

TEST REPORT

Product Name : Smart Portable Projector
Model Number : J61-7K4, J61-7KA, J61-7KB, J61-7KC, J61-7KD,
J61-7KE, J61-7KF
FCC ID : SMC-C62A

Prepared for : SHENZHEN HOLATEK CO., LTD.
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Report Number : ENS2502280323W00104R
Date(s) of Tests : March 1, 2025 to March 25, 2025
Date of issue : March 26, 2025

1 TEST RESULT CERTIFICATION

Applicant : SHENZHEN HOLATEK CO., LTD.

Address : #12,Building 1,Chongwen Park, Nanshan Zhiyuan,3370 Liuxian Ave, Nanshan District, Shenzhen, China

Manufacturer : SHENZHEN HOLATEK CO., LTD.

Address : #12,Building 1,Chongwen Park, Nanshan Zhiyuan,3370 Liuxian Ave, Nanshan District, Shenzhen, China

EUT : Smart Portable Projector

Model Name : J61-7K4, J61-7KA, J61-7KB, J61-7KC, J61-7KD, J61-7KE, J61-7KF

Trademark : JMGO

Measurement Procedure Used:

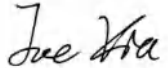
APPLICABLE STANDARDS	
STANDARD	TEST RESULT
FCC 47 CFR Part 2, Subpart J FCC 47 CFR Part 15, Subpart E	PASS
IC RSS-GEN, Issue 5(04-2018)+A1(03-2019)+A2(02-2021) IC RSS-247 Issue 3(08-2023)	PASS

The above equipment was tested by EMTEK (SHENZHEN) CO., LTD. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10 (2013) and the energy emitted by the sample EUT tested as described in this report is in compliance with the requirements of FCC Rules Part 2, Part 15.407, IC RSS-247 Issue 3 and IC RSS-GEN, Issue 5.

The test results of this report relate only to the tested sample identified in this report.

Date of Test : March 1, 2025 to March 25, 2025

Prepared by : 
Una Yu /Editor

Reviewer : 
Joe Xia/Supervisor

Approve & Authorized Signer : 
Lisa Wang/Manager



Modified History

Version	Report No.	Revision Date	Summary
Ver.1.0	ENS2502280323W00104R	/	Original Report



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2 EUT TECHNICAL DESCRIPTION

Characteristics	Description
Product:	Smart Portable Projector
Model Number:	J61-7K4, J61-7KA, J61-7KB, J61-7KC, J61-7KD, J61-7KE, J61-7KF (Note: All models are identical in circuitry and electrical, mechanical and physical construction; It is just that the number of laser light sources used by different models is not the same. Mode J61-7K4 was Chosen final test.)
Test Sample S/N:	N/A
Variant Number:	N/A
Wifi Type:	Wifi 5G with 5150MHz-5250MHz Band Wifi 5G with 5250MHz-5350MHz Band Wifi 5G with 5470MHz-5725MHz Band Wifi 5G with 5725MHz-5850MHz Band
WLAN Supported:	802.11a/n/ac
Data Rate :	802.11a: 54/48/36/24/12/9/6Mbps 802.11n: MCS0-MCS7 802.11ac: MCS0-MCS9
Modulation:	OFDM with BPSK/QPSK/16QAM/64QAM for 802.11a/n OFDM with BPSK/QPSK/16QAM/64QAM/256QAM for 802.11ac
Frequency Range:	UNII-1: 5150MHz-5250MHz Band 5180-5240MHz for 802.11a/n(HT20)/ac(VHT20) 5190-5230MHz for 802.11n(HT40)/ac(VHT40) 5210MHz for 802.11ac(VHT80)
	UNII-2A: 5250MHz-5350MHz Band 5260-5320MHz for 802.11a/n(HT20)/ac(VHT20) 5270-5310MHz for 802.11n(HT40)/ac(VHT40) 5290MHz for 802.11ac(VHT80)
	UNII-2C: 5470MHz-5725MHz Band 5500-5700MHz for 802.11a/n(HT20)/ac(VHT20) 5510-5670MHz for 802.11n(HT40)/ac(VHT40) 5530-5610MHz for 802.11ac(VHT80)
	UNII-3 with 5725MHz-5850MHz Band 5745-5825MHz for 802.11a/n(HT20)/ac(VHT20) 5755-5795MHz for 802.11n(HT40)/ac(VHT40) 5775MHz for 802.11ac(VHT80);
TPC Function:	Not Applicable
Antenna Port:	☒ Antenna port 1 ☒ Antenna port 2
Antenna Type:	FPC Antenna

Antenna Gain:	☒ ANT 1: UNII-1: 3.1 dBi UNII-2A: 3.1 dBi UNII-2C: 3.2 dBi UNII-3: 3.1 dBi ☒ ANT 2: UNII-1: 2.9 dBi UNII-2A: 2.9 dBi UNII-2C: 3.2 dBi UNII-3: 3.0 dBi (Note: The antenna information is provided by the customers, which will have a certain impact on the test results.)
Power Supply:	DC 20V from adapter
Adapter:	Adapter 1 MODEL: PD065E-G1C0AVU INPUT: 100-240V~50/60Hz 1.5A OUTPUT: 5.0V/3A or 9.0V/3A or 12.0V/3A or 15.0V/3A or 20.0V/3.25A Adapter 2: MODEL: XY-PD065U75 INPUT: 100-240V~50/60Hz 1.5A OUTPUT: 5.0V/3A or 9.0V/3A or 12.0V/3A or 15.0V/3A or 20.0V/3.25A 65W
Test Voltage:	AC 120V/60Hz
Temperature Range:	0°C ~ +40°C
Software Version:	1.1.21.6
Hardware Version:	Ver B
Note: 1. For more details, please refer to the User's manual of the EUT.	

3 SUMMARY OF TEST RESULT

FCC Part Clause	IC Part Clause	Test Parameter	Verdict	Remark
15.407 (a) 15.407 (e) 2.1049	RSS-247, 6.2 RSS-Gen 6.7	99% , 6dB and 26dB Bandwidth	PASS	
15.407 (a)	RSS-247, 6.2	Maximum Conducted Output Power	PASS	
15.407 (a)	RSS-247, 6.2	PeakPower Spectral Density	PASS	
15.407 (b) 15.209 15.205	RSS-247, 6.2 RSS-Gen 8.9 RSS-Gen 8.10 RSS-Gen 6.13	RadiatedSpurious Emission	PASS	
15.207	RSS-Gen 8.8	Power Line Conducted Emission	PASS	
15.407(a) 15.203	RSS-Gen 6.8	Antenna Application	PASS	
NOTE1:N/A (Not Applicable) NOTE2:According to FCC OET KDB 789033, the report use radiated measurements in the restricted frequency bands. In addition, the radiated test is also performed to ensure the emissions emanating from the device cabinet also comply with the applicable limits.				

RELATED SUBMITTAL(S) / GRANT(S):

This submittal(s) (test report) is intended for **FCC ID:SMC-C62A** filing to comply with Section 15.407 of the FCC Part 15, Subpart C Rules.

4 TEST METHODOLOGY

4.1 GENERAL DESCRIPTION OF APPLIED STANDARDS

According to its specifications, the EUT must comply with the requirements of the following standards:

FCC 47 CFR Part 2, Subpart J

FCC 47 CFR Part 15, Subpart E

IC RSS-GEN, Issue 5(04-2018)+A1(03-2019)+A2(02-2021)

IC RSS-247 Issue 3(08-2023)

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

FCC KDB 789033 D2 General UNII Test Procedures New Rules v02r01

4.2 MEASUREMENT EQUIPMENT USED

Conducted Emission Test Equipment

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
EMI Test Receiver	Rohde & Schwarz	ESCI	101384	2024/5/11	1Year
AMN	Rohde & Schwarz	ENV216	101161	2024/5/10	1Year

For Spurious Emissions Test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
EMI Test Receiver	Rohde & Schwarz	ESU 26	100154	2024/5/10	1Year
Pre-Amplifier	Lunar EM	LNA30M3G-25	J10100000070	2024/5/10	1Year
Bilog Antenna	Schwarzbeck	VULB9163	661	2023/6/2	2 Year
Horn antenna	Schwarzbeck	BBHA9120D	9120D-1177	2023/5/12	2 Year
Pre-Amplifier	SKET	LNPA_0118G-45	SK2019051801	2024/5/10	1Year
Loop Antenna	Schwarzbeck	FMZB1519	1519-012	2023/5/12	2 Year
Spectrum Analyzer	Rohde & Schwarz	FSV40	100967	2024/5/10	1Year
Horn antenna	Schwarzbeck	BBHA9170	9170-399	2023/5/12	2 Year
Coaxial Cable	TIMES	NmNm-7-C15702	N/A	2024/5/23	1Year
Coaxial Cable	TIMES	HF290-NMSM-6.5M	N/A	2024/5/23	1Year
Coaxial Cable	TIMES	LMR-240 N-N	N/A	2024/5/23	1Year

For other test items:

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
Signal Analyzer	Agilent	N9010A	MY53470879	2024/5/10	1Year
Vector Signal Generator	Agilent	N5182B	MY53050878	2024/5/10	1Year
Analog Signal Generator	Agilent	N5171B	MY53050553	2024/5/10	1Year
RF Control Unit(Power Meter)	Tonscend	JS0806-2	\	2024/5/10	1Year
Temperature&Humidity Chamber	ESPEC	EL-02KA	12107166	2024/5/10	1Year

4.3 DESCRIPTION OF TEST MODES

The EUT has been tested under its typical operating condition.

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

Test of channel included the lowest and middle and highest frequency to perform the test, then record on this report.

Those data rates (802.11a: 54 Mbps; 802.11n(HT20): MCS0; 802.11ac(VHT20): MCS0; 802.11n(HT40): MCS0; 802.11ac(VHT40): MCS0; 802.11ac(VHT80): MCS0;)were used for all test.

Pre-defined engineering program for regulatory testing used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

☒ Wifi 5G with U-NII - 1

Frequency and Channel list for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	44	5220		
40	5200	48	5240		

Frequency and Channel list for 802.11n (HT40), 802.11ac (VHT40):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
38	5190	46	5230		

Frequency and Channel list for 802.11ac (VHT80):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
42	5210				

Test Frequency and Channel for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	40	5200	48	5240

Test Frequency and channel for 802.11n (HT40), 802.11ac (VHT40):

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
38	5190	N/A	N/A	46	5230

Test Frequency and channel for 802.11ac (VHT80):

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
42	5210	N/A	N/A	N/A	N/A

☒ Wifi 5G with U-NII -2A

Frequency and Channel list 802.11a, 802.11n (HT20), 802.11ac (VHT20):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
52	5260	60	5300		
56	5280	64	5320		

Frequency and Channel list for 802.11n (HT40), 802.11ac (VHT40):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
54	5270				
62	5310				

Frequency and Channel list for 802.11ac (VHT80):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
58	5290				

Test Frequency and Channel for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
52	5260	56	5280	64	5320

Test Frequency and channel for 802.11n (HT40), 802.11ac (VHT40):

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
54	5270	N/A	N/A	62	5310

Test Frequency and channel for 802.11ac (VHT80):

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
58	5290				

☒ Wifi 5G with U-NII -2C

Frequency and Channel list for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
100	5500	116	5580	132	5660
104	5520	120	5600	136	5680
108	5540	124	5620	140	5700
112	5560	128	5640		

Frequency and Channel list for 802.11n (HT40), 802.11ac (VHT40):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
102	5510	118	5590	134	5670
110	5550	126	5630		

Frequency and Channel list for 802.11ac (VHT80):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
106	5530	122	5610		

Test Frequency and Channel for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
100	5500	116	5580	140	5700

Test Frequency and channel for 802.11n (HT40), 802.11ac (VHT40):

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
102	5510	110	5550	134	5670

Test Frequency and channel for 802.11ac (VHT80):

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
106	5530			122	5610

☒ Wifi 5G with U-NII -3

Frequency and Channel list for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
149	5745	157	5785	165	5825
153	5765	161	5805		

Frequency and Channel list for 802.11n (HT40), 802.11ac (VHT40):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
151	5755	159	5795		

Frequency and Channel list for 802.11ac (VHT80):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
155	5775				

Test Frequency and Channel for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
149	5745	157	5785	165	5825

Test Frequency and channel for 802.11n (HT40), 802.11ac (VHT40):

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
151	5755	N/A	N/A	159	5795

Test Frequency and channel for 802.11ac (VHT80):

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
155	5775				

Multi-antenna correlation:

☒	Transmit Signals are Correlated
	Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}]$ dBi
☐	All Transmit Signals are Completely Uncorrelated
	Directional gain = $10 \log[(10^{G1/10} + 10^{G2/10} + \dots + 10^{GN/10}) / N_{ANT}]$ dBi

UNII-1: Directional gain = $10 \log [(10^{3.1/20} + 10^{2.9/20})^2/2]$ dBi=6.01 dBi

UNII-2A: Directional gain = $10 \log [(10^{3.1/20} + 10^{2.9/20})^2/2]$ dBi=6.01 dBi

UNII-2C: Directional gain = $10 \log [(10^{3.2/20} + 10^{3.2/20})^2/2]$ dBi=6.21 dBi

UNII-3: Directional gain = $10 \log [(10^{3.1/20} + 10^{3.0/20})^2/2]$ dBi=6.06 dBi

5 FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

All measurement facilities used to collect the measurement data are located at:

EMTEK (Shenzhen) Co., Ltd.

Building 69, Majialong Industry Zone District, Nanshan District, Shenzhen, China

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

5.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, biconical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with preselectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

5.3 LABORATORY ACCREDITATIONS AND LISTINGS

Site Description

EMC Lab.

: **Accredited by CNAS**

The Certificate Registration Number is L2291

The Laboratory has been assessed and proved to be in compliance with CNAS-CL01 (identical to ISO/IEC 17025:2017)

Accredited by FCC

Designation Number: CN1204

Test Firm Registration Number: 882943

Accredited by A2LA

The Certificate Number is 4321.01

Accredited by Industry Canada

The Conformity Assessment Body Identifier is CN0008

Name of Firm : EMTEK (SHENZHEN) CO., LTD.

Site Location : Building 69, Majialong Industry Zone, Nanshan District, Shenzhen, Guangdong, China

6 TEST SYSTEM UNCERTAINTY

The following measurement uncertainty levels have been estimated for tests performed on the apparatus:

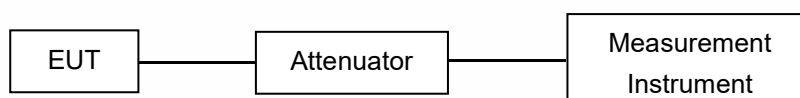
Test Parameter	Measurement Uncertainty
Frequency error	$\pm 20\text{Hz}$
Occupied Bandwidth	$\pm 0.5\text{KHz}$
Transmitter output power	$\pm 0.6\text{dB}$
Conducted spurious emissions	$\pm 3.2\text{dB}$
Radiated spurious emissions	$\pm 4.5\text{dB}$
Temperature	$\pm 1.2^{\circ}\text{C}$
Humidity	$\pm 3\%$
DC voltages	$\pm 0.25\text{V}$
Time	$\pm 1\%$

Measurement Uncertainty for a level of Confidence of 95%

7 SETUP OF EQUIPMENT UNDER TEST

7.1 RADIO FREQUENCY TEST SETUP

The WLAN component's antenna ports(s) of the EUT are connected to the measurement instrument per an appropriate attenuator. The EUT is controlled by PC/software to emit the specified signals for the purpose of measurements.



7.2 RADIO FREQUENCY TEST SETUP

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4 dB according to the standards: ANSI C63.10. The test distance is 3m. The setup is according to the requirements in Section 13.1.4.1 of ANSI C63.10-2013 and CAN/CSA-CEI/IEC CISPR 22.

Below 30MHz:

The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna (loop antenna). The Antenna should be positioned with its plane vertical at the specified distance from the EUT and rotated about its vertical axis for maximum response at each azimuth about the EUT. The center of the loop shall be 1 m above the ground. For certain applications, the loop antenna plane may also need to be positioned horizontally at the specified distance from the EUT.

Above 30MHz:

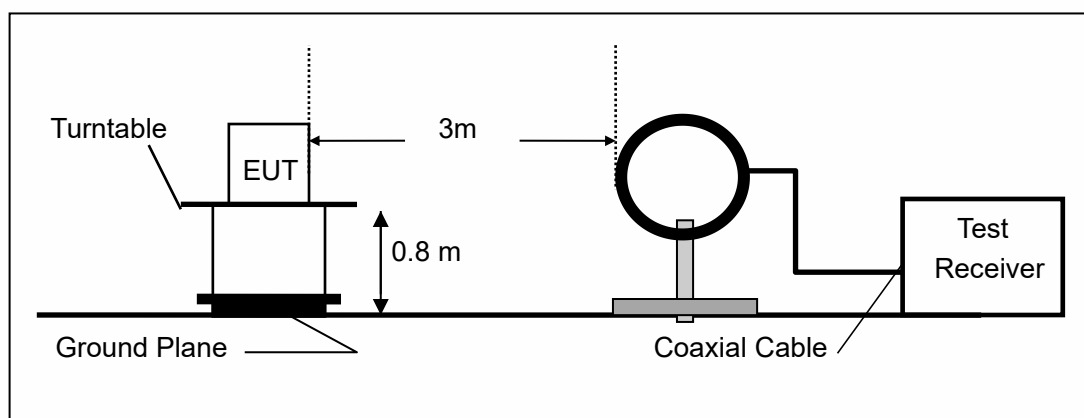
The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).

Above 1GHz:

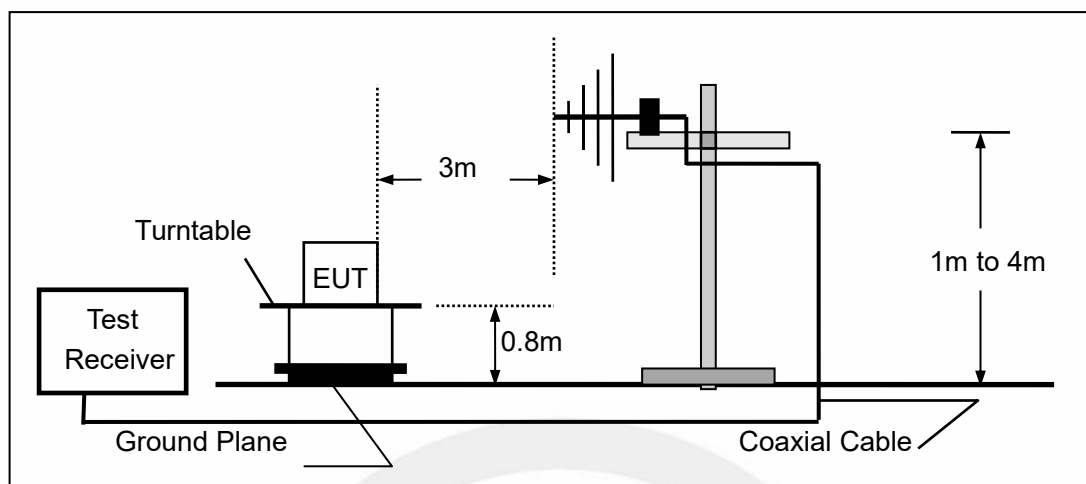
(Note: the FCC's permission to use 1.5m as an alternative per TCBC Conf call of Dec. 2, 2014.)

