



■ **Report No.:** DDT-RE23011110-2E04

■ **Issued Date:** Jun. 02, 2023

FCC CERTIFICATION TEST REPORT

FOR

Applicant	:	Shenzhen NED Optics Co., Ltd.
Address	:	4105, Building 1, CFC Building, South side of Shihua Road, Fubao Community, Fubao Street, Futian District, Shenzhen City, Guangdong Province, P.R. China.
Equipment under Test	:	Portable Stream Media Player
Model No.	:	D4-H2
Trade Mark	:	HAKO
FCC ID	:	2ATNDGOOVISD4-H2
Manufacturer	:	Shenzhen SDMC Technology Co., Ltd.
Address	:	19/F, Changhong Science & Technology Mansion, No.18, Keji South 12th Road, High-tech Industrial Park, Nanshan District, Shenzhen, China

Issued By: Dongguan Dongdian Testing Service Co., Ltd.

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REPORT

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Test Report Declare

Applicant	:	Shenzhen NED Optics Co., Ltd.
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Address	:	19/F, Changhong Science & Technology Mansion, No.18, Keji South 12th Road, High-tech Industrial Park, Nanshan District, Shenzhen, China

Test Standard Used:

FCC Rules and Regulations Part 15 Subpart E

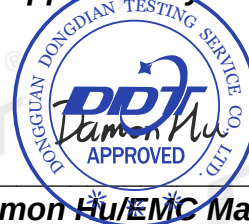
Test procedure used: ANSI C63.10:2013, 789033 D02 General U-NII Test Procedures New
Rules v02r01, 662911 D01 Multiple Transmitter Output v02r01, KDB 905462 D02 v02, KDB
905462 D03

We Declare:

The equipment described above is tested by Dongguan 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 Dongguan Dongdian Testing Service Co., Ltd. is assumed of full responsibility for the accuracy and completeness of these tests.

After test and evaluation, our opinion is that the equipment provided for test compliance with the requirement of the above FCC standards.

Report No:	DDT-RE23011110-2E04		
Date of Receipt:	Apr. 19, 2023	Date of Test:	Apr. 19, 2023 ~ Jun. 02, 2023

Prepared By:**Tiger Mo/Engineer****Approved By:****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 Dongguan Dongdian Testing Service Co., Ltd.

Revision History

Rev.	Revisions	Issue Date	Revised By
---	Initial issue	Jun. 02, 2023	

1. Summary of Test Results

The EUT have been tested according to the applicable standards as referenced below.		
Description of Test Item	Standard	Results
6/26db Bandwidth	FCC 15.407 (e)	PASS
Maximum Conducted Output Power	FCC 15.407 (a)	PASS
Power Spectral Density	FCC 15.407 (a)	PASS
Frequency Stability Measurement	FCC 15.407 (g)	PASS
Emissions in restricted frequency bands	FCC 15.407 (b) FCC 15.209 FCC 15.205	PASS
Band Edge Compliance	FCC 15.407 (b) FCC 15.209 FCC 15.205	PASS
Power Line Conducted Emission	FCC 15.207	PASS
Antenna requirement	FCC 15.203	PASS
Dynamic Frequency Selection	FCC 15.407 (h)	PASS

2. General Test Information

2.1. Description of EUT

EUT* Name	: Portable Stream Media Player
Model Number	: D4-H2
EUT function description	: Please reference user manual of this device
Power Supply	: DC 5.0V/2A From USB Type-C DC 5.0V/2A from external Powerbank Base
Radio Technology	: IEEE 802.11a/n/ac
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-5755MHz 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, 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)
Transmitter rate	: IEEE 802.11a: up to 54 Mbps IEEE 802.11n HT20: up to 144.4 Mbps IEEE 802.11n HT40: up to 300 Mbps IEEE 802.11ac VHT20: up to 173.4 Mbps IEEE 802.11ac VHT40: up to 400 Mbps IEEE 802.11ac VHT80: up to 866.6 Mbps
Antenna Type	: Antenna 1: FPC antenna, Maximum PK gain: 3.19 dBi Antenna 2: FPC antenna, Maximum PK gain: 3.29 dBi
Sample Number	: S23011110-01 for conductive S23011110-02 for radiation

Note 1: EUT is the ab. of equipment under test.

Antenna information			
	Ant1 gain	Ant2 gain	MIMO
IEEE 802.11a	3.19	3.29	/
IEEE 802.11n HT20	3.19	3.29	6.25
IEEE 802.11n HT40	3.19	3.29	6.25
IEEE 802.11ac VHT20	3.19	3.29	6.25
IEEE 802.11ac VHT40	3.19	3.29	6.25
IEEE 802.11ac VHT80	3.19	3.29	6.25
This EUT supports MIMO 2X2, any transmit signals are correlated with each other, according to KDB 662911, Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / N_{ANT}] = 6.25 \text{ dBi}$.			

Channel information					
IEEE 802.11a IEEE 802.11n (HT20) IEEE 802.11ac (VHT20)		IEEE 802.11n (HT40) IEEE 802.11ac (VHT40)		IEEE 802.11ac (VHT80)	
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	/	/	/	/

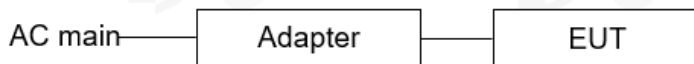
2.2. Accessories of EUT

Description of Accessories	Manufacturer	Model number	Description	Remark
Type-C cable	VARIOUS	VARIOUS	N/A	N/A
Remote control	Ohsung	C008	N/A	N/A
Powerbank Base	Shenzhen NED Optics Co., Ltd.	PS20	Battery: 8000mAh, DC 3.8V, 30.4Wh Input: DC 5V/3.0A, 9V/2.0A, 12V/1.5A Output: DC 5V/2.4A	N/A

2.3. Assistant equipment used for test

Assistant equipment	Manufacturer	Model number	EMC Compliance	Remark
ASUS Router	ASUSTek Computer inc.	GT-AX11000	N/A	FCC ID: MSQ-RTAXJF00

2.4. Block diagram of EUT configuration for test



Test software: SecureCRT.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	65	65	6	Low: CH36	5180
	65	65	6	Middle: CH40	5200
	61	65	6	High: CH48	5240
	61	65	6	Low: CH52	5260
	57	65	6	Middle: CH56	5280
	53	65	6	High: CH64	5320
	56	56	6	Low: CH100	5500
	60	49	6	Middle: CH116	5580
	61	48	6	High: CH144	5720
	57	45	6	Low: CH149	5745
	57	45	6	Middle: CH157	5785
	54	45	6	High: CH165	5825
IEEE 802.11n HT20	65	65	MCS 8	Low: CH36	5180
	65	65	MCS 8	Middle: CH40	5200
	58	65	MCS 8	High: CH48	5240
	57	65	MCS 8	Low: CH52	5260
	55	63	MCS 8	Middle: CH56	5280

	53	65	MCS 8	High: CH64	5320
	61	57	MCS 8	Low: CH100	5500
	63	52	MCS 8	Middle:CH116	5580
	65	50	MCS 8	High: CH144	5720
	61	48	MCS 8	Low: CH149	5745
	58	48	MCS 8	Middle:CH157	5785
	58	48	MCS 8	High: CH165	5825
	64	64	MCS 8	Low:CH38	5190
IEEE 802.11n HT40	64	64	MCS 8	High:CH46	5230
	54	64	MCS 8	Low:CH54	5270
	54	64	MCS 8	High:CH62	5310
	62	62	MCS 8	Low:CH102	5510
	62	54	MCS 8	Middle:CH110	5550
	62	50	MCS 8	High:CH142	5710
	57	49	MCS 8	Low:CH151	5755
	57	53	MCS 0	High:CH159	5795
IEEE 802.11n VHT20	65	65	MCS 0	Low: CH36	5180
	65	65	MCS 0	Middle: CH40	5200
	58	65	MCS 0	High: CH48	5240
	57	65	MCS 0	Low: CH52	5260
	55	63	MCS 0	Middle: CH56	5280
	53	65	MCS 0	High: CH64	5320
	61	57	MCS 0	Low: CH100	5500
	63	52	MCS 0	Middle:CH116	5580
	65	50	MCS 0	High: CH144	5720
	61	48	MCS 0	Low: CH149	5745
	58	48	MCS 0	Middle:CH157	5785
	58	48	MCS 0	High: CH165	5825
IEEE 802.11n VHT40	65	65	MCS 0	Low:CH38	5190
	61	65	MCS 0	High:CH46	5230
	58	67	MCS 0	Low:CH54	5270
	55	67	MCS 0	High:CH62	5310
	65	59	MCS 0	Low:CH102	5510
	65	56	MCS 0	Middle:CH110	5550
	66	48	MCS 0	High:CH142	5710
	61	48	MCS 0	Low:CH151	5755
	61	48	MCS 0	High:CH159	5795
IEEE 802.11ac VHT80	63	65	MCS 0	CH42	5210
	58	65	MCS 0	CH58	5290
	65	59	MCS 0	CH106	5530
	65	53	MCS 0	CH122	5610
	65	53	MCS 0	CH138	5690
	60	48	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

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

2.7. Test laboratory

Dongguan Dongdian Testing Service Co., Ltd.

Add.: No. 17, Zongbu Road 2, Songshan Lake Sci&Tech, Industry Park, Dongguan City, Guangdong Province, China, 523808

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

CNAS Accreditation No. L6451; A2LA Accreditation Number: 3870.01

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

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

Conformity Assessment Body identifier: CN0048

VCCI facility registration number: C-20087, T-20088, R-20123, R-20155, G-20118

2.8. Measurement uncertainty

Test Item	Uncertainty
Bandwidth	1.1%
Peak Output Power (Conducted) (Spectrum analyzer)	0.86 dB (10 MHz ≤ f < 3.6 GHz); 1.38 dB (3.6 GHz ≤ f < 8 GHz)
Peak Output Power (Conducted) (Power Sensor)	0.74 dB
Power Spectral Density	0.74 dB (10 MHz ≤ f < 3.6 GHz); 1.38 dB (3.6 GHz ≤ f < 8 GHz)
Frequencies Stability	6.7 × 10 ⁻⁸ (Antenna couple method) 5.5 × 10 ⁻⁸ (Conducted method)
Conducted spurious emissions	0.86 dB (10 MHz ≤ f < 3.6 GHz); 1.40 dB (3.6 GHz ≤ f < 8 GHz) 1.66 dB (8 GHz ≤ f < 26.5 GHz)
Uncertainty for radio frequency (RBW < 20 kHz)	3×10 ⁻⁸
Temperature	0.4 ℃
Humidity	2 %
Uncertainty for Radiation Emission test (9 kHz – 30 MHz)	3.44 dB
Uncertainty for Radiation Emission test (30 MHz - 1 GHz)	4.70 dB (Antenna Polarize: V) 4.84 dB (Antenna Polarize: H)
Uncertainty for Radiation Emission test	4.10 dB (1 - 6 GHz)

(1 GHz - 40 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.	

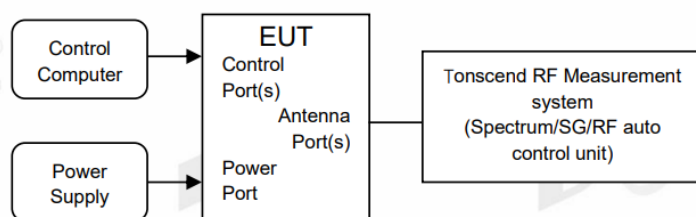
3. Equipment Used During Test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
☑RF Connected Test (Tonscend RF Measurement System 3#)					
Signal & Spectrum analyzer	R&S	FSV40	101407	Jul. 21, 2022	1 Year
Wideband Radio Communication tester	R&S	CMW500	117491	May 18, 2022 Apr. 27, 2023	1 Year
EXG Analog Signal Generator	KEYSIGHT	N5173B	MY62153058	Aug. 26, 2022	1 Year
Vector Signal Generator	Agilent	N5182A	MY48180912	May 18, 2022 Apr. 23, 2023	1 Year
RF Control Unit	Tonscend	JS0806-2	20C8060230	May 18, 2022 Apr. 27, 2023	1 Year
Temp&Humi Programmable	ZHIXIANG	ZXGDJS-150L	ZX170110-A	May 26, 2022 May 15, 2023	1 Year
Test Software	JS Tonscend	JS1120-3	Ver.3.2.22	N/A	N/A
☑Radiation 3#chamber					
EMI Test Receiver	R&S	ESU26	100472	May 19, 2022 Apr. 23, 2023	1 Year
Spectrum analyzer	Agilent	E4447A	MY50180031	May 17, 2022 Apr. 23, 2023	1 Year
Active Loop antenna	Schwarzbeck	FMZB-1519	1519-038	Sep. 29, 2022	1 Year
Trilog Broadband Antenna	Schwarzbeck	VULB 9163	01429	Jul. 22, 2022	1 Year
Double Ridged Horn Antenna	Schwarzbeck	BBHA9120 D	02468	Sep. 29, 2022	1 Year
Broad Band Horn Antenna	Schwarzbeck	BBHA 9170	790	May 06, 2022 Apr. 26, 2023	1 Year
Pre-amplifier	COM-POWER	PAM-118A	18040084	Aug. 17, 2022	1 Year
RE Cable	N/A	W23.02 CP1-X2 + W23.09 AP1-X8+ JCT26S-NJ-NJ-1.5M+ JCT26S-NJ-NJ-1.5M	4.5M+8M+1.5M+1.5M	Aug. 17, 2022	1 Year
RF Cable	Yuhu Technology	JCTB810-NJ-NJ-9M	21123964	May 19, 2022 Apr. 23, 2023	1 Year
RF Cable	Yuhu Technology	ZT26S-SMAJ-SMAJ-1M	21073466	Aug. 17, 2022	1 Year
Micro-Tronics filters	REBES	BRM50702	G555	N/A	N/A
Micro-Tronics filters	REBES	BRM50716	G392	N/A	N/A
High Pass filter	XB	XBLBQ-GTA67	210820-2-3	N/A	N/A
Test software	Tonscend	JS32-RE	V 5.0.0.1	N/A	N/A
☑Power Line Conducted Emissions Test 1#					

Test Receiver	R&S	ESCI	100551	Aug. 26, 2022	1 Year
LISN 1	R&S	ENV216	101109	Aug. 26, 2022	1 Year
LISN 2	R&S	ESH2-Z5	100309	Aug. 26, 2022	1 Year
Pulse Limiter	R&S	ESH3-Z2	101242	Aug. 26, 2022	1 Year
CE Cable 1	HUBSER	N/A	W10.01	Aug. 26, 2022	1 Year
Test software	Audix	E3	V 6.11111b	N/A	N/A
Test Receiver	R&S	ESCI	100551	Aug. 26, 2022	1 Year

4. 26dB Bandwidth

4.1. Block diagram of test setup



4.2. Limits

FCC Part15, Subpart E		
Test Item	Limit	Frequency Range (MHz)
26 dB Bandwidth	---	5150 - 5250
	---	5250 - 5350
	---	5470 - 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

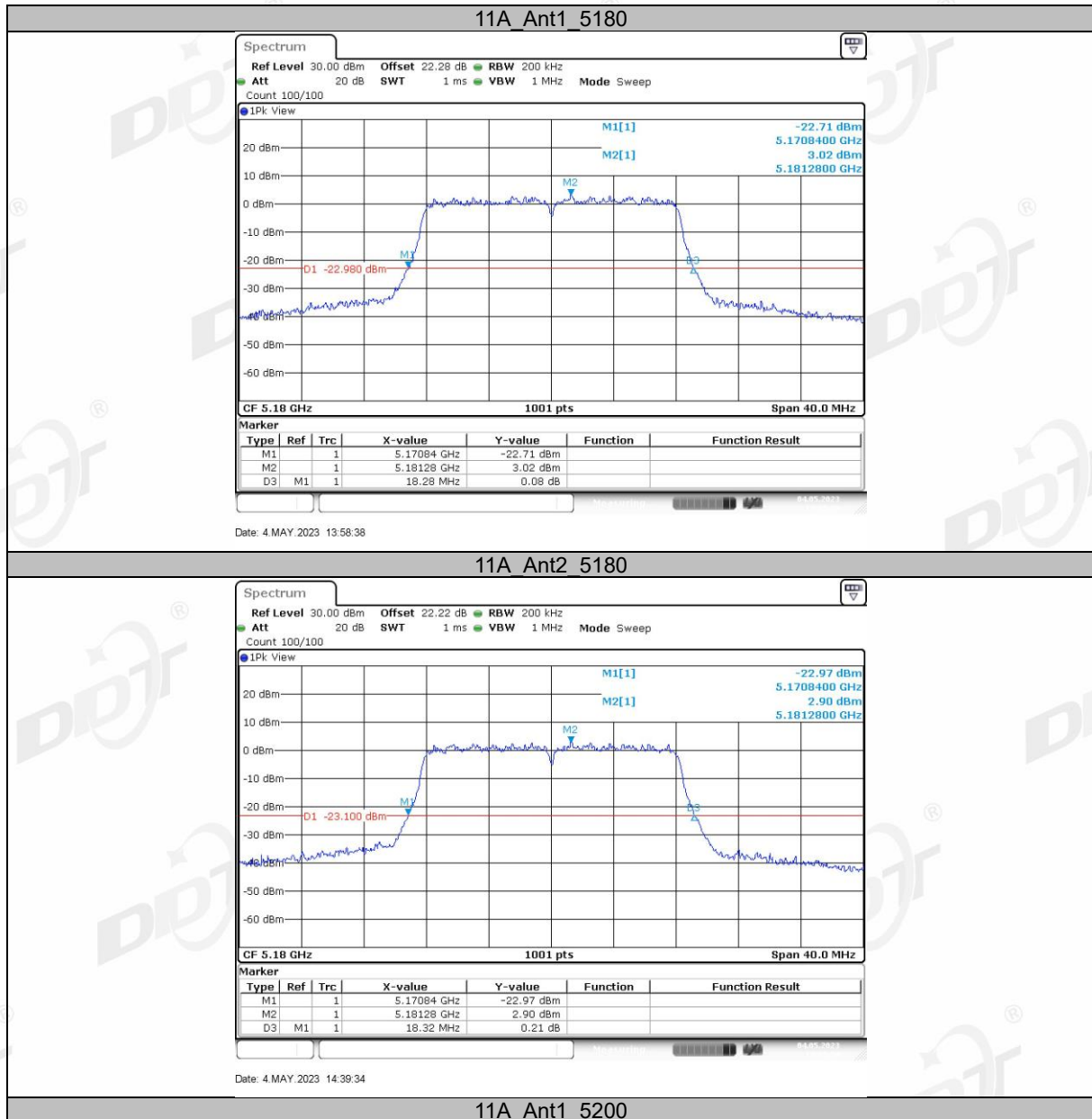
Test Mode	Antenna	Frequency[MHz]	26db EBW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A	Ant1	5180	18.28	5170.84	5189.12	---	---
	Ant2	5180	18.32	5170.84	5189.16	---	---
	Ant1	5200	18.32	5190.84	5209.16	---	---
	Ant2	5200	18.44	5190.76	5209.20	---	---
	Ant1	5240	18.44	5230.76	5249.20	---	---
	Ant2	5240	18.32	5230.84	5249.16	---	---
	Ant1	5260	18.44	5250.76	5269.20	---	---
	Ant2	5260	18.44	5250.76	5269.20	---	---
	Ant1	5280	18.36	5270.80	5289.16	---	---
	Ant2	5280	18.40	5270.76	5289.16	---	---
	Ant1	5320	18.32	5310.84	5329.16	---	---
	Ant2	5320	18.52	5310.64	5329.16	---	---
	Ant1	5500	18.36	5490.80	5509.16	---	---
	Ant2	5500	18.48	5490.80	5509.28	---	---

