

# **TEST REPORT**

**Report Number:** 14523758-E4V2

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

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

**Brand :** APPLE

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

**IC ID :** 579C-E8427A (Parent Model)  
579C-E8428A, 579C-E8429A, 579C-E8430A  
(Variant Models)

**EUT Description :** SMARTPAHONE

**Test Standard(s) :** FCC 47 CFR PART 15 SUBPART C  
ISED RSS-247 ISSUE 2  
ISED RSS-GEN ISSUE 5 + A1 + A2

**Date Of Issue:**  
July 07, 2023

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**REPORT REVISION HISTORY**

| Rev. | Issue<br>Date | Revisions                                          | Revised By |
|------|---------------|----------------------------------------------------|------------|
| V1   | 7/1/2023      | Initial Issue                                      | Chin Pang  |
| V2   | 7/7/2023      | Address TCB's question section 6.5, 8, 9.1, and 10 | Chin Pang  |

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## 1. ATTESTATION OF TEST RESULTS

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

**EUT DESCRIPTION:** SMARTPHONE

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

**BRAND:** APPLE

**SERIAL NUMBER:** V9CMW29KXK, P6XL92MQDL

**SAMPLE RECEIPT DATE:** JANUARY 30, 2023

**DATE TESTED:** JANUARY 30, 2023 – JULY 12, 2023

| APPLICABLE STANDARDS           |              |
|--------------------------------|--------------|
| STANDARD                       | TEST RESULTS |
| CFR 47 Part 15 Subpart C       | Complies     |
| ISED RSS-247 Issue 2           | Complies     |
| ISED RSS-GEN Issue 5 + A1 + A2 | 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 For  
UL Verification Services Inc. By:

Prepared By:



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## 2. TEST RESULTS SUMMARY

| FCC Clause     | ISED Clause       | Requirement                  | Result                  | Comment                               |
|----------------|-------------------|------------------------------|-------------------------|---------------------------------------|
| See Comment    |                   | Duty Cycle                   | Reporting purposes only | ANSI C63.10 Section 11.6.             |
| -              | RSS-GEN 6.7       | 99% OBW                      | Reporting purposes only | ANSI C63.10 Section 6.9.3.            |
| 15.247 (a) (2) | RSS-247 5.2 (a)   | 6dB BW                       | Complies                | None.                                 |
| 15.247 (b) (3) | RSS-247 5.4 (d)   | Output Power (Average)       | Complies                | Per ANSI C63.10, Section 11.9.2.3.2.. |
| 15.247 (e)     | RSS-247 5.2 (b)   | PSD                          | Complies                | None.                                 |
| 15.247 (d)     | RSS-247 5.5       | Conducted Spurious Emissions | Complies                | None.                                 |
| 15.209, 15.205 | RSS-GEN 8.9, 8.10 | Radiated Emissions           | Complies                | None.                                 |
| 15.207         | RSS-Gen 8.8       | AC Mains Conducted Emissions | Complies                | None.                                 |

## 3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with;

- FCC CFR 47 Part 2
- FCC CFR 47 Part 15
- FCC KDB 558074 D01 v05r02 15.247 Meas Guidance
- ANSI C63.10-2013
- RSS-GEN Issue 5 + A1 + A2
- KDB 414788 D01 Radiated Test Site v01r01-247 Issue 2

## 4. FACILITIES AND ACCREDITATION

UL Verifications 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<br>CABID | ISED<br>Company<br>Number | FCC<br>Registration |
|-------------------------------------|----------------------------------------------------------|---------------|---------------------------|---------------------|
| <input type="checkbox"/>            | Building 1: 47173 Benicia Street, Fremont, CA 94538, USA | US0104        | 2324A                     | 550739              |
| <input checked="" type="checkbox"/> | Building 2: 47266 Benicia Street, Fremont, CA 94538, USA |               |                           |                     |
| <input checked="" type="checkbox"/> | Building 3: 843 Auburn Court, Fremont, CA 94538 USA      |               |                           |                     |
| <input checked="" type="checkbox"/> | Building 4: 47658 Kato Rd, Fremont, CA 94538 USA         |               |                           |                     |
| <input type="checkbox"/>            | Building 5: 47670 Kato Rd, Fremont, CA 94538 USA         |               |                           |                     |

## 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 <sub>LAB</sub>        |
|------------------------------------------------------|-------------------------|
| 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%.

## 6. EQUIPMENT UNDER TEST

### 6.1. EUT DESCRIPTION

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

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

The Model and FCC/IC ID covered by this report includes:

Parent Model: A2846, FCC ID: BCG-E8427A, IC ID: 579C-E8427A

Variant Models: A3089; FCC ID: BCG-E8428A, IC ID: 579C-E8428A  
 A3090 FCC ID: BCG-E8429A, IC ID: 579C-E8429A  
 A3092; FCC ID: BCG-E8430A, IC ID: 579C-E8430A

### 6.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum conducted output power as follows:

| Frequency Range (MHz) | Mode          | Output Power (dBm)          | Output Power (mW) |
|-----------------------|---------------|-----------------------------|-------------------|
| <b>1Tx</b>            |               |                             |                   |
| 2412 - 2472           | 802.11b       | 21.45                       | 139.64            |
|                       | 802.11g       | Covered by 802.11n HT20 1TX |                   |
|                       | 802.11n HT20  | 21.52                       | 141.91            |
|                       | 802.11ax HE20 | 21.48                       | 140.60            |

|             |                  |                                 |        |
|-------------|------------------|---------------------------------|--------|
| <b>2Tx</b>  |                  |                                 |        |
| 2412 - 2472 | 802.11n HT20 CDD | 24.47                           | 279.90 |
|             | 802.11g SDM/STBC | Covered by 802.11n HT20 2TX CDD |        |
|             | 802.11ax HE20    | 24.48                           | 280.54 |

### 6.3. DESCRIPTION OF AVAILABLE ANTENNAS

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

Cable loss is 1.96 dB for antenna 4 and 2.18dB for Antenna 3

| Frequency Range (GHz) | ANT 4 (dBi) | ANT 3 (dBi) |
|-----------------------|-------------|-------------|
| 2.4                   | -1.0        | -1.90       |

## 6.4. SOFTWARE AND FIRMWARE

The EUT firmware installed during testing was WiFi FW Version: 20\_97\_1\_4.

## 6.5. WORST-CASE CONFIGURATION AND MODE

EUT was investigated in three orthogonal orientations X (Flatbed), Y (Landscape) and Z (Portrait) on ANT 4 , ANT 3, and 2TX. It was determined that X (Flatbed) orientation was worst-case orientation for ANT 4 and Y (Landscape) for ANT 3 and 2TX.

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

Radiated band edge, harmonic, and spurious emissions from 1GHz to 18GHz were performed with the EUT set to transmit at highest power on Low/Middle/High channels.

Radiated emissions below 1GHz, 18-26GHz and power line conducted emissions were performed with the EUT transmits at the channel with the highest output power as worst-case scenario. There were no emissions found below 30MHz within 20dB of the limit.

For radiated harmonics spurious below 1GHz, 1-18GHz L/M/H channels, 18-26GHz, and power line conducted emissions were performed with the EUT set at the 2TX CDD mode among the CDD/SDM modes and 2TX HE mode with power setting equal or higher than SISO modes as worst-case scenario. G mode covered by HT20 mode since it has the same power as HT20.

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

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

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 bandedge, following are the worst-case data rates set for test:

802.11b mode: 1 Mbps  
802.11n HT20mode: MCS7  
802.11ax HE20mode: MCS9  
802.11ax HE20 RU26 and SU, MCS9

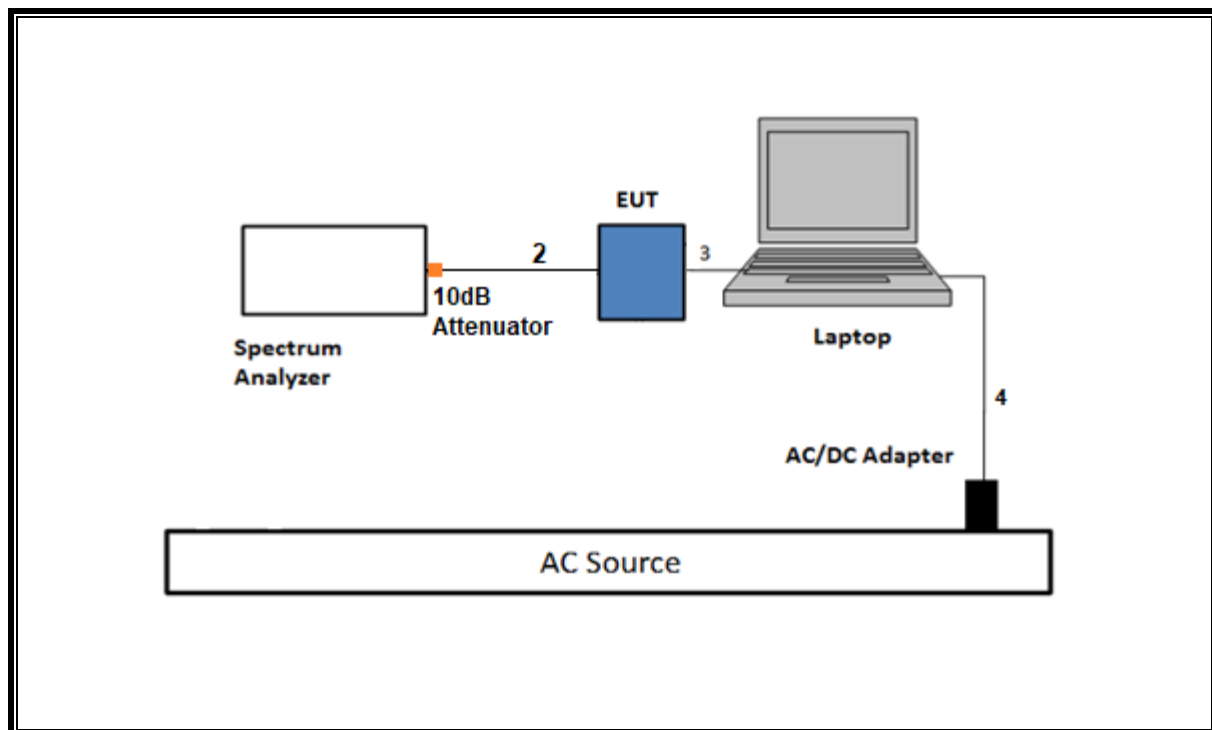
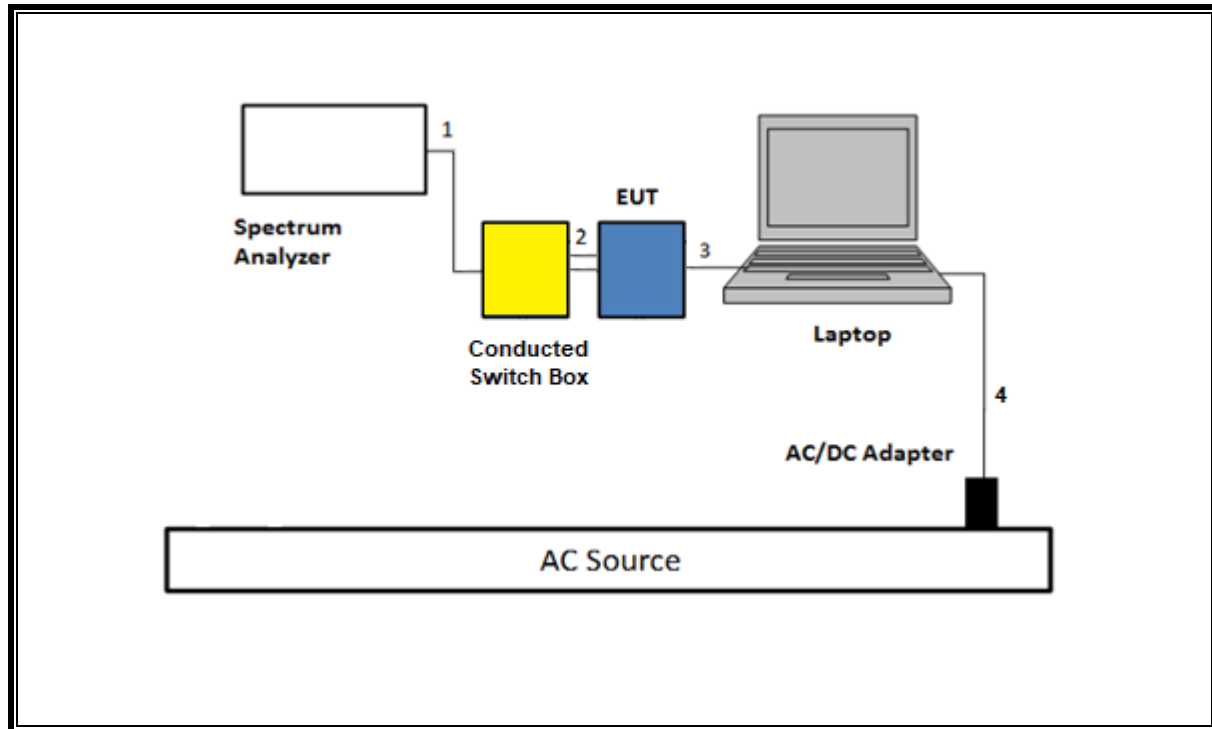
Note: In the Radiated Plots and emissions data, ANT0=ANT4 and ANT1=ANT 3.

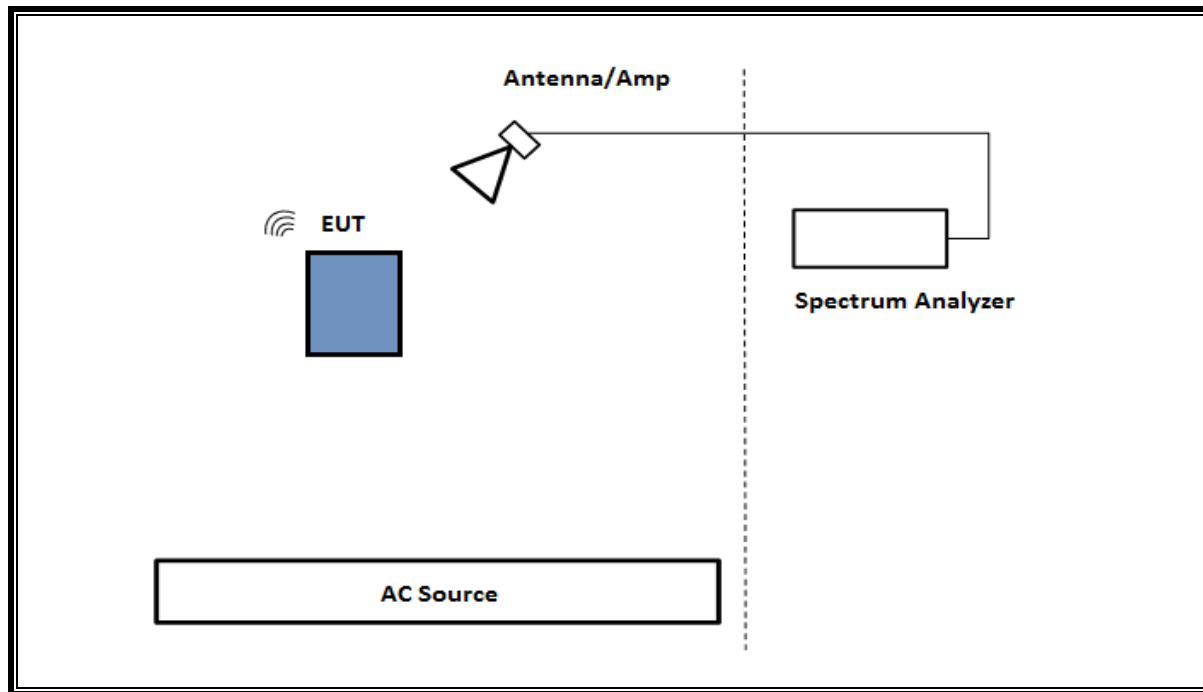
## 6.6. DESCRIPTION OF TEST SETUP

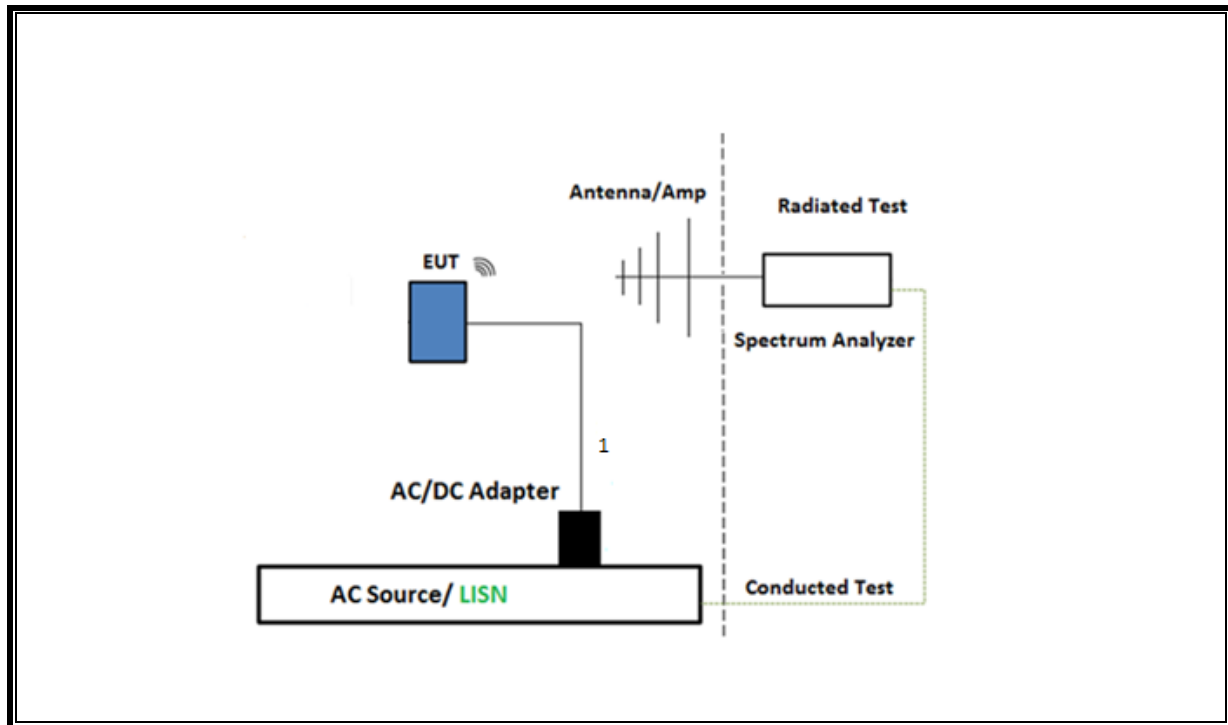
| SUPPORT TEST EQUIPMENT                              |         |                        |                |                   |                  |                         |
|-----------------------------------------------------|---------|------------------------|----------------|-------------------|------------------|-------------------------|
| Description                                         |         | Manufacturer           | Model          | Serial Number     | FCC ID/ DoC      |                         |
| Laptop                                              |         | Apple                  | Macbook Pro    | C02VD7SAHV22      | BCGA1708         |                         |
| Laptop AC/DC adapter                                |         | Liteon Technology      | A1424          | NSW25679          | DoC              |                         |
| EUT AC/DC adapter                                   |         | Apple                  | A1720          | C3D8417A7R93KVPA8 | DoC              |                         |
| Conducted Switch Box                                |         | UL                     | n/a            | 208281            | N/A              |                         |
| 10dB Fixed Attenuator, 2 Watts Up to 26.5 GHz       |         | Pasternack Enterprises | PE7024-10      | 236358            | N/A              |                         |
| I/O CABLES (RF CONDUCTED TEST)                      |         |                        |                |                   |                  |                         |
| Cable No.                                           | Port    | # of Identical Ports   | Connector Type | Cable Type        | Cable Length (m) | Remarks                 |
| 1                                                   | SMA     | 1                      | SMA            | Shielded          | 0.75             | To spectrum Analyzer    |
| 2                                                   | Antenna | 2                      | SMA            | Un-shielded       | 0.2              | To Conducted Switch Box |
| 3                                                   | USB-C   | 1                      | USB-C          | Shielded          | 1.0              | N/A                     |
| 4                                                   | AC      | 1                      | AC             | Un-shielded       | 2                | N/A                     |
| I/O CABLES (RF RADIATED AND AC LINE CONDUCTED TEST) |         |                        |                |                   |                  |                         |
| Cable No.                                           | Port    | # of Identical Ports   | Connector Type | Cable Type        | Cable Length (m) | Remarks                 |
| 1                                                   | AC      | 1                      | AC             | Un-shielded       | 2                | N/A                     |
| 2                                                   | USB     | 1                      | USB            | Shielded          | 1                | N/A                     |

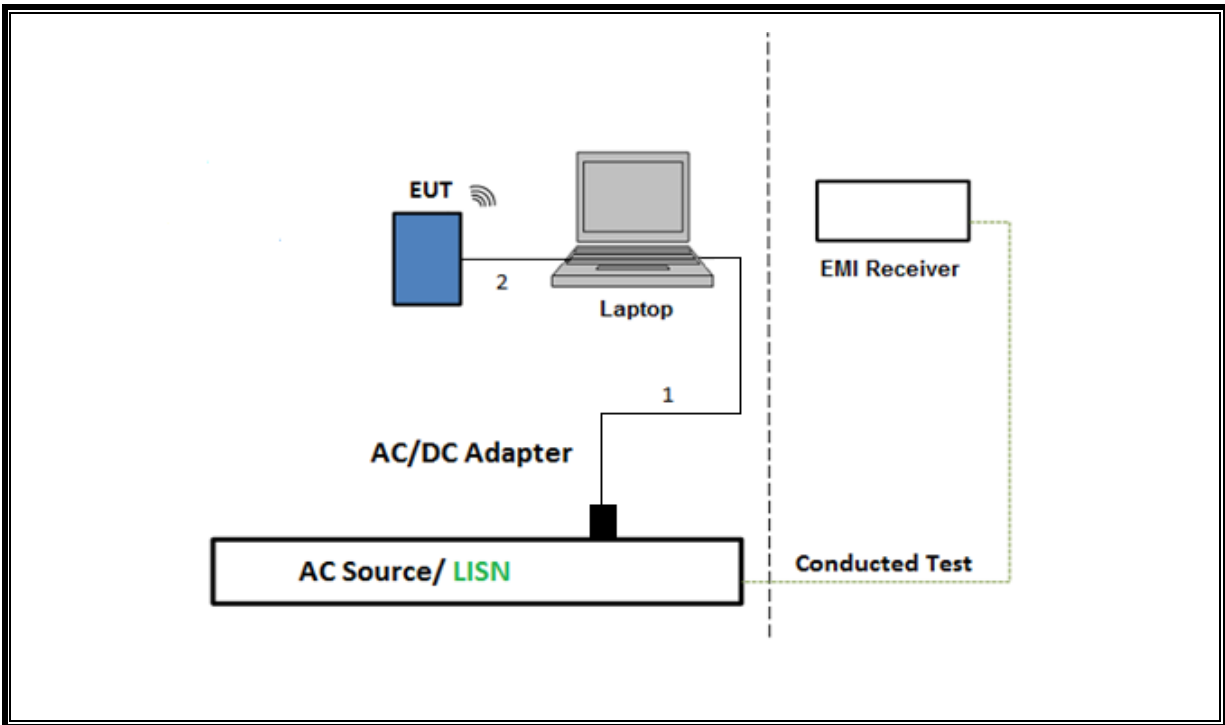
### TEST SETUP

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

**SETUP DIAGRAM FOR CONDUCTED TESTS**

**SETUP DIAGRAM FOR RADIATED TESTS Above 1 GHz**

**SETUP DIAGRAM FOR Below 1GHz and AC LINE CONDUCTED TEST**

**TEST SETUP- AC LINE CONDUCTED: LAPTOP CONFIGURATION**

## 7. MEASUREMENT METHOD

| Test Item                                         | Test Method                                                                                                                  |
|---------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| 6 dB BW                                           | ANSI C63.10 Subclause -11.8.1 RBW $\geq$ DTS BW                                                                              |
| 99% BW                                            | ANSI C63.10-2013, Subclause 6.9.3.                                                                                           |
| Output Power                                      | ANSI C63.10 Subclause -11.9.2.3.1 Method AVGPM<br>(Measurement using an RF average-reading power meter)                      |
| PSD                                               | ANSI C63.10 Subclause -11.10.3 Method AVGPS-1                                                                                |
| Radiated emissions non-restricted frequency bands | ANSI C63.10 Subclause -11.11 & Clause 13                                                                                     |
| Radiated emissions restricted frequency bands     | ANSI C63.10 Subclause -11.12.1 & Clause 13                                                                                   |
| Conducted emissions in restricted frequency bands | ANSI C63.10 Subclause -11.12.2                                                                                               |
| Band-edge                                         | ANSI C63.10 Subclause -11.13.3.2 & Clause 13: Integration method -Peak detection                                             |
| Band-edge                                         | ANSI C63.10 Subclause -11.13.3.3 & Clause 13: Integration method -Trace averaging with continuous transmission at full power |
| Radiated Spurious Emissions Below 30MHz           | ANSI C63.10-2013 Subclause 6.4 & Clause 13                                                                                   |
| AC Power Line Conducted Emissions                 | ANSI C63.10-2013, Subclause 6.2                                                                                              |

