



# FCC PART 15C TEST REPORT No. 23T04Z70506-07

for

**Samsung Electronics Co., Ltd.**

**Multi-band WCDMA/LTE/5GNR Tablet with Bluetooth, WLAN**

**SM-X218U**

**FCC ID: ZCASM218U**

with

**Hardware Version: REV1.0**

**Software Version: X218U.001**

**Issued Date: 2023-11-02**

**Note:**

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

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## **REPORT HISTORY**

<b>Report Number</b>	<b>Revision</b>	<b>Description</b>	<b>Issue Date</b>
23T04Z70506-07	Rev.0	1st edition	2023-11-02

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

## **CONTENTS**

<b>1. TEST LABORATORY .....</b>	<b>5</b>
1.1. INTRODUCTION & ACCREDITATION .....	5
1.2. TESTING LOCATION .....	5
1.3. TESTING ENVIRONMENT.....	6
1.4. PROJECT DATE .....	6
1.5. SIGNATURE .....	6
<b>2. CLIENT INFORMATION.....</b>	<b>7</b>
2.1. APPLICANT INFORMATION .....	7
2.2. MANUFACTURER INFORMATION .....	7
<b>3. EQUIPMENT UNDER TEST (EUT) AND ANCILLARY EQUIPMENT (AE) .....</b>	<b>8</b>
3.1. ABOUT EUT .....	8
3.2. INTERNAL IDENTIFICATION OF EUT .....	8
3.3. INTERNAL IDENTIFICATION OF AE.....	8
3.4. GENERAL DESCRIPTION.....	9
3.5. INTERPRETATION OF THE TEST ENVIRONMENT.....	9
<b>4. REFERENCE DOCUMENTS.....</b>	<b>9</b>
4.1. DOCUMENTS SUPPLIED BY APPLICANT .....	9
4.2. REFERENCE DOCUMENTS FOR TESTING.....	9
<b>5. LABORATORY ENVIRONMENT.....</b>	<b>10</b>
<b>6. TEST RESULTS .....</b>	<b>10</b>
6.1. SUMMARY OF TEST RESULTS .....	10
6.2. STATEMENTS.....	10
6.3. TEST CONDITIONS .....	10
<b>7. TEST FACILITIES UTILIZED .....</b>	<b>11</b>
<b>8. MEASUREMENT UNCERTAINTY .....</b>	<b>12</b>
8.1. MAXIMUM OUTPUT POWER.....	12
8.2. PEAK POWER SPECTRAL DENSITY.....	12
8.3. DTS 6-DB SIGNAL BANDWIDTH.....	12
8.4. BAND EDGES COMPLIANCE.....	12
8.5. TRANSMITTER SPURIOUS EMISSION .....	12
8.6. AC POWER-LINE CONDUCTED EMISSION .....	12
<b>ANNEX A: DETAILED TEST RESULTS.....</b>	<b>13</b>
<b>A.1. MEASUREMENT METHOD.....</b>	<b>13</b>
<b>A.2. MAXIMUM OUTPUT POWER.....</b>	<b>14</b>
A.2.1 ANTENNA GAIN.....	14



A.2.2. PEAK OUTPUT POWER-CONDUCTED ..... 14

**A.3. PEAK POWER SPECTRAL DENSITY ..... 16**

**A.4. DTS 6-DB SIGNAL BANDWIDTH ..... 22**

**A.5. BAND EDGES COMPLIANCE ..... 28**

**A.6. TRANSMITTER SPURIOUS EMISSION ..... 32**

    A.6.1 TRANSMITTER SPURIOUS EMISSION – CONDUCTED..... 32

    A.6.2 TRANSMITTER SPURIOUS EMISSION - RADIATED ..... 48

**A.7. AC POWER-LINE CONDUCTED EMISSION ..... 62**

**ANNEX B: EUT PARAMETERS..... 66**

**ANNEX C: ACCREDITATION CERTIFICATE ..... 66**



## **1. Test Laboratory**

### **1.1. Introduction & Accreditation**

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

### **1.2. Testing Location**

Location 1:CTTL(Huayuan North Road)

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

Location 2:CTTL(BDA)

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

### **1.3. Testing Environment**

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

### **1.4. Project date**

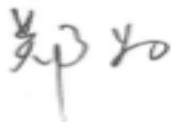
Testing Start Date: 2023-09-11  
Testing End Date: 2023-11-02

### **1.5. Signature**



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**Dong Jiaxuan**  
**(Prepared this test report)**



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**Zheng Wei**  
**(Reviewed this test report)**



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**Pang Shuai**  
**(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: New Jersey  
Postal Code: /  
Country: US  
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  
City: Suwon  
Postal Code: /  
Country: Korea  
Telephone: +82-10-2722-4159  
Fax: /

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

#### **3.1. About EUT**

Description	Multi-band WCDMA/LTE/5G NR Tablet with Bluetooth, WLAN
Model name	SM-X218U
FCC ID	ZCASM218U
With WLAN Function	Yes
Frequency Band	ISM 2400MHz~2483.5MHz
Type of Modulation	DSSS/CCK/OFDM
Number of Channels	11
Antenna	Integral Antenna
MAX Conducted Power	27.36dBm
Nominal Voltage	3.85V
Extreme High Voltage	4.40V
Extreme Low Voltage	3.55V

#### **3.2. Internal Identification of EUT**

<b>EUT ID*</b>	<b>SN or IMEI</b>	<b>HW Version</b>	<b>SW Version</b>	<b>Date of receipt</b>
UT12a	2370506UT12a	REV1.0	X218U.001	2023-09-24
UT28a	2370506UT28a	REV1.0	X218U.001	2023-09-24

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

UT28a is used for Conduction test, UT12a is used for Radiation test.

#### **3.3. Internal Identification of AE**

<b>AE ID*</b>	<b>Name</b>	<b>Model</b>	<b>Manufacturer</b>
AE1	Battery	WT-S-W11	SCUD (Fujian) Electronics Co., Ltd.
AE2*	Adapter	EP-T1510	DONGGUAN DONGWON ELECTRONICS CO.,LTD.
AE3-1	Date Cable1 C-C	EP-DN980BWE	Guangxi Broad Telecommunication Co.,Ltd.
AE3-2	Date Cable2 C-C	EP-DN980BWE	RFTECH Co., Ltd.
AE3-3	Date Cable3 C-C	EP-DN980BWE	CRESYN HANOI Co., Ltd
AE5*	Headset	ESH61ASFWE	/

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

\*AE2 and A5 are not the AE for EUT, provided by the client for relevant tests.



### **3.4. General Description**

The Equipment under Test (EUT) is a model of Multi-band WCDMA/LTE/5G NR Tablet with Bluetooth, 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.	2021
ANSI C63.10	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices Federal Communications Commission Office of Engineering and Technology Laboratory Division	2013
KDB 558074 D01	GUIDANCE FOR COMPLIANCE MEASUREMENTS ON DIGITAL TRANSMISSION SYSTEM, FREQUENCY HOPPING SPREAD SPECTRUM SYSTEM, AND HYBRID SYSTEM DEVICES OPERATING UNDER SECTION 15.247 OF THE FCC RULES	2019

## 5. LABORATORY ENVIRONMENT

Conducted RF performance testing is performed in shielding room.

EMC performance testing is performed in Semi-anechoic chamber.

## 6. Test Results

### 6.1. Summary of Test Results

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

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

Terms used in Verdict column

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

### 6.2. Statements

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

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

### 6.3. Test Conditions

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

Temperature	26°C
Voltage	3.85V
Humidity	44%

## 7. Test Facilities Utilized

### Conducted test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Period	Calibration Due date
1	Vector Signal Analyzer	FSQ40	200089	Rohde & Schwarz	1 year	2024-07-04
2	Vector Signal Analyzer	FSW67	104051	Rohde & Schwarz	1 year	2024-03-06
3	Attenuator	10dB/2W	/	Rosenberger	/	/
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	2024-06-29
2	Test Receiver	ESW44	103015	R&S	1 year	2024-01-14
3	Loop Antenna	HFH2-Z2	829324/007	R&S	1 year	2023-12-22
4	EMI Antenna	VULB9163	9163-235	Schwarzbeck	1 year	2024-06-10
5	EMI Antenna	3117	00119021	ETS-Lindgren	1 year	2024-06-24
6	EMI Antenna	LB-180400 -25-C-KF	21100840000 06	A-INFO	1 year	2024-03-02

### AC Power Line Conducted Emission

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Period	Calibration Due date
1	LISN	ENV216	101459	R&S	1 year	2024-02-29
2	Test Receiver	ESCI	100766	R&S	1 year	2024-03-30

## 8. Measurement Uncertainty

### 8.1. Maximum Output Power

Measurement Uncertainty: 0.387dB,k=1.96

### 8.2. Peak Power Spectral Density

Measurement Uncertainty: 0.705dB,k=1.96

### 8.3. DTS 6-dB Signal Bandwidth

Measurement Uncertainty: 60.80Hz,k=1.96

### 8.4. Band Edges Compliance

Measurement Uncertainty : 0.62dB,k=1.96

### 8.5. Transmitter Spurious Emission

#### Conducted (k=1.96)

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

#### Radiated (k=2)

Frequency Range	Uncertainty(dB)
9kHz-30MHz	/
$30\text{MHz} \leq f \leq 1\text{GHz}$	5.40
$1\text{GHz} \leq f \leq 18\text{GHz}$	4.32
$18\text{GHz} \leq f \leq 40\text{GHz}$	5.26

### 8.6. AC Power-line Conducted Emission

Measurement Uncertainty : 3.08dB,k=2

## **ANNEX A: Detailed Test Results**

### **A.1. Measurement Method**

#### **A.1.1. Conducted Measurements**

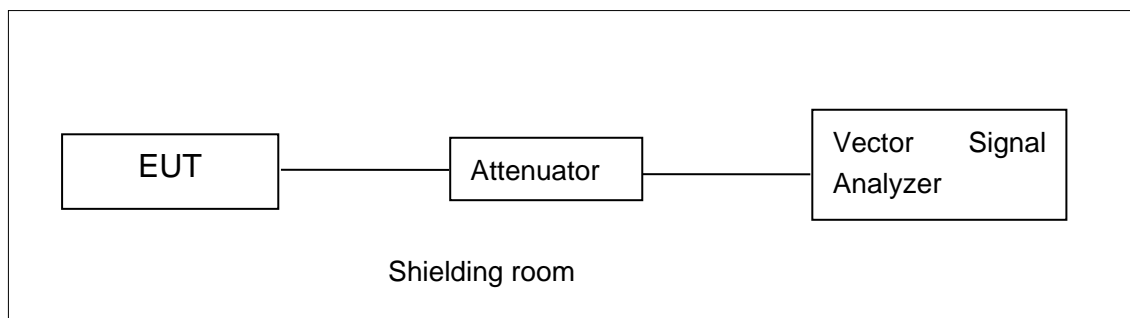
Connect the EUT to the test system as Fig.A.1.1.1 shows.

Set the EUT to the required work mode.

Set the EUT to the required channel.

Set the Vector Signal Analyzer and start measurement.

Record the values. Vector Signal Analyzer



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

#### **A.1.2. Radiated Emission Measurements**

The measurement is made according to ANSI C63.10

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

## A.2. Maximum Output Power

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

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

**Measurement Limit:**

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

### A.2.1 Antenna Gain

Antenna gain is -1.36dBi and the value is supplied by the applicant or manufacturer.

### A.2.2. Peak Output Power-conducted

**EUT ID: UT28a**

**Measurement Results:**

**802.11b/g mode**

Mode	Data Rate (Mbps)	Test Result (dBm)		
		2412MHz (Ch1)	2437MHz (Ch6)	2462 MHz (Ch11)
802.11b	1	25.62	25.25	25.41
	2	25.17	/	/
	5.5	25.57	/	/
	11	25.51	/	/
802.11g	6	26.86	/	/
	9	24.58	/	/
	12	24.65	/	/
	18	25.47	/	/
	24	25.13	/	/
	36	26.95	/	/
	48	27.04	27.36	26.99
54	26.49	/	/	

The data rate 1Mbps and 48Mbps are selected as worst condition, and the following cases are performed with this condition.

**802.11n-HT20 mode**

Mode	Data Rate (Index)	Test Result (dBm)		
		2412MHz (Ch1)	2437MHz (Ch6)	2462 MHz (Ch11)
802.11n (20MHz)	MCS0	25.44	/	/
	MCS1	24.78	/	/
	MCS2	26.53	/	/
	MCS3	25.28	/	/
	MCS4	26.80	/	/
	MCS5	26.56	/	/
	MCS6	27.04	27.13	27.05
	MCS7	26.83	/	/

The data rate MSC6 is selected as worst condition, and the following cases are performed with this condition.

The duty cycle of all mode are 99%.

**Conclusion: Pass**

### **A.3. Peak Power Spectral Density**

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

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

**Measurement Limit:**

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

**EUT ID: UT28a**

**Measurement Results:**

#### **802.11b/g mode**

Mode	Channel	Power Spectral Density ( dBm/3 kHz )		Conclusion
802.11b	1	Fig.A.3.1	3.97	<b>P</b>
	6	Fig.A.3.2	-0.70	<b>P</b>
	11	Fig.A.3.3	-1.56	<b>P</b>
802.11g	1	Fig.A.3.4	-8.42	<b>P</b>
	6	Fig.A.3.5	-8.22	<b>P</b>
	11	Fig.A.3.6	-8.55	<b>P</b>

#### **802.11n-HT20 mode**

Mode	Channel	Power Spectral Density ( dBm/3 kHz )		Conclusion
802.11n (HT20)	1	Fig.A.3.7	-7.93	<b>P</b>
	6	Fig.A.3.8	-7.60	<b>P</b>
	11	Fig.A.3.9	-7.61	<b>P</b>

**Test graphs as below:**



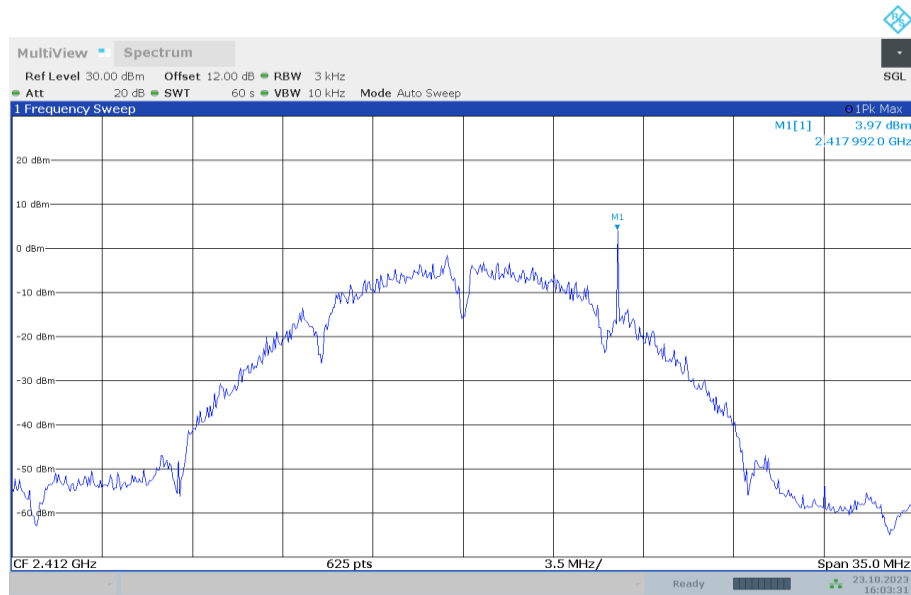


Fig.A.3.1 Power Spectral Density(802.11b,Ch1)

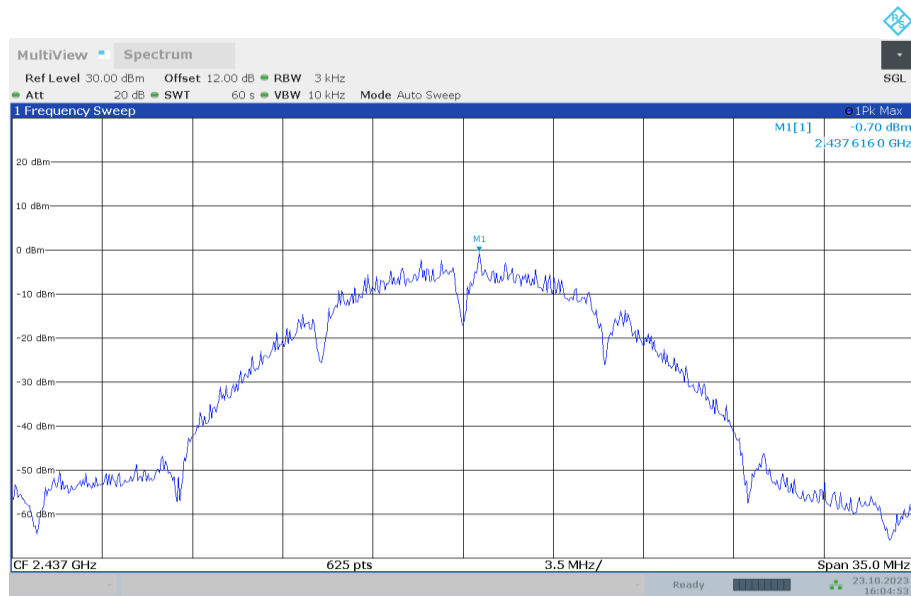
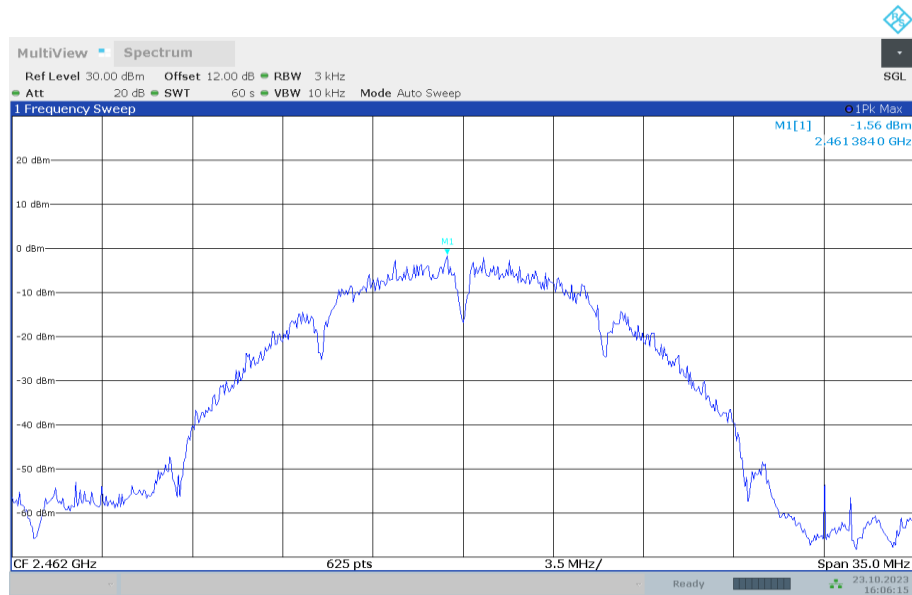
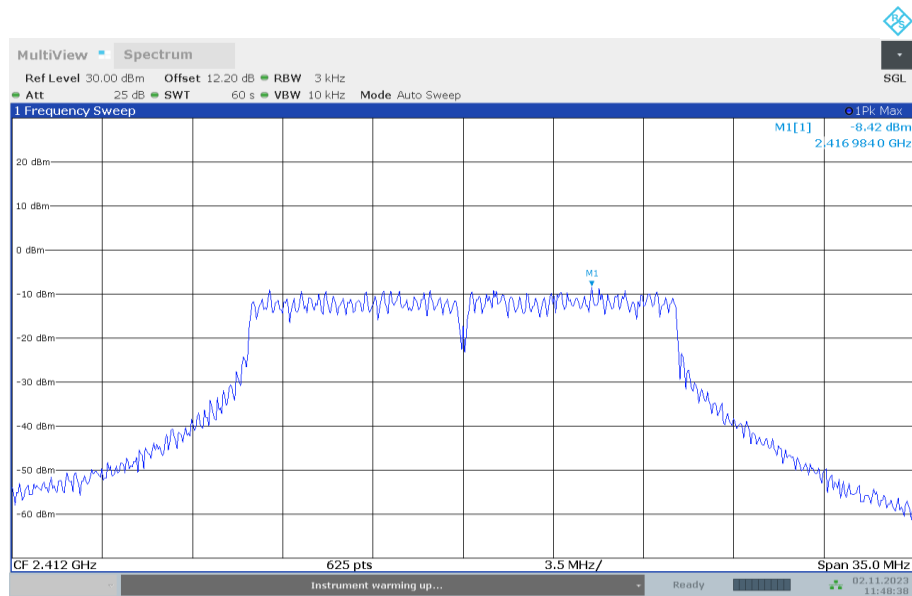