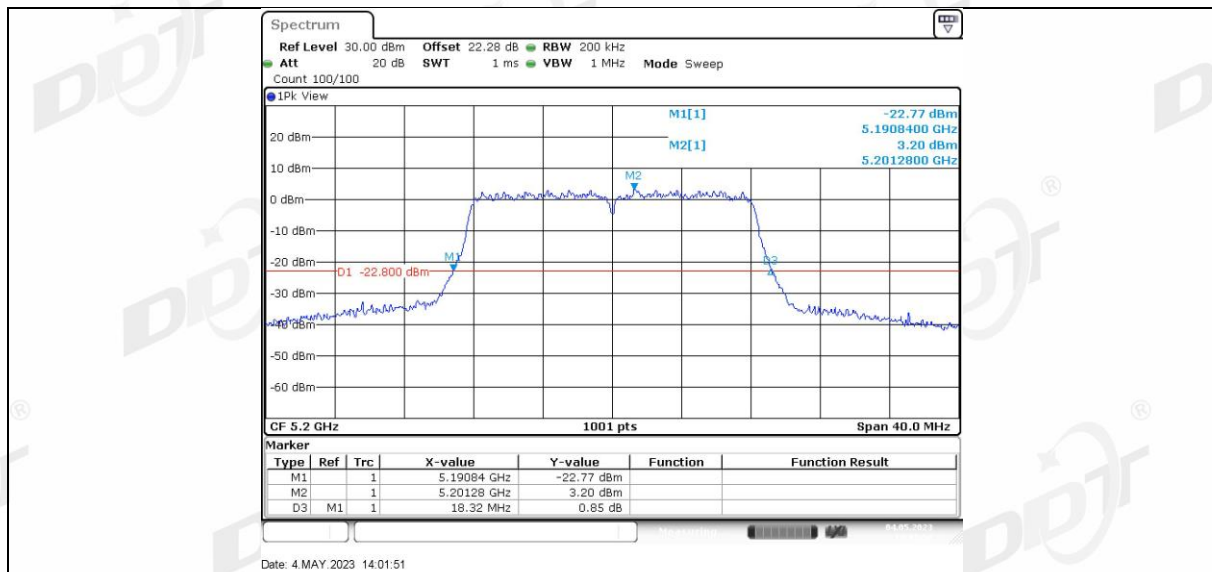
	Ant1	5580	18.52	5570.72	5589.24	---	---
	Ant2	5580	18.32	5570.84	5589.16	---	---
	Ant1	5720	18.52	5710.68	5729.20	---	---
	Ant2	5720	18.40	5710.84	5729.24	---	---
	Ant1	5720 UNII-2C	14.32	5710.68	5725	---	---
	Ant2	5720 UNII-2C	14.16	5710.84	5725	---	---
	Ant1	5720 UNII-3	4.2	5725	5729.20	---	---
	Ant2	5720 UNII-3	4.24	5725	5729.24	---	---
	Ant1	5745	18.40	5735.84	5754.24	---	---
	Ant2	5745	18.52	5735.72	5754.24	---	---
	Ant1	5785	18.52	5775.72	5794.24	---	---
	Ant2	5785	18.36	5775.80	5794.16	---	---
	Ant1	5825	18.40	5815.84	5834.24	---	---
	Ant2	5825	18.40	5815.80	5834.20	---	---
11N20MIMO	Ant1	5180	19.12	5170.48	5189.60	---	---
	Ant2	5180	19.28	5170.36	5189.64	---	---
	Ant1	5200	19.16	5190.44	5209.60	---	---
	Ant2	5200	19.28	5190.40	5209.68	---	---
	Ant1	5240	19.28	5230.32	5249.60	---	---
	Ant2	5240	19.20	5230.40	5249.60	---	---
	Ant1	5260	19.16	5250.44	5269.60	---	---
	Ant2	5260	19.28	5250.36	5269.64	---	---
	Ant1	5280	19.20	5270.44	5289.64	---	---
	Ant2	5280	19.36	5270.36	5289.72	---	---
	Ant1	5320	19.12	5310.44	5329.56	---	---
	Ant2	5320	19.24	5310.40	5329.64	---	---
	Ant1	5500	19.20	5490.40	5509.60	---	---
	Ant2	5500	19.28	5490.40	5509.68	---	---
	Ant1	5580	19.12	5570.44	5589.56	---	---
	Ant2	5580	19.28	5570.44	5589.72	---	---
	Ant1	5720	19.16	5710.44	5729.60	---	---
	Ant2	5720	19.28	5710.40	5729.68	---	---
	Ant1	5720 UNII-2C	14.56	5710.44	5725	---	---
	Ant2	5720 UNII-2C	14.6	5710.40	5725	---	---
	Ant1	5720 UNII-3	4.6	5725	5729.60	---	---
	Ant2	5720 UNII-3	4.68	5725	5729.68	---	---
	Ant1	5745	19.16	5735.52	5754.68	---	---
	Ant2	5745	19.24	5735.44	5754.68	---	---
	Ant1	5785	19.04	5775.48	5794.52	---	---
	Ant2	5785	19.28	5775.40	5794.68	---	---
	Ant1	5825	19.20	5815.44	5834.64	---	---
	Ant2	5825	19.28	5815.40	5834.68	---	---
11N40MIMO	Ant1	5190	40.24	5169.76	5210.00	---	---
	Ant2	5190	41.44	5169.28	5210.72	---	---
	Ant1	5230	40.56	5209.60	5250.16	---	---
	Ant2	5230	41.20	5209.60	5250.80	---	---
	Ant1	5270	40.80	5249.52	5290.32	---	---
	Ant2	5270	41.20	5249.44	5290.64	---	---
	Ant1	5310	40.32	5289.68	5330.00	---	---
	Ant2	5310	41.60	5289.12	5330.72	---	---
	Ant1	5510	40.88	5489.52	5530.40	---	---
	Ant2	5510	41.76	5489.36	5531.12	---	---
	Ant1	5550	40.72	5529.52	5570.24	---	---
	Ant2	5550	41.44	5529.52	5570.96	---	---
	Ant1	5710	40.96	5689.44	5730.40	---	---
	Ant2	5710	41.84	5688.96	5730.80	---	---
	Ant1	5710 UNII-2C	35.56	5689.44	5725	---	---
	Ant2	5710 UNII-2C	36.04	5688.96	5725	---	---
	Ant1	5710 UNII-3	5.4	5725	5730.40	---	---
	Ant2	5710 UNII-3	5.8	5725	5730.80	---	---
	Ant1	5755	41.04	5734.52	5775.56	---	---
	Ant2	5755	41.76	5734.20	5775.96	---	---
	Ant1	5795	40.56	5774.60	5815.16	---	---
	Ant2	5795	41.68	5774.04	5815.72	---	---

11AC20MIMO	Ant1	5180	19.16	5170.44	5189.60	---	---
	Ant2	5180	19.24	5170.44	5189.68	---	---
	Ant1	5200	19.28	5190.32	5209.60	---	---
	Ant2	5200	19.32	5190.36	5209.68	---	---
	Ant1	5240	19.12	5230.48	5249.60	---	---
	Ant2	5240	19.20	5230.40	5249.60	---	---
	Ant1	5260	19.08	5250.48	5269.56	---	---
	Ant2	5260	19.28	5250.36	5269.64	---	---
	Ant1	5280	19.16	5270.40	5289.56	---	---
	Ant2	5280	19.20	5270.40	5289.60	---	---
	Ant1	5320	19.16	5310.44	5329.60	---	---
	Ant2	5320	19.32	5310.36	5329.68	---	---
	Ant1	5500	19.08	5490.48	5509.56	---	---
	Ant2	5500	19.28	5490.44	5509.72	---	---
	Ant1	5580	19.12	5570.52	5589.64	---	---
	Ant2	5580	19.24	5570.36	5589.60	---	---
	Ant1	5720	19.08	5710.48	5729.56	---	---
	Ant2	5720	19.28	5710.36	5729.64	---	---
	Ant1	5720 UNII-2C	14.52	5710.48	5725	---	---
	Ant2	5720 UNII-2C	14.64	5710.36	5725	---	---
	Ant1	5720 UNII-3	4.56	5725	5729.56	---	---
	Ant2	5720 UNII-3	4.64	5725	5729.64	---	---
	Ant1	5745	19.20	5735.44	5754.64	---	---
	Ant2	5745	19.20	5735.44	5754.64	---	---
	Ant1	5785	19.16	5775.48	5794.64	---	---
	Ant2	5785	19.28	5775.36	5794.64	---	---
	Ant1	5825	19.16	5815.44	5834.60	---	---
	Ant2	5825	19.20	5815.44	5834.64	---	---
11AC40MIMO	Ant1	5190	40.40	5169.68	5210.08	---	---
	Ant2	5190	41.60	5169.28	5210.88	---	---
	Ant1	5230	40.80	5209.68	5250.48	---	---
	Ant2	5230	41.44	5209.36	5250.80	---	---
	Ant1	5270	40.88	5249.84	5290.72	---	---
	Ant2	5270	41.44	5248.96	5290.40	---	---
	Ant1	5310	40.16	5290.00	5330.16	---	---
	Ant2	5310	41.36	5289.36	5330.72	---	---
	Ant1	5510	40.96	5489.36	5530.32	---	---
	Ant2	5510	41.84	5489.20	5531.04	---	---
	Ant1	5550	40.48	5529.60	5570.08	---	---
	Ant2	5550	41.28	5529.52	5570.80	---	---
	Ant1	5710	40.64	5689.68	5730.32	---	---
	Ant2	5710	42.16	5688.80	5730.96	---	---
	Ant1	5710 UNII-2C	35.32	5689.68	5725	---	---
	Ant2	5710 UNII-2C	36.2	5688.80	5725	---	---
	Ant1	5710 UNII-3	5.32	5725	5730.32	---	---
	Ant2	5710 UNII-3	5.96	5725	5730.96	---	---
	Ant1	5755	40.32	5734.92	5775.24	---	---
	Ant2	5755	42.24	5733.96	5776.20	---	---
	Ant1	5795	40.40	5774.92	5815.32	---	---
	Ant2	5795	42.24	5773.80	5816.04	---	---
11AC80MIMO	Ant1	5210	80.64	5169.84	5250.48	---	---
	Ant2	5210	81.60	5169.36	5250.96	---	---
	Ant1	5290	80.64	5250.16	5330.80	---	---
	Ant2	5290	81.60	5249.36	5330.96	---	---
	Ant1	5530	81.44	5489.36	5570.80	---	---
	Ant2	5530	81.28	5489.52	5570.80	---	---
	Ant1	5610	80.96	5569.68	5650.64	---	---
	Ant2	5610	81.76	5569.20	5650.96	---	---
	Ant1	5690	81.28	5649.52	5730.80	---	---
	Ant2	5690	81.60	5649.36	5730.96	---	---
	Ant1	5690 UNII-2C	75.48	5649.52	5725	---	---
	Ant2	5690 UNII-2C	75.64	5649.36	5725	---	---
	Ant1	5690 UNII-3	5.8	5725	5730.80	---	---
	Ant2	5690 UNII-3	5.96	5725	5730.96	---	---

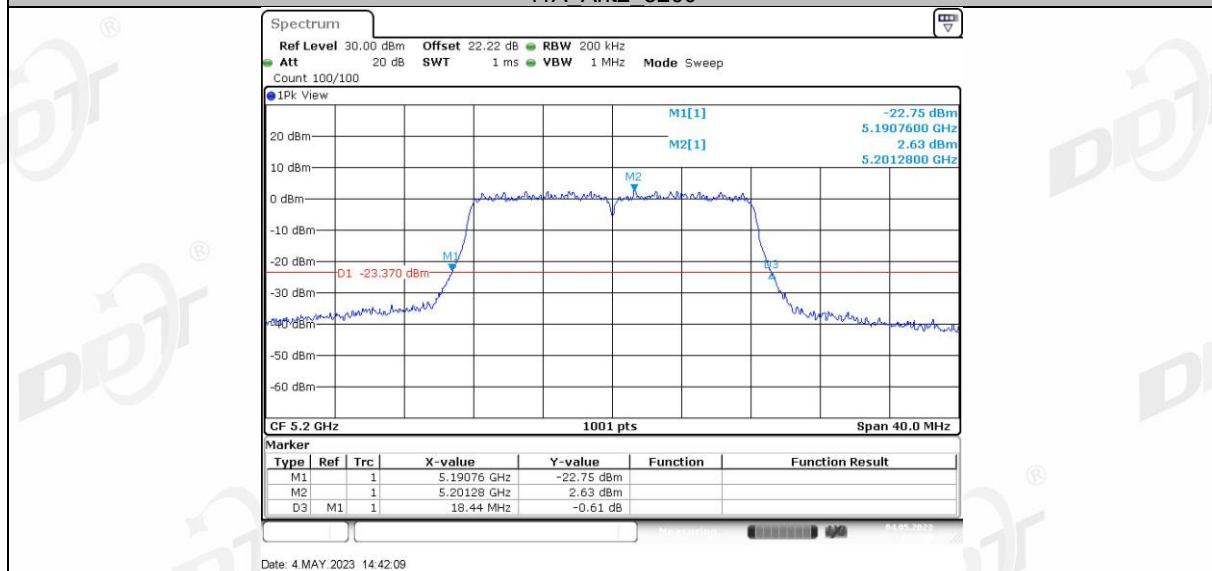
	Ant1	5775	80.80	5734.84	5815.64	---	---
	Ant2	5775	81.76	5734.04	5815.80	---	---