## 8. TEST AND MEASUREMENT EQUIPMENT

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

| TEST EQUIPMENT LIST                               |                           |               |        |                                   |            |
|---------------------------------------------------|---------------------------|---------------|--------|-----------------------------------|------------|
| Description                                       | Manufacturer              | Model         | ID Num | Cal Due                           | Last Cal   |
| Spectrum Analyzer, PSA, 3Hz to 26.5GHz            | Keysight Technologies Inc | E4440A        | 81311  | 02/29/2024                        | 02/29/2023 |
| Spectrum Analyzer, PXA, 3Hz to 44GHz              | Keysight Technologies Inc | N9030A        | 125179 | 02/29/2024                        | 02/29/2023 |
| Spectrum Analyzer, PXA, 3Hz to 44GHz              | Keysight Technologies Inc | E4446A        | 80396  | 01/31/2024                        | 01/31/2023 |
| Spectrum Analyzer, PXA, 3Hz to 44GHz              | Keysight Technologies Inc | N9030A        | 87738  | 01/31/2024                        | 01/31/2023 |
| *Conducted Switch Box                             | N/A                       | CSB           | 221008 | 06/21/2023                        | 06/21/2022 |
| Conducted Switch Box                              | N/A                       | CSB           | 208281 | 04/30/2024                        | 04/30/2023 |
| 10dB Fixed Attenuator, 2 Watts Up to 26.5 GHz     | Pasternack Enterprises    | PE7024-10     | 236358 | Verified/Characterized before use |            |
| 10dB Fixed Attenuator, 2 Watts Up to 26.5 GHz     | Pasternack Enterprises    | PE7024-10     | 236355 | Verified/Characterized before use |            |
| Power Meter, P-series single channel              | Keysight Technologies Inc | N1911A        | 90756  | 01/31/2024                        | 01/31/2023 |
| Power Sensor, P- series, 50MHz to 18GHz, Wideband | Keysight Technologies Inc | N1921A        | 90389  | 01/31/2024                        | 01/31/2023 |
| Antenna, Horn 1-18GHz                             | ETS Lindgren              | 3117          | 222740 | 08/31/2023                        | 08/31/2022 |
| Filter Box, 1-18GHz 12 Port                       | UL-FR1                    | Frankenstein  | 217255 | 08/23/2023                        | 08/23/2022 |
| EMI Test Receiver                                 | Rohde & Schwarz           | ESW44         | 201500 | 02/29/2024                        | 02/29/2023 |
| Antenna, Horn 1-18GHz                             | ETS Lindgren              | 3117          | 230300 | 01/12/2024                        | 01/12/2023 |
| RF Filter Box, 1-18GHz, 12 Port                   | UL-FR1                    | Frankenstein  | 216812 | 09/17/2023                        | 09/17/2022 |
| Antenna, Horn 1-18GHz                             | ETS Lindgren              | 3117          | 84797  | 09/20/2023                        | 09/20/2022 |
| RF Filter Box 1-18GHz                             | UL-FR                     | NA            | 206359 | 08/13/2023                        | 08/13/2022 |
| Antenna, Broadband Hybrid, 30MHz to 3GHz          | Sunol Sciences Corp       | JB3           | 80714  | 10/06/2023                        | 10/06/2022 |
| Amplifier, 9KHz to 1GHz, 32dB                     | SONOMA INSTRUMENT         | 310           | 204041 | 08/24/2023                        | 08/24/2022 |
| *Antenna Horn, 18 to 26.5GHz                      | ARA                       | MWH-1826/B    | 172353 | 06/01/2023                        | 06/01/2022 |
| RF Amplifier Assembly, 18-26.5GHz, 60dB Gain      | AMPLICAL                  | AMP18G26.5-60 | 171583 | 02/29/2024                        | 02/29/2023 |
| EMI Receiver                                      | Rohde & Schwarz           | ESW44         | 235670 | 04/30/2024                        | 04/30/2023 |
| EMI Test Receiver                                 | Rohde & Schwarz           | ESW44         | 169927 | 02/29/2024                        | 02/29/2023 |
| Antenna, Horn 1-18GHz                             | ETS-Lindgren              | 3117          | 206807 | 02/28/2024                        | 02/28/2023 |
| RF Filter Box, 1-18GHz                            | UL-FR1                    | N/A           | 171875 | 11/10/2023                        | 11/10/2022 |
| Antenna, Passive Loop 100KHz to 30MHz             | ETS-Lindgren              | EM-6872       | 170015 | 07/28/2023                        | 07/28/2022 |
| Antenna, Passive Loop 30Hz to 1MHz                | Electro-Metrics           | EM-6871       | 170013 | 07/28/2023                        | 07/28/2022 |
| Antenna, Horn 1-18GHz                             | ETS Lindgren              | 3117          | 226672 | 01/09/2024                        | 01/09/2023 |
| *EMI Receiver                                     | Rohde & Schwarz           | ESW44         | 201502 | 02/22/2023                        | 02/22/2022 |

| AC Line Conducted                        |                                  |                                  |                       |            |            |
|------------------------------------------|----------------------------------|----------------------------------|-----------------------|------------|------------|
| Description                              | Manufacturer                     | Model                            | ID Num                | Cal Due    | Last Cal   |
| EMI Test Receiver 9kHz-7GHz              | Rohde & Schwarz                  | ESR                              | 93091                 | 02/29/2024 | 02/29/2023 |
| LISN for Conducted Emissions<br>CISPR-16 | FISCHER CUSTOM<br>COMMUNICATIONS | FCC-LISN-50/250-<br>25-2-01-480V | 175764                | 01/31/2024 | 01/31/2023 |
| Transient Limiter                        | TE                               | TBFL1                            | 207996                | 07/15/2023 | 07/15/2022 |
| UL AUTOMATION SOFTWARE                   |                                  |                                  |                       |            |            |
| Radiated Software                        | UL                               | UL EMC                           | Ver 9.5, 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 is completed before equipment expiration date.

## 9. ANTENNA PORT TEST RESULTS

### 9.1. ON TIME AND DUTY CYCLE

#### LIMITS

None; for reporting purposes only.

#### PROCEDURE

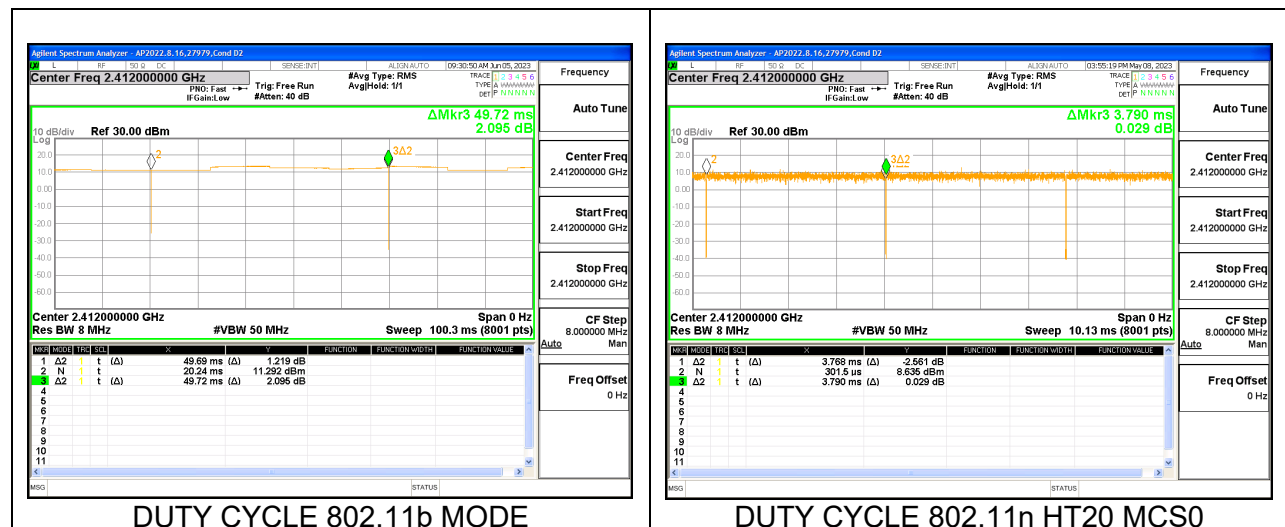
KDB 558074 Zero-Span Spectrum Analyzer Method.

#### ON TIME AND DUTY CYCLE RESULTS

| Mode                     | ON Time<br>B<br>(msec) | Period<br>(msec) | Duty Cycle<br>x<br>(linear) | Duty<br>Cycle<br>(%) | Duty Cycle<br>Correction Factor<br>(dB) | 1/B<br>Minimum VBW<br>(kHz) |
|--------------------------|------------------------|------------------|-----------------------------|----------------------|-----------------------------------------|-----------------------------|
| <b>2.4GHz Band</b>       |                        |                  |                             |                      |                                         |                             |
| 802.11b                  | 49.690                 | 49.720           | 0.999                       | 99.94%               | 0.00                                    | 0.010                       |
| 802.11n HT20 MCS0        | 3.768                  | 3.790            | 0.994                       | 99.42%               | 0.00                                    | 0.010                       |
| 802.11n HT20 MCS7        | 0.412                  | 0.434            | 0.950                       | 95.02%               | 0.22                                    | 2.427                       |
| 802.11ax HE20, RU26 MCS0 | 3.992                  | 4.037            | 0.989                       | 98.89%               | 0.00                                    | 0.010                       |
| 802.11ax HE20, SU MCS0   | 1.487                  | 1.509            | 0.985                       | 98.54%               | 0.00                                    | 0.010                       |
| 802.11ax HE20, RU26 MCS9 | 0.350                  | 0.394            | 0.887                       | 88.69%               | 0.52                                    | 2.859                       |
| 802.11ax HE20, SU MCS9   | 0.168                  | 0.190            | 0.883                       | 88.30%               | 0.54                                    | 5.967                       |

Note: Duty cycle 2TX is the same as 1TX. And to reduce file size, only two plots are included.

#### DUTY CYCLE PLOTS



## **9.2. 99% BANDWIDTH**

### **LIMITS**

None; for reporting purposes only.

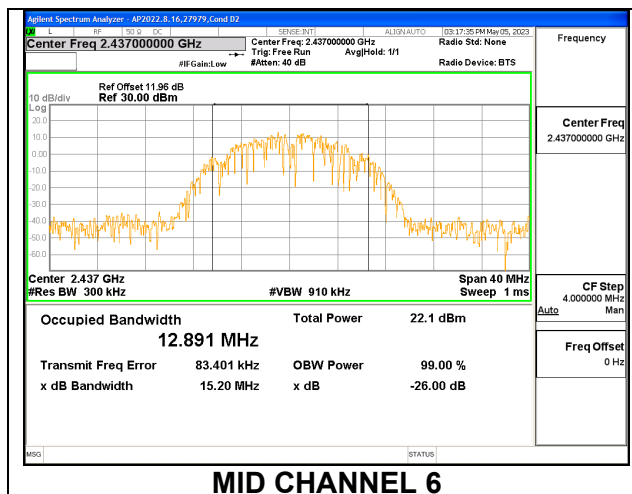
### **RESULTS**

Only Mid channel plot is reported to show setting parameter complies with testing method/procedure.

## 9.2.1. 802.11b MODE 1TX

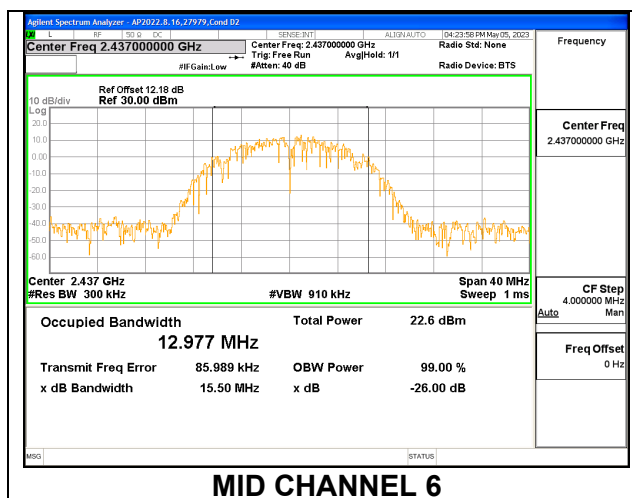
### 1TX ANT 4 MODE

| Channel | Frequency (MHz) | 99% Bandwidth (MHz) |
|---------|-----------------|---------------------|
| Low 1   | 2412            | 12.722              |
| Mid 6   | 2437            | 12.891              |
| High 11 | 2462            | 12.693              |
| High 12 | 2467            | 12.702              |
| High 13 | 2472            | 12.715              |



**1TX ANT 3 MODE**

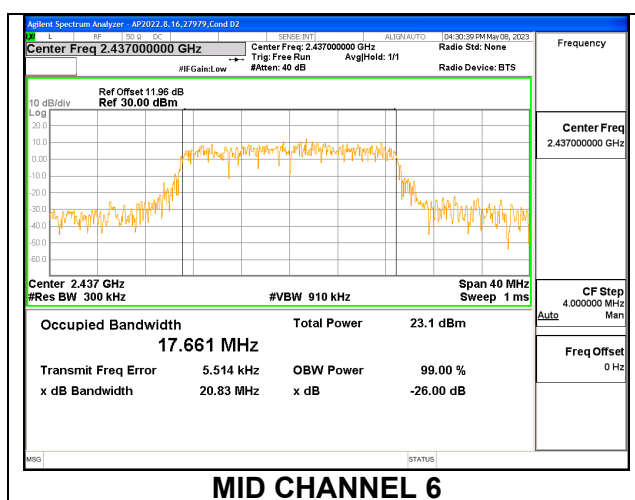
| Channel | Frequency (MHz) | 99% Bandwidth (MHz) |
|---------|-----------------|---------------------|
| Low 1   | 2412            | 12.729              |
| Mid 6   | 2437            | 12.977              |
| High 11 | 2462            | 12.976              |
| High 12 | 2467            | 12.754              |
| High 13 | 2472            | 12.774              |



## 9.2.2. 802.11n HT20 MODE

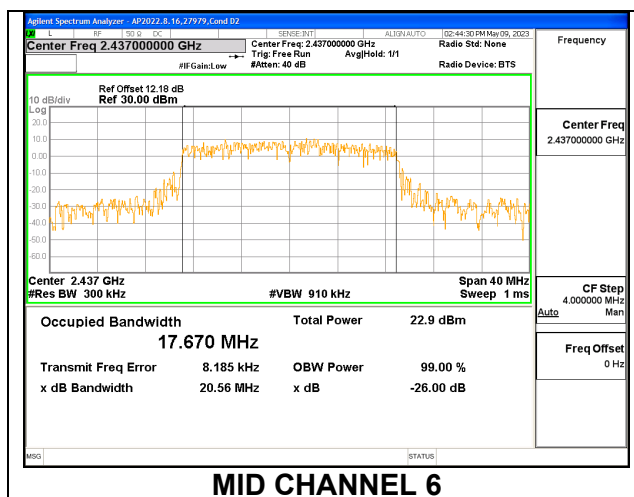
### 1TX ANT 4 MODE

| Channel | Frequency (MHz) | 99% Bandwidth (MHz) |
|---------|-----------------|---------------------|
| Low 1   | 2412            | 17.622              |
| Low 2   | 2417            | 17.609              |
| Low 3   | 2422            | 17.566              |
| Mid 6   | 2437            | 17.661              |
| High 9  | 2452            | 17.722              |
| High 10 | 2457            | 17.718              |
| High 11 | 2462            | 17.57               |
| High 12 | 2467            | 17.684              |
| High 13 | 2472            | 17.544              |



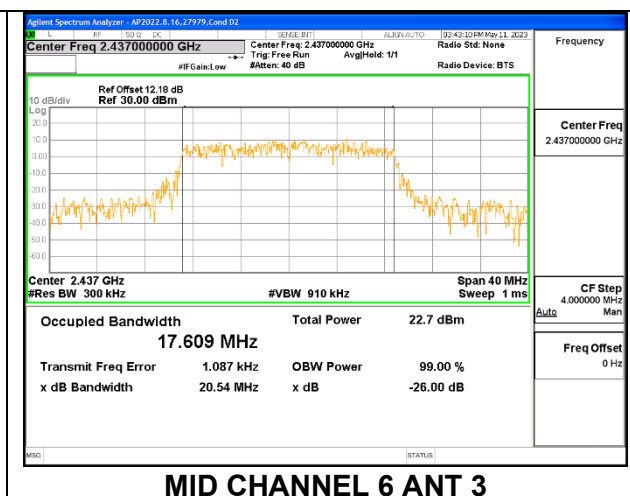
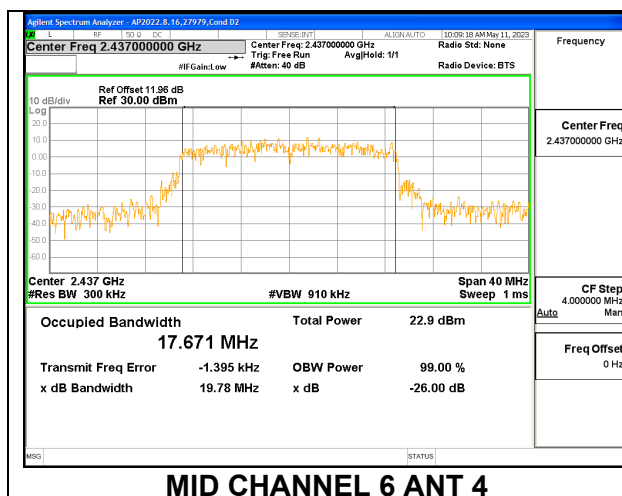
**1TX ANT 3 MODE**

| Channel | Frequency (MHz) | 99% Bandwidth (MHz) |
|---------|-----------------|---------------------|
| Low 1   | 2412            | 17.742              |
| Low 2   | 2417            | 17.647              |
| Low 3   | 2422            | 17.854              |
| Mid 6   | 2437            | 17.670              |
| High 9  | 2452            | 17.678              |
| High 10 | 2457            | 17.662              |
| High 11 | 2462            | 17.713              |
| High 12 | 2467            | 17.717              |
| High 13 | 2472            | 17.690              |



**9.2.3. 802.11n HT20 CDD MODE 2TX****ANT 4 + ANT 3 2TX MODE**

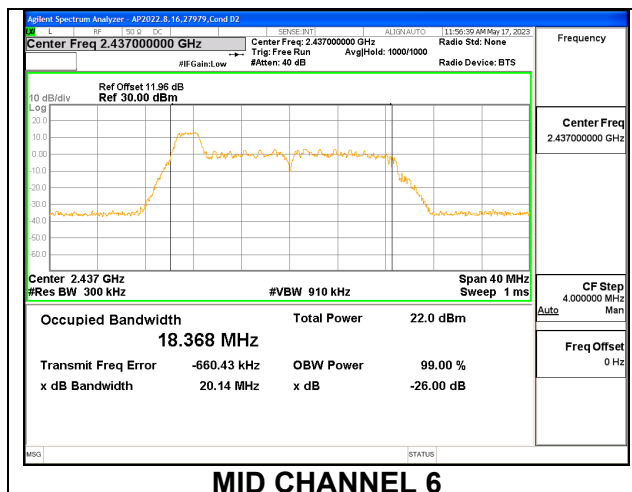
| Channel | Frequency (MHz) | 99% Bandwidth (MHz)<br>ANT 4 | 99% Bandwidth (MHz)<br>ANT 3 |
|---------|-----------------|------------------------------|------------------------------|
| Low 1   | 2412            | 17.745                       | 17.715                       |
| Low 2   | 2417            | 17.69                        | 17.708                       |
| Low 3   | 2422            | 17.627                       | 17.812                       |
| Low 4   | 2427            | 17.625                       | 17.680                       |
| Mid 6   | 2437            | 17.671                       | 17.609                       |
| High 8  | 2447            | 17.609                       | 17.600                       |
| High 9  | 2452            | 17.544                       | 17.698                       |
| High 10 | 2457            | 17.694                       | 17.631                       |
| High 11 | 2462            | 17.787                       | 17.839                       |
| High 12 | 2467            | 17.940                       | 17.842                       |
| High 13 | 2472            | 17.621                       | 17.605                       |



## 9.2.4. 802.11ax HE20 MODE

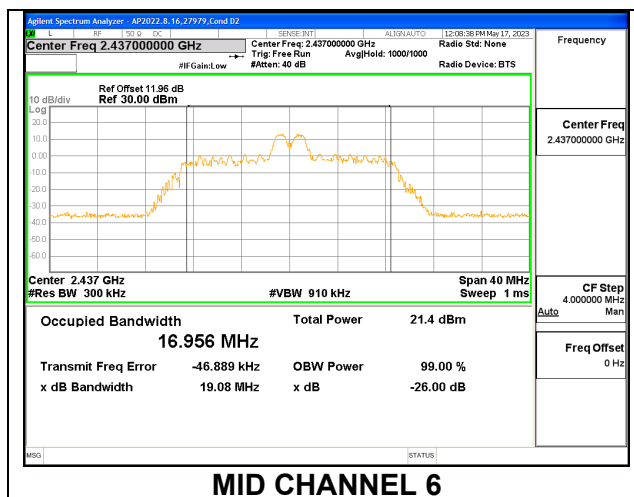
### ANT 4 LEGACY SISO MODE: 26-Tones, RU Index 0

| Channel | Frequency (MHz) | 99% Bandwidth (MHz) |
|---------|-----------------|---------------------|
| Low 1   | 2412            | 18.440              |
| Mid 6   | 2437            | 18.368              |
| High 11 | 2462            | 18.387              |
| High 12 | 2467            | 18.465              |
| High 13 | 2472            | 18.446              |



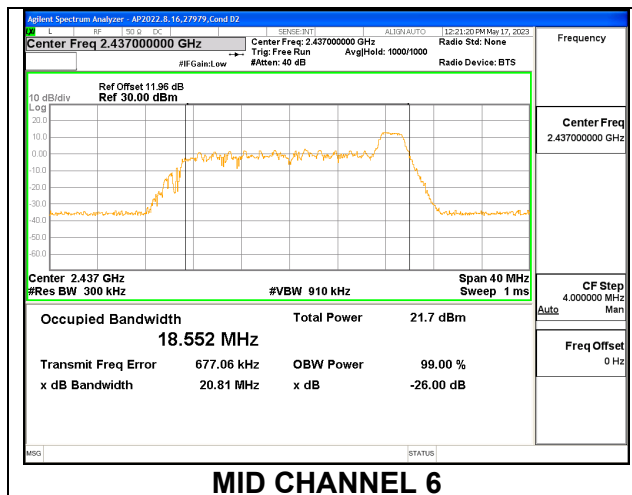
**ANT 4 LEGACY SISO MODE: 26-Tones, RU Index 4**

| Channel | Frequency (MHz) | 99% Bandwidth (MHz) |
|---------|-----------------|---------------------|
| Low 1   | 2412            | 17.055              |
| Mid 6   | 2437            | 16.956              |
| High 11 | 2462            | 17.170              |
| High 12 | 2467            | 17.229              |
| High 13 | 2472            | 17.162              |



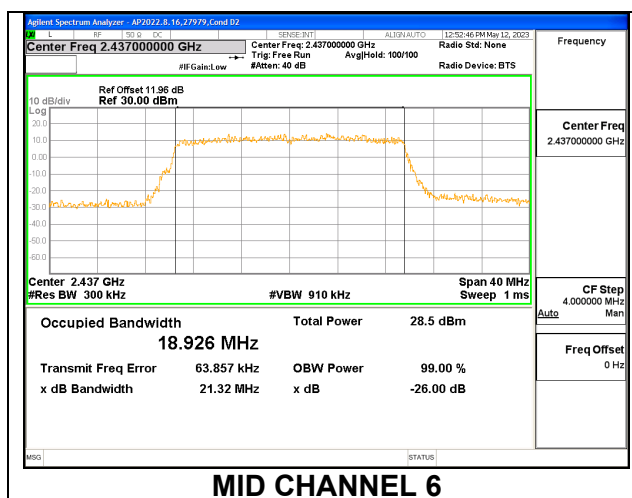
**ANT 4 LEGACY SISO MODE: 26-Tones, RU Index 8**

| Channel | Frequency (MHz) | 99% Bandwidth (MHz) |
|---------|-----------------|---------------------|
| Low 1   | 2412            | 18.767              |
| Mid 6   | 2437            | 18.552              |
| High 11 | 2462            | 18.759              |
| High 12 | 2467            | 18.649              |
| High 13 | 2472            | 18.837              |



