



FCC AND ISED CERTIFICATION TEST REPORT

Applicant	:	Harman International Industries, Inc.
Address of Applicant	:	8500 Balboa Boulevard, Northridge, CA 91329, UNITED STATES
Manufacturer	:	Harman International Industries, Inc.
Address of Manufacturer	:	8500 Balboa Boulevard, Northridge, CA 91329, UNITED STATES
Equipment under Test	:	Multi-Channel Soundbar with wireless subwoofer
Model No.	:	BAR 500MK2
FCC ID	:	APIBAR500MK2
IC	:	6132A-BAR500MK2
Test Standard(s)	:	FCC Rules and Regulations Part 15 Subpart C, RSS-247 Issue 3 August 2023, ANSI C63.10:2013, RSS-Gen Issue 5, Apr. 2018, Amendment 2 (February 2021)
Report No.	:	DDT-RE24111413-2E04
Issue Date	:	2025/02/28
Issue By	:	Guangdong Dongdian Testing Service Co., Ltd. Unit 2, Building 1, No. 17, Zongbu 2nd Road, Songshan Lake Park, Dongguan, Guangdong, China, 523808

REPORT

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Test Report Declare

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Test Standard Used:
FCC Rules and Regulations Part 15 Subpart C,
RSS-247 Issue 3 August 2023,
ANSI C63.10:2013,
RSS-Gen Issue 5, Apr. 2018, Amendment 2 (February 2021)

We Declare:
The equipment described above is tested by Guangdong Dongdian Testing Service Co., Ltd. and in the configuration tested the equipment complied with the standards specified above. The test results are contained in this test report and Guangdong Dongdian Testing Service Co., Ltd. is assumed of full responsibility for the accuracy and completeness of these tests.

Report No.:	DDT-RE24111413-2E04		
Date of Receipt:	2024/11/14	Date of Test:	2024/11/14 - 2025/02/28

Created: Bobo Chen	Reviewed: Ella Gong	Approved: Damon Hu
		
2025/02/28	2025/02/28	2025/02/28

Note: This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Guangdong Dongdian Testing Service Co., Ltd.

Revision History

Rev.	Revisions	Issue Date	Revised By
---	Initial issue	2025/02/28	

1. Summary of Test Results

No.	Test Parameter	Clause No.	Condition	Result
1	6 dB Bandwidth and 99% Bandwidth	FCC Part 15: 15.247(a)(2), RSS-247 Issue 3 clause 5.2(a), RSS-Gen Issue 5 clause 6.7	/	Pass
2	Peak Output Power	FCC Part 15: 15.247(b)(3), RSS-247 Issue 3 clause 5.4(d)	/	Pass
3	Power Spectral Density	FCC Part 15:15.247(e), RSS-247 Issue 3 clause 5.2(b)	/	Pass
4	RF Conducted Spurious Emissions	FCC Part 15: 15.247(d), RSS-247 Issue 3 clause 5.5	/	Pass
5	Radiated Emission	FCC Part 15: 15.205, FCC Part 15: 15.209, FCC Part 15: 15.247(d), RSS-247 Issue 3 clause 5.5, RSS-Gen Issue 5 clause 8.9, RSS-Gen Issue 5 clause 8.10	/	Pass
6	Band Edge Compliance	FCC Part 15: 15.205, FCC Part 15: 15.209, FCC Part 15: 15.247(d), RSS-247 Issue 3 clause 5.5, RSS-Gen Issue 5 clause 8.9, RSS-Gen Issue 5 clause 8.10	/	Pass
7	Power Line Conducted Emissions	FCC Part 15: 15.207(a), RSS-Gen Issue 5 clause 8.8	/	Pass
8	Antenna Requirement	FCC Part 15: 15.203, RSS-Gen Issue 5 clause 6.8	/	Pass
Note: N/A is an abbreviation for Not Applicable, and means this item is not applicable for this device or no need to test according to standard.				

2. General Test Information

2.1. Description of EUT

EUT Name	: Multi-Channel Soundbar with wireless subwoofer
Model Number	: BAR 500MK2
EUT Function Description	: Please reference user manual of this device
Power Supply	: AC 100-240V, 50/60Hz, 70W

Note: This EUT support Bluetooth BR/EDR/LE, 2.4 GHz SRD, 2.4 GHz WLAN, 5 GHz WLAN, this report only for 2.4 GHz WLAN.

Radio Technology	: IEEE 802.11b/g/n/ax
Operation frequency	: IEEE 802.11b: 2412MHz to 2462MHz IEEE 802.11g: 2412MHz to 2462MHz IEEE 802.11n HT20: 2412MHz to 2462MHz IEEE 802.11n HT40: 2422MHz to 2452MHz IEEE 802.11ax HE20: 2412MHz to 2462MHz IEEE 802.11ax HE40: 2422MHz to 2452MHz
Modulation	: IEEE 802.11b: DSSS (CCK, DQPSK, DBPSK) IEEE 802.11g: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11ax: OFDM, OFDMA (1024QAM, 256QAM, 64QAM, 16QAM, QPSK, BPSK)

Antenna information			
Antenna Type		FPC	
/		Ant1 gain	Ant2 gain
Max Antenna Gain(dBi)	IEEE 802.11b	1.83	1.64
	IEEE 802.11g	1.83	1.64
	IEEE 802.11n HT20	1.83	1.64
	IEEE 802.11n HT40	1.83	1.64
	IEEE 802.11ax HE20	1.83	1.64
	IEEE 802.11ax HE40	1.83	1.64
Note: This product does not support beamforming.			

Channel information					
CH	Frequency (MHz)	CH	Frequency (MHz)	CH	Frequency (MHz)
1	2412	5	2432	9	2452
2	2417	6	2437	10	2457
3	2422	7	2442	11	2462
4	2427	8	2447	/	/

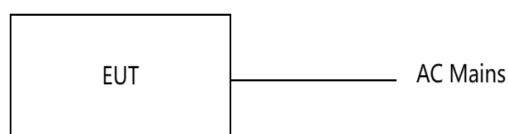
Note: The above EUT information is declared by manufacturer and for more detailed features description please refer to the manufacturer's specifications or User's Manual. The above Antenna information is declared by manufacturer and for more detailed features description please refer to the manufacturer's specifications, the laboratory shall not be held responsible.

“☑” means to be chosen or applicable; “☐” means don't to be chosen or not applicable; This note applies to entire report.

2.2. Accessories of EUT

Accessories	Manufacturer	Model number	Description
AC cable	Harman	N/A	Length: 150cm
HDMI cable	Harman	N/A	Length: 120cm, with two magnetic rings
Remote control	Harman	N/A	N/A

2.3. Block diagram of EUT configuration for test



2.4. Decision of final test mode

According pre-test, the worst test modes were reported as below:

Test software: adb.exe

The test software was used to control EUT work in Continuous Tx mode and select test channel, wireless mode as below table.

The pathloss of external cable: 0.5dB (According to the manufacturer's claims)

Tested mode, channel, and data rate information					
Mode	Setting Tx Power		Data rate (Mbps) (see Note)	Channel	Frequency (MHz)
	ANT1	ANT2			
IEEE 802.11b	16	16	1	LCH: CH1	2412
	16	16	1	MCH: CH6	2437
	16	16	1	HCH: CH11	2462
IEEE 802.11g	16	16	6	LCH: CH1	2412
	16	16	6	MCH: CH6	2437
	16	16	6	HCH: CH11	2462
IEEE 802.11n HT20	14	14	MCS 8	LCH: CH1	2412
	14	14	MCS 8	MCH: CH6	2437
	14	14	MCS 8	HCH: CH11	2462
IEEE 802.11n HT40	14	14	MCS 8	LCH: CH3	2422
	14	14	MCS 8	MCH: CH6	2437
	14	14	MCS 8	HCH: CH9	2452
IEEE 802.11ax HE20	SU: 11 RU: 11	SU: 11 RU: 11	MCS 0	LCH: CH1	2412
	SU: 11	SU: 11	MCS 0	MCH: CH6	2437

IEEE 802.11ax HE40	SU: 11 RU: 11	SU: 11 RU: 11	MCS 0	HCH: CH11	2462
	SU: 11 RU: 11	SU: 11 RU: 11			
	SU: 11 RU: 11	SU: 11 RU: 11	MCS 0	LCH: CH3	2422
	SU: 11 RU: 11	SU: 11 RU: 11	MCS 0	MCH: CH6	2437
	SU: 11 RU: 11	SU: 11 RU: 11	MCS 0	HCH: CH9	2452
Note: According exploratory test, EUT will have maximum output power in those data rate, so those data rate were used for all test.					

2.5. Deviations of test standard

No deviation.

2.6. Test environment conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature range:	+15°C to +35 °C
Humidity range:	20% to 75%
Pressure range:	86 kPa to 106 kPa

Note: The specific temperature and humidity information of each test item refers to the temperature and humidity record in the corresponding test data.

2.7. Test laboratory

Guangdong Dongdian Testing Service Co., Ltd.

Add.: Unit 2, Building 1, No. 17, Zongbu 2nd Road, Songshan Lake Park, Dongguan, Guangdong, China, 523808.

Tel.: +86-0769-38826678, <http://www.dgddt.com>, Email: ddt@dgddt.com.

CNAS Accreditation No. L6451; A2LA Accreditation Number: 3870.01

FCC Designation Number: CN1182, Test Firm Registration Number: 540522

Innovation, Science and Economic Development Canada Site Registration Number: 10288A

Conformity Assessment Body identifier: CN0048

VCCI facility registration number: C-20087, T-20088, R-20123, R-20240, G-20118

2.8. Measurement uncertainty

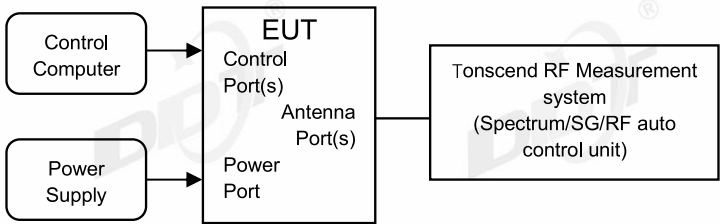
Test Item	Uncertainty
Bandwidth	1.1%
Peak Output Power (Conducted) (Spectrum analyzer)	0.86 dB ($10 \text{ MHz} \leq f < 3.6 \text{ GHz}$); 1.38 dB ($3.6 \text{ GHz} \leq f < 8 \text{ GHz}$)
Peak Output Power (Conducted) (Power Sensor)	0.74 dB
Power Spectral Density	0.74 dB ($10 \text{ MHz} \leq f < 3.6 \text{ GHz}$); 1.38 dB ($3.6 \text{ GHz} \leq f < 8 \text{ GHz}$)
Frequencies Stability	6.7×10^{-8} (Antenna couple method) 5.5×10^{-8} (Conducted method)
Conducted spurious emissions	0.86 dB ($10 \text{ MHz} \leq f < 3.6 \text{ GHz}$); 1.40 dB ($3.6 \text{ GHz} \leq f < 8 \text{ GHz}$) 1.66 dB ($8 \text{ GHz} \leq f < 26.5 \text{ GHz}$)
Uncertainty for radio frequency (RBW < 20 kHz)	3×10^{-8}
Temperature	0.4 °C
Humidity	2 %
Uncertainty for Radiation Emission test (9 kHz – 30 MHz)	3.44 dB
Uncertainty for Radiation Emission test (30 MHz - 1 GHz)	4.70 dB (Antenna Polarize: V) 4.84 dB (Antenna Polarize: H)
Uncertainty for Radiation Emission test (1 GHz - 40 GHz)	4.10 dB (1 - 6 GHz) 4.40 dB (6 GHz - 18 GHz) 3.54 dB (18 GHz - 26 GHz) 4.30 dB (26 GHz - 40 GHz)
Uncertainty for Power line conduction emission test	3.34dB (150KHz-30MHz) 3.72dB (9KHz-150KHz)
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.	

3. Equipment Used During Conductive Test

Equipment	Manufacturer	Model No.	Serial Number	Due Date
☑RF Connected Test (RF Measurement System 3#)				
SIGNAL ANALYZER	R&S	FSV40	101407	2025/07/08
Wideband Radio Communication Tester	R&S	CMW500	117491	2025/03/31
EXG Analog Signal Generator	KEYSIGHT	N5173B	MY62153058	2025/07/08
MXG Vector Signal Generator	Agilent	N5182A	MY48180912	2025/03/31
RF Control Unit	Tonscend	JS0806-2	20C8060230	2025/03/31
TEMP&HUMI Programmable Chamber	ZHIXIANG	ZXGDJS-150L	ZX170110-A	2025/04/22
Test Software	Tonscend	JS1120-3	Ver.3.2.22	N/A

4. 6dB Bandwidth

4.1. Block diagram of test setup



4.2. Limits

For direct sequence systems, the minimum 6 dB bandwidth shall be at least 500 kHz

4.3. Test procedure

- (1) The test according to ANSI C63.10-2013 clause 11.8.
- (2) Connect EUT's antenna output to spectrum analyzer by RF cable, the path loss was compensated to the results
- (3) Set the EUT as maximum power setting and enable the EUT transmit continuously
- (4) Use the following spectrum analyzer settings for 6 dB Bandwidth:

RBW:	100 kHz
VBW:	$\geq [3 \times \text{RBW}]$
Detector Mode:	peak
Sweep time:	auto
Trace mode	max hold

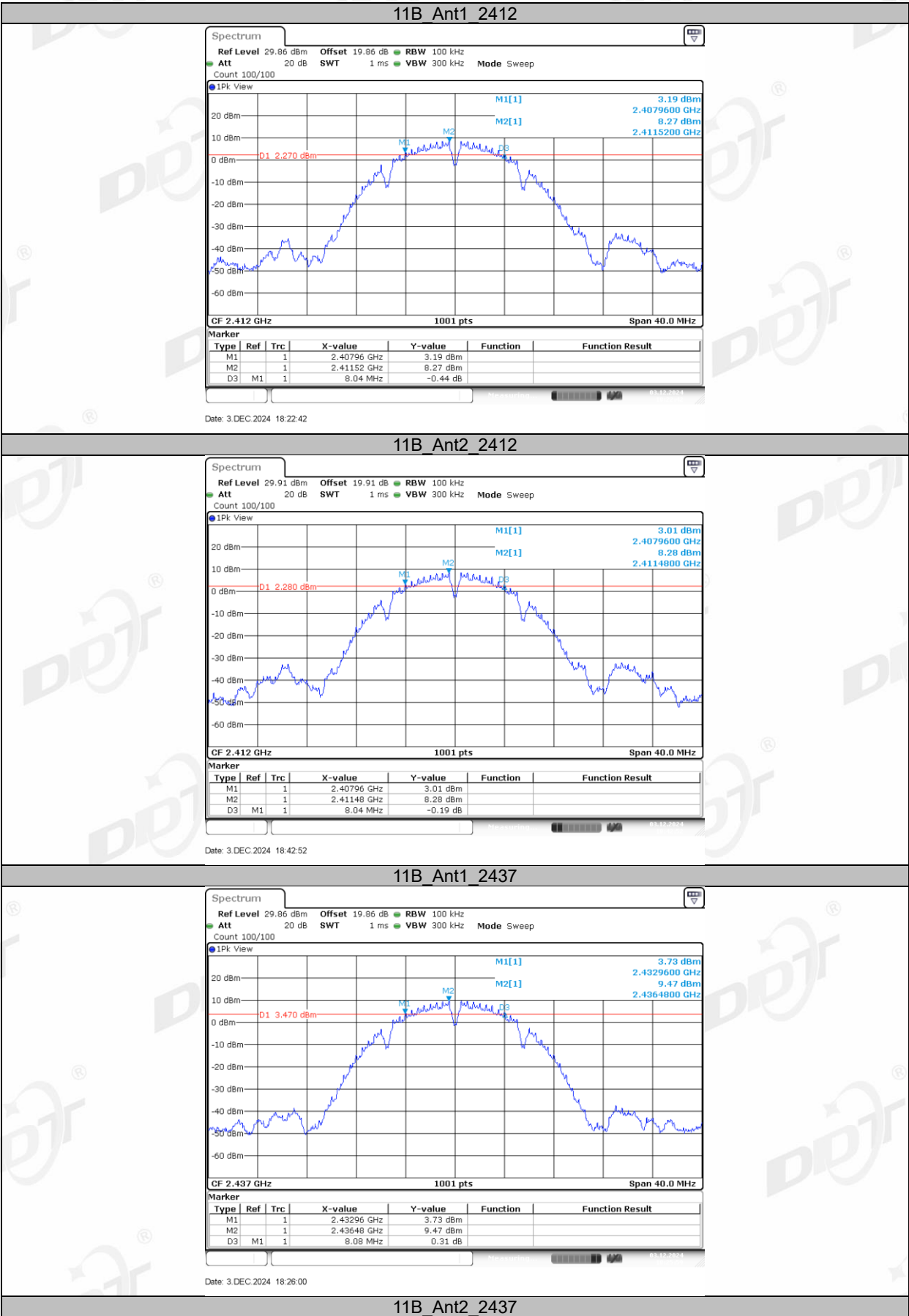
Allow the trace to stabilize, measure the 6 dB bandwidth of signal, and record the results in the report

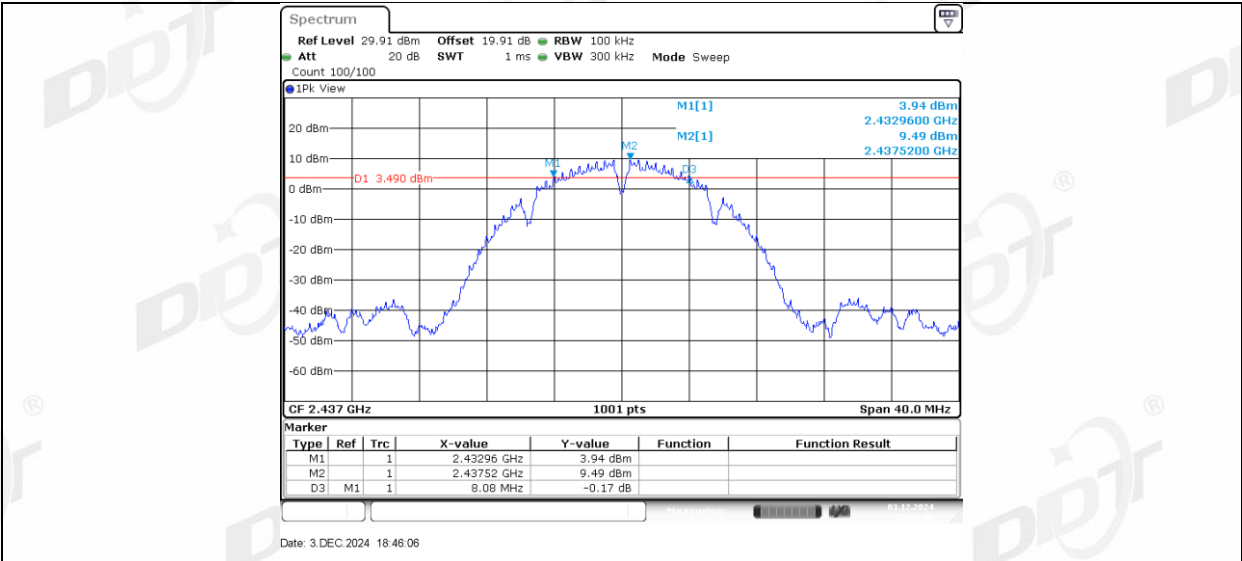
4.4. Test result

Test Engineer:	Zhongyao	Test Site:	RF Measurement System 3#
Ambient Condition:	22.6-26.3℃,43.6-57.3%RH	Test Date:	2024.11.14-2025.02.10
Test Power Supply:	AC 120V/60Hz	Sample Number:	S24111413-003

