FCC CERTIFICATION TEST REPORT

Applicant	:	Shenzhen SDMC Technology Co., Ltd.
Address of Applicant	:	Room 1022, Floor 10, Building A, Customs Building, No. 2, Xin'an 3rd Road, Dalang Community, Xin'an Street, Bao'an District, Shenzhen, China
Manufacturer	:	Shenzhen SDMC Technology Co., Ltd.
Address of Manufacturer	:	19/F, Changhong Technology Building,No.18, Keji South 12th Road, High-tech Industrial Park, Nanshan District, Shenzhen, China
Equipment under Test	:	WINBOX
Model No.	:	WINBOX DV8947
FCC ID	:	2AW68-DV8947
Test Standard(s)	:	FCC Rules and Regulations Part 15 Subpart C, ANSI C63.10:2013
Report No.	:	DDT-RE24042530-2E03
Issue Date	:	2024/06/13
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,
ANSI C63.10:2013

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-RE24042530-2E03		
Date of Receipt:	2024/05/17	**Date of Test:**	2024/05/17~2024/06/13

Prepared By:

Tiger Mo

Tiger Mo/Engineer

Approved By:

Damon Hu

Certificate and Report Seal
检验检测专用章

Damon Hu/EMC Manager

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	2024/06/13	

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)	/	Pass
2	Peak Output Power	FCC Part 15: 15.247(b)(3)	/	Pass
3	Power Spectral Density	FCC Part 15:15.247(e)	/	Pass
4	RF Conducted Spurious Emissions	FCC Part 15: 15.247(d)	/	Pass
5	Radiated Emission	FCC Part 15: 15.205, FCC Part 15: 15.209, FCC Part 15: 15.247(d)	/	Pass
6	Band Edge Compliance	FCC Part 15: 15.205, FCC Part 15: 15.209, FCC Part 15: 15.247(d)	/	Pass
7	Power Line Conducted Emissions	FCC Part 15: 15.207(a)	/	Pass
8	Antenna Requirement	FCC Part 15: 15.203	/	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	:	WINBOX
Model Number	:	WINBOX DV8947
EUT Function Description	:	Please reference user manual of this device
Power Supply	:	DC 12V powered by an external adapter

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

Radio Technology	:	IEEE 802.11b/g/n
Operation frequency	:	IEEE 802.11b: 2412MHz-2462MHz IEEE 802.11g: 2412MHz-2462MHz IEEE 802.11n HT20: 2412MHz-2462MHz IEEE 802.11n HT40: 2422MHz-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)

Antenna information				
Antenna Type	PCB			
Max Antenna Gain(dBi)		Ant1 gain	Ant2 gain	Directional gain
	IEEE 802.11b	4.57	3.88	/
	IEEE 802.11g	4.57	3.88	/
	IEEE 802.11n HT20	4.57	3.88	7.24
	IEEE 802.11n HT40	4.57	3.88	7.24
Note: This EUT MIMO 2X2, any transmit signals are correlated with each other. So the Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2/2$] =7.24dBi				

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
Adapter	SUNUN	SA12BV-120100U	Input: AC 100-240V 50/60Hz Output: DC 12V1A
HDMI cable	/	/	Length: 1.00m, Unshielded
Remote controller	/	/	/

2.3. Block diagram of EUT configuration for test

Configuration diagram


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	98	98	1	LCH: CH1	2412
	98	98	1	MCH: CH6	2437
	98	98	1	HCH: CH11	2462
IEEE 802.11g	76	76	6	LCH: CH1	2412
	76	76	6	MCH: CH6	2437
	76	76	6	HCH: CH11	2462
IEEE 802.11n HT20	76	76	MCS 8	LCH: CH1	2412
	76	76	MCS 8	MCH: CH6	2437
	76	76	MCS 8	HCH: CH11	2462
IEEE 802.11n HT40	72	72	MCS 8	LCH: CH3	2422
	72	72	MCS 8	MCH: CH6	2437
	72	72	MCS 8	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℃ to +35 ℃
Humidity range:	20% to 75%
Pressure range:	86 kPa to106 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-20155, G-20118

2.8. Measurement uncertainty

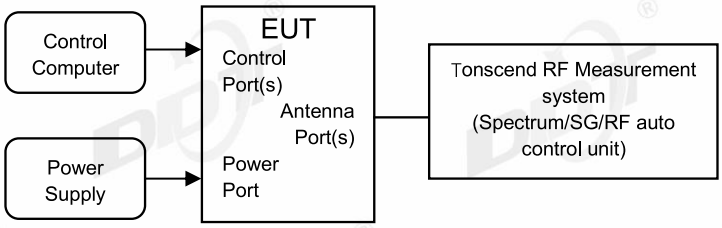
Test Item	Uncertainty
Bandwidth	1.1%
Peak Output Power (Conducted) (Spectrum analyzer)	0.86 dB (10 MHz ≤ f < 3.6 GHz);
	1.38 dB (3.6 GHz ≤ f < 8 GHz)
Peak Output Power (Conducted) (Power Sensor)	0.74 dB
Power Spectral Density	0.74 dB (10 MHz ≤ f < 3.6 GHz);
	1.38 dB (3.6 GHz ≤ f < 8 GHz)
Frequencies Stability	6.7×10^{-8} (Antenna couple method)
	5.5×10^{-8} (Conducted method)
Conducted spurious emissions	0.86 dB (10 MHz ≤ f < 3.6 GHz);
	1.40 dB (3.6 GHz ≤ f < 8 GHz)
	1.66 dB (8 GHz ≤ f < 26.5 GHz)
Uncertainty for radio frequency (RBW < 20 kHz)	3×10^{-8}
Temperature	0.4 ℃
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 1#)				
SIGNAL ANALYZER	R&S	FSQ26	101272	2025/03/31
Wideband Radio Communication Tester	R&S	CMW500	120259	2024/07/14
MXG Vector Signal Generator	KEYSIGHT	N5182B	MY59100192	2025/03/31
MXG Vector Signal Generator	Agilent	N5182A	MY19060405	2025/03/31
RF Control Unit	Tonsend	JS0806-2	158060010	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:	≥ [3 × 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

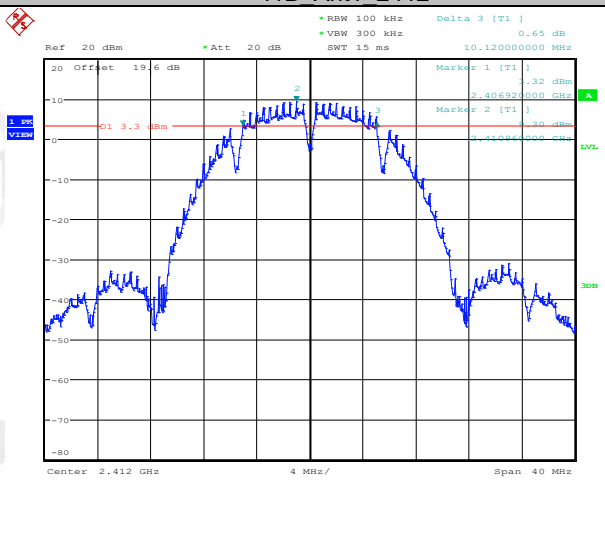
4.4. Test result

Test Engineer:	Zora Zhang	Test Site:	RF Measurement System 1#
Ambient Condition:	25.1℃,52.5%RH	Test Date:	2024.06.05-2024.06.13
Test Power Supply:	DC 12V	Sample Number:	S24042530-001

Test Mode	Antenna	Frequency [MHz]	DTS BW [MHz]	FL [MHz]	FH [MHz]	Limit [MHz]	Verdict
11B	Ant1	2412	10.12	2406.92	2417.04	0.5	PASS
	Ant2	2412	10.08	2406.96	2417.04	0.5	PASS
	Ant1	2437	10.08	2431.96	2442.04	0.5	PASS
	Ant2	2437	10.08	2431.96	2442.04	0.5	PASS
	Ant1	2462	10.08	2456.96	2467.04	0.5	PASS
	Ant2	2462	10.08	2456.96	2467.04	0.5	PASS
11G	Ant1	2412	15.80	2404.08	2419.88	0.5	PASS
	Ant2	2412	16.32	2403.84	2420.16	0.5	PASS
	Ant1	2437	16.04	2428.84	2444.88	0.5	PASS
	Ant2	2437	15.88	2428.88	2444.76	0.5	PASS
	Ant1	2462	15.84	2454.08	2469.92	0.5	PASS
	Ant2	2462	15.84	2454.08	2469.92	0.5	PASS
11N20MIMO	Ant1	2412	16.40	2404.12	2420.52	0.5	PASS
	Ant2	2412	16.52	2403.88	2420.40	0.5	PASS
	Ant1	2437	15.52	2429.24	2444.76	0.5	PASS
	Ant2	2437	15.68	2429.24	2444.92	0.5	PASS
	Ant1	2462	16.72	2453.84	2470.56	0.5	PASS
	Ant2	2462	17.16	2453.24	2470.40	0.5	PASS
11N40MIMO	Ant1	2422	35.12	2404.48	2439.60	0.5	PASS
	Ant2	2422	35.12	2404.48	2439.60	0.5	PASS
	Ant1	2437	35.04	2419.48	2454.52	0.5	PASS
	Ant2	2437	35.12	2419.48	2454.60	0.5	PASS
	Ant1	2452	35.12	2434.48	2469.60	0.5	PASS
	Ant2	2452	35.12	2434.48	2469.60	0.5	PASS

4.5. Test graphs

11B_Ant1_2412



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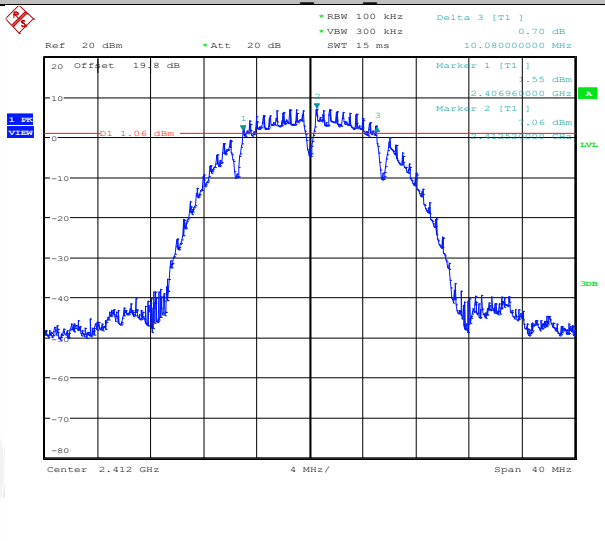

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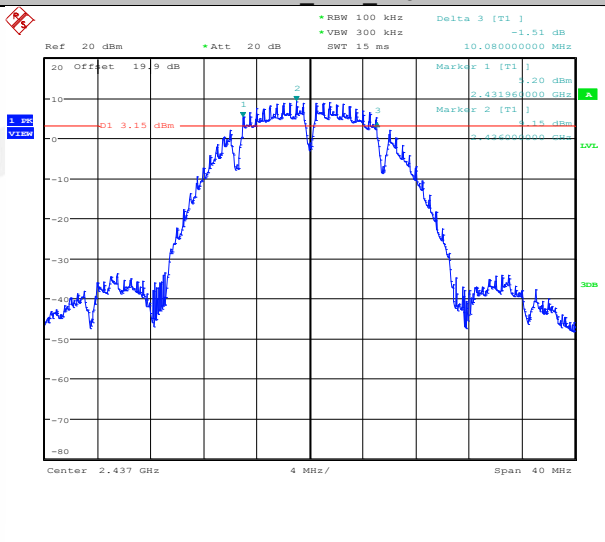

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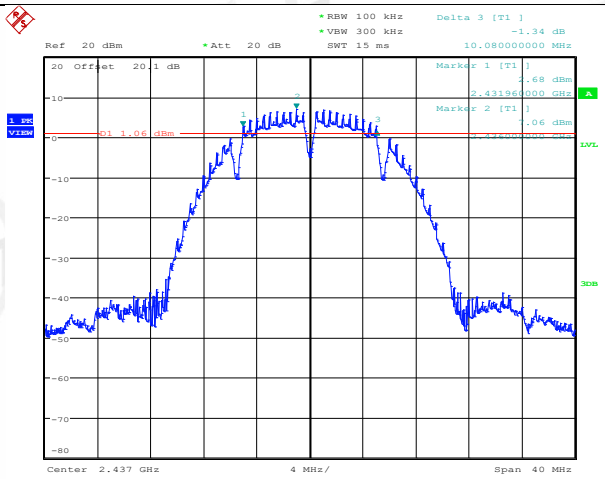

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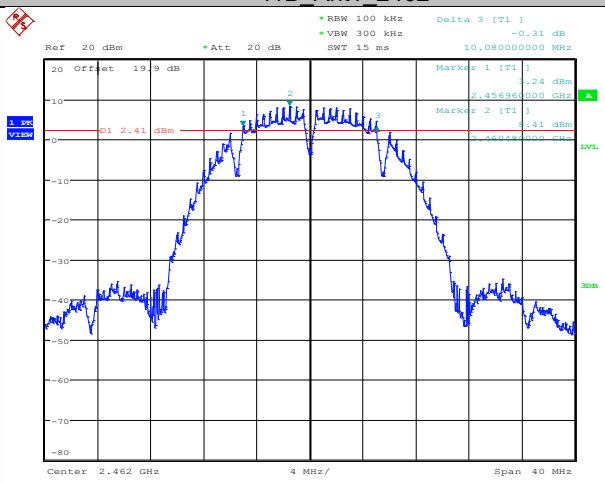

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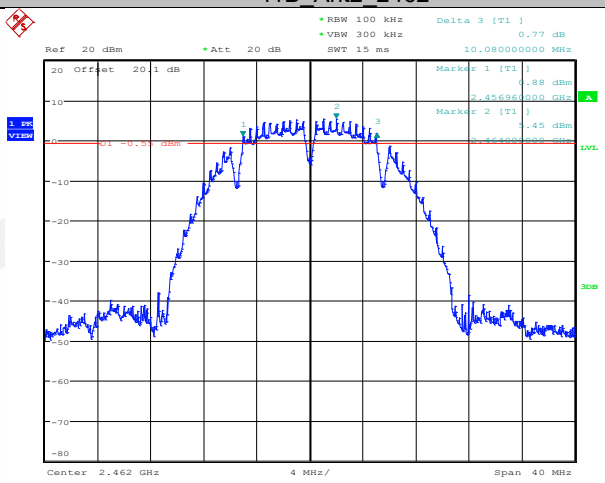

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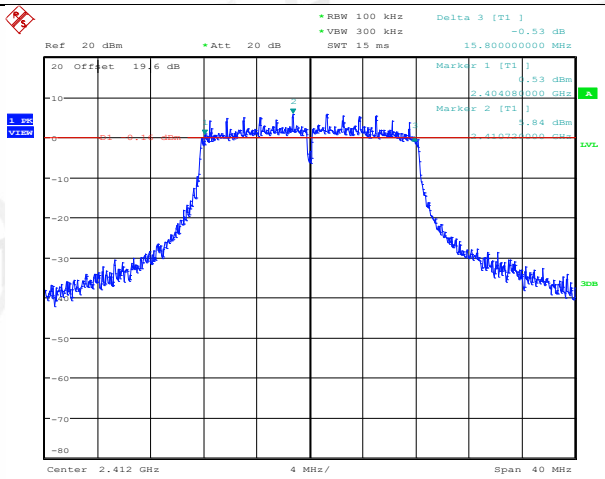

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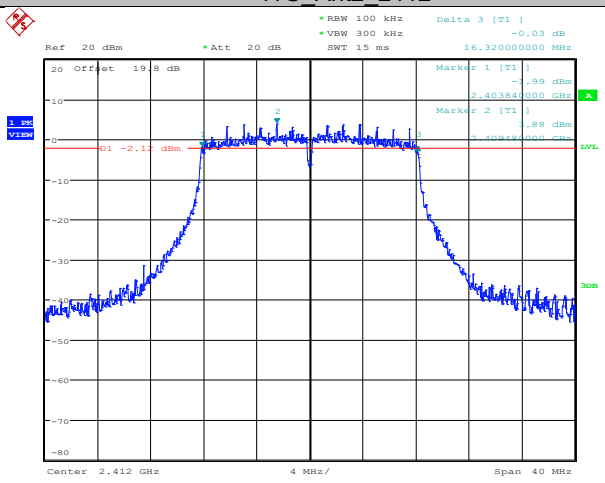

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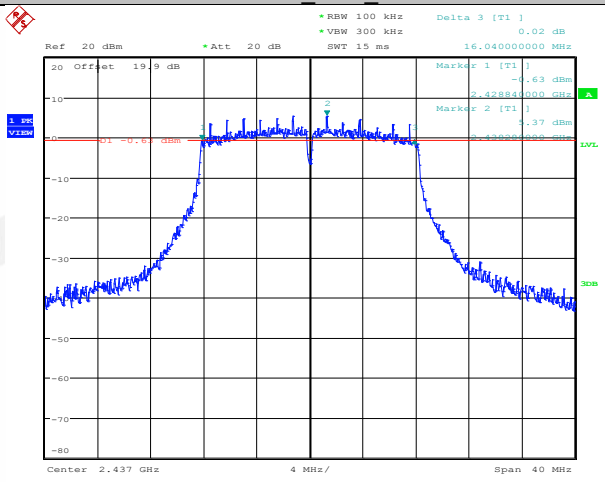

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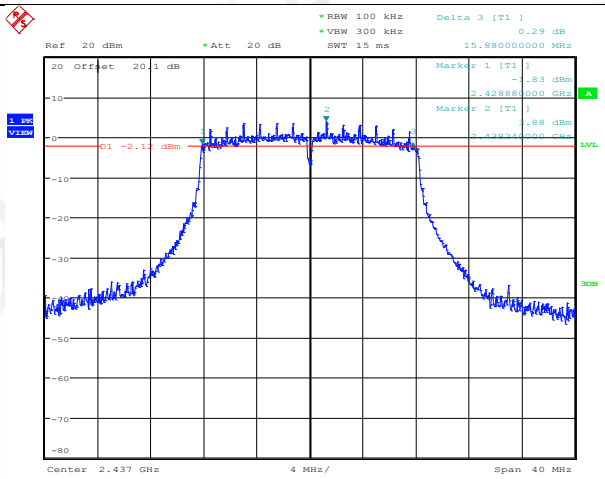

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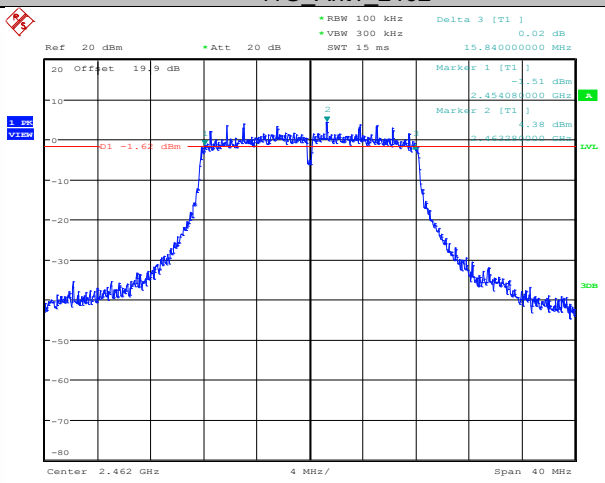

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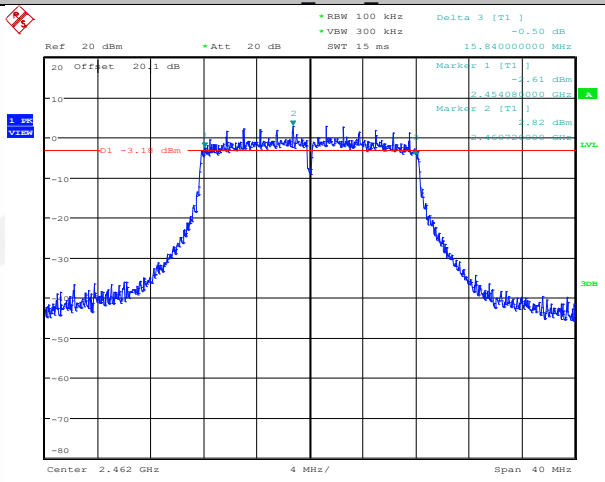

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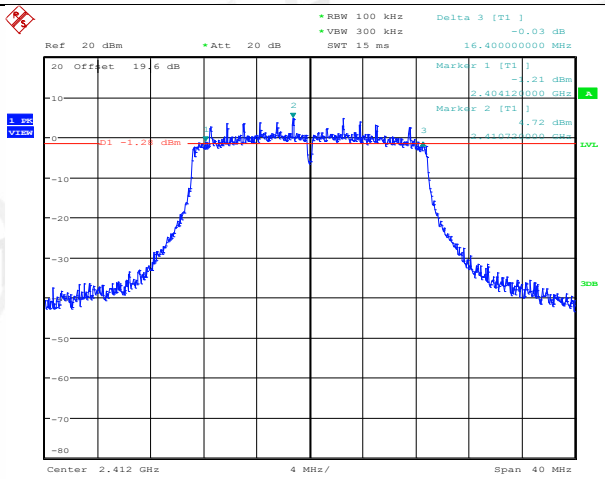

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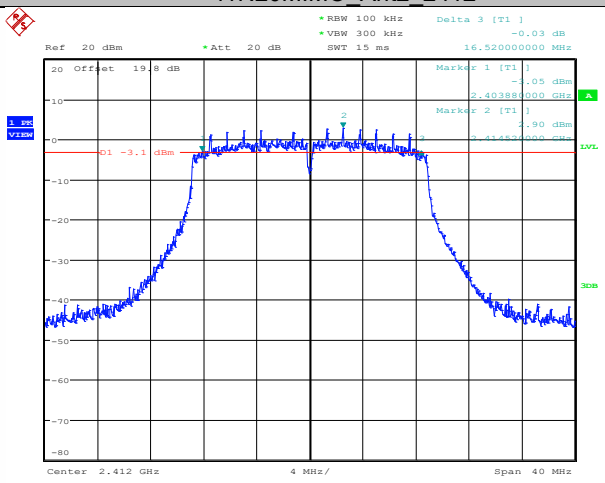

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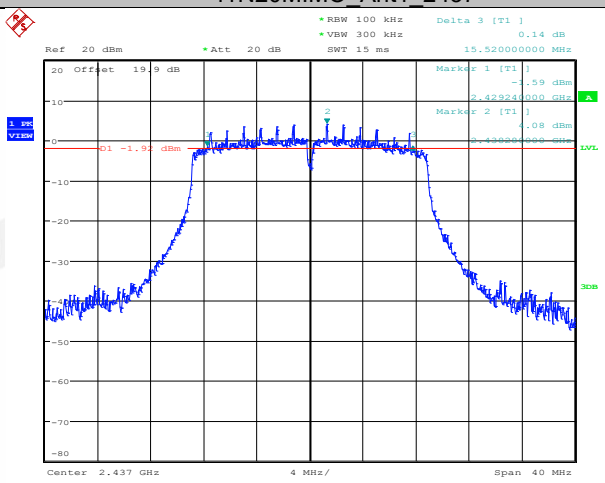

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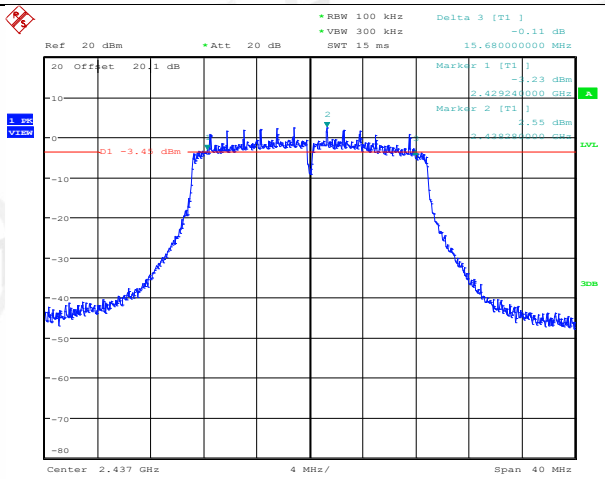

