

RF TEST REPORT

Test Equipment : RC-TGU
Model Name : RC-TGU (300611-02665)
FCC ID : 2AXDMTGU5GWIFI6
IC : 26419-TGU5GWIFI6
Date of receipt : 2024-09-30
Test duration : 2024-10-16 ~ 2024-11-12
Date of issue : 2024-12-06

Applicant : DASAN Networks, Inc.
DASAN Tower, 49, Daewangpangyo-ro644Beon-gil, Bundang-gu,
Seongnam-si, Gyeonggi-do, 13493 KOREA

Test Laboratory : Lab-T, Inc.
2182-42 Baegok-daero, Mohyeon-eup, Cheoin-gu, Yongin-si
Gyeonggi-do 17036, Korea

Test specification : FCC Part 15 Subpart C 15.247
RSS-247 Issue 3 (2023-08), RSS-GEN Issue 5 A2 (2021-02)

RF Output Power : 26.32 dBm

Test result : Pass

The above equipment was tested by Lab-T Testing Laboratory for compliance
with the requirements of FCC,IC Rules and Regulations.
The test results presented in this test report are limited only to the sample supplied by applicant
and the use of this test report is inhibited other than its purpose.
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Tested by:



Engineer
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Reviewed by:



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CONTENTS

1. Revision history.....	3
2. Information.....	4
2.1 Applicant Information.....	4
2.2 Test Laboratory information.....	4
2.3 Test Location.....	4
3. Information About Test Equipment	5
3.1 Equipment Information	5
3.2 Antenna Information	5
3.3 Test Frequency.....	6
3.4 Worst case.....	6
3.5 Tested Companion Device Information	7
3.6 Operating conditions for the EUT.....	7
4. Test Report.....	8
4.1 Summary	8
4.2 Measurement Uncertainty.....	8
4.3 Transmitter Requirements	9
4.3.1 Antenna Requirement.....	9
4.3.2 Maximum Peak Output Power.....	10
4.3.3 Peak Power Spectral Density	16
4.3.4 6 dB Bandwidth(DTS Bandwidth).....	85
4.3.5 Spurious Emission, Band Edge, and Restricted bands	194
4.3.6 Conducted Emission.....	382
APPENDIX I.....	383

1. Revision history

Test Report No.	Date	Description
TRRFCC24-0019	2024-12-06	Initial issue

2. Information

2.1 Applicant Information

Applicant name	DASAN Networks, Inc.
Address	DASAN Tower, 49, Daewangpangyo-ro644Beon-gil, Bundang-gu, Seongnam-si, Gyeonggi-do, 13493 KOREA
Telephone No.	+82 70-7010-1567
Person in charge	Kee Ryong Sung / kryong07@dasannetworks.com
Manufacturer	DASAN Networks, Inc.
Address	DASAN Tower, 49, Daewangpangyo-ro644Beon-gil, Bundang-gu, Seongnam-si, Gyeonggi-do, 13493 KOREA

2.2 Test Laboratory information

Corporate name	Lab-T, Inc.
Representative	Duke (Jongyoung) Kim
Address	2182-42 Baegok-daero, Mohyeon-eup, Cheoin-gu, Yongin-si, Gyeonggi-do 17036, Korea(Republic of)
Telephone	+82-31-322-6767
Fax	+82-31-322-6768
E-mail	info@lab-t.net

2.3 Test Location

Test Site	used	Address
Building L	☒	2182-40 Baegok-daero, Mohyeon-eup, Cheoin-gu, Yongin-si, Gyeonggi-do 17036, Korea(Republic of)
Building T	☒	2182-42 Baegok-daero, Mohyeon-eup, Cheoin-gu, Yongin-si, Gyeonggi-do 17036, Korea(Republic of)
Building A	☐	2182-44 Baegok-daero, Mohyeon-eup, Cheoin-gu, Yongin-si, Gyeonggi-do 17036, Korea(Republic of)

3. Information About Test Equipment

3.1 Equipment Information

Equipment type	RC-TGU
Equipment model name	RC-TGU (300611-02665)
Frequency range	WLAN 2G : 2 412 MHz ~ 2 462 MHz / 2 422 MHz ~ 2 452 MHz
	Bluetooth LE : 2 402 MHz ~ 2 480 MHz
Modulation type	WLAN 2G : DSSS, CCK, OFDM, OFDMA
	Bluetooth LE : GFSK
Power supply ^{Note 2}	DC 12 V, DC 24 V
H/W version	B1
S/W version	V0.10

Note 1 : The above EUT information was declared by the manufacturer.

Note 2 : The test was performed only at DC 24V.

3.2 Antenna Information

Type	Model No.	Gain	Note.
External antenna	HAG-TGU-WIFI-D	3.96 dBi	WLAN 2G_ANT1
External antenna	HAG-TGU-WIFI-D	3.36 dBi	WLAN 2G_ANT2
SMA stubby antenna	FST-BT-STB	3.91 dBi	Bluetooth LE

Note 1 : Antenna gain and antenna cable (LMR200) were considered together. (WLAN 2G)

3.3 Test Frequency

Test mode	Test frequency (MHz)		
	Lowest frequency	Middle frequency	Highest frequency
802.11b	2 412	2 437	2 462
802.11g	2 412	2 437	2 462
802.11n(HT20)	2 412	2 437	2 462
802.11n(HT40)	2 422	2 437	2 452
802.11ax(HE20)_OFDM	2 412	2 437	2 462
802.11ax(HE20)_OFDMA	2 412	2 437	2 462
802.11ax(HE40)_OFDM	2 422	2 437	2 452
802.11ax(HE40)_OFDMA	2 422	2 437	2 452
Bluetooth LE 1M	2 402	2 440	2 480
Bluetooth LE 2M	2 402	2 440	2 480
Bluetooth LE Coded S=2	2 402	2 440	2 480
Bluetooth LE Coded S=8	2 402	2 440	2 480

3.4 Worst case

802.11b_SISO	1 Mbps	802.11ax(HE20)_OFMD_MIMO	MCS0
802.11g_SISO	6 Mbps	802.11ax(HE20)_OFMDA_SISO	MCS0
802.11n(HT20)_SISO	MCS0	802.11ax(HE20)_OFMDA_MIMO	MCS0
802.11n(HT20)_MIMO	MCS8	802.11ax(HE40)_OFDM_SISO	MCS0
802.11n(HT40)_SISO	MCS0	802.11ax(HE40)_OFDM_MIMO	MCS0
802.11n(HT40)_MIMO	MCS8	802.11ax(HE40)_OFDMA_SISO	MCS0
802.11ax(HE20)_OFMD_SISO	MCS0	802.11ax(HE40)_OFDMA_MIMO	MCS0

Note1 : The power measurement has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates.

3.5 Tested Companion Device Information

Type	Manufacturer	Model	Note
NXP EVB	-	-	Used OFDMA Test
Ublox EVB	-	-	Used OFDMA Test

3.6 Operating conditions for the EUT

Firmware state		V0.1
Test software name(version)		Bluetooth : EBTerminal (v1.3b) WLAN 2G : Used native test mode (-)
Test power setting		Declared setting value
Serial number (Setup mode)	EUT #1	#1 (Conducted / Radiated Emission)

4. Test Report

4.1 Summary

FCC Part 15				
FCC Rule	IC Rule	Parameter	Clause	Status
Transmitter Requirements				
15.203 15.247(b)(4)	RSS-247 5.4(f)	Antenna Requirement	4.3.1	C
15.247(b)(3)	RSS-247 5.4(d)	Maximum Peak Output Power	4.3.2	C
15.247(e)	RSS-247 5.2(b)	Peak Power Spectral Density	4.3.3	C
15.247(a)(2)	RSS-247 5.2(a)	6 dB Channel Bandwidth	4.3.4	C
-	RSS-GEN 6.7	Occupied Bandwidth	4.3.4	C
15.247(d) 15.205(a) 15.209(a)	RSS-247 5.5 RSS-GEN 8.9 RSS-GEN 8.10	Spurious Emission, Band Edge and Restricted bands	4.3.5	C
15.207(a)	RSS-GEN 8.8	Conducted Emissions	4.3.6	N/A ^{NOTE2}
NOTE 1 : C = Comply N/C = Not Comply N/T = Not Tested N/A = Not Applicable				
NOTE 2 : This device only uses DC power.				

* The general test methods used to test this device is ANSI C63.10:2020

4.2 Measurement Uncertainty

Mesurement items	Expanded Uncertainty	
RF Output Power	0.77 dB	(The confidence level is about 95 %, $k=2$)
Power Spectral Density	0.98 dB	(The confidence level is about 95 %, $k=2$)
Occupied Channel Bandwidth	6.95 kHz	(The confidence level is about 95 %, $k=2$)
Conducted Spurious Emissions	0.47 dB	(The confidence level is about 95 %, $k=2$)
Radiated Spurious Emissions (1 GHz under)	4.78 dB	(The confidence level is about 95 %, $k=2$)
Radiated Spurious Emissions (Above 1 GHz)	5.96 dB	(The confidence level is about 95 %, $k=2$)

4.3 Transmitter Requirements

4.3.1 Antenna Requirement

4.3.1.1 Regulation

According to §15.203 An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

According to §15.247(b)(4) e conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

According to §RSS-247 5.4(f)(ii) If the transmitter employs an antenna system that emits multiple directional beams, but does not emit multiple directional beams simultaneously, the total output power conducted to the array or arrays that comprise the device (i.e. the sum of the power supplied to all antennas, antenna elements, staves, etc., and summed across all carriers or frequency channels) shall not exceed the applicable output power limit specified in sections 5.4(b) and 5.4(d). However, the total conducted output power shall be reduced by 1 dB below the specified limits for each 3 dB that the directional gain of the antenna/antenna array exceeds 6 dBi. The directional antenna gain shall be computed as the sum of 10 log (number of array elements or staves) plus the directional gain of the element or stave having the highest gain.

4.3.1.2 Result

Comply

[Bluetooth LE] : The transmitter has a SMA stubby Antenna.
The directional peak gain of the antenna is 3.91 dBi.

[WLAN 2G]

	Antenna 1	Antenna 2
Type	External Antenna	
Connector type	SMA	
Gain	3.96 dBi	3.36 dBi

Antenna	Directional Gain For Power (dBi)	Directional Gain For PSD (dBi)	Power Limit Reduction (dB)	PSD Limit Reduction (dB)
1	3.96	3.96	0.00	0.00
2	3.36	3.36	0.00	0.00
1+2	3.96	6.68	0.00	0.68

Note 1 : Antenna gain and antenna cable (LMR200) were considered together. (WLAN 2G)

4.3.2 Maximum Peak Output Power

4.3.2.1 Regulation

According to §15.247(b)(3) and RSS-247 §5.4(d) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

According to §15.247(b)(4) The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

4.3.2.2 Measurement Procedure

ANSI C63.10 § 11.9.1 Maximum peak conducted output power

4.3.2.2.1 PKPM1 Peak power meter method

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 utilize a fast-responding diode detector

4.3.2.3 Result

Comply (measurement data : refer to the next page)

4.3.2.4 Measurement data

Test mode : 802.11b

Antenna	Freq. (MHz)	Result (dBm)	Result (mW)	Limit (mW)
SISO ANT1	2 412	20.82	120.78	1 000
	2 437	22.42	174.58	1 000
	2 462	21.30	134.90	1 000
SISO ANT2	2 412	18.97	78.89	1 000
	2 437	20.89	122.74	1 000
	2 462	19.67	92.68	1 000

Test mode : 802.11g

Antenna	Freq. (MHz)	Result (dBm)	Result (mW)	Limit (mW)
SISO ANT1	2 412	22.85	192.75	1 000
	2 437	22.99	199.07	1 000
	2 462	22.22	166.72	1 000
SISO ANT2	2 412	21.72	148.59	1 000
	2 437	24.62	289.73	1 000
	2 462	21.63	145.55	1 000

Test mode : 802.11n(HT20)

Antenna	Freq. (MHz)		Result (dBm)		Result (mW)		Limit (mW)	
SISO ANT1	2 412		22.66		184.50		1 000	
	2 437		22.89		194.54		1 000	
	2 462		22.09		161.81		1 000	
SISO ANT2	2 412		21.83		152.41		1 000	
	2 437		24.18		261.82		1 000	
	2 462		21.64		145.88		1 000	
Antenna	Freq. (MHz)	ANT1 (dBm)		ANT2 (dBm)	Result (dBm)	Result (mW)		Limit (mW)
MIMO	2 412	22.56		21.57	25.10	323.85		1 000
	2 437	22.57		23.30	25.96	394.51		1 000
	2 462	22.00		21.34	24.69	294.63		1 000

Note 1 : refer to 4.3.1 for information on limit reduction.

Note 2 : We took the insertion loss of the cable loss into consideration within the measuring instrument.

Note 3 : Result(dBm) = ANT1(dBm) + ANT2(dBm)

Test mode : 802.11n(HT40)

Antenna	Freq. (MHz)		Result (dBm)	Result (mW)	Limit (mW)	
SISO ANT1	2 422		22.43	174.98	1 000	
	2 437		22.44	175.39	1 000	
	2 452		22.10	162.18	1 000	
SISO ANT2	2 422		21.47	140.28	1 000	
	2 437		21.64	145.88	1 000	
	2 452		20.54	113.24	1 000	
Antenna	Freq. (MHz)	ANT1 (dBm)	ANT2 (dBm)	Result (dBm)	Result (mW)	Limit (mW)
MIMO	2 422	22.26	21.04	24.70	295.32	1 000
	2 437	22.26	21.80	25.05	319.62	1 000
	2 452	21.66	20.74	24.23	265.13	1 000

Test mode : 802.11ax(HE20)_OFDM

Antenna	Freq. (MHz)		Result (dBm)	Result (mW)	Limit (mW)	
SISO ANT1	2 412		22.18	165.20	1 000	
	2 437		22.93	196.34	1 000	
	2 462		21.70	147.91	1 000	
SISO ANT2	2 412		20.40	109.65	1 000	
	2 437		23.82	240.99	1 000	
	2 462		20.29	106.91	1 000	
Antenna	Freq. (MHz)	ANT1 (dBm)	ANT2 (dBm)	Result (dBm)	Result (mW)	Limit (mW)
MIMO	2 412	22.02	21.02	24.56	285.69	1 000
	2 437	22.68	23.86	26.32	428.57	1 000
	2 462	21.66	20.71	24.22	264.32	1 000

Test mode : 802.11ax(HE20)_OFDMA

Antenna	Freq. (MHz)	Result (dBm)	Result (mW)	Limit (mW)		
SISO ANT1	2 412	20.77	119.40	1 000		
	2 437	20.76	119.12	1 000		
	2 462	19.92	98.17	1 000		
SISO ANT2	2 412	18.55	71.61	1 000		
	2 437	18.75	74.99	1 000		
	2 462	19.12	81.66	1 000		
Antenna	Freq. (MHz)	ANT1 (dBm)	ANT2 (dBm)	Result (dBm)	Result (mW)	Limit (mW)
MIMO	2 412	20.83	18.59	22.86	193.34	1 000
	2 437	20.75	18.76	22.88	194.01	1 000
	2 462	19.94	19.40	22.69	185.72	1 000

Note 1 : refer to 4.3.1 for information on limit reduction.

Note 2 : We took the insertion loss of the cable loss into consideration within the measuring instrument.

Note 3 : Result(dBm) = ANT1(dBm) + ANT2(dBm)

Test mode : 802.11ax(HE40)_OFDM

Antenna	Freq. (MHz)		Result (dBm)	Result (mW)		Limit (mW)
SISO ANT1	2 422		22.15	164.06		1 000
	2 437		22.40	173.78		1 000
	2 452		21.56	143.22		1 000
SISO ANT2	2 422		20.21	104.95		1 000
	2 437		20.45	110.92		1 000
	2 452		19.80	95.50		1 000
Antenna	Freq. (MHz)	ANT1 (dBm)	ANT2 (dBm)	Result (dBm)	Result (mW)	Limit (mW)
MIMO	2 422	22.13	21.09	24.65	291.83	1 000
	2 437	22.30	21.45	24.91	309.46	1 000
	2 452	21.37	20.80	24.10	257.31	1 000

Test mode : 802.11ax(HE40)_OFDMA

Antenna	Freq. (MHz)		Result (dBm)	Result (mW)	Limit (mW)	
SISO ANT1	2 422		17.74	59.43	1 000	
	2 437		18.19	65.92	1 000	
	2 452		18.30	67.61	1 000	
SISO ANT2	2 422		15.83	38.28	1 000	
	2 437		16.21	41.78	1 000	
	2 452		16.23	41.98	1 000	
Antenna	Freq. (MHz)	ANT1 (dBm)	ANT2 (dBm)	Result (dBm)	Result (mW)	Limit (mW)
MIMO	2 422	17.88	16.11	20.09	102.21	1 000
	2 437	18.41	16.20	20.45	111.03	1 000
	2 452	18.45	16.79	20.71	117.74	1 000

Note 1 : refer to 4.3.1 for information on limit reduction.

Note 2 : We took the insertion loss of the cable loss into consideration within the measuring instrument.

Note 3 : Result(dBm) = ANT1(dBm) + ANT2(dBm)

Test Mode : Bluetooth LE 1M

Maximum Peak Output Power			
Freq. (MHz)	Result (dBm)	Result (mW)	Limit (mW)
2 402	3.93	2.47	1 000
2 440	4.08	2.56	1 000
2 480	4.08	2.56	1 000

Test Mode : Bluetooth LE 2M

Maximum Peak Output Power			
Freq. (MHz)	Result (dBm)	Result (mW)	Limit (mW)
2 402	3.93	2.47	1 000
2 440	4.08	2.56	1 000
2 480	4.08	2.56	1 000

Test Mode : Bluetooth LE Coded S=2

Maximum Peak Output Power			
Freq. (MHz)	Result (dBm)	Result (mW)	Limit (mW)
2 402	3.93	2.47	1 000
2 440	4.08	2.56	1 000
2 480	4.08	2.56	1 000

Test Mode : Bluetooth LE Coded S=8

Maximum Peak Output Power			
Freq. (MHz)	Result (dBm)	Result (mW)	Limit (mW)
2 402	3.93	2.47	1 000
2 440	4.08	2.56	1 000
2 480	4.08	2.56	1 000

Note 1 : refer to 4.3.1 for information on limit reduction.

Note 2 : We took the insertion loss of the cable loss into consideration within the measuring instrument

Test Mode : Bluetooth LE 1M

Average Output Power					
Freq. (MHz)	ANT1 (dBm)	ANT1 (mW)	Result (dBm)	Result (mW)	Limit (mW)
2 402	3.16	2.07	3.84	2.42	1 000
2 440	3.31	2.14	3.99	2.51	1 000
2 480	3.31	2.14	3.99	2.51	1 000

Test Mode : Bluetooth LE 2M

Average Output Power					
Freq. (MHz)	ANT1 (dBm)	ANT1 (mW)	Result (dBm)	Result (mW)	Limit (mW)
2 402	1.45	1.40	3.85	2.43	1 000
2 440	1.61	1.45	4.010	2.52	1 000
2 480	1.61	1.45	4.01	2.52	1 000

Test Mode : Bluetooth LE Coded S=2

Average Output Power					
Freq. (MHz)	ANT1 (dBm)	ANT1 (mW)	Result (dBm)	Result (mW)	Limit (mW)
2 402	3.44	2.21	3.84	2.42	1 000
2 440	3.60	2.29	4.00	2.51	1 000
2 480	3.60	2.29	4.00	2.51	1 000

Test Mode : Bluetooth LE Coded S=8

Average Output Power					
Freq. (MHz)	ANT1 (dBm)	ANT1 (mW)	Result (dBm)	Result (mW)	Limit (mW)
2 402	3.73	2.36	3.84	2.42	1 000
2 440	3.89	2.45	4.00	2.51	1 000
2 480	3.89	2.45	4.00	2.51	1 000

Note 1 : refer to 4.3.1 for information on limit reduction.

Note 2 : We took the insertion loss of the cable loss into consideration within the measuring instrument.

Note 3 : Result : Measured Value + Duty cycle Factor

Note 4 : Average Factor : $10 \cdot \log(1/(\text{On-time}/\text{Period}))$ refer to 4.3.5.8

4.3.3 Peak Power Spectral Density

4.3.3.1 Regulation

According to §15.247(e) and RSS-247 §5.2(b) For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

4.3.3.2 Measurement Procedure

ANSI C63.10 § 11.10 Maximum power spectral density level in the fundamental emission

4.3.3.2.1 Method PKPSD (peak PSD)

This procedure shall be used if maximum peak conducted output power was used to demonstrate compliance, and is optional if the maximum conducted (average) output power was used to demonstrate compliance.

- 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: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
- d) Set the VBW $\geq 3 \text{ RBW}$.
- 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.
- j) If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

4.3.3.3 Result

Comply (measurement data : refer to the next page)

4.3.3.4 Measurement data

Test mode : 802.11b

Antenna	Freq. (MHz)	Result (dBm)	Limit (dBm)
SISO ANT1	2 412	-0.19	8.00
	2 437	1.95	8.00
	2 462	0.42	8.00
SISO ANT2	2 412	-1.96	8.00
	2 437	0.02	8.00
	2 462	-1.47	8.00

Test mode : 802.11g

Antenna	Freq. (MHz)	Result (dBm)	Limit (dBm)
SISO ANT1	2 412	-9.42	8.00
	2 437	-6.62	8.00
	2 462	-10.34	8.00
SISO ANT2	2 412	-11.76	8.00
	2 437	-7.27	8.00
	2 462	-13.04	8.00

Test mode : 802.11n(HT20)

Antenna	Freq. (MHz)		Result (dBm)		Limit (dBm)
SISO ANT1	2 412		-10.35		8.00
	2 437		-5.78		8.00
	2 462		-10.50		8.00
SISO ANT2	2 412		-10.00		8.00
	2 437		-8.83		8.00
	2 462		-11.70		8.00
Antenna	Freq. (MHz)	ANT1 (dBm)	ANT2 (dBm)	Result (dBm)	Limit (dBm)
MIMO	2 412	-11.07	-13.14	-8.97	7.32
	2 437	-8.97	-9.28	-6.11	7.32
	2 462	-12.13	-12.66	-9.38	7.32

Note 1 : refer to 4.3.1 for information on limit reduction.

Note 2 : We took the insertion loss of the cable loss into consideration within the measuring instrument.

Note 3 : Result(dBm) = ANT1(dBm) + ANT2(dBm)

Test mode : 802.11n(HT40)

Antenna	Freq. (MHz)		Result (dBm)		Limit (dBm)
SISO ANT1	2 422		-13.19		8.00
	2 437		-12.16		8.00
	2 452		-14.47		8.00
SISO ANT2	2 422		-14.32		8.00
	2 437		-15.29		8.00
	2 452		-14.57		8.00
Antenna	Freq. (MHz)	ANT1 (dBm)	ANT2 (dBm)	Result (dBm)	Limit (dBm)
MIMO	2 422	-14.05	-14.73	-11.37	7.32
	2 437	-14.40	-14.79	-11.58	7.32
	2 452	-15.26	-16.81	-12.95	7.32

Test mode : 802.11ax(HE20)_OFDM

Antenna	Freq. (MHz)		Result (dBm)		Limit (dBm)
SISO ANT1	2 412		-12.59		8.00
	2 437		-7.49		8.00
	2 462		-12.17		8.00
SISO ANT2	2 412		-12.82		8.00
	2 437		-9.58		8.00
	2 462		-13.17		8.00
Antenna	Freq. (MHz)	ANT1 (dBm)	ANT2 (dBm)	Result (dBm)	Limit (dBm)
MIMO	2 412	-12.95	-13.21	-10.07	7.32
	2 437	-9.01	-9.86	-6.41	7.32
	2 462	-13.95	-15.18	-11.51	7.32

Test mode : 802.11ax(HE20)_OFDMA

Antenna	Freq. (MHz)		Result (dBm)		Limit (dBm)
SISO ANT1	2 412		-6.98		8.00
	2 437		-6.35		8.00
	2 462		-6.85		8.00
SISO ANT2	2 412		-8.21		8.00
	2 437		-7.70		8.00
	2 462		-7.50		8.00
Antenna	Freq. (MHz)	ANT1 (dBm)	ANT2 (dBm)	Result (dBm)	Limit (dBm)
MIMO	2 412	-6.53	-7.92	-4.16	7.32
	2 437	-6.80	-7.82	-4.27	7.32
	2 462	-6.83	-6.45	-3.63	7.32

Note 1 : refer to 4.3.1 for information on limit reduction.

Note 2 : We took the insertion loss of the cable loss into consideration within the measuring instrument.

Note 3 : Result(dBm) = ANT1(dBm) + ANT2(dBm)

Test mode : 802.11ax(HE40)_OFDM

Antenna	Freq. (MHz)	Result (dBm)		Limit (dBm)	
SISO ANT1	2 422	-13.88		8.00	
	2 437	-13.53		8.00	
	2 452	-14.94		8.00	
SISO ANT2	2 422	-14.58		8.00	
	2 437	-14.99		8.00	
	2 452	-16.03		8.00	
Antenna	Freq. (MHz)	ANT1 (dBm)	ANT2 (dBm)	Result (dBm)	Limit (dBm)
MIMO	2 422	-15.04	-15.19	-12.11	7.32
	2 437	-14.73	-16.09	-12.34	7.32
	2 452	-15.73	-17.16	-13.38	7.32

Test mode : 802.11ax(HE40)_OFDMA

Antenna	Freq. (MHz)	Result (dBm)		Limit (dBm)	
SISO ANT1	2 422	-9.62		8.00	
	2 437	-9.29		8.00	
	2 452	-8.87		8.00	
SISO ANT2	2 422	-10.82		8.00	
	2 437	-10.95		8.00	
	2 452	-9.60		8.00	
Antenna	Freq. (MHz)	ANT1 (dBm)	ANT2 (dBm)	Result (dBm)	Limit (dBm)
MIMO	2 422	-8.86	-10.82	-6.72	7.32
	2 437	-9.16	-10.21	-6.64	7.32
	2 452	-8.79	-10.47	-6.54	7.32

Note 1 : refer to 4.3.1 for information on limit reduction.

Note 2 : We took the insertion loss of the cable loss into consideration within the measuring instrument.

Note 3 : Result(dBm) = ANT1(dBm) + ANT2(dBm)

Test Mode : Bluetooth LE 1M

Peak Power Spectral Density		
Freq. (MHz)	Result (dBm)	Limit (dBm)
2 402	-12.49	8.00
2 440	-12.26	8.00
2 480	-12.40	8.00

Test Mode : Bluetooth LE 2M

Peak Power Spectral Density		
Freq. (MHz)	Result (dBm)	Limit (dBm)
2 402	-13.60	8.00
2 440	-13.44	8.00
2 480	-13.51	8.00

Test Mode : Bluetooth LE Coded S=2

Peak Power Spectral Density		
Freq. (MHz)	Result (dBm)	Limit (dBm)
2 402	-2.59	8.00
2 440	-2.46	8.00
2 480	-2.52	8.00

Test Mode : Bluetooth LE Coded S=8

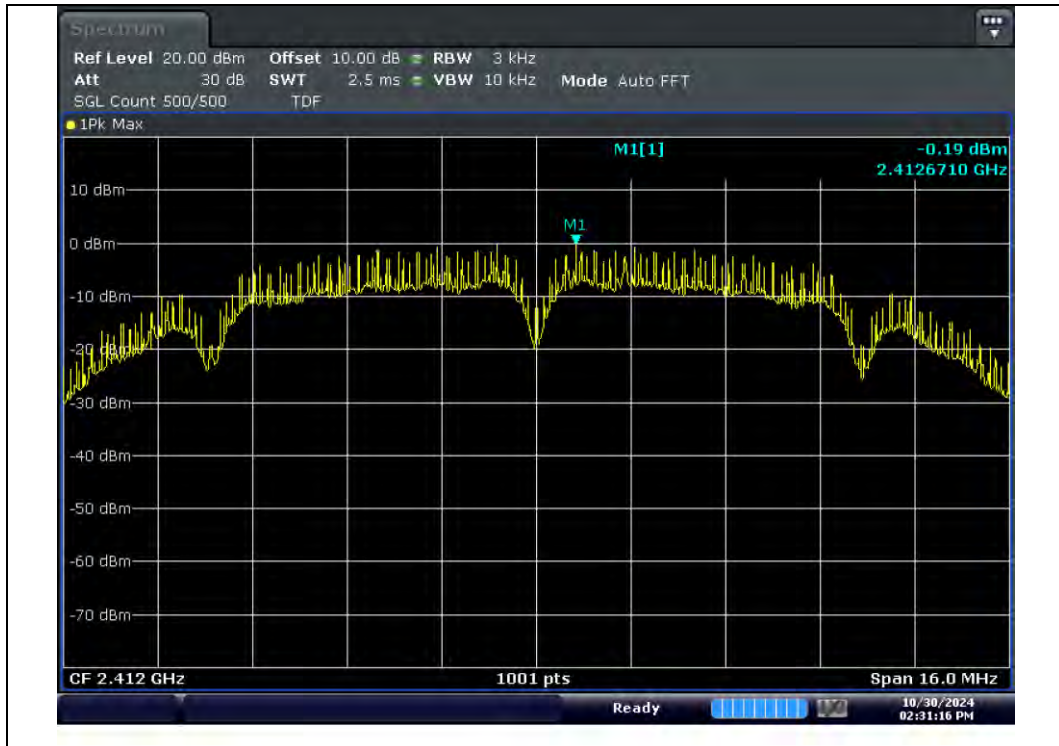
Peak Power Spectral Density		
Freq. (MHz)	Result (dBm)	Limit (dBm)
2 402	-2.35	8.00
2 440	-2.24	8.00
2 480	-2.32	8.00

Note 1 : refer to 4.3.1 for information on limit reduction.