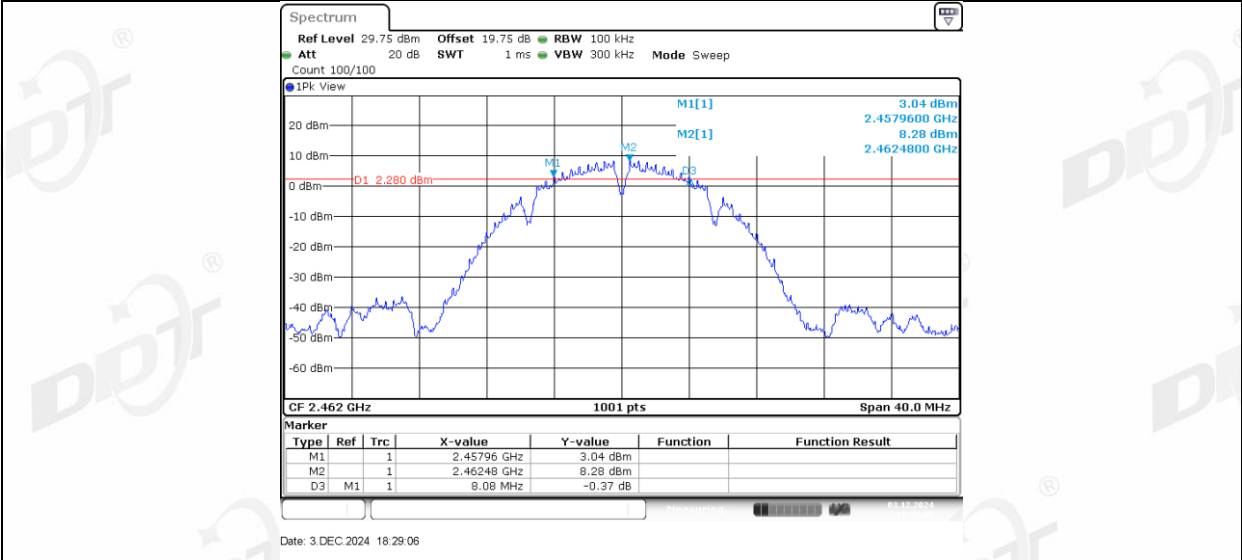
Test Mode	Antenna	Frequency [MHz]	DTS BW [MHz]	FL [MHz]	FH [MHz]	Limit [MHz]	Verdict
11B	Ant1	2412	8.04	2407.96	2416.00	0.5	PASS
	Ant2	2412	8.04	2407.96	2416.00	0.5	PASS
	Ant1	2437	8.08	2432.96	2441.04	0.5	PASS
	Ant2	2437	8.08	2432.96	2441.04	0.5	PASS
	Ant1	2462	8.08	2457.96	2466.04	0.5	PASS
	Ant2	2462	8.08	2457.96	2466.04	0.5	PASS
11G	Ant1	2412	15.32	2404.24	2419.56	0.5	PASS
	Ant2	2412	15.12	2404.44	2419.56	0.5	PASS
	Ant1	2437	15.32	2429.24	2444.56	0.5	PASS
	Ant2	2437	15.36	2429.52	2444.88	0.5	PASS
	Ant1	2462	16.04	2453.84	2469.88	0.5	PASS
	Ant2	2462	15.76	2454.12	2469.88	0.5	PASS
11N20MIMO	Ant1	2412	15.08	2404.44	2419.52	0.5	PASS
	Ant2	2412	16.28	2403.84	2420.12	0.5	PASS
	Ant1	2437	15.12	2429.44	2444.56	0.5	PASS
	Ant2	2437	16.32	2428.84	2445.16	0.5	PASS
	Ant1	2462	15.80	2454.08	2469.88	0.5	PASS
	Ant2	2462	17.32	2453.44	2470.76	0.5	PASS
11N40MIMO	Ant1	2422	35.12	2404.48	2439.60	0.5	PASS
	Ant2	2422	35.20	2404.40	2439.60	0.5	PASS
	Ant1	2437	35.04	2419.48	2454.52	0.5	PASS
	Ant2	2437	35.04	2419.48	2454.52	0.5	PASS
	Ant1	2452	35.04	2434.48	2469.52	0.5	PASS
	Ant2	2452	35.04	2434.48	2469.52	0.5	PASS
11AX20MIMO	Ant1	2412	17.92	2402.84	2420.76	0.5	PASS
	Ant2	2412	16.80	2402.88	2419.68	0.5	PASS
	Ant1	2437	16.76	2429.44	2446.20	0.5	PASS
	Ant2	2437	18.24	2427.92	2446.16	0.5	PASS
	Ant1	2462	18.68	2452.56	2471.24	0.5	PASS
	Ant2	2462	18.72	2452.64	2471.36	0.5	PASS
11AX40MIMO	Ant1	2422	37.68	2403.36	2441.04	0.5	PASS
	Ant2	2422	37.60	2403.28	2440.88	0.5	PASS
	Ant1	2437	36.00	2419.48	2455.48	0.5	PASS
	Ant2	2437	35.04	2419.48	2454.52	0.5	PASS
	Ant1	2452	37.60	2433.28	2470.88	0.5	PASS
	Ant2	2452	36.88	2433.92	2470.80	0.5	PASS

4.5. Test graphs

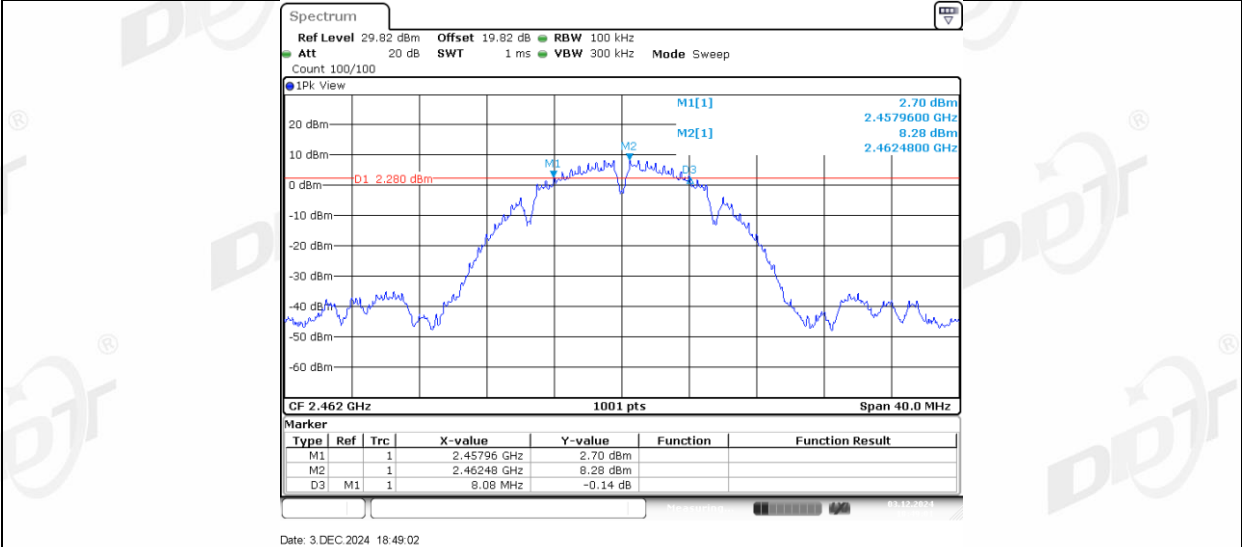




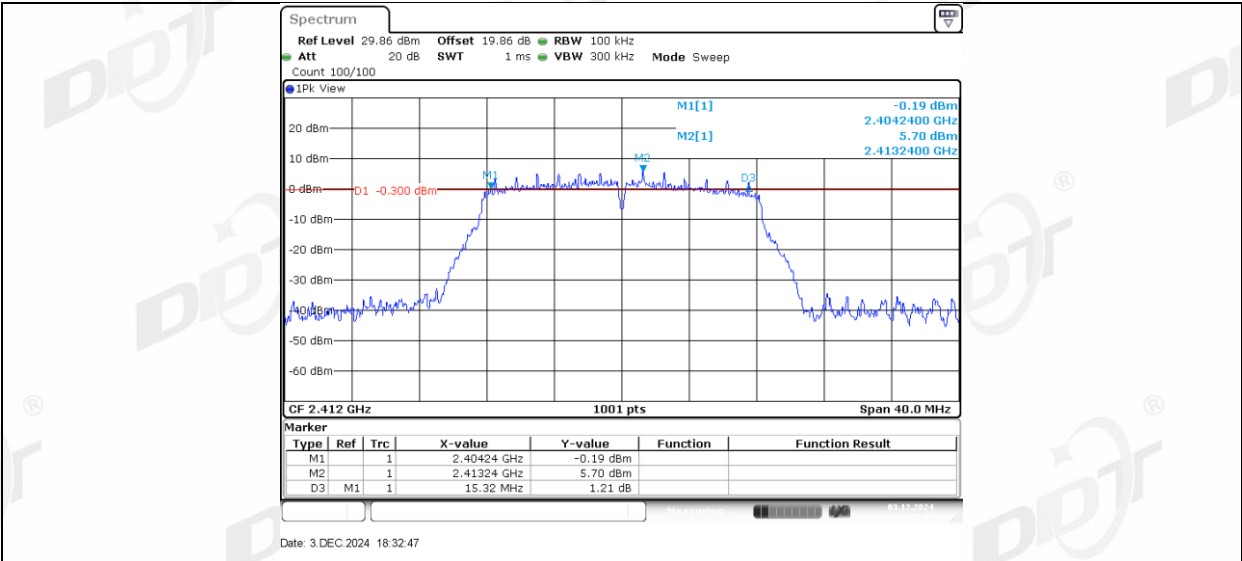
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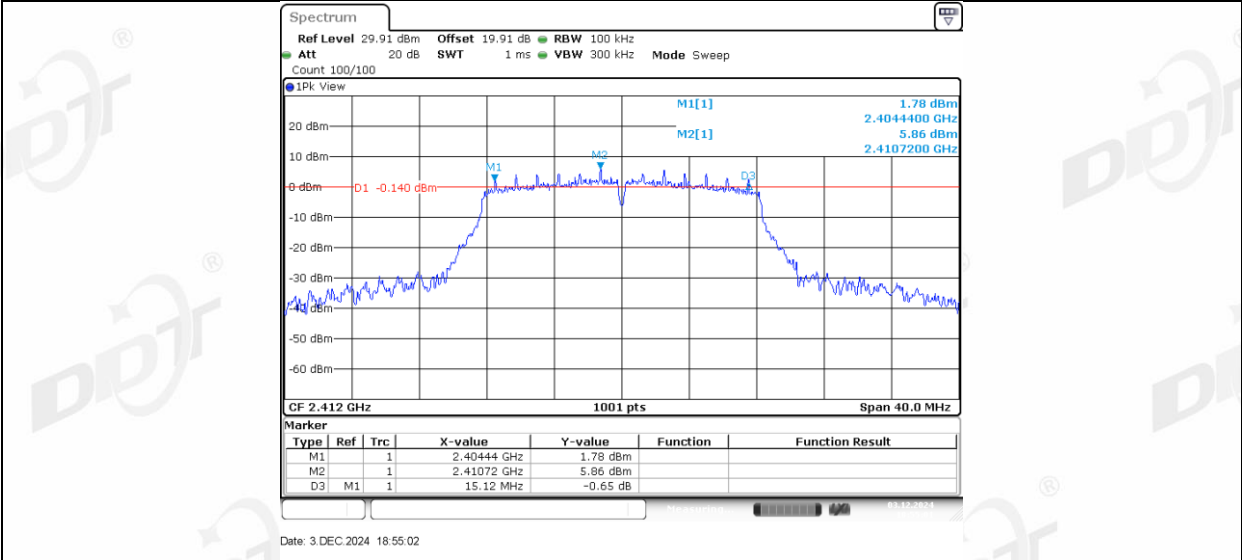
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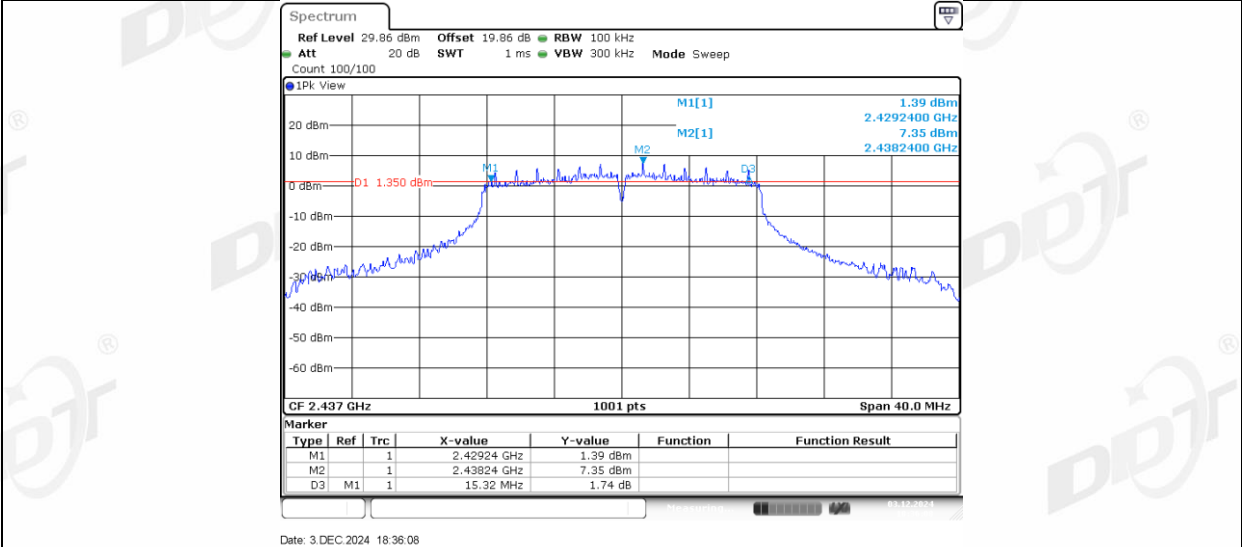
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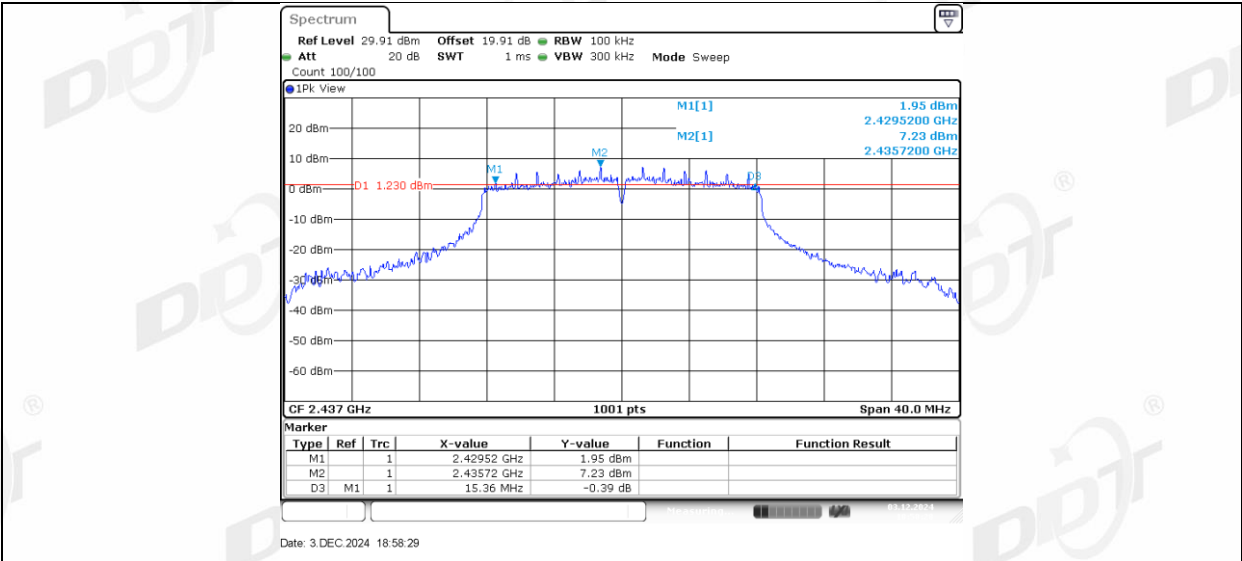
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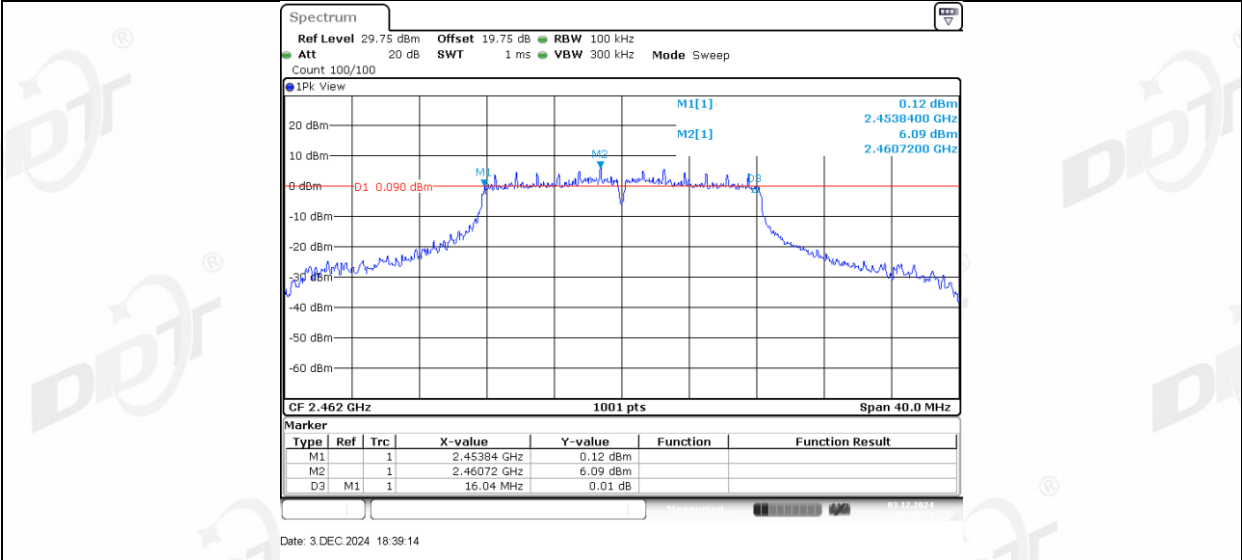
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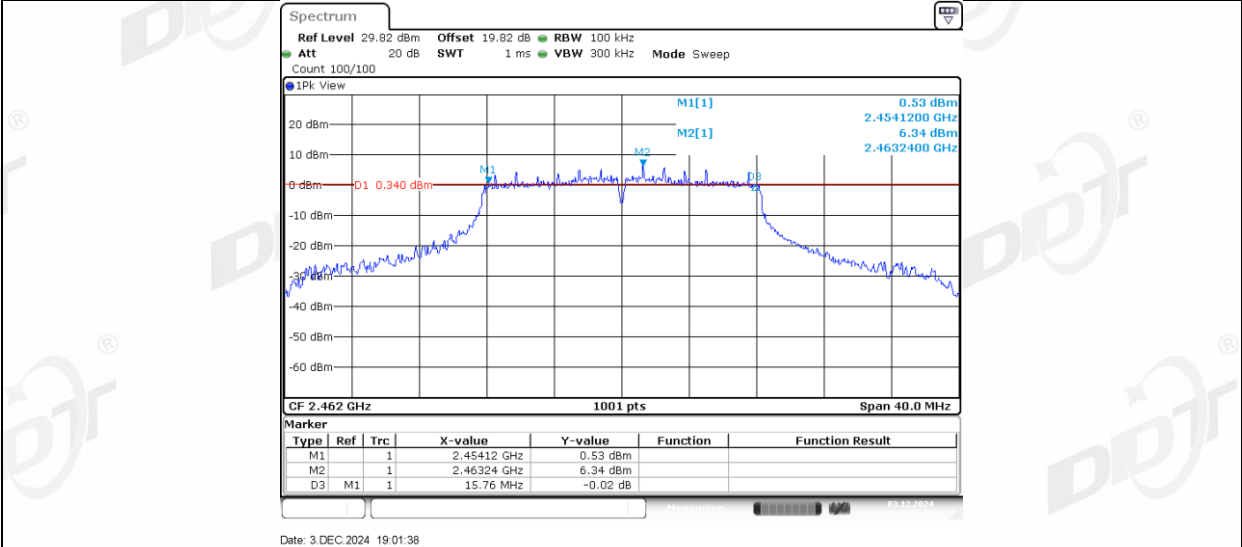
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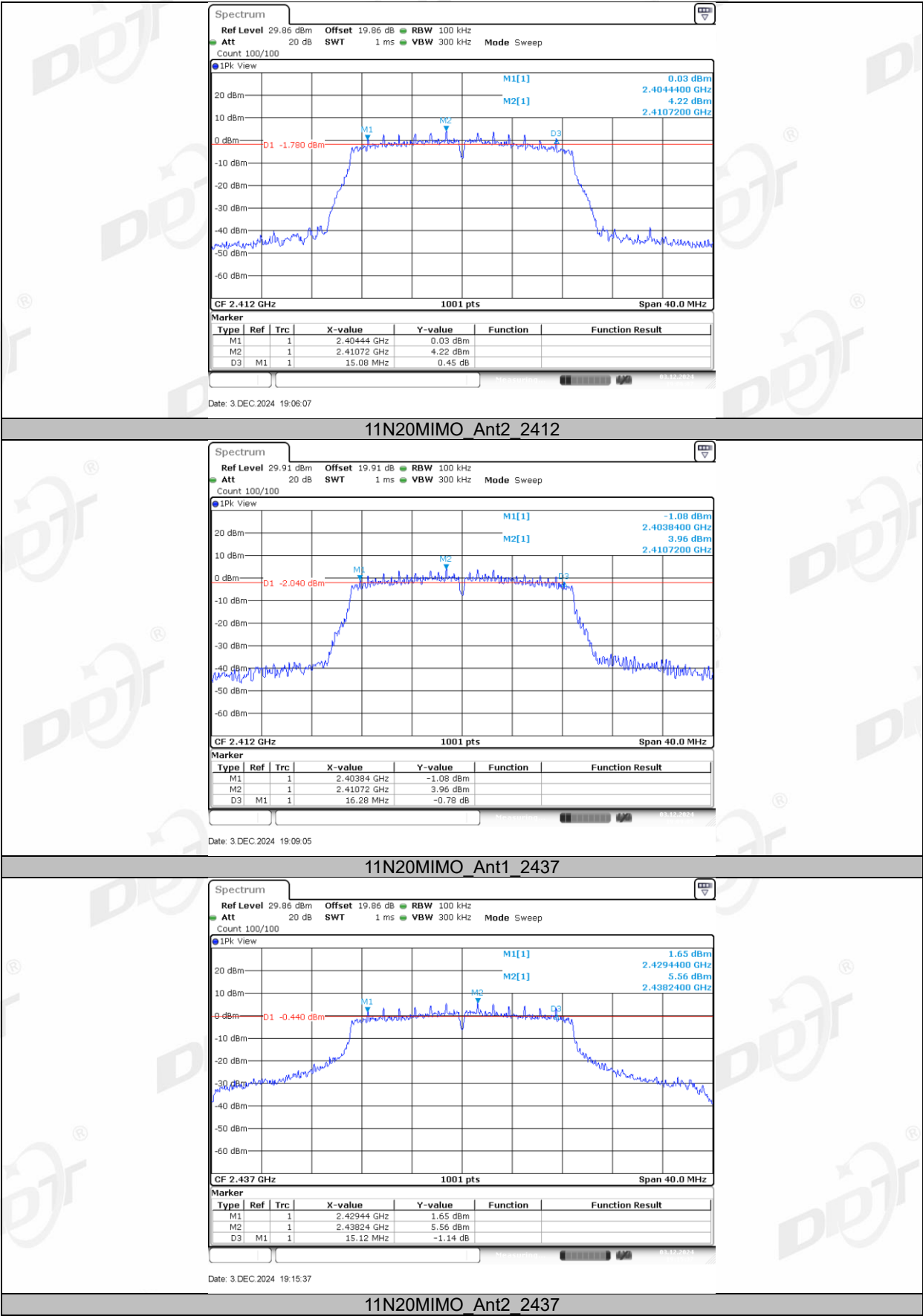
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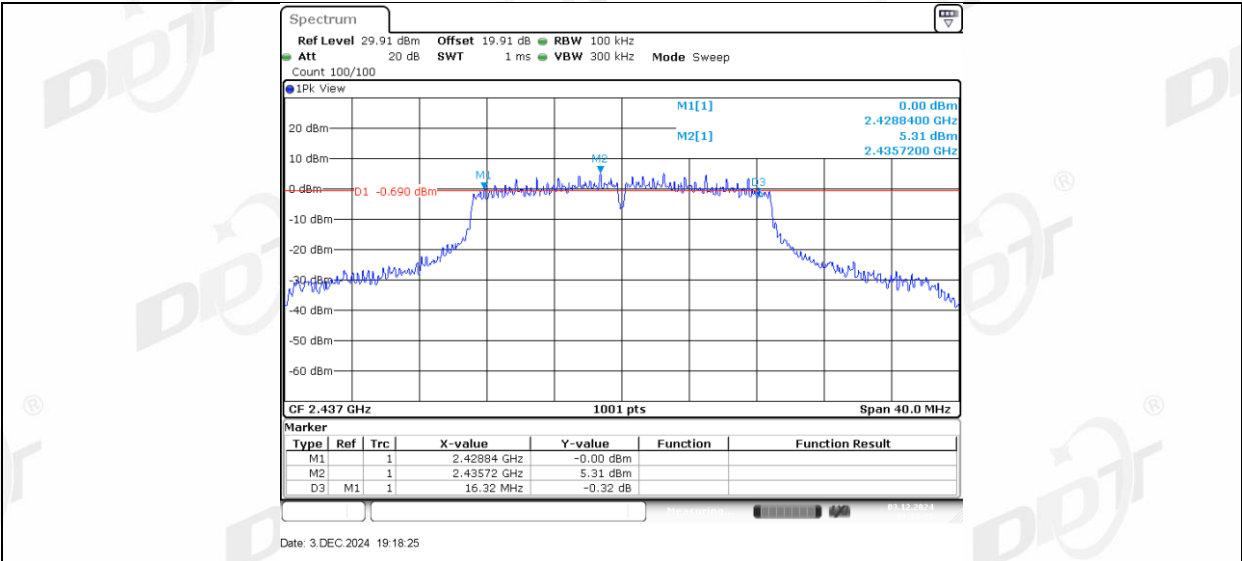


