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 1300XMK2
FCC ID	:	APIBAR1300MK2
IC	:	6132A-BAR1300MK2
Test Standard(s)	:	FCC Rules and Regulations Part 15 Subpart E, RSS-247 Issue 3 August 2023, ANSI C63.10:2013, 789033 D02 General U-NII Test Procedures New Rules v02r01, 662911 D01 Multiple Transmitter Output v02r01, RSS-Gen Issue 5 April 2018
Report No.	:	DDT-RE24111520-1E04
Issue Date	:	2025/03/14
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

Table of Contents

1. Summary of Test Results 7
2. General Test Information 8
2.1. Description of EUT 8
2.2. Accessories of EUT 9
2.3. Block diagram of EUT configuration for test 10
2.4. Decision of final test mode 10
2.5. Deviations of test standard 13
2.6. Test environment conditions 13
2.7. Test laboratory 13
2.8. Measurement uncertainty 14
3. Equipment Used During Conductive Test 15
4. 26dB Bandwidth 16
4.1. Block diagram of test setup 16
4.2. Limits 16
4.3. Test procedure 16
4.4. Test result 17
4.5. Test graphs 21
5. 6dB Bandwidth 84
5.1. Block diagram of test setup 84
5.2. Limits 84
5.3. Test procedure 84
5.4. Test result B4 85
5.5. Test graphs B4 86
6. 99% Bandwidth 100
6.1. Block diagram of test setup 100
6.2. Limits 100
6.3. Test procedure 100
6.4. Test result 101
6.5. Test graphs 105
7. Duty Cycle 168
7.1. Block diagram of test setup 168
7.2. Limit 168
7.3. Test procedure 168
7.4. Test result 169
7.5. Test graphs 178
8. Maximum Output Power 332

8.1. Block diagram of test setup 332
8.2. Limits 332
8.3. Test procedure 332
8.4. Test result channel power 333
9. Power Spectral Density 347
9.1. Block diagram of test setup 347
9.2. Limits 347
9.3. Test procedure 347
9.4. Test result 349
9.5. Test graphs 365
10. Frequency Stability Measurement 533
10.1. Limit of Frequency Stability 533
10.2. Measuring Instruments 533
10.3. Test procedures 533
10.4. Test setup 533
10.5. Test result 534
11. Dynamic Frequency Selection 542
11.1. Applicability of DFS requirements 542
11.2. Limit 543
11.3. Parameters of radar test waveforms 543
11.4. Calibration of radar waveform 544
11.5. Channel closing transmission time, channel move time and non-occupancy period549
11.6. Test setup 549
11.7. Test result 551
12. Antenna Requirements 552
12.1. Limit 552
12.2. Result 552
13. Radiated Emission 553
13.1. Test equipment 553
13.2. Block diagram of test setup 554
13.3. Limits 555
13.4. Assistant equipment used for test 557
13.5. Test procedure 557
13.6. Test result 558
13.7. Test data 559
14. Band Edge Compliance 587
14.1. Test equipment 587
14.2. Block diagram of test setup 588

14.3. Limits 588
14.4. Assistant equipment used for test 588
14.5. Test procedure 588
14.6. Test result 589
14.7. Test data 590
15. Power Line Conducted Emissions 748
15.1. Test equipment 748
15.2. Block diagram of test setup 748
15.3. Limits 748
15.4. Assistant equipment used for test 748
15.5. Test procedure 748
15.6. Test result 749
15.7. Test data 750
16. Test Setup Photograph 752
17. Photos of the EUT 754

Test Report Declare

Applicant	:	Harman International Industries, Inc.
Address of Applicant	:	8500 Balboa Boulevard, Northridge, CA 91329, UNITED STATES
Equipment under Test	:	Multi-Channel Soundbar with wireless subwoofer
Model No.	:	BAR 1300XMK2
Manufacturer	:	Harman International Industries, Inc.
Address of Manufacturer	:	8500 Balboa Boulevard, Northridge, CA 91329, UNITED STATES

Test Standard Used:

FCC Rules and Regulations Part 15 Subpart E,
RSS-247 Issue 3 August 2023,
ANSI C63.10:2013,
789033 D02 General U-NII Test Procedures New Rules v02r01,
662911 D01 Multiple Transmitter Output v02r01,
RSS-Gen Issue 5 April 2018

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-RE24111520-1E04		
Date of Receipt:	2024/11/26	**Date of Test:**	2024/11/26 - 2025/03/14

Created: Bobo Chen	Reviewed: Ella Gong	Approved: Damon Hu
Bobo Chen	Ella Gong	GUANGDONG DONGDIAN TESTING SERVICE CO.,LTD. 广东电检测技术有限公司 Damon Hu Certificate and Report Seal 检验检测专用章
2025/03/14	2025/03/14	2025/03/14

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	2025/03/14	

1. Summary of Test Results

No.	Test Parameter	Clause No.	Condition	Result
1	6/26db Bandwidth and 99% Bandwidth	FCC 15.407 (e), RSS-247 Clause 6.2, RSS-GEN Clause 6.7	/	Pass
2	Output Power	FCC 15.407 (a)； RSS-247 Clause 6.2	/	Pass
3	Power Spectral Density	FCC 15.407 (a)； RSS-247 Clause 6.2	/	Pass
4	Frequency Stability Measurement	FCC 15.407 (g); RSS-247 Clause 6.2; RSS-GEN Clause 8.11	/	Pass
5	Radiated Emission	FCC 15.407 (b); FCC 15.209; FCC 15.205; RSS-247 Clause 6.2; RSS-GEN Clause 8.9	/	Pass
6	Band Edge Compliance	FCC 15.407 (b); FCC 15.209; FCC 15.205; RSS-247 Clause 6.2; RSS-GEN Clause 8.10	/	Pass
7	Antenna Requirement	FCC Part 15: 15.203, RSS-Gen Issue 5 clause 6.8	/	Pass
8	Dynamic Frequency Selection	FCC 15.407 (h); RSS-247 Clause 6.8	/	Pass
9	Power Line Conducted Emissions	FCC Part 15: 15.207(a), RSS-Gen Issue 5 clause 8.8	/	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 1300XMK2
EUT Function Description	:	Please reference user manual of this device
Power Supply	:	AC 100-240V, 50/60Hz, 160W

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

Radio Technology	:	IEEE 802.11a/n/ac/ax
Operation frequency	:	U-NII-1: 5180 MHz to 5240 MHz U-NII-2A: 5260 MHz to 5320 MHz U-NII-2C: 5500 MHz to 5720 MHz U-NII-3: 5745 MHz to 5825 MHz
Modulation	:	IEEE 802.11a: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11ac: OFDM (256QAM, 64QAM, 16QAM, QPSK, BPSK) IEEE 802.11ax: OFDM, OFDMA (1024QAM,256QAM, 64QAM, 16QAM, QPSK, BPSK)

Antenna information			
Antenna Type	FPC		
Max Antenna Gain (dBi)		Ant1 Gain	Ant2 Gain
	IEEE 802.11a	2.44	2.46
	IEEE 802.11n HT20	2.44	2.46
	IEEE 802.11n HT40	2.44	2.46
	IEEE 802.11ac VHT20	2.44	2.46
	IEEE 802.11ac VHT40	2.44	2.46
	IEEE 802.11ac VHT80	2.44	2.46
	IEEE 802.11ax HE20	2.44	2.46
	IEEE 802.11ax HE40	2.44	2.46
	IEEE 802.11ax HE80	2.44	2.46
Note: This product does not support beamforming.			

Channel information					
IEEE 802.11a IEEE 802.11n (HT20) IEEE 802.11ac (VHT20) IEEE 802.11ax (HE20)		IEEE 802.11n (HT40) IEEE 802.11ac (VHT40) IEEE 802.11ax (HE40)		IEEE 802.11ac (VHT80) IEEE 802.11ax (HE80)	
UNII-1					
CH	Frequency (MHz)	CH	Frequency (MHz)	CH	Frequency (MHz)
36	5180	38	5190	42	5210
40	5200	46	5230	/	/
44	5220	/	/	/	/

48	5240	/	/	/	/
UNII-2A					
52	5260	54	5270	58	5290
56	5280	62	5310		/
60	5300	/	/	/	/
64	5320	/	/	/	/
UNII-2C					
100	5500	102	5510	106	5530
104	5520	110	5550	122	5610
108	5540	118	5590	138	5690
112	5560	126	5630	/	/
116	5580	134	5670	/	/
120	5600	142	5710	/	/
124	5620	/	/	/	/
128	5640	/	/	/	/
132	5660	/	/	/	/
136	5680	/	/	/	/
140	5700	/	/	/	/
144	5720	/	/	/	/
UNII-3					
149	5745	151	5755	155	5775
153	5765	159	5795	/	/
157	5785	/	/	/	/
161	5805	/	/	/	/
165	5825	/	/	/	/
Note: Band 5600-5650MHz will be disabled when shipped to Canada					

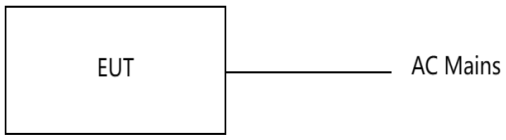
Note: The above EUT information is declared by manufacturer and for more detailed features description please refer to the manufacturer's specifications or User's Manual. The above Antenna information is declared by manufacturer and for more detailed features description please refer to the manufacturer's 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: 2 dB (According to the manufacturer's claims)

Tested mode, Tx Power Setting, Data rate, Channel, and Frequency					
Tested mode	Tx Power Setting		Data rate (Mpbs) (see Note)	Test Channel	Frequency (MHz)
	ANT1	ANT2			
IEEE 802.11a	15	15	6	LCH: CH36	5180
	15	15	6	MCH: CH40	5200
	15	15	6	HCH: CH48	5240
	15	15	6	LCH: CH52	5260
	15	15	6	MCH: CH56	5280
	15	15	6	HCH: CH64	5320
	15	15	6	LCH: CH100	5500
	15	15	6	MCH: CH116	5580
	15	15	6	HCH: CH140	5700
	15	15	6	Straddle: CH144	5720
	15	15	6	LCH: CH149	5745
	15	15	6	MCH: CH157	5785
	15	15	6	HCH: CH165	5825
IEEE 802.11n HT20	14	14	MCS 8	LCH: CH36	5180
	14	14	MCS 8	MCH: CH40	5200
	14	14	MCS 8	HCH: CH48	5240
	15	15	MCS 8	LCH: CH52	5260
	15	15	MCS 8	MCH: CH56	5280
	15	15	MCS 8	HCH: CH64	5320
	15	15	MCS 8	LCH: CH100	5500
	15	15	MCS 8	MCH: CH116	5580

	15	15	MCS 8	HCH: CH140	5700
	15	15	MCS 8	Straddle: CH144	5720
	15	15	MCS 8	LCH: CH149	5745
	15	15	MCS 8	MCH: CH157	5785
	15	15	MCS 8	HCH: CH165	5825
IEEE 802.11n HT40	14	14	MCS 8	LCH: CH38	5190
	14	14	MCS 8	HCH: CH46	5230
	14	14	MCS 8	LCH: CH54	5270
	14	14	MCS 8	HCH: CH62	5310
	14	14	MCS 8	LCH: CH102	5510
	14	14	MCS 8	MCH: CH110	5550
	14	14	MCS 8	HCH: CH134	5670
	14	14	MCS 8	Straddle: CH151	5710
	14	14	MCS 8	LCH: CH151	5755
	14	14	MCS 8	HCH: CH159	5795
IEEE 802.11ac VHT20	14	14	MCS 0	LCH: CH36	5180
	14	14	MCS 0	MCH: CH40	5200
	14	14	MCS 0	HCH: CH48	5240
	15	15	MCS 0	LCH: CH52	5260
	15	15	MCS 0	MCH: CH56	5280
	15	15	MCS 0	HCH: CH64	5320
	15	15	MCS 0	LCH: CH100	5500
	15	15	MCS 0	MCH: CH116	5580
	15	15	MCS 0	HCH: CH140	5700
	15	15	MCS 0	Straddle: CH144	5720
	15	15	MCS 0	LCH: CH149	5745
	15	15	MCS 0	MCH: CH157	5785
	15	15	MCS 0	HCH: CH165	5825
IEEE 802.11 ac VHT40	14	14	MCS 0	LCH: CH38	5190
	14	14	MCS 0	HCH: CH46	5230
	14	14	MCS 0	LCH: CH54	5270
	14	14	MCS 0	HCH: CH62	5310
	14	14	MCS 0	LCH: CH102	5510
	14	14	MCS 0	MCH: CH110	5550
	14	14	MCS 0	HCH: CH134	5670
	14	14	MCS 0	Straddle: CH151	5710
	14	14	MCS 0	LCH: CH159	5755
	14	14	MCS 0	HCH: CH36	5795
IEEE 802.11ac VHT80	14	14	MCS 0	CH42	5210
	14	14	MCS 0	CH58	5290

	14	14	MCS 0	LCH: CH106	5530
	14	14	MCS 0	HCH: CH122	5610
	14	14	MCS 0	Straddle: CH138	5690
	14	14	MCS 0	CH155	5775
IEEE 802.11ax HE20	SU: 15 RU: 6	SU: 15 RU: 6	MCS 0	LCH: CH36	5180
	SU: 15 RU: 6	SU: 15 RU: 6	MCS 0	MCH: CH40	5200
	SU: 15 RU: 6	SU: 15 RU: 6	MCS 0	HCH: CH48	5240
	SU: 15 RU: 9	SU: 15 RU: 9	MCS 0	LCH: CH52	5260
	SU: 15 RU: 9	SU: 15 RU: 9	MCS 0	MCH: CH56	5280
	SU: 15 RU: 9	SU: 15 RU: 9	MCS 0	HCH: CH64	5320
	SU: 15 RU: 9	SU: 15 RU: 9	MCS 0	LCH: CH100	5500
	SU: 15 RU: 9	SU: 15 RU: 9	MCS 0	MCH: CH116	5580
	SU: 15 RU: 9	SU: 15 RU: 9	MCS 0	HCH: CH140	5700
	SU: 15 RU: 9	SU: 15 RU: 9	MCS 0	Straddle: CH144	5720
	SU: 15 RU: 9	SU: 15 RU: 9	MCS 0	LCH: CH149	5745
	SU: 15 RU: 9	SU: 15 RU: 9	MCS 0	MCH: CH157	5785
	SU: 15 RU: 9	SU: 15 RU: 9	MCS 0	HCH: CH165	5825
IEEE 802.11ax HE40	SU: 14 RU: 6	SU: 14 RU: 6	MCS 0	LCH: CH38	5190
	SU: 14 RU: 6	SU: 14 RU: 6	MCS 0	HCH: CH46	5230
	SU: 14 RU: 10	SU: 14 RU: 10	MCS 0	LCH: CH54	5270
	SU: 14 RU: 10	SU: 14 RU: 10	MCS 0	HCH: CH62	5310
	SU: 14 RU: 10	SU: 14 RU: 10	MCS 0	LCH: CH102	5510
	SU: 14 RU: 10	SU: 14 RU: 10	MCS 0	MCH: CH110	5550
	SU: 14 RU: 10	SU: 14 RU: 10	MCS 0	HCH: CH134	5670
	SU: 14 RU: 10	SU: 14 RU: 10	MCS 0	Straddle: CH151	5710
	SU: 14 RU: 10	SU: 14 RU: 10	MCS 0	LCH: CH159	5755
	SU: 14 RU: 10	SU: 14 RU: 10	MCS 0	HCH: CH36	5795
IEEE 802.11ax HE80	SU: 14 RU: 6	SU: 14 RU: 6	MCS 0	CH42	5210
	SU: 14 RU: 10	SU: 14 RU: 10	MCS 0	CH58	5290

	SU: 14 RU: 10	SU: 14 RU: 10	MCS 0	LCH: CH106	5530
	SU: 14 RU: 10	SU: 14 RU: 10	MCS 0	HCH: CH122	5610
	SU: 14 RU: 10	SU: 14 RU: 10	MCS 0	Straddle: CH138	5690
	SU: 14 RU: 10	SU: 14 RU: 10	MCS 0	CH155	5775
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-20240, G-20118

2.8. Measurement uncertainty

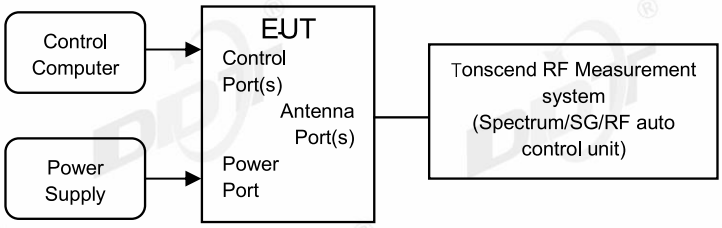
Test Item	Uncertainty
Bandwidth	1.1%
Peak Output Power (Conducted) (Spectrum analyzer)	0.86 dB (10 MHz ≤ f < 3.6 GHz);
	1.38 dB (3.6 GHz ≤ f < 8 GHz)
Peak Output Power (Conducted) (Power Sensor)	0.74 dB
Power Spectral Density	0.74 dB (10 MHz ≤ f < 3.6 GHz);
	1.38 dB (3.6 GHz ≤ f < 8 GHz)
Frequencies Stability	6.7 x 10^{-8} (Antenna couple method)
	5.5 x 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	2025/07/08
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. 26dB Bandwidth

4.1. Block diagram of test setup



4.2. Limits

FCC Part15, Subpart E/ RSS-247		
Test Item	Limit	Frequency Range (MHz)
26 dB Bandwidth	---	5150 - 5250
	---	5250 - 5350
	---	For FCC: 5470 - 5725 For IC: 5470 - 5600 5650 - 5725

4.3. Test procedure

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

Center Frequency	The center frequency of the channel under test
Detector	Peak
RBW	approximately 1% of the emission bandwidth.
VBW	> RBW
Trace	Max hold
Sweep	Auto couple

Allow the trace to stabilize, measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 26 dB relative to the maximum level measured in the fundamental emission.

4.4. Test result

Test Engineer:	Zora Zhang	Test Site:	RF Measurement System 1#
Ambient Condition:	23.4℃,36.6%RH	Test Date:	2024.12.03-2025.02.26
Test Power Supply:	AC 120V/60Hz	Sample Number:	S24111520-011

Test Mode	Antenna	Frequency[MHz]	26db EBW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A	Ant1	5180	24.76	5167.44	5192.20	---	---
	Ant2	5180	24.72	5167.48	5192.20	---	---
	Ant1	5200	26.04	5186.60	5212.64	---	---
	Ant2	5200	26.04	5186.60	5212.64	---	---
	Ant1	5240	20.00	5230.04	5250.04	---	---
	Ant2	5240	19.84	5230.04	5249.88	---	---
	Ant1	5260	25.08	5247.40	5272.48	---	---
	Ant2	5260	25.40	5247.36	5272.76	---	---
	Ant1	5280	25.20	5267.36	5292.56	---	---
	Ant2	5280	24.48	5267.72	5292.20	---	---
	Ant1	5320	26.00	5306.68	5332.68	---	---
	Ant2	5320	26.00	5306.68	5332.68	---	---
	Ant1	5500	25.88	5487.00	5512.88	---	---
	Ant2	5500	25.16	5487.08	5512.24	---	---
	Ant1	5580	25.04	5567.72	5592.76	---	---
	Ant2	5580	25.08	5567.60	5592.68	---	---
	Ant1	5700	26.12	5687.12	5713.24	---	---
	Ant2	5700	25.36	5687.36	5712.72	---	---
	Ant1	5720	25.36	5706.88	5732.24	---	---
	Ant2	5720	25.32	5707.08	5732.40	---	---
	Ant1	5720_UNII-2C	18.12	5706.88	5725	---	---
	Ant2	5720_UNII-2C	17.92	5707.08	5725	---	---
	Ant1	5720_UNII-3	7.24	5725	5732.24	---	---
	Ant2	5720_UNII-3	7.4	5725	5732.40	---	---
	Ant1	5745	24.48	5732.92	5757.40	---	---
	Ant2	5745	24.64	5732.80	5757.44	---	---
	Ant1	5785	25.56	5772.20	5797.76	---	---
	Ant2	5785	25.44	5772.20	5797.64	---	---
	Ant1	5825	25.04	5812.16	5837.20	---	---
	Ant2	5825	24.96	5812.24	5837.20	---	---
11N20MIMO	Ant1	5180	26.16	5166.88	5193.04	---	---
	Ant2	5180	25.36	5166.56	5191.92	---	---
	Ant1	5200	26.48	5186.32	5212.80	---	---
	Ant2	5200	27.20	5185.56	5212.76	---	---
	Ant1	5240	20.24	5229.84	5250.08	---	---
	Ant2	5240	20.16	5229.92	5250.08	---	---
	Ant1	5260	26.16	5247.08	5273.24	---	---
	Ant2	5260	24.52	5247.80	5272.32	---	---
	Ant1	5280	25.76	5267.12	5292.88	---	---
	Ant2	5280	24.52	5267.72	5292.24	---	---
	Ant1	5320	25.96	5306.92	5332.88	---	---
	Ant2	5320	25.56	5306.56	5332.12	---	---
	Ant1	5500	26.60	5486.28	5512.88	---	---
	Ant2	5500	26.32	5485.96	5512.28	---	---
	Ant1	5580	26.32	5566.56	5592.88	---	---
	Ant2	5580	25.16	5567.44	5592.60	---	---
	Ant1	5700	27.32	5685.72	5713.04	---	---
	Ant2	5700	25.32	5686.56	5711.88	---	---
	Ant1	5720	26.12	5706.92	5733.04	---	---
	Ant2	5720	24.48	5707.40	5731.88	---	---
	Ant1	5720_UNII-2C	18.08	5706.92	5725	---	---
	Ant2	5720_UNII-2C	17.6	5707.40	5725	---	---
	Ant1	5720_UNII-3	8.04	5725	5733.04	---	---
	Ant2	5720_UNII-3	6.88	5725	5731.88	---	---
	Ant1	5745	25.92	5732.12	5758.04	---	---
	Ant2	5745	23.64	5733.28	5756.92	---	---