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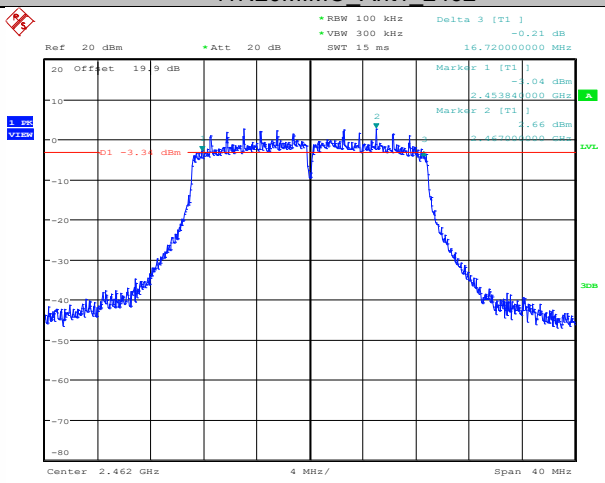

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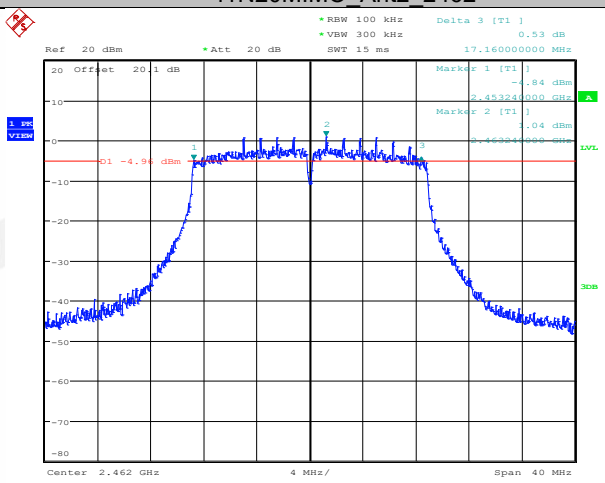

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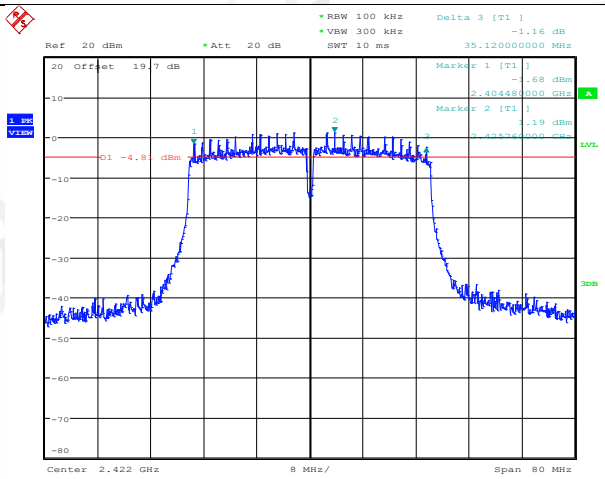

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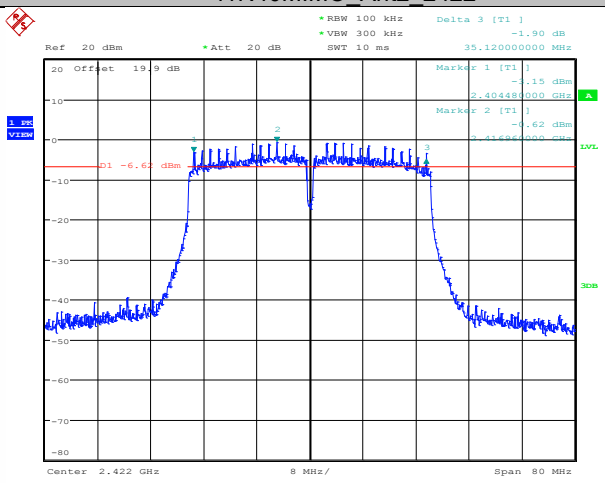

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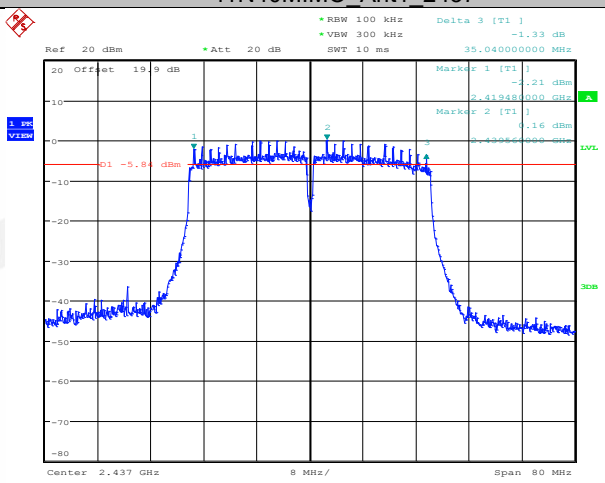

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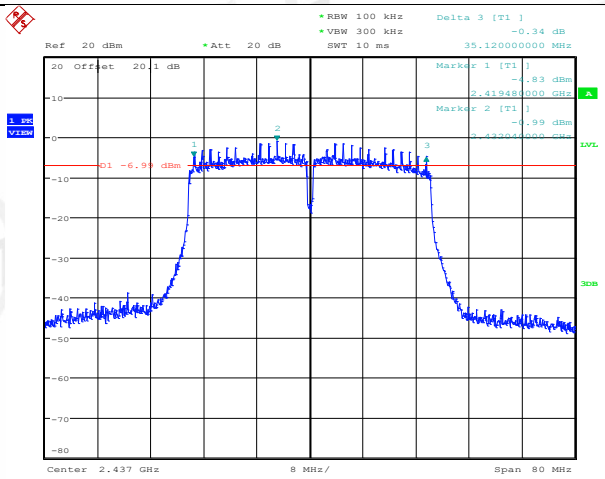

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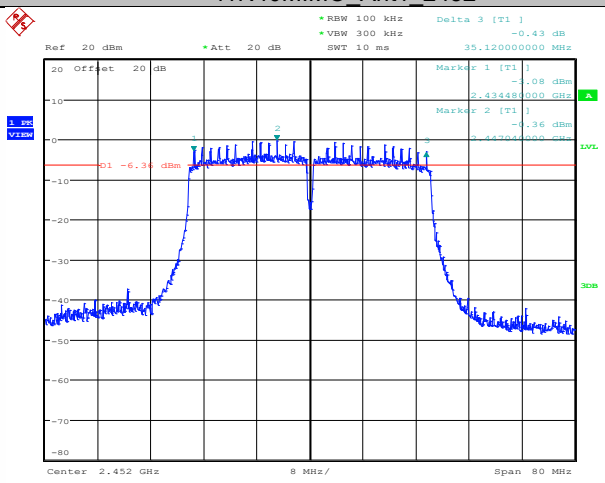

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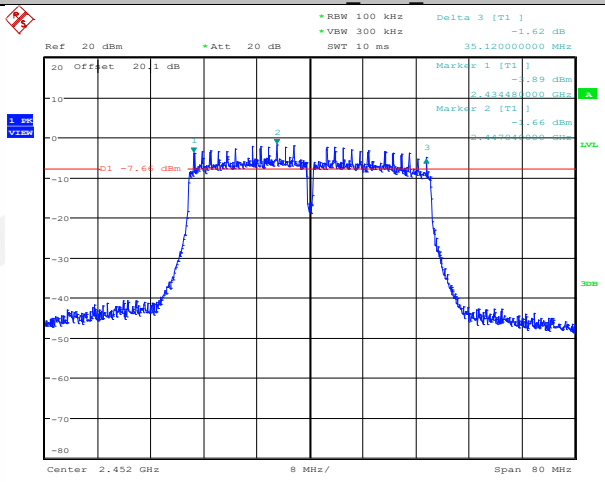

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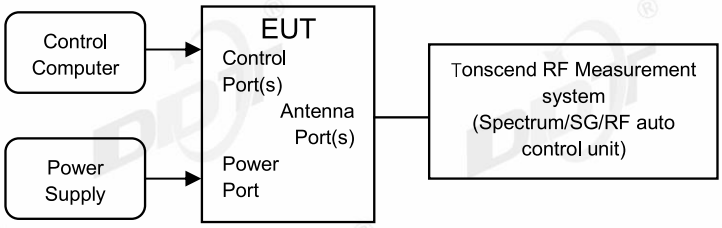
5. 99% Bandwidth

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.

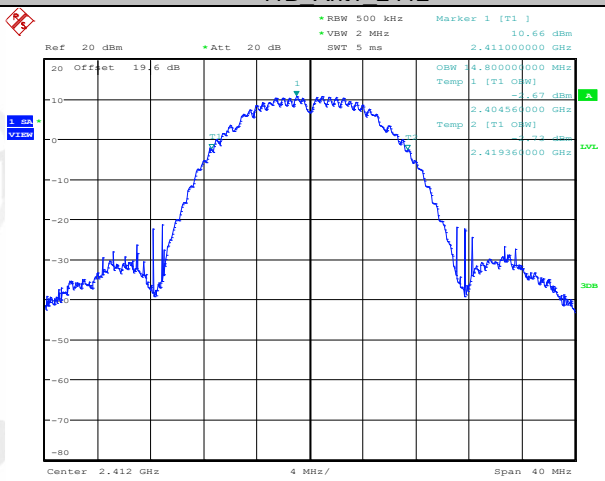
5.4. Test result

Test Engineer:	Zora Zhang	Test Site:	RF Measurement System 1#
Ambient Condition:	25.1℃,52.5%RH	Test Date:	2024.06.05-2024.06.13
Test Power Supply:	DC 12V	Sample Number:	S24042530-001

TestMode	Antenna	Channel Frequency[MHz]	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	14.80	2404.5600	2419.3600	---	---
	Ant2	2412	14.72	2404.6400	2419.3600	---	---
	Ant1	2437	14.76	2429.5600	2444.3200	---	---
	Ant2	2437	14.68	2429.6400	2444.3200	---	---
	Ant1	2462	14.80	2454.6000	2469.4000	---	---
	Ant2	2462	14.76	2454.6400	2469.4000	---	---
11G	Ant1	2412	16.96	2403.4800	2420.4400	---	---
	Ant2	2412	16.96	2403.4800	2420.4400	---	---
	Ant1	2437	17.00	2428.4000	2445.4000	---	---
	Ant2	2437	16.84	2428.5600	2445.4000	---	---
	Ant1	2462	17.00	2453.5200	2470.5200	---	---
	Ant2	2462	16.96	2453.5200	2470.4800	---	---
11N20MIMO	Ant1	2412	18.04	2403.0000	2421.0400	---	---
	Ant2	2412	18.04	2403.0000	2421.0400	---	---
	Ant1	2437	18.04	2427.9600	2446.0000	---	---
	Ant2	2437	18.04	2428.0000	2446.0400	---	---
	Ant1	2462	18.16	2452.8800	2471.0400	---	---
	Ant2	2462	18.12	2452.8800	2471.0000	---	---
11N40MIMO	Ant1	2422	36.40	2403.7600	2440.1600	---	---
	Ant2	2422	36.32	2403.8400	2440.1600	---	---
	Ant1	2437	36.24	2418.8400	2455.0800	---	---
	Ant2	2437	36.24	2418.8400	2455.0800	---	---
	Ant1	2452	36.48	2433.6800	2470.1600	---	---
	Ant2	2452	36.48	2433.6800	2470.1600	---	---

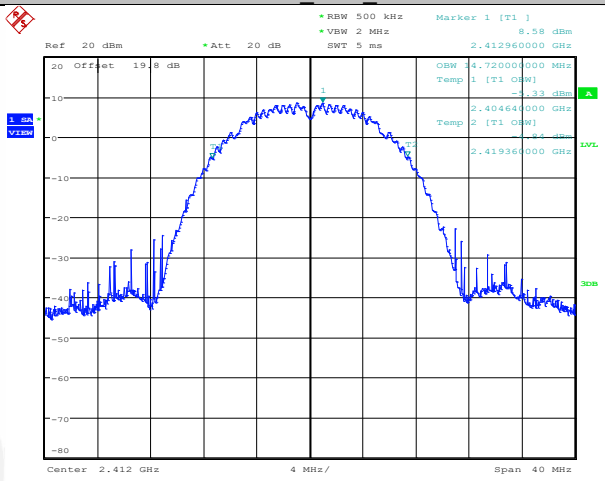
5.5. Test graphs

11B_Ant1_2412



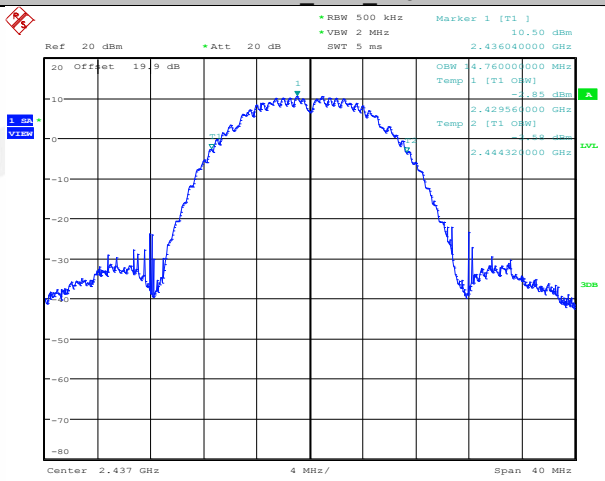
Date: 5.JUN.2024 11:47:57

11B_Ant2_2412



Date: 5.JUN.2024 12:08:33

11B_Ant1_2437



Date: 5.JUN.2024 11:50:35

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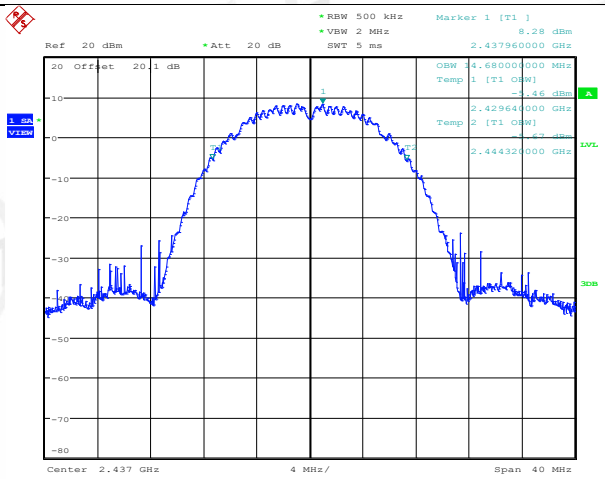
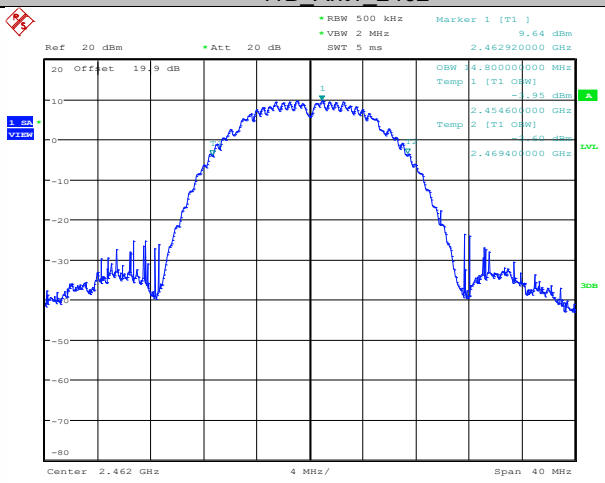
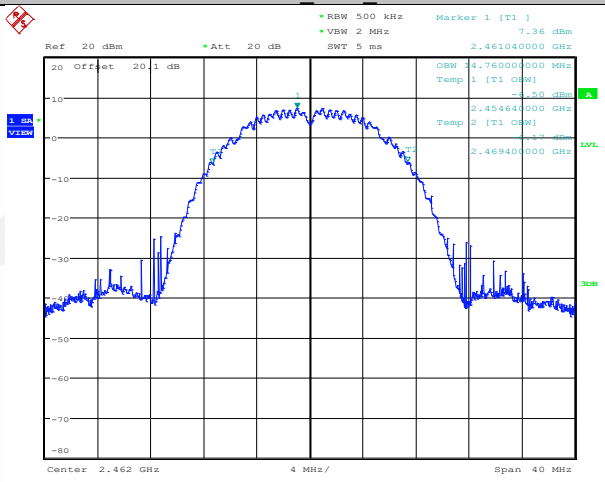


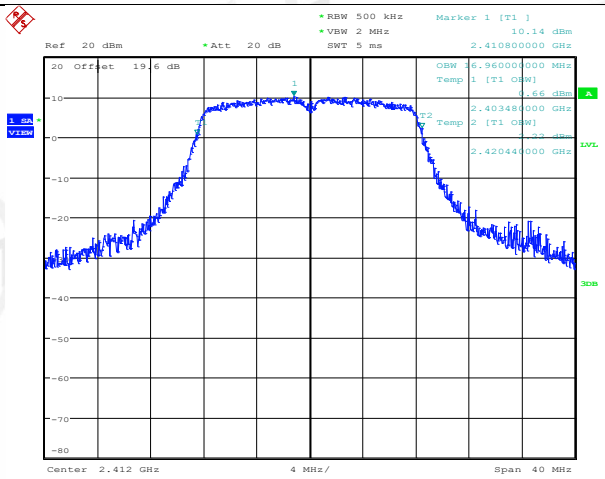
11B_Ant1_2462



11B_Ant2_2462



11G_Ant1_2412



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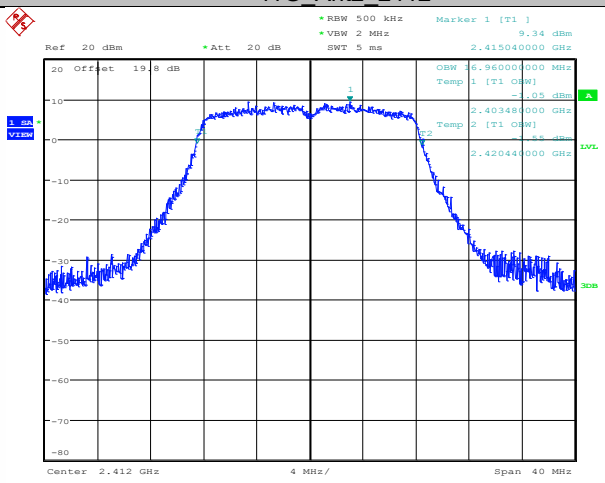
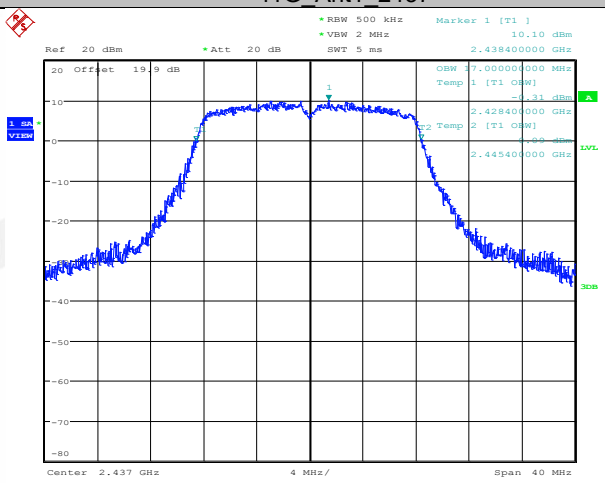


11G_Ant1_2437



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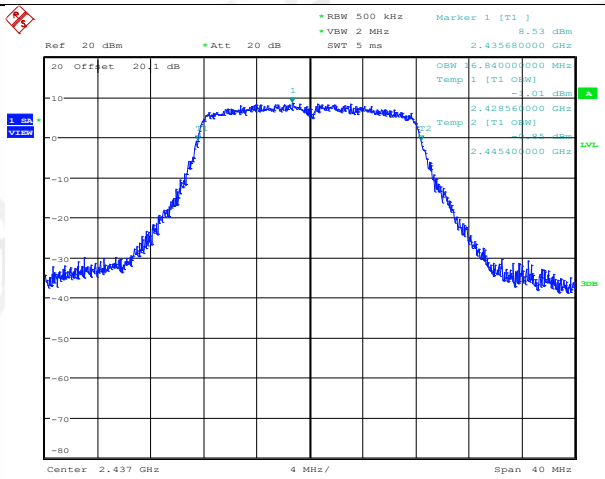
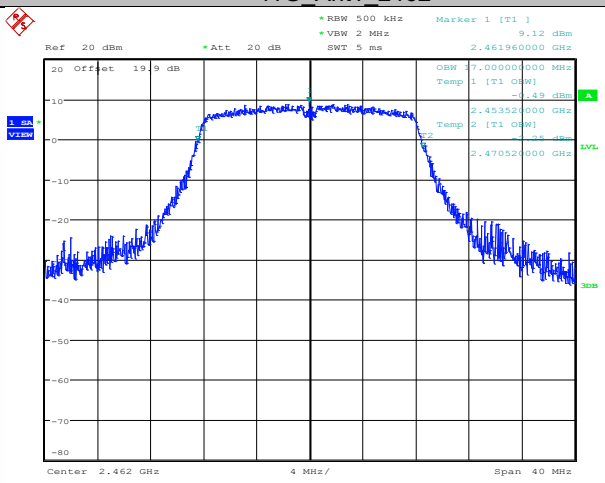


11G_Ant1_2462



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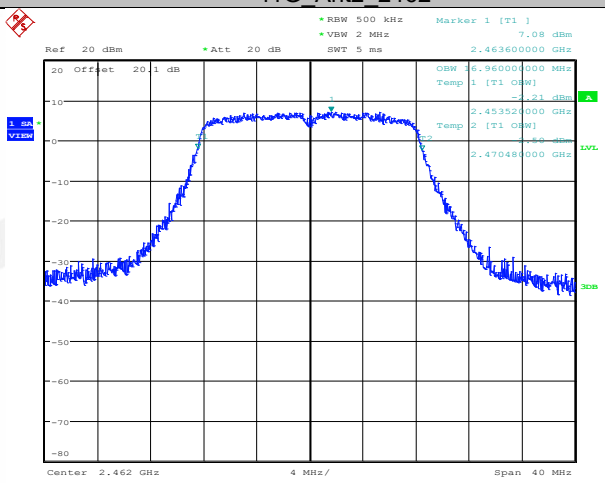
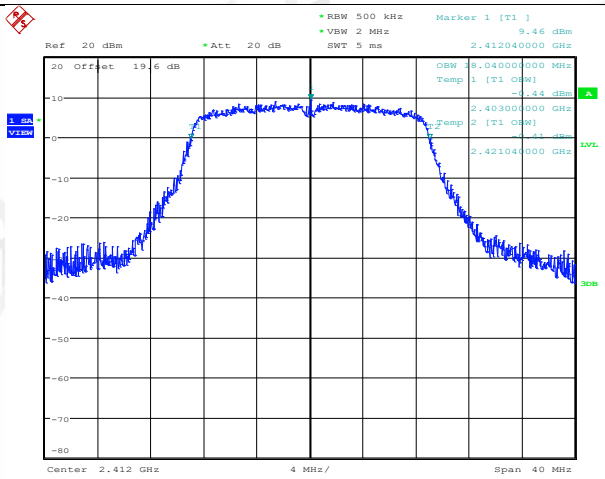
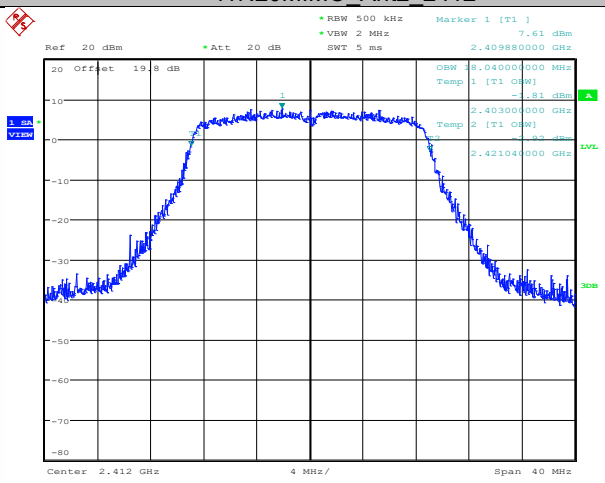