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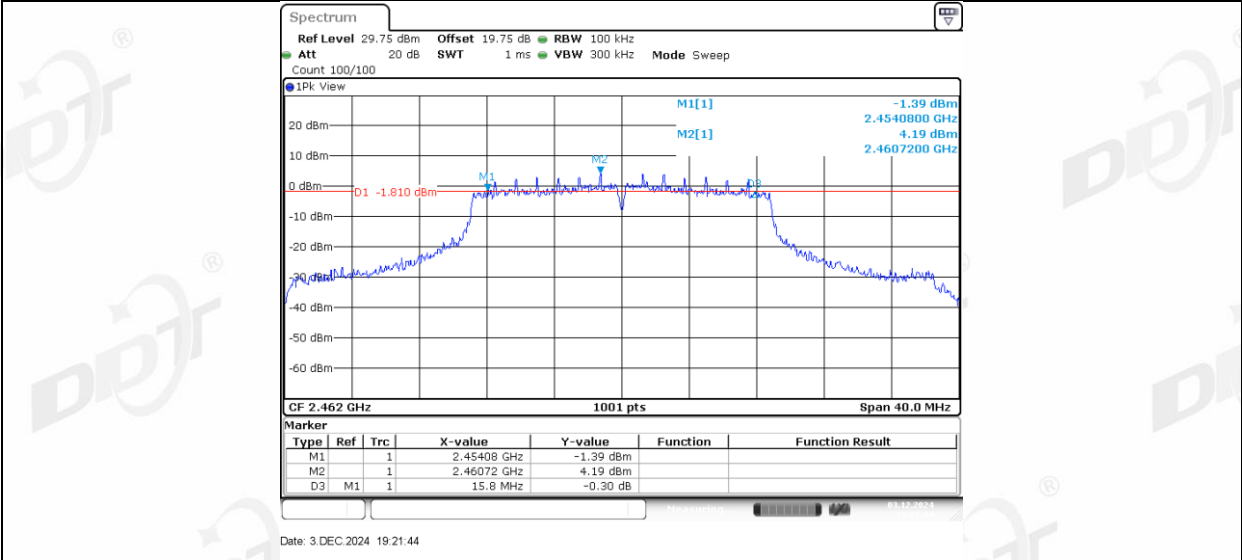


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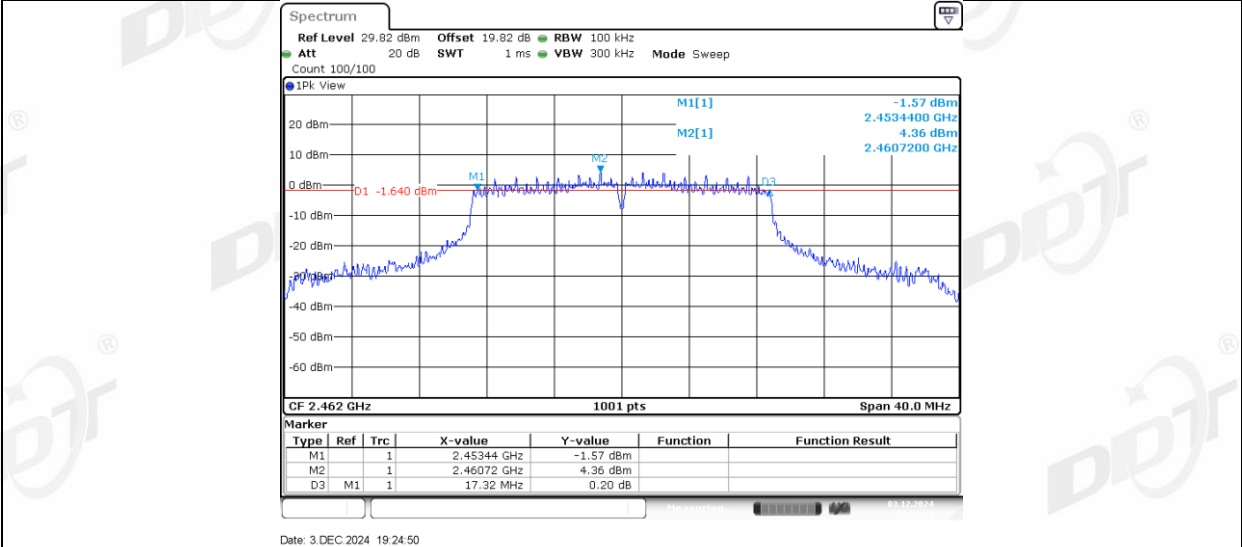




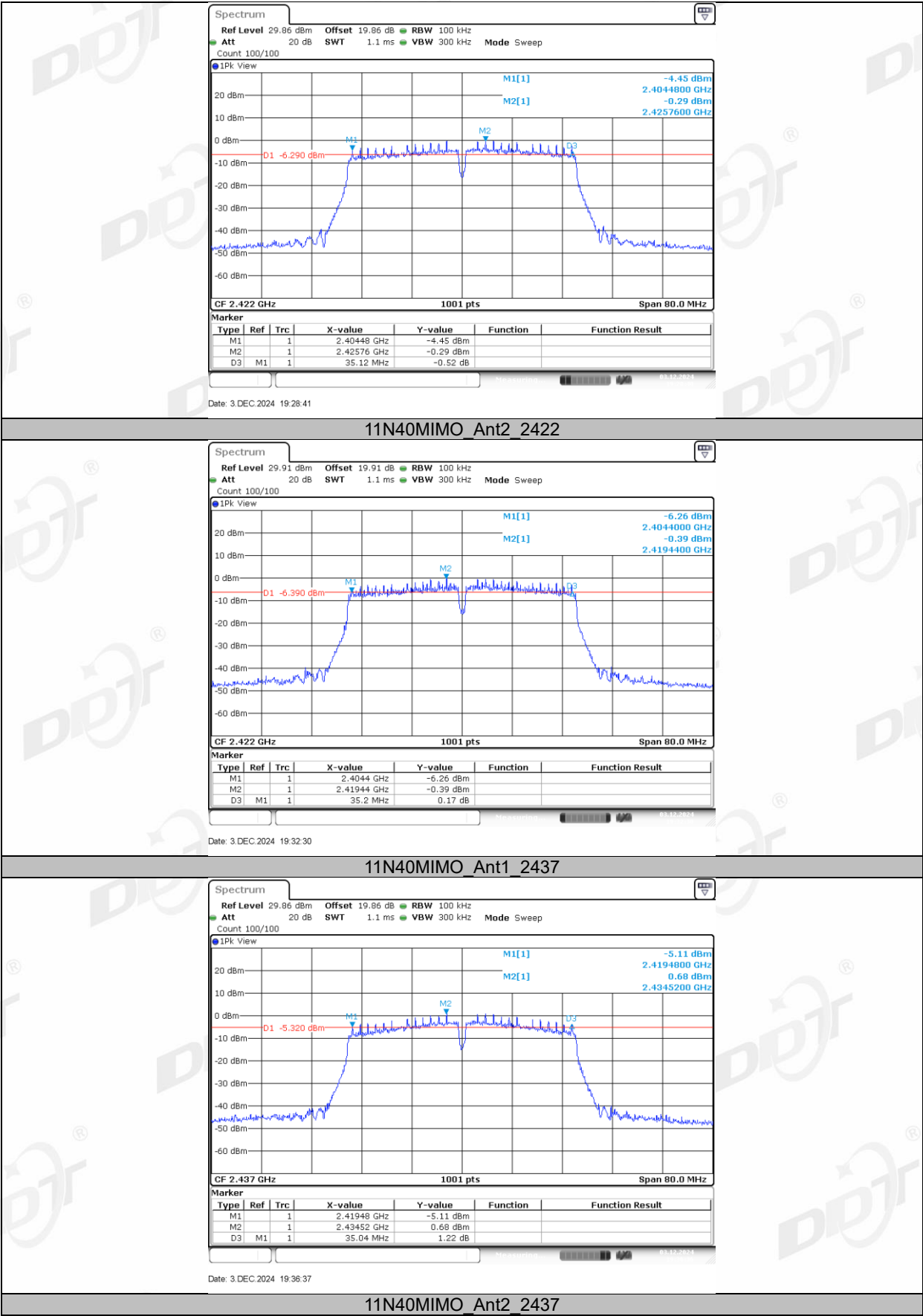
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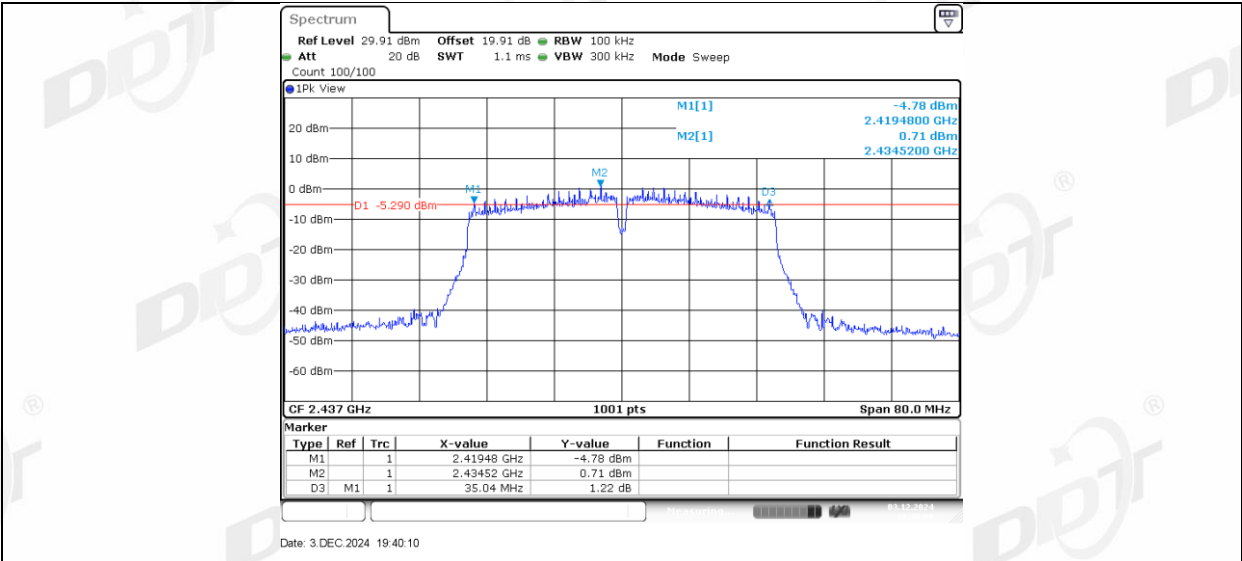


