FCC PART 15C
TEST REPORT
No. I21Z70411-IOT05

for

Samsung Electronics Co., Ltd

Multi-band GSM/WCDMA/LTE phone with Bluetooth, WLAN

SM-A032M/DS，SM-A032M

FCC ID : ZCASMA032M

with

Hardware Version: REV1.0

Software Version: A032M.001

Issued Date: 2021-09-22

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.

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

REPORT HISTORY

Report Number	Revision	Description	Issue Date
No.I21Z70411-IOT05	Rev.0	1st edition	2021-09-22

CONTENTS

1. Test Laboratory

1.1. Introduction & Accreditation

Telecommunication Technology Labs, CAICT is an ISO/IEC 17025:2005 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 (CN0066). The detail accreditation scope can be found on NVLAP 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:Radiated testing Location: CTTL(BDA)

Address:No. 18A, Kangding Street, Beijing Economic-Technology Development Area, Beijing, 100176, P.R. China

1.3. Testing Environment

Normal Temperature: 15-35℃

Relative Humidity: 20-75%

1.4. Project date

Testing Start Date: 2021-08-13

Testing End Date: 2021-09-22

1.5. Signature

封爱宇

Feng Aiyu

(Prepared this test report)

Zheng Wei

(Reviewed this test report)

胡晓宇

Hu Xiaoyu

(Approved this test report)

2. Client Information

2.1. Applicant Information

Company Name:	Samsung Electronics Co., Ltd
Address:	19 Chapin Rd.,Building D Pine Brook, NJ 07058
City:	/
Postal Code:	/
Country:	/
Contact:	Jenni Chun
Telephone	+1-201-937-4203
E-mail:	j1.chun@samsung.com

2.2. Manufacturer Information

Company Name:	Samsung Electronics Co., Ltd
Address:	Samsung R5, Maetan dong 129, Samsung ro Youngtong gu, Suwon city 443 742, Korea
City:	/
Postal Code:	/
Country:	/
Contact:	조성훈 (Sunghoon Cho)
Telephone	+82-10-2722-4159
E-mail:	ggobi.cho@samsung.com

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

3.1. About EUT

Description	Multi-band GSM/WCDMA/LTE phone with Bluetooth, WLAN
Model name	SM-A032M/DS，SM-A032M
FCC ID	ZCASMA032M
With WLAN Function	Yes
Frequency Range	ISM 2400MHz~2483.5MHz
Type of Modulation	DSSS/CCK/OFDM
Number of Channels	11
Antenna	Integral Antenna
MAX Conducted Power	24.26dBm
Power Supply	3.85V

3.2. Internal Identification of EUT

EUT ID*	SN or IMEI	HW Version	SW Version
UT08a	2170411UT08a	REV1.0	A032M.001
UT17a	2170411UT17a	REV1.0	A032M.001

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

3.3. Internal Identification of AE

AE ID*	Description	Remark
AE1-1	Adapter1	/
AE1-2	Adapter2	/
AE1-3	Adapter3	/
AE2-1	Adapter4	/
AE2-2	Adapter5	/
AE2-3	Adapter6	/
AE2-4	Adapter7	/
AE2-5	Adapter8	/
AE3-1	Adapter9	/
AE3-2	Adapter10	/
AE3-3	Adapter11	/
AE3-4	Adapter12	/
AE3-11	Adapter13	/
AE4-1	Adapter14	/
AE4-4	Adapter15	/
AE5-1	USB Cable1	/

AE5-2	USB Cable2	/
AE5-3	USB Cable3	/
AE6	Headset1	/
AE7	Headset2	/
AE8	Battery	/

AE1-1

Model	EP-TA50EWE
Manufacturer	RFTECH Co., Ltd.
Length of cable	/

AE1-2

Model	EP-TA50JWS
Manufacturer	RFTECH Co., Ltd.
Length of cable	/

AE1-3

Model	EP-TA50JWE
Manufacturer	RFTECH Co., Ltd.
Length of cable	/

AE2-1

Model	EP-TA50EWE
Manufacturer	DONGYANG E&P Inc.
Length of cable	/

AE2-2

Model	EP-TA50JWS
Manufacturer	DONGYANG E&P Inc.
Length of cable	/

AE2-3

Model	EP-TA50JWE
Manufacturer	DONGYANG E&P Inc.
Length of cable	/

AE2-4

Model	EP-TA50UWE
Manufacturer	DONGYANG E&P Inc.
Length of cable	/

AE2-5

Model	EP-TA50RWS
Manufacturer	DONGYANG E&P Inc.
Length of cable	/

AE3-1

Model	EP-TA50EWE
Manufacturer	HAEM Co.,Ltd
Length of cable	/

AE3-2

Model	EP-TA50JWS

Manufacturer	HAEM Co.,Ltd	
Length of cable	/	
AE3-3		
Model	EP-TA50JWE	
Manufacturer	HAEM Co.,Ltd	
Length of cable	/	
AE3-4		
Model	EP-TA50UWE	
Manufacturer	HAEM Co.,Ltd	
Length of cable	/	
AE3-11		
Model	EP-TA50EWE	
Manufacturer	HAEM Co.,Ltd	
Length of cable	/	
AE4-1		
Model	EP-TA50EWE	
Manufacturer	Salcomp (Shenzhen) Co., Ltd.	
Length of cable	/	
AE4-4		
Model	EP-TA50UWE	
Manufacturer	Salcomp (Shenzhen) Co., Ltd.	
Length of cable	/	
AE5-1		
Model	ECB-DU68WE(GH39-02004A)	
Manufacturer	CRESYN HANOI Co., Ltd	
Length	/	/
AE5-2		
Model	ECB-DU68WE(GH39-02004A)/ / ECB-DU68WZ(GH39-02005A) / ECB-DU68WE(GH39-02004B)	
Manufacturer	DONGGUAN KSD CO.,LTD	
Length	/	/
AE5-3		
Model	ECB-DU68WE(GH39-02004A)/ / ECB-DU68WZ(GH39-02005A) / ECB-DU68WE(GH39-02004B	
Manufacturer	RFTECH Co., Ltd.	
Length	/	/
AE6		
Model	GH59-15054A/ GH59-15071A	
Manufacturer	DONGGUAN YOUNGBO ELECTRONICS CO.,LTD	
Length	/	
AE7		

Model	GH59-15054A/ GH59-15071A
Manufacturer	CRESYN HANOI Co., Ltd
Length	/

AE8

TYPE	Secondary Li-ion Battery
SN	SLC-50
Manufacturer	Ningde Amperex Technology Limited

*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 Smart Phone with WLAN 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.	2018
ANSI C63.10	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices	2013
KDB 558074 D01	Federal Communications Commission Office of	2019

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

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	FSQ40	200089	Rohde & Schwarz	1 year	2022-05-15
2	LISN	ENV216	101459	R&S	1 year	2022-04-10
3	Test Receiver	ESCI7	100948	R&S	1 year	2022-07-17
4	Shielding Room	S81	/	ETS-Lindgren	/	/

Radiated emission test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Period	Calibration Due date
1	Test Receiver	ESU26	100235	R&S	1 year	2022-02-23
2	EMI Antenna	VULB9163	9163-482	Schwarzbeck	1 year	2021-11-04
3	EMI Antenna	LB-180-NF	203001300041	A-INFO	1 year	2022-02-28
4	EMI Antenna	LB-180400-25-C-KF	211008400006	A-INFO	1 year	2022-02-28
5	Analytical Spectrometer	FSV40	101047	R&S	1 year	2022-06-02

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	5.40
1GHz ≤ f ≤18GHz	4.32
18GHz ≤ f ≤40GHz	5.26

7.6. AC Power-line Conducted Emission

Measurement Uncertainty: 3.10dB, 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

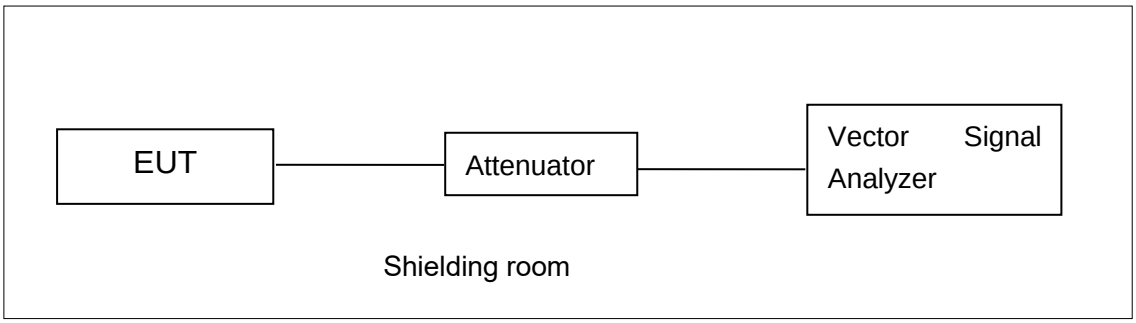


Fig.A.1.1.1: Test Setup Diagram for Conducted Measurements

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;

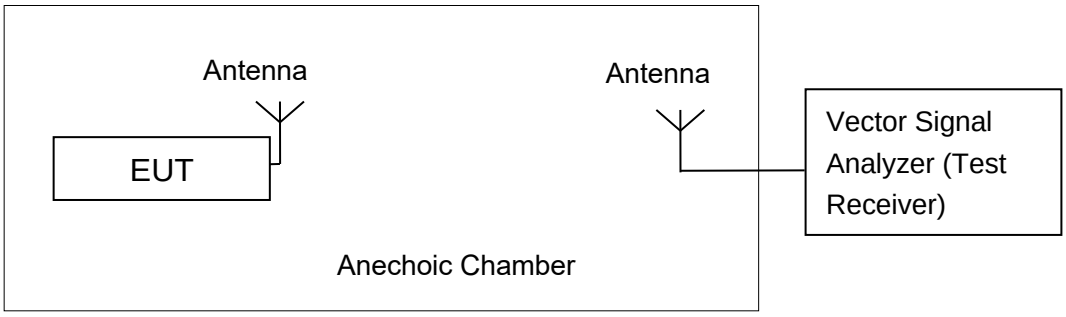


Fig.A.1.2.1: Test Setup Diagram for Radiated Measurements

A.2. Maximum Output Power

Method of Measurement: See ANSI C63.10-2013-clause 11.9.1.2

a) Set the RBW = 1 MHz.
b) Set the VBW = 3 MHz.
c) Set the span ≥ [1.5 × DTS bandwidth].
d) Detector = peak.
e) Sweep time = auto couple.
f) Trace mode = max hold.
g) Allow trace to fully stabilize.
h) Use the instrument's band/channel power measurement function with the band limits set equal to the DTS bandwidth edges (for some instruments, this may require a manual override to select the peak detector).

Measurement Limit:

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

EUT ID: UT17a

A.2.1. Peak Output Power-conducted

Measurement Results:

802.11b/g mode

Mode	Data Rate (Mbps)	Test Result (dBm)		
		2412MHz (Ch1)	2437MHz (Ch6)	2462 MHz (Ch11)
802.11b	1	20.45	/	/
	2	20.84	/	/
	5.5	22.37	/	/
	11	23.97	23.29	23.59
802.11g	6	22.91	/	/
	9	23.07	/	/
	12	22.54	/	/
	18	22.51	/	/
	24	23.04	/	/
	36	23.38	24.23	19.87
	48	21.97	/	/
	54	21.98	/	/

802.11n-HT20 mode

Mode	Data Rate (Index)	Test Result (dBm)		
		2412MHz (Ch1)	2437MHz (Ch6)	2462 MHz (Ch11)

802.11n (20MHz)	MCS0	22.71	/	/
	MCS1	22.85	/	/
	MCS2	23.85	/	/
	MCS3	24.06	/	/
	MCS4	24.26	23.89	19.64
	MCS5	23.98	/	/
	MCS6	23.42	/	/
	MCS7	21.99	/	/

The data rate MCS4 are selected as worse condition, and the following cases are performed with this condition.

Note: The duty cycle of the EUT is 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:

UT17a

Mode	Channel	Power Spectral Density (dBm/3 kHz) ANT0
802.11b	1	-0.76
	6	-0.41
	11	-5.49
802.11g	1	-10.9
	6	-11.6
	11	-14.41
802.11n (HT20)	1	-10.39
	6	-11.53
	11	-13.71

Conclusion: Pass

Test graphs as below:

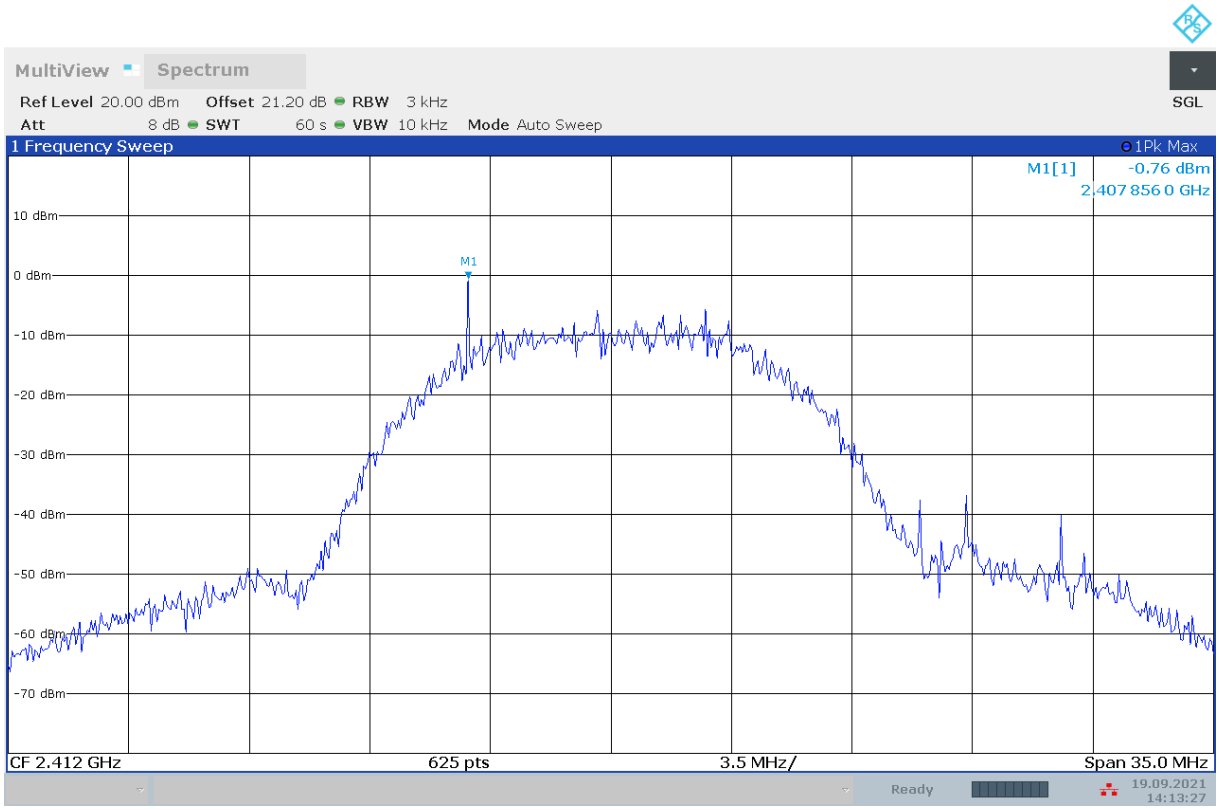


Fig.A.3.1 Power Spectral Density(802.11b,Ch1)

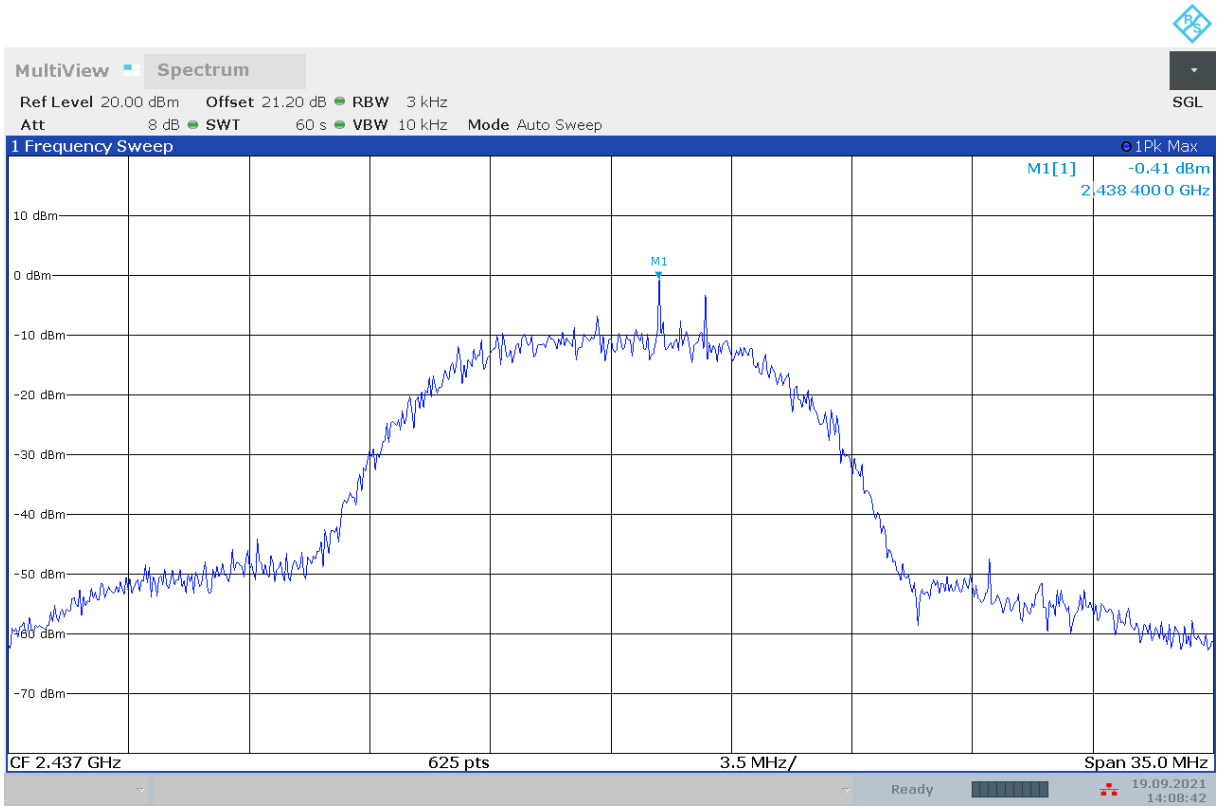


Fig.A.3.2 Power Spectral Density (802.11b, Ch 6)

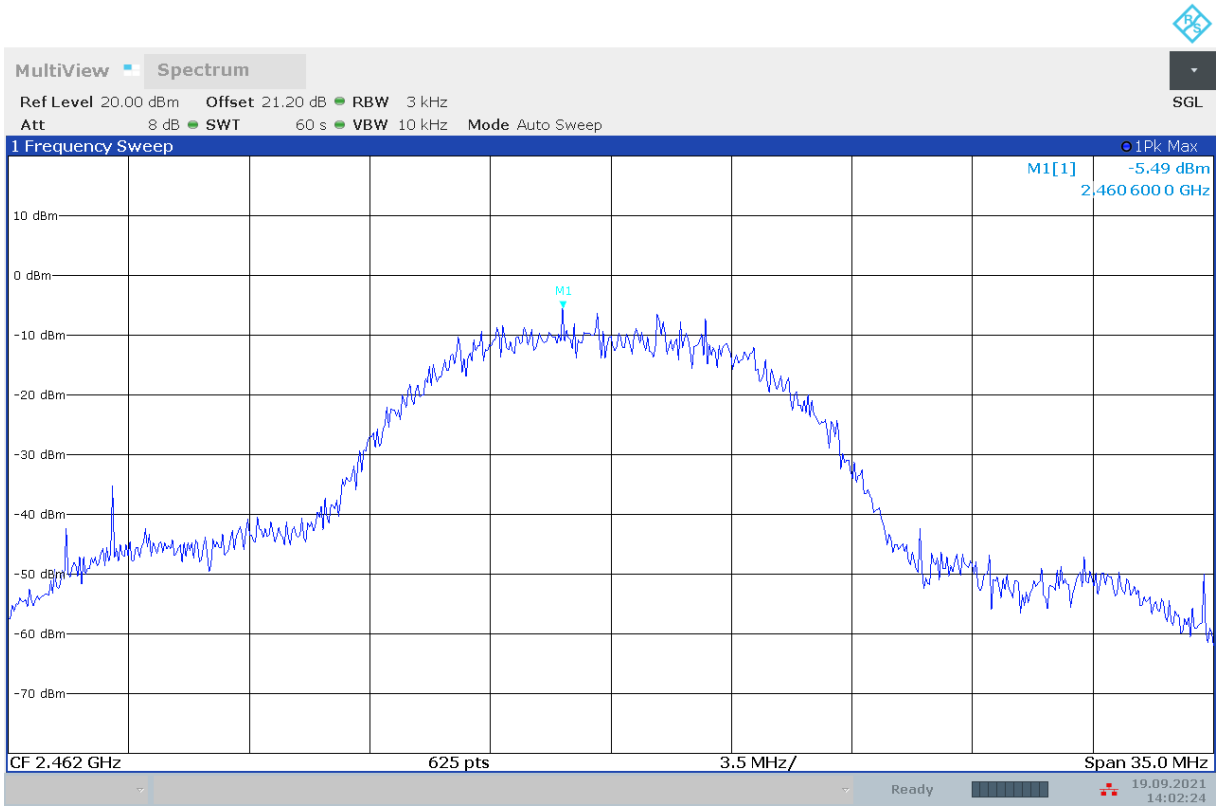


Fig.A.3.3 Power Spectral Density (802.11b, Ch 11)

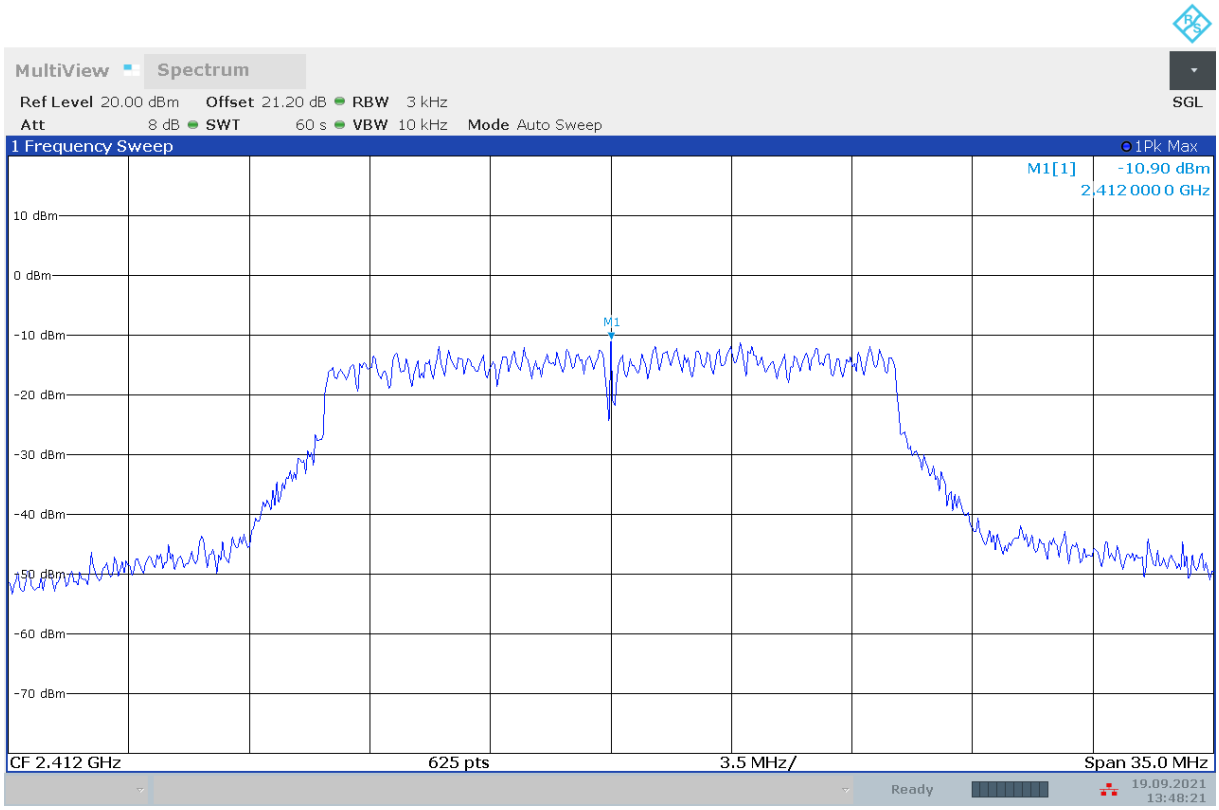


Fig.A.3.4 Power Spectral Density (802.11g, Ch 1)