11N20MIMO_Ant1_2412



11N20MIMO_Ant2_2412



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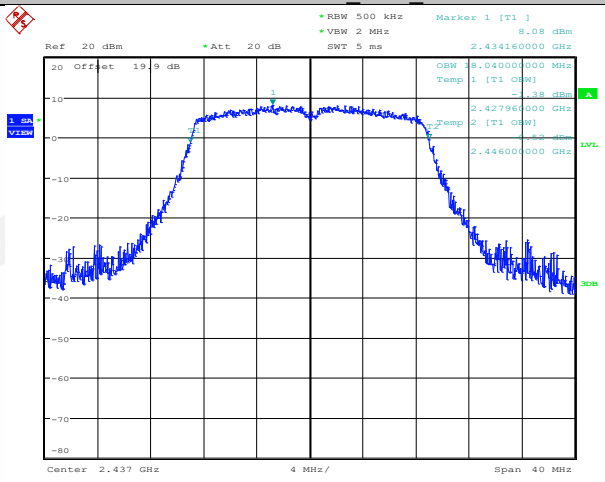
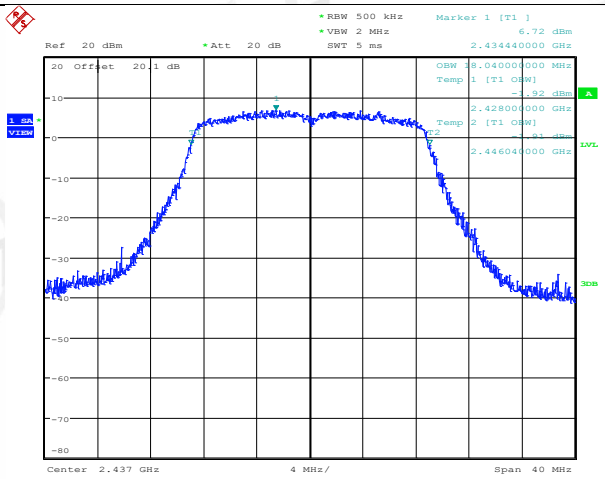
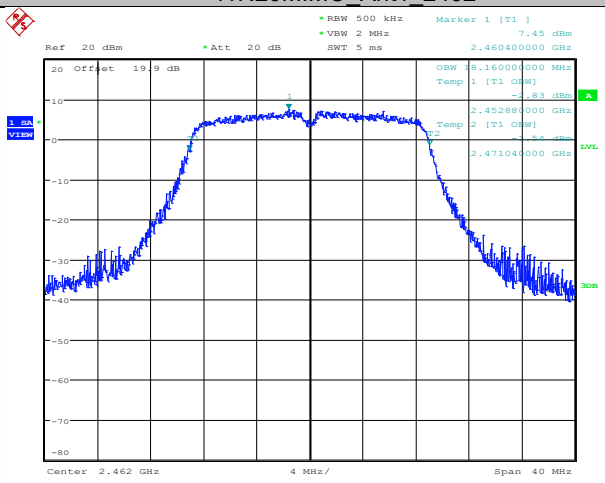


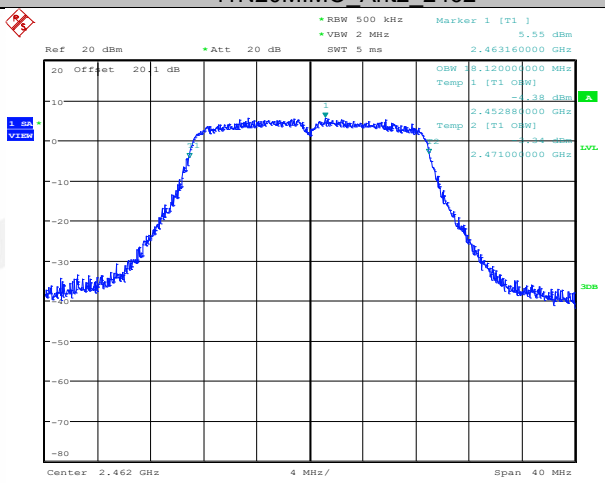
11N20MIMO_Ant2_2437



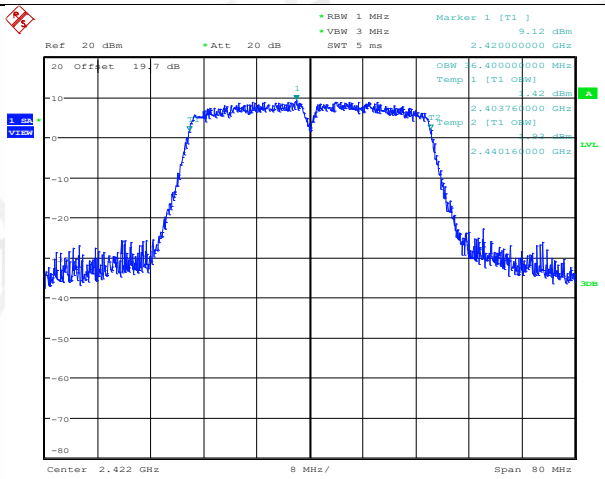
11N20MIMO_Ant1_2462



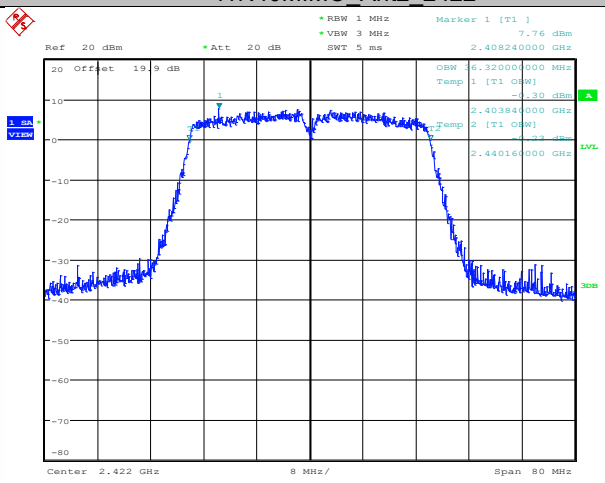
11N20MIMO_Ant2_2462



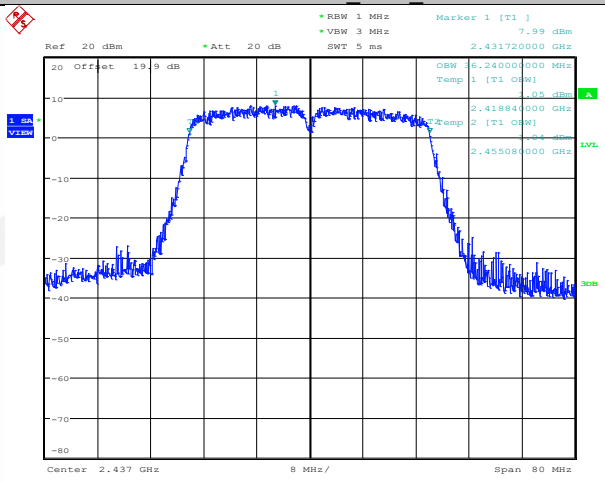
11N40MIMO_Ant1_2422



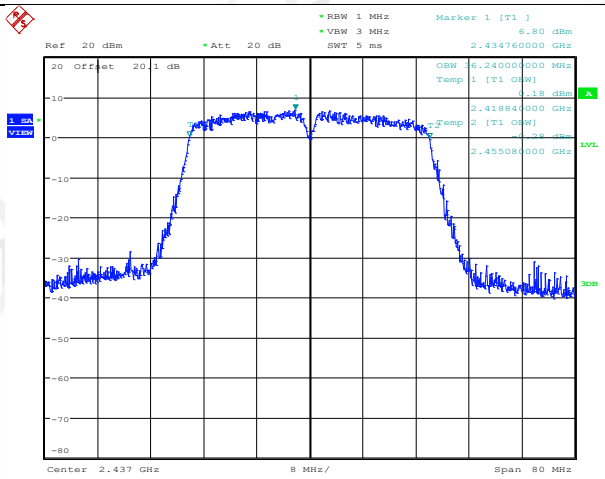
11N40MIMO_Ant2_2422



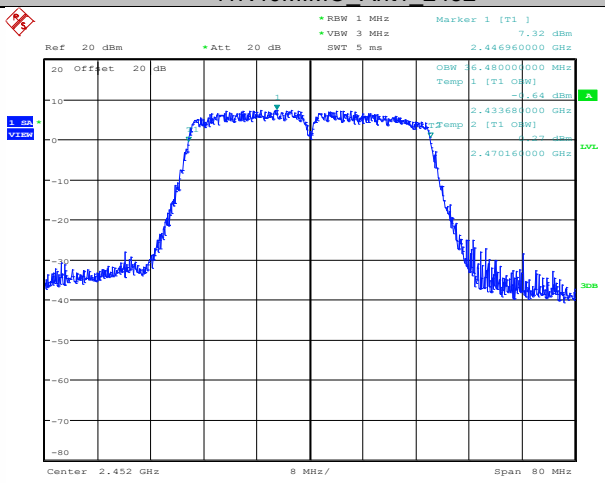
11N40MIMO_Ant1_2437



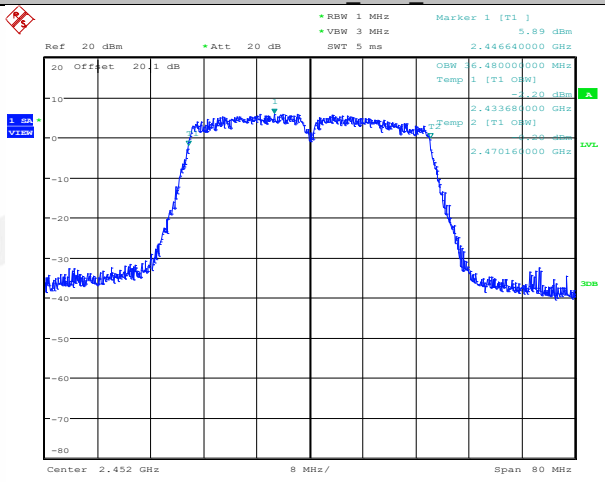
11N40MIMO_Ant2_2437



11N40MIMO_Ant1_2452

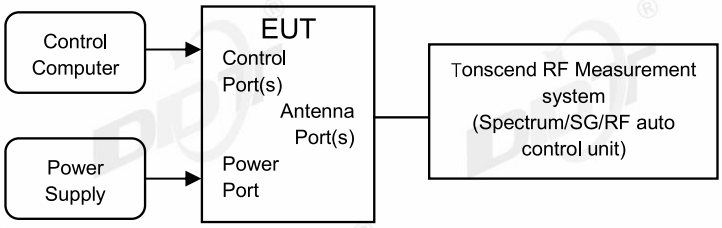


11N40MIMO_Ant2_2452



6. Conducted Output Power

6.1. Block diagram of test setup



6.2. Limits

For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. 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 as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

6.3. Test procedure

(1) The test according to ANSI C63.10-2013 clause 11.9.2.3.
(2) Connect EUT's antenna output to RF power meter 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, If the transmitter does not transmit continuously, measure the duty cycle, D, of the transmitter output signal.
(4) Measure the average power of the transmitter. This measurement is an average over both the ON and OFF periods of the transmitter.
(5) Adjust the measurement in dBm by adding [10 log (1 / D)], where D is the duty cycle.
(6) Record the RF average power of each antenna port.

6.4. Test result average

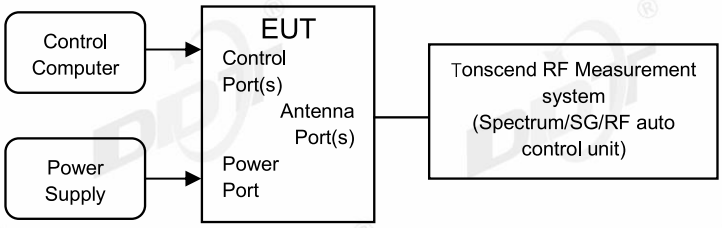
Test Engineer:	Zora Zhang	Test Site:	RF Measurement System 1#
Ambient Condition:	25.1℃,52.5%RH	Test Date:	2024.06.05-2024.06.13
Test Power Supply:	DC 12V	Sample Number:	S24042530-001

Test Mode	Antenna	Frequency [MHz]	Average power [dBm]	Duty Cycle [%]	DC Factor [dB]	Result [dBm]	Limit [dBm]	Verdict
11B	Ant1	2412	19.27	97.19	0.12	19.39	≤30	PASS
	Ant2	2412	16.75	96.58	0.15	16.90	≤30	PASS
	Ant1	2437	18.65	96.58	0.15	18.80	≤30	PASS
	Ant2	2437	16.26	96.43	0.16	16.42	≤30	PASS
	Ant1	2462	18.49	96.73	0.14	18.63	≤30	PASS
	Ant2	2462	15.82	97.34	0.12	15.94	≤30	PASS
11G	Ant1	2412	17.07	91.19	0.40	17.47	≤30	PASS
	Ant2	2412	15.32	93.27	0.30	15.62	≤30	PASS
	Ant1	2437	16.04	91.19	0.40	16.44	≤30	PASS
	Ant2	2437	14.63	93.69	0.28	14.91	≤30	PASS
	Ant1	2462	15.77	93.24	0.30	16.07	≤30	PASS
	Ant2	2462	14.10	91.63	0.38	14.48	≤30	PASS
11N20MIMO	Ant1	2412	15.62	90.19	0.45	16.07	≤30	PASS
	Ant2	2412	13.85	92.79	0.32	14.17	≤30	PASS
	total	2412	---	---	---	18.23	≤30	PASS
	Ant1	2437	14.62	91.47	0.39	15.01	≤30	PASS
	Ant2	2437	13.12	89.81	0.47	13.59	≤30	PASS
	total	2437	---	---	---	17.37	≤30	PASS
	Ant1	2462	14.24	89.81	0.47	14.71	≤30	PASS
	Ant2	2462	12.43	91.04	0.41	12.84	≤30	PASS
	total	2462	---	---	---	16.89	≤30	PASS
11N40MIMO	Ant1	2422	14.47	82.61	0.83	15.30	≤30	PASS
	Ant2	2422	12.38	81.20	0.90	13.28	≤30	PASS
	total	2422	---	---	---	17.42	≤30	PASS
	Ant1	2437	13.25	80.51	0.94	14.19	≤30	PASS
	Ant2	2437	11.70	80.51	0.94	12.64	≤30	PASS
	total	2437	---	---	---	16.49	≤30	PASS
	Ant1	2452	12.92	81.20	0.90	13.82	≤30	PASS
	Ant2	2452	10.91	85.59	0.68	11.59	≤30	PASS
	total	2452	---	---	---	15.86	≤30	PASS

Note: EIRP (dBm)=Conducted Output Power (dBm)+ Antenna Gain (dBi)

7. Power Spectral Density

7.1. Block diagram of test setup



7.2. Limits

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.

7.3. Test procedure

(1) The test according to ANSI C63.10-2013 clause 11.10.5.
(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 Power Spectral Density measurement:

Center frequency	DTS Channel center frequency
RBW:	3 kHz ≤ RBW ≤ 100 kHz
VBW:	≥ 3RBW
Span	1.5 times the DTS bandwidth
Detector Mode:	RMS
Sweep time:	auto
Trace mode	max hold
	Employ trace averaging (rms)
Trace	mode over a minimum of 100
	traces.

(5) Add [10 log (1 / D)], where D is the duty cycle measured in step a), to the measured PSD to compute the average PSD during the actual transmission time.
If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

7.4. Test result

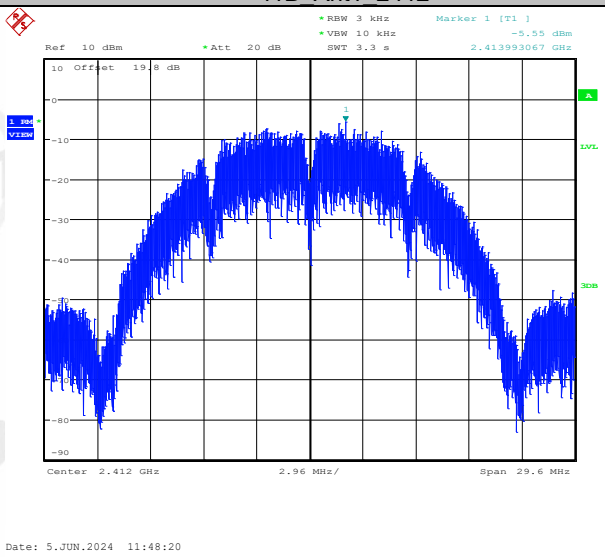
Test Engineer:	Zora Zhang	Test Site:	RF Measurement System 1#
Ambient Condition:	25.1℃,52.5%RH	Test Date:	2024.06.05-2024.06.13
Test Power Supply:	DC 12V	Sample Number:	S24042530-001

Test Mode	Antenna	Frequency [MHz]	Result[dBm/3-100kHz]	Limit[dBm/3kHz]	Verdict
11B	Ant1	2412	-5.55	≤6.76	PASS
	Ant2	2412	-7.74	≤6.76	PASS
	Ant1	2437	-7.31	≤6.76	PASS
	Ant2	2437	-9.08	≤6.76	PASS
	Ant1	2462	-7.36	≤6.76	PASS
	Ant2	2462	-9.12	≤6.76	PASS
11G	Ant1	2412	-9.20	≤6.76	PASS
	Ant2	2412	-10.23	≤6.76	PASS
	Ant1	2437	-10.54	≤6.76	PASS
	Ant2	2437	-11.43	≤6.76	PASS
	Ant1	2462	-10.58	≤6.76	PASS
	Ant2	2462	-12.42	≤6.76	PASS
11N20MIMO	Ant1	2412	-11.40	≤6.76	PASS
	Ant2	2412	-11.56	≤6.76	PASS
	total	2412	-8.47	≤6.76	PASS
	Ant1	2437	-11.59	≤6.76	PASS
	Ant2	2437	-12.39	≤6.76	PASS
	total	2437	-8.96	≤6.76	PASS
	Ant1	2462	-13.03	≤6.76	PASS
	Ant2	2462	-13.15	≤6.76	PASS
	total	2462	-10.08	≤6.76	PASS
11N40MIMO	Ant1	2422	-22.21	≤6.76	PASS
	Ant2	2422	-23.63	≤6.76	PASS
	total	2422	-19.85	≤6.76	PASS
	Ant1	2437	-22.42	≤6.76	PASS
	Ant2	2437	-24.56	≤6.76	PASS
	total	2437	-20.35	≤6.76	PASS
	Ant1	2452	-24.02	≤6.76	PASS
	Ant2	2452	-25.19	≤6.76	PASS
	total	2452	-21.56	≤6.76	PASS

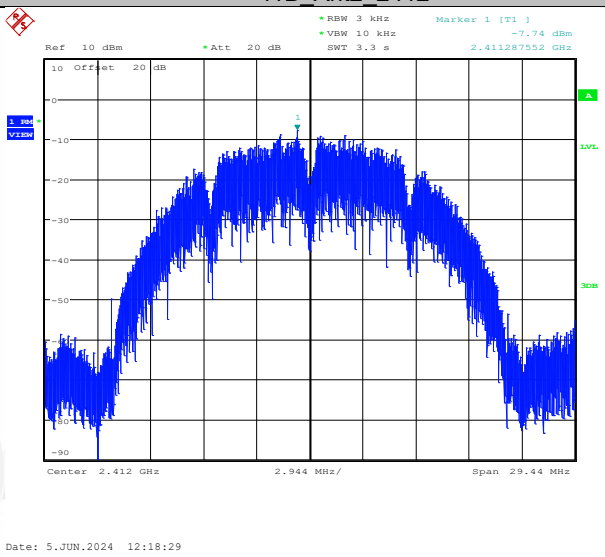
Note1:The Duty Cycle Factor is compensated in the graph.
Note2: The Antenna directional gain is 7.24 dBi, the Power Spectral Density limit is the above limits-(7.24-6) dB.

