FCC PART 15C
TEST REPORT
No.I23Z60340-IOT03

for

Wingtech Group (Hong Kong) Limited

5G Mobile Phone

TMRV065G

With

FCC ID: 2APXW-TMRV065G

Hardware Version: V1.0

Software Version: TMRV065G_0.01.01

Issued Date: 2023-04-11

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.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S.Government.

Test Laboratory:

CTTL-Telecommunication Technology Labs, CAICT

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

Tel:+86(0)10-62304633-2512, Fax:+86(0)10-62304633-2504

Email: cttl_terminals@caict.ac.cn, website: www.caict.ac.cn

REPORT HISTORY

Report Number	Revision	Description	Issue Date
I23Z60340-IOT03	Rev.0	1st edition	2023-04-11

CONTENTS

1. Test Laboratory

1.1. Introduction & Accreditation

Telecommunication Technology Labs, CAICT is an ISO/IEC 17025:2017 accredited test laboratory under NATIONAL VOLUNTARY LABORATORY ACCREDITATION PROGRAM (NVLAP) with lab code 600118-0, and is also an FCC accredited test laboratory (CN5017), and ISED accredited test laboratory (ISED#: 24849). The detail accreditation scope can be found on NVLAP website.

1.2. Testing Location

Conducted testing Location: CTTL (Huayuan North Road)

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

Radiated testing Location: 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℃

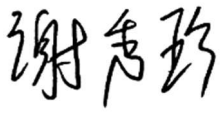
Relative Humidity: 20-75%

1.4. Project date

Testing Start Date: 2023-02-28

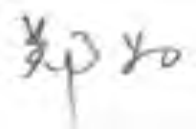
Testing End Date: 2023-04-11

1.5. Signature



Xie Xiuzhen

(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:	Wingtech Group (Hong Kong) Limited
Address:	Flat/RM 1903 19/F, Podium Plaza, 5 Hanoi Road, Tsim Sha Tsui, KL, HK
City:	Hong Kong
Postal Code:	/
Country:	China
Telephone:	+86-21-53529900
Fax:	/

2.2. Manufacturer Information

Company Name:	Wingtech Group (Hong Kong) Limited
Address:	Flat/RM 1903 19/F, Podium Plaza, 5 Hanoi Road, Tsim Sha Tsui, KL, HK
City:	Hong Kong
Postal Code:	/
Country:	China
Telephone:	+86-21-53529900
Fax:	/

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

3.1. About EUT

Description	5G Mobile Phone
Model name	TMRV065G
FCC ID	2APXW-TMRV065G
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	27.17dBm
Power Supply	3.85V

3.2. Internal Identification of EUT

EUT ID*	SN or IMEI	HW Version	SW Version
UT22a	861690060031057	V1.0	TMRV065G_0.01.01
UT09a	861690060031701	V1.0	TMRV065G_0.01.01

*EUT ID: is used to identify the test sample in the lab internally.
UT09a is used for Conduction test, UT22a is used for Radiation test.

3.3. Internal Identification of AE

AE ID*	Description	SN
AE1	Battery	/
AE2	Charger	/
AE3	USB Cable	/

AE1

Model	RE001
Manufacturer	SUNWODA ELECTRONIC CO ., LTD
Capacity	4500mAh
Nominal Voltage	

AE2

Model	BLJ-QC06HU
Manufacturer	Zhongshan Baolijin Electronic Co., Ltd
Length of cable	/

AE3

Model	USB AM TO TYPE-C2.0
Manufacturer	Huizhou WASHIN Electronics Co.，Ltd
Length of cable	/

*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 5G Mobile Phone with integrated antenna and inbuilt battery.

It has Bluetooth (EDR) function.

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	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

5. Test Results

5.1. 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

5.2. Statements

The test cases as listed in section 5.1 of this report for the EUT specified in section 3 was performed by CTTL and according to the standards or reference documents listed in section 4.2 The EUT met all requirements of the standards or reference documents, and only the WLAN function was tested in this report.

5.3. Test Conditions

T nom	Normal Temperature
T min	Low Temperature
T max	High Temperature
V nom	Normal Voltage

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

Temperature	T nom	26℃
Voltage	V nom	3.85V
Humidity	H nom	20-75%

6. Test Facilities Utilized

Conducted test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Period	Calibration Due date
1	Vector Signal Analyzer	FSW67	104051	Rohde & Schwarz	1 year	2024-03-06
2	LISN	ENV216	101200	Rohde & Schwarz	1 year	2023-06-29
3	Test Receiver	ESU26	100235	R&S	1 year	2023-04-07
4	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	2023-10-25
2	EMI Antenna	VULB 9163	01223	SCHWARZBECK	1 year	2023-07-25
3	EMI Antenna	3115	00167250	ETS-Lindgren	1 year	2023-06-20

7. Measurement Uncertainty

7.1. Maximum Output Power

Measurement Uncertainty: 0.387dB,k=1.96

7.2. Peak Power Spectral Density

Measurement Uncertainty: 0.705dB,k=1.96

7.3. DTS 6-dB Signal Bandwidth

Measurement Uncertainty: 60.80Hz,k=1.96

7.4. Band Edges Compliance

Measurement Uncertainty : 0.62dB,k=1.96

7.5. 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

Radiated (k=2)

Frequency Range	Uncertainty(dB)
9kHz-30MHz	/
30MHz ≤ f ≤ 1GHz	5.15
1GHz ≤ f ≤18GHz	5.54
18GHz ≤ f ≤40GHz	5.26

7.6. 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

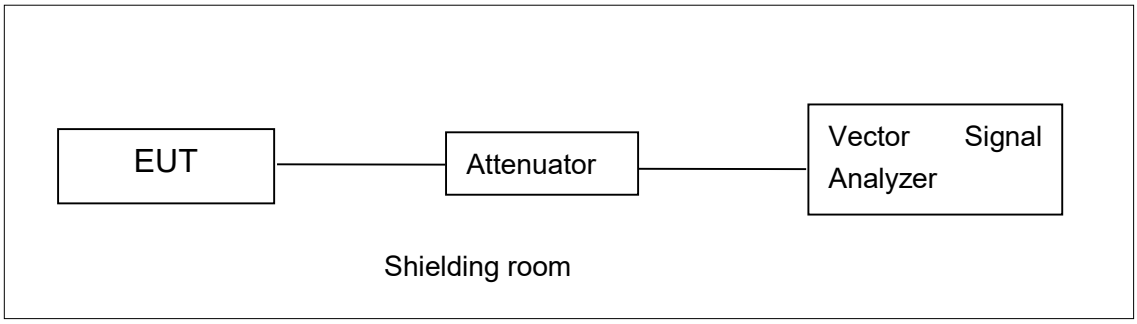


Fig.A.1.1.1: Test Setup Diagram for Conducted Measurements

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 = 10Hz;

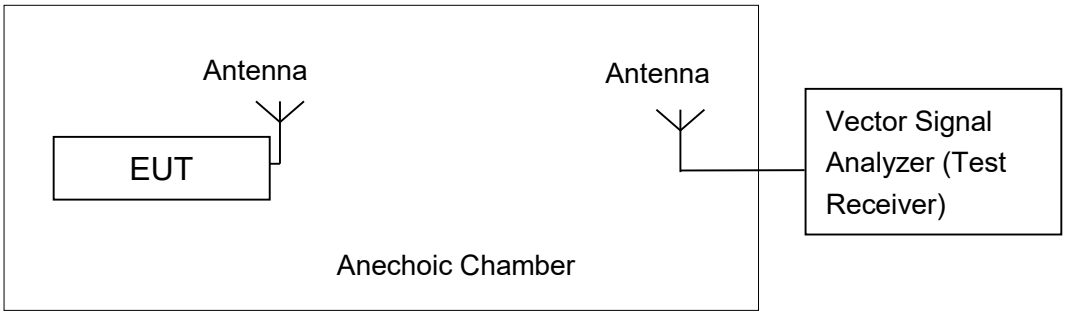


Fig.A.1.2.1: Test Setup Diagram for Radiated Measurements

A.2. Maximum Output Power

Method of Measurement: See ANSI C63.10-2013-clause 11.9.1.1

a) Set the RBW ≥ DTS bandwidth.
b) Set VBW ≥ [3 × RBW].
c) Set span ≥ [3 × RBW].
d) Sweep time = auto couple.
e) Detector = peak.
f) Trace mode = max hold.
g) Allow trace to fully stabilize.
h) Use peak marker function to determine the peak amplitude level.

Measurement Limit:

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

EUT ID: UT09a

A.2.1. Peak Output Power-conducted

Antenna Gain: -1.8dBi

Measurement Results:

802.11b/g mode

Mode	Data Rate (Mbps)	Test Result (dBm)		
		2412MHz (Ch1)	2437MHz (Ch6)	2462 MHz (Ch11)
802.11b	1	24.25	24.32	24.43
802.11g	6	24.50	27.17	24.75

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	24.40	26.40	23.87

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	24.30	24.65	23.06

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

The duty cycle of all mode are 100%

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

Measurement Results:

802.11b/g mode

Mode	Channel	Power Spectral Density (dBm/3 kHz)		Conclusion
802.11b	1	Fig.A.3.1	-0.17	P
	6	Fig.A.3.2	-0.38	P
	11	Fig.A.3.3	-0.08	P
802.11g	1	Fig.A.3.4	-8.00	P
	6	Fig.A.3.5	-5.02	P
	11	Fig.A.3.6	-7.31	P

802.11n-HT20 mode

Mode	Channel	Power Spectral Density (dBm/3 kHz)		Conclusion
802.11n (HT20)	1	Fig.A.3.7	-7.90	P
	6	Fig.A.3.8	-6.31	P
	11	Fig.A.3.9	-8.76	P

802.11n-HT40 mode

Mode	Channel	Power Spectral Density (dBm/3 kHz)		Conclusion
802.11n (HT40)	3	Fig.A.3.10	-10.93	P
	6	Fig.A.3.11	-10.03	P
	9	Fig.A.3.12	-12.68	P

Conclusion: Pass

Test graphs as below:

Fig.A.3.1 Power Spectral Density(802.11b,Ch1)

Fig.A.3.2 Power Spectral Density (802.11b, Ch 6)

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Fig.A.3.3 Power Spectral Density (802.11b, Ch 11)

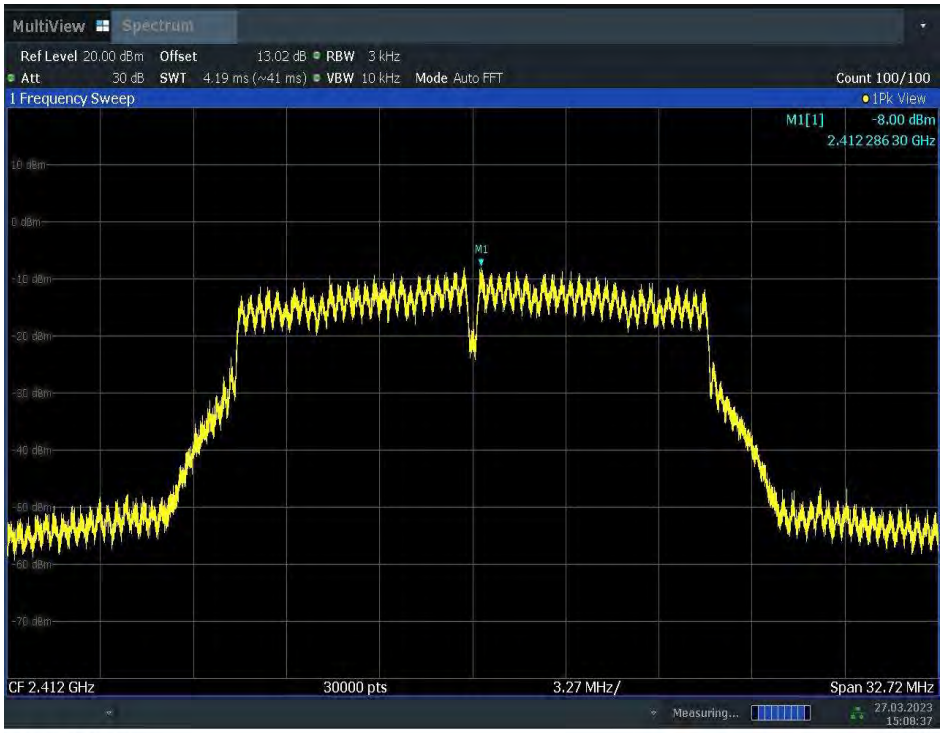

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Fig.A.3.4 Power Spectral Density (802.11g, Ch 1)

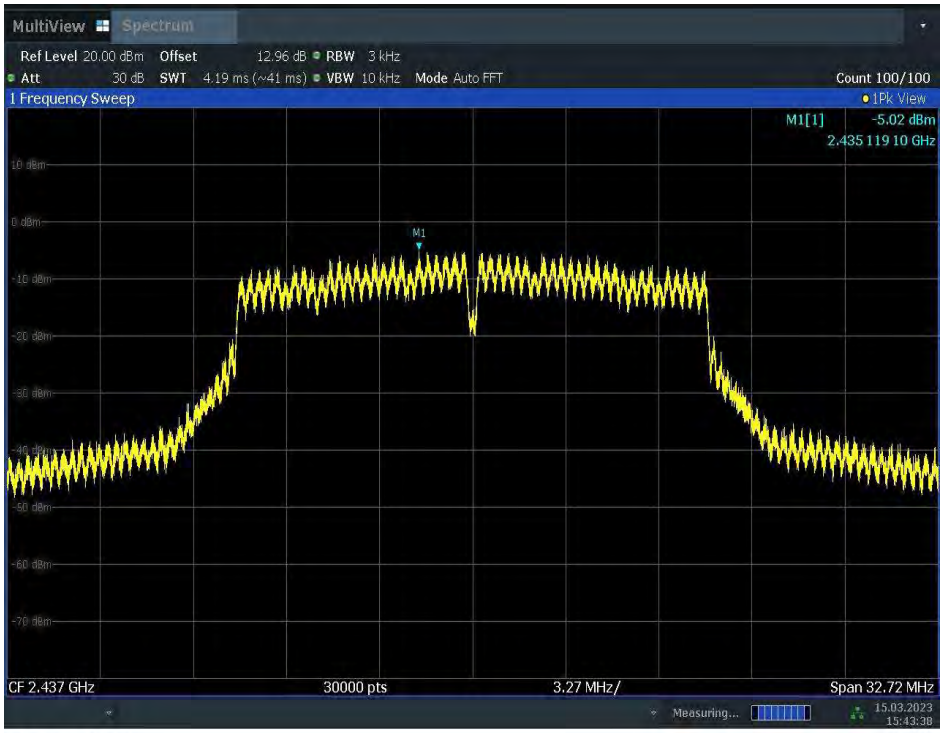

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Fig.A.3.5 Power Spectral Density (802.11g, Ch 6)

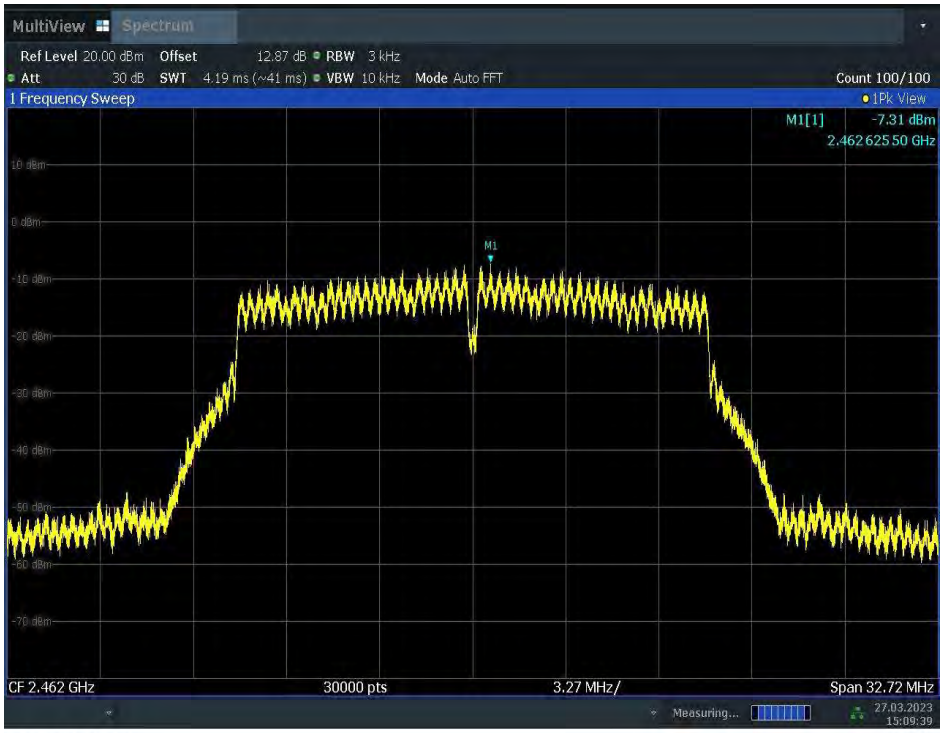

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Fig.A.3.6 Power Spectral Density (802.11g, Ch 11)

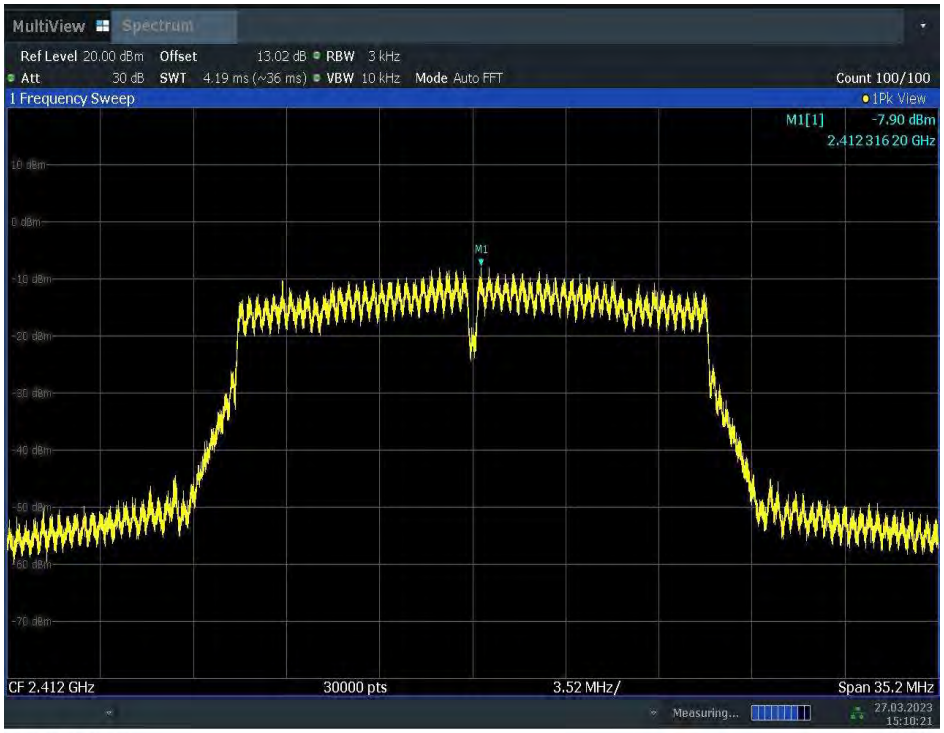

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Fig.A.3.7 Power Spectral Density (802.11n-HT20, Ch 1)

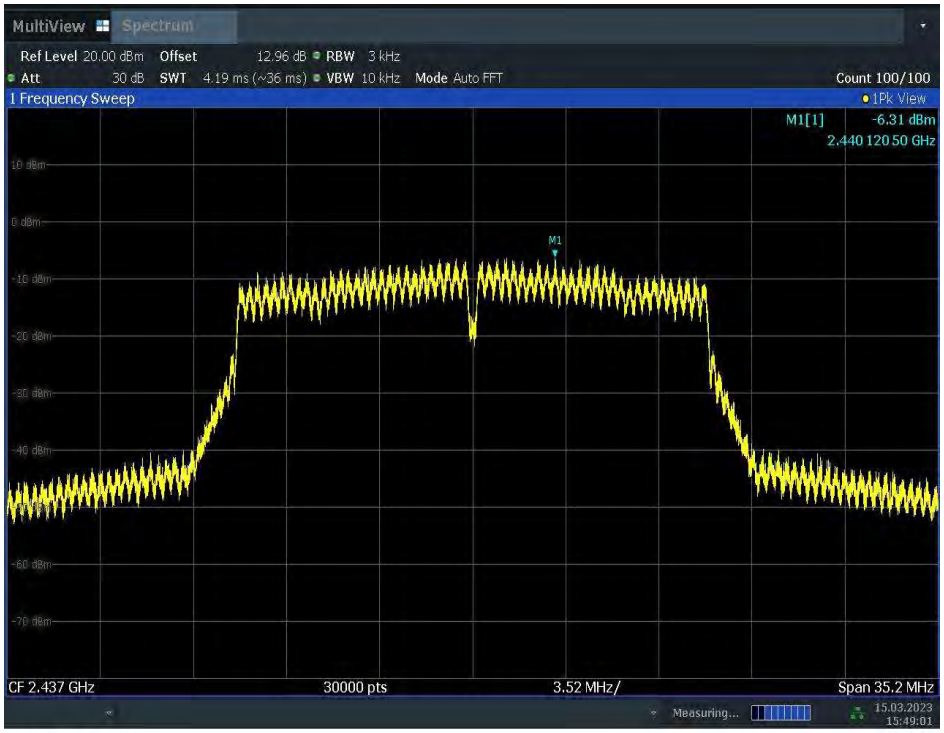

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Fig.A.3.8 Power Spectral Density (802.11n-HT20, Ch 6)