4.5. Test graphs

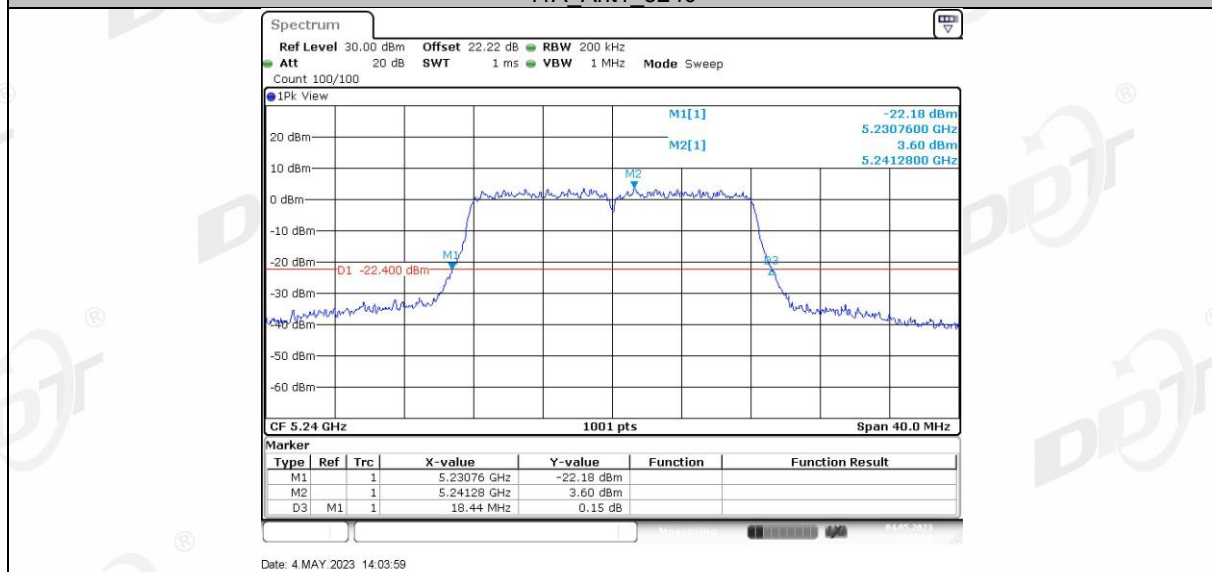




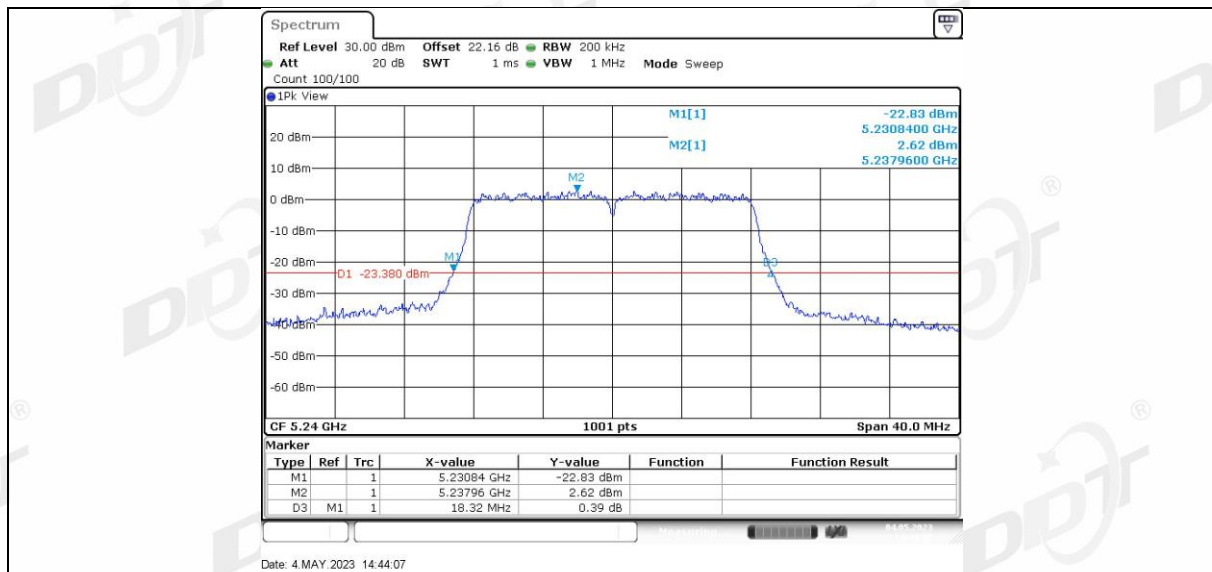
11A Ant2 5200



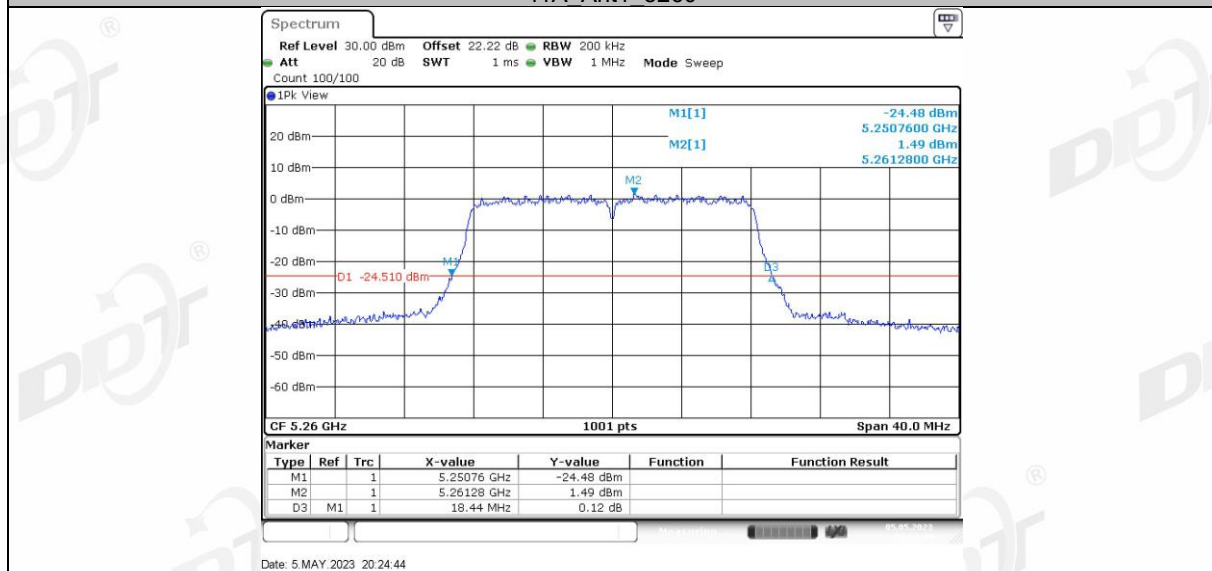
11A Ant1 5240



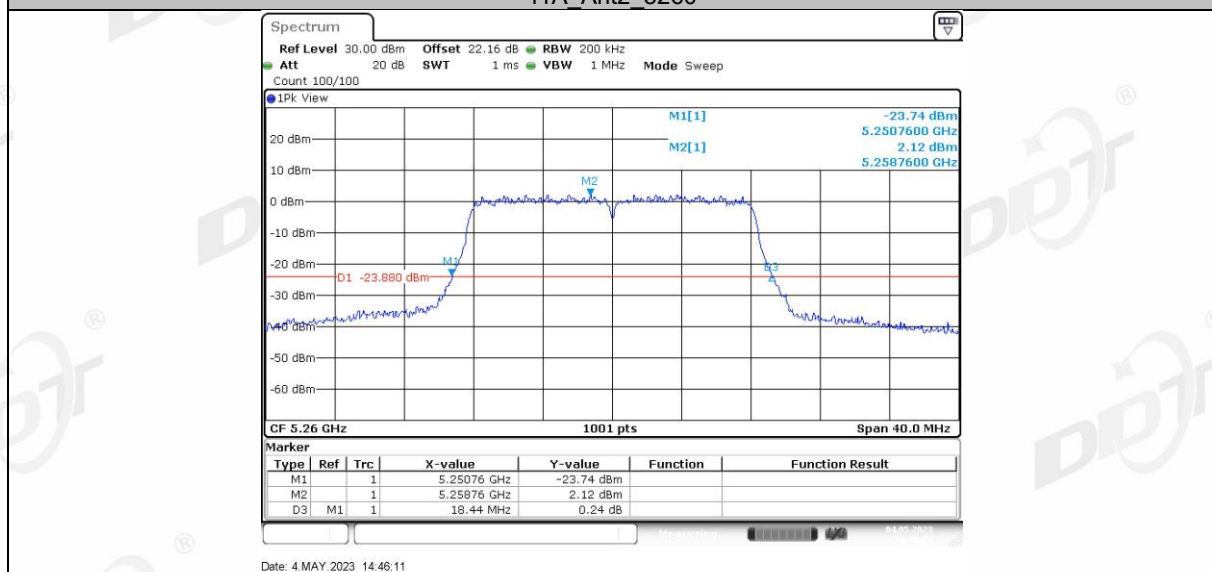
11A Ant2 5240



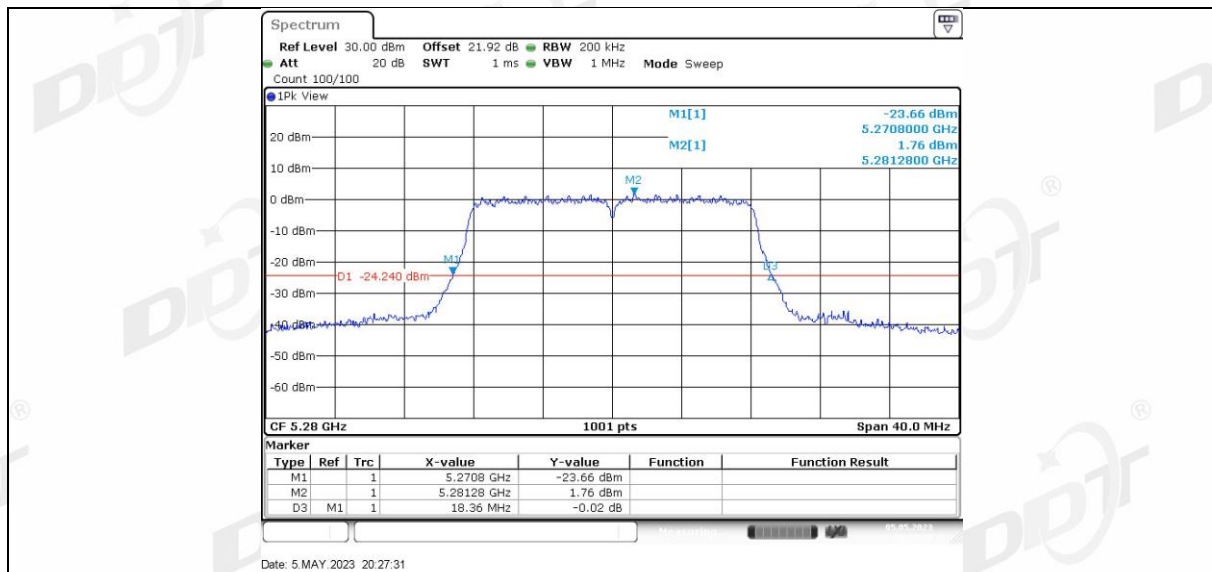
11A Ant1 5260



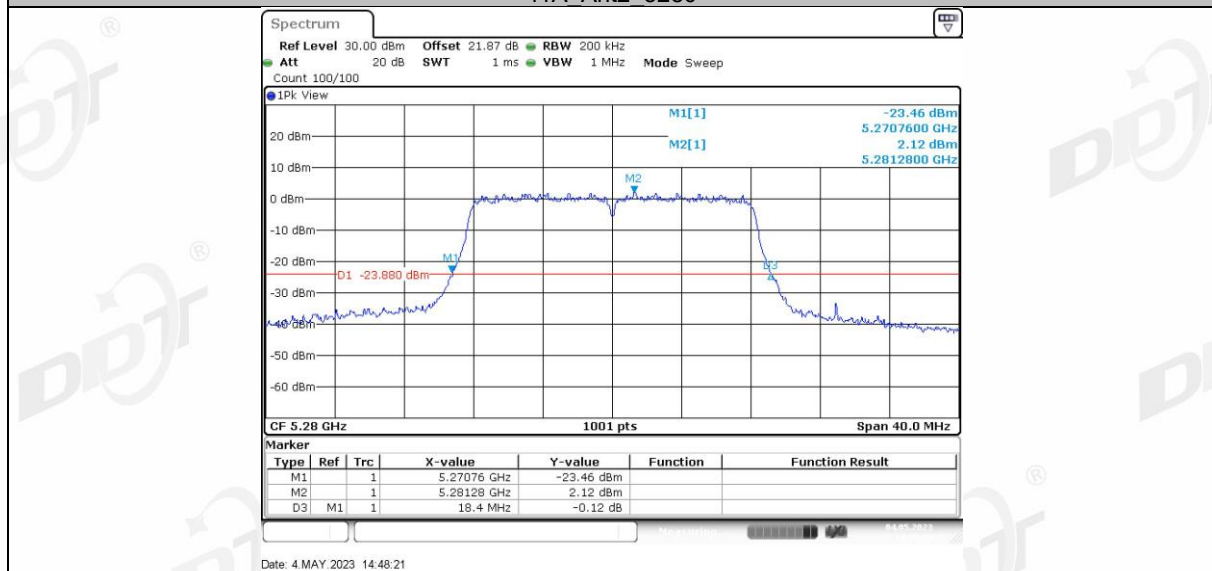
11A Ant2 5260



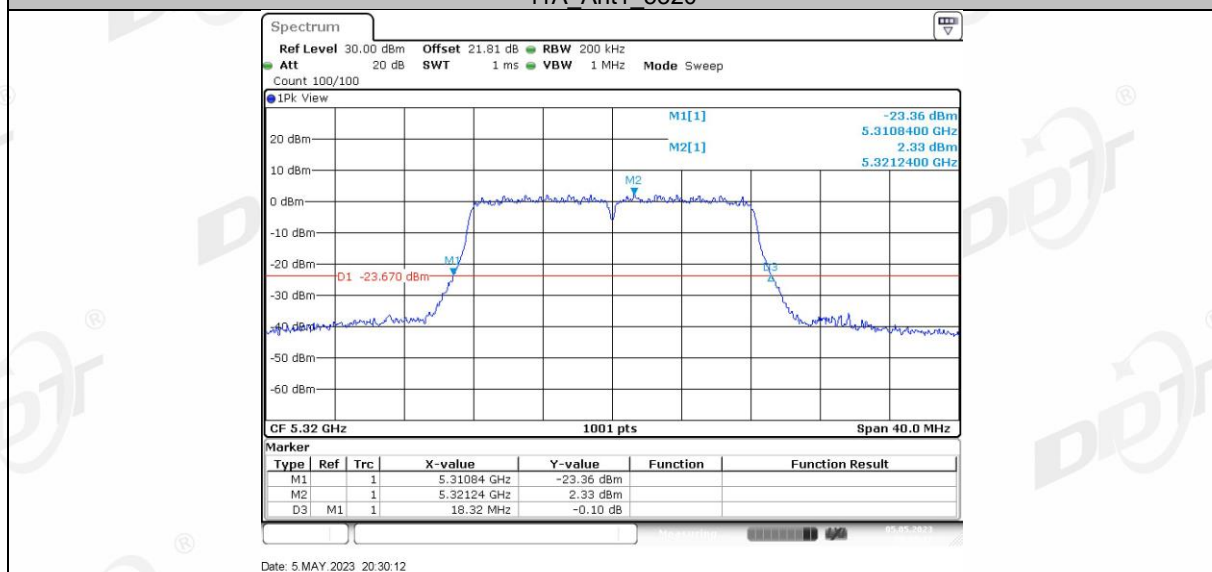
11A Ant1 5280



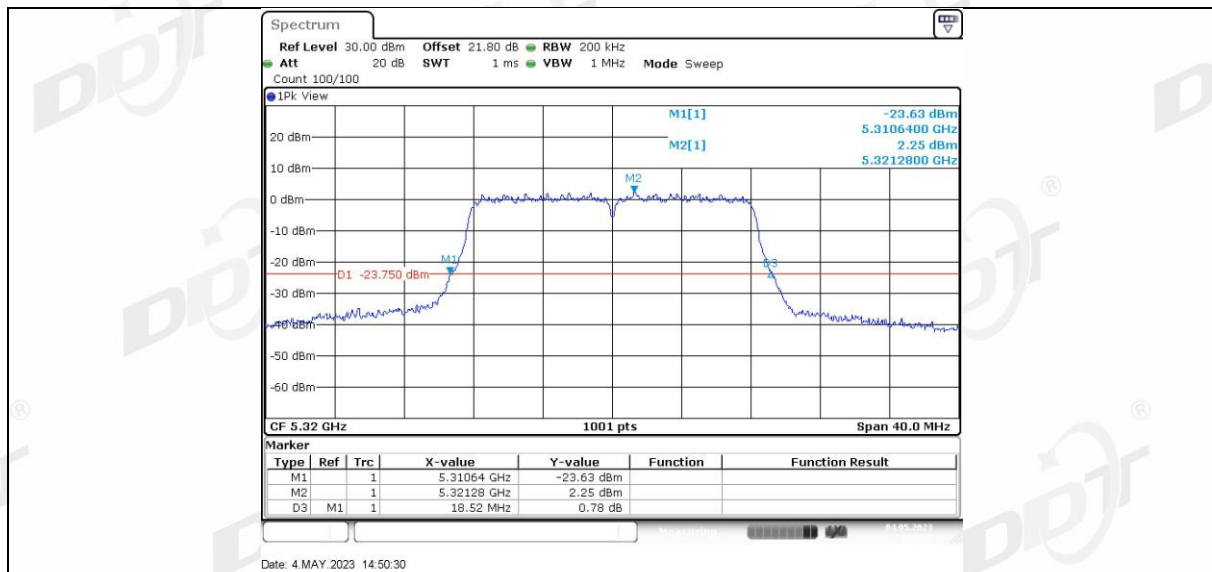
11A Ant2 5280



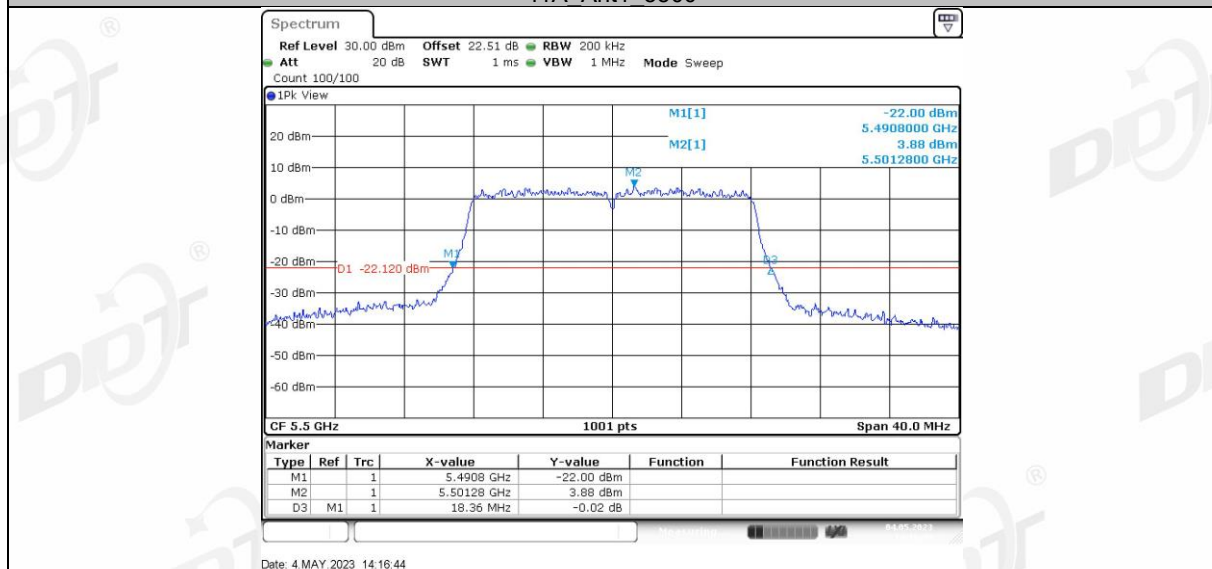
11A Ant1 5320



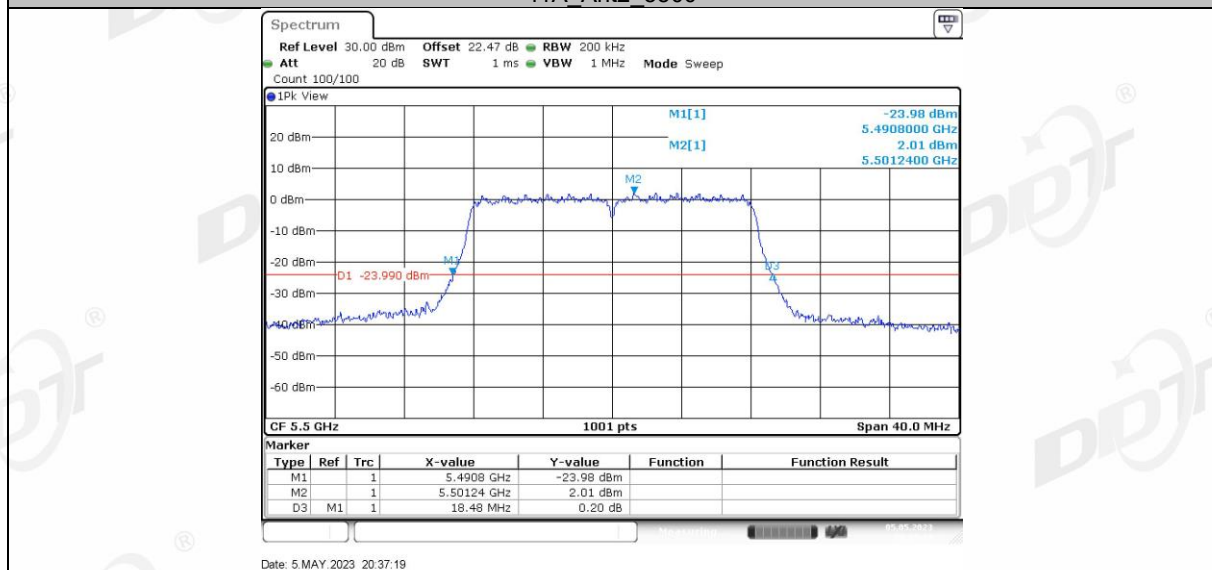
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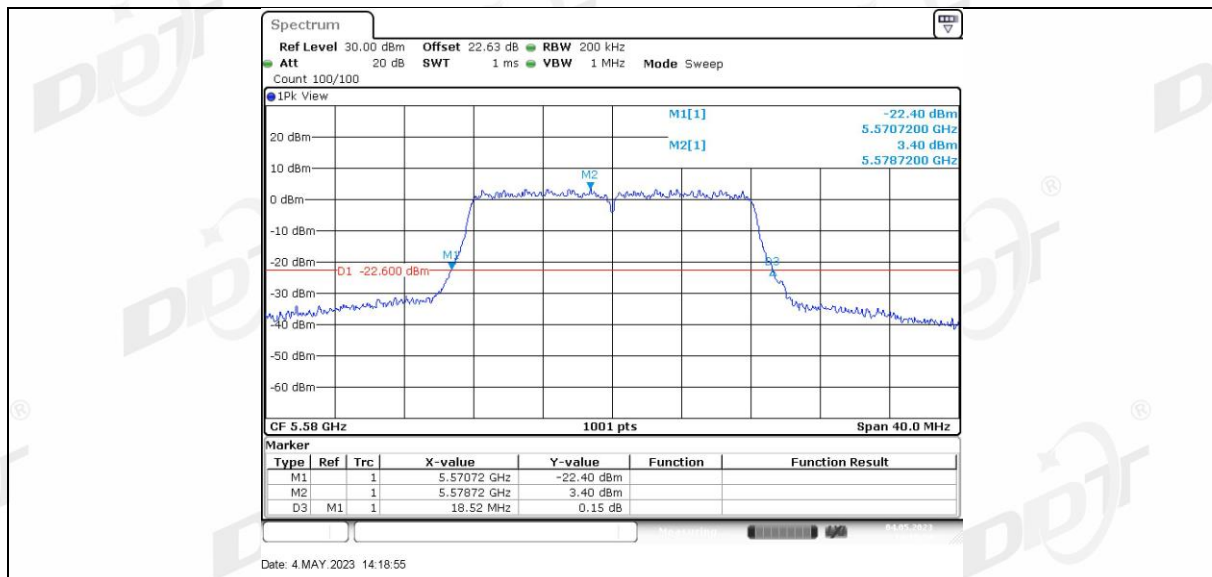
11A Ant1 5500