The EUT is placed on a turntable 1.5 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).

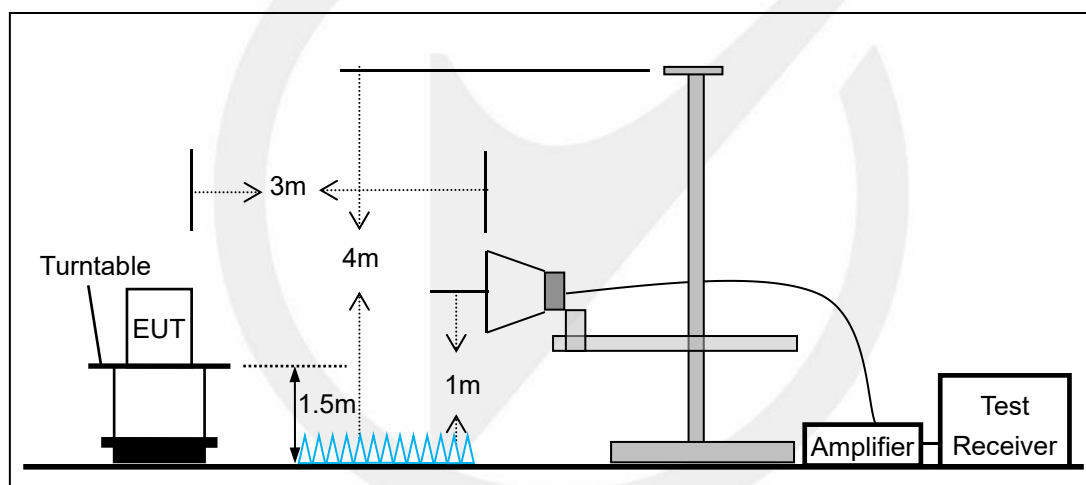
(a) Radiated Emission Test Set-Up, Frequency Below 30MHz



(b) Radiated Emission Test Set-Up, Frequency Below 1000MHz



(c) Radiated Emission Test Set-Up, Frequency above 1000MHz

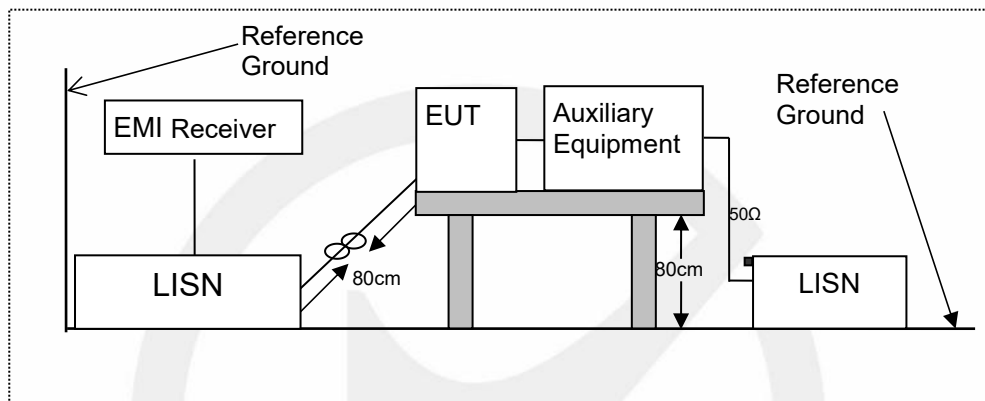


7.3 CONDUCTED EMISSION TEST SETUP

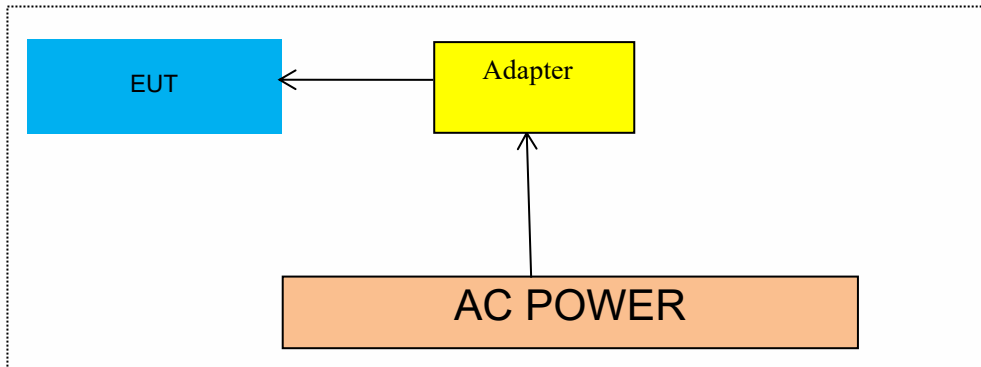
The mains cable of the EUT (maybe per AC/DC Adapter) must be connected to LISN. The LISN shall be placed 0.8 m from the boundary of EUT and bonded to a ground reference plane for LISN mounted on top of the ground reference plane. This distance is between the closest points of the LISN and the EUT. All other units of the EUT and associated equipment shall be at least 0.8m from the LISN.

Ground connections, where required for safety purposes, shall be connected to the reference ground point of the LISN and, where not otherwise provided or specified by the manufacturer, shall be of same length as the mains cable and run parallel to the mains connection at a separation distance of not more than 0.1 m.

According to the requirements in Section 13.1.4.1 of ANSI C63.10-2013 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-Peak and average detector mode.



7.4 BLOCK DIAGRAM CONFIGURATION OF TEST SYSTEM



7.5 SUPPORT EQUIPMENT

EUT Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
/	/	/	/

Auxiliary Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
/	/	/	/

Auxiliary Equipment List and Details			
Description	Manufacturer	Model	Serial Number
/	/	/	/

Notes:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

8 TEST REQUIREMENTS

8.1 BANDWIDTH MEASUREMENT

8.1.1 Applicable Standard

According to FCC Part 15.407(a)(1) for UNII Band I
 According to FCC Part 15.407(a)(2) for UNII Band II-A and UNII Band II-C
 According to FCC Part 15.407(a)(3) for UNII Band III
 According to FCC Part 15.407(e) for UNII Band III
 According to 789033 D02 Section II(C)
 According to 789033 D02 Section II(D)
 According to RSS-Gen6.6, RSS 247, 6.2

8.1.2 Conformance Limit

The 26dB bandwidth is used to determine the conducted power limits.
 Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

8.1.3 Test Configuration

Test according to clause 7.1 radio frequency test setup

8.1.4 Test Procedure

According to 789033 D02 v02r01 section C&D, the following is the measurement procedure.

1. Emission Bandwidth (EBW)

- Set RBW = approximately 1% of the emission bandwidth.
- Set the VBW > RBW.
- Detector = Peak.
- Trace mode = max hold.
- Measure the maximum width of the emission that is 26 dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

2. Minimum Emission Bandwidth for the band 5.725-5.85 GHz

Section 15.407(e) specifies the minimum 6 dB emission bandwidth of at least 500 KHz for the band 5.715-5.85 GHz. The following procedure shall be used for measuring this bandwidth:

- Set RBW = 100 kHz.
- Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
- Detector = Peak.
- Trace mode = 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 6 dB relative to the maximum level measured in the fundamental emission.

Note: The automatic bandwidth measurement capability of a spectrum analyzer or EMI receiver may be employed if it implements the functionality described above.

D. 99 Percent Occupied Bandwidth

The 99-percent occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers are each equal to 0.5 % of the total mean power of the given emission. Measurement of the 99-percent occupied bandwidth is required only as a condition for using the optional band-edge measurement techniques described in section II.G.3.d). Measurements of 99-percent occupied bandwidth may also optionally be used in lieu of the EBW to 789033 D02 v01r02 General UNII Test Procedures New Rules v01 define the minimum frequency range over which the spectrum is integrated when measuring maximum conducted output power as described in section II.E.

However, the EBW must be measured to determine bandwidth dependent limits on maximum conducted output power in accordance with 15.407(a).

The following procedure shall be used for measuring (99 %) power bandwidth:

1. Set center frequency to the nominal EUT channel center frequency.
2. Set span = 1.5 times to 5.0 times the OBW.
3. Set RBW = 1 % to 5 % of the OBW
4. Set VBW $\geq 3 \cdot$ RBW
5. Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.
6. Use the 99 % power bandwidth function of the instrument (if available).
7. If the instrument does not have a 99 % power bandwidth function, the trace data points are recovered and directly summed in power units. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 % of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5 % of the total is reached; that frequency is recorded as the upper frequency. The 99% occupied bandwidth is the difference between these two frequencies.



8.1.5 Test Results

Temperature:	25°C
Relative Humidity:	45%
ATM Pressure:	1011 mbar

Note: N/A

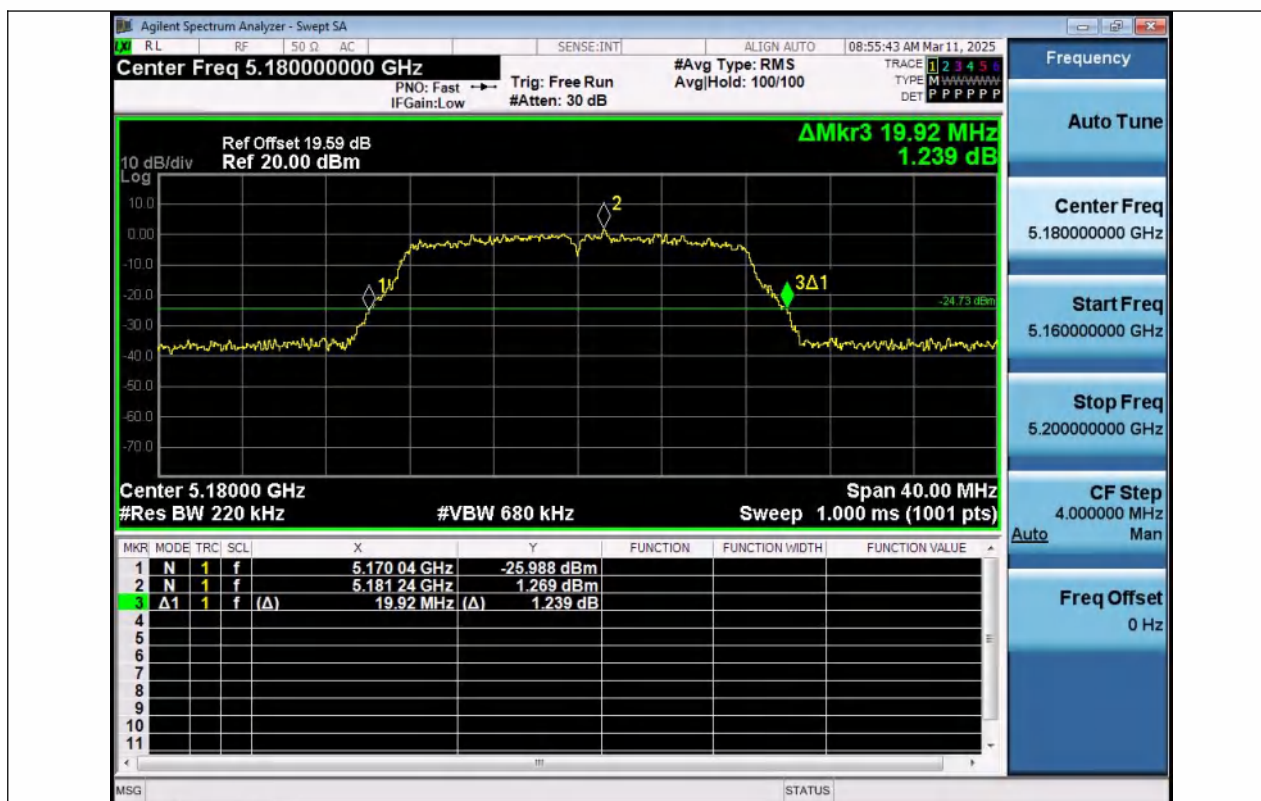
Emission Bandwidth

TestMode	Antenna	Frequency[MHz]	26db EBW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A	Ant1	5180	19.920	5170.040	5189.960	---	---
11A	Ant2	5180	20.040	5169.960	5190.000	---	---
11A	Ant1	5200	20.000	5190.000	5210.000	---	---
11A	Ant2	5200	20.200	5189.920	5210.120	---	---
11A	Ant1	5240	20.160	5229.960	5250.120	---	---
11A	Ant2	5240	19.720	5230.040	5249.760	---	---
11A	Ant1	5260	20.200	5249.960	5270.160	---	---
11A	Ant2	5260	20.200	5249.880	5270.080	---	---
11A	Ant1	5280	19.960	5269.920	5289.880	---	---
11A	Ant2	5280	19.840	5270.120	5289.960	---	---
11A	Ant1	5320	19.920	5310.160	5330.080	---	---
11A	Ant2	5320	19.720	5310.160	5329.880	---	---
11A	Ant1	5500	19.960	5490.080	5510.040	---	---
11A	Ant2	5500	20.040	5490.160	5510.200	---	---
11A	Ant1	5580	20.440	5569.680	5590.120	---	---
11A	Ant2	5580	20.040	5570.040	5590.080	---	---
11A	Ant1	5700	20.320	5689.880	5710.200	---	---
11A	Ant2	5700	20.080	5689.880	5709.960	---	---
11A	Ant1	5745	20.080	5734.920	5755.000	---	---
11A	Ant2	5745	19.960	5735.080	5755.040	---	---
11A	Ant1	5785	19.920	5774.960	5794.880	---	---
11A	Ant2	5785	19.840	5775.040	5794.880	---	---
11A	Ant1	5825	19.800	5815.000	5834.800	---	---
11A	Ant2	5825	20.000	5814.880	5834.880	---	---
11N20MIMO	Ant1	5180	20.280	5169.760	5190.040	---	---
11N20MIMO	Ant2	5180	20.280	5169.800	5190.080	---	---
11N20MIMO	Ant1	5200	20.360	5189.920	5210.280	---	---
11N20MIMO	Ant2	5200	19.960	5190.040	5210.000	---	---
11N20MIMO	Ant1	5240	20.280	5229.880	5250.160	---	---
11N20MIMO	Ant2	5240	20.280	5229.800	5250.080	---	---
11N20MIMO	Ant1	5260	20.400	5249.720	5270.120	---	---
11N20MIMO	Ant2	5260	20.240	5249.960	5270.200	---	---
11N20MIMO	Ant1	5280	20.200	5269.840	5290.040	---	---
11N20MIMO	Ant2	5280	20.400	5269.800	5290.200	---	---
11N20MIMO	Ant1	5320	20.120	5309.960	5330.080	---	---
11N20MIMO	Ant2	5320	19.960	5309.960	5329.920	---	---
11N20MIMO	Ant1	5500	20.400	5489.760	5510.160	---	---
11N20MIMO	Ant2	5500	20.240	5489.800	5510.040	---	---
11N20MIMO	Ant1	5580	20.320	5569.880	5590.200	---	---
11N20MIMO	Ant2	5580	20.120	5569.880	5590.000	---	---
11N20MIMO	Ant1	5700	20.560	5689.800	5710.360	---	---
11N20MIMO	Ant2	5700	20.080	5690.000	5710.080	---	---
11N20MIMO	Ant1	5745	20.360	5734.840	5755.200	---	---
11N20MIMO	Ant2	5745	20.120	5734.800	5754.920	---	---
11N20MIMO	Ant1	5785	20.360	5774.840	5795.200	---	---
11N20MIMO	Ant2	5785	20.480	5774.800	5795.280	---	---