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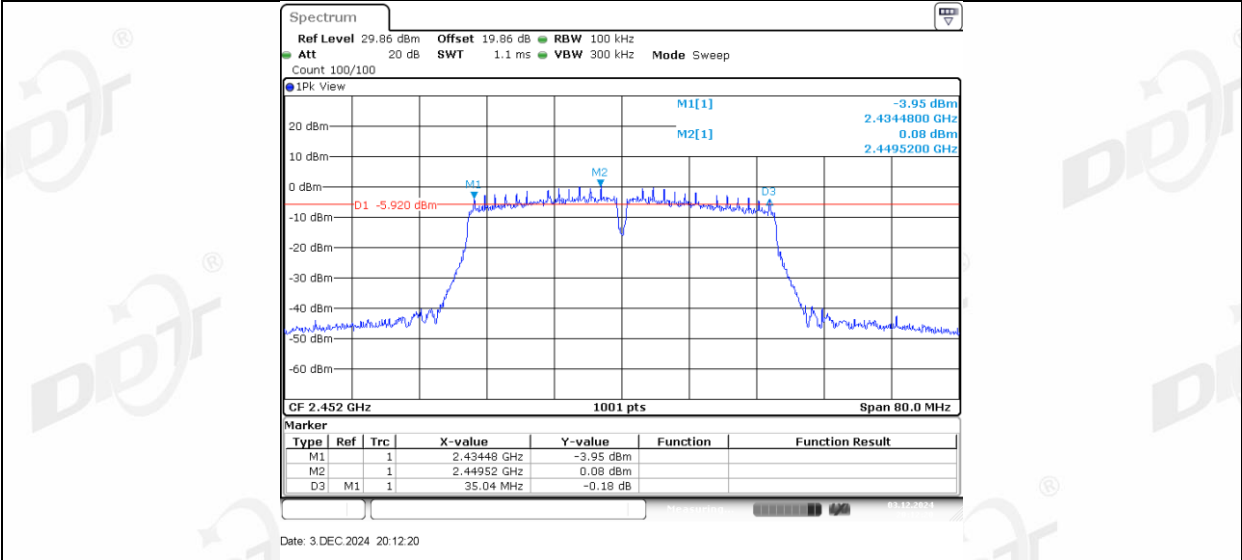


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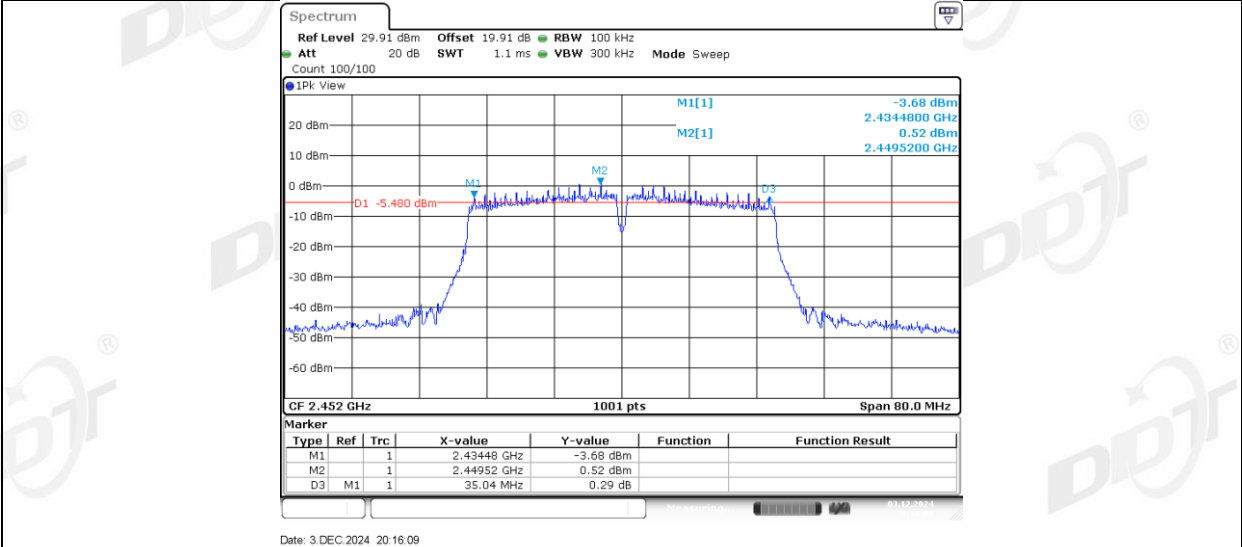




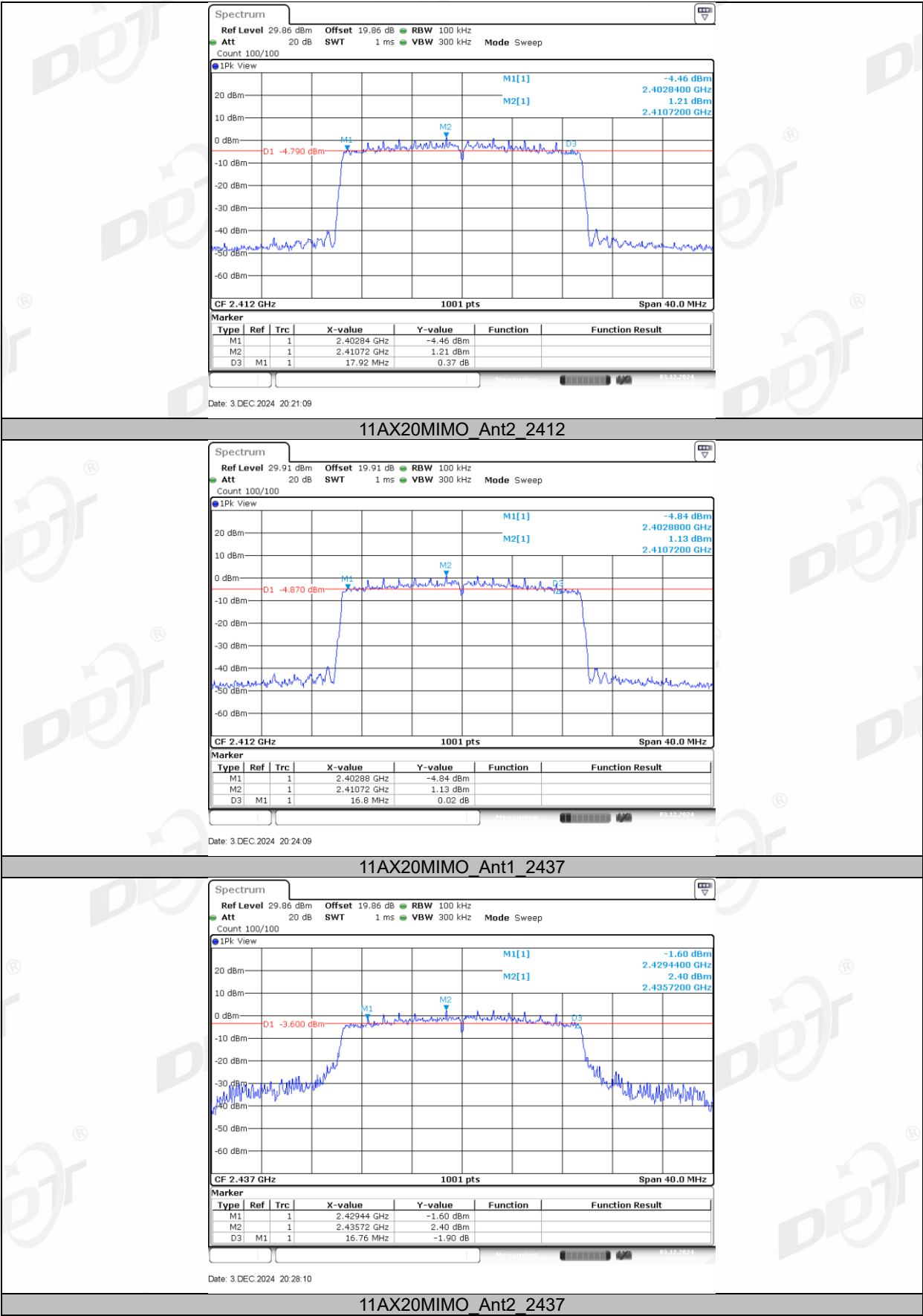
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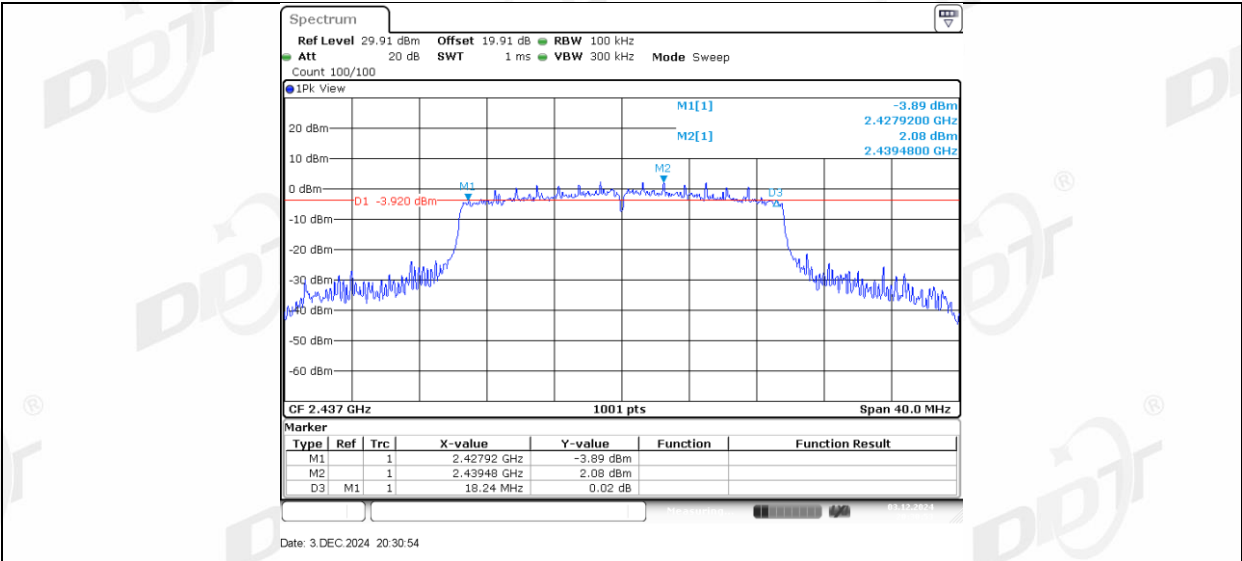


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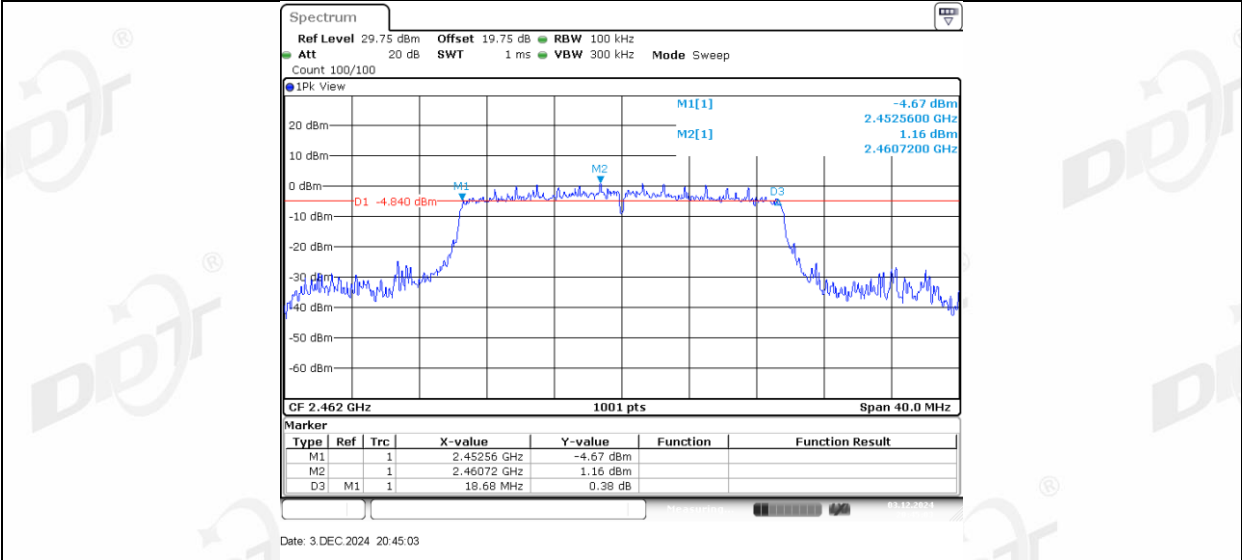


