TEST REPORT

Report Number : 14523758-E6V3

Applicant : APPLE INC.
1 APPLE PARK WAY
CUPERTINO, CA 95014, U.S.A

Model : A2846 (Parent Model)
A3089, A3090, A3092 (Variant Models)

Brand : APPLE

FCC ID : BCG-E8427A (Parent Model)
BCG-E8428A, BCG-E8429A, BCG-E8430A (variant Models)

EUT Description : SMARTPHONE

Test Standard(s) : FCC 47 CFR PART 15 SUBPART E

Date Of Issue:
August 02, 2023

Prepared by:
UL Verification Services Inc.
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CERT #0751.05

REPORT REVISION HISTORY

Rev.	Issue Date	Revisions	Revised By
V1	7/13/2023	Initial Issue	Chin Pang
V2	7/15/2023	Address TCB Questions sections 8 and 9	Chin Pang
V3	7/27/2023	Address TCB's question, removed note on page 182 and Section 9.4	Chin Pang

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: APPLE INC.
1 APPLE PARK WAY
CUPERTINO, CA 95014, U.S.A

EUT DESCRIPTION: SMARTPHONE

MODEL: A2846 (Parent Model)
A3089, A3090, A3092 (Variant Models)

BRAND: APPLE

SERIAL NUMBER: KW3FH07PW3, K1V4RQY79H

SAMPLE RECEIPT DATE: JANUARY 30, 2023

DATE TESTED: FEBRUARY 08, 2023 – JULY 18, 2023

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 Part 15 Subpart E	Complies

UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. All samples tested were in good operating condition throughout the entire test program. Measurement Uncertainties are published for informational purposes only and were not taken into account unless noted otherwise.

This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by A2LA, NIST, any agency of the Federal Government, or any agency of the U.S. government.

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Approved & Released For
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2. TEST RESULT SUMMARY

FCC Clause	Requirement	Result	Comment
See Comment	Duty Cycle	Reporting purposes only	Per ANSI C63.10, Section 12.2.
See Comment	26dB BW/99% OBW	Reporting purposes only	Per ANSI C63.10 Sections 6.9.2 and 6.9.3
15.407 (e)	6 dB BW	Complies	None.
15.407 (a) (1-4), (h) (1)	Output Power	Complies	None.
15.407 (a) (1-3, 5)	PSD	Complies	None.
15.209, 15.205, 15.407 (b)	Radiated Emissions	Complies	None.
15.207	AC Mains Conducted Emissions	Complies	None.

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3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with:
- FCC CFR 47 Part 2
- FCC CFR 47 Part 15
- FCC KDB 662911 D01 v02r01
- FCC KDB 789033 D02 v02r01
- FCC KDB 644545 D03 v01
- ANSI C63.10-2013
- KDB 414788 D01 Radiated Test Site v01r01

4. FACILITIES AND ACCREDITATION

UL Verification Services Inc. is accredited by A2LA, certification #0751.05, for all testing performed within the scope of this report. Testing was performed at the locations noted below.

	Address	ISED CABID	ISED Company Number	FCC Registration
☒	Building 1: 47173 Benicia Street, Fremont, CA 94538, USA	US0104	2324A	550739
☒	Building 2: 47266 Benicia Street, Fremont, CA 94538, USA			
☒	Building 3: 843 Auburn Court, Fremont, CA 94538 USA			
☒	Building 4: 47658 Kato Rd, Fremont, CA 94538 USA			
☒	Building 5: 47670 Kato Rd, Fremont, CA 94538 USA			

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5. DECISION RULES AND MEASUREMENT UNCERTAINTY

5.1. METROLOGICAL TRACEABILITY

All test and measuring equipment utilized to perform the tests documented in this report are calibrated on a regular basis, with a maximum time between calibrations of one year or the manufacturers' recommendation, whichever is less, and where applicable is traceable to recognized national standards.

5.2. DECISION RULES

The Decision Rule is based on Simple Acceptance in accordance with ISO Guide 98-4:2012 Clause 8.2. (Measurement uncertainty is not taken into account when stating conformity with a specified requirement.)

5.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	U_{LAB}
Conducted Antenna Port Emission Measurement	1.94
Power Spectral Density	2.466
Time Domain Measurements Using SA	3.39
RF Power Measurement Direct Method Using Power Meter	0.450 (Peak), 1.3 (Ave)
Radio Frequency (Spectrum Analyzer)	141.16 Hz
Occupied Bandwidth	1.2%
Worst Case Conducted Disturbance, 9KHz to 0.15 MHz	3.78 dB
Worst Case Conducted Disturbance, 0.15 to 30 MHz	3.40 dB
Worst Case Radiated Disturbance, 9KHz to 30 MHz	2.87 dB
Worst Case Radiated Disturbance, 30 to 1000 MHz	6.01 dB
Worst Case Radiated Disturbance, 1000 to 18000 MHz	4.73 dB
Worst Case Radiated Disturbance, 18000 to 26000 MHz	4.51 dB
Worst Case Radiated Disturbance, 26000 to 40000 MHz	5.29 dB

Uncertainty figures are valid to a confidence level of 95%.

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5.4. SAMPLE CALCULATION

RADIATED EMISSIONS

Where relevant, the following sample calculation is provided:
Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)
36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

MAINS CONDUCTED EMISSIONS

Where relevant, the following sample calculation is provided:
Final Voltage (dBuV) = Measured Voltage (dBuV) + Cable Loss (dB) + Limiter Factor (dB) + LISN Insertion Loss.
36.5 dBuV + 0 dB +10.1 dB+ 0 dB = 46.6 dBuV

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6. EQUIPMENT UNDER TEST

6.1. EUT DESCRIPTION

The Apple iPhone is a smartphone with multimedia functions (music, application support, and video), cellular GSM, GPRS, EGPRS, UMTS, LTE, 5G, IEEE 802.11a/b/g/n/ac/ax, Bluetooth, Ultra-Wideband, GPS, NFC, 802.15.4ab-NB and MSS technologies. The rechargeable battery is not user accessible.

Testing was performed on the parent model and is used to support the application for the parent and variants identified in this report based on the test plan submitted and approved via KDB inquiry by the FCC and by ISED-Canada.

The Model and FCC ID covered by this report includes:

Parent Model: A2846, FCC ID: BCG-E8427A

Variant Models: A3089, FCC ID: BCG-E8428A
A3090, FCC ID: BCG-E8429A
A3092, FCC ID: BCG-E8430A

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6.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum conducted output power as follows:

5.2 GHz BAND (FCC)

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
5.2 GHz band, 1TX			
5180-5240	802.11a	Covered by 802.11n HT20 1TX	
5180-5240	802.11n HT20	19.48	88.72
5190-5230	802.11n HT40	19.98	99.54
5180-5240	802.11ac VHT20	Covered by 802.11n HT20 1TX	
5190-5230	802.11ac VHT40	Covered by 802.11n HT40 1TX	
5210	802.11ac VHT80	17.40	54.95
5180-5240	802.11ax HE20	19.47	88.51
5190-5230	802.11ax HE40	19.96	99.08
5210	802.11ax HE80	16.48	44.46
5.2 GHz band, 2TX			
5180-5240	802.11n HT20 CDD	19.45	88.10
5180-5240	802.11n HT20 SDM/STBC	Covered by 802.11n HT20 2TX CDD	
5190-5230	802.11n HT40 CDD	21.95	156.68
5190-5230	802.11n HT40 SDM/STBC	Covered by 802.11n HT40 2TX CDD	
5180-5240	802.11ac VHT20 SDM/STBC/CDD	Covered by 802.11n HT20 2TX CDD	
5190-5230	802.11ac VHT40 SDM/STBC/CDD	Covered by 802.11n HT40 2TX CDD	
5210	802.11ac VHT80 CDD	19.46	88.31
5210	802.11ac VHT80 SDM/STBC	Covered by 802.11ac VHT80 2TX CDD	
5180-5240	802.11ax HE20 OFDMA	19.45	88.10
5190-5230	802.11ax HE40 OFDMA	21.94	156.31
5210	802.11ax HE80 OFDMA	18.95	78.52

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5.3 GHz BAND (FCC)

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
5.3 GHz band, 1TX			
5260 - 5320	802.11a	Covered by 802.11n HT20 1TX	
5260 - 5320	802.11n HT20	19.48	88.72
5270 - 5310	802.11n HT40	19.98	99.54
5260 - 5320	802.11ac VHT20	Covered by 802.11n HT20 1TX	
5270 - 5310	802.11ac VHT40	Covered by 802.11n HT40 1TX	
5290	802.11ac VHT80	15.95	39.36
5260 - 5320	802.11ax HE20	19.48	88.72
5270 - 5310	802.11ax HE40	19.98	99.54
5290	802.11ax HE80	15.46	35.16
5.3 GHz band, 2TX			
5260 - 5320	802.11n HT20 CDD	19.48	88.72
5260 - 5320	802.11n HT20 SDM/STBC	Covered by 802.11n HT40 2TX CDD	
5270 - 5310	802.11n HT40 CDD	21.92	155.60
5270 - 5310	802.11n HT40 SDM/STBC	Covered by 802.11n HT40 2TX CDD	
5260 - 5320	802.11ac VHT20 SDM/STBC/CDD	Covered by 802.11n HT20 2TX CDD	
5270 - 5310	802.11ac VHT40 SDM/STBC/CDD	Covered by 802.11n HT40 2TX CDD	
5290	802.11ac VHT80 CDD	18.47	70.31
5290	802.11ac VHT80 SDM/STBC	Covered by 802.11ac VHT80 2TX CDD	
5260 - 5320	802.11ax HE20 OFDMA	19.45	88.10
5270 - 5310	802.11ax HE40 OFDMA	21.93	155.96
5290	802.11ax HE80 OFDMA	17.46	55.72

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5.6 GHz BAND (FCC)

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
5.6 GHz band, 1TX			
5500-5720	802.11a	Covered by 802.11n HT20 1TX	
5500-5720	802.11n HT20	19.48	88.72
5510-5710	802.11n HT40	19.98	99.54
5500-5720	802.11ac VHT20	Covered by 802.11n HT20 1TX	
5510-5710	802.11ac VHT40	Covered by 802.11n HT40 1TX	
5530-5690	802.11ac VHT80	19.95	98.86
5500-5720	802.11ax HE20	19.48	88.72
5510-5710	802.11ax HE40	19.98	99.54
5530-5690	802.11ax HE80	19.94	98.63
5.6 GHz band, 2TX			
5500-5720	802.11n HT20 CDD	19.48	88.72
5500-5720	802.11n HT20 SDM/STBC	Covered by 802.11n HT40 2TX CDD	
5510-5710	802.11n HT40 CDD	21.95	156.68
5510-5710	802.11n HT40 SDM/STBC	Covered by 802.11n HT40 2TX CDD	
5500-5720	802.11ac VHT20 SDM/STBC/CDD	Covered by 802.11n HT20 2TX CDD	
5510-5710	802.11ac VHT40 SDM/STBC/CDD	Covered by 802.11n HT40 2TX CDD	
5530-5690	802.11ac VHT80 CDD	22.98	198.61
5530-5690	802.11ac VHT80 SDM/STBC	Covered by 802.11ac VHT80 2TX CDD	
5500-5720	802.11ax HE20 OFDMA	19.47	88.51
5510-5710	802.11ax HE40 OFDMA	21.96	157.04
5530-5690	802.11ax HE80 OFDMA	22.98	198.61

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5.8 GHz BAND (FCC)

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
5.8 GHz band, 1TX			
5745-5825	802.11a	Covered by 802.11n HT20 1TX	
5745-5825	802.11n HT20	20.97	125.03
5755-5795	802.11n HT40	19.97	99.31
5745-5825	802.11ac VHT20	Covered by 802.11n HT20 1TX	
5755-5795	802.11ac VHT40	Covered by 802.11n HT40 1TX	
5775	802.11ac VHT80	19.98	99.54
5745-5825	802.11ax HE20	20.97	125.03
5755-5795	802.11ax HE40	19.98	99.54
5775	802.11ax HE80	19.98	99.54
5.8 GHz band, 2TX			
5745-5825	802.11n HT20 CDD	23.96	248.89
5745-5825	802.11n HT20 SDM/STBC	Covered by 802.11n HT40 2TX CDD	
5755-5795	802.11n HT40 CDD	22.96	197.70
5755-5795	802.11n HT40 SDM/STBC	Covered by 802.11n HT40 2TX CDD	
5745-5825	802.11ac VHT20 STM/STBC/CDD	Covered by 802.11n HT20 2TX CDD	
5755-5795	802.11ac VHT40 STM/STBC/CDD	Covered by 802.11n HT40 2TX CDD	
5775	802.11ac VHT80 CDD	22.97	198.15
5775	802.11ac VHT80 SDM/STBC	Covered by 802.11ac VHT80 2TX CDD	
5745-5825	802.11ax HE20 OFDMA	23.96	248.89
5755-5795	802.11ax HE40 OFDMA	22.95	197.24
5775	802.11ax HE80 OFDMA	22.99	199.07

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6.3. DESCRIPTION OF AVAILABLE ANTENNAS

The antenna(s) gain and type, as provided by the manufacturer' are as follows:
The radio utilizes Cable loss is 3.3dB

Frequency Range (GHz)	ANT 6 (dBi)	ANT 5 (dBi)
5.2	-1.9	-3.1
5.3	-0.4	-2.5
5.6	-0.6	-2.8
5.8	-0.1	-2.3

6.4. SOFTWARE AND FIRMWARE

The EUT firmware installed during testing was 20_97_1_4

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6.5. WORST-CASE CONFIGURATION AND MODE

The fundamental of the EUT was investigated in three orthogonal orientations X, Y and Z on ANT 6, ANT 5 and 2TX. It was determined that Z (Portrait) orientation was the worst-case orientation for ANT 6, ANT 5, and X orientation (Flatbed) for 2TX.

802.11n 2TX and 802.11ax 2TX modes were used to perform on radiated harmonic spurious final test to cover all SISO modes. Max power was tuned to maximum based on among all the modes. For testing purposes, radiated harmonics spurious below 1GHz, 1-18GHz L/M/H channels, 18-40GHz, and power line conducted emissions were performed with the EUT set at the 2TX CDD mode among the CDD/SDM modes with power setting equal or higher than FCC conducted SISO modes as worst-case scenario.

For Radiated band edge test all test modes have been investigated with power setting equal or higher than FCC conducted SISO modes as worst-case scenario.

Below 1GHz tests were performed with EUT connected to AC power adapter as the worst case; and for above 1GHz, the worst-case configuration reported was tested with EUT only. For AC line conducted emission, test was investigated with AC power adapter and with laptop. There were no emissions found below 30MHz within 20dB of the limit.

Simultaneous transmission with the bluetooth was investigated, and no noticeable emission was found.

The output power and psd for the IEEE 802.11 ax mode were investigated between all different tones, and baseline investigation SU mode had the highest output power and the lowest tone, RU26 on 5.2 and 5.8GHz band had the highest PSD readings, and for 5.3 and 5.6GHz band, RU106 are the worst case. Therefore, antenna port conducted and radiated tests were performed on 5.2 & 5.8 GHz band at SU, RU26 Tones and 5.3 and 5.6 GHz band at SU , RU106 tones.

With same power on Full RU and SU higher data rate, investigation were performed on both band edge to determine the worst case, and SU mode was determined to be the worst case.

Low data rate was used to test on antenna port conducted tests and radiated spurious emissions since it has the highest maximum power. For radiated band edge, the following are the worst-case data rates set for test:

802.11n HT20 mode: MCS7
802.11n HT40 mode: MCS7
802.11ac VHT80 mode: MCS9
802.11ax (5.2G & 5.8G bands): HE20/HE40/HE80 RU 26 Tones and SU mode: MCS11.
802.11ax (5.3G & 5.6G bands – Unsupported RU26): HE20/HE40/HE80 RU 106 Tones and SU mode: MCS11.

Note: In the Radiated Plots and emissions data, ANT0=ANT6 and ANT1=Ant 5.

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6.6. DESCRIPTION OF TEST SETUP

SUPPORT TEST EQUIPMENT				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID/ DoC**
Laptop	Apple	Macbook Pro	C02VD7SAHV22	BCGA1708
Laptop AC/DC adapter	Liteon Technology	A1424	NSW25679	DoC
EUT AC/DC adapter	Apple	A1720	C3D8417A7R93KVPA8	DoC
Conducted Switch Box	UL	n/a	208281	N/A
10dB Fixed Attenuator, 2 Watts Up to 26.5 GHz	Pasternack Enterprises	PE7024-10	236358	N/A

I/O CABLES (RF CONDUCTED TEST)						
Cable No.	**Port**	**# of Identical Ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	SMA	1	SMA	Shielded	0.75	To spectrum Analyzer
2	Antenna	2	SMA	Un-shielded	0.2	To Conducted Switch Box
3	USB-C	1	USB-C	Shielded	1.0	N/A
4	AC	1	AC	Un-shielded	2	N/A

I/O CABLES (RF RADIATED AND AC LINE CONDUCTED TEST)						
Cable No.	**Port**	**# of Identical Ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	AC	1	AC	Un-shielded	2	N/A
2	USB	1	USB	Shielded	1	N/A

TEST SETUP

The EUT setup is shown as below. Test software exercised the radio card.

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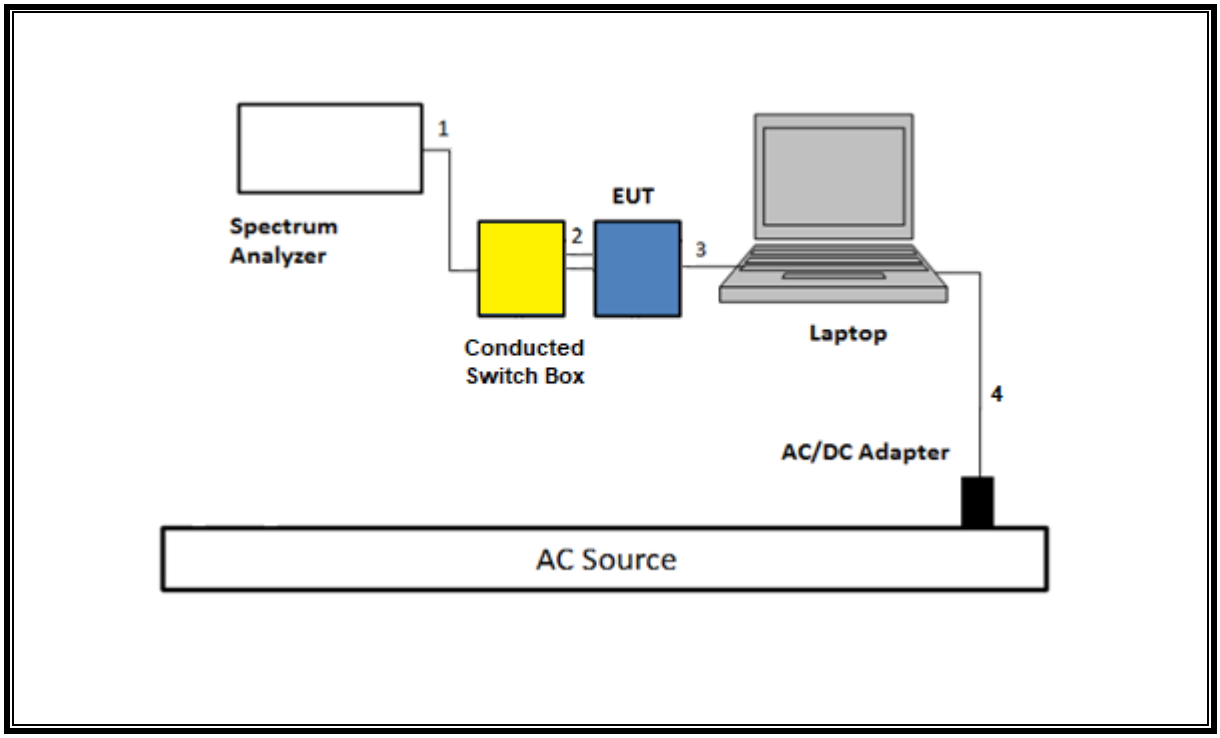
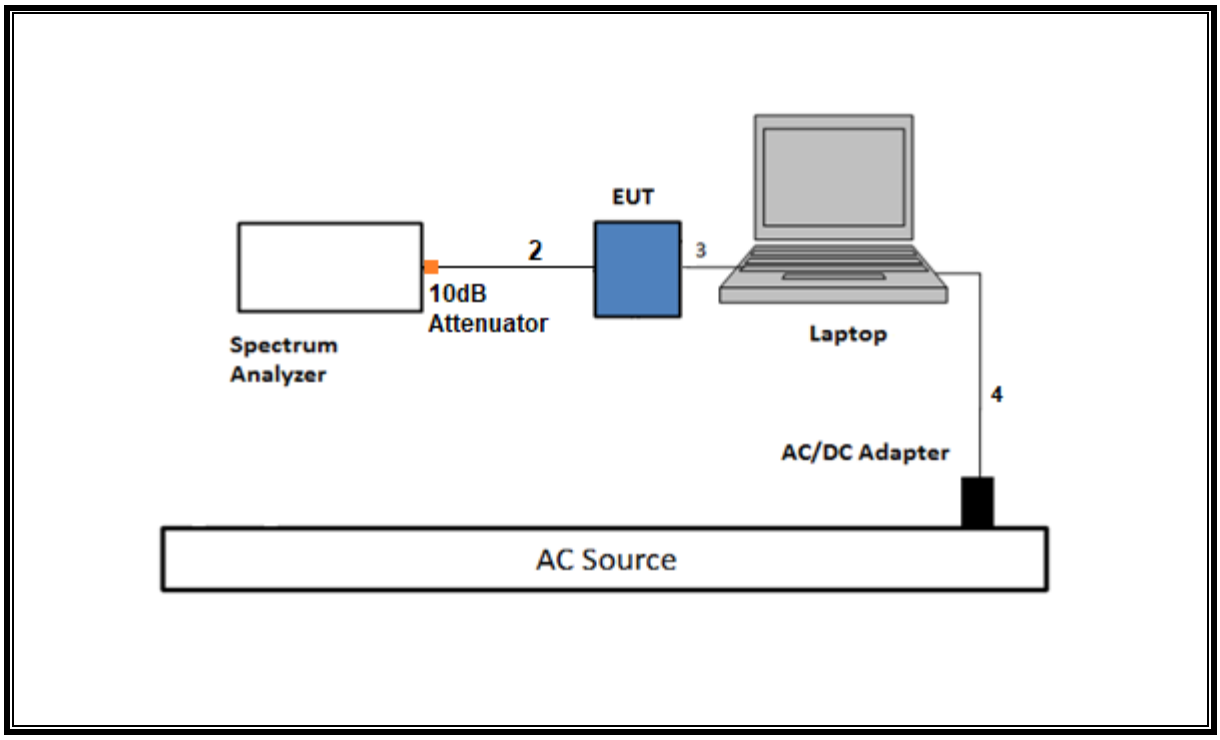
SETUP DIAGRAM FOR CONDUCTED TESTS





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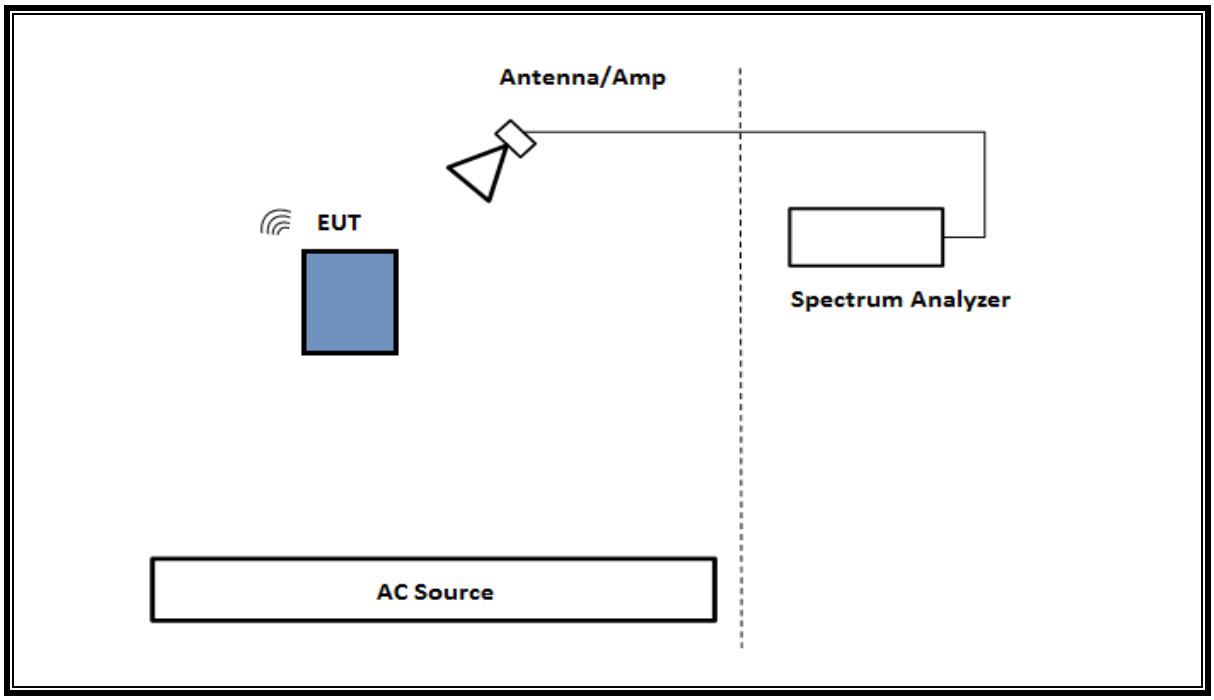
SETUP DIAGRAM FOR RADIATED TESTS Above 1 GHz



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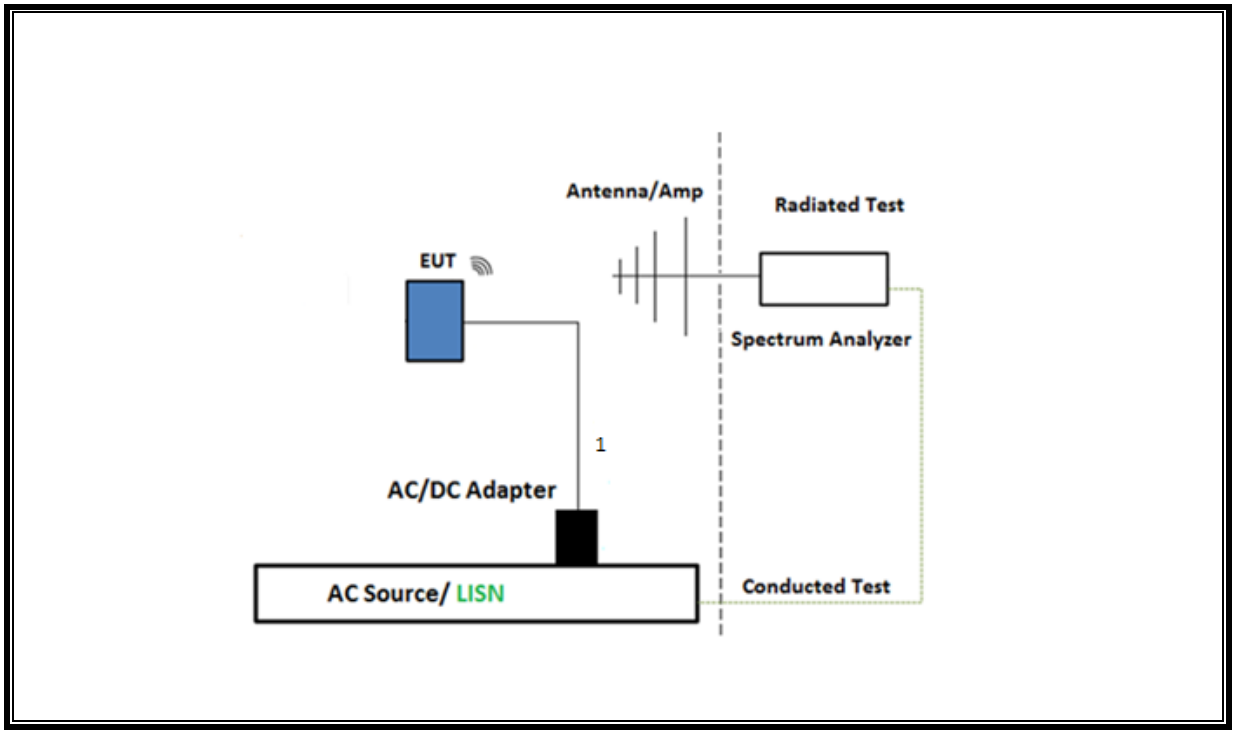
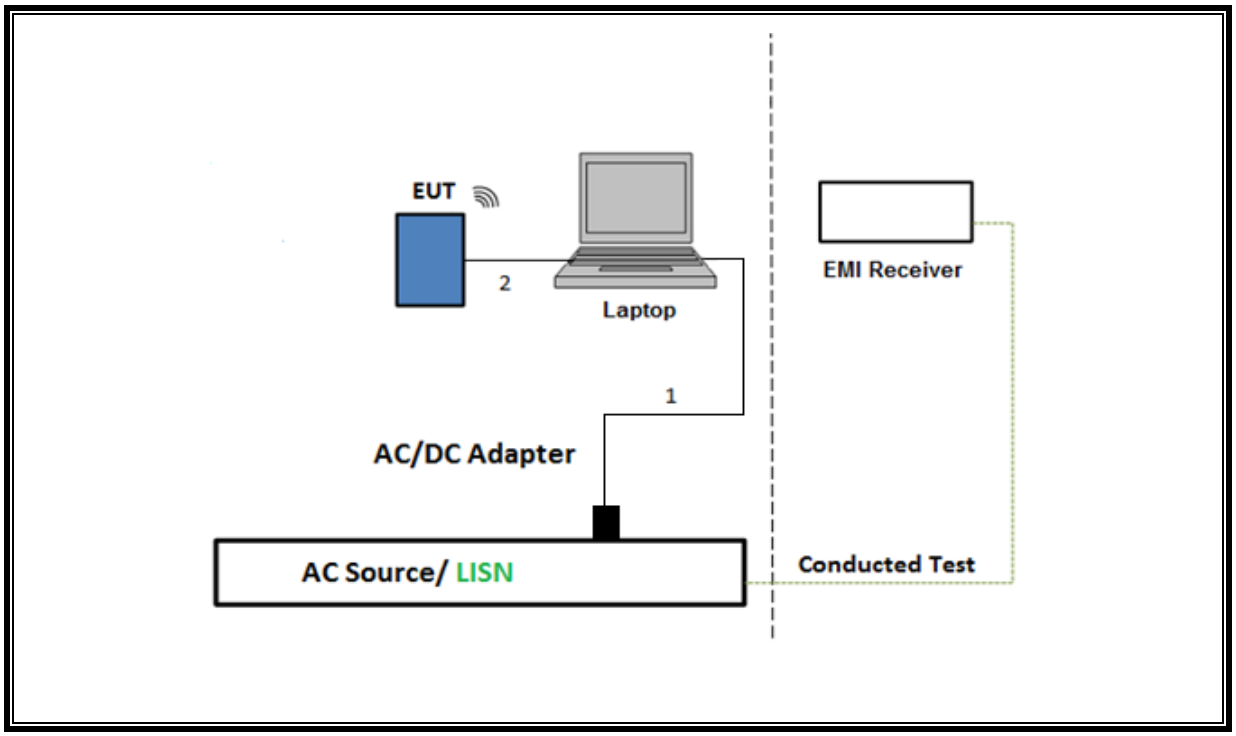
SETUP DIAGRAM FOR Below 1GHz and AC LINE CONDUCTED TEST



TEST SETUP- AC LINE CONDUCTED: LAPTOP CONFIGURATION



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7. MEASUREMENT METHOD

On Time and Duty Cycle: KDB 789033 D02 v02r01, Section B.

6 dB Emission BW: KDB 789033 D02 v02r01, Section C.2

26 dB Emission BW: KDB 789033 D02 v02r01, Section C.1

99% Occupied BW: KDB 789033 D02 v02r01, Section D.

Conducted Output Power: KDB 789033 D02 v02r01

Power Spectral Density: KDB 789033 D02 v02r01, Section F

Unwanted emissions in restricted bands: KDB 789033 D02 v02r01, Sections G.3, G.4, G.5, and G.6.

Unwanted emissions in non-restricted bands: KDB 789033 D02 v02r01, Sections G.3, G.4, and G.5.

AC Power Line Conducted Emissions: ANSI C63.10-2013, Section 6.2.

Radiated Spurious Emissions Below 30MHz: ANSI C63.10-2013 Section 6.4

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8. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

TEST EQUIPMENT LIST					
Description	**Manufacturer**	**Model**	**ID Num**	**Cal Due**	**Last Cal**
Spectrum Analyzer, PSA, 3Hz to 26.5GHz	Keysight Technologies Inc	E4440A	81311	02/29/2024	02/29/2023
Spectrum Analyzer, PXA, 3Hz to 44GHz	Keysight Technologies Inc	N9030A	80397	02/29/2024	02/29/2023
Spectrum Analyzer, PXA, 3Hz to 44GHz	Keysight Technologies Inc	N9030A	85214	02/29/2024	02/29/2023
Spectrum Analyzer, PXA, 3Hz to 44GHz	Keysight Technologies Inc	N9030A-544	PRE0074756	02/29/2024	02/292/2023
*Conducted Switch Box	N/A	CSB	221008	06/21/2023	06/21/2022
Conducted Switch Box	N/A	CSB	208281	04/30/2024	04/12/2023
10dB Fixed Attenuator, 2 Watts Up to 26.5 GHz	Pasternack Enterprises	PE7024-10	236358	Verified/Characterized before use	
10dB Fixed Attenuator, 2 Watts Up to 26.5 GHz	Pasternack Enterprises	PE7024-10	236355	Verified/Characterized before use	
Power Meter, P-series single channel	Keysight Technologies Inc	N1911A	90756	01/31/2024	01/31/2023
Power Sensor, P - series, 50MHz to 18GHz, Wideband	Keysight Technologies Inc	N1921A	90389	01/31/2024	01/31/2023
Antenna, Horn 1-18GHz	ETS Lindgren	3117	84797	09/20/2023	09/20/2022
Antenna, Horn 1-18GHz	ETS Lindgren	3117	200784	01/31/2024	01/31/2023
Antenna, Horn 1-18GHz	ETS Lindgren	3117	222740	08/31/2023	08/31/2022
Antenna, Horn 1-18GHz	ETS Lindgren	3117	230300	01/12/2024	01/12/2023
*Antenna, Horn 1-18GHz	ETS Lindgren	3117	80402	07/05/2023	07/05/2022
Antenna, Horn 1-18GHz	ETS Lindgren	3117	226672	01/09/2024	01/09/2023
Antenna, Horn 1-18GHz	ETS Lindgren	3117	230299	01/12/2024	01/12/2023
Antenna, Horn 1-18GHz	ETS Lindgren	3117	206807	02/28/2024	02/28/2023
Antenna, Horn 1-18GHz	ETS Lindgren	3117	226673	01/09/2024	01/09/2023
Antenna, Broadband Hybrid, 30MHz to 2000MHz	Sunol Sciences Corp.	JB3	80714	10/06/2023	10/06/2022
*Antenna Horn, 18 to 26.5GHz	ARA	MWH-1826/B	172353	06/01/2023	06/01/2022
*Antenna Horn, 26.5 to 40GHz	ARA	MWH-2640/B	172367	06/01/2023	06/01/2022
RF Filter Box, 1-18GHz	Miteq	UL-FR1	168534	07/31/2023	07/31/2022
*RF Filter Box 1-18GHz	UL-FR1	NA	168535	06/26/2023	06/26/2022
RF Filter Box, 1-18GHz	UL-FR1	N/A	171875	11/10/2023	11/10/2022
RF Filter Box	UL-FR1	N/A	172938	08/16/2023	08/16/2022
*RF Filter Box	UL-FR1	NA	173233	03/28/2023	03/28/2022
*RF Filter Box 1-18GHz	UL-FR1	NA	169334	04/15/2023	04/15/2022
*RF Filter Box, 1-18GHz	Fremont	SAC-L1	171013	06/24/2023	06/24/2022
RF Filter Box 1-18GHz	UL-FR	NA	206359	08/13/2023	08/13/2022
RF Filter Box 1-18GHz 12 Port	UL-FR1	Frankenstein	217255	08/23/2023	08/23/2022
*EMI Test Receiver	Rohde & Schwarz	ESW44	201501	02/19/2023	02/19/2022
EMI Receiver	Rohde & Schwarz	ESW44	201500	02/29/2024	02/29/2023
RF Amplifier Assembly, 18-26.5GHz, 60dB Gain	AMPLICAL	AMP18G26.5-60	171583	02/29/2024	02/29/2023

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TEST EQUIPMENT LIST					
Description	**Manufacturer**	**Model**	**ID Num**	**Cal Due**	**Last Cal**
Antenna, Passive Loop 100KHz to 30MHz	ETS-Lindgren	EM-6872	170015	07/28/2023	07/28/2022
Antenna, Passive Loop 30Hz to 1MHz	Electro-Metrics	EM-6871	170013	07/28/2023	07/28/2022
*Antenna, Horn 1-18GHz	ETS Lindgren	3117	200786	02/24/2023	02/24/2022
RF Filter Box 1-18GHz	UL-FR13528	NA	173528	12/22/2023	12/22/2022
Antenna, Horn 1-18GHz	ETS Lindgren	3117	222741	08/31/2023	08/31/2022
RF Filter, 1-18GHz, 12 Port	UL-FR1	Frankenstein 1	216812	09/17/2023	09/17/2022
Antenna, Horn 1-18GHz	ETS Lindgren	3117	200896	02/28/2024	02/28/2023
RF Filter Box 1-18GHz	UL-FR1	SAC 12 port rf box	217521	10/09/2023	10/09/2022
Amplifier, 9KHz to 1GHz, 32dB	SONOMA INSTRUMENT	310	204041	08/24/2023	08/24/2022
EMI Receiver	Rohde & Schwarz	ESW44	201502	02/29/2024	02/29/2023
EMI Receiver	Rohde & Schwarz	ESW44	235670	04/30/2024	04/30/2023
Link File, RF Amplifier Assembly, 26-40GHz, 65dB Gain	AMPLICAL	AMP26G40-65	172346	02/29/2024	02/29/2023
EMI Receiver	Rohde & Schwarz	ESW44	201497	02/29/2024	02/29/2023
EMI Receiver	Rohde & Schwarz	ESW44	201498	02/29/2024	02/29/2023
EMI Test Receiver	Rohde & Schwarz	ESW44	169927	02/29/2024	02/29/2023

AC Line Conducted					
Description	**Manufacturer**	**Model**	**ID Num**	**Cal Due**	**Last Cal**
EMI Test Receiver 9kHz-7GHz	Rohde & Schwarz	ESR	93091	02/29/2024	02/29/2023
LISN for Conducted Emissions CISPR-16	FISCHER CUSTOM COMMUNICATIONS	FCC-LISN-50/250-25-2-01-480V	175765	01/31/2024	01/31/2023
Transient Limiter	TE	TBFL1	207996	07/15/2023	07/15/2022
UL AUTOMATION SOFTWARE					
Radiated Software	UL	UL EMC	Ver 9.5, Mar 6, 2020		
Conducted Software	UL	UL EMC	2020.2.26		
AC Line Conducted Software	UL	UL EMC	Ver 9.5, February 21, 2020		

*Testing is completed before equipment expiration date.

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9. ANTENNA PORT TEST RESULTS

9.1. ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only.

PROCEDURE

KDB 558074 Zero-Span Spectrum Analyzer Method.

ON TIME AND DUTY CYCLE RESULTS

Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/B Minimum VBW (kHz)
5GHz Band						
802.11n HT20 MCS0	3.767	3.791	0.994	99.37%	0.00	0.010
802.11n HT20 MCS7	0.228	0.250	0.914	91.38%	0.39	4.386
802.11n HT40 MCS0	4.793	4.818	0.995	99.48%	0.00	0.010
802.11n HT40 MCS7	0.128	0.149	0.861	86.10%	0.65	7.800
802.11ac VHT80 MCS0	2.239	2.267	0.988	98.76%	0.00	0.010
802.11ac VHT80 MCS9	0.093	0.116	0.804	80.42%	0.95	10.738
802.11ax HE20 RU26, MCS0	3.992	4.025	0.992	99.18%	0.00	0.010
802.11ax HE20 RU26, MCS11	0.292	0.327	0.894	89.41%	0.49	3.425
802.11ax HE20 RU106, MCS0	3.518	3.540	0.994	99.38%	0.00	0.010
802.11ax HE20 RU106 MCS11	0.940	0.964	0.975	97.51%	0.11	1.064
802.11ax HE40 RU26, MCS0	3.992	4.025	0.992	99.18%	0.00	0.010
802.11ax HE40 RU26, MCS11	0.293	0.325	0.901	90.15%	0.45	3.415
802.11ax HE40 RU106, MCS0	3.519	3.550	0.991	99.13%	0.00	0.010
802.11ax HE40 RU106, MCS11	0.941	0.973	0.967	96.71%	0.15	1.063
802.11ax HE80 RU26, MCS0	3.992	4.035	0.989	98.93%	0.00	0.010
802.11ax HE80 RU26, MCS11	0.121	0.153	0.788	78.77%	1.04	8.292
802.11ax HE80 RU106, MCS0	3.516	3.550	0.990	99.04%	0.00	0.010
802.11ax HE80 RU106 MCS11	0.264	0.297	0.889	88.89%	0.51	3.786

Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/B Minimum VBW (kHz)
5GHz Band						
802.11ax HE20 SU, MCS0	1.487	1.511	0.984	98.41%	0.00	0.010
802.11ax HE20 SU, MCS11	0.147	0.168	0.875	87.50%	0.58	6.803
802.11ax HE40 SU, MCS0	0.771	0.795	0.970	97.03%	0.13	1.296
802.11ax HE40 SU, MCS11	0.102	0.123	0.829	82.93%	0.81	9.804
802.11ax HE80 SU, MCS0	0.400	0.423	0.947	94.68%	0.24	2.498
802.11ax HE80 SU, MCS11	0.082	0.105	0.784	78.39%	1.06	12.161
802.11n HT20 SDM MCS0	0.992	1.015	0.977	97.72%	0.10	1.008
802.11n HT40 SDM MCS0	0.500	0.523	0.955	95.55%	0.20	2.000
802.11ac VHT80 SDM MCS0	0.256	0.278	0.919	91.91%	0.37	3.914
802.11ax HE20 RU26 SDM MCS0	3.992	4.025	0.992	99.18%	0.00	0.010
802.11ax HE40 RU26 SDM MCS0	3.990	4.025	0.991	99.13%	0.00	0.010
802.11ax HE80 RU26 SDM MCS0	3.977	4.035	0.986	98.56%	0.00	0.010
802.11ax HE20 SU SDM MCS0	0.779	0.803	0.970	97.01%	0.13	1.284
802.11ax HE40 SU SDM MCS0	0.422	0.445	0.948	94.76%	0.23	2.372
802.11ax HE80 SU SDM MCS0	0.239	0.263	0.909	90.87%	0.42	4.184

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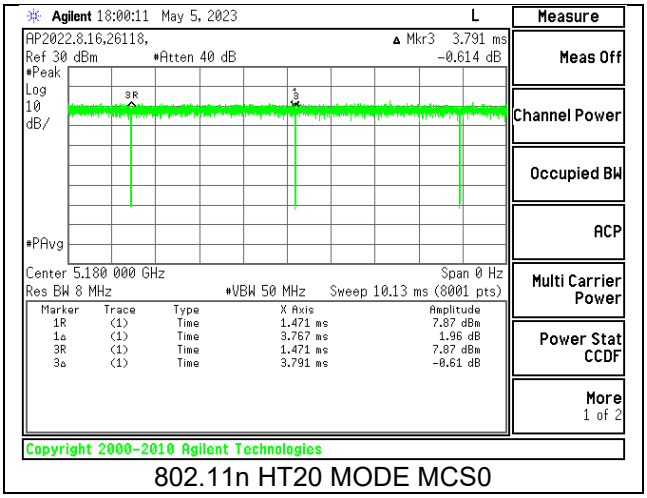
DUTY CYCLE PLOTS



802.11n HT20 MODE MCS0

Note: There are same duty cycle factor on 1TX and 2TX

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9.2. 26 dB AND 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

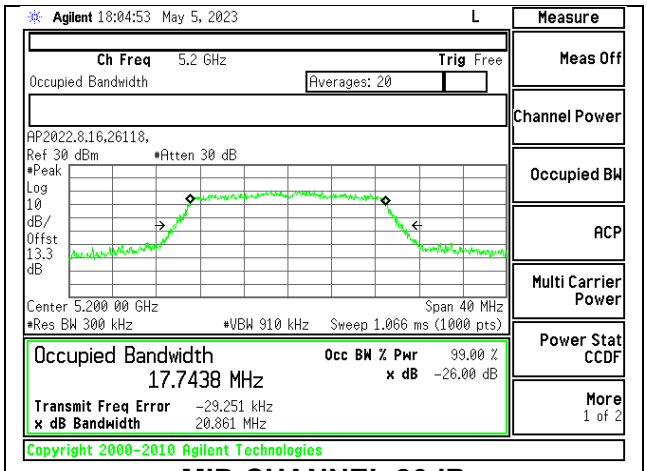
RESULTS

ID:	26118	Date:	5/5/2023

9.2.1. 802.11n HT20 MODE IN THE 5.2 GHz BAND

1TX Antenna 6 MODE

Channel	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5180	22.57	17.8952
Mid	5200	20.86	17.7438
High	5240	20.59	17.7156



MID CHANNEL 26dB

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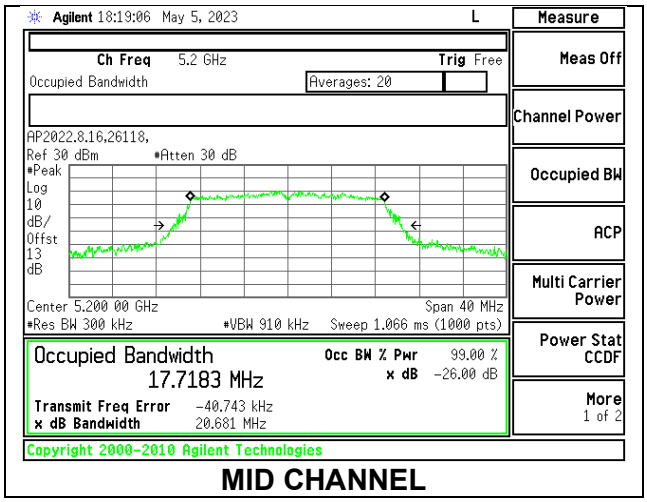
1TX Antenna 5 MODE

Channel	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5180	22.35	17.8769
Mid	5200	20.68	17.7183
High	5240	20.88	17.7799



MID CHANNEL

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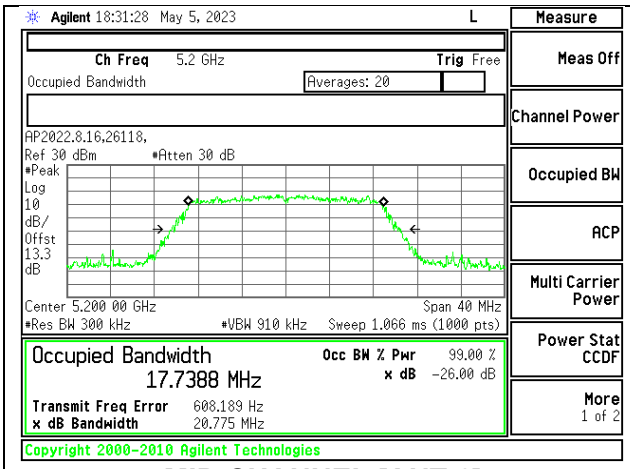
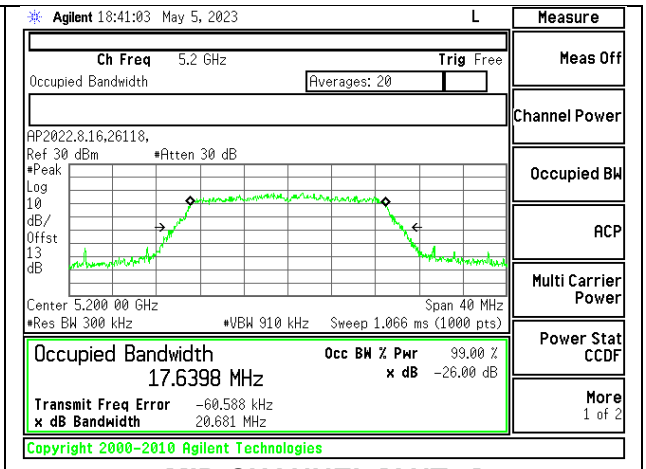
2TX Antenna 6 + Antenna 5 CDD MODE

Channel	Frequency (MHz)	26dB Bandwidth Antenna 6 (MHz)	26dB Bandwidth Antenna 5 (MHz)	99% Bandwidth Antenna 6 (MHz)	99% Bandwidth Antenna 5 (MHz)
Low	5180	22.11	21.34	17.7859	17.8126
Mid	5200	20.77	20.68	17.7388	17.6398
High	5240	20.39	20.83	17.7083	17.2770



MID CHANNEL [ANT 6]



MID CHANNEL [ANT 5]

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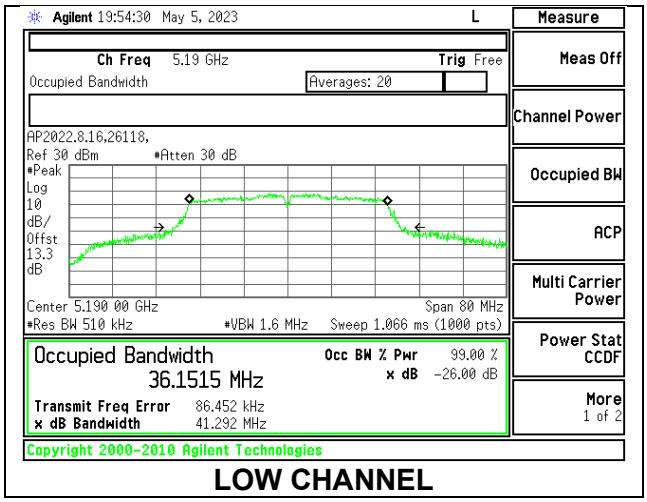
9.2.2. 802.11n HT40 MODE IN THE 5.2 GHz BAND

1TX Antenna 6 MODE

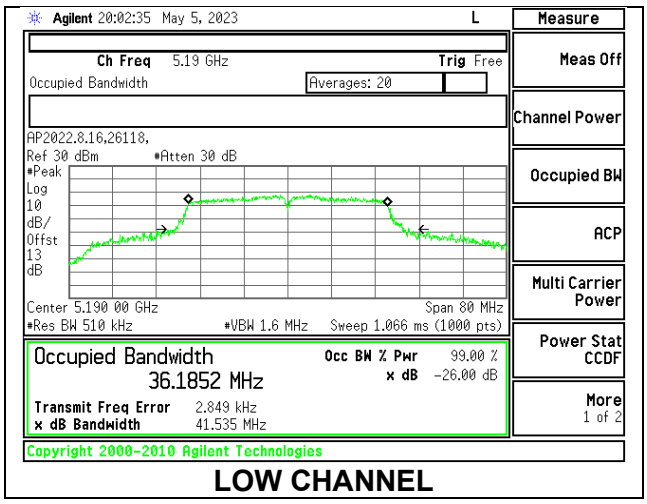
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5190	41.29	36.1515
High	5230	40.77	36.2198



LOW CHANNEL

1TX Antenna 5 MODE

Channel	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5190	41.53	36.1852
High	5230	40.54	36.0721



