



## FCC AND ISED CERTIFICATION TEST REPORT

<b>Applicant</b>	:	Harman International Industries, Incorporated.
<b>Address of Applicant</b>	:	8500 Balboa Boulevard Nothridge CA 91329,USA
<b>Manufacturer</b>	:	Harman International Industries, Incorporated.
<b>Address of Manufacturer</b>	:	8500 Balboa Boulevard Nothridge CA 91329,USA
<b>Equipment under Test</b>	:	Wireless Speaker
<b>Model No.</b>	:	CHARGE 5 Wi-Fi
<b>FCC ID</b>	:	APIJBLC5-WIFI
<b>IC</b>	:	6132A-C5WIFI
<b>Test Standard(s)</b>	:	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
<b>Report No.</b>	:	DDT-RE23111313-2E04
<b>Issue Date</b>	:	2024/06/23
<b>Issue By</b>	:	Guangdong Dongdian Testing Service Co., Ltd. Unit 2, Building 1, No. 17, Zongbu 2nd Road, Songshan Lake Park, Dongguan, Guangdong, China, 523808

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## Test Report Declare

<b>Applicant</b>	:	Harman International Industries, Incorporated.
<b>Address of Applicant</b>	:	8500 Balboa Boulevard Nothridge CA 91329,USA
<b>Equipment under Test</b>	:	Wireless Speaker
<b>Model No.</b>	:	CHARGE 5 Wi-Fi
<b>Manufacturer</b>	:	Harman International Industries, Incorporated.
<b>Address of Manufacturer</b>	:	8500 Balboa Boulevard Nothridge CA 91329,USA

### 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.

<b>Report No.:</b>	DDT-RE23111313-2E04		
<b>Date of Receipt:</b>	2023/11/13	<b>Date of Test:</b>	2023/11/13~2024/06/20

**Prepared By:**

*Ella Gong*

**Ella Gong/Engineer**

**Approved By:**

*Damon Hu*

**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	2024/06/23	

## 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	/	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 8.9	/	Pass
5	Radiated Emission	FCC 15.407 (a) FCC 15.209; FCC 15.205; RSS-247 Clause 6.2; RSS-GEN Clause 8.9	/	Pass
6	Band Edge Compliance	FCC 15.407 (a) FCC 15.209; FCC 15.205; RSS-247 Clause 6.2; RSS-GEN Clause 8.9	/	Pass
7	Power Line Conducted Emissions	FCC Part 15: 15.207(a), RSS-Gen Issue 5 clause 8.8	/	Pass
8	Antenna Requirement	FCC Part 15: 15.203, RSS-Gen Issue 5 clause 6.8	/	Pass
9	Dynamic Frequency Selection	FCC 15.407 (h); RSS-247 Clause 6.3	/	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	: Wireless Speaker
Model Number	: CHARGE 5 Wi-Fi
EUT Function Description	: Please reference user manual of this device
Power Supply	: DC 5V from external adapter or DC 3.69V built-in battery, 14100mAh, 52Wh
Hardware Version	: MP
Software Version	: 23.16.35.60.00

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

Radio Technology	: IEEE 802.11a/n/ac/ax
Operation frequency	: IEEE 802.11a: 5180MHz-5240MHz, 5260MHz-5320MHz, 5500MHz-5720MHz, 5745MHz-5825MHz IEEE 802.11n HT20: 5180MHz-5240MHz, 5260MHz-5320MHz, 5500MHz-5720MHz, 5745MHz-5825MHz IEEE 802.11n HT40: 5190MHz-5230MHz, 5270MHz-5310MHz, 5510MHz-5710MHz, 5755MHz-5795MHz IEEE 802.11ac VHT20: 5180MHz-5240MHz, 5260MHz-5320MHz, 5500MHz-5720MHz, 5745MHz-5825MHz IEEE 802.11ac VHT40: 5190MHz-5230MHz, 5270MHz-5310MHz, 5510MHz-5710MHz, 5755MHz-5795MHz IEEE 802.11ac VHT80: 5210MHz, 5290MHz, 5530MHz, 5610MHz, 5690MHz, 5775MHz IEEE 802.11ax HE20: 5180MHz-5240MHz, 5260MHz-5320MHz,5500MHz-5720MHz, 5745MHz-5825MHz IEEE 802.11ax HE40: 5190MHz-5230MHz, 5270MHz-5310MHz, 5510MHz-5710MHz, 5755MHz-5795MHz IEEE 802.11ax HE80: 5210MHz, 5290MHz, 5530MHz,5610MHz, 5690MHz, 5775MHz
Modulation	: IEEE 802.11a: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n HT20, HT40: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11ac: OFDM (256QAM, 64QAM, 16QAM, QPSK, BPSK) IEEE 802.11ax: OFDM (1024QAM,256QAM, 64QAM, 16QAM, QPSK, BPSK)

Antenna information			
	Ant1 gain	Ant2 gain	Directional gain
IEEE 802.11a	4.33	4.59	/
IEEE 802.11n HT20	4.33	4.59	4.46
IEEE 802.11n HT40	4.33	4.59	4.46
IEEE 802.11ac VHT20	4.33	4.59	4.46
IEEE 802.11ac VHT40	4.33	4.59	4.46
IEEE 802.11ac VHT80	4.33	4.59	4.46
IEEE 802.11ax HE20	4.33	4.59	4.46
IEEE 802.11ax HE40	4.33	4.59	4.46
IEEE 802.11ax HE80	4.33	4.59	4.46

Note: This EUT supports STBC, any transmit signals are uncorrelated with each other. So the Directional gain =  $10 \log[(10^{G1/10} + 10^{G2/10})/2]$  dBi

Channel information		
IEEE 802.11a	IEEE 802.11n (HT40)	IEEE 802.11ac (VHT80)
IEEE 802.11n (HT20)	IEEE 802.11ac (VHT40)	IEEE 802.11ax (HE80)



IEEE 802.11ac (VHT20)		IEEE 802.11ax (HE40)			
IEEE 802.11ax (HE20)					
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 : "☑" means to be chosen or applicable; "☐" means don't to be chosen or not applicable; This note applies to entire report.

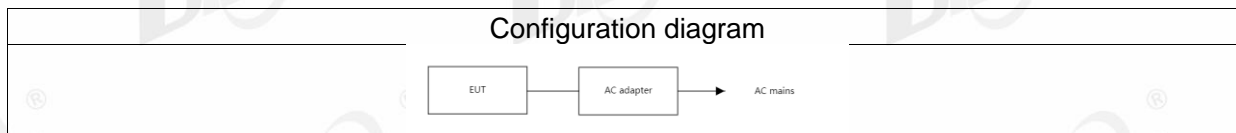
Note: The above EUT information is declared by manufacturer and for more detailed features description please refer to the manufacturer's specifications or User's Manual. The above Antenna information is declared by manufacturer and for more detailed features description please refer to the manufacturer's 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
USB cable	Harman	N/A	Length: 1.17m

## 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, channel, and data rate information					
Mode	Setting Tx Power		Data rate (Mbps) (see Note)	Channel	Frequency (MHz)
	ANT1	ANT2			
IEEE 802.11a	14	14	6	Low: CH36	5180
	14	14	6	Middle: CH40	5200
	14	14	6	High: CH48	5240
	15	15	6	Low: CH52	5260
	15	15	6	Middle: CH56	5280
	15	15	6	High: CH64	5320
	15	15	6	Low: CH100	5500
	15	15	6	Middle: CH116	5580
	15	15	6	High: CH140	5700
	15	15	6	Straddle:CH144	5720
	15	15	6	Low: CH149	5745
	15	15	6	Middle: CH157	5785
IEEE 802.11n HT20	14	14	MCS 8	Low: CH36	5180
	14	14	MCS 8	Middle: CH40	5200
	14	14	MCS 8	High: CH48	5240
	14	14	MCS 8	Low: CH52	5260
	14	14	MCS 8	Middle: CH56	5280
	14	14	MCS 8	High: CH64	5320
	14	14	MCS 8	Low: CH100	5500

	14	14	MCS 8	Middle: CH116	5580
	14	14	MCS 8	High: CH140	5700
	14	14	MCS 8	Straddle:CH144	5720
	14	14	MCS 8	Low: CH149	5745
	14	14	MCS 8	Middle: CH157	5785
	14	14	MCS 8	High: CH165	5825
IEEE 802.11n HT40	14	14	MCS 8	Low: CH38	5190
	14	14	MCS 8	Middle: CH46	5230
	14	14	MCS 8	High: CH54	5270
	14	14	MCS 8	Low: CH62	5310
	14	14	MCS 8	Middle: CH102	5510
	14	14	MCS 8	High: CH110	5550
	14	14	MCS 8	Low: CH134	5670
	14	14	MCS 8	Middle: CH151	5755
	14	14	MCS 8	High: CH159	5795
IEEE 802.11ax HE20	SU: 14 RU: 5	SU: 14 RU: 5	MCS 0	Low: CH36	5180
	SU: 14 RU: 5	SU: 14 RU: 5	MCS 0	Middle: CH40	5200
	SU: 14 RU: 5	SU: 14 RU: 5	MCS 0	High: CH48	5240
	SU: 15 RU: 5	SU: 15 RU: 5	MCS 0	Low: CH52	5260
	SU: 15 RU: 5	SU: 15 RU: 5	MCS 0	Middle: CH56	5280
	SU: 15 RU: 5	SU: 15 RU: 5	MCS 0	High: CH64	5320
	SU: 15 RU: 5	SU: 15 RU: 5	MCS 0	Low: CH100	5500
	SU: 15 RU: 5	SU: 15 RU: 5	MCS 0	Middle: CH116	5580
	SU: 15 RU: 5	SU: 15 RU: 5	MCS 0	High: CH140	5700
	SU: 15 RU: 5	SU: 15 RU: 5	MCS 0	Straddle:CH144	5720
	SU: 15 RU: 5	SU: 15 RU: 5	MCS 0	Low: CH149	5745
	SU: 15 RU: 5	SU: 15 RU: 5	MCS 0	Middle: CH157	5785
	SU: 15 RU: 5	SU: 15 RU: 5	MCS 0	High: CH165	5825
IEEE 802.11ax HE40	SU: 15 RU: 6	SU: 15 RU: 6	MCS 0	Low: CH38	5190
	SU: 15 RU: 6	SU: 15 RU: 6	MCS 0	Middle: CH46	5230
	SU: 15 RU: 6	SU: 15 RU: 6	MCS 0	High: CH54	5270
	SU: 15 RU: 6	SU: 15 RU: 6	MCS 0	Low: CH62	5310
	SU: 15 RU: 6	SU: 15 RU: 6	MCS 0	Middle: CH102	5510
	SU: 15 RU: 6	SU: 15 RU: 6	MCS 0	High: CH110	5550
	SU: 15 RU: 6	SU: 15 RU: 6	MCS 0	Low: CH134	5670
	SU: 15 RU: 6	SU: 15 RU: 6	MCS 0	Straddle: CH142	5710
	SU: 15 RU: 6	SU: 15 RU: 6	MCS 0	Middle: CH151	5755
	SU: 15 RU: 6	SU: 15 RU: 6	MCS 0	High: CH159	5795
	SU: 15 RU: 6	SU: 15 RU: 6	MCS 0	CH42	5210
	SU: 15 RU: 6	SU: 15 RU: 6	MCS 0	CH58	5290

IEEE 802.11ax HE80	SU: 15 RU: 6	SU: 15 RU: 6	MCS 0	CH106	5530
	SU: 15 RU: 6	SU: 15 RU: 6	MCS 0	CH122	5610
	SU: 15 RU: 6	SU: 15 RU: 6	MCS 0	CH138	5690
	SU: 15 RU: 6	SU: 15 RU: 6	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:

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

Temperature range:	21-25°C
Humidity range:	40-75%
Pressure range:	86-106 kPa

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

## 2.7. Test laboratory

Guangdong Dongdian Testing Service Co., Ltd.

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

Tel.: +86-0769-38826678, <http://www.dgddt.com>, Email: [ddt@dgddt.com](mailto: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 x 10 <sup>-8</sup> (Antenna couple method)
	5.5 x 10 <sup>-8</sup> (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)	3x10 <sup>-8</sup>
Temperature	0.4 °C
Humidity	2 %
Uncertainty for Radiation Emission test (9 kHz – 30 MHz)	3.44 dB
Uncertainty for Radiation Emission test (30 MHz - 1 GHz)	4.70 dB (Antenna Polarize: V)
	4.84 dB (Antenna Polarize: H)
Uncertainty for Radiation Emission test (1 GHz - 40 GHz)	4.10 dB (1 - 6 GHz)
	4.40 dB (6 GHz - 18 GHz)
	3.54 dB (18 GHz - 26 GHz)
	4.30 dB (26 GHz - 40 GHz)
Uncertainty for Power line conduction emission test	3.34dB (150KHz-30MHz)
	3.72dB (9KHz-150KHz)

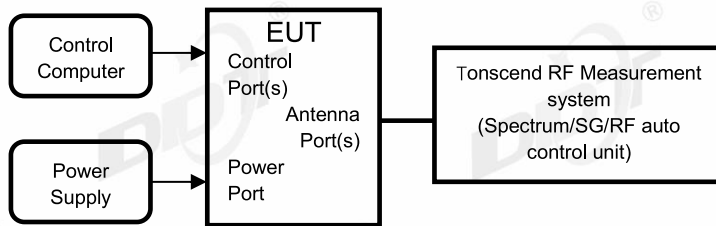
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

### 3. Equipment Used During Conductive Test

Equipment	Manufacturer	Model No.	Serial Number	Due Date
☒RF Connected Test (RF Measurement System 4#)				
Signal &Spectrum Analyzer	R&S	FSV3044	101173	2024/04/22
Wideband Radio Communication Tester	R&S	CMW500	168801	2024/04/26
MXG Vector Signal Generator	Agilent	N5182A	MY48180737	2024/04/26
PSG Vector Signal Generator	Agilent	E8267D	US49060192	2024/09/05
RF Control Unit	Tonsend	JS0806-2	2118060485	2024/04/26
TEMP&HUMI Programmable Chamber	ZHIXIANG	ZXGDJS-150L	ZX170110-A	2024/05/14
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:	Haofeng	Test Site:	RF Measurement System 4#
Ambient Condition:	24.4℃,45.3%RH	Test Date:	2024.02.20-2024.02.22
Test Power Supply:	Battery	EUT:	Wireless Speaker
Sample Number:	S23111313-04	Model No.:	CHARGE5 Wi-Fi

Test Mode	Antenna	Frequency[MHz]	26db EBW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A	Ant1	5180	24.12	5167.64	5191.76	---	---
	Ant2	5180	25.00	5166.68	5191.68	---	---
	Ant1	5200	24.36	5187.64	5212.00	---	---
	Ant2	5200	24.12	5187.64	5211.76	---	---
	Ant1	5240	19.88	5230.00	5249.88	---	---
	Ant2	5240	19.72	5230.04	5249.76	---	---
	Ant1	5260	23.68	5248.12	5271.80	---	---
	Ant2	5260	24.04	5247.72	5271.76	---	---
	Ant1	5280	23.56	5268.16	5291.72	---	---
	Ant2	5280	23.64	5268.12	5291.76	---	---
	Ant1	5320	25.36	5306.64	5332.00	---	---
	Ant2	5320	25.08	5306.64	5331.72	---	---
	Ant1	5500	24.28	5487.64	5511.92	---	---
	Ant2	5500	24.12	5487.64	5511.76	---	---
	Ant1	5580	24.00	5567.72	5591.72	---	---
	Ant2	5580	24.32	5568.00	5592.32	---	---
	Ant1	5700	24.12	5687.64	5711.76	---	---
	Ant2	5700	25.00	5686.72	5711.72	---	---
	Ant1	5720	24.00	5707.68	5731.68	---	---
	Ant2	5720	23.72	5708.16	5731.88	---	---
	Ant1	5720_UNII-2C	17.32	5707.68	5725	---	---
	Ant2	5720_UNII-2C	16.84	5708.16	5725	---	---
	Ant1	5720_UNII-3	6.68	5725	5731.68	---	---
	Ant2	5720_UNII-3	6.88	5725	5731.88	---	---
	Ant1	5745	23.84	5732.88	5756.72	---	---
	Ant2	5745	23.56	5733.08	5756.64	---	---
	Ant1	5785	23.60	5773.16	5796.76	---	---
	Ant2	5785	23.92	5773.04	5796.96	---	---
	Ant1	5825	23.56	5813.16	5836.72	---	---
	Ant2	5825	23.60	5813.12	5836.72	---	---
	Ant1	5180	24.68	5167.64	5192.32	---	---
	Ant2	5180	25.36	5166.00	5191.36	---	---
Ant1	5200	24.40	5187.84	5212.24	---	---	
Ant2	5200	25.52	5186.52	5212.04	---	---	
Ant1	5240	20.08	5229.92	5250.00	---	---	
Ant2	5240	19.96	5230.00	5249.96	---	---	
Ant1	5260	24.48	5247.76	5272.24	---	---	
Ant2	5260	23.80	5248.24	5272.04	---	---	
Ant1	5280	24.76	5267.72	5292.48	---	---	
Ant2	5280	23.36	5268.12	5291.48	---	---	
Ant1	5320	24.60	5307.64	5332.24	---	---	
Ant2	5320	25.24	5306.52	5331.76	---	---	
Ant1	5500	24.56	5487.84	5512.40	---	---	
Ant2	5500	24.12	5487.40	5511.52	---	---	
Ant1	5580	24.96	5567.60	5592.56	---	---	
Ant2	5580	23.72	5568.08	5591.80	---	---	
Ant1	5700	24.68	5687.64	5712.32	---	---	
Ant2	5700	26.04	5685.80	5711.84	---	---	
Ant1	5720	24.64	5707.68	5732.32	---	---	
Ant2	5720	23.72	5708.12	5731.84	---	---	
Ant1	5720_UNII-2C	17.32	5707.68	5725	---	---	
Ant2	5720_UNII-2C	16.88	5708.12	5725	---	---	
Ant1	5720_UNII-3	7.32	5725	5732.32	---	---	
Ant2	5720_UNII-3	6.84	5725	5731.84	---	---	



