# TEST REPORT

**CTK Co., Ltd.**
**(Ho-dong), 113, Yejik-ro, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea**
**Tel: +82-31-339-9970**
**Fax: +82-31-624-9501**

Report No.: CTK-2023-00952


## 1. Applicant

◦ Name : Samsung Electronics Co Ltd

◦ Address : 19 Chapin Rd, Building D. Pine Brook, New Jersey, United States

◦ Date of Receipt : 2023-03-20

## 2. Manufacturer

◦ Name : Samsung Electronics Co., Ltd.

◦ Address : 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Republic of Korea

## 3. Factory

◦ Name #1: CHEMTRONICS CO.,LTD.

◦ Address #1: 35, Buk-ri, Namsa-myeon, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea

◦ Name #2: Chengdu Xuguang Technology Co., Ltd.

◦ Address #2: No.86 2nd Section, Park Road, Longquanyi District, Chengdu City, Sichuan Province, P.R.China

◦ Name #3: CHEMTROVINA COMPANY LIMITED

◦ Address #3: Nhon Trach 2 - Loc Khang IZ, Hiep Phuoc Town, Nhon Trach District, Dong Nai Province, Vietnam

**4. Use of Report :** For FCC Conformance

**5. Test Sample / Model:** Wi-Fi/BT Transceiver / WCC940M

**6. Date of Test :** 2023-03-21 to 2023-05-09

**7. Test Standard(method) used :** FCC 47 CFR part 15 subpart E 15.407

**8. Testing Environment:** Temp.: (23 ± 1) ℃, Humidity: (28 ± 3) % R.H.

**9. Test Results :** Compliance

**10. Location of Test :** ☒ Permanent Testing Lab ☐ On Site Testing

(Address : (Unhak-Dong) 5, Dongbu-ro 221beon-gil, Cheoin-gu, Yong-in-si, Gyeonggi-do, Korea)

The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
This report cannot be reproduced or copied without the written consent of CTK.

| | | |
|---|---|---|
| Approval | Tested by<br><br>Ji-Hye, Kim: (Signature) | Technical Manager<br><br>Won-Jae, Hwang: (Signature) |

Remark. This report is not related to KOLAS accreditation and relevant regulation.

2023-05-10

**CTK Co., Ltd.**

# REPORT REVISION HISTORY

| Date | Revision | Page No |
|---|---|---|
| 2023-05-10 | Issued (CTK-2023-00952) | all |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

***This report shall not be reproduced except in full, without the written approval of CTK Co., Ltd. This document may be altered or revised by CTK Co., Ltd. personnel only, and shall be noted in the revision section of the document. Any alteration of this document not carried out by CTK Co., Ltd. will constitute fraud and shall nullify the document.***

# CONTENTS

1. General Product Description ..... 5
1.1 Applicant Information ..... 5
1.2 Product Information ..... 5
1.3 Peripheral Devices ..... 7
1.4 Model Differences ..... 7
2. Accreditations ..... 8
2.1 Laboratory Accreditations and Listings ..... 8
2.2 Calibration Details of Equipment Used for Measurement ..... 8
3. Test Specifications ..... 9
3.1 Standards ..... 9
3.2 Mode of operation during the test ..... 10
3.3 Device Modifications ..... 13
3.4 Maximum Measurement Uncertainty ..... 13
3.5 Test Software ..... 13
4. Technical Characteristic Test ..... 14
4.1 26 dB Bandwidth and 99% Bandwidth ..... 14
4.2 OUTPUT POWER ..... 75
4.3 Power Spectral Density ..... 129
4.4 In-Band Emissions ..... 326
4.5 Frequency Stability ..... 344
4.6 Contention Based Protocol ..... 346
4.7 Unwanted Emissions ..... 354
4.8 AC Conducted Emissions ..... 423
APPENDIX A – Test Equipment Used For Tests ..... 426

# 1. General Product Description

## 1.1 Applicant Information

| | |
|---|---|
| **Company** | Samsung Electronics Co., Ltd. |
| **Contact Point** | 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Republic of Korea |
| **Contact Person** | Name : Minhyung Cho<br>E-mail : mh719.cho@samsung.com<br>Tel : +82-31-277-2688<br>Fax : - |

## 1.2 Product Information

| | | |
|---|---|---|
| **FCC ID** | A3LWCC940M | |
| **Product Description** | Wi-Fi/BT Transceiver | |
| **Model name** | WCC940M | |
| **Variant Model name** | - | |
| **Device Type** | Indoor Client | |
| **Operating Frequency** | UNII 5 | 20 MHz_BW : 5 955 MHz – 6 415 MHz<br>40 MHz_BW : 5 965 MHz – 6 405 MHz<br>80 MHz_BW : 5 985 MHz – 6 385 MHz |
| | UNII 6 | 20 MHz_BW : 6 435 MHz – 6 515 MHz<br>40 MHz_BW : 6 445 MHz – 6 485 MHz<br>80 MHz_BW : 6 465 MHz |
| | UNII 7 | 20 MHz_BW : 6 535 MHz – 6 855 MHz<br>40 MHz_BW : 6 525 MHz – 6 845 MHz<br>80 MHz_BW : 6 545 MHz – 6 865 MHz |
| | UNII 8 | 20 MHz_BW : 6 875 MHz – 7 115 MHz<br>40 MHz_BW : 6 885 MHz – 7 085 MHz<br>80 MHz_BW : 6 945 MHz – 7 025 MHz |
| **RF Output Power** | 802.11a : 8.98 dBm/7.91 mW (EIRP)<br>802.11ax_HE20 : 7.65 dBm/5.82 mW (EIRP)<br>802.11ax_HE40 : 9.58 dBm/9.08 mW (EIRP)<br>802.11ax_HE80 : 13.86 dBm/24.32 mW (EIRP) | |
| **Antenna Specification** | Antenna type : Chip Antenna<br>Peak Gain : 1.27 dBi (ANT0), -0.04 dBi (ANT1) | |
| **Antenna Configurations** | 802.11a : SISO(ANT0, ANT1)<br>802.11ax : SISO(ANT0, ANT1), MIMO(ANT0+ANT1) | |
| **Type of Modulation** | 802.11a : OFDM<br>802.11ax : OFDMA | |
| **Data Rate** | 802.11a : 54 / 48 / 36 / 24 / 18 / 12 / 9 / 6 Mbps<br>802.11ax : up to 1 200 Mbps | |
| **Power Source** | DC 5 V | |
| **Hardware Rev** | V1.0 | |
| **Software Rev** | FC 3 | |

## - RF Power setting in Test SW

| Mode | | Frequency Band | Power Setting Value |
|---|---|---|---|
| 802.11a | | UNII 5 | 8.0 |
| | | UNII 6 | 9.0 |
| | | UNII 7 | 7.0 |
| | | UNII 8 | 5.0 |
| 802.11ax _HE20 | 26T | UNII 5 | -6.0 |
| | | UNII 6 | -5.5 |
| | | UNII 7 | -6.0 |
| | | UNII 8 | -6.0 (Only 7 115 MHz : -8.0) |
| | 52T | UNII 5 | -4.5 |
| | | UNII 6 | -4.0 |
| | | UNII 7 | -4.5 |
| | | UNII 8 | -5.0 |
| | 106T | UNII 5 | -2.0 |
| | | UNII 6 | -1.0 |
| | | UNII 7 | -1.5 |
| | | UNII 8 | -1.5 |
| | 242T | UNII 5 | 1.0 |
| | | UNII 6 | 2.0 |
| | | UNII 7 | 1.5 |
| | | UNII 8 | 1.0 |
| 802.11ax _HE40 | 26T | UNII 5 | -6.0 |
| | | UNII 6 | -5.5 |
| | | UNII 7 | -6.0 |
| | | UNII 8 | -5.5 |
| | 52T | UNII 5 | -4.5 |
| | | UNII 6 | -4.0 |
| | | UNII 7 | -4.5 |
| | | UNII 8 | -4.5 |
| | 106T | UNII 5 | -2.0 |
| | | UNII 6 | -1.0 |
| | | UNII 7 | -1.5 |
| | | UNII 8 | -1.5 |
| | 242T | UNII 5 | 1.5 |
| | | UNII 6 | 2.0 |
| | | UNII 7 | 2.0 |
| | | UNII 8 | 1.5 |
| | 484T | UNII 5 | 4.0 |
| | | UNII 6 | 5.0 |
| | | UNII 7 | 5.0 |
| | | UNII 8 | 4.0 |
| 802.11ax _HE80 | 26T | UNII 5 | -6.0 |
| | | UNII 6 | -5.5 |
| | | UNII 7 | -6.0 |

| | | | |
|---|---|---|---|
| | | UNII 8 | -5.5 |
| | 52T | UNII 5 | -4.5 |
| | | UNII 6 | -4.0 |
| | | UNII 7 | -4.5 |
| | | UNII 8 | -4.5 |
| | 106T | UNII 5 | -2.0 |
| | | UNII 6 | -1.0 |
| | | UNII 7 | -1.5 |
| | | UNII 8 | -1.5 |
| | 242T | UNII 5 | 1.5 |
| | | UNII 6 | 2.0 |
| | | UNII 7 | 2.0 |
| | | UNII 8 | 1.5 |
| | 484T | UNII 5 | 5.0 |
| | | UNII 6 | 6.0 |
| | | UNII 7 | 6.0 |
| | | UNII 8 | 5.0 |
| | 996T | UNII 5 | 8.0 |
| | | UNII 6 | 9.0 |
| | | UNII 7 | 9.0 |
| | | UNII 8 | 7.0 |

## 1.3 Peripheral Devices

| Device | Manufacturer | Model No. | Serial No. |
|---|---|---|---|
| Note Computer | HP | 15-bs563TU | CND7253R6N |
| AC/DC Adapter | HP | HSTNN-LA40 | - |
| Note Computer | Samsung Electronics Co., Ltd. | NT-RC530-WS55 | HPFG91EC300116B |
| AC/DC Adapter | Samsung Electronics Co., Ltd. | PA-1600-66 | - |
| Note Computer | Samsung Electronics Co., Ltd. | NT751BBC | 4LMA9FGNC00112B |
| AC/DC Adapter | Samsung Electronics Co., Ltd. | GST40A12 | - |
| AXE5400 Tri-Band Wi-Fi 6E Router | TP-Link Corporation Limited | Archer AXE75 | 22221J6000455 |
| AC/DC Adapter | Dong Guan City Gang Qi Electronic Co., Ltd | GQ48-120300-AK | - |

## 1.4 Model Differences

Not applicable

# 2. Accreditations

## 2.1 Laboratory Accreditations and Listings

| Country | Agency | Registration Number |
|---|---|---|
| USA | FCC | 805871 |
| CANADA | ISED | 8737A |
| KOREA | NRRA | KR0025 |

## 2.2 Calibration Details of Equipment Used for Measurement

Test equipment and test accessories are calibrated on regular basis. The maximum time between calibrations is one year or what is recommended by the manufacturer, whichever is less. All test equipment calibrations are traceable to the Korea Research Institute of Standards and Science (KRISS), therefore, all test data recorded in this report is traceable to KRISS.

# 3. Test Specifications

## 3.1 Standards

| FCC Part Section(s) | Requirement(s) | Limit | Status (Note 1) | Test Condition |
|---|---|---|---|---|
| **15.407(a)(10)** | 26 dB Bandwidth and 99% Bandwidth | <= 320 MHz | C | Conducted |
| **15.407(a)(8)** | Conducted Output Power | < 24 dBm EIRP | C | |
| **15.407(a)(8)** | Power Spectral Density | < -1 dBm/MHz EIRP | C | |
| **15.407(b)(7)** | In-Band Emissions | a. Suppressed by 20 dB at 1MHz outside of the channel edge<br><br>b. Suppressed by 28 dB at one channel bandwidth from the channel center.<br><br>c. Suppressed by 40 dB at one-and one-half times the channel bandwidth from the channel center. | C | |
| **15.407(g)** | Frequency Stability | NA | C | |
| **15.407(d)(6)** | Contention Based Protocol | Detect co-channel energe with 90% or greater certainty | C | |
| **15.407 (b)(6)** | Undesirable emission | < -27 dBm/MHz EIRP | C | Radiated |
| **15.205, 15.407 (b)(9),(10)** | Radiated Spurious Emission | 15.209(a) | C | |
| **15.407 (b)(9)** | AC Conducted Emissions | 15.207(a) | C | Line Conducted |
| *Note 1*: C=Complies NC=Not Complies NT=Not Tested NA=Not Applicable | | | | |
| *Note 2*: The data in this test report are traceable to the national or international standards. | | | | |
| *Note 3*: The sample was tested according to the following specification: FCC Part 15.407, ANSI C63.10-2013 | | | | |
| *Note 4*: The tests were performed according to the method of measurements prescribed in KDB No.987594, No.789033 | | | | |

## 3.2 Mode of operation during the test

The EUT is operated in a manner representative of the typical of the equipments.
During at testing, system components were manipulated within the confines of typical usage to maximize each emission.
For WLAN function, the engineering test program was provided and enabled to make EUT continuous transmit.
All modulation modes were tests. The results are only attached worst cases.

The Output power and Power Spectral Density for the 802.11 ax mode were investigated between all different tones, and we found that the highest tone had the highest output power and lowest tone had the highest PSD readings. Therefore, full testing was performed on both the highest and lowest tones.

**Test Frequency & Bandwidth**

- 802.11a

| | Lowest channel | Middle channel | Highest channel |
|---|---|---|---|
| **UNII 5** | 5 975 MHz | 6 215 MHz | 6 375 MHz |
| **UNII 6** | 6 455 MHz | - | - |
| **UNII 7** | 6 535 MHz | 6 695 MHz | 6 855 MHz |
| **UNII 8** | 6 935 MHz | 7 105 MHz | 7 095 MHz |

- 802.11ax_HE20

| | Lowest channel | Middle channel | Highest1 channel | Highest2 channel |
|---|---|---|---|---|
| **UNII 5** | 5 955 MHz | 6 175 MHz | 6 415 MHz | - |
| **UNII 6** | 6 435 MHz | 6 475 MHz | 6 515 MHz | - |
| **UNII 7** | 6 535 MHz | 6 695 MHz | 6 855 MHz | - |
| **UNII 8** | 6 875 MHz | 6 995 MHz | 7 095 MHz | 7 115 MHz |

- 802.11ax_HE40

| | Lowest channel | Middle channel | Highest channel |
|---|---|---|---|
| **UNII 5** | 5 965 MHz | 6 165 MHz | 6 405 MHz |
| **UNII 6** | 6 445 MHz | - | 6 485 MHz |
| **UNII 7** | 6 525 MHz | 6 685 MHz | 6 845 MHz |
| **UNII 8** | 6 885 MHz | 7 005 MHz | 7 085 MHz |

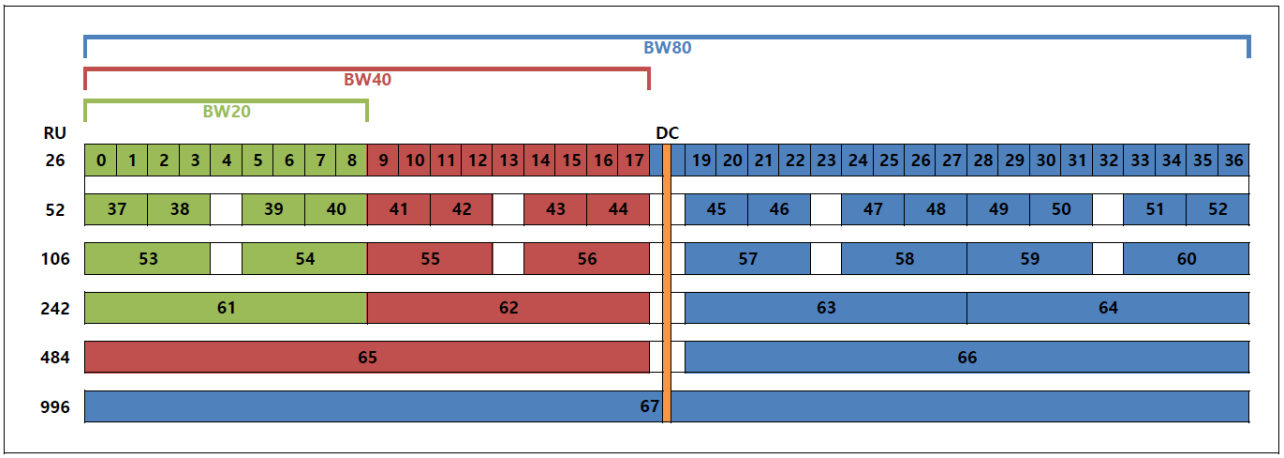
- 802.11ax_HE80

| | Lowest channel | Middle channel | Highest channel |
|---|---|---|---|
| **UNII 5** | 5 985 MHz | 6 145 MHz | 6 385 MHz |
| **UNII 6** | 6 465 MHz | - | - |
| **UNII 7** | 6 545 MHz | 6 705 MHz | 6 865 MHz |
| **UNII 8** | 6 945 MHz | - | 7 025 MHz |

## Test mode & Worst case

| Test mode | Modulation | Data rate | Duty Cycle | Duty Cycle Factor |
|---|---|---|---|---|
| 802.11a | OFDM | 6 Mbps | 97.1 % | 0.13 dB |
| 802.11ax_HE20_26T | OFDMA | MCS 0 | 95.2 % | 0.21 dB |
| 802.11ax_HE20_52T | | | 95.0 % | 0.22 dB |
| 802.11ax_HE20_106T | | | 94.8 % | 0.23 dB |
| 802.11ax_HE20_242T | | | 93.9 % | 0.27 dB |
| 802.11ax_HE40_26T | | | 95.3 % | 0.21 dB |
| 802.11ax_HE40_52T | | | 95.1 % | 0.22 dB |
| 802.11ax_HE40_106T | | | 94.8 % | 0.23 dB |
| 802.11ax_HE40_242T | | | 94.2 % | 0.26 dB |
| 802.11ax HE40 484T | | | 94.0 % | 0.27 dB |
| 802.11ax HE80 26T | | | 95.3 % | 0.21 dB |
| 802.11ax HE80 52T | | | 95.1 % | 0.22 dB |
| 802.11ax HE80 106T | | | 94.8 % | 0.23 dB |
| 802.11ax HE80 242T | | | 93.9 % | 0.27 dB |
| 802.11ax HE80 484T | | | 93.8 % | 0.28 dB |
| 802.11ax HE80 996T | | | 93.6 % | 0.29 dB |

## 802.11ax RU Locations



## Test RU Index for Tones

| Mode | Tones | RU Index | |
|---|---|---|---|
| 802.11ax_HE20 | 26T | Low | 0 |
| | | Mid | 4 |
| | | High | 8 |
| | 52T | Low | 37 |
| | | Mid | 39 |
| | | High | 40 |
| | 106T | Low | 53 |
| | | Mid | - |
| | | High | 54 |
| | 242T / SU | 61 / NA | 61 / NA |
| 802.11ax_HE40 | 26T | Low | 0 |
| | | Mid | 9 |
| | | High | 17 |
| | 52T | Low | 37 |
| | | Mid | 41 |
| | | High | 44 |
| | 106T | Low | 53 |
| | | Mid | 55 |
| | | High | 56 |
| | 242T | Low | 61 |
| | | Mid | - |
| | | High | 62 |
| | 484T / SU | 65 / NA | 65 / NA |
| 802.11ax_HE80 | 26T | Low | 0 |
| | | Mid | 18 |
| | | High | 36 |
| | 52T | Low | 37 |
| | | Mid | 45 |
| | | High | 52 |
| | 106T | Low | 53 |
| | | Mid | 57 |
| | | High | 60 |
| | 242T | Low | 61 |
| | | Mid | 63 |
| | | High | 64 |
| | 484T | Low | 65 |
| | | Mid | - |
| | | High | 66 |
| | 996T / SU | 67 / NA | 67 / NA |

Full RU(Resource Unit) mode and SU(Single Unit) mode have no difference in physical waveform. This Report has been reported the Full RU(Resource Unit) mode with worst output power.