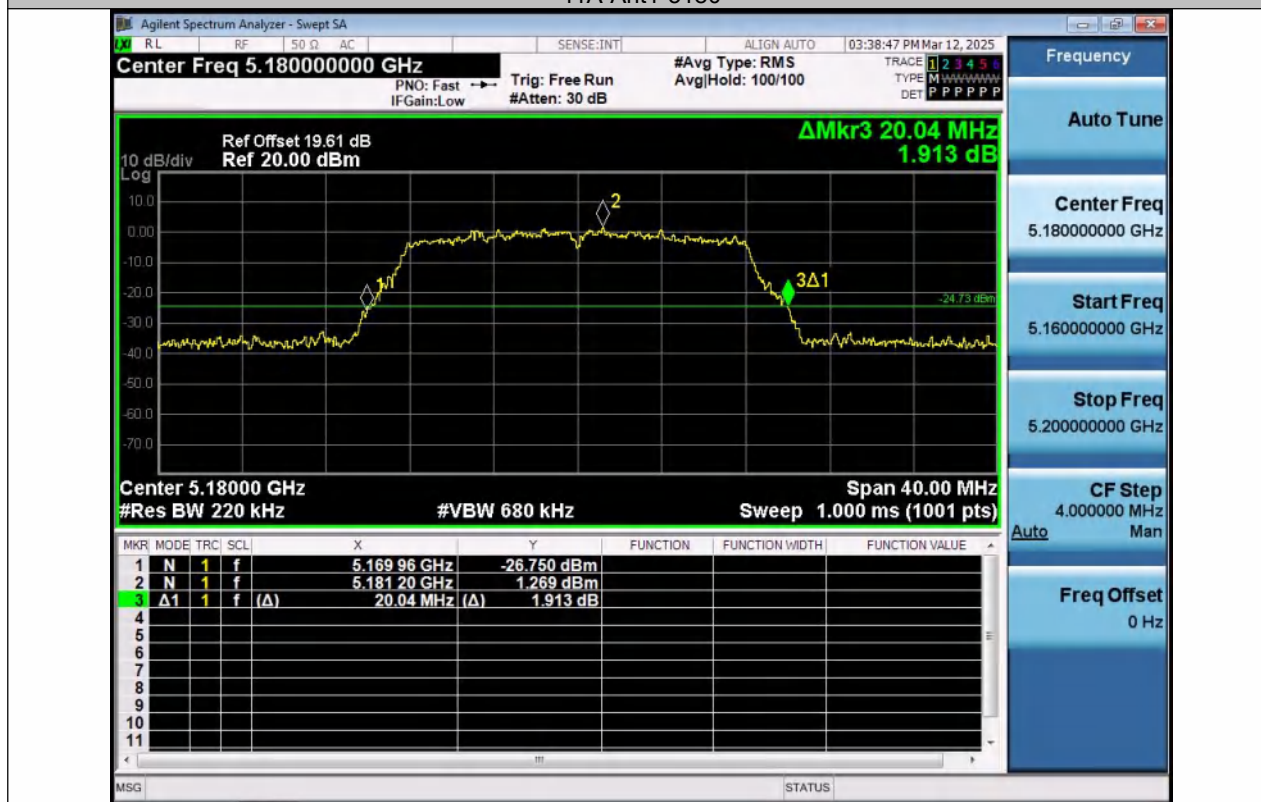
11N20MIMO	Ant1	5825	20.400	5814.720	5835.120	---	---
11N20MIMO	Ant2	5825	19.840	5815.160	5835.000	---	---
11N40MIMO	Ant1	5190	40.560	5169.680	5210.240	---	---
11N40MIMO	Ant2	5190	39.760	5169.840	5209.600	---	---
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11N40MIMO	Ant1	5270	40.560	5249.520	5290.080	---	---
11N40MIMO	Ant2	5270	39.920	5249.920	5289.840	---	---
11N40MIMO	Ant1	5310	41.200	5289.520	5330.720	---	---
11N40MIMO	Ant2	5310	39.760	5290.080	5329.840	---	---
11N40MIMO	Ant1	5510	41.280	5489.280	5530.560	---	---
11N40MIMO	Ant2	5510	40.240	5490.000	5530.240	---	---
11N40MIMO	Ant1	5550	47.600	5528.800	5576.400	---	---
11N40MIMO	Ant2	5550	39.840	5530.080	5569.920	---	---
11N40MIMO	Ant1	5670	54.640	5644.000	5698.640	---	---
11N40MIMO	Ant2	5670	40.080	5650.080	5690.160	---	---
11N40MIMO	Ant1	5755	41.440	5734.120	5775.560	---	---
11N40MIMO	Ant2	5755	40.080	5734.920	5775.000	---	---
11N40MIMO	Ant1	5795	41.440	5774.040	5815.480	---	---
11N40MIMO	Ant2	5795	39.520	5775.240	5814.760	---	---
11AC20MIMO	Ant1	5180	20.120	5169.960	5190.080	---	---
11AC20MIMO	Ant2	5180	19.800	5170.080	5189.880	---	---
11AC20MIMO	Ant1	5200	20.480	5189.720	5210.200	---	---
11AC20MIMO	Ant2	5200	20.000	5190.040	5210.040	---	---
11AC20MIMO	Ant1	5240	20.240	5229.840	5250.080	---	---
11AC20MIMO	Ant2	5240	20.000	5229.960	5249.960	---	---
11AC20MIMO	Ant1	5260	20.160	5250.000	5270.160	---	---
11AC20MIMO	Ant2	5260	19.880	5250.040	5269.920	---	---
11AC20MIMO	Ant1	5280	20.360	5269.720	5290.080	---	---
11AC20MIMO	Ant2	5280	20.000	5269.960	5289.960	---	---
11AC20MIMO	Ant1	5320	20.280	5309.880	5330.160	---	---
11AC20MIMO	Ant2	5320	20.040	5309.960	5330.000	---	---
11AC20MIMO	Ant1	5500	20.120	5489.880	5510.000	---	---
11AC20MIMO	Ant2	5500	20.040	5490.000	5510.040	---	---
11AC20MIMO	Ant1	5580	21.360	5569.360	5590.720	---	---
11AC20MIMO	Ant2	5580	20.000	5570.000	5590.000	---	---
11AC20MIMO	Ant1	5700	20.560	5689.840	5710.400	---	---
11AC20MIMO	Ant2	5700	20.080	5690.040	5710.120	---	---
11AC20MIMO	Ant1	5745	20.320	5734.840	5755.160	---	---
11AC20MIMO	Ant2	5745	20.000	5734.960	5754.960	---	---
11AC20MIMO	Ant1	5785	20.200	5774.880	5795.080	---	---
11AC20MIMO	Ant2	5785	20.040	5775.000	5795.040	---	---
11AC20MIMO	Ant1	5825	20.280	5814.800	5835.080	---	---
11AC20MIMO	Ant2	5825	20.080	5815.000	5835.080	---	---
11AC40MIMO	Ant1	5190	40.640	5169.600	5210.240	---	---
11AC40MIMO	Ant2	5190	39.680	5170.160	5209.840	---	---
11AC40MIMO	Ant1	5230	40.640	5209.760	5250.400	---	---
11AC40MIMO	Ant2	5230	39.840	5210.000	5249.840	---	---
11AC40MIMO	Ant1	5270	41.120	5249.360	5290.480	---	---
11AC40MIMO	Ant2	5270	39.680	5250.240	5289.920	---	---
11AC40MIMO	Ant1	5310	40.400	5289.760	5330.160	---	---
11AC40MIMO	Ant2	5310	39.760	5290.080	5329.840	---	---
11AC40MIMO	Ant1	5510	40.400	5489.840	5530.240	---	---
11AC40MIMO	Ant2	5510	40.400	5489.840	5530.240	---	---
11AC40MIMO	Ant1	5550	46.480	5529.360	5575.840	---	---
11AC40MIMO	Ant2	5550	40.080	5530.240	5570.320	---	---
11AC40MIMO	Ant1	5670	59.760	5643.600	5703.360	---	---
11AC40MIMO	Ant2	5670	39.760	5650.160	5689.920	---	---
11AC40MIMO	Ant1	5755	40.640	5734.520	5775.160	---	---
11AC40MIMO	Ant2	5755	39.760	5735.080	5774.840	---	---
11AC40MIMO	Ant1	5795	40.720	5774.680	5815.400	---	---

11AC40MIMO	Ant2	5795	39.920	5775.000	5814.920	---	---
11AC80MIMO	Ant1	5210	81.920	5169.040	5250.960	---	---
11AC80MIMO	Ant2	5210	79.840	5170.160	5250.000	---	---
11AC80MIMO	Ant1	5290	81.920	5249.200	5331.120	---	---
11AC80MIMO	Ant2	5290	79.520	5250.160	5329.680	---	---
11AC80MIMO	Ant1	5530	115.040	5489.040	5604.080	---	---
11AC80MIMO	Ant2	5530	80.000	5490.320	5570.320	---	---
11AC80MIMO	Ant1	5610	91.200	5568.880	5660.080	---	---
11AC80MIMO	Ant2	5610	80.640	5569.520	5650.160	---	---
11AC80MIMO	Ant1	5775	81.760	5733.720	5815.480	---	---
11AC80MIMO	Ant2	5775	79.840	5735.160	5815.000	---	---





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11A-Ant2-5180



11A-Ant1-5200



11A-Ant2-5200



11A-Ant1-5240



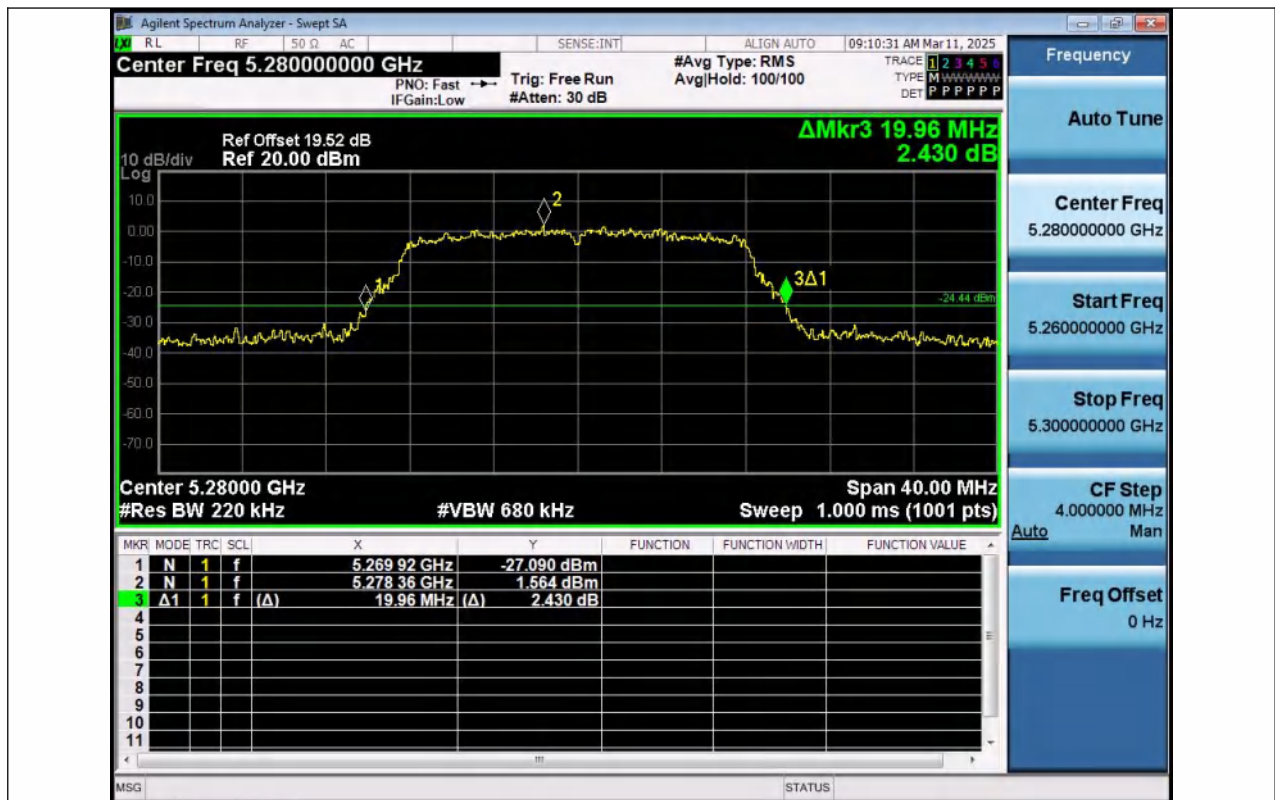
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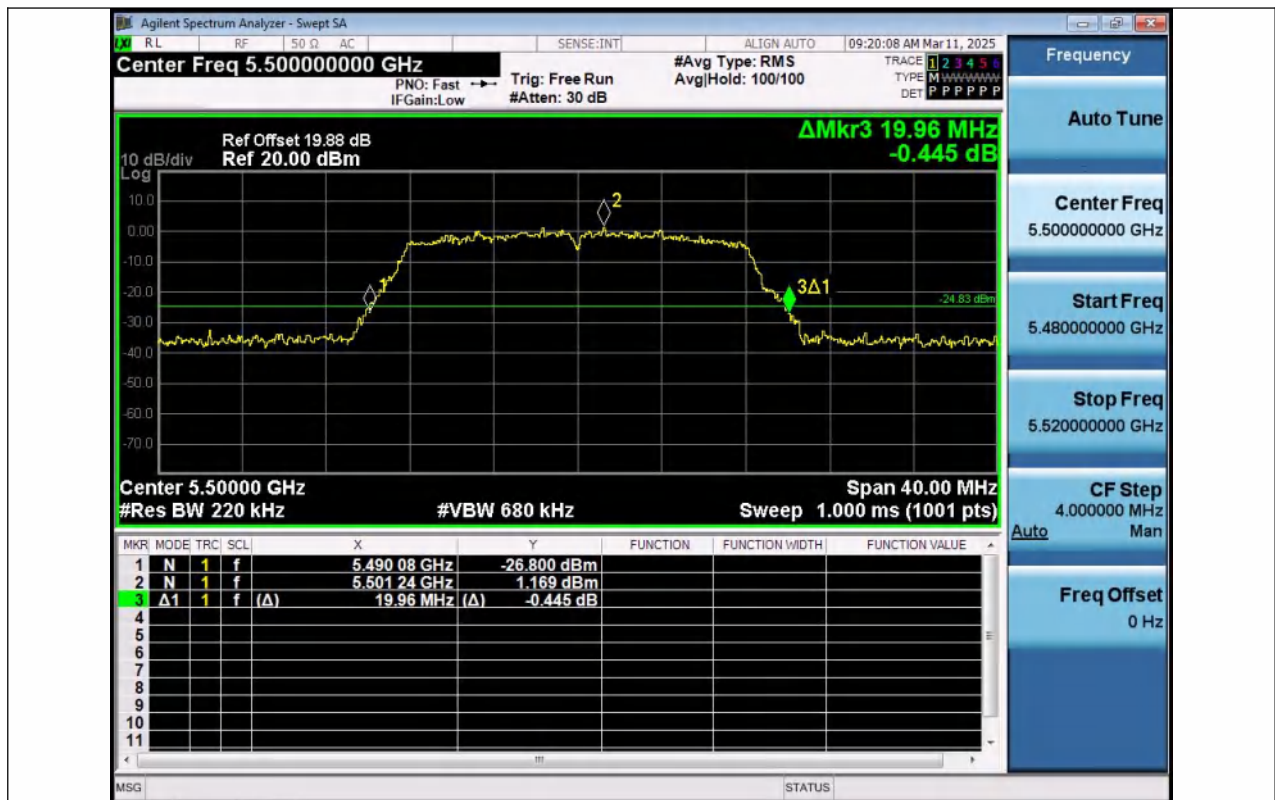
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11A-Ant2-5320



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11A-Ant2-5500



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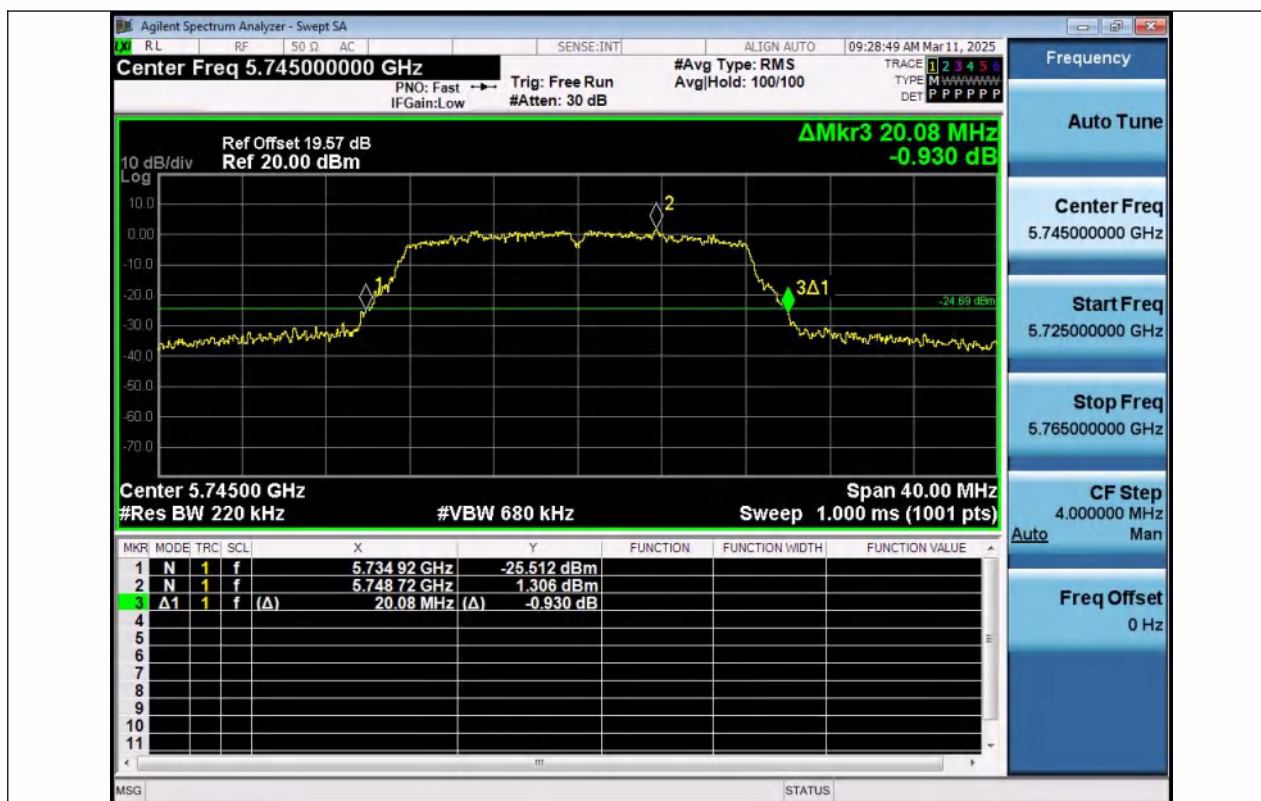
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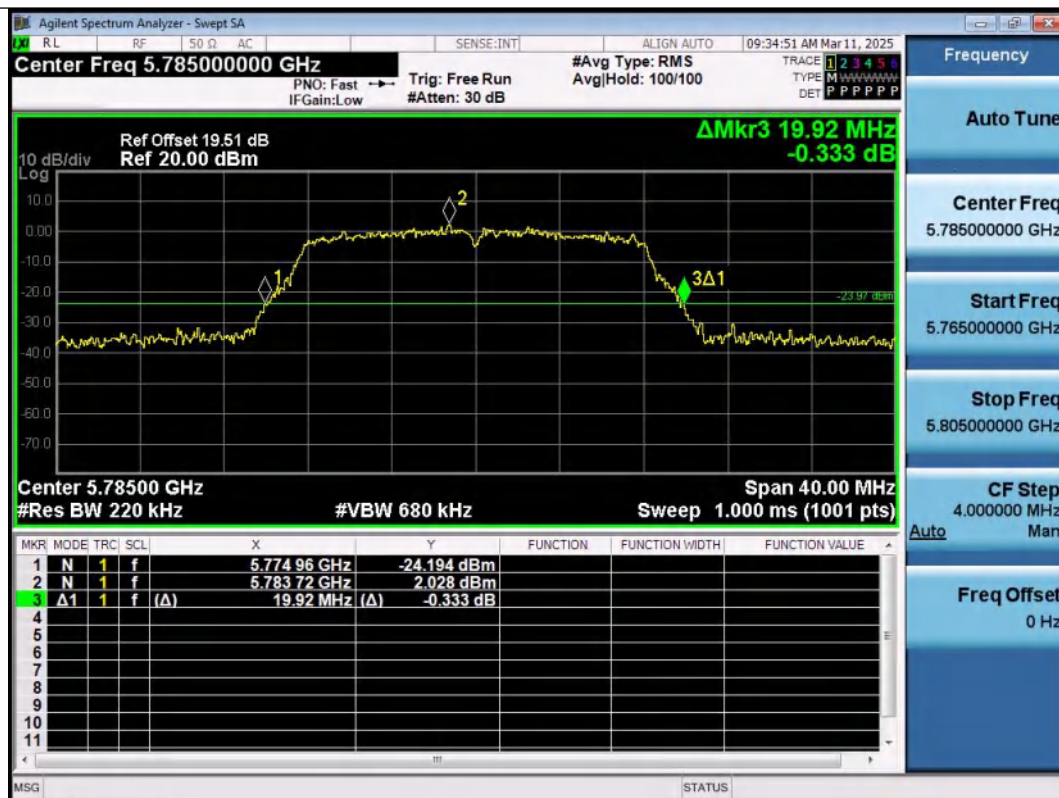
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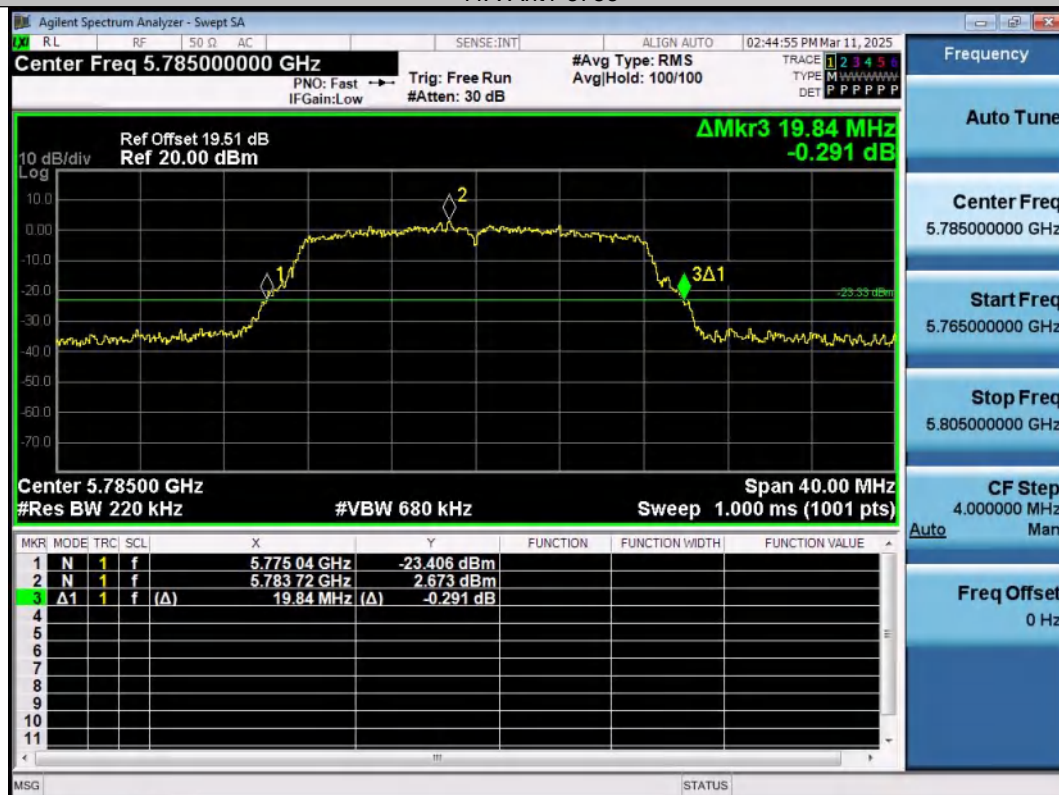
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11A-Ant2-5745



