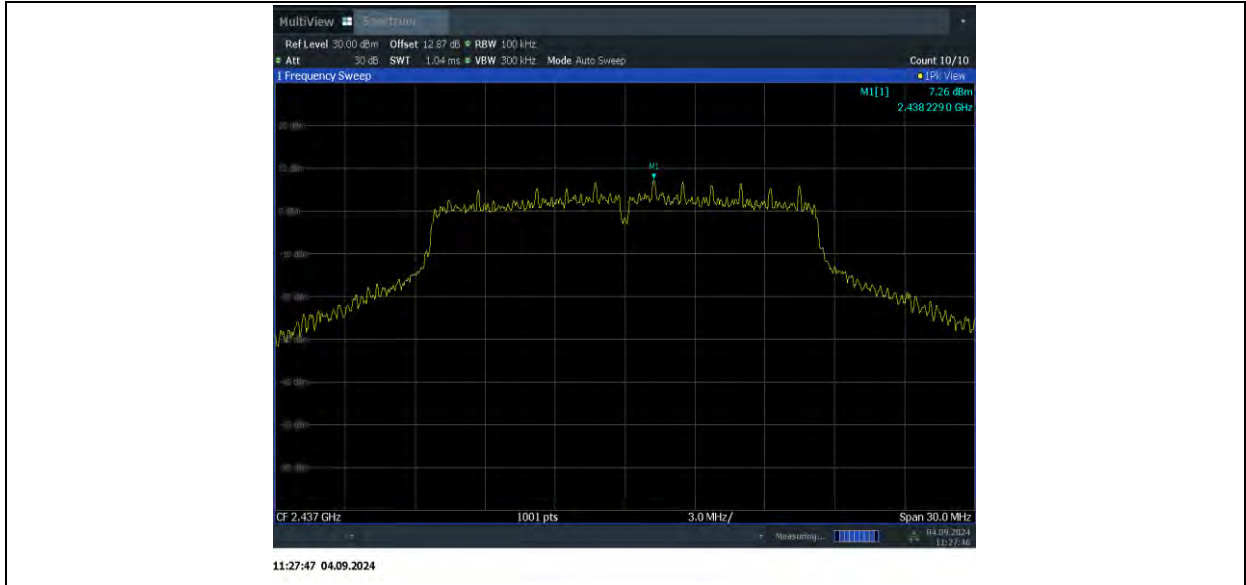
11G_Ant1_2412_30~1000



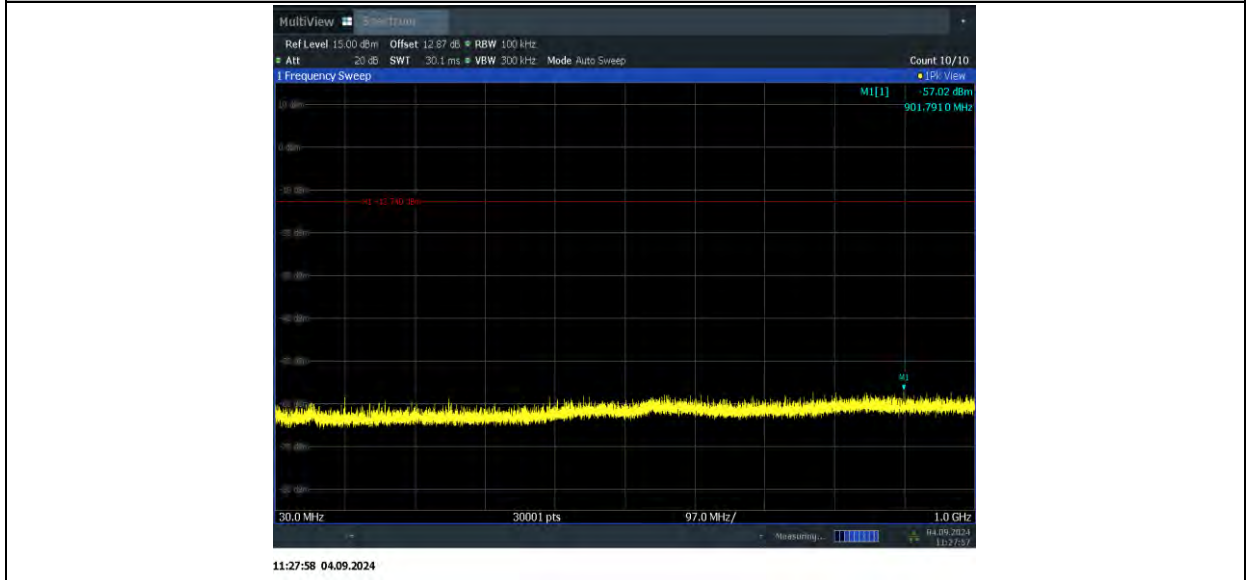
11G_Ant1_2412_1000~26500



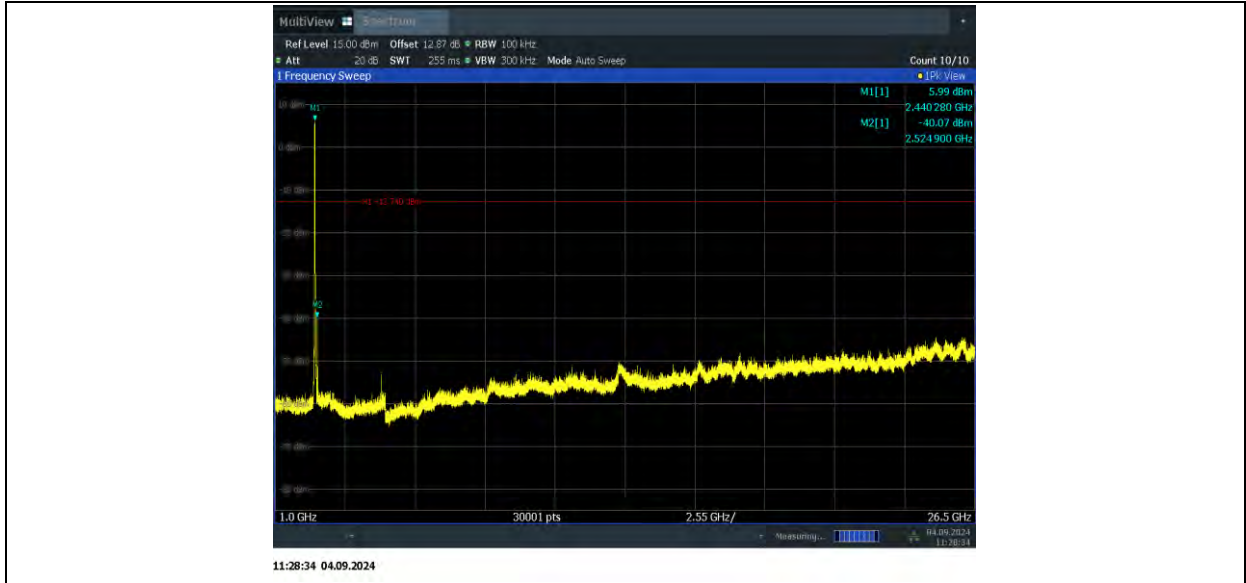
11G_Ant1_2437_0~Reference



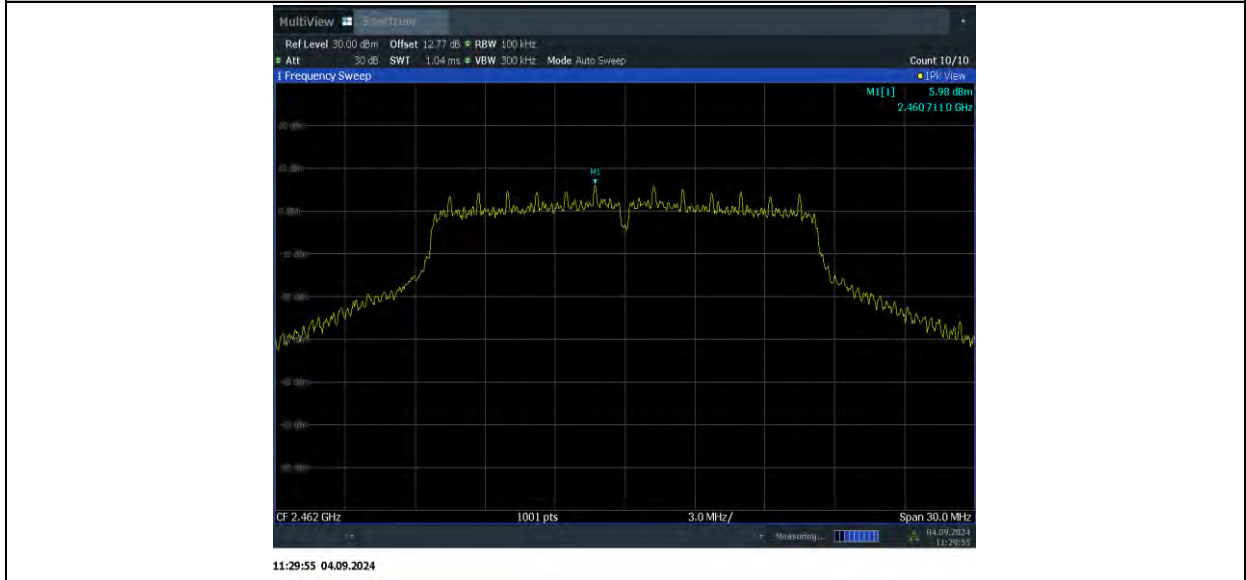
11G_Ant1_2437_30~1000



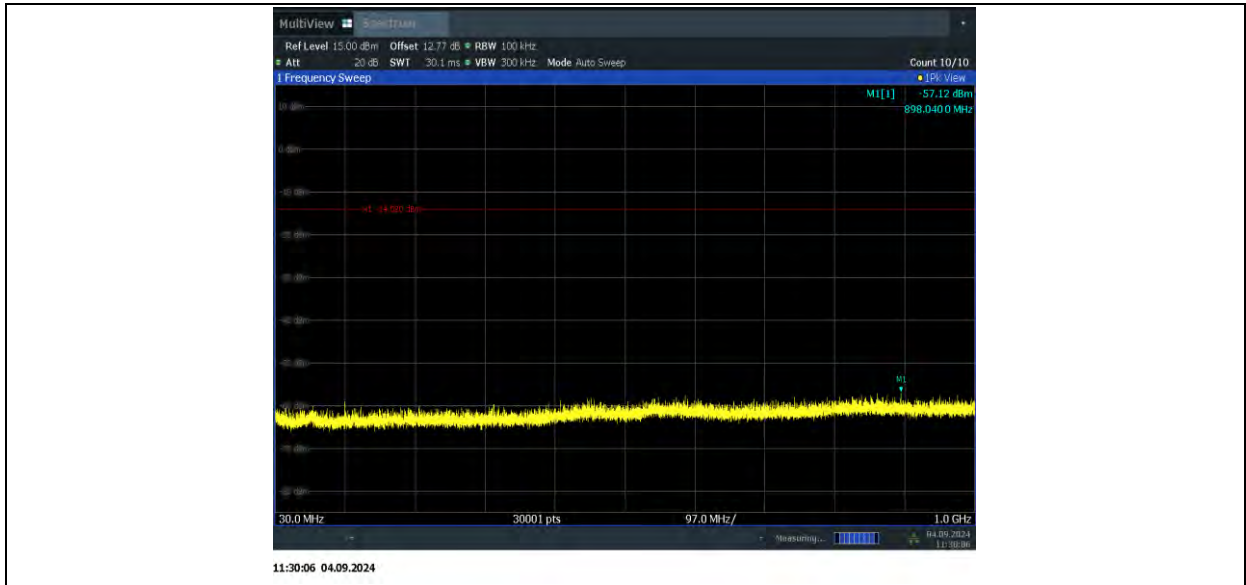
11G_Ant1_2437_1000~26500



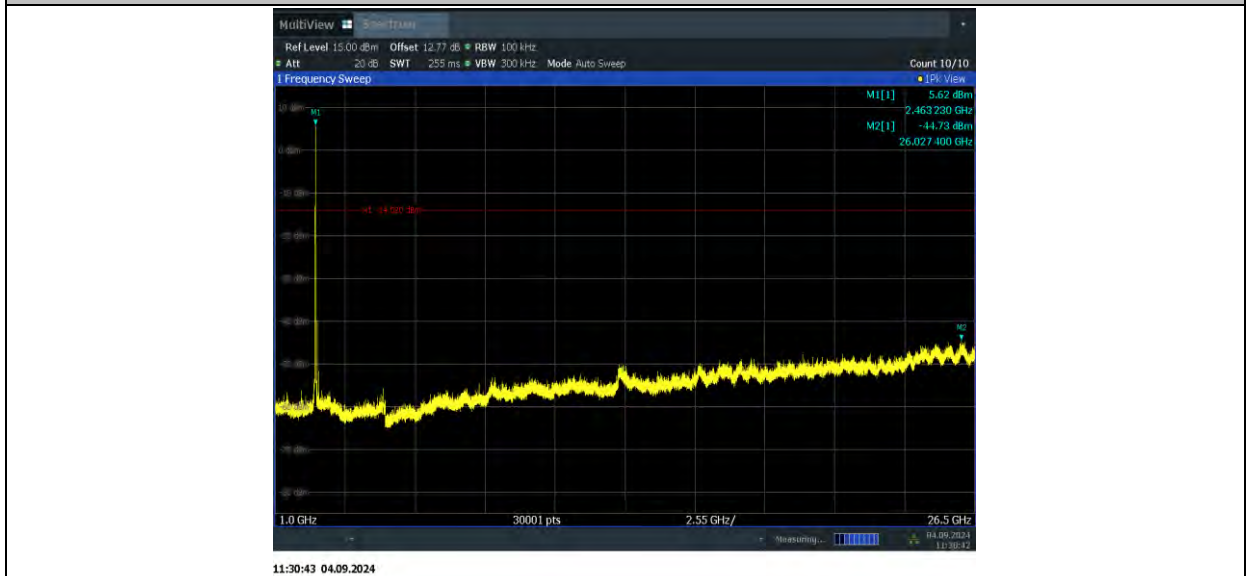
11G_Ant1_2462_0~Reference



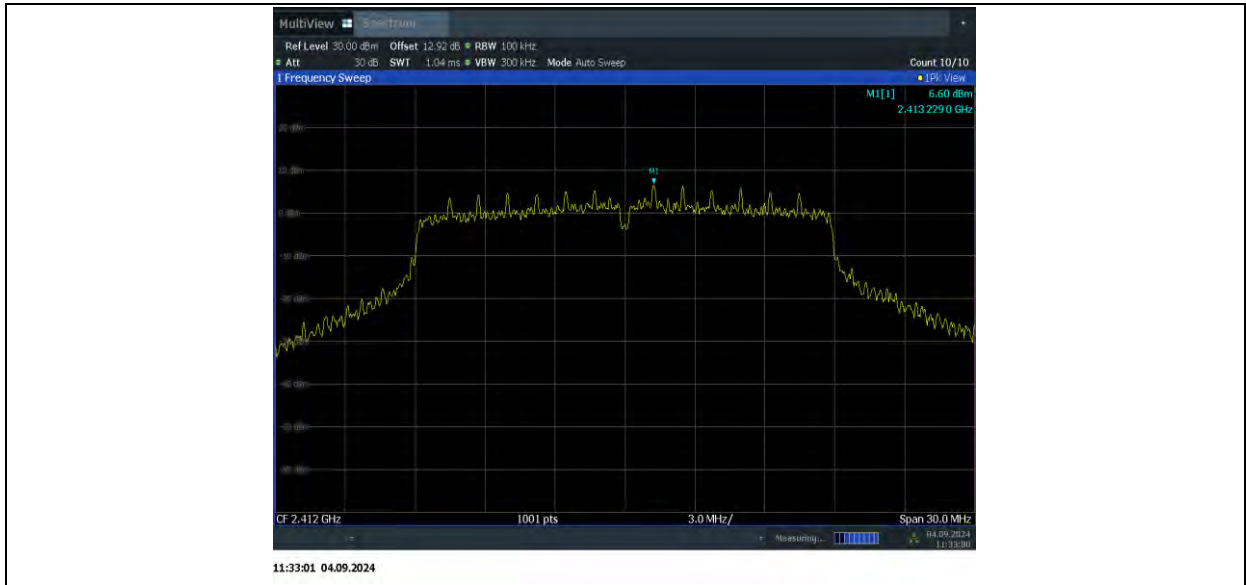
11G_Ant1_2462_30~1000



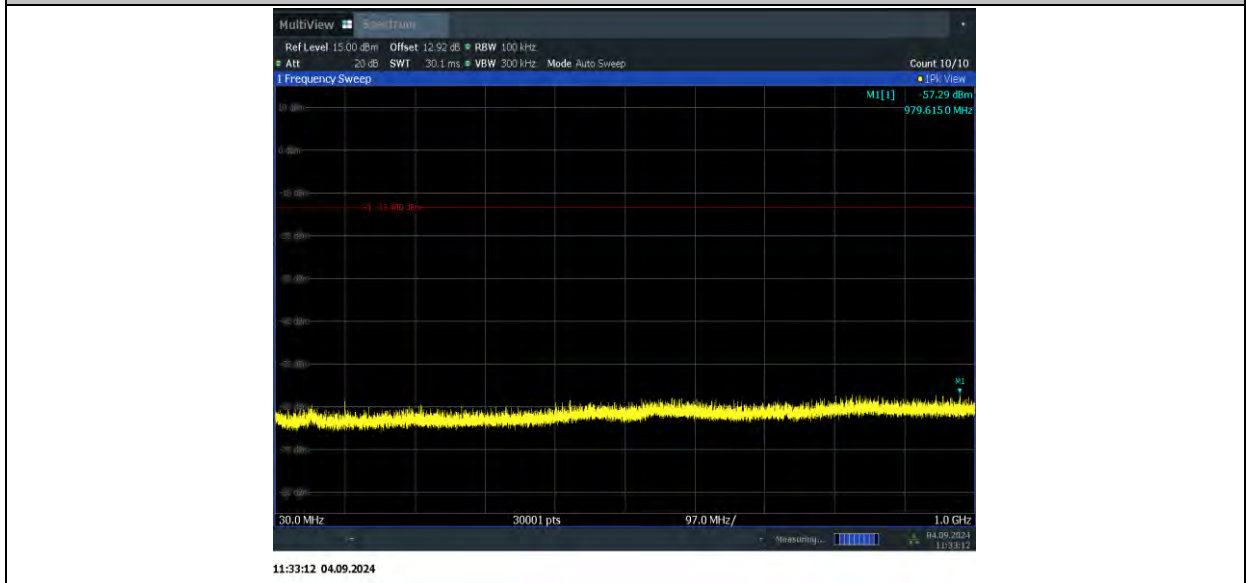
11G_Ant1_2462_1000~26500



11N20SISO_Ant1_2412_0~Reference



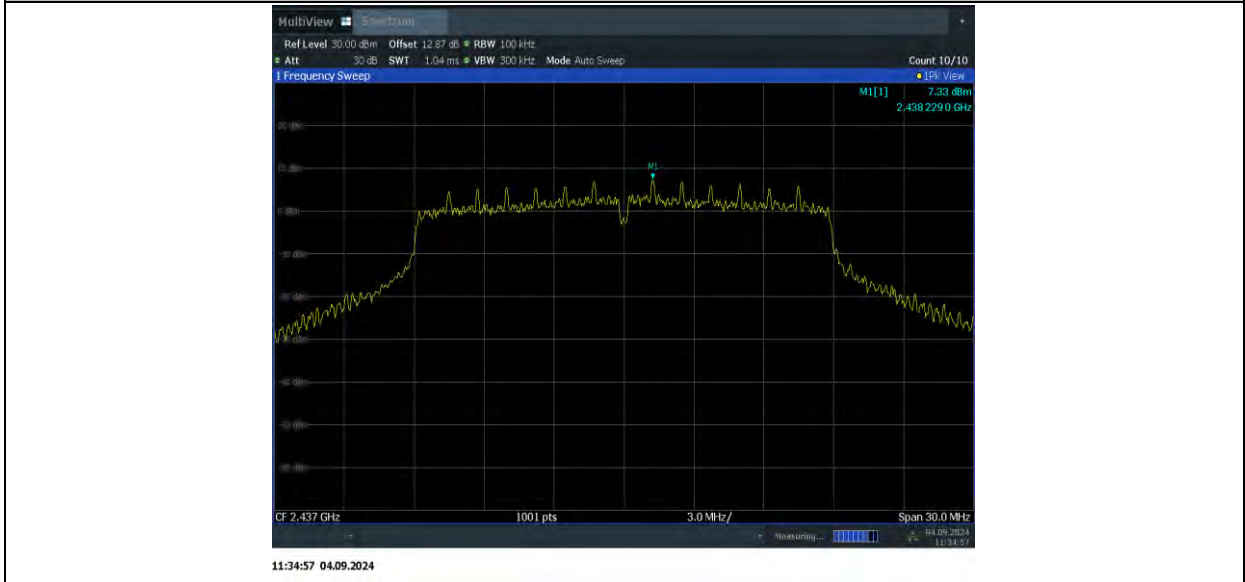
11N20SISO_Ant1_2412_30~1000



11N20SISO_Ant1_2412_1000~26500



11N20SISO_Ant1_2437_0~Reference



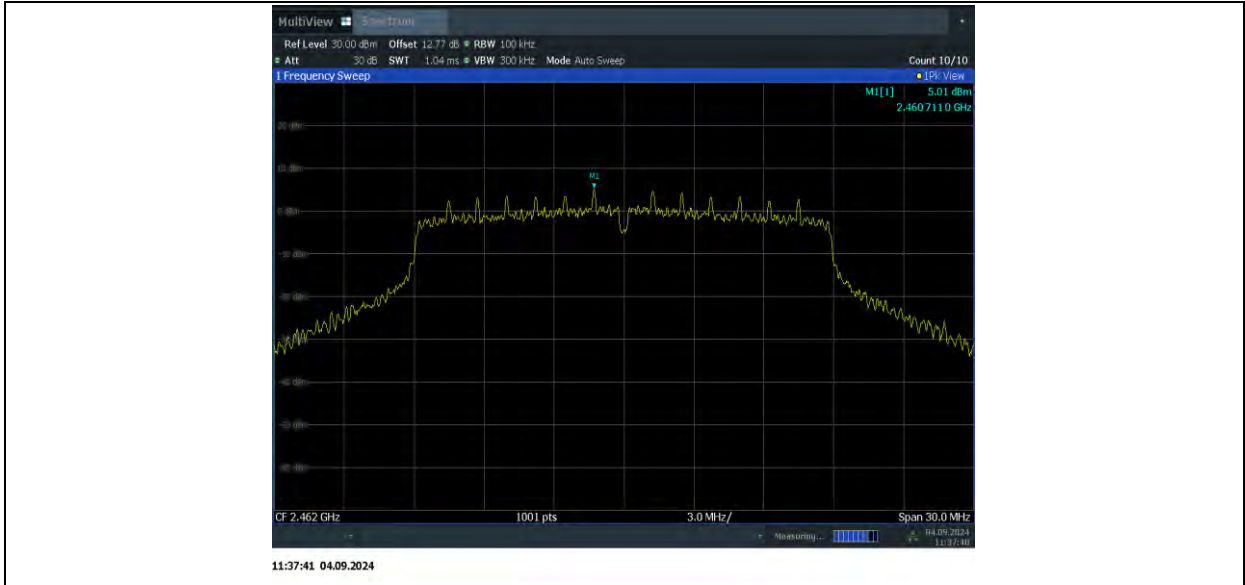
11N20SISO_Ant1_2437_30~1000



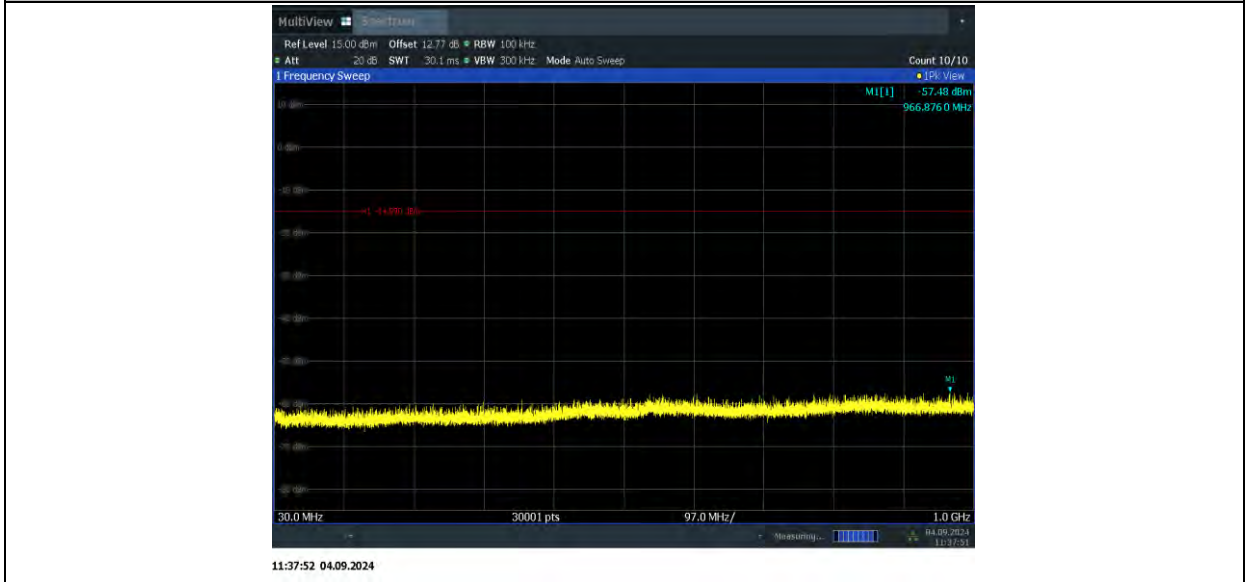
11N20SISO_Ant1_2437_1000~26500



11N20SISO_Ant1_2462_0~Reference



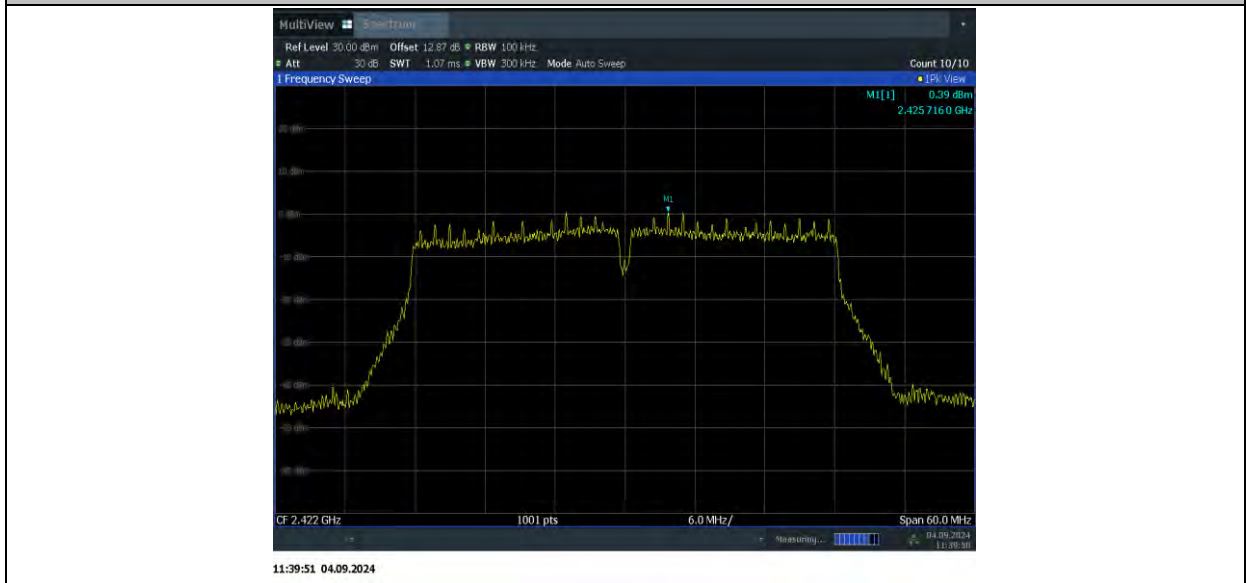
11N20SISO_Ant1_2462_30~1000



11N20SISO_Ant1_2462_1000~26500



11N40SISO_Ant1_2422_0~Reference



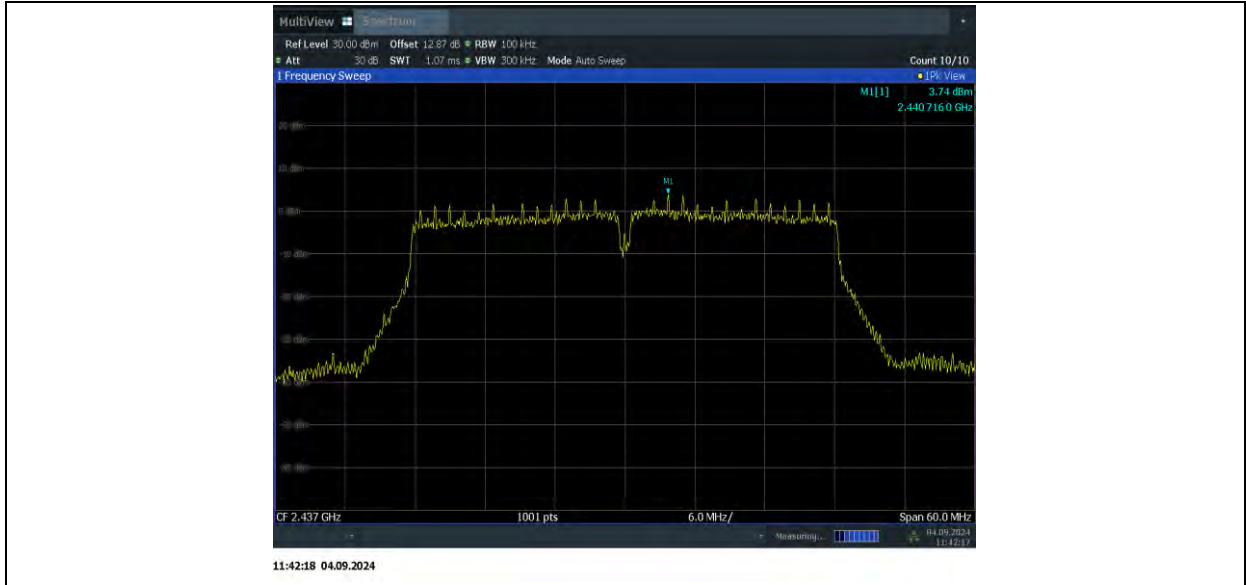
11N40SISO_Ant1_2422_30~1000



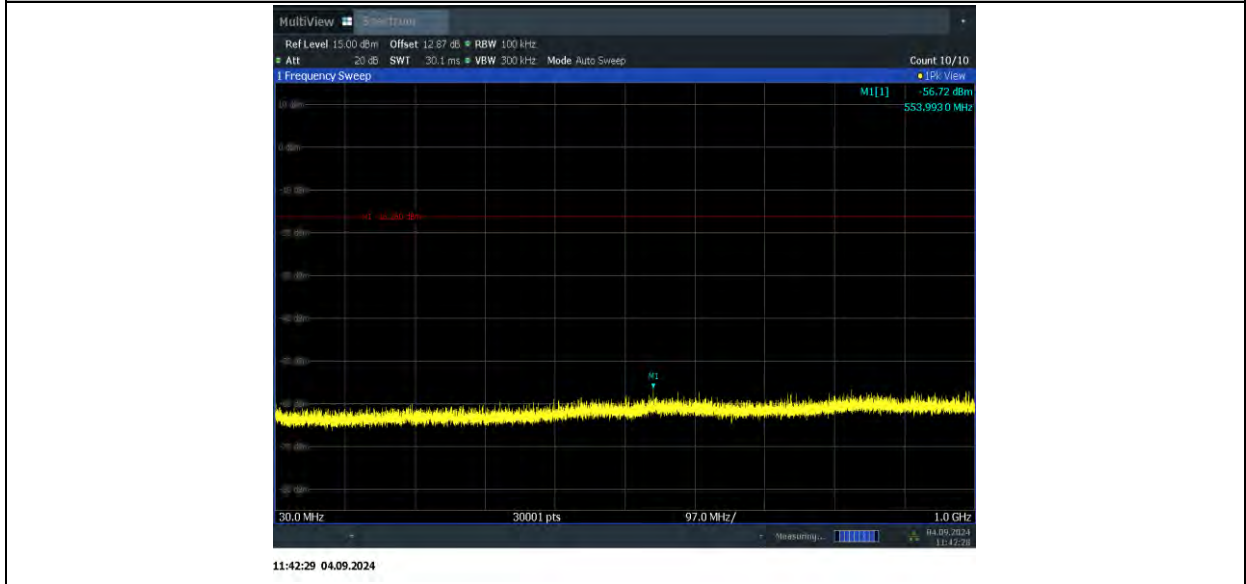
11N40SISO_Ant1_2422_1000~26500



11N40SISO_Ant1_2437_0~Reference



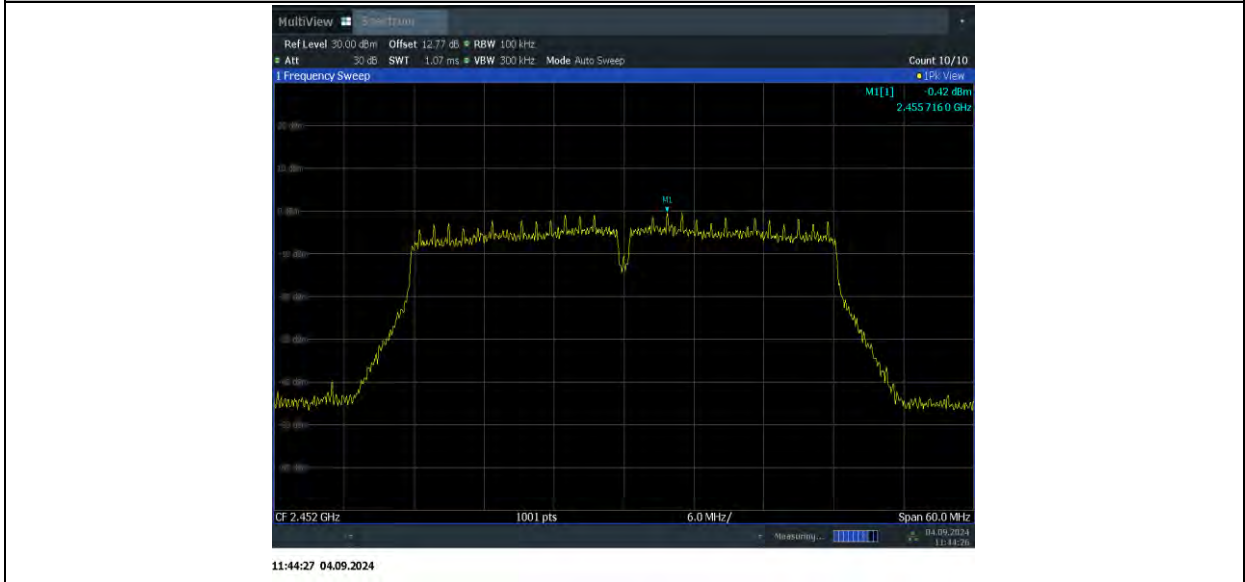
11N40SISO_Ant1_2437_30~1000



11N40SISO_Ant1_2437_1000~26500



11N40SISO_Ant1_2452_0~Reference



11N40SISO_Ant1_2452_30~1000



11N40SISO_Ant1_2452_1000~26500



Conclusion: Pass

A.6.2 Transmitter Spurious Emission - Radiated

Method of Measurement: See ANSI C63.10-2013-clause 6.4 & 6.5 & 6.6