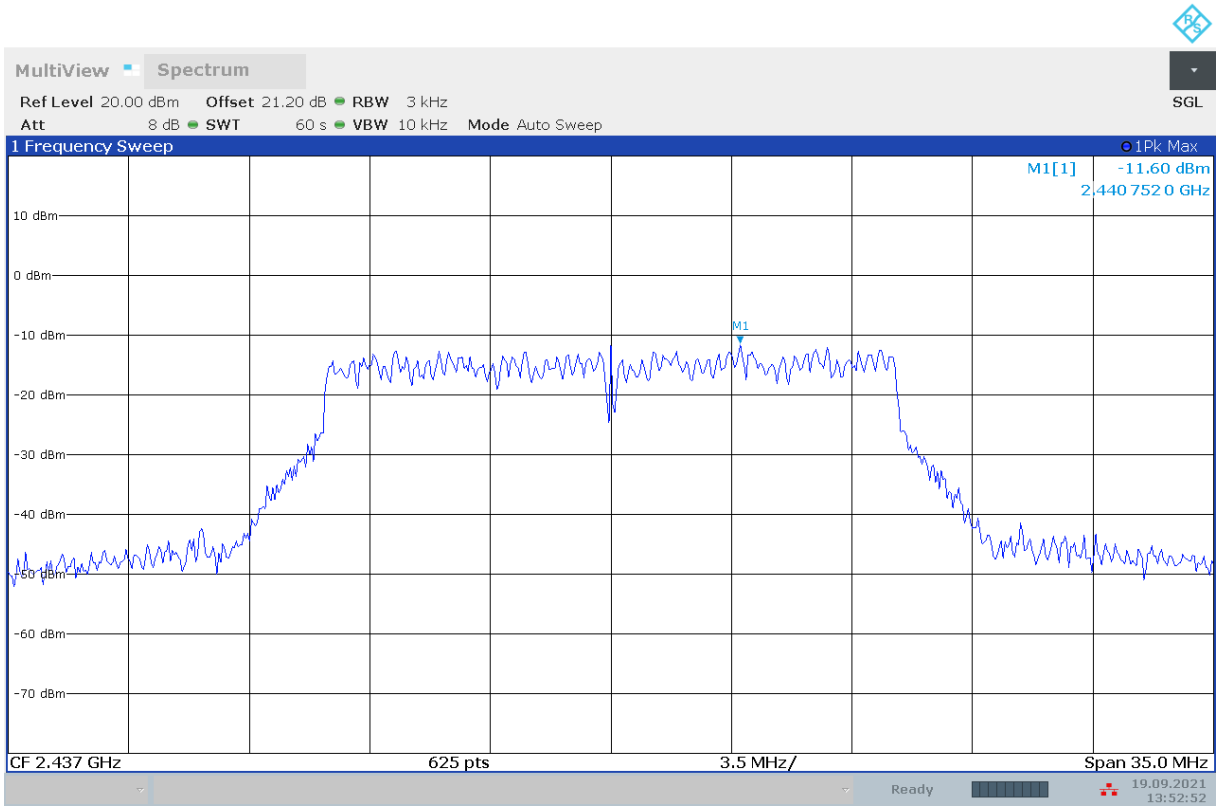


Fig.A.3.5 Power Spectral Density (802.11g, Ch 6)

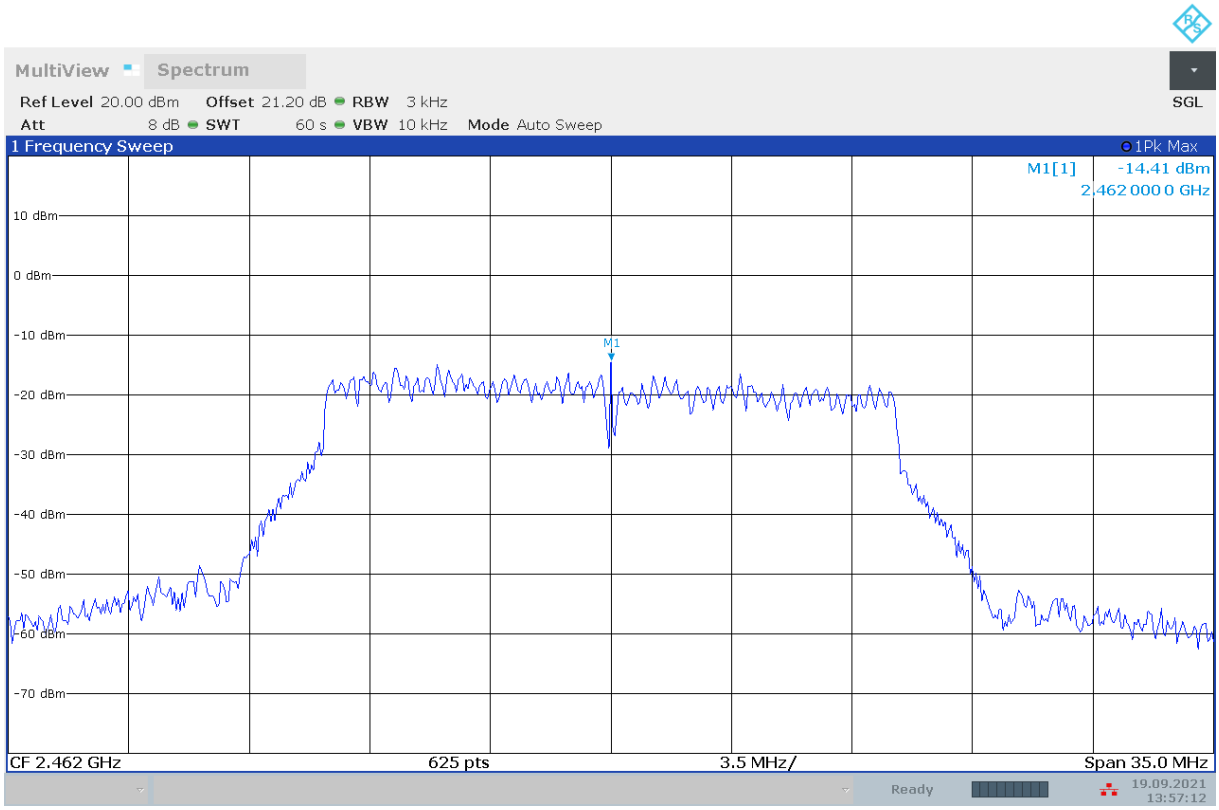


Fig.A.3.6 Power Spectral Density (802.11g, Ch 11)

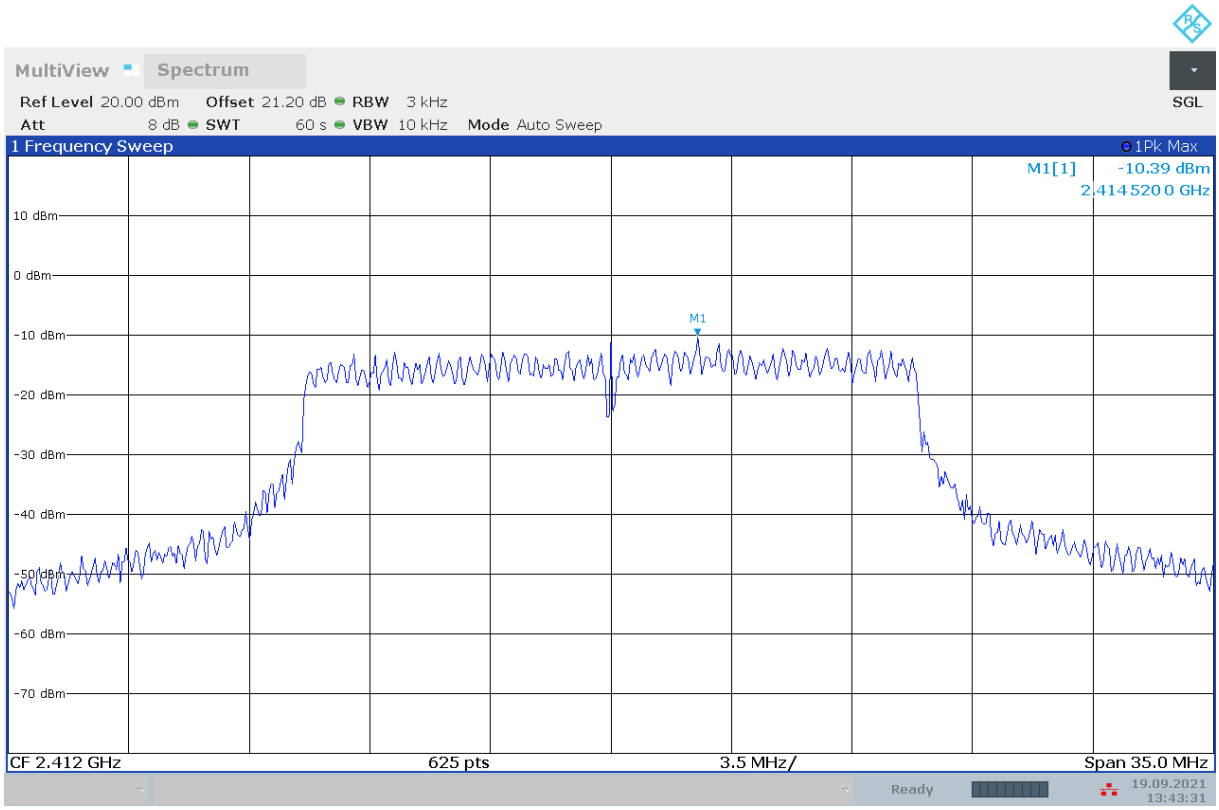


Fig.A.3.7 Power Spectral Density (802.11n-HT20, Ch 1)

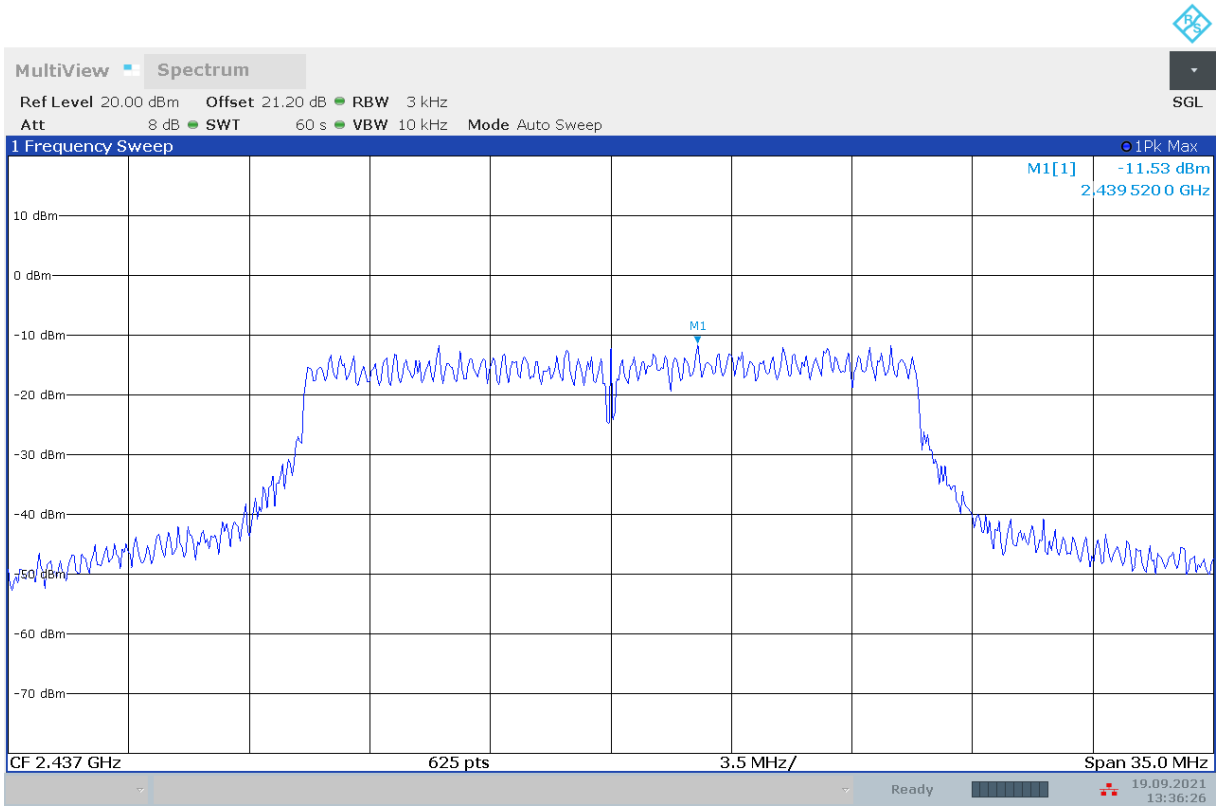


Fig.A.3.8 Power Spectral Density (802.11n-HT20, Ch 6)

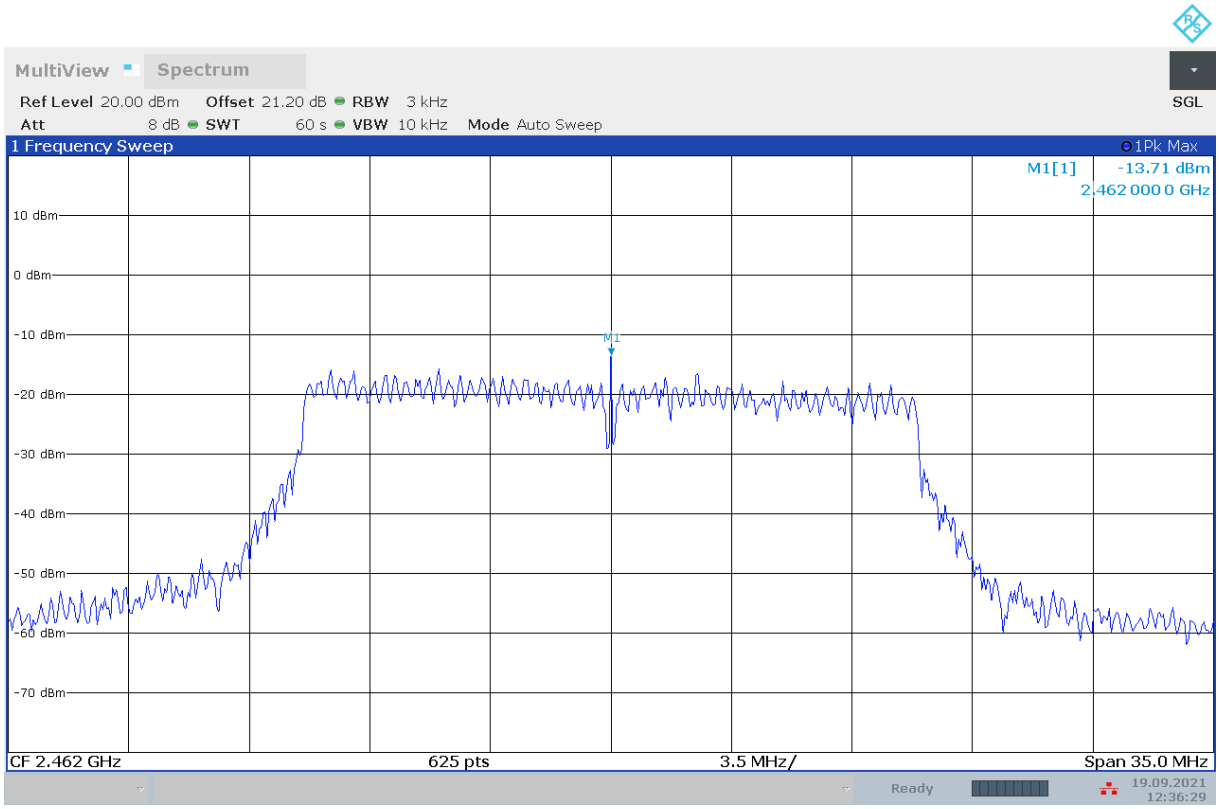


Fig.A.3.9 Power Spectral Density (802.11n-HT20, Ch 11)

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: UT17a

Measurement Result:

SISO ANT0:

802.11b/g mode

Mode	Channel	Occupied 6dB Bandwidth (kHz)		conclusion
802.11b	1	Fig.A.4.1	8581	P
	6	Fig.A.4.2	8617	P
	11	Fig.A.4.3	8601	P
802.11g	1	Fig.A.4.4	16460	P
	6	Fig.A.4.5	16487	P
	11	Fig.A.4.6	16104	P

802.11n-HT20 mode

Mode	Channel	Occupied 6dB Bandwidth (kHz)		conclusion
802.11n (HT20)	1	Fig.A.4.7	17608	P
	6	Fig.A.4.8	17689	P
	11	Fig.A.4.9	17021	P

Test graphs as below:

SISO ANT0:

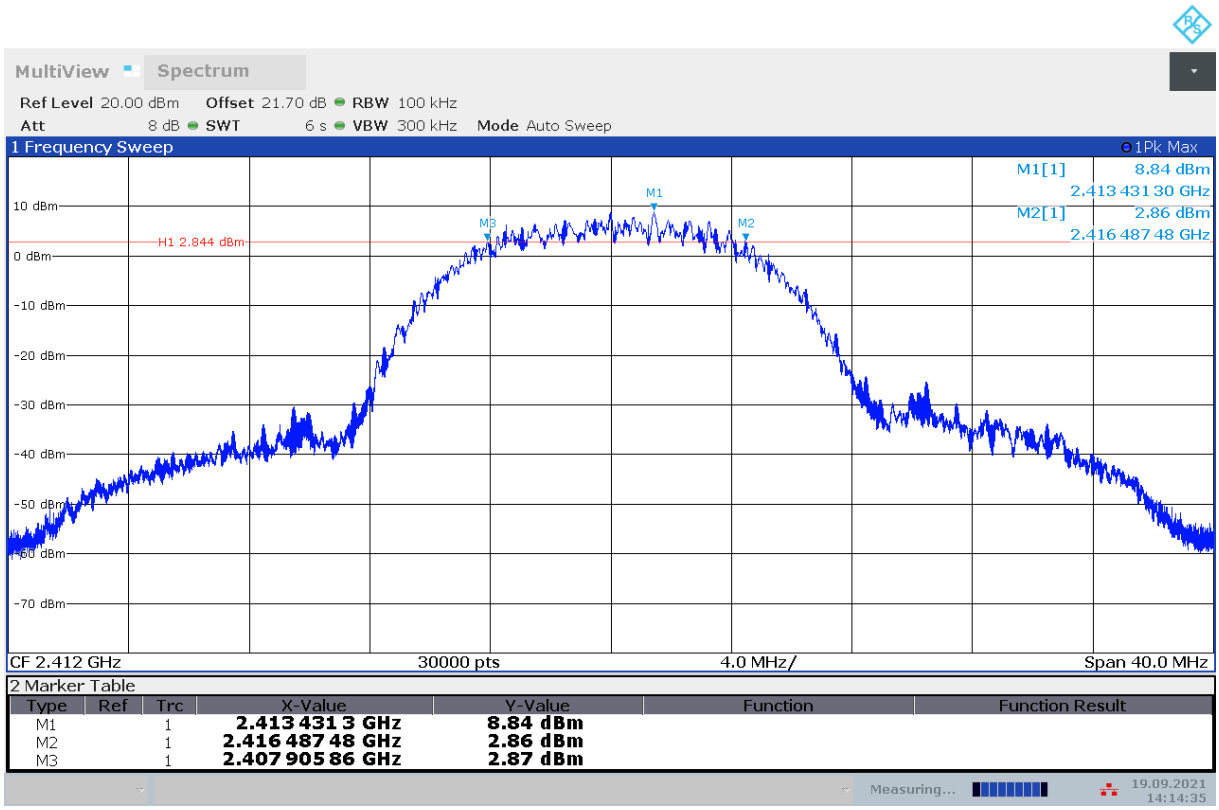


Fig.A.4.1 Occupied 6dB Bandwidth(802.11b,Ch 1)

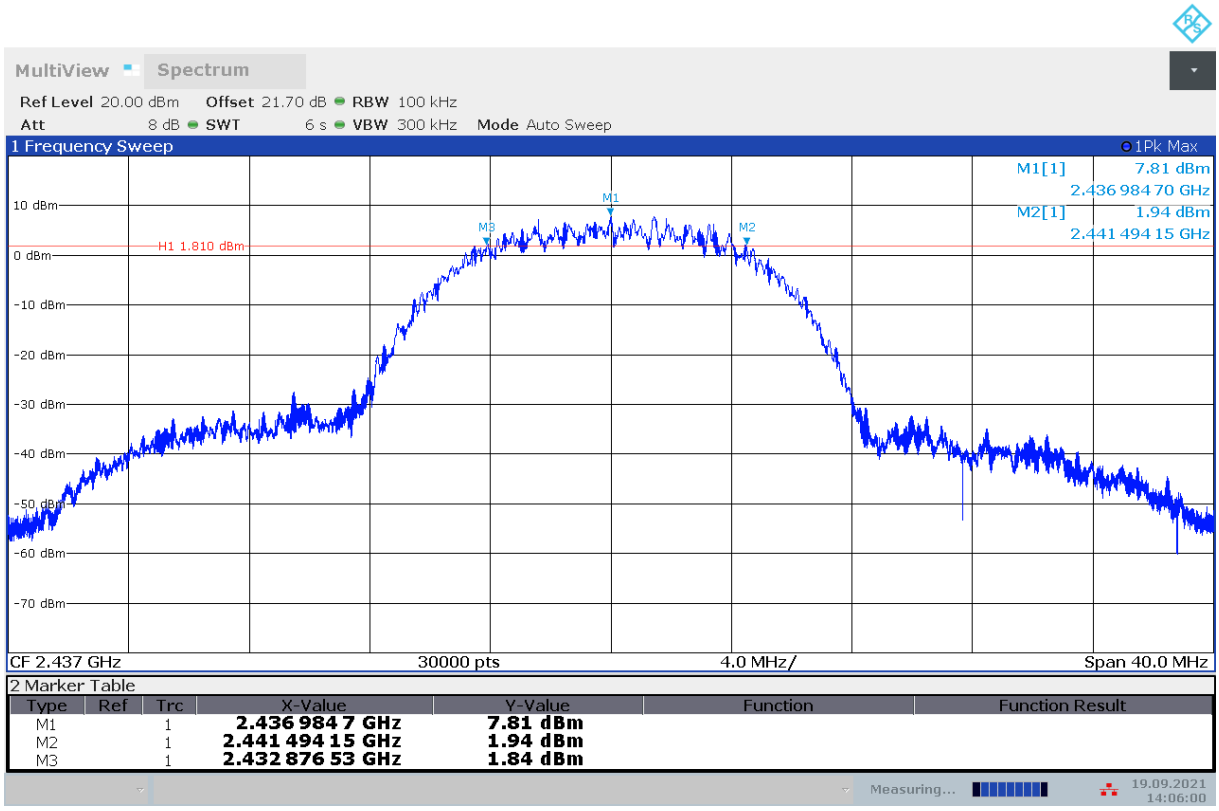


Fig.A.4.2 Occupied 6dB Bandwidth (802.11b, Ch 6)

