FCC PART 15C
TEST REPORT
No.I21Z70258-IOT03

for

Samsung Electronics Co., Ltd.

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

SM-A037M/DS,SM-A037M

With

FCC ID: ZCASMA037M

Hardware Version: REV1.0

Software Version: A037M.001

Issued Date: 2021-07-30

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
I21Z70258-IOT03	Rev.0	1st edition	2021-07-12
I21Z70258-IOT03	Rev.1	Reselect worst case to test.	2021-07-30

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

Location 1:CTTL(Gaolizhang Road)

Address: Cuihu Cloud Center, No.1, Gaolizhang Road, Wenquan, Haidian District, Beijing, China

Location 2:CTTL(BDA)

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

1.3. Testing Environment

Normal Temperature: 15-35℃

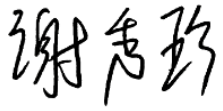
Relative Humidity: 20-75%

1.4. Project date

Testing Start Date: 2021-05-25

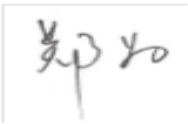
Testing End Date: 2021-07-30

1.5. Signature



Xie Xiuzhen

(Prepared this test report)



Zheng Wei

(Reviewed this test report)

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
Contact:	Jenni Chun
Email:	j1.chun@samsung.com
Telephone:	+1-201-937-4203
Fax:	/

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
Contact:	Sunghoon Cho
Email:	ggobi.cho@samsung.com
Telephone:	+82-10-2722-4159
Fax:	/

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-A037M/DS,SM-A037M
FCC ID	ZCASMA037M
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	25.04dBm
Power Supply	4V

3.2. Internal Identification of EUT

EUT ID*	SN or IMEI	HW Version	SW Version
UT37a	2170258UT37a	REV1.0	A037M.001
UT17a	2170258UT17a	REV1.0	A037M.001

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

3.3. Internal Identification of AE

AE ID*	Description	Remarks
AE1	Charger1	/
AE2	Charger2	/
AE3	Charger3	/
AE4	Charger4	/
AE5	Charger5	/
AE6	USB cable	/
AE7	Headset1	/
AE8	Headset2	/
AE9	battery	/
AE10	Charger6	No test
AE11	Charger7	No test
AE12	Charger8	No test
AE13	Charger9	No test
AE14	Charger10	No test

AE1

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

AE2

Model	EP-TA50JWE
Manufacturer	RFTech Electronics(HuiZhou)Co.,LTD
Length of cable	/

AE3

Model	EP-TA50UWE
Manufacturer	Dong Yang
Length of cable	/

AE4

Model	EP-TA50UWE
Manufacturer	HAEM Co.,Ltd
Length of cable	/

AE5

Model	EP-TA50UWE
Manufacturer	Salcomp
Length of cable	/

AE6

Model	EP-DR140AWE
Manufacturer	Samsung Electronics Co., Ltd.
Length of cable	/

AE7

Model	EHS61ASFWE
Manufacturer	DONGGUAN YOUNGBO ELECTRONICS CO.,LTD
Length of cable	/

AE8

Model	EHS61ASFWE
Manufacturer	WATA ELECTRONICS CO.,LTD
Length of cable	/

AE9

Type	Secondary Li-ion Battery
SN	HQ-50S
Manufacturer	SUCD(FUJIAN) Electronics Co.,Ltd

AE10

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

AE11

Model	EP-TA50JWS
Manufacturer	RFTech Electronics(HuiZhou)Co.,LTD
Length of cable	/

AE12

Model	EP-TA50UWS
Manufacturer	Dong Yang

Length of cable	/

AE13

Model	EP-TA50JWE
Manufacturer	Dong Yang
Length of cable	/

AE14

Model	EP-TA50UWE
Manufacturer	RFTech Electronics(HuiZhou)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 Multi-band GSM/WCDMA/LTE phone with Bluetooth, WLAN 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.	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 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	4V
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	2022-05-24
2	LISN	ENV216	101459	R&S	1 year	2022-03-16
3	Test Receiver	ESCI	100766	R&S	1 year	2022-03-09
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	100376	R&S	1 year	2021-09-04
2	BiLog Antenna	VULB9163	9163-482	Schwarzbeck	1 year	2021-11-04
3	Dual-Ridge Waveguide Horn Antenna	3117	00139065	ETS-Lindgren	1 year	2021-10-11
4	Dual-Ridge Waveguide Horn Antenna	3116	2663	ETS-Lindgren	1 year	2021-08-05
5	Vector Signal Analyzer	FSV40	101047	R&S	1 year	2022-05-17

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

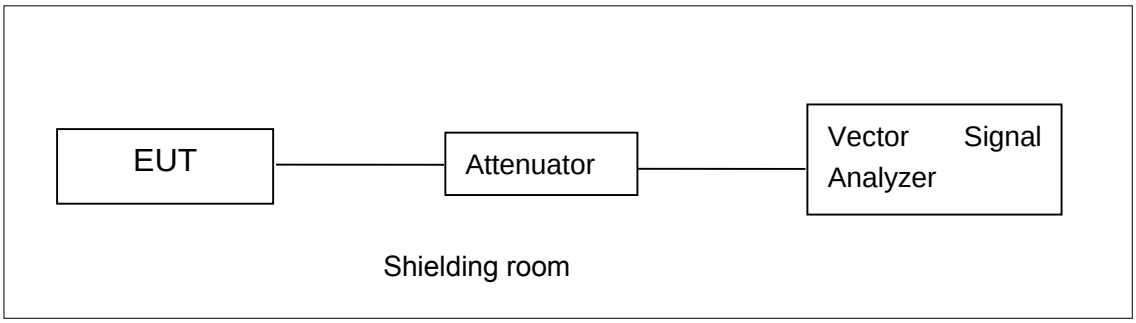


Fig.A.1.1.1: Test Setup Diagram for Conducted Measurements

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 = 10Hz;

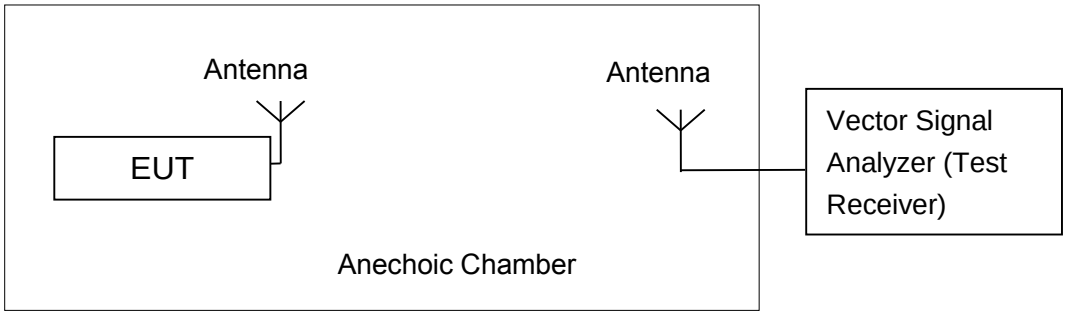


Fig.A.1.2.1: Test Setup Diagram for Radiated Measurements

A.2. Maximum Output Power

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

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 mode

Channel\data rate	1Mbps	2Mbps	5.5Mbps	11Mbps
11(2462MHz)	/	/	/	22.45
6(2437MHz)	/	/	/	22.64
1(2412MHz)	18.72	19.65	21.15	22.60

The data rate 11Mbps are selected as worse condition, and the following cases are performed with this condition.

802.11g mode

Channel\data rate	6Mbps	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
11(2462MHz)	/	/	/	/	/	/	23.51	/
6(2437MHz)	/	/	/	/	/	/	24.00	/
1(2412MHz)	23.50	23.46	23.79	23.98	24.20	23.99	25.04	24.64

The data rate 48Mbps are selected as worse condition, and the following cases are performed with this condition.

802.11n-HT20 mode

Channel\data rate	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
11(2462MHz)	/	/	/	/	/	/	23.48	/
6(2437MHz)	/	/	/	/	/	/	23.97	/
1(2412MHz)	23.40	23.75	23.80	24.07	24.10	24.72	24.84	24.77

The data rate MCS6 is selected as worse condition, and the following cases are performed with this condition.

802.11n-HT40 mode

Channel\data rate	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
9(2452MHz)	/	/	/	/	/	20.61	/	/
6(2437MHz)	/	/	/	/	/	19.10	/	/
3(2422MHz)	19.12	19.88	19.79	19.89	20.19	20.32	19.89	19.79

The data rate MCS5 is selected as worse condition, and the following cases are performed with this condition.

The duty cycle of all mode are100%.

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	-8.1	P
	6	Fig.A.3.2	-7.56	P
	11	Fig.A.3.3	-7.82	P
802.11g	1	Fig.A.3.4	-9.79	P
	6	Fig.A.3.5	-10.69	P
	11	Fig.A.3.6	-10.04	P

802.11n-HT20 mode

Mode	Channel	Power Spectral Density (dBm/3 kHz)		Conclusion
802.11n (HT20)	1	Fig.A.3.7	-10.80	P
	6	Fig.A.3.8	-11.33	P
	11	Fig.A.3.9	-10.80	P

802.11n-HT40 mode

Mode	Channel	Power Spectral Density (dBm/3 kHz)		Conclusion
802.11n (HT40)	3	Fig.A.3.10	-14.52	P
	6	Fig.A.3.11	-16.70	P
	9	Fig.A.3.12	-14.22	P

Conclusion: Pass

Test graphs as below:

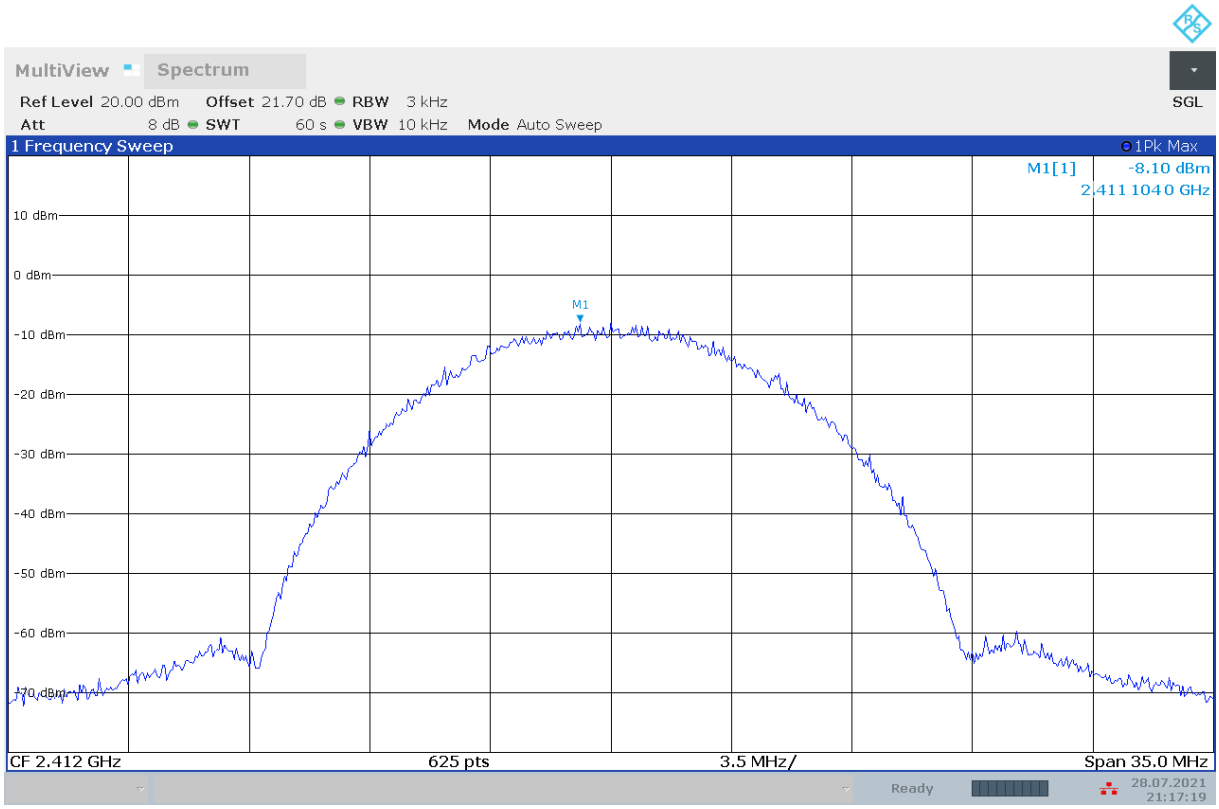


Fig.A.3.1 Power Spectral Density(802.11b,Ch1)

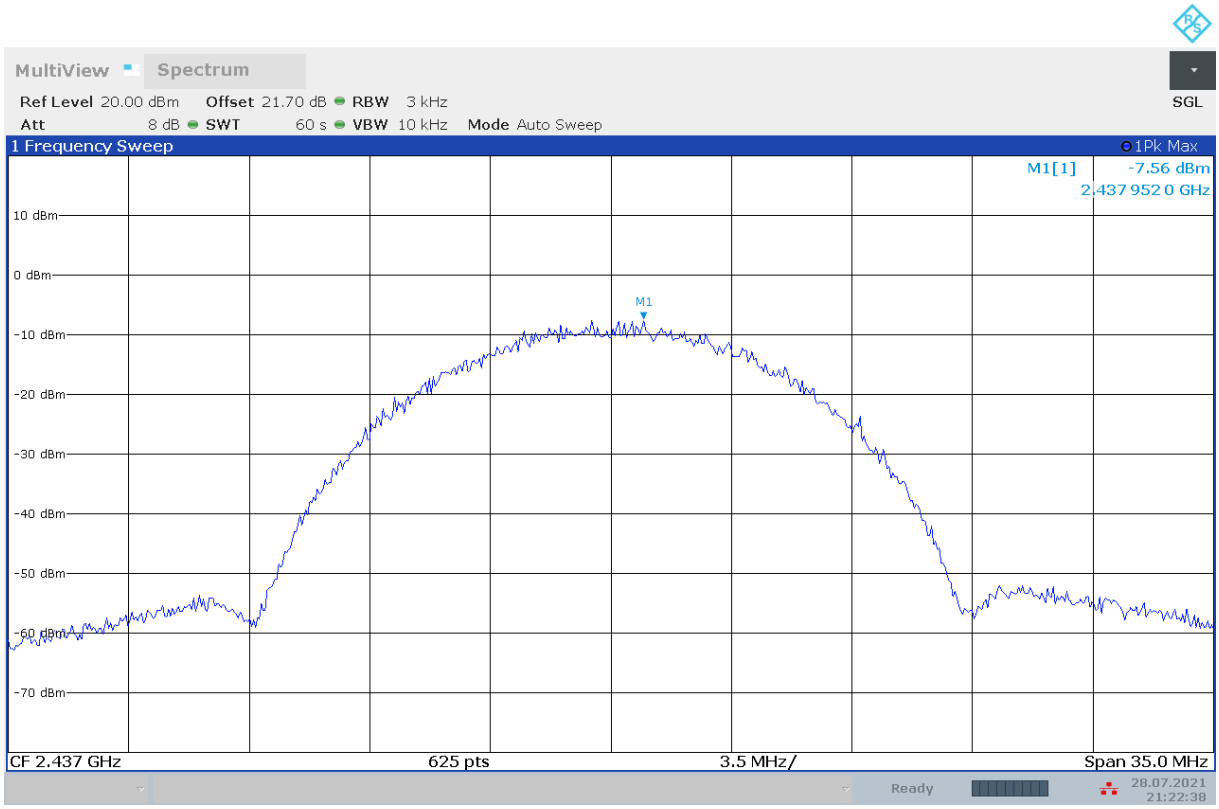


Fig.A.3.2 Power Spectral Density (802.11b, Ch 6)

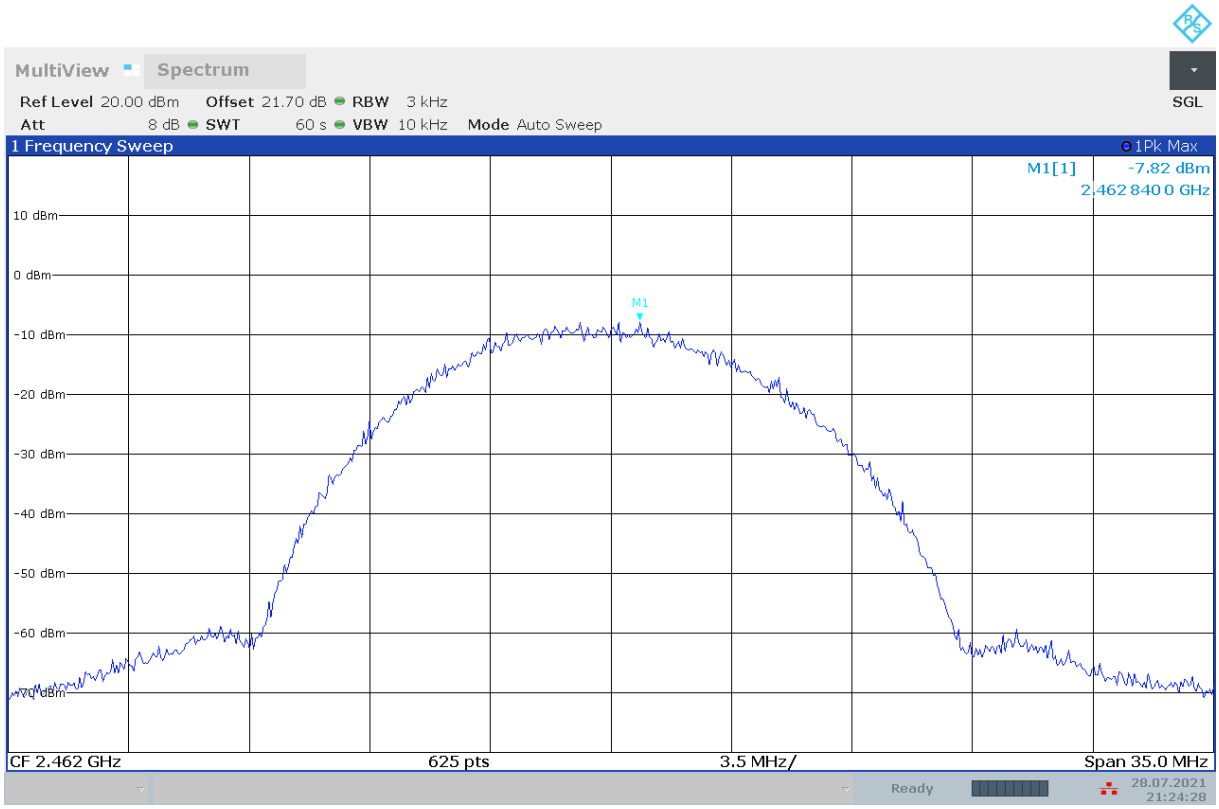


Fig.A.3.3 Power Spectral Density (802.11b, Ch 11)

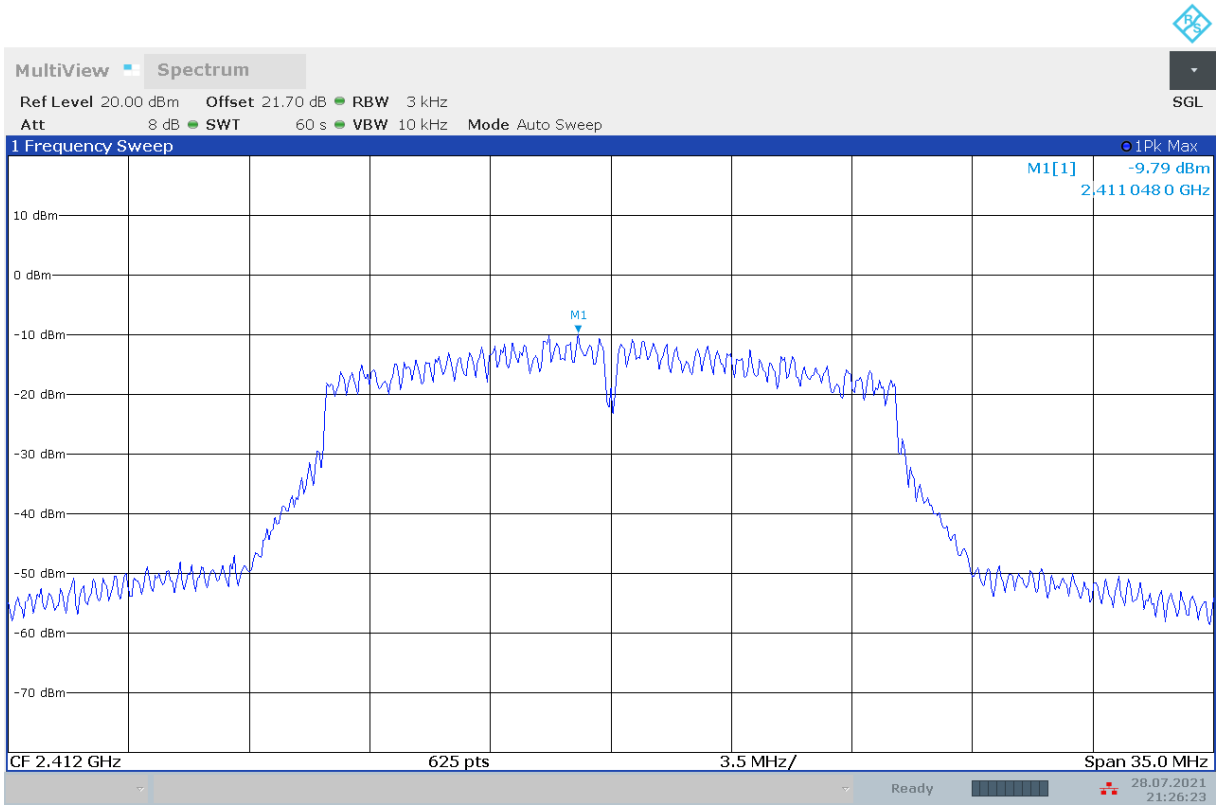


Fig.A.3.4 Power Spectral Density (802.11g, Ch 1)

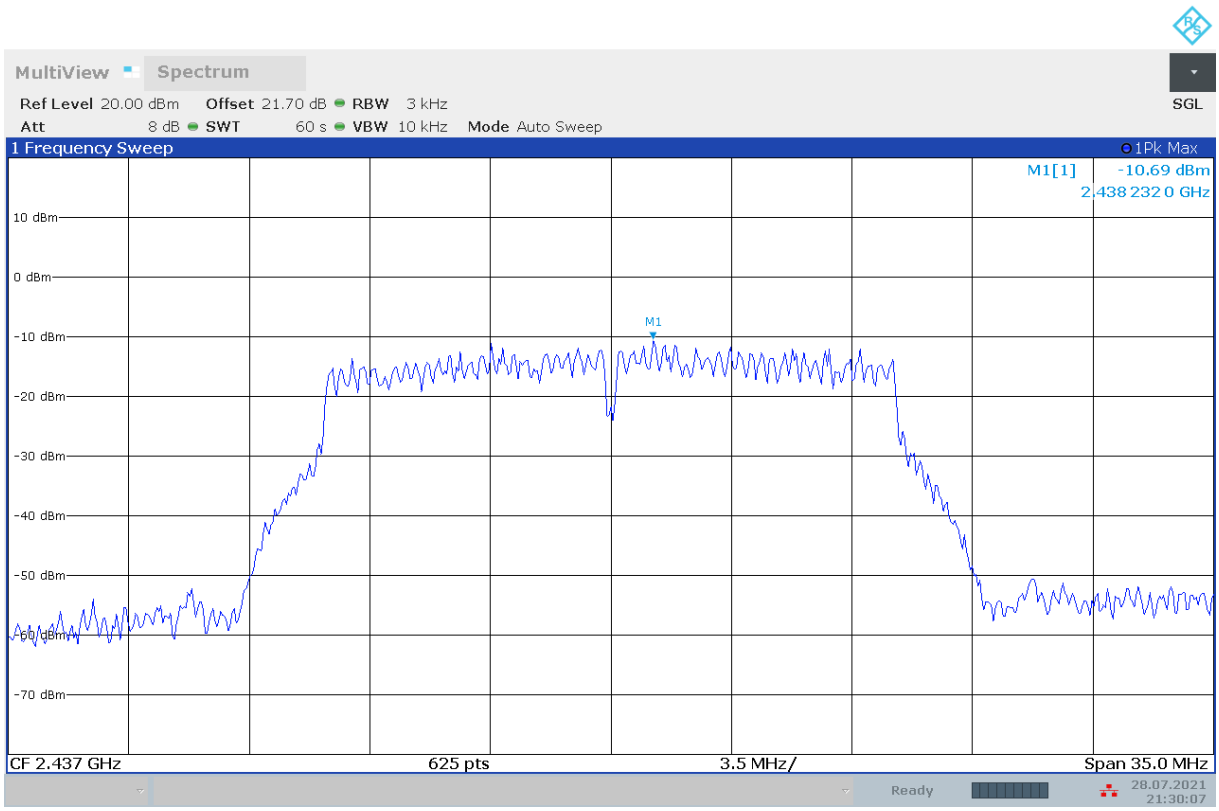


Fig.A.3.5 Power Spectral Density (802.11g, Ch 6)

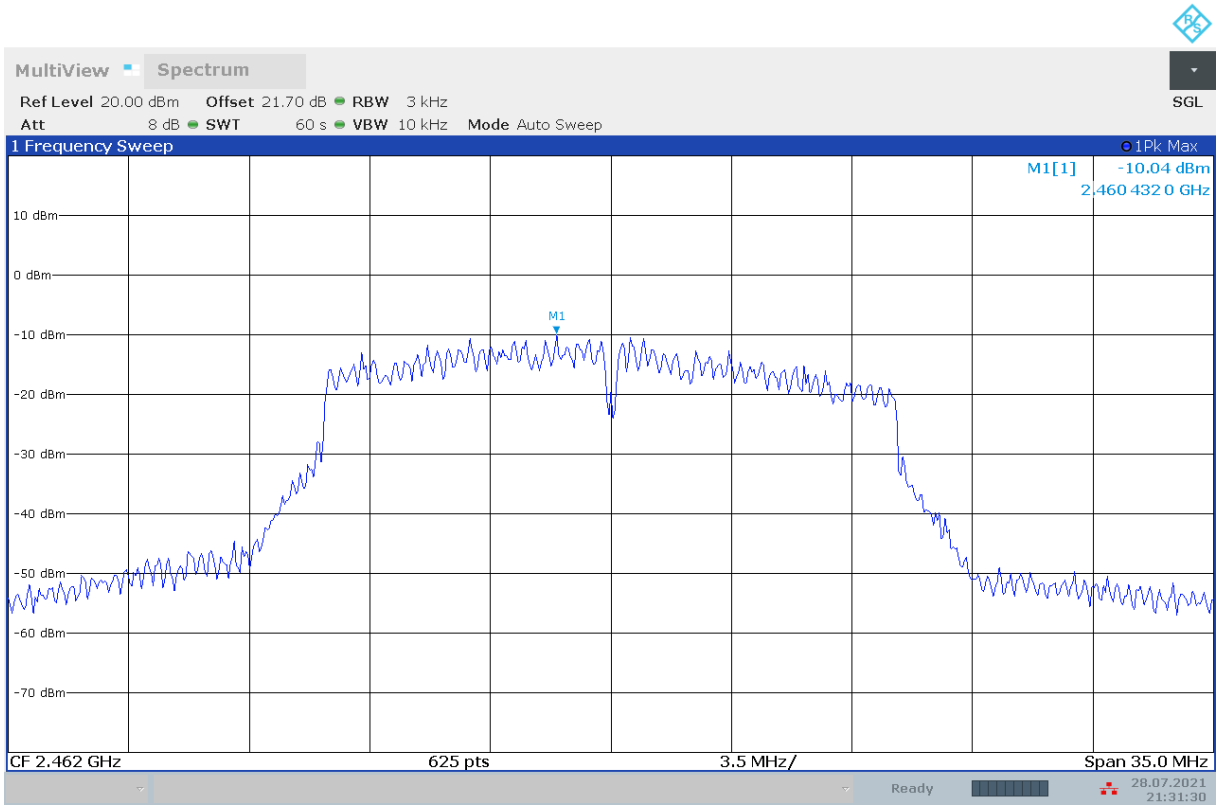


Fig.A.3.6 Power Spectral Density (802.11g, Ch 11)