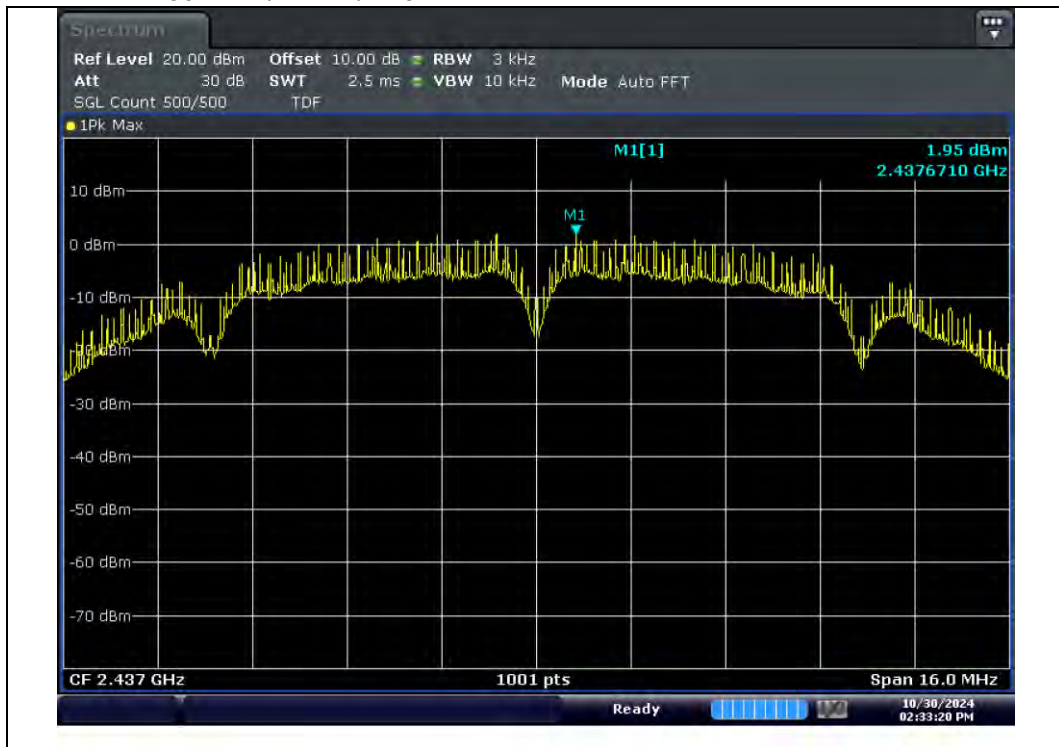
Note 2 : We took the insertion loss of the cable loss into consideration within the measuring instrument.

4.3.3.5 Test Plot

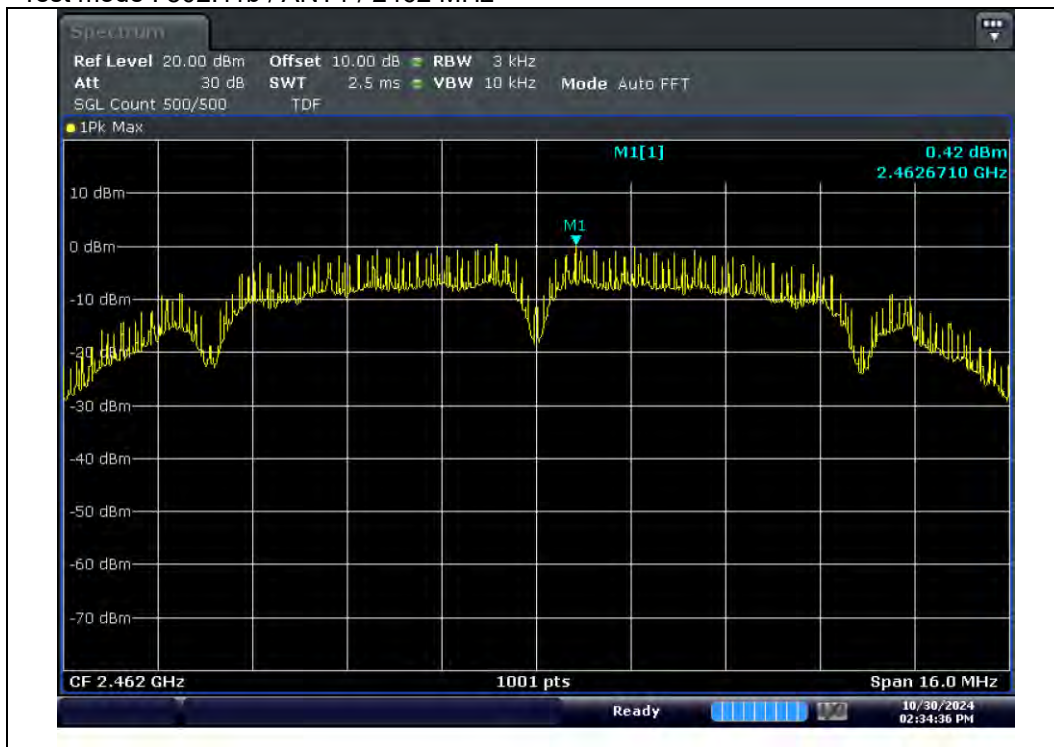
Test mode : 802.11b / ANT1 / 2412 MHz



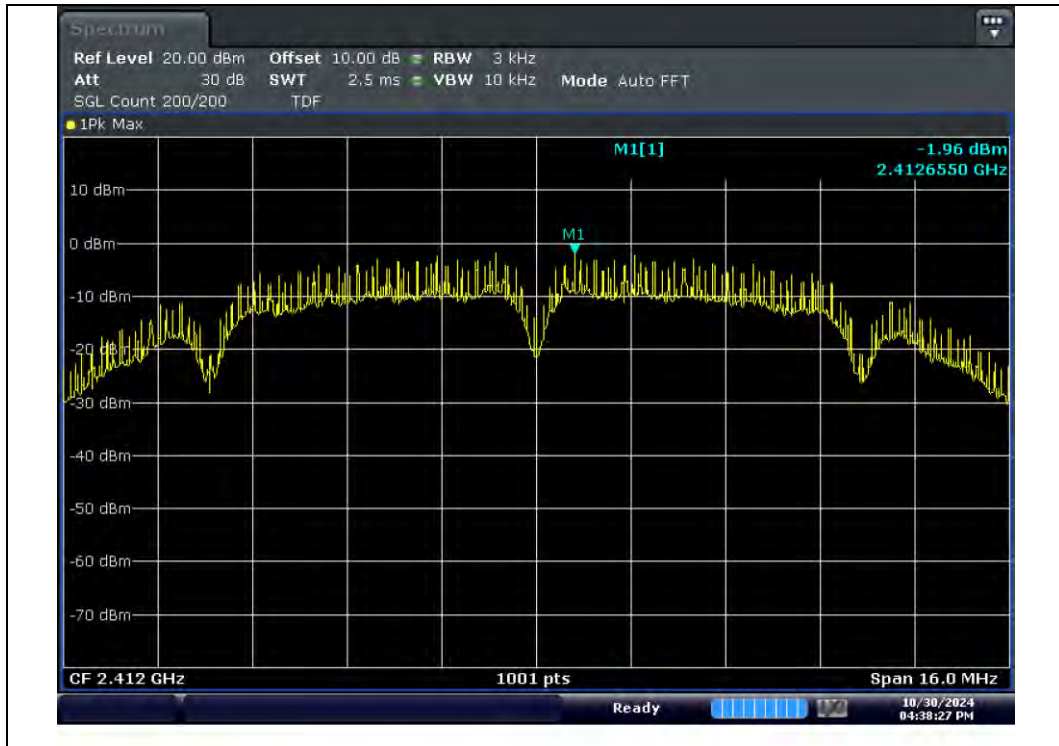
Test mode : 802.11b / ANT1 / 2437 MHz



Test mode : 802.11b / ANT1 / 2462 MHz



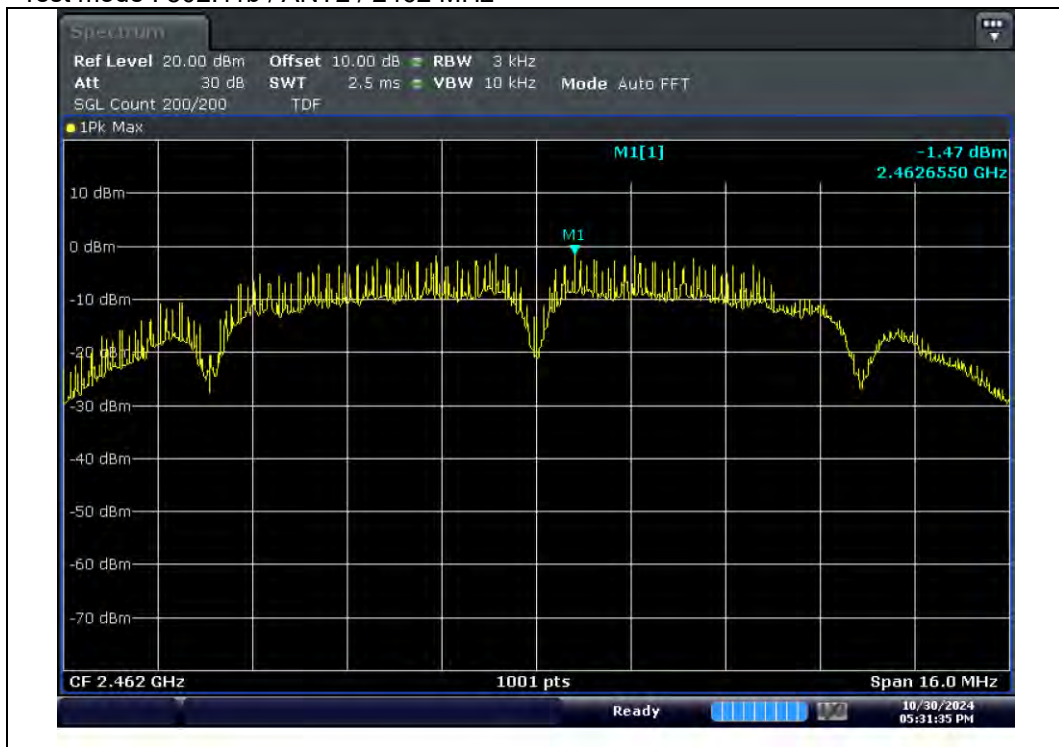
Test mode : 802.11b / ANT2 / 2412 MHz



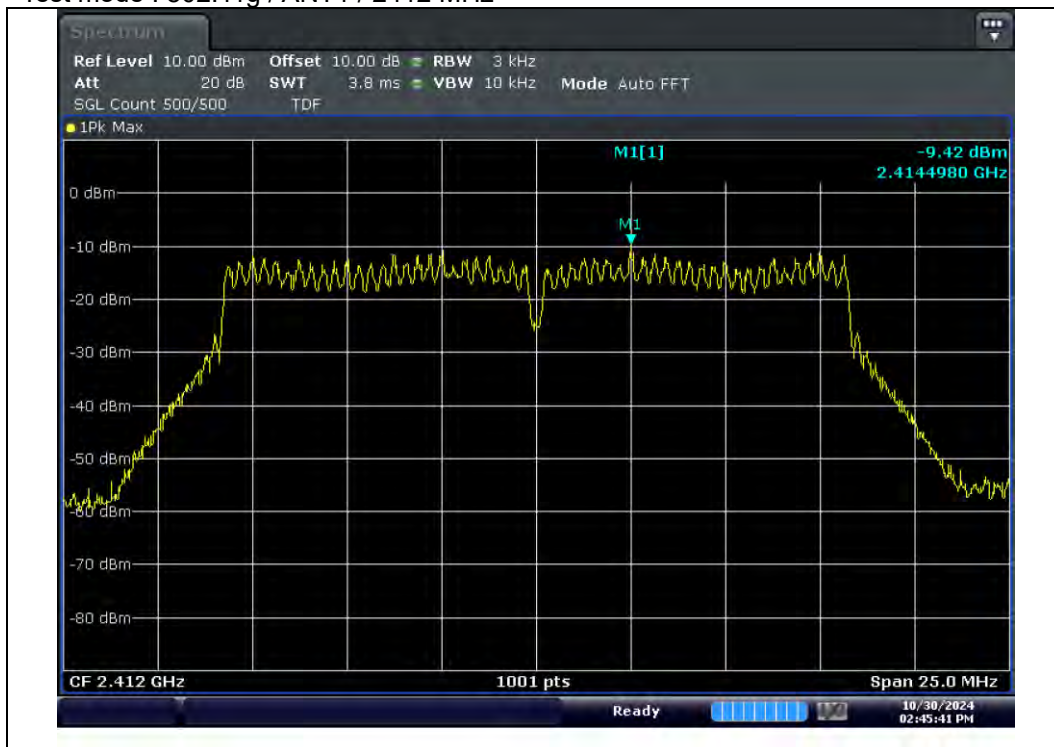
Test mode : 802.11b / ANT2 / 2437 MHz



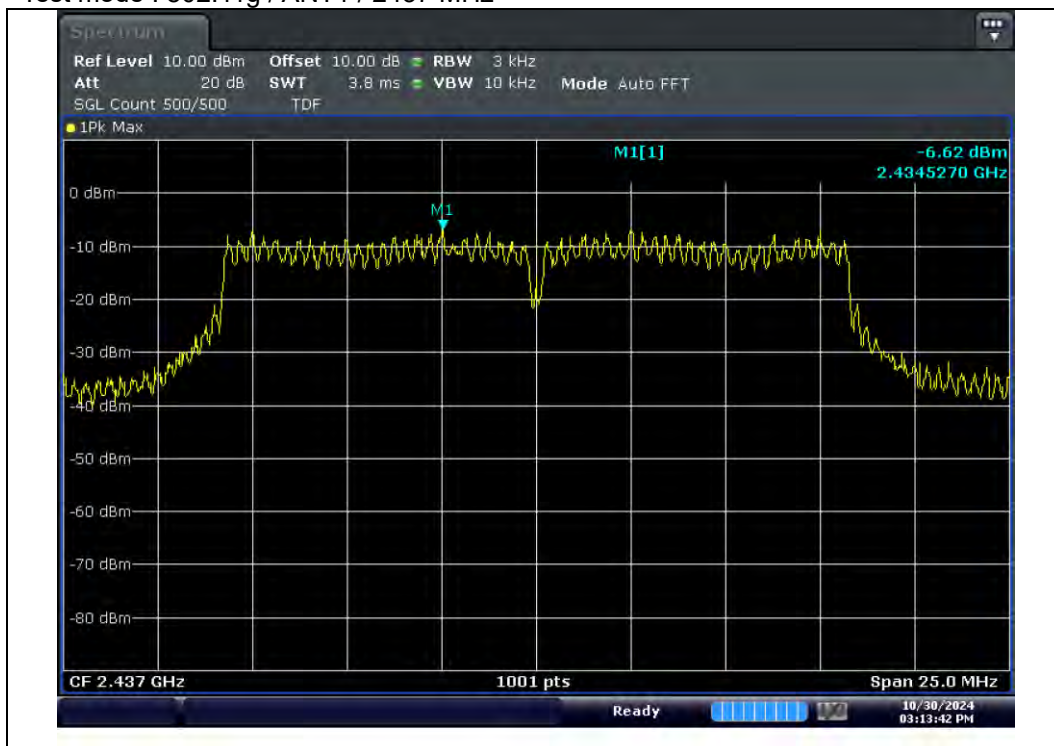
Test mode : 802.11b / ANT2 / 2462 MHz



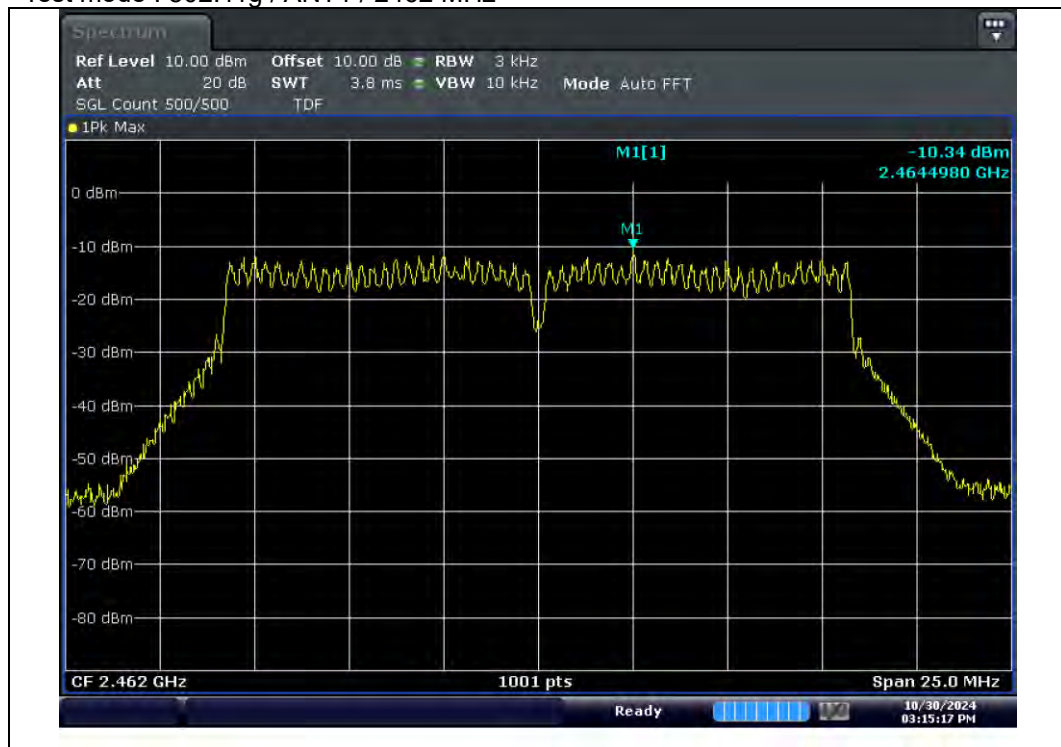
Test mode : 802.11g / ANT1 / 2412 MHz



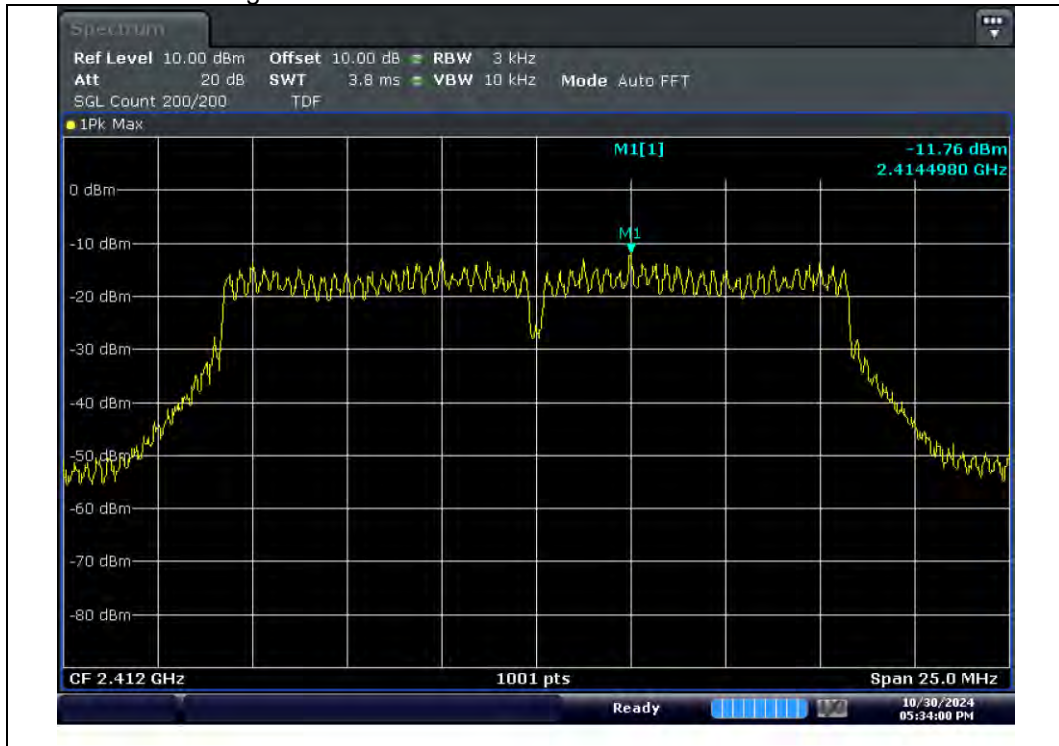
Test mode : 802.11g / ANT1 / 2437 MHz



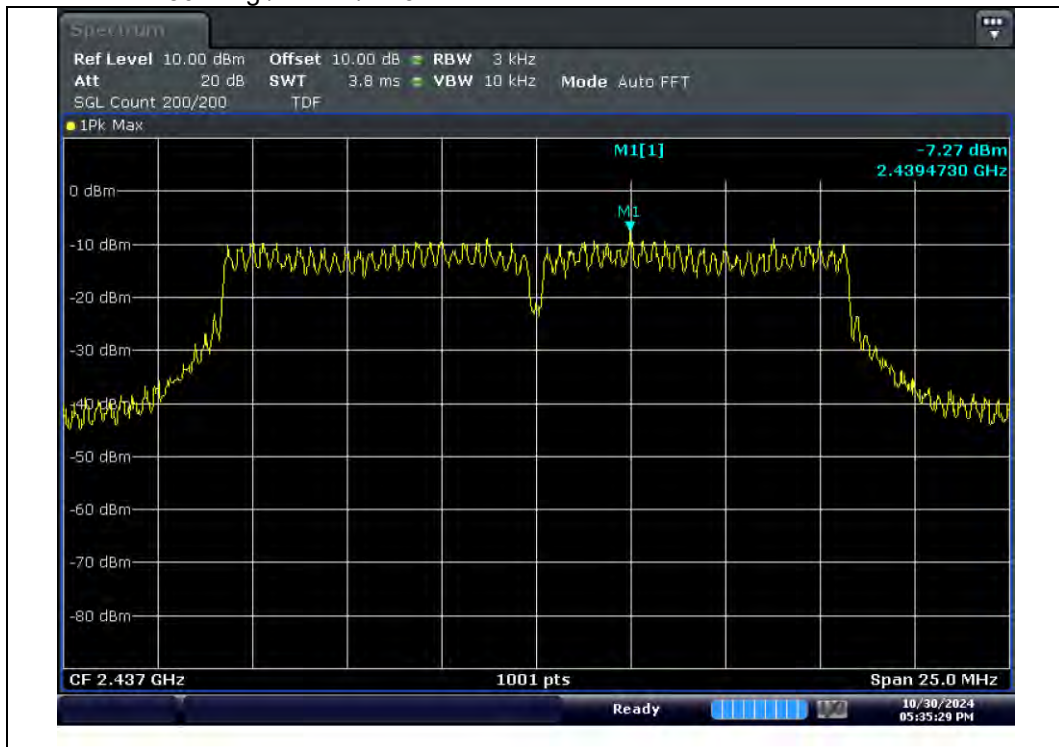
Test mode : 802.11g / ANT1 / 2462 MHz



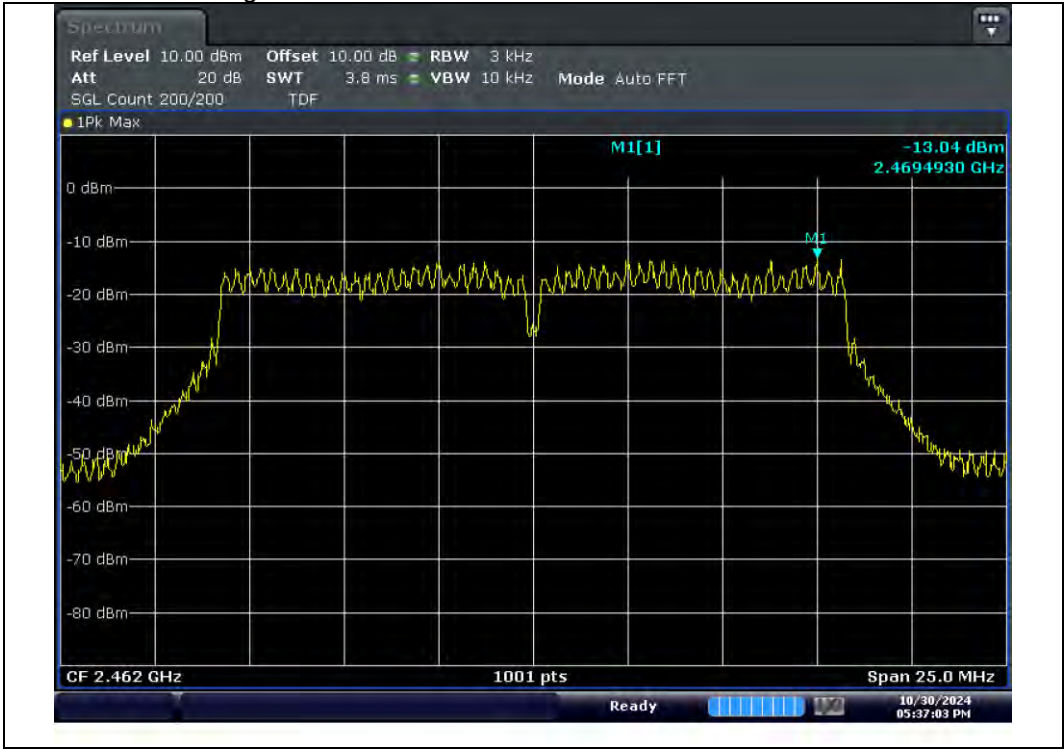
Test mode : 802.11g / ANT2 / 2412 MHz



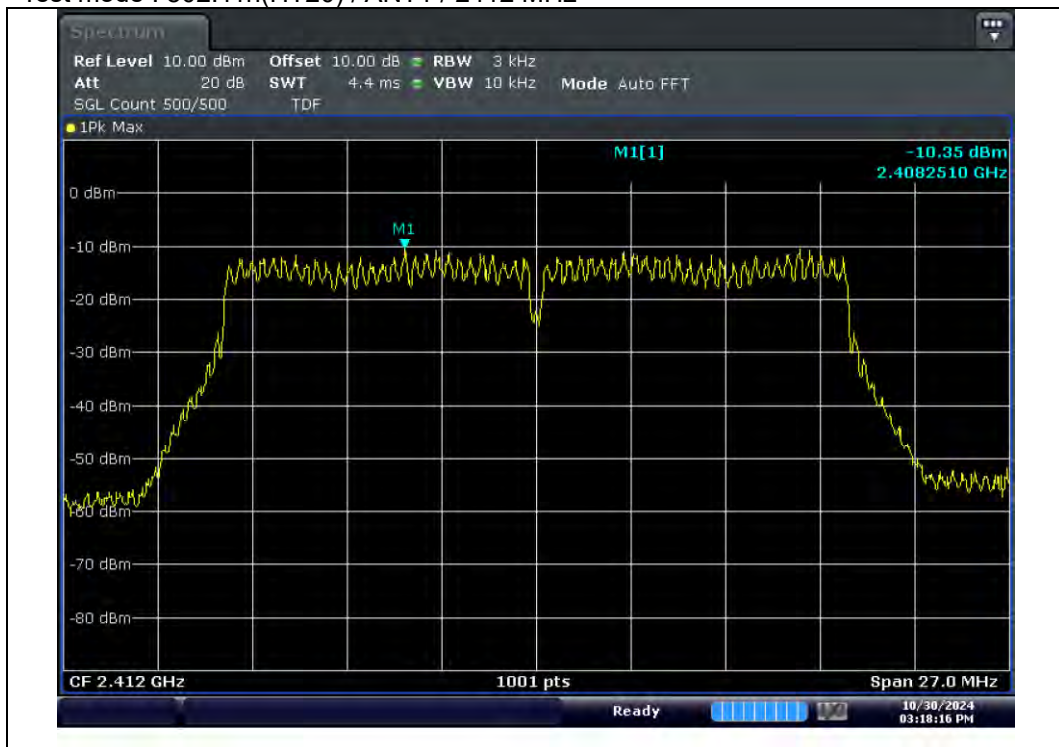
Test mode : 802.11g / ANT2 / 2437 MHz



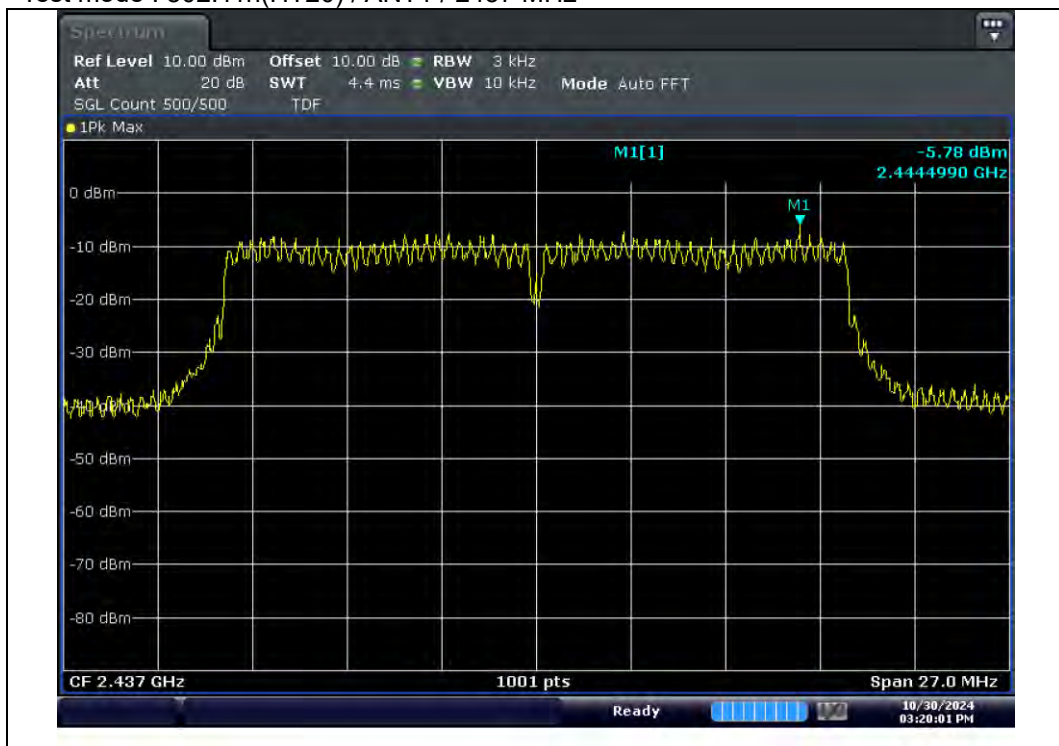
Test mode : 802.11g / ANT2 / 2462 MHz



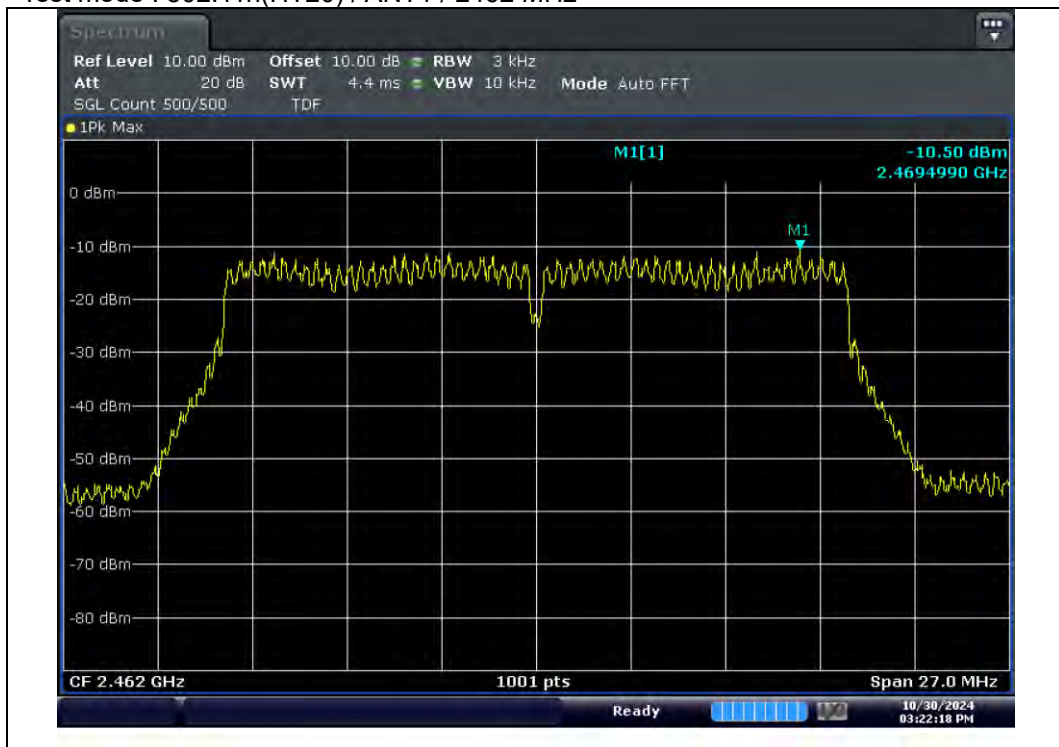
Test mode : 802.11n(HT20) / ANT1 / 2412 MHz