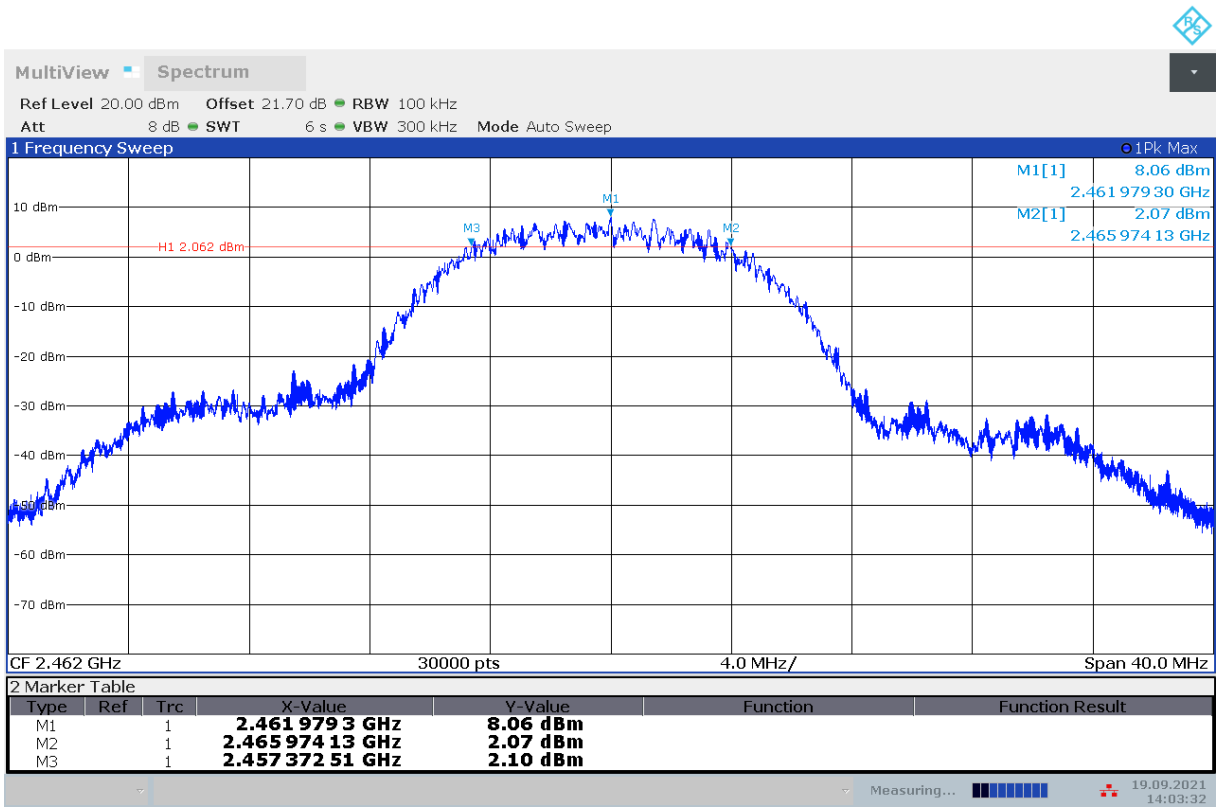


Fig.A.4.3 Occupied 6dB Bandwidth (802.11b, Ch 11)

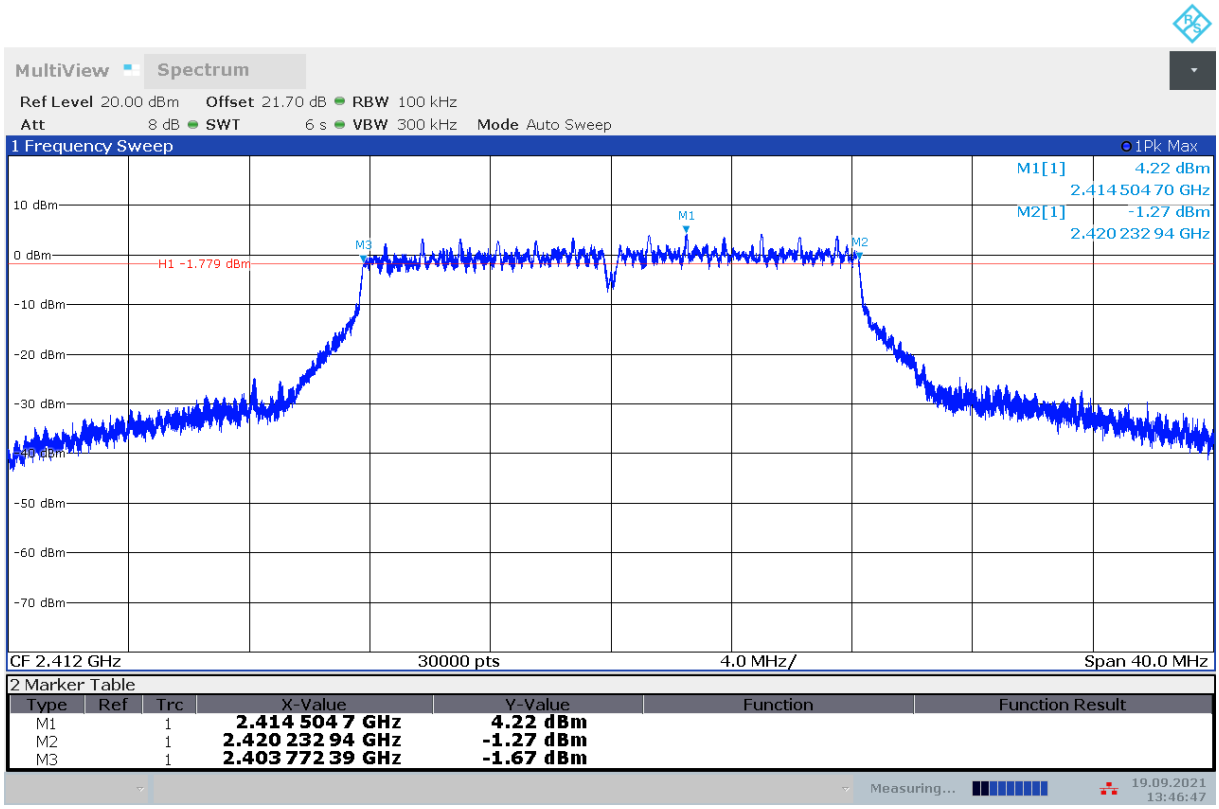


Fig.A.4.4 Occupied 6dB Bandwidth (802.11g, Ch 1)

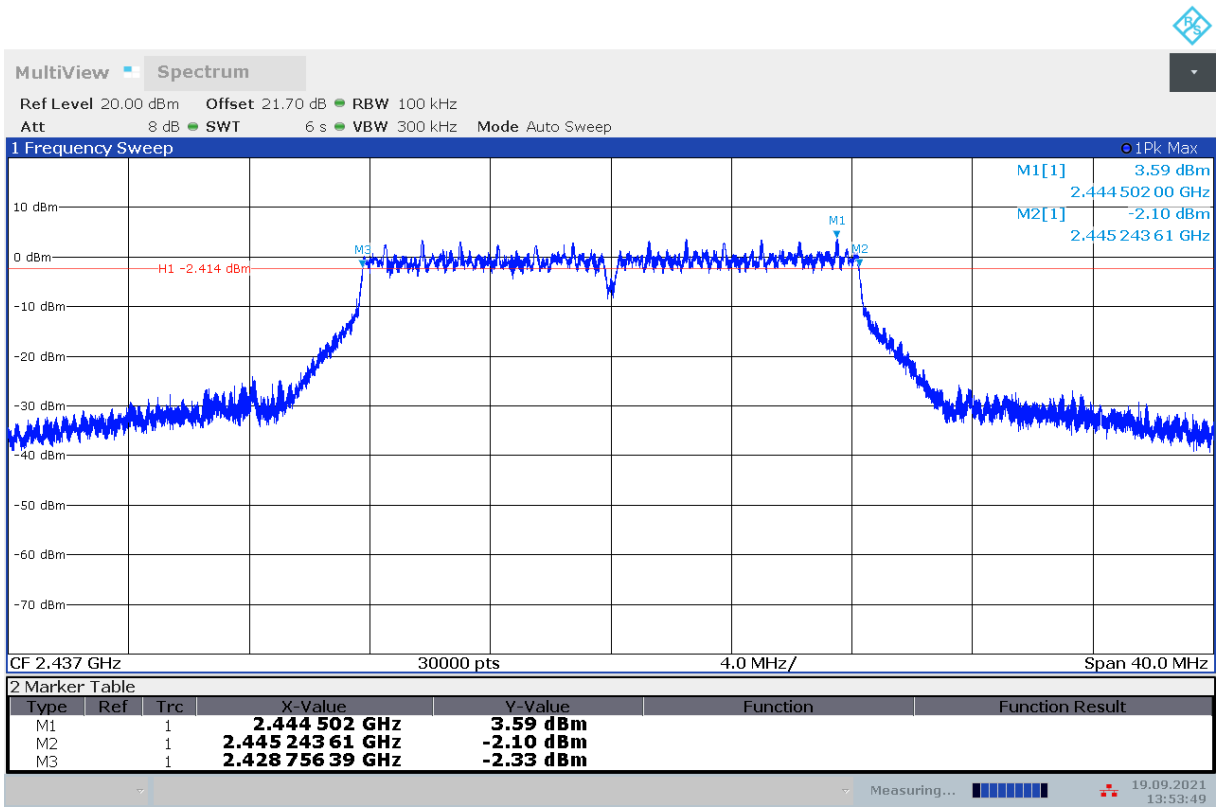


Fig.A.4.5 Occupied 6dB Bandwidth (802.11g, Ch 6)

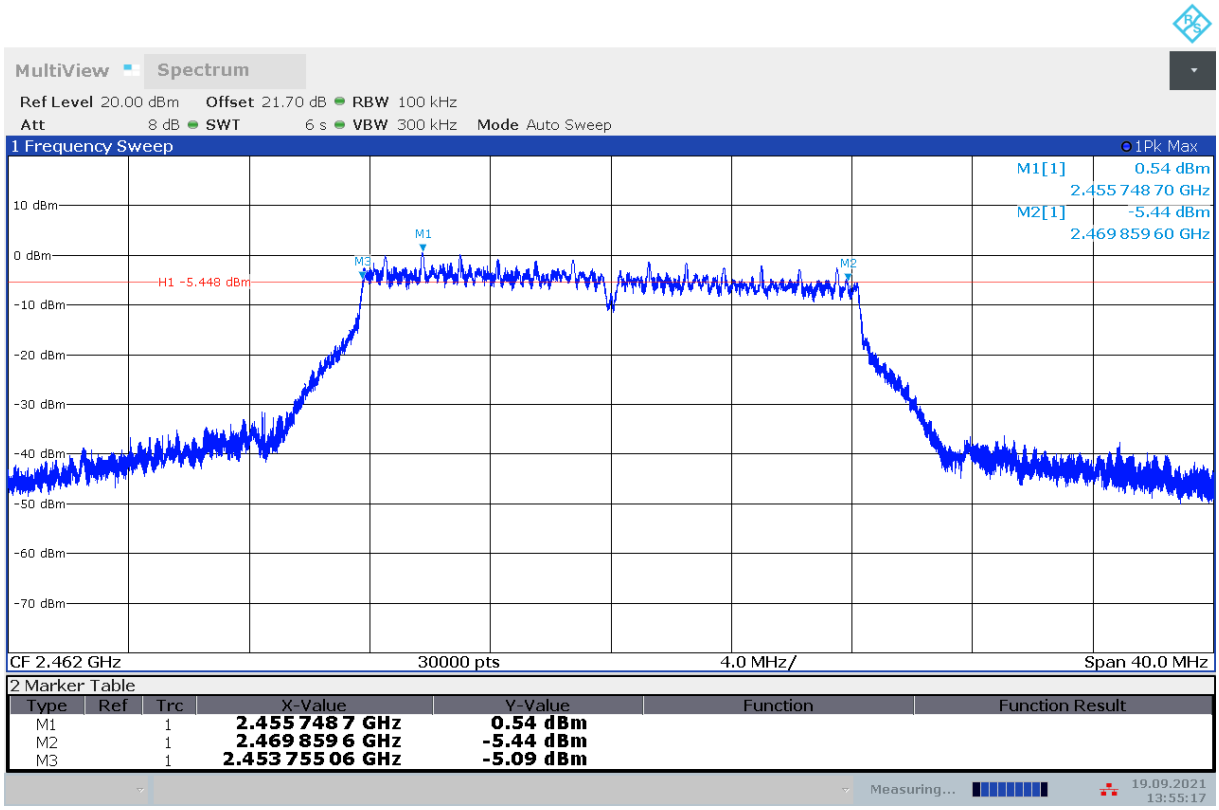


Fig.A.4.6 Occupied 6dB Bandwidth (802.11g, Ch 11)

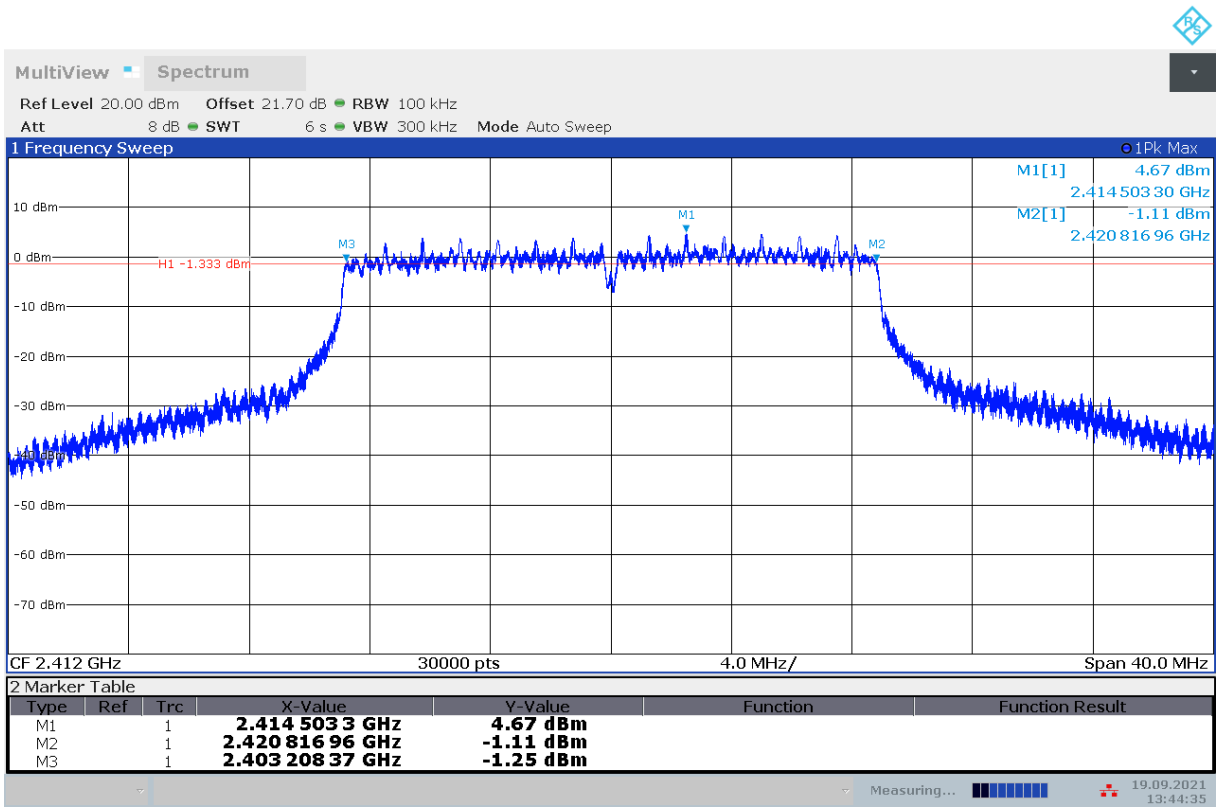


Fig.A.4.7 Occupied 6dB Bandwidth (802.11n-20MHz, Ch 1)

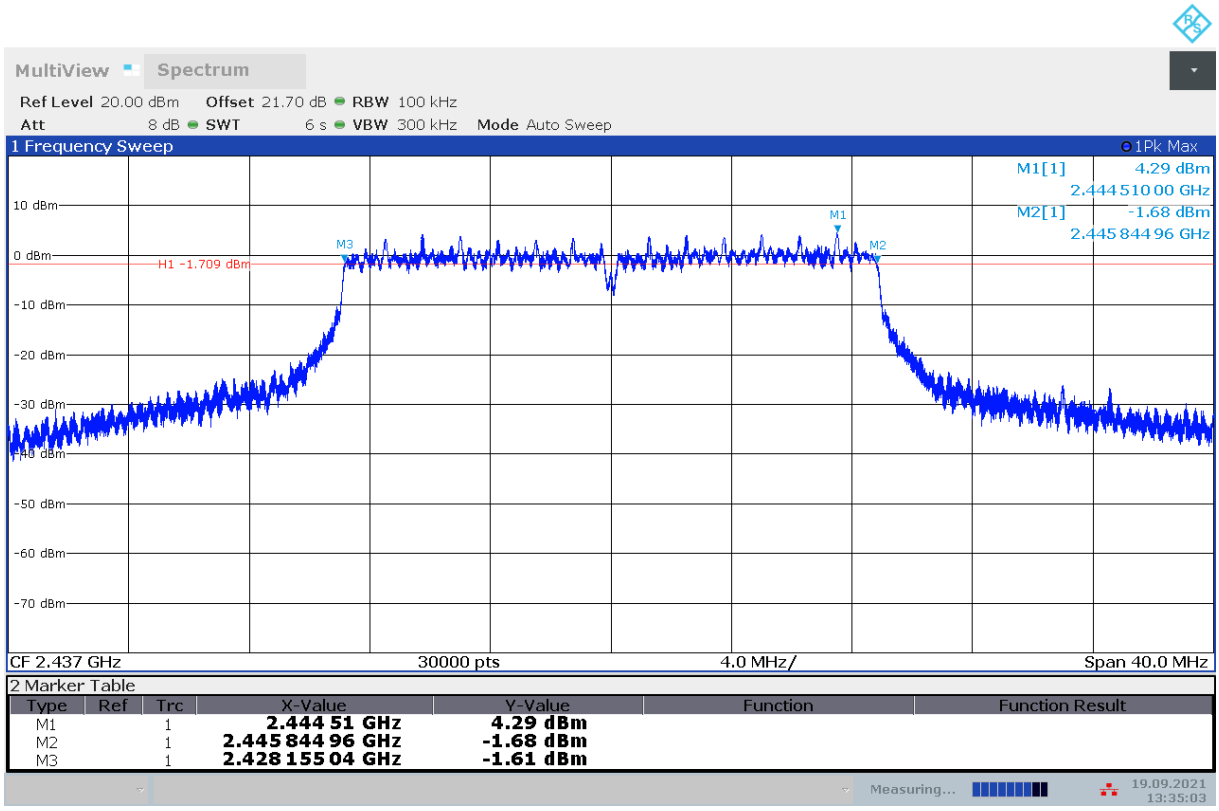


Fig.A.4.8 Occupied 6dB Bandwidth (802.11n-HT20, Ch 6)

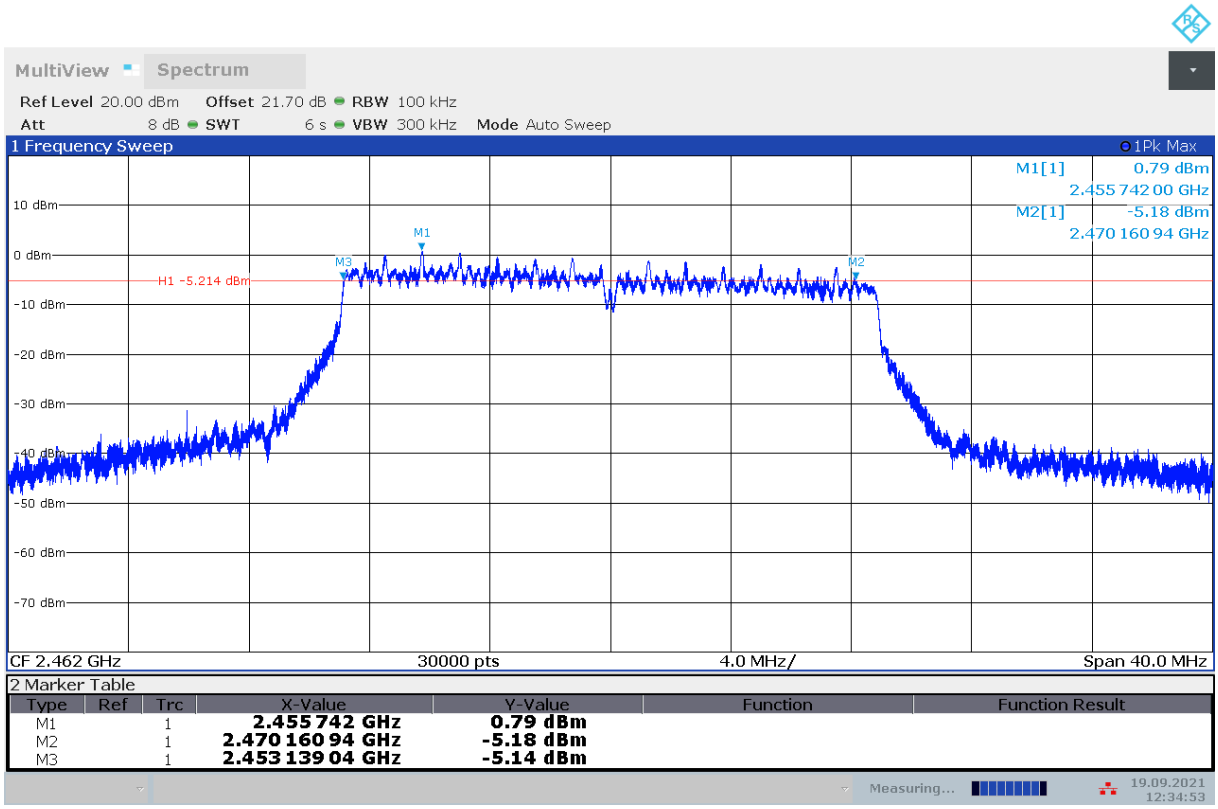


Fig.A.4.9 Occupied 6dB Bandwidth (802.11n-HT20, Ch 11)

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: UT17a

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**

Test graphs as below:

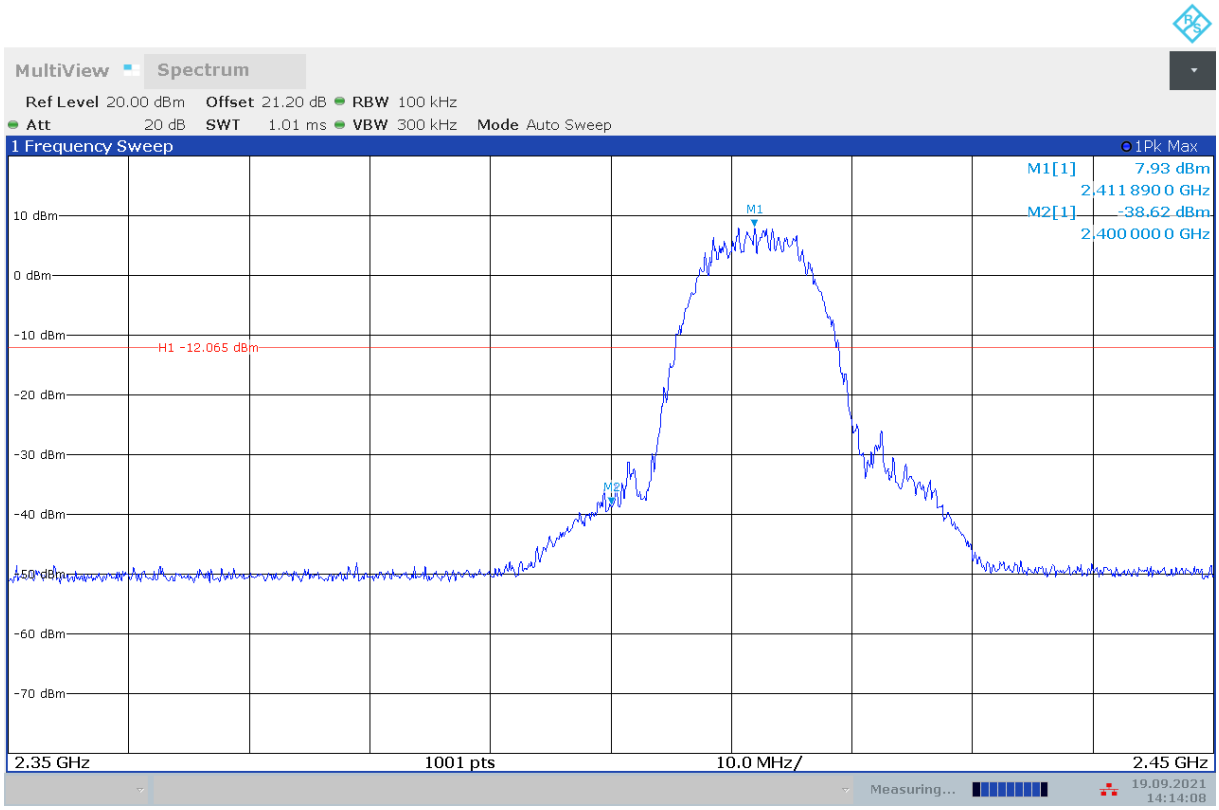


Fig.A.5.1 Band Edges (802.11b, Ch 1)