LOW CHANNEL

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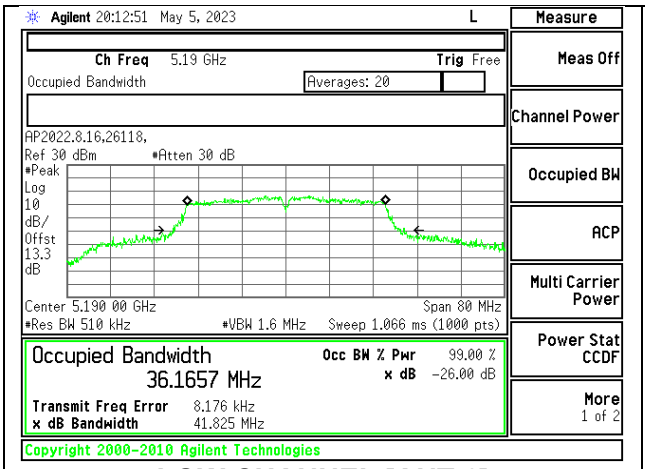
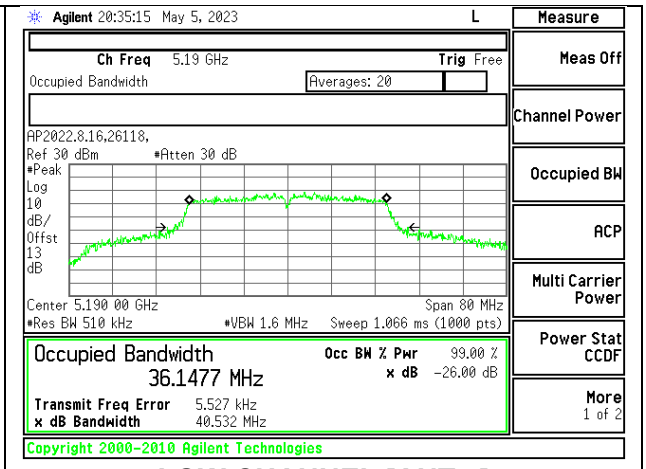
2TX Antenna 6 + Antenna 5 CDD MODE

Channel	Frequency (MHz)	26dB Bandwidth Antenna 6 (MHz)	26dB Bandwidth Antenna 5 (MHz)	99% Bandwidth Antenna 6 (MHz)	99% Bandwidth Antenna 5 (MHz)
Low	5190	41.82	40.53	36.1657	36.1477
High	5230	40.67	40.52	36.1367	36.3404



LOW CHANNEL [ANT 6]



LOW CHANNEL [ANT 5]

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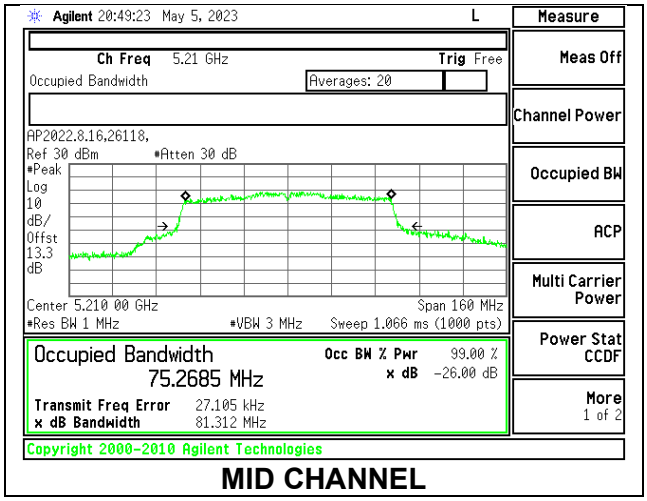
9.2.3. 802.11ac VHT80 MODE IN THE 5.2 GHz BAND

1TX Antenna 6 MODE

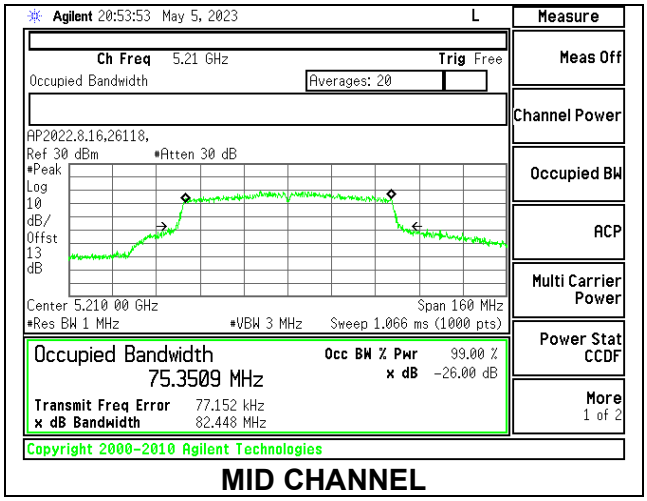
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Mid	5210	81.31	75.2685



MID CHANNEL

1TX Antenna 5 MODE

Channel	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Mid	5210	82.44	75.3509



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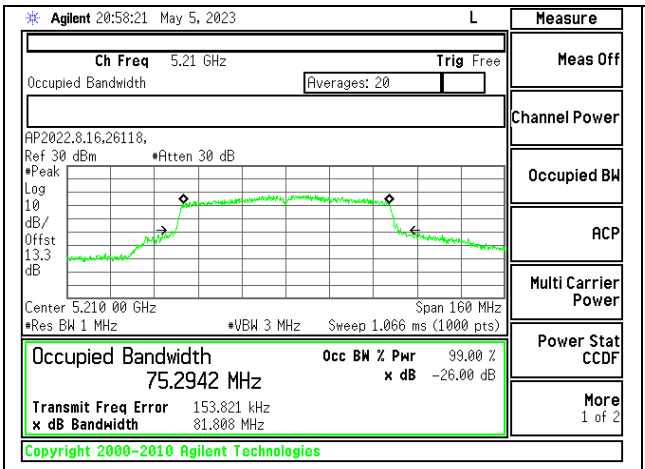
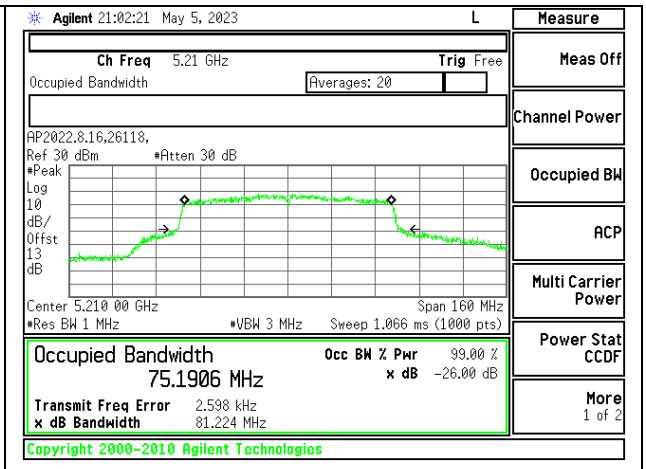
2TX Antenna 6 + Antenna 5 CDD MODE

Channel	Frequency (MHz)	26dB Bandwidth Antenna 6 (MHz)	26dB Bandwidth Antenna 5 (MHz)	99% Bandwidth Antenna 6 (MHz)	99% Bandwidth Antenna 5 (MHz)
Mid	5210	81.80	81.22	75.2942	75.1906



MID CHANNEL [ANT 6]



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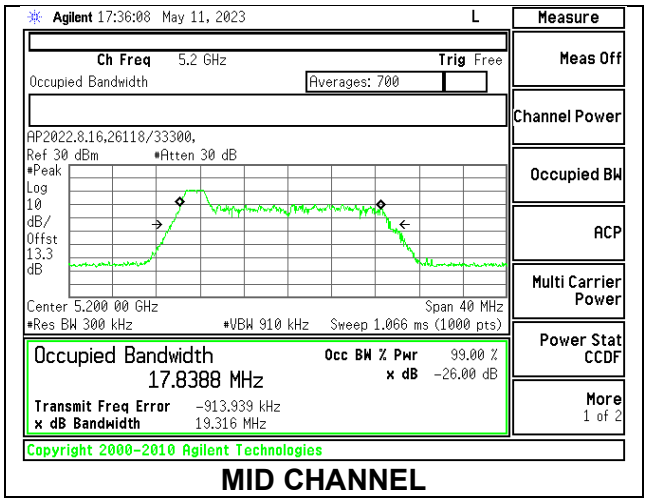
9.2.4. 802.11ax HE20 MODE IN THE 5.2 GHz BAND

1TX Antenna 6 MODE: 26 Tones, RU Index 0

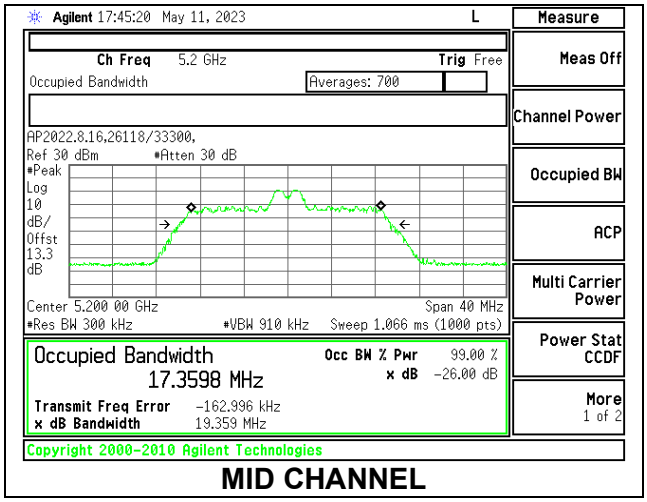
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5180	18.84	17.4486
Mid	5200	19.31	17.8388
High	5240	20.08	18.3613



MID CHANNEL

1TX Antenna 6 MODE: 26 Tones, RU Index 4

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5180	18.75	17.1664
Mid	5200	19.35	17.3598
High	5240	19.42	17.2401



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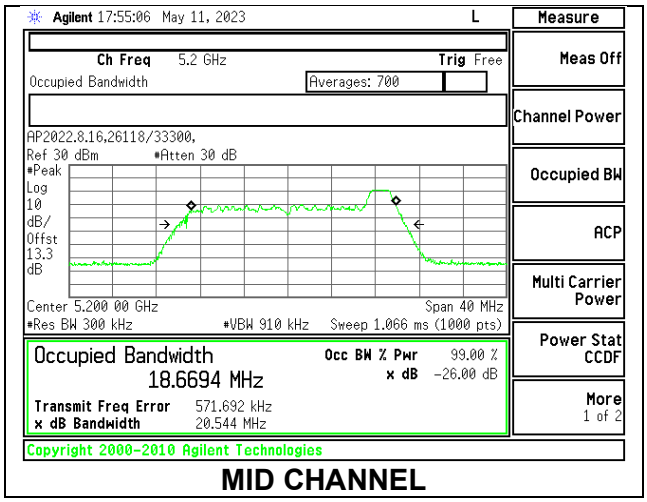
1TX Antenna 6 MODE: 26 Tones, RU Index 8

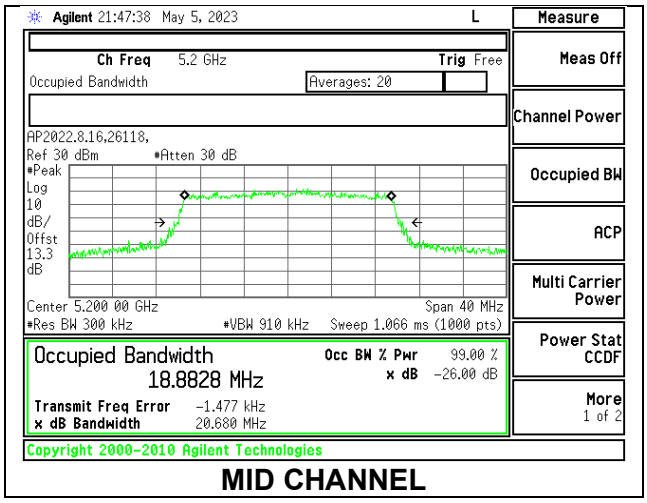
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5180	20.47	18.5678
Mid	5200	20.54	18.6694
High	5240	20.70	18.6575



MID CHANNEL

1TX Antenna 6 MODE: SU Mode

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5180	21.30	18.9005
Mid	5200	20.68	18.8828
High	5240	20.46	18.8958



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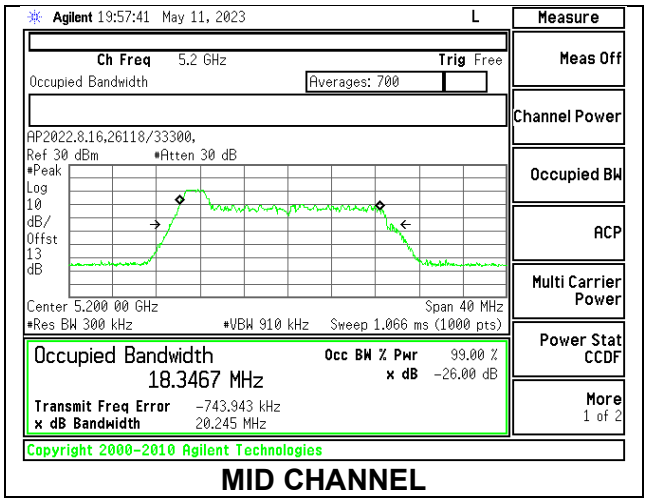
1TX Antenna 5 MODE: 26 Tones, RU Index 0

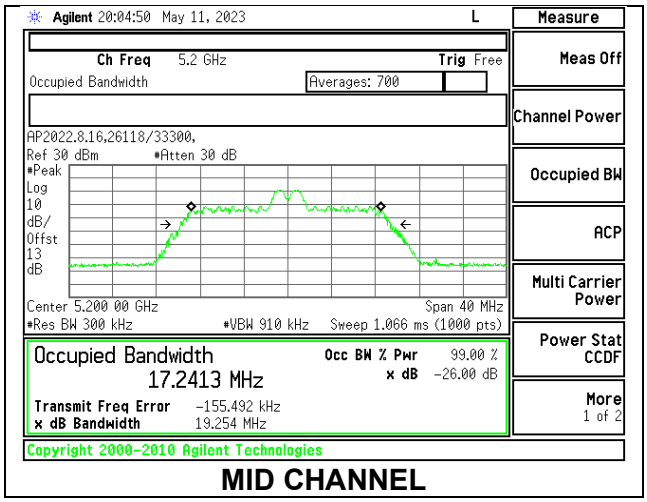
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5180	20.07	18.4521
Mid	5200	20.45	18.3467
High	5240	19.87	18.3976



MID CHANNEL

1TX Antenna 5 MODE: 26 Tones, RU Index 4

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5180	19.07	17.0868
Mid	5200	19.25	17.2413
High	5240	19.17	17.1324



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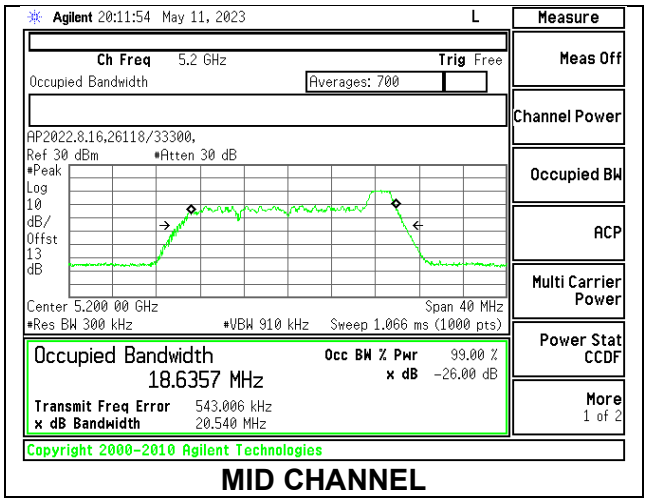
1TX Antenna 5 MODE: 26 Tones, RU Index 8

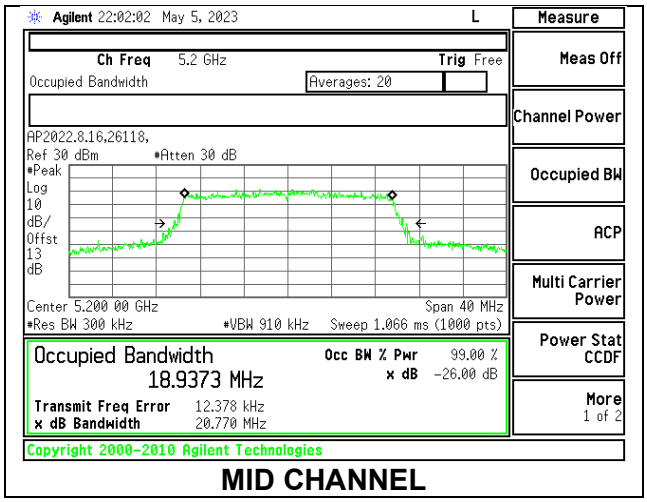
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5180	20.62	18.6608
Mid	5200	20.54	18.6357
High	5240	20.60	18.6009



MID CHANNEL

1TX Antenna 5 MODE: SU Mode

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5180	20.74	18.9224
Mid	5200	20.77	18.9373
High	5240	20.66	18.8411



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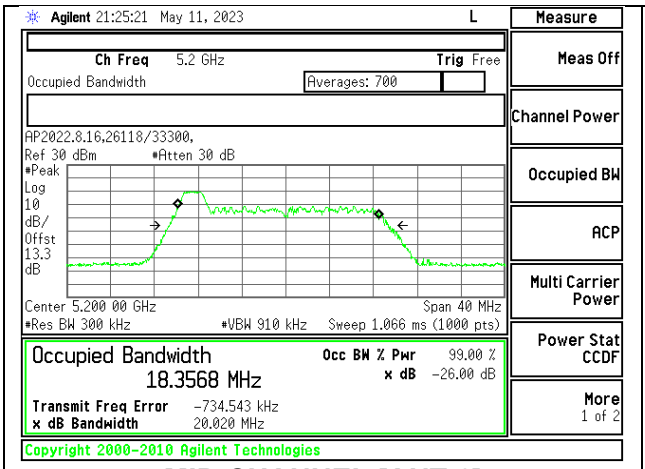
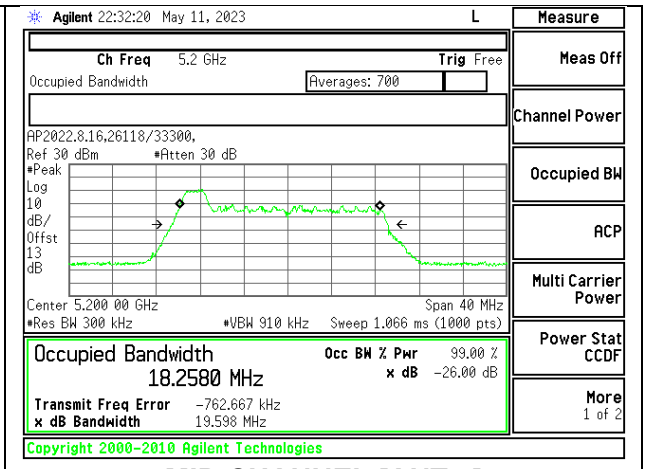
2TX Antenna 6 + Antenna 5 CDD MODE: 26 Tones, RU Index 0

Channel	Frequency (MHz)	26 dB Bandwidth Antenna 6 (MHz)	26 dB Bandwidth Antenna 5 (MHz)	99% Bandwidth Antenna 6 (MHz)	99% Bandwidth Antenna 5 (MHz)
Low	5180	19.43	18.18	18.0543	16.8716
Mid	5200	20.02	19.59	18.3568	18.2580
High	5240	20.16	19.70	18.4088	18.2959



MID CHANNEL [ANT 6]



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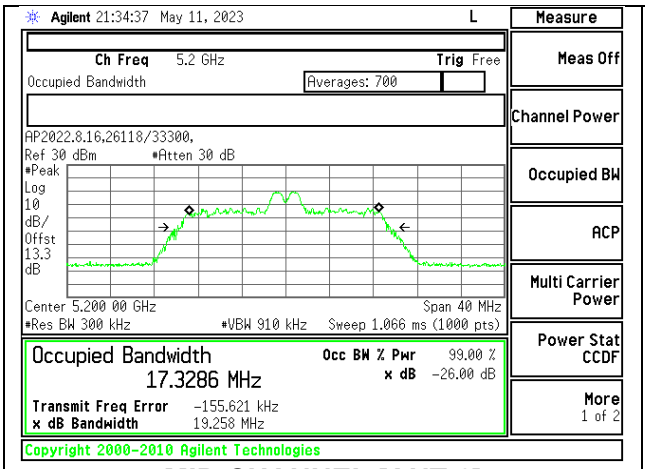
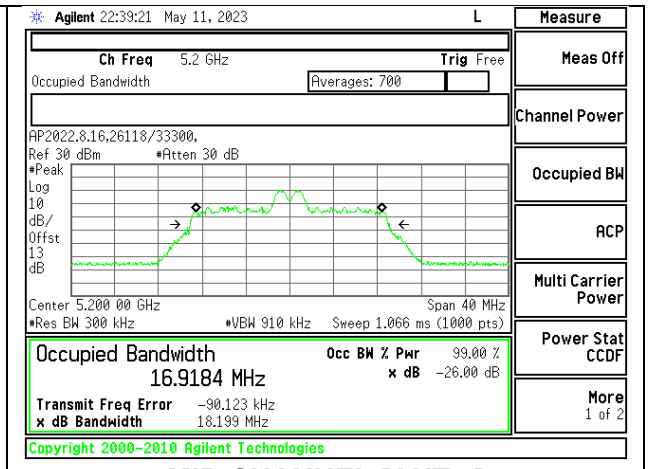
2TX Antenna 6 + Antenna 5 CDD MODE: 26 Tones, RU Index 4

Channel	Frequency (MHz)	26 dB Bandwidth Antenna 6 (MHz)	26 dB Bandwidth Antenna 5 (MHz)	99% Bandwidth Antenna 6 (MHz)	99% Bandwidth Antenna 5 (MHz)
Low	5180	18.78	18.25	17.0259	16.8546
Mid	5200	19.25	18.20	17.3286	16.9184
High	5240	19.20	18.24	17.1426	16.6918



MID CHANNEL [ANT 6]



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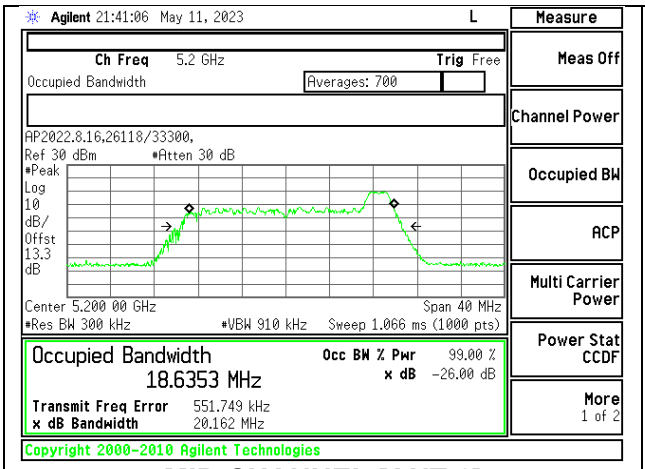
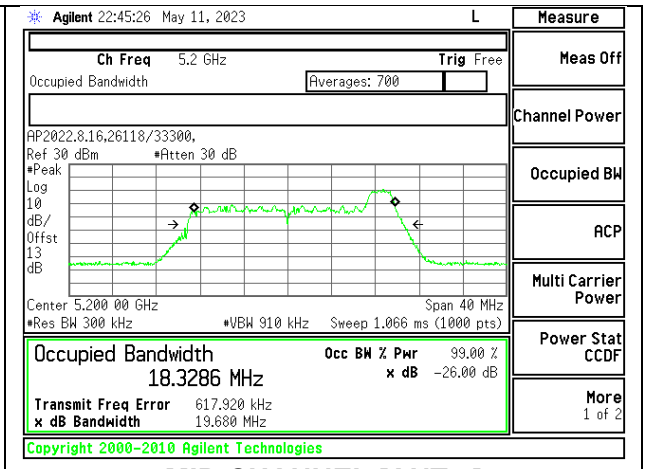
2TX Antenna 6 + Antenna 5 CDD MODE: 26 Tones, RU Index 8

Channel	Frequency (MHz)	26 dB Bandwidth Antenna 6 (MHz)	26 dB Bandwidth Antenna 5 (MHz)	99% Bandwidth Antenna 6 (MHz)	99% Bandwidth Antenna 5 (MHz)
Low	5180	20.48	19.67	18.6154	18.2479
Mid	5200	20.16	19.68	18.6353	18.3286
High	5240	20.61	19.34	18.5406	17.7672



MID CHANNEL [ANT 6]



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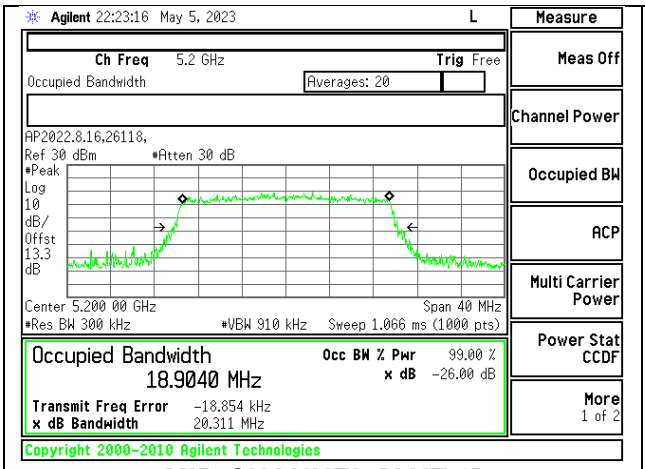
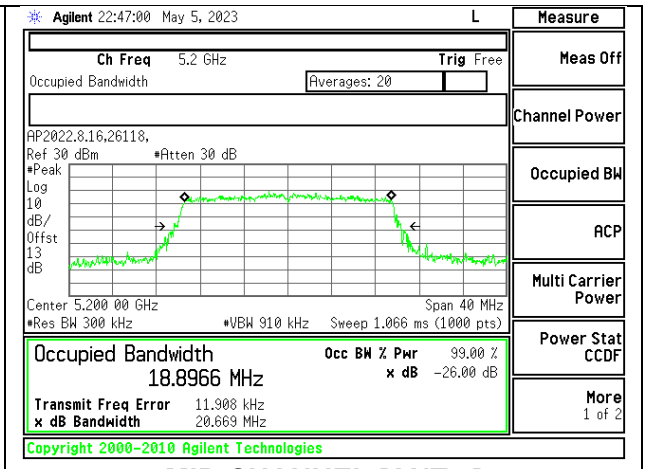
2TX Antenna 6 + Antenna 5 CDD MODE: SU Mode

Channel	Frequency (MHz)	26 dB Bandwidth Antenna 6 (MHz)	26 dB Bandwidth Antenna 5 (MHz)	99% Bandwidth Antenna 6 (MHz)	99% Bandwidth Antenna 5 (MHz)
Low	5180	21.06	22.13	18.8544	18.9272
Mid	5200	20.31	20.66	18.9040	18.8966
High	5240	20.45	20.43	18.8682	18.8583



MID CHANNEL [ANT 6]



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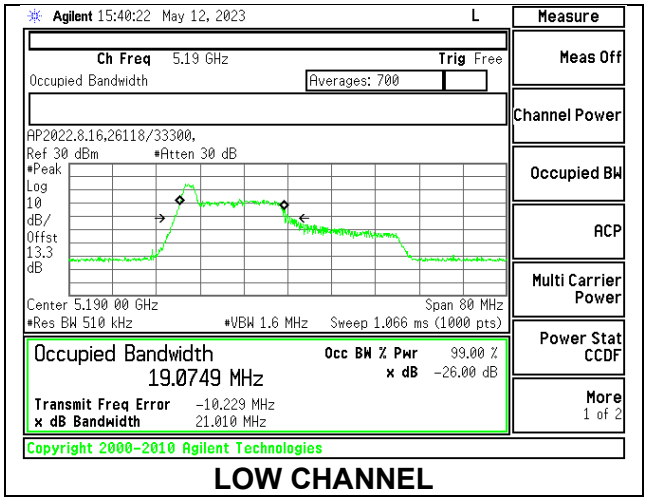
9.2.5. 802.11ax HE40 MODE IN THE 5.2 GHz BAND

1TX Antenna 6 MODE: 26 Tones, RU Index 0

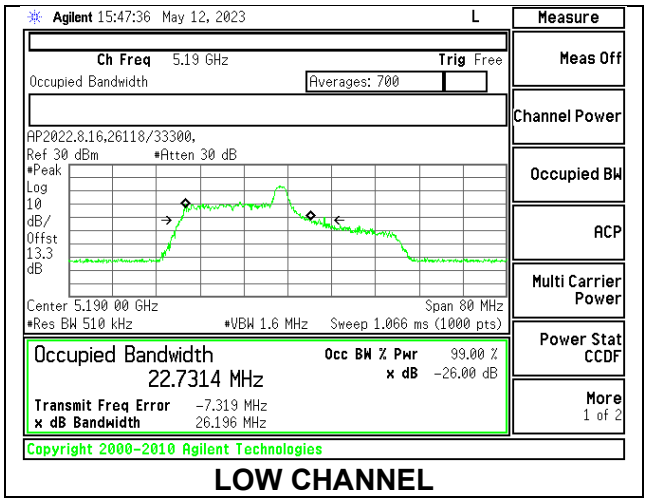
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5190	21.01	19.0749
High	5230	21.11	19.0062



LOW CHANNEL

1TX Antenna 6 MODE: 26 Tones, RU Index 8

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5190	26.19	22.7314
High	5230	24.44	22.4400



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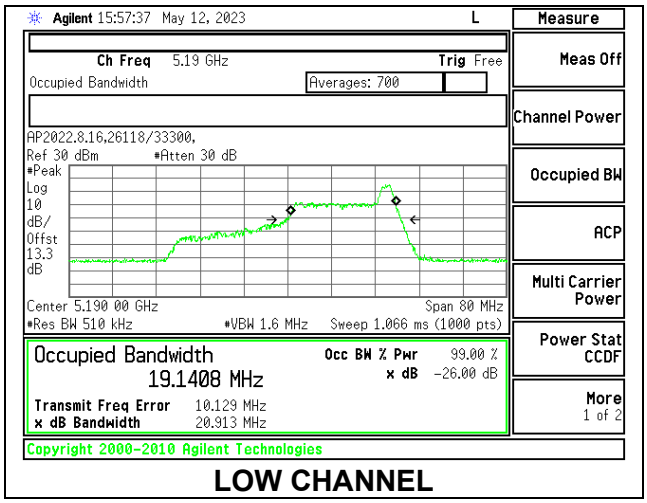
1TX Antenna 6 MODE: 26 Tones, RU Index 17

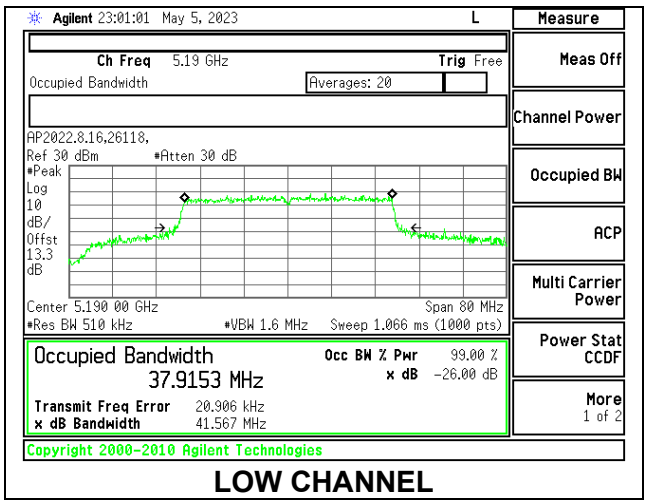
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5190	20.91	19.1408
High	5230	21.17	18.8179



LOW CHANNEL

1TX Antenna 6 MODE: SU Mode

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5190	41.56	37.9153
High	5230	40.82	37.8504



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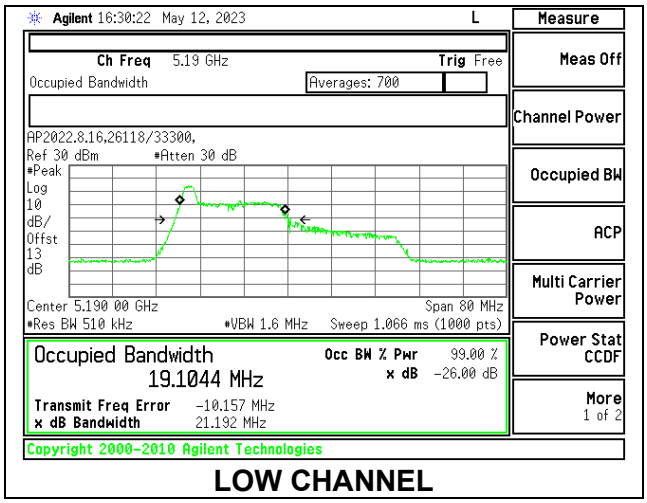
1TX Antenna 5 MODE: 26 Tones, RU Index 0

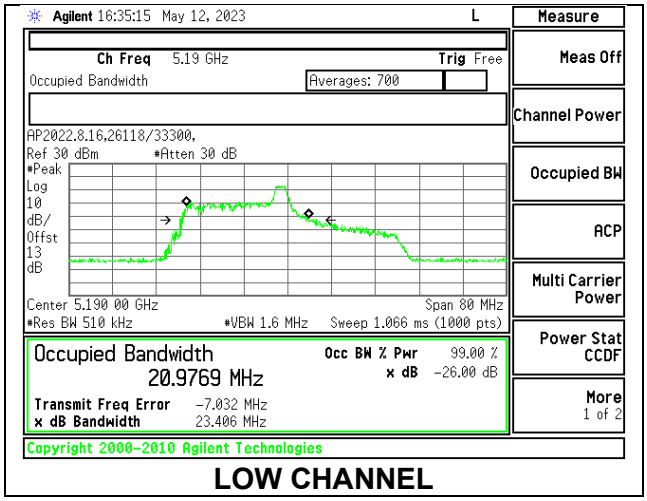
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5190	21.19	19.1044
High	5230	20.13	18.7648



LOW CHANNEL

1TX Antenna 5 MODE: 26 Tones, RU Index 8

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5190	23.40	20.9769
High	5230	23.72	22.0408



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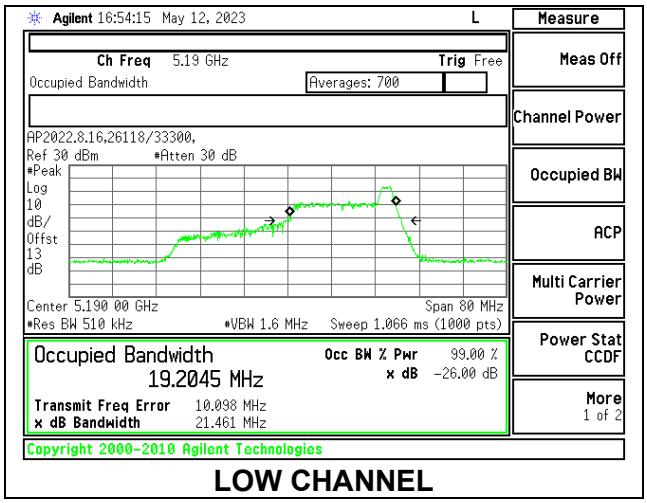
1TX Antenna 6 MODE: 26 Tones, RU Index 17

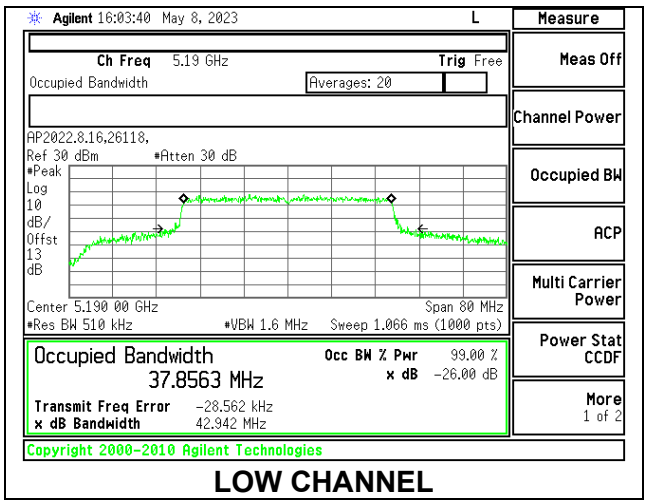
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5190	21.46	19.2045
High	5230	20.90	19.2124



LOW CHANNEL

1TX Antenna 6 MODE: SU Mode

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5190	42.94	37.8563
High	5230	40.61	37.8012



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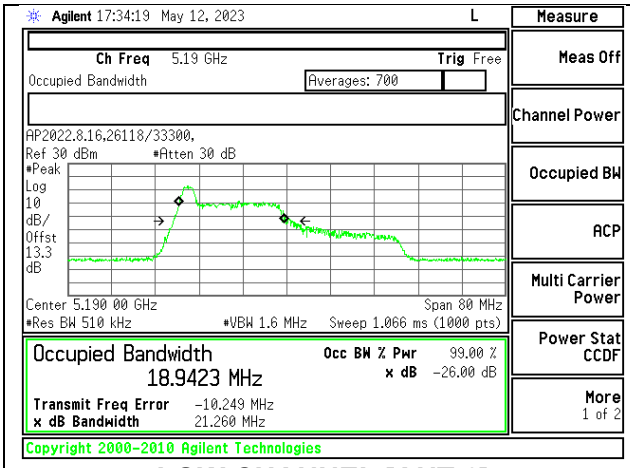
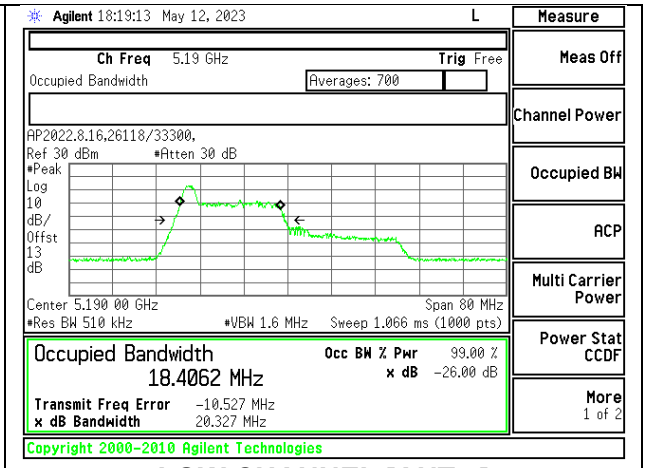
2TX Antenna 6 + Antenna 5 CDD MODE: 26 Tones, RU Index 0

Channel	Frequency (MHz)	26 dB Bandwidth Antenna 6 (MHz)	26 dB Bandwidth Antenna 5 (MHz)	99% Bandwidth Antenna 6 (MHz)	99% Bandwidth Antenna 5 (MHz)
Low	5190	21.26	20.32	18.9423	18.4062
High	5230	20.67	19.95	18.9972	18.1924



LOW CHANNEL [ANT 6]



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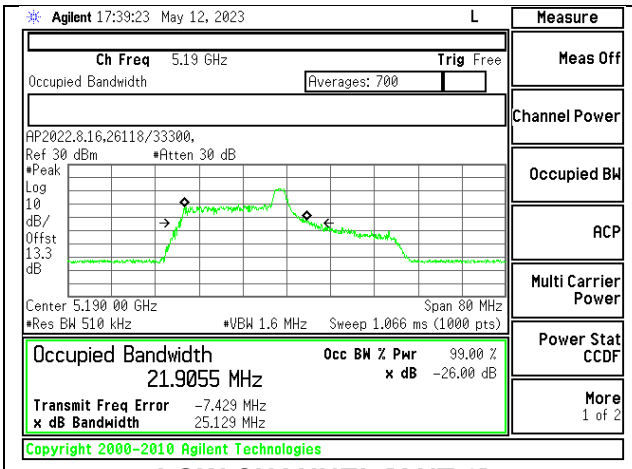
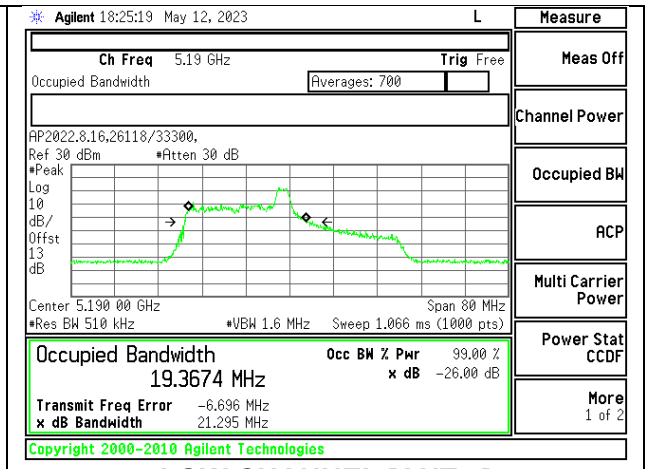
2TX Antenna 6 + Antenna 5 CDD MODE: 26 Tones, RU Index 8

Channel	Frequency (MHz)	26 dB Bandwidth Antenna 6 (MHz)	26 dB Bandwidth Antenna 5 (MHz)	99% Bandwidth Antenna 6 (MHz)	99% Bandwidth Antenna 5 (MHz)
Low	5190	25.12	21.29	21.9055	19.3674
High	5230	22.54	21.34	21.2259	20.0372



LOW CHANNEL [ANT 6]



LOW CHANNEL [ANT 5]

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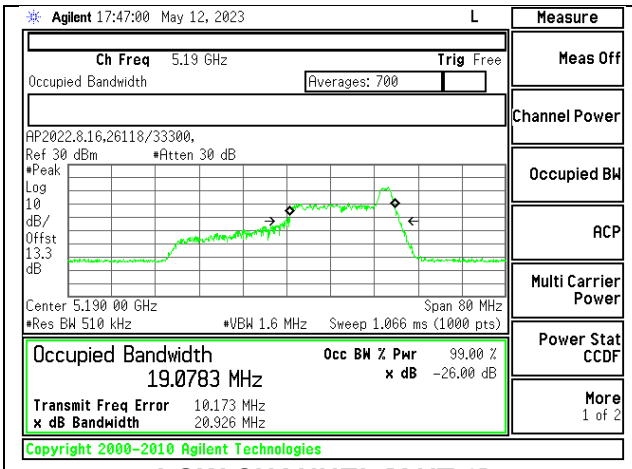
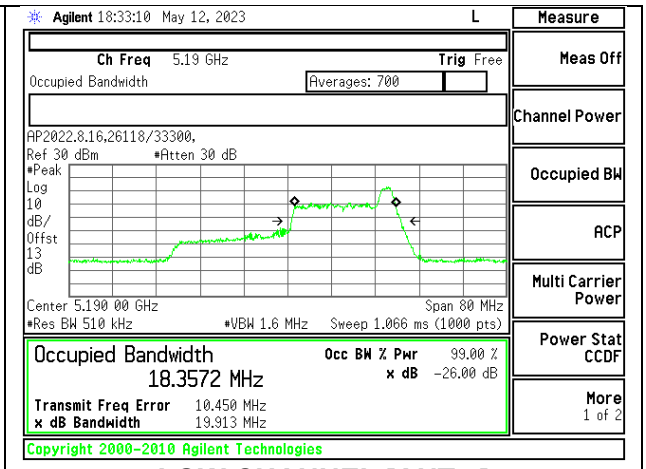
2TX Antenna 6 + Antenna 5 CDD MODE: 26 Tones, RU Index 17

Channel	Frequency (MHz)	26 dB Bandwidth Antenna 6 (MHz)	26 dB Bandwidth Antenna 5 (MHz)	99% Bandwidth Antenna 6 (MHz)	99% Bandwidth Antenna 5 (MHz)
Low	5190	20.92	19.91	19.0783	18.3572
High	5230	21.33	20.01	19.2008	18.4574



LOW CHANNEL [ANT 6]



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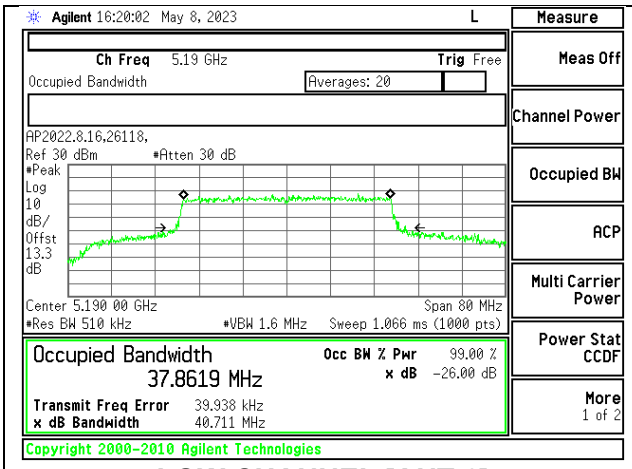
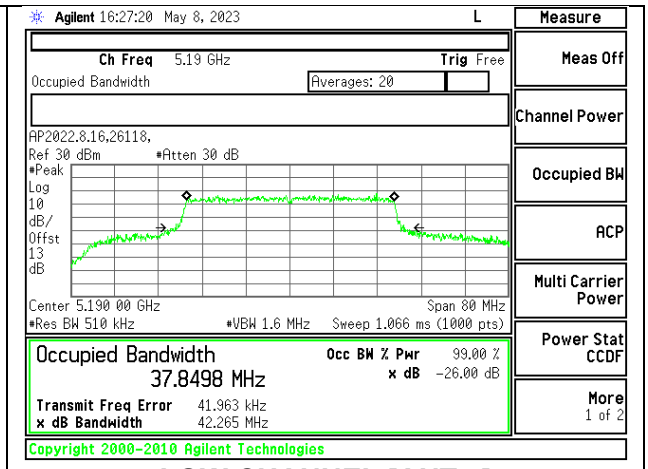
2TX Antenna 6 + Antenna 5 CDD MODE: SU Mode

Channel	Frequency (MHz)	26 dB Bandwidth Antenna 6 (MHz)	26 dB Bandwidth Antenna 5 (MHz)	99% Bandwidth Antenna 6 (MHz)	99% Bandwidth Antenna 5 (MHz)
Low	5190	40.71	42.26	37.8619	37.8498
High	5230	41.20	40.43	37.8103	37.8531



LOW CHANNEL [ANT 6]



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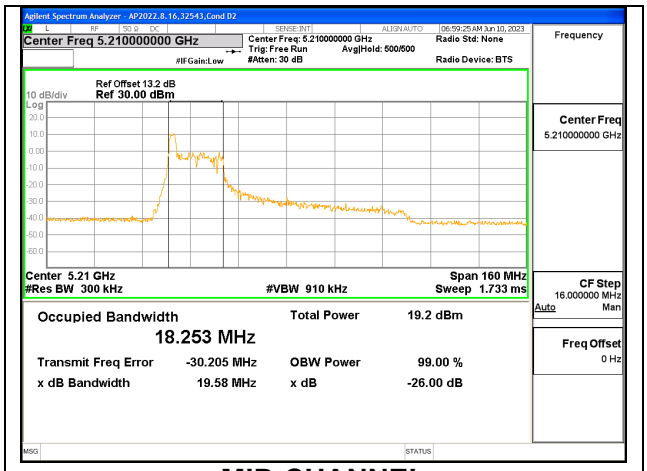
9.2.6. 802.11ax HE80 MODE IN THE 5.2 GHz BAND

1TX Antenna 6 MODE: 26 Tones, RU Index 0

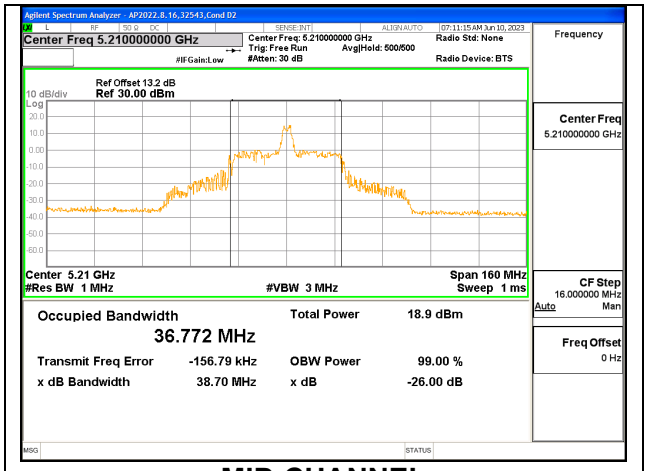
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Mid	5210	19.58	18.2530



MID CHANNEL

1TX Antenna 6 MODE: 26 Tones, RU Index 18

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Mid	5210	38.70	36.7720



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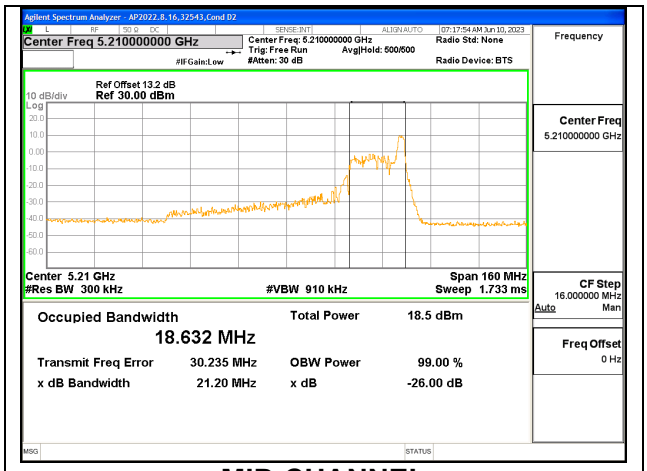
1TX Antenna 6 MODE: 26 Tones, RU Index 36

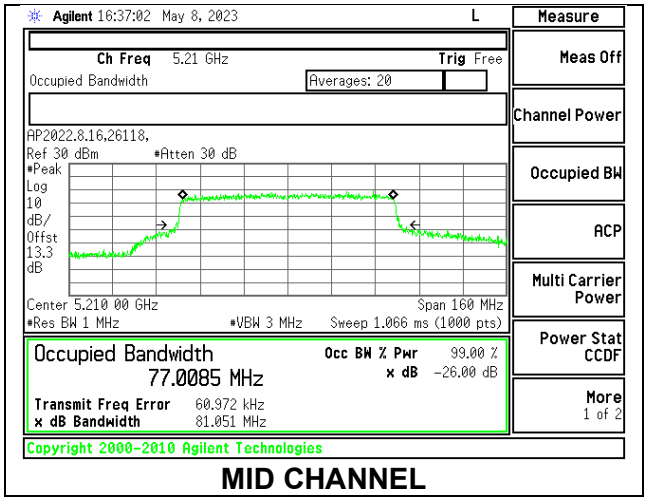
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Mid	5210	21.20	18.6320



MID CHANNEL

1TX Antenna 6 MODE: SU Mode

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Mid	5210	81.05	77.0085



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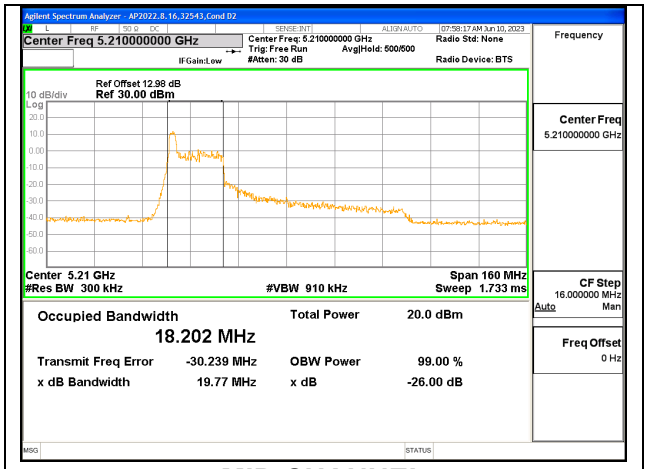
1TX Antenna 5 MODE: 26 Tones, RU Index 0

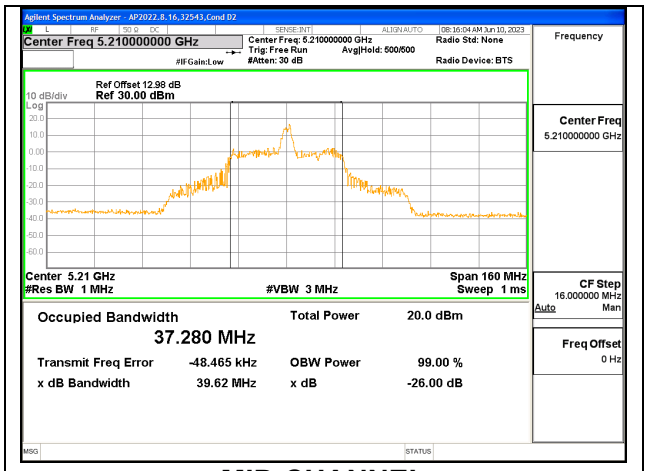
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Mid	5210	19.77	18.2020