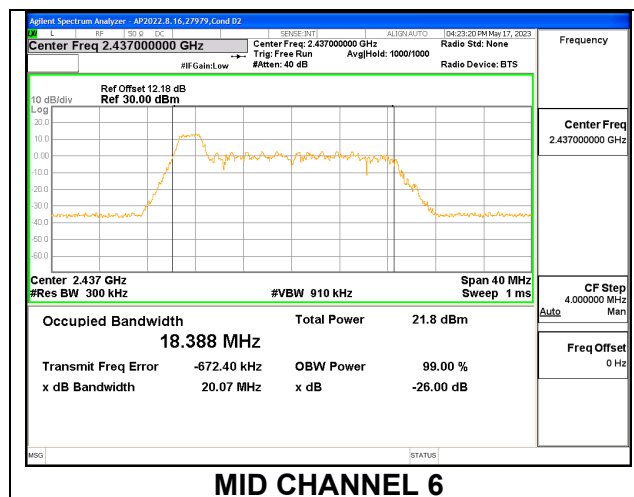
**ANT 4 LEGACY SISO MODE: SU Mode**

| Channel | Frequency (MHz) | 99% Bandwidth (MHz) |
|---------|-----------------|---------------------|
| Low 1   | 2412            | 19.082              |
| Low 2   | 2417            | 18.967              |
| Low 3   | 2422            | 18.996              |
| Mid 6   | 2437            | 18.926              |
| High 9  | 2452            | 18.978              |
| High 10 | 2457            | 18.978              |
| High 11 | 2462            | 18.995              |
| High 12 | 2467            | 18.971              |
| High 13 | 2472            | 18.932              |



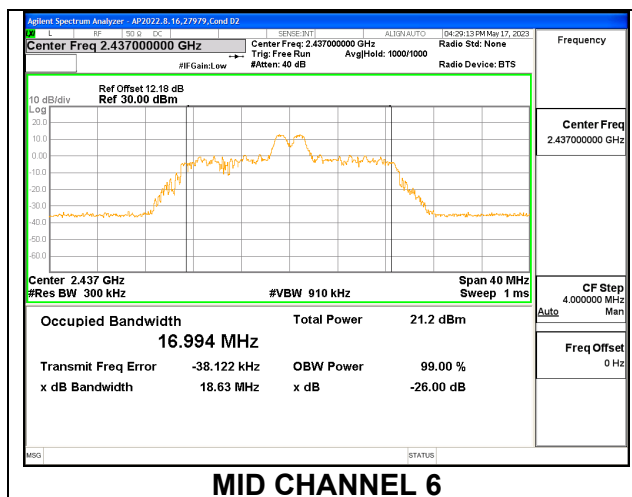
**ANT 3 LEGACY SISO MODE: 26-Tones, RU Index 0**

| Channel | Frequency (MHz) | 99% Bandwidth (MHz) |
|---------|-----------------|---------------------|
| Low 1   | 2412            | 18.435              |
| Mid 6   | 2437            | 18.388              |
| High 11 | 2462            | 18.162              |
| High 12 | 2467            | 18.417              |
| High 13 | 2472            | 18.291              |



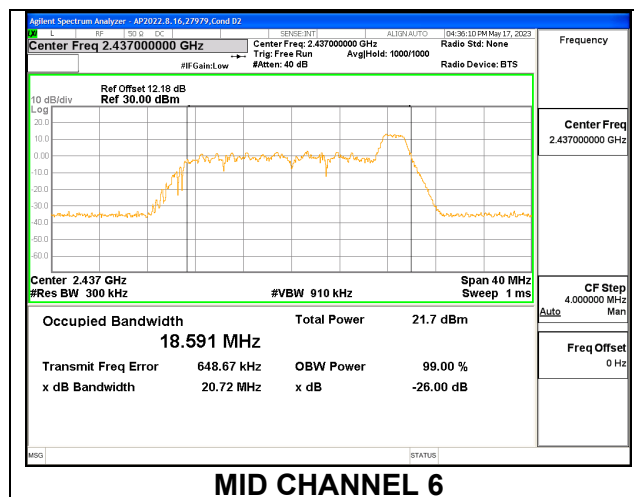
**ANT 3 LEGACY SISO MODE: 26-Tones, RU Index 4**

| Channel | Frequency (MHz) | 99% Bandwidth (MHz) |
|---------|-----------------|---------------------|
| Low 1   | 2412            | 17.015              |
| Mid 6   | 2437            | 16.994              |
| High 11 | 2462            | 17.054              |
| High 12 | 2467            | 16.992              |
| High 13 | 2472            | 16.697              |



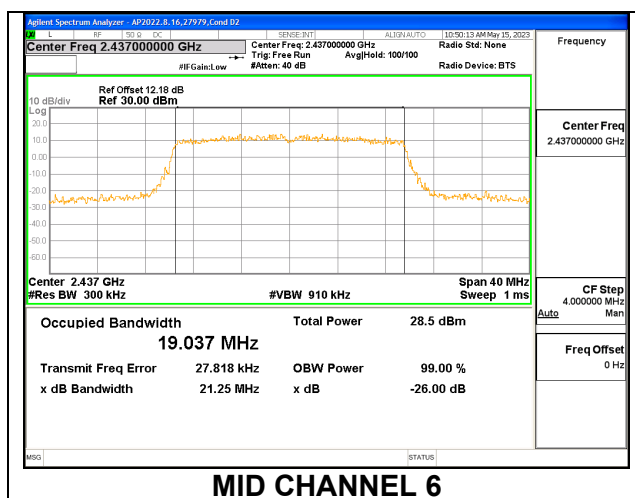
**ANT 3 LEGACY SISO MODE: 26-Tones, RU Index 8**

| Channel | Frequency (MHz) | 99% Bandwidth (MHz) |
|---------|-----------------|---------------------|
| Low 1   | 2412            | 18.626              |
| Mid 6   | 2437            | 18.591              |
| High 11 | 2462            | 18.571              |
| High 12 | 2467            | 18.805              |
| High 13 | 2472            | 18.679              |



**ANT 3 LEGACY SISO MODE: SU Mode**

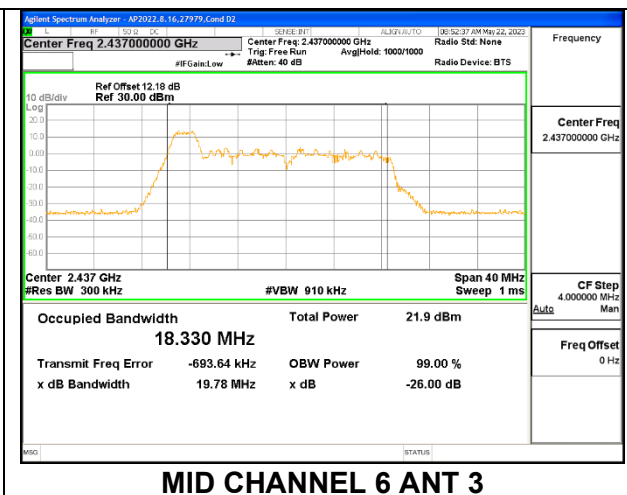
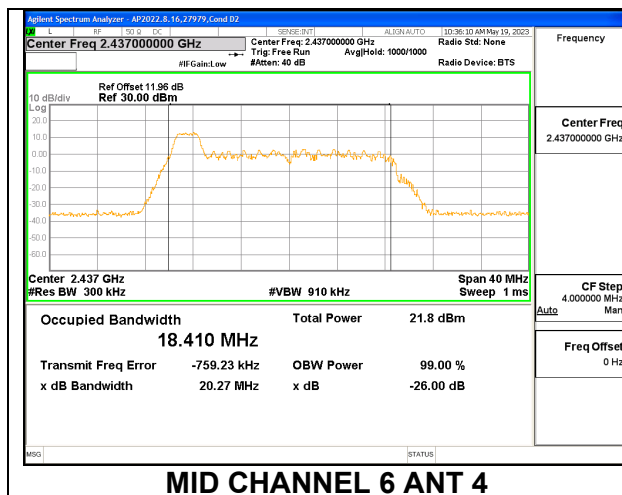
| Channel | Frequency (MHz) | 99% Bandwidth (MHz) |
|---------|-----------------|---------------------|
| Low 1   | 2412            | 19.067              |
| Low 2   | 2417            | 18.979              |
| Low 3   | 2422            | 19.003              |
| Mid 6   | 2437            | 19.037              |
| High 9  | 2452            | 18.994              |
| High 10 | 2457            | 19.014              |
| High 11 | 2462            | 19.006              |
| High 12 | 2467            | 19.013              |
| High 13 | 2472            | 18.919              |



## 9.2.5. 802.11ax HE20 OFDMA MODE 2TX

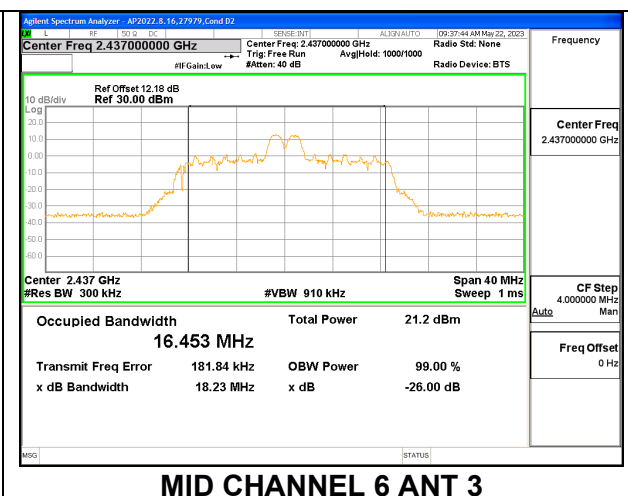
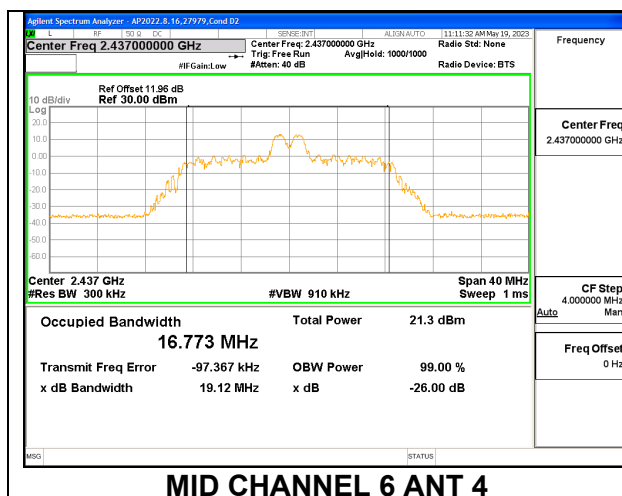
### ANT 4 + ANT 3 2TX MODE: 26-Tones, RU Index 0

| Channel | Frequency (MHz) | 99% Bandwidth (MHz)<br>ANT 4 | 99% Bandwidth (MHz)<br>ANT 3 |
|---------|-----------------|------------------------------|------------------------------|
| Low 1   | 2412            | 18.433                       | 18.332                       |
| Mid 6   | 2437            | 18.410                       | 18.330                       |
| High 11 | 2462            | 18.415                       | 18.121                       |
| High 12 | 2467            | 18.265                       | 18.360                       |
| High 13 | 2472            | 18.400                       | 18.322                       |



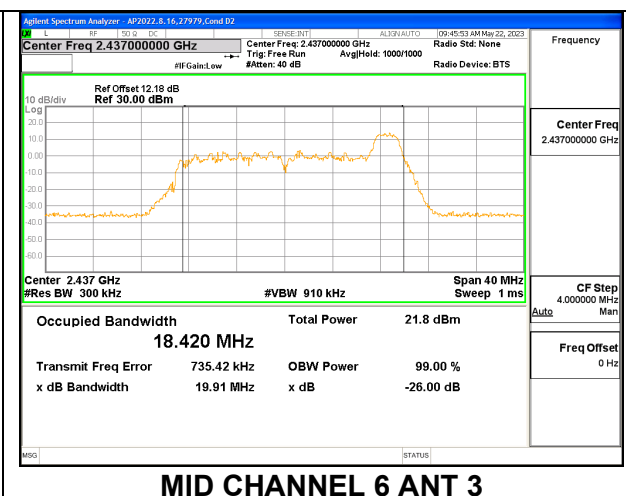
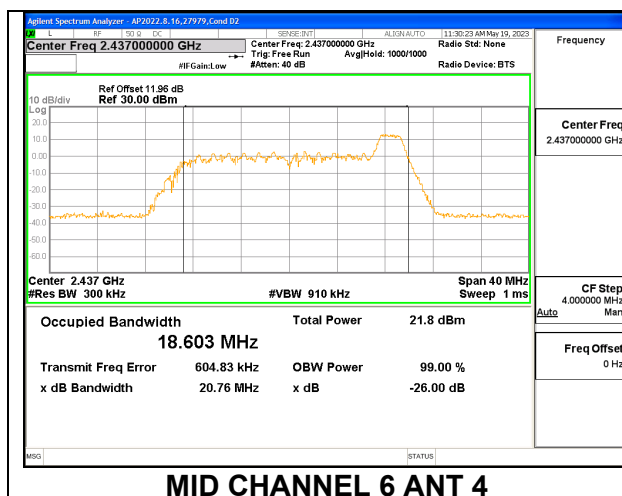
**ANT 4 + ANT 3 2TX MODE: 26-Tones, RU Index 4**

| Channel | Frequency (MHz) | 99% Bandwidth (MHz)<br>ANT 4 | 99% Bandwidth (MHz)<br>ANT 3 |
|---------|-----------------|------------------------------|------------------------------|
| Low 1   | 2412            | 17.088                       | 16.866                       |
| Mid 6   | 2437            | 16.773                       | 16.453                       |
| High 11 | 2462            | 17.170                       | 16.898                       |
| High 12 | 2467            | 17.305                       | 16.765                       |
| High 13 | 2472            | 16.778                       | 16.927                       |



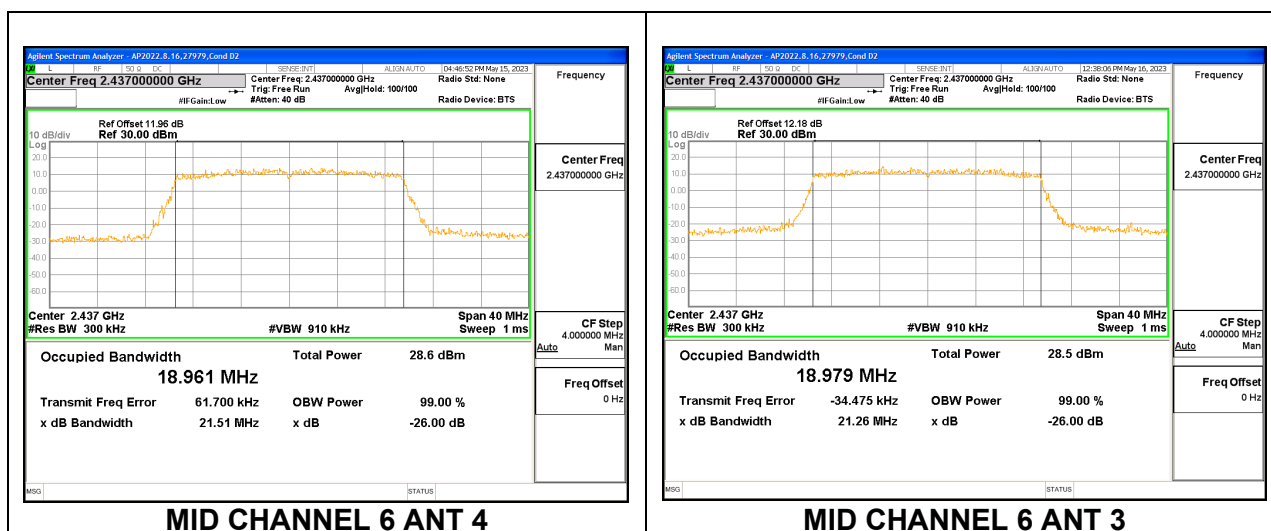
**ANT 4 + ANT 3 2TX MODE: 26-Tones, RU Index 8**

| Channel | Frequency (MHz) | 99% Bandwidth (MHz)<br>ANT 4 | 99% Bandwidth (MHz)<br>ANT 3 |
|---------|-----------------|------------------------------|------------------------------|
| Low 1   | 2412            | 18.714                       | 18.493                       |
| Mid 6   | 2437            | 18.603                       | 18.420                       |
| High 11 | 2462            | 18.749                       | 18.511                       |
| High 12 | 2467            | 18.729                       | 18.461                       |
| High 13 | 2472            | 18.789                       | 18.468                       |



**ANT 4 + ANT 3 2TX MODE: SU MODE**

| Channel | Frequency (MHz) | 99% Bandwidth (MHz)<br>ANT 4 | 99% Bandwidth (MHz)<br>ANT 3 |
|---------|-----------------|------------------------------|------------------------------|
| Low 1   | 2412            | 19.112                       | 19.056                       |
| Low 2   | 2417            | 18.971                       | 18.952                       |
| Low 3   | 2422            | 18.976                       | 18.959                       |
| Low 4   | 2427            | 18.971                       | 18.915                       |
| Mid 6   | 2437            | 18.961                       | 18.979                       |
| High 8  | 2447            | 18.973                       | 18.983                       |
| High 9  | 2452            | 18.981                       | 18.982                       |
| High 10 | 2457            | 18.975                       | 18.966                       |
| High 11 | 2462            | 19.011                       | 18.960                       |
| High 12 | 2467            | 18.993                       | 19.001                       |
| High 13 | 2472            | 18.886                       | 18.955                       |



### **9.3. 6dB BANDWIDTH**

#### **LIMITS**

FCC §15.247 (a) (2)

RSS-247 5.2 (a)

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

#### **RESULTS**

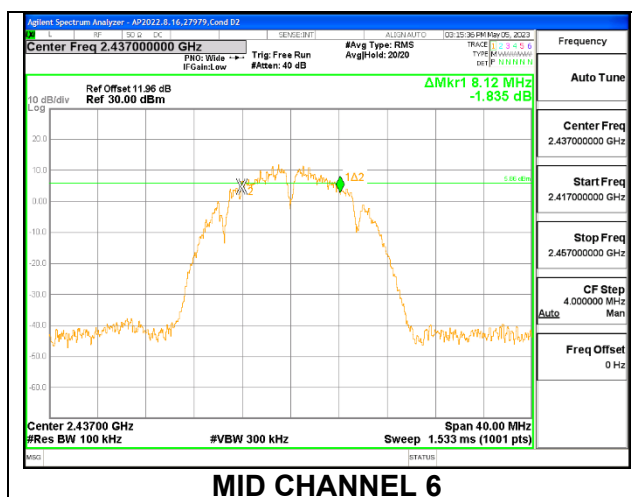
The 6dB bandwidth was measured for the narrowest bandwidth mode, b Mode and ax HE20 Mode 26-Tones as worst case to demonstrate compliance with the minimum required bandwidth of 500 kHz to cover all OFDMA modes.

Only Mid channel plot is reported to show setting parameter complies with testing method/procedure.

### 9.3.1. 802.11b MODE 1TX

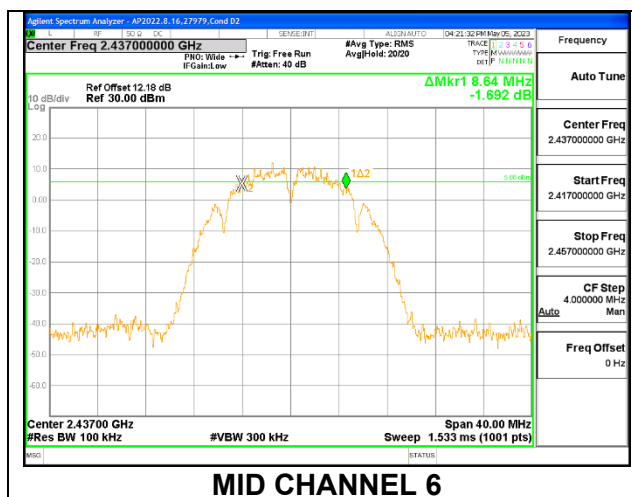
#### 1TX ANT 4 MODE

| Channel | Frequency (MHz) | 6dB Bandwidth (MHz) | Minimum Limit (MHz) |
|---------|-----------------|---------------------|---------------------|
| Low 1   | 2412            | 8.44                | 0.5                 |
| Low 2   | 2417            | 8.64                | 0.5                 |
| Mid 6   | 2437            | 8.12                | 0.5                 |
| High 11 | 2462            | 7.72                | 0.5                 |
| High 12 | 2467            | 8.64                | 0.5                 |
| High 13 | 2472            | 8.44                | 0.5                 |



**1TX ANT 3 MODE**

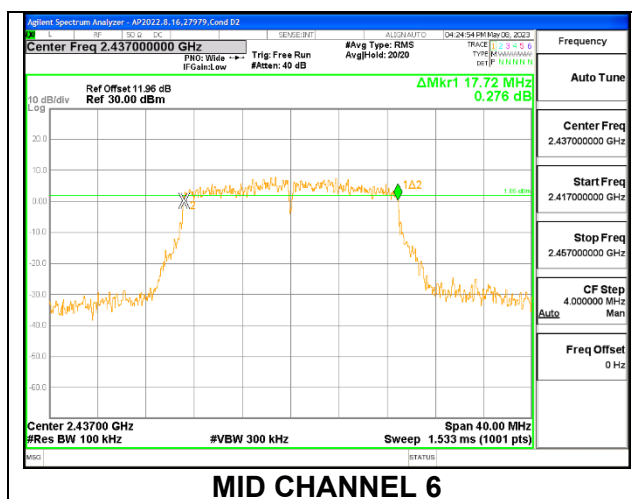
| Channel | Frequency (MHz) | 6dB Bandwidth (MHz) | Minimum Limit (MHz) |
|---------|-----------------|---------------------|---------------------|
| Low 1   | 2412            | 6.68                | 0.5                 |
| Low 2   | 2417            | 8.20                | 0.5                 |
| Mid 6   | 2437            | 8.64                | 0.5                 |
| High 11 | 2462            | 7.04                | 0.5                 |
| High 12 | 2467            | 7.76                | 0.5                 |
| High 13 | 2472            | 8.64                | 0.5                 |



### 9.3.2. 802.11n HT20 MODE

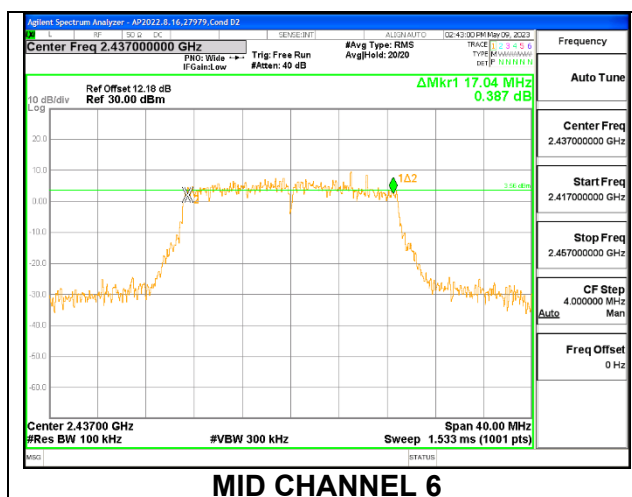
#### 1TX ANT 4 MODE

| Channel | Frequency (MHz) | 6dB Bandwidth (MHz) | Minimum Limit (MHz) |
|---------|-----------------|---------------------|---------------------|
| Low 1   | 2412            | 17.76               | 0.5                 |
| Low 2   | 2417            | 17.68               | 0.5                 |
| Low 3   | 2422            | 17.72               | 0.5                 |
| Mid 6   | 2437            | 17.72               | 0.5                 |
| High 9  | 2452            | 17.76               | 0.5                 |
| High 10 | 2457            | 17.24               | 0.5                 |
| High 11 | 2462            | 17.72               | 0.5                 |
| High 12 | 2467            | 17.76               | 0.5                 |
| High 13 | 2472            | 17.36               | 0.5                 |