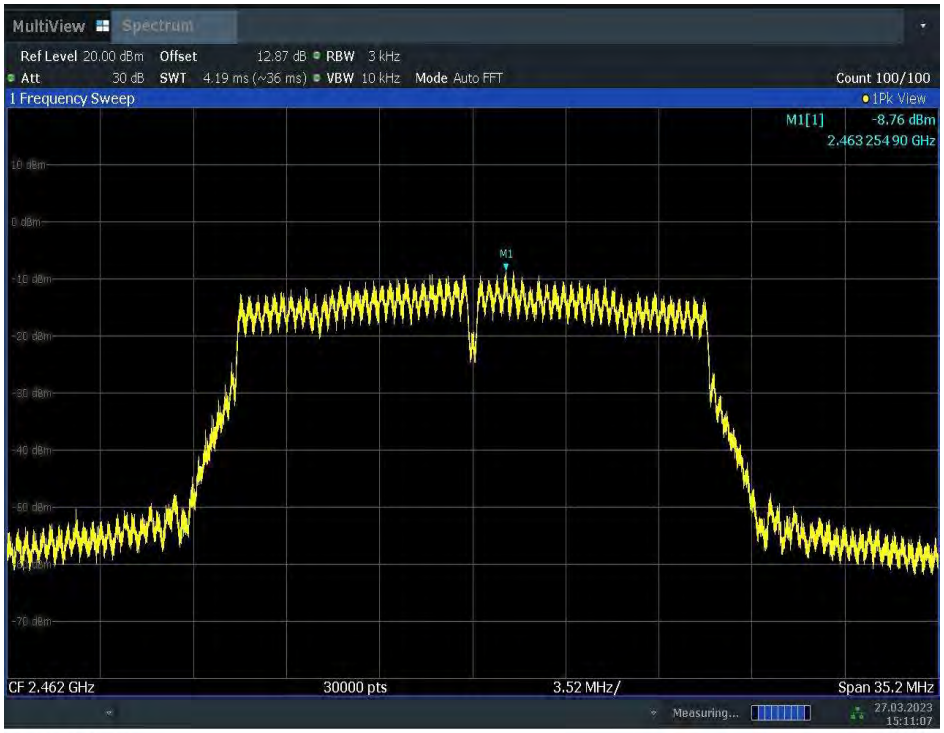

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Fig.A.3.9 Power Spectral Density (802.11n-HT20, Ch 11)

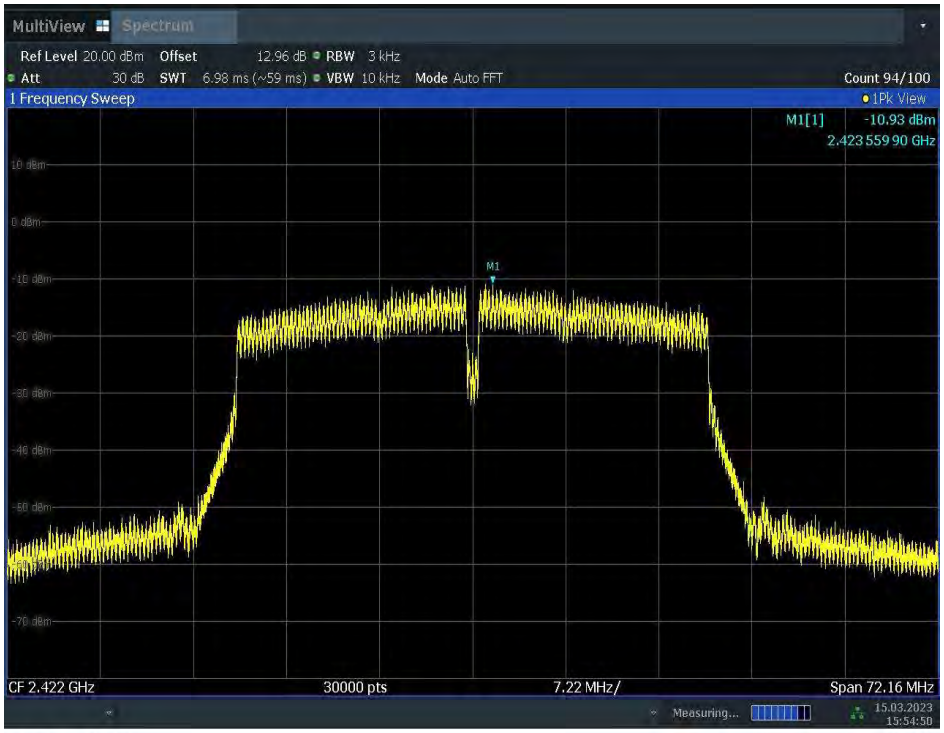

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Fig.A.3.10 Power Spectral Density (802.11n-HT40, Ch 3)

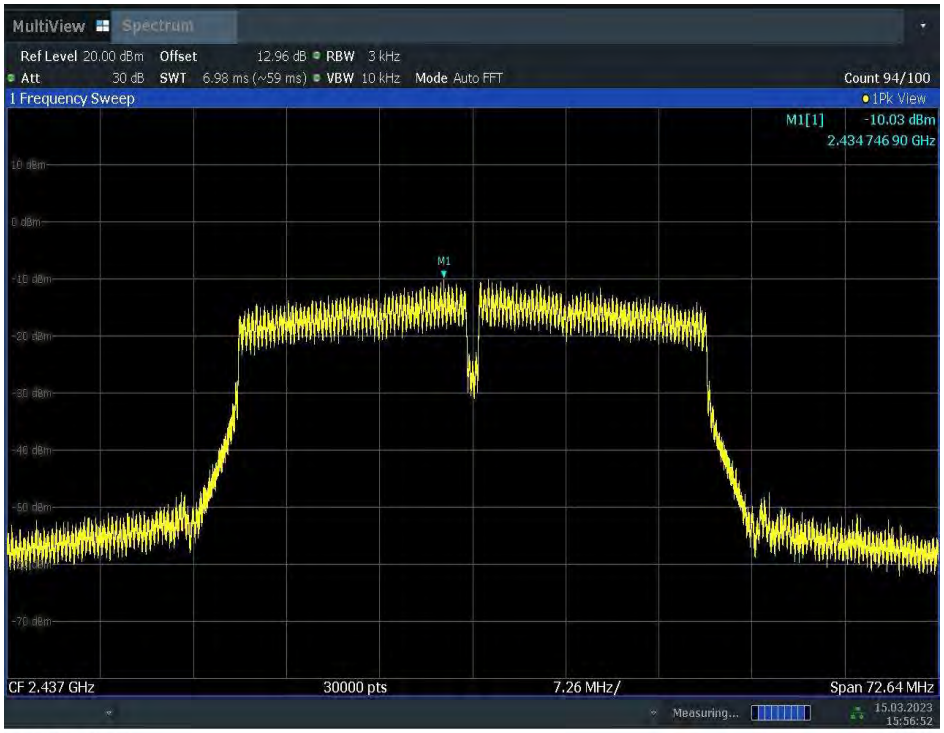

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Fig.A.3.11 Power Spectral Density (802.11n-HT40, Ch 6)

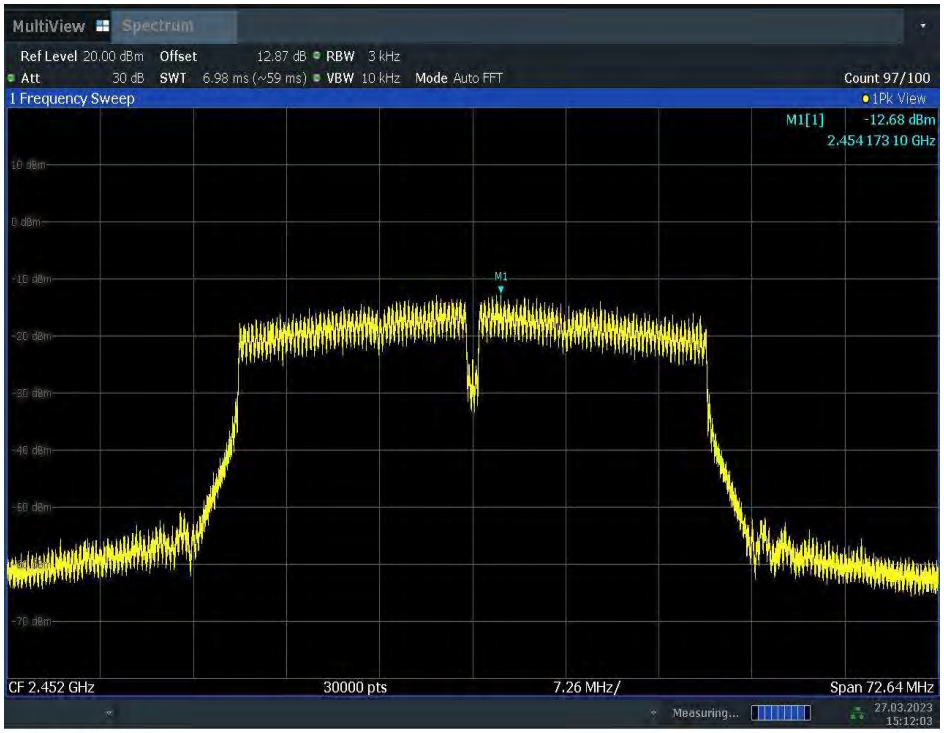

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Fig.A.3.12 Power Spectral Density (802.11n-HT40, Ch 9)

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: UT09a

Measurement Result:

802.11b/g mode

Mode	Channel	Occupied 6dB Bandwidth (MHz)		conclusion
802.11b	1	Fig.A.4.1	8.56	P
	6	Fig.A.4.2	8.04	P
	11	Fig.A.4.3	8.04	P
802.11g	1	Fig.A.4.4	16.36	P
	6	Fig.A.4.5	16.36	P
	11	Fig.A.4.6	16.36	P

802.11n-HT20 mode

Mode	Channel	Occupied 6dB Bandwidth (MHz)		conclusion
802.11n (HT20)	1	Fig.A.4.7	17.60	P
	6	Fig.A.4.8	17.60	P
	11	Fig.A.4.9	17.60	P

802.11n-HT40 mode

Mode	Channel	Occupied 6dB Bandwidth (MHz)		conclusion
802.11n (HT40)	3	Fig.A.4.10	36.08	P
	6	Fig.A.4.11	36.32	P
	9	Fig.A.4.12	36.32	P

Conclusion: Pass

Test graphs as below:

Fig.A.4.1 Occupied 6dB Bandwidth(802.11b,Ch 1)

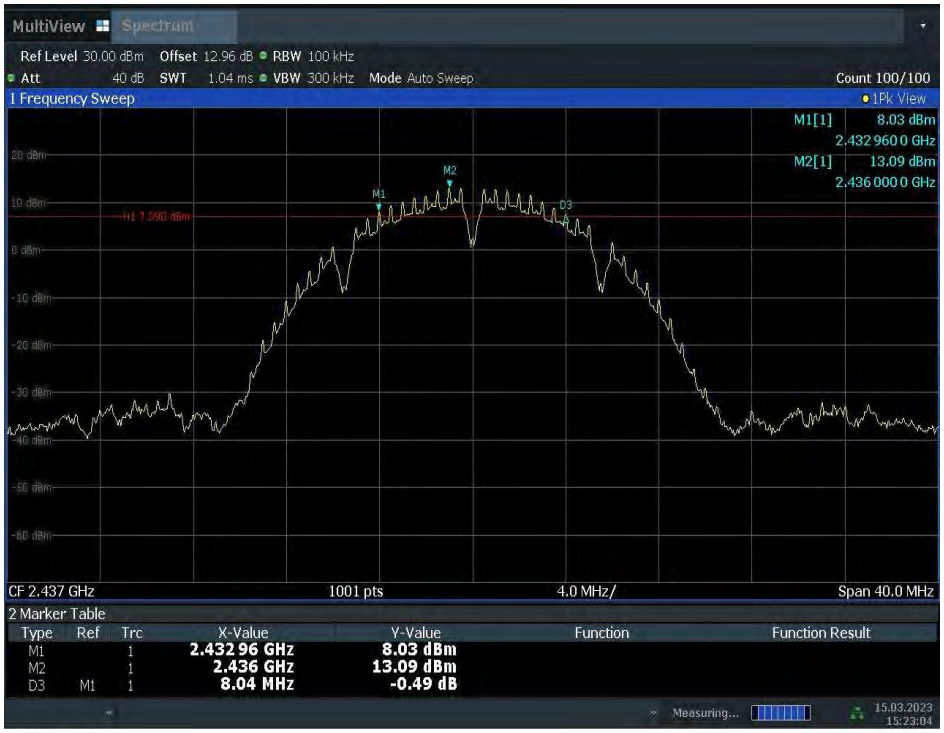

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Fig.A.4.2 Occupied 6dB Bandwidth (802.11b, Ch 6)

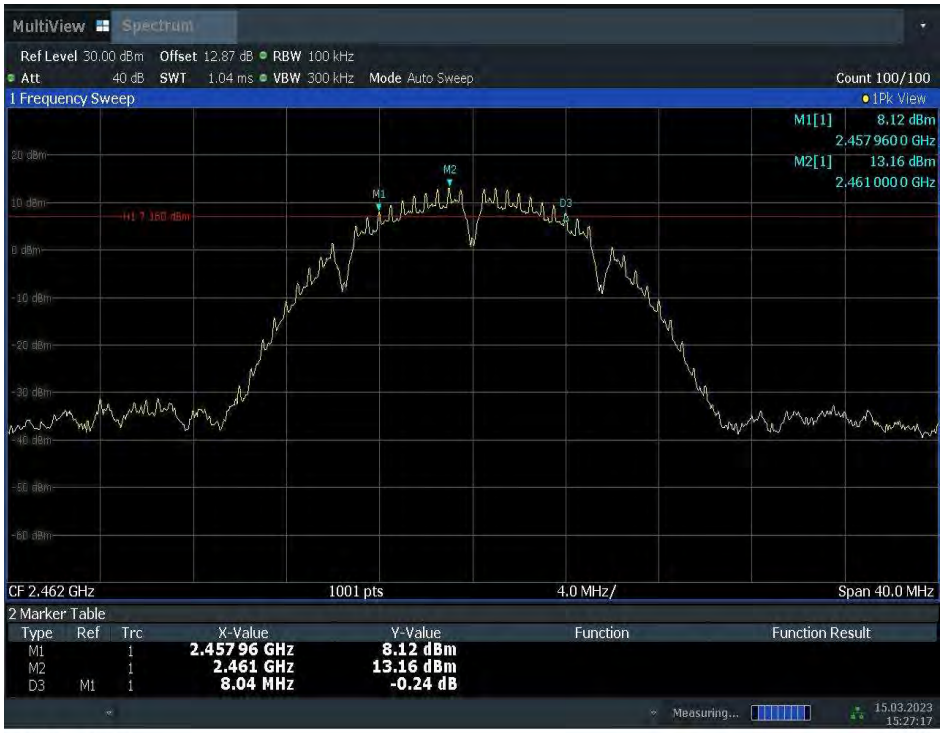

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Fig.A.4.3 Occupied 6dB Bandwidth (802.11b, Ch 11)

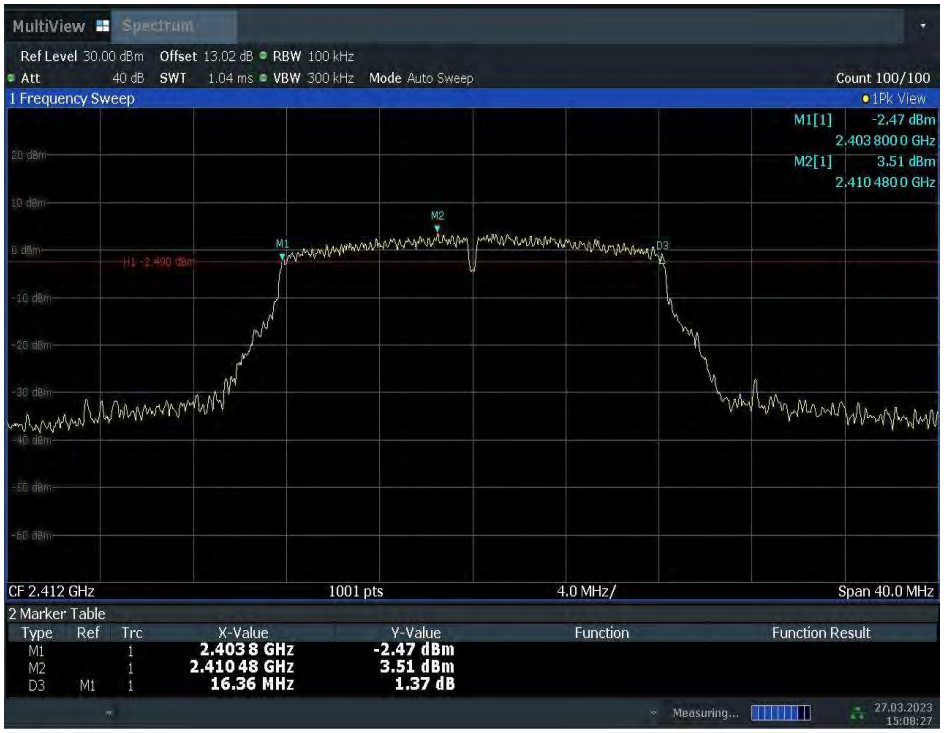

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Fig.A.4.4 Occupied 6dB Bandwidth (802.11g, Ch 1)

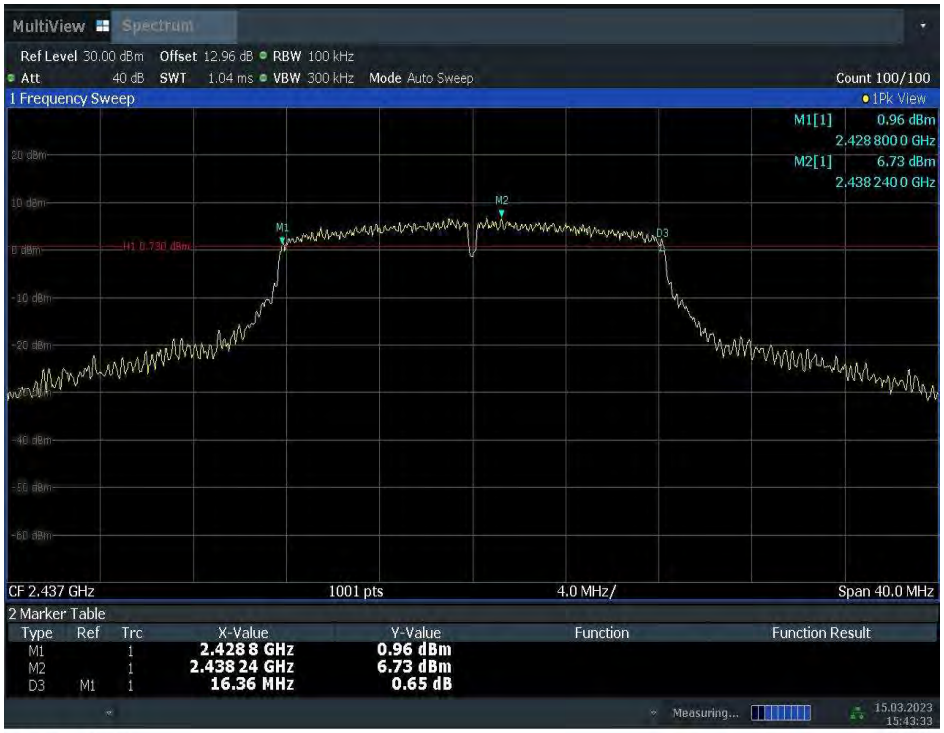

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Fig.A.4.5 Occupied 6dB Bandwidth (802.11g, Ch 6)