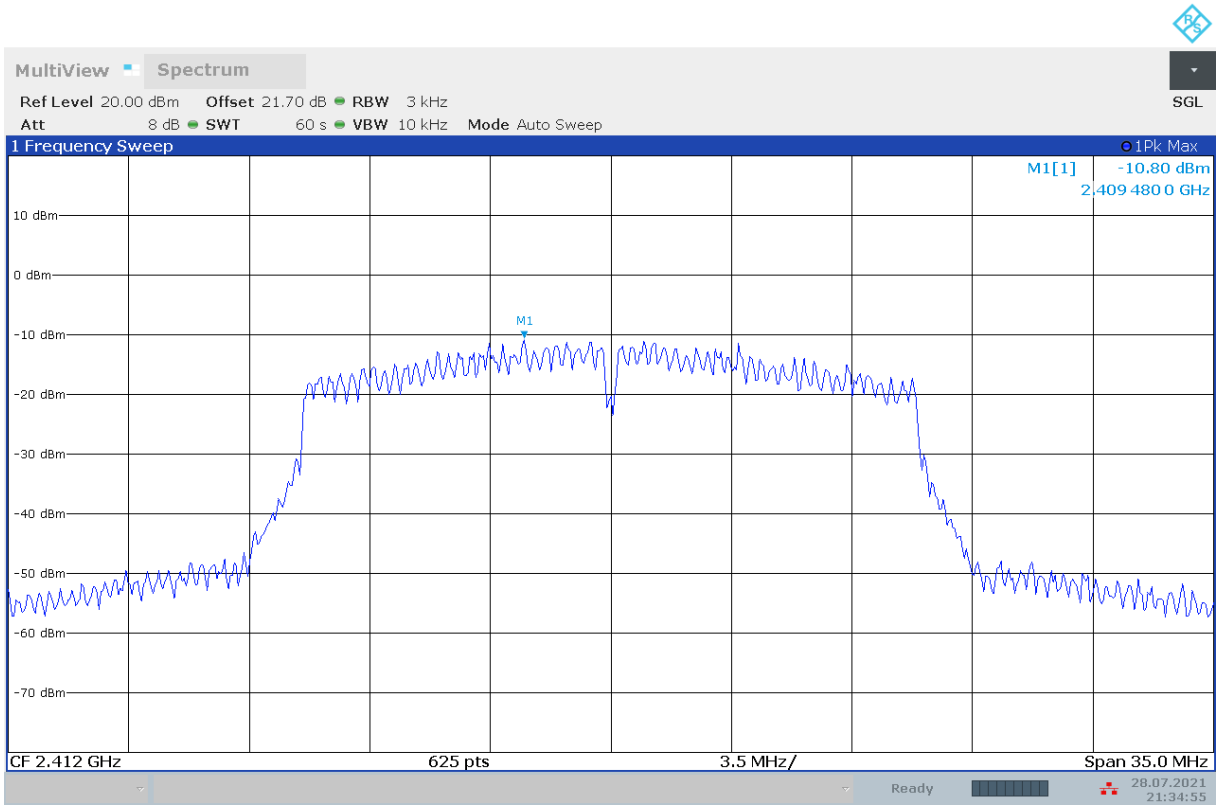


Fig.A.3.7 Power Spectral Density (802.11n-HT20, Ch 1)

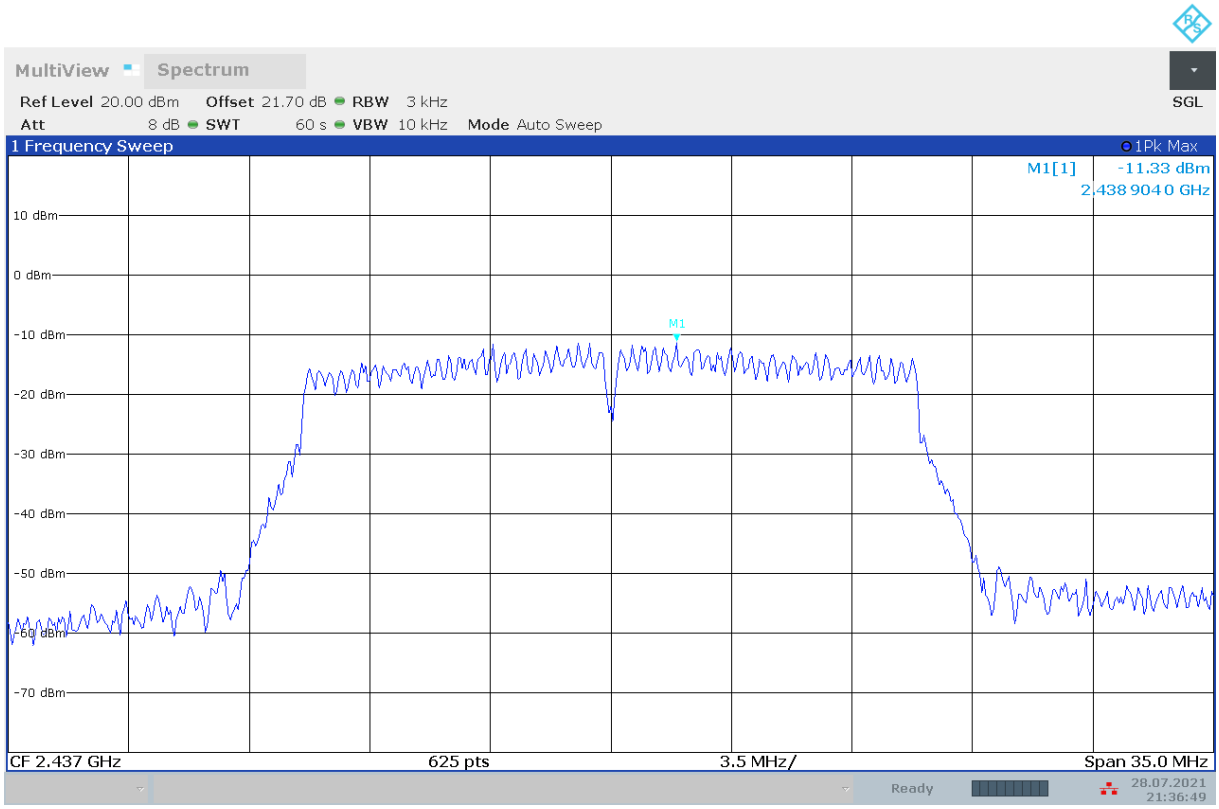


Fig.A.3.8 Power Spectral Density (802.11n-HT20, Ch 6)

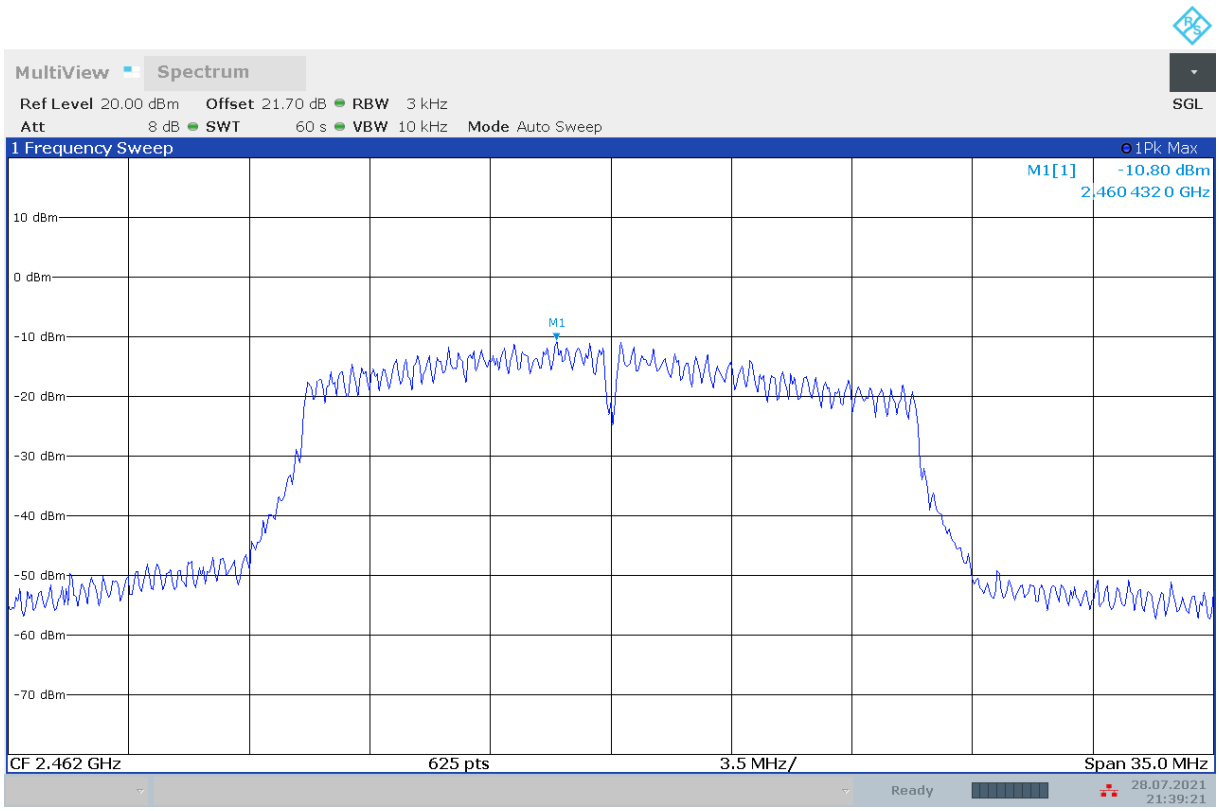


Fig.A.3.9 Power Spectral Density (802.11n-HT20, Ch 11)

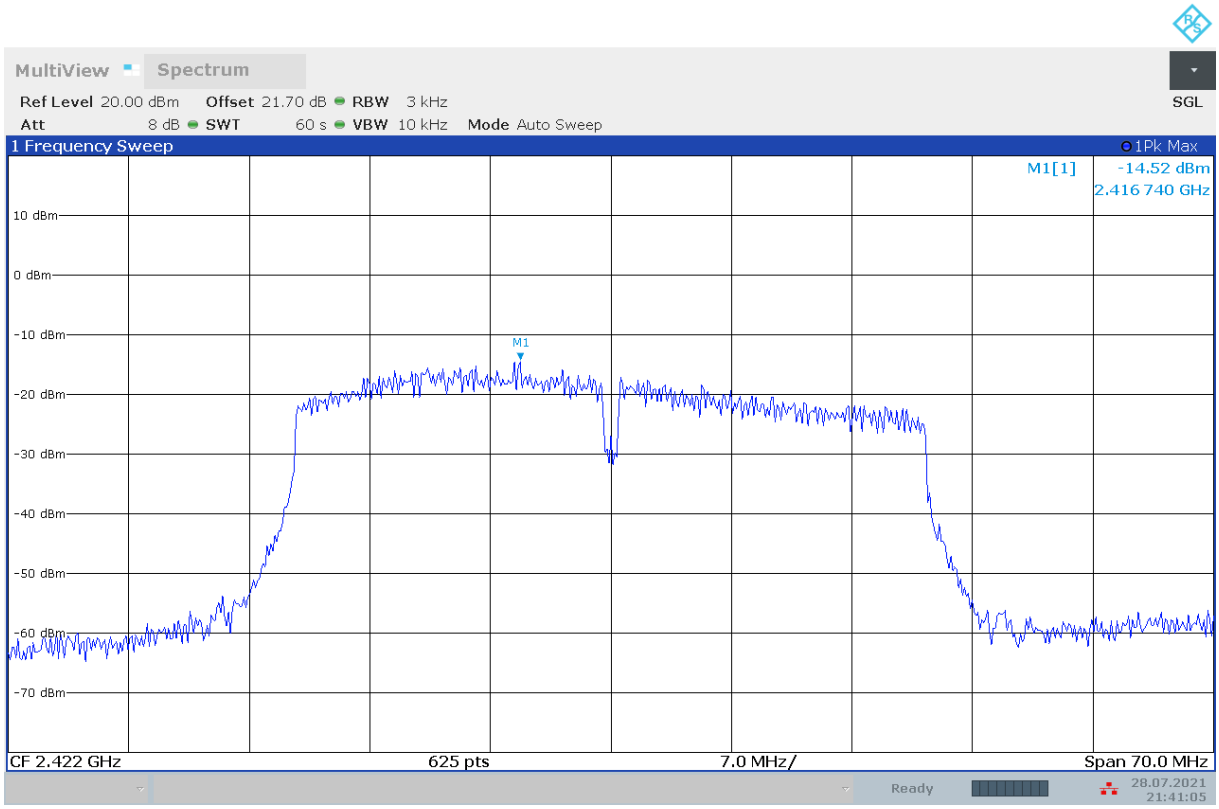


Fig.A.3.10 Power Spectral Density (802.11n-HT40, Ch 3)

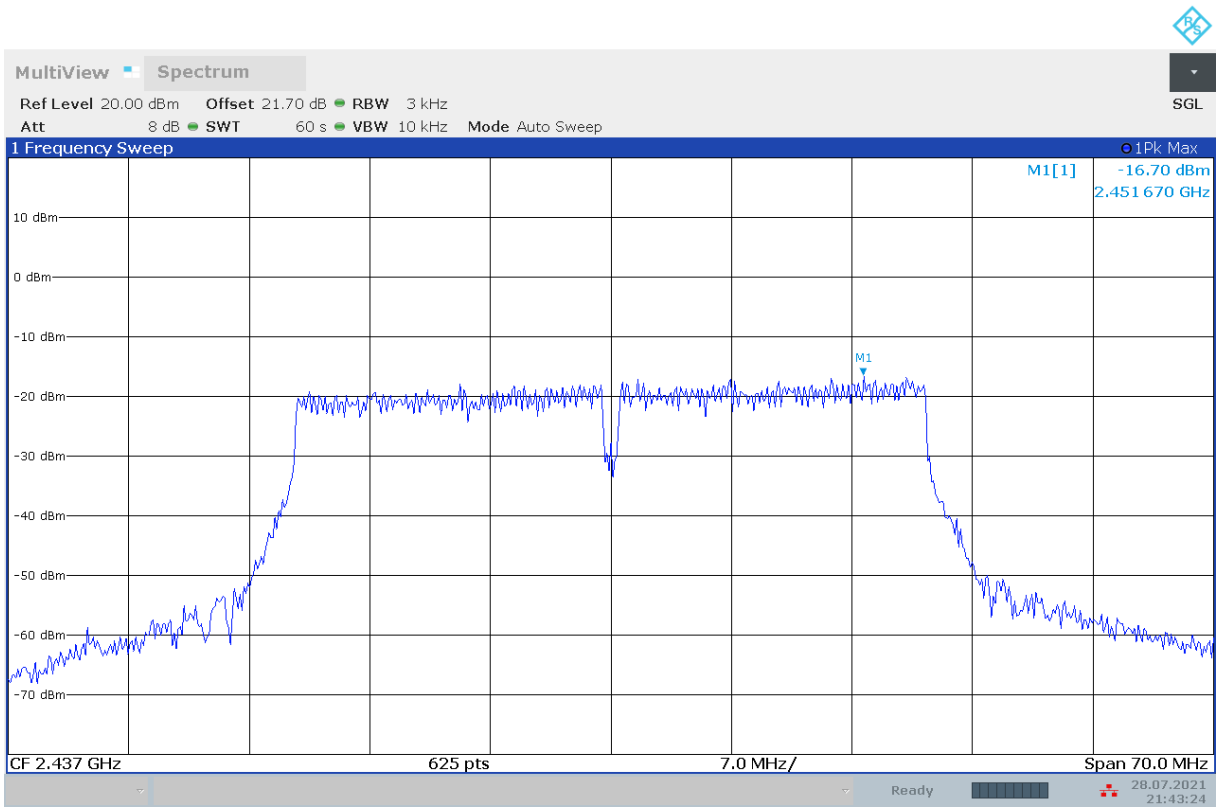


Fig.A.3.11 Power Spectral Density (802.11n-HT40, Ch 6)

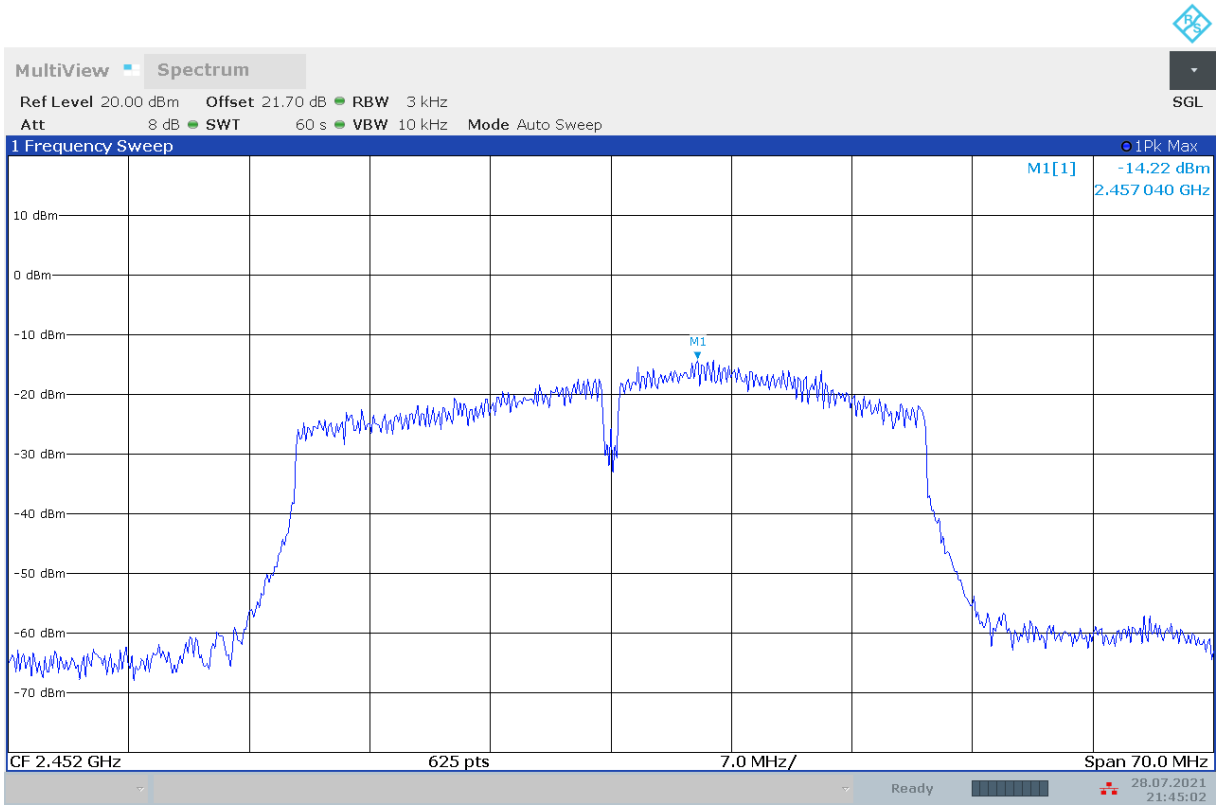


Fig.A.3.12 Power Spectral Density (802.11n-HT40, Ch 9)

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: UT17a

Measurement Result:

802.11b/g mode

Mode	Channel	Occupied 6dB Bandwidth (MHz)		conclusion
802.11b	1	Fig.A.4.1	7.19	P
	6	Fig.A.4.2	8.03	P
	11	Fig.A.4.3	7.38	P
802.11g	1	Fig.A.4.4	14.97	P
	6	Fig.A.4.5	16.45	P
	11	Fig.A.4.6	13.49	P

802.11n-HT20 mode

Mode	Channel	Occupied 6dB Bandwidth (MHz)		conclusion
802.11n (HT20)	1	Fig.A.4.7	15.94	P
	6	Fig.A.4.8	17.65	P
	11	Fig.A.4.9	14.40	P

802.11n-HT40 mode

Mode	Channel	Occupied 6dB Bandwidth (MHz)		conclusion
802.11n (HT40)	3	Fig.A.4.10	29.84	P
	6	Fig.A.4.11	36.46	P
	9	Fig.A.4.12	21.60	P

Conclusion: Pass

Test graphs as below:

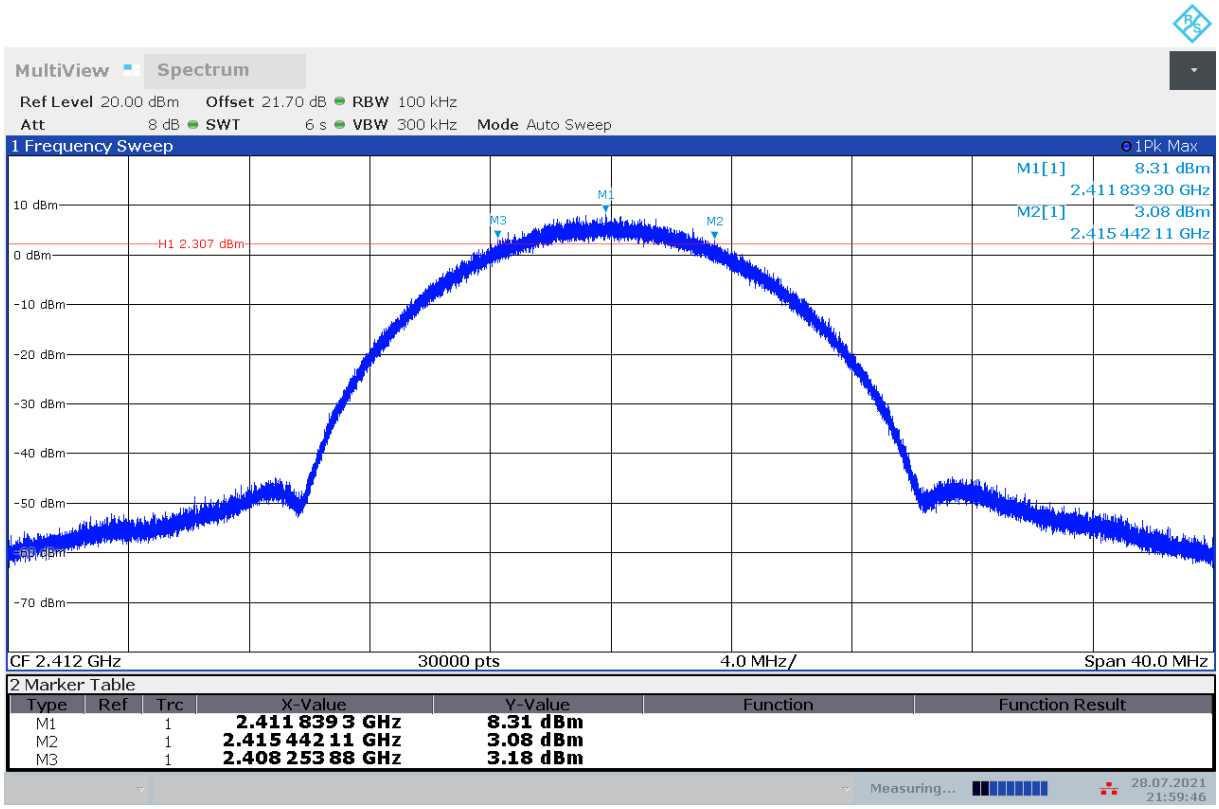


Fig.A.4.1 Occupied 6dB Bandwidth(802.11b,Ch 1)

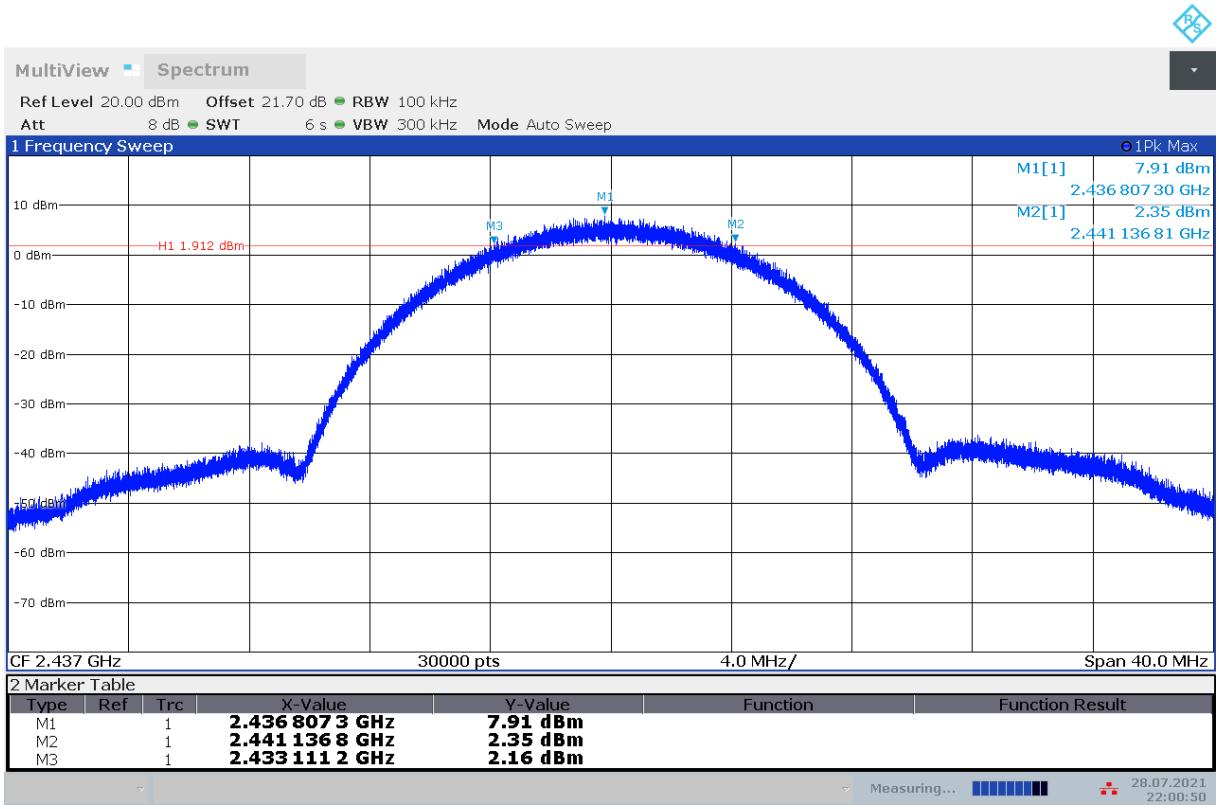


Fig.A.4.2 Occupied 6dB Bandwidth (802.11b, Ch 6)

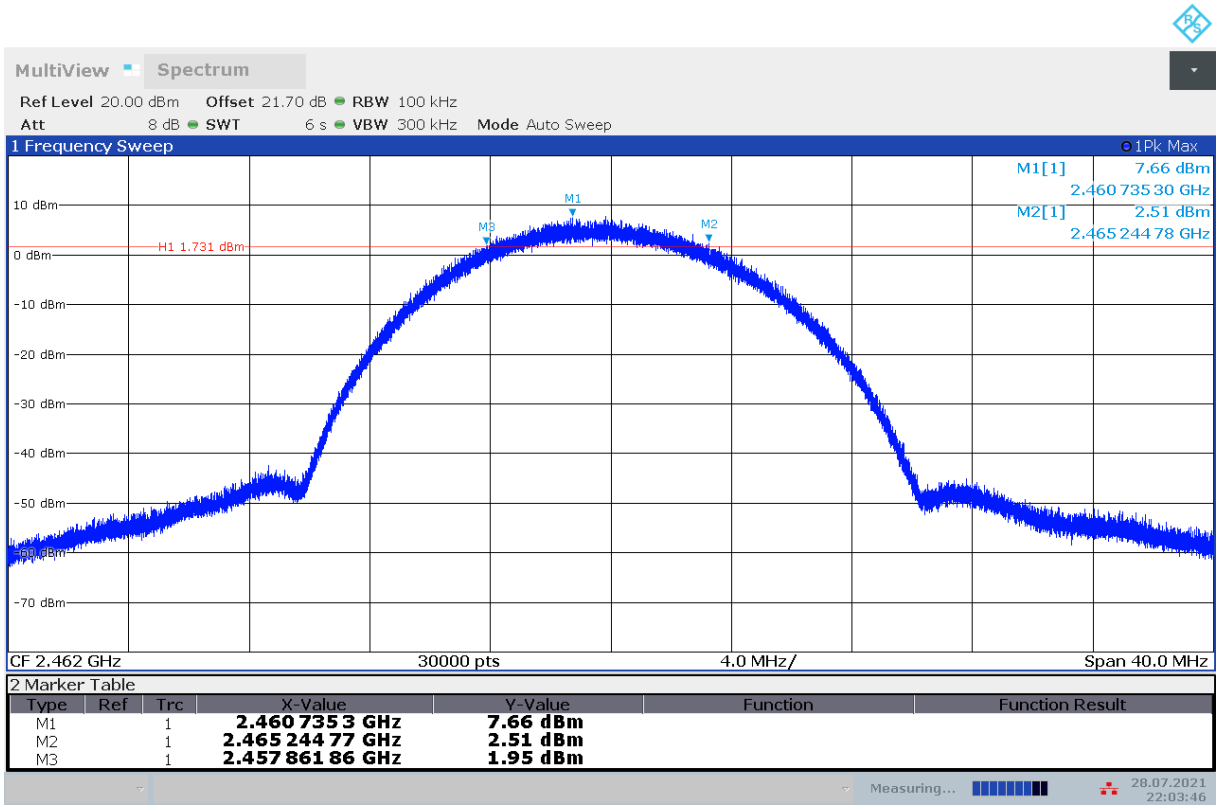


Fig.A.4.3 Occupied 6dB Bandwidth (802.11b, Ch 11)