**1TX ANT 3 MODE**

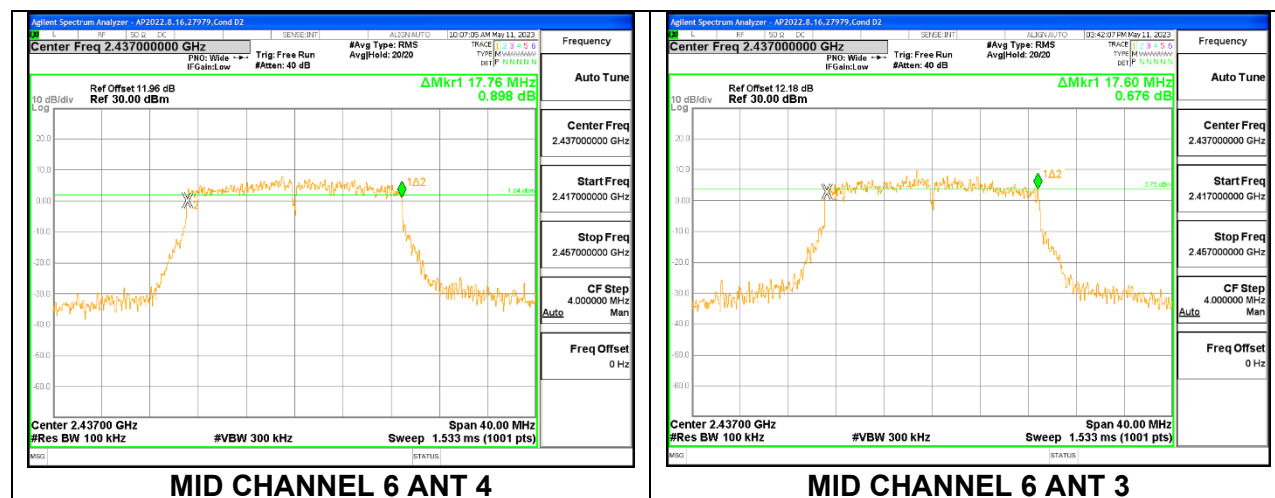
| Channel | Frequency (MHz) | 6dB Bandwidth (MHz) | Minimum Limit (MHz) |
|---------|-----------------|---------------------|---------------------|
| Low 1   | 2412            | 17.76               | 0.5                 |
| Low 2   | 2417            | 17.68               | 0.5                 |
| Low 3   | 2422            | 17.72               | 0.5                 |
| Mid 6   | 2437            | 17.04               | 0.5                 |
| High 9  | 2452            | 17.68               | 0.5                 |
| High 10 | 2457            | 17.68               | 0.5                 |
| High 11 | 2462            | 17.68               | 0.5                 |
| High 12 | 2467            | 17.76               | 0.5                 |
| High 13 | 2472            | 17.64               | 0.5                 |



### 9.3.3. 802.11n HT20 MODE CDD MODE 2TX

#### ANT 4 + ANT 3 2TX MODE

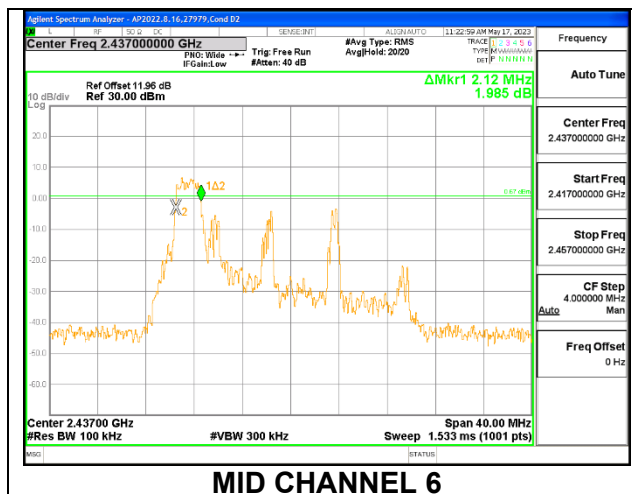
| Channel | Frequency (MHz) | 6dB BW(MHz)<br>ANT 4 | 6dB BW (MHz)<br>ANT 3 | Minimum Limit (MHz) |
|---------|-----------------|----------------------|-----------------------|---------------------|
| Low 1   | 2412            | 17.68                | 17.76                 | 0.5                 |
| Low 2   | 2417            | 17.68                | 17.72                 | 0.5                 |
| Low 3   | 2422            | 17.64                | 17.40                 | 0.5                 |
| Low 4   | 2427            | 17.72                | 17.56                 | 0.5                 |
| Mid 6   | 2437            | 17.76                | 17.60                 | 0.5                 |
| High 8  | 2447            | 16.96                | 17.44                 | 0.5                 |
| High 9  | 2452            | 17.04                | 17.68                 | 0.5                 |
| High 10 | 2457            | 17.76                | 17.68                 | 0.5                 |
| High 11 | 2462            | 16.44                | 17.72                 | 0.5                 |
| High 12 | 2467            | 17.04                | 17.68                 | 0.5                 |
| High 13 | 2472            | 17.68                | 17.64                 | 0.5                 |



### 9.3.4. 802.11ax HE20 MODE

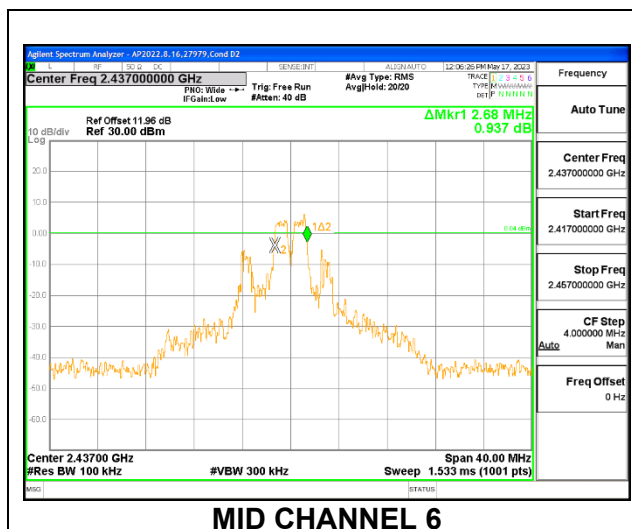
#### ANT 4 LEGACY SISO MODE: 26-Tones, RU Index 0

| Channel | Frequency (MHz) | 6dB Bandwidth (MHz) | Minimum Limit (MHz) |
|---------|-----------------|---------------------|---------------------|
| Low 1   | 2412            | 2.12                | 0.5                 |
| Mid 6   | 2437            | 2.12                | 0.5                 |
| High 11 | 2462            | 2.12                | 0.5                 |
| High 12 | 2467            | 2.04                | 0.5                 |
| High 13 | 2472            | 2.12                | 0.5                 |



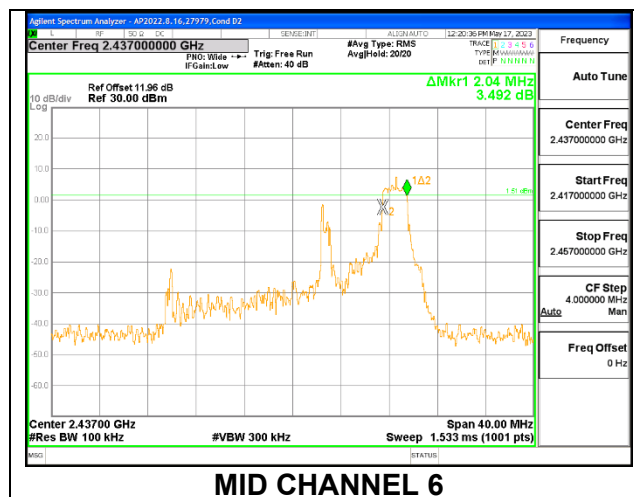
**ANT 4 LEGACY SISO MODE: 26-Tones, RU Index 4**

| Channel | Frequency (MHz) | 6dB Bandwidth (MHz) | Minimum Limit (MHz) |
|---------|-----------------|---------------------|---------------------|
| Low 1   | 2412            | 2.72                | 0.5                 |
| Mid 6   | 2437            | 2.68                | 0.5                 |
| High 11 | 2462            | 2.68                | 0.5                 |
| High 12 | 2467            | 2.76                | 0.5                 |
| High 13 | 2472            | 2.64                | 0.5                 |



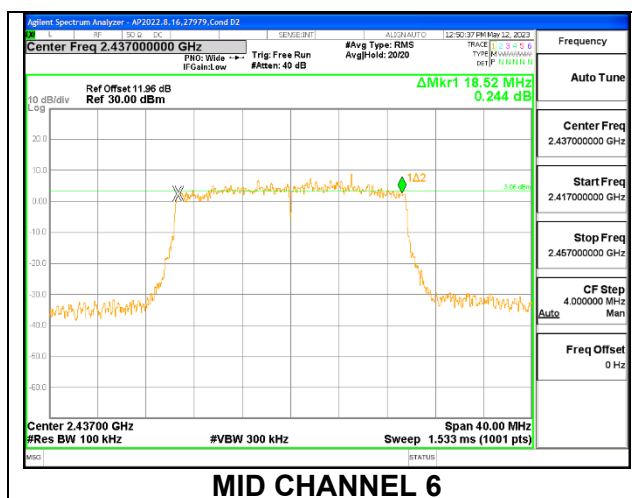
**ANT 4 LEGACY SISO MODE: 26-Tones, RU Index 8**

| Channel | Frequency (MHz) | 6dB Bandwidth (MHz) | Minimum Limit (MHz) |
|---------|-----------------|---------------------|---------------------|
| Low 1   | 2412            | 2.04                | 0.5                 |
| Mid 6   | 2437            | 2.04                | 0.5                 |
| High 11 | 2462            | 2.12                | 0.5                 |
| High 12 | 2467            | 2.08                | 0.5                 |
| High 13 | 2472            | 2.08                | 0.5                 |



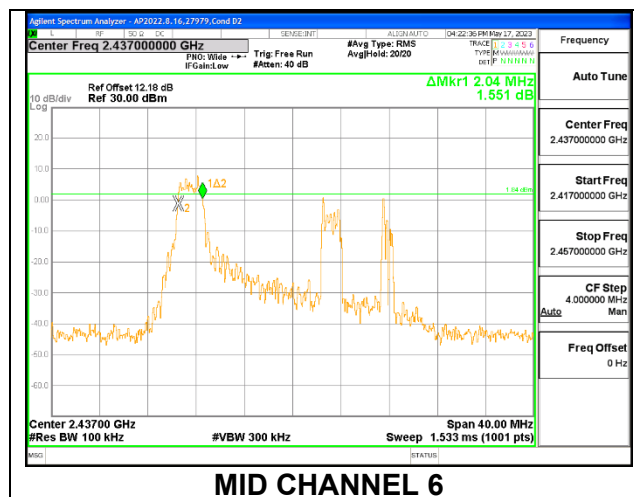
**ANT 4 LEGACY SISO MODE: SU Mode**

| Channel | Frequency (MHz) | 6dB Bandwidth (MHz) | Minimum Limit (MHz) |
|---------|-----------------|---------------------|---------------------|
| Low 1   | 2412            | 18.40               | 0.5                 |
| Low 2   | 2417            | 18.84               | 0.5                 |
| Low 3   | 2422            | 19.04               | 0.5                 |
| Mid 6   | 2437            | 18.52               | 0.5                 |
| High 9  | 2452            | 18.72               | 0.5                 |
| High 10 | 2457            | 19.00               | 0.5                 |
| High 11 | 2462            | 19.16               | 0.5                 |
| High 12 | 2467            | 18.68               | 0.5                 |
| High 13 | 2472            | 18.60               | 0.5                 |



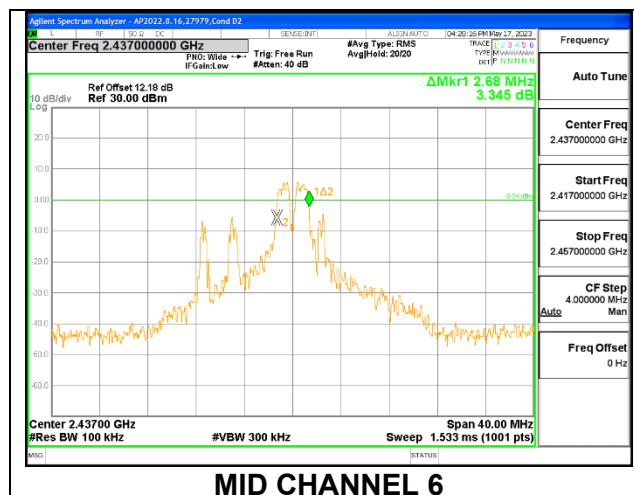
**ANT 3 LEGACY SISO MODE: 26-Tones, RU Index 0**

| Channel | Frequency (MHz) | 6dB Bandwidth (MHz) | Minimum Limit (MHz) |
|---------|-----------------|---------------------|---------------------|
| Low 1   | 2412            | 2.12                | 0.5                 |
| Mid 6   | 2437            | 2.04                | 0.5                 |
| High 11 | 2462            | 2.08                | 0.5                 |
| High 12 | 2467            | 2.16                | 0.5                 |
| High 13 | 2472            | 2.08                | 0.5                 |



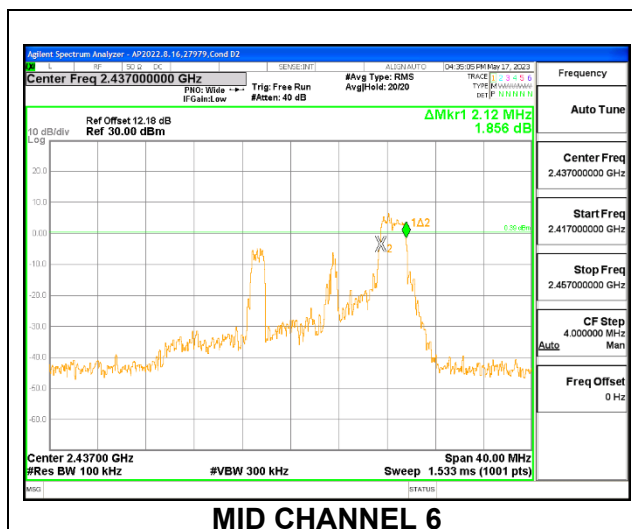
**ANT 3 LEGACY SISO MODE: 26-Tones, RU Index 4**

| Channel | Frequency (MHz) | 6dB Bandwidth (MHz) | Minimum Limit (MHz) |
|---------|-----------------|---------------------|---------------------|
| Low 1   | 2412            | 2.64                | 0.5                 |
| Mid 6   | 2437            | 2.68                | 0.5                 |
| High 11 | 2462            | 2.68                | 0.5                 |
| High 12 | 2467            | 2.68                | 0.5                 |
| High 13 | 2472            | 2.68                | 0.5                 |



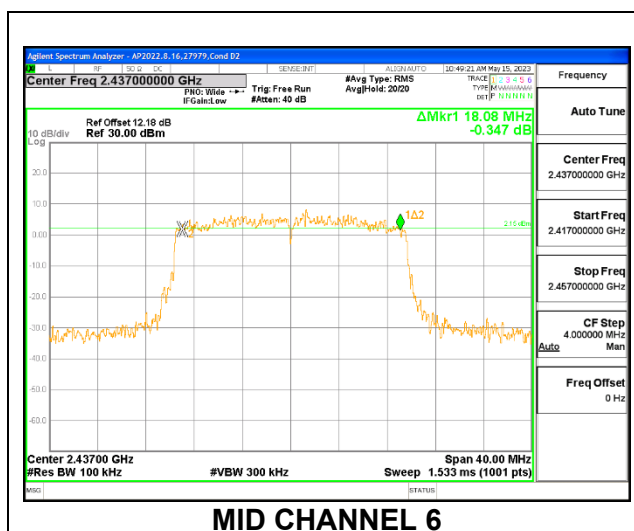
**ANT 3 LEGACY SISO MODE: 26-Tones, RU Index 8**

| Channel | Frequency (MHz) | 6dB Bandwidth (MHz) | Minimum Limit (MHz) |
|---------|-----------------|---------------------|---------------------|
| Low 1   | 2412            | 2.12                | 0.5                 |
| Mid 6   | 2437            | 2.12                | 0.5                 |
| High 11 | 2462            | 2.16                | 0.5                 |
| High 12 | 2467            | 2.16                | 0.5                 |
| High 13 | 2472            | 2.2                 | 0.5                 |



**ANT 3 LEGACY SISO MODE: SU Mode**

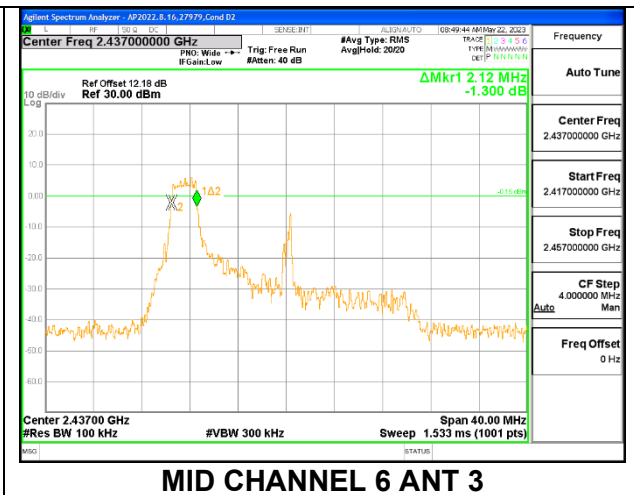
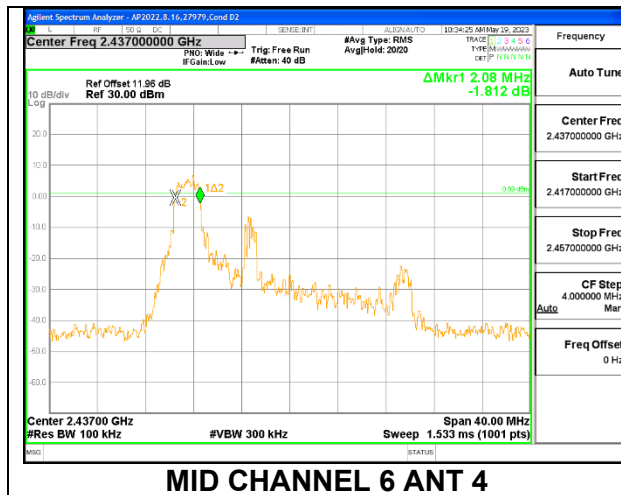
| Channel | Frequency (MHz) | 6dB Bandwidth (MHz) | Minimum Limit (MHz) |
|---------|-----------------|---------------------|---------------------|
| Low 1   | 2412            | 18.48               | 0.5                 |
| Low 2   | 2417            | 18.96               | 0.5                 |
| Low 3   | 2422            | 19.04               | 0.5                 |
| Mid 6   | 2437            | 18.08               | 0.5                 |
| High 9  | 2452            | 19.04               | 0.5                 |
| High 10 | 2457            | 18.84               | 0.5                 |
| High 11 | 2462            | 18.84               | 0.5                 |
| High 12 | 2467            | 18.40               | 0.5                 |
| High 13 | 2472            | 18.92               | 0.5                 |



### 9.3.5. 802.11ax HE20 OFDMA MODE 2TX

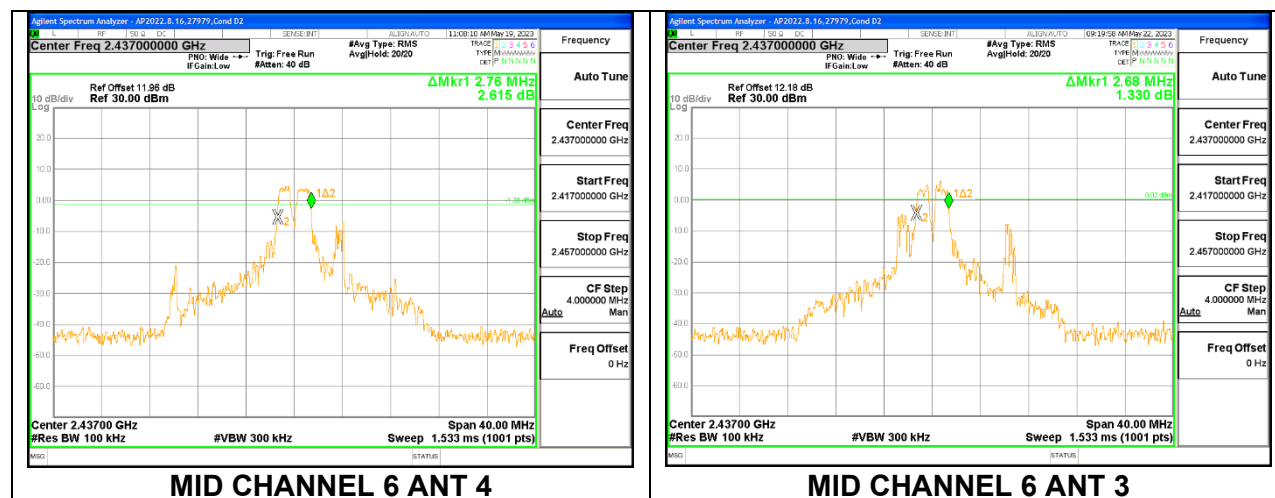
#### ANT 4 + ANT 3 2TX MODE: 26-Tones, RU Index 0

| Channel | Frequency (MHz) | 6dB BW(MHz)<br>ANT 4 | 6dB BW (MHz)<br>ANT 3 | Minimum Limit (MHz) |
|---------|-----------------|----------------------|-----------------------|---------------------|
| Low 1   | 2412            | 2.16                 | 2.16                  | 0.5                 |
| Mid 6   | 2437            | 2.08                 | 2.12                  | 0.5                 |
| High 11 | 2462            | 2.12                 | 2.24                  | 0.5                 |
| High 12 | 2467            | 2.16                 | 2.08                  | 0.5                 |
| High 13 | 2472            | 2.12                 | 2.04                  | 0.5                 |



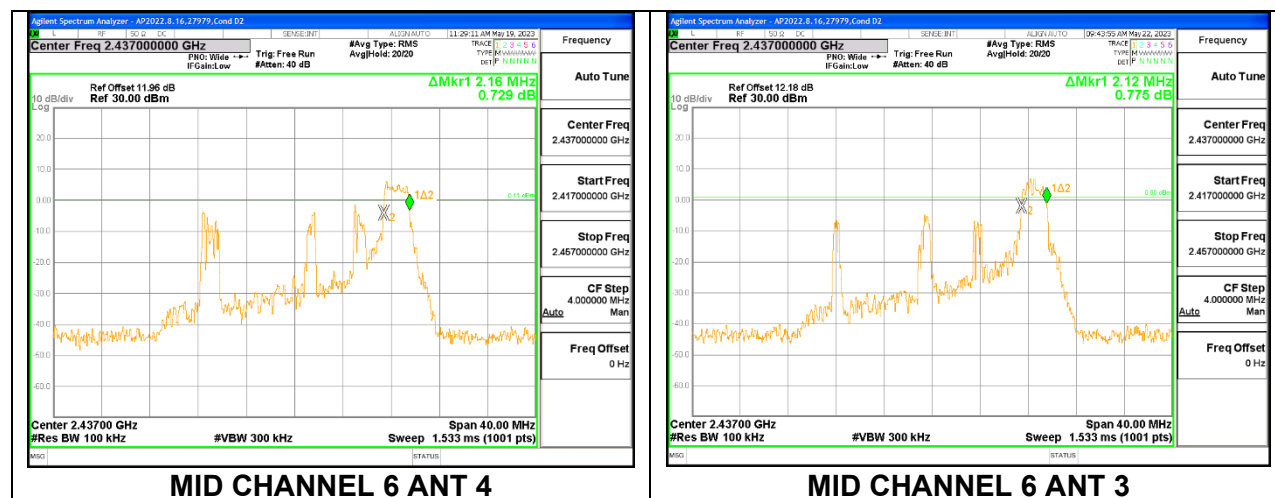
**ANT 4 + ANT 3 2TX MODE: 26-Tones, RU Index 4**

| Channel | Frequency (MHz) | 6dB BW(MHz)<br>ANT 4 | 6dB BW (MHz)<br>ANT 3 | Minimum Limit (MHz) |
|---------|-----------------|----------------------|-----------------------|---------------------|
| Low 1   | 2412            | 2.76                 | 2.60                  | 0.5                 |
| Mid 6   | 2437            | 2.76                 | 2.68                  | 0.5                 |
| High 11 | 2462            | 2.72                 | 2.68                  | 0.5                 |
| High 12 | 2467            | 2.68                 | 2.68                  | 0.5                 |
| High 13 | 2472            | 2.76                 | 2.68                  | 0.5                 |