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 of emission (MHz)	Field strength($\mu\text{V}/\text{m}$)	Field strength(dBuV/m)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

Frequency (MHz)	Field strength($\mu\text{V}/\text{m}$)	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

Test Condition

The EUT was placed on a non-conductive table. The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.

Frequency of emission (MHz)	RBW/VBW	Sweep Time(s)
30-1000	100KHz/300KHz	5
1000-4000	1MHz/1MHz	15
4000-18000	1MHz/1MHz	40
18000-26500	1MHz/1MHz	20

EUT ID: UT20a

Measurement Results:
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
	10	Fig.A.6.2.4	P
	11	Fig.A.6.2.5	P

802.11n-HT20 mode

Mode	Channel	Test Results	Conclusion
802.11n (HT20)	1	Fig.A.6.2.6	P
	2	Fig.A.6.2.7	P
	10	Fig.A.6.2.8	P
	11	Fig.A.6.2.9	P

802.11n-HT40 mode

Mode	Channel	Test Results	Conclusion
802.11n (HT40)	3	Fig.A.6.2.10	P
	4	Fig.A.6.2.11	P
	5	Fig.A.6.2.12	P
	6	Fig.A.6.2.13	P
	7	Fig.A.6.2.14	P
	8	Fig.A.6.2.15	P
	9	Fig.A.6.2.16	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:

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

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)
17977.000	55.72	-25.90	46.00	35.62	74.00	18.28	H
4823.500	53.17	-36.90	33.00	57.07	74.00	20.83	H
13749.000	51.56	-29.10	41.10	39.56	74.00	22.44	V
11799.000	48.88	-31.00	39.20	40.68	74.00	25.12	V
8939.000	46.63	-33.60	37.70	42.53	74.00	27.37	H
2388.648	56.70	-19.26	28.20	47.76	74.00	17.30	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)
17914.000	56.39	-25.90	46.00	36.29	74.00	17.61	V
13722.500	52.48	-29.10	41.10	40.48	74.00	21.52	H
4874.000	52.36	-36.90	33.40	55.86	74.00	21.64	H