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

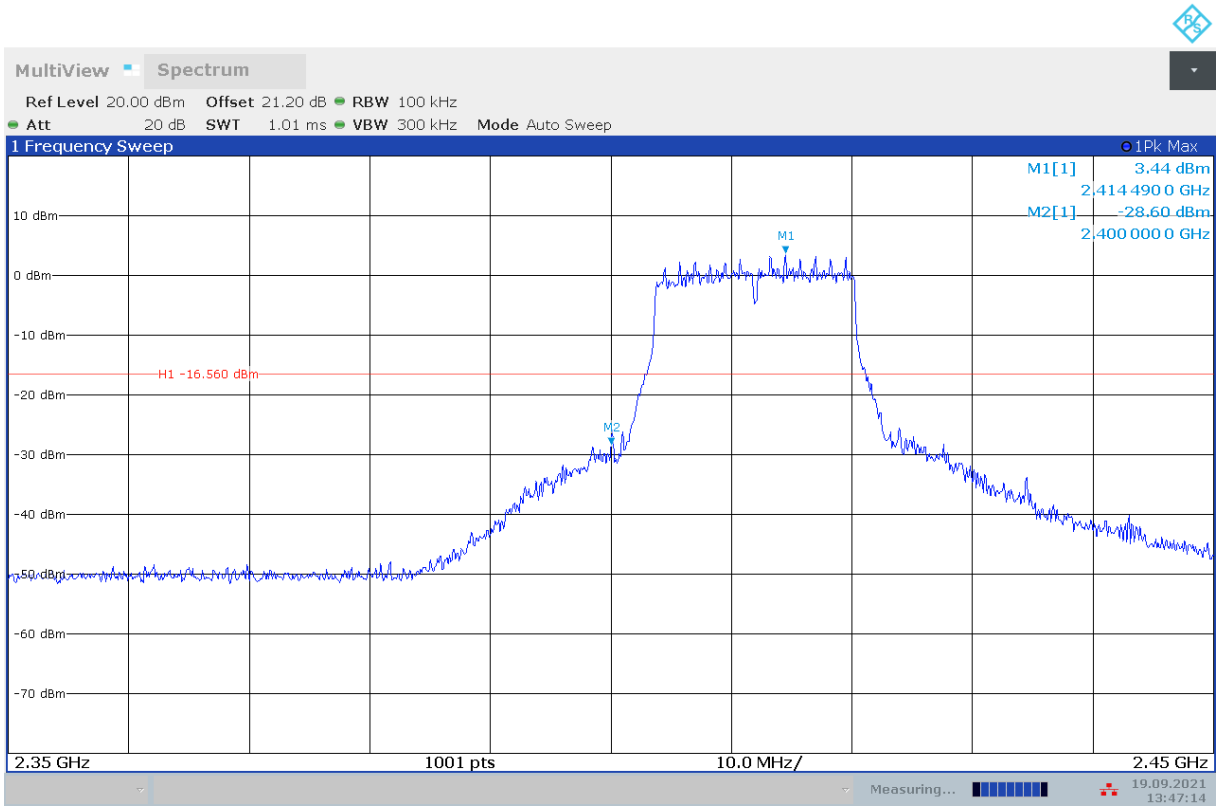


Fig.A.5.3 Band Edges (802.11g, Ch 1)

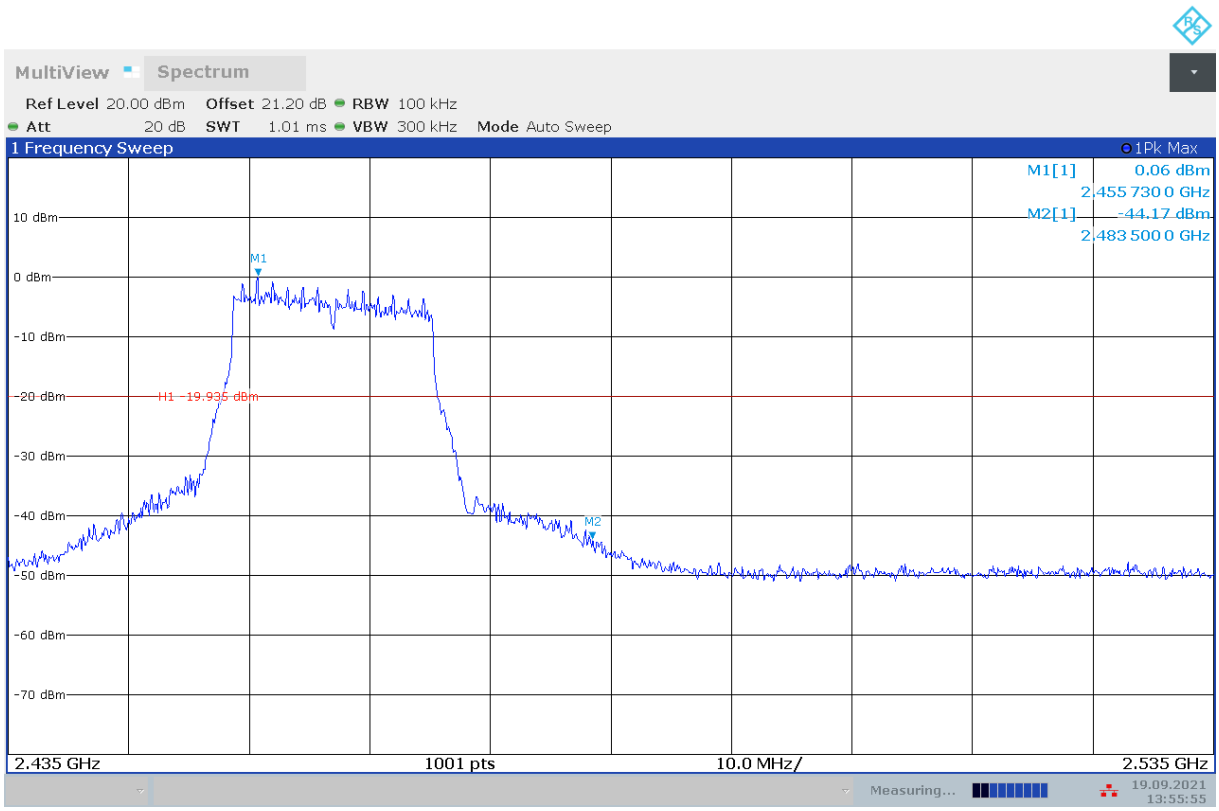


Fig.A.5.4 Band Edges (802.11g, Ch 11)

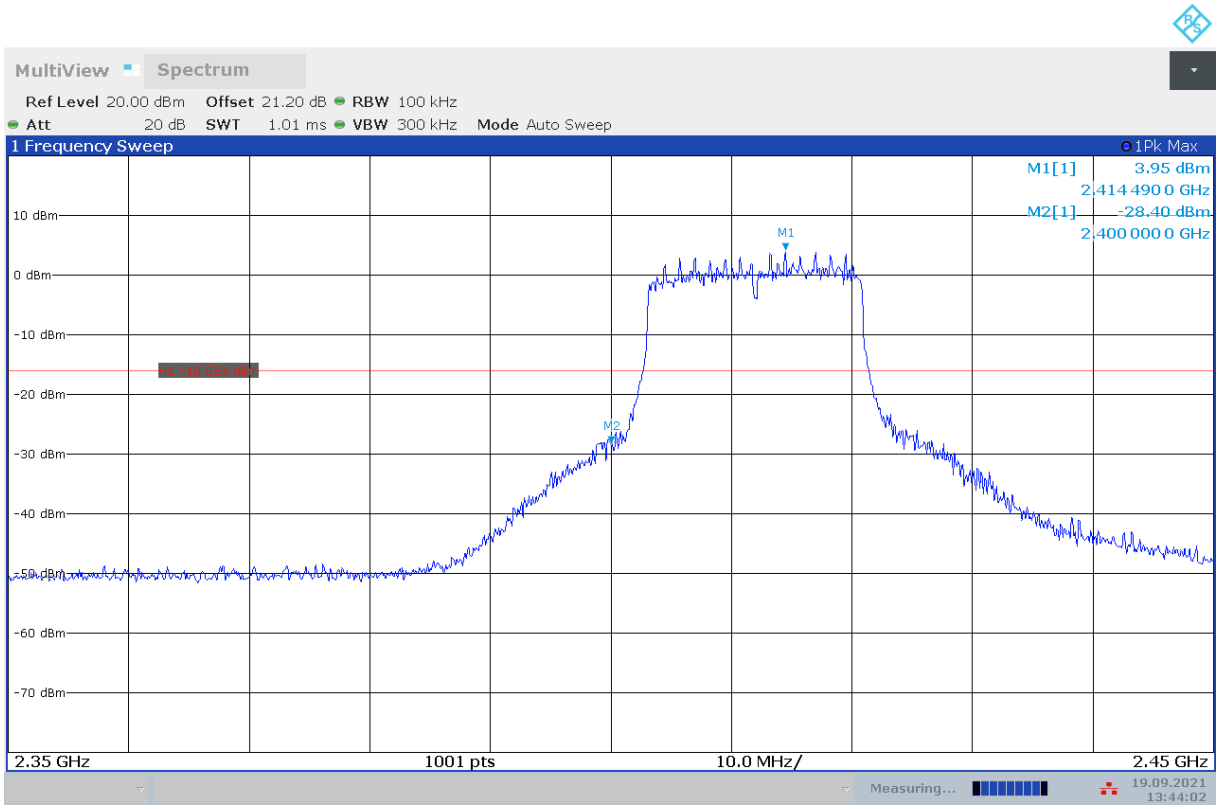


Fig.A.5.5 Band Edges (802.11n-HT20, Ch 1)

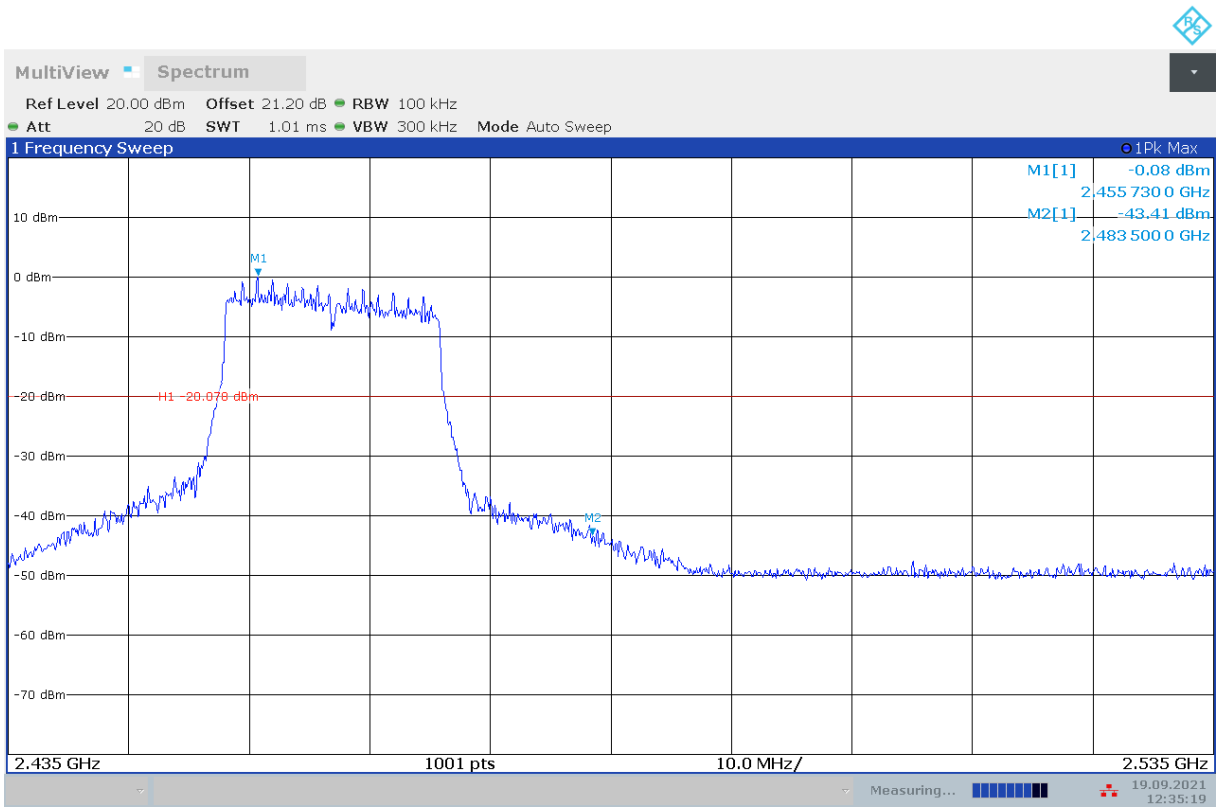


Fig.A.5.6 Band Edges (802.11n-HT20, Ch 11)

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: UT17a

Measurement Results:

MODE	Channel	Frequency Range	Test Results	Conclusion
802.11b	1	2.412 GHz	Fig.A.6.1.1	P
		30 MHz ~ 26 GHz	Fig.A.6.1.2	P
	6	2.437 GHz	Fig.A.6.1.3	P
		30 MHz ~ 26 GHz	Fig.A.6.1.4	P
	11	2.462 GHz	Fig.A.6.1.5	P
		30 MHz ~ 26 GHz	Fig.A.6.1.6	P
MODE	**Channel**	**Frequency Range**	**Test Results**	**Conclusion**
802.11g	1	2.412 GHz	Fig.A.6.1.7	P
		30 MHz ~ 26 GHz	Fig.A.6.1.8	P
	6	2.437 GHz	Fig.A.6.1.9	P
		30 MHz ~ 26 GHz	Fig.A.6.1.10	P
	11	2.462 GHz	Fig.A.6.1.11	P
		30 MHz ~ 26 GHz	Fig.A.6.1.12	P
MODE	**Channel**	**Frequency Range**	**Test Results**	**Conclusion**
802.11n (HT20)	1	2.412 GHz	Fig.A.6.1.13	P
		30 MHz ~ 26 GHz	Fig.A.6.1.14	P
	6	2.437 GHz	Fig.A.6.1.15	P
		30 MHz ~ 26 GHz	Fig.A.6.1.16	P
	11	2.462 GHz	Fig.A.6.1.17	P
		30 MHz ~ 26 GHz	Fig.A.6.1.18	P

Conclusion: Pass

Test graphs as below:

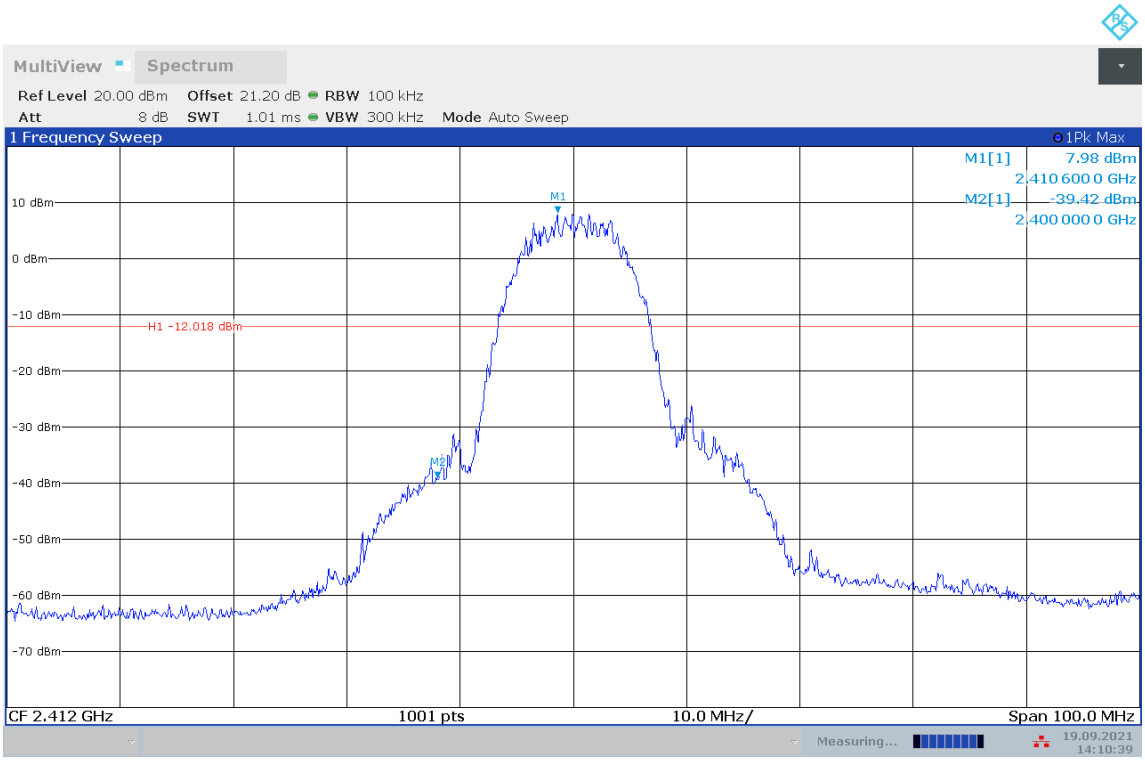


Fig.A.6.1.1 Transmitter Spurious Emission - Conducted (802.11b, Ch1, Center Frequency)

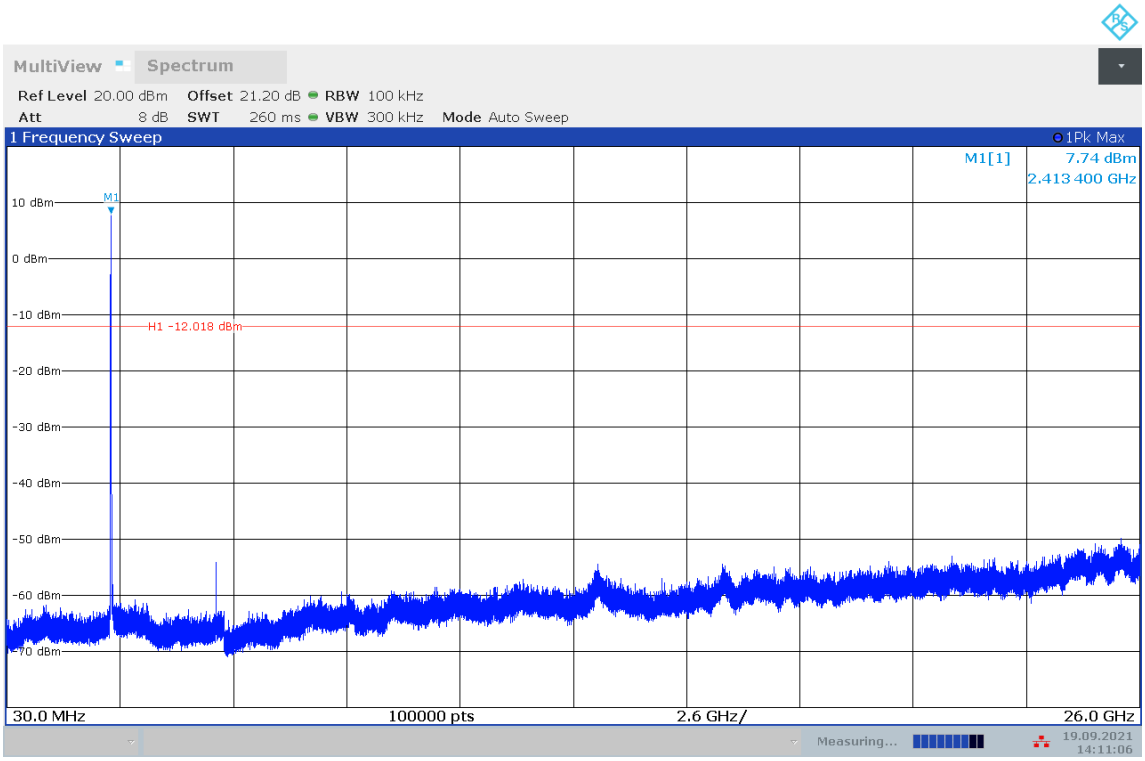


Fig.A.6.1.2 Transmitter Spurious Emission - Conducted (802.11b, Ch1, 30 MHz-26 GHz)

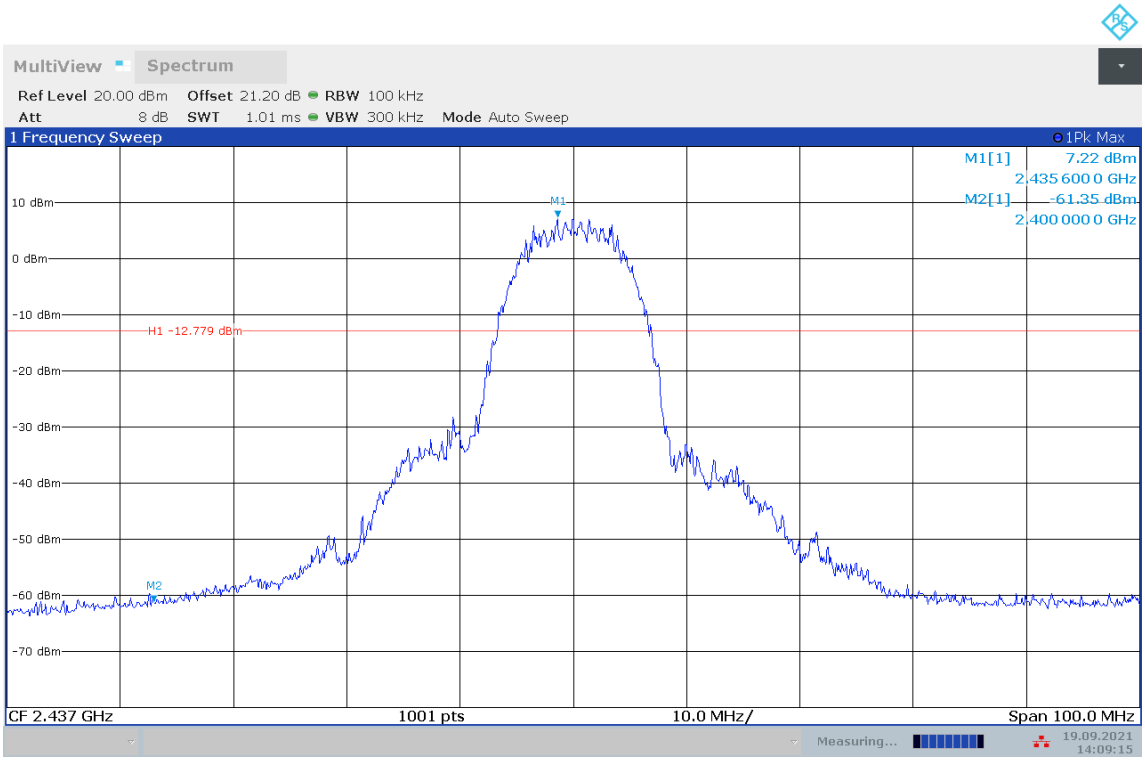


Fig.A.6.1.3 Transmitter Spurious Emission - Conducted (802.11b, Ch6, Center Frequency)