MID CHANNEL

1TX Antenna 5 MODE: 26 Tones, RU Index 18

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Mid	5210	39.62	37.2800



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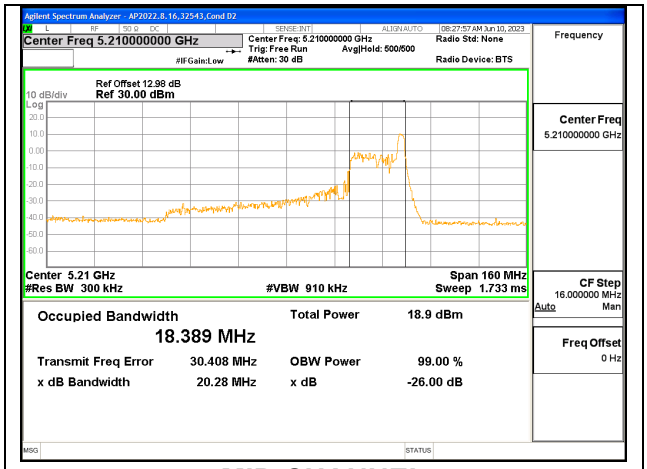
1TX Antenna 5 MODE: 26 Tones, RU Index 36

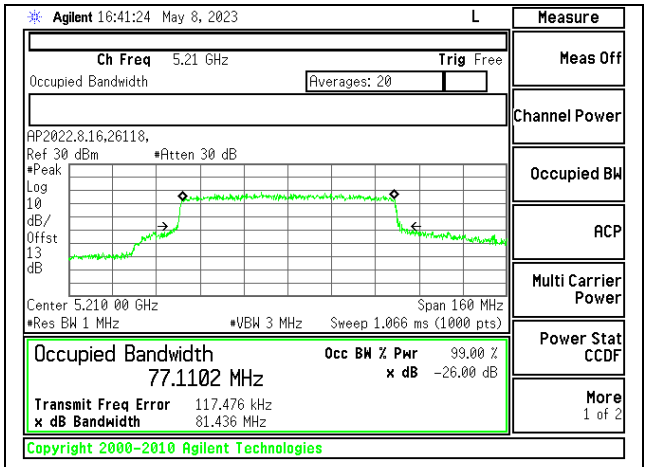
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Mid	5210	20.28	18.3890



MID CHANNEL

1TX Antenna 5 MODE: SU Mode

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Mid	5210	81.43	77.1102



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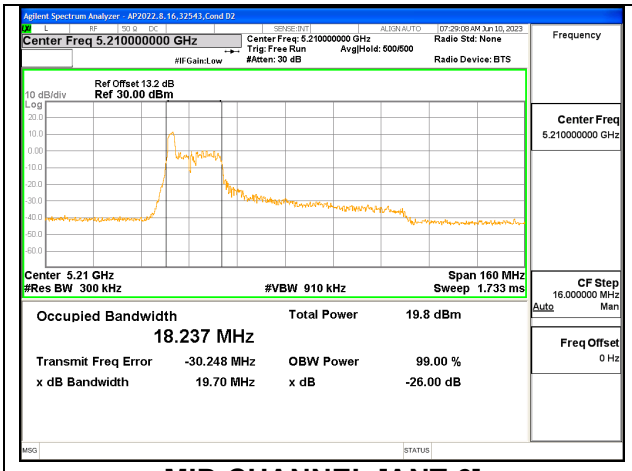
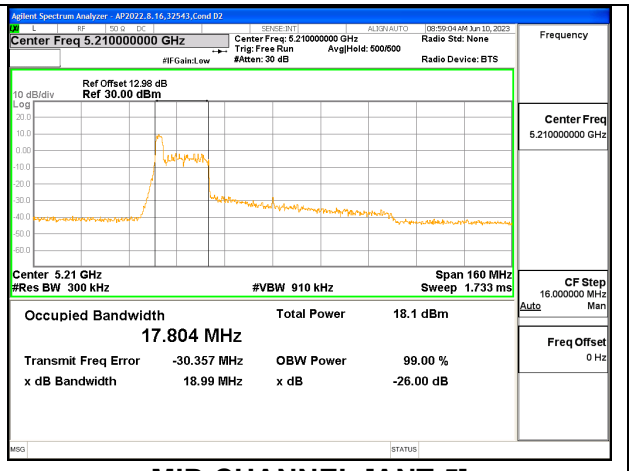
2TX Antenna 6 + Antenna 5 CDD MODE: 26 Tones, RU Index 0

Channel	Frequency (MHz)	26 dB Bandwidth Antenna 6 (MHz)	26 dB Bandwidth Antenna 5 (MHz)	99% Bandwidth Antenna 6 (MHz)	99% Bandwidth Antenna 5 (MHz)
Mid	5210	19.70	18.99	18.2370	17.8040



MID CHANNEL [ANT 6]



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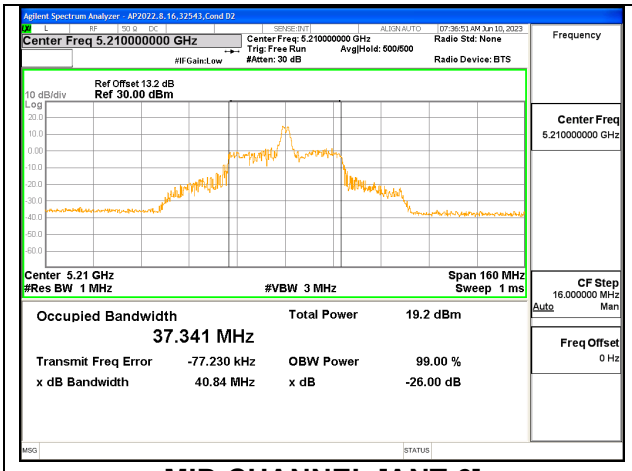
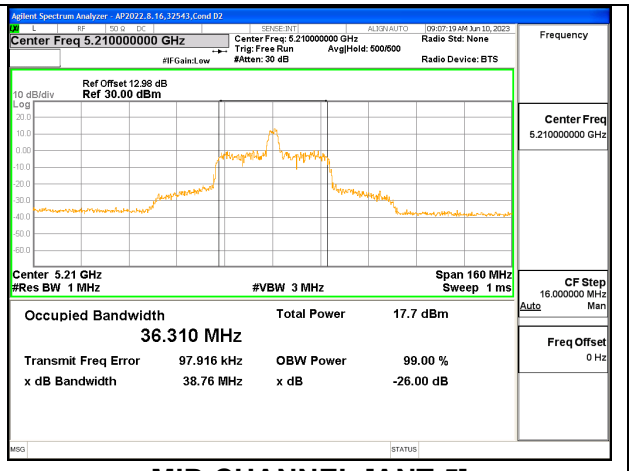
2TX Antenna 6 + Antenna 5 CDD MODE: 26 Tones, RU Index 18

Channel	Frequency (MHz)	26 dB Bandwidth Antenna 6 (MHz)	26 dB Bandwidth Antenna 5 (MHz)	99% Bandwidth Antenna 6 (MHz)	99% Bandwidth Antenna 5 (MHz)
Mid	5210	40.84	38.76	37.3410	36.3100



MID CHANNEL [ANT 6]



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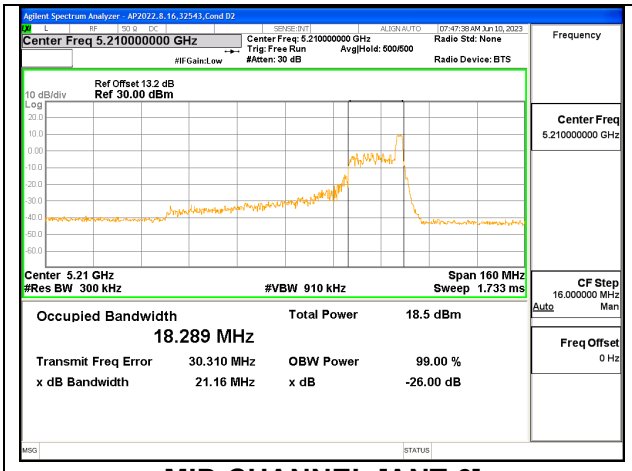
2TX Antenna 6 + Antenna 5 CDD MODE: 26 Tones, RU Index 36

Channel	Frequency (MHz)	26 dB Bandwidth Antenna 6 (MHz)	26 dB Bandwidth Antenna 5 (MHz)	99% Bandwidth Antenna 6 (MHz)	99% Bandwidth Antenna 5 (MHz)
Mid	5210	21.16	19.34	18.2890	18.1300



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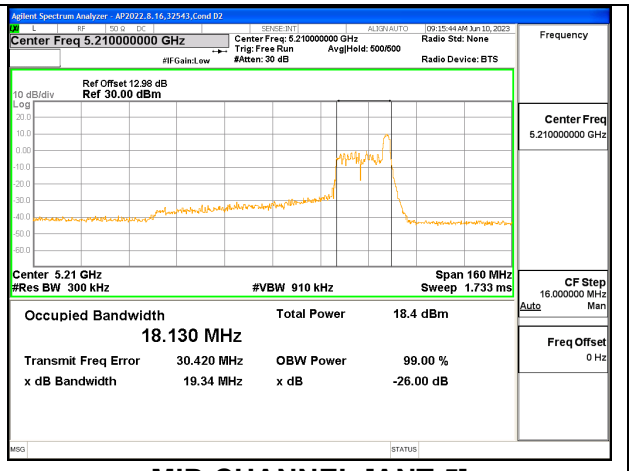

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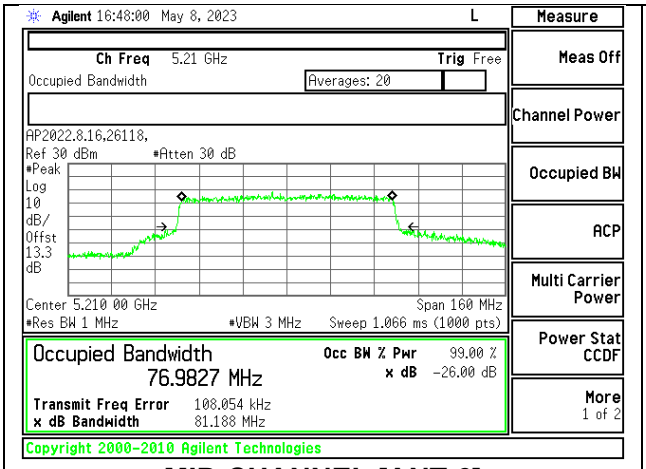
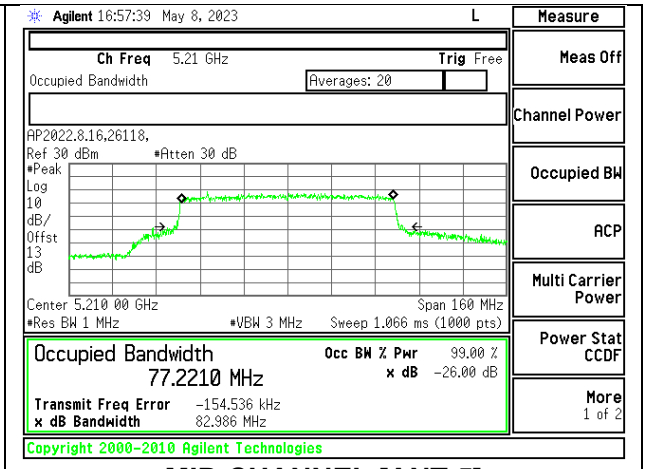
2TX Antenna 6 + Antenna 5 CDD MODE: SU Mode

Channel	Frequency (MHz)	26 dB Bandwidth Antenna 6 (MHz)	26 dB Bandwidth Antenna 5 (MHz)	99% Bandwidth Antenna 6 (MHz)	99% Bandwidth Antenna 5 (MHz)
Mid	5210	81.18	82.98	76.9827	77.2210



MID CHANNEL [ANT 6]



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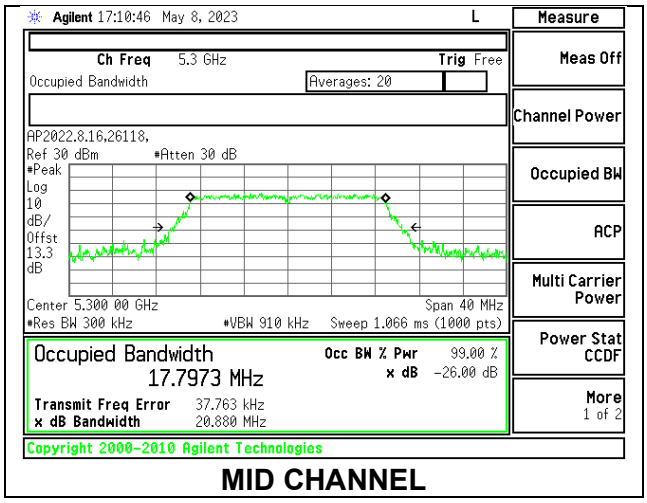
9.2.7. 802.11n HT20 MODE IN THE 5.3 GHz BAND

1TX Antenna 6 MODE

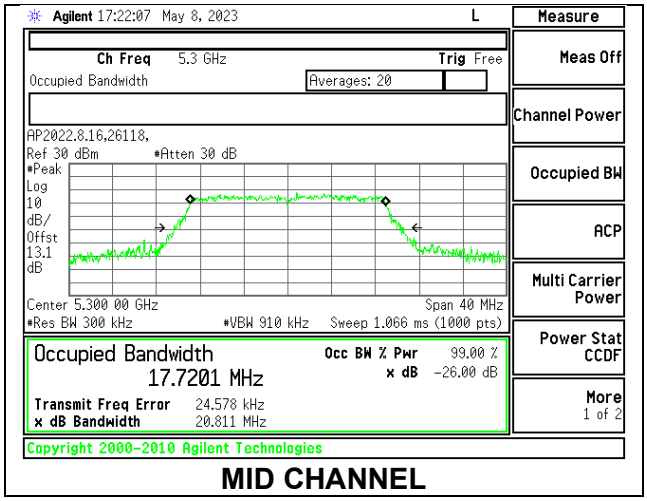
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5260	20.57	17.7037
Mid	5300	20.88	17.7973
High	5320	20.54	17.7751



MID CHANNEL

1TX Antenna 5 MODE

Channel	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5260	20.84	17.7807
Mid	5300	20.81	17.7201
High	5320	20.48	17.8089



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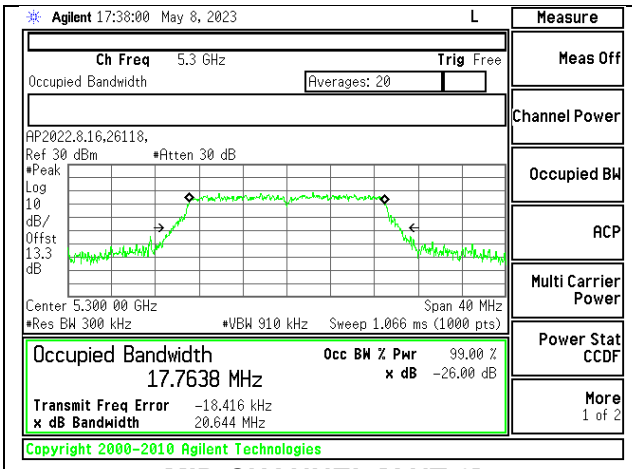
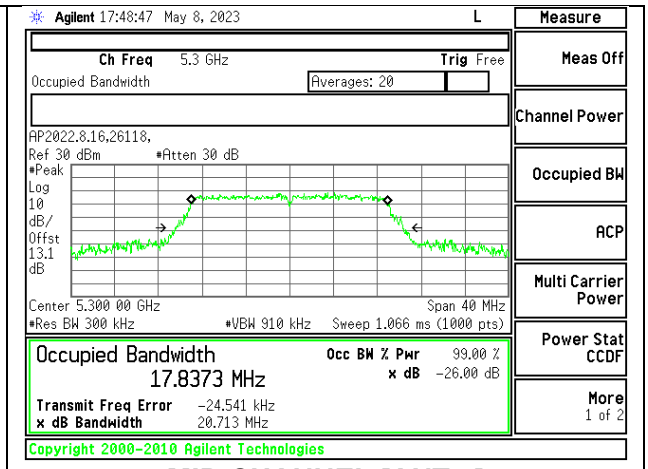
2TX Antenna 6 + Antenna 5 CDD MODE

Channel	Frequency (MHz)	26 dB Bandwidth Antenna 6 (MHz)	26 dB Bandwidth Antenna 5 (MHz)	99% Bandwidth Antenna 6 (MHz)	99% Bandwidth Antenna 5 (MHz)
Low	5260	20.70	20.84	17.7461	17.7528
Mid	5300	20.64	20.71	17.7638	17.8373
High	5320	20.97	20.57	17.8217	17.7921



MID CHANNEL [ANT 6]



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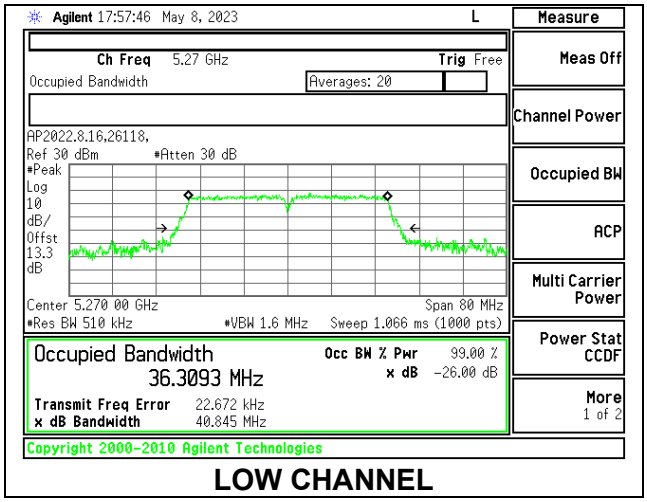
9.2.8. 802.11n HT40 MODE IN THE 5.3 GHz BAND

1TX Antenna 6 MODE

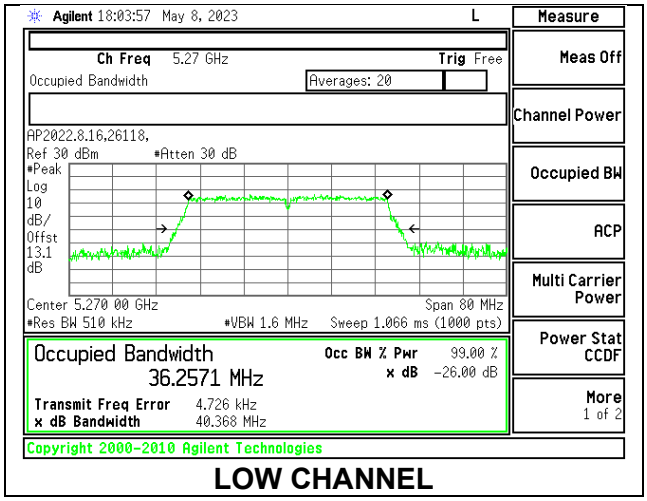
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5270	40.84	36.3093
High	5310	40.94	36.3486



LOW CHANNEL

1TX Antenna 5 MODE

Channel	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5270	40.37	36.2571
High	5310	40.75	36.2636



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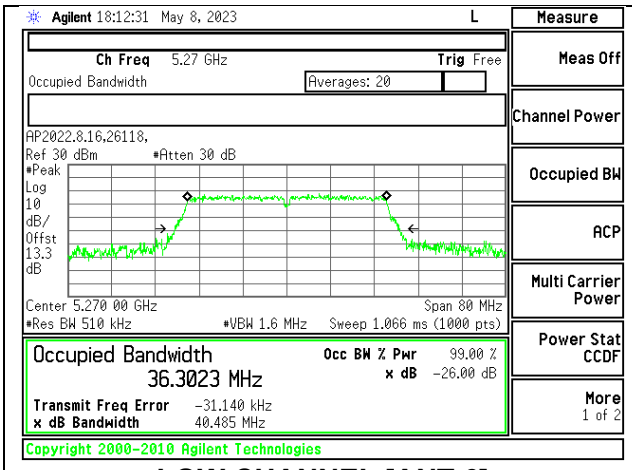
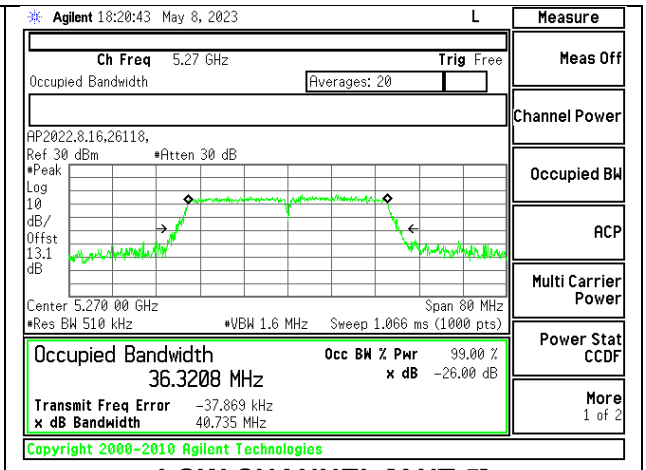
2TX Antenna 6 + Antenna 5 CDD MODE

Channel	Frequency (MHz)	26dB Bandwidth Antenna 6 (MHz)	26dB Bandwidth Antenna 5 (MHz)	99% Bandwidth Antenna 6 (MHz)	99% Bandwidth Antenna 5 (MHz)
Low	5270	40.48	40.73	36.3023	36.3208
High	5310	41.05	40.60	36.3629	36.4586



LOW CHANNEL [ANT 6]



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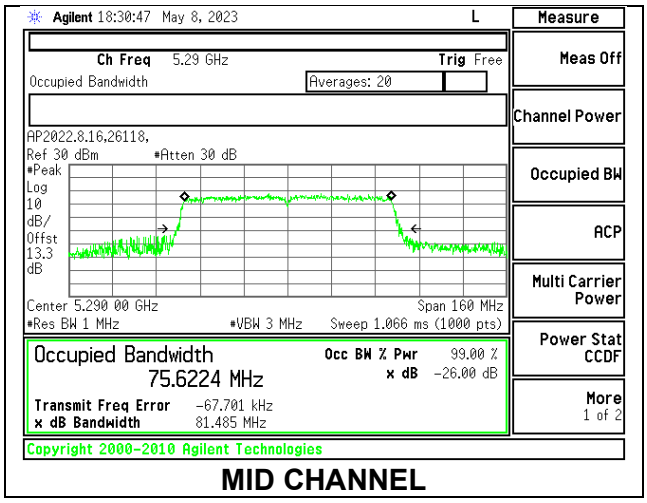
9.2.9. 802.11ac VHT80 MODE IN THE 5.3 GHz BAND

1TX Antenna 6 MODE

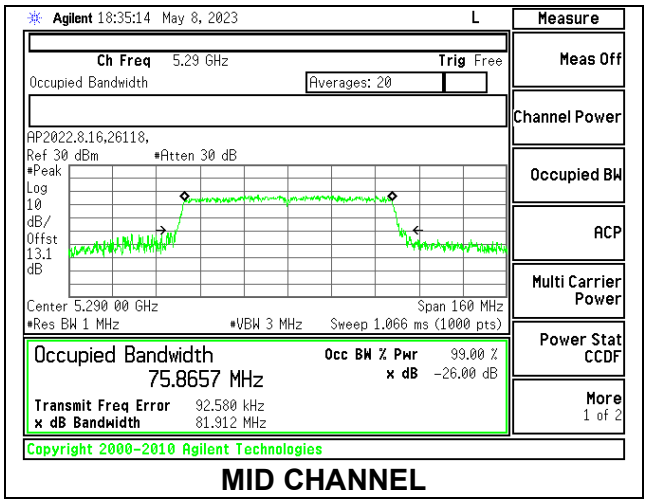
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	99& Bandwidth (MHz)
Mid	5290	81.48	75.6224



MID CHANNEL

1TX Antenna 5 MODE

Channel	Frequency (MHz)	26dB Bandwidth (MHz)	99& Bandwidth (MHz)
Mid	5290	81.81	75.8657



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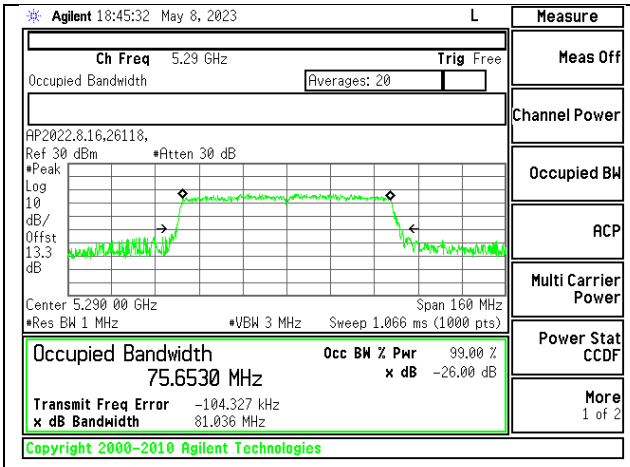
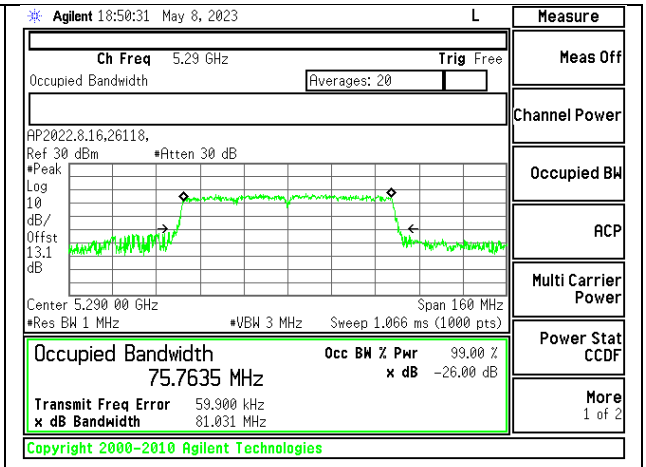
2TX Antenna 6 + Antenna 5 CDD MODE

Channel	Frequency (MHz)	26dB Bandwidth Antenna 6 (MHz)	26dB Bandwidth Antenna 5 (MHz)	99% Bandwidth Antenna 6 (MHz)	99% Bandwidth Antenna 5 (MHz)
Mid	5290	81.03	81.03	75.6530	75.7635



MID CHANNEL [ANT 6]



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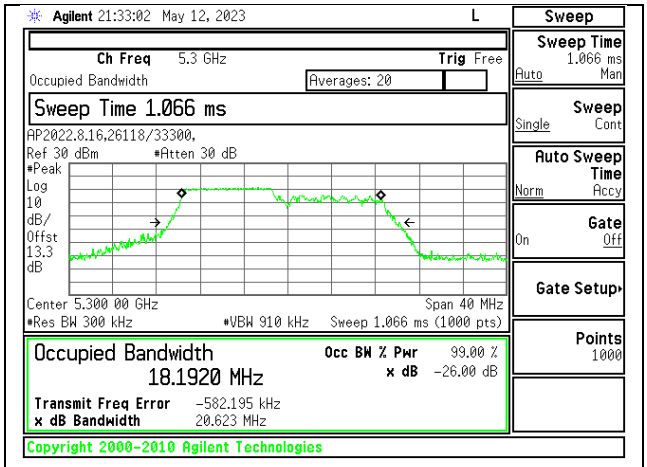
9.2.10. 802.11ax HE20 MODE IN THE 5.3 GHz BAND

1TX Antenna 6 MODE: 106 Tones, RU Index 53

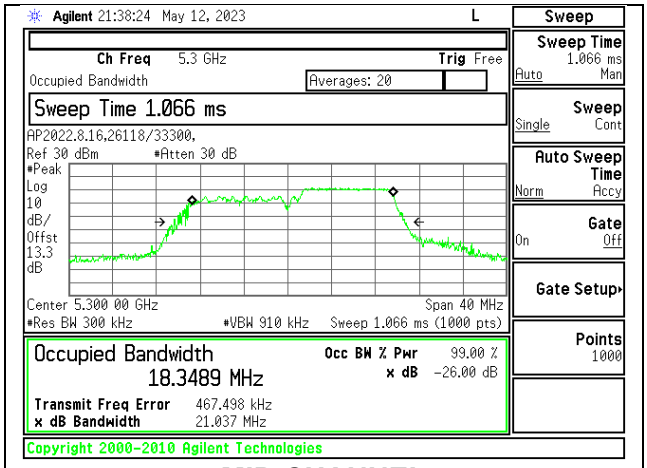
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5260	20.86	18.2655
Mid	5300	20.62	18.1920
High	5320	20.92	18.2017



MID CHANNEL

1TX Antenna 6 MODE: 106 Tones, RU Index 54

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5260	21.17	18.4762
Mid	5300	21.03	18.3489
High	5320	21.06	18.3990



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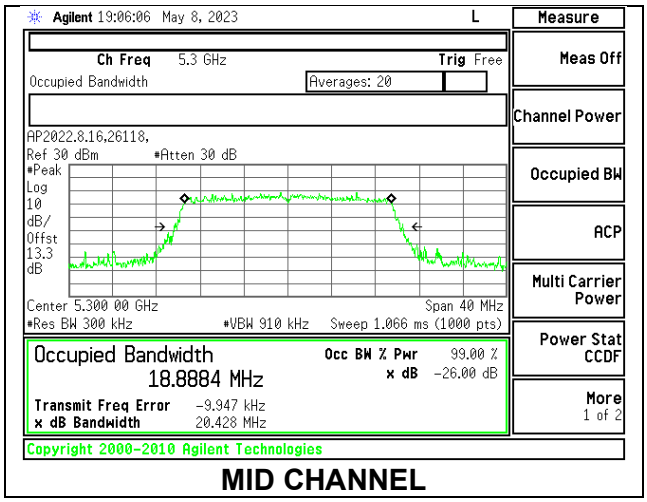
1TX Antenna 6 MODE: SU Mode

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5260	20.80	18.8569
Mid	5300	20.42	18.8884
High	5320	20.42	18.8865



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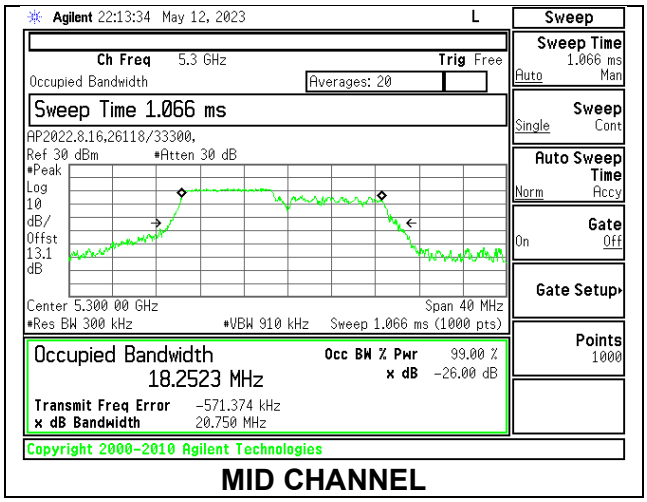
1TX Antenna 5 MODE: 106 Tones, RU Index 53

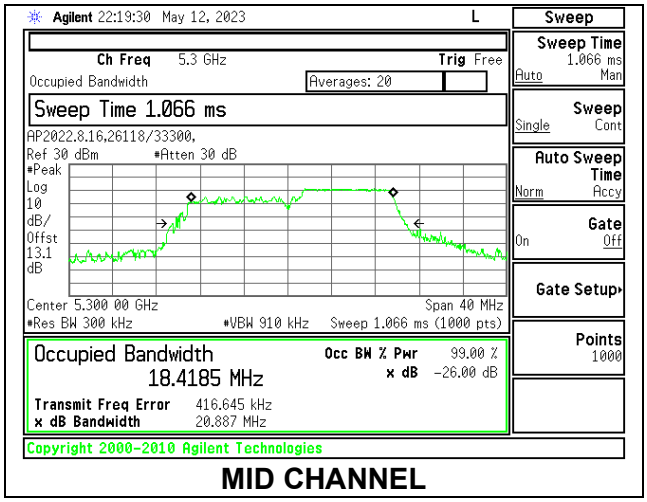
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5260	20.78	18.2570
Mid	5300	20.75	18.2523
High	5320	20.72	18.1782



MID CHANNEL

1TX Antenna 5 MODE: 106 Tones, RU Index 54

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5260	21.23	18.4397
Mid	5300	20.89	18.4185
High	5320	21.15	18.3896



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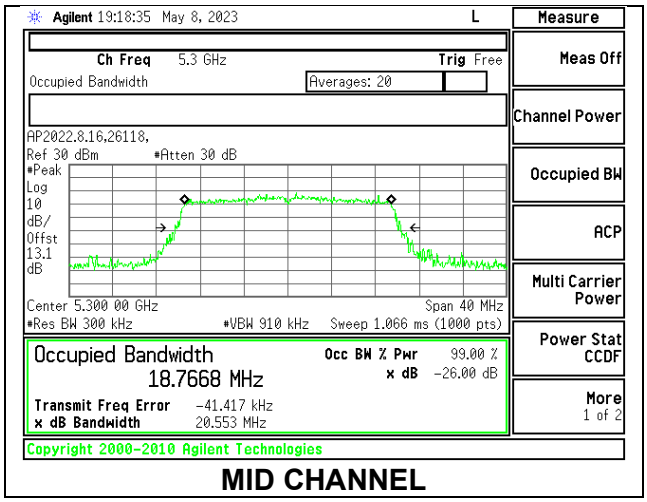
1TX Antenna 5 MODE: SU Mode

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5260	20.86	18.8701
Mid	5300	20.55	18.7668
High	5320	21.00	18.9167



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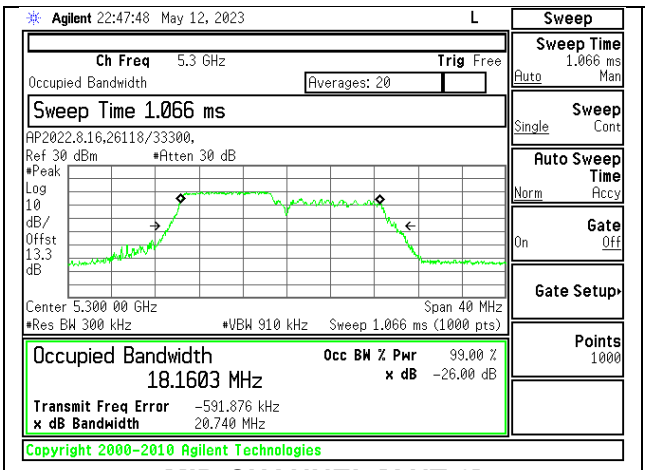
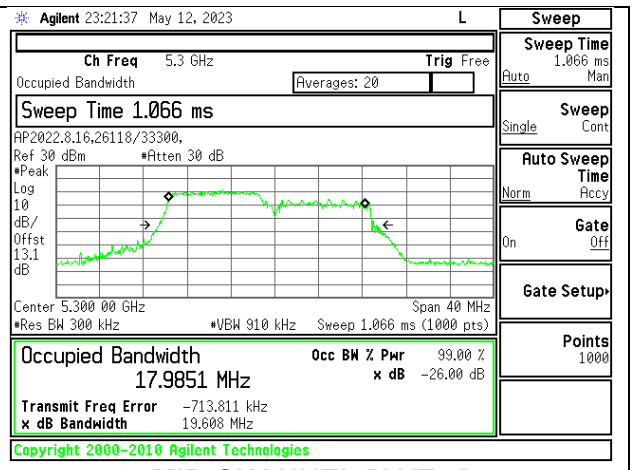
2TX Antenna 6 + Antenna 5 CDD MODE: 106 Tones, RU Index 53

Channel	Frequency (MHz)	26 dB Bandwidth Antenna 6 (MHz)	26 dB Bandwidth Antenna 5 (MHz)	99% Bandwidth Antenna 6 (MHz)	99% Bandwidth Antenna 5 (MHz)
Low	5260	20.76	20.10	18.1717	18.1498
Mid	5300	20.74	19.60	18.1603	17.9851
High	5320	20.94	19.87	18.2185	18.1207



MID CHANNEL [ANT 6]



MID CHANNEL [ANT 5]

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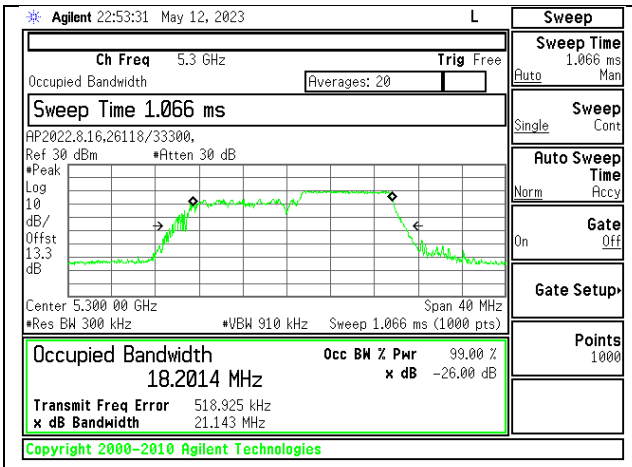
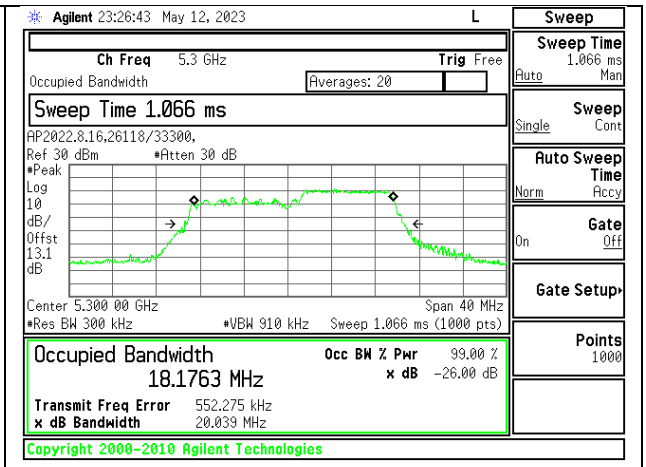
2TX Antenna 6 + Antenna 5 CDD MODE: 106 Tones, RU Index 54

Channel	Frequency (MHz)	26 dB Bandwidth Antenna 6 (MHz)	26 dB Bandwidth Antenna 5 (MHz)	99% Bandwidth Antenna 6 (MHz)	99% Bandwidth Antenna 5 (MHz)
Low	5260	20.98	20.04	18.4630	18.1354
Mid	5300	21.14	20.03	18.2014	18.1763
High	5320	20.92	20.11	18.4165	18.1725



MID CHANNEL [ANT 6]



MID CHANNEL [ANT 5]

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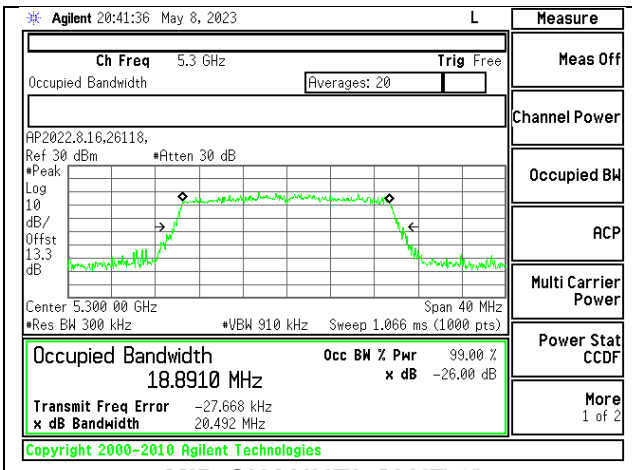
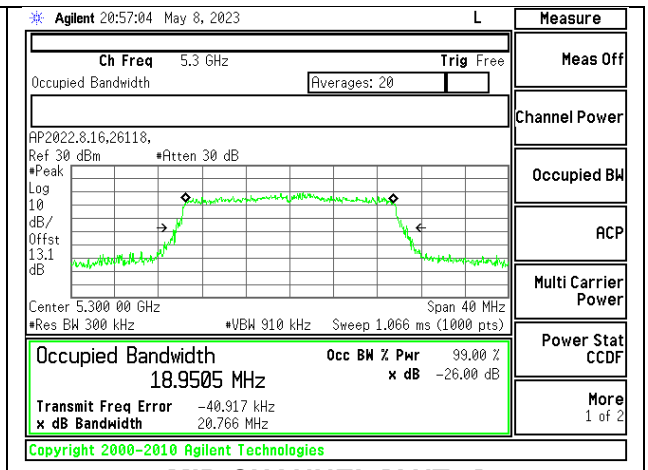
2TX Antenna 6 + Antenna 5 CDD MODE: SU Mode

Channel	Frequency (MHz)	26 dB Bandwidth Antenna 6 (MHz)	26 dB Bandwidth Antenna 5 (MHz)	99% Bandwidth Antenna 6 (MHz)	99% Bandwidth Antenna 5 (MHz)
Low	5260	20.88	20.67	18.9118	18.8639
Mid	5300	20.49	20.76	18.8910	18.9505
High	5320	21.37	20.90	18.9487	18.9407



MID CHANNEL [ANT 6]



MID CHANNEL [ANT 5]

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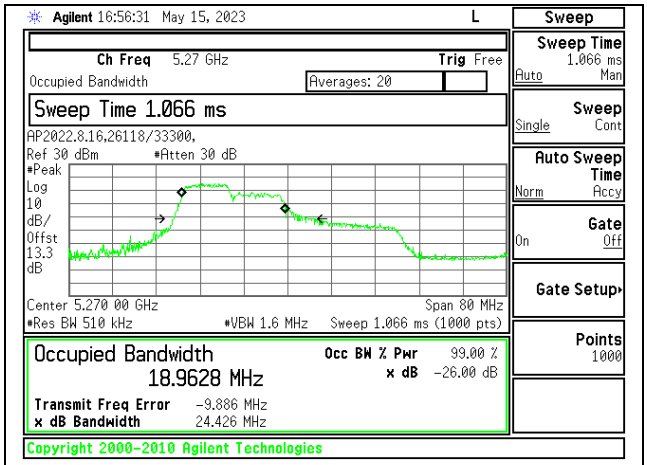
9.2.11. 802.11ax HE40 MODE IN THE 5.3 GHz BAND

1TX Antenna 6 MODE: 106 Tones, RU Index 53

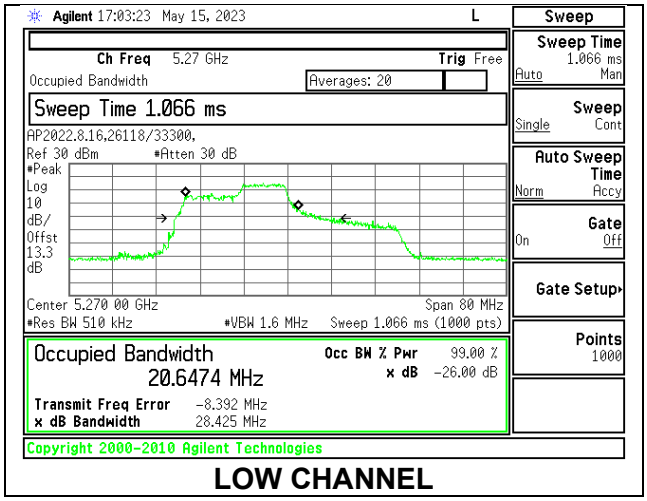
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5270	24.42	18.9628
High	5310	23.44	18.3922



LOW CHANNEL

1TX Antenna 6 MODE: 106 Tones, RU Index 54

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5270	28.42	20.6474
High	5310	29.44	21.1175



LOW CHANNEL

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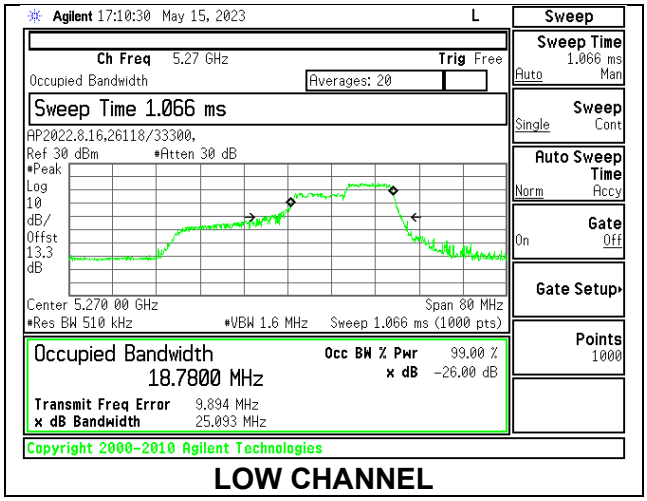
1TX Antenna 6 MODE: 106 Tones, RU Index 56

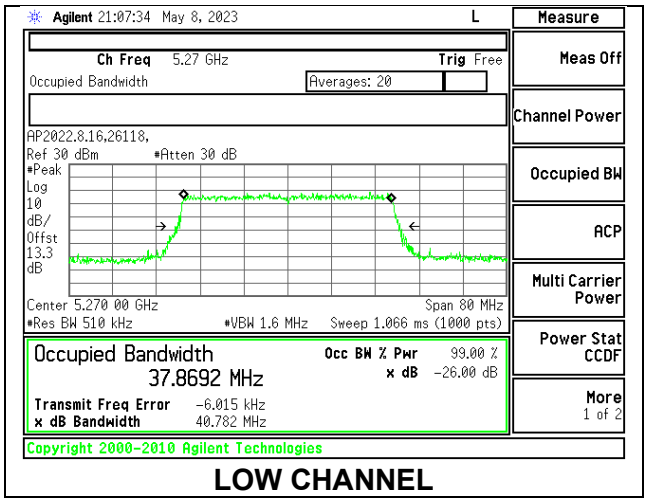
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5270	25.09	18.7800
High	5310	25.44	18.9815



LOW CHANNEL

1TX Antenna 6 MODE: SU Mode

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5270	40.78	37.8692
High	5310	41.01	37.8752



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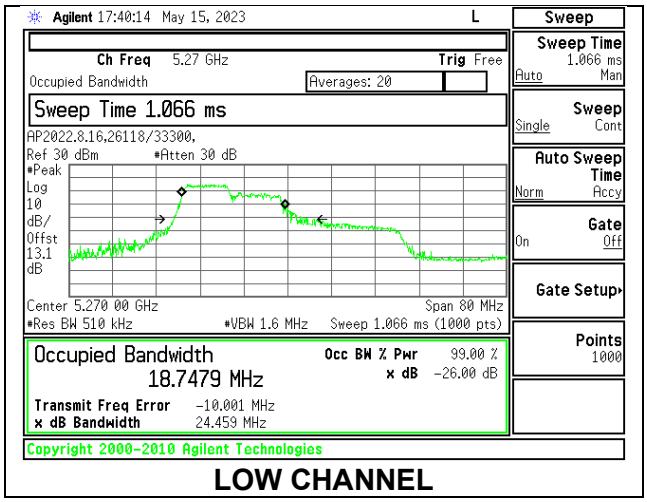
1TX Antenna 5 MODE: 106 Tones, RU Index 53

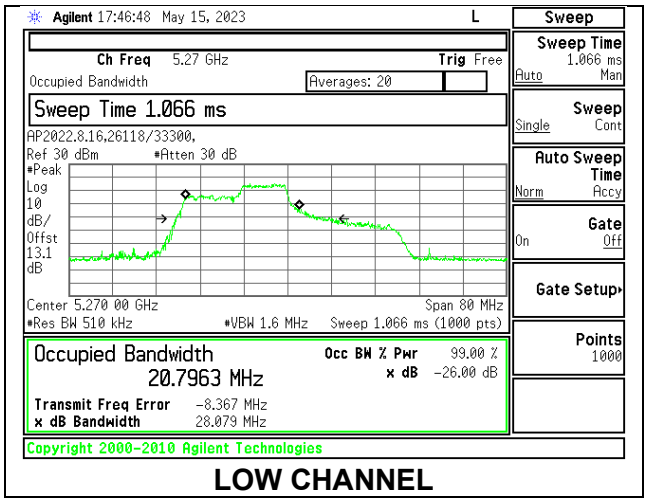
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5270	24.45	18.7479
High	5310	25.77	18.9874



LOW CHANNEL

1TX Antenna 5 MODE: 106 Tones, RU Index 54

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5270	28.07	20.7963
High	5310	28.50	20.9098



LOW CHANNEL

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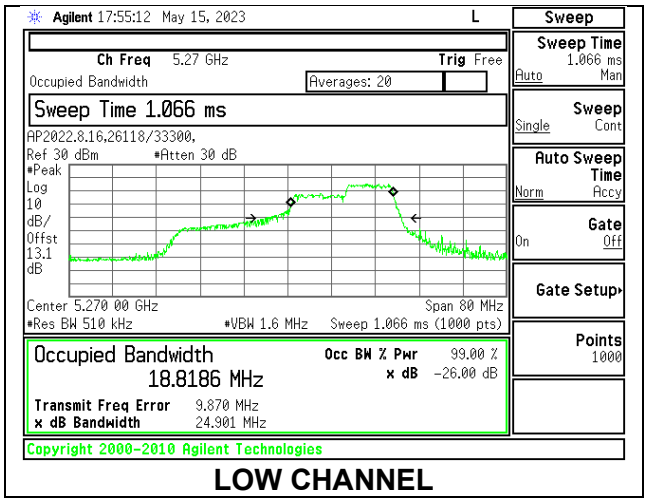
1TX Antenna 5 MODE: 106 Tones, RU Index 56

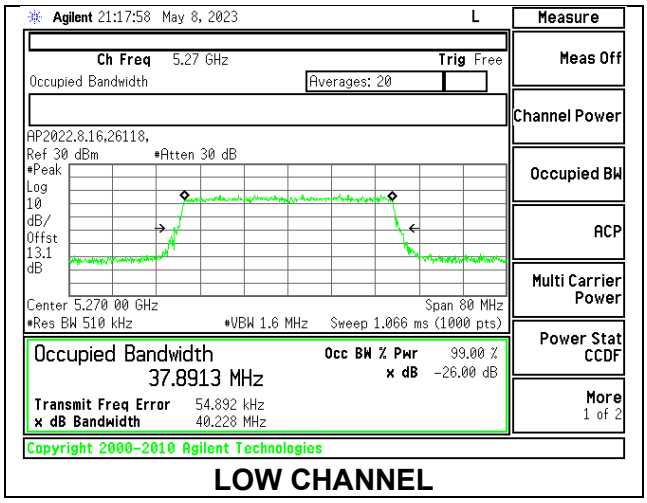
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5270	24.90	18.8186
High	5310	25.25	18.4723



LOW CHANNEL

1TX Antenna 5 MODE: SU Mode

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5270	40.22	37.8913
High	5310	40.91	37.8856



LOW CHANNEL

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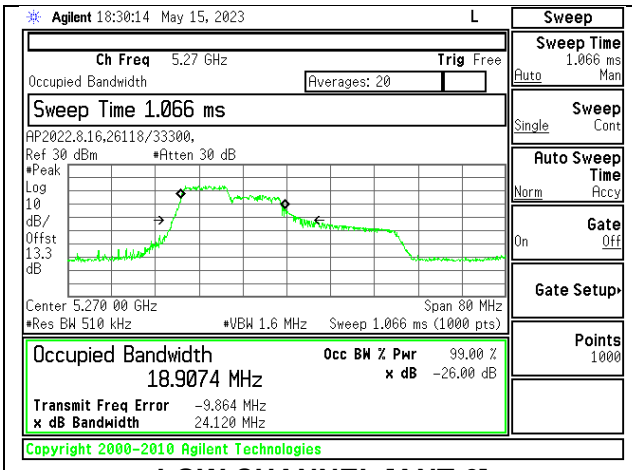
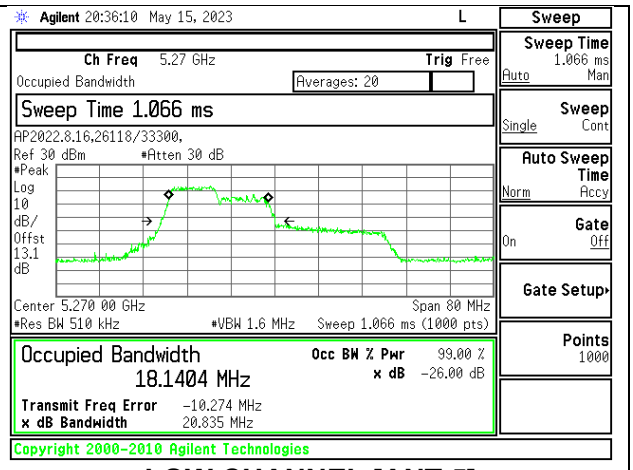
2TX Antenna 6 + Antenna 5 CDD MODE: 106 Tones, RU Index 53