## 3.3 Device Modifications

The following modifications were necessary for compliance:

Not applicable

## 3.4 Maximum Measurement Uncertainty

The value of the measurement uncertainty for the measurement of each parameter.
Coverage factor $k$ = 2, Confidence levels of 95 %

| Description | Uncertainty |
|---|---|
| Conducted RF Output Power | 1.5 dB (C.L.: Approx. 95 %, $k$ = 2) |
| Power Spectral Density | 1.5 dB (C.L.: Approx. 95 %, $k$ = 2) |
| Occupied Bandwidth | 0.1 MHz (C.L.: Approx. 95 %, $k$ = 2) |
| Unwanted Emission(conducted) | 3.0 dB (C.L.: Approx. 95 %, $k$ = 2) |
| Radiated Emissions (f ≤ 1 GHz) | 3.88 dB (C.L.: Approx. 95 %, $k$ = 2) |
| Radiated Emissions (f > 1 GHz) | 4.50 dB (C.L.: Approx. 95 %, $k$ = 2) |
| Line Conducted Emission | 1.94 dB (C.L.: Approx. 95 %, $k$ = 2) |

## 3.5 Test Software

| | |
|---|---|
| Conducted Test | Ics Pro Ver. 6.0.3 |
| Radiated Test | EP5RE Ver. 6.0.1.0, ES10 Ver. 10.001 |
| Line Conducted Test | EMC32 Ver. 10.50.00 |

# 4. Technical Characteristic Test

## 4.1 26 dB Bandwidth and 99% Bandwidth

**Test Procedures**

KDB 987594 – Section C
KDB 789033 – Section C.1
ANSI C63.10-2013 - Section 12.4.1

Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 26 dB relative to the maximum level measured in the fundamental emission.

**Test Procedures**

KDB 987594 – Section D
KDB 789033 – Section D
ANSI C63.10-2013 - Section 6.9.3

The occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers are each equal to 0.5% of the total mean power of the given emission.
Use the 99% power bandwidth function of the instrument and report the measured bandwidth.

Test Settings :

Center frequency = the highest, middle and the lowest channels

a) RBW = approximately 1 % of the emission bandwidth

b) VBW ≥ RBW

c) Detector = peak

d) Trace mode = Max hold

e) Measure the maximum width of the emission that is 26 dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

**Minimum Standard:**

| |
|---|
| <= 320 MHz |

**Test Data**

**ANT0**

| | 26 dB Bandwidth and 99 % Bandwidth (MHz) | |
|---|---|---|
| Mode | 802.11a | |
| Frequency | 26 dB | 99 % |
| 5 975 MHz | 24.33 | 16.73 |
| 6 215 MHz | 23.38 | 16.77 |
| 6 375 MHz | 24.23 | 16.79 |
| 6 455 MHz | 23.67 | 16.77 |
| 6 535 MHz | 23.87 | 16.78 |
| 6 695 MHz | 24.52 | 16.75 |
| 6 855 MHz | 24.11 | 16.75 |
| 6 935 MHz | 23.39 | 16.81 |
| 7 105 MHz | 23.13 | 16.76 |
| 7 095 MHz | 23.67 | 16.77 |
| Measurement uncertainty | ± 0.1 MHz | |

| | 26 dB Bandwidth and 99 % Bandwidth (MHz) | | | | | |
|---|---|---|---|---|---|---|
| Mode | 802.11ax_HE20_26T | | | | | |
| RU Index | Low | | Mid | | High | |
| Frequency | 26 dB | 99 % | 26 dB | 99 % | 26 dB | 99 % |
| 5 955 MHz | 20.59 | 18.58 | 18.26 | 17.06 | 20.59 | 18.45 |
| 6 175 MHz | 20.62 | 18.66 | 18.19 | 16.98 | 20.46 | 18.54 |
| 6 415 MHz | 20.59 | 18.54 | 18.16 | 17.02 | 20.18 | 18.48 |
| 6 435 MHz | 20.61 | 18.71 | 18.25 | 17.06 | 20.60 | 18.55 |
| 6 475 MHz | 20.37 | 18.49 | 18.18 | 17.04 | 20.50 | 18.48 |
| 6 515 MHz | 20.72 | 18.63 | 18.25 | 17.04 | 20.25 | 18.43 |
| 6 535 MHz | 20.76 | 18.70 | 18.18 | 17.06 | 20.13 | 18.50 |
| 6 695 MHz | 20.76 | 18.64 | 18.26 | 17.04 | 20.33 | 18.59 |
| 6 855 MHz | 20.44 | 18.67 | 18.10 | 17.03 | 20.28 | 18.46 |
| 6 875 MHz | 20.90 | 18.59 | 18.26 | 17.07 | 20.28 | 18.55 |
| 6 995 MHz | 21.17 | 18.75 | 18.18 | 17.05 | 20.13 | 18.47 |
| 7 095 MHz | 20.75 | 18.60 | 18.24 | 17.07 | 20.58 | 18.57 |
| 7 115 MHz | 20.96 | 18.60 | 18.09 | 16.99 | 20.57 | 18.55 |
| Measurement uncertainty | ± 0.1 MHz | | | | | |

| | 26 dB Bandwidth and 99 % Bandwidth (MHz) | |
|---|---|---|
| Mode | 802.11ax_HE20_242T | |
| Frequency | 26 dB | 99 % |
| 5 955 MHz | 23.08 | 19.01 |
| 6 175 MHz | 23.09 | 18.99 |
| 6 415 MHz | 22.77 | 18.98 |
| 6 435 MHz | 24.14 | 19.00 |
| 6 475 MHz | 29.03 | 18.99 |
| 6 515 MHz | 26.11 | 18.96 |
| 6 535 MHz | 23.38 | 19.00 |
| 6 695 MHz | 23.05 | 18.99 |
| 6 855 MHz | 22.36 | 19.02 |
| 6 875 MHz | 22.98 | 19.03 |
| 6 995 MHz | 26.69 | 19.01 |
| 7 095 MHz | 25.79 | 19.01 |
| 7 115 MHz | 23.56 | 19.02 |
| Measurement uncertainty | ± 0.1 MHz | |

| | 26 dB Bandwidth and 99 % Bandwidth (MHz) | | | | | |
|---|---|---|---|---|---|---|
| Mode | 802.11ax_HE40_26T | | | | | |
| RU Index | Low | | Mid | | High | |
| Frequency | 26 dB | 99 % | 26 dB | 99 % | 26 dB | 99 % |
| 5 965 MHz | 19.12 | 17.92 | 22.19 | 20.11 | 19.36 | 17.91 |
| 6 165 MHz | 19.11 | 17.87 | 21.93 | 20.25 | 19.28 | 17.94 |
| 6 405 MHz | 19.20 | 17.87 | 21.56 | 20.12 | 19.25 | 18.01 |
| 6 445 MHz | 19.17 | 17.84 | 22.17 | 20.18 | 19.17 | 17.89 |
| 6 485 MHz | 19.06 | 17.90 | 22.17 | 20.38 | 19.22 | 17.91 |
| 6 525 MHz | 19.13 | 17.91 | 22.28 | 20.17 | 19.39 | 17.95 |
| 6 685 MHz | 19.29 | 17.90 | 22.02 | 20.19 | 19.36 | 17.95 |
| 6 845 MHz | 19.33 | 17.90 | 22.48 | 20.42 | 19.35 | 17.97 |
| 6 885 MHz | 19.21 | 17.92 | 22.50 | 20.03 | 19.24 | 17.94 |
| 7 005 MHz | 19.27 | 17.89 | 22.53 | 20.52 | 19.36 | 18.01 |
| 7 085 MHz | 19.31 | 17.83 | 21.99 | 20.17 | 19.31 | 17.95 |
| Measurement uncertainty | ± 0.1 MHz | | | | | |

| | 26 dB Bandwidth and 99 % Bandwidth (MHz) | |
|---|---|---|
| Mode | 802.11ax_HE40_484T | |
| Frequency | 26 dB | 99 % |
| 5 965 MHz | 39.40 | 37.44 |
| 6 165 MHz | 39.46 | 37.47 |
| 6 405 MHz | 39.42 | 37.48 |
| 6 445 MHz | 39.39 | 37.53 |
| 6 485 MHz | 39.45 | 37.49 |
| 6 525 MHz | 39.40 | 37.53 |
| 6 685 MHz | 39.40 | 37.54 |
| 6 845 MHz | 39.39 | 37.50 |
| 6 885 MHz | 39.49 | 37.39 |
| 7 005 MHz | 39.31 | 37.39 |
| 7 085 MHz | 39.42 | 37.42 |
| Measurement uncertainty | ± 0.1 MHz | |

| | 26 dB Bandwidth and 99 % Bandwidth (MHz) | | | | | |
|---|---|---|---|---|---|---|
| Mode | 802.11ax_HE80_26T | | | | | |
| RU Index | Low | | Mid | | High | |
| Frequency | 26 dB | 99 % | 26 dB | 99 % | 26 dB | 99 % |
| 5 985 MHz | 20.36 | 18.57 | 23.51 | 21.01 | 20.60 | 18.52 |
| 6 145 MHz | 20.10 | 18.61 | 24.11 | 20.88 | 20.30 | 18.94 |
| 6 385 MHz | 20.16 | 18.35 | 23.91 | 20.91 | 20.31 | 18.77 |
| 6 465 MHz | 20.04 | 18.55 | 22.49 | 21.02 | 20.37 | 18.69 |
| 6 545 MHz | 19.95 | 18.48 | 22.67 | 20.53 | 20.27 | 18.86 |
| 6 705 MHz | 20.58 | 18.64 | 21.46 | 20.15 | 20.48 | 18.77 |
| 6 865 MHz | 20.29 | 18.47 | 22.03 | 20.63 | 19.98 | 18.73 |
| 6 945 MHz | 20.66 | 18.58 | 23.49 | 20.69 | 20.67 | 18.91 |
| 7 025 MHz | 20.34 | 18.42 | 23.26 | 21.50 | 20.95 | 18.84 |
| Measurement uncertainty | ± 0.1 MHz | | | | | |

| | 26 dB Bandwidth and 99 % Bandwidth (MHz) | |
|---|---|---|
| Mode | 802.11ax_HE80_996T | |
| Frequency | 26 dB | 99 % |
| 5 985 MHz | 79.93 | 76.79 |
| 6 145 MHz | 80.09 | 76.42 |
| 6 385 MHz | 79.94 | 76.79 |
| 6 465 MHz | 80.15 | 76.89 |
| 6 545 MHz | 79.89 | 76.83 |
| 6 705 MHz | 79.98 | 76.79 |
| 6 865 MHz | 79.92 | 76.65 |
| 6 945 MHz | 80.17 | 76.83 |
| 7 025 MHz | 80.15 | 76.94 |
| Measurement uncertainty | ± 0.1 MHz | |

**ANT1**

| | 26 dB Bandwidth and 99 % Bandwidth (MHz) | |
|---|---|---|
| Mode | 802.11a | |
| Frequency | 26 dB | 99 % |
| 5 975 MHz | 23.53 | 16.78 |
| 6 215 MHz | 23.71 | 16.76 |
| 6 375 MHz | 23.61 | 16.78 |
| 6 455 MHz | 23.98 | 16.73 |
| 6 535 MHz | 23.17 | 16.73 |
| 6 695 MHz | 23.00 | 16.77 |
| 6 855 MHz | 23.11 | 16.71 |
| 6 935 MHz | 23.90 | 16.74 |
| 7 105 MHz | 23.42 | 16.74 |
| 7 095 MHz | 24.58 | 16.79 |
| Measurement uncertainty | ± 0.1 MHz | |

| | 26 dB Bandwidth and 99 % Bandwidth (MHz) | | | | | |
|---|---|---|---|---|---|---|
| Mode | 802.11ax_HE20_26T | | | | | |
| RU Index | Low | | Mid | | High | |
| Frequency | 26 dB | 99 % | 26 dB | 99 % | 26 dB | 99 % |
| 5 955 MHz | 19.77 | 18.37 | 18.11 | 17.07 | 20.07 | 18.36 |
| 6 175 MHz | 20.07 | 18.42 | 18.09 | 17.11 | 20.08 | 18.47 |
| 6 415 MHz | 20.15 | 18.48 | 18.07 | 17.07 | 20.65 | 18.54 |
| 6 435 MHz | 20.29 | 18.42 | 18.12 | 17.07 | 20.13 | 18.54 |
| 6 475 MHz | 20.67 | 18.55 | 18.07 | 17.13 | 20.18 | 18.48 |
| 6 515 MHz | 20.39 | 18.52 | 18.08 | 16.98 | 19.91 | 18.43 |
| 6 535 MHz | 20.07 | 18.46 | 18.13 | 17.07 | 20.48 | 18.54 |
| 6 695 MHz | 19.99 | 18.4 | 18.15 | 17.01 | 20.09 | 18.42 |
| 6 855 MHz | 20.18 | 18.47 | 18.02 | 17.03 | 20.42 | 18.46 |
| 6 875 MHz | 19.86 | 18.48 | 18.06 | 17.03 | 20.45 | 18.56 |
| 6 995 MHz | 20.16 | 18.54 | 18.10 | 17.06 | 20.24 | 18.56 |
| 7 095 MHz | 20.13 | 18.43 | 18.07 | 17.07 | 20.12 | 18.50 |
| 7 115 MHz | 20.32 | 18.46 | 18.06 | 16.96 | 20.76 | 18.48 |
| Measurement uncertainty | ± 0.1 MHz | | | | | |

| | 26 dB Bandwidth and 99 % Bandwidth (MHz) | |
|---|---|---|
| Mode | 802.11ax_HE20_242T | |
| Frequency | 26 dB | 99 % |
| 5 955 MHz | 22.63 | 18.99 |
| 6 175 MHz | 22.28 | 18.99 |
| 6 415 MHz | 23.63 | 19.01 |
| 6 435 MHz | 22.99 | 19.00 |
| 6 475 MHz | 22.54 | 18.98 |
| 6 515 MHz | 22.35 | 18.96 |
| 6 535 MHz | 22.61 | 19.00 |
| 6 695 MHz | 22.49 | 19.00 |
| 6 855 MHz | 22.04 | 18.99 |
| 6 875 MHz | 22.64 | 18.99 |
| 6 995 MHz | 21.86 | 18.97 |
| 7 095 MHz | 23.32 | 18.99 |
| 7 115 MHz | 22.99 | 18.98 |
| Measurement uncertainty | ± 0.1 MHz | |

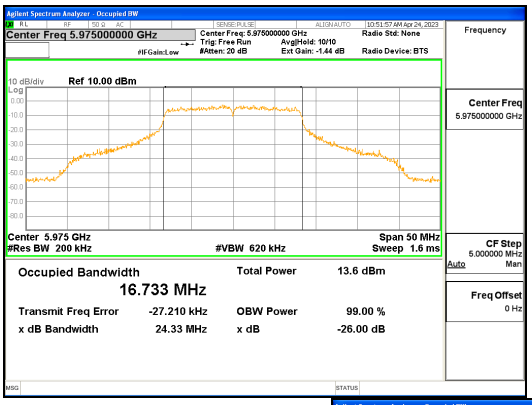
| | 26 dB Bandwidth and 99 % Bandwidth (MHz) | | | | | |
|---|---|---|---|---|---|---|
| Mode | 802.11ax_HE40_26T | | | | | |
| RU Index | Low | | Mid | | High | |
| Frequency | 26 dB | 99 % | 26 dB | 99 % | 26 dB | 99 % |
| 5 965 MHz | 19.03 | 17.77 | 22.00 | 19.76 | 19.00 | 17.79 |
| 6 165 MHz | 19.12 | 17.84 | 21.52 | 19.69 | 18.97 | 17.81 |
| 6 405 MHz | 19.06 | 17.79 | 21.79 | 19.94 | 19.04 | 17.85 |
| 6 445 MHz | 19.18 | 17.90 | 21.75 | 19.93 | 19.12 | 17.85 |
| 6 485 MHz | 19.25 | 17.85 | 22.26 | 19.95 | 19.05 | 17.75 |
| 6 525 MHz | 19.05 | 17.83 | 21.66 | 19.92 | 19.08 | 17.84 |
| 6 685 MHz | 19.20 | 17.80 | 21.95 | 20.00 | 19.09 | 17.77 |
| 6 845 MHz | 19.26 | 17.90 | 21.82 | 19.70 | 18.99 | 17.83 |
| 6 885 MHz | 19.18 | 17.90 | 22.02 | 19.68 | 19.15 | 17.73 |
| 7 005 MHz | 19.36 | 17.90 | 22.15 | 19.75 | 19.04 | 17.79 |
| 7 085 MHz | 19.21 | 17.83 | 22.56 | 19.85 | 19.02 | 17.80 |
| Measurement uncertainty | ± 0.1 MHz | | | | | |

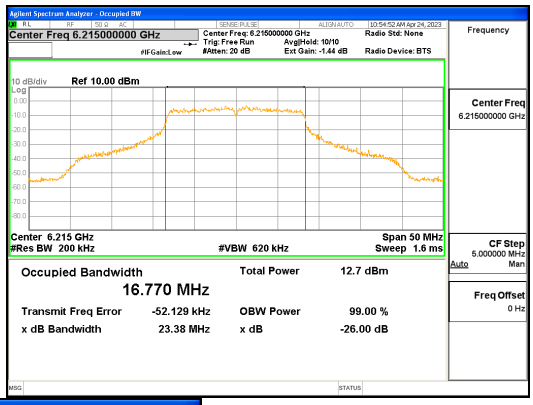
| | 26 dB Bandwidth and 99 % Bandwidth (MHz) | |
|---|---|---|
| Mode | 802.11ax_HE40_484T | |
| Frequency | 26 dB | 99 % |
| 5 965 MHz | 39.40 | 37.46 |
| 6 165 MHz | 39.47 | 37.52 |
| 6 405 MHz | 39.44 | 37.50 |
| 6 445 MHz | 39.29 | 37.49 |
| 6 485 MHz | 39.42 | 37.50 |
| 6 525 MHz | 39.42 | 37.50 |
| 6 685 MHz | 39.37 | 37.41 |
| 6 845 MHz | 39.42 | 37.42 |
| 6 885 MHz | 39.39 | 37.43 |
| 7 005 MHz | 39.46 | 37.42 |
| 7 085 MHz | 39.45 | 37.54 |
| Measurement uncertainty | ± 0.1 MHz | |