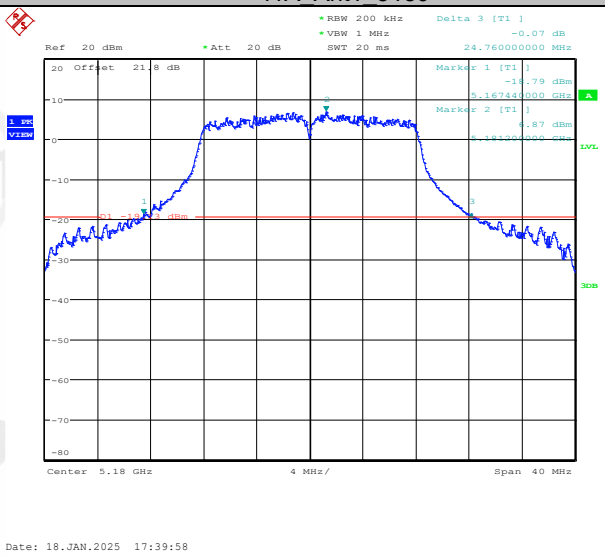
	Ant1	5785	25.80	5772.04	5797.84	---	---
	Ant2	5785	25.40	5772.32	5797.72	---	---
	Ant1	5825	25.96	5811.92	5837.88	---	---
	Ant2	5825	25.12	5812.20	5837.32	---	---
11N40MIMO	Ant1	5190	40.88	5169.68	5210.56	---	---
	Ant2	5190	39.92	5170.00	5209.92	---	---
	Ant1	5230	40.88	5209.52	5250.40	---	---
	Ant2	5230	39.76	5210.16	5249.92	---	---
	Ant1	5270	40.96	5249.60	5290.56	---	---
	Ant2	5270	39.92	5250.08	5290.00	---	---
	Ant1	5310	40.96	5289.52	5330.48	---	---
	Ant2	5310	40.00	5290.08	5330.08	---	---
	Ant1	5510	40.96	5489.52	5530.48	---	---
	Ant2	5510	40.00	5490.00	5530.00	---	---
	Ant1	5550	41.04	5529.52	5570.56	---	---
	Ant2	5550	39.84	5530.08	5569.92	---	---
	Ant1	5670	40.80	5649.60	5690.40	---	---
	Ant2	5670	39.92	5650.00	5689.92	---	---
	Ant1	5710	40.80	5689.52	5730.32	---	---
	Ant2	5710	40.00	5690.00	5730.00	---	---
	Ant1	5710_UNII-2C	35.48	5689.52	5725	---	---
	Ant2	5710_UNII-2C	35	5690.00	5725	---	---
	Ant1	5710_UNII-3	5.32	5725	5730.32	---	---
	Ant2	5710_UNII-3	5	5725	5730.00	---	---
	Ant1	5755	40.96	5734.60	5775.56	---	---
	Ant2	5755	39.84	5735.08	5774.92	---	---
	Ant1	5795	40.80	5774.60	5815.40	---	---
	Ant2	5795	39.92	5775.00	5814.92	---	---
11AC20MIMO	Ant1	5180	26.48	5166.48	5192.96	---	---
	Ant2	5180	24.40	5167.52	5191.92	---	---
	Ant1	5200	27.08	5186.44	5213.52	---	---
	Ant2	5200	24.96	5187.52	5212.48	---	---
	Ant1	5240	20.28	5229.80	5250.08	---	---
	Ant2	5240	19.92	5230.00	5249.92	---	---
	Ant1	5260	25.88	5247.16	5273.04	---	---
	Ant2	5260	23.88	5248.24	5272.12	---	---
	Ant1	5280	26.00	5267.12	5293.12	---	---
	Ant2	5280	23.84	5268.52	5292.36	---	---
	Ant1	5320	27.04	5306.48	5333.52	---	---
	Ant2	5320	24.64	5307.80	5332.44	---	---
	Ant1	5500	26.40	5486.52	5512.92	---	---
	Ant2	5500	24.64	5487.80	5512.44	---	---
	Ant1	5580	25.52	5567.40	5592.92	---	---
	Ant2	5580	23.64	5568.44	5592.08	---	---
	Ant1	5700	26.32	5687.16	5713.48	---	---
	Ant2	5700	24.16	5688.28	5712.44	---	---
	Ant1	5720	26.64	5706.52	5733.16	---	---
	Ant2	5720	24.80	5707.48	5732.28	---	---
	Ant1	5720_UNII-2C	18.48	5706.52	5725	---	---
	Ant2	5720_UNII-2C	17.52	5707.48	5725	---	---
	Ant1	5720_UNII-3	8.16	5725	5733.16	---	---
	Ant2	5720_UNII-3	7.28	5725	5732.28	---	---
	Ant1	5745	25.60	5732.60	5758.20	---	---
	Ant2	5745	23.48	5733.56	5757.04	---	---
	Ant1	5785	26.28	5771.96	5798.24	---	---
	Ant2	5785	23.92	5773.28	5797.20	---	---
	Ant1	5825	26.28	5811.88	5838.16	---	---
	Ant2	5825	24.68	5812.76	5837.44	---	---
11AC40MIMO	Ant1	5190	40.56	5169.60	5210.16	---	---
	Ant2	5190	39.84	5170.08	5209.92	---	---
	Ant1	5230	40.48	5209.68	5250.16	---	---
	Ant2	5230	39.92	5210.00	5249.92	---	---
	Ant1	5270	40.40	5249.84	5290.24	---	---
	Ant2	5270	39.84	5250.08	5289.92	---	---

	Ant1	5310	40.32	5289.76	5330.08	---	---
	Ant2	5310	40.00	5290.00	5330.00	---	---
	Ant1	5510	40.32	5489.84	5530.16	---	---
	Ant2	5510	39.76	5490.08	5529.84	---	---
	Ant1	5550	40.32	5529.76	5570.08	---	---
	Ant2	5550	39.60	5530.16	5569.76	---	---
	Ant1	5670	40.48	5649.76	5690.24	---	---
	Ant2	5670	39.84	5650.00	5689.84	---	---
	Ant1	5710	40.32	5689.76	5730.08	---	---
	Ant2	5710	39.60	5690.08	5729.68	---	---
	Ant1	5710_UNII-2C	35.24	5689.76	5725	---	---
	Ant2	5710_UNII-2C	34.92	5690.08	5725	---	---
	Ant1	5710_UNII-3	5.08	5725	5730.08	---	---
	Ant2	5710_UNII-3	4.68	5725	5729.68	---	---
	Ant1	5755	40.40	5734.76	5775.16	---	---
	Ant2	5755	39.60	5735.16	5774.76	---	---
	Ant1	5795	40.56	5774.76	5815.32	---	---
	Ant2	5795	39.76	5775.08	5814.84	---	---
11AC80MIMO	Ant1	5210	80.48	5169.68	5250.16	---	---
	Ant2	5210	79.68	5170.16	5249.84	---	---
	Ant1	5290	80.64	5249.68	5330.32	---	---
	Ant2	5290	79.52	5250.32	5329.84	---	---
	Ant1	5530	80.64	5489.68	5570.32	---	---
	Ant2	5530	79.68	5490.16	5569.84	---	---
	Ant1	5610	80.64	5569.68	5650.32	---	---
	Ant2	5610	79.52	5570.32	5649.84	---	---
	Ant1	5690	80.80	5649.52	5730.32	---	---
	Ant2	5690	79.68	5650.16	5729.84	---	---
	Ant1	5690_UNII-2C	75.48	5649.52	5725	---	---
	Ant2	5690_UNII-2C	74.84	5650.16	5725	---	---
	Ant1	5690_UNII-3	5.32	5725	5730.32	---	---
	Ant2	5690_UNII-3	4.84	5725	5729.84	---	---
	Ant1	5775	80.48	5734.68	5815.16	---	---
	Ant2	5775	79.52	5735.32	5814.84	---	---
11AX20MIMO	Ant1	5180	23.52	5167.96	5191.48	---	---
	Ant2	5180	23.96	5168.00	5191.96	---	---
	Ant1	5200	28.96	5185.52	5214.48	---	---
	Ant2	5200	27.80	5185.60	5213.40	---	---
	Ant1	5240	20.00	5229.96	5249.96	---	---
	Ant2	5240	19.92	5230.00	5249.92	---	---
	Ant1	5260	31.12	5243.16	5274.28	---	---
	Ant2	5260	24.24	5247.72	5271.96	---	---
	Ant1	5280	28.24	5265.04	5293.28	---	---
	Ant2	5280	23.96	5268.20	5292.16	---	---
	Ant1	5320	31.24	5303.36	5334.60	---	---
	Ant2	5320	29.20	5308.24	5337.44	---	---
	Ant1	5500	26.20	5486.16	5512.36	---	---
	Ant2	5500	24.08	5488.52	5512.60	---	---
	Ant1	5580	30.92	5564.84	5595.76	---	---
	Ant2	5580	23.56	5568.72	5592.28	---	---
	Ant1	5700	27.60	5685.32	5712.92	---	---
	Ant2	5700	24.36	5688.08	5712.44	---	---
	Ant1	5720	33.20	5702.64	5735.84	---	---
	Ant2	5720	25.16	5707.36	5732.52	---	---
	Ant1	5720_UNII-2C	22.36	5702.64	5725	---	---
	Ant2	5720_UNII-2C	17.64	5707.36	5725	---	---
	Ant1	5720_UNII-3	10.84	5725	5735.84	---	---
	Ant2	5720_UNII-3	7.52	5725	5732.52	---	---
	Ant1	5745	27.80	5731.16	5758.96	---	---
	Ant2	5745	23.00	5734.04	5757.04	---	---
	Ant1	5785	24.36	5773.28	5797.64	---	---
	Ant2	5785	25.00	5772.20	5797.20	---	---
	Ant1	5825	31.16	5808.64	5839.80	---	---
	Ant2	5825	24.44	5812.68	5837.12	---	---

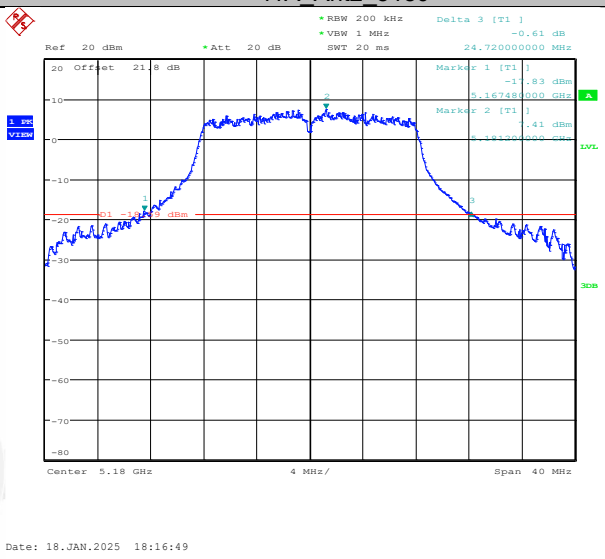
11AX40MIMO	Ant1	5190	39.68	5170.16	5209.84	---	---
	Ant2	5190	39.76	5170.16	5209.92	---	---
	Ant1	5230	39.76	5210.08	5249.84	---	---
	Ant2	5230	39.84	5210.08	5249.92	---	---
	Ant1	5270	39.76	5250.08	5289.84	---	---
	Ant2	5270	39.84	5250.08	5289.92	---	---
	Ant1	5310	39.68	5290.08	5329.76	---	---
	Ant2	5310	39.84	5290.08	5329.92	---	---
	Ant1	5510	39.76	5490.08	5529.84	---	---
	Ant2	5510	39.84	5490.00	5529.84	---	---
	Ant1	5550	39.76	5530.08	5569.84	---	---
	Ant2	5550	39.76	5530.16	5569.92	---	---
	Ant1	5670	39.76	5650.08	5689.84	---	---
	Ant2	5670	39.84	5650.08	5689.92	---	---
	Ant1	5710	39.68	5690.08	5729.76	---	---
	Ant2	5710	39.76	5690.08	5729.84	---	---
	Ant1	5710_UNII-2C	34.92	5690.08	5725	---	---
	Ant2	5710_UNII-2C	34.92	5690.08	5725	---	---
	Ant1	5710_UNII-3	4.76	5725	5729.76	---	---
	Ant2	5710_UNII-3	4.84	5725	5729.84	---	---
	Ant1	5755	39.60	5735.16	5774.76	---	---
	Ant2	5755	39.76	5735.08	5774.84	---	---
	Ant1	5795	39.68	5775.08	5814.76	---	---
	Ant2	5795	39.76	5775.08	5814.84	---	---
11AX80MIMO	Ant1	5210	80.80	5169.52	5250.32	---	---
	Ant2	5210	80.96	5169.52	5250.48	---	---
	Ant1	5290	80.80	5249.52	5330.32	---	---
	Ant2	5290	80.80	5249.52	5330.32	---	---
	Ant1	5530	80.80	5489.52	5570.32	---	---
	Ant2	5530	80.96	5489.52	5570.48	---	---
	Ant1	5610	80.80	5569.68	5650.48	---	---
	Ant2	5610	80.80	5569.52	5650.32	---	---
	Ant1	5690	80.80	5649.52	5730.32	---	---
	Ant2	5690	80.96	5649.52	5730.48	---	---
	Ant1	5690_UNII-2C	75.48	5649.52	5725	---	---
	Ant2	5690_UNII-2C	75.48	5649.52	5725	---	---
	Ant1	5690_UNII-3	5.32	5725	5730.32	---	---
	Ant2	5690_UNII-3	5.48	5725	5730.48	---	---
	Ant1	5775	80.64	5734.68	5815.32	---	---
	Ant2	5775	80.96	5734.52	5815.48	---	---