11A-Ant1-5785



11A-Ant2-5785



11A-Ant1-5825



11A-Ant2-5825



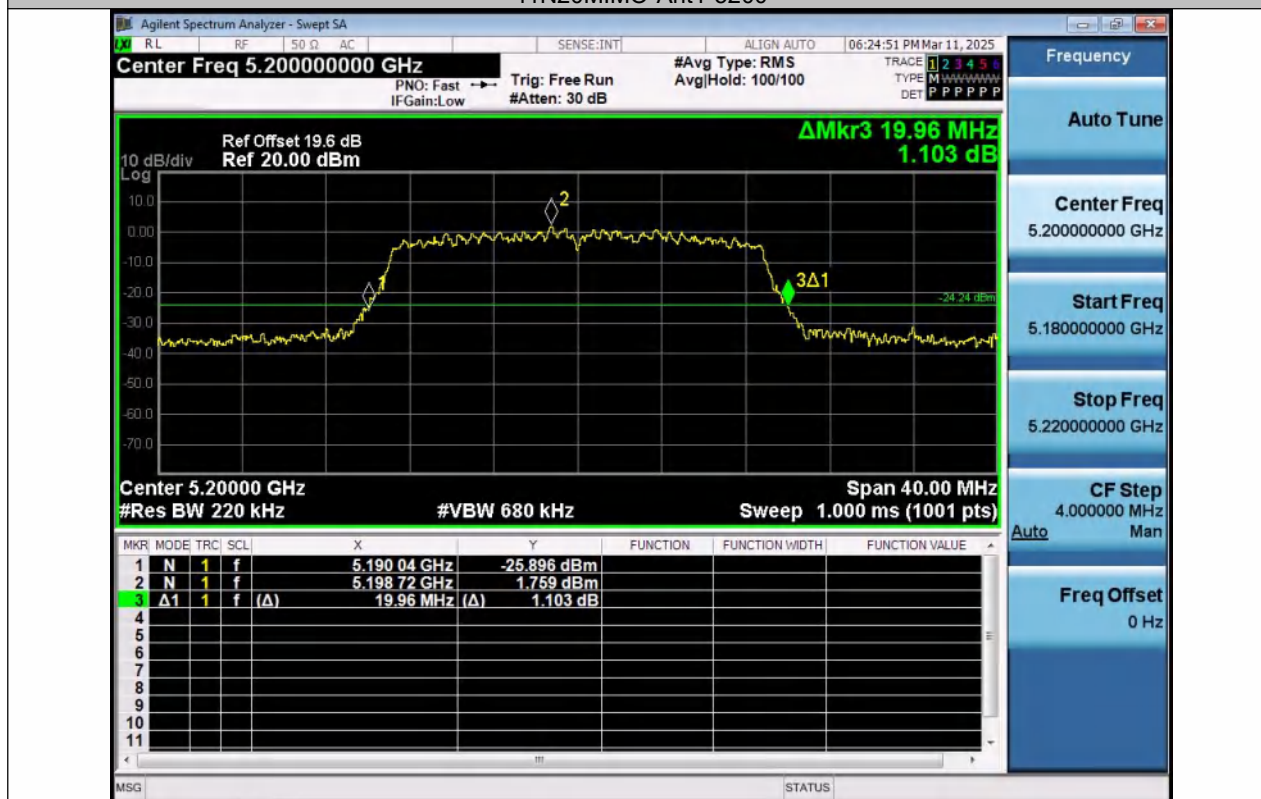
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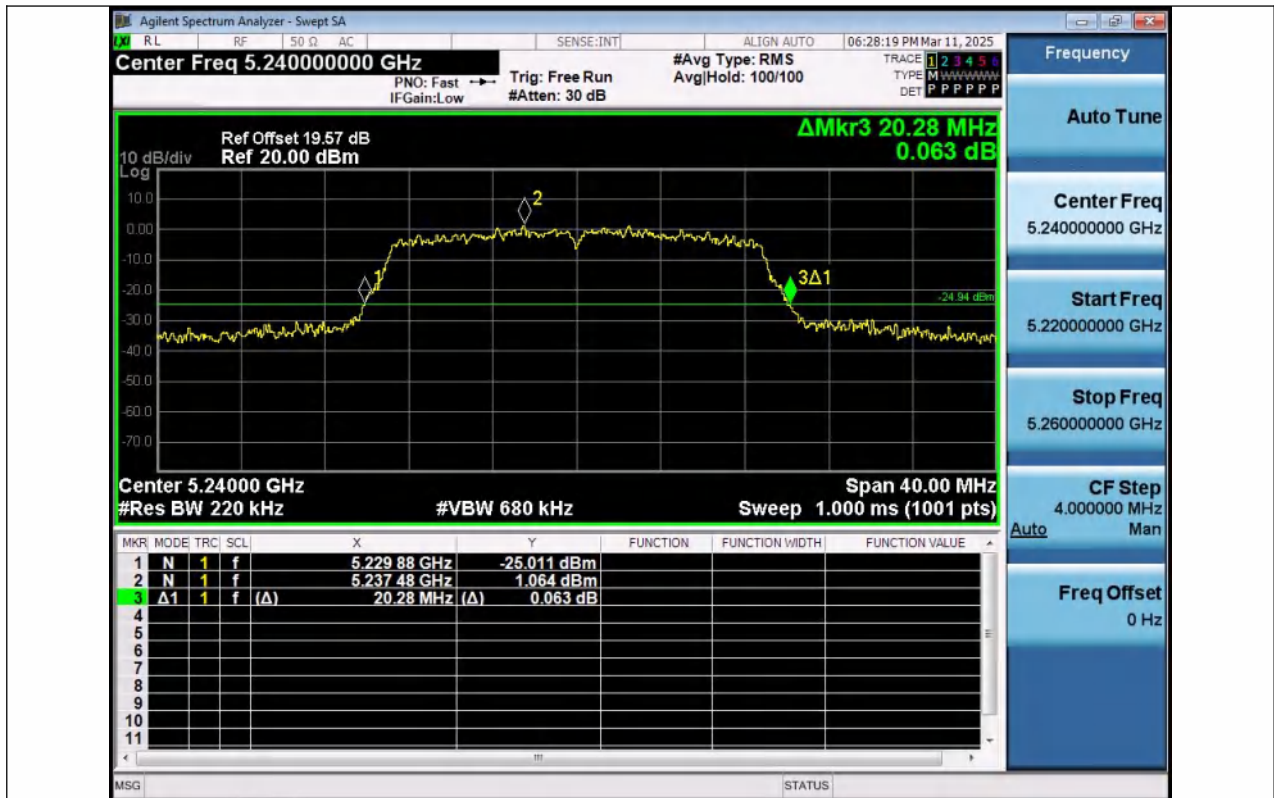
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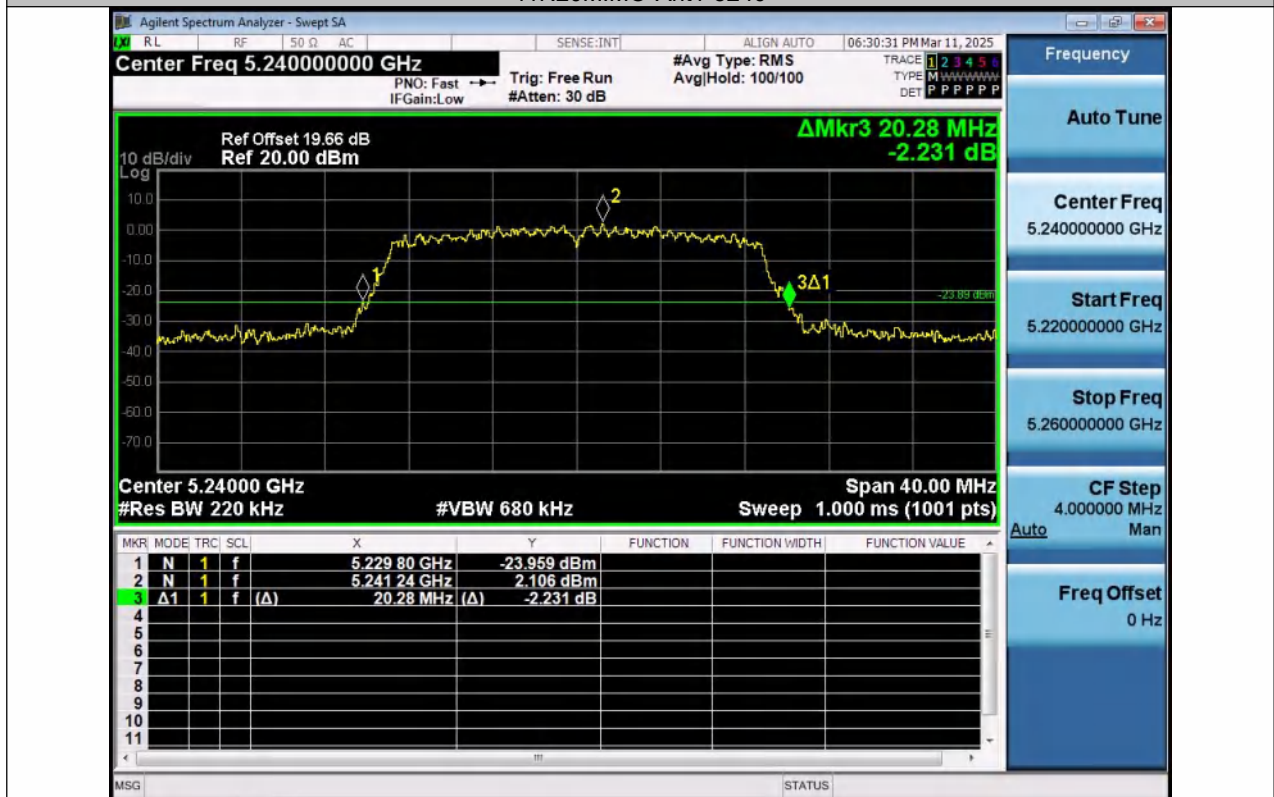
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11N20MIMO-Ant2-5200