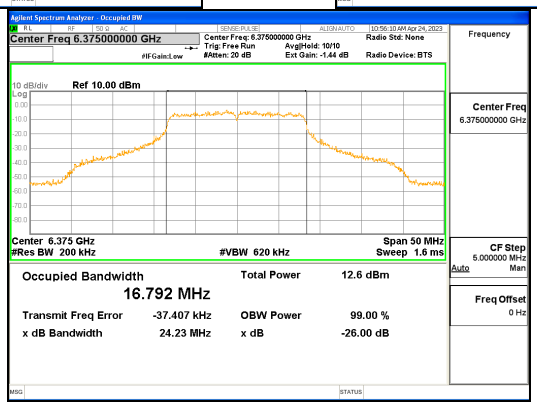
| | 26 dB Bandwidth and 99 % Bandwidth (MHz) | | | | | |
|---|---|---|---|---|---|---|
| Mode | 802.11ax_HE80_26T | | | | | |
| RU Index | Low | | Mid | | High | |
| Frequency | 26 dB | 99 % | 26 dB | 99 % | 26 dB | 99 % |
| 5 985 MHz | 19.91 | 18.36 | 23.21 | 19.91 | 19.50 | 18.22 |
| 6 145 MHz | 19.87 | 18.37 | 22.62 | 20.06 | 19.82 | 18.28 |
| 6 385 MHz | 20.40 | 18.35 | 21.77 | 19.92 | 19.53 | 18.23 |
| 6 465 MHz | 19.77 | 18.39 | 22.19 | 19.94 | 19.57 | 18.28 |
| 6 545 MHz | 20.07 | 18.37 | 22.06 | 20.09 | 19.86 | 18.34 |
| 6 705 MHz | 20.42 | 18.44 | 22.73 | 20.26 | 19.67 | 18.22 |
| 6 865 MHz | 19.65 | 18.33 | 22.29 | 20.61 | 19.78 | 18.37 |
| 6 945 MHz | 20.03 | 18.32 | 22.31 | 20.33 | 19.61 | 18.34 |
| 7 025 MHz | 20.31 | 18.31 | 22.44 | 20.20 | 19.52 | 18.38 |
| Measurement uncertainty | ± 0.1 MHz | | | | | |

| | 26 dB Bandwidth and 99 % Bandwidth (MHz) | |
|---|---|---|
| Mode | 802.11ax_HE80_996T | |
| Frequency | 26 dB | 99 % |
| 5 985 MHz | 79.98 | 76.80 |
| 6 145 MHz | 79.89 | 76.70 |
| 6 385 MHz | 79.87 | 76.85 |
| 6 465 MHz | 79.93 | 76.83 |
| 6 545 MHz | 79.86 | 76.83 |
| 6 705 MHz | 79.84 | 76.68 |
| 6 865 MHz | 79.97 | 76.82 |
| 6 945 MHz | 80.04 | 76.74 |
| 7 025 MHz | 79.77 | 76.88 |
| Measurement uncertainty | ± 0.1 MHz | |

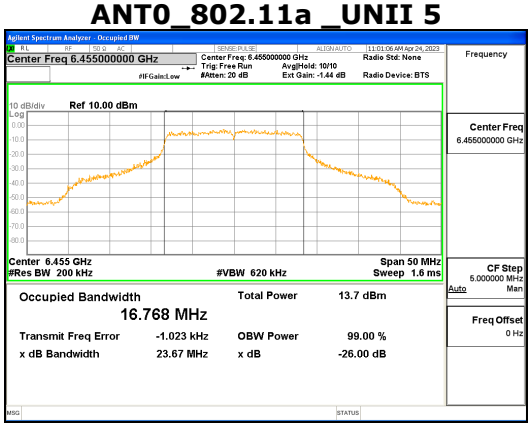
See next pages for actual measured spectrum plots.