Channel	Frequency (MHz)	26 dB Bandwidth Antenna 6 (MHz)	26 dB Bandwidth Antenna 5 (MHz)	99% Bandwidth Antenna 6 (MHz)	99% Bandwidth Antenna 5 (MHz)
Low	5270	24.12	20.83	18.9074	18.1404
High	5310	23.89	20.47	18.6172	18.0361



LOW CHANNEL [ANT 6]



LOW CHANNEL [ANT 5]

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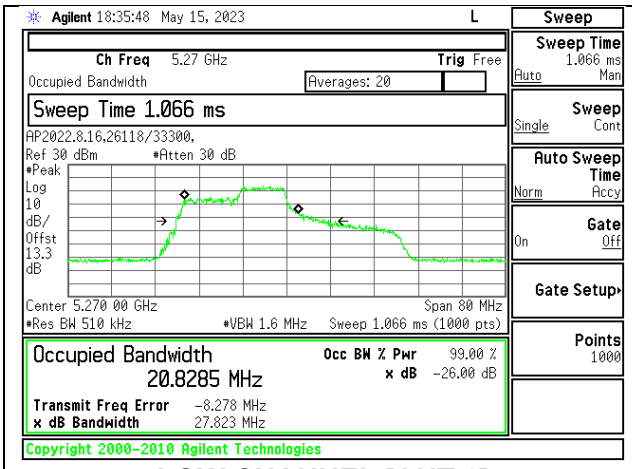
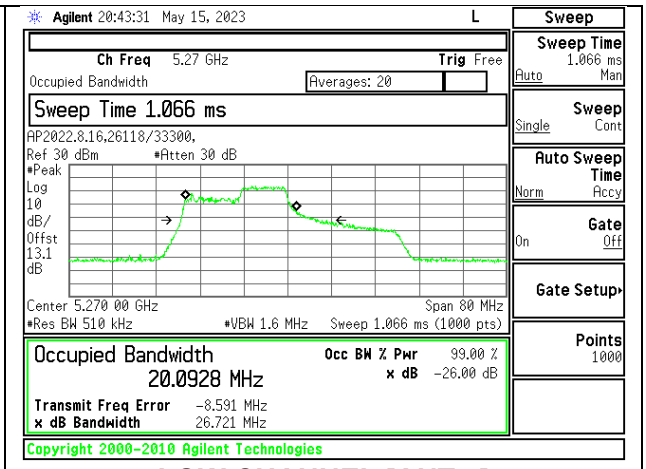
2TX Antenna 6 + Antenna 5 CDD MODE: 106 Tones, RU Index 54

Channel	Frequency (MHz)	26 dB Bandwidth Antenna 6 (MHz)	26 dB Bandwidth Antenna 5 (MHz)	99% Bandwidth Antenna 6 (MHz)	99% Bandwidth Antenna 5 (MHz)
Low	5270	27.82	26.72	20.8285	20.0928
High	5310	28.25	26.03	20.9973	20.3665



LOW CHANNEL [ANT 6]



LOW CHANNEL [ANT 5]

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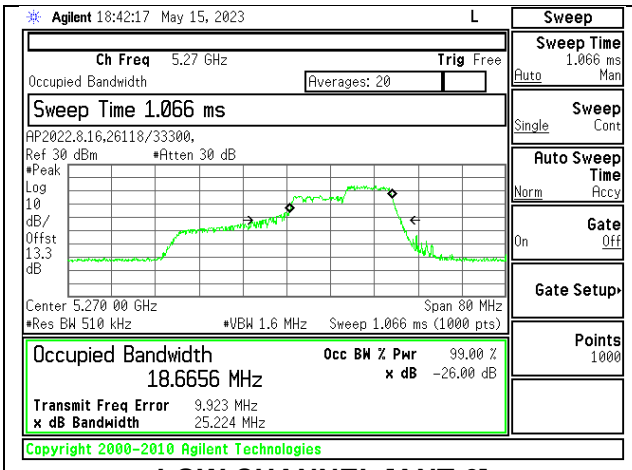
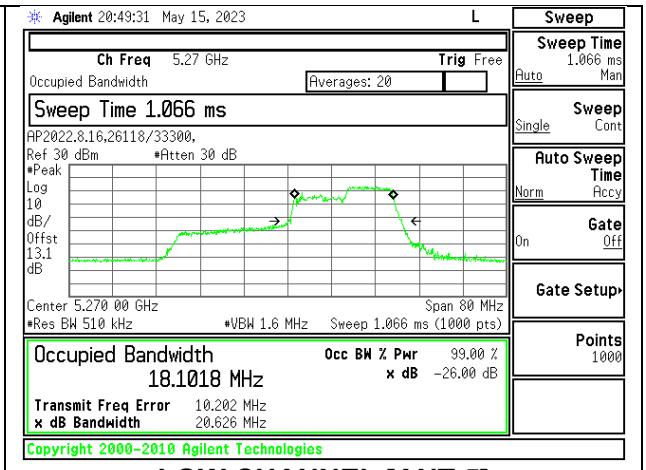
2TX Antenna 6 + Antenna 5 CDD MODE: 106 Tones, RU Index 56

Channel	Frequency (MHz)	26 dB Bandwidth Antenna 6 (MHz)	26 dB Bandwidth Antenna 5 (MHz)	99% Bandwidth Antenna 6 (MHz)	99% Bandwidth Antenna 5 (MHz)
Low	5270	25.22	20.63	18.6656	18.1018
High	5310	25.24	22.07	19.0779	18.0645



LOW CHANNEL [ANT 6]



LOW CHANNEL [ANT 5]

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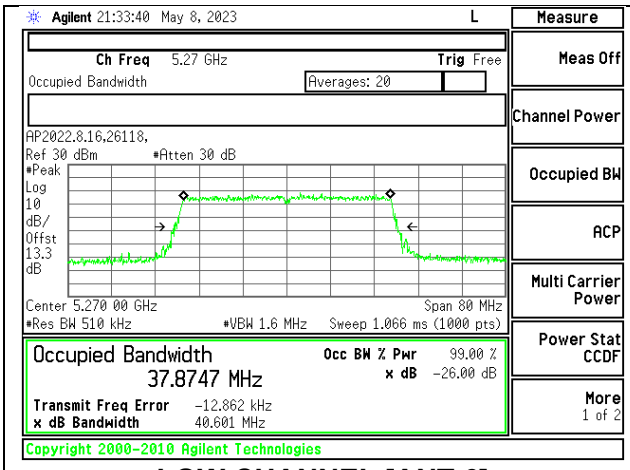
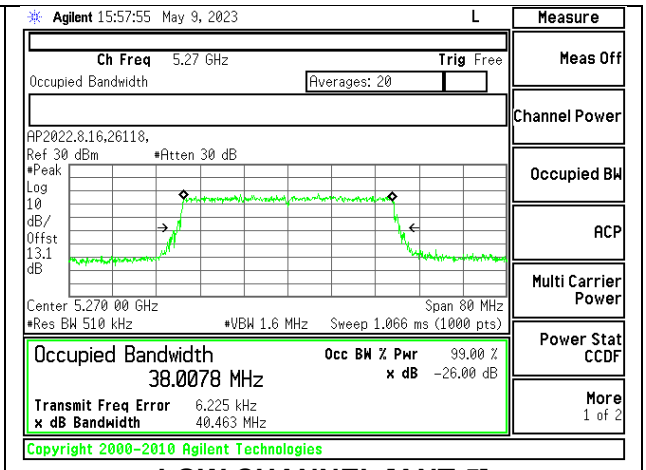
2TX Antenna 6 + Antenna 5 CDD MODE: SU Mode

Channel	Frequency (MHz)	26 dB Bandwidth Antenna 6 (MHz)	26 dB Bandwidth Antenna 5 (MHz)	99% Bandwidth Antenna 6 (MHz)	99% Bandwidth Antenna 5 (MHz)
Low	5270	40.60	40.46	37.8747	38.0078
High	5310	41.33	42.23	37.9461	37.8844



LOW CHANNEL [ANT 6]



LOW CHANNEL [ANT 5]

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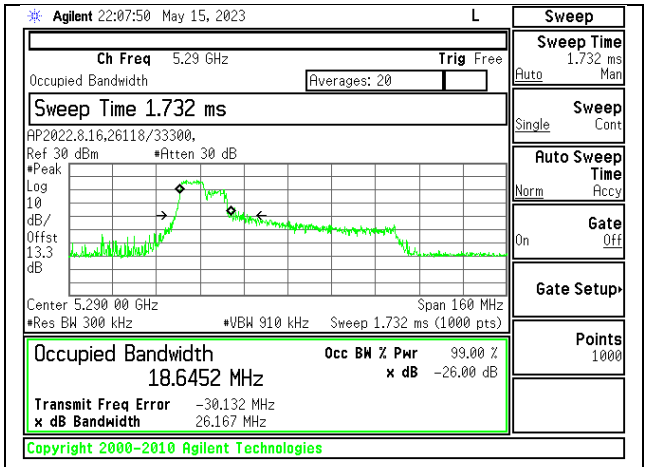
9.2.12. 802.11ax HE80 MODE IN THE 5.3 GHz BAND

1TX Antenna 6 MODE: 106 Tones, RU Index 53

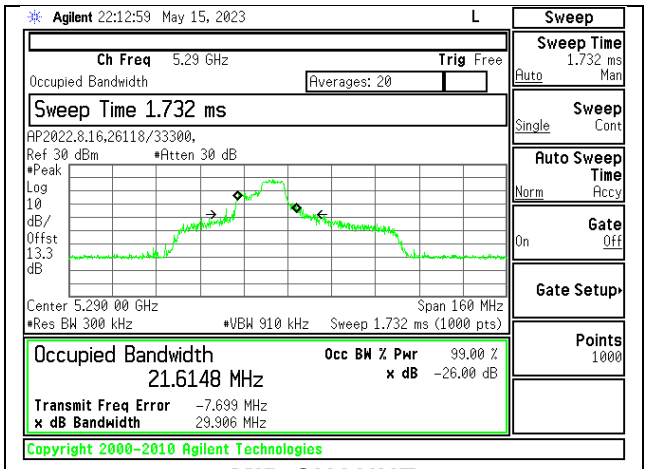
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Mid	5290	26.16	18.6452



MID CHANNEL

1TX Antenna 6 MODE: 106 Tones, RU Index 56

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Mid	5290	29.90	21.6148



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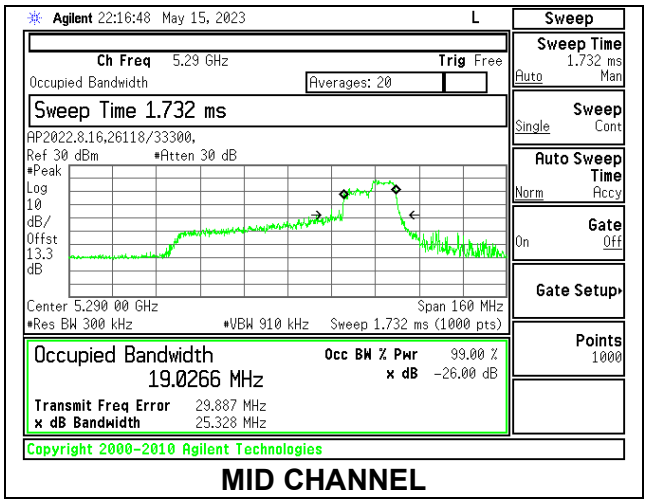
1TX Antenna 6 MODE: 106 Tones, RU Index 60

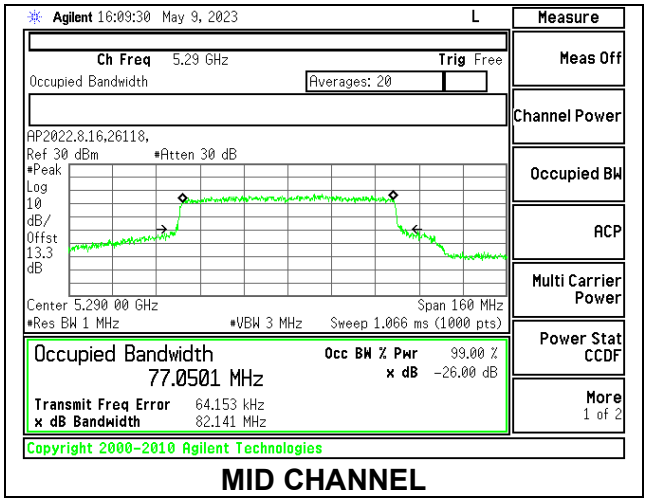
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Mid	5290	25.32	19.0266



MID CHANNEL

1TX Antenna 6 MODE: SU Mode

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Mid	5290	82.14	77.05



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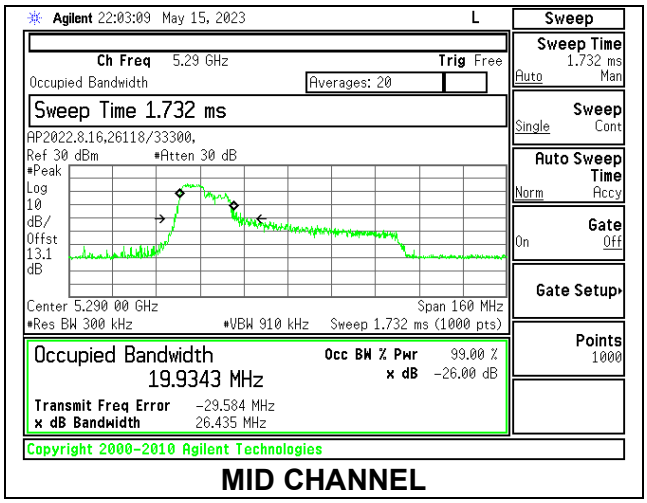
1TX Antenna 5 MODE: 106 Tones, RU Index 53

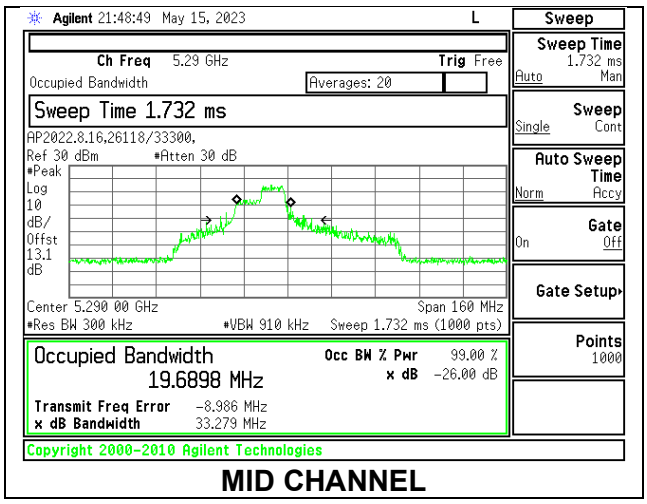
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Mid	5290	26.43	19.9343



MID CHANNEL

1TX Antenna 5 MODE: 106 Tones, RU Index 56

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Mid	5290	33.27	19.6898



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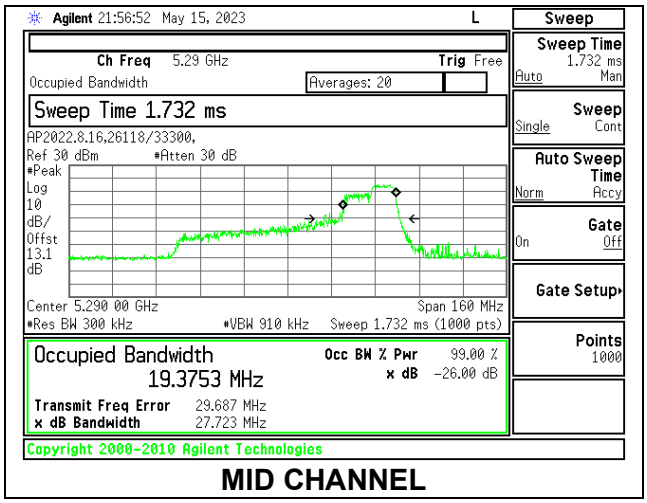
1TX Antenna 5 MODE: 106 Tones, RU Index 60

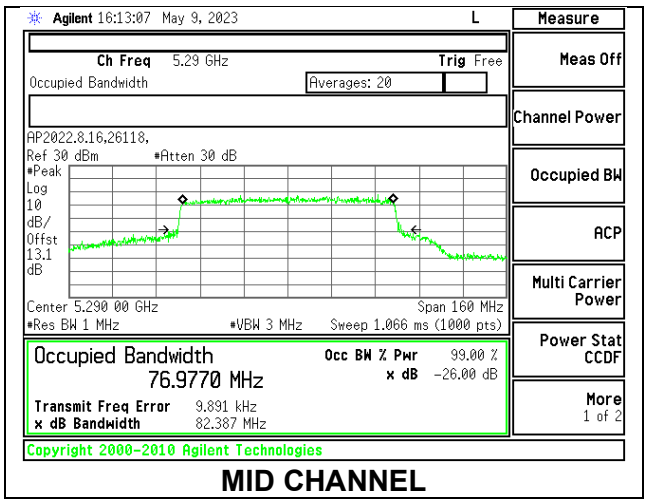
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Mid	5290	27.72	19.3753



MID CHANNEL

1TX Antenna 5 MODE: SU Mode

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Mid	5290	82.38	76.9770



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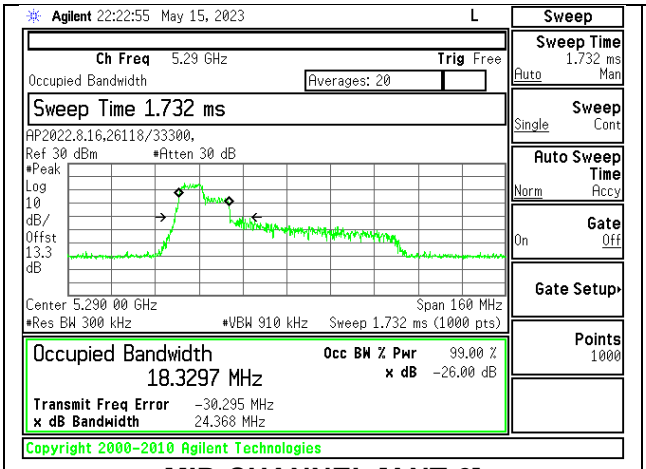
2TX Antenna 6 + Antenna 5 CDD MODE: 106 Tones, RU Index 53

Channel	Frequency (MHz)	26 dB Bandwidth Antenna 6 (MHz)	26 dB Bandwidth Antenna 5 (MHz)	99% Bandwidth Antenna 6 (MHz)	99% Bandwidth Antenna 5 (MHz)
Mid	5290	24.36	20.63	18.3297	18.4408



MID CHANNEL [ANT 6]

MID CHANNEL [ANT 5]

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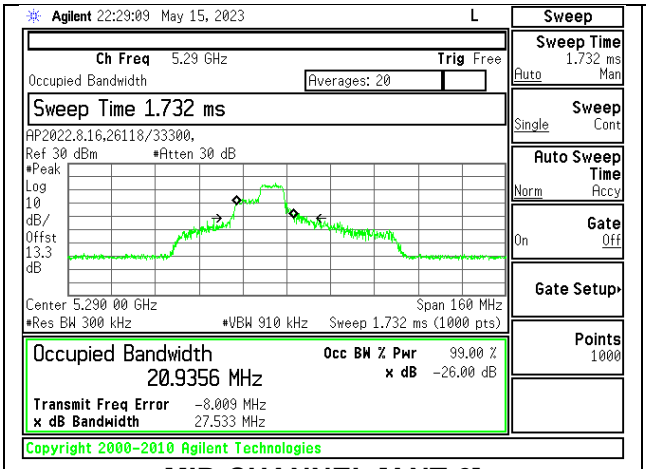
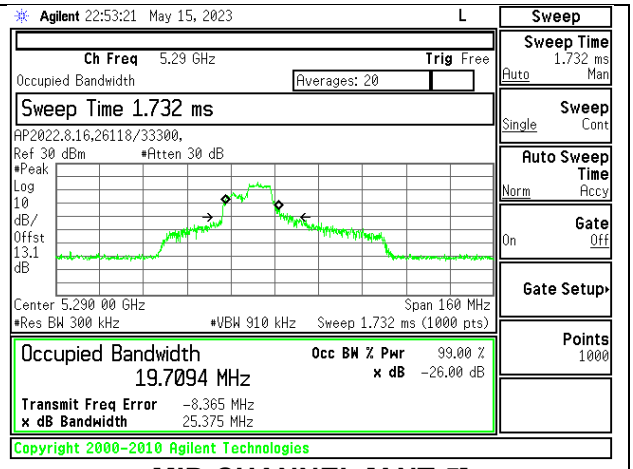
2TX Antenna 6 + Antenna 5 CDD MODE: 106 Tones, RU Index 56

Channel	Frequency (MHz)	26 dB Bandwidth Antenna 6 (MHz)	26 dB Bandwidth Antenna 5 (MHz)	99% Bandwidth Antenna 6 (MHz)	99% Bandwidth Antenna 5 (MHz)
Mid	5290	27.53	25.37	20.9356	19.7094



MID CHANNEL [ANT 6]



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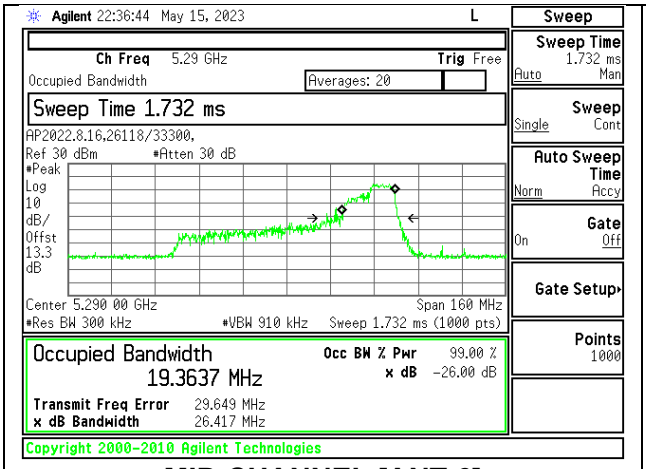
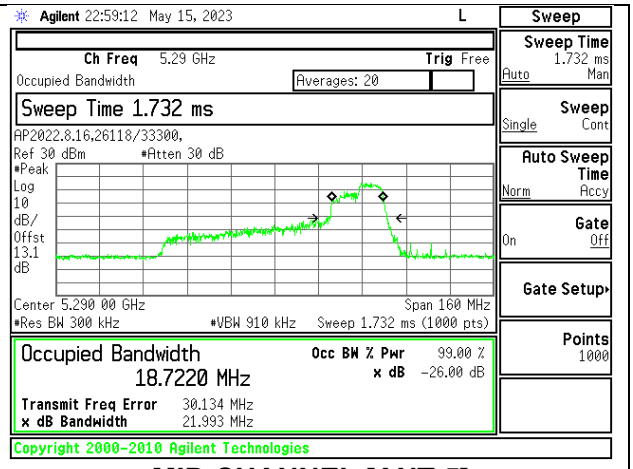
2TX Antenna 6 + Antenna 5 CDD MODE: 106 Tones, RU Index 60

Channel	Frequency (MHz)	26 dB Bandwidth Antenna 6 (MHz)	26 dB Bandwidth Antenna 5 (MHz)	99% Bandwidth Antenna 6 (MHz)	99% Bandwidth Antenna 5 (MHz)
Mid	5290	26.41	21.99	19.3637	18.7220



MID CHANNEL [ANT 6]



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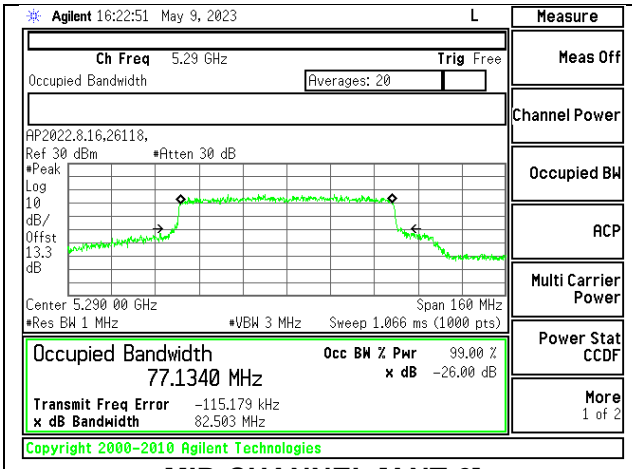
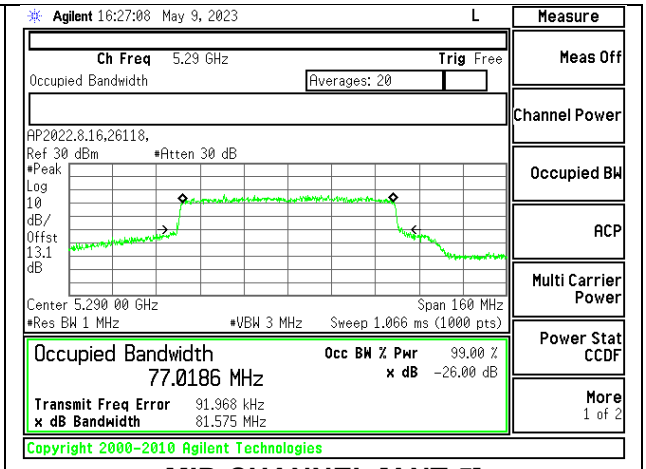
2TX Antenna 6 + Antenna 5 CDD MODE: SU Mode

Channel	Frequency (MHz)	26 dB Bandwidth Antenna 6 (MHz)	26 dB Bandwidth Antenna 5 (MHz)	99% Bandwidth Antenna 6 (MHz)	99% Bandwidth Antenna 5 (MHz)
Mid	5290	82.50	81.57	77.1340	77.0186



MID CHANNEL [ANT 6]



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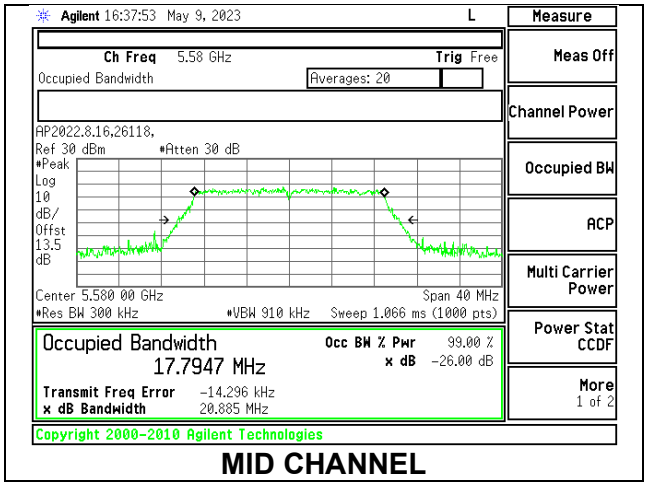
9.2.13. 802.11n HT20 MODE IN THE 5.6 GHz BAND

1TX Antenna 6 MODE

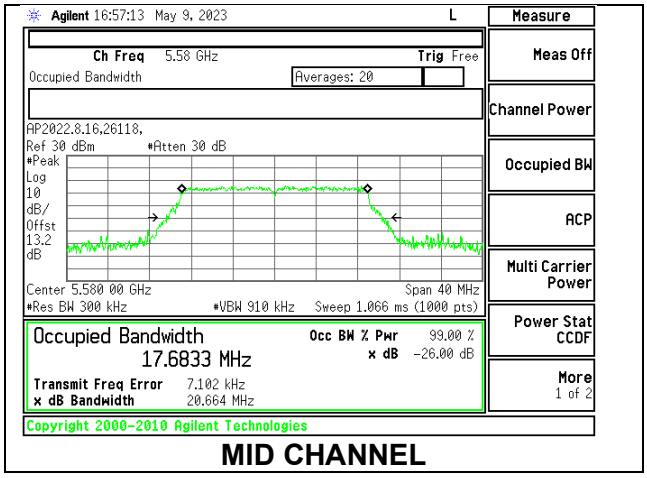
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5500	20.47	17.7630
Mid	5580	20.88	17.7947
High	5700	20.76	17.7386
144	5720	20.56	17.7298



MID CHANNEL

1TX Antenna 5 MODE

Channel	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5500	20.81	17.7448
Mid	5580	20.66	17.6833
High	5700	20.86	17.7559
144	5720	20.65	17.7591



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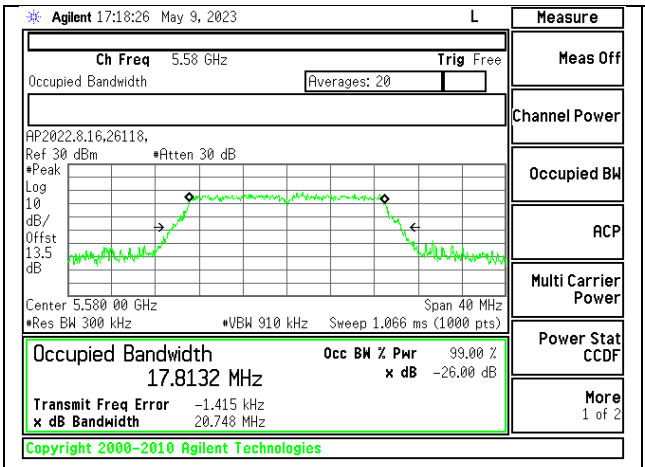
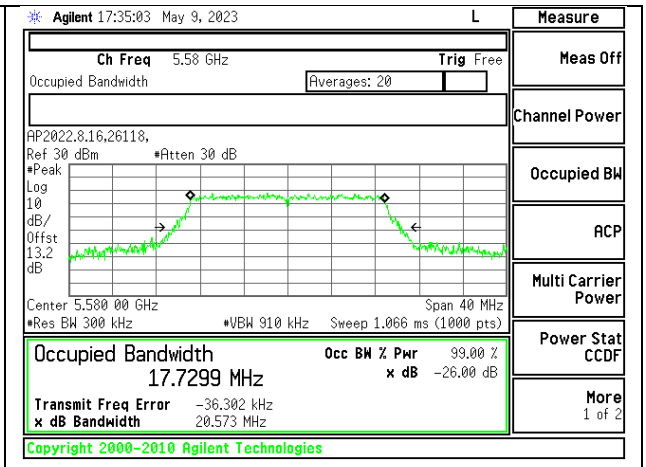
2TX Antenna 6 + Antenna 5 CDD MODE

Channel	Frequency (MHz)	26dB Bandwidth Antenna 6 (MHz)	26dB Bandwidth Antenna 5 (MHz)	99% Bandwidth Antenna 6 (MHz)	99% Bandwidth Antenna 5 (MHz)
Low	5500	20.53	20.96	17.6693	17.8206
Mid	5580	20.74	20.57	17.8132	17.7299
High	5700	20.78	20.61	17.7661	17.7422
144	5720	20.75	20.72	17.7739	17.7539



MID CHANNEL [ANT 6]



MID CHANNEL [ANT 5]

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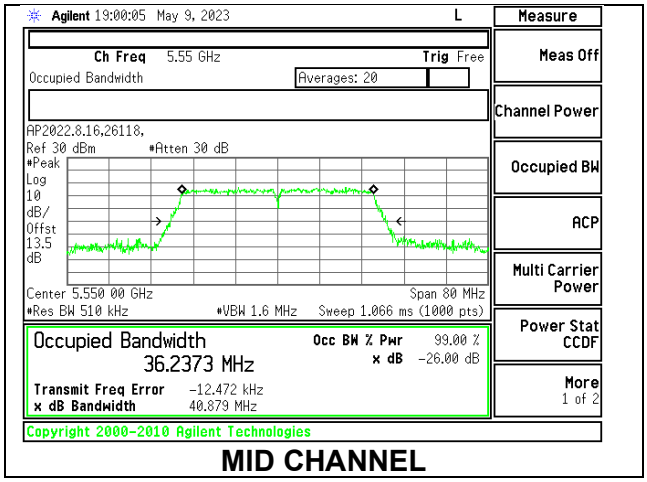
9.2.14. 802.11n HT40 MODE IN THE 5.6 GHz BAND

1TX Antenna 6 MODE

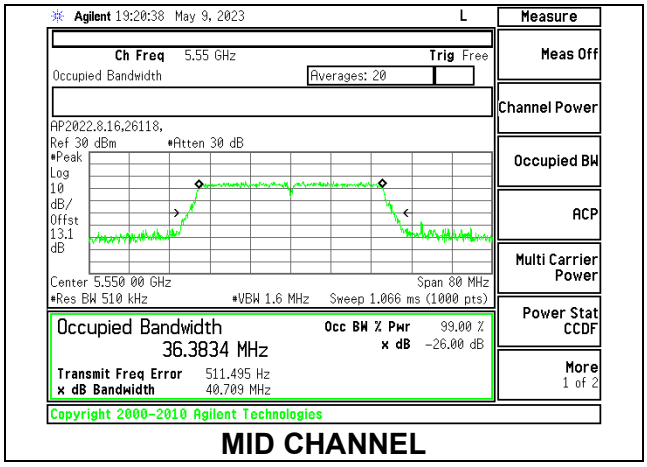
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5510	40.61	36.2692
Mid	5550	40.87	36.2373
High	5670	40.67	36.2660
142	5710	40.91	36.3339



MID CHANNEL

1TX Antenna 5 MODE

Channel	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5510	40.59	36.3976
Mid	5550	40.70	36.3834
High	5670	40.90	36.2350
142	5710	40.86	36.3535



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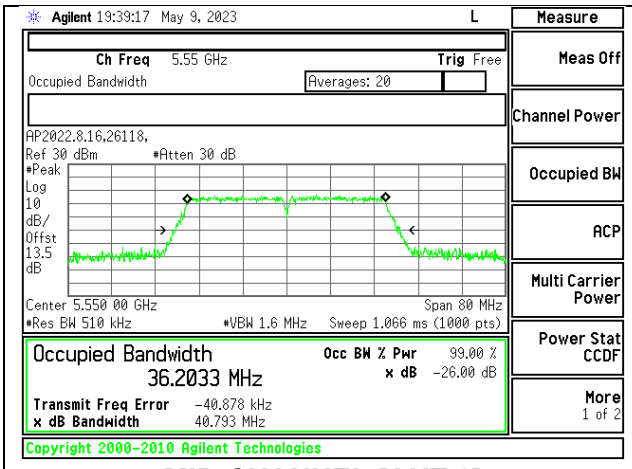
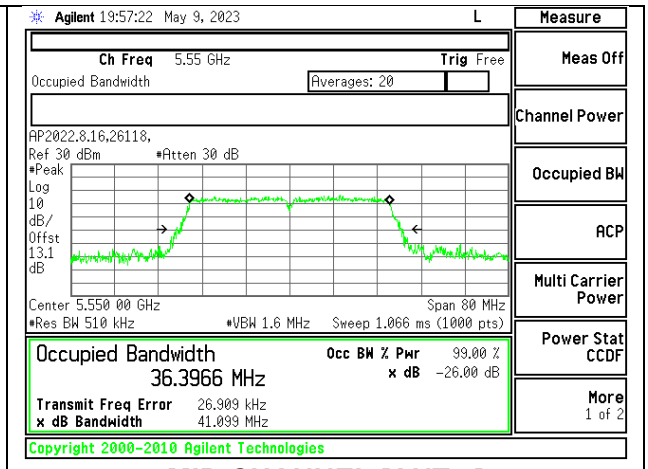
2TX Antenna 6 + Antenna 5 CDD MODE

Channel	Frequency (MHz)	26dB Bandwidth Antenna 6 (MHz)	26dB Bandwidth Antenna 5 (MHz)	99% Bandwidth Antenna 6 (MHz)	99% Bandwidth Antenna 5 (MHz)
Low	5510	40.55	40.50	36.3076	36.3821
Mid	5550	40.79	41.09	36.2033	36.3966
High	5670	40.60	40.35	36.2789	36.1492
142	5710	40.87	40.41	36.3333	36.2419



MID CHANNEL [ANT 6]



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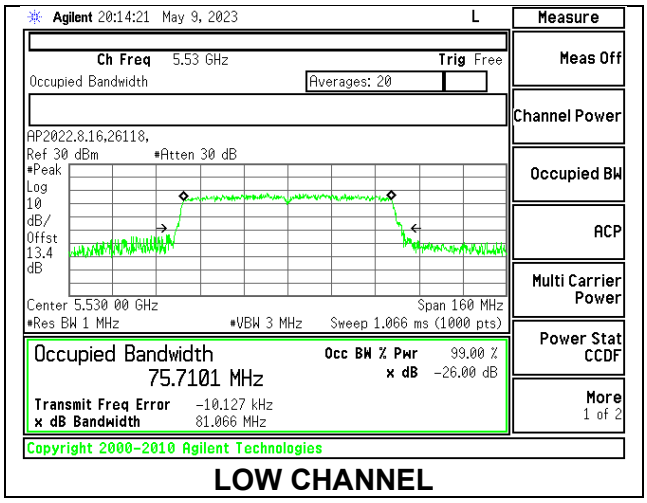
9.2.15. 802.11ac VHT80 MODE IN THE 5.6 GHz BAND

1TX Antenna 6 MODE

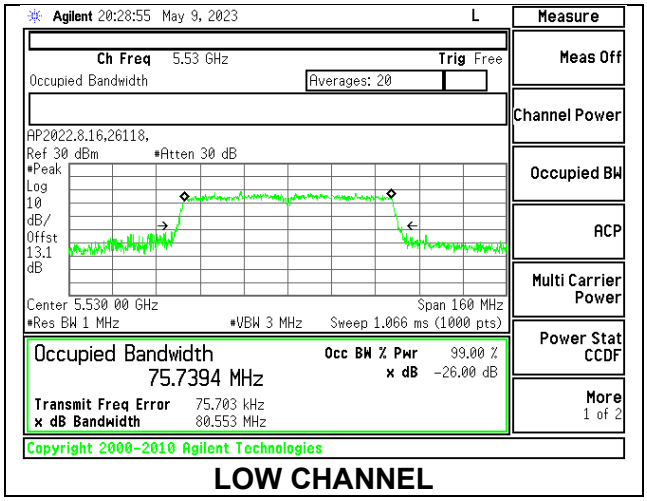
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5530	81.06	75.7101
High	5610	81.49	75.6678
138	5690	81.18	76.0039



LOW CHANNEL

1TX Antenna 5 MODE

Channel	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5530	80.55	75.7394
High	5610	82.00	75.7659
138	5690	80.91	75.6820



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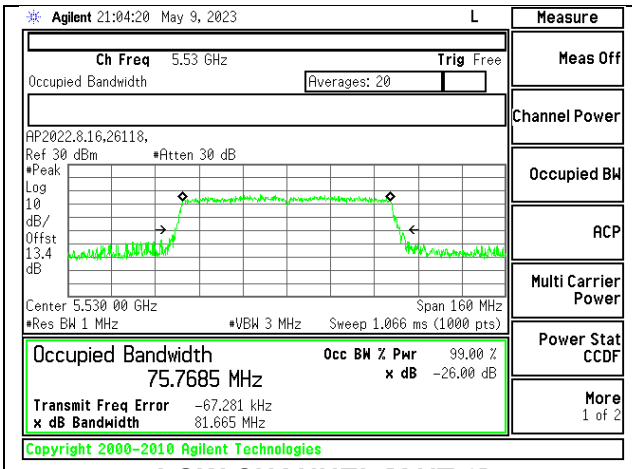
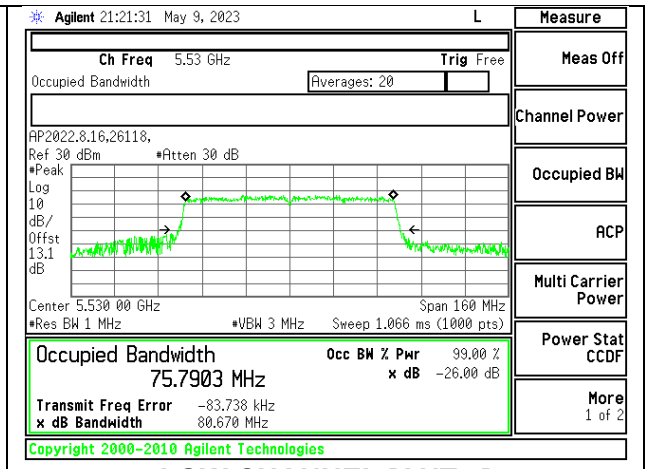
2TX Antenna 6 + Antenna 5 CDD MODE

Channel	Frequency (MHz)	26dB Bandwidth Antenna 6 (MHz)	26dB Bandwidth Antenna 5 (MHz)	99% Bandwidth Antenna 6 (MHz)	99% Bandwidth Antenna 5 (MHz)
Low	5530	81.66	80.67	75.7685	75.7903
High	5610	81.55	80.82	75.7840	75.5907
138	5690	81.15	79.94	75.7277	75.5934



LOW CHANNEL [ANT 6]



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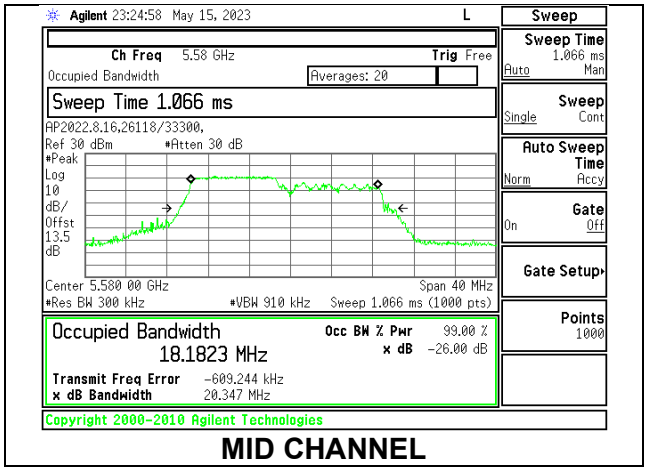
9.2.16. 802.11ax HE20 MODE IN THE 5.6 GHz BAND

1TX Antenna 6 MODE: 106 Tones, RU Index 53

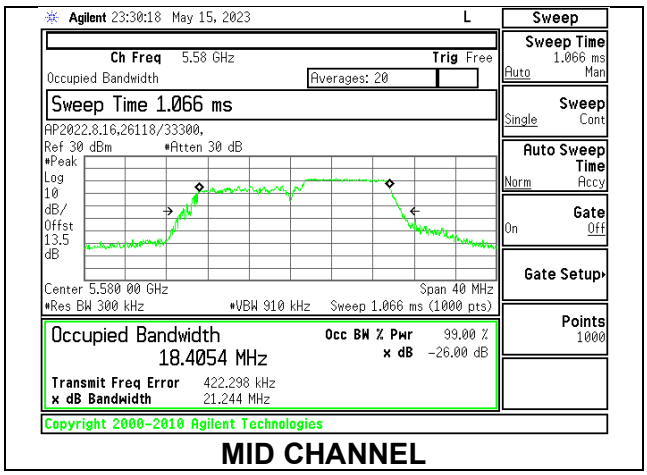
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5500	20.86	18.2455
Mid	5580	20.34	18.1823
High	5700	20.67	18.1899
144	5720	20.82	18.2219



MID CHANNEL

1TX Antenna 6 MODE: 106 Tones, RU Index 54

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5500	21.21	18.3424
Mid	5580	21.24	18.4054
High	5700	21.29	18.5705
144	5720	21.16	18.4977



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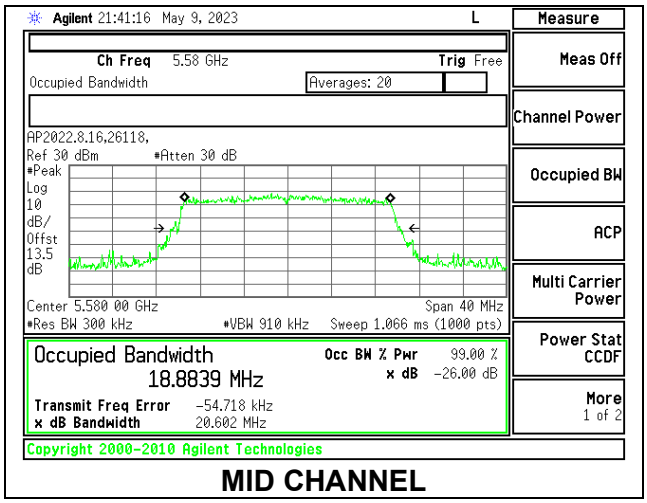
1TX Antenna 6 MODE: SU Mode

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5500	21.61	18.9470
Mid	5580	20.60	18.8839
High	5700	20.40	18.8268
144	5720	20.31	18.9356



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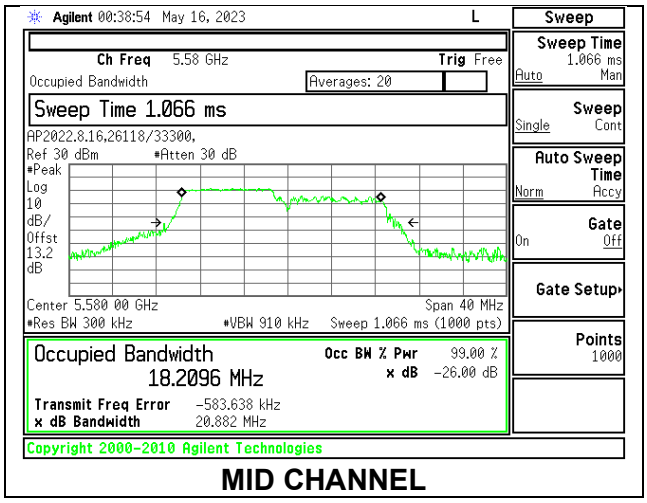
1TX Antenna 5 MODE: 106 Tones, RU Index 53

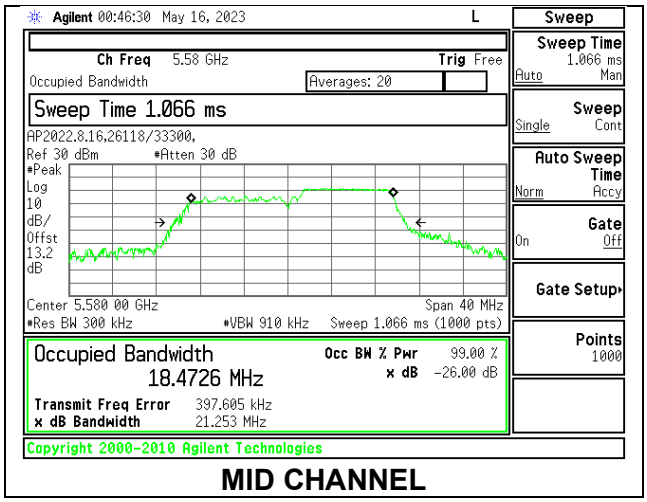
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5500	20.86	18.1574
Mid	5580	20.88	18.2086
High	5700	21.04	18.2311
144	5720	21.04	18.2107



MID CHANNEL

1TX Antenna 5 MODE: 106 Tones, RU Index 54

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5500	20.84	18.4109
Mid	5580	21.25	18.4726
High	5700	21.19	18.4266
144	5720	21.01	18.5427



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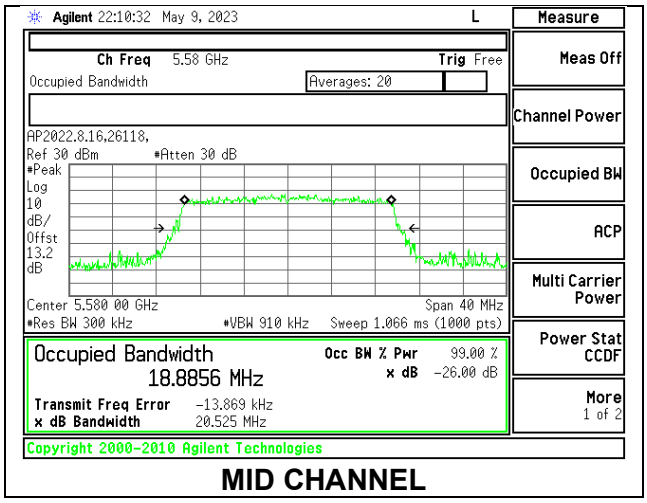
1TX Antenna 5 MODE: SU Mode

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5500	21.12	18.8989
Mid	5580	20.52	18.8856
High	5700	20.92	18.9379
144	5720	20.15	18.9054



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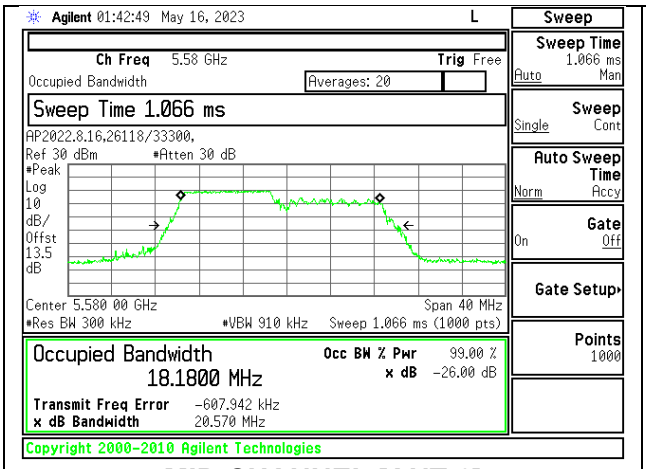
2TX Antenna 6 + Antenna 5 CDD MODE: 106 Tones, RU Index 53

Channel	Frequency (MHz)	26 dB Bandwidth Antenna 6 (MHz)	26 dB Bandwidth Antenna 5 (MHz)	99% Bandwidth Antenna 6 (MHz)	99% Bandwidth Antenna 5 (MHz)
Low	5500	20.91	19.92	18.2574	18.0970
Mid	5580	20.57	20.00	18.1800	18.0916
High	5700	20.90	19.89	18.2647	18.1441
144	5720	20.84	20.08	18.1900	18.1259



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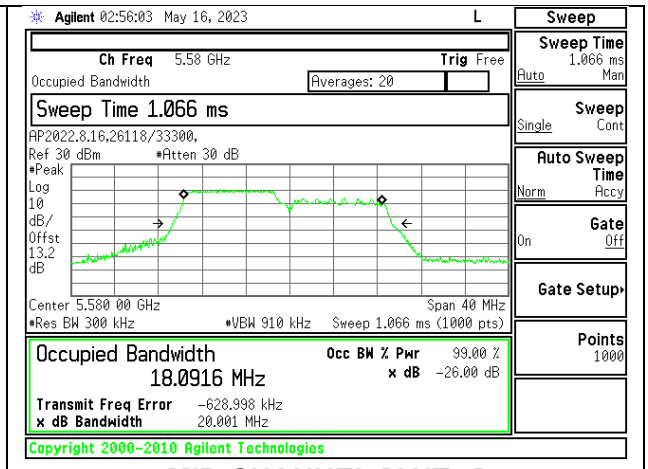

MID CHANNEL [ANT 5]

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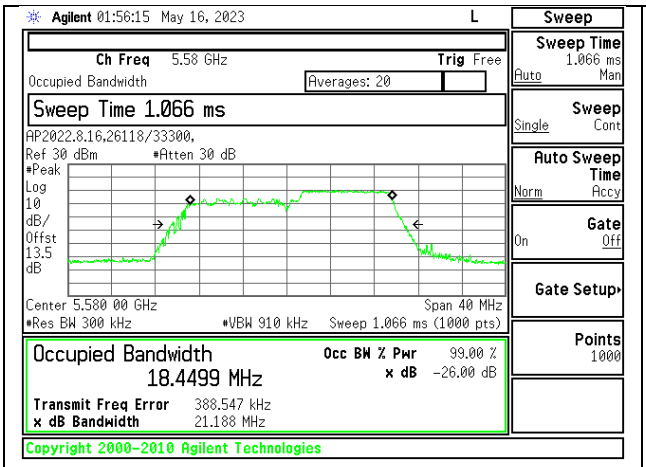
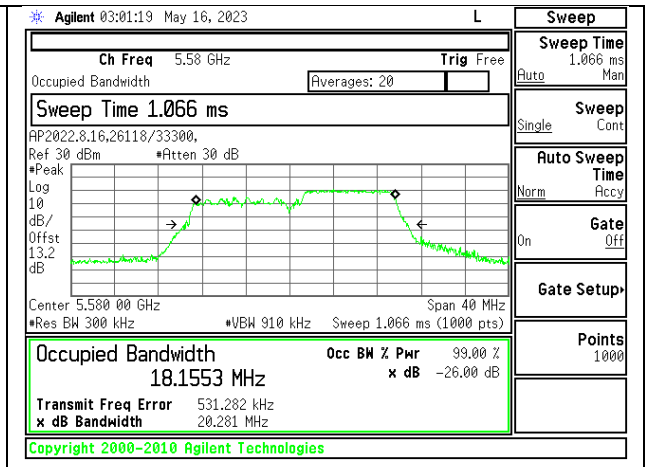
2TX Antenna 6 + Antenna 5 CDD MODE: 106 Tones, RU Index 54