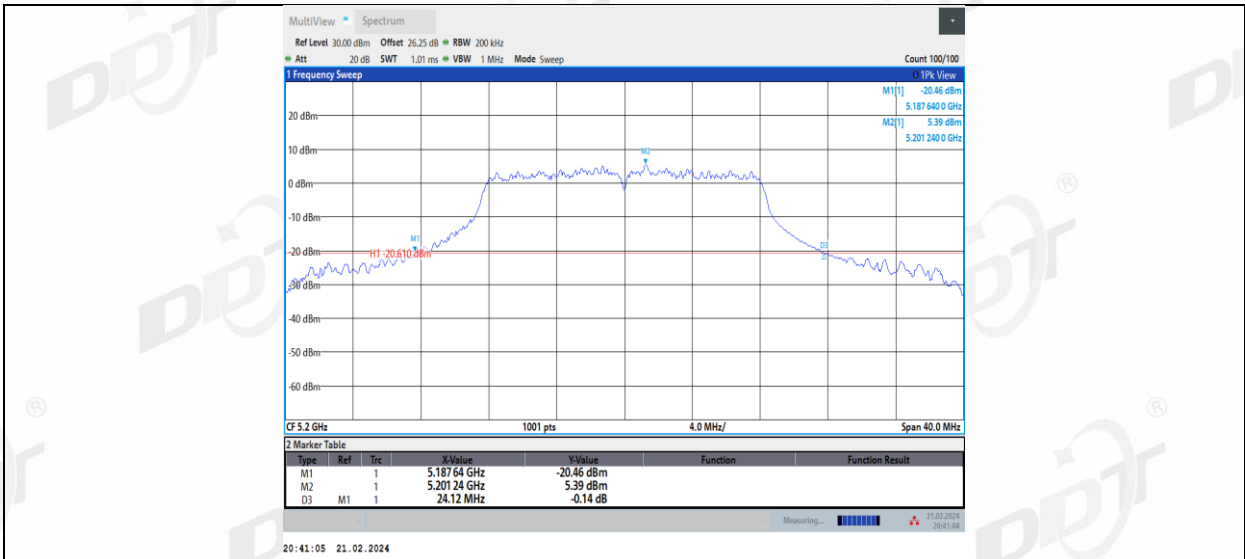
	Ant1	5745	24.48	5732.68	5757.16	---	---
	Ant2	5745	23.32	5733.16	5756.48	---	---
	Ant1	5785	24.36	5772.88	5797.24	---	---
	Ant2	5785	23.28	5773.16	5796.44	---	---
	Ant1	5825	24.84	5812.56	5837.40	---	---
	Ant2	5825	23.60	5813.00	5836.60	---	---
11N40MI MO	Ant1	5190	40.72	5169.76	5210.48	---	---
	Ant2	5190	40.00	5170.00	5210.00	---	---
	Ant1	5230	40.80	5209.60	5250.40	---	---
	Ant2	5230	39.68	5210.16	5249.84	---	---
	Ant1	5270	40.72	5249.76	5290.48	---	---
	Ant2	5270	39.76	5250.24	5290.00	---	---
	Ant1	5310	40.72	5289.76	5330.48	---	---
	Ant2	5310	39.84	5290.08	5329.92	---	---
	Ant1	5510	40.88	5489.60	5530.48	---	---
	Ant2	5510	39.84	5490.08	5529.92	---	---
	Ant1	5550	40.80	5529.68	5570.48	---	---
	Ant2	5550	39.92	5530.00	5569.92	---	---
	Ant1	5670	40.56	5649.76	5690.32	---	---
	Ant2	5670	39.84	5650.16	5690.00	---	---
	Ant1	5710	40.72	5689.68	5730.40	---	---
	Ant2	5710	39.84	5690.08	5729.92	---	---
	Ant1	5710_UNII-2C	35.32	5689.68	5725	---	---
	Ant2	5710_UNII-2C	34.92	5690.08	5725	---	---
	Ant1	5710_UNII-3	5.4	5725	5730.40	---	---
	Ant2	5710_UNII-3	4.92	5725	5729.92	---	---
	Ant1	5755	40.88	5734.52	5775.40	---	---
	Ant2	5755	39.84	5735.08	5774.92	---	---
	Ant1	5795	40.80	5774.60	5815.40	---	---
	Ant2	5795	40.08	5775.08	5815.16	---	---
11AC20M IMO	Ant1	5180	25.44	5167.68	5193.12	---	---
	Ant2	5180	23.84	5168.56	5192.40	---	---
	Ant1	5200	25.00	5187.88	5212.88	---	---
	Ant2	5200	23.00	5188.76	5211.76	---	---
	Ant1	5240	20.08	5229.96	5250.04	---	---
	Ant2	5240	19.96	5229.96	5249.92	---	---
	Ant1	5260	24.76	5247.52	5272.28	---	---
	Ant2	5260	23.20	5248.60	5271.80	---	---
	Ant1	5280	24.36	5267.92	5292.28	---	---
	Ant2	5280	23.12	5268.52	5291.64	---	---
	Ant1	5320	24.76	5307.36	5332.12	---	---
	Ant2	5320	24.00	5308.44	5332.44	---	---
	Ant1	5500	24.72	5488.08	5512.80	---	---
	Ant2	5500	23.88	5488.56	5512.44	---	---
	Ant1	5580	24.52	5567.76	5592.28	---	---
	Ant2	5580	23.96	5568.00	5591.96	---	---
	Ant1	5700	25.48	5687.32	5712.80	---	---
	Ant2	5700	22.88	5688.60	5711.48	---	---
	Ant1	5720	24.52	5707.72	5732.24	---	---
	Ant2	5720	23.00	5708.60	5731.60	---	---
	Ant1	5720_UNII-2C	17.28	5707.72	5725	---	---
	Ant2	5720_UNII-2C	16.4	5708.60	5725	---	---
	Ant1	5720_UNII-3	7.24	5725	5732.24	---	---
	Ant2	5720_UNII-3	6.6	5725	5731.60	---	---
	Ant1	5745	24.56	5732.68	5757.24	---	---
	Ant2	5745	23.48	5733.48	5756.96	---	---
	Ant1	5785	25.32	5772.64	5797.96	---	---
	Ant2	5785	22.96	5773.76	5796.72	---	---
	Ant1	5825	24.84	5812.48	5837.32	---	---
	Ant2	5825	23.08	5813.56	5836.64	---	---
11AC40M IMO	Ant1	5190	40.32	5169.84	5210.16	---	---
	Ant2	5190	39.84	5170.08	5209.92	---	---
	Ant1	5230	40.24	5209.92	5250.16	---	---
	Ant2	5230	39.92	5210.08	5250.00	---	---

	Ant1	5270	40.40	5249.84	5290.24	---	---
	Ant2	5270	39.68	5250.16	5289.84	---	---
	Ant1	5310	40.08	5290.00	5330.08	---	---
	Ant2	5310	39.84	5290.08	5329.92	---	---
	Ant1	5510	40.56	5489.76	5530.32	---	---
	Ant2	5510	39.92	5490.00	5529.92	---	---
	Ant1	5550	40.24	5529.84	5570.08	---	---
	Ant2	5550	39.76	5530.00	5569.76	---	---
	Ant1	5670	40.40	5649.92	5690.32	---	---
	Ant2	5670	39.68	5650.24	5689.92	---	---
	Ant1	5710	40.56	5689.60	5730.16	---	---
	Ant2	5710	39.84	5690.00	5729.84	---	---
	Ant1	5710 UNII-2C	35.4	5689.60	5725	---	---
	Ant2	5710 UNII-2C	35	5690.00	5725	---	---
	Ant1	5710 UNII-3	5.16	5725	5730.16	---	---
	Ant2	5710 UNII-3	4.84	5725	5729.84	---	---
Ant1	5755	40.40	5734.68	5775.08	---	---	
Ant2	5755	39.84	5735.00	5774.84	---	---	
Ant1	5795	40.16	5774.92	5815.08	---	---	
Ant2	5795	39.68	5775.16	5814.84	---	---	
11AC80M IMO	Ant1	5210	80.32	5169.84	5250.16	---	---
	Ant2	5210	79.36	5170.32	5249.68	---	---
	Ant1	5290	80.48	5249.84	5330.32	---	---
	Ant2	5290	79.52	5250.32	5329.84	---	---
	Ant1	5530	80.32	5489.84	5570.16	---	---
	Ant2	5530	79.36	5490.32	5569.68	---	---
	Ant1	5610	80.32	5569.84	5650.16	---	---
	Ant2	5610	79.36	5570.32	5649.68	---	---
	Ant1	5690	80.64	5649.68	5730.32	---	---
	Ant2	5690	79.36	5650.32	5729.68	---	---
	Ant1	5690 UNII-2C	75.32	5649.68	5725	---	---
	Ant2	5690 UNII-2C	74.68	5650.32	5725	---	---
	Ant1	5690 UNII-3	5.32	5725	5730.32	---	---
	Ant2	5690 UNII-3	4.68	5725	5729.68	---	---
	Ant1	5775	80.64	5734.68	5815.32	---	---
	Ant2	5775	79.68	5735.16	5814.84	---	---
11AX20M IMO	Ant1	5180	26.72	5164.88	5191.60	---	---
	Ant2	5180	24.60	5167.40	5192.00	---	---
	Ant1	5200	25.20	5187.84	5213.04	---	---
	Ant2	5200	22.92	5188.56	5211.48	---	---
	Ant1	5240	19.88	5230.04	5249.92	---	---
	Ant2	5240	19.88	5230.04	5249.92	---	---
	Ant1	5260	27.32	5247.40	5274.72	---	---
	Ant2	5260	25.20	5248.48	5273.68	---	---
	Ant1	5280	25.52	5267.84	5293.36	---	---
	Ant2	5280	24.24	5267.88	5292.12	---	---
	Ant1	5320	22.36	5308.92	5331.28	---	---
	Ant2	5320	26.20	5305.72	5331.92	---	---
	Ant1	5500	25.88	5486.36	5512.24	---	---
	Ant2	5500	23.32	5488.56	5511.88	---	---
	Ant1	5580	24.36	5567.12	5591.48	---	---
	Ant2	5580	23.36	5568.40	5591.76	---	---
	Ant1	5700	24.84	5687.32	5712.16	---	---
	Ant2	5700	23.84	5688.04	5711.88	---	---
	Ant1	5720	23.88	5707.72	5731.60	---	---
	Ant2	5720	22.84	5708.12	5730.96	---	---
	Ant1	5720 UNII-2C	17.28	5707.72	5725	---	---
	Ant2	5720 UNII-2C	16.88	5708.12	5725	---	---
	Ant1	5720 UNII-3	6.6	5725	5731.60	---	---
	Ant2	5720 UNII-3	5.96	5725	5730.96	---	---
	Ant1	5745	25.36	5730.60	5755.96	---	---
	Ant2	5745	24.04	5733.00	5757.04	---	---
	Ant1	5785	26.44	5774.04	5800.48	---	---
	Ant2	5785	24.60	5772.88	5797.48	---	---

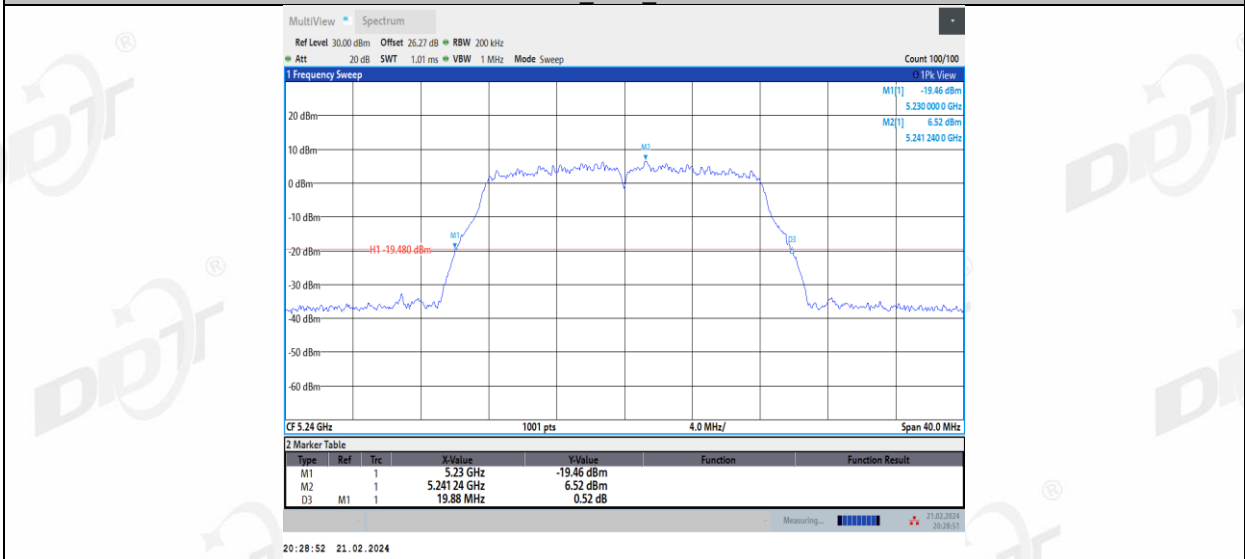
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	Ant2	5825	23.32	5813.00	5836.32	---	---	
	Ant1	5190	39.76	5170.08	5209.84	---	---	
	Ant2	5190	39.68	5170.16	5209.84	---	---	
	Ant1	5230	39.68	5210.08	5249.76	---	---	
	Ant2	5230	39.76	5210.08	5249.84	---	---	
	Ant1	5270	39.76	5250.08	5289.84	---	---	
	Ant2	5270	39.68	5250.16	5289.84	---	---	
	Ant1	5310	39.68	5290.16	5329.84	---	---	
	Ant2	5310	39.68	5290.16	5329.84	---	---	
	Ant1	5510	39.60	5490.16	5529.76	---	---	
	Ant2	5510	39.76	5490.08	5529.84	---	---	
	Ant1	5550	39.68	5530.16	5569.84	---	---	
	Ant2	5550	39.68	5530.08	5569.76	---	---	
	Ant1	5670	39.76	5650.08	5689.84	---	---	
	Ant2	5670	39.60	5650.16	5689.76	---	---	
	Ant1	5710	39.68	5690.16	5729.84	---	---	
	Ant2	5710	39.68	5690.16	5729.84	---	---	
	11AX80M IMO	Ant1	5710 UNII-2C	34.84	5690.16	5725	---	---
		Ant2	5710 UNII-2C	34.84	5690.16	5725	---	---
Ant1		5710 UNII-3	4.84	5725	5729.84	---	---	
Ant2		5710 UNII-3	4.84	5725	5729.84	---	---	
Ant1		5755	39.76	5735.08	5774.84	---	---	
Ant2		5755	39.60	5735.16	5774.76	---	---	
Ant1		5795	39.60	5775.16	5814.76	---	---	
Ant2		5795	39.68	5775.16	5814.84	---	---	
Ant1		5210	80.48	5169.68	5250.16	---	---	
Ant2		5210	80.32	5169.84	5250.16	---	---	
Ant1		5290	80.48	5249.68	5330.16	---	---	
Ant2		5290	80.32	5249.84	5330.16	---	---	
Ant1		5530	80.64	5489.68	5570.32	---	---	
Ant2		5530	80.32	5489.84	5570.16	---	---	
Ant1		5610	80.32	5569.84	5650.16	---	---	
Ant2		5610	80.48	5569.68	5650.16	---	---	
Ant1		5690	80.48	5649.84	5730.32	---	---	
Ant2		5690	80.32	5649.84	5730.16	---	---	
Ant1	5690 UNII-2C	75.16	5649.84	5725	---	---		
Ant2	5690 UNII-2C	75.16	5649.84	5725	---	---		
Ant1	5690 UNII-3	5.32	5725	5730.32	---	---		
Ant2	5690 UNII-3	5.16	5725	5730.16	---	---		
Ant1	5775	80.48	5734.68	5815.16	---	---		
Ant2	5775	80.64	5734.68	5815.32	---	---		