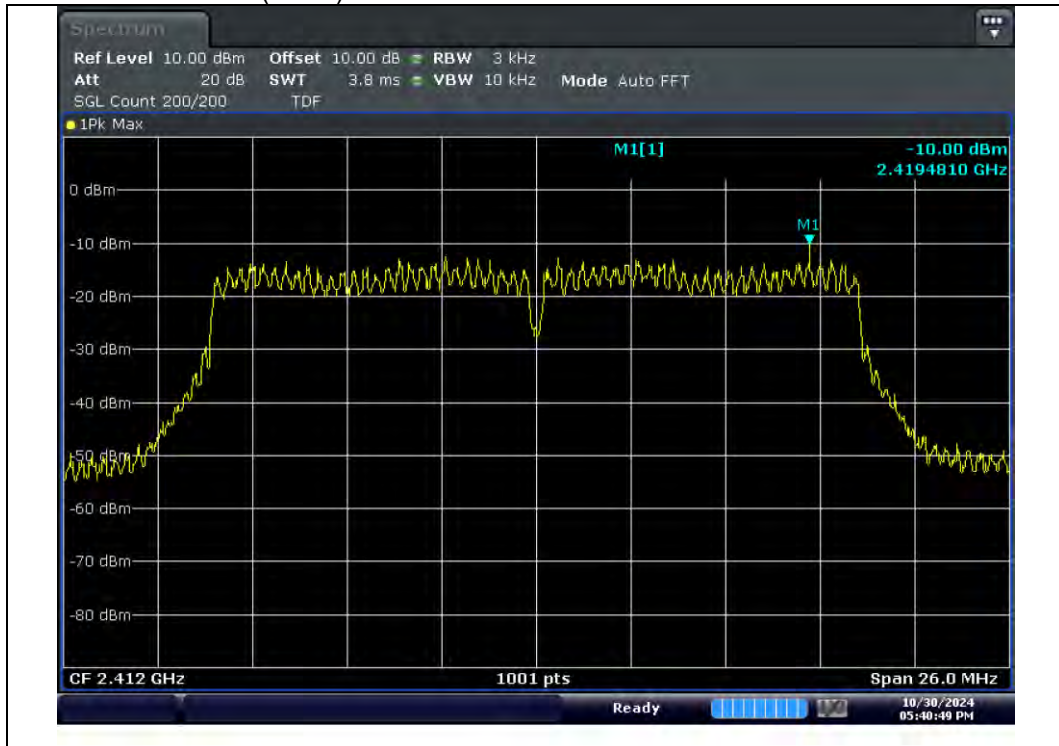
Test mode : 802.11n(HT20) / ANT1 / 2437 MHz



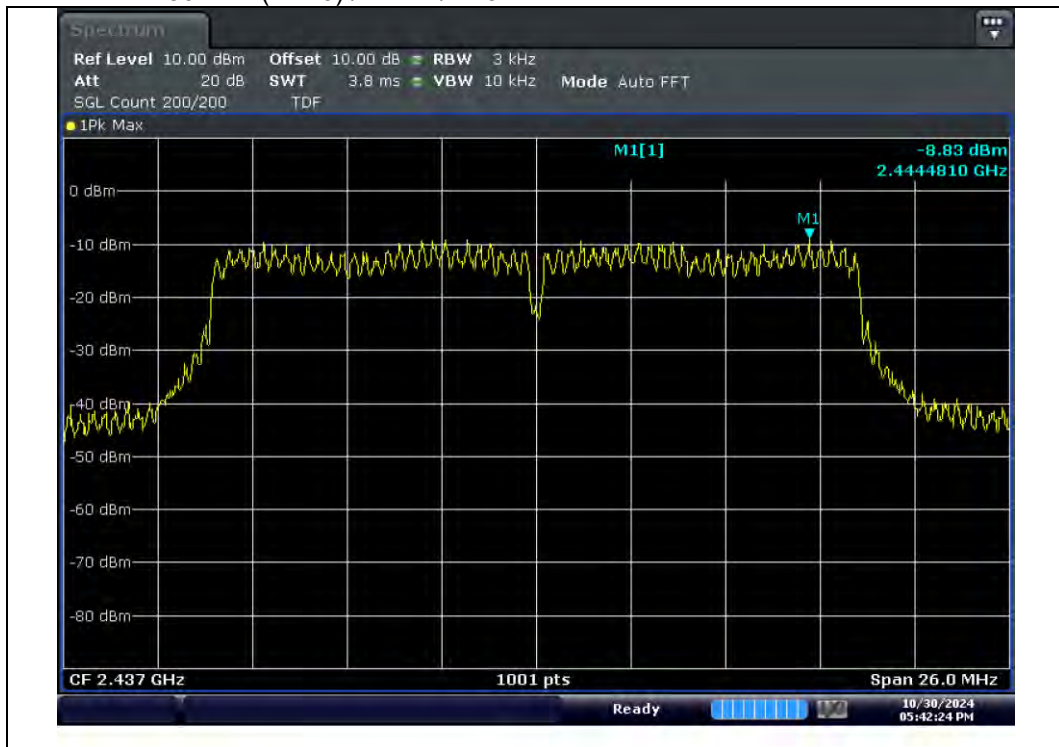
Test mode : 802.11n(HT20) / ANT1 / 2462 MHz



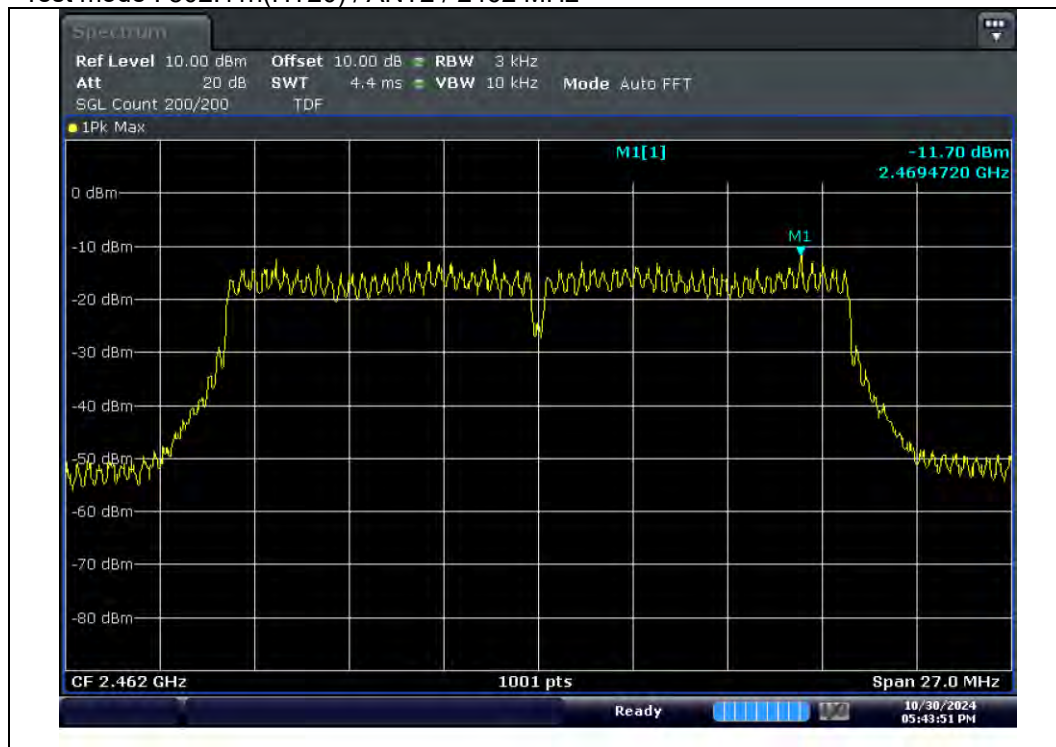
Test mode : 802.11n(HT20) / ANT2 / 2412 MHz



Test mode : 802.11n(HT20) / ANT2 / 2437 MHz



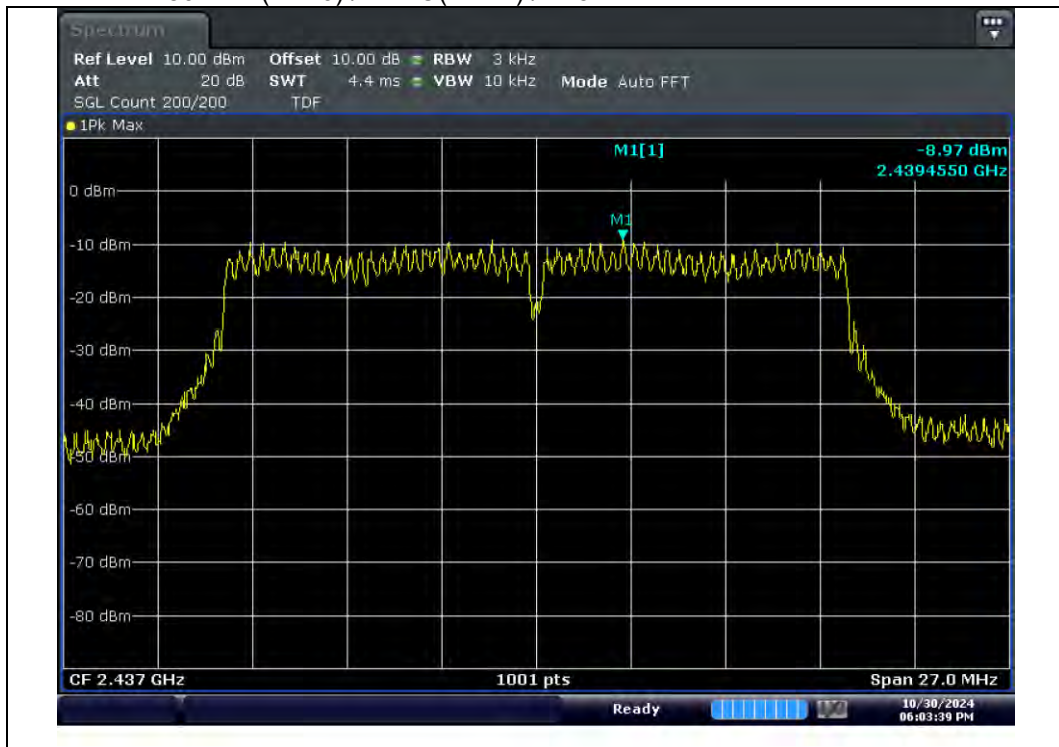
Test mode : 802.11n(HT20) / ANT2 / 2462 MHz



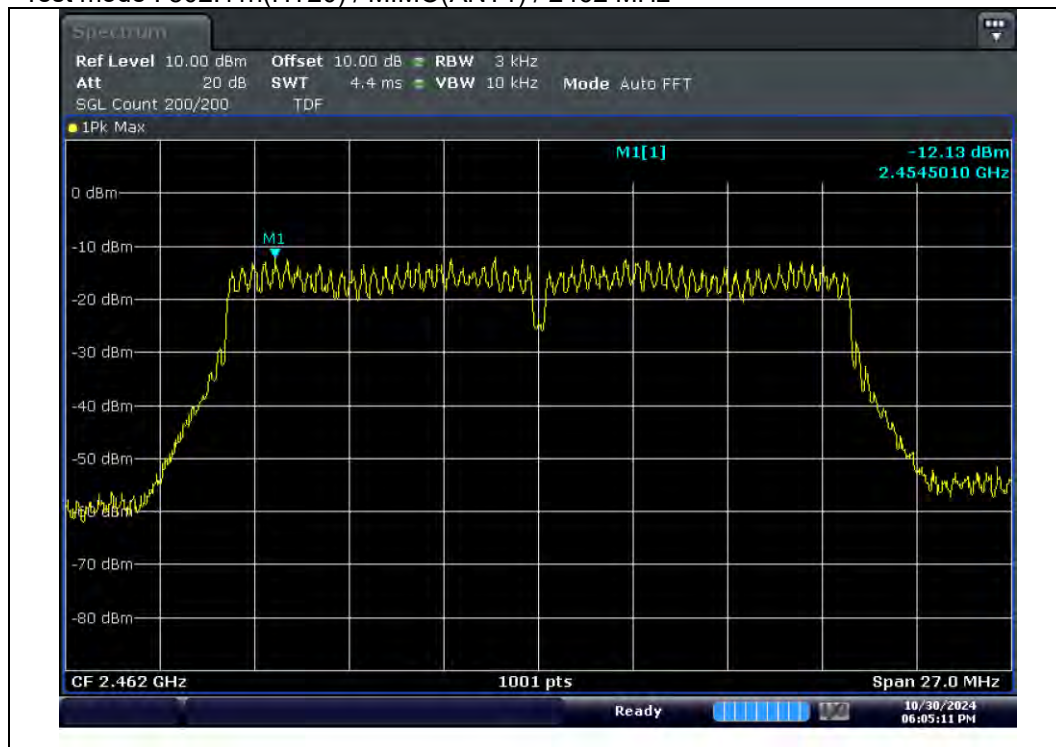
Test mode : 802.11n(HT20) / MIMO(ANT1) / 2412 MHz



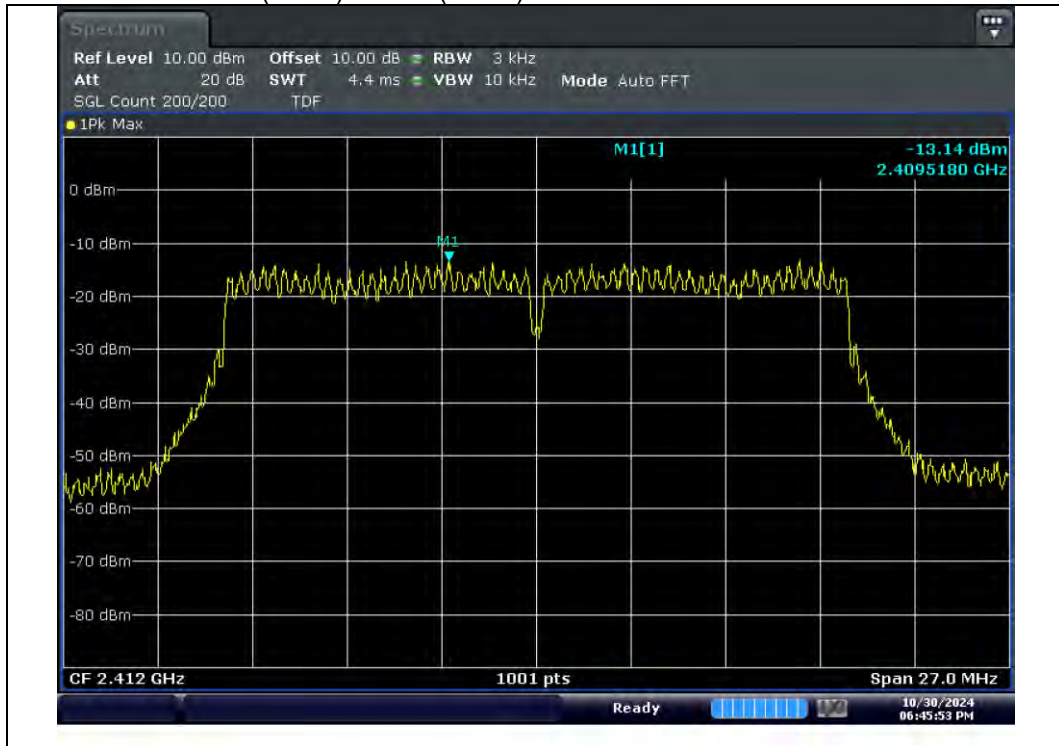
Test mode : 802.11n(HT20) / MIMO(ANT1) / 2437 MHz



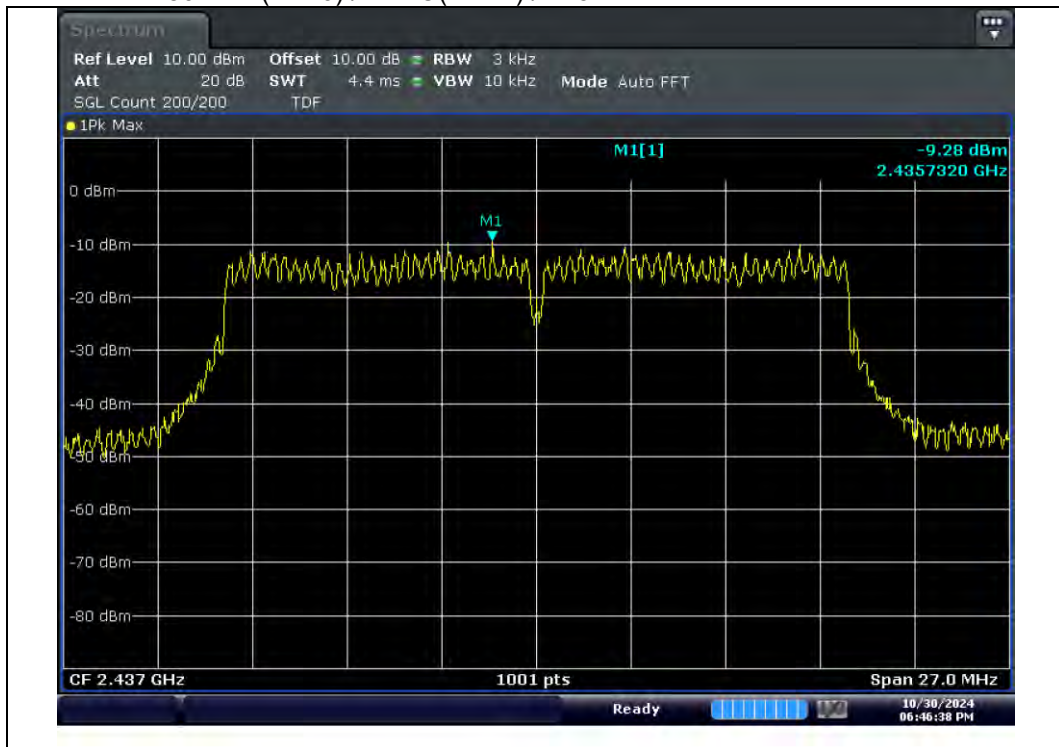
Test mode : 802.11n(HT20) / MIMO(ANT1) / 2462 MHz



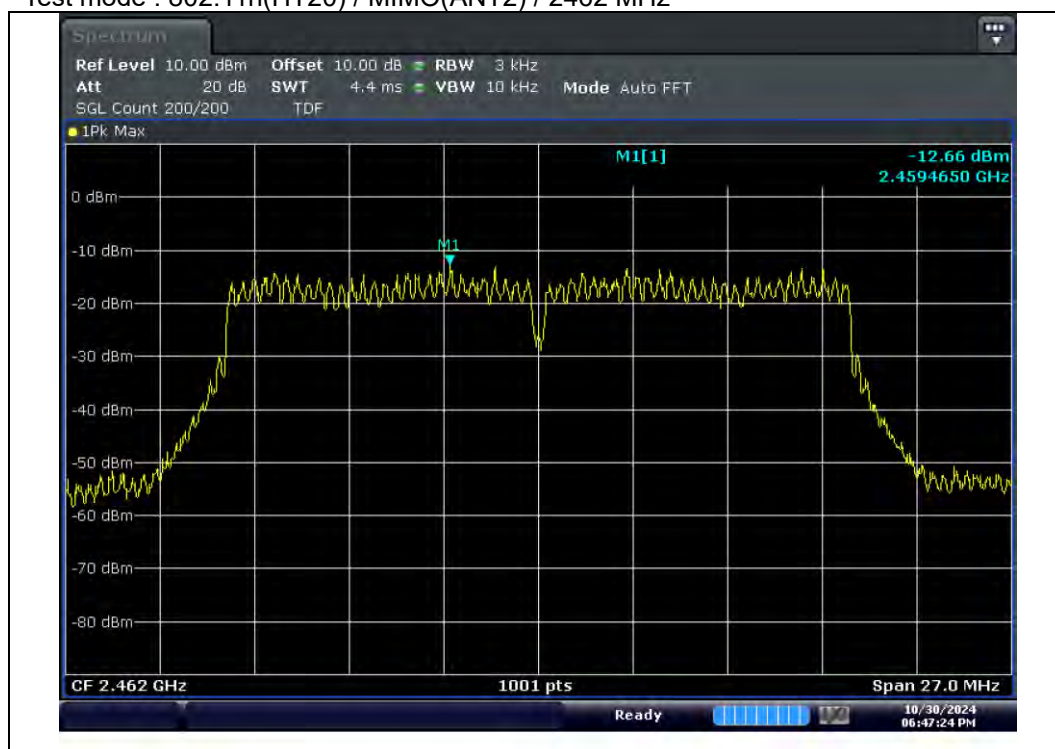
Test mode : 802.11n(HT20) / MIMO(ANT2) / 2412 MHz



Test mode : 802.11n(HT20) / MIMO(ANT2) / 2437 MHz



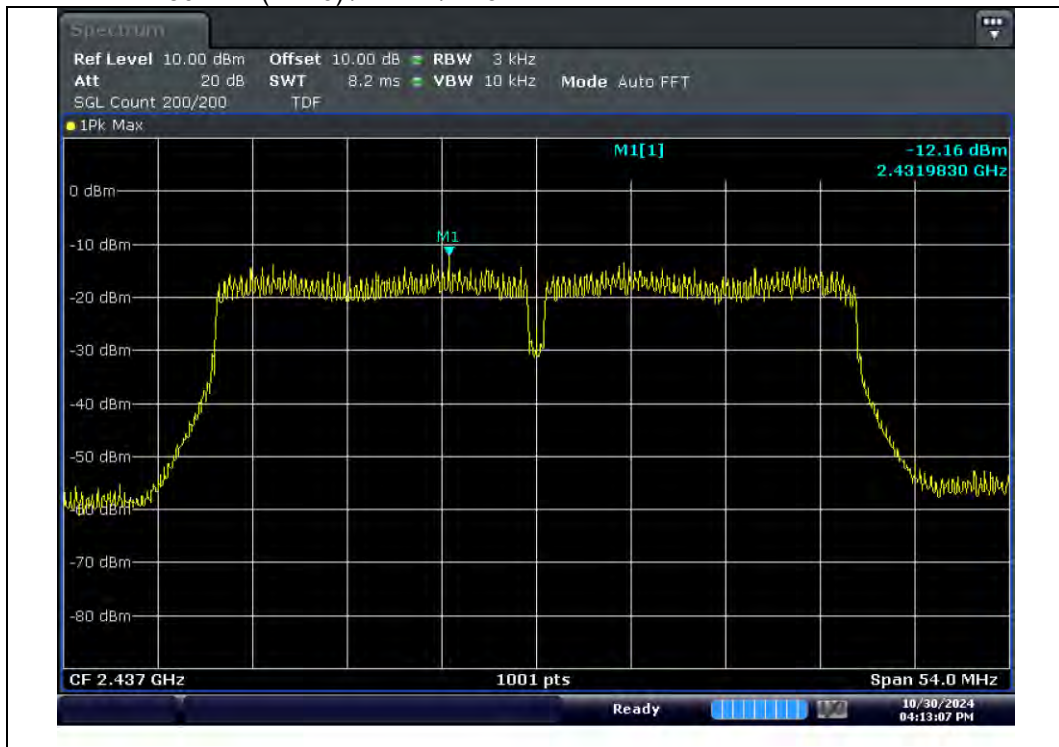
Test mode : 802.11n(HT20) / MIMO(ANT2) / 2462 MHz



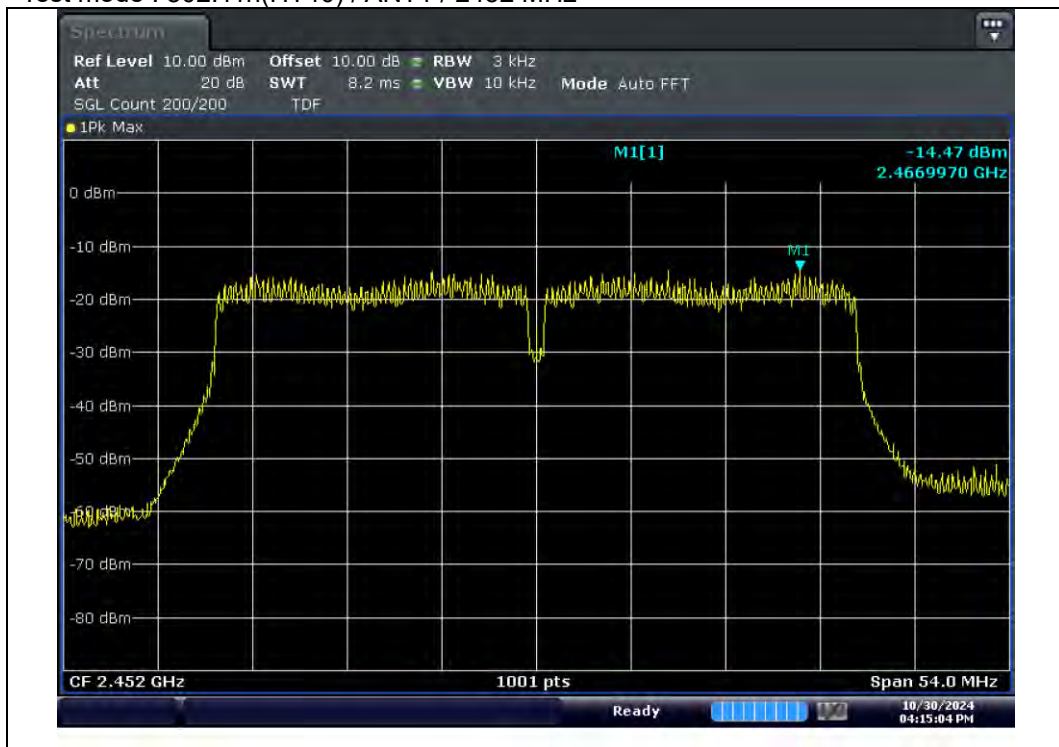
Test mode : 802.11n(HT40) / ANT1 / 2422 MHz



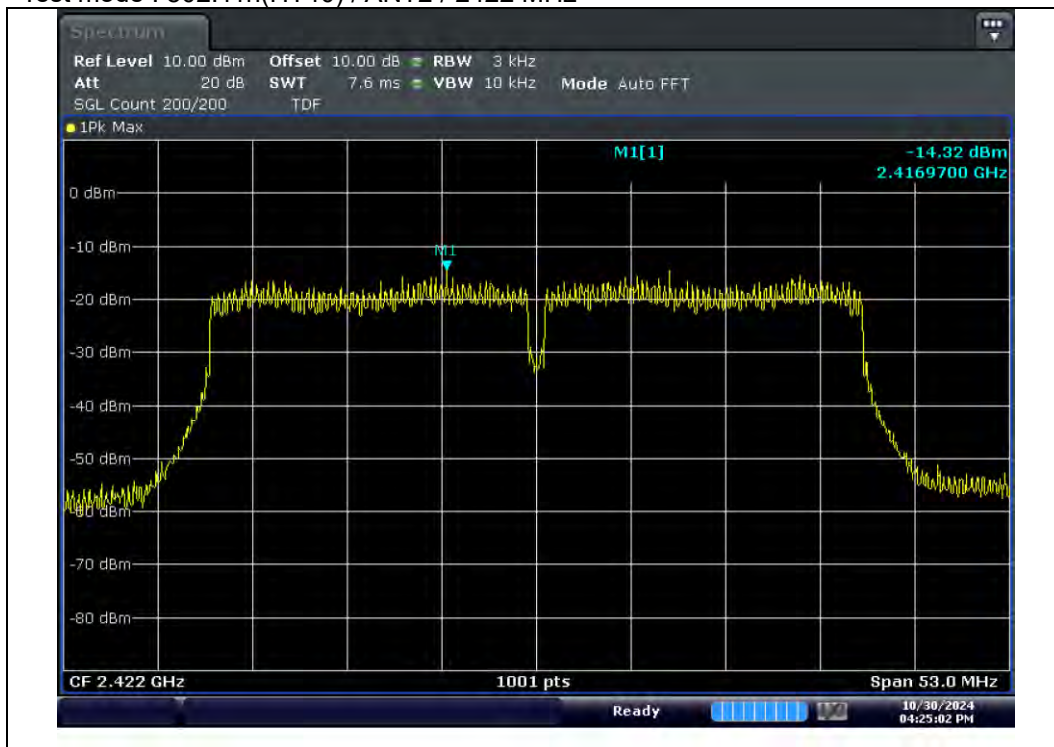
Test mode : 802.11n(HT40) / ANT1 / 2437 MHz