4.5. Test graphs

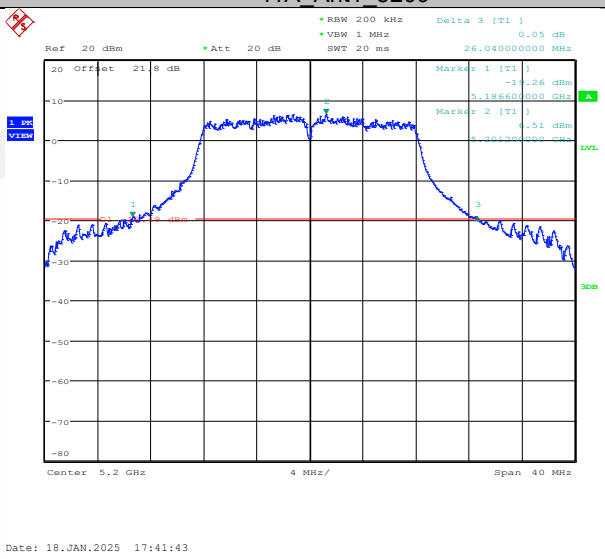
11A_Ant1_5180



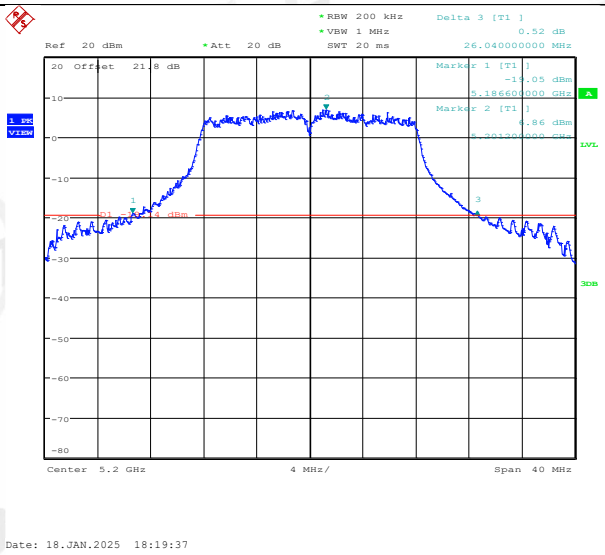
11A_Ant2_5180



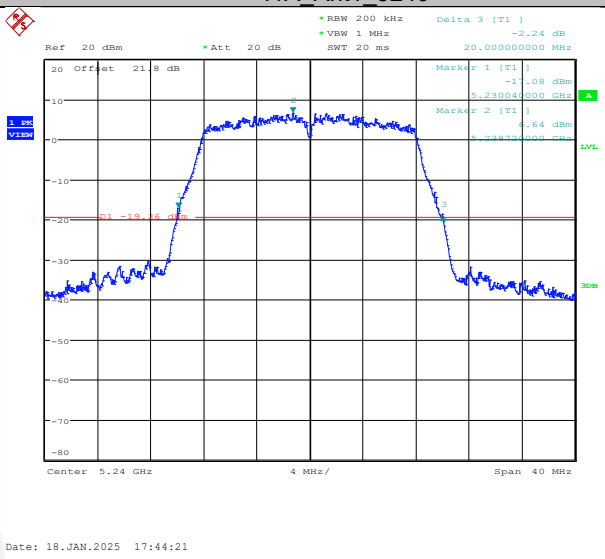
11A_Ant1_5200



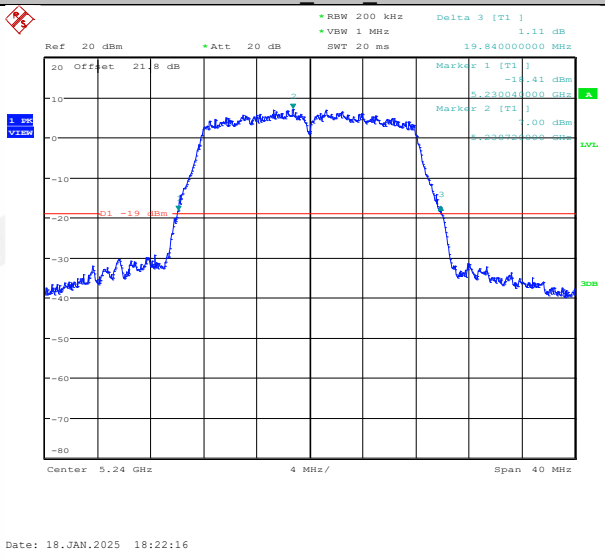
11A_Ant2_5200



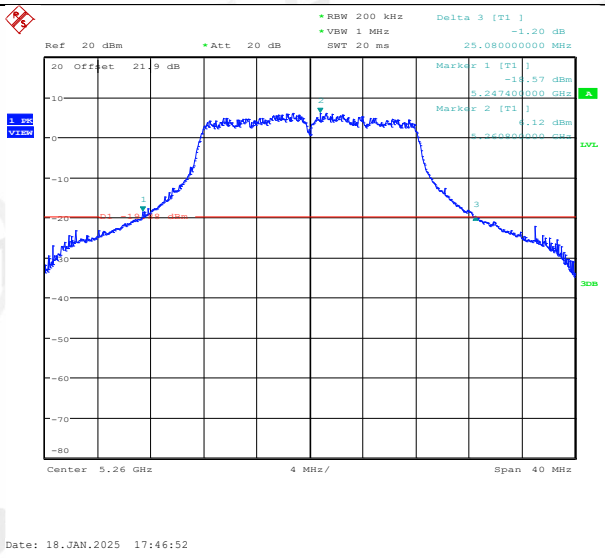
11A_Ant1_5240



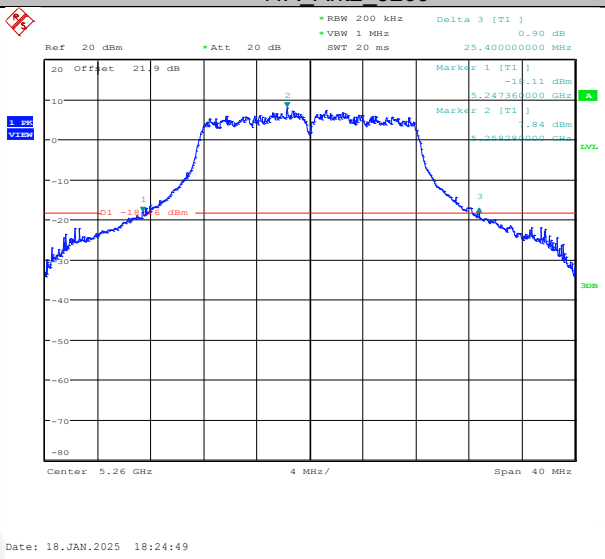
11A_Ant2_5240



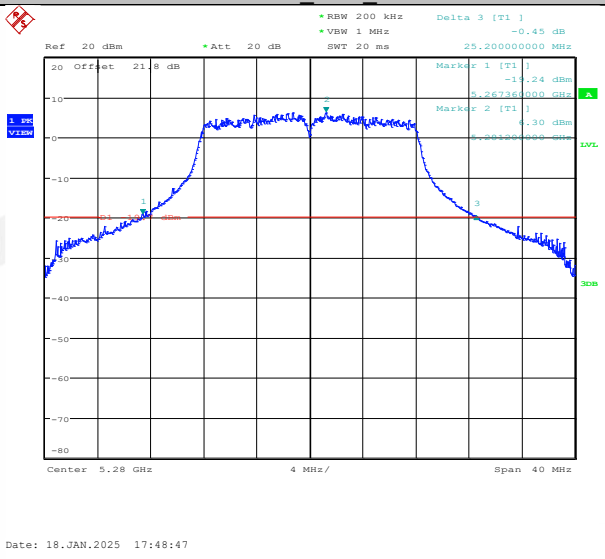
11A_Ant1_5260



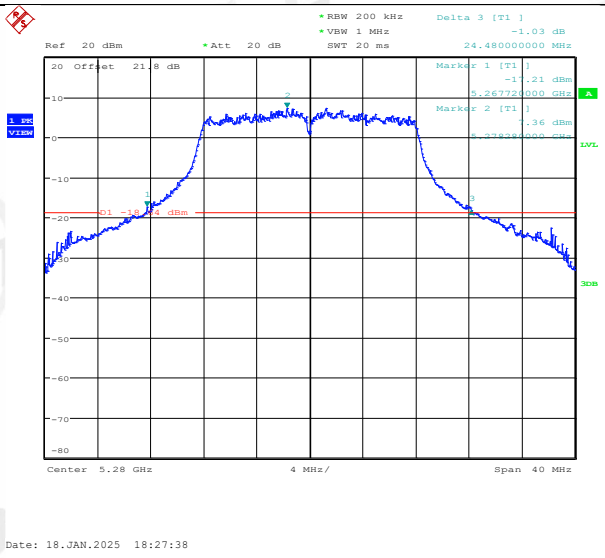
11A_Ant2_5260



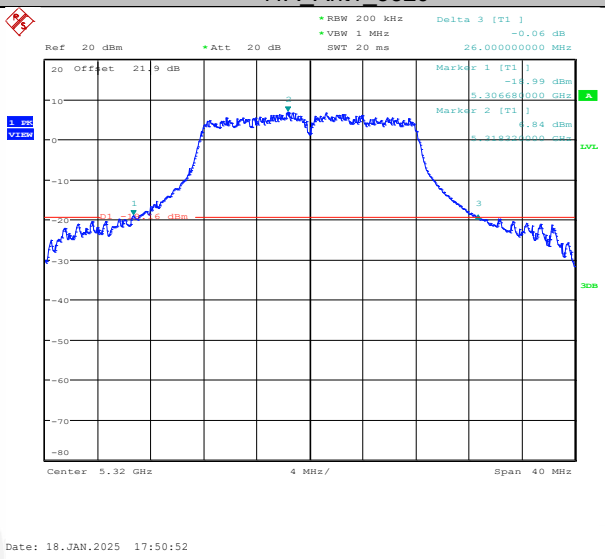
11A_Ant1_5280



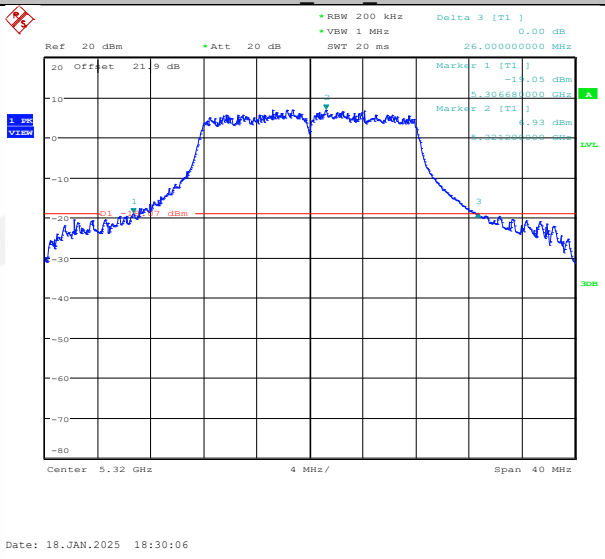
11A_Ant2_5280



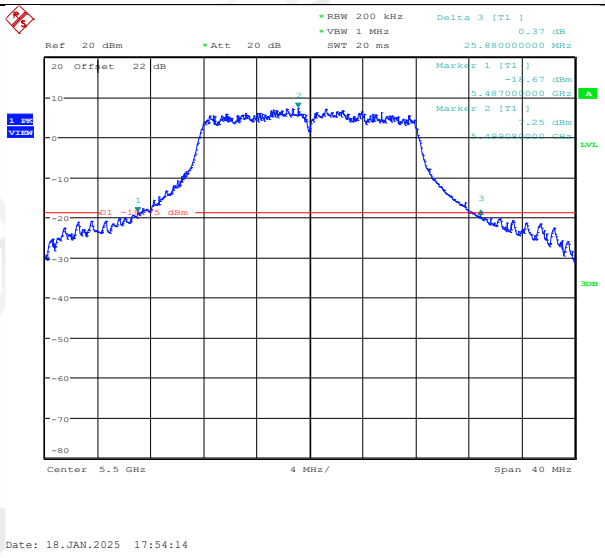
11A_Ant1_5320



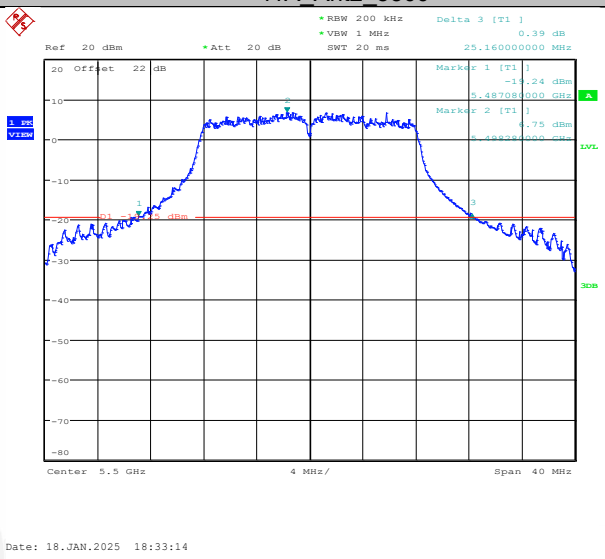
11A_Ant2_5320



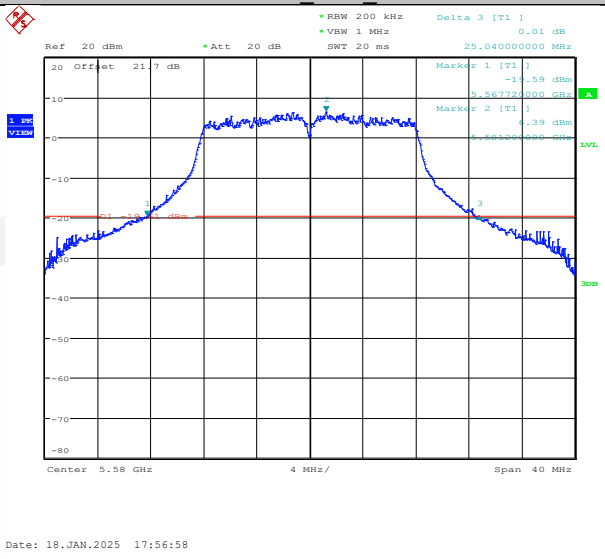
11A_Ant1_5500



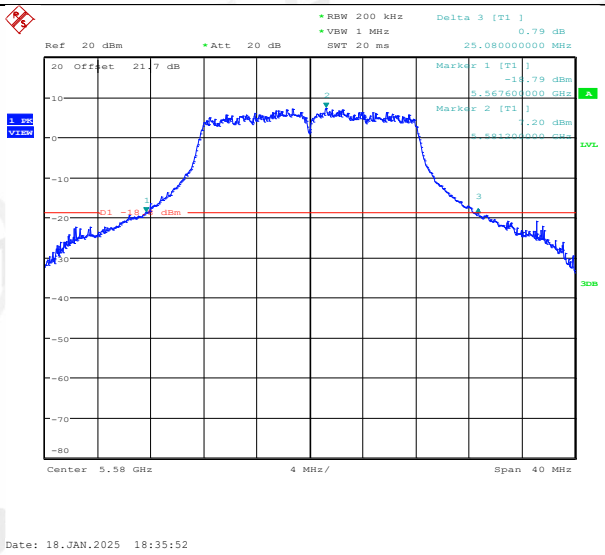
11A_Ant2_5500



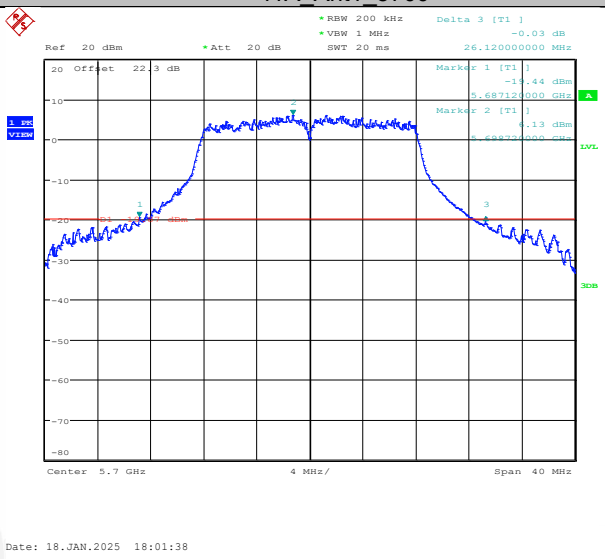
11A_Ant1_5580



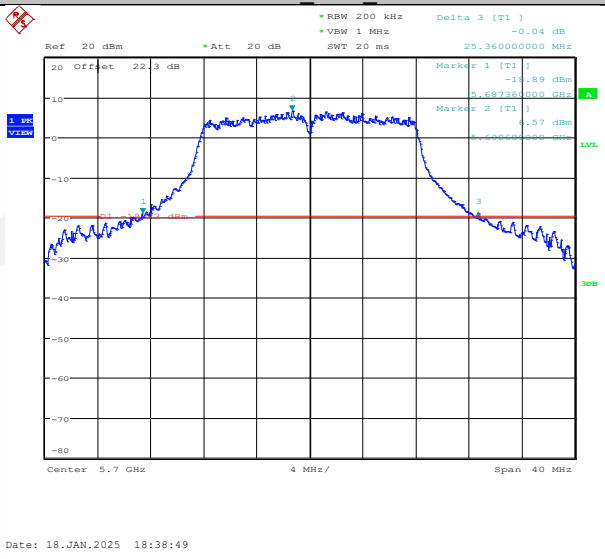
11A_Ant2_5580



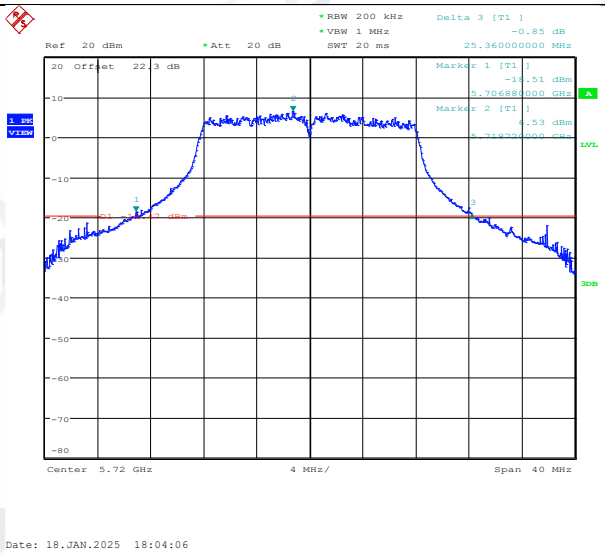
11A_Ant1_5700



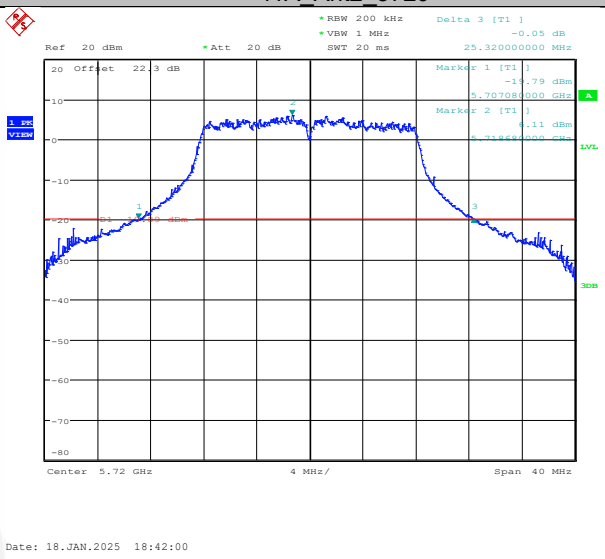
11A_Ant2_5700



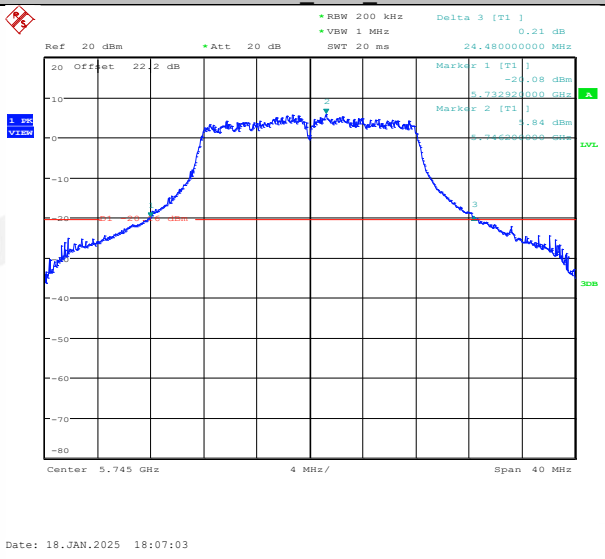
11A_Ant1_5720



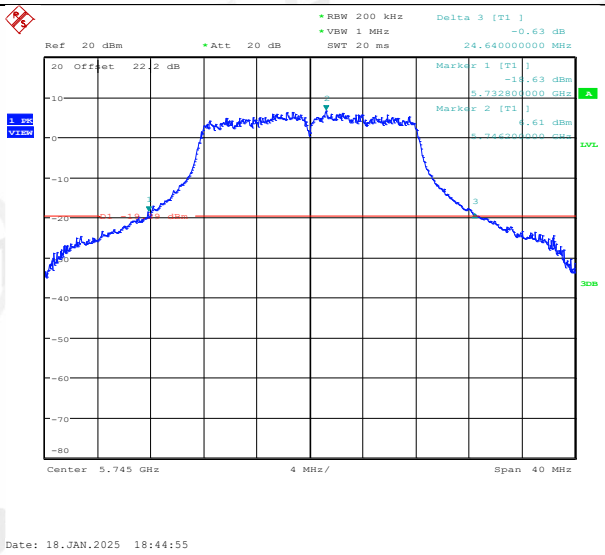
11A_Ant2_5720



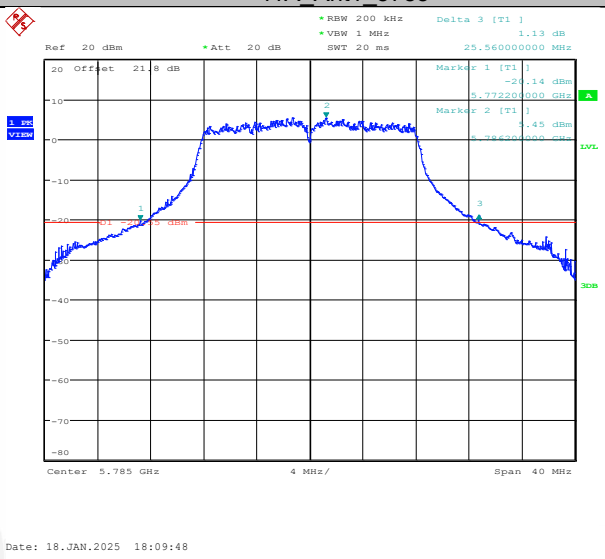
11A_Ant1_5745



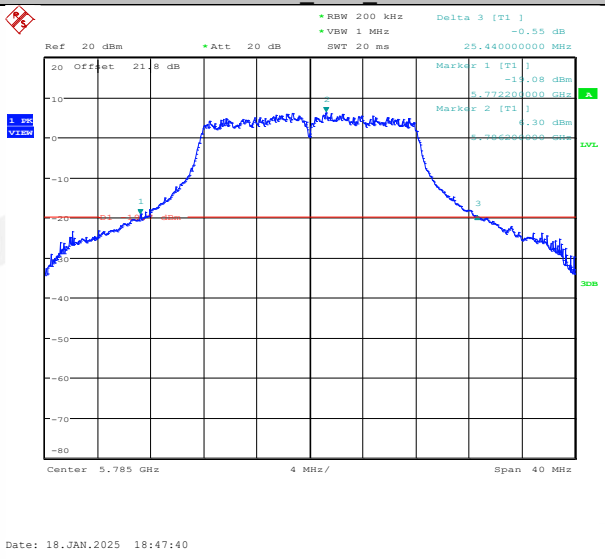
11A_Ant2_5745



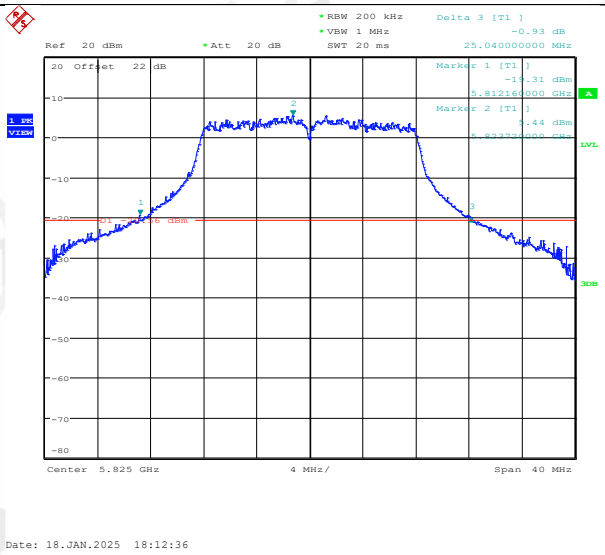