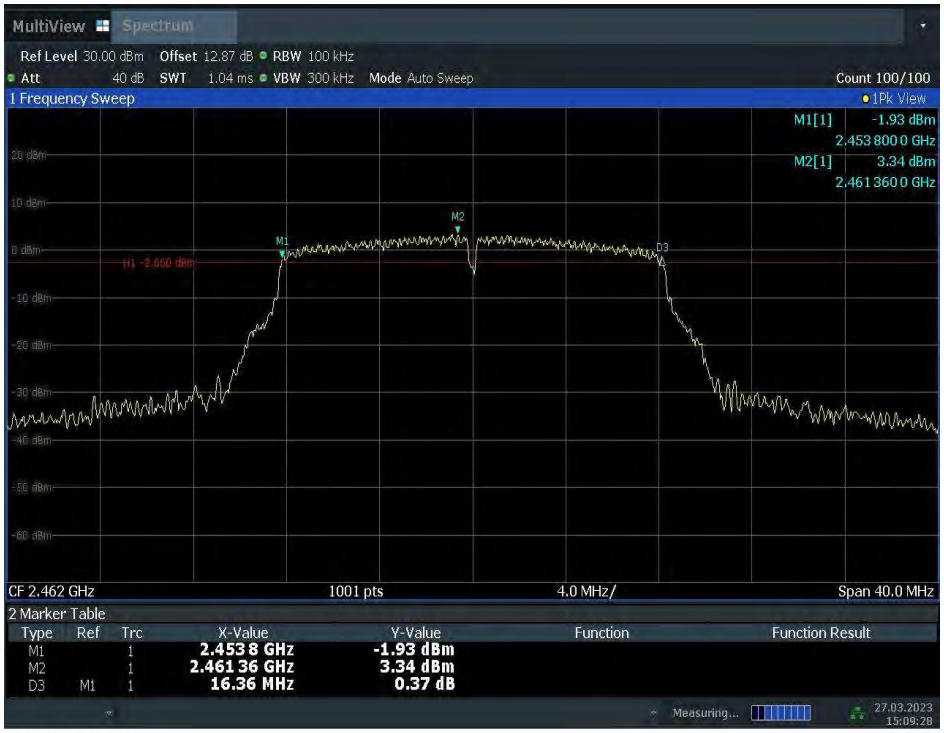

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Fig.A.4.6 Occupied 6dB Bandwidth (802.11g, Ch 11)

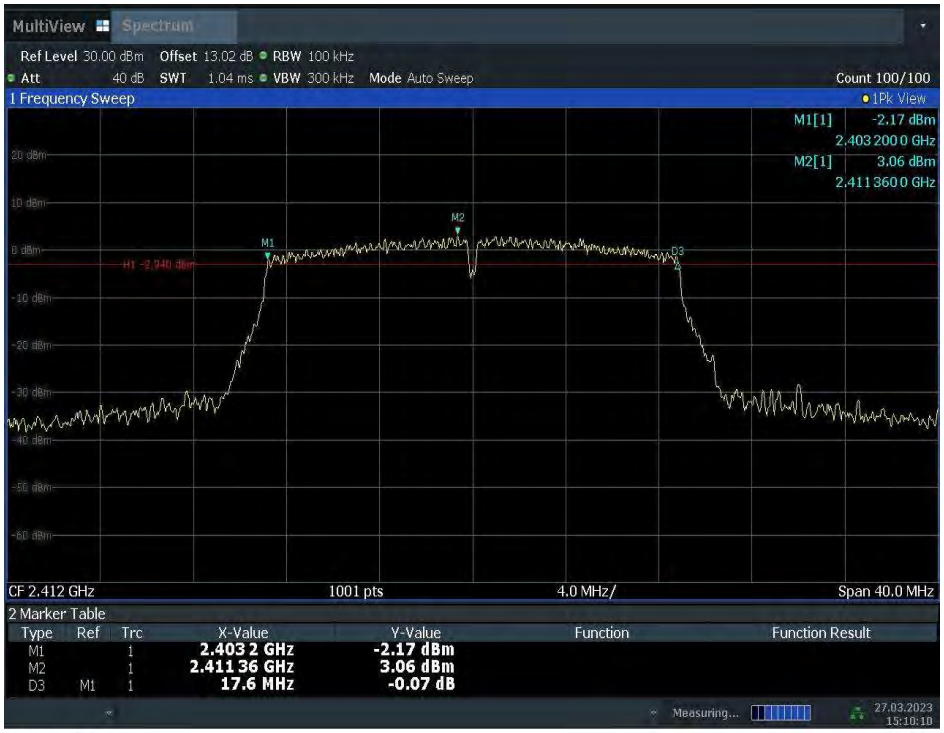

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Fig.A.4.7 Occupied 6dB Bandwidth (802.11n-20MHz, Ch 1)

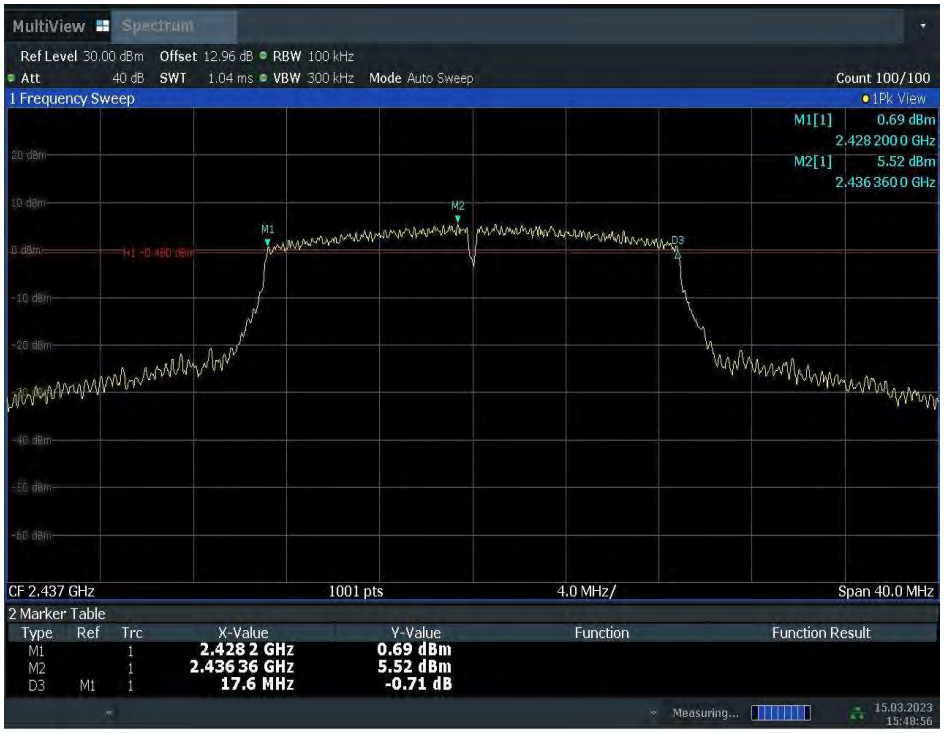

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Fig.A.4.8 Occupied 6dB Bandwidth (802.11n-HT20, Ch 6)

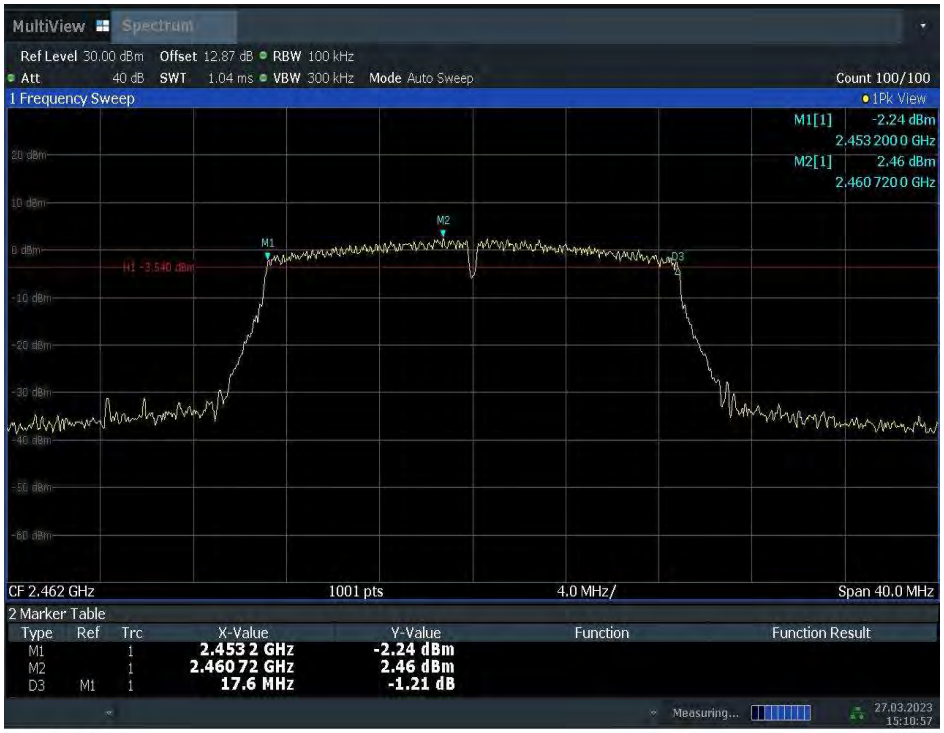

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Fig.A.4.9 Occupied 6dB Bandwidth (802.11n-HT20, Ch 11)

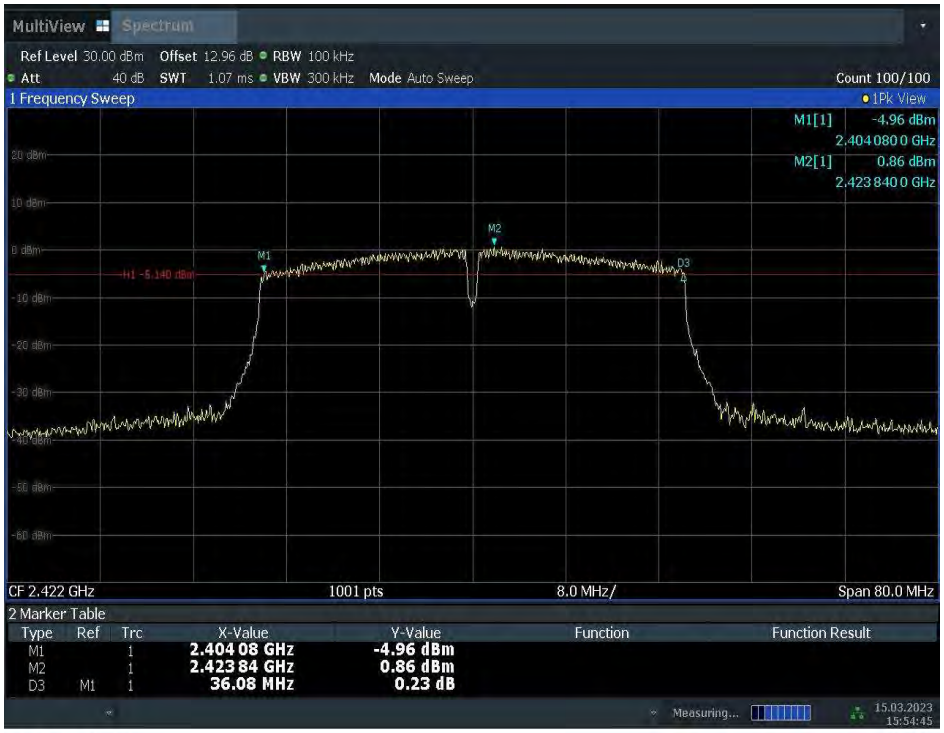

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Fig.A.4.10 Occupied 6dB Bandwidth (802.11n-40MHz, Ch 3)

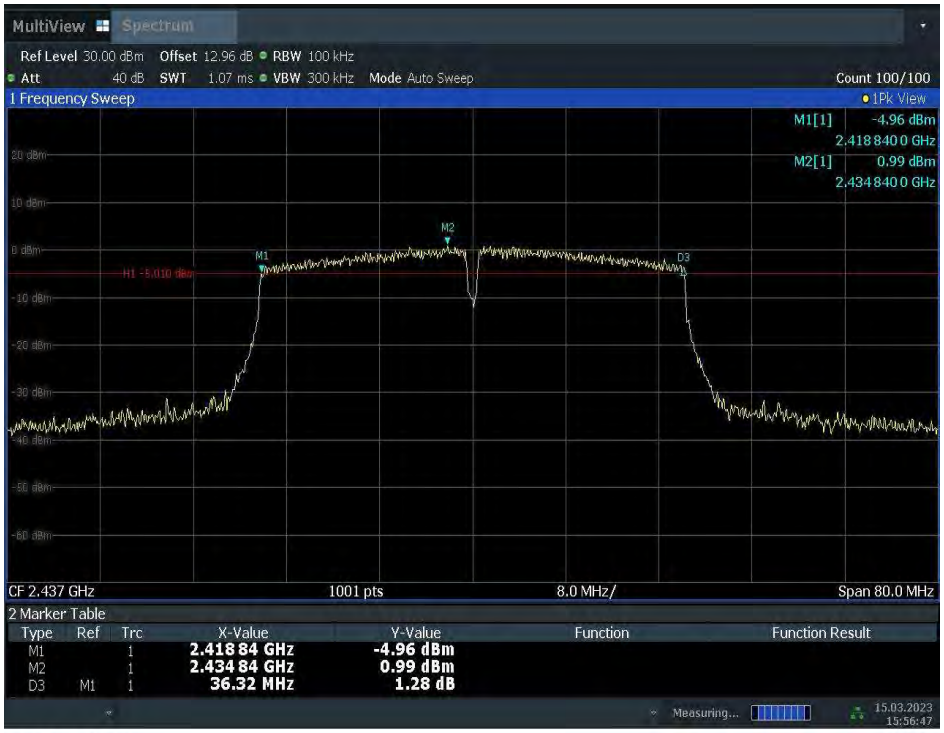

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Fig.A.4.11 Occupied 6dB Bandwidth (802.11n-HT40, Ch 6)

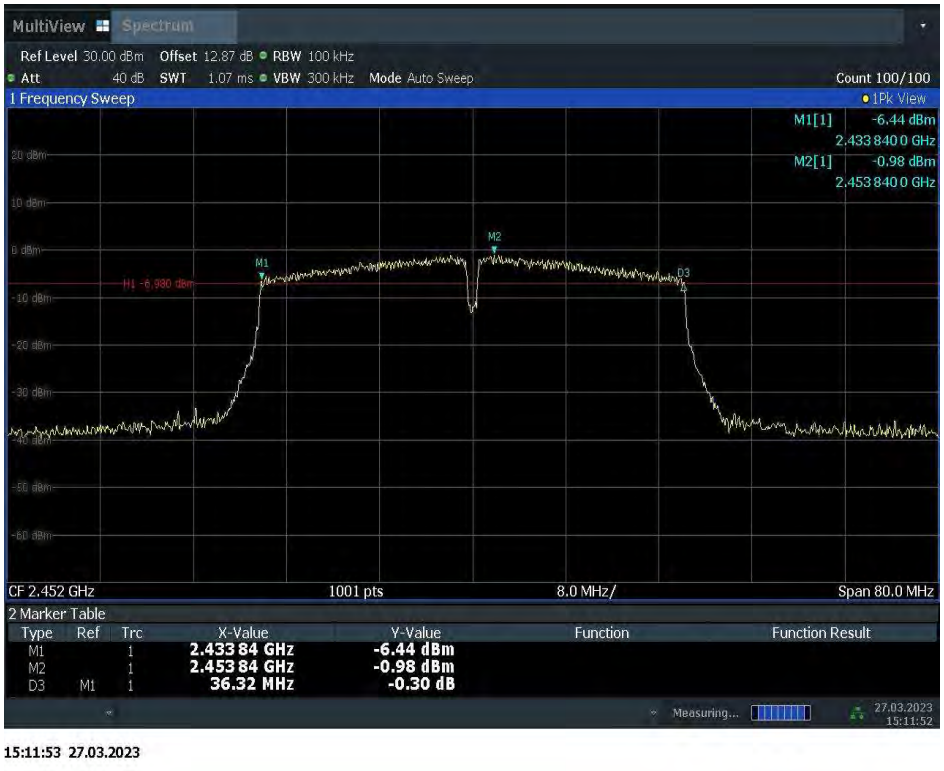

Fig.A.4.12 Occupied 6dB Bandwidth (802.11n-HT40, Ch 9)

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: UT09a

Measurement Result:

802.11b/g mode

Mode	Channel	Test Results	Conclusion
802.11b	1	Fig.A.5.1	P
	11	Fig.A.5.2	P
802.11g	1	Fig.A.5.3	P
	11	Fig.A.5.4	P

802.11n-HT20 mode

Mode	Channel	Test Results	Conclusion
802.11n (HT20)	1	Fig.A.5.5	P
	11	Fig.A.5.6	P

802.11n-HT40 mode

Mode	Channel	Test Results	Conclusion
802.11n (HT40)	3	Fig.A.5.7	P
	9	Fig.A.5.8	P

Conclusion: Pass

Test graphs as below:

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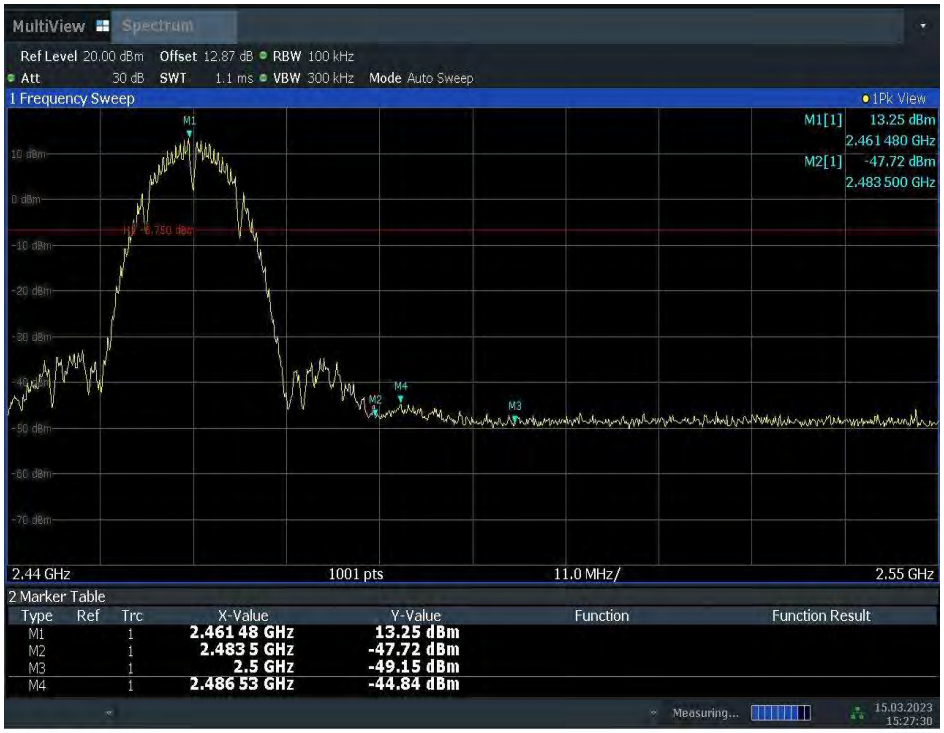
Fig.A.5.1 Band Edges (802.11b, Ch 1)



15:27:31 15.03.2023

Fig.A.5.2 Band Edges (802.11b, Ch 11)

15:08:47 27.03.2023

Fig.A.5.3 Band Edges (802.11g, Ch 1)

15:09:47 27.03.2023

Fig.A.5.4 Band Edges (802.11g, Ch 11)

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Fig.A.5.5 Band Edges (802.11n-HT20, Ch 1)

15:11:16 27.03.2023

Fig.A.5.6 Band Edges (802.11n-HT20, Ch 11)

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Fig.A.5.7 Band Edges (802.11n-HT40, Ch 3)

15:12:12 27.03.2023

Fig.A.5.8 Band Edges (802.11n-HT40, Ch 9)

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: UT09a

Measurement Results:

802.11b mode

MODE	Channel	Frequency Range	Test Results	Conclusion
802.11b	1	2.412 GHz	Fig.A.6.1.1	P
		30 MHz ~ 1 GHz	Fig.A.6.1.2	P
		1 GHz ~ 26.5 GHz	Fig.A.6.1.3	P
	6	2.437 GHz	Fig.A.6.1.4	P
		30 MHz ~ 1 GHz	Fig.A.6.1.5	P
		1 GHz ~ 26.5 GHz	Fig.A.6.1.6	P
	11	2.462 GHz	Fig.A.6.1.7	P
		30 MHz ~ 1 GHz	Fig.A.6.1.8	P
		1 GHz ~ 26.5 GHz	Fig.A.6.1.9	P

802.11g mode

MODE	Channel	Frequency Range	Test Results	Conclusion
802.11g	1	2.412 GHz	Fig.A.6.1.10	P
		30 MHz ~ 1 GHz	Fig.A.6.1.11	P
		1 GHz ~ 26.5 GHz	Fig.A.6.1.12	P
	6	2.437 GHz	Fig.A.6.1.13	P
		30 MHz ~ 1 GHz	Fig.A.6.1.14	P
		1 GHz ~ 26.5 GHz	Fig.A.6.1.15	P
	11	2.462 GHz	Fig.A.6.1.16	P
		30 MHz ~ 1 GHz	Fig.A.6.1.17	P
		1 GHz ~ 26.5 GHz	Fig.A.6.1.18	P

802.11n-HT20 mode

MODE	Channel	Frequency Range	Test Results	Conclusion
802.11n (HT20)	1	2.412 GHz	Fig.A.6.1.19	P
		30 MHz ~ 1 GHz	Fig.A.6.1.20	P
		1 GHz ~ 26.5 GHz	Fig.A.6.1.21	P
	6	2.437 GHz	Fig.A.6.1.22	P
		30 MHz ~ 1 GHz	Fig.A.6.1.23	P
		1 GHz ~ 26.5 GHz	Fig.A.6.1.24	P
	11	2.462 GHz	Fig.A.6.1.25	P
		30 MHz ~ 1 GHz	Fig.A.6.1.26	P
		1 GHz ~ 26.5 GHz	Fig.A.6.1.27	P