7.5. Test graphs

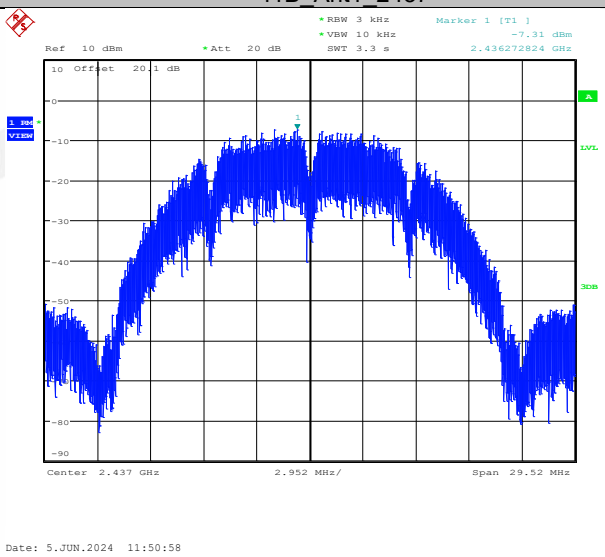
11B_Ant1_2412



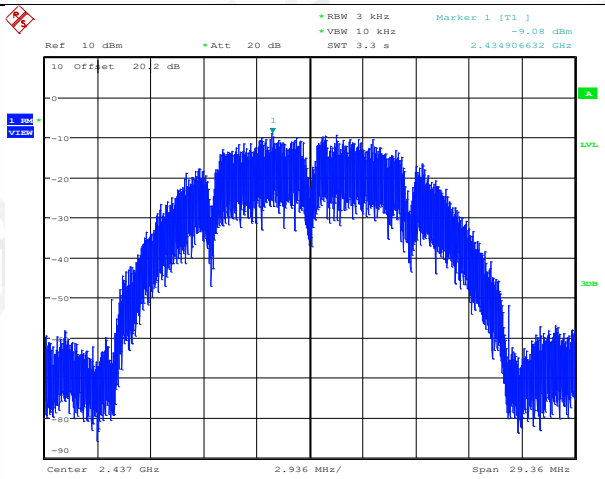
11B_Ant2_2412



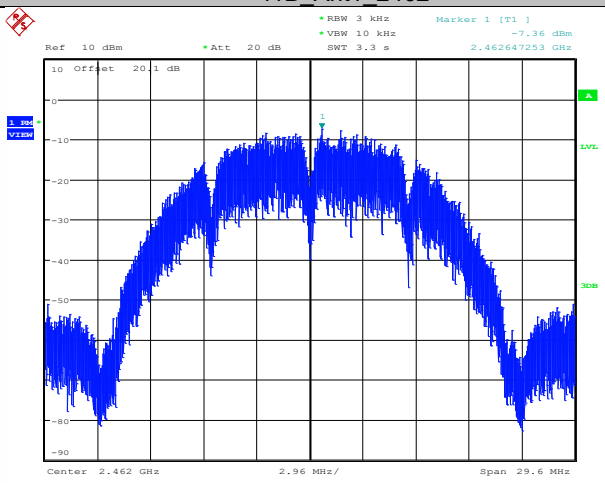
11B_Ant1_2437



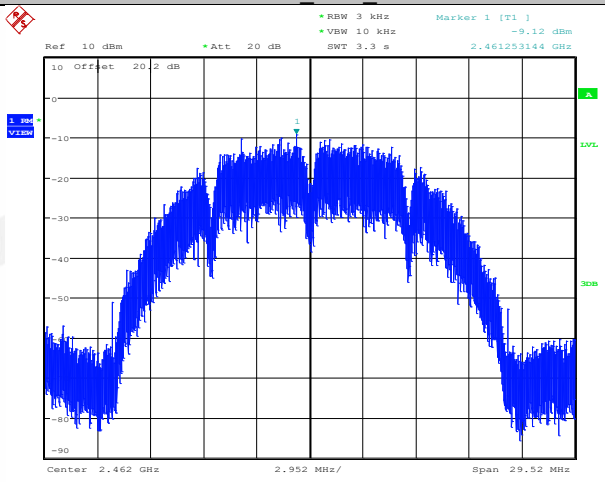
11B_Ant2_2437



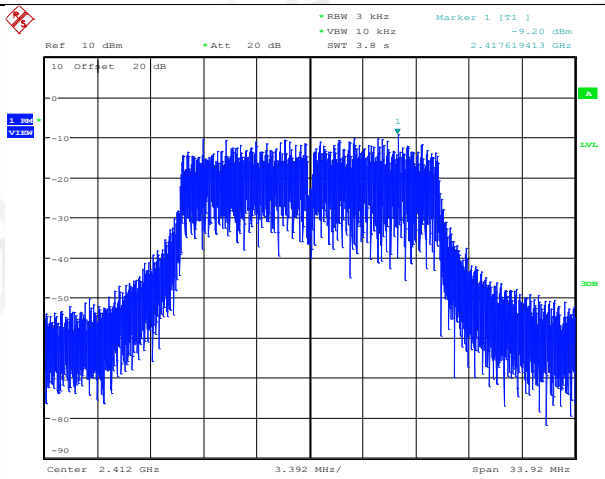
11B_Ant1_2462



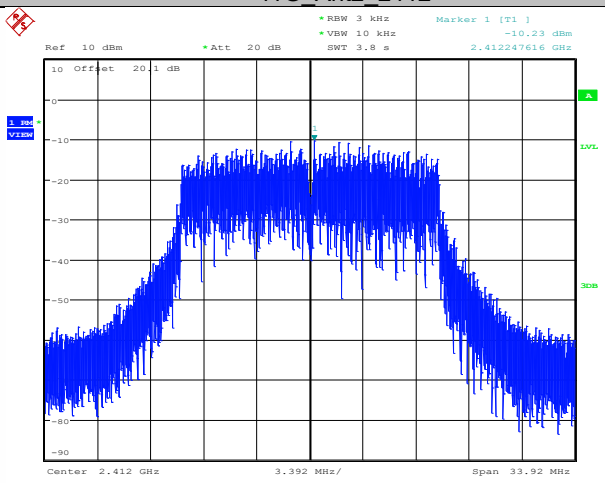
11B_Ant2_2462



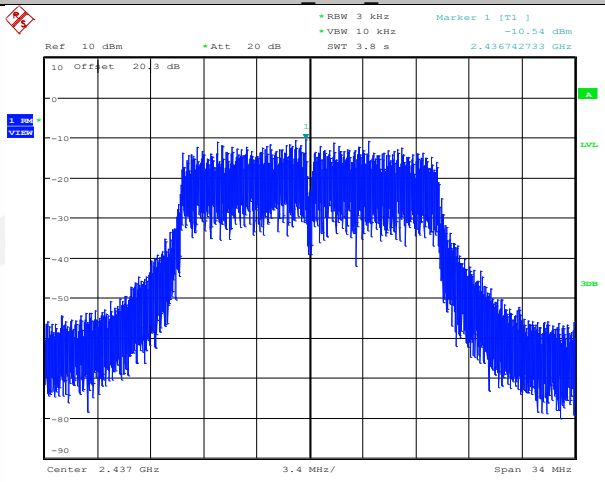
11G_Ant1_2412



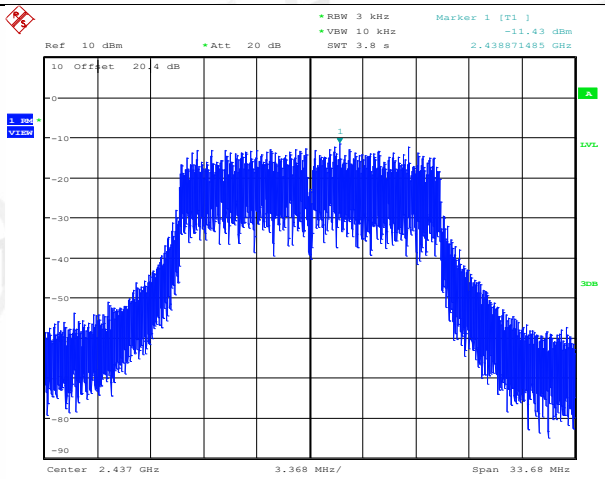
11G_Ant2_2412



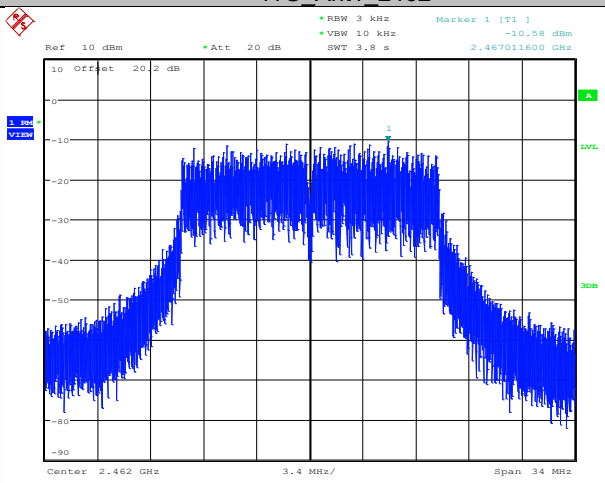
11G_Ant1_2437



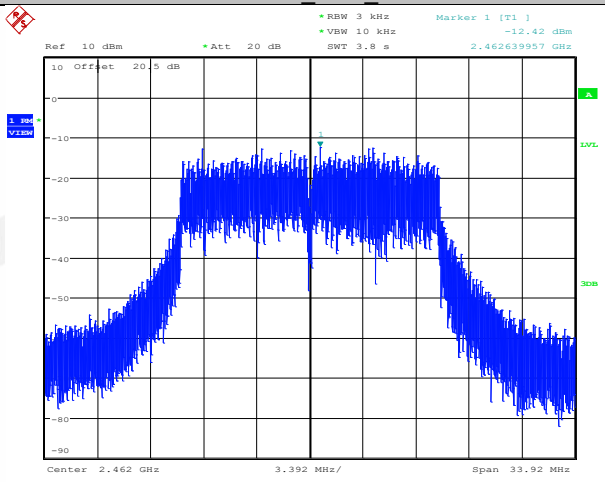
11G_Ant2_2437



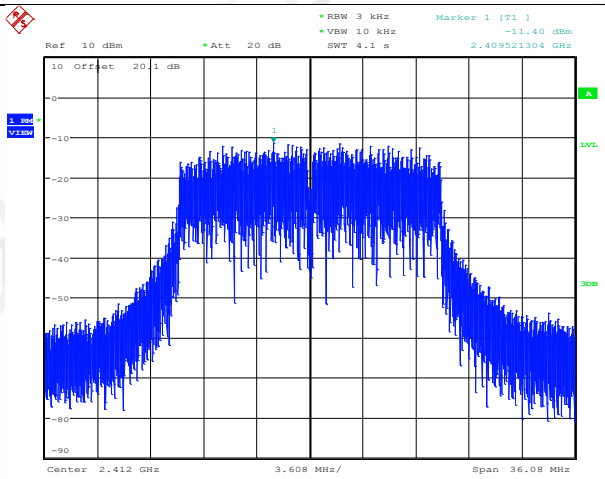
11G_Ant1_2462



11G_Ant2_2462



11N20MIMO_Ant1_2412



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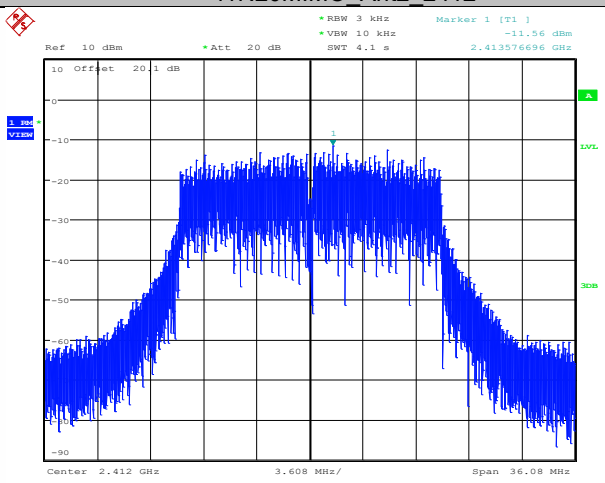
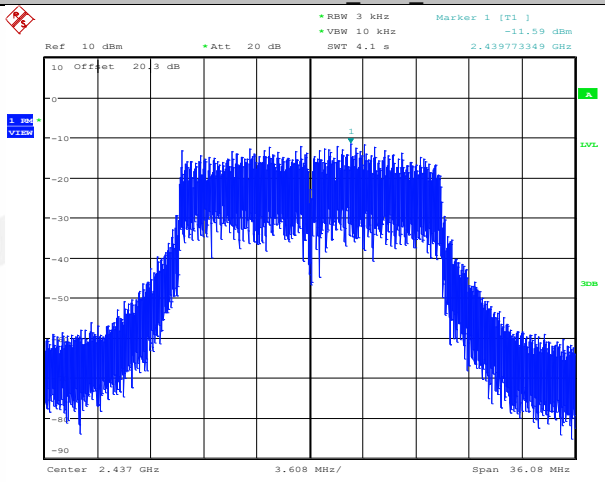


11N20MIMO_Ant1_2437



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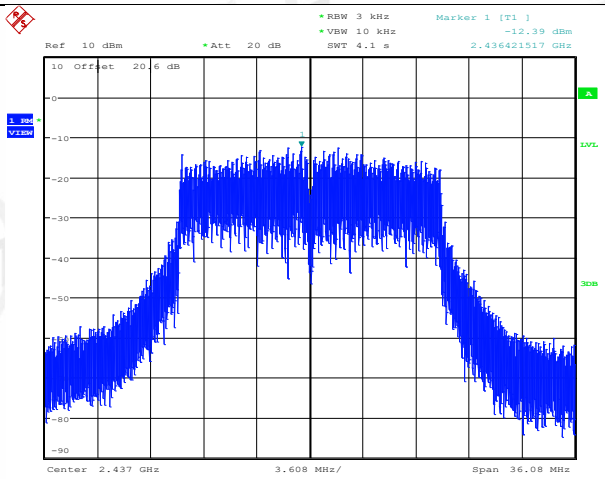
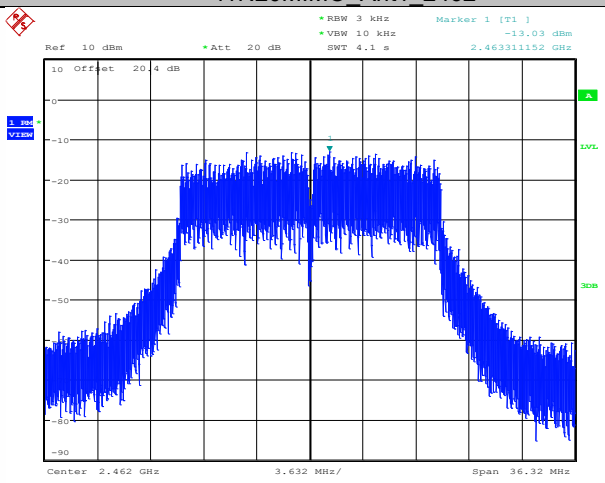
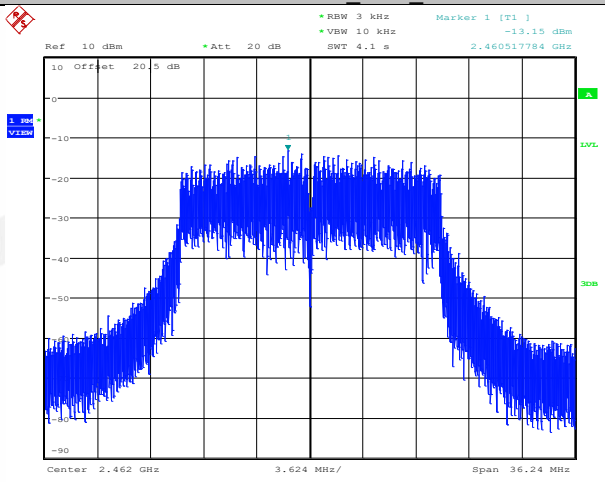


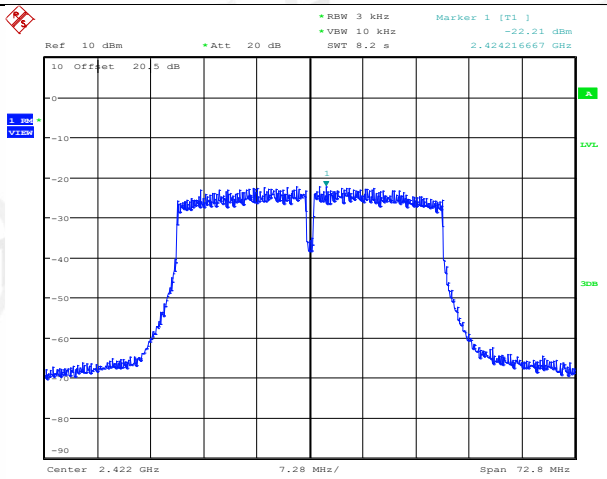
11N20MIMO_Ant1_2462



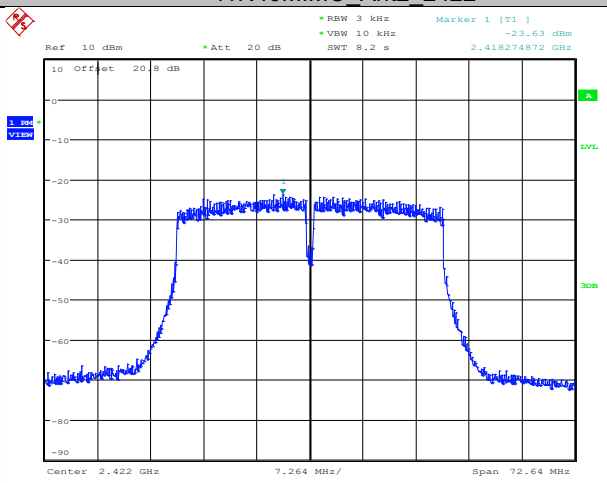
11N20MIMO_Ant2_2462



11N40MIMO_Ant1_2422



11N40MIMO_Ant2_2422



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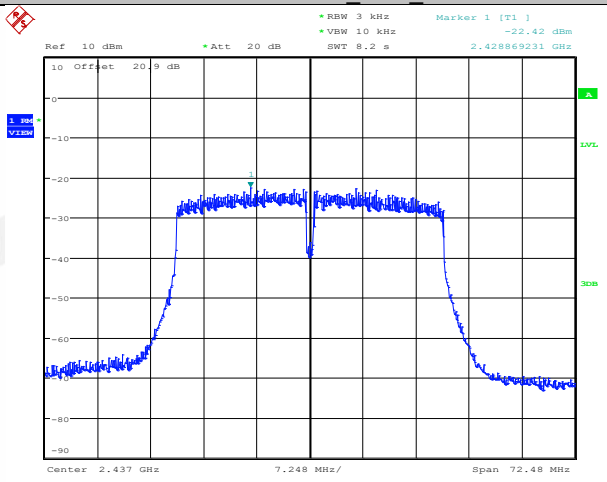
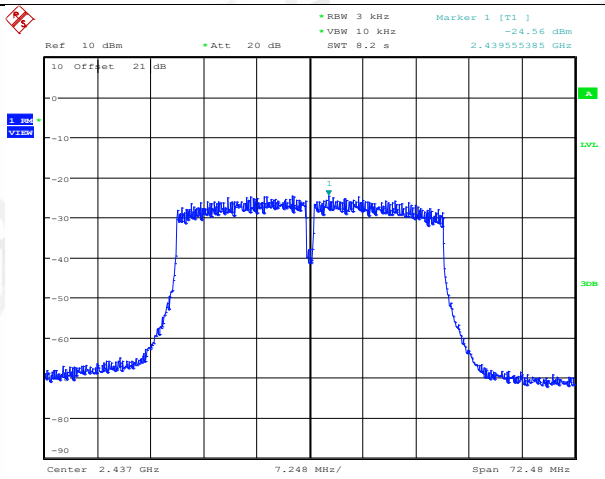
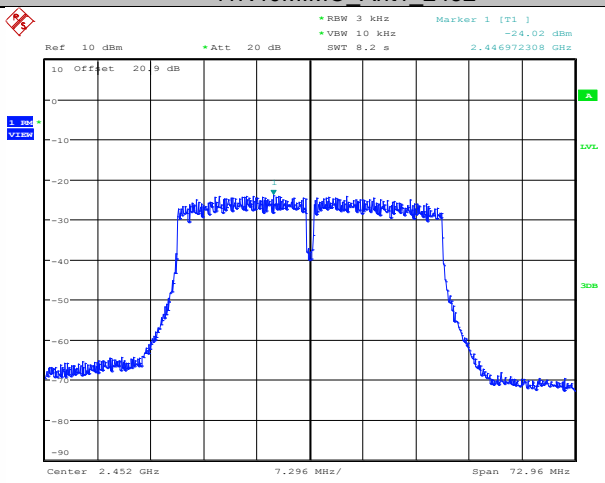


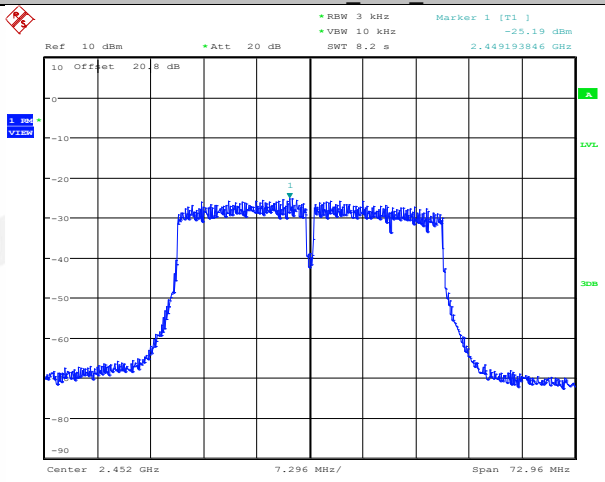
11N40MIMO_Ant2_2437



11N40MIMO_Ant1_2452

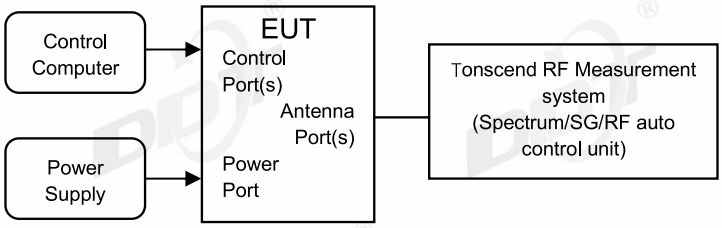


11N40MIMO_Ant2_2452



8. Band Edge Compliance (Conducted Method)

8.1. Block diagram of test setup



8.2. Limits

In any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in operating, the radio frequency power that is produced by the intentional radiator shall be at least 30 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power.

8.3. Test procedure

(1) Connect EUT's antenna output to spectrum analyzer by RF cable.

(2) Establish a reference level by using the following procedure:

RBW:	100 kHz
VBW:	300 kHz
Span	Encompass frequency range to be measured
Detector Mode:	Peak
Sweep time:	auto
Trace mode	Max hold

(3) Allow the trace to stabilize, use the peak marker function to determine the maximum peak power level to establish the reference level.

Then mark the maximum amplitude of all unwanted emissions outside of the authorized frequency band.

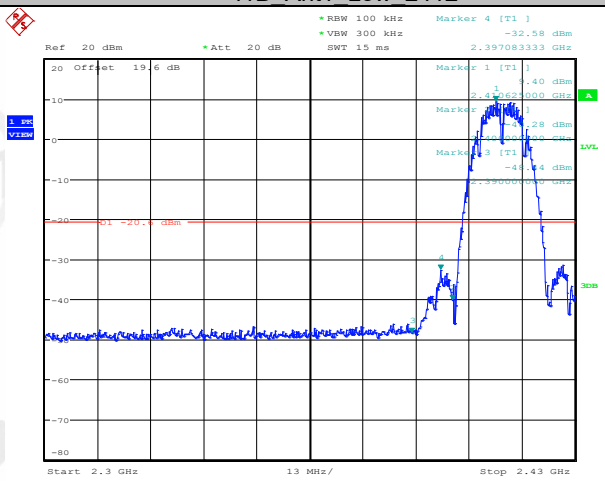
8.4. Test result

Test Engineer:	Zora Zhang	Test Site:	RF Measurement System 1#
Ambient Condition:	25.1℃,52.5%RH	Test Date:	2024.06.05-2024.06.13
Test Power Supply:	DC 12V	Sample Number:	S24042530-001

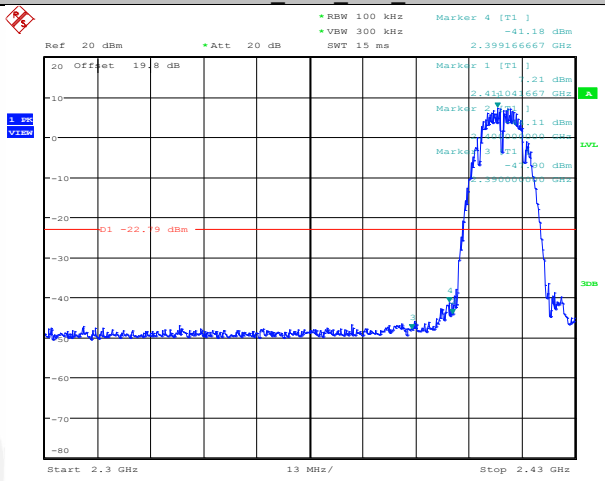
EUT Set Mode	CH or Frequency	Result(dBm)	EUT Set Mode	CH or Frequency	Result (dBm)
11b	CH1	Pass	11g	CH1	Pass
	CH11	Pass		CH11	Pass
11n HT 20	CH1	Pass	11n HT 40	CH3	Pass
	CH11	Pass		CH9	Pass