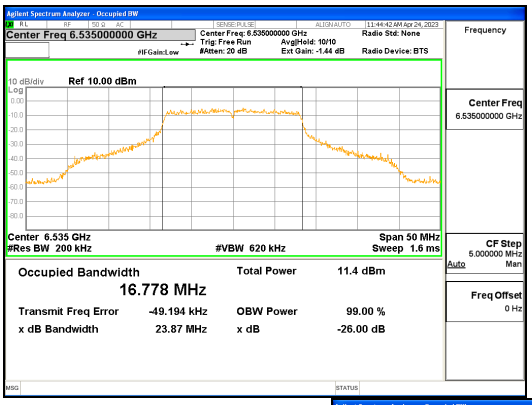



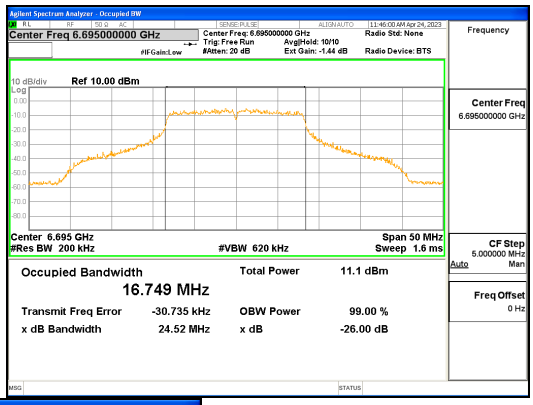



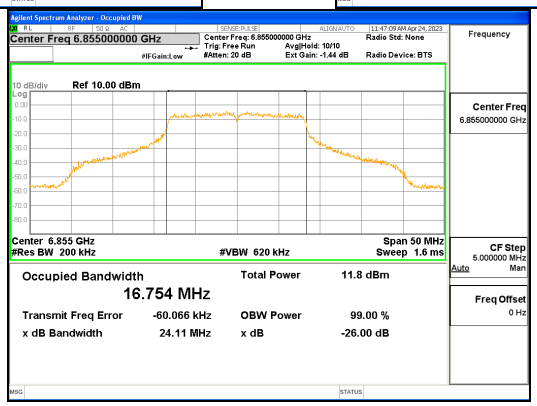

**ANT0_802.11a _UNII 5**



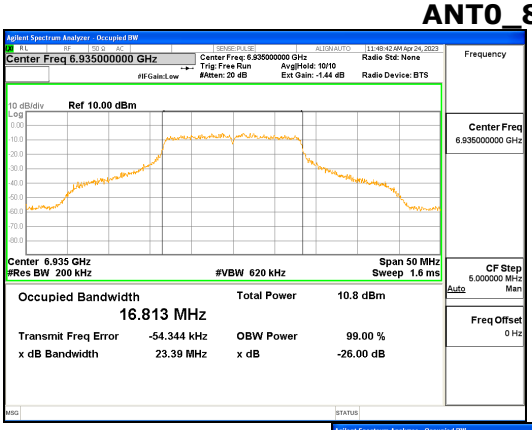

**ANT0_802.11a_UNII 6**

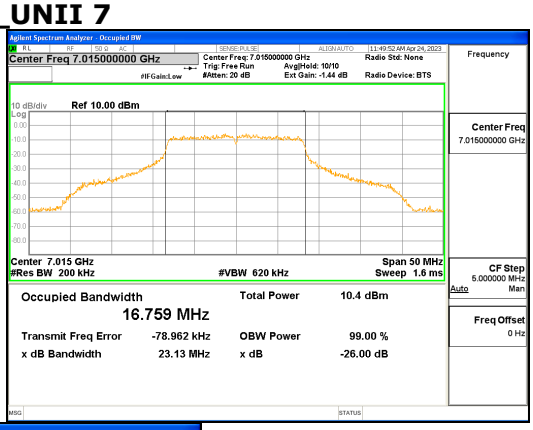


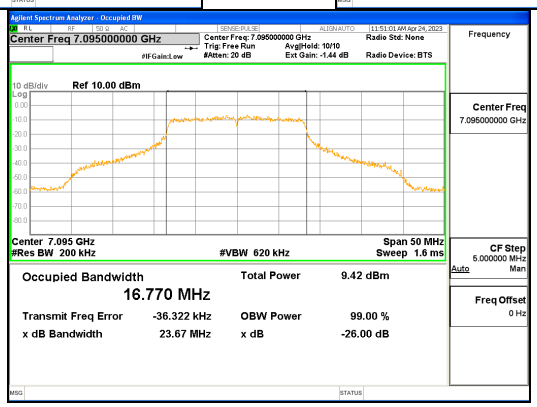



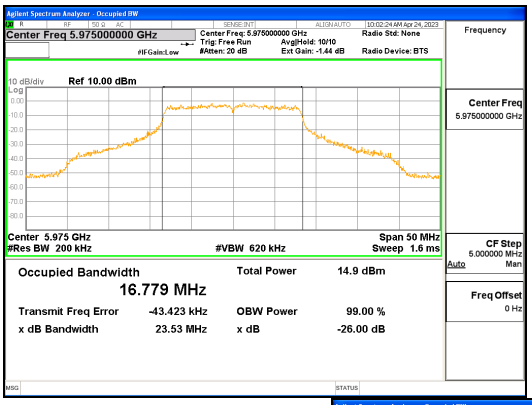

**ANT0_802.11a_UNII 7**

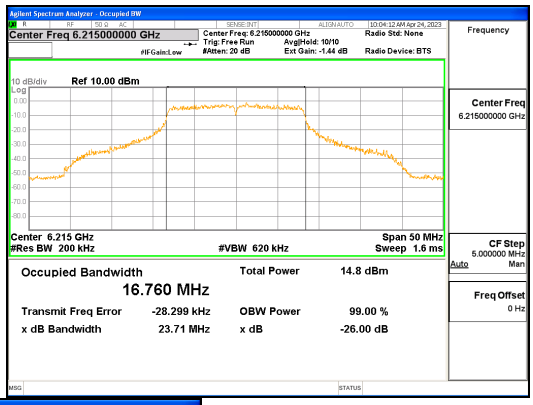


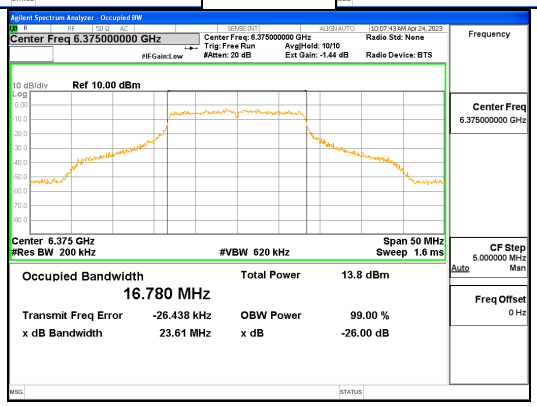



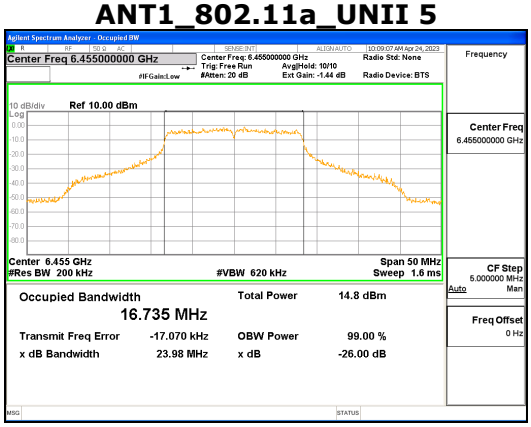

**ANT0_802.11a_UNII 8**



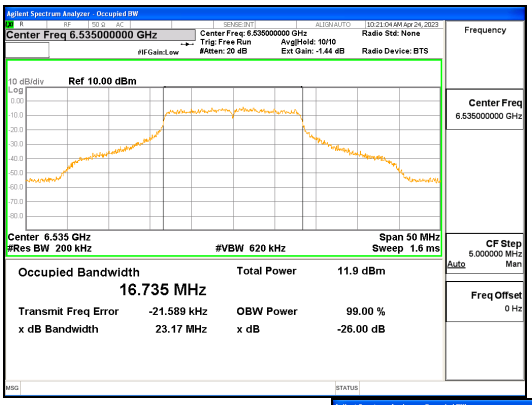



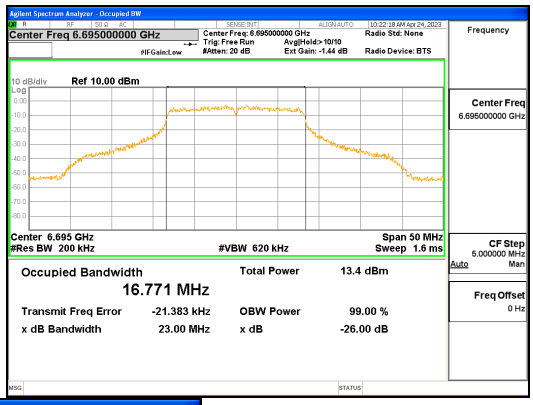



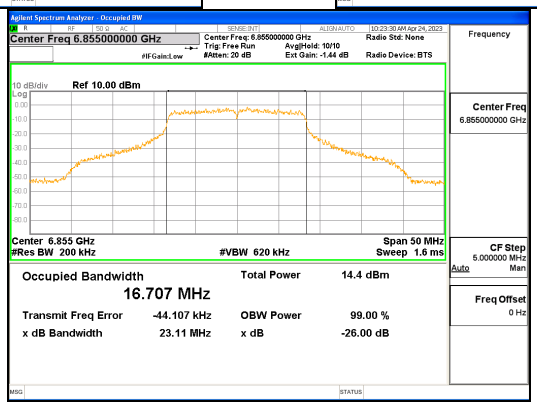

**ANT1_802.11a_UNII 5**



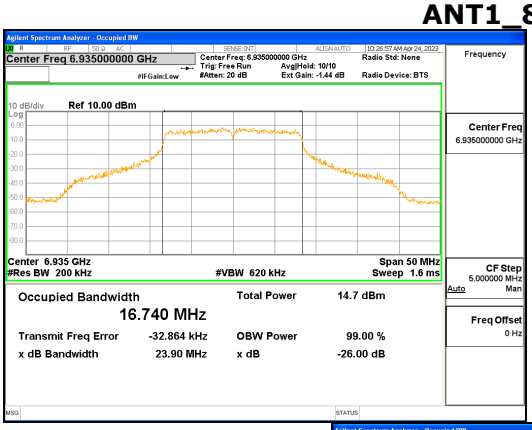

**ANT1_802.11a_UNII 6**

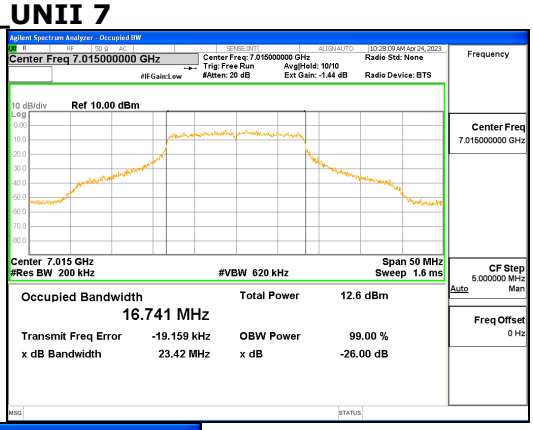


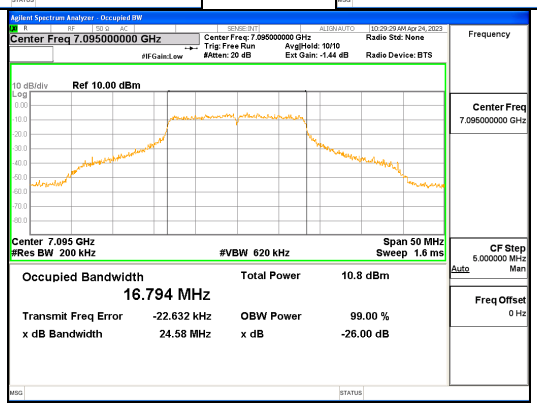



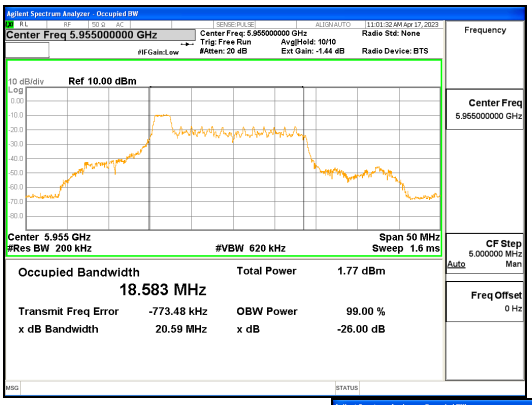

**ANT1_802.11a_UNII 7**

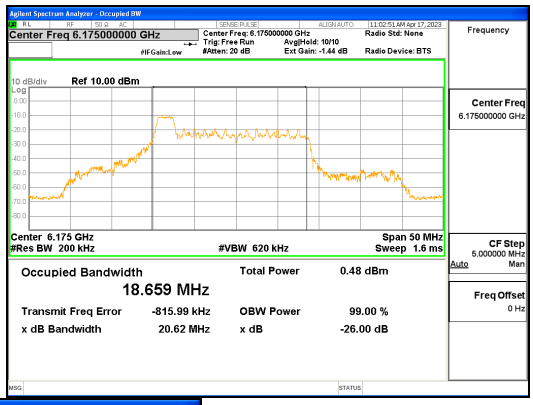


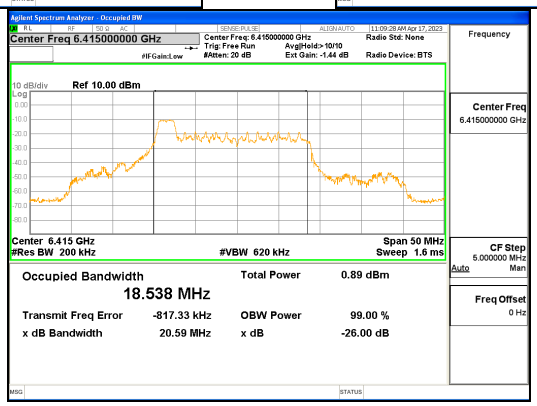



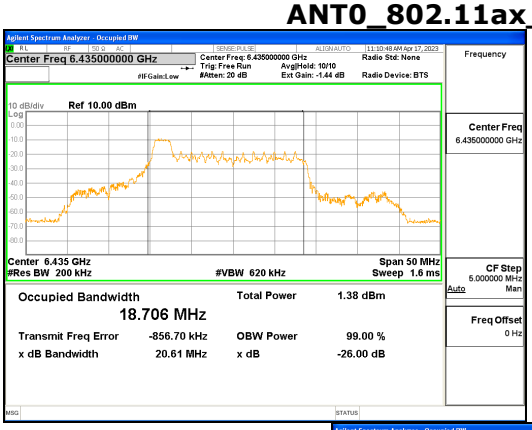

**ANT1_802.11a_UNII 8**

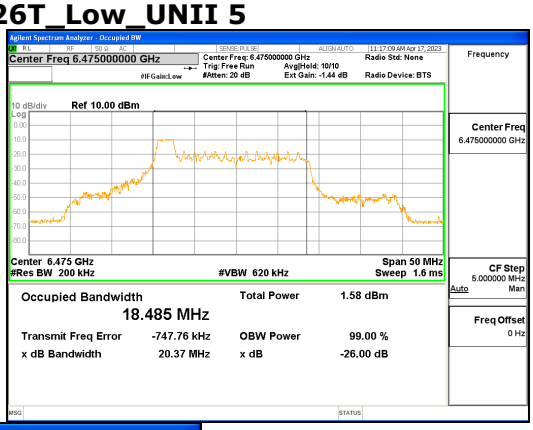


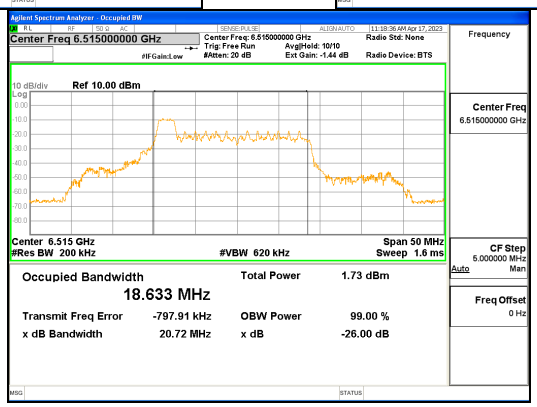



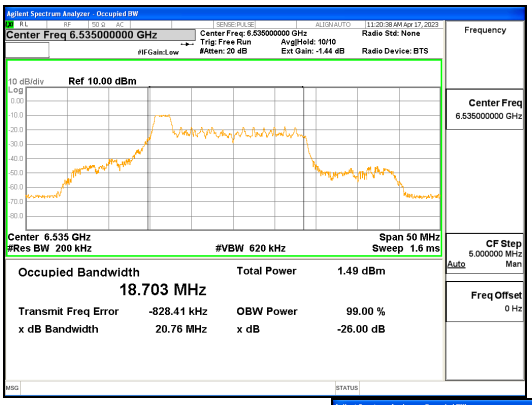

**ANT0_802.11ax_HE20_26T_Low_UNII 5**

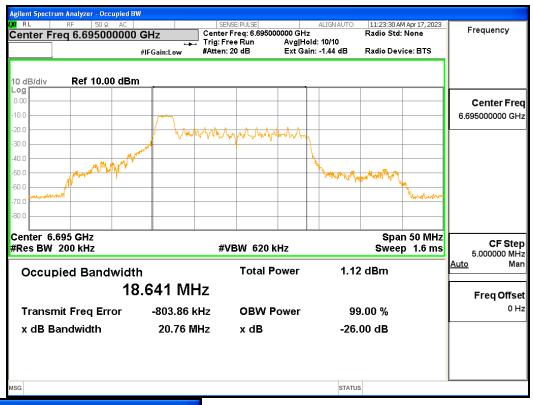


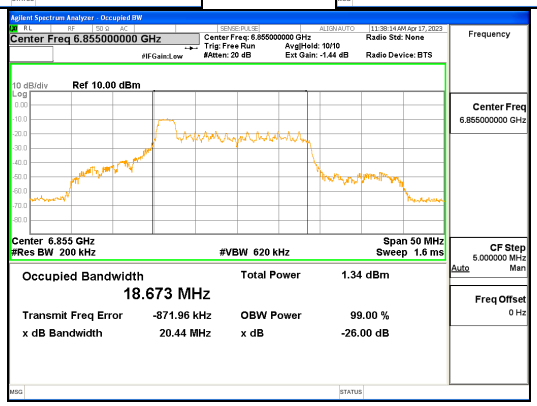



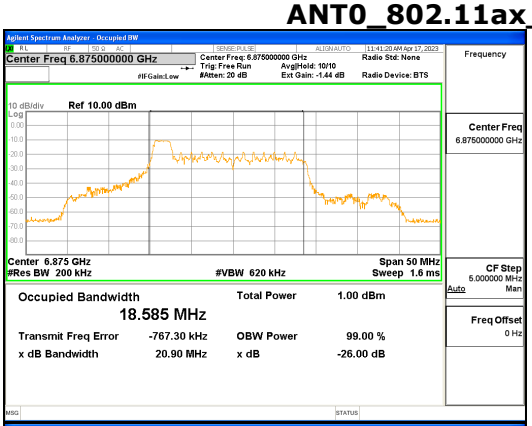

**ANT0_802.11ax_HE20_26T_Low_UNII 6**

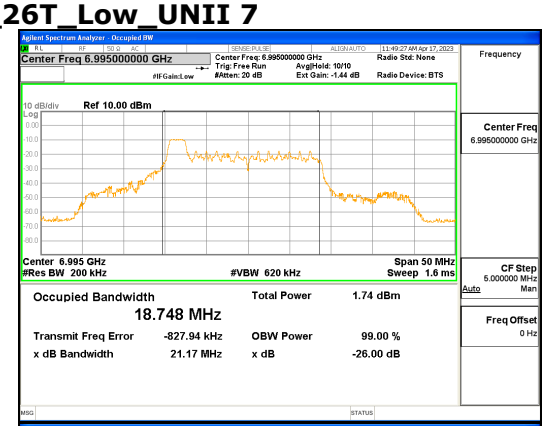


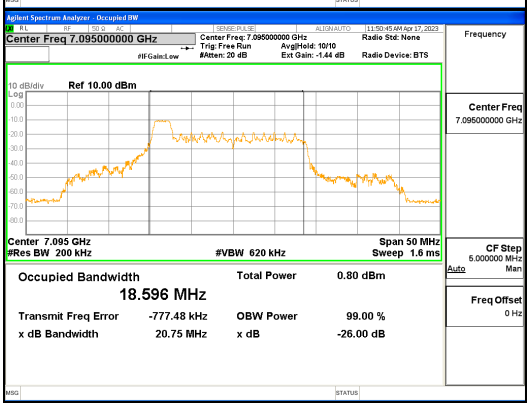



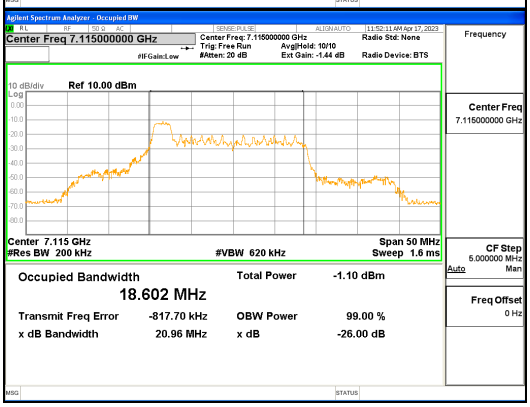




**ANT0_802.11ax_HE20_26T_Low_UNII 7**

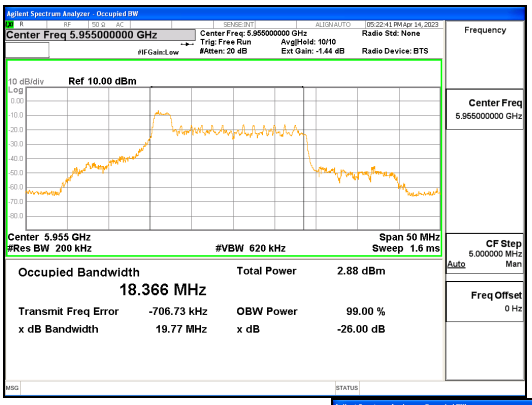