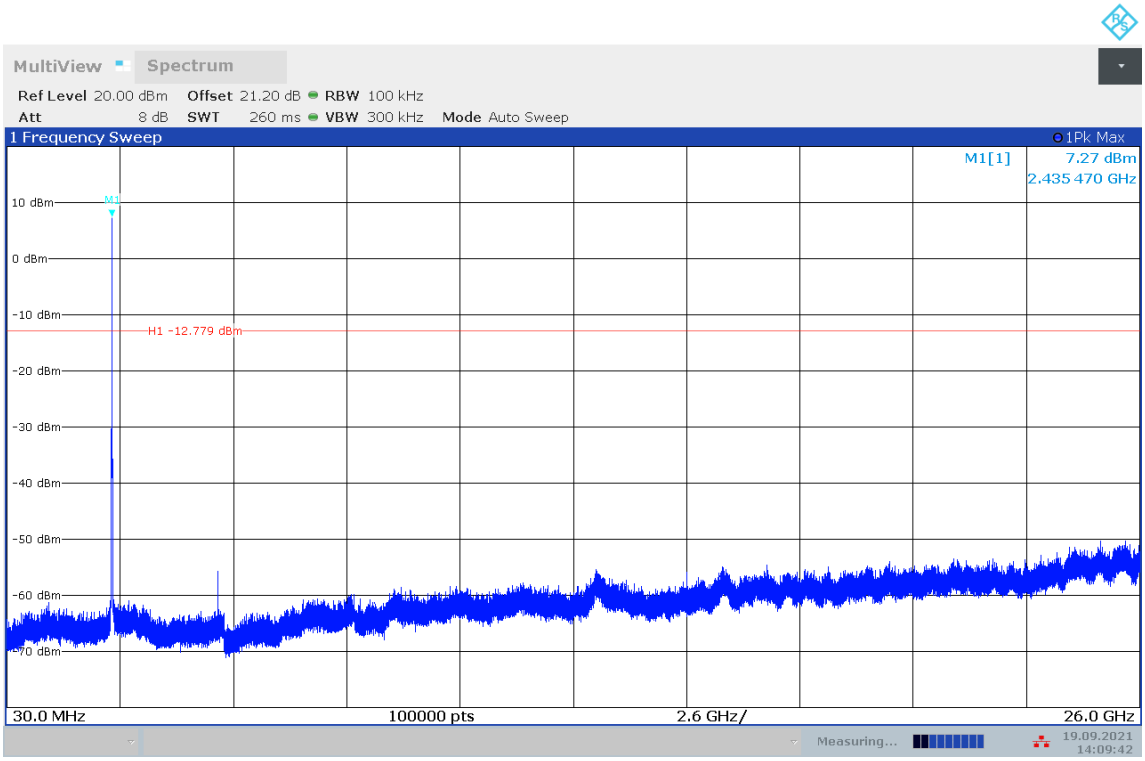


Fig.A.6.1.4 Transmitter Spurious Emission - Conducted (802.11b, Ch6, 30 MHz-26 GHz)

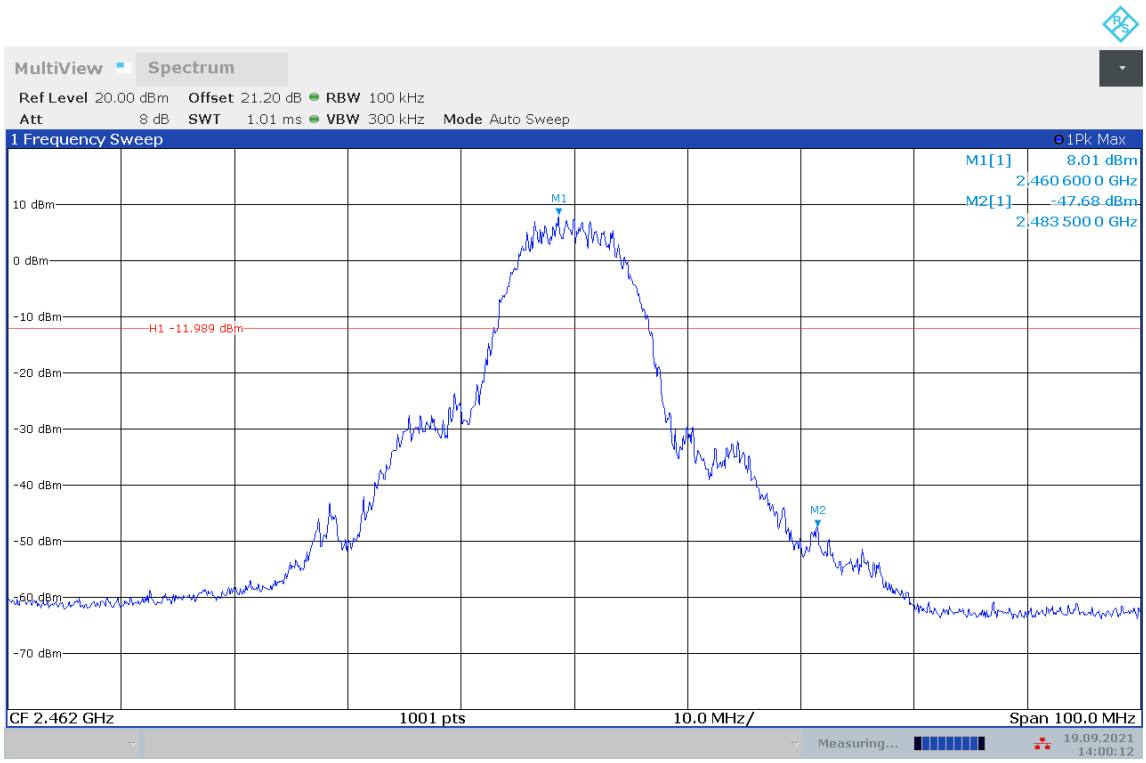


Fig.A.6.1.5 Transmitter Spurious Emission - Conducted (802.11b, Ch11, Center Frequency)

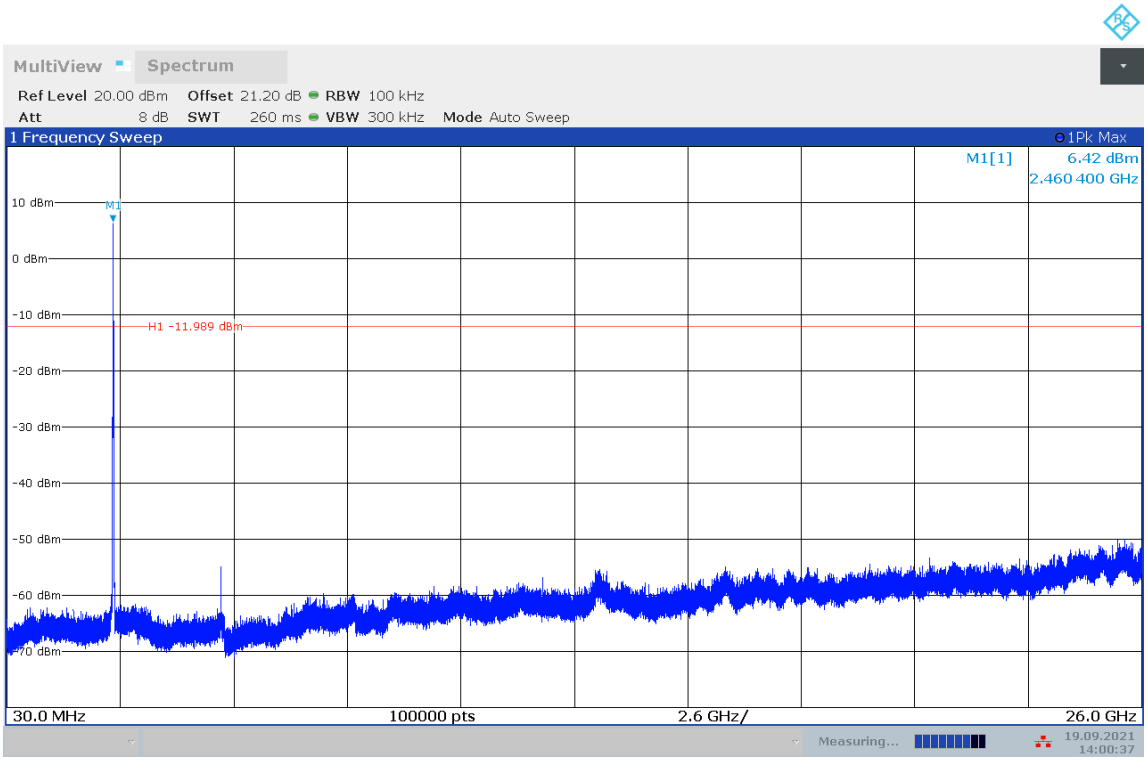


Fig.A.6.1.6 Transmitter Spurious Emission - Conducted (802.11b, Ch11, 30 MHz-26 GHz)

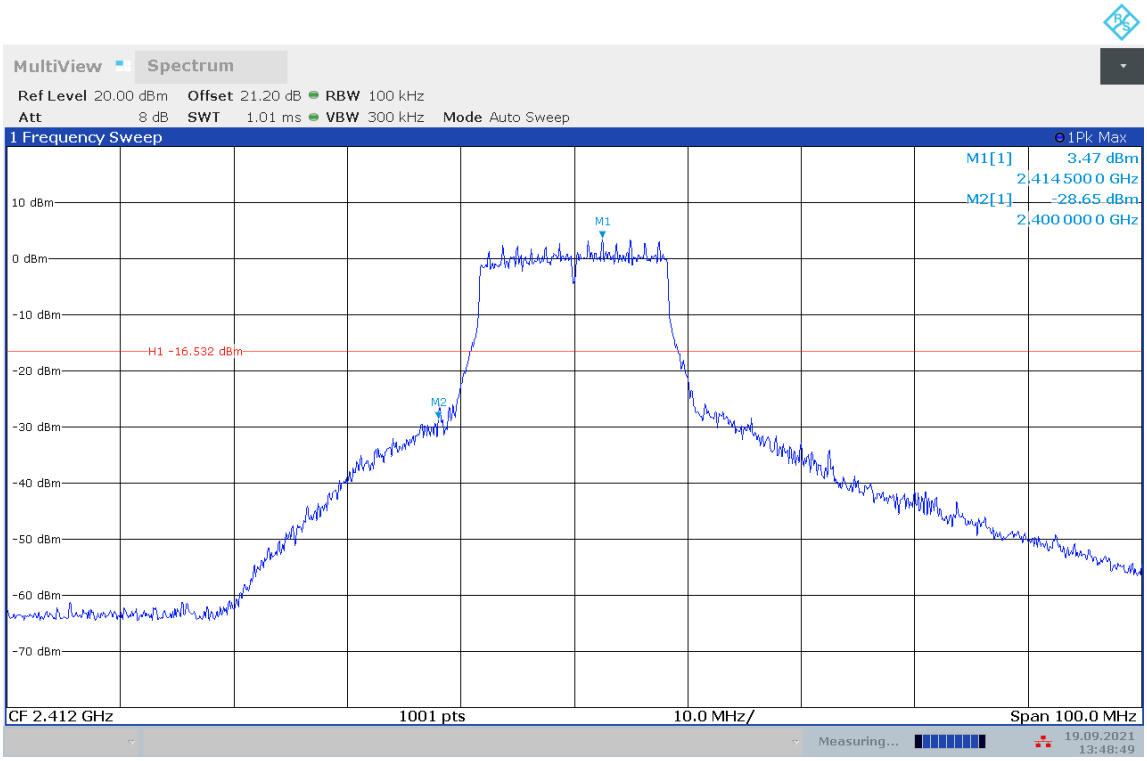


Fig.A.6.1.7 Transmitter Spurious Emission - Conducted (802.11g, Ch1, Center Frequency)

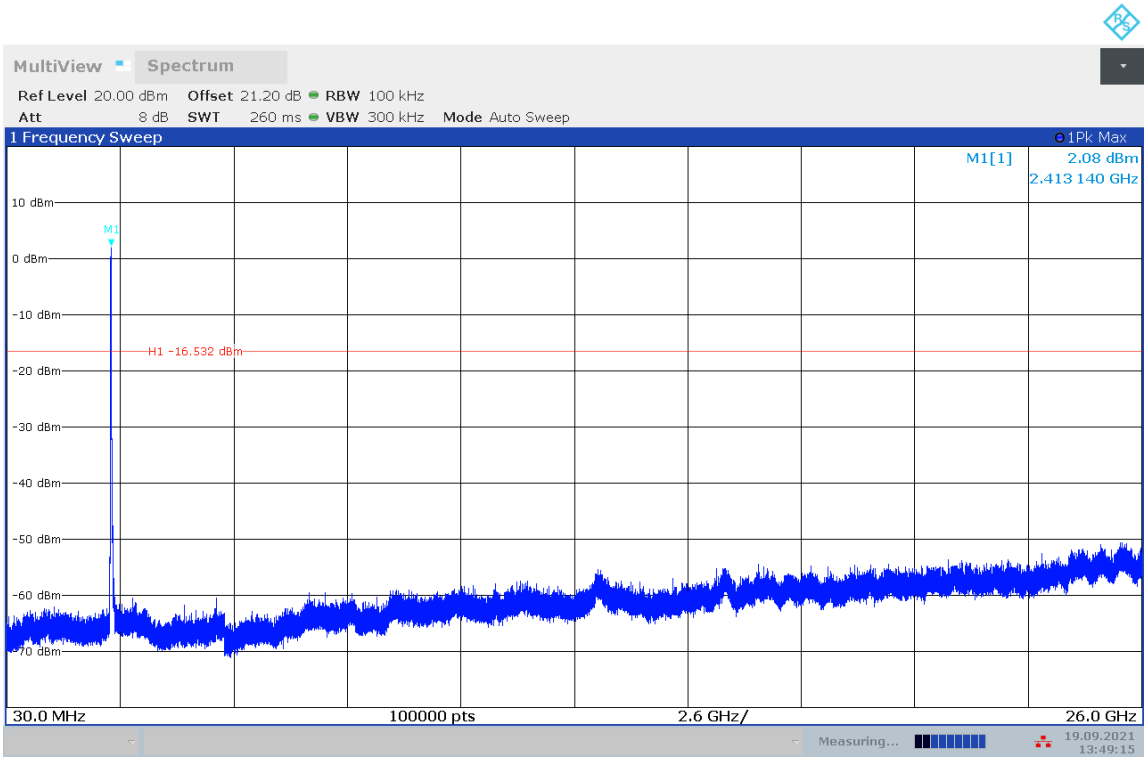


Fig.A.6.1.8 Transmitter Spurious Emission - Conducted (802.11g, Ch1, 30 MHz-26 GHz)

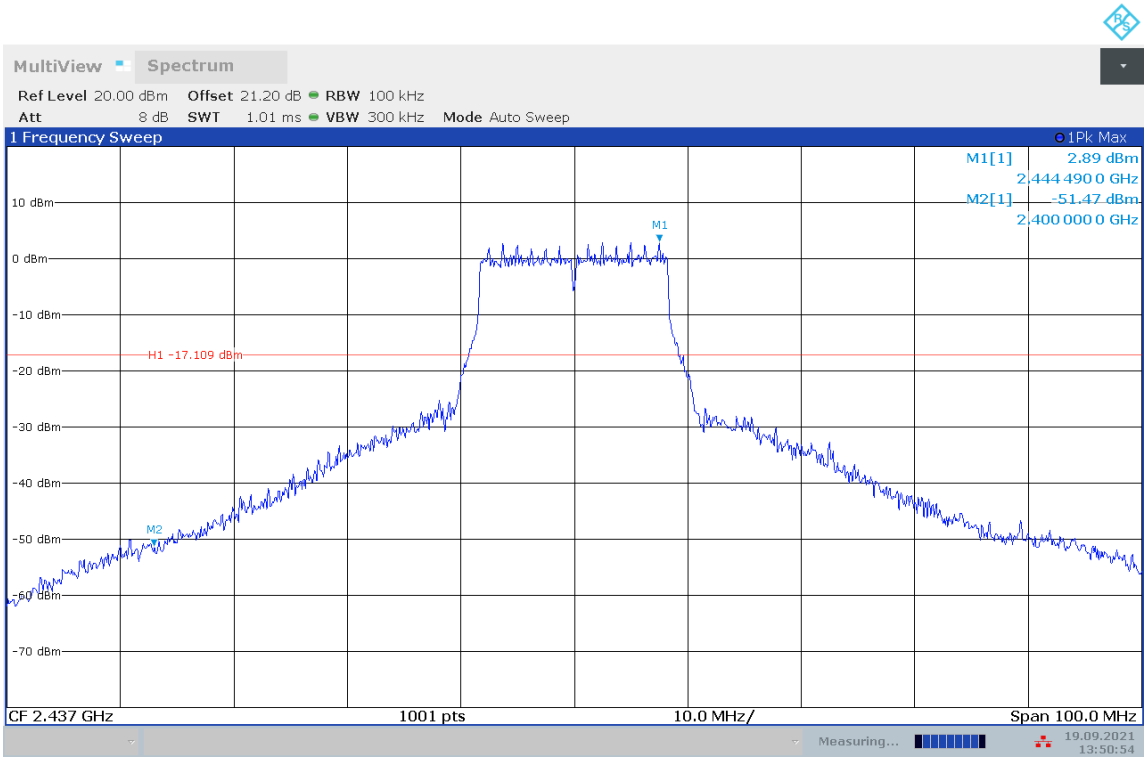


Fig.A.6.1.9 Transmitter Spurious Emission - Conducted (802.11g, Ch6, Center Frequency)

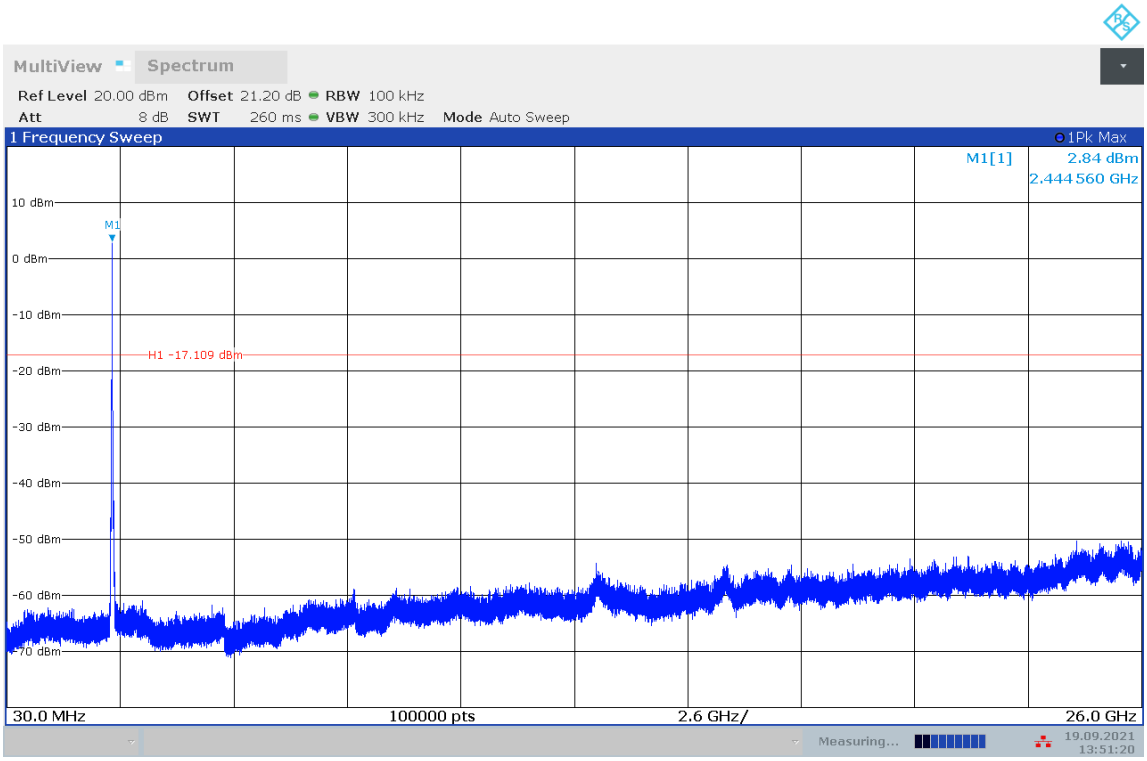


Fig.A.6.1.10 Transmitter Spurious Emission - Conducted (802.11g, Ch6, 30 MHz-26 GHz)

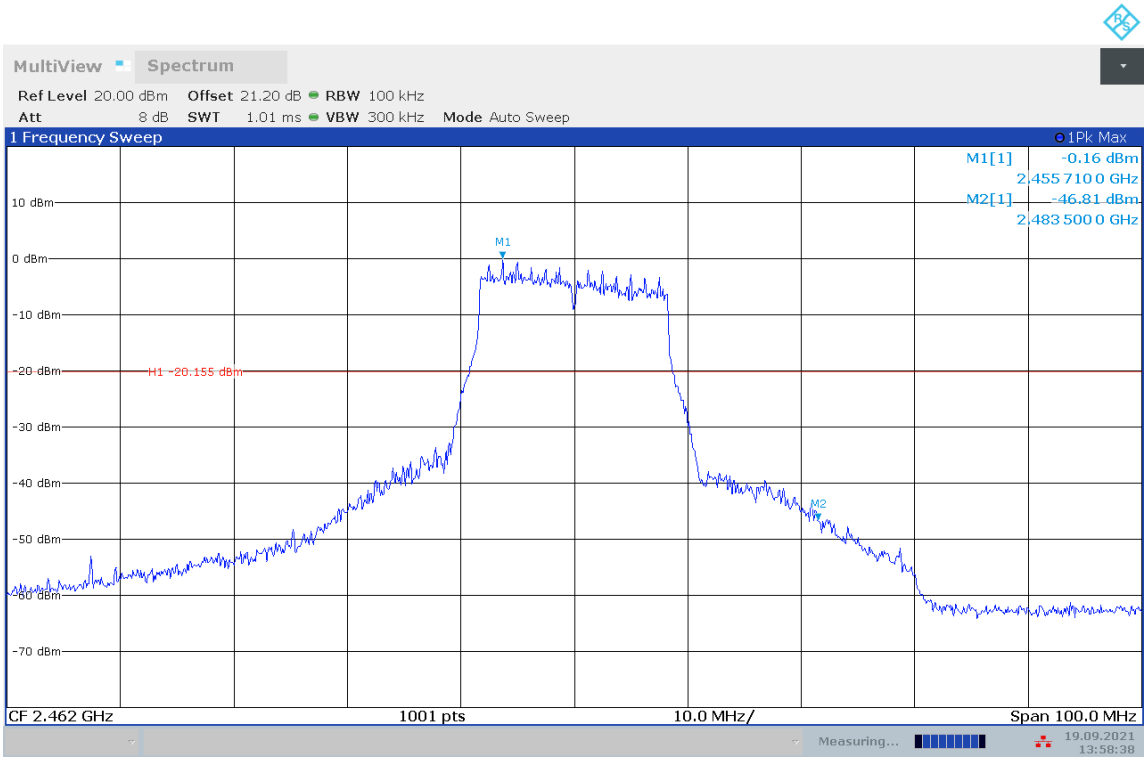


Fig.A.6.1.11 Transmitter Spurious Emission - Conducted (802.11g, Ch11, Center Frequency)