4.5. Test graphs

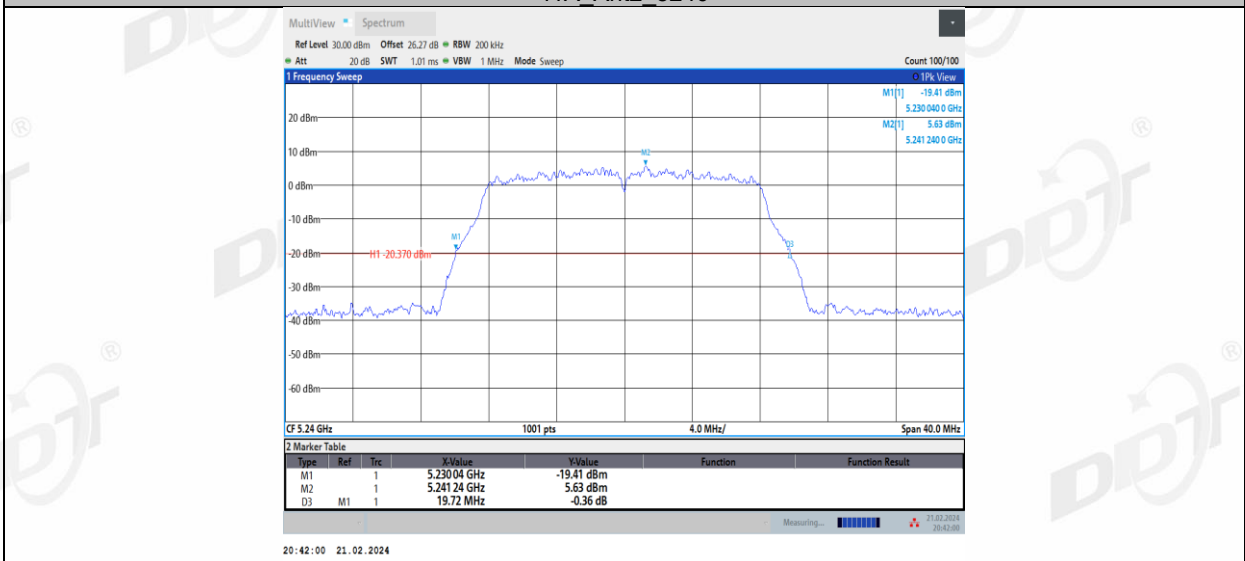




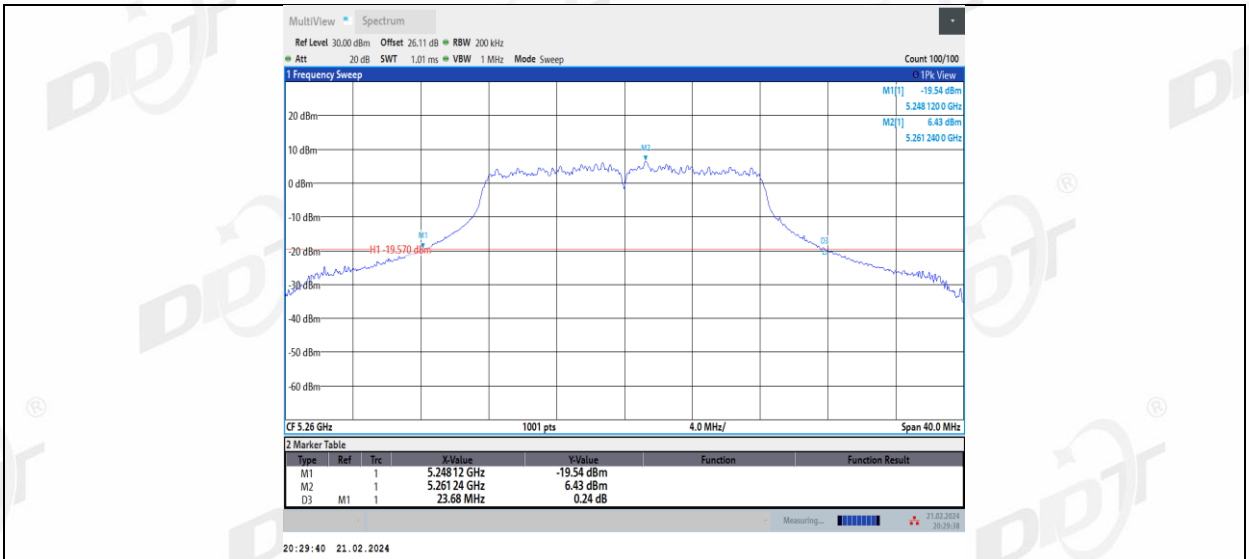
11A\_Ant1\_5240



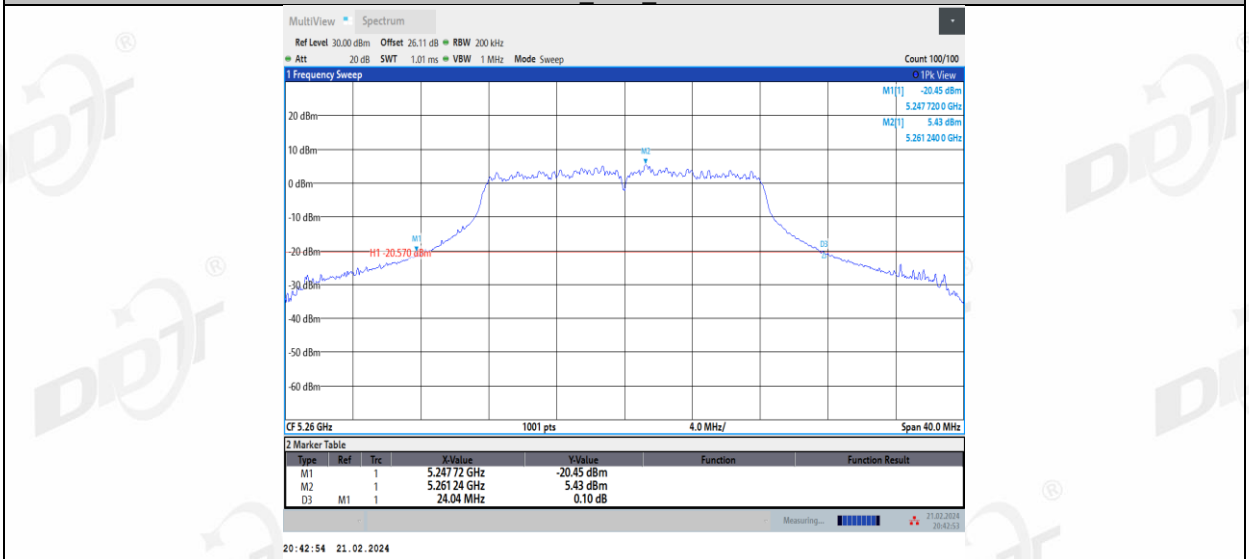
11A\_Ant2\_5240



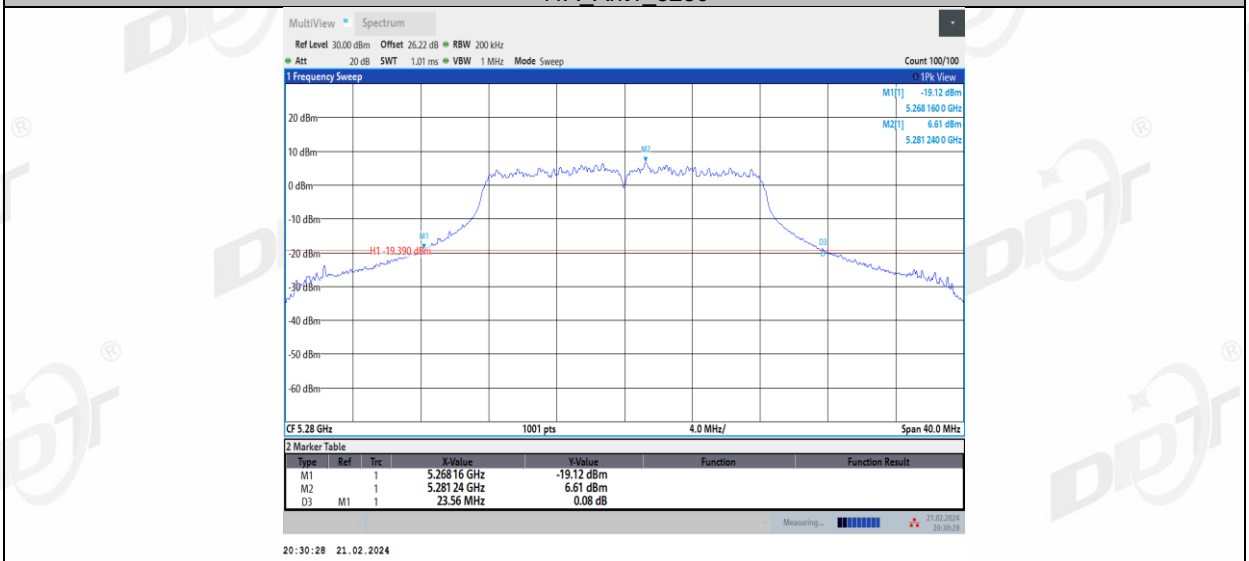
11A\_Ant1\_5260



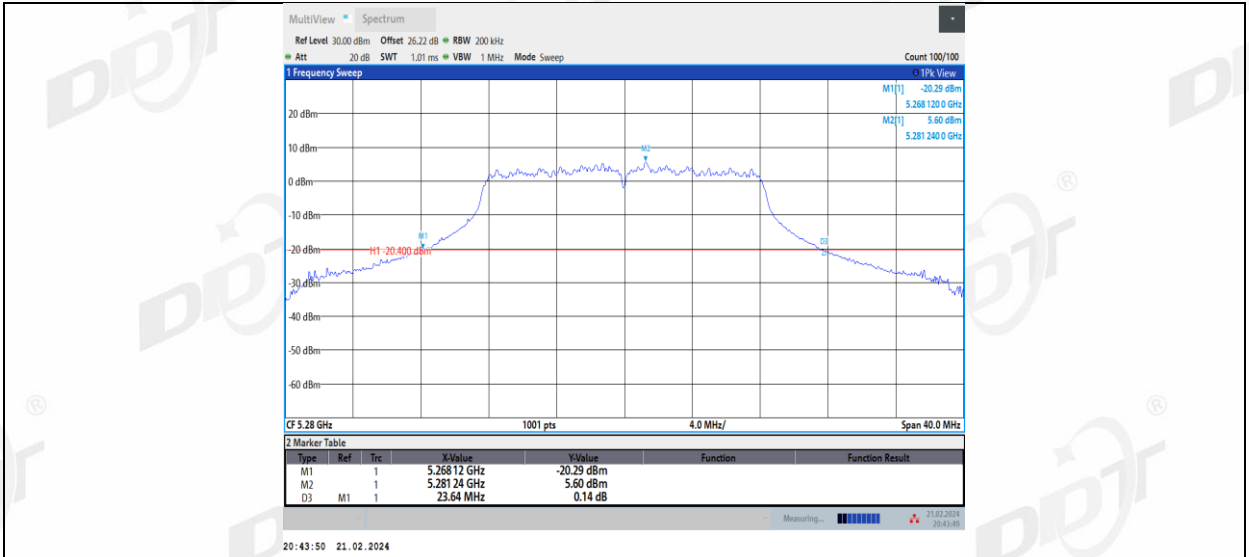
11A\_Ant2\_5260



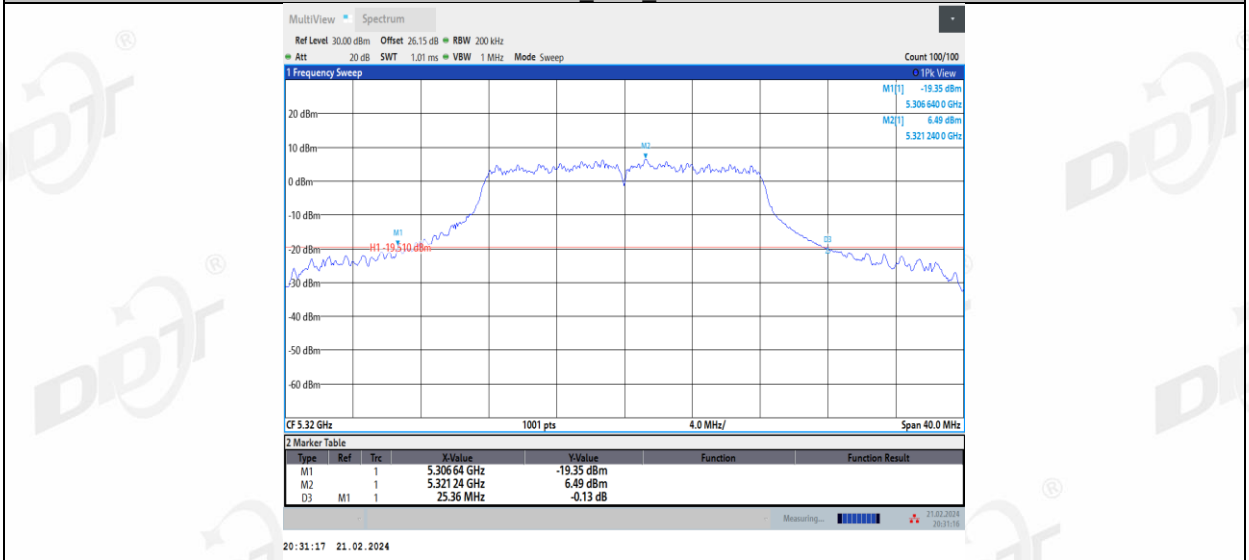
11A\_Ant1\_5280



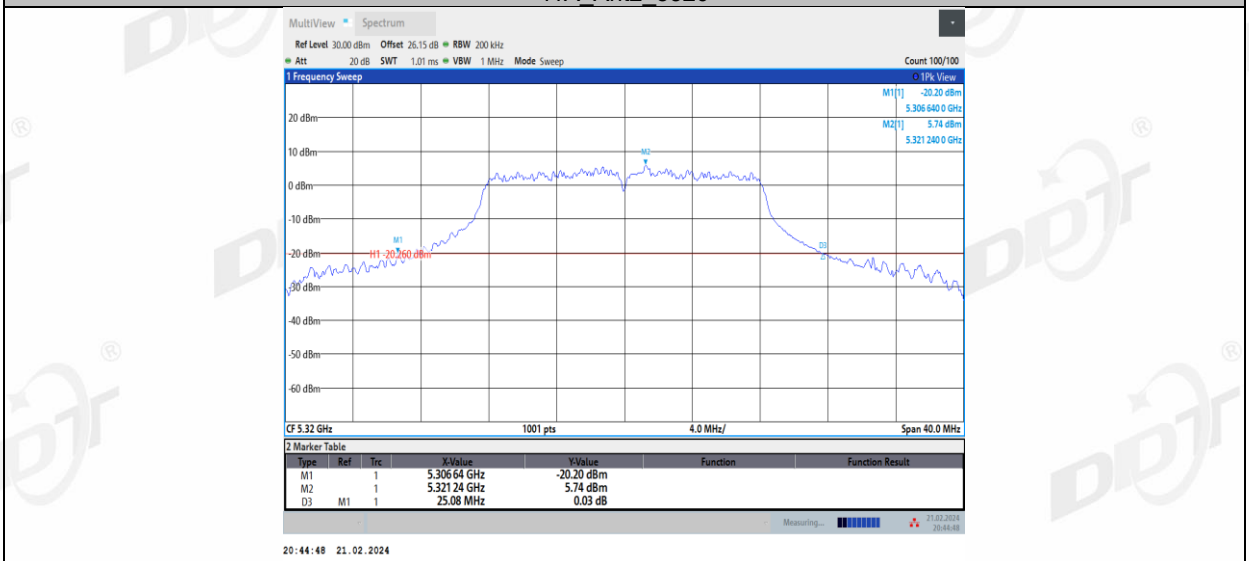