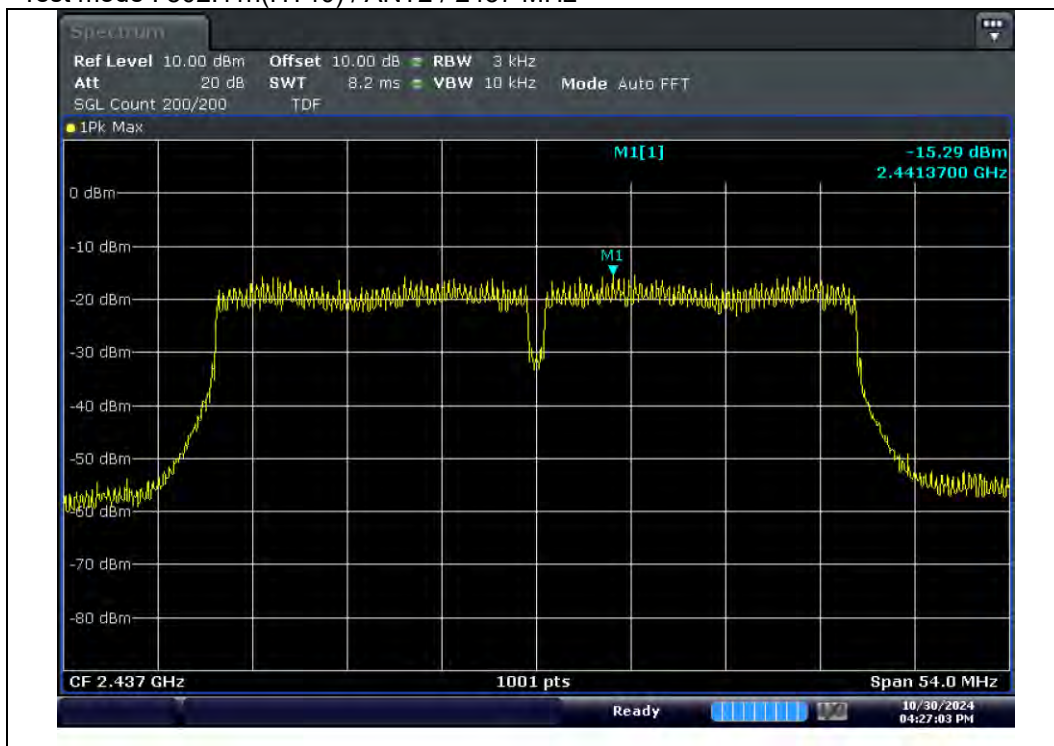
Test mode : 802.11n(HT40) / ANT1 / 2452 MHz



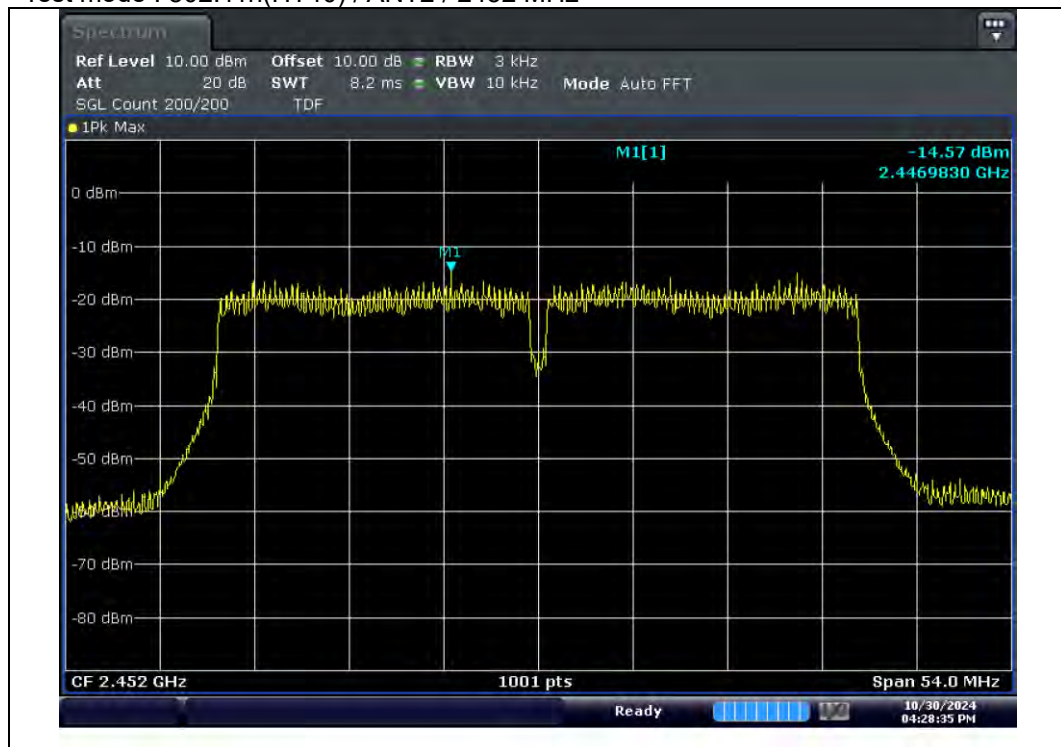
Test mode : 802.11n(HT40) / ANT2 / 2422 MHz



Test mode : 802.11n(HT40) / ANT2 / 2437 MHz



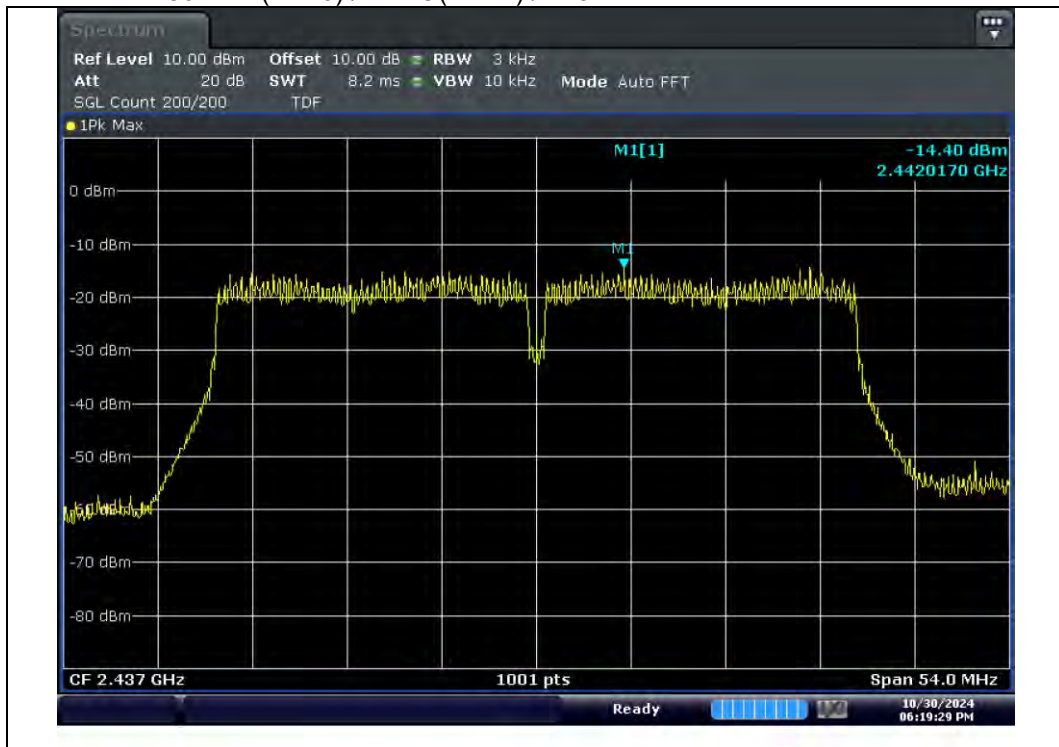
Test mode : 802.11n(HT40) / ANT2 / 2452 MHz



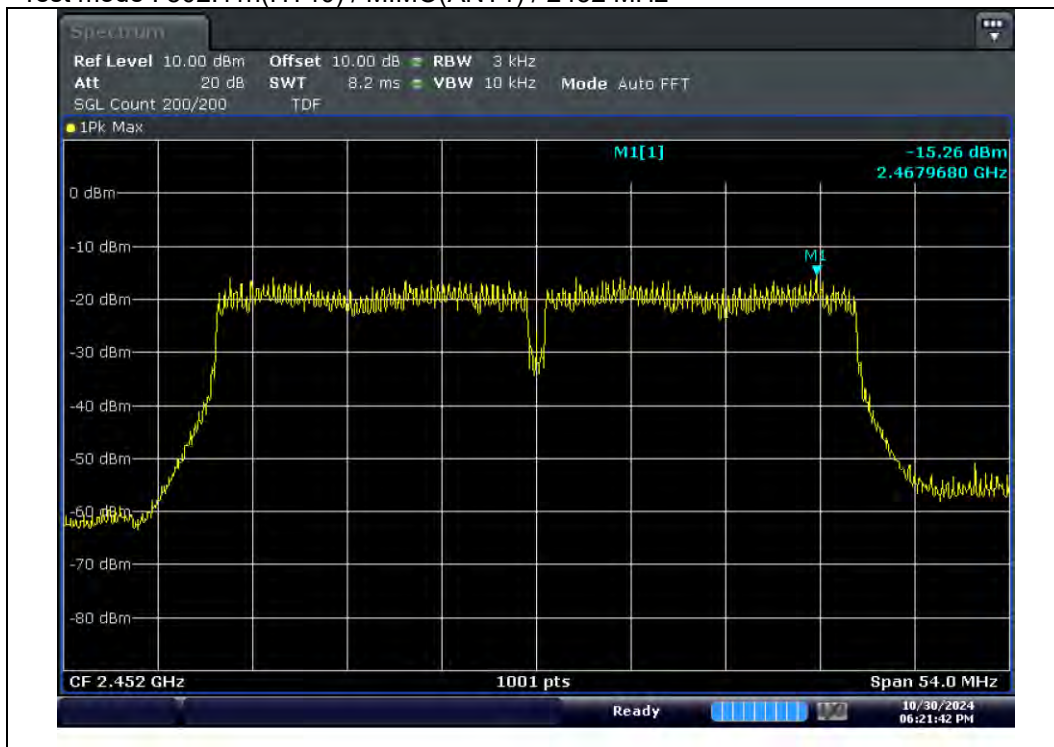
Test mode : 802.11n(HT40) / MIMO(ANT1) / 2422 MHz



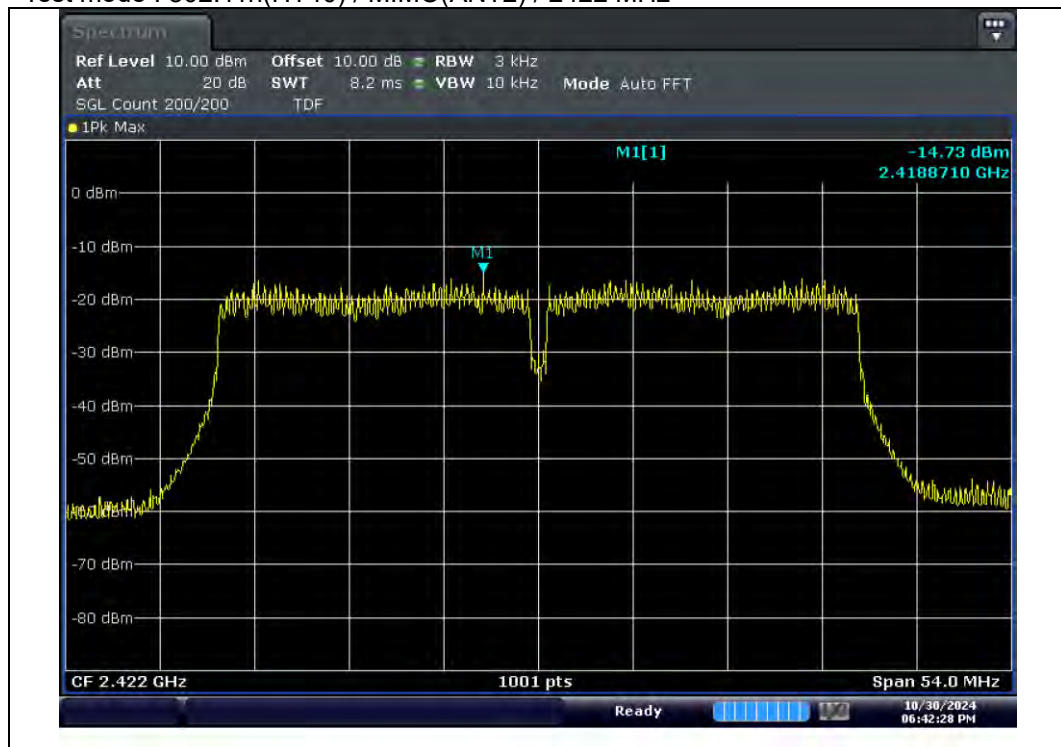
Test mode : 802.11n(HT40) / MIMO(ANT1) / 2437 MHz



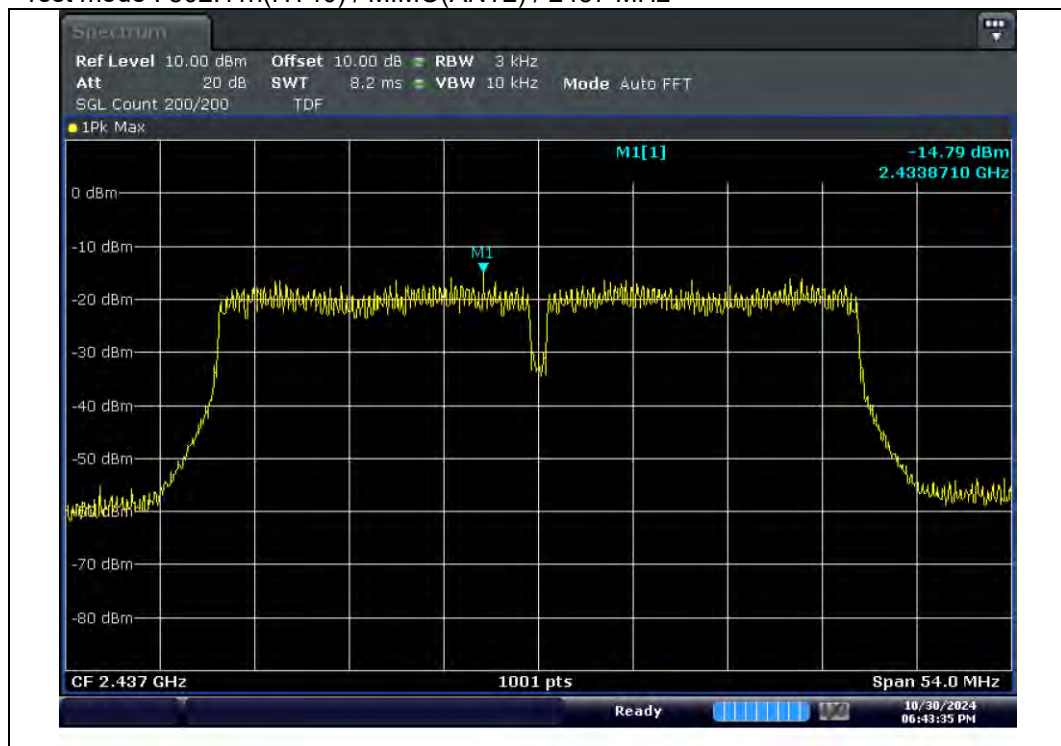
Test mode : 802.11n(HT40) / MIMO(ANT1) / 2452 MHz



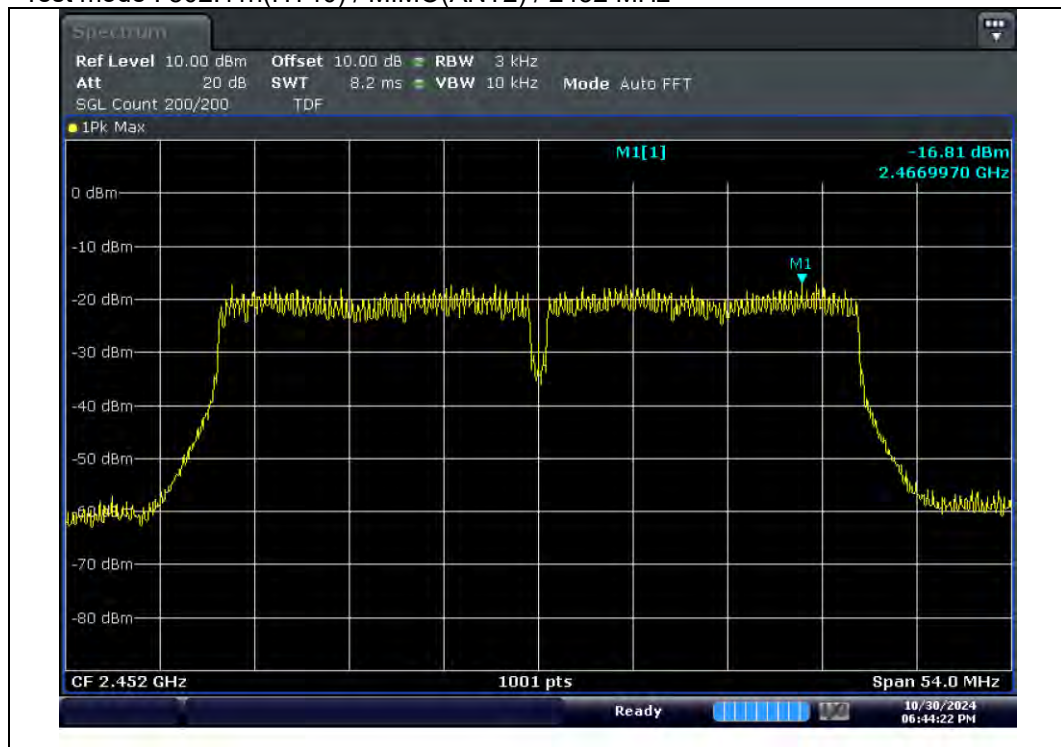
Test mode : 802.11n(HT40) / MIMO(ANT2) / 2422 MHz



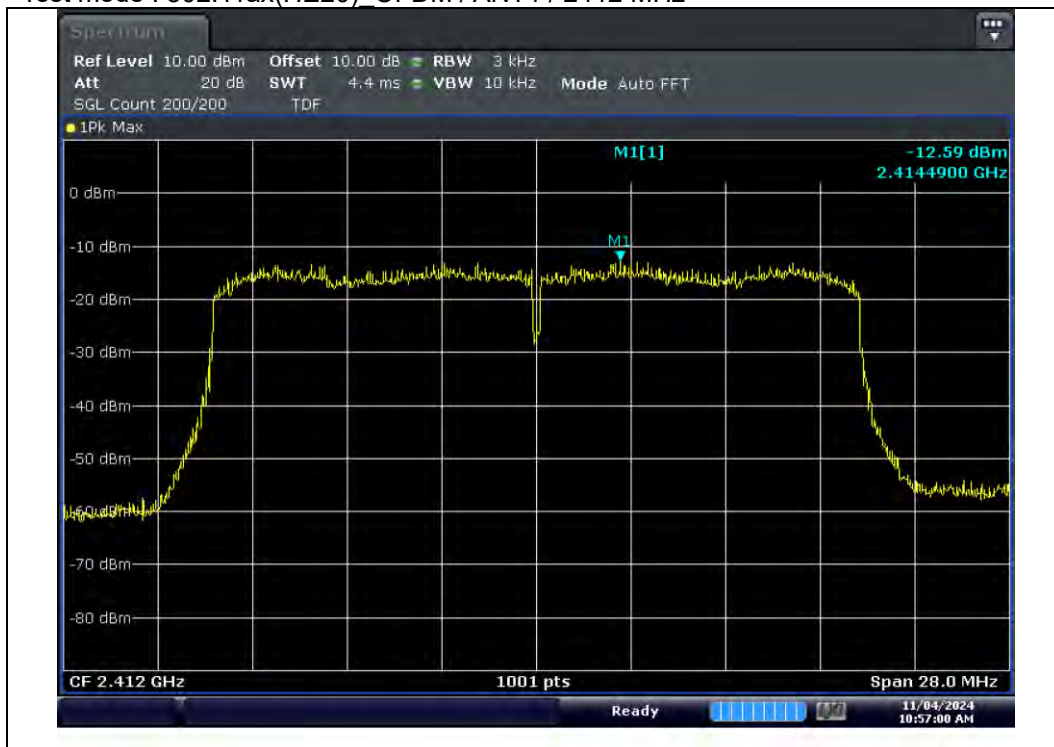
Test mode : 802.11n(HT40) / MIMO(ANT2) / 2437 MHz



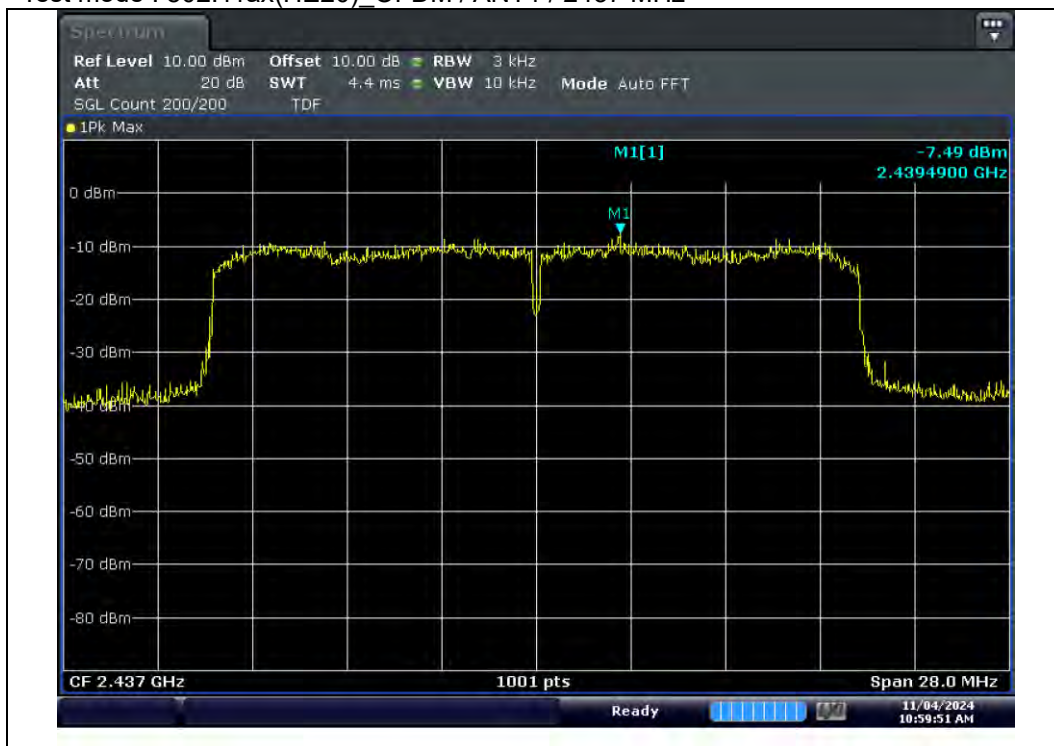
Test mode : 802.11n(HT40) / MIMO(ANT2) / 2452 MHz



Test mode : 802.11ax(HE20)_OFDM / ANT1 / 2412 MHz



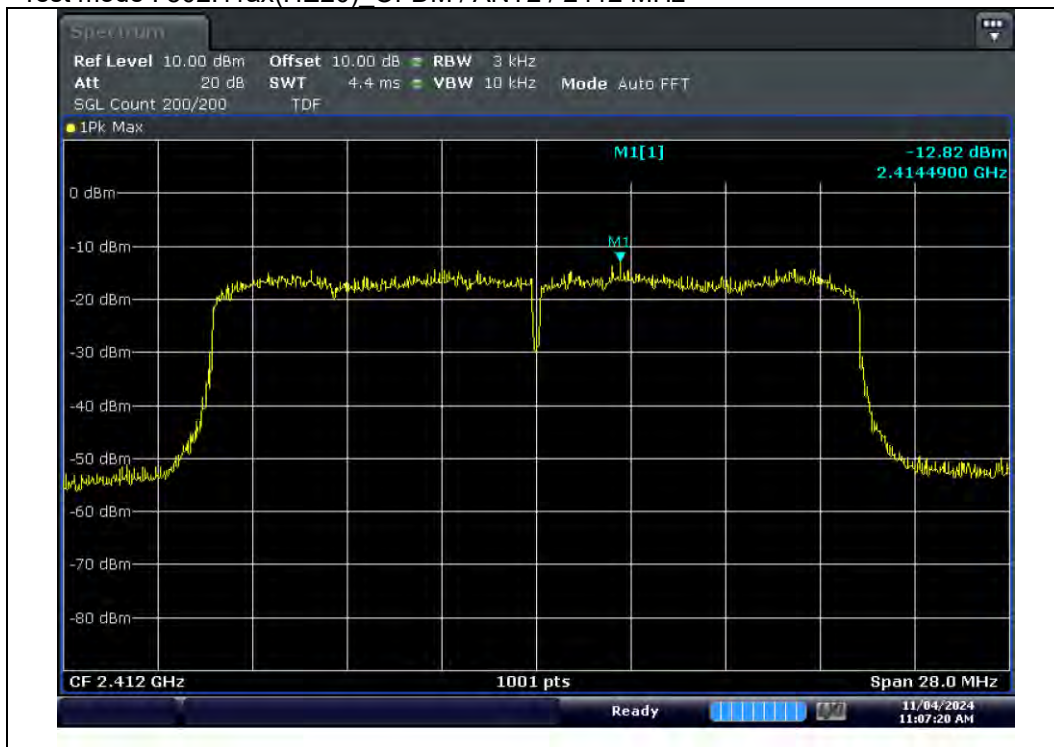
Test mode : 802.11ax(HE20)_OFDM / ANT1 / 2437 MHz



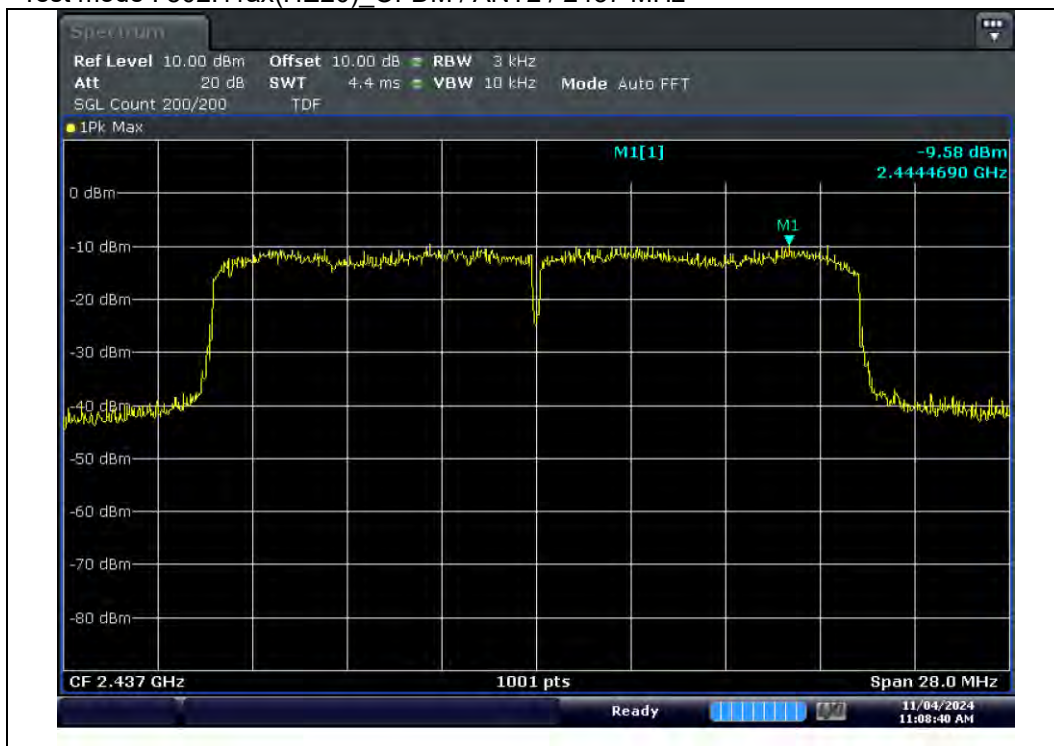
Test mode : 802.11ax(HE20) OFDM / ANT1 / 2462 MHz



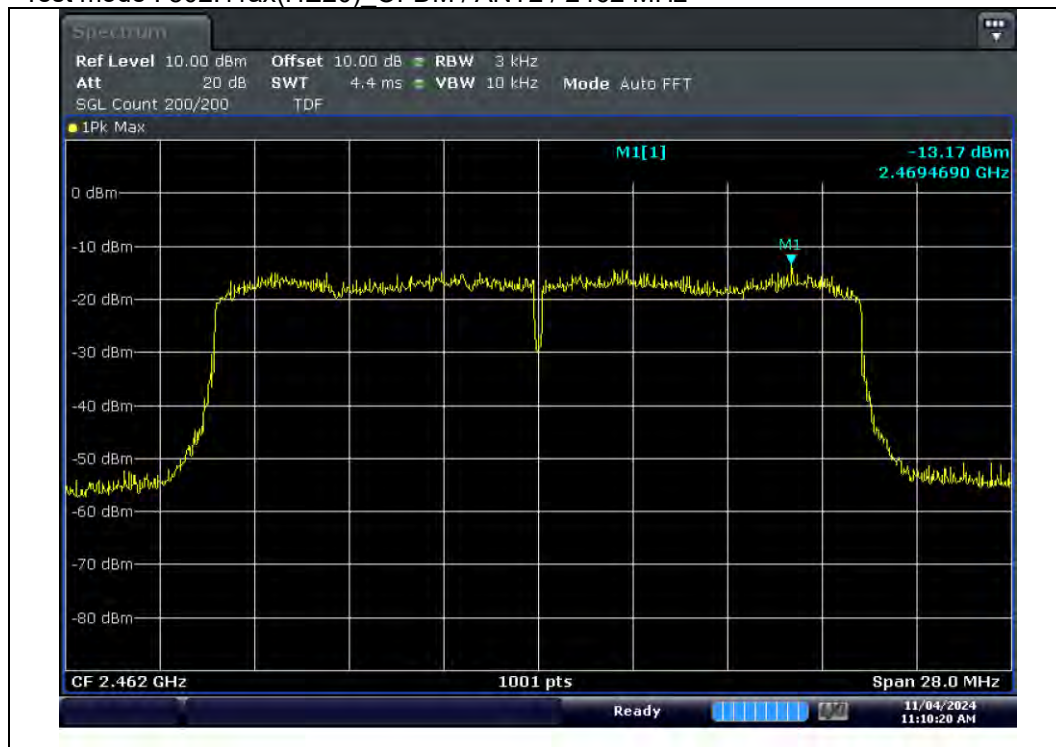
Test mode : 802.11ax(HE20)_OFDM / ANT2 / 2412 MHz