Channel	Frequency (MHz)	26 dB Bandwidth Antenna 6 (MHz)	26 dB Bandwidth Antenna 5 (MHz)	99% Bandwidth Antenna 6 (MHz)	99% Bandwidth Antenna 5 (MHz)
Low	5500	21.25	20.04	18.5240	18.1433
Mid	5580	21.18	20.28	18.4499	18.1553
High	5700	21.27	20.17	18.5684	18.0071
144	5720	21.20	20.14	18.4531	18.2159



MID CHANNEL [ANT 6]



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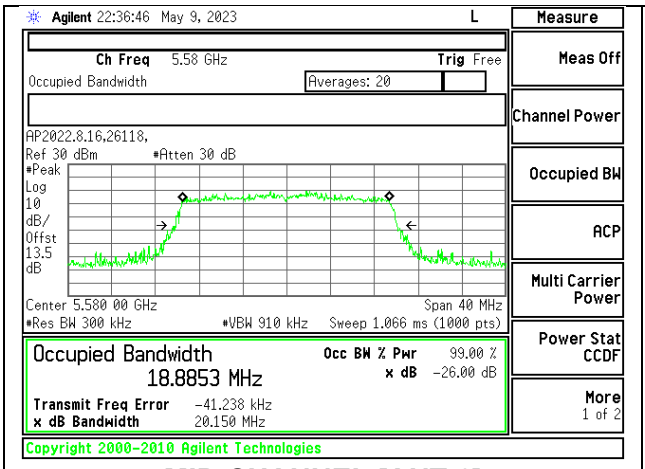
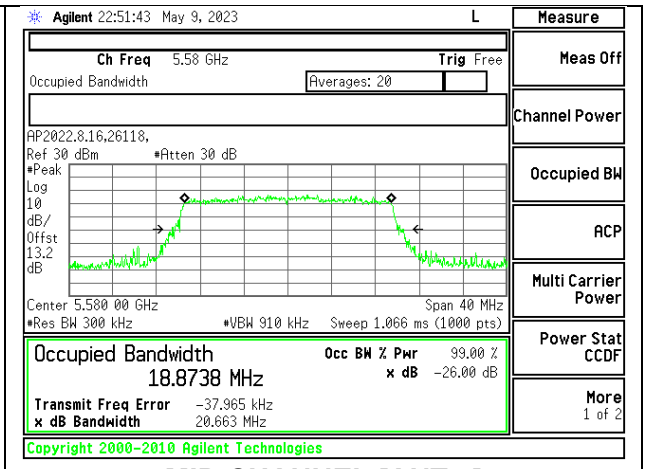
2TX Antenna 6 + Antenna 5 CDD MODE: SU Mode

Channel	Frequency (MHz)	26 dB Bandwidth Antenna 6 (MHz)	26 dB Bandwidth Antenna 5 (MHz)	99% Bandwidth Antenna 6 (MHz)	99% Bandwidth Antenna 5 (MHz)
Low	5500	21.27	21.98	18.9108	18.9380
Mid	5580	20.15	20.66	18.8853	18.8738
High	5700	20.91	21.15	18.9890	18.8253
144	5720	20.54	20.39	18.8966	18.8715



MID CHANNEL [ANT 6]



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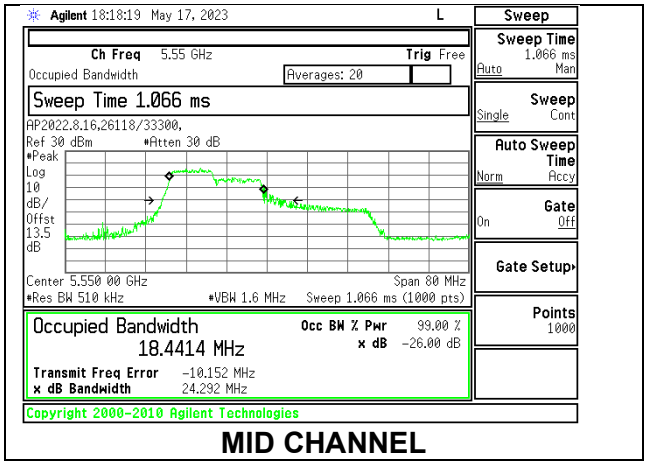
9.2.17. 802.11ax HE40 MODE IN THE 5.6 GHz BAND

1TX Antenna 6 MODE: 106 Tones, RU Index 53

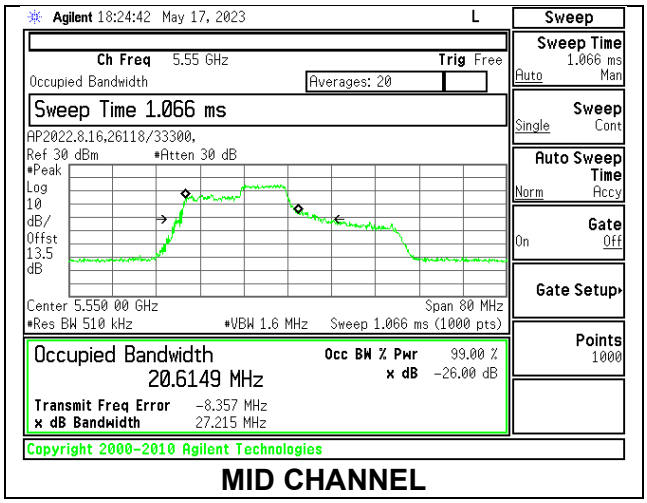
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5510	24.73	19.0451
Mid	5550	24.29	18.4414
High	5670	23.91	18.6098
142	5710	23.77	18.4254



MID CHANNEL

1TX Antenna 6 MODE: 106 Tones, RU Index 54

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5510	27.69	21.4531
Mid	5550	27.21	20.6149
High	5670	29.91	20.5876
142	5710	27.75	20.6597



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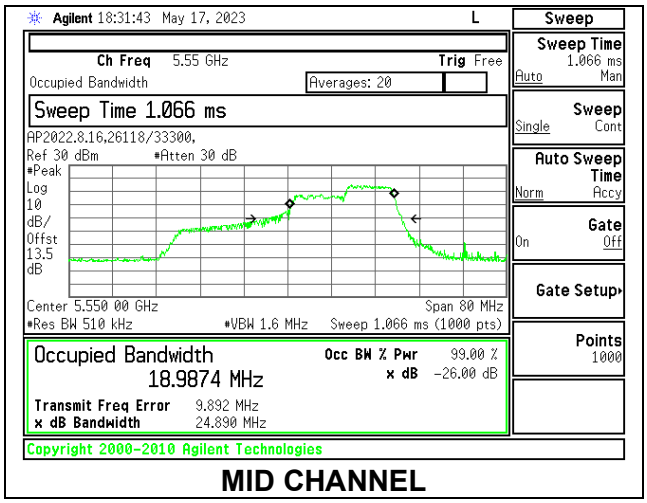
1TX Antenna 6 MODE: 106 Tones, RU Index 56

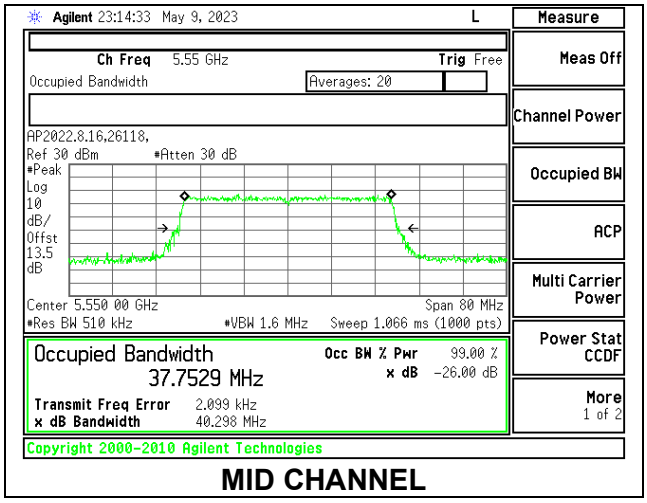
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5510	25.31	18.3880
Mid	5550	24.89	18.9874
High	5670	25.80	19.1382
142	5710	25.57	19.0806



MID CHANNEL

1TX Antenna 6 MODE: SU Mode

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5510	42.29	37.9086
Mid	5550	40.29	37.7529
High	5670	41.25	37.8921
142	5710	40.40	37.8278



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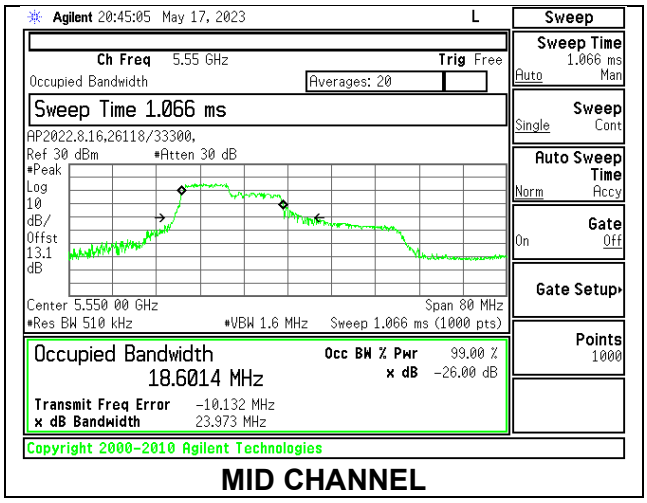
1TX Antenna 5 MODE: 106 Tones, RU Index 53

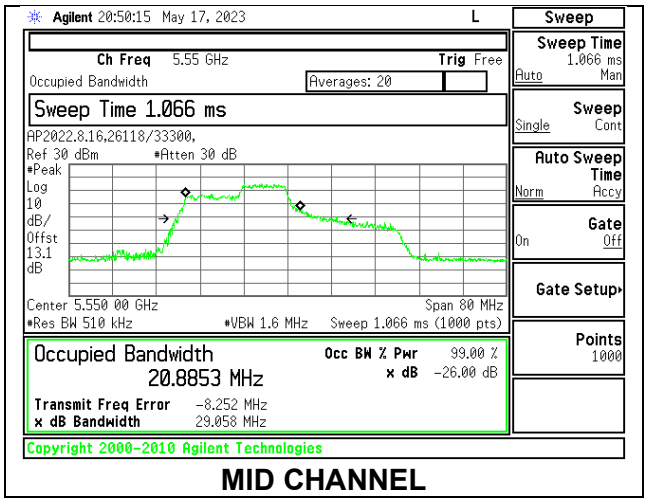
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5510	24.35	18.4841
Mid	5550	23.97	18.6014
High	5670	26.15	18.8203
142	5710	24.53	19.0628



MID CHANNEL

1TX Antenna 5 MODE: 106 Tones, RU Index 54

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5510	29.03	20.8013
Mid	5550	29.05	20.8853
High	5670	28.84	20.7077
142	5710	28.32	20.4367



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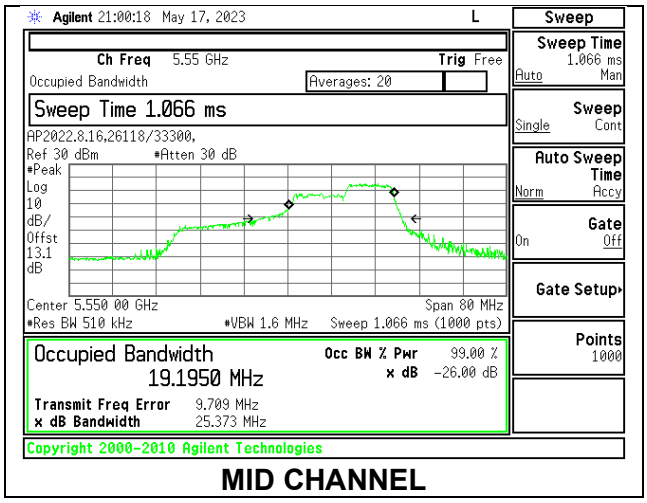
1TX Antenna 5 MODE: 106 Tones, RU Index 56

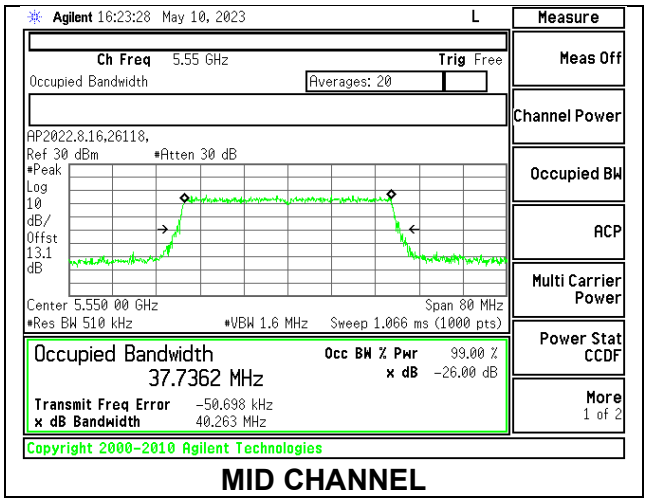
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5510	25.10	18.8328
Mid	5550	25.37	19.1950
High	5670	25.34	18.6957
142	5710	25.47	18.6488



MID CHANNEL

1TX Antenna 5 MODE: SU Mode

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5510	41.54	37.9321
Mid	5550	40.26	37.7362
High	5670	41.49	37.9268
142	5710	40.23	37.7180



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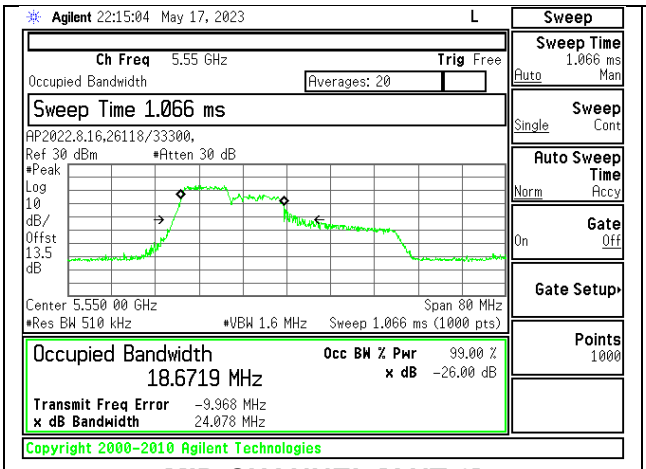
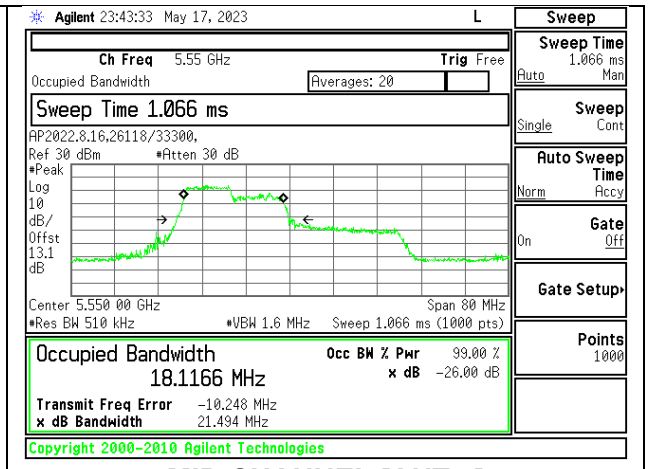
2TX Antenna 6 + Antenna 5 CDD MODE: 106 Tones, RU Index 53

Channel	Frequency (MHz)	26 dB Bandwidth Antenna 6 (MHz)	26 dB Bandwidth Antenna 5 (MHz)	99% Bandwidth Antenna 6 (MHz)	99% Bandwidth Antenna 5 (MHz)
Low	5510	24.42	20.91	18.6782	18.1242
Mid	5550	24.07	21.49	18.6719	18.1166
High	5670	23.77	22.73	18.6848	18.1216
142	5710	23.94	21.77	18.8690	18.2538



MID CHANNEL [ANT 6]



MID CHANNEL [ANT 5]

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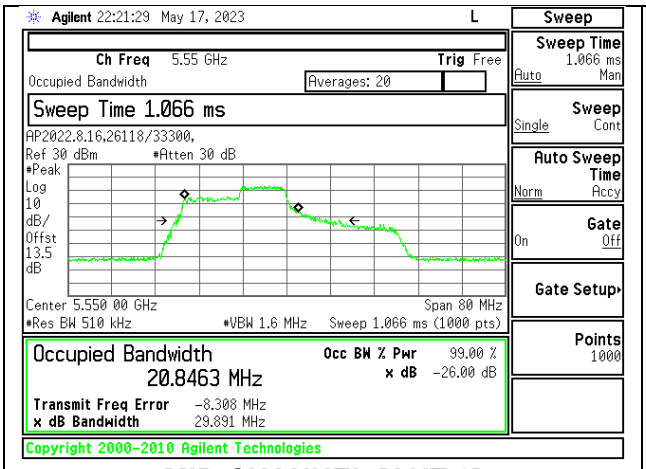
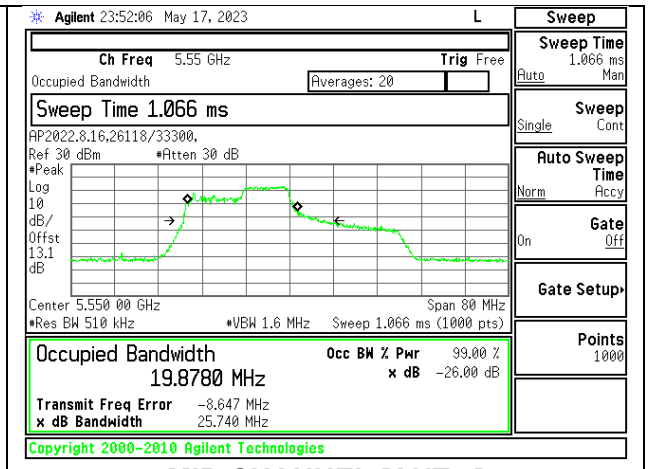
2TX Antenna 6 + Antenna 5 CDD MODE: 106 Tones, RU Index 54

Channel	Frequency (MHz)	26 dB Bandwidth Antenna 6 (MHz)	26 dB Bandwidth Antenna 5 (MHz)	99% Bandwidth Antenna 6 (MHz)	99% Bandwidth Antenna 5 (MHz)
Low	5510	30.24	29.35	21.1374	20.2180
Mid	5550	29.89	25.74	20.8463	19.8780
High	5670	34.60	26.88	20.9758	20.4694
142	5710	28.20	25.60	20.7757	19.9525



MID CHANNEL [ANT 6]



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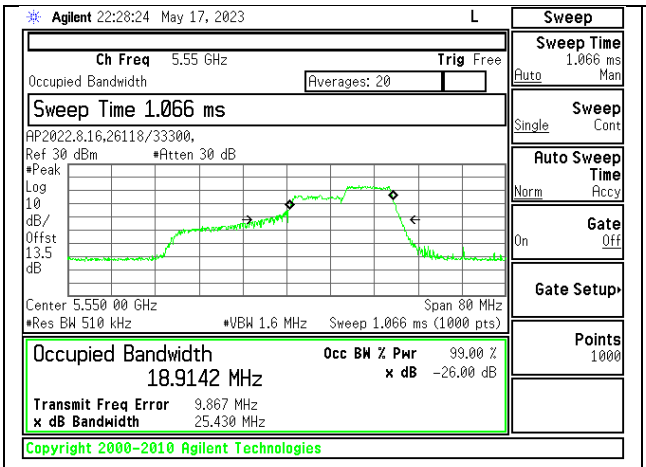
2TX Antenna 6 + Antenna 5 CDD MODE: 106 Tones, RU Index 56

Channel	Frequency (MHz)	26 dB Bandwidth Antenna 6 (MHz)	26 dB Bandwidth Antenna 5 (MHz)	99% Bandwidth Antenna 6 (MHz)	99% Bandwidth Antenna 5 (MHz)
Low	5510	25.88	20.33	18.8682	17.9850
Mid	5550	25.43	20.12	18.9142	18.0566
High	5670	25.65	20.47	19.3196	18.1109
142	5710	25.84	20.31	19.1639	18.1564



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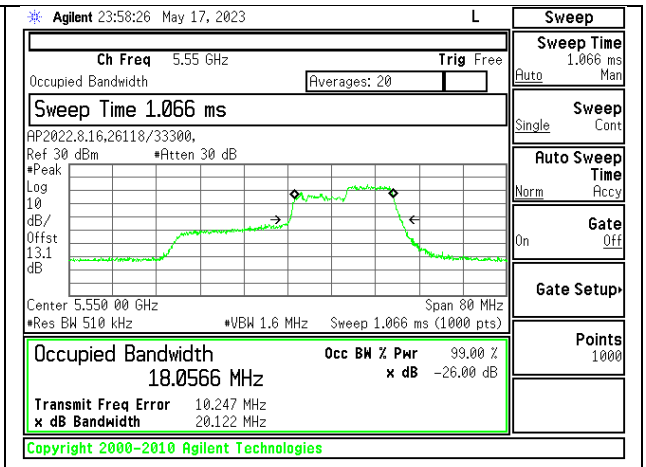

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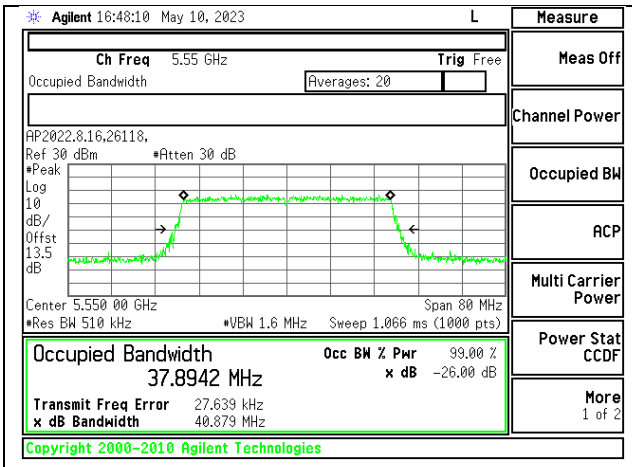
2TX Antenna 6 + Antenna 5 CDD MODE: SU Mode

Channel	Frequency (MHz)	26 dB Bandwidth Antenna 6 (MHz)	26 dB Bandwidth Antenna 5 (MHz)	99% Bandwidth Antenna 6 (MHz)	99% Bandwidth Antenna 5 (MHz)
Low	5510	41.34	41.66	37.8431	37.9895
Mid	5550	40.87	40.56	37.8942	37.8841
High	5670	45.16	42.23	37.9009	37.8620
142	5710	40.51	40.35	37.7553	37.9265



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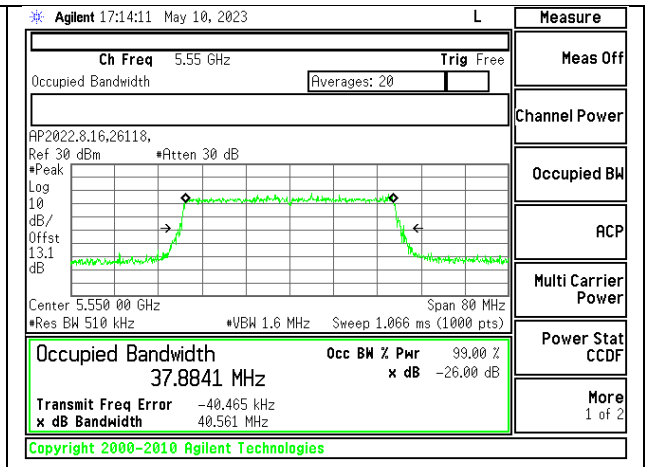

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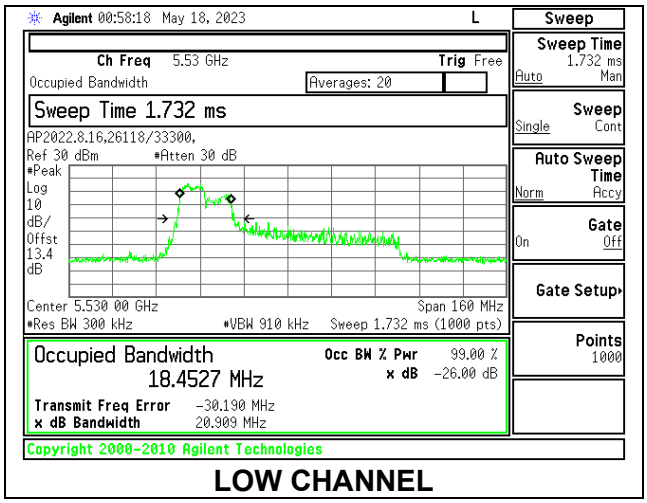
9.2.18. 802.11ax HE80 MODE IN THE 5.6 GHz BAND

1TX Antenna 6 MODE: 106 Tones, RU Index 53

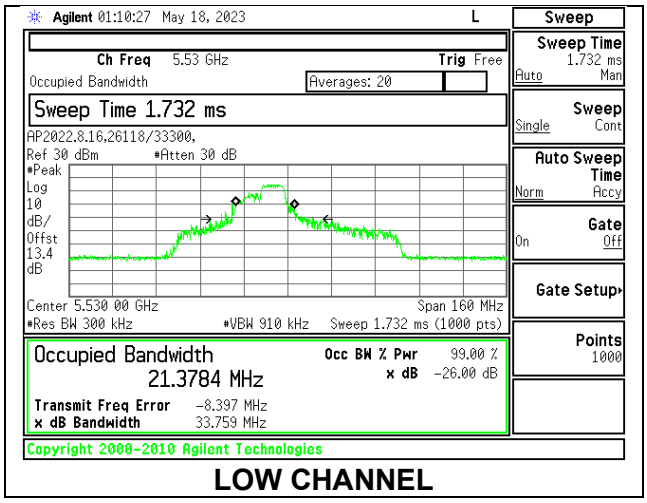
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5530	20.90	18.4527
High	5610	21.09	18.0855
138	5690	22.11	18.1592



LOW CHANNEL

1TX Antenna 6 MODE: 106 Tones, RU Index 56

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5530	33.75	21.3784
High	5610	35.65	21.4297
138	5690	22.11	18.1592



LOW CHANNEL

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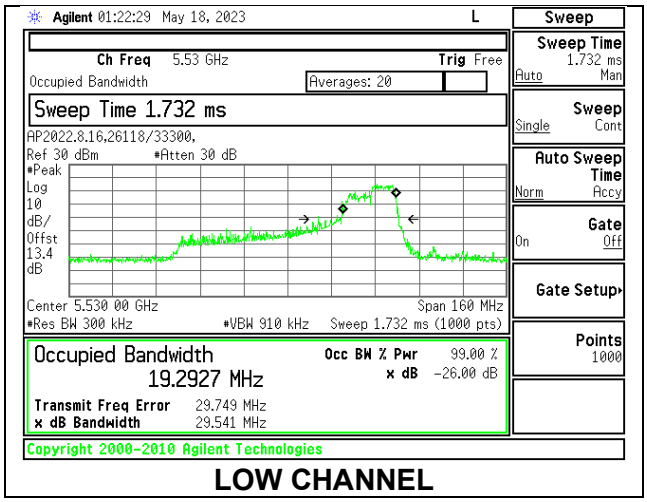
1TX Antenna 6 MODE: 106 Tones, RU Index 60

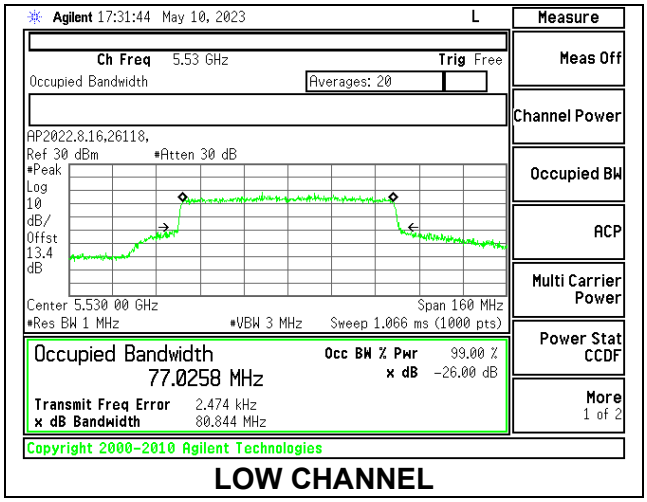
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5530	29.54	19.2927
High	5610	25.66	19.0355
138	5690	29.14	18.6146



LOW CHANNEL

1TX Antenna 6 MODE: SU Mode

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5530	80.84	77.0258
High	5610	82.56	76.9827
138	5690	80.55	77.0069



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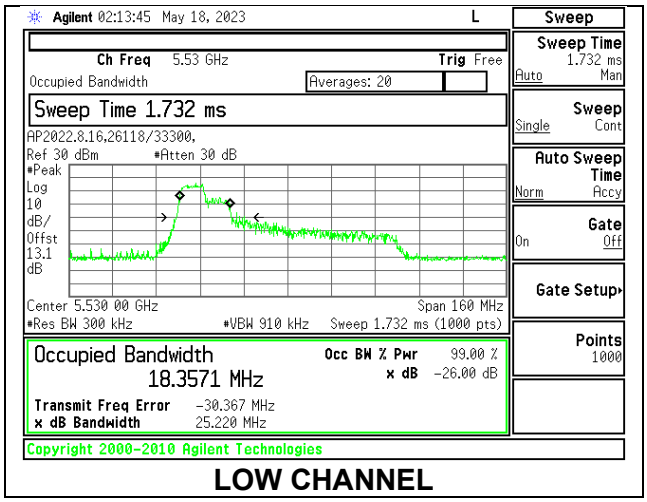
1TX Antenna 5 MODE: 106 Tones, RU Index 53

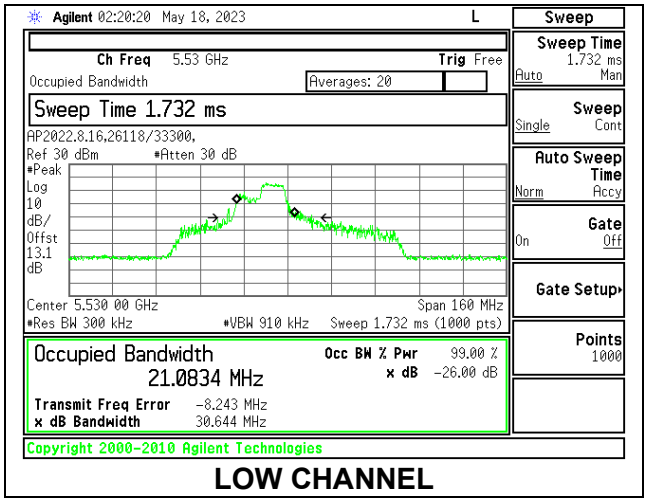
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5530	25.22	18.3571
High	5610	23.50	18.2217
138	5690	26.27	18.3490



LOW CHANNEL

1TX Antenna 5 MODE: 106 Tones, RU Index 56

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5530	30.64	21.0834
High	5610	27.47	20.6431
138	5690	35.70	21.1063



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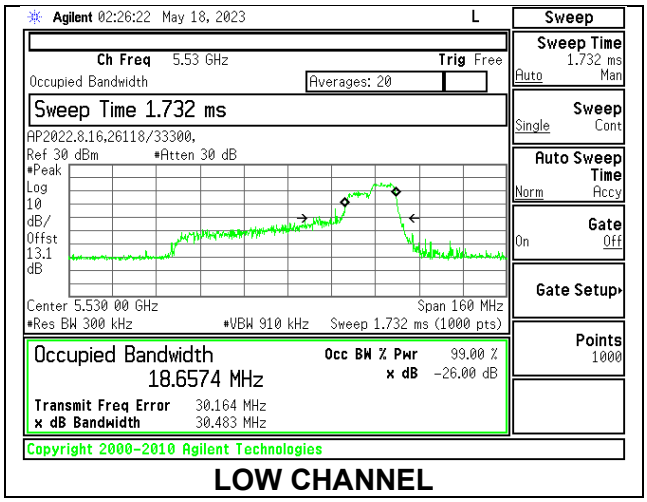
1TX Antenna 5 MODE: 106 Tones, RU Index 60

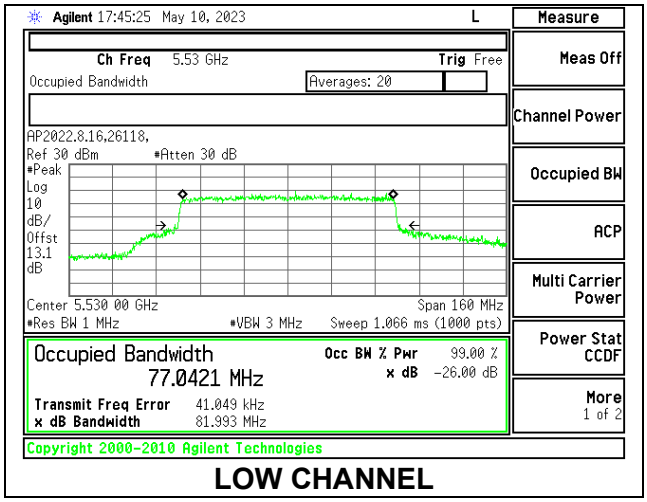
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5530	30.48	18.6574
High	5610	28.60	18.6694
138	5690	25.80	18.3522



LOW CHANNEL

1TX Antenna 5 MODE: SU Mode

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5530	81.99	77.0421
High	5610	81.71	77.1359
138	5690	80.83	77.0330



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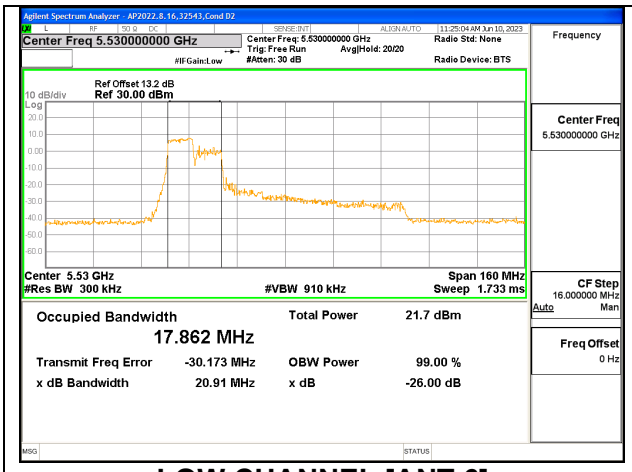
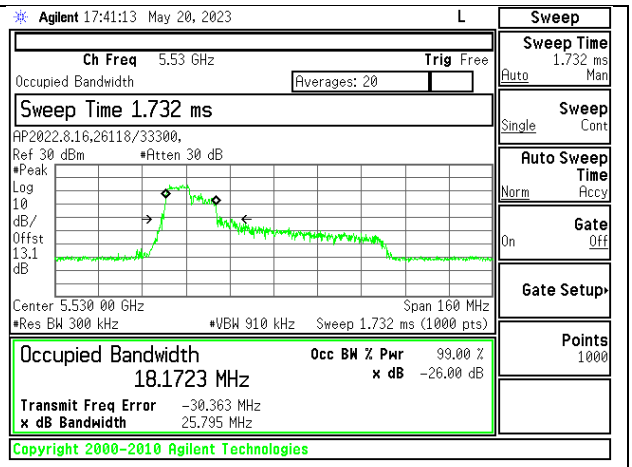
2TX Antenna 6 + Antenna 5 CDD MODE: 106 Tones, RU Index 53

Channel	Frequency (MHz)	26 dB Bandwidth Antenna 6 (MHz)	26 dB Bandwidth Antenna 5 (MHz)	99% Bandwidth Antenna 6 (MHz)	99% Bandwidth Antenna 5 (MHz)
Low	5530	20.9100	25.7950	17.8620	18.1723
High	5610	21.0700	21.2800	17.8770	18.1607
138	5690	20.3900	20.4000	18.0486	18.0666



LOW CHANNEL [ANT 6]



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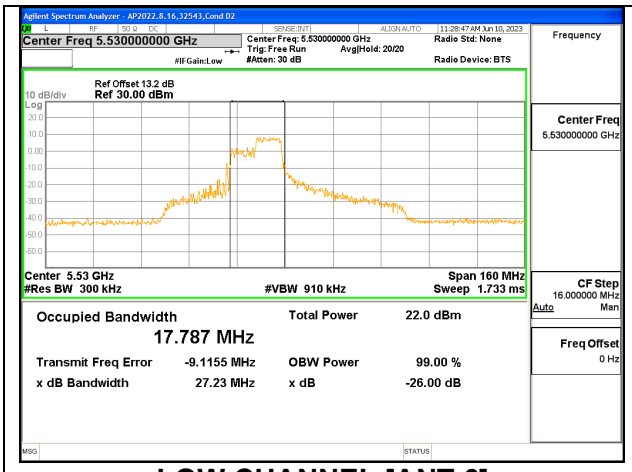
2TX Antenna 6 + Antenna 5 CDD MODE: 106 Tones, RU Index 56

Channel	Frequency (MHz)	26 dB Bandwidth Antenna 6 (MHz)	26 dB Bandwidth Antenna 5 (MHz)	99% Bandwidth Antenna 6 (MHz)	99% Bandwidth Antenna 5 (MHz)
Low	5530	27.23	24.24	17.7870	19.9117
High	5610	27.26	26.04	19.0200	20.5801
138	5690	26.99	24.70	20.2469	20.9297



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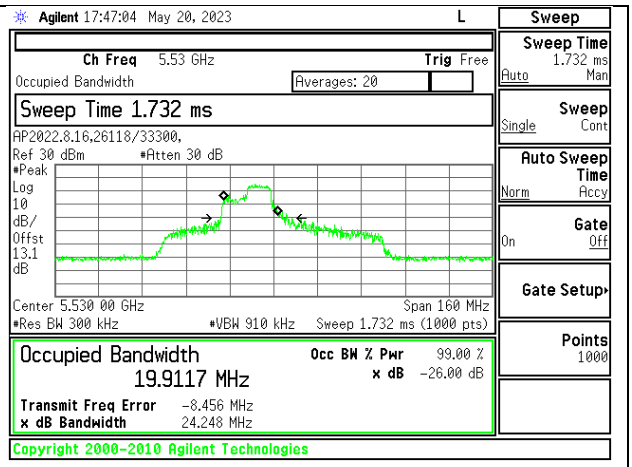

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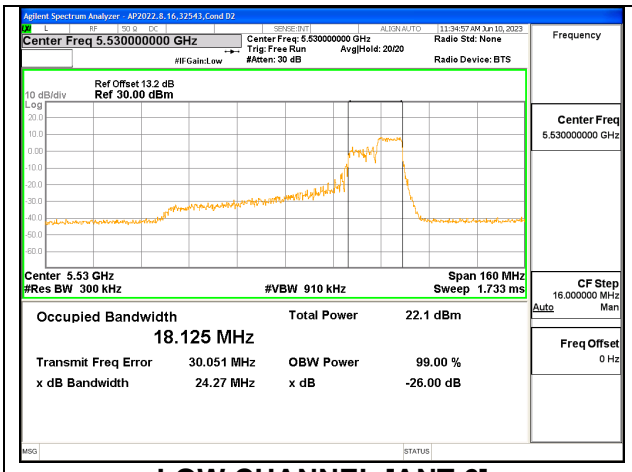
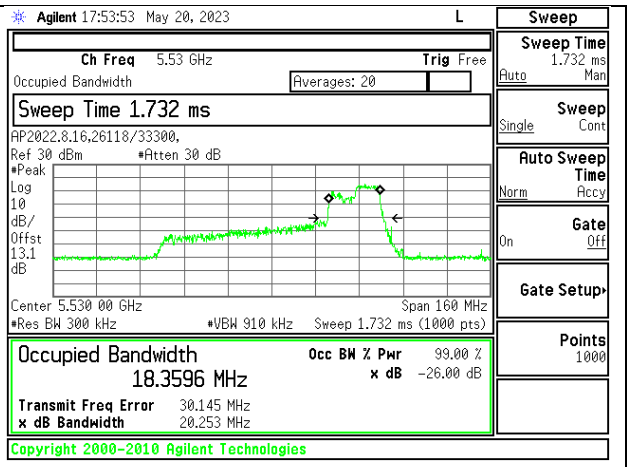
2TX Antenna 6 + Antenna 5 CDD MODE: 106 Tones, RU Index 60

Channel	Frequency (MHz)	26 dB Bandwidth Antenna 6 (MHz)	26 dB Bandwidth Antenna 5 (MHz)	99% Bandwidth Antenna 6 (MHz)	99% Bandwidth Antenna 5 (MHz)
Low	5530	24.27	20.25	18.1250	18.3596
High	5610	24.42	20.26	18.1760	18.0834
138	5690	28.18	21.12	18.7256	18.4254



LOW CHANNEL [ANT 6]



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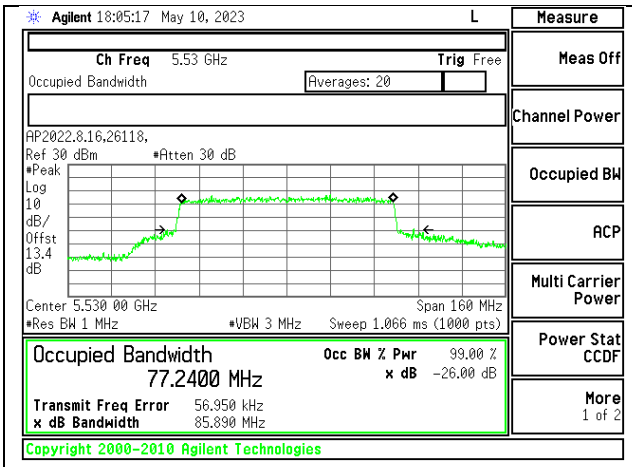
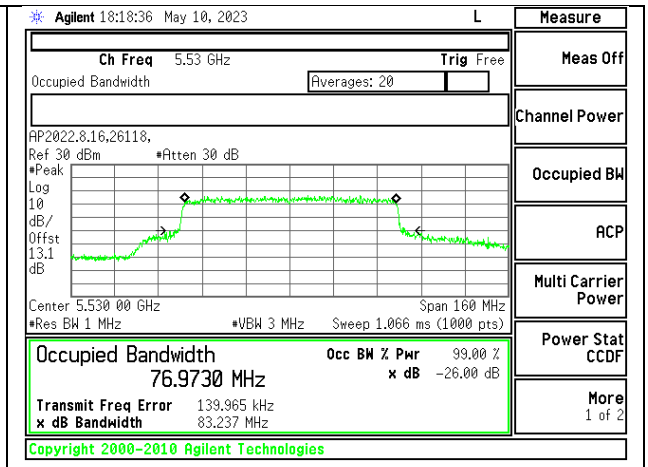
2TX Antenna 6 + Antenna 5 CDD MODE: SU Mode

Channel	Frequency (MHz)	26 dB Bandwidth Antenna 6 (MHz)	26 dB Bandwidth Antenna 5 (MHz)	99% Bandwidth Antenna 6 (MHz)	99% Bandwidth Antenna 5 (MHz)
Low	5530	85.89	83.23	77.2400	76.9730
High	5610	81.03	82.73	77.0910	77.0799
138	5690	81.29	80.60	77.1314	77.2616



LOW CHANNEL [ANT 6]



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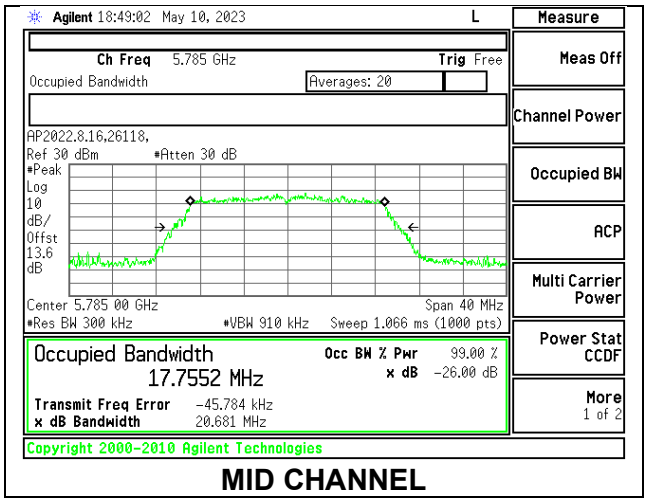
9.2.19. 802.11n HT20 MODE IN THE 5.8 GHz BAND

1TX Antenna 6 MODE

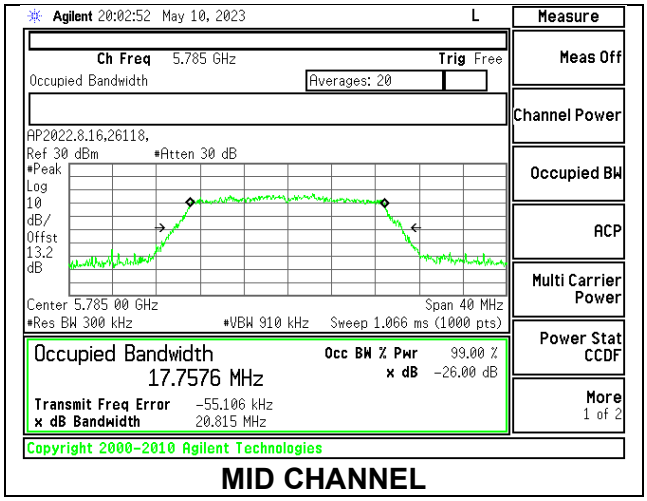
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5745	20.90	17.7220
Mid	5785	20.68	17.7552
High	5825	20.69	17.7540



MID CHANNEL

1TX Antenna 5 MODE

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5745	20.65	17.6647
Mid	5785	20.81	17.7576
High	5825	20.66	17.7652



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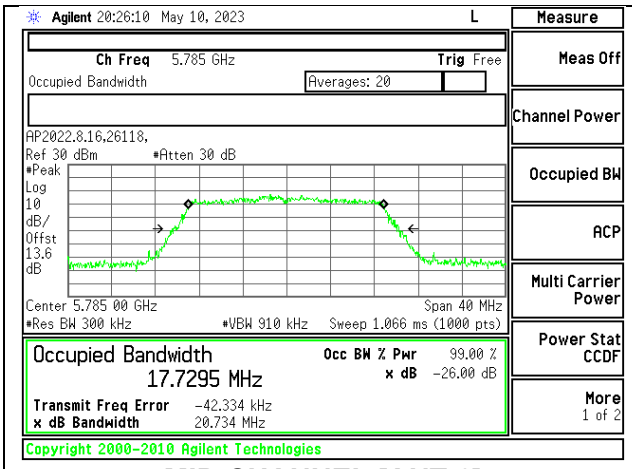
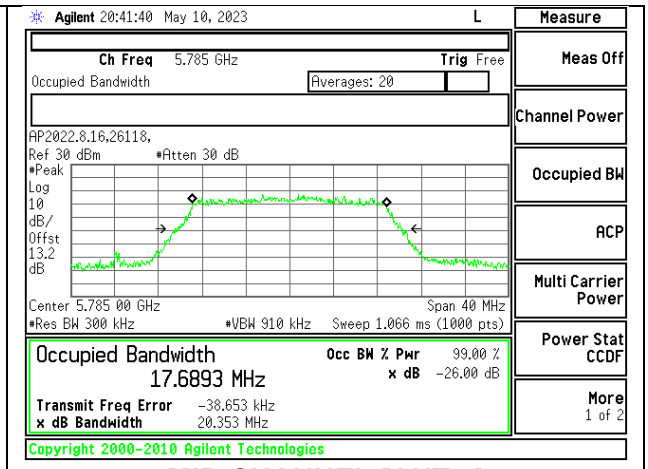
2TX Antenna 6 + Antenna 5 CDD MODE

Channel	Frequency (MHz)	26dB Bandwidth Antenna 6 (MHz)	26dB Bandwidth Antenna 5 (MHz)	99% Bandwidth Antenna 6 (MHz)	99% Bandwidth Antenna 5 (MHz)
Low	5745	20.63	20.51	17.7228	17.7123
Mid	5785	20.73	20.35	17.7295	17.6893
High	5825	20.64	20.66	17.7231	17.7296



MID CHANNEL [ANT 6]



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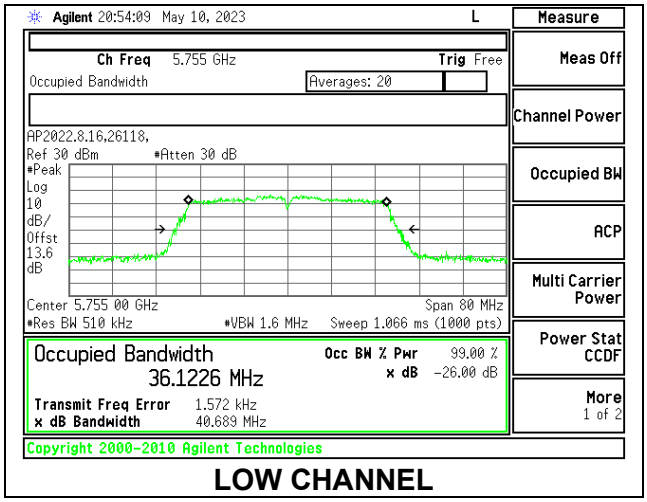
9.2.20. 802.11n HT40 MODE IN THE 5.8 GHz BAND

1TX Antenna 6 MODE

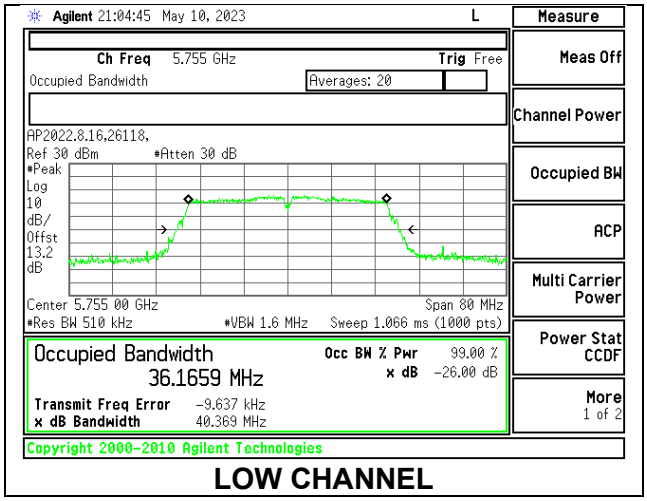
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5755	40.68	36.1226
High	5795	41.02	36.1701



LOW CHANNEL

1TX Antenna 5 MODE

Channel	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5755	40.36	36.1659
High	5795	40.61	36.0836



LOW CHANNEL

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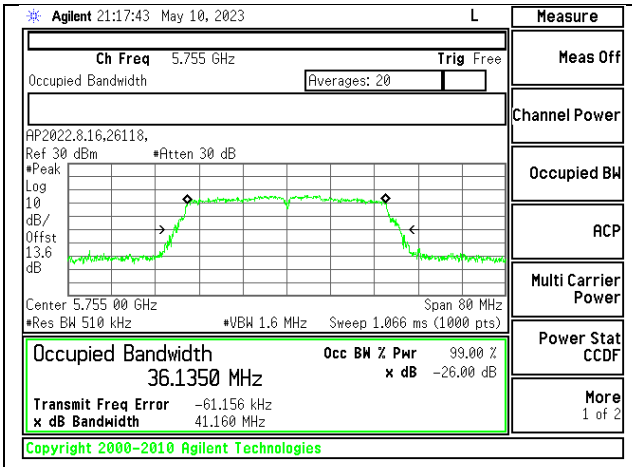
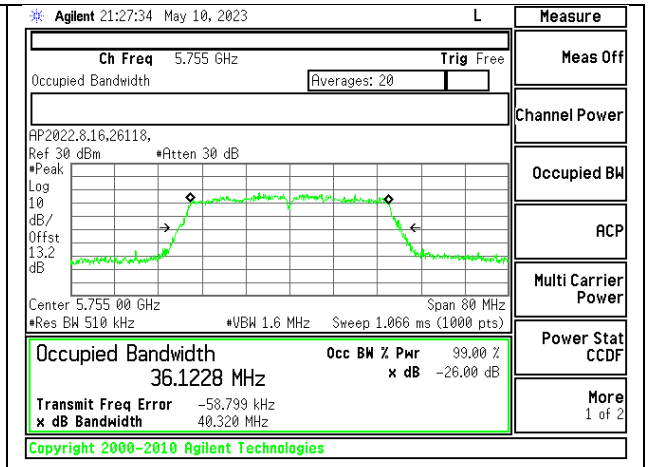
2TX Antenna 6 + Antenna 5 CDD MODE