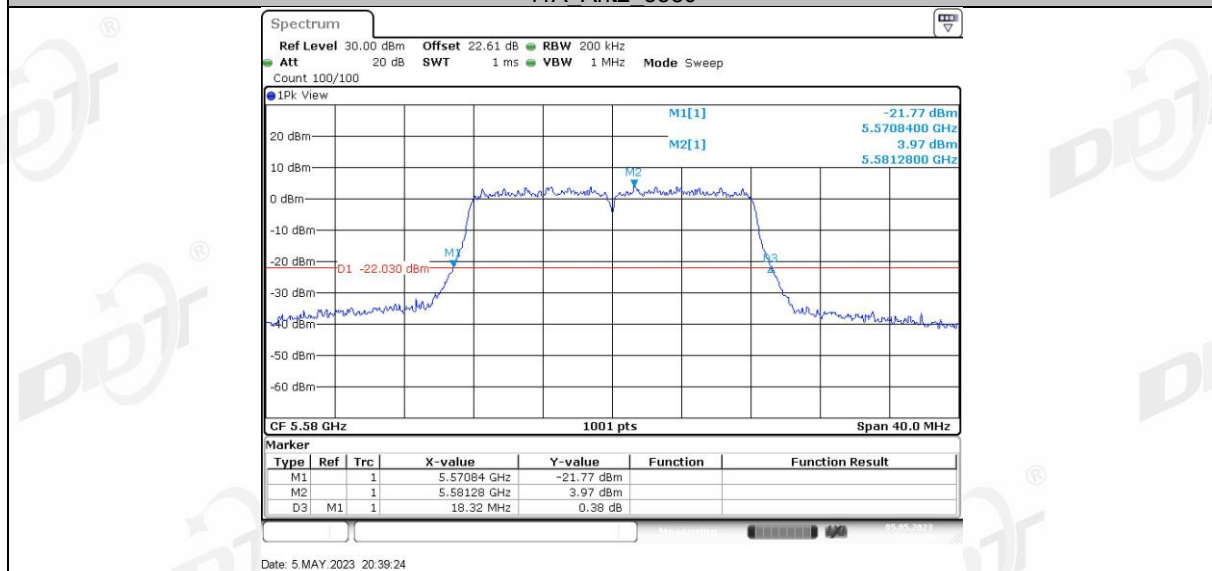
11A Ant2 5500



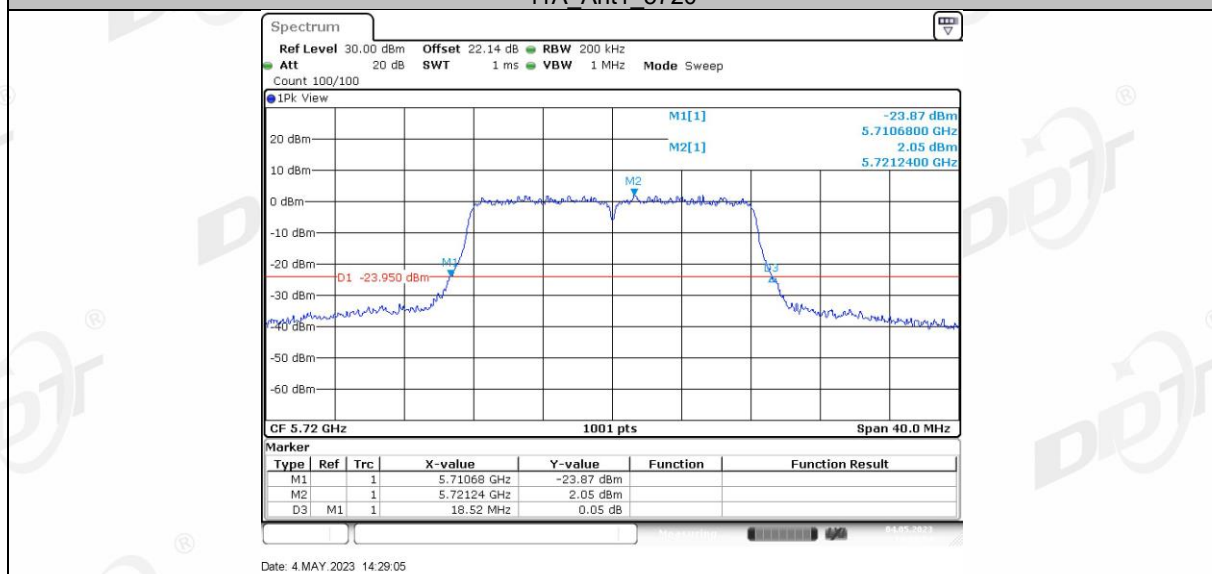
11A Ant1 5580



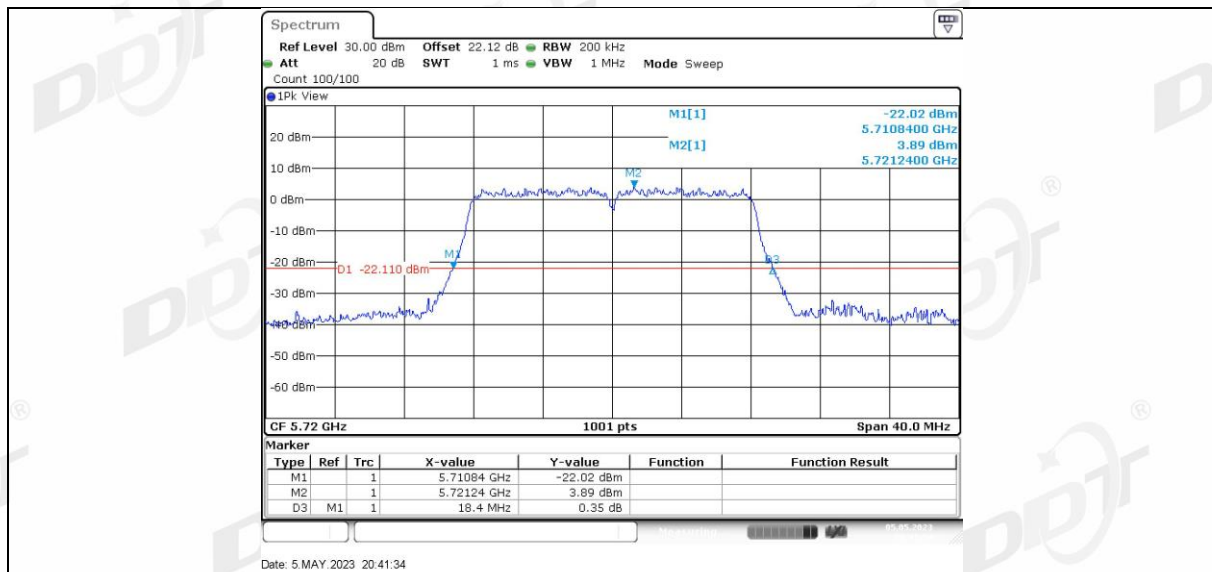
11A Ant2 5580



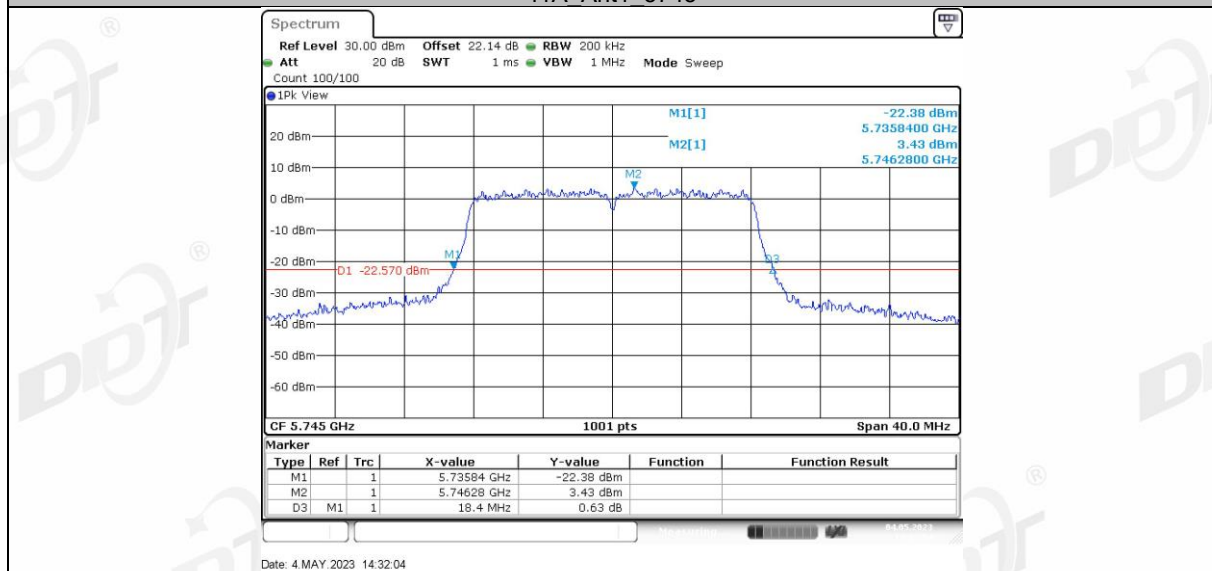
11A Ant1 5720



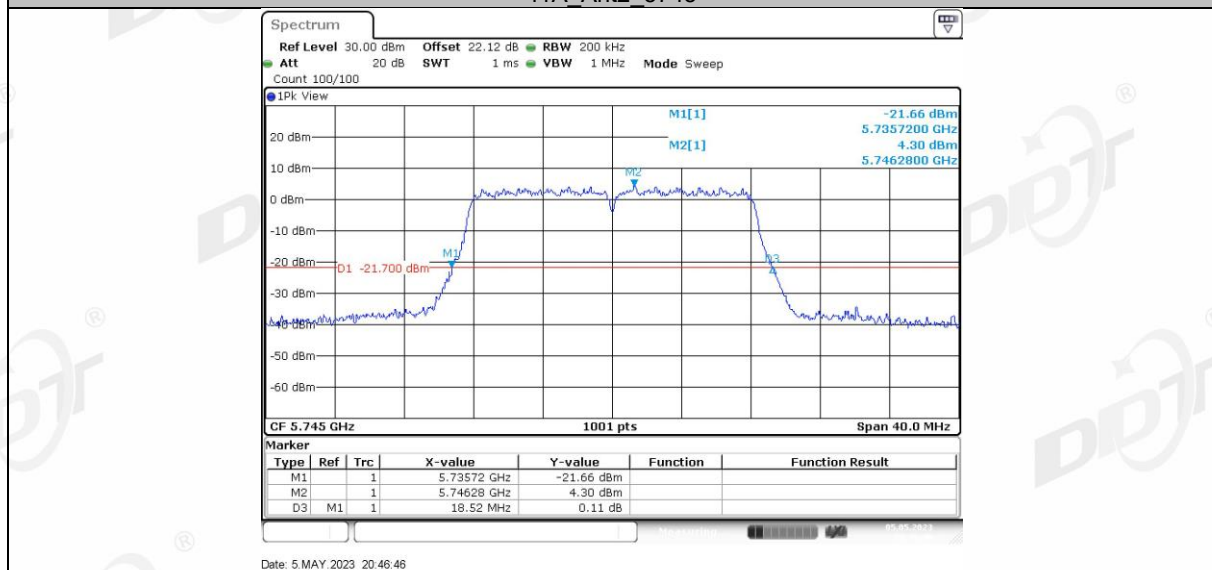
11A Ant2 5720



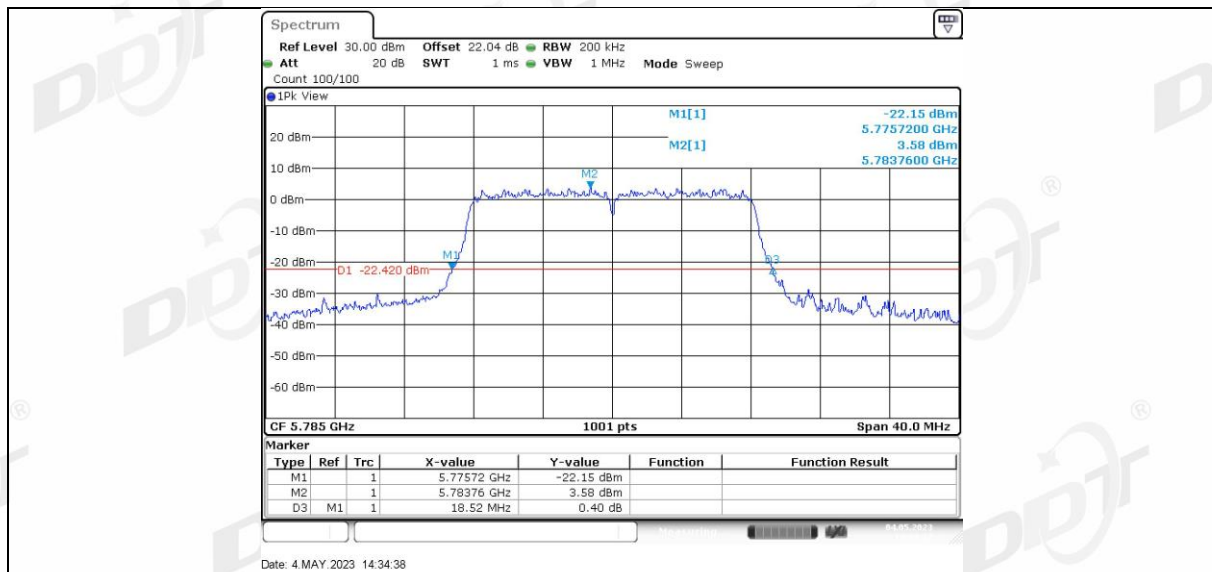
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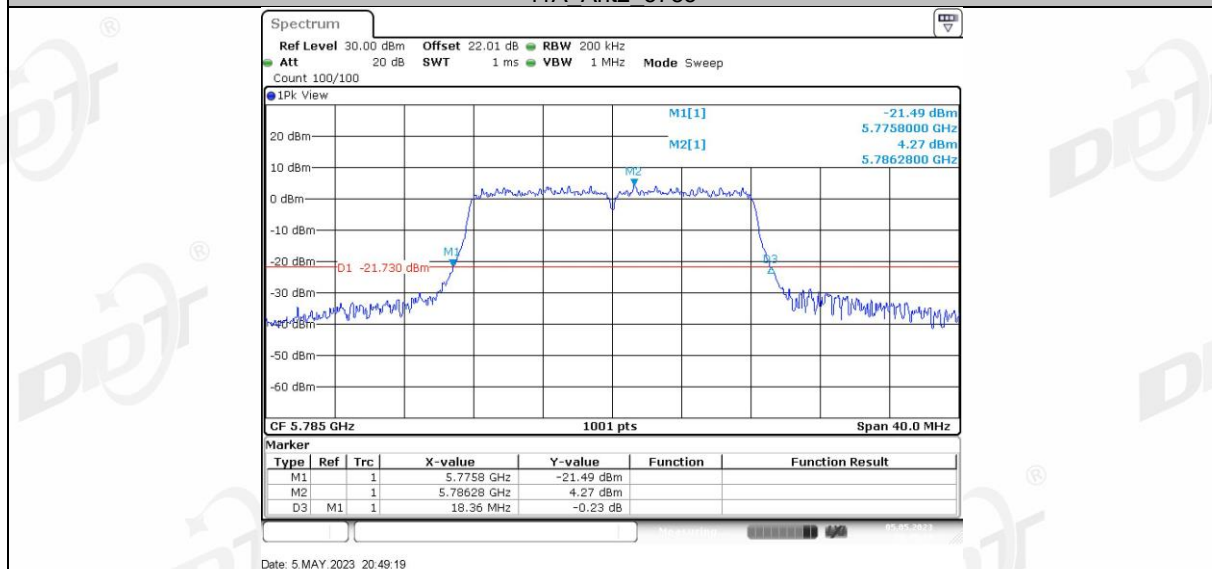
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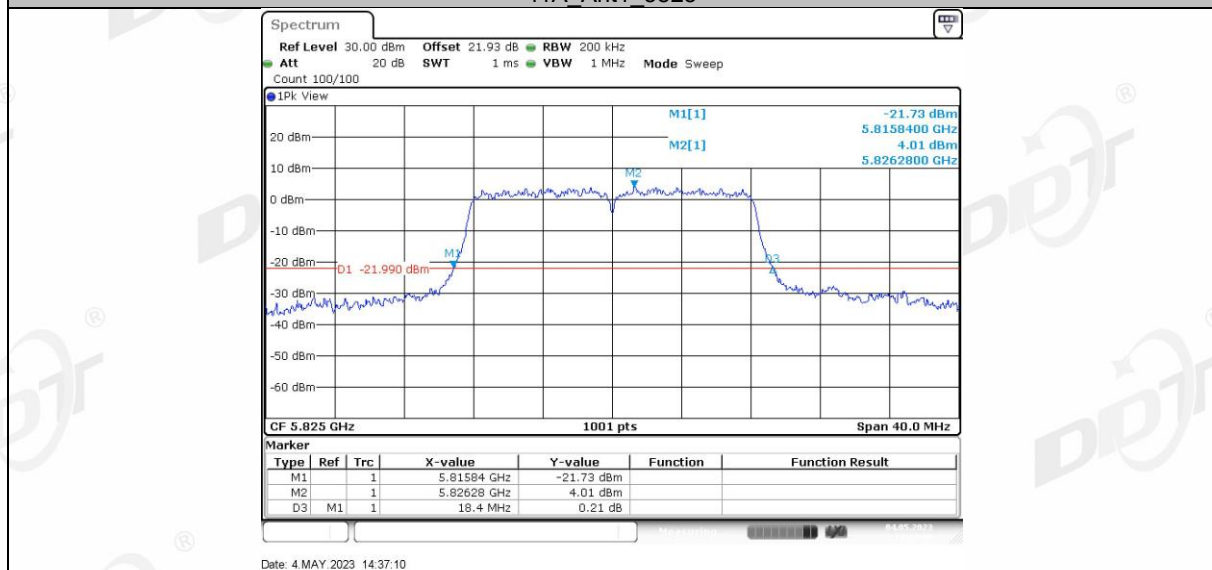
11A Ant1 5785