11AX20MIMO_Ant1_2412

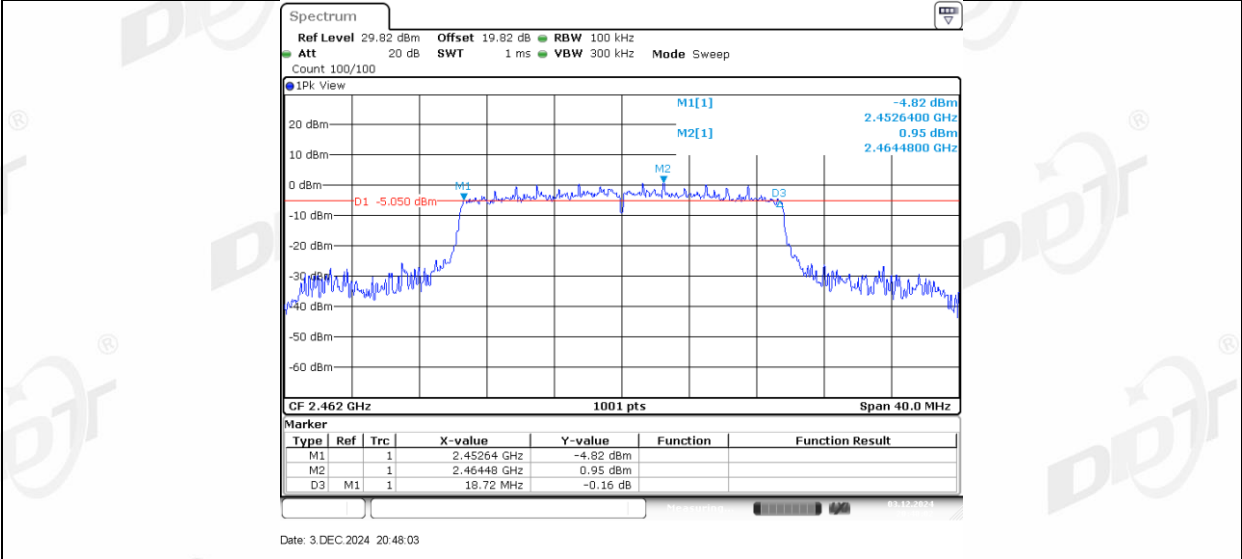




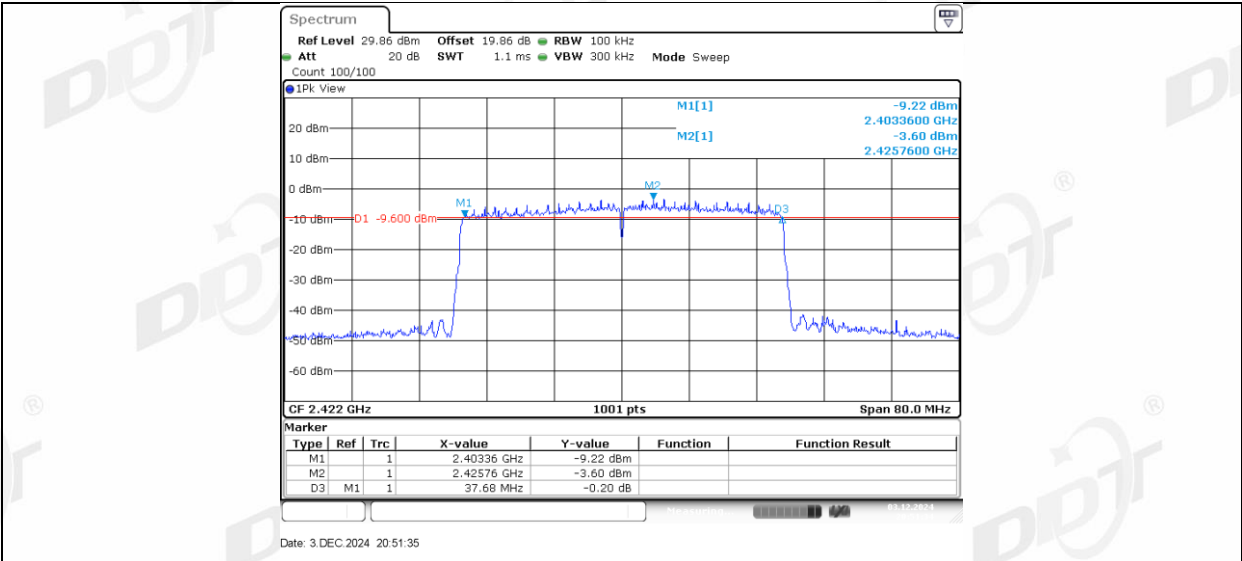
11AX20MIMO_Ant1_2462



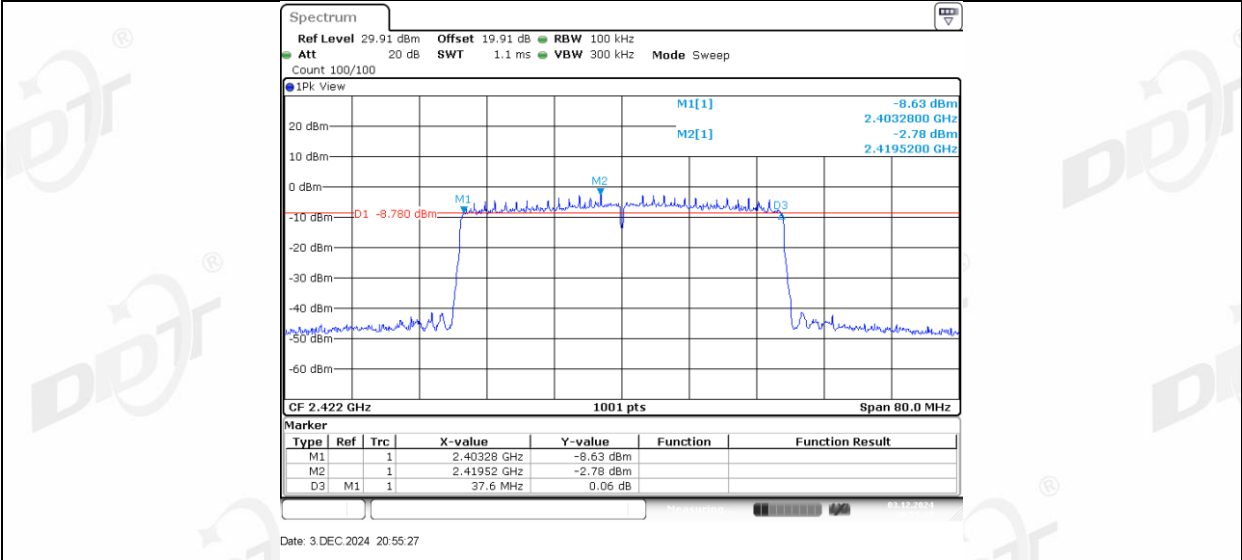
11AX20MIMO_Ant2_2462



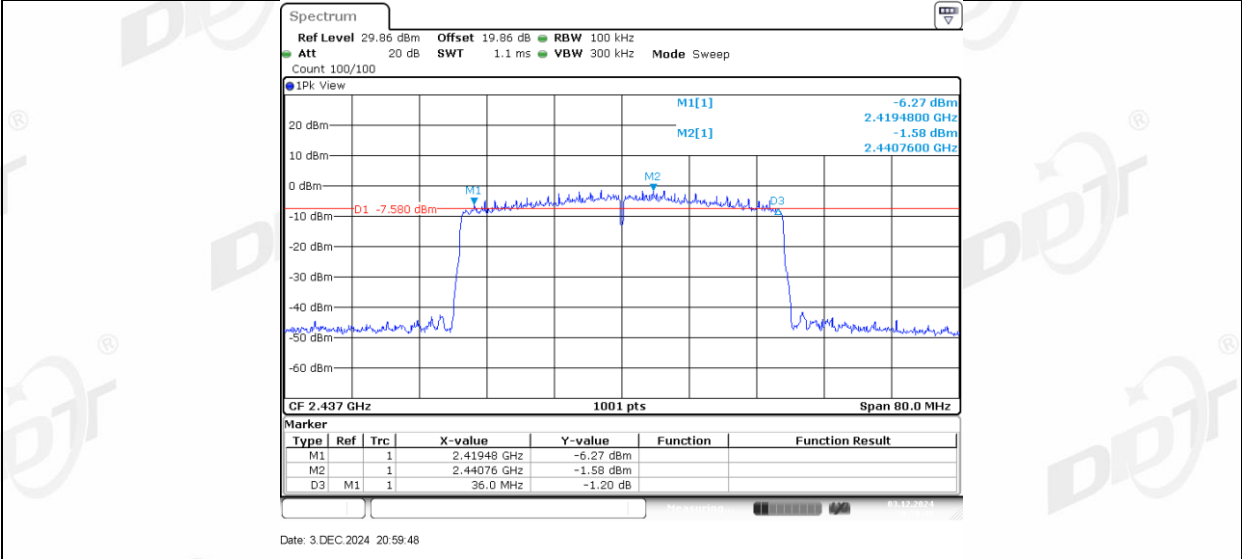
11AX40MIMO_Ant1_2422



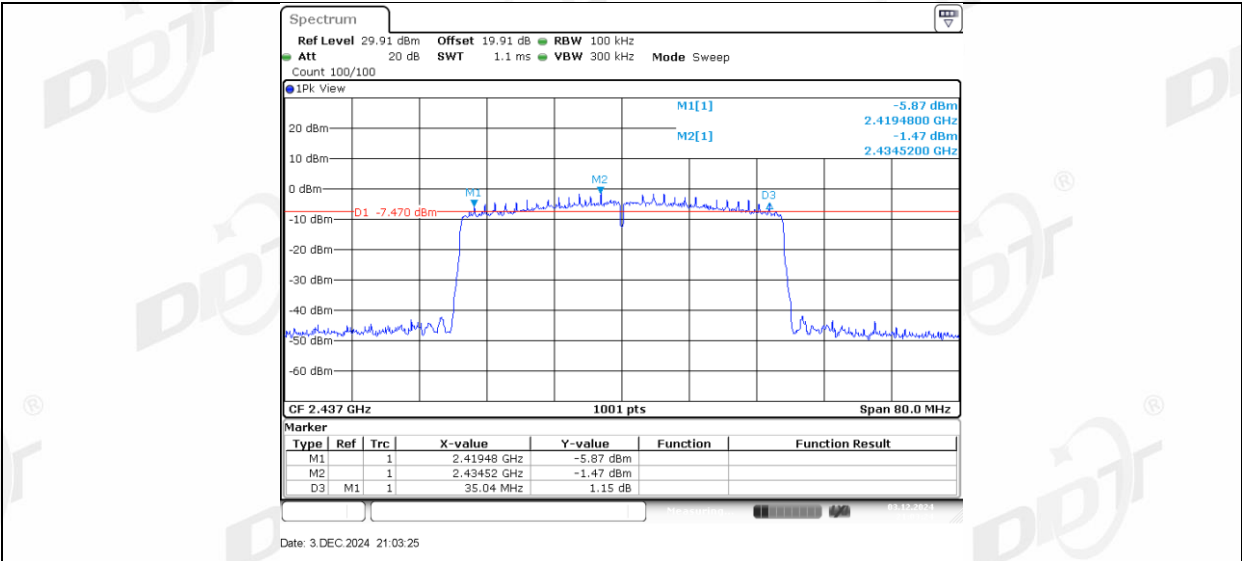
11AX40MIMO_Ant2_2422



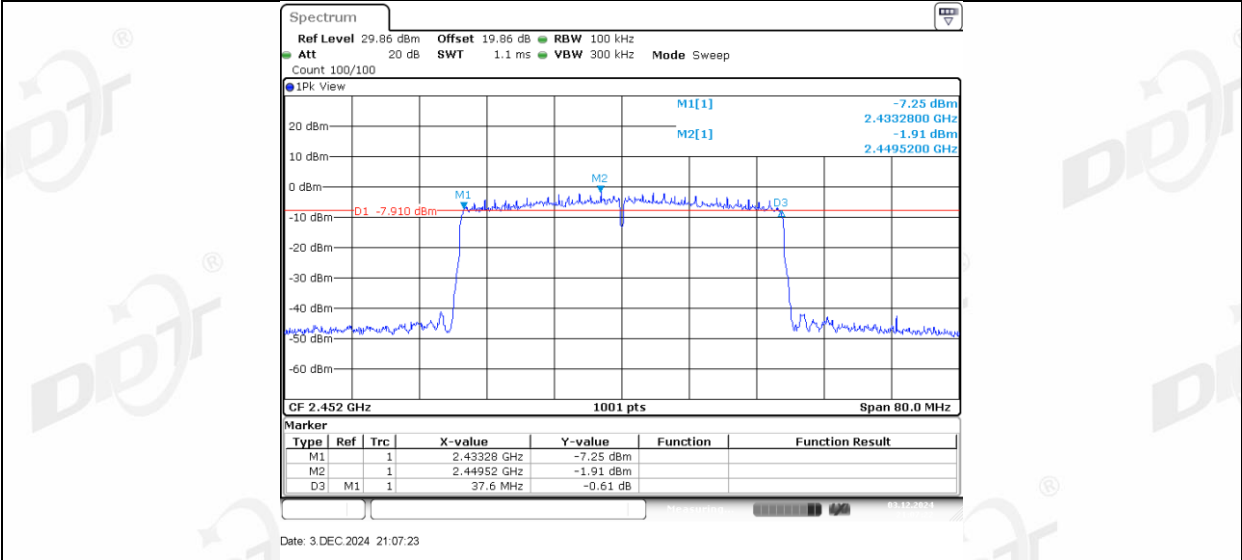
11AX40MIMO_Ant1_2437



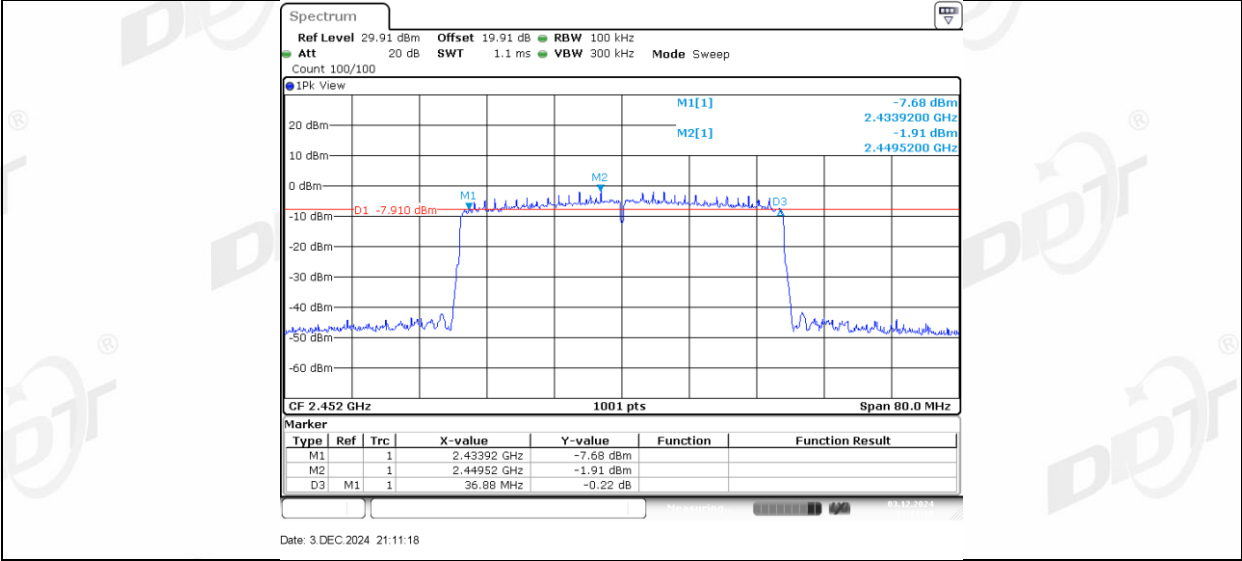
11AX40MIMO_Ant2_2437



11AX40MIMO_Ant1_2452

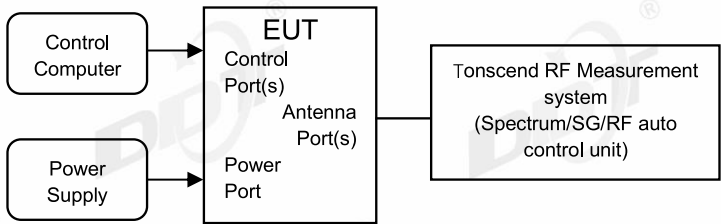


11AX40MIMO_Ant2_2452



5. 99% Bandwidth

5.1. Block diagram of test setup



5.2. Limits

Just for Report.

5.3. Test procedure

- (1) The test according to ANSI C63.10-2013 clause 6.9.3.
- (2) Connect EUT's antenna output to spectrum analyzer by RF cable, the path loss was compensated to the results
- (3) Set the EUT as maximum power setting and enable the EUT transmit continuously
- (4) Use the following spectrum analyzer settings for the 99% Bandwidth:

RBW:	1% to 5% of the OBW
VBW:	approximately three times RBW
Span:	between 1.5 times and 5.0 times the OBW
Detector Mode:	peak
Sweep time:	auto
Trace mode	max hold

Allow the trace to stabilize, measure the 99% bandwidth of signal, and record the results in the report.

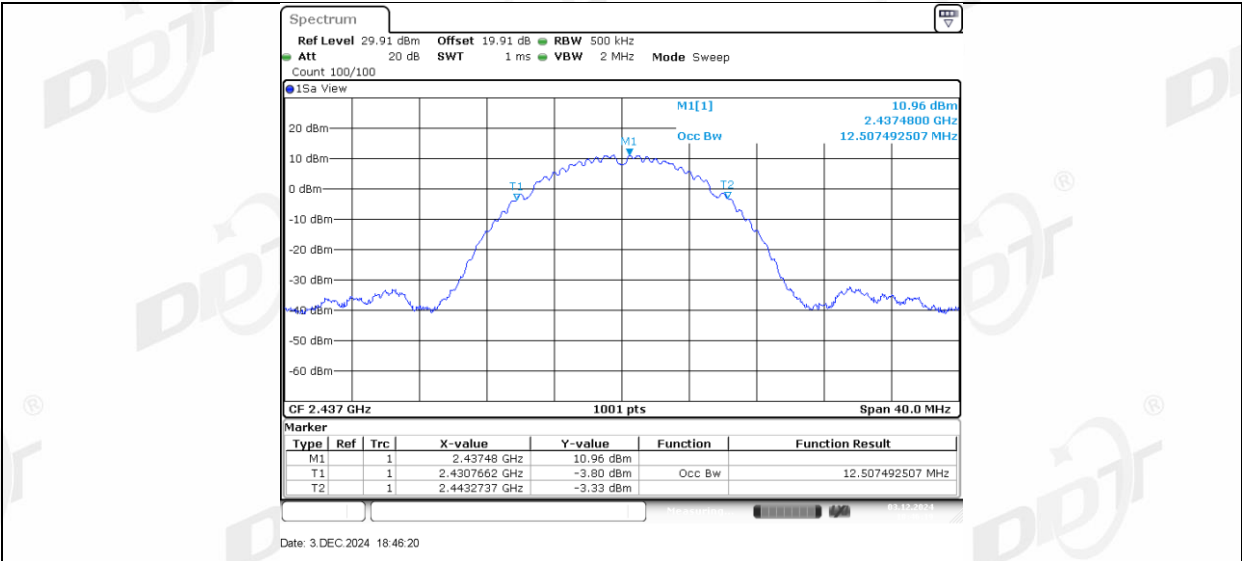
5.4. Test result

Test Engineer:	Zhongyao	Test Site:	RF Measurement System 3#
Ambient Condition:	22.6-26.3℃,43.6-57.3%RH	Test Date:	2024.11.14-2025.02.10
Test Power Supply:	AC 120V/60Hz	Sample Number:	S24111413-003

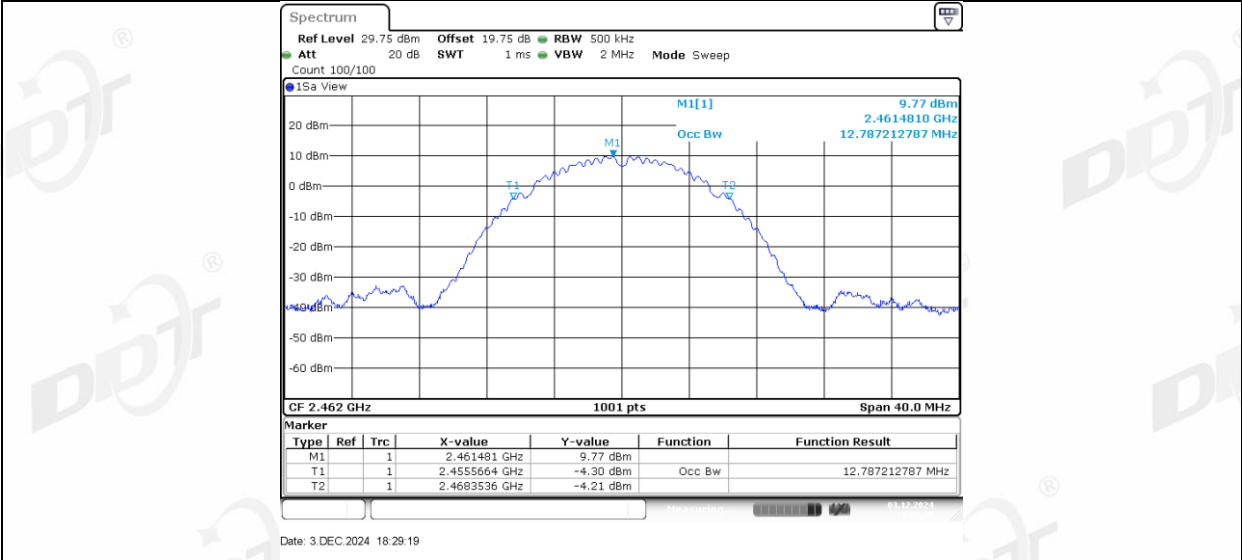
Test Mode	Antenna	Channel Frequency [MHz]	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	12.627	2405.6064	2418.2338	---	---
	Ant2	2412	12.468	2405.7263	2418.1938	---	---
	Ant1	2437	12.667	2430.6863	2443.3536	---	---
	Ant2	2437	12.507	2430.7662	2443.2737	---	---
	Ant1	2462	12.787	2455.5664	2468.3536	---	---
	Ant2	2462	12.627	2455.6863	2468.3137	---	---
11G	Ant1	2412	17.183	2403.2887	2420.4715	---	---
	Ant2	2412	17.263	2403.2887	2420.5514	---	---
	Ant1	2437	18.741	2427.6094	2446.3506	---	---
	Ant2	2437	18.741	2427.6094	2446.3506	---	---
	Ant1	2462	19.461	2452.1299	2471.5904	---	---
	Ant2	2462	19.461	2452.1698	2471.6304	---	---
11N20MIMO	Ant1	2412	17.942	2402.9291	2420.8711	---	---
	Ant2	2412	17.582	2403.1688	2420.7512	---	---
	Ant1	2437	19.261	2427.4496	2446.7103	---	---
	Ant2	2437	18.142	2427.9690	2446.1109	---	---
	Ant1	2462	20.06	2451.9301	2471.9900	---	---
	Ant2	2462	18.462	2452.8092	2471.2707	---	---
11N40MIMO	Ant1	2422	36.284	2403.9381	2440.2218	---	---
	Ant2	2422	36.444	2403.7782	2440.2218	---	---
	Ant1	2437	35.884	2419.0979	2454.9820	---	---
	Ant2	2437	36.204	2418.9381	2455.1419	---	---
	Ant1	2452	36.124	2433.8581	2469.9820	---	---
	Ant2	2452	36.364	2433.7782	2470.1419	---	---
11AX20MIMO	Ant1	2412	18.861	2402.5295	2421.3906	---	---
	Ant2	2412	18.861	2402.5295	2421.3906	---	---
	Ant1	2437	19.301	2427.3696	2446.6703	---	---
	Ant2	2437	19.181	2427.4096	2446.5904	---	---
	Ant1	2462	19.381	2452.2498	2471.6304	---	---
	Ant2	2462	19.341	2452.3297	2471.6703	---	---
11AX40MIMO	Ant1	2422	37.802	2403.1389	2440.9411	---	---
	Ant2	2422	37.882	2403.0589	2440.9411	---	---
	Ant1	2437	37.642	2418.1389	2455.7812	---	---
	Ant2	2437	37.722	2418.1389	2455.8611	---	---
	Ant1	2452	37.802	2433.0589	2470.8611	---	---
	Ant2	2452	37.802	2433.1389	2470.9411	---	---