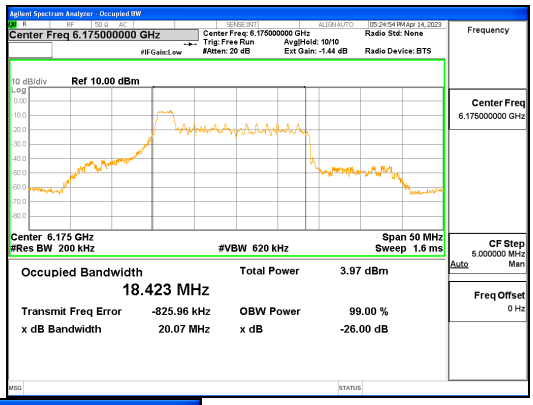



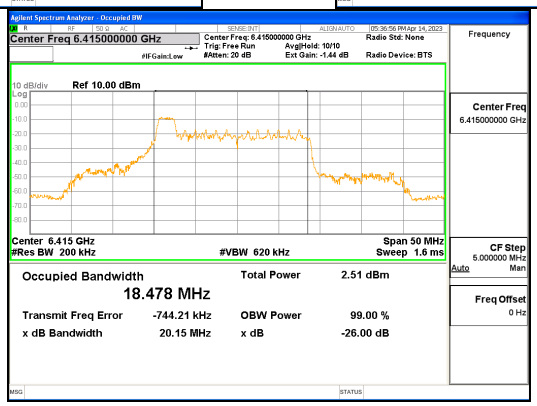



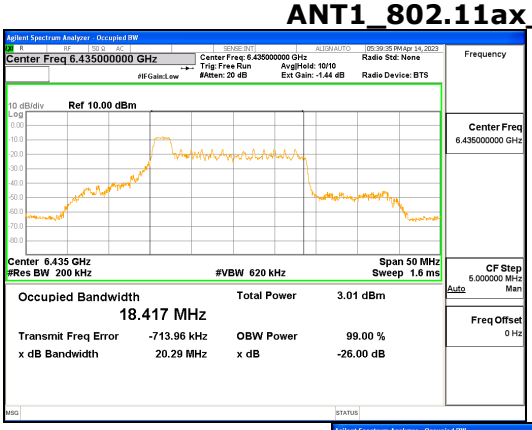

**ANT0_802.11ax_HE20_26T_Low_UNII 8**

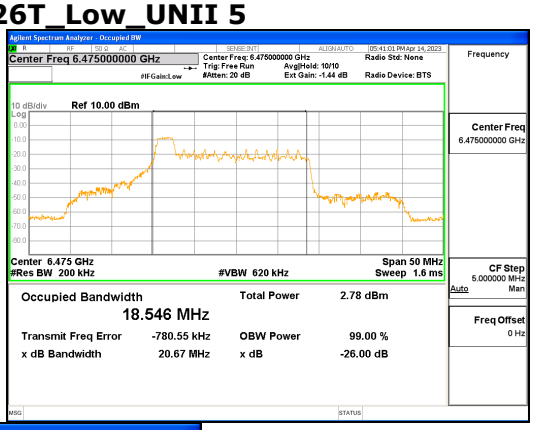


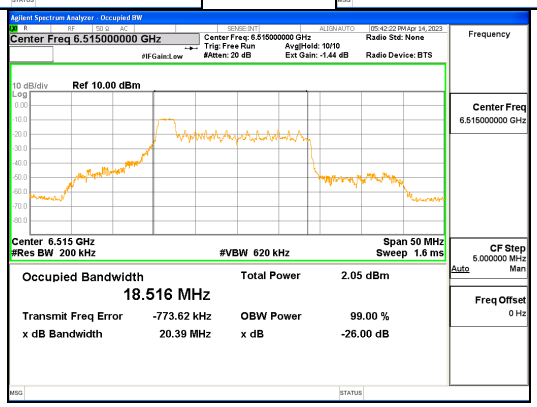



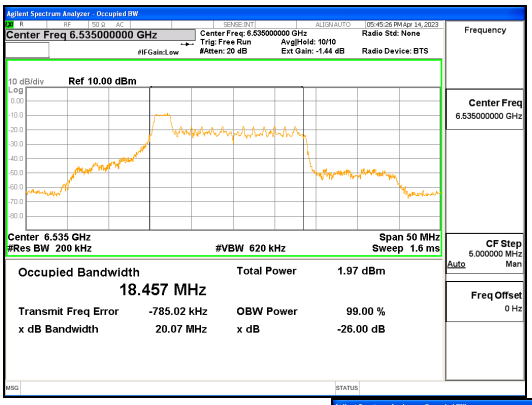

**ANT1_802.11ax_HE20_26T_Low_UNII 5**

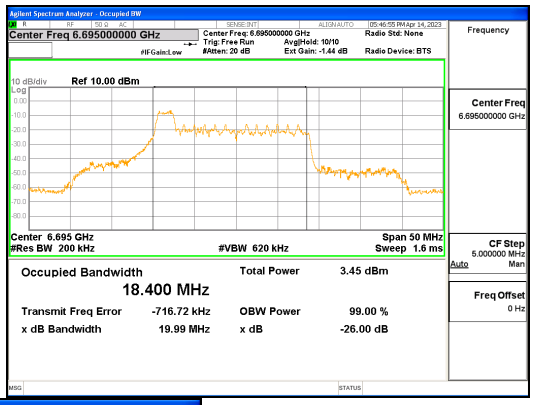


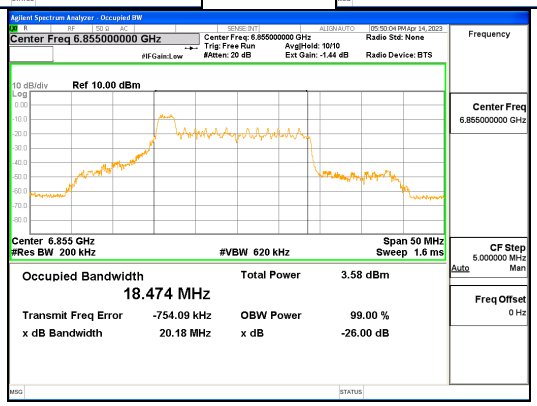



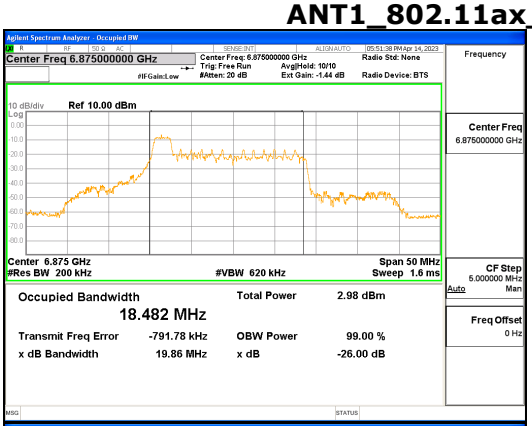

**ANT1_802.11ax_HE20_26T_Low_UNII 6**

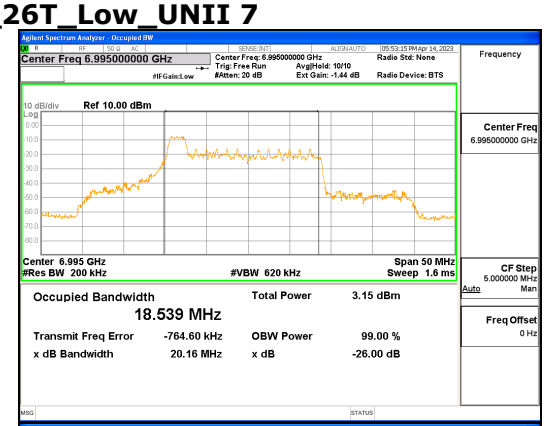


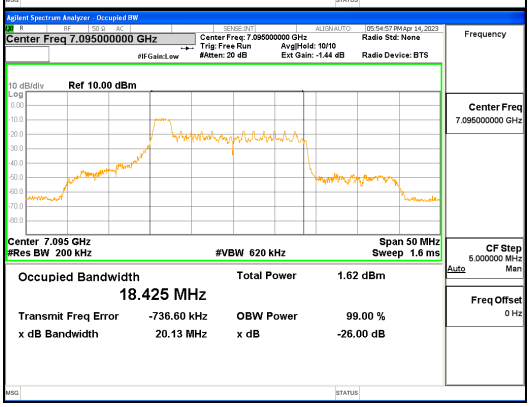



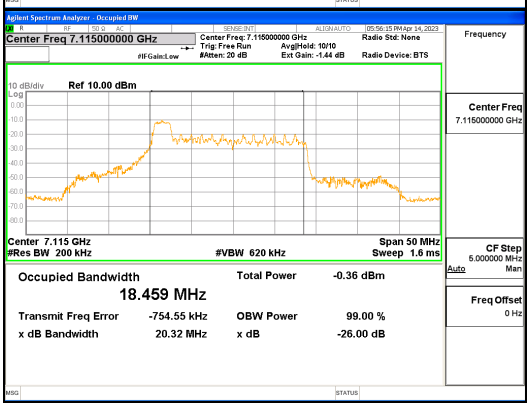




**ANT1_802.11ax_HE20_26T_Low_UNII 7**

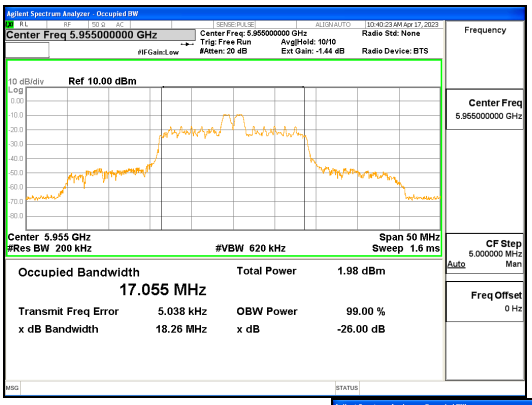


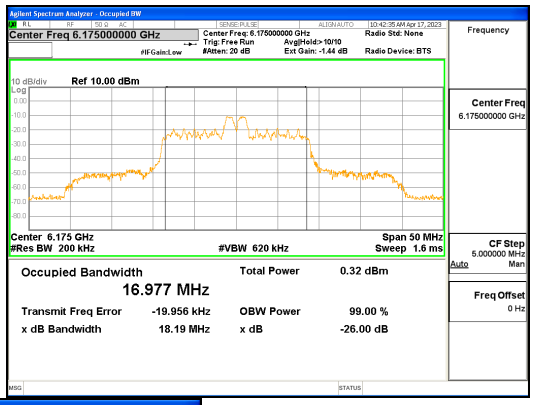



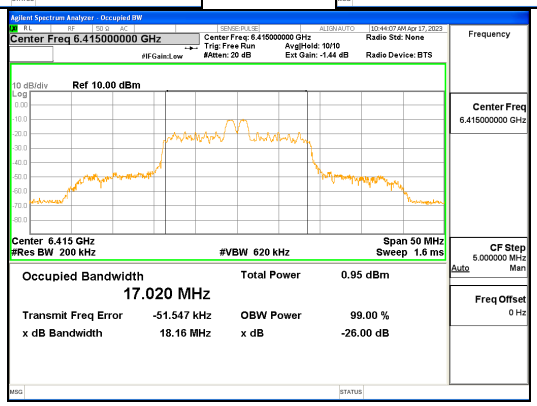



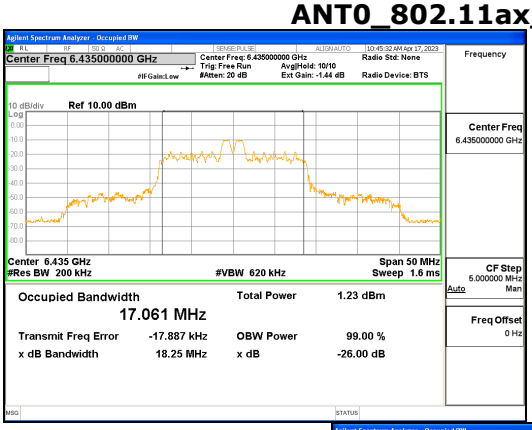

**ANT1_802.11ax_HE20_26T_Low_UNII 8**

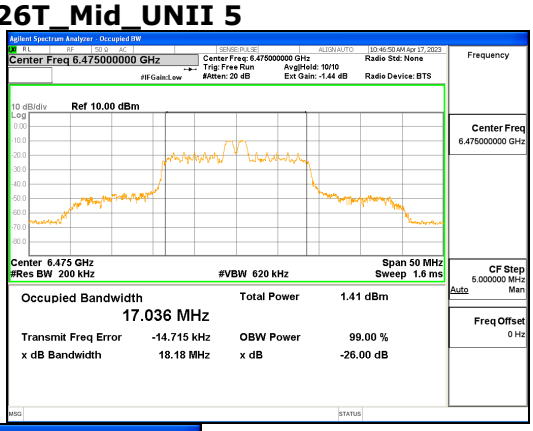


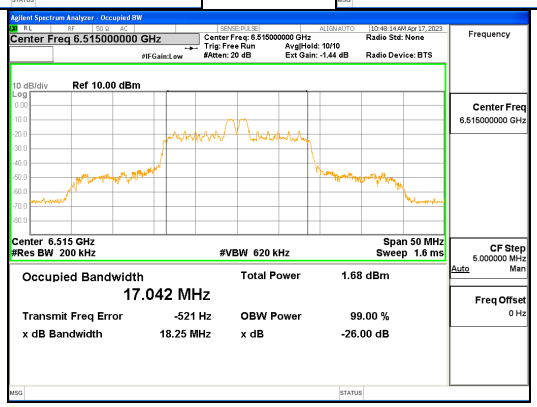



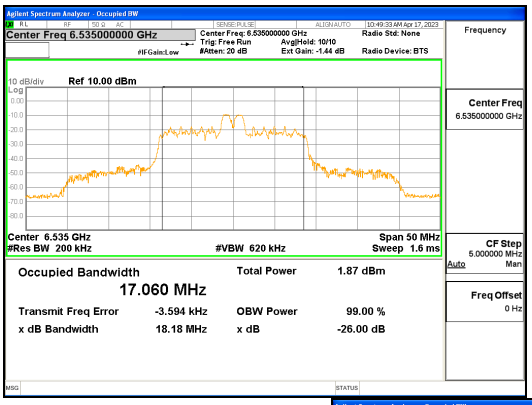

**ANT0_802.11ax_HE20_26T_Mid_UNII 5**

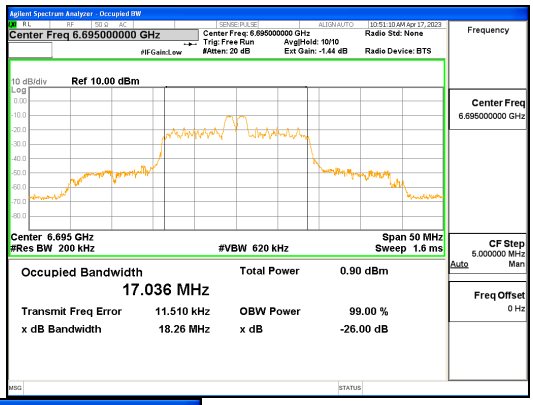


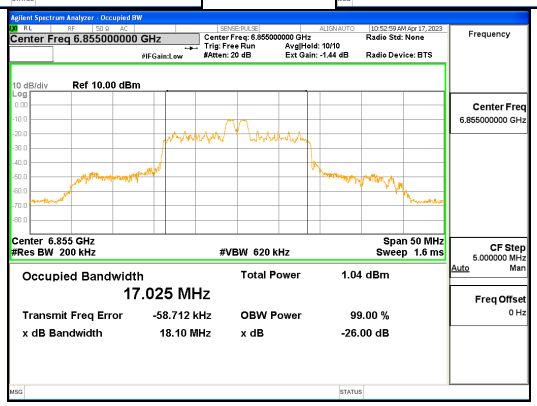



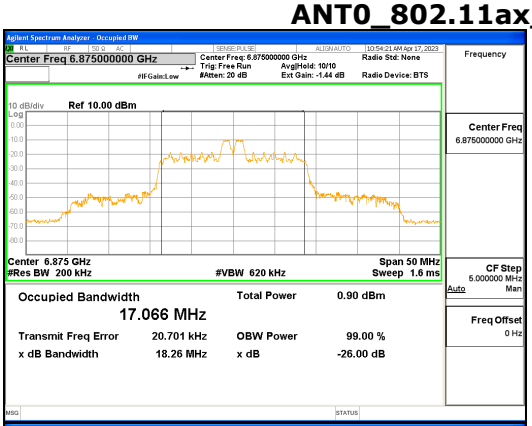

**ANT0_802.11ax_HE20_26T_Mid_UNII 6**

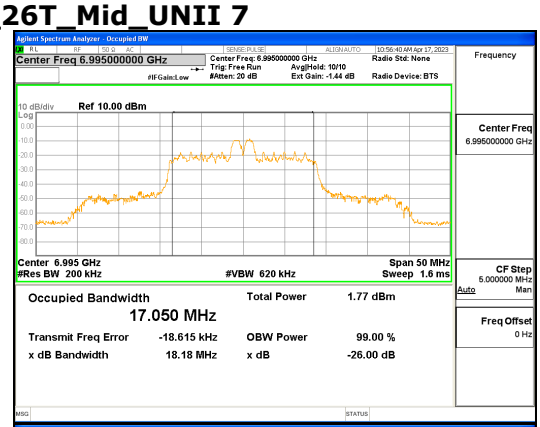


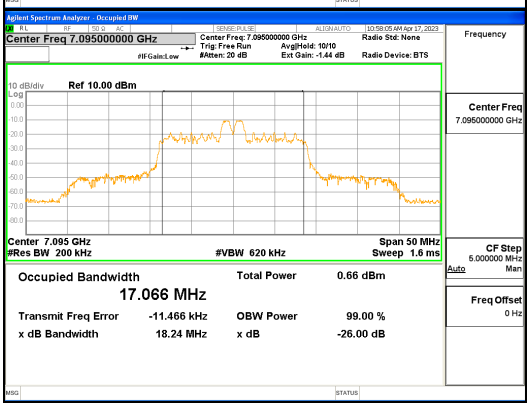



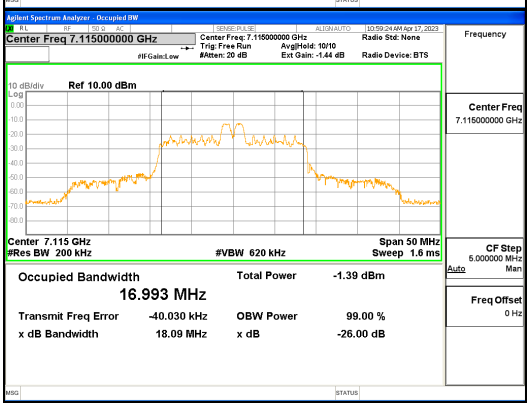




**ANT0_802.11ax_HE20_26T_Mid_UNII 7**

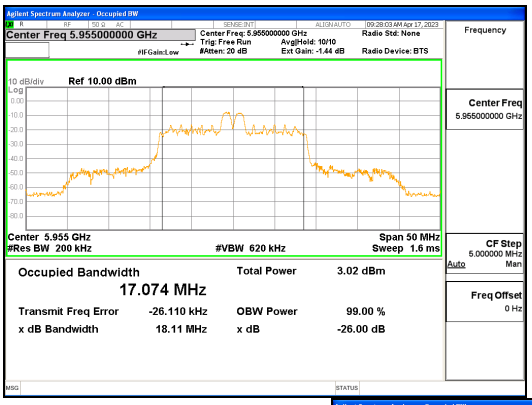


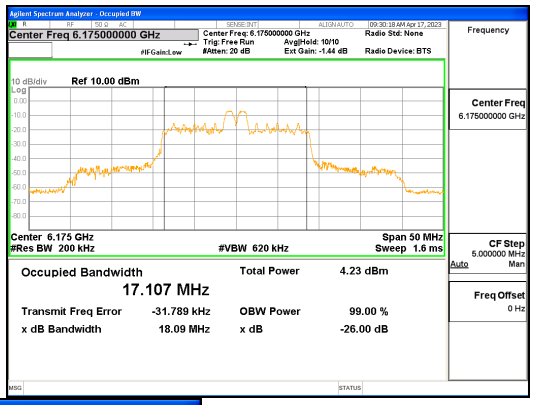



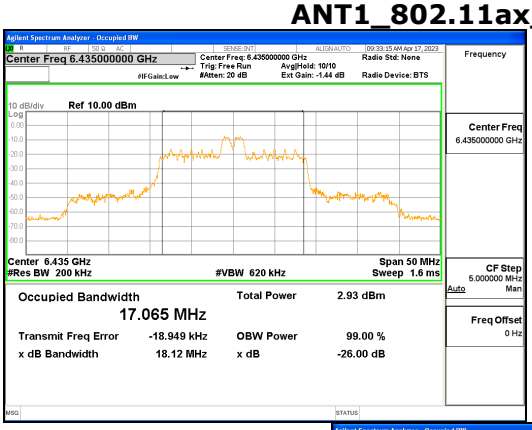



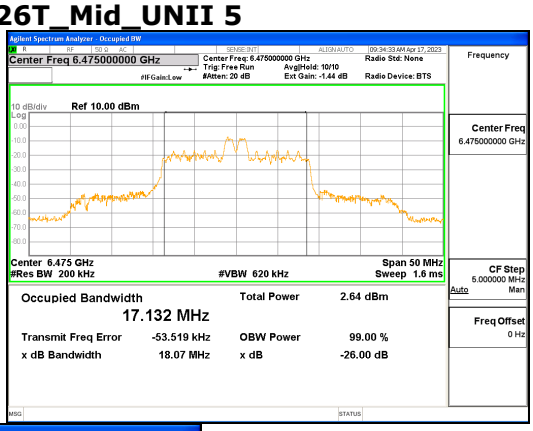

**ANT0_802.11ax_HE20_26T_Mid_UNII 8**

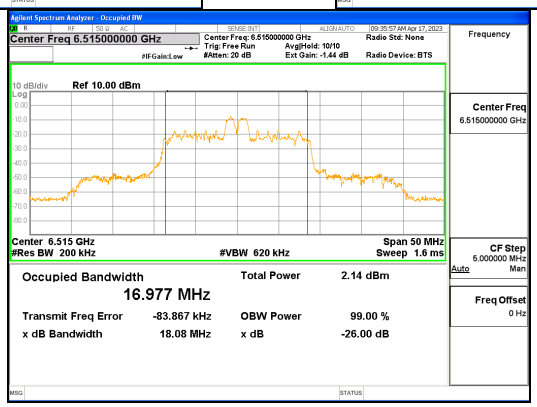