802.11n-HT40 mode

MODE	Channel	Frequency Range	Test Results	Conclusion
802.11n (HT40)	3	2.422 GHz	Fig.A.6.1.28	**P**
		30 MHz ~ 1 GHz	Fig.A.6.1.29	**P**
		1 GHz ~ 26.5 GHz	Fig.A.6.1.30	**P**
	6	2.437 GHz	Fig.A.6.1.31	**P**
		30 MHz ~ 1 GHz	Fig.A.6.1.32	**P**
		1 GHz ~ 26.5 GHz	Fig.A.6.1.33	**P**
	9	2.452 GHz	Fig.A.6.1.34	**P**
		30 MHz ~ 1 GHz	Fig.A.6.1.35	**P**
		1 GHz ~ 26.5 GHz	Fig.A.6.1.36	**P**

Conclusion: Pass

Test graphs as below:

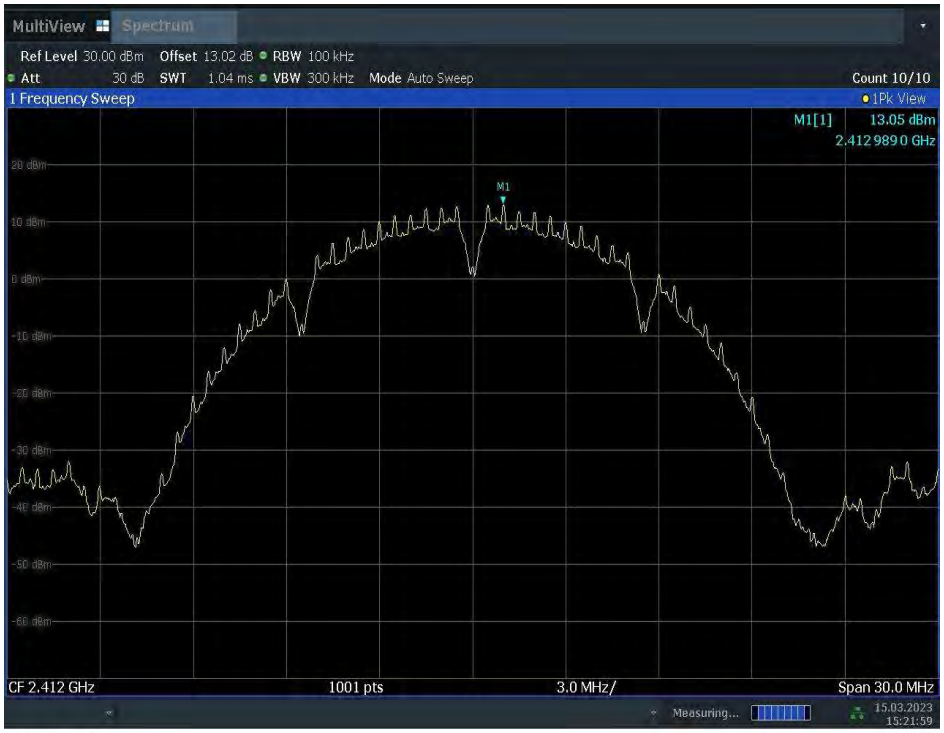

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Fig.A.6.1.1 Transmitter Spurious Emission - Conducted (802.11b, Ch1, Center Frequency)

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Fig.A.6.1.2 Transmitter Spurious Emission - Conducted (802.11b, Ch1, 30 MHz-1 GHz)

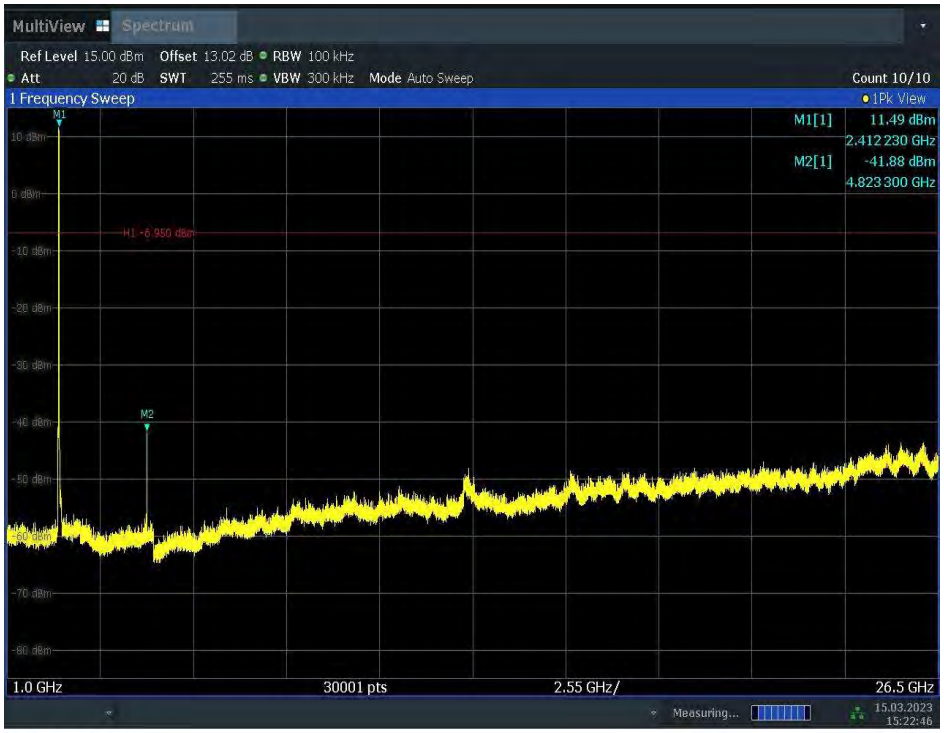

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Fig.A.6.1.3 Transmitter Spurious Emission - Conducted (802.11b, Ch1, 1 GHz-26.5 GHz)

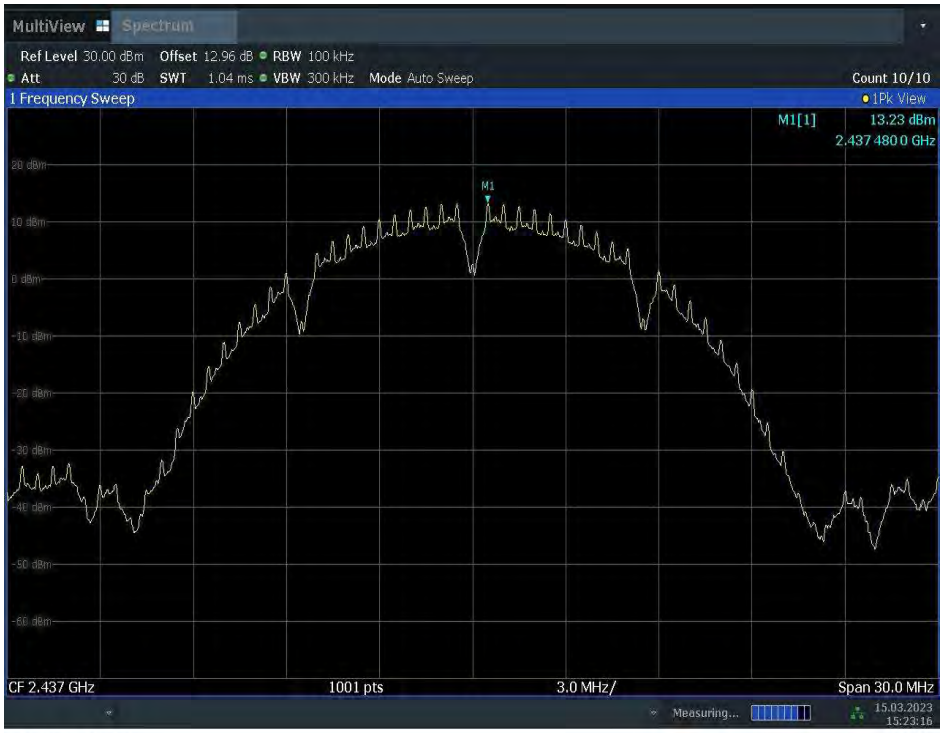

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Fig.A.6.1.4 Transmitter Spurious Emission - Conducted (802.11b, Ch6, Center Frequency)

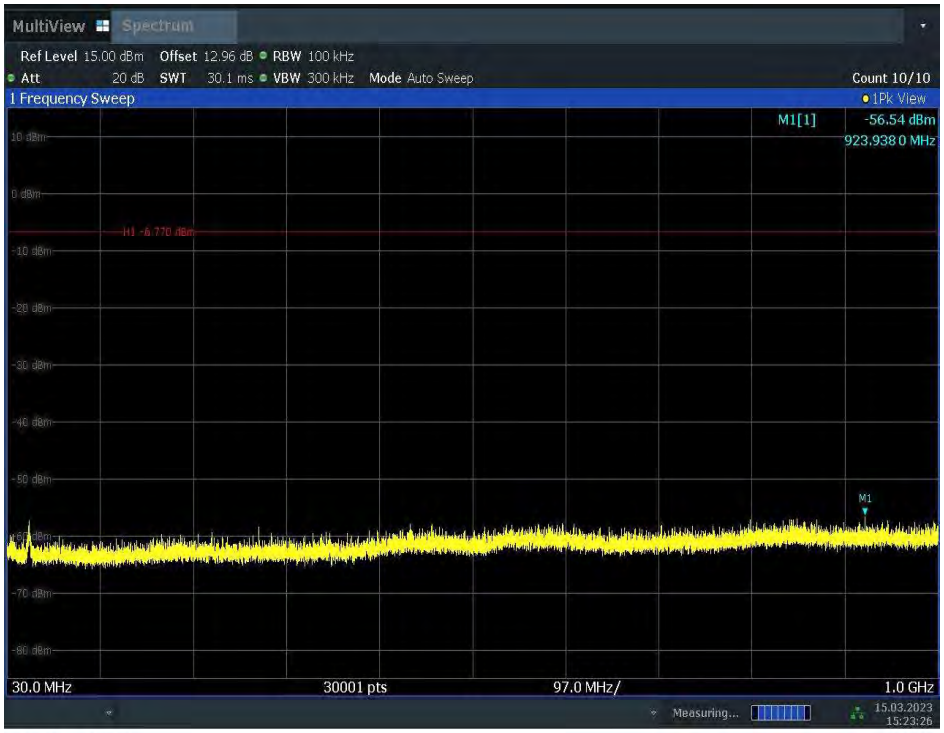

Fig.A.6.1.5 Transmitter Spurious Emission - Conducted (802.11b, Ch6, 30 MHz-1 GHz)

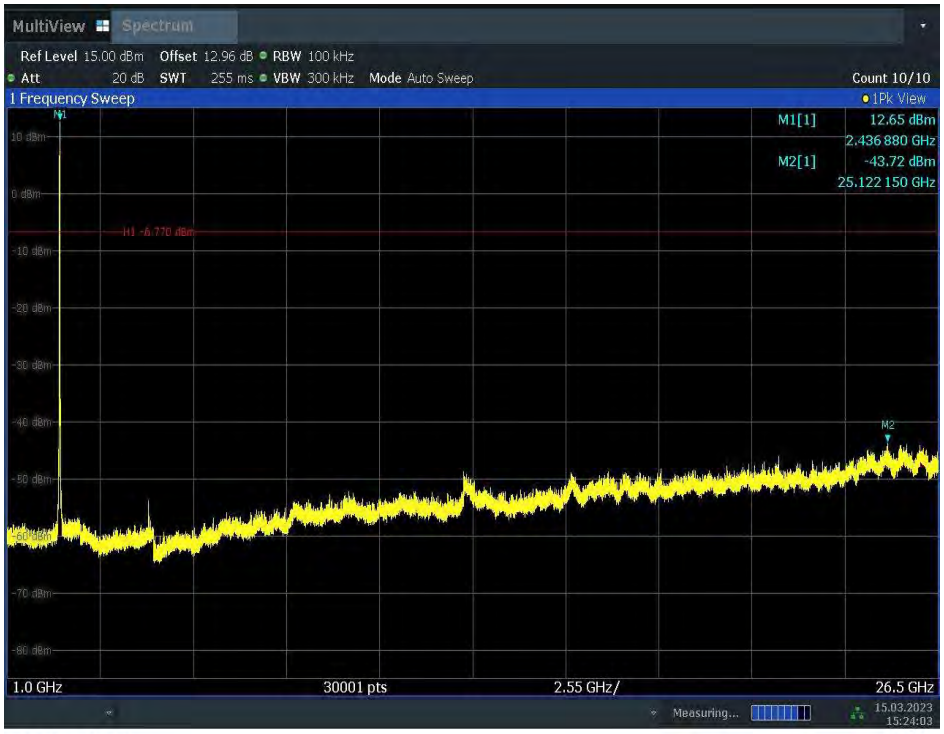

Fig.A.6.1.6 Transmitter Spurious Emission - Conducted (802.11b, Ch6, 1 GHz-26.5 GHz)

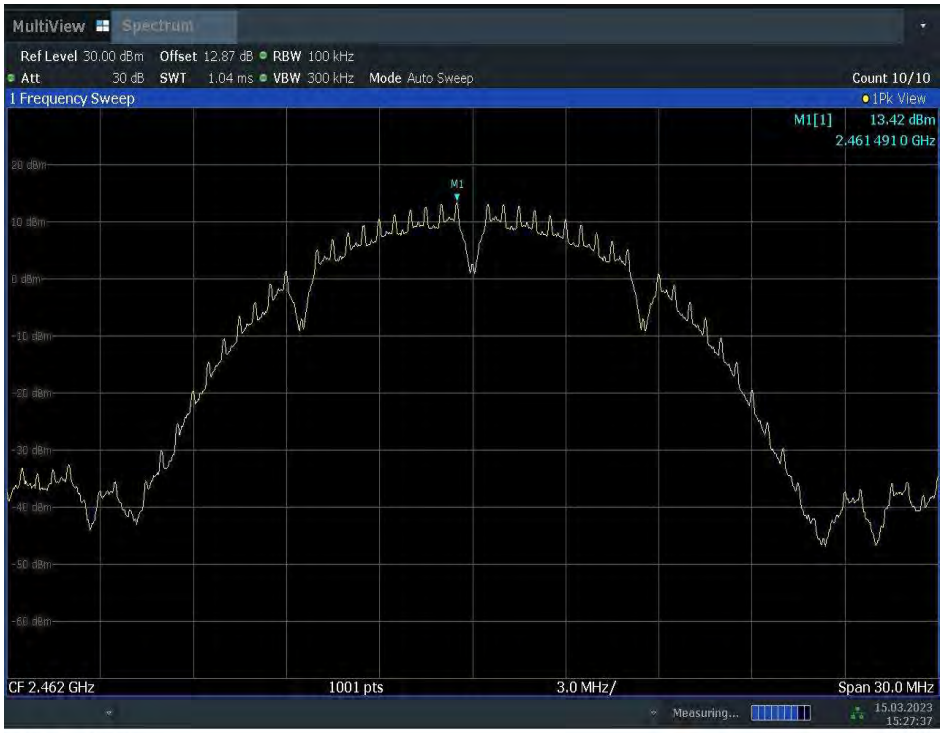

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Fig.A.6.1.7 Transmitter Spurious Emission - Conducted (802.11b, Ch11, Center Frequency)

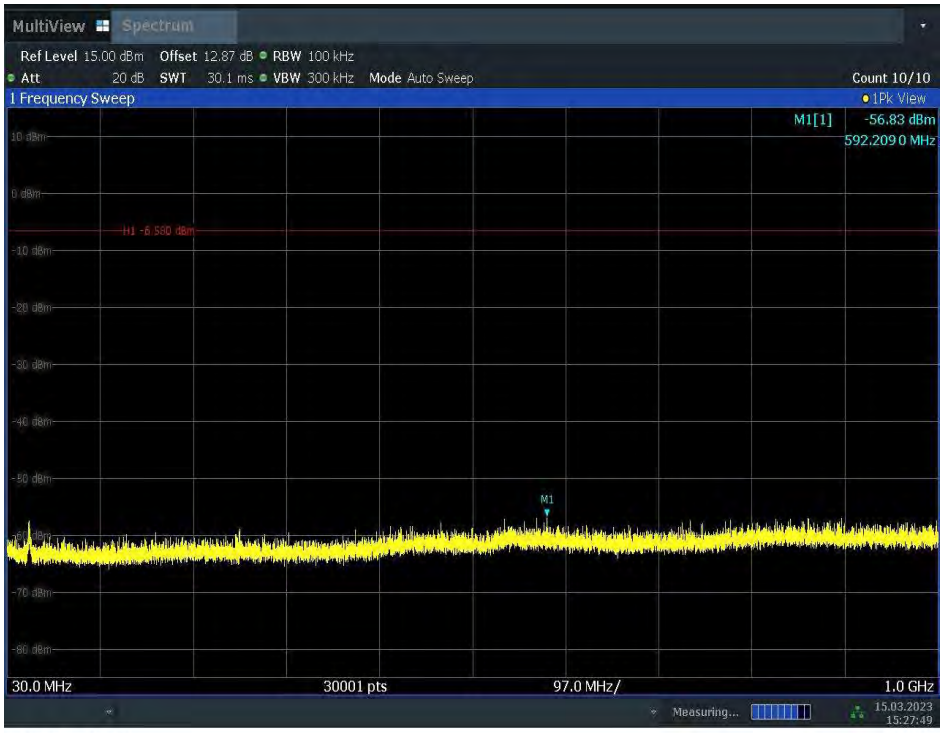

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Fig.A.6.1.8 Transmitter Spurious Emission - Conducted (802.11b, Ch11, 30 MHz-1 GHz)

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Fig.A.6.1.9 Transmitter Spurious Emission - Conducted (802.11b, Ch11, 1 GHz-26.5 GHz)

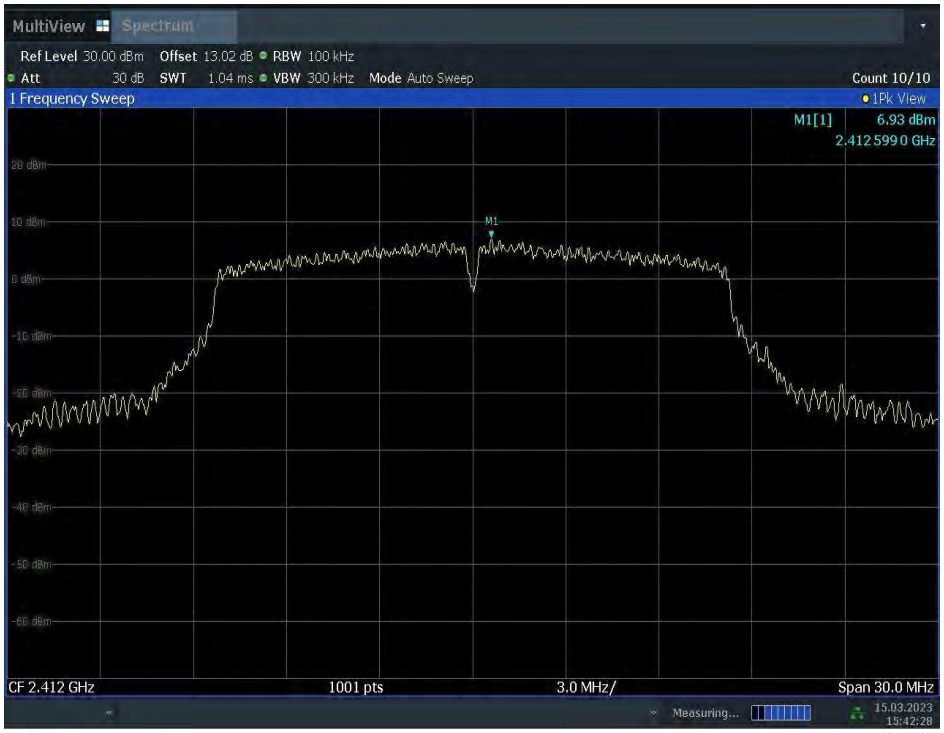

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Fig.A.6.1.10 Transmitter Spurious Emission - Conducted (802.11g, Ch1, Center Frequency)