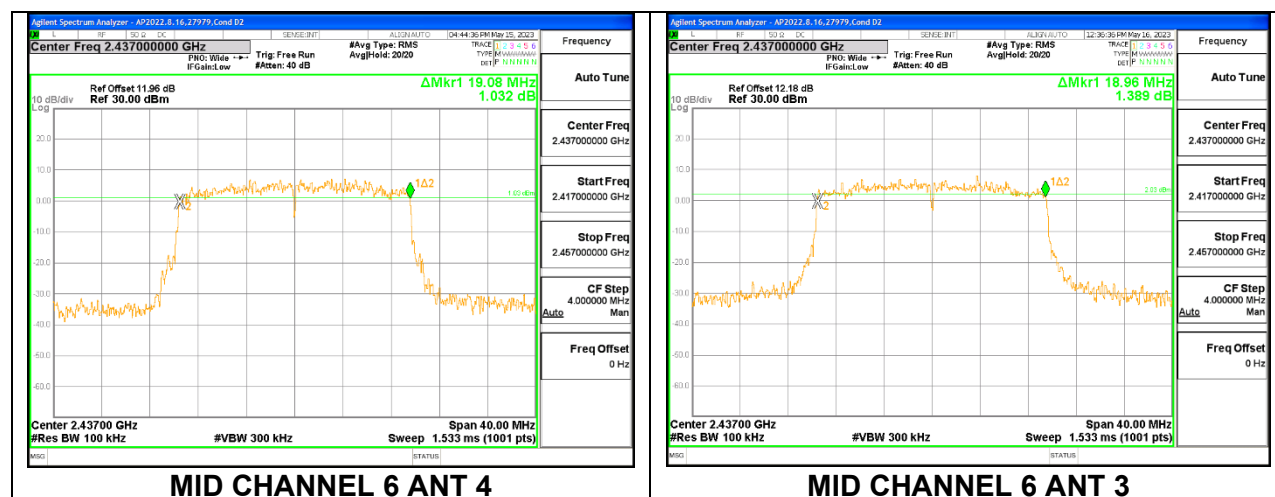
**ANT 4 + ANT 3 2TX MODE: 26-Tones, RU Index 8**

| Channel | Frequency (MHz) | 6dB BW(MHz)<br>ANT 4 | 6dB BW (MHz)<br>ANT 3 | Minimum Limit (MHz) |
|---------|-----------------|----------------------|-----------------------|---------------------|
| Low 1   | 2412            | 2.16                 | 2.12                  | 0.5                 |
| Mid 6   | 2437            | 2.16                 | 2.12                  | 0.5                 |
| High 11 | 2462            | 2.08                 | 2.20                  | 0.5                 |
| High 12 | 2467            | 2.04                 | 2.04                  | 0.5                 |
| High 13 | 2472            | 2.12                 | 2.08                  | 0.5                 |



**ANT 4 + ANT 3 2TX MODE: SU Mode**

| Channel | Frequency (MHz) | 6dB BW(MHz)<br>ANT 4 | 6dB BW (MHz)<br>ANT 3 | Minimum Limit (MHz) |
|---------|-----------------|----------------------|-----------------------|---------------------|
| Low 1   | 2412            | 18.76                | 18.36                 | 0.5                 |
| Low 2   | 2417            | 18.72                | 18.24                 | 0.5                 |
| Low 3   | 2422            | 18.40                | 18.52                 | 0.5                 |
| Low 4   | 2417            | 18.40                | 19.00                 | 0.5                 |
| Mid 6   | 2437            | 19.08                | 18.96                 | 0.5                 |
| High 8  | 2447            | 19.12                | 19.00                 | 0.5                 |
| High 9  | 2452            | 18.36                | 18.96                 | 0.5                 |
| High 10 | 2457            | 18.08                | 19.00                 | 0.5                 |
| High 11 | 2462            | 18.72                | 18.68                 | 0.5                 |
| High 12 | 2467            | 18.24                | 19.16                 | 0.5                 |
| High 13 | 2472            | 18.68                | 18.84                 | 0.5                 |



## 9.4. OUTPUT POWER

### LIMITS

FCC §15.247 (b) (3)

RSS-247 5.4 (d)

For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt, based on the use of antennas with directional gains that do not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

### TEST PROCEDURE

Measurements perform using a wideband RF power meter.

The power output was measured on the EUT antenna port using SMA cable with 10dB attenuator connected to a power meter via wideband power sensor. Average output power was read directly from the power meter.

### 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<br>(GHz) | ANT 4<br>Antenna<br>Gain<br>(dBi) | ANT 3<br>Antenna<br>Gain<br>(dBi) | Uncorrelated Chains<br>Directional<br>Gain<br>(dBi) | Correlated Chains<br>Directional<br>Gain<br>(dBi) |
|---------------|-----------------------------------|-----------------------------------|-----------------------------------------------------|---------------------------------------------------|
| 2.4           | -1.00                             | -1.90                             | -1.43                                               | 1.57                                              |

### RESULTS

**DIRECTIONAL GAIN CALCULATION:**

ANSI C63.10-2013 section 14.4.3

Uncorrelated directional gain= $10 \cdot \text{LOG}((10^{(\text{Ant1}/10)} + 10^{(\text{Ant2}/10)})/2)$

Correlated directional Gain= $10 \cdot \text{LOG}(((10^{(\text{Ant1}/20)} + 10^{(\text{Ant2}/20)})^2)/2)$

Sample Calculation:

Ant4=-1.00, Ant3=-1.90

Uncorrelated Antenna gain= $10 \log[(10^{(-1.0/10)} + 10^{(-1.90/10)})/2] = -1.43 \text{dBi}$

Correlated Antenna gain= $10 \log[(10^{(-1.0/20)} + 10^{(-1.90/20)})^2/2] = 1.57 \text{dBi}$

**9.4.1. 802.11b MODE 1TX**

|                       |          |
|-----------------------|----------|
| <b>Test Engineer:</b> | 27979    |
| <b>Test Date:</b>     | 6/1/1023 |

**1TX ANT 4 MODE****Limits**

| Channel | Frequency<br>(MHz) | Directional<br>Gain<br>(dBi) | FCC<br>Power<br>Limit<br>(dBm) | ISED<br>Power<br>Limit<br>(dBm) | ISED<br>EIRP<br>Limit<br>(dBm) | Max<br>Power<br>(dBm) |
|---------|--------------------|------------------------------|--------------------------------|---------------------------------|--------------------------------|-----------------------|
| Low 1   | 2412               | -1.00                        | 30.00                          | 30                              | 36                             | 30.00                 |
| Mid 6   | 2437               | -1.00                        | 30.00                          | 30                              | 36                             | 30.00                 |
| High 11 | 2462               | -1.00                        | 30.00                          | 30                              | 36                             | 30.00                 |
| High 12 | 2467               | -1.00                        | 30.00                          | 30                              | 36                             | 30.00                 |
| High 13 | 2472               | -1.00                        | 30.00                          | 30                              | 36                             | 30.00                 |

|                           |      |                                                 |
|---------------------------|------|-------------------------------------------------|
| <b>Duty Cycle CF (dB)</b> | 0.00 | <b>Included in Calculations of Corr'd Power</b> |
|---------------------------|------|-------------------------------------------------|

**Results**

| Channel | Frequency<br>(MHz) | Meas<br>Power<br>(dBm) | Total<br>Corr'd<br>Power<br>(dBm) | Power<br>Limit<br>(dBm) | Margin<br>(dB) |
|---------|--------------------|------------------------|-----------------------------------|-------------------------|----------------|
| Low 1   | 2412               | 20.40                  | 20.40                             | 30.00                   | -9.60          |
| Mid 6   | 2437               | 21.41                  | 21.41                             | 30.00                   | -8.59          |
| High 11 | 2462               | 21.45                  | 21.45                             | 30.00                   | -8.55          |
| High 12 | 2467               | 20.44                  | 20.44                             | 30.00                   | -9.56          |
| High 13 | 2472               | 17.91                  | 17.91                             | 30.00                   | -12.09         |

**1TX ANT 3 MODE****Limits**

| Channel | Frequency<br>(MHz) | Directional<br>Gain<br>(dBi) | FCC<br>Power<br>Limit<br>(dBm) | ISED<br>Power<br>Limit<br>(dBm) | ISED<br>EIRP<br>Limit<br>(dBm) | Max<br>Power<br>(dBm) |
|---------|--------------------|------------------------------|--------------------------------|---------------------------------|--------------------------------|-----------------------|
| Low 1   | 2412               | -1.90                        | 30.00                          | 30                              | 36                             | 30.00                 |
| Mid 6   | 2437               | -1.90                        | 30.00                          | 30                              | 36                             | 30.00                 |
| High 11 | 2462               | -1.90                        | 30.00                          | 30                              | 36                             | 30.00                 |
| High 12 | 2467               | -1.90                        | 30.00                          | 30                              | 36                             | 30.00                 |
| High 13 | 2472               | -1.90                        | 30.00                          | 30                              | 36                             | 30.00                 |

|                           |      |                                                 |
|---------------------------|------|-------------------------------------------------|
| <b>Duty Cycle CF (dB)</b> | 0.00 | <b>Included in Calculations of Corr'd Power</b> |
|---------------------------|------|-------------------------------------------------|

**Results**

| Channel | Frequency<br>(MHz) | Meas<br>Power<br>(dBm) | Total<br>Corr'd<br>Power<br>(dBm) | Power<br>Limit<br>(dBm) | Margin<br>(dB) |
|---------|--------------------|------------------------|-----------------------------------|-------------------------|----------------|
| Low 1   | 2412               | 20.41                  | 20.41                             | 30.00                   | -9.59          |
| Mid 6   | 2437               | 21.40                  | 21.40                             | 30.00                   | -8.60          |
| High 11 | 2462               | 21.45                  | 21.45                             | 30.00                   | -8.55          |
| High 12 | 2467               | 20.44                  | 20.44                             | 30.00                   | -9.56          |
| High 13 | 2472               | 17.94                  | 17.94                             | 30.00                   | -12.06         |

**9.4.2. 802.11n HT20 MODE**

|                       |          |
|-----------------------|----------|
| <b>Test Engineer:</b> | 27979    |
| <b>Test Date:</b>     | 6/1/2023 |

**1TX ANT 4 MODE****Limits**

| Channel | Frequency<br>(MHz) | Directional<br>Gain<br>(dBi) | FCC<br>Power<br>Limit<br>(dBm) | ISED<br>Power<br>Limit<br>(dBm) | ISED<br>EIRP<br>Limit<br>(dBm) | Max<br>Power<br>(dBm) |
|---------|--------------------|------------------------------|--------------------------------|---------------------------------|--------------------------------|-----------------------|
| Low 1   | 2412               | -1.00                        | 30.00                          | 30                              | 36                             | 30.00                 |
| Low 2   | 2417               | -1.00                        | 30.00                          | 30                              | 36                             | 30.00                 |
| Low 3   | 2422               | -1.00                        | 30.00                          | 30                              | 36                             | 30.00                 |
| Mid 6   | 2437               | -1.00                        | 30.00                          | 30                              | 36                             | 30.00                 |
| High 9  | 2452               | -1.00                        | 30.00                          | 30                              | 36                             | 30.00                 |
| High 10 | 2457               | -1.00                        | 30.00                          | 30                              | 36                             | 30.00                 |
| High 11 | 2462               | -1.00                        | 30.00                          | 30                              | 36                             | 30.00                 |
| High 12 | 2467               | -1.00                        | 30.00                          | 30                              | 36                             | 30.00                 |
| High 13 | 2472               | -1.00                        | 30.00                          | 30                              | 36                             | 30.00                 |

|                           |      |                                                 |
|---------------------------|------|-------------------------------------------------|
| <b>Duty Cycle CF (dB)</b> | 0.00 | <b>Included in Calculations of Corr'd Power</b> |
|---------------------------|------|-------------------------------------------------|

**Results**

| Channel | Frequency<br>(MHz) | Meas<br>Power<br>(dBm) | Total<br>Corr'd<br>Power<br>(dBm) | Power<br>Limit<br>(dBm) | Margin<br>(dB) |
|---------|--------------------|------------------------|-----------------------------------|-------------------------|----------------|
| Low 1   | 2412               | 17.97                  | 17.97                             | 30.00                   | -12.03         |
| Low 2   | 2417               | 19.47                  | 19.47                             | 30.00                   | -10.53         |
| Low 3   | 2422               | 21.52                  | 21.52                             | 30.00                   | -8.48          |
| Mid 6   | 2437               | 21.45                  | 21.45                             | 30.00                   | -8.55          |
| High 9  | 2452               | 20.91                  | 20.91                             | 30.00                   | -9.09          |
| High 10 | 2457               | 19.47                  | 19.47                             | 30.00                   | -10.53         |
| High 11 | 2462               | 18.40                  | 18.40                             | 30.00                   | -11.60         |
| High 12 | 2467               | 15.93                  | 15.93                             | 30.00                   | -14.07         |
| High 13 | 2472               | 12.97                  | 12.97                             | 30.00                   | -17.03         |

**1TX ANT 3 MODE****Limits**

| Channel | Frequency<br>(MHz) | Directional<br>Gain<br>(dBi) | FCC<br>Power<br>Limit<br>(dBm) | ISED<br>Power<br>Limit<br>(dBm) | ISED<br>EIRP<br>Limit<br>(dBm) | Max<br>Power<br>(dBm) |
|---------|--------------------|------------------------------|--------------------------------|---------------------------------|--------------------------------|-----------------------|
| Low 1   | 2412               | -1.90                        | 30.00                          | 30                              | 36                             | 30.00                 |
| Low 2   | 2417               | -1.90                        | 30.00                          | 30                              | 36                             | 30.00                 |
| Low 3   | 2422               | -1.90                        | 30.00                          | 30                              | 36                             | 30.00                 |
| Mid 6   | 2437               | -1.90                        | 30.00                          | 30                              | 36                             | 30.00                 |
| High 9  | 2452               | -1.90                        | 30.00                          | 30                              | 36                             | 30.00                 |
| High 10 | 2457               | -1.90                        | 30.00                          | 30                              | 36                             | 30.00                 |
| High 11 | 2462               | -1.90                        | 30.00                          | 30                              | 36                             | 30.00                 |
| High 12 | 2467               | -1.90                        | 30.00                          | 30                              | 36                             | 30.00                 |
| High 13 | 2472               | -1.90                        | 30.00                          | 30                              | 36                             | 30.00                 |

|                           |      |                                                 |
|---------------------------|------|-------------------------------------------------|
| <b>Duty Cycle CF (dB)</b> | 0.00 | <b>Included in Calculations of Corr'd Power</b> |
|---------------------------|------|-------------------------------------------------|

**Results**

| Channel | Frequency<br>(MHz) | Meas<br>Power<br>(dBm) | Total<br>Corr'd<br>Power<br>(dBm) | Power<br>Limit<br>(dBm) | Margin<br>(dB) |
|---------|--------------------|------------------------|-----------------------------------|-------------------------|----------------|
| Low 1   | 2412               | 17.94                  | 17.94                             | 30.00                   | -12.06         |
| Low 2   | 2417               | 19.41                  | 19.41                             | 30.00                   | -10.59         |
| Low 3   | 2422               | 21.44                  | 21.44                             | 30.00                   | -8.56          |
| Mid 6   | 2437               | 21.45                  | 21.45                             | 30.00                   | -8.55          |
| High 9  | 2452               | 20.93                  | 20.93                             | 30.00                   | -9.07          |
| High 10 | 2457               | 19.48                  | 19.48                             | 30.00                   | -10.52         |
| High 11 | 2462               | 18.44                  | 18.44                             | 30.00                   | -11.56         |
| High 12 | 2467               | 15.90                  | 15.90                             | 30.00                   | -14.10         |
| High 13 | 2472               | 12.88                  | 12.88                             | 30.00                   | -17.12         |

**9.4.3. 802.11n HT20 CDD MODE 2TX**

|                       |          |
|-----------------------|----------|
| <b>Test Engineer:</b> | 27979    |
| <b>Test Date:</b>     | 6/1/2023 |

**Limits**

| Channel | Frequency<br>(MHz) | Directional<br>Gain<br>(dBi) | FCC/ISED<br>Power<br>Limit<br>(dBm) | ISED<br>EIRP<br>Limit<br>(dBm) | Max<br>Power<br>(dBm) |
|---------|--------------------|------------------------------|-------------------------------------|--------------------------------|-----------------------|
| Low 1   | 2412               | 1.57                         | 30.00                               | 36                             | 30.00                 |
| Low 2   | 2417               | 1.57                         | 30.00                               | 36                             | 30.00                 |
| Low 3   | 2422               | 1.57                         | 30.00                               | 36                             | 30.00                 |
| Low 4   | 2427               | 1.57                         | 30.00                               | 36                             | 30.00                 |
| Mid 6   | 2437               | 1.57                         | 30.00                               | 36                             | 30.00                 |
| High 8  | 2447               | 1.57                         | 30.00                               | 36                             | 30.00                 |
| High 9  | 2452               | 1.57                         | 30.00                               | 36                             | 30.00                 |
| High 10 | 2457               | 1.57                         | 30.00                               | 36                             | 30.00                 |
| High 11 | 2462               | 1.57                         | 30.00                               | 36                             | 30.00                 |
| High 12 | 2467               | 1.57                         | 30.00                               | 36                             | 30.00                 |
| High 13 | 2472               | 1.57                         | 30.00                               | 36                             | 30.00                 |

|                           |      |                                                 |
|---------------------------|------|-------------------------------------------------|
| <b>Duty Cycle CF (dB)</b> | 0.00 | <b>Included in Calculations of Corr'd Power</b> |
|---------------------------|------|-------------------------------------------------|

**Results**

| Channel | Frequency<br>(MHz) | ANT 4<br>Meas<br>Power<br>(dBm) | ANT 3<br>Meas<br>Power<br>(dBm) | Total<br>Corr'd<br>Power<br>(dBm) | Power<br>Limit<br>(dBm) | Margin<br>(dB) |
|---------|--------------------|---------------------------------|---------------------------------|-----------------------------------|-------------------------|----------------|
| Low 1   | 2412               | 17.47                           | 17.44                           | 20.47                             | 30.00                   | -9.53          |
| Low 2   | 2417               | 18.47                           | 18.48                           | 21.49                             | 30.00                   | -8.51          |
| Low 3   | 2422               | 19.91                           | 19.91                           | 22.92                             | 30.00                   | -7.08          |
| Low 4   | 2427               | 21.47                           | 21.44                           | 24.47                             | 30.00                   | -5.53          |
| Mid 6   | 2437               | 21.42                           | 21.40                           | 24.42                             | 30.00                   | -5.58          |
| High 8  | 2447               | 21.45                           | 21.46                           | 24.47                             | 30.00                   | -5.53          |
| High 9  | 2452               | 19.47                           | 19.40                           | 22.45                             | 30.00                   | -7.55          |
| High 10 | 2457               | 18.43                           | 18.41                           | 21.43                             | 30.00                   | -8.57          |
| High 11 | 2462               | 17.47                           | 17.41                           | 20.45                             | 30.00                   | -9.55          |
| High 12 | 2467               | 14.95                           | 14.96                           | 17.97                             | 30.00                   | -12.03         |
| High 13 | 2472               | 11.96                           | 11.97                           | 14.98                             | 30.00                   | -15.02         |

**9.4.4. 802.11ax HE20 MODE**

|                       |          |
|-----------------------|----------|
| <b>Test Engineer:</b> | 27979    |
| <b>Test Date:</b>     | 6/1/2023 |

**1TX ANT 4 MODE: 26-Tones, RU Index 0****Limits**

| Channel | Frequency<br>(MHz) | Directional<br>Gain<br>(dBi) | FCC<br>Power<br>Limit<br>(dBm) | ISED<br>Power<br>Limit<br>(dBm) | ISED<br>EIRP<br>Limit<br>(dBm) | Max<br>Power<br>(dBm) |
|---------|--------------------|------------------------------|--------------------------------|---------------------------------|--------------------------------|-----------------------|
| Low 1   | 2412               | -1.00                        | 30.00                          | 30                              | 36                             | 30.00                 |
| Mid 6   | 2437               | -1.00                        | 30.00                          | 30                              | 36                             | 30.00                 |
| High 11 | 2462               | -1.00                        | 30.00                          | 30                              | 36                             | 30.00                 |
| High 12 | 2467               | -1.00                        | 30.00                          | 30                              | 36                             | 30.00                 |
| High 13 | 2472               | -1.00                        | 30.00                          | 30                              | 36                             | 30.00                 |

|                           |      |                                                 |
|---------------------------|------|-------------------------------------------------|
| <b>Duty Cycle CF (dB)</b> | 0.00 | <b>Included in Calculations of Corr'd Power</b> |
|---------------------------|------|-------------------------------------------------|

**Results**

| Channel | Frequency<br>(MHz) | Meas<br>Power<br>(dBm) | Total<br>Corr'd<br>Power<br>(dBm) | Power<br>Limit<br>(dBm) | Margin<br>(dB) |
|---------|--------------------|------------------------|-----------------------------------|-------------------------|----------------|
| Low 1   | 2412               | 11.91                  | 11.91                             | 30.00                   | -18.09         |
| Mid 6   | 2437               | 11.93                  | 11.93                             | 30.00                   | -18.07         |
| High 11 | 2462               | 11.87                  | 11.87                             | 30.00                   | -18.13         |
| High 12 | 2467               | 11.97                  | 11.97                             | 30.00                   | -18.03         |
| High 13 | 2472               | -0.29                  | -0.29                             | 30.00                   | -30.29         |

**1TX ANT 4 MODE: 26-Tones, RU Index 4****Limits**

| Channel | Frequency<br>(MHz) | Directional<br>Gain<br>(dBi) | FCC<br>Power<br>Limit<br>(dBm) | ISED<br>Power<br>Limit<br>(dBm) | ISED<br>EIRP<br>Limit<br>(dBm) | Max<br>Power<br>(dBm) |
|---------|--------------------|------------------------------|--------------------------------|---------------------------------|--------------------------------|-----------------------|
| Low 1   | 2412               | -1.00                        | 30.00                          | 30                              | 36                             | 30.00                 |
| Mid 6   | 2437               | -1.00                        | 30.00                          | 30                              | 36                             | 30.00                 |
| High 11 | 2462               | -1.00                        | 30.00                          | 30                              | 36                             | 30.00                 |
| High 12 | 2467               | -1.00                        | 30.00                          | 30                              | 36                             | 30.00                 |
| High 13 | 2472               | -1.00                        | 30.00                          | 30                              | 36                             | 30.00                 |

|                           |      |                                                 |
|---------------------------|------|-------------------------------------------------|
| <b>Duty Cycle CF (dB)</b> | 0.00 | <b>Included in Calculations of Corr'd Power</b> |
|---------------------------|------|-------------------------------------------------|

**Results**

| Channel | Frequency<br>(MHz) | Meas<br>Power<br>(dBm) | Total<br>Corr'd<br>Power<br>(dBm) | Power<br>Limit<br>(dBm) | Margin<br>(dB) |
|---------|--------------------|------------------------|-----------------------------------|-------------------------|----------------|
| Low 1   | 2412               | 11.97                  | 11.97                             | 30.00                   | -18.03         |
| Mid 6   | 2437               | 11.92                  | 11.92                             | 30.00                   | -18.08         |
| High 11 | 2462               | 11.92                  | 11.92                             | 30.00                   | -18.08         |
| High 12 | 2467               | 11.92                  | 11.92                             | 30.00                   | -18.08         |
| High 13 | 2472               | -0.02                  | -0.02                             | 30.00                   | -30.02         |

**1TX ANT 4 MODE: 26-Tones, RU Index 8****Limits**

| Channel | Frequency<br>(MHz) | Directional<br>Gain<br>(dBi) | FCC<br>Power<br>Limit<br>(dBm) | ISED<br>Power<br>Limit<br>(dBm) | ISED<br>EIRP<br>Limit<br>(dBm) | Max<br>Power<br>(dBm) |
|---------|--------------------|------------------------------|--------------------------------|---------------------------------|--------------------------------|-----------------------|
| Low 1   | 2412               | -1.00                        | 30.00                          | 30                              | 36                             | 30.00                 |
| Mid 6   | 2437               | -1.00                        | 30.00                          | 30                              | 36                             | 30.00                 |
| High 11 | 2462               | -1.00                        | 30.00                          | 30                              | 36                             | 30.00                 |
| High 12 | 2467               | -1.00                        | 30.00                          | 30                              | 36                             | 30.00                 |
| High 13 | 2472               | -1.00                        | 30.00                          | 30                              | 36                             | 30.00                 |

|                           |      |                                                 |
|---------------------------|------|-------------------------------------------------|
| <b>Duty Cycle CF (dB)</b> | 0.00 | <b>Included in Calculations of Corr'd Power</b> |
|---------------------------|------|-------------------------------------------------|