11901.500	49.12	-31.30	39.10	41.32	74.00	24.88	V
8486.500	46.81	-33.70	37.30	43.21	74.00	27.19	H
7175.500	45.24	-34.50	35.90	43.84	74.00	28.76	V

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)
17942.500	55.95	-25.90	46.00	35.85	74.00	18.05	H
4924.000	52.69	-36.70	33.30	56.09	74.00	21.31	H
14093.000	51.24	-29.10	41.70	38.64	74.00	22.76	V
12849.000	48.71	-30.30	39.90	39.11	74.00	25.29	V
9004.500	46.74	-33.60	37.70	42.64	74.00	27.26	V
2485.100	58.11	-19.00	28.20	48.91	74.00	15.89	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)
17917.500	56.00	-25.90	46.00	35.90	74.00	18.00	V
4826.500	53.39	-36.90	33.00	57.29	74.00	20.61	H
13690.500	51.67	-29.30	41.00	39.97	74.00	22.33	H
12335.000	48.67	-30.10	39.00	39.87	74.00	25.33	V
9218.500	46.91	-33.90	37.60	43.21	74.00	27.09	V
2389.700	63.79	-19.20	28.20	54.79	74.00	10.21	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)
17916.000	55.34	-25.90	46.00	35.24	74.00	18.66	V
4870.500	51.83	-36.90	33.40	55.33	74.00	22.17	H
13773.500	51.29	-29.00	41.20	39.09	74.00	22.71	V
12787.000	48.58	-30.60	39.80	39.38	74.00	25.42	H
9605.000	46.82	-33.00	37.60	42.22	74.00	27.18	V
7538.000	46.08	-34.80	36.30	44.58	74.00	27.92	H

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)
17941.000	55.87	-25.90	46.00	35.77	74.00	18.13	V
13784.000	51.41	-29.00	41.20	39.21	74.00	22.59	H
11829.500	49.75	-31.00	39.20	41.55	74.00	24.25	V
4928.000	49.28	-36.70	33.30	52.68	74.00	24.72	H
9103.500	46.68	-33.60	37.70	42.58	74.00	27.32	V
2491.700	62.12	-19.00	28.20	52.92	74.00	11.88	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)
17922.000	55.69	-25.90	46.00	35.59	74.00	18.31	H