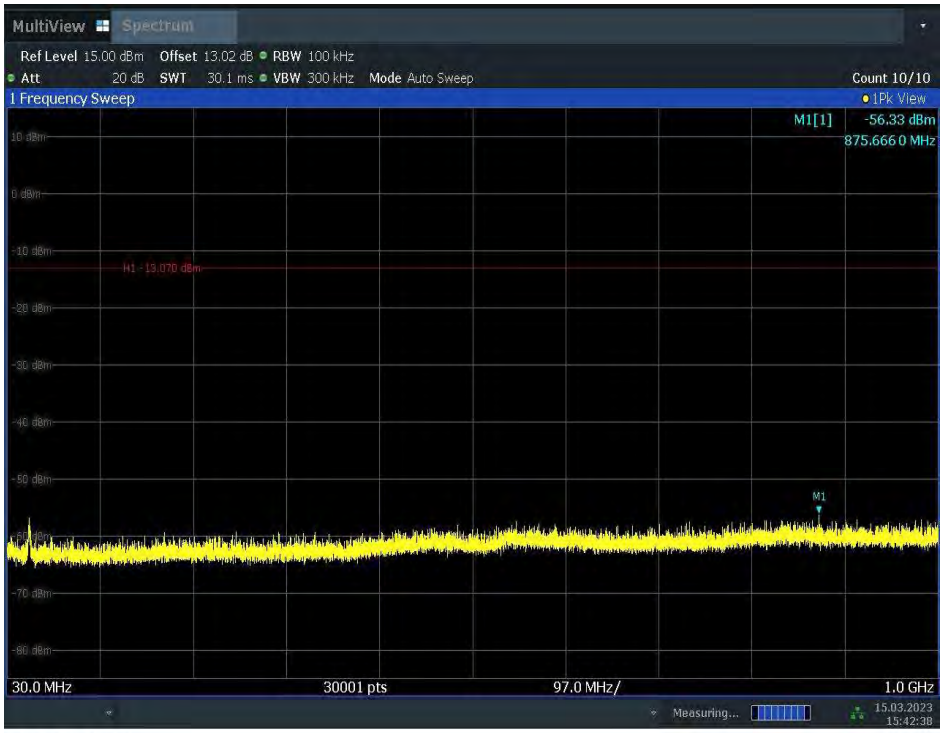

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Fig.A.6.1.11 Transmitter Spurious Emission - Conducted (802.11g, Ch1, 30 MHz-1 GHz)

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Fig.A.6.1.12 Transmitter Spurious Emission - Conducted (802.11g, Ch1, 1 GHz-26.5 GHz)

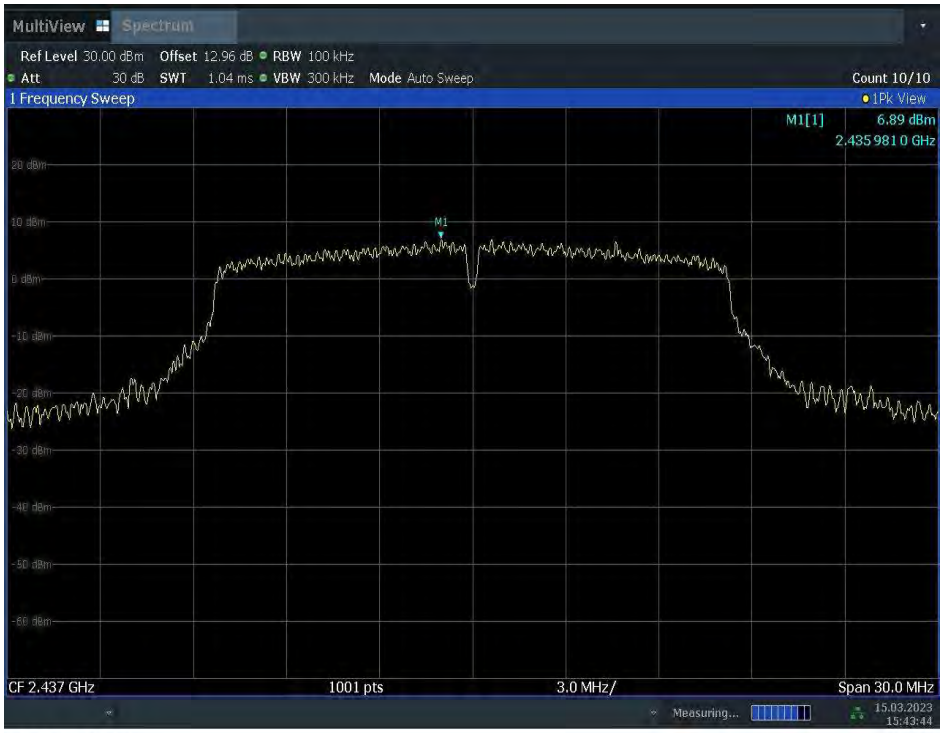

Fig.A.6.1.13 Transmitter Spurious Emission - Conducted (802.11g, Ch6, Center Frequency)

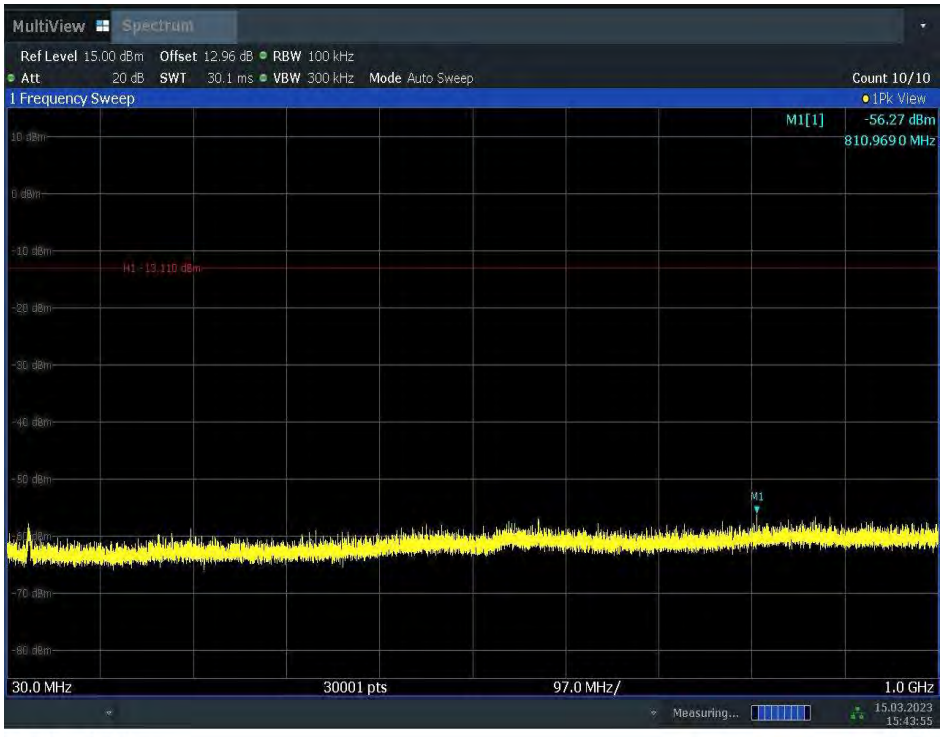

Fig.A.6.1.14 Transmitter Spurious Emission - Conducted (802.11g, Ch6, 30 MHz-1 GHz)

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Fig.A.6.1.15 Transmitter Spurious Emission - Conducted (802.11g, Ch6, 1 GHz-26.5 GHz)

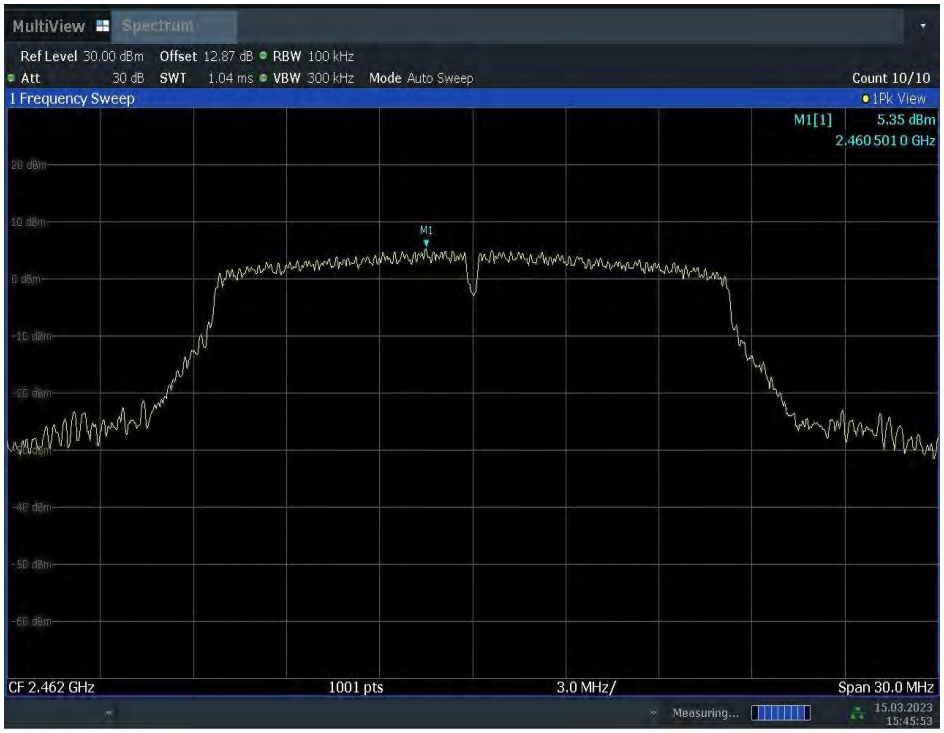

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Fig.A.6.1.16 Transmitter Spurious Emission - Conducted (802.11g, Ch11, Center Frequency)

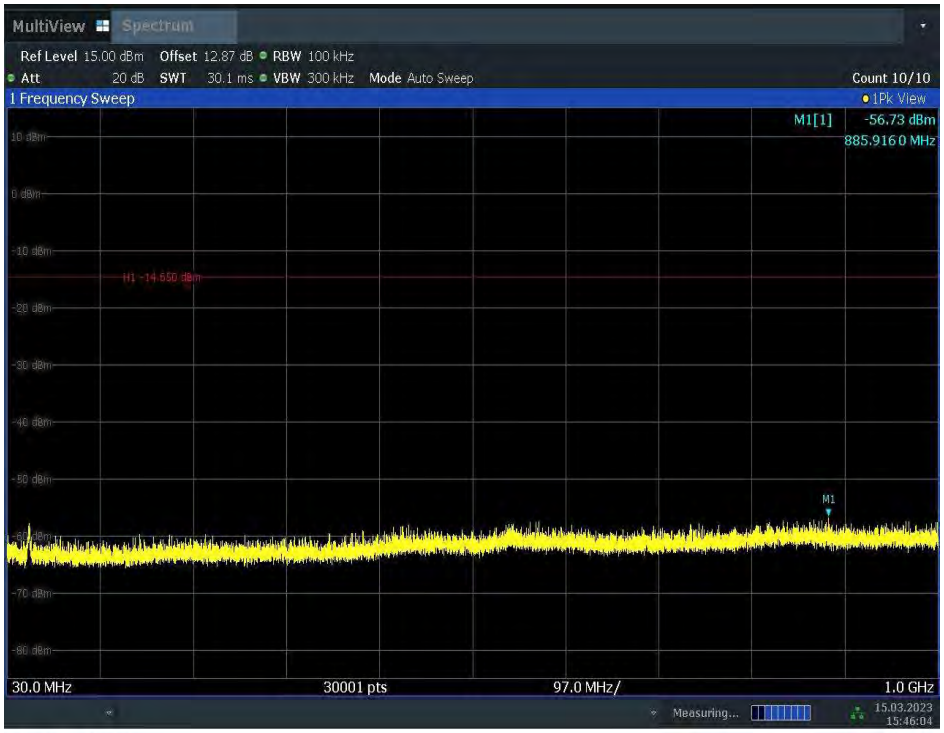

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Fig.A.6.1.17 Transmitter Spurious Emission - Conducted (802.11g, Ch11, 30 MHz-1 GHz)

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Fig.A.6.1.18 Transmitter Spurious Emission - Conducted (802.11g, Ch11, 1 GHz-26.5 GHz)

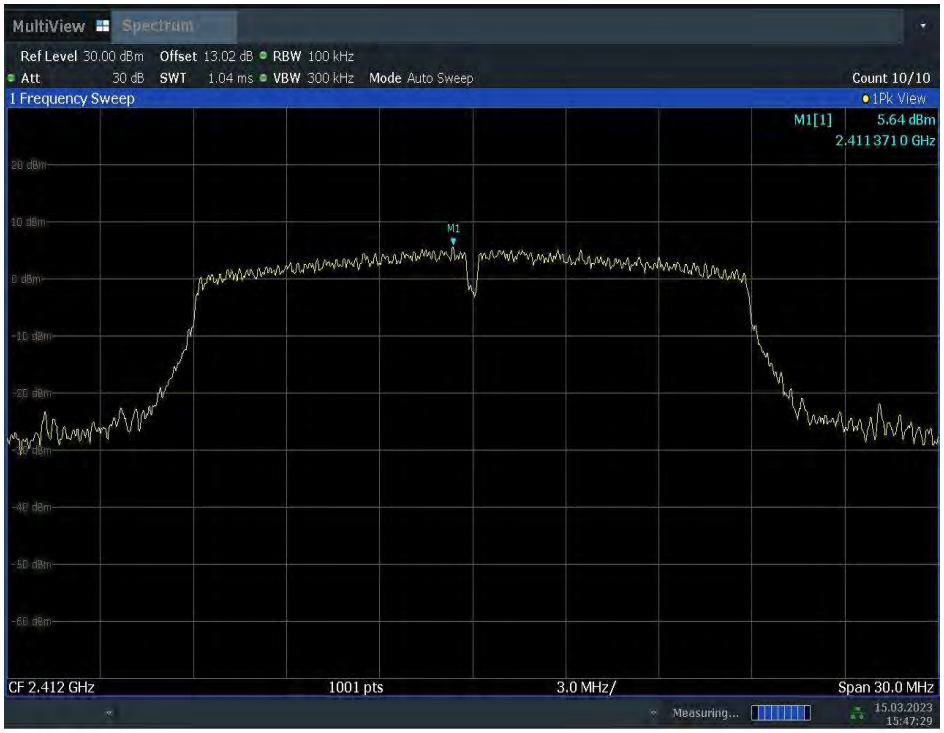

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Fig.A.6.1.19 Transmitter Spurious Emission - Conducted (802.11n-HT20, Ch1, Center Frequency)

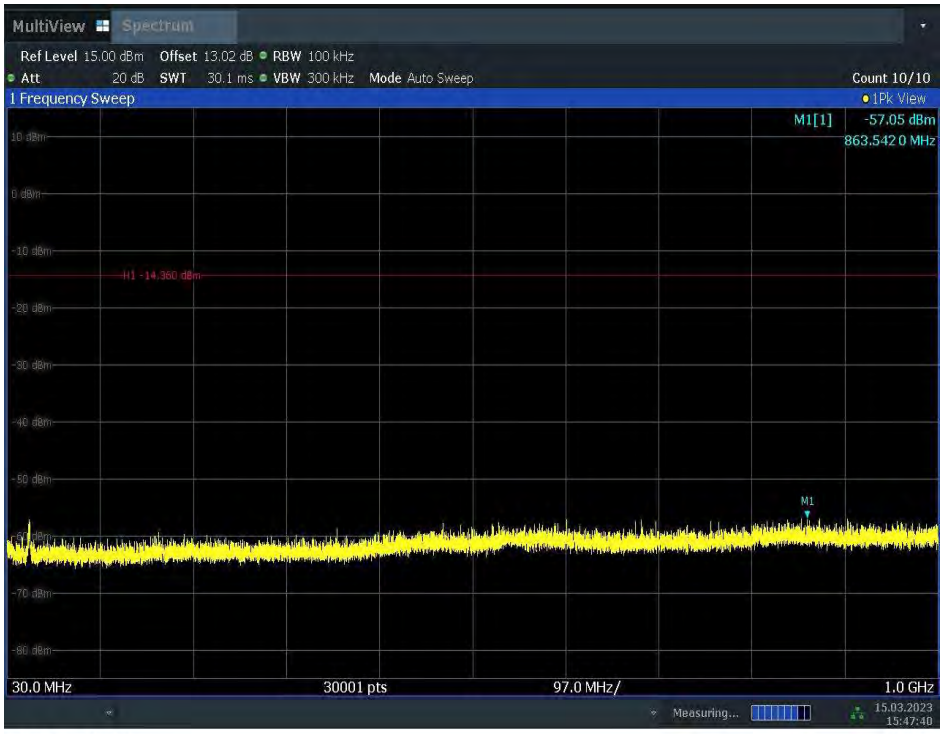

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Fig.A.6.1.20 Transmitter Spurious Emission - Conducted (802.11n-HT20, Ch1, 30 MHz-1 GHz)

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Fig.A.6.1.21 Transmitter Spurious Emission - Conducted (802.11n-HT20, Ch1, 1 GHz-26.5 GHz)

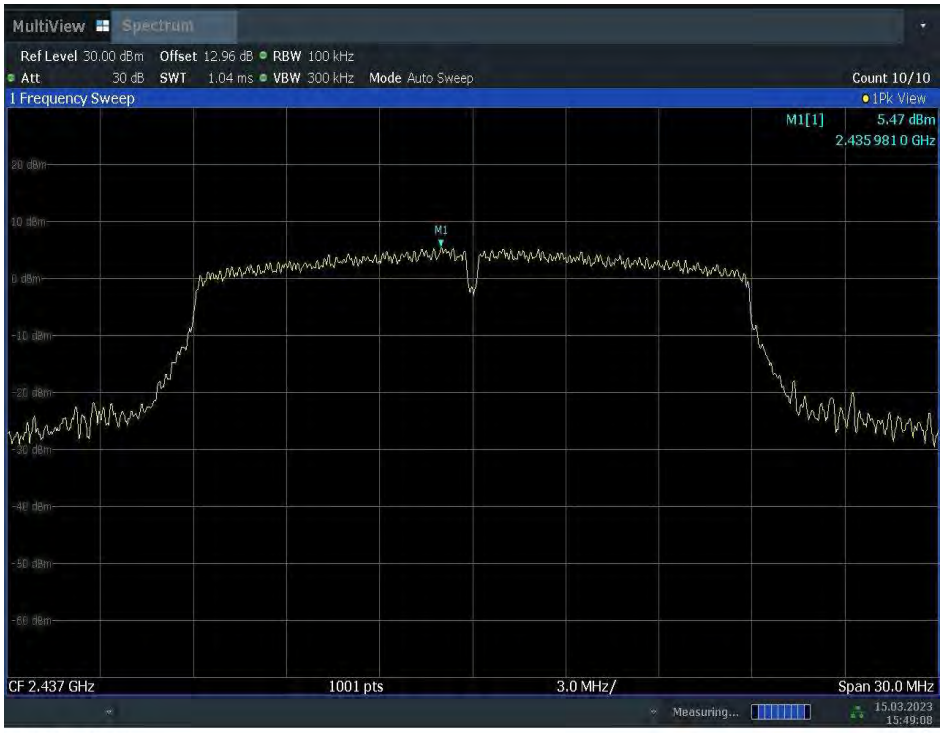

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Fig.A.6.1.22 Transmitter Spurious Emission - Conducted (802.11n-HT20, Ch6, Center Frequency)

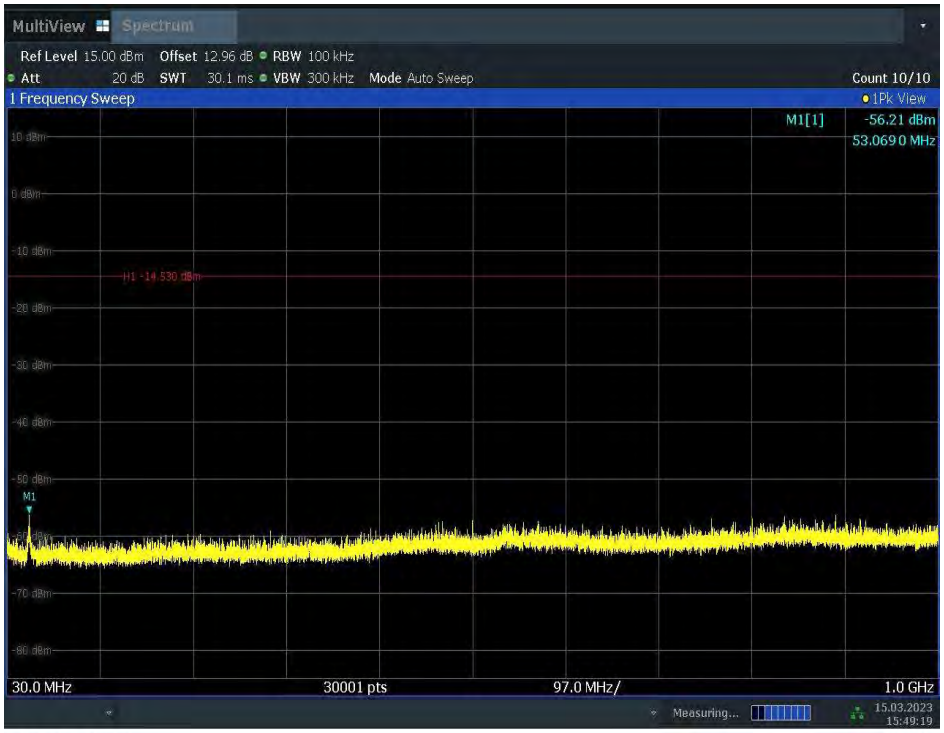

Fig.A.6.1.23 Transmitter Spurious Emission - Conducted (802.11n-HT20, Ch6, 30 MHz-1 GHz)