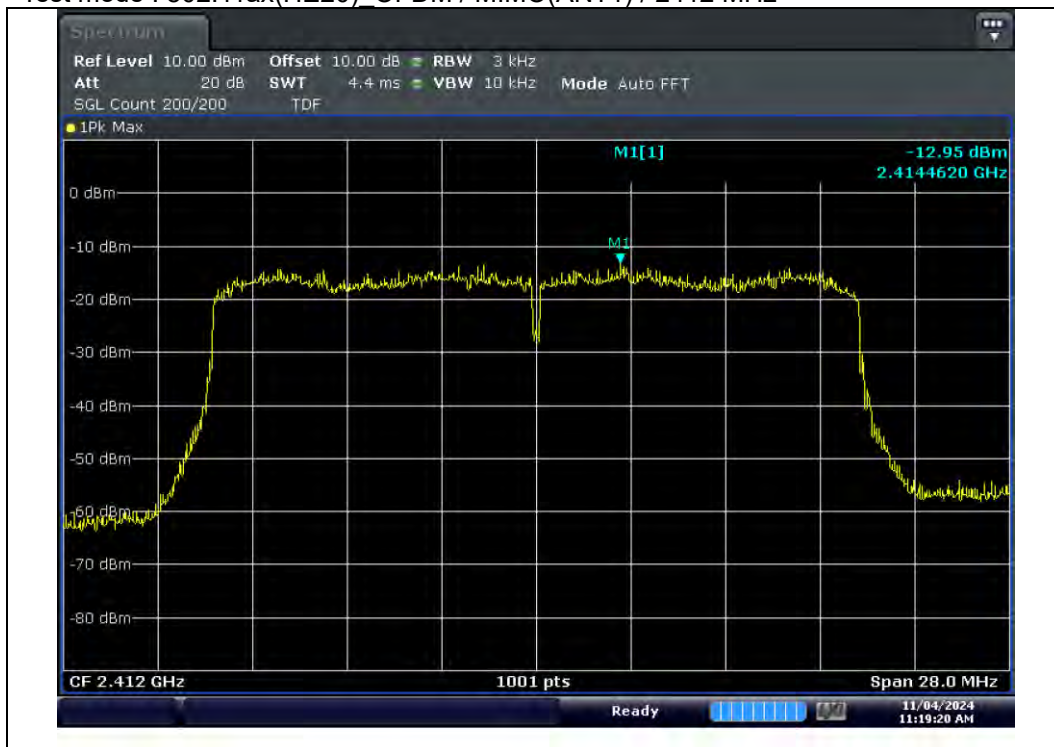
Test mode : 802.11ax(HE20)_OFDM / ANT2 / 2437 MHz



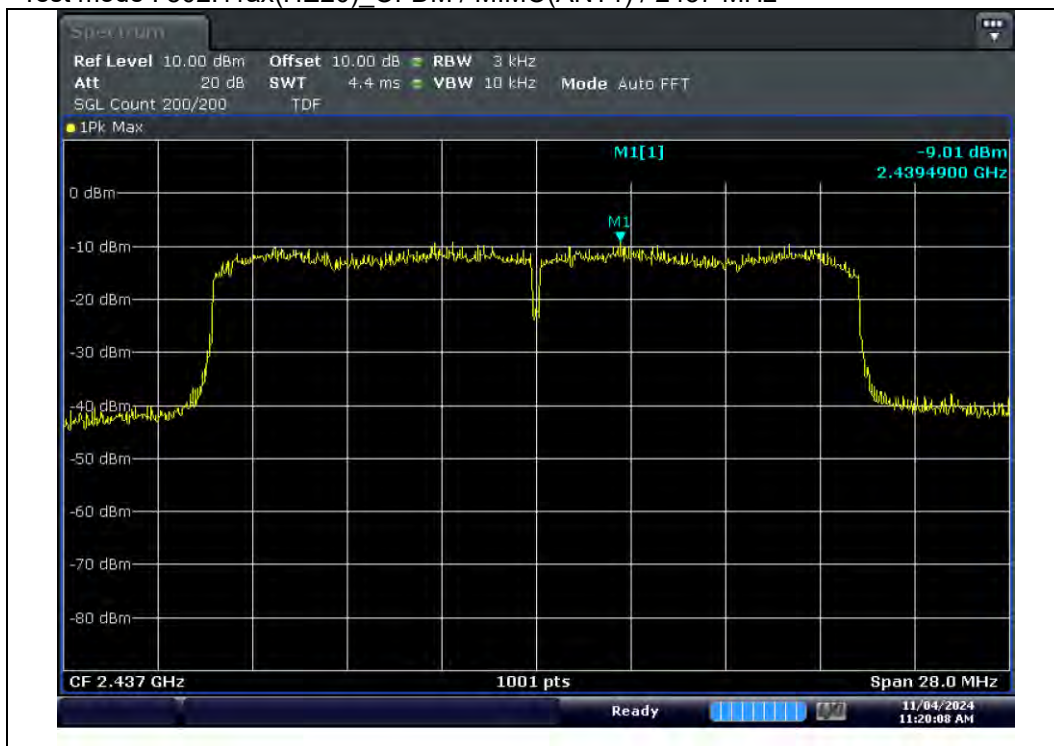
Test mode : 802.11ax(HE20) OFDM / ANT2 / 2462 MHz



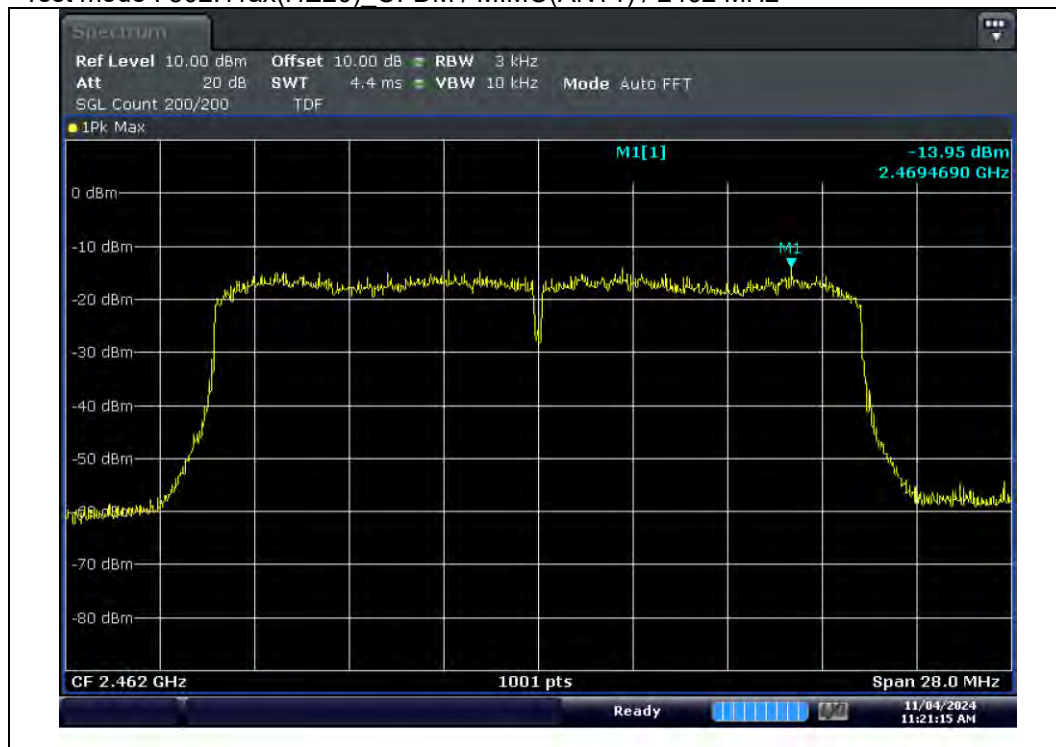
Test mode : 802.11ax(HE20)_OFDM / MIMO(ANT1) / 2412 MHz



Test mode : 802.11ax(HE20)_OFDM / MIMO(ANT1) / 2437 MHz



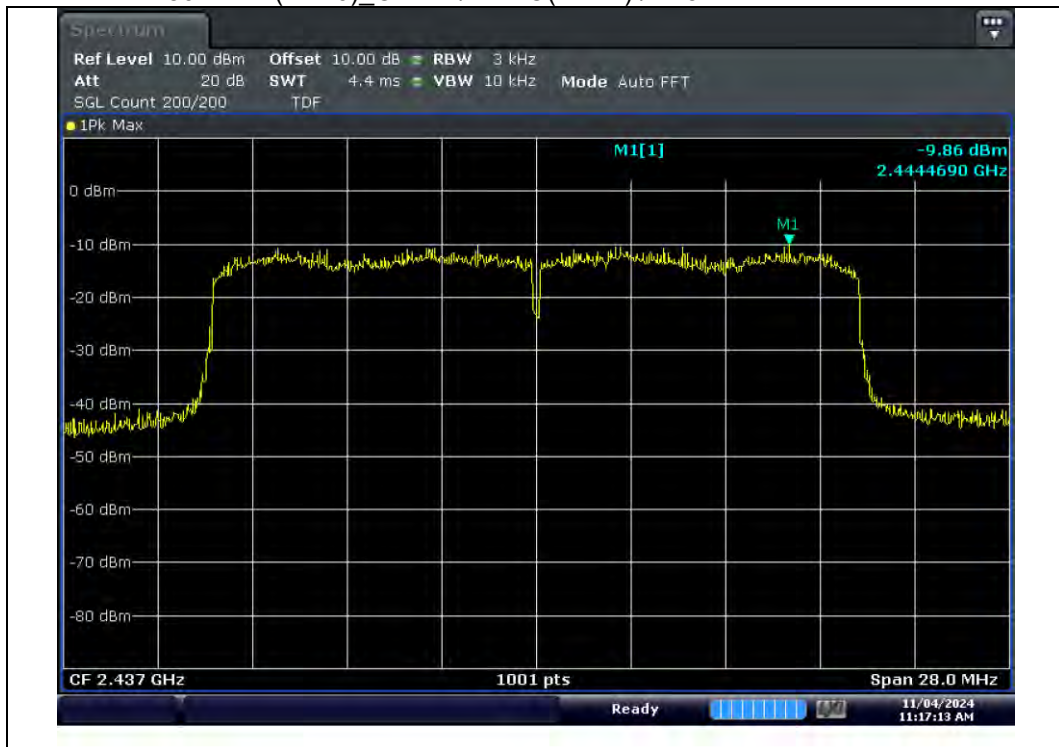
Test mode : 802.11ax(HE20) OFDM / MIMO(ANT1) / 2462 MHz



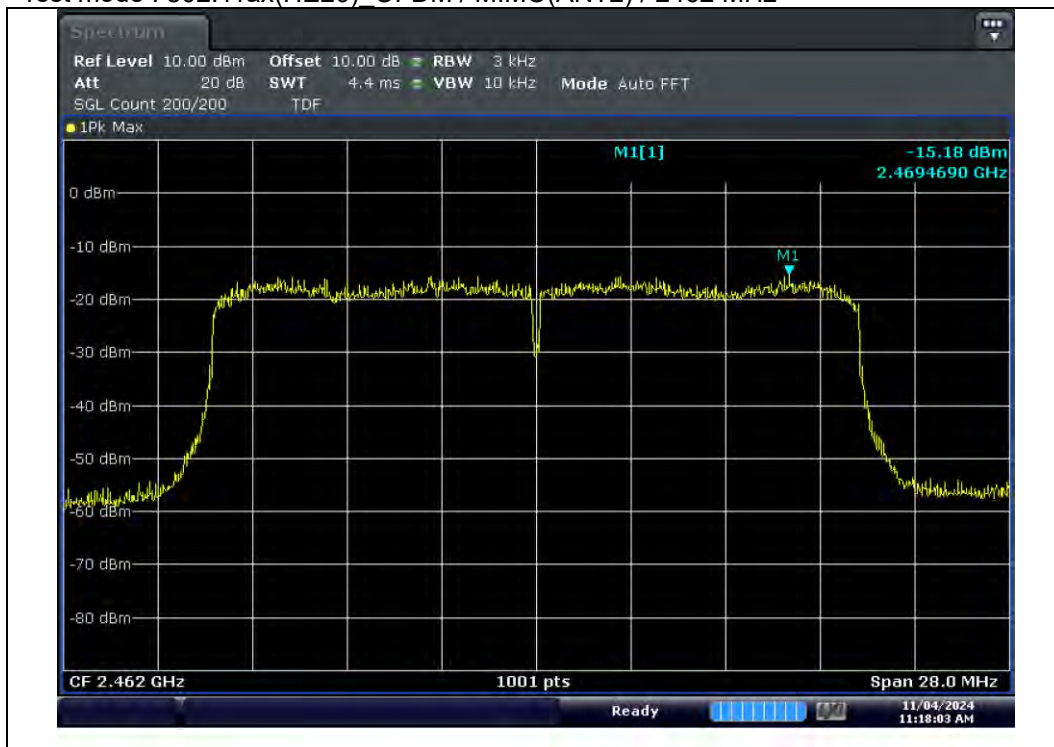
Test mode : 802.11ax(HE20)_OFDM / MIMO(ANT2) / 2412 MHz



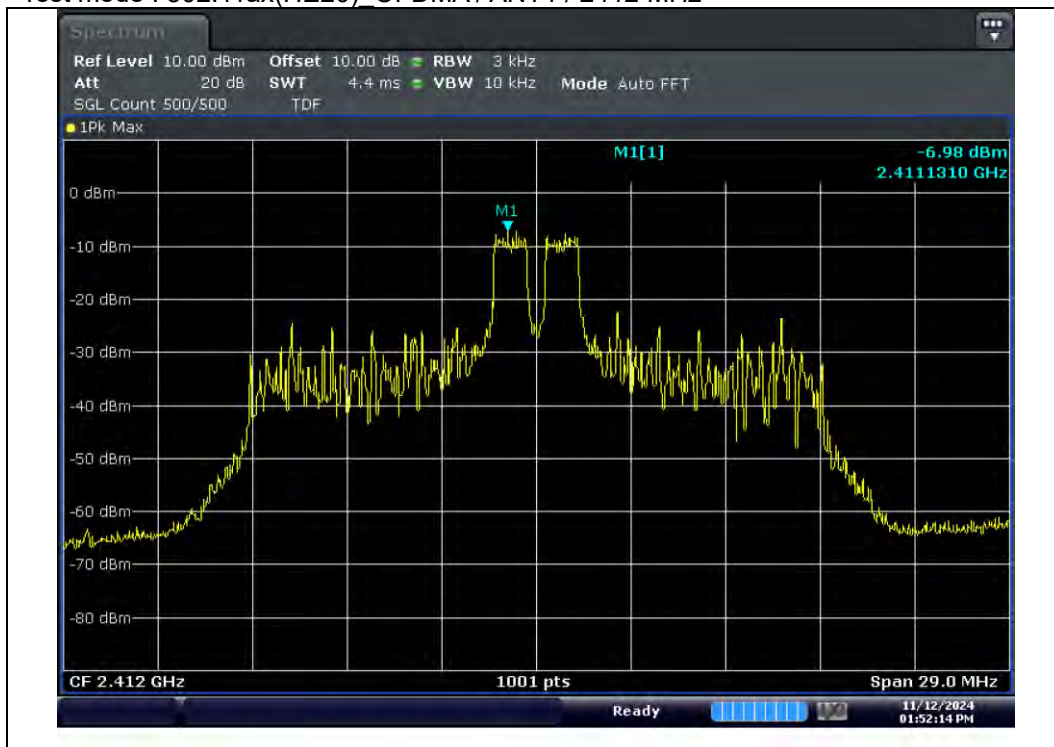
Test mode : 802.11ax(HE20)_OFDM / MIMO(ANT2) / 2437 MHz



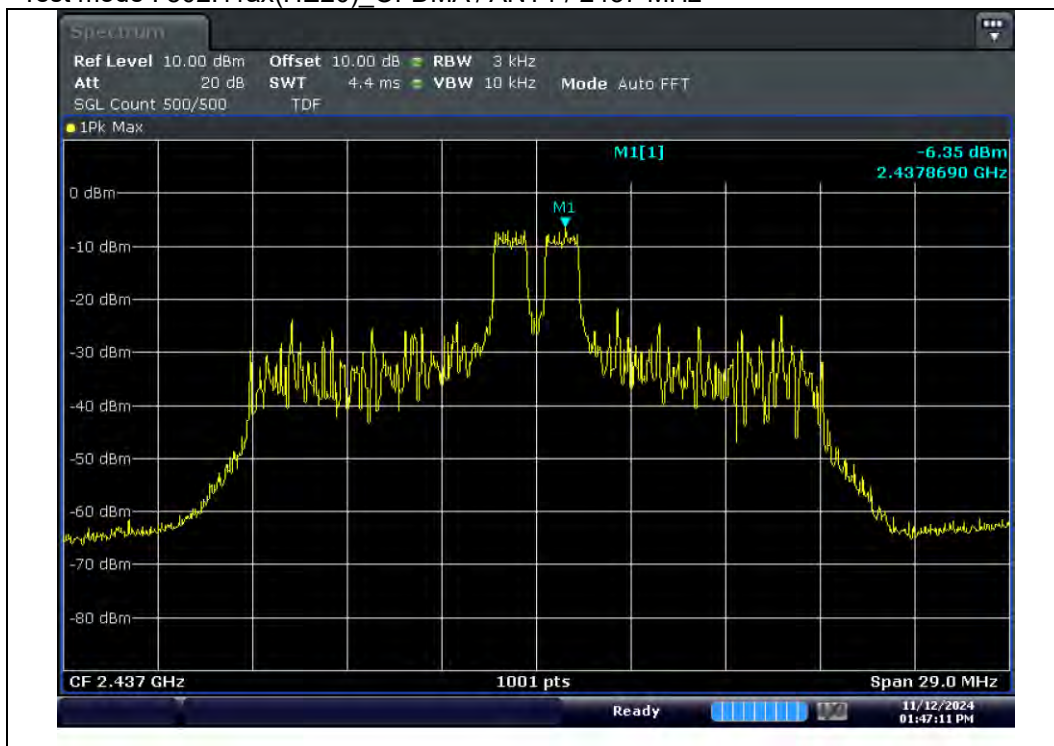
Test mode : 802.11ax(HE20) OFDM / MIMO(ANT2) / 2462 MHz



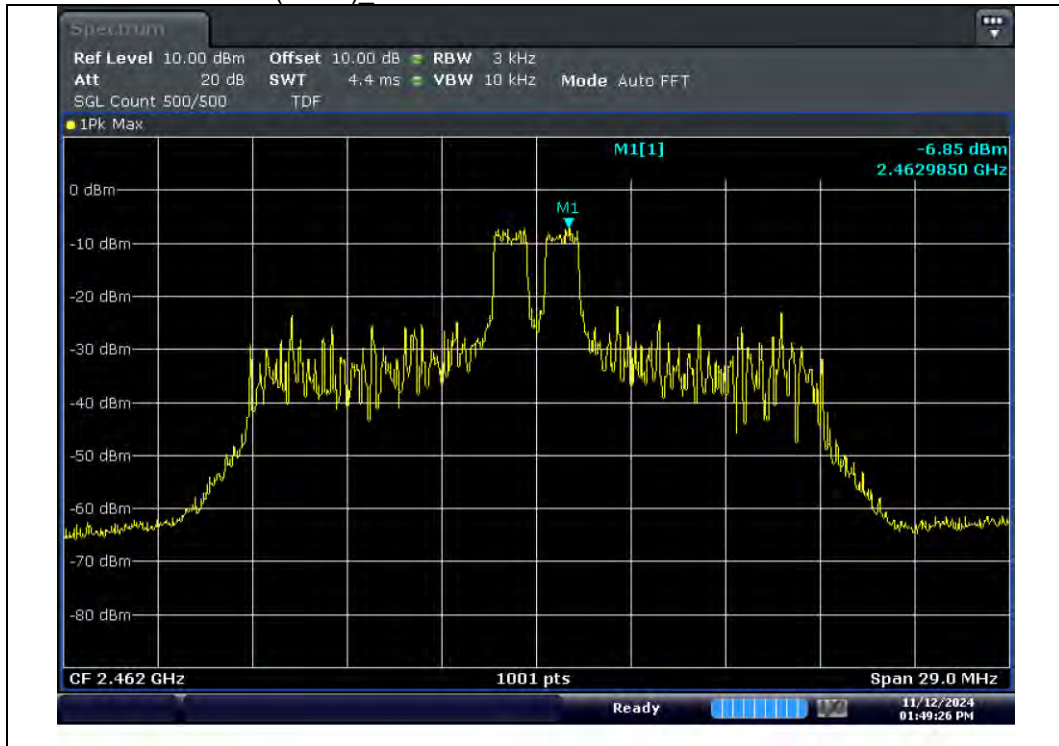
Test mode : 802.11ax(HE20)_OFDMA / ANT1 / 2412 MHz



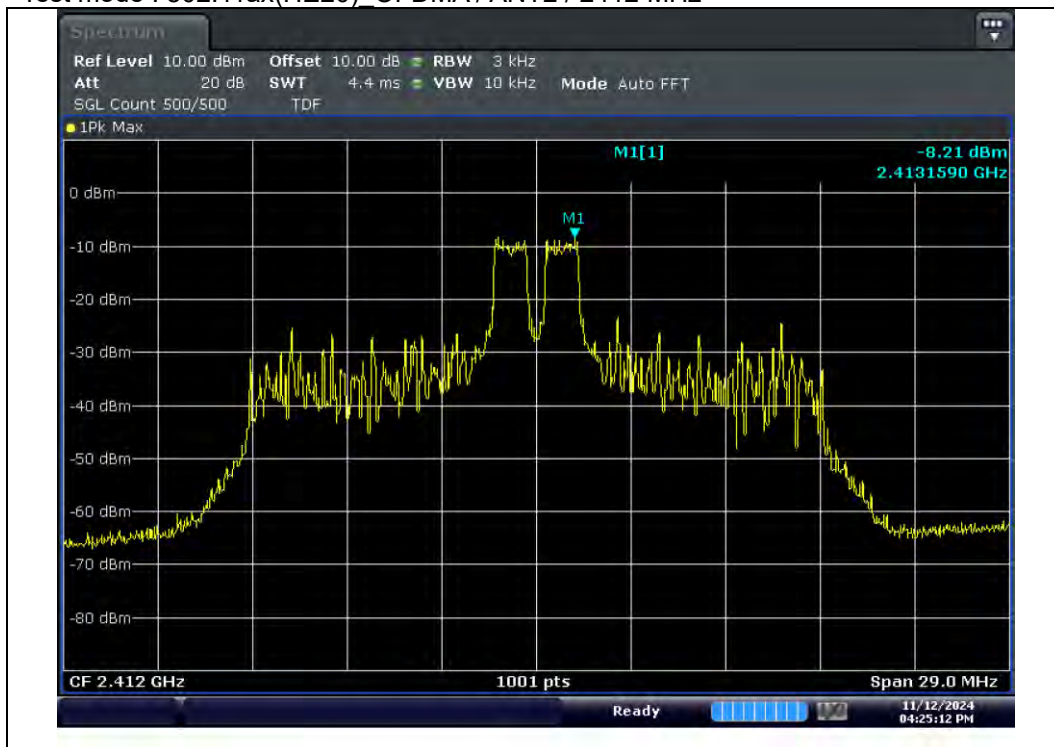
Test mode : 802.11ax(HE20)_OFDMA / ANT1 / 2437 MHz



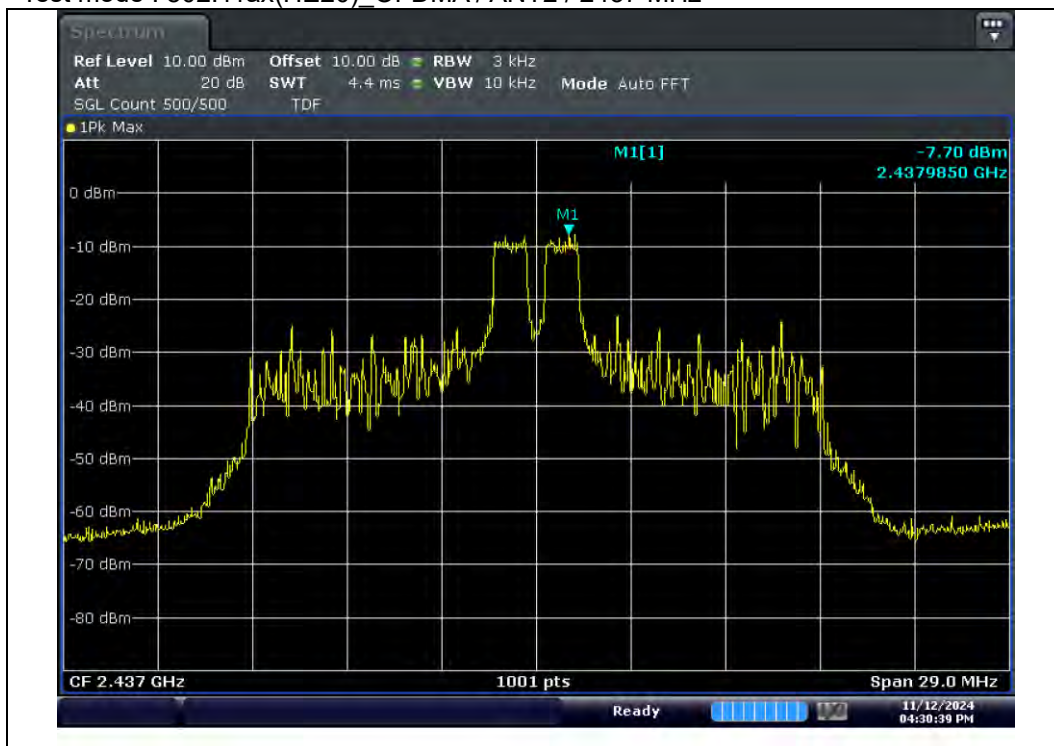
Test mode : 802.11ax(HE20) OFDMA / ANT1 / 2462 MHz



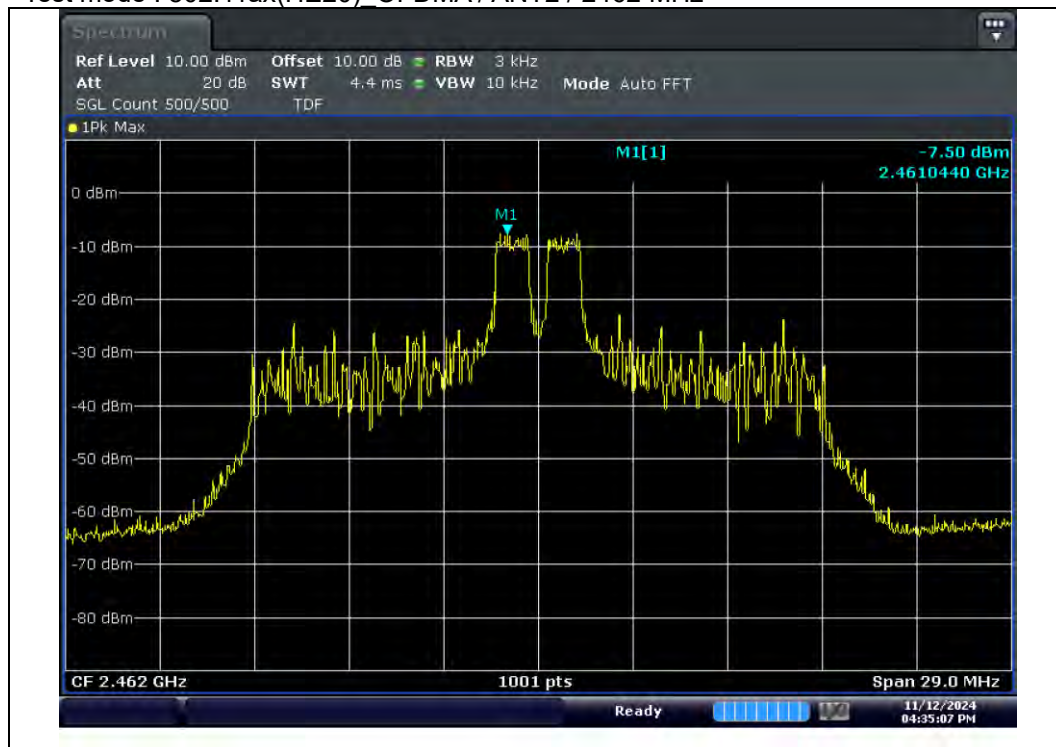
Test mode : 802.11ax(HE20)_OFDMA / ANT2 / 2412 MHz