Channel	Frequency (MHz)	26dB Bandwidth Antenna 6 (MHz)	26dB Bandwidth Antenna 5 (MHz)	99% Bandwidth Antenna 6 (MHz)	99% Bandwidth Antenna 5 (MHz)
Low	5755	41.16	40.32	36.1350	36.1228
High	5795	40.57	40.13	36.1613	36.0720



LOW CHANNEL [ANT 6]



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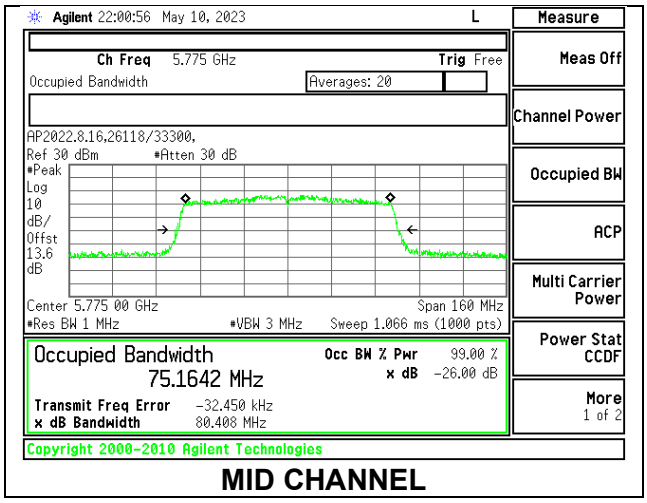
9.2.21. 802.11ac VHT80 MODE IN THE 5.8 GHz BAND

1TX Antenna 6 MODE

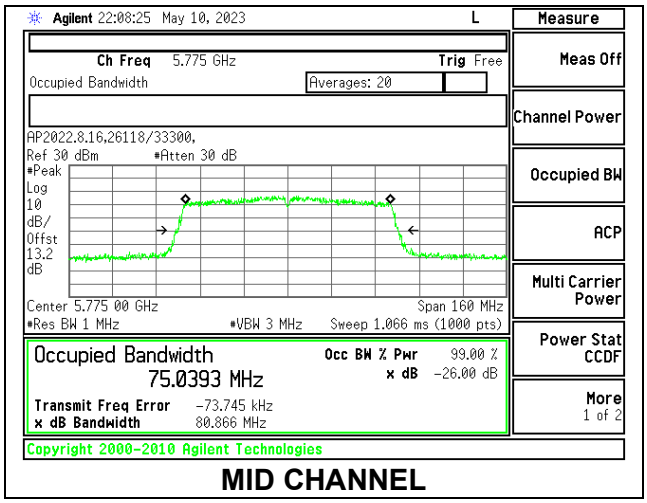
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Mid	5775	80.40	75.1642



MID CHANNEL

1TX Antenna 5 MODE

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Mid	5775	80.86	75.0393



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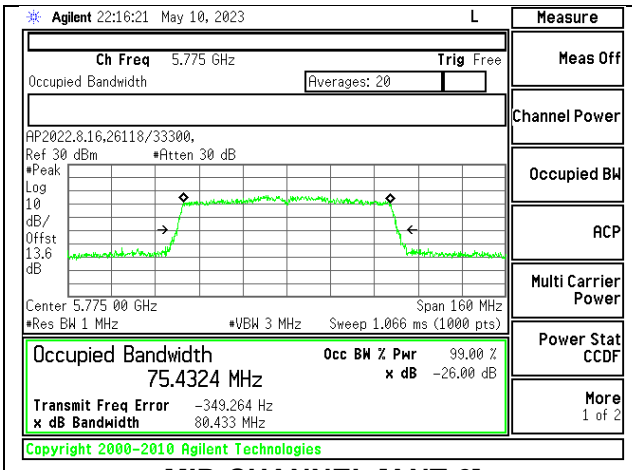
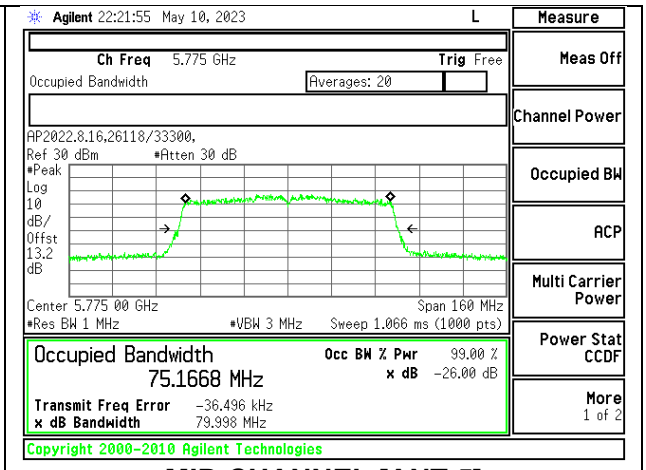
2TX Antenna 6 + Antenna 5 CDD MODE

Channel	Frequency (MHz)	26dB Bandwidth Antenna 6 (MHz)	26dB Bandwidth Antenna 5 (MHz)	99% Bandwidth Antenna 6 (MHz)	99% Bandwidth Antenna 5 (MHz)
Mid	5775	80.43	79.99	75.4324	75.1668



MID CHANNEL [ANT 6]



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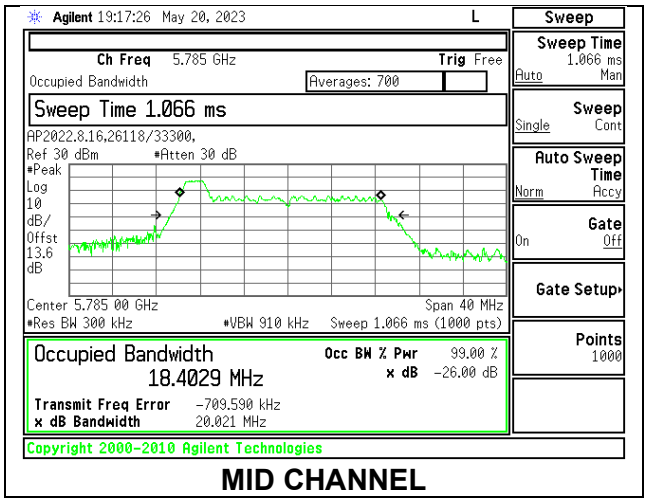
9.2.22. 802.11ax HE20 MODE IN THE 5.8 GHz BAND

1TX Antenna 6 MODE: 26 Tones, RU Index 0

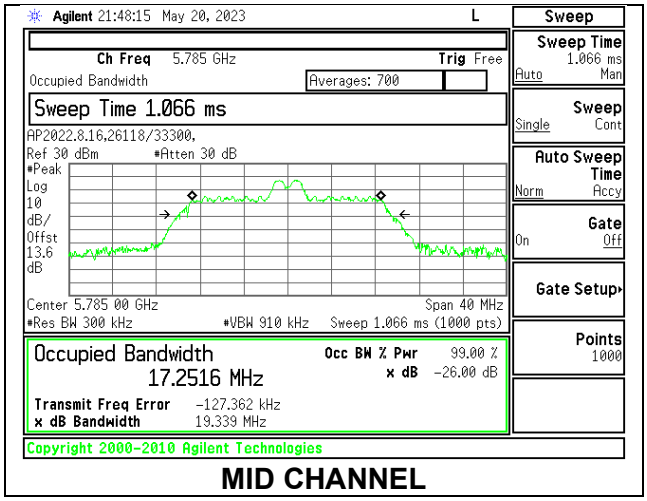
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5745	19.97	18.3548
Mid	5785	20.02	18.4029
High	5825	20.02	18.4382



MID CHANNEL

1TX Antenna 6 MODE: 26 Tones, RU Index 4

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5745	19.10	17.2401
Mid	5785	19.34	17.2516
High	5825	19.33	17.2917



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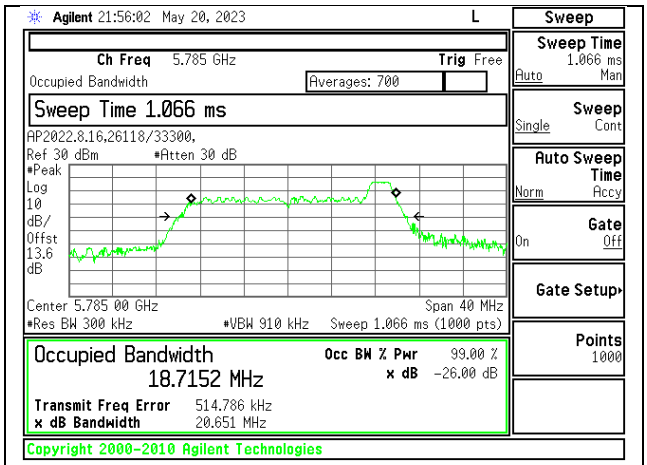
1TX Antenna 6 MODE: 26 Tones, RU Index 8

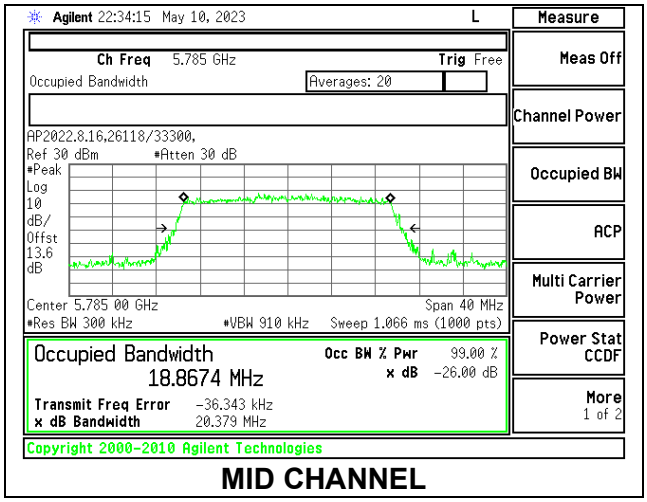
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5745	20.64	18.7523
Mid	5785	20.65	18.7152
High	5825	20.59	18.6724



MID CHANNEL

1TX Antenna 6 MODE: SU Mode

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5745	20.46	18.8876
Mid	5785	20.37	18.8674
High	5825	20.34	18.9140



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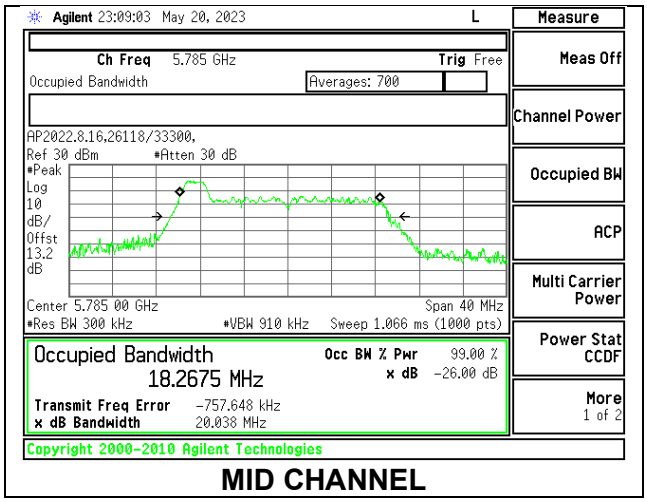
1TX Antenna 5 MODE: 26 Tones, RU Index 0

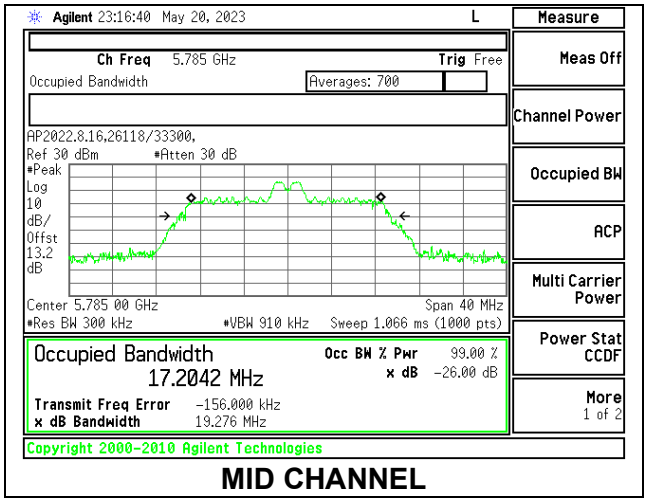
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5745	20.06	18.3816
Mid	5785	20.03	18.2675
High	5825	20.04	18.2766



MID CHANNEL

1TX Antenna 5 MODE: 26 Tones, RU Index 4

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5745	19.04	17.2512
Mid	5785	19.27	17.2042
High	5825	19.09	17.1904



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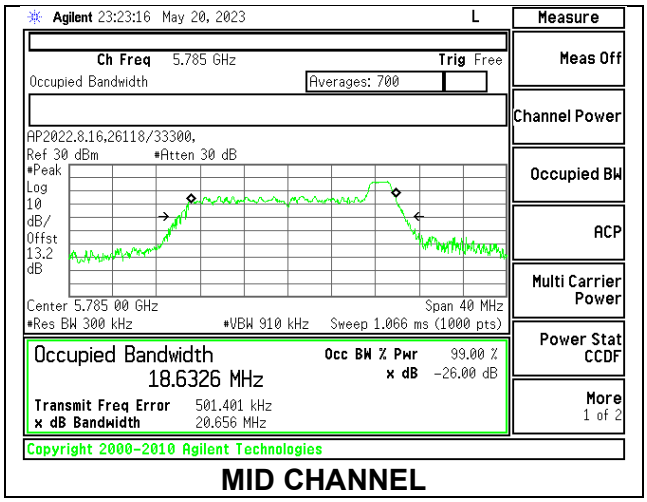
1TX Antenna 5 MODE: 26 Tones, RU Index 8

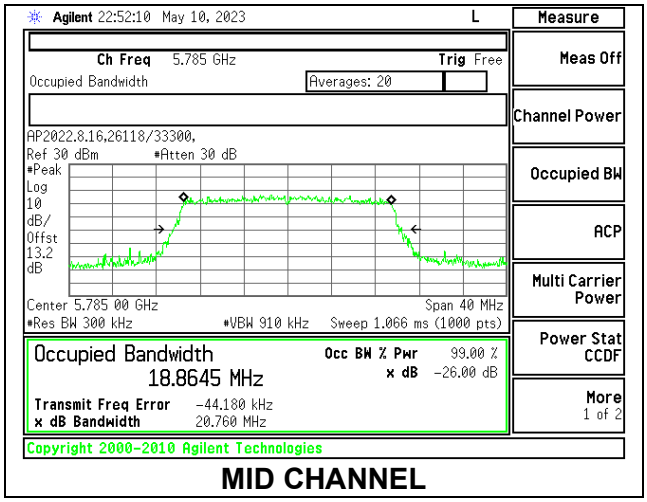
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5745	20.60	18.5623
Mid	5785	20.65	18.6326
High	5825	20.22	18.5580



MID CHANNEL

1TX Antenna 5 MODE: SU Mode

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5745	20.47	18.8848
Mid	5785	20.76	18.8645
High	5825	20.45	18.8344



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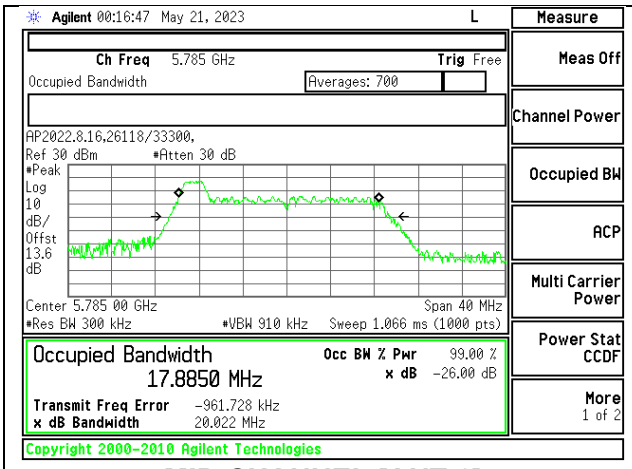
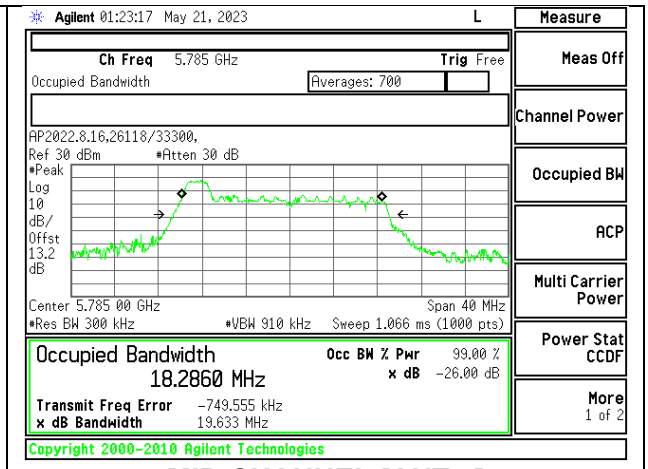
2TX Antenna 6 + Antenna 5 CDD MODE: 26 Tones, RU Index 0

Channel	Frequency (MHz)	26 dB Bandwidth Antenna 6 (MHz)	26 dB Bandwidth Antenna 5 (MHz)	99% Bandwidth Antenna 6 (MHz)	99% Bandwidth Antenna 5 (MHz)
Low	5745	19.74	19.71	18.3015	18.2822
Mid	5785	20.02	19.63	17.8850	18.2860
High	5825	20.10	18.74	18.4100	17.1013



MID CHANNEL [ANT 6]



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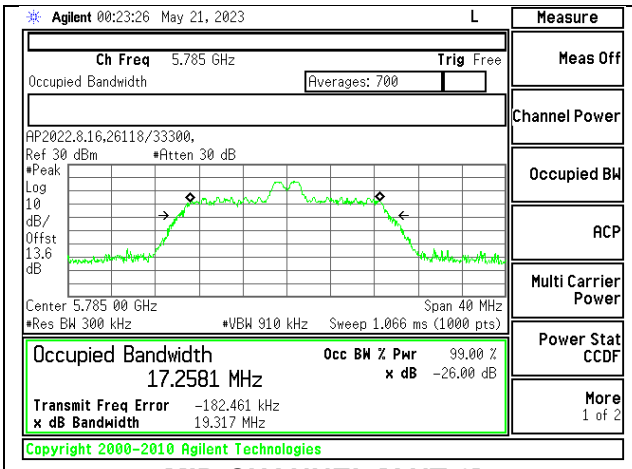
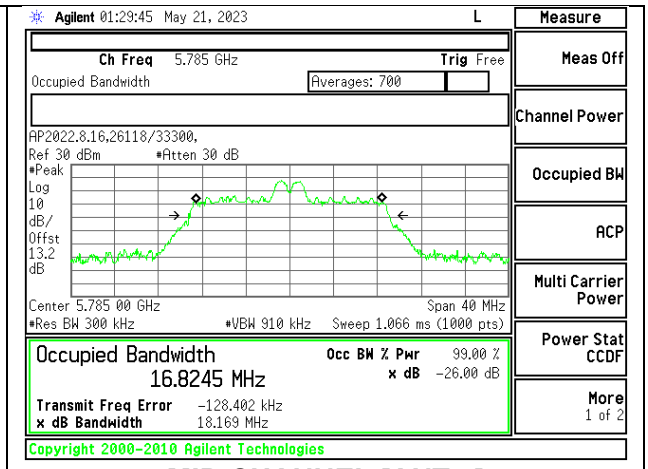
2TX Antenna 6 + Antenna 5 CDD MODE: 26 Tones, RU Index 4

Channel	Frequency (MHz)	26 dB Bandwidth Antenna 6 (MHz)	26 dB Bandwidth Antenna 5 (MHz)	99% Bandwidth Antenna 6 (MHz)	99% Bandwidth Antenna 5 (MHz)
Low	5745	19.27	17.98	16.9382	16.6912
Mid	5785	19.31	18.16	17.2581	16.8245
High	5825	19.32	18.10	17.1247	16.8594



MID CHANNEL [ANT 6]



MID CHANNEL [ANT 5]

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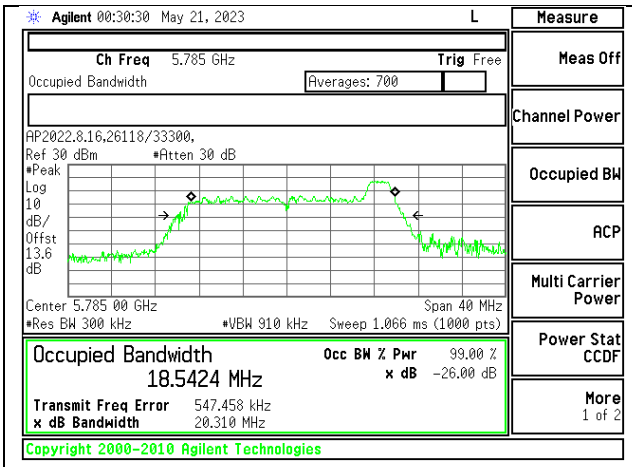
2TX Antenna 6 + Antenna 5 CDD MODE: 26 Tones, RU Index 8

Channel	Frequency (MHz)	26 dB Bandwidth Antenna 6 (MHz)	26 dB Bandwidth Antenna 5 (MHz)	99% Bandwidth Antenna 6 (MHz)	99% Bandwidth Antenna 5 (MHz)
Low	5745	20.24	18.88	18.5996	17.5511
Mid	5785	20.31	19.70	18.5424	18.3312
High	5825	20.57	18.79	18.5522	16.8447



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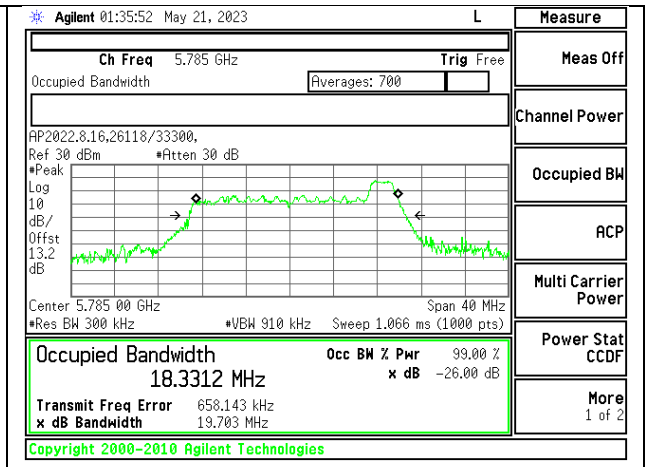

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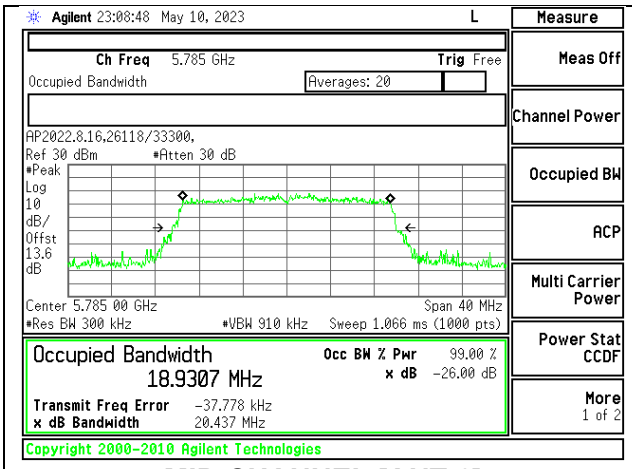
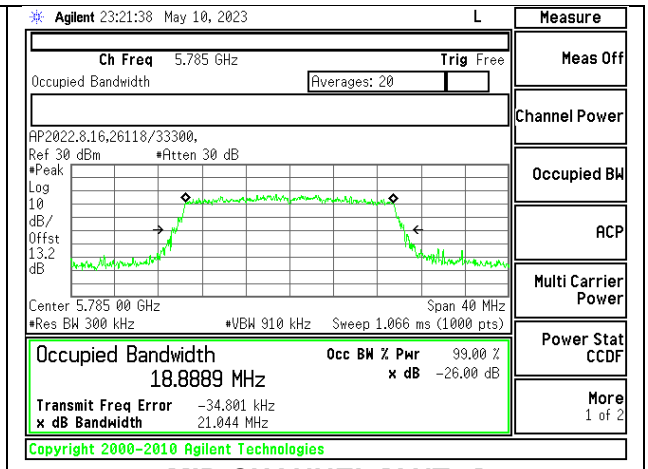
2TX Antenna 6 + Antenna 5 CDD MODE: SU Mode

Channel	Frequency (MHz)	26 dB Bandwidth Antenna 6 (MHz)	26 dB Bandwidth Antenna 5 (MHz)	99% Bandwidth Antenna 6 (MHz)	99% Bandwidth Antenna 5 (MHz)
Low	5745	20.78	20.50	18.8614	18.9501
Mid	5785	20.43	21.01	18.9307	18.8889
High	5825	20.54	20.83	18.8962	18.8882



MID CHANNEL [ANT 6]



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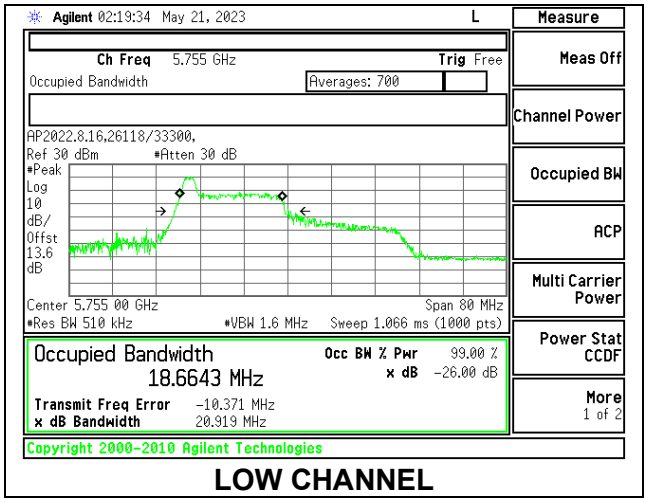
9.2.23. 802.11ax HE40 MODE IN THE 5.8 GHz BAND

1TX Antenna 6 MODE: 26 Tones, RU Index 0

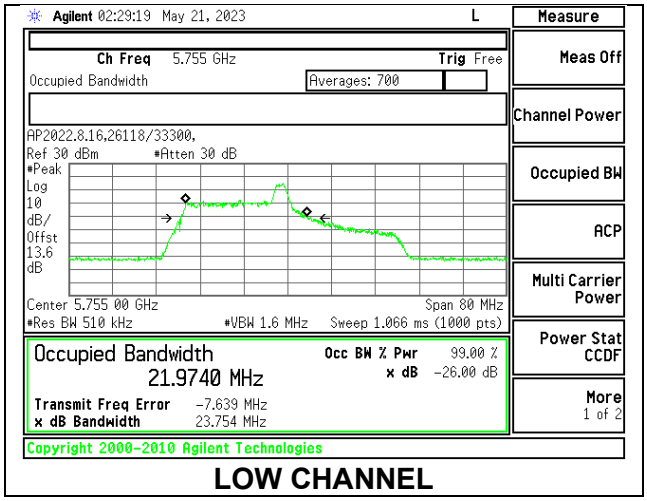
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5755	20.91	18.6643
High	5795	20.97	18.6055



LOW CHANNEL

1TX Antenna 6 MODE: 26 Tones, RU Index 8

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5755	23.75	21.9740
High	5795	24.40	22.3975



LOW CHANNEL

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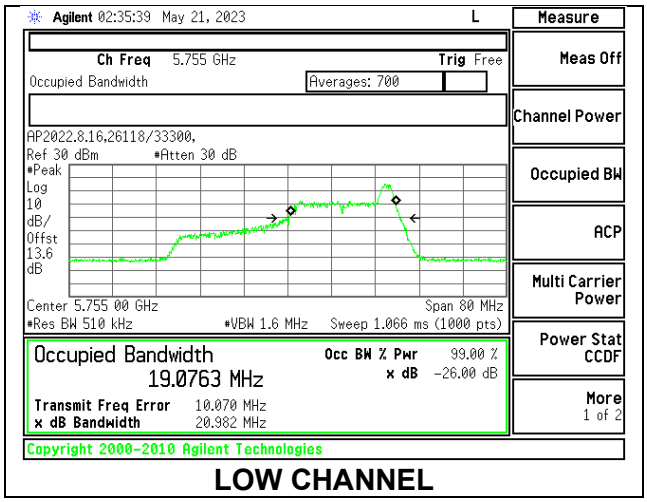
1TX Antenna 6 MODE: 26 Tones, RU Index 17

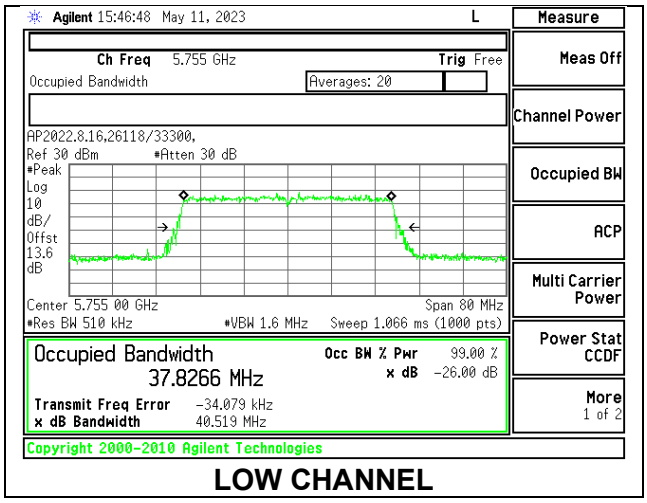
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5755	20.98	19.0763
High	5795	20.90	19.1026



LOW CHANNEL

1TX Antenna 6 MODE: SU Mode

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5755	40.51	37.8266
High	5795	41.23	37.8410



LOW CHANNEL

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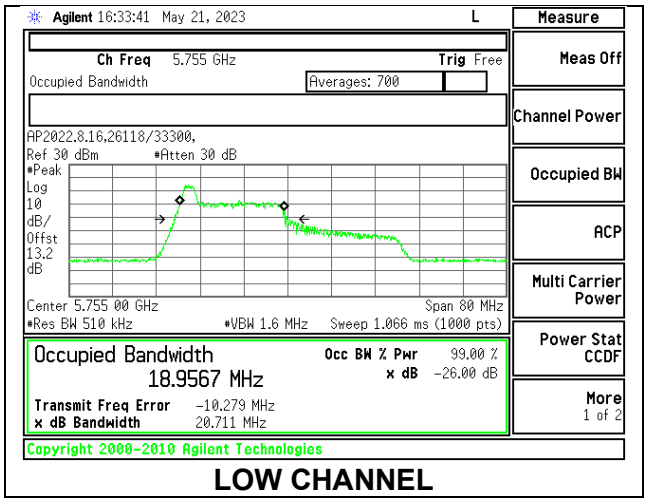
1TX Antenna 5 MODE: 26 Tones, RU Index 0

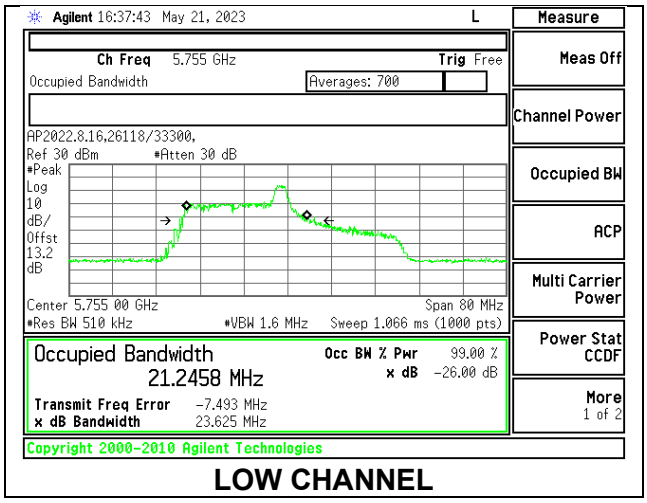
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5755	20.71	18.9567
High	5795	20.67	18.5196



LOW CHANNEL

1TX Antenna 5 MODE: 26 Tones, RU Index 8

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5755	23.62	21.2458
High	5795	23.95	21.1897



LOW CHANNEL

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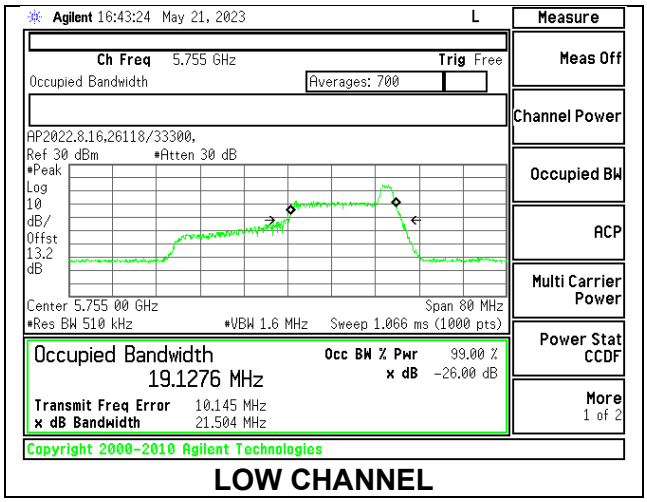
1TX Antenna 5 MODE: 26 Tones, RU Index 17

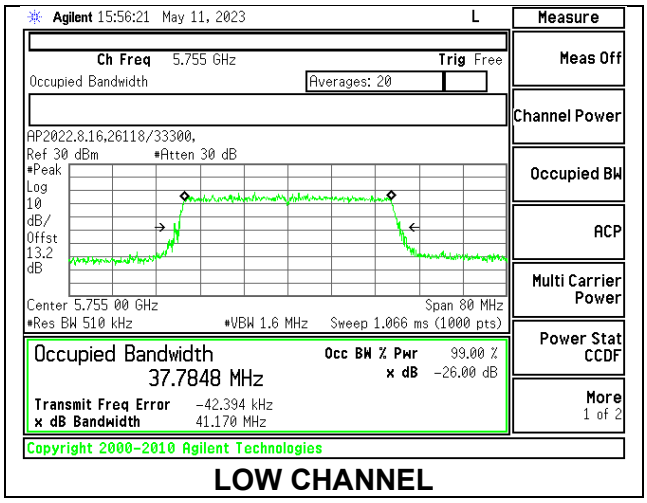
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5755	21.50	19.1276
High	5795	21.30	19.1156



LOW CHANNEL

1TX Antenna 5 MODE: SU Mode

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5755	41.17	37.7848
High	5795	40.46	37.9213



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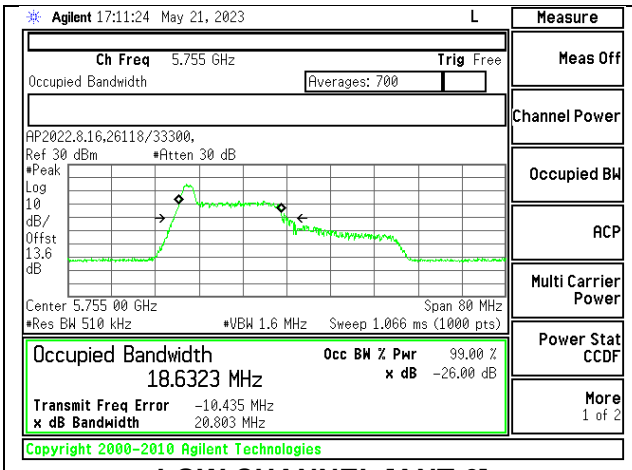
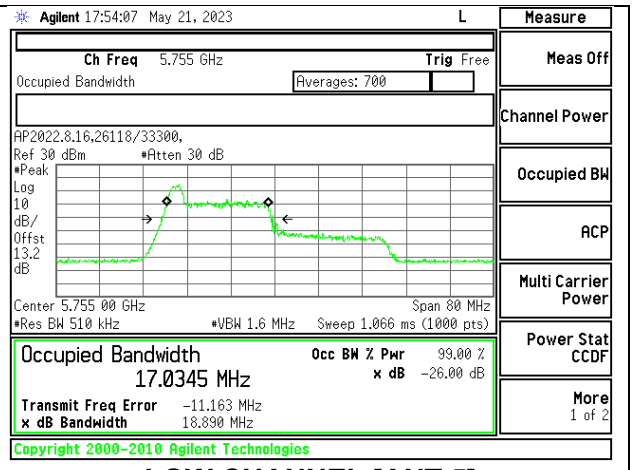
2TX Antenna 6 + Antenna 5 CDD MODE: 26 Tones, RU Index 0

Channel	Frequency (MHz)	26 dB Bandwidth Antenna 6 (MHz)	26 dB Bandwidth Antenna 5 (MHz)	99% Bandwidth Antenna 6 (MHz)	99% Bandwidth Antenna 5 (MHz)
Low	5755	20.80	18.89	18.6323	17.0345
High	5795	21.14	19.00	18.8106	17.4494



LOW CHANNEL [ANT 6]



LOW CHANNEL [ANT 5]

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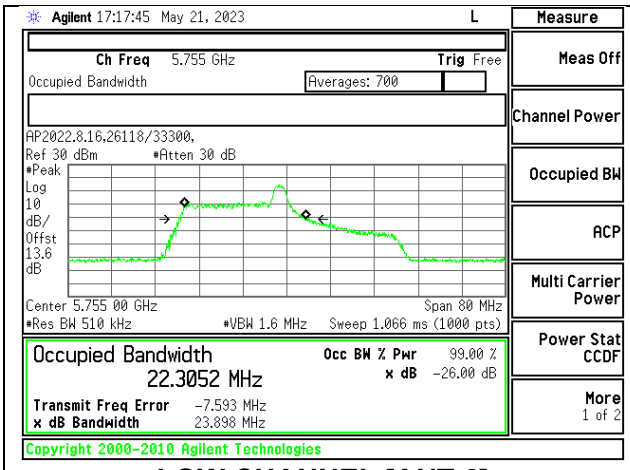
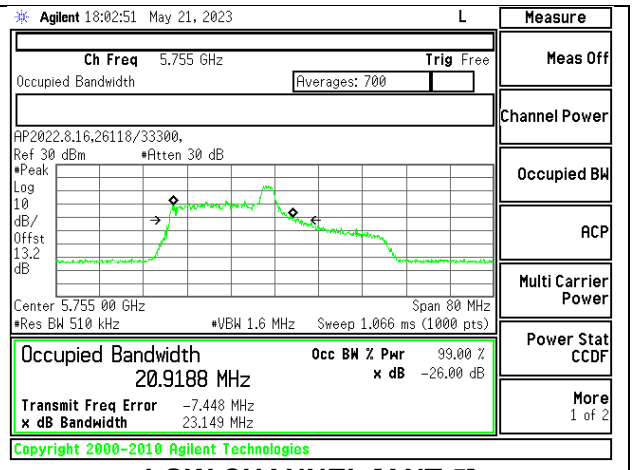
2TX Antenna 6 + Antenna 5 CDD MODE: 26 Tones, RU Index 8

Channel	Frequency (MHz)	26 dB Bandwidth Antenna 6 (MHz)	26 dB Bandwidth Antenna 5 (MHz)	99% Bandwidth Antenna 6 (MHz)	99% Bandwidth Antenna 5 (MHz)
Low	5755	23.89	23.14	22.3052	20.9188
High	5795	24.11	23.58	21.9213	21.4901



LOW CHANNEL [ANT 6]



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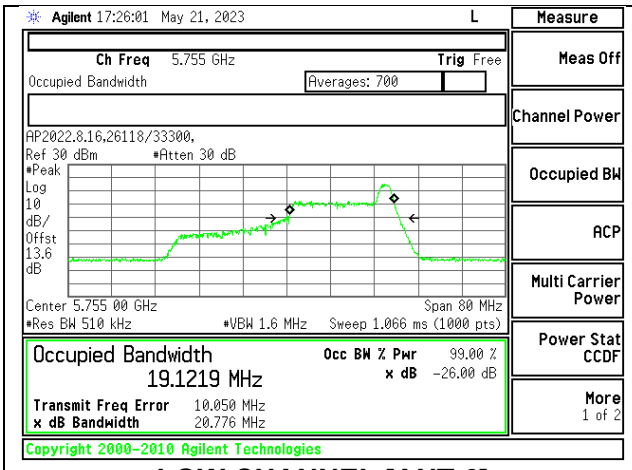
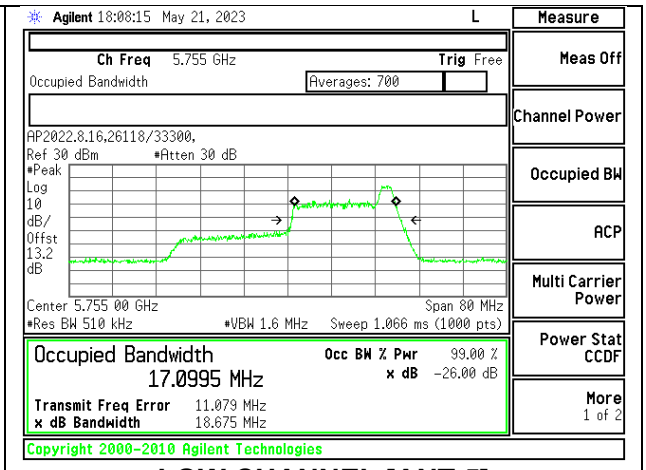
2TX Antenna 6 + Antenna 5 CDD MODE: 26 Tones, RU Index 17

Channel	Frequency (MHz)	26 dB Bandwidth Antenna 6 (MHz)	26 dB Bandwidth Antenna 5 (MHz)	99% Bandwidth Antenna 6 (MHz)	99% Bandwidth Antenna 5 (MHz)
Low	5755	20.77	18.67	19.1219	17.0995
High	5795	21.03	20.04	18.9640	18.4470



LOW CHANNEL [ANT 6]



LOW CHANNEL [ANT 5]

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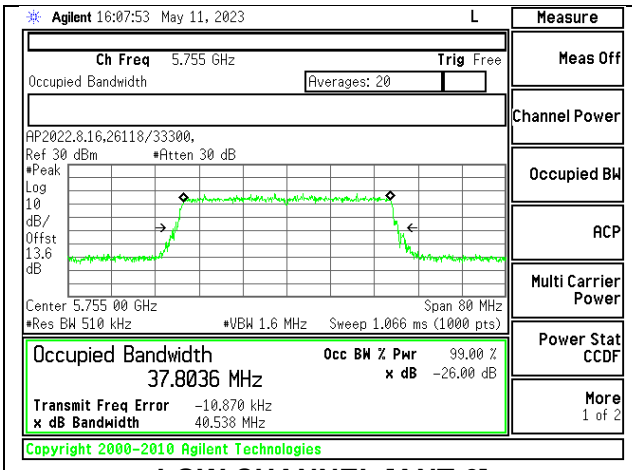
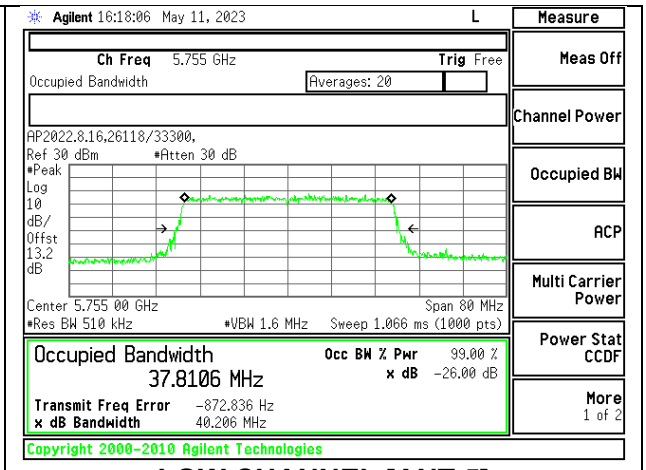
2TX Antenna 6 + Antenna 5 CDD MODE: SU Mode

Channel	Frequency (MHz)	26 dB Bandwidth Antenna 6 (MHz)	26 dB Bandwidth Antenna 5 (MHz)	99% Bandwidth Antenna 6 (MHz)	99% Bandwidth Antenna 5 (MHz)
Low	5755	40.53	40.20	37.8036	37.8106
High	5795	40.54	40.51	37.8345	37.7922



LOW CHANNEL [ANT 6]



LOW CHANNEL [ANT 5]

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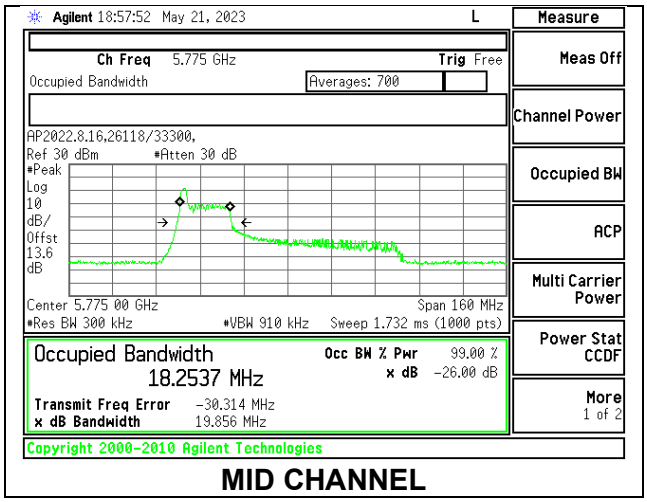
9.2.24. 802.11ax HE80 MODE IN THE 5.8 GHz BAND

1TX Antenna 6 MODE: 26 Tones, RU Index 0

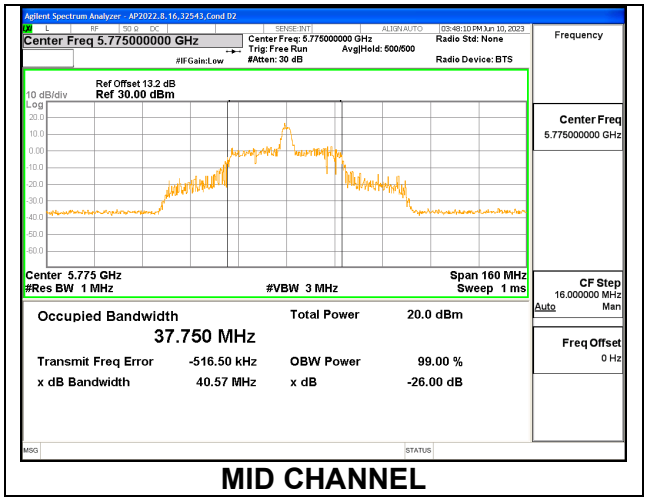
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Mid	5775	19.85	18.2537



MID CHANNEL

1TX Antenna 6 MODE: 26 Tones, RU Index 18

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Mid	5775	40.57	37.7500



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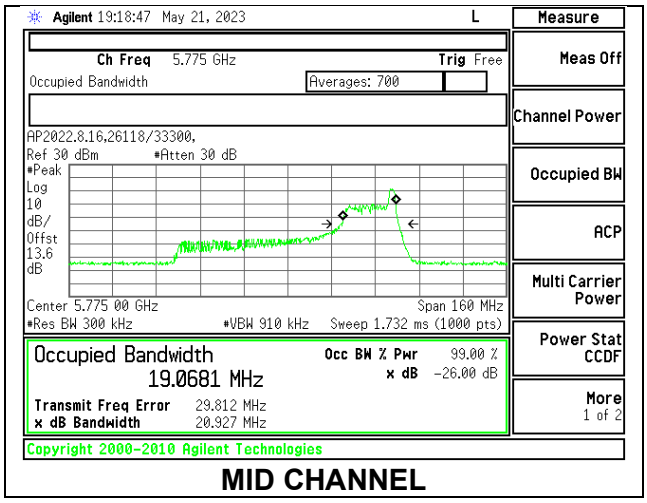
1TX Antenna 6 MODE: 26 Tones, RU Index 36

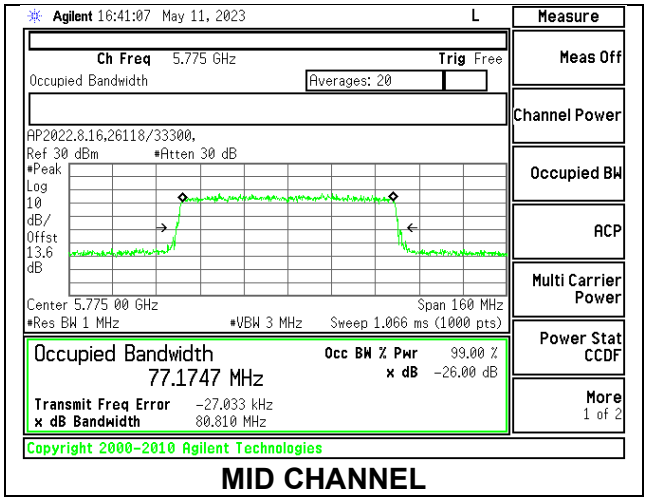
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Mid	5775	20.92	19.0681



MID CHANNEL

1TX Antenna 6 MODE: SU Mode

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Mid	5775	80.81	77.1747



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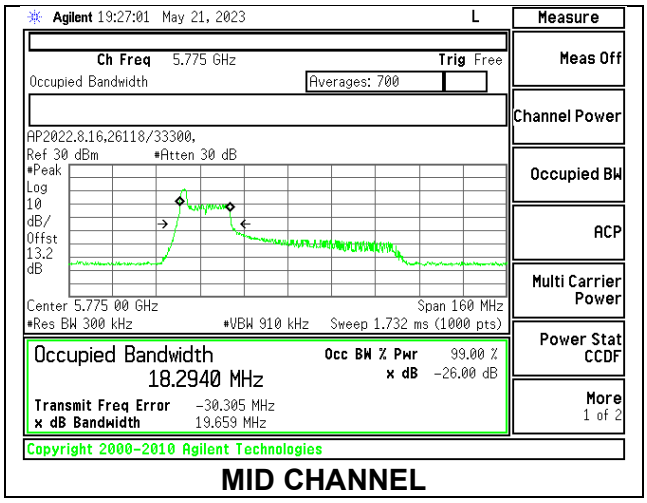
1TX Antenna 5 MODE: 26 Tones, RU Index 0

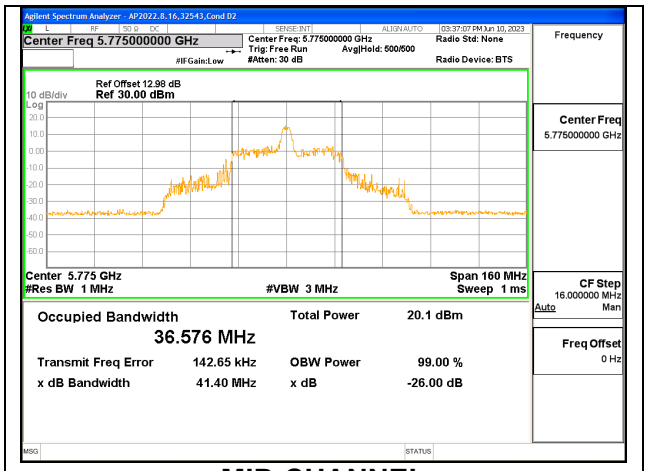
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Mid	5775	19.65	18.2940



MID CHANNEL

1TX Antenna 5 MODE: 26 Tones, RU Index 18

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Mid	5775	41.40	36.5760



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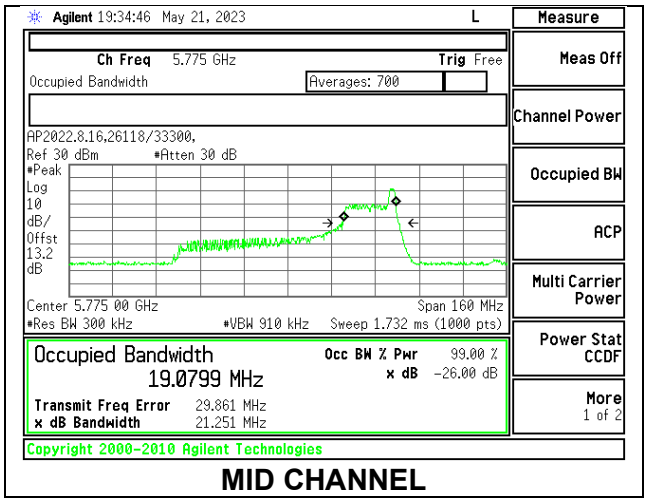
1TX Antenna 5 MODE: 26 Tones, RU Index 36