11A_Ant1_5785



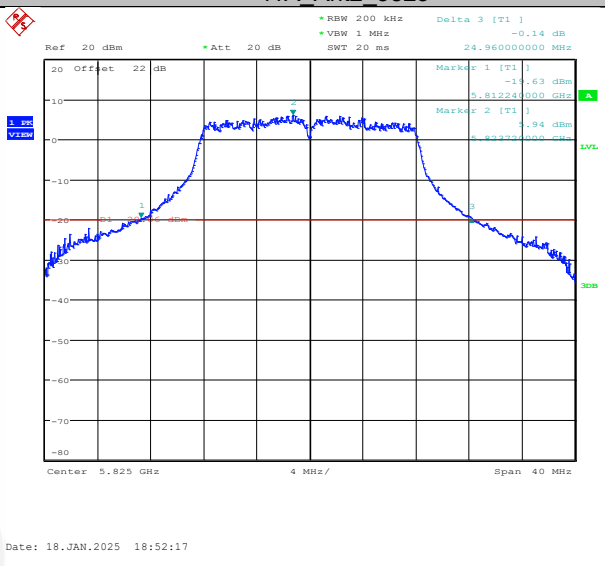
11A_Ant2_5785



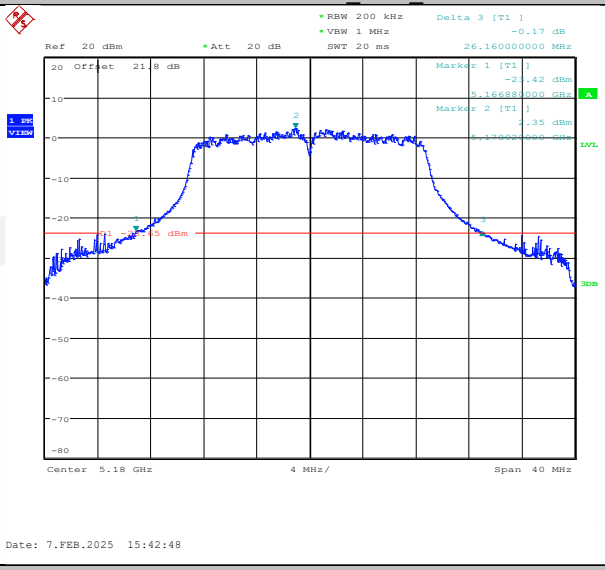
11A_Ant1_5825



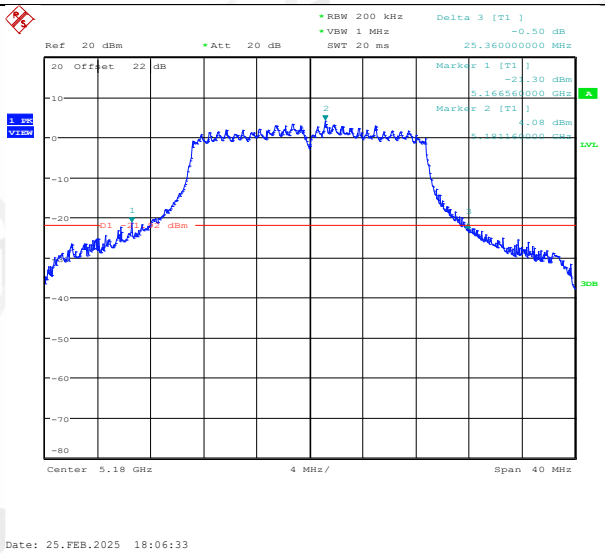
11A_Ant2_5825



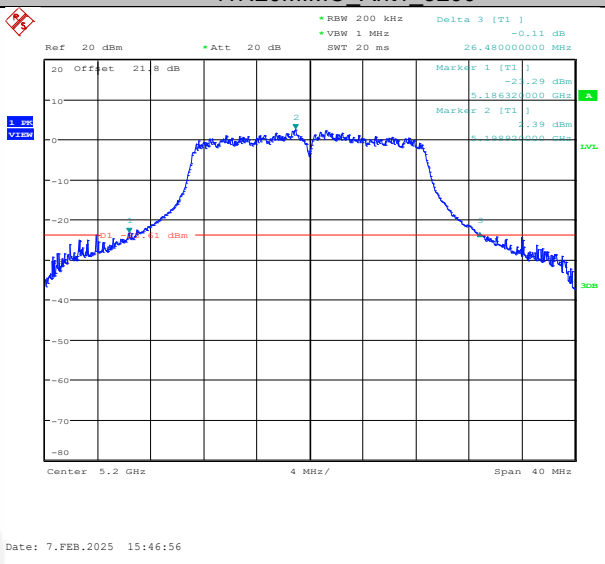
11N20MIMO_Ant1_5180



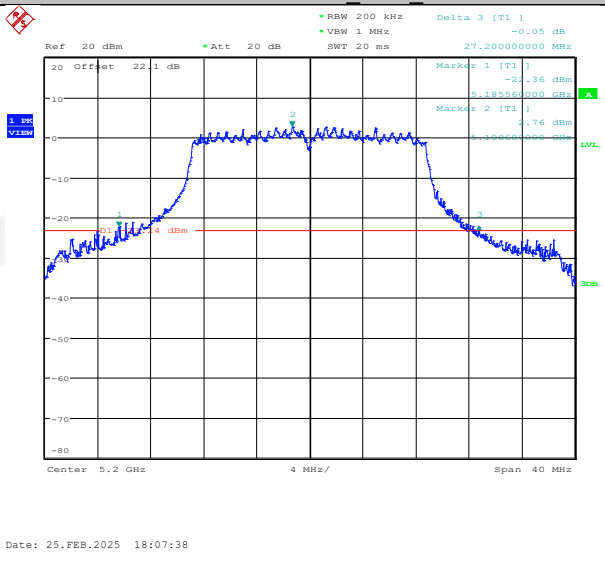
11N20MIMO_Ant2_5180



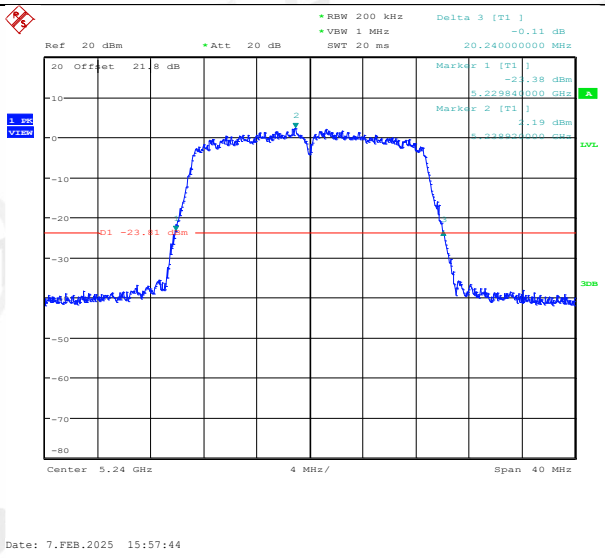
11N20MIMO_Ant1_5200



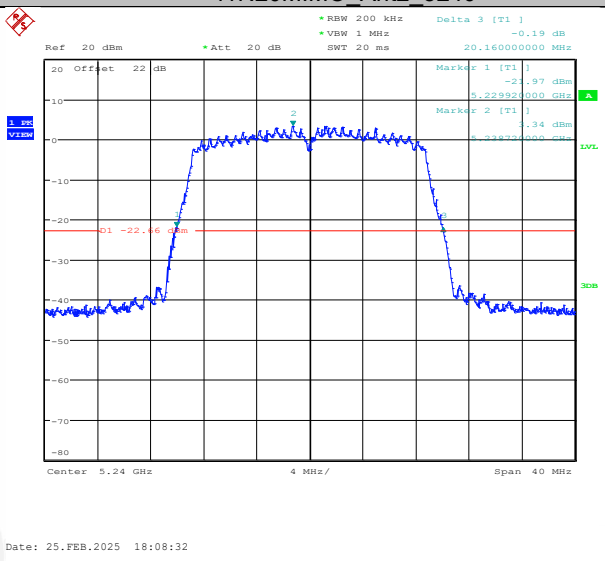
11N20MIMO_Ant2_5200



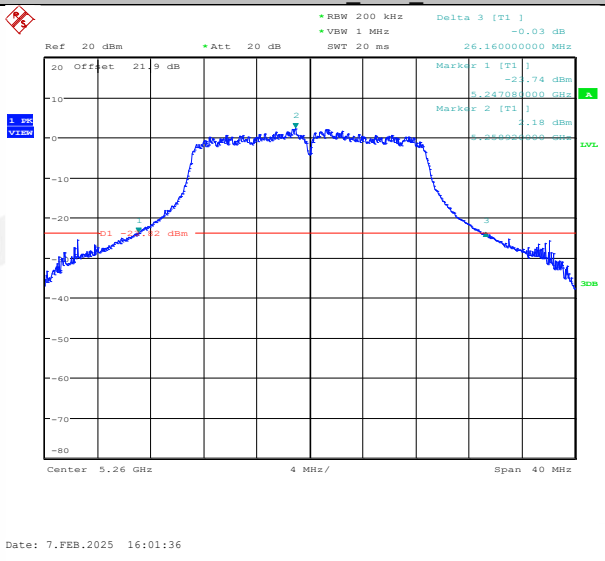
11N20MIMO_Ant1_5240



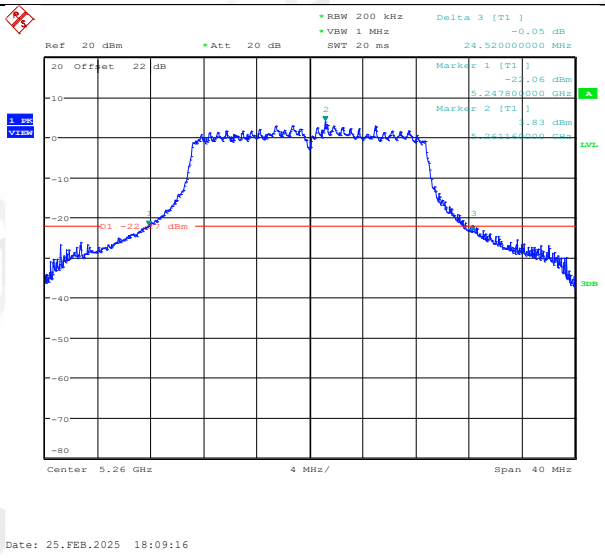
11N20MIMO_Ant2_5240



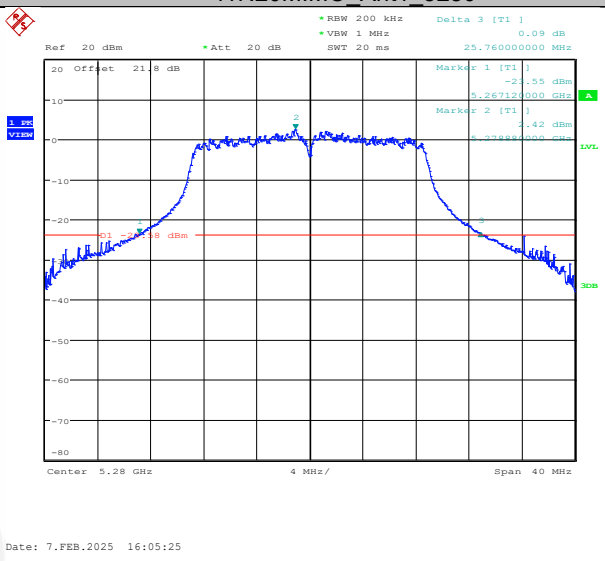
11N20MIMO_Ant1_5260



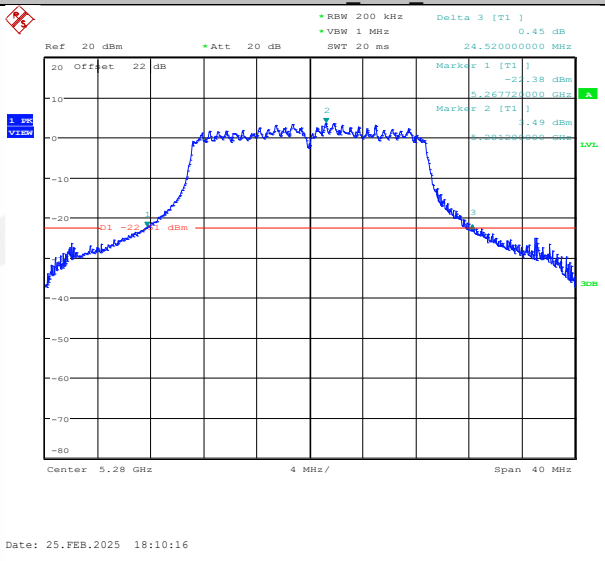
11N20MIMO_Ant2_5260



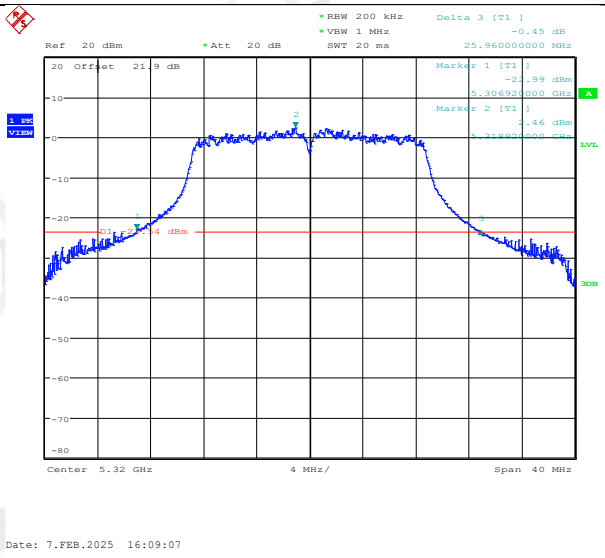
11N20MIMO_Ant1_5280



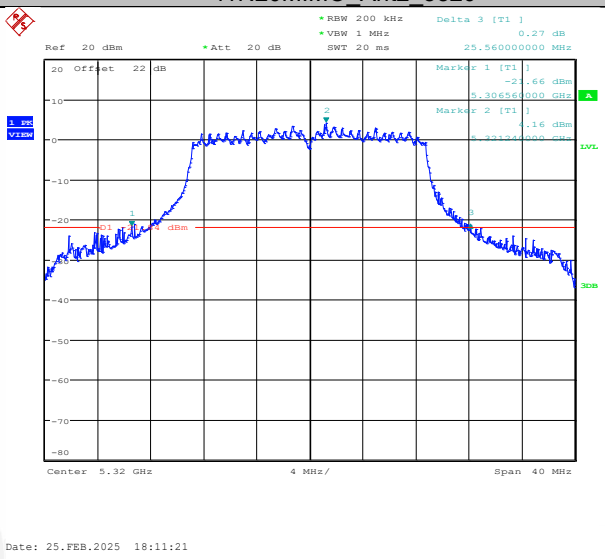
11N20MIMO_Ant2_5280



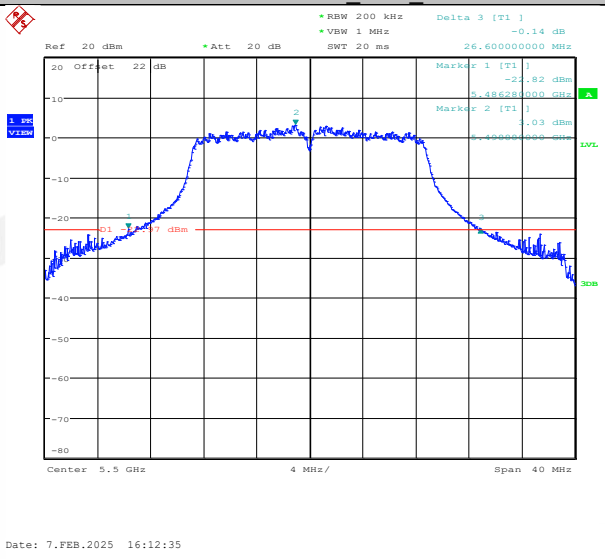
11N20MIMO_Ant1_5320



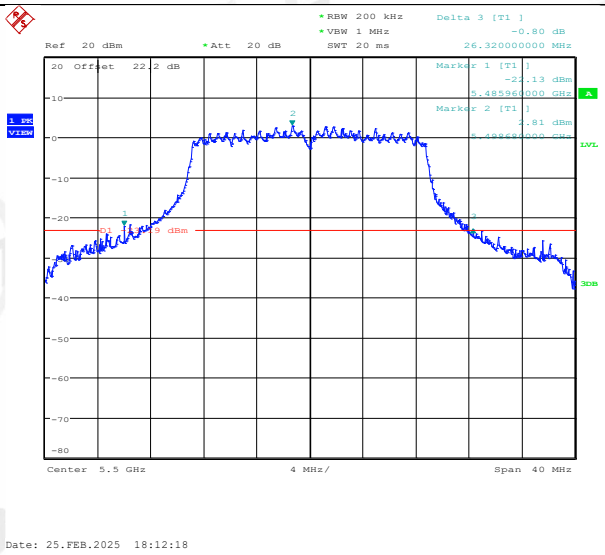
11N20MIMO_Ant2_5320



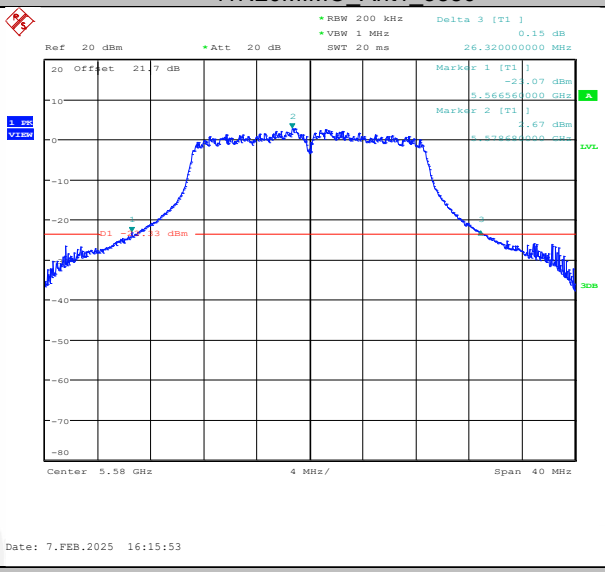
11N20MIMO_Ant1_5500



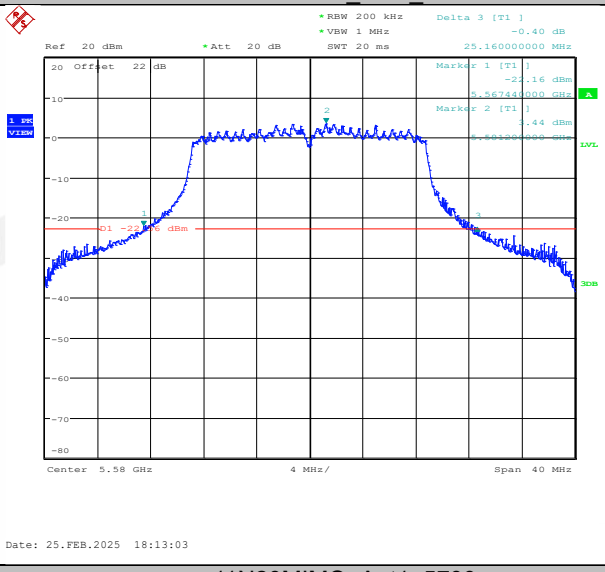
11N20MIMO_Ant2_5500



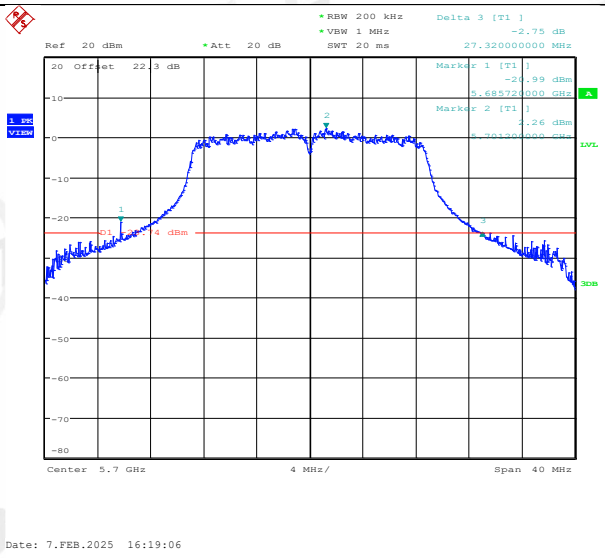
11N20MIMO_Ant1_5580



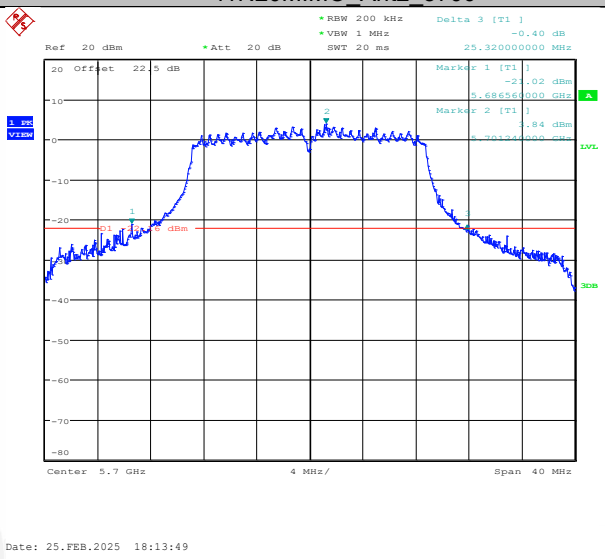
11N20MIMO_Ant2_5580



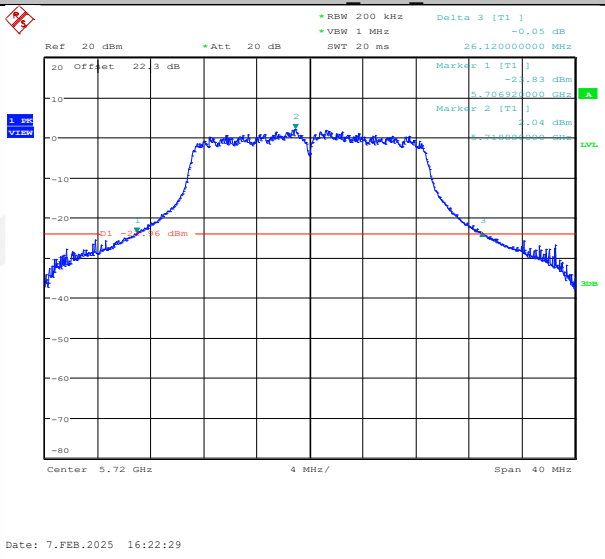
11N20MIMO_Ant1_5700



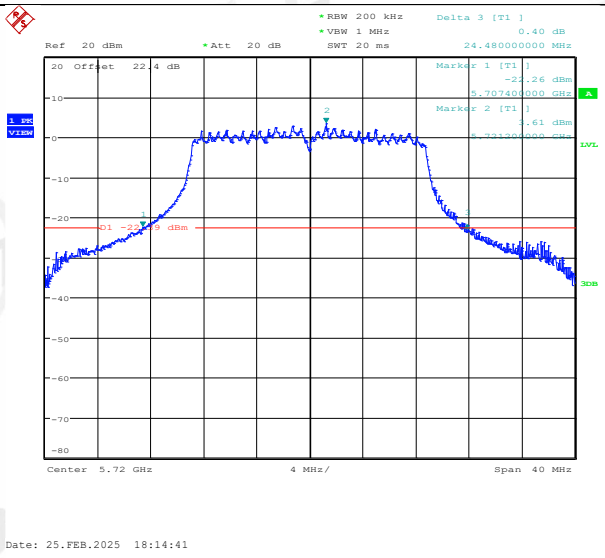
11N20MIMO_Ant2_5700



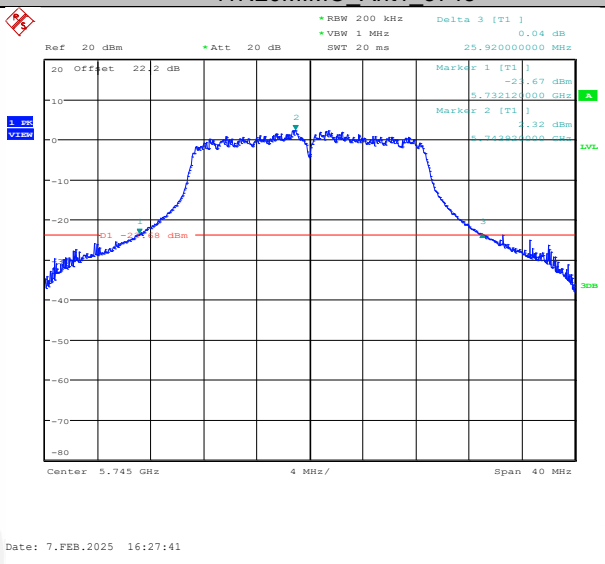
11N20MIMO_Ant1_5720



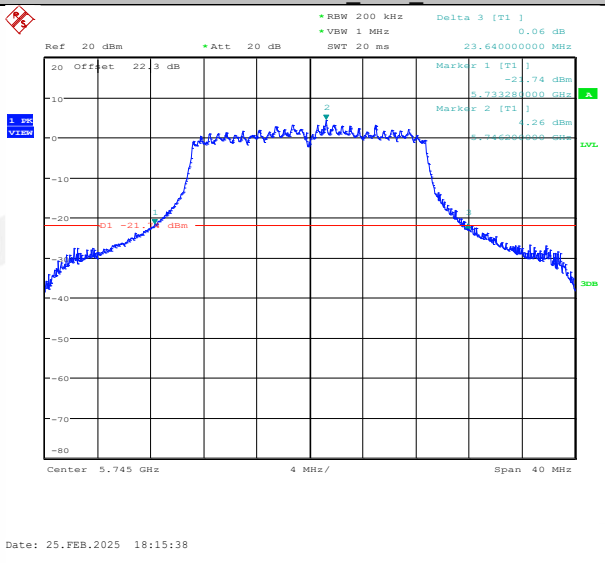
11N20MIMO_Ant2_5720



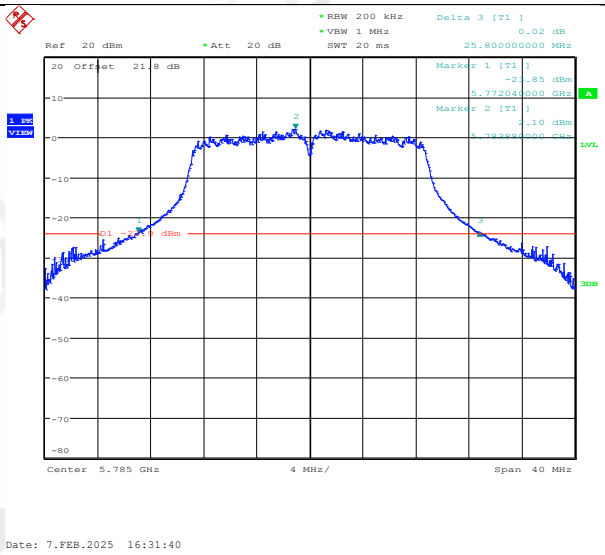
11N20MIMO_Ant1_5745



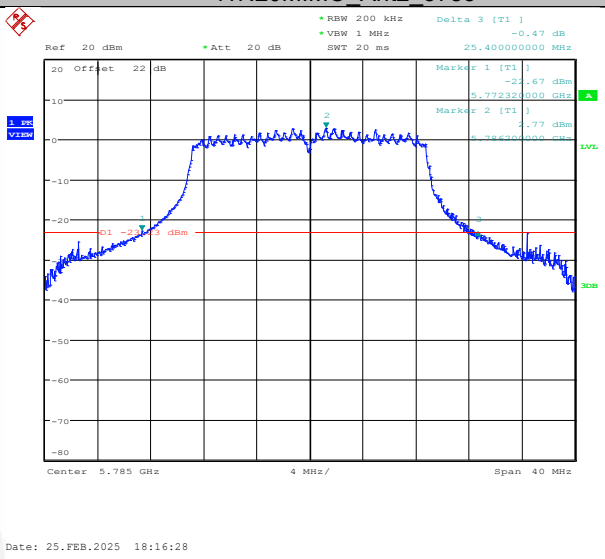
11N20MIMO_Ant2_5745



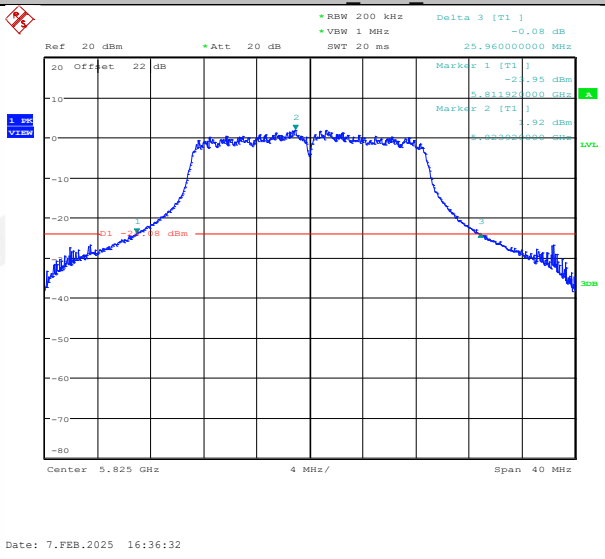
11N20MIMO_Ant1_5785



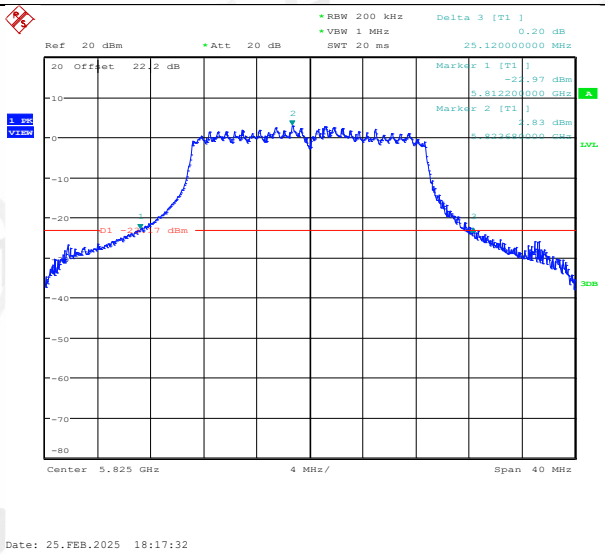
11N20MIMO_Ant2_5785



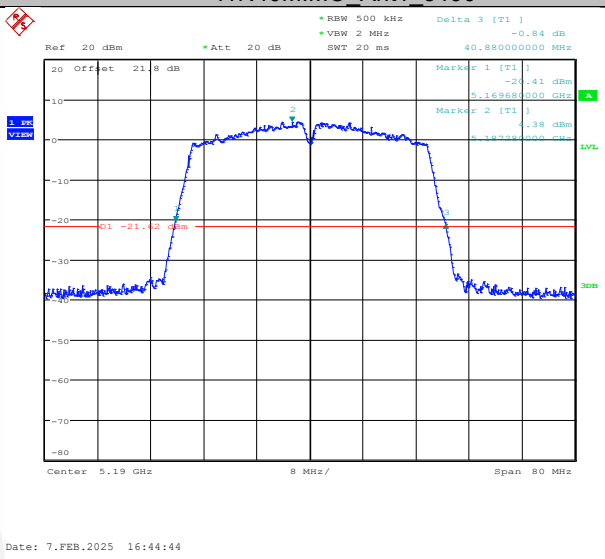
11N20MIMO_Ant1_5825



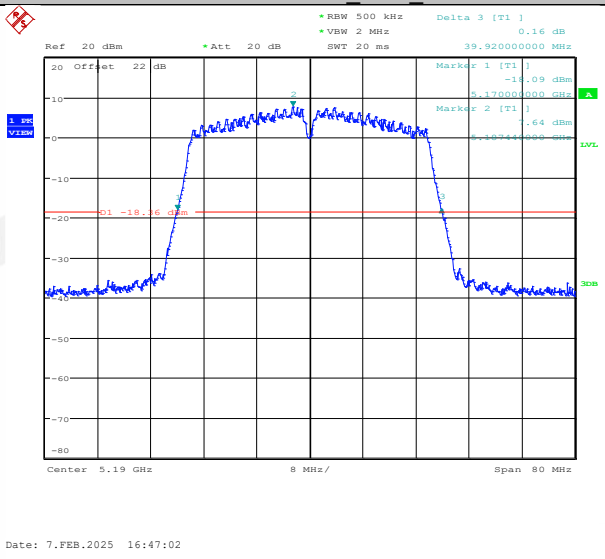
11N20MIMO_Ant2_5825



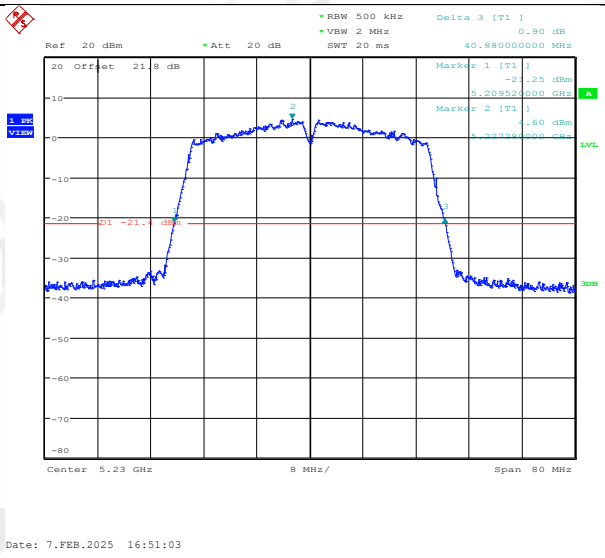
11N40MIMO_Ant1_5190



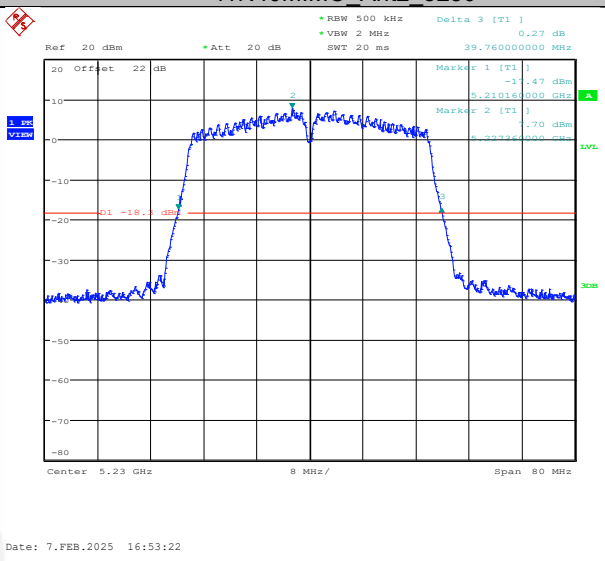
11N40MIMO_Ant2_5190



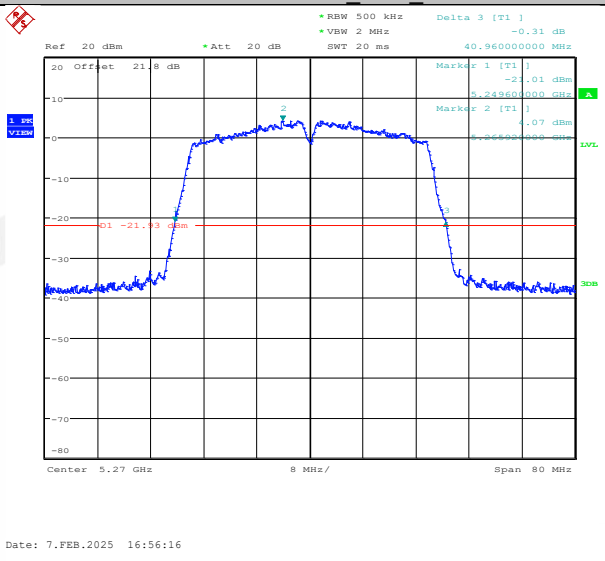
11N40MIMO_Ant1_5230



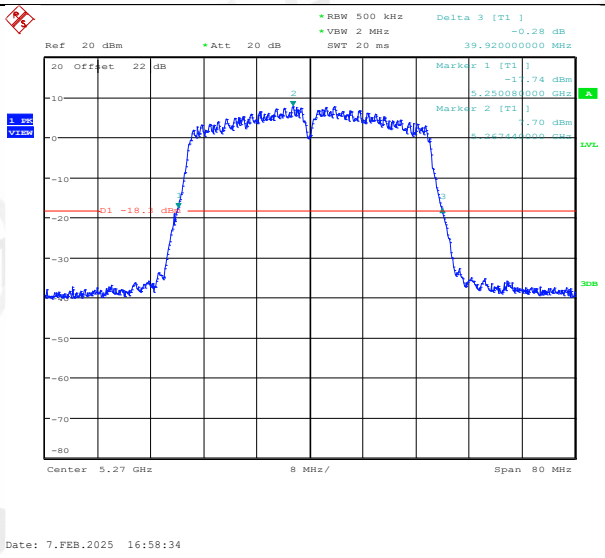
11N40MIMO_Ant2_5230



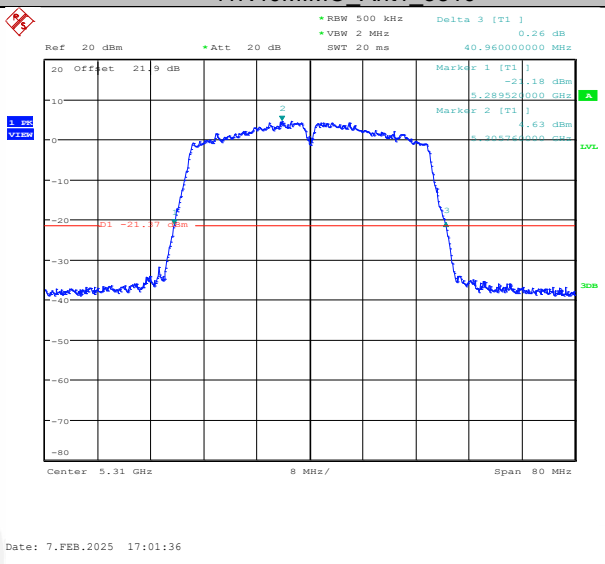
11N40MIMO_Ant1_5270



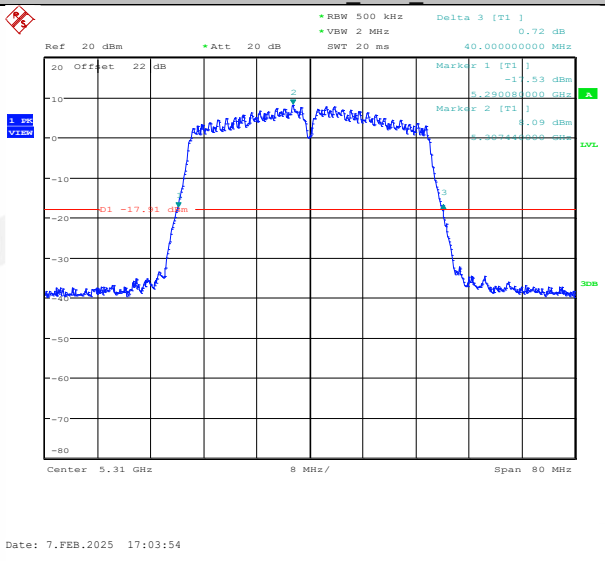
11N40MIMO_Ant2_5270



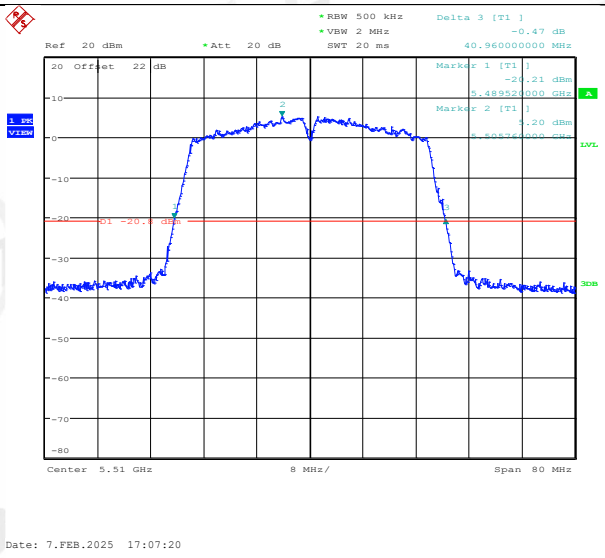
11N40MIMO_Ant1_5310



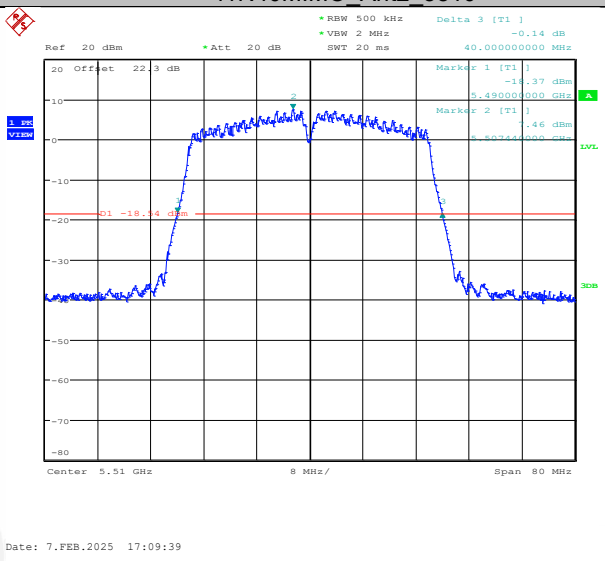
11N40MIMO_Ant2_5310



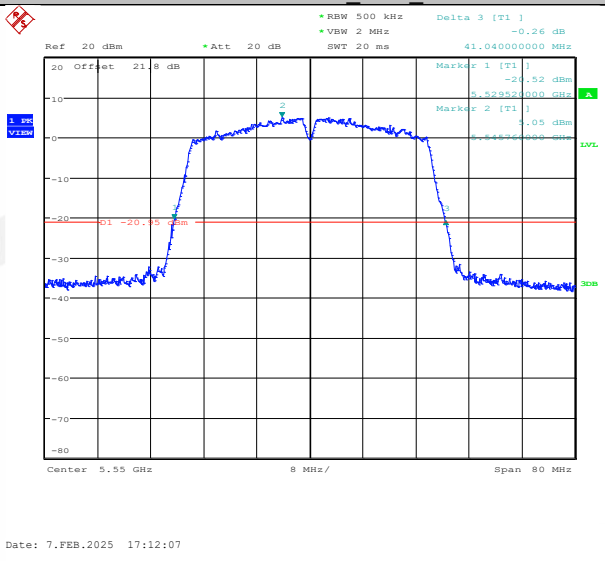
11N40MIMO_Ant1_5510



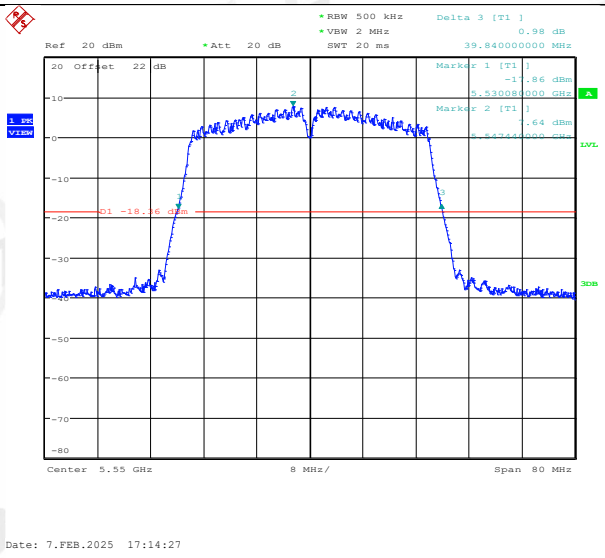
11N40MIMO_Ant2_5510



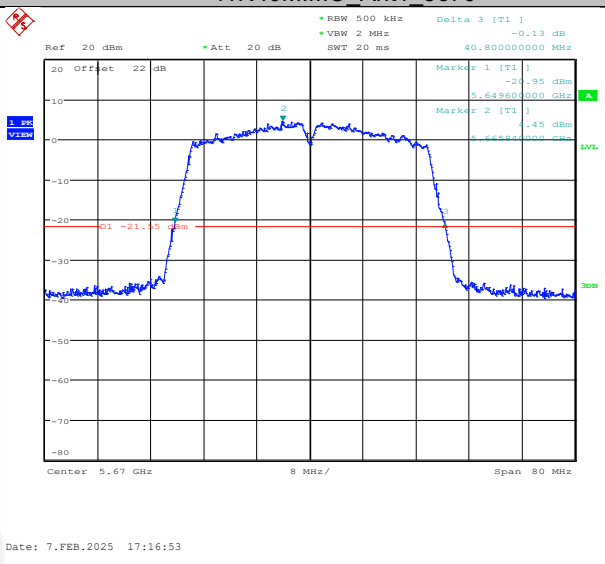
11N40MIMO_Ant1_5550



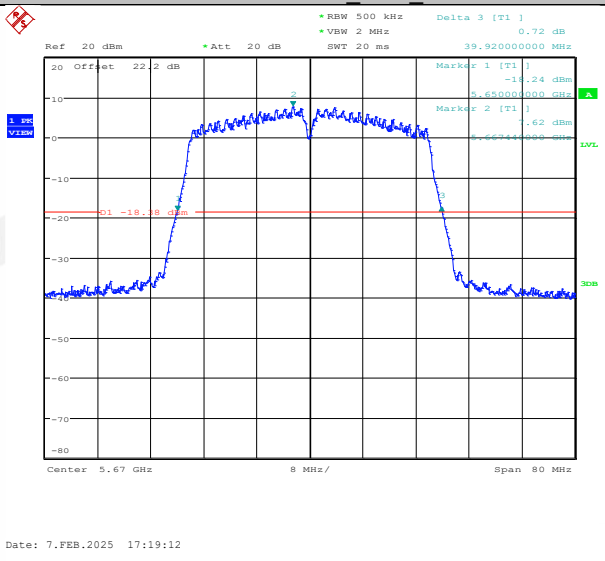
11N40MIMO_Ant2_5550