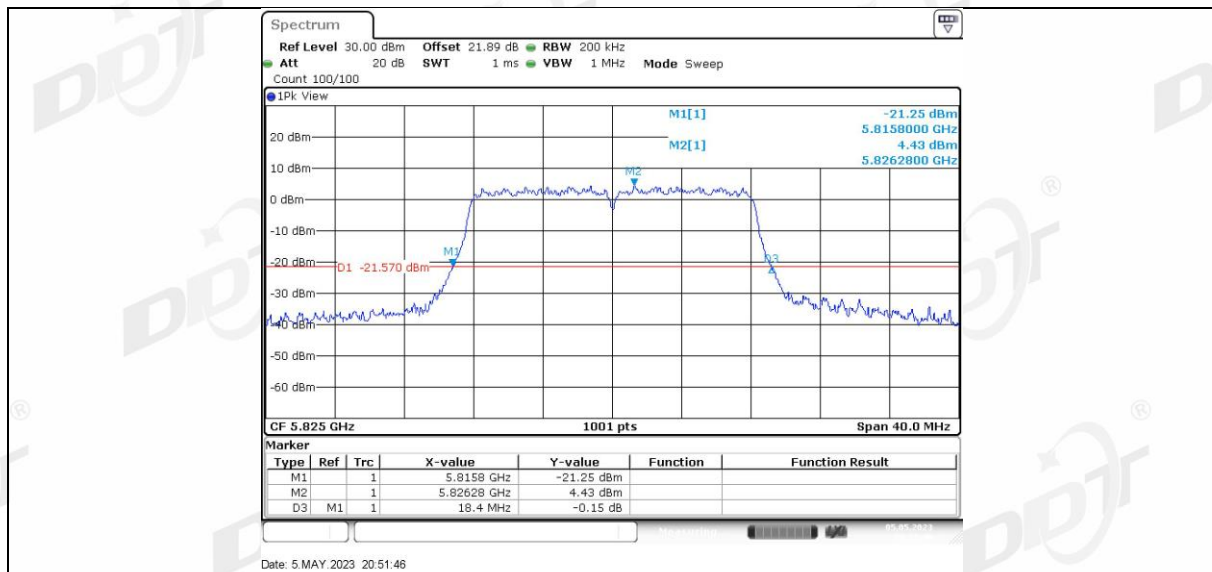
11A Ant2 5785



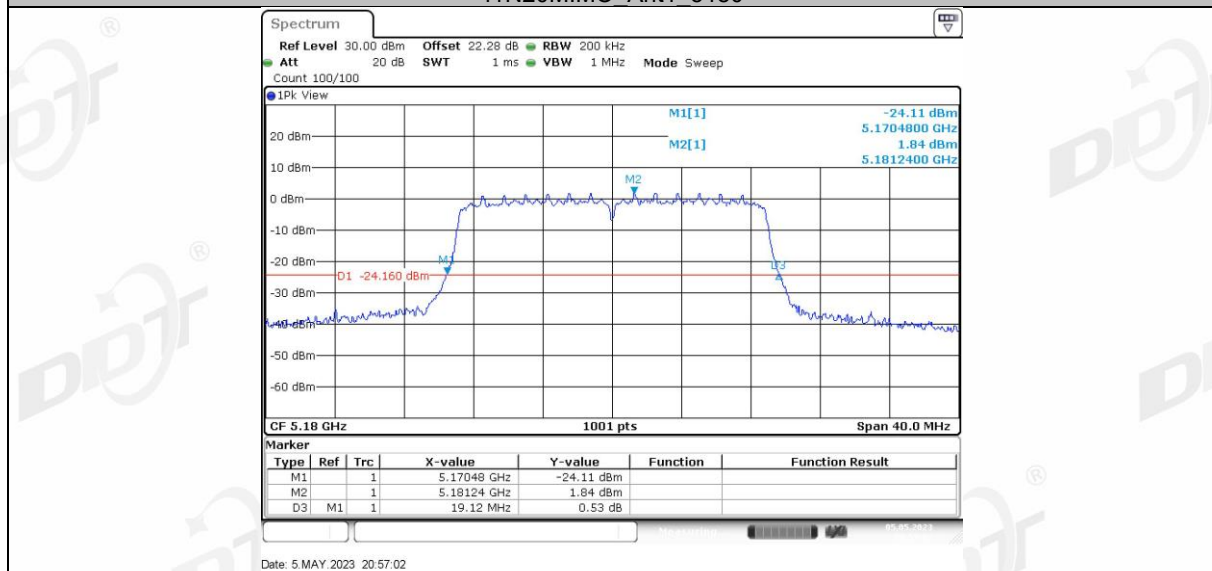
11A Ant1 5825



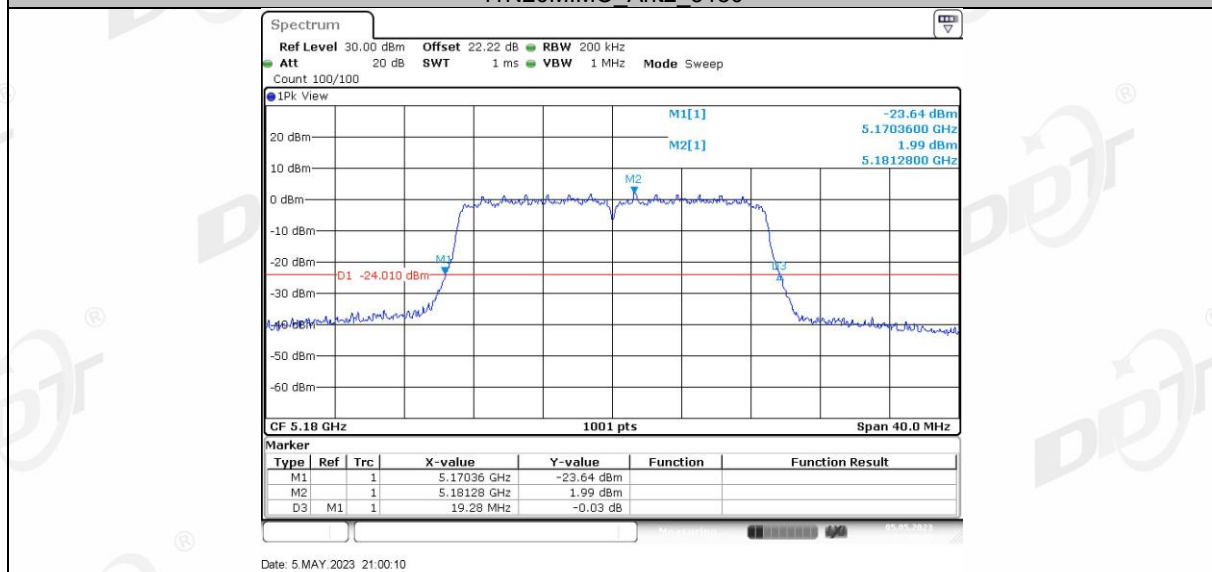
11A Ant2 5825



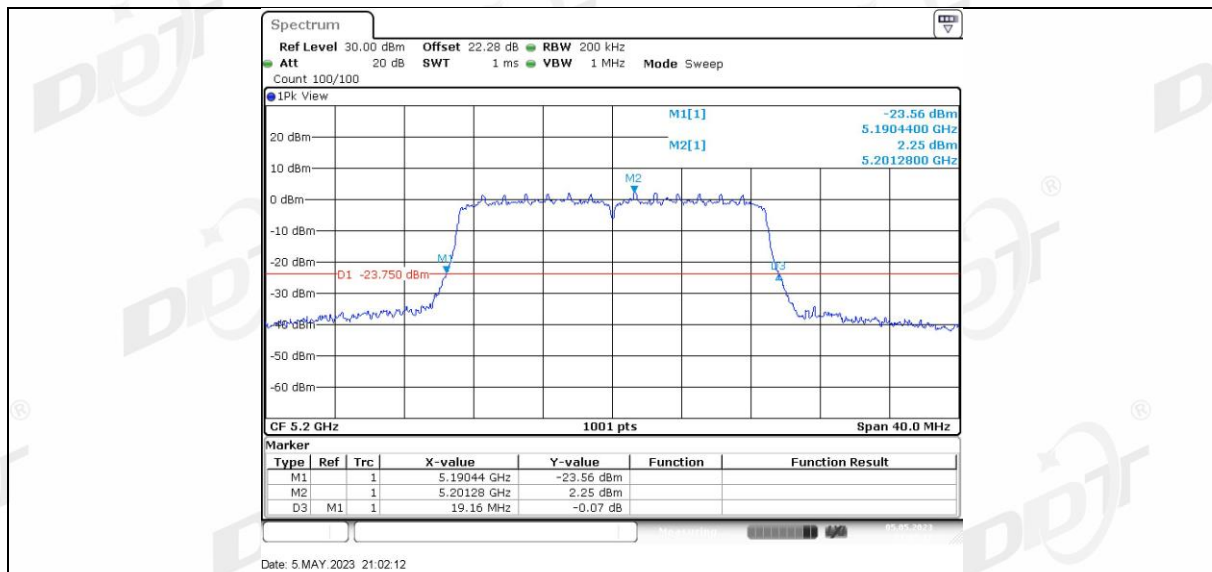
11N20MIMO Ant1 5180



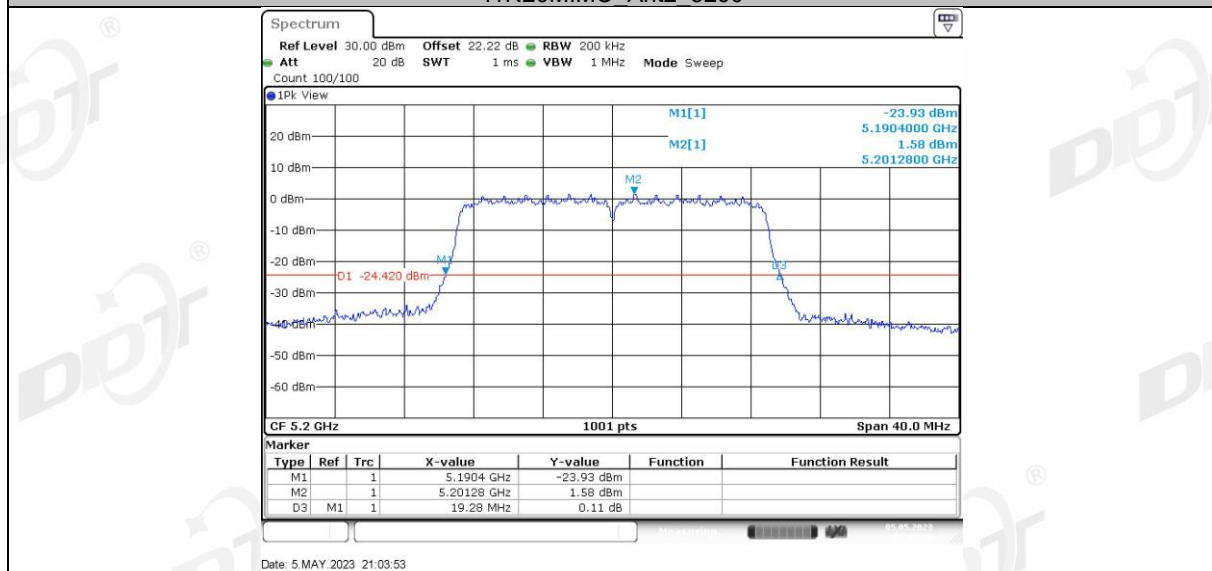
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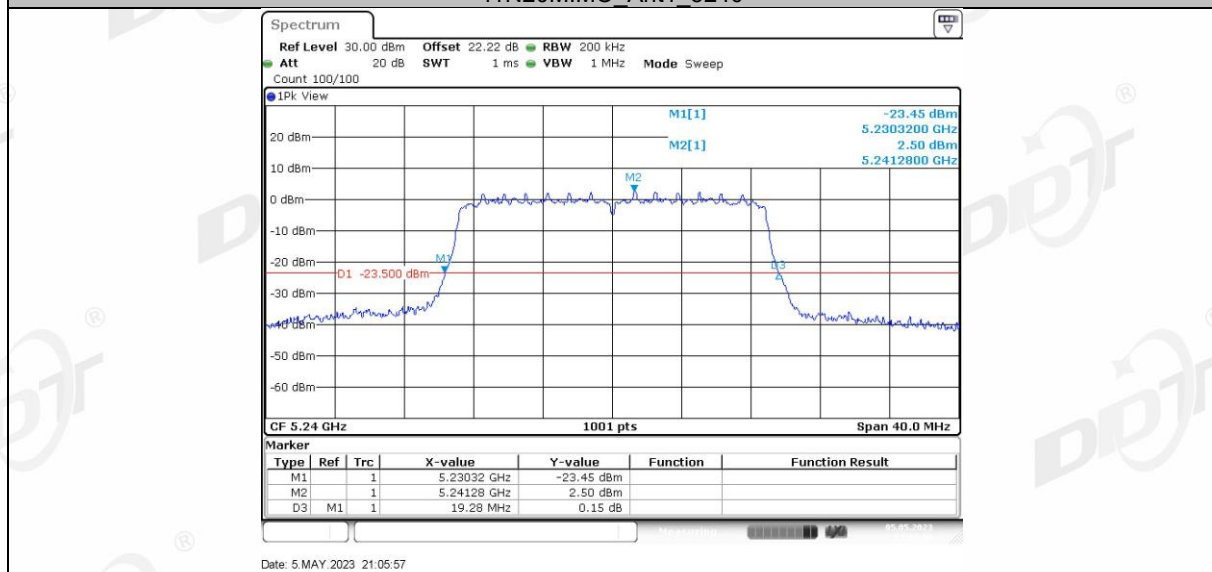
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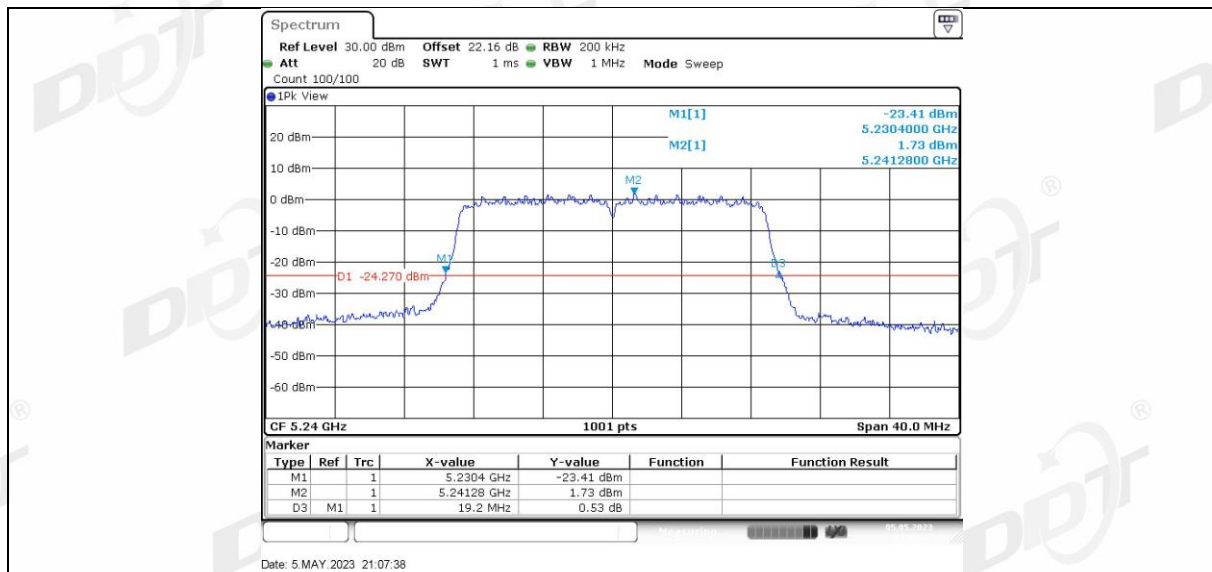
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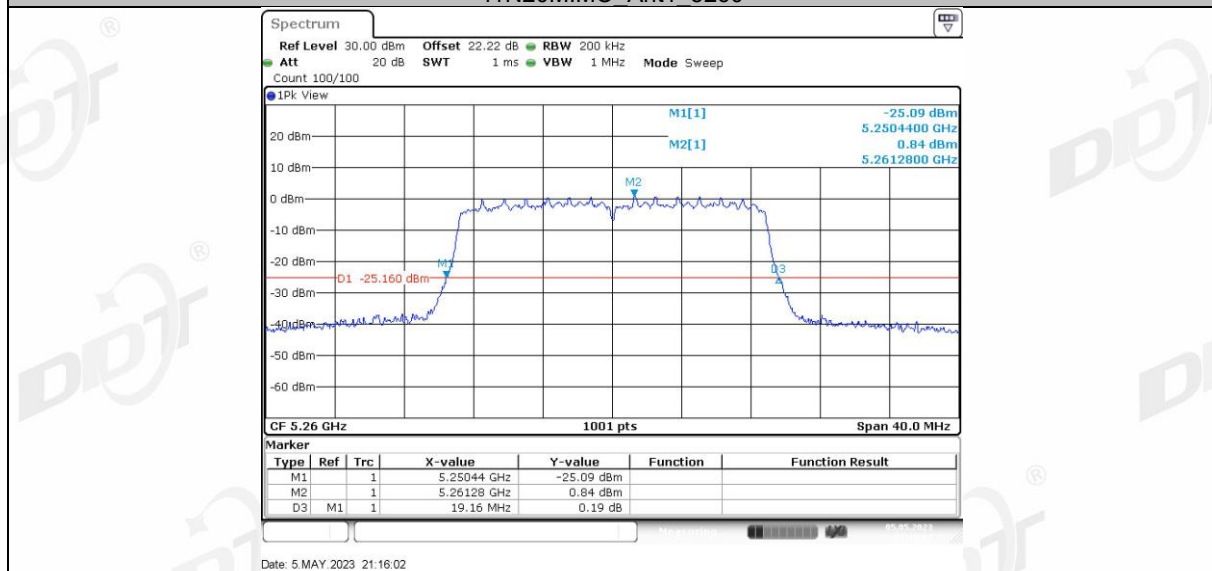
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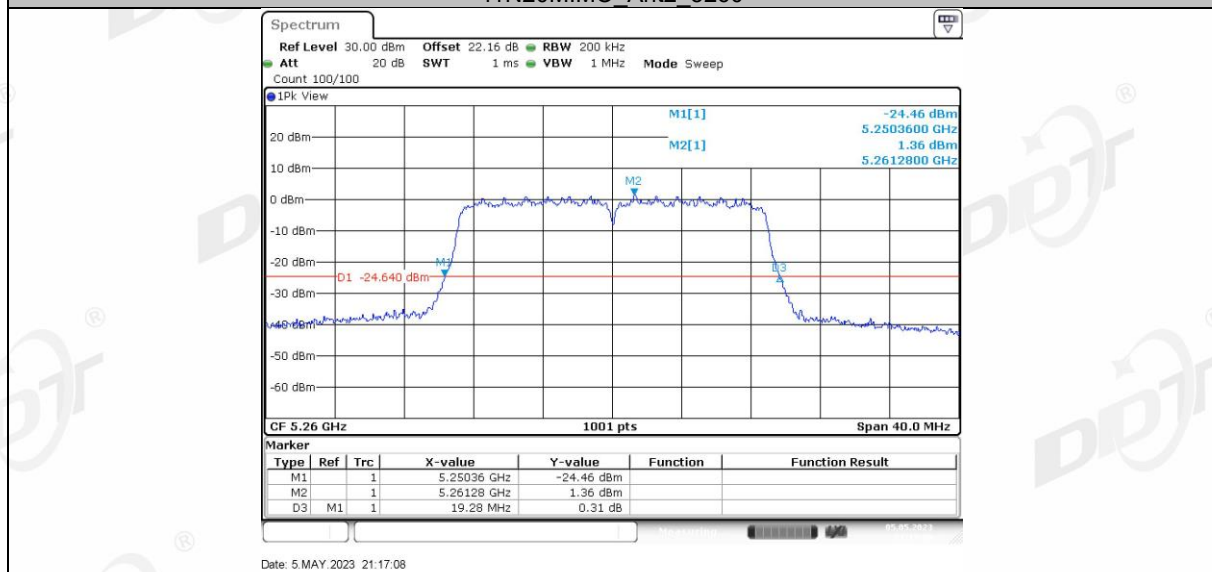
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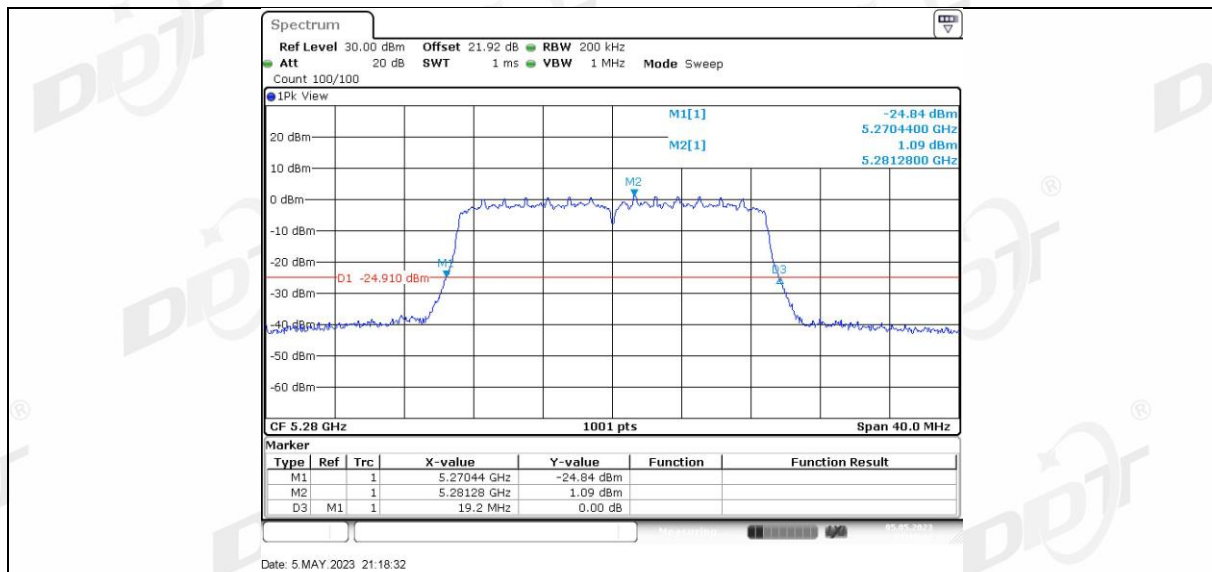
11N20MIMO Ant1 5260