**Results**

| Channel | Frequency<br>(MHz) | Meas<br>Power<br>(dBm) | Total<br>Corr'd<br>Power<br>(dBm) | Power<br>Limit<br>(dBm) | Margin<br>(dB) |
|---------|--------------------|------------------------|-----------------------------------|-------------------------|----------------|
| Low 1   | 2412               | 11.95                  | 11.95                             | 30.00                   | -18.05         |
| Mid 6   | 2437               | 11.95                  | 11.95                             | 30.00                   | -18.05         |
| High 11 | 2462               | 11.97                  | 11.97                             | 30.00                   | -18.03         |
| High 12 | 2467               | 11.97                  | 11.97                             | 30.00                   | -18.03         |
| High 13 | 2472               | -0.15                  | -0.15                             | 30.00                   | -30.15         |

**1TX ANT 4 MODE: SU Mode****Limits**

| Channel | Frequency<br>(MHz) | Directional<br>Gain<br>(dBi) | FCC<br>Power<br>Limit<br>(dBm) | ISED<br>Power<br>Limit<br>(dBm) | ISED<br>EIRP<br>Limit<br>(dBm) | Max<br>Power<br>(dBm) |
|---------|--------------------|------------------------------|--------------------------------|---------------------------------|--------------------------------|-----------------------|
| Low 1   | 2412               | -1.00                        | 30.00                          | 30                              | 36                             | 30.00                 |
| Low 2   | 2417               | -1.00                        | 30.00                          | 30                              | 36                             | 30.00                 |
| Low 3   | 2422               | -1.00                        | 30.00                          | 30                              | 36                             | 30.00                 |
| Mid 6   | 2437               | -1.00                        | 30.00                          | 30                              | 36                             | 30.00                 |
| High 9  | 2452               | -1.00                        | 30.00                          | 30                              | 36                             | 30.00                 |
| High 10 | 2457               | -1.00                        | 30.00                          | 30                              | 36                             | 30.00                 |
| High 11 | 2462               | -1.00                        | 30.00                          | 30                              | 36                             | 30.00                 |
| High 12 | 2467               | -1.00                        | 30.00                          | 30                              | 36                             | 30.00                 |
| High 13 | 2472               | -1.00                        | 30.00                          | 30                              | 36                             | 30.00                 |

|                           |      |                                                 |
|---------------------------|------|-------------------------------------------------|
| <b>Duty Cycle CF (dB)</b> | 0.00 | <b>Included in Calculations of Corr'd Power</b> |
|---------------------------|------|-------------------------------------------------|

**Results**

| Channel | Frequency<br>(MHz) | Meas<br>Power<br>(dBm) | Total<br>Corr'd<br>Power<br>(dBm) | Power<br>Limit<br>(dBm) | Margin<br>(dB) |
|---------|--------------------|------------------------|-----------------------------------|-------------------------|----------------|
| Low 1   | 2412               | 16.91                  | 16.91                             | 30.00                   | -13.09         |
| Low 2   | 2417               | 17.92                  | 17.92                             | 30.00                   | -12.08         |
| Low 3   | 2422               | 21.48                  | 21.48                             | 30.00                   | -8.52          |
| Mid 6   | 2437               | 21.43                  | 21.43                             | 30.00                   | -8.57          |
| High 9  | 2452               | 21.40                  | 21.40                             | 30.00                   | -8.60          |
| High 10 | 2457               | 17.95                  | 17.95                             | 30.00                   | -12.05         |
| High 11 | 2462               | 16.91                  | 16.91                             | 30.00                   | -13.09         |
| High 12 | 2467               | 14.87                  | 14.87                             | 30.00                   | -15.13         |
| High 13 | 2472               | 8.88                   | 8.88                              | 30.00                   | -21.12         |

**1TX ANT 3 MODE: 26-Tones, RU Index 0****Limits**

| Channel | Frequency<br>(MHz) | Directional<br>Gain<br>(dBi) | FCC<br>Power<br>Limit<br>(dBm) | ISED<br>Power<br>Limit<br>(dBm) | ISED<br>EIRP<br>Limit<br>(dBm) | Max<br>Power<br>(dBm) |
|---------|--------------------|------------------------------|--------------------------------|---------------------------------|--------------------------------|-----------------------|
| Low 1   | 2412               | -1.90                        | 30.00                          | 30                              | 36                             | 30.00                 |
| Mid 6   | 2437               | -1.90                        | 30.00                          | 30                              | 36                             | 30.00                 |
| High 11 | 2462               | -1.90                        | 30.00                          | 30                              | 36                             | 30.00                 |
| High 12 | 2467               | -1.90                        | 30.00                          | 30                              | 36                             | 30.00                 |
| High 13 | 2472               | -1.90                        | 30.00                          | 30                              | 36                             | 30.00                 |

|                           |      |                                                 |
|---------------------------|------|-------------------------------------------------|
| <b>Duty Cycle CF (dB)</b> | 0.00 | <b>Included in Calculations of Corr'd Power</b> |
|---------------------------|------|-------------------------------------------------|

**Results**

| Channel | Frequency<br>(MHz) | Meas<br>Power<br>(dBm) | Total<br>Corr'd<br>Power<br>(dBm) | Power<br>Limit<br>(dBm) | Margin<br>(dB) |
|---------|--------------------|------------------------|-----------------------------------|-------------------------|----------------|
| Low 1   | 2412               | 11.95                  | 11.95                             | 30.00                   | -18.05         |
| Mid 6   | 2437               | 11.97                  | 11.97                             | 30.00                   | -18.03         |
| High 11 | 2462               | 11.98                  | 11.98                             | 30.00                   | -18.02         |
| High 12 | 2467               | 11.97                  | 11.97                             | 30.00                   | -18.03         |
| High 13 | 2472               | -0.79                  | -0.79                             | 30.00                   | -30.79         |

**1TX ANT 3 MODE: 26-Tones, RU Index 4****Limits**

| Channel | Frequency<br>(MHz) | Directional<br>Gain<br>(dBi) | FCC<br>Power<br>Limit<br>(dBm) | ISED<br>Power<br>Limit<br>(dBm) | ISED<br>EIRP<br>Limit<br>(dBm) | Max<br>Power<br>(dBm) |
|---------|--------------------|------------------------------|--------------------------------|---------------------------------|--------------------------------|-----------------------|
| Low 1   | 2412               | -1.90                        | 30.00                          | 30                              | 36                             | 30.00                 |
| Mid 6   | 2437               | -1.90                        | 30.00                          | 30                              | 36                             | 30.00                 |
| High 11 | 2462               | -1.90                        | 30.00                          | 30                              | 36                             | 30.00                 |
| High 12 | 2467               | -1.90                        | 30.00                          | 30                              | 36                             | 30.00                 |
| High 13 | 2472               | -1.90                        | 30.00                          | 30                              | 36                             | 30.00                 |

|                           |      |                                                 |
|---------------------------|------|-------------------------------------------------|
| <b>Duty Cycle CF (dB)</b> | 0.00 | <b>Included in Calculations of Corr'd Power</b> |
|---------------------------|------|-------------------------------------------------|

**Results**

| Channel | Frequency<br>(MHz) | Meas<br>Power<br>(dBm) | Total<br>Corr'd<br>Power<br>(dBm) | Power<br>Limit<br>(dBm) | Margin<br>(dB) |
|---------|--------------------|------------------------|-----------------------------------|-------------------------|----------------|
| Low 1   | 2412               | 11.97                  | 11.97                             | 30.00                   | -18.03         |
| Mid 6   | 2437               | 11.89                  | 11.89                             | 30.00                   | -18.11         |
| High 11 | 2462               | 11.91                  | 11.91                             | 30.00                   | -18.09         |
| High 12 | 2467               | 11.96                  | 11.96                             | 30.00                   | -18.04         |
| High 13 | 2472               | -0.21                  | -0.21                             | 30.00                   | -30.21         |

**1TX ANT 3 MODE: 26-Tones, RU Index 8****Limits**

| Channel | Frequency<br>(MHz) | Directional<br>Gain<br>(dBi) | FCC<br>Power<br>Limit<br>(dBm) | ISED<br>Power<br>Limit<br>(dBm) | ISED<br>EIRP<br>Limit<br>(dBm) | Max<br>Power<br>(dBm) |
|---------|--------------------|------------------------------|--------------------------------|---------------------------------|--------------------------------|-----------------------|
| Low 1   | 2412               | -1.90                        | 30.00                          | 30                              | 36                             | 30.00                 |
| Mid 6   | 2437               | -1.90                        | 30.00                          | 30                              | 36                             | 30.00                 |
| High 11 | 2462               | -1.90                        | 30.00                          | 30                              | 36                             | 30.00                 |
| High 12 | 2467               | -1.90                        | 30.00                          | 30                              | 36                             | 30.00                 |
| High 13 | 2472               | -1.90                        | 30.00                          | 30                              | 36                             | 30.00                 |

|                    |      |                                          |
|--------------------|------|------------------------------------------|
| Duty Cycle CF (dB) | 0.00 | Included in Calculations of Corr'd Power |
|--------------------|------|------------------------------------------|

**Results**

| Channel | Frequency<br>(MHz) | Meas<br>Power<br>(dBm) | Total<br>Corr'd<br>Power<br>(dBm) | Power<br>Limit<br>(dBm) | Margin<br>(dB) |
|---------|--------------------|------------------------|-----------------------------------|-------------------------|----------------|
| Low 1   | 2412               | 11.88                  | 11.88                             | 30.00                   | -18.12         |
| Mid 6   | 2437               | 11.95                  | 11.95                             | 30.00                   | -18.05         |
| High 11 | 2462               | 11.92                  | 11.92                             | 30.00                   | -18.08         |
| High 12 | 2467               | 11.98                  | 11.98                             | 30.00                   | -18.02         |
| High 13 | 2472               | -0.72                  | -0.72                             | 30.00                   | -30.72         |

**1TX ANT 3 MODE: SU Mode****Limits**

| Channel | Frequency<br>(MHz) | Directional<br>Gain<br>(dBi) | FCC<br>Power<br>Limit<br>(dBm) | ISED<br>Power<br>Limit<br>(dBm) | ISED<br>EIRP<br>Limit<br>(dBm) | Max<br>Power<br>(dBm) |
|---------|--------------------|------------------------------|--------------------------------|---------------------------------|--------------------------------|-----------------------|
| Low 1   | 2412               | -1.90                        | 30.00                          | 30                              | 36                             | 30.00                 |
| Low 2   | 2417               | -1.90                        | 30.00                          | 30                              | 36                             | 30.00                 |
| Low 3   | 2422               | -1.90                        | 30.00                          | 30                              | 36                             | 30.00                 |
| Mid 6   | 2437               | -1.90                        | 30.00                          | 30                              | 36                             | 30.00                 |
| High 9  | 2452               | -1.90                        | 30.00                          | 30                              | 36                             | 30.00                 |
| High 10 | 2457               | -1.90                        | 30.00                          | 30                              | 36                             | 30.00                 |
| High 11 | 2462               | -1.90                        | 30.00                          | 30                              | 36                             | 30.00                 |
| High 12 | 2467               | -1.90                        | 30.00                          | 30                              | 36                             | 30.00                 |
| High 13 | 2472               | -1.90                        | 30.00                          | 30                              | 36                             | 30.00                 |

|                           |      |                                                 |
|---------------------------|------|-------------------------------------------------|
| <b>Duty Cycle CF (dB)</b> | 0.00 | <b>Included in Calculations of Corr'd Power</b> |
|---------------------------|------|-------------------------------------------------|

**Results**

| Channel | Frequency<br>(MHz) | Meas<br>Power<br>(dBm) | Total<br>Corr'd<br>Power<br>(dBm) | Power<br>Limit<br>(dBm) | Margin<br>(dB) |
|---------|--------------------|------------------------|-----------------------------------|-------------------------|----------------|
| Low 1   | 2412               | 16.98                  | 16.98                             | 30.00                   | -13.02         |
| Low 2   | 2417               | 17.91                  | 17.91                             | 30.00                   | -12.09         |
| Low 3   | 2422               | 21.45                  | 21.45                             | 30.00                   | -8.55          |
| Mid 6   | 2437               | 21.43                  | 21.43                             | 30.00                   | -8.57          |
| High 9  | 2452               | 21.47                  | 21.47                             | 30.00                   | -8.53          |
| High 10 | 2457               | 17.88                  | 17.88                             | 30.00                   | -12.12         |
| High 11 | 2462               | 16.92                  | 16.92                             | 30.00                   | -13.08         |
| High 12 | 2467               | 14.92                  | 14.92                             | 30.00                   | -15.08         |
| High 13 | 2472               | 8.88                   | 8.88                              | 30.00                   | -21.12         |

**9.4.5. 802.11ax HE20 OFDMA MODE 2TX**

|                       |          |
|-----------------------|----------|
| <b>Test Engineer:</b> | 27979    |
| <b>Test Date:</b>     | 6/1/2023 |

**ANT 4 + ANT 3 2TX MODE: 26-Tones, RU Index 0****Limits**

| Channel | Frequency<br>(MHz) | Directional<br>Gain<br>(dBi) | FCC/ISED<br>Power<br>Limit<br>(dBm) | ISED<br>EIRP<br>Limit<br>(dBm) | Max<br>Power<br>(dBm) |
|---------|--------------------|------------------------------|-------------------------------------|--------------------------------|-----------------------|
| Low 1   | 2412               | 1.57                         | 30.00                               | 36                             | 30.00                 |
| Mid 6   | 2437               | 1.57                         | 30.00                               | 36                             | 30.00                 |
| High 11 | 2462               | 1.57                         | 30.00                               | 36                             | 30.00                 |
| High 12 | 2467               | 1.57                         | 30.00                               | 36                             | 30.00                 |
| High 13 | 2472               | 1.57                         | 30.00                               | 36                             | 30.00                 |

|                           |      |                                                 |
|---------------------------|------|-------------------------------------------------|
| <b>Duty Cycle CF (dB)</b> | 0.00 | <b>Included in Calculations of Corr'd Power</b> |
|---------------------------|------|-------------------------------------------------|

**Results**

| Channel | Frequency<br>(MHz) | ANT 4<br>Meas<br>Power<br>(dBm) | ANT 3<br>Meas<br>Power<br>(dBm) | Total<br>Corr'd<br>Power<br>(dBm) | Power<br>Limit<br>(dBm) | Margin<br>(dB) |
|---------|--------------------|---------------------------------|---------------------------------|-----------------------------------|-------------------------|----------------|
| Low 1   | 2412               | 11.94                           | 11.94                           | 14.95                             | 30.00                   | -15.05         |
| Mid 6   | 2437               | 11.92                           | 11.87                           | 14.91                             | 30.00                   | -15.09         |
| High 11 | 2462               | 11.92                           | 11.91                           | 14.93                             | 30.00                   | -15.07         |
| High 12 | 2467               | 11.97                           | 11.94                           | 14.97                             | 30.00                   | -15.03         |
| High 13 | 2472               | -0.33                           | -0.67                           | 2.51                              | 30.00                   | -27.49         |

**ANT 4 + ANT 3 2TX MODE: 26-Tones, RU Index 4****Limits**

| Channel | Frequency<br>(MHz) | Directional<br>Gain<br>(dBi) | FCC/ISED<br>Power<br>Limit<br>(dBm) | ISED<br>EIRP<br>Limit<br>(dBm) | Max<br>Power<br>(dBm) |
|---------|--------------------|------------------------------|-------------------------------------|--------------------------------|-----------------------|
| Low 1   | 2412               | 1.57                         | 30.00                               | 36                             | 30.00                 |
| Mid 6   | 2437               | 1.57                         | 30.00                               | 36                             | 30.00                 |
| High 11 | 2462               | 1.57                         | 30.00                               | 36                             | 30.00                 |
| High 12 | 2467               | 1.57                         | 30.00                               | 36                             | 30.00                 |
| High 13 | 2472               | 1.57                         | 30.00                               | 36                             | 30.00                 |

|                           |      |                                                 |
|---------------------------|------|-------------------------------------------------|
| <b>Duty Cycle CF (dB)</b> | 0.00 | <b>Included in Calculations of Corr'd Power</b> |
|---------------------------|------|-------------------------------------------------|

**Results**

| Channel | Frequency<br>(MHz) | ANT 4<br>Meas<br>Power<br>(dBm) | ANT 3<br>Meas<br>Power<br>(dBm) | Total<br>Corr'd<br>Power<br>(dBm) | Power<br>Limit<br>(dBm) | Margin<br>(dB) |
|---------|--------------------|---------------------------------|---------------------------------|-----------------------------------|-------------------------|----------------|
| Low 1   | 2412               | 11.93                           | 11.95                           | 14.95                             | 30.00                   | -15.05         |
| Mid 6   | 2437               | 11.92                           | 11.90                           | 14.92                             | 30.00                   | -15.08         |
| High 11 | 2462               | 11.92                           | 11.97                           | 14.96                             | 30.00                   | -15.04         |
| High 12 | 2467               | 11.93                           | 11.95                           | 14.95                             | 30.00                   | -15.05         |
| High 13 | 2472               | -0.02                           | -0.12                           | 2.94                              | 30.00                   | -27.06         |

**ANT 4 + ANT 3 2TX MODE: 26-Tones, RU Index 8****Limits**

| Channel | Frequency<br>(MHz) | Directional<br>Gain<br>(dBi) | FCC/ISED<br>Power<br>Limit<br>(dBm) | ISED<br>EIRP<br>Limit<br>(dBm) | Max<br>Power<br>(dBm) |
|---------|--------------------|------------------------------|-------------------------------------|--------------------------------|-----------------------|
| Low 1   | 2412               | 1.57                         | 30.00                               | 36                             | 30.00                 |
| Mid 6   | 2437               | 1.57                         | 30.00                               | 36                             | 30.00                 |
| High 11 | 2462               | 1.57                         | 30.00                               | 36                             | 30.00                 |
| High 12 | 2467               | 1.57                         | 30.00                               | 36                             | 30.00                 |
| High 13 | 2472               | 1.57                         | 30.00                               | 36                             | 30.00                 |

|                           |      |                                                 |
|---------------------------|------|-------------------------------------------------|
| <b>Duty Cycle CF (dB)</b> | 0.00 | <b>Included in Calculations of Corr'd Power</b> |
|---------------------------|------|-------------------------------------------------|

**Results**

| Channel | Frequency<br>(MHz) | ANT 4<br>Meas<br>Power<br>(dBm) | ANT 3<br>Meas<br>Power<br>(dBm) | Total<br>Corr'd<br>Power<br>(dBm) | Power<br>Limit<br>(dBm) | Margin<br>(dB) |
|---------|--------------------|---------------------------------|---------------------------------|-----------------------------------|-------------------------|----------------|
| Low 1   | 2412               | 11.93                           | 11.91                           | 14.93                             | 30.00                   | -15.07         |
| Mid 6   | 2437               | 11.94                           | 11.90                           | 14.93                             | 30.00                   | -15.07         |
| High 11 | 2462               | 11.97                           | 11.97                           | 14.98                             | 30.00                   | -15.02         |
| High 12 | 2467               | 11.88                           | 11.97                           | 14.94                             | 30.00                   | -15.06         |
| High 13 | 2472               | -0.27                           | -0.54                           | 2.61                              | 30.00                   | -27.39         |

**ANT 4 + ANT 3 2TX MODE: SU Mode****Limits**

| Channel | Frequency<br>(MHz) | Directional<br>Gain<br>(dBi) | FCC/ISED<br>Power<br>Limit<br>(dBm) | ISED<br>EIRP<br>Limit<br>(dBm) | Max<br>Power<br>(dBm) |
|---------|--------------------|------------------------------|-------------------------------------|--------------------------------|-----------------------|
| Low 1   | 2412               | 1.57                         | 30.00                               | 36                             | 30.00                 |
| Low 2   | 2417               | 1.57                         | 30.00                               | 36                             | 30.00                 |
| Low 3   | 2422               | 1.57                         | 30.00                               | 36                             | 30.00                 |
| Low 4   | 2427               | 1.57                         | 30.00                               | 36                             | 30.00                 |
| Mid 6   | 2437               | 1.57                         | 30.00                               | 36                             | 30.00                 |
| High 8  | 2447               | 1.57                         | 30.00                               | 36                             | 30.00                 |
| High 9  | 2452               | 1.57                         | 30.00                               | 36                             | 30.00                 |
| High 10 | 2457               | 1.57                         | 30.00                               | 36                             | 30.00                 |
| High 11 | 2462               | 1.57                         | 30.00                               | 36                             | 30.00                 |
| High 12 | 2467               | 1.57                         | 30.00                               | 36                             | 30.00                 |
| High 13 | 2472               | 1.57                         | 30.00                               | 36                             | 30.00                 |

|                    |      |                                          |
|--------------------|------|------------------------------------------|
| Duty Cycle CF (dB) | 0.00 | Included in Calculations of Corr'd Power |
|--------------------|------|------------------------------------------|

**Results**

| Channel | Frequency<br>(MHz) | ANT 4<br>Meas<br>Power<br>(dBm) | ANT 3<br>Meas<br>Power<br>(dBm) | Total<br>Corr'd<br>Power<br>(dBm) | Power<br>Limit<br>(dBm) | Margin<br>(dB) |
|---------|--------------------|---------------------------------|---------------------------------|-----------------------------------|-------------------------|----------------|
| Low 1   | 2412               | 15.98                           | 15.92                           | 18.96                             | 30.00                   | -11.04         |
| Low 2   | 2417               | 16.82                           | 16.97                           | 19.91                             | 30.00                   | -10.09         |
| Low 3   | 2422               | 18.90                           | 18.91                           | 21.92                             | 30.00                   | -8.08          |
| Low 4   | 2427               | 21.40                           | 21.41                           | 24.42                             | 30.00                   | -5.58          |
| Mid 6   | 2437               | 21.47                           | 21.42                           | 24.46                             | 30.00                   | -5.54          |
| High 8  | 2447               | 21.47                           | 21.47                           | 24.48                             | 30.00                   | -5.52          |
| High 9  | 2452               | 18.47                           | 18.47                           | 21.48                             | 30.00                   | -8.52          |
| High 10 | 2457               | 16.91                           | 16.90                           | 19.92                             | 30.00                   | -10.08         |
| High 11 | 2462               | 15.92                           | 15.97                           | 18.96                             | 30.00                   | -11.04         |
| High 12 | 2467               | 13.91                           | 13.95                           | 16.94                             | 30.00                   | -13.06         |
| High 13 | 2472               | 8.45                            | 8.40                            | 11.44                             | 30.00                   | -18.56         |

## **9.5. POWER SPECTRAL DENSITY**

### **LIMITS**

FCC §15.247 (e)

RSS-247 (5.2) (b)

The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

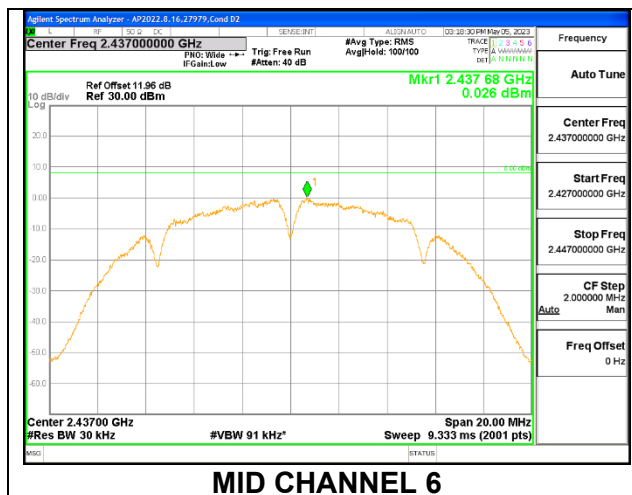
### **RESULTS**

Only Mid channel plot is reported to show setting parameter complies with testing method/procedure.