11N20MIMO-Ant1-5240



11N20MIMO-Ant2-5240



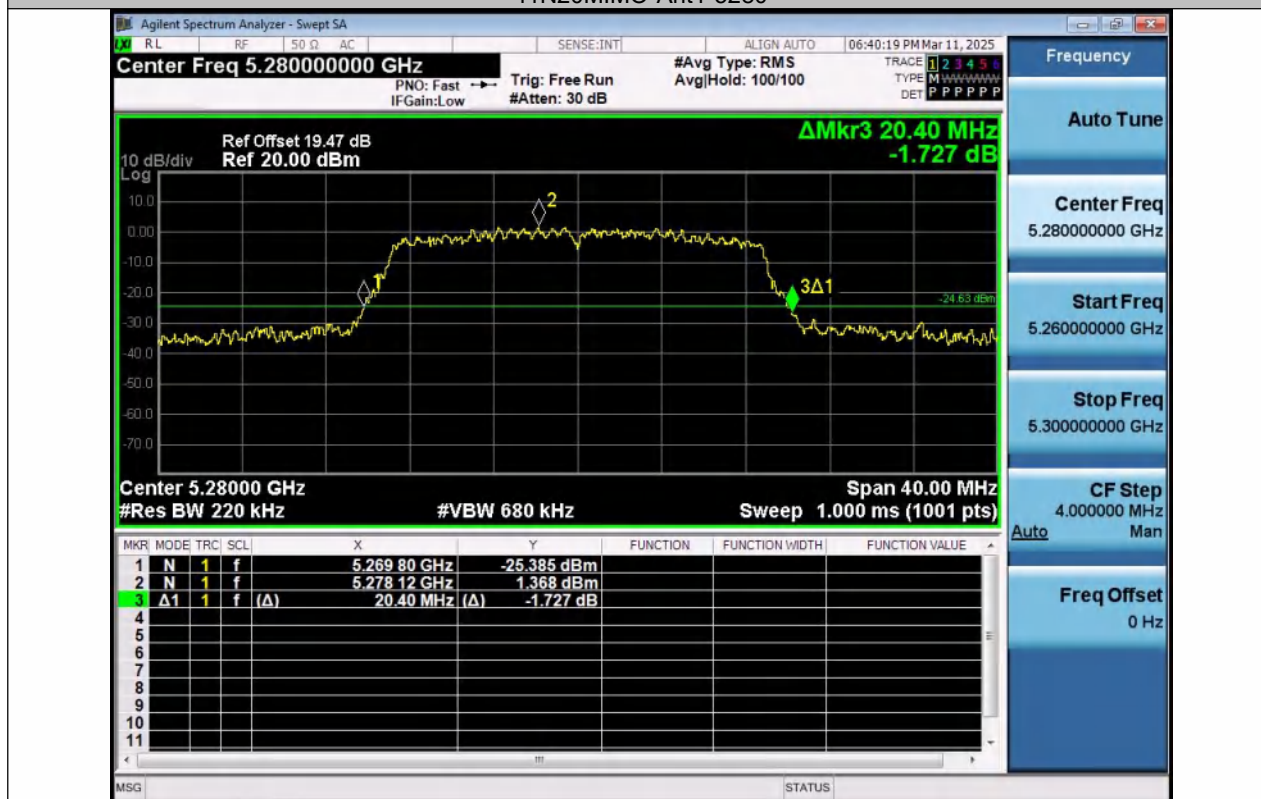
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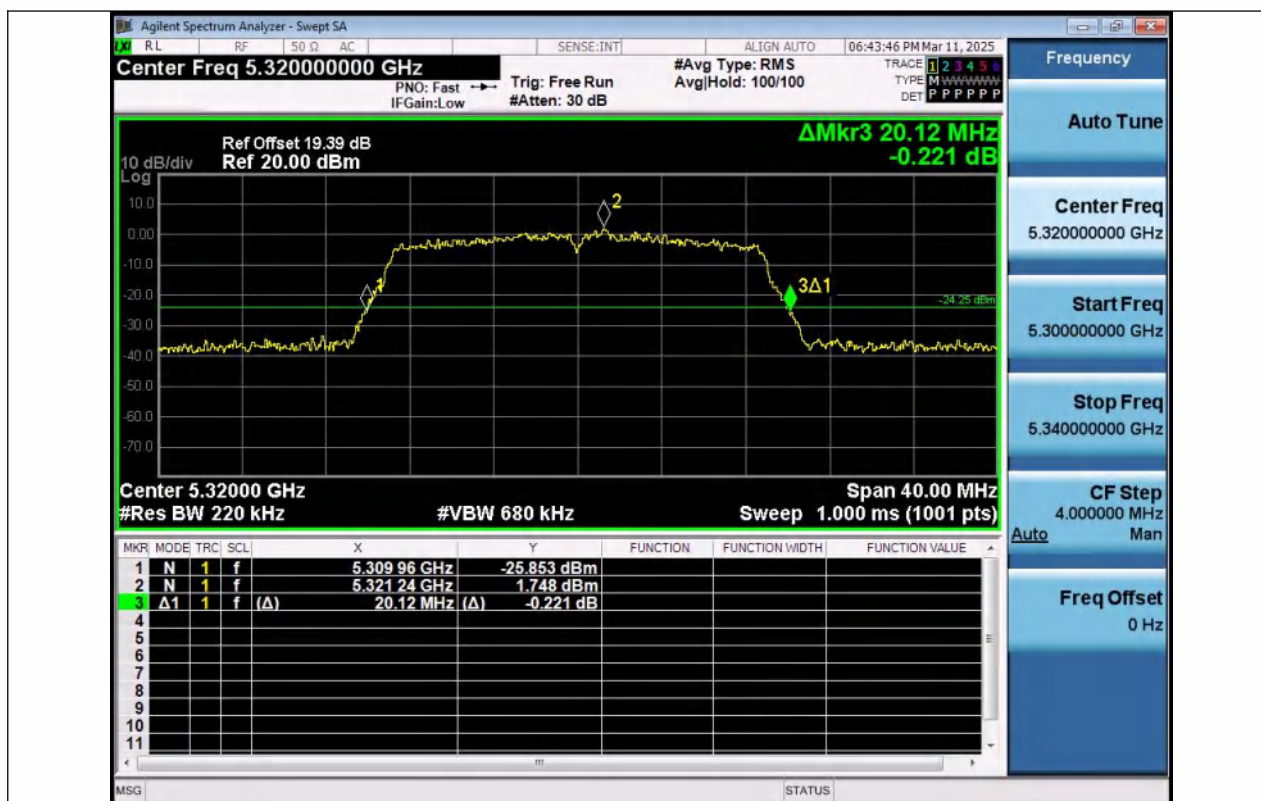
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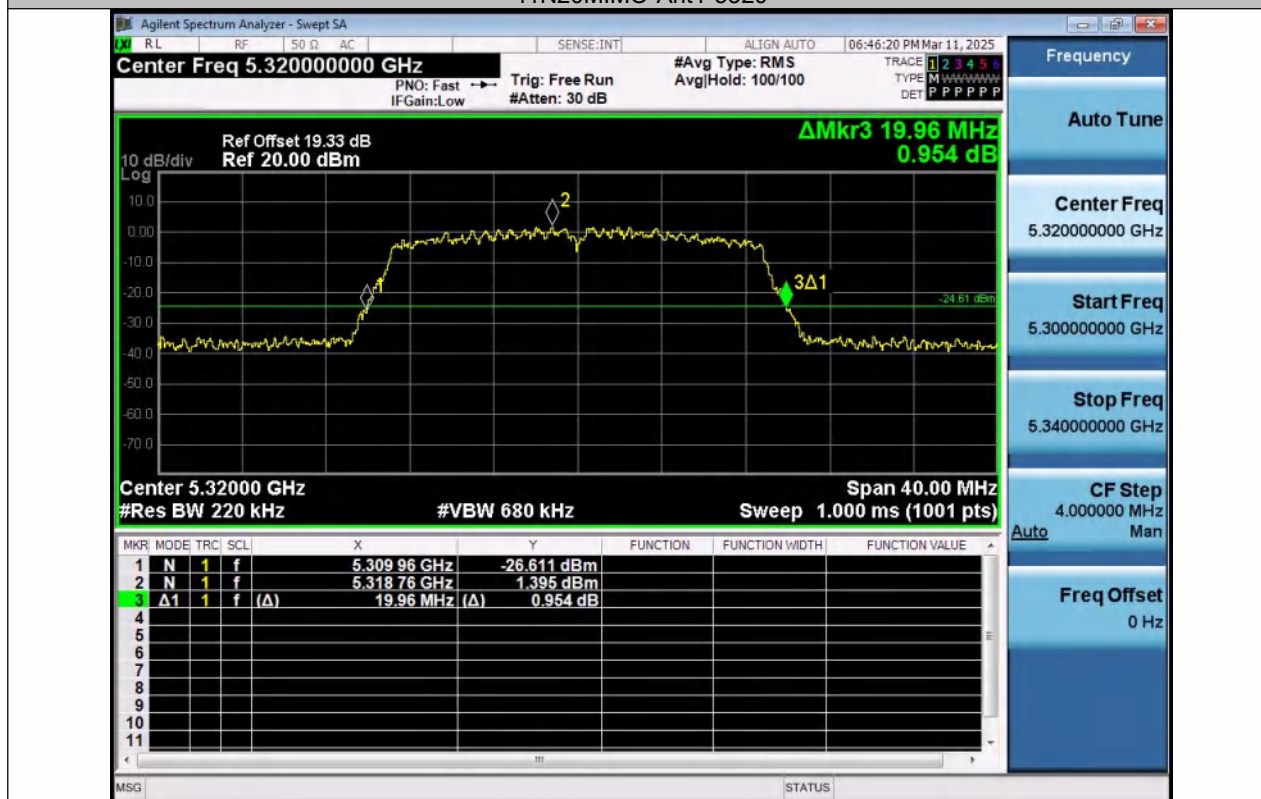
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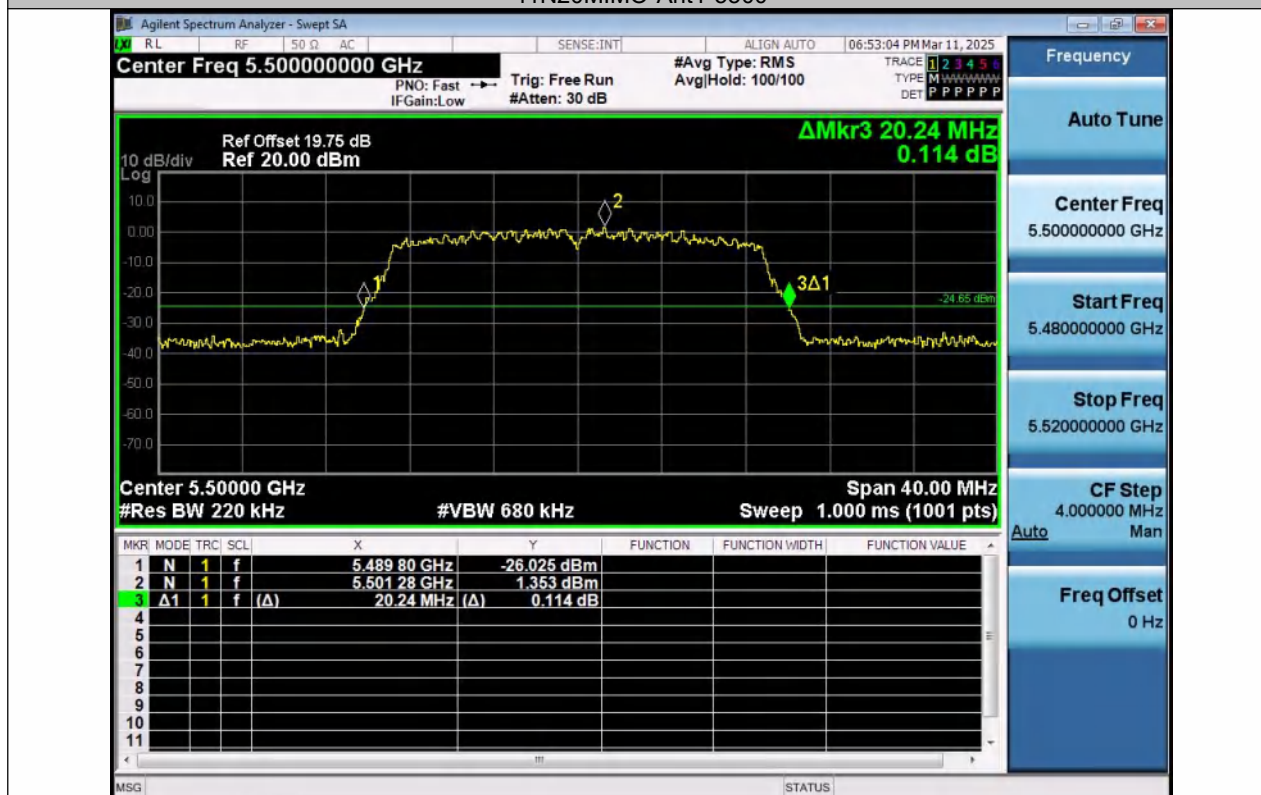
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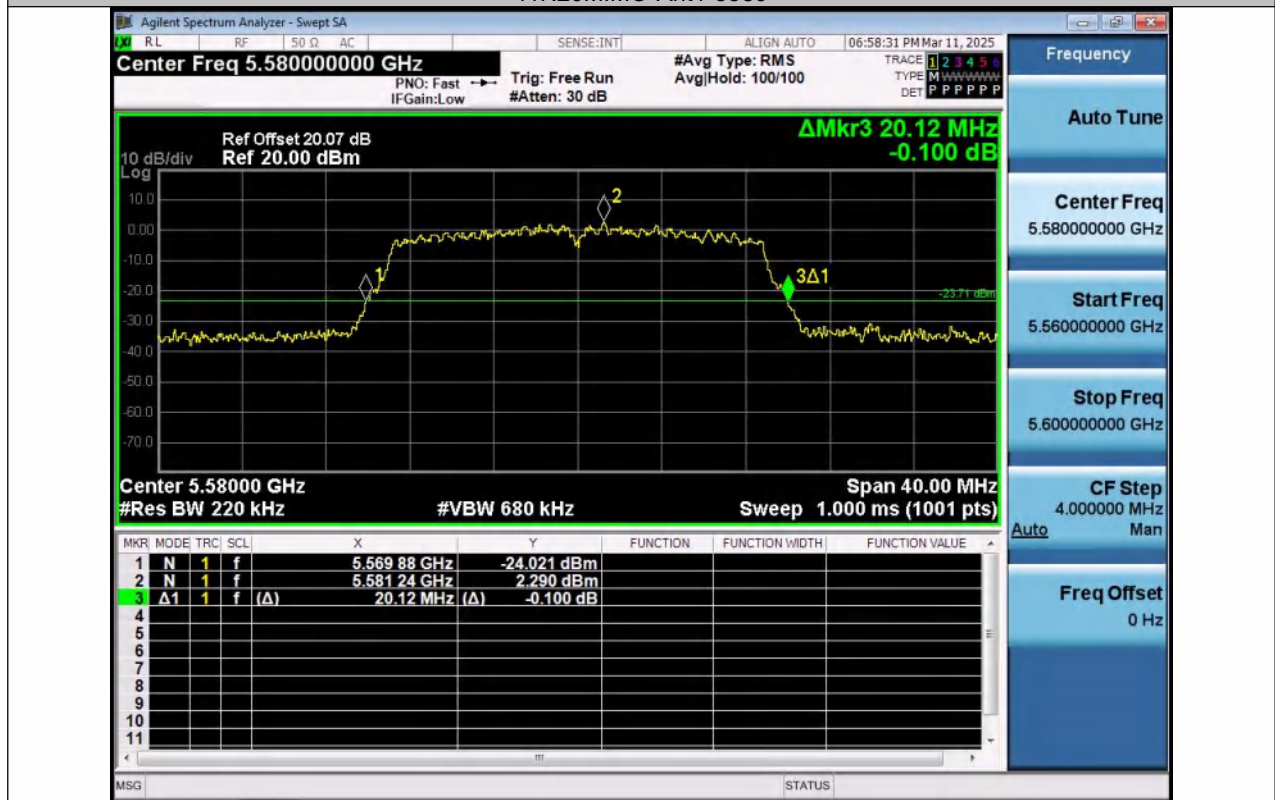
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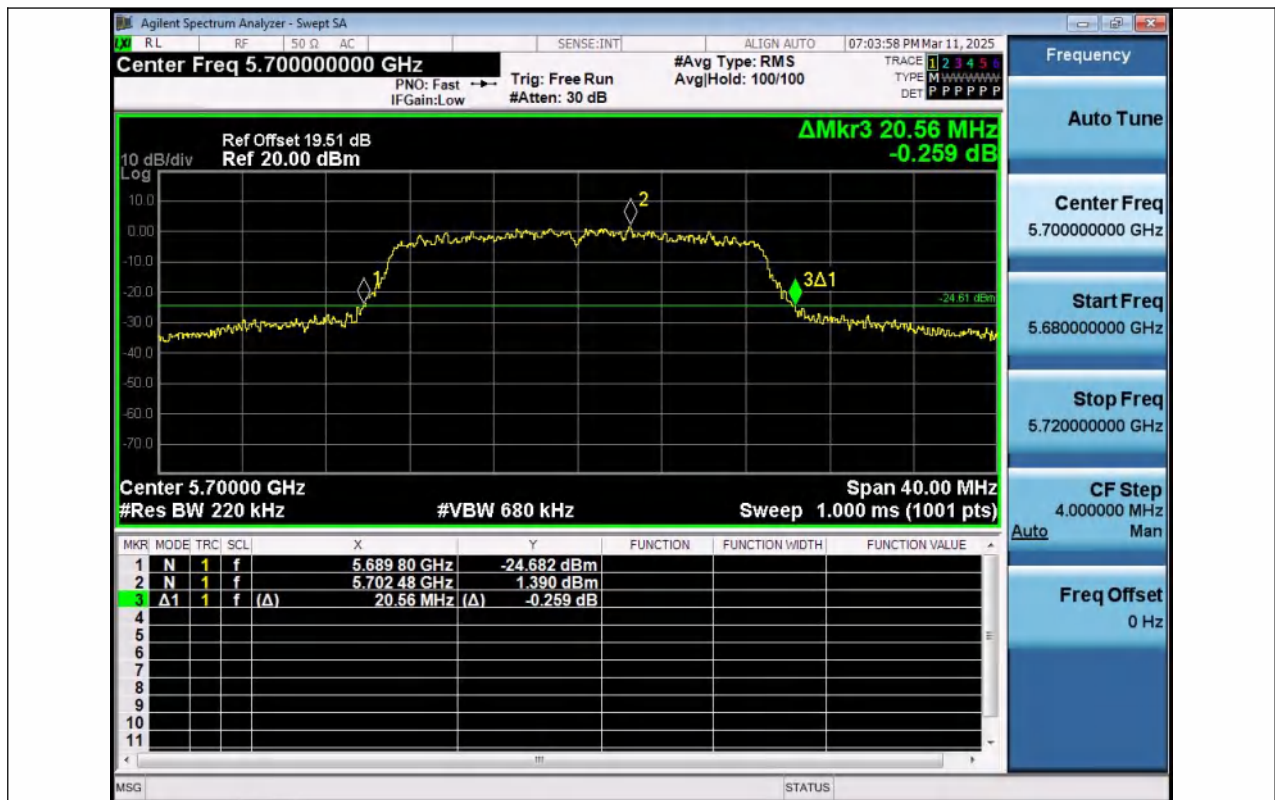
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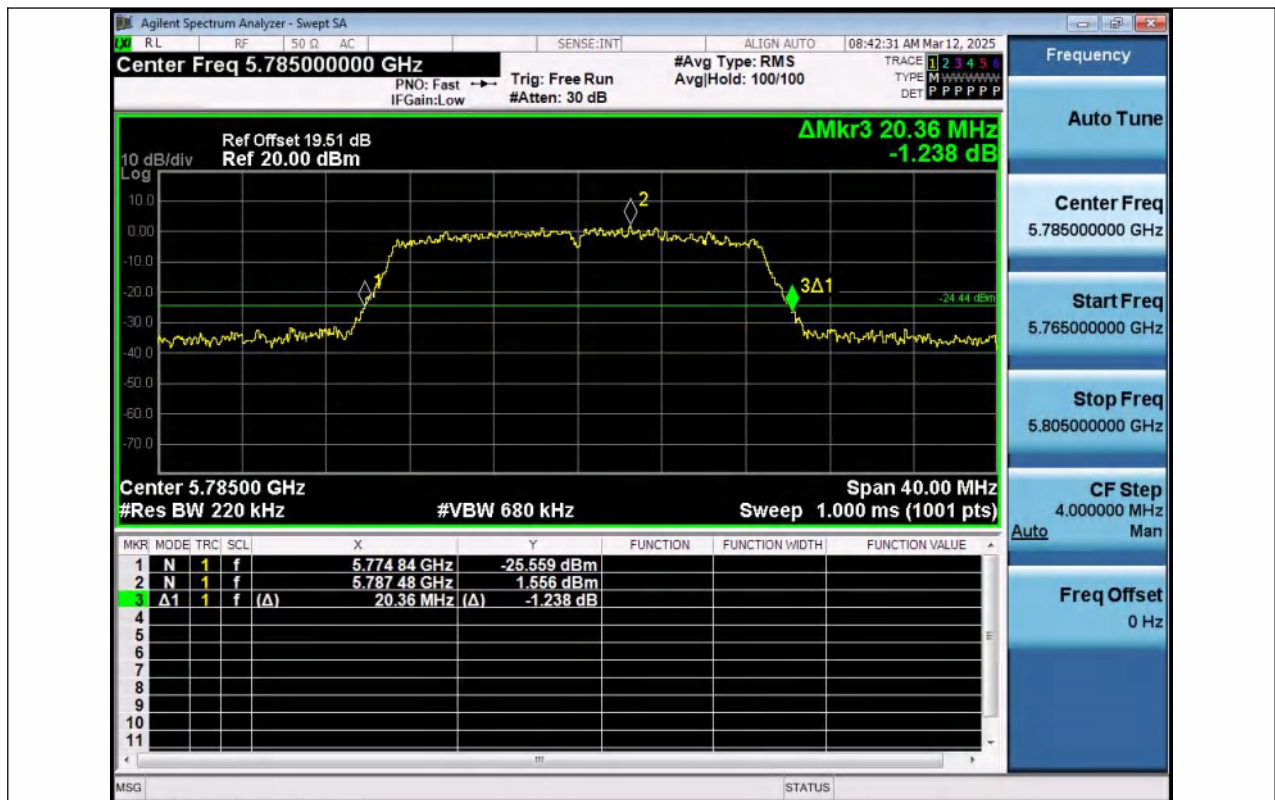
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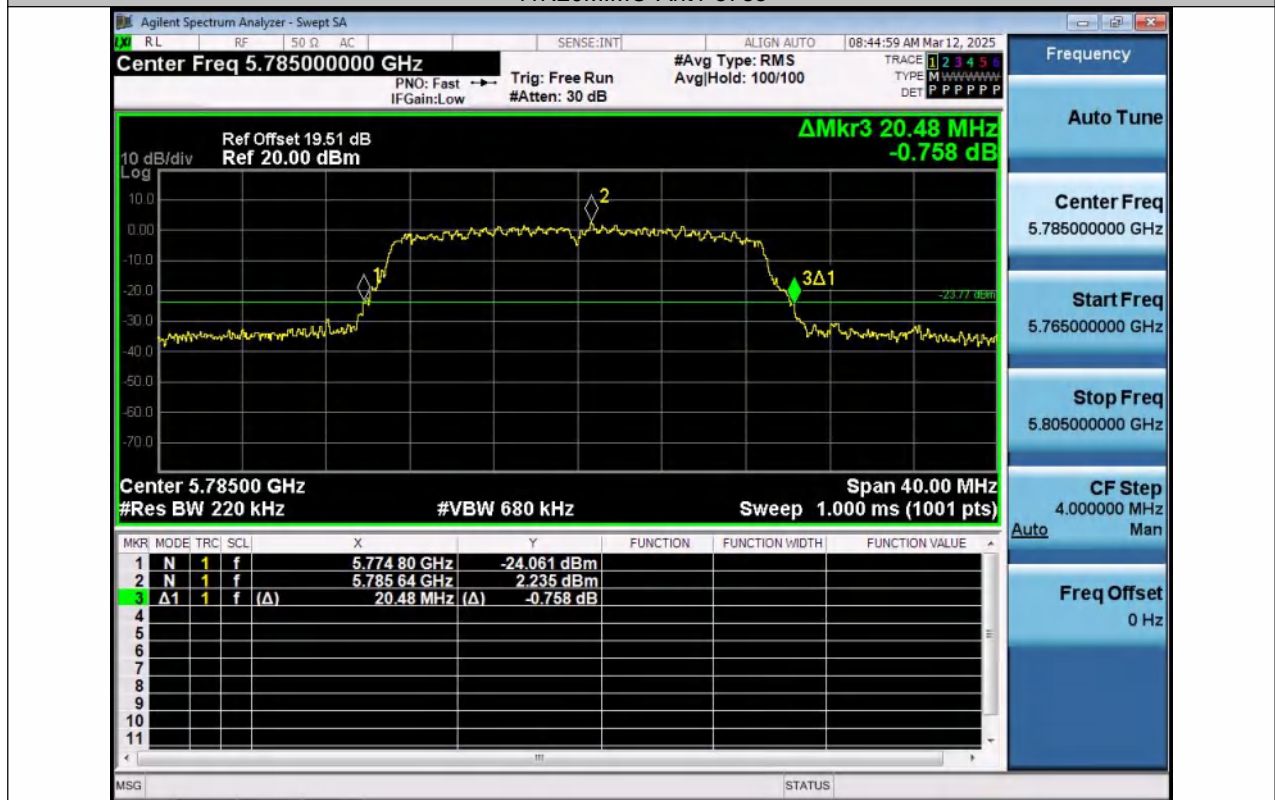
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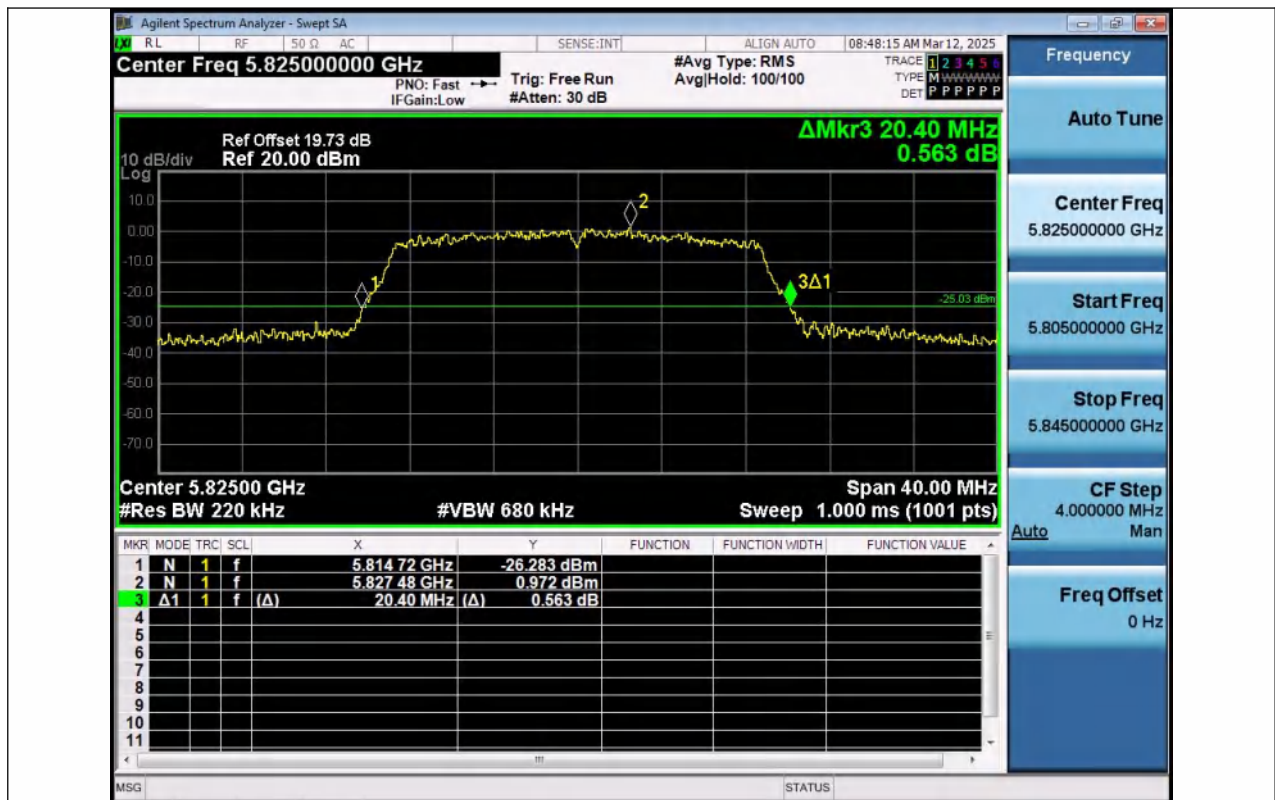
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11N20MIMO-Ant1-5785