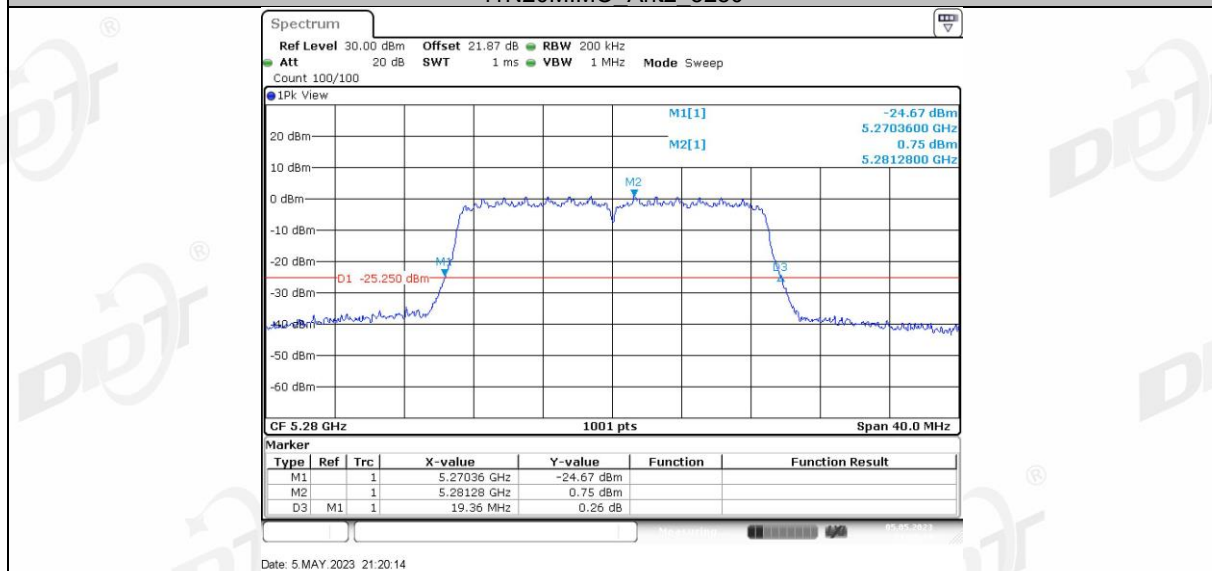
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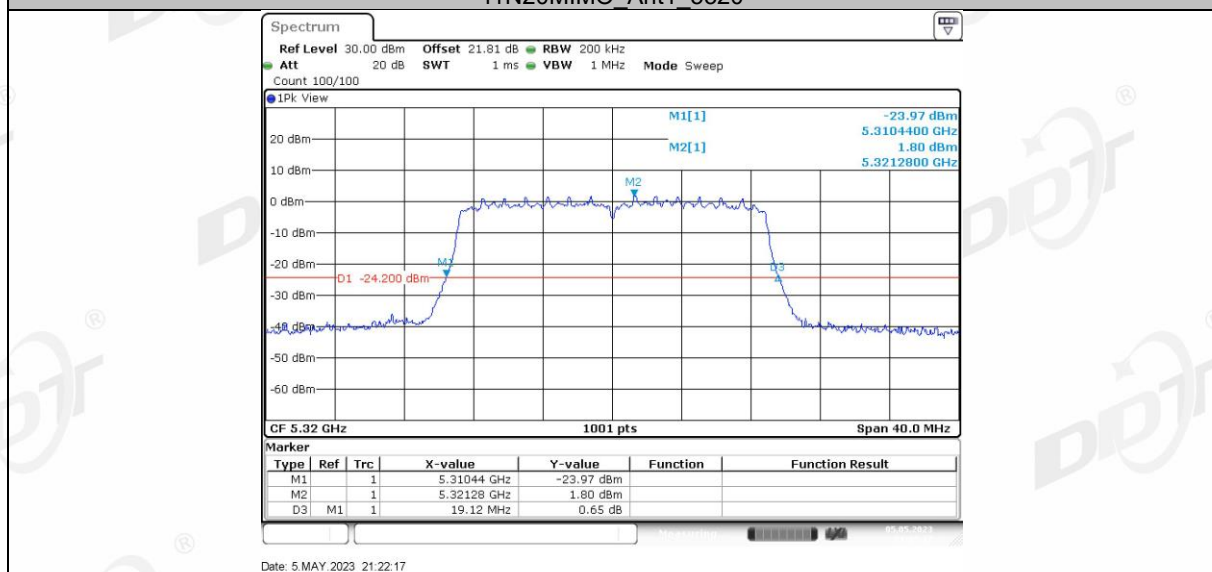
11N20MIMO Ant1 5280



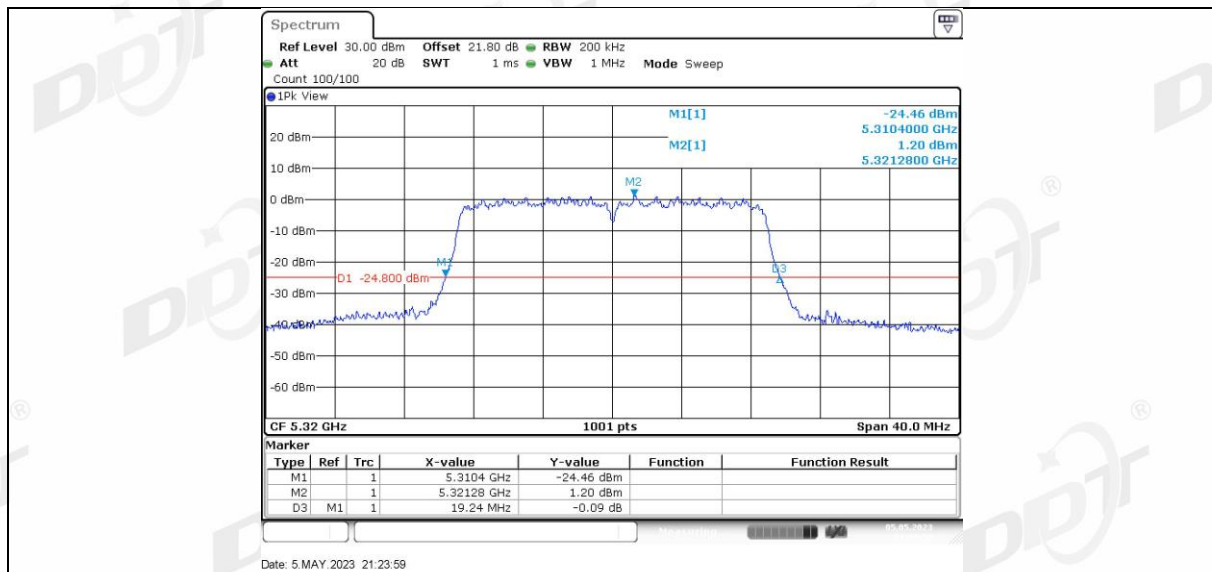
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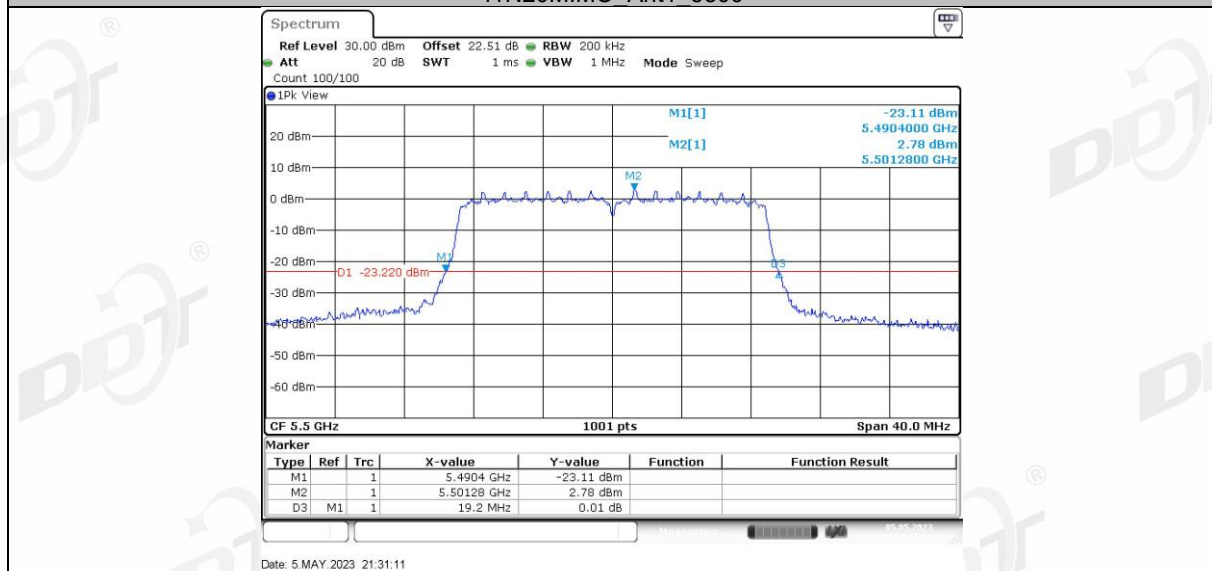
11N20MIMO Ant1 5320