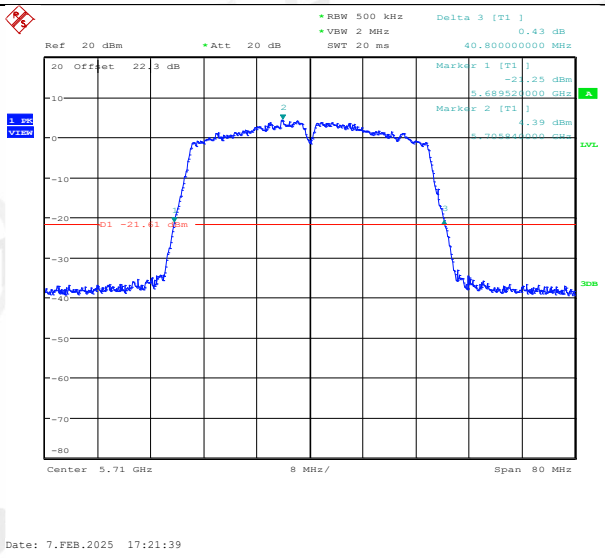
11N40MIMO_Ant1_5670



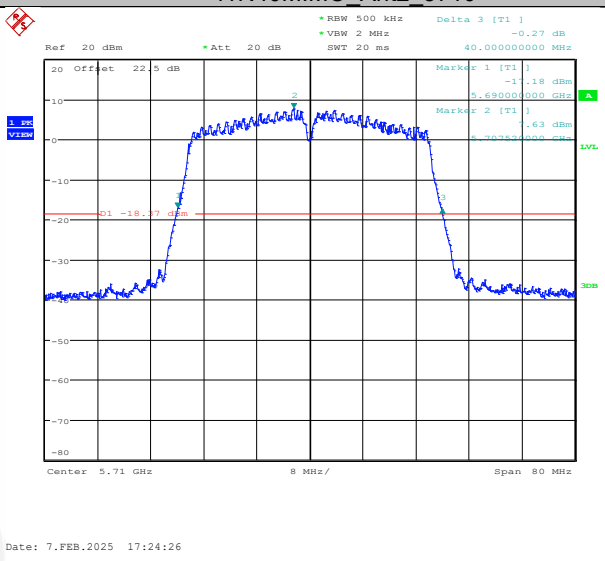
11N40MIMO_Ant2_5670



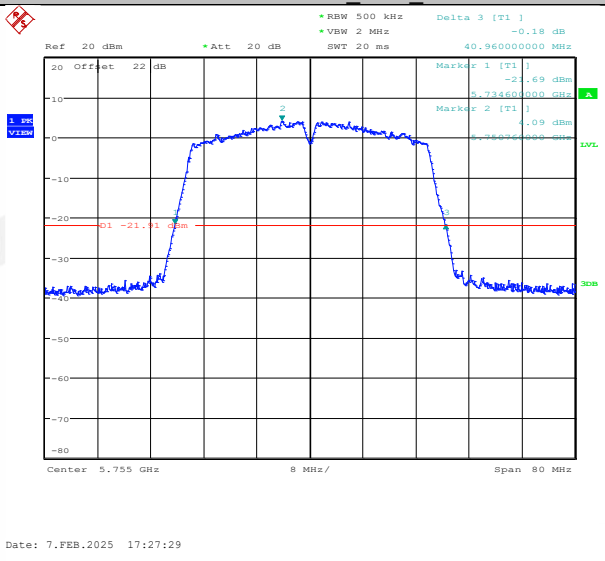
11N40MIMO_Ant1_5710



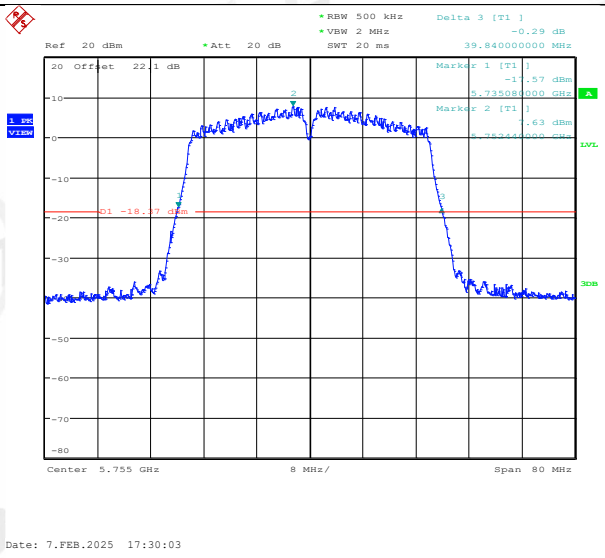
11N40MIMO_Ant2_5710



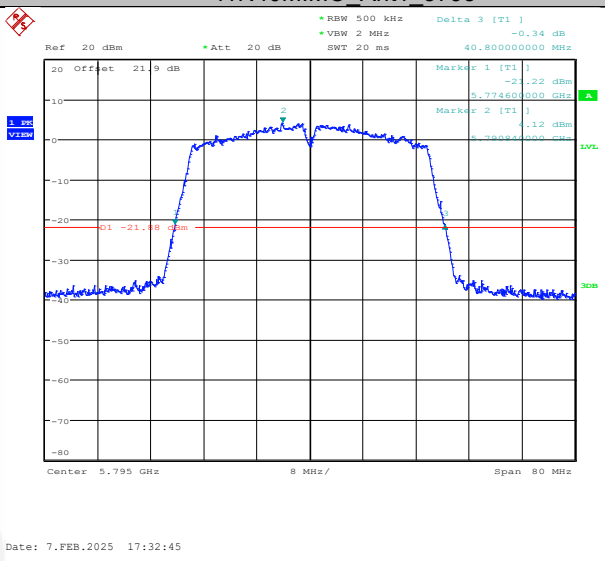
11N40MIMO_Ant1_5755



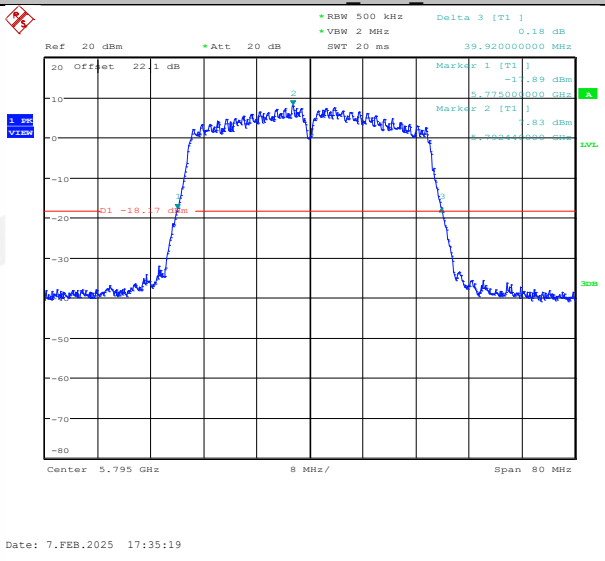
11N40MIMO_Ant2_5755



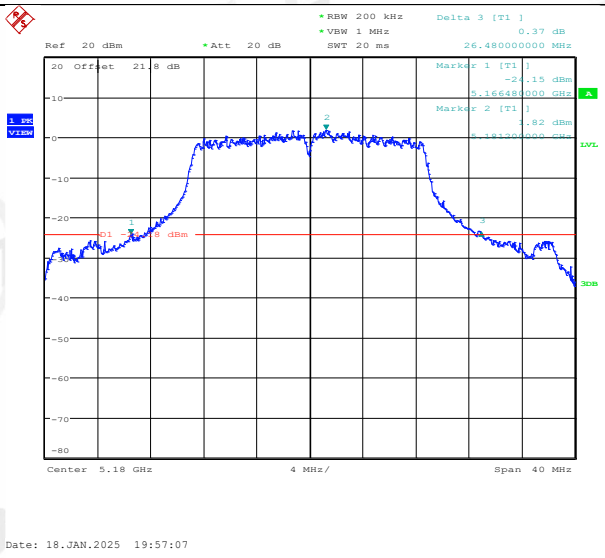
11N40MIMO_Ant1_5795



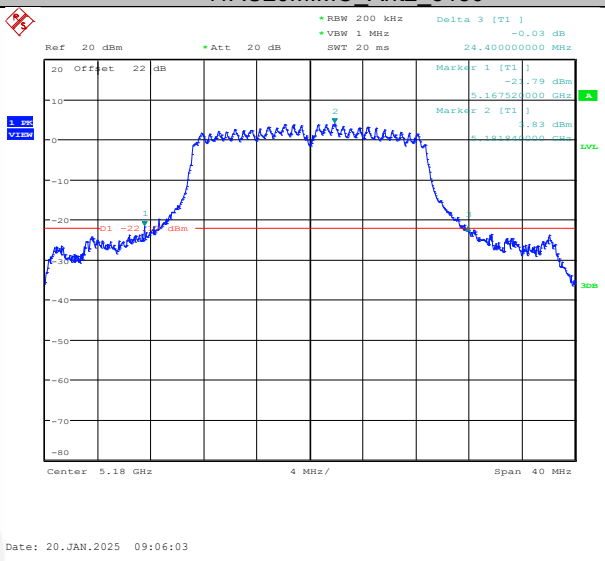
11N40MIMO_Ant2_5795



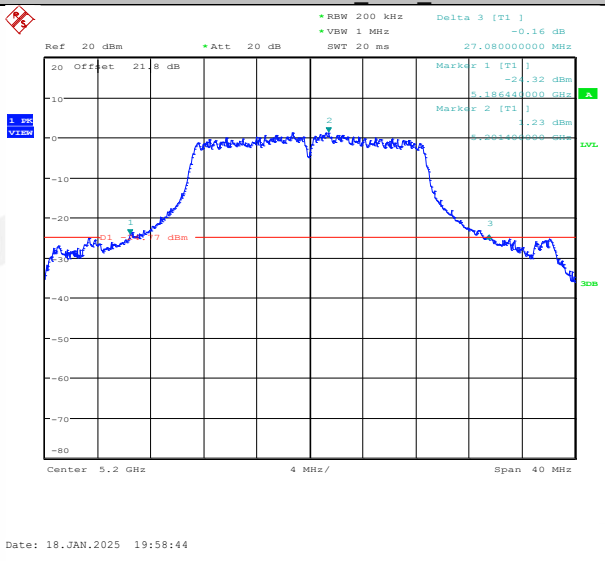
11AC20MIMO_Ant1_5180



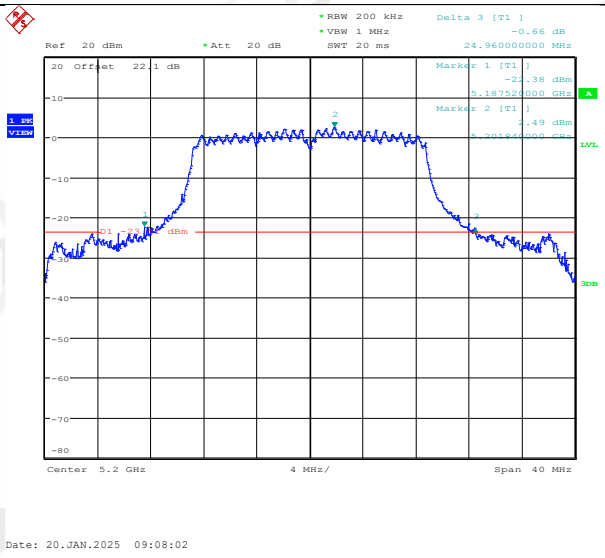
11AC20MIMO_Ant2_5180



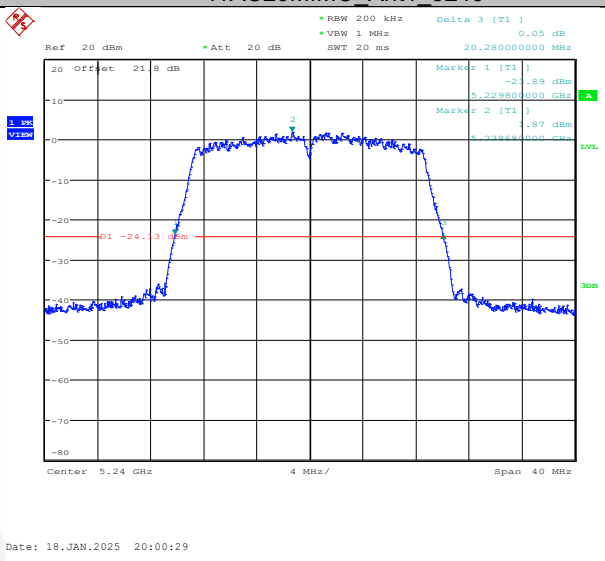
11AC20MIMO_Ant1_5200



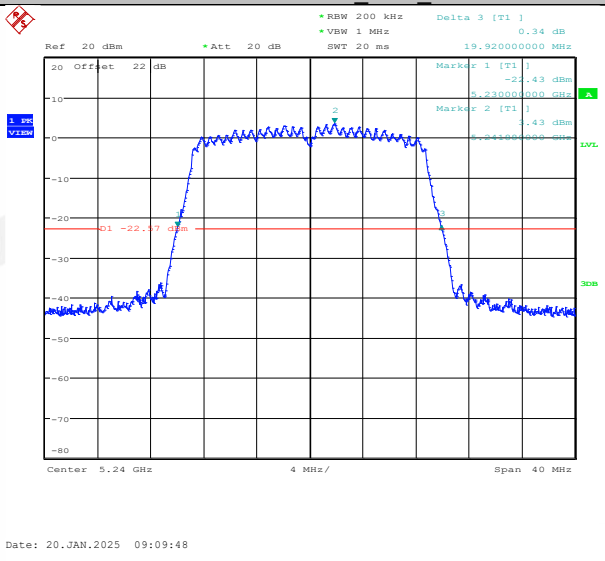
11AC20MIMO_Ant2_5200



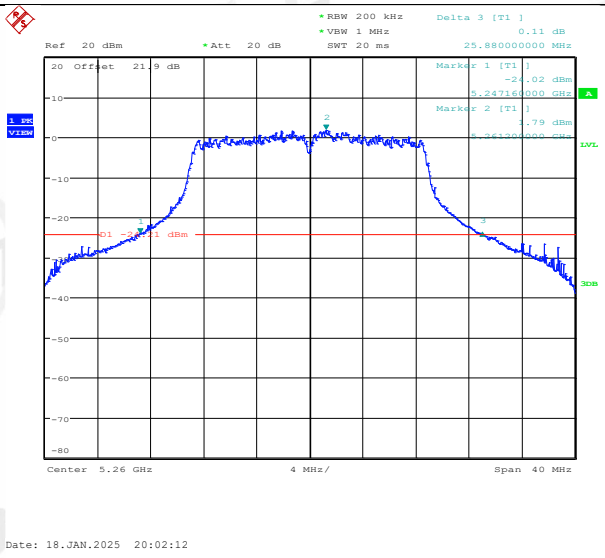
11AC20MIMO_Ant1_5240



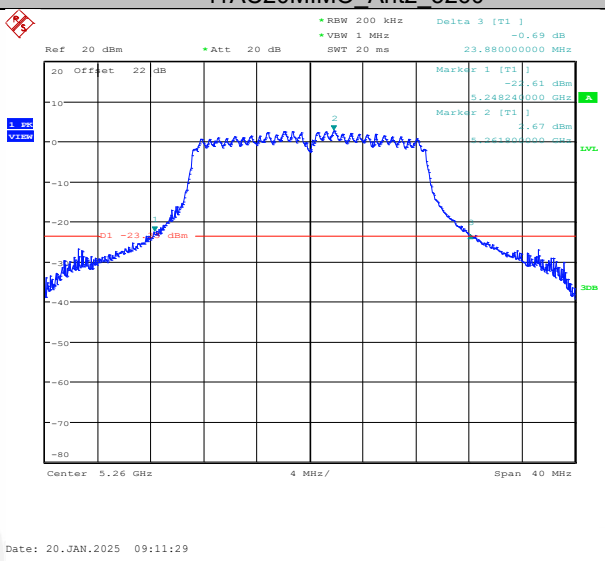
11AC20MIMO_Ant2_5240



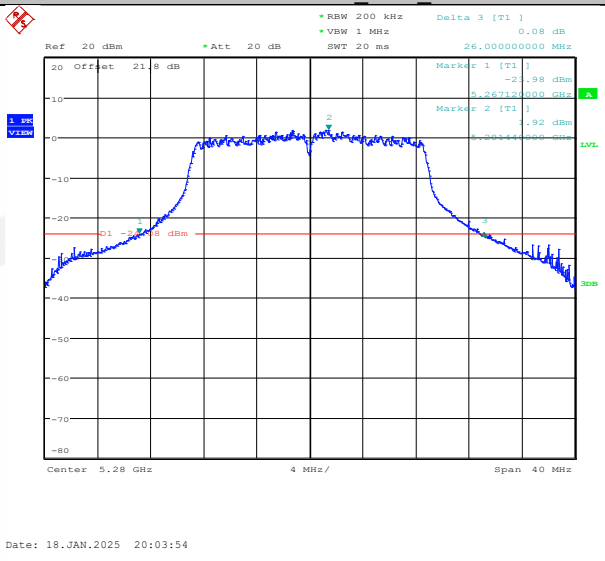
11AC20MIMO_Ant1_5260



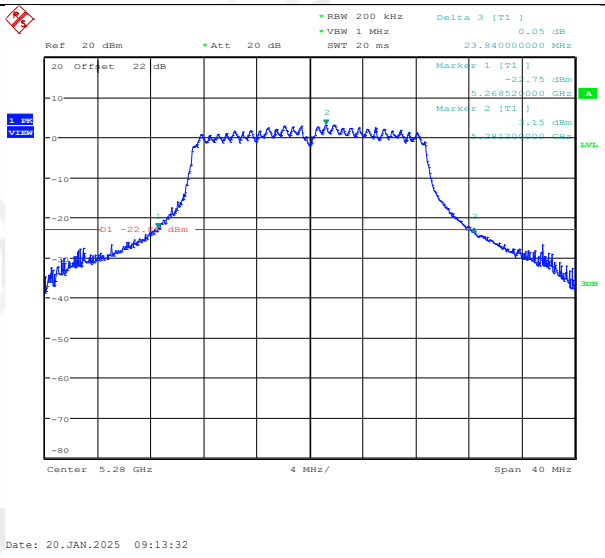
11AC20MIMO_Ant2_5260



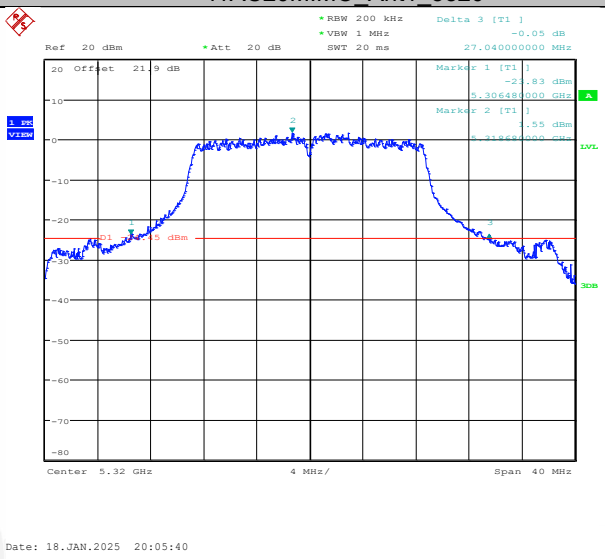
11AC20MIMO_Ant1_5280



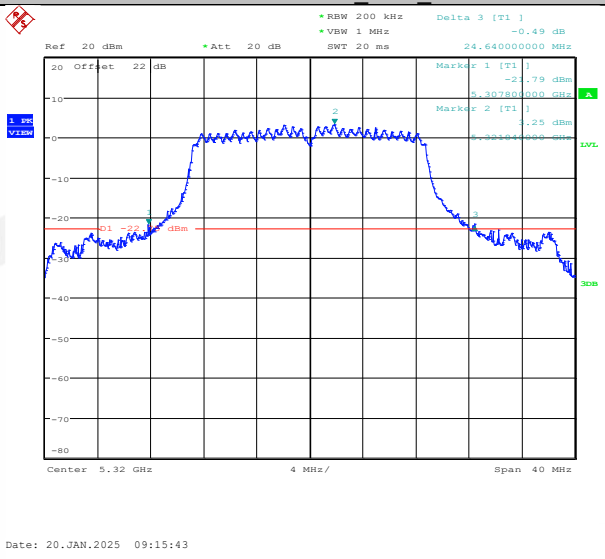
11AC20MIMO_Ant2_5280



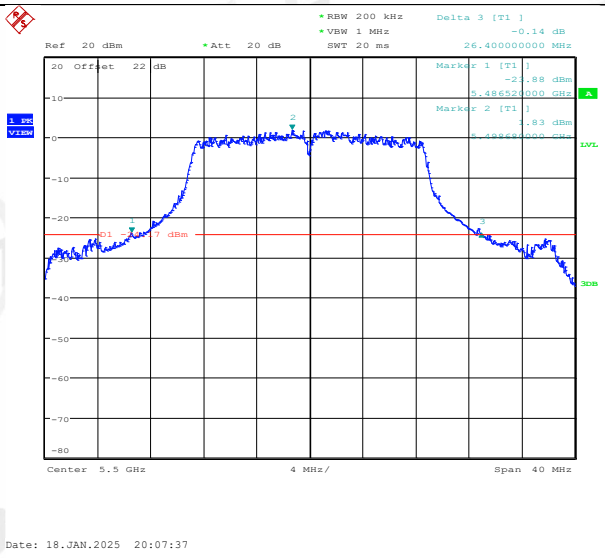
11AC20MIMO_Ant1_5320



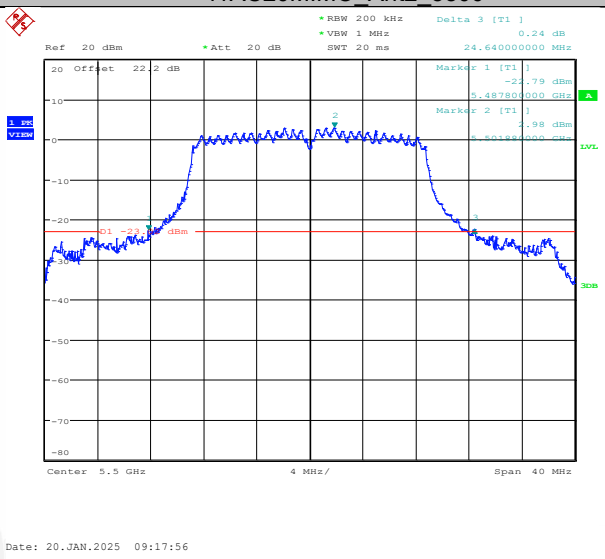
11AC20MIMO_Ant2_5320



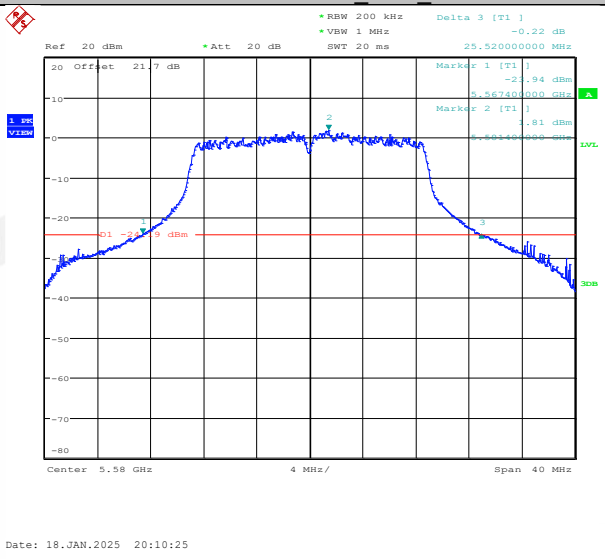