4829.000	51.51	-36.90	33.00	55.41	74.00	22.49	H
13827.000	51.45	-28.90	41.20	39.15	74.00	22.55	H
12726.000	48.87	-30.50	39.60	39.77	74.00	25.13	V
9736.000	46.81	-33.10	37.80	42.11	74.00	27.19	V
2389.400	63.27	-19.20	28.20	54.27	74.00	10.73	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)
17416.500	55.23	-27.30	43.80	38.73	74.00	18.77	H
13775.500	51.62	-29.00	41.20	39.42	74.00	22.38	V
4878.000	50.75	-36.90	33.40	54.25	74.00	23.25	H
12925.000	49.12	-29.70	40.00	38.72	74.00	24.88	H
9897.000	46.48	-33.20	37.90	41.78	74.00	27.52	H
7269.500	45.76	-34.90	36.40	44.26	74.00	28.24	H

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)
17868.500	55.97	-25.90	46.00	35.87	74.00	18.03	H
14120.000	51.34	-29.40	41.70	39.04	74.00	22.66	H
4917.500	50.14	-36.70	33.30	53.54	74.00	23.86	H
12682.000	48.56	-30.40	39.50	39.46	74.00	25.44	H
9137.500	46.38	-33.70	37.70	42.38	74.00	27.62	V
2485.300	60.09	-19.00	28.20	50.89	74.00	13.91	H

802.11n-HT40

Ch3

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)
17899.500	56.19	-25.90	46.00	36.09	74.00	17.81	V
13740.500	51.63	-29.10	41.10	39.63	74.00	22.37	H
12820.500	49.15	-30.60	39.80	39.95	74.00	24.85	H
4845.000	48.59	-36.90	33.00	52.49	74.00	25.41	H
8514.500	46.50	-33.70	37.30	42.90	74.00	27.50	V
2389.700	59.23	-19.20	28.20	50.23	74.00	14.77	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)
17913.500	56.62	-25.90	46.00	36.52	74.00	17.38	V
14123.000	52.49	-29.40	41.70	40.19	74.00	21.51	H
12743.000	48.84	-30.50	39.60	39.74	74.00	25.16	V
4871.500	48.35	-36.90	33.40	51.85	74.00	25.65	H
9790.500	46.97	-33.10	38.00	42.07	74.00	27.03	H
7537.000	45.63	-34.80	36.30	44.13	74.00	28.37	H