8.5. Test graphs

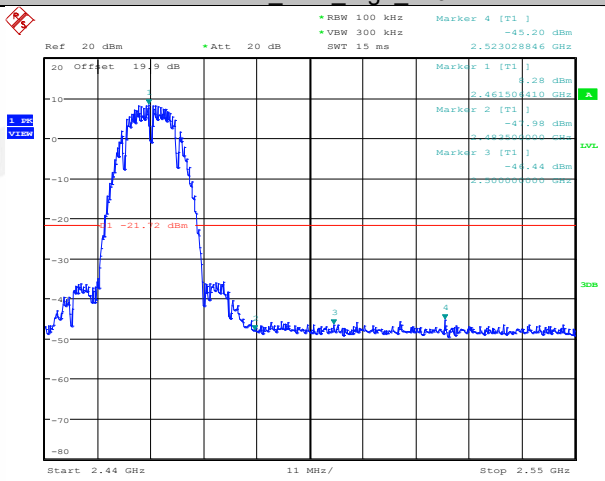
11B_Ant1_Low_2412



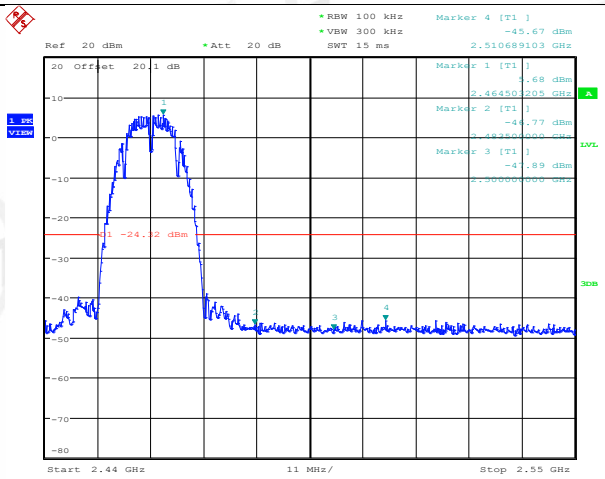
11B_Ant2_Low_2412



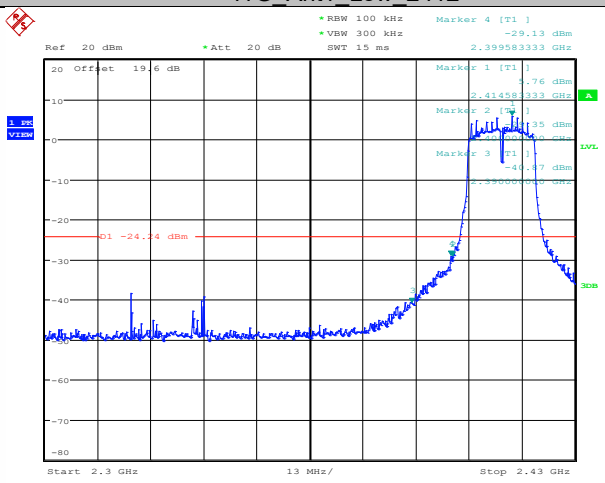
11B_Ant1_High_2462



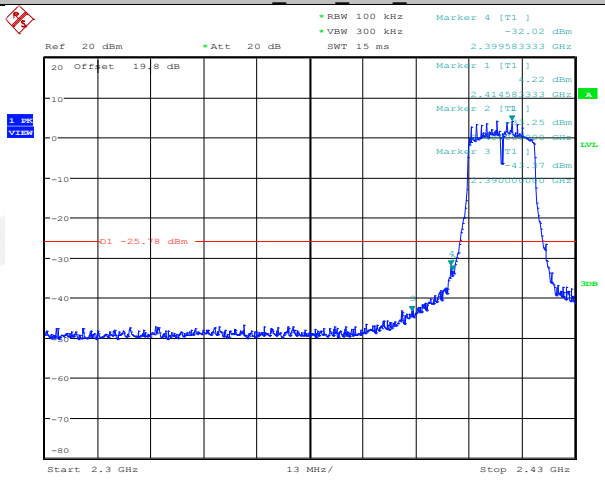
11B_Ant2_High_2462



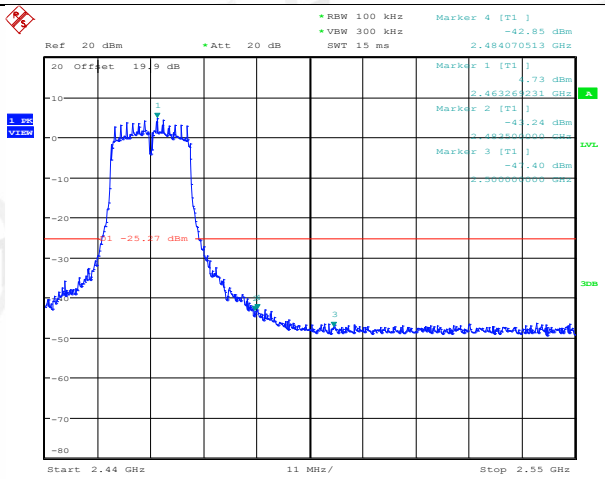
11G_Ant1_Low_2412



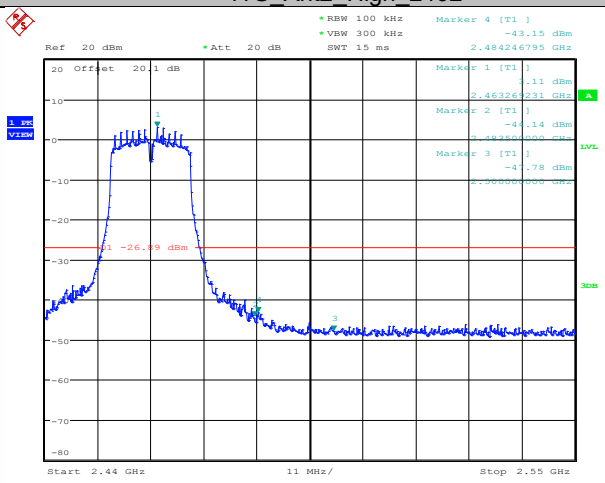
11G_Ant2_Low_2412



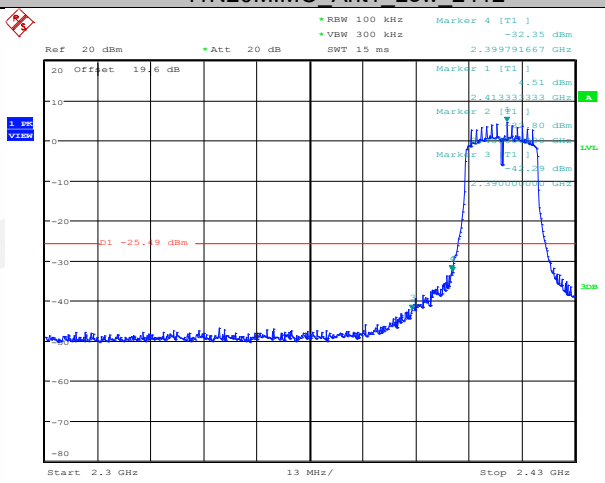
11G_Ant1_High_2462



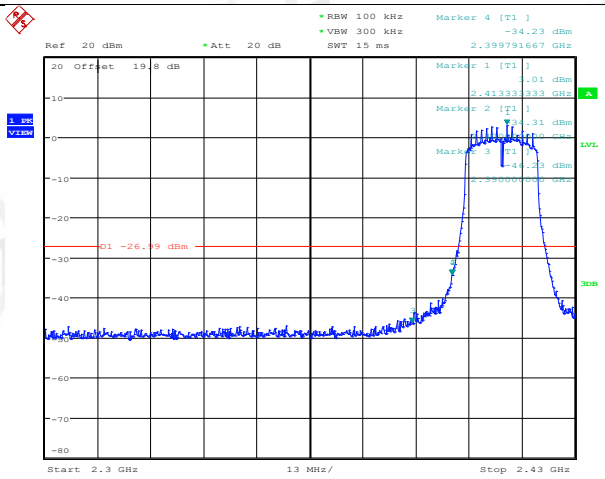
11G_Ant2_High_2462



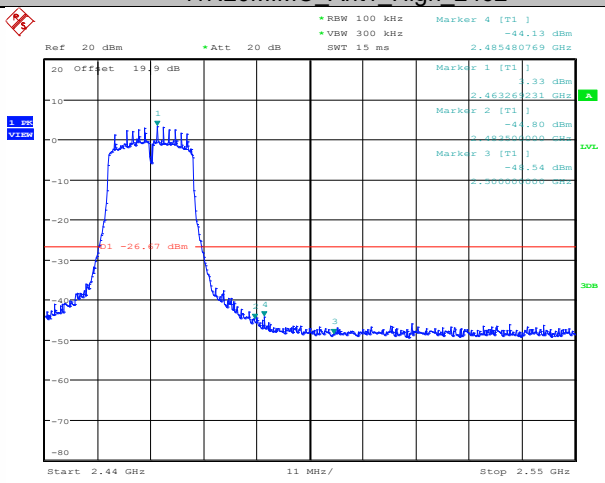
11N20MIMO_Ant1_Low_2412



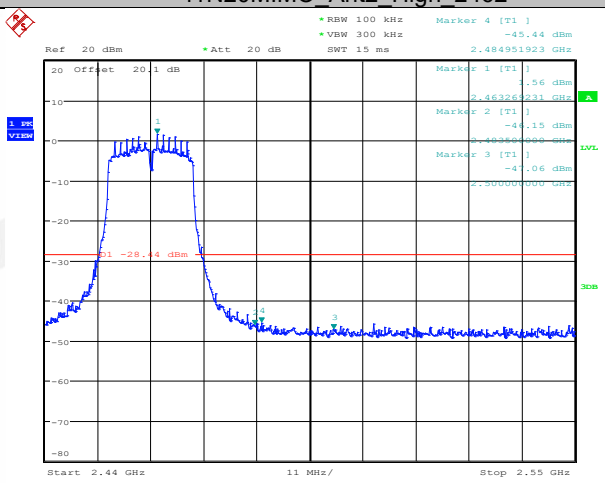
11N20MIMO_Ant2_Low_2412



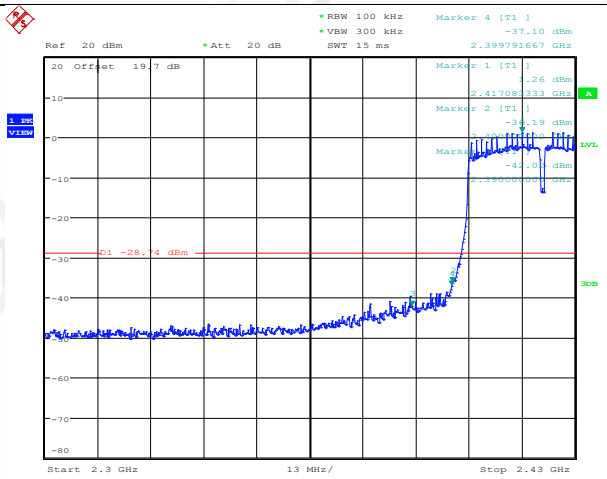
11N20MIMO_Ant1_High_2462



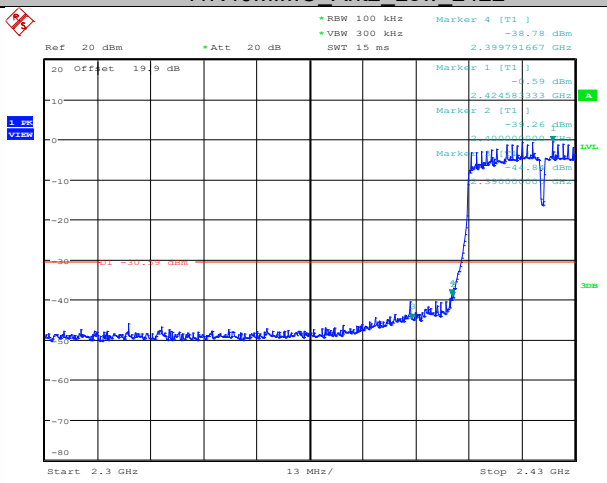
11N20MIMO_Ant2_High_2462



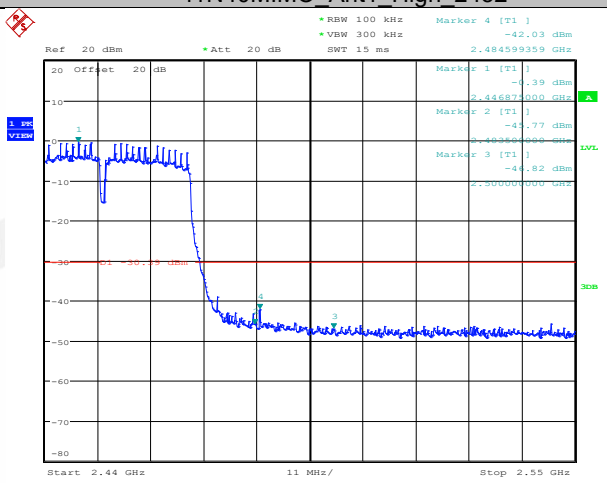
11N40MIMO_Ant1_Low_2422



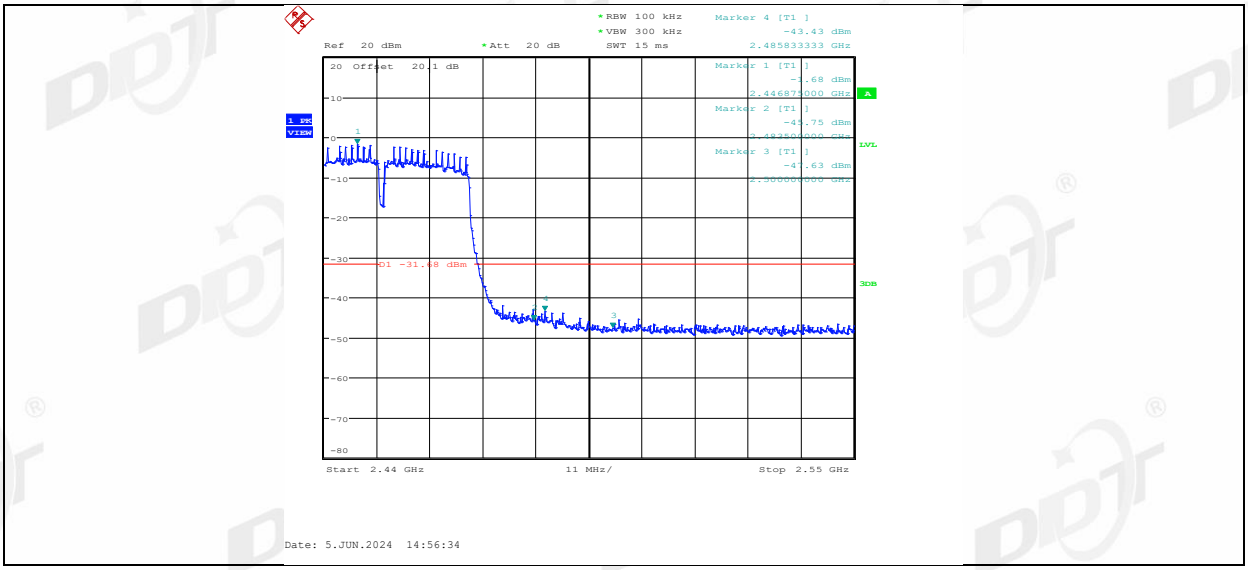
11N40MIMO_Ant2_Low_2422



11N40MIMO_Ant1_High_2452

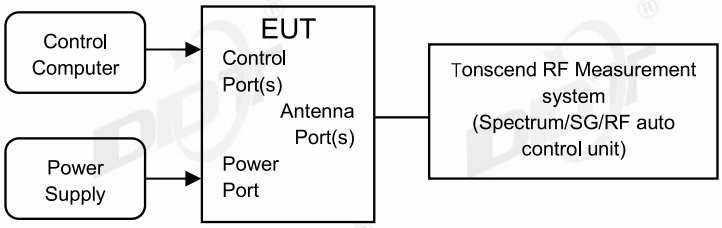


11N40MIMO_Ant2_High_2452


RBW 100 kHz
VBW 300 kHz
SWT 15 ms
Marker 4 [T1]
-43.43 dBm
2.485833333 GHz
Ref 20 dBm
Att 20 dB
20 Offset 20.1 dB
Marker 1 [T1]
-1.68 dBm
2.446875000 GHz
Marker 2 [T1]
-45.75 dBm
2.483500000 GHz
Marker 3 [T1]
-47.63 dBm
2.390000000 GHz
D1 -31.68 dBm
Start 2.44 GHz
11 MHz/
Stop 2.55 GHz
Date: 5.JUN.2024 14:56:34

9. RF Conducted Spurious Emissions

9.1. Block diagram of test setup



9.2. Limits

In any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in operating, the radio frequency power that is produced by the intentional radiator shall be at least 30 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power.

9.3. Test procedure

(1) Connect EUT's antenna output to spectrum analyzer by RF cable.
(2) Establish a reference level by using the following procedure:

Center frequency	Test frequency
RBW:	100 kHz
VBW:	300 kHz
Span	Wide enough to capture the peak level of the in-band emission
Detector Mode:	Peak
Sweep time:	auto
Trace mode	Max hold

(3) Allow the trace to stabilize, use the peak marker function to determine the maximum peak power level to establish the reference level.
(4) Set the spectrum analyzer as follows:

RBW:	100 kHz
VBW:	300 kHz
Span	Encompass frequency range to be measured
Number of measurement points	≥Span/RBW
Detector Mode:	Peak
Sweep time:	auto
Trace mode	Max hold

(5) Allow the trace to stabilize, use the peak marker function to determine the maximum amplitude of all unwanted emissions outside of the authorized frequency band

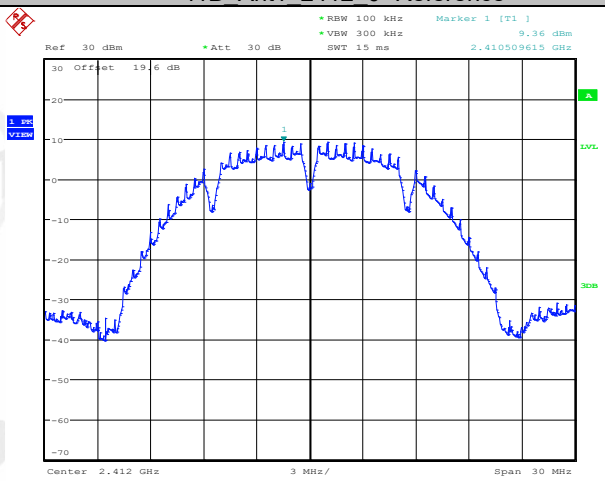
9.4. Test result

Test Engineer:	Zora Zhang	Test Site:	RF Measurement System 1#
Ambient Condition:	25.1℃,52.5%RH	Test Date:	2024.06.05-2024.06.13
Test Power Supply:	DC 12V	Sample Number:	S24042530-001

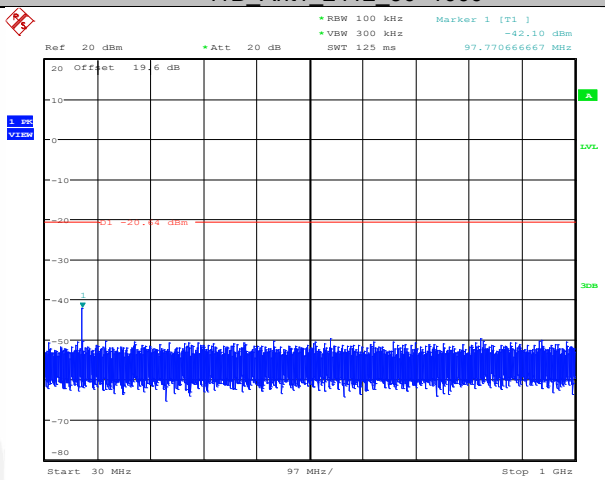
EUT Set Mode	CH or Frequency	Result(dBm)	EUT Set Mode	CH or Frequency	Result (dBm)
11b	CH1	Pass	11g	CH1	Pass
	CH11	Pass		CH11	Pass
11n HT 20	CH1	Pass	11n HT 40	CH3	Pass
	CH11	Pass		CH9	Pass