11AC20MIMO_Ant1_5500



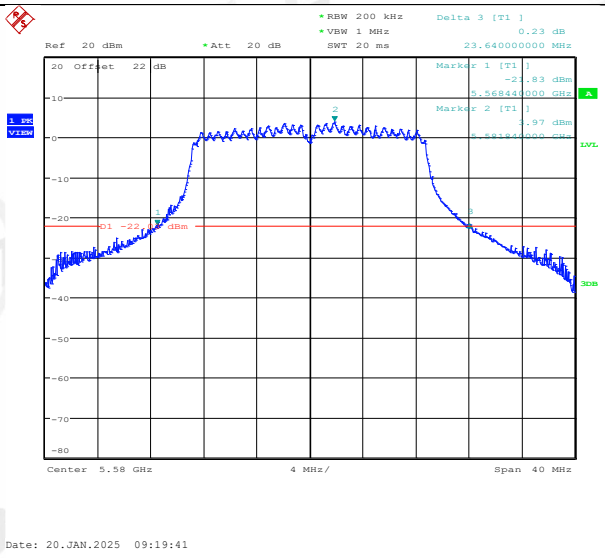
11AC20MIMO_Ant2_5500



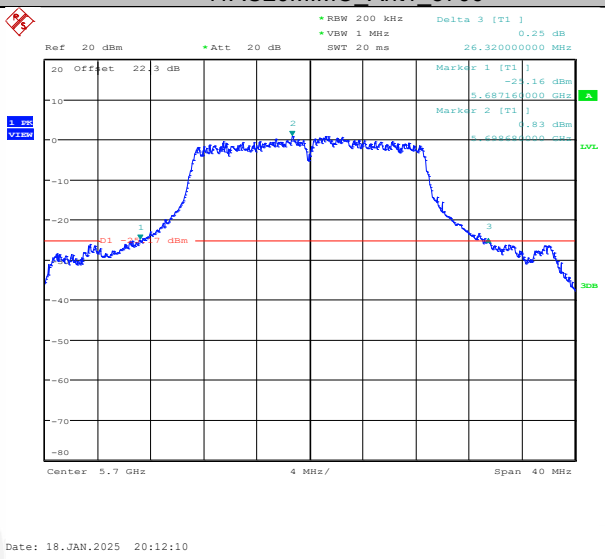
11AC20MIMO_Ant1_5580



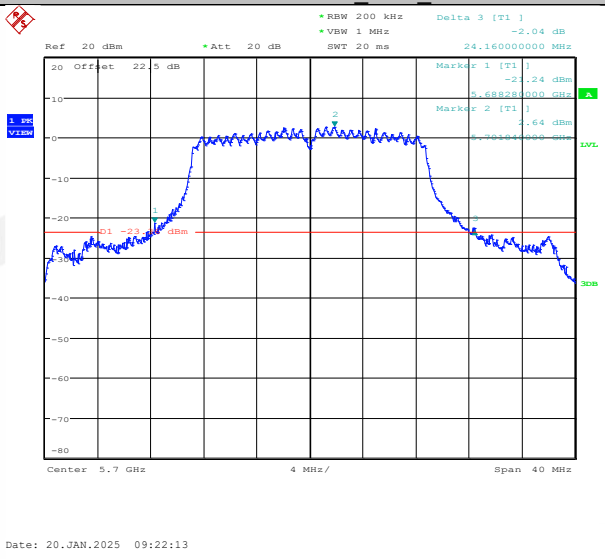
11AC20MIMO_Ant2_5580



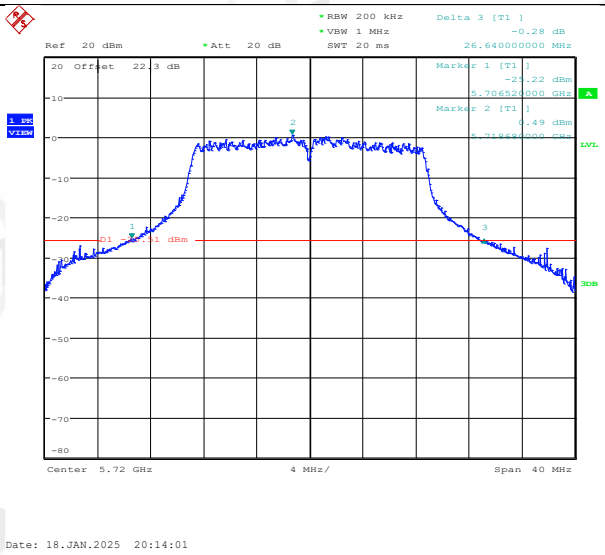
11AC20MIMO_Ant1_5700



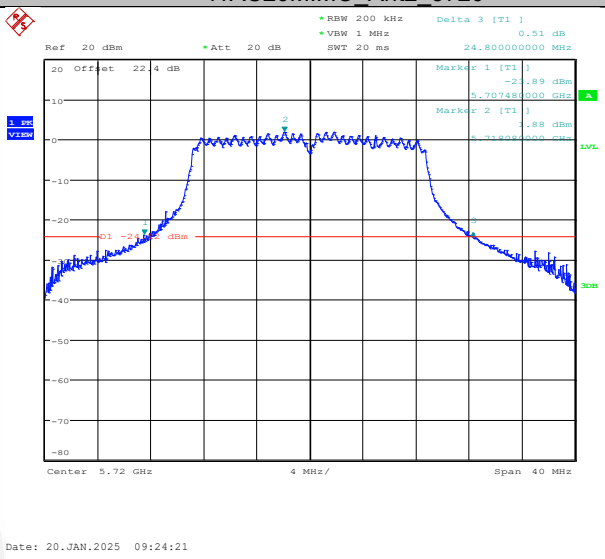
11AC20MIMO_Ant2_5700



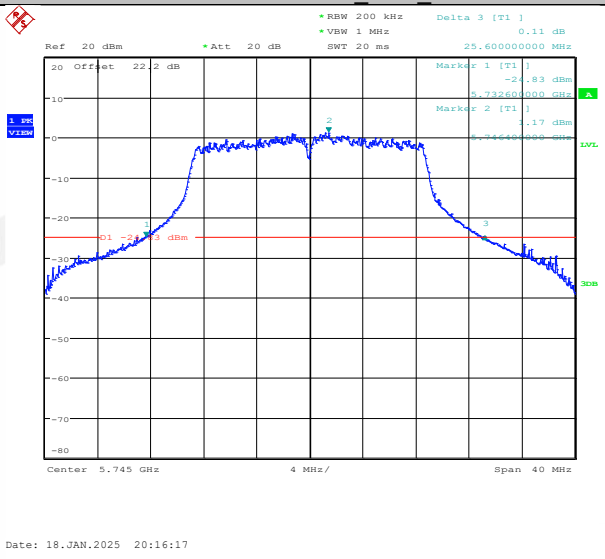
11AC20MIMO_Ant1_5720



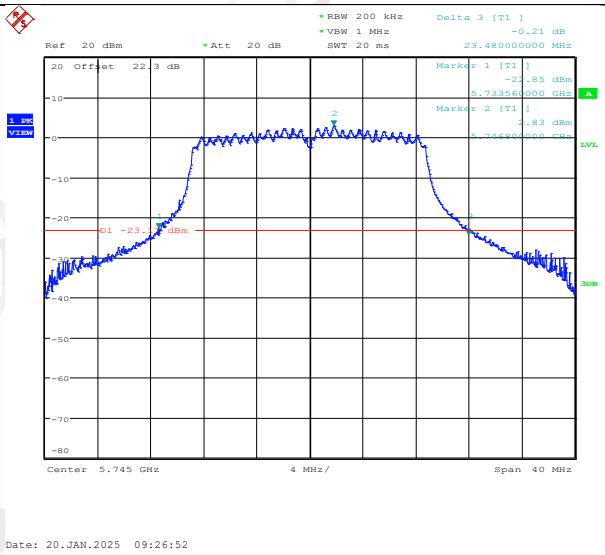
11AC20MIMO_Ant2_5720



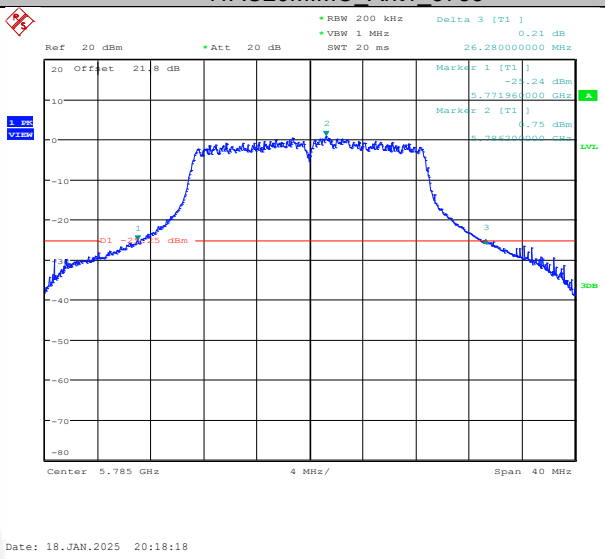
11AC20MIMO_Ant1_5745



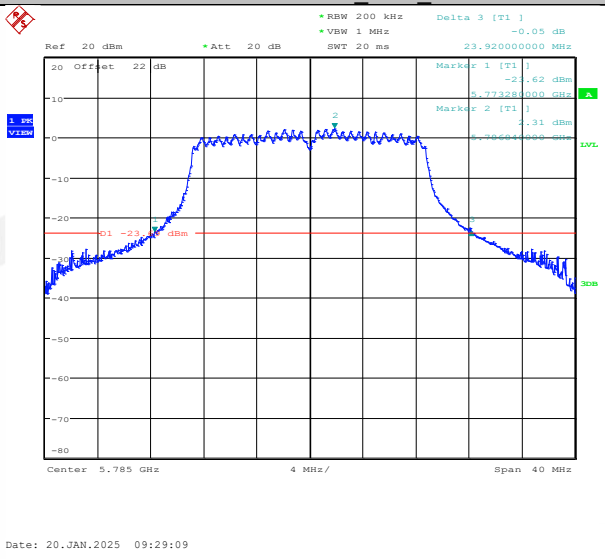
11AC20MIMO_Ant2_5745



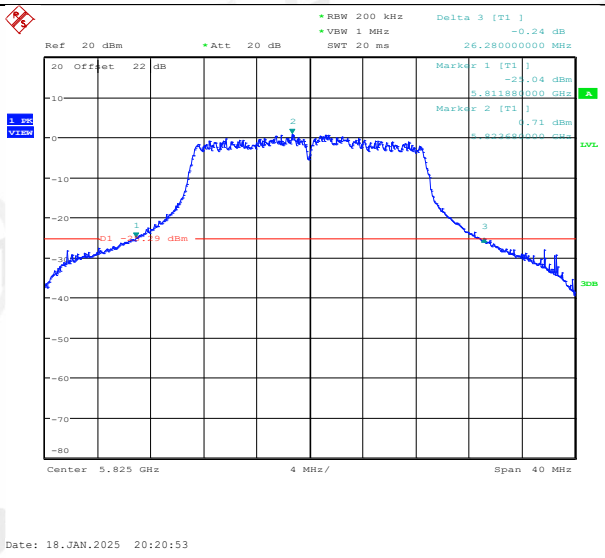
11AC20MIMO_Ant1_5785



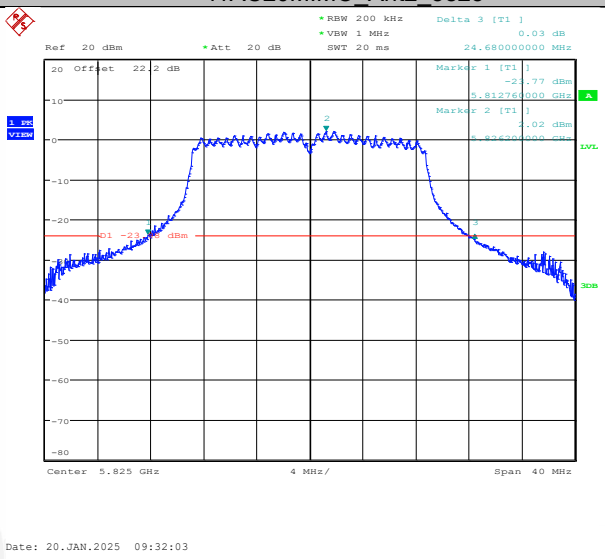
11AC20MIMO_Ant2_5785



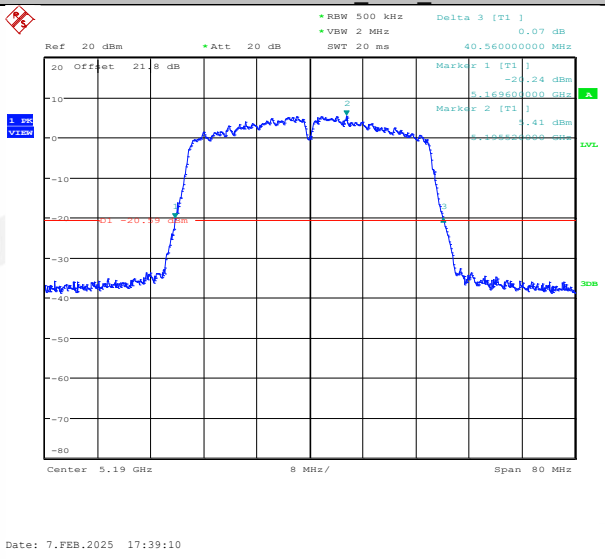
11AC20MIMO_Ant1_5825



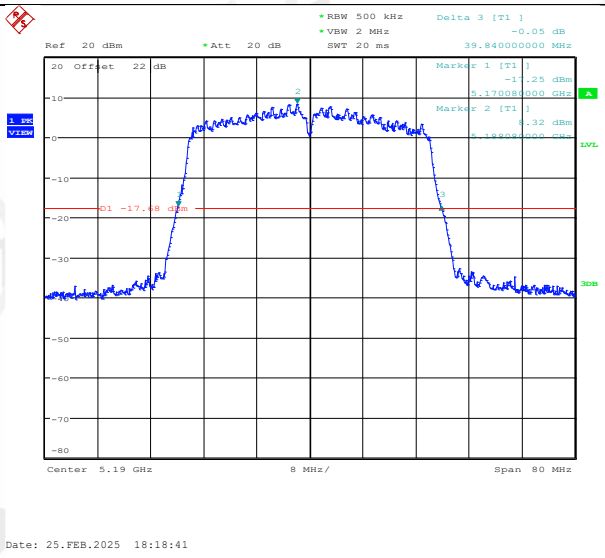
11AC20MIMO_Ant2_5825



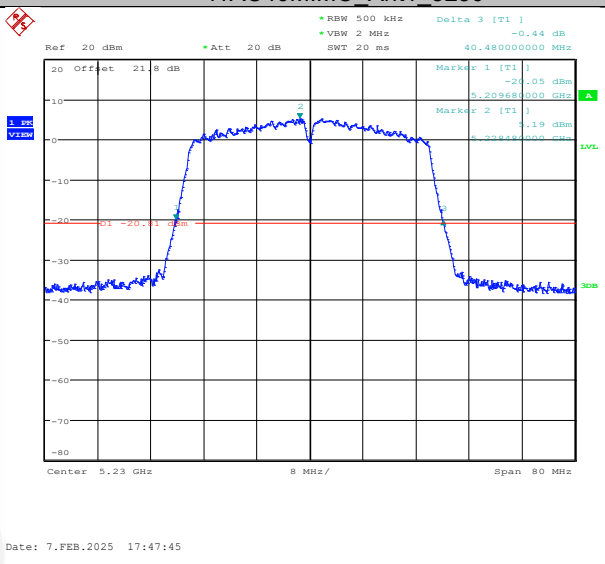
11AC40MIMO_Ant1_5190



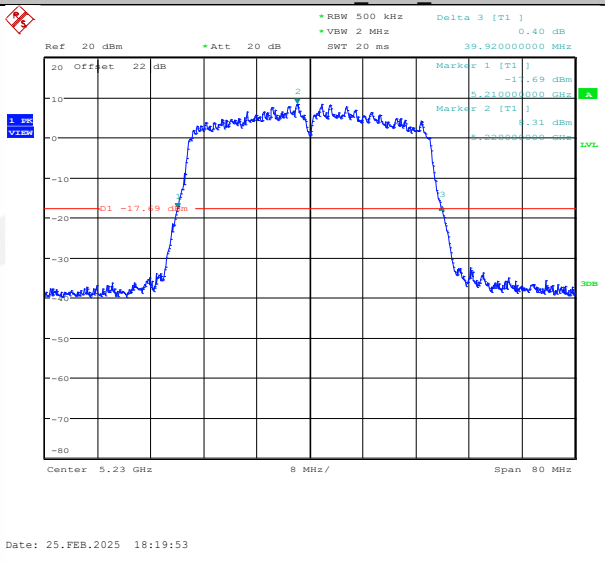
11AC40MIMO_Ant2_5190



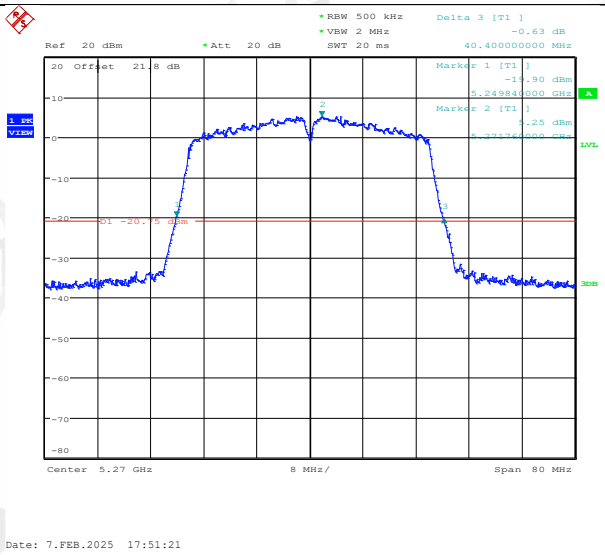
11AC40MIMO_Ant1_5230



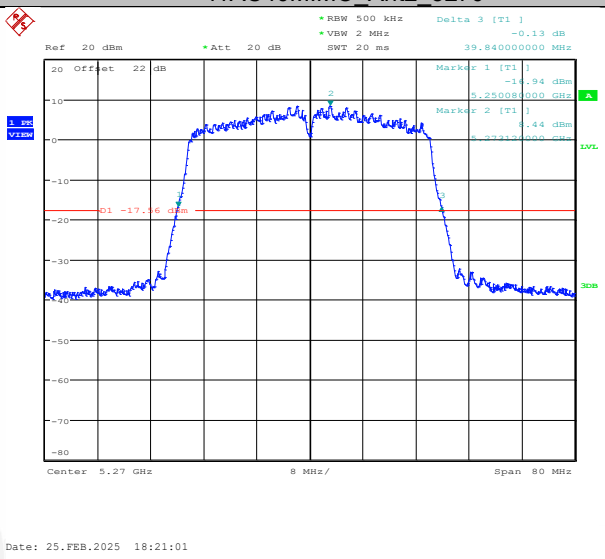
11AC40MIMO_Ant2_5230



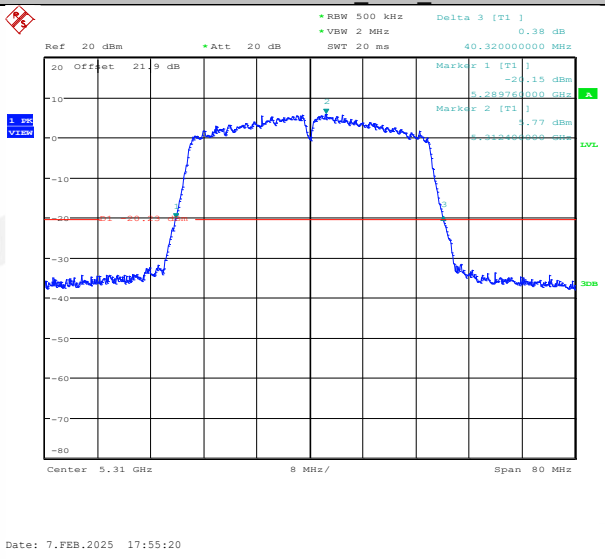
11AC40MIMO_Ant1_5270



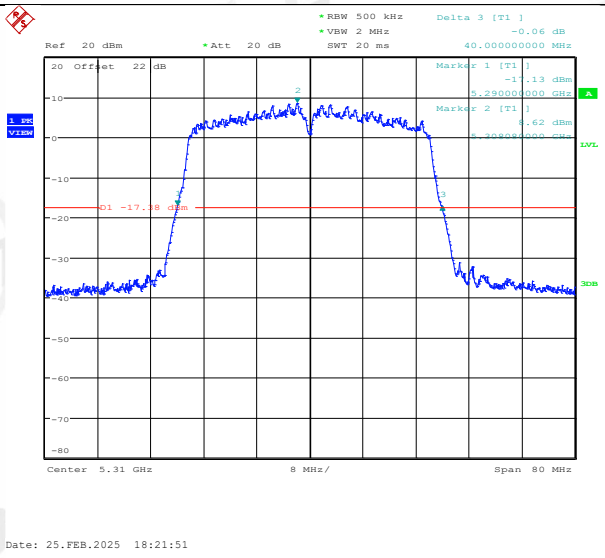
11AC40MIMO_Ant2_5270



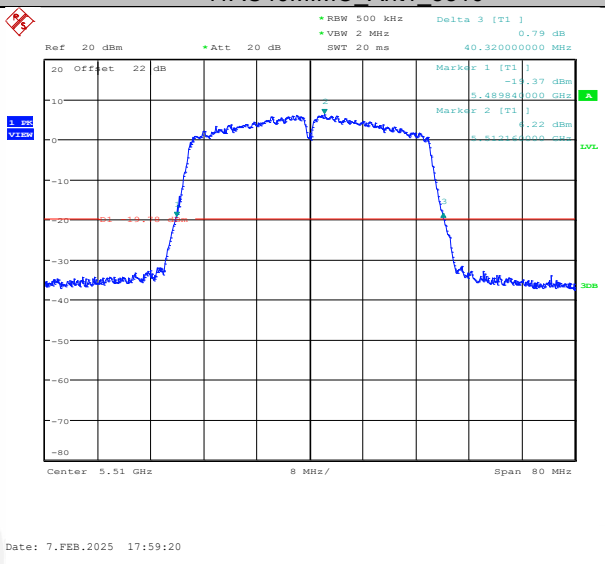