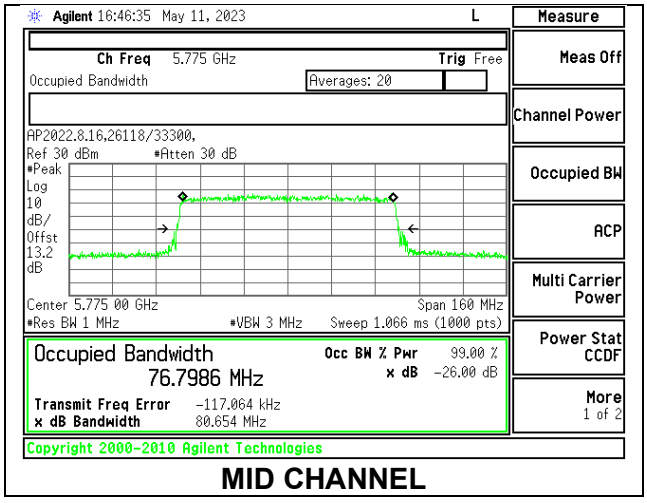
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Mid	5775	21.25	19.0799



MID CHANNEL

1TX Antenna 5 MODE: SU Mode

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Mid	5775	80.65	76.7986



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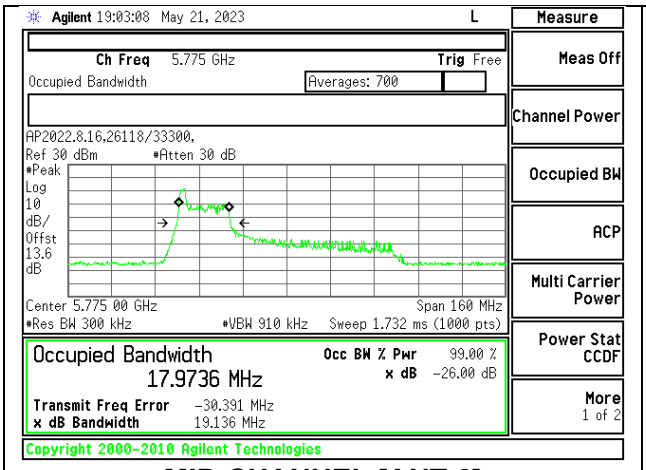
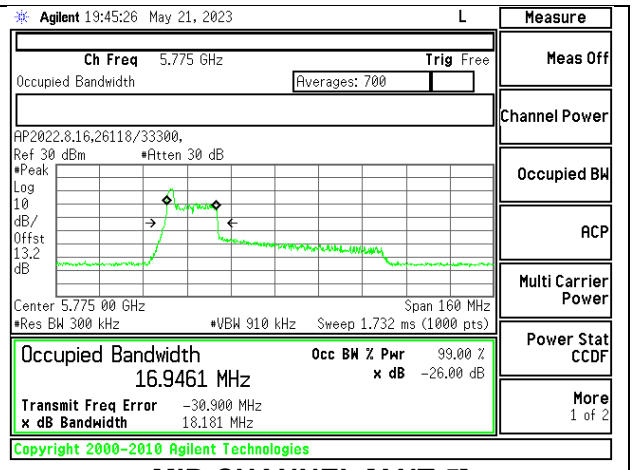
2TX Antenna 6 + Antenna 5 CDD MODE: 26 Tones, RU Index 0

Channel	Frequency (MHz)	26 dB Bandwidth Antenna 6 (MHz)	26 dB Bandwidth Antenna 5 (MHz)	99% Bandwidth Antenna 6 (MHz)	99% Bandwidth Antenna 5 (MHz)
Mid	5775	19.13	18.18	17.9736	16.9461



MID CHANNEL [ANT 6]



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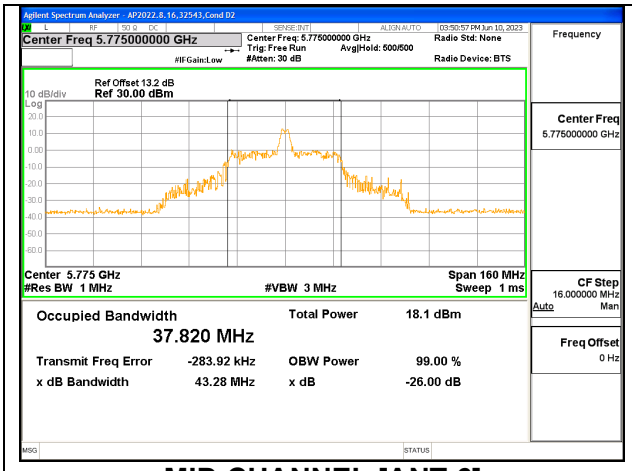
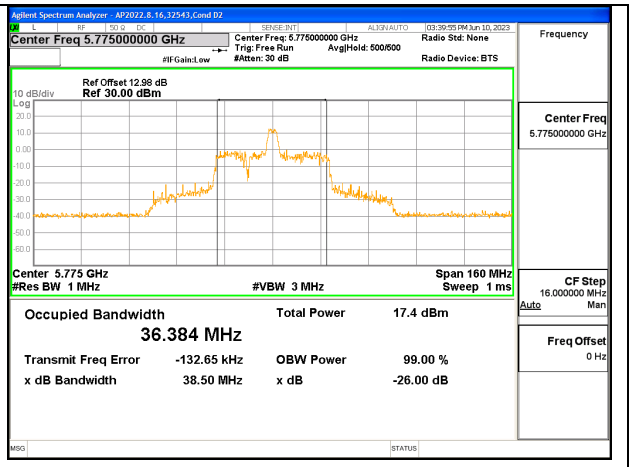
2TX Antenna 6 + Antenna 5 CDD MODE: 26 Tones, RU Index 18

Channel	Frequency (MHz)	26 dB Bandwidth Antenna 6 (MHz)	26 dB Bandwidth Antenna 5 (MHz)	99% Bandwidth Antenna 6 (MHz)	99% Bandwidth Antenna 5 (MHz)
Mid	5775	43.28	38.50	37.8200	36.3840



MID CHANNEL [ANT 6]



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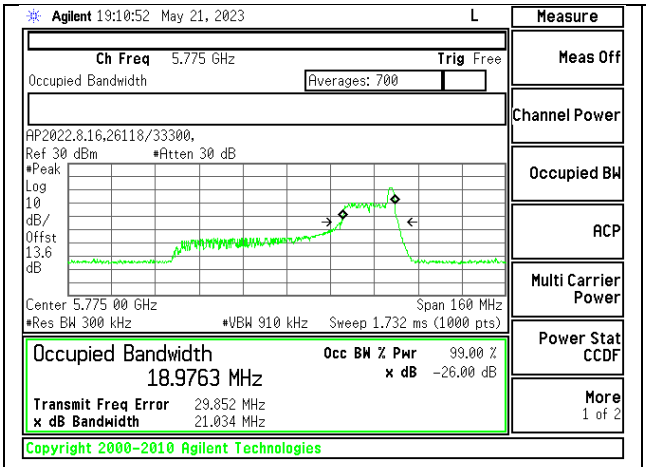
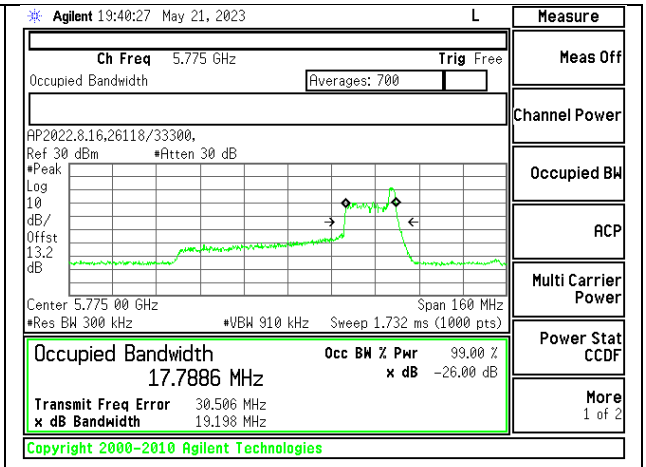
2TX Antenna 6 + Antenna 5 CDD MODE: 26 Tones, RU Index 36

Channel	Frequency (MHz)	26 dB Bandwidth Antenna 6 (MHz)	26 dB Bandwidth Antenna 5 (MHz)	99% Bandwidth Antenna 6 (MHz)	99% Bandwidth Antenna 5 (MHz)
Mid	5775	21.03	19.19	18.9763	17.7886



MID CHANNEL [ANT 6]



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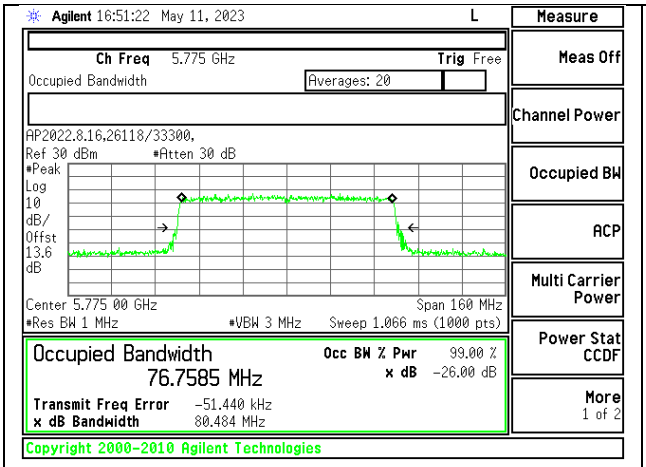
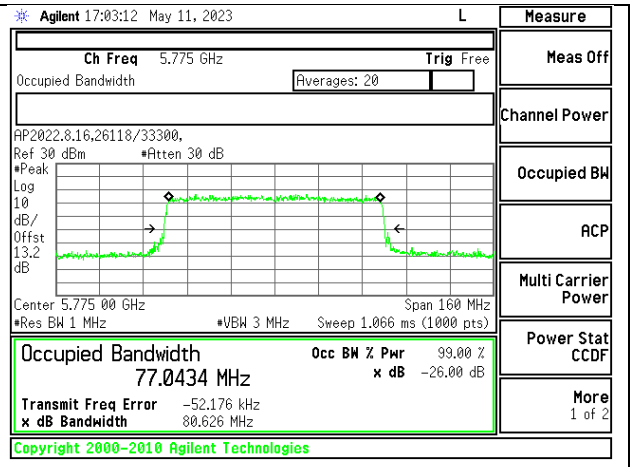
2TX Antenna 6 + Antenna 5 CDD MODE: SU Mode

Channel	Frequency (MHz)	26 dB Bandwidth Antenna 6 (MHz)	26 dB Bandwidth Antenna 5 (MHz)	99% Bandwidth Antenna 6 (MHz)	99% Bandwidth Antenna 5 (MHz)
Mid	5775	80.48	80.62	76.7585	77.0434



MID CHANNEL [ANT 6]



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9.3. 6 dB BANDWIDTH

LIMITS

FCC §15.407 (e)

RSS-247 6.2.4.1

The minimum 6 dB bandwidth shall be at least 500 kHz.

RESULTS

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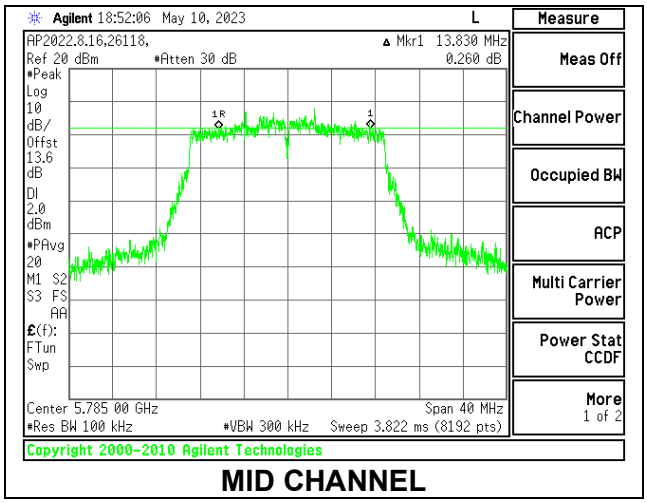
9.3.1. 802.11n HT20 MODE IN THE 5.8 GHz BAND

1TX Antenna 6 MODE

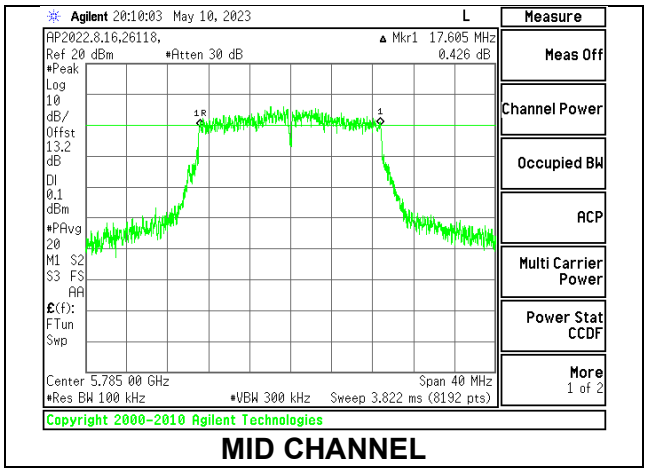
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	5745	17.590	0.5
Mid	5785	13.830	0.5
High	5825	17.317	0.5
144	5720	3.749	0.5



MID CHANNEL

1TX Antenna 5 MODE

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	5745	17.619	0.5
Mid	5785	17.605	0.5
High	5825	17.600	0.5
144	5720	3.778	0.5



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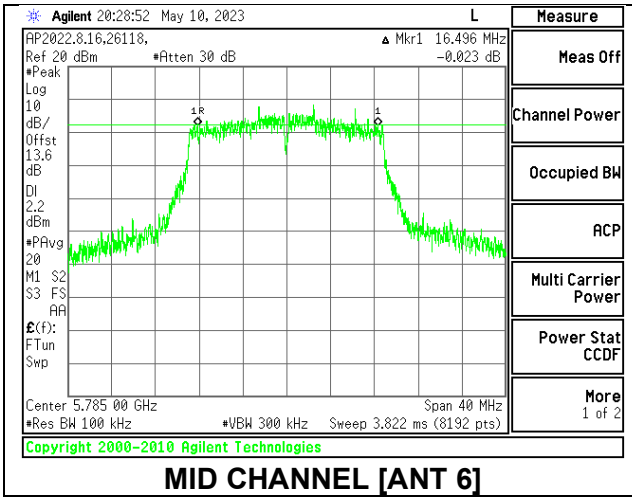
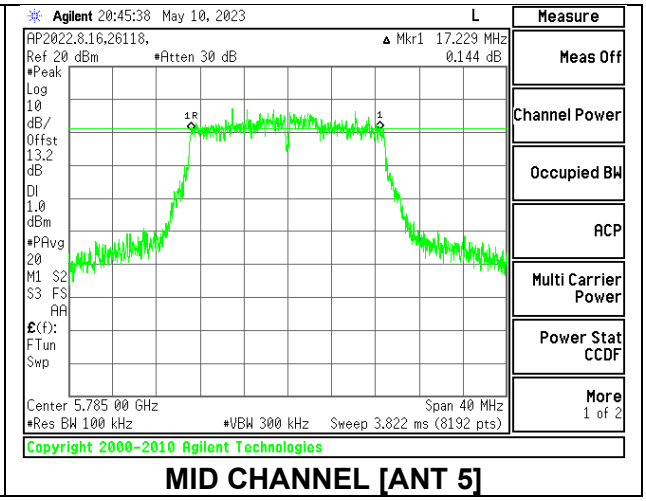
2TX Antenna 6 + Antenna 5 CDD MODE

Channel	Frequency (MHz)	6 dB Bandwidth Antenna 6 (MHz)	6 dB Bandwidth Antenna 5 (MHz)	Minimum Limit (MHz)
Low	5745	17.316	16.926	0.5
Mid	5785	16.496	17.229	0.5
High	5825	17.165	17.580	0.5
144	5720	3.783	3.778	0.5



MID CHANNEL [ANT 6]



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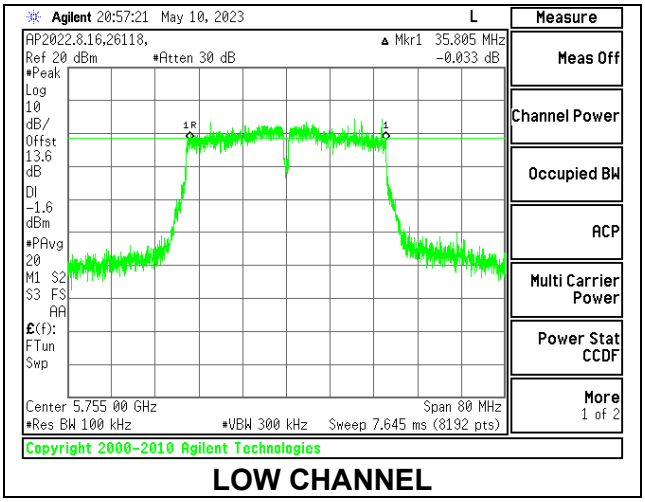
9.3.2. 802.11n HT40 MODE IN THE 5.8 GHz BAND

1TX Antenna 6 MODE (REDO)

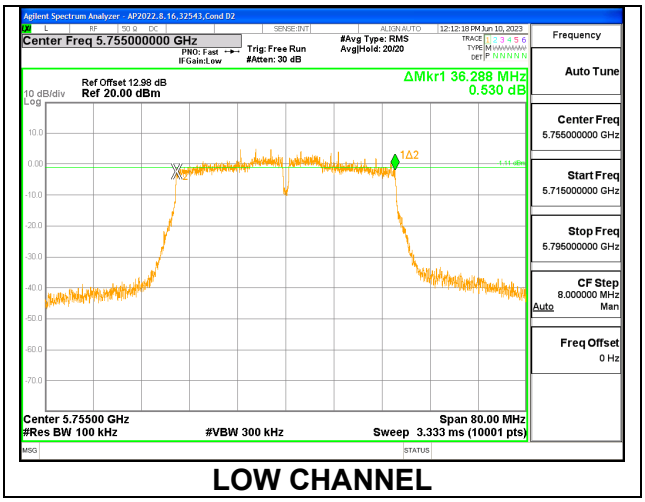
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	5755	35.805	0.5
High	5795	36.360	0.5
142	5710	3.181	0.5



LOW CHANNEL

1TX Antenna 5 MODE

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	5755	36.288	0.5
High	5795	35.493	0.5
142	5710	3.191	0.5



LOW CHANNEL

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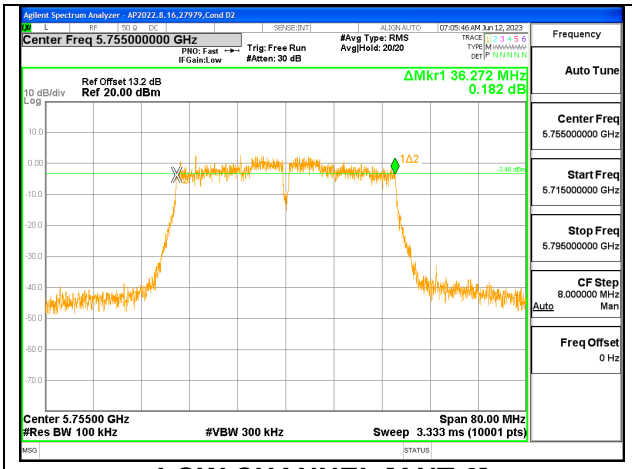
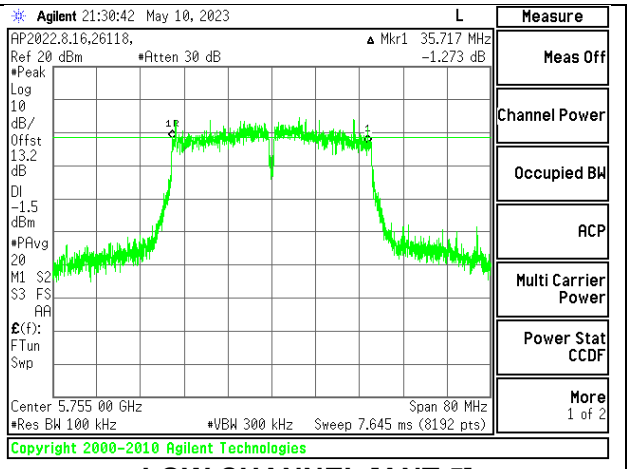
2TX Antenna 6 + Antenna 5 CDD MODE

Channel	Frequency (MHz)	6 dB Bandwidth Antenna 6 (MHz)	6 dB Bandwidth Antenna 5 (MHz)	Minimum Limit (MHz)
Low	5755	36.272	35.717	0.5
High	5795	36.344	35.063	0.5
142	5710	3.103	3.161	0.5



LOW CHANNEL [ANT 6]



LOW CHANNEL [ANT 5]

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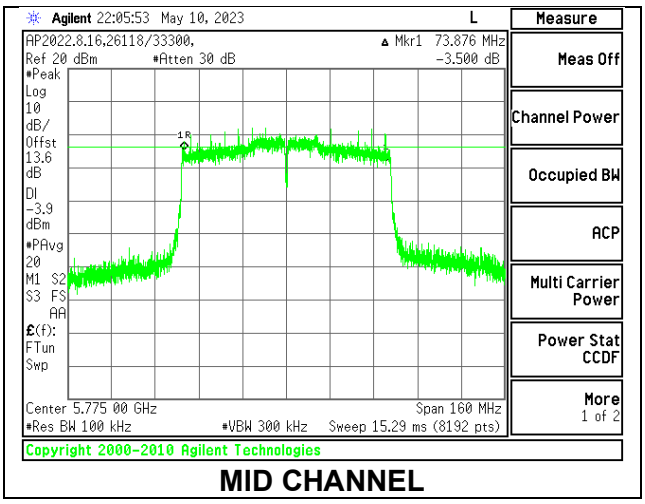
9.3.3. 802.11ac VHT80 MODE IN THE 5.8 GHz BAND

1TX Antenna 6 MODE

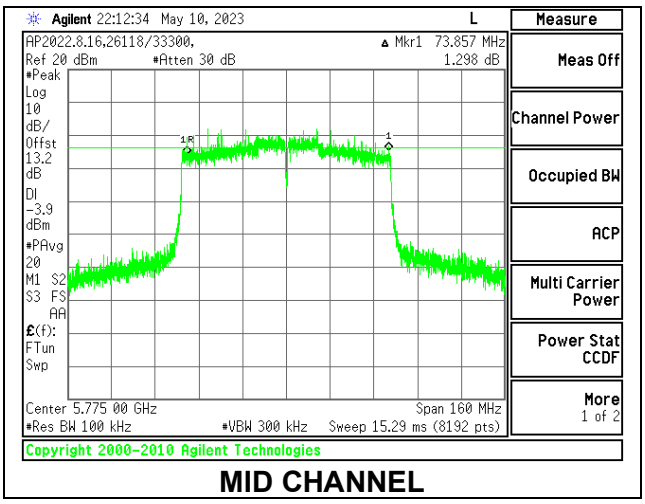
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Mid	5775	73.876	0.5
138	5690	3.120	0.5



MID CHANNEL

1TX Antenna 5 MODE

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Mid	5775	73.857	0.5
138	5690	3.081	0.5



MID CHANNEL

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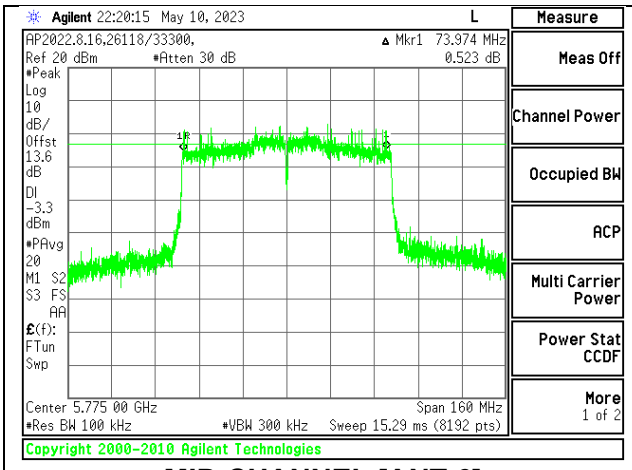
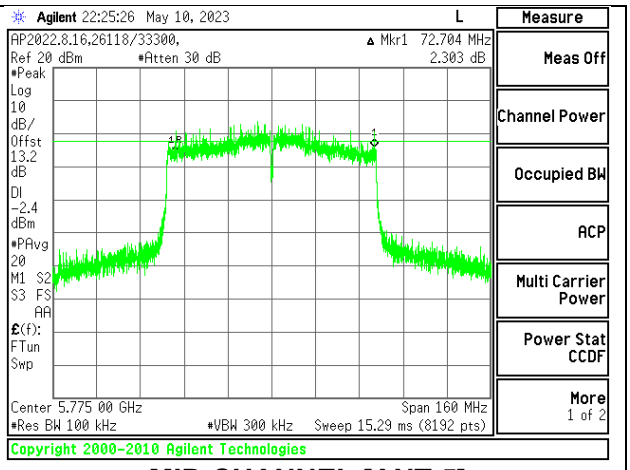
2TX Antenna 6 + Antenna 5 CDD MODE

Channel	Frequency (MHz)	6 dB Bandwidth Antenna 6 (MHz)	6 dB Bandwidth Antenna 5 (MHz)	Minimum Limit (MHz)
Mid	5775	73.974	72.704	0.5
138	5690	3.100	3.120	0.5



MID CHANNEL [ANT 6]



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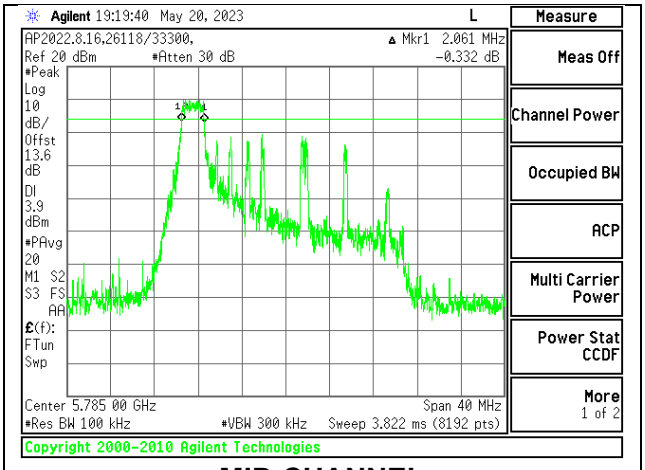
9.3.4. 802.11ax HE20 MODE IN THE 5.8 GHz BAND

1TX Antenna 6 MODE: 26 Tones, RU Index 0

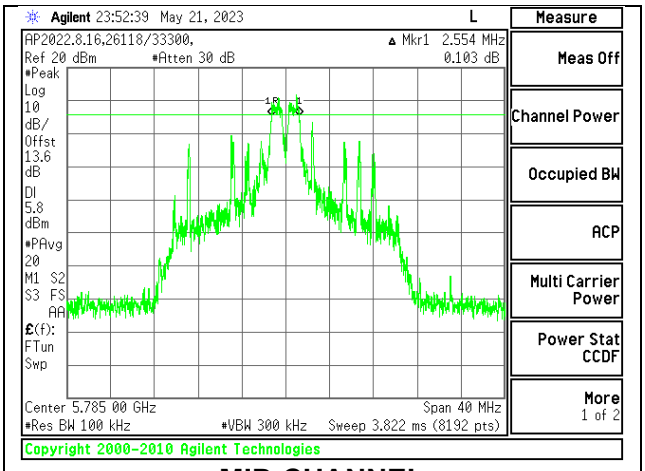
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	5745	2.012	0.5
Mid	5785	2.061	0.5
High	5825	1.978	0.5



MID CHANNEL

1TX Antenna 6 MODE: 26 Tones, RU Index 4

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	5745	2.549	0.5
Mid	5785	2.554	0.5
High	5825	2.593	0.5



MID CHANNEL

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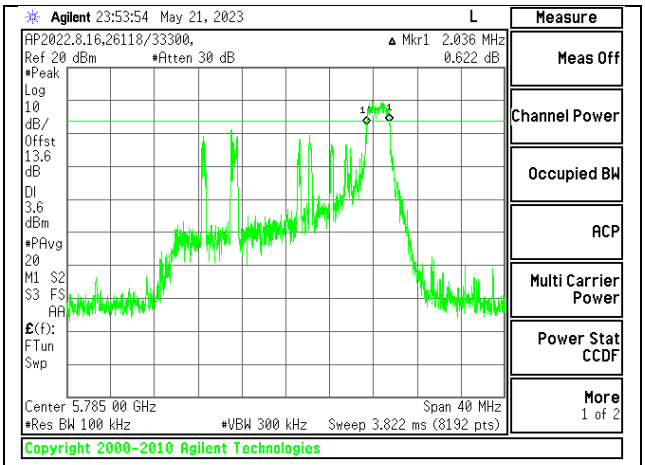
1TX Antenna 6 MODE: 26 Tones, RU Index 8

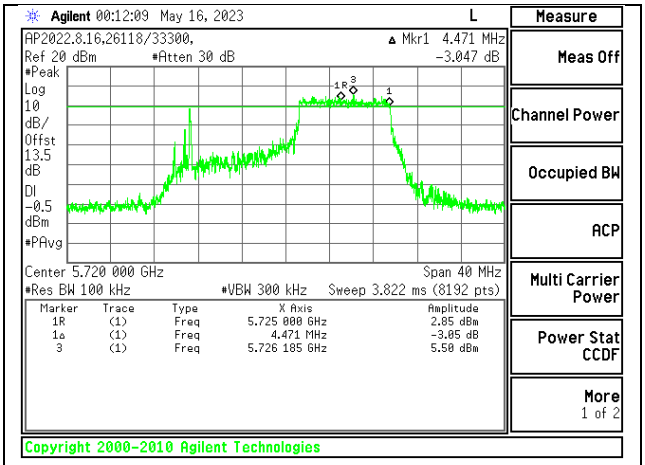
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	5745	2.027	0.5
Mid	5785	2.036	0.5
High	5825	2.036	0.5



MID CHANNEL

1TX Antenna 6 MODE: 106 Tones, RU Index 54

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
144	5720	4.471	0.5



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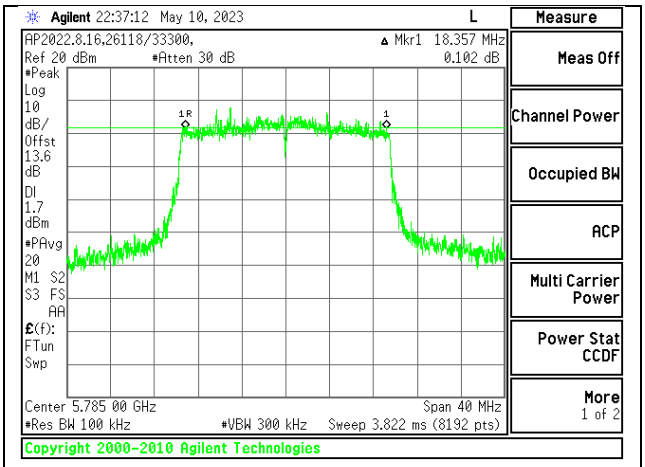
1TX Antenna 6 MODE: SU Mode

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	5745	18.054	0.5
Mid	5785	18.357	0.5
High	5825	18.880	0.5
144	5720	4.496	0.5



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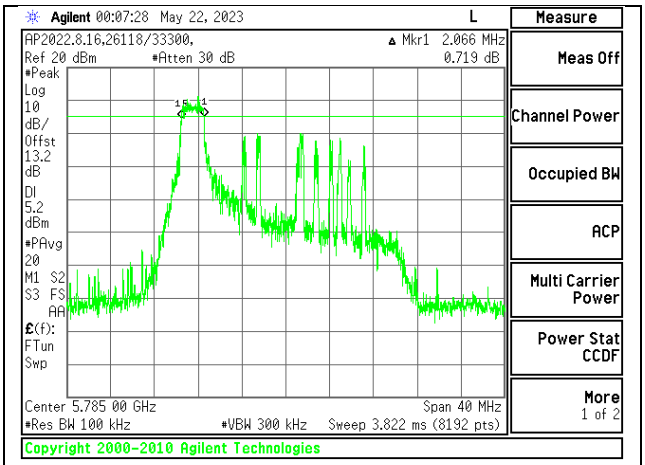
1TX Antenna 5 MODE: 26 Tones, RU Index 0

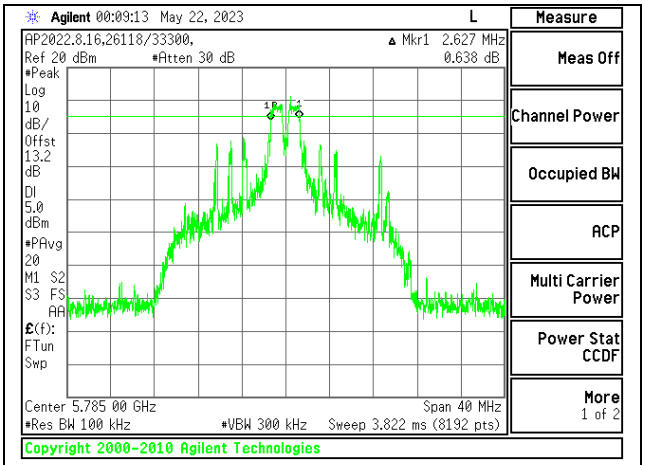
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	5745	1.968	0.5
Mid	5785	2.066	0.5
High	5825	1.988	0.5



MID CHANNEL

1TX Antenna 5 MODE: 26 Tones, RU Index 4

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	5745	2.549	0.5
Mid	5785	2.627	0.5
High	5825	2.588	0.5



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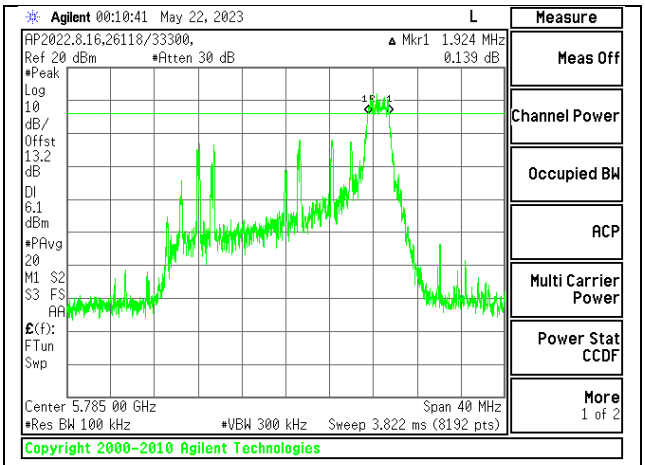
1TX Antenna 5 MODE: 26 Tones, RU Index 8

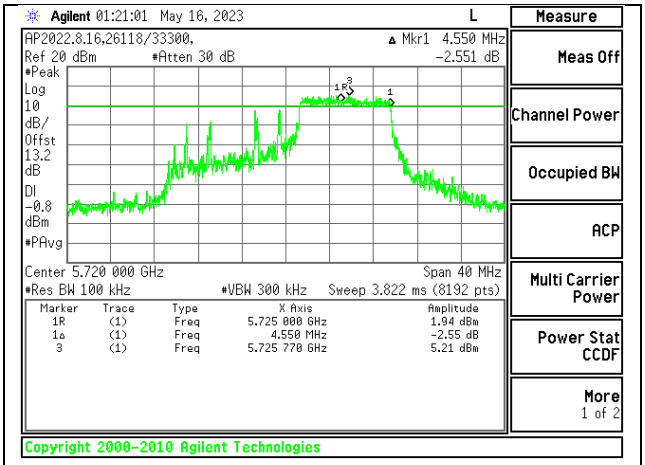
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	5745	2.017	0.5
Mid	5785	1.924	0.5
High	5825	1.997	0.5



MID CHANNEL

1TX Antenna 5 MODE: 106 Tones, RU Index 54

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
144	5720	4.550	0.5



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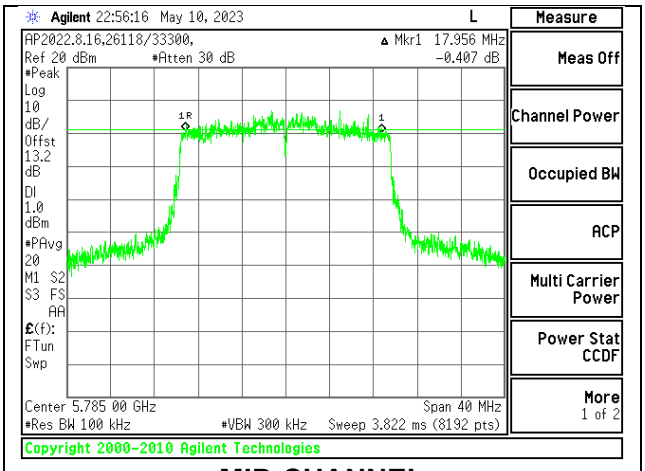
1TX Antenna 5 MODE: SUTones

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	5745	18.259	0.5
Mid	5785	17.956	0.5
High	5825	18.555	0.5
144	5720	4.520	0.5



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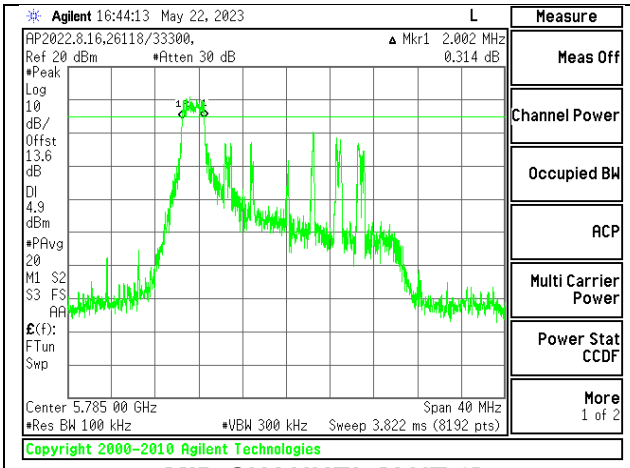
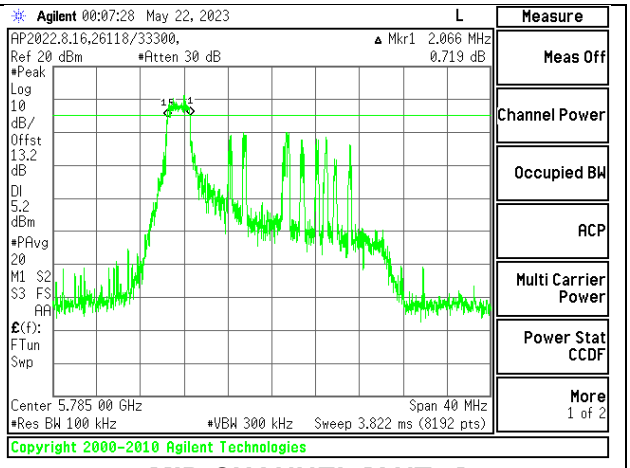
2TX Antenna 6 + Antenna 5 CDD MODE: 26 Tones, RU Index 0

Channel	Frequency (MHz)	6 dB Bandwidth Antenna 6 (MHz)	6 dB Bandwidth Antenna 5 (MHz)	Minimum Limit (MHz)
Low	5745	2.051	2.017	0.5
Mid	5785	2.002	2.066	0.5
High	5825	1.978	2.075	0.5



MID CHANNEL [ANT 6]



MID CHANNEL [ANT 5]

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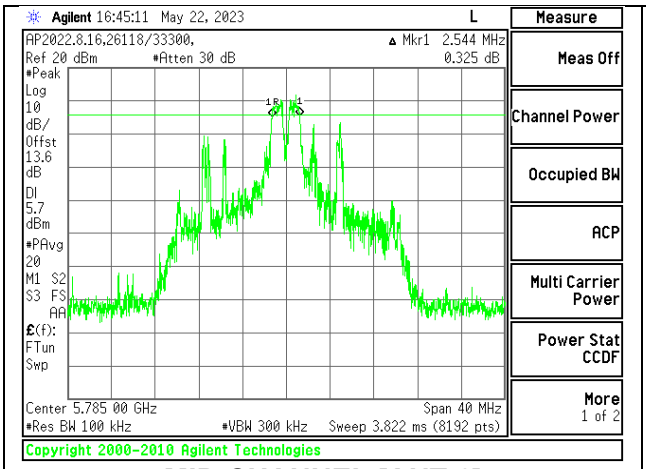
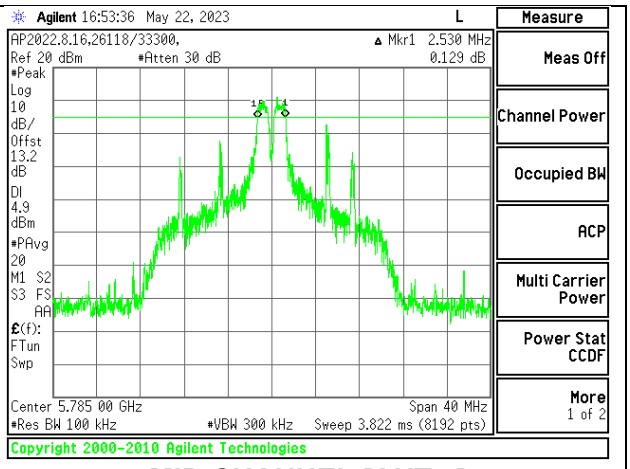
2TX Antenna 6 + Antenna 5 CDD MODE: 26 Tones, RU Index 4

Channel	Frequency (MHz)	6 dB Bandwidth Antenna 6 (MHz)	6 dB Bandwidth Antenna 5 (MHz)	Minimum Limit (MHz)
Low	5745	2.539	2.569	0.5
Mid	5785	2.544	2.530	0.5
High	5825	2.569	2.554	0.5



MID CHANNEL [ANT 6]



MID CHANNEL [ANT 5]

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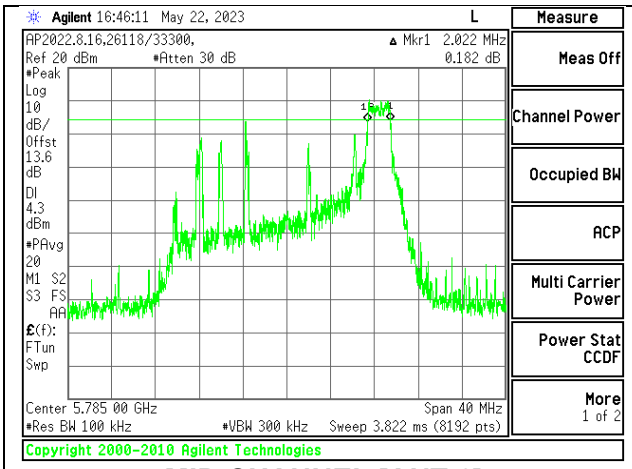
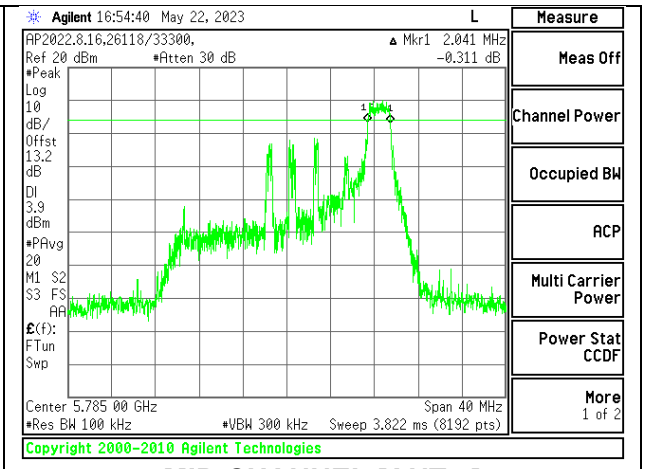
2TX Antenna 6 + Antenna 5 CDD MODE: 26 Tones, RU Index 8

Channel	Frequency (MHz)	6 dB Bandwidth Antenna 6 (MHz)	6 dB Bandwidth Antenna 5 (MHz)	Minimum Limit (MHz)
Low	5745	1.997	2.017	0.5
Mid	5785	2.022	2.041	0.5
High	5825	1.988	2.022	0.5



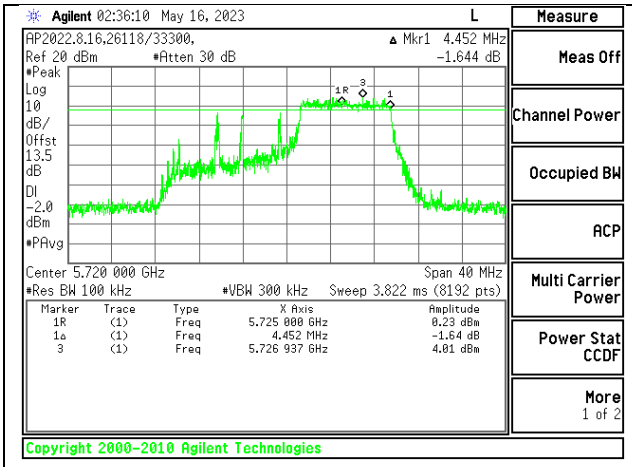
MID CHANNEL [ANT 6]



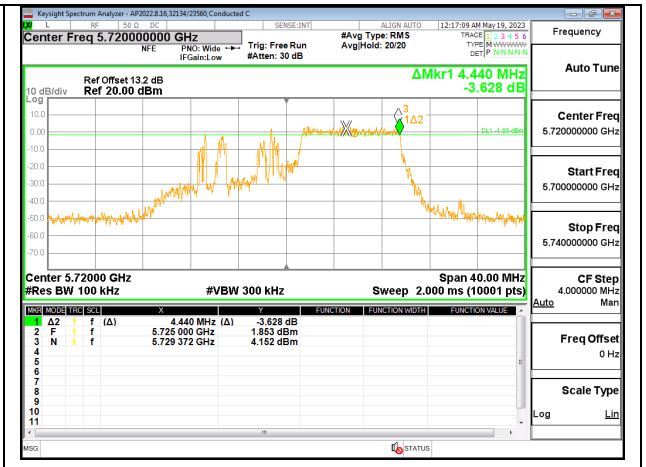
MID CHANNEL [ANT 5]

2TX Antenna 6 + Antenna 5 CDD MODE: 106 Tones, RU Index 54

Channel	Frequency (MHz)	6 dB Bandwidth Antenna 6 (MHz)	6 dB Bandwidth Antenna 5 (MHz)	Minimum Limit (MHz)
144	5720	4.452	4.440	0.5



MID CHANNEL [ANT 6]



MID CHANNEL [ANT 5]

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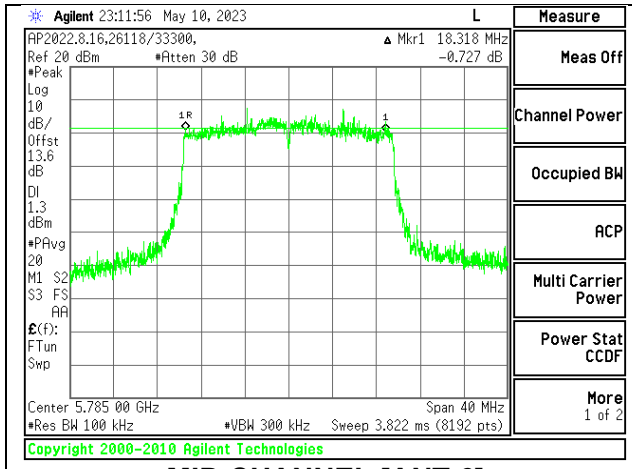
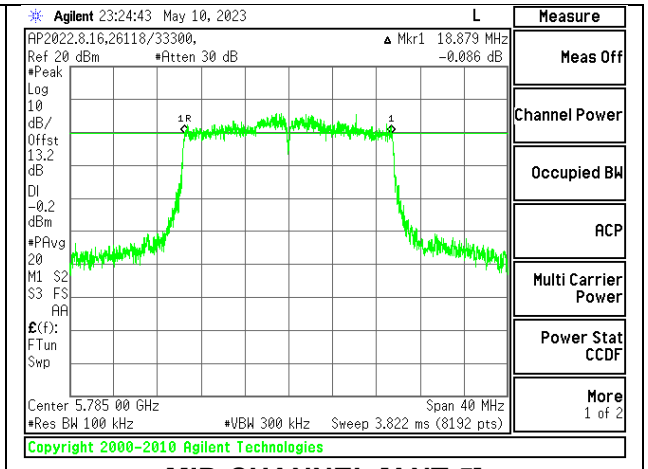
2TX Antenna 6 + Antenna 5 CDD MODE: SU Mode

Channel	Frequency (MHz)	6 dB Bandwidth Antenna 6 (MHz)	6 dB Bandwidth Antenna 5 (MHz)	Minimum Limit (MHz)
Low	5745	19.084	18.049	0.5
Mid	5785	18.318	18.876	0.5
High	5825	18.288	18.371	0.5
144	5720	4.027	4.423	0.5



MID CHANNEL [ANT 6]



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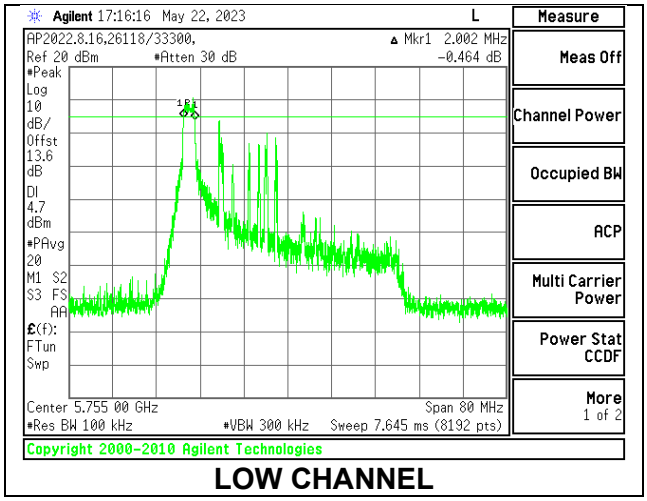
9.3.5. 802.11ax HE40 MODE IN THE 5.8 GHz BAND

1TX Antenna 6 MODE: 26 Tones, RU Index 0

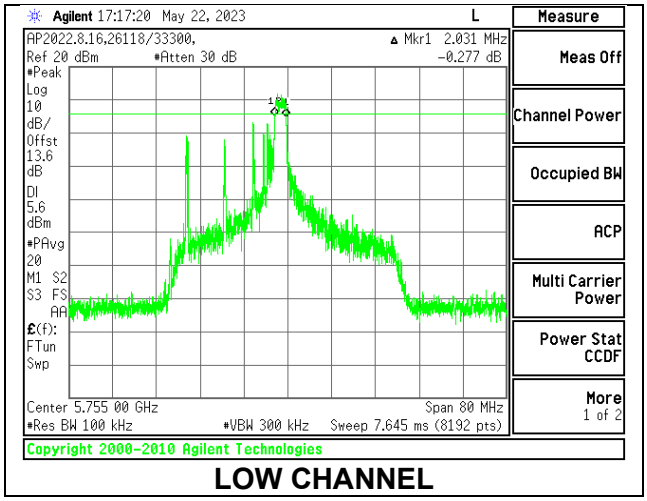
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	5755	2.002	0.5
High	5795	2.012	0.5



LOW CHANNEL

1TX Antenna 6 MODE: 26 Tones, RU Index 8

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	5755	2.031	0.5
High	5795	1.983	0.5