11A\_Ant2\_5280



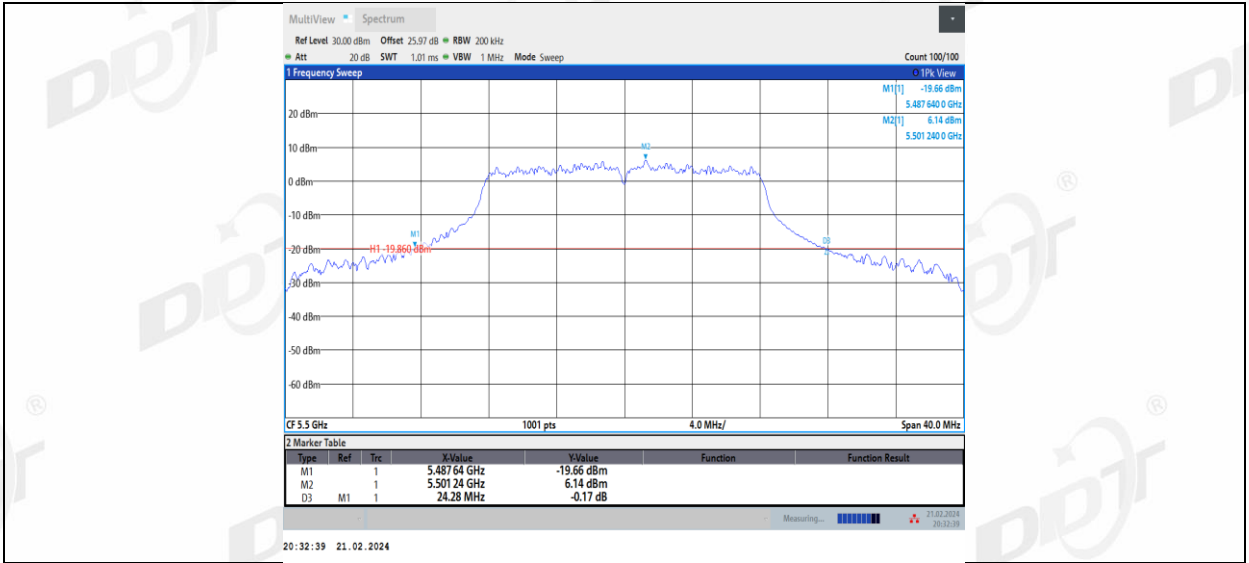
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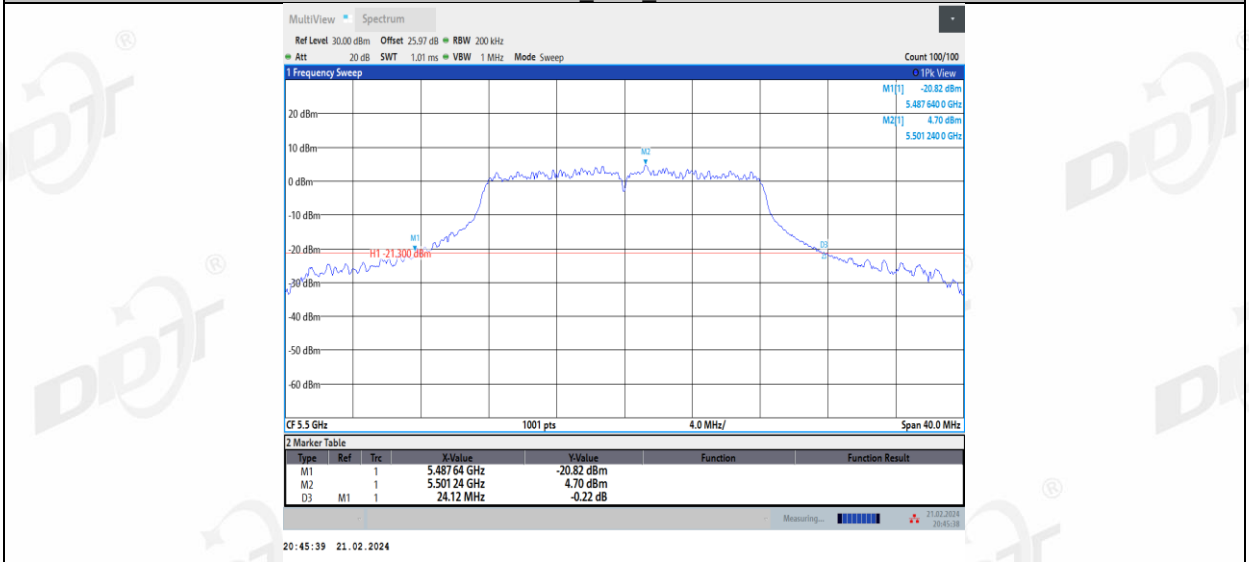
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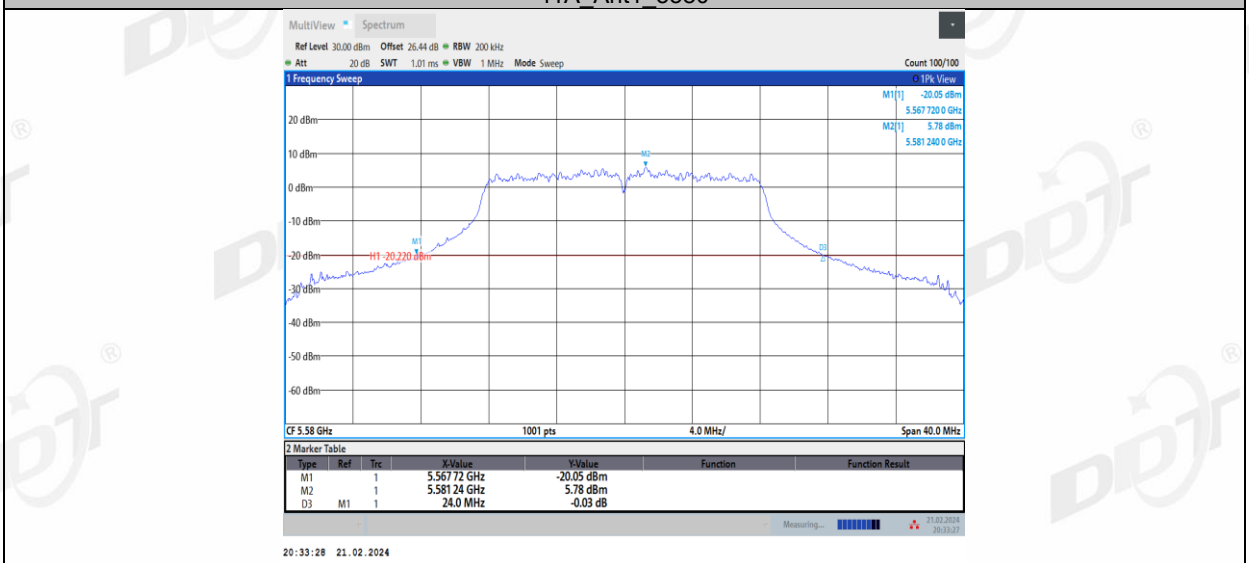
11A\_Ant1\_5500



11A\_Ant2\_5500

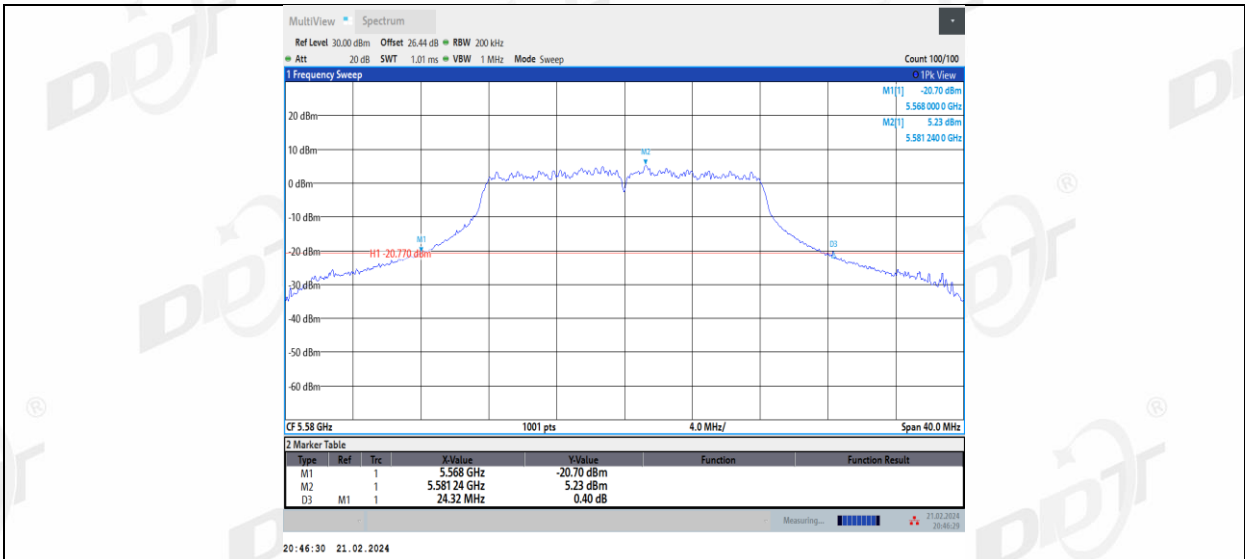


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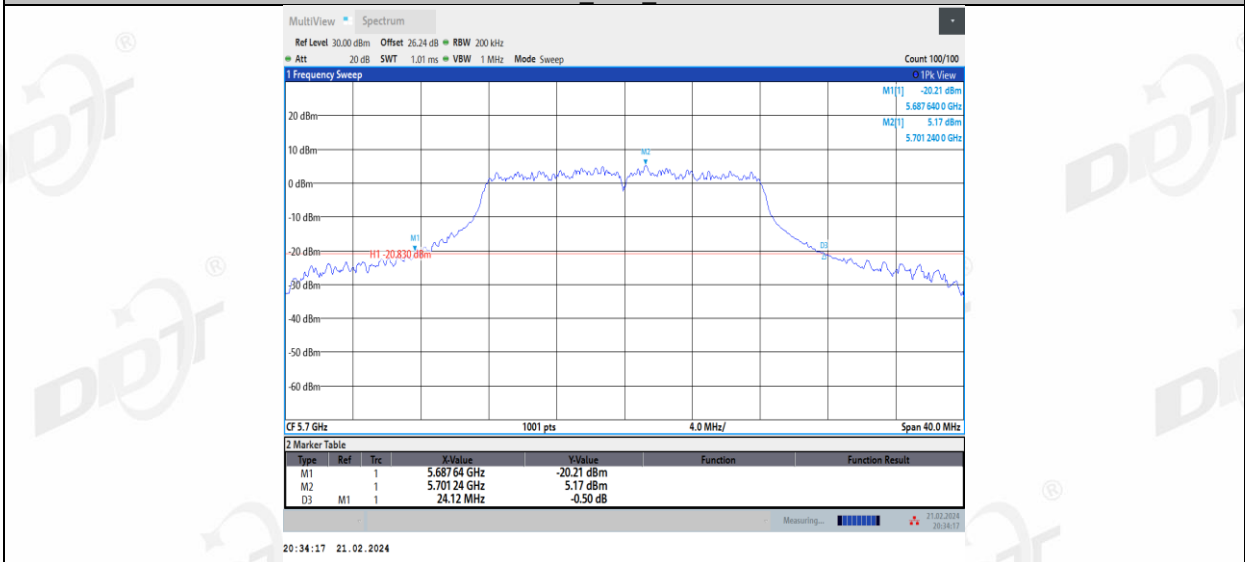