11AC40MIMO_Ant1_5310



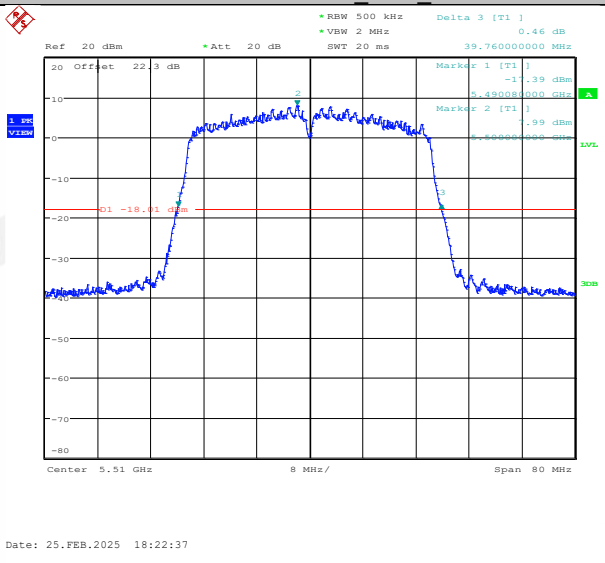
11AC40MIMO_Ant2_5310



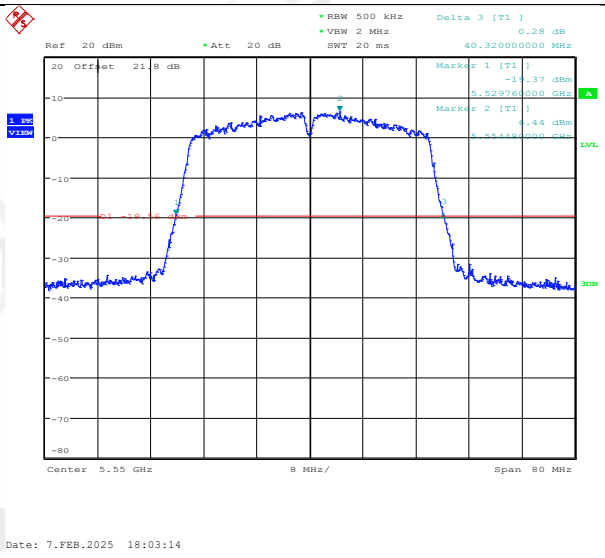
11AC40MIMO_Ant1_5510



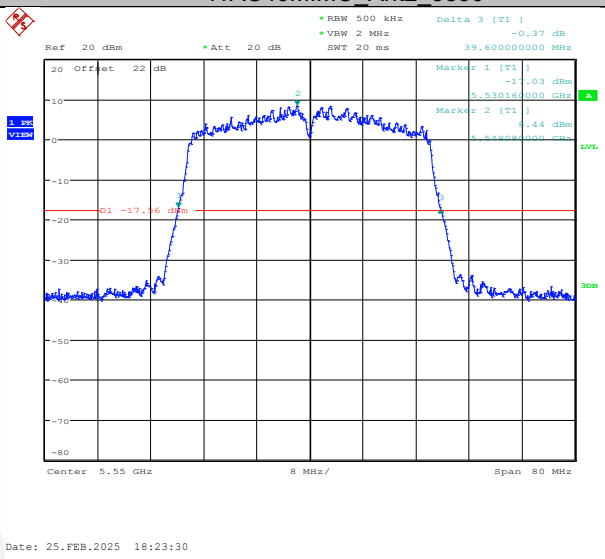
11AC40MIMO_Ant2_5510



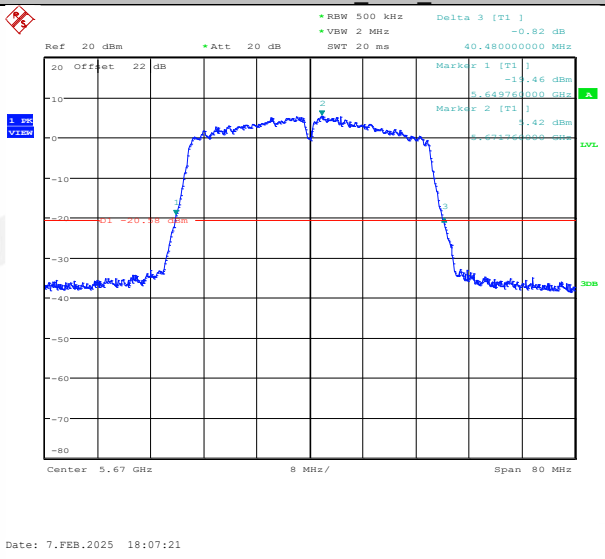
11AC40MIMO_Ant1_5550



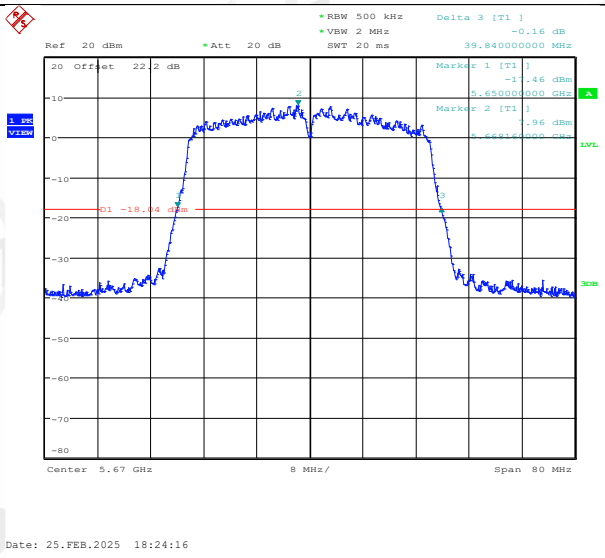
11AC40MIMO_Ant2_5550



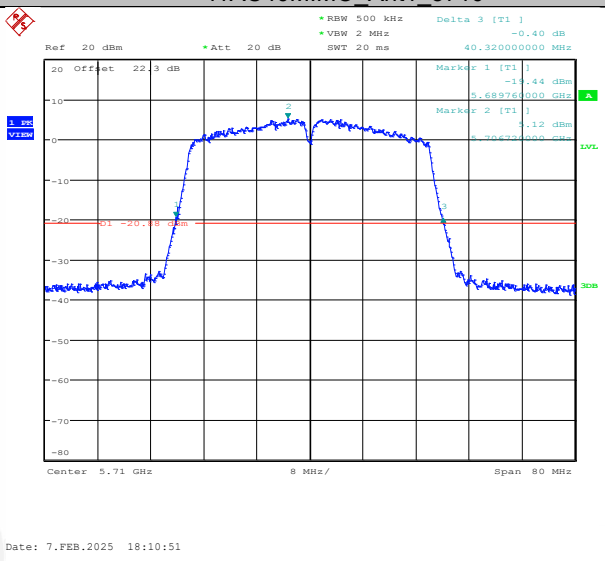
11AC40MIMO_Ant1_5670



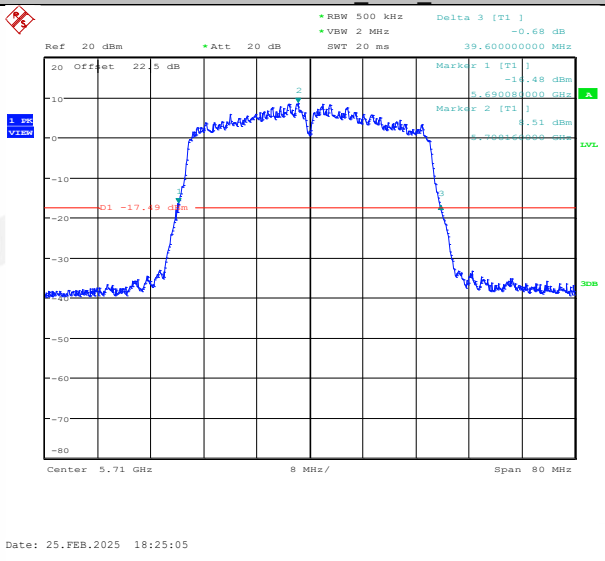
11AC40MIMO_Ant2_5670



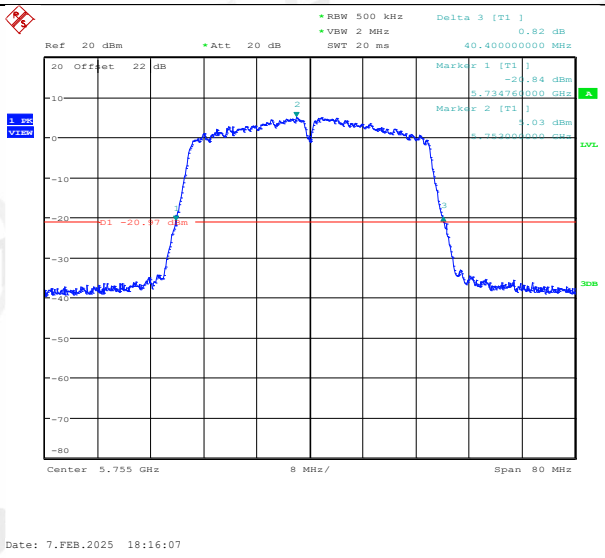
11AC40MIMO_Ant1_5710



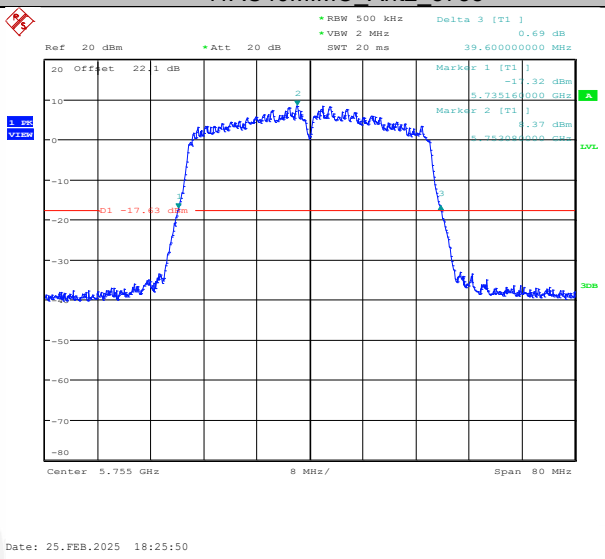
11AC40MIMO_Ant2_5710



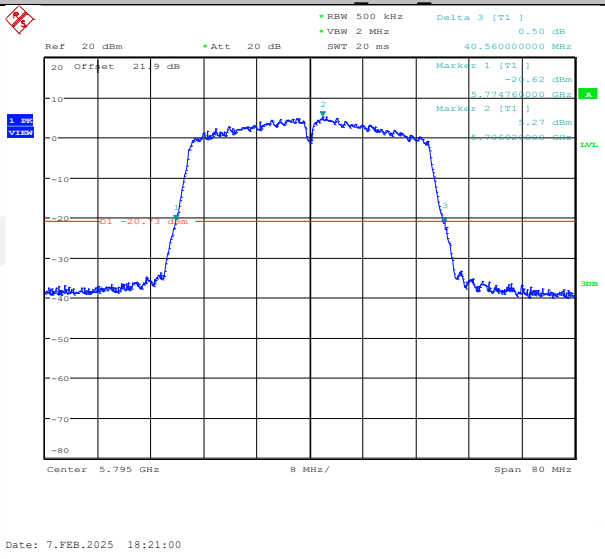
11AC40MIMO_Ant1_5755



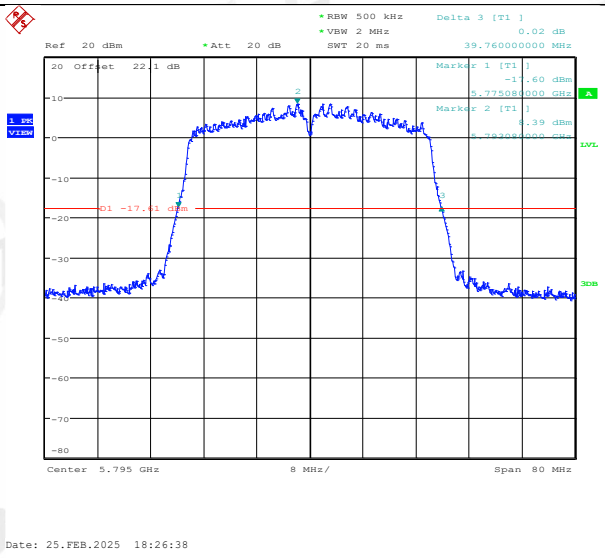
11AC40MIMO_Ant2_5755



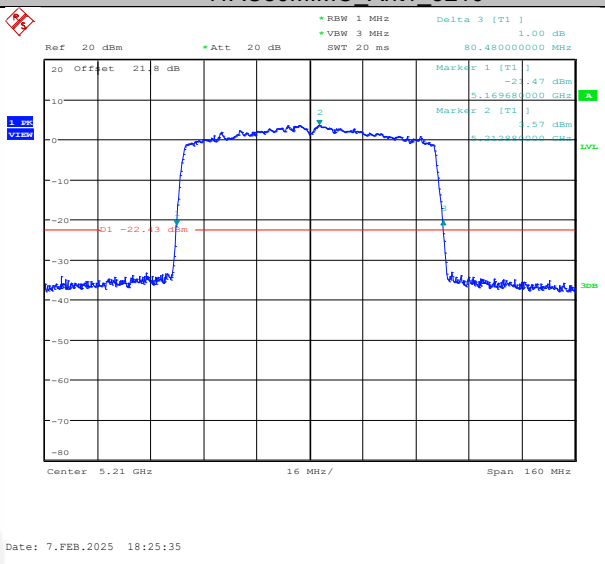
11AC40MIMO_Ant1_5795



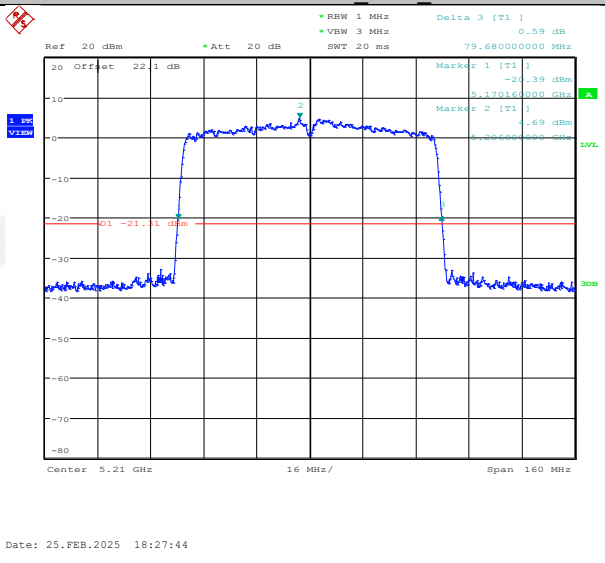
11AC40MIMO_Ant2_5795



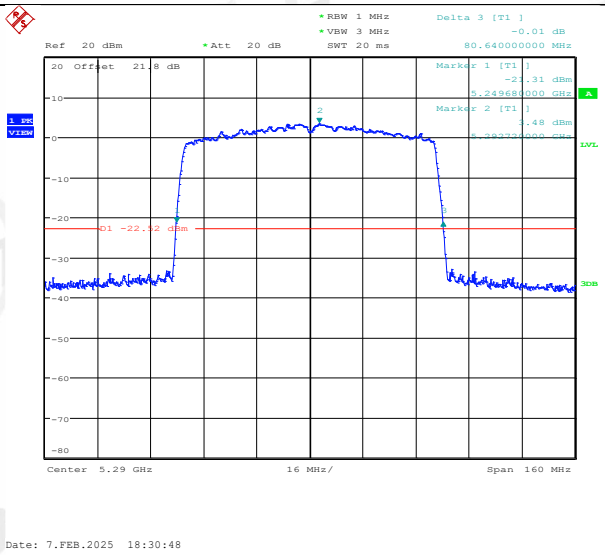
11AC80MIMO_Ant1_5210



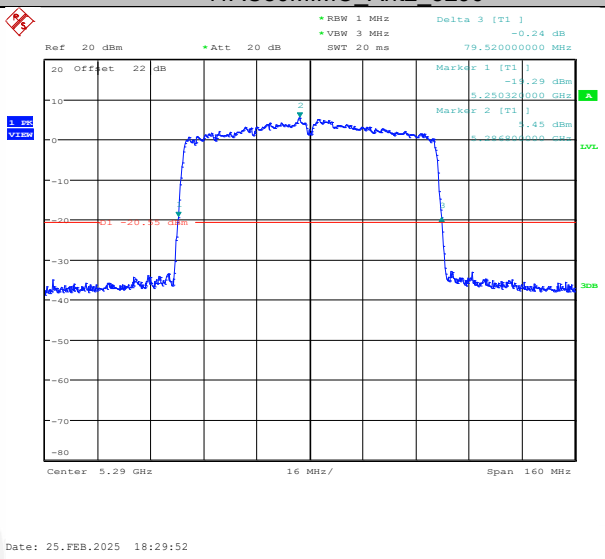
11AC80MIMO_Ant2_5210



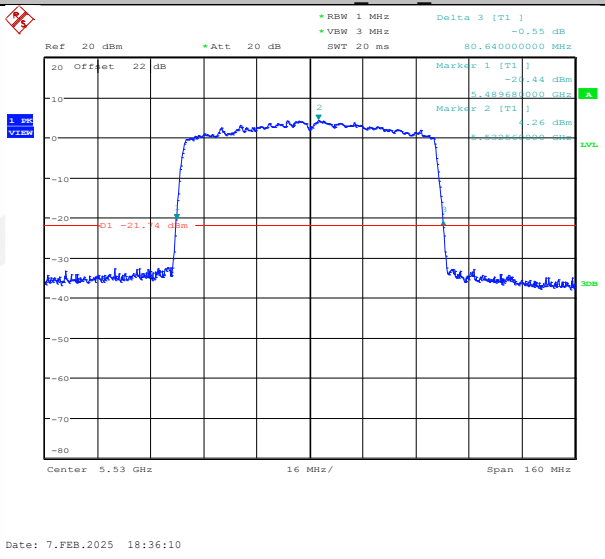
11AC80MIMO_Ant1_5290



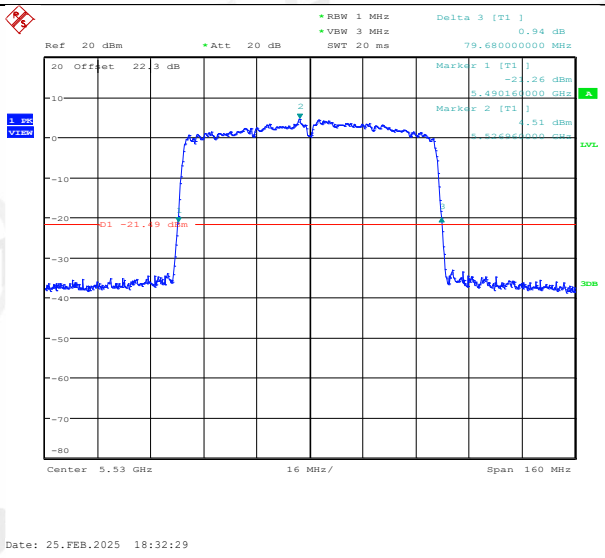
11AC80MIMO_Ant2_5290



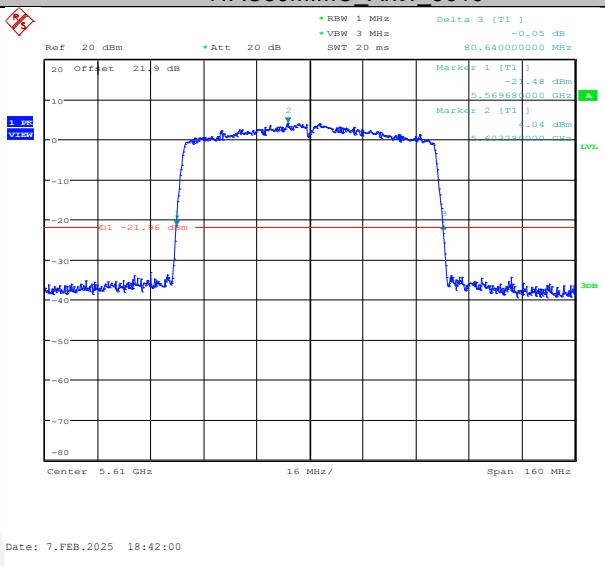
11AC80MIMO_Ant1_5530



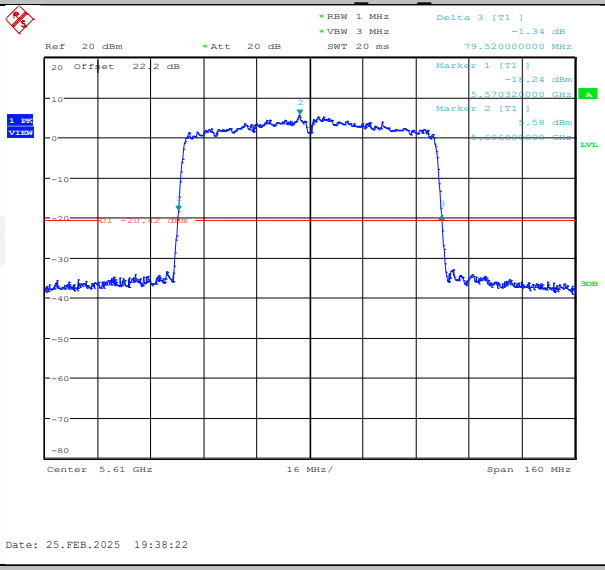
11AC80MIMO_Ant2_5530



11AC80MIMO_Ant1_5610



11AC80MIMO_Ant2_5610



11AC80MIMO_Ant1_5690