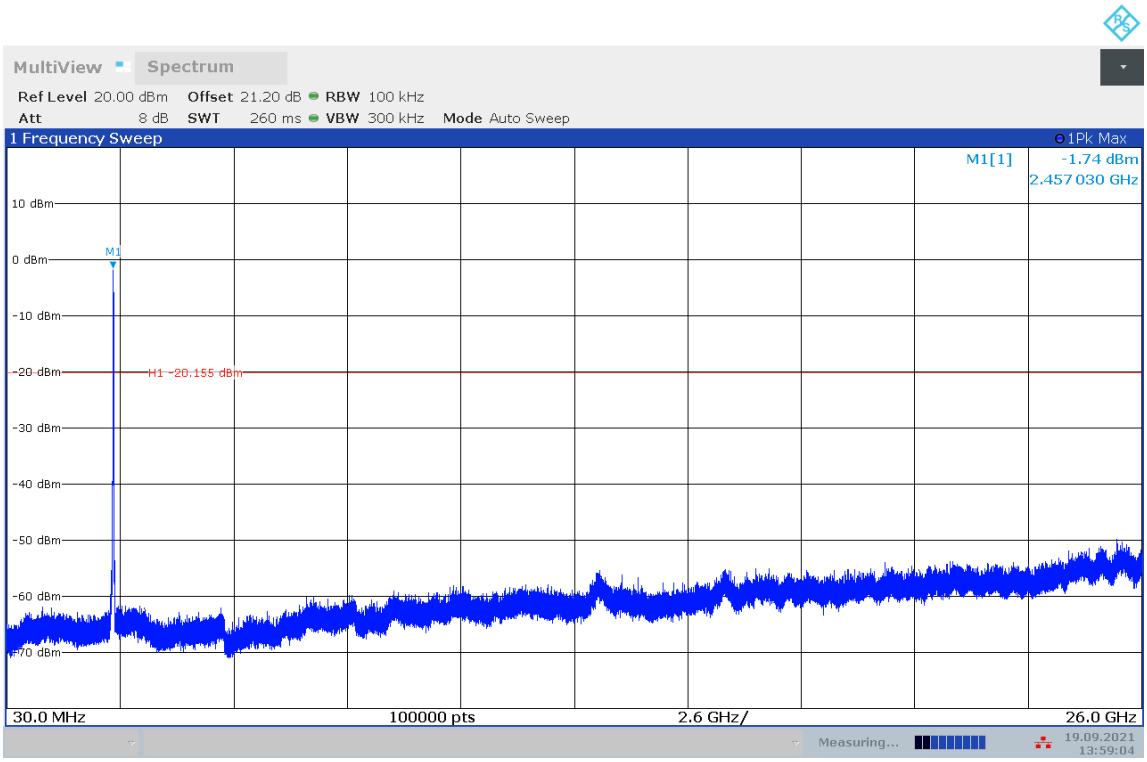


Fig.A.6.1.12 Transmitter Spurious Emission - Conducted (802.11g, Ch11, 30 MHz-26 GHz)

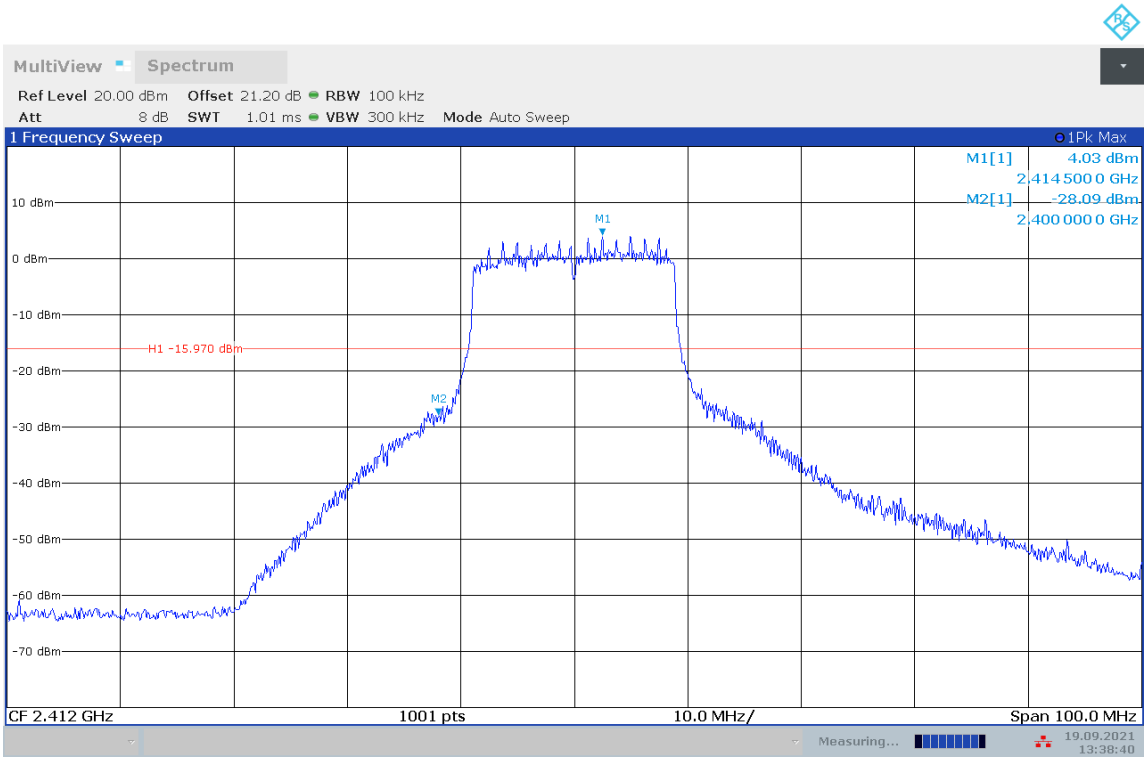


Fig.A.6.1.13 Transmitter Spurious Emission - Conducted (802.11n-HT20, Ch1, Center Frequency)

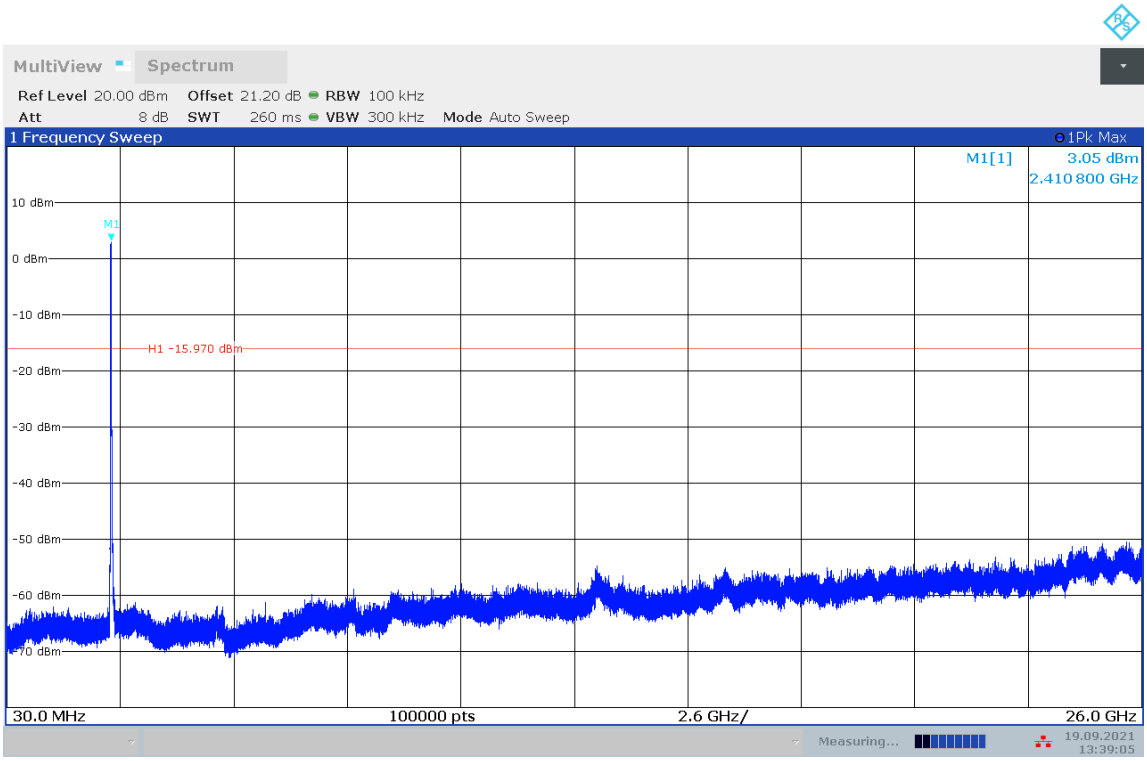


Fig.A.6.1.14 Transmitter Spurious Emission - Conducted (802.11n-HT20, Ch1, 30 MHz-26 GHz)

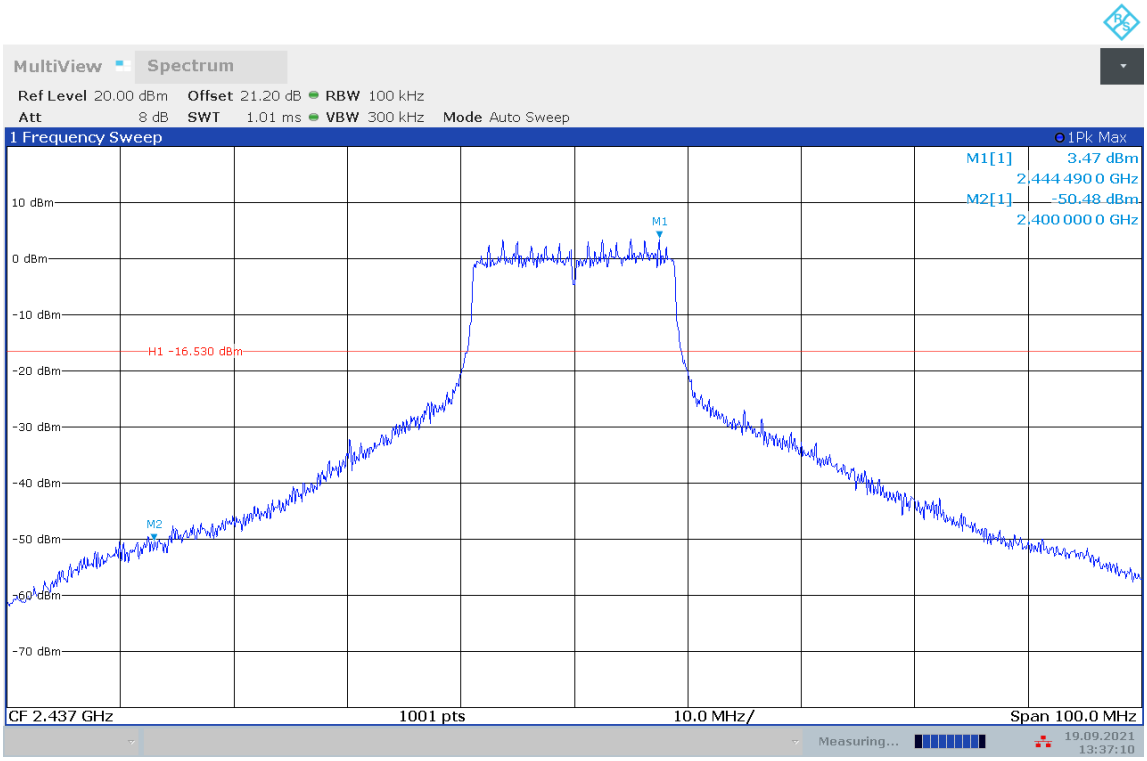


Fig.A.6.1.15 Transmitter Spurious Emission - Conducted (802.11n-HT20, Ch6, Center Frequency)

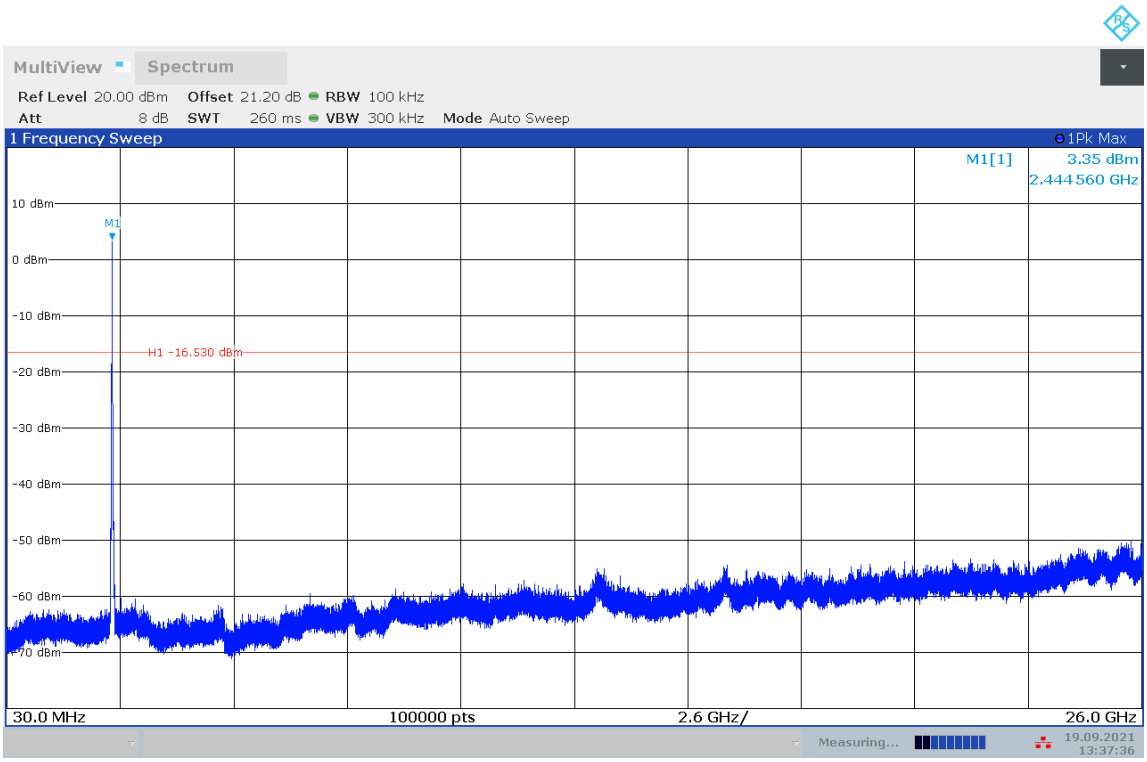


Fig.A.6.1.16 Transmitter Spurious Emission - Conducted (802.11n-HT20, Ch6, 30 MHz-26 GHz)

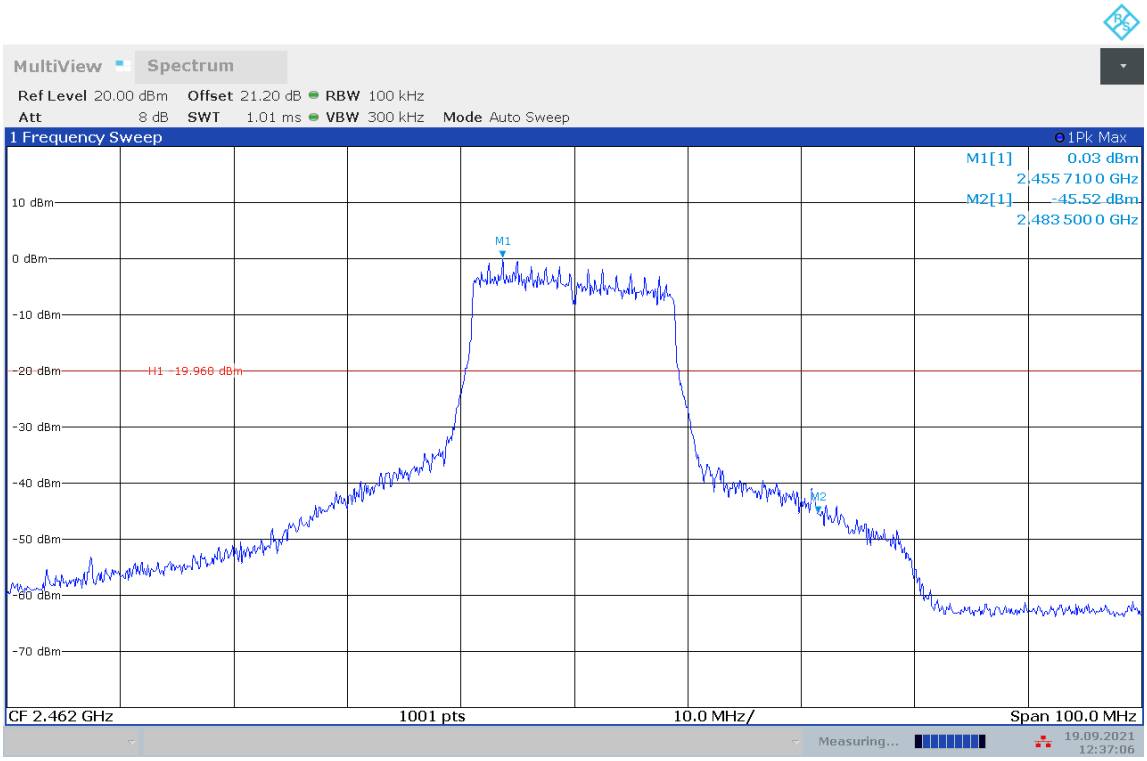


Fig.A.6.1.17 Transmitter Spurious Emission - Conducted (802.11n-HT20, Ch11, Center Frequency)

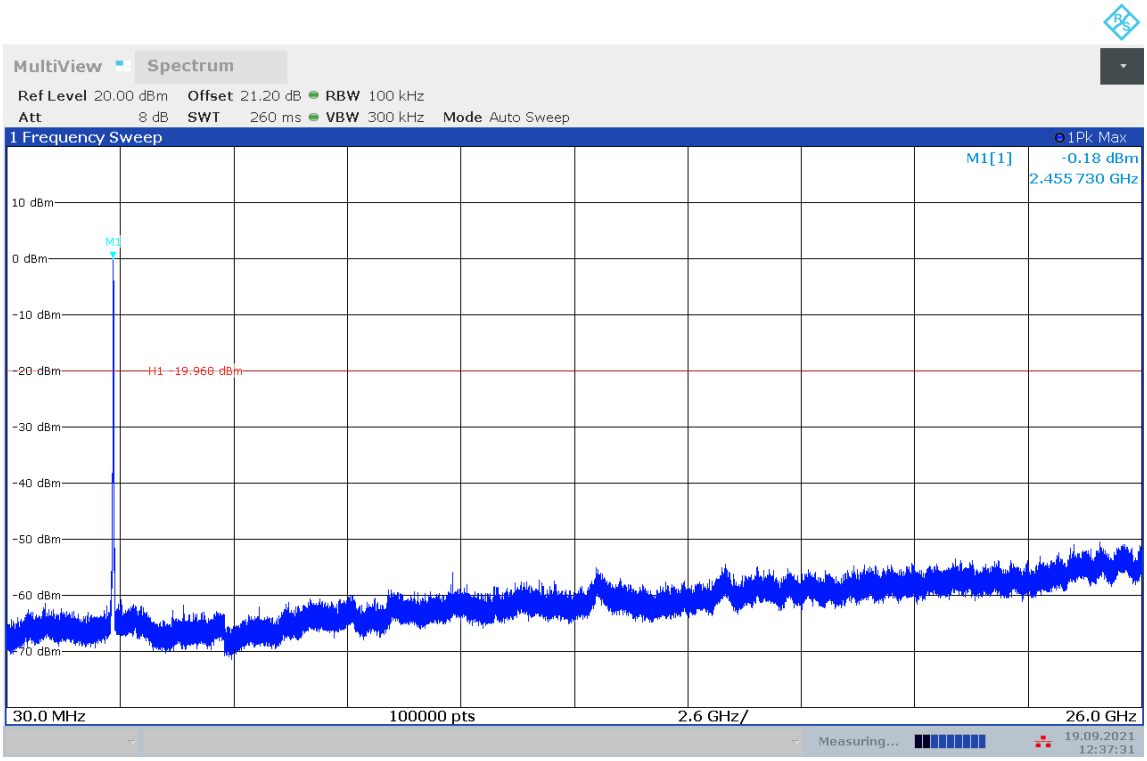


Fig.A.6.1.18 Transmitter Spurious Emission - Conducted (802.11n-HT20, Ch11, 30 MHz-26 GHz)

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)	Measurement distance (m)
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
Above 960	500	54	3

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

Set up:

Tabletop devices shall be placed on a nonconducting platform with nominal top surface dimensions 1 m by 1.5 m. For emissions testing at or below 1 GHz, the table height shall be 80 cm above the reference ground plane. For emission measurements above 1 GHz, the table height shall be 1.5 m

The EUT and transmitting antenna shall be centered on the turntable.

Test Procedure

The EUT was placed on a non-conductive table. The measurement antenna was placed at a distance of 3 meters from the EUT. The test is carried out on both vertical and horizontal polarization and only maximization result of both polarizations is kept. During the test, the turntable is rotated 360° and the measurement antenna is moved from 1m to 4m to get the maximization result. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.

The instrument setting:

Frequency of emission (MHz)	RBW/VBW
30-1000	100kHz/300kHz
1000-4000	1MHz/3MHz
4000-18000	1MHz/3MHz
18000-26500	1MHz/3MHz

EUT ID: UT08a

Measurement results:

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**
	2	2.31GHz~2.43GHz---L	Fig.A.6.2.4	**P**
	11	2.45GHz~2.50GHz---H	Fig.A.6.2.5	**P**
	10	2.45GHz~2.50GHz---H	Fig.A.6.2.6	**P**
	9	2.45GHz~2.50GHz---H	Fig.A.6.2.7	**P**
	8	2.45GHz~2.50GHz---H	Fig.A.6.2.8	**P**

802.11n-HT20 mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11n (HT20)	1	2.31GHz~2.43GHz---L	Fig.A.6.2.9	**P**
	2	2.31GHz~2.43GHz---L	Fig.A.6.2.10	**P**
	11	2.45GHz~2.50GHz---H	Fig.A.6.2.11	**P**
	10	2.45GHz~2.50GHz---H	Fig.A.6.2.12	**P**
	9	2.45GHz~2.50GHz---H	Fig.A.6.2.13	**P**

Conclusion: Pass

Note:

1. 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
2. The range of evaluated frequency is from 9 kHz to 26GHz. Measurement value show only up to 6 maximum emissions noted.