11A\_Ant2\_5580

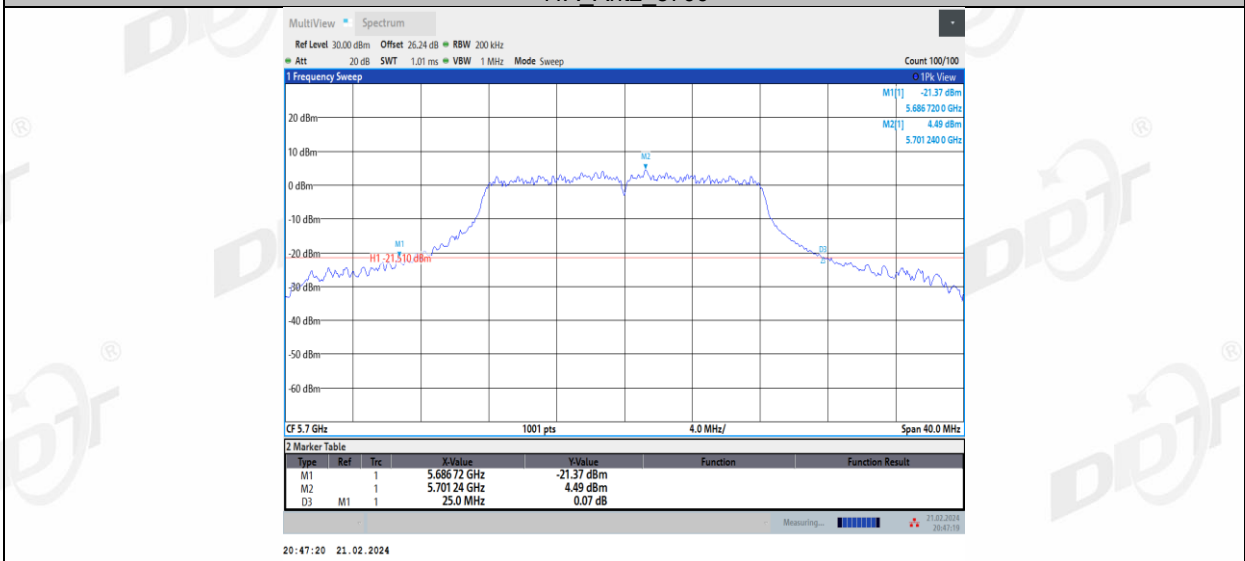




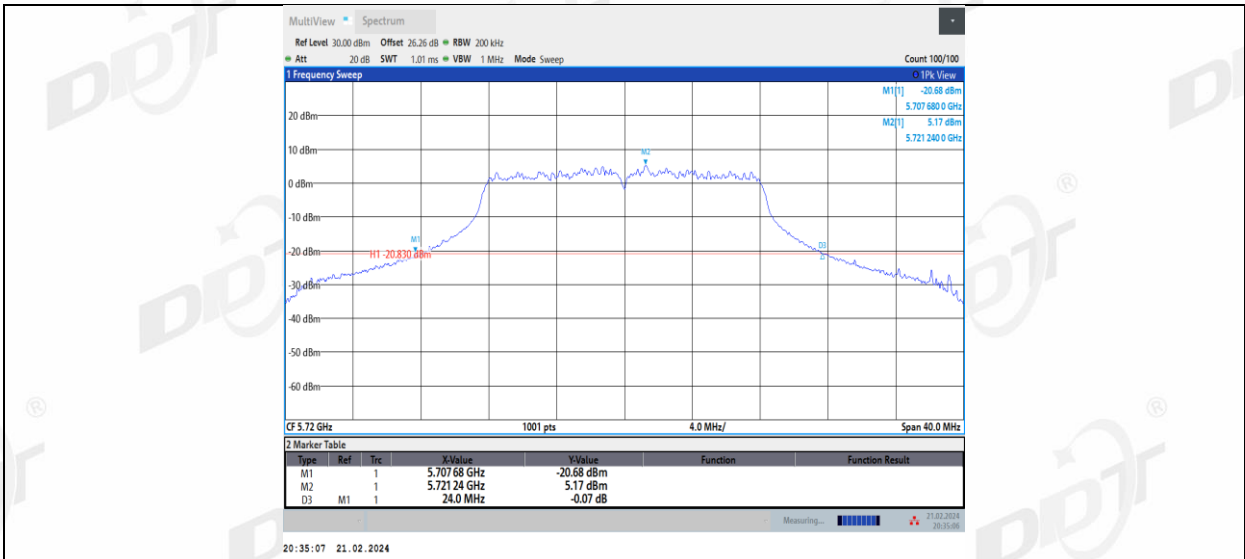
11A\_Ant1\_5700



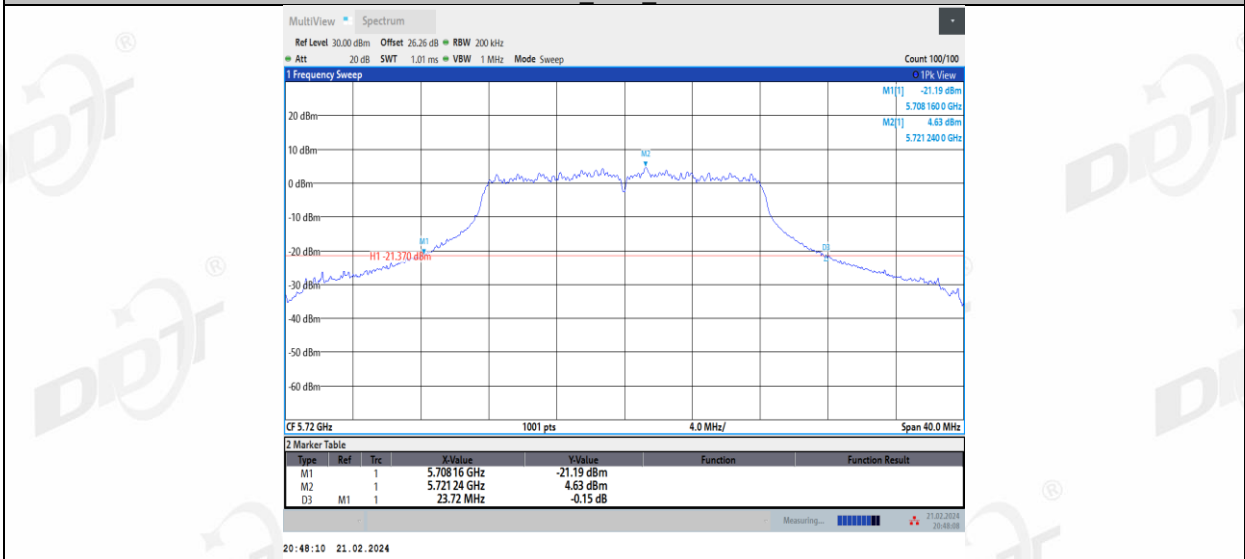
11A\_Ant2\_5700



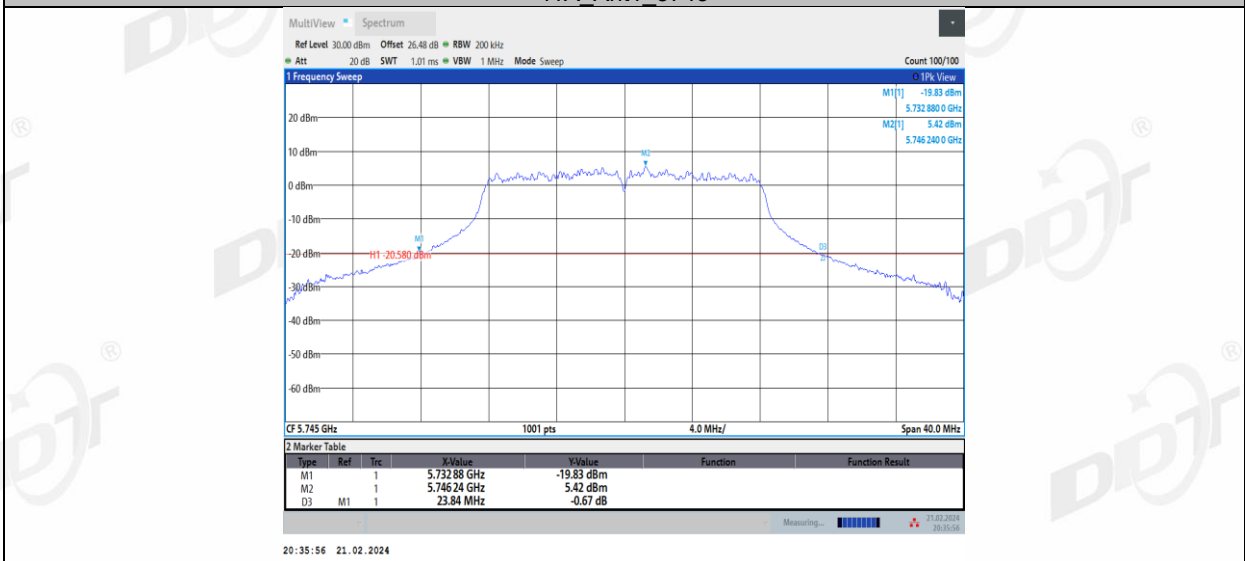
11A\_Ant1\_5720



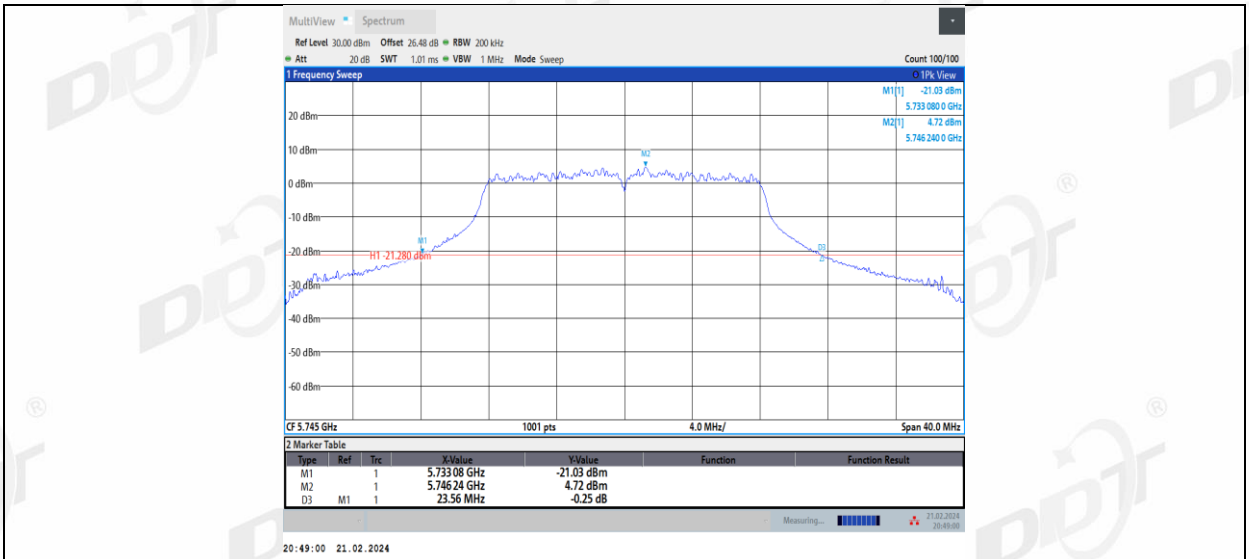
11A\_Ant2\_5720



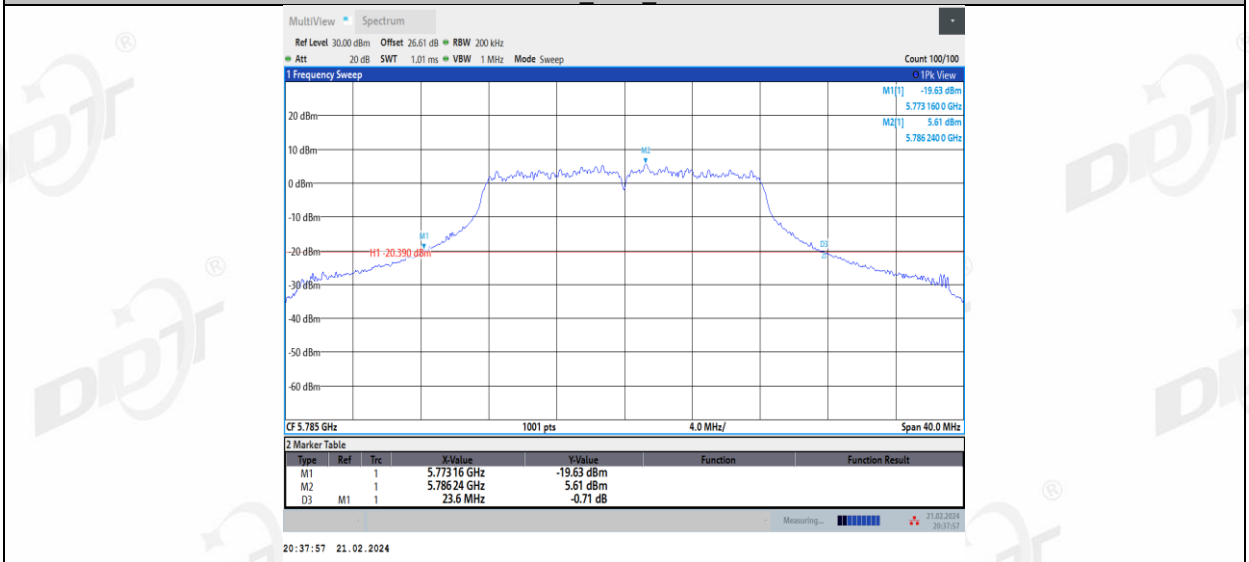
11A\_Ant1\_5745



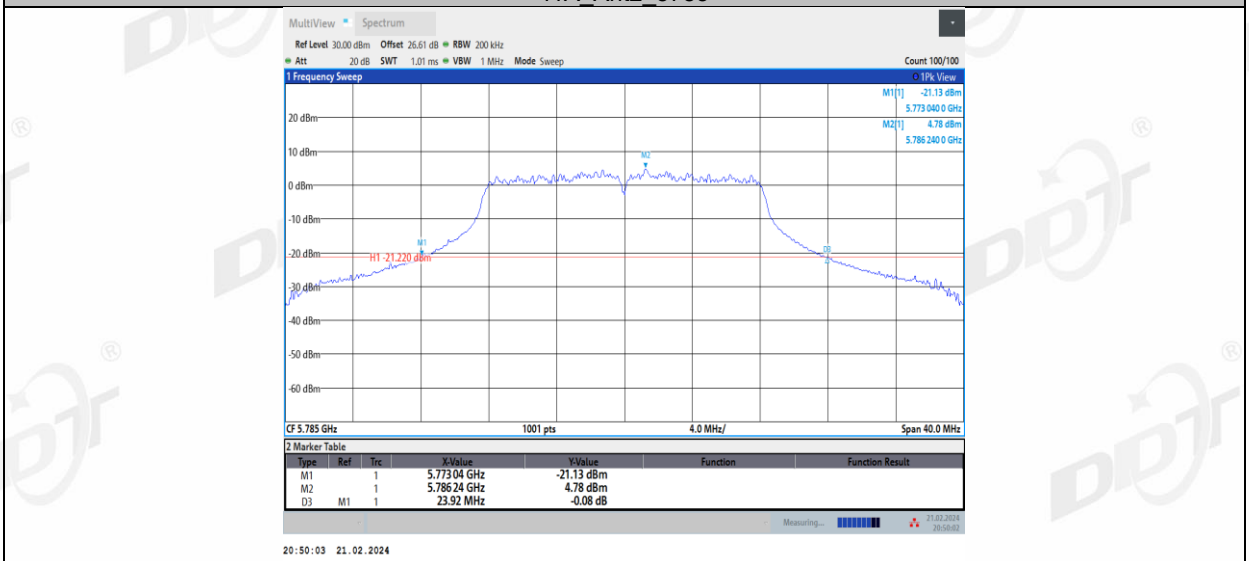
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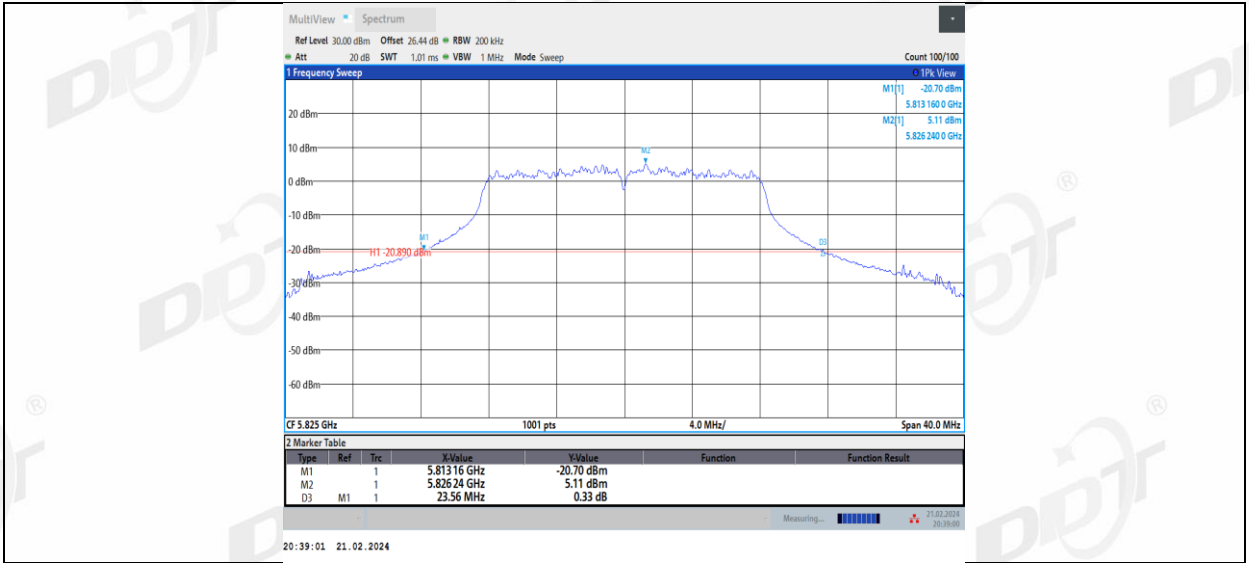
11A\_Ant1\_5785