### 9.5.1. 802.11b MODE 1TX

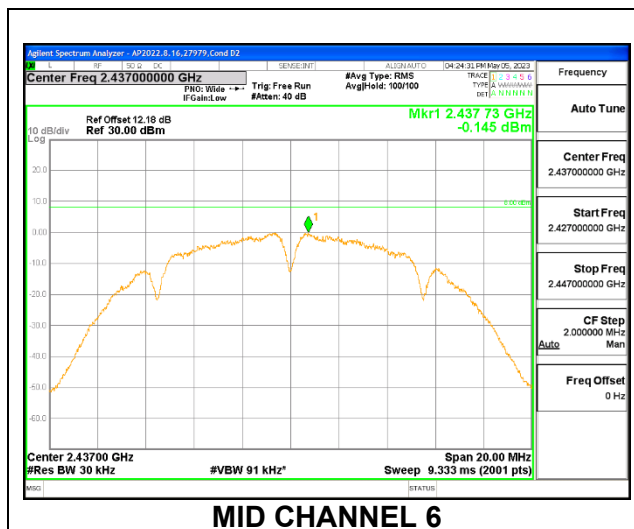
#### 1TX ANT 4 MODE

| Duty Cycle CF (dB) |                 | 0.00             | Included in Calculations of Corr'd PSD |                   |             |
|--------------------|-----------------|------------------|----------------------------------------|-------------------|-------------|
| Channel            | Frequency (MHz) | Meas (dBm/ 3kHz) | Total Corr'd PSD (dBm/ 3kHz)           | Limit (dBm/ 3kHz) | Margin (dB) |
| Low 1              | 2412            | -0.996           | -0.996                                 | 8.0               | -9.0        |
| Mid 6              | 2437            | 0.026            | 0.026                                  | 8.0               | -8.0        |
| High 11            | 2462            | 0.115            | 0.115                                  | 8.0               | -7.9        |
| High 12            | 2467            | -1.077           | -1.077                                 | 8.0               | -9.1        |
| High 13            | 2472            | -3.480           | -3.480                                 | 8.0               | -11.5       |



**1TX ANT 3 MODE**

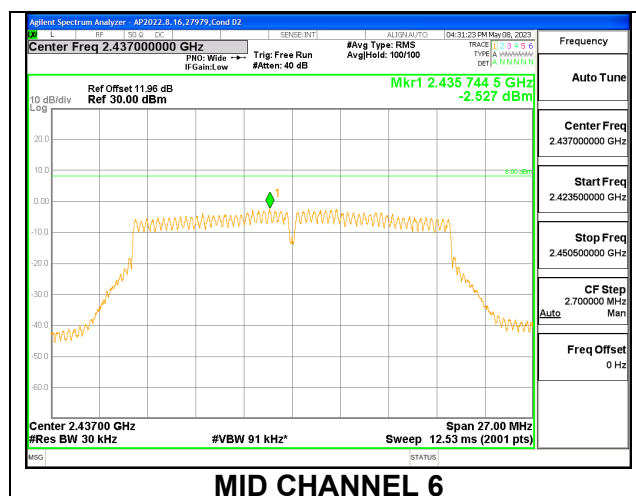
| Duty Cycle CF (dB) |                 | 0.00             | Included in Calculations of Corr'd PSD |                   |             |
|--------------------|-----------------|------------------|----------------------------------------|-------------------|-------------|
| Channel            | Frequency (MHz) | Meas (dBm/ 3kHz) | Total Corr'd PSD (dBm/ 3kHz)           | Limit (dBm/ 3kHz) | Margin (dB) |
| Low 1              | 2412            | -1.087           | -1.087                                 | 8.0               | -9.1        |
| Mid 6              | 2437            | -0.145           | -0.145                                 | 8.0               | -8.1        |
| High 11            | 2462            | -0.106           | -0.106                                 | 8.0               | -8.1        |
| High 12            | 2467            | -0.621           | -0.621                                 | 8.0               | -8.6        |
| High 13            | 2472            | -3.324           | -3.324                                 | 8.0               | -11.3       |



## 9.5.2. 802.11n HT20 MODE

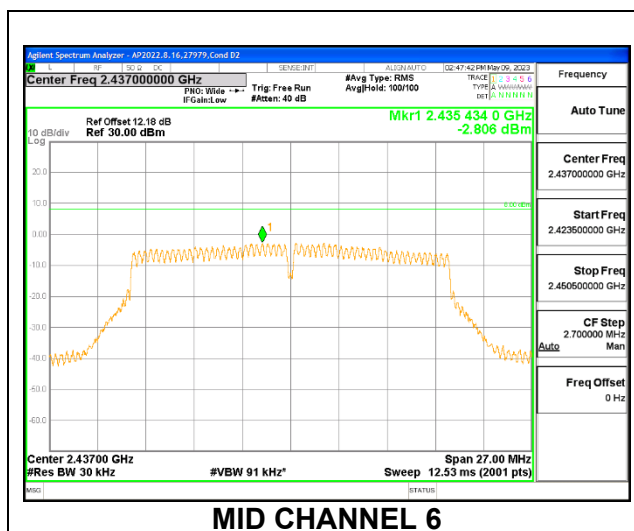
### 1TX ANT 4 MODE

| Duty Cycle CF (dB) |                 | 0.00             | Included in Calculations of Corr'd PSD |                   |             |
|--------------------|-----------------|------------------|----------------------------------------|-------------------|-------------|
| Channel            | Frequency (MHz) | Meas (dBm/ 3kHz) | Total Corr'd PSD (dBm/ 3kHz)           | Limit (dBm/ 3kHz) | Margin (dB) |
| Low 1              | 2412            | -6.749           | -6.749                                 | 8.0               | -14.7       |
| Low 2              | 2417            | -4.485           | -4.485                                 | 8.0               | -12.5       |
| Low 3              | 2422            | -2.490           | -2.490                                 | 8.0               | -10.5       |
| Mid 6              | 2437            | -2.527           | -2.527                                 | 8.0               | -10.5       |
| High 9             | 2452            | -2.473           | -2.473                                 | 8.0               | -10.5       |
| High 10            | 2457            | -4.439           | -4.439                                 | 8.0               | -12.4       |
| High 11            | 2462            | -5.700           | -5.700                                 | 8.0               | -13.7       |
| High 12            | 2467            | -7.951           | -7.951                                 | 8.0               | -16.0       |
| High 13            | 2472            | -9.933           | -9.933                                 | 8.0               | -17.9       |



**1TX ANT 3 MODE**

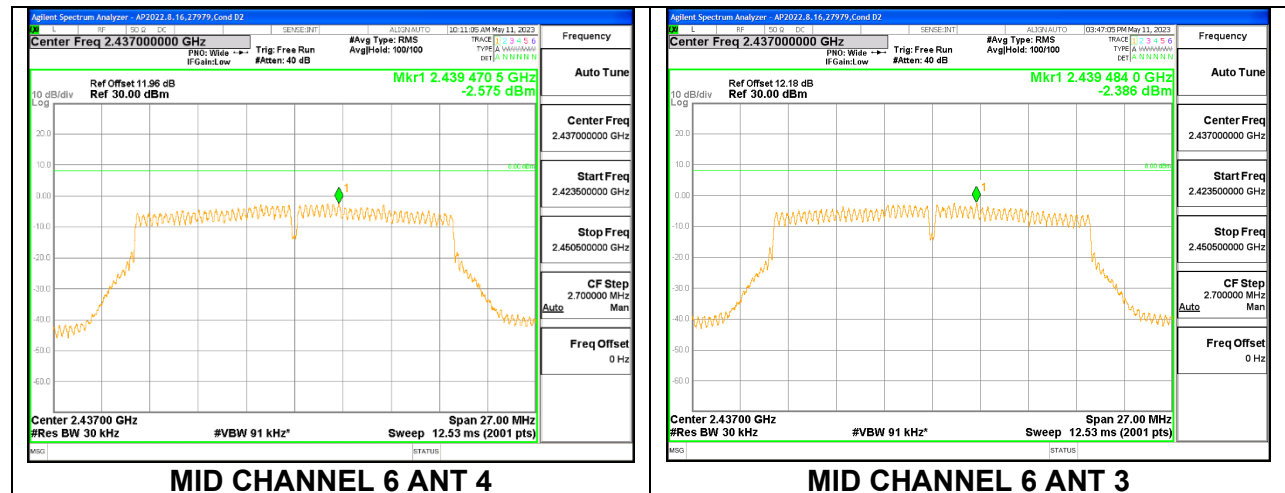
| Duty Cycle CF (dB) |                 | 0.00             | Included in Calculations of Corr'd PSD |                   |             |
|--------------------|-----------------|------------------|----------------------------------------|-------------------|-------------|
| Channel            | Frequency (MHz) | Meas (dBm/ 3kHz) | Total Corr'd PSD (dBm/ 3kHz)           | Limit (dBm/ 3kHz) | Margin (dB) |
| Low 1              | 2412            | -6.434           | -6.434                                 | 8.0               | -14.4       |
| Low 2              | 2417            | -4.777           | -4.777                                 | 8.0               | -12.8       |
| Low 3              | 2422            | -2.694           | -2.694                                 | 8.0               | -10.7       |
| Mid 6              | 2437            | -2.806           | -2.806                                 | 8.0               | -10.8       |
| High 9             | 2452            | -2.882           | -2.882                                 | 8.0               | -10.9       |
| High 10            | 2457            | -4.689           | -4.689                                 | 8.0               | -12.7       |
| High 11            | 2462            | -5.497           | -5.497                                 | 8.0               | -13.5       |
| High 12            | 2467            | -8.057           | -8.057                                 | 8.0               | -16.1       |
| High 13            | 2472            | -9.998           | -9.998                                 | 8.0               | -18.0       |



### 9.5.3. 802.11n HT20 CDD MODE 2TX

#### ANT 4 + ANT 3 2TX MODE

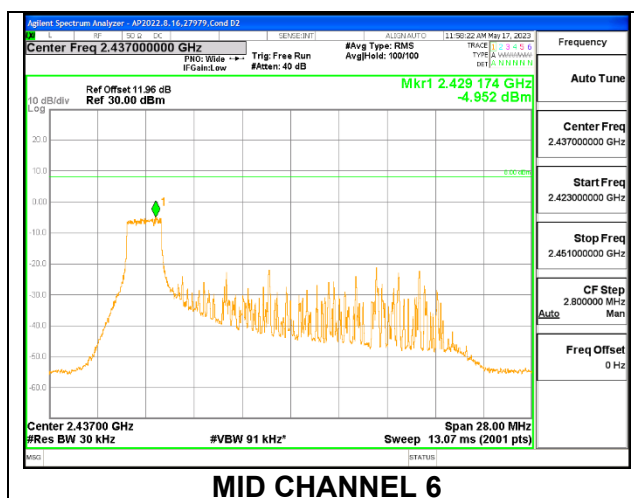
| Duty Cycle CF (dB) |                 | 0.00                  |                       | Included in Calculations of Corr'd PSD |                   |             |
|--------------------|-----------------|-----------------------|-----------------------|----------------------------------------|-------------------|-------------|
| Channel            | Frequency (MHz) | ANT4 Meas (dBm/ 3kHz) | ANT3 Meas (dBm/ 3kHz) | Total Corr'd PSD (dBm/ 3kHz)           | Limit (dBm/ 3kHz) | Margin (dB) |
| Low 1              | 2412            | -6.530                | -6.711                | -3.609                                 | 8.0               | -11.6       |
| Low 2              | 2417            | -5.714                | -5.659                | -2.676                                 | 8.0               | -10.7       |
| Low 3              | 2422            | -4.219                | -4.273                | -1.236                                 | 8.0               | -9.2        |
| Mid 6              | 2437            | -2.575                | -2.386                | 0.531                                  | 8.0               | -7.5        |
| High 9             | 2452            | -4.232                | -4.483                | -1.345                                 | 8.0               | -9.3        |
| High 10            | 2457            | -5.500                | -5.423                | -2.451                                 | 8.0               | -10.5       |
| High 11            | 2462            | -6.479                | -6.110                | -3.280                                 | 8.0               | -11.3       |
| High 12            | 2467            | -9.336                | -9.083                | -6.197                                 | 8.0               | -14.2       |
| High 13            | 2472            | -11.329               | -11.103               | -8.204                                 | 8.0               | -16.2       |



### 9.5.4. 802.11ax HE20 MODE

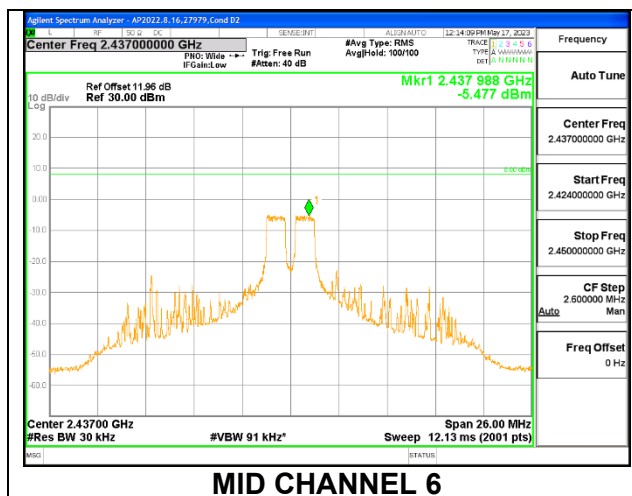
#### 1TX ANT 4 MODE , 26-Tone RU Index 0

| Duty Cycle CF (dB) |                 | 0.00             | Included in Calculations of Corr'd PSD |                   |             |
|--------------------|-----------------|------------------|----------------------------------------|-------------------|-------------|
| Channel            | Frequency (MHz) | Meas (dBm/ 3kHz) | Total Corr'd PSD (dBm/ 3kHz)           | Limit (dBm/ 3kHz) | Margin (dB) |
| Low 1              | 2412            | -4.754           | -4.754                                 | 8.0               | -12.8       |
| Mid 6              | 2437            | -4.952           | -4.952                                 | 8.0               | -13.0       |
| High 11            | 2462            | -4.980           | -4.980                                 | 8.0               | -13.0       |
| High 12            | 2467            | -5.036           | -5.036                                 | 8.0               | -13.0       |
| High 13            | 2472            | -15.830          | -15.830                                | 8.0               | -23.8       |



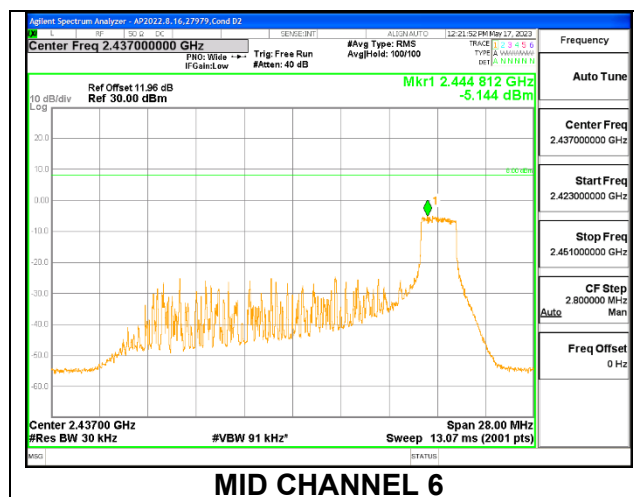
**1TX ANT 4 MODE , 26-Tone RU Index 4**

| Duty Cycle CF (dB) |                 | 0.00             | Included in Calculations of Corr'd PSD |                   |             |
|--------------------|-----------------|------------------|----------------------------------------|-------------------|-------------|
| Channel            | Frequency (MHz) | Meas (dBm/ 3kHz) | Total Corr'd PSD (dBm/ 3kHz)           | Limit (dBm/ 3kHz) | Margin (dB) |
| Low 1              | 2412            | -5.050           | -5.050                                 | 8.0               | -13.1       |
| Mid 6              | 2437            | -5.477           | -5.477                                 | 8.0               | -13.5       |
| High 11            | 2462            | -4.943           | -4.943                                 | 8.0               | -12.9       |
| High 12            | 2467            | -4.843           | -4.843                                 | 8.0               | -12.8       |
| High 13            | 2472            | -15.762          | -15.762                                | 8.0               | -23.8       |



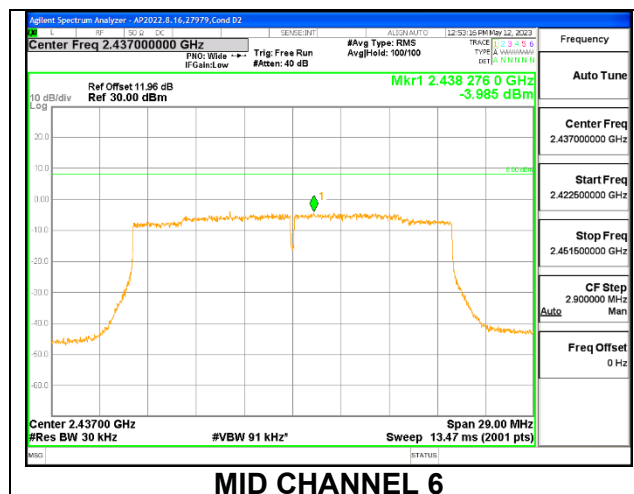
**1TX ANT 4 MODE , 26-Tone RU Index 8**

| Duty Cycle CF (dB) |                 | 0.00             | Included in Calculations of Corr'd PSD |                   |             |
|--------------------|-----------------|------------------|----------------------------------------|-------------------|-------------|
| Channel            | Frequency (MHz) | Meas (dBm/ 3kHz) | Total Corr'd PSD (dBm/ 3kHz)           | Limit (dBm/ 3kHz) | Margin (dB) |
| Low 1              | 2412            | -5.249           | -5.249                                 | 8.0               | -13.2       |
| Mid 6              | 2437            | -5.144           | -5.144                                 | 8.0               | -13.1       |
| High 11            | 2462            | -4.975           | -4.975                                 | 8.0               | -13.0       |
| High 12            | 2467            | -4.953           | -4.953                                 | 8.0               | -13.0       |
| High 13            | 2472            | -15.562          | -15.562                                | 8.0               | -23.6       |



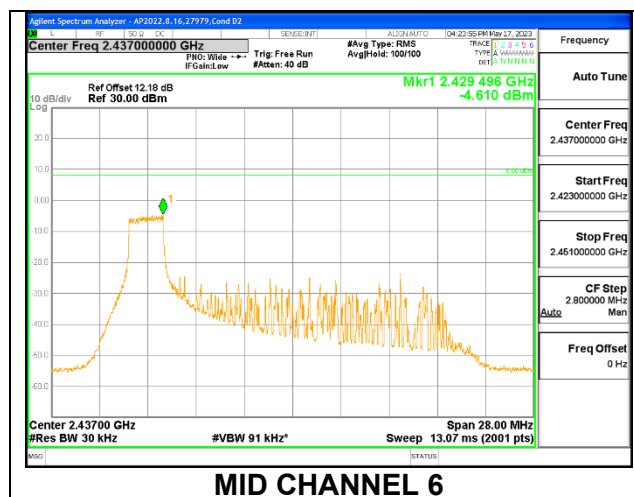
**1TX ANT 4 MODE , SU MODE**

| Duty Cycle CF (dB) |                 | 0.00             | Included in Calculations of Corr'd PSD |                   |             |
|--------------------|-----------------|------------------|----------------------------------------|-------------------|-------------|
| Channel            | Frequency (MHz) | Meas (dBm/ 3kHz) | Total Corr'd PSD (dBm/ 3kHz)           | Limit (dBm/ 3kHz) | Margin (dB) |
| Low 1              | 2412            | -8.707           | -8.707                                 | 8.0               | -16.7       |
| Low 2              | 2417            | -7.747           | -7.747                                 | 8.0               | -15.7       |
| Low 3              | 2422            | -4.041           | -4.041                                 | 8.0               | -12.0       |
| Mid 6              | 2437            | -3.985           | -3.985                                 | 8.0               | -12.0       |
| High 9             | 2452            | -3.807           | -3.807                                 | 8.0               | -11.8       |
| High 10            | 2457            | -7.349           | -7.349                                 | 8.0               | -15.3       |
| High 11            | 2462            | -8.773           | -8.773                                 | 8.0               | -16.8       |
| High 12            | 2467            | -10.771          | -10.771                                | 8.0               | -18.8       |
| High 13            | 2472            | -16.898          | -16.898                                | 8.0               | -24.9       |



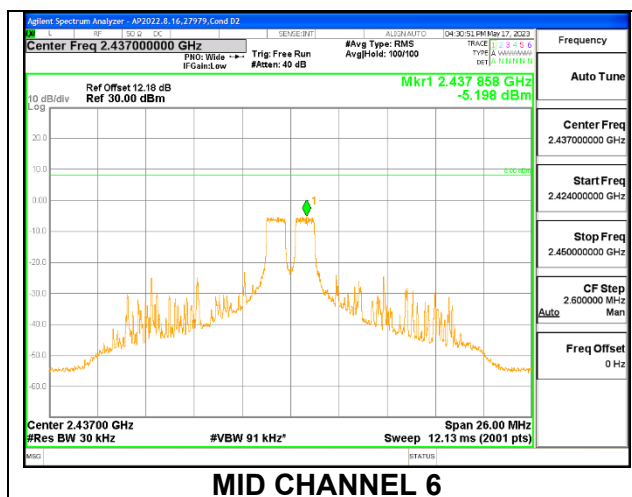
**1TX ANT 3 MODE , 26-Tone RU Index 0**

| Duty Cycle CF (dB) |                 | 0.00             | Included in Calculations of Corr'd PSD |                   |             |
|--------------------|-----------------|------------------|----------------------------------------|-------------------|-------------|
| Channel            | Frequency (MHz) | Meas (dBm/ 3kHz) | Total Corr'd PSD (dBm/ 3kHz)           | Limit (dBm/ 3kHz) | Margin (dB) |
| Low 1              | 2412            | -4.830           | -4.830                                 | 8.0               | -12.8       |
| Mid 6              | 2437            | -4.610           | -4.610                                 | 8.0               | -12.6       |
| High 11            | 2462            | -5.034           | -5.034                                 | 8.0               | -13.0       |
| High 12            | 2467            | -5.020           | -5.020                                 | 8.0               | -13.0       |
| High 13            | 2472            | -16.069          | -16.069                                | 8.0               | -24.1       |



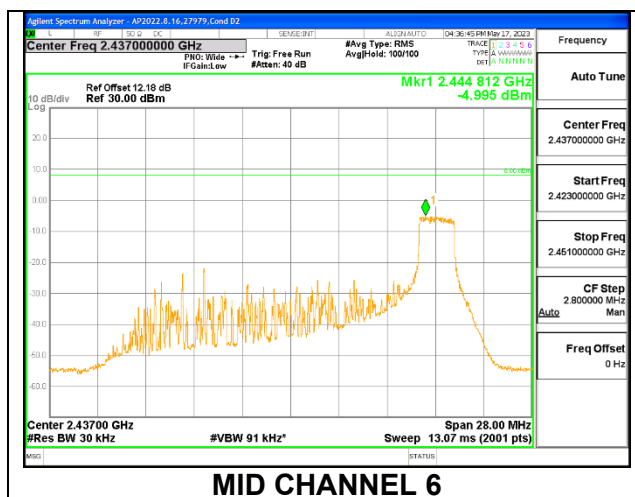
**1TX ANT 3 MODE , 26-Tone RU Index 4**

| Duty Cycle CF (dB) |                 | 0.00             | Included in Calculations of Corr'd PSD |                   |             |
|--------------------|-----------------|------------------|----------------------------------------|-------------------|-------------|
| Channel            | Frequency (MHz) | Meas (dBm/ 3kHz) | Total Corr'd PSD (dBm/ 3kHz)           | Limit (dBm/ 3kHz) | Margin (dB) |
| Low 1              | 2412            | -5.309           | -5.309                                 | 8.0               | -13.3       |
| Mid 6              | 2437            | -5.198           | -5.198                                 | 8.0               | -13.2       |
| High 11            | 2462            | -4.990           | -4.990                                 | 8.0               | -13.0       |
| High 12            | 2467            | -4.990           | -4.990                                 | 8.0               | -13.0       |
| High 13            | 2472            | -16.250          | -16.250                                | 8.0               | -24.3       |



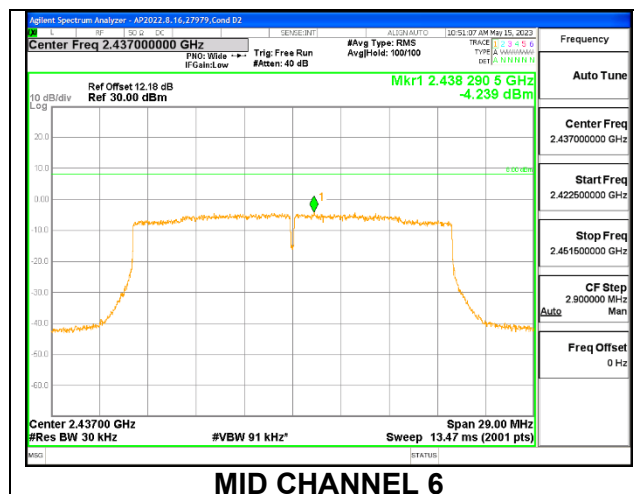
**1TX ANT 3 MODE , 26-Tone RU Index 8**

| Duty Cycle CF (dB) |                 | 0.00             | Included in Calculations of Corr'd PSD |                   |             |
|--------------------|-----------------|------------------|----------------------------------------|-------------------|-------------|
| Channel            | Frequency (MHz) | Meas (dBm/ 3kHz) | Total Corr'd PSD (dBm/ 3kHz)           | Limit (dBm/ 3kHz) | Margin (dB) |
| Low 1              | 2412            | -4.990           | -4.990                                 | 8.0               | -13.0       |
| Mid 6              | 2437            | -4.995           | -4.995                                 | 8.0               | -13.0       |
| High 11            | 2462            | -4.758           | -4.758                                 | 8.0               | -12.8       |
| High 12            | 2467            | -5.009           | -5.009                                 | 8.0               | -13.0       |
| High 13            | 2472            | -16.579          | -16.579                                | 8.0               | -24.6       |