5.5. Test graphs

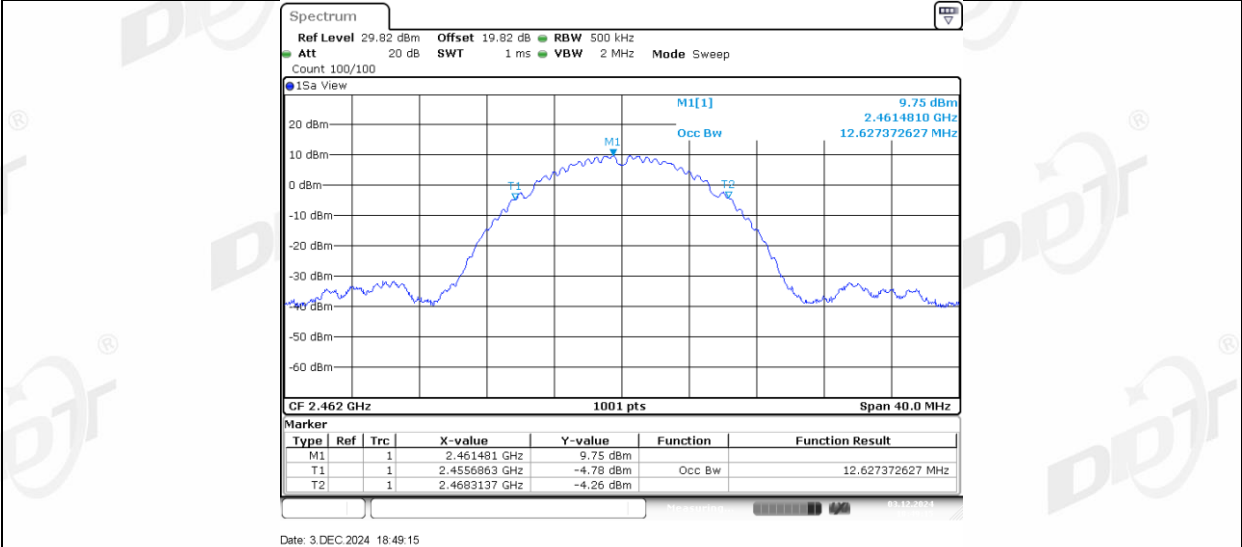




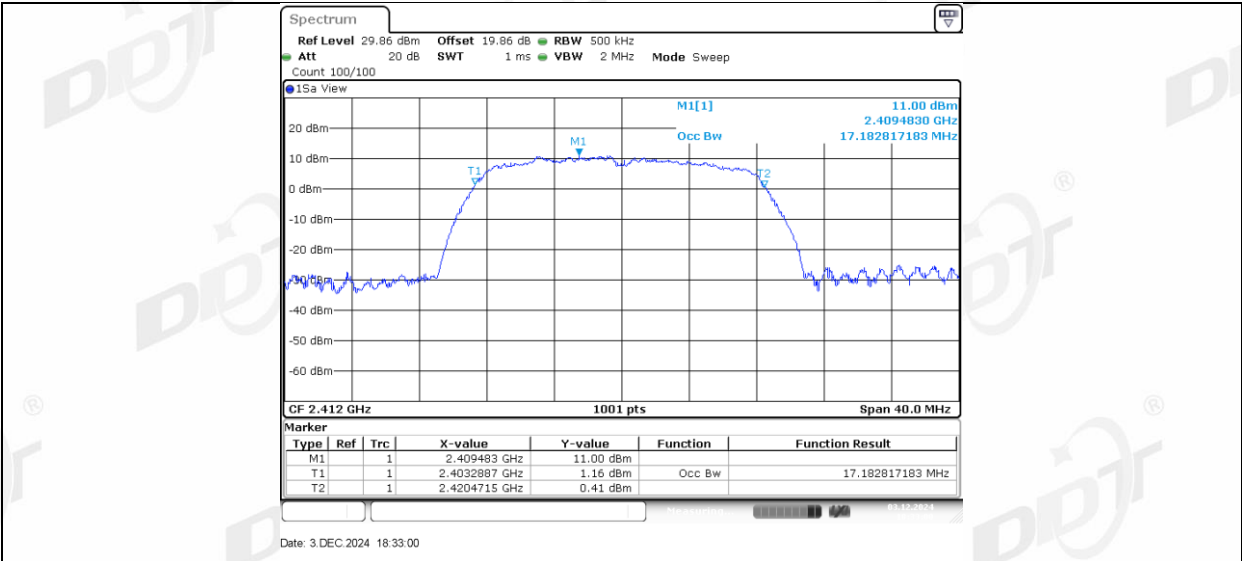
11B_Ant1_2462



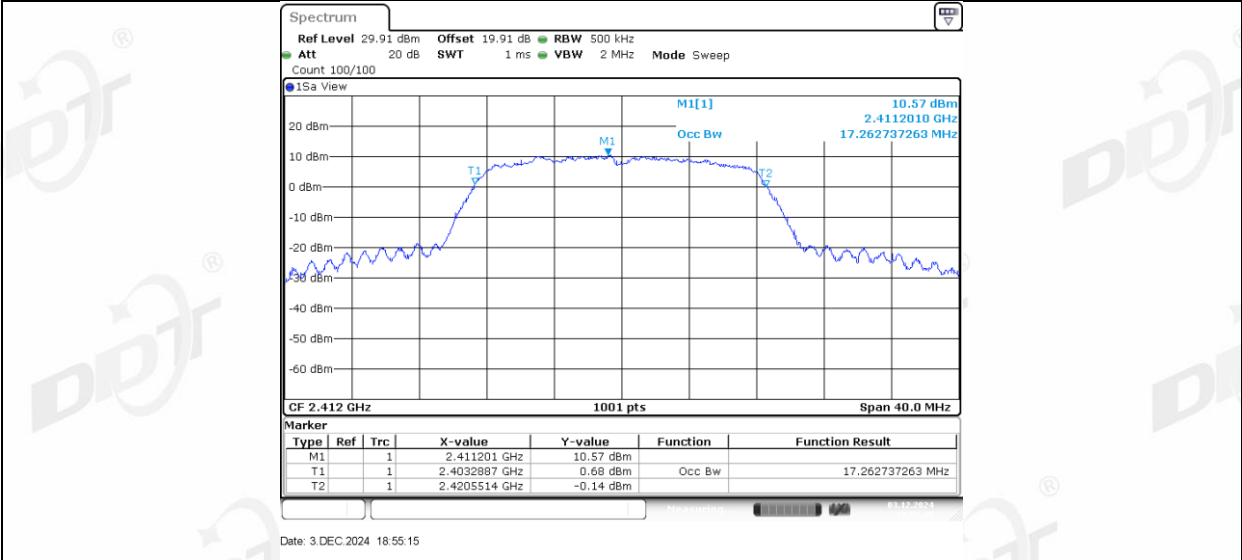
11B_Ant2_2462



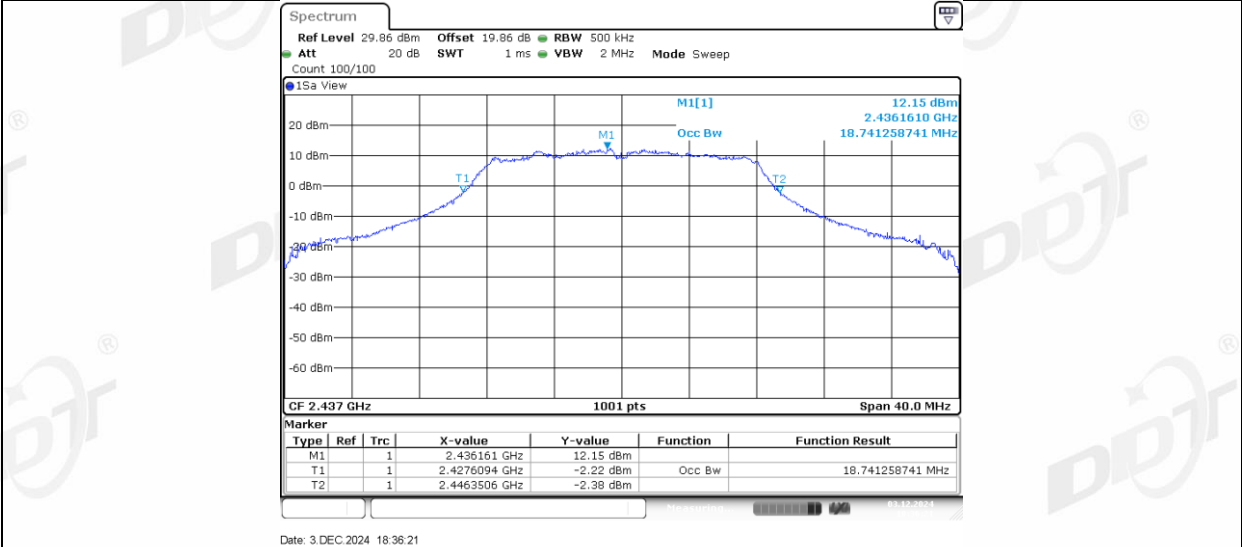
11G_Ant1_2412



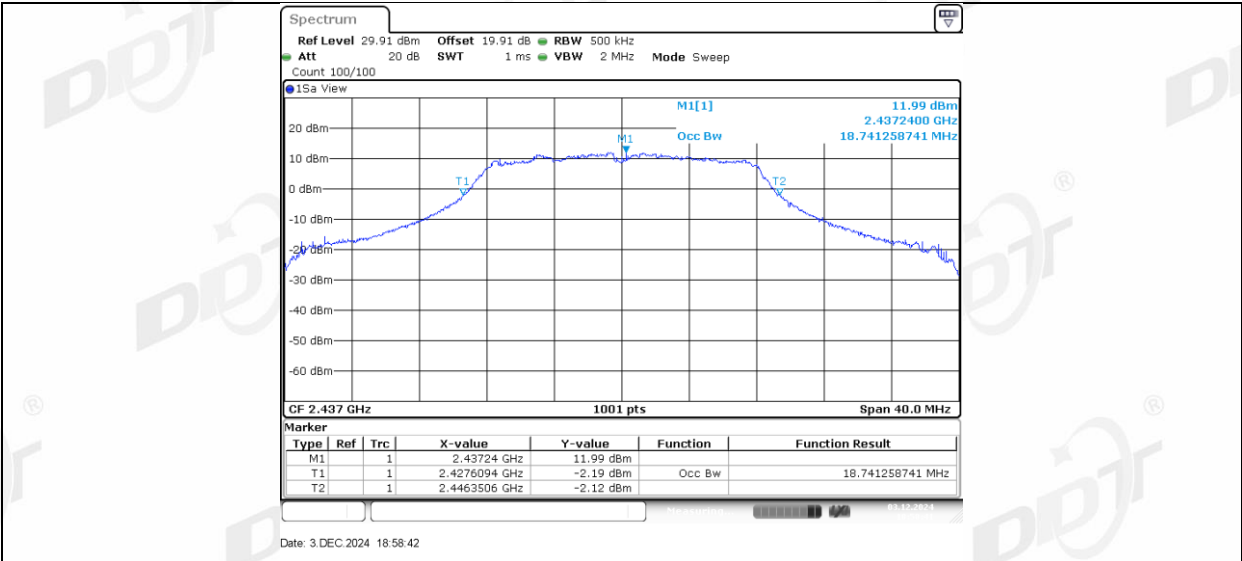
11G Ant2_2412



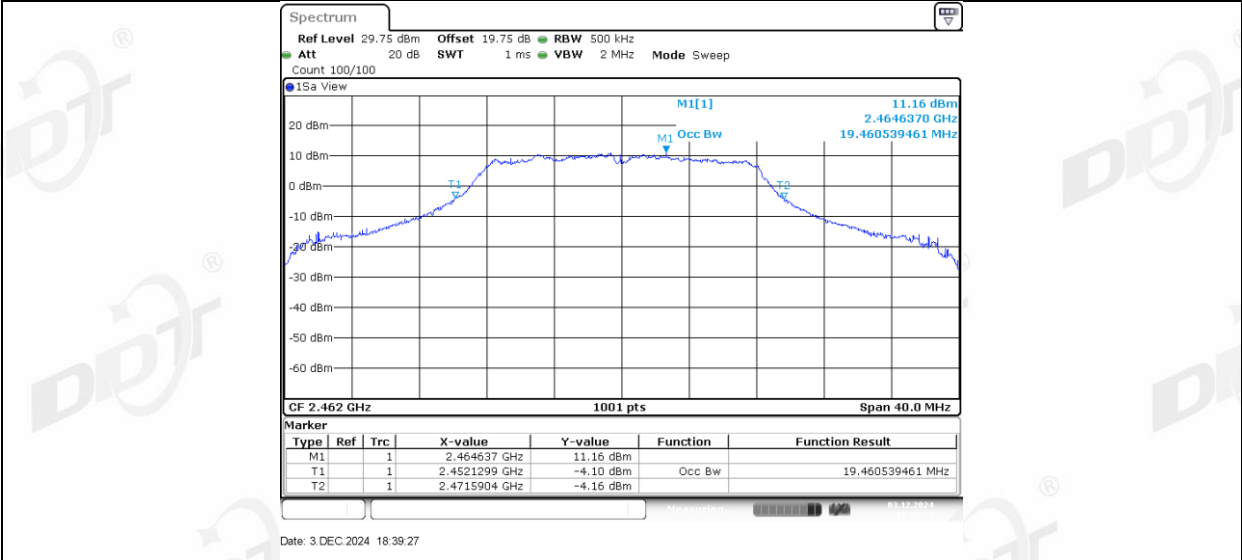
11G Ant1_2437



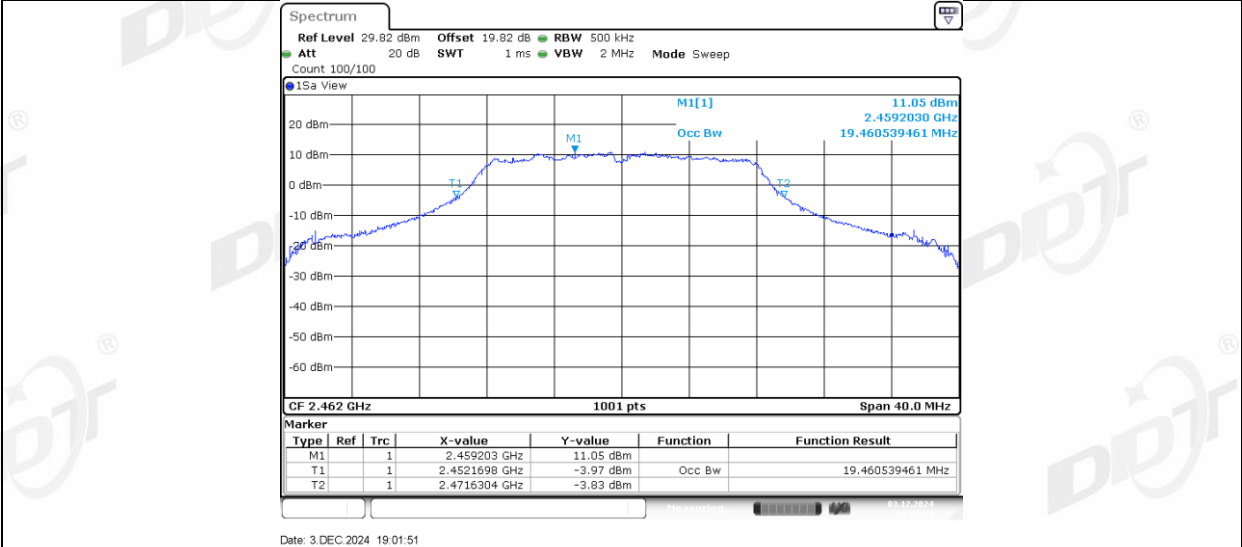
11G Ant2_2437



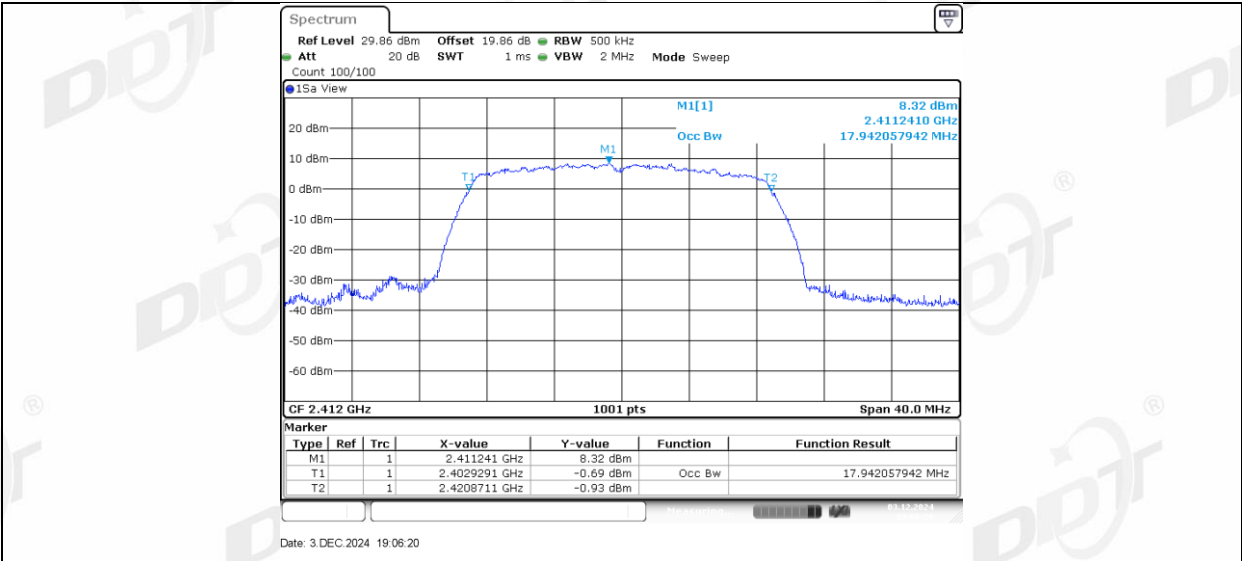
11G Ant1_2462



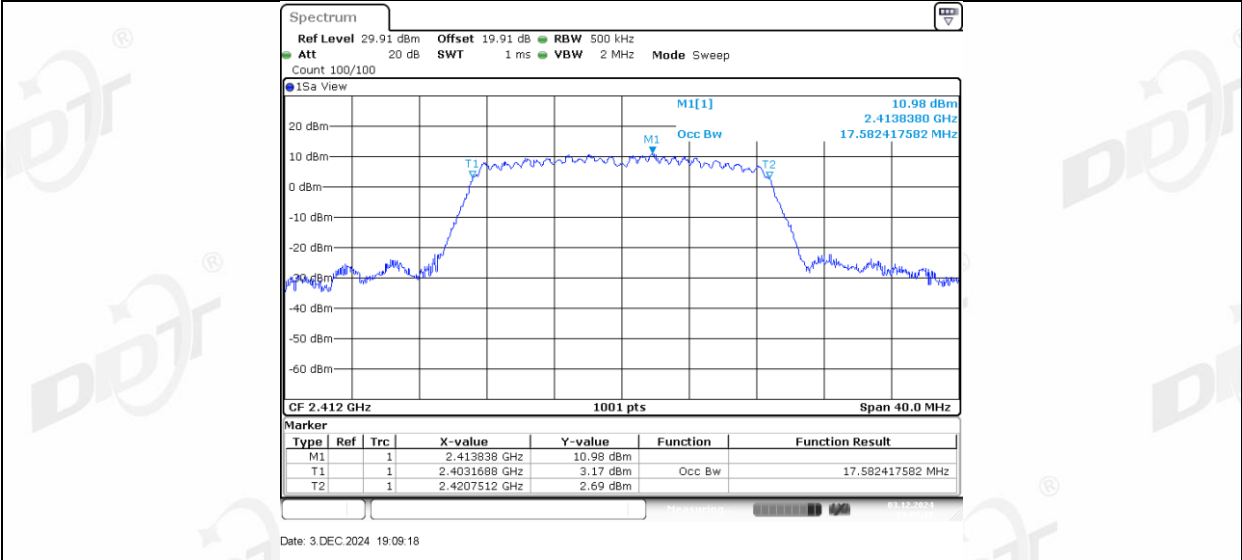
11G Ant2_2462



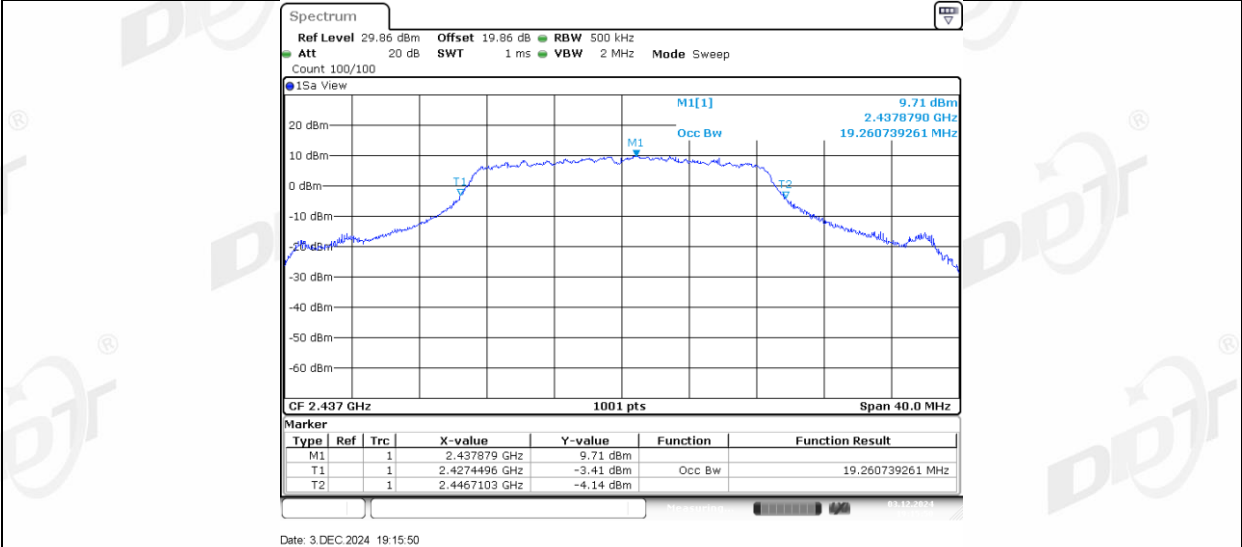