9.5. Test graphs

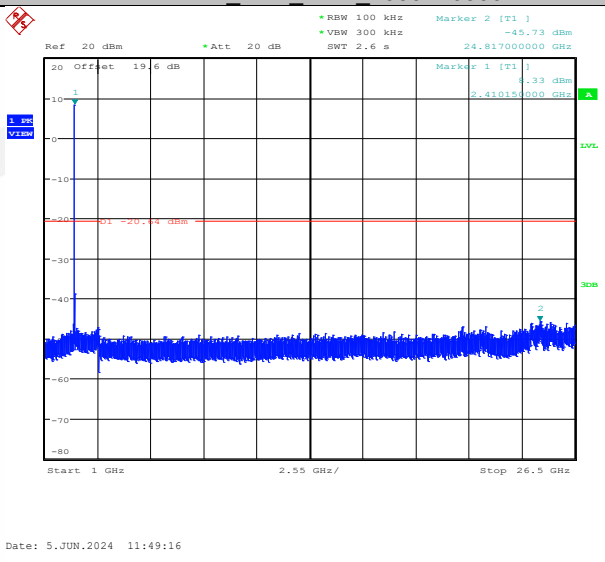
11B_Ant1_2412_0~Reference



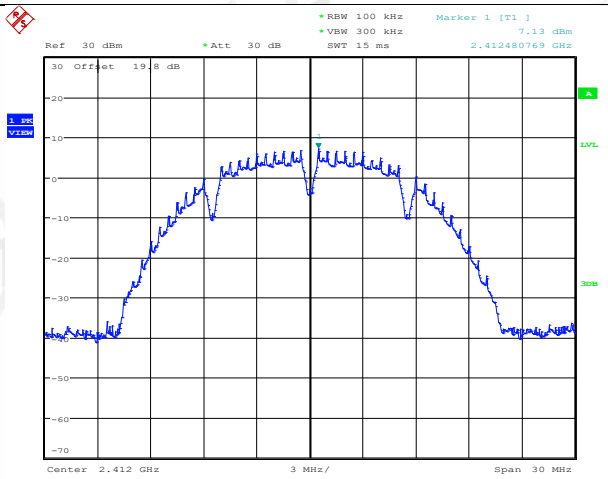
11B_Ant1_2412_30~1000



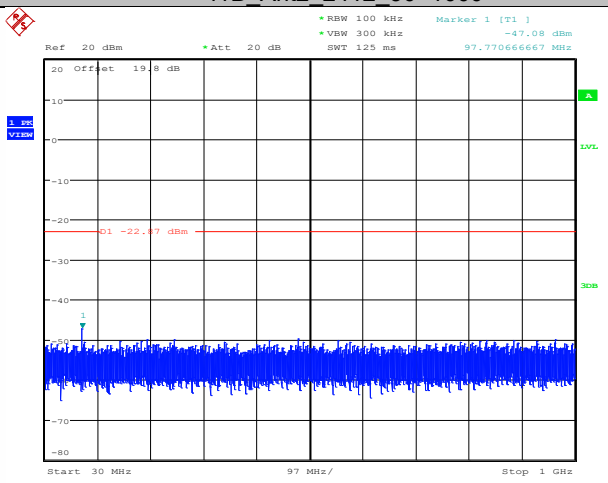
11B_Ant1_2412_1000~26500



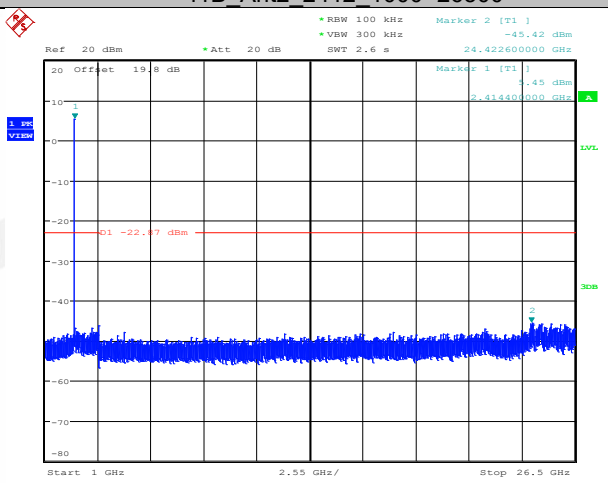
11B_Ant2_2412_0~Reference



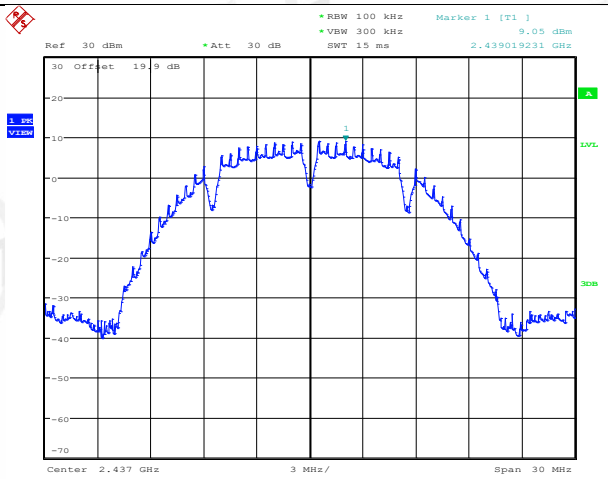
11B_Ant2_2412_30~1000



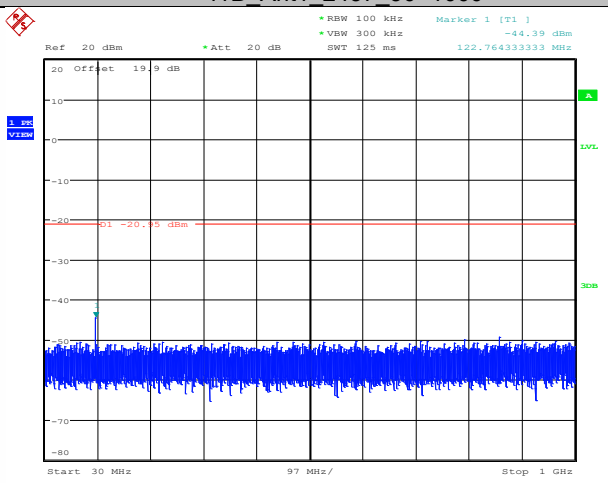
11B_Ant2_2412_1000~26500



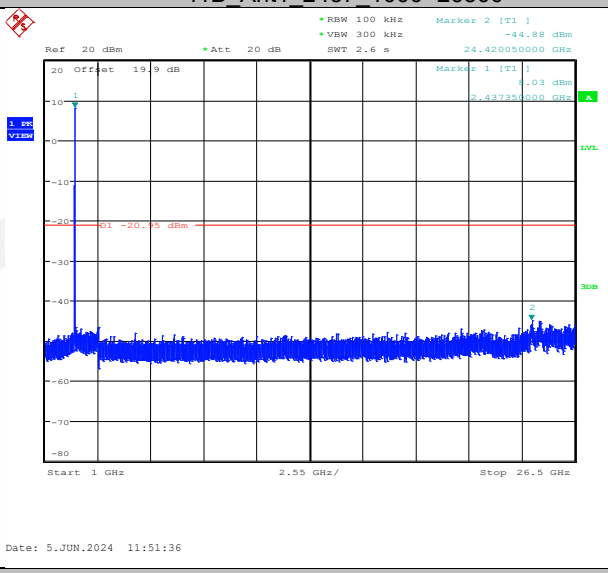
11B_Ant1_2437_0~Reference



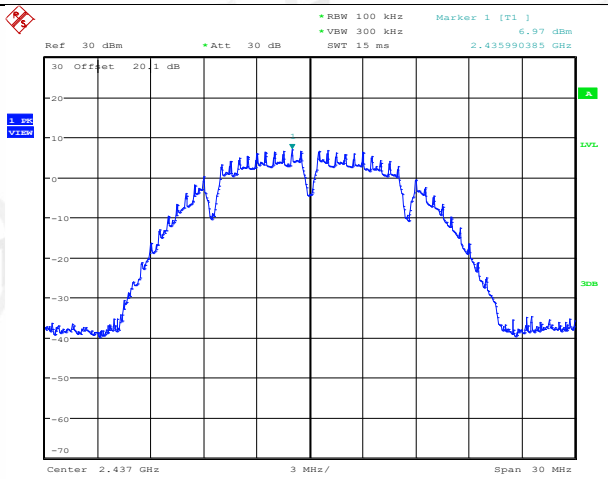
11B_Ant1_2437_30~1000



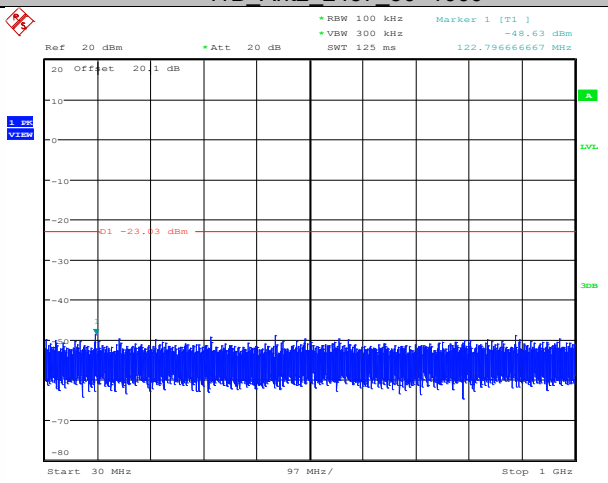
11B_Ant1_2437_1000~26500



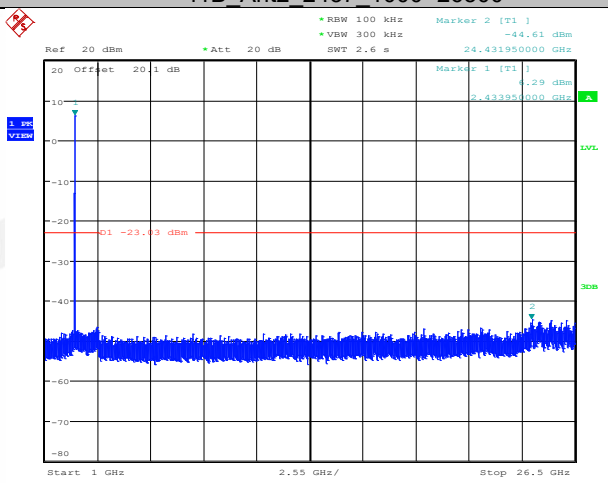
11B_Ant2_2437_0~Reference



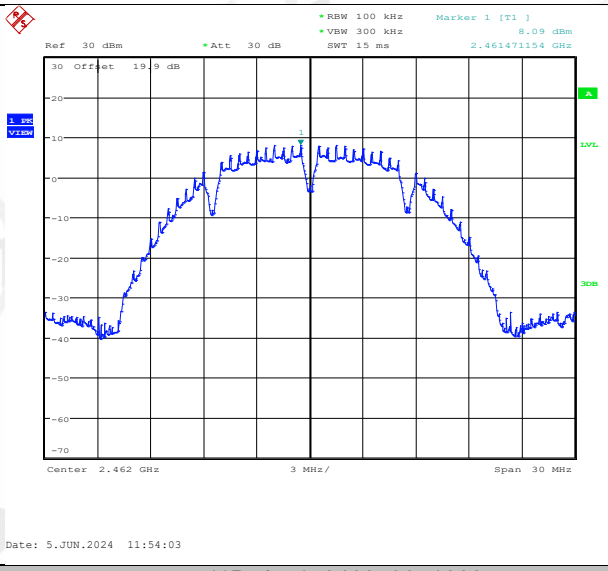
11B_Ant2_2437_30~1000



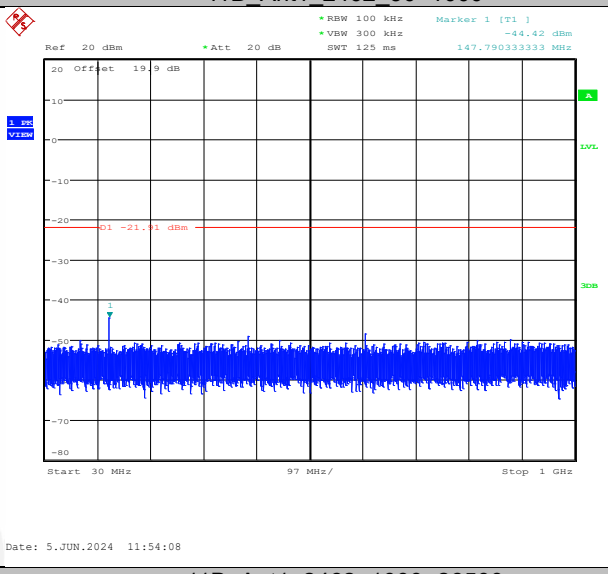
11B_Ant2_2437_1000~26500



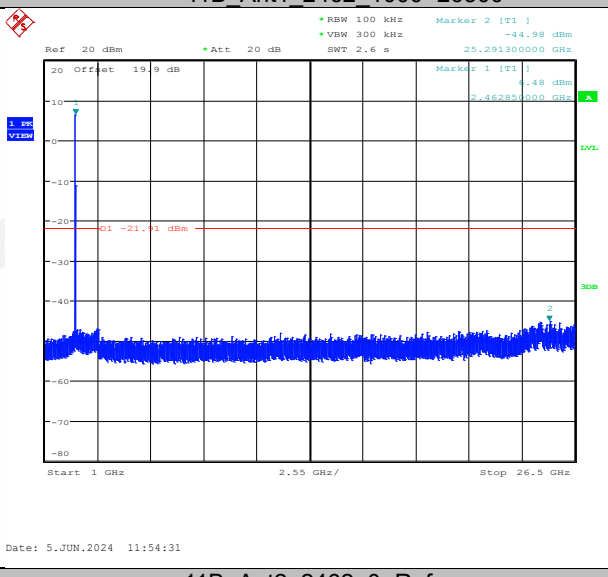
11B_Ant1_2462_0~Reference



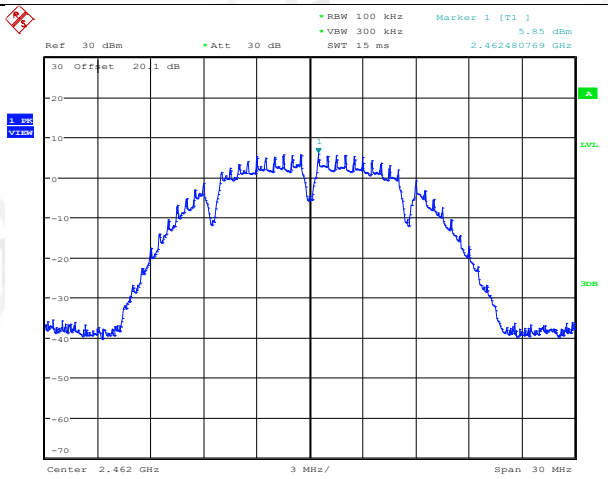
11B_Ant1_2462_30~1000



11B_Ant1_2462_1000~26500



11B_Ant2_2462_0~Reference



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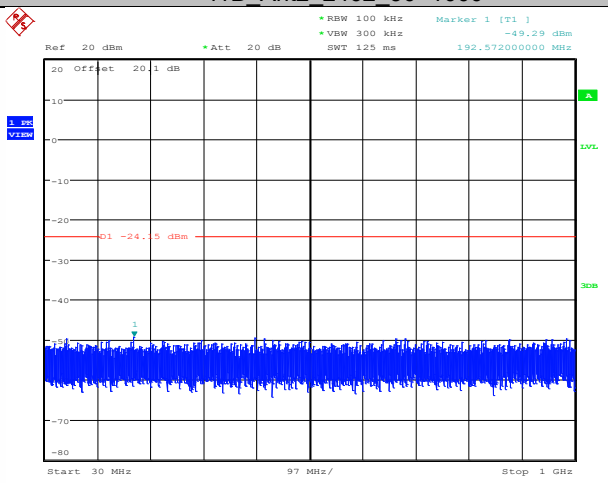

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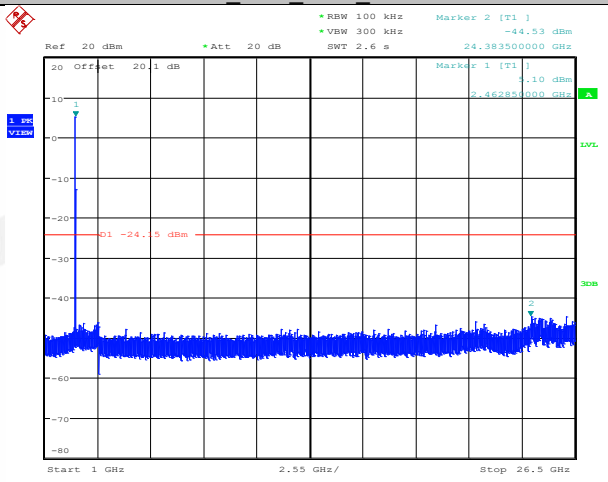

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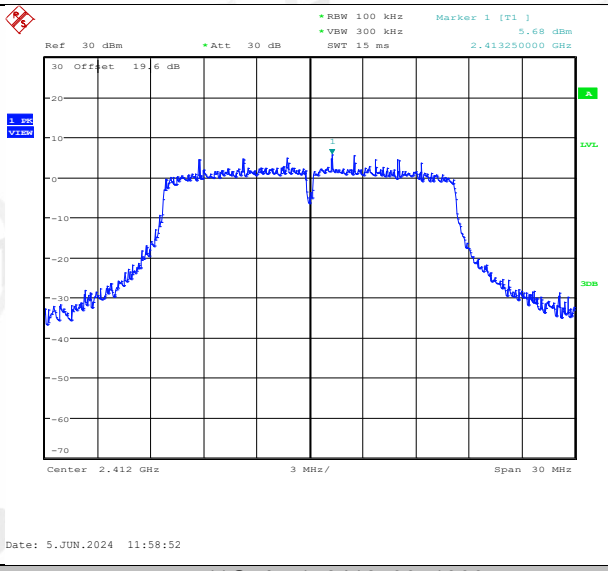

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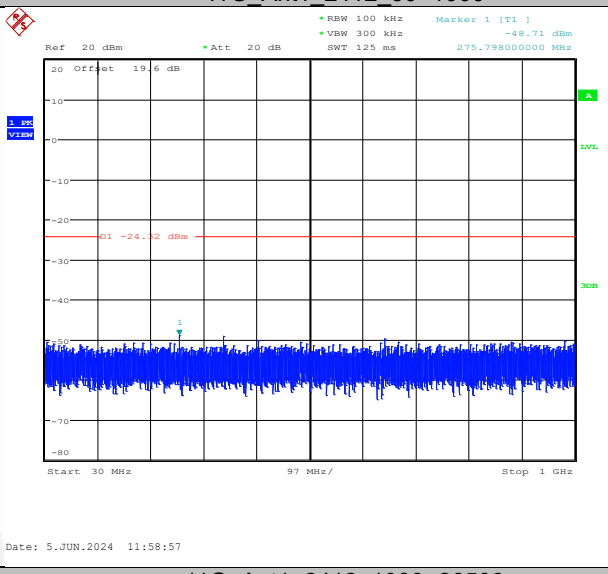

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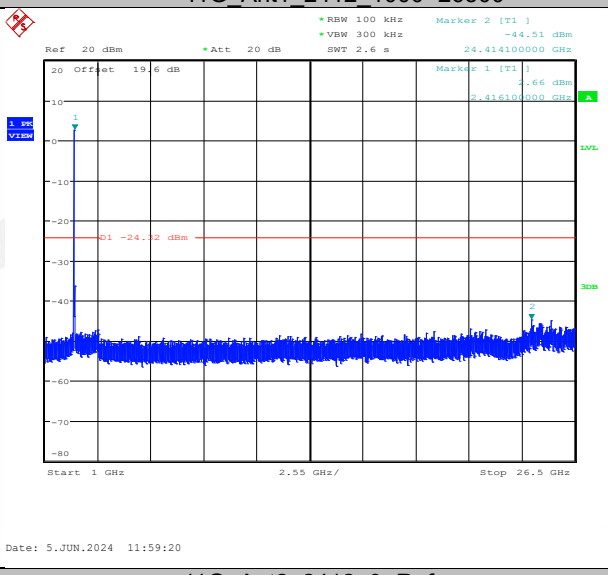

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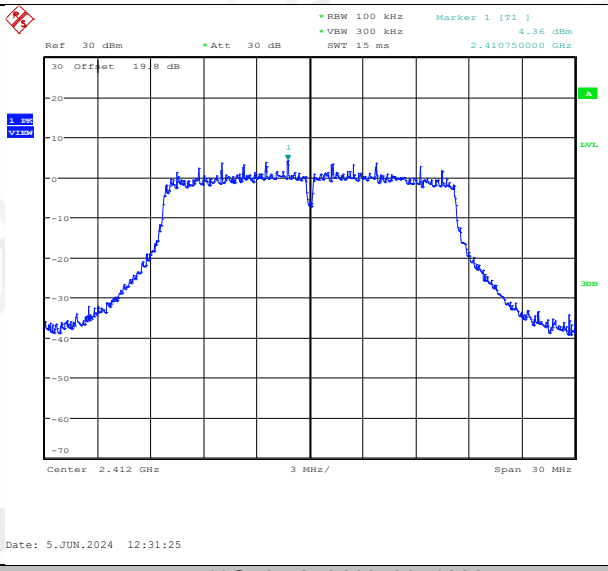

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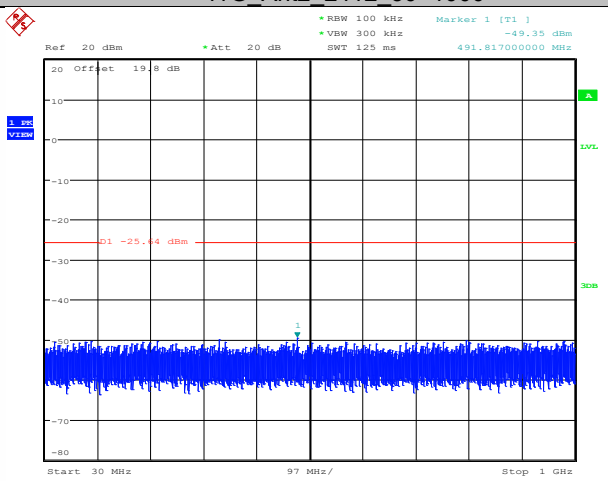
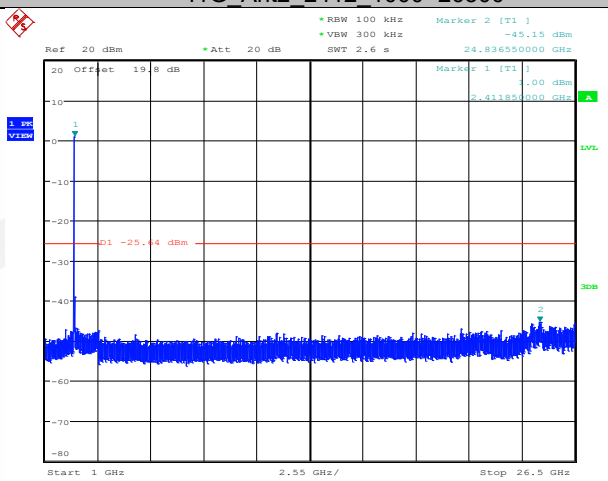


11G_Ant2_2412_1000~26500



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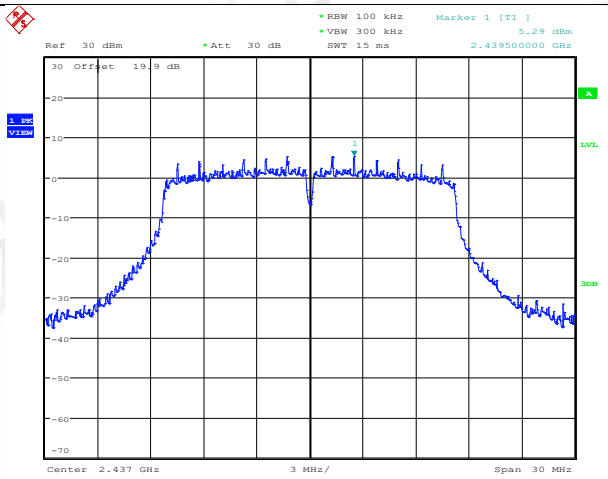

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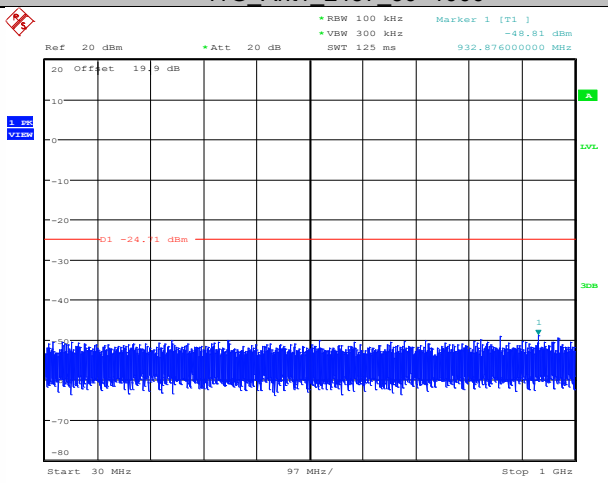

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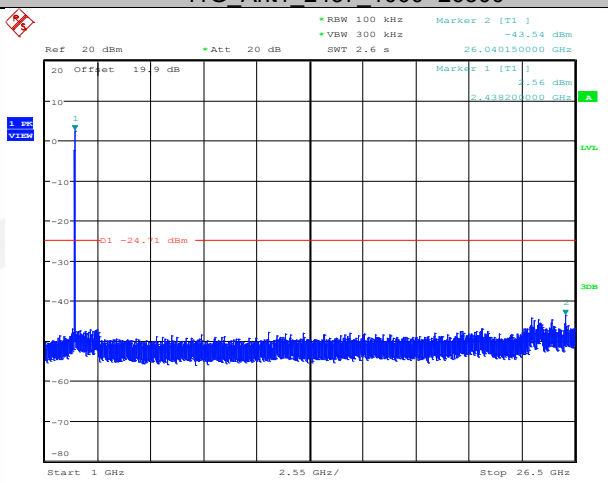

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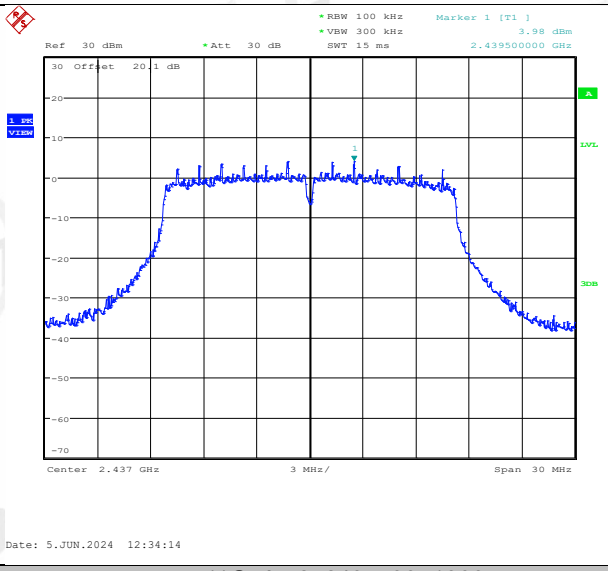

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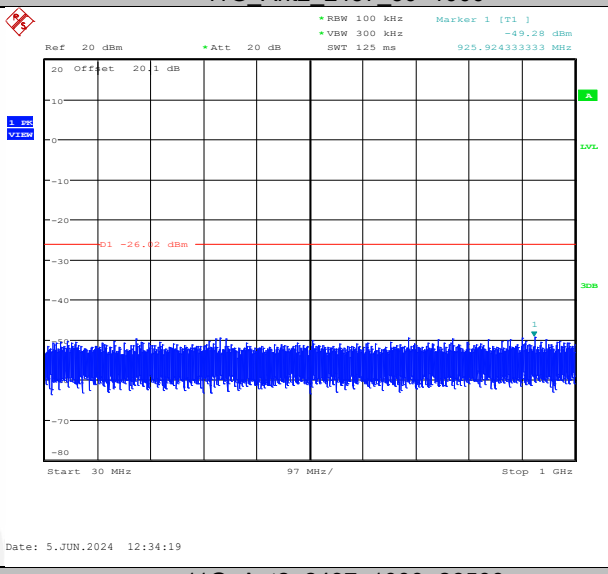