**1TX ANT 3 MODE , SU Mode**

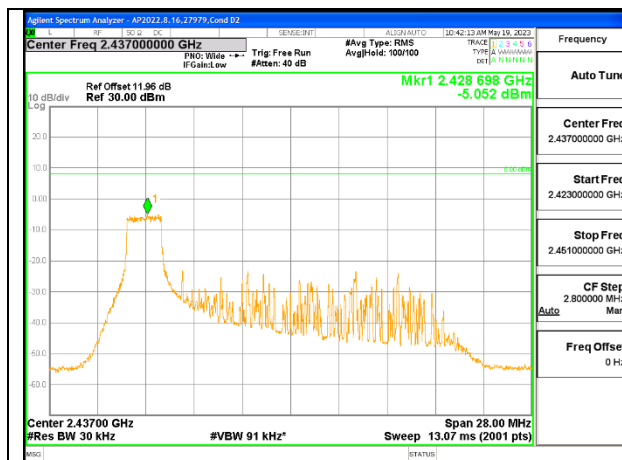
| Duty Cycle CF (dB) |                 | 0.00             | Included in Calculations of Corr'd PSD |                   |             |
|--------------------|-----------------|------------------|----------------------------------------|-------------------|-------------|
| Channel            | Frequency (MHz) | Meas (dBm/ 3kHz) | Total Corr'd PSD (dBm/ 3kHz)           | Limit (dBm/ 3kHz) | Margin (dB) |
| Low 1              | 2412            | -8.866           | -8.866                                 | 8.0               | -16.9       |
| Low 2              | 2417            | -7.932           | -7.932                                 | 8.0               | -15.9       |
| Low 3              | 2422            | -4.017           | -4.017                                 | 8.0               | -12.0       |
| Mid 6              | 2437            | -4.239           | -4.239                                 | 8.0               | -12.2       |
| High 9             | 2452            | -4.167           | -4.167                                 | 8.0               | -12.2       |
| High 10            | 2457            | -7.619           | -7.619                                 | 8.0               | -15.6       |
| High 11            | 2462            | -8.615           | -8.615                                 | 8.0               | -16.6       |
| High 12            | 2467            | -10.776          | -10.776                                | 8.0               | -18.8       |
| High 13            | 2472            | -16.848          | -16.848                                | 8.0               | -24.8       |



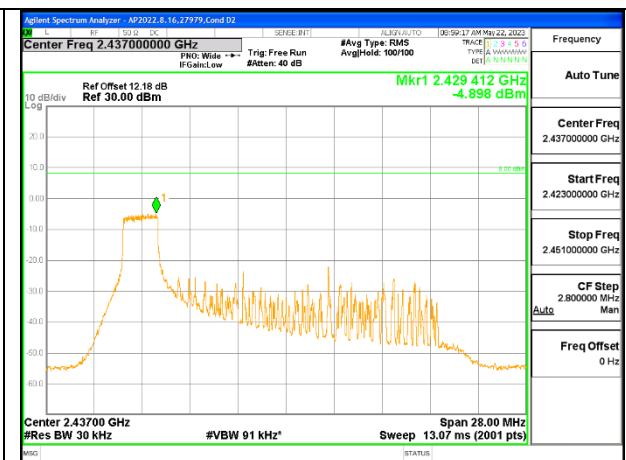
### 9.5.5. 802.11ax HE20 OFDMA MODE 2TX

#### ANT 4 + ANT 3 2TX MODE: 26-Tones, RU Index 0

| Duty Cycle CF (dB) |                 | 0.00                   | Included in Calculations of Corr'd PSD |                              |                   |             |
|--------------------|-----------------|------------------------|----------------------------------------|------------------------------|-------------------|-------------|
| Channel            | Frequency (MHz) | ANT 4 Meas (dBm/ 3kHz) | ANT 3 Meas (dBm/ 3kHz)                 | Total Corr'd PSD (dBm/ 3kHz) | Limit (dBm/ 3kHz) | Margin (dB) |
| Low 1              | 2412            | -5.005                 | -4.801                                 | -1.892                       | 8.0               | -9.9        |
| Mid 6              | 2437            | -5.052                 | -4.898                                 | -1.964                       | 8.0               | -10.0       |
| High 11            | 2462            | -5.081                 | -4.988                                 | -2.024                       | 8.0               | -10.0       |
| High 12            | 2467            | -5.082                 | -5.014                                 | -2.038                       | 8.0               | -10.0       |
| High 13            | 2472            | -16.173                | -16.647                                | -13.393                      | 8.0               | -21.4       |



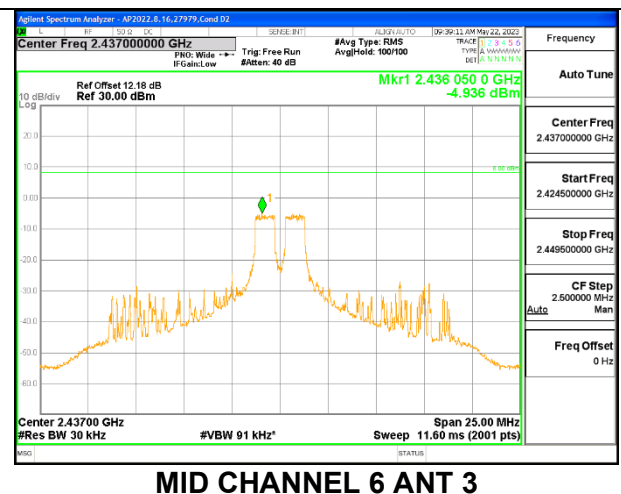
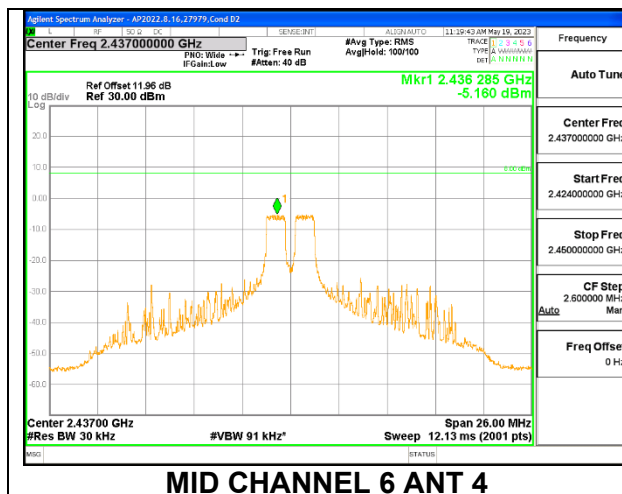
MID CHANNEL 6 ANT 4



MID CHANNEL 6 ANT 3

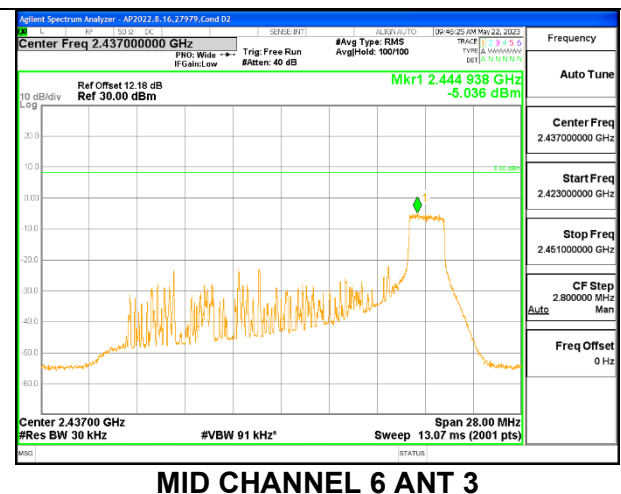
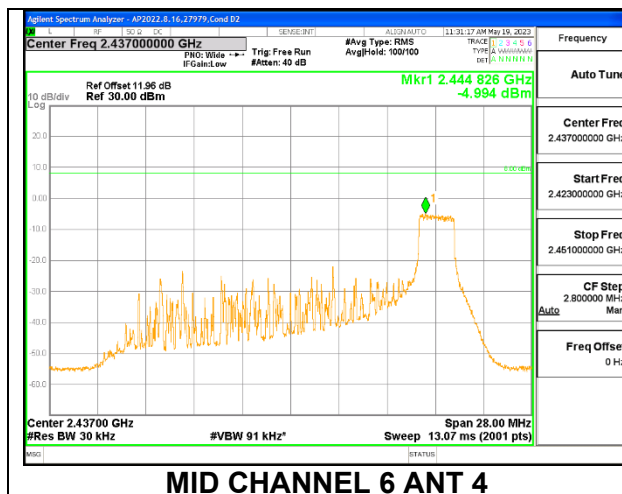
**ANT 4 + ANT 3 2TX MODE: 26-Tones, RU Index 4**

| Duty Cycle CF (dB) |                 | 0.00                   | Included in Calculations of Corr'd PSD |                              |                   |             |
|--------------------|-----------------|------------------------|----------------------------------------|------------------------------|-------------------|-------------|
| Channel            | Frequency (MHz) | ANT 4 Meas (dBm/ 3kHz) | ANT 3 Meas (dBm/ 3kHz)                 | Total Corr'd PSD (dBm/ 3kHz) | Limit (dBm/ 3kHz) | Margin (dB) |
| Low 1              | 2412            | -5.043                 | -4.948                                 | -1.985                       | 8.0               | -10.0       |
| Mid 6              | 2437            | -5.160                 | -4.936                                 | -2.036                       | 8.0               | -10.0       |
| High 11            | 2462            | -5.153                 | -5.290                                 | -2.211                       | 8.0               | -10.2       |
| High 12            | 2467            | -4.890                 | -4.838                                 | -1.854                       | 8.0               | -9.9        |
| High 13            | 2472            | -15.741                | -15.788                                | -12.754                      | 8.0               | -20.8       |



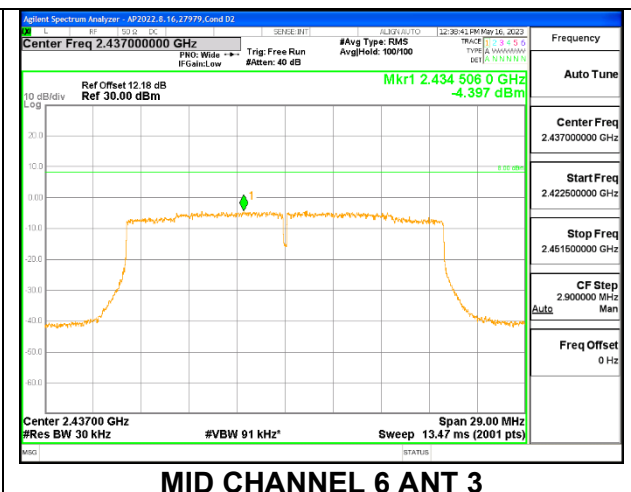
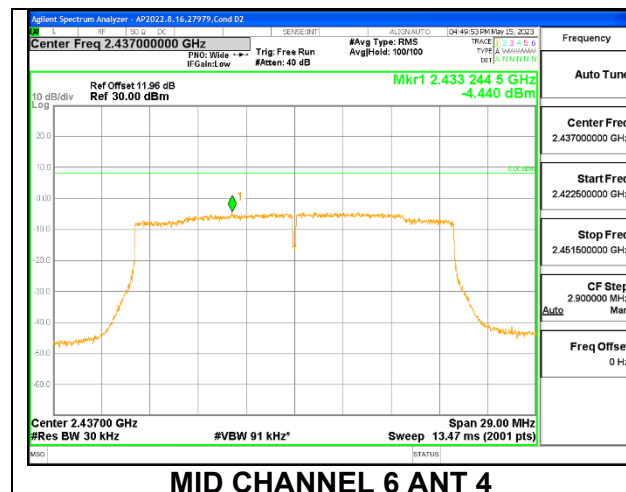
**ANT 4 + ANT 3 2TX MODE: 26-Tones, RU Index 8**

| Duty Cycle CF (dB) |                 | 0.00                   | Included in Calculations of Corr'd PSD |                              |                   |             |
|--------------------|-----------------|------------------------|----------------------------------------|------------------------------|-------------------|-------------|
| Channel            | Frequency (MHz) | ANT 4 Meas (dBm/ 3kHz) | ANT 3 Meas (dBm/ 3kHz)                 | Total Corr'd PSD (dBm/ 3kHz) | Limit (dBm/ 3kHz) | Margin (dB) |
| Low 1              | 2412            | -5.071                 | -4.848                                 | -1.948                       | 8.0               | -9.9        |
| Mid 6              | 2437            | -4.994                 | -5.036                                 | -2.005                       | 8.0               | -10.0       |
| High 11            | 2462            | -5.170                 | -5.028                                 | -2.088                       | 8.0               | -10.1       |
| High 12            | 2467            | -4.926                 | -5.005                                 | -1.955                       | 8.0               | -10.0       |
| High 13            | 2472            | -15.958                | -16.270                                | -13.101                      | 8.0               | -21.1       |



**ANT 4 + ANT 3 2TX MODE: SU MODE**

| Duty Cycle CF (dB) |                 | 0.00                   |                        | Included in Calculations of Corr'd PSD |                   |             |
|--------------------|-----------------|------------------------|------------------------|----------------------------------------|-------------------|-------------|
| Channel            | Frequency (MHz) | ANT 4 Meas (dBm/ 3kHz) | ANT 3 Meas (dBm/ 3kHz) | Total Corr'd PSD (dBm/ 3kHz)           | Limit (dBm/ 3kHz) | Margin (dB) |
| Low 1              | 2412            | -9.567                 | -9.648                 | -6.597                                 | 8.0               | -14.6       |
| Low 2              | 2417            | -8.585                 | -8.681                 | -5.622                                 | 8.0               | -13.6       |
| Low 3              | 2422            | -6.794                 | -6.785                 | -3.779                                 | 8.0               | -11.8       |
| Mid 6              | 2437            | -4.440                 | -4.397                 | -1.408                                 | 8.0               | -9.4        |
| High 9             | 2452            | -7.146                 | -7.116                 | -4.121                                 | 8.0               | -12.1       |
| High 10            | 2457            | -8.564                 | -8.515                 | -5.529                                 | 8.0               | -13.5       |
| High 11            | 2462            | -9.379                 | -9.835                 | -6.591                                 | 8.0               | -14.6       |
| High 12            | 2467            | -11.828                | -11.789                | -8.798                                 | 8.0               | -16.8       |
| High 13            | 2472            | -17.542                | -17.407                | -14.464                                | 8.0               | -22.5       |



## **9.6. CONDUCTED SPURIOUS EMISSIONS**

### **LIMITS**

FCC §15.247 (d)

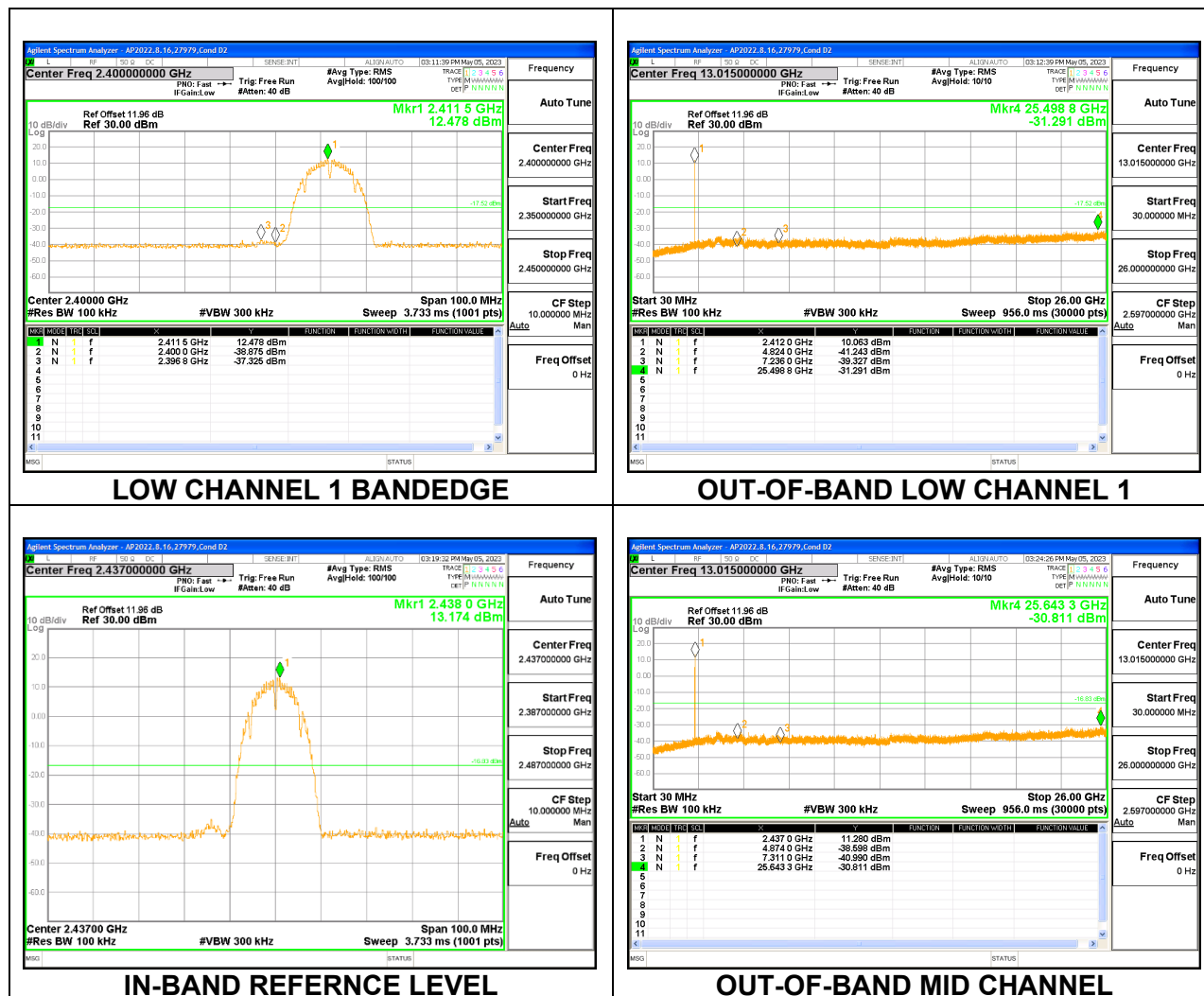
RSS-247 5.5

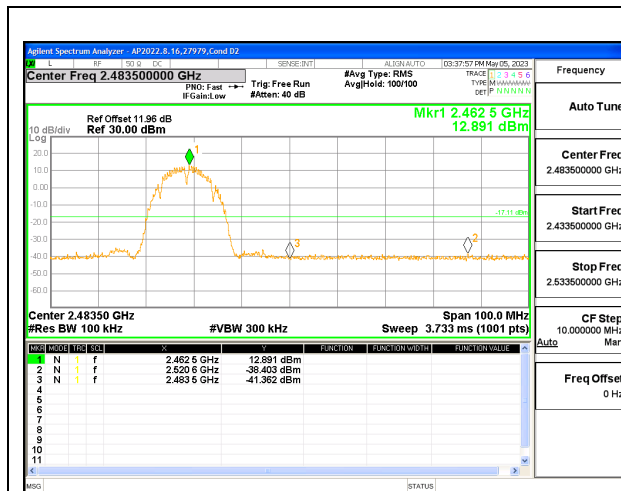
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

### **RESULTS**

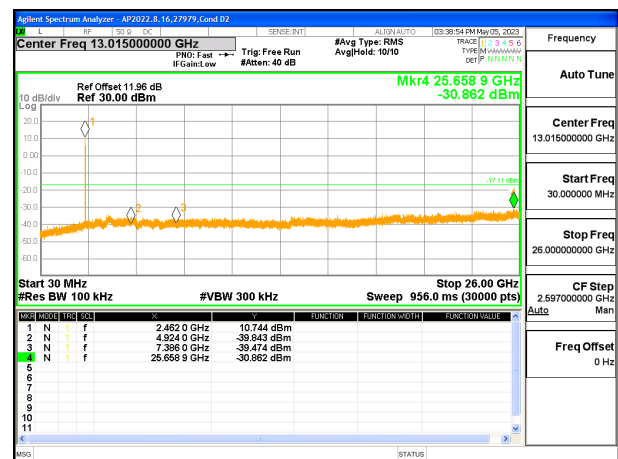
## 9.6.1. 802.11b MODE 1TX

### 1TX ANT 4 MODE

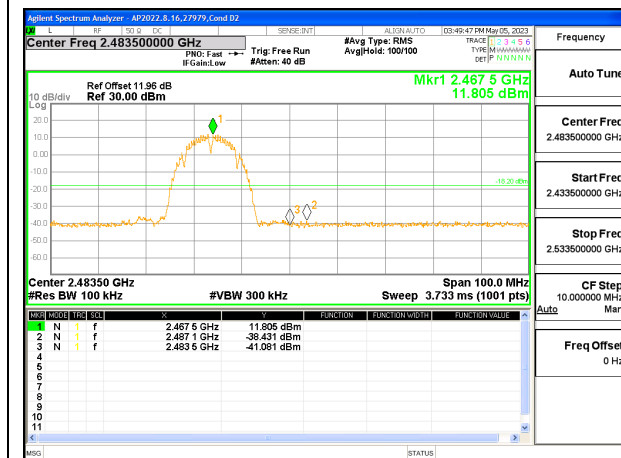




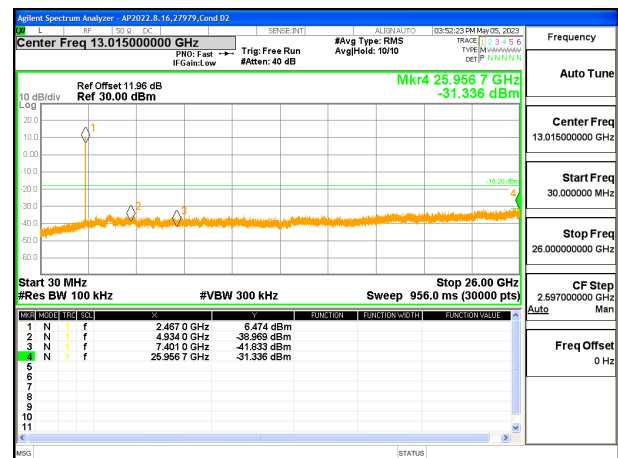
HIGH CHANNEL 11 BANDEDGE



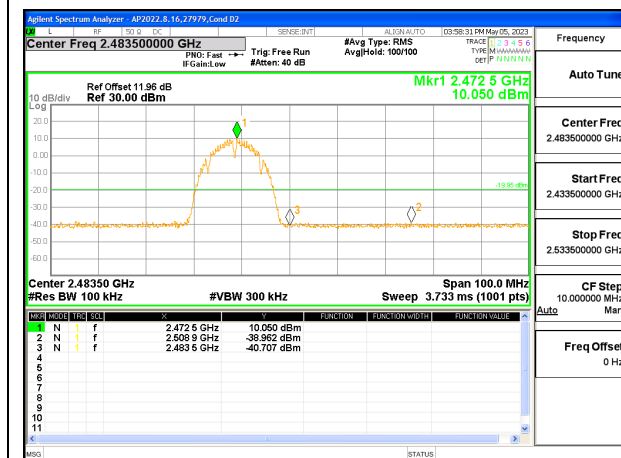
OUT-OF-BAND HIGH CHANNEL 11



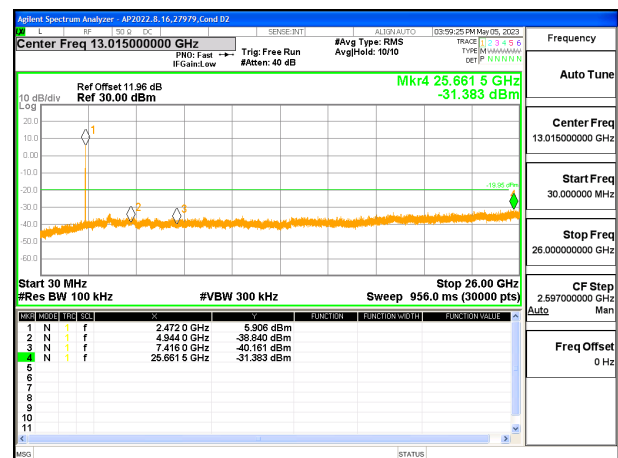
HIGH CHANNEL 12 BANDEDGE



OUT-OF-BAND HIGH CHANNEL 12



HIGH CHANNEL 13 BANDEDGE



OUT-OF-BAND HIGH CHANNEL 13

**1TX ANT 3 MODE**