Ch9

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)
17928.000	55.96	-25.90	46.00	35.86	74.00	18.04	H
13742.000	51.51	-29.10	41.10	39.51	74.00	22.49	V
12775.000	49.10	-30.60	39.80	39.90	74.00	24.90	H
8554.000	46.86	-33.80	37.40	43.26	74.00	27.14	V
4886.500	46.70	-36.90	33.40	50.20	74.00	27.30	H
2486.600	57.03	-19.00	28.20	47.83	74.00	16.97	H

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)
4824.000	50.91	-36.90	33.00	54.81	54.00	3.09	H
17910.500	46.38	-25.90	46.00	26.28	54.00	7.62	H
14179.000	41.58	-29.20	41.70	29.08	54.00	12.42	V
12760.500	39.10	-30.50	39.60	30.00	54.00	14.90	V
9615.000	36.95	-33.00	37.60	32.35	54.00	17.05	V
2374.152	44.60	-19.26	28.20	35.66	54.00	9.40	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)
4874.000	49.68	-36.90	33.40	53.18	54.00	4.32	H
17918.000	46.26	-25.90	46.00	26.16	54.00	7.74	V
13829.500	41.66	-28.90	41.20	29.36	54.00	12.34	V
12426.500	39.10	-30.20	39.00	30.30	54.00	14.90	H
9932.500	37.00	-33.30	37.90	32.40	54.00	17.00	H
7513.500	36.09	-34.70	36.40	34.39	54.00	17.91	V

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)
4924.000	50.60	-36.70	33.30	54.00	54.00	3.40	H
17904.500	46.81	-25.90	46.00	26.71	54.00	7.19	V
14109.500	41.48	-29.40	41.70	29.18	54.00	12.52	V
12849.500	39.19	-30.30	39.90	29.59	54.00	14.81	H
9717.000	36.77	-33.10	37.80	32.07	54.00	17.23	H
2487.500	47.66	-19.00	28.20	38.46	54.00	6.34	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)
17936.000	46.27	-25.90	46.00	26.17	54.00	7.73	V
4824.500	44.08	-36.90	33.00	47.98	54.00	9.92	H
14135.000	41.70	-29.40	41.70	29.40	54.00	12.30	H
12956.500	39.26	-29.70	40.00	28.86	54.00	14.74	V
9648.000	37.29	-33.00	37.60	32.69	54.00	16.71	V
2389.900	50.02	-19.20	28.20	41.02	54.00	3.98	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)
17915.000	46.19	-25.90	46.00	26.09	54.00	7.81	V
4878.000	42.46	-36.90	33.40	45.96	54.00	11.54	H
13730.500	42.23	-29.10	41.10	30.23	54.00	11.77	V
12770.500	39.17	-30.50	39.60	30.07	54.00	14.83	V
9923.500	37.52	-33.30	37.90	32.92	54.00	16.48	V
7225.500	36.03	-34.50	36.20	34.33	54.00	17.97	V

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)
17925.500	46.53	-25.90	46.00	26.43	54.00	7.47	H
4926.500	42.44	-36.70	33.30	45.84	54.00	11.56	H
14088.000	42.08	-29.10	41.70	29.48	54.00	11.92	V
11842.500	39.05	-31.10	39.10	31.05	54.00	14.95	H
9821.000	37.05	-33.10	37.90	32.25	54.00	16.95	H
2485.400	47.45	-19.00	28.20	38.25	54.00	6.55	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)
17914.000	46.00	-25.90	46.00	25.90	54.00	8.00	V
4824.500	44.38	-36.90	33.00	48.28	54.00	9.62	H
14108.000	41.82	-29.10	41.70	29.22	54.00	12.18	V
11865.000	39.66	-31.10	39.10	31.66	54.00	14.34	H
9648.000	36.93	-33.00	37.60	32.33	54.00	17.07	H
2389.900	50.57	-19.20	28.20	41.57	54.00	3.43	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)
17896.500	46.27	-25.90	46.00	26.17	54.00	7.73	H
4871.500	42.54	-36.90	33.40	46.04	54.00	11.46	H
14086.500	41.90	-29.10	41.70	29.30	54.00	12.10	V
12344.500	39.03	-30.10	39.00	30.23	54.00	14.97	V
9626.000	37.02	-33.00	37.60	32.42	54.00	16.98	H
7409.500	35.86	-34.40	36.60	33.66	54.00	18.14	V

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)
17915.500	46.07	-25.90	46.00	25.97	54.00	7.93	H
13733.500	41.86	-29.10	41.10	29.86	54.00	12.14	H
4928.500	41.16	-36.70	33.30	44.56	54.00	12.84	H
12362.500	39.18	-30.10	39.00	30.38	54.00	14.82	V
9848.000	37.07	-33.10	37.90	32.27	54.00	16.93	V
2485.600	47.68	-19.00	28.20	38.48	54.00	6.32	H

802.11n-HT40

Ch3

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)
17931.500	46.38	-25.90	46.00	26.28	54.00	7.62	V
14109.500	41.51	-29.40	41.70	29.21	54.00	12.49	V
4838.000	40.77	-36.90	33.00	44.67	54.00	13.23	H
12929.500	39.24	-29.70	40.00	28.84	54.00	14.76	V
9705.000	36.91	-33.10	37.80	32.21	54.00	17.09	V
2389.800	50.18	-19.20	28.20	41.18	54.00	3.82	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)
17920.000	46.63	-25.90	46.00	26.53	54.00	7.37	H
13852.000	41.66	-28.90	41.20	29.36	54.00	12.34	V
4877.000	39.45	-36.90	33.40	42.95	54.00	14.55	H
12954.500	38.97	-29.70	40.00	28.57	54.00	15.03	H
8543.000	36.81	-33.80	37.40	33.21	54.00	17.19	H
7215.500	36.07	-34.50	36.20	34.37	54.00	17.93	V

Ch9

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)
17915.000	46.13	-25.90	46.00	26.03	54.00	7.87	H
13721.000	41.68	-29.10	41.10	29.68	54.00	12.32	V
12765.500	38.94	-30.50	39.60	29.84	54.00	15.06	V
4896.000	37.67	-36.90	33.40	41.17	54.00	16.33	H
8560.000	37.03	-33.80	37.40	33.43	54.00	16.97	V
2485.400	46.70	-19.00	28.20	37.50	54.00	7.30	H

Test graphs as below:

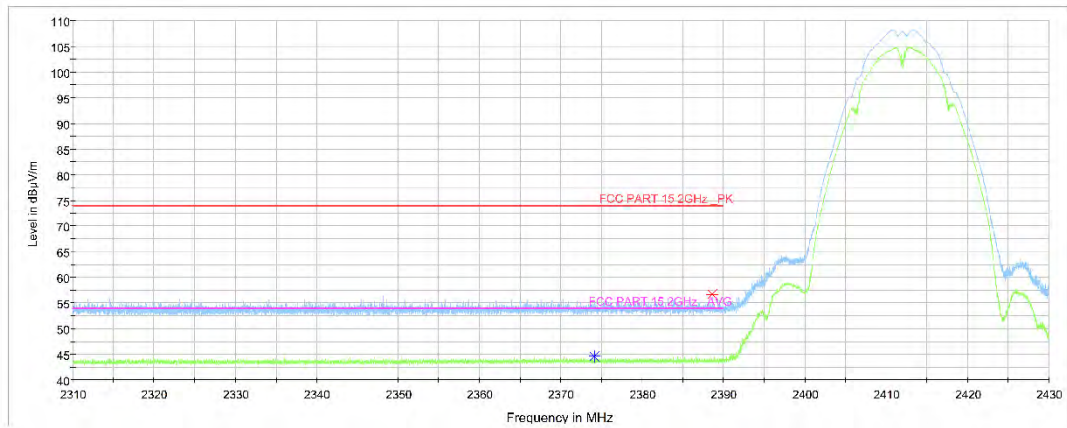


Fig.A.6.2.1 Transmitter Spurious Emission - Radiated (Power): 802.11b, ch1, 2.31 GHz – 2.43GHz

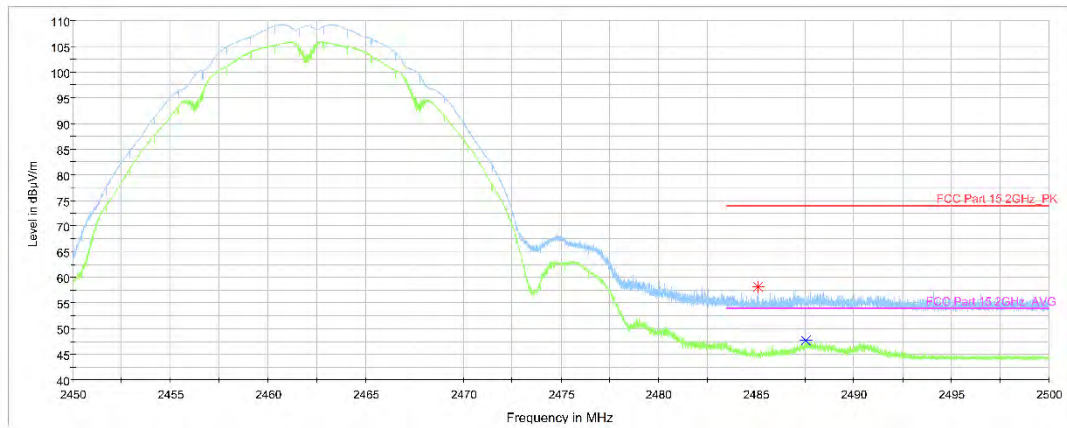


Fig.A.6.2.2 Transmitter Spurious Emission - Radiated (Power): 802.11b, ch11, 2.45 GHz - 2.50GHz

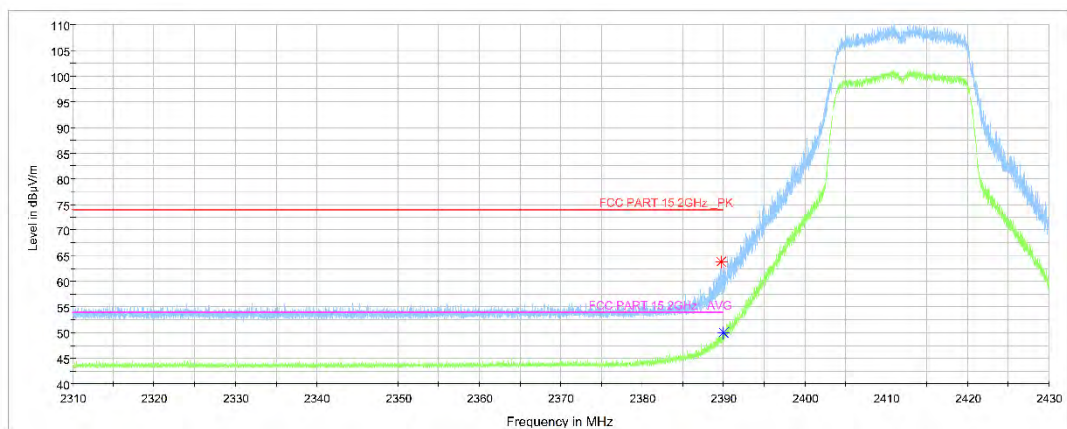


Fig.A.6.2.3 Transmitter Spurious Emission - Radiated (Power): 802.11g, ch1, 2.31 GHz - 2.43GHz