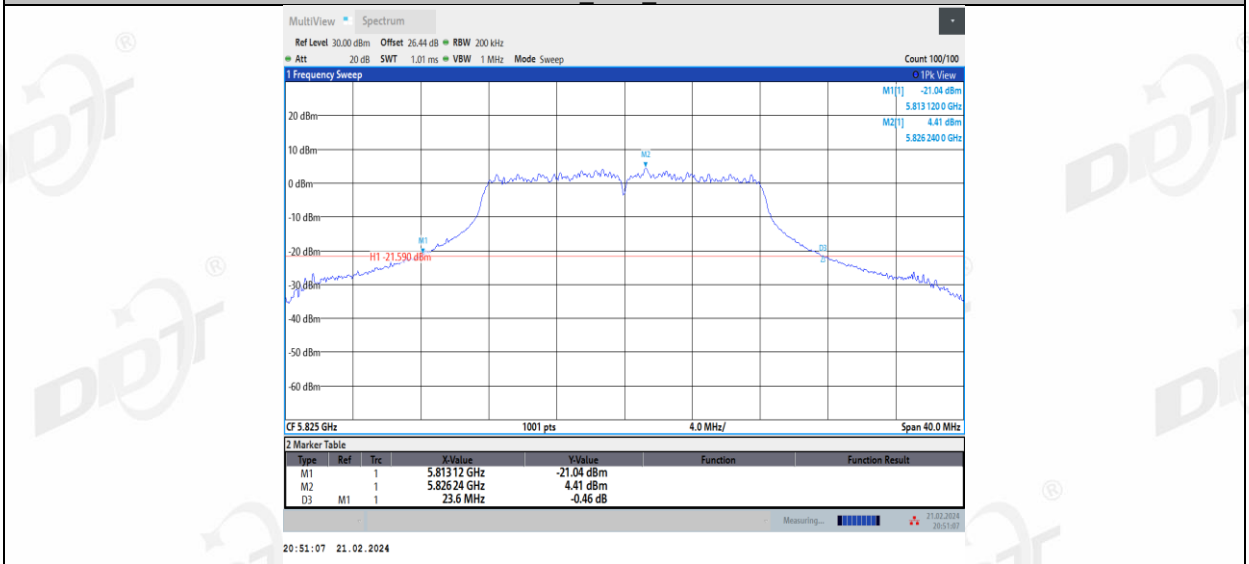
11A\_Ant2\_5785



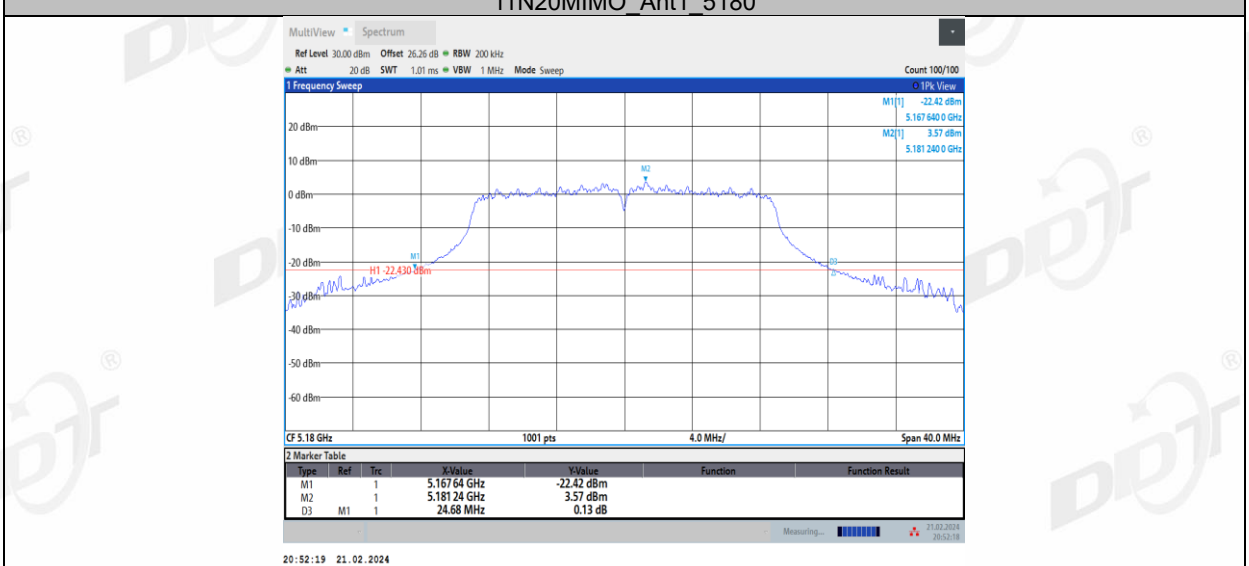
11A\_Ant1\_5825



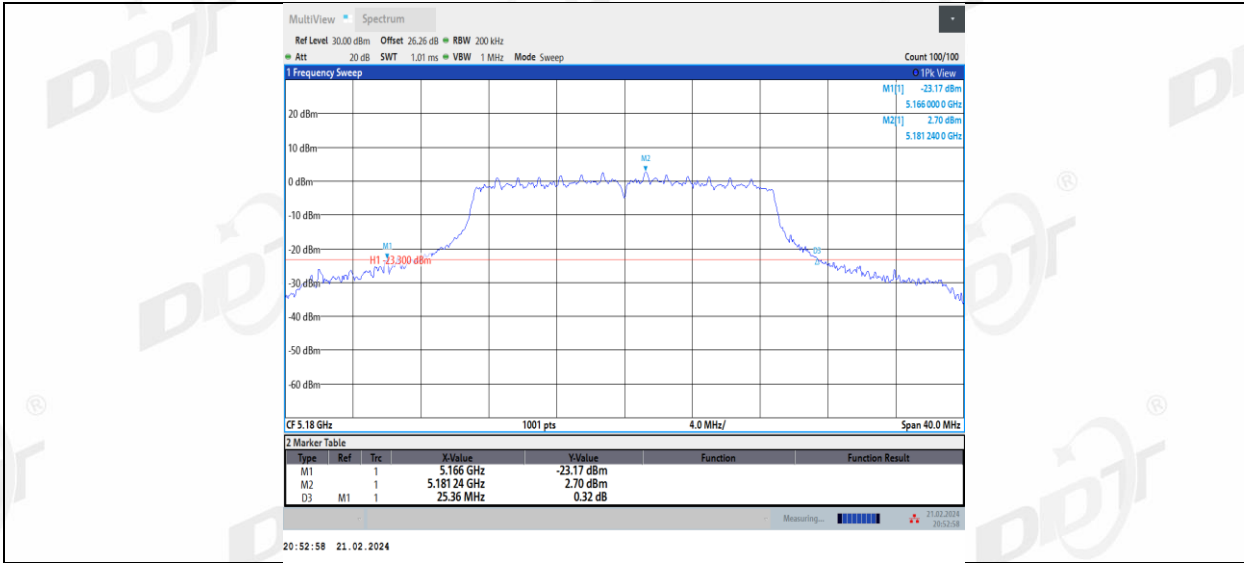
11A\_Ant2\_5825



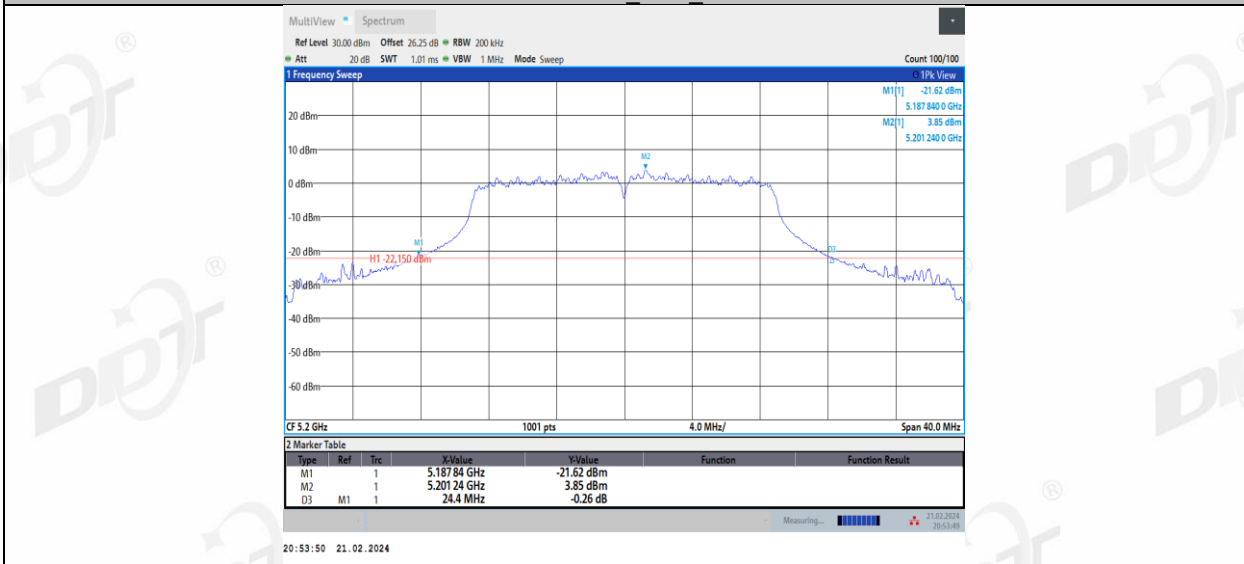
11N20MIMO\_Ant1\_5180



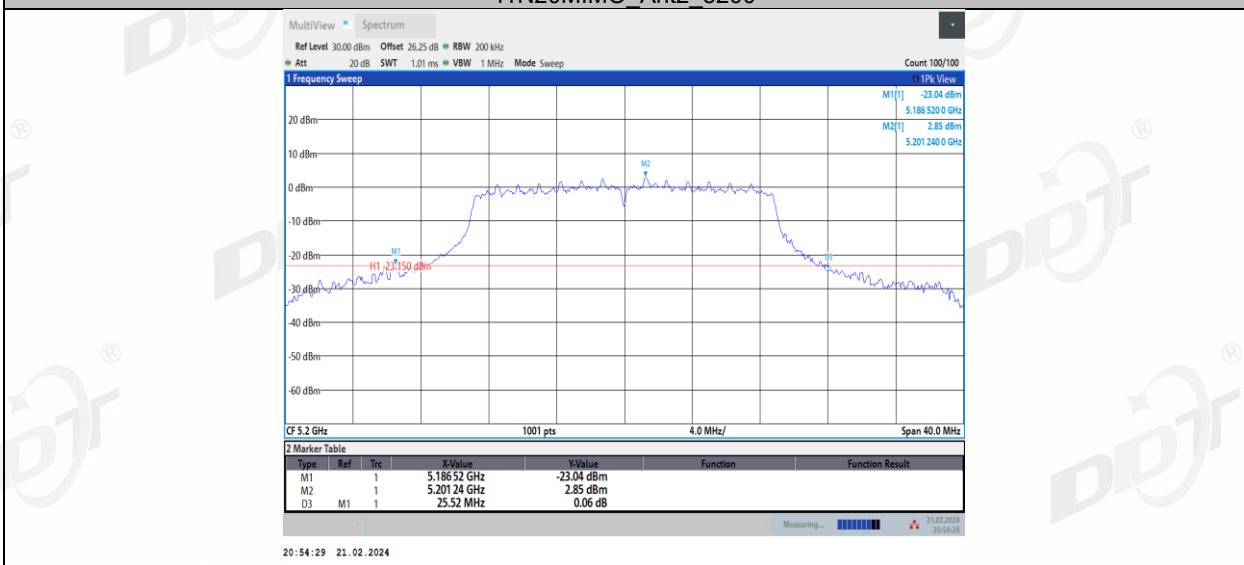
11N20MIMO\_Ant2\_5180



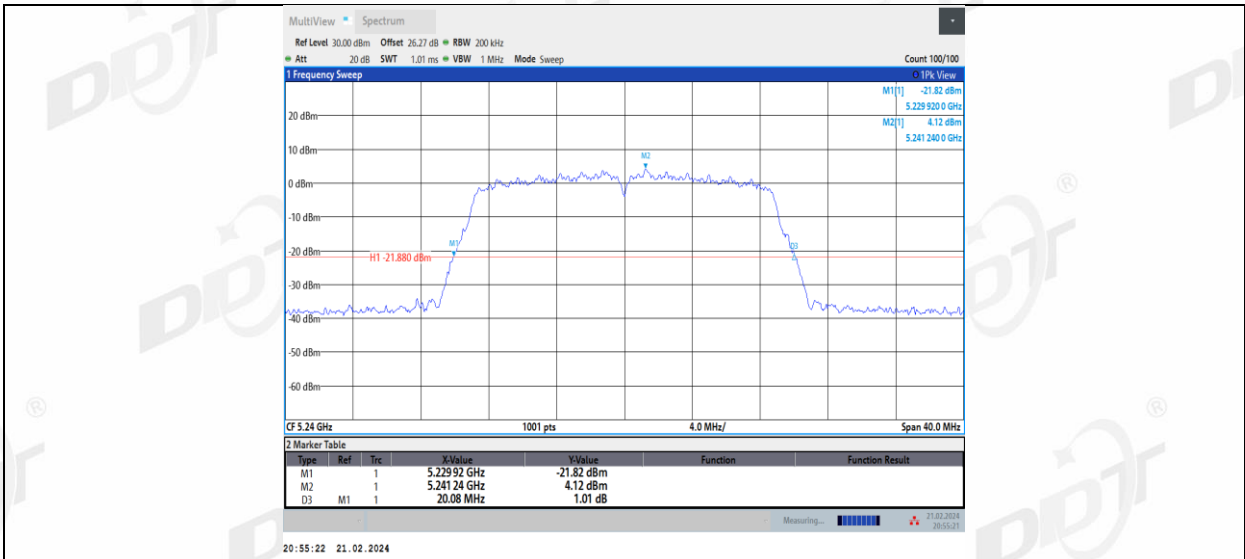
11N20MIMO\_Ant1\_5200



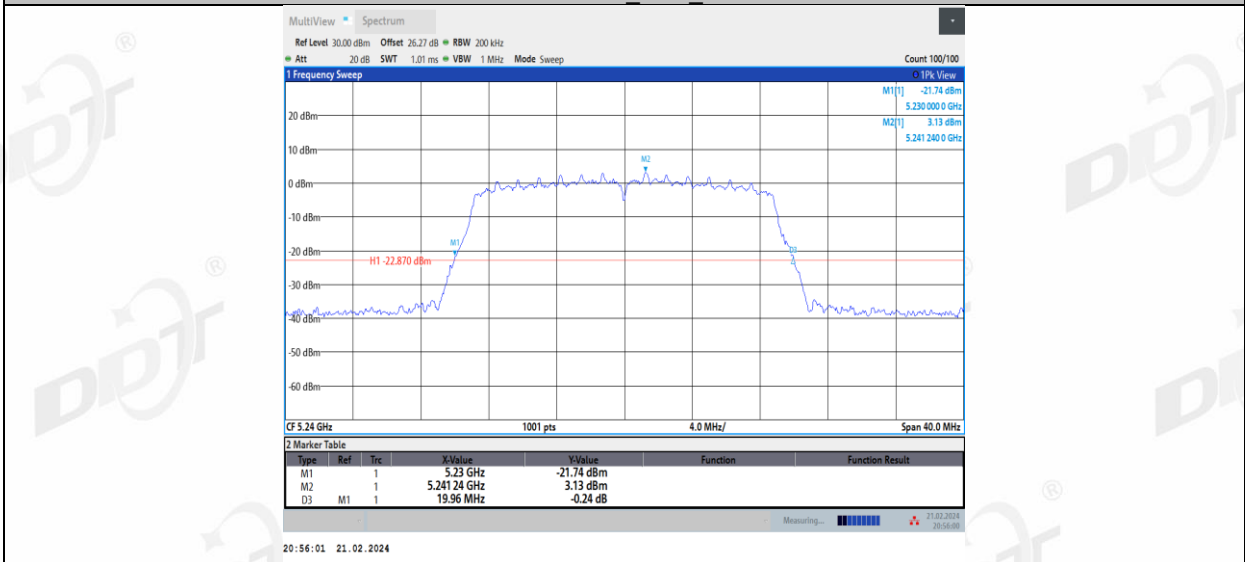
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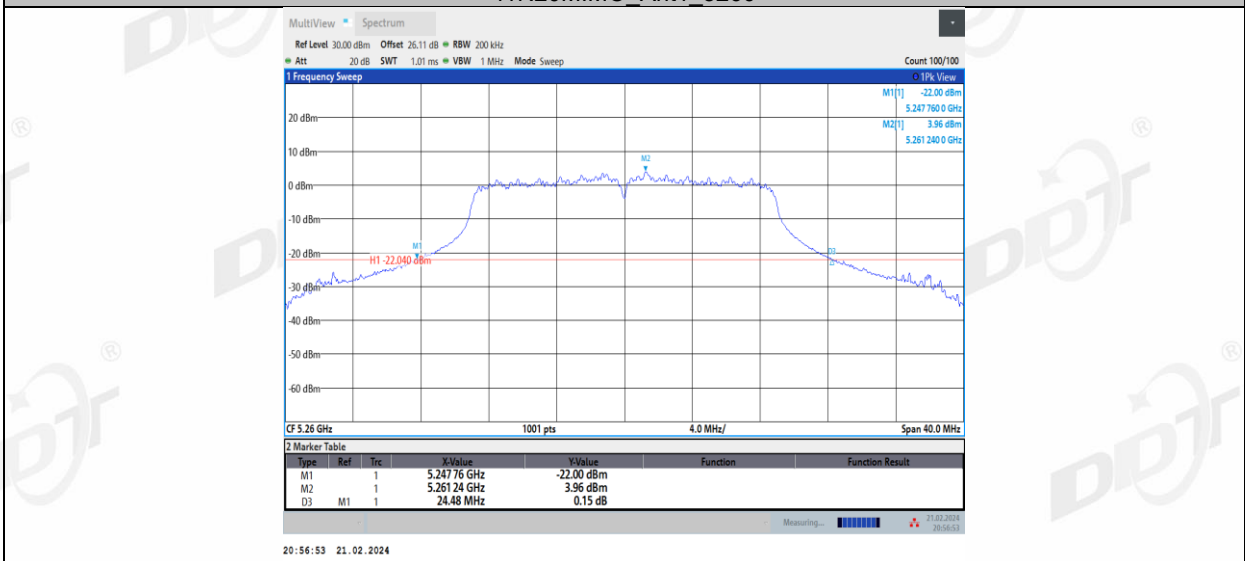
11N20MIMO\_Ant1\_5240