11N20MIMO_Ant1_2412



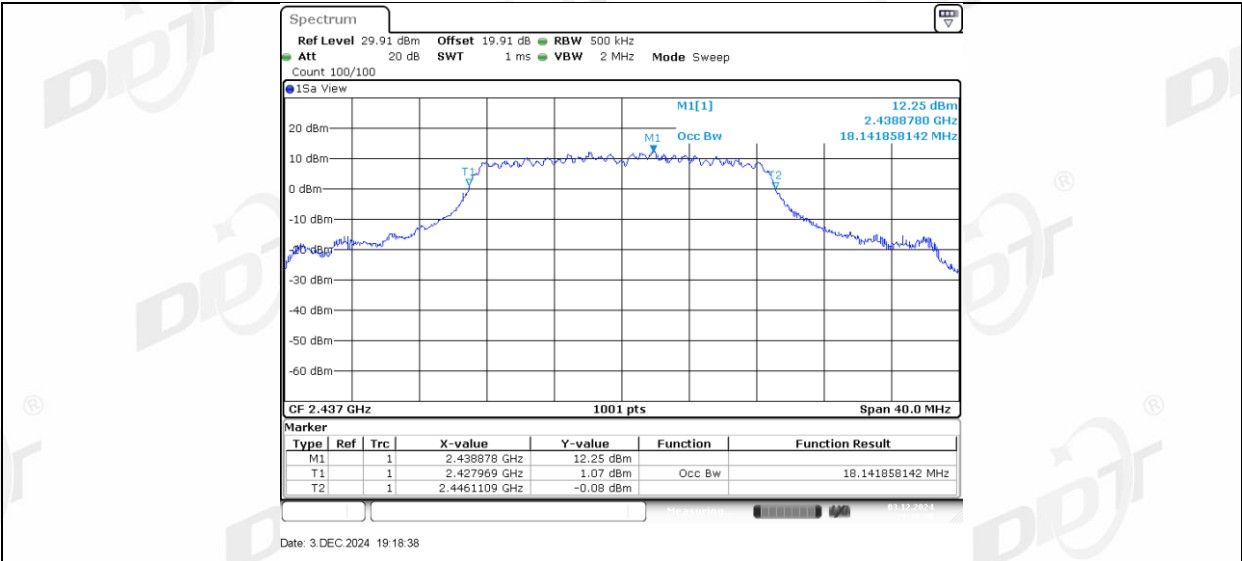
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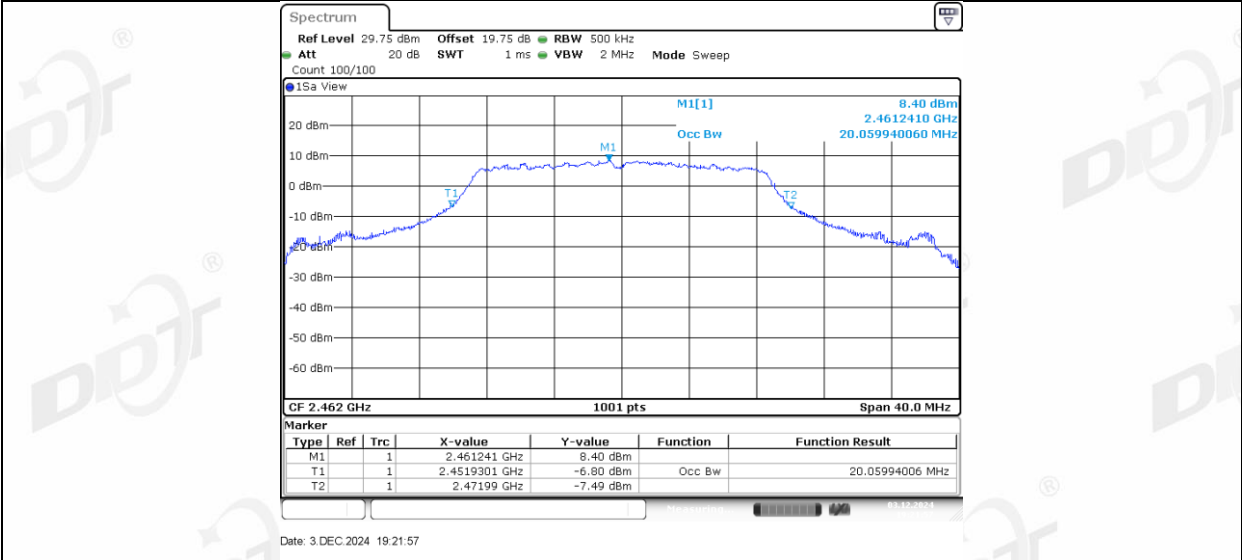
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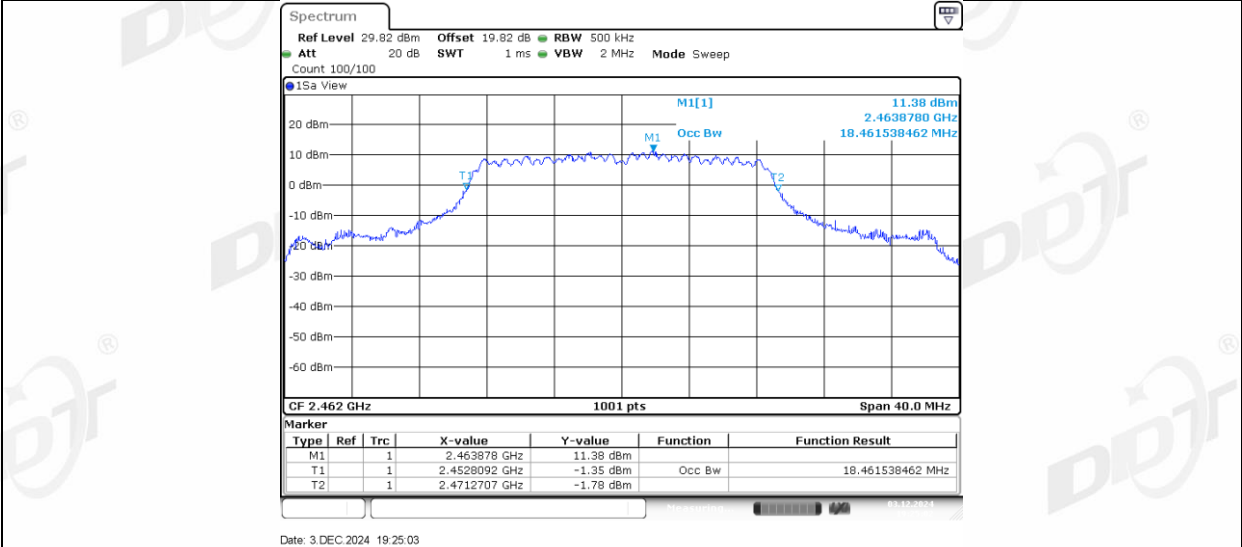
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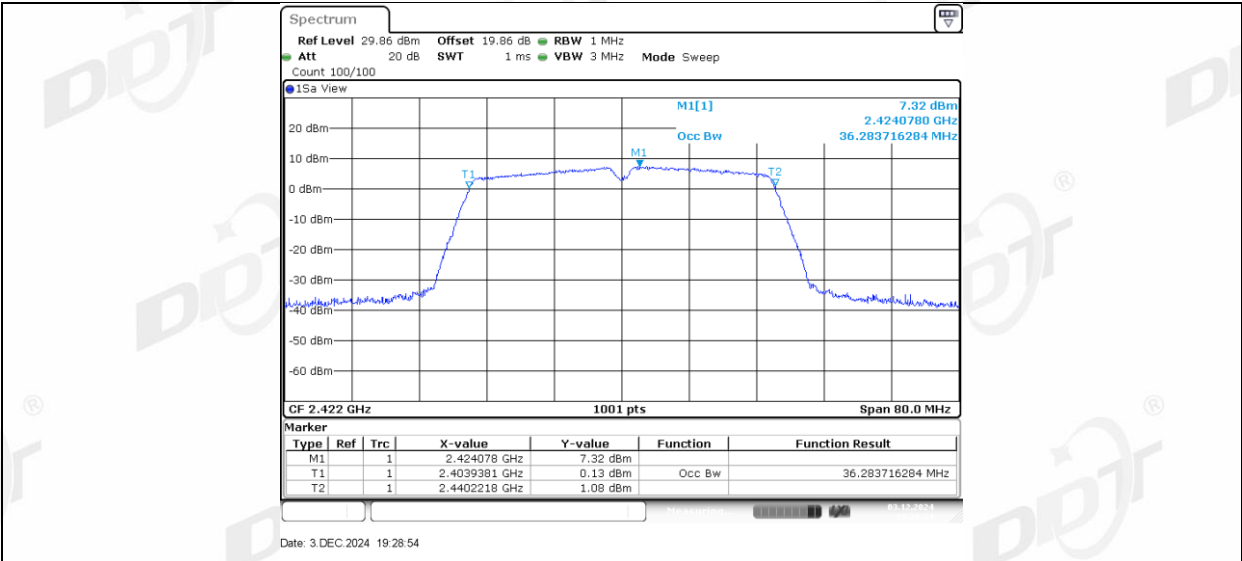
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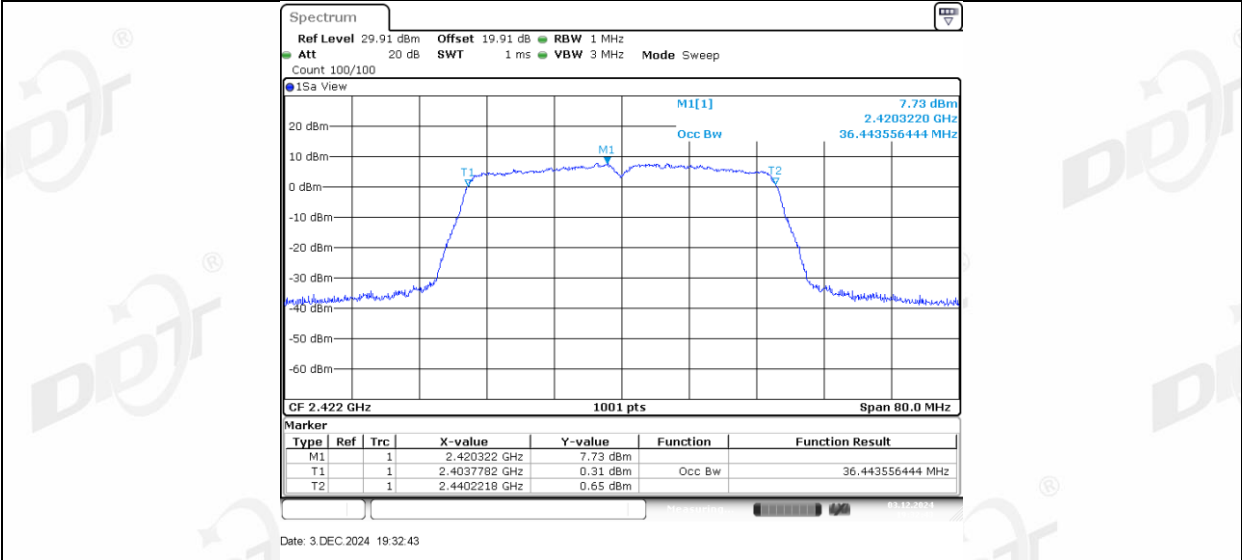
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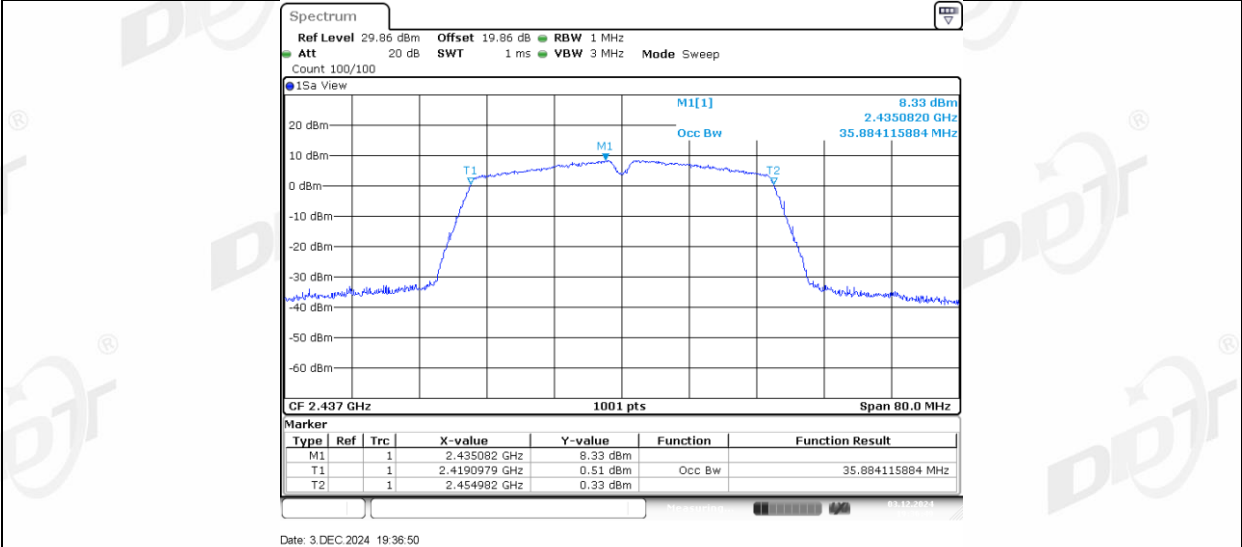
11N40MIMO_Ant1_2422