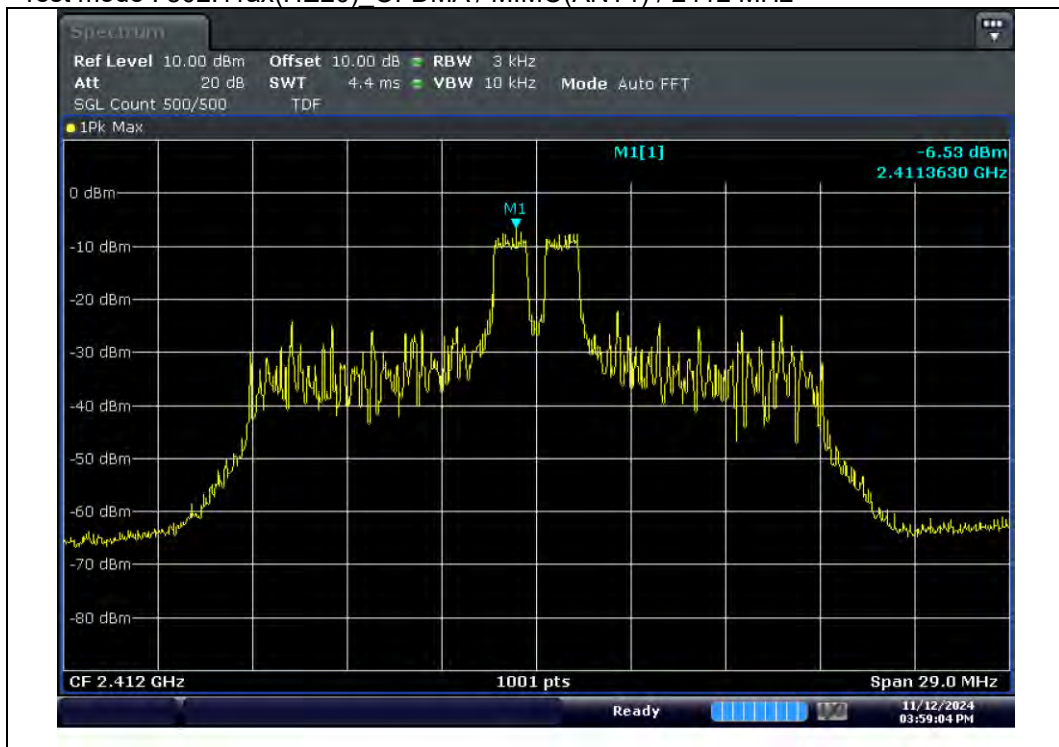
Test mode : 802.11ax(HE20)_OFDMA / ANT2 / 2437 MHz



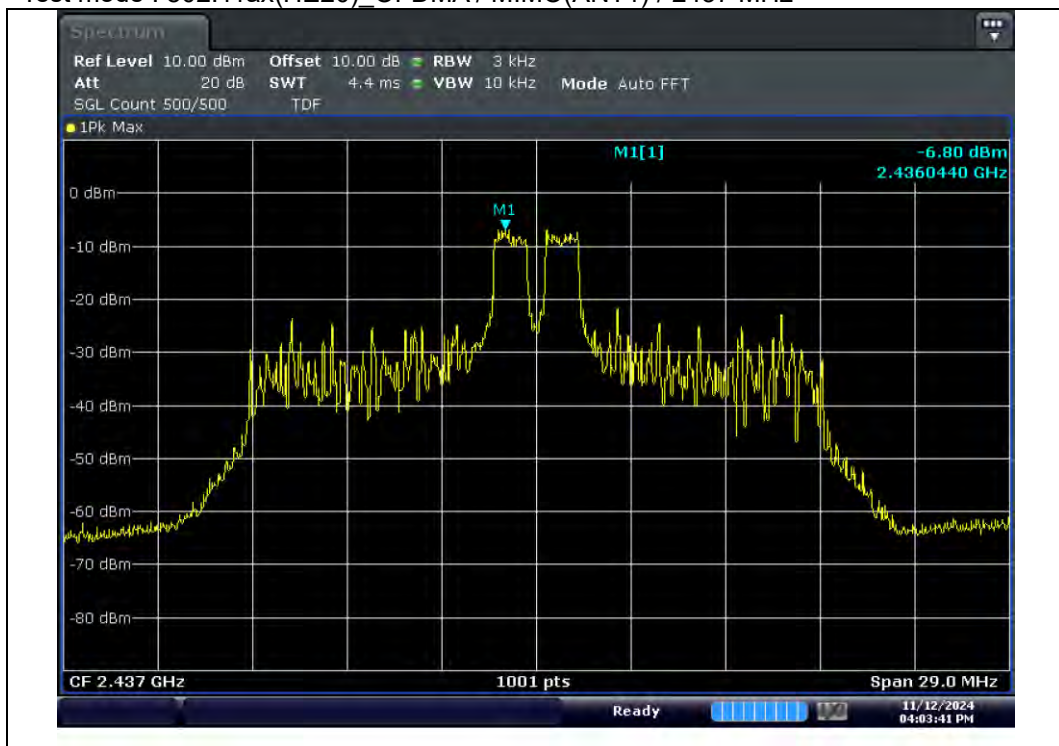
Test mode : 802.11ax(HE20) OFDMA / ANT2 / 2462 MHz



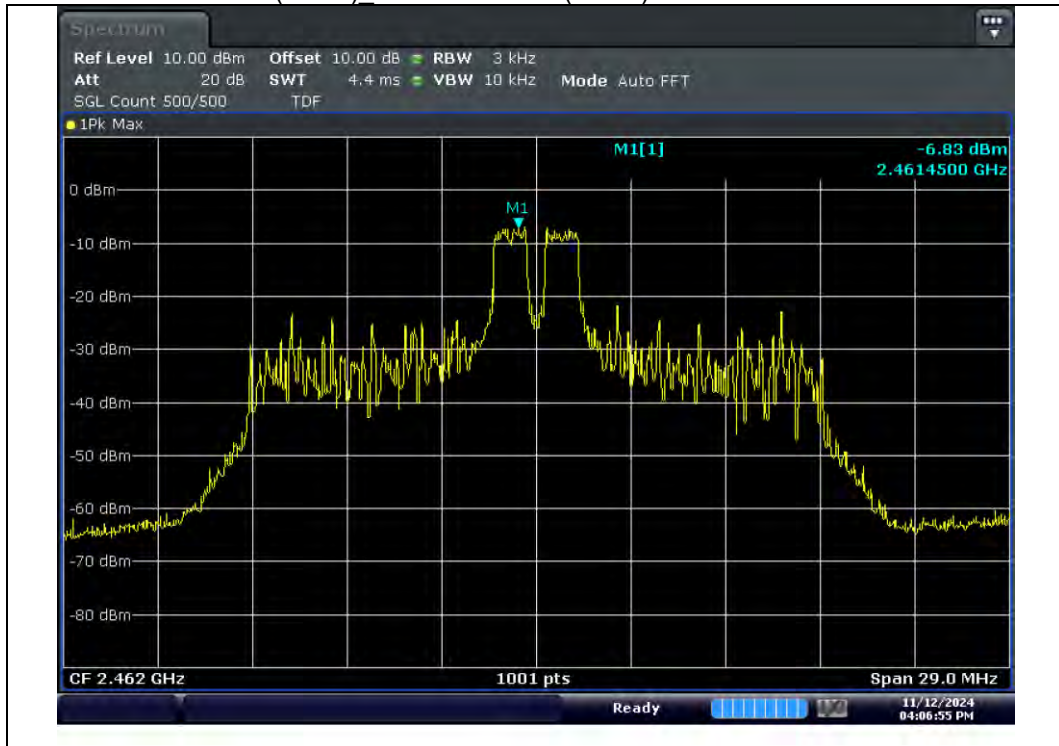
Test mode : 802.11ax(HE20)_OFDMA / MIMO(ANT1) / 2412 MHz



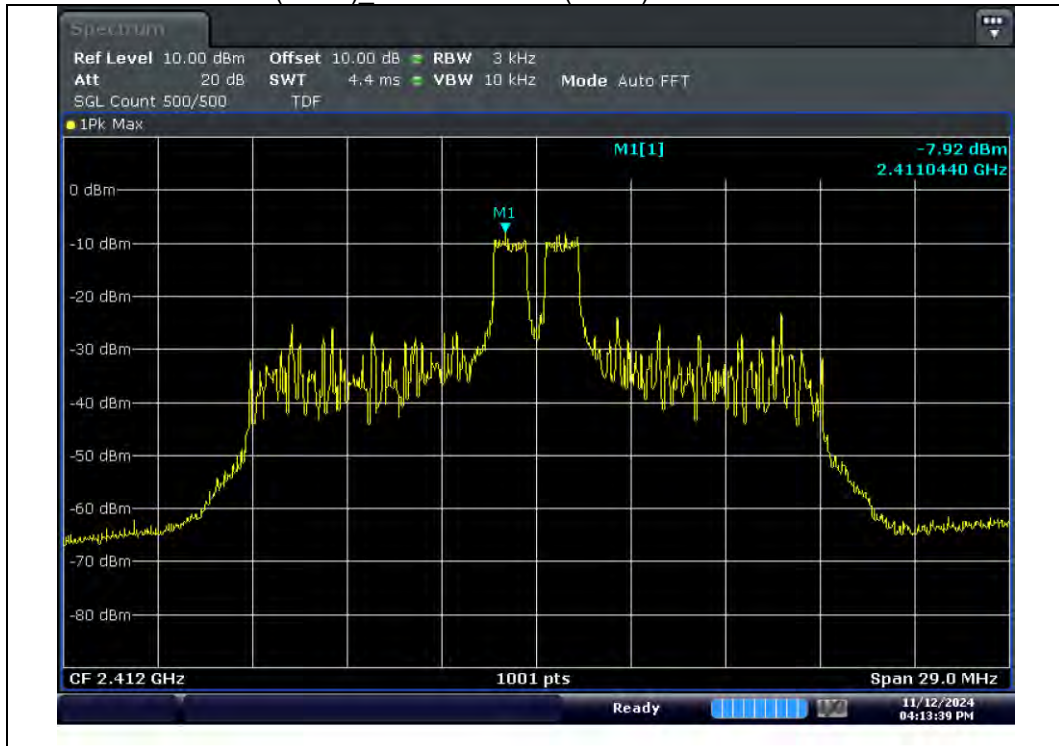
Test mode : 802.11ax(HE20)_OFDMA / MIMO(ANT1) / 2437 MHz



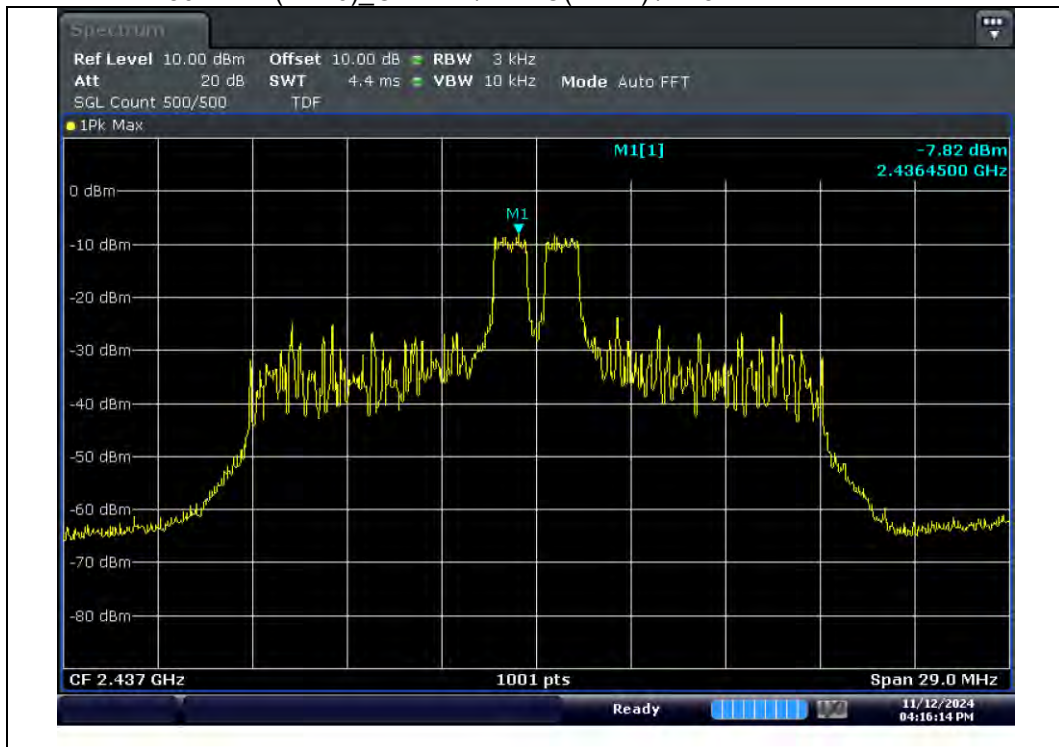
Test mode : 802.11ax(HE20) OFDMA / MIMO(ANT1) / 2462 MHz



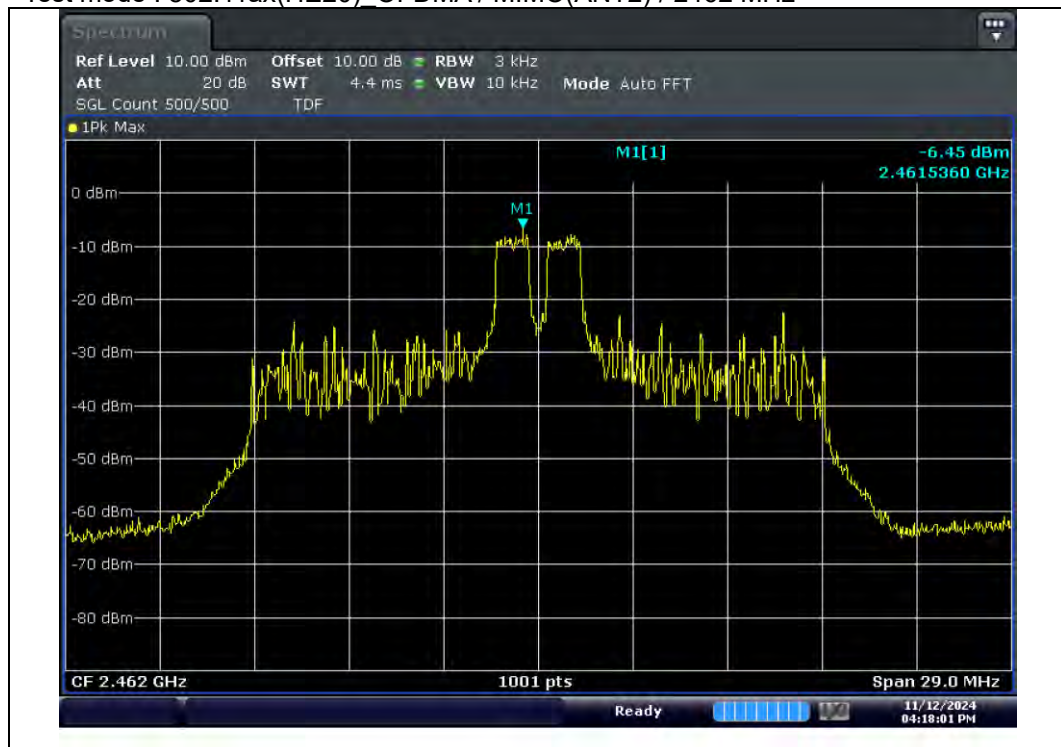
Test mode : 802.11ax(HE20)_OFDMA / MIMO(ANT2) / 2412 MHz



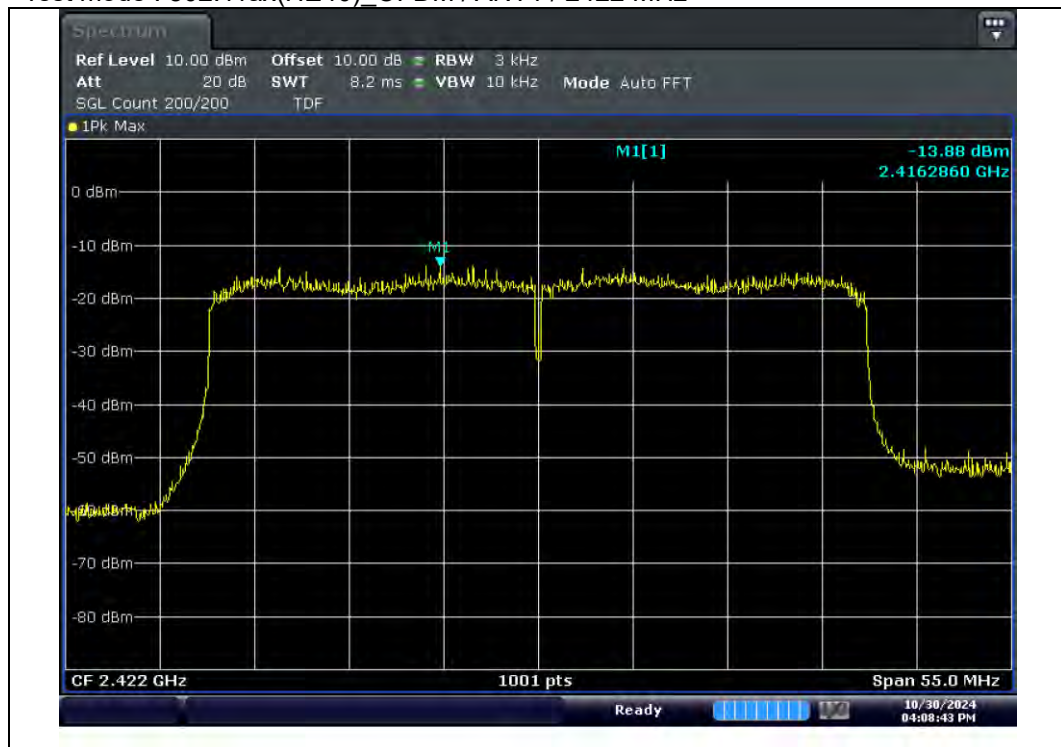
Test mode : 802.11ax(HE20)_OFDMA / MIMO(ANT2) / 2437 MHz



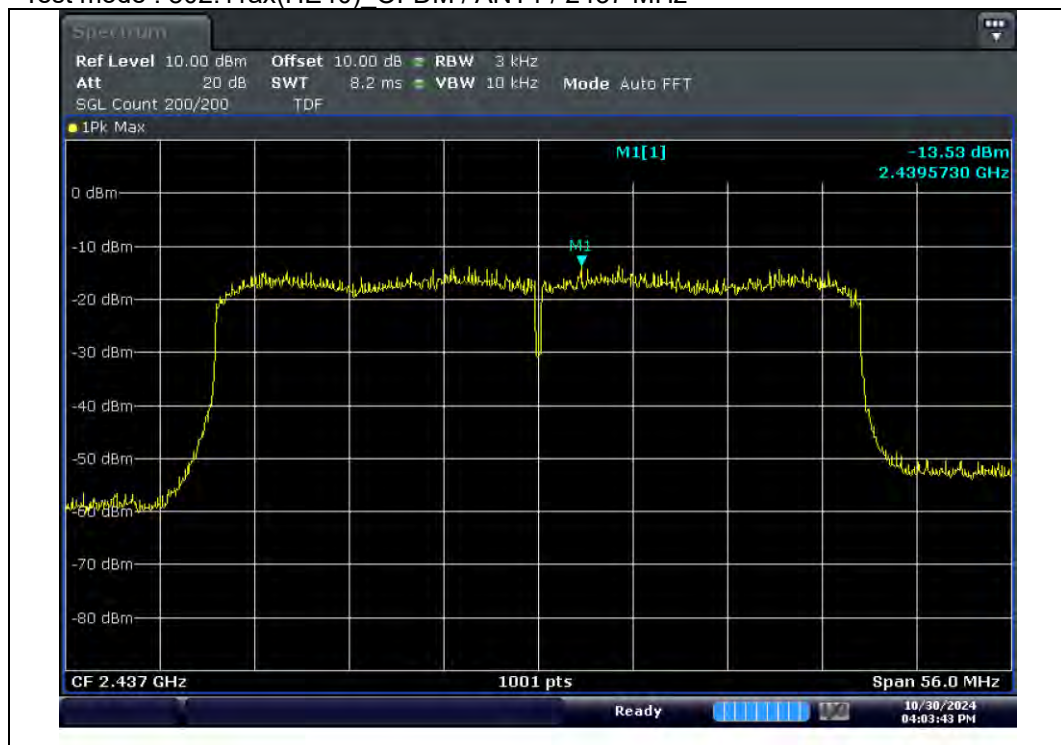
Test mode : 802.11ax(HE20) OFDMA / MIMO(ANT2) / 2462 MHz



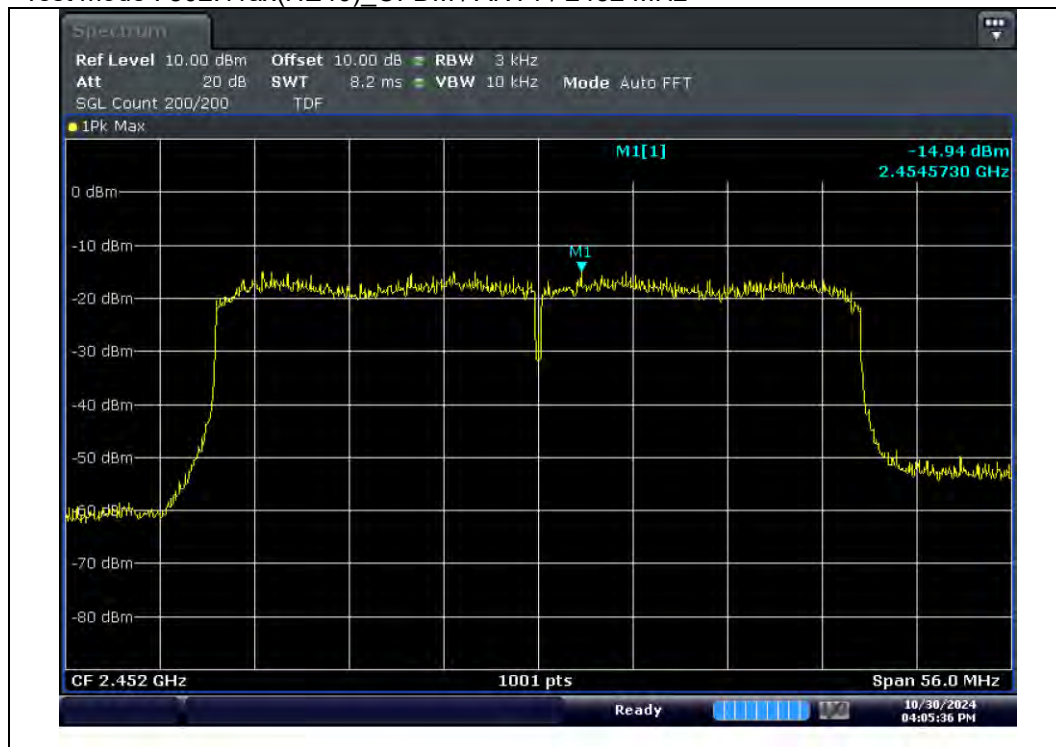
Test mode : 802.11ax(HE40)_OFDM / ANT1 / 2422 MHz



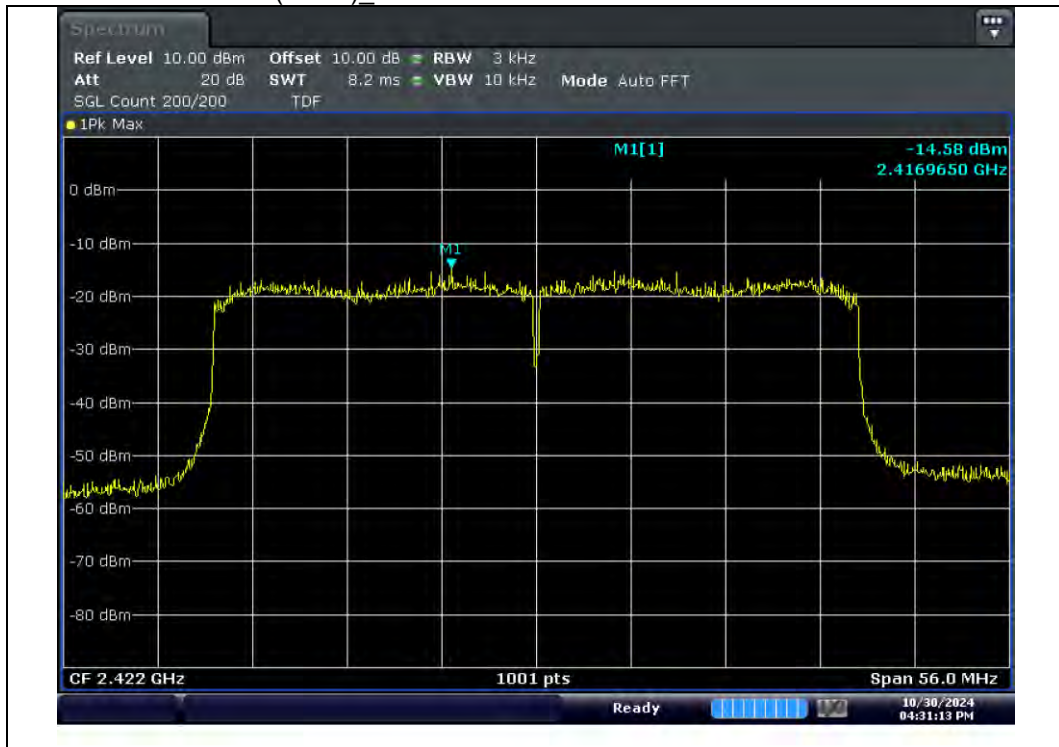
Test mode : 802.11ax(HE40)_OFDM / ANT1 / 2437 MHz



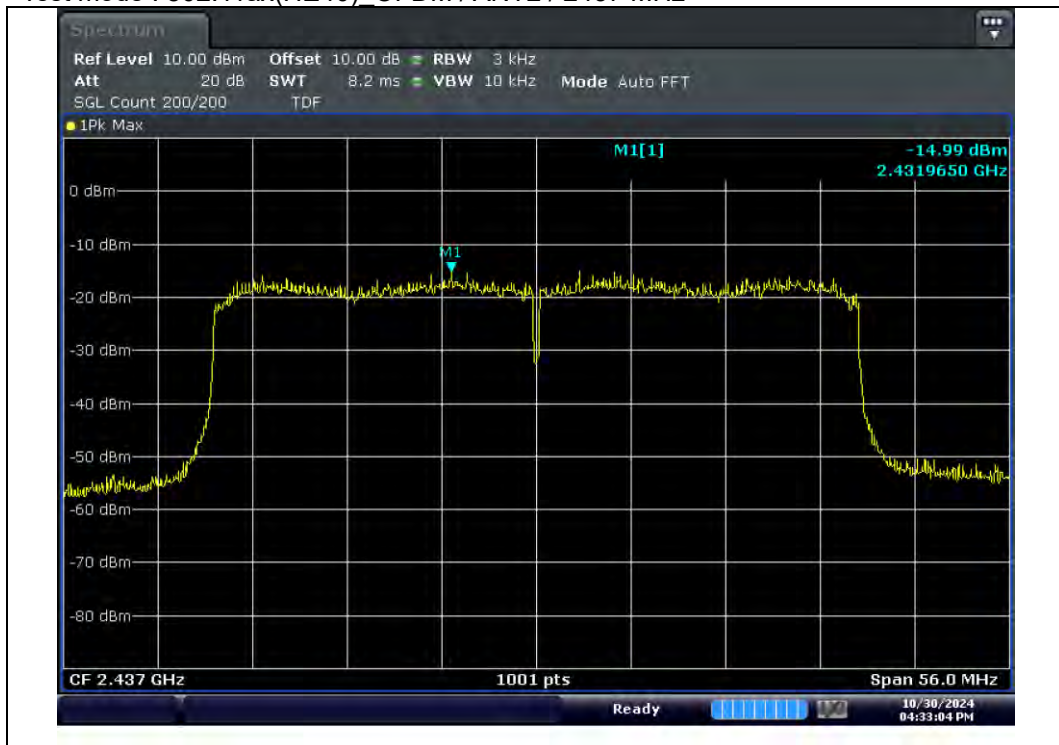
Test mode : 802.11ax(HE40)_OFDM / ANT1 / 2452 MHz



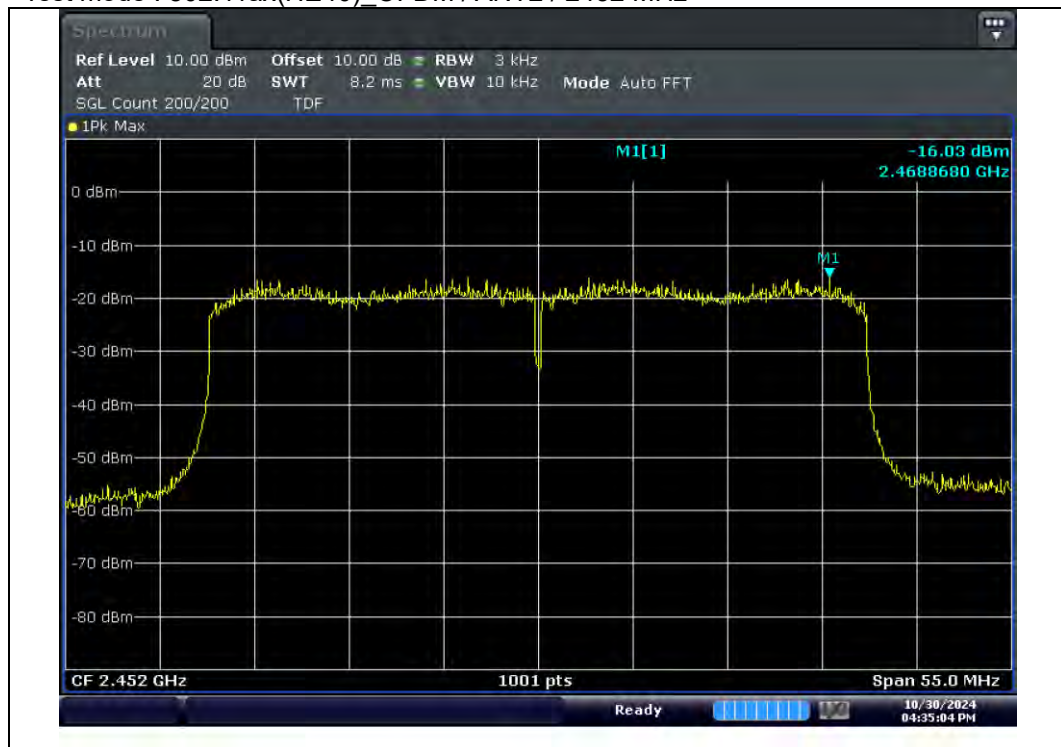
Test mode : 802.11ax(HE40)_OFDM / ANT2 / 2422 MHz