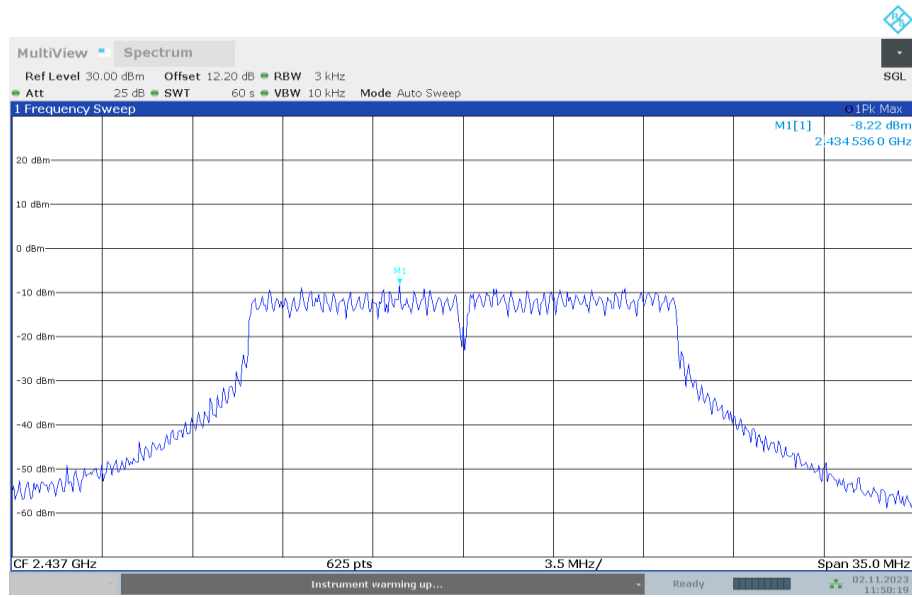
Fig.A.3.2 Power Spectral Density (802.11b, Ch 6)



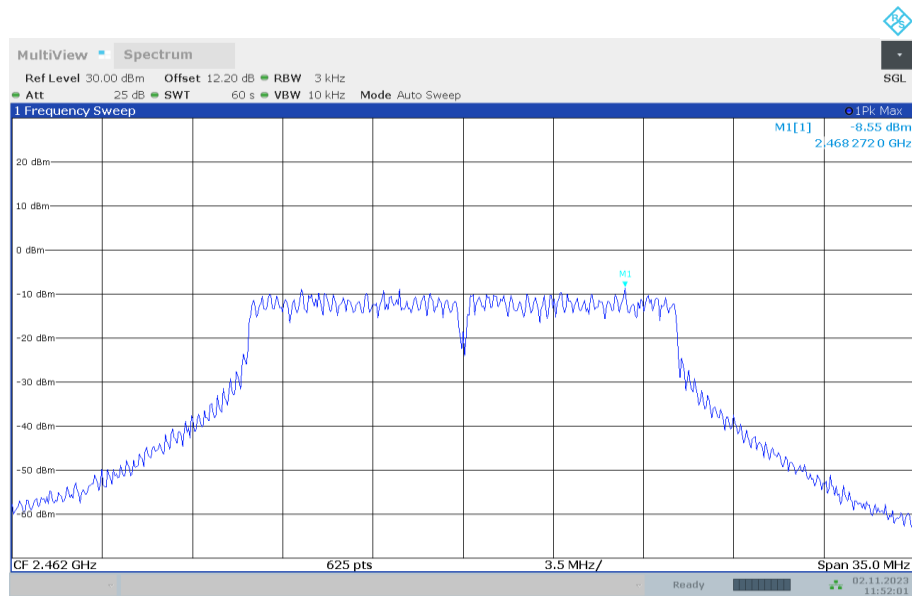
**Fig.A.3.3 Power Spectral Density (802.11b, Ch 11)**



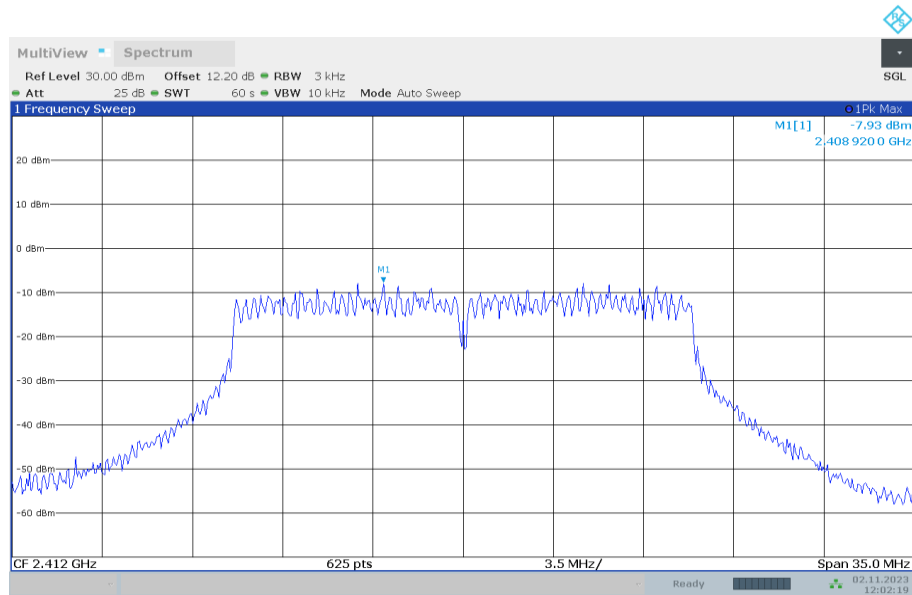
**Fig.A.3.4 Power Spectral Density (802.11g, Ch 1)**



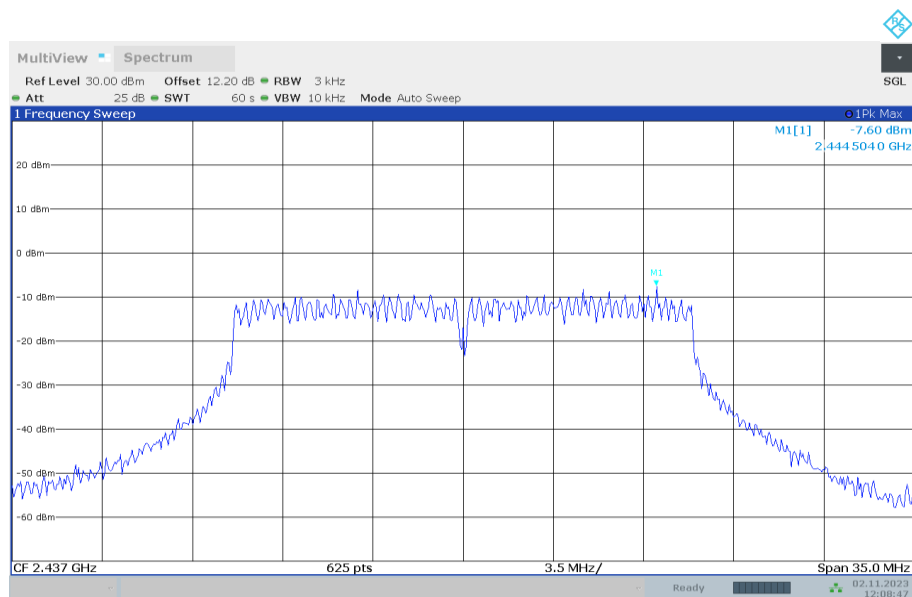
**Fig.A.3.5 Power Spectral Density (802.11g, Ch 6)**



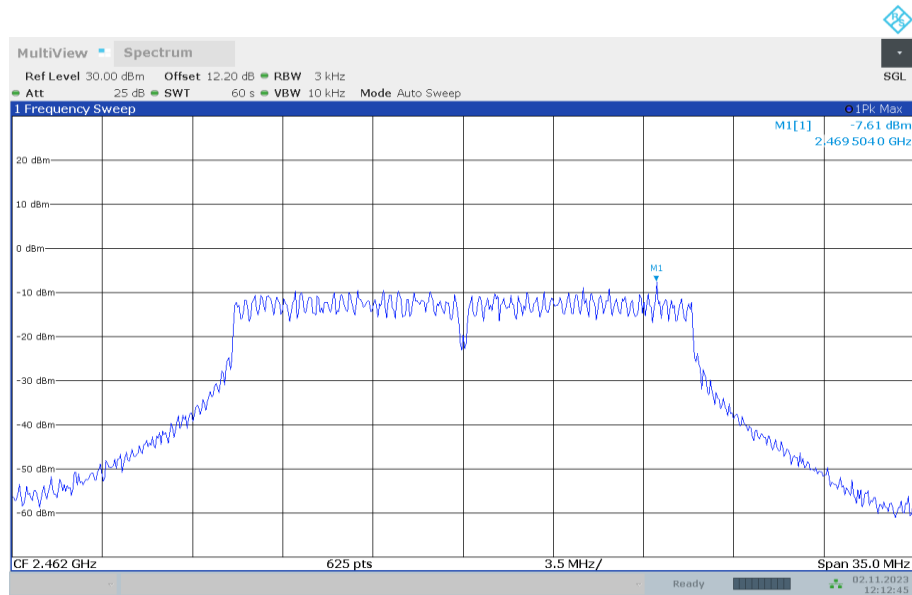
**Fig.A.3.6 Power Spectral Density (802.11g, Ch 11)**



**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)**

**Conclusion: Pass**

#### **A.4. DTS 6-dB Signal Bandwidth**

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

- a) Set RBW = 100 kHz.
- b) Set the video bandwidth (VBW) = 300 kHz.
- c) Detector = Peak.
- d) Trace mode = max hold.
- e) Sweep = auto couple.
- f) Allow the trace to stabilize.
- g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

**Measurement Limit:**

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

**EUT ID: UT28a**

**Measurement Result:**

**802.11b/g mode**

Mode	Channel	DTS Bandwidth ( MHz)		conclusion
802.11b	1	Fig.A.4.1	9.55	<b>P</b>
	6	Fig.A.4.2	8.56	<b>P</b>
	11	Fig.A.4.3	9.05	<b>P</b>
802.11g	1	Fig.A.4.4	16.44	<b>P</b>
	6	Fig.A.4.5	16.45	<b>P</b>
	11	Fig.A.4.6	16.45	<b>P</b>

**802.11n-HT20 mode**

Mode	Channel	DTS Bandwidth ( MHz)		conclusion
802.11n (HT20)	1	Fig.A.4.7	17.68	<b>P</b>
	6	Fig.A.4.8	17.68	<b>P</b>
	11	Fig.A.4.9	17.68	<b>P</b>

**Test graphs as below:**

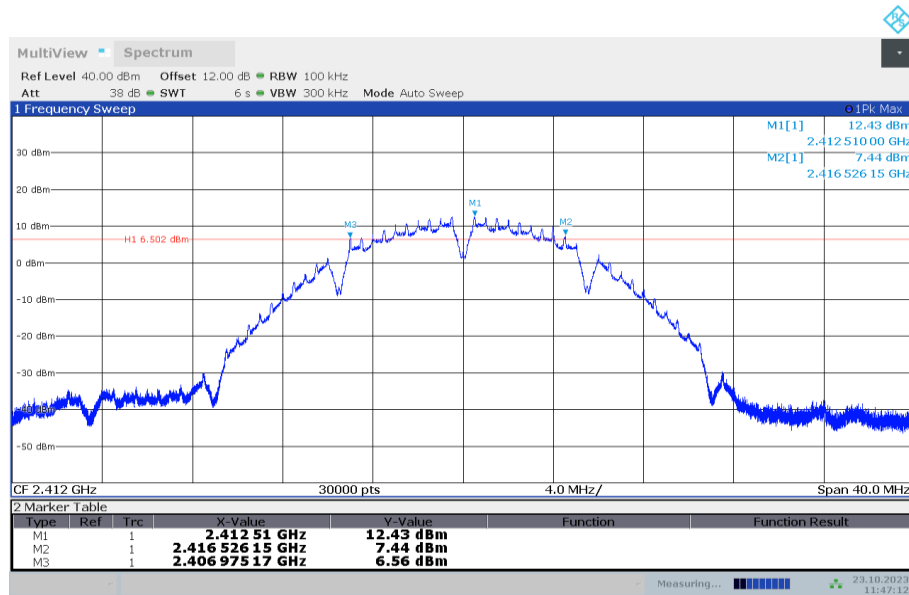


Fig.A.4.1 DTS Bandwidth(802.11b,Ch 1)

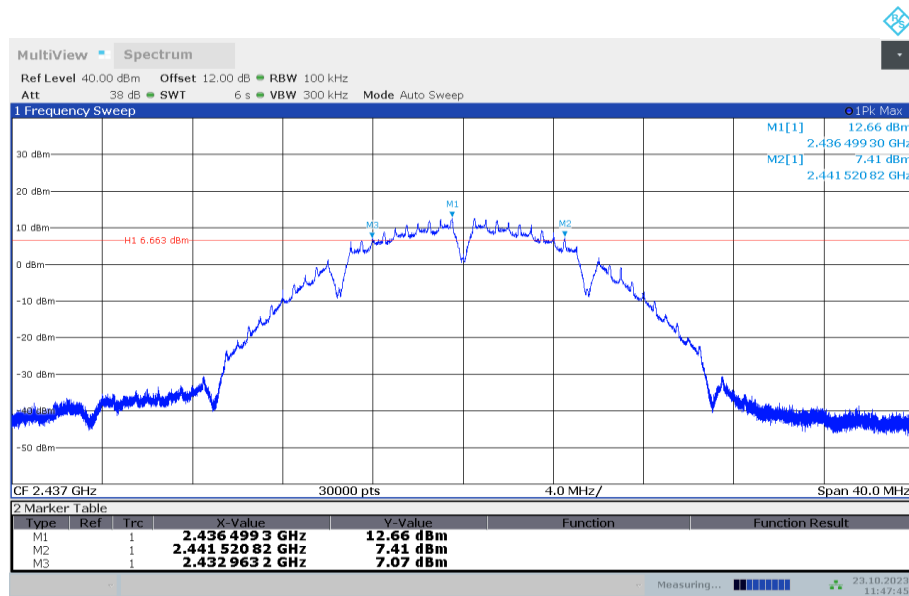


Fig.A.4.2 DTS Bandwidth (802.11b, Ch 6)

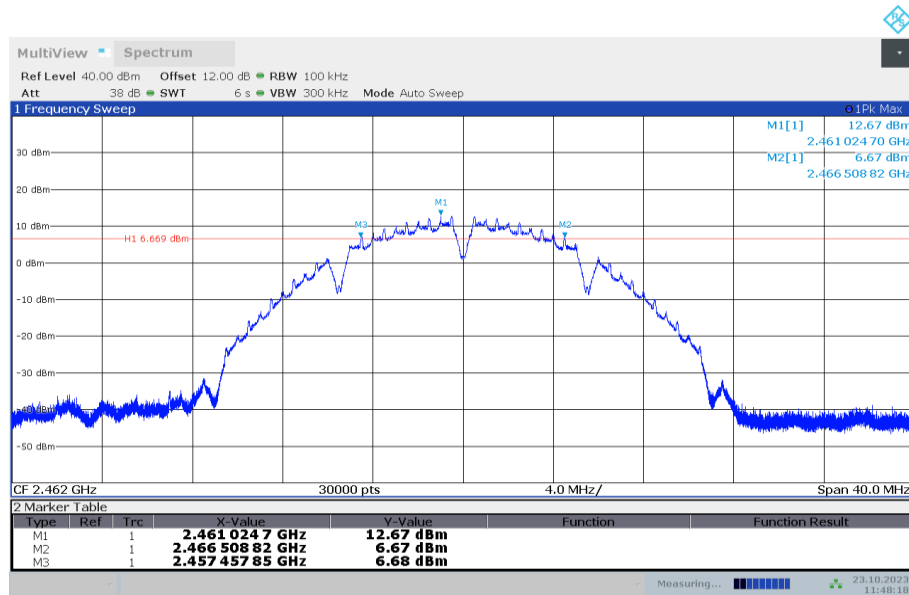


Fig.A.4.3 DTS Bandwidth (802.11b, Ch 11)

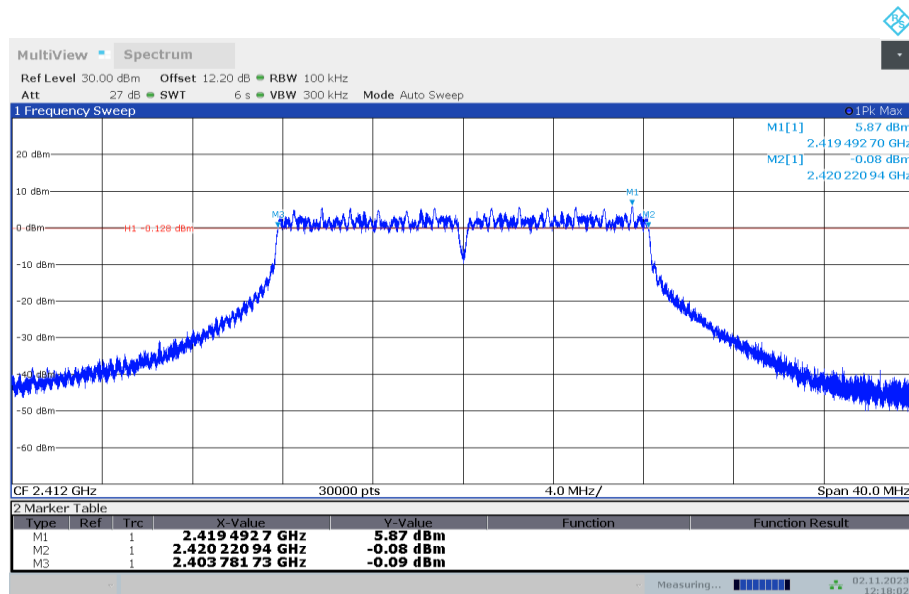


Fig.A.4.4 DTS Bandwidth (802.11g, Ch 1)