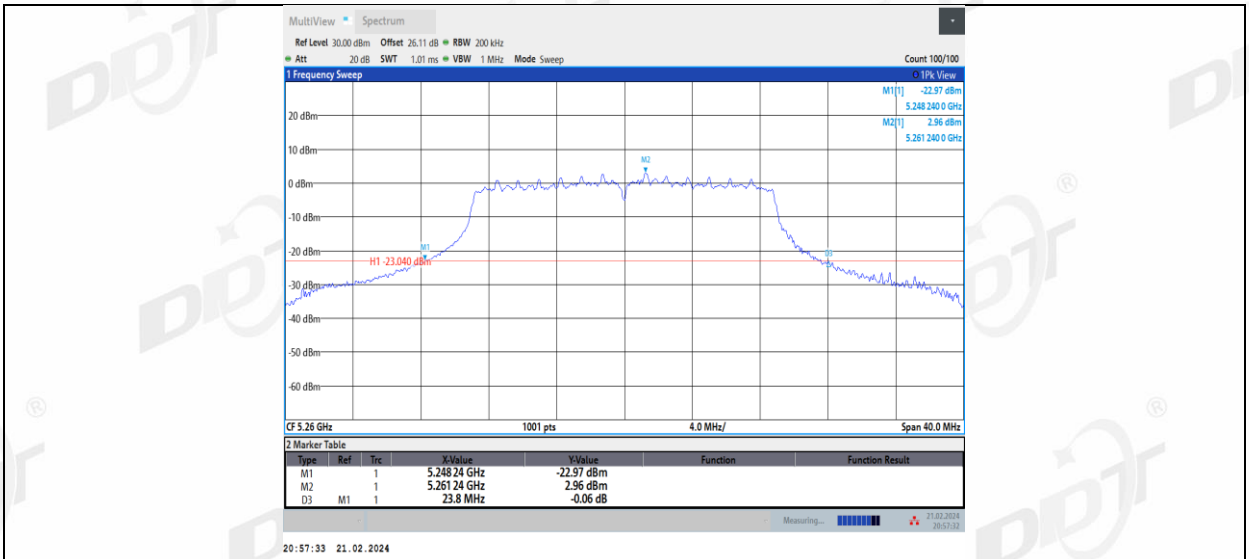
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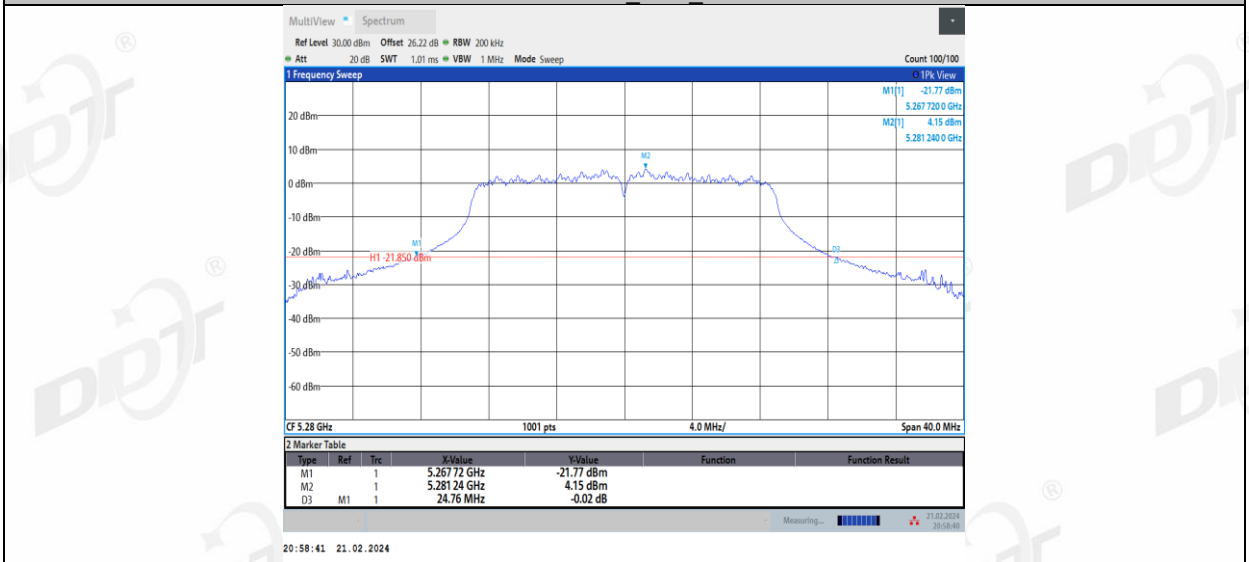
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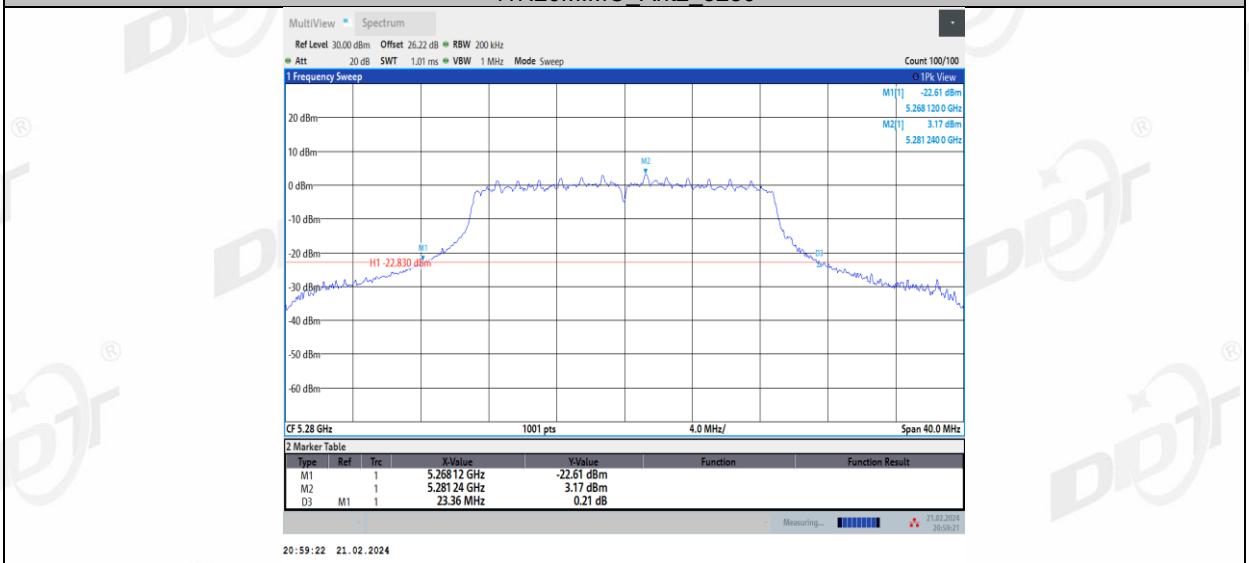
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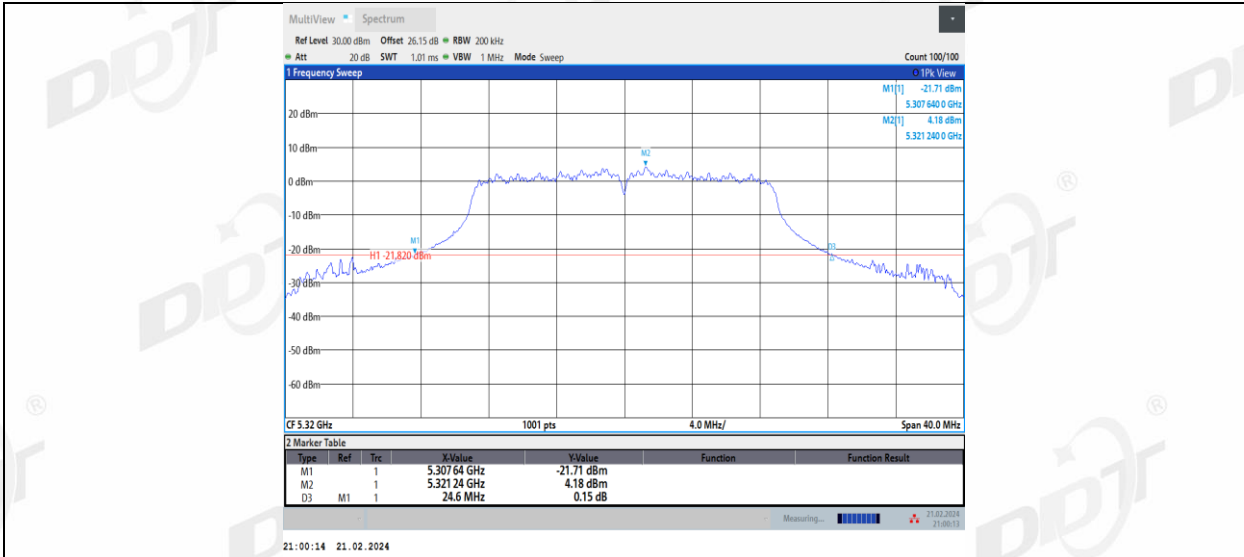
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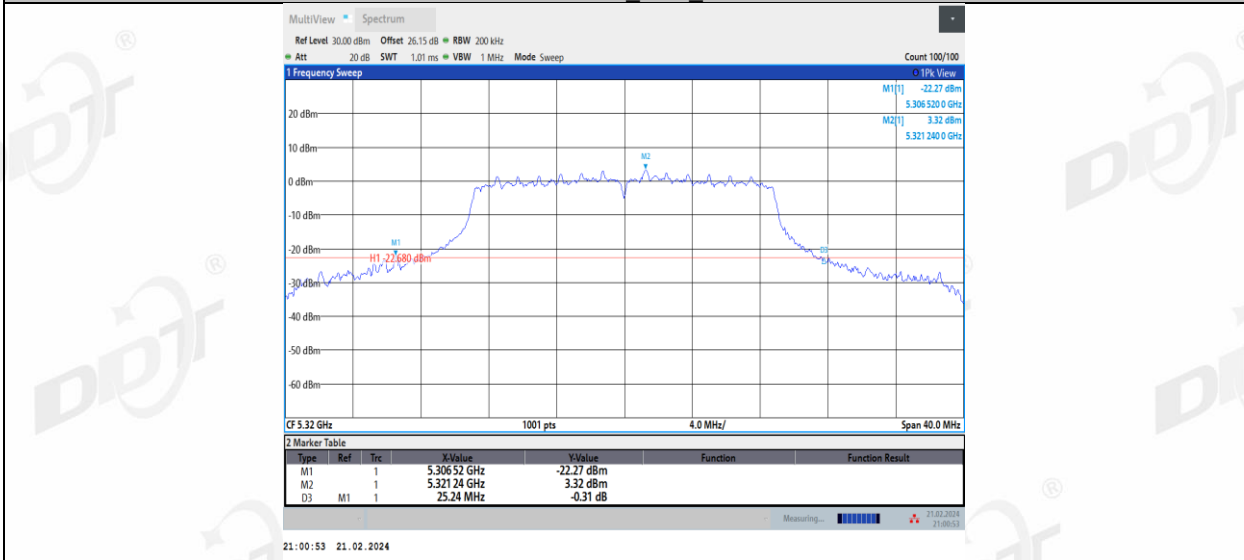
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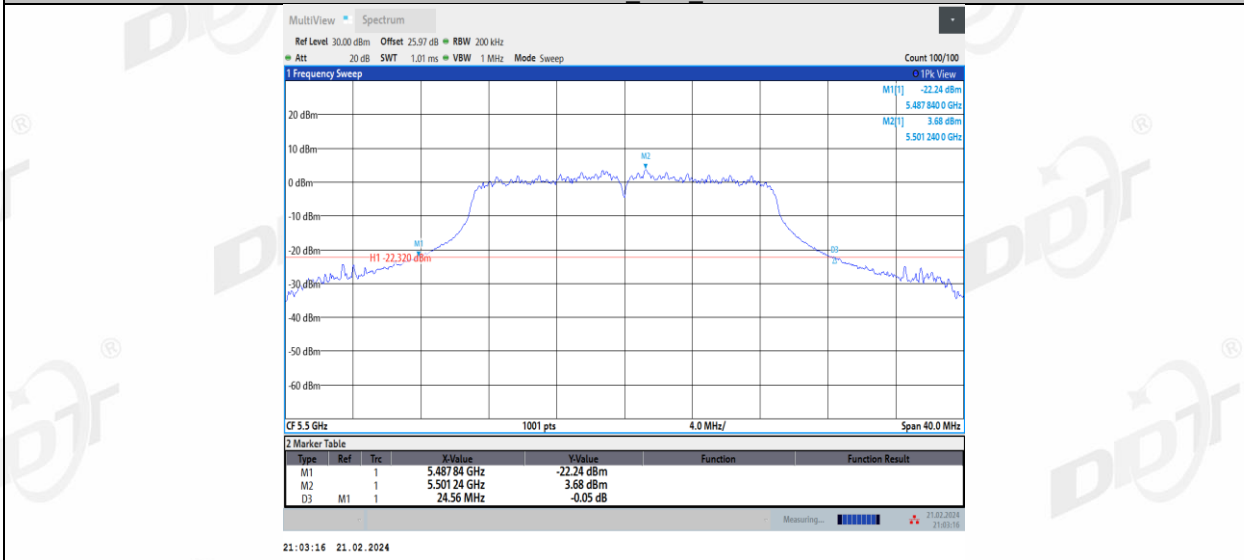
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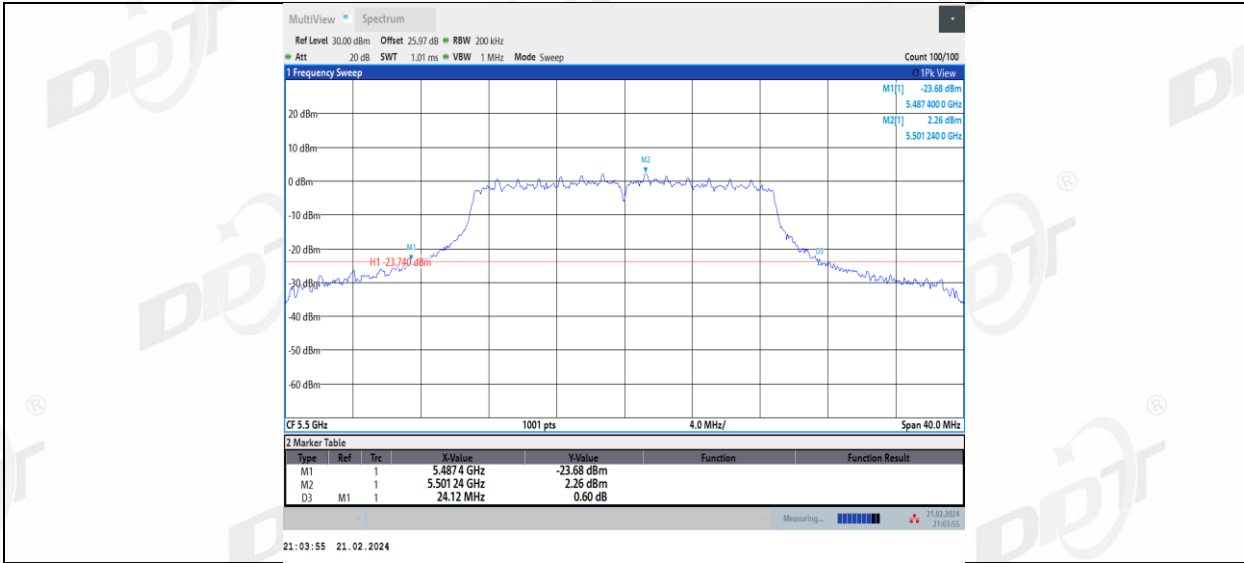


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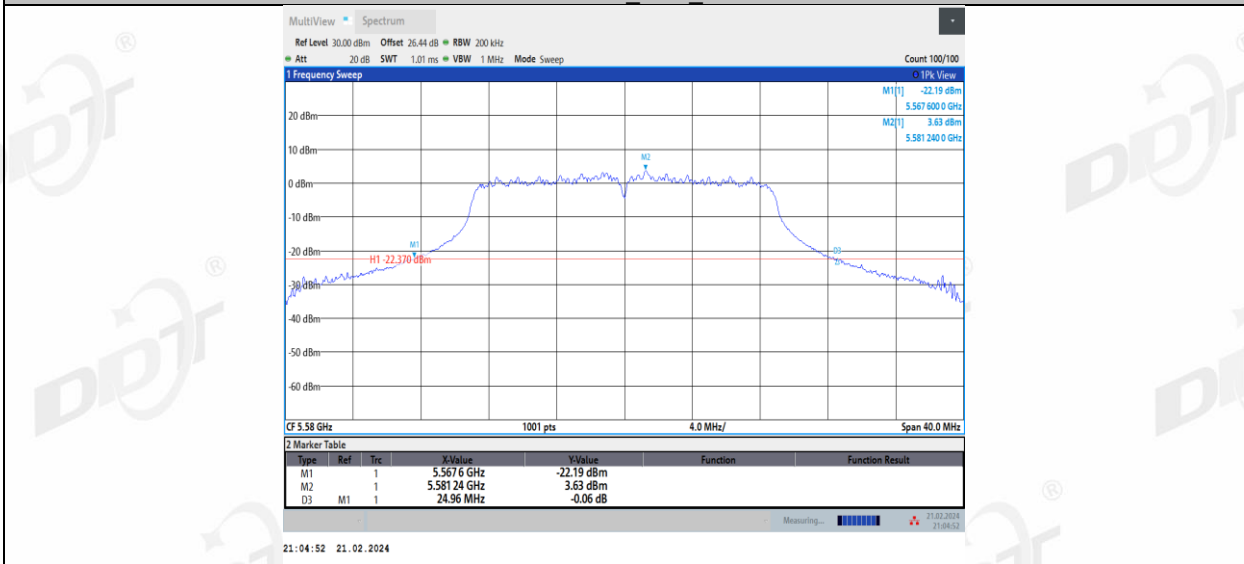


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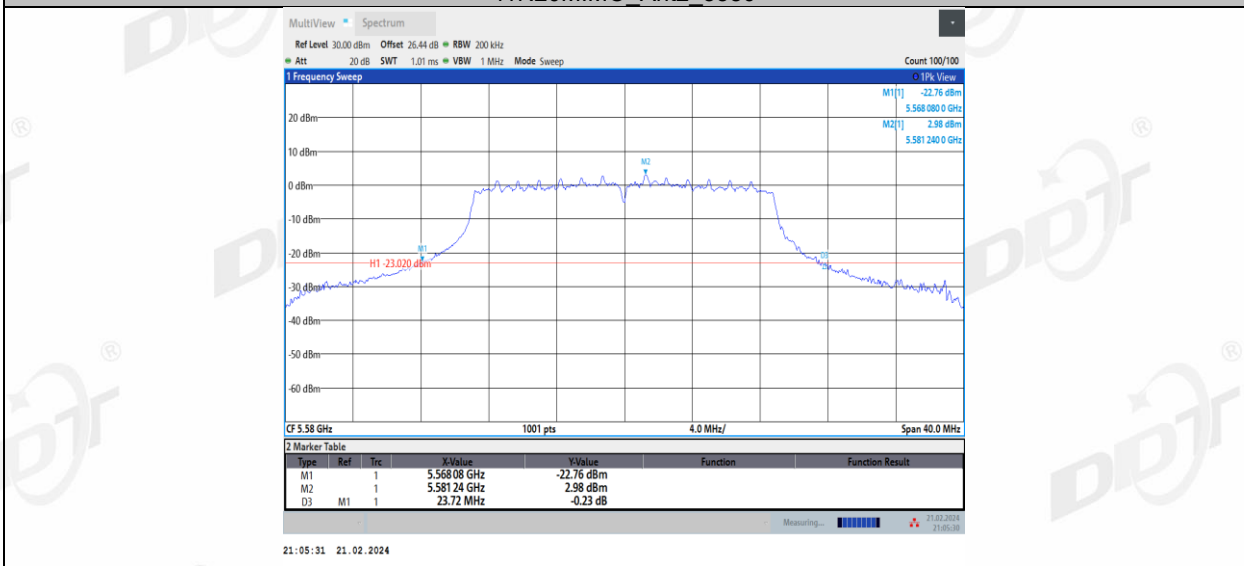