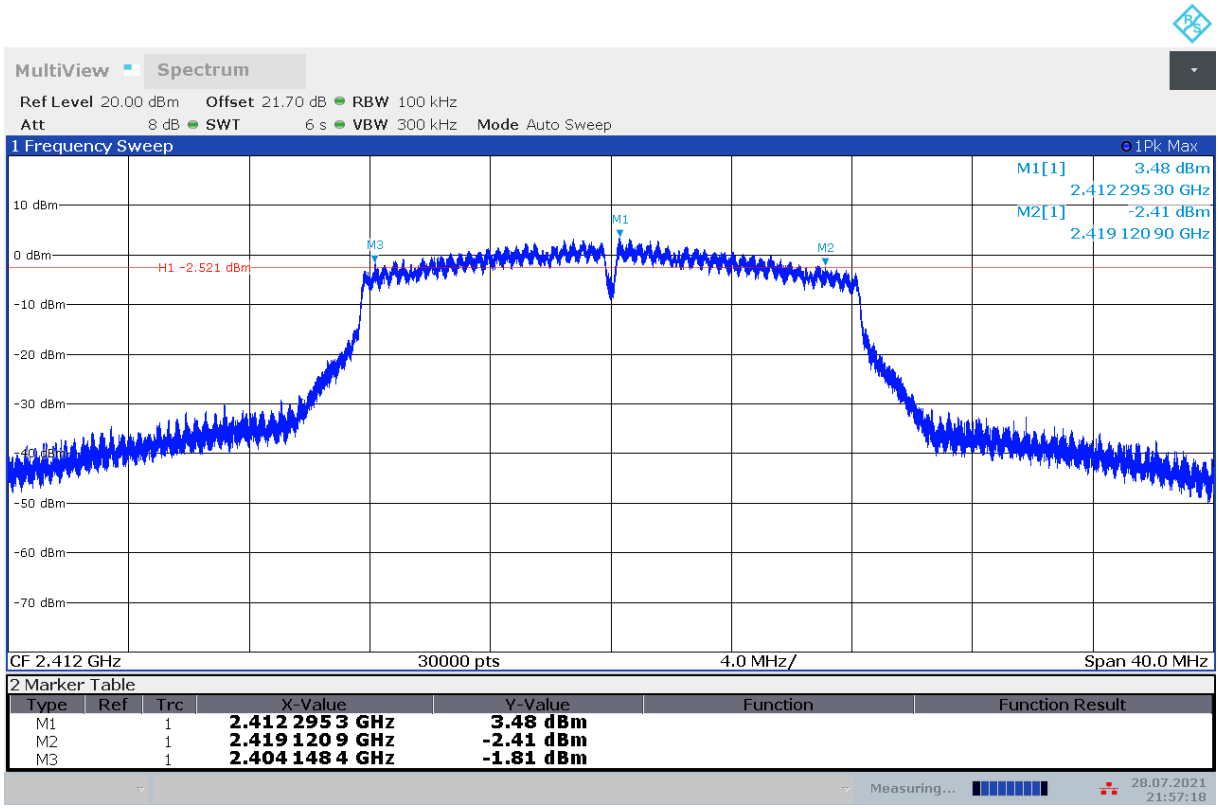


Fig.A.4.4 Occupied 6dB Bandwidth (802.11g, Ch 1)

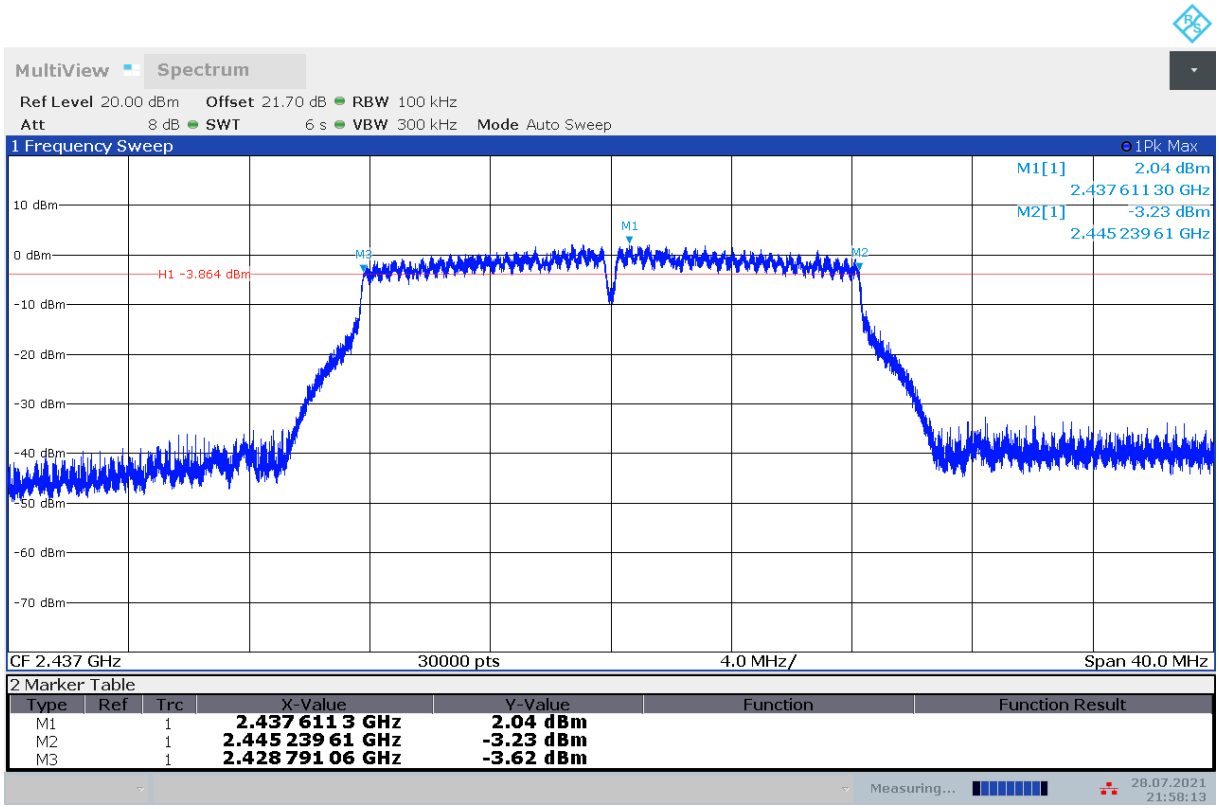


Fig.A.4.5 Occupied 6dB Bandwidth (802.11g, Ch 6)

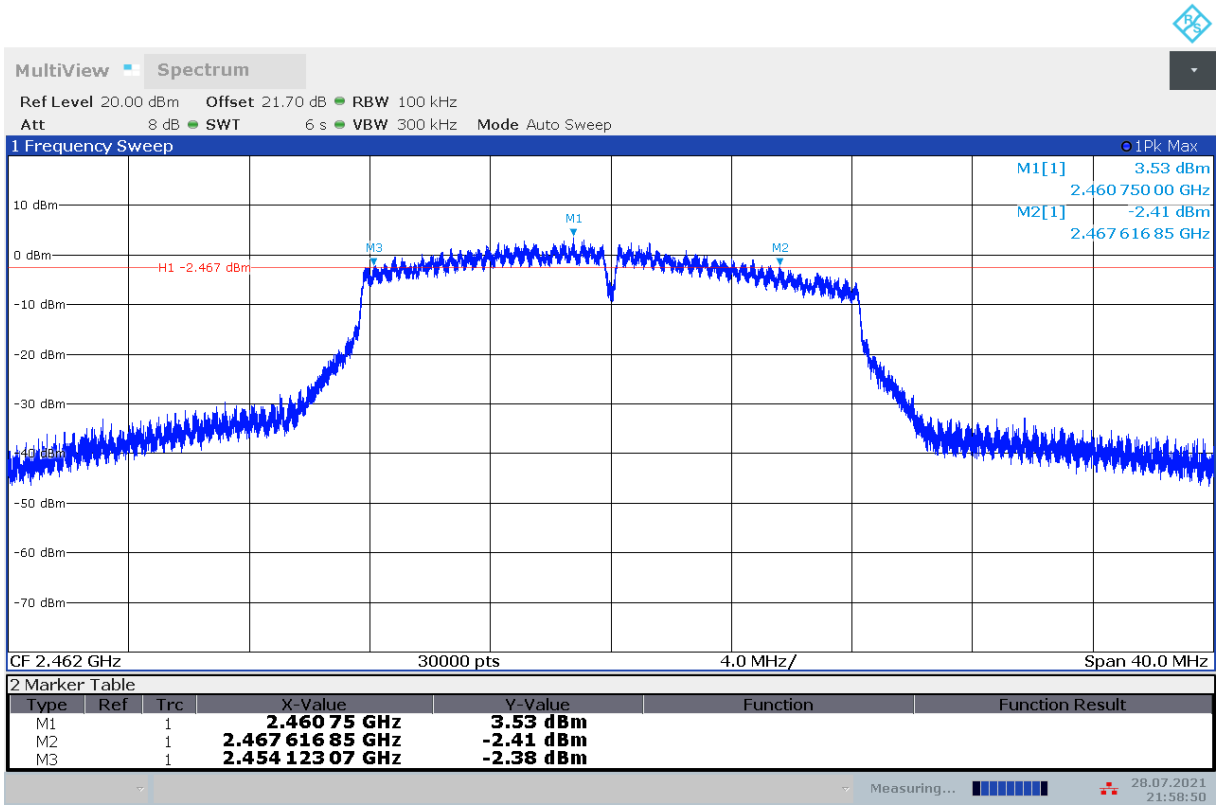


Fig.A.4.6 Occupied 6dB Bandwidth (802.11g, Ch 11)

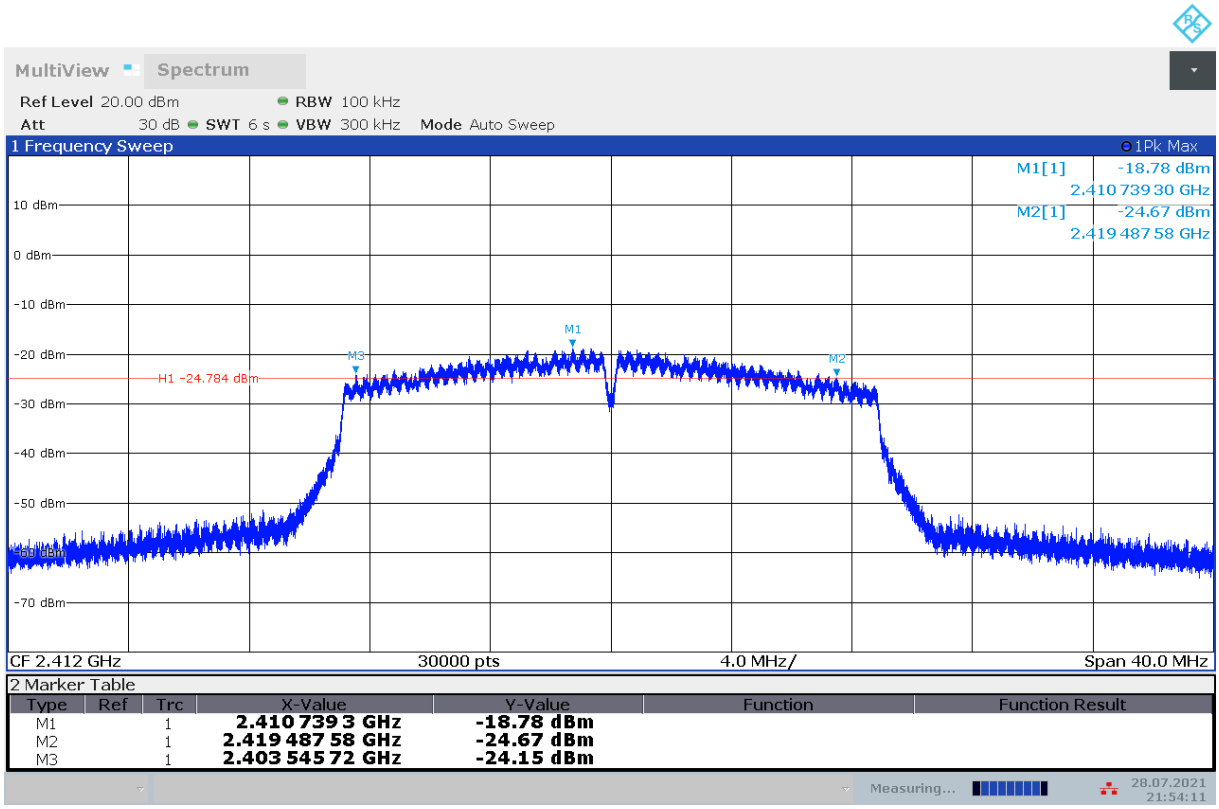


Fig.A.4.7 Occupied 6dB Bandwidth (802.11n-20MHz, Ch 1)

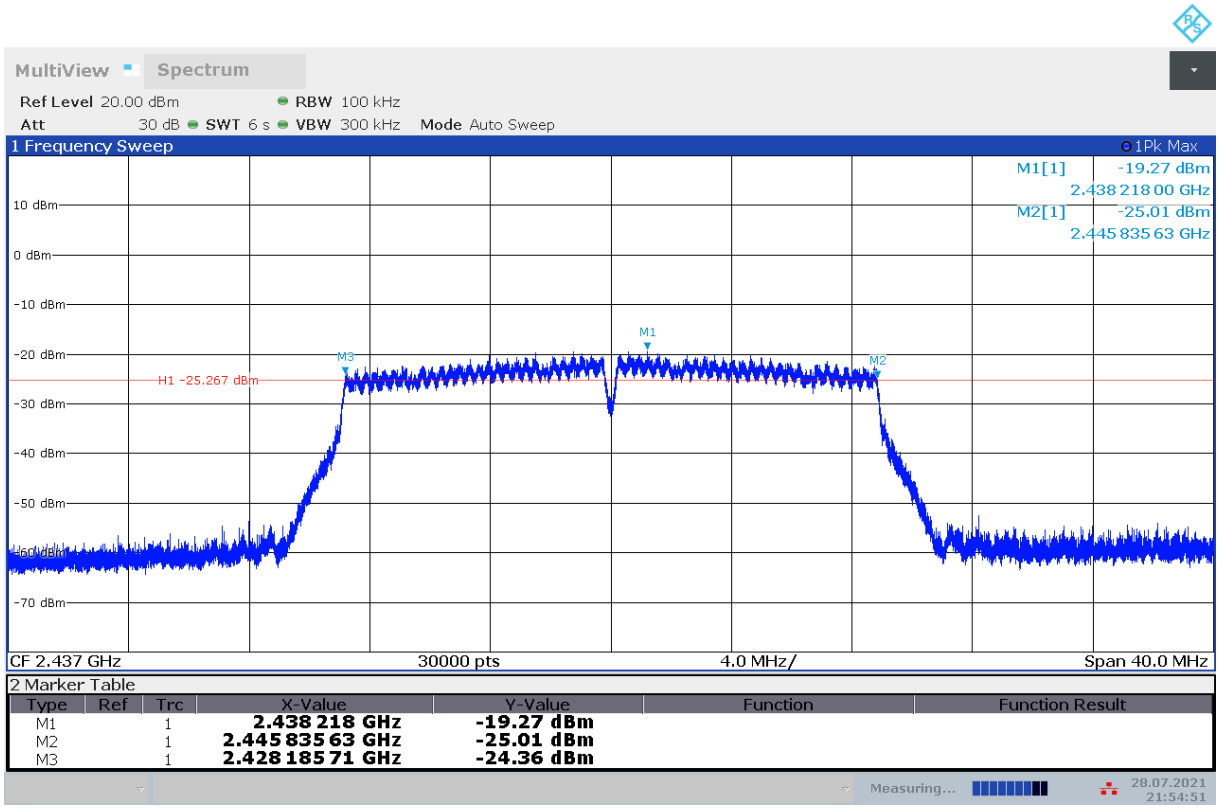


Fig.A.4.8 Occupied 6dB Bandwidth (802.11n-HT20, Ch 6)

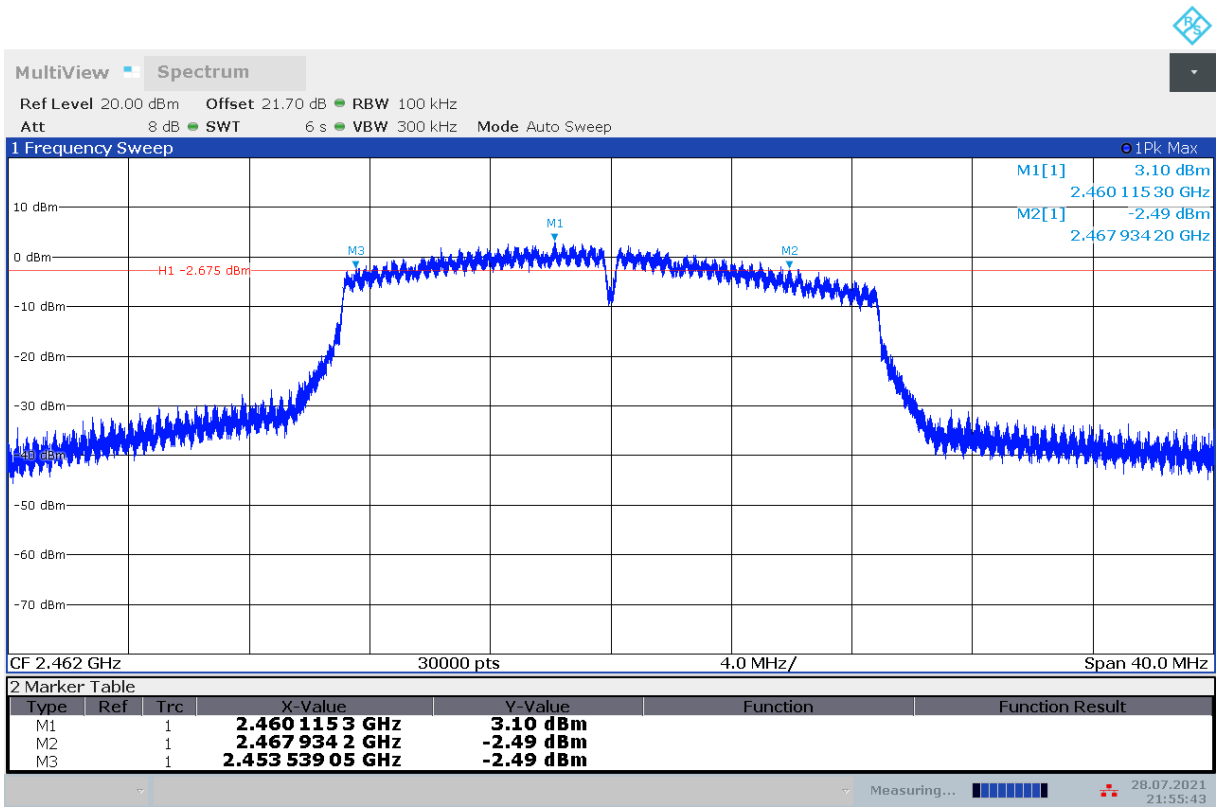


Fig.A.4.9 Occupied 6dB Bandwidth (802.11n-HT20, Ch 11)

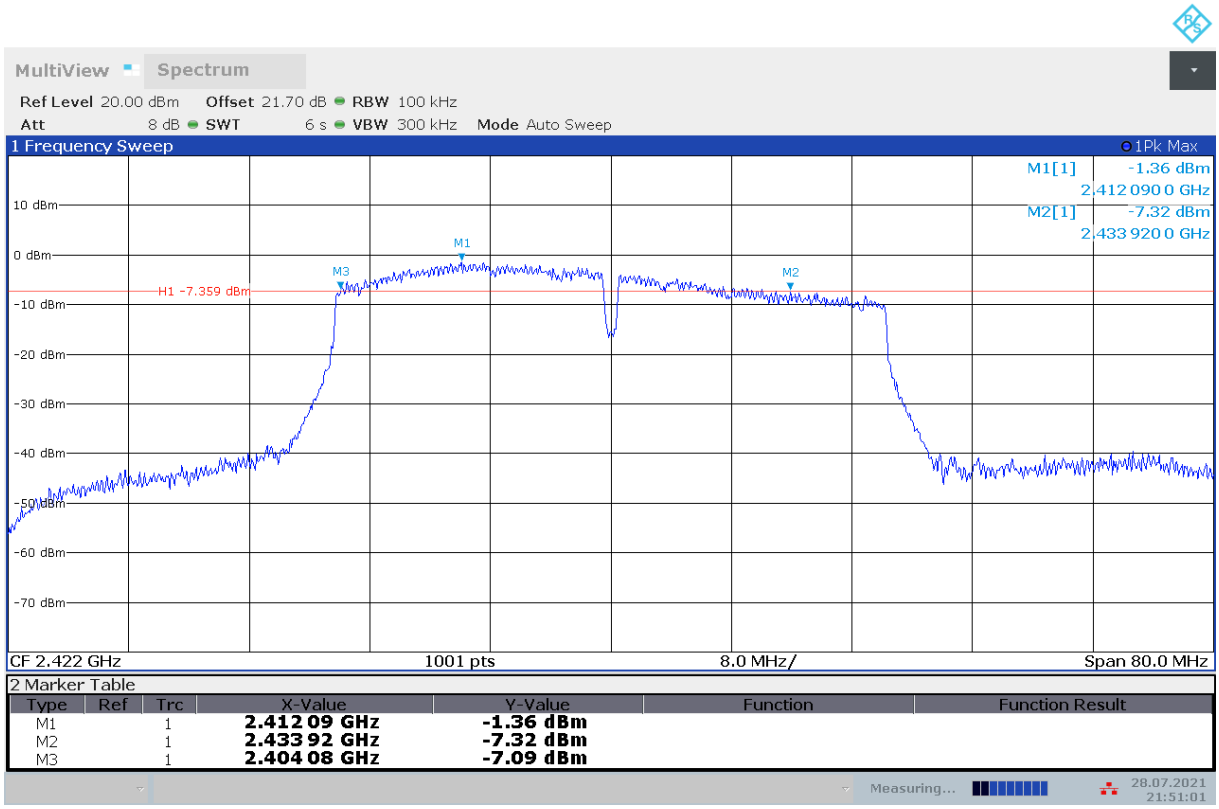


Fig.A.4.10 Occupied 6dB Bandwidth (802.11n-40MHz, Ch 3)

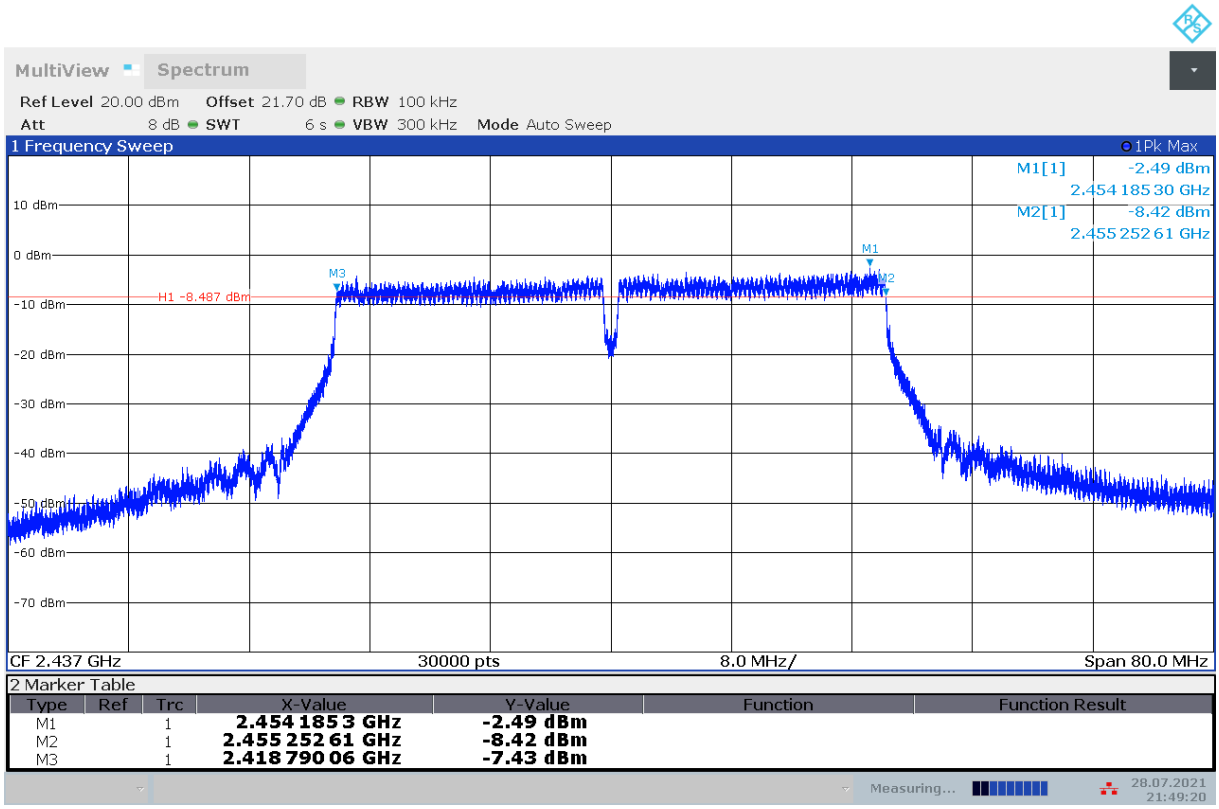


Fig.A.4.11 Occupied 6dB Bandwidth (802.11n-HT40, Ch 6)

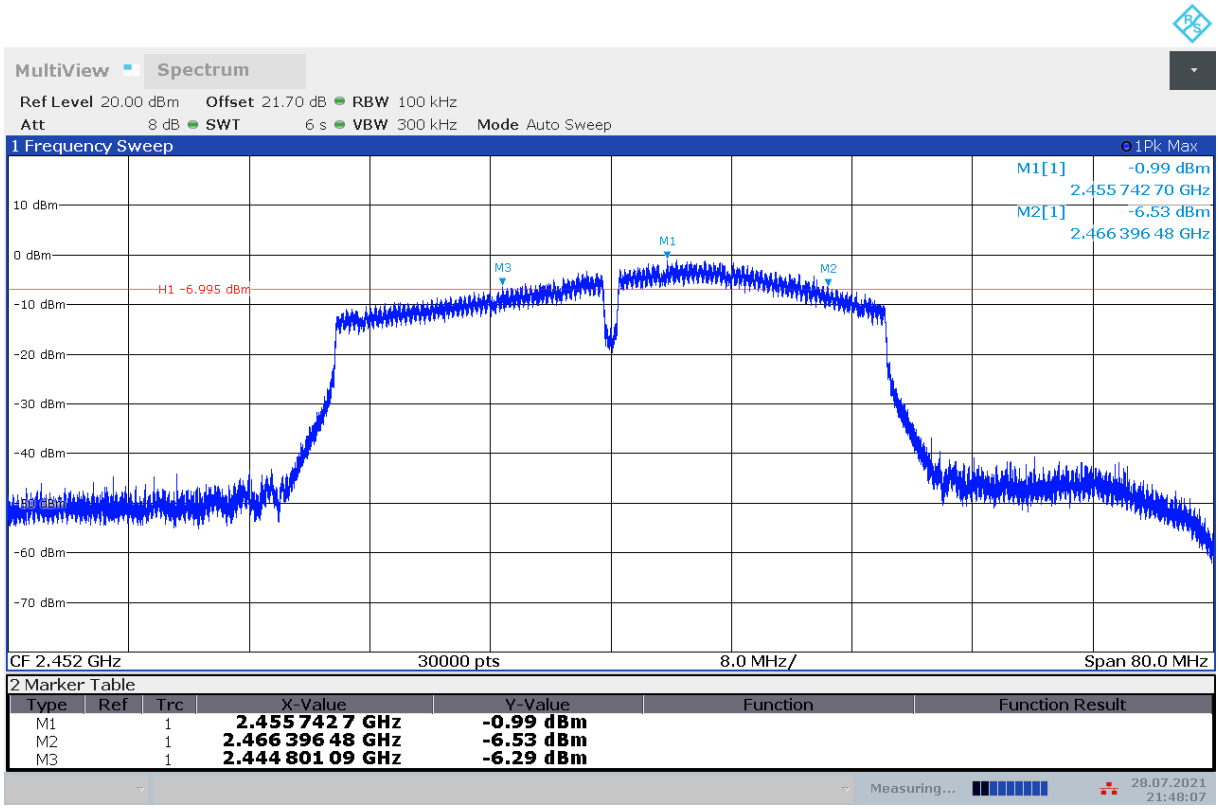


Fig.A.4.12 Occupied 6dB Bandwidth (802.11n-HT40, Ch 9)