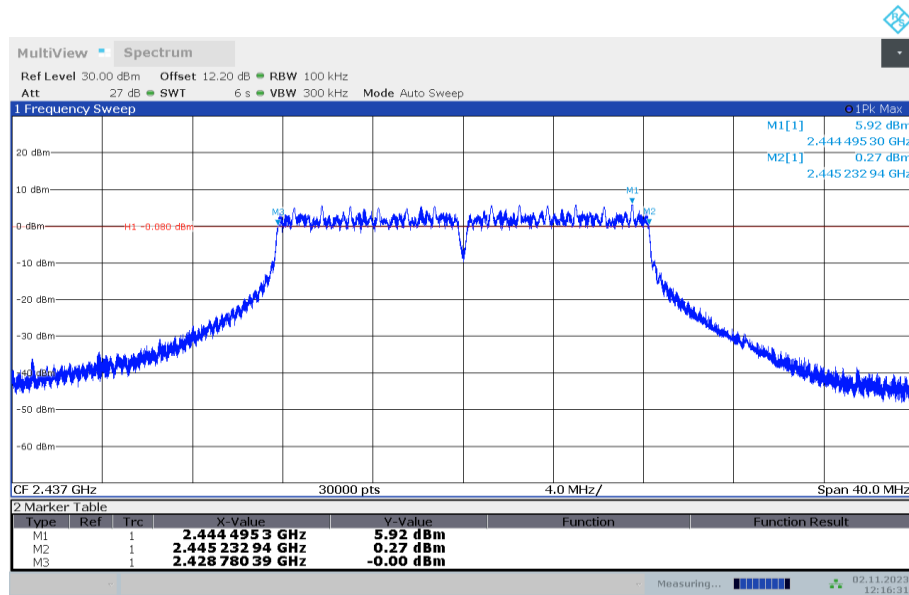


Fig.A.4.5 DTS Bandwidth (802.11g, Ch 6)

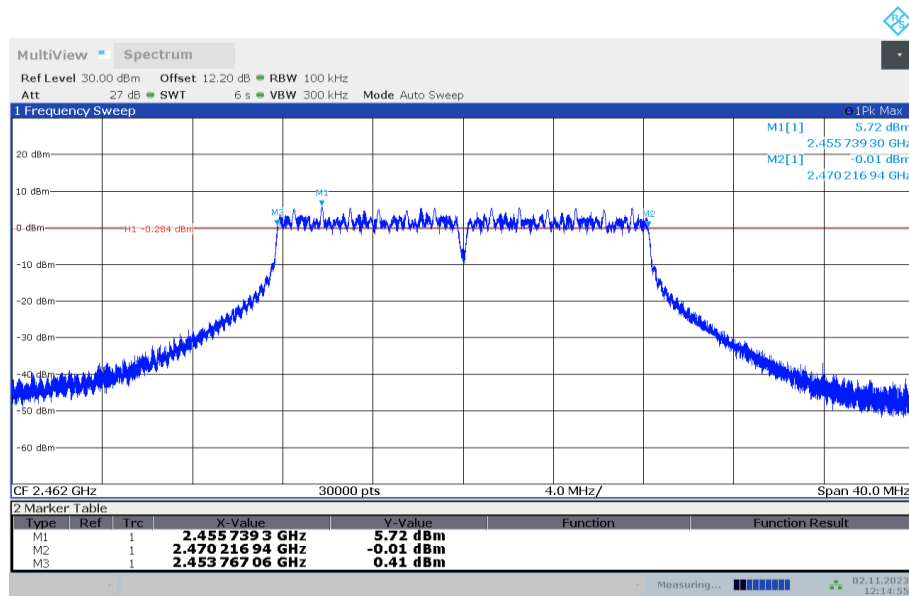


Fig.A.4.6 DTS Bandwidth (802.11g, Ch 11)

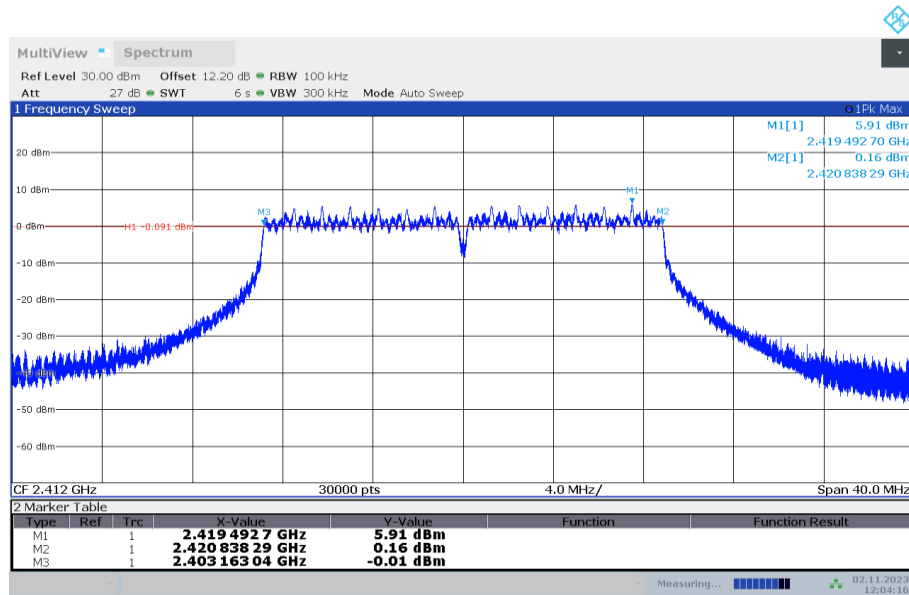


Fig.A.4.7 DTS Bandwidth (802.11n-20MHz, Ch 1)

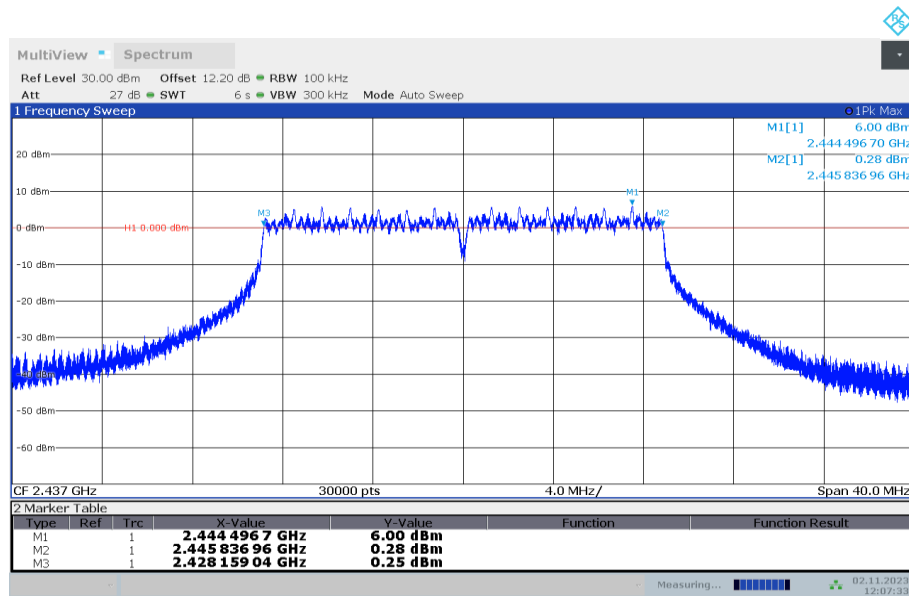


Fig.A.4.8 DTS Bandwidth (802.11n-HT20, Ch 6)

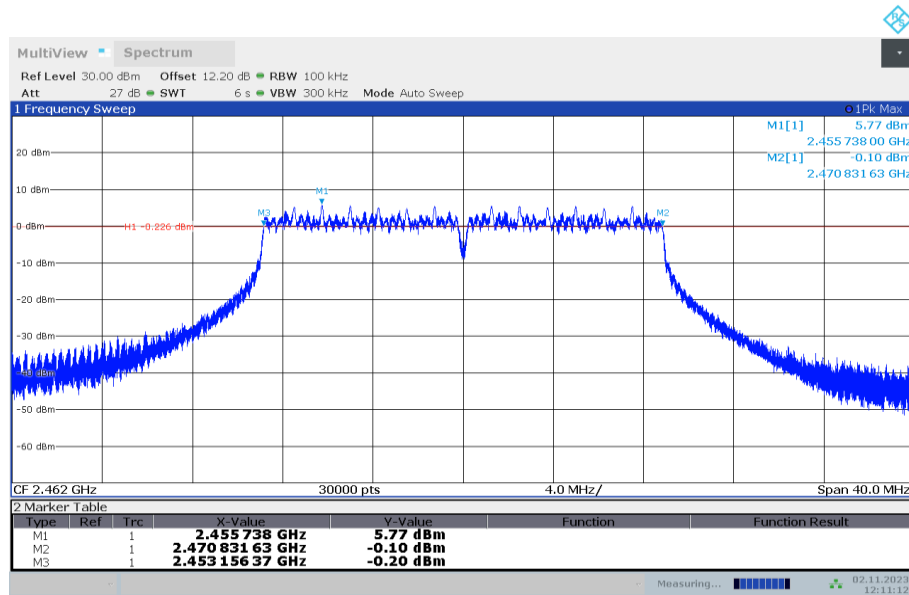


Fig.A.4.9 DTS Bandwidth (802.11n-HT20, Ch 11)

Conclusion: Pass

## **A.5. Band Edges Compliance**

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

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

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

### **Measurement Limit:**

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

**EUT ID: UT28a**

### **Measurement Result:**

#### **802.11b/g mode**

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

#### **802.11n-HT20 mode**

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

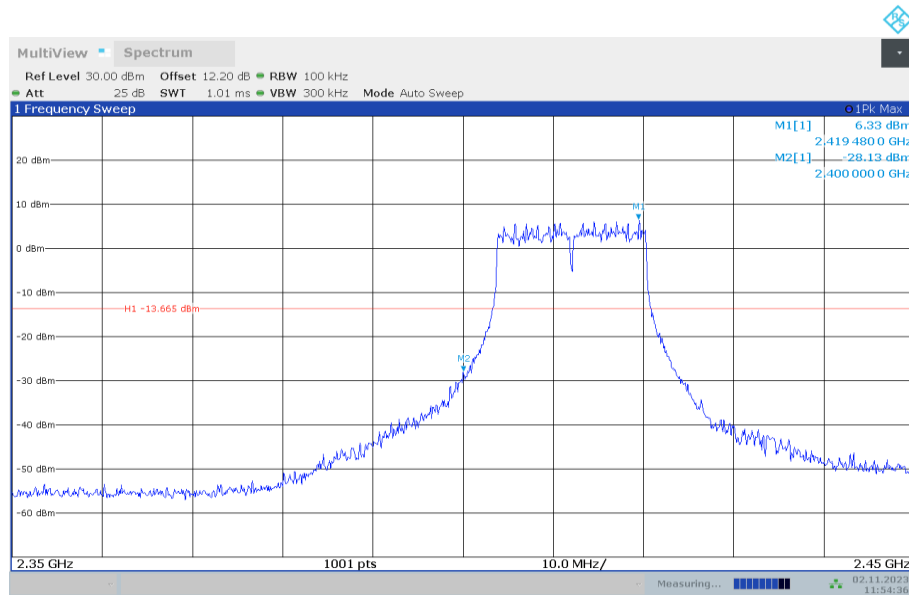
**Test graphs as below:**



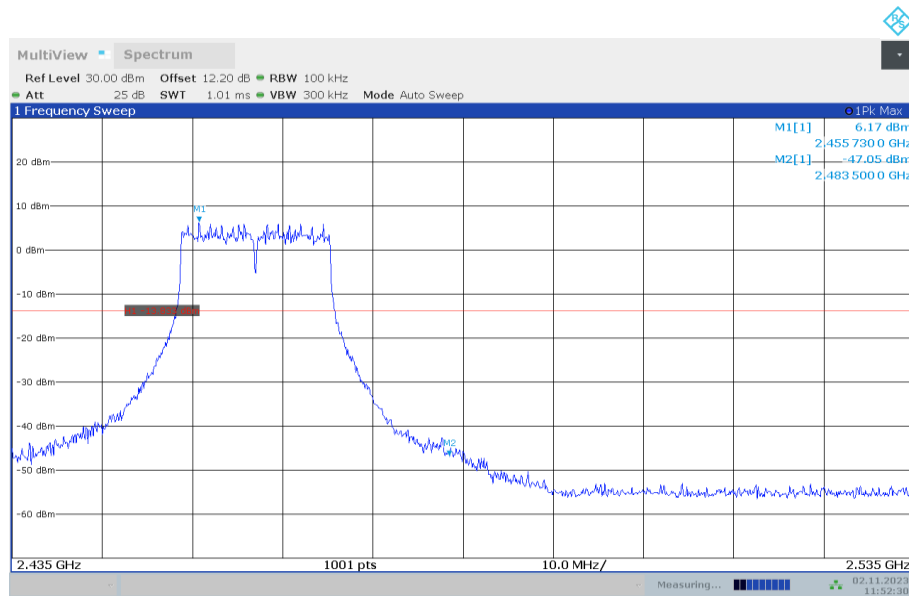
Fig.A.5.1 Band Edges (802.11b, Ch 1)



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)**

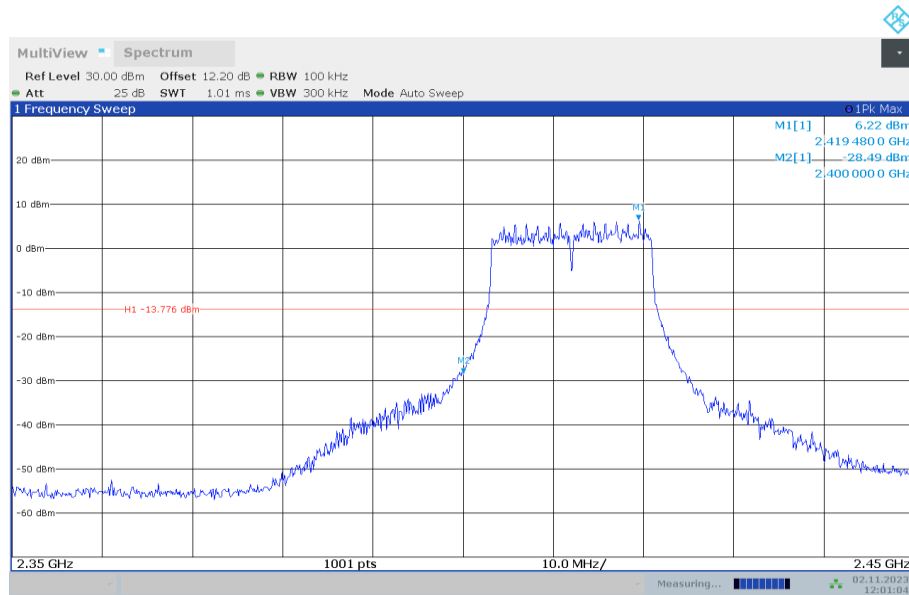


Fig.A.5.5 Band Edges (802.11n-HT20, Ch 1)

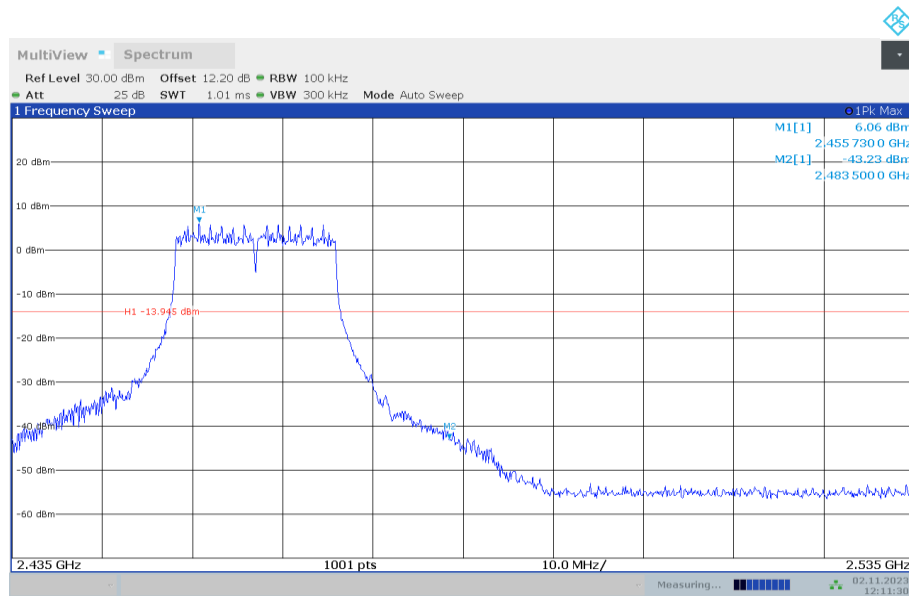


Fig.A.5.6 Band Edges (802.11n-HT20, Ch 11)

Conclusion: Pass

## **A.6. Transmitter Spurious Emission**

### **A.6.1 Transmitter Spurious Emission – Conducted**

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

Establish a reference level by using the following procedure:

- a) Set instrument center frequency to DTS channel center frequency
- b) Set the span to  $\geq 1.5$  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:**

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

**EUT ID: UT28a**

**Measurement Results:**



**802.11b mode**

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

**802.11g mode**

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

**802.11n-HT20 mode**

MODE	Channel	Frequency Range	Test Results	Conclusion
802.11n (HT20)	1	2.412 GHz	Fig.A.6.1.1	<b>P</b>
		30 MHz ~ 1 GHz	Fig.A.6.1.2	<b>P</b>
		1 GHz ~ 26.5 GHz	Fig.A.6.1.3	<b>P</b>
	6	2.437 GHz	Fig.A.6.1.4	<b>P</b>
		30 MHz ~ 1 GHz	Fig.A.6.1.5	<b>P</b>
		1 GHz ~ 26.5 GHz	Fig.A.6.1.6	<b>P</b>
	11	2.462 GHz	Fig.A.6.1.7	<b>P</b>
		30 MHz ~ 1 GHz	Fig.A.6.1.8	<b>P</b>
		1 GHz ~ 26.5 GHz	Fig.A.6.1.9	<b>P</b>

Test graphs as below:

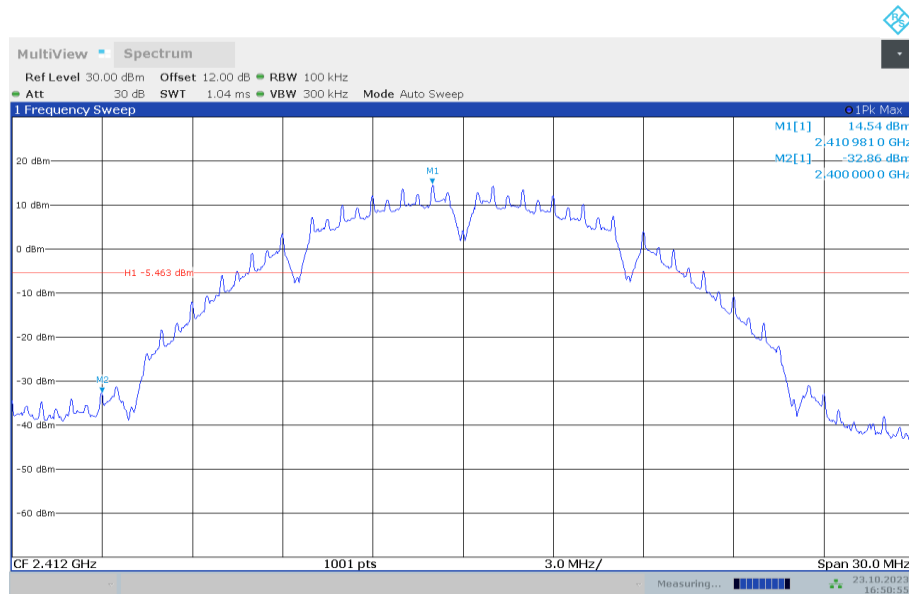


Fig.A.6.1.1 Transmitter Spurious Emission - Conducted (802.11b, Ch1, Center Frequency)

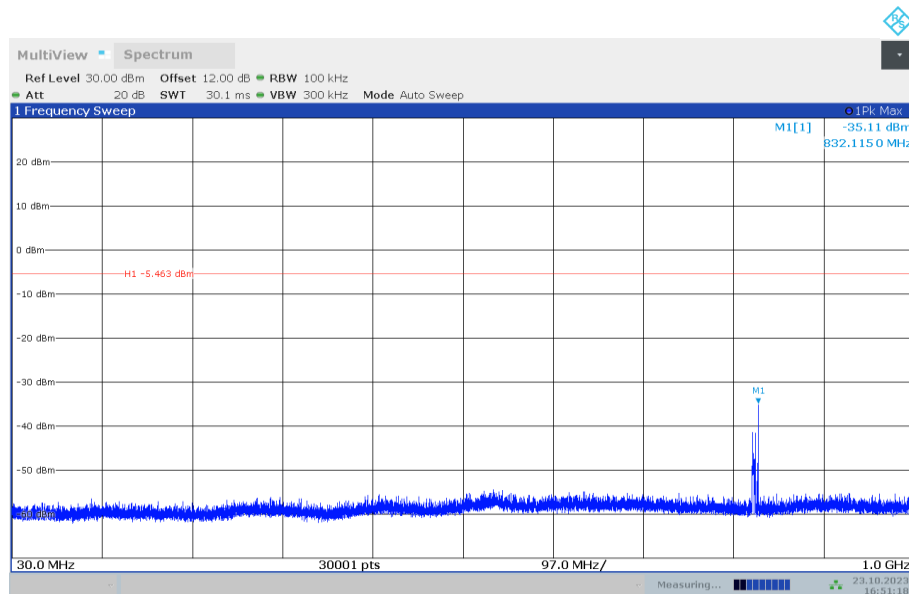
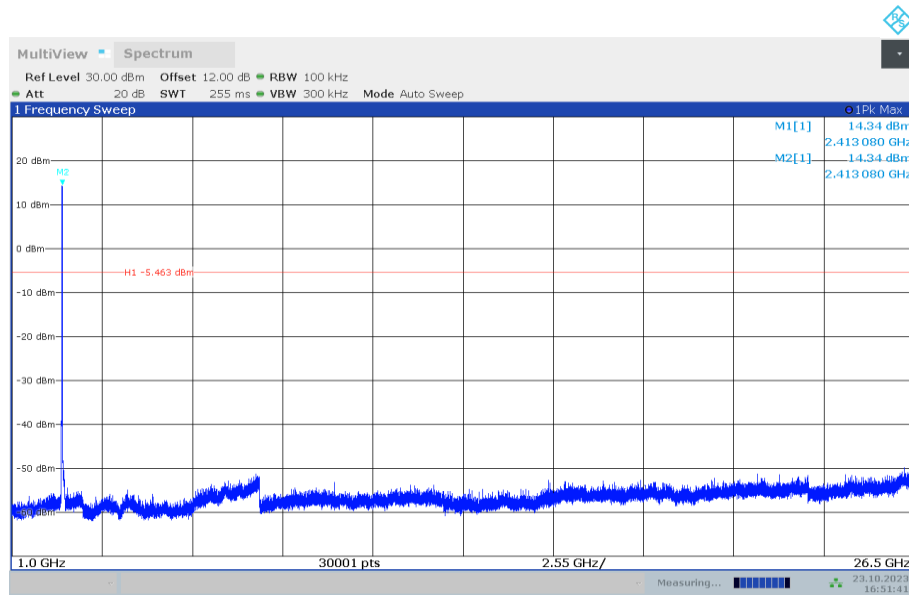
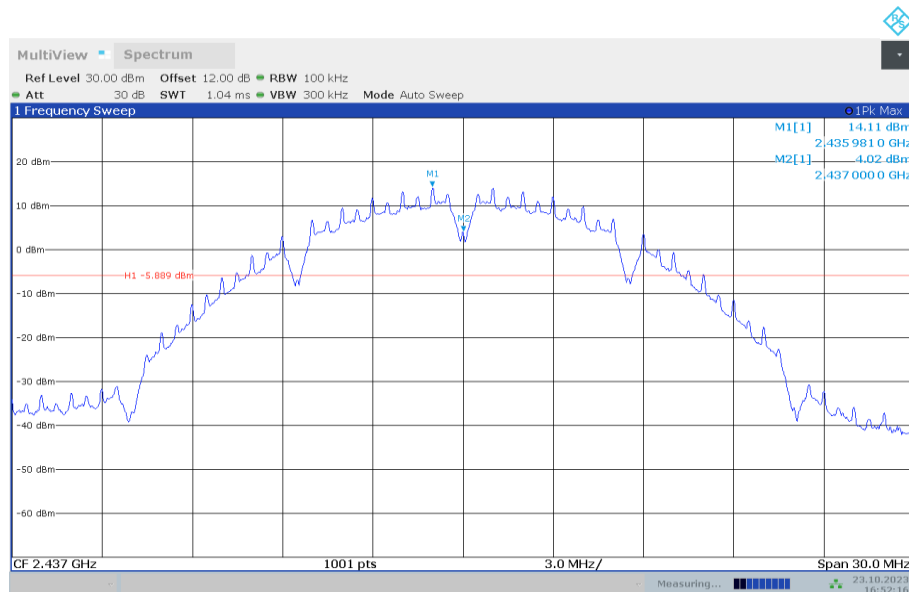


Fig.A.6.1.2 Transmitter Spurious Emission - Conducted (802.11b, Ch1, 30 MHz-1 GHz)



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



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

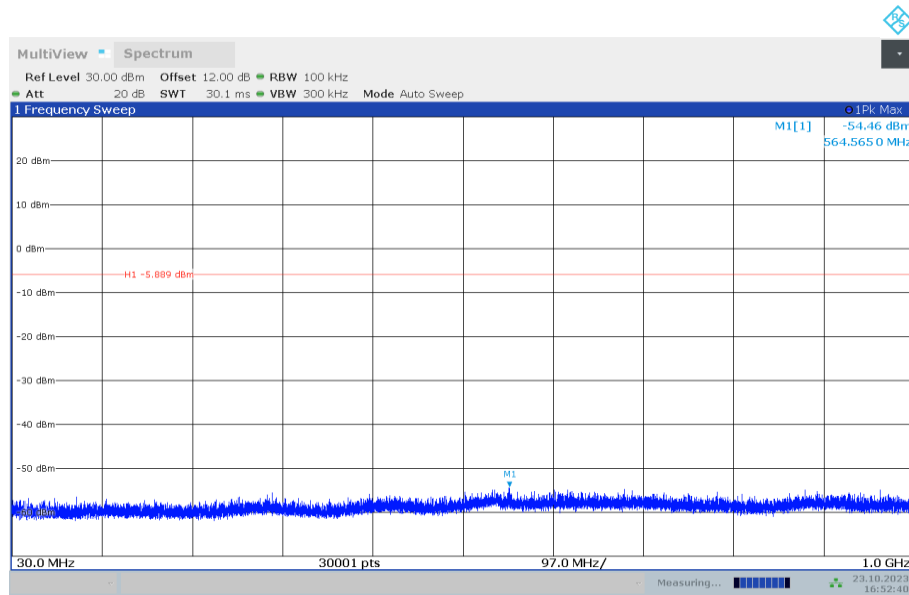


Fig.A.6.1.5 Transmitter Spurious Emission - Conducted (802.11b, Ch6, 30 MHz-1 GHz)

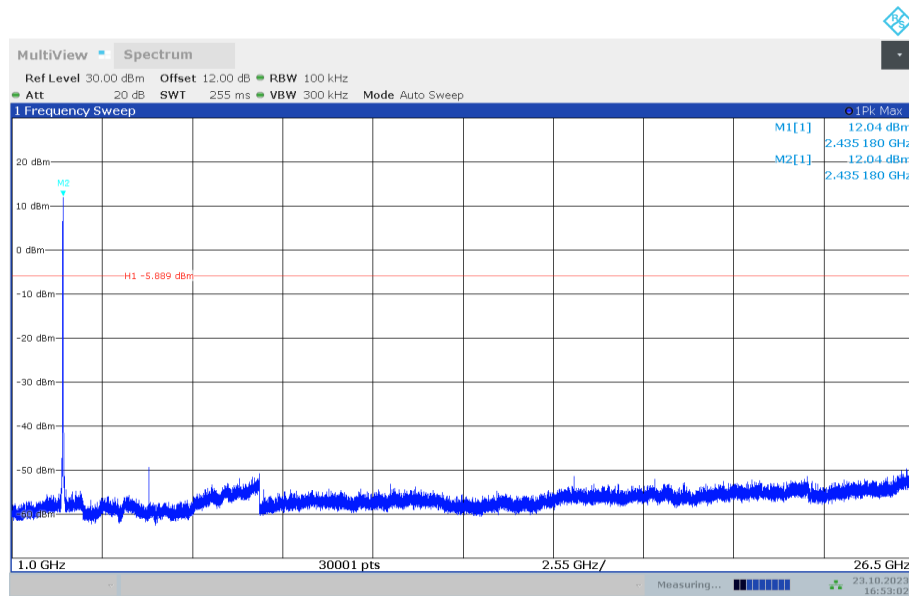
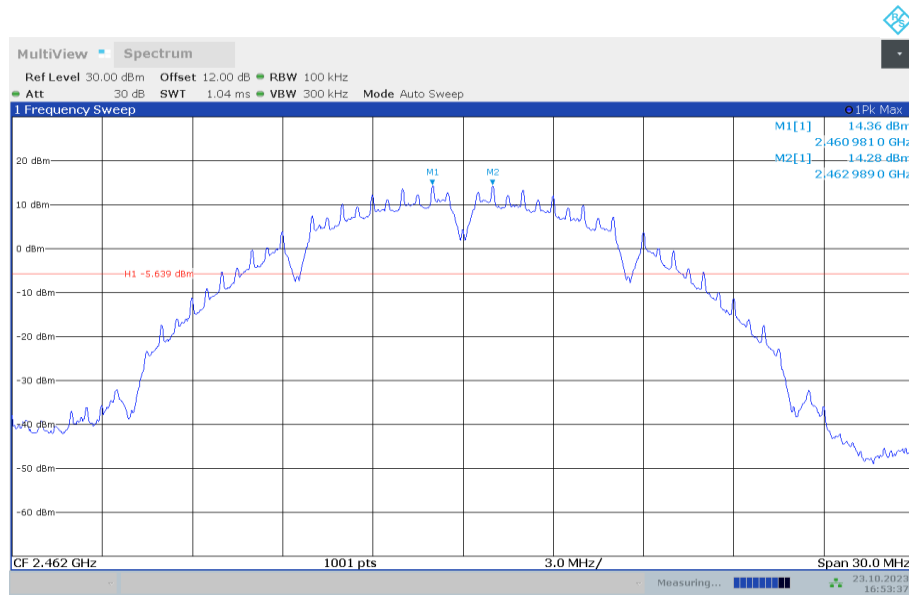
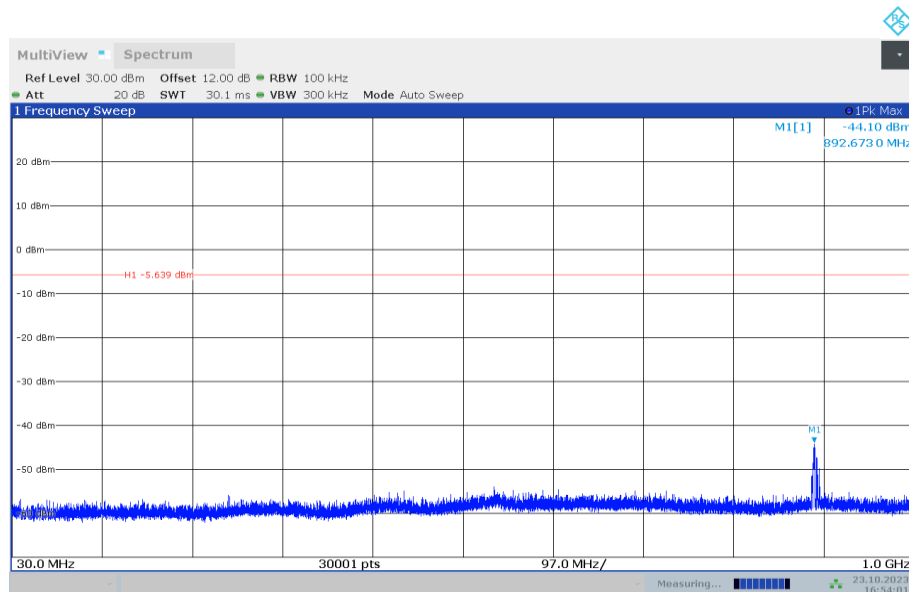


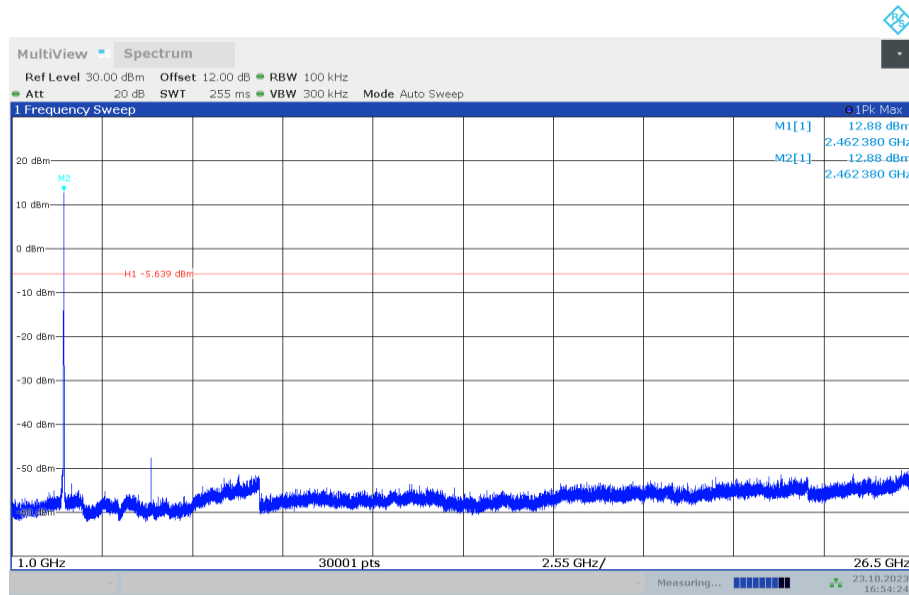
Fig.A.6.1.6 Transmitter Spurious Emission - Conducted (802.11b, Ch6, 1 GHz-26.5 GHz)



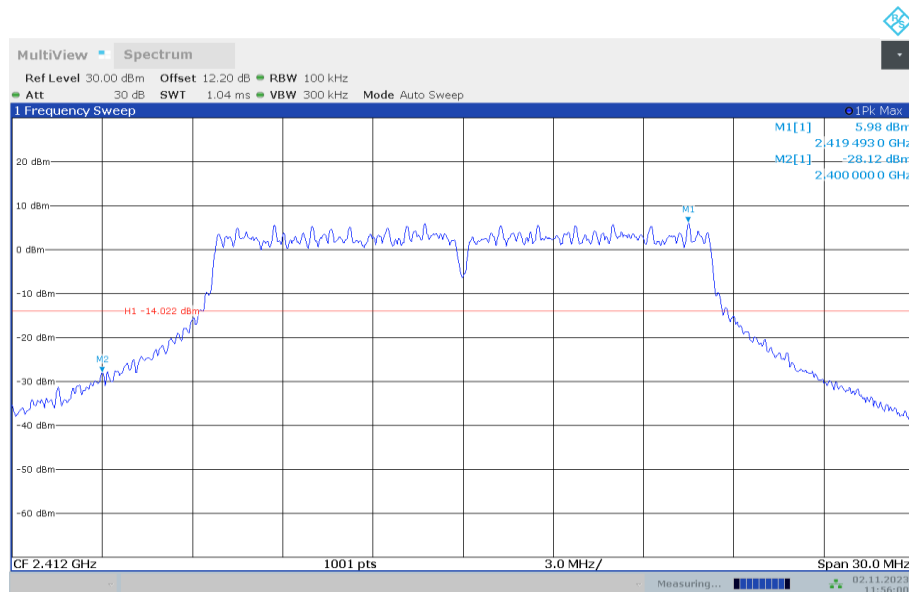
**Fig.A.6.1.7 Transmitter Spurious Emission - Conducted (802.11b, Ch11, Center Frequency)**



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



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



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

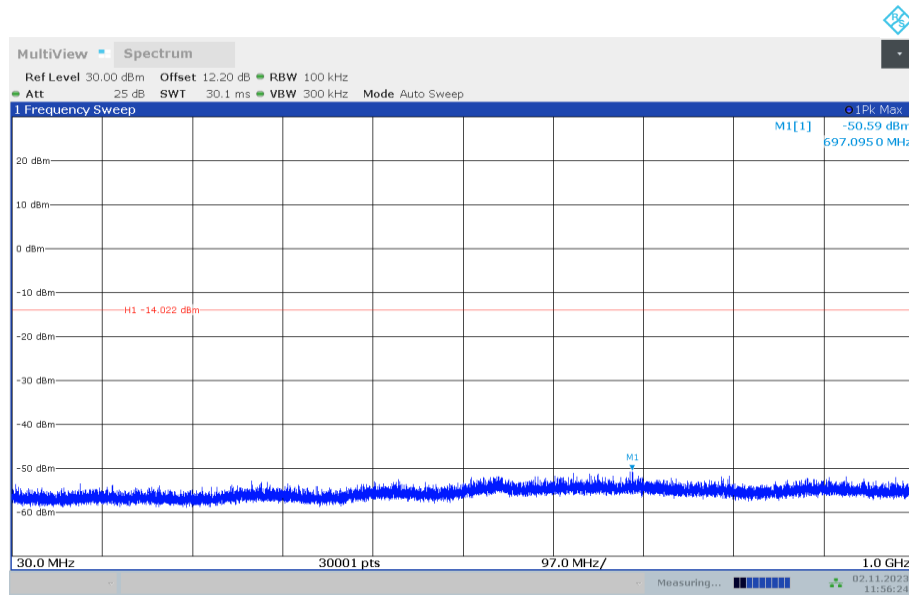


Fig.A.6.1.11 Transmitter Spurious Emission - Conducted (802.11g, Ch1, 30 MHz-1 GHz)

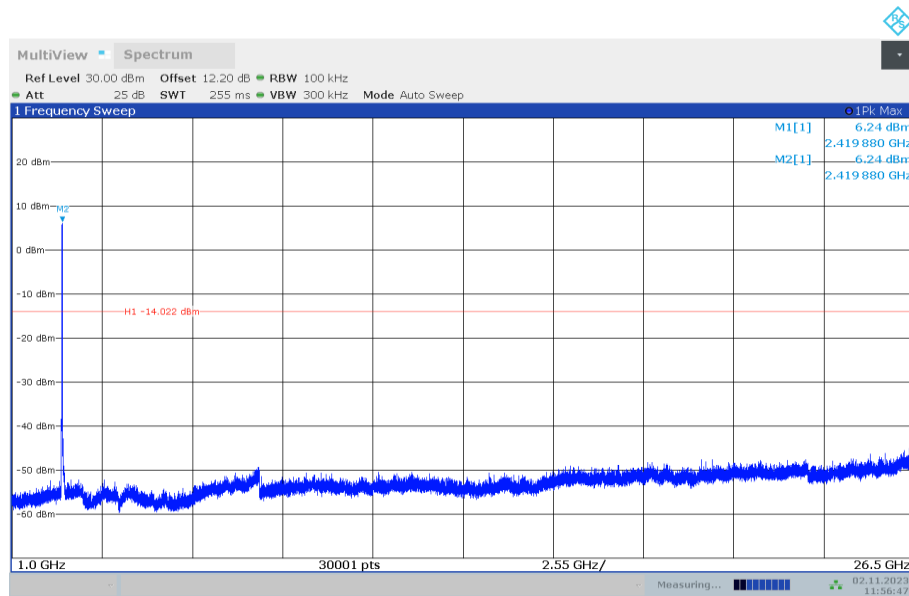
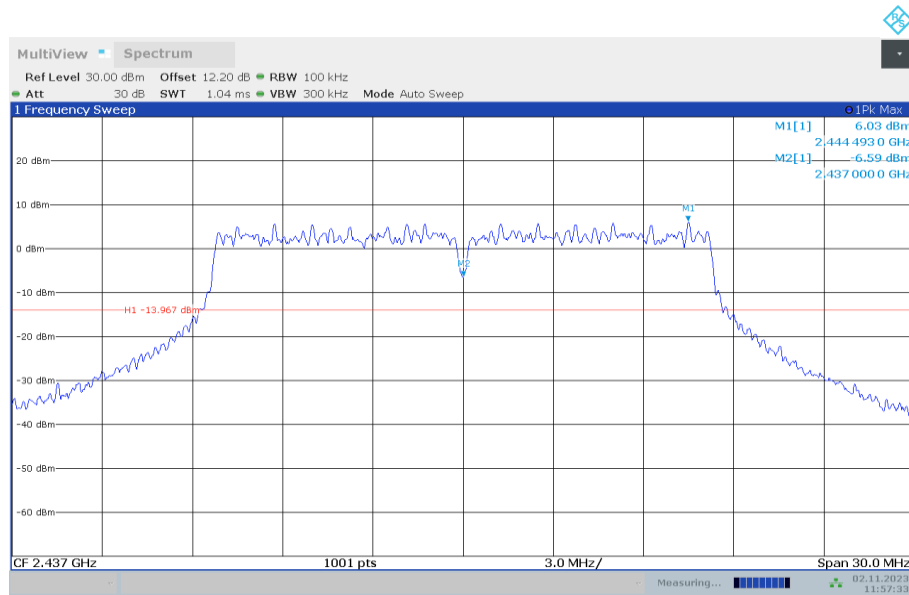
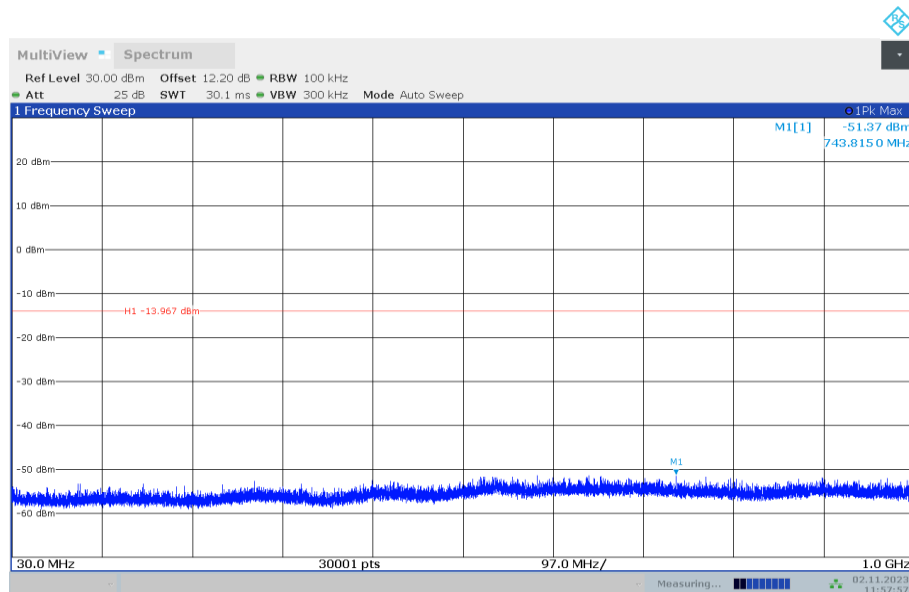


Fig.A.6.1.12 Transmitter Spurious Emission - Conducted (802.11g, Ch1, 1 GHz-26.5 GHz)

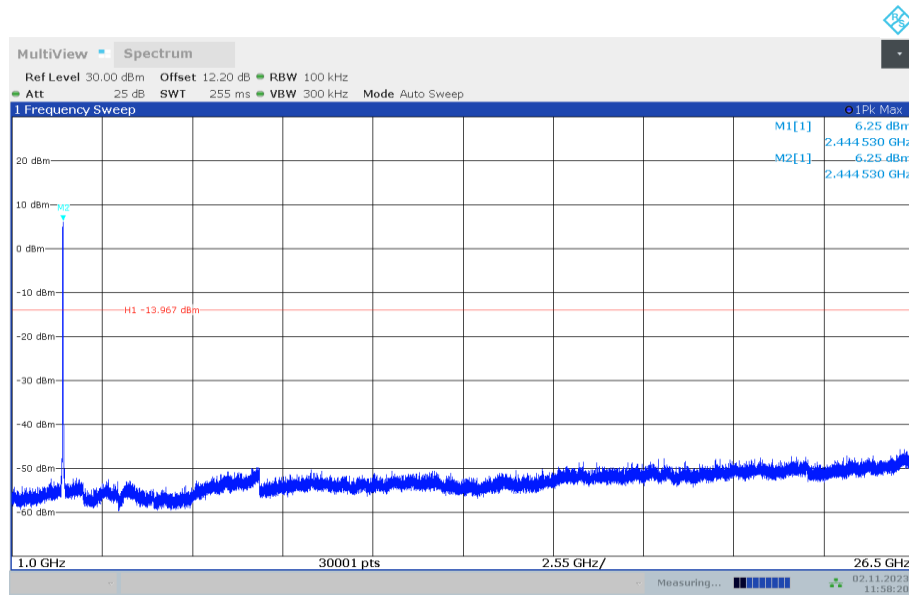


**Fig.A.6.1.13 Transmitter Spurious Emission - Conducted (802.11g, Ch6, Center Frequency)**

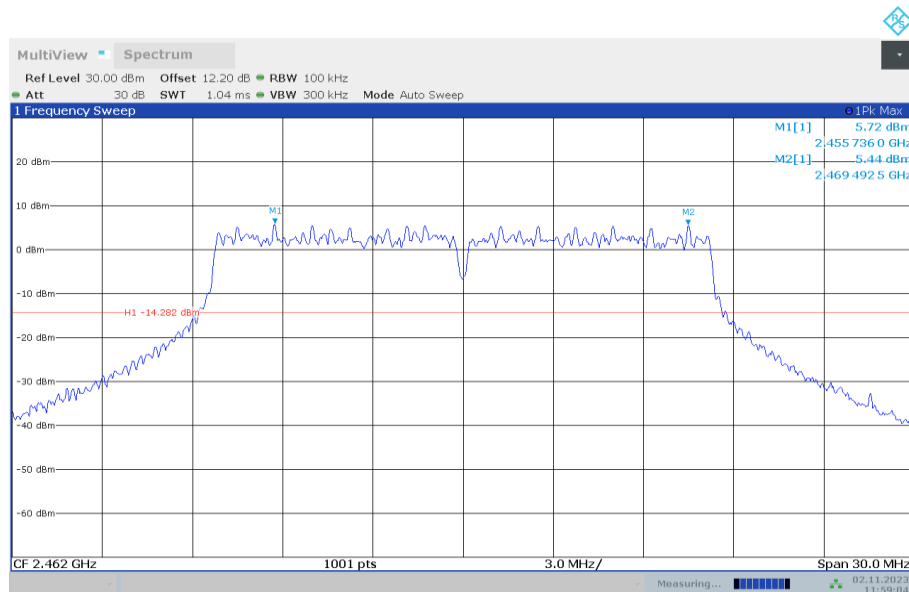


**Fig.A.6.1.14 Transmitter Spurious Emission - Conducted (802.11g, Ch6, 30 MHz-1 GHz)**

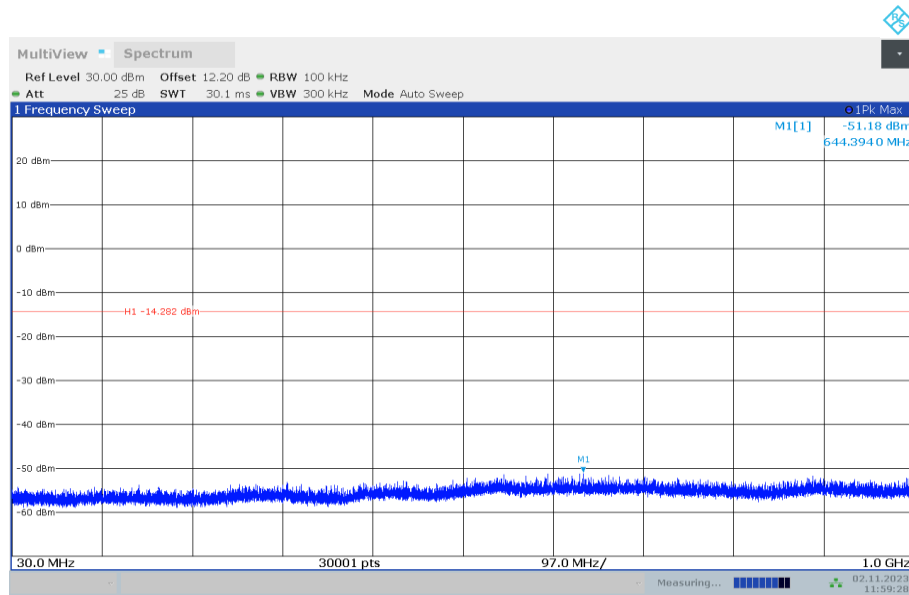




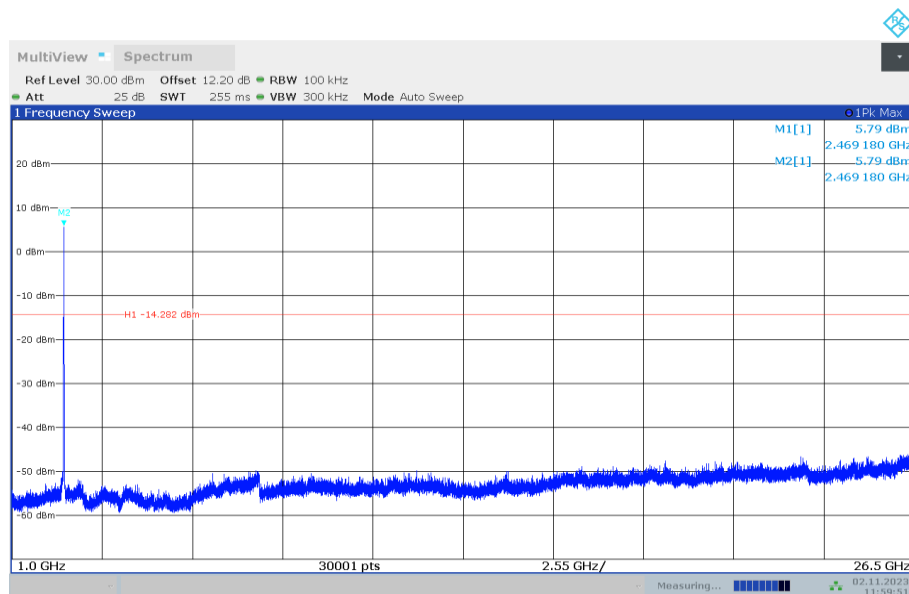
**Fig.A.6.1.15 Transmitter Spurious Emission - Conducted (802.11g, Ch6, 1 GHz-26.5 GHz)**



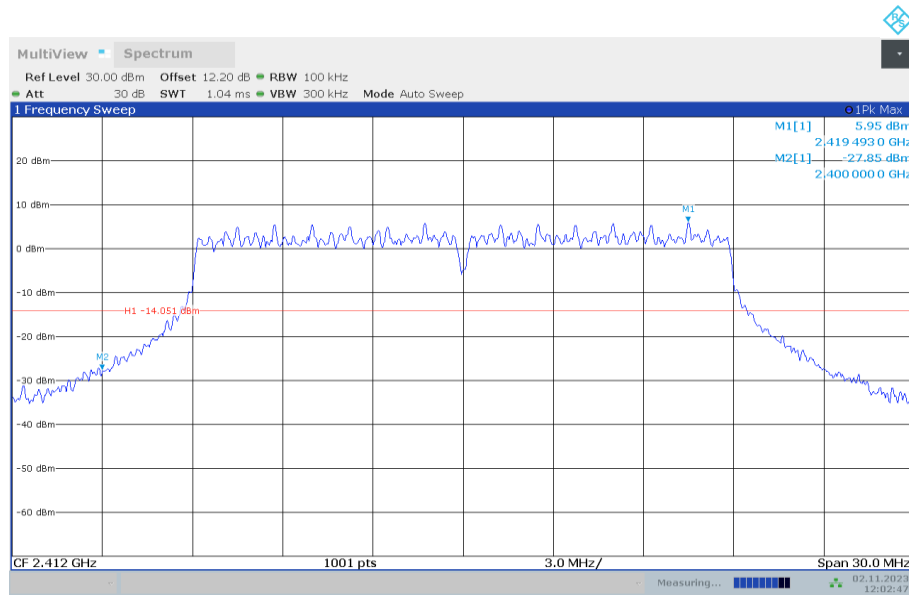
**Fig.A.6.1.16 Transmitter Spurious Emission - Conducted (802.11g, Ch11, Center Frequency)**



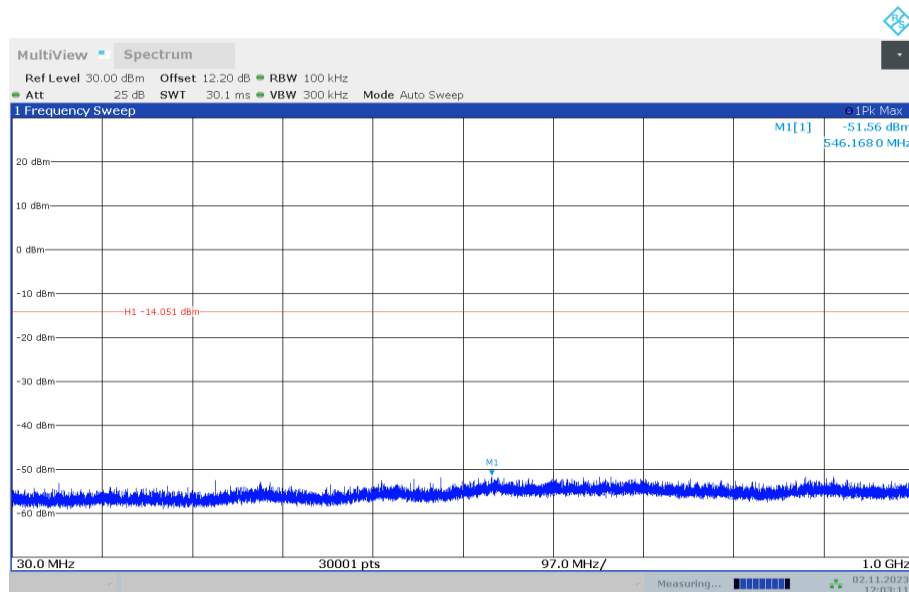
**Fig.A.6.1.17 Transmitter Spurious Emission - Conducted (802.11g, Ch11, 30 MHz-1 GHz)**



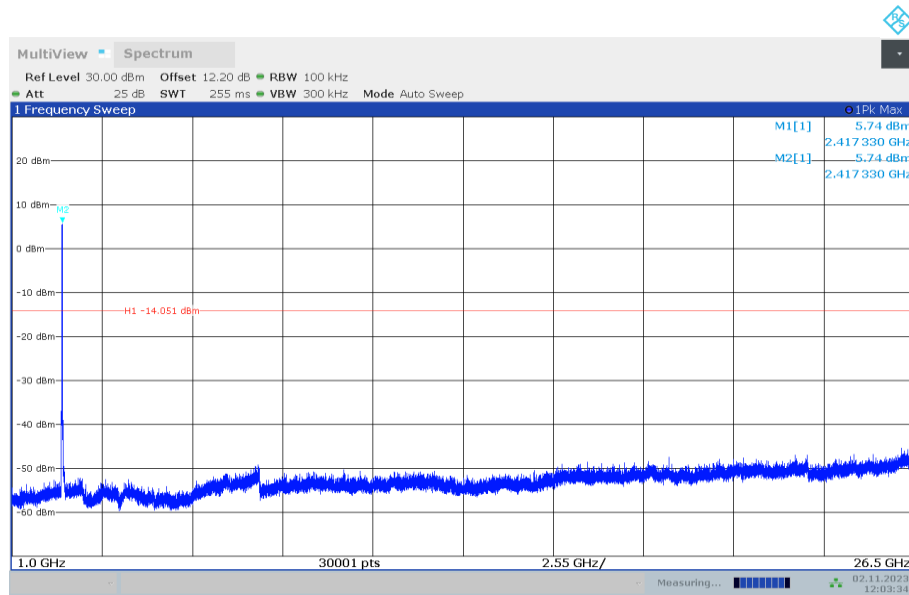
**Fig.A.6.1.18 Transmitter Spurious Emission - Conducted (802.11g, Ch11, 1 GHz-26.5 GHz)**



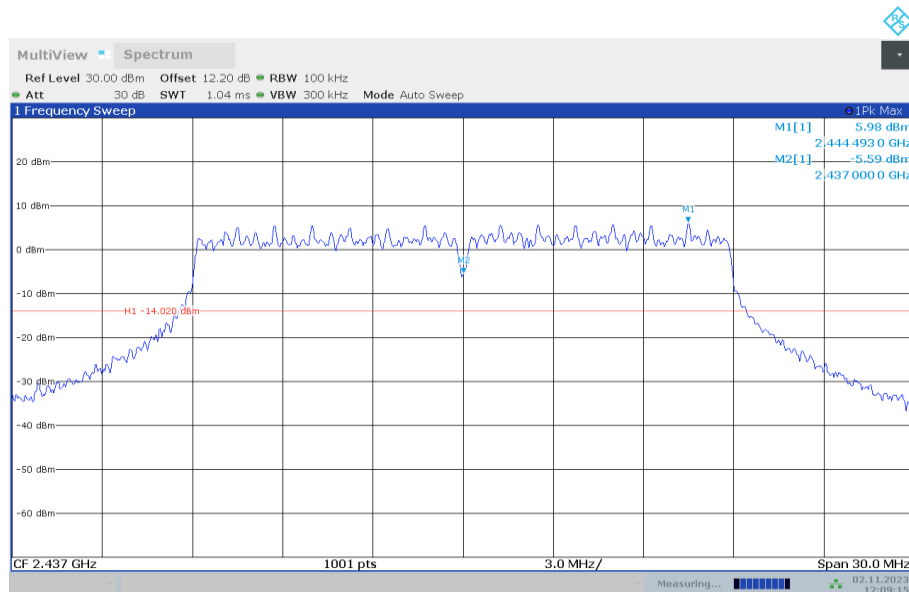
**Fig.A.6.1.19 Transmitter Spurious Emission - Conducted (802.11n-HT20, Ch1, Center Frequency)**



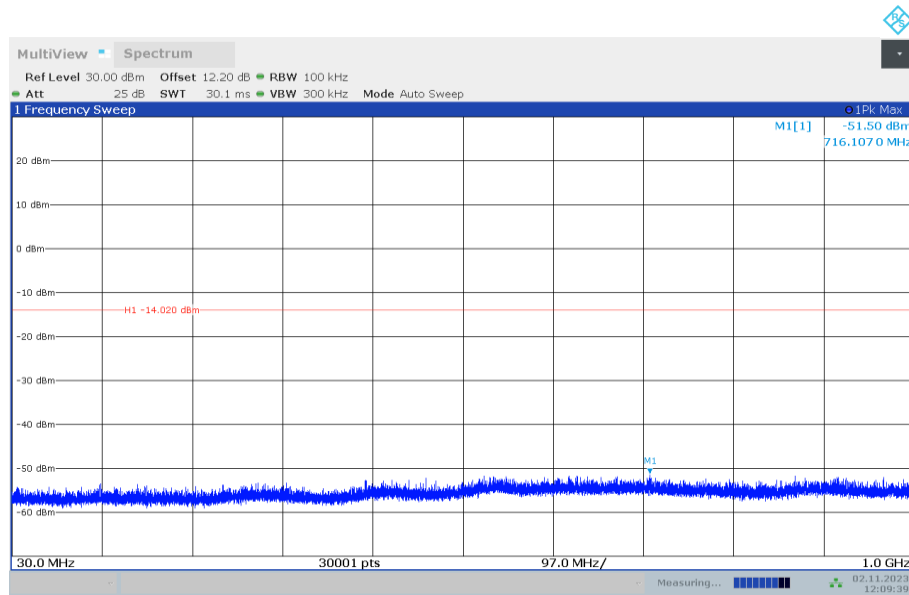
**Fig.A.6.1.20 Transmitter Spurious Emission - Conducted (802.11n-HT20, Ch1, 30 MHz-1 GHz)**



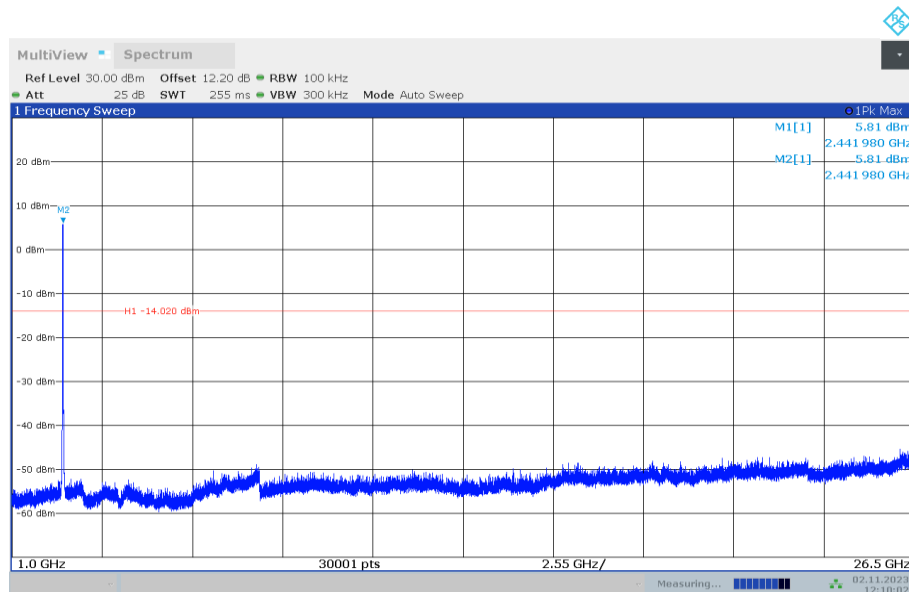
**Fig.A.6.1.21 Transmitter Spurious Emission - Conducted (802.11n-HT20, Ch1, 1 GHz-26.5 GHz)**



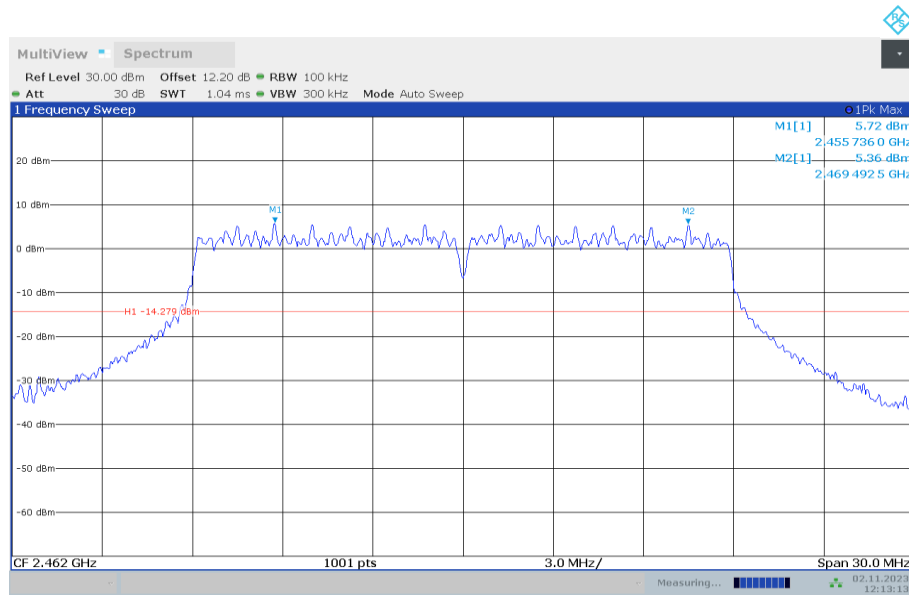
**Fig.A.6.1.22 Transmitter Spurious Emission - Conducted (802.11n-HT20, Ch6, Center Frequency)**



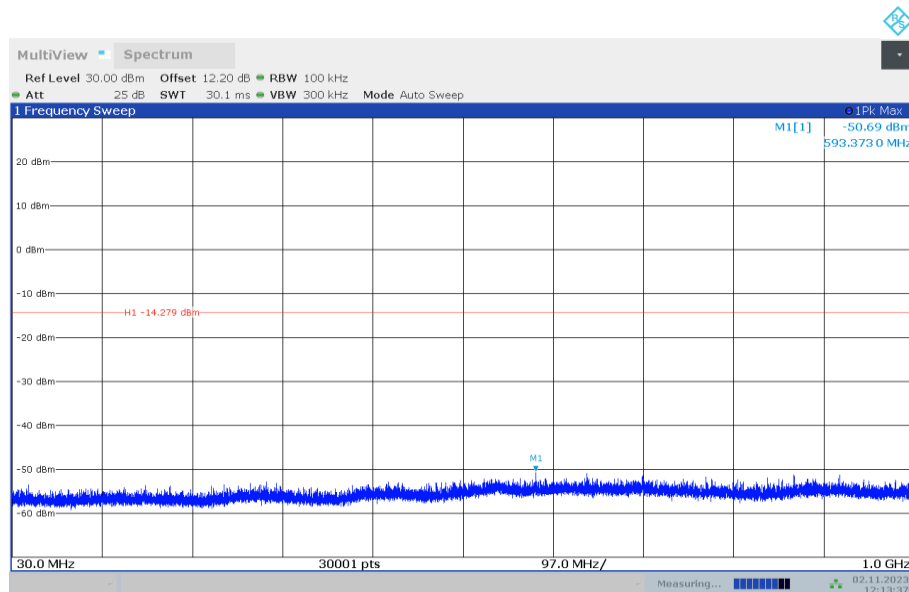
**Fig.A.6.1.23 Transmitter Spurious Emission - Conducted (802.11n-HT20, Ch6, 30 MHz-1 GHz)**



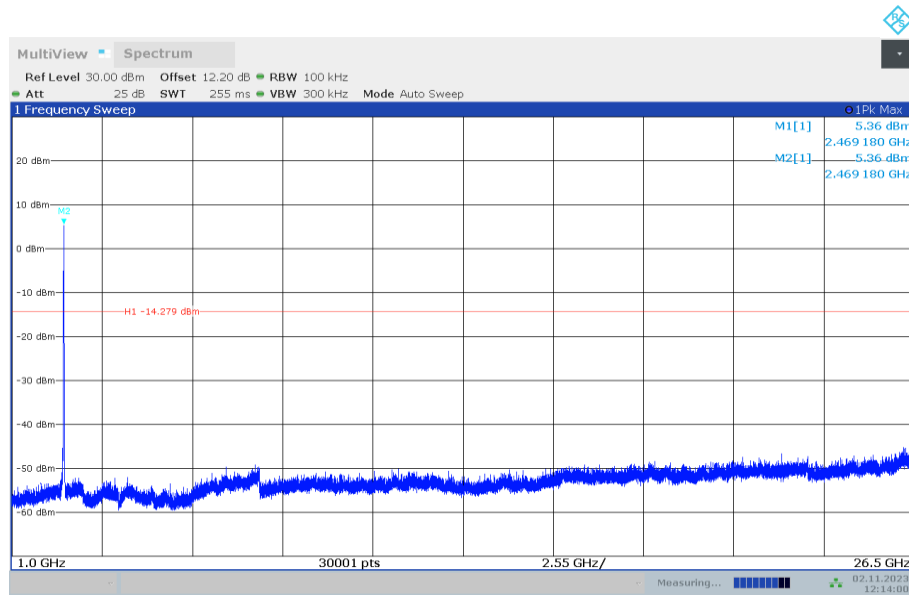
**Fig.A.6.1.24 Transmitter Spurious Emission - Conducted (802.11n-HT20, Ch6, 1 GHz-26.5 GHz)**



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



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



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

**Conclusion: Pass**

### A.6.2 Transmitter Spurious Emission - Radiated

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

**Measurement Limit:**

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

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

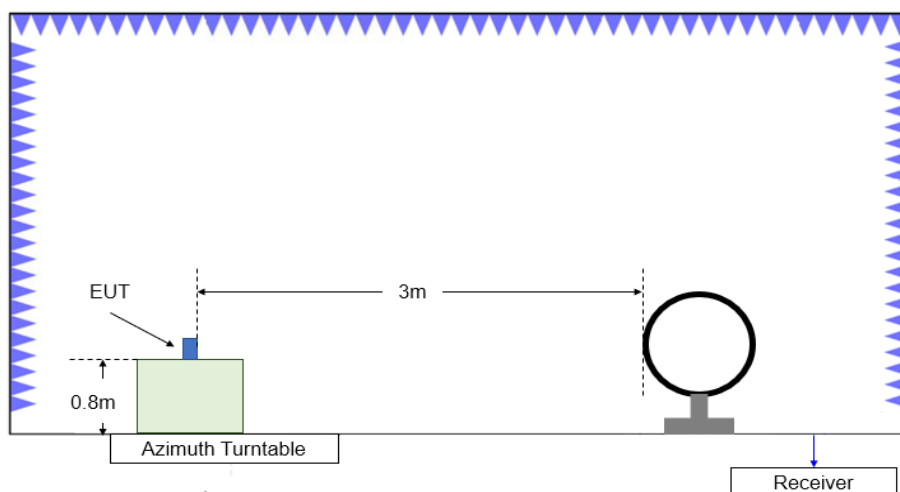
**Limit in restricted band:**

Frequency of emission (MHz)	Field strength (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

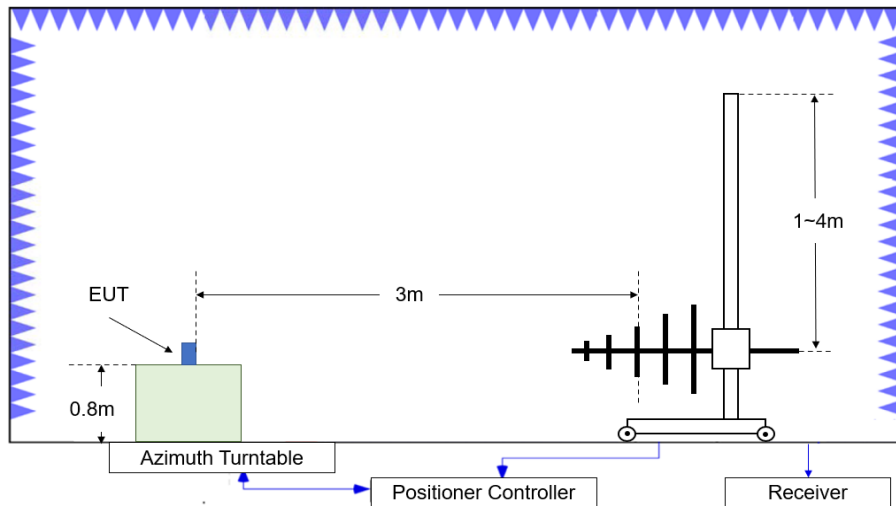
Note: When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor.

#### Test setup

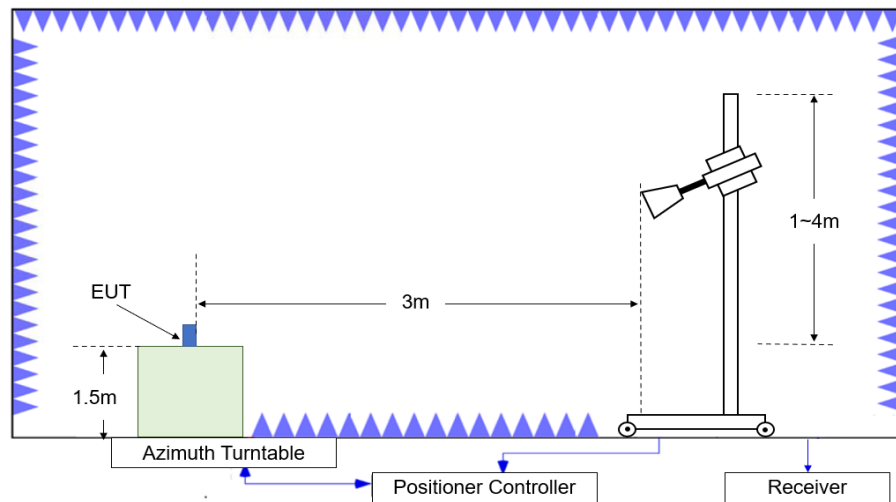


**Fig.A.6.2.1 Test Site Diagram (9kHz-30MHz)**





**Fig.A.6.2.2 Test Site Diagram (30MHz-1GHz)**



**Fig.A.6.2.3 Test Site Diagram (1GHz-40GHz)**

### Test Procedure

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

### Test setting

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

### Calculation

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

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

The measurement results are obtained as described below:

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

**Note**

1. The EUT is operating at its maximum duty cycle and its maximum power control level.
2. Investigation has been done on all modes and modulations/data rates. Only the radiated emissions of the configuration that produced the worst case emissions are reported in this section.
3. Spurious emissions for all channels were investigated and almost the same below 1GHz. According to FCC 47 CFR §15.31, emission levels are not report much lower than the limit by over 20dB
4. Measurement frequencies were performed from 9 kHz to the 10<sup>th</sup> harmonic of highest fundamental frequency.

