TEST REPORT

Report Number : 14523772-E10V2

Applicant	:	APPLE INC. 1 APPLE PARK WAY CUPERTINO, CA 95014, U.S.A
Model	:	A3105 (Parent Model) A3106, A3108 (Variant Models)
Brand	:	APPLE
FCC ID	:	BCG-E8440A (Parent Model) BCG-E8441A, BCG-E8442A (Variant Models)
EUT Description	:	SMARTPHONE
Test Standard(s)	:	FCC 47 CFR PART 15 SUBPART E

Date Of Issue:
2023/08/22

Prepared by:
UL Verification Services Inc.
47173 Benicia Street
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CERT #0751.05

REPORT REVISION HISTORY

Rev.	Issue Date	Revisions	Revised By
V1	2023/08/08	Initial Issue	Tony X. Li
V2	2023/08/22	Address TCB Questions sections 8, 9	Tony X. Li

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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: SMART PHONE

MODEL: A3105
A3106, A3108 (Variant Models)

BRAND: APPLE

SERIAL NUMBER: JKX4322779 (Conducted)
Q9VTP6V23T (Conducted)
GD61FMWJ6W (Radiated)
D20VVH9KF7 (Radiated)

SAMPLE RECEIPT DATE: MARCH 23, 2023

DATE TESTED: APRIL 7, 2023 – AUGUST 3, 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.

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Approved & Released For
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2. TEST RESULT SUMMARY

This report contains data provided by the customer which can impact the validity of results. UL Verification Services Inc. is only responsible for the validity of results after the integration of the data provided by the customer.

Below is a list of the data provided by the customer:

1. Antenna gain and type (see section 6.3)
2. Cable loss (see section 6.3)

FCC Clause	Requirement	Result	Comment
See Comment	Duty Cycle	Reporting purposes only	ANSI C63.10 Section 12.2 ...
See Comment	99% BW	Reporting purposes only	ANSI C63.10 Section 6.9.3
See Comment	26dB BW	Reporting purposes only	None.
§15.407 (a) (7), (8)	Output Power e.i.r.p.	Compliant	Dual Client.
§15.407 (a) (7), (8)	PSD e.i.r.p	Compliant	Dual Client.
§15.407 (b) (6)	Emissions outside 5.925-7.125 GHz band	Compliant	None
§15.407 (b) (7)	Emissions within 5.925-7.125 GHz Band(Emissions Mask)	Compliant	None
§15.205	Unwanted emissions in restricted bands	Compliant	None
§15.209	Radiated Spurious Emissions	Compliant	None
§15.207	AC Mains Conducted Emissions	Compliant	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 987594 D01 General Requirements v02r01
- FCC KDB 987594 D02 EMC Measurement v02r01
- KDB 414788 D01 Radiated Test Site v01r01
- ANSI C63.10-2013

4. FACILITIES AND ACCREDITATION

UL LLC 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	1.940 dB
Power Spectral Density	2.466 dB
Time Domain Measurements Using SA	3.39 %
RF Power Measurement Direct Method Using Power Meter	0.450 dB (Peak) 1.300 dB (Ave)
Radio Frequency (Spectrum Analyzer)	141.16 Hz
Occupied Bandwidth	1.22%
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 cellular GSM, GPRS, EGPRS, UMTS, LTE, 5GNR1, IEEE 802.11a/b/g/n/ac/ax, Bluetooth (BT), Ultra-Wideband (UWB), GPS, NFC, NB UNII, 802.15.4, 802.15.4ab-NB and MSS technologies. The rechargeable battery is not user accessible.

This report covers 6E 802.11 ax Wifi radio.

The Model covered by this report includes:

Full Test Model: A3105, FCC ID: BCG-E8440A

Variant Models: A3106, FCC ID: BCG-E8441A
A3108, FCC ID: BCG-E8442A

6.1.1. EUT DEVICE CLASS

Dual Client (6CD)	U-NII Bands of Operation			
	5	6	7	8
Indoor Client	☒	☒	☒	☒
Standard Client	☒	☐	☒	☐

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6.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum EIRP output power as follows:

6.2.1. LP

UNII-5 BAND (FCC)

Frequency Range (MHz)	Mode	Output Power EIRP (dBm)	Output Power EIRP (mW)
UNII-5 Band, 1TX			
5955-6415	802.11ax HE20	8.92	7.80
5965-6405	802.11ax HE40	11.98	15.78
5985-6385	802.11ax HE80	14.35	27.23
6025-6345	802.11ax HE160	17.44	55.46
UNII-5 Band, 2TX			
5955-6415	802.11ax HE20 OFDMA	6.00	3.98
5955-6415	802.11ax HE20 OFDMA, SDM	8.79	7.57
5965-6405	802.11ax HE40 OFDMA	9.00	7.94
5965-6405	802.11ax HE40 OFDMA, SDM	11.81	15.17
5985-6385	802.11ax HE80 OFDMA	11.48	14.06
5985-6385	802.11ax HE80 OFDMA, SDM	11.31	13.52
6025-6345	802.11ax HE160 OFDMA	14.50	28.18
6025-6345	802.11ax HE160 OFDMA, SDM	17.30	53.70

UNII-6 BAND (FCC)

Frequency Range (MHz)	Mode	Output Power EIRP (dBm)	Output Power EIRP (mW)
UNII-6 Band, 1TX			
6435 - 6515	802.11ax HE20	8.96	7.87
6445 - 6525	802.11ax HE40	11.98	15.78
6465	802.11ax HE80	14.44	27.80
6505	802.11ax HE160, Straddle Channel	17.42	55.21
UNII-6 band, 2TX			
6435 - 6515	802.11ax HE20 OFDMA	5.85	3.85
6435 - 6515	802.11ax HE20 OFDMA, SDM	8.88	7.73
6445 - 6525	802.11ax HE40 OFDMA	8.86	7.69
6445 - 6525	802.11ax HE40 OFDMA, SDM	11.87	15.38
6465	802.11ax HE80 OFDMA	11.35	13.65
6465	802.11ax HE80 OFDMA, SDM	14.33	27.10
6505	802.11ax HE160 OFDMA, Straddle	13.93	24.72
6505	802.11ax HE160 OFDMA, SDM Straddle	16.95	49.55

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UNII-7 BAND (FCC)

Frequency Range (MHz)	Mode	Output Power EIRP (dBm)	Output Power EIRP (mW)
UNII-7 Band 1TX			
6535 - 6875	802.11ax HE20	8.91	7.78
6565 - 6845	802.11ax HE40	11.95	15.67
6545 - 6865	802.11ax HE80	14.46	27.93
6665 - 6825	802.11ax HE160	17.41	55.08
UNII-7 Band 2TX			
6535-6875	802.11ax HE20 OFDMA	6.07	4.05
6535-6875	802.11ax HE20 OFDMA, SDM	9.06	8.05
6565-6845	802.11ax HE40 OFDMA	8.83	7.64
6565-6845	802.11ax HE40 OFDMA, SDM	11.82	15.21
6545-6865	802.11ax HE80 OFDMA	11.58	14.39
6545-6865	802.11ax HE80 OFDMA, SDM	14.56	28.58
6665-6825	802.11ax HE160 OFDMA	14.55	28.51
6665-6825	802.11ax HE160 OFDMA, SDM	17.54	56.75

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UNII-8 BAND (FCC)

Frequency Range (MHz)	Mode	Output Power EIRP (dBm)	Output Power EIRP (mW)
UNII-8 Band 1TX			
6895-7115	802.11ax HE20	8.84	7.66
6885-7085	802.11ax HE40	11.87	15.38
6945-7025	802.11ax HE80	14.38	27.42
6985	802.11ax HE160	17.35	54.33
UNII-8 Band 2TX			
6895-7115	802.11ax HE20 OFDMA	6.29	4.26
6895-7115	802.11ax HE20 OFDMA, SDM	8.78	7.55
6885-7085	802.11ax HE40 OFDMA	9.28	8.47
6885-7085	802.11ax HE40 OFDMA, SDM	12.07	16.11
6945-7025	802.11ax HE80 OFDMA	11.77	15.03
6945-7025	802.11ax HE80 OFDMA, SDM	14.28	26.79
6985	802.11ax HE160 OFDMA	14.76	29.92
6985	802.11ax HE160 OFDMA, SDM	17.29	53.58

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6.2.2. SP

UNII-5 BAND (FCC)

Frequency Range (MHz)	Mode	Output Power EIRP (dBm)	Output Power EIRP (mW)
UNII-5 Band, 1TX			
5955-6415	802.11ax HE20	18.96	78.70
5965-6405	802.11ax HE40	18.98	79.07
5985-6385	802.11ax HE80	18.94	78.34
6025-6345	802.11ax HE160	18.97	78.89
UNII-5 Band, 2TX			
5955-6415	802.11ax HE20 OFDMA	21.52	141.91
5955-6415	802.11ax HE20 SDM	Covered by 802.11ax HE20 OFDMA	
5965-6405	802.11ax HE40 OFDMA	21.54	142.56
5955-6415	802.11ax HE40 SDM	Covered by 802.11ax HE40 OFDMA	
5985-6385	802.11ax HE80 OFDMA	21.52	141.91
5985-6385	802.11ax HE80 SDM	Covered by 802.11ax HE80 OFDMA	
6025-6345	802.11ax HE160 OFDMA	21.53	142.23
6025-6345	802.11ax HE160 SDM	Covered by 802.11ax HE160 OFDMA	

UNII-7 BAND (FCC)

Frequency Range (MHz)	Mode	Output Power EIRP (dBm)	Output Power EIRP (mW)
UNII-7 Band 1TX			
6535-6855	802.11ax HE20	19.47	88.51
6565-6845	802.11ax HE40	19.47	88.51
6625-6785	802.11ax HE80	19.46	88.31
6665	802.11ax HE160	19.37	86.50
UNII-7 Band 2TX			
6535-6855	802.11ax HE20 OFDMA	21.53	142.23
6535-6855	802.11ax HE20 SDM	Covered by 802.11ax HE20 OFDMA	
6565-6845	802.11ax HE40 OFDMA	21.56	143.22
6565-6845	802.11ax HE40 SDM	Covered by 802.11ax HE40 OFDMA	
6625-6785	802.11ax HE80 OFDMA	21.54	142.56
6625-6785	802.11ax HE80 SDM	Covered by 802.11ax HE80 OFDMA	
6665	802.11ax HE160 OFDMA	21.55	142.89
6665	802.11ax HE160 SDM	Covered by 802.11ax HE160 OFDMA	

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6.3. DESCRIPTION OF AVAILABLE ANTENNAS

The antenna(s) gain and type, as provided by the manufacturer' are as follows:

Antenna Gain					
Frequency Range	Sub-band	Antenna 6	Antenna 5	Uncorrelated Chains	Correlated Chains
(MHz)	(MHz)	Gain (dBi)	Gain (dBi)	Directional Gain (dBi)	Directional Gain (dBi)
5925 - 6425 UNII-5	Sub-band 1 (5955 - 6095)	-2.60	-4.00	-3.24	-0.26
	Sub-band 2 (6115 - 6255)	-1.00	-0.90	-0.95	2.06
	Sub-band 3 (6275 - 6415)	-1.40	-0.50	-0.93	2.07
6425 - 6525 UNII-6	N/A	-0.70	-0.50	-0.60	2.41
UNII-6/7 (Straddle Channel)	N/A	1.00	-0.50	-0.31	3.29
6525 - 6875 UNII-7	N/A	1.00	-1.10	0.08	3.02
UNII-7/8 (Straddle Channel)	N/A	1.40	-1.10	0.33	3.25
6875 - 7125 UNII-8	N/A	1.40	-4.80	-0.68	1.85

Cable Loss		
Frequency Range (MHz)	Antenna 6 (dBi)	Antenna 5 (dBi)
5925-6105	0.75	1.00
6105-6265	0.75	1.00
6265-6425	0.75	1.00
6425-6525	0.75	1.00
6525-6875	0.75	1.00
6875-7125	0.75	1.00

The cables were used for RF antenna port tests that had been offset to the test equipment during testing.

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6.4. SOFTWARE AND FIRMWARE

The EUT firmware installed during testing was 23_10_686.

6.5. WORST-CASE CONFIGURATION AND MODE

This device is classified as dual client and programmed with two output power levels: indoor client mode (LP) & standard client mode (SP) and only indoor client mode supports straddle channels.

For RF conducted tests, indoor client mode has been tested with SISO and 2TX CDD and SDM MIMO modes; Standard client mode was done with SISO and 2TX CDD modes as it has same output power levels in 2TX CDD and SDM modes and 2TX CDD mode was set for all antenna port tests after investigation.

The 802.11a mode 20MHz covered by the 802.11ax mode since both have the same power.

Radiated was performed at the higher of the LP and SP power levels. The fundamental of the EUT was investigated in three orthogonal orientations X,Y,Z, it was determined that Z (Portrait) orientation was worst-case orientation for ANT6, ANT5, and 2TX.

With same power on Full RU and SU higher data rate, investigations were performed on both for band edge to determine the worst case, and SU mode was determined to be the worst case. Radiated emissions below 1GHz, above 18GHz, and power line conducted emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario. There were no emissions found below 30MHz within 20dB of the limit.

For radiated harmonics spurious below 1GHz, 1-18GHz L/M/H channels, 18-26GHz, 26-40GHz and power line conducted emissions were performed with the EUT set at the 2TX CDD mode among the CDD/SDM modes and 2TX HE mode with power setting equal or higher than SISO modes as worst-case scenario.

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

Below 1GHz tests were performed with EUT connected to AC power adapter as the worst case; and for above 1GHz tests, the worst-case configuration reported was with EUT only. For AC line conducted emission, test was investigated with AC power adapter and with laptop.

The output power and psd for the 802.11 ax mode were investigated between all different tones, and we found that SU mode had the highest output power and the lowest tone had the highest PSD readings. And after investigation, antenna port conducted tests were performed on both SU and lowest tones; radiated spurious emission and radiated band edge tests were performed on SU and lowest tones.

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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	C02YVBPOLVDD	BCGA1708
Laptop AC/DC adapter	Apple	n/a	C069115877XJFYFAT	DoC
EUT AC/DC adapter	Apple	n/a	C4H64450H9PGN8RAA	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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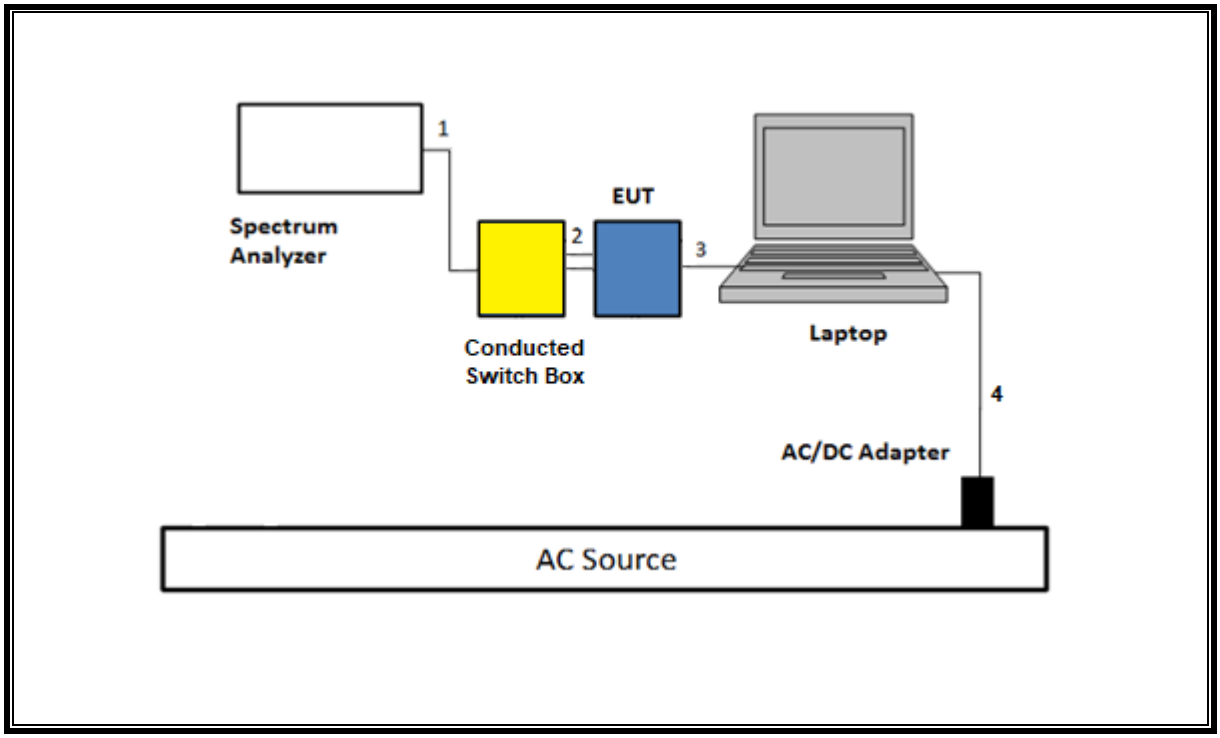
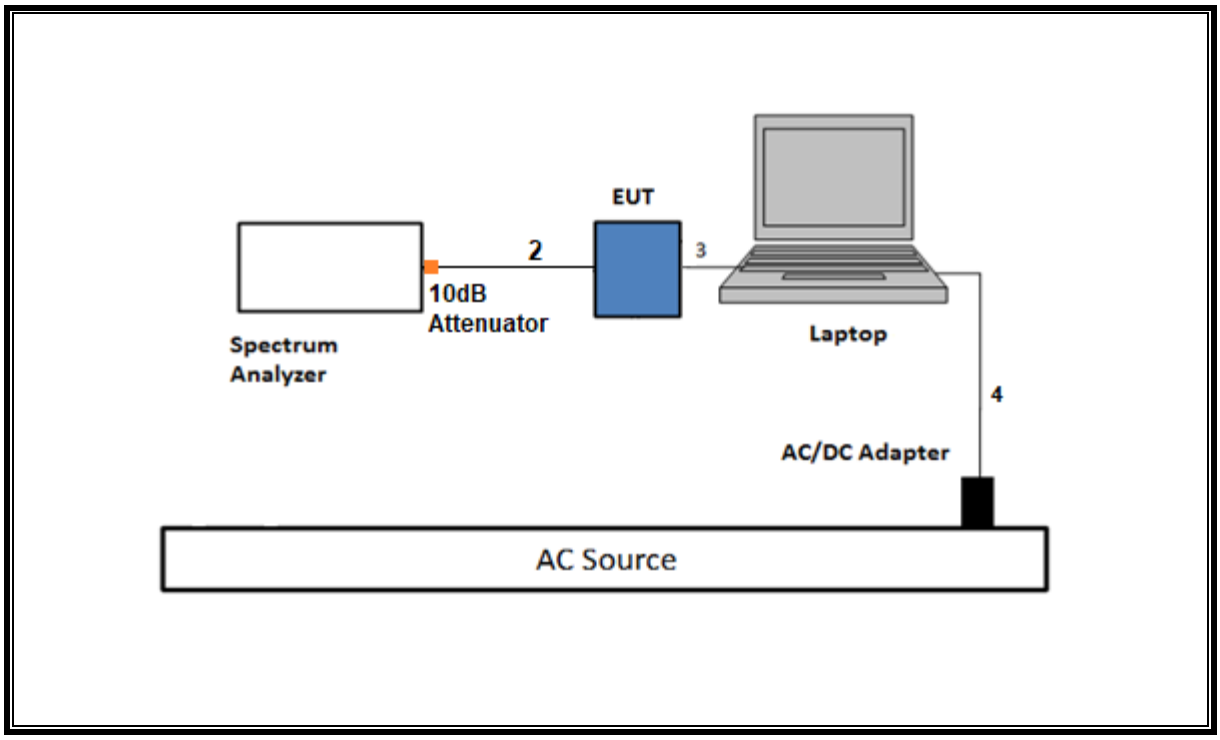
SETUP DIAGRAM FOR CONDUCTED TESTS





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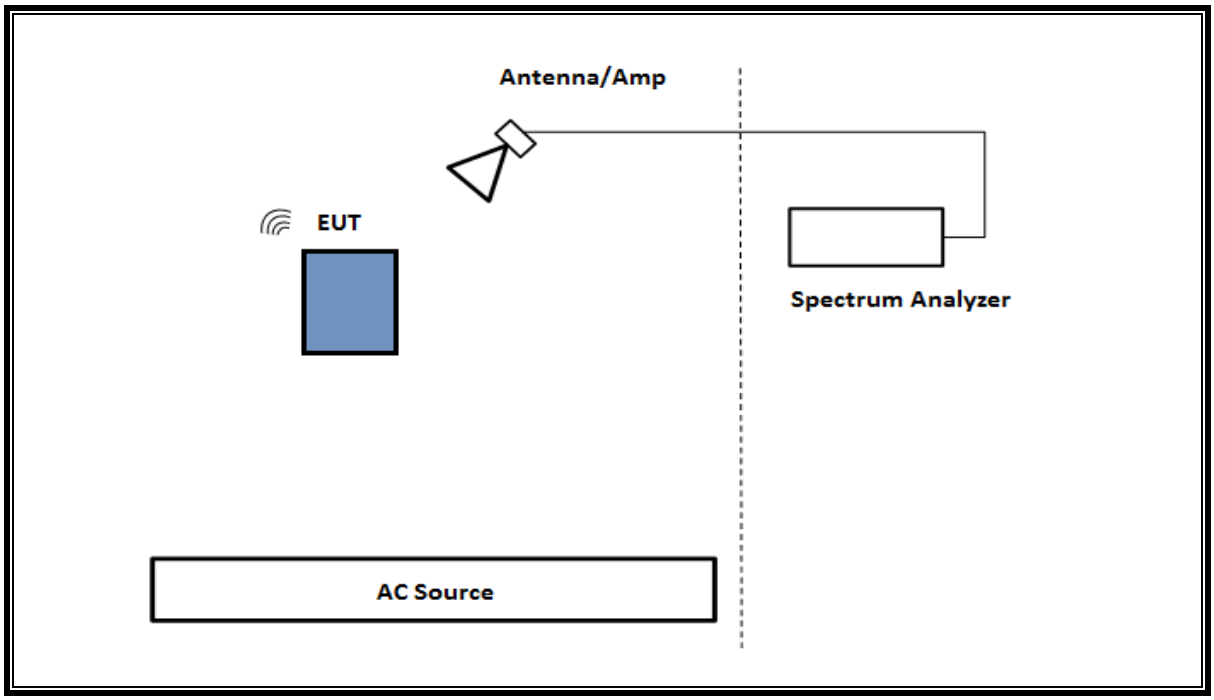
SETUP DIAGRAM FOR RADIATED TESTS Above 1 GHz



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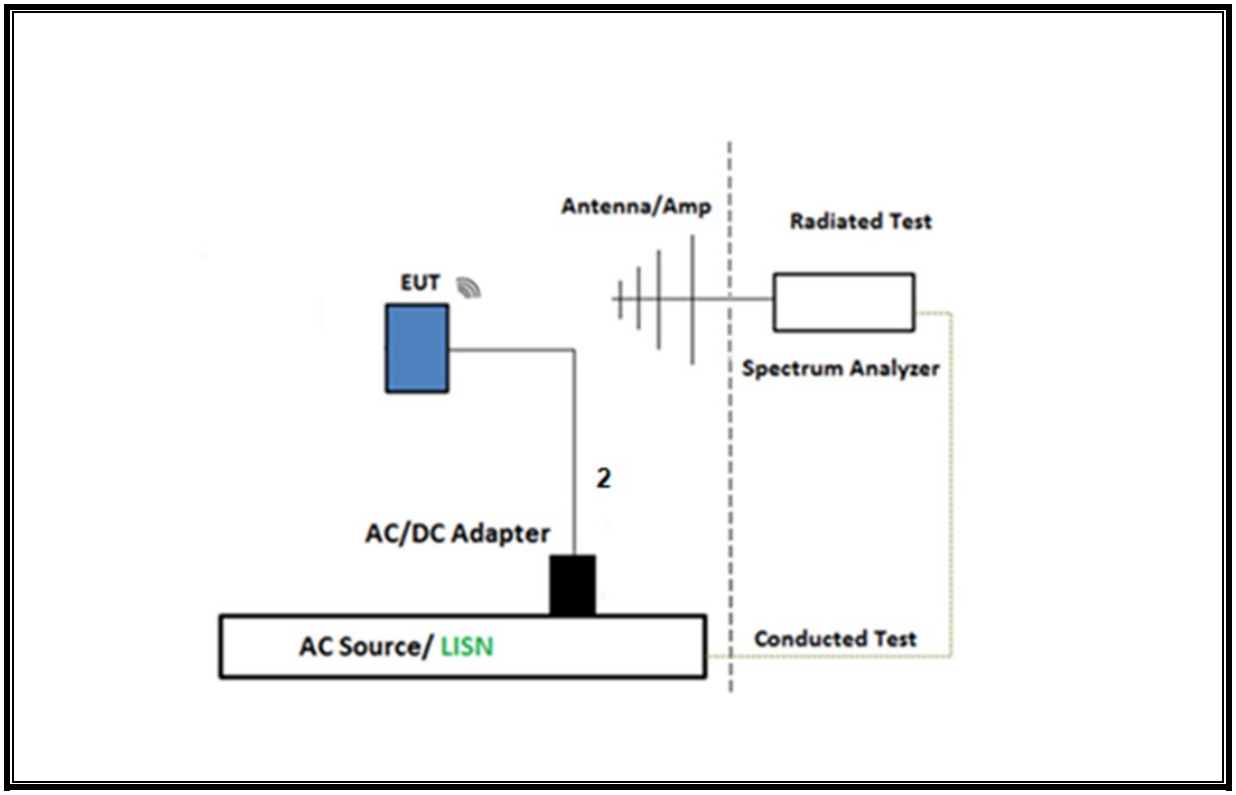
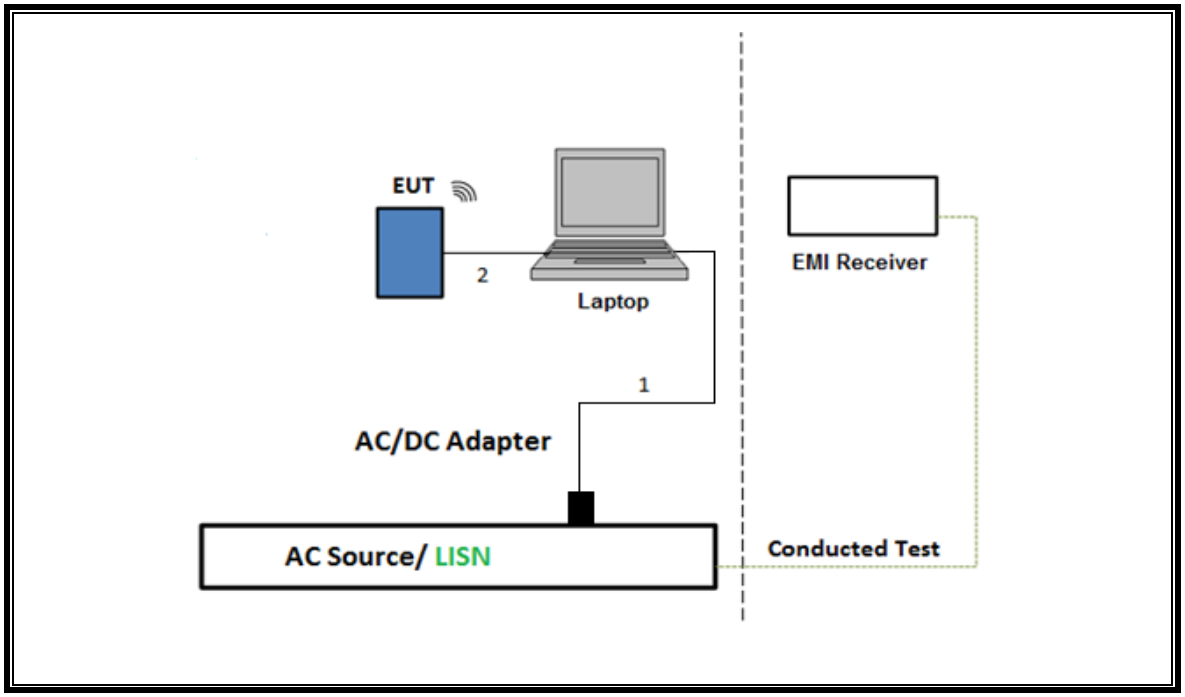
SETUP DIAGRAM FOR Below 1GHz and AC LINE CONDUCTED TEST



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.

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

99% Occupied Bandwidth: KDB 789033 D02 v02r01, Section II-D

Conducted Output Power: KDB 789033 D02 v02r01, Section II E.3.b (Method PM-G).

Power Spectral Density (PSD): KDB 789033 D02 v02r01, Section F

Spurious emissions within 5.925-7.125 GHz Band (Emissions Mask): KDB 987594 D02 EMC Measurement Section II-J

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**
Amplifier, 9KHz to 1GHz, 32dB	SONOMA INSTRUMENT	310	204041	08/24/2023	08/24/2022
Spectrum Analyzer, PSA, 3Hz to 26.5GHz	Keysight Technologies Inc	E4440A	81311	02/29/2024	02/23/2023
Spectrum Analyzer, PXA, 3Hz to 44GHz	Keysight Technologies Inc	N9030A	80397	02/28/2024	02/23/2023
Spectrum Analyzer, PXA, 3Hz to 44GHz	Keysight Technologies Inc	N9030A	85214	02/28/2024	02/23/2023
Spectrum Analyzer, PXA, 3Hz to 44GHz	Keysight Technologies Inc	N9030A-544	87738	02/28/2024	02/23/2023
*Conducted Switch Box	N/A	CSB	221008	06/21/2023	06/21/2022
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	01/24/2023
Power Sensor, P - series, 50MHz to 18GHz, Wideband	Keysight Technologies Inc	N1921A	90389	01/31/2024	01/24/2023
Antenna, Horn 18 to 26.5GHz	ARA	MWH-1826/B	172363	01/31/2024	01/31/2023
Antenna, Horn 26 to 40GHz	ARA	MWH-2640/B	172366	01/31/2024	01/31/2023
Amplifier 18-26.5GHz, +5Vdc, -54dBm P1dB	AMPLICAL	AMP18G26.5-60	171583	02/29/2024	02/29/2023
Amplifier 26-40GHz +5Vdc, -62dBm P1dB	AMPLICAL	AMP26G40-65	172346	02/29/2024	02/29/2023
*Antenna, Passive Loop 30Hz - 1MHz	ELECTRO METRICS	EM-6871	170014	07/19/2023	07/19/2022
*Antenna, Passive Loop 100KHz - 30MHz	ELECTRO METRICS	EM-6872	170015	07/28/2023	07/28/2022
Antenna, BroadBand Hybrid 30 MHz - 3 GHz	SUNOL SCIENCES CORP.	JB3	230635	01/31/2024	01/23/2023
Amplifier, 10KHz to 1GHz, 32dB	SONOMA INSTRUMENT	310N	230310	02/02/2024	02/02/2023
Antenna, Horn 1-18GHz	ETS-Lindgren (Cedar Park, Texas)	3117	206807	02/28/2024	02/28/2023
RF Filter Box, 1-18GHz, 12 Port.	UL-FR1	Frankenstein	230878	02/29/2024	02/29/2023
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	191428	02/29/2024	02/29/2023
*Antenna, Horn 1-18GHz	ETS-Lindgren (Cedar Park, Texas)	3117	80404	08/08/2023	08/08/2022
*RF Filter Box, 1-18GHz	FREMONT	SAC-L1	171013	06/24/2023	06/24/2022
EMI TEST RECEIVER,	Rohde & Schwarz	ESW44	201497	02/29/2024	02/29/2023

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TEST EQUIPMENT LIST (cont.)					
Description	**Manufacturer**	**Model**	**ID Num**	**Cal Due**	**Last Cal**
Antenna, Horn 1-18GHz	ETS-Lindgren (Cedar Park, Texas)	3117	200784	01/31/2024	01/31/2023
RF Filter Box, 1-18GHz, 12 Port	UL-FR1	Frankenstein	220095	01/31/2024	01/31/2023
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	201500	02/29/2024	02/29/2023
Antenna, Horn 1-18GHz	ETS-Lindgren (Cedar Park, Texas)	3117	226673	01/09/2024	01/09/2023
*RF Filter Box, 1-18GHz, 17 Ports	UL-FR1	RATS 2	226781	04/30/2023	04/30/2022
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	169935	02/29/2024	02/29/2023
Antenna, Horn 1-18GHz	ETS-Lindgren (Cedar Park, Texas)	3117	226671	01/09/2024	01/09/2023
RF Filter Box, 1-18GHz, 17 Ports	UL-FR1	RATS 2	226779	03/05/2024	03/05/2023
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	226078	02/29/2024	02/29/2023
Antenna, Horn 1-18GHz	ETS-Lindgren (Cedar Park, Texas)	3117	226672	01/09/2024	01/09/2023

AC Line Conducted					
Description	**Manufacturer**	**Model**	**ID Num**	**Cal Due**	**Last Cal**
*EMI Test Receiver	Rohde & Schwarz	ESW44	201501	05/31/2024	05/31/2023
LISN for Conducted Emissions CISPR-16	FISCHER CUSTOM COMMUNICATIONS	FCC-LISN-50/250-25-2-01-480V	175764	01/31/2024	01/31/2023
*Transient Limiter	TE	TBFL1	207996	08/31/2024	08/10/2023
UL AUTOMATION SOFTWARE					
Radiated Software	UL	UL EMC	Ver 9.5, May 1 , 2023		
Conducted Software	UL	UL EMC	2020.8.16		
AC Line Conducted Software	UL	UL EMC	Ver 9.5, Mar 3, 2023		

*Testing was completed before calibration due date and/or after calibration was completed.

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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)
802.11ax HE20 RU26, MCS0	3.992	4.027	0.991	99.13%	0.00	0.010
802.11ax HE20 RU26, MCS11	0.292	0.327	0.893	89.32%	0.49	3.425
802.11ax HE20 SU, MCS0	2.879	2.899	0.993	99.31%	0.00	0.010
802.11ax HE20 SU, MCS11	0.146	0.167	0.873	87.30%	0.59	6.869
802.11ax HE40 RU26, MCS0	3.961	4.031	0.983	98.26%	0.00	0.010
802.11ax HE40 RU26, MCS11	0.292	0.328	0.890	89.01%	0.51	3.429
802.11ax HE40 SU, MCS0	3.795	3.816	0.994	99.45%	0.00	0.010
802.11ax HE40 SU, MCS11	0.281	0.304	0.924	92.40%	0.34	3.561
802.11ax HE80 RU26, MCS0	3.967	4.029	0.985	98.46%	0.00	0.010
802.11ax HE80 RU26, MCS11	0.291	0.327	0.890	88.99%	0.51	3.434
802.11ax HE80 SU, MCS0	1.841	1.864	0.988	98.77%	0.00	0.010
802.11ax HE80 SU, MCS11	0.167	0.189	0.883	88.35%	0.54	5.988
802.11ax HE160 RU26, MCS0	3.961	4.029	0.983	98.31%	0.00	0.010
802.11ax HE160 RU26, MCS11	0.292	0.328	0.888	88.85%	0.51	3.430
802.11ax HE160 SU, MCS0	0.953	0.974	0.978	97.80%	0.10	1.050
802.11ax HE160 SU, MCS11	0.069	0.089	0.770	77.00%	1.13	14.547
802.11ax HE20 RU26 SDM, MCS0	3.992	4.031	0.990	99.03%	0.00	0.010
802.11ax HE20 SU SDM, MCS0	3.801	3.824	0.994	99.40%	0.00	0.010
802.11ax HE40 RU26 SDM, MCS0	3.961	4.029	0.983	98.31%	0.00	0.010
802.11ax HE40 SU SDM, MCS0	1.935	1.956	0.989	98.93%	0.00	0.010
802.11ax HE80 RU26 SDM, MCS0	3.969	4.031	0.985	98.46%	0.00	0.010
802.11ax HE80 SU SDM, MCS0	0.960	0.981	0.978	97.78%	0.10	1.042
802.11ax HE160 RU26 SDM, MCS0	3.961	4.029	0.983	98.31%	0.00	0.010
802.11ax HE160 SU SDM, MCS0	0.514	0.536	0.958	95.80%	0.19	1.947

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

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DUTY CYCLE PLOT

DUTY CYCLE 802.11ax HE20 RU26, MCS0

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9.2. 26 dB AND 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

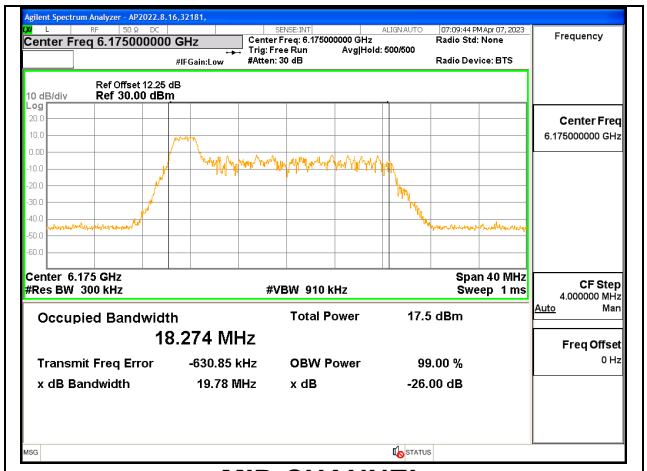
RESULTS

ID:	19336	Date:	7/31/2023

9.2.1. 802.11ax HE20 MODE IN THE UNII-5 BAND

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

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5955	19.79	18.0330
Mid	6175	19.78	18.2740
High	6415	19.77	18.2990



MID CHANNEL

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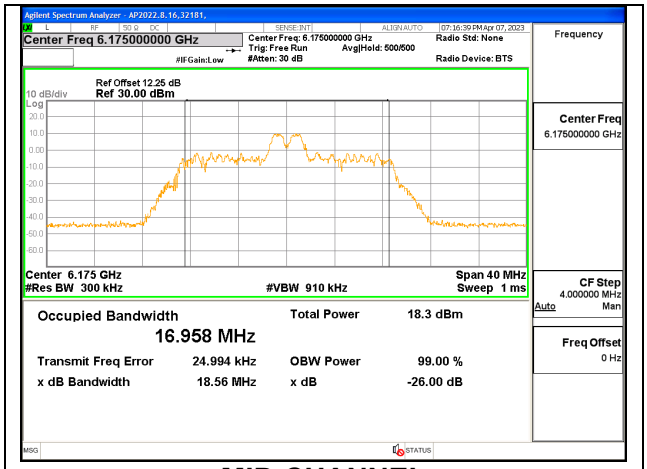
1TX Antenna 6 MODE: 26 Tones, RU Index 4

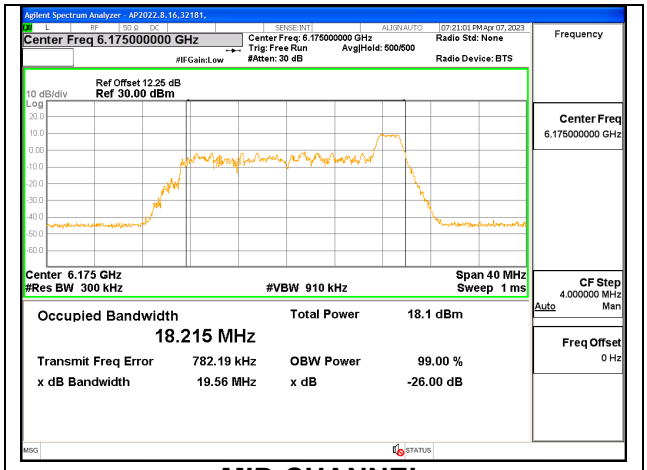
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5955	18.41	16.8730
Mid	6175	18.56	16.9580
High	6415	18.33	16.8000



MID CHANNEL

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

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5955	20.11	18.4740
Mid	6175	19.56	18.2150
High	6415	19.79	18.3950



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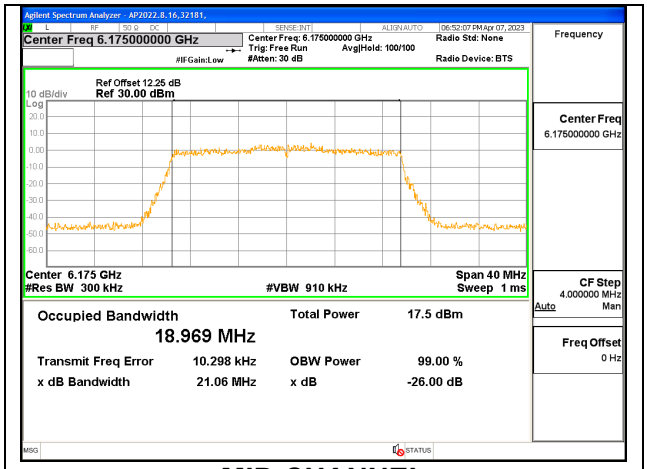
1TX Antenna 6 MODE: SU Mode

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5955	20.86	18.9610
Mid	6175	21.06	18.9690
High	6415	20.85	18.9330



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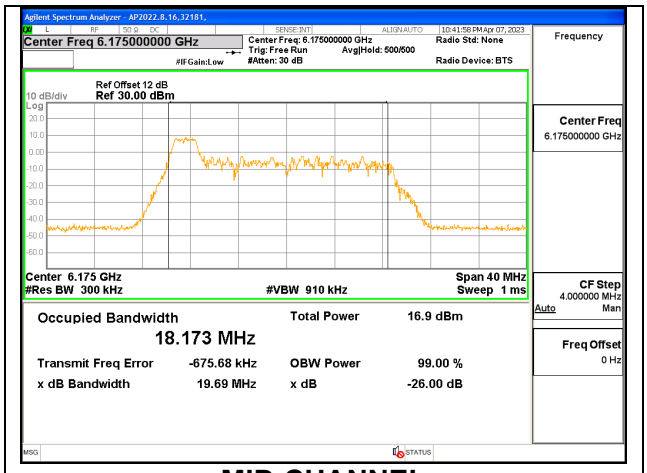
1TX Antenna 5 MODE: 26 Tones, RU Index 0

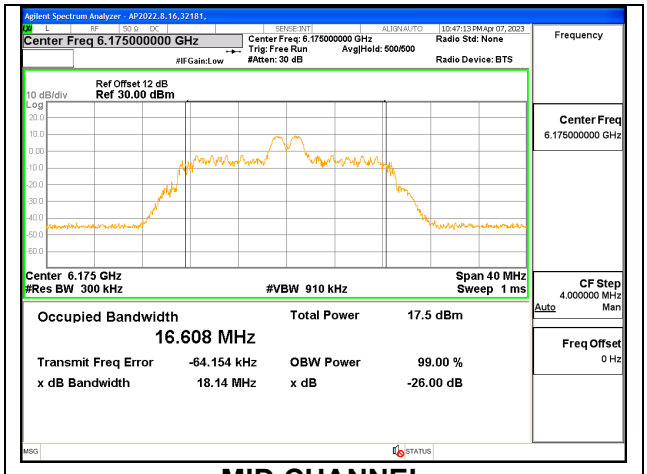
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5955	19.71	18.3340
Mid	6175	19.69	18.1730
High	6415	19.56	18.3220



MID CHANNEL

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

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5955	17.86	16.2440
Mid	6175	18.14	16.6080
High	6415	18.30	16.9230



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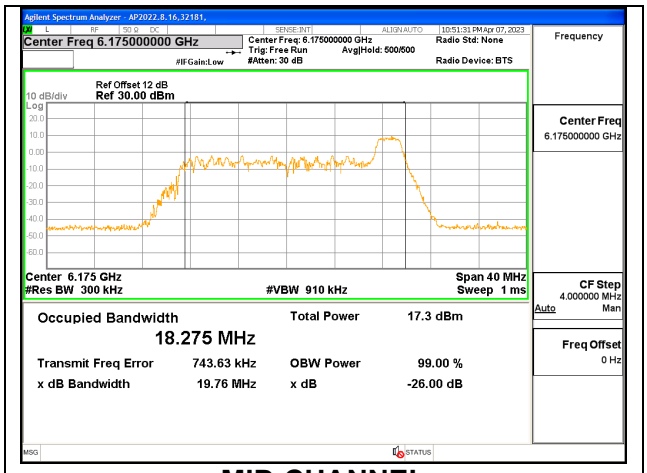
1TX Antenna 5 MODE: 26 Tones, RU Index 8

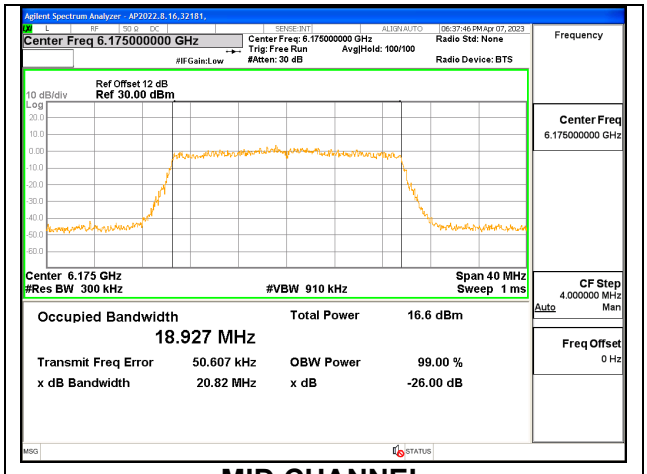
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5955	19.81	18.2860
Mid	6175	19.76	18.2750
High	6415	19.74	18.3610



MID CHANNEL

1TX Antenna 5 MODE: SU Mode

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5955	21.04	18.9870
Mid	6175	20.82	18.9270
High	6415	21.11	18.9580



MID CHANNEL

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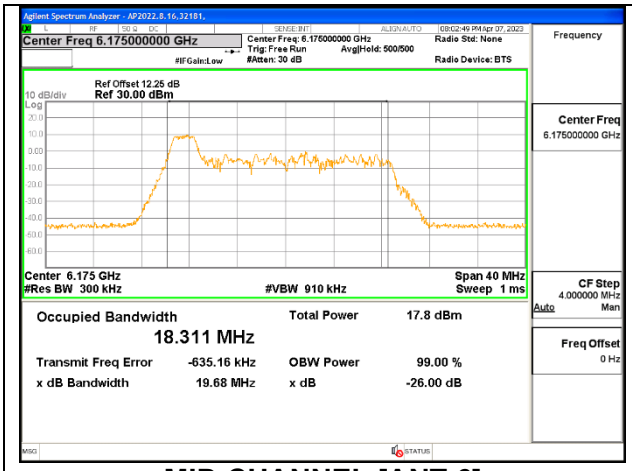
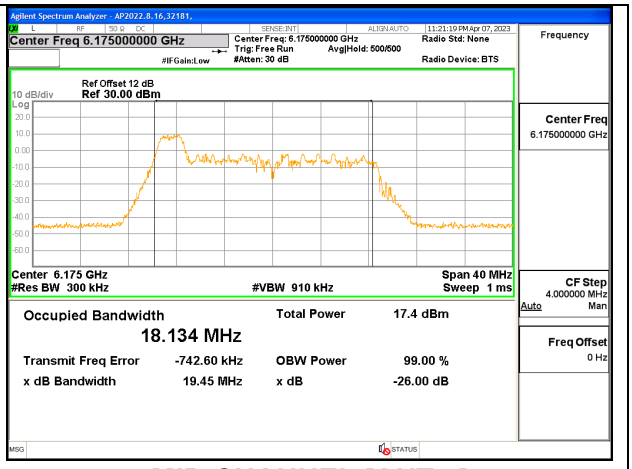
2TX Antenna 6 + Antenna 5 CDD MODE: 26 Tones, RU Index 0

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	5955	19.67	19.80	18.0180	17.3230
Mid	6175	19.68	19.45	18.3110	18.1340
High	6415	19.72	19.58	18.2760	18.1520



MID CHANNEL [ANT 6]



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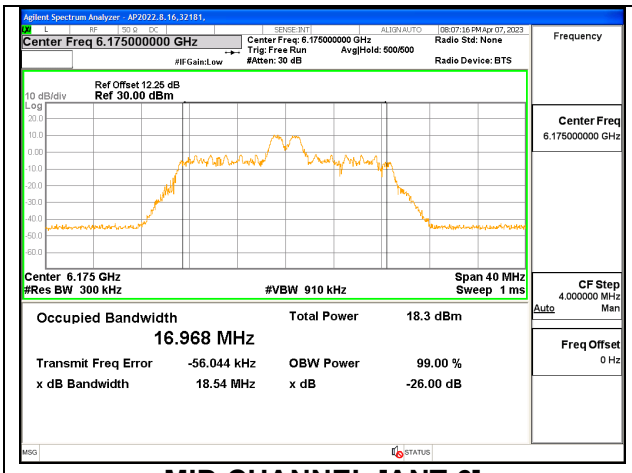
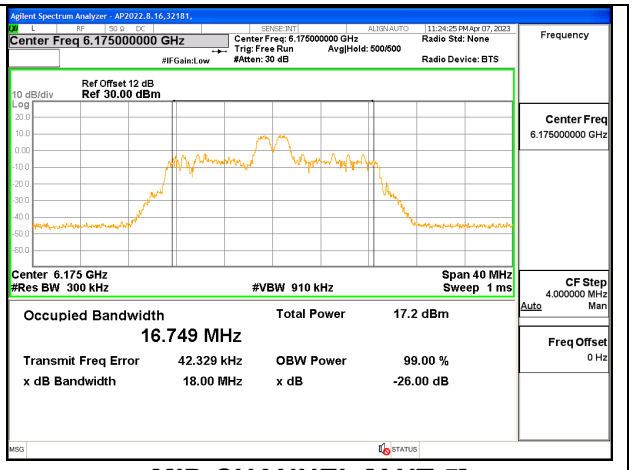
2TX Antenna 6 + Antenna 5 CDD MODE: 26 Tones, RU Index 4

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	5955	17.61	18.07	16.1500	16.8440
Mid	6175	18.54	18.00	16.9680	16.7490
High	6415	18.39	18.11	16.8400	16.6810



MID CHANNEL [ANT 6]



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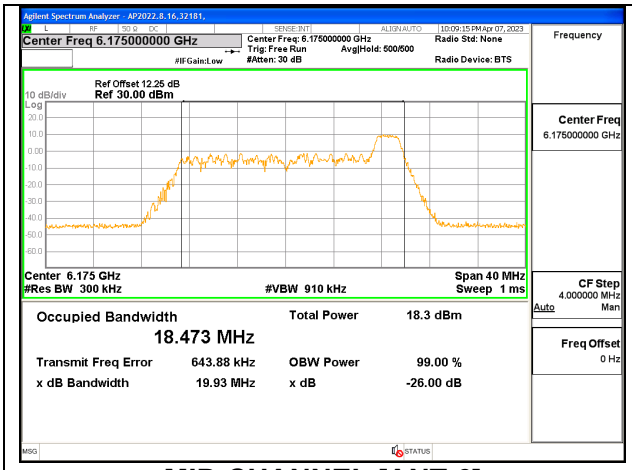
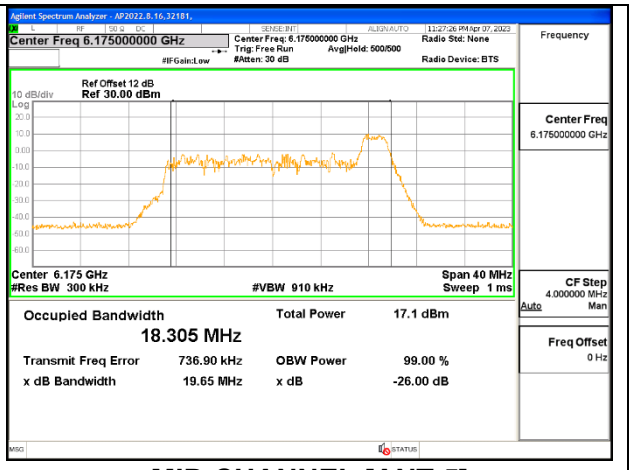
2TX Antenna 6 + Antenna 5 CDD MODE: 26 Tones, RU Index 8

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	5955	20.09	19.60	18.4000	18.3390
Mid	6175	19.93	19.65	18.4730	18.3050
High	6415	20.03	19.51	18.2730	18.3280



MID CHANNEL [ANT 6]



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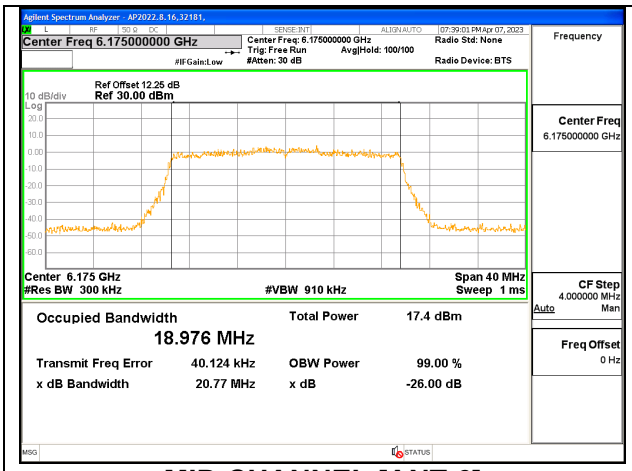
2TX Antenna 6 + Antenna 5 CDD MODE: SU Mode

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	5955	21.38	20.91	18.9280	18.9620
Mid	6175	20.77	20.99	18.9760	18.9730
High	6415	20.82	20.80	18.9450	18.9070



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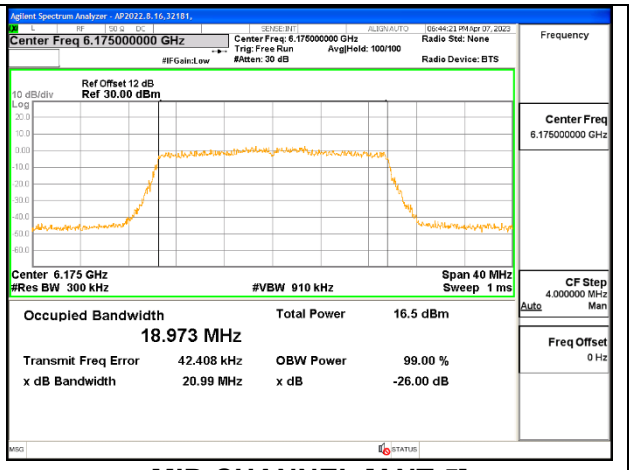

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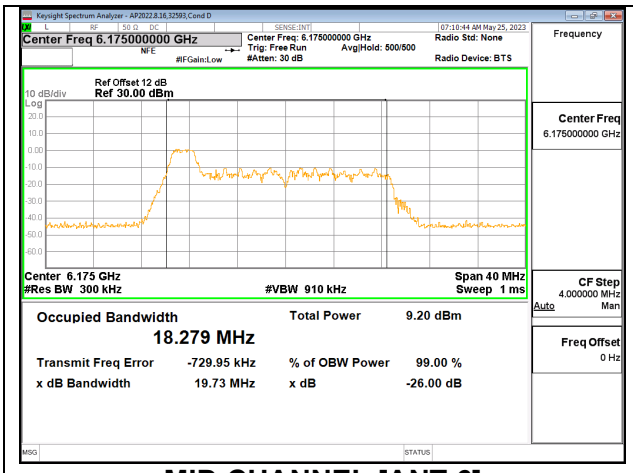
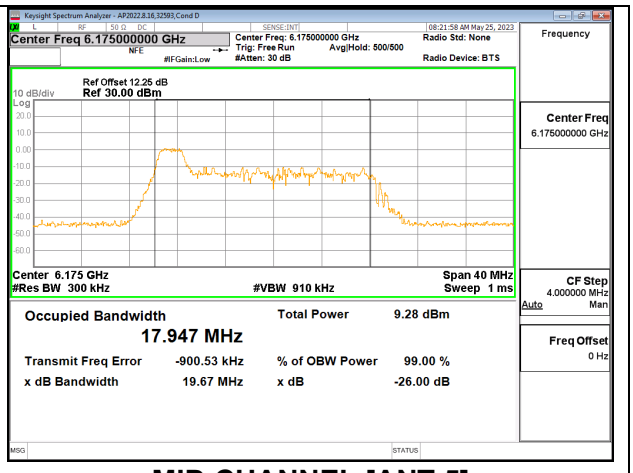
2TX Antenna 6 + Antenna 5 SDM MODE: 26 Tones, RU Index 0

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	5955	19.84	19.75	18.1420	18.2260
Mid	6175	19.73	19.67	18.2790	17.9470
High	6415	19.65	19.64	18.2420	18.3100



MID CHANNEL [ANT 6]



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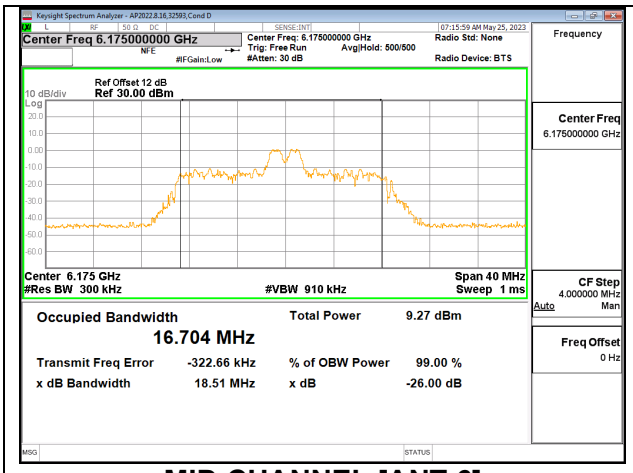
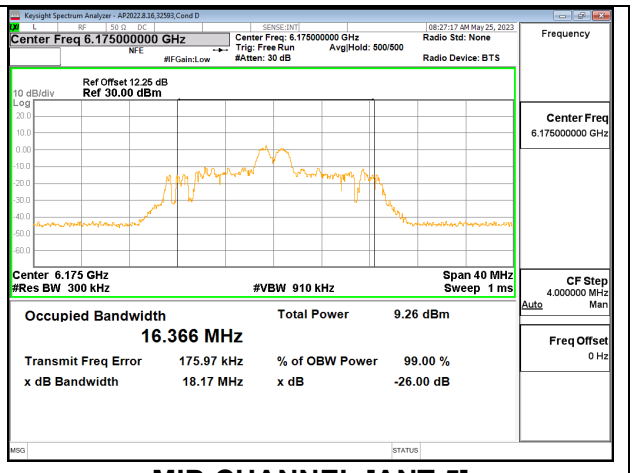
2TX Antenna 6 + Antenna 5 SDM MODE: 26 Tones, RU Index 4

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	5955	18.30	18.12	16.9590	16.8730
Mid	6175	18.51	18.17	16.7040	16.3660
High	6415	17.55	16.69	16.4960	15.5740



MID CHANNEL [ANT 6]



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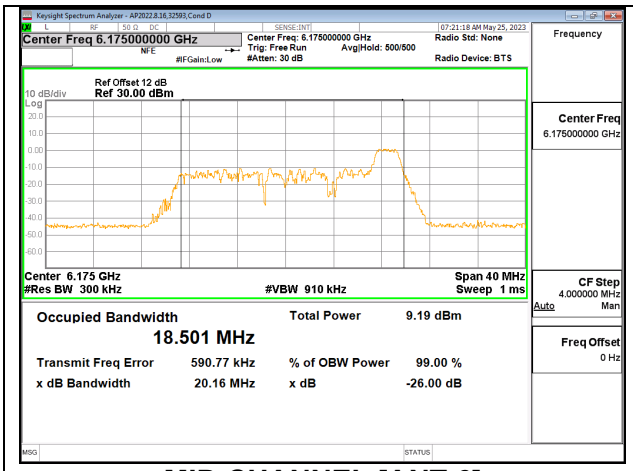
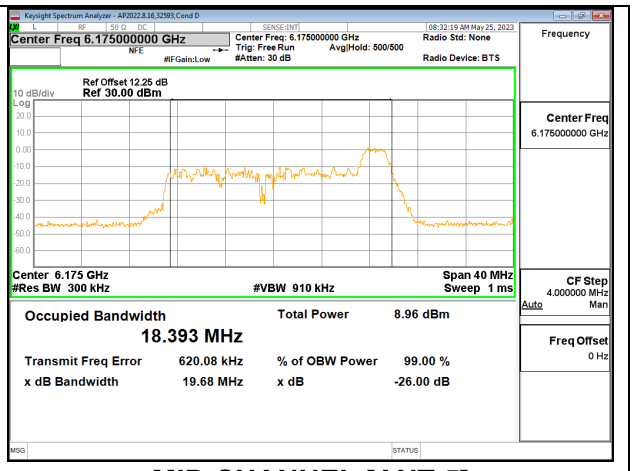
2TX Antenna 6 + Antenna 5 SDM MODE: 26 Tones, RU Index 8

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	5955	20.10	19.63	18.3930	18.3590
Mid	6175	20.16	19.68	18.5010	18.3930
High	6415	20.17	19.78	18.5020	18.3010



MID CHANNEL [ANT 6]



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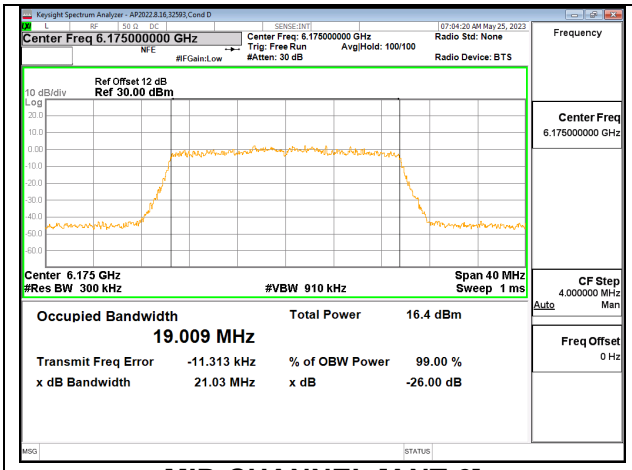
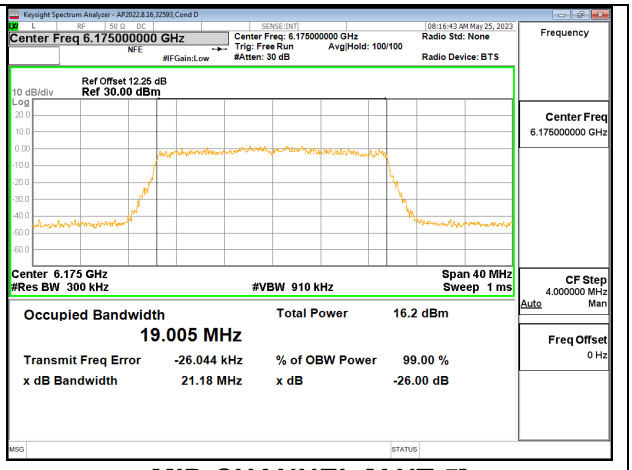
2TX Antenna 6 + Antenna 5 SDM MODE: SU Mode

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	5955	20.76	20.74	18.9720	18.9910
Mid	6175	21.03	21.18	19.0090	19.0050
High	6415	20.93	20.95	18.9380	18.9500



MID CHANNEL [ANT 6]



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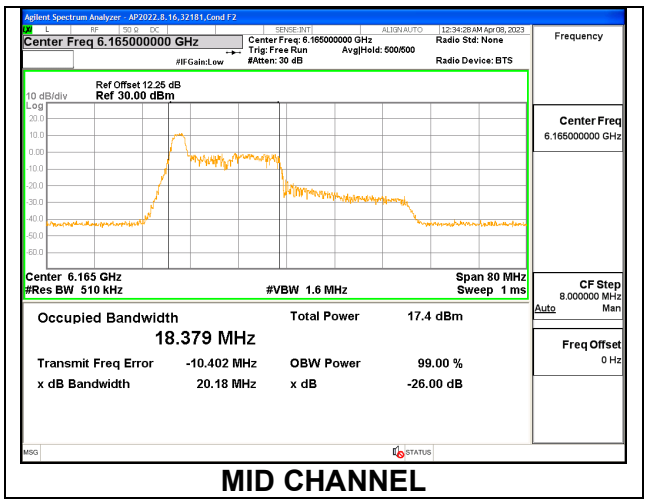
9.2.2. 802.11ax HE40 MODE IN THE UNII-5 BAND

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

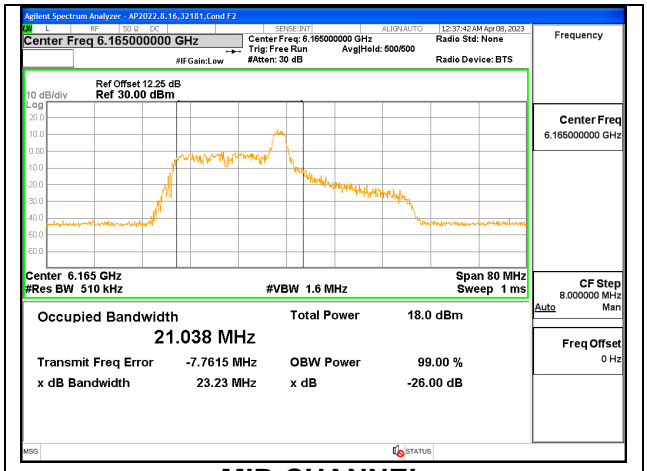
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5965	20.44	18.2750
Mid	6165	20.18	18.3790
High	6405	20.40	18.4210



MID CHANNEL

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

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5965	23.13	21.1580
Mid	6165	23.23	21.0380
High	6405	23.91	21.6540



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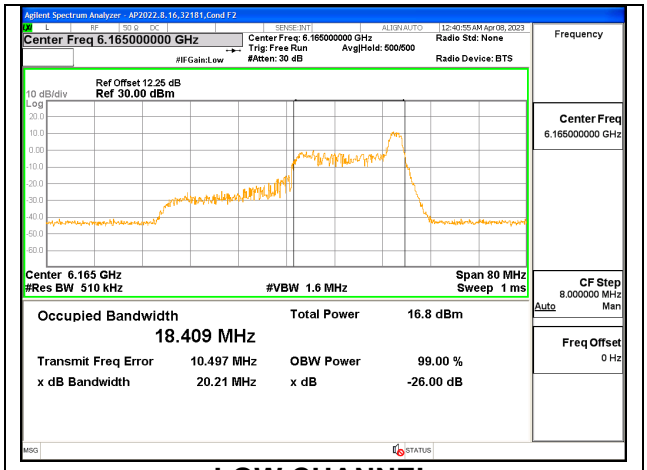
1TX Antenna 6 MODE: 26 Tones, RU Index 17

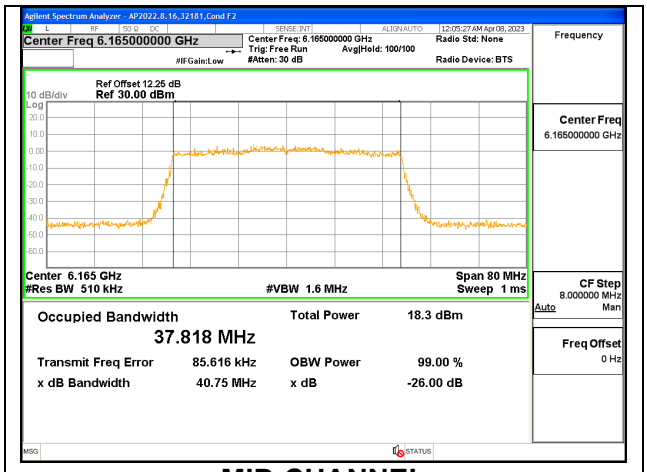
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5965	20.25	18.5630
Mid	6165	20.21	18.4090
High	6405	20.71	18.4970



LOW CHANNEL

1TX Antenna 6 MODE: SU Mode

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5965	40.76	37.8060
Mid	6165	40.75	37.8180
High	6405	40.61	37.7470



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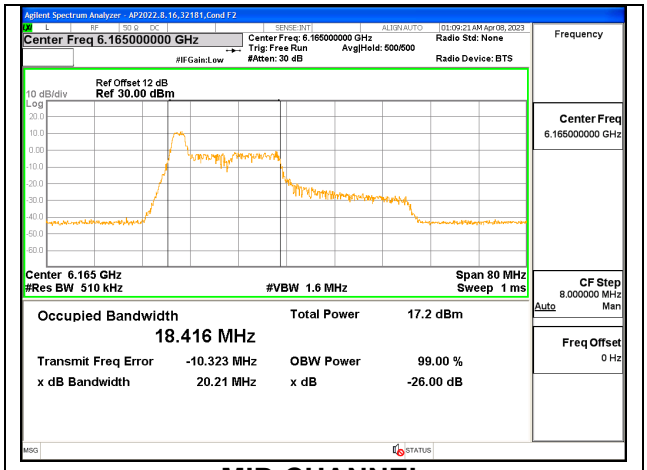
1TX Antenna 5 MODE: 26 Tones, RU Index 0

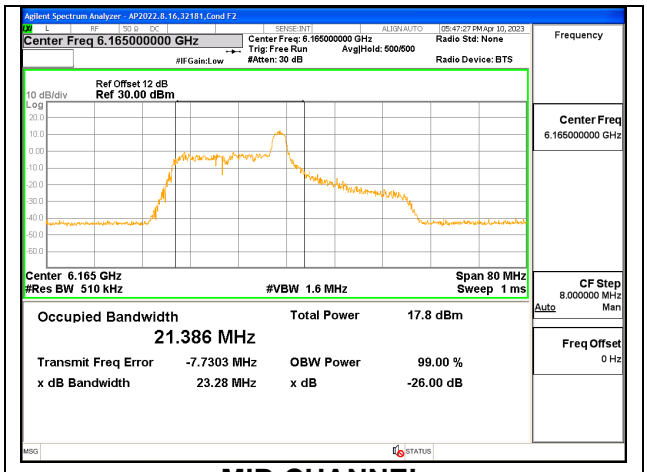
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5965	19.65	18.2660
Mid	6165	20.21	18.4160
High	6405	19.79	18.3960



MID CHANNEL

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

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5965	23.37	21.2170
Mid	6165	23.28	21.3860
High	6405	23.11	21.3090



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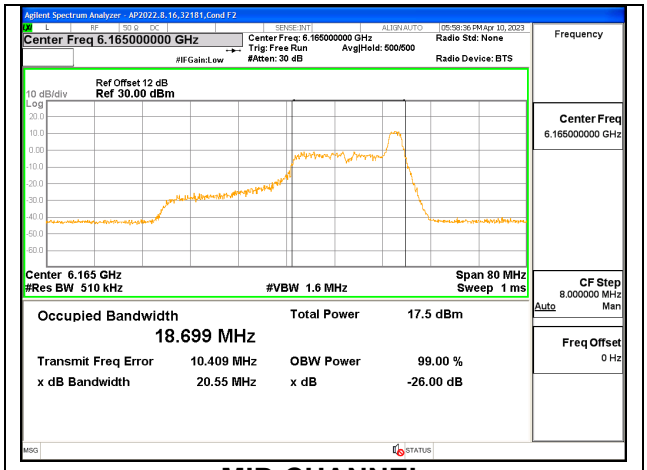
1TX Antenna 5 MODE: 26 Tones, RU Index 17

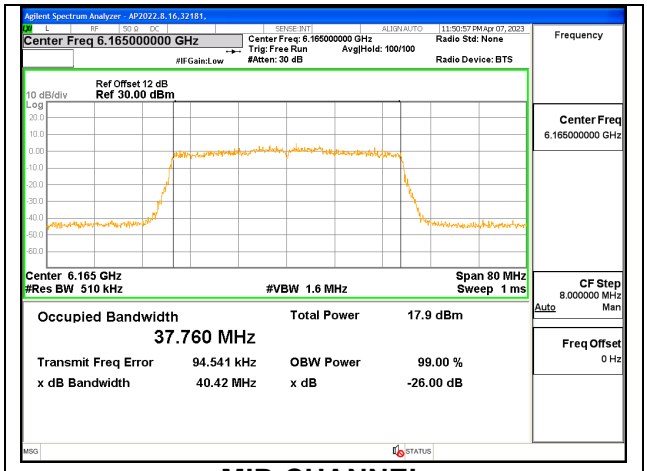
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5965	20.31	18.7470
Mid	6165	20.55	18.6990
High	6405	20.16	18.4950



MID CHANNEL

1TX Antenna 5 MODE: SU Mode

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5965	40.53	37.8400
Mid	6165	40.42	37.7600
High	6405	40.80	37.8330



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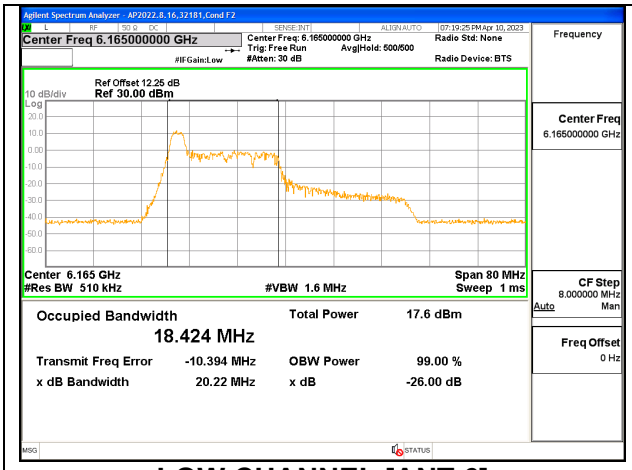
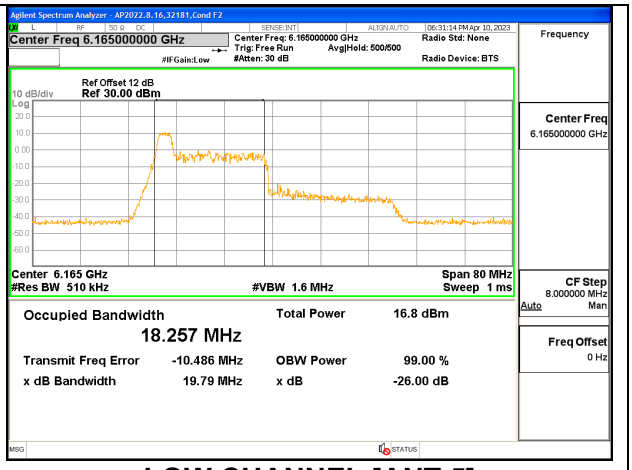
2TX Antenna 6 + Antenna 5 CDD MODE: 26 Tones, RU Index 0

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	5965	20.07	19.94	18.3350	18.2250
Mid	6165	20.22	19.79	18.4240	18.2570
High	6405	19.83	19.57	18.3080	18.2010



LOW CHANNEL [ANT 6]



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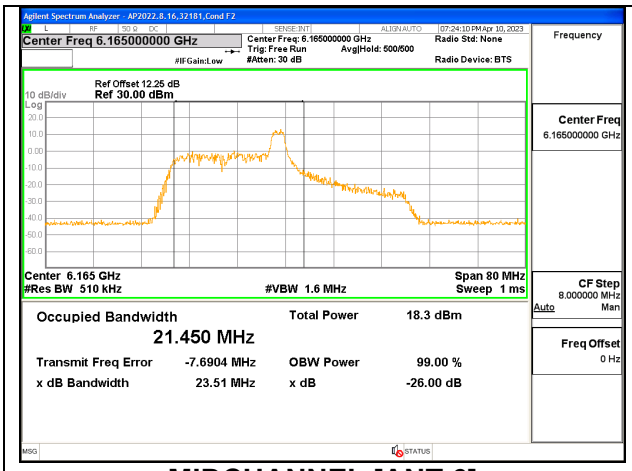
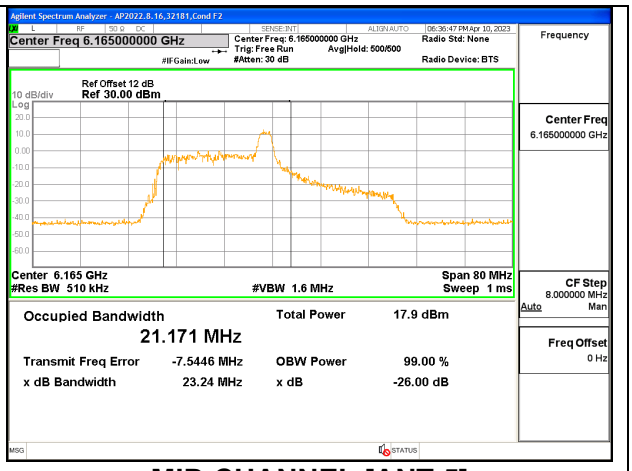
2TX Antenna 6 + Antenna 5 CDD MODE: 26 Tones, RU Index 8

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	5965	22.46	23.71	21.3160	21.1340
Mid	6165	23.51	23.24	21.4500	21.1710
High	6405	23.07	22.52	21.2180	21.0050



MIDCHANNEL [ANT 6]



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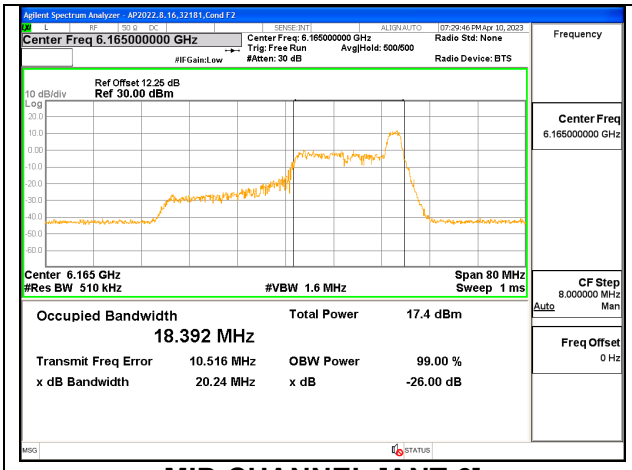
2TX Antenna 6 + Antenna 5 CDD MODE: 26 Tones, RU Index 17

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	5965	20.67	20.06	18.6260	18.4510
Mid	6165	20.24	20.26	18.3920	18.3930
High	6405	20.43	19.74	18.6270	18.2900



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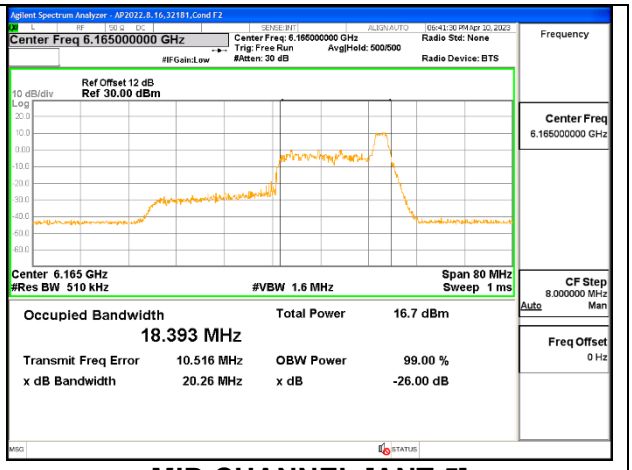

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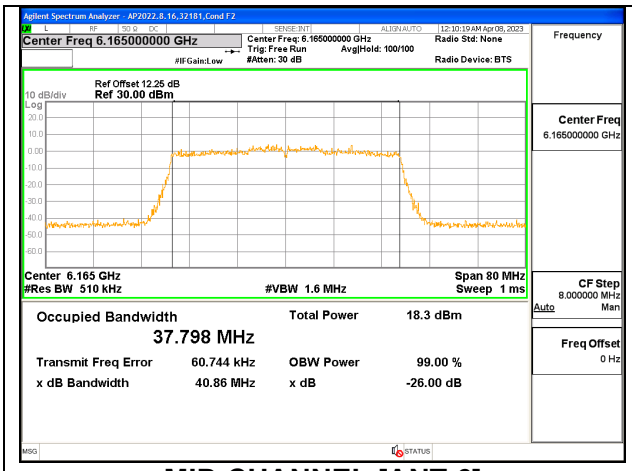
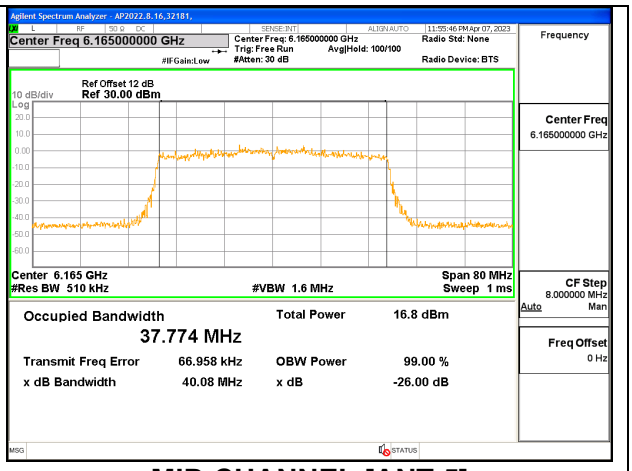
2TX Antenna 6 + Antenna 5 CDD MODE: SU Mode

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	5965	41.01	40.76	37.7780	37.8970
Mid	6165	40.86	40.08	37.7980	37.7740
High	6405	40.87	40.28	37.7820	37.7700



MID CHANNEL [ANT 6]



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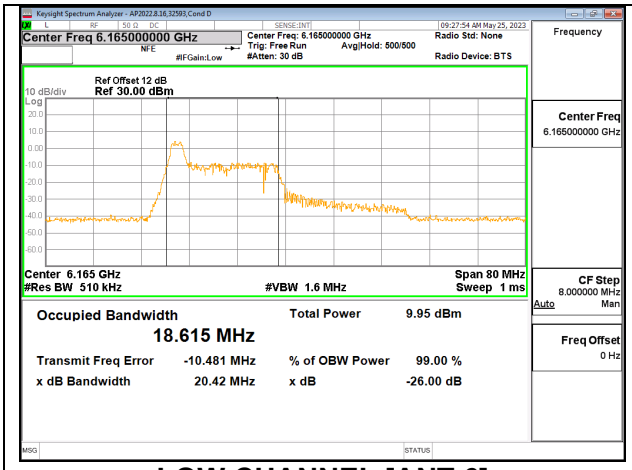
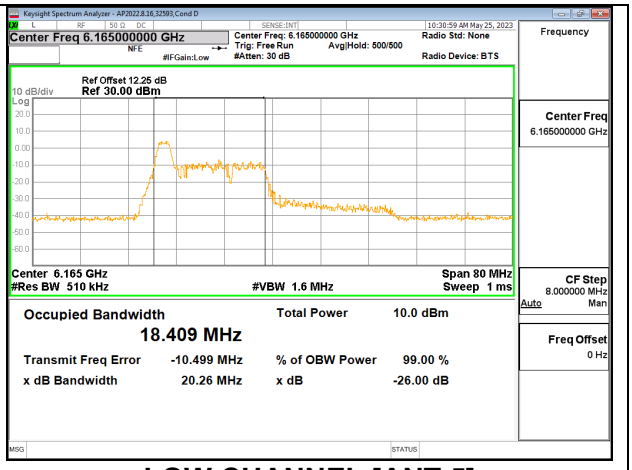
2TX Antenna 6 + Antenna 5 SDM MODE: 26 Tones, RU Index 0

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	5965	19.21	19.99	18.1420	18.5170
Mid	6165	20.42	20.26	18.6150	18.4090
High	6405	20.04	19.74	18.5930	17.8650



LOW CHANNEL [ANT 6]



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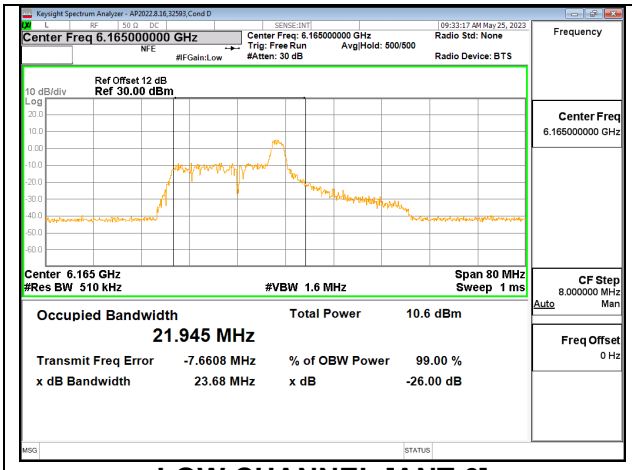
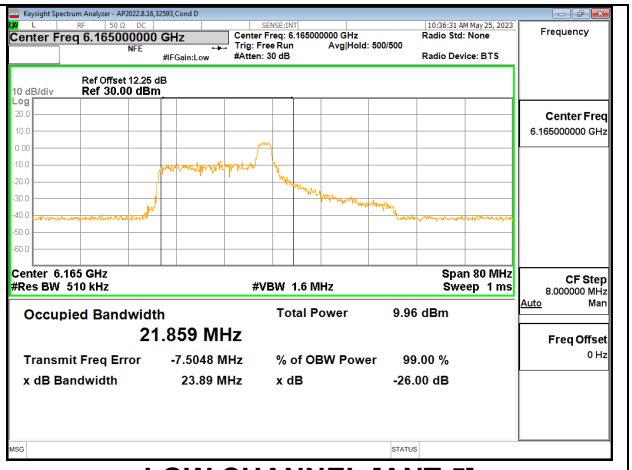
2TX Antenna 6 + Antenna 5 SDM MODE: 26 Tones, RU Index 8

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	5965	25.20	23.18	22.4050	21.9340
Mid	6165	23.68	23.89	21.9450	21.8590
High	6405	24.41	23.56	22.2310	22.1290



LOW CHANNEL [ANT 6]



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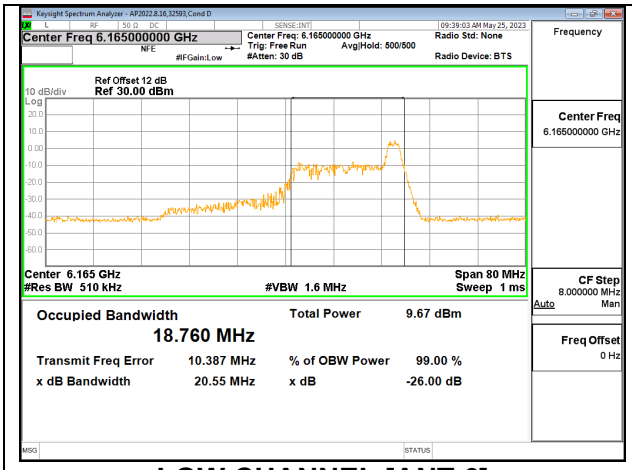
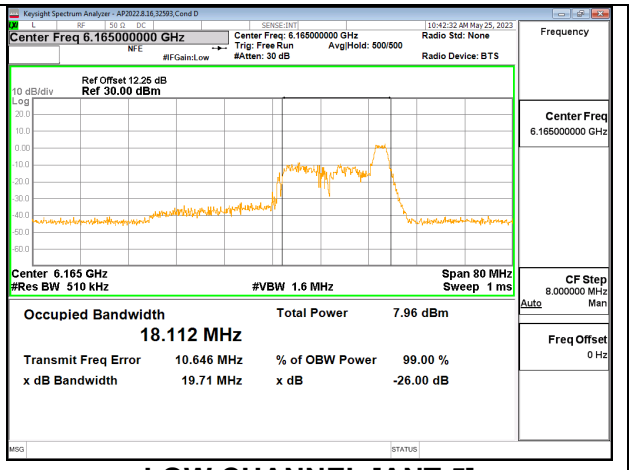
2TX Antenna 6 + Antenna 5 SDM MODE: 26 Tones, RU Index 17

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	5965	20.39	19.58	18.8720	18.3820
Mid	6165	20.55	19.71	18.7600	18.1120
High	6405	20.65	19.84	18.4570	18.4070



LOW CHANNEL [ANT 6]



LOW CHANNEL [ANT 5]

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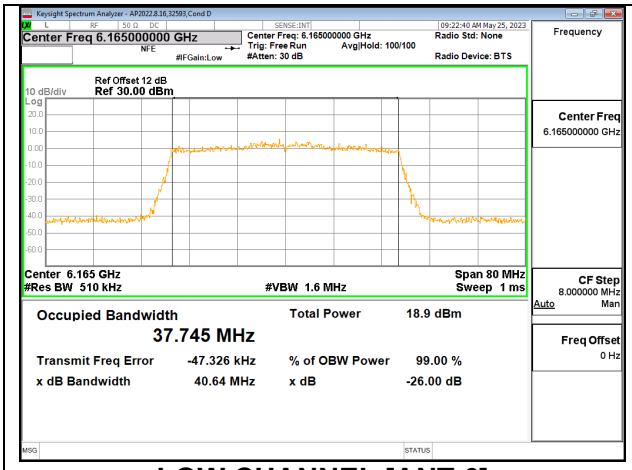
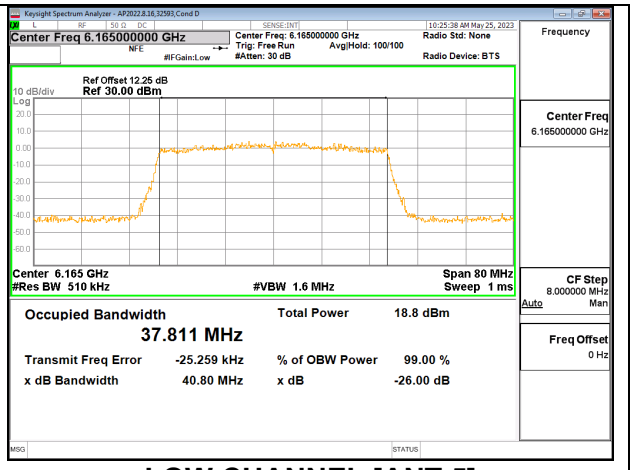
2TX Antenna 6 + Antenna 5 SDM MODE: SU Mode

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	5965	41.06	40.73	37.8290	37.8650
Mid	6165	40.64	40.80	37.7450	37.8110
High	6405	40.77	40.87	37.7930	37.7710



LOW CHANNEL [ANT 6]



LOW CHANNEL [ANT 5]

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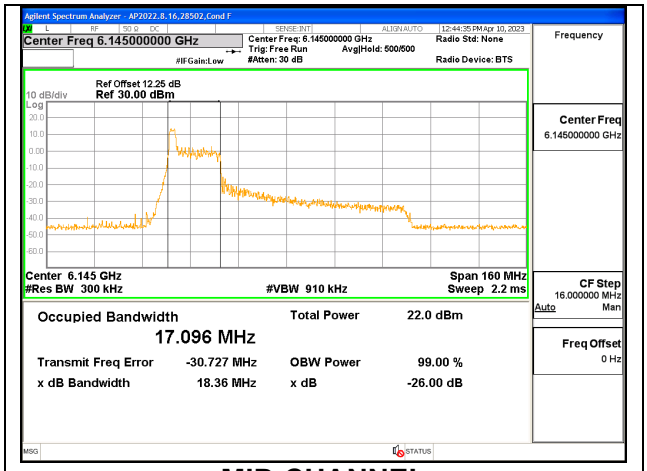
9.2.3. 802.11ax HE80 MODE IN THE UNII-5 BAND

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

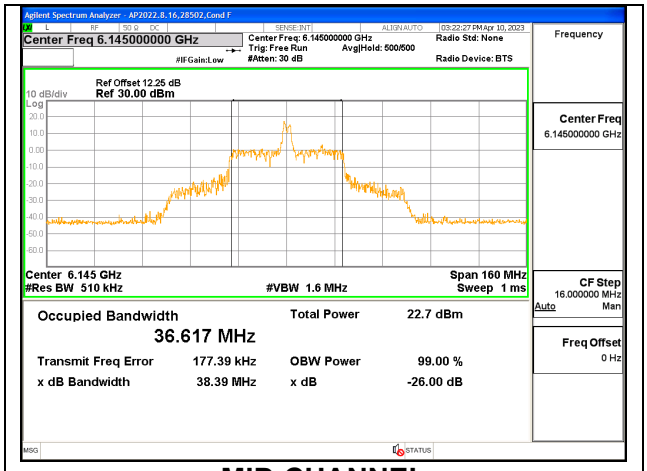
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5985	19.33	18.0130
Mid	6145	18.36	17.0960
High	6385	19.39	17.9930



MID CHANNEL

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

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5985	38.29	36.5190
Mid	6145	38.39	36.6170
High	6385	38.23	36.4890



MID CHANNEL

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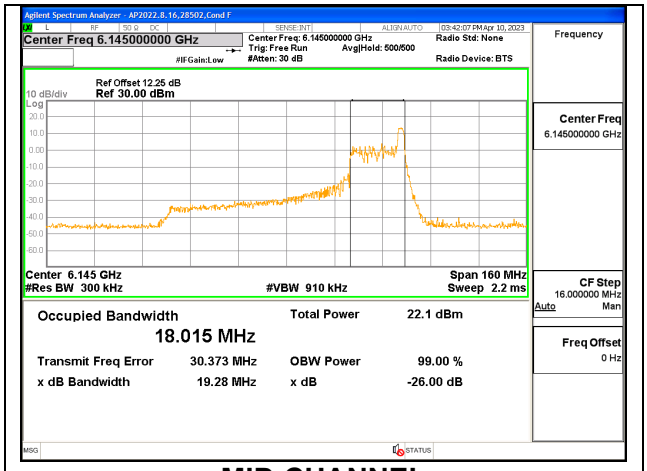
1TX Antenna 6 MODE: 26 Tones, RU Index 36

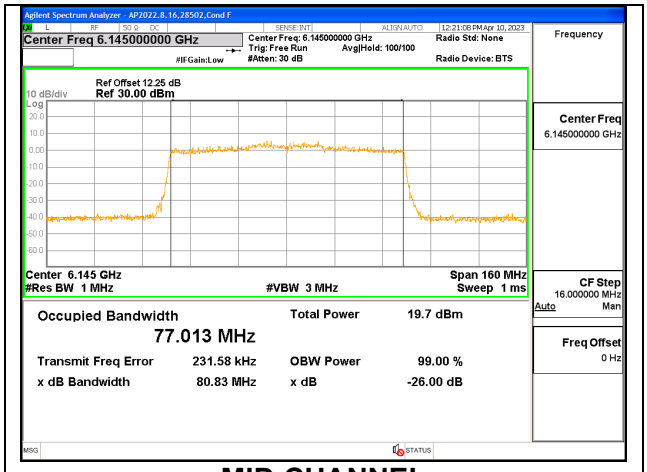
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5985	20.00	18.1220
Mid	6145	19.28	18.0150
High	6385	19.44	18.0110



MID CHANNEL

1TX Antenna 6 MODE: SU Mode

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5985	80.66	76.8470
Mid	6145	80.83	77.0130
High	6385	80.61	76.8300



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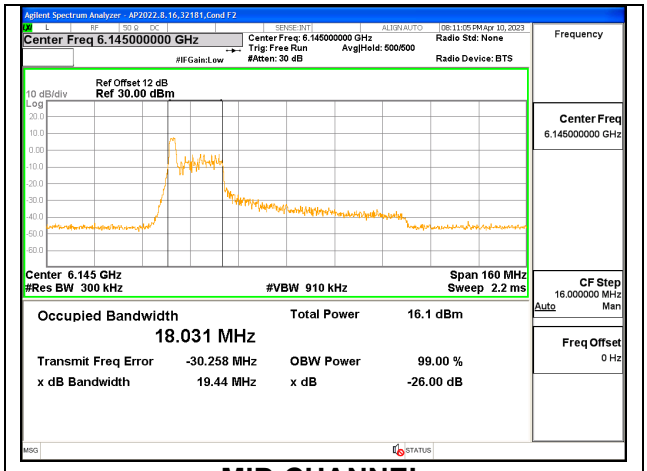
1TX Antenna 5 MODE: 26 Tones, RU Index 0

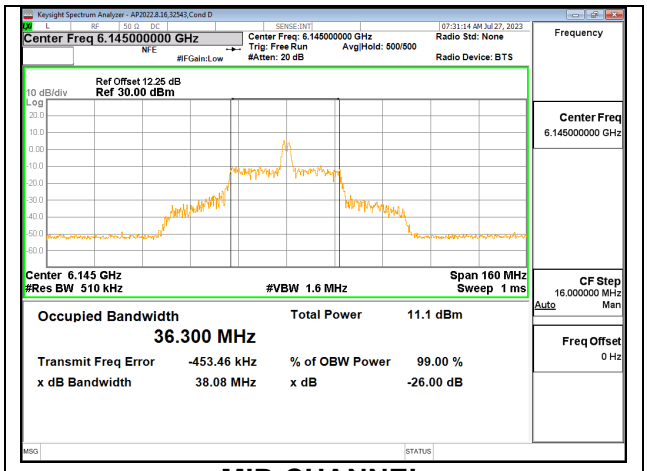
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5985	19.31	17.9670
Mid	6145	19.44	18.0310
High	6385	19.50	18.0180



MID CHANNEL

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

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5985	39.05	36.6220
Mid	6145	38.08	36.3000
High	6385	38.65	36.5590



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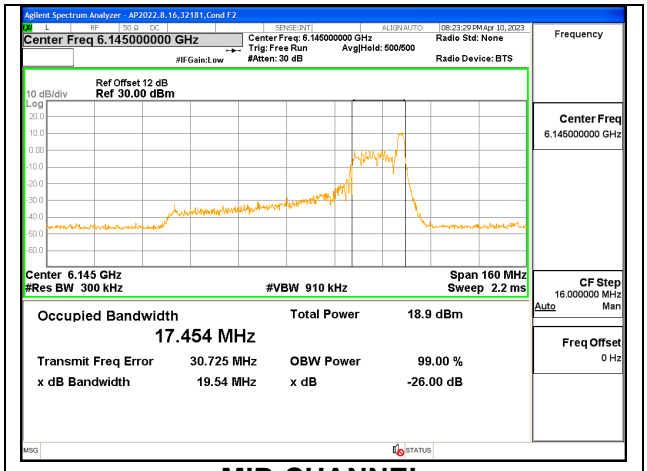
1TX Antenna 5 MODE: 26 Tones, RU Index 36

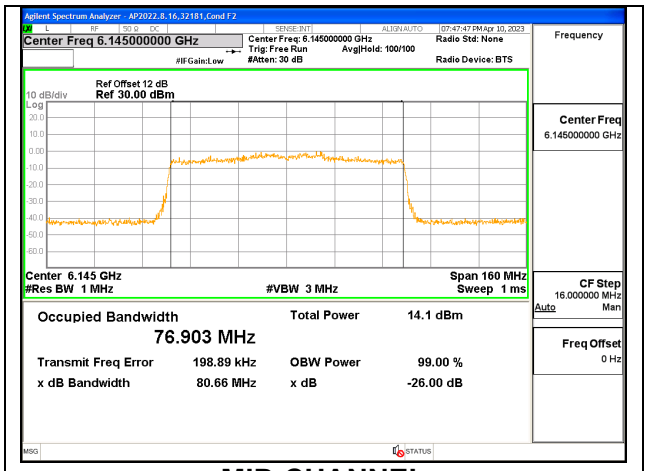
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5985	19.16	18.1070
Mid	6145	19.54	17.4540
High	6385	19.46	18.0690



MID CHANNEL

1TX Antenna 5 MODE: SU Mode

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5985	80.79	76.7970
Mid	6145	80.66	76.9030
High	6385	80.58	77.0760



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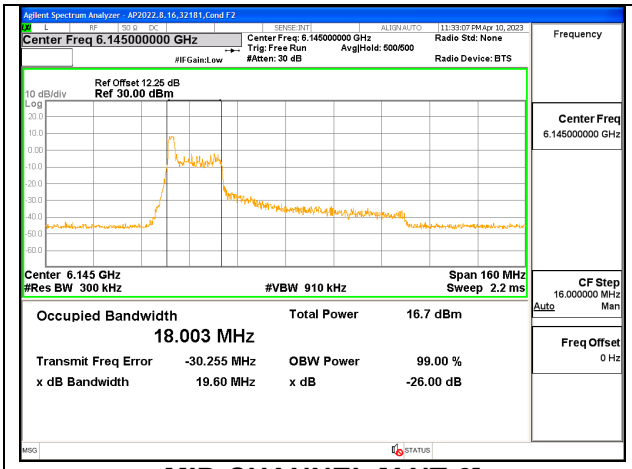
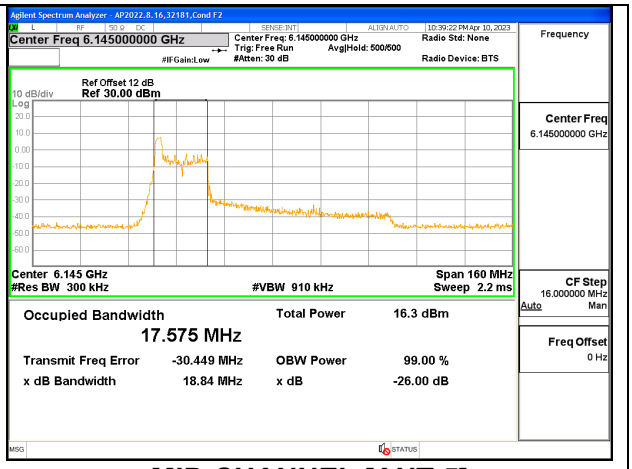
2TX Antenna 6 + Antenna 5 CDD MODE: 26 Tones, RU Index 0

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	5985	19.04	19.41	17.5870	17.9050
Mid	6145	19.60	18.84	18.0030	17.5750
High	6385	19.52	18.72	17.9620	17.5050



MID CHANNEL [ANT 6]



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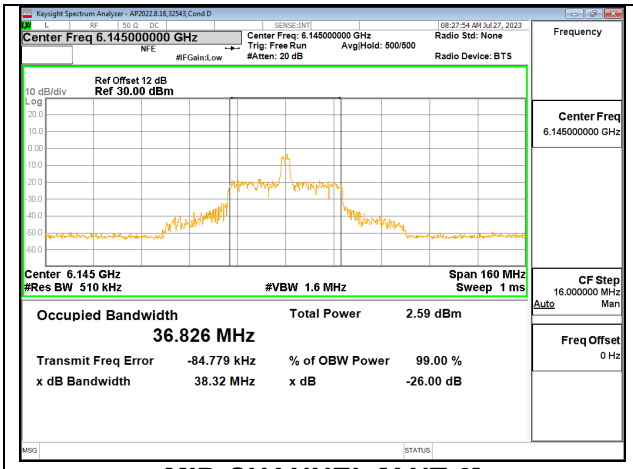
2TX Antenna 6 + Antenna 5 CDD MODE: 26 Tones, RU Index 18

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)
Low	5985	38.31	38.26	36.5490	36.1830
Mid	6145	38.32	37.05	36.8260	35.2190
High	6385	37.41	38.20	35.8660	36.1480



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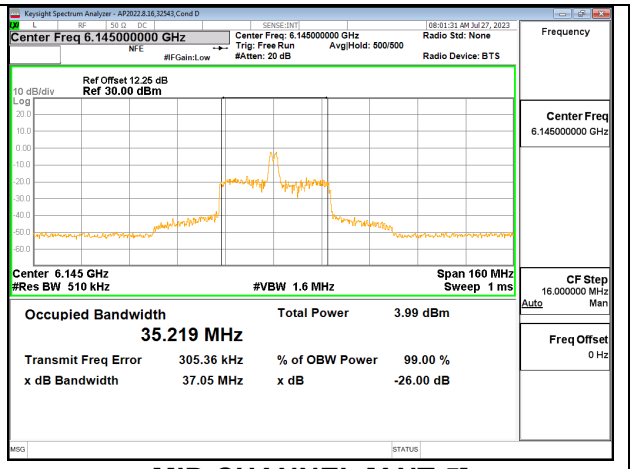

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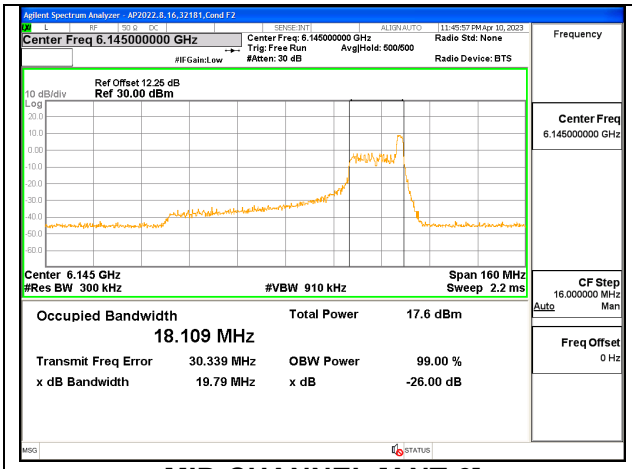
2TX Antenna 6 + Antenna 5 CDD MODE: 26 Tones, RU Index 36

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)
Low	5985	19.65	19.34	18.1010	17.9540
Mid	6145	19.79	19.34	18.1090	18.0000
High	6385	19.53	19.13	18.1800	17.9840



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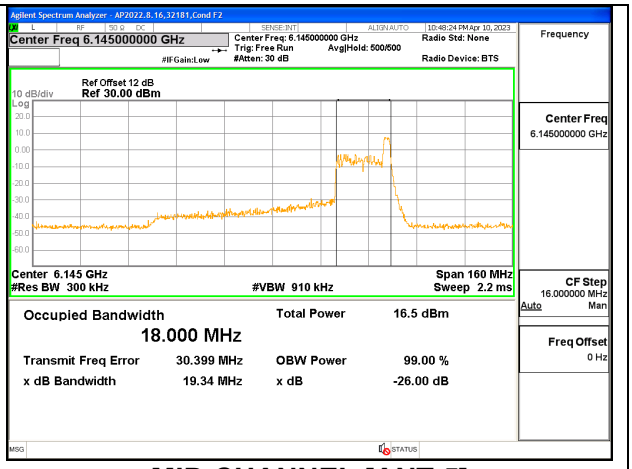

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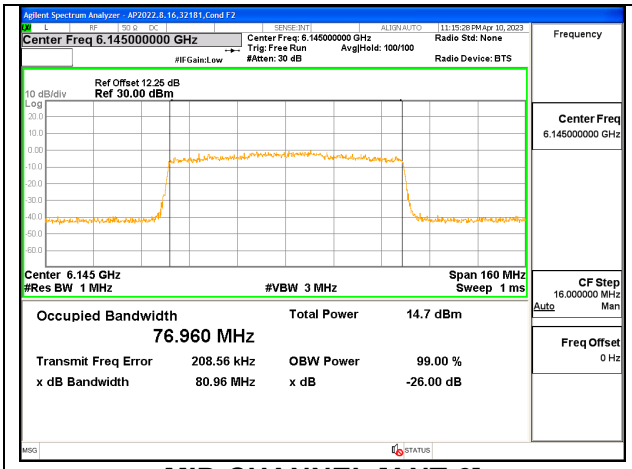
2TX Antenna 6 + Antenna 5 CDD MODE: SU Mode

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	5985	80.31	80.39	77.1830	77.0810
Mid	6145	80.96	80.54	76.9600	76.7520
High	6385	80.70	80.38	77.0630	76.9220



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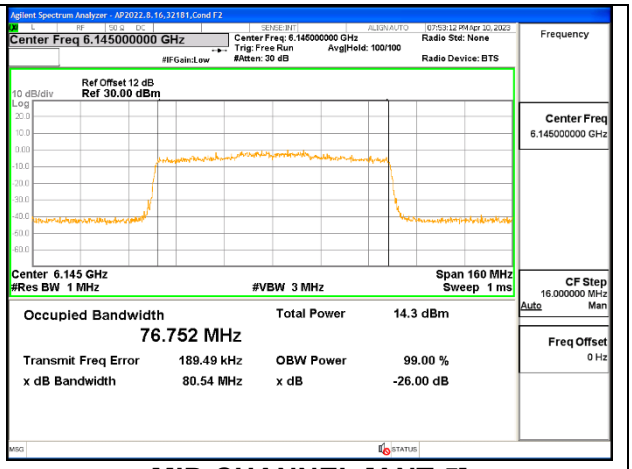

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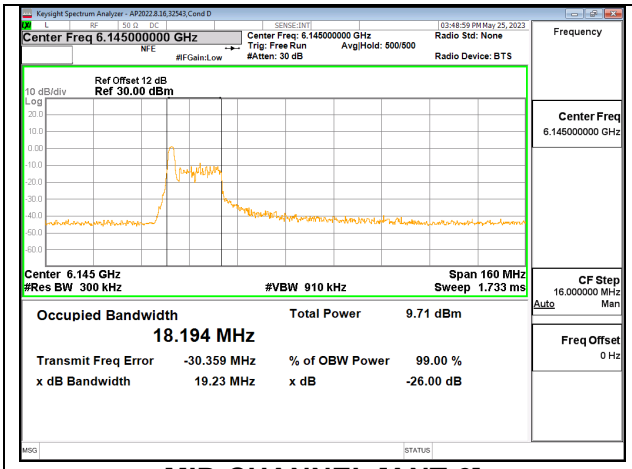
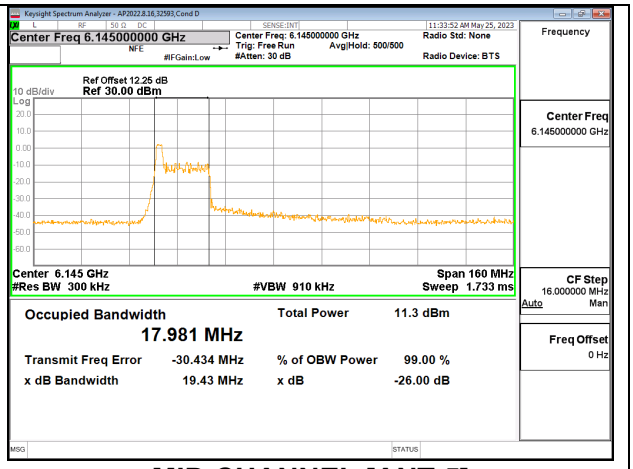
2TX Antenna 6 + Antenna 5 SDM MODE: 26 Tones, RU Index 0

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	5985	19.44	19.35	18.1200	18.0040
Mid	6145	19.23	19.43	18.1940	17.9810
High	6385	19.12	18.41	18.0490	17.1970



MID CHANNEL [ANT 6]



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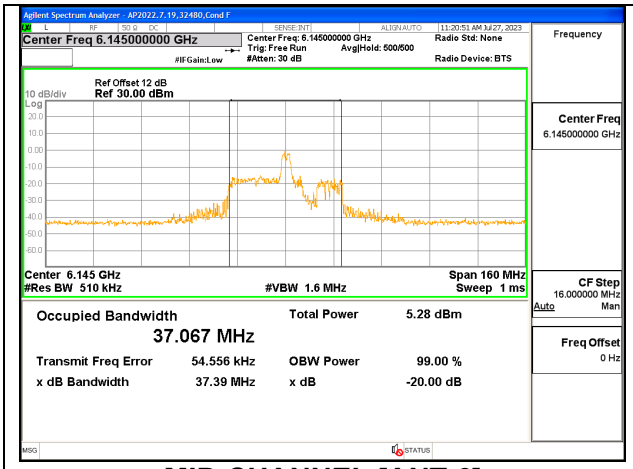
2TX Antenna 6 + Antenna 5 SDM MODE: 26 Tones, RU Index 18

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)
Low	5985	37.65	37.75	36.8320	36.7500
Mid	6145	37.39	37.22	37.0670	36.6940
High	6385	37.07	37.31	36.8310	36.8840



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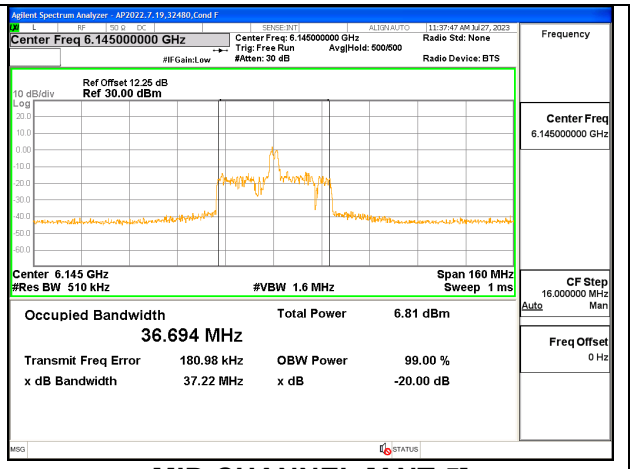

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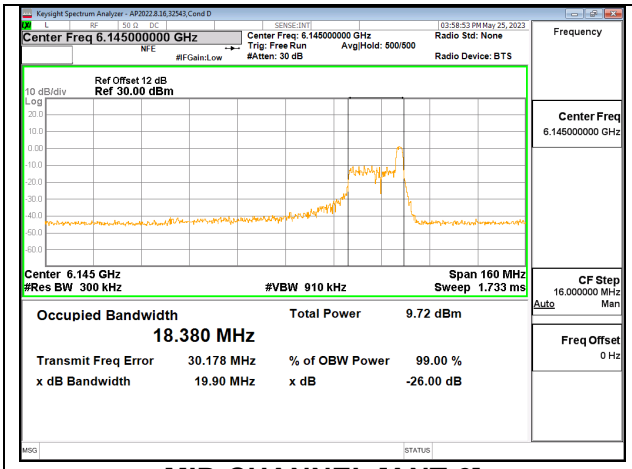
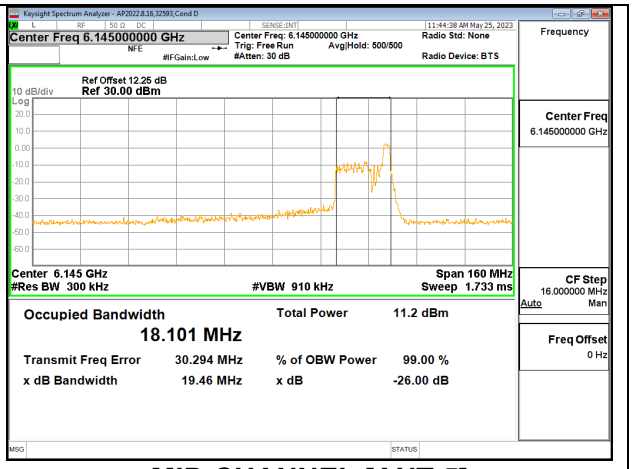
2TX Antenna 6 + Antenna 5 SDM MODE: 26 Tones, RU Index 36

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)
Low	5985	19.94	19.37	18.5080	18.0050
Mid	6145	19.90	19.46	18.3800	18.1010
High	6385	19.56	18.21	18.3040	17.1680



MID CHANNEL [ANT 6]



MID CHANNEL [ANT 5]

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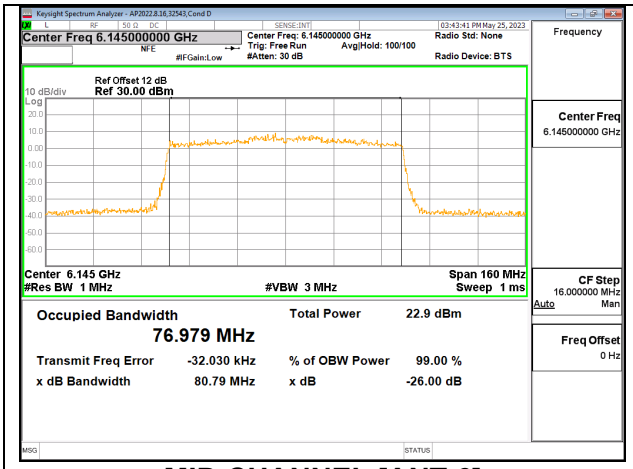
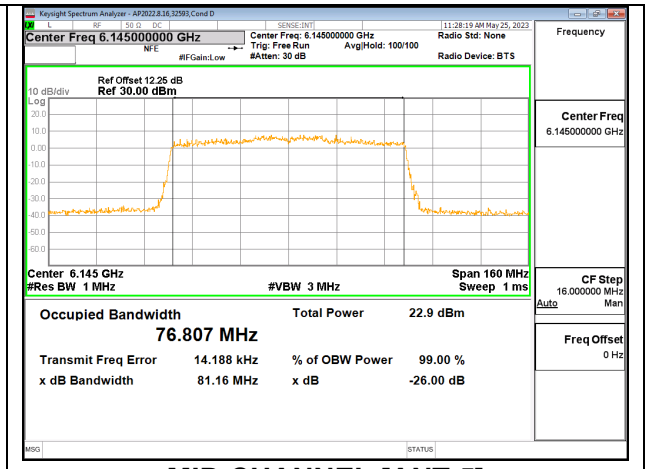
2TX Antenna 6 + Antenna 5 SDM MODE: SU Mode

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	5985	80.71	81.06	77.0240	76.9110
Mid	6145	80.79	81.16	76.9790	76.8070
High	6385	80.70	80.62	76.8790	76.9830



MID CHANNEL [ANT 6]



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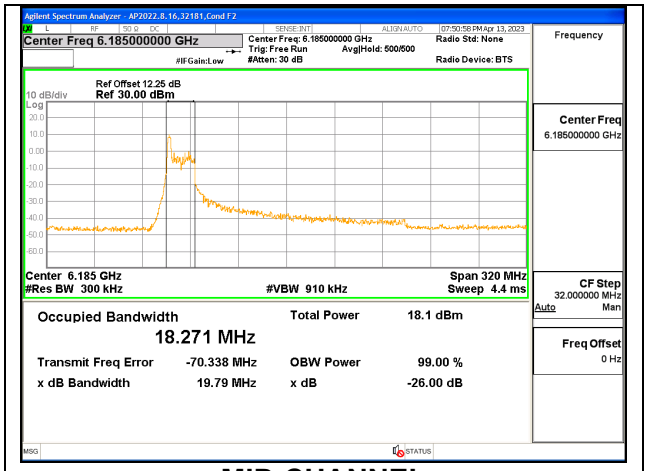
9.2.4. 802.11ax HE160 MODE IN THE UNII-5 BAND

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

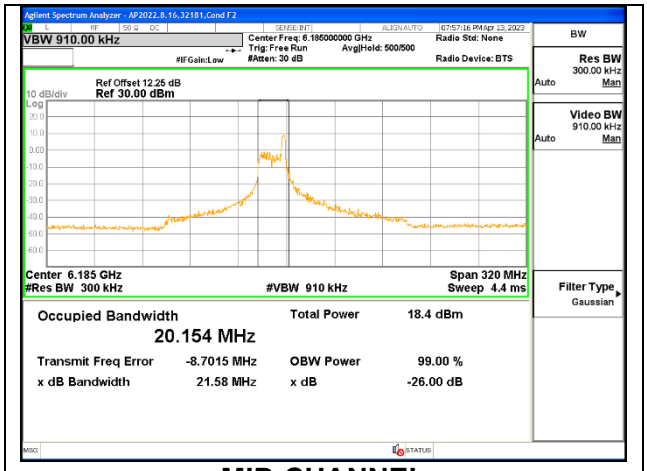
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	6025	20.06	18.2470
Mid	6185	19.79	18.2710
High	6345	20.12	18.3280



MID CHANNEL

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

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	6025	21.89	19.8820
Mid	6185	21.58	20.1540
High	6345	21.46	19.6210



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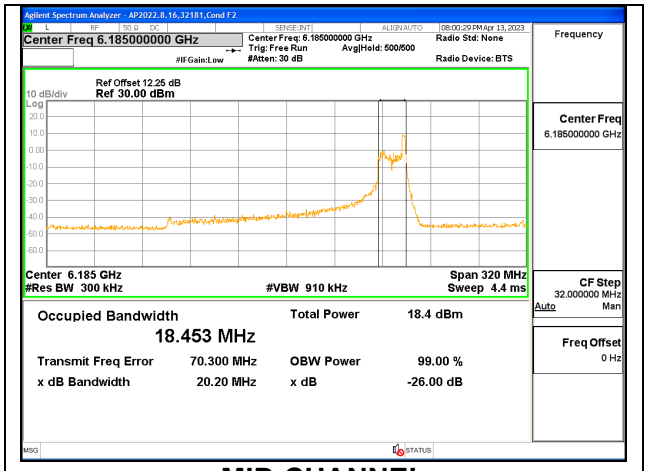
1TX Antenna 6 MODE: 26 Tones, RU Index S36

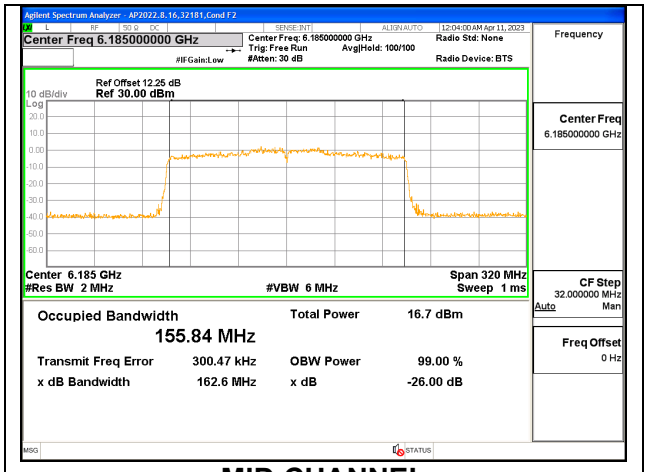
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	6025	20.58	18.4370
Mid	6185	20.20	18.4530
High	6345	20.37	18.4750



MID CHANNEL

1TX Antenna 6 MODE: SU Mode

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	6025	162.60	155.9300
Mid	6185	162.60	155.8400
High	6345	163.20	156.0200



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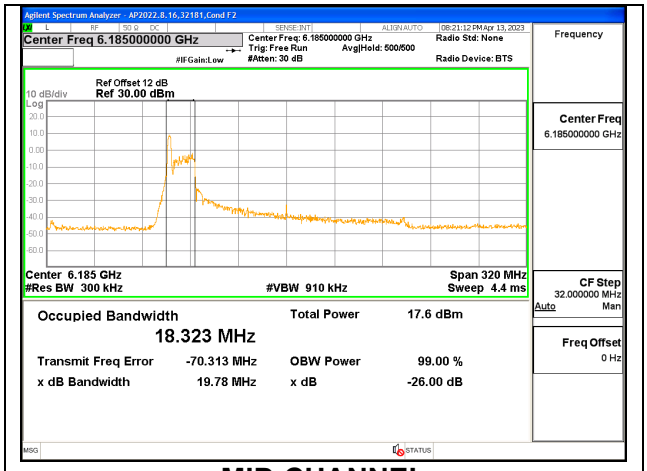
1TX Antenna 5 MODE: 26 Tones, RU Index 0

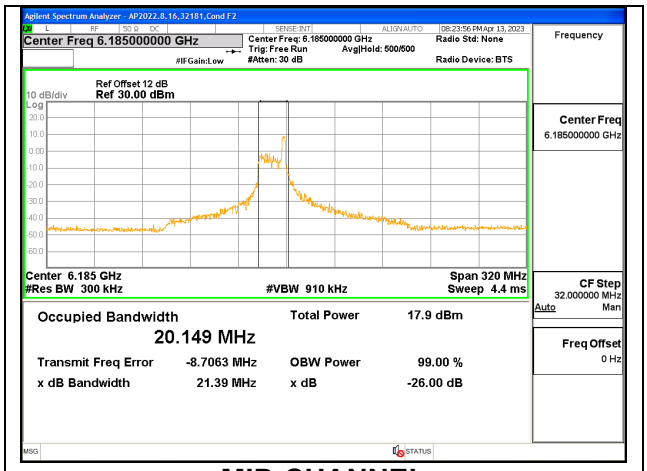
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	6025	20.14	18.3380
Mid	6185	19.78	18.3230
High	6345	19.84	18.2900



MID CHANNEL

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

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	6025	21.81	20.1590
Mid	6185	21.39	20.1490
High	6345	21.03	19.7840



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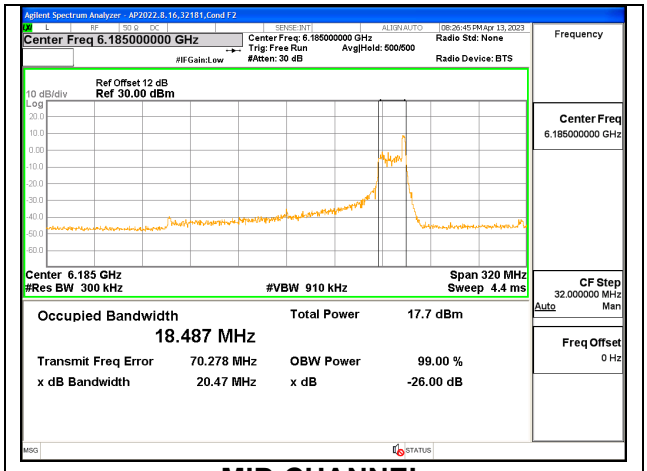
1TX Antenna 5 MODE: 26 Tones, RU Index S36

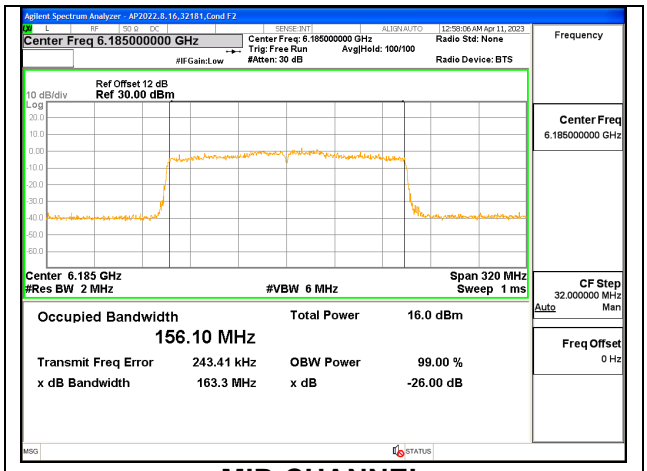
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	6025	20.18	18.3270
Mid	6185	20.47	18.4870
High	6345	20.24	18.5040



MID CHANNEL

1TX Antenna 5 MODE: SU Mode

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	6025	163.10	155.8600
Mid	6185	163.30	156.1000
High	6345	163.60	156.1200



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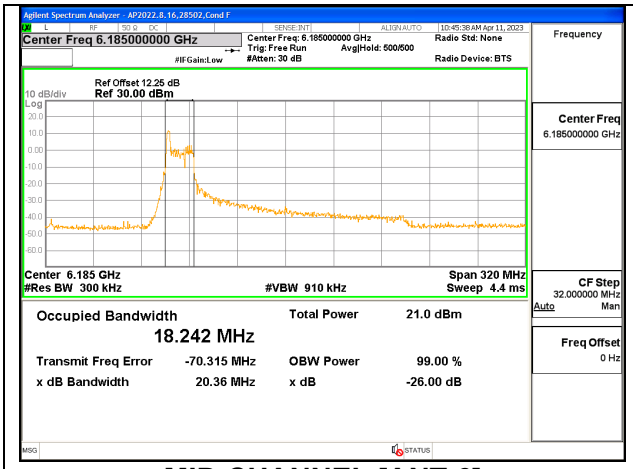
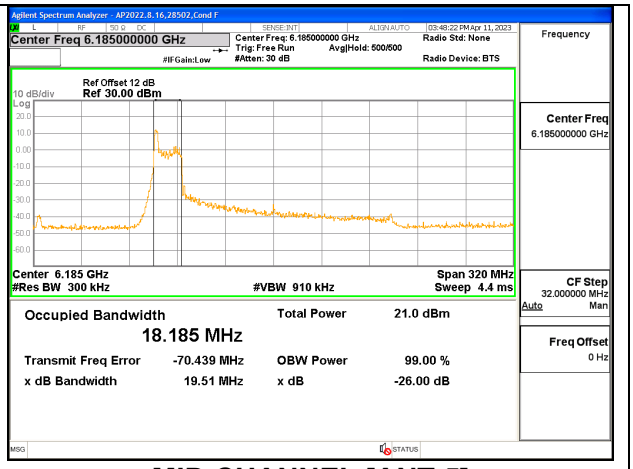
2TX Antenna 6 + Antenna 5 CDD MODE: 26 Tones, RU Index 0

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	6025	19.86	19.75	18.2370	18.1120
Mid	6185	20.36	19.51	18.2420	18.1850
High	6345	19.75	19.49	18.1120	18.0860



MID CHANNEL [ANT 6]



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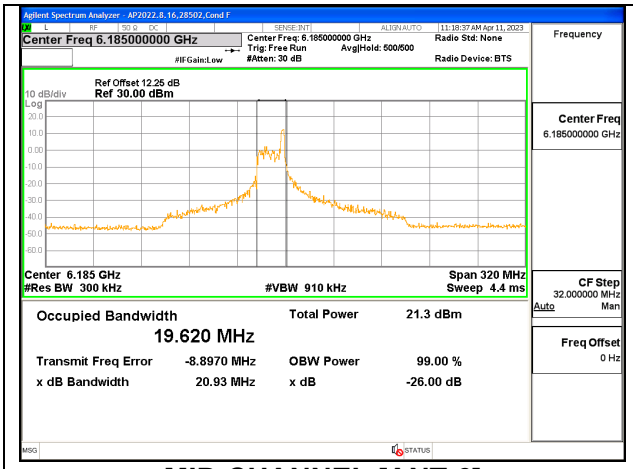
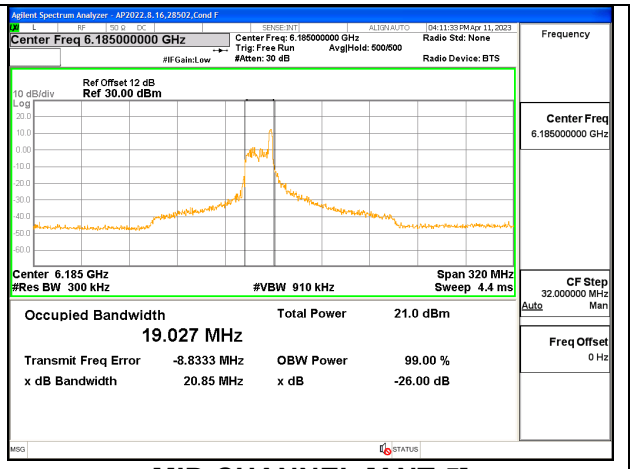
2TX Antenna 6 + Antenna 5 CDD MODE: 26 Tones, RU Index 36

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)
Low	6025	21.02	20.56	19.6400	19.2650
Mid	6185	20.93	20.85	19.6200	19.0270
High	6345	21.70	21.36	19.5260	19.5100



MID CHANNEL [ANT 6]



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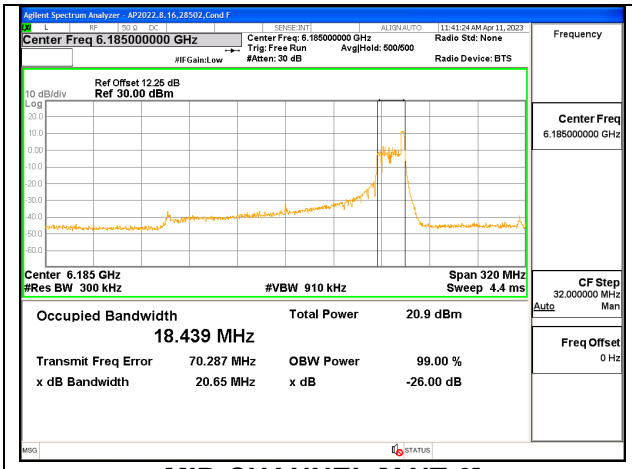
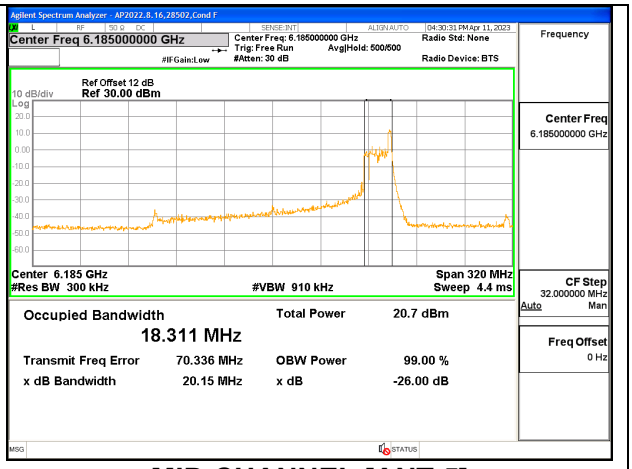
2TX Antenna 6 + Antenna 5 CDD MODE: 26 Tones, RU Index S36

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	6025	20.47	20.01	18.5330	18.3200
Mid	6185	20.65	20.15	18.4390	18.3110
High	6345	19.40	19.86	17.5550	18.2170



MID CHANNEL [ANT 6]



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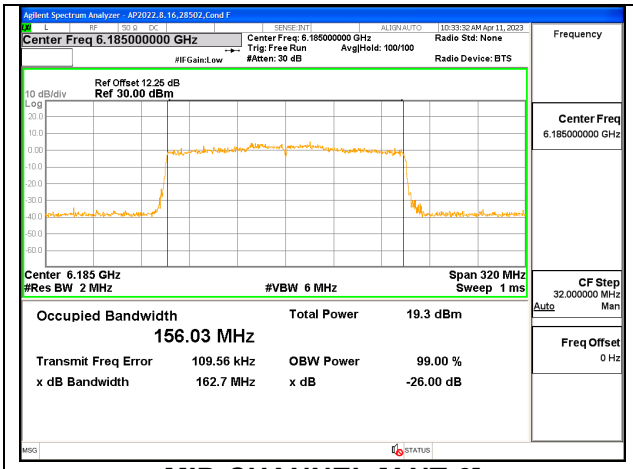
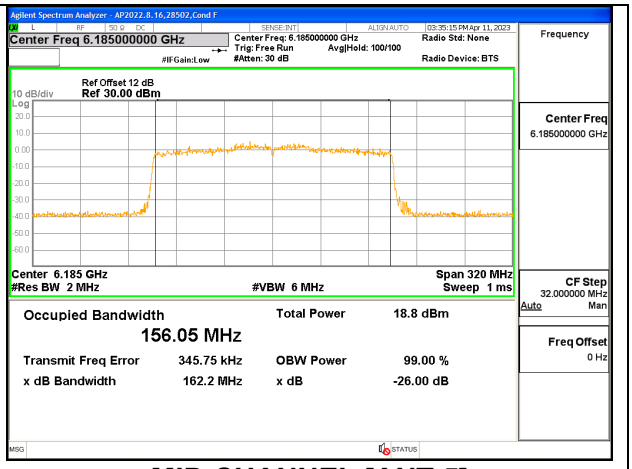
2TX Antenna 6 + Antenna 5 CDD MODE: SU Mode

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	6025	163.30	162.10	155.9900	156.1200
Mid	6185	162.70	162.20	156.0300	156.0500
High	6345	163.00	162.10	155.9900	156.1000



MID CHANNEL [ANT 6]



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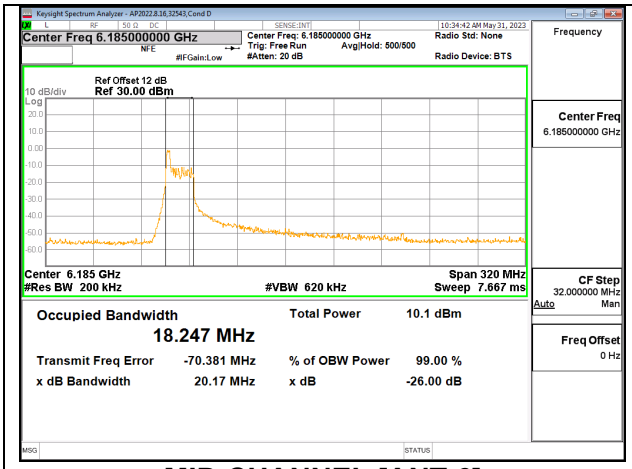
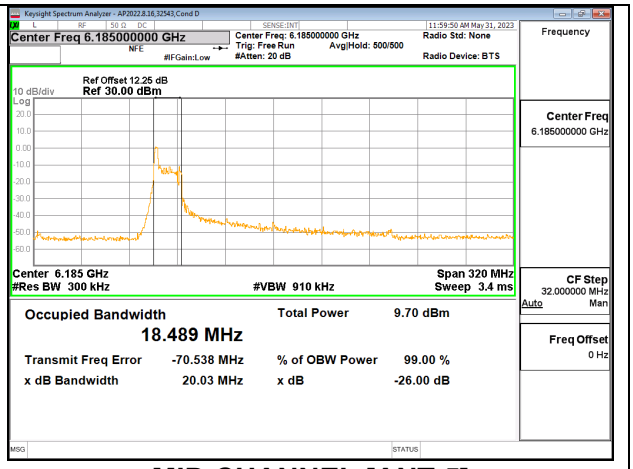
2TX Antenna 6 + Antenna 5 SDM MODE: 26 Tones, RU Index 0

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	6025	20.67	19.90	18.7990	18.1990
Mid	6185	20.17	20.03	18.2470	18.4890
High	6345	19.68	20.14	17.9170	18.4380



MID CHANNEL [ANT 6]



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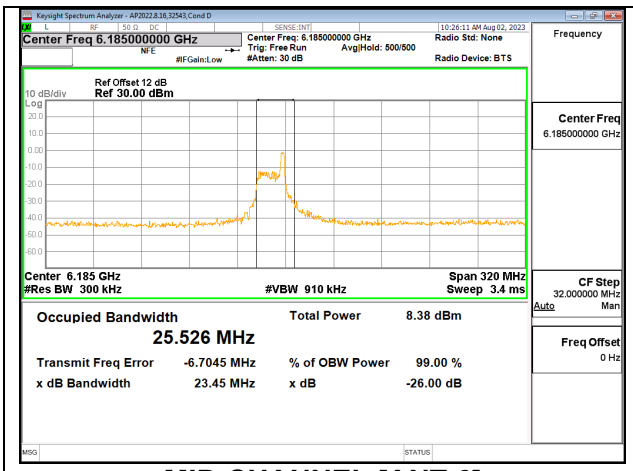
2TX Antenna 6 + Antenna 5 SDM MODE: 26 Tones, RU Index 36

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)
Low	6025	22.51	21.59	22.1770	20.4050
Mid	6185	23.45	22.05	25.5260	20.6420
High	6345	20.92	21.59	19.4390	20.1890



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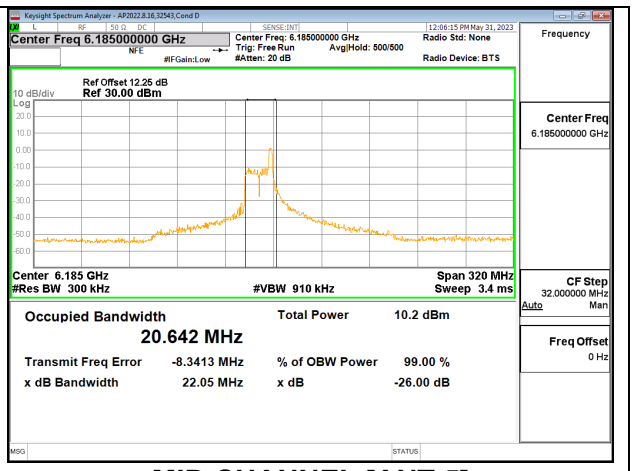

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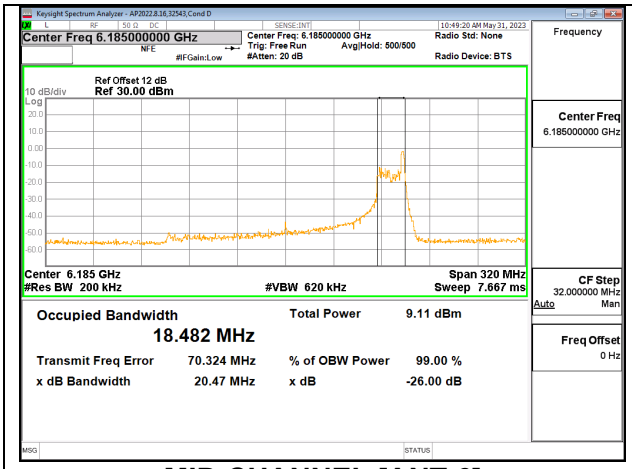
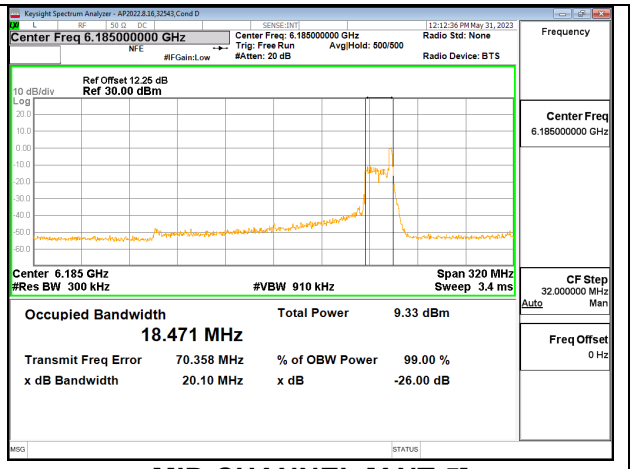
2TX Antenna 6 + Antenna 5 SDM MODE: 26 Tones, RU Index S36

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	6025	20.44	20.07	18.6790	18.3490
Mid	6185	20.47	20.10	18.4820	18.4710
High	6345	20.13	20.52	18.4170	18.4420



MID CHANNEL [ANT 6]



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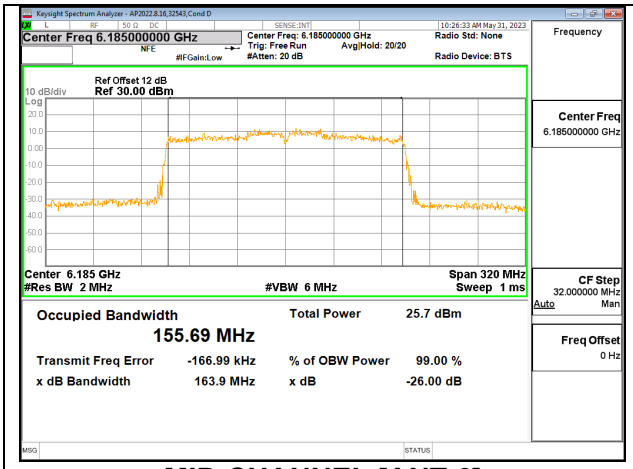
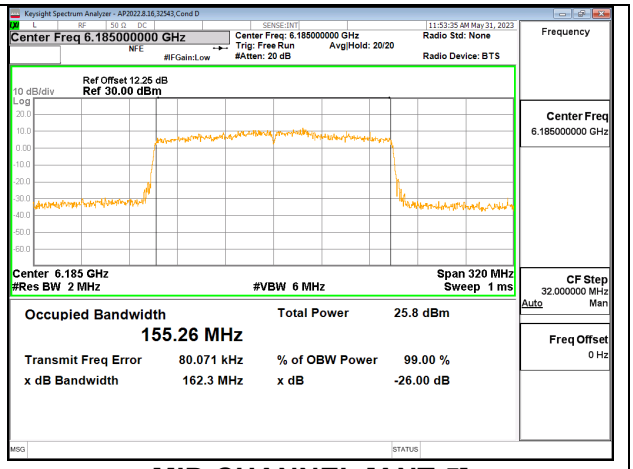
2TX Antenna 6 + Antenna 5 SDM MODE: SU Mode

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	6025	164.20	164.00	155.3400	155.3200
Mid	6185	163.90	162.30	155.6900	155.2600
High	6345	162.80	163.30	155.5200	155.6800



MID CHANNEL [ANT 6]



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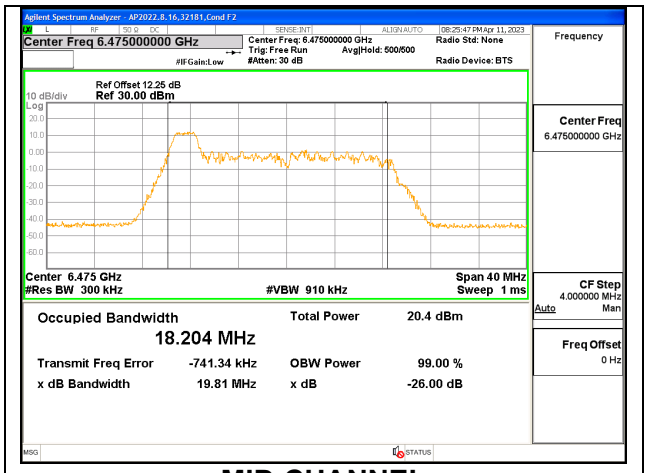
9.2.5. 802.11ax HE20 MODE IN THE UNII-6 BAND

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

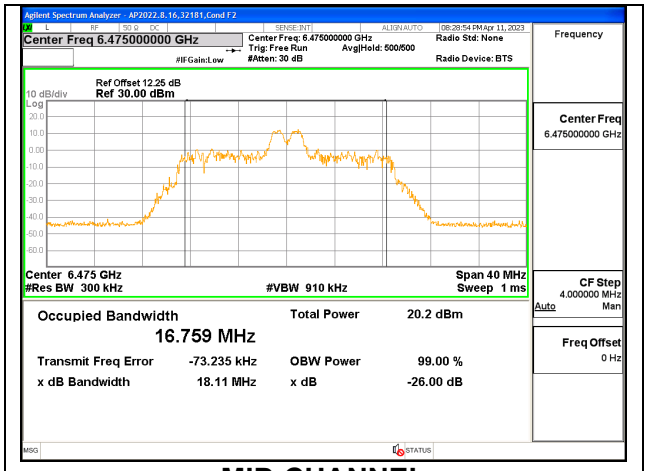
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	6435	19.58	18.2040
Mid	6475	19.81	18.2040
High	6515	19.67	18.2990



MID CHANNEL

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

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	6435	18.45	16.9490
Mid	6475	18.11	16.7590
High	6515	18.21	16.9990



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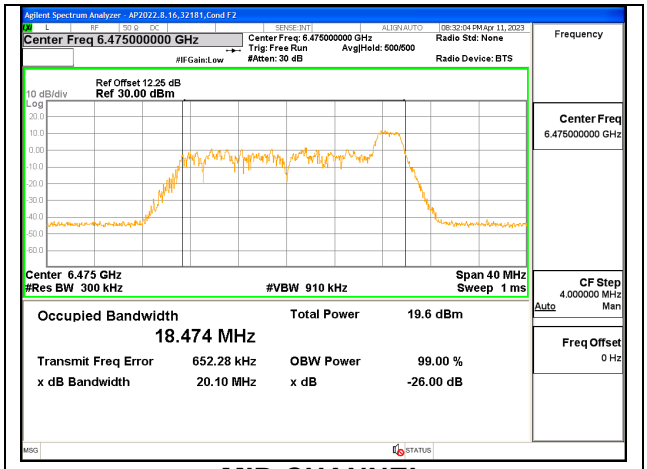
1TX Antenna 6 MODE: 26 Tones, RU Index 8

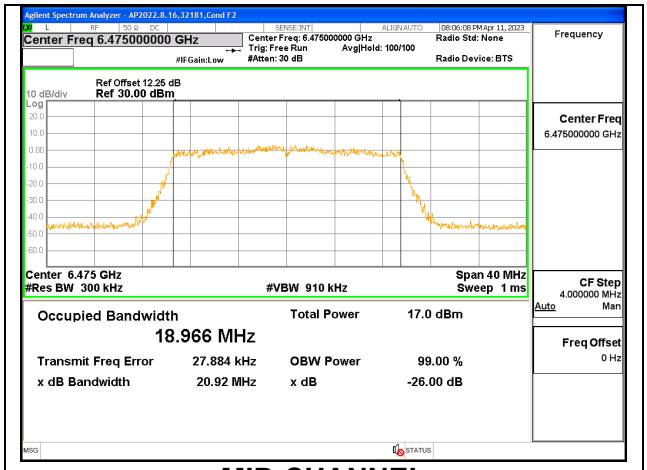
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	6435	20.07	18.4830
Mid	6475	20.10	18.4740
High	6515	19.73	18.4880



MID CHANNEL

1TX Antenna 6 MODE: SU Mode

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	6435	20.96	18.9710
Mid	6475	20.92	18.9660
High	6515	20.73	19.0090



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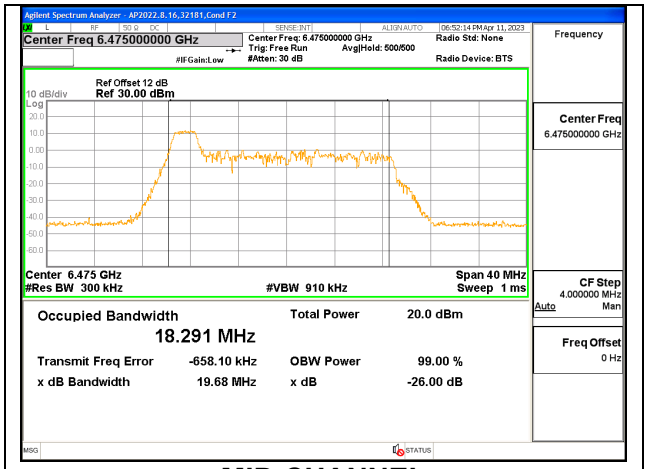
1TX Antenna 5 MODE: 26 Tones, RU Index 0

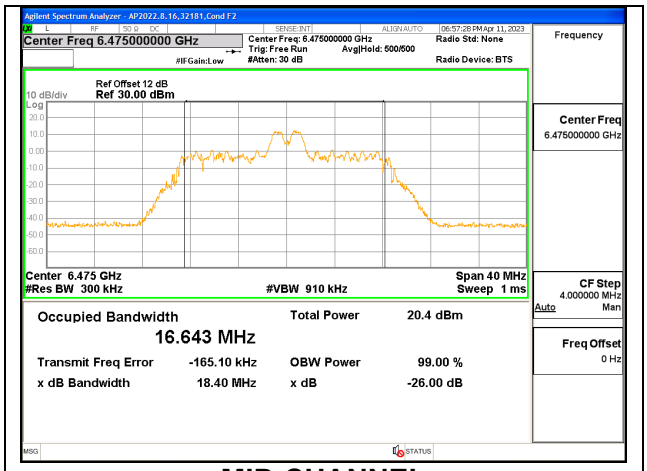
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	6435	19.67	18.3070
Mid	6475	19.68	18.2910
High	6515	19.86	18.2940



MID CHANNEL

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

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	6435	18.42	16.7950
Mid	6475	18.40	16.6430
High	6515	18.06	16.7680



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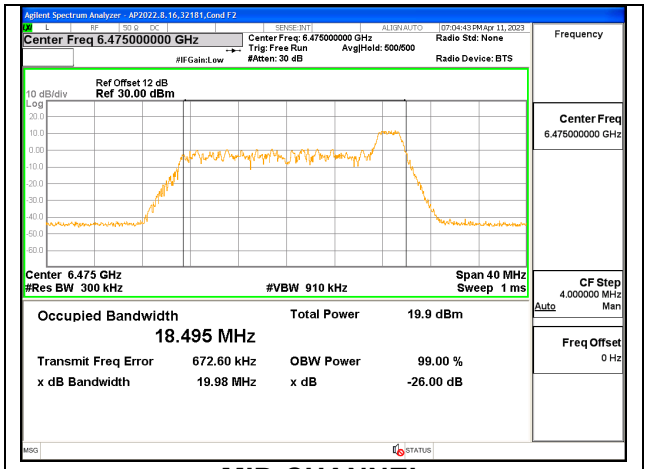
1TX Antenna 5 MODE: 26 Tones, RU Index 8

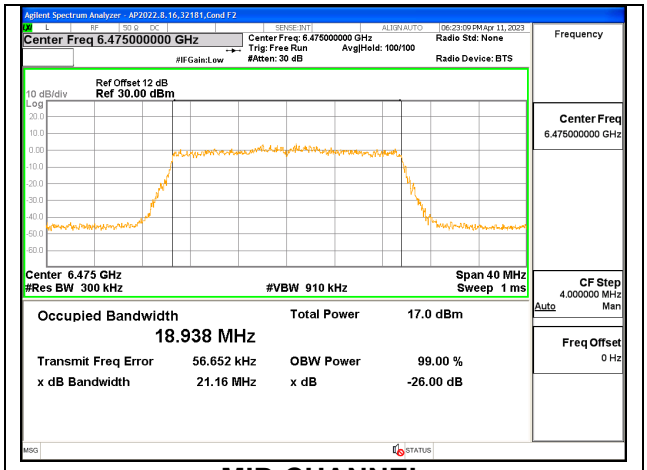
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	6435	20.19	18.3640
Mid	6475	19.98	18.4950
High	6515	19.84	18.2760



MID CHANNEL

1TX Antenna 5 MODE: SU Mode

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	6435	20.85	18.9740
Mid	6475	21.16	18.9380
High	6515	20.80	18.9610



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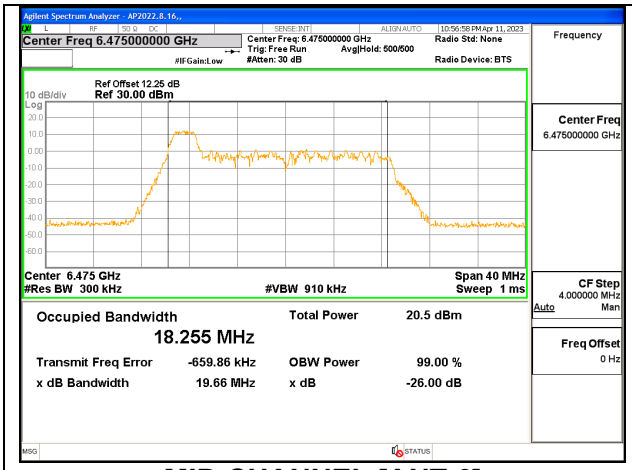
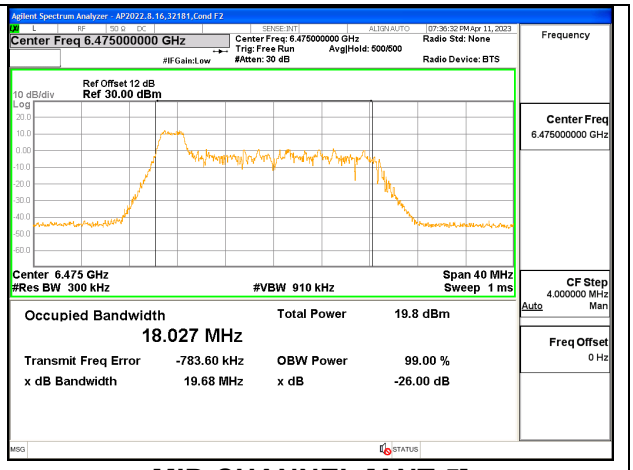
2TX Antenna 6 + Antenna 5 CDD MODE: 26 Tones, RU Index 0

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	6435	19.66	19.72	18.2750	18.1490
Mid	6475	19.66	19.68	18.2550	18.0270
High	6515	19.60	18.60	18.2610	18.2830



MID CHANNEL [ANT 6]



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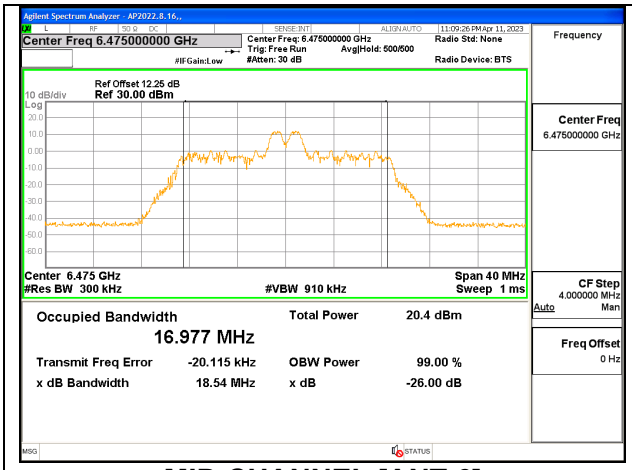
2TX Antenna 6 + Antenna 5 CDD MODE: 26 Tones, RU Index 4

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	6435	18.29	18.16	16.9980	16.6900
Mid	6475	18.54	17.64	16.9770	16.1470
High	6515	18.56	18.22	16.9090	16.6780



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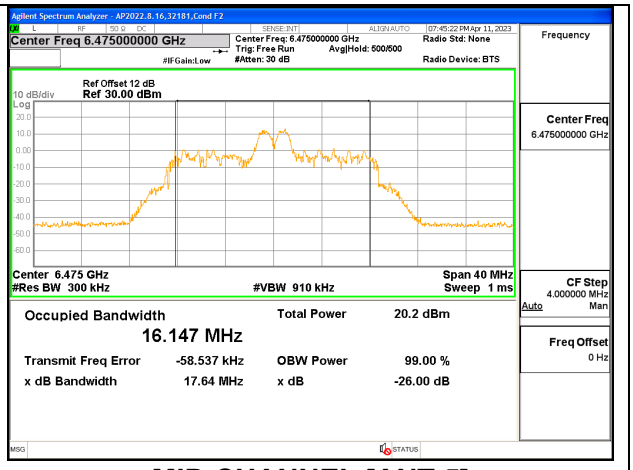

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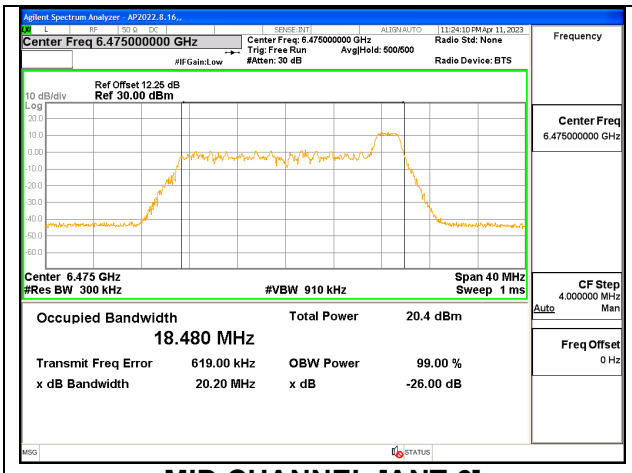
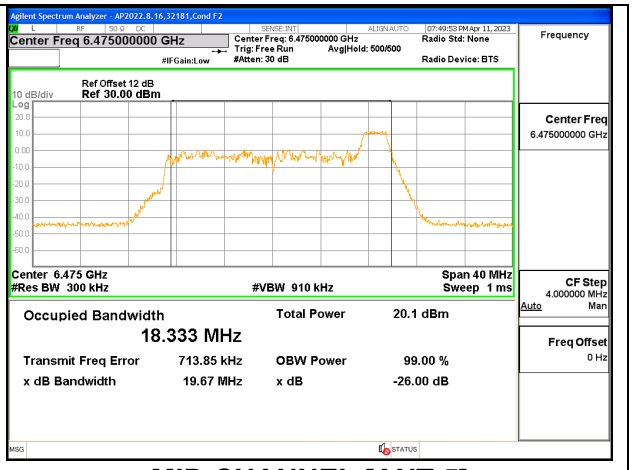
2TX Antenna 6 + Antenna 5 CDD MODE: 26 Tones, RU Index 8

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	6435	20.05	19.61	18.4840	18.1460
Mid	6475	20.20	19.67	18.4800	18.3330
High	6515	19.96	19.68	18.4090	18.2220



MID CHANNEL [ANT 6]



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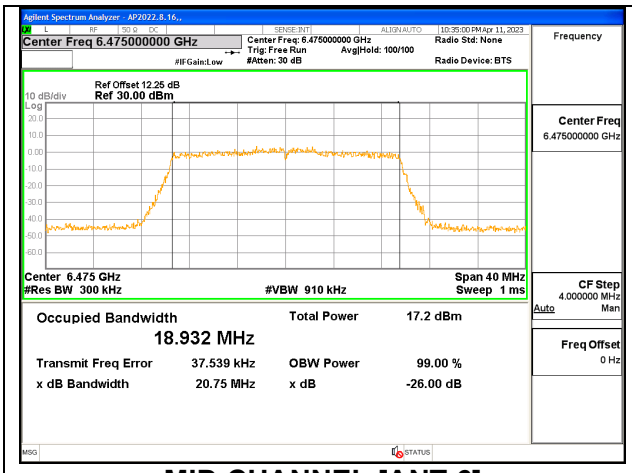
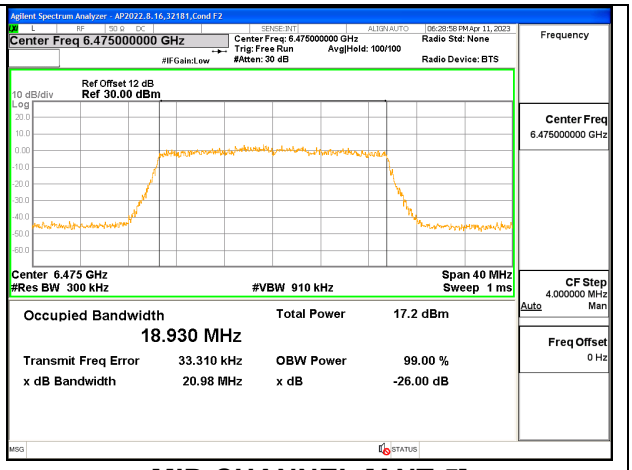
2TX Antenna 6 + Antenna 5 CDD MODE: SU Mode

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	6435	20.93	20.84	19.0110	19.0140
Mid	6475	20.75	20.98	18.9320	18.9300
High	6515	20.96	20.87	18.9860	18.9260



MID CHANNEL [ANT 6]



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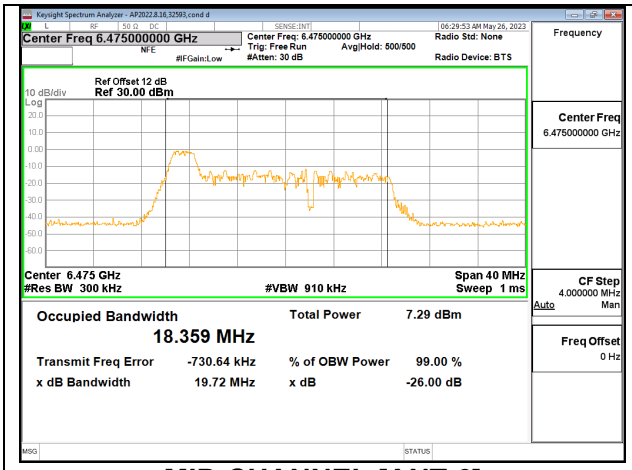
2TX Antenna 6 + Antenna 5 SDM MODE: 26 Tones, RU Index 0

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	6435	19.63	19.78	18.2990	18.2390
Mid	6475	19.72	19.76	18.3590	18.3500
High	6515	19.76	19.63	18.3420	17.8060



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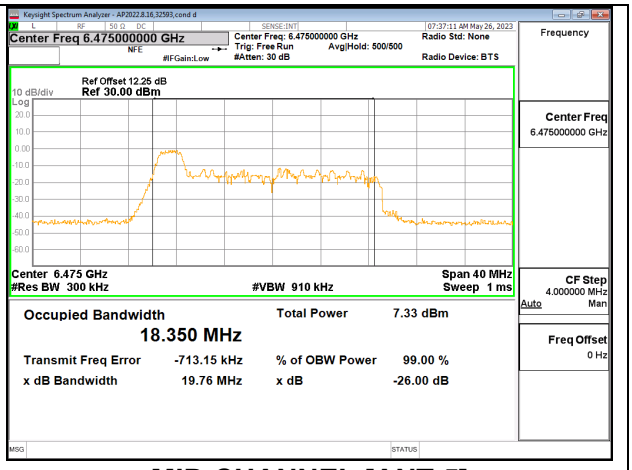

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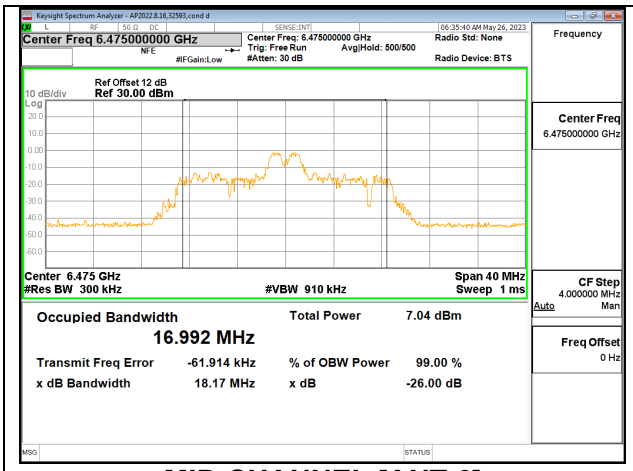
2TX Antenna 6 + Antenna 5 SDM MODE: 26 Tones, RU Index 4

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	6435	18.27	17.79	17.0630	16.4260
Mid	6475	18.17	18.12	16.9920	16.4610
High	6515	17.80	18.25	16.8740	16.0410



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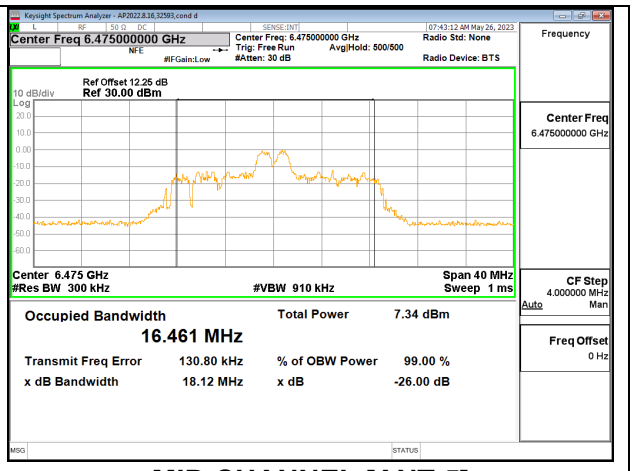

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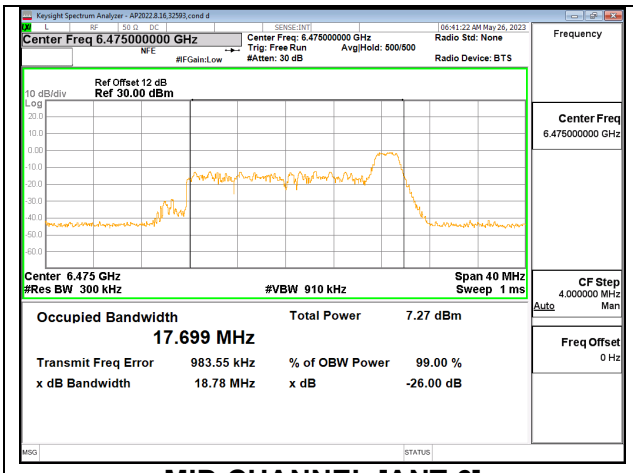
2TX Antenna 6 + Antenna 5 SDM MODE: 26 Tones, RU Index 8

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	6435	20.03	19.63	18.5670	18.4410
Mid	6475	18.78	19.52	17.6990	18.3320
High	6515	20.21	19.56	18.3810	18.4250



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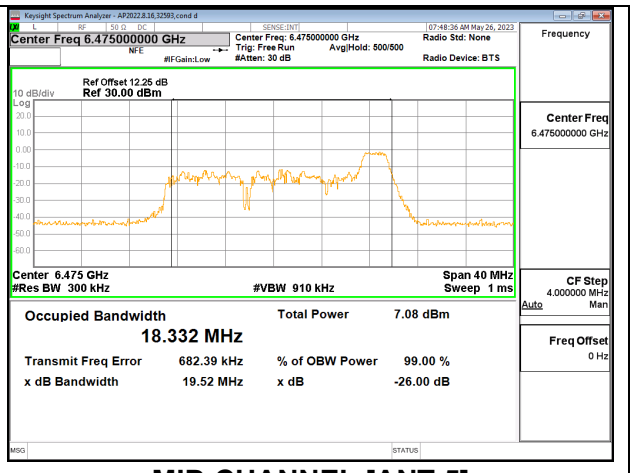

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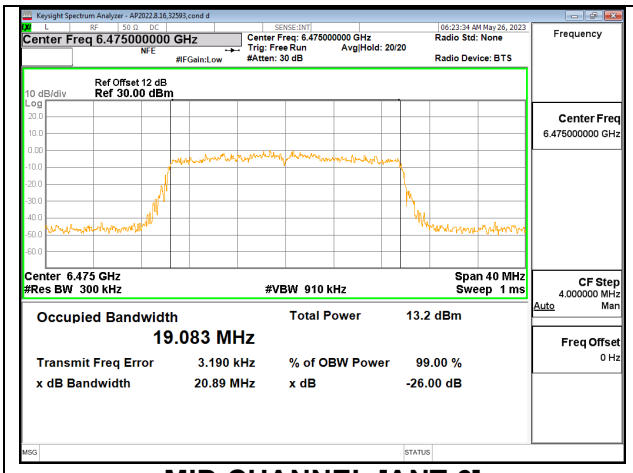
2TX Antenna 6 + Antenna 5 SDM MODE: SU Mode

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	6435	20.62	21.57	18.9010	18.9020
Mid	6475	20.89	20.69	19.0830	18.9610
High	6515	20.64	20.57	18.9120	18.9650



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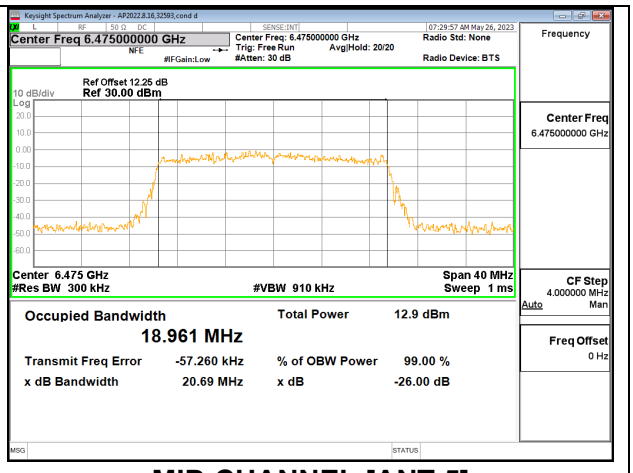

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