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: 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**

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:

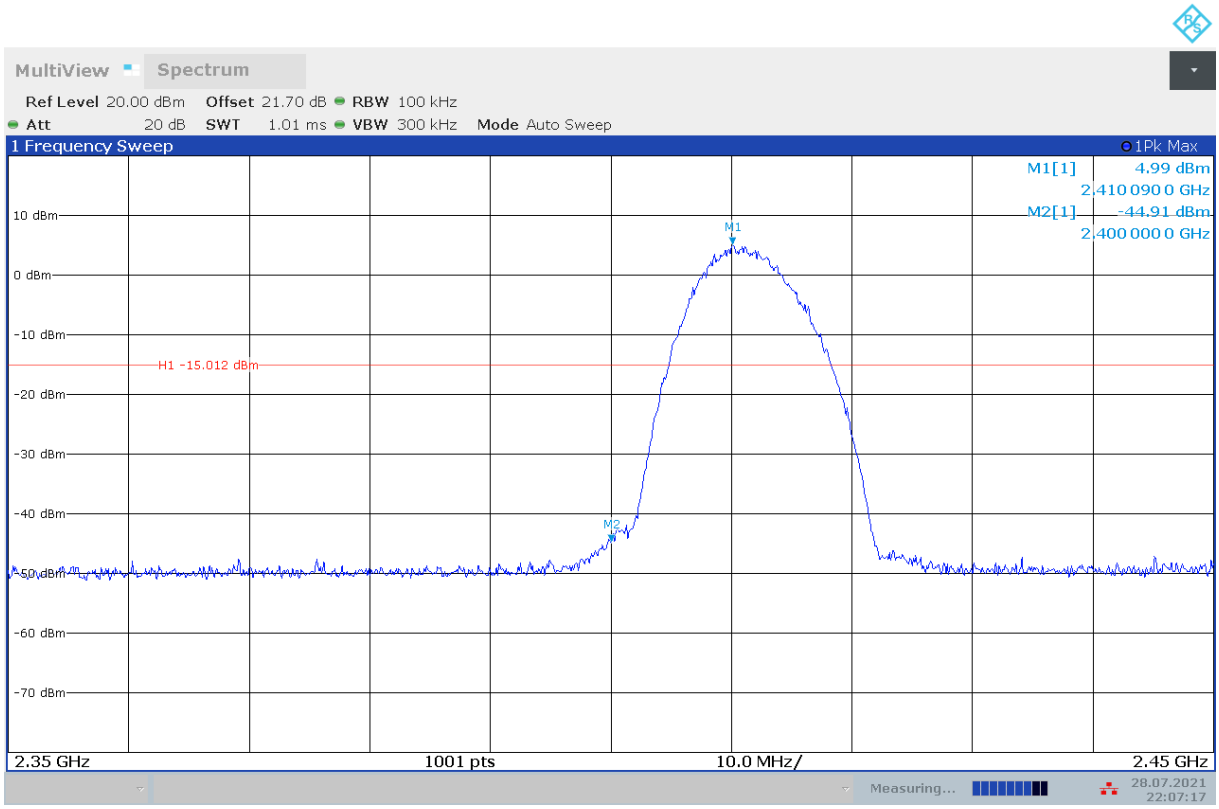


Fig.A.5.1 Band Edges (802.11b, Ch 1)

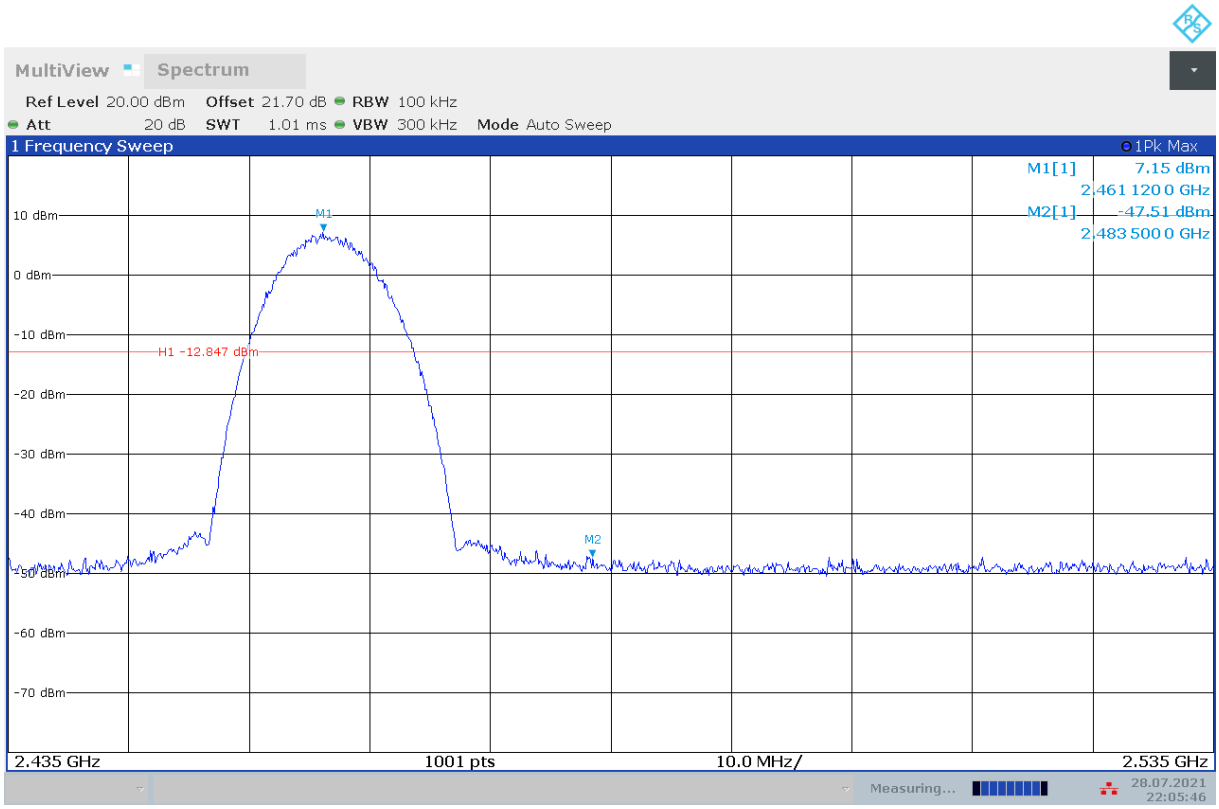


Fig.A.5.2 Band Edges (802.11b, Ch 11)

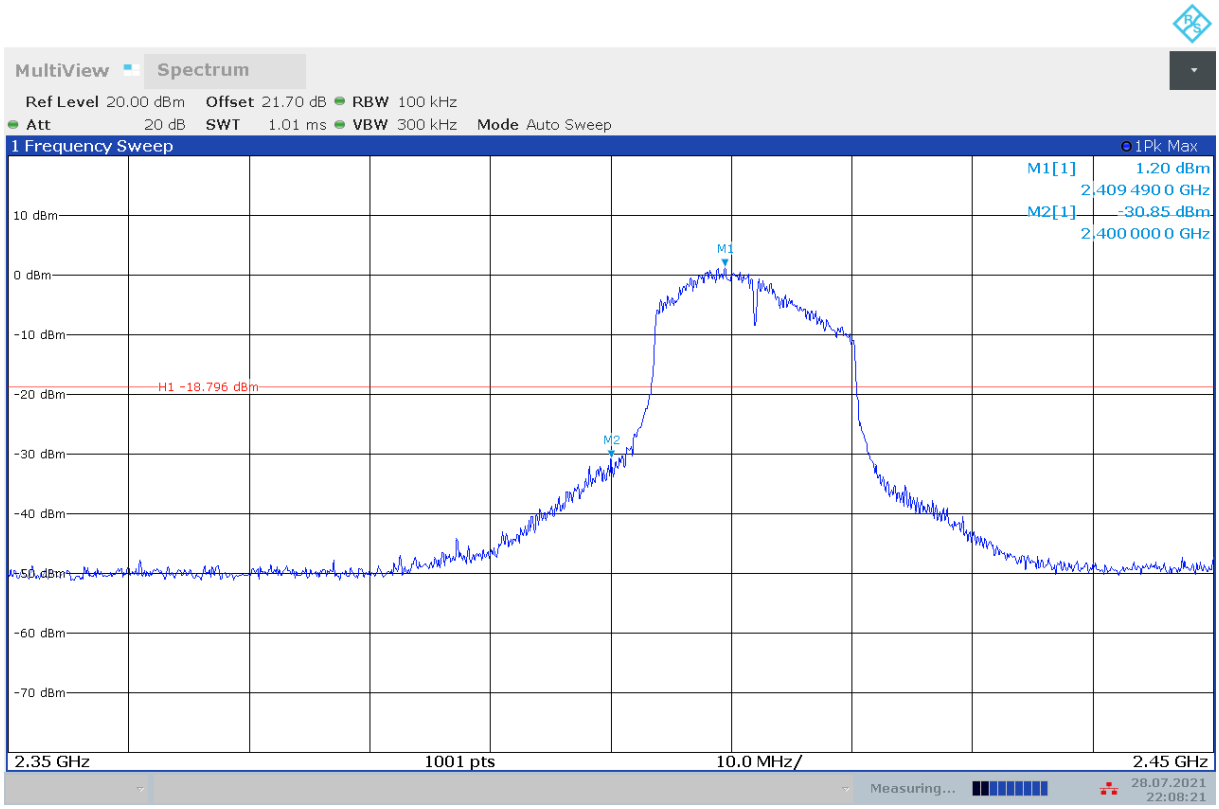


Fig.A.5.3 Band Edges (802.11g, Ch 1)

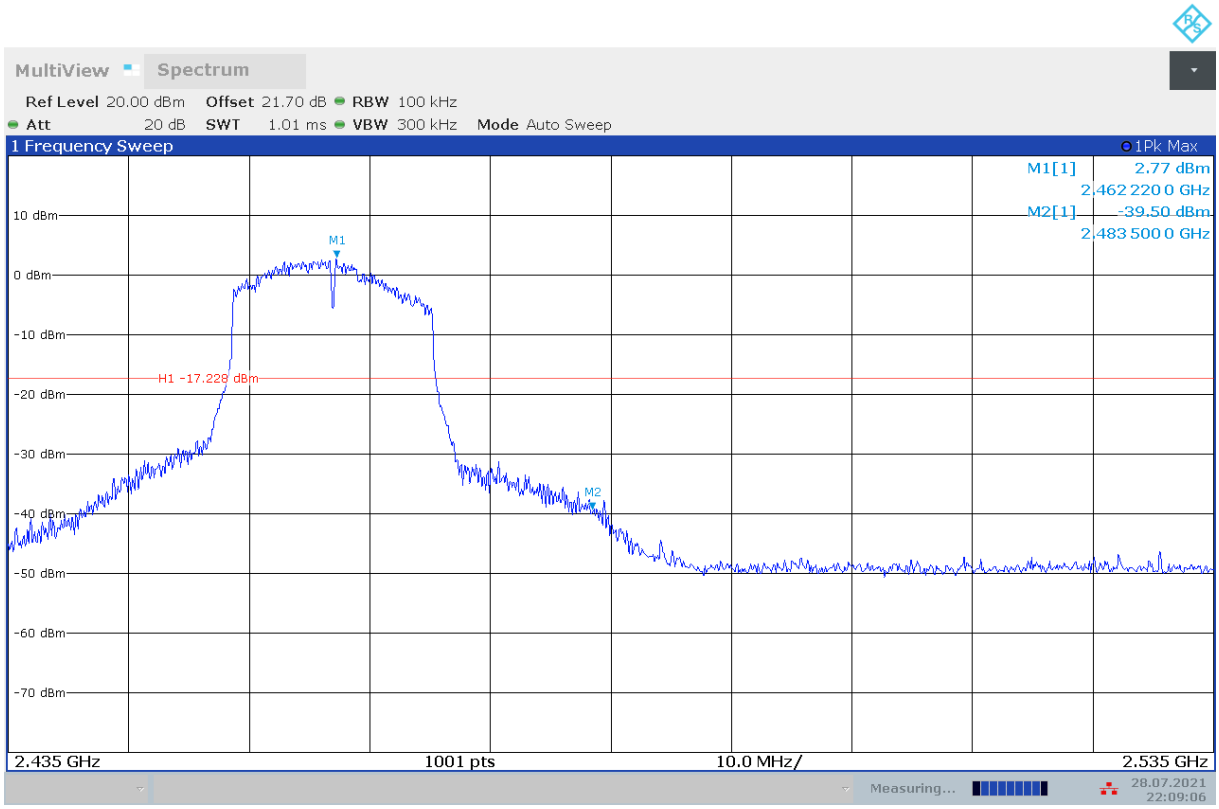


Fig.A.5.4 Band Edges (802.11g, Ch 11)

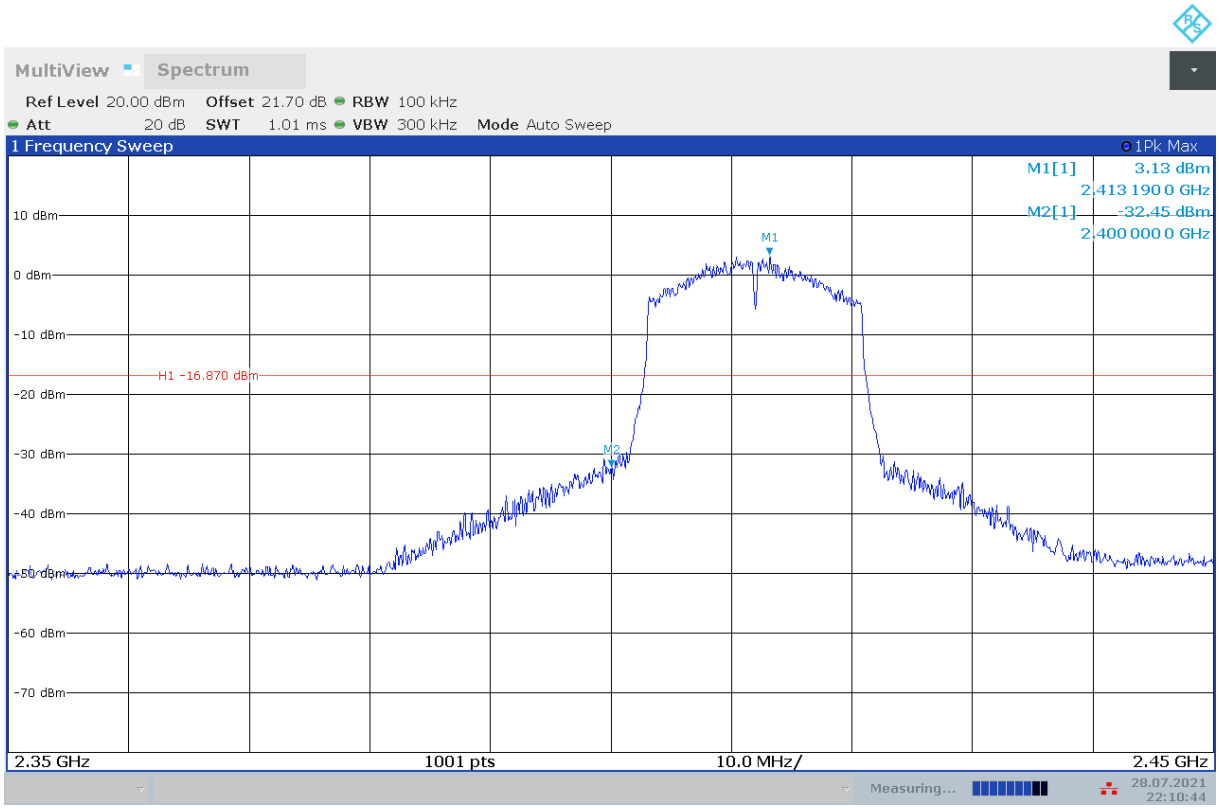


Fig.A.5.5 Band Edges (802.11n-HT20, Ch 1)

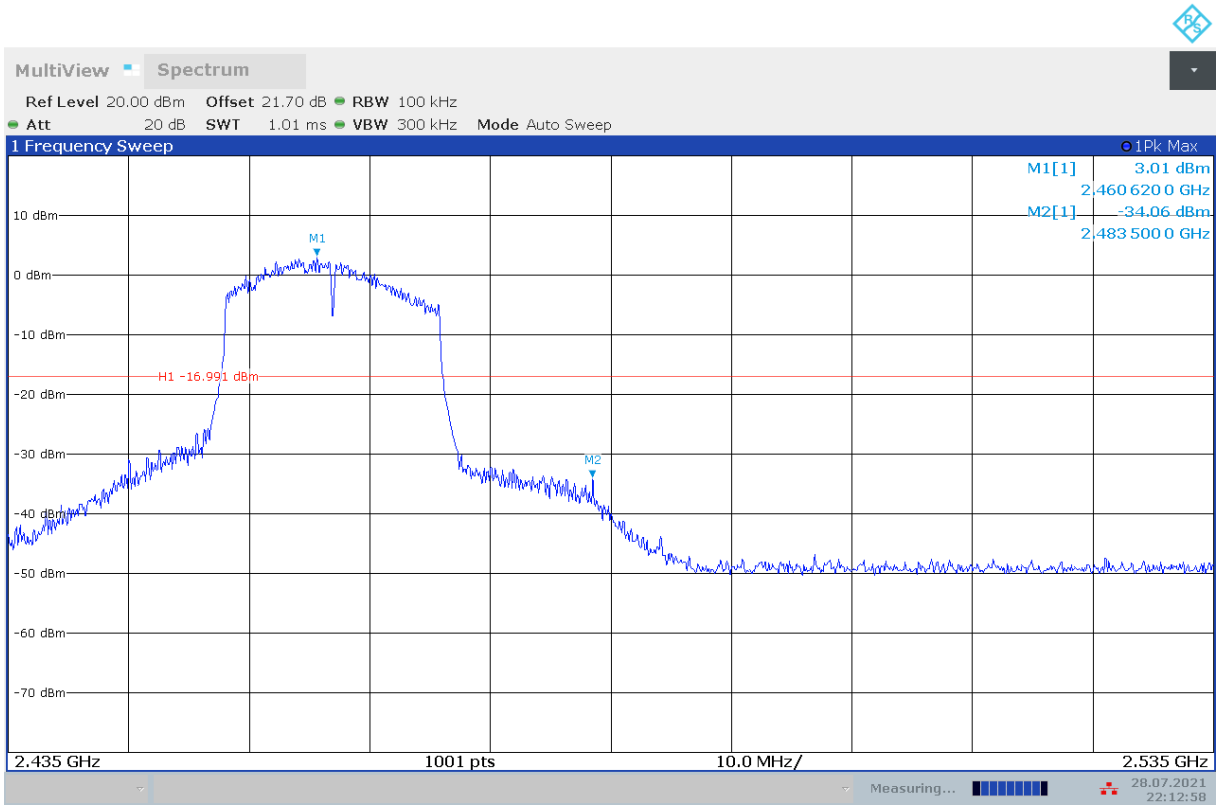


Fig.A.5.6 Band Edges (802.11n-HT20, Ch 11)

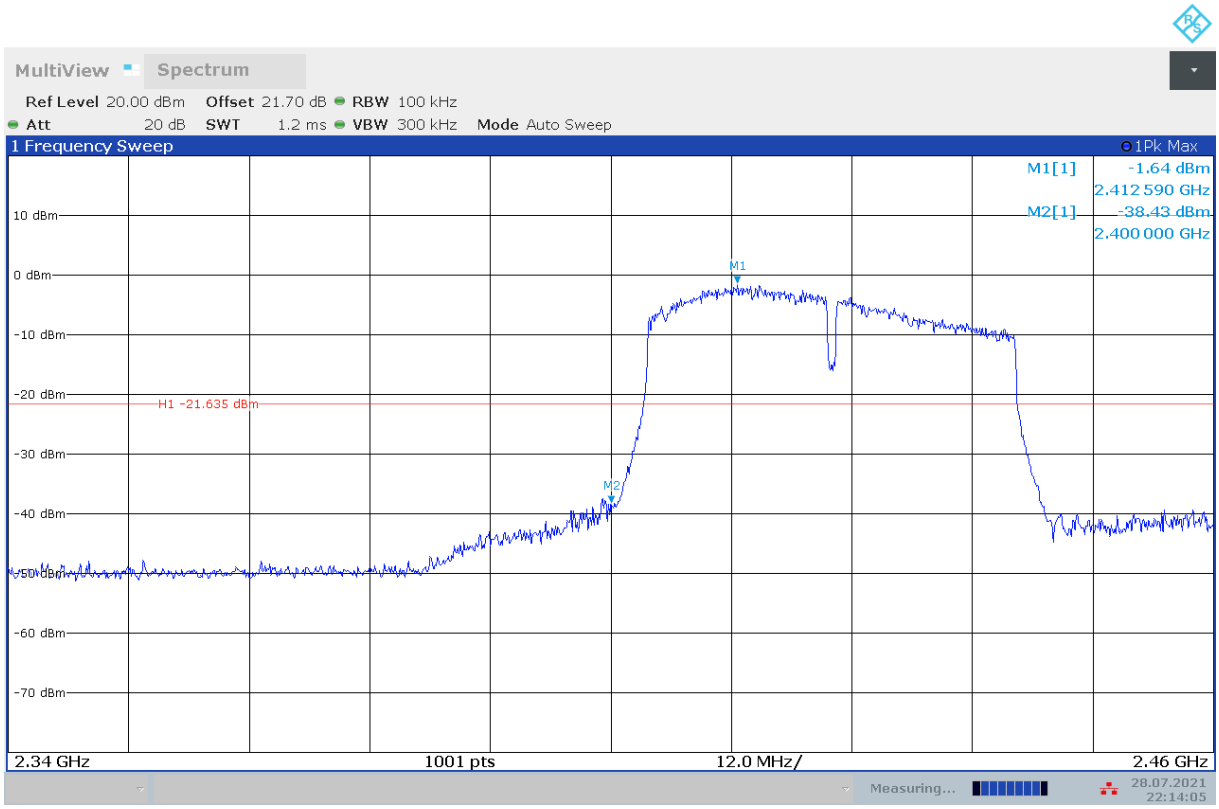


Fig.A.5.7 Band Edges (802.11n-HT40, Ch 3)

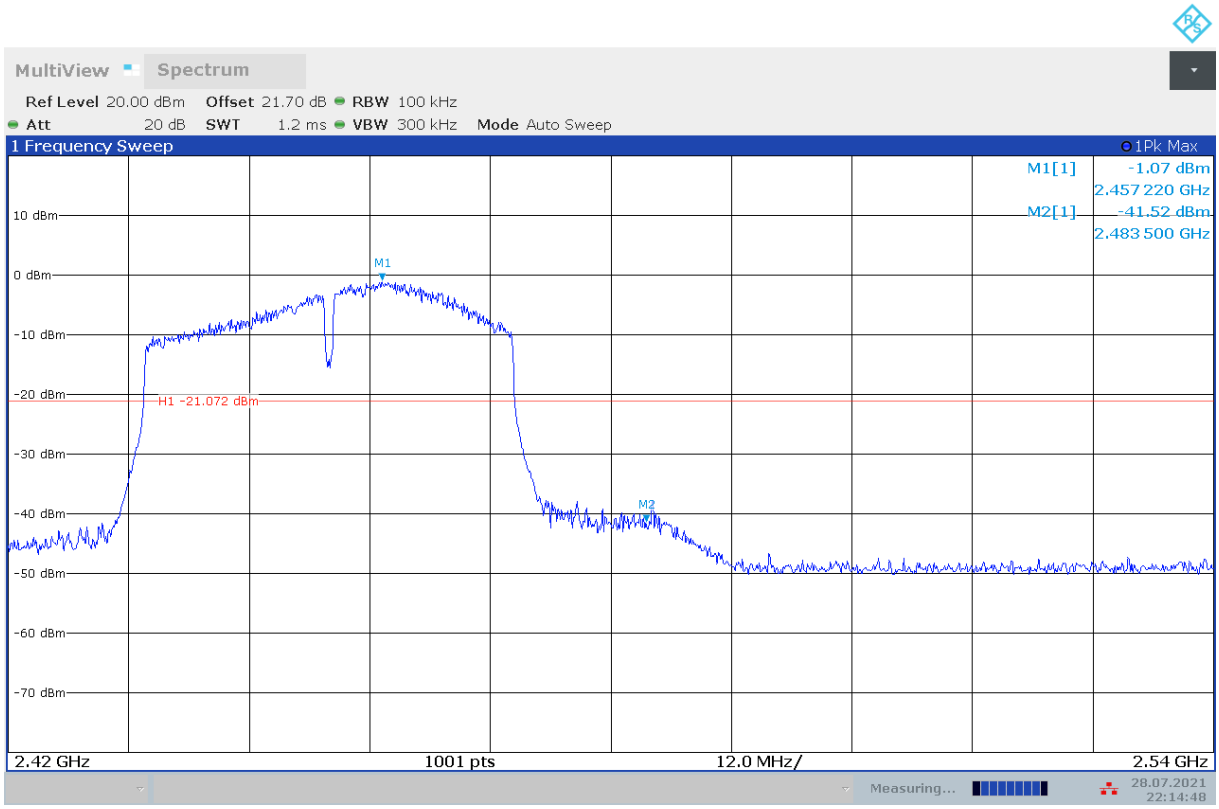


Fig.A.5.8 Band Edges (802.11n-HT40, Ch 9)

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: UT17a

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 ~ 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

802.11g mode

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

802.11n-HT20 mode

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 ~ 26GHz	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

802.11n-HT40 mode

MODE	Channel	Frequency Range	Test Results	Conclusion
802.11n (HT40)	3	2.422 GHz	Fig.A.6.1.19	P
		30 MHz ~ 26 GHz	Fig.A.6.1.20	P
	6	2.437 GHz	Fig.A.6.1.21	P
		30 MHz ~ 26 GHz	Fig.A.6.1.22	P
	9	2.452 GHz	Fig.A.6.1.23	P
		30 MHz ~ 26 GHz	Fig.A.6.1.24	P

Conclusion: Pass

Test graphs as below:

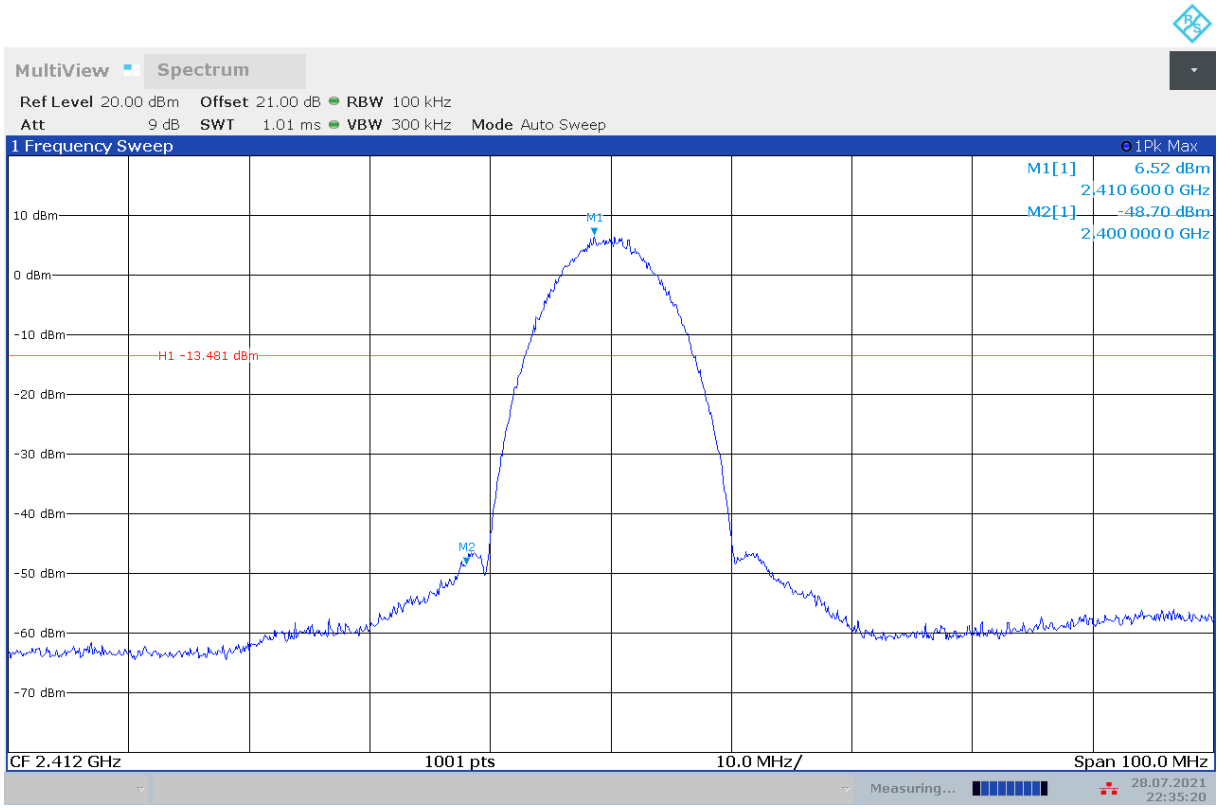


Fig.A.6.1.1 Transmitter Spurious Emission - Conducted (802.11b, Ch1, Center Frequency)

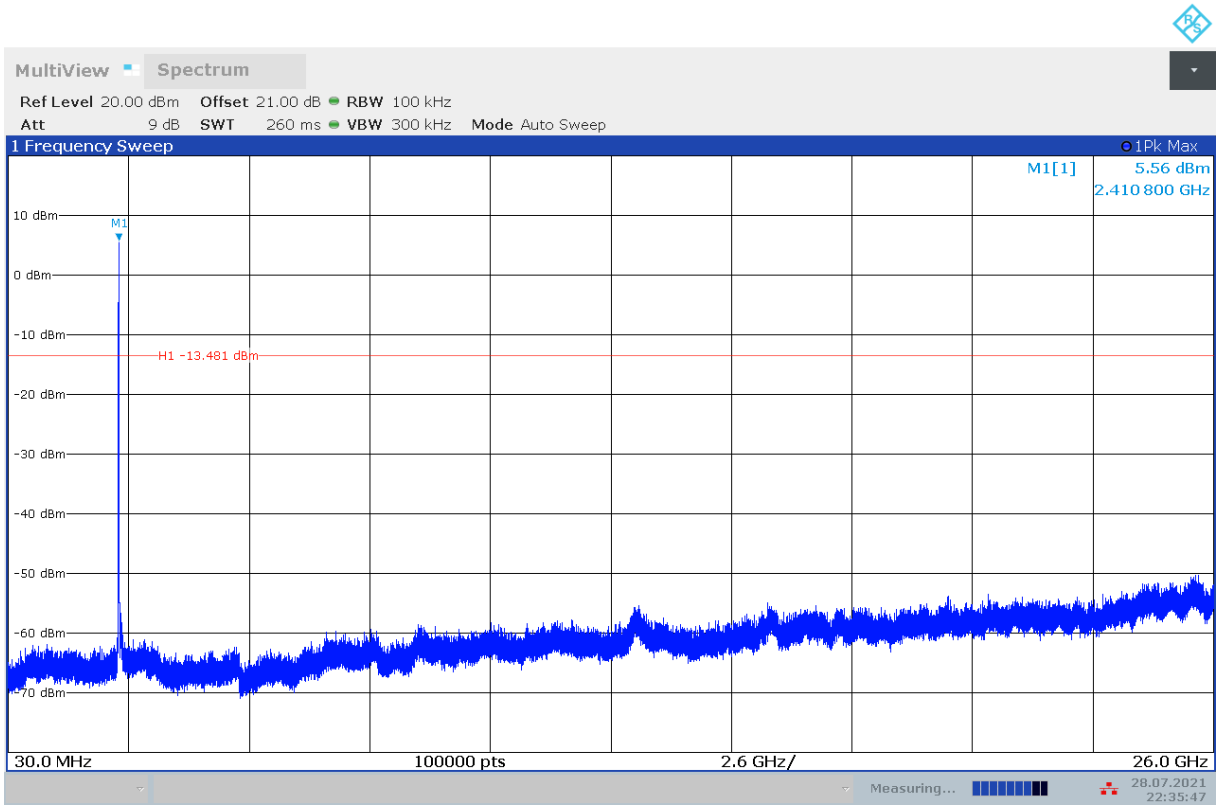


Fig.A.6.1.2 Transmitter Spurious Emission - Conducted (802.11b, Ch1, 30 MHz-26

GHz)

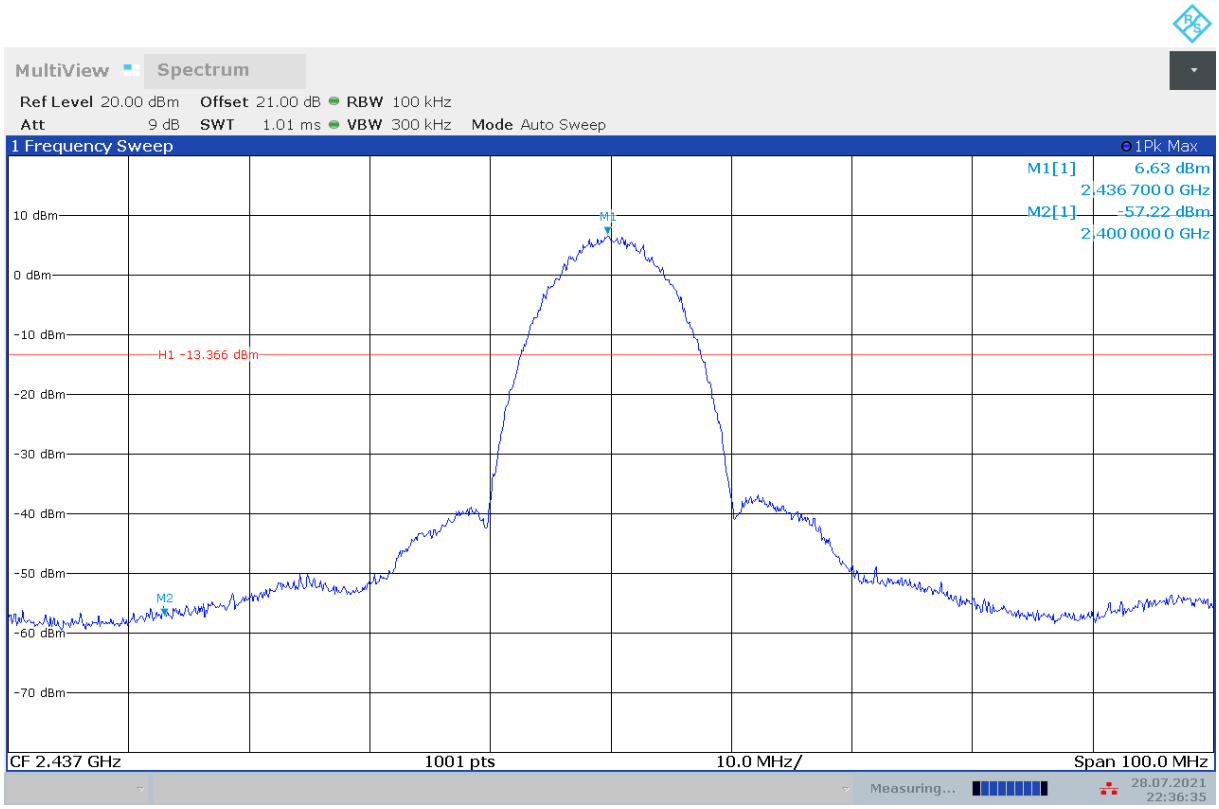


Fig.A.6.1.3 Transmitter Spurious Emission - Conducted (802.11b, Ch6, Center Frequency)

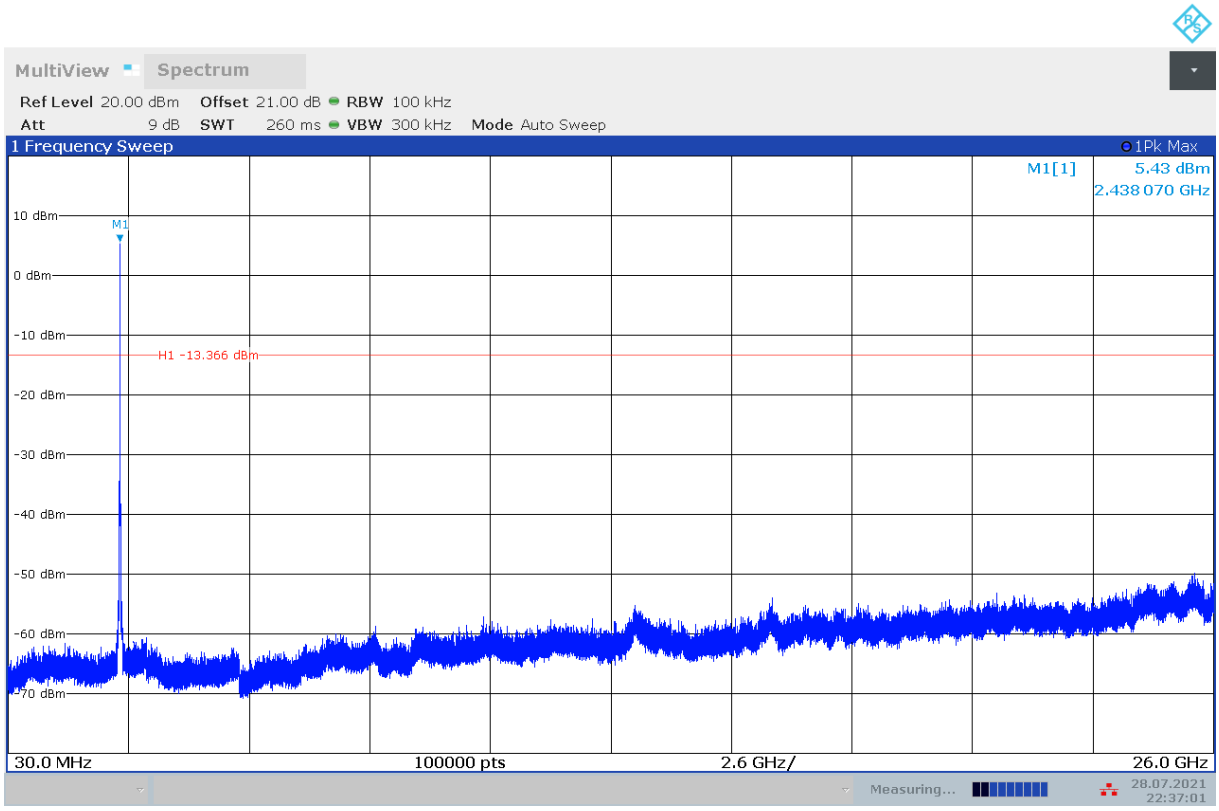


Fig.A.6.1.4 Transmitter Spurious Emission - Conducted (802.11b, Ch6, 30 MHz-26 GHz)

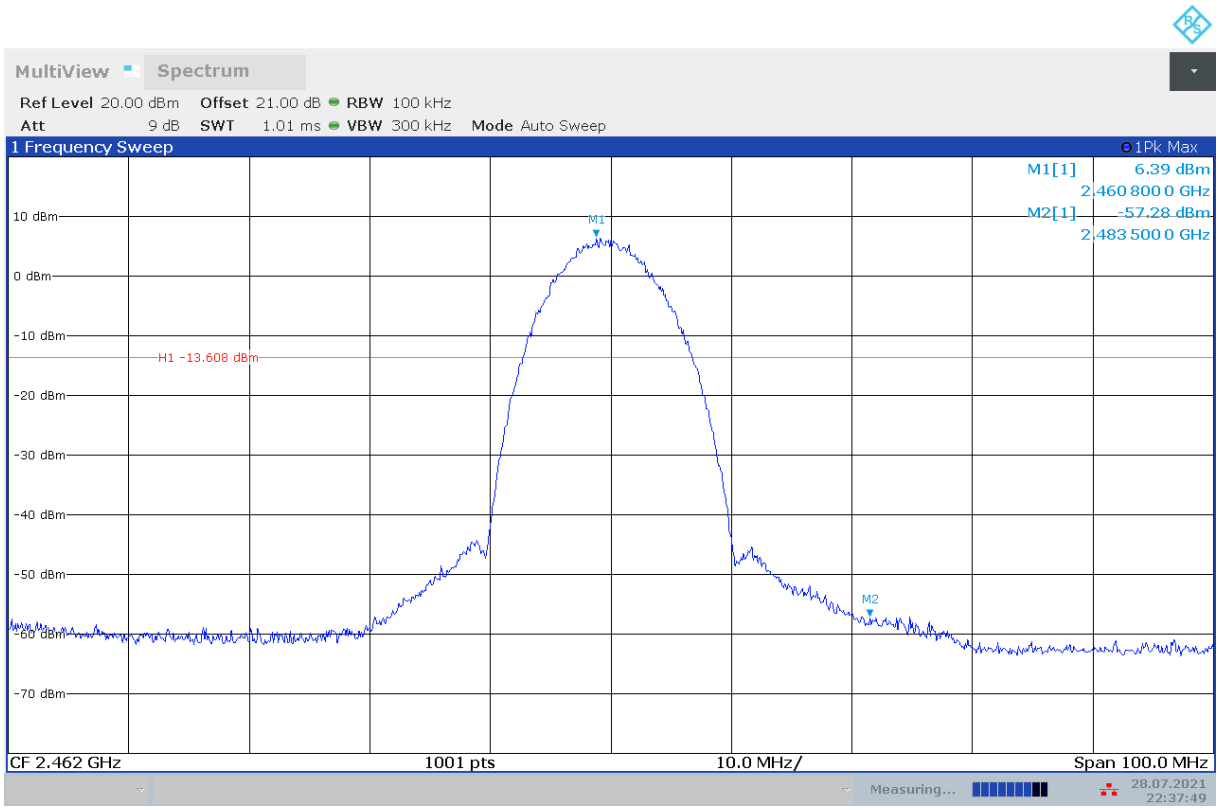


Fig.A.6.1.5 Transmitter Spurious Emission - Conducted (802.11b, Ch11, Center Frequency)

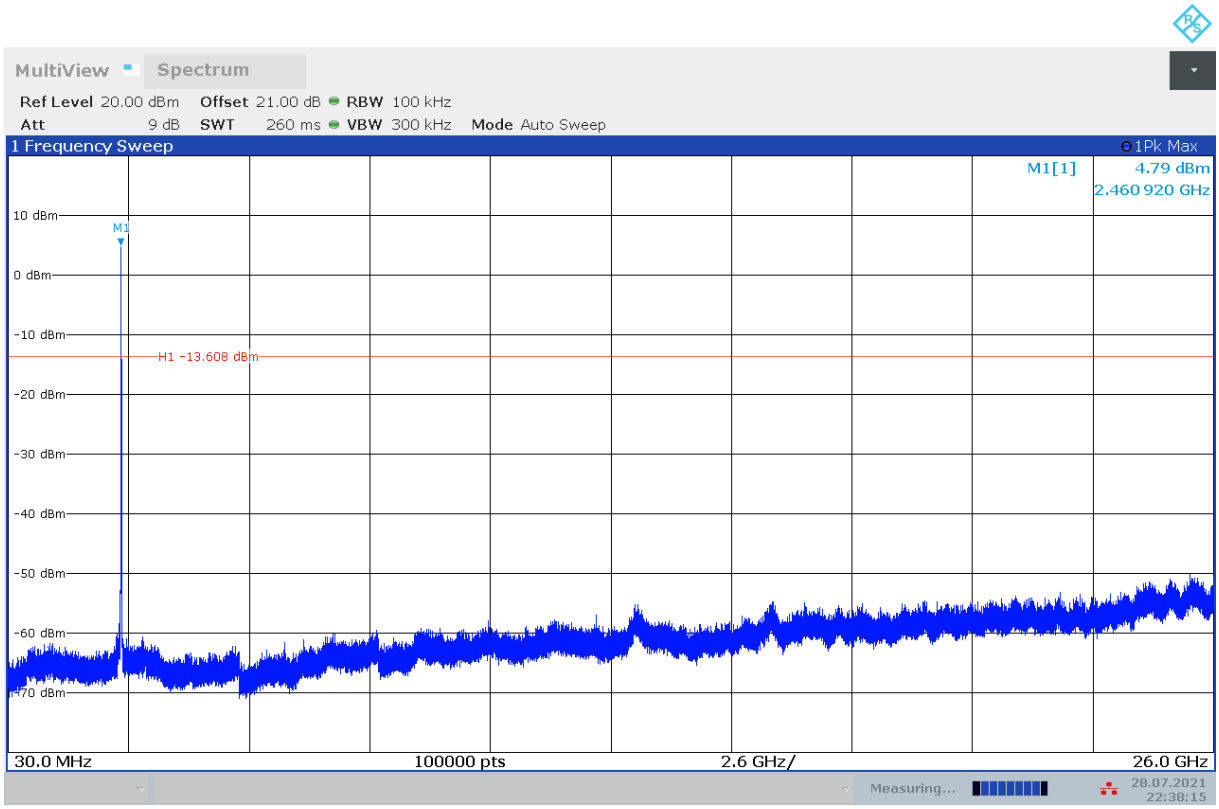


Fig.A.6.1.6 Transmitter Spurious Emission - Conducted (802.11b, Ch11, 30 MHz-26GHz)

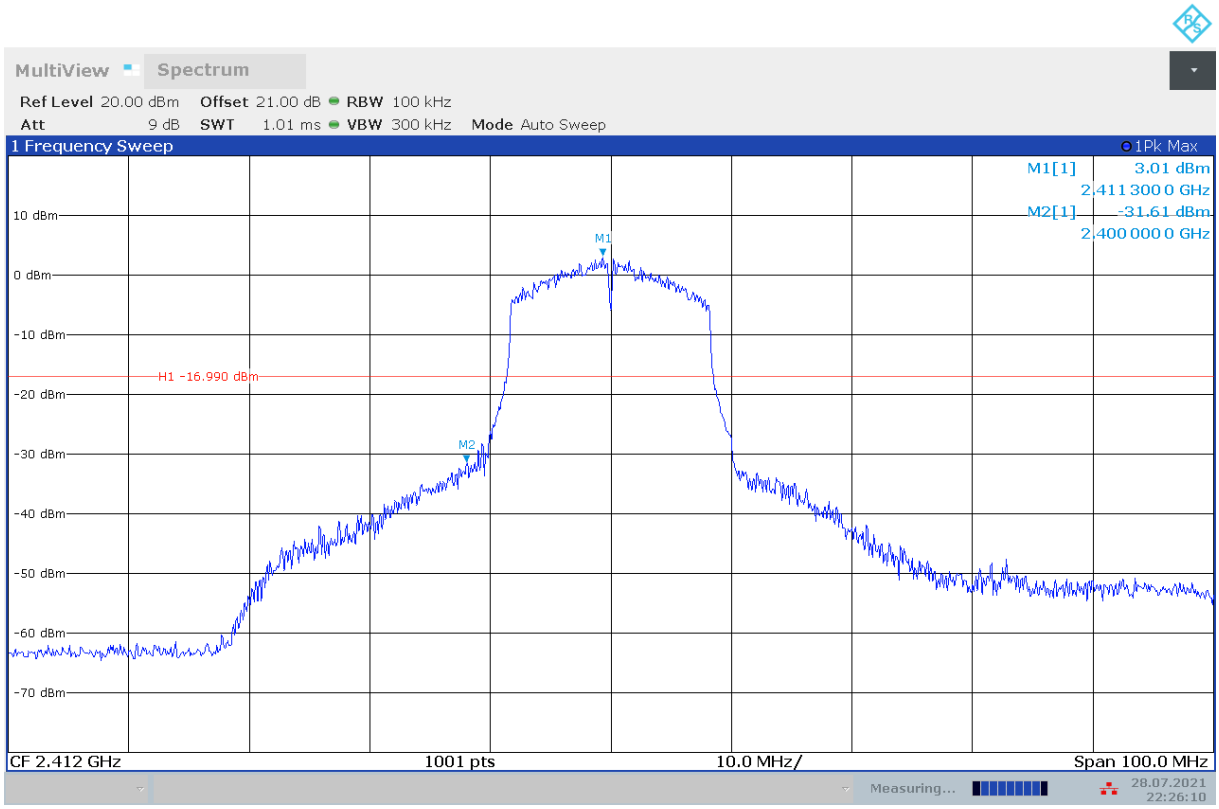


Fig.A.6.1.7 Transmitter Spurious Emission - Conducted (802.11g, Ch1, Center

Frequency)

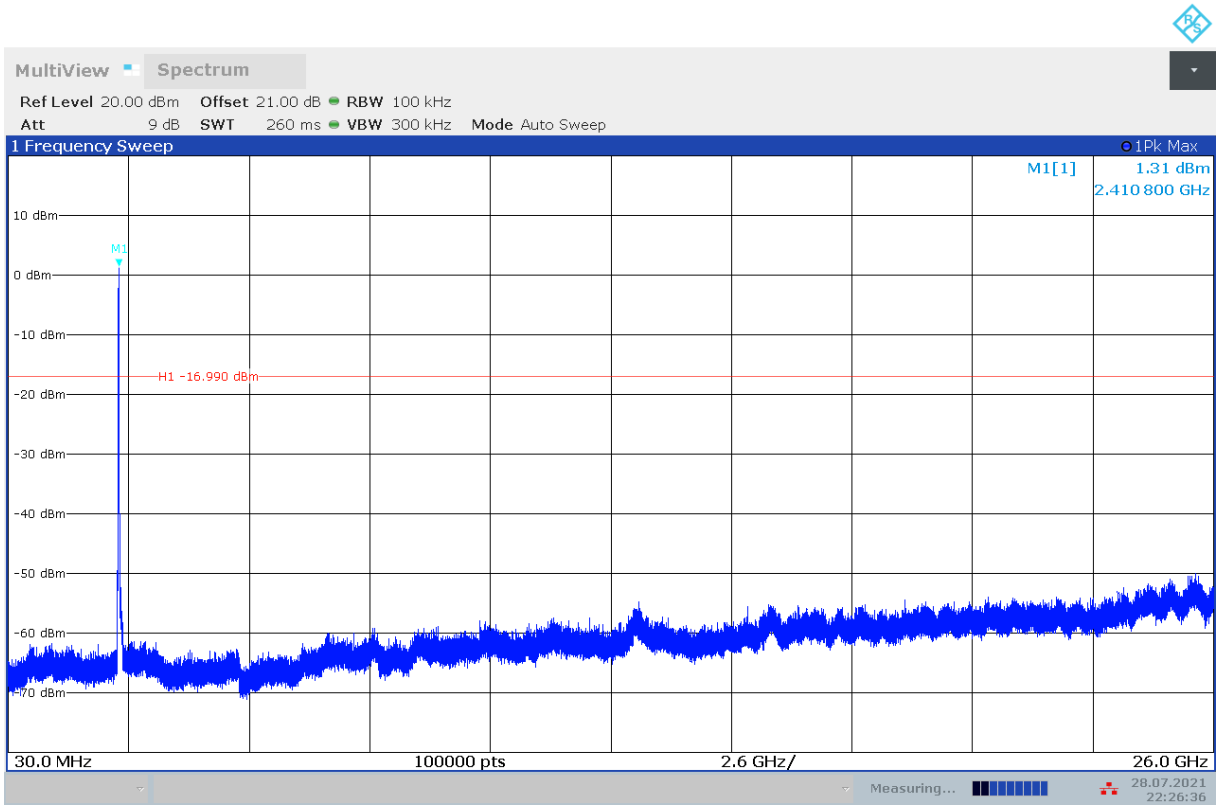


Fig.A.6.1.8 Transmitter Spurious Emission - Conducted (802.11g, Ch1, 30 MHz-26 GHz)

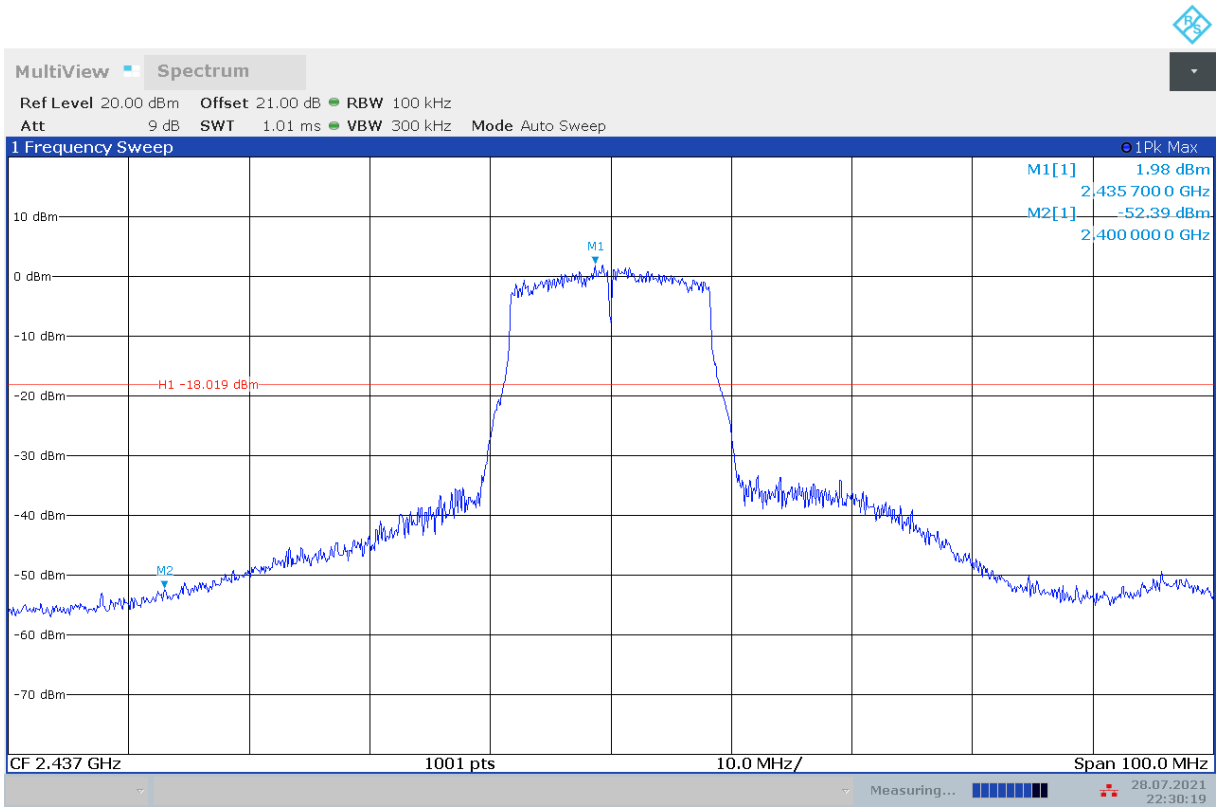


Fig.A.6.1.9 Transmitter Spurious Emission - Conducted (802.11g, Ch6, Center Frequency)

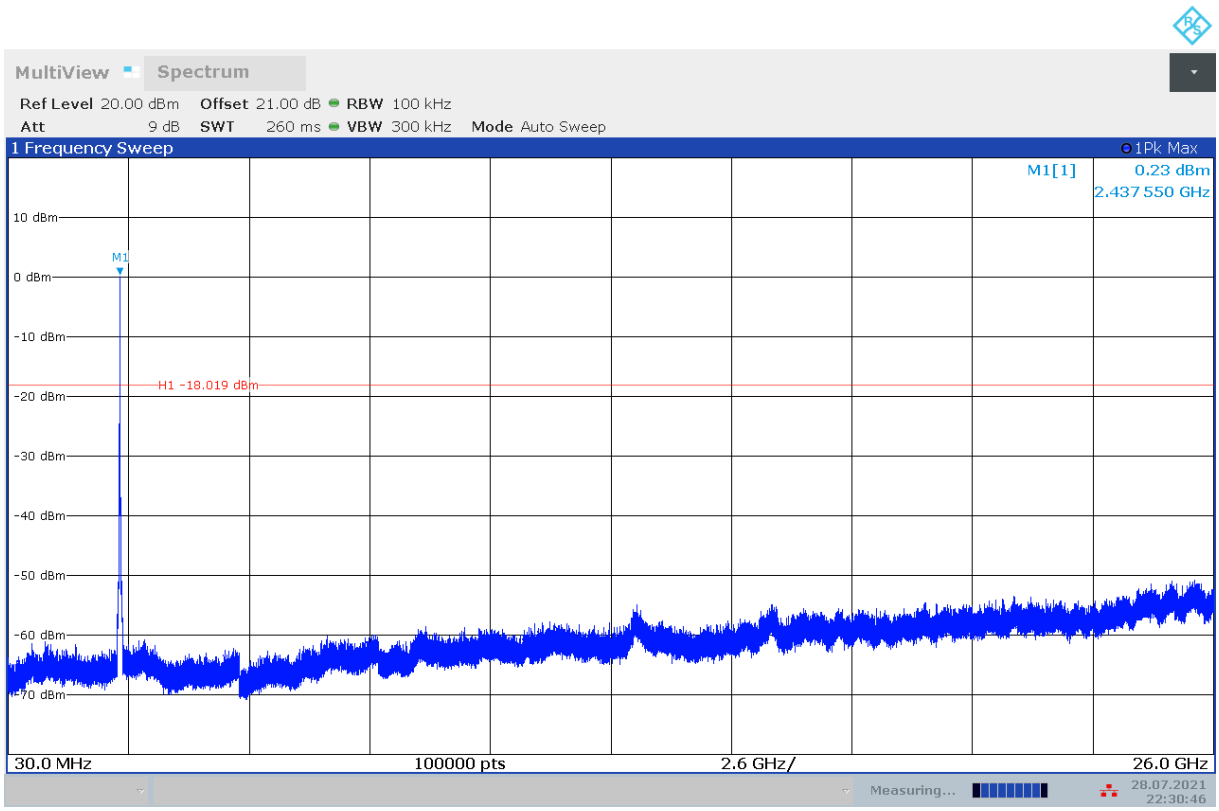


Fig.A.6.1.10 Transmitter Spurious Emission - Conducted (802.11g, Ch6, 30 MHz-26 GHz)

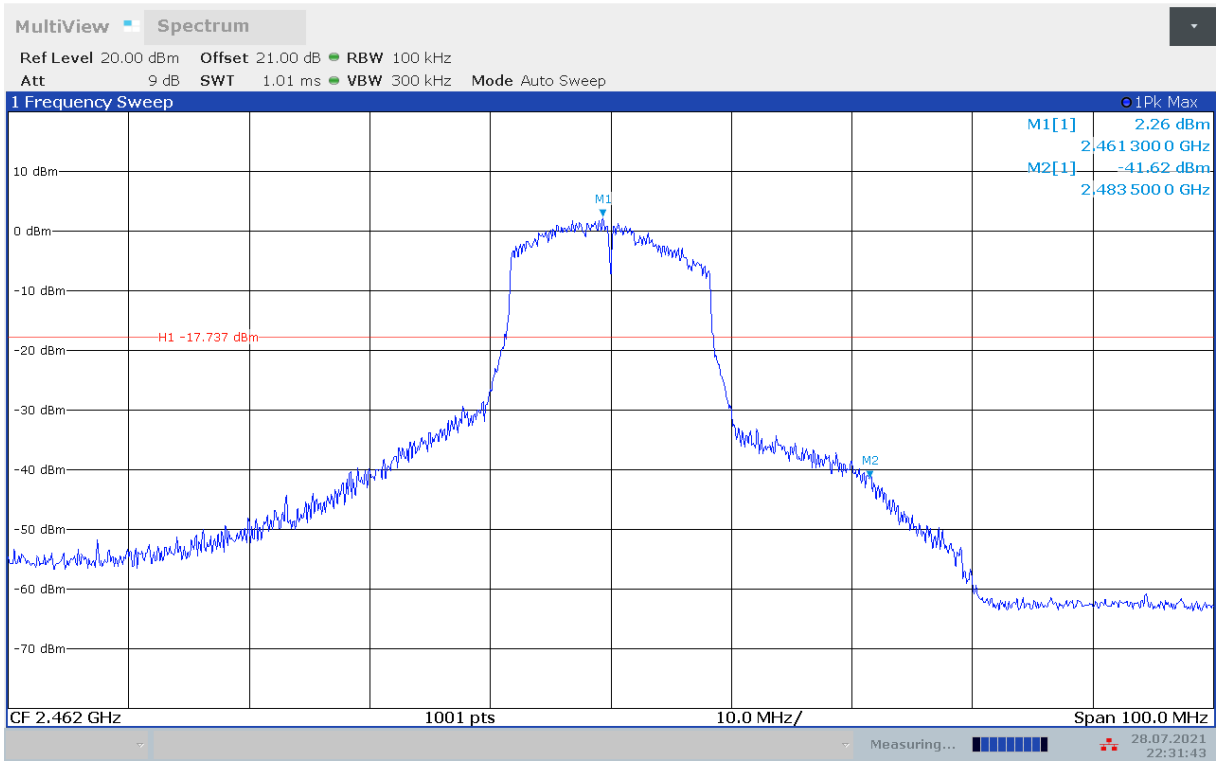


Fig.A.6.1.11 Transmitter Spurious Emission - Conducted (802.11g, Ch11, Center Frequency)

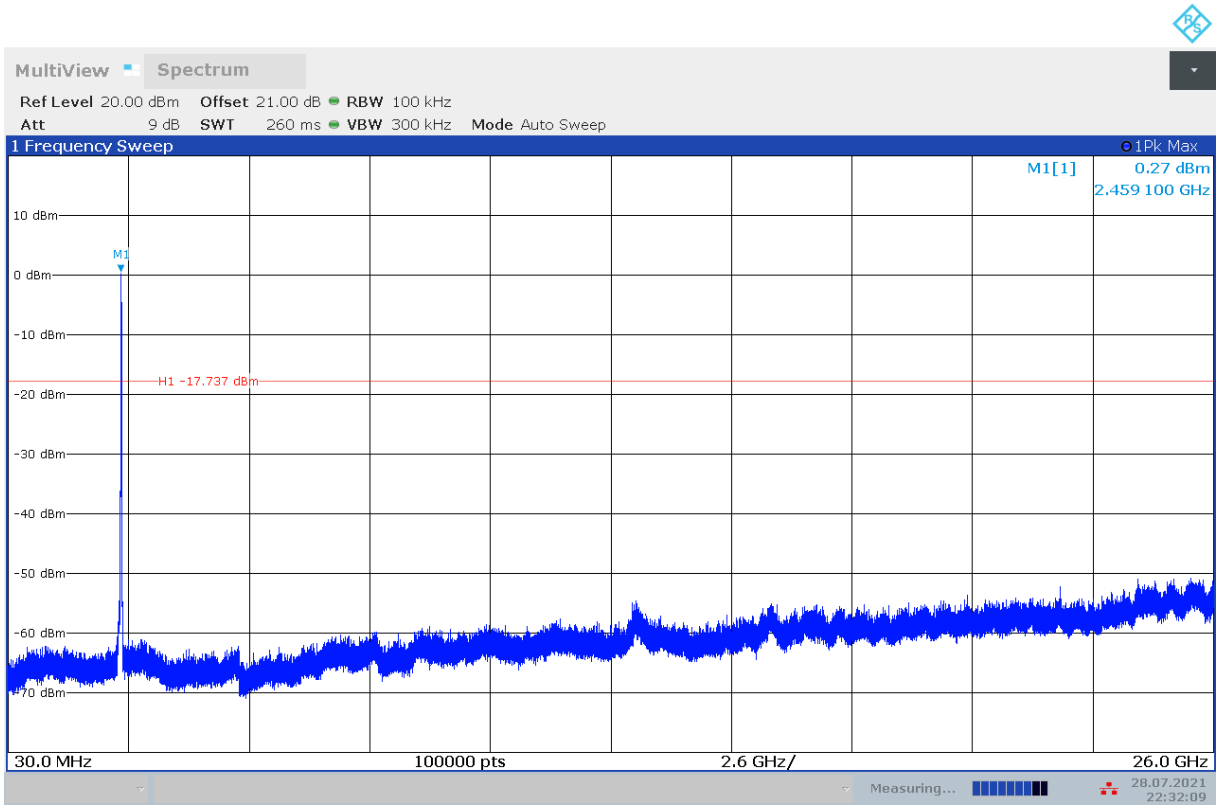


Fig.A.6.1.12 Transmitter Spurious Emission - Conducted (802.11g, Ch11, 30 MHz-

26GHz)

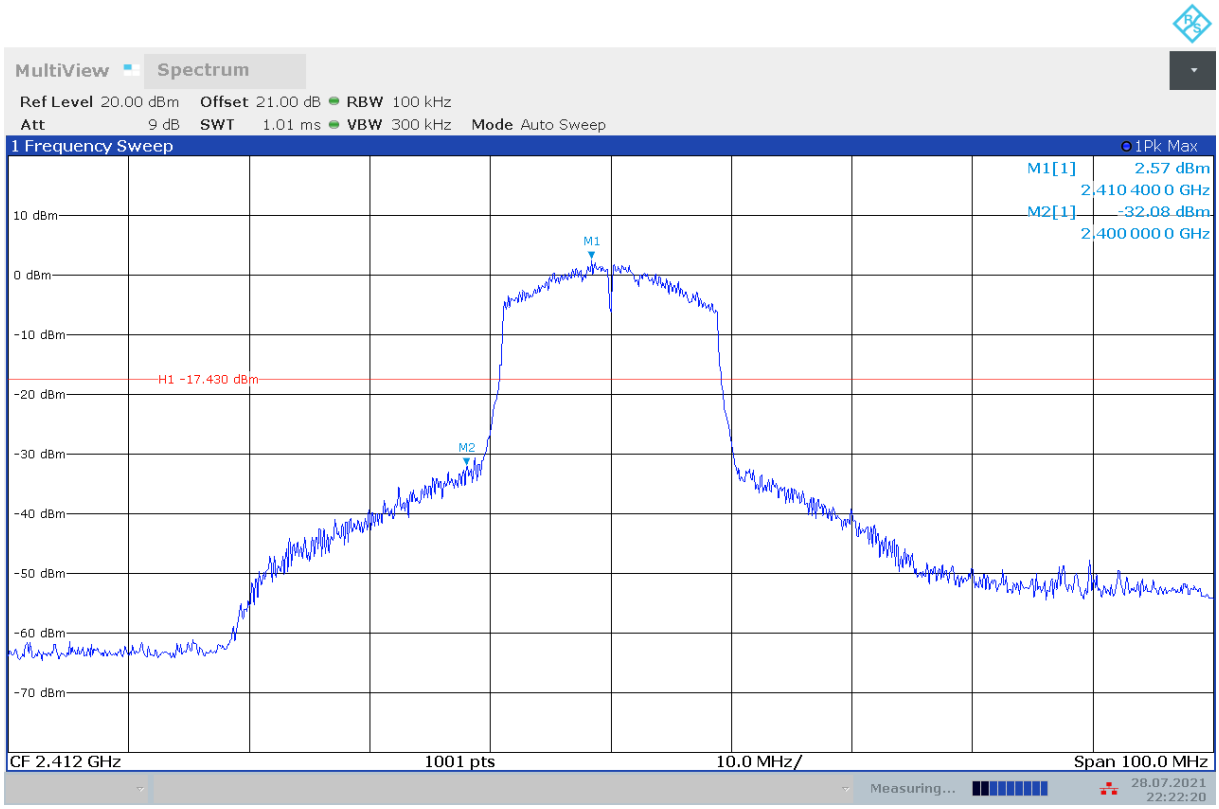


Fig.A.6.1.13 Transmitter Spurious Emission - Conducted (802.11n-HT20, Ch1, Center Frequency)

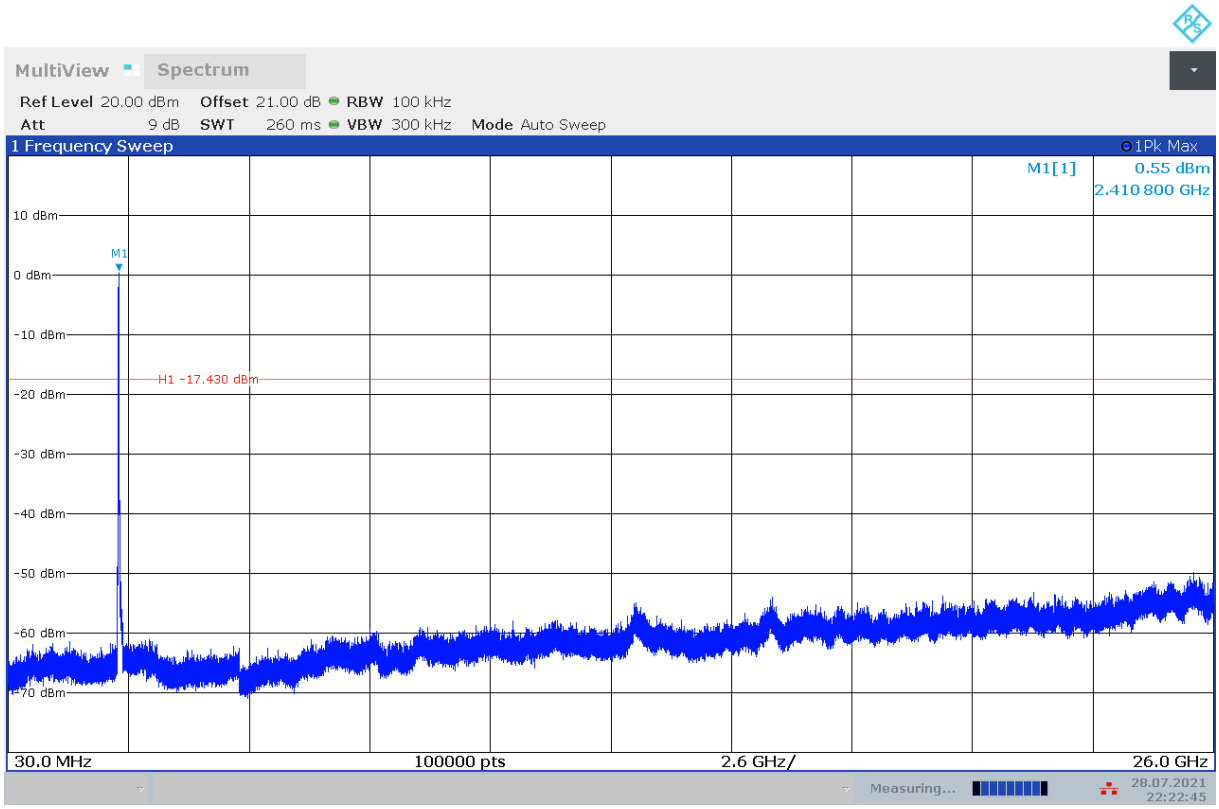


Fig.A.6.1.14 Transmitter Spurious Emission - Conducted (802.11n-HT20, Ch1, 30 MHz-26GHz)

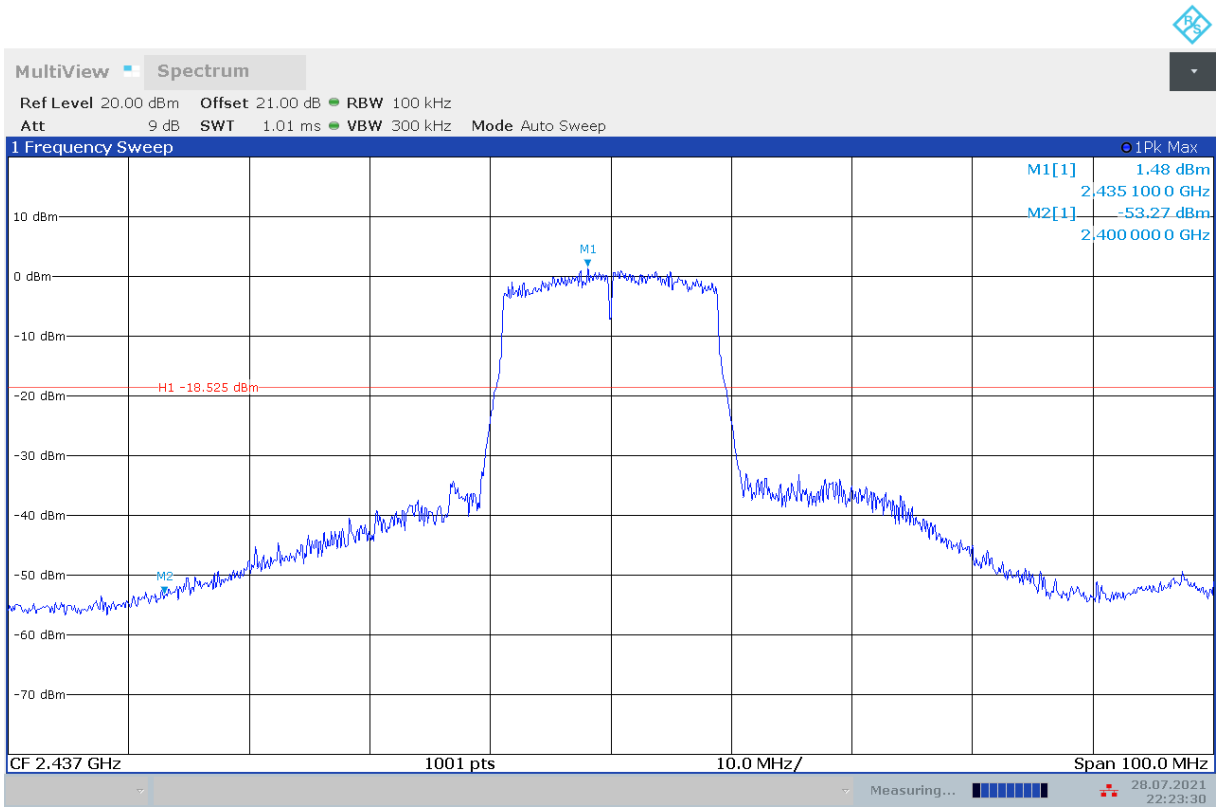


Fig.A.6.1.15 Transmitter Spurious Emission - Conducted (802.11n-HT20, Ch6, Center Frequency)

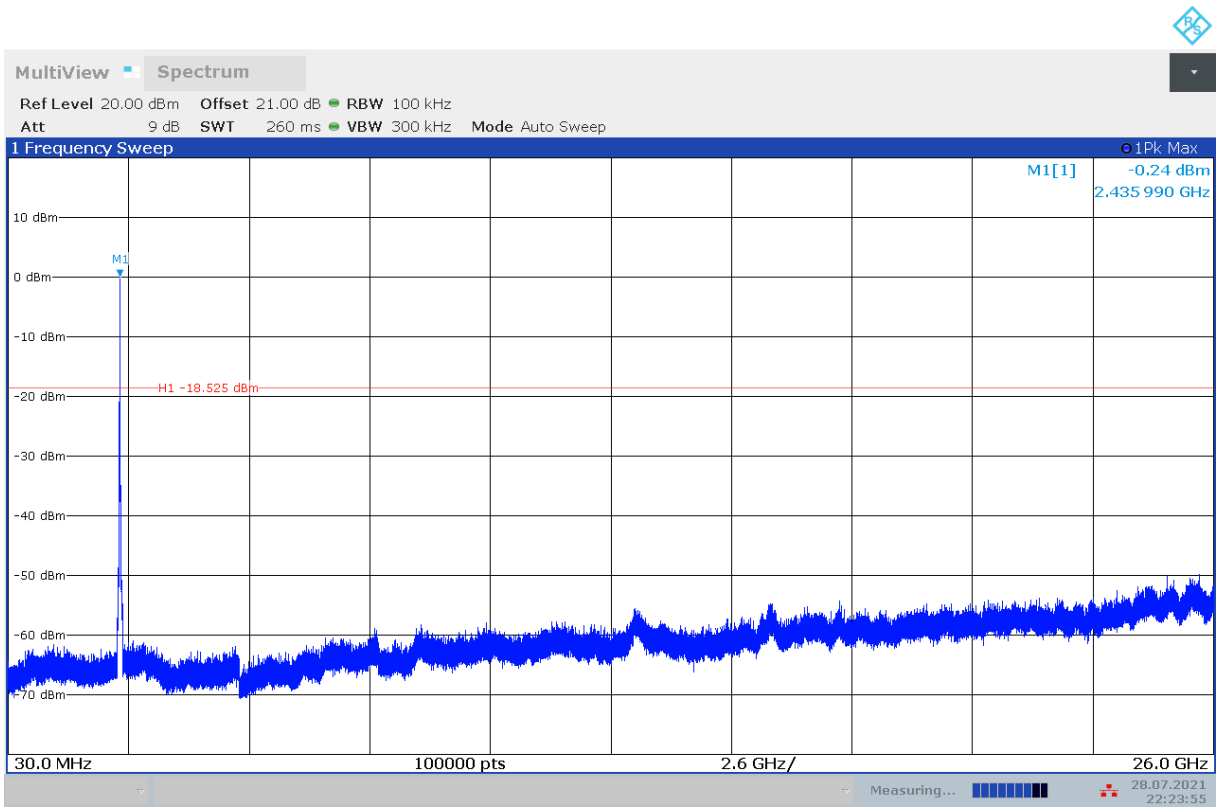


Fig.A.6.1.16 Transmitter Spurious Emission - Conducted (802.11n-HT20, Ch6, 30 MHz-26GHz)

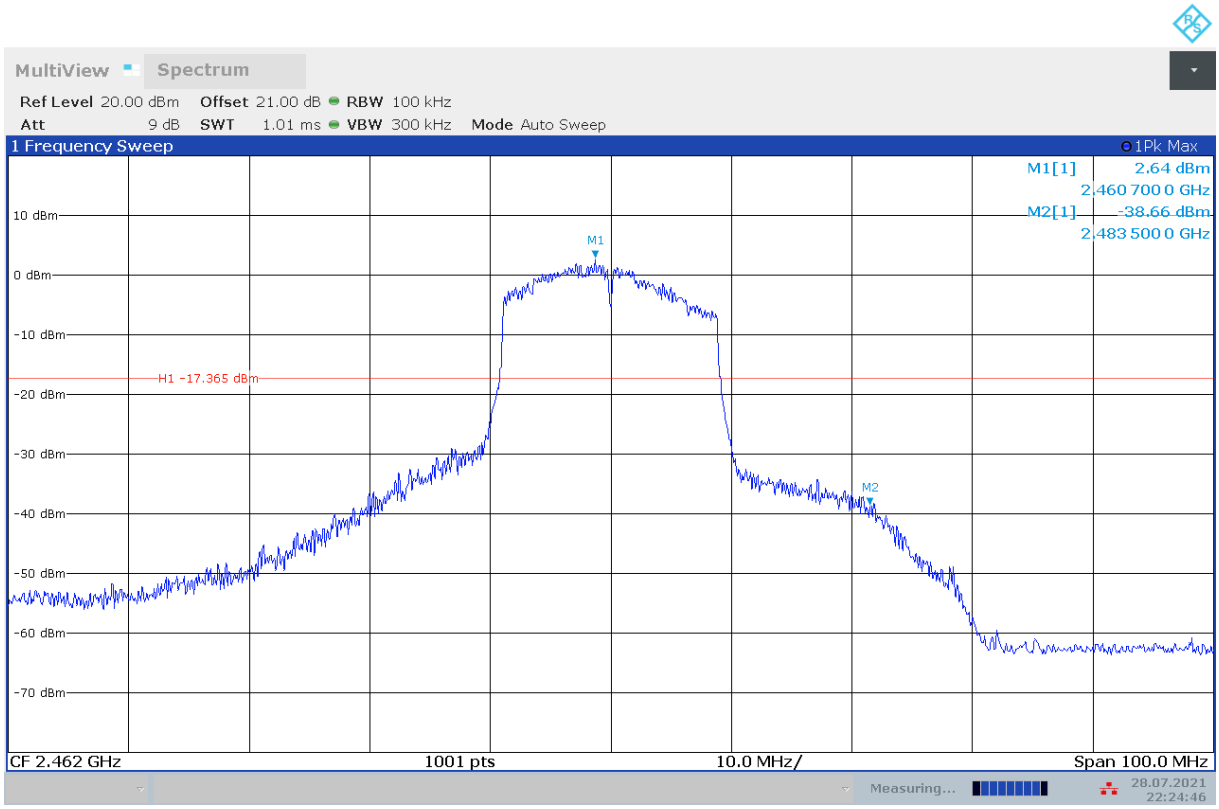


Fig.A.6.1.17 Transmitter Spurious Emission - Conducted (802.11n-HT20, Ch11, Center Frequency)

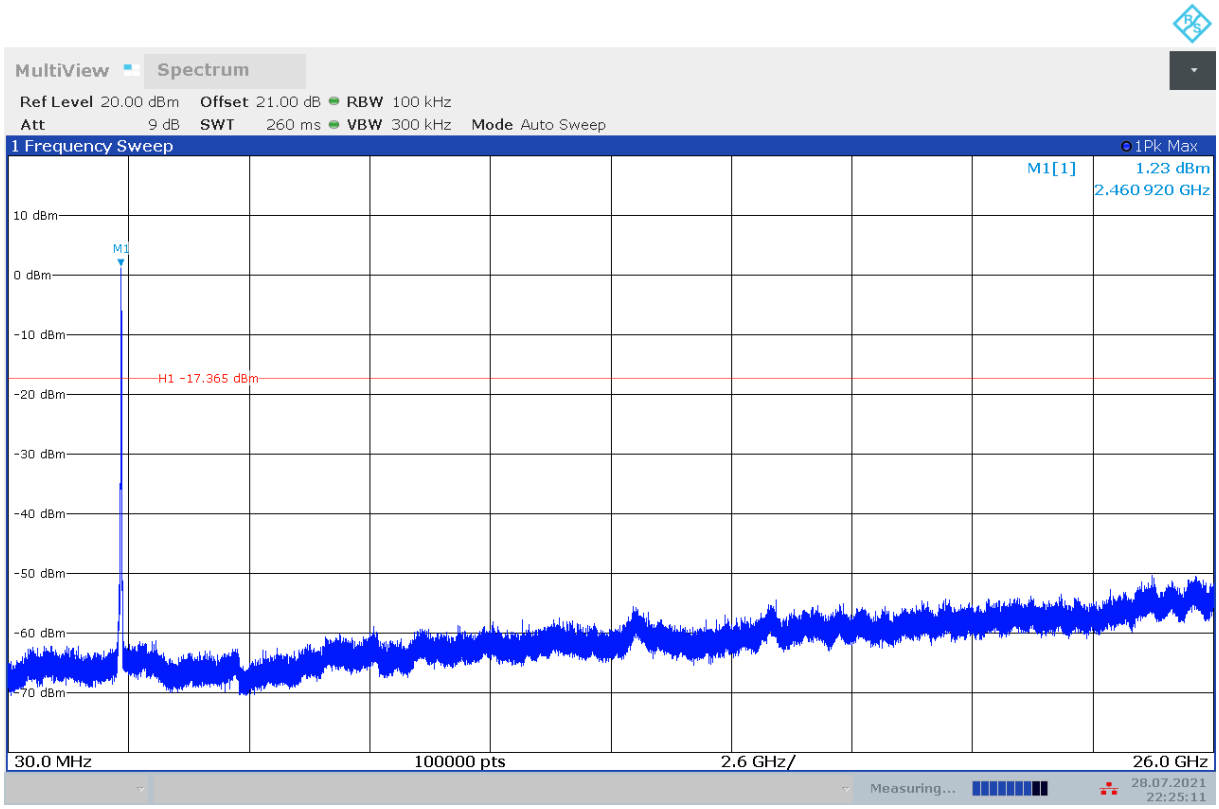


Fig.A.6.1.18 Transmitter Spurious Emission - Conducted (802.11n-HT20, Ch11, 30 MHz-