**Measurement Results:**

**EUT ID: UT12a**

**802.11b mode**

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11b	1	2.31GHz~2.43GHz---L	Fig.A.6.2.4	<b>P</b>
	11	2.45GHz~2.50GHz---H	Fig.A.6.2.5	<b>P</b>

**802.11g mode**

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11g	1	2.31GHz~2.43GHz---L	Fig.A.6.2.6	<b>P</b>
	2	2.31GHz~2.43GHz---L	Fig.A.6.2.7	<b>P</b>
	10	2.45GHz~2.50GHz---H	Fig.A.6.2.8	<b>P</b>
	11	2.45GHz~2.50GHz---H	Fig.A.6.2.9	<b>P</b>

**802.11n-HT20 mode**

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11n (HT20)	1	2.31GHz~2.43GHz---L	Fig.A.6.2.10	<b>P</b>
	2	2.31GHz~2.43GHz---L	Fig.A.6.2.11	
	11	2.45GHz~2.50GHz---H	Fig.A.6.2.12	<b>P</b>

**Conclusion: Pass**

**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)
2385.220	57.10	5.66	27.67	23.77	74.00	16.90	V
2387.798	57.35	5.67	27.68	24.01	74.00	16.65	V
4824.000	42.12	-33.96	32.95	43.13	74.00	31.88	V
7236.000	44.19	-31.22	37.50	37.91	74.00	29.81	V
9648.000	46.03	-31.16	38.00	39.19	74.00	27.97	H
12060.000	45.33	-29.42	38.64	36.11	74.00	28.67	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)
2419.800	61.71	5.77	27.66	28.28	74.00	12.29	V
2455.200	59.91	5.69	27.62	26.60	74.00	14.09	H
4873.500	44.61	-33.59	33.00	45.21	74.00	29.39	H
7309.500	47.38	-31.37	37.60	41.16	74.00	26.62	H
9748.000	46.66	-31.15	38.10	39.71	74.00	27.34	V
12185.000	46.53	-29.44	38.69	37.29	74.00	27.47	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)
2484.845	57.36	5.71	27.74	23.91	74.00	16.64	H
2487.400	56.88	5.73	27.75	23.40	74.00	17.12	H
4923.500	48.57	-33.40	32.95	49.02	74.00	25.43	H
7386.000	44.71	-32.20	37.53	39.38	74.00	29.29	H
9848.000	44.64	-31.37	38.20	37.81	74.00	29.36	H
12310.000	46.25	-30.30	38.60	37.95	74.00	27.75	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)
2389.856	63.17	5.67	27.68	29.82	74.00	10.83	H
5389.954	62.82	-33.75	33.26	63.31	74.00	11.18	V
4830.000	42.27	-34.00	32.96	43.31	74.00	31.73	V
7236.000	44.66	-31.22	37.50	38.39	74.00	29.34	V
9648.000	46.59	-31.16	38.00	39.75	74.00	27.41	V
12060.000	45.84	-29.42	38.64	36.62	74.00	28.16	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)
2411.800	64.17	5.72	27.68	30.78	74.00	9.83	H
2461.400	62.97	5.68	27.65	29.64	74.00	11.03	H
4874.000	41.64	-33.60	33.00	42.24	74.00	32.36	V
7311.000	44.46	-31.37	37.60	38.22	74.00	29.54	V
9748.000	46.23	-31.15	38.10	39.29	74.00	27.77	H
12185.000	44.66	-29.44	38.69	35.41	74.00	29.34	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)
2484.565	61.12	5.71	27.74	27.67	74.00	12.88	H
2484.660	61.17	5.71	27.74	27.72	74.00	12.83	H
4922.000	46.22	-33.42	32.96	46.68	74.00	27.78	V
7386.000	44.28	-32.20	37.53	38.96	74.00	29.72	H
9848.000	45.12	-31.37	38.20	38.29	74.00	28.88	V
12310.000	44.65	-30.30	38.60	36.35	74.00	29.35	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)
2389.464	64.13	5.67	27.68	30.78	74.00	9.87	H
2389.800	65.02	5.67	27.68	31.66	74.00	8.98	H
4824.000	40.17	-33.96	32.95	41.19	74.00	33.83	V
7236.000	44.01	-31.22	37.50	37.74	74.00	29.99	V
9648.000	47.24	-31.16	38.00	40.39	74.00	26.76	H
12060.000	46.76	-29.42	38.64	37.54	74.00	27.24	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)
2415.000	62.69	5.75	27.67	29.27	74.00	11.31	V
2460.200	61.63	5.68	27.64	28.31	74.00	12.37	V
4866.500	42.83	-33.71	33.00	43.54	74.00	31.17	H
7311.000	44.40	-31.37	37.60	38.17	74.00	29.60	V
9748.000	45.25	-31.15	38.10	38.30	74.00	28.75	V
12185.000	44.91	-29.44	38.69	35.66	74.00	29.09	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)
2483.620	60.35	5.71	27.73	26.91	74.00	13.65	H
2484.050	60.50	5.71	27.74	27.06	74.00	13.50	H
4923.000	44.23	-33.41	32.95	44.68	74.00	29.77	H
7386.000	44.93	-32.20	37.53	39.61	74.00	29.07	V
9848.000	44.17	-31.37	38.20	37.34	74.00	29.83	V
12310.000	45.81	-30.30	38.60	37.51	74.00	28.19	H

**Average**  
**802.11b**

Ch1

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
2383.387	45.27	5.65	27.67	11.95	54.00	8.73	H
2383.613	45.39	5.65	27.67	12.07	54.00	8.61	H
4823.550	35.94	-33.96	32.95	36.96	54.00	18.06	V
7236.000	32.95	-31.22	37.50	26.67	54.00	21.05	H
9648.000	34.27	-31.16	38.00	27.42	54.00	19.73	H
12060.000	34.00	-29.42	38.64	24.79	54.00	20.00	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)
2411.887	46.34	5.72	27.68	12.94	54.00	7.66	V
2464.875	46.36	5.67	27.66	13.03	54.00	7.64	H
4873.500	38.45	-33.59	33.00	39.05	54.00	15.55	V
7309.800	36.74	-31.37	37.60	30.51	54.00	17.26	V
9747.900	34.14	-31.15	38.10	27.19	54.00	19.86	V
12185.100	33.90	-29.44	38.69	24.65	54.00	20.10	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)
2483.512	44.72	5.71	27.73	11.28	54.00	9.28	V
2483.662	44.58	5.71	27.74	11.14	54.00	9.42	V
4923.900	44.30	-33.39	32.95	44.73	54.00	9.70	V
7384.950	34.43	-32.19	37.53	29.09	54.00	19.57	H
9847.800	32.62	-31.37	38.20	25.78	54.00	21.38	H
12310.200	33.82	-30.30	38.60	25.52	54.00	20.18	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)
2389.875	48.12	5.67	27.68	14.76	54.00	5.88	V
2389.988	48.21	5.67	27.68	14.85	54.00	5.79	V
4829.850	29.67	-34.00	32.96	30.71	54.00	24.33	V
7236.000	32.78	-31.22	37.50	26.50	54.00	21.22	V
9648.000	34.18	-31.16	38.00	27.33	54.00	19.82	V
12060.000	33.99	-29.42	38.64	24.77	54.00	20.01	H

## Ch6

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
2411.475	49.22	5.71	27.68	15.83	54.00	4.78	V
2462.062	47.83	5.68	27.65	14.51	54.00	6.17	H
4872.150	30.64	-33.58	33.00	31.22	54.00	23.36	H
7311.150	32.85	-31.36	37.60	26.62	54.00	21.15	V
9747.900	33.79	-31.15	38.10	26.84	54.00	20.21	H
12185.100	33.49	-29.44	38.69	24.25	54.00	20.51	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)
2483.550	47.29	5.71	27.73	13.85	54.00	6.71	V
2483.925	46.85	5.71	27.74	13.40	54.00	7.15	H
4921.200	33.07	-33.44	32.96	33.55	54.00	20.93	H
7385.850	32.79	-32.20	37.53	27.47	54.00	21.21	H
9847.800	32.41	-31.37	38.20	25.58	54.00	21.59	H
12310.200	33.68	-30.30	38.60	25.38	54.00	20.32	H

**802.11n-HT20**

## Ch1

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
2389.612	48.13	5.67	27.68	14.78	54.00	5.87	H
2389.837	48.52	5.67	27.68	15.17	54.00	5.48	H
4824.000	28.59	-33.96	32.95	29.60	54.00	25.41	H
7236.000	32.67	-31.22	37.50	26.39	54.00	21.33	V
9648.000	34.12	-31.16	38.00	27.27	54.00	19.88	H
12060.000	34.02	-29.42	38.64	24.80	54.00	19.98	H

## Ch6

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
2408.812	45.19	5.69	27.68	11.82	54.00	8.81	V
2466.075	45.15	5.67	27.66	11.82	54.00	8.85	H
4872.150	29.90	-33.58	33.00	30.48	54.00	24.10	H
7311.150	32.88	-31.36	37.60	26.65	54.00	21.12	V
9747.900	33.66	-31.15	38.10	26.71	54.00	20.34	H
12185.100	33.50	-29.44	38.69	24.25	54.00	20.50	H

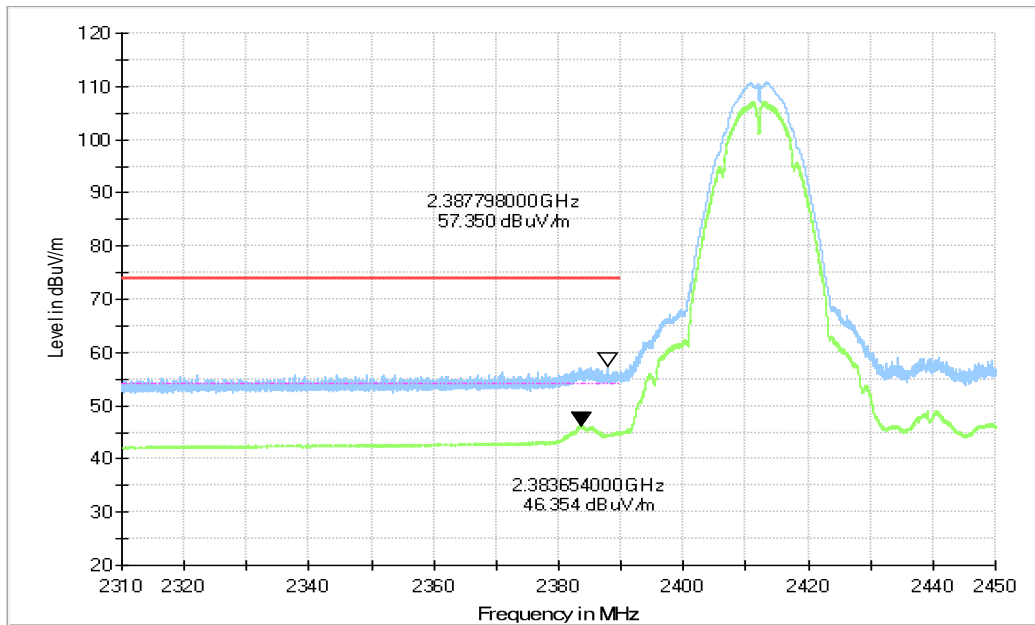
## Ch11

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)
2483.700	46.19	5.71	27.74	12.75	54.00	7.81	V
2484.337	45.78	5.71	27.74	12.33	54.00	8.22	H
4918.500	31.28	-33.56	32.96	31.87	54.00	22.72	H
7358.850	32.67	-31.59	37.58	26.67	54.00	21.33	V
9847.800	32.40	-31.37	38.20	25.56	54.00	21.60	V
12310.000	33.69	-30.30	38.60	25.39	54.00	20.31	H

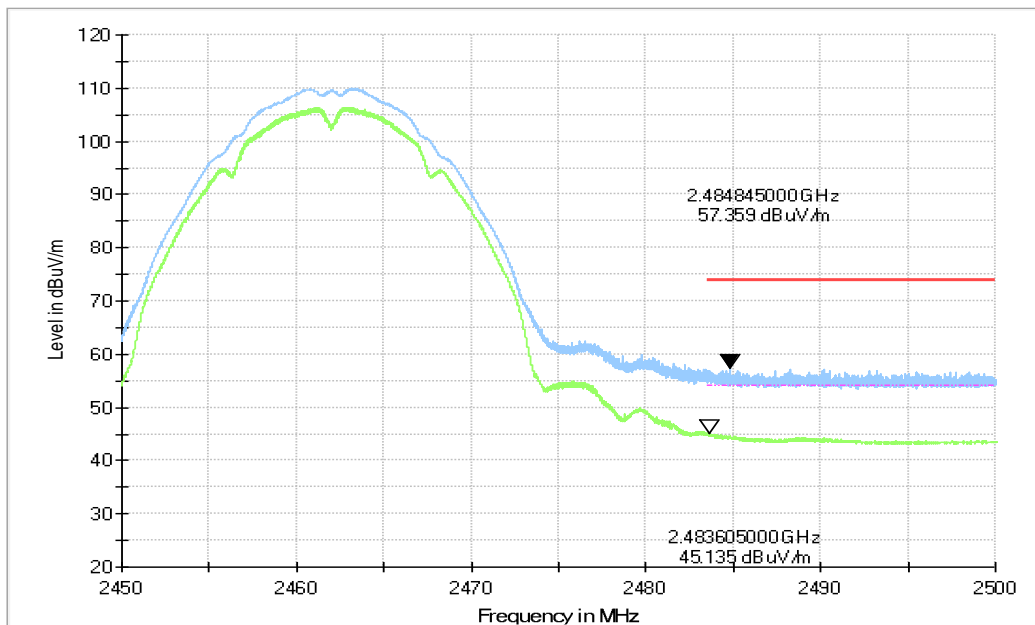
Note: the spurious emission above 18G is noise only and did not show on the report.



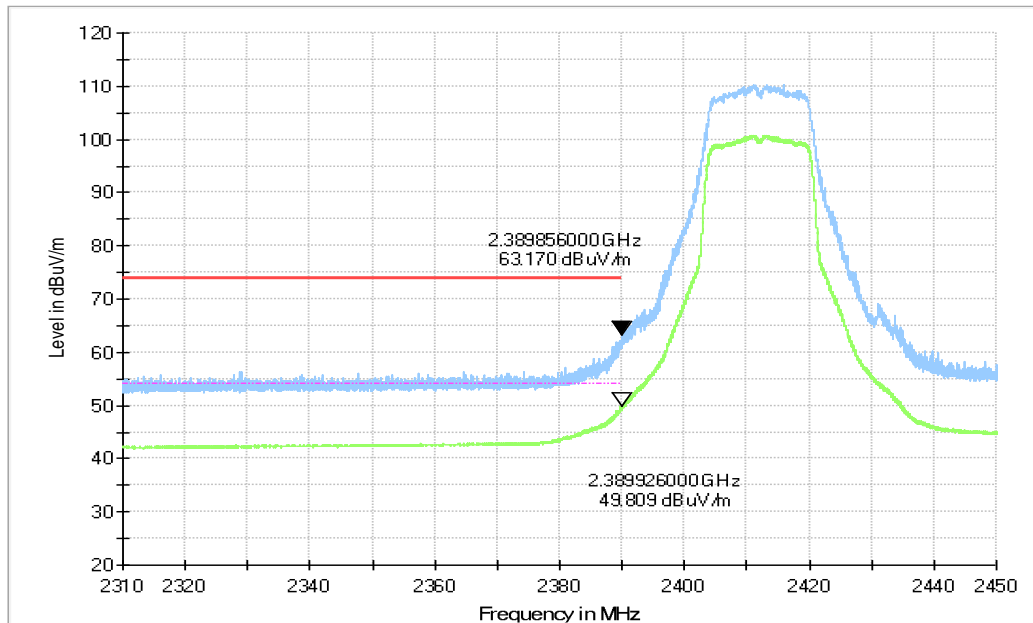
Test graphs as below:



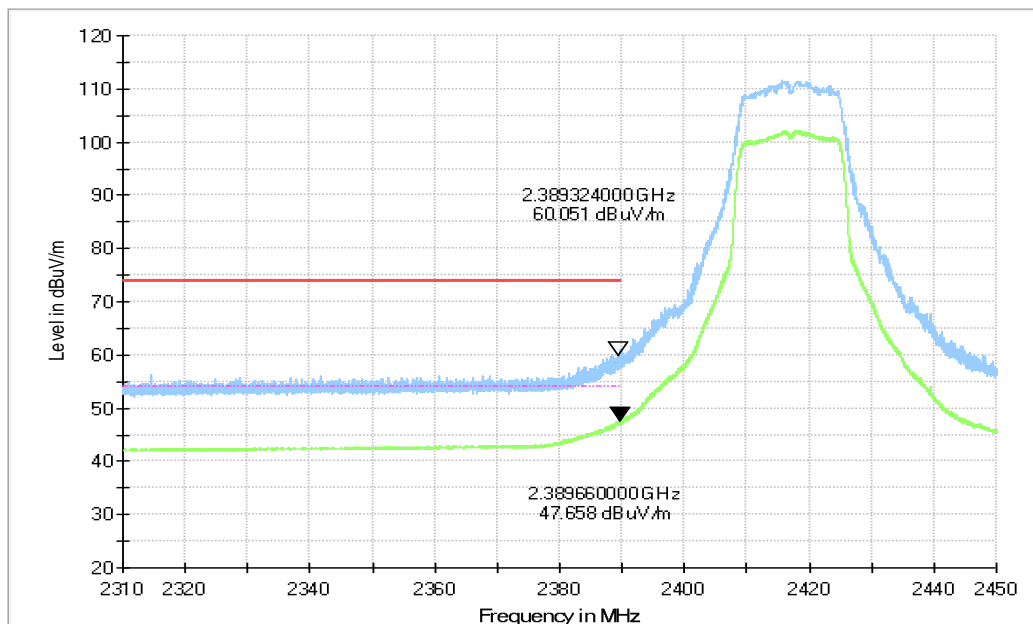
**Fig.A.6.2.4 Transmitter Spurious Emission - Radiated (Power): 802.11b, ch1, 2.31 GHz – 2.43GHz**



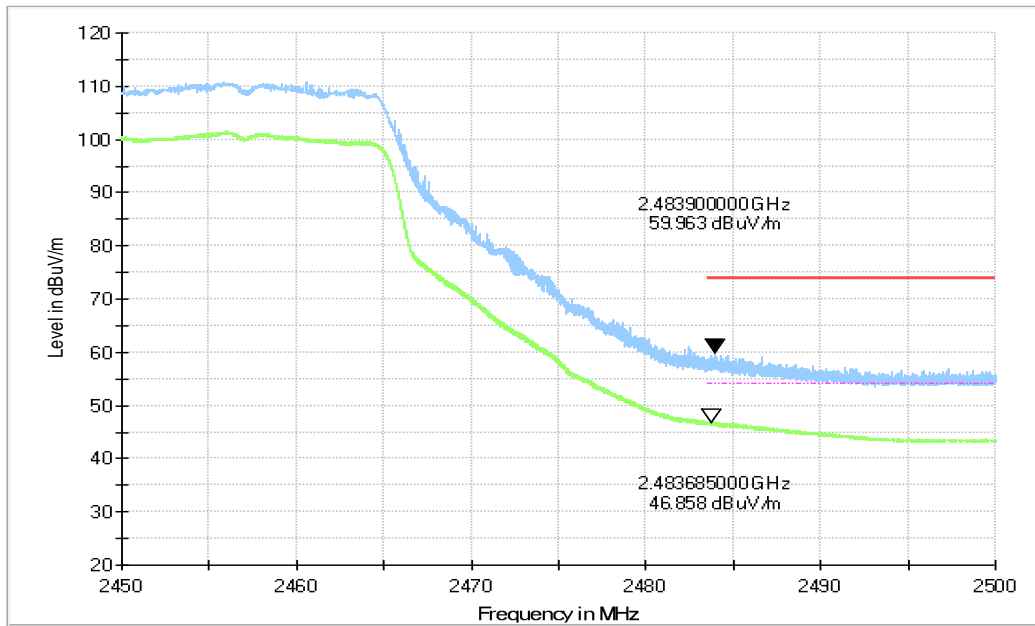
**Fig.A.6.2.5 Transmitter Spurious Emission - Radiated (Power): 802.11b, ch11, 2.45 GHz - 2.50GHz**