11N20MIMO-Ant2-5785



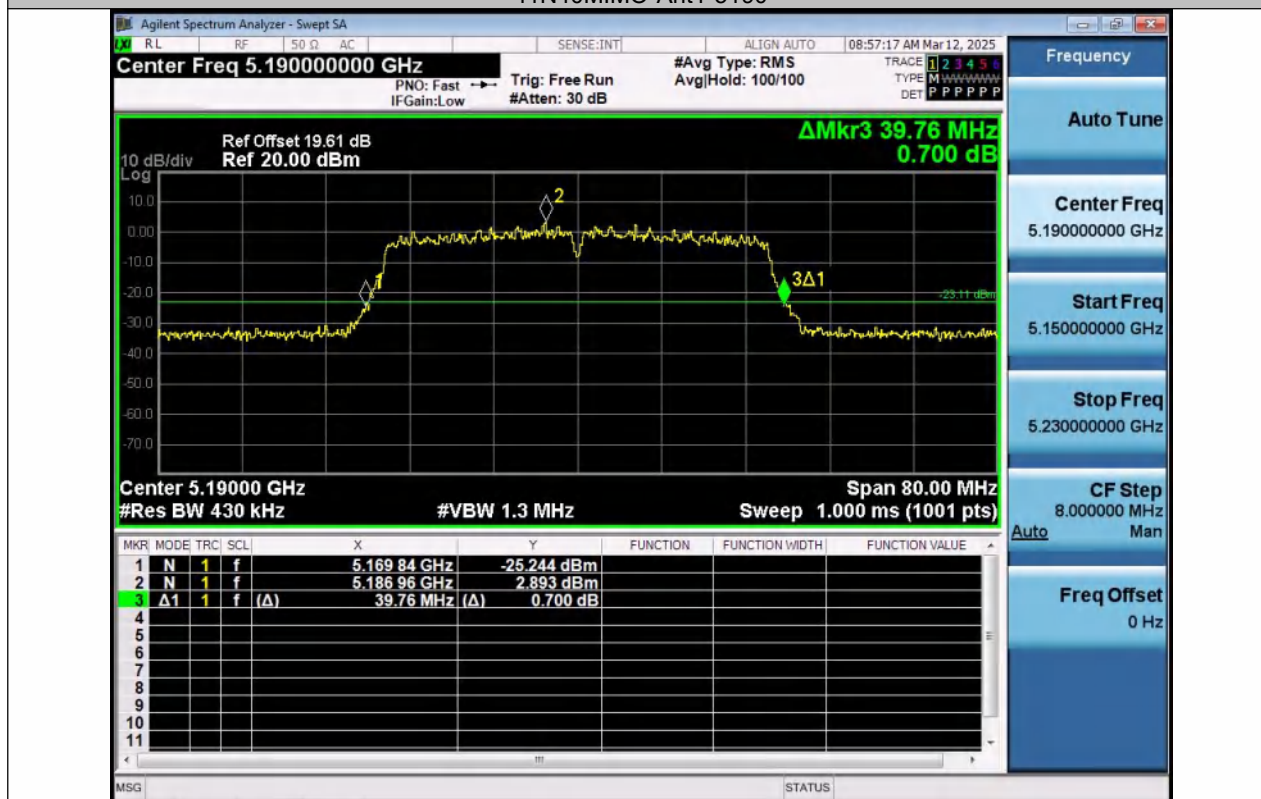
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11N20MIMO-Ant2-5825



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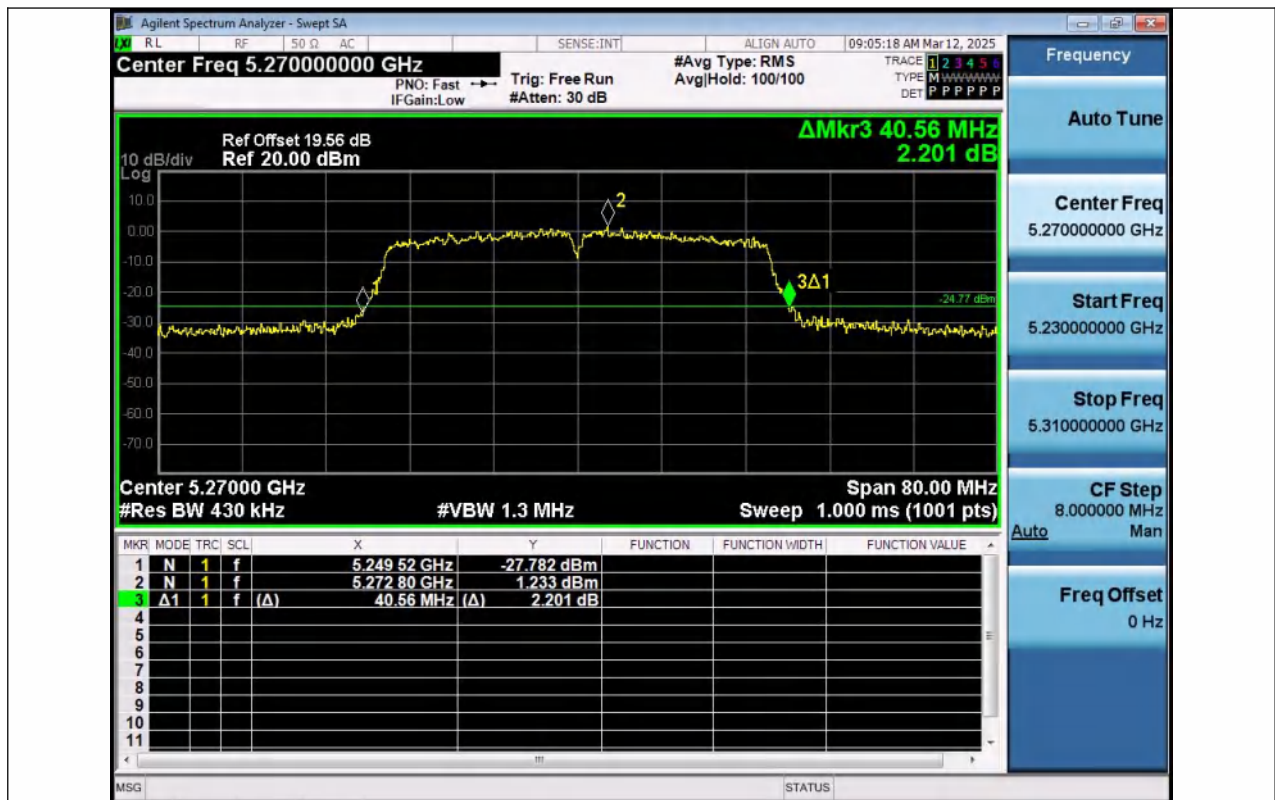
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11N40MIMO-Ant1-5230



11N40MIMO-Ant2-5230



11N40MIMO-Ant1-5270



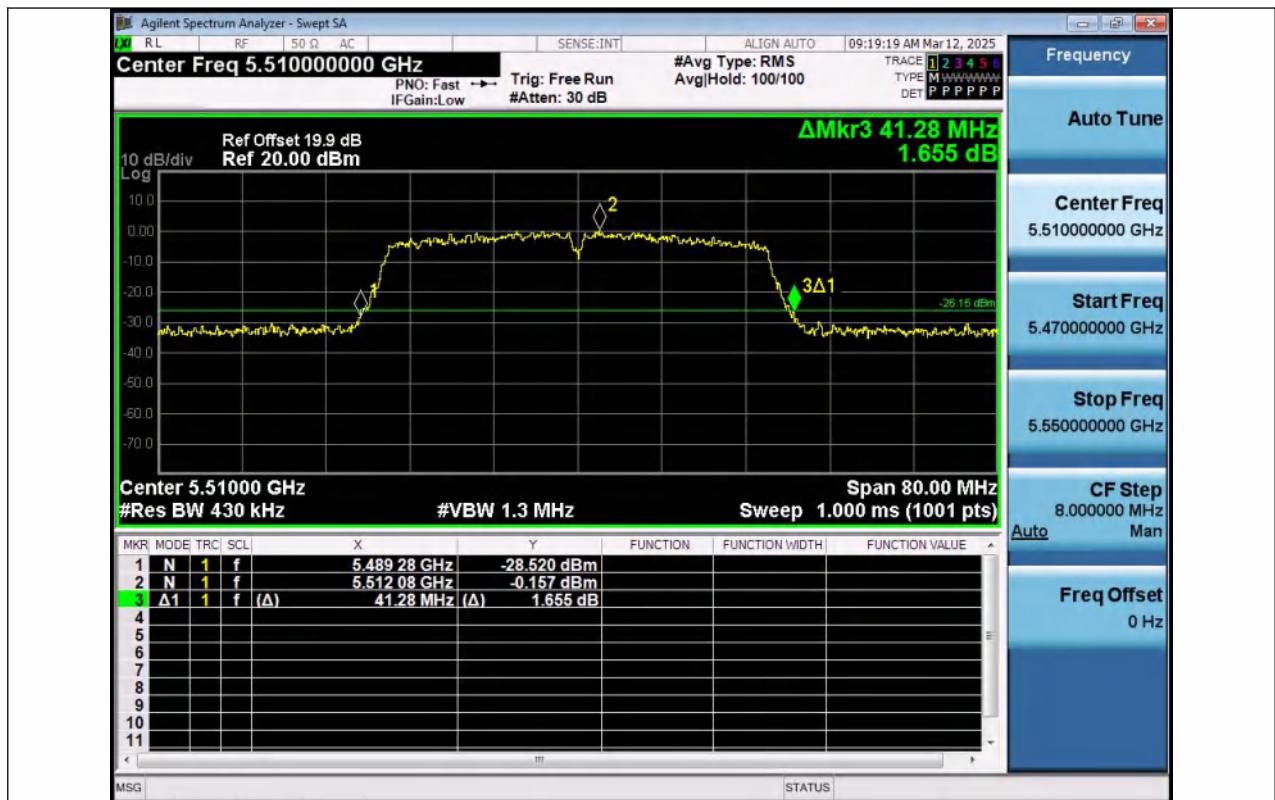
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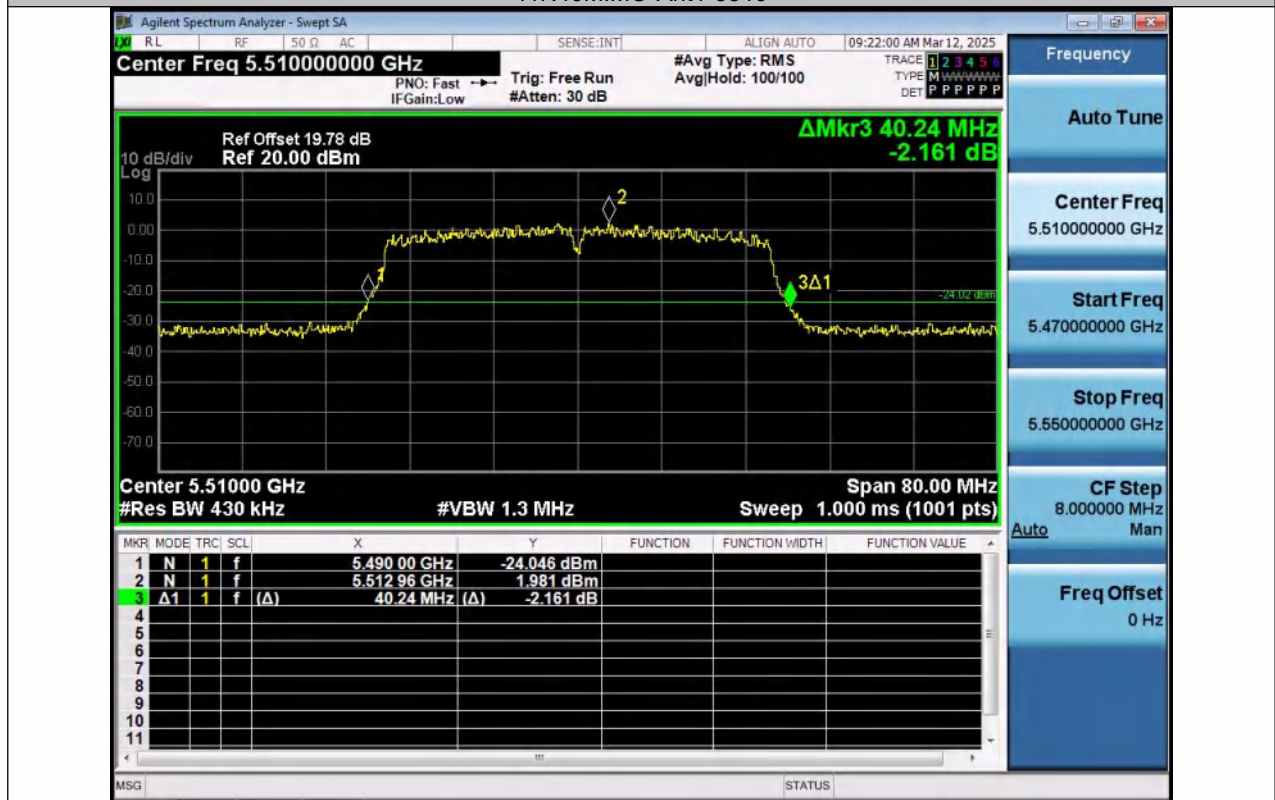
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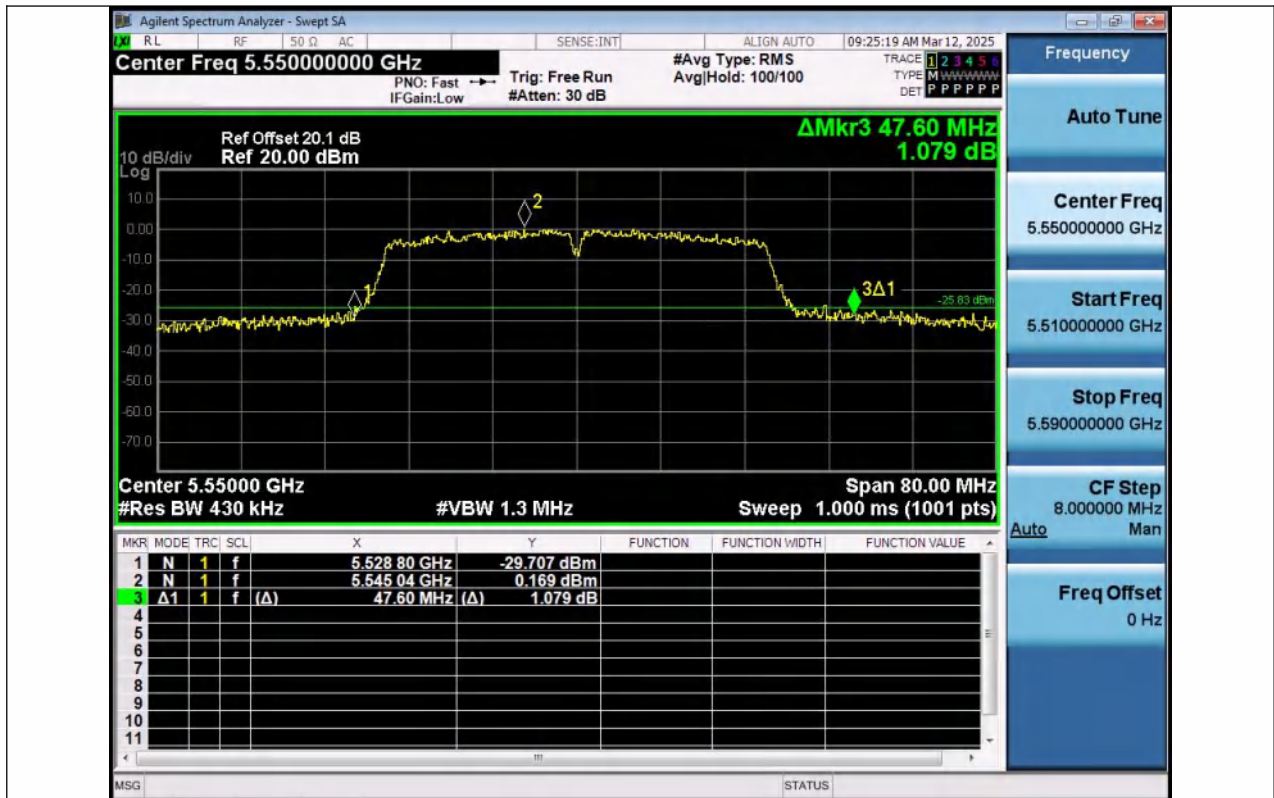
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11N40MIMO-Ant1-5510