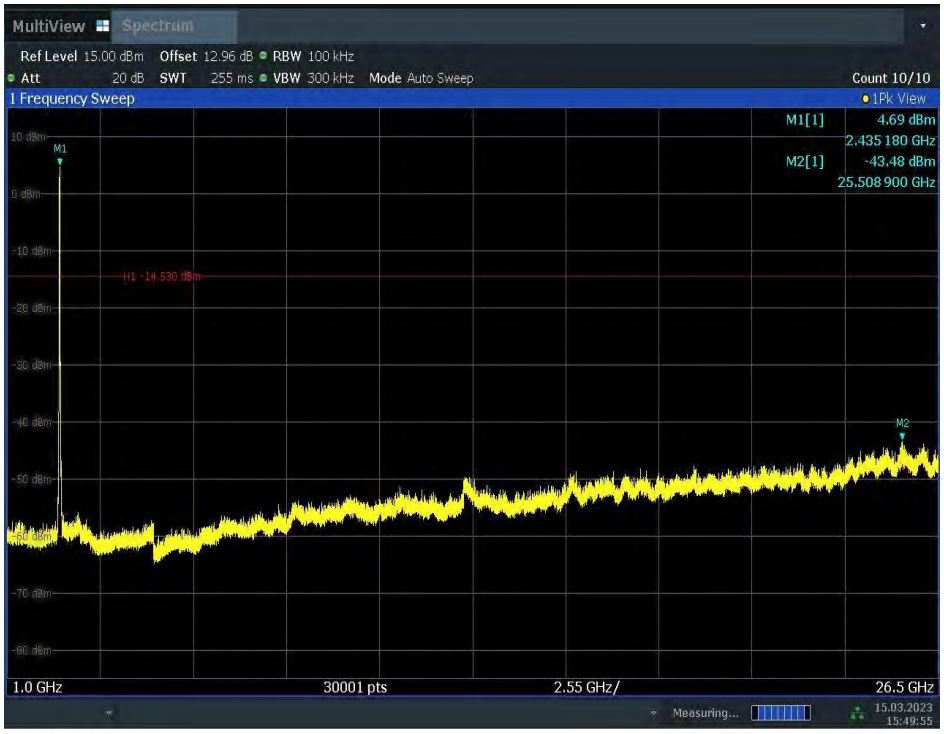

Fig.A.6.1.24 Transmitter Spurious Emission - Conducted (802.11n-HT20, Ch6, 1 GHz-26.5 GHz)

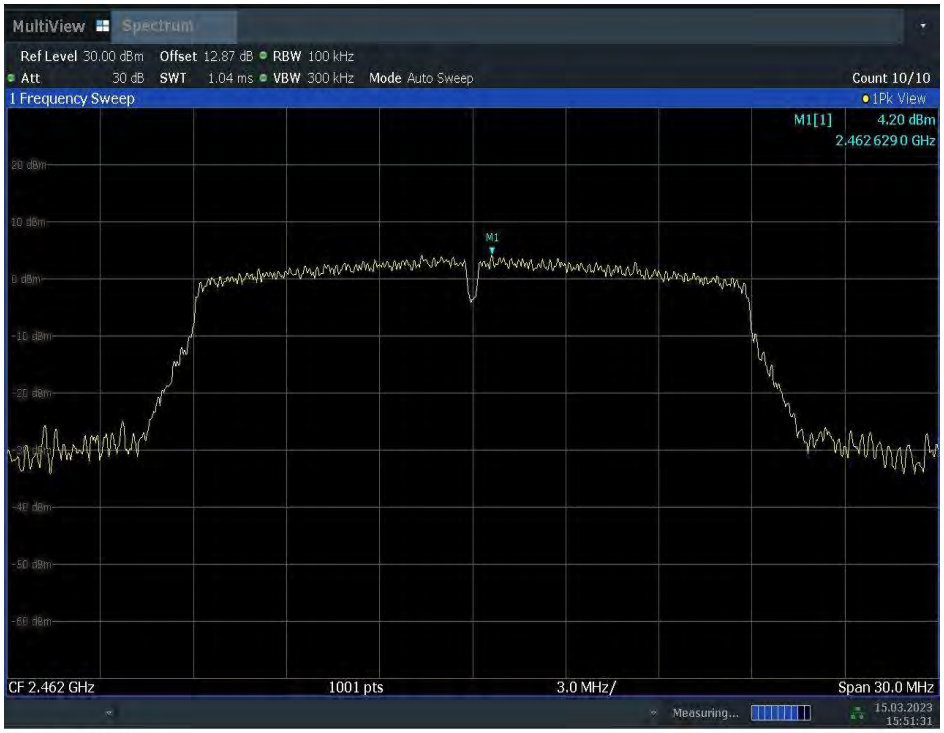

Fig.A.6.1.25 Transmitter Spurious Emission - Conducted (802.11n-HT20, Ch11, Center Frequency)

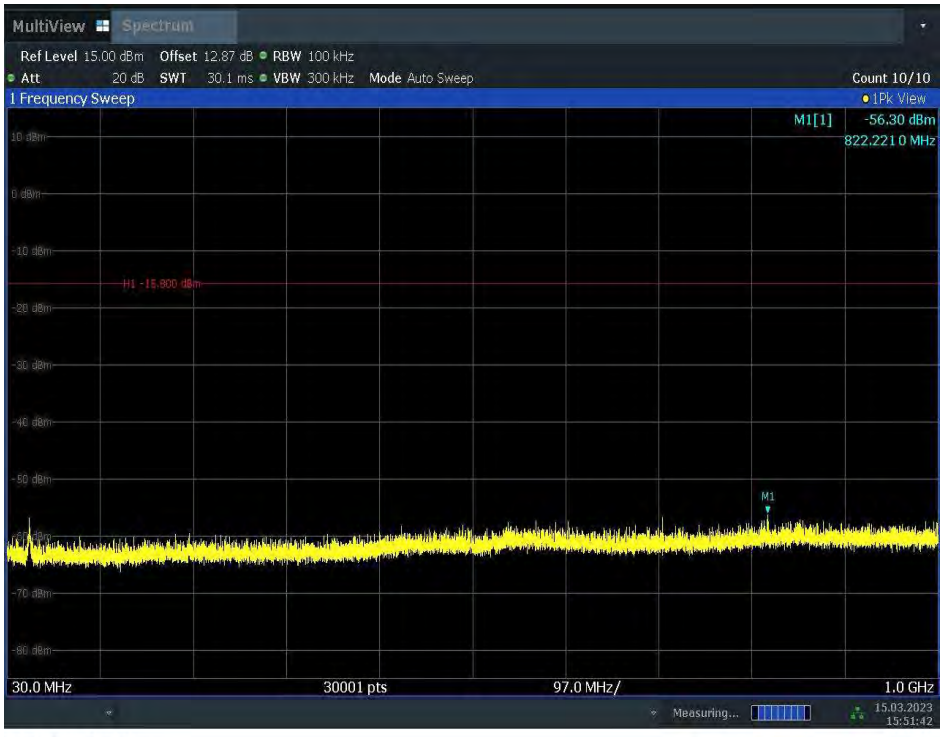

Fig.A.6.1.26 Transmitter Spurious Emission - Conducted (802.11n-HT20, Ch11, 30 MHz-1 GHz)

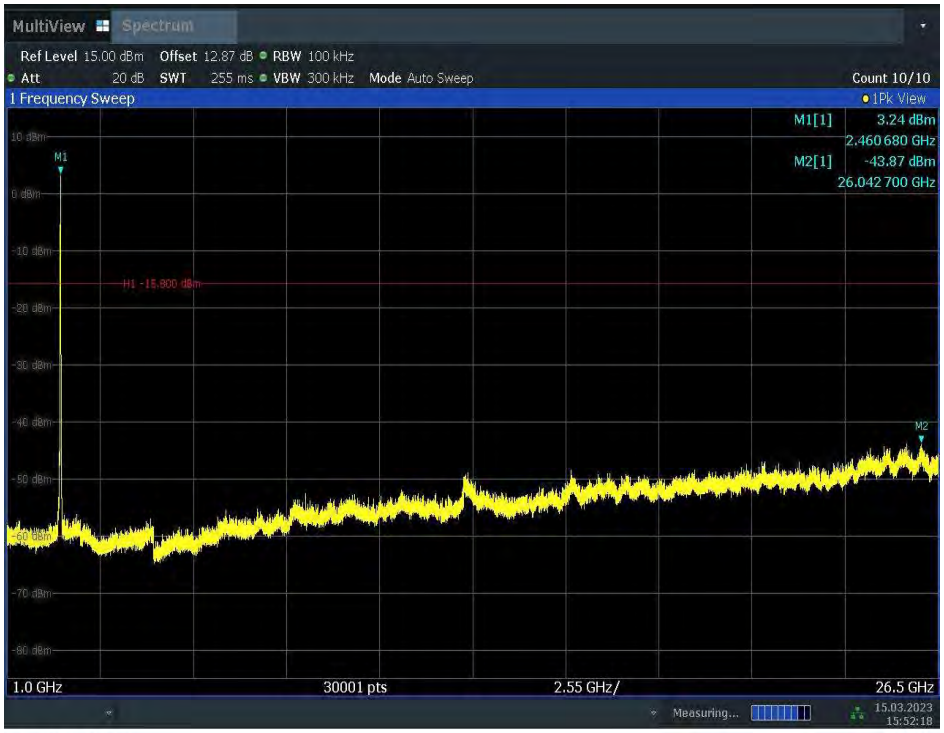

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Fig.A.6.1.27 Transmitter Spurious Emission - Conducted (802.11n-HT20, Ch11, 1 GHz-26.5 GHz)

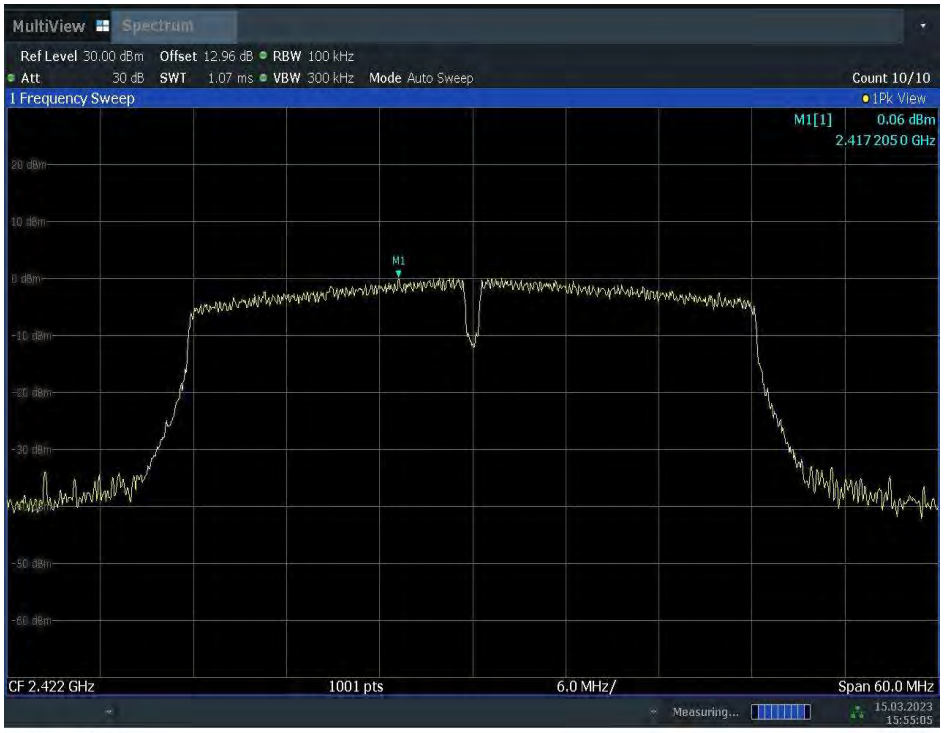

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Fig.A.6.1.28 Transmitter Spurious Emission - Conducted (802.11n-HT40, Ch3, Center Frequency)

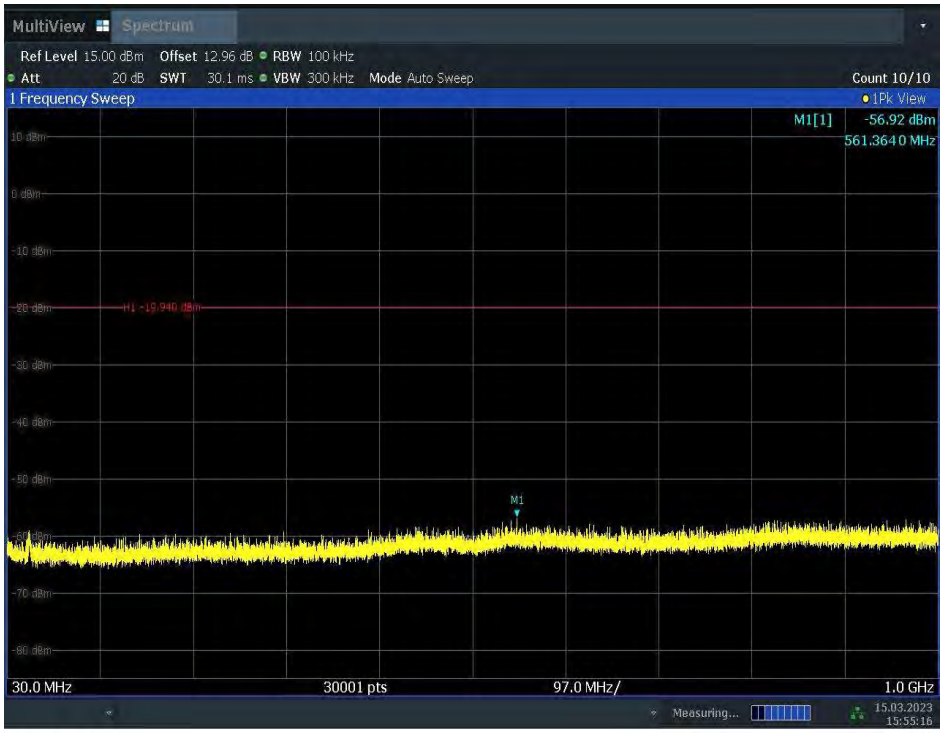

Fig.A.6.1.29 Transmitter Spurious Emission - Conducted (802.11n-HT40, Ch3, 30 MHz-1 GHz)

Fig.A.6.1.30 Transmitter Spurious Emission - Conducted (802.11n-HT40, Ch3, 1 GHz-26.5 GHz)

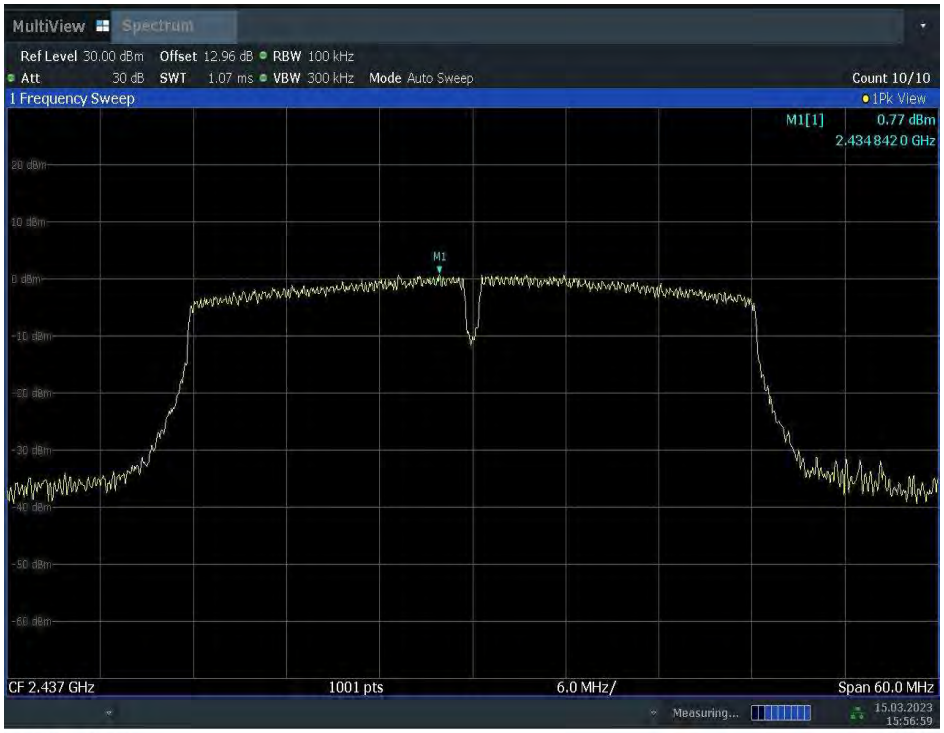

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Fig.A.6.1.31 Transmitter Spurious Emission - Conducted (802.11n-HT40, Ch6, Center Frequency)

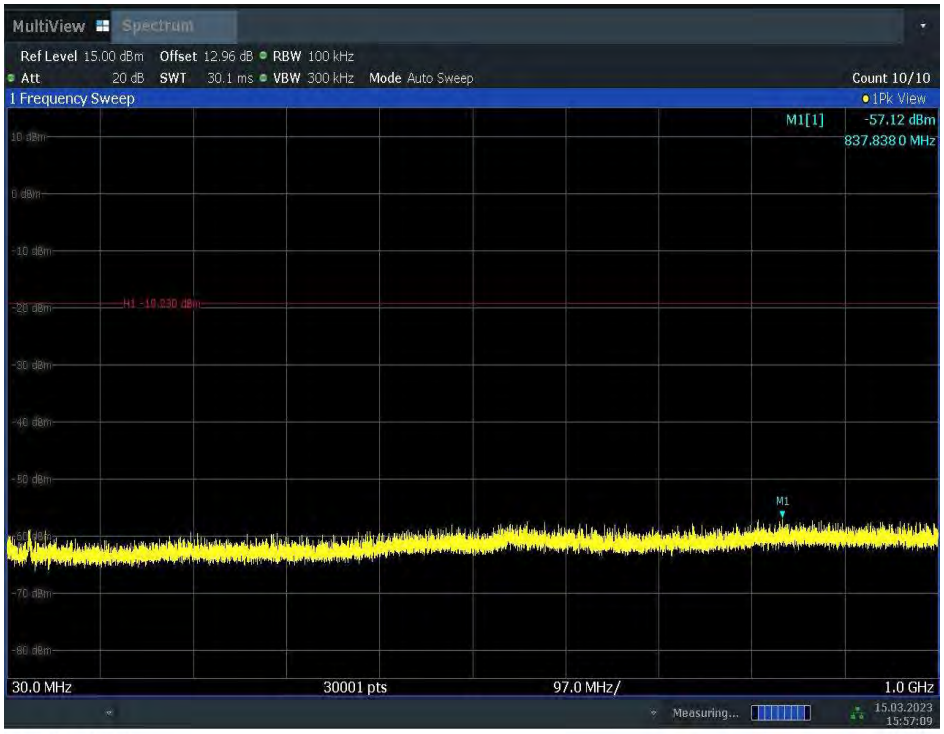

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Fig.A.6.1.32 Transmitter Spurious Emission - Conducted (802.11n-HT40, Ch6, 30 MHz-1 GHz)

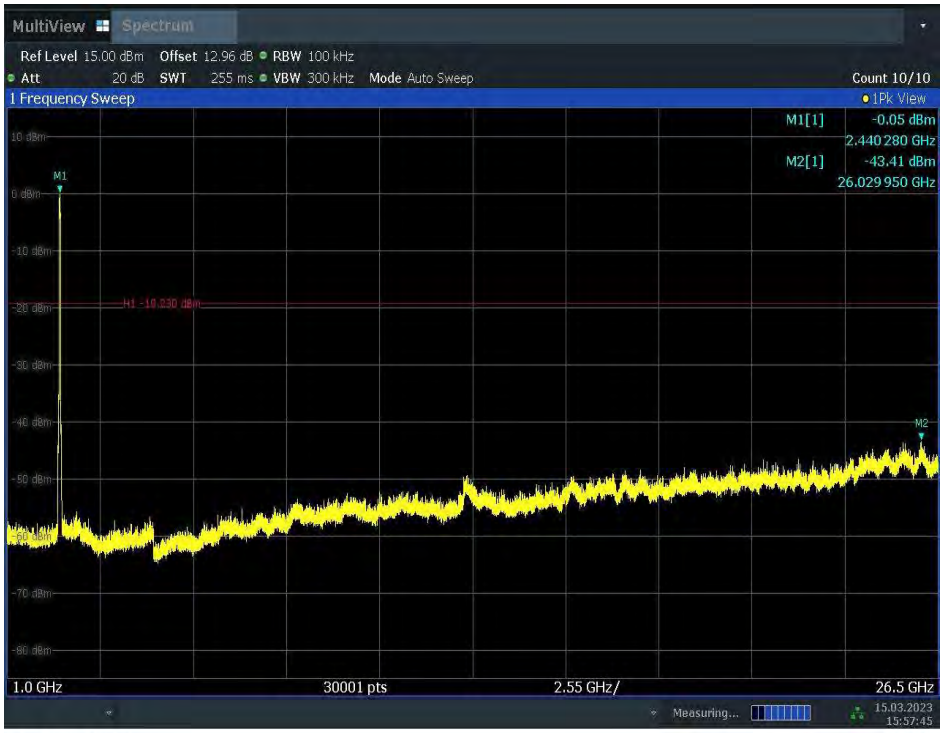

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Fig.A.6.1.33 Transmitter Spurious Emission - Conducted (802.11n-HT40, Ch6, 1 GHz-26.5 GHz)