26 GHz)

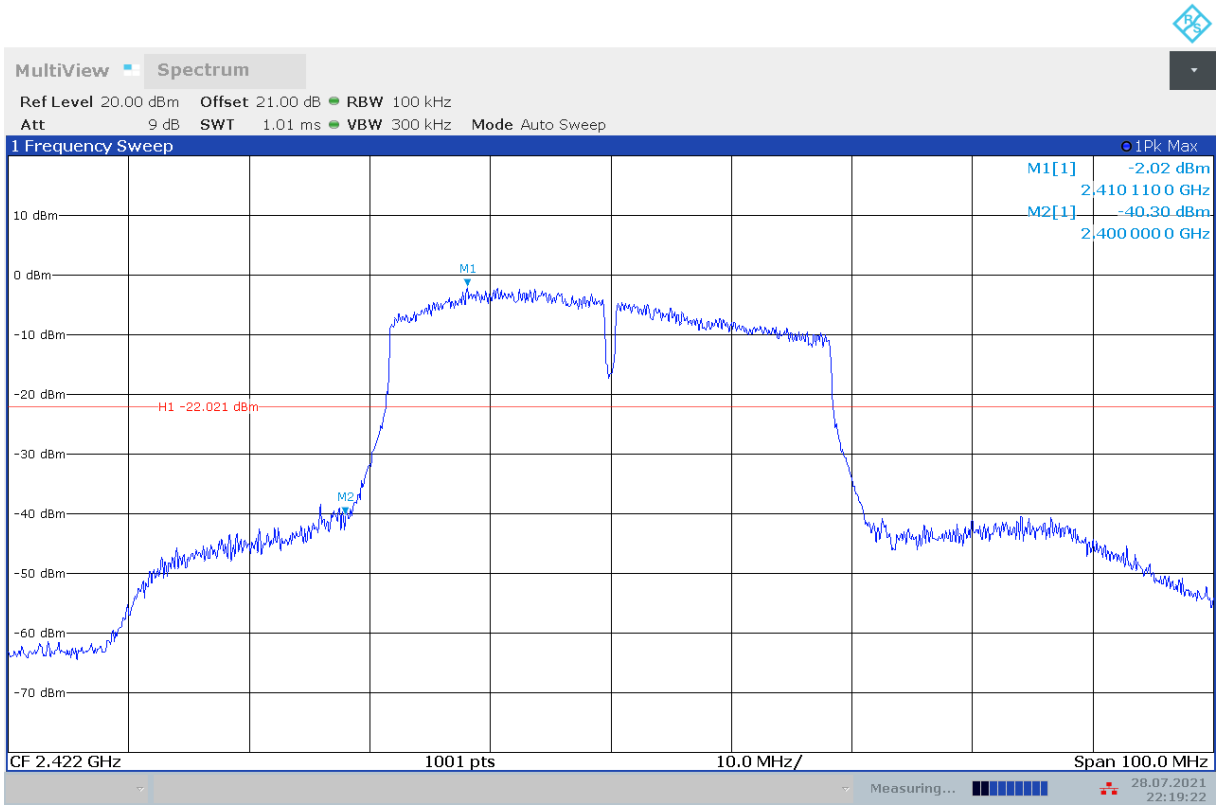


Fig.A.6.1.19 Transmitter Spurious Emission - Conducted (802.11n-HT40, Ch3, Center Frequency)

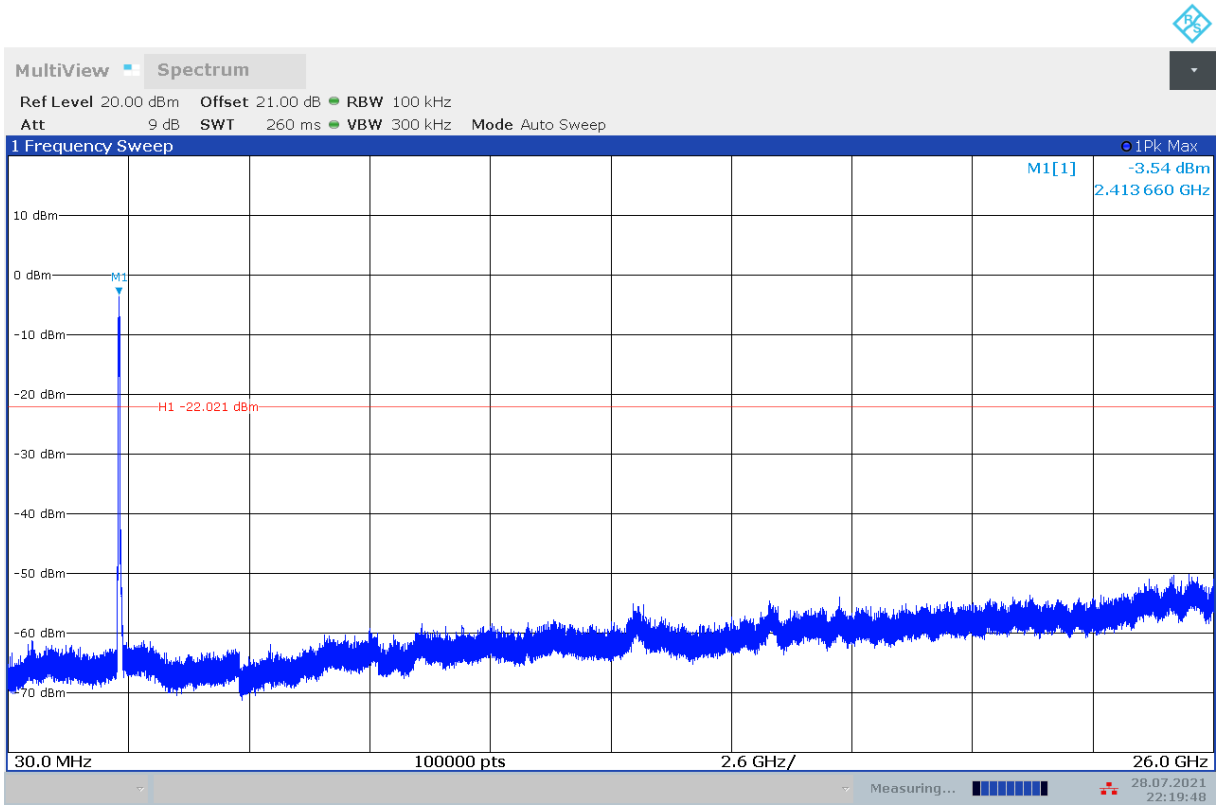


Fig.A.6.1.20 Transmitter Spurious Emission - Conducted (802.11n-HT40, Ch3, 30 MHz-26GHz)

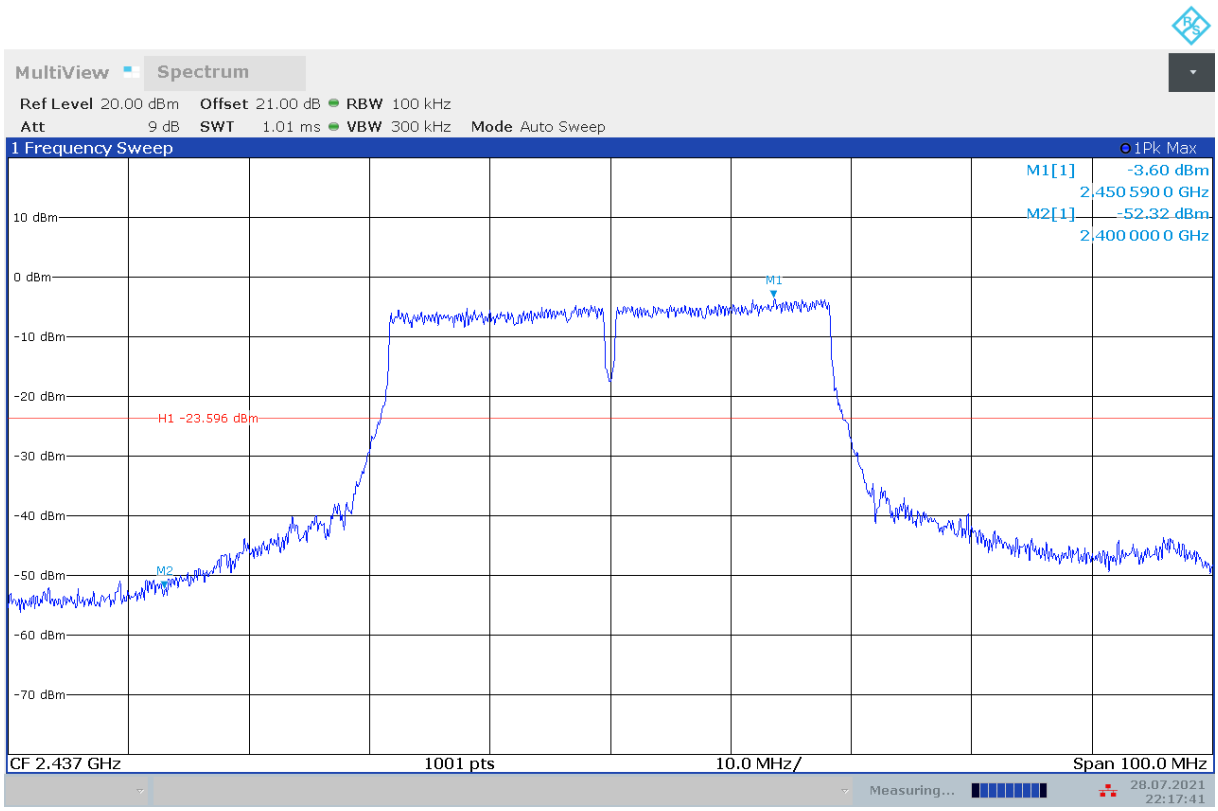


Fig.A.6.1.21 Transmitter Spurious Emission - Conducted (802.11n-HT40, Ch6, Center

Frequency)

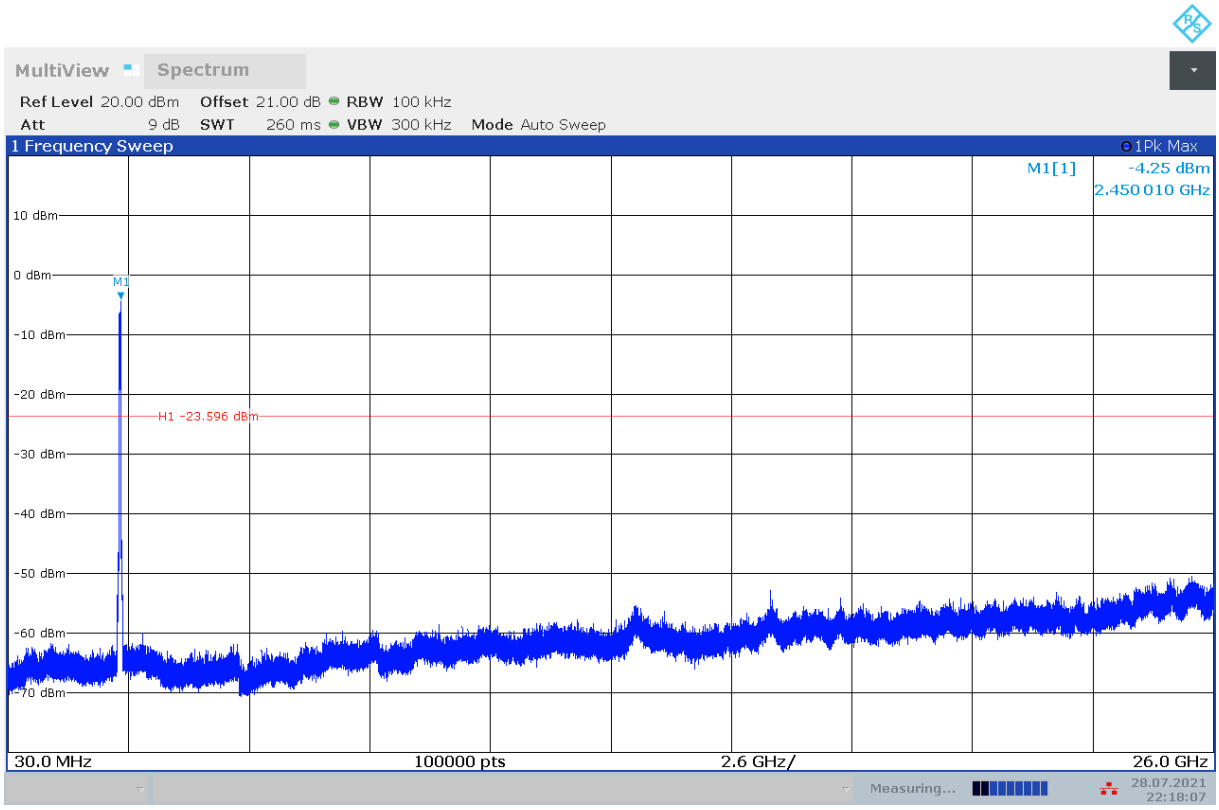


Fig.A.6.1.22 Transmitter Spurious Emission - Conducted (802.11n-HT40, Ch6, 30 MHz-26GHz)

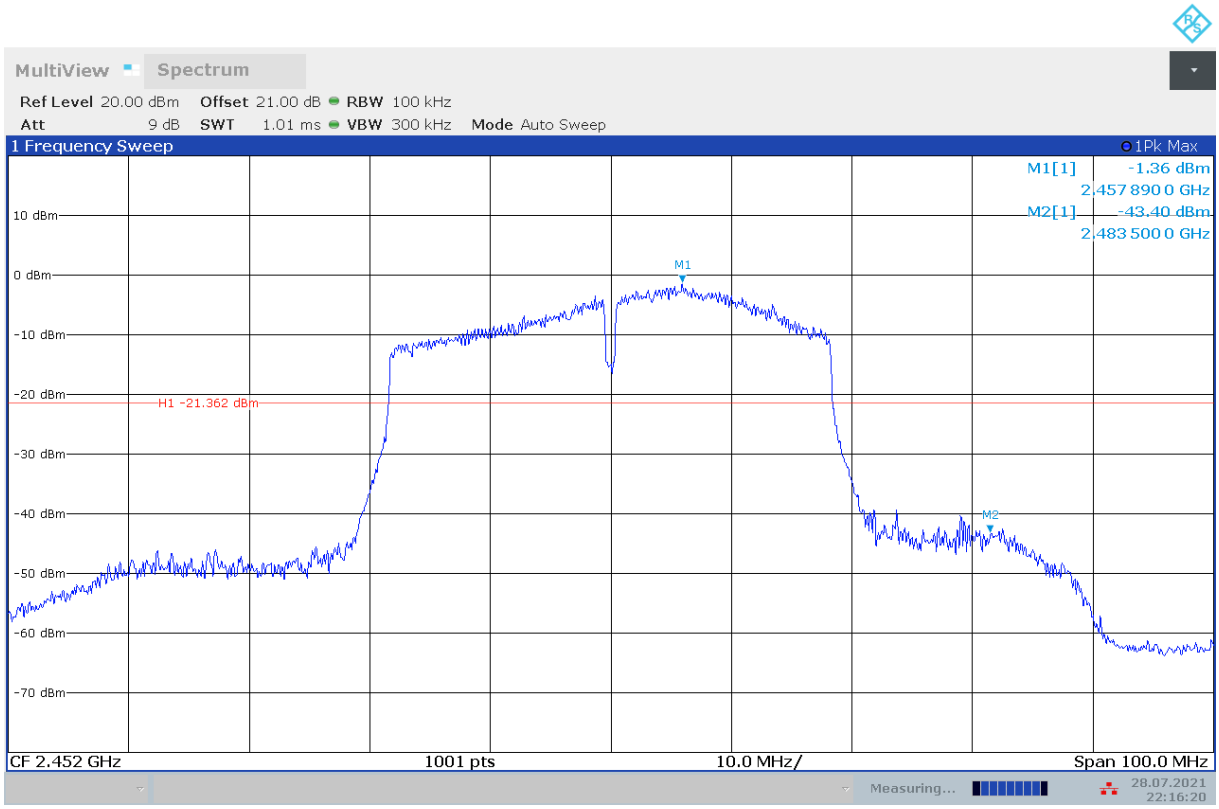


Fig.A.6.1.23 Transmitter Spurious Emission - Conducted (802.11n-HT40, Ch9, Center Frequency)

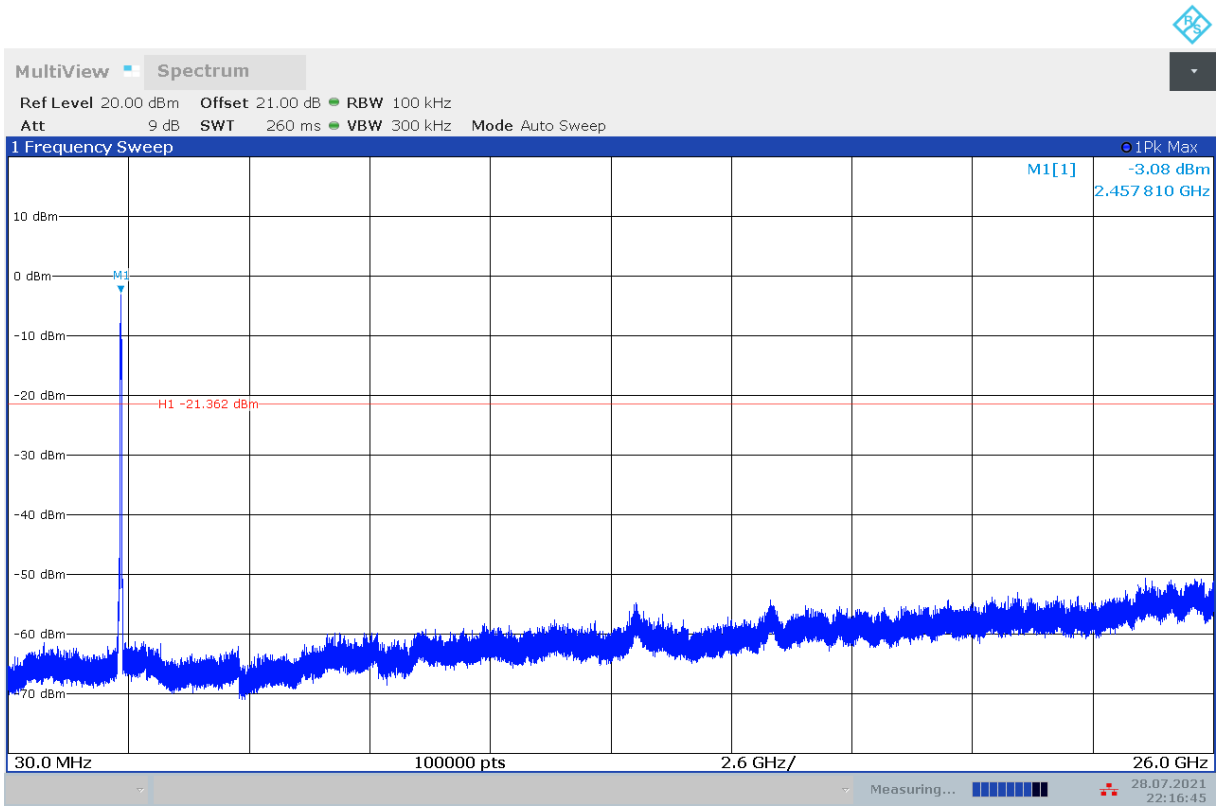


Fig.A.6.1.24 Transmitter Spurious Emission - Conducted (802.11n-HT40, Ch9, 30 MHz-26GHz)

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 Procedure

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: UT37a

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:

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)
2374.526	62.21	2.9	32.0	27.37	74.0	11.8	V
2387.798	62.35	2.9	32.0	27.48	74.0	11.7	V
4824.000	39.43	-33.2	34.1	38.53	74.0	34.6	H
7236.000	41.44	-30.9	35.8	36.53	74.0	32.6	H
9648.000	42.79	-30.5	36.7	36.54	74.0	31.2	H
12060.000	44.86	-28.7	38.7	34.82	74.0	29.1	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)
2356.800	47.95	2.8	32.0	13.14	74.0	26.1	H
2509.600	49.20	3.0	32.1	14.13	74.0	24.8	H
4874.000	38.08	-33.3	34.2	37.23	74.0	35.9	H
7311.000	40.73	-30.8	35.8	35.72	74.0	33.3	V
9748.000	43.55	-30.3	36.9	37.03	74.0	30.4	V
12185.000	45.41	-28.1	38.8	34.70	74.0	28.6	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)
2493.710	62.71	2.9	32.1	27.67	74.0	11.3	H
2495.895	63.18	2.9	32.1	28.15	74.0	10.8	H
4924.000	39.60	-33.5	34.2	38.96	74.0	34.4	H
7386.000	41.11	-31.5	35.9	36.70	74.0	32.9	V
9848.000	42.01	-30.2	37.0	35.20	74.0	32.0	H
12310.000	46.38	-27.8	38.9	35.25	74.0	27.6	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)
2388.792	64.00	2.9	32.0	29.14	74.0	10.0	V
2389.395	65.20	2.9	32.0	30.34	74.0	8.8	V
4824.000	39.49	-33.2	34.1	38.60	74.0	34.5	H
7236.000	43.16	-30.9	35.8	38.25	74.0	30.8	V
9648.000	43.68	-30.5	36.7	37.43	74.0	30.3	V
12060.000	44.67	-28.7	38.7	34.63	74.0	29.3	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)
2350.200	50.16	2.8	32.0	15.36	74.0	23.8	V
2516.400	48.69	3.0	32.1	13.60	74.0	25.3	H
4874.000	39.05	-33.3	34.2	38.20	74.0	35.0	V
7311.000	41.44	-30.8	35.8	36.43	74.0	32.6	V
9748.000	42.14	-30.3	36.9	35.62	74.0	31.9	H
12185.000	44.46	-28.1	38.8	33.76	74.0	29.5	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)
2483.735	66.31	2.9	32.1	31.29	74.0	7.7	V
2484.495	64.97	2.9	32.1	29.95	74.0	9.0	V
4924.000	39.31	-33.5	34.2	38.67	74.0	34.7	V
7386.000	40.82	-31.5	35.9	36.42	74.0	33.2	V
9848.000	42.57	-30.2	37.0	35.75	74.0	31.4	V
12310.000	45.21	-27.8	38.9	34.08	74.0	28.8	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)
2388.400	64.79	2.9	32.0	29.93	74.0	9.2	V
2389.856	65.34	2.9	32.0	30.47	74.0	8.7	V
4824.000	39.34	-33.2	34.1	38.45	74.0	34.7	H
7236.000	41.24	-30.9	35.8	36.32	74.0	32.8	H
9648.000	43.35	-30.5	36.7	37.10	74.0	30.6	V
12060.000	44.29	-28.7	38.7	34.26	74.0	29.7	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)
2351.600	48.48	2.8	32.0	13.68	74.0	25.5	H
2511.400	49.01	3.0	32.1	13.93	74.0	25.0	H
4874.000	39.50	-33.3	34.2	38.65	74.0	34.5	V
7311.000	40.50	-30.8	35.8	35.49	74.0	33.5	H
9748.000	41.66	-30.3	36.9	35.14	74.0	32.3	H
12185.000	44.96	-28.1	38.8	34.25	74.0	29.0	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)
2484.595	68.26	2.9	32.1	33.24	74.0	5.7	V
2484.970	67.56	2.9	32.1	32.54	74.0	6.4	H
4924.000	40.14	-33.5	34.2	39.50	74.0	33.9	V
7386.000	40.97	-31.5	35.9	36.56	74.0	33.0	H
9848.000	41.82	-30.2	37.0	35.00	74.0	32.2	H
12310.000	45.42	-27.8	38.9	34.28	74.0	28.6	V

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)
2387.322	68.22	2.9	32.0	33.36	74.0	5.8	H
2388.274	68.41	2.9	32.0	33.54	74.0	5.6	V
4844.000	39.31	-33.2	34.1	38.41	74.0	34.7	H
7266.000	42.95	-30.6	35.8	37.74	74.0	31.0	H
9688.000	42.06	-30.4	36.8	35.66	74.0	31.9	H
12110.000	44.84	-28.5	38.8	34.54	74.0	29.2	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)
2357.400	48.48	2.8	32.0	13.66	74.0	25.5	H
2520.400	48.49	3.0	32.1	13.39	74.0	25.5	H
4874.000	39.00	-33.3	34.2	38.15	74.0	35.0	V
7311.000	41.56	-30.8	35.8	36.55	74.0	32.4	H
9748.000	42.28	-30.3	36.9	35.76	74.0	31.7	H
12185.000	45.76	-28.1	38.8	35.05	74.0	28.2	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)
2484.260	70.28	2.9	32.1	35.27	74.0	3.7	V
2484.370	70.43	2.9	32.1	35.41	74.0	3.6	H
4904.000	40.71	-33.4	34.2	39.98	74.0	33.3	H
7356.000	43.34	-31.2	35.8	38.67	74.0	30.7	V
9808.000	43.48	-30.3	36.9	36.87	74.0	30.5	V
12260.000	45.49	-27.9	38.9	34.51	74.0	28.5	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)
2389.800	48.60	2.9	32.0	13.74	54.0	5.4	V
2389.980	48.62	2.9	32.0	13.75	54.0	5.4	V
4824.000	28.00	-33.2	34.1	27.11	54.0	26.0	H
7236.000	30.21	-30.9	35.8	25.29	54.0	23.8	V
9648.000	31.11	-30.5	36.7	24.85	54.0	22.9	H
12060.000	33.17	-28.7	38.7	23.14	54.0	20.8	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)
2401.080	50.02	2.9	32.0	15.14	54.0	4.0	V
2466.660	50.43	2.9	32.1	15.44	54.0	3.6	V
4873.500	27.82	-33.3	34.2	26.97	54.0	26.2	V
7311.000	30.19	-30.8	35.8	25.18	54.0	23.8	H
9748.500	31.19	-30.3	36.9	24.67	54.0	22.8	H
12184.500	34.21	-28.1	38.8	23.51	54.0	19.8	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)
2483.520	48.80	2.9	32.1	13.78	54.0	5.2	V
2483.580	48.77	2.9	32.1	13.75	54.0	5.2	V
4924.500	28.31	-33.5	34.2	27.67	54.0	25.7	H
7386.000	29.53	-31.5	35.9	25.13	54.0	24.5	H
9847.500	31.09	-30.2	37.0	24.28	54.0	22.9	H
12310.500	33.85	-27.8	38.9	22.72	54.0	20.1	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)
2388.720	47.24	2.9	32.0	12.37	54.0	6.8	V
2389.500	47.30	2.9	32.0	12.43	54.0	6.7	V
4824.000	28.00	-33.2	34.1	27.10	54.0	26.0	V
7236.000	30.15	-30.9	35.8	25.23	54.0	23.9	V
9648.000	31.12	-30.5	36.7	24.87	54.0	22.9	V
12060.000	33.16	-28.7	38.7	23.13	54.0	20.8	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)
2411.880	49.85	2.9	32.0	14.95	54.0	4.2	V
2462.880	50.21	2.9	32.1	15.23	54.0	3.8	V
4873.500	27.69	-33.3	34.2	26.84	54.0	26.3	V
7311.000	30.14	-30.8	35.8	25.13	54.0	23.9	H
9748.500	31.19	-30.3	36.9	24.67	54.0	22.8	V
12184.500	34.29	-28.1	38.8	23.58	54.0	19.7	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)
2483.580	48.06	2.9	32.1	13.04	54.0	5.9	V
2484.720	48.05	2.9	32.1	13.03	54.0	6.0	V
4924.500	28.39	-33.5	34.2	27.75	54.0	25.6	V
7386.000	29.56	-31.5	35.9	25.16	54.0	24.4	H
9847.500	31.16	-30.2	37.0	24.35	54.0	22.8	H
12310.500	33.94	-27.8	38.9	22.81	54.0	20.1	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)
2389.260	47.73	2.9	32.0	12.87	54.0	6.3	V
2389.860	47.79	2.9	32.0	12.92	54.0	6.2	V
4824.000	28.18	-33.2	34.1	27.29	54.0	25.8	V
7236.000	30.24	-30.9	35.8	25.32	54.0	23.8	V
9648.000	31.21	-30.5	36.7	24.96	54.0	22.8	V
12060.000	33.36	-28.7	38.7	23.33	54.0	20.6	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)
2403.780	50.79	2.9	32.0	15.91	54.0	3.2	V
2469.900	50.29	2.9	32.1	15.29	54.0	3.7	V
4873.500	27.85	-33.3	34.2	27.00	54.0	26.1	V
7311.000	30.24	-30.8	35.8	25.23	54.0	23.8	V
9748.500	31.34	-30.3	36.9	24.82	54.0	22.7	H
12184.500	34.33	-28.1	38.8	23.63	54.0	19.7	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)
2483.760	47.88	2.9	32.1	12.86	54.0	6.1	V
2484.540	47.81	2.9	32.1	12.79	54.0	6.2	V
4924.500	28.40	-33.5	34.2	27.76	54.0	25.6	V
7386.000	29.65	-31.5	35.9	25.25	54.0	24.4	H
9847.500	31.26	-30.2	37.0	24.45	54.0	22.7	V
12310.500	34.06	-27.8	38.9	22.92	54.0	19.9	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)
2388.840	48.02	2.9	32.0	13.16	54.0	6.0	V
2389.560	48.12	2.9	32.0	13.26	54.0	5.9	V
4843.500	27.89	-33.2	34.1	26.98	54.0	26.1	V
7266.000	30.88	-30.6	35.8	25.67	54.0	23.1	H
9688.500	31.20	-30.4	36.8	24.80	54.0	22.8	H
12109.500	33.97	-28.5	38.8	23.67	54.0	20.0	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)
2382.120	49.48	2.9	32.0	14.63	54.0	4.5	V
2492.640	48.76	2.9	32.1	13.73	54.0	5.2	V
4873.500	27.88	-33.3	34.2	27.02	54.0	26.1	H
7311.000	30.19	-30.8	35.8	25.18	54.0	23.8	V
9748.500	31.24	-30.3	36.9	24.72	54.0	22.8	V
12184.500	34.35	-28.1	38.8	23.65	54.0	19.6	V