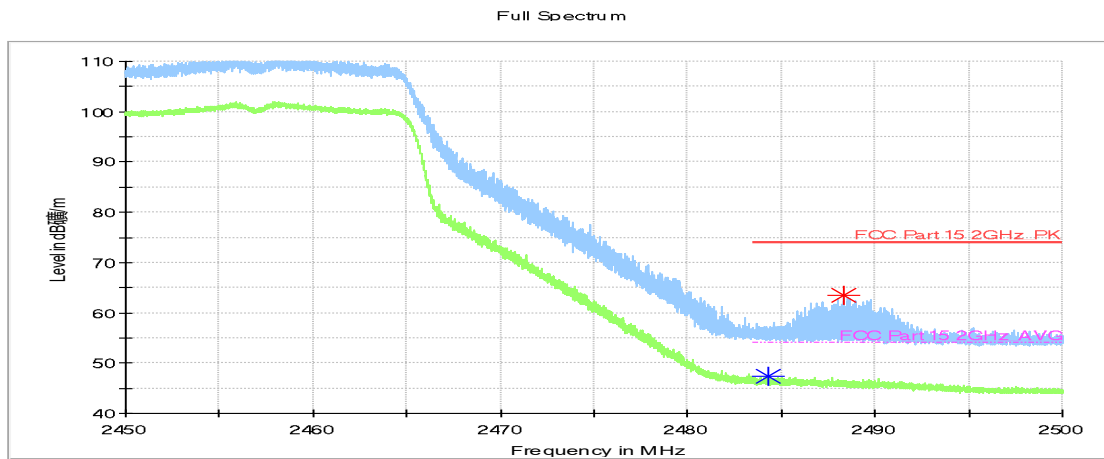


Fig.A.6.2.4 Transmitter Spurious Emission - Radiated (Power): 802.11g, ch10, 2.45 GHz - 2.50GHz

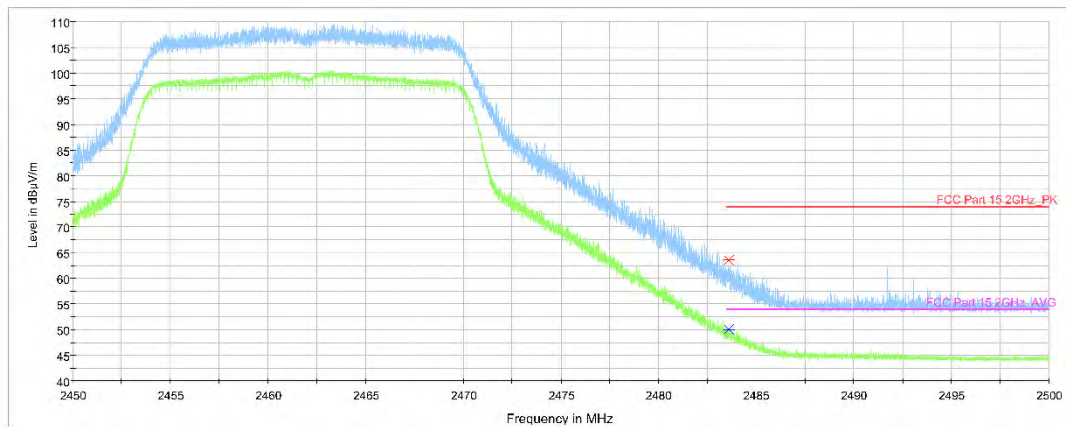


Fig.A.6.2.5 Transmitter Spurious Emission - Radiated (Power): 802.11g, ch11, 2.45 GHz - 2.50GHz

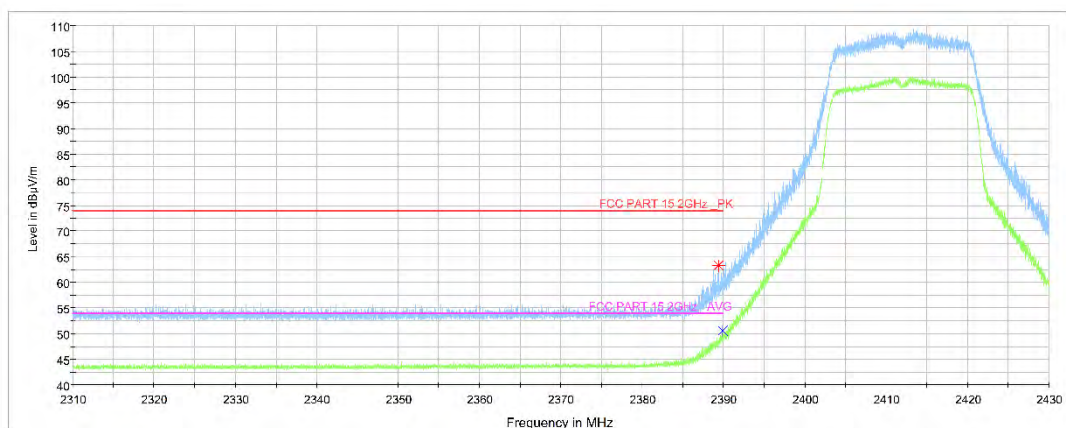


Fig.A.6.2.6 Transmitter Spurious Emission - Radiated (Power): 802.11n-HT20, ch1, 2.31 GHz - 2.43GHz

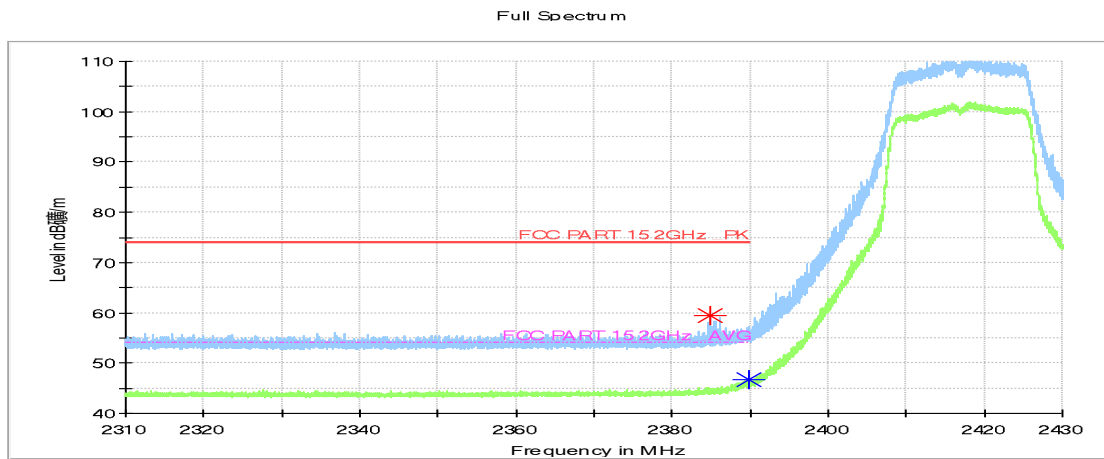


Fig.A.6.2.7 Transmitter Spurious Emission - Radiated (Power): 802.11n-HT20, ch2, 2.31 GHz - 2.43GHz

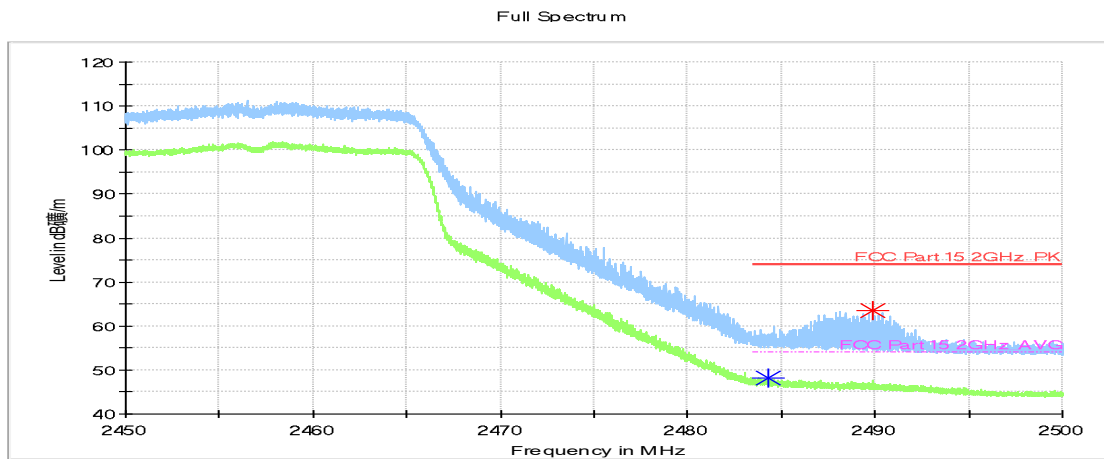


Fig.A.6.2.8 Transmitter Spurious Emission - Radiated (Power): 802.11n-HT20, ch10, 2.45 GHz - 2.50GHz

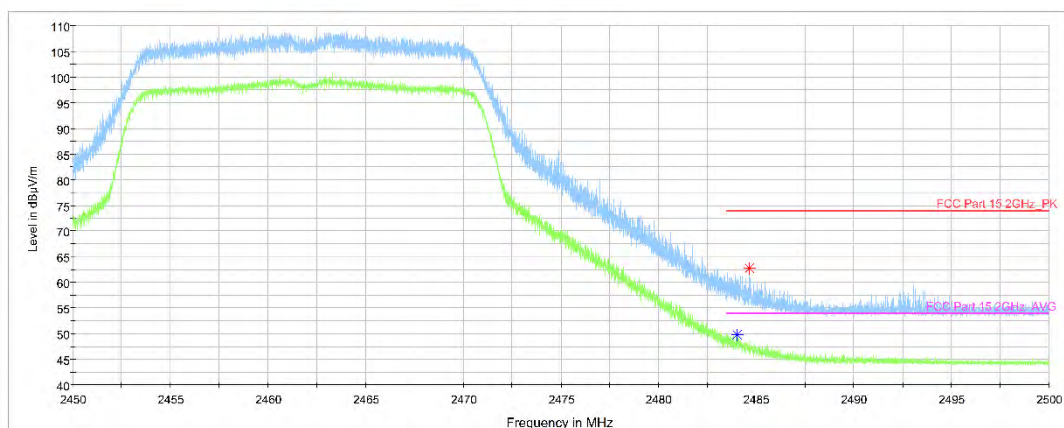


Fig.A.6.2.9 Transmitter Spurious Emission - Radiated (Power): 802.11n-HT20, ch11, 2.45 GHz - 2.50GHz