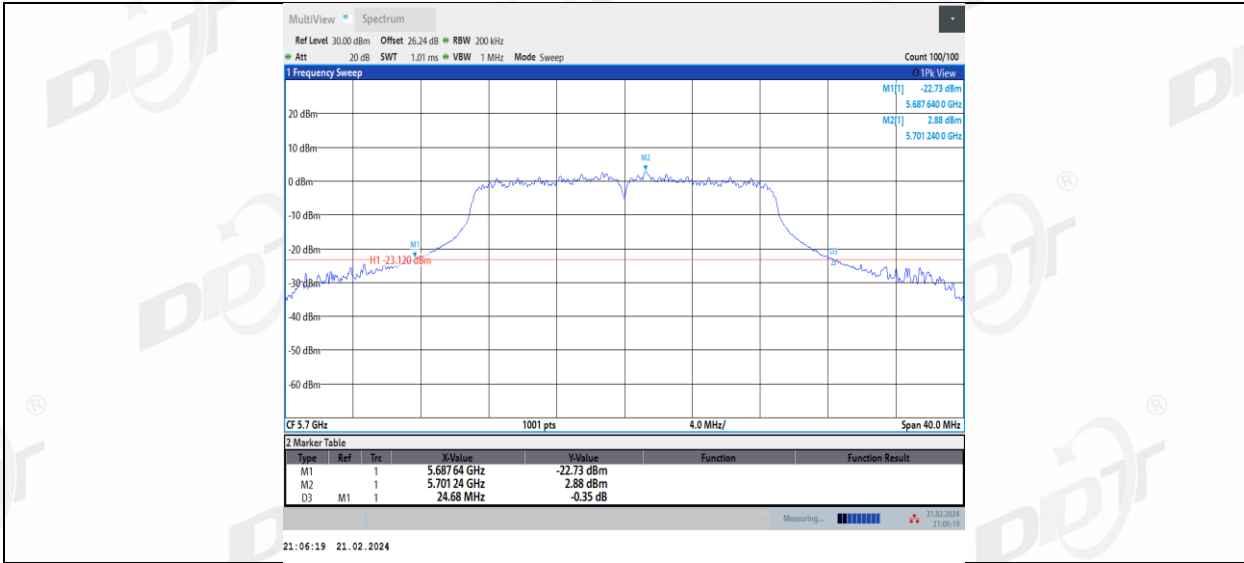
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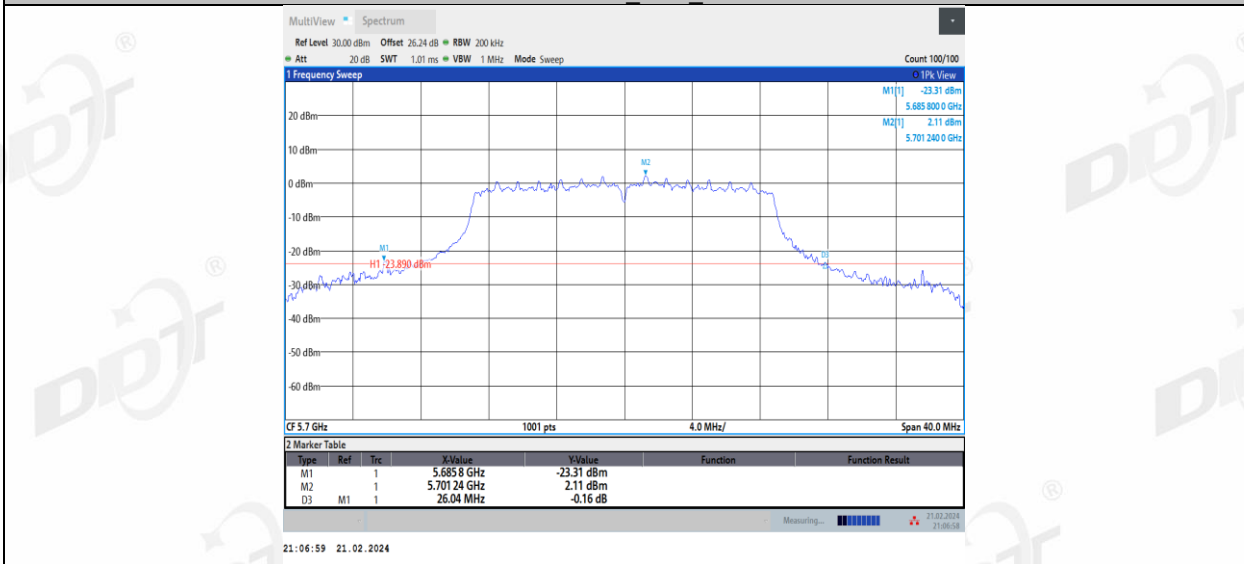
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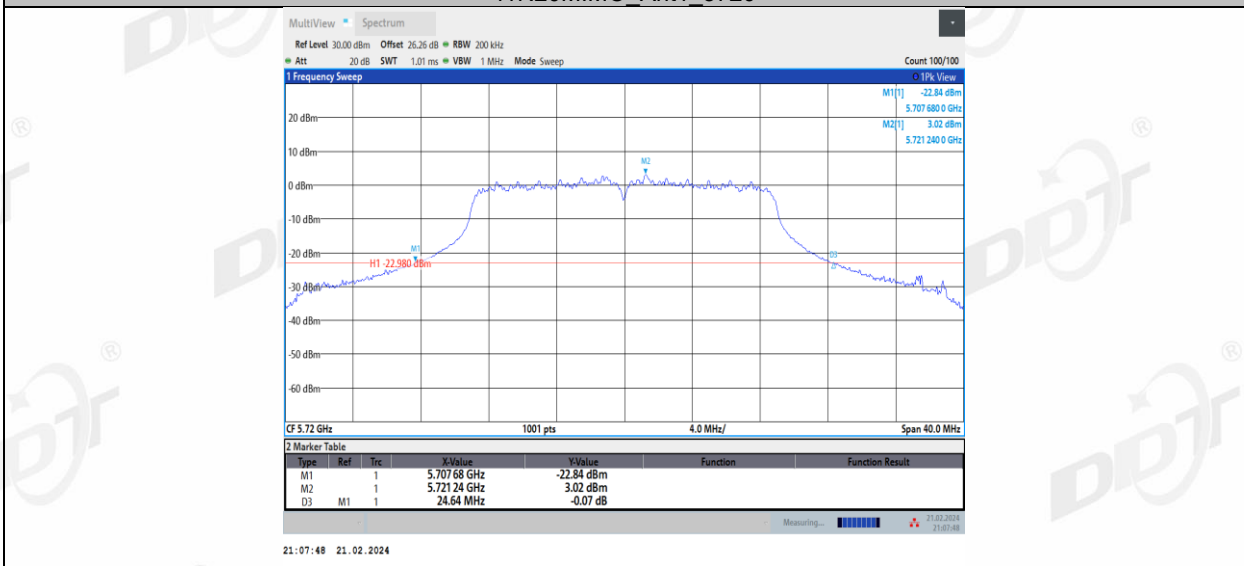
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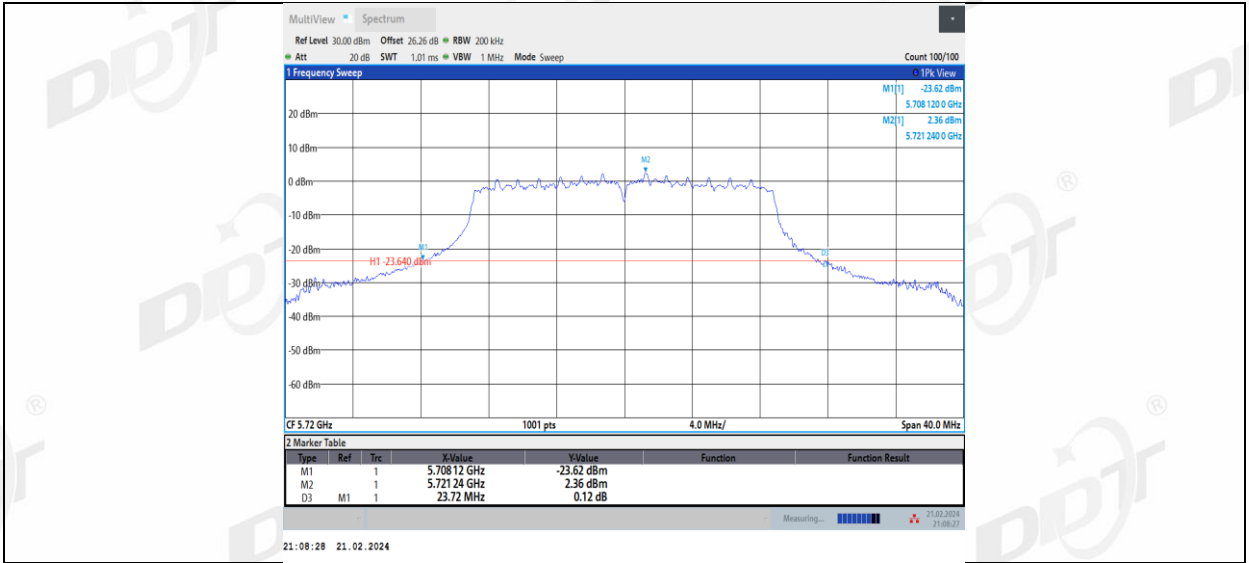
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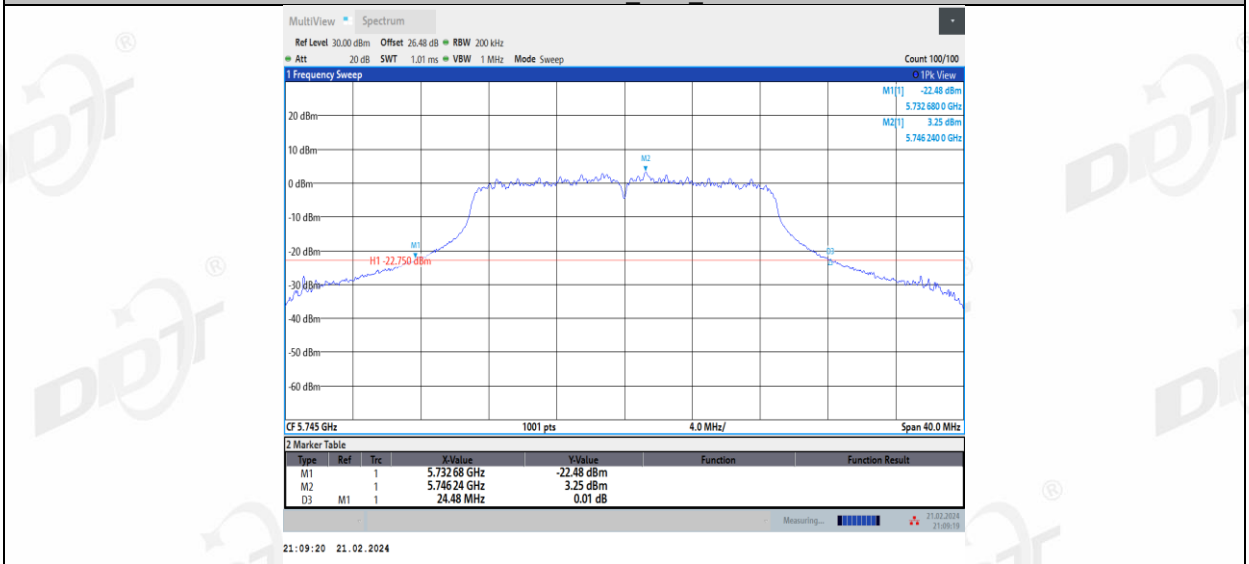
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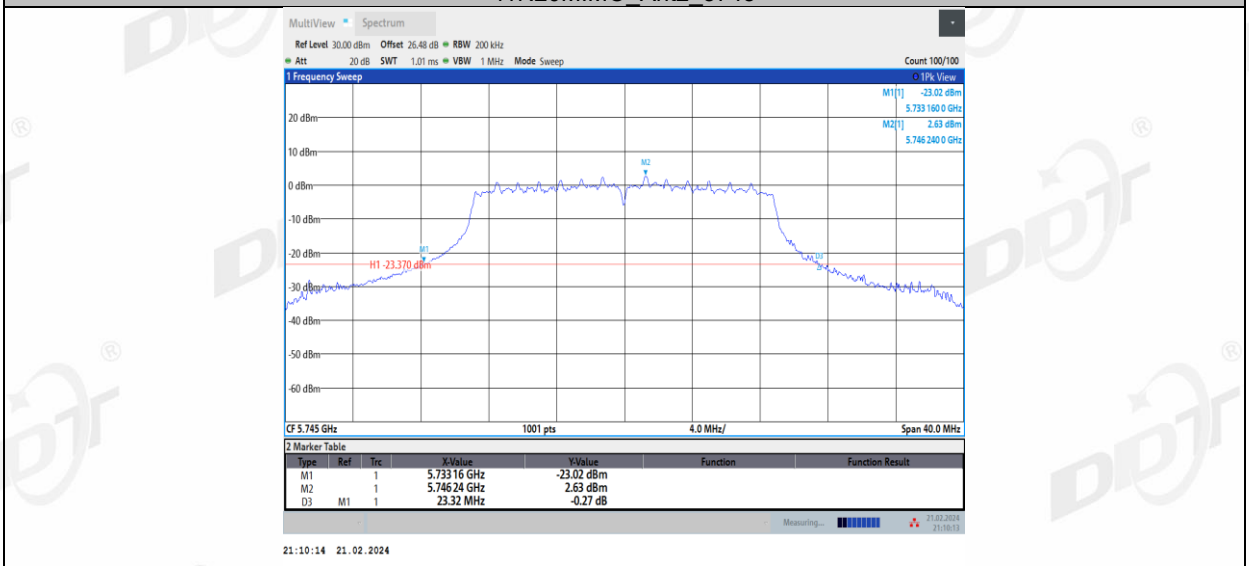
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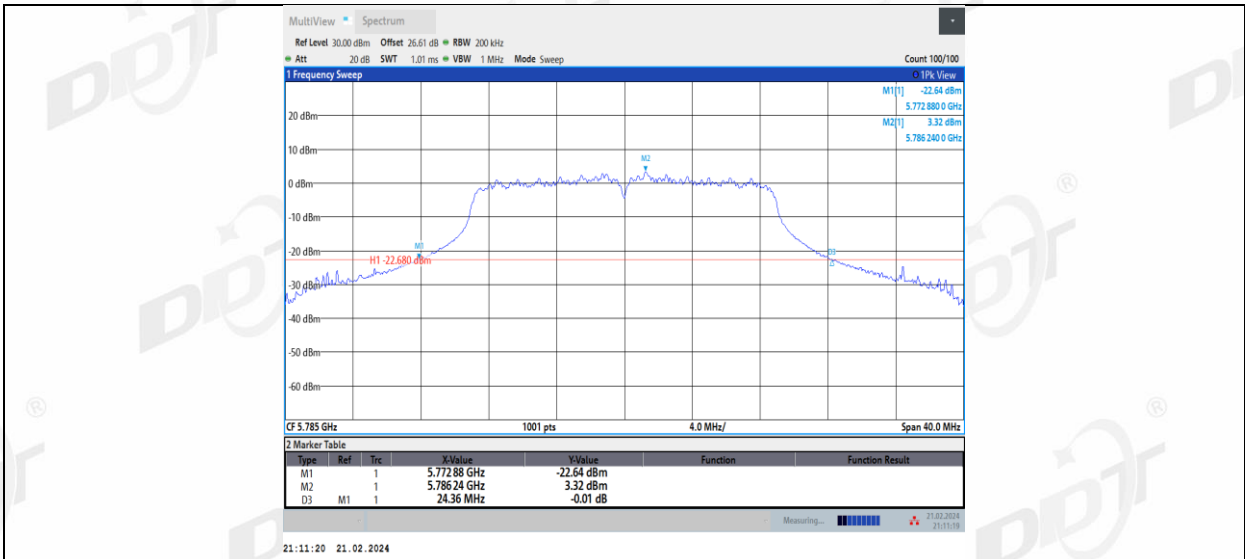
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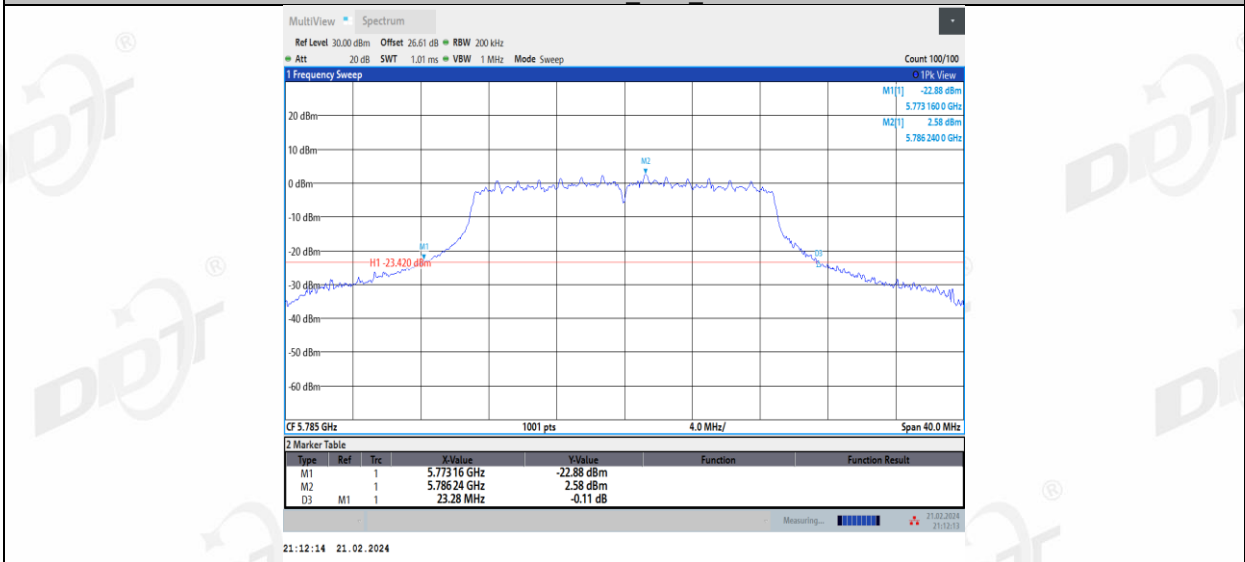
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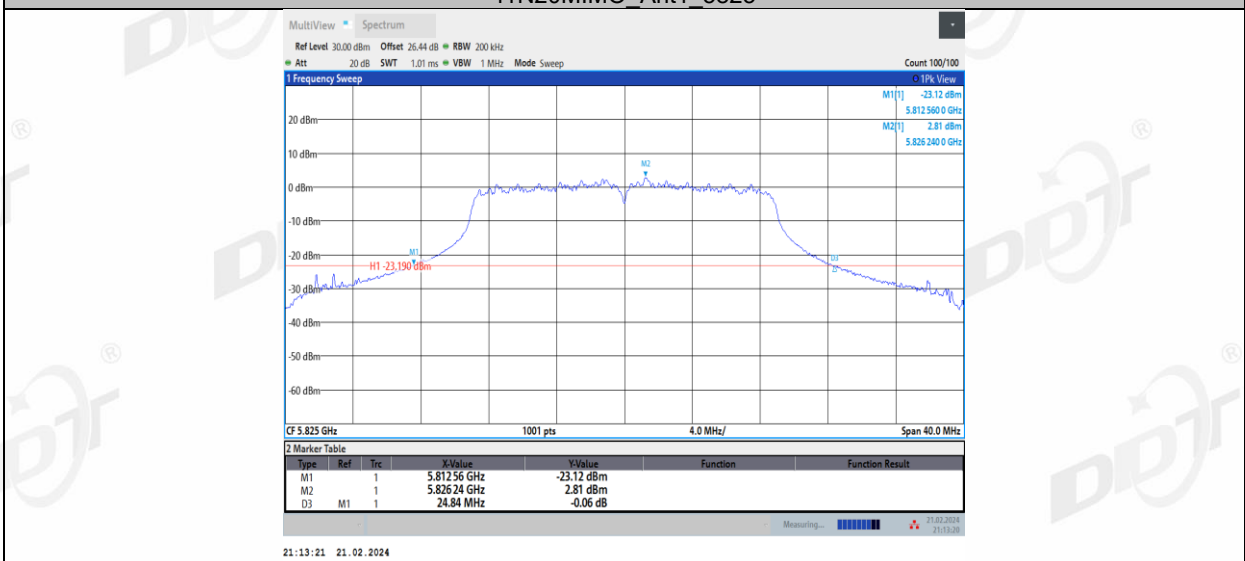
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11N20MIMO\_Ant2\_5785



11N20MIMO\_Ant1\_5825



11N20MIMO\_Ant2\_5825