11N40MIMO-Ant2-5510



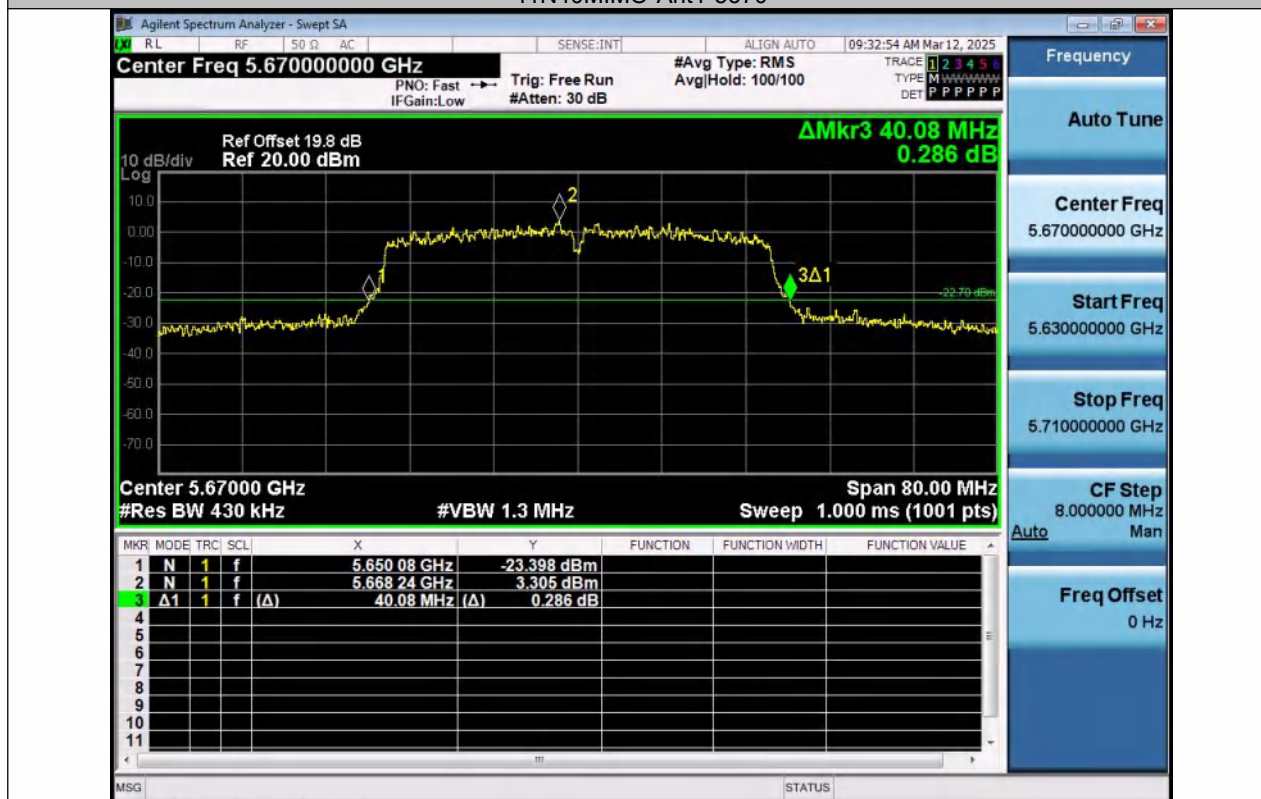
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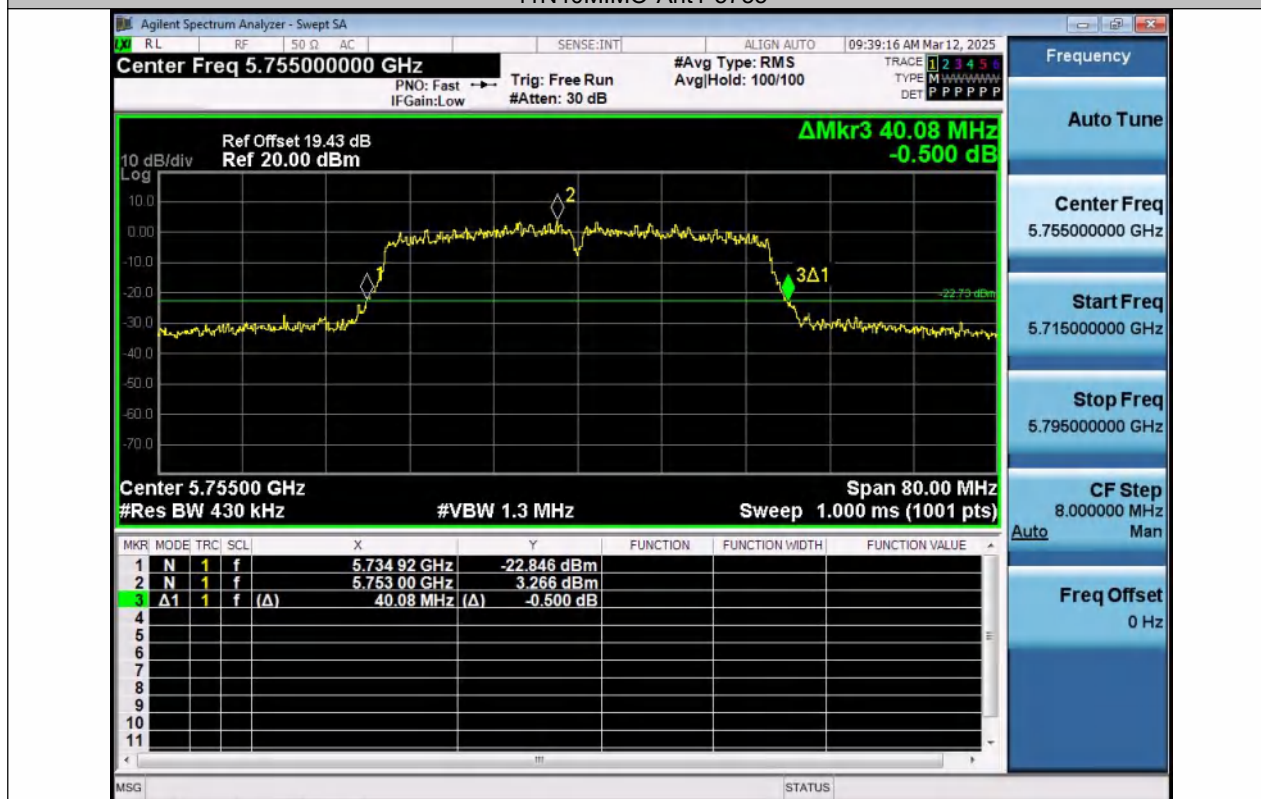
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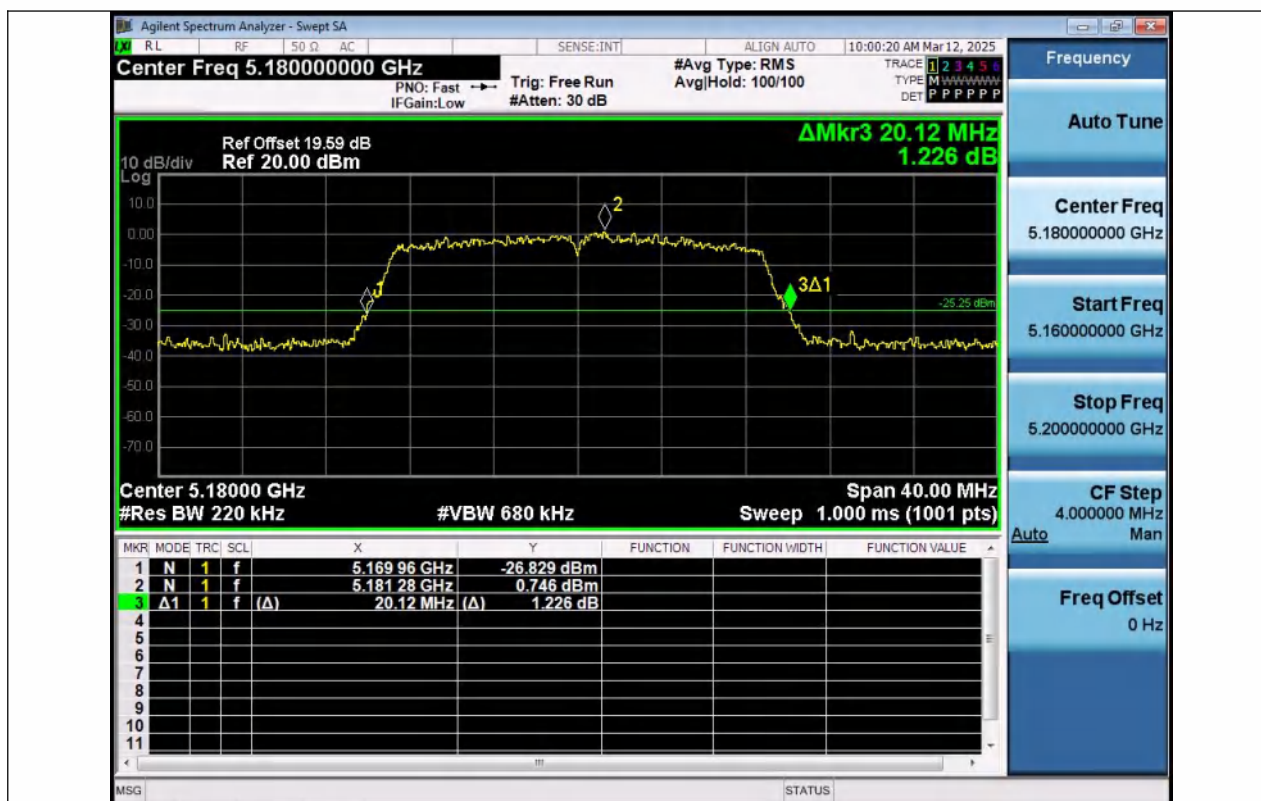
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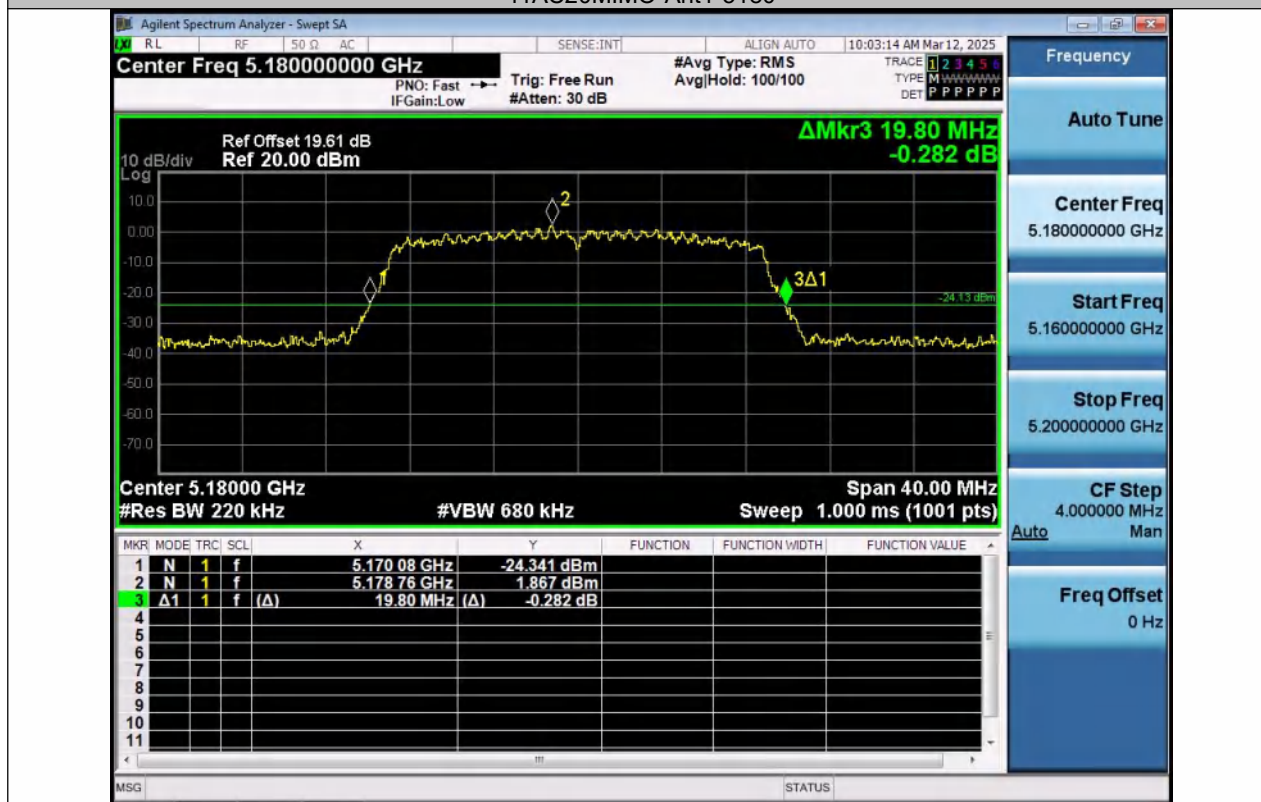
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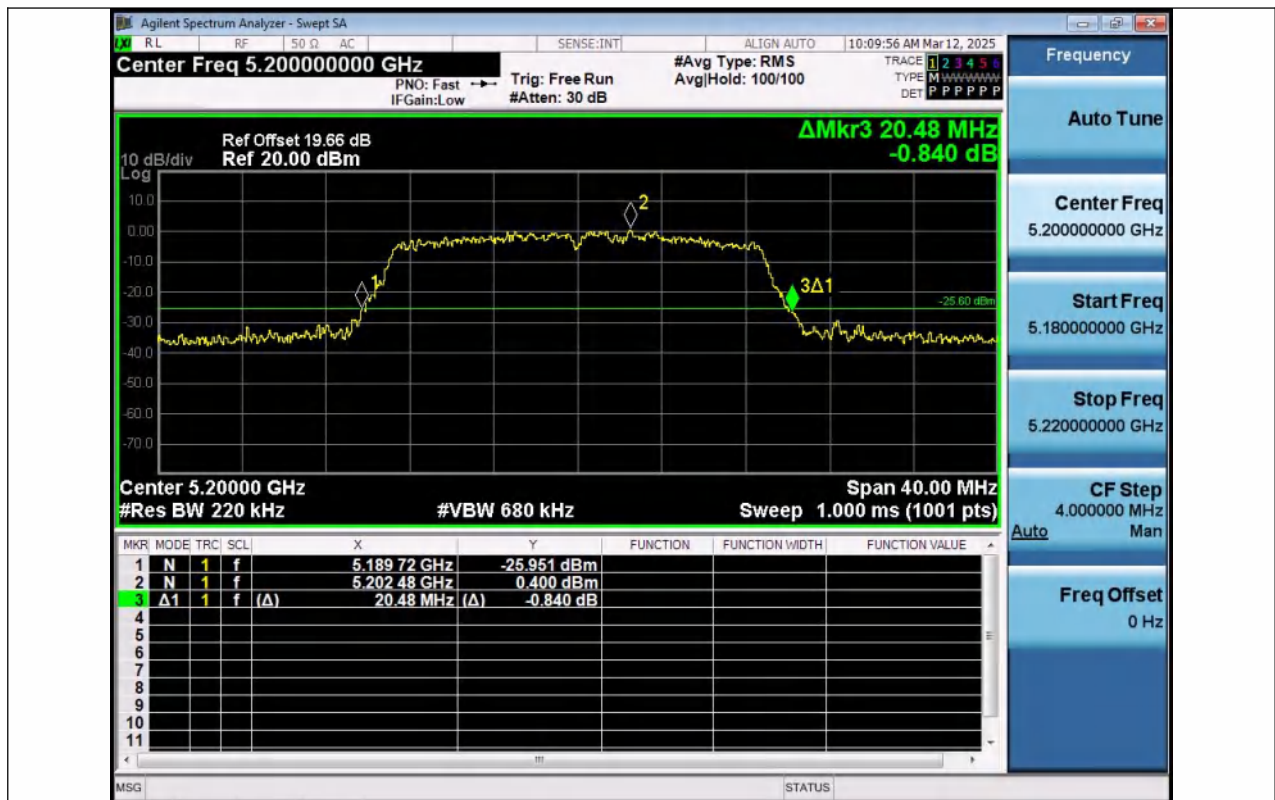
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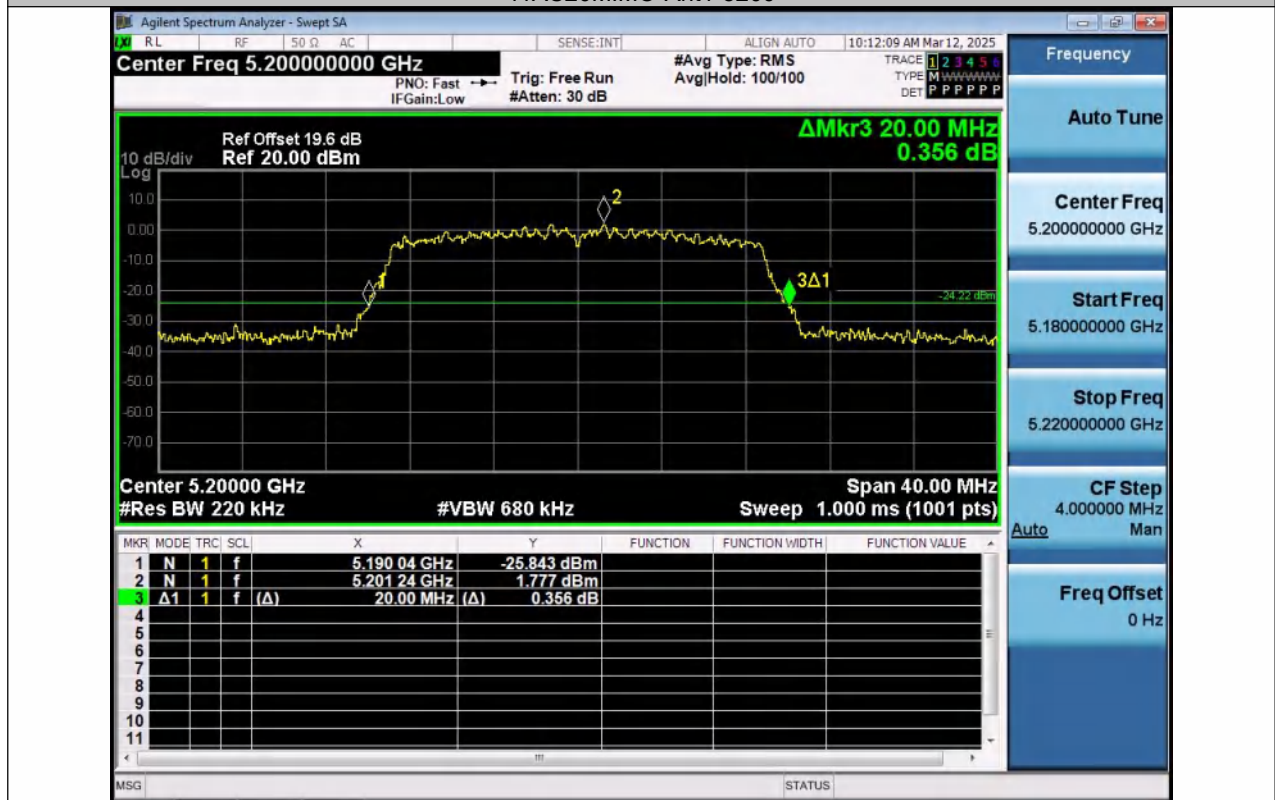
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11AC20MIMO-Ant2-5180