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)
2384.605	60.63	2.62	27.66	30.35	74.00	13.37	V
2389.642	60.14	2.62	27.66	29.86	74.00	13.86	H
4823.906	40.07	-37.50	32.06	45.52	74.00	33.93	H
7234.688	53.05	-37.00	35.77	54.28	74.00	20.95	V
9647.812	46.26	-36.00	37.80	44.46	74.00	27.74	V
12060.000	47.51	-34.81	39.06	43.26	74.00	26.49	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)
1865.500	42.81	-41.05	26.87	56.99	74.00	31.19	V
2815.000	39.59	-39.92	28.55	50.97	74.00	34.41	V
4874.062	42.13	-37.87	32.19	47.81	74.00	31.87	H
73120.312	53.63	0.00	0.00	53.63	74.00	20.37	V
9748.125	46.41	-35.41	37.80	44.03	74.00	27.59	H
12185.156	48.21	-34.73	38.99	43.95	74.00	25.79	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)
2483.756	60.66	2.65	27.69	30.32	74.00	13.34	V
2483.856	60.28	2.65	27.69	29.93	74.00	13.72	V
4924.219	41.80	-37.91	32.31	47.39	74.00	32.20	H
7386.094	56.92	-36.93	36.13	57.71	74.00	17.08	H
9846.094	47.47	-35.55	37.80	45.22	74.00	26.53	H
12309.844	48.14	-34.68	38.91	43.90	74.00	25.86	V

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)
2389.677	67.11	2.62	27.66	36.83	74.00	6.89	V
2389.923	67.39	2.62	27.66	37.10	74.00	6.61	V
4353.281	42.85	-38.53	31.09	50.29	74.00	31.15	V
7233.281	53.88	-37.00	35.77	55.11	74.00	20.12	V
9647.812	45.61	-36.00	37.80	43.81	74.00	28.39	V
12060.000	48.12	-34.81	39.06	43.87	74.00	25.88	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)
2227.875	39.22	-40.35	27.60	51.97	74.00	34.78	H
2568.875	38.82	-39.99	27.89	50.92	74.00	35.18	V
4874.062	41.46	-37.87	32.19	47.14	74.00	32.54	H
7305.469	54.89	-37.06	35.94	56.01	74.00	19.11	V
9748.125	46.61	-35.41	37.80	44.23	74.00	27.39	V
12185.156	47.92	-34.73	38.99	43.66	74.00	26.08	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)
2483.569	69.19	2.65	27.69	38.85	74.00	4.81	V
2484.344	70.05	2.65	27.69	39.71	74.00	3.95	V
4354.219	41.55	-38.53	31.09	48.99	74.00	32.45	H
7388.906	54.66	-36.93	36.14	55.44	74.00	19.34	V
9847.969	46.92	-35.56	37.80	44.68	74.00	27.08	H
12309.844	47.75	-34.68	38.91	43.51	74.00	26.25	V

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)
2389.870	70.18	2.62	27.66	39.90	74.00	3.82	V
2389.940	70.89	2.62	27.66	40.61	74.00	3.11	V
4823.906	39.98	-37.50	32.06	45.42	74.00	34.02	H
7237.031	52.47	-37.00	35.78	53.70	74.00	21.53	H
9647.812	45.63	-36.00	37.80	43.83	74.00	28.37	V
12060.000	48.30	-34.81	39.06	44.05	74.00	25.70	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)
2151.000	39.04	-40.91	27.57	52.39	74.00	34.96	H
2815.125	39.70	-39.92	28.55	51.08	74.00	34.30	V
4874.062	40.36	-37.87	32.19	46.04	74.00	33.64	H
7319.531	53.07	-37.06	35.98	54.15	74.00	20.93	V
9748.125	46.61	-35.41	37.80	44.22	74.00	27.39	V
12185.156	48.93	-34.73	38.99	44.67	74.00	25.07	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)
2483.744	67.62	2.65	27.69	37.28	74.00	6.38	V
2484.338	67.30	2.65	27.69	36.96	74.00	6.70	V
4924.219	40.63	-37.91	32.31	46.22	74.00	33.37	H
7382.812	56.09	-36.94	36.13	56.90	74.00	17.91	V
9847.969	47.07	-35.56	37.80	44.83	74.00	26.93	V
12309.844	49.42	-34.68	38.91	45.19	74.00	24.58	V

Average

802.11b

Ch1

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
2389.850	46.31	2.62	27.66	16.03	54.00	7.69	V
2389.925	46.32	2.62	27.66	16.04	54.00	7.68	V
4823.750	29.16	-37.50	32.06	34.61	54.00	24.84	H
7235.000	47.63	-37.00	35.77	48.86	54.00	6.37	H
9648.125	34.29	-36.00	37.80	32.49	54.00	19.71	H
12060.000	35.96	-34.81	39.06	31.71	54.00	18.04	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)
2413.775	46.28	2.63	27.67	15.99	54.00	7.72	V
2459.050	46.67	2.60	27.69	16.38	54.00	7.33	V
4873.750	28.57	-37.87	32.18	34.25	54.00	25.43	V
7311.875	48.38	-37.06	35.96	49.48	54.00	5.62	V
9748.125	34.74	-35.41	37.80	32.35	54.00	19.26	H
12185.000	36.88	-34.73	38.99	32.62	54.00	17.12	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)
2483.500	48.75	2.64	27.69	18.41	54.00	5.25	V
2483.525	48.60	2.64	27.69	18.26	54.00	5.40	V
4923.750	33.22	-37.90	32.31	38.81	54.00	20.78	V
7385.000	52.29	-36.93	36.13	53.09	54.00	1.71	V
9878.125	35.06	-35.66	37.80	32.92	54.00	18.94	V
12310.000	36.46	-34.67	38.91	32.22	54.00	17.54	V

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)
2389.725	49.35	2.62	27.66	19.07	54.00	4.65	V
2389.950	49.42	2.62	27.66	19.14	54.00	4.58	V
4353.750	27.84	-38.53	31.09	35.28	54.00	26.16	V
7235.625	40.83	-37.00	35.78	42.05	54.00	13.17	V
9648.125	34.44	-36.00	37.80	32.63	54.00	19.56	V
12060.000	36.13	-34.81	39.06	31.88	54.00	17.87	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)
2399.425	48.26	2.63	27.66	17.97	54.00	5.74	V
2477.725	48.53	2.60	27.69	18.23	54.00	5.47	V
4873.750	29.05	-37.87	32.18	34.73	54.00	24.95	V
7313.125	42.03	-37.07	35.96	43.13	54.00	11.97	V
9748.125	34.92	-35.41	37.80	32.54	54.00	19.08	V
12185.000	37.11	-34.73	38.99	32.85	54.00	16.89	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)
2483.550	49.24	2.64	27.69	18.90	54.00	4.76	V
2483.575	49.30	2.65	27.69	18.96	54.00	4.70	V
4353.750	28.19	-38.53	31.09	35.63	54.00	25.81	V
7385.000	44.94	-36.93	36.13	45.75	54.00	9.06	V
9708.125	34.63	-35.69	37.80	32.51	54.00	19.37	V
12135.000	36.58	-34.75	39.02	32.31	54.00	17.42	H

802.11n-HT20

Ch1

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
2389.950	49.26	2.62	27.66	18.98	54.00	4.74	V
2389.975	49.29	2.62	27.66	19.00	54.00	4.71	V
4823.750	28.58	-37.50	32.06	34.02	54.00	25.42	H
7236.250	38.84	-37.00	35.78	40.06	54.00	15.16	H
9648.125	34.29	-36.00	37.80	32.49	54.00	19.71	V
12060.000	36.26	-34.81	39.06	32.02	54.00	17.74	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)
2399.875	47.40	2.63	27.66	17.11	54.00	6.60	V
2474.275	47.42	2.57	27.69	17.15	54.00	6.58	V
4873.750	28.89	-37.87	32.18	34.58	54.00	25.11	H
7314.375	39.89	-37.07	35.96	40.99	54.00	14.11	H
9748.125	35.07	-35.41	37.80	32.69	54.00	18.93	H
12185.000	37.07	-34.73	38.99	32.81	54.00	16.93	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)
2483.500	48.51	2.64	27.69	18.17	54.00	5.49	V
2483.525	48.49	2.64	27.69	18.15	54.00	5.51	V
4923.750	28.78	-37.90	32.31	34.37	54.00	25.22	H
7385.625	41.73	-36.93	36.13	42.53	54.00	12.27	V
9848.125	35.11	-35.56	37.80	32.87	54.00	18.89	H
12310.000	36.75	-34.67	38.91	32.51	54.00	17.25	V

Test graphs as below:

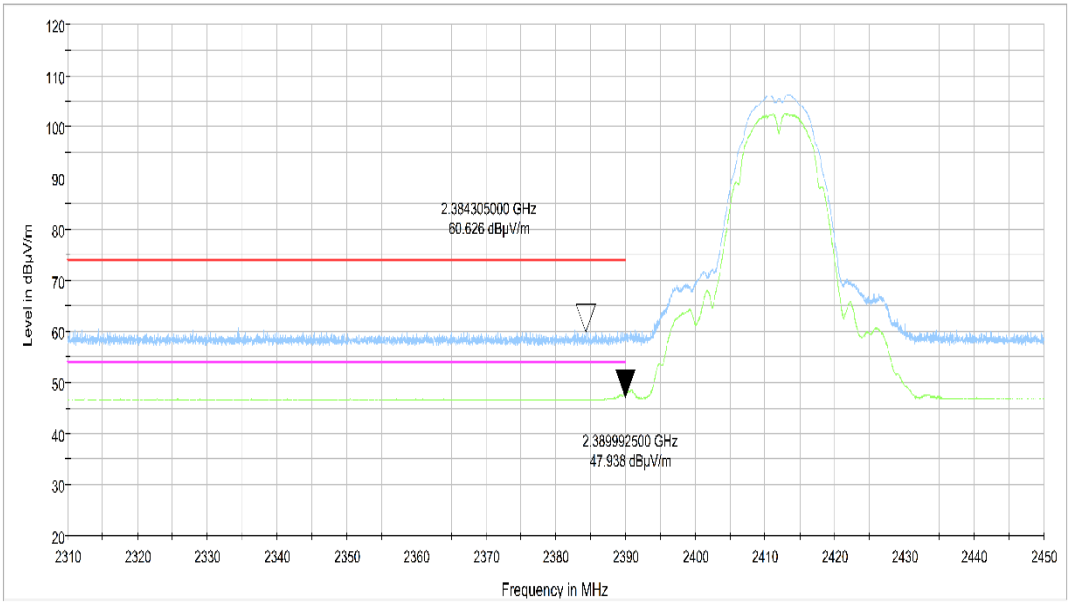


Fig.A.6.2.1 Transmitter Spurious Emission - Radiated (Power): 802.11b, ch1, 2.31 GHz – 2.45GHz

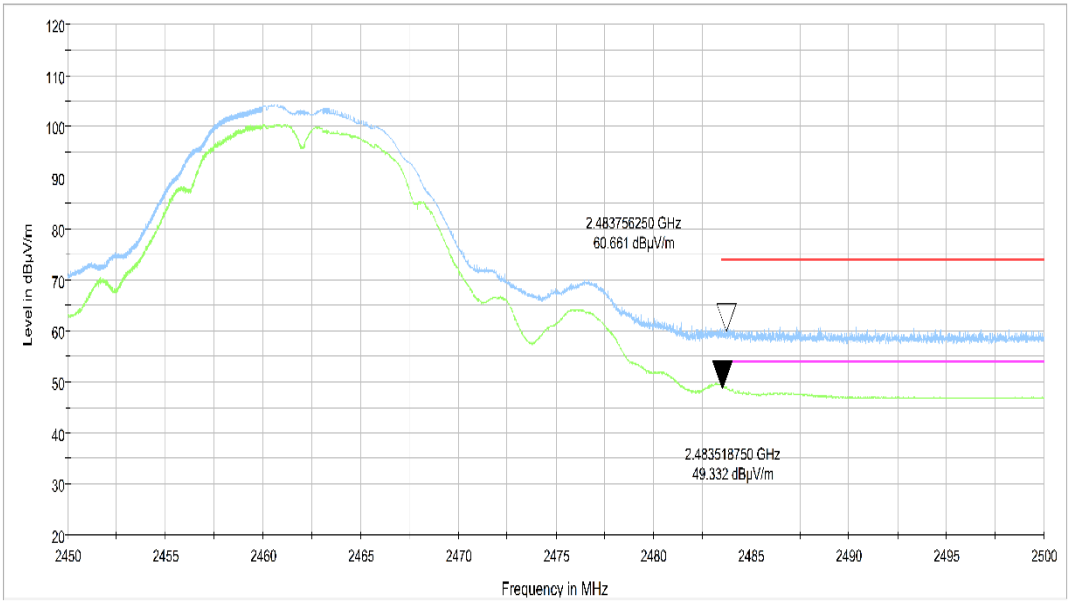


Fig.A.6.2.2 Transmitter Spurious Emission - Radiated (Power): 802.11b, ch11, 2.45 GHz - 2.50GHz

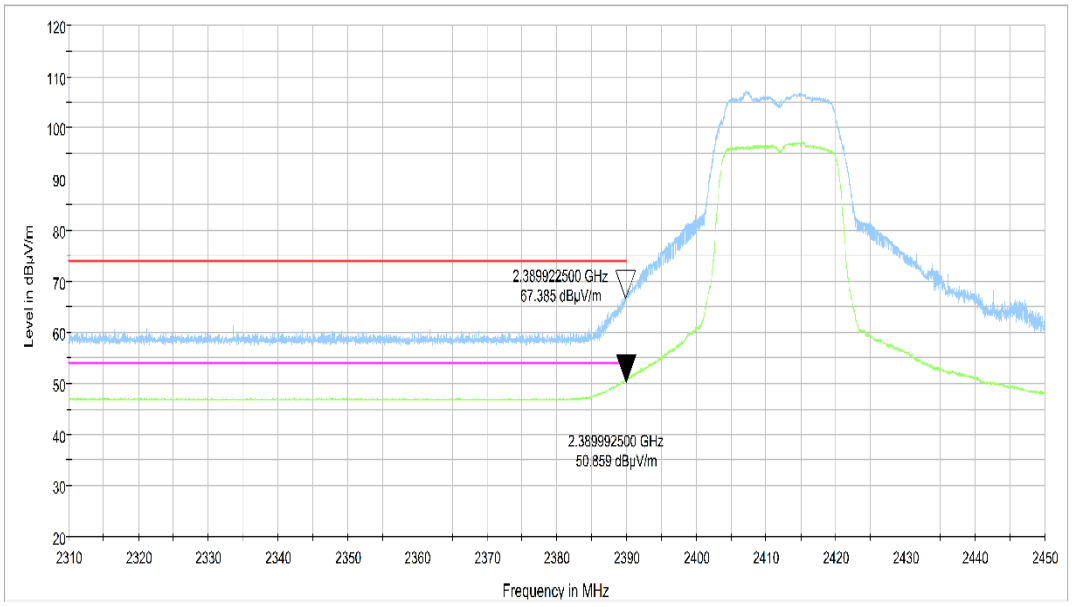


Fig.A.6.2.3 Transmitter Spurious Emission - Radiated (Power): 802.11g, ch1, 2.31 GHz - 2.45GHz

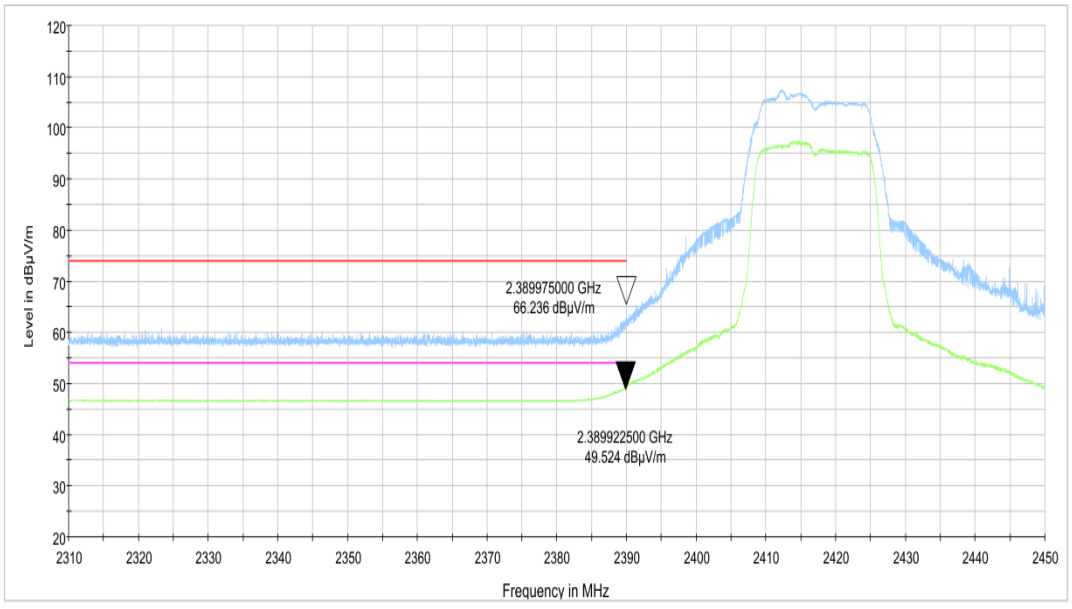


Fig.A.6.2.4 Transmitter Spurious Emission - Radiated (Power): 802.11g, ch2, 2.31 GHz - 2.45GHz

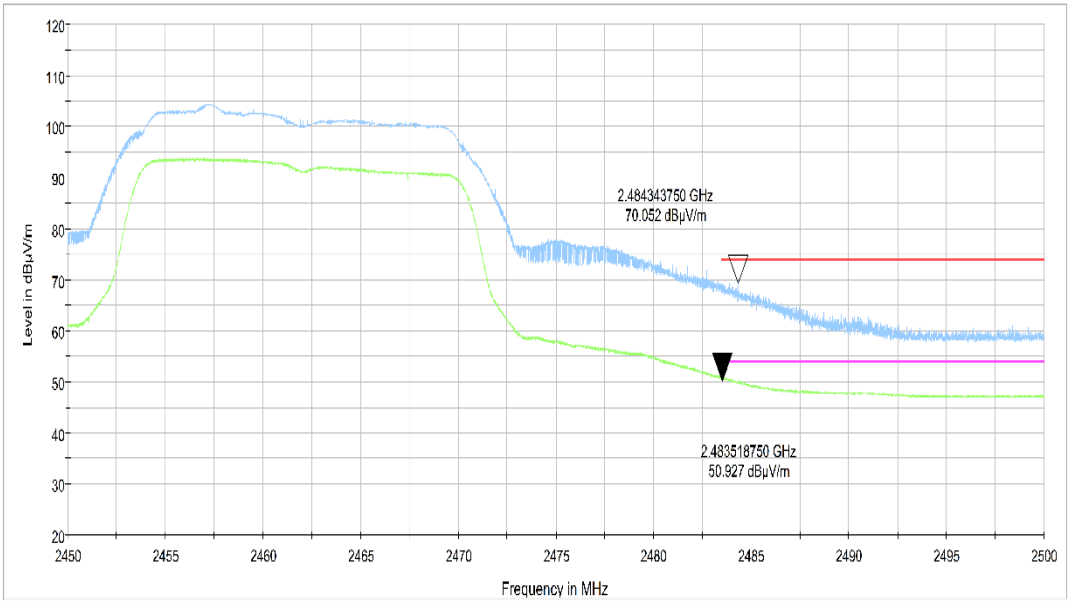


Fig.A.6.2.5 Transmitter Spurious Emission - Radiated (Power): 802.11g, ch11, 2.45 GHz - 2.50GHz

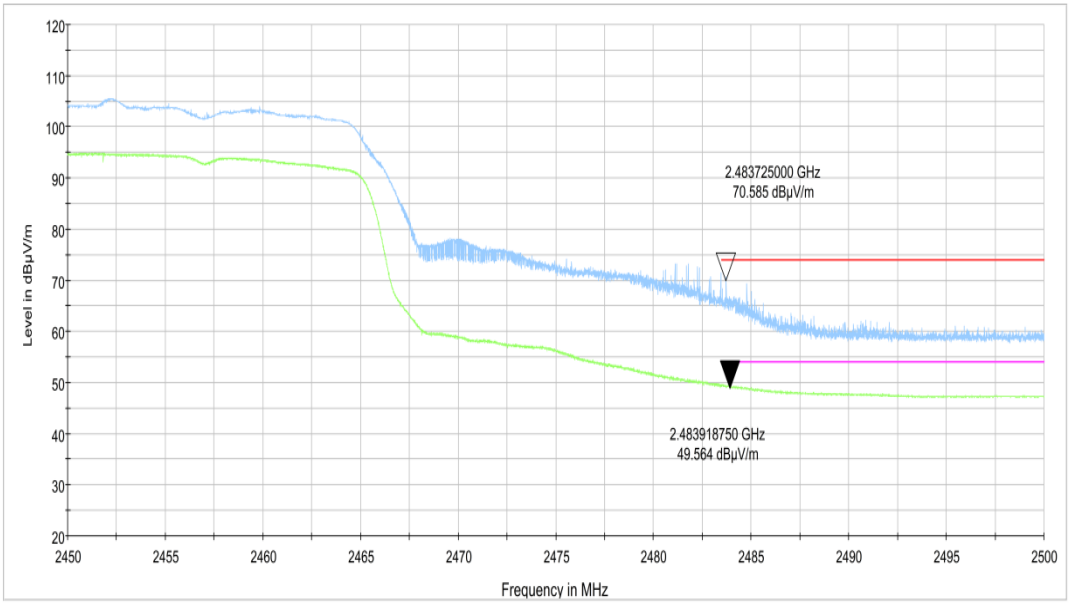


Fig.A.6.2.6 Transmitter Spurious Emission - Radiated (Power): 802.11g, ch10, 2.45 GHz - 2.50GHz

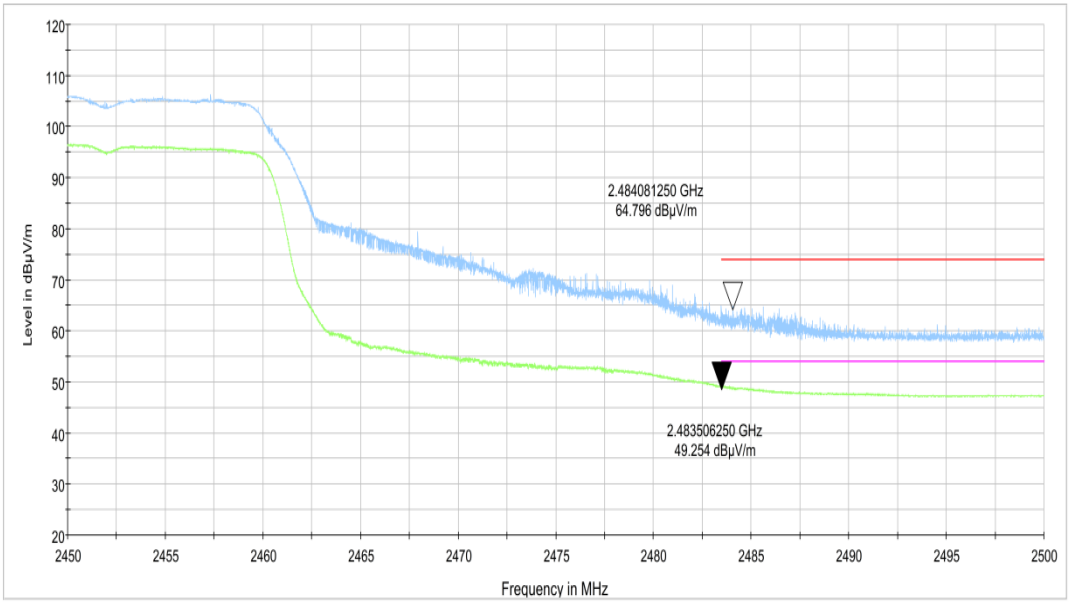


Fig.A.6.2.7 Transmitter Spurious Emission - Radiated (Power): 802.11g, ch9, 2.45 GHz - 2.50GHz

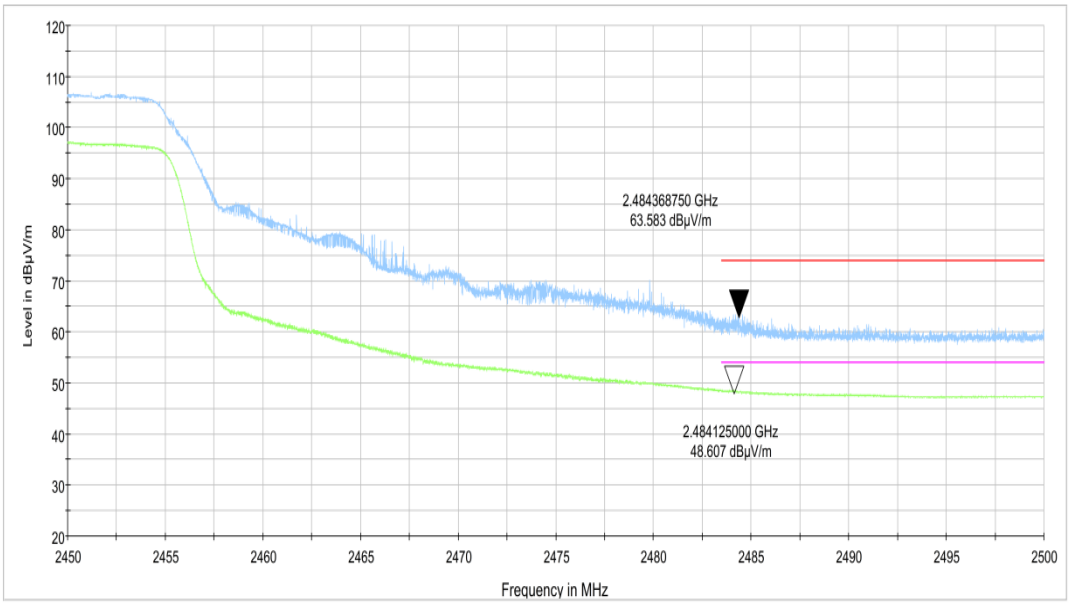


Fig.A.6.2.8 Transmitter Spurious Emission - Radiated (Power): 802.11g, ch8, 2.45 GHz - 2.50GHz