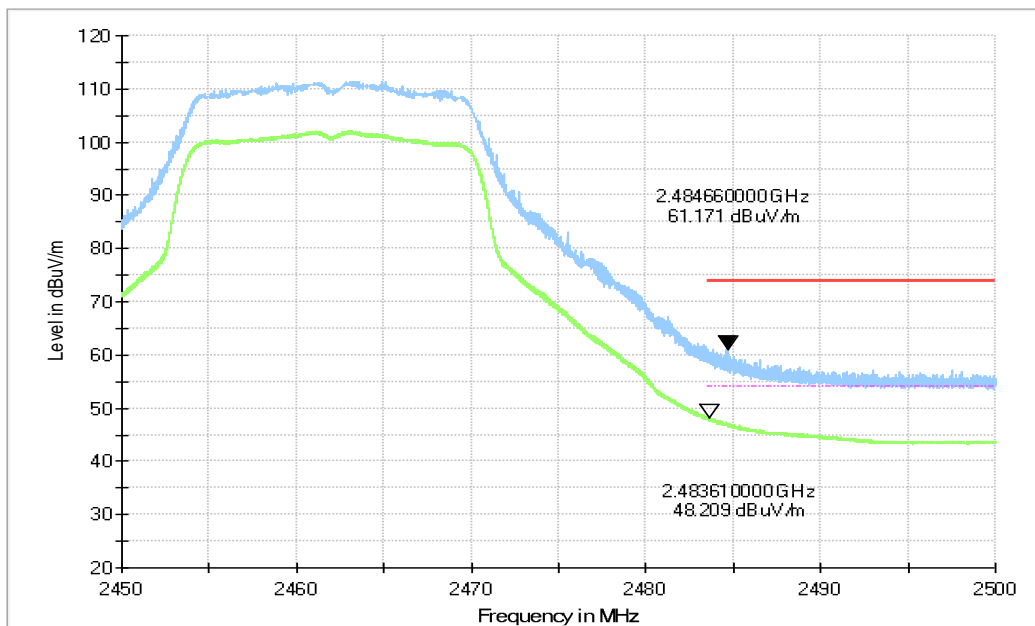
**Fig.A.6.2.6 Transmitter Spurious Emission - Radiated (Power): 802.11g, ch1, 2.31 GHz - 2.43GHz**



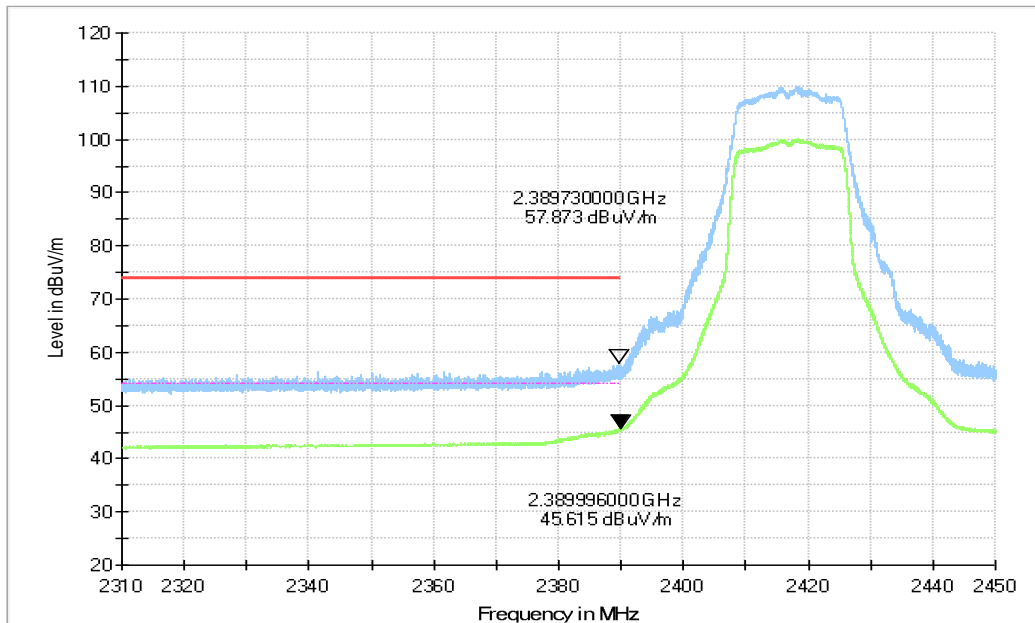
**Fig.A.6.2.7 Transmitter Spurious Emission - Radiated (Power): 802.11g, ch2, 2.31 GHz - 2.43GHz**



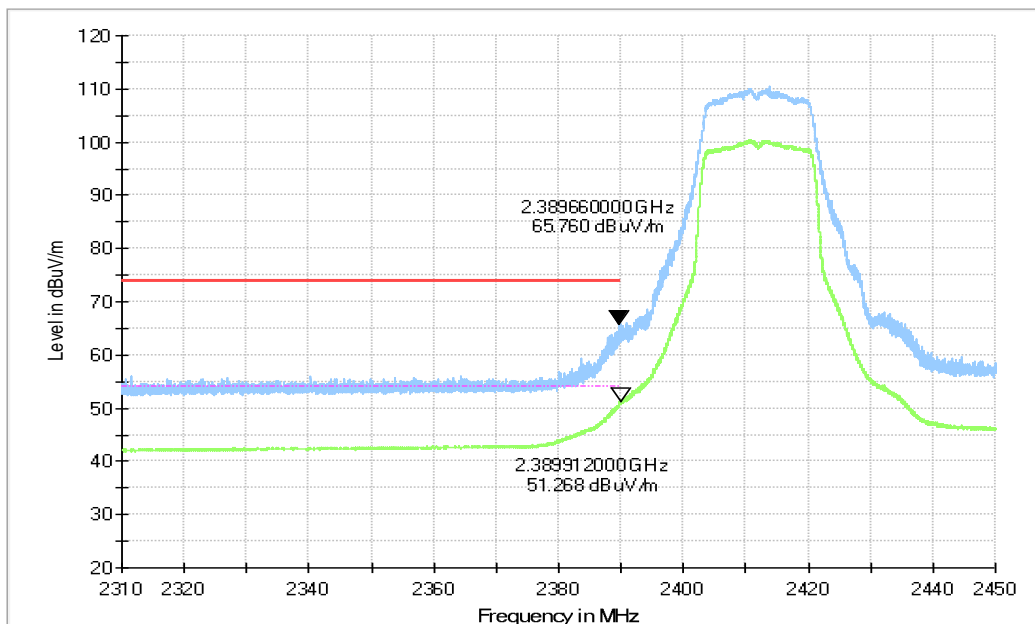
**Fig.A.6.2.8 Transmitter Spurious Emission - Radiated (Power): 802.11g, ch10, 2.45 GHz - 2.50GHz**



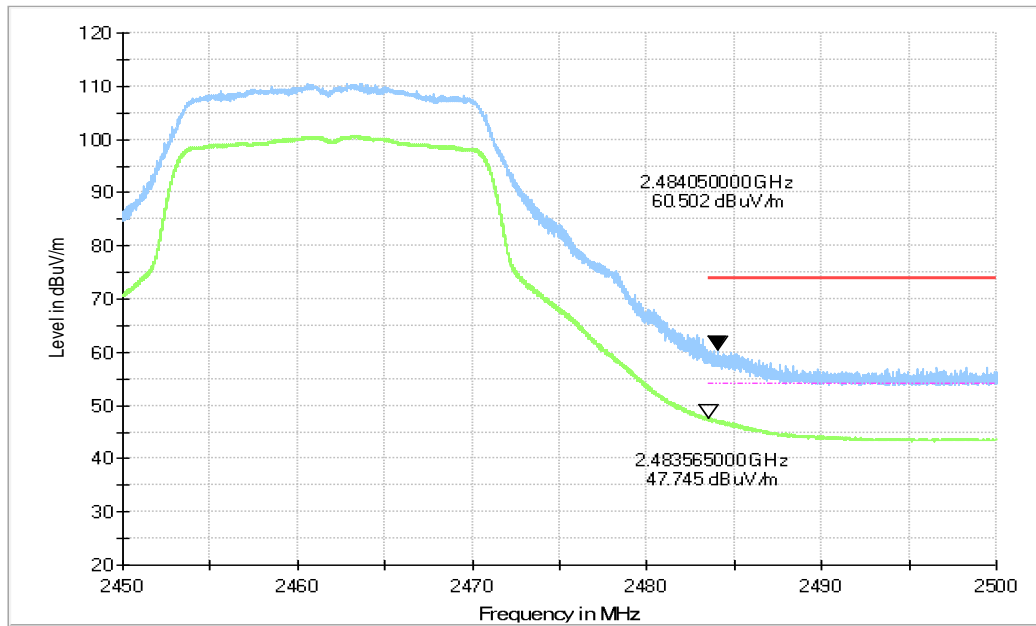
**Fig.A.6.2.9 Transmitter Spurious Emission - Radiated (Power): 802.11g, ch11, 2.45 GHz - 2.50GHz**



**Fig.A.6.2.10 Transmitter Spurious Emission - Radiated (Power): 802.11n-HT20, ch1, 2.31 GHz - 2.43GHz**



**Fig.A.6.2.11 Transmitter Spurious Emission - Radiated (Power): 802.11n-HT20, ch2, 2.31 GHz - 2.43GHz**



**Fig.A.6.2.12 Transmitter Spurious Emission - Radiated (Power): 802.11n-HT20, ch11, 2.45 GHz - 2.50GHz**

## **A.7. AC Power-line Conducted Emission**

### **Summary**

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

### **Method of Measurement:**

See Clause 6.2 of ANSI C63.10 specifically.

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

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

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

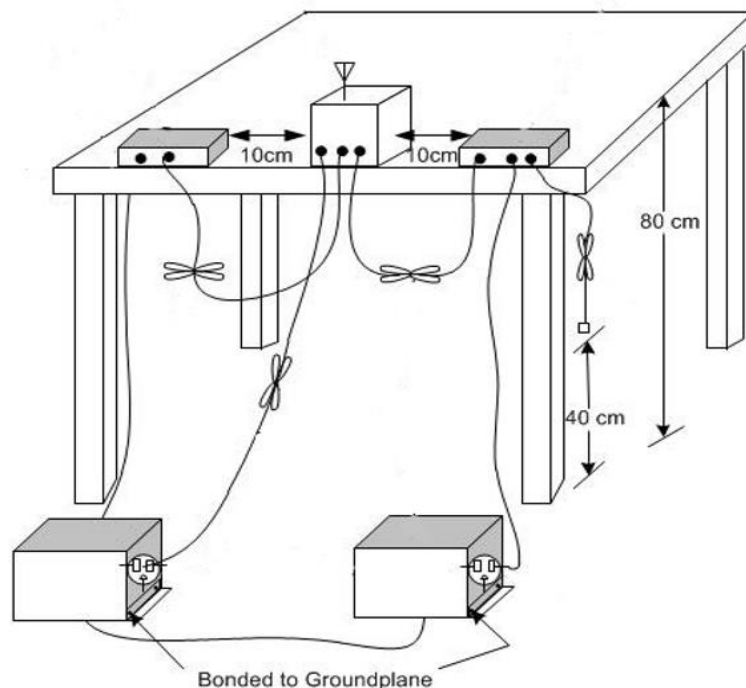
The measurement bandwidth is:

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

### **Test Condition:**

Voltage (V)	Frequency (Hz)
120	60

### **Test setup**



**Measurement Result and limit:**

WLAN (Quasi-peak Limit)

Frequency range (MHz)	Quasi-peak Limit (dB $\mu$ V)	Result (dB $\mu$ V)		Conclusion
		With charger		
		802.11b	Idle	
0.15 to 0.5	66 to 56	Fig.A.7.1	Fig.A.7.2	<b>P</b>
0.5 to 5	56			
5 to 30	60			

NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

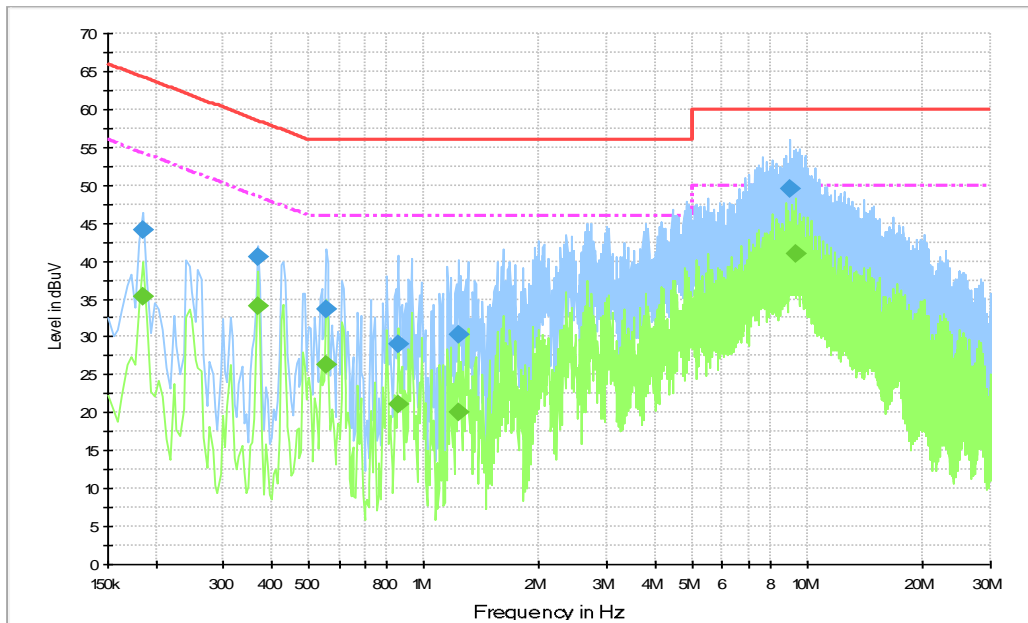
WLAN (Average Limit)

Frequency range (MHz)	Average Limit (dB $\mu$ V)	Result (dB $\mu$ V)		Conclusion
		With charger		
		802.11b	Idle	
0.15 to 0.5	56 to 46	Fig.A.7.1	Fig.A.7.2	<b>P</b>
0.5 to 5	46			
5 to 30	50			

NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

**Conclusion: Pass**

Test graphs as below:



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

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

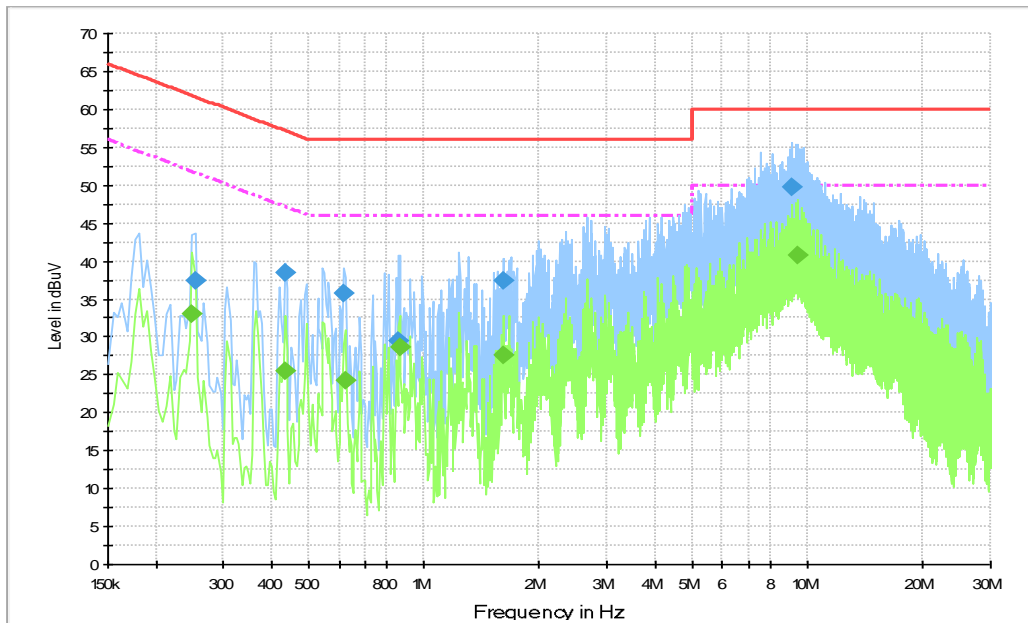
**Final Result 1**

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.186000	44.1	2000.	9.000	N	19.5	20.1	64.2
0.370500	40.5	2000.	9.000	L1	19.5	18.0	58.5
0.555000	33.7	2000.	9.000	N	19.5	22.3	56.0
0.852000	29.0	2000.	9.000	N	19.5	27.0	56.0
1.230000	30.3	2000.	9.000	N	19.5	25.7	56.0
8.952000	49.5	2000.	9.000	L1	19.7	10.5	60.0

**Final Result 2**

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.186000	35.2	2000.0	9.000	L1	19.5	19.0	54.2
0.370500	34.0	2000.0	9.000	L1	19.5	14.5	48.5
0.555000	26.4	2000.0	9.000	N	19.5	19.6	46.0
0.856500	21.1	2000.0	9.000	N	19.5	24.9	46.0
1.230000	20.0	2000.0	9.000	N	19.5	26.0	46.0
9.321000	41.1	2000.0	9.000	L1	19.7	8.9	50.0





**Fig.A.7.2 AC Powerline Conducted Emission-Idle**

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

**Final Result 1**

Frequency (MHz)	QuasiPeak (dB $\mu$ V)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)
0.253500	37.3	2000.	9.000	L1	19.4	24.3	61.6
0.433500	38.5	2000.	9.000	L1	19.5	18.7	57.2
0.618000	35.7	2000.	9.000	L1	19.4	20.3	56.0
0.861000	29.5	2000.	9.000	N	19.5	26.5	56.0
1.608000	37.5	2000.	9.000	L1	19.5	18.5	56.0
9.100500	49.8	2000.	9.000	L1	19.7	10.2	60.0

**Final Result 2**

Frequency (MHz)	Average (dB $\mu$ V)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)
0.249000	33.0	2000.0	9.000	N	19.4	18.8	51.8
0.433500	25.5	2000.0	9.000	N	19.5	21.7	47.2
0.622500	24.3	2000.0	9.000	N	19.4	21.7	46.0
0.865500	28.7	2000.0	9.000	L1	19.5	17.3	46.0
1.608000	27.6	2000.0	9.000	L1	19.5	18.4	46.0
9.393000	40.8	2000.0	9.000	L1	19.7	9.2	50.0

## ANNEX B: EUT parameters

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

## ANNEX C: Accreditation Certificate



**Accredited Laboratory**

A2LA has accredited

**TELECOMMUNICATION TECHNOLOGY LABS, CAICT**  
*Beijing, People's Republic of China*

for technical competence in the field of  
**Electrical Testing**

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



Presented this 26<sup>th</sup> day of June 2023.



Mr. Trace McInturf, Vice President, Accreditation Services  
For the Accreditation Council  
Certificate Number 7049.01  
Valid to July 31, 2024

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

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