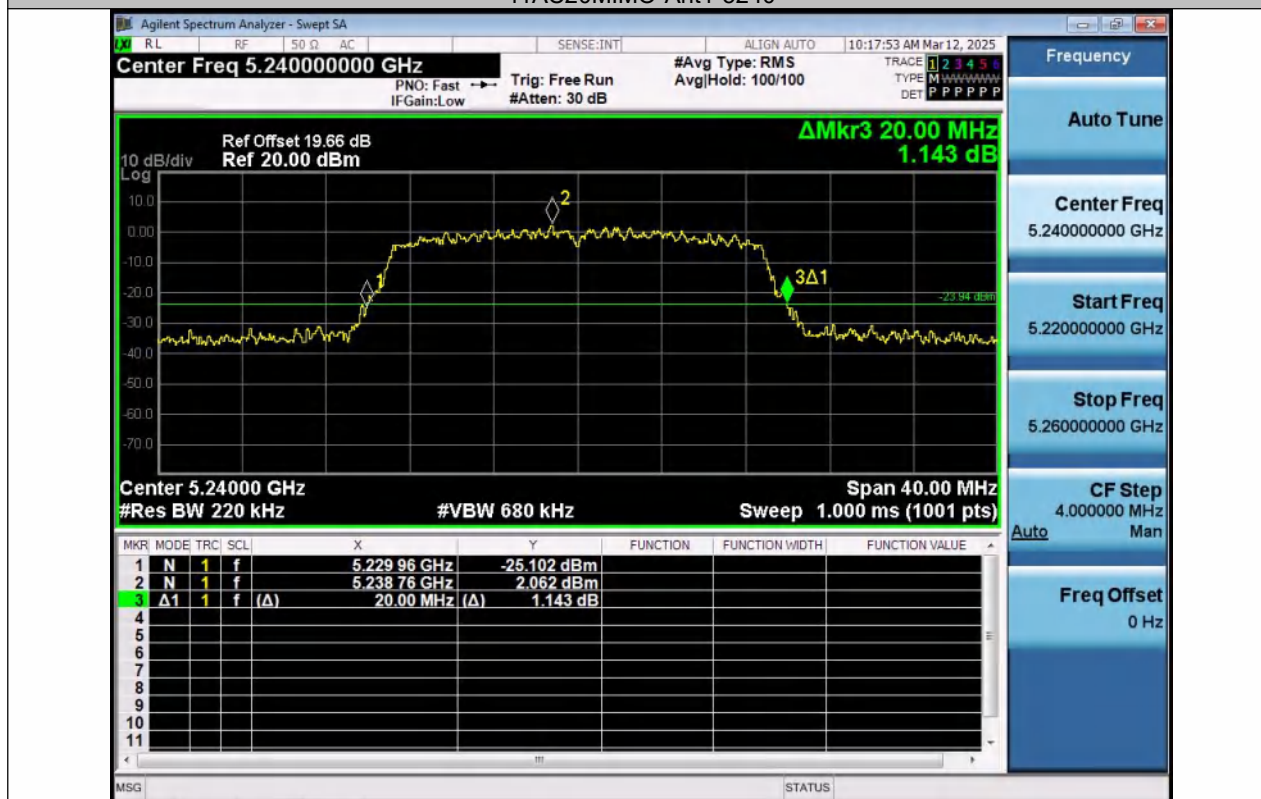
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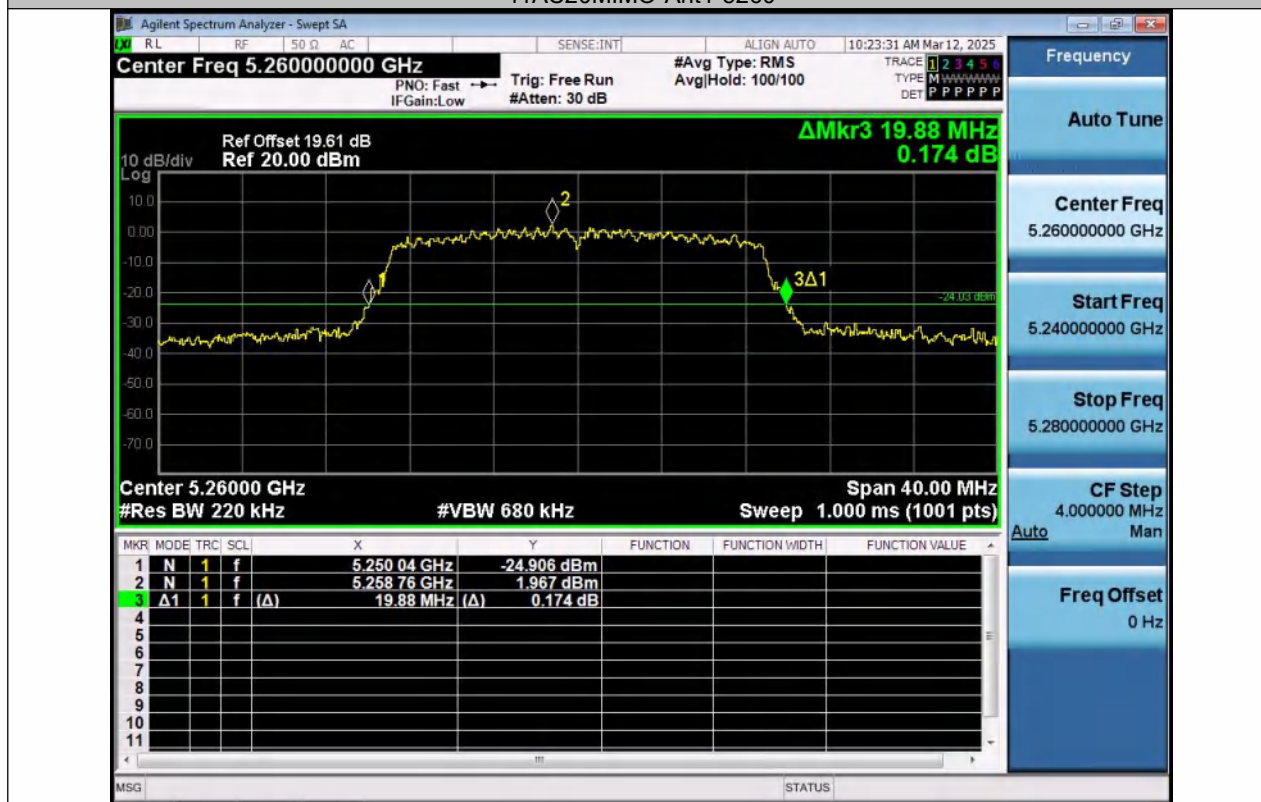
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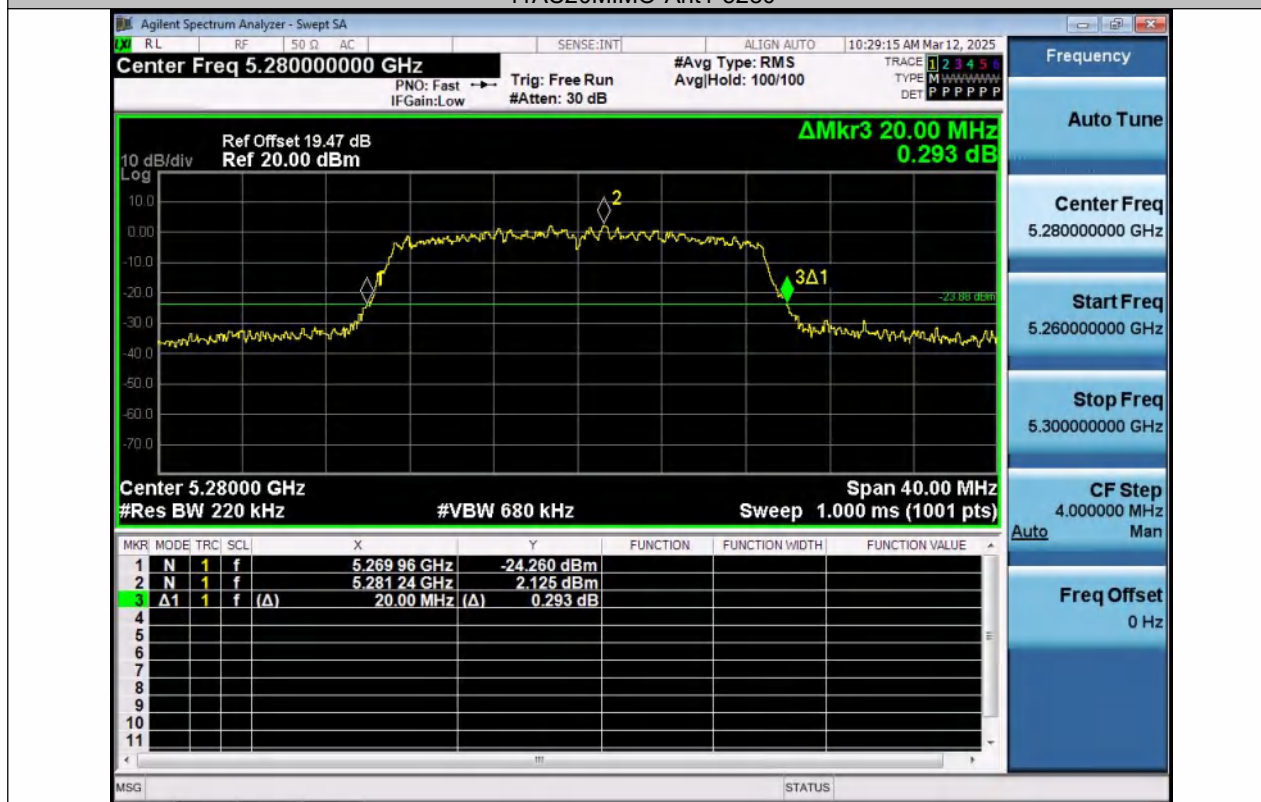
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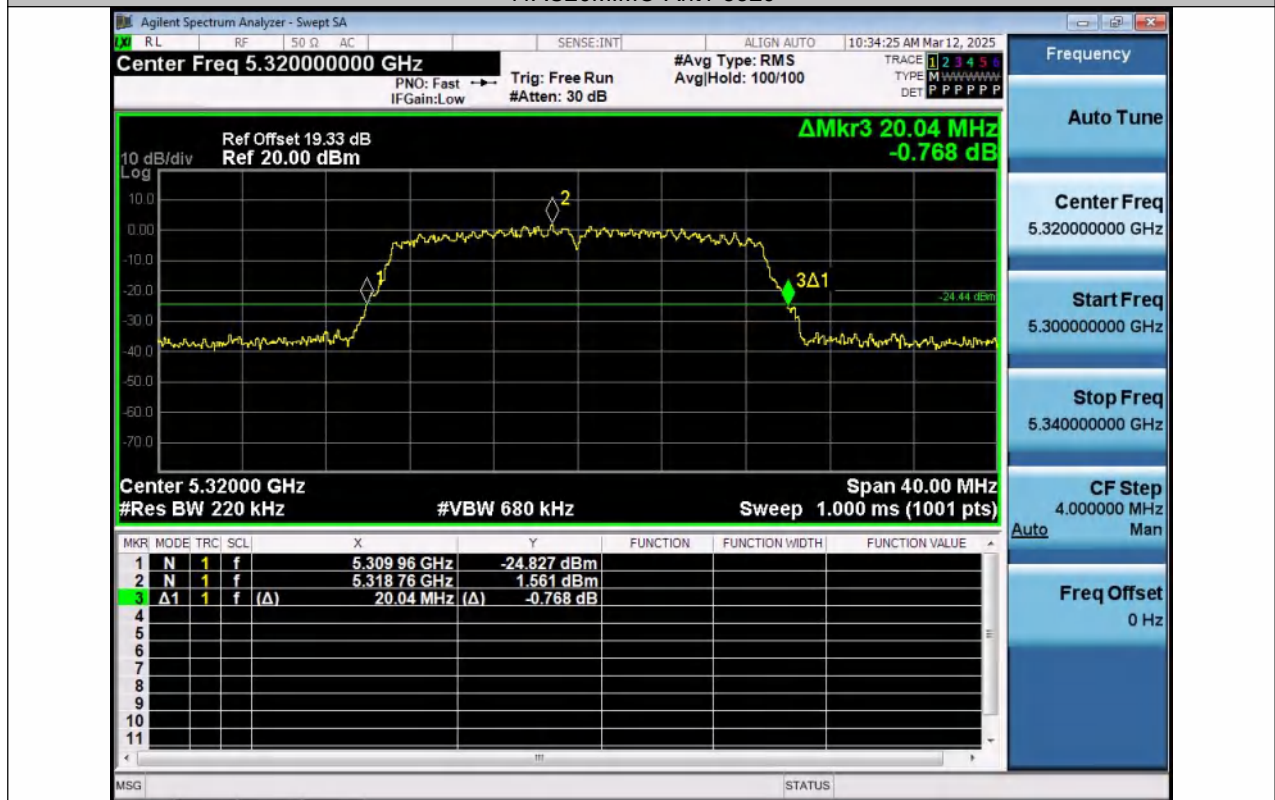
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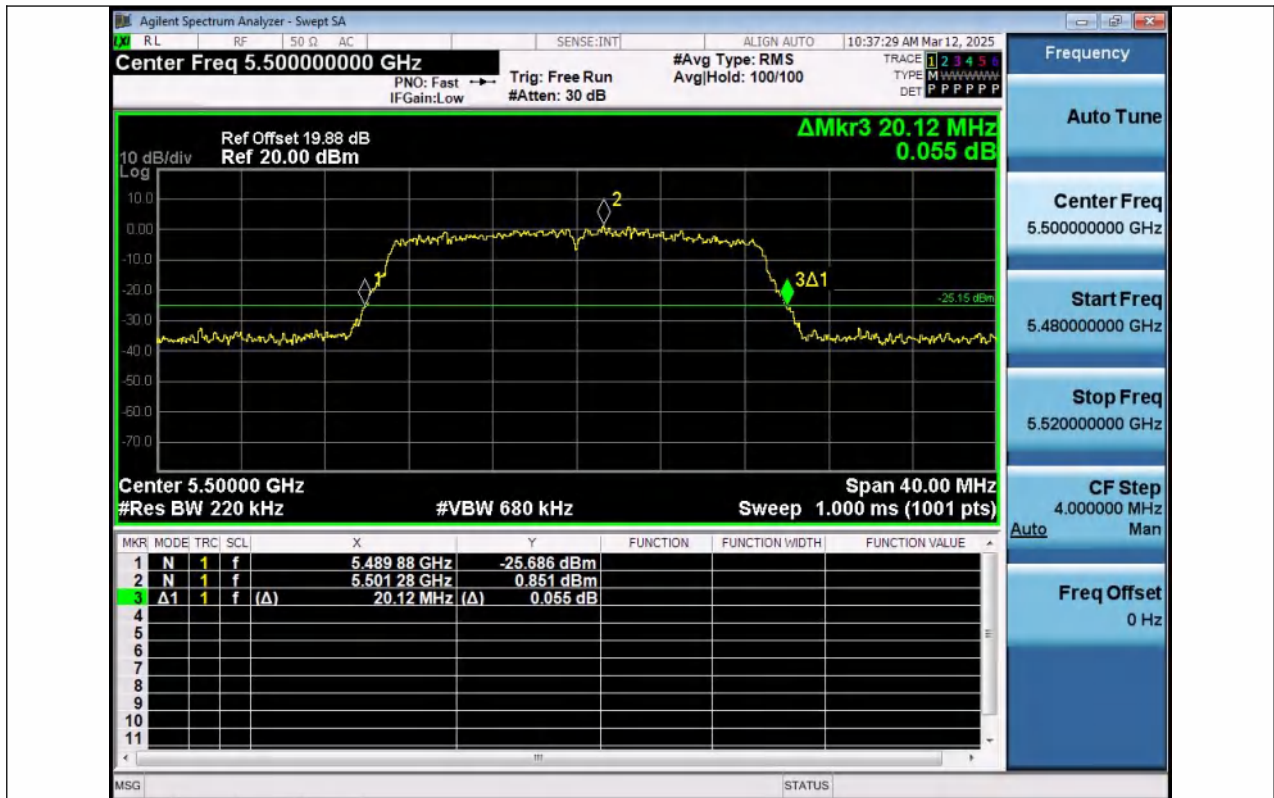
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11AC20MIMO-Ant1-5320



11AC20MIMO-Ant2-5320



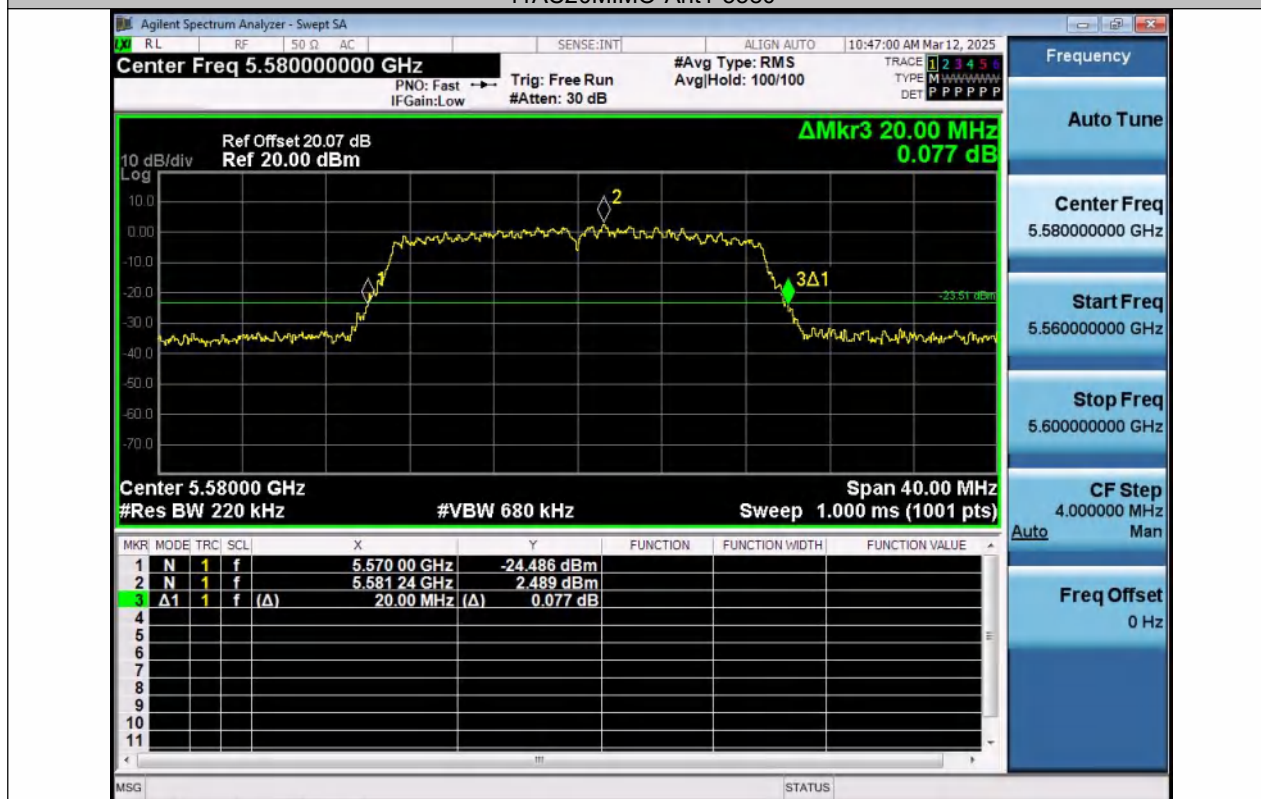
11AC20MIMO-Ant1-5500



11AC20MIMO-Ant2-5500



11AC20MIMO-Ant1-5580



11AC20MIMO-Ant2-5580