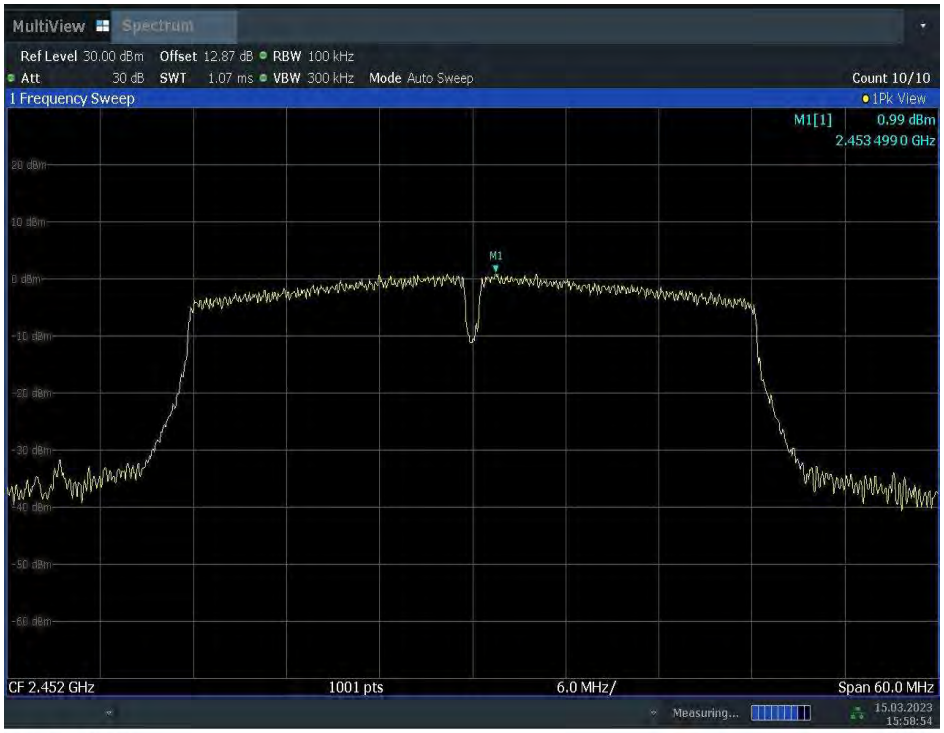

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Fig.A.6.1.34 Transmitter Spurious Emission - Conducted (802.11n-HT40, Ch9, Center Frequency)

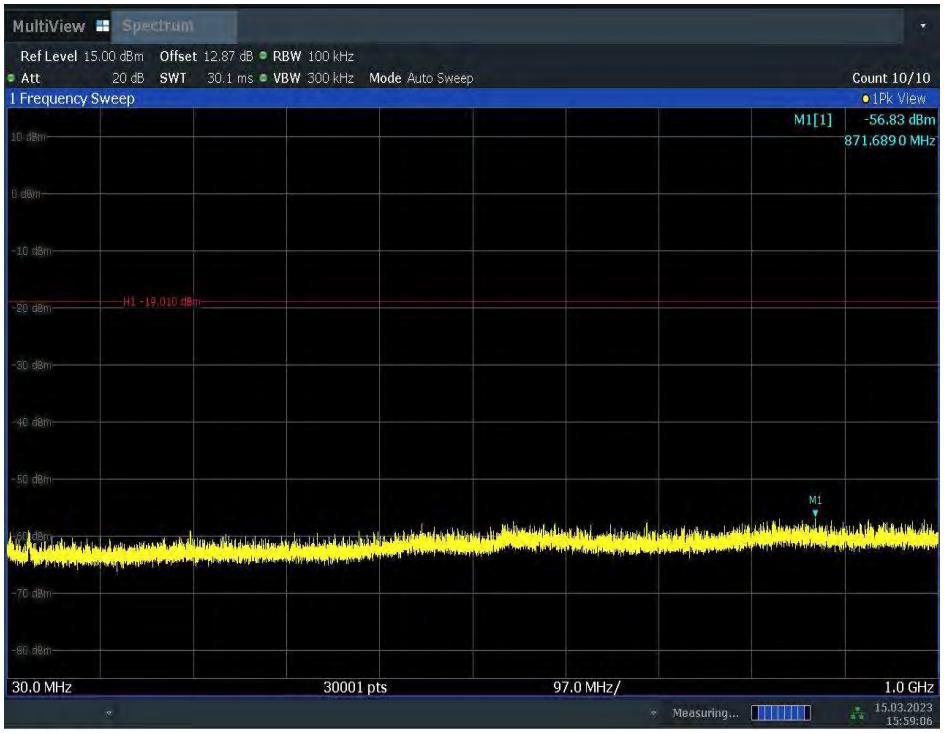

Fig.A.6.1.35 Transmitter Spurious Emission - Conducted (802.11n-HT40, Ch9, 30 MHz-1 GHz)

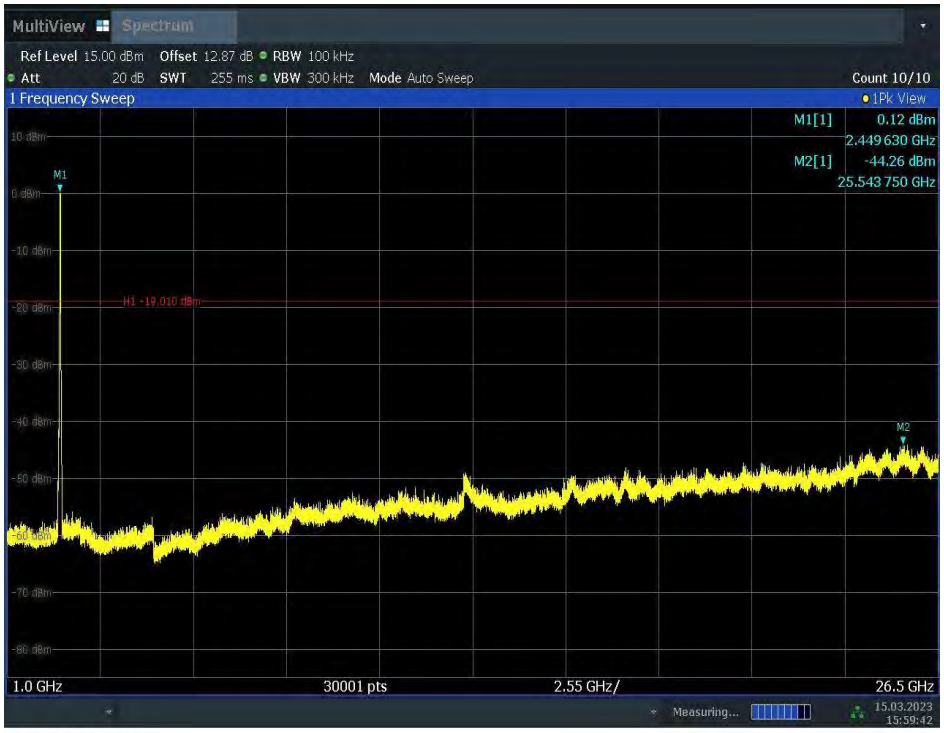

Fig.A.6.1.36 Transmitter Spurious Emission - Conducted (802.11n-HT40, Ch9, 1 GHz-26.5 GHz)

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(uV/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(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

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/3MHz	15
4000-18000	1MHz/3MHz	40
18000-26500	1MHz/3MHz	20

EUT ID: UT22a

Measurement results for Set.1:

802.11b mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11b	1	2.31GHz~2.43GHz---L	Fig.A.6.2.1	**P**
	11	2.45GHz~2.50GHz---H	Fig.A.6.2.2	**P**

802.11g mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11g	1	2.31GHz~2.43GHz---L	Fig.A.6.2.3	**P**
	11	2.45GHz~2.50GHz---H	Fig.A.6.2.4	**P**

802.11n-HT20 mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11n (HT20)	1	2.31GHz~2.43GHz---L	Fig.A.6.2.5	**P**
	11	2.45GHz~2.50GHz---H	Fig.A.6.2.6	**P**

802.11n-HT40 mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11n (HT40)	3	2.31GHz~2.43GHz---L	Fig.A.6.2.7	**P**
	9	2.45GHz~2.50GHz---H	Fig.A.6.2.8	**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

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)
7235.000	54.58	-35.50	36.40	53.68	74.00	19.42	V
4824.000	50.72	-37.50	33.10	55.02	74.00	23.28	H
17024.500	49.99	-26.30	42.40	33.99	74.00	24.01	H
14587.500	46.74	-27.30	41.90	32.14	74.00	27.26	H
9647.500	46.32	-33.10	38.00	41.42	74.00	27.68	V
2385.600	58.06	-20.00	28.10	50.06	74.00	15.94	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)
7312.500	52.14	-35.00	36.50	50.54	74.00	21.86	V
17051.500	49.38	-26.60	43.40	32.58	74.00	24.62	H
13977.000	46.55	-29.40	41.70	34.35	74.00	27.45	H
11785.000	45.14	-32.00	39.00	38.14	74.00	28.86	H
9960.000	43.74	-33.60	38.10	39.24	74.00	30.26	H
4989.000	37.99	-36.60	33.40	41.19	74.00	36.01	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)
4924.000	52.02	-37.10	33.30	55.82	74.00	21.98	H
17245.000	48.55	-25.90	44.40	30.15	74.00	25.45	H
7385.500	48.18	-35.10	36.60	46.68	74.00	25.82	V
13910.000	46.07	-29.50	41.30	34.27	74.00	27.93	H
12749.500	45.54	-30.50	39.10	36.94	74.00	28.46	V
2489.000	56.48	-20.00	28.30	48.18	74.00	17.52	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)
7236.500	54.37	-35.50	36.40	53.47	74.00	19.63	V
17998.500	49.62	-25.50	46.70	28.42	74.00	24.38	H
13235.000	47.73	-29.70	39.60	37.83	74.00	26.27	H
12770.500	46.44	-30.50	39.10	37.84	74.00	27.56	V
4823.000	46.19	-37.50	33.10	50.49	74.00	27.81	H
2389.700	65.78	-20.00	28.10	57.78	74.00	8.22	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)
7314.000	53.74	-35.00	36.50	52.14	74.00	20.26	V
17444.000	50.47	-26.90	45.20	32.07	74.00	23.53	V
13308.000	47.77	-29.50	39.70	37.57	74.00	26.23	H
11885.500	45.94	-31.80	39.00	38.74	74.00	28.06	V
8961.000	45.49	-33.30	38.20	40.59	74.00	28.51	H
4819.500	40.57	-37.50	33.10	44.87	74.00	33.43	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)
4924.000	50.79	-37.10	33.30	54.59	74.00	23.21	H
17128.500	50.76	-26.60	43.40	33.96	74.00	23.24	V
7392.000	49.98	-35.20	36.70	48.38	74.00	24.02	V
13579.000	48.13	-29.50	40.40	37.23	74.00	25.87	H
12558.000	47.15	-31.00	39.00	39.25	74.00	26.85	H
2485.100	67.68	-20.00	28.30	59.38	74.00	6.32	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)
7236.000	53.92	-35.50	36.40	53.02	74.00	20.08	V
17991.000	49.80	-25.50	46.70	28.60	74.00	24.20	V
14327.500	47.22	-28.40	42.30	33.32	74.00	26.78	V
11868.000	46.08	-31.80	39.00	38.88	74.00	27.92	V
9634.000	44.40	-33.10	38.00	39.50	74.00	29.60	H
2390.000	66.40	-20.00	28.10	58.40	74.00	7.60	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)
7314.500	51.70	-35.00	36.50	50.10	74.00	22.30	V
17035.500	49.30	-26.30	42.40	33.30	74.00	24.70	V
13304.000	46.85	-29.50	39.70	36.65	74.00	27.15	V
12778.000	45.29	-30.70	39.10	36.79	74.00	28.71	V
9620.500	44.47	-33.10	38.00	39.57	74.00	29.53	V
4875.000	38.96	-37.20	33.20	42.96	74.00	35.04	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)
17447.500	49.53	-26.90	45.20	31.13	74.00	24.47	V
7384.000	47.55	-35.10	36.60	46.05	74.00	26.45	V
13887.500	46.68	-29.50	41.30	34.88	74.00	27.32	H
4931.500	46.63	-37.10	33.30	50.43	74.00	27.37	H
10490.000	45.22	-33.00	38.30	39.92	74.00	28.78	H
2485.100	65.96	-20.00	28.30	57.66	74.00	8.04	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)
17447.500	48.98	-26.90	45.20	30.58	74.00	25.02	V
14079.000	46.20	-29.40	41.70	34.00	74.00	27.80	V
11897.000	44.61	-31.80	39.00	37.41	74.00	29.39	H
9629.000	44.18	-33.10	38.00	39.28	74.00	29.82	V
7239.500	42.85	-35.50	36.40	41.95	74.00	31.15	V
2387.800	66.99	-20.00	28.10	58.99	74.00	7.01	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)
17454.000	48.86	-26.90	45.20	30.46	74.00	25.14	V
13892.000	46.47	-29.50	41.30	34.67	74.00	27.53	H
11863.000	45.37	-31.80	39.00	38.17	74.00	28.63	V
7316.500	44.98	-35.10	36.60	43.48	74.00	29.02	V
9566.500	44.66	-33.20	37.90	39.96	74.00	29.34	H
4185.500	38.43	-37.90	32.50	43.83	74.00	35.57	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)
17973.500	48.88	-25.50	46.70	27.68	74.00	25.12	V
13947.500	46.22	-29.50	41.30	34.42	74.00	27.78	V
11878.000	45.31	-31.80	39.00	38.11	74.00	28.69	V
9067.500	43.74	-33.80	38.10	39.34	74.00	30.26	V
7347.500	43.11	-35.10	36.60	41.61	74.00	30.89	V
2485.700	67.41	-20.00	28.30	59.11	74.00	6.59	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)
7235.000	51.14	-35.50	36.40	50.24	54.00	2.86	V
4824.000	48.15	-37.50	33.10	52.45	54.00	5.85	H
17447.000	38.64	-26.90	45.20	20.24	54.00	15.36	V
9648.000	38.38	-33.10	38.00	33.48	54.00	15.62	V
13932.500	36.17	-29.50	41.30	24.37	54.00	17.83	V
2385.300	50.63	-20.00	28.10	42.63	54.00	3.37	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)
7312.500	48.54	-35.00	36.50	46.94	54.00	5.46	V
17982.000	37.55	-25.50	46.70	16.35	54.00	16.45	V
13919.500	35.18	-29.50	41.30	23.38	54.00	18.82	V
12760.500	33.97	-30.50	39.10	25.37	54.00	20.03	V
9748.000	32.88	-33.00	38.00	27.88	54.00	21.12	V
4874.000	31.01	-37.20	33.20	35.01	54.00	22.99	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	49.57	-37.10	33.30	53.37	54.00	4.43	H
7385.000	43.92	-35.10	36.60	42.42	54.00	10.08	V
17055.000	37.63	-26.60	43.40	20.83	54.00	16.37	V
14089.000	35.17	-29.40	41.70	22.97	54.00	18.83	H
9848.000	33.77	-33.50	38.00	29.27	54.00	20.23	V
2489.000	47.02	-20.00	28.30	38.72	54.00	6.98	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)
7233.000	44.70	-35.50	36.40	43.80	54.00	9.30	V
17067.500	38.81	-26.60	43.40	22.01	54.00	15.19	V
13933.000	36.19	-29.50	41.30	24.39	54.00	17.81	V
4824.000	35.69	-37.50	33.10	39.99	54.00	18.31	H
11874.000	34.95	-31.80	39.00	27.75	54.00	19.05	H
2389.700	52.66	-20.00	28.10	44.66	54.00	1.34	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)
7313.000	43.31	-35.00	36.50	41.71	54.00	10.69	V
17049.000	39.23	-26.60	43.40	22.43	54.00	14.77	H
13918.500	36.68	-29.50	41.30	24.88	54.00	17.32	V
11885.000	35.16	-31.80	39.00	27.96	54.00	18.84	V
9646.000	34.19	-33.10	38.00	29.29	54.00	19.81	H
4954.500	28.35	-37.10	33.30	32.15	54.00	25.65	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)
17132.500	39.99	-26.60	43.40	23.19	54.00	14.01	H
7387.000	39.83	-35.10	36.60	38.33	54.00	14.17	V
4925.500	39.06	-37.10	33.30	42.86	54.00	14.94	H
13936.000	37.47	-29.50	41.30	25.67	54.00	16.53	H
11888.000	35.93	-31.80	39.00	28.73	54.00	18.07	H
2485.200	51.13	-20.00	28.30	42.83	54.00	2.87	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)
7233.500	42.81	-35.50	36.40	41.91	54.00	11.19	V
17991.000	38.73	-25.50	46.70	17.53	54.00	15.27	V
13915.500	35.85	-29.50	41.30	24.05	54.00	18.15	V
11852.500	34.53	-31.80	39.00	27.33	54.00	19.47	H
4824.500	33.31	-37.50	33.10	37.61	54.00	20.69	H
2389.200	51.46	-20.00	28.10	43.46	54.00	2.54	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)
7314.500	40.87	-35.00	36.50	39.27	54.00	13.13	V
17982.000	38.15	-25.50	46.70	16.95	54.00	15.85	H
14666.000	35.72	-27.30	41.90	21.12	54.00	18.28	V
12768.000	34.59	-30.50	39.10	25.99	54.00	19.41	V
9610.500	33.37	-33.10	38.00	28.47	54.00	20.63	V
4874.500	27.63	-37.20	33.20	31.63	54.00	26.37	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)
17976.500	38.14	-25.50	46.70	16.94	54.00	15.86	V
7387.000	36.73	-35.10	36.60	35.23	54.00	17.27	V
4925.000	36.04	-37.10	33.30	39.84	54.00	17.96	H
13931.000	35.69	-29.50	41.30	23.89	54.00	18.31	V
11887.000	34.52	-31.80	39.00	27.32	54.00	19.48	H
2485.200	51.04	-20.00	28.30	42.74	54.00	2.96	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)
17049.500	37.40	-26.60	43.40	20.60	54.00	16.60	H
13892.500	35.02	-29.50	41.30	23.22	54.00	18.98	V
11877.500	33.86	-31.80	39.00	26.66	54.00	20.14	H
7263.000	32.83	-35.00	36.50	31.23	54.00	21.17	V
9721.000	32.82	-33.00	38.00	27.82	54.00	21.18	V
2389.900	53.86	-20.00	28.10	45.86	54.00	0.14	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)
16863.000	37.48	-26.60	41.50	22.58	54.00	16.52	V
14101.000	35.14	-29.40	41.70	22.94	54.00	18.86	V
7309.000	34.73	-35.00	36.50	33.13	54.00	19.27	V
11869.000	34.00	-31.80	39.00	26.80	54.00	20.00	H
9648.000	32.47	-33.10	38.00	27.57	54.00	21.53	H
4964.000	27.10	-36.60	33.40	30.30	54.00	26.90	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)
17973.500	37.46	-25.50	46.70	16.26	54.00	16.54	V
13938.500	35.05	-29.50	41.30	23.25	54.00	18.95	H
11892.000	34.32	-31.80	39.00	27.12	54.00	19.68	V
7350.000	33.51	-35.10	36.60	32.01	54.00	20.49	V
9642.500	32.72	-33.10	38.00	27.82	54.00	21.28	H
2485.400	49.38	-20.00	28.30	41.08	54.00	4.62	H

Test graphs as below:

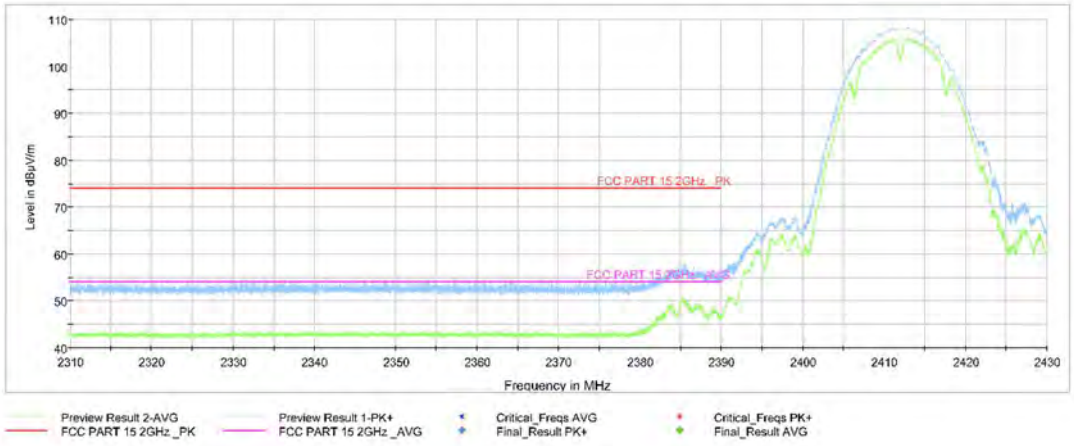

Fig.A.6.2.1 Transmitter Spurious Emission - Radiated (Power): 802.11b, ch1, 2.31 GHz – 2.43GHz