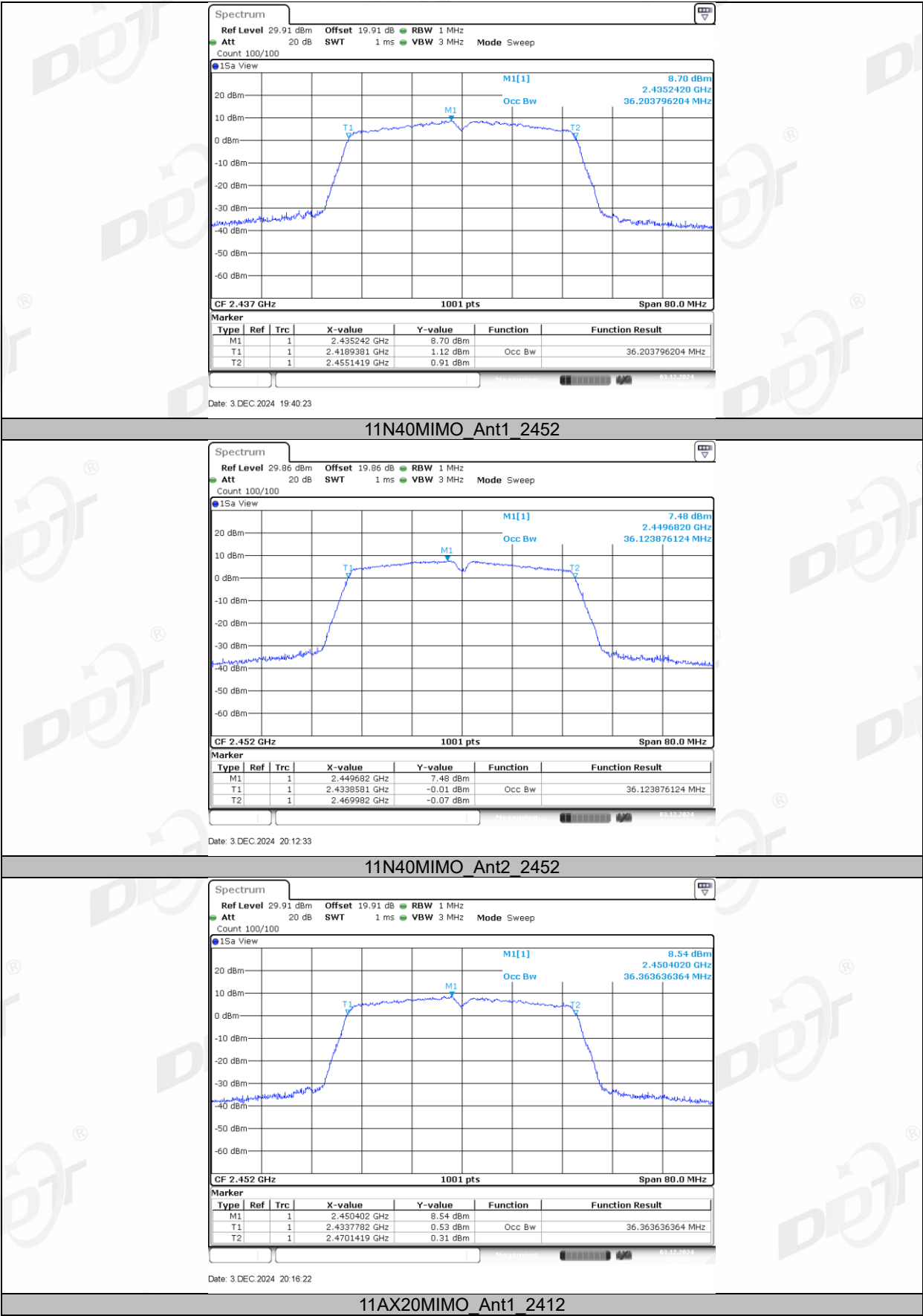
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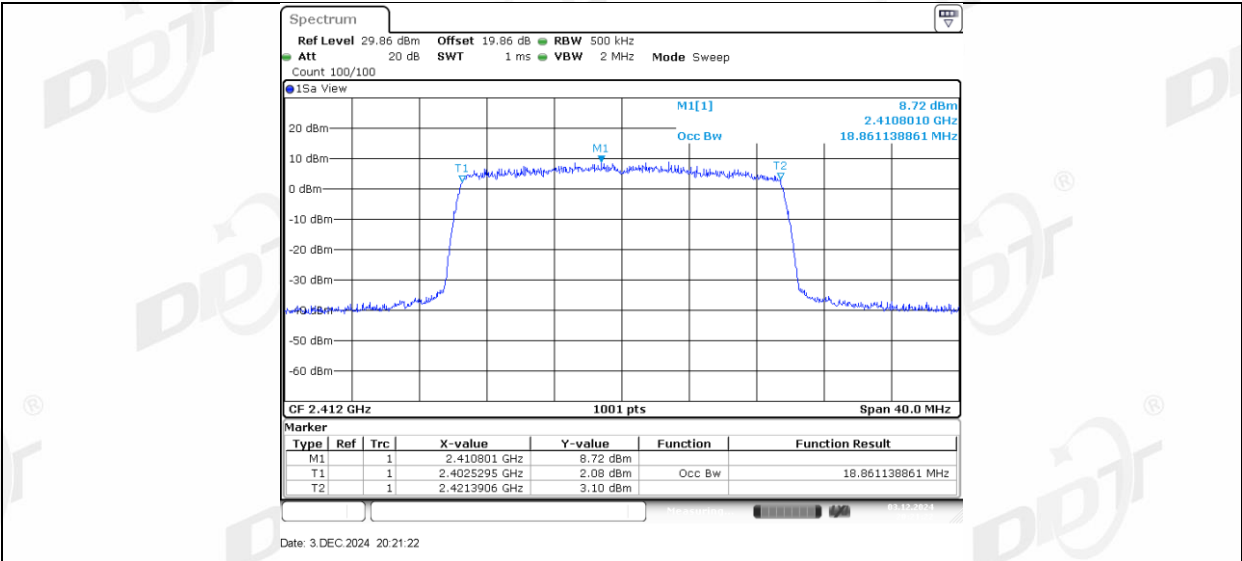


11N40MIMO_Ant1_2437

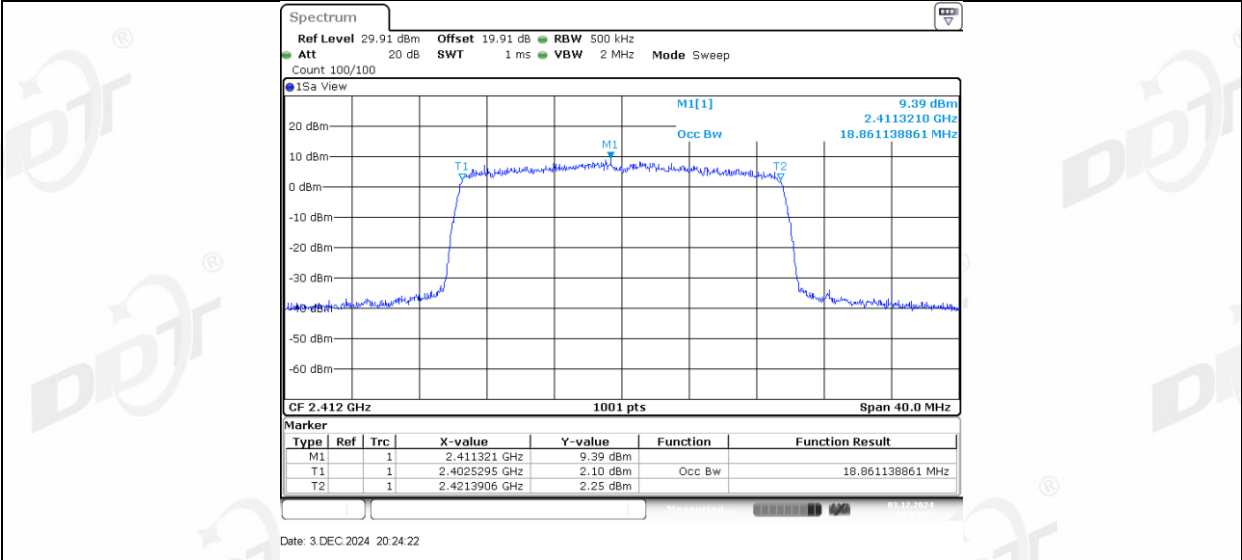


11N40MIMO_Ant2_2437

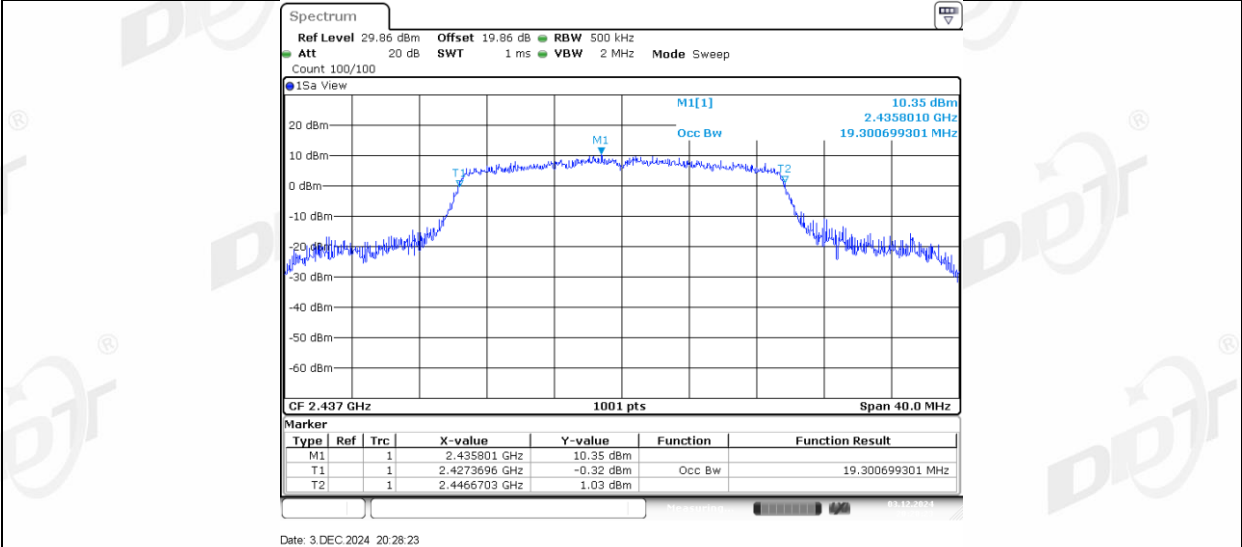




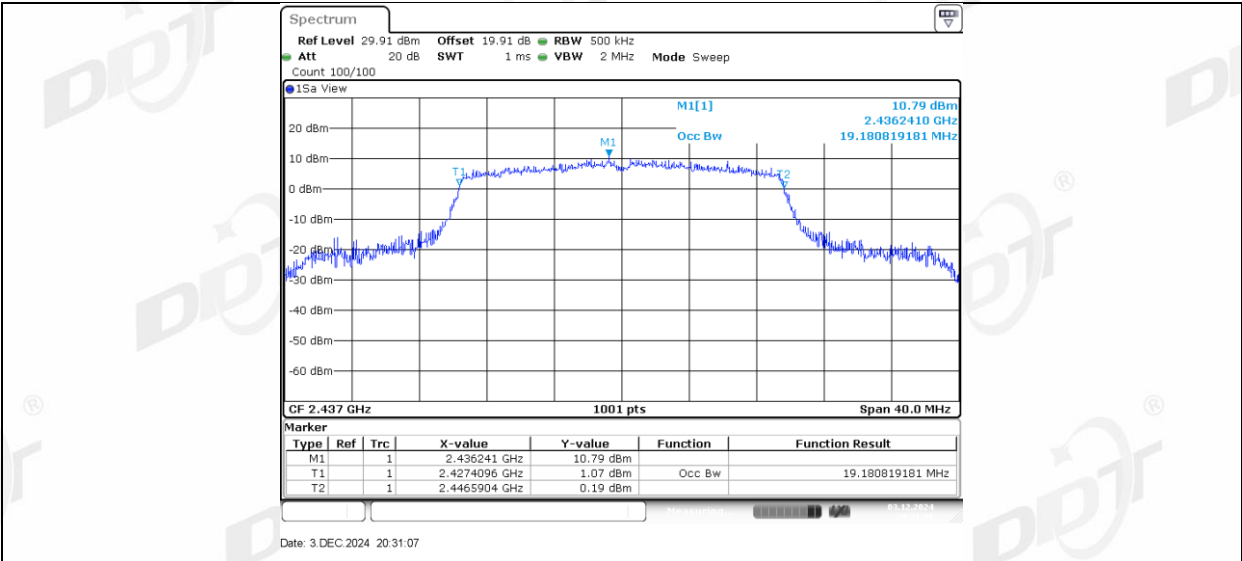
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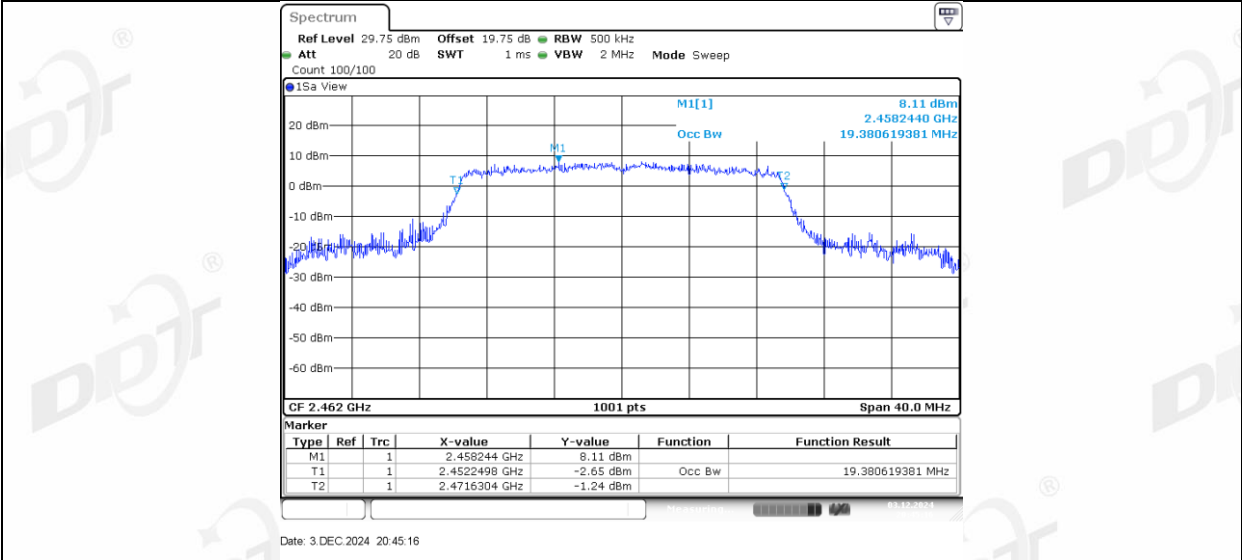
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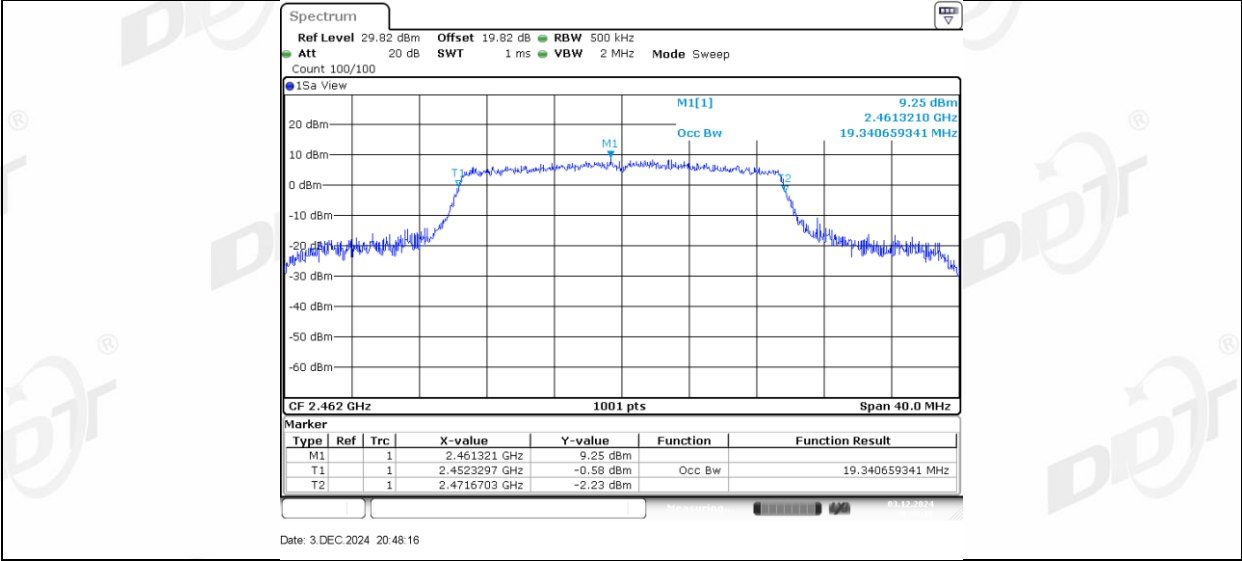
11AX20MIMO_Ant2_2437



11AX20MIMO_Ant1_2462



11AX20MIMO_Ant2_2462



11AX40MIMO_Ant1_2422