Ch9

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
2483.880	48.60	2.9	32.1	13.59	54.0	5.4	V
2484.480	48.65	2.9	32.1	13.63	54.0	5.4	V
4903.500	28.15	-33.4	34.2	27.41	54.0	25.8	H
7356.000	30.11	-31.2	35.8	25.44	54.0	23.9	V
9808.500	30.82	-30.3	36.9	24.21	54.0	23.2	H
12259.500	33.96	-27.9	38.9	22.98	54.0	20.0	V

Test graphs as below:

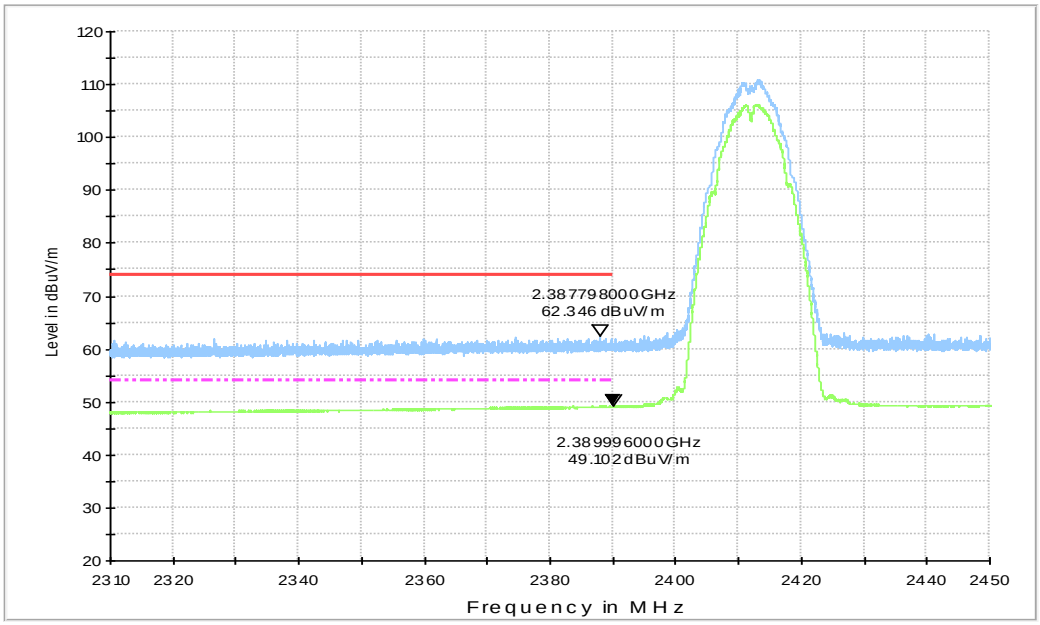


Fig.A.6.2.1 Transmitter Spurious Emission - Radiated (Power): 802.11b, ch1, 2.31 GHz – 2.45GHz

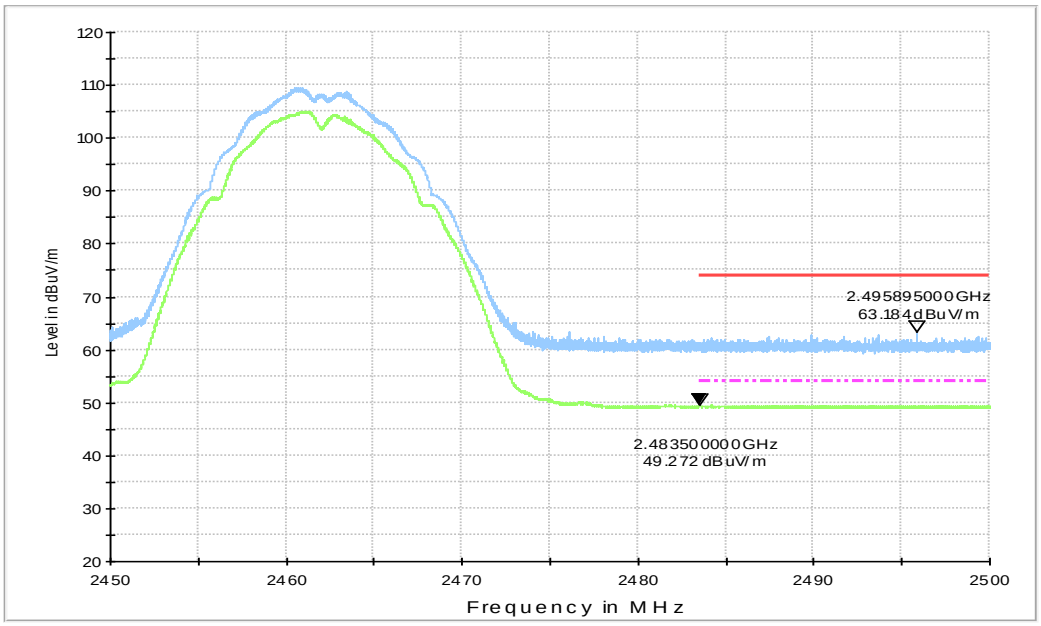


Fig.A.6.2.2 Transmitter Spurious Emission - Radiated (Power): 802.11b, ch11, 2.45 GHz - 2.50GHz

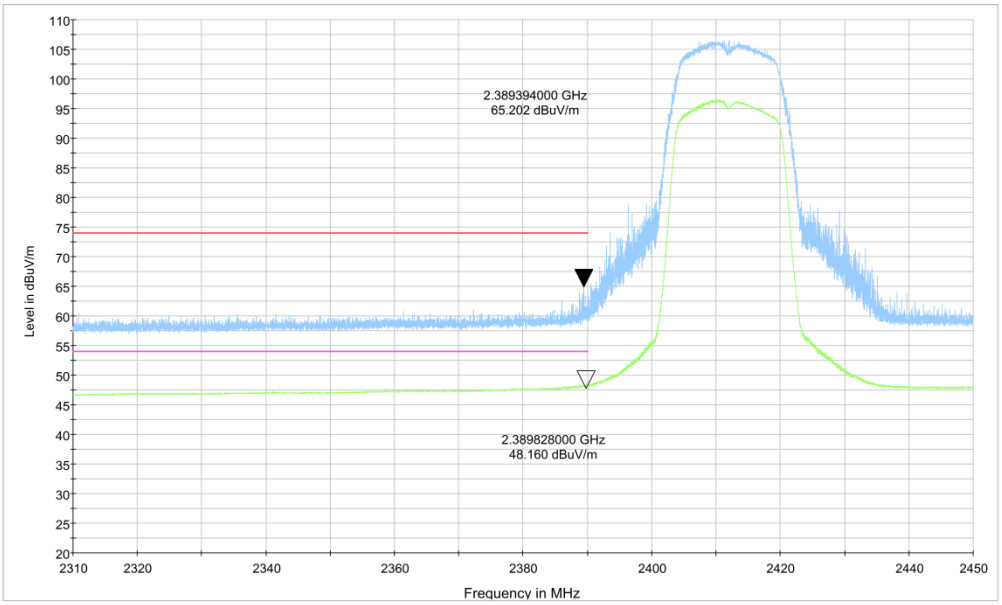


Fig.A.6.2.3 Transmitter Spurious Emission - Radiated (Power): 802.11g, ch1, 2.31 GHz - 2.45GHz

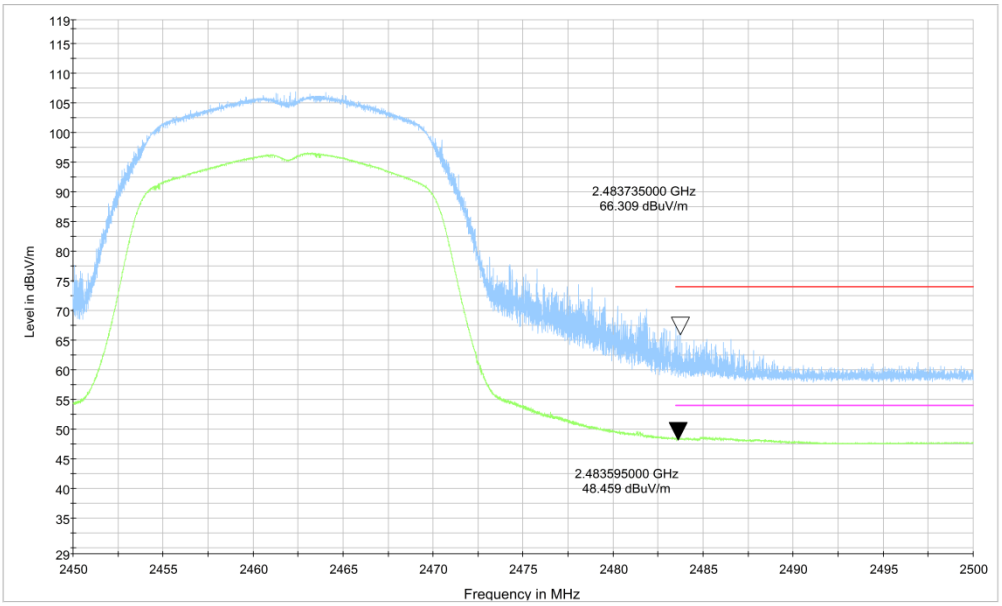


Fig.A.6.2.4 Transmitter Spurious Emission - Radiated (Power): 802.11g, ch11, 2.45 GHz - 2.50GHz

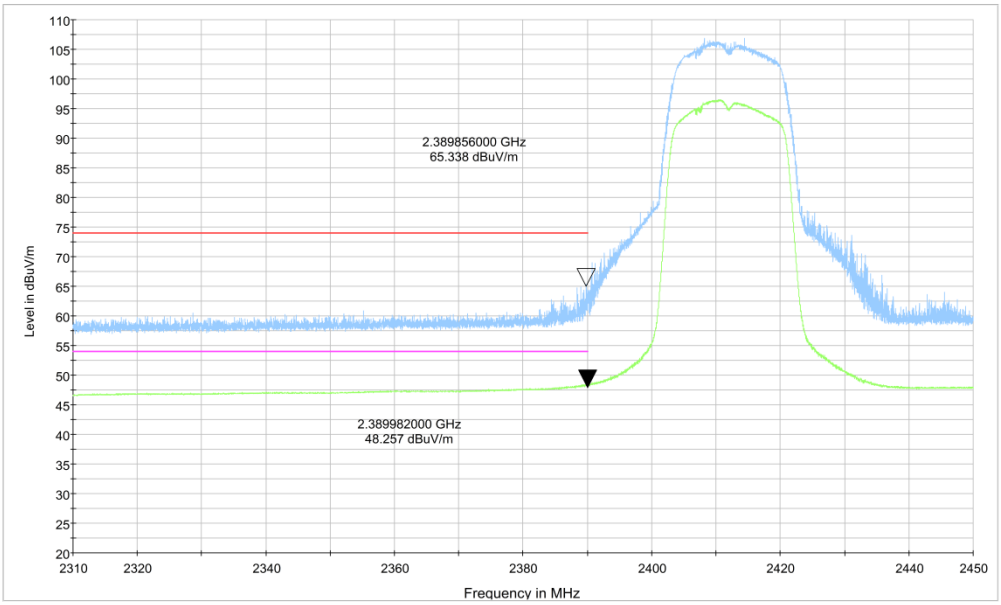


Fig.A.6.2.5 Transmitter Spurious Emission - Radiated (Power): 802.11n-HT20, ch1, 2.31 GHz - 2.45GHz

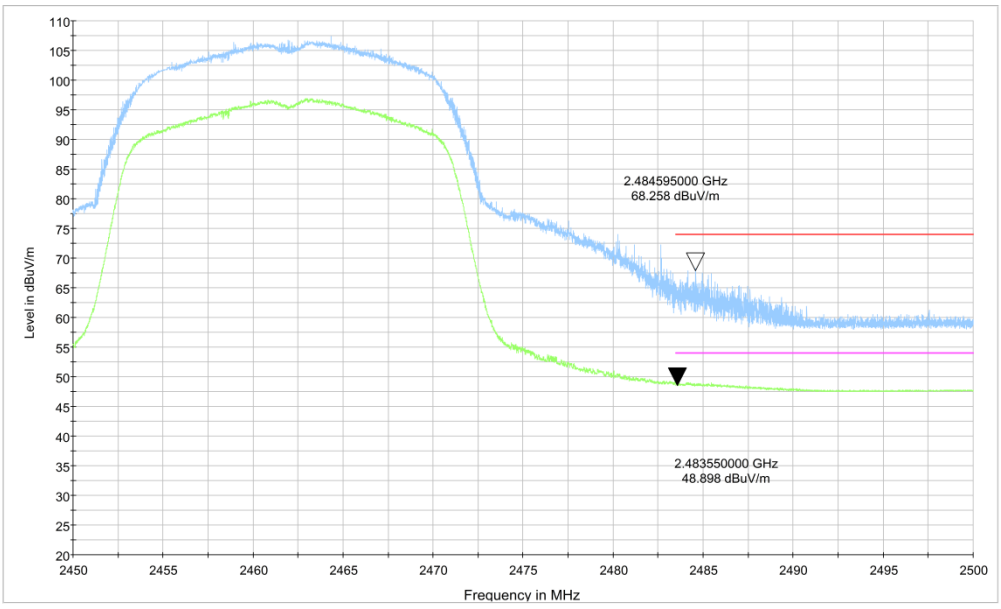


Fig.A.6.2.6 Transmitter Spurious Emission - Radiated (Power): 802.11n-HT20, ch11, 2.45 GHz - 2.50GHz

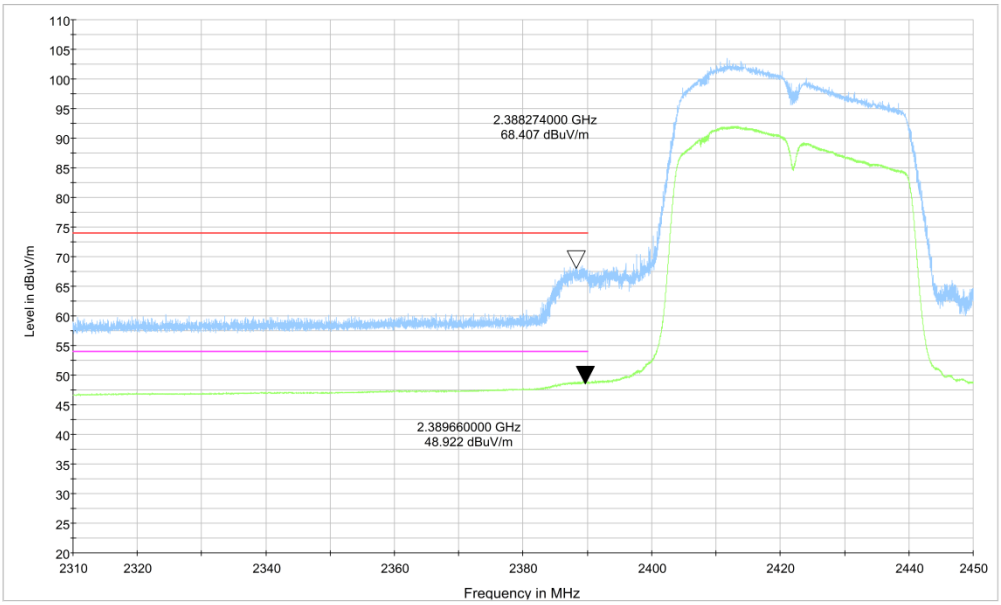


Fig.A.6.2.7 Transmitter Spurious Emission - Radiated (Power): 802.11n-HT40, ch3, 2.31 GHz - 2.45GHz

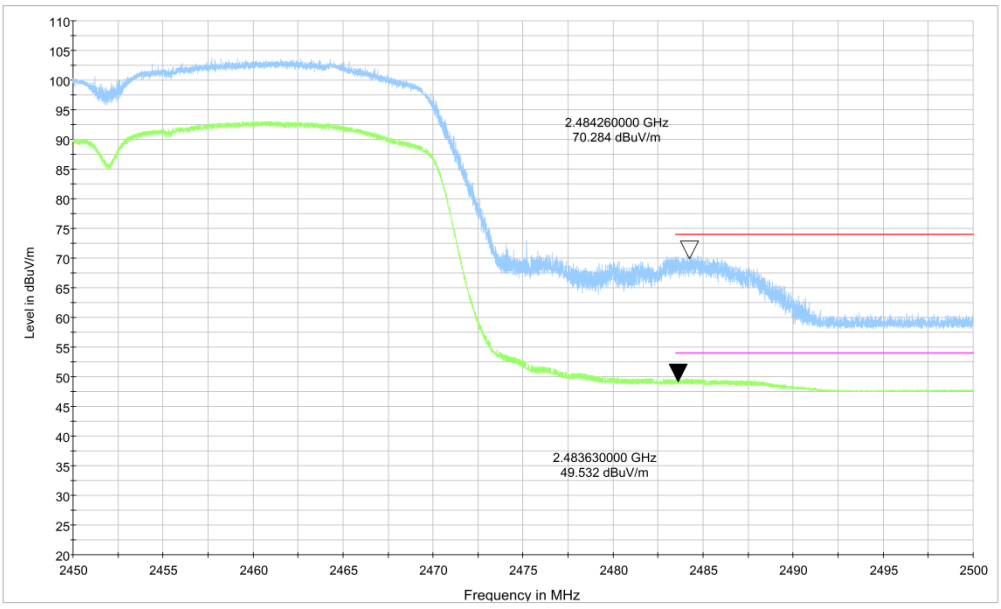


Fig.A.6.2.8 Transmitter Spurious Emission - Radiated (Power): 802.11n-HT40, ch9, 2.45 GHz - 2.50GHz

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:

Result for Traffic:

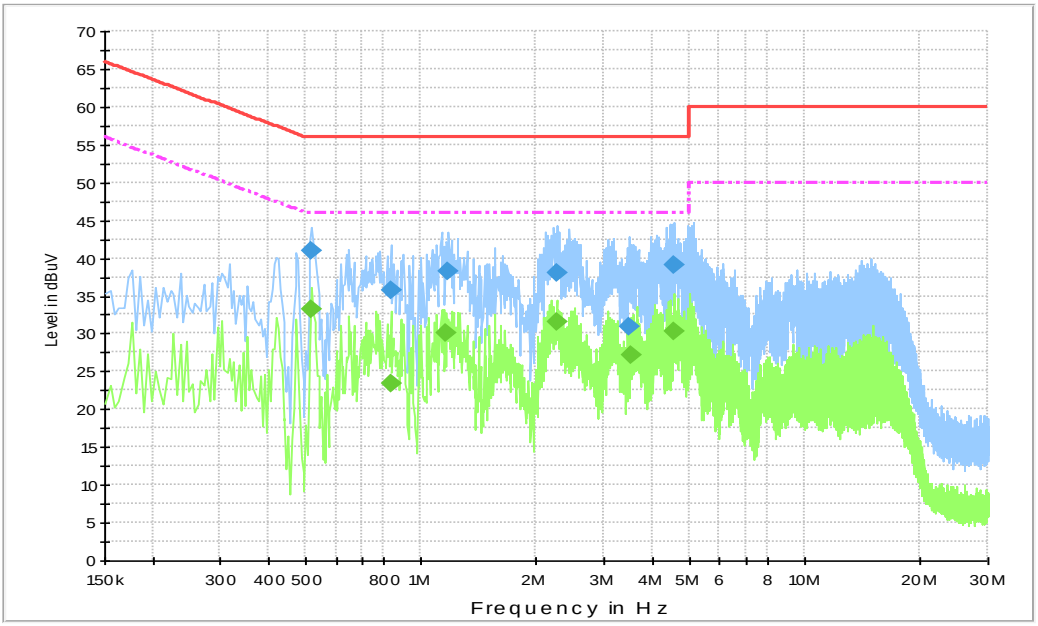


Fig.A.7.1 AC Powerline Conducted Emission-802.11b

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)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.519000	41.0	1000.	9.000	L1	19.8	15.0	56.0
0.834000	35.8	1000.	9.000	L1	19.7	20.2	56.0
1.180500	38.2	1000.	9.000	L1	19.6	17.8	56.0
2.265000	38.1	1000.	9.000	L1	19.6	17.9	56.0
3.480000	31.0	1000.	9.000	N	19.6	25.0	56.0
4.551000	39.2	1000.	9.000	L1	19.6	16.8	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.519000	33.2	1000.0	9.000	L1	19.8	12.8	46.0
0.834000	23.4	1000.0	9.000	N	19.7	22.6	46.0
1.167000	30.0	1000.0	9.000	L1	19.7	16.0	46.0
2.251500	31.6	1000.0	9.000	L1	19.6	14.4	46.0
3.511500	27.2	1000.0	9.000	L1	19.6	18.8	46.0
4.551000	30.2	1000.0	9.000	L1	19.6	15.8	46.0

Note: The measurement results showed here are worst cases of the combinations of different chargers.

Result for Idle:

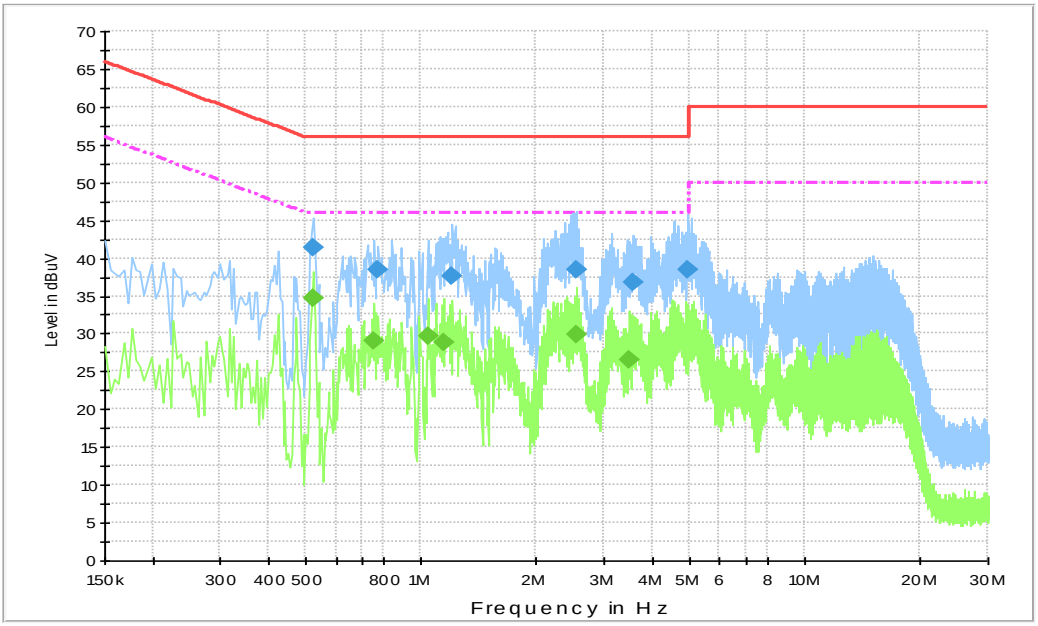


Fig.A.7.2 AC Powerline Conducted Emission-Idle

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)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.523500	41.4	1000.	9.000	L1	19.8	14.6	56.0
0.775500	38.5	1000.	9.000	L1	19.7	17.5	56.0
1.207500	37.7	1000.	9.000	L1	19.6	18.3	56.0
2.539500	38.6	1000.	9.000	L1	19.6	17.5	56.0
3.583500	36.8	1000.	9.000	L1	19.6	19.2	56.0
4.965000	38.4	1000.	9.000	L1	19.7	17.6	56.0

Final Result 2

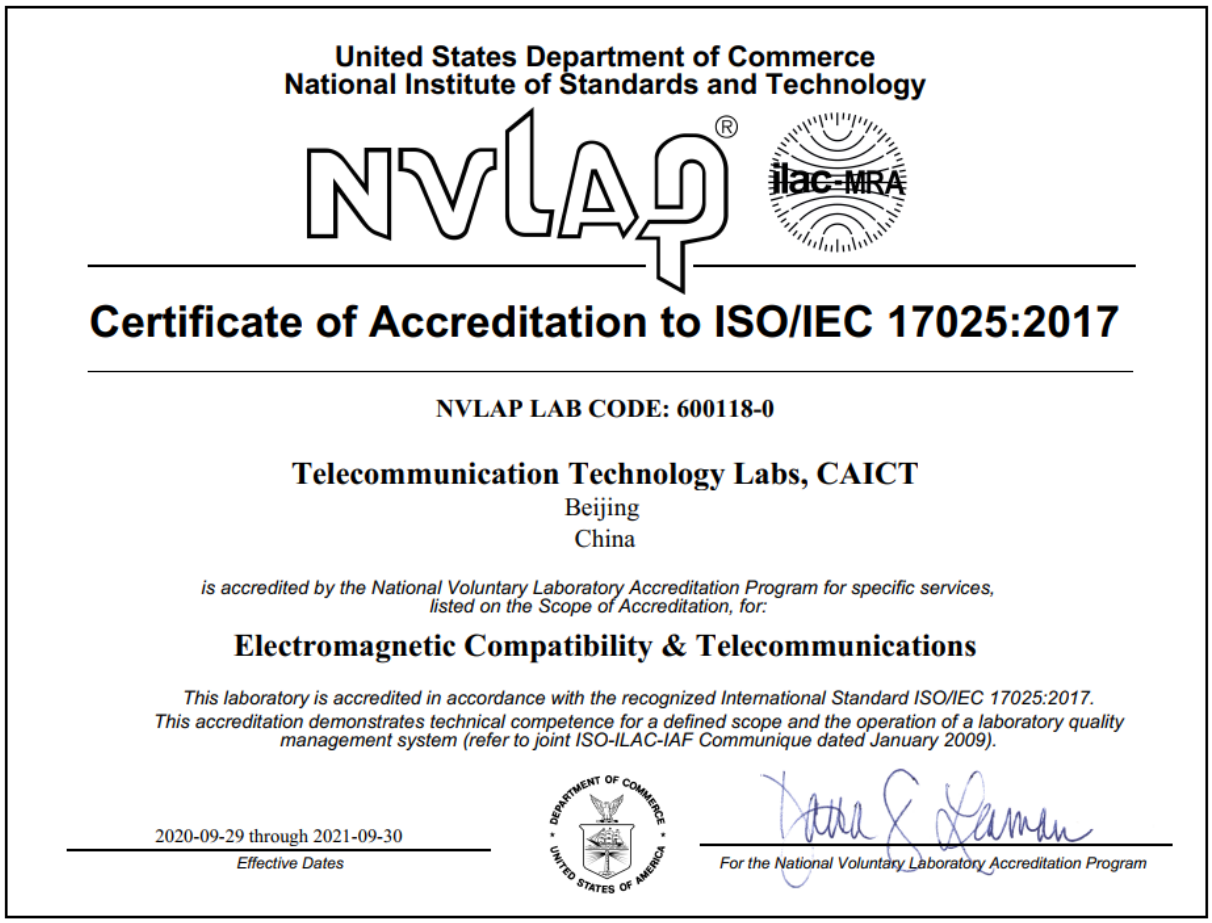
Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.523500	34.7	1000.0	9.000	L1	19.8	11.3	46.0
0.757500	29.1	1000.0	9.000	L1	19.7	16.9	46.0
1.041000	29.7	1000.0	9.000	L1	19.6	16.3	46.0
1.149000	28.9	1000.0	9.000	L1	19.7	17.1	46.0
2.539500	29.8	1000.0	9.000	L1	19.6	16.2	46.0
3.489000	26.6	1000.0	9.000	L1	19.6	19.4	46.0

Note2: The measurement results showed here are worst cases of the combinations of different chargers.

ANNEX B: EUT parameters

Disclaimer: The 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
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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*****