

# FCC and ISED Test Report

Apple Inc  
Model: A2780

In accordance with FCC 47 CFR Part 15C, ISED  
RSS-247 and ISED RSS-GEN  
(2.4 GHz WLAN)

Prepared for: Apple Inc  
One Apple Park Way  
Cupertino, California  
95014, USA

FCC ID: BCGA2780

IC: 579C-A2780

## COMMERCIAL-IN-CONFIDENCE

Document 75955429-14 Issue 01



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### SIGNATURE

| NAME      | JOB TITLE                       | RESPONSIBLE FOR      | ISSUE DATE       |
|-----------|---------------------------------|----------------------|------------------|
| S Bennett | Head Of New Service Development | Authorised Signatory | 17 November 2022 |

Signatures in this approval box have checked this document in line with the requirements of TUV SUD document control rules.

### ENGINEERING STATEMENT

The measurements shown in this report were made in accordance with the procedures described on test pages. All reported testing was carried out on a sample equipment to demonstrate limited compliance with FCC 47 CFR Part 15C, ISED RSS-247 and ISED RSS-GEN. The sample tested was found to comply with the requirements defined in the applied rules.

| RESPONSIBLE FOR   | NAME            | DATE             | SIGNATURE |
|-------------------|-----------------|------------------|-----------|
| Report Generation | Hollie Marshall | 17 November 2022 |           |

FCC Accreditation  
90987 Octagon House, Fareham Test Laboratory

ISED Accreditation  
12669A Octagon House, Fareham Test Laboratory

### EXECUTIVE SUMMARY

A sample of this product was tested and found to be compliant with FCC 47 CFR Part 15C: 2020, ISED RSS-247: Issue 2 (02-2017) and ISED RSS-GEN: Issue 5 (04-2018) + A2 (02-2021) for the tests detailed in section 1.3.



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# 1 Report Summary

## 1.1 Report Modification Record

Alterations and additions to this report will be issued to the holders of each copy in the form of a complete document.

| Issue | Description of Change | Date of Issue    |
|-------|-----------------------|------------------|
| 1     | First Issue           | 17 November 2022 |

**Table 1**

## 1.2 Introduction

|                               |                                                                                                                   |
|-------------------------------|-------------------------------------------------------------------------------------------------------------------|
| Applicant                     | Apple Inc                                                                                                         |
| Manufacturer                  | Apple Inc                                                                                                         |
| Model Number(s)               | A2780                                                                                                             |
| Serial Number(s)              | FWC3JLYYHC and NW3J007K67                                                                                         |
| Hardware Version(s)           | REV 1.0                                                                                                           |
| Software Version(s)           | 22A42770m and 22A31991j                                                                                           |
| Number of Samples Tested      | 2                                                                                                                 |
| Test Specification/Issue/Date | FCC 47 CFR Part 15C: 2020<br>ISED RSS-247: Issue 2 (02-2017)<br>ISED RSS-GEN: Issue 5 (04-2018) + A2 (02-2021)    |
| Order Number                  | 0540246998                                                                                                        |
| Start of Test                 | 12-July-2022                                                                                                      |
| Finish of Test                | 20-October-2022                                                                                                   |
| Name of Engineer(s)           | Elliot Callender, Taha Shafique, Nicolae Mihailiuc, Danial Shafique, Ioan-Alexandru Bogatu and Thomas Biddlecombe |
| Related Document(s)           | KDB 662911 D01 v02r01<br>ANSI C63.10 (2013)<br>ANSI C63.10 (2020)                                                 |



### 1.3 Brief Summary of Results

A brief summary of the tests carried out in accordance with FCC 47 CFR Part 15C, ISSED RSS-247 and ISSED RSS-GEN is shown below.

| Section                              | Specification Clause  |             |              | Test Description               | Result | Comments/Base Standard                                                                                      |
|--------------------------------------|-----------------------|-------------|--------------|--------------------------------|--------|-------------------------------------------------------------------------------------------------------------|
|                                      | FCC Part 15C          | RSS-247     | RSS-GEN      |                                |        |                                                                                                             |
| Configuration and Mode: 2.4 GHz WLAN |                       |             |              |                                |        |                                                                                                             |
| -                                    | 15.203                | -           | -            | Antenna Requirement            | N/T    | The device complies with the provisions of this section, as it uses permanently attached integral antennas. |
| 2.1                                  | 15.205                | 3.1         | 8.10         | Restricted Band Edges          | Pass   |                                                                                                             |
| 2.2                                  | 15.247 (a)(2)         | 5.2         | 6.7          | Emission Bandwidth             | Pass   |                                                                                                             |
| 2.3                                  | 15.247 (b)            | 5.4         | 6.12         | Maximum Conducted Output Power | Pass   |                                                                                                             |
| 2.4                                  | 15.209 and 15.247 (d) | 3.3 and 5.5 | 6.13 and 8.9 | Spurious Radiated Emissions    | Pass   |                                                                                                             |
| 2.5                                  | 15.247 (d)            | 5.5         | -            | Authorised Band Edges          | Pass   |                                                                                                             |
| 2.6                                  | 15.247 (e)            | 5.2         | 6.12         | Power Spectral Density         | Pass   |                                                                                                             |

**Table 2**



## 1.4 Product Information

### 1.4.1 Technical Description

The equipment under test was an Apple laptop computer with Bluetooth® and IEEE 802.11 a/b/g/n/ac/ax Wi-Fi capabilities in the 2.4GHz, 5GHz and 6GHz bands.

### 1.4.2 Test Modes

The EUT's 2.4 GHz 802.11 radio supports Single Input/Single Output (SISO) and 2x2 MIMO (Multiple Input/Multiple Output). It supports 802.11b and g for SISO and 802.11n and ax at 20 MHz channel bandwidths for SISO and MIMO. 802.11ax supports RU 26/52/106/242.

The EUT uses different output powers per core dependent on how many cores are used. It uses the same conducted power across all cores in any given mode, but due to the different antenna gains the radiated powers per core differs.

After preliminary investigations were performed, the EUT was therefore tested in the following worst-case modes:

SISO Modes (Core 1):

- 802.11b 1 Mbps
- 802.11g 12 Mbps
- 802.11n HT20 MCS2
- 802.11ax HE20 MCS2x1 SU, RU26/52/106\*

2x2 MIMO Modes (Core 0 + Core 1):

- 802.11n HT20 MCS2 – CDD
- 802.11ax HE20 MCS2x1 CDD SU, RU26/52/106\*

\*Note: The RU offset for bottom and middle channels were placed in the lowest position and on the top channel, the offset was placed in the upper most position.

### 1.4.3 Test Set-up

For conducted tests the EUT antennas were disconnected and replaced with U.FL to SMA test cables to enable conducted testing on each core. The loss of these test cables were known and compensated for in any conducted measurements.

For all tests, the EUT was put into a continuous transmit test mode with the chipset manufacturer's test commands via a script running in the EUTs terminal application. The EUT then transmitted the required type of packeted 802.11 data frames of fixed length, containing the standard headers and with pseudo-random data content, ensuring the measured signals were representative and contained all the symbols at the highest power control level.

All testing was performed with the EUT powered via a 120 V AC, 60 Hz source.

### 1.4.4 Antenna Gain Table

| Antenna Port | Frequency Range (MHz) | Peak Gain (dBi) | Conducted Cable Loss (dB) |
|--------------|-----------------------|-----------------|---------------------------|
| Core 0       | 2400 to 2480          | 4.60            | 0.70                      |
| Core 1       | 2400 to 2480          | 6.13            | 0.70                      |

Table 3



### 1.5 Deviations from the Standard

No deviations from the applicable test standard were made during testing.

### 1.6 EUT Modification Record

The table below details modifications made to the EUT during the test programme.

The modifications incorporated during each test are recorded on the appropriate test pages.

| Modification State                      | Description of Modification still fitted to EUT | Modification Fitted By | Date Modification Fitted |
|-----------------------------------------|-------------------------------------------------|------------------------|--------------------------|
| Model: A2780, Serial Number: NW3J007K67 |                                                 |                        |                          |
| 0                                       | As supplied by the customer                     | Not Applicable         | Not Applicable           |
| Model: A2780, Serial Number: FWC3JLYYHC |                                                 |                        |                          |
| 0                                       | As supplied by the customer                     | Not Applicable         | Not Applicable           |

**Table 4**



## 1.7 Test Location

TÜV SÜD conducted the following tests at our Octagon House Test Laboratory.

| Test Name                            | Name of Engineer(s)                                                    | Accreditation |
|--------------------------------------|------------------------------------------------------------------------|---------------|
| Configuration and Mode: 2.4 GHz WLAN |                                                                        |               |
| Restricted Band Edges                | Elliot Callender, Taha Shafique, Nicolae Mihailiuc and Danial Shafique | UKAS          |
| Emission Bandwidth                   | Thomas Biddlecombe                                                     | UKAS          |
| Maximum Conducted Output Power       | Thomas Biddlecombe                                                     | UKAS          |
| Authorised Band Edges                | Elliot Callender, Taha Shafique, Nicolae Mihailiuc and Danial Shafique | UKAS          |
| Power Spectral Density               | Thomas Biddlecombe                                                     | UKAS          |

**Table 5**

Office Address:

TÜV SÜD  
Octagon House  
Concorde Way  
Fareham  
Hampshire  
PO15 5RL  
United Kingdom

TÜV SÜD conducted the following tests at our Concorde Park Test Laboratory.

| Test Name                            | Name of Engineer(s)                         | Accreditation |
|--------------------------------------|---------------------------------------------|---------------|
| Configuration and Mode: 2.4 GHz WLAN |                                             |               |
| Spurious Radiated Emissions          | Ioan-Alexandru Bogatu and Nicolae Mihailiuc | UKAS          |

**Table 6**

Office Address:

TÜV SÜD  
Concorde Park  
Concorde Way  
Fareham  
Hampshire  
PO15 5FG  
United Kingdom



## 2 Test Details

### 2.1 Restricted Band Edges

#### 2.1.1 Specification Reference

FCC 47 CFR Part 15C, Clause 15.205  
ISED RSS-247, Clause 3.1  
ISED RSS-GEN, Clause 8.10

#### 2.1.2 Equipment Under Test and Modification State

A2780, S/N: FWC3JLYYHC - Modification State 0

#### 2.1.3 Date of Test

12-July-2022 to 23-July-2022

#### 2.1.4 Test Method

This test was performed in accordance with ANSI C63.10, clause 6.10.5 and 11.12.1.

Plots for average measurements were taken in accordance with ANSI C63.10, clause 11.12.2.5.2.

The following conversion can be applied to convert from dB $\mu$ V/m to  $\mu$ V/m:  
 $10^{(\text{Field Strength in dB}\mu\text{V/m}/20)}$ .

#### 2.1.5 Environmental Conditions

|                     |                |
|---------------------|----------------|
| Ambient Temperature | 20.0 - 24.5 °C |
| Relative Humidity   | 41.2 - 64.8 %  |



## 2.1.6 Test Results

### 2.4 GHz WLAN

#### SISO

| Mode                  | Data Rate /MCS | Resource Size | Resource Index | TX Frequency (MHz) | Band Edge Frequency (MHz) | Peak Level (dBμV/m) | Average Level (dBμV/m) |
|-----------------------|----------------|---------------|----------------|--------------------|---------------------------|---------------------|------------------------|
| 802.11b, Core 1       | 1 Mbps         | -             | -              | 2412               | 2390.0                    | 59.14               | 51.22                  |
| 802.11b, Core 1       | 1 Mbps         | -             | -              | 2462               | 2483.5                    | 58.52               | 50.11                  |
| 802.11b, Core 1       | 1 Mbps         | -             | -              | 2467               | 2483.5                    | 59.58               | 51.02                  |
| 802.11b, Core 1       | 1 Mbps         | -             | -              | 2472               | 2483.5                    | 58.75               | 51.39                  |
| 802.11g, Core 1       | 24 Mbps        | -             | -              | 2412               | 2390.0                    | 66.31               | 51.21                  |
| 802.11g, Core 1       | 24 Mbps        | -             | -              | 2462               | 2483.5                    | 67.38               | 51.38                  |
| 802.11g, Core 1       | 54 Mbps        | -             | -              | 2467               | 2483.5                    | 67.91               | 51.35                  |
| 802.11g, Core 1       | 24 Mbps        | -             | -              | 2472               | 2483.5                    | 65.81               | 51.36                  |
| 802.11n HT20, Core 1  | MCS4           | -             | -              | 2412               | 2390.0                    | 67.22               | 51.06                  |
| 802.11n HT20, Core 1  | MCS4           | -             | -              | 2462               | 2483.5                    | 67.42               | 51.17                  |
| 802.11n HT20, Core 1  | MCS7           | -             | -              | 2467               | 2483.5                    | 67.47               | 51.44                  |
| 802.11n HT20, Core 1  | MCS2           | -             | -              | 2472               | 2483.5                    | 65.17               | 51.40                  |
| 802.11ax HE20, Core 1 | MCS2           | SU            | -              | 2412               | 2390.0                    | 66.40               | 51.35                  |
| 802.11ax HE20, Core 1 | MCS9           | 26            | 0              | 2412               | 2390.0                    | 58.32               | 43.88                  |
| 802.11ax HE20, Core 1 | MCS4           | SU            | -              | 2462               | 2483.5                    | 68.44               | 51.36                  |
| 802.11ax HE20, Core 1 | MCS9           | SU            | -              | 2467               | 2483.5                    | 66.46               | 51.01                  |
| 802.11ax HE20, Core 1 | MCS9           | 26            | 8              | 2467               | 2483.5                    | 63.05               | 45.37                  |
| 802.11ax HE20, Core 1 | MCS2           | SU            | -              | 2472               | 2483.5                    | 66.83               | 51.44                  |
| 802.11ax HE20, Core 1 | MCS9           | 26            | 8              | 2472               | 2483.5                    | 69.17               | 48.06                  |

