TEST REPORT

Report Number: 14982485-E8V2

Applicant	:	APPLE INC. 1 APPLE PARK WAY CUPERTINO, CA 95014, U.S.A.
Model	:	A3286, A3287, A3288
Brand	:	APPLE
FCC ID	:	BCG-E8689A, BCG-E8690A, BCG-E8691A
EUT Description	:	SMARTPHONE
Test Standard(s)	:	FCC 47 CFR PART 15 SUBPART E

Date Of Issue:
2024/07/25

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

REPORT REVISION HISTORY

Rev.	Issue Date	Revisions	Revised By
V1	2024/07/23	Initial Review	Everardo H. Torres
V2	2024/07/25	Adressed TCB's questions in sections 6.2, 6.5, 8, and section 9.5	Everardo H. Torres

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1. ATTESTATION OF TEST RESULTS

Applicant Name and Address	APPLE INC. 1 APPLE PARK WAY CUPERTINO, CA 95014, U.S.A.
Model	A3286, A3287, A3288
Brand	APPLE
EUT Description	Smartphone
Serial Number	V7QCNQFGF0, WXWQLPF6GQ, C07H15000530000FGR, C07H5X000700000FGP, C07H5T000VA0000FGU, J431DW3433, XFDJ2H4LVW
Sample Receipt Date	2023/10/04
Date Tested	2024/01/22 to 2024/07/18
Applicable Standards	CFR 47 Part 15 Subpart E
Test Results	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.

Approved & Released By:	Prepared & Reviewed By:
 Chin Pang Senior Lab Engineer UL Verification Services, Inc.	 Everardo H. Torres Senior Test Engineer UL Verification Services, Inc.

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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 6.2)
2. Cable loss (see section 6.2)

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 47 CFR Part 2
- FCC 47 CFR Part 15
- FCC KDB 662911 D01 v02r01
- FCC KDB 789033 D02 v02r01
- 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 cellular GSM, GPRS, EGPRS, WCDMA, LTE, 5GNR1, IEEE 802.11a/b/g/n/ac/ax/be, Bluetooth (BT), Ultra-Wideband (UWB), Global Positioning System (GPS), Near-Field Communication (NFC), Narrow-Band (NB) UNII, 802.15.4, 802.15.4ab-Narrow Band (NB), Wireless Power Transfer (WPT) and Mobile Satellite Service (MSS) technologies. The rechargeable battery is not user accessible. This device is not user-serviceable and requires special tools to disassemble.

6.2. DESCRIPTION OF AVAILABLE ANTENNAS

Antenna Type is IFA.

The antennas' gains, as provided by the manufacturer, are as follows:

Frequency Range (MHz)	Antenna 6 (dBi)	Antenna 5 (dBi)	Uncorrelated Chains (dBi)	Correlated Chains (dBi)
5150 - 5250 UNII - 1	-0.50	-5.00	-2.19	0.55
5250 - 5350 UNII - 2a	0.00	-3.90	-1.53	1.28
5500 - 5700 UNII - 2c	0.80	-2.70	-0.61	2.24
5725 - 5825 UNII 3	0.50	-2.30	-0.68	2.22

Cable Loss (dB)	
Ant 6	ANT 5
3.20	2.98

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

6.3. SOFTWARE AND FIRMWARE

The EUT firmware installed during testing was 27_20_111_38.

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6.4. 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	19.98	99.54
5190-5230	802.11n HT40	20.47	111.43
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	17.47	55.85
5250	802.11ac VHT160	16.48	44.46
5180-5240	802.11ax HE20	Covered by 802.11be EHT20 1TX	
5180-5240	802.11be EHT20	19.98	99.54
5190-5230	802.11ax HE40	Covered by 802.11be EHT40 1TX	
5190-5230	802.11be EHT40	20.41	109.90
5210	802.11ax HE80	Covered by 802.11be EHT80 1TX	
5210	802.11be EHT80	17.99	62.95
5250	802.11ax HE160	Covered by 802.11be EHT160 1TX	
5250	802.11be EHT160	17.99	62.95
5.2 GHz band, 2TX			
5180-5240	802.11n HT20 CDD	19.94	98.63
5180-5240	802.11n HT20 SDM/STBC	Covered by 802.11n HT20 2TX CDD	
5190-5230	802.11n HT40 CDD	22.94	196.79
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	19.47	88.51
5210	802.11ac VHT80 SDM/STBC	Covered by 802.11ac VHT80 2TX CDD	
5250	802.11ac VHT160 CDD	18.48	70.47
5250	802.11ac VHT160 SDM/STBC	Covered by 802.11ac VHT160 2TX CDD	
5180-5240	802.11ax HE20 OFDMA	Covered by 802.11be EHT20 2TX CDD	
5180-5240	802.11be EHT20 CDD	19.95	98.86
5180-5240	802.11ax HE20 SDM	Covered by 802.11be EHT20 SDM	
5180-5240	802.11be EHT20 SDM	Covered by 802.11be EHT20 2TX CDD	
5190-5230	802.11ax HE40 OFDMA	Covered by 802.11be EHT40 2TX CDD	
5190-5230	802.11be EHT40 CDD	22.96	197.70
5190-5230	802.11ax HE40 SDM	Covered by 802.11be EHT40 SDM	
5190-5230	802.11be EHT40 SDM	Covered by 802.11be EHT40 2TX CDD	
5210	802.11ax HE80 OFDMA	Covered by 802.11be EHT80 2TX CDD	
5210	802.11be EHT80 CDD	19.95	98.86
5210	802.11ax HE80 SDM	Covered by 802.11be EHT80 SDM	
5210	802.11be EHT80 SDM	Covered by 802.11be EHT80 2TX CDD	
5250	802.11ax HE160 OFDMA	Covered by 802.11be EHT160 2TX CDD	
5250	802.11be EHT160 CDD	19.93	98.40
5250	802.11ax HE160 SDM	Covered by 802.11be EHT160 SDM	
5250	802.11be EHT160 SDM	Covered by 802.11be EHT160 2TX CDD	

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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	19.97	99.31
5270 - 5310	802.11n HT40	20.43	110.41
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	15.97	39.54
5250	802.11ac VHT160	16.48	44.46
5260 - 5320	802.11ax HE20	Covered by 802.11be EHT20 1TX	
5260 - 5320	802.11be EHT20	19.94	98.63
5270 - 5310	802.11ax HE40	Covered by 802.11be EHT40 1TX	
5270 - 5310	802.11be EHT40	20.49	111.94
5290	802.11ax HE80	Covered by 802.11be EHT80 1TX	
5290	802.11be EHT80	15.99	39.72
5250	802.11ax HE160	Covered by 802.11be EHT160 1TX	
5250	802.11be EHT160	17.99	62.95
5.3 GHz band, 2TX			
5260 - 5320	802.11n HT20 CDD	19.96	99.08
5260 - 5320	802.11n HT20 SDM/STBC	Covered by 802.11n HT40 2TX CDD	
5270 - 5310	802.11n HT40 CDD	22.94	196.79
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	18.46	70.15
5290	802.11ac VHT80 SDM/STBC	Covered by 802.11ac VHT80 2TX CDD	
5250	802.11ac VHT160 CDD	18.48	70.47
5250	802.11ac VHT160 SDM/STBC	Covered by 802.11ac VHT160 2TX CDD	
5260 - 5320	802.11ax HE20 OFDMA	Covered by 802.11be EHT20 2TX CDD	
5260 - 5320	802.11be EHT20 CDD	19.98	99.54
5260 - 5320	802.11ax HE20 SDM	Covered by 802.11be EHT20 SDM	
5260 - 5320	802.11be EHT20 SDM	Covered by 802.11be EHT20 2TX CDD	
5270 - 5310	802.11ax HE40 OFDMA	Covered by 802.11be EHT40 2TX CDD	
5270 - 5310	802.11be EHT40 CDD	22.94	196.79
5270 - 5310	802.11ax HE40 SDM	Covered by 802.11be EHT40 SDM	
5270 - 5310	802.11be EHT40 SDM	Covered by 802.11be EHT40 2TX CDD	
5290	802.11ax HE80 OFDMA	Covered by 802.11be EHT80 2TX CDD	
5290	802.11be EHT80 CDD	18.47	70.31
5290	802.11ax HE80 SDM	Covered by 802.11be EHT80 SDM	
5290	802.11be EHT80 SDM	Covered by 802.11be EHT80 2TX CDD	
5250	802.11ax HE160 OFDMA	Covered by 802.11be EHT160 2TX CDD	
5250	802.11be EHT160 CDD	19.93	98.40
5250	802.11ax HE160 SDM	Covered by 802.11be EHT160 SDM	
5250	802.11be EHT160 SDM	Covered by 802.11be EHT160 2TX CDD	

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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	19.99	99.77
5510-5710	802.11n HT40	20.44	110.66
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	20.41	109.90
5570	802.11ac VHT160	16.44	44.06
5500-5720	802.11ax HE20	Covered by 802.11be EHT20 1TX	
5500-5720	802.11be EHT20	19.95	98.86
5510-5710	802.11ax HE40	Covered by 802.11be EHT40 1TX	
5510-5710	802.11be EHT40	20.47	111.43
5530-5690	802.11ax HE80	Covered by 802.11be EHT80 1TX	
5530-5690	802.11be EHT80	20.49	111.94
5570	802.11ax HE160	Covered by 802.11be EHT160 1TX	
5570	802.11be EHT160	17.96	62.52
5.6 GHz band, 2TX			
5500-5720	802.11n HT20 CDD	19.94	98.63
5500-5720	802.11n HT20 SDM/STBC	Covered by 802.11n HT40 2TX CDD	
5510-5710	802.11n HT40 CDD	22.95	197.24
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	22.96	197.70
5530-5690	802.11ac VHT80 SDM/STBC	Covered by 802.11ac VHT80 2TX CDD	
5570	802.11ac VHT160 CDD	18.44	69.82
5570	802.11ac VHT160 SDM/STBC	Covered by 802.11ac VHT160 2TX CDD	
5500-5720	802.11ax HE20 OFDMA	Covered by 802.11be EHT20 2TX CDD	
5500-5720	802.11be EHT20 CDD	19.96	99.08
5500-5720	802.11ax HE20 SDM	Covered by 802.11be EHT20 SDM	
5500-5720	802.11be EHT20 SDM	Covered by 802.11be EHT20 2TX CDD	
5510-5710	802.11ax HE40 OFDMA	Covered by 802.11be EHT40 2TX CDD	
5510-5710	802.11be EHT40 CDD	22.93	196.34
5510-5710	802.11ax HE40 SDM	Covered by 802.11be EHT40 SDM	
5510-5710	802.11be EHT40 SDM	Covered by 802.11be EHT40 2TX CDD	
5530-5690	802.11ax HE80 OFDMA	Covered by 802.11be EHT80 2TX CDD	
5530-5690	802.11be EHT80 CDD	22.94	196.79
5530-5690	802.11ax HE80 SDM	Covered by 802.11be EHT80 SDM	
5530-5690	802.11ax HE80 SDM	Covered by 802.11be EHT80 2TX CDD	
5570	802.11ax HE160 OFDMA	Covered by 802.11be EHT160 2TX CDD	
5570	802.11be EHT160 CDD	19.98	99.54
5570	802.11ax HE160 SDM	Covered by 802.11be EHT160 SDM	
5570	802.11be EHT160 SDM	Covered by 802.11be EHT160 2TX CDD	

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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	20.48	111.69
5755-5795	802.11n HT40	20.47	111.43
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	20.46	111.17
5745-5825	802.11ax HE20	Covered by 802.11be EHT20 1TX	
5745-5825	802.11be EHT20	20.49	111.94
5755-5795	802.11ax HE40	Covered by 802.11be EHT40 1TX	
5755-5795	802.11be EHT40	20.47	111.43
5775	802.11ax HE80	Covered by 802.11be EHT80 1TX	
5775	802.11be EHT80	20.46	111.17
5.8 GHz band, 2TX			
5745-5825	802.11n HT20 CDD	23.46	221.82
5745-5825	802.11n HT20 SDM/STBC	Covered by 802.11n HT40 2TX CDD	
5755-5795	802.11n HT40 CDD	23.47	222.33
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	23.44	220.80
5775	802.11ac VHT80 SDM/STBC	Covered by 802.11ac VHT80 2TX CDD	
5745-5825	802.11ax HE20 OFDMA	Covered by 802.11be EHT20 2TX CDD	
5745-5825	802.11be EHT20 CDD	23.48	222.84
5745-5825	802.11ax HE20 SDM	Covered by 802.11ax HE20 OFDMA	
5745-5825	802.11be EHT20 SDM	Covered by 802.11be EHT20 2TX CDD	
5755-5795	802.11ax HE40 OFDMA	Covered by 802.11be EHT40 2TX CDD	
5755-5795	802.11be EHT40 CDD	23.49	223.36
5755-5795	802.11ax HE40 SDM	Covered by 802.11ax HE40 OFDMA	
5755-5795	802.11be EHT40 SDM	Covered by 802.11be EHT40 2TX CDD	
5775	802.11ax HE80 OFDMA	Covered by 802.11be EHT80 2TX CDD	
5775	802.11be EHT80 CDD	23.49	223.36
5775	802.11ax HE80 SDM	Covered by 802.11be EHT80 SDM	
5775	802.11be EHT80 SDM	Covered by 802.11be EHT80 2TX CDD	

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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 Y (Landscape) orientation was the worst-case orientation for ANT 6, 2TX, and Z (Portrait) for ANT 5.

802.11n 2TX and 802.11be 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.

With same power on Full RU and SU higher data rate, investigation was 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
802.11ac VHT160 mode MCS9
802.11be (5.2G & 5.8G bands) : EHT20/EHT40/EHT80 Partial Tones and SU mode : MCS11
802.11be (5.3G & 5.6G bands) : EHT20/EHT40/EHT80/Partial Tones and SU mode : MCS11.

Note: ANT1 and ANT2 indicated in the test result sections are representative of ANT6 and ANT5, respectively.

The modulation and bandwidth of 802.11ax and 802.11be modes are similar at 20 MHz (40 MHz, 80 MHz, 160 MHz), and the target power of 802.11ax mode is equal to or lower than that of 802.11be mode, and the data rate of 802.11be mode is higher than 802.11ax mode, so 802.11be mode is performed in the test to represent worst-case reporting.

The modulation and bandwidth of 802.11a and 802.11n modes are similar at 20 MHz and the target power of 802.11a mode is equal to or lower than that of 802.11n mode. The data rate of 802.11n mode is higher than 802.11a mode, so 802.11n mode is performed in the test to represent worst-case reporting.

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The target power of SDM mode is equal to or lower than that of CDD mode. CDD correlated antenna gain is also worst-case, so CDD mode is performed in the test to represent worst-case reporting.

After the investigation, we found that the worst case of power and PSD modes for full testing as table shown below, in addition we were also spot-check for Full RU and the rest of Partial RU modes on radiated bandedge and radiated spurious emissions.

Due to the ANT6 antenna gain increased, all antenna port test results on ANT5 and ANT 6 and radiated test data on ANT5 are reused based on reference model, A3081, FCC ID: BCG-E8688A to cover variant models: A3286, FCC ID: BCG-E8689A; A3287, FCC ID: BCG-E8690A; and A3288, FCC ID: BCG-E8691A per manufacturer KDB inquiry approved by FCC except the following radiated test items related to ANT 6 are retested:

- 2TX radiated harmonic spurious for below 1GHz, 1-18GHz and 18-40GHz.
- ANT 6 SISO mode band edge and 2TX MIMO mode band-edge tests.

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BW (MHz)	Tone (T)	RU Index (Chipset Support only)	Worst Case Tone (UNII-1)		Worst Case Tone (UNII-2a)		Worst Case Tone (UNII-2c)		Worst Case Tone (UNII-3)	
			Highest Power	Highest PSD	Highest Power	Highest PSD	Highest Power	Highest PSD	Highest Power	Highest PSD
20	26	0 ~ 8								
	52	37 ~ 40								
	52 + 26	70, 71, 72								
	106	53 ~ 54		X		X		X		X
	106 + 26	82, 83								
	242	61								
	SU	--	X		X		X		X	
40	26	0 ~ 17								
	52	37 ~ 44				x		x		
	52 + 26	70, 72, 72, 73, 74, 75								
	106	53 ~ 56		X						x
	106 + 26	82, 83, 84, 85								
	242	61 ~ 62	X			X		X		
	484	65								
	SU	--	X		X		X		X	
80	26	0 ~ 36								
	52	37 ~ 52								
	52 + 26	71,72,73,74,77,78,79,80								
	106	53 ~ 60								
	106 + 26	82, 85, 86, 89								
	242	61 ~ 64		X						x
	484	65 ~ 66				x		x		
	484 + 242	90, 91, 92, 93								
	996	67								
	SU	--	X		X		X		X	
160	26	0 ~ S36								
	52	37 ~ S52								
	52 + 26	sb0: 71,72,73,74,77,78,79,80 sb1: 71,72,73,74,77,78,79,80								
	106	53 ~ S60								
	106 + 26	82, 85, 86, 89								
	242	61 ~ S64		X		X		X		
	484	65 ~ S66								
	484 + 242	sb0: 90, 91, 92, 93 sb1: 90, 91, 92, 93								
	996	67 ~ S67								
	996 + 484	sb0: 94, 95 sb1: 94, 95								
	996 + 484 + 242	sb0: 96, 97, 98, 99 sb1: 96, 97, 98, 99								
	996x2	S68								
	SU	--	X		X		X			

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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
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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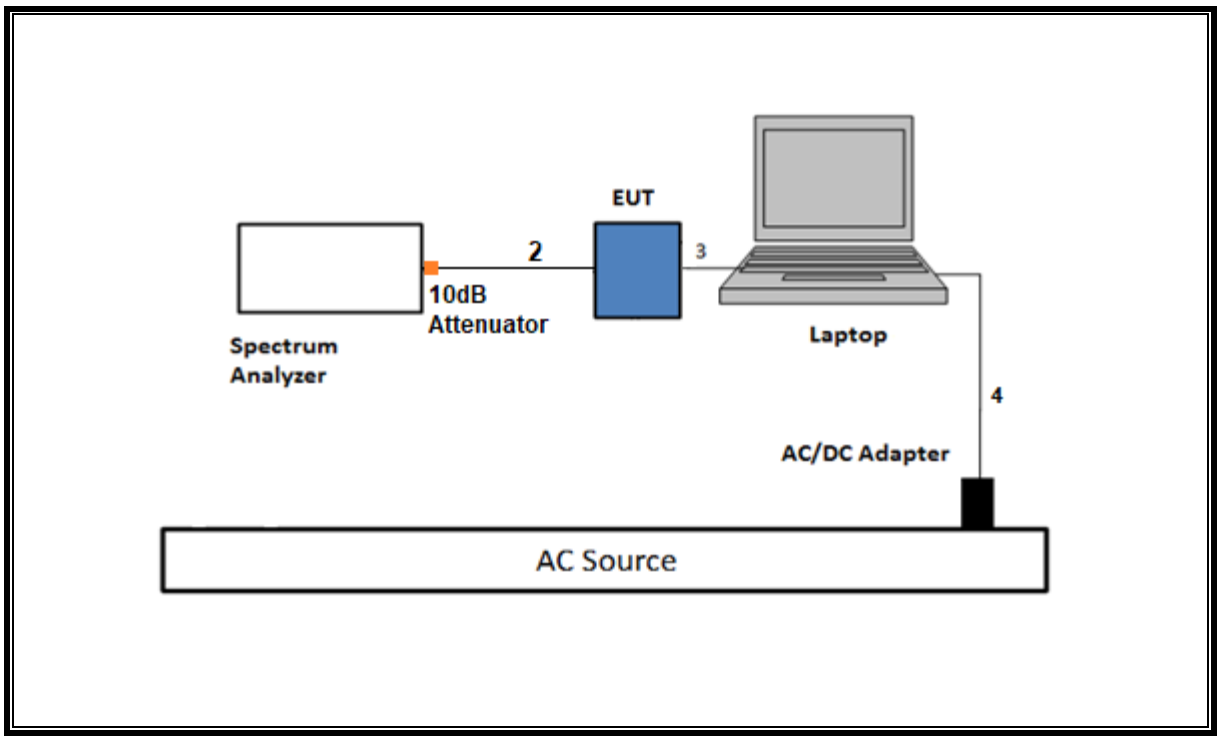
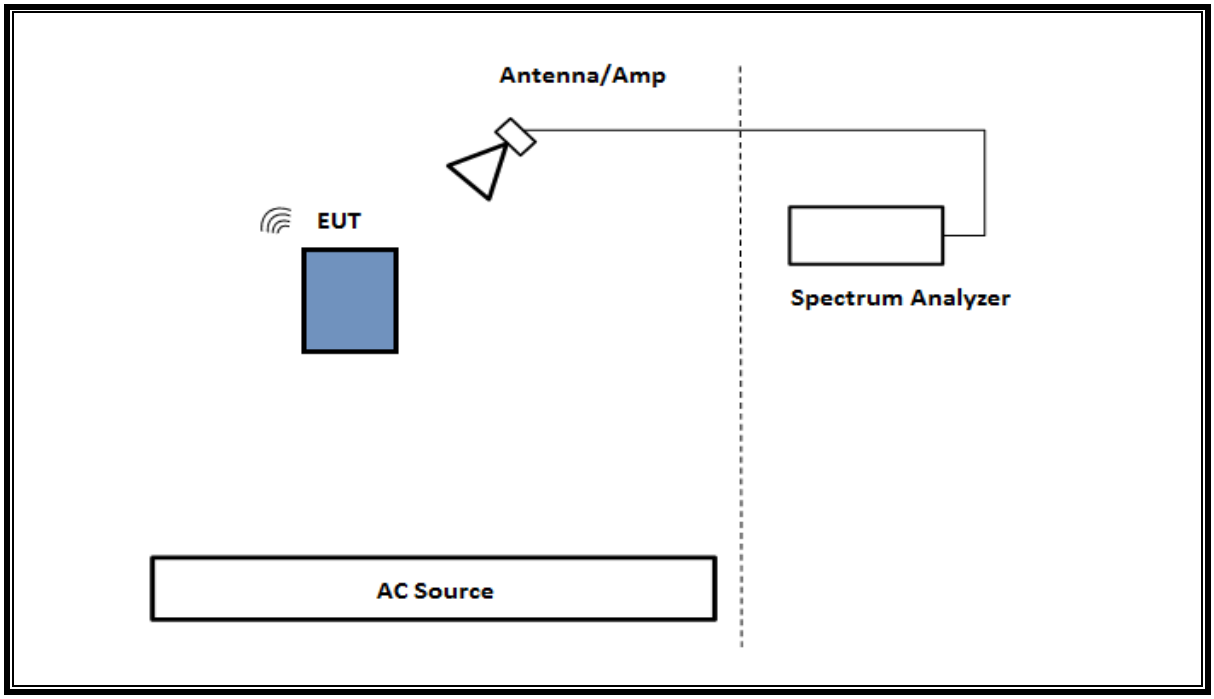
SETUP DIAGRAM FOR CONDUCTED TESTS



SETUP DIAGRAM FOR RADIATED TESTS Above 1 GHz (1 to 40GHz)



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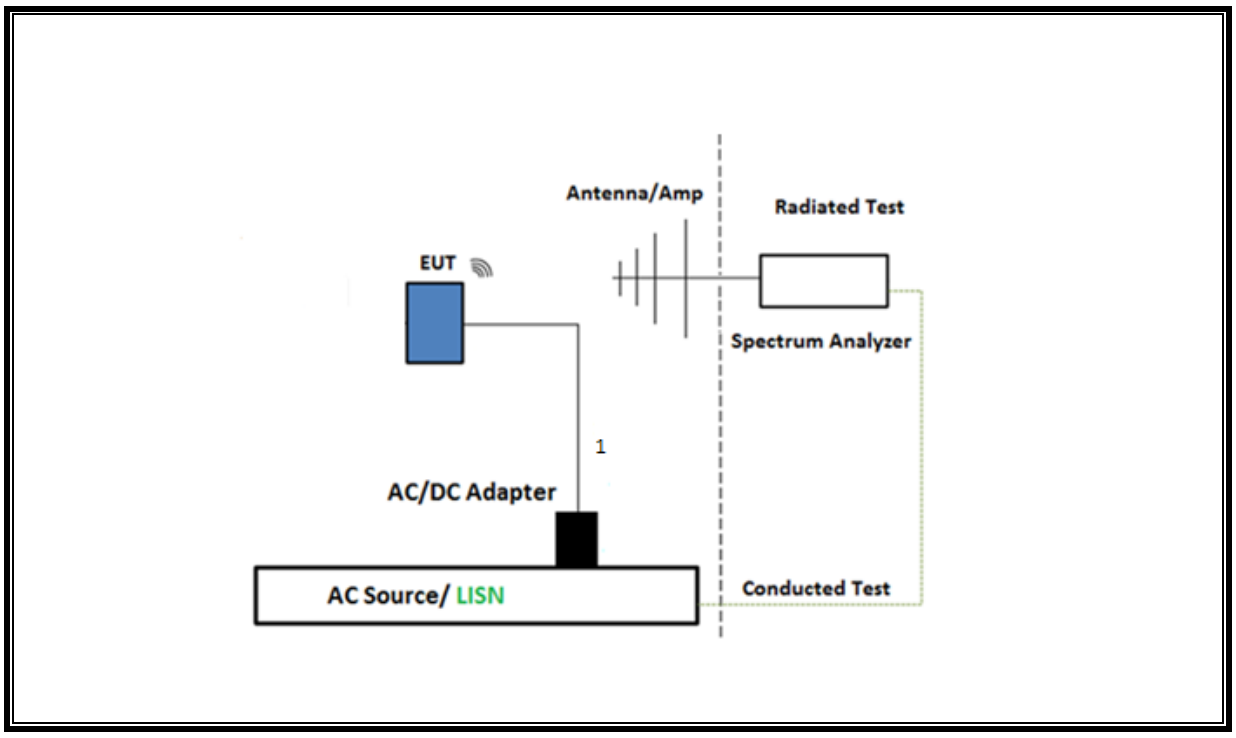
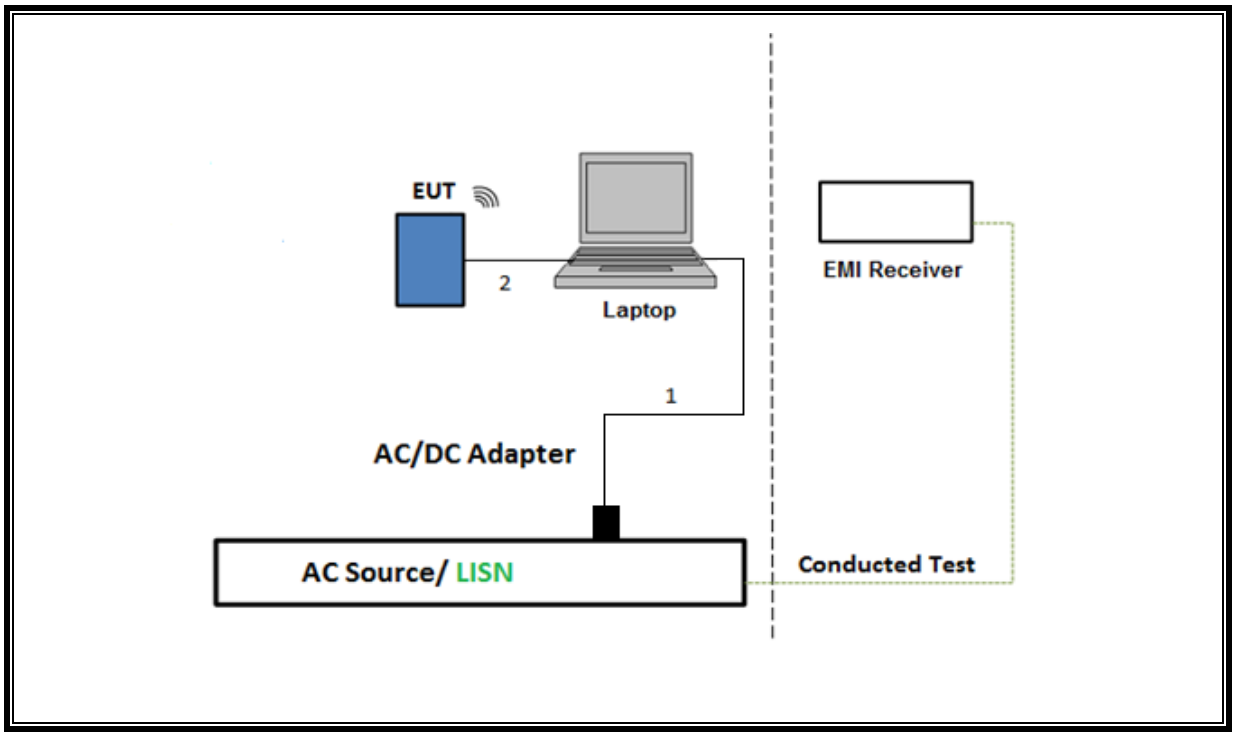
SETUP DIAGRAM FOR 30-1000MHz and AC LINE CONDUCTED TEST



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, Section 6.2.

Radiated Spurious Emissions Below 30MHz: ANSI C63.10 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**
Horn Antenna 1-18GHz	ETS-Lindgren (Cedar Park, Texas)	3117	226673	2025/02/28
RF Filter Box, 1-18GHz, 12 Port.	UL-FR1	Frankenstein	231874	2024/08/30
ESW, EMI TEST RECEIVER	Rohde & Schwarz	ESW44	179372	2025/02/28
Link File, @3m, 9kHz-1000MHz Hybrid Path Loss	UL-FR1	Port 0 Factors	226862	2025/01/31
Antenna, Broadband Hybrid, 30MHz to 3GHz	Sunol Sciences Corp.	JB3	224378	2024/10/27
RF Filter Box, 1-18GHz, 17 Ports	UL-FR1	Frankenstein	171389	2025/03/31
Horn Antenna 1-18GHz	ETS-Lindgren (Cedar Park, Texas)	3117	84797	2024/09/30
ESW, EMI TEST RECEIVER	Rohde & Schwarz	ESW44	201497	2025/02/28
RF Filter Box, 1-18GHz, 17 Ports	UL-FR1	F3A	243707	2025/02/28
Horn Antenna 1-18GHz	ETS-Lindgren (Cedar Park, Texas)	3117	80402	2024/07/31
ESW, EMI TEST RECEIVER	Rohde & Schwarz	ESW44	230548	2025/02/28
RF Filter Box, 1-18GHz, 17 Ports	UL-FR1	Frankenstein	217255	2024/10/31
Horn Antenna 1-18GHz	ETS-Lindgren (Cedar Park, Texas)	3117	84796	2024/09/30
ESW, EMI TEST RECEIVER	Rohde & Schwarz	ESW44	223461	2025/02/28
RF Filter Box, 1-18GHz, 17 Ports	UL-FR1	F2A	224478	2025/01/31
Antenna, Passive Loop 30Hz - 1MHz	ELECTRO-METRICS	EM-6871	170014	2024/08/31
Antenna, Passive Loop 100kHz to 30MHz	ELECTRO-METRICS	EM-6872	170016	2024/08/31

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TEST EQUIPMENT LIST (cont.)				
Description	**Manufacturer**	**Model**	**ID Num**	**Cal Due**
Horn Antenna 1-18GHz	ETS-Lindgren (Cedar Park, Texas)	3117	41112	2024/10/31
ESW, EMI TEST RECEIVER	Rohde & Schwarz	ESW44	201499	2025/02/28
RF Filter Box, 1-18GHz, 17 Ports	UL-FR1	Rats 2.0	225575	2025/04/30
Antenna, Horn 18 to 26.5GHz	MWH-1826/B	A.R.A	172354	2024/10/31
Link File, RF Amplifier Assembly, 18-26.5GHz, 60dB Gain	AMPLICAL	AMP18G26.5-60	220194	2024/08/31
Antenna, Horn 26.5 to 40GHz	A.R.A.	MWH-2640/B	172369	2024/10/31
10dB Fixed Attenuator	Pasternack Enterprises	PE7087-10	178557	Verified Before Use
10dB Fixed Attenuator	Pasternack Enterprises	PE7087-10	178558	Verified Before Use
RF Amplifier Assembly, 26-40GHz, 65dB Gain	AMPLICAL	AMP26G40-65	221834	2025/03/31
Power Meter, P-series single channel	Keysight Technologies Inc	N1911A	90719	2025/01/31
Power Sensor, P - series, 50MHz to 18GHz, Wideband	Keysight Technologies Inc	N1921A	90389	2025/01/31
Spectrum Analyzer, PXA, 3Hz to 44GHz	Keysight Technologies Inc	N9030A	80396	2025/02/28
Spectrum Analyzer, PXA, 3Hz to 44GHz	Keysight Technologies Inc	N9030A	81188	2025/01/31
Spectrum Analyzer, PXA, 3Hz to 44GHz	Keysight Technologies Inc	N9030A	125178	2025/01/31
RF Filter Box, 1-18GHz, 17 Ports	UL-FR1	F2A	237597	2024/09/30
Horn Antenna 1-18GHz	ETS-Lindgren (Cedar Park, Texas)	3117	80430	2024/08/31
ESW, EMI TEST RECEIVER	Rohde & Schwarz	ESW44	169935	2025/02/28
RF Filter Box, 1-18GHz, 17 Ports	UL-FR1	RATS 2	225474	2025/04/30
Horn Antenna 1-18GHz	ETS-Lindgren (Cedar Park, Texas)	3117	81887	2025/03/31
ESW, EMI TEST RECEIVER	Rohde & Schwarz	ESW44	201502	2025/02/28
Horn Antenna 1-18GHz	ETS-Lindgren (Cedar Park, Texas)	3117	226674	2025/01/09
RF Filter Box, 1-18GHz, 17 Ports	UL-FR1	RATS 2	226780	2025/04/30
ESW, EMI TEST RECEIVER	Rohde & Schwarz	ESW44	226079	2025/02/28

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AC Line Conducted				
EMI Test Receiver 9kHz-7GHz	Rohde & Schwarz	ESR	93091	2025/02/28
LISN for Conducted Emissions CISPR-16	FISCHER CUSTOM COMMUNICATIONS	FCC-LISN-50/250-25-2-01-480V	175764	2025/01/31
Transient Limiter	TE	TBFL1	207996	2024/08/31
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 789033 Zero-Span Spectrum Analyzer Method.

ON TIME AND DUTY CYCLE RESULTS

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Mode	Tone (T)	Data Rate (Mbps)	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/B Minimum VBW (kHz)
HT20	--	MCS0	0.993	1.017	0.9764	97.64%	0.10	1.007
	--	MCS7	0.139	0.165	0.8424	84.24%	0.74	7.194
HT40	--	MCS0	0.942	0.963	0.9782	97.82%	0.10	1.062
	--	MCS7	0.128	0.158	0.8070	80.70%	0.93	7.843
VHT80	--	MCS0	0.459	0.485	0.9464	94.64%	0.24	2.179
	--	MCS9	0.071	0.102	0.6961	69.61%	1.57	14.085
VHT160	--	MCS0	0.252	0.277	0.9097	90.97%	0.41	3.968
	--	MCS9	0.056	0.081	0.6914	69.14%	1.60	17.857
EHT20	SU	MCS0	1.576	1.604	0.9825	98.25%	0.00	0.010
		MCS11	0.1606	0.1815	0.8848	88.48%	0.53	6.227
	106T	MCS0	3.493	3.525	0.9909	99.09%	0.00	0.010
		MCS11	0.264	0.2848	0.9270	92.70%	0.33	3.788
	52T	MCS0	3.82	3.858	0.9902	99.02%	0.00	0.010
		MCS11	0.278	0.3159	0.8800	88.00%	0.56	3.597
EHT40	SU	MCS0	1.532	1.58	0.9696	96.96%	0.13	0.653
		MCS11	0.1564	0.1779	0.8791	87.91%	0.56	6.394
	242T	MCS0	3.01	3.06	0.9837	98.37%	0.00	0.010
		MCS11	0.2349	0.2554	0.9197	91.97%	0.36	4.257
	106T	MCS0	3.486	3.553	0.9811	98.11%	0.00	0.010
		MCS11	0.2632	0.3008	0.8750	87.50%	0.58	3.799
	52T	MCS0	3.789	3.858	0.9821	98.21%	0.00	0.010
		MCS11	0.2775	0.3153	0.8801	88.01%	0.55	3.604
EHT80	SU	MCS0	1.472	1.524	0.9659	96.59%	0.15	0.679
		MCS11	0.154	0.176	0.8750	87.50%	0.58	6.494
	484T	MCS0	4.008	4.029	0.9948	99.48%	0.00	0.010
		MCS11	0.2931	0.3136	0.9346	93.46%	0.29	3.412
	242T	MCS0	3.024	3.061	0.9879	98.79%	0.00	0.010
		MCS11	0.2353	0.2731	0.8616	86.16%	0.65	4.250
	MRU 52 + 26	MCS0	3.752	3.812	0.9843	98.43%	0.00	0.010
		MCS11	0.2784	0.316	0.8810	88.10%	0.55	3.592
EHT160	SU	MCS0	1.472	1.524	0.9659	96.59%	0.15	0.679
		MCS11	0.154	0.176	0.8750	87.50%	0.58	6.494
	996T	MCS0	1.948	1.969	0.9893	98.93%	0.00	0.010
		MCS11	0.1625	0.184	0.8832	88.32%	0.54	6.154
	242T	MCS0	3.024	3.061	0.9879	98.79%	0.00	0.010
		MCS11	0.2353	0.2731	0.8616	86.16%	0.65	4.250
HT20 SDM	--	MCS0	0.992	1.013	0.9788	97.88%	0.09	1.009
HT40 SDM	--	MCS0	0.500	0.520	0.9606	96.06%	0.17	2.001
VHT80 SDM	--	MCS0	0.256	0.2776	0.9222	92.22%	0.35	3.906
VHT160 SDM	--	MCS0	0.1519	0.1721	0.8826	88.26%	0.54	6.583
EHT20 SDM	SU	MCS0	0.7785	0.7999	0.9732	97.32%	0.12	1.285
	106T	MCS0	3.518	3.54	0.9938	99.38%	0.00	0.010
	52T	MCS0	3.819	3.858	0.9899	98.99%	0.00	0.010
EHT40 SDM	SU	MCS0	0.7733	0.7943	0.9736	97.36%	0.12	1.293
	242T	MCS0	3.043	3.063	0.9935	99.35%	0.00	0.010
	106T	MCS0	3.488	3.556	0.9809	98.09%	0.00	0.010
	52T	MCS0	3.789	3.858	0.9821	98.21%	0.00	0.010
EHT80 SDM	SU	MCS0	0.7369	0.7601	0.9695	96.95%	0.13	1.357
	484T	MCS0	3.029	3.049	0.9934	99.34%	0.00	0.010
	242T	MCS0	3.041	3.081	0.9870	98.70%	0.00	0.010
EHT160 SDM	SU	MCS0	0.5148	0.5355	0.9613	96.13%	0.17	1.943
	996T	MCS0	1.472	1.51	0.9748	97.48%	0.11	0.679
	242T	MCS0	3.041	3.081	0.9870	98.70%	0.00	0.010

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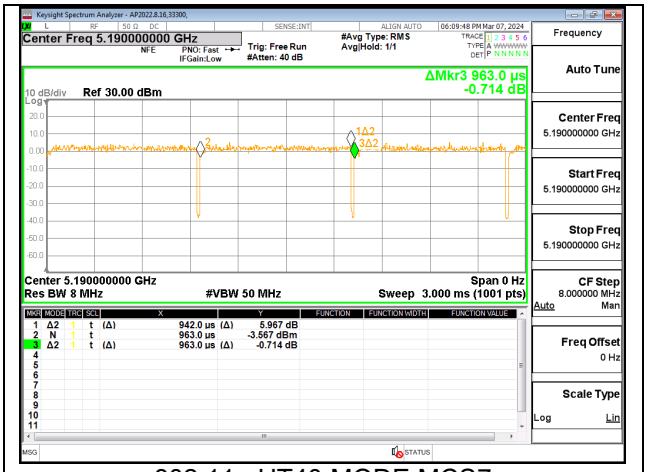
Note: There is same duty cycle factor on 1TX and 2TX

DUTY CYCLE PLOTS



802.11n HT40 MODE MCS7

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9.2. 26 dB AND 99% BANDWIDTH

LIMITS

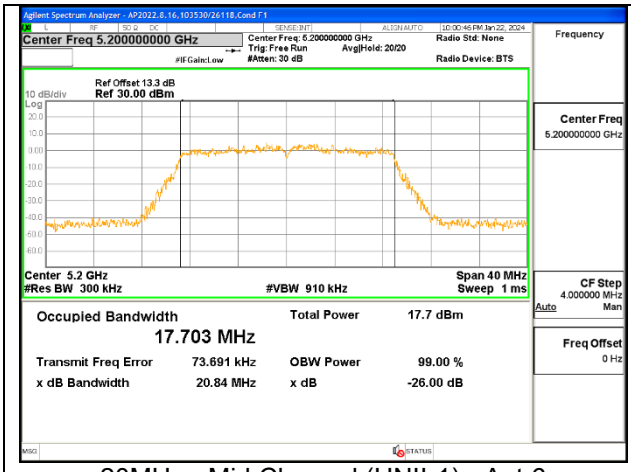
None; for reporting purposes only.

RESULTS

ID:	103530/26118	Date:	01/22/2024

9.2.1. 802.11n/ac SISO MODE IN THE UNII-1 BAND

UNII-1 (SISO)	Frequency (MHz)	Channel Number	26 dB Bandwidth (MHz)		99% Bandwidth (MHz)	
			Ant 1	Ant 2	Ant 1	Ant 2
HT20 (FCC)	5180	36	21.71	21.46	17.8510	17.8370
	5200	40	20.84	20.94	17.7030	17.7600
	5240	48	21.23	21.09	17.8250	17.7680
HT40 (FCC)	5190	38	41.39	42.69	36.4790	36.4960
	5230	46	40.78	41.04	36.2810	36.3150
VHT80 (FCC)	5210	42	85.99	86.98	75.7490	75.7060
VHT160 (FCC)	5250 (Straddle)	50	164.20	164.70	154.7900	154.9500



20MHz - Mid Channel (UNII-1) - Ant 6

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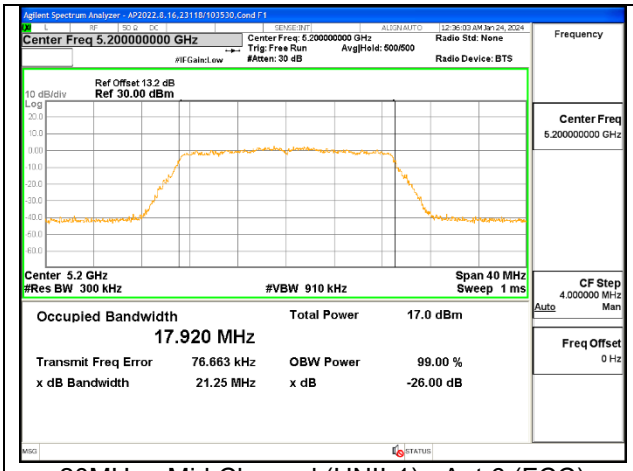
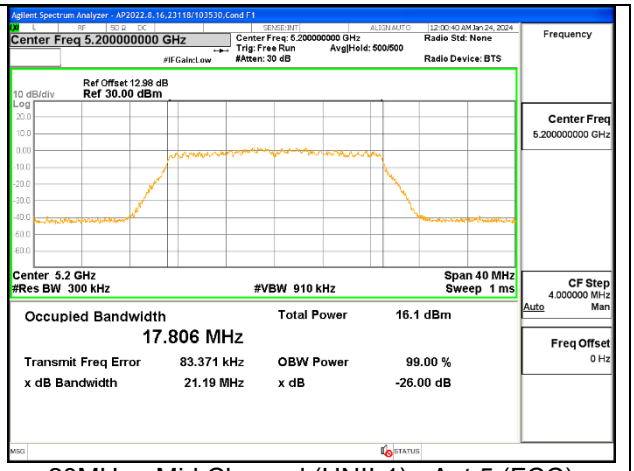
9.2.2. 802.11n/ac MIMO CDD MODE IN THE UNII-1 BAND

UNII-1 (MIMO CDD)	Frequency (MHz)	Channel Number	26 dB Bandwidth (MHz)			99% Bandwidth (MHz)		
			Ant 1	Ant 2	Min BW	Ant 1	Ant 2	Min BW
HT20 (FCC)	5180	36	22.29	22.01	--	18.0800	17.9820	--
	5200	40	21.25	21.19	--	17.9200	17.8060	--
	5240	48	21.08	20.98	--	17.8650	17.7950	--
HT40 (FCC)	5190	38	43.23	42.30	--	36.6500	36.4520	--
	5230	46	41.35	40.76	--	36.5180	36.3280	--
VHT80 (FCC)	5210	42	85.14	84.73	--	75.7950	75.8450	--
VHT160 (FCC)	5250 (Straddle)	50	164.40	164.30	--	154.8000	154.8000	--



20MHz - Mid Channel (UNII-1) - Ant 6 (FCC)



20MHz - Mid Channel (UNII-1) - Ant 5 (FCC)

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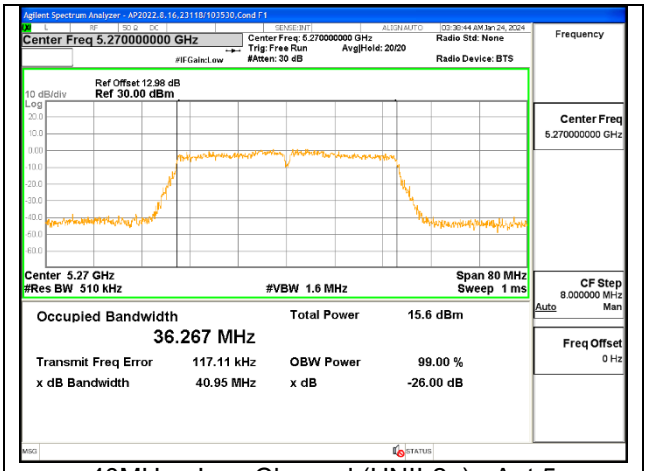
9.2.3. 802.11n/ac SISO MODE IN THE UNII-2A BAND

UNII-2a (SISO)	Frequency (MHz)	Channel Number	26 dB Bandwidth (MHz)		99% Bandwidth (MHz)	
			Ant 1	Ant 2	Ant 1	Ant 2
HT20	5260	52	20.98	20.85	17.7530	17.8160
	5300	60	20.99	21.20	17.7700	17.7070
	5320	64	21.21	20.84	17.9740	17.7880
HT40	5270	54	41.24	40.95	36.2070	36.2670
	5310	62	42.88	44.87	36.3330	36.4880
VHT80	5290	58	84.22	87.53	75.7770	75.9070
VHT160	5250 (Straddle)	50	164.20	164.70	154.7900	154.9500



40MHz - Low Channel (UNII-2a) - Ant 5

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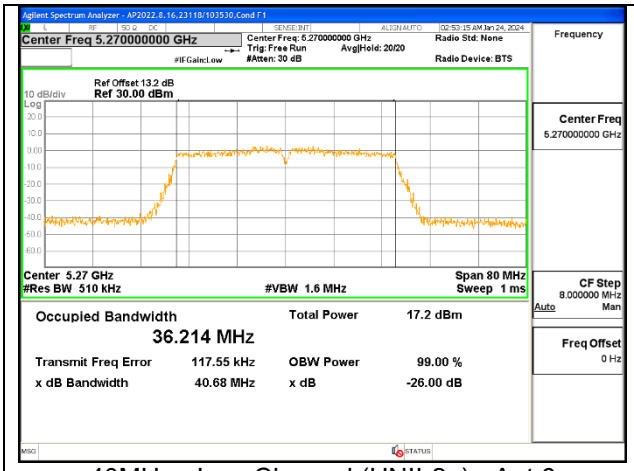
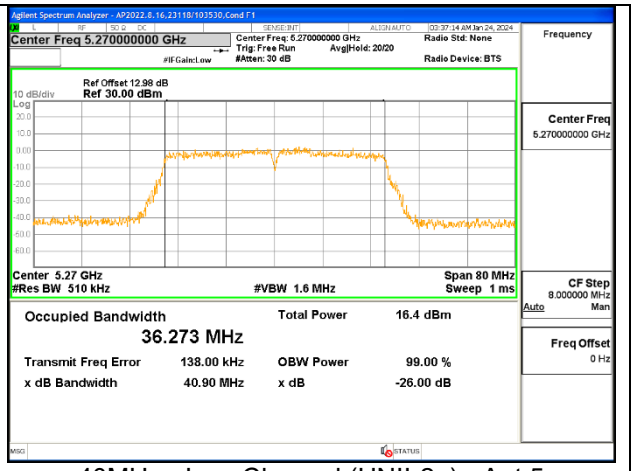
9.2.4. 802.11n/ac MIMO CDD MODE IN THE UNII-2A BAND

UNII-2a (MIMO CDD)	Frequency (MHz)	Channel Number	26 dB Bandwidth (MHz)			99% Bandwidth (MHz)		
			Ant 1	Ant 2	Min BW	Ant 1	Ant 2	Min BW
HT20	5260	52	21.14	20.55	20.55	17.8550	17.7440	17.7440
	5300	60	21.03	21.05	21.03	17.7620	17.7480	17.7480
	5320	64	21.27	21.29	21.27	17.9470	17.8160	17.8160
HT40	5270	54	40.68	40.90	40.68	36.2140	36.2730	36.2140
	5310	62	42.55	43.56	42.55	36.3200	36.2840	36.2840
VHT80	5290	58	85.40	85.34	85.34	75.8120	75.7660	75.7660
VHT160	5250 (Straddle)	50	164.40	164.30	164.30	154.8000	154.8000	154.8000



40MHz - Low Channel (UNII-2a) - Ant 6



40MHz - Low Channel (UNII-2a) - Ant 5

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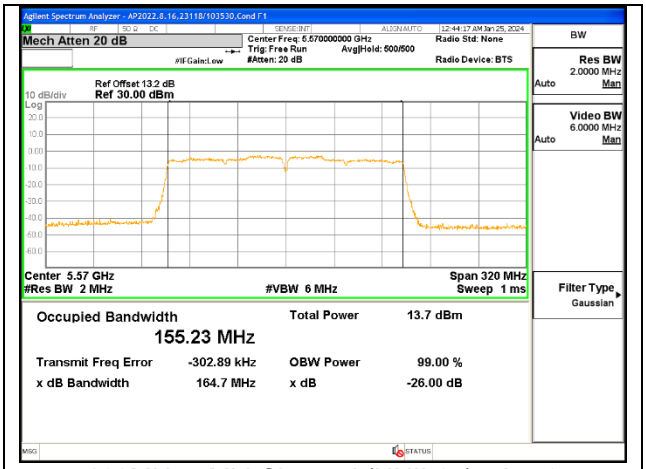
9.2.5. 802.11n/ac SISO MODE IN THE UNII-2C BAND

UNII-2c (SISO)	Frequency (MHz)	Channel Number	26 dB Bandwidth (MHz)		99% Bandwidth (MHz)	
			Ant 1	Ant 2	Ant 1	Ant 2
HT20	5500	100	22.12	21.87	18.0810	18.0640
	5580	116	21.13	21.18	17.9210	17.9130
	5700	140	23.53	24.82	18.0500	18.0880
	5720 (Straddle)	144	21.29	21.07	17.9230	17.8960
HT40	5510	102	45.01	44.34	36.6670	36.3740
	5550	110	41.52	41.52	36.4970	36.4570
	5670	134	43.70	42.16	36.6620	36.3270
	5710 (Straddle)	142	41.31	41.73	36.4640	36.4660
VHT80	5530	106	84.14	83.96	75.7860	75.8240
	5610	122	84.42	83.67	75.7620	75.8550
	5690 (Straddle)	138	81.71	81.44	75.8340	75.8230
VHT160	5570	114	164.70	165.00	155.2300	155.1100



160MHz - Mid Channel (UNII-2c) - Ant 6

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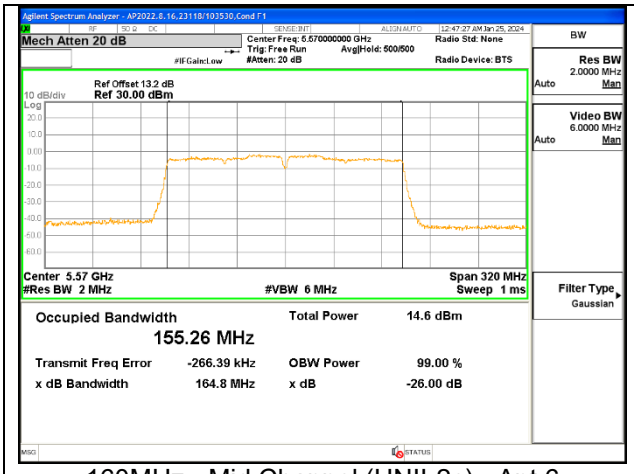
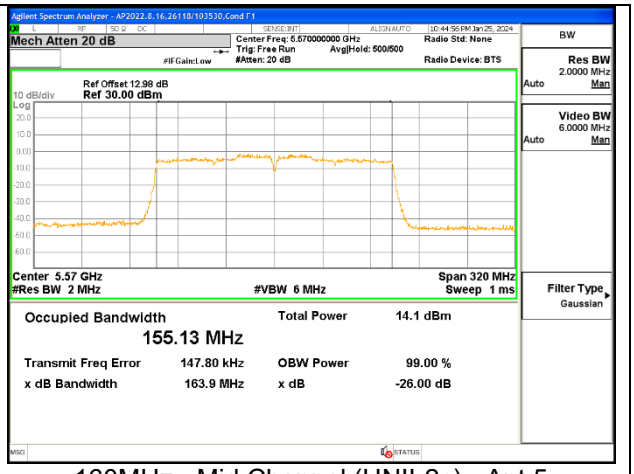
9.2.6. 802.11n/ac MIMO CDD MODE IN THE UNII-2C BAND

UNII-2c (MIMO CDD)	Frequency (MHz)	Channel Number	26 dB Bandwidth (MHz)			99% Bandwidth (MHz)		
			Ant 1	Ant 2	Min BW	Ant 1	Ant 2	Min BW
HT20	5500	100	22.15	22.57	22.15	18.0550	17.9840	17.9840
	5580	116	21.03	21.02	21.02	17.9200	17.8200	17.8200
	5700	140	21.99	22.35	21.99	18.0480	18.0010	18.0010
	5720 (Straddle)	144	21.21	21.11	21.11	17.8900	17.8020	17.8020
HT40	5510	102	43.93	42.76	42.76	36.6880	36.4940	36.4940
	5550	110	41.38	40.85	40.85	36.4500	36.3340	36.3340
	5670	134	44.60	42.19	42.19	36.6540	36.5090	36.5090
	5710 (Straddle)	142	41.80	40.72	40.72	36.4080	36.3070	36.3070
VHT80	5530	106	82.18	83.89	82.18	75.9120	75.8870	75.8870
	5610	122	82.96	81.22	81.22	75.8830	75.7730	75.7730
	5690 (Straddle)	138	81.84	80.81	80.81	75.7740	75.8500	75.7740
VHT160	5570	114	164.80	163.90	163.90	155.2600	155.1300	155.1300



160MHz - Mid Channel (UNII-2c) - Ant 6



160MHz - Mid Channel (UNII-2c) - Ant 5

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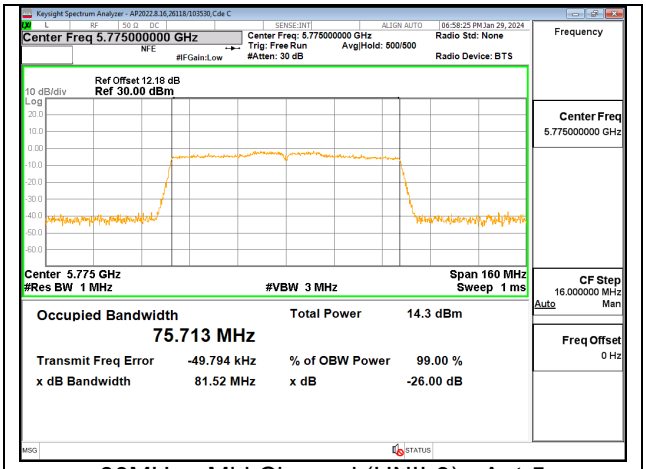
9.2.7. 802.11n/ac SISO MODE IN THE UNII-3 BAND

UNII-3 (SISO)	Frequency (MHz)	Channel Number	26 dB Bandwidth (MHz)		99% Bandwidth (MHz)	
			Ant 1	Ant 2	Ant 1	Ant 2
HT20	5745	149	21.12	21.18	17.9300	17.8790
	5785	157	20.97	21.13	17.8770	17.8780
	5825	165	21.28	21.21	17.8500	17.9020
HT40	5755	151	41.19	40.98	36.4160	36.3490
	5795	159	41.32	41.22	36.3750	36.4100
VHT80	5775	155	81.76	81.52	75.7570	75.7130



80MHz - Mid Channel (UNII-3) - Ant 5

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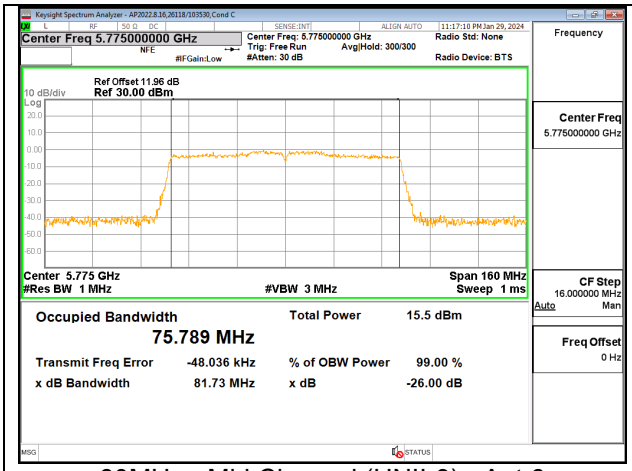
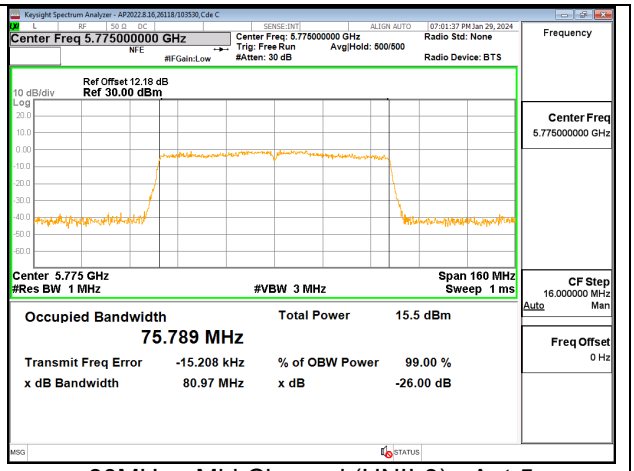
9.2.8. 802.11n/ac MIMO CDD MODE IN THE UNII-3 BAND

UNII-3 (MIMO CDD)	Frequency (MHz)	Channel Number	26 dB Bandwidth (MHz)		99% Bandwidth (MHz)	
			Ant 1	Ant 2	Ant 1	Ant 2
HT20	5745	149	21.22	20.64	17.8550	17.7700
	5785	157	21.05	21.01	17.8870	17.8340
	5825	165	20.88	20.79	17.8450	17.8240
HT40	5755	151	41.27	40.87	36.3990	36.3670
	5795	159	41.16	40.66	36.4440	36.3490
VHT80	5775	155	81.73	80.97	75.7890	75.7890



80MHz - Mid Channel (UNII-3) - Ant 6



80MHz - Mid Channel (UNII-3) - Ant 5

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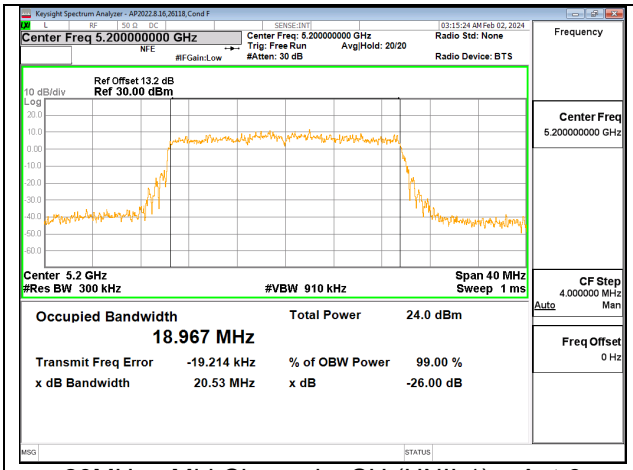
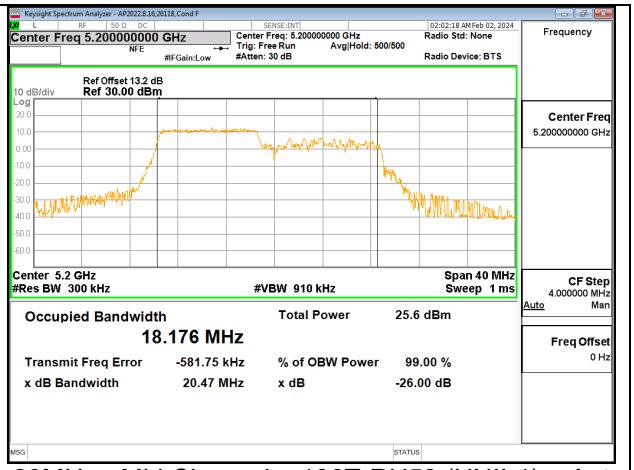
9.2.9. 802.11be SISO MODE IN THE UNII-1 BAND

UNII-1 (SISO)	Frequency (MHz)	Channel Number	Tone	RU Index	26 dB Bandwidth (MHz)		99% Bandwidth (MHz)	
					Ant 1	Ant 2	Ant 1	Ant 2
EHT20 (FCC)	5180	36	SU	--	22.91	21.41	18.9930	19.0300
			106T	53	20.73	20.59	18.2120	18.2690
				54	20.81	20.91	18.2410	18.3230
	5200	40	SU	--	20.53	21.17	18.9670	19.0120
			106T	53	20.47	20.67	18.1760	18.2030
				54	20.84	20.70	18.2880	18.2490
	5240	48	SU	--	21.13	20.71	18.9400	18.9880
			106T	53	20.44	20.70	18.2080	18.2180
				54	20.84	20.90	18.2690	18.3460
EHT40 (FCC)	5190	38	SU	--	43.42	42.02	37.9420	37.9860
			242T	61	30.99	29.05	19.5410	19.3220
				62	28.41	26.28	19.5340	19.2520
			106T	53	21.04	23.13	17.7530	18.0290
				54	26.59	27.35	20.4610	19.7140
				56	24.33	22.61	18.3180	18.2610
	5230	46	SU	--	41.04	41.24	37.8810	37.9250
			242T	61	32.40	30.39	19.6610	19.2900
				62	28.43	27.99	19.2950	19.3560
			106T	53	22.71	20.71	18.1230	17.8270
				54	28.34	25.66	20.3180	19.8860
				56	24.43	24.12	18.4330	18.2140
EHT80 (FCC)	5210	42	SU	--	83.27	85.33	77.1880	77.1490
			242T	61	28.33	25.75	19.2100	19.1750
				62	28.91	29.10	19.3770	19.2320
				64	27.39	28.34	19.1170	19.1610
EHT160 (FCC)	5250 (Straddle)	50	SU	--	163.60	165.00	156.2700	156.1800
			242T	61	29.73	29.88	20.4100	20.3460
				62	32.52	31.23	19.9790	19.7910
				S64	27.75	27.26	19.7810	19.9220



20MHz - Mid Channel – SU (UNII-1) – Ant 6



20MHz - Mid Channel – 106T-RU53 (UNII-1) – Ant 6

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9.2.10. 802.11be MIMO CDD MODE IN THE UNII-1 BAND

UNII-1 (MIMO CDD)	Frequency (MHz)	Channel Number	Tone	RU Index	26 dB Bandwidth (MHz)			99% Bandwidth (MHz)		
					Ant 1	Ant 2	Min BW	Ant 1	Ant 2	Min BW
EHT20 (FCC)	5180	36	SU	--	24.90	21.80	--	18.9660	19.0190	--
			106T	53	20.74	20.05	--	18.0330	18.0830	--
				54	20.89	20.06	--	18.3070	18.0430	--
	5200	40	SU	--	20.84	21.00	--	18.9210	18.9330	--
			106T	53	20.72	20.23	--	18.1470	18.0860	--
				54	20.90	20.23	--	18.3090	18.0760	--
	5240	48	SU	--	20.99	20.86	--	18.8940	18.9770	--
			106T	53	20.42	19.95	--	18.0350	18.0210	--
				54	20.74	19.97	--	18.0820	18.0640	--
EHT40 (FCC)	5190	38	SU	--	41.89	42.60	--	37.9470	37.9130	--
			242T	61	31.61	29.51	--	19.5840	19.4180	--
				62	29.14	26.93	--	19.6520	19.2560	--
			106T	53	19.29	19.69	--	18.1170	17.8550	--
				54	26.56	25.65	--	20.4480	19.3010	--
				56	24.16	20.01	--	18.2270	17.7800	--
	5230	46	SU	--	39.90	40.62	--	37.8720	37.9090	--
			242T	61	27.78	27.50	--	19.3180	19.3320	--
				62	28.71	26.85	--	19.5240	19.1990	--
			106T	53	22.36	19.72	--	18.1120	17.7750	--
				54	27.33	26.15	--	20.2940	19.5620	--
				56	24.09	20.35	--	18.4340	17.8790	--
EHT80 (FCC)	5210	42	SU	--	84.85	84.75	--	77.3690	77.3180	--
			242T	61	27.88	26.89	--	19.2430	19.0950	--
				62	33.06	32.38	--	19.4600	19.6060	--
				64	26.51	24.96	--	19.0290	18.9480	--
EHT160 (FCC)	5250 (Straddle)	50	SU	--	162.8	163.7	--	156.41	156.47	--
			242T	61	27.61	30.1	--	20.473	19.844	--
				62	30.57	30.05	--	19.861	19.672	--
				S64	28.98	29.75	--	20.096	19.674	--

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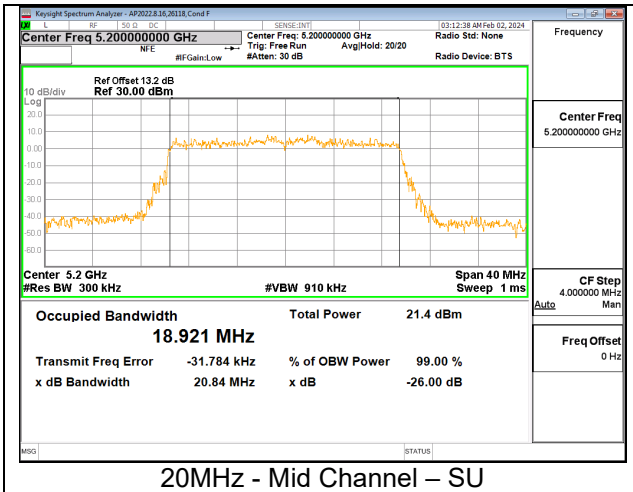
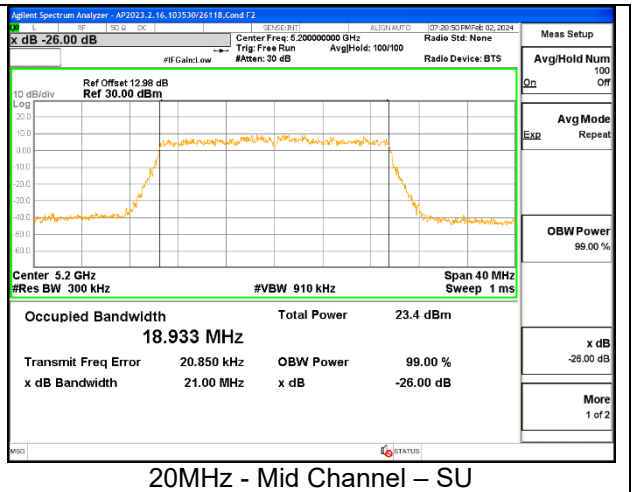
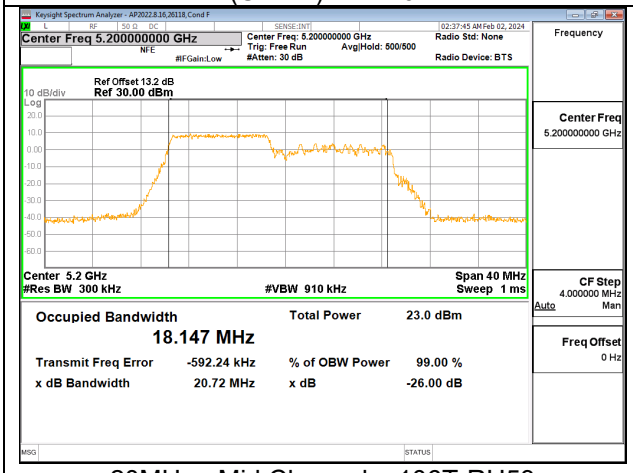


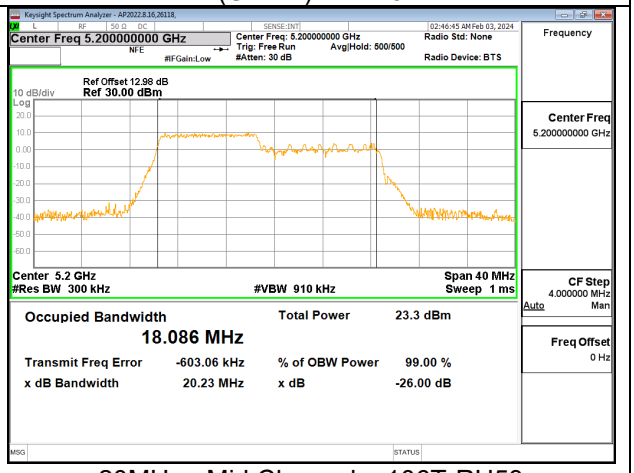
20MHz - Mid Channel – SU
(UNII-1) – Ant 6



20MHz - Mid Channel – SU
(UNII-1) – Ant 5



20MHz - Mid Channel – 106T-RU53
(UNII-1) – Ant 6



20MHz - Mid Channel – 106T-RU53
(UNII-1) – Ant 5

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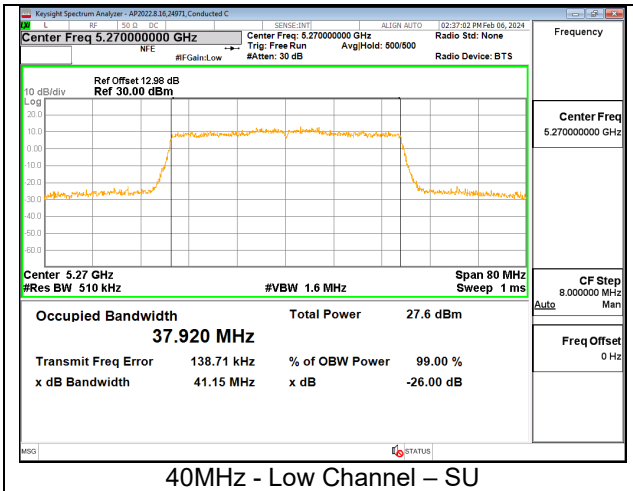
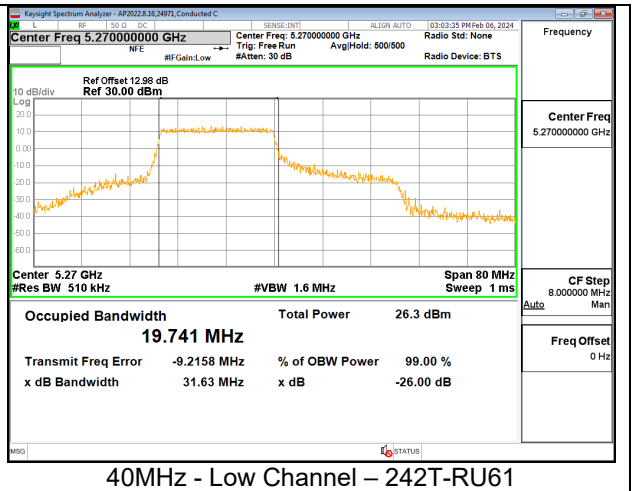
9.2.11. 802.11be SISO MODE IN THE UNII-2A BAND

UNII-2a (SISO)	Frequency (MHz)	Channel Number	Tone	RU Index	26 dB Bandwidth (MHz)		99% Bandwidth (MHz)	
					Ant 1	Ant 2	Ant 1	Ant 2
EHT20	5260	52	SU	--	20.80	20.95	18.9670	18.9490
			106T	53	20.64	20.66	18.1280	18.2450
				54	20.93	21.01	18.3210	18.3060
	5300	60	SU	--	21.13	20.98	18.9980	19.0070
			106T	53	20.58	20.58	17.9110	18.1830
				54	20.91	20.92	18.2670	18.3660
	5320	64	SU	--	21.33	22.29	19.0070	18.9140
			106T	53	19.99	20.76	18.2270	18.2330
				54	20.96	20.94	18.3160	18.3210
EHT40	5270	54	SU	--	41.24	41.15	37.9360	37.9200
			242T	61	30.47	31.63	20.0200	19.7410
				62	29.47	28.84	19.4980	19.7550
			52T	37	19.94	19.92	18.0330	18.0300
				41	23.84	24.83	20.1840	19.8830
				44	21.43	21.36	18.1270	18.0690
	5310	62	SU	--	43.52	43.07	38.0110	37.8850
			242T	61	31.21	29.32	19.3700	19.5870
				62	30.54	30.60	19.6190	19.6610
			52T	37	19.90	19.71	18.0040	18.0740
				41	23.73	22.92	20.0230	20.0020
				44	20.52	21.41	18.0870	18.3760
EHT80	5290	58	SU	--	84.32	82.33	77.1900	77.3060
			484T	65	46.70	45.18	37.8030	37.7960
				66	47.95	47.27	37.9110	37.7830
EHT160	5250 (Straddle)	50	SU	--	163.60	165.00	156.2700	156.1800
			242T	61	29.73	29.88	20.4100	20.3460
				62	32.52	31.23	19.9790	19.7910
				S64	27.75	27.26	19.7810	19.2200



40MHz - Low Channel – SU (UNII-2a) – Ant 5



40MHz - Low Channel – 242T-RU61 (UNII-2a) – Ant 5

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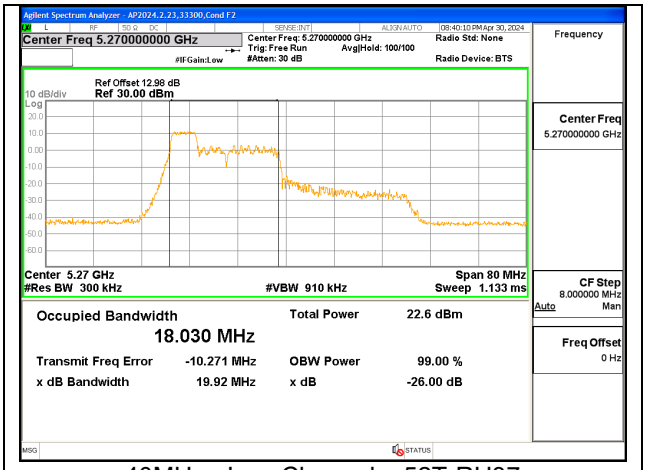

40MHz - Low Channel – 52T-RU37
(UNII-2a) – Ant 5

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9.2.12. 802.11be MIMO CDD MODE IN THE UNII-2A BAND

UNII-2a (MIMO CDD)	Frequency (MHz)	Channel Number	Tone	RU Index	26 dB Bandwidth (MHz)			99% Bandwidth (MHz)		
					Ant 1	Ant 2	Min BW	Ant 1	Ant 2	Min BW
EHT20	5260	52	SU	--	21.02	20.85	20.85	18.9820	18.9390	18.9390
			106T	53	20.53	20.04	20.04	18.0840	18.1470	18.0840
				54	20.95	20.08	20.08	18.2810	18.0710	18.0710
	5300	60	SU	--	21.12	21.03	21.03	18.9680	18.9440	18.9440
			106T	53	20.46	20.09	20.09	18.2130	18.1110	18.1110
				54	20.85	20.12	20.12	18.2550	18.0390	18.0390
	5320	64	SU	--	22.59	21.33	21.33	19.0360	19.0090	19.0090
			106T	53	20.65	19.72	19.72	18.2380	18.0630	18.0630
				54	20.68	20.03	20.03	18.0920	18.0490	18.0490
EHT40	5270	54	SU	--	41.10	40.96	40.96	37.8760	37.8630	37.8630
			242T	61	29.29	26.88	26.88	19.5170	19.4460	19.4460
				62	28.21	25.48	25.48	19.6990	19.2010	19.2010
			52T	37	19.85	19.50	19.50	18.0380	17.8290	17.8290
				41	24.87	22.93	22.93	20.0900	19.4290	19.4290
				44	21.18	19.53	19.53	17.9980	17.7600	17.7600
	5310	62	SU	--	42.40	42.58	42.40	37.9790	37.8950	37.8950
			242T	61	29.95	28.36	28.36	19.5390	19.4410	19.4410
				62	28.09	28.38	28.09	19.8200	19.4190	19.4190
			52T	37	19.83	19.65	19.65	17.9880	17.8020	17.8020
				41	23.59	22.71	22.71	19.3970	19.3060	19.3060
				44	21.53	19.60	19.60	18.1900	17.8780	17.8780
EHT80	5290	58	SU	--	81.20	83.10	81.20	77.1210	77.1790	77.1210
			484T	65	45.30	42.99	42.99	37.8490	37.8680	37.8490
				66	46.40	43.18	43.18	37.8320	37.8580	37.8320
EHT160	5250 (Straddle)	50	SU	--	162.8	163.7	162.8	156.41	156.47	156.41
			242T	61	25.39	26.61	25.39	19.129	20.575	19.129
				62	28.84	27.63	27.63	19.173	19.112	19.112
				S64	26.98	25.68	25.68	19.123	18.995	18.995

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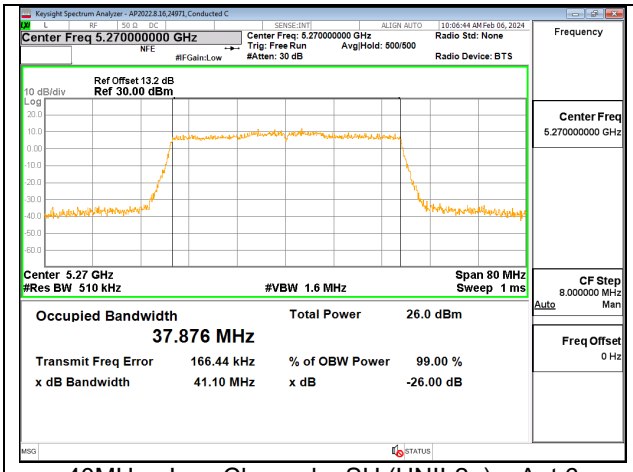
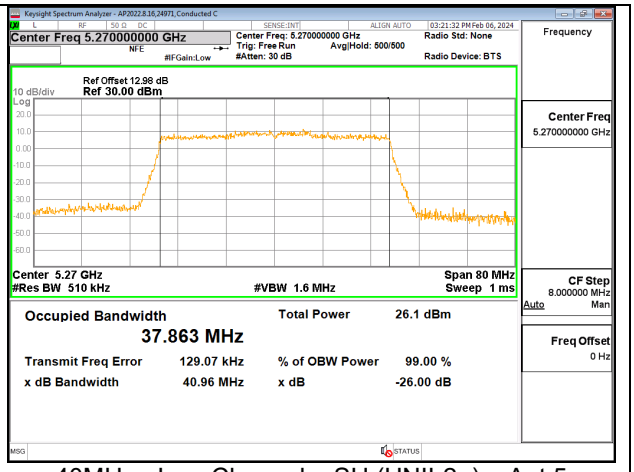
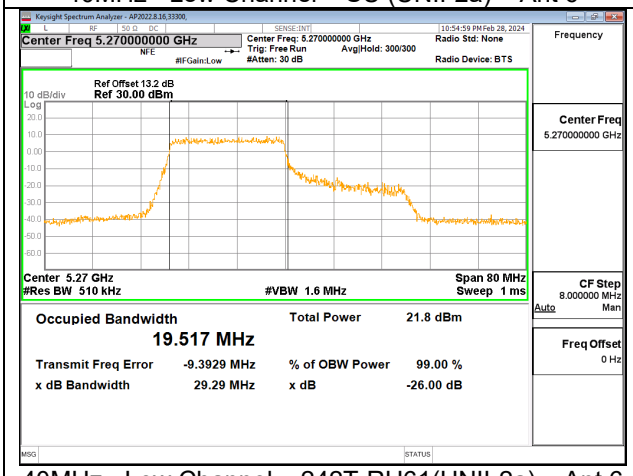


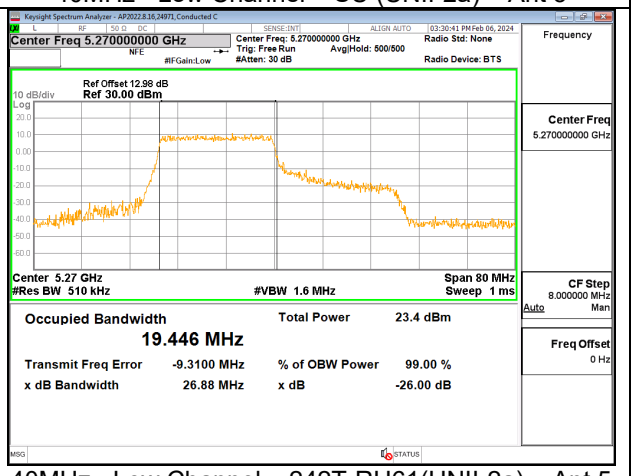
40MHz - Low Channel – SU (UNII-2a) – Ant 6



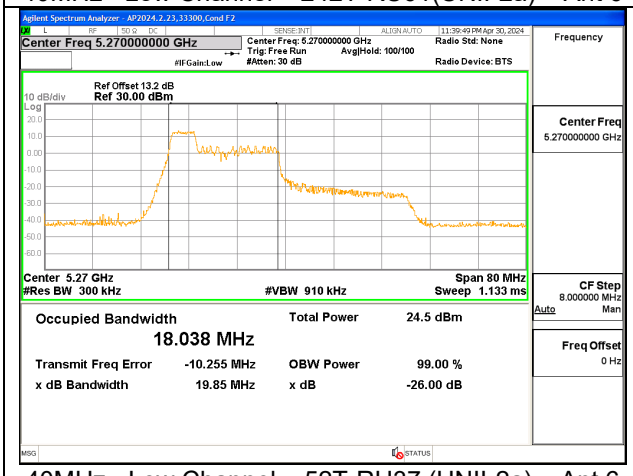
40MHz - Low Channel – SU (UNII-2a) – Ant 5



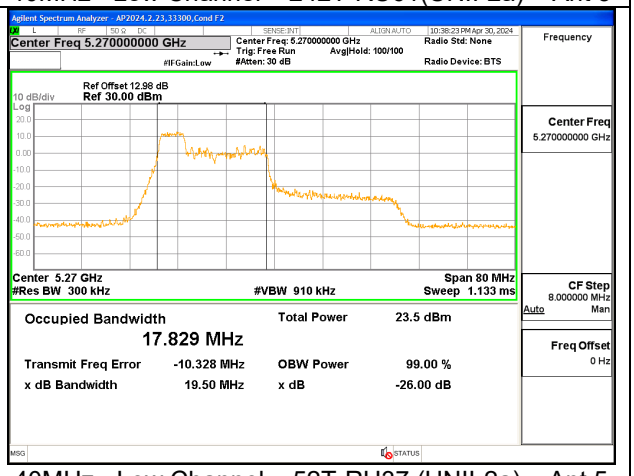
40MHz - Low Channel – 242T-RU61(UNII-2a) – Ant 6



40MHz - Low Channel – 242T-RU61(UNII-2a) – Ant 5



40MHz - Low Channel – 52T-RU37 (UNII-2a) – Ant 6



40MHz - Low Channel – 52T-RU37 (UNII-2a) – Ant 5

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9.2.13. 802.11be SISO MODE IN THE UNII-2C BAND

UNII-2c (SISO)	Frequency (MHz)	Channel Number	Tone	RU Index	26 dB Bandwidth (MHz)		99% Bandwidth (MHz)	
					Ant 1	Ant 2	Ant 1	Ant 2
EHT20	5500	100	SU	--	22.29	22.72	19.0350	19.0060
			106T	53	20.62	20.69	18.1790	18.2290
				54	20.83	21.06	18.3000	18.3180
	5580	116	SU	--	21.06	21.00	18.9790	19.0260
			106T	53	20.62	20.67	18.2400	18.1820
				54	21.00	20.97	18.3210	18.3070
	5700	140	SU	--	22.42	20.85	19.0170	19.0010
			106T	53	20.90	20.75	18.2000	18.2270
				54	20.92	20.76	18.3070	18.2720
	5720 (Straddle)	144	SU	--	21.41	21.07	18.9520	18.9810
			106T	53	20.66	20.74	18.1980	18.2070
				54	20.62	20.87	18.2380	18.3120
EHT40	5510	102	SU	--	41.11	42.28	37.8940	37.9230
			242T	61	31.24	30.74	19.6100	19.7410
				62	32.08	29.24	19.6290	19.5380
			52T	37	19.82	19.93	18.0130	18.0760
				41	23.42	24.42	19.8870	19.7780
				44	21.32	21.18	18.1020	18.1400
	5550	110	SU	--	40.95	41.36	37.8680	37.8460
			242T	61	31.39	30.89	19.7420	19.4390
				62	32.19	27.91	19.5290	19.6690
			52T	37	19.87	19.89	18.0160	18.0120
				41	24.10	24.33	20.2360	19.7710
				44	21.40	20.56	18.0650	18.0660
	5670	134	SU	--	44.25	41.22	37.9260	37.8950
			242T	61	33.14	29.46	19.6020	19.7090
				62	29.61	30.55	19.5310	19.5910
			52T	37	19.99	19.97	18.0280	17.9940
				41	24.02	24.30	20.0820	20.1670
				44	21.03	21.48	18.1340	18.0890
	5710 (Straddle)	142	SU	--	41.27	41.09	37.8180	37.8390
			242T	61	29.22	29.87	19.6430	19.5580
				62	29.72	28.20	19.6250	19.5140
			52T	37	20.06	19.64	18.0370	17.9630
				41	24.94	24.19	19.9360	20.0210
				44	21.08	21.70	18.1760	18.1250
EHT80	5530	106	SU	--	84.99	84.29	77.4000	77.2530
			484T	65	46.92	46.47	38.1200	38.1750
				66	56.18	54.42	38.3250	38.2350
	5610	122	SU	--	81.21	83.94	77.2640	77.3110
			484T	65	44.35	45.95	38.1210	38.0960
				66	54.48	54.10	38.6480	38.1560
	5690 (Straddle)	138	SU	--	81.72	82.24	77.1550	77.3040
			484T	65	46.38	48.03	38.2360	38.1550
				66	53.32	50.30	38.5140	38.6280
EHT160	5570	106	SU	--	163.20	165.10	156.4100	156.4000
			242T	61	27.43	28.48	19.6370	19.5950
				62	32.89	30.66	19.6170	19.9020
				S64	30.33	26.85	20.0380	19.5490

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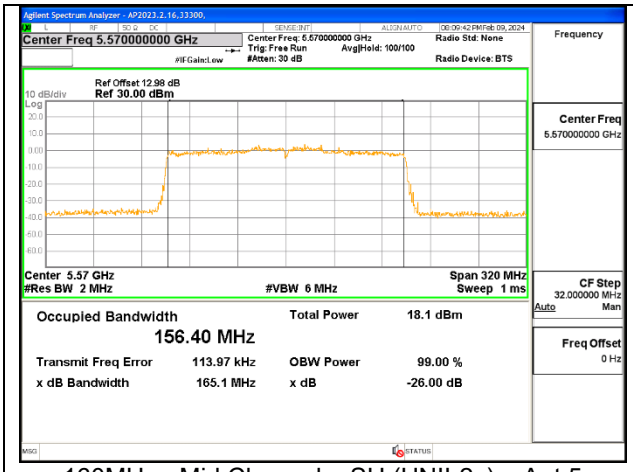
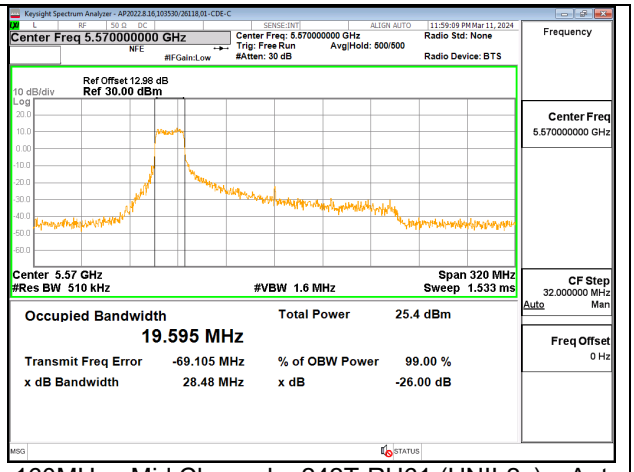


160MHz - Mid Channel – SU (UNII-2c) – Ant 5



160MHz - Mid Channel – 242T-RU61 (UNII-2c) – Ant 5

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9.2.14. 802.11be MIMO CDD MODE IN THE UNII-2C BAND

UNII-2c (MIMO CDD)	Frequency (MHz)	Channel Number	Tone	RU Index	26 dB Bandwidth (MHz)			99% Bandwidth (MHz)		
					Ant 1	Ant 2	Min BW	Ant 1	Ant 2	Min BW
EHT20	5500	100	SU	--	21.87	21.12	21.12	19.0470	19.0060	19.0060
			106T	53	20.34	19.54	19.54	18.2200	18.0730	18.0730
				54	20.76	19.94	19.94	18.2010	18.0670	18.0670
	5580	116	SU	--	21.08	20.91	20.91	18.9810	18.9630	18.9630
			106T	53	20.69	20.05	20.05	18.2020	18.1200	18.1200
				54	20.94	19.98	19.98	18.3060	17.9810	17.9810
	5700	140	SU	--	22.68	22.74	22.68	19.0010	19.0280	19.0010
			106T	53	20.62	19.68	19.68	18.1410	18.0580	18.0580
				54	20.79	19.92	19.92	18.2250	18.0260	18.0260
	5720 (Straddle)	144	SU	--	21.16	20.86	20.86	18.9420	19.0010	18.9420
			106T	53	20.68	20.03	20.03	17.9520	18.1080	17.9520
				54	20.94	19.90	19.90	18.0990	18.0790	18.0790
EHT40	5510	102	SU	--	41.34	44.51	41.34	37.8740	37.8970	37.8740
			242T	61	29.26	29.57	29.26	19.6040	19.4310	19.4310
				62	29.10	27.29	27.29	19.5940	19.2720	19.2720
			52T	37	19.95	19.54	19.54	18.0750	17.6380	17.6380
				41	23.83	22.25	22.25	20.1340	19.3640	19.3640
				44	21.51	19.65	19.65	18.1660	17.8360	17.8360
	5550	110	SU	--	41.08	41.10	41.08	37.8510	37.9020	37.8510
			242T	61	33.16	29.56	29.56	19.7060	19.4500	19.4500
				62	30.77	27.57	27.57	19.5530	19.1820	19.1820
			52T	37	19.73	19.60	19.60	18.1020	17.8110	17.8110
				41	23.69	21.95	21.95	20.2870	19.3820	19.3820
				44	20.98	19.48	19.48	18.0480	17.8790	17.8790
	5670	134	SU	--	41.84	42.56	41.84	37.8950	37.9160	37.8950
			242T	61	31.65	29.03	29.03	19.7120	19.5370	19.5370
				62	30.54	27.67	27.67	19.5610	19.2330	19.2330
			52T	37	20.00	19.76	19.76	18.0070	17.8460	17.8460
				41	24.70	22.60	22.60	20.1200	19.5190	19.5190
				44	21.35	19.66	19.66	18.1640	17.8500	17.8500
	5710 (Straddle)	142	SU	--	40.97	41.28	40.97	37.8440	37.8670	37.8440
			242T	61	34.17	26.77	26.77	19.7660	19.3000	19.3000
				62	30.32	26.98	26.98	19.5010	19.4670	19.4670
			52T	37	19.97	19.63	19.63	18.0190	17.7960	17.7960
				41	23.89	22.74	22.74	19.8720	19.5090	19.5090
				44	21.04	19.61	19.61	18.1830	17.5260	17.5260
EHT80	5530	106	SU	--	85.39	85.51	85.39	77.3720	77.2650	77.2650
			484T	65	47.81	38.35	38.35	38.1800	38.1870	38.1800
				66	48.32	45.61	45.61	38.2220	38.2870	38.2220
	5610	122	SU	--	85.58	84.53	84.53	77.2440	77.1660	77.1660
			484T	65	50.14	50.06	50.06	38.2220	38.3700	38.2220
				66	53.97	52.55	52.55	38.1750	38.3950	38.1750
	5690 (Straddle)	138	SU	--	81.64	81.18	81.18	77.3990	77.4030	77.3990
			484T	65	46.99	47.67	46.99	38.2660	38.0960	38.0960
				66	48.79	49.63	48.79	38.1820	38.3280	38.1820
EHT160	5570	106	SU	--	163.9	162.7	162.7	156.42	156.4	156.4
			242T	61	28.89	25.27	25.27	19.989	19.044	19.044
				62	30.66	32.05	30.66	19.841	19.634	19.634
				S64	27.1	24.52	24.52	19.859	19.094	19.094

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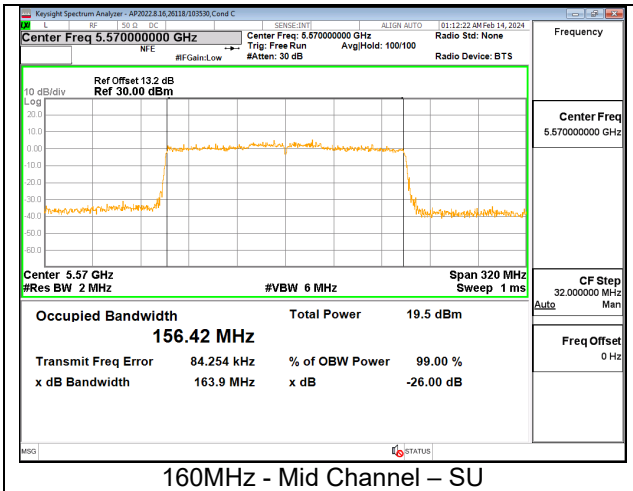
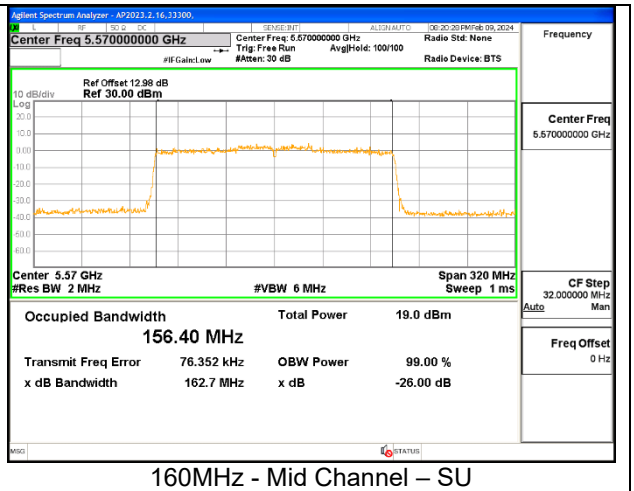
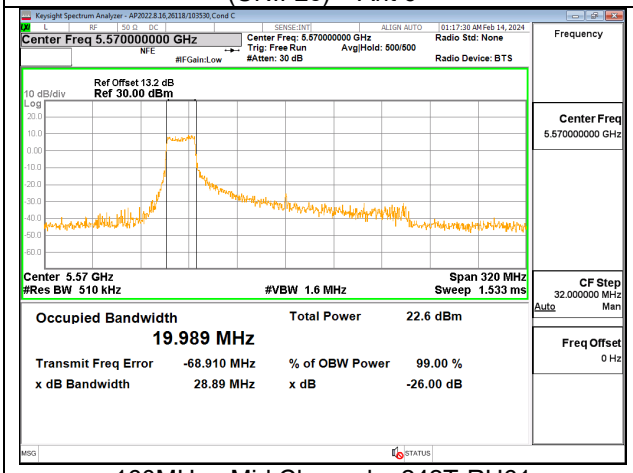


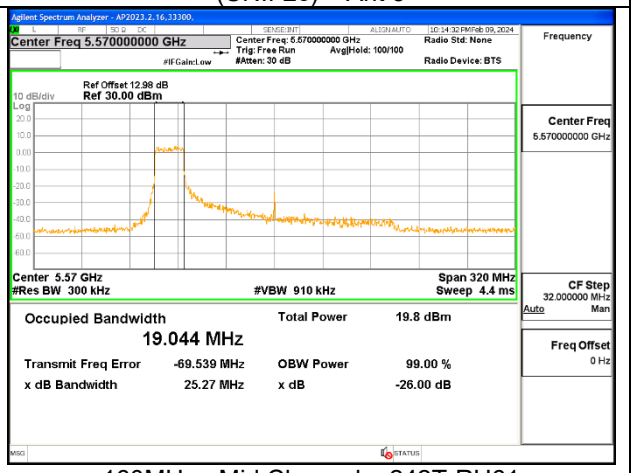
160MHz - Mid Channel – SU (UNII-2c) – Ant 6



160MHz - Mid Channel – SU (UNII-2c) – Ant 5



160MHz - Mid Channel – 242T-RU61 (UNII-2c) – Ant 6



160MHz - Mid Channel – 242T-RU61 (UNII-2c) – Ant 5

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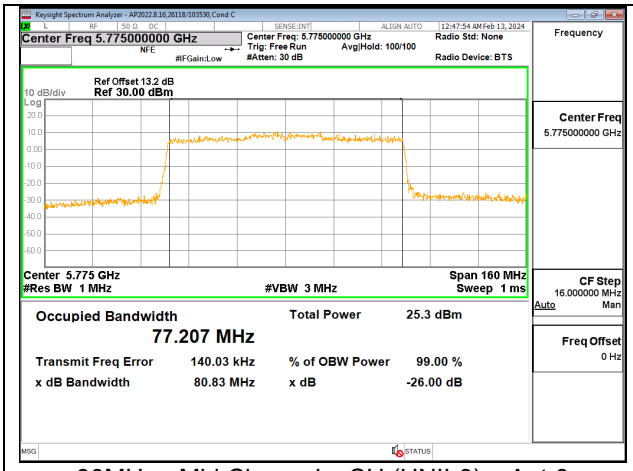
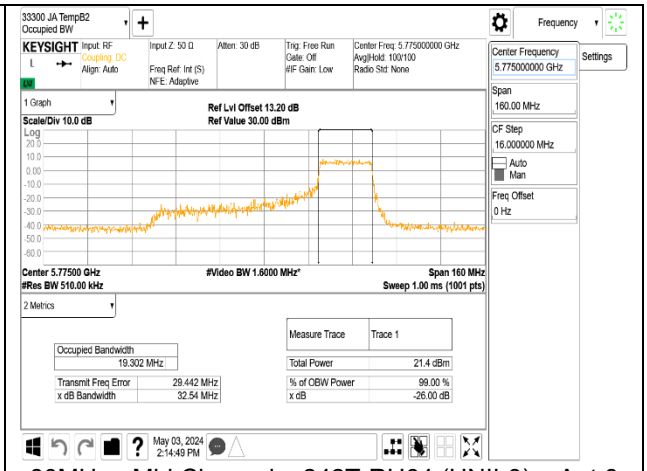
9.2.15. 802.11be SISO MODE IN THE UNII-3 BAND

UNII-3 (SISO)	Frequency (MHz)	Channel Number	Tone	RU Index	26 dB Bandwidth (MHz)		99% Bandwidth (MHz)	
					Ant 1	Ant 2	Ant 1	Ant 2
EHT20	5745	149	SU	--	21.14	20.91	18.9380	18.9870
			106T	53	20.72	20.34	18.2030	18.2400
				54	20.99	20.60	18.2460	18.2830
	5785	157	SU	--	21.34	21.34	19.0000	18.9570
			106T	53	20.72	20.77	18.2400	18.2210
				54	20.78	20.99	18.3210	18.3220
	5825	165	SU	--	20.99	20.88	18.9980	18.9520
			106T	53	20.62	20.34	18.2500	18.2220
				54	20.92	21.09	18.2630	18.3410
EHT40	5755	151	SU	--	40.92	41.26	37.8840	37.9340
			242T	61	29.56	29.02	19.5170	19.2780
				62	31.25	29.57	19.8300	19.3200
	5795	159	SU	--	40.89	40.78	37.8010	37.8310
			242T	61	29.71	27.93	19.6800	19.3500
				62	30.72	27.50	19.7720	19.2260
EHT80	5775	155	SU	--	80.83	81.77	77.2070	77.2580
			242T	61	28.23	31.64	19.3890	19.6910
				62	31.36	32.60	19.5230	19.5690
				64	32.54	31.59	19.3020	19.3960



80MHz - Mid Channel – SU (UNII-3) – Ant 6



80MHz - Mid Channel – 242T-RU64 (UNII-3) – Ant 6

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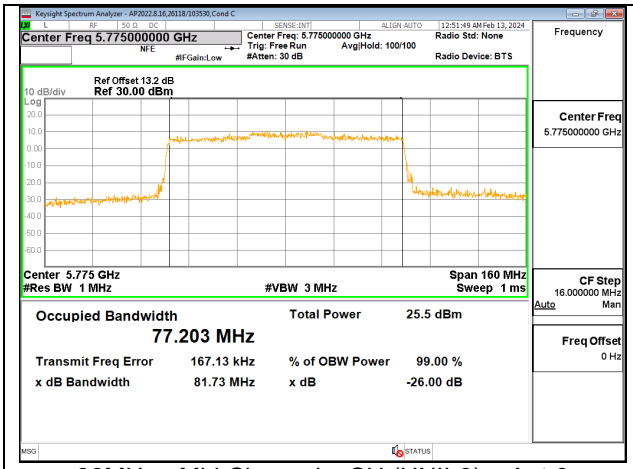
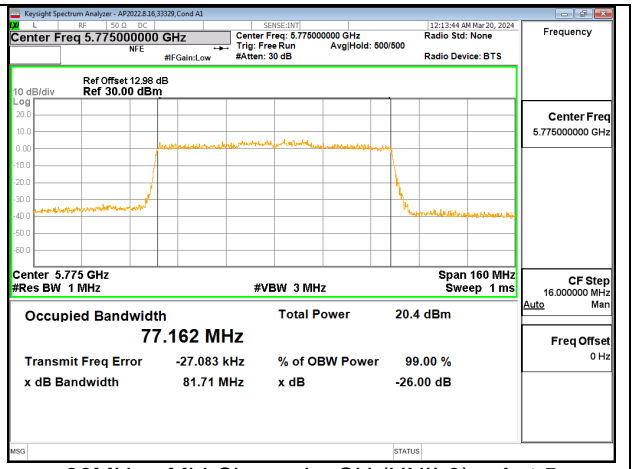
9.2.16. 802.11be MIMO CDD MODE IN THE UNII-3 BAND

UNII-3 (MIMO CDD)	Frequency (MHz)	Channel Number	Tone	RU Index	26 dB Bandwidth (MHz)		99% Bandwidth (MHz)	
					Ant 1	Ant 2	Ant 1	Ant 2
EHT20	5745	149	SU	--	20.93	20.94	19.0000	18.9870
			106T	53	21.33	19.85	18.2290	18.1120
				54	21.10	20.19	18.3470	18.0860
	5785	157	SU	--	20.86	20.90	18.9990	18.9290
			106T	53	21.26	20.06	18.2090	17.9510
				54	20.94	20.15	18.3780	18.0730
	5825	165	SU	--	20.94	21.03	18.9750	19.0110
			106T	53	20.30	19.69	18.1810	18.0670
				54	20.93	19.98	18.1980	18.0080
EHT40	5755	151	SU	--	41.16	41.23	37.7980	37.8620
			242T	61	28.91	28.83	19.3020	19.3400
				62	32.34	28.31	19.4310	19.4290
	5795	159	SU	--	40.93	40.93	37.8070	37.8690
			242T	61	30.56	27.85	19.4720	19.4380
				62	31.74	26.93	19.7850	19.4690
EHT80	5775	155	SU	--	81.73	81.71	77.2030	77.1620
			242T	61	28.60	26.54	19.2480	19.3010
				62	31.31	31.41	19.5440	19.4550
				64	27.55	26.94	19.4300	19.3990



80MHz - Mid Channel – SU (UNII-3) – Ant 6



80MHz - Mid Channel – SU (UNII-3) – Ant 5

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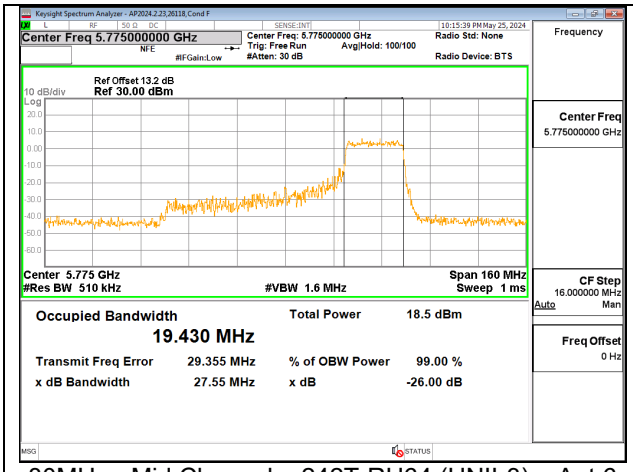
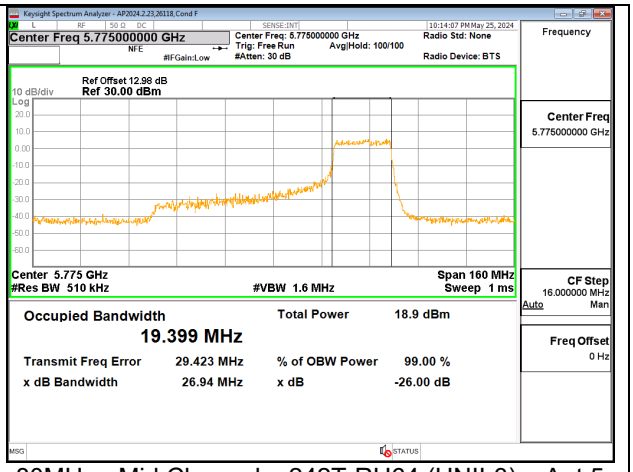


80MHz - Mid Channel – 242T-RU64 (UNII-3) – Ant 6



80MHz - Mid Channel – 242T-RU64 (UNII-3) – Ant 5

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9.3. BANDWIDTH VERIFICATION OF CHANNEL PUNCTUIRNG IN THE DFS BANDS

LIMITS

When a 20 MHz portion is punctured the remaining emissions do not bleed into the notched channel.

For Channel Puncturing, investigation was performed on the following :

Bandwidth	RU Size
80MHz	484+242
160MHz	996+484
	996+484+242

RESULTS

The 99% Occupied Bandwidth are contained outside of the notched band.

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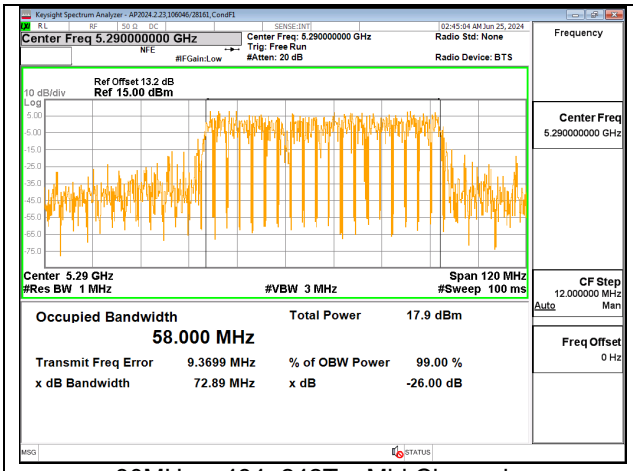
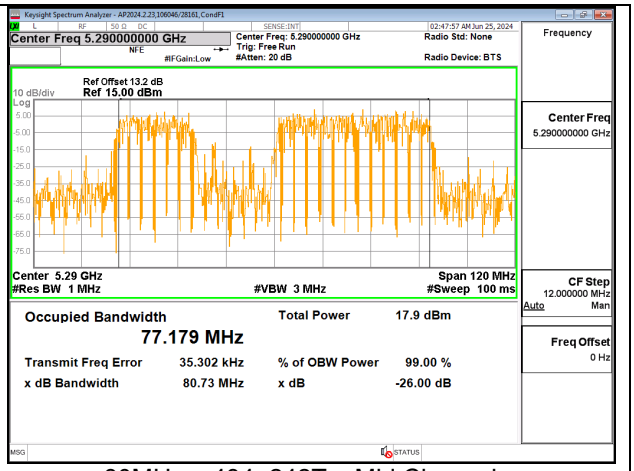
9.3.1. 802.11be EHT80 SISO MODE

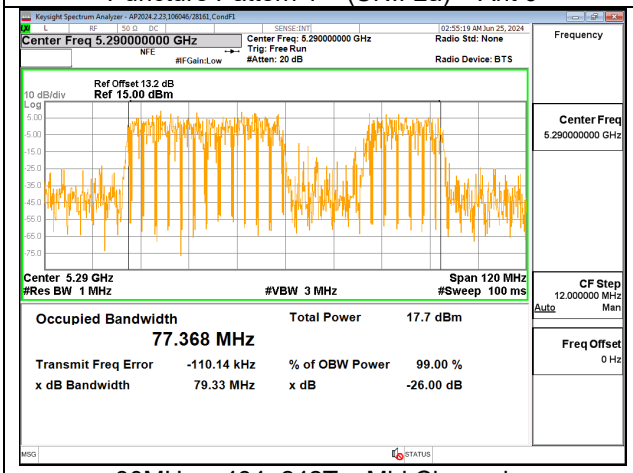
ID:	106046/28161	Date:	06/25/2024



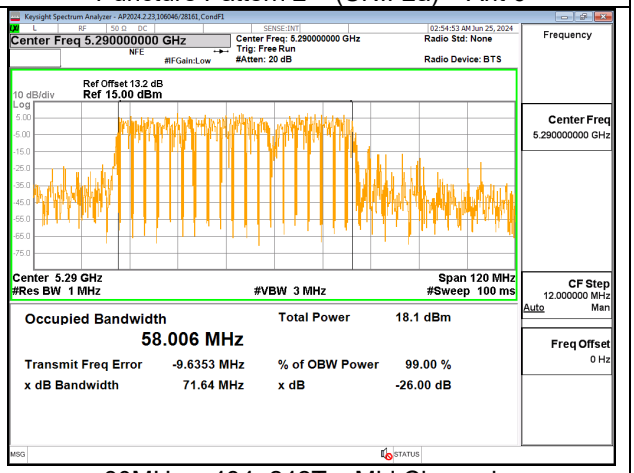
80MHz – 484+242T – Mid Channel – Puncture Pattern 1 – (UNII-2a) – Ant 6



80MHz – 484+242T – Mid Channel – Puncture Pattern 2 – (UNII-2a) – Ant 6



80MHz – 484+242T – Mid Channel – Puncture Pattern 4 – (UNII-2a) – Ant 6



80MHz – 484+242T – Mid Channel – Puncture Pattern 8 – (UNII-2a) – Ant 6

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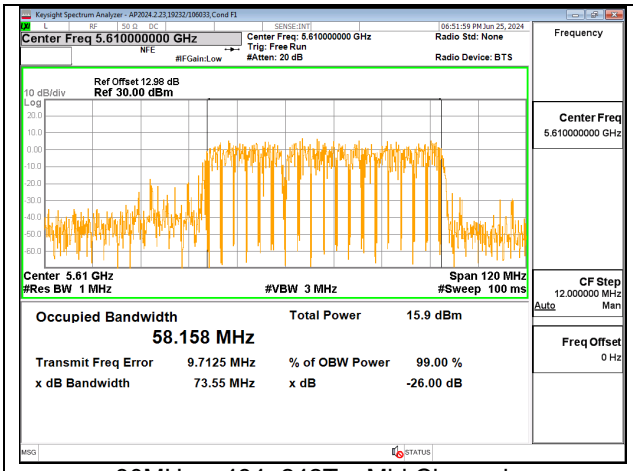
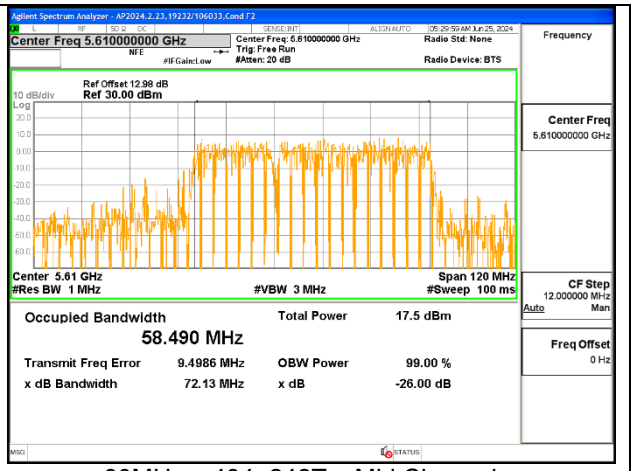
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888

9.3.2. 802.11be EHT80 MIMO CDD MODE

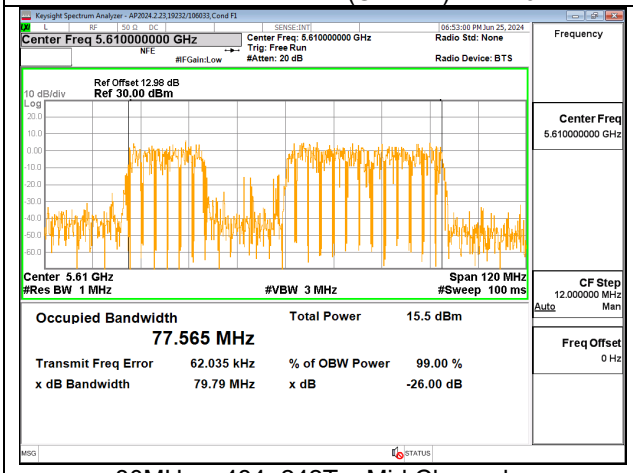
ID:	19232/106033	Date:	06/25/2024



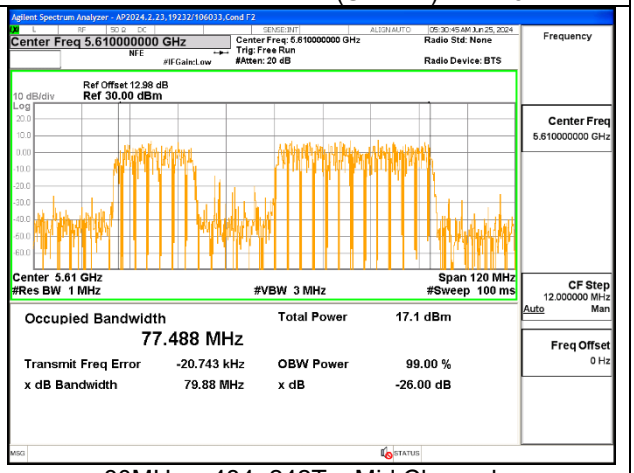
80MHz – 484+242T – Mid Channel – Puncture Pattern 1 – (UNII-2c) – Ant 6



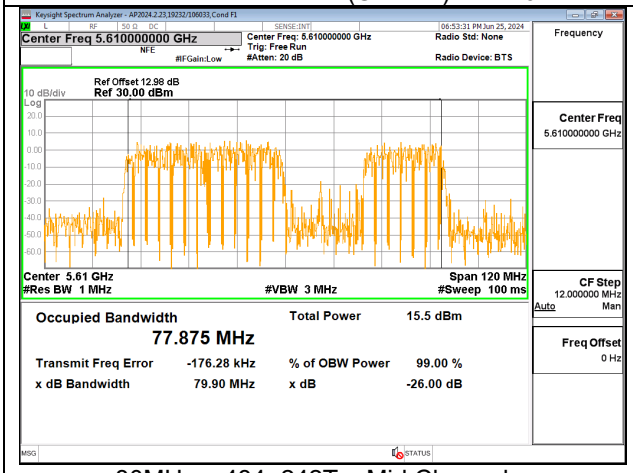
80MHz – 484+242T – Mid Channel – Puncture Pattern 1 – (UNII-2c) – Ant 5



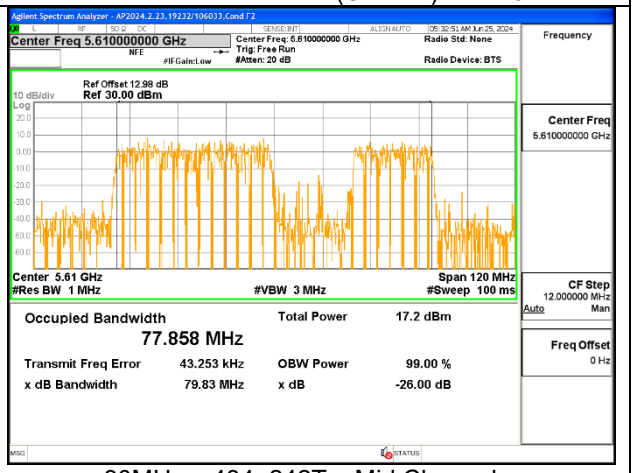
80MHz – 484+242T – Mid Channel – Puncture Pattern 2 – (UNII-2c) – Ant 6



80MHz – 484+242T – Mid Channel – Puncture Pattern 2 – (UNII-2c) – Ant 5



80MHz – 484+242T – Mid Channel – Puncture Pattern 4 – (UNII-2c) – Ant 6



80MHz – 484+242T – Mid Channel – Puncture Pattern 4 – (UNII-2c) – Ant 5

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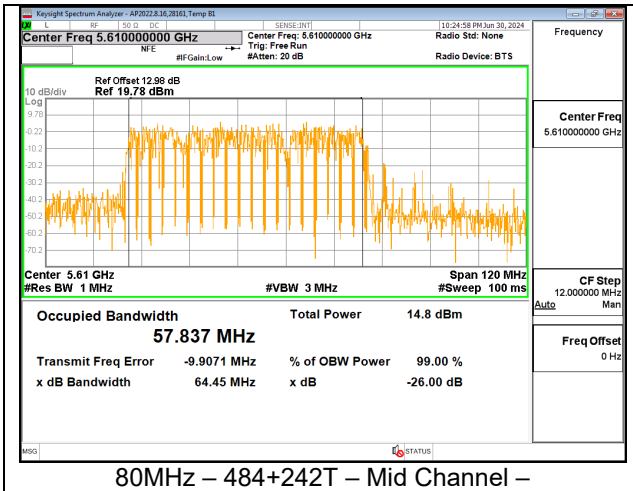
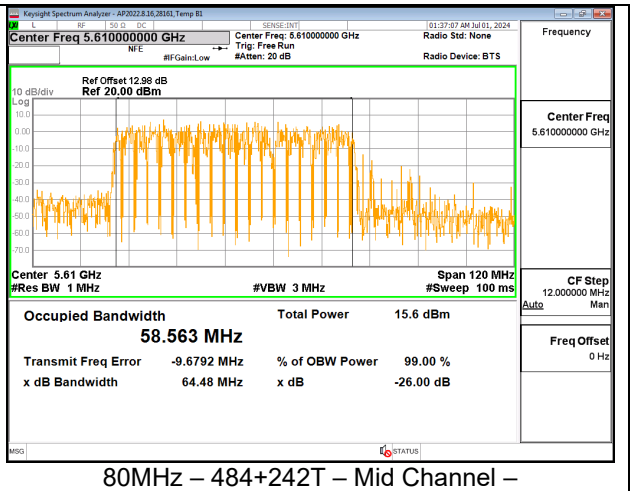


80MHz – 484+242T – Mid Channel – Puncture Pattern 8 – (UNII-2c) – Ant 6



80MHz – 484+242T – Mid Channel – Puncture Pattern 8 – (UNII-2c) – Ant 5

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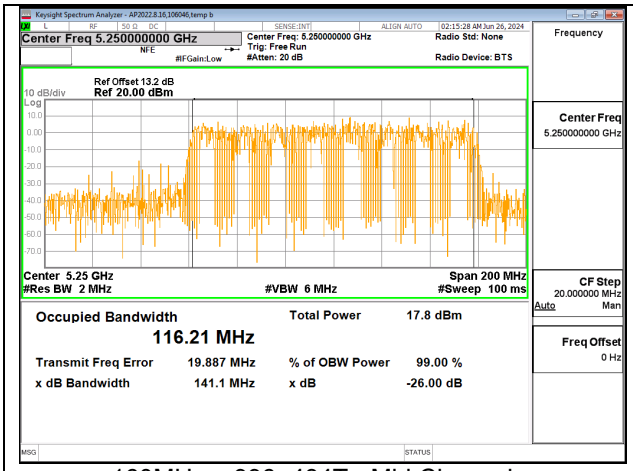
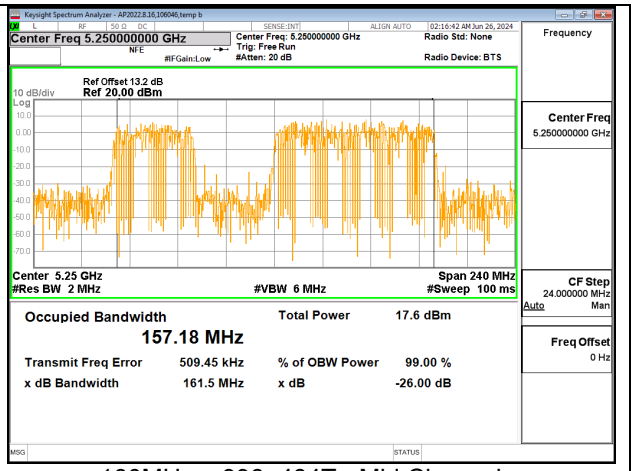
9.3.3. 802.11be EHT160 SISO MODE

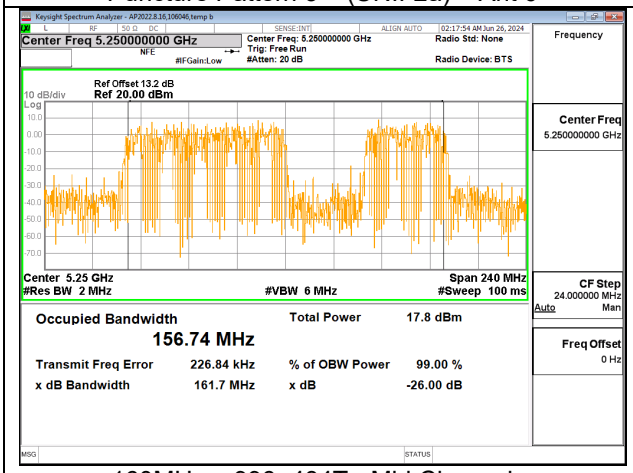
ID:	106046	Date:	23560



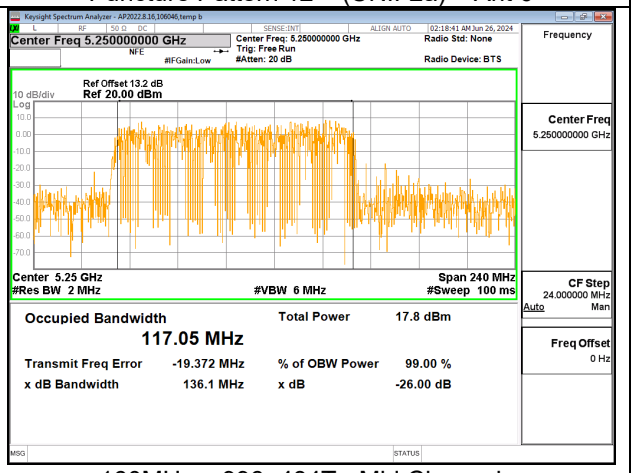
160MHz – 996+484T - Mid Channel – Puncture Pattern 3 – (UNII-2a) – Ant 6



160MHz – 996+484T - Mid Channel – Puncture Pattern 12 – (UNII-2a) – Ant 6



160MHz – 996+484T - Mid Channel – Puncture Pattern 48 – (UNII-2a) – Ant 6



160MHz – 996+484T - Mid Channel – Puncture Pattern 192 – (UNII-2a) – Ant 6

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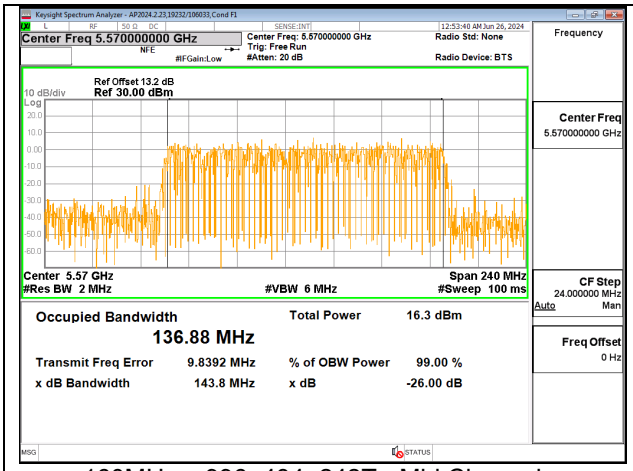
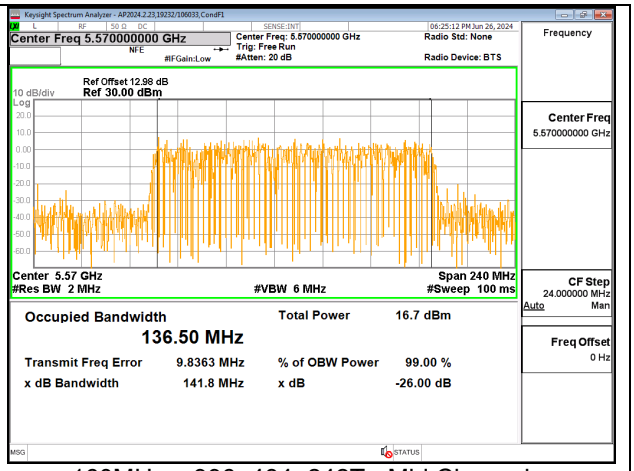
9.3.4. 802.11be EHT160 MIMO CDD MODE

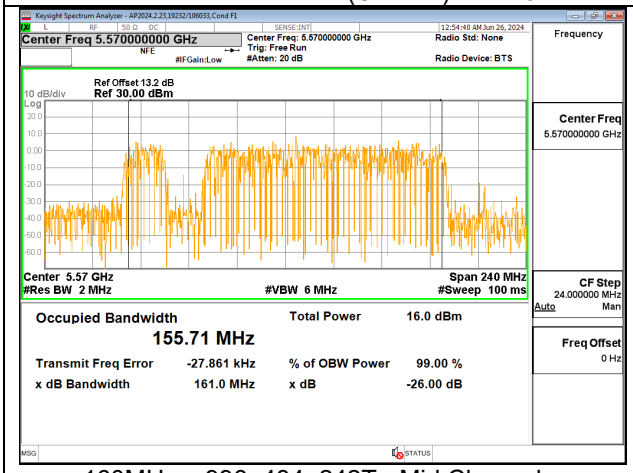
ID:	19232/106033	Date:	06/26/2024



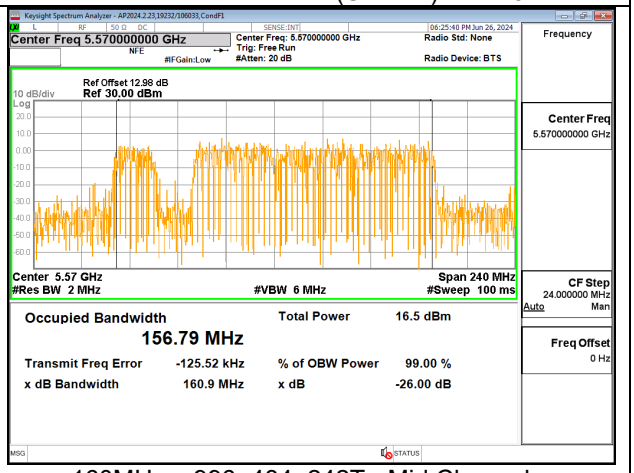
160MHz – 996+484+242T - Mid Channel – Puncture Pattern 1 – (UNII-2c) – Ant 6



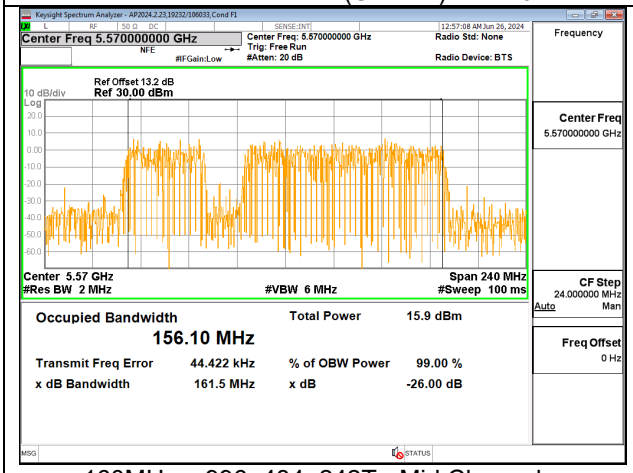
160MHz – 996+484+242T - Mid Channel – Puncture Pattern 1 – (UNII-2c) – Ant 5



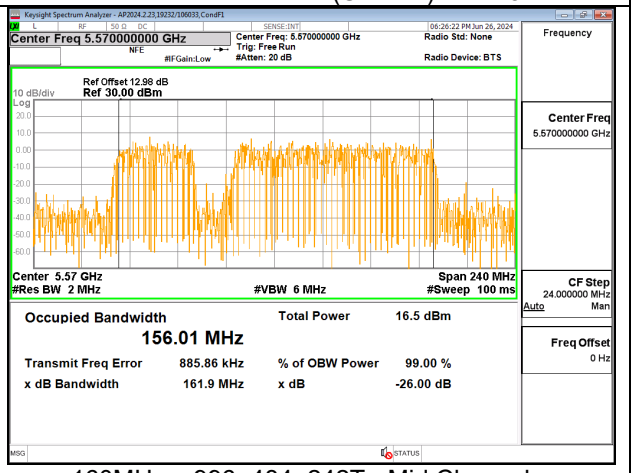
160MHz – 996+484+242T - Mid Channel – Puncture Pattern 2– (UNII-2c) – Ant 6



160MHz – 996+484+242T - Mid Channel – Puncture Pattern 2– (UNII-2c) – Ant 5



160MHz – 996+484+242T - Mid Channel – Puncture Pattern 4 – (UNII-2c) – Ant 6



160MHz – 996+484+242T - Mid Channel – Puncture Pattern 4 – (UNII-2c) – Ant 5

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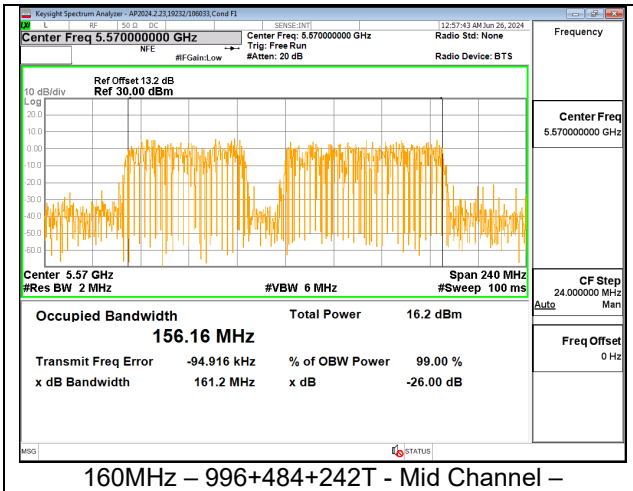
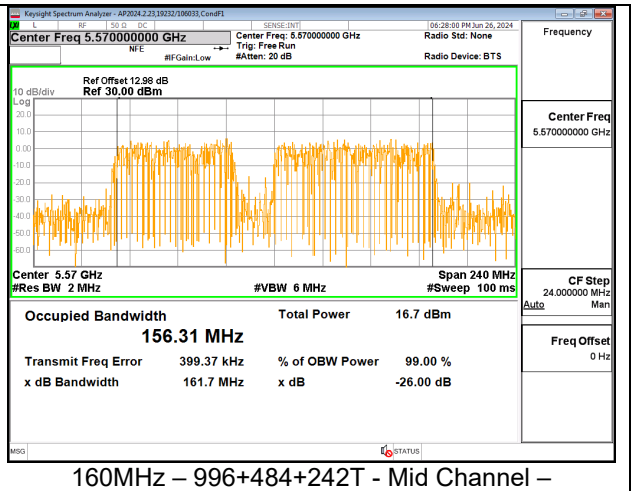
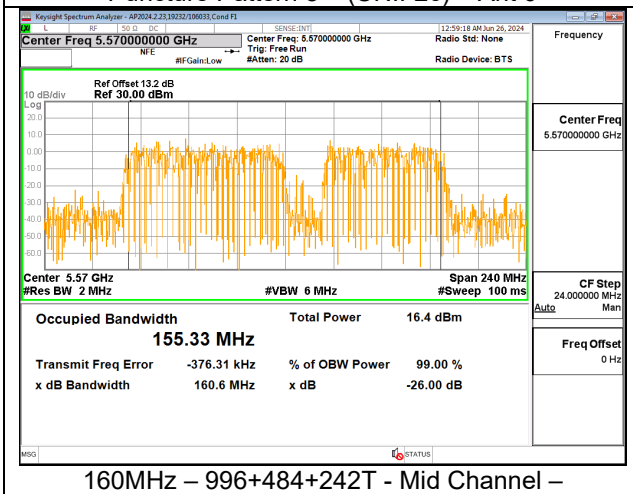


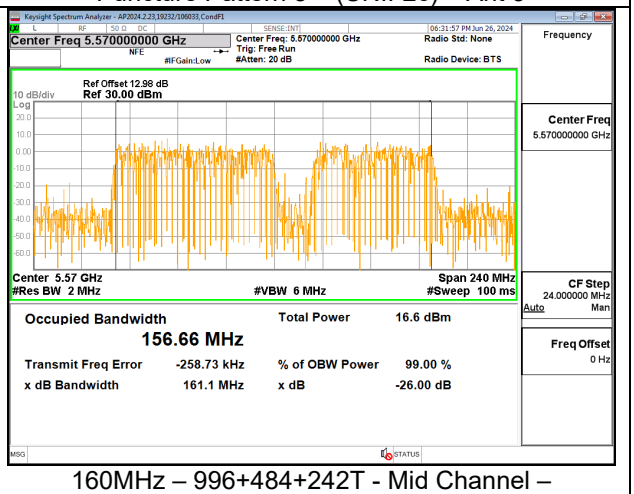
160MHz – 996+484+242T - Mid Channel – Puncture Pattern 8 – (UNII-2c) – Ant 6



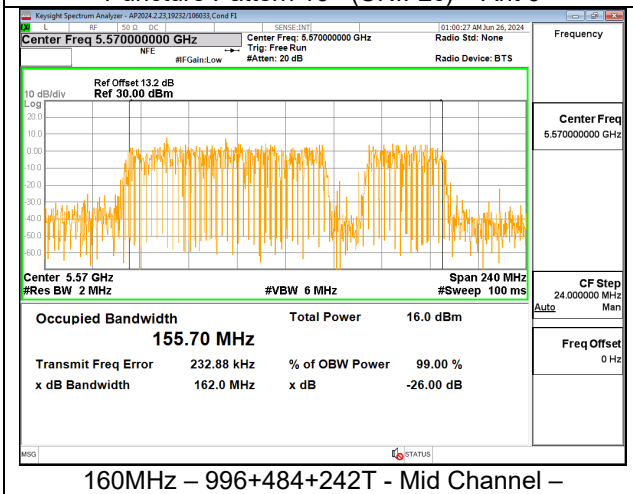
160MHz – 996+484+242T - Mid Channel – Puncture Pattern 8 – (UNII-2c) – Ant 5



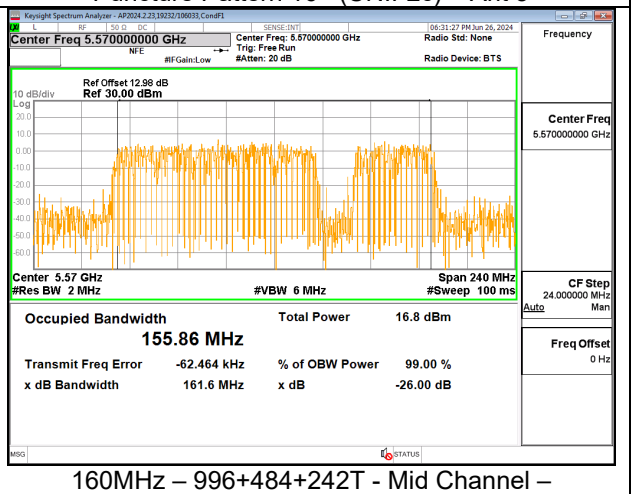
160MHz – 996+484+242T - Mid Channel – Puncture Pattern 16– (UNII-2c) – Ant 6



160MHz – 996+484+242T - Mid Channel – Puncture Pattern 16– (UNII-2c) – Ant 5



160MHz – 996+484+242T - Mid Channel – Puncture Pattern 32 – (UNII-2c) – Ant 6



160MHz – 996+484+242T - Mid Channel – Puncture Pattern 32 – (UNII-2c) – Ant 5

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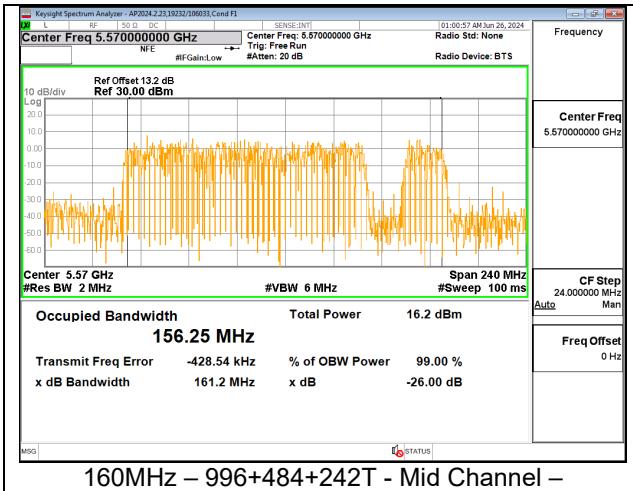
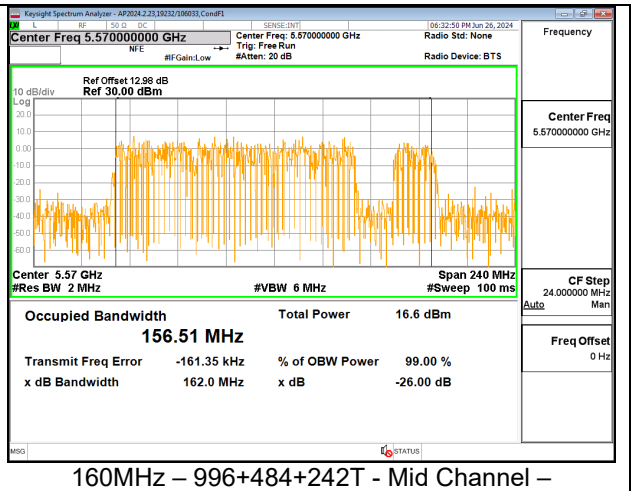
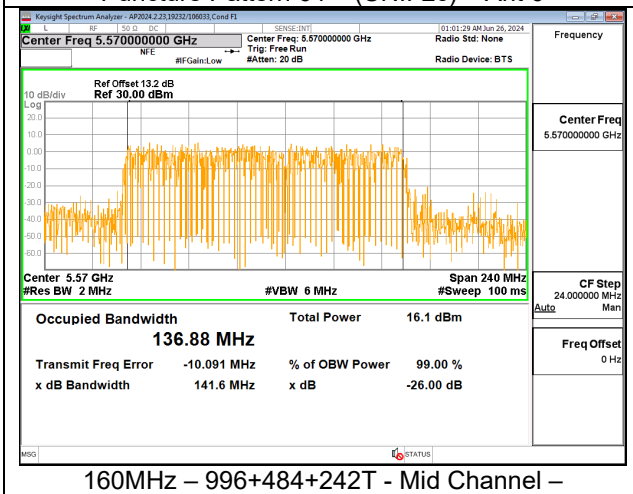


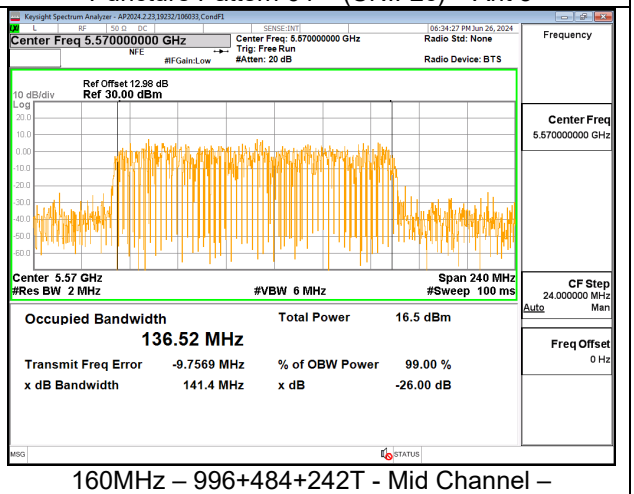
160MHz – 996+484+242T - Mid Channel – Puncture Pattern 64 – (UNII-2c) – Ant 6



160MHz – 996+484+242T - Mid Channel – Puncture Pattern 64 – (UNII-2c) – Ant 5



160MHz – 996+484+242T - Mid Channel – Puncture Pattern 128– (UNII-2c) – Ant 6



160MHz – 996+484+242T - Mid Channel – Puncture Pattern 128– (UNII-2c) – Ant 5

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9.4. 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

For 6dB bandwidth measurements, the 802.11be HT20 was tested at 26T as a worst-case scenario. For straddle channels, 52T was tested as worst-case as 26T is not supported.

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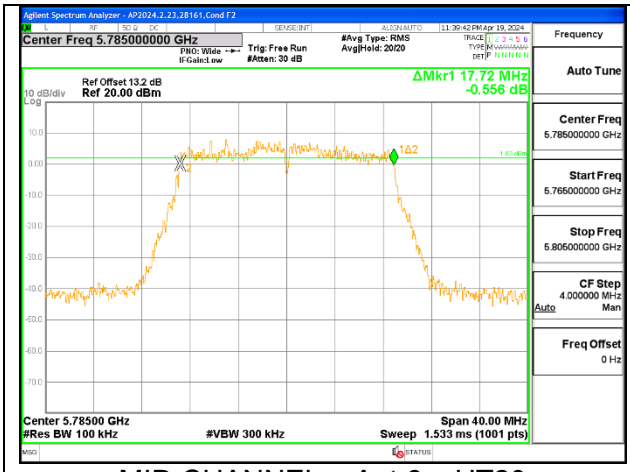
9.4.1. 802.11n/ac SISO MODE IN THE 5.8 GHz BAND

UNII-3 (SISO)	Frequency (MHz)	Channel Number	6 dB BW (MHz)	
			Ant 1	Ant 2
HT20	5720 (Straddle)	144	3.800	3.880
	5745	149	17.680	17.720
	5785	157	17.720	17.680
	5825	165	17.680	17.760
HT40	5710 (Straddle)	142	3.160	3.240
	5755	151	36.560	36.080
	5795	159	36.560	36.080
VHT80	5690 (Straddle)	138	3.080	3.240
	5775	155	75.840	75.680



MID CHANNEL – Ant 6 – HT20

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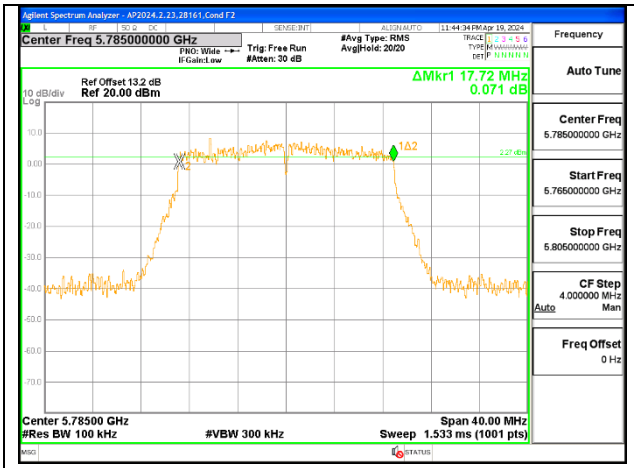
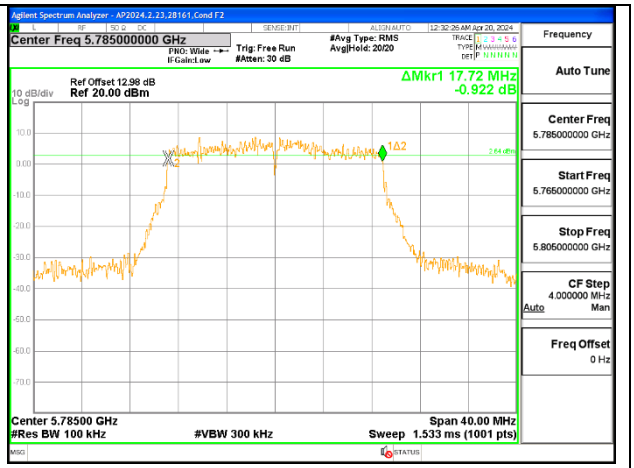
9.4.2. 802.11n/ac MIMO CDD MODE IN THE 5.8 GHz BAND

UNII-3 (MIMO CDD)	Frequency (MHz)	Channel Number	6 dB BW (MHz)	
			Ant 1	Ant 2
HT20	5720 (Straddle)	144	3.840	3.840
	5745	149	17.720	17.680
	5785	157	17.720	17.720
	5825	165	17.760	17.680
HT40	5710 (Straddle)	142	3.240	3.160
	5755	151	36.240	35.920
	5795	159	36.480	36.480
VHT80	5690 (Straddle)	138	3.080	3.080
	5775	155	74.880	75.520



MID CHANNEL – Ant 6 – HT20



MID CHANNEL – Ant 5 – HT20

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9.4.3. 802.11be SISO MODE IN THE 5.8 GHz BAND

UNII-3 (SISO)	Frequency (MHz)	Channel Number	Tone	RU Index	6 dB BW (MHz)	
					Ant 1	Ant 2
EHT20	5720 (Straddle)	144	SU	--	--	--
			52T	40	4.080	4.160
	5745	149	SU	--	--	--
			26T	0	2.040	2.160
				4	2.68	2.680
				8	2.08	2.200
	5785	157	SU	--	--	--
			26T	0	2.080	2.120
				4	2.640	2.680
				8	2.080	2.120
	5825	165	SU	--	--	--
			26T	0	2.080	2.120
				4	2.680	2.600
				8	2.160	2.160
EHT40	5710 (Straddle)	142	SU	--	--	--
			52T	44	4.040	4.040
	5755	151	SU	--	--	--
			26T	0	2.240	2.160
				9	2.080	2.080
				17	2.080	2.080
	5795	159	SU	--	--	--
			26T	0	2.080	2.080
				9	2.160	2.080
				17	2.080	2.080
EHT80	5690 (Straddle)	138	SU	--	--	--
			52T	52	4.040	4.040
	5775	155	SU	--	--	--
			26T	0	2.240	2.080
				18	2.880	2.880
				36	2.080	2.080

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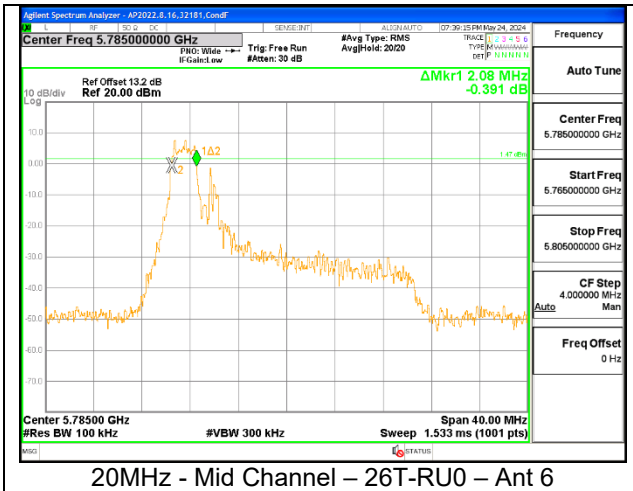
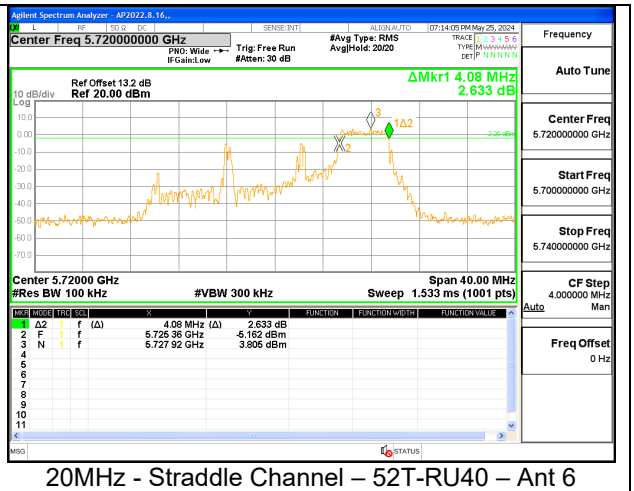


20MHz - Mid Channel – 26T-RU0 – Ant 6



20MHz - Straddle Channel – 52T-RU40 – Ant 6

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9.4.4. 802.11be MIMO CDD MODE IN THE 5.8 GHz BAND

UNII-3 (MIMO CDD)	Frequency (MHz)	Channel Number	Tone	RU Index	6 dB BW (MHz)	
					Ant 1	Ant 2
EHT20	5720 (Straddle)	144	SU	--	--	--
			52T	40	4.080	4.040
	5745	149	SU	--	--	--
			26T	0	2.080	2.080
				4	2.680	2.600
				8	2.080	2.160
	5785	157	SU	--	--	--
			26T	0	2.120	2.080
				4	2.640	2.680
				8	2.200	2.080
	5825	165	SU	--	--	--
			26T	0	2.120	2.120
				4	2.680	2.600
				8	2.080	2.120
EHT40	5710 (Straddle)	142	SU	--	--	--
			52T	44	4.400	4.040
	5755	151	SU	--	--	--
			26T	0	2.160	2.240
				9	2.080	2.080
				17	2.240	2.080
	5795	159	SU	--	--	--
			26T	0	2.080	2.160
				9	2.160	2.080
				17	2.080	2.160
EHT80	5690 (Straddle)	138	SU	--	--	--
			52T	52	4.040	4.040
	5775	155	SU	--	--	--
			26T	0	2.080	1.920
				18	2.880	2.880
				36	2.080	2.080

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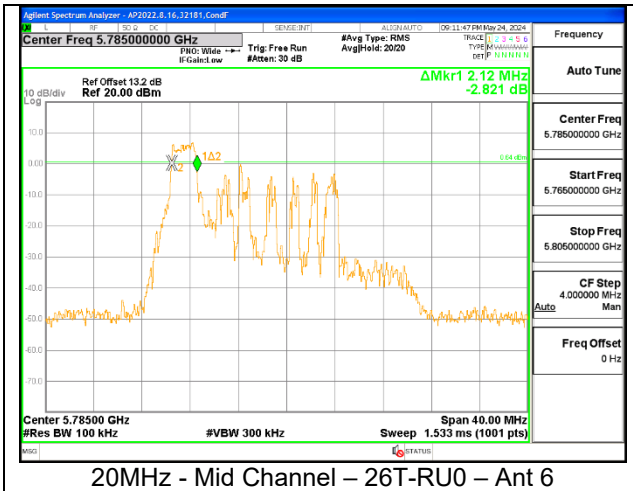
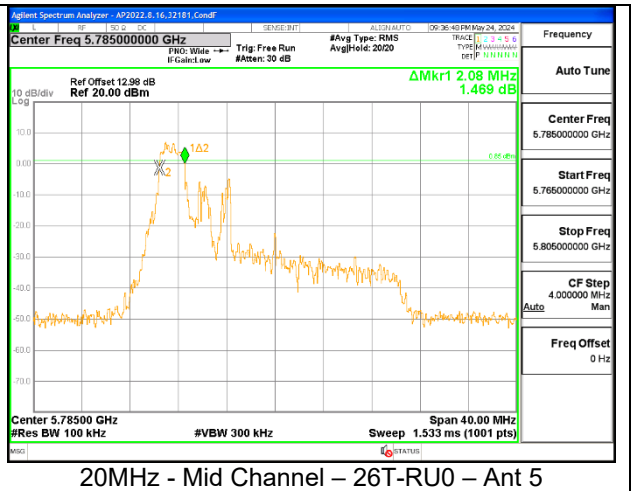
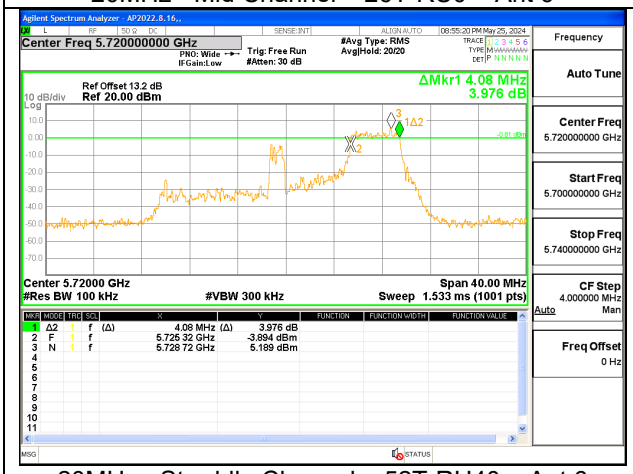


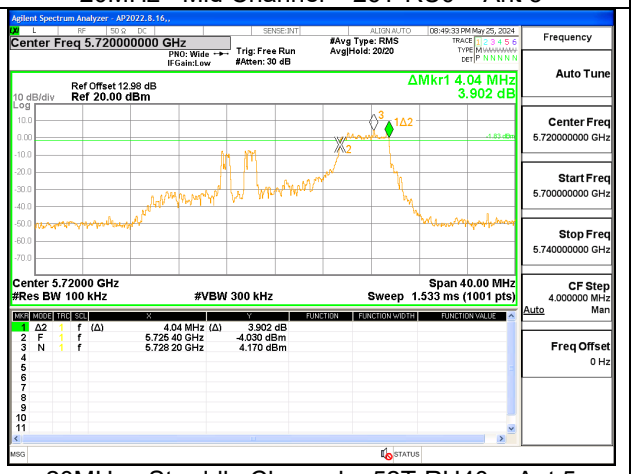
20MHz - Mid Channel – 26T-RU0 – Ant 6



20MHz - Mid Channel – 26T-RU0 – Ant 5



20MHz - Straddle Channel – 52T-RU40 – Ant 6



20MHz - Straddle Channel – 52T-RU40 – Ant 5

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9.5. 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 11be ETH20 straddle channel 26dB bandwidth= (26dB BW/2)+5
11n HT20 and 11be ETH20 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	-0.50	-5.00	-2.19	0.55
5.3	0.00	-3.90	-1.53	1.28
5.6	0.80	-2.70	-0.61	2.24
5.8	0.50	-2.30	-0.68	2.22

DIRECTIONAL GAIN CALCULATION:

ANSI C63.10-2020 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=-0.5, Ant5=-5.0

Uncorrelated Antenna gain=10log[(10^(-0.5/10)+10^(-5.0/10))/2]=-2.19dBi

Correlated Antenna gain=10log[(10^(-0.5/20)+10^(-5.0/20))^2)/2]=0.55dBi

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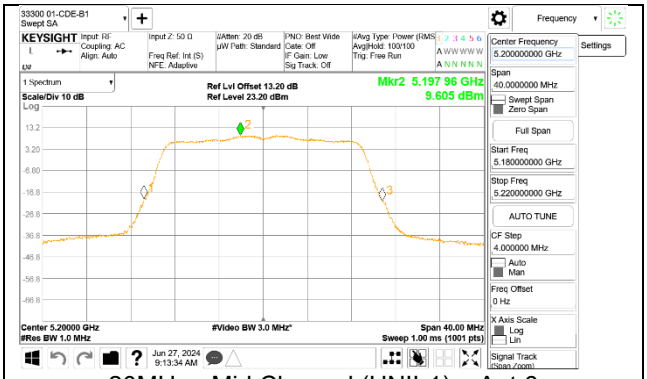
9.5.1. 802.11n/ac SISO MODE IN THE UNII-1 BAND

UNII-1 (SISO)	20MHz	40MHz	80MHz	160MHz
DCCF (MCS0) (dB)	0.10	0.10	0.24	0.41
Ant 6 (dBi)	-0.50			
Ant 5 (dBi)	-5.00			

UNII-2a (SISO)	
Straddle Channel	
Ant 6 (dBi)	0.00
Ant 5 (dBi)	-3.90

UNII-1 (SISO)	Freq (MHz)	Ch. #	Minimum Bandwidth (MHz)		Power Limit (dBm)		Output Power (Gated) (dBm)		Total Corrected Power (dBm)		PSD Limit (dBm/MHz)		PSD (dBm/MHz)		Total Corrected PSD (dBm/MHz)	
			Ant 6	Ant 5	Ant 6	Ant 5	Ant 6	Ant 5	Ant 6	Ant 5	Ant 6	Ant 5	Ant 6	Ant 5	Ant 6	Ant 5
HT20 (FCC)	5180	36	--		24	24	18.93	18.97	18.93	18.97	11	11	8.739	8.944	8.839	9.044
	5200	40					19.92	19.98	19.92	**19.98**			9.605	9.693	9.705	9.793
	5240	48					19.88	19.80	19.88	19.80			9.555	9.444	9.655	9.544
HT40 (FCC)	5190	38	--		24	24	17.43	17.48	17.43	17.48	11	11	4.382	4.751	4.482	4.851
	5230	46					20.46	20.47	20.46	**20.47**			7.141	7.265	7.241	7.365
VHT80 (FCC)	5210	42	--		24	24	17.44	17.47	17.44	**17.47**	11	11	1.056	1.292	1.296	1.532
VHT160 (FCC)	5250 (Straddle)	50	--		24	24	16.47	16.48	16.47	**16.48**	11	11	-2.502	-2.501	-2.092	-2.091



20MHz - Mid Channel (UNII-1) – Ant 6

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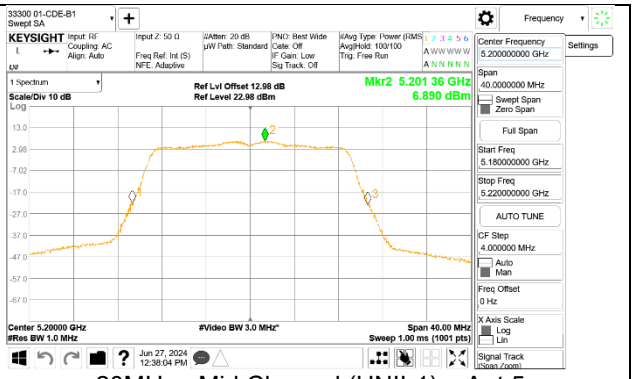
9.5.2. 802.11n/ac MIMO CDD MODE IN THE UNII-1 BAND

UNII-1 (MIMO CDD)	20MHz	40MHz	80MHz	160MHz
DCCF (MCS0) (dB)	0.10	0.10	0.24	0.41
Un-Correlated Gain (dBi)	-2.19			
Correlated Gain (dBi)	0.55			

UNII-2a (MIMO CDD)	
Straddle Channel	
Un-Correlated Gain (dBi)	-1.53
Correlated Gain (dBi)	1.28

UNII-1 (MIMO CDD)	Freq (MHz)	Ch. #	Min BW (MHz)	Power Limit (dBm)	Output Power (Gated) (dBm)		Total MIMO Corrected Power (dBm)	PSD Limit (dBm/MHz)	PSD (dBm/MHz)		Total MIMO Corrected PSD (dBm/MHz)
					Ant 6	Ant 5			Ant 6	Ant 5	
HT20 (FCC)	5180	36	--	24	16.99	16.85	19.93	11	6.957	6.725	9.953
	5200	40			16.95	16.90	**19.94**		6.891	6.890	10.001
	5240	48			16.88	16.80	19.85		6.742	6.553	9.759
HT40 (FCC)	5190	38	--	24	15.97	15.93	18.96	11	3.430	3.313	6.482
	5230	46			19.95	19.90	**22.94**		7.312	7.058	10.297
VHT80 (FCC)	5210	42	--	24	16.48	16.43	**19.47**	11	0.286	-0.084	3.355
VHT160 (FCC)	5250 (Straddle)	50	--	24	15.45	15.48	**18.48**	11	-3.680	-3.479	-0.158

20MHz - Mid Channel (UNII-1) – Ant 6



20MHz - Mid Channel (UNII-1) – Ant 5

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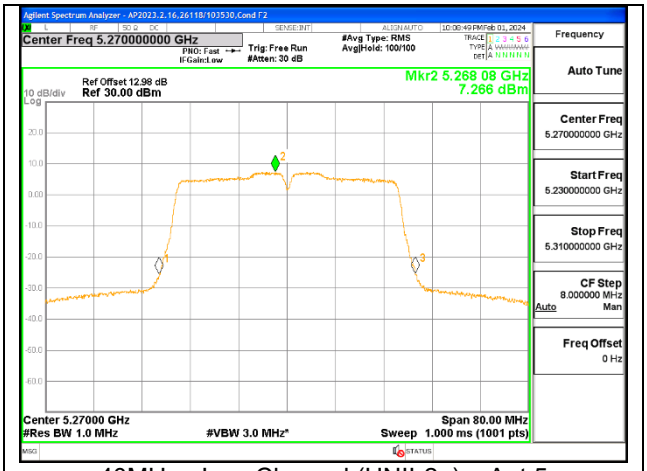
9.5.3. 802.11n/ac SISO MODE IN THE UNII-2A BAND

UNII-2a (SISO)	20MHz	40MHz	80MHz	160MHz
DCCF (MCS0) (dB)	0.10	0.10	0.24	0.41
Ant 6 (dBi)	0.00			
Ant 5 (dBi)	-3.90			

UNII-1 (SISO)	
Straddle Channel	
Ant 6 (dBi)	-0.50
Ant 5 (dBi)	-5.00

UNII-2a (SISO)	Freq (MHz)	Ch. #	Minimum Bandwidth (MHz)		Power Limit (dBm)		Output Power (Gated) (dBm)		Total Corrected Power (dBm)		PSD Limit (dBm/MHz)		PSD (dBm/MHz)		Total Corrected PSD (dBm/MHz)	
			ANT 6	ANT 5	ANT 6	ANT 5	ANT 6	ANT 5	ANT 6	ANT 5	ANT 6	ANT 5	ANT 6	ANT 5	ANT 6	ANT 5
HT20 (FCC)	5260	52	20.98	20.85	24.00	24.00	19.97	19.88	**19.97**	19.88	11.00	11.00	10.504	10.336	10.604	10.436
	5300	60	20.99	21.20	24.00	24.00	19.91	19.95	19.91	19.95			10.356	10.422	10.456	10.522
	5320	64	21.21	20.84	24.00	24.00	18.90	18.93	18.90	18.93			8.889	8.997	8.989	9.097
HT40 (FCC)	5270	54	41.24	40.95	24.00	24.00	20.43	20.34	**20.43**	20.34	11.00	11.00	7.538	7.266	7.638	7.366
	5310	62	42.88	44.87	24.00	24.00	17.41	17.36	17.41	17.36			4.517	4.361	4.617	4.461
VHT80 (FCC)	5290	58	84.22	87.53	24.00	24.00	15.90	15.97	15.90	**15.97**	11.00	11.00	-0.266	0.025	-0.026	0.265
VHT160 (FCC)	5250 (Straddle)	50	164.20	164.70	24.00	24.00	16.47	16.48	16.47	**16.48**	11.00	11.00	-2.502	-2.501	-2.092	-2.091



40MHz - Low Channel (UNII-2a) – Ant 5

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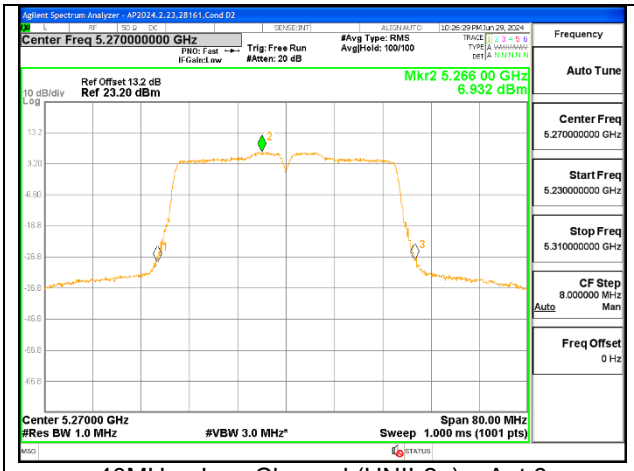
9.5.4. 802.11n/ac MIMO CDD MODE IN THE UNII-2A BAND

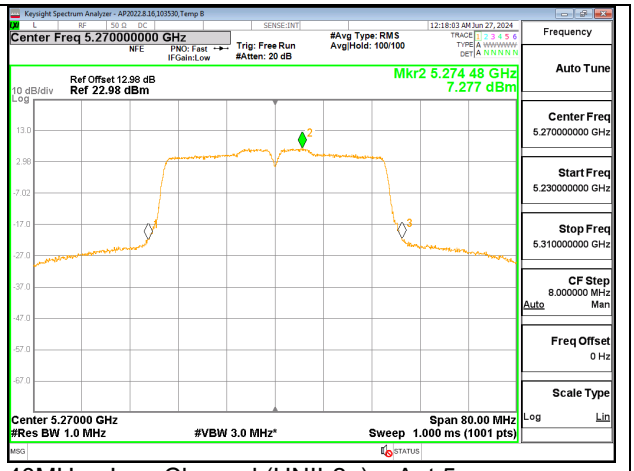
UNII-2a (MIMO CDD)	20MHz	40MHz	80MHz	160MHz
DCCF (MCS0) (dB)	0.10	0.10	0.24	0.41
Un-Correlated Gain (dBi)	-1.53			
Correlated Gain (dBi)	1.28			

UNII-1 (MIMO CDD)	
Straddle Channel	
Un-Correlated Gain (dBi)	-2.19
Correlated Gain (dBi)	0.55

UNII-2a (MIMO CDD)	Freq (MHz)	Ch. #	Min BW (MHz)	Power Limit (dBm)	Output Power (Gated) (dBm)		Total MIMO Corrected Power (dBm)	PSD Limit (dBm/MHz)	PSD (dBm/MHz)		Total MIMO Corrected PSD (dBm/MHz)
					Ant 6	Ant 5			Ant 6	Ant 5	
HT20 (FCC)	5260	52	20.55	24.00	16.86	16.95	19.92	11.00	7.286	7.414	10.461
	5300	60	21.03	24.00	16.82	16.88	19.86		7.093	7.291	10.303
	5320	64	21.27	24.00	16.99	16.91	**19.96**		7.443	7.413	10.538
HT40 (FCC)	5270	54	40.90	24.00	19.88	19.98	**22.94**	11.00	6.932	7.277	10.218
	5310	62	43.56	24.00	15.97	15.92	18.96		2.861	2.847	5.964
VHT80 (FCC)	5290	58	85.34	24.00	15.46	15.43	**18.46**	11.00	-0.391	-0.505	2.803
VHT160 (FCC)	5250 (Straddle)	50	164.30	24.00	15.45	15.48	**18.48**	11.00	-3.680	-3.479	-0.158



40MHz - Low Channel (UNII-2a) – Ant 6



40MHz - Low Channel (UNII-2a) – Ant 5

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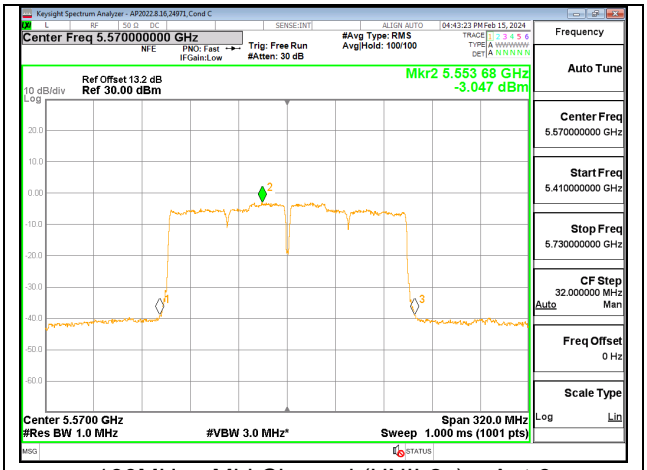
9.5.5. 802.11n/ac SISO MODE IN THE UNII-2C BAND

UNII-2c (SISO)	20MHz	40MHz	80MHz	160MHz
DCCF (MCS0) (dB)	0.10	0.10	0.24	0.41
Ant 6 (dBi)	0.80			
Ant 5 (dBi)	-2.70			

UNII-3 (SISO)	
Straddle Channel	
Ant 6 (dBi)	0.50
Ant 5 (dBi)	-2.30

UNII-2c (SISO)	Freq (MHz)	Ch. #	Minimum Bandwidth (MHz)		Power Limit (dBm)		Output Power (Gated) (dBm)		Total Corrected Power (dBm)		PSD Limit (dBm/MHz)		PSD (dBm/MHz)		Total Corrected PSD (dBm/MHz)	
			Ant 6	Ant 5	Ant 6	Ant 5	Ant 6	Ant 5	Ant 6	Ant 5	Ant 6	Ant 5	Ant 6	Ant 5	Ant 6	Ant 5
HT20 (FCC)	5500	100	22.12	21.87	24.00	24.00	18.71	18.67	18.71	18.67	11.00	11.00	8.746	8.722	8.846	8.822
	5580	116	21.13	21.18	24.00	24.00	19.85	19.98	19.85	19.98			9.376	9.477	9.476	9.577
	5700	140	23.53	24.82	24.00	24.00	18.44	18.46	18.44	18.46			8.047	8.089	8.147	8.189
	5720 (Straddle)	144	15.65	15.54	22.95	22.91	19.86	19.99	19.86	**19.99**			9.627	9.839	9.727	9.939
HT40 (FCC)	5510	102	45.01	44.34	24.00	24.00	16.39	16.42	16.39	16.42	11.00	11.00	3.123	3.361	3.223	3.461
	5550	110	41.52	41.52	24.00	24.00	20.36	20.41	20.36	20.41			7.058	7.265	7.158	7.365
	5670	134	43.70	42.16	24.00	24.00	20.42	20.44	20.42	**20.44**			7.407	7.538	7.507	7.638
	5710 (Straddle)	142	41.31	41.73	24.00	24.00	20.41	20.43	20.41	20.43			7.423	7.485	7.523	7.585
VHT80 (FCC)	5530	106	84.14	83.96	24.00	24.00	15.86	15.93	15.86	15.93	11.00	11.00	-0.766	-0.616	-0.526	-0.376
	5610	122	84.42	83.67	24.00	24.00	20.41	20.37	**20.41**	20.37			3.627	3.592	3.867	3.832
	5690 (Straddle)	138	81.71	81.44	24.00	24.00	20.34	20.31	20.34	20.31			3.231	3.127	3.471	3.367
VHT160 (FCC)	5570	106	164.70	165.00	24.00	24.00	16.40	16.44	16.40	**16.44**	11.00	11.00	-3.047	-2.938	-2.637	-2.528



160MHz - Mid Channel (UNII-2c) – Ant 6

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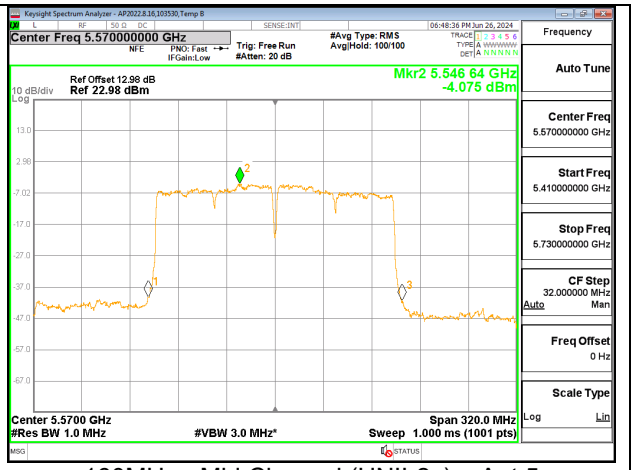
9.5.6. 802.11n/ac MIMO CDD MODE IN THE UNII-2C BAND

UNII-2c (MIMO CDD)	20MHz	40MHz	80MHz	160MHz
DCCF (MCS0) (dB)	0.10	0.10	0.24	0.41
Un-Correlated Gain (dBi)	-0.61			
Correlated Gain (dBi)	2.24			

UNII-3 (MIMO CDD)	
Straddle Channel	
Un-Correlated Gain (dBi)	-0.68
Correlated Gain (dBi)	2.22

UNII-2c (MIMO CDD)	Freq (MHz)	Ch. #	Min BW (MHz)	Power Limit (dBm)	Output Power (Gated) (dBm)		Total MIMO Corrected Power (dBm)	PSD Limit (dBm/MHz)	PSD (dBm/MHz)		Total MIMO Corrected PSD (dBm/MHz)
					Ant 6	Ant 5			Ant 6	Ant 5	
HT20 (FCC)	5500	100	22.15	24.00	16.90	16.95	**19.94**	11.00	6.574	6.666	9.731
	5580	116	21.02	24.00	16.78	16.81	19.81		6.160	6.449	9.417
	5700	140	21.99	24.00	16.88	16.93	19.92		6.561	6.631	9.706
	5720 (Straddle)	144	15.61	22.93	16.84	16.99	19.93		6.501	6.921	9.826
HT40 (FCC)	5510	102	42.76	24.00	15.37	15.44	18.42	11.00	2.139	2.434	5.399
	5550	110	40.85	24.00	19.80	19.95	22.89		6.185	6.484	9.447
	5670	134	42.19	24.00	19.84	19.87	22.87		6.072	6.299	9.297
	5710 (Straddle)	142	40.72	24.00	19.97	19.90	**22.95**		6.557	6.419	9.599
VHT80 (FCC)	5530	106	82.18	24.00	15.18	15.22	18.21	11.00	-1.391	-0.928	2.097
	5610	122	81.22	24.00	19.93	19.97	**22.96**		3.293	3.330	6.562
	5690 (Straddle)	138	80.81	24.00	19.90	19.86	22.89		3.206	3.109	6.408
VHT160 (FCC)	5570	106	163.90	24.00	15.45	15.40	**18.44**	11.00	-4.069	-4.075	-0.652

160MHz - Mid Channel (UNII-2c) – Ant 6



160MHz - Mid Channel (UNII-2c) – Ant 5

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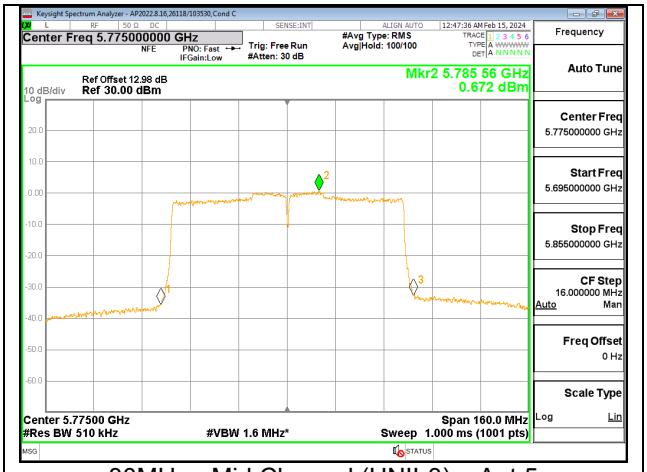
9.5.7. 802.11n/ac SISO MODE IN THE UNII-3 BAND

UNII-3 (SISO)	20MHz	40MHz	80MHz	160MHz
DCCF (MCS0) (dB)	0.10	0.10	0.24	N/A
Ant 1 (dBi)	0.50			
Ant 5 (dBi)	-2.30			

UNII-3 (SISO)	Freq (MHz)	Ch. #	Minimum Bandwidth (MHz)		Power Limit (dBm)		Output Power (Gated) (dBm)		Total Corrected Power (dBm)		PSD Limit (dBm/500kHz)		PSD (dBm/MHz)		Total Corrected PSD (dBm/500kHz)	
			Ant 6	Ant 5	Ant 6	Ant 5	Ant 6	Ant 5	Ant 6	Ant 5	Ant 6	Ant 5	Ant 6	Ant 5	Ant 6	Ant 5
HT20	5745	149	--		30	30	20.48	20.43	**20.48**	20.43	30	30	7.767	7.673	7.867	7.773
	5785	157					20.42	20.38	20.42	20.38			7.619	7.555	7.719	7.655
	5825	165					20.46	20.37	20.46	20.37			7.757	7.550	7.857	7.650
HT40	5755	151	--		30	30	20.36	20.43	20.36	20.43	30	30	4.840	5.039	4.940	5.139
	5795	159					20.47	20.40	**20.47**	20.40			5.066	4.941	5.166	5.041
VHT80	5775	155	--		30	30	20.46	20.43	**20.46**	20.43	30	30	0.731	0.672	0.971	0.912



80MHz - Mid Channel (UNII-3) – Ant 5

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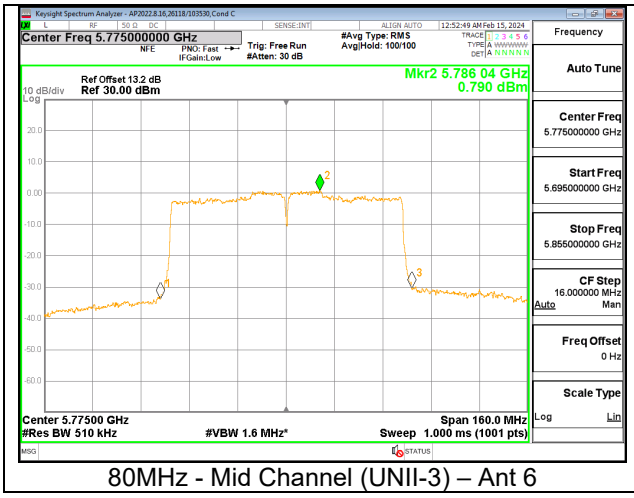
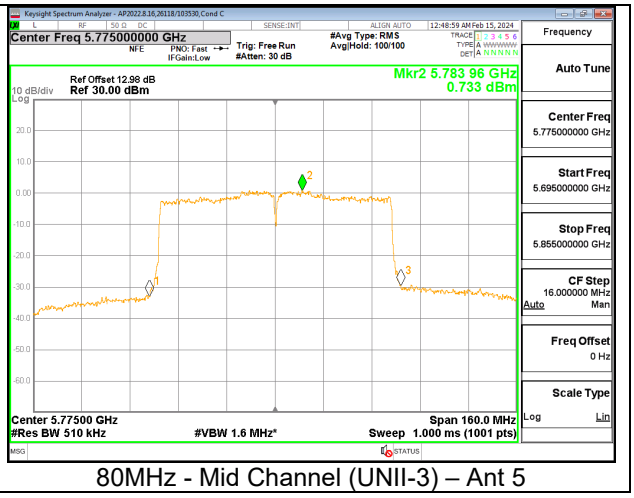
9.5.8. 802.11n/ac MIMO CDD MODE IN THE UNII-3 BAND

UNII-3 (MIMO CDD)	20MHz	40MHz	80MHz	160MHz
DCCF (MCS0) (dB)	0.10	0.10	0.24	N/A
Un-Correlated Gain (dBi)	-0.68			
Correlated Gain (dBi)	2.22			

UNII-3 (MIMO CDD)	Freq (MHz)	Ch. #	Min BW (MHz)	Power Limit (dBm)	Output Power (Gated) (dBm)		Total MIMO Corrected Power (dBm)	PSD Limit (dBm/500kHz)	PSD (dBm/500kHz)		Total MIMO Corrected PSD (dBm/500kHz)
					Ant 6	Ant 5			Ant 6	Ant 5	
HT20	5745	149	--	30	20.43	20.47	**23.46**	30	7.847	7.982	11.025
	5785	157			20.42	20.36	23.40		7.775	7.644	10.820
	5825	165			20.45	20.40	23.44		7.864	7.706	10.896
HT40	5755	151	--	30	20.49	20.42	**23.47**	30	4.900	4.690	7.907
	5795	159			20.47	20.44	23.47		4.887	4.703	7.906
VHT80	5775	155	--	30	20.45	20.40	**23.44**	30	0.790	0.733	4.012



80MHz - Mid Channel (UNII-3) – Ant 6



80MHz - Mid Channel (UNII-3) – Ant 5

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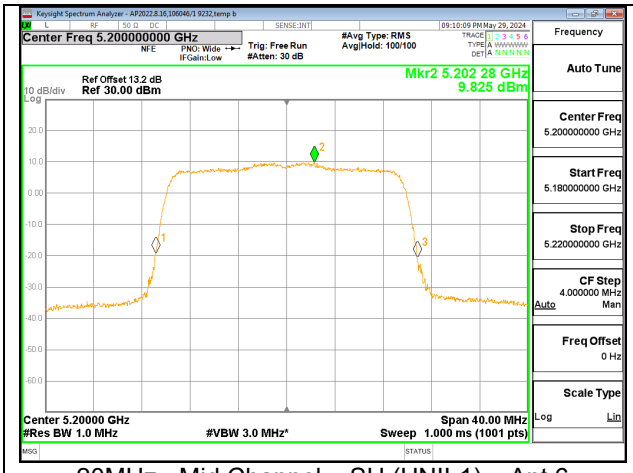
9.5.9. 802.11be SISO MODE IN THE UNII-1 BAND

UNII-1 (SISO)	20MHz		40MHz			80MHz		160MHz	
	SU	106T	SU	242T	106T	SU	242T	SU	242T
DCCF (MCS0) (dB)	0.00	0.00	0.13	0.00	0.00	0.15	0.00	0.15	0.00
Ant 6 (dBi)	-0.50								
Ant 5 (dBi)	-5.00								

UNII-2a (SISO)	
Straddle Channel	
Ant 6 (dBi)	0.00
Ant 5 (dBi)	-3.90

UNII-1 (SISO)	Freq (MHz)	Ch. #	Tone	RU Index	Minimum Bandwidth (MHz)		Power Limit (dBm)		Output Power (Gated) (dBm)		Total Corrected Power (dBm)		PSD Limit (dBm/MHz)		PSD (dBm/MHz)		Total Corrected PSD (dBm/MHz)	
					Ant 6	Ant 5	Ant 6	Ant 5	Ant 6	Ant 5	Ant 6	Ant 5	Ant 6	Ant 5	Ant 6	Ant 5	Ant 6	Ant 5
EHT20 (FCC)	5180	36	SU	--	--		24.00	24.00	18.43	18.48	18.43	18.48	11.00	11.00	8.186	8.328	8.186	8.328
			106T	53					16.73	16.62	16.73	16.62			8.601	8.453	8.601	8.453
				54					16.68	16.70	16.68	16.70			8.455	8.533	8.455	8.533
	5200	40	SU	--					19.87	19.97	19.87	19.97			9.825	10.188	9.825	10.188
			106T	53					16.65	16.73	16.65	16.73			8.372	8.559	8.372	8.559
				54					16.70	16.69	16.70	16.69			8.531	8.435	8.531	8.435
	5240	48	SU	--					19.90	19.98	19.90	**19.98**			9.308	9.581	9.308	9.581
			106T	53					16.71	16.68	16.71	16.68			8.543	8.485	8.543	8.485
				54					16.60	16.65	16.60	16.65			8.366	8.438	8.366	8.438
EHT40 (FCC)	5190	38	SU	--	--		24.00	24.00	16.43	16.39	16.43	16.39	11.00	11.00	3.264	3.135	3.394	3.265
			242T	61					17.96	17.88	17.96	17.88			6.809	6.524	6.809	6.524
				62					17.91	17.85	17.91	17.85			6.731	6.394	6.731	6.394
			106T	53					13.71	13.59	13.71	13.59			5.804	5.508	5.804	5.508
				54					13.74	13.66	13.74	13.66			5.820	5.651	5.820	5.651
				56					13.61	13.69	13.61	13.69			5.625	5.675	5.625	5.675
	5230	46	SU	--					20.41	20.39	**20.41**	20.39			7.153	7.015	7.283	7.145
			242T	61					19.80	19.90	19.80	19.90			8.647	8.962	8.647	8.962
				62					19.87	19.93	19.87	19.93			8.940	9.004	8.940	9.004
			106T	53					13.69	13.60	13.69	13.60			5.475	5.385	5.475	5.385
				54					13.70	13.73	13.70	13.73			5.475	5.534	5.475	5.534
				56					13.61	13.65	13.61	13.65			5.389	5.418	5.389	5.418
EHT80 (FCC)	5210	42	SU	--	--		24.00	24.00	16.48	16.42	16.48	16.42	11.00	11.00	0.552	0.471	0.702	0.621
			242T	61					17.93	17.83	17.93	17.83			6.509	6.407	6.509	6.407
				62					17.80	17.99	17.80	**17.99**			6.337	6.799	6.337	6.799
				64					17.86	17.90	17.86	17.90			6.492	6.508	6.492	6.508
EHT160 (FCC)	5250 (Straddle)	50	SU	--	--		24.00	24.00	15.92	15.86	15.92	15.86	11.00	11.00	-2.948	-3.265	-2.798	-3.115
			242T	61					17.95	17.99	17.95	**17.99**			6.959	7.028	6.959	7.028
				62					17.88	17.81	17.88	17.81			6.265	6.100	6.265	6.100
				S64					17.93	17.90	17.93	17.90			6.908	6.709	6.908	6.709



20MHz - Mid Channel – SU (UNII-1) – Ant 6

20MHz - Mid Channel – 106T-RU53 (UNII-1) – Ant 6

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