Test mode : 802.11ax(HE40)_OFDM / ANT2 / 2437 MHz



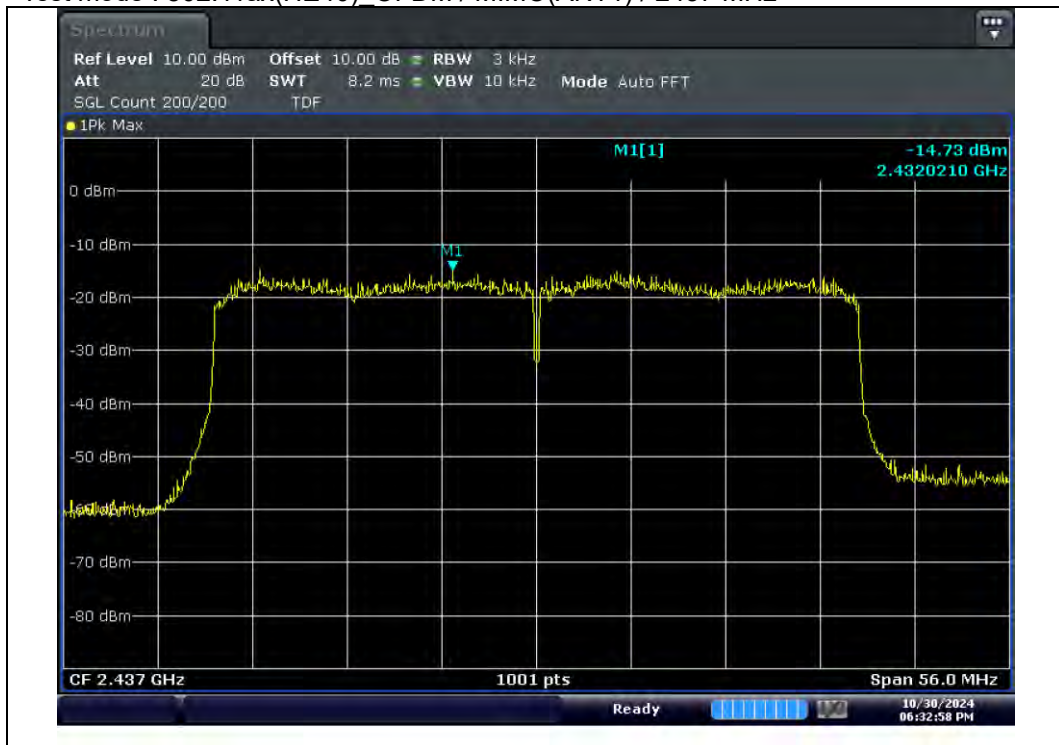
Test mode : 802.11ax(HE40)_OFDM / ANT2 / 2452 MHz



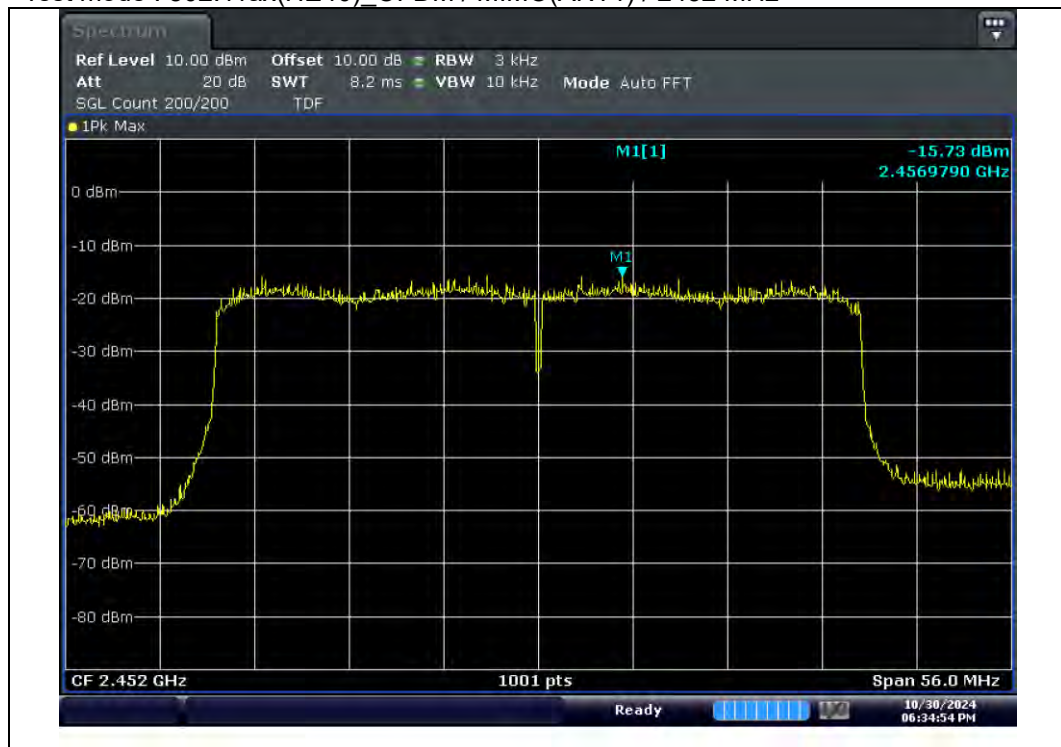
Test mode : 802.11ax(HE40)_OFDM / MIMO(ANT1) / 2422 MHz



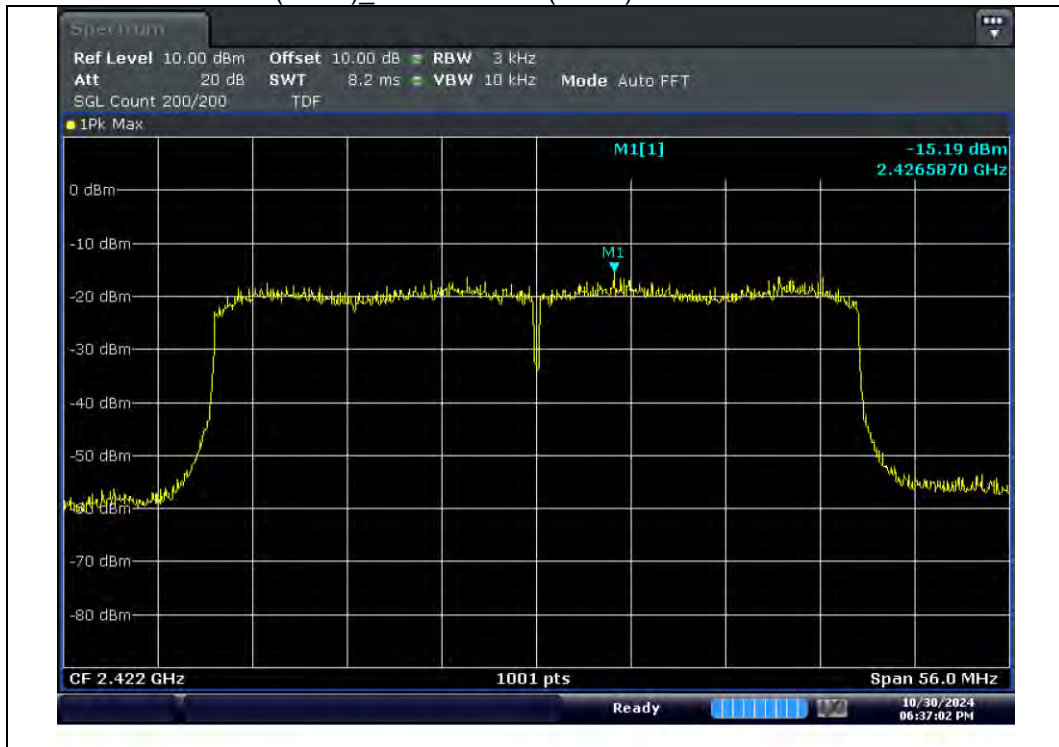
Test mode : 802.11ax(HE40)_OFDM / MIMO(ANT1) / 2437 MHz



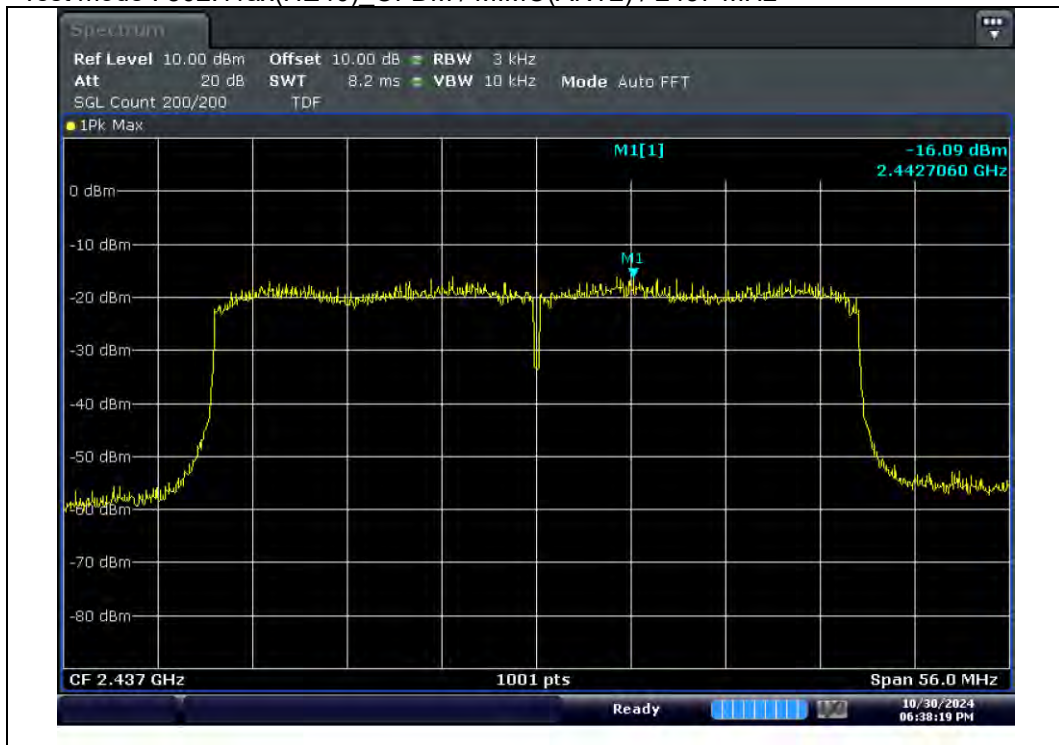
Test mode : 802.11ax(HE40)_OFDM / MIMO(ANT1) / 2452 MHz



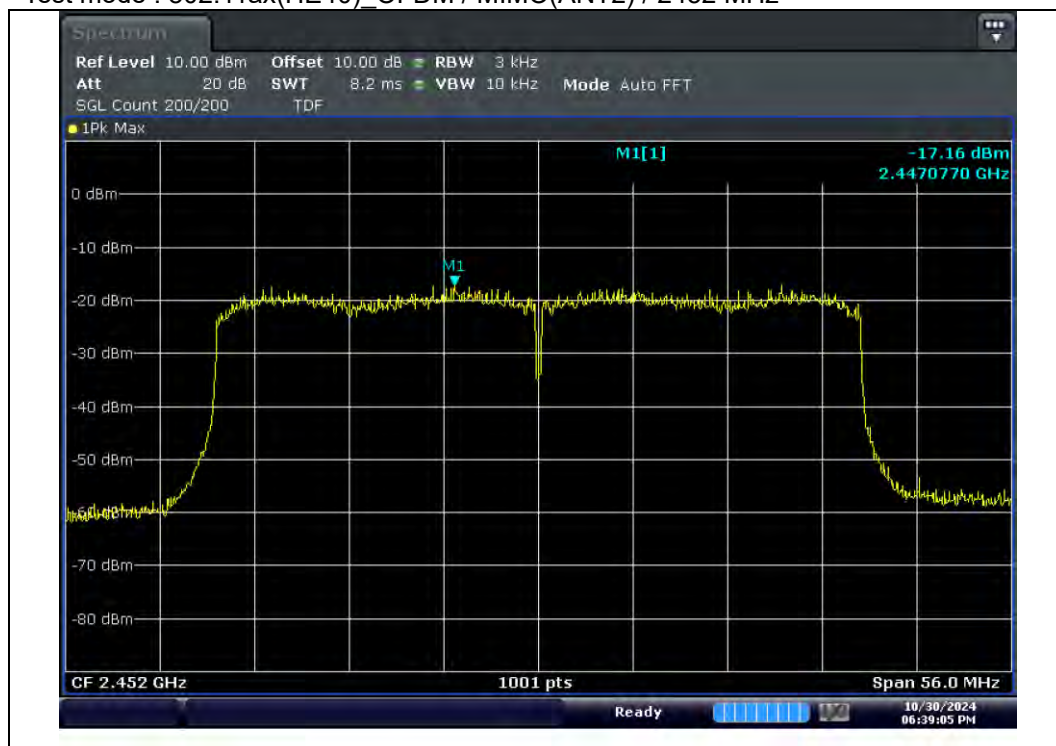
Test mode : 802.11ax(HE40)_OFDM / MIMO(ANT2) / 2422 MHz



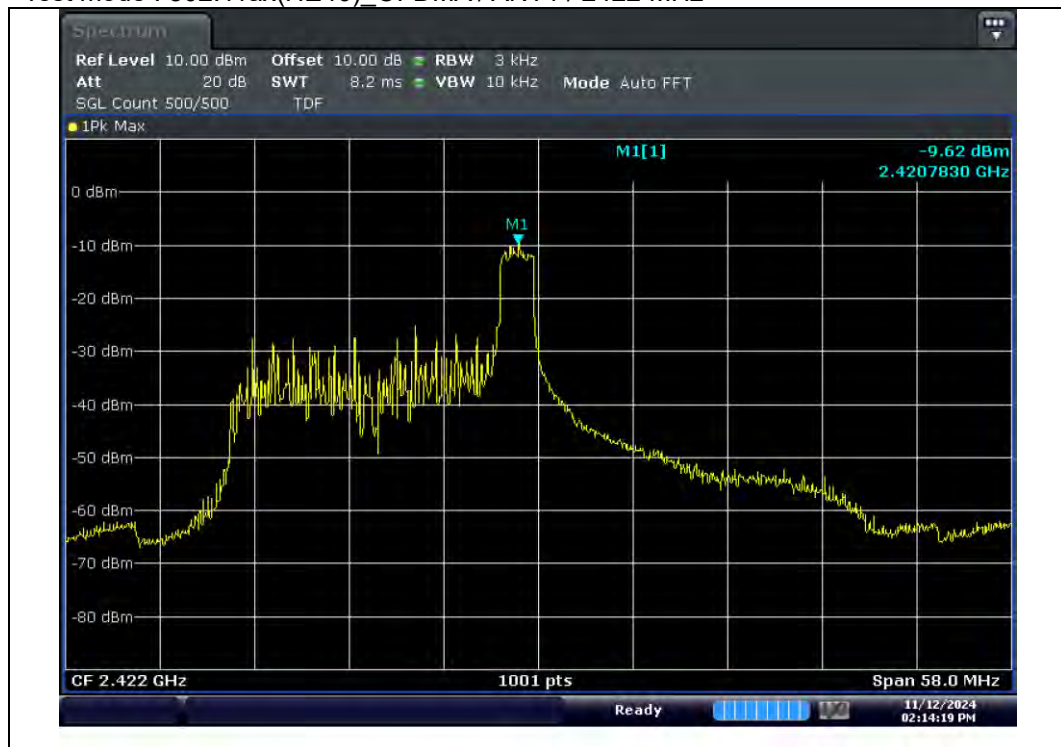
Test mode : 802.11ax(HE40)_OFDM / MIMO(ANT2) / 2437 MHz



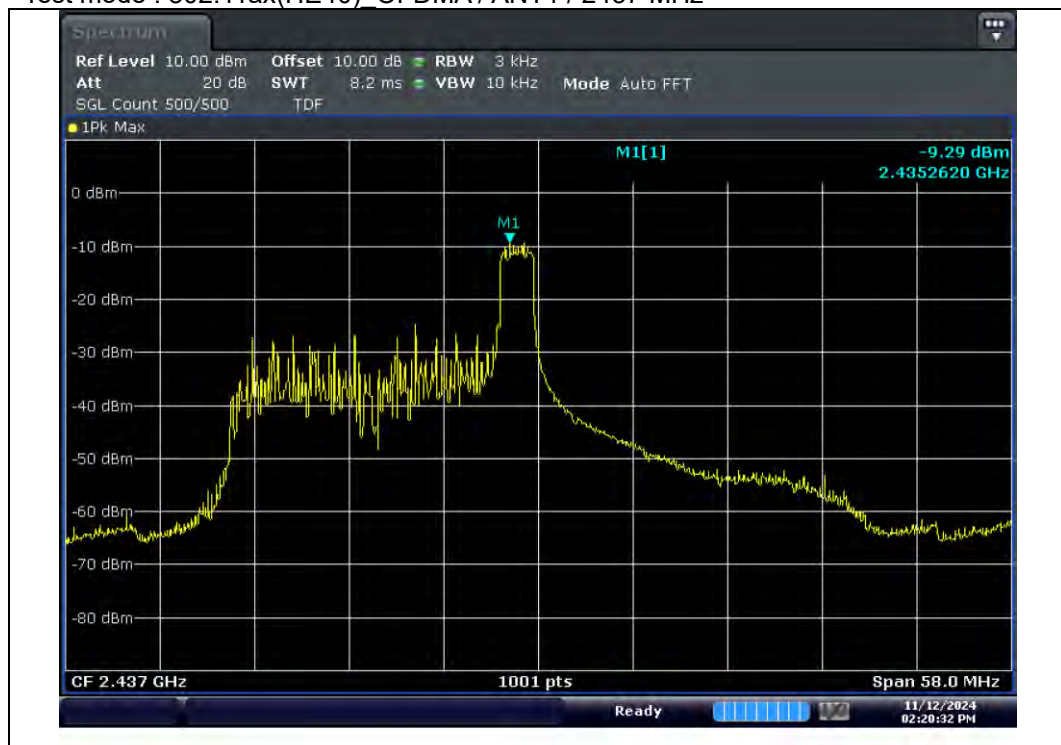
Test mode : 802.11ax(HE40)_OFDM / MIMO(ANT2) / 2452 MHz



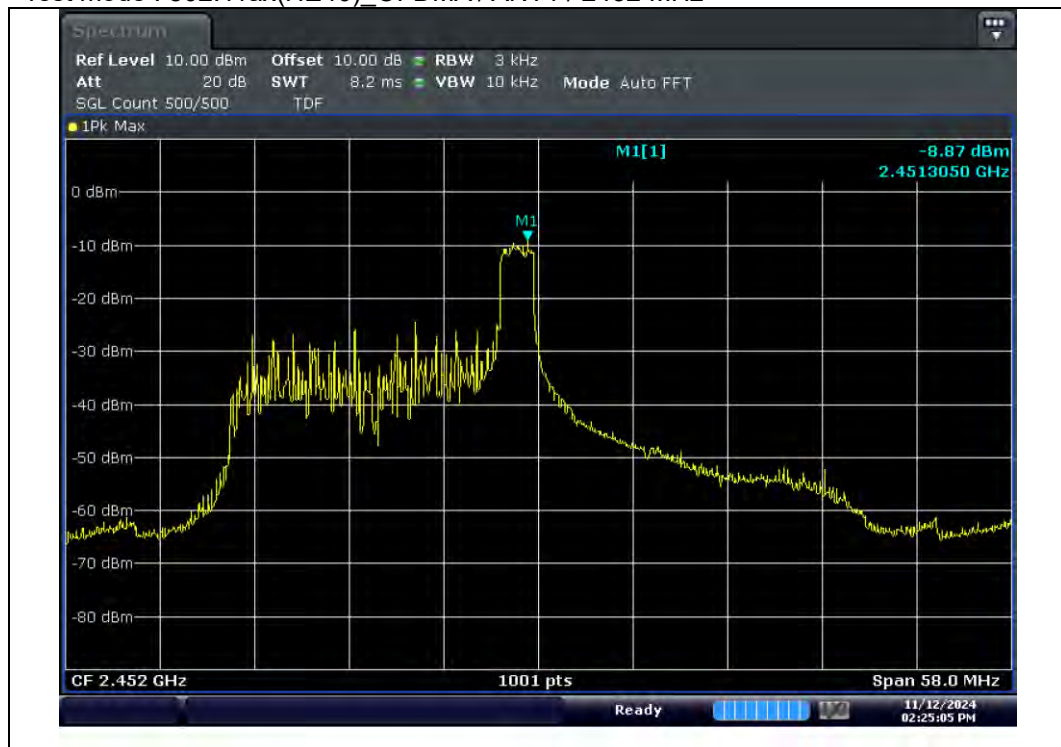
Test mode : 802.11ax(HE40)_OFDMA / ANT1 / 2422 MHz



Test mode : 802.11ax(HE40)_OFDMA / ANT1 / 2437 MHz



Test mode : 802.11ax(HE40)_OFDMA / ANT1 / 2452 MHz



Test mode : 802.11ax(HE40)_OFDMA / ANT2 / 2422 MHz



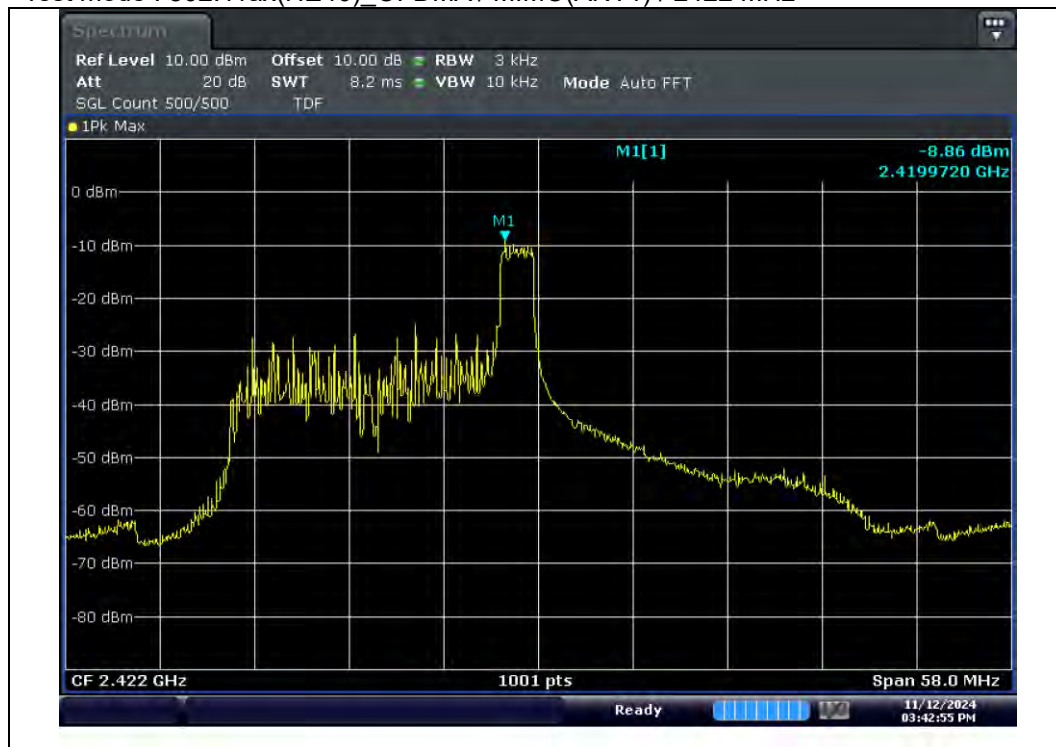
Test mode : 802.11ax(HE40)_OFDMA / ANT2 / 2437 MHz



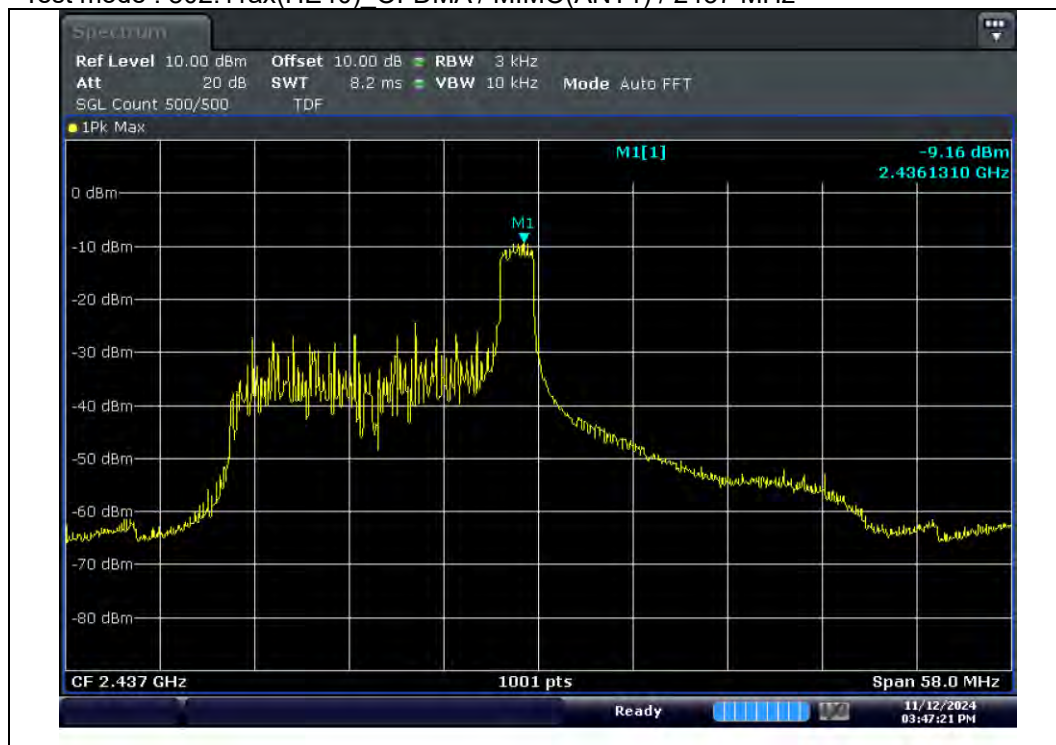
Test mode : 802.11ax(HE40)_OFDMA / ANT2 / 2452 MHz



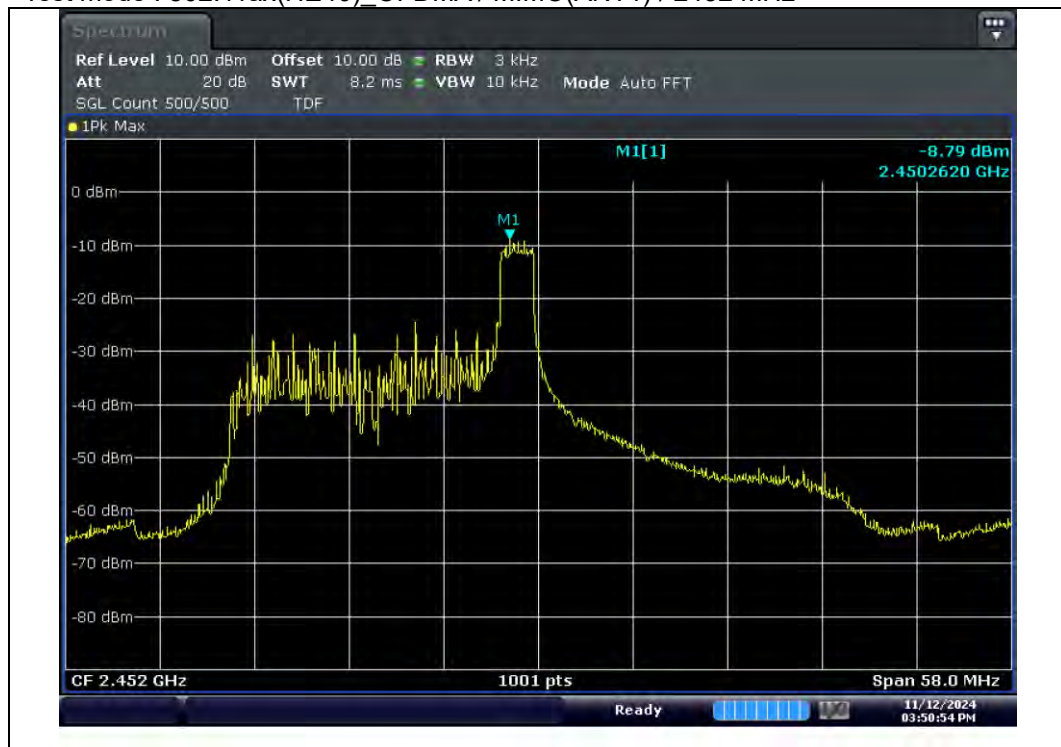
Test mode : 802.11ax(HE40)_OFDMA / MIMO(ANT1) / 2422 MHz



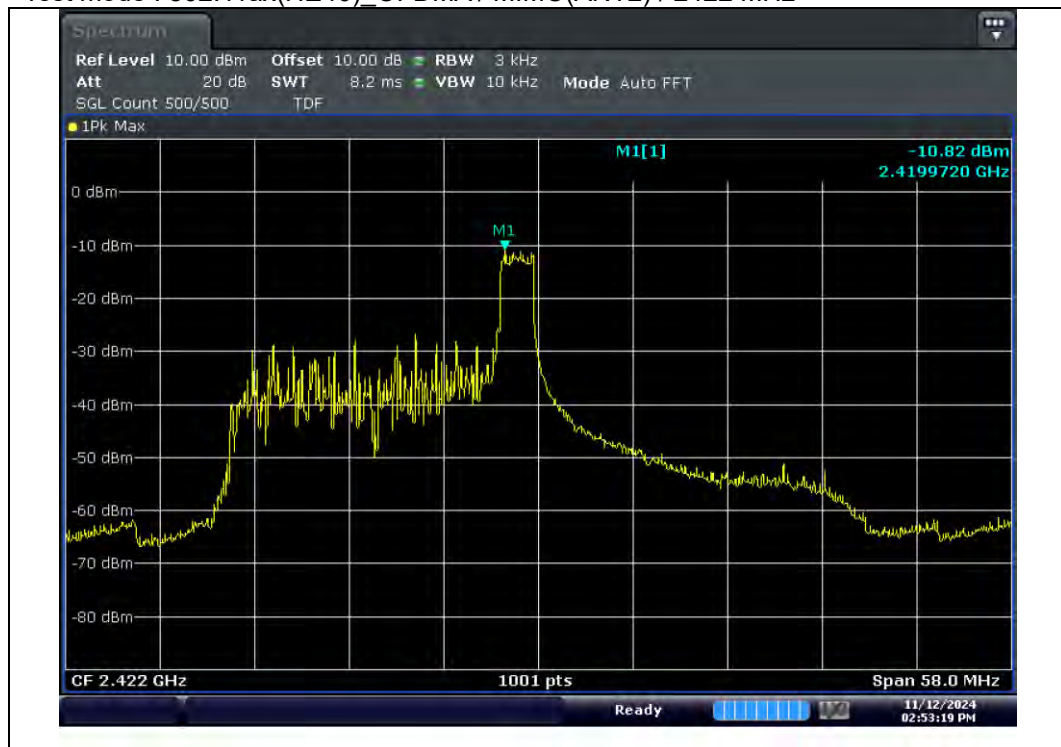
Test mode : 802.11ax(HE40)_OFDMA / MIMO(ANT1) / 2437 MHz