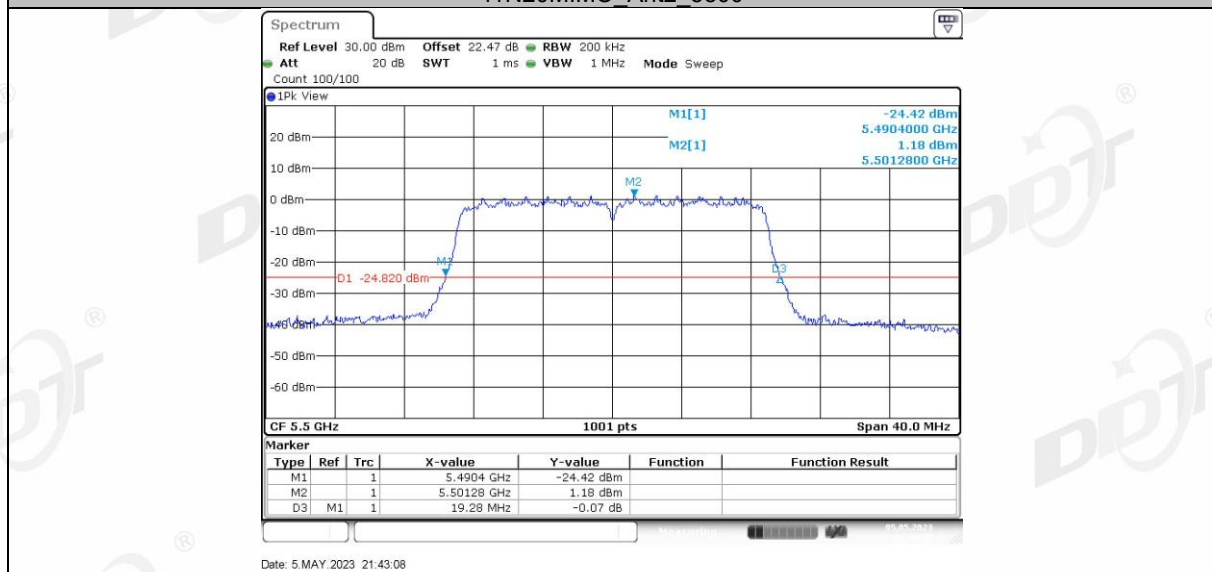
11N20MIMO Ant2 5320



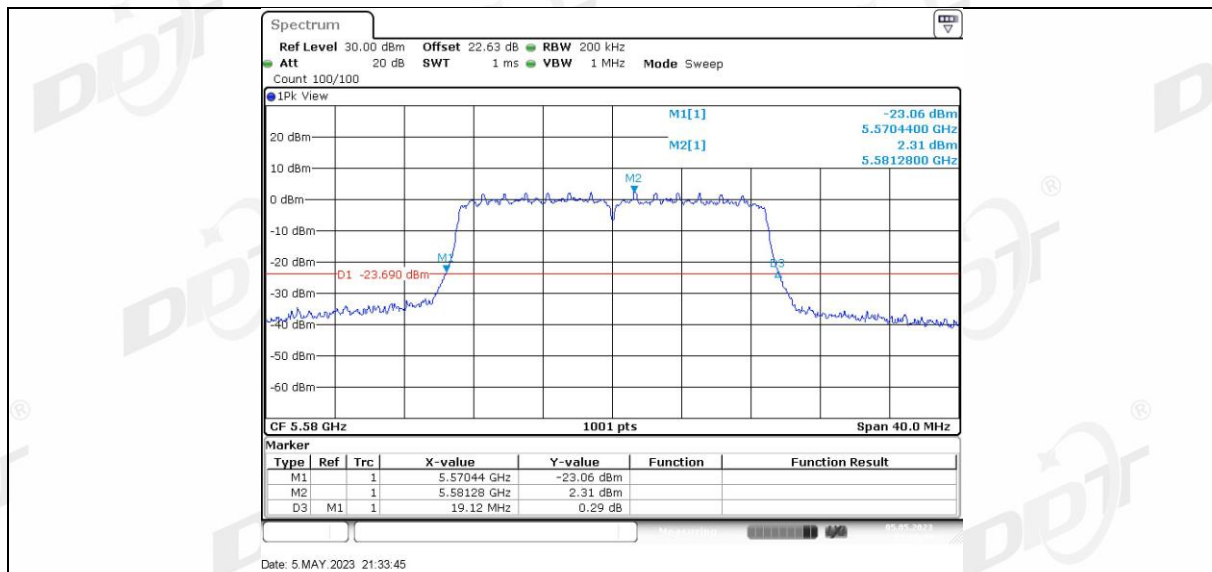
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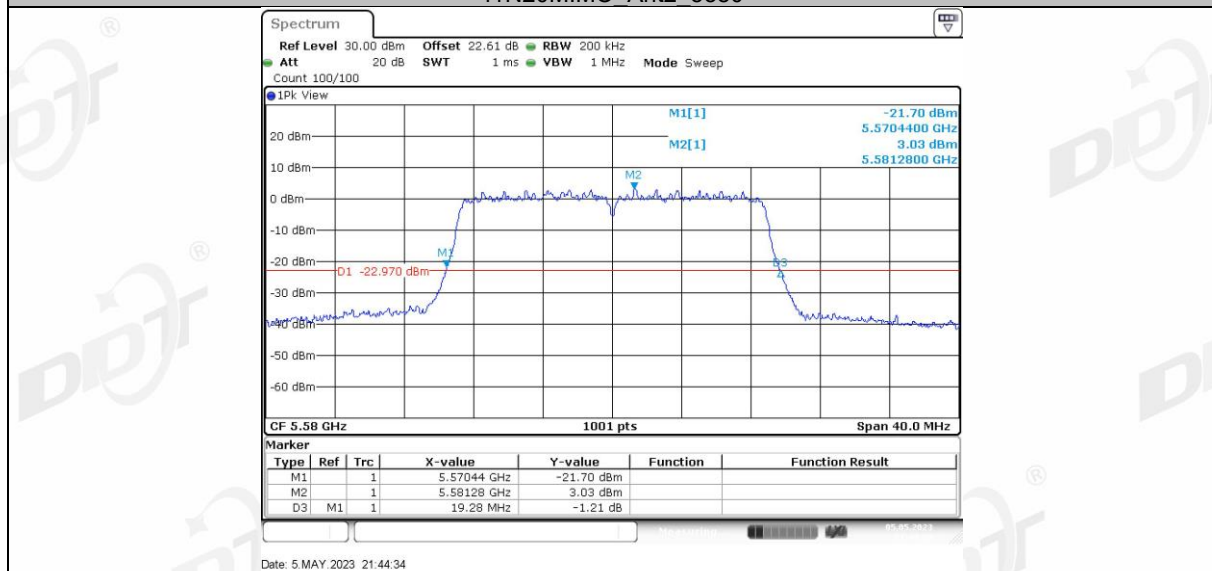
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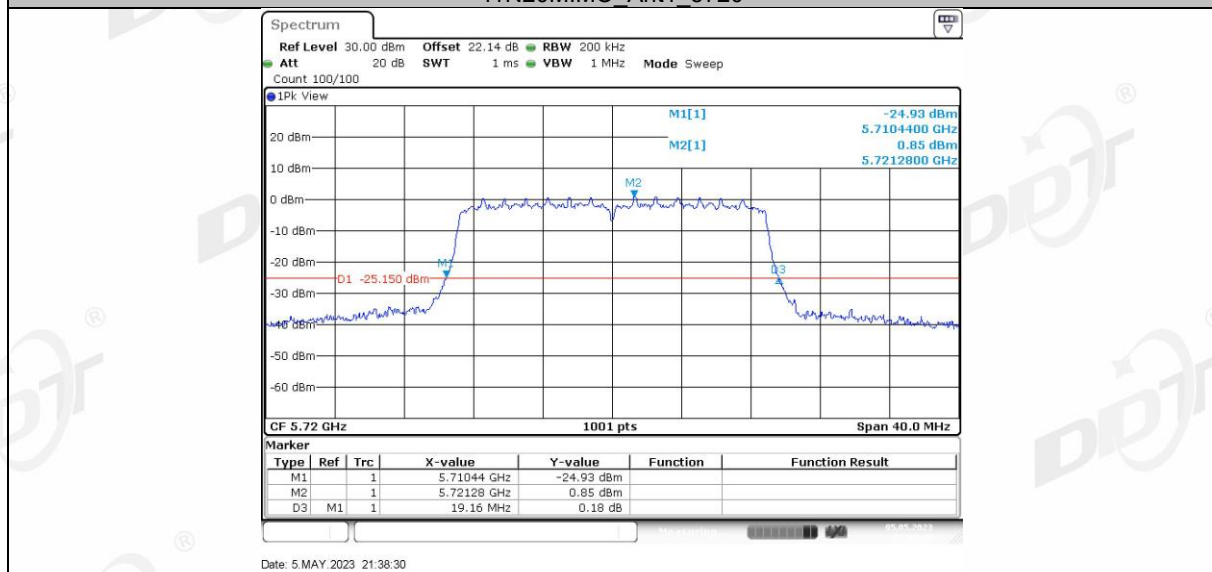
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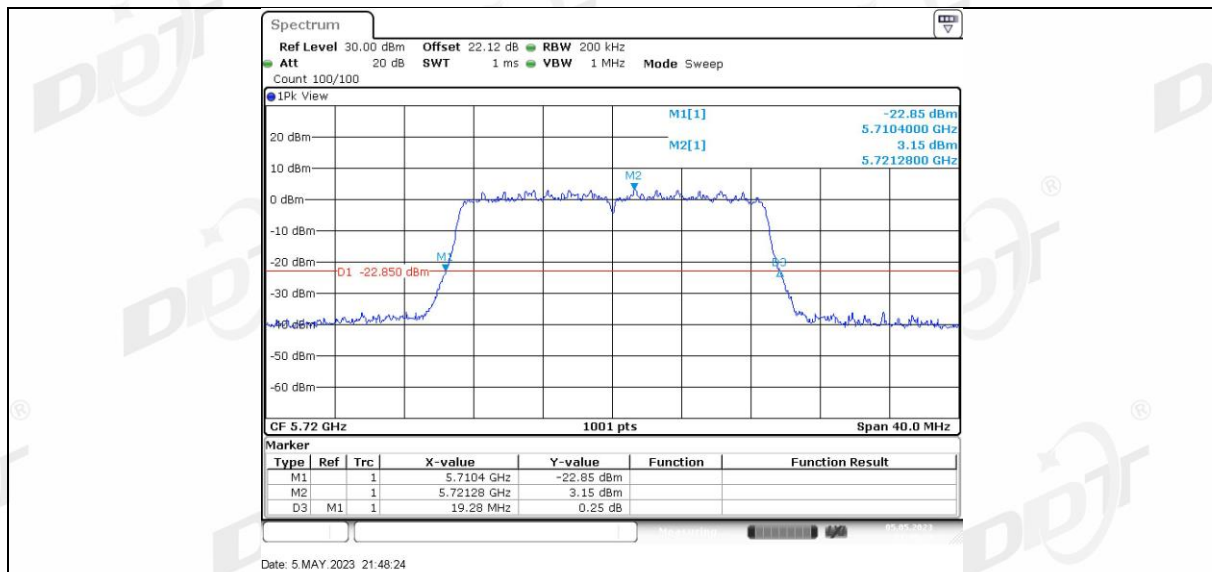
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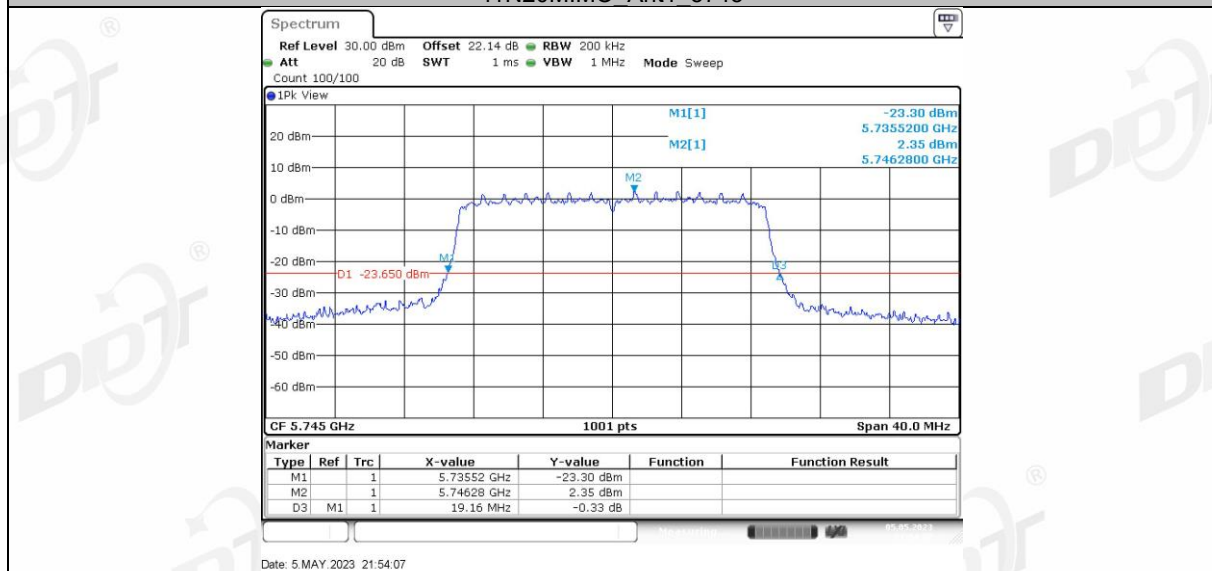
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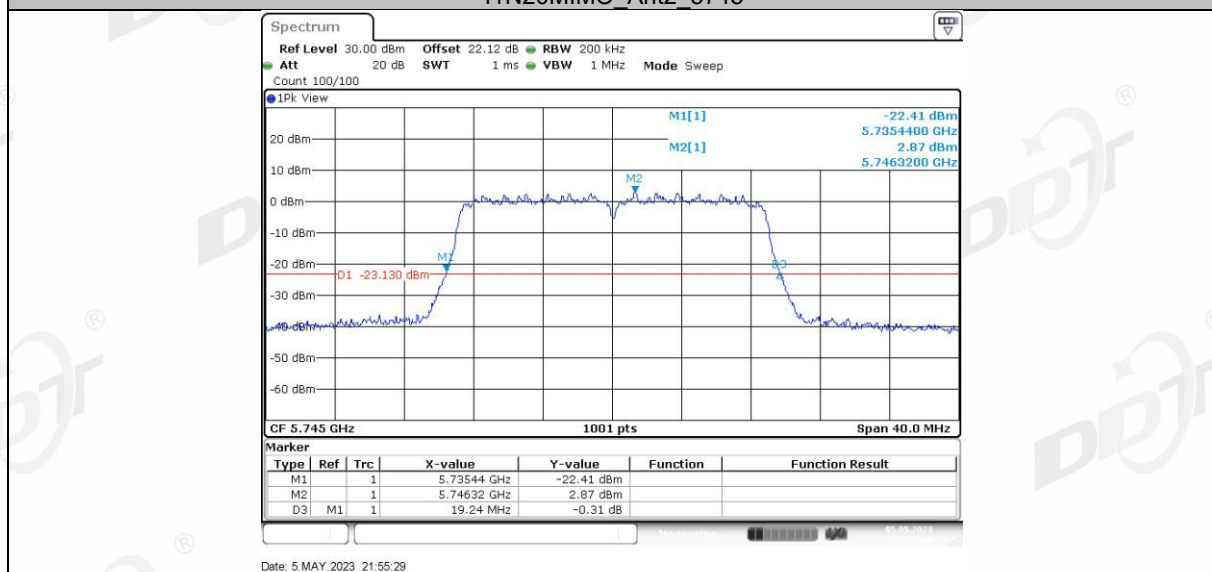
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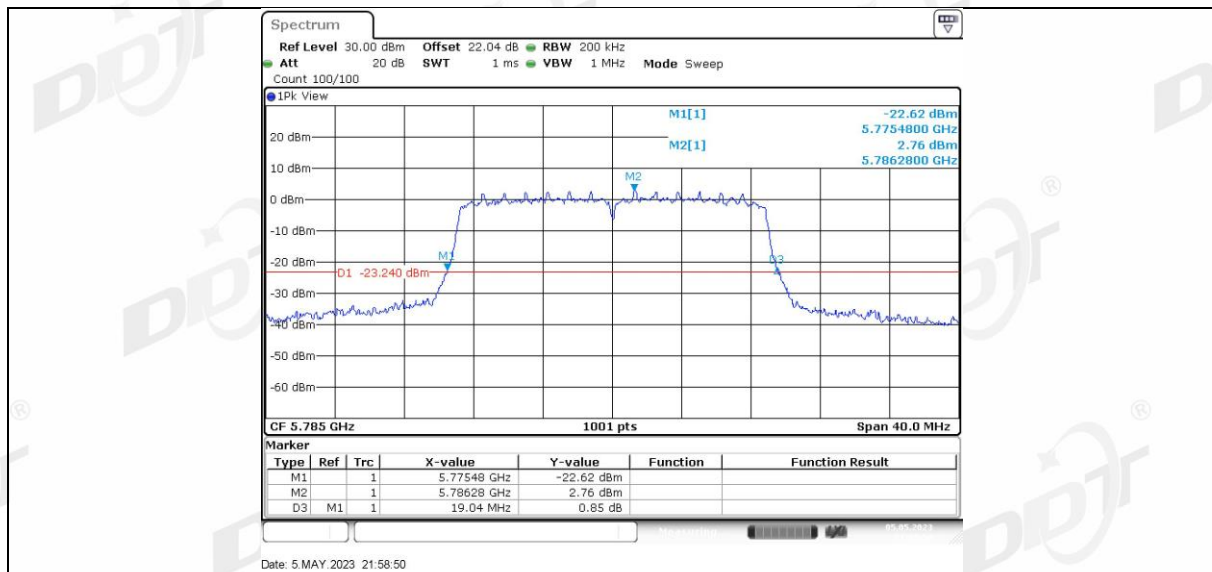
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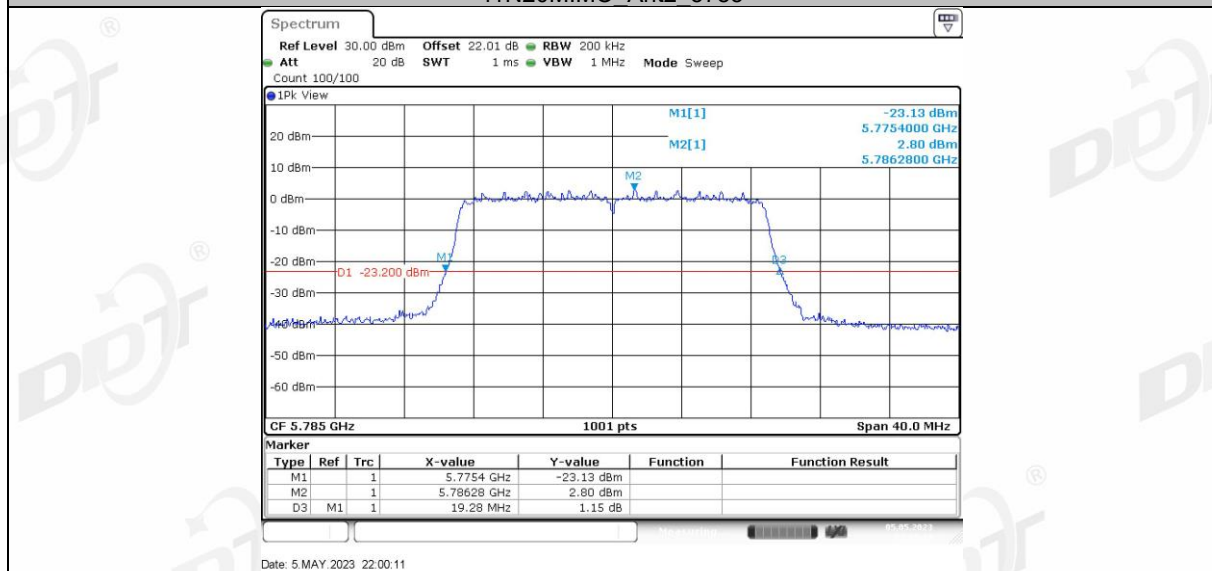
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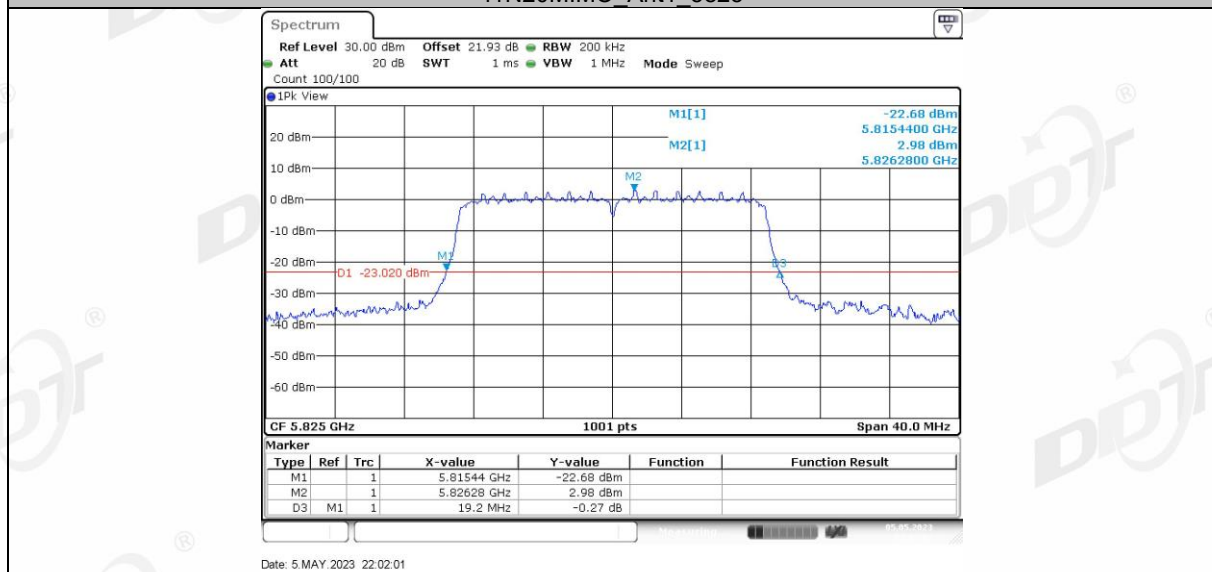
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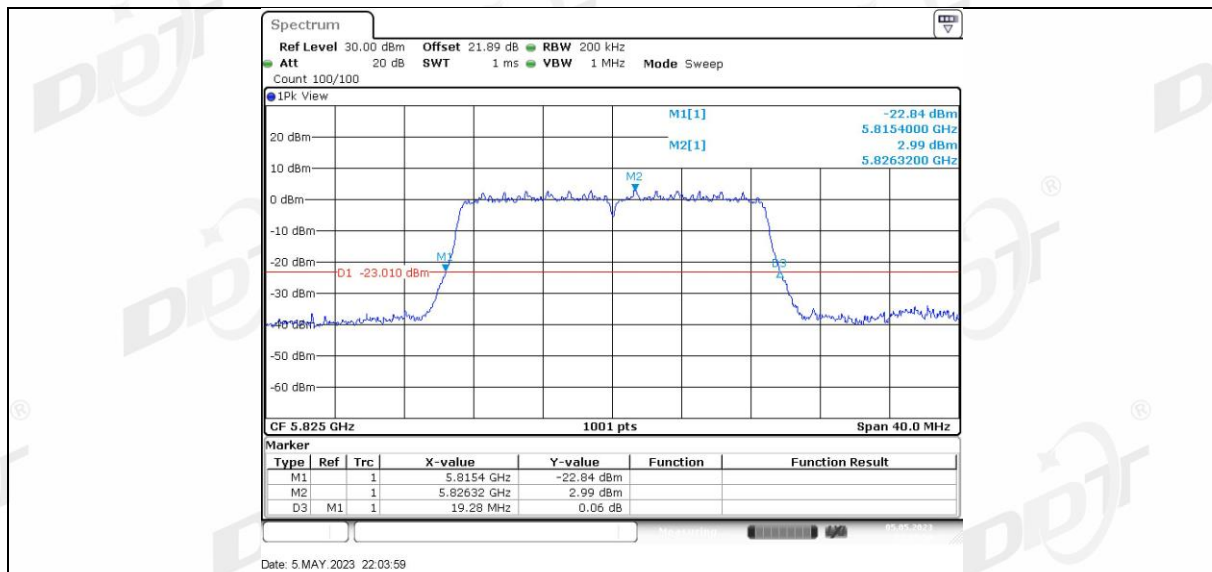
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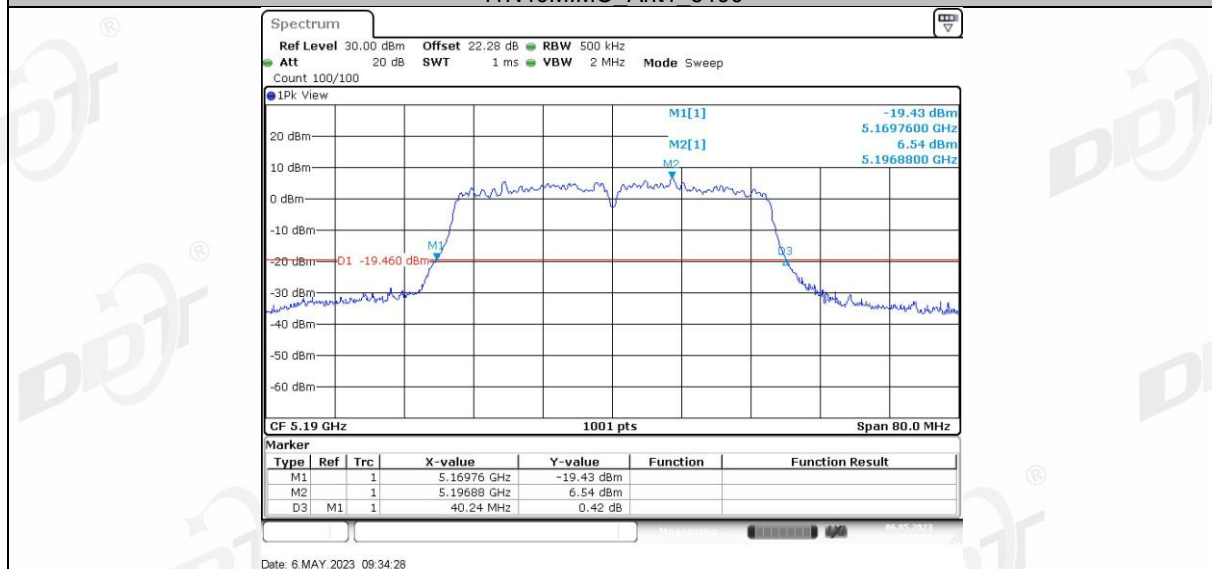
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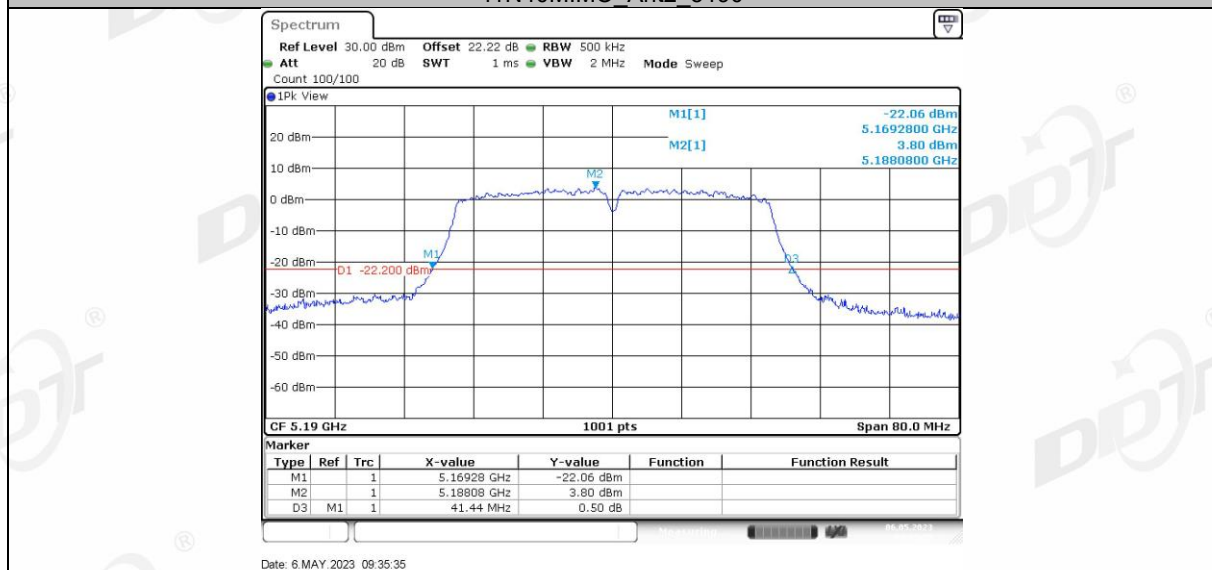
11N20MIMO Ant2 5825