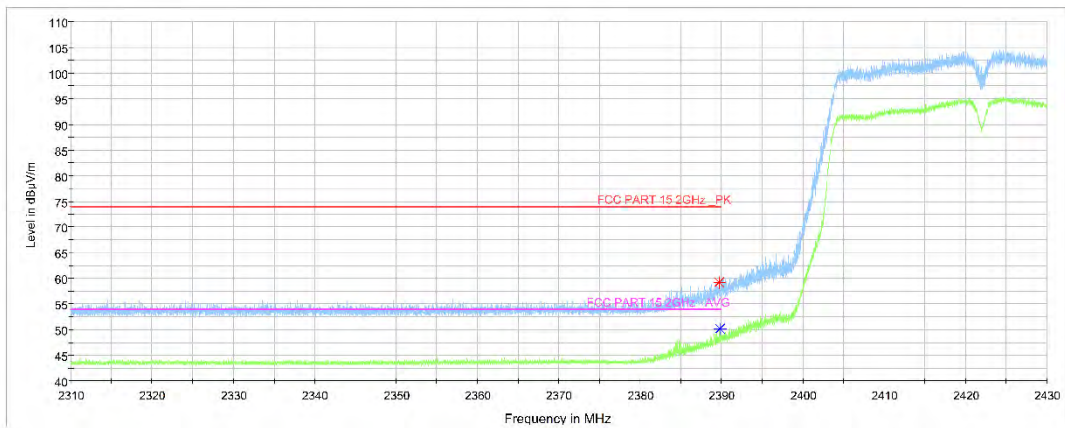


Fig.A.6.2.10 Transmitter Spurious Emission - Radiated (Power): 802.11n-HT40, ch3, 2.31 GHz - 2.43GHz

Full Spectrum

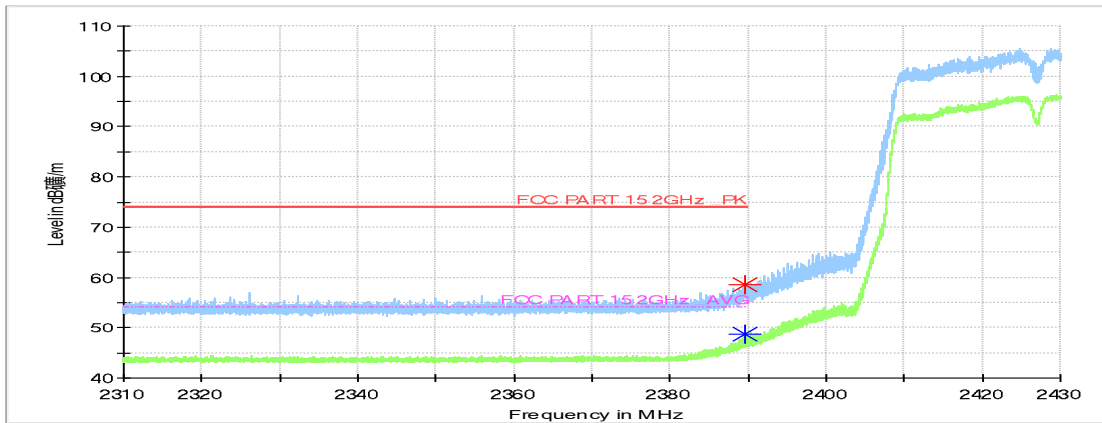


Fig.A.6.2.11 Transmitter Spurious Emission - Radiated (Power): 802.11n-HT40, ch4, 2.31 GHz - 2.43GHz

Full Spectrum

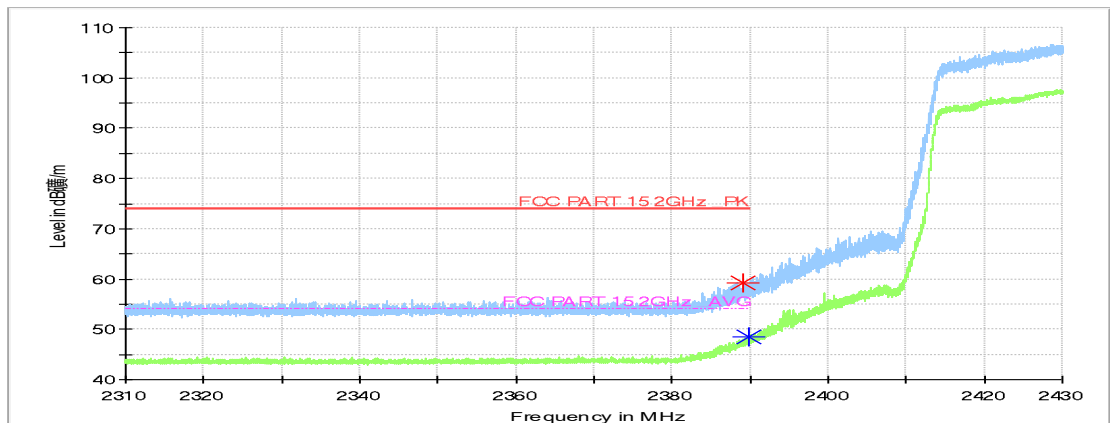


Fig.A.6.2.12 Transmitter Spurious Emission - Radiated (Power): 802.11n-HT40, ch5, 2.31 GHz - 2.43GHz

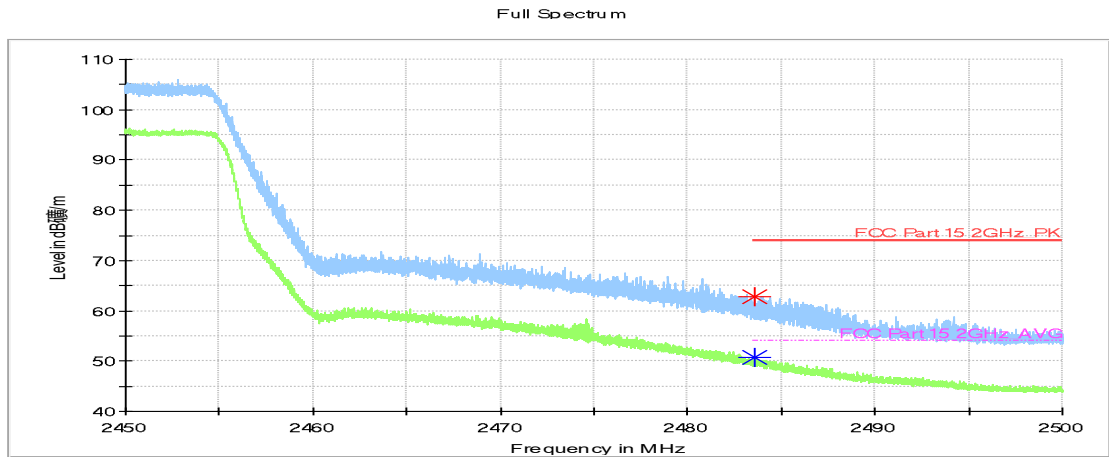


Fig.A.6.2.13 Transmitter Spurious Emission - Radiated (Power): 802.11n-HT40, ch6, 2.45 GHz - 2.50GHz

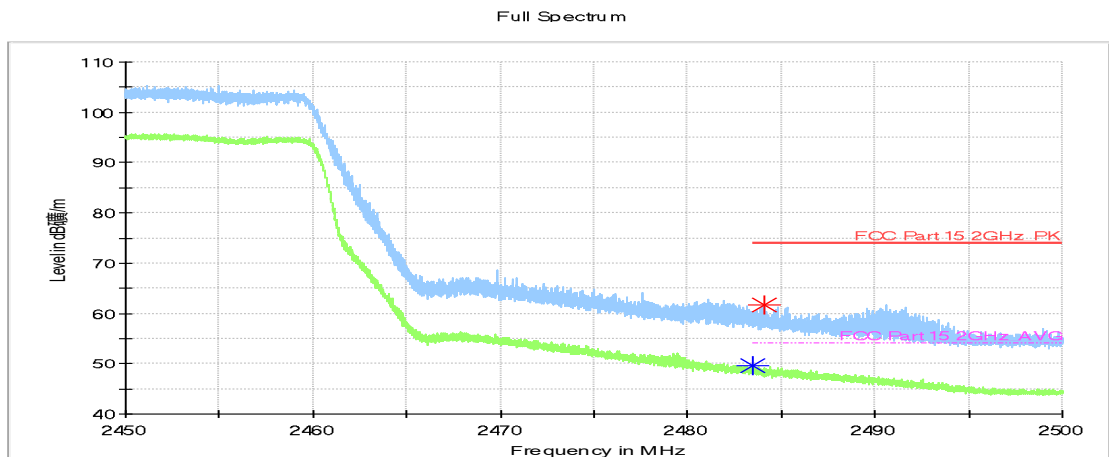


Fig.A.6.2.14 Transmitter Spurious Emission - Radiated (Power): 802.11n-HT40, ch7, 2.45 GHz - 2.50GHz

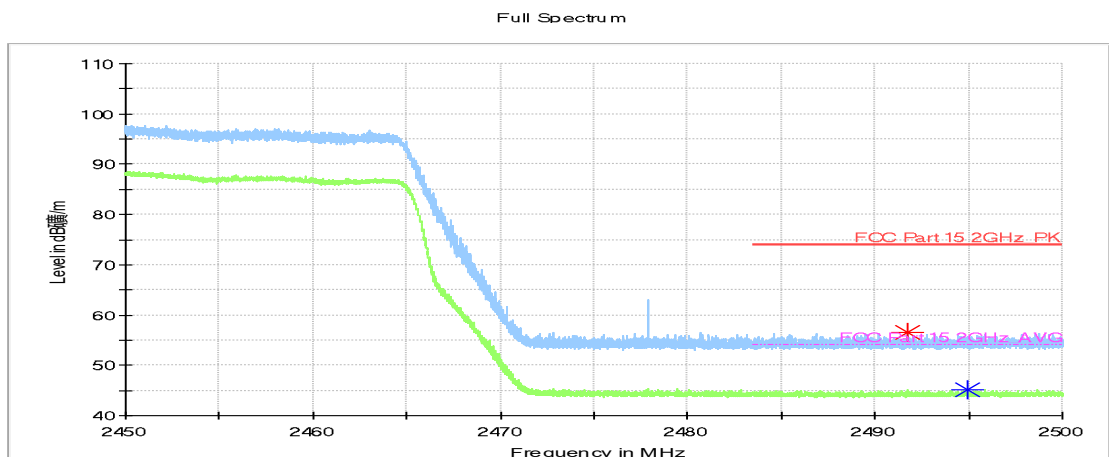


Fig.A.6.2.15 Transmitter Spurious Emission - Radiated (Power): 802.11n-HT40, ch8, 2.45 GHz - 2.50GHz