Test mode : 802.11ax(HE40)_OFDMA / MIMO(ANT1) / 2452 MHz



Test mode : 802.11ax(HE40)_OFDMA / MIMO(ANT2) / 2422 MHz



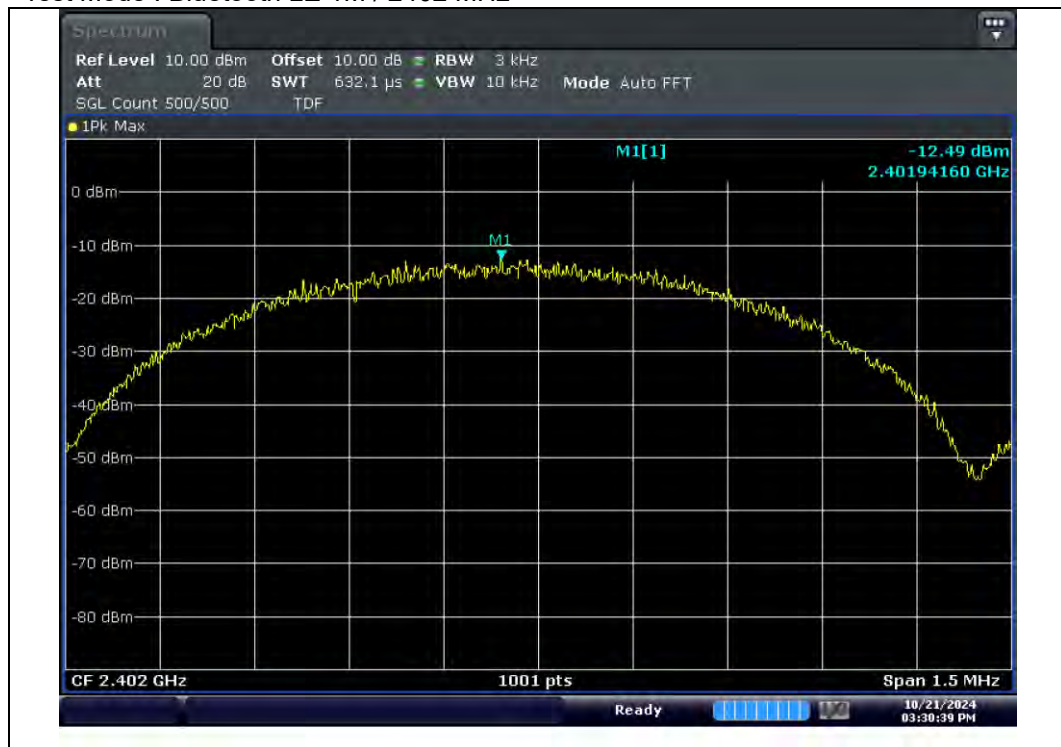
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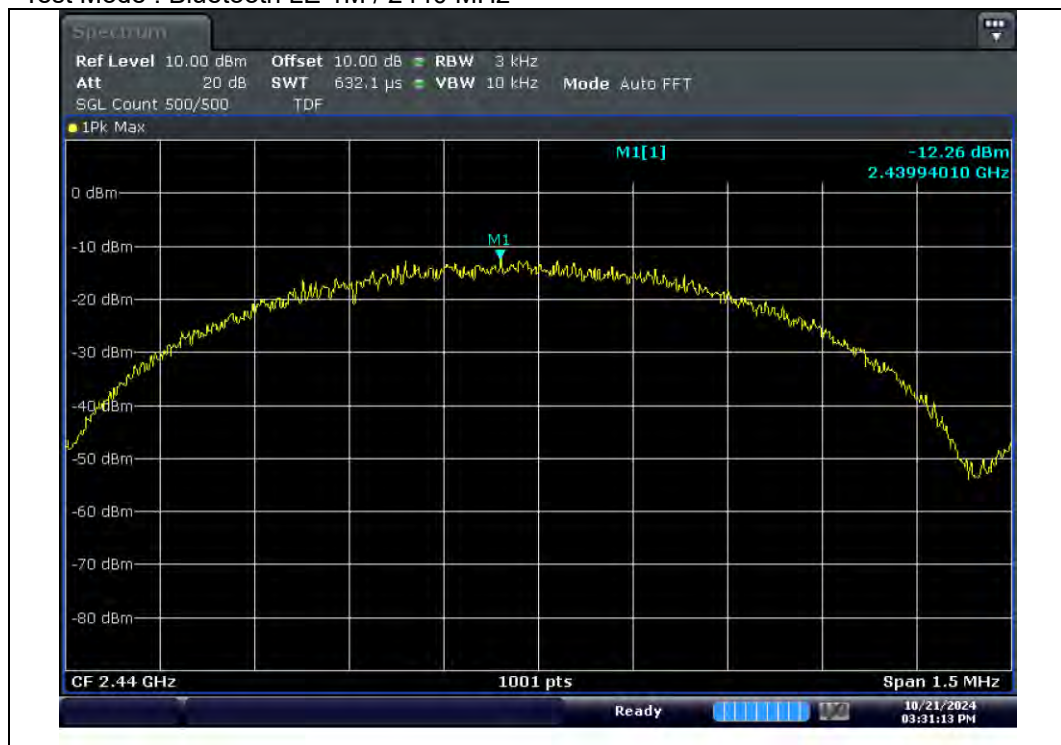
Test mode : 802.11ax(HE40)_OFDMA / MIMO(ANT2) / 2452 MHz



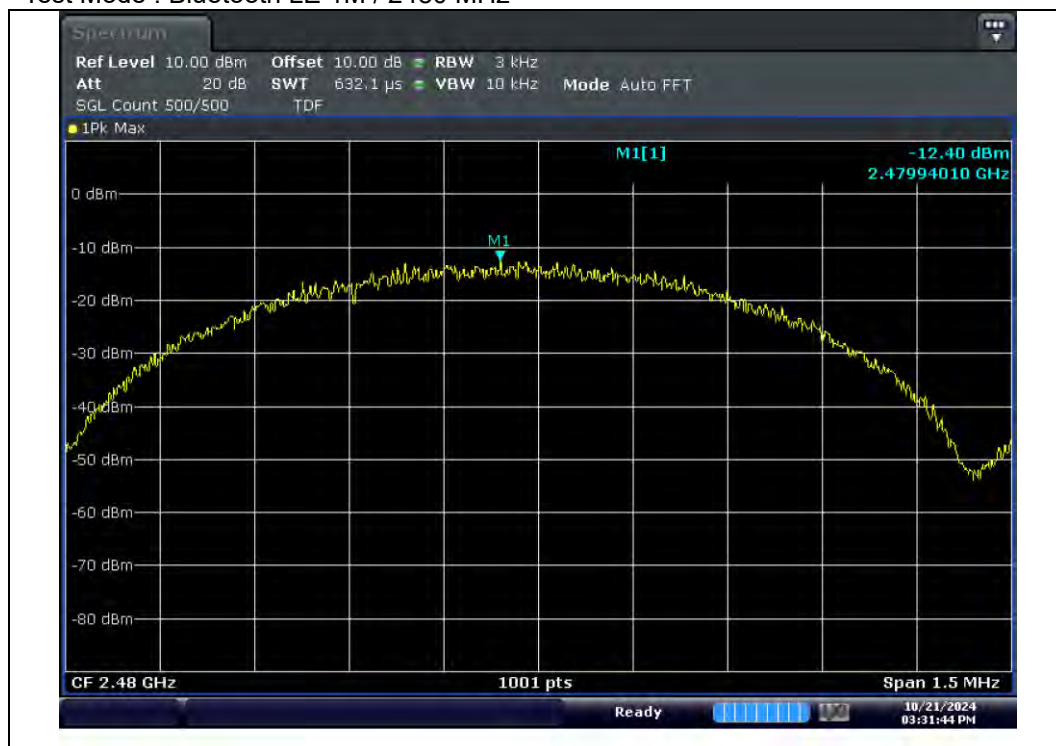
Test Mode : Bluetooth LE 1M / 2402 MHz



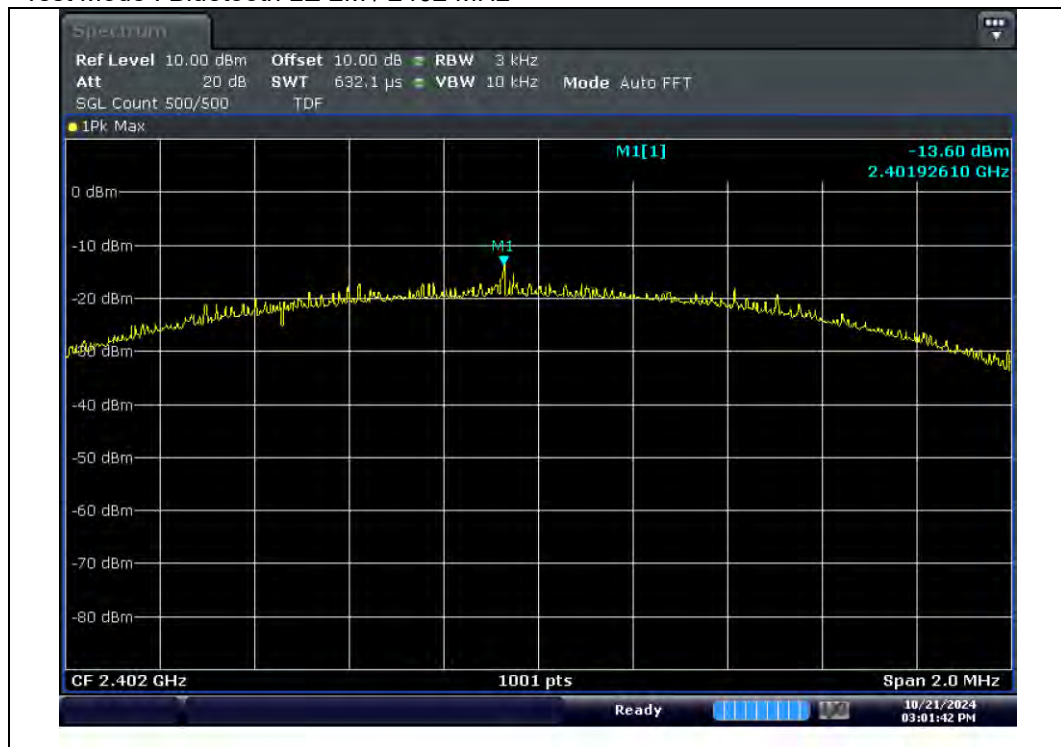
Test Mode : Bluetooth LE 1M / 2440 MHz



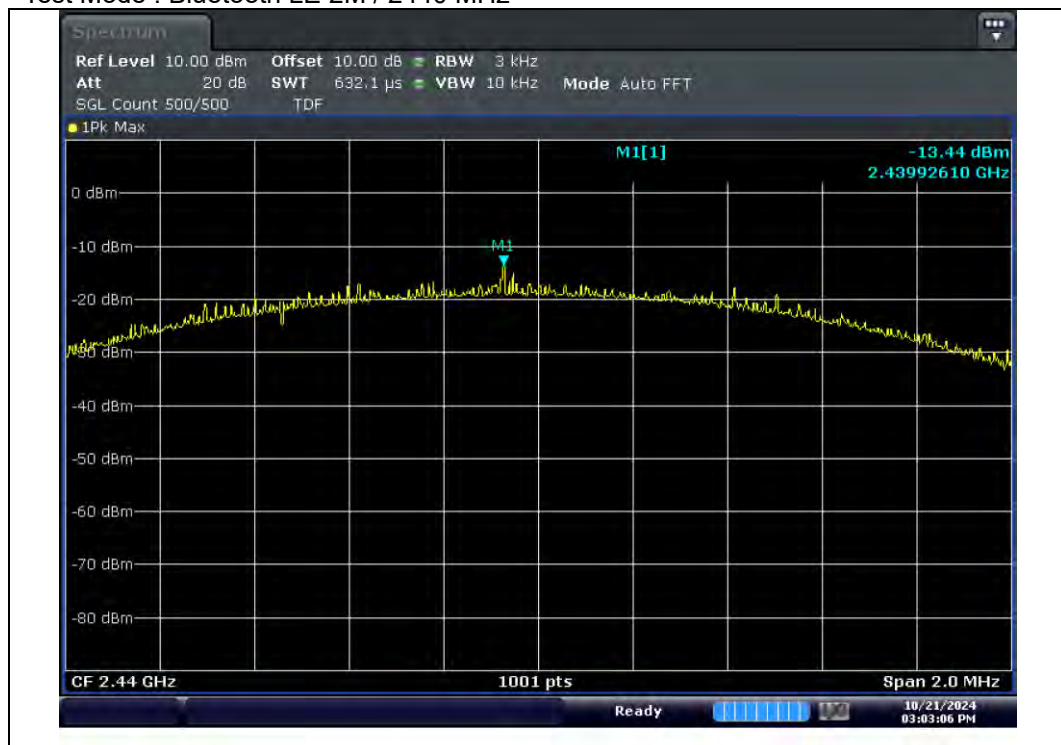
Test Mode : Bluetooth LE 1M / 2480 MHz



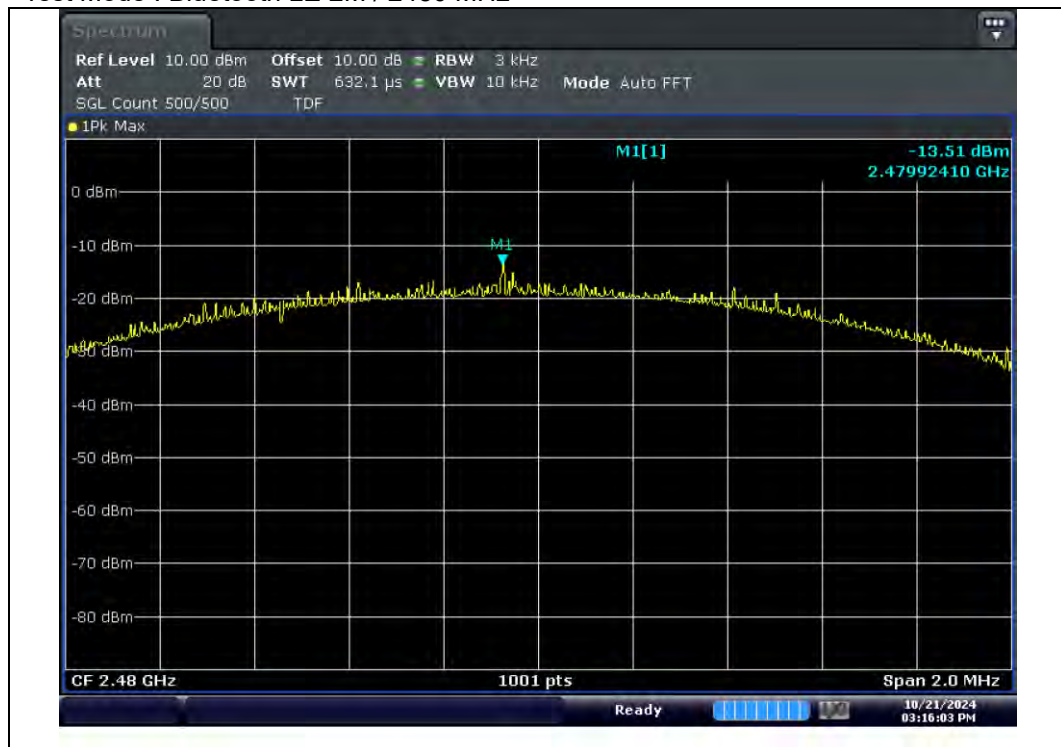
Test Mode : Bluetooth LE 2M / 2402 MHz



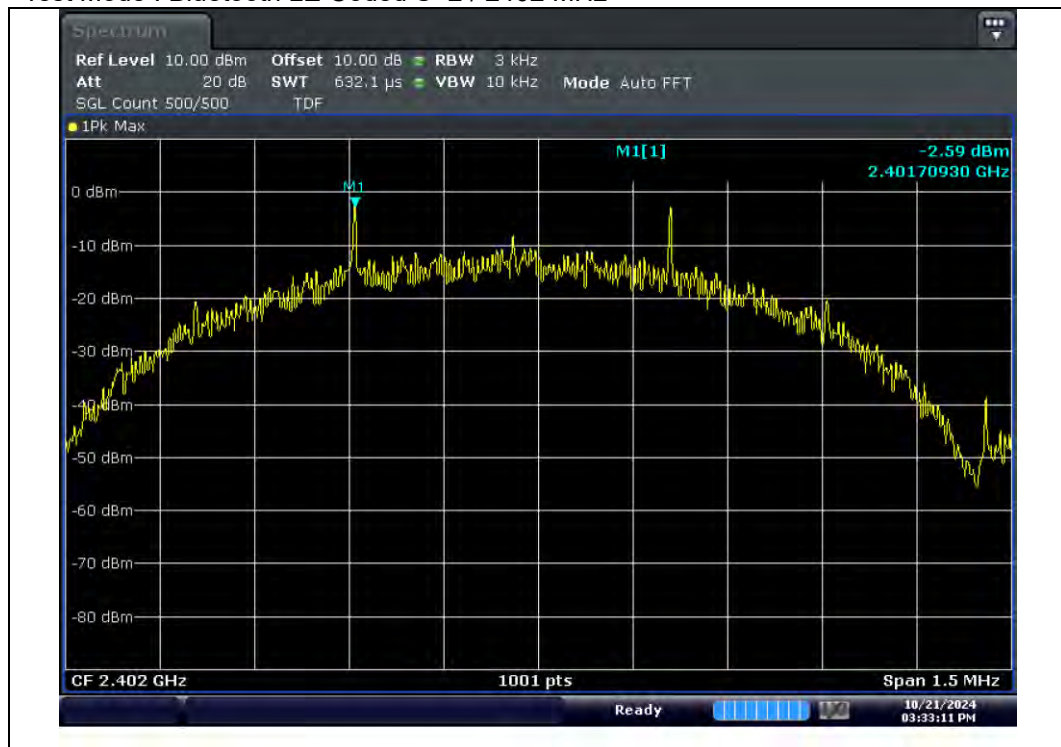
Test Mode : Bluetooth LE 2M / 2440 MHz



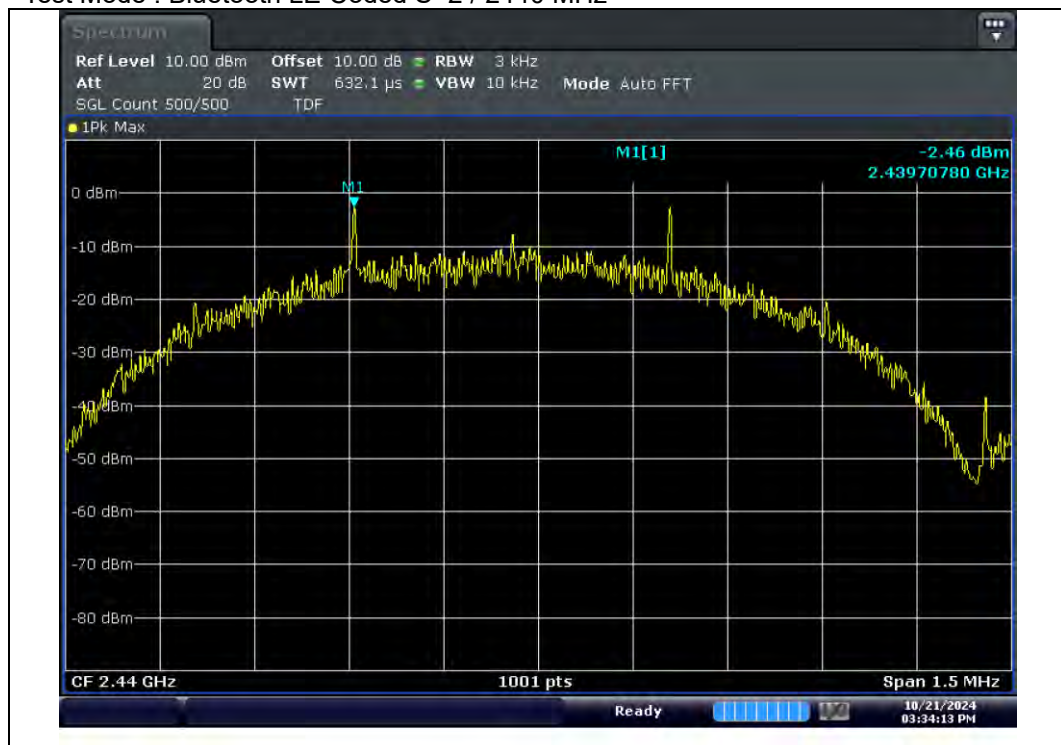
Test Mode : Bluetooth LE 2M / 2480 MHz



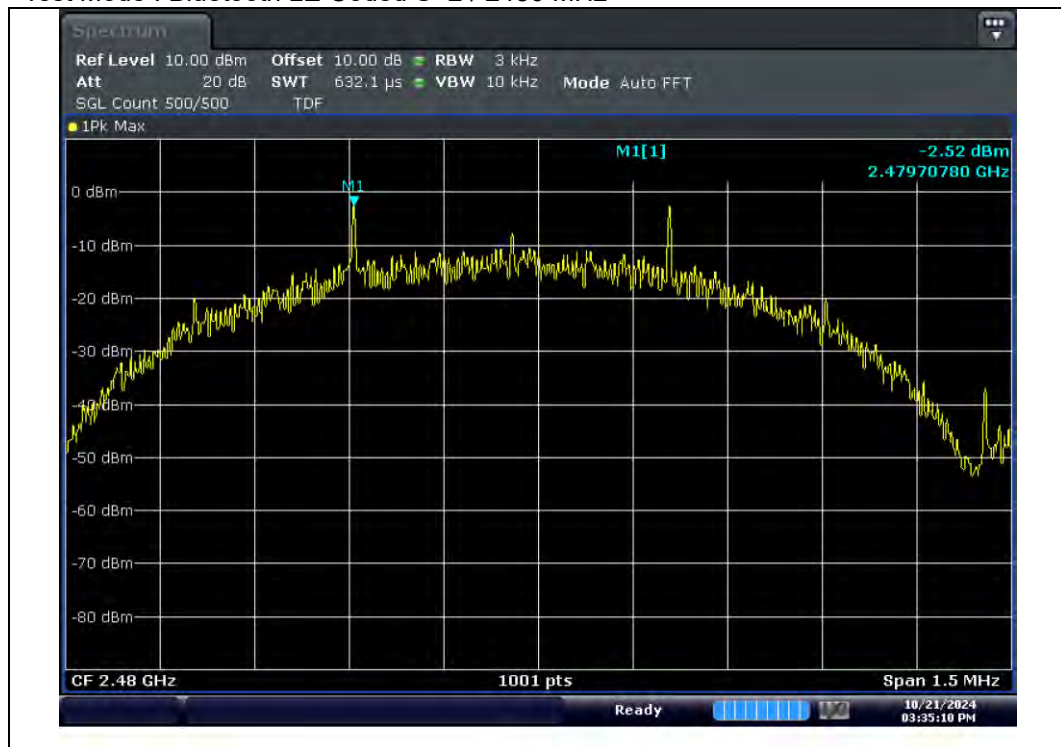
Test Mode : Bluetooth LE Coded S=2 / 2402 MHz



Test Mode : Bluetooth LE Coded S=2 / 2440 MHz



Test Mode : Bluetooth LE Coded S=2 / 2480 MHz



Test Mode : Bluetooth LE Coded S=8 / 2402 MHz



Test Mode : Bluetooth LE Coded S=8 / 2440 MHz



Test Mode : Bluetooth LE Coded S=8 / 2480 MHz



4.3.4 6 dB Bandwidth(DTS Bandwidth)

4.3.4.1 Regulation

According to §15.247(e) and RSS-247 §5.2(a) Systems using digital modulation techniques may operate in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

4.3.4.2 Measurement Procedure

These test measurement settings are specified in section 8.0 of 558074 D01 DTS Meas Guidance

4.3.4.2.1 DTS Channel Bandwidth-Option 1

- a) Set RBW = 100 kHz.
- b) Set the video bandwidth (VBW) ≥ 3 RBW.
- 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.

4.3.4.2.2 DTS Channel Bandwidth Measurement Procedure-Option 2

The automatic bandwidth measurement capability of an instrument may be employed using the X dB bandwidth mode with X set to 6 dB, if the functionality described above (i.e., RBW = 100 kHz, VBW ≥ 3 RBW, peak detector with maximum hold) is implemented by the instrumentation function. When using this capability, care shall be taken so that the bandwidth measurement is not influenced by any intermediate power nulls in the fundamental emission that might be ≥ 6 dB.

4.3.4.3 Result

Comply (measurement data : refer to the next page)

4.3.4.4 Measurement data

Test mode : 802.11b

Antenna	Frequency (MHz)	6 dB Bandwidth (MHz)	Min. Limit (MHz)	Occupied Bandwidth (MHz)
SISO ANT1	2412	10.06	0.50	13.35
	2437	10.08	0.50	13.80
	2462	10.09	0.50	13.33
SISO ANT2	2412	10.06	0.50	13.67
	2437	10.08	0.50	13.83
	2462	10.09	0.50	13.71

Test mode : 802.11g

Antenna	Frequency (MHz)	6 dB Bandwidth (MHz)	Min. Limit (MHz)	Occupied Bandwidth (MHz)
SISO ANT1	2412	16.32	0.50	16.58
	2437	16.31	0.50	16.77
	2462	16.35	0.50	16.51
SISO ANT2	2412	16.32	0.50	16.57
	2437	16.34	0.50	16.66
	2462	16.32	0.50	16.53

Test mode : 802.11n(HT20)

Antenna	Frequency (MHz)	6 dB Bandwidth (MHz)	Min. Limit (MHz)	Occupied Bandwidth (MHz)
SISO ANT1	2412	17.54	0.50	17.57
	2437	17.52	0.50	17.77
	2462	17.55	0.50	17.67
SISO ANT2	2412	17.31	0.50	17.68
	2437	17.27	0.50	17.66
	2462	17.57	0.50	17.59
MIMO	2412	17.05	0.50	17.57
	2437	17.05	0.50	17.69
	2462	17.52	0.50	17.63

Test mode : 802.11n(HT40)

Antenna	Frequency (MHz)	6 dB Bandwidth (MHz)	Min. Limit (MHz)	Occupied Bandwidth (MHz)
SISO ANT1	2422	35.41	0.50	36.23
	2437	35.43	0.50	36.23
	2452	35.63	0.50	36.20
SISO ANT2	2422	35.23	0.50	36.23
	2437	35.50	0.50	36.22
	2452	35.65	0.50	36.21
MIMO	2422	35.36	0.50	36.26
	2437	35.32	0.50	36.26
	2452	35.69	0.50	36.27

Test mode : 802.11ax(HE20)_OFDM

Antenna	Frequency (MHz)	6 dB Bandwidth (MHz)	Min. Limit (MHz)	Occupied Bandwidth (MHz)
SISO ANT1	2412	18.04	0.50	18.76
	2437	18.05	0.50	18.88
	2462	17.92	0.50	18.73
SISO ANT2	2412	18.20	0.50	18.79
	2437	17.90	0.50	18.82
	2462	17.90	0.50	18.77
MIMO	2412	17.63	0.50	18.79
	2437	18.22	0.50	18.85
	2462	18.21	0.50	18.79

Test mode : 802.11ax(HE20)_OFDMA

Antenna	Frequency (MHz)	6 dB Bandwidth (MHz)	Min. Limit (MHz)	Occupied Bandwidth (MHz)
SISO ANT1	2412	18.19	0.50	18.74
	2437	18.33	0.50	18.81
	2462	18.03	0.50	18.79
SISO ANT2	2412	18.32	0.50	18.75
	2437	18.33	0.50	18.81
	2462	18.42	0.50	18.73
MIMO	2412	18.20	0.50	18.74
	2437	18.36	0.50	18.81
	2462	18.35	0.50	18.75

Test mode : 802.11ax(HE40)_OFDM

Antenna	Frequency (MHz)	6 dB Bandwidth (MHz)	Min. Limit (MHz)	Occupied Bandwidth (MHz)
SISO ANT1	2422	36.55	0.50	37.56
	2437	36.84	0.50	37.55
	2452	36.92	0.50	37.57
SISO ANT2	2422	37.11	0.50	37.55
	2437	36.96	0.50	37.57
	2452	36.26	0.50	37.56
MIMO	2422	36.96	0.50	37.55
	2437	36.68	0.50	37.56
	2452	36.63	0.50	37.58

Test mode : 802.11ax(HE40)_OFDMA

Antenna	Frequency (MHz)	6 dB Bandwidth (MHz)	Min. Limit (MHz)	Occupied Bandwidth (MHz)
SISO ANT1	2422	37.17	0.50	37.54
	2437	37.08	0.50	37.55
	2452	36.86	0.50	37.52
SISO ANT2	2422	36.95	0.50	37.53
	2437	36.36	0.50	37.55
	2452	36.90	0.50	37.53
MIMO	2422	36.41	0.50	37.57
	2437	37.04	0.50	37.56
	2452	36.86	0.50	37.53