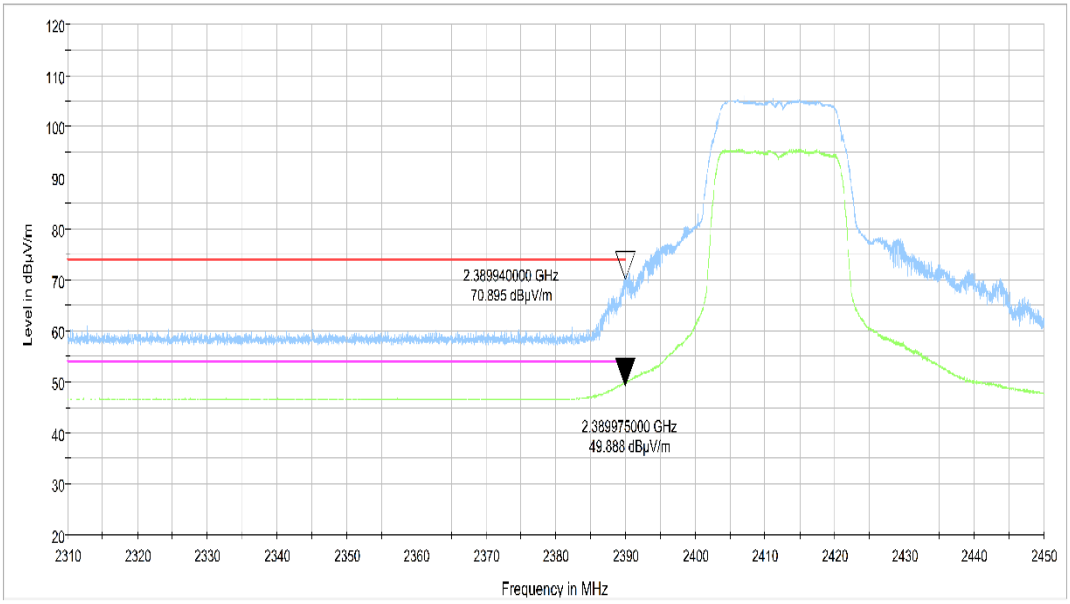


Fig.A.6.2.9 Transmitter Spurious Emission - Radiated (Power): 802.11n-HT20, ch1, 2.31 GHz - 2.45GHz

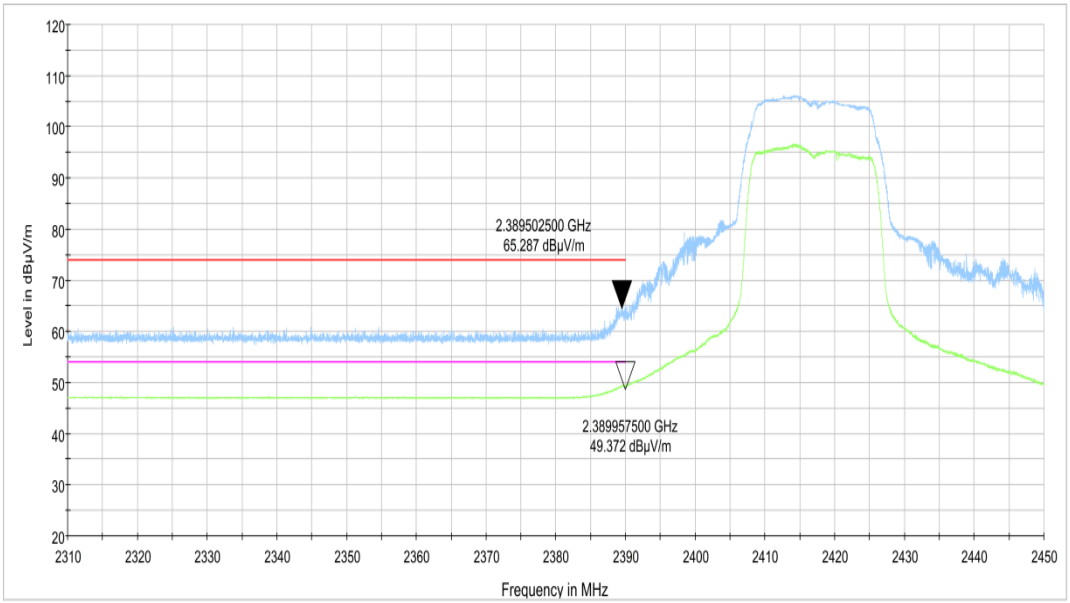


Fig.A.6.2.10 Transmitter Spurious Emission - Radiated (Power): 802.11n-HT20, ch2, 2.31 GHz - 2.45GHz

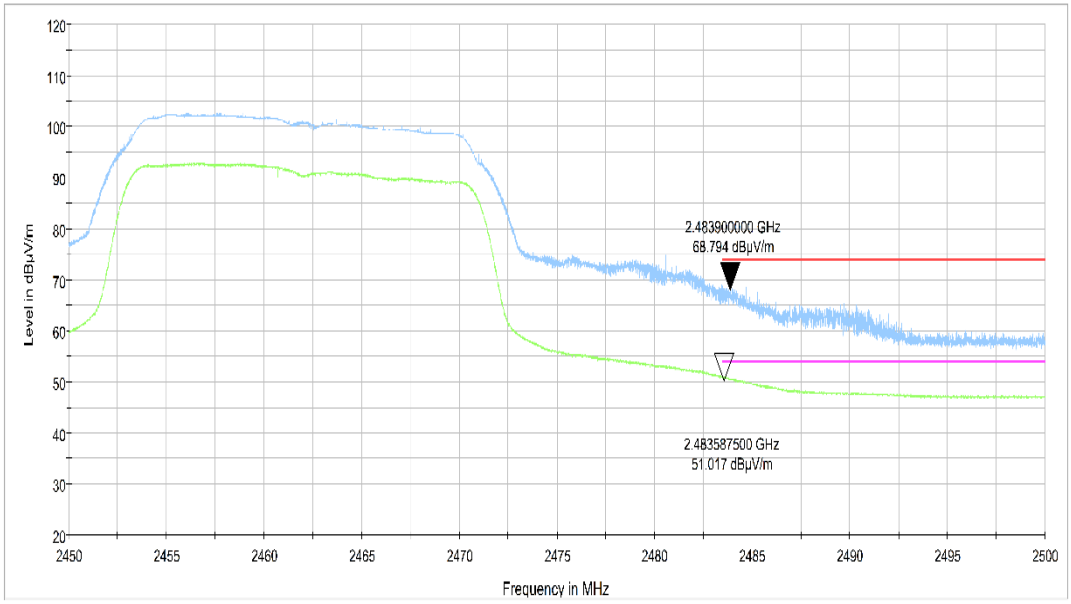


Fig.A.6.2.11 Transmitter Spurious Emission - Radiated (Power): 802.11n-HT20, ch11, 2.45 GHz - 2.50GHz

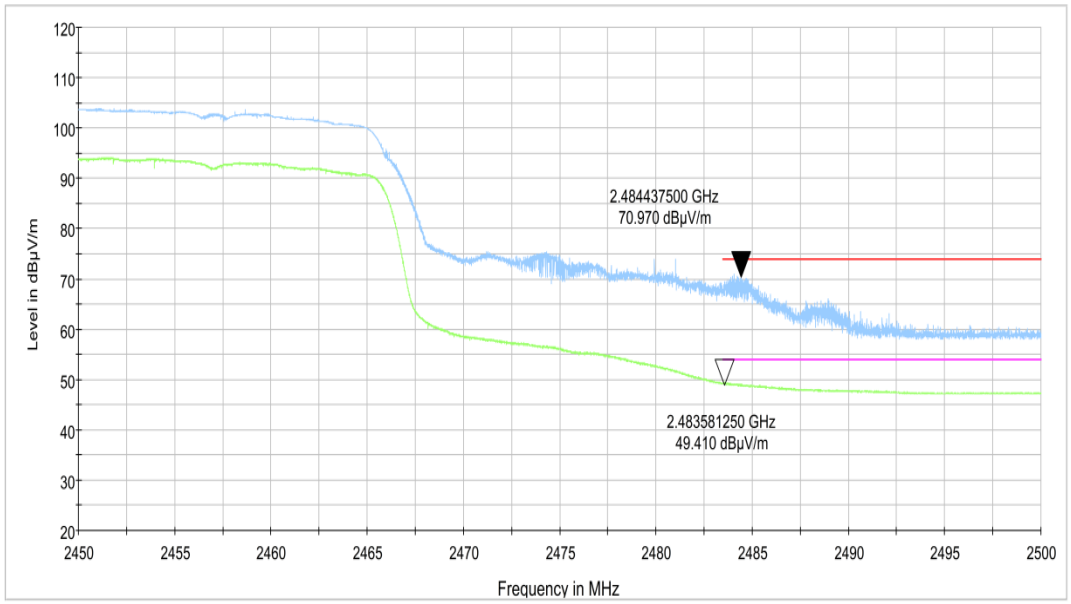


Fig.A.6.2.12 Transmitter Spurious Emission - Radiated (Power): 802.11n-HT20, ch10, 2.45 GHz - 2.50GHz

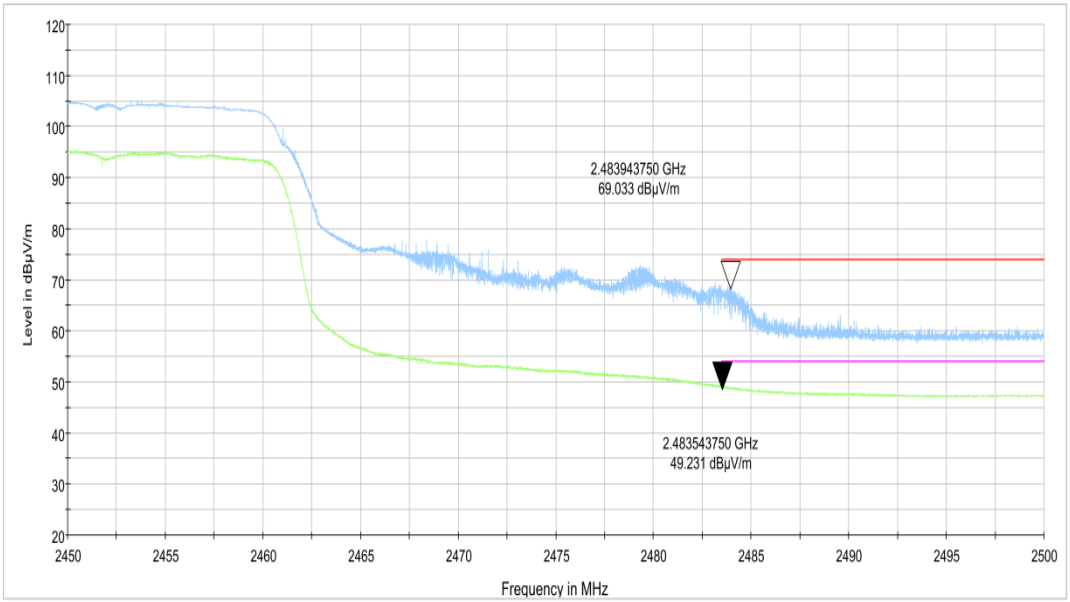


Fig.A.6.2.13 Transmitter Spurious Emission - Radiated (Power): 802.11n-HT20, ch9, 2.45 GHz - 2.50GHz

A.7. AC Power-line Conducted Emission

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

See Clause 6.2 of ANSI C63.10-2013 specifically.

See Clause 4 and Clause 5 of ANSI C63.10-2013 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.

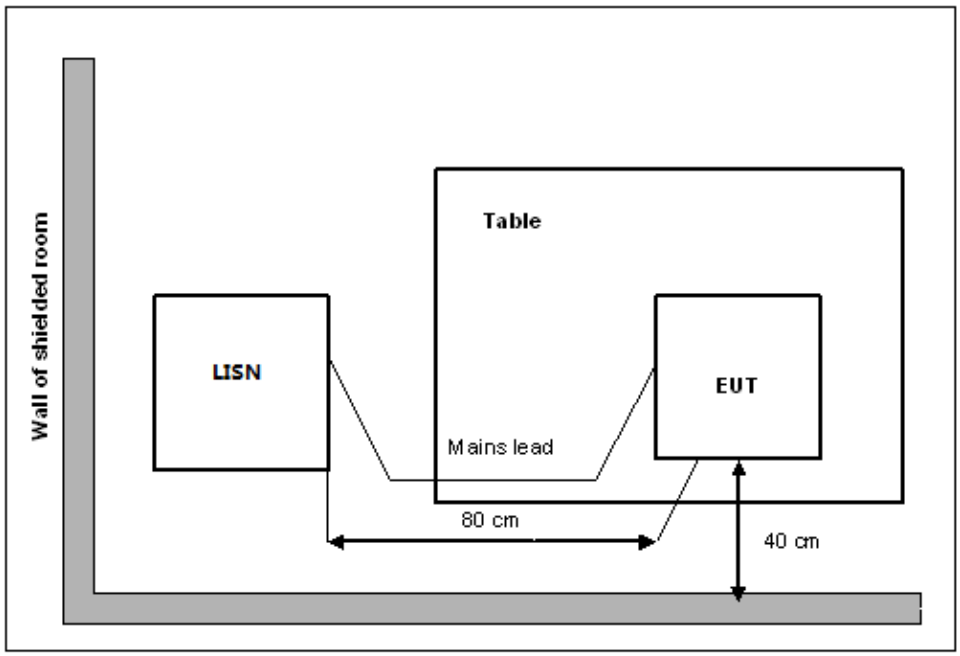
The measurement bandwidth is:

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

Test Condition:

Voltage（V）	Frequency（Hz）
120	60

Measurement Setup



Measurement Result and limit:

WLAN (Quasi-peak Limit)

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Result (dBμV)		Conclusion
		With Adapter		
		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 Adapter		
		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:

Result for Traffic:

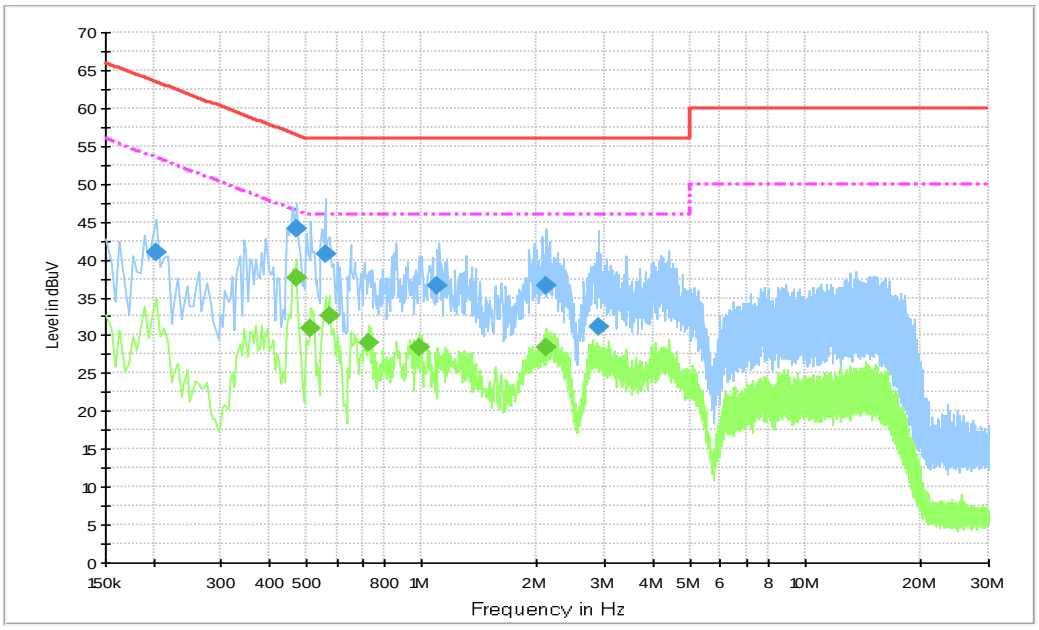


Fig.A.7.1 AC Powerline Conducted Emission-802.11b

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

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.204000	40.9	3000.0	9.000	On	L1	27.5	22.6	63.4
0.474000	44.0	3000.0	9.000	On	N	23.6	12.4	56.4
0.559500	40.8	3000.0	9.000	On	N	22.9	15.2	56.0
1.099500	36.6	3000.0	9.000	On	N	20.2	19.4	56.0
2.116500	36.7	3000.0	9.000	On	N	20.0	19.3	56.0
2.881500	31.1	3000.0	9.000	On	L1	19.9	24.9	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.469500	37.7	3000.0	9.000	On	N	23.7	8.8	46.5
0.514500	31.0	3000.0	9.000	On	L1	23.3	15.0	46.0
0.573000	32.6	3000.0	9.000	On	L1	22.8	13.4	46.0
0.726000	29.0	3000.0	9.000	On	N	21.7	17.0	46.0
0.982500	28.5	3000.0	9.000	On	N	20.3	17.5	46.0
2.116500	28.5	3000.0	9.000	On	N	20.0	17.5	46.0

Note: The measurement results showed here are worst cases of the combinations of different Adapters and USB cables.

Result for Idle:

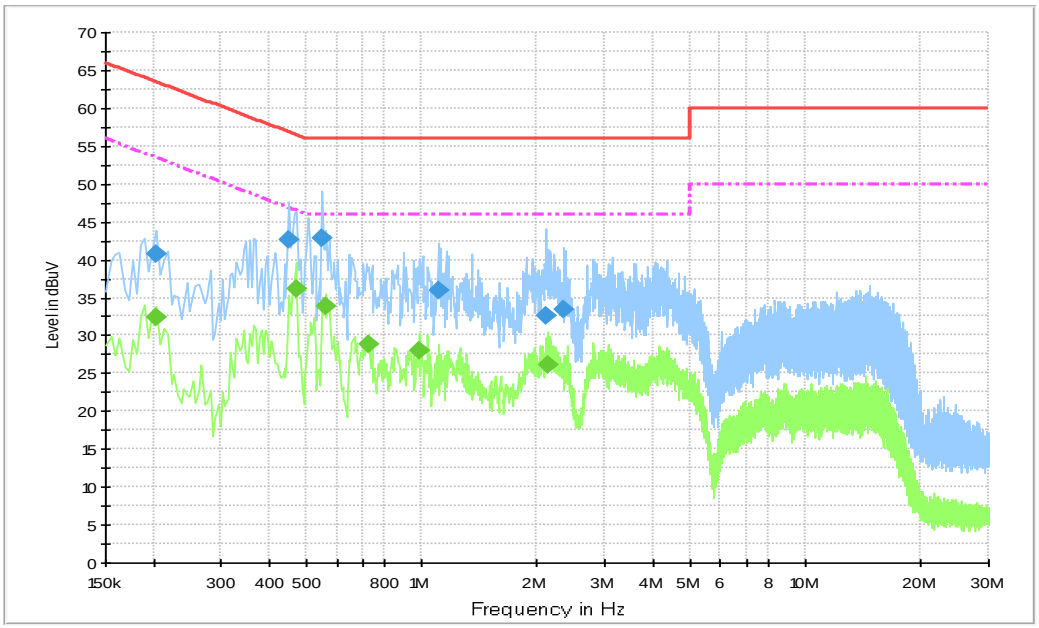


Fig.A.7.2 AC Powerline Conducted Emission-Idle

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

Final Result 1

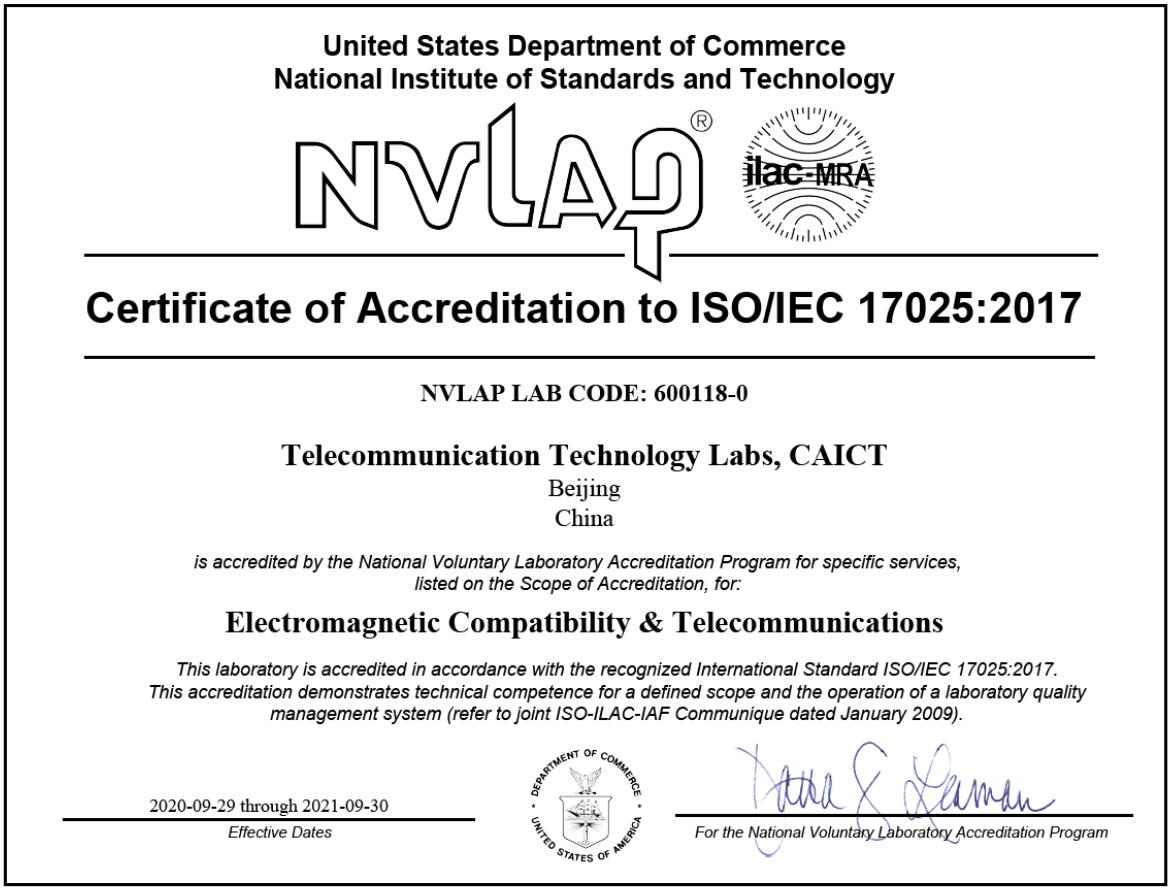
Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.204000	40.7	3000.0	9.000	On	L1	27.5	22.7	63.4
0.451500	42.6	3000.0	9.000	On	N	23.9	14.3	56.8
0.550500	42.9	3000.0	9.000	On	N	22.9	13.1	56.0
1.104000	36.0	3000.0	9.000	On	N	20.2	20.0	56.0
2.103000	32.5	3000.0	9.000	On	L1	20.0	23.5	56.0
2.350500	33.5	3000.0	9.000	On	N	19.9	22.5	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.204000	32.4	3000.0	9.000	On	L1	27.5	21.0	53.4
0.469500	36.1	3000.0	9.000	On	N	23.7	10.4	46.5
0.564000	33.8	3000.0	9.000	On	L1	22.8	12.2	46.0
0.726000	28.8	3000.0	9.000	On	N	21.7	17.2	46.0
0.987000	28.1	3000.0	9.000	On	N	20.3	17.9	46.0
2.125500	26.2	3000.0	9.000	On	L1	20.0	19.8	46.0

Note: The measurement results showed here are worst cases of the combinations of different Adapters and USB cables.

ANNEX B: 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).

2020-09-29 through 2021-09-30
Effective Dates

DEPARTMENT OF COMMERCE * UNITED STATES OF AMERICA *

For the National Voluntary Laboratory Accreditation Program

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