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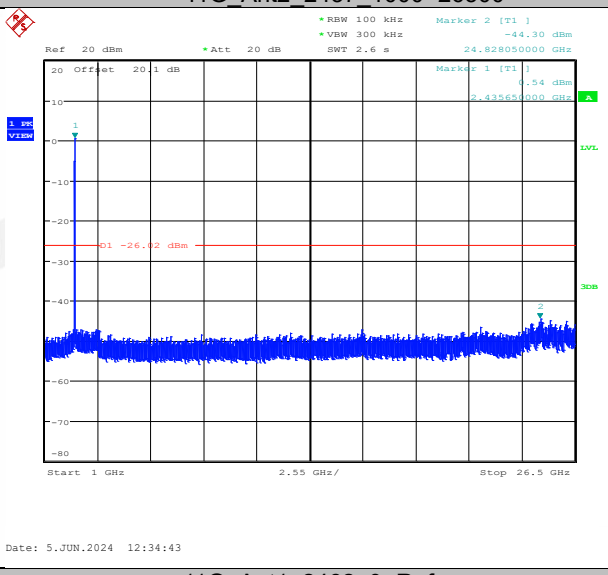

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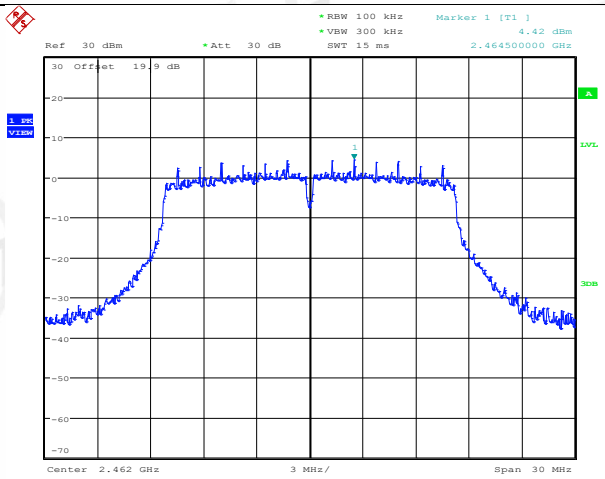

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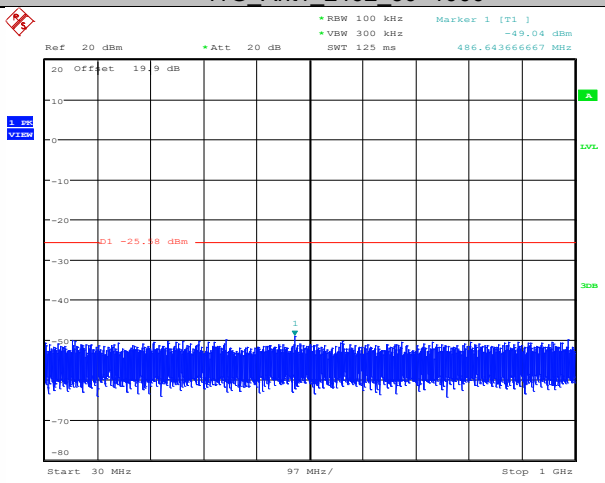

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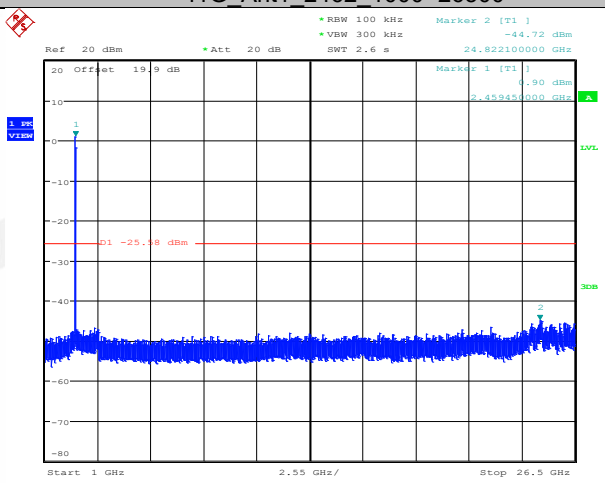

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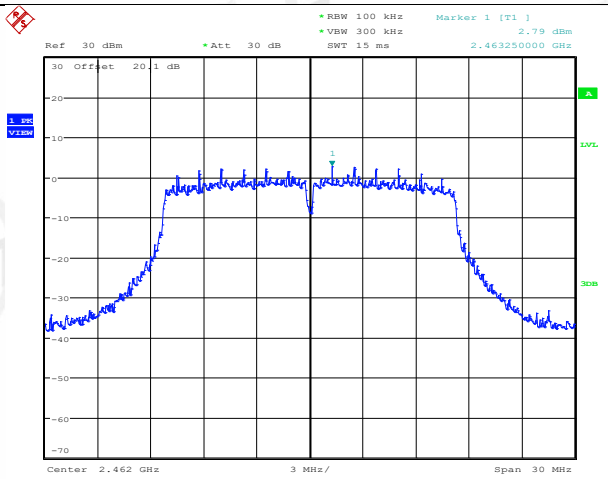
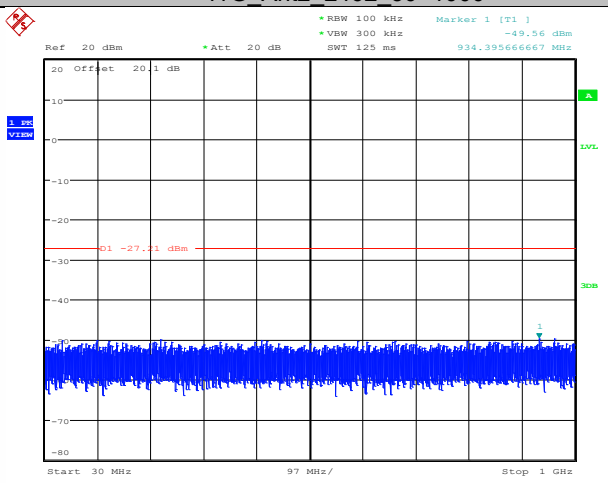


11G_Ant2_2462_30~1000



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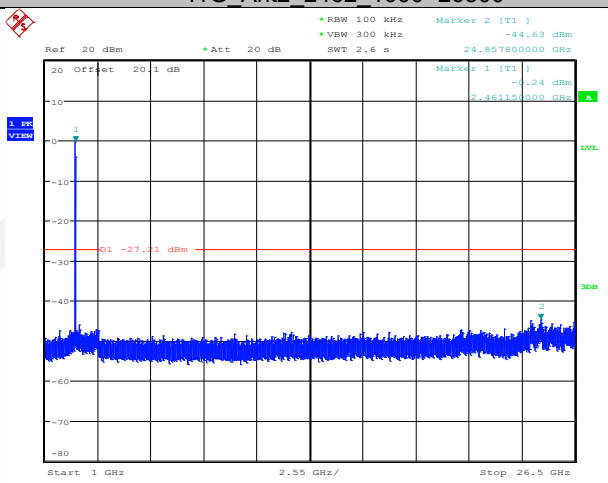

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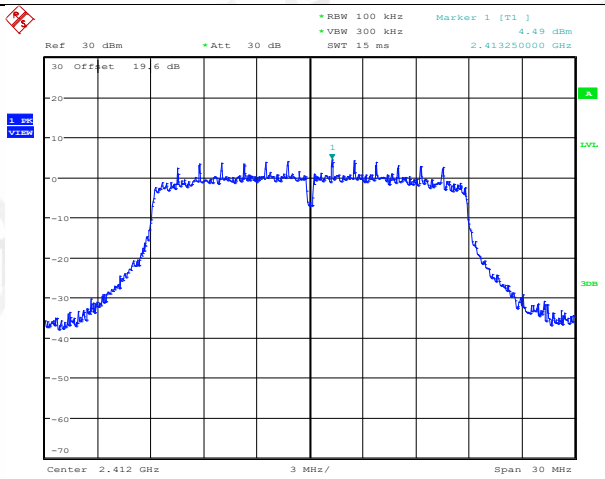

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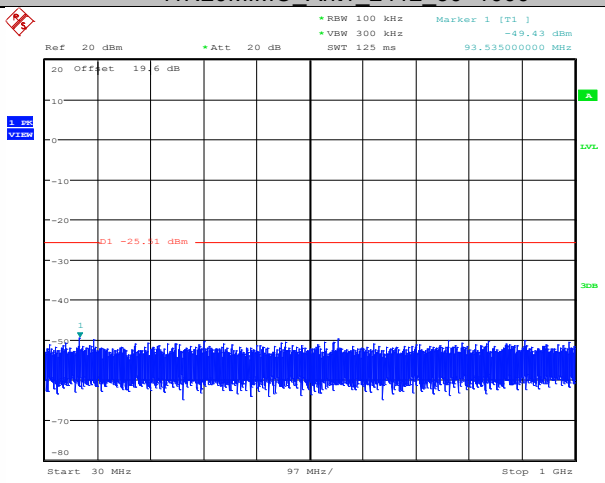

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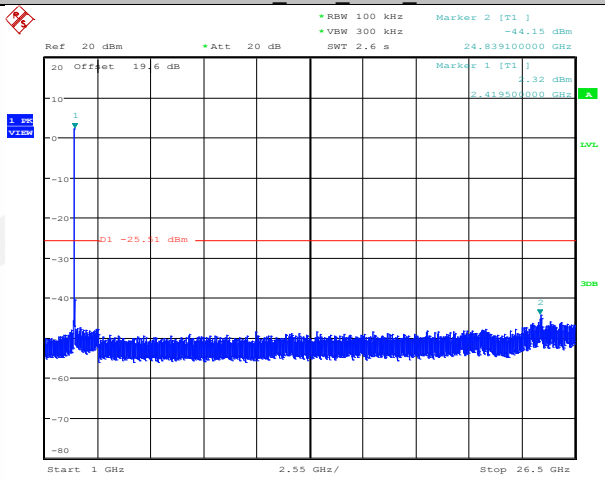

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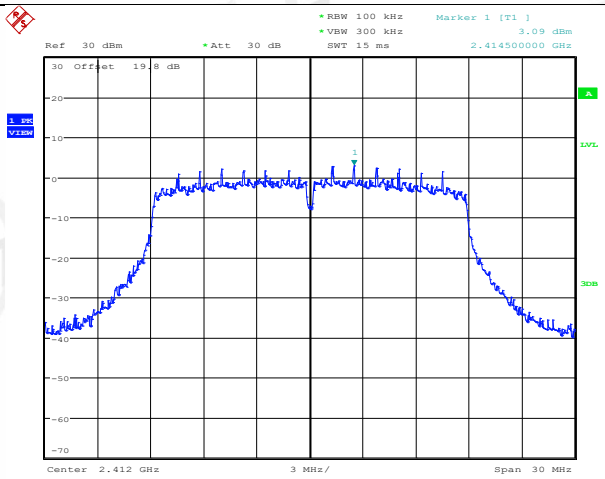

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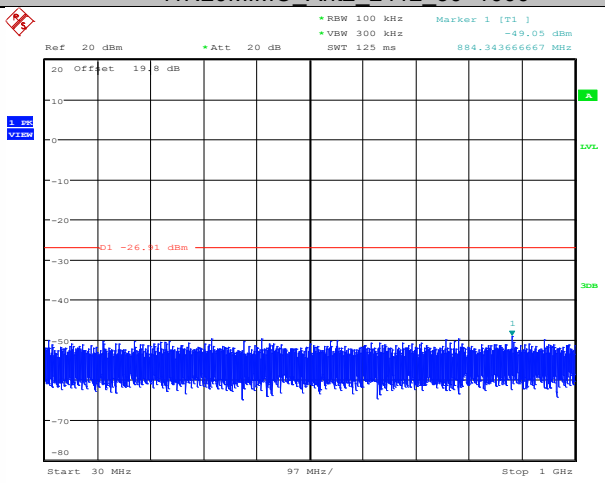
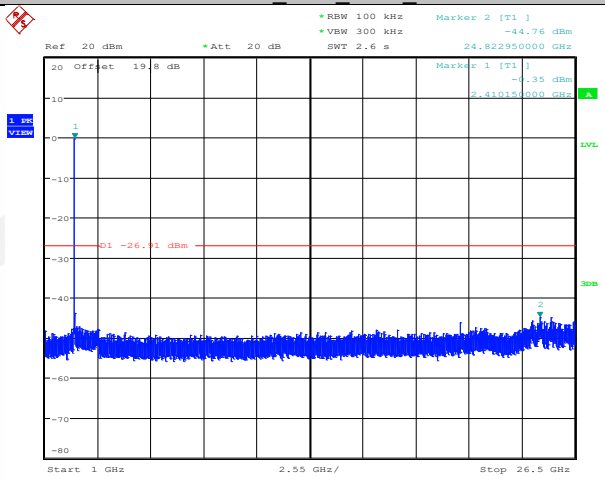


11N20MIMO_Ant2_2412_1000~26500



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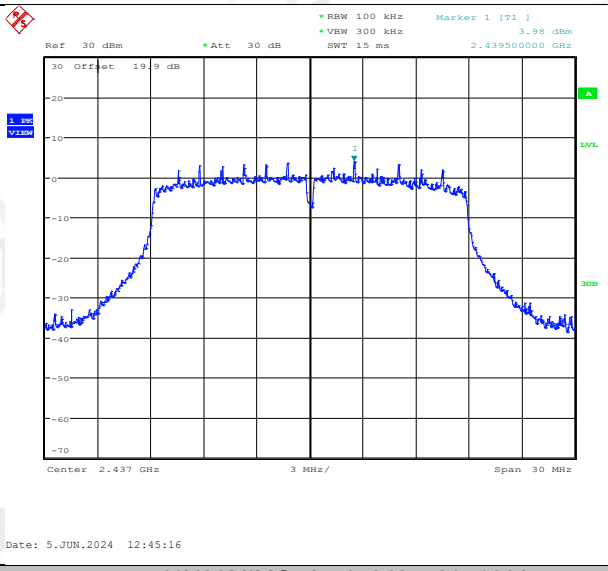

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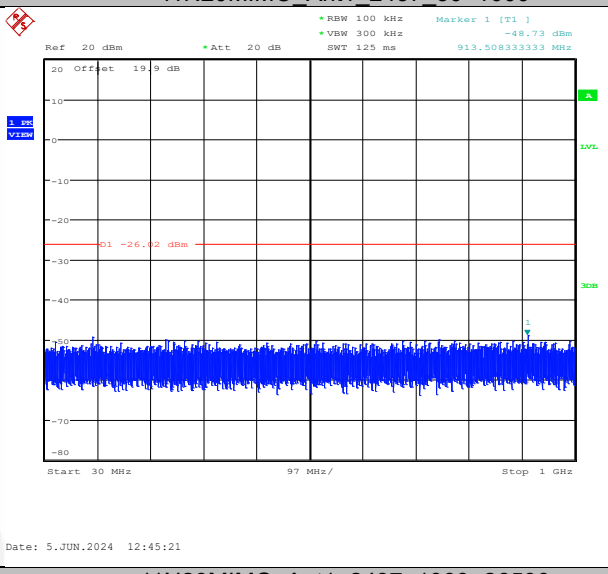

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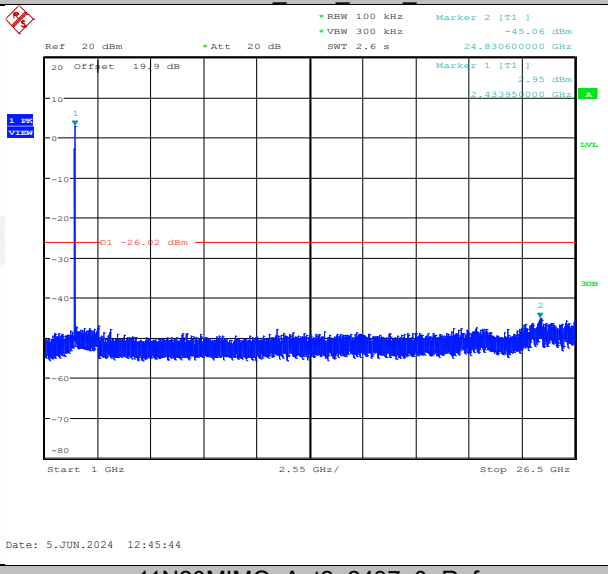

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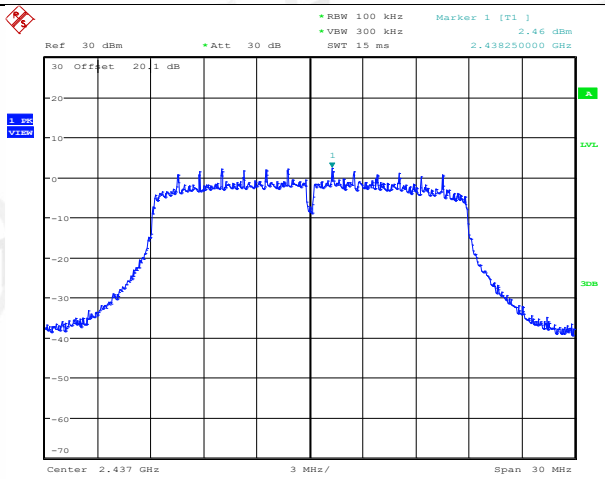

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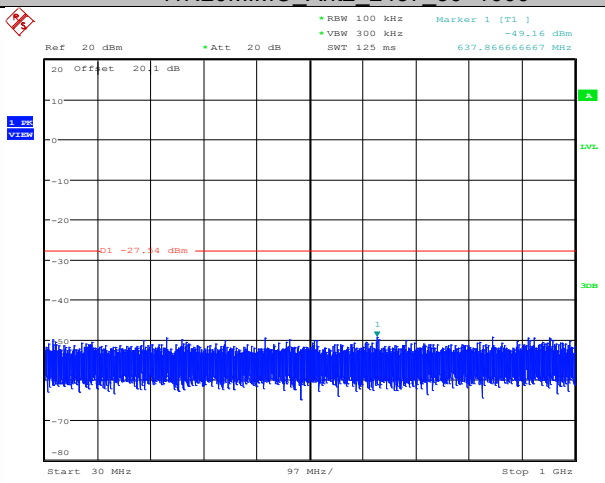

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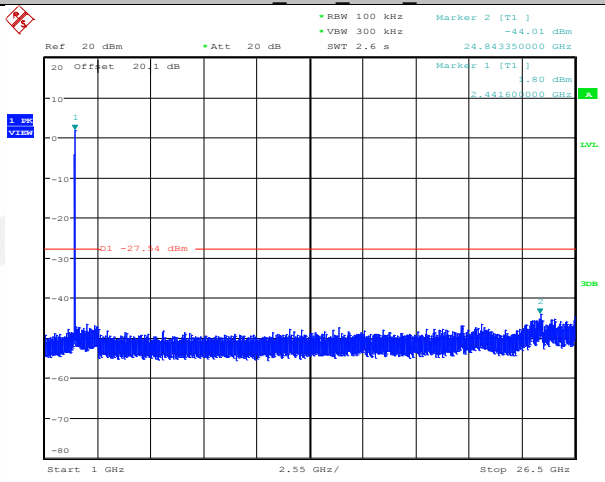

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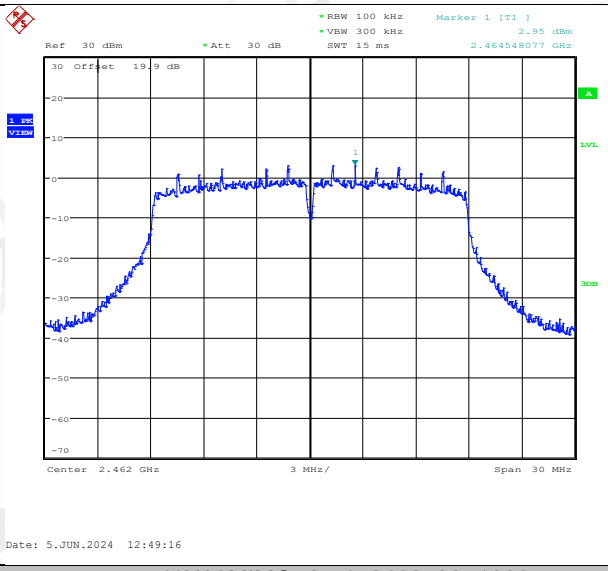
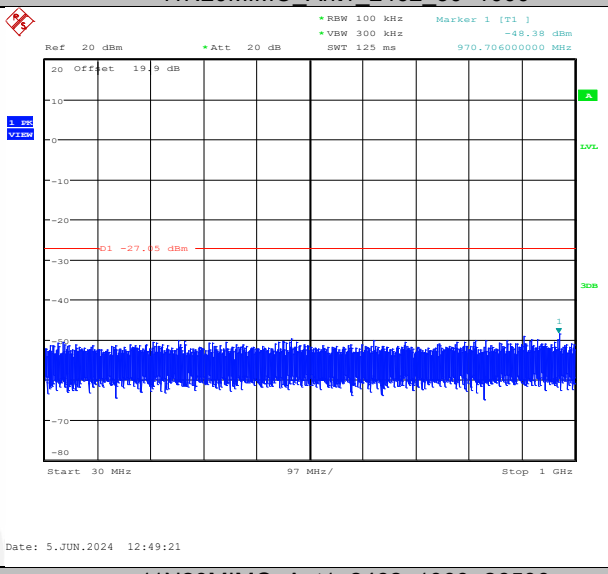


11N20MIMO_Ant1_2462_30~1000



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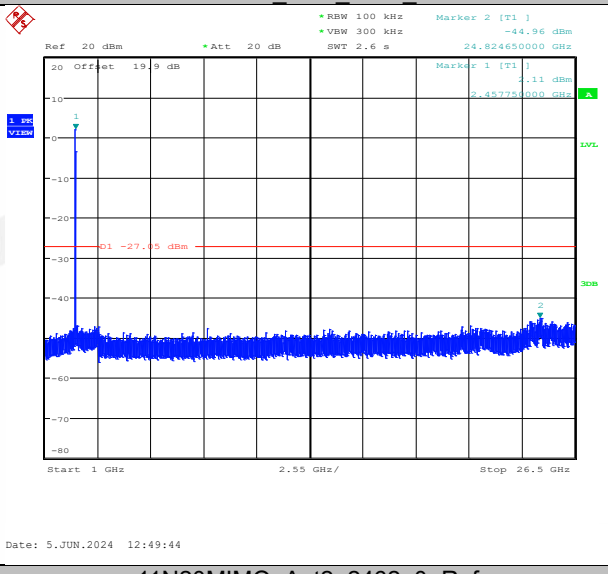

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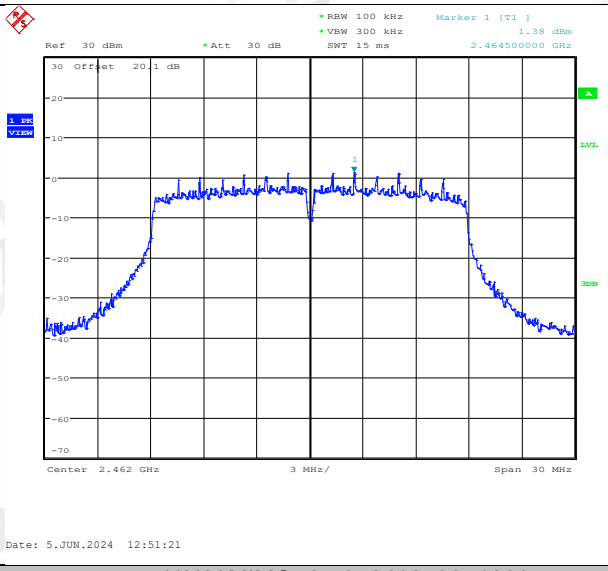
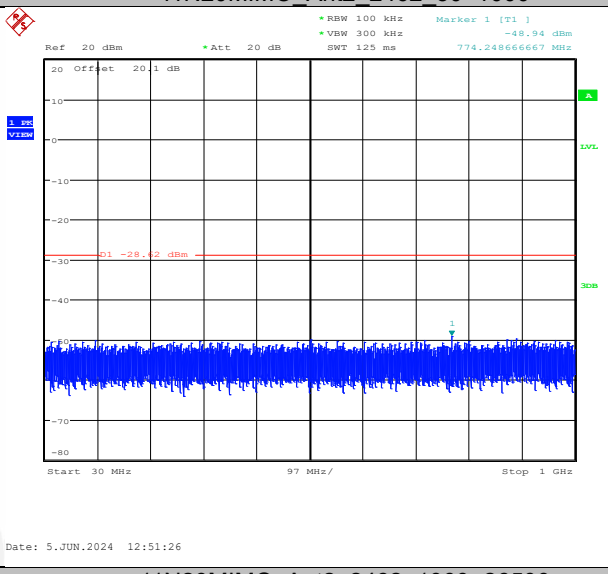


11N20MIMO_Ant2_2462_30~1000



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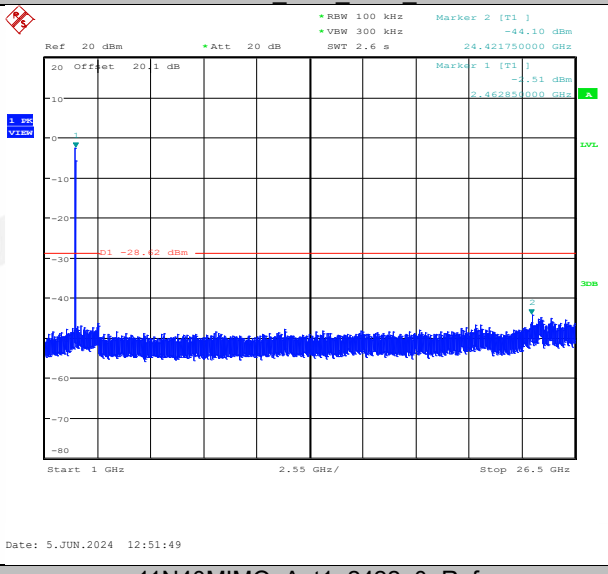

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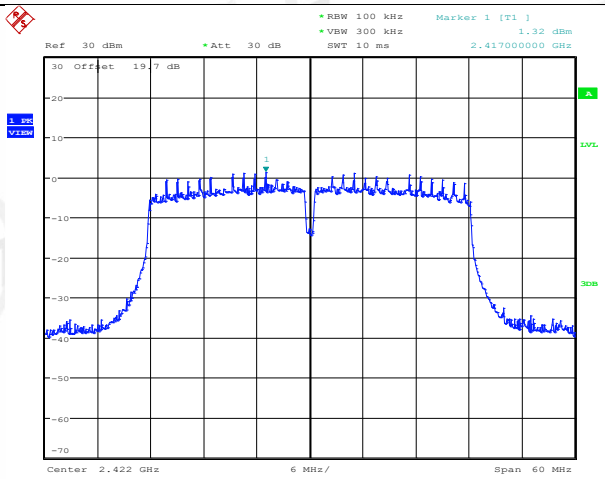

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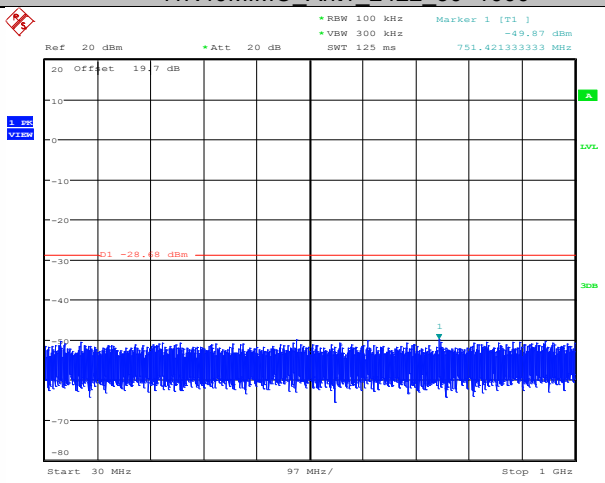

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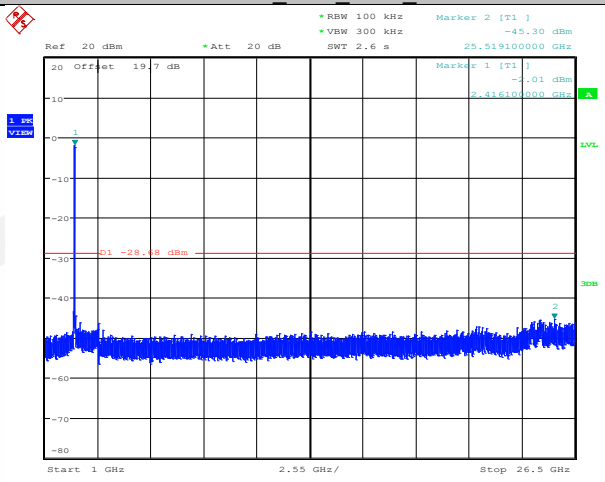

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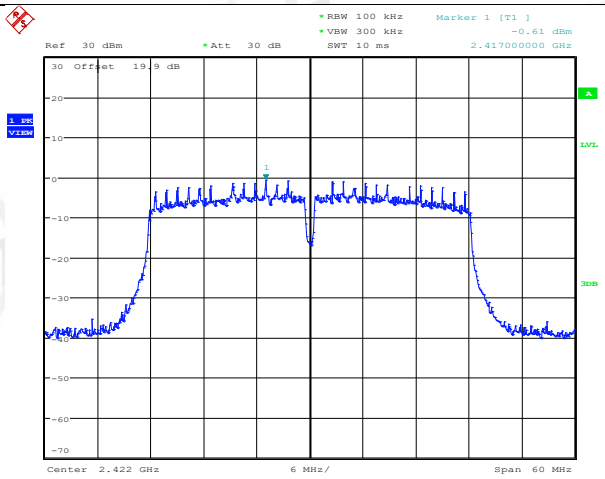

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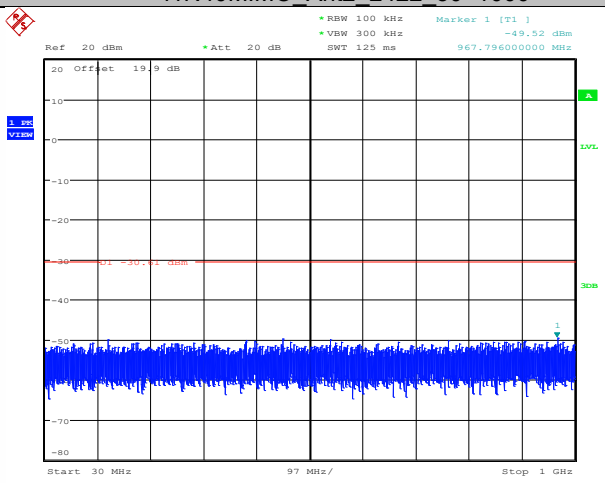

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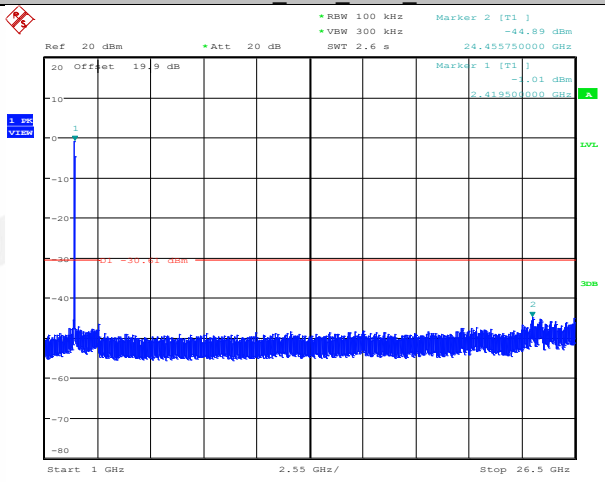

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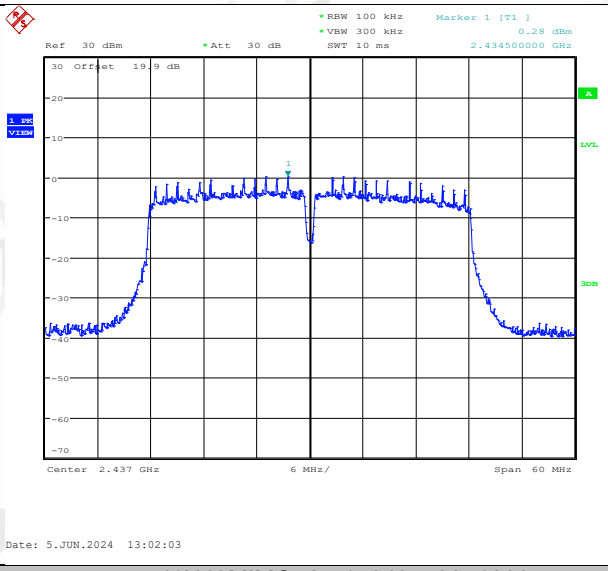
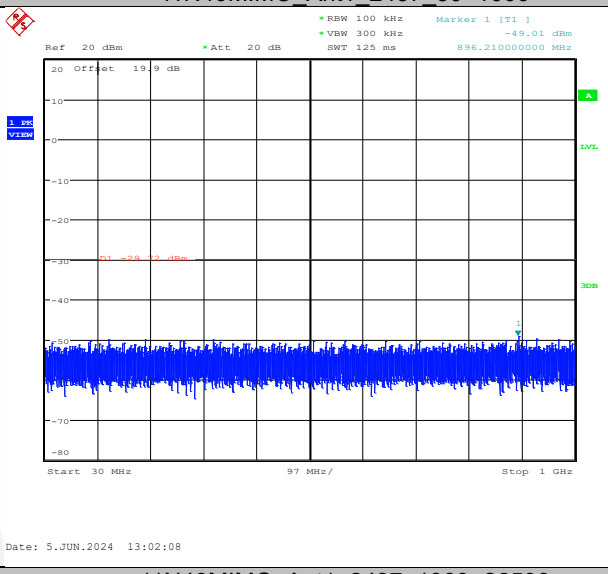
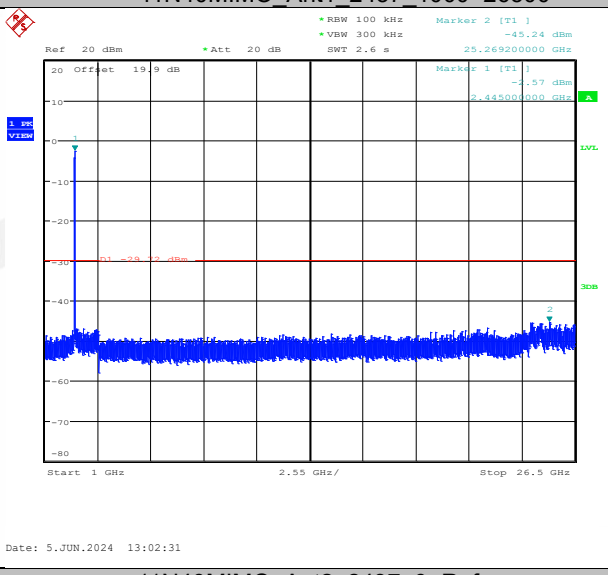


11N40MIMO_Ant1_2437_30~1000



11N40MIMO_Ant1_2437_1000~26500



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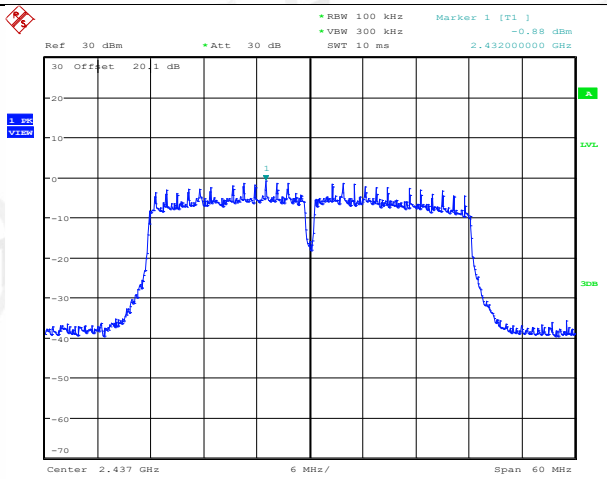
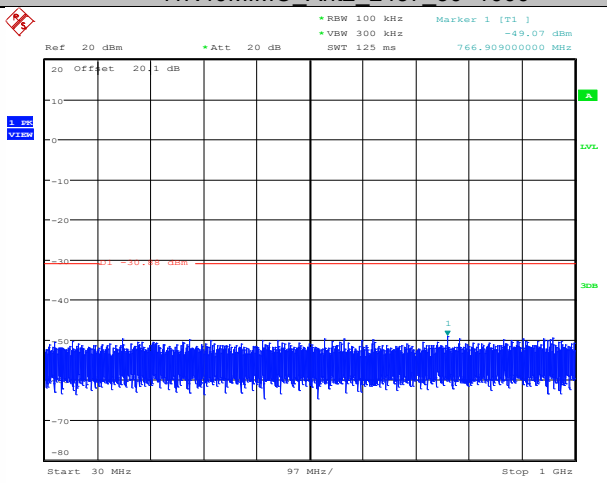
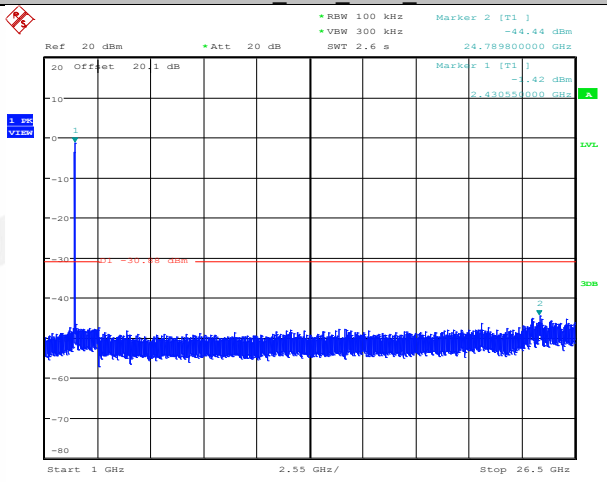


11N40MIMO_Ant2_2437_30~1000



11N40MIMO_Ant2_2437_1000~26500



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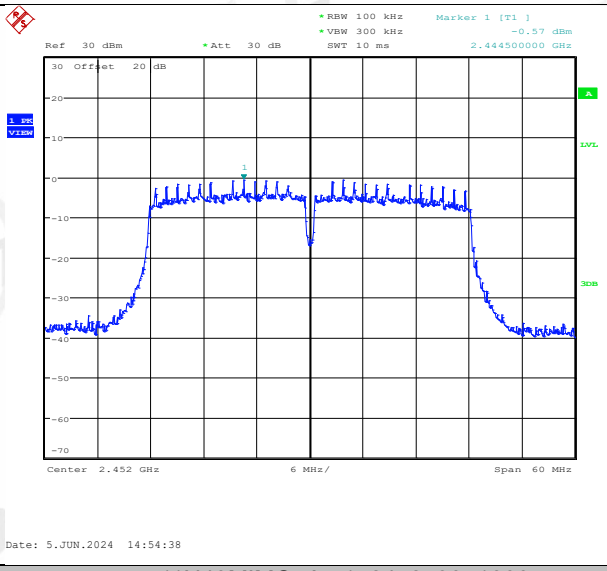
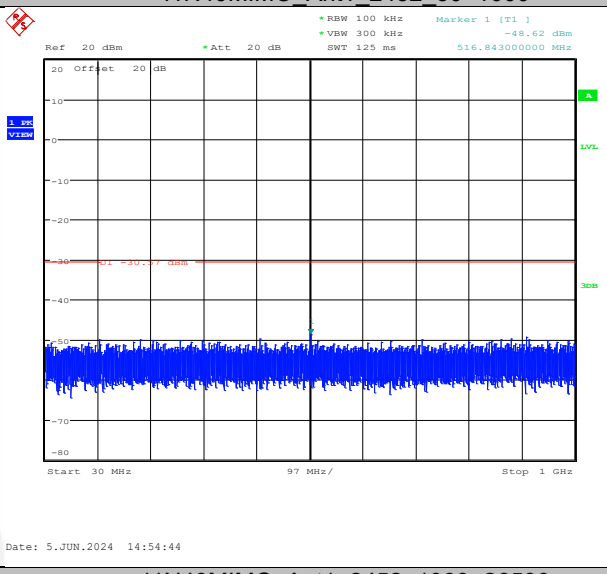


11N40MIMO_Ant1_2452_30~1000



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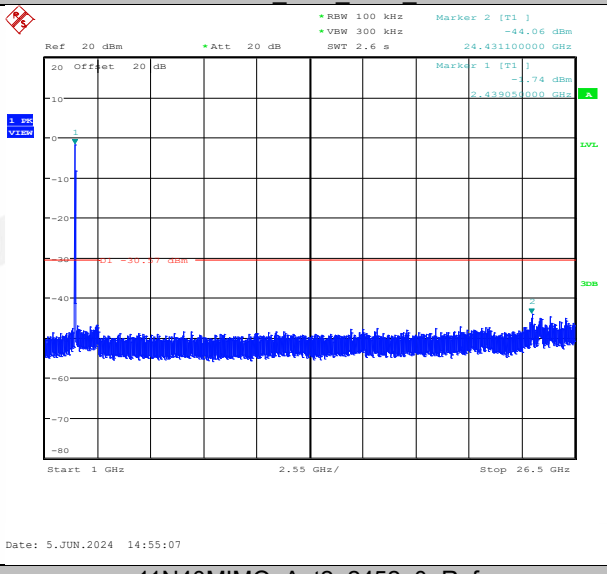

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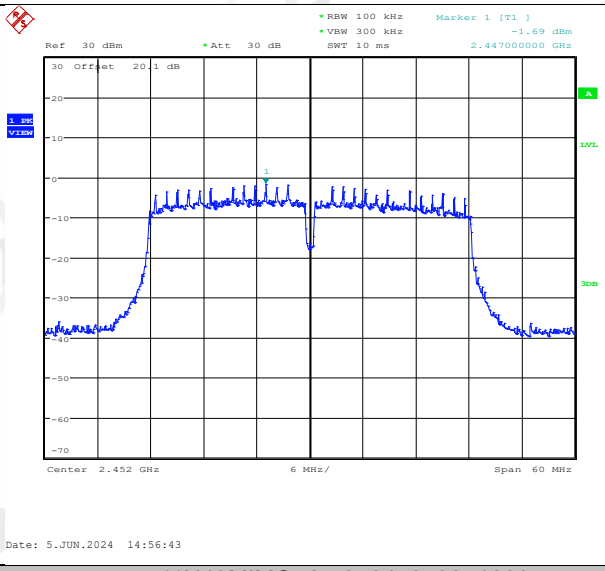
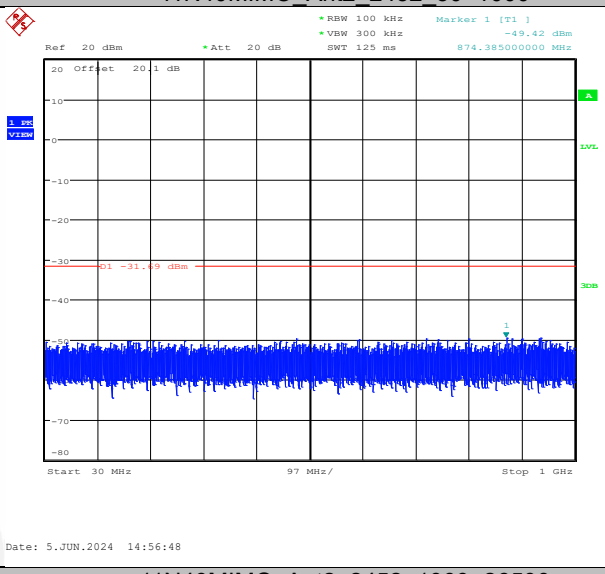
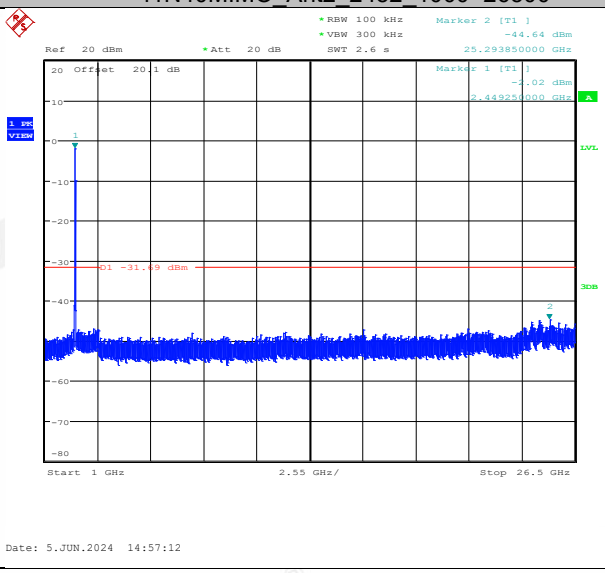


11N40MIMO_Ant2_2452_30~1000

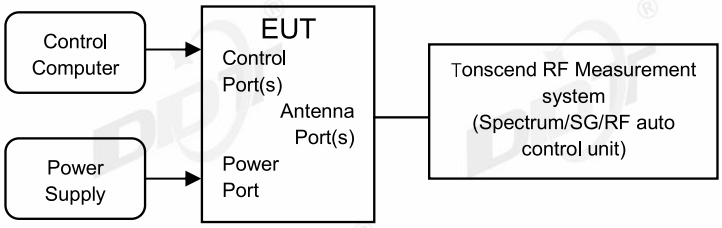


11N40MIMO_Ant2_2452_1000~26500



10. Duty Cycle

10.1. Block diagram of test setup



10.2. Limit

Just for Report.

10.3. Test procedure

(1) Connected the EUT's antenna port to the Spectrum Analyzer by suitable attenuator, The cable loss and attenuator loss have been put into spectrum analyzer as amplitude offset.
set the Spectrum Analyzer as below:
Centre Frequency: The centre frequency of the middle hopping channel.
Resolution BW: 10 MHz.
Video BW: 10 MHz.
Span: Zero span.
Detector: Peak.
Trace Mode: Clear Write.
Sweep: Video Trigger

(2) When the trace is complete, measure the sending time of 1 burst and the duty cycle of 1 burst cycle.

(3) Calculate dwell time follow below formula:
Duty cycle= Pulse's on time / Burst cycle

10.4. Test result

Test Engineer:	Zora Zhang	Test Site:	RF Measurement System 1#
Ambient Condition:	25.1℃,52.5%RH	Test Date:	2024.06.05-2024.06.13
Test Power Supply:	DC 12V	Sample Number:	S24042530-001

Test Mode	Antenna	Frequency [MHz]	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]
11B	Ant1	2412	12.45	12.81	97.19
	Ant2	2412	12.44	12.88	96.58
	Ant1	2437	12.44	12.88	96.58
	Ant2	2437	12.44	12.90	96.43
	Ant1	2462	12.44	12.86	96.73
	Ant2	2462	12.44	12.78	97.34
11G	Ant1	2412	2.07	2.27	91.19
	Ant2	2412	2.08	2.23	93.27
	Ant1	2437	2.07	2.27	91.19
	Ant2	2437	2.08	2.22	93.69
	Ant1	2462	2.07	2.22	93.24
	Ant2	2462	2.08	2.27	91.63
11N20MIMO	Ant1	2412	1.93	2.14	90.19
	Ant2	2412	1.93	2.08	92.79
	Ant1	2437	1.93	2.11	91.47
	Ant2	2437	1.94	2.16	89.81
	Ant1	2462	1.94	2.16	89.81
	Ant2	2462	1.93	2.12	91.04
11N40MIMO	Ant1	2422	0.95	1.15	82.61
	Ant2	2422	0.95	1.17	81.20
	Ant1	2437	0.95	1.18	80.51
	Ant2	2437	0.95	1.18	80.51
	Ant1	2452	0.95	1.17	81.20
	Ant2	2452	0.95	1.11	85.59