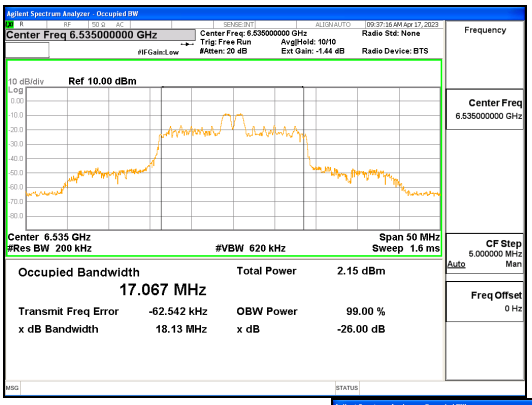
**ANT1_802.11ax_HE20_26T_Mid_UNII 5**

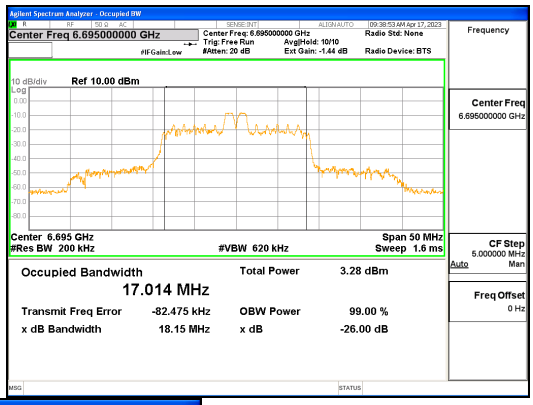


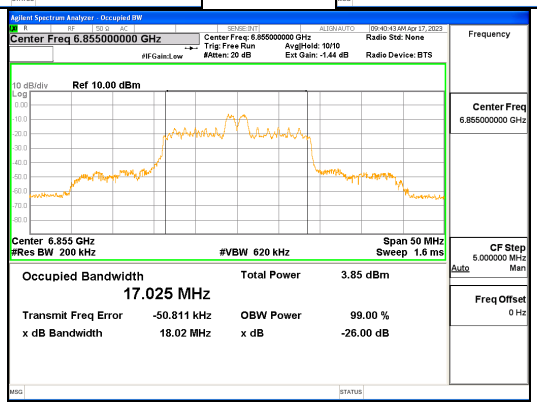



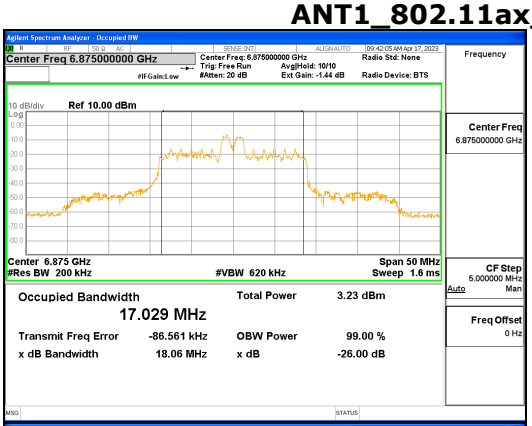

**ANT1_802.11ax_HE20_26T_Mid_UNII 6**

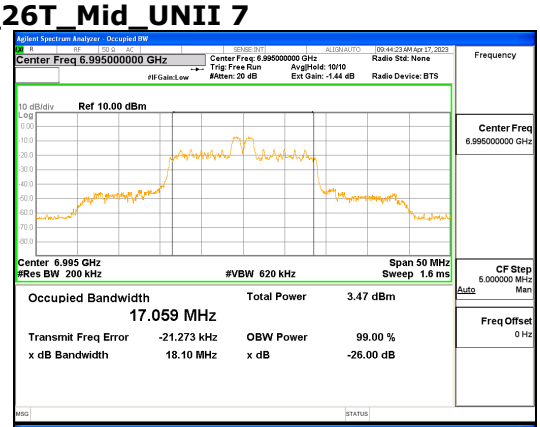


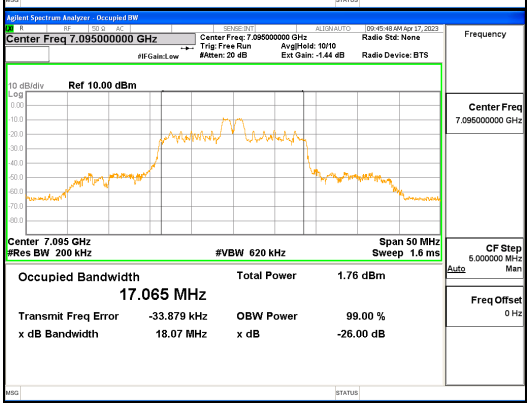



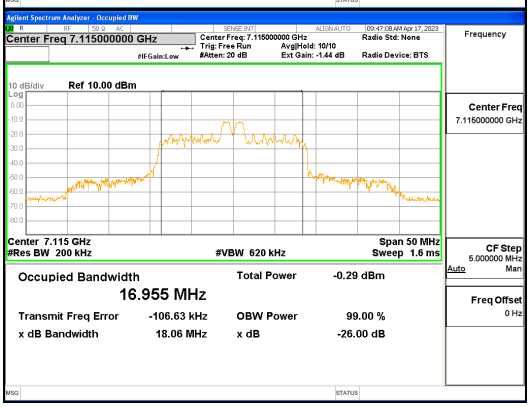




**ANT1_802.11ax_HE20_26T_Mid_UNII 7**

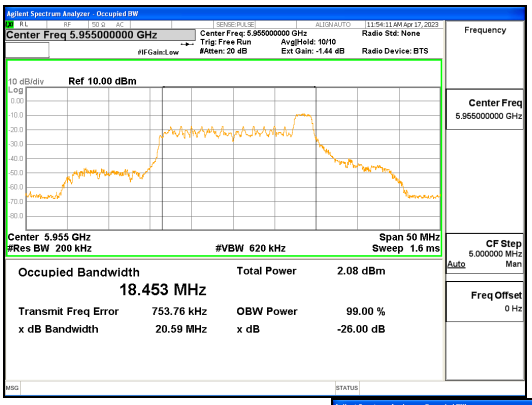


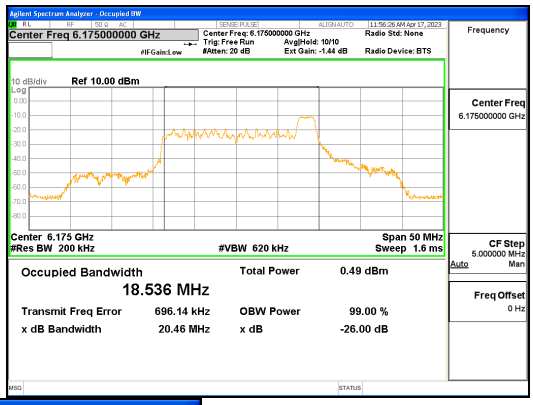



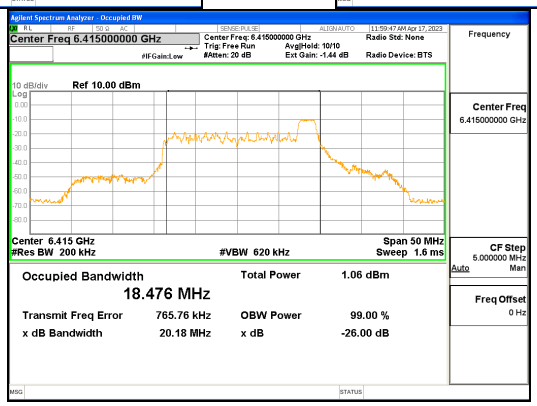



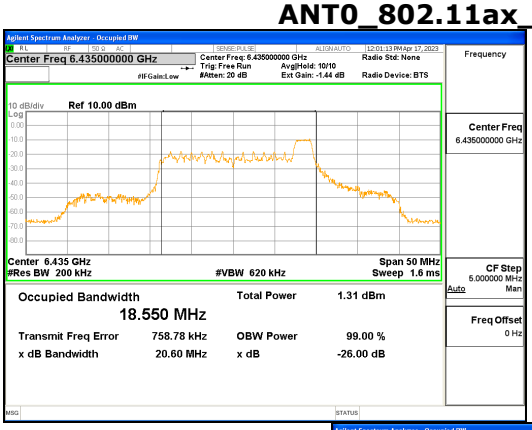

**ANT1_802.11ax_HE20_26T_Mid_UNII 8**

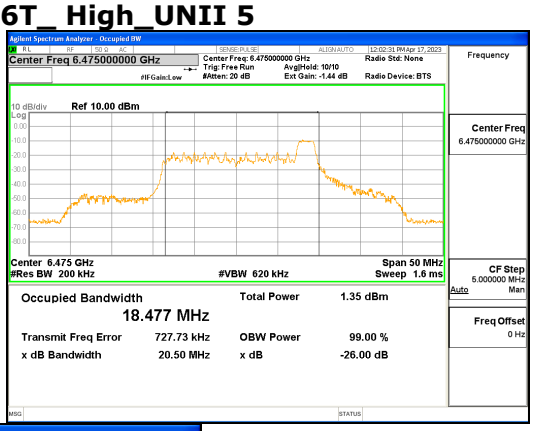


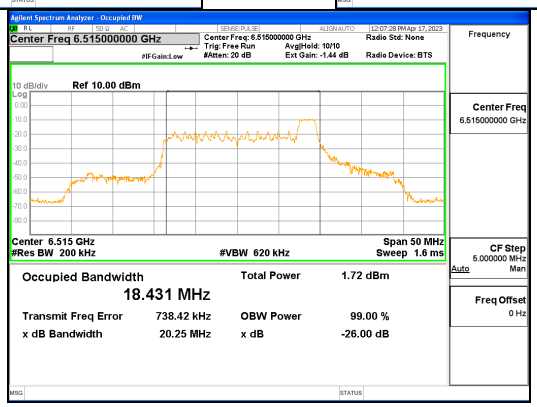



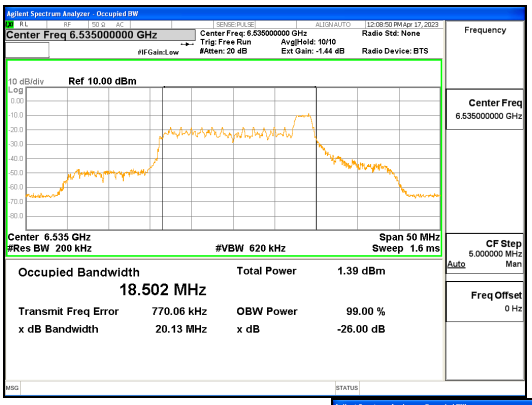

**ANT0_802.11ax_HE20_26T_ High_UNII 5**

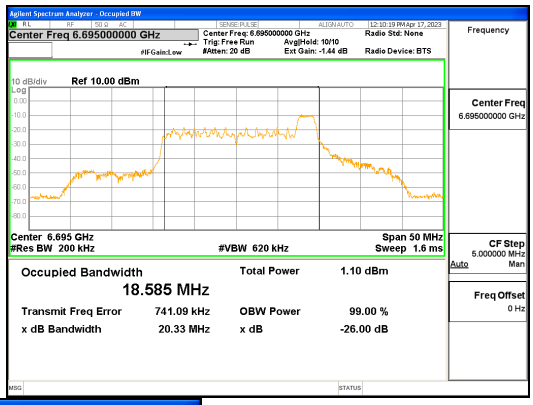


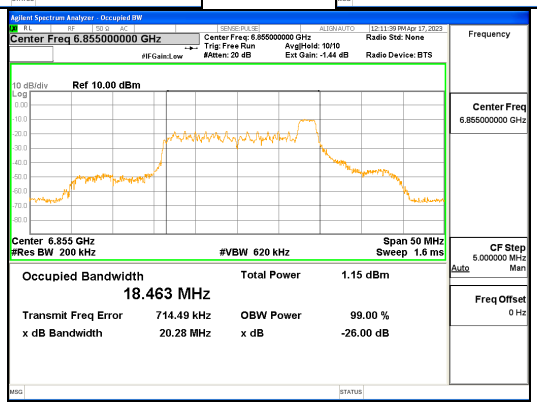



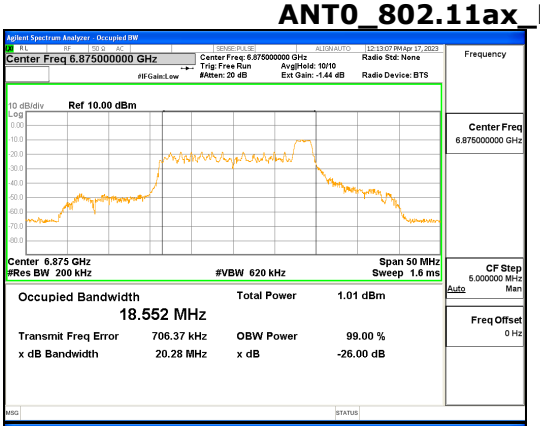

**ANT0_802.11ax_HE20_26T_ High_UNII 6**

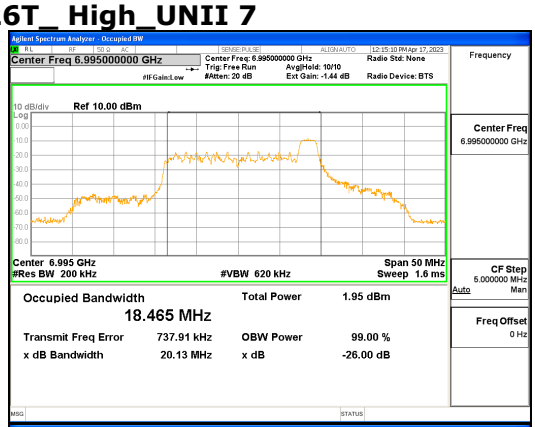


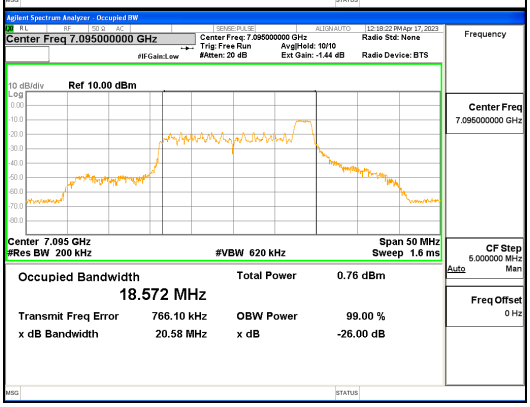



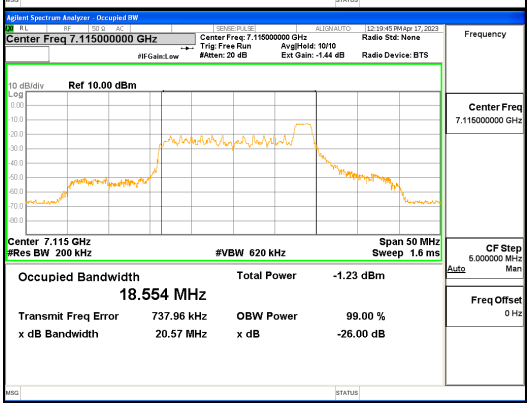




**ANT0_802.11ax_HE20_26T_ High_UNII 7**

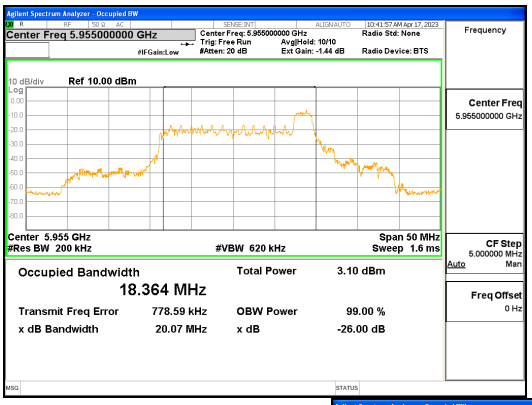


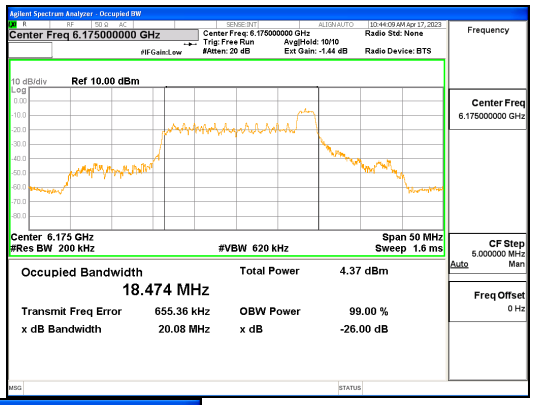



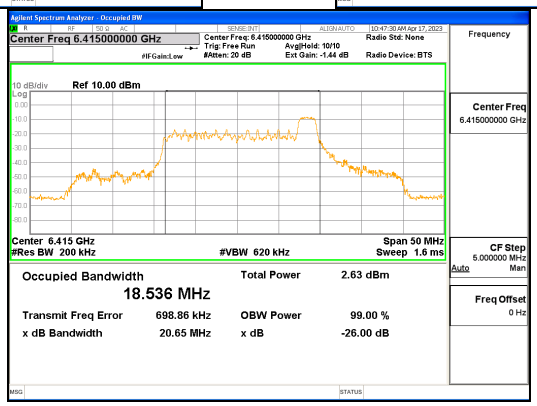



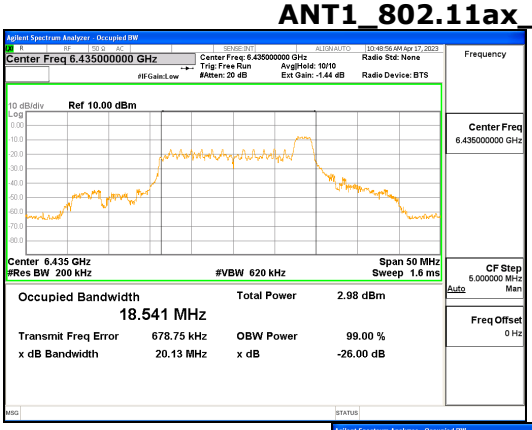

**ANT0_802.11ax_HE20_26T_ High_UNII 8**

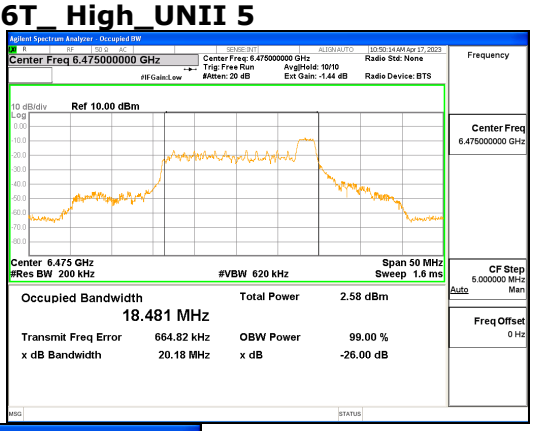


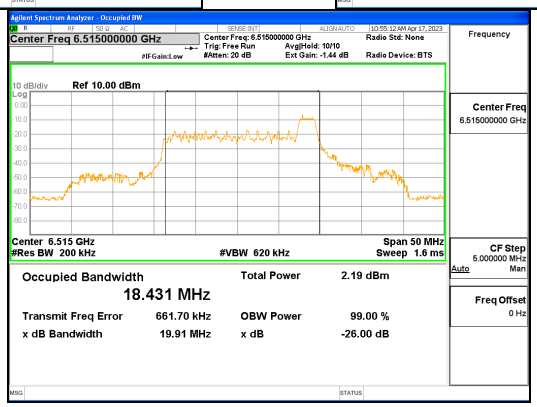



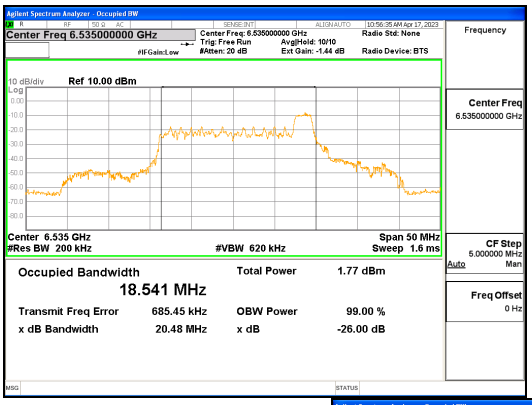

**ANT1_802.11ax_HE20_26T_ High_UNII 5**

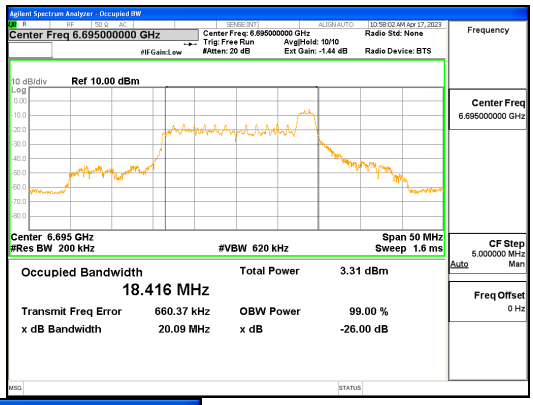


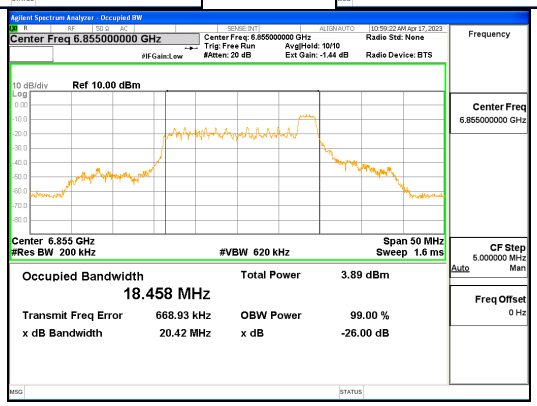



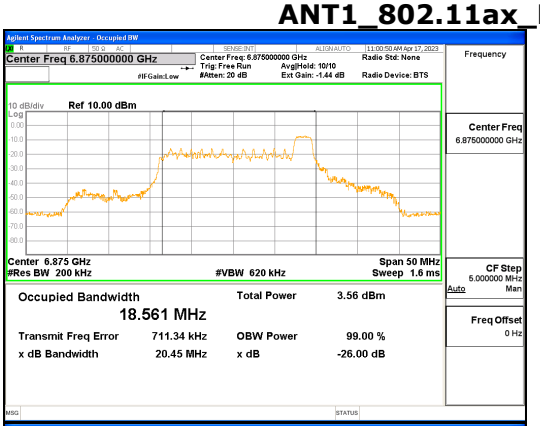

**ANT1_802.11ax_HE20_26T_ High_UNII 6**

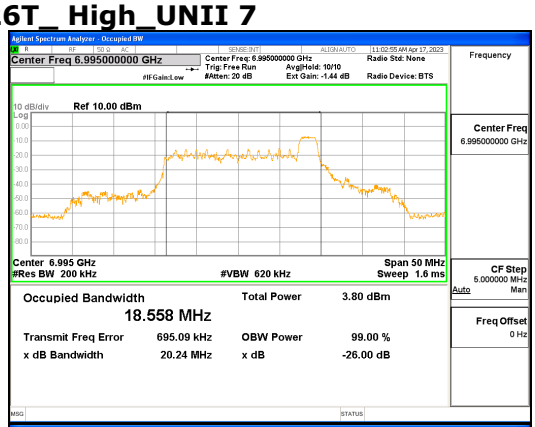


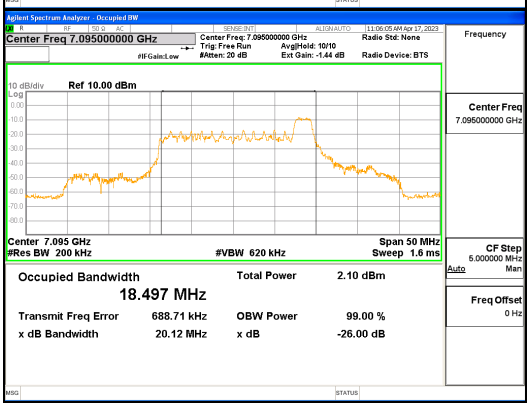



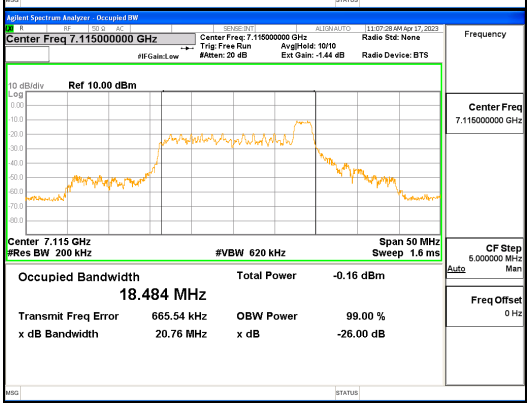




**ANT1_802.11ax_HE20_26T_ High_UNII 7**

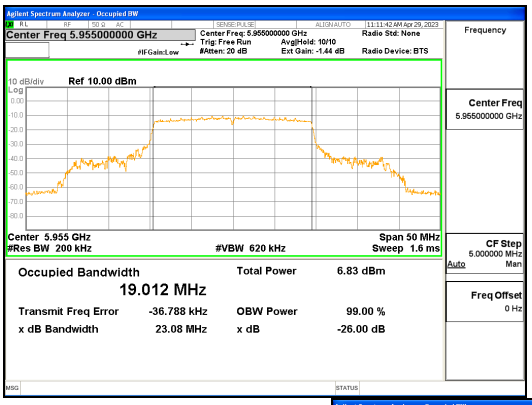


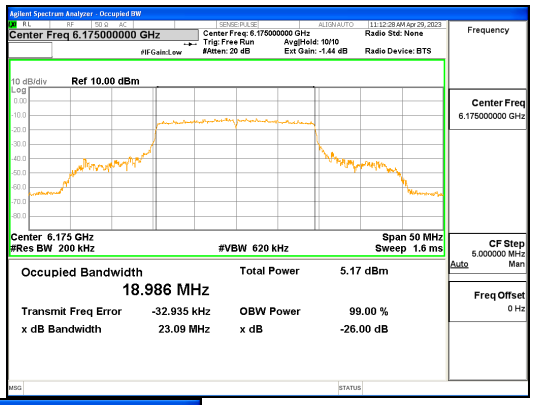



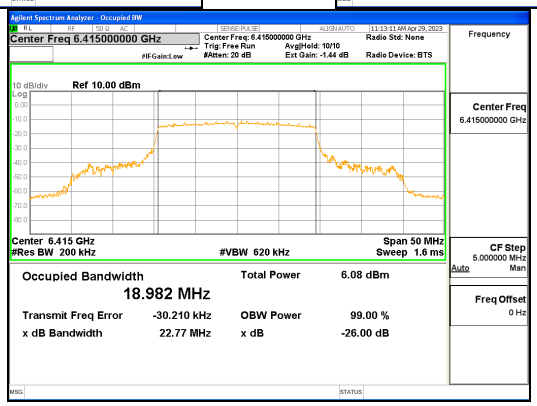



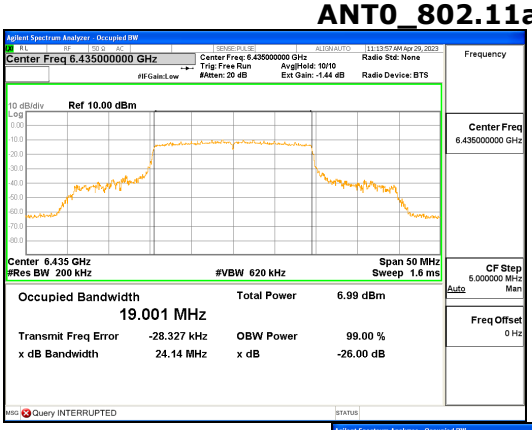

**ANT1_802.11ax_HE20_26T_High_UNII 8**

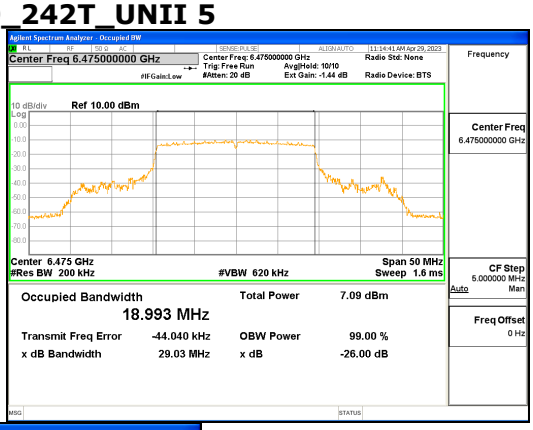


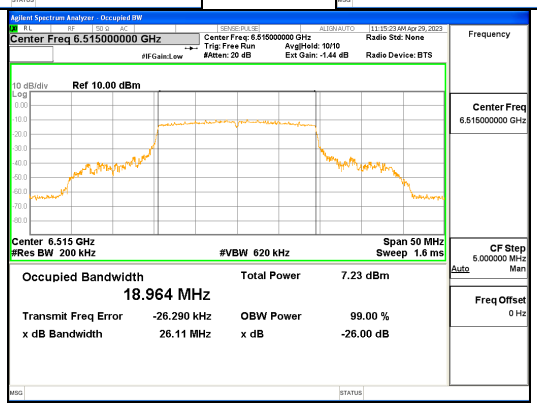



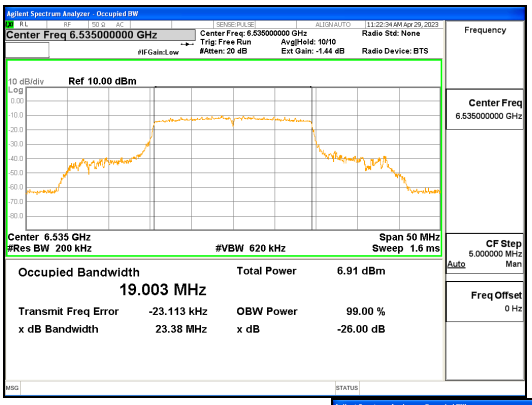

**ANT0_802.11ax_HE20_242T_UNII 5**

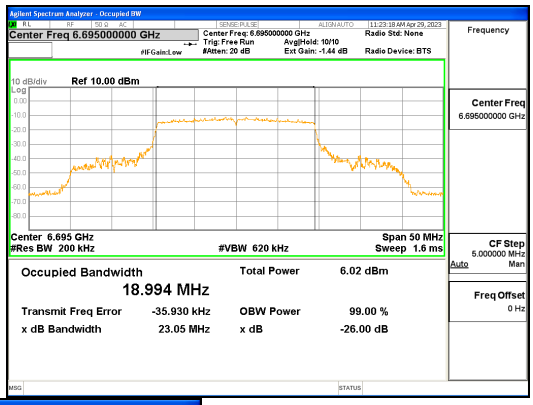


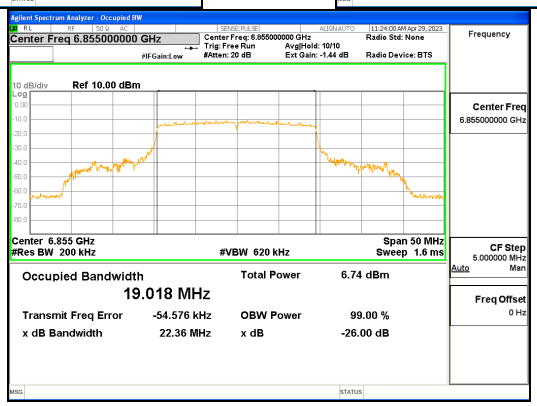



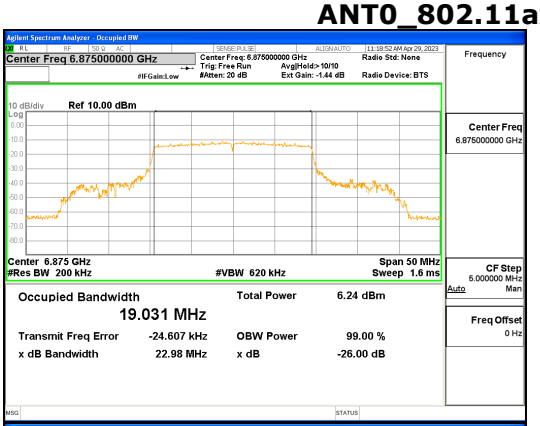

**ANT0_802.11ax_HE20_242T_UNII 6**

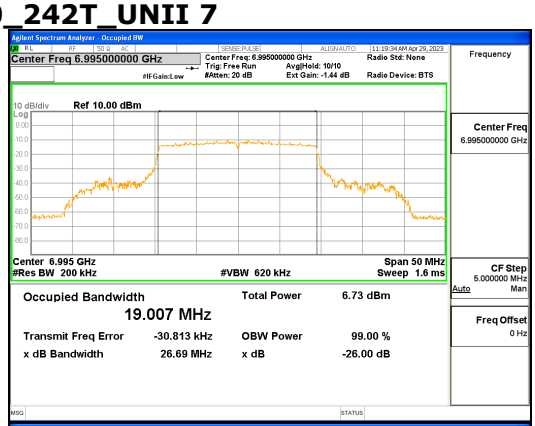


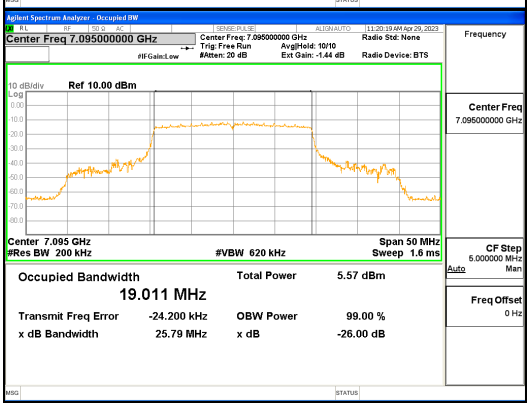



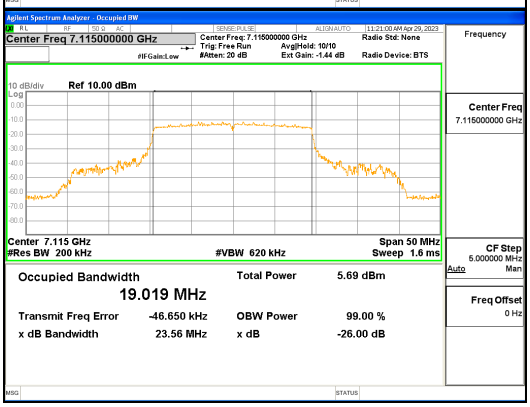




**ANT0_802.11ax_HE20_242T_UNII 7**

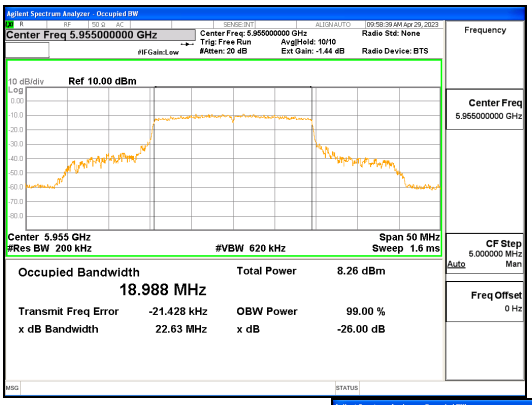


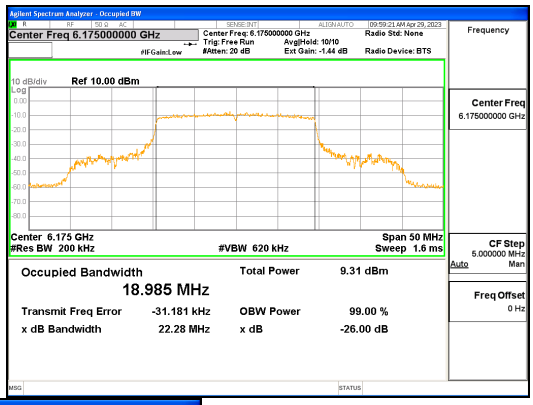



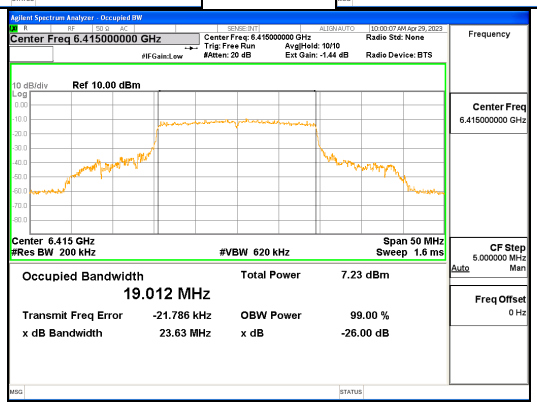



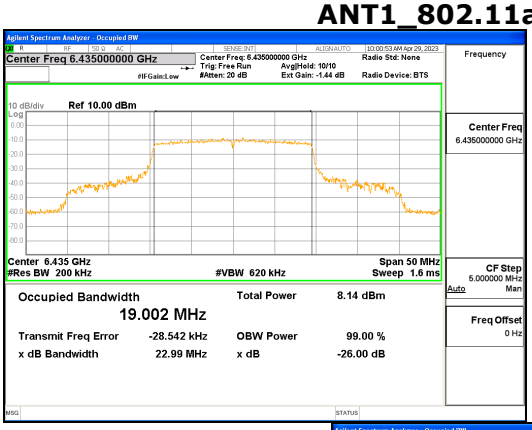

**ANT0_802.11ax_HE20_242T_UNII 8**

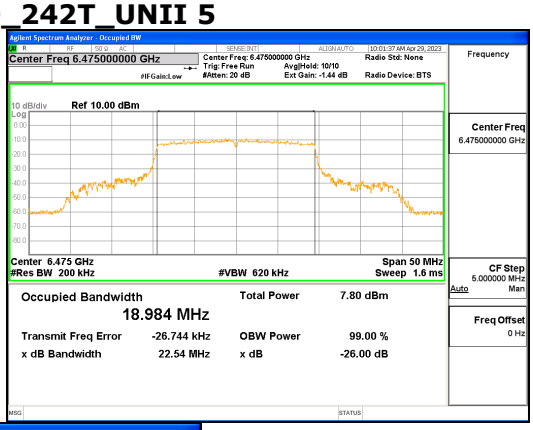


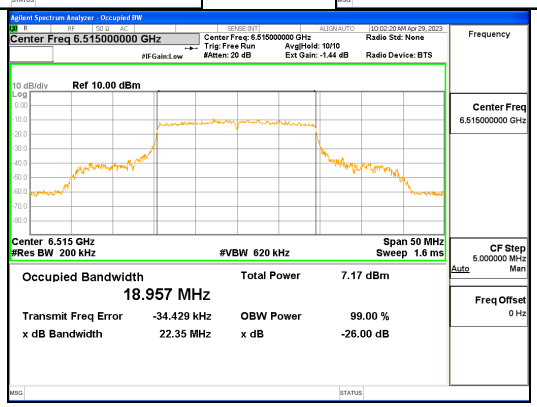



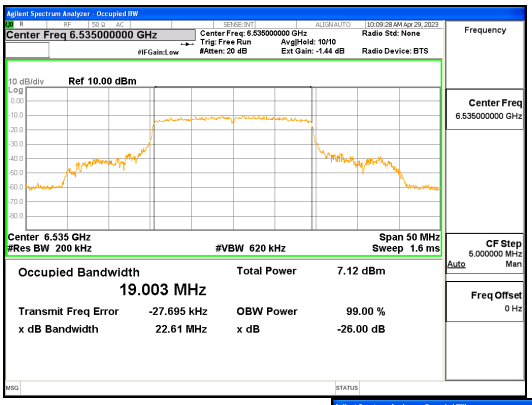

**ANT1_802.11ax_HE20_242T_UNII 5**

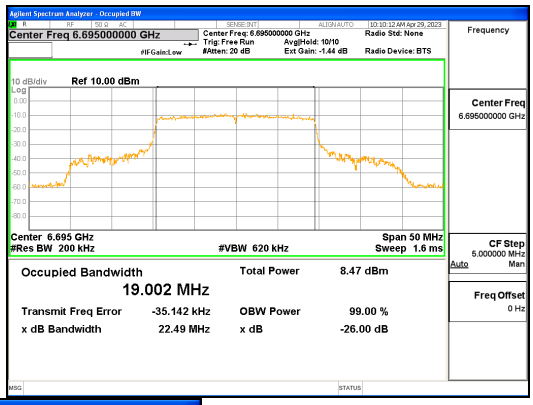


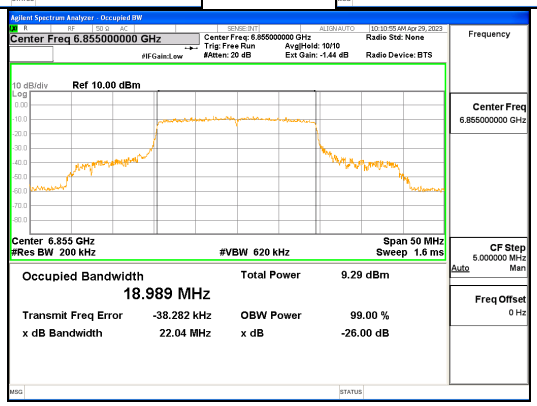



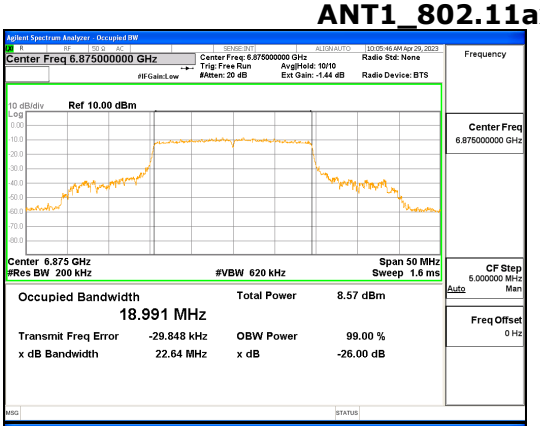

**ANT1_802.11ax_HE20_242T_UNII 6**

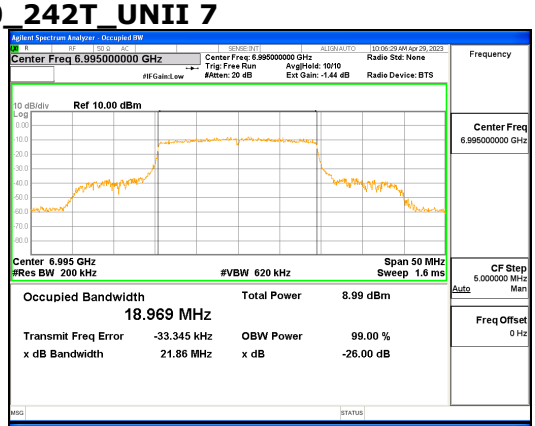


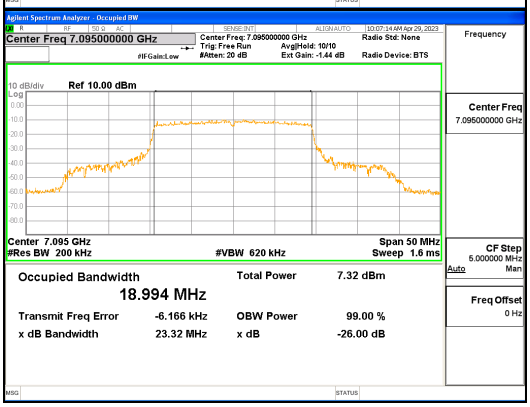



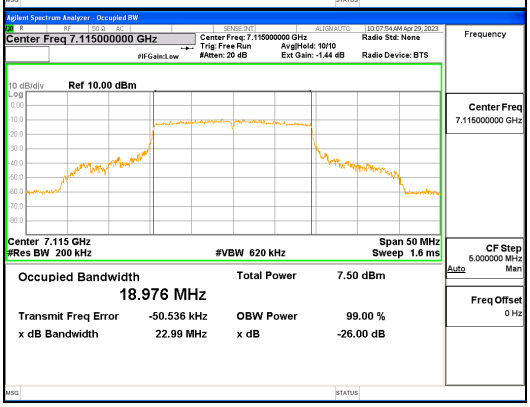




**ANT1_802.11ax_HE20_242T_UNII 7**

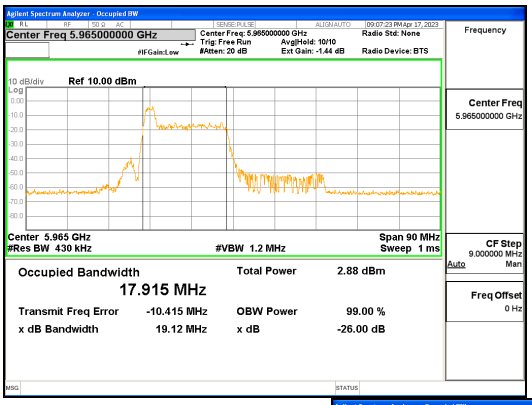


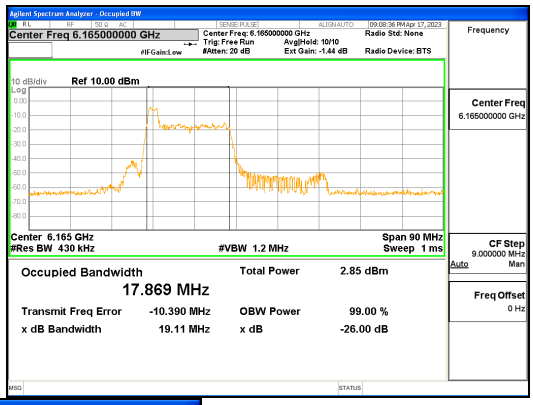



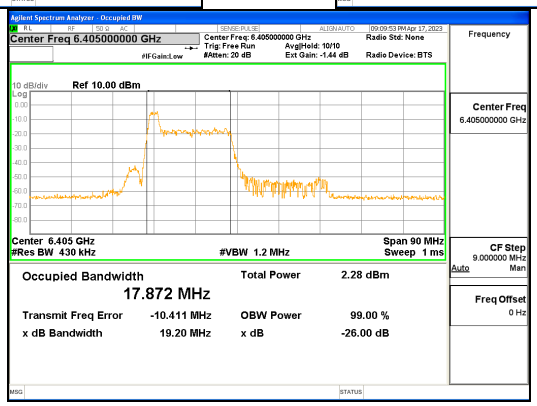



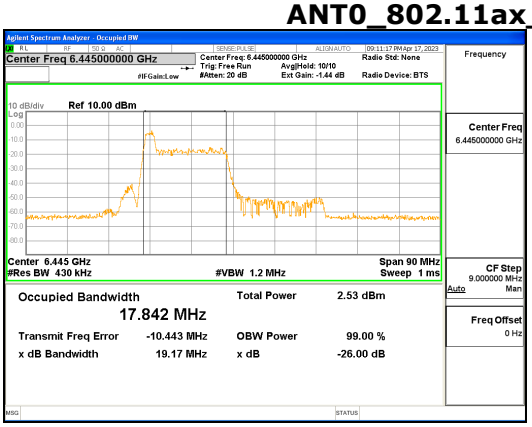

**ANT1_802.11ax_HE20_242T_UNII 8**

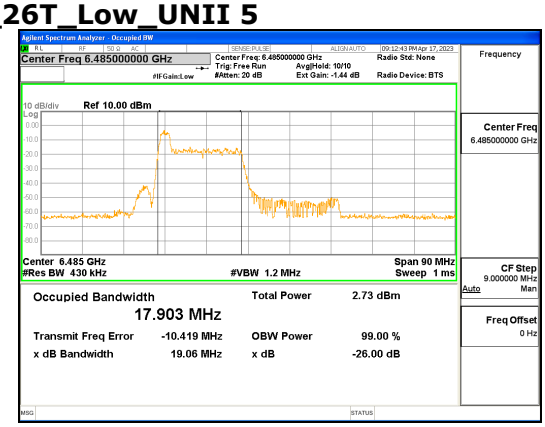


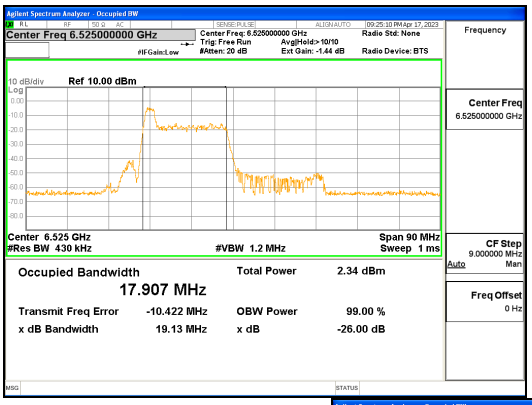



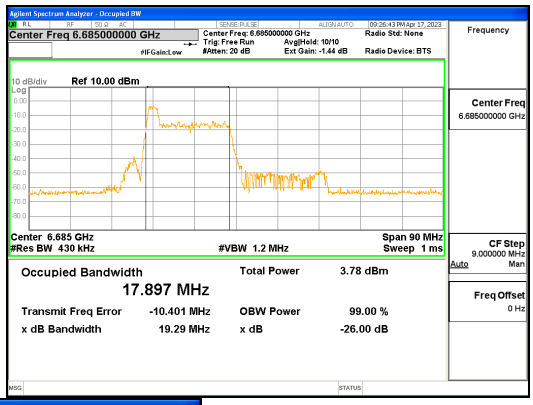

**ANT0_802.11ax_HE40_26T_Low_UNII 5**

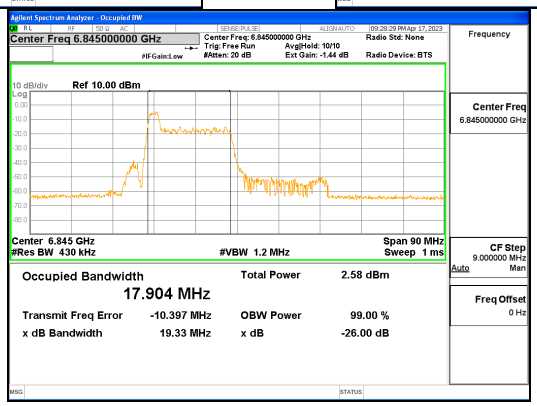


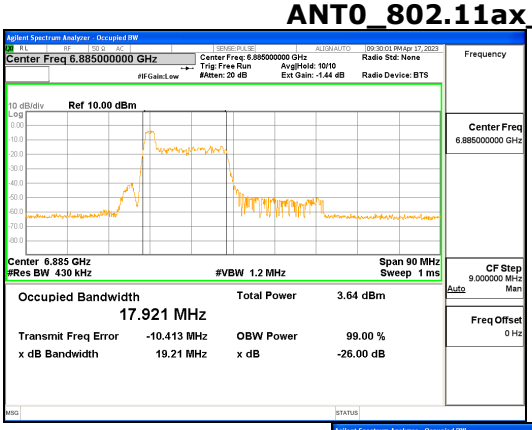

**ANT0_802.11ax_HE40_26T_Low_UNII 6**

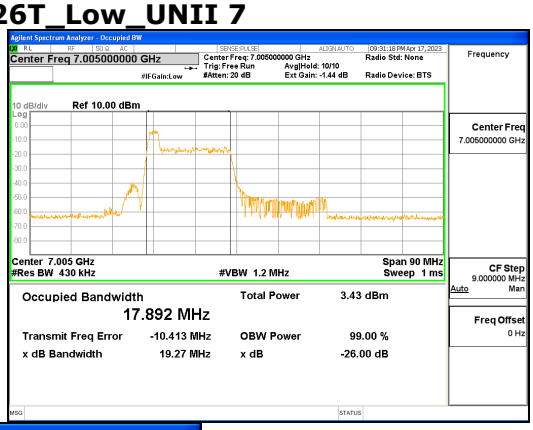


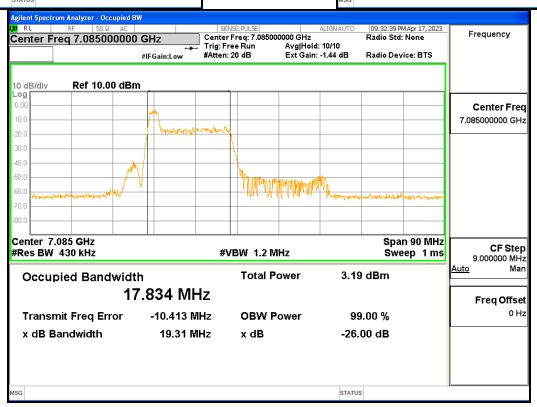



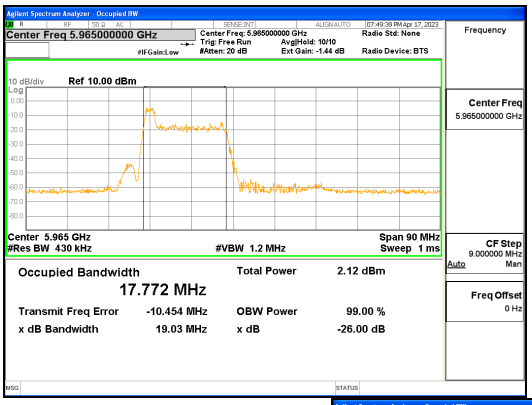

**ANT0_802.11ax_HE40_26T_Low_UNII 7**

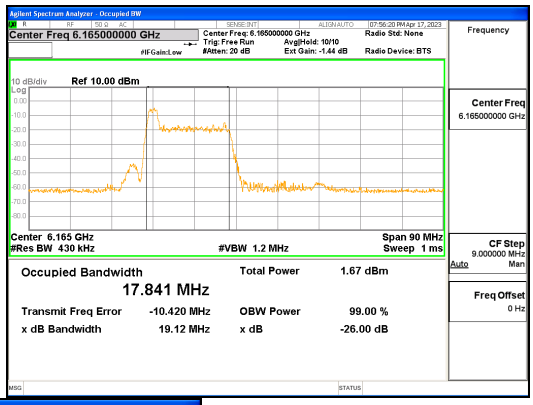


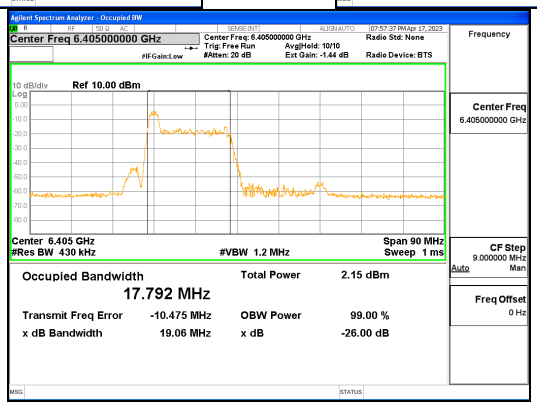



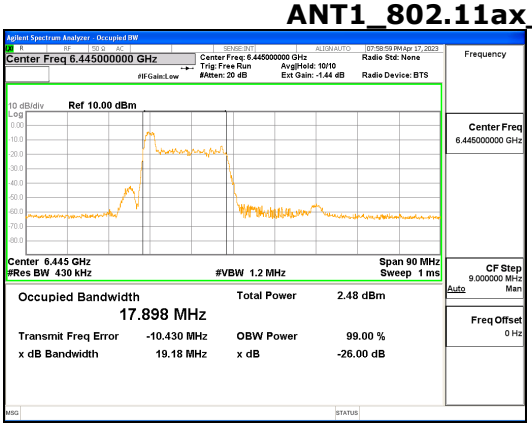

**ANT0_802.11ax_HE40_26T_Low_UNII 8**

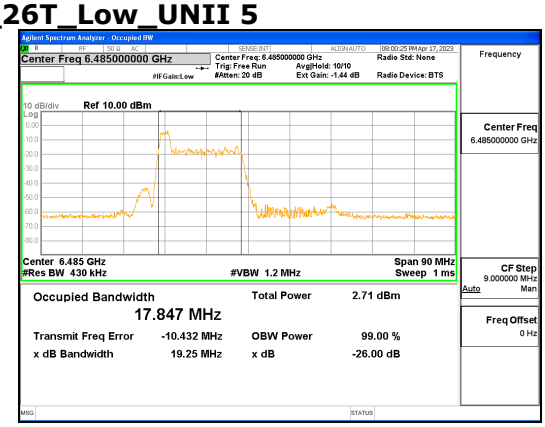


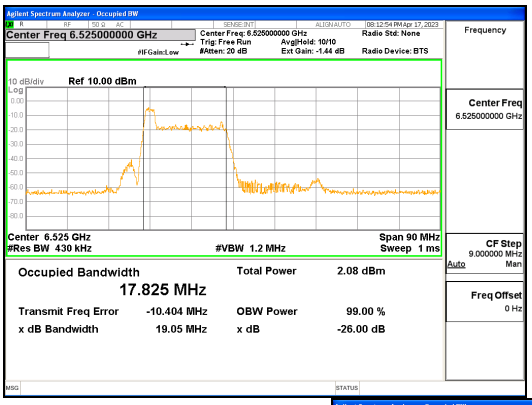



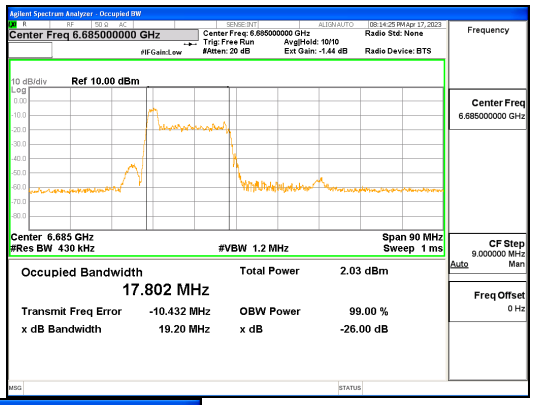

**ANT1_802.11ax_HE40_26T_Low_UNII 5**

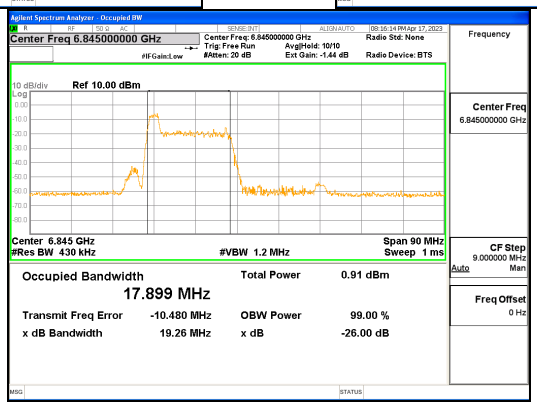


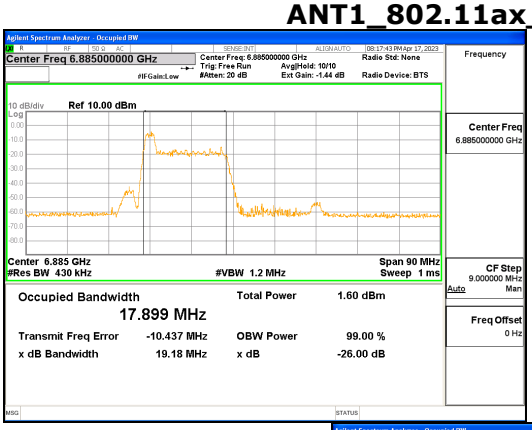

**ANT1_802.11ax_HE40_26T_Low_UNII 6**

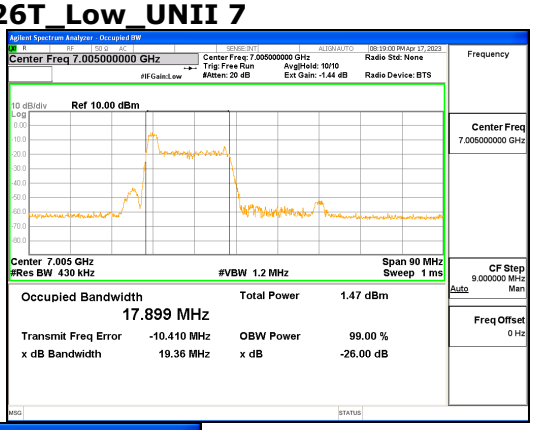


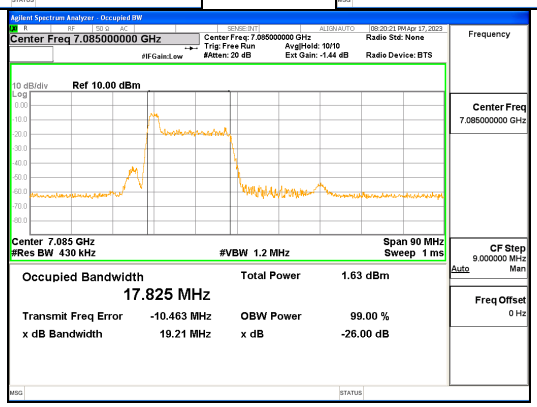



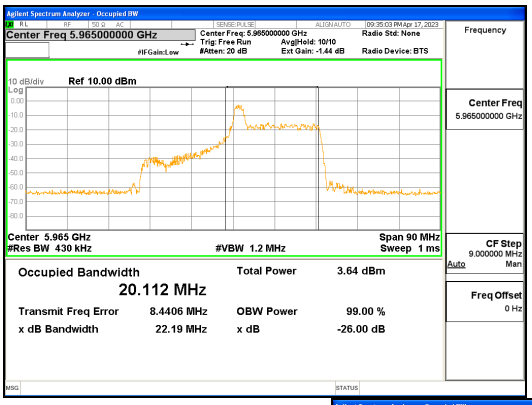

**ANT1_802.11ax_HE40_26T_Low_UNII 7**

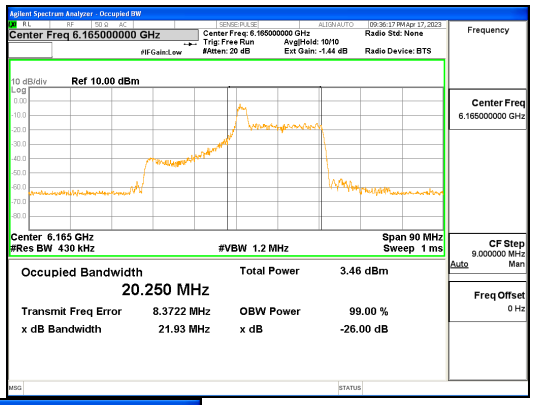


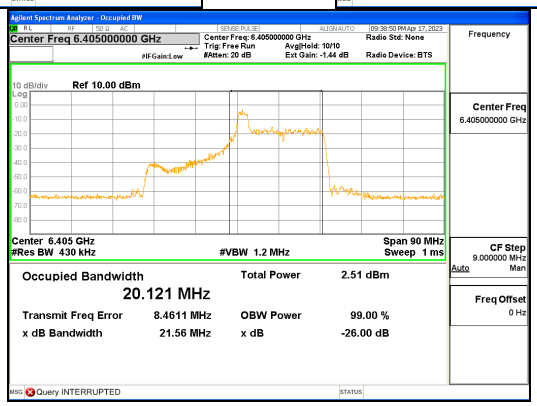



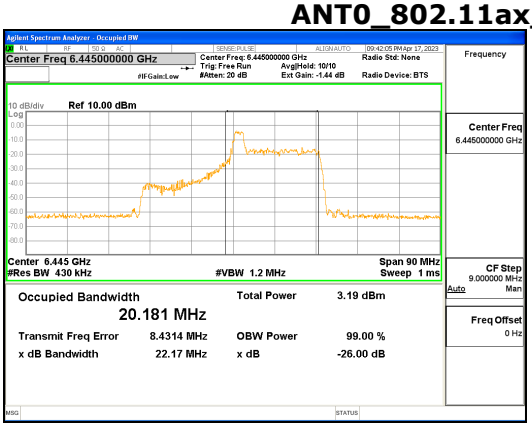

**ANT1_802.11ax_HE40_26T_Low_UNII 8**

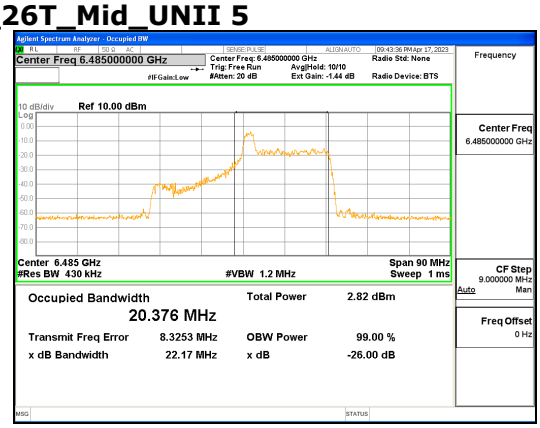



**ANT0_802.11ax_HE40_26T_Mid_UNII 5**




**ANT0_802.11ax_HE40_26T_Mid_UNII 6**