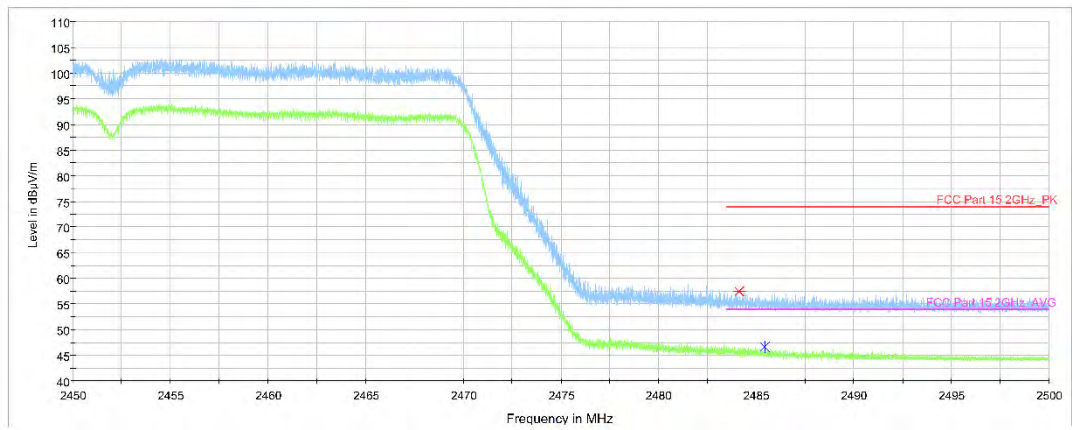


Fig.A.6.2.16 Transmitter Spurious Emission - Radiated (Power): 802.11n-HT40, ch9, 2.45 GHz - 2.50GHz

A.7. 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.

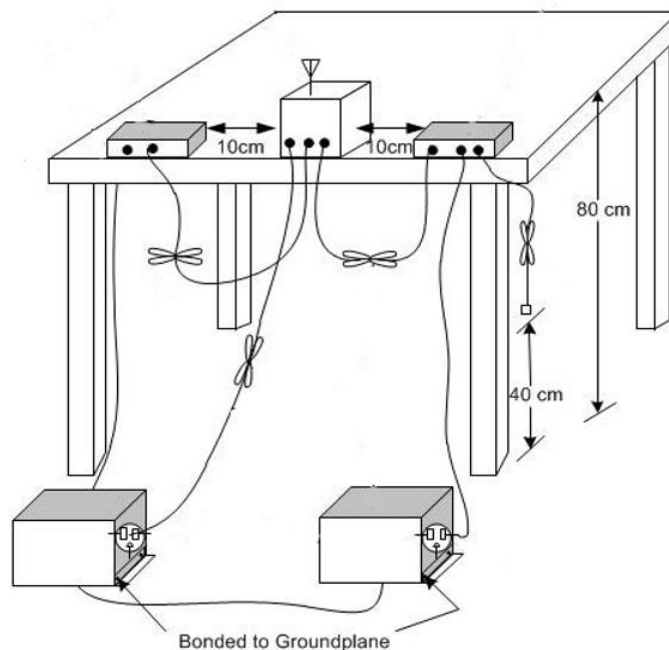
The measurement bandwidth is:

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

Test Condition:

Voltage (V)	Frequency (Hz)
120	60

Test setup



Measurement Result and limit:

WLAN (Quasi-peak Limit)

Frequency range (MHz)	Quasi-peak Limit (dB μ V)	Result (dB μ V)		Conclusion
		With charger		
		802.11b	Idle	
0.15 to 0.5	66 to 56	Fig.A.7.1	Fig.A.7.2	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 (dB μ V)	Result (dB μ V)		Conclusion
		With charger		
		802.11b	Idle	
0.15 to 0.5	56 to 46	Fig.A.7.1	Fig.A.7.2	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:

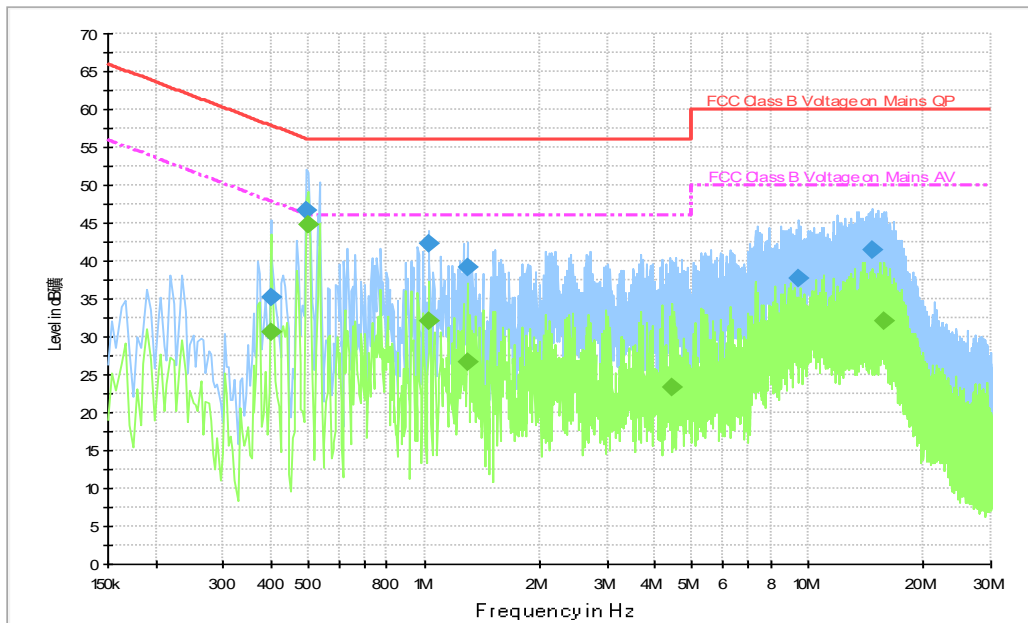


Fig.A.7.1 AC Powerline Conducted Emission-802.11b

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

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.398000	35.1	2000.0	9.000	On	L1	20.0	22.8	57.9
0.494000	46.7	2000.0	9.000	On	L1	20.0	9.4	56.1
1.030000	42.3	2000.0	9.000	On	L1	19.9	13.7	56.0
1.294000	39.2	2000.0	9.000	On	L1	19.9	16.8	56.0
9.502000	37.7	2000.0	9.000	On	L1	19.9	22.3	60.0
14.702000	41.4	2000.0	9.000	On	L1	20.0	18.6	60.0

Final Result 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.398000	30.6	2000.0	9.000	On	L1	20.0	17.3	47.9
0.498000	44.8	2000.0	9.000	On	N	19.9	1.2	46.0
1.030000	32.2	2000.0	9.000	On	L1	19.9	13.8	46.0
1.294000	26.7	2000.0	9.000	On	L1	19.9	19.3	46.0
4.418000	23.2	2000.0	9.000	On	L1	19.8	22.8	46.0
15.782000	32.1	2000.0	9.000	On	L1	20.0	17.9	50.0

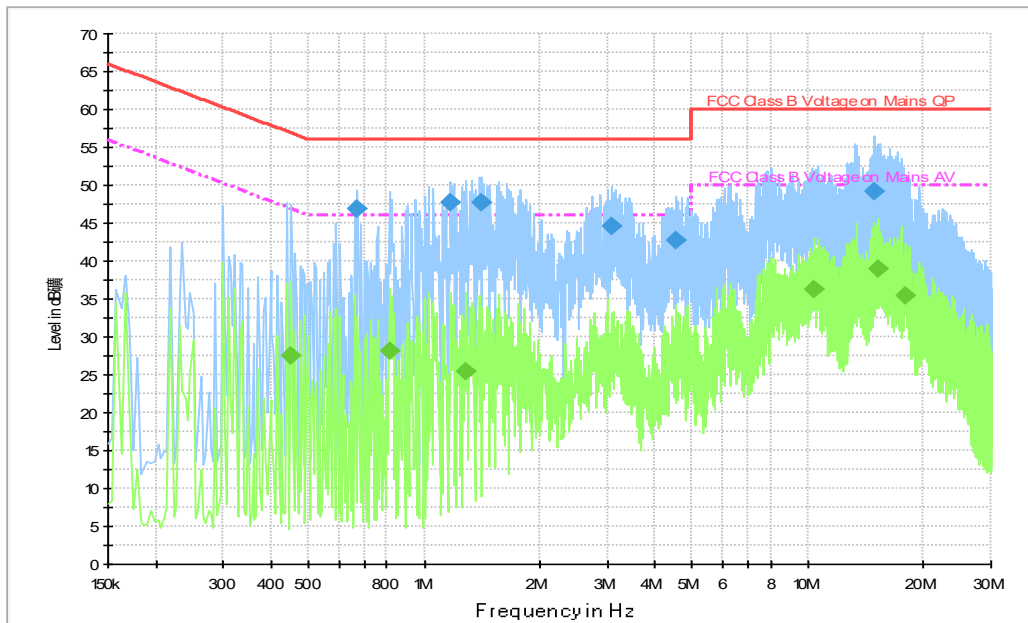


Fig.A.7.2 AC Powerline Conducted Emission-Idle

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

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.670000	47.0	2000.0	9.000	On	L1	20.0	9.0	56.0
1.170000	47.7	2000.0	9.000	On	L1	19.9	8.3	56.0
1.406000	47.7	2000.0	9.000	On	L1	19.9	8.3	56.0
3.094000	44.5	2000.0	9.000	On	L1	19.8	11.5	56.0
4.546000	42.7	2000.0	9.000	On	L1	19.8	13.3	56.0
14.862000	49.2	2000.0	9.000	On	L1	20.0	10.8	60.0

Final Result 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.450000	27.5	2000.0	9.000	On	L1	20.0	19.4	46.9
0.810000	28.0	2000.0	9.000	On	L1	19.9	18.0	46.0
1.278000	25.5	2000.0	9.000	On	L1	19.9	20.5	46.0
10.318000	36.2	2000.0	9.000	On	L1	19.9	13.8	50.0
15.242000	39.0	2000.0	9.000	On	L1	20.0	11.0	50.0
17.882000	35.5	2000.0	9.000	On	L1	20.0	14.5	50.0



A.8. 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.

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 McInturf, 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*****