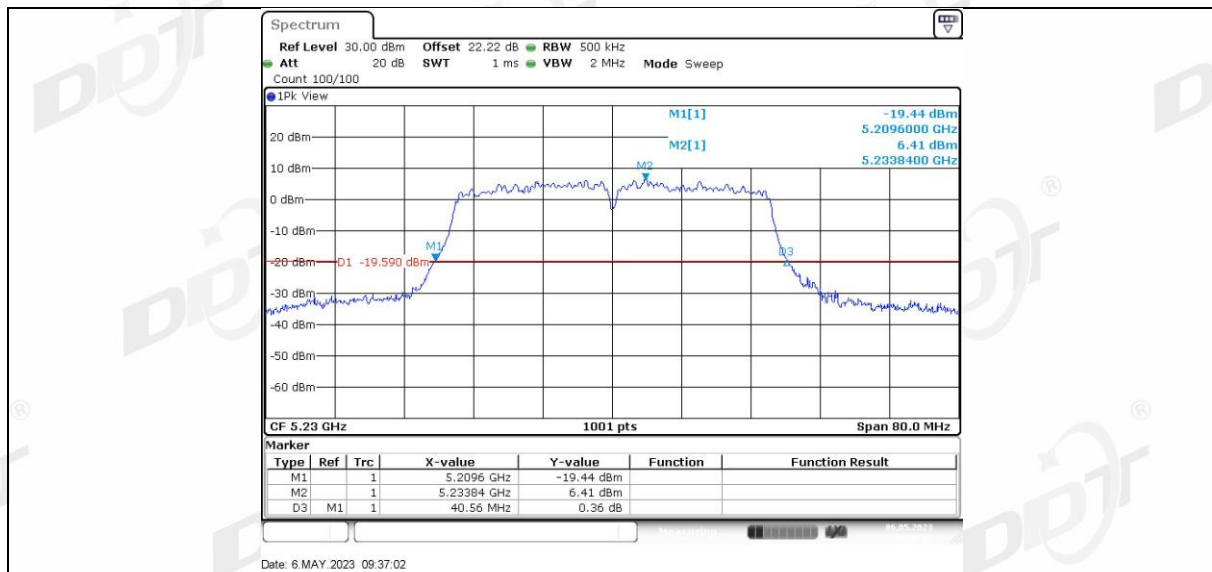
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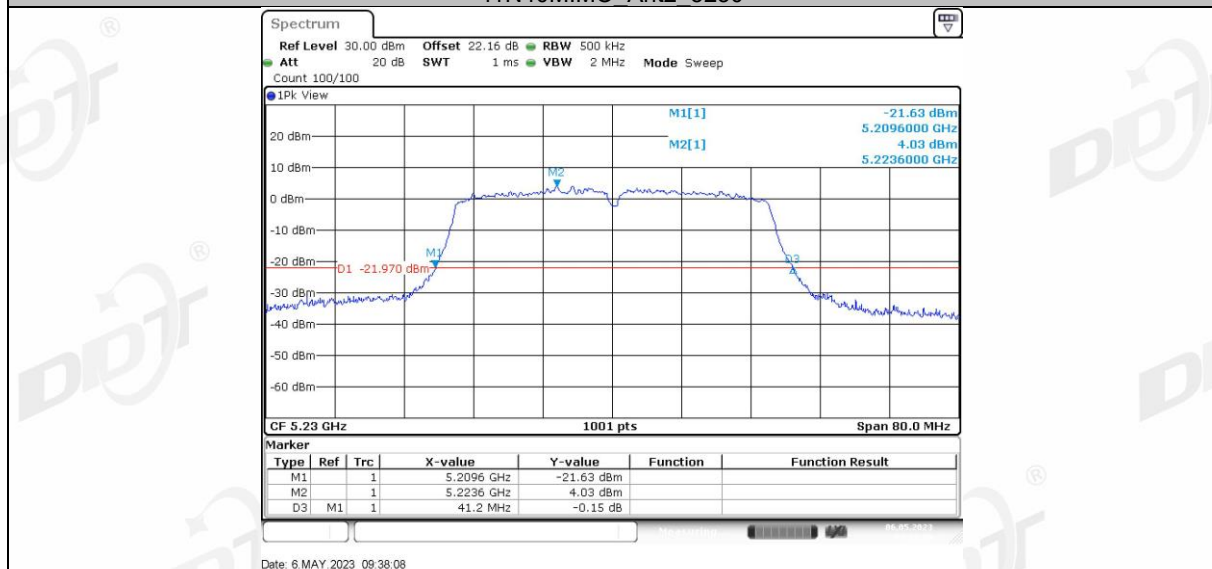
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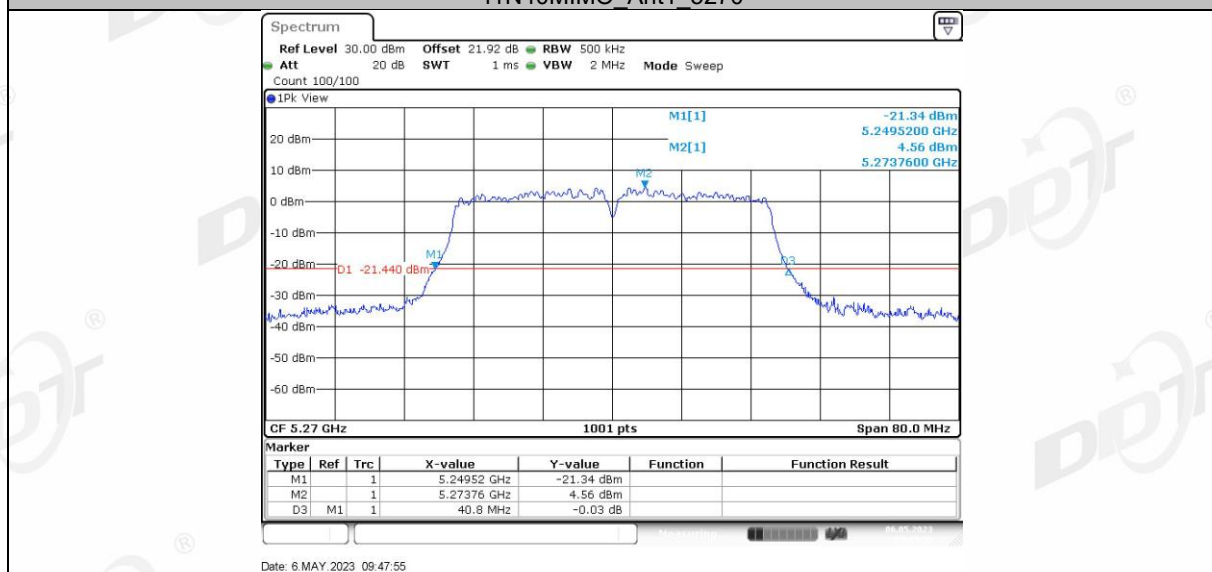
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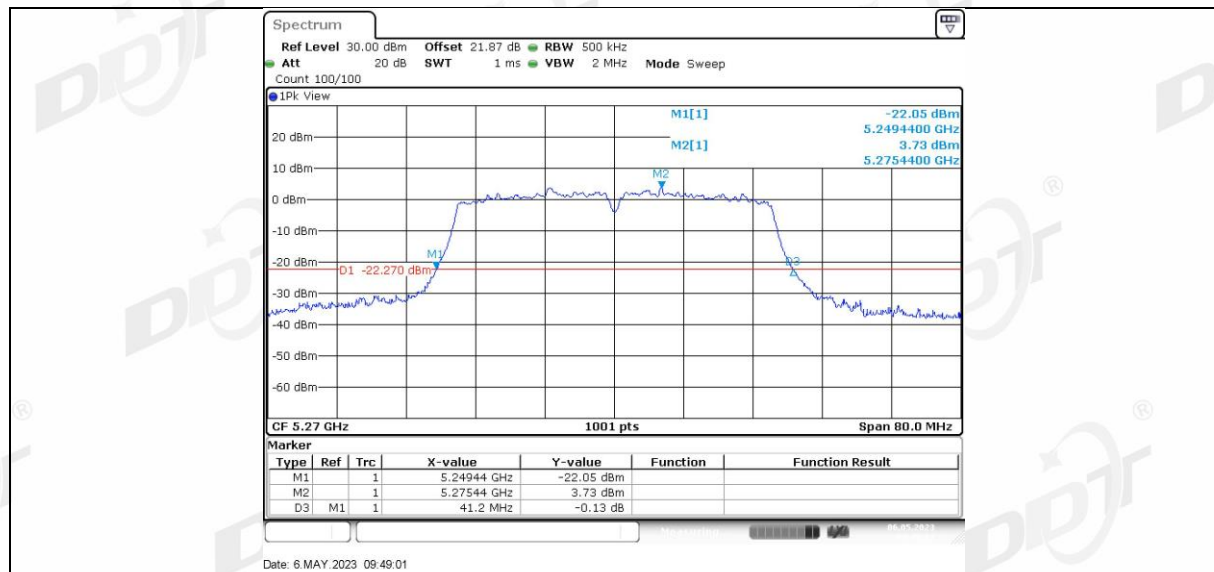
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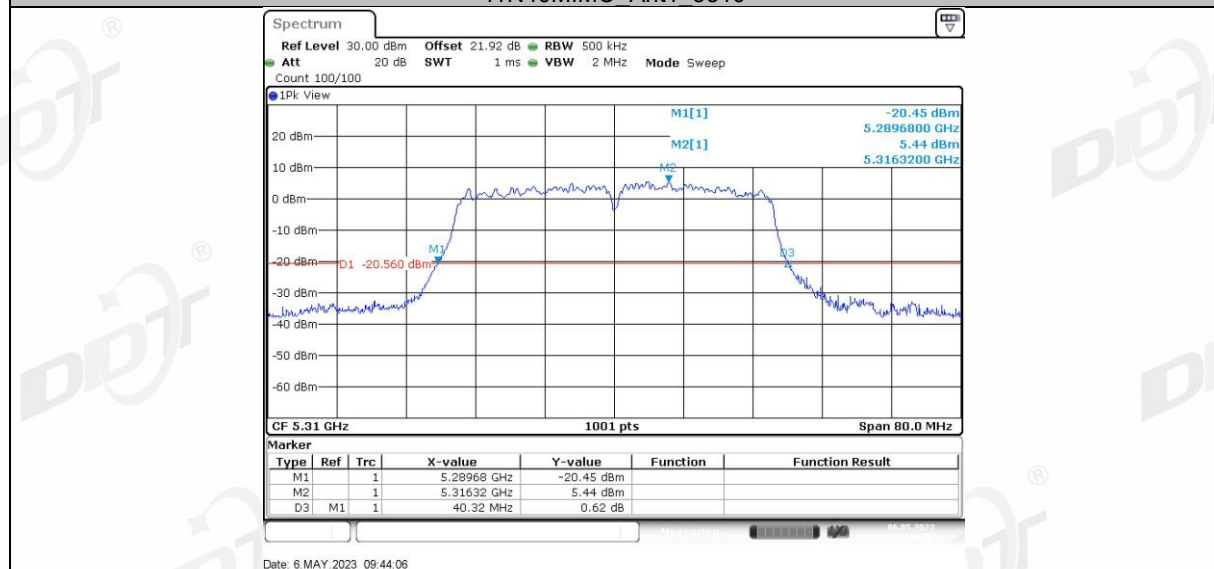
11N40MIMO Ant1 5270



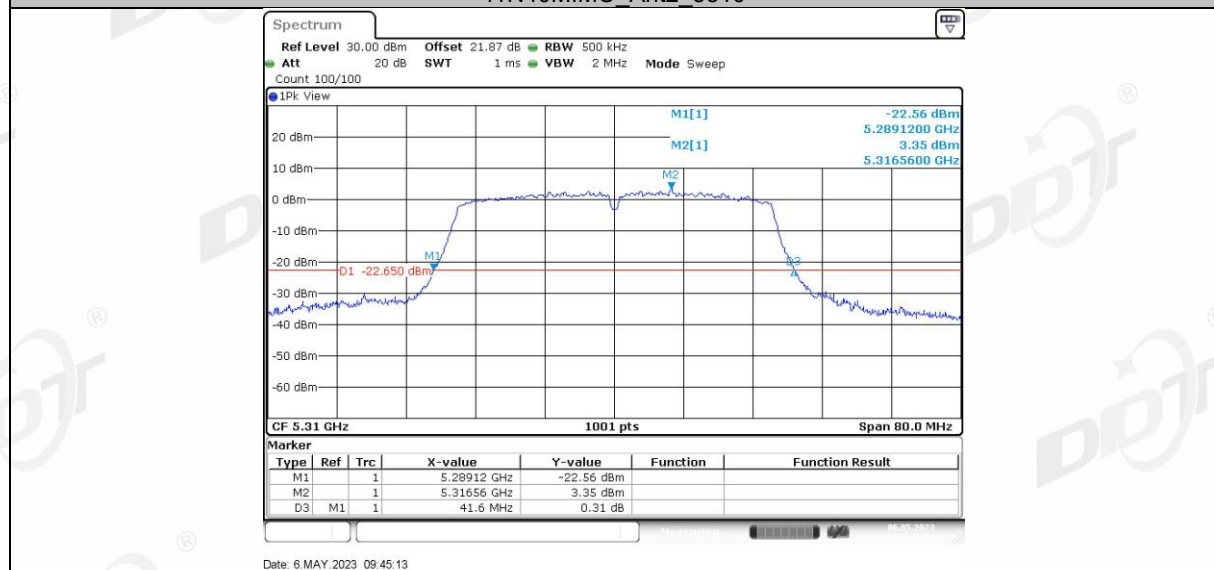
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11N40MIMO Ant1 5310



11N40MIMO Ant2 5310



11N40MIMO Ant1 5510