LOW CHANNEL

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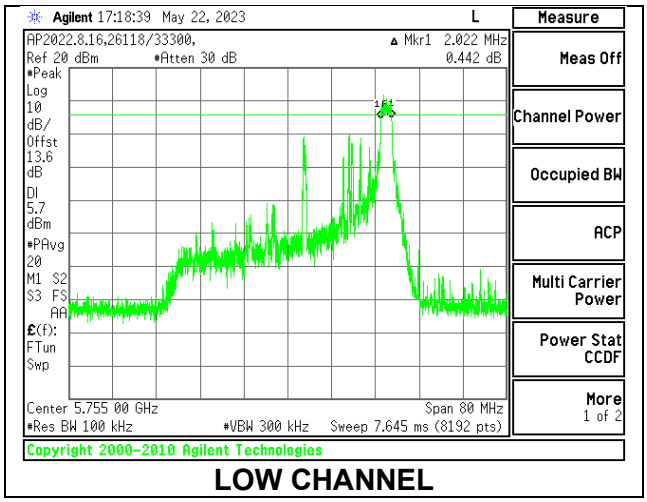
1TX Antenna 6 MODE: 26 Tones, RU Index 17

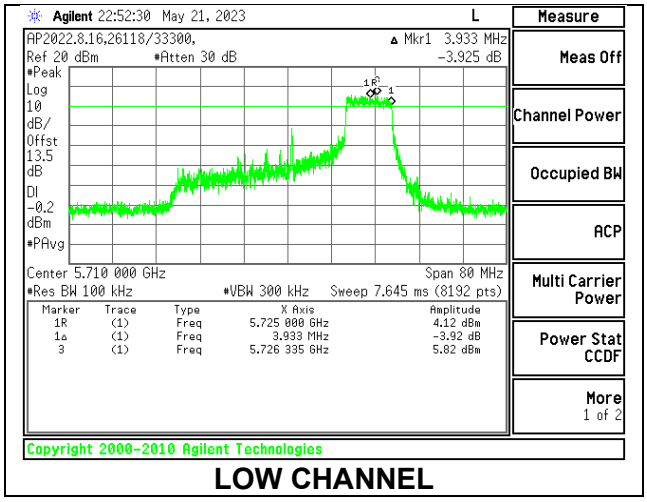
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	5755	2.022	0.5
High	5795	2.090	0.5



LOW CHANNEL

1TX Antenna 6 MODE: 106 Tones, RU Index 56

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
142	5710	3.933	0.5



LOW CHANNEL

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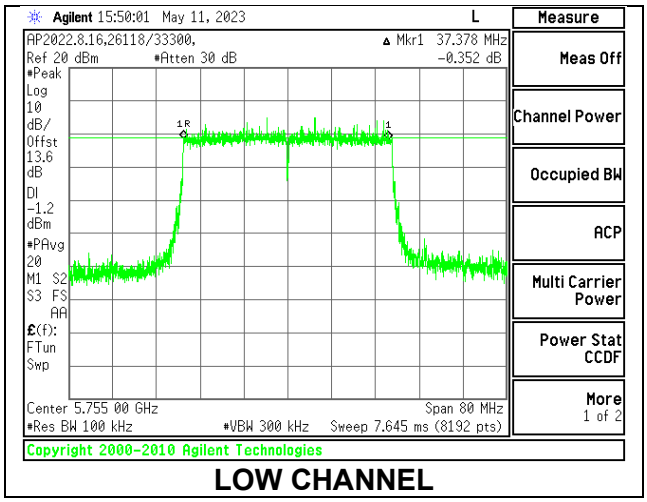
1TX Antenna 6 MODE: SU Mode

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	5755	37.378	0.5
High	5795	37.339	0.5
142	5710	4.031	0.5



LOW CHANNEL

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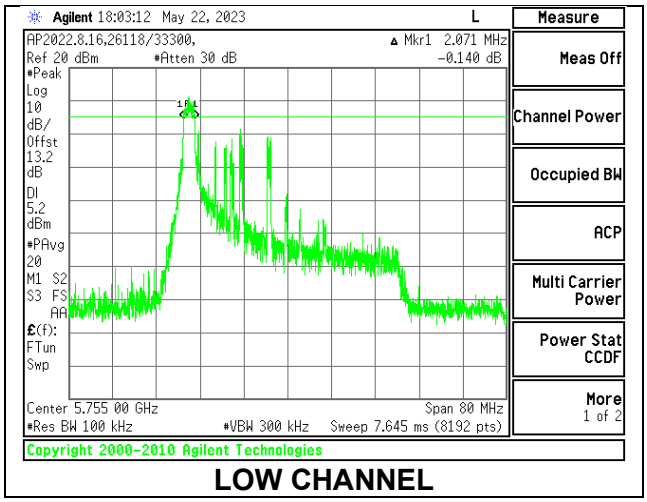
1TX Antenna 5 MODE: 26 Tones, RU Index 0

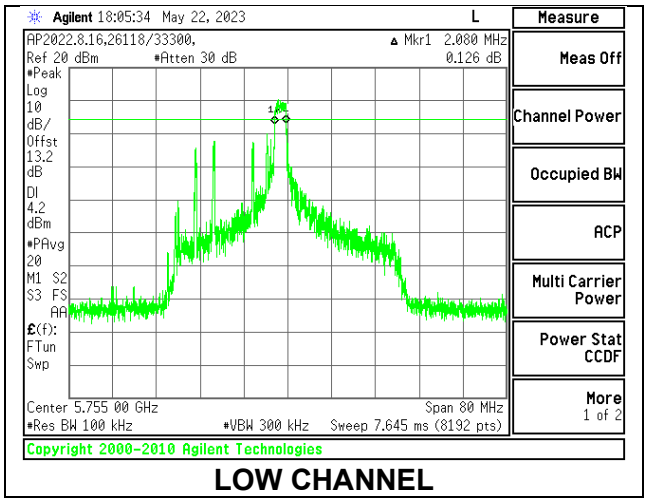
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	5755	2.071	0.5
High	5795	2.051	0.5



LOW CHANNEL

1TX Antenna 5 MODE: 26 Tones, RU Index 8

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	5755	2.080	0.5
High	5795	2.041	0.5



LOW CHANNEL

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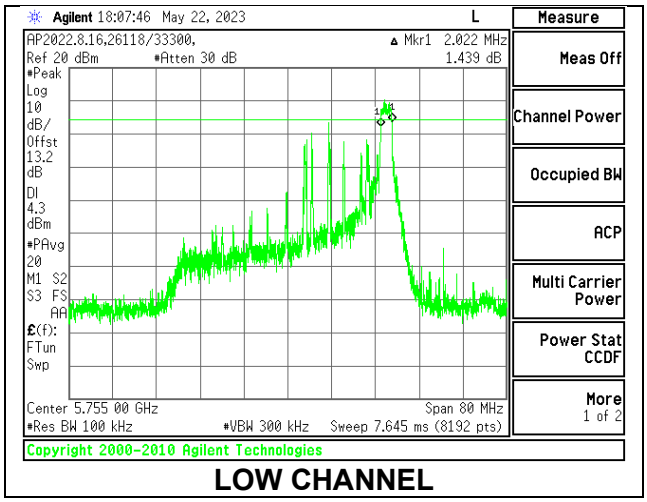
1TX Antenna 5 MODE: 26 Tones, RU Index 17

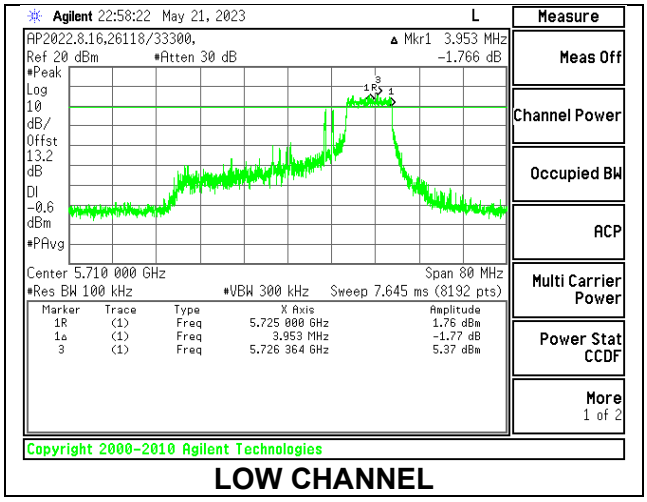
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	5755	2.022	0.5
High	5795	2.031	0.5



LOW CHANNEL

1TX Antenna 5 MODE: 106 Tones, RU Index 56

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
142	5710	3.953	0.5



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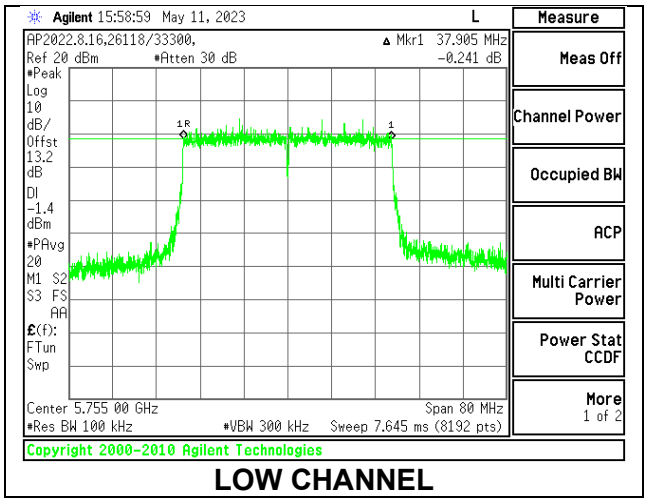
1TX Antenna 5 MODE: SU Mode

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	5755	37.905	0.5
High	5795	37.514	0.5
142	5710	4.021	0.5



LOW CHANNEL

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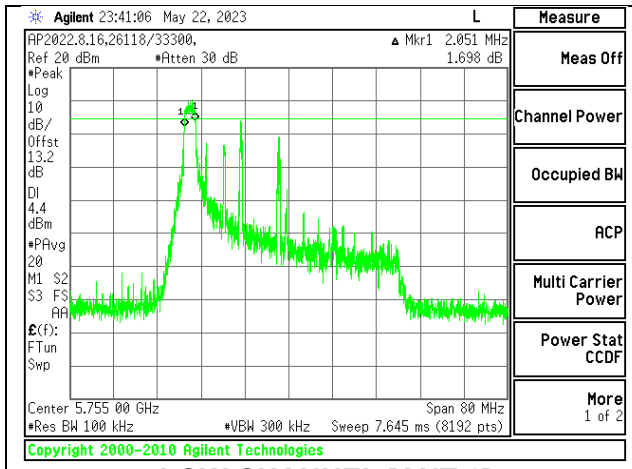
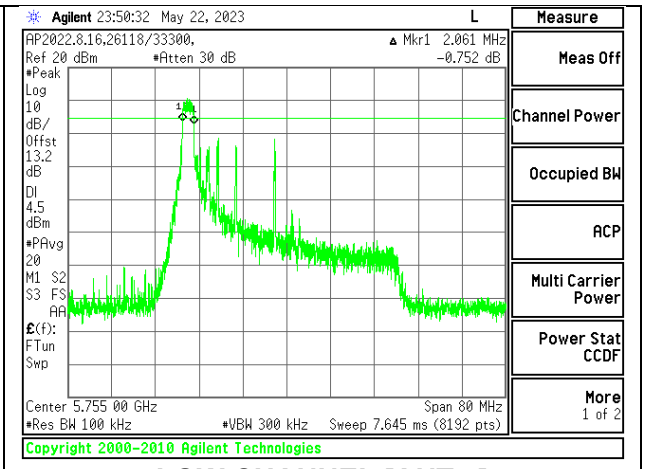
2TX Antenna 6 + Antenna 5 CDD MODE: 26 Tones, RU Index 0

Channel	Frequency (MHz)	6 dB Bandwidth Antenna 6 (MHz)	6 dB Bandwidth Antenna 5 (MHz)	Minimum Limit (MHz)
Low	5755	2.051	2.061	0.5
High	5795	2.031	2.080	0.5



LOW CHANNEL [ANT 6]



LOW CHANNEL [ANT 5]

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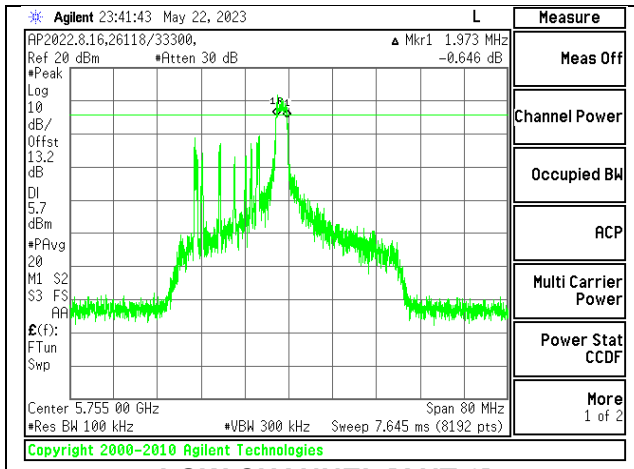
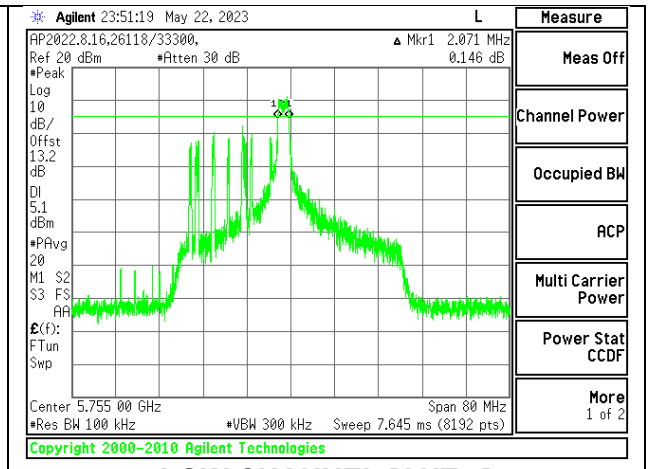
2TX Antenna 6 + Antenna 5 CDD MODE: 26 Tones, RU Index 8

Channel	Frequency (MHz)	6 dB Bandwidth Antenna 6 (MHz)	6 dB Bandwidth Antenna 5 (MHz)	Minimum Limit (MHz)
Low	5755	1.973	2.071	0.5
High	5795	1.992	1.983	0.5



LOW CHANNEL [ANT 6]



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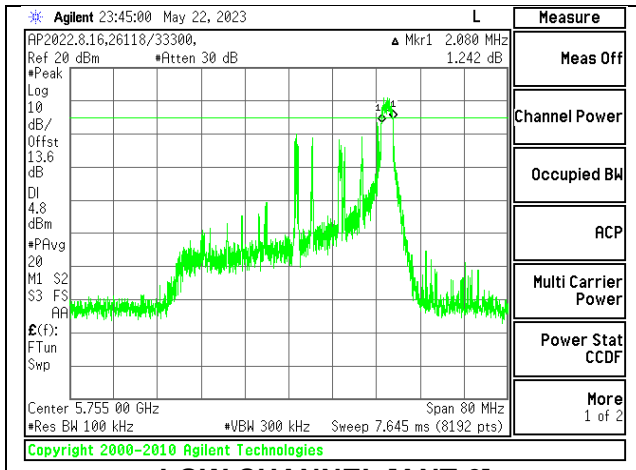
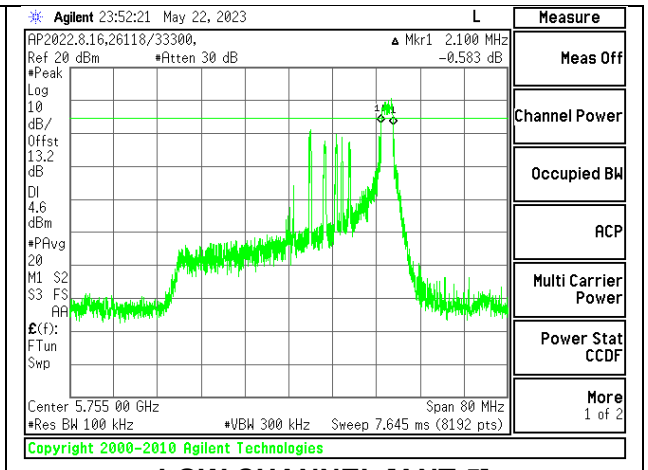
2TX Antenna 6 + Antenna 5 CDD MODE: 26 Tones, RU Index 17

Channel	Frequency (MHz)	6 dB Bandwidth Antenna 6 (MHz)	6 dB Bandwidth Antenna 5 (MHz)	Minimum Limit (MHz)
Low	5755	2.080	2.100	0.5
High	5795	2.080	1.992	0.5



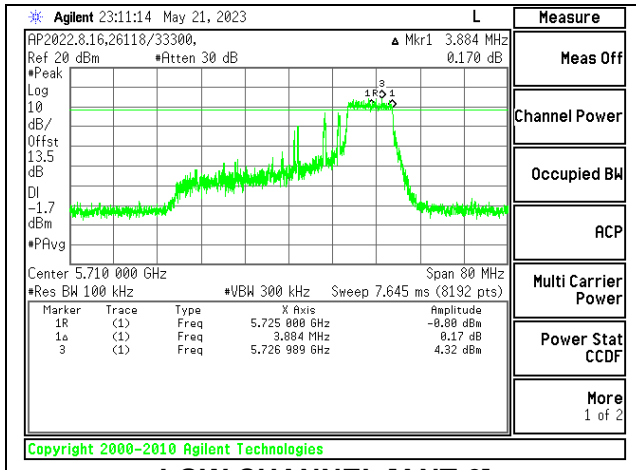
LOW CHANNEL [ANT 6]



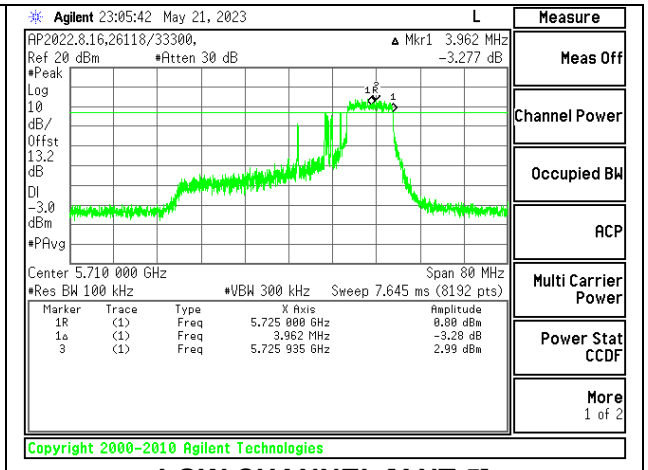
LOW CHANNEL [ANT 5]

2TX Antenna 6 + Antenna 5 CDD MODE: 106 Tones, RU Index 56

Channel	Frequency (MHz)	6 dB Bandwidth Antenna 6 (MHz)	6 dB Bandwidth Antenna 5 (MHz)	Minimum Limit (MHz)
142	5710	3.884	3.962	0.5



LOW CHANNEL [ANT 6]



LOW CHANNEL [ANT 5]

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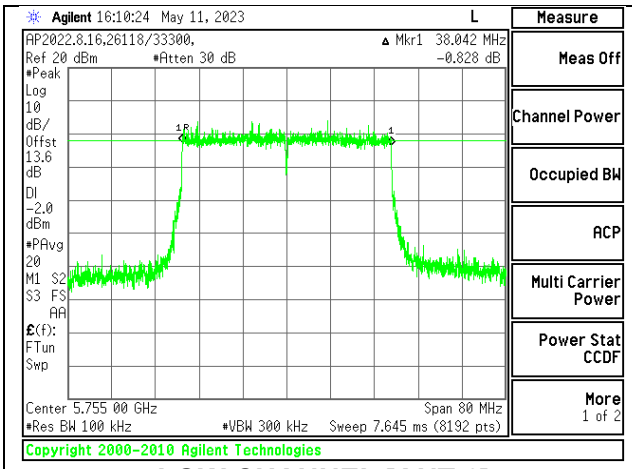
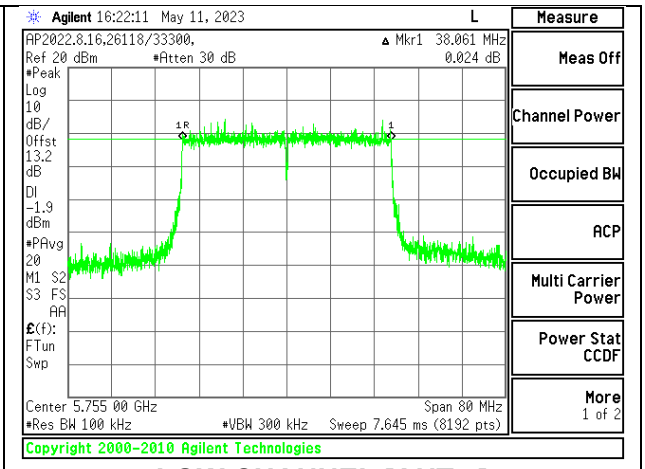
2TX Antenna 6 + Antenna 5 CDD MODE: SU Mode

Channel	Frequency (MHz)	6 dB Bandwidth Antenna 6 (MHz)	6 dB Bandwidth Antenna 5 (MHz)	Minimum Limit (MHz)
Low	5755	38.042	38.061	0.5
High	5795	37.827	37.710	0.5
142	5710	3.904	3.982	0.5



LOW CHANNEL [ANT 6]



LOW CHANNEL [ANT 5]

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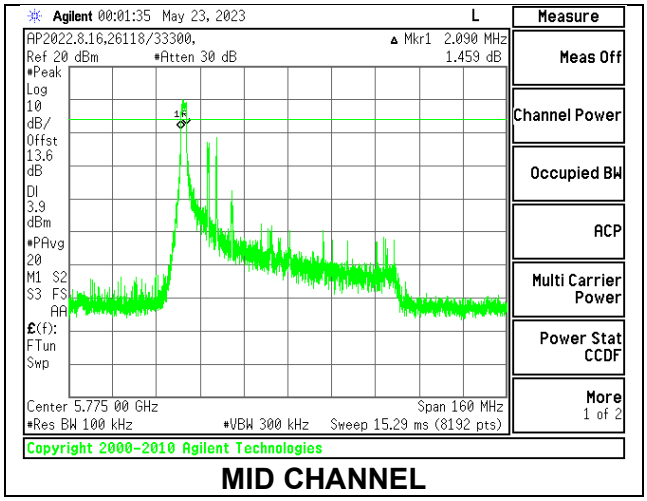
9.3.6. 802.11ax HE80 MODE IN THE 5.8 GHz BAND

1TX Antenna 6 MODE: 26 Tones, RU Index 0

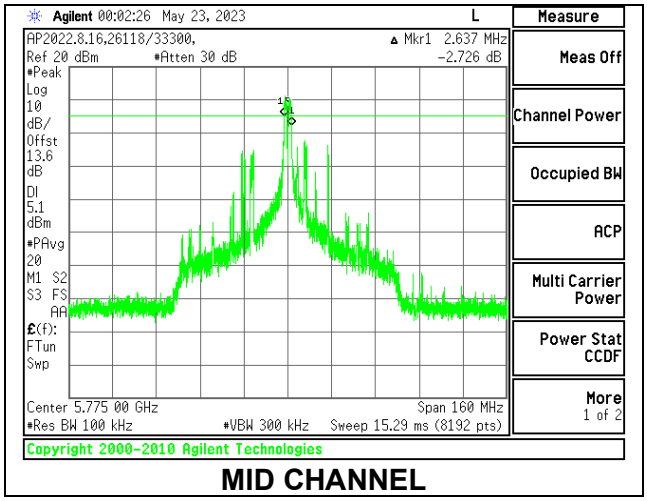
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Mid	5775	2.090	0.5



MID CHANNEL

1TX Antenna 6 MODE: 26 Tones, RU Index 18

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Mid	5775	2.637	0.5



MID CHANNEL

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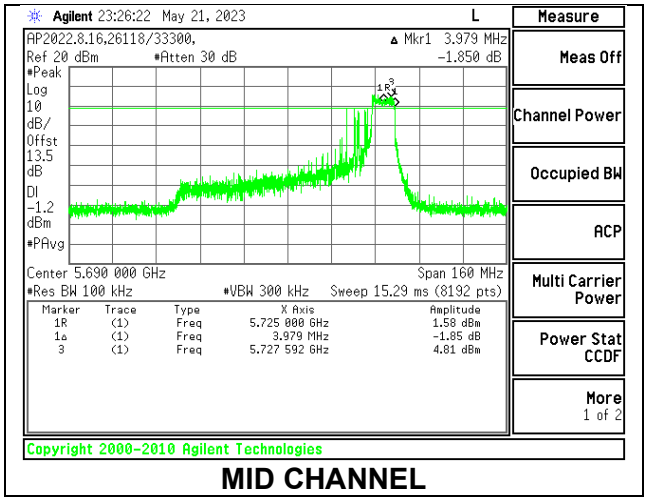
1TX Antenna 6 MODE: 106 Tones, RU Index 60

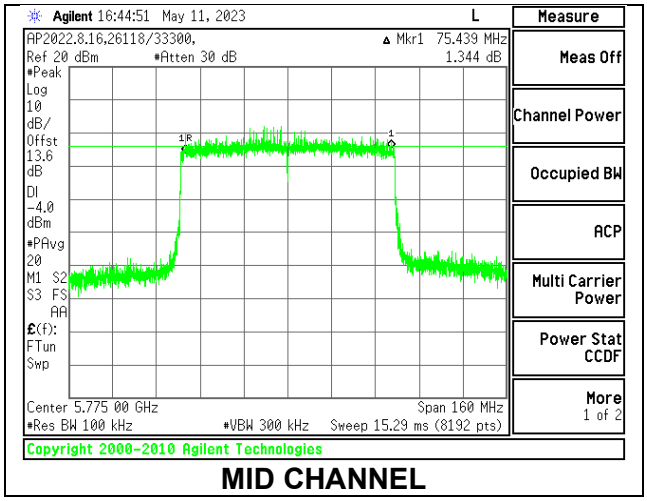
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
138	5690	3.979	0.5



MID CHANNEL

1TX Antenna 6 MODE: SU Mode

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Mid	5775	75.439	0.5
138	5690	3.804	0.5



MID CHANNEL

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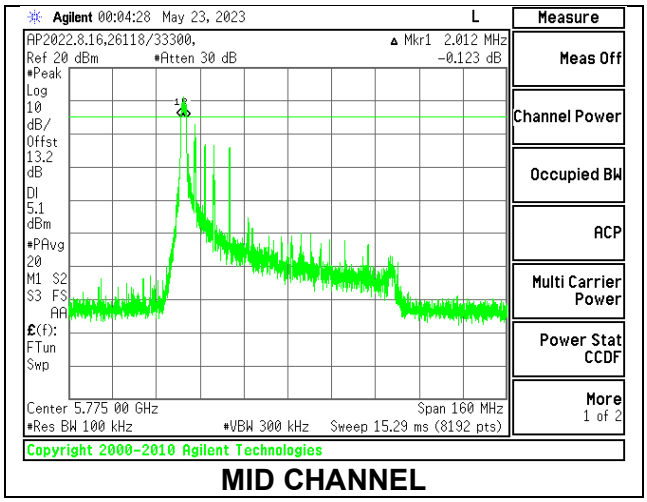
1TX Antenna 5 MODE: 26 Tones, RU Index 0

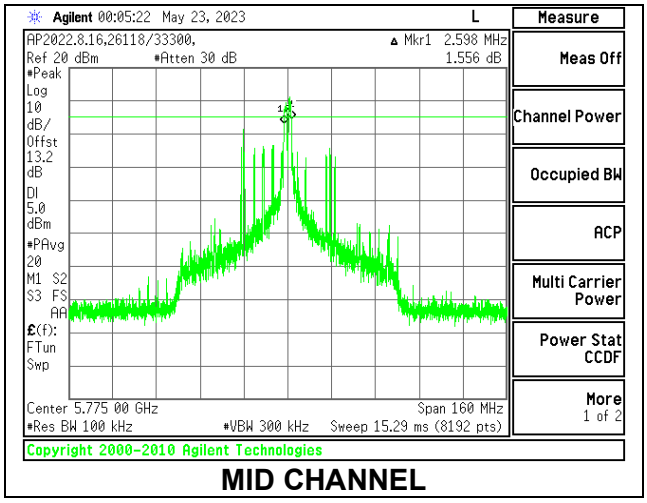
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Mid	5775	2.012	0.5



MID CHANNEL

1TX Antenna 5 MODE: 26 Tones, RU Index 18

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Mid	5775	2.598	0.5



MID CHANNEL

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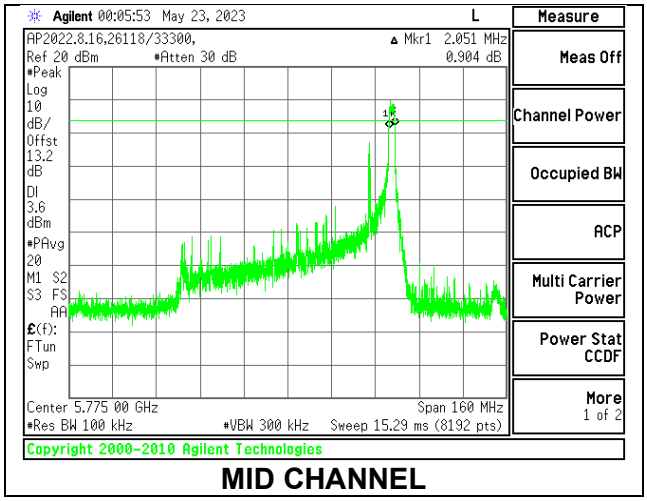
1TX Antenna 5 MODE: 26 Tones, RU Index 36

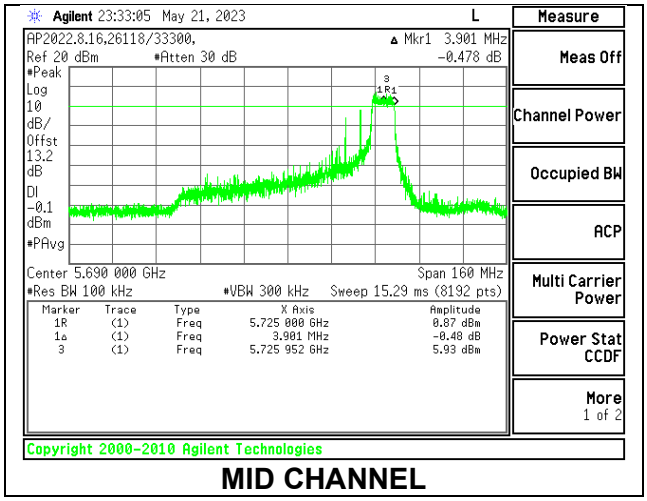
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Mid	5775	2.051	0.5



MID CHANNEL

1TX Antenna 5 MODE: 106 Tones, RU Index 60

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
138	5690	3.901	0.5



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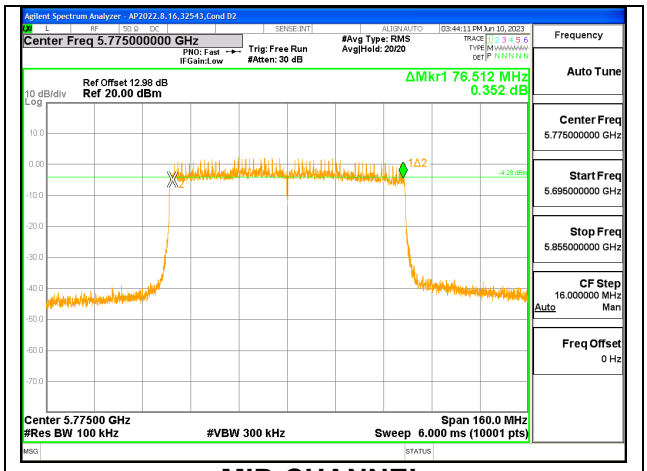
1TX Antenna 5 MODE: SU Mode

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Mid	5775	76.512	0.5
138	5690	3.784	0.5



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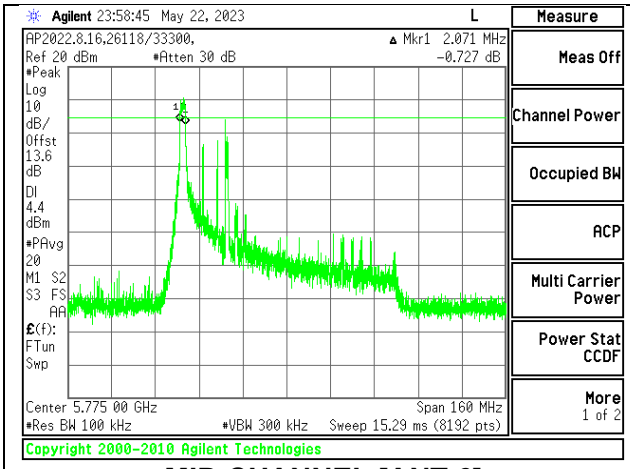
2TX Antenna 6 + Antenna 5 CDD MODE: 26 Tones, RU Index 0

Channel	Frequency (MHz)	6 dB Bandwidth Antenna 6 (MHz)	6 dB Bandwidth Antenna 5 (MHz)	Minimum Limit (MHz)
Mid	5775	2.071	2.090	0.5



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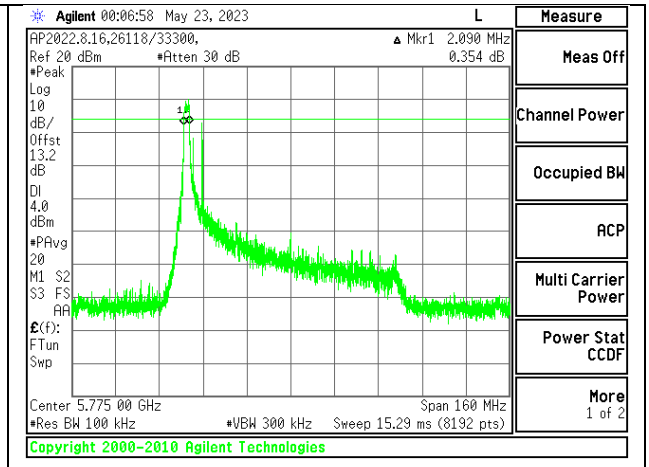

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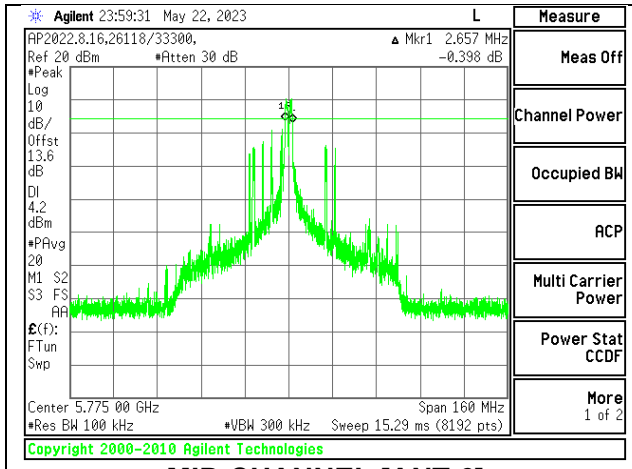
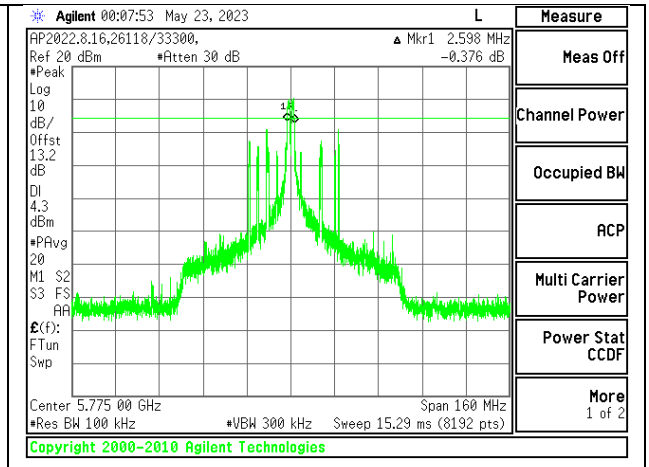
2TX Antenna 6 + Antenna 5 CDD MODE: 26 Tones, RU Index 18

Channel	Frequency (MHz)	6 dB Bandwidth Antenna 6 (MHz)	6 dB Bandwidth Antenna 5 (MHz)	Minimum Limit (MHz)
Mid	5775	2.657	2.598	0.5



MID CHANNEL [ANT 6]



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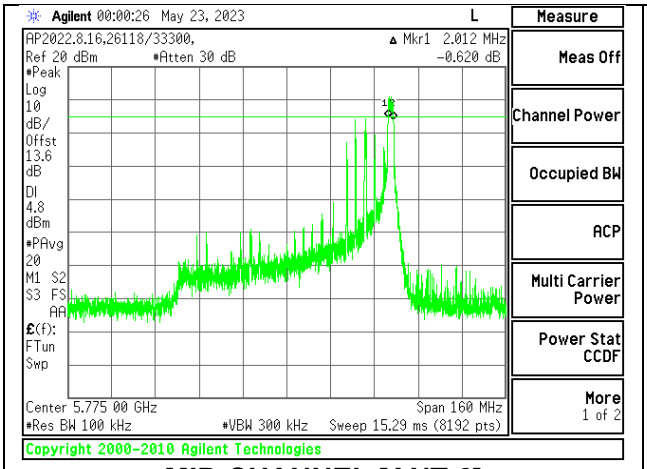
2TX Antenna 6 + Antenna 5 CDD MODE: 26 Tones, RU Index 36

Channel	Frequency (MHz)	6 dB Bandwidth Antenna 6 (MHz)	6 dB Bandwidth Antenna 5 (MHz)	Minimum Limit (MHz)
Mid	5775	2.012	2.090	0.5



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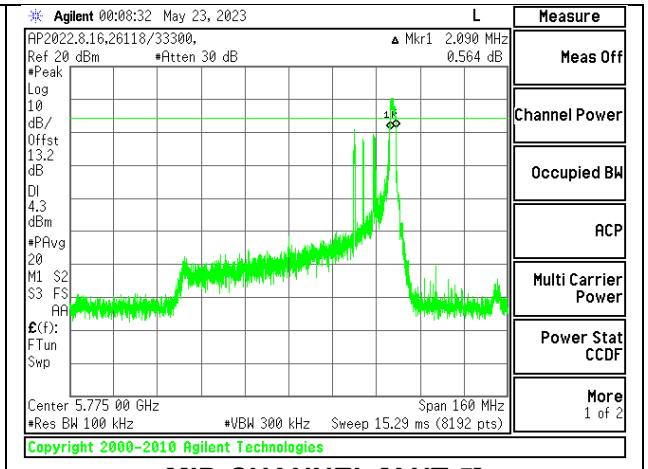
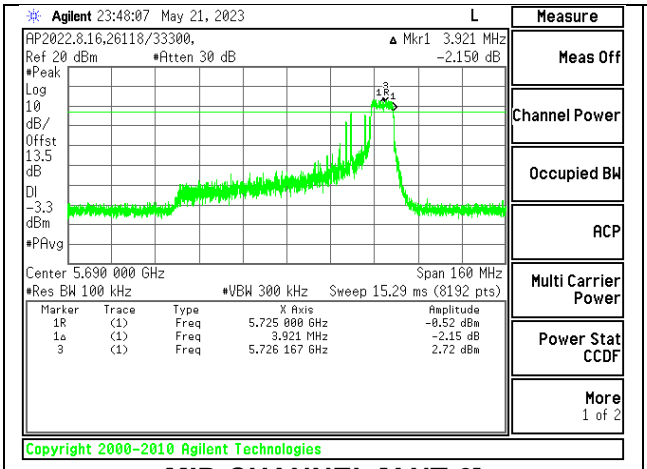


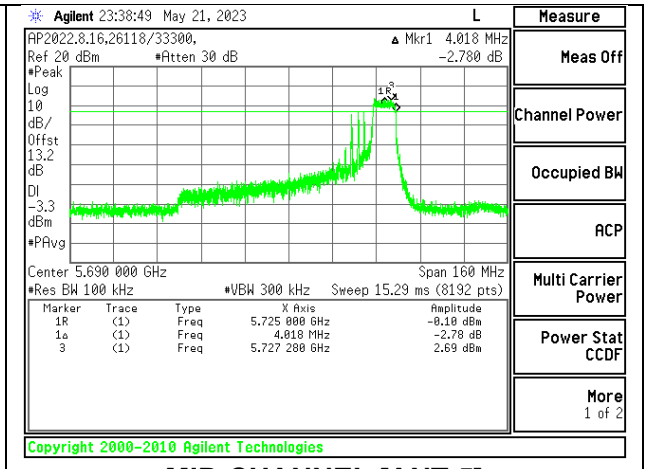
MID CHANNEL [ANT 5]

Antenna 6 + Antenna 5 CDD MODE: 106 Tones, RU Index 60

Channel	Frequency (MHz)	6 dB Bandwidth Antenna 6 (MHz)	6 dB Bandwidth Antenna 5 (MHz)	Minimum Limit (MHz)
Mid	5775	3.921	4.018	0.5



MID CHANNEL [ANT 6]



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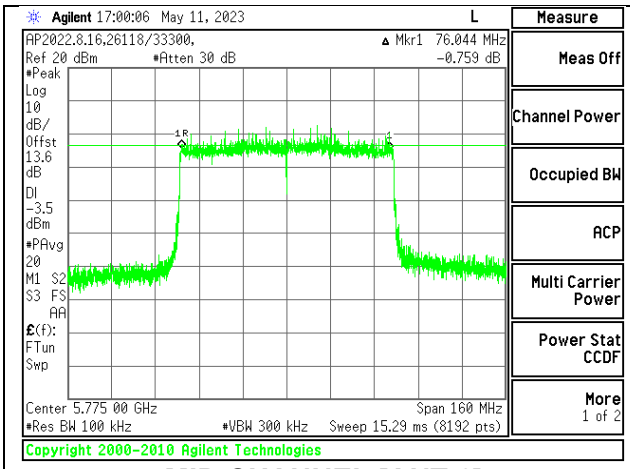
TX Antenna 6 + Antenna 5 CDD MODE: SU Mode

Channel	Frequency (MHz)	6 dB Bandwidth Antenna 6 (MHz)	6 dB Bandwidth Antenna 5 (MHz)	Minimum Limit (MHz)
Mid	5775	76.044	74.462	0.5
138	5690	3.862	3.999	0.5



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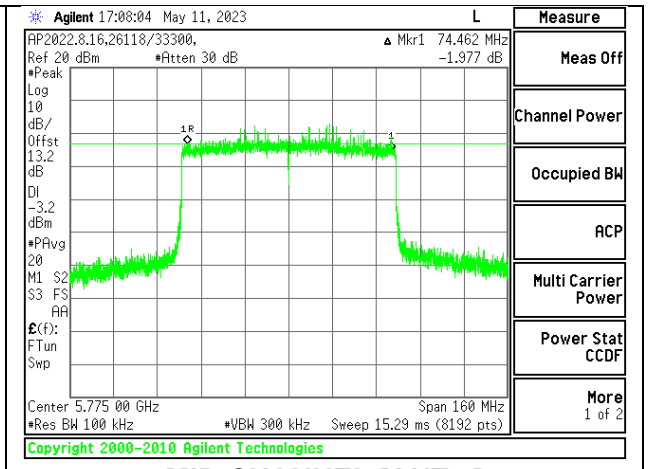

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9.4. OUTPUT POWER AND PSD

LIMITS

FCC §15.407

Band 5.15–5.25 GHz

(iv) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Bands 5.25-5.35 GHz and 5.47-5.725 GHz
The maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Band 5.725-5.85 GHz

The maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information.

TEST PROCEDURE

The measurement method used for output power is KDB 789033 D02 v02r01, Section E.3.b (Method PM-G).

The measurement method used for power spectral density is KDB 789033 D02 v02r01, Section F.
For all straddle channels, full bandwidth power and PSD/MHz are reported in the 5.6GHz section because the combined 5.6GHz and 5.8GHz power and PSD/MHz already passed the worst-case 5.6GHz power and 5.8 GHz PSD/500kHz limits.

11n HT20 and 11ax HE20 straddle channel 26dB bandwidth= (26dB BW/2)+5
11n HT20 and 11ax HE20 straddle channel 99% bandwidth= (99% BW/2)+5

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DIRECTIONAL ANTENNA GAIN

For 1 TX:

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

For 2 TX:

Tx chains are uncorrelated for power and correlated for PSD due to the device supporting CDD in all MIMO modes. The directional gains are as follows:

Band (GHz)	ANT6 Gain (dBi)	ANT5 Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)	Correlated Chains Directional Gain (dBi)
5.2	-1.90	-3.10	-2.46	0.53
5.3	-0.40	-2.50	-1.32	1.62
5.6	-0.60	-2.80	-1.56	1.38
5.8	-0.10	-2.30	-1.06	1.88

DIRECTIONAL GAIN CALCULATION:

ANSI C63.10-2013 section 14.4.3

Uncorrelated directional gain=10*LOG((10^(Ant6/10)+10^(Ant5/10))/2)
Correlated directional Gain=10*LOG(((10^(Ant6/20)+10^(Ant5/20))^2)/2)

Sample Calculation at 5.2GHz Band:

Ant6=-1.9, Ant5=-3.10

Uncorrelated Antenna gain=10log[(10^(-1.9/10)+10^(-3.1/10))/2]=-2.46 dBi

Correlated Antenna gain=10log[(10^(-1.9/20)+10^(-3.1/20))^2)/2]= 0.533dBi

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9.4.1. 802.11n HT20 MODE IN THE 5.2 GHz BAND

1TX Antenna 6 MODE (FCC) MOBILE

Test Engineer:	26118
Test Date:	5/5/2023

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	Power Limit (dBm)	PSD Limit (dBm/ 1MHz)
Low	5180	-1.90	24.00	11.00
Mid	5200	-1.90	24.00	11.00
High	5240	-1.90	24.00	11.00

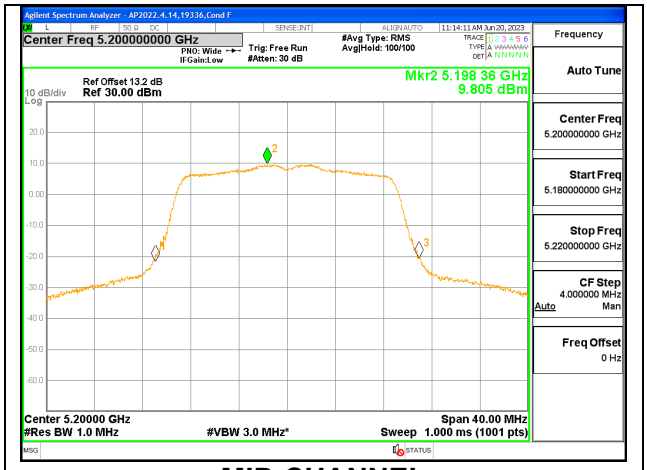
Duty Cycle CF (dB)	0.00	**Included in Calculations of Corr'd PSD**

Output Power Results

Channel	Frequency (MHz)	Antenna 6 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5180	18.95	18.95	24.00	-5.05
Mid	5200	19.41	19.41	24.00	-4.59
High	5240	19.43	19.43	24.00	-4.57

PSD Results

Channel	Frequency (MHz)	Antenna 6 Meas PSD (dBm/1MHz)	Total Corr'd PSD (dBm/1MHz)	PSD Limit (dBm/ 1MHz)	PSD Margin (dB)
Low	5180	9.143	9.143	11.00	-1.857
Mid	5200	9.805	9.805	11.00	-1.195
High	5240	9.882	9.882	11.00	-1.118



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1TX Antenna 5 MODE (FCC) MOBILE

Test Engineer:	26118
Test Date:	5/5/2023

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	Power Limit (dBm)	PSD Limit (dBm/ 1MHz)
Low	5180	-3.10	24.00	11.00
Mid	5200	-3.10	24.00	11.00
High	5240	-3.10	24.00	11.00

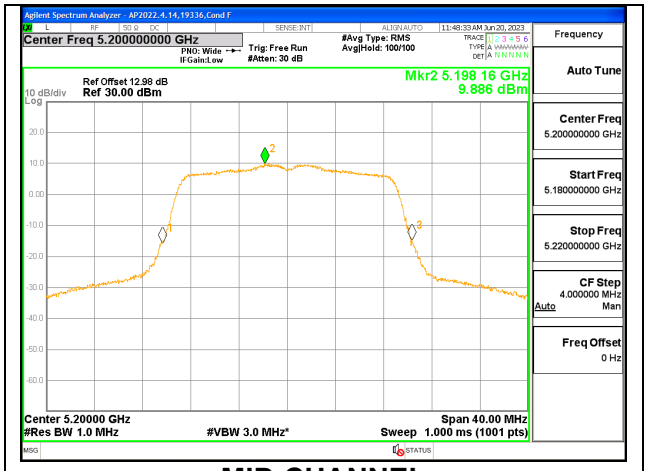
Duty Cycle CF (dB)	0.00	**Included in Calculations of Corr'd PSD**

Output Power Results

Channel	Frequency (MHz)	Antenna 5 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5180	18.93	18.93	24.00	-5.07
Mid	5200	19.48	19.48	24.00	-4.52
High	5240	19.46	19.46	24.00	-4.54

PSD Results

Channel	Frequency (MHz)	Antenna 5 Meas PSD (dBm/1MHz)	Total Corr'd PSD (dBm/1MHz)	PSD Limit (dBm/ 1MHz)	PSD Margin (dB)
Low	5180	8.872	8.872	11.00	-2.128
Mid	5200	9.886	9.886	11.00	-1.114
High	5240	9.814	9.814	11.00	-1.186



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2TX Antenna 6 + Antenna 5 CDD MODE (FCC) MOBILE

Test Engineer:	26118
Test Date:	5/5/2023

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm/ 1MHz)
Low	5180	-2.46	0.53	24.00	11.00
Mid	5200	-2.46	0.53	24.00	11.00
High	5240	-2.46	0.53	24.00	11.00

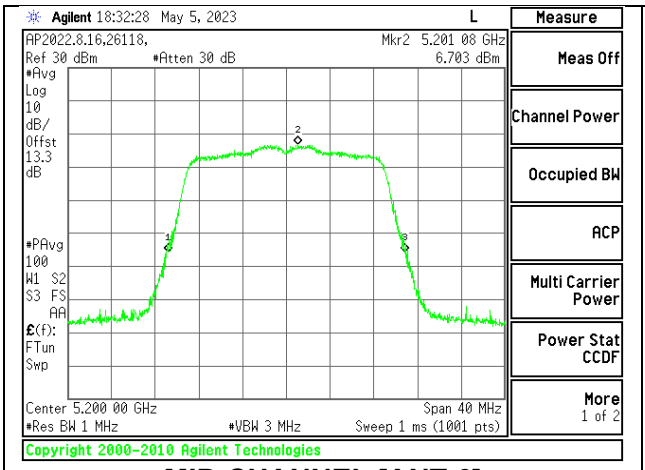
Duty Cycle CF (dB)	0.00	**Included in Calculations of Corr'd PSD**

Output Power Results

Channel	Frequency (MHz)	Antenna 6 Meas Power (dBm)	Antenna 5 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5180	16.40	16.41	19.42	24.00	-4.58
Mid	5200	16.43	16.44	19.45	24.00	-4.55
High	5240	16.43	16.42	19.44	24.00	-4.56

PSD Results

Channel	Frequency (MHz)	Antenna 6 Meas PSD (dBm/1MHz)	Antenna 5 Meas PSD (dBm/1MHz)	Total Corr'd PSD (dBm/1MHz)	PSD Limit (dBm/ 1MHz)	PSD Margin (dB)
Low	5180	6.400	6.594	9.508	11.00	-1.492
Mid	5200	6.703	6.508	9.617	11.00	-1.383
High	5240	6.542	6.740	9.652	11.00	-1.348



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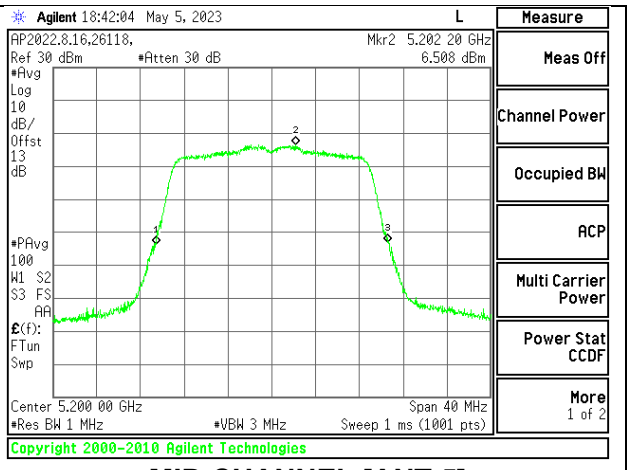

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