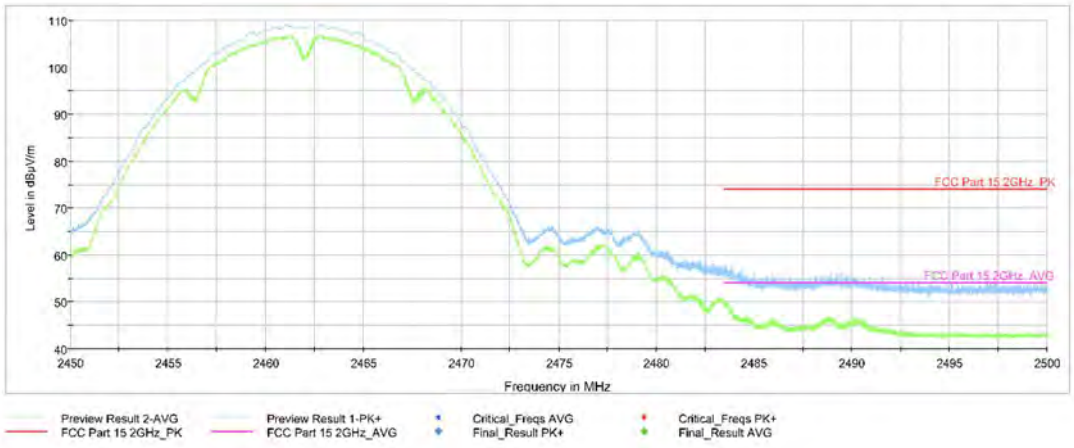

Fig.A.6.2.2 Transmitter Spurious Emission - Radiated (Power): 802.11b, ch11, 2.45 GHz - 2.50GHz

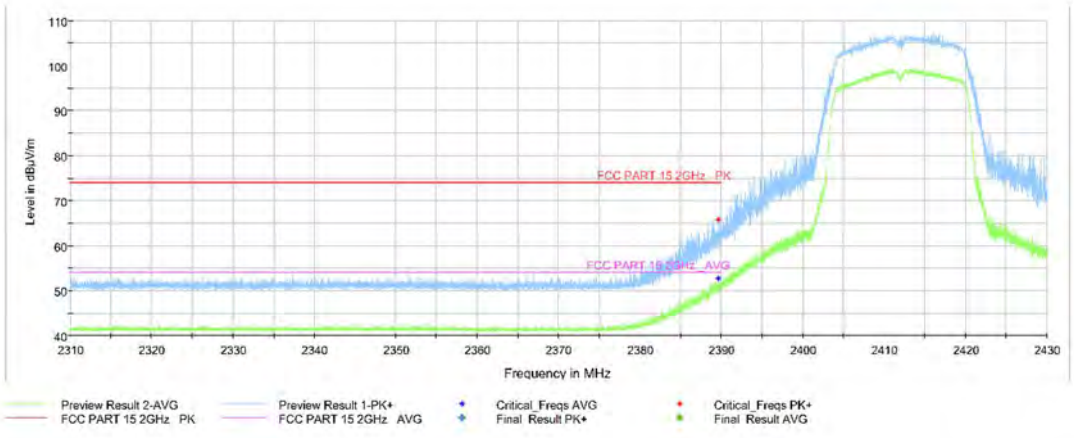

Fig.A.6.2.3 Transmitter Spurious Emission - Radiated (Power): 802.11g, ch1, 2.31 GHz - 2.43GHz

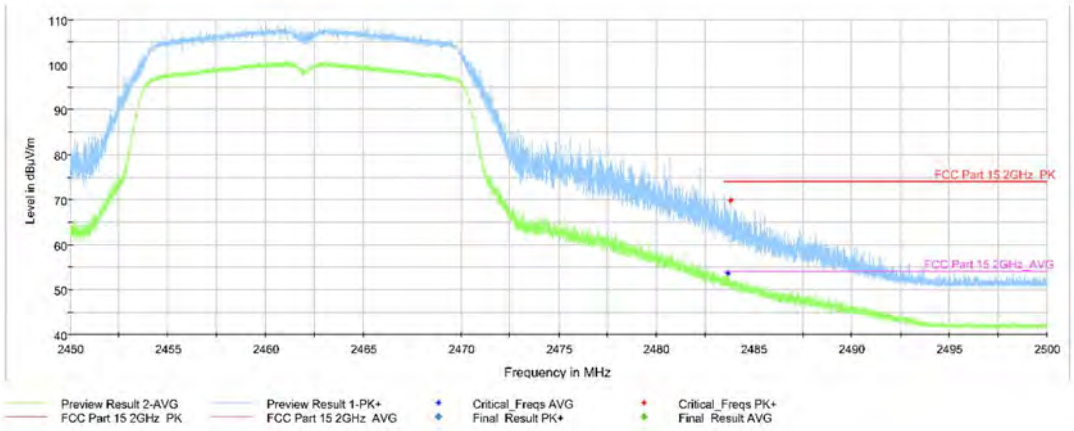

Fig.A.6.2.4 Transmitter Spurious Emission - Radiated (Power): 802.11g, ch11, 2.45 GHz - 2.50GHz

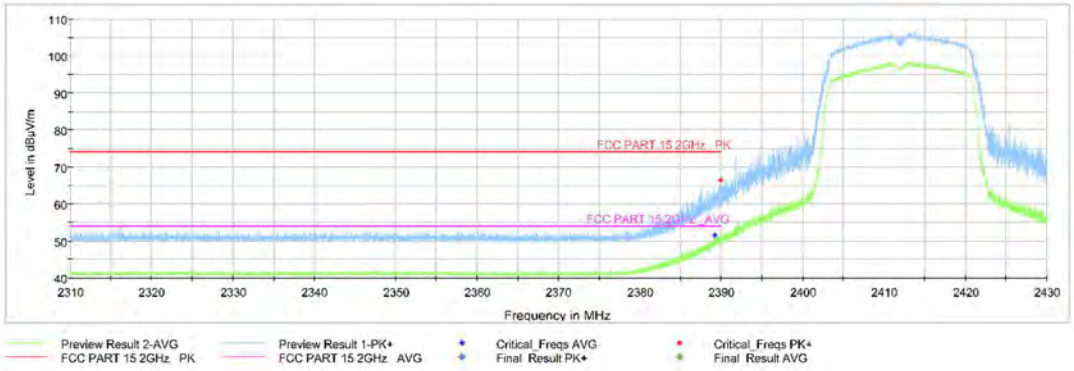

Fig.A.6.2.5 Transmitter Spurious Emission - Radiated (Power): 802.11n-HT20, ch1, 2.31 GHz - 2.43GHz

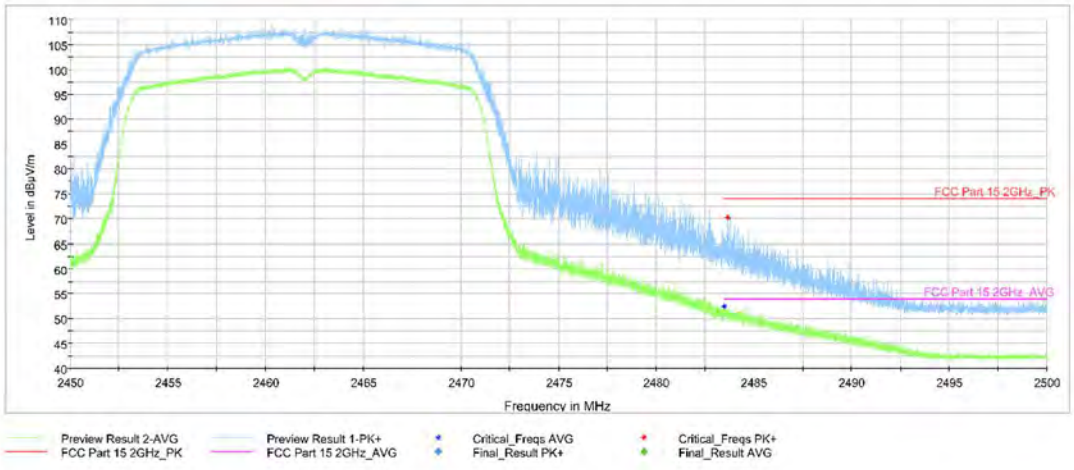

Fig.A.6.2.6 Transmitter Spurious Emission - Radiated (Power): 802.11n-HT20, ch11, 2.45 GHz - 2.50GHz

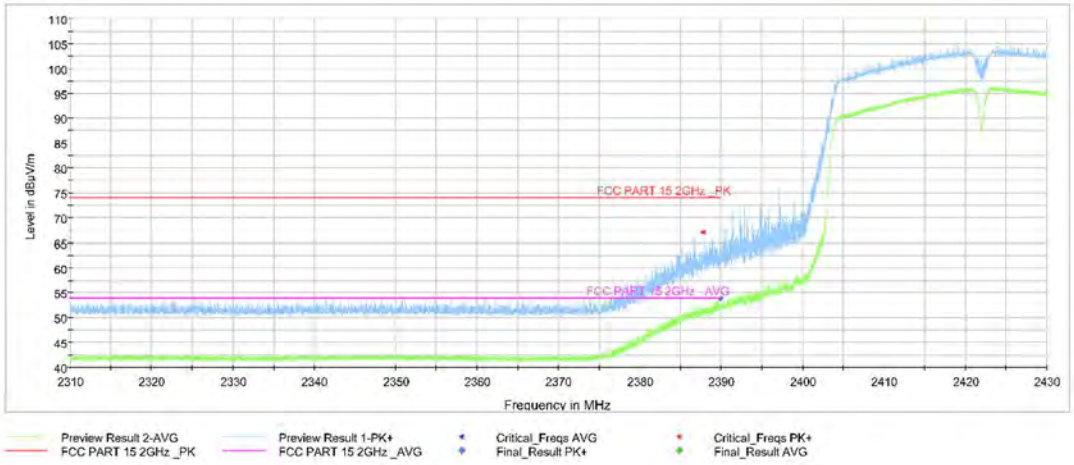

Fig.A.6.2.7 Transmitter Spurious Emission - Radiated (Power): 802.11n-HT40, ch3, 2.31 GHz - 2.43GHz

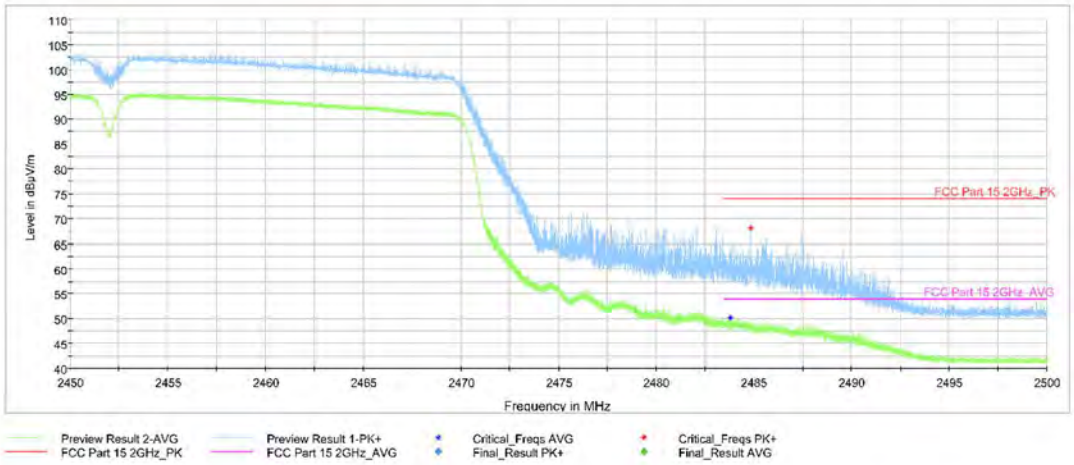

Fig.A.6.2.8 Transmitter Spurious Emission - Radiated (Power): 802.11n-HT40, ch9, 2.45 GHz - 2.50GHz

A.7. AC Power-line Conducted Emission

Method of Measurement: See ANSI C63.10-2013-clause 6.2

1 The one EUT cable configuration and arrangement and mode of operation that produced the emission with the highest amplitude relative to the limit is selected for the final measurement, while applying the appropriate modulating signal to the EUT.

2 If the EUT is relocated from an exploratory test site to a final test site, the highest emissions shall be remaximized at the final test location before final ac power-line conducted emission measurements are performed.

3 The final test on all current-carrying conductors of all of the power cords to the equipment that comprises the EUT (but not the cords associated with other non-EUT equipment in the system) is then performed for the full frequency range for which the EUT is being tested for compliance without further variation of the EUT arrangement, cable positions, or EUT mode of operation.

4 If the EUT is comprised of equipment units that have their own separate ac power connections, e.g., floor-standing equipment with independent power cords for each shelf that are able to connect directly to the ac power network, each current-carrying conductor of one unit is measured while the other units are connected to a second (or more) LISN(s). All units shall be separately measured. If a power strip is provided by the manufacturer, to supply all of the units making up the EUT, only the conductors in the power cord of the power strip shall be measured.

5 If the EUT uses a detachable antenna, these measurements shall be made with a suitable dummy load connected to the antenna output terminals; otherwise, the tests shall be made with the antenna connected and, if adjustable, fully extended. When measuring the ac conducted emissions from a device that operates between 150 kHz and 30 MHz a non-detachable antenna may be replaced with a dummy load for the measurements within the fundamental emission band of the transmitter, but only for those measurements.36 Record the six highest EUT emissions relative to the limit of each of the current-carrying conductors of the power cords of the equipment that comprises the EUT over the frequency range specified by the procuring or regulatory agency. Diagram or photograph the test setup that was used. See Clause 8 for full reporting requirements.

Test Condition:

Voltage（V）	Frequency（Hz）
120	60

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.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 (dBμV)	Result (dBμV)		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:

Measurement results for Set.1:

Result for Traffic:

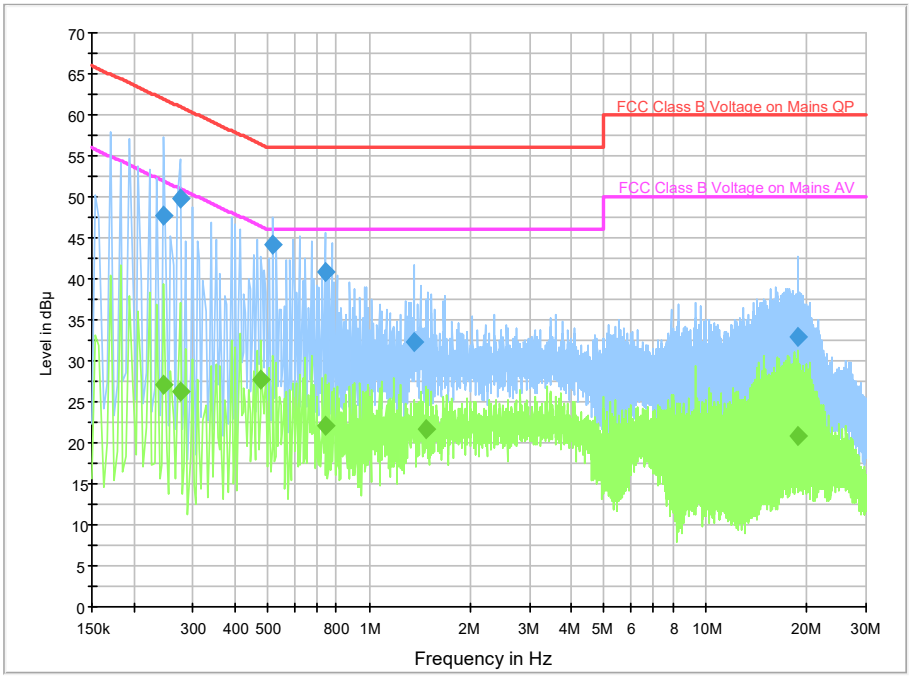

Fig.A.7.1 AC Powerline Conducted Emission-802.11b

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

Final Result 1

Frequency (MHz)	QuasiPeak (dBuV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)	Comment
0.246000	47.7	2000.0	9.000	On	N	19.7	14.2	61.9	
0.274000	49.7	2000.0	9.000	On	N	19.7	11.3	61.0	
0.518000	44.3	2000.0	9.000	On	N	19.7	11.7	56.0	
0.738000	40.8	2000.0	9.000	On	N	19.7	15.2	56.0	
1.358000	32.3	2000.0	9.000	On	L1	19.6	23.7	56.0	
18.906000	33.0	2000.0	9.000	On	N	19.8	27.0	60.0	

Final Result 2

Frequency (MHz)	Average (dBuV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)	Comment
0.246000	27.1	2000.0	9.000	On	N	19.7	24.8	51.9	
0.274000	26.3	2000.0	9.000	On	N	19.7	24.7	51.0	
0.478000	27.7	2000.0	9.000	On	N	19.7	18.7	46.4	
0.738000	22.0	2000.0	9.000	On	N	19.7	24.0	46.0	
1.486000	21.7	2000.0	9.000	On	L1	19.7	24.3	46.0	
18.906000	20.9	2000.0	9.000	On	N	19.8	29.1	50.0	

Measurement results for Set.1:

Result for Idle:

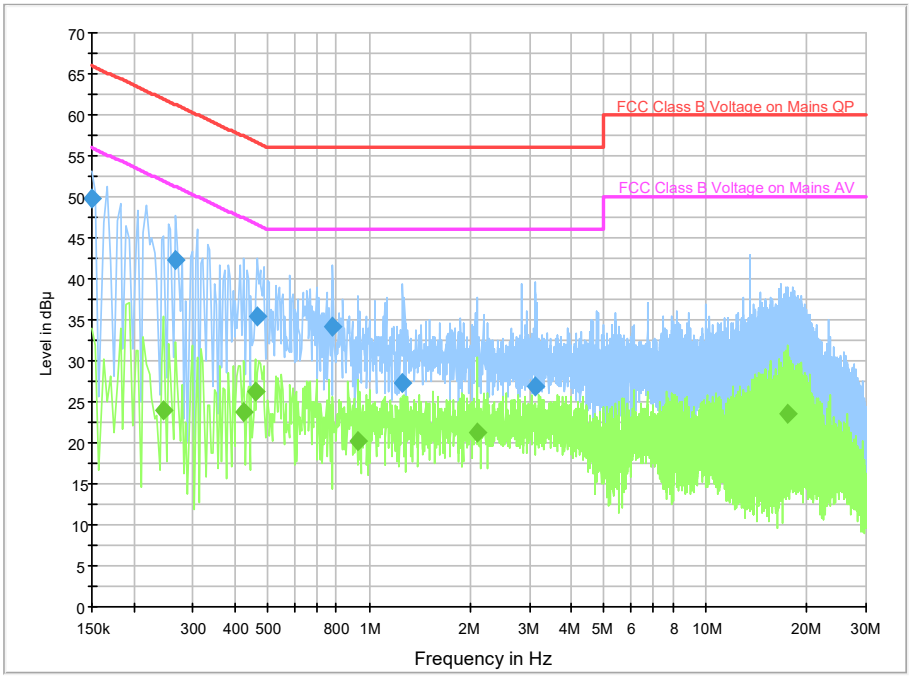

Fig.A.7.2 AC Powerline Conducted Emission-Idle

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

Final Result 1

Frequency (MHz)	QuasiPeak (dBuV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)	Comment
0.150000	49.7	2000.0	9.000	On	L1	20.0	16.3	66.0	
0.266000	42.3	2000.0	9.000	On	L1	19.7	19.0	61.2	
0.466000	35.4	2000.0	9.000	On	N	19.7	21.2	56.6	
0.782000	34.3	2000.0	9.000	On	L1	19.7	21.7	56.0	
1.262000	27.4	2000.0	9.000	On	L1	19.7	28.6	56.0	
3.130000	26.9	2000.0	9.000	On	L1	19.6	29.1	56.0	

Final Result 2

Frequency (MHz)	Average (dBuV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)	Comment
0.246000	24.1	2000.0	9.000	On	N	19.7	27.8	51.9	
0.426000	23.7	2000.0	9.000	On	N	19.7	23.7	47.3	
0.458000	26.2	2000.0	9.000	On	L1	19.7	20.5	46.7	
0.930000	20.2	2000.0	9.000	On	N	19.6	25.8	46.0	
2.098000	21.3	2000.0	9.000	On	L1	19.6	24.7	46.0	
17.594000	23.6	2000.0	9.000	On	L1	19.7	26.4	50.0	

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

United States Department of Commerce
National Institute of Standards and Technology

NVLAP®

ilac-MRA

Certificate of Accreditation to ISO/IEC 17025:2017

NVLAP LAB CODE: 600118-0

Telecommunication Technology Labs, CAICT
Beijing
China

is accredited by the National Voluntary Laboratory Accreditation Program for specific services, listed on the Scope of Accreditation, for:

Electromagnetic Compatibility & Telecommunications

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communique dated January 2009).

2022-10-01 through 2023-09-30
Effective Dates

DEPARTMENT OF COMMERCE · UNITED STATES OF AMERICA

For the National Voluntary Laboratory Accreditation Program

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