**Table 7 - SISO Restricted Band Edge Results**

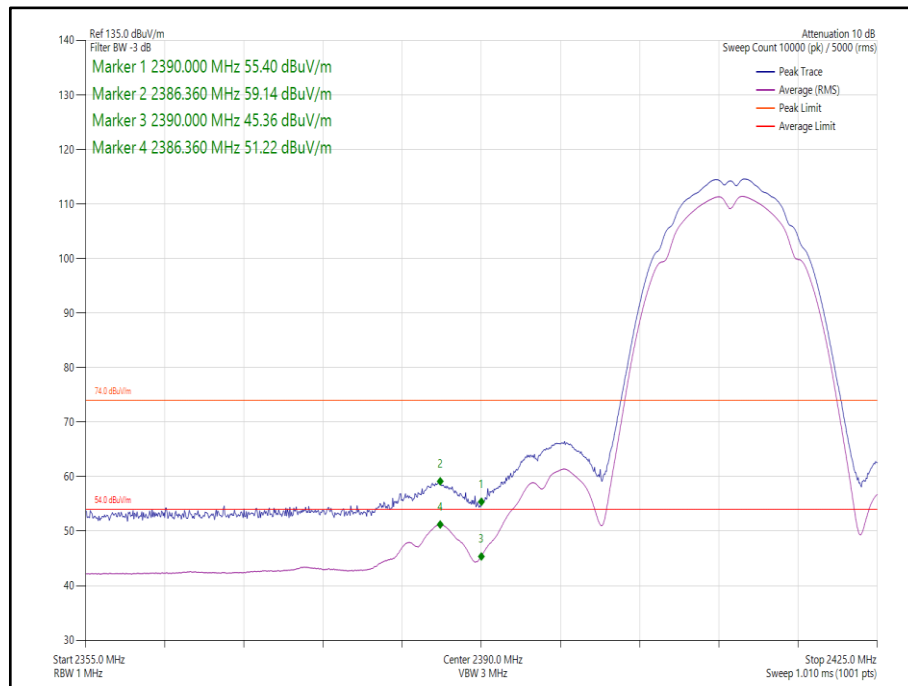


Figure 1 - 802.11b, Core 1 - 2412 MHz, Band Edge Frequency 2390.0 MHz

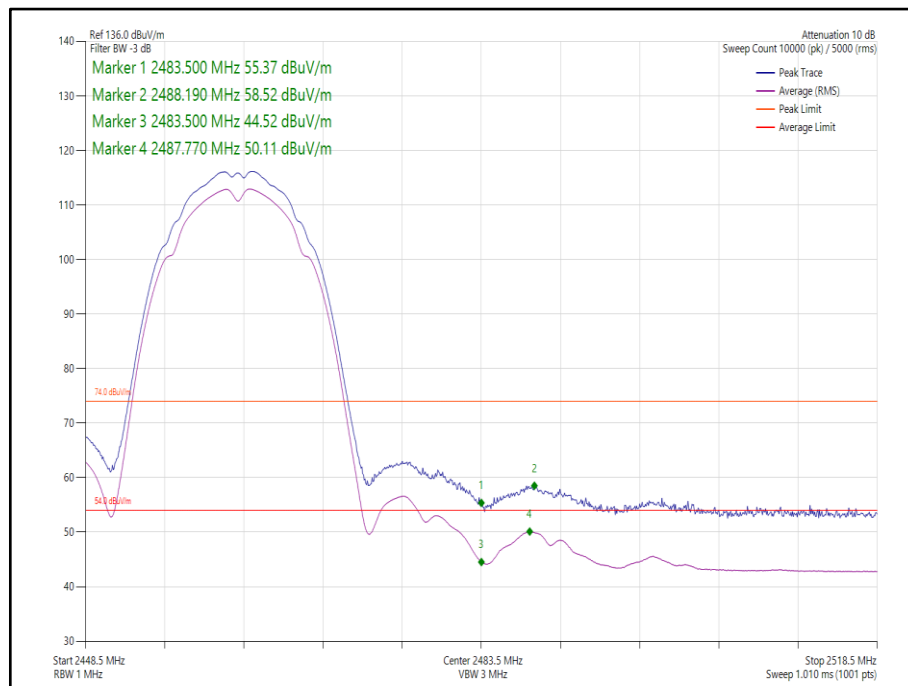


Figure 2 - 802.11b, Core 1 - 2462 MHz, Band Edge Frequency 2483.5 MHz

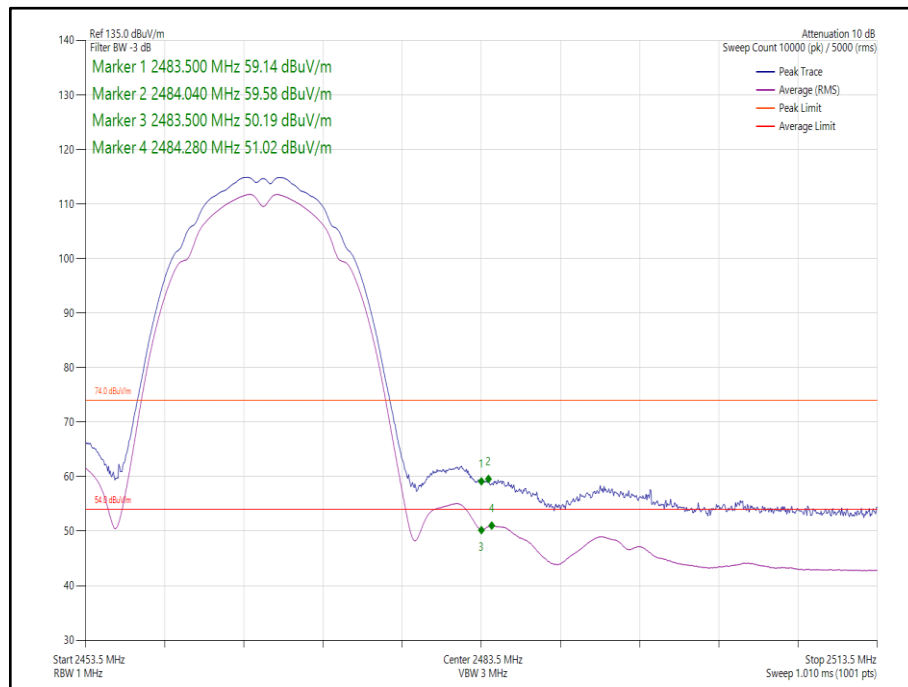


Figure 3 - 802.11b, Core 1 - 2467 MHz, Band Edge Frequency 2483.5 MHz

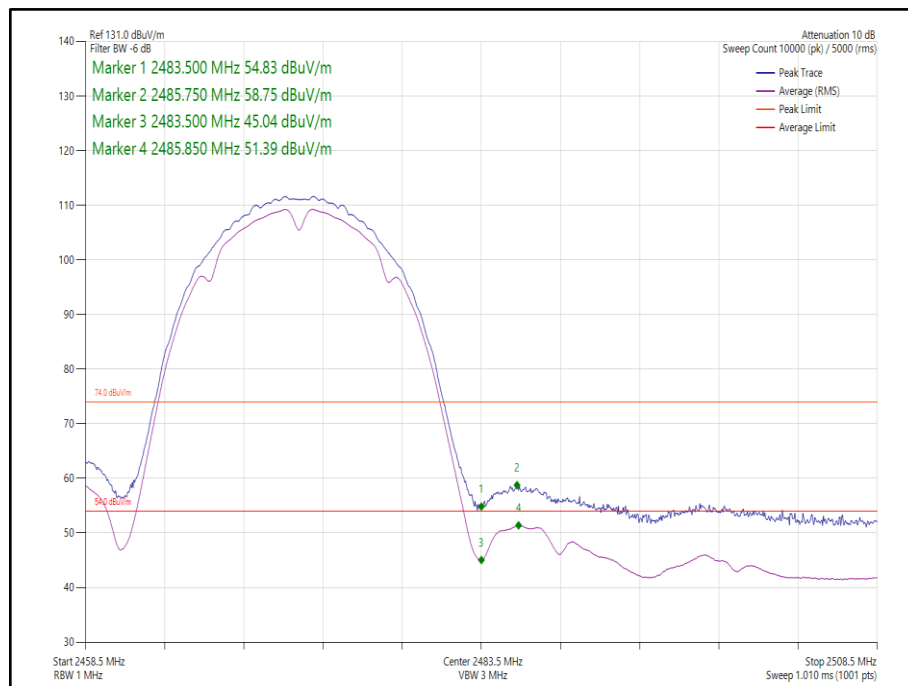


Figure 4 - 802.11b, Core 1 - 2472 MHz, Band Edge Frequency 2483.5 MHz

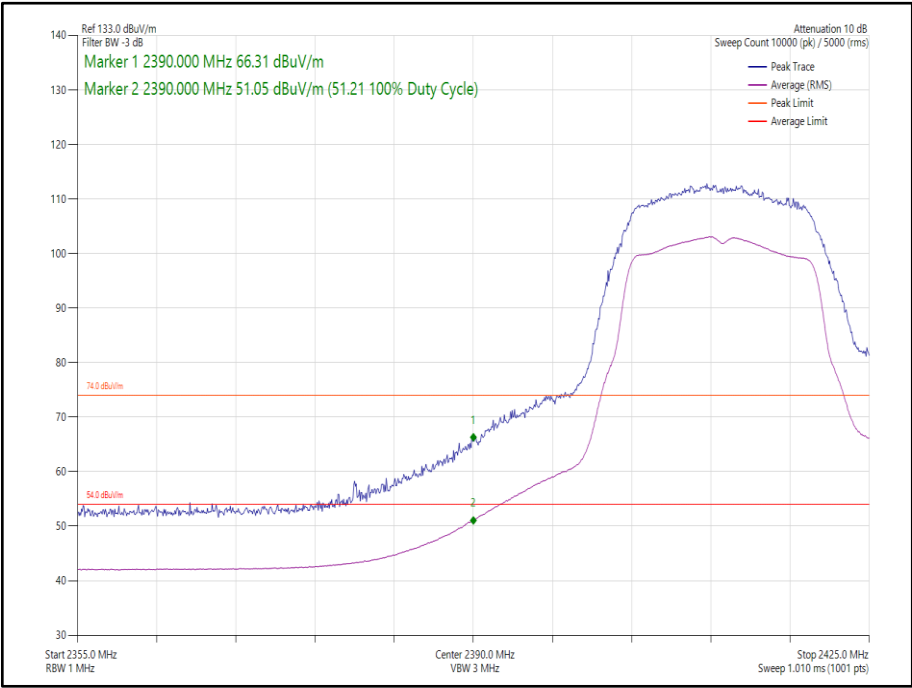


Figure 5 - 802.11g, Core 1 - 2412 MHz, Band Edge Frequency 2390.0 MHz

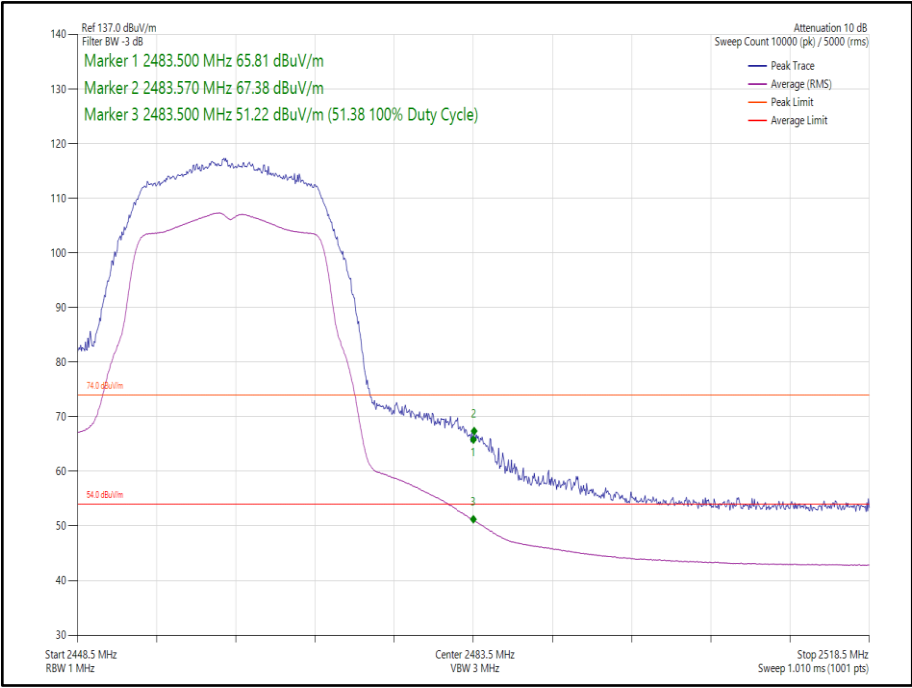


Figure 6 - 802.11g, Core 1 - 2462 MHz, Band Edge Frequency 2483.5 MHz

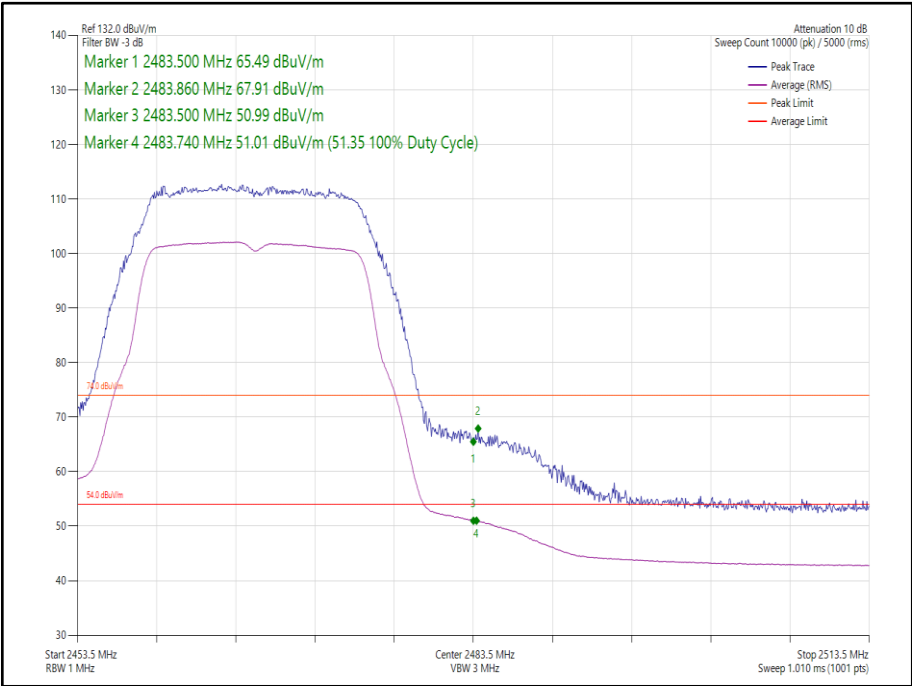


Figure 7 - 802.11g, Core 1 - 2467 MHz, Band Edge Frequency 2483.5 MHz

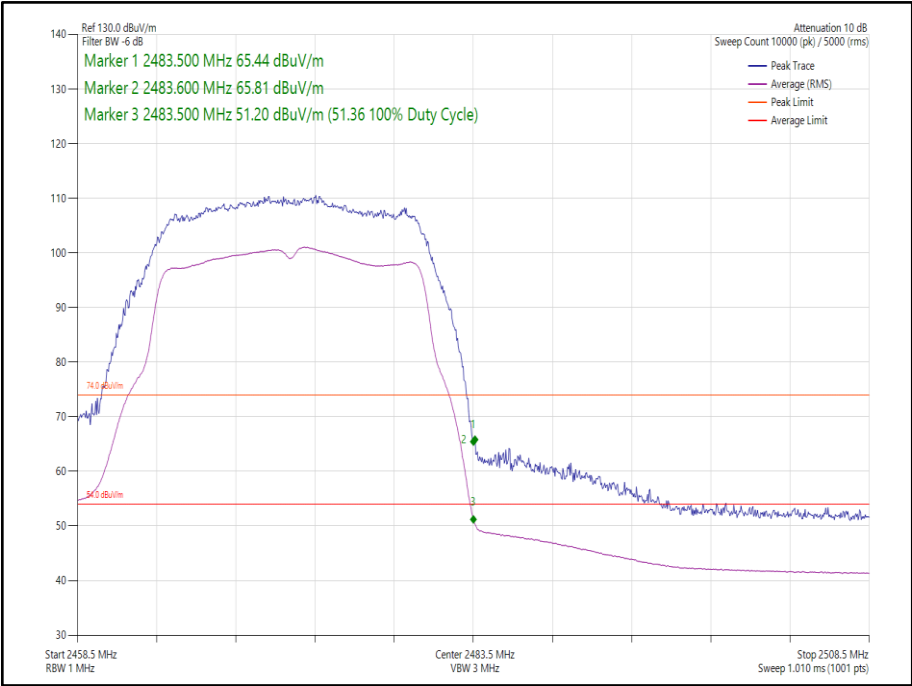


Figure 8 - 802.11g, Core 1 - 2472 MHz, Band Edge Frequency 2483.5 MHz

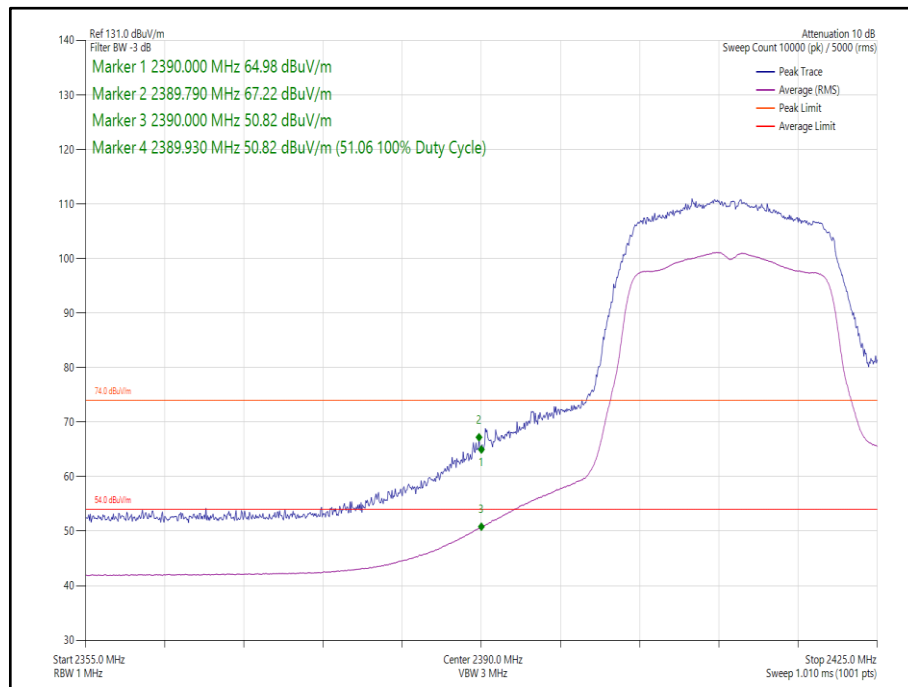


Figure 9 - 802.11n, HT20, Core 1 - 2412 MHz, Band Edge Frequency 2390 MHz

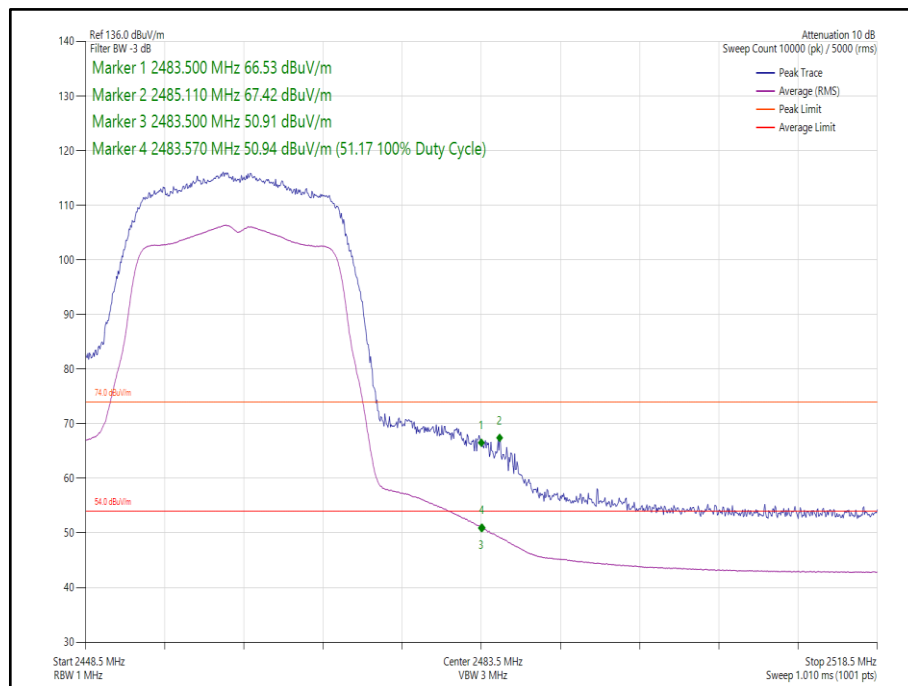
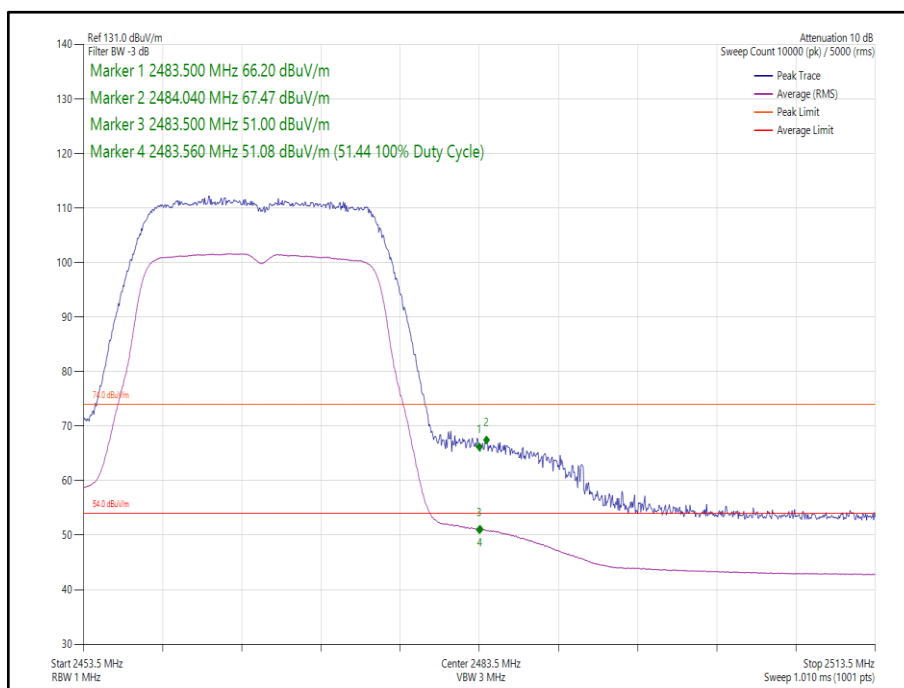
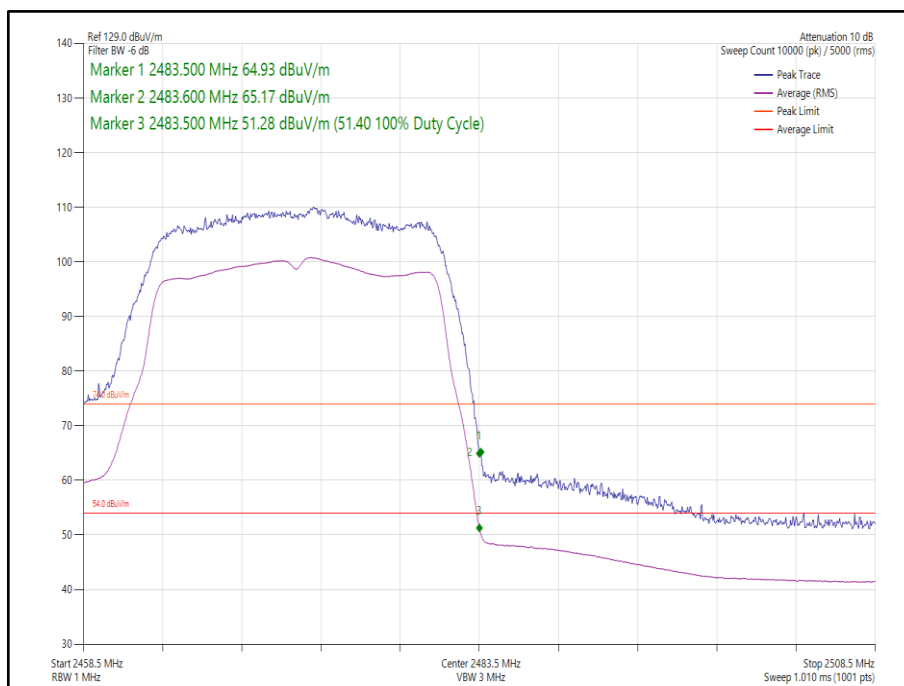


Figure 10 - 802.11n HT20, Core 1 - 2462 MHz, Band Edge Frequency 2483.5 MHz



**Figure 11 - 802.11n HT20, Core 1 - 2467 MHz, Band Edge Frequency 2483.5 MHz**



**Figure 12 - 802.11n HT20, Core 1 - 2472 MHz, Band Edge Frequency 2483.5 MHz**

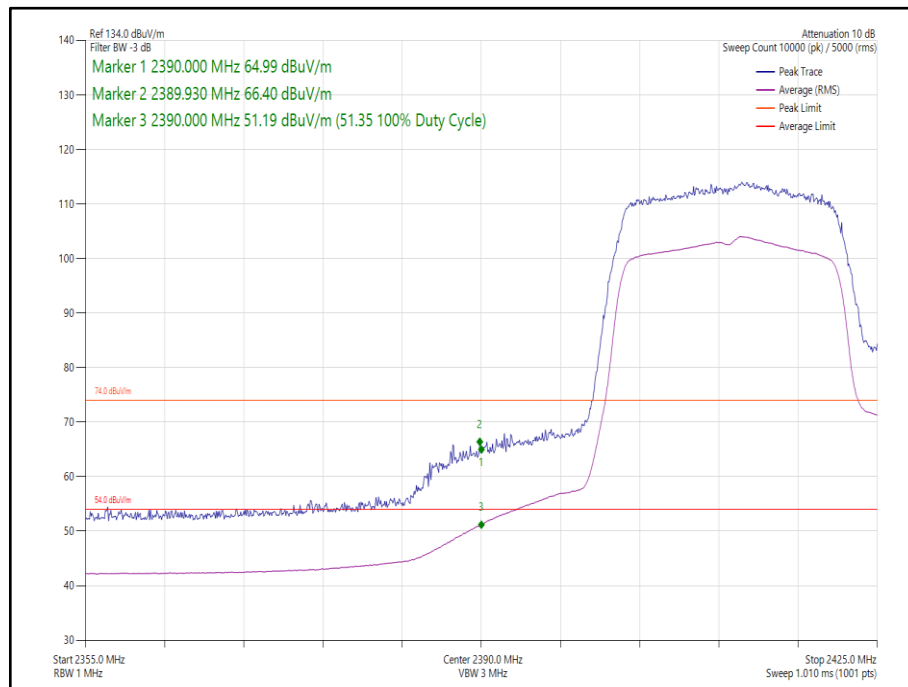


Figure 13 - 802.11ax HE20, Core 1, SU - 2412 MHz, Band Edge Frequency 2390 MHz

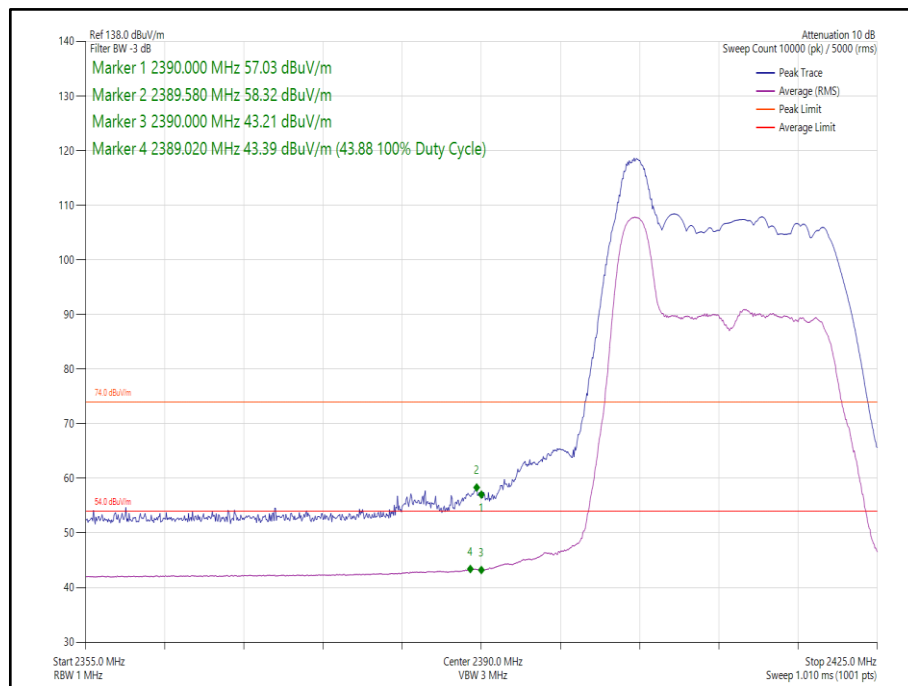


Figure 14 - 802.11ax HE20, Core 1, 26-0 - 2412 MHz, Band Edge Frequency 2390 MHz

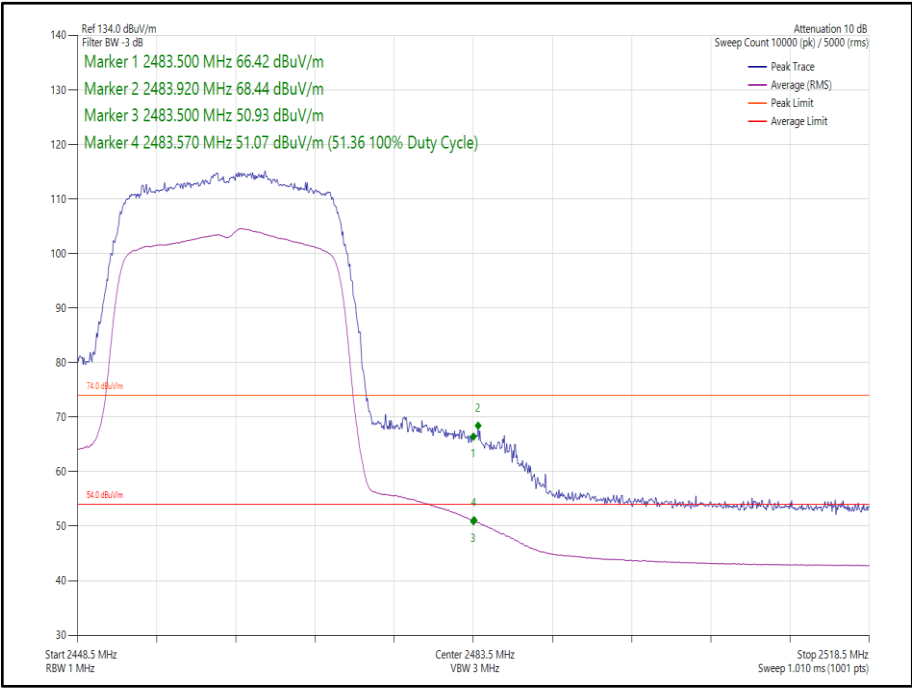


Figure 15 - 802.11ax HE20, Core 1, SU - 2462 MHz, Band Edge Frequency 2483.5 MHz

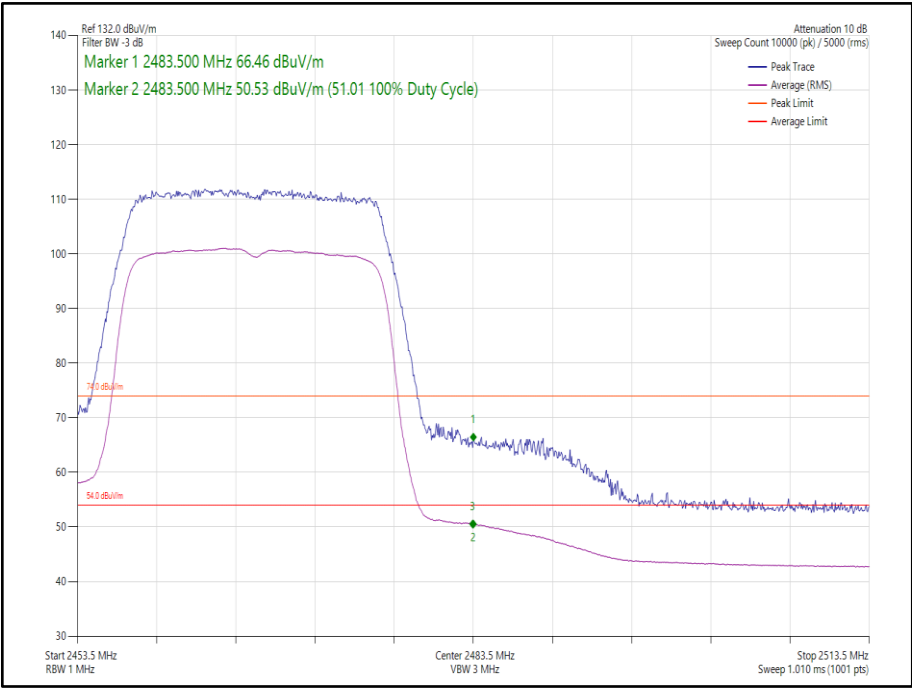


Figure 16 - 802.11ax HE20, Core 1, SU - 2467 MHz, Band Edge Frequency 2483.5 MHz

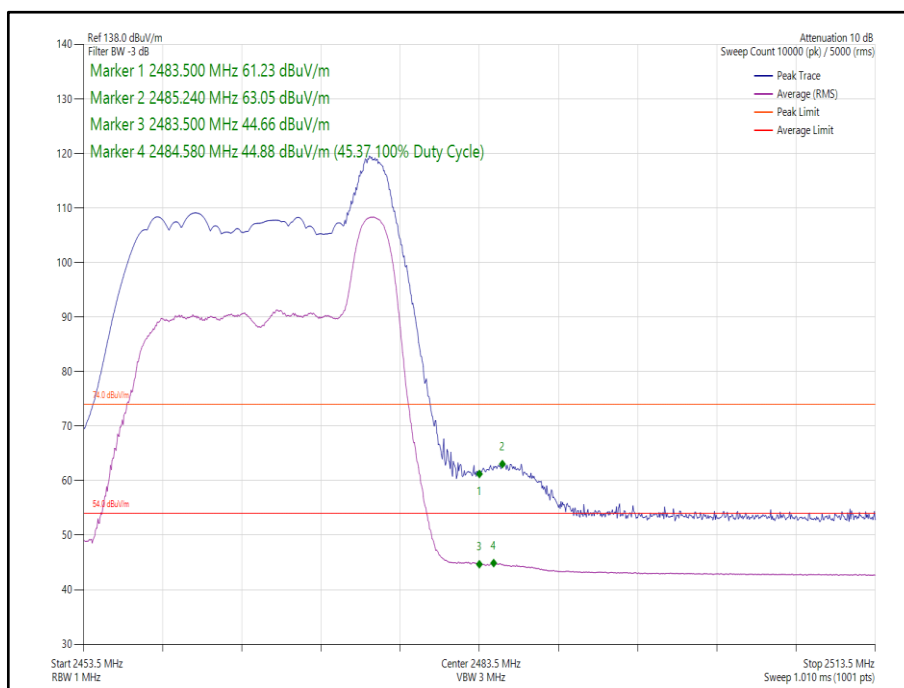


Figure 17 - 802.11ax HE20, Core 1, 26-8 - 2467 MHz, Band Edge Frequency 2483.5 MHz

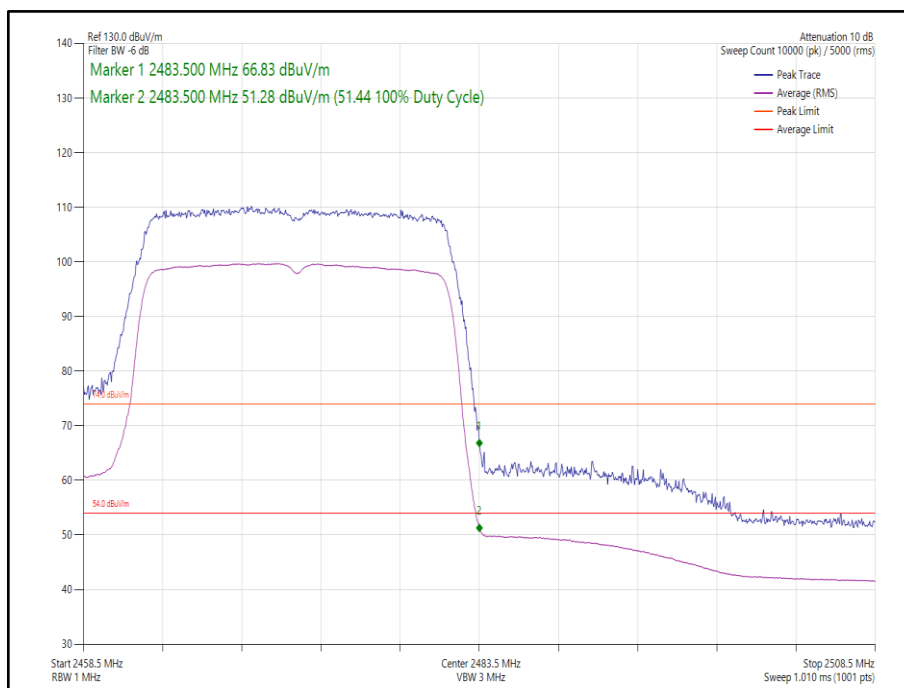


Figure 18 - 802.11ax HE20, Core 1, SU - 2472 MHz, Band Edge Frequency 2483.5 MHz

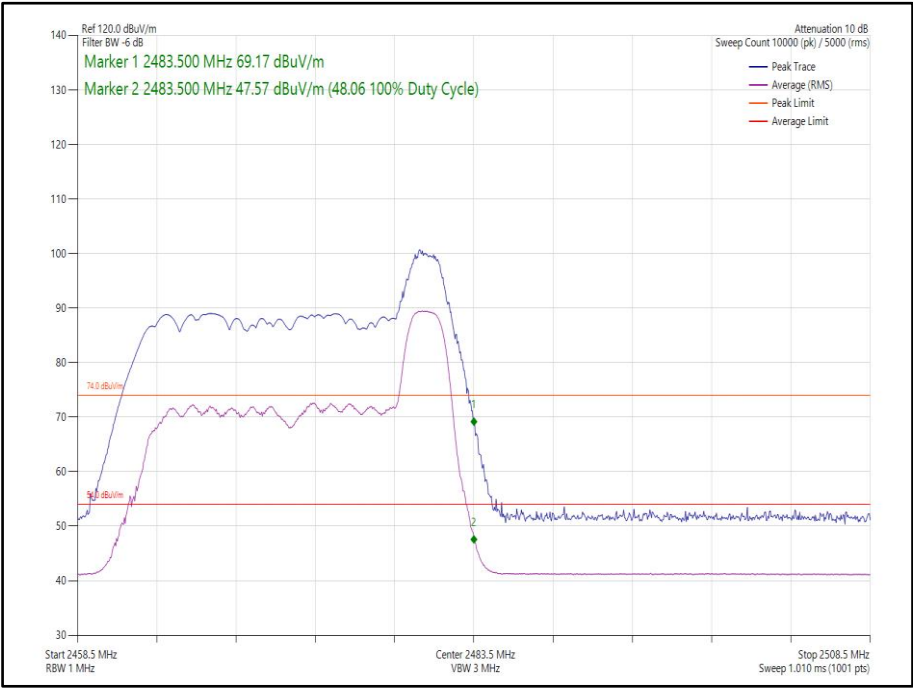


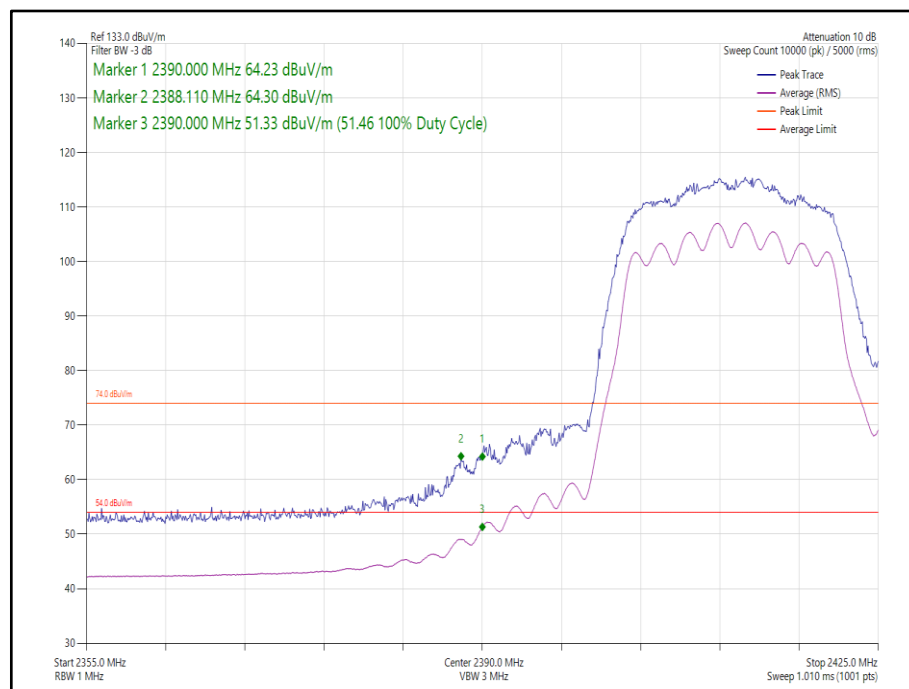
Figure 19 - 802.11ax HE20, Core 1, 26-8 - 2472 MHz, Band Edge Frequency 2483.5 MHz



## 2TX MIMO

| Mode                    | Data Rate/MCS | Resource Size | Resource Index | TX Frequency (MHz) | Band Edge Frequency (MHz) | Peak Level (dBμV/m) | Average Level (dBμV/m) |
|-------------------------|---------------|---------------|----------------|--------------------|---------------------------|---------------------|------------------------|
| 802.11n HT20, Core 0-1  | MCS2          | -             | -              | 2412               | 2390.0                    | 64.30               | 51.46                  |
| 802.11n HT20, Core 0-1  | MCS4          | -             | -              | 2462               | 2483.5                    | 67.08               | 51.44                  |
| 802.11n HT20, Core 0-1  | MCS4          | -             | -              | 2467               | 2483.5                    | 64.73               | 51.31                  |
| 802.11n HT20, Core 0-1  | MCS4          | -             | -              | 2472               | 2483.5                    | 66.26               | 51.48                  |
| 802.11ax HE20, Core 0-1 | MCS4          | SU            | -              | 2412               | 2390.0                    | 67.67               | 51.12                  |
| 802.11ax HE20, Core 0-1 | MCS9          | 26            | 0              | 2412               | 2390.0                    | 61.34               | 45.72                  |
| 802.11ax HE20, Core 0-1 | MCS2          | SU            | -              | 2462               | 2483.5                    | 64.52               | 51.26                  |
| 802.11ax HE20, Core 0-1 | MCS9          | SU            | -              | 2467               | 2483.5                    | 67.47               | 51.29                  |
| 802.11ax HE20, Core 0-1 | MCS9          | 26            | 8              | 2467               | 2483.5                    | 67.58               | 48.23                  |
| 802.11ax HE20, Core 0-1 | MCS4          | SU            | -              | 2472               | 2483.5                    | 66.79               | 51.44                  |
| 802.11ax HE20, Core 0-1 | MCS9          | 26            | 8              | 2472               | 2483.5                    | 69.41               | 49.06                  |

**Table 8 – MIMO 2TX Restricted Band Edge Results**



**Figure 20 - 802.11n HT20, Core 0-1 - 2412 MHz, Band Edge Frequency 2390 MHz**

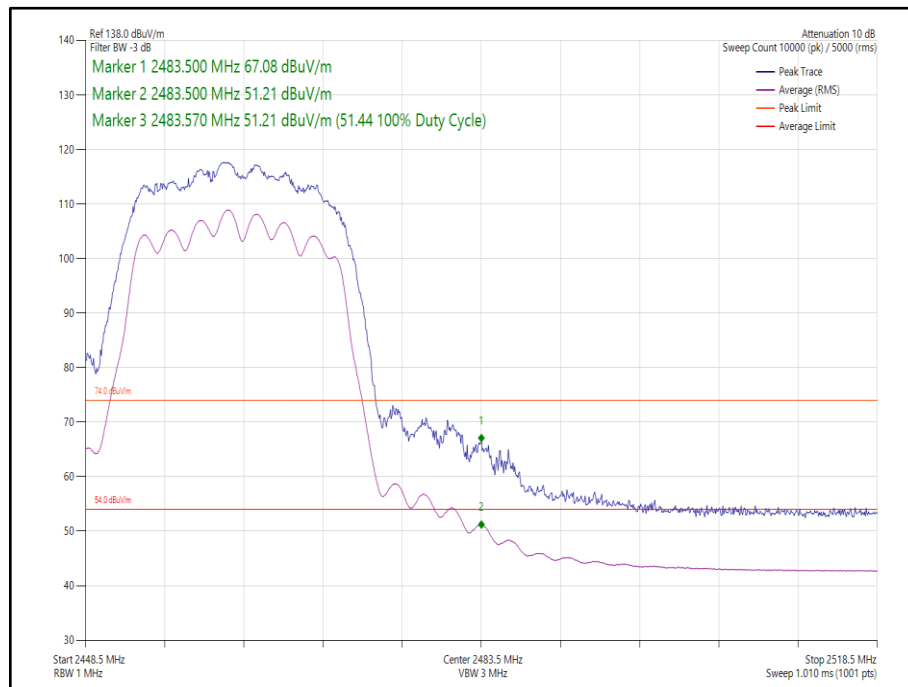


Figure 21 - 802.11n HT20, Core 0-1 - 2462 MHz, Band Edge Frequency 2483.5 MHz

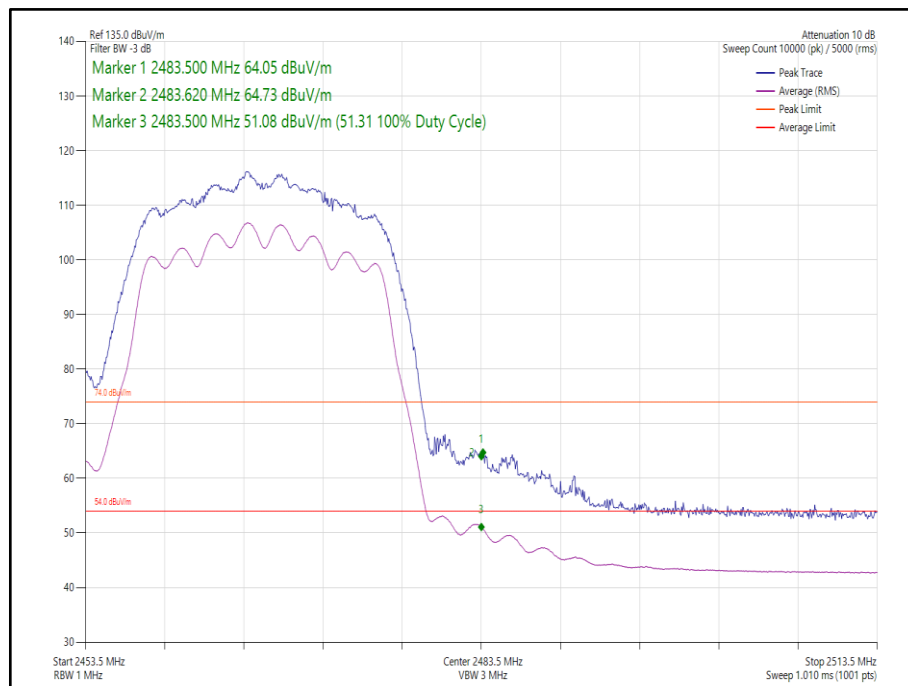


Figure 22 - 802.11n HT20, Core 0-1 - 2467 MHz, Band Edge Frequency 2483.5 MHz

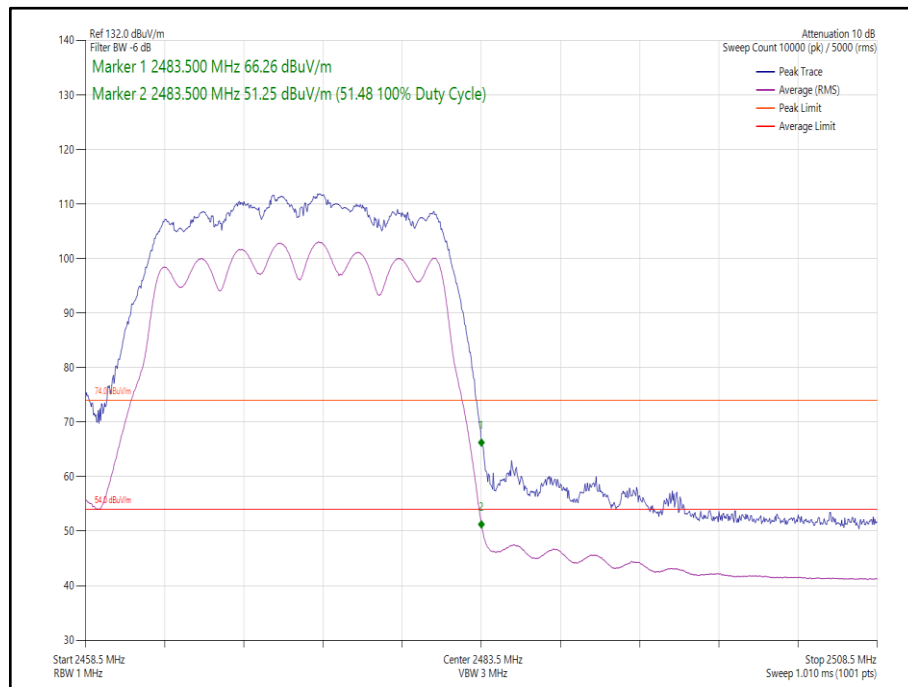


Figure 23 - 802.11n HT20, Core 0-1 - 2472 MHz, Band Edge Frequency 2483.5 MHz

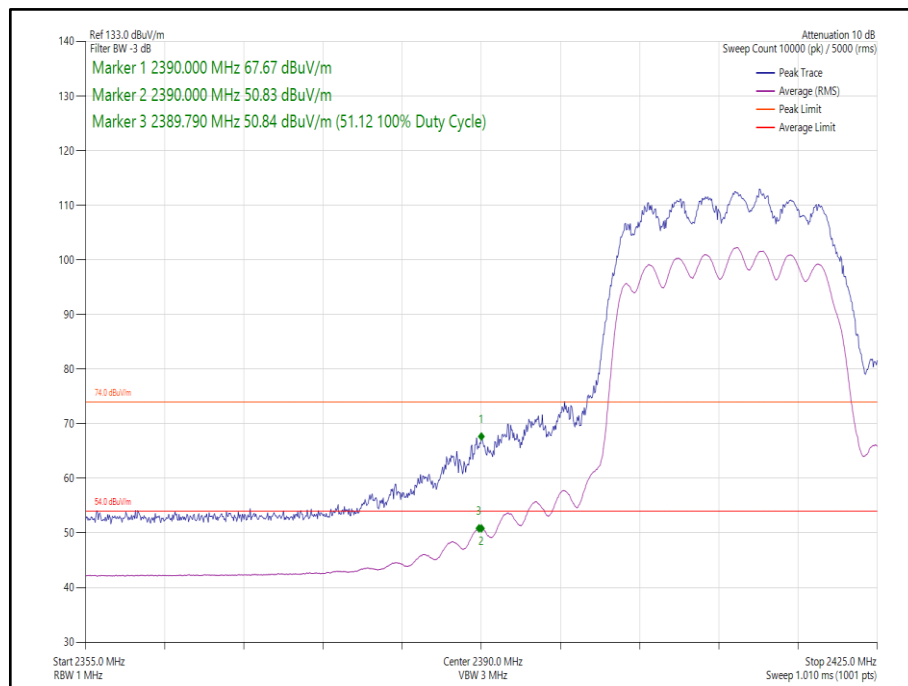


Figure 24 - 802.11ax HE20, Core 0-1, SU - 2412 MHz, Band Edge Frequency 2390 MHz

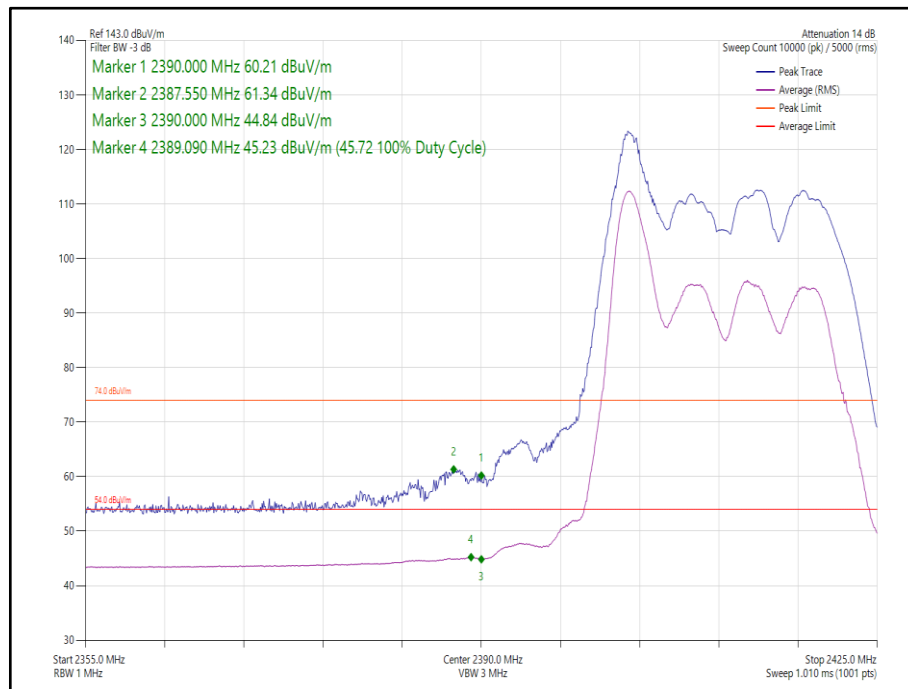


Figure 25 - 802.11ax HE20, Core 0-1, 26-0 - 2412 MHz, Band Edge Frequency 2390 MHz

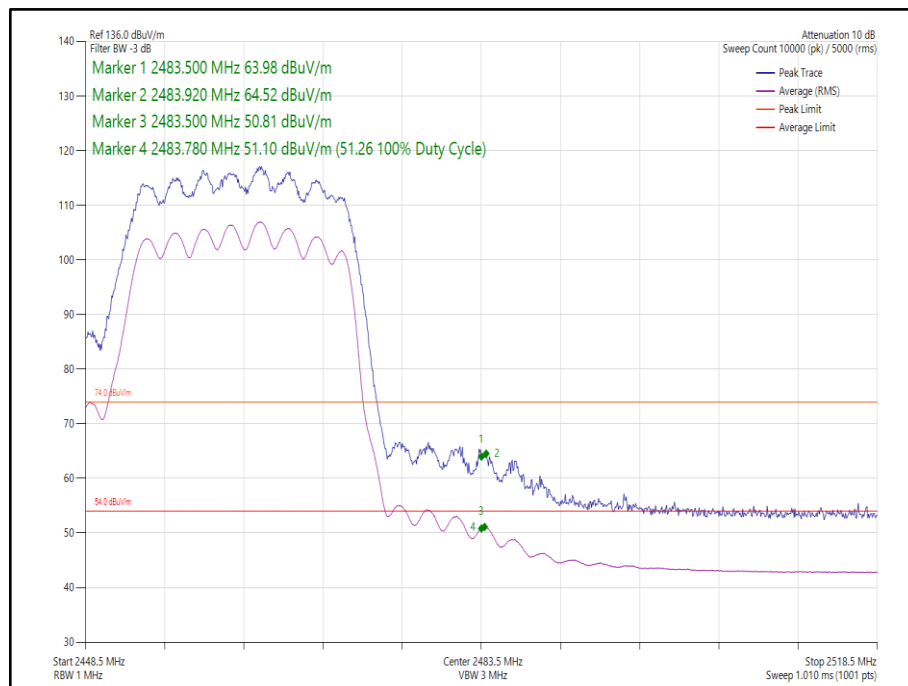


Figure 26 - 802.11ax HE20, Core 0-1, SU - 2462 MHz, Band Edge Frequency 2483.5 MHz

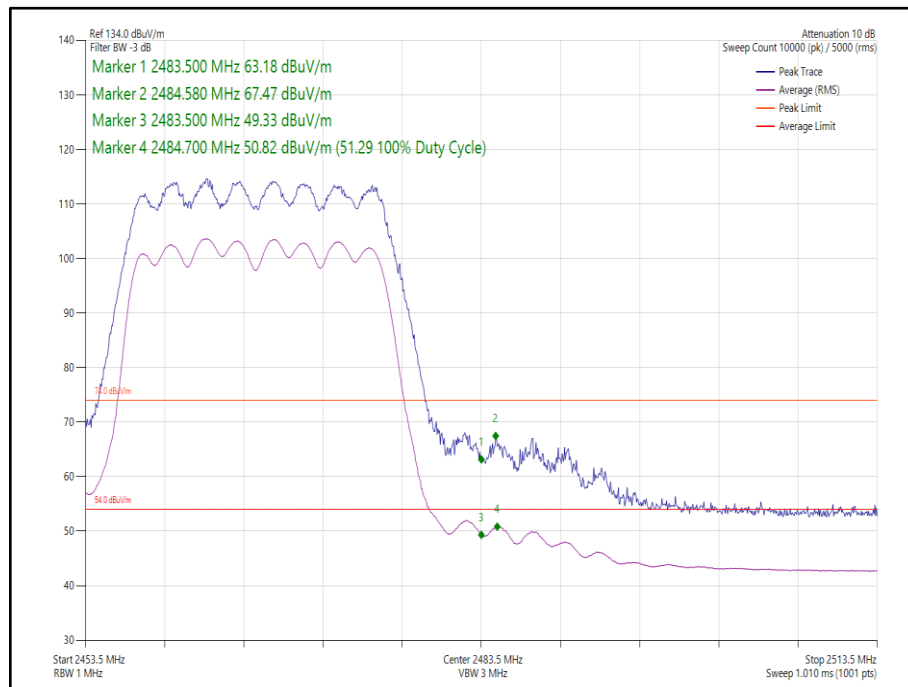


Figure 27 - 802.11ax HE20, Core 0-1, SU - 2467 MHz, Band Edge Frequency 2483.5 MHz

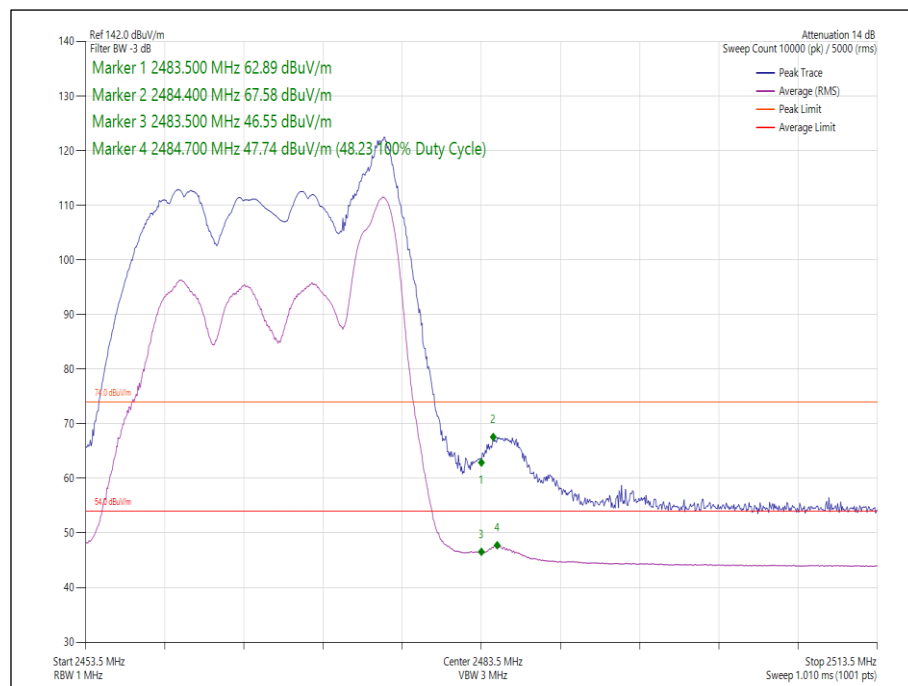


Figure 28 - 802.11ax HE20, Core 0-1, 26-8 - 2467 MHz, Band Edge Frequency 2483.5 MHz

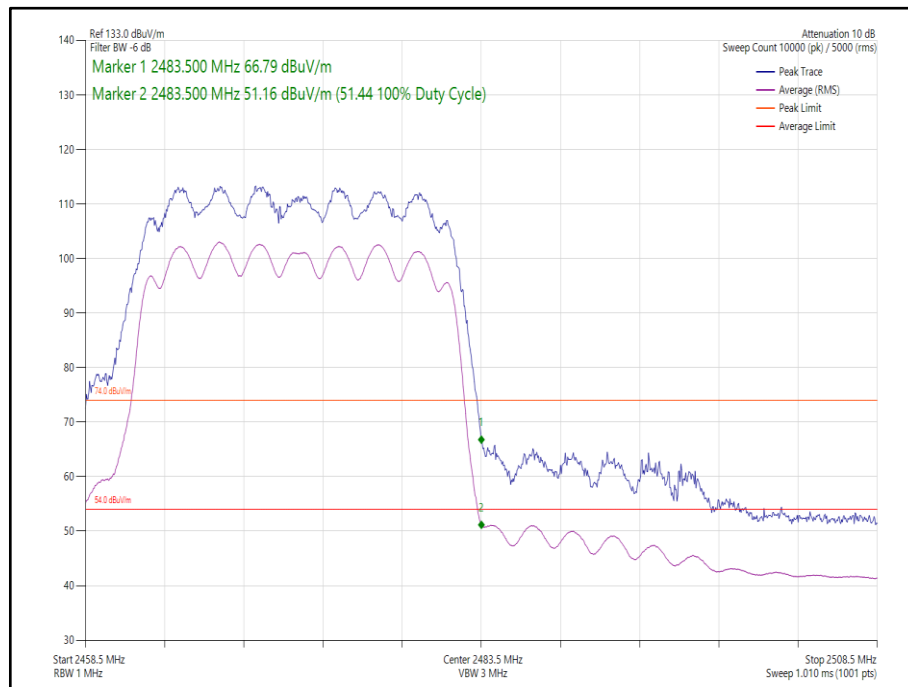


Figure 29 - 802.11ax HE20, Core 0-1, SU - 2472 MHz, Band Edge Frequency 2483.5 MHz

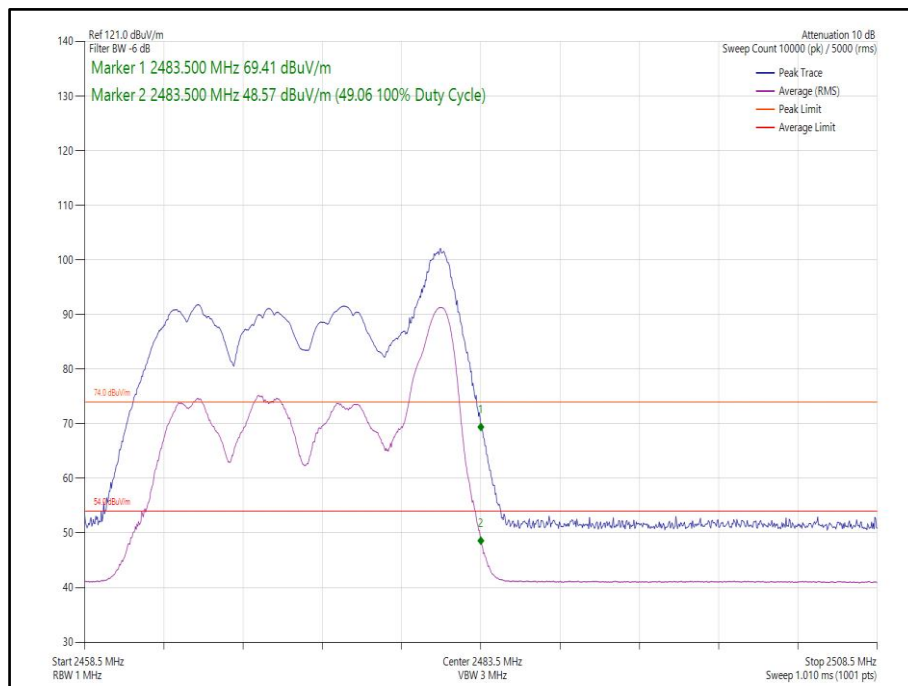


Figure 30 - 802.11ax HE20, Core 0-1, 26-8 - 2472 MHz, Band Edge Frequency 2483.5 MHz



FCC 47 CFR Part 15, Limit Clause 15.209

| Frequency (MHz) | Field Strength ( $\mu\text{V/m}$ at 3 m) |
|-----------------|------------------------------------------|
| 30 to 88        | 100                                      |
| 88 to 216       | 150                                      |
| 216 to 960      | 200                                      |
| Above 960       | 500                                      |

**Table 9**

ISED RSS-GEN, Limit Clause 8.9

| Frequency (MHz) | Field Strength ( $\mu\text{V/m}$ at 3 m) |
|-----------------|------------------------------------------|
| 30 to 88        | 100                                      |
| 88 to 216       | 150                                      |
| 216 to 960      | 200                                      |
| Above 960*      | 500                                      |

**Table 10**

\*Unless otherwise specified, for all frequencies greater than 1 GHz, the radiated emission limits for licence-exempt radio apparatus stated in applicable RSSs (including RSS-Gen) are based on measurements using a linear average detector function having a minimum resolution bandwidth of 1 MHz. If an average limit is specified for the EUT, then the peak emission shall also be measured with instrumentation properly adjusted for such factors as pulse desensitization to ensure the peak emission is less than 20 dB above the average limit.



### 2.1.7 Test Location and Test Equipment Used

This test was carried out in RF Chamber 11.

| Instrument                    | Manufacturer    | Type No              | TE No | Calibration Period (months) | Calibration Expires |
|-------------------------------|-----------------|----------------------|-------|-----------------------------|---------------------|
| EMI Test Receiver             | Rohde & Schwarz | ESW44                | 5084  | 12                          | 17-May-2023         |
| Screened Room (11)            | Rainford        | Rainford             | 5136  | 36                          | 24-Nov-2024         |
| Mast                          | Maturo          | TAM 4.0-P            | 5158  | -                           | TU                  |
| Mast and Turntable Controller | Maturo          | Maturo NCD           | 5159  | -                           | TU                  |
| Turntable                     | Maturo          | TT 15WF              | 5160  | -                           | TU                  |
| Antenna (DRG 1-10.5GHz)       | Schwarzbeck     | BBHA9120B            | 5215  | 12                          | 28-May-2023         |
| 2m SMA Cable                  | Junkosha        | MWX221-02000AMSAMS/A | 5518  | 12                          | 12-Apr-2023         |
| 8m N Type Cable               | Junkosha        | MWX221-08000NMSNMS/B | 5522  | 12                          | 24-Mar-2023         |
| Thermo-Hygro-Barometer        | PCE Instruments | PCE-THB 40           | 5604  | 12                          | 22-Sep-2022         |

**Table 11**

TU – Traceability Unscheduled



## **2.2 Emission Bandwidth**

### **2.2.1 Specification Reference**

FCC 47 CFR Part 15C, Clause 15.247 (a)(2)  
ISED RSS-247, Clause 5.2  
ISED RSS-GEN, Clause 6.7

### **2.2.2 Equipment Under Test and Modification State**

A2780, S/N: NW3J007K67 - Modification State 0

### **2.2.3 Date of Test**

20-October-2022

### **2.2.4 Test Method**

This test was performed in accordance with ANSI C63.10, clause 11.8.1 for 6 dB BW and 6.9.3 for 99% occupied bandwidth measurements.

### **2.2.5 Environmental Conditions**

|                     |         |
|---------------------|---------|
| Ambient Temperature | 22.7 °C |
| Relative Humidity   | 52.3 %  |

## 2.2.6 Test Results

### 2.4 GHz WLAN

| Protocol         | 6 dB Bandwidth (MHz) |         |
|------------------|----------------------|---------|
|                  | Minimum              | Maximum |
| 802.11b          | 8.640                | 9.120   |
| 802.11g          | 15.240               | 16.440  |
| 802.11n HT20     | 15.240               | 17.700  |
| 802.11ax HE20 SU | 18.360               | 19.020  |

Table 12 - 6 dB Bandwidth Summary Results

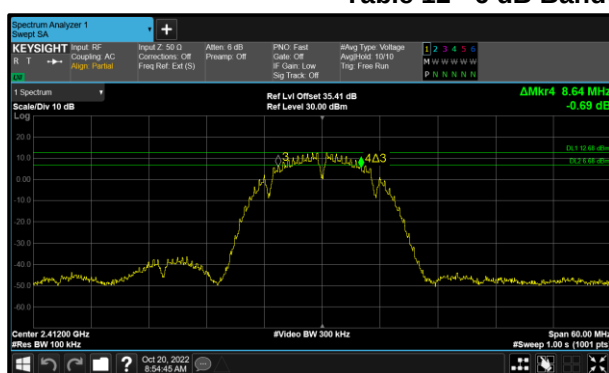


Figure 31 - 802.11b Minimum 6 dB EBW

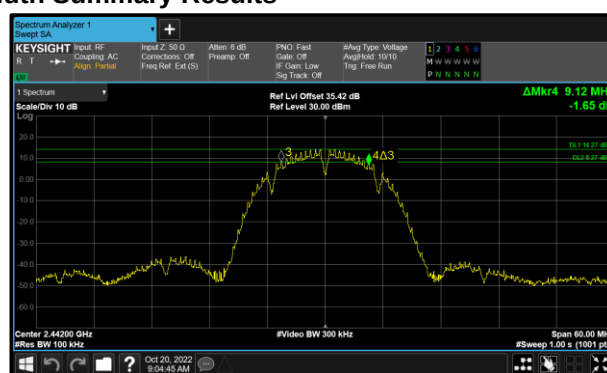


Figure 32 - 802.11b Maximum 6 dB EBW

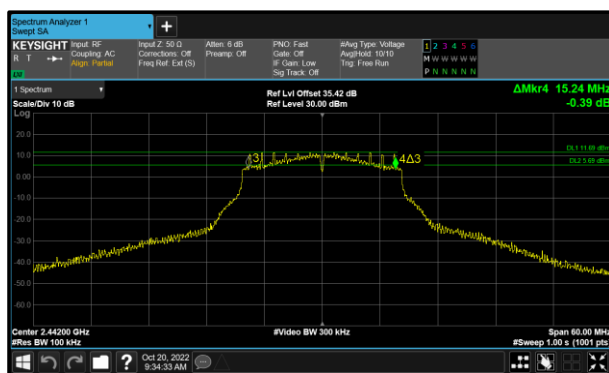


Figure 33 - 802.11g Minimum 6 dB EBW

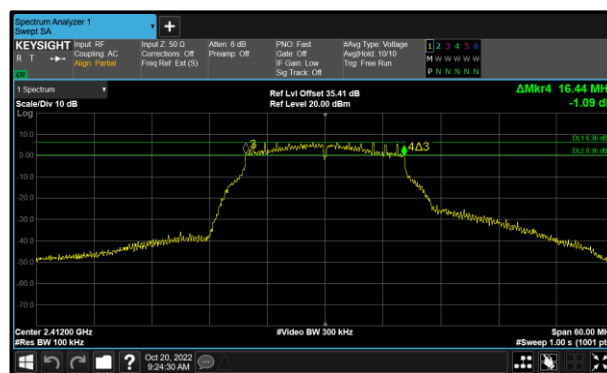


Figure 34 - 802.11g Maximum 6 dB EBW

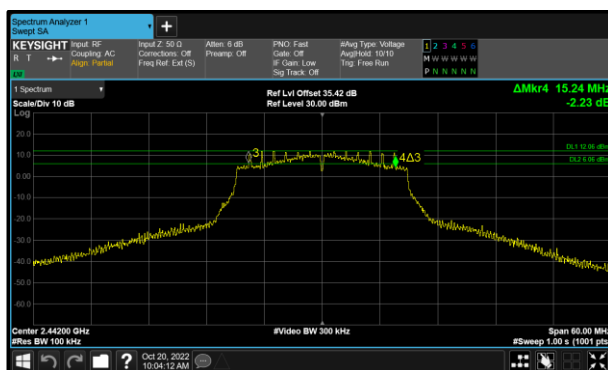


Figure 35 - 802.11n HT20 Minimum 6 dB EBW

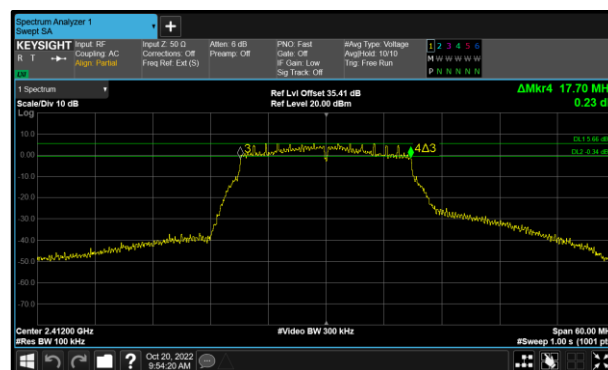


Figure 36 - 802.11n HT20 Maximum 6 dB EBW

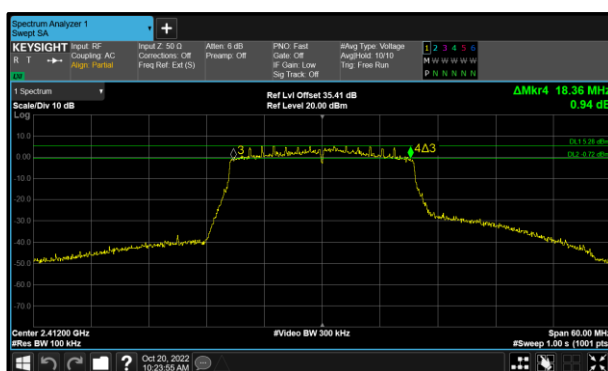


Figure 37 - 802.11ax HE20 SU Minimum 6 dB EBW

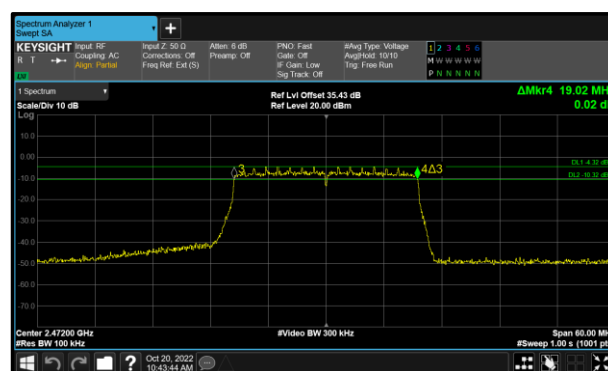


Figure 38 - 802.11ax HE20 SU Maximum 6 dB EBW

| Protocol         | 99% Bandwidth (MHz) |         |
|------------------|---------------------|---------|
|                  | Minimum             | Maximum |
| 802.11b          | 12.900              | 12.960  |
| 802.11g          | 16.380              | 16.800  |
| 802.11n HT20     | 17.580              | 17.820  |
| 802.11ax HE20 SU | 18.960              | 18.960  |

Table 13 - 99% Bandwidth Summary Results

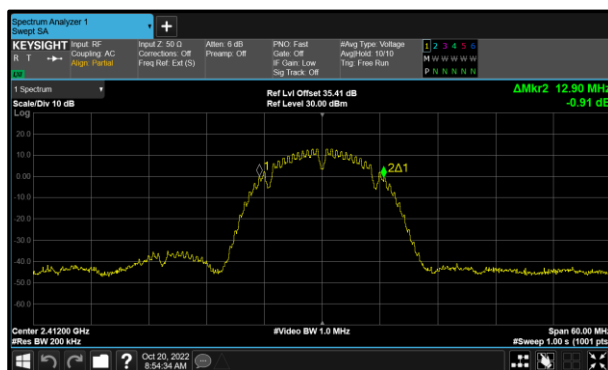


Figure 39 - 802.11b Minimum 99% OBW

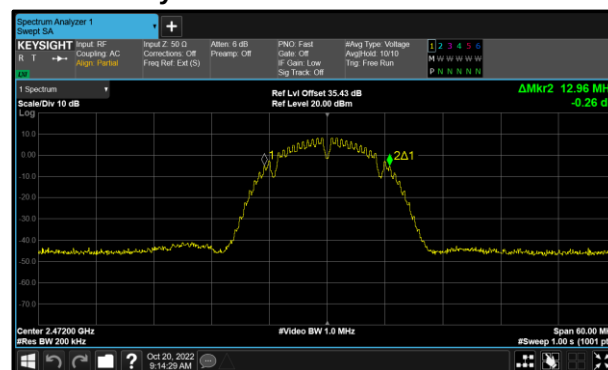


Figure 40 - 802.11b Maximum 99% OBW

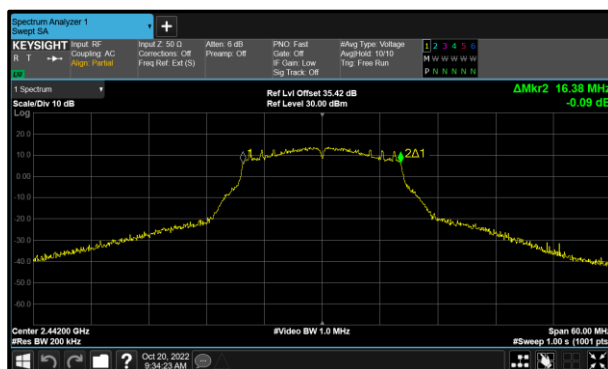


Figure 41 - 802.11g Minimum 99% OBW

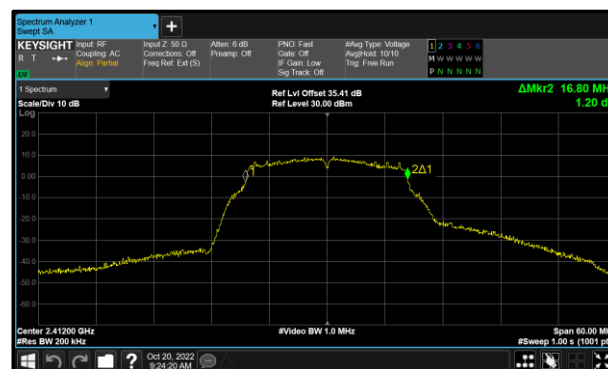


Figure 42 - 802.11g Maximum 99% OBW

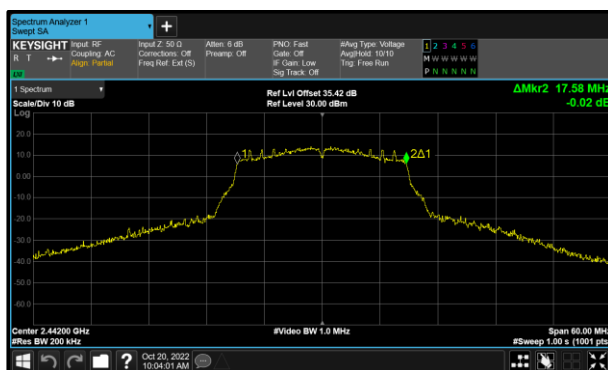


Figure 43 - 802.11n HT20 Minimum 99% OBW

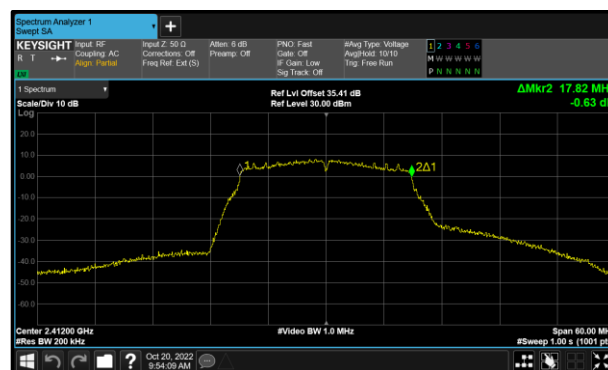


Figure 44 - 802.11n HT20 Maximum 99% OBW

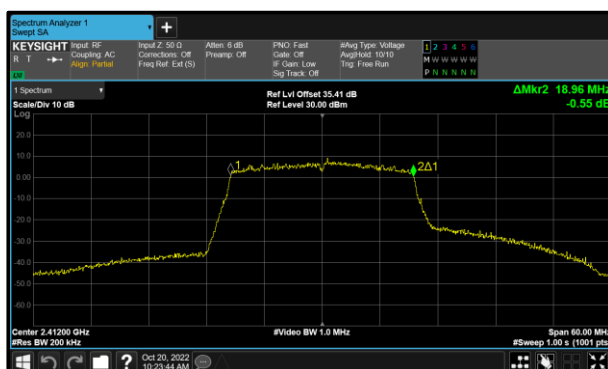


Figure 45 - 802.11ax HE20 SU Minimum 99% OBW

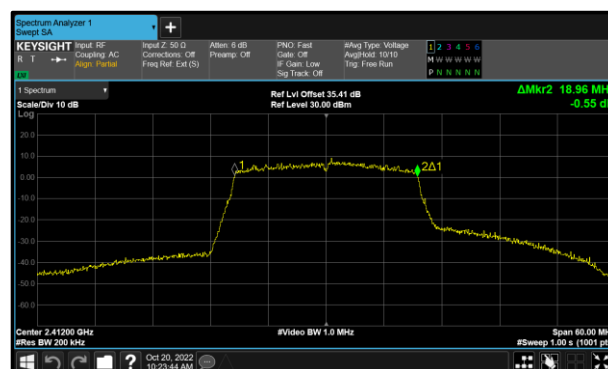


Figure 46 - 802.11ax HE20 SU Maximum 99% OBW



| Test Configuration       |                                 |                 |                               |
|--------------------------|---------------------------------|-----------------|-------------------------------|
| Frequency Range:         | 2400-2483.5 MHz                 | Band:           | 2.4 GHz                       |
| Limit Clause(s):         | 15.247 (a)(2)<br>RSS-247 5.2 a) | Test Method(s): | C63.10 6.9.3<br>C63.10 11.8.1 |
| Additional Reference(s): | -                               |                 |                               |

| DUT Configuration      |            |                          |   |
|------------------------|------------|--------------------------|---|
| Mode:                  | 802.11b    | Duty Cycle (%):          | - |
| Data Rate:             | 1 Mbps     | DCCF (dB):               | - |
| Antenna Configuration: | SISO       | Peak Antenna Gain (dBi): | - |
| Active Port(s):        | B (Core 1) | Active Chain(s):         | 1 |

| Test Frequency (MHz) | 6 dB Bandwidth (MHz) |       |   |   | Limit (kHz) |
|----------------------|----------------------|-------|---|---|-------------|
|                      | A                    | B     | C | D |             |
| 2412                 | -                    | 8.640 | - | - | ≥500.0      |
| 2442                 | -                    | 9.120 | - | - | ≥500.0      |
| 2472                 | -                    | 8.640 | - | - | ≥500.0      |

**Table 14 - 6 dB Bandwidth Results**

| Test Frequency (MHz) | 99% Bandwidth (MHz) |        |   |   | Limit (kHz) |
|----------------------|---------------------|--------|---|---|-------------|
|                      | A                   | B      | C | D |             |
| 2412                 | -                   | 12.900 | - | - | -           |
| 2442                 | -                   | 12.900 | - | - | -           |
| 2472                 | -                   | 12.960 | - | - | -           |

**Table 15 - 99% Bandwidth Results**



| Test Configuration       |                                 |                 |                               |
|--------------------------|---------------------------------|-----------------|-------------------------------|
| Frequency Range:         | 2400-2483.5 MHz                 | Band:           | 2.4 GHz                       |
| Limit Clause(s):         | 15.247 (a)(2)<br>RSS-247 5.2 a) | Test Method(s): | C63.10 6.9.3<br>C63.10 11.8.1 |
| Additional Reference(s): | -                               |                 |                               |

| DUT Configuration      |            |                          |   |
|------------------------|------------|--------------------------|---|
| Mode:                  | 802.11g    | Duty Cycle (%):          | - |
| Data Rate:             | 12 Mbps    | DCCF (dB):               | - |
| Antenna Configuration: | SISO       | Peak Antenna Gain (dBi): | - |
| Active Port(s):        | B (Core 1) | Active Chain(s):         | 1 |

| Test Frequency (MHz) | 6 dB Bandwidth (MHz) |        |   |   | Limit (kHz) |
|----------------------|----------------------|--------|---|---|-------------|
|                      | A                    | B      | C | D |             |
| 2412                 | -                    | 16.440 | - | - | ≥500.0      |
| 2442                 | -                    | 15.240 | - | - | ≥500.0      |
| 2472                 | -                    | 16.200 | - | - | ≥500.0      |

**Table 16 - 6 dB Bandwidth Results**

| Test Frequency (MHz) | 99% Bandwidth (MHz) |        |   |   | Limit (kHz) |
|----------------------|---------------------|--------|---|---|-------------|
|                      | A                   | B      | C | D |             |
| 2412                 | -                   | 16.800 | - | - | -           |
| 2442                 | -                   | 16.380 | - | - | -           |
| 2472                 | -                   | 16.560 | - | - | -           |

**Table 17 - 99% Bandwidth Results**



| Test Configuration       |                                 |                 |                               |
|--------------------------|---------------------------------|-----------------|-------------------------------|
| Frequency Range:         | 2400-2483.5 MHz                 | Band:           | 2.4 GHz                       |
| Limit Clause(s):         | 15.247 (a)(2)<br>RSS-247 5.2 a) | Test Method(s): | C63.10 6.9.3<br>C63.10 11.8.1 |
| Additional Reference(s): | -                               |                 |                               |

| DUT Configuration         |              |                          |   |
|---------------------------|--------------|--------------------------|---|
| Mode:                     | 802.11n HT20 | Duty Cycle (%):          | - |
| Modulation Coding Scheme: | MCS2         | DCCF (dB):               | - |
| Antenna Configuration:    | SISO         | Peak Antenna Gain (dBi): | - |
| Active Port(s):           | B (Core 1)   | Active Chain(s):         | 1 |

| Test Frequency (MHz) | 6 dB Bandwidth (MHz) |        |   |   | Limit (kHz) |
|----------------------|----------------------|--------|---|---|-------------|
|                      | A                    | B      | C | D |             |
| 2412                 | -                    | 17.700 | - | - | ≥500.0      |
| 2442                 | -                    | 15.240 | - | - | ≥500.0      |
| 2472                 | -                    | 17.400 | - | - | ≥500.0      |

**Table 18 - 6 dB Bandwidth Results**

| Test Frequency (MHz) | 99% Bandwidth (MHz) |        |   |   | Limit (kHz) |
|----------------------|---------------------|--------|---|---|-------------|
|                      | A                   | B      | C | D |             |
| 2412                 | -                   | 17.820 | - | - | -           |
| 2442                 | -                   | 17.580 | - | - | -           |
| 2472                 | -                   | 17.700 | - | - | -           |

**Table 19 - 99% Bandwidth Results**



| Test Configuration       |                                 |                 |                               |
|--------------------------|---------------------------------|-----------------|-------------------------------|
| Frequency Range:         | 2400-2483.5 MHz                 | Band:           | 2.4 GHz                       |
| Limit Clause(s):         | 15.247 (a)(2)<br>RSS-247 5.2 a) | Test Method(s): | C63.10 6.9.3<br>C63.10 11.8.1 |
| Additional Reference(s): | -                               |                 |                               |

| DUT Configuration         |                  |                          |   |
|---------------------------|------------------|--------------------------|---|
| Mode:                     | 802.11ax HE20 SU | Duty Cycle (%):          | - |
| Modulation Coding Scheme: | MCS2x1           | DCCF (dB):               | - |
| Antenna Configuration:    | SISO             | Peak Antenna Gain (dBi): | - |
| Active Port(s):           | B (Core 1)       | Active Chain(s):         | 1 |

| Test Frequency (MHz) | 6 dB Bandwidth (MHz) |        |   |   | Limit (kHz) |
|----------------------|----------------------|--------|---|---|-------------|
|                      | A                    | B      | C | D |             |
| 2412                 | -                    | 18.360 | - | - | ≥500.0      |
| 2442                 | -                    | 18.960 | - | - | ≥500.0      |
| 2472                 | -                    | 19.020 | - | - | ≥500.0      |

**Table 20 - 6 dB Bandwidth Results**

| Test Frequency (MHz) | 99% Bandwidth (MHz) |        |   |   | Limit (kHz) |
|----------------------|---------------------|--------|---|---|-------------|
|                      | A                   | B      | C | D |             |
| 2412                 | -                   | 18.960 | - | - | -           |
| 2442                 | -                   | 18.960 | - | - | -           |
| 2472                 | -                   | 18.960 | - | - | -           |

**Table 21 - 99% Bandwidth Results**

| Protocol         | 6 dB Bandwidth (MHz) |         |
|------------------|----------------------|---------|
|                  | Minimum              | Maximum |
| 802.11n HT20     | 15.300               | 17.520  |
| 802.11ax HE20 SU | 18.600               | 19.080  |

Table 22 - 6 dB Bandwidth Summary Results

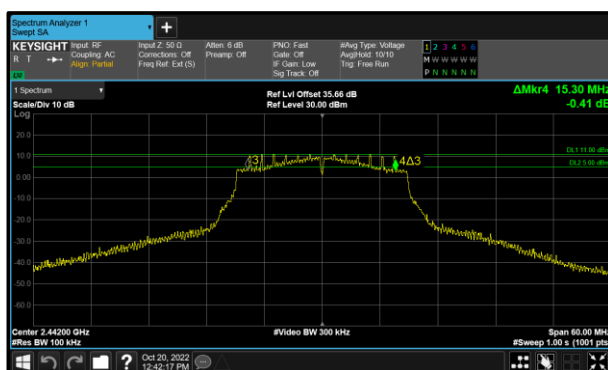


Figure 47 - 802.11n HT20 Minimum 6 dB EBW

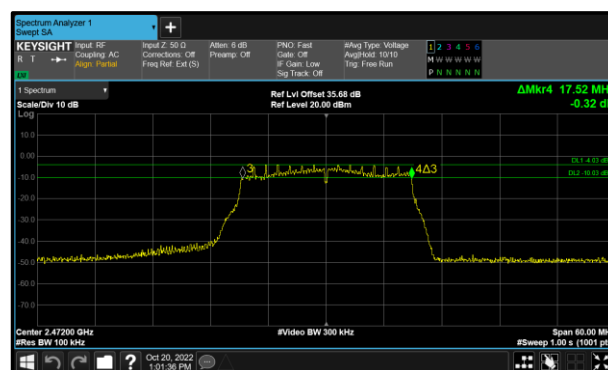


Figure 48 - 802.11n HT20 Maximum 6 dB EBW

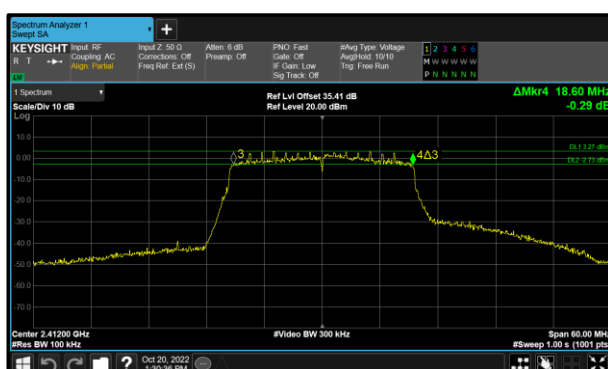


Figure 49 - 802.11ax HE20 SU Minimum 6 dB EBW

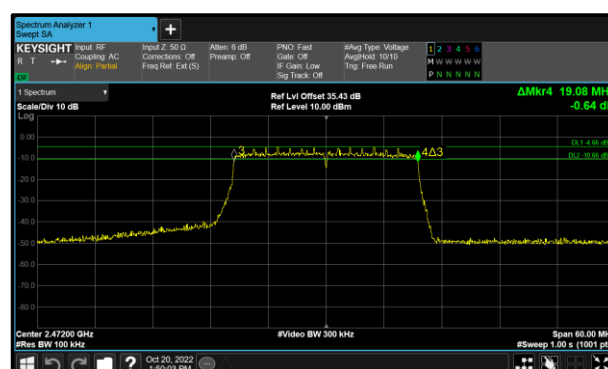


Figure 50 - 802.11ax HE20 SU Maximum 6 dB EBW

| Protocol         | 99% Bandwidth (MHz) |         |
|------------------|---------------------|---------|
|                  | Minimum             | Maximum |
| 802.11n HT20     | 17.580              | 17.820  |
| 802.11ax HE20 SU | 18.960              | 18.960  |

Table 23 - 99% Bandwidth Summary Results

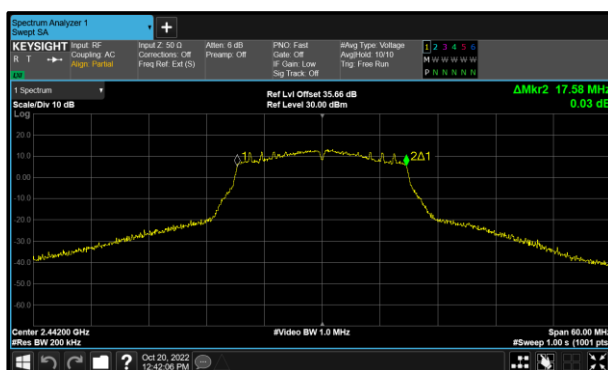


Figure 51 - 802.11n HT20 Minimum 99% OBW

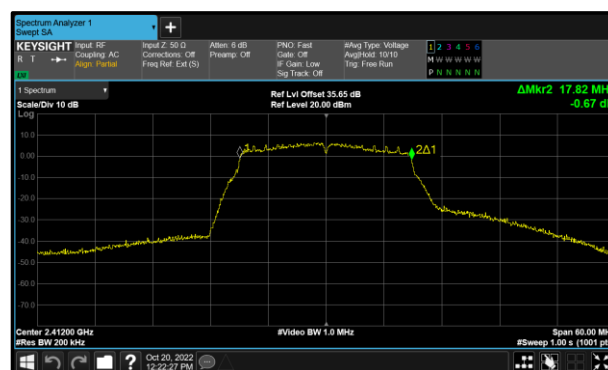


Figure 52 - 802.11n HT20 Maximum 99% OBW

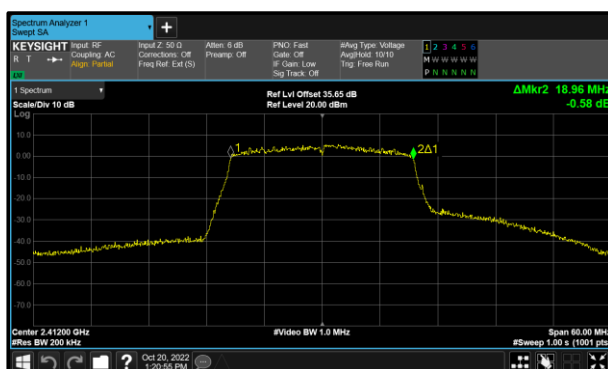


Figure 53 - 802.11ax HE20 SU Minimum 99% OBW

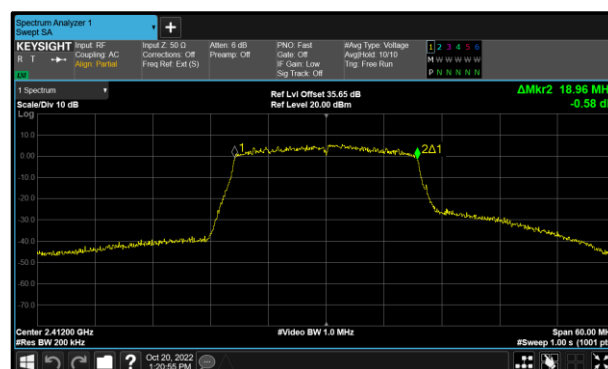


Figure 54 - 802.11ax HE20 SU Maximum 99% OBW



| Test Configuration       |                                 |                 |                               |
|--------------------------|---------------------------------|-----------------|-------------------------------|
| Frequency Range:         | 2400-2483.5 MHz                 | Band:           | 2.4 GHz                       |
| Limit Clause(s):         | 15.247 (a)(2)<br>RSS-247 5.2 a) | Test Method(s): | C63.10 6.9.3<br>C63.10 11.8.1 |
| Additional Reference(s): | -                               |                 |                               |

| DUT Configuration         |                       |                          |     |
|---------------------------|-----------------------|--------------------------|-----|
| Mode:                     | 802.11n HT20          | Duty Cycle (%):          | -   |
| Modulation Coding Scheme: | MCS2                  | DCCF (dB):               | -   |
| Antenna Configuration:    | MIMO CDD              | Peak Antenna Gain (dBi): | -   |
| Active Port(s):           | A+B (Core 0 + Core 1) | Active Chain(s):         | 0+1 |

| Test Frequency (MHz) | 6 dB Bandwidth (MHz) |        |   |   | Limit (kHz) |
|----------------------|----------------------|--------|---|---|-------------|
|                      | A                    | B      | C | D |             |
| 2412                 | 17.100               | 17.400 | - | - | ≥500.0      |
| 2442                 | 15.300               | 15.300 | - | - | ≥500.0      |
| 2472                 | 17.520               | 17.460 | - | - | ≥500.0      |

**Table 24 - 6 dB Bandwidth Results**

| Test Frequency (MHz) | 99% Bandwidth (MHz) |        |   |   | Limit (kHz) |
|----------------------|---------------------|--------|---|---|-------------|
|                      | A                   | B      | C | D |             |
| 2412                 | 17.820              | 17.820 | - | - | -           |
| 2442                 | 17.580              | 17.580 | - | - | -           |
| 2472                 | 17.700              | 17.700 | - | - | -           |

**Table 25 - 99% Bandwidth Results**



| Test Configuration       |                                 |                 |                               |
|--------------------------|---------------------------------|-----------------|-------------------------------|
| Frequency Range:         | 2400-2483.5 MHz                 | Band:           | 2.4 GHz                       |
| Limit Clause(s):         | 15.247 (a)(2)<br>RSS-247 5.2 a) | Test Method(s): | C63.10 6.9.3<br>C63.10 11.8.1 |
| Additional Reference(s): | -                               |                 |                               |

| DUT Configuration         |                       |                          |     |
|---------------------------|-----------------------|--------------------------|-----|
| Mode:                     | 802.11ax HE20 SU      | Duty Cycle (%):          | -   |
| Modulation Coding Scheme: | MCS2x1                | DCCF (dB):               | -   |
| Antenna Configuration:    | MIMO CDD              | Peak Antenna Gain (dBi): | -   |
| Active Port(s):           | A+B (Core 0 + Core 1) | Active Chain(s):         | 0+1 |

| Test Frequency (MHz) | 6 dB Bandwidth (MHz) |        |   |   | Limit (kHz) |
|----------------------|----------------------|--------|---|---|-------------|
|                      | A                    | B      | C | D |             |
| 2412                 | 18.900               | 18.600 | - | - | ≥500.0      |
| 2437                 | 19.020               | 18.900 | - | - | ≥500.0      |
| 2472                 | 19.020               | 19.080 | - | - | ≥500.0      |

**Table 26 - 6 dB Bandwidth Results**

| Test Frequency (MHz) | 99% Bandwidth (MHz) |        |   |   | Limit (kHz) |
|----------------------|---------------------|--------|---|---|-------------|
|                      | A                   | B      | C | D |             |
| 2412                 | 18.960              | 18.960 | - | - | -           |
| 2437                 | 18.960              | 18.960 | - | - | -           |
| 2472                 | 18.960              | 18.960 | - | - | -           |

**Table 27 - 99% Bandwidth Results**

FCC 47 CFR Part 15, Limit Clause 15.247(a)(2) and ISSED RSS-247, Clause 5.2(a)

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



## 2.2.7 Test Location and Test Equipment Used

This test was carried out in RF Laboratory 1.

| Instrument                   | Manufacturer          | Type No                   | TE No | Calibration Period (months) | Calibration Expires |
|------------------------------|-----------------------|---------------------------|-------|-----------------------------|---------------------|
| Multimeter                   | Fluke                 | 79 Series III             | 611   | 12                          | 21-Dec-2022         |
| Hygrometer                   | Rotronic              | I-1000                    | 3220  | 12                          | 5-Nov-2022          |
| Frequency Standard           | Spectracom            | SecureSync 1200-0408-0601 | 4393  | 6                           | 01-Feb-2023         |
| AC Programmable Power Supply | iTech                 | IT7324                    | 5226  | -                           | O/P Mon             |
| MXA Signal Analyser          | Keysight Technologies | N9020B                    | 5529  | 24                          | 13-Sep-2024         |
| Signal Conditioning Unit     | TUV SUD               | SPECTRUM SCU002           | 5759  | 12                          | 05-Jul-2023         |

**Table 28**

O/P Mon – Output Monitored using calibrated equipment



## **2.3 Maximum Conducted Output Power**

### **2.3.1 Specification Reference**

FCC 47 CFR Part 15C, Clause 15.247 (b)  
ISED RSS-247, Clause 5.4  
ISED RSS-GEN, Clause 6.12

### **2.3.2 Equipment Under Test and Modification State**

A2780, S/N: NW3J007K67 - Modification State 0

### **2.3.3 Date of Test**

20-October-2022

### **2.3.4 Test Method**

The test was performed in accordance with ANSI C63.10 clause 11.9.2.3.2 Method AVGPM-G.

MIMO output port summing was performed in accordance with KDB 662911 D01. For the CDD results, the Directional Gain was calculated in accordance with clause F)2)f)(ii) using the calculations from F)2)f)(i) with worst-case individual gain and an array gain of zero.

### **2.3.5 Environmental Conditions**

|                     |         |
|---------------------|---------|
| Ambient Temperature | 22.7 °C |
| Relative Humidity   | 52.3 %  |



## 2.3.6 Test Results

### 2.4 GHz WLAN

| Test Configuration       |                                 |                 |                   |
|--------------------------|---------------------------------|-----------------|-------------------|
| Frequency Range:         | 2400-2483.5 MHz                 | Band:           | 2.4 GHz           |
| Limit Clause(s):         | 15.247 (b)(3)<br>RSS-247 5.4 d) | Test Method(s): | C63.10 11.9.2.3.2 |
| Additional Reference(s): | -                               |                 |                   |

| DUT Configuration      |            |                          |      |
|------------------------|------------|--------------------------|------|
| Mode:                  | 802.11b    | Duty Cycle (%):          | 99.4 |
| Data Rate:             | 1 Mbps     | DCCF (dB):               | -    |
| Antenna Configuration: | SISO       | Peak Antenna Gain (dBi): | 6.13 |
| Active Port(s):        | B (Core 1) | Active Chain(s):         | 1    |

| Test Frequency (MHz) | Maximum Conducted Output Power (dBm) |       |   |   |          | Limit (dBm) | Margin (dB) |
|----------------------|--------------------------------------|-------|---|---|----------|-------------|-------------|
|                      | A                                    | B     | C | D | $\Sigma$ |             |             |
| 2412                 | -                                    | 20.67 | - | - | -        | 29.87       | -9.20       |
| 2442                 | -                                    | 22.37 | - | - | -        | 29.87       | -7.50       |
| 2472                 | -                                    | 15.69 | - | - | -        | 29.87       | -14.18      |

**Table 29 - FCC Maximum Conducted (average) Output Power Results**

| Test Frequency (MHz) | Maximum Conducted Output Power (dBm) |       |   |   |          | Limit (dBm) | Margin (dB) | EIRP (dBm) | EIRP Limit (dBm) | EIRP Margin (dB) |
|----------------------|--------------------------------------|-------|---|---|----------|-------------|-------------|------------|------------------|------------------|
|                      | A                                    | B     | C | D | $\Sigma$ |             |             |            |                  |                  |
| 2412                 | -                                    | 20.67 | - | - | -        | 30.00       | -9.33       | 26.80      | 36.00            | -9.20            |
| 2442                 | -                                    | 22.37 | - | - | -        | 30.00       | -7.63       | 28.50      | 36.00            | -7.50            |
| 2472                 | -                                    | 15.69 | - | - | -        | 30.00       | -14.31      | 21.82      | 36.00            | -14.18           |

**Table 30 - ISSED Maximum Conducted (average) Output Power Results**



| Test Configuration       |                                 |                 |                   |
|--------------------------|---------------------------------|-----------------|-------------------|
| Frequency Range:         | 2400-2483.5 MHz                 | Band:           | 2.4 GHz           |
| Limit Clause(s):         | 15.247 (b)(3)<br>RSS-247 5.4 d) | Test Method(s): | C63.10 11.9.2.3.2 |
| Additional Reference(s): | -                               |                 |                   |

| DUT Configuration      |            |                          |      |
|------------------------|------------|--------------------------|------|
| Mode:                  | 802.11g    | Duty Cycle (%):          | 97.6 |
| Data Rate:             | 12 Mbps    | DCCF (dB):               | -    |
| Antenna Configuration: | SISO       | Peak Antenna Gain (dBi): | 6.13 |
| Active Port(s):        | B (Core 1) | Active Chain(s):         | 1    |

| Test Frequency (MHz) | Maximum Conducted Output Power (dBm) |       |   |   |          | Limit (dBm) | Margin (dB) |
|----------------------|--------------------------------------|-------|---|---|----------|-------------|-------------|
|                      | A                                    | B     | C | D | $\Sigma$ |             |             |
| 2412                 | -                                    | 17.47 | - | - | -        | 29.87       | -12.40      |
| 2442                 | -                                    | 22.37 | - | - | -        | 29.87       | -7.50       |
| 2472                 | -                                    | 7.82  | - | - | -        | 29.87       | -22.05      |

**Table 31 - FCC Maximum Conducted (average) Output Power Results**

| Test Frequency (MHz) | Maximum Conducted Output Power (dBm) |       |   |   |          | Limit (dBm) | Margin (dB) | EIRP (dBm) | EIRP Limit (dBm) | EIRP Margin (dB) |
|----------------------|--------------------------------------|-------|---|---|----------|-------------|-------------|------------|------------------|------------------|
|                      | A                                    | B     | C | D | $\Sigma$ |             |             |            |                  |                  |
| 2412                 | -                                    | 17.47 | - | - | -        | 30.00       | -12.53      | 23.60      | 36.00            | -12.40           |
| 2442                 | -                                    | 22.37 | - | - | -        | 30.00       | -7.63       | 28.50      | 36.00            | -7.50            |
| 2472                 | -                                    | 7.82  | - | - | -        | 30.00       | -22.18      | 13.95      | 36.00            | -22.05           |

**Table 32 - ISSED Maximum Conducted (average) Output Power Results**



| Test Configuration       |                                 |                 |                   |
|--------------------------|---------------------------------|-----------------|-------------------|
| Frequency Range:         | 2400-2483.5 MHz                 | Band:           | 2.4 GHz           |
| Limit Clause(s):         | 15.247 (b)(3)<br>RSS-247 5.4 d) | Test Method(s): | C63.10 11.9.2.3.2 |
| Additional Reference(s): | -                               |                 |                   |

| DUT Configuration         |              |                          |      |
|---------------------------|--------------|--------------------------|------|
| Mode:                     | 802.11n HT20 | Duty Cycle (%):          | 96.5 |
| Modulation Coding Scheme: | MCS2         | DCCF (dB):               | -    |
| Antenna Configuration:    | SISO         | Peak Antenna Gain (dBi): | 6.13 |
| Active Port(s):           | B (Core 1)   | Active Chain(s):         | 1    |

| Test Frequency (MHz) | Maximum Conducted Output Power (dBm) |       |   |   |          | Limit (dBm) | Margin (dB) |
|----------------------|--------------------------------------|-------|---|---|----------|-------------|-------------|
|                      | A                                    | B     | C | D | $\Sigma$ |             |             |
| 2412                 | -                                    | 16.65 | - | - | -        | 29.87       | -13.22      |
| 2442                 | -                                    | 22.15 | - | - | -        | 29.87       | -7.72       |
| 2472                 | -                                    | 7.46  | - | - | -        | 29.87       | -22.41      |

**Table 33 - FCC Maximum Conducted (average) Output Power Results**

| Test Frequency (MHz) | Maximum Conducted Output Power (dBm) |       |   |   |          | Limit (dBm) | Margin (dB) | EIRP (dBm) | EIRP Limit (dBm) | EIRP Margin (dB) |
|----------------------|--------------------------------------|-------|---|---|----------|-------------|-------------|------------|------------------|------------------|
|                      | A                                    | B     | C | D | $\Sigma$ |             |             |            |                  |                  |
| 2412                 | -                                    | 16.65 | - | - | -        | 30.00       | -13.35      | 22.78      | 36.00            | -13.22           |
| 2442                 | -                                    | 22.15 | - | - | -        | 30.00       | -7.85       | 28.28      | 36.00            | -7.72            |
| 2472                 | -                                    | 7.46  | - | - | -        | 30.00       | -22.54      | 13.59      | 36.00            | -22.41           |

**Table 34 - ISSED Maximum Conducted (average) Output Power Results**



| Test Configuration       |                                 |                 |                   |
|--------------------------|---------------------------------|-----------------|-------------------|
| Frequency Range:         | 2400-2483.5 MHz                 | Band:           | 2.4 GHz           |
| Limit Clause(s):         | 15.247 (b)(3)<br>RSS-247 5.4 d) | Test Method(s): | C63.10 11.9.2.3.2 |
| Additional Reference(s): | -                               |                 |                   |

| DUT Configuration         |                  |                          |      |
|---------------------------|------------------|--------------------------|------|
| Mode:                     | 802.11ax HE20 SU | Duty Cycle (%):          | 95.8 |
| Modulation Coding Scheme: | MCS2x1           | DCCF (dB):               | -    |
| Antenna Configuration:    | SISO             | Peak Antenna Gain (dBi): | 6.13 |
| Active Port(s):           | B (Core 1)       | Active Chain(s):         | 1    |

| Test Frequency (MHz) | Maximum Conducted Output Power (dBm) |       |   |   |          | Limit (dBm) | Margin (dB) |
|----------------------|--------------------------------------|-------|---|---|----------|-------------|-------------|
|                      | A                                    | B     | C | D | $\Sigma$ |             |             |
| 2412                 | -                                    | 15.82 | - | - | -        | 29.87       | -14.05      |
| 2442                 | -                                    | 22.22 | - | - | -        | 29.87       | -7.65       |
| 2472                 | -                                    | 6.57  | - | - | -        | 29.87       | -23.30      |

**Table 35 - FCC Maximum Conducted (average) Output Power Results**

| Test Frequency (MHz) | Maximum Conducted Output Power (dBm) |       |   |   |          | Limit (dBm) | Margin (dB) | EIRP (dBm) | EIRP Limit (dBm) | EIRP Margin (dB) |
|----------------------|--------------------------------------|-------|---|---|----------|-------------|-------------|------------|------------------|------------------|
|                      | A                                    | B     | C | D | $\Sigma$ |             |             |            |                  |                  |
| 2412                 | -                                    | 15.82 | - | - | -        | 30.00       | -14.18      | 21.95      | 36.00            | -14.05           |
| 2442                 | -                                    | 22.22 | - | - | -        | 30.00       | -7.78       | 28.35      | 36.00            | -7.65            |
| 2472                 | -                                    | 6.57  | - | - | -        | 30.00       | -23.43      | 12.70      | 36.00            | -23.30           |

**Table 36 - ISSED Maximum Conducted (average) Output Power Results**



| Test Configuration       |                                 |                 |                   |
|--------------------------|---------------------------------|-----------------|-------------------|
| Frequency Range:         | 2400-2483.5 MHz                 | Band:           | 2.4 GHz           |
| Limit Clause(s):         | 15.247 (b)(3)<br>RSS-247 5.4 d) | Test Method(s): | C63.10 11.9.2.3.2 |
| Additional Reference(s): | -                               |                 |                   |

| DUT Configuration         |                    |                          |      |
|---------------------------|--------------------|--------------------------|------|
| Mode:                     | 802.11ax HE20 RU26 | Duty Cycle (%):          | 96.5 |
| Modulation Coding Scheme: | MCS2x1             | DCCF (dB):               | -    |
| Antenna Configuration:    | SISO               | Peak Antenna Gain (dBi): | 6.13 |
| Active Port(s):           | B (Core 1)         | Active Chain(s):         | 1    |

| Test Frequency (MHz) | Maximum Conducted Output Power (dBm) |       |   |   |          | Limit (dBm) | Margin (dB) |
|----------------------|--------------------------------------|-------|---|---|----------|-------------|-------------|
|                      | A                                    | B     | C | D | $\Sigma$ |             |             |
| 2412                 | -                                    | 14.26 | - | - | -        | 29.87       | -15.61      |
| 2442                 | -                                    | 14.47 | - | - | -        | 29.87       | -15.40      |
| 2472                 | -                                    | -3.28 | - | - | -        | 29.87       | -33.15      |

**Table 37 - FCC Maximum Conducted (average) Output Power Results**

| Test Frequency (MHz) | Maximum Conducted Output Power (dBm) |       |   |   |          | Limit (dBm) | Margin (dB) | EIRP (dBm) | EIRP Limit (dBm) | EIRP Margin (dB) |
|----------------------|--------------------------------------|-------|---|---|----------|-------------|-------------|------------|------------------|------------------|
|                      | A                                    | B     | C | D | $\Sigma$ |             |             |            |                  |                  |
| 2412                 | -                                    | 14.26 | - | - | -        | 30.00       | -15.74      | 20.39      | 36.00            | -15.61           |
| 2442                 | -                                    | 14.47 | - | - | -        | 30.00       | -15.53      | 20.60      | 36.00            | -15.40           |
| 2472                 | -                                    | -3.28 | - | - | -        | 30.00       | -33.28      | 2.85       | 36.00            | -33.15           |

**Table 38 - ISSED Maximum Conducted (average) Output Power Results**



| Test Configuration       |                                 |                 |                   |
|--------------------------|---------------------------------|-----------------|-------------------|
| Frequency Range:         | 2400-2483.5 MHz                 | Band:           | 2.4 GHz           |
| Limit Clause(s):         | 15.247 (b)(3)<br>RSS-247 5.4 d) | Test Method(s): | C63.10 11.9.2.3.2 |
| Additional Reference(s): | -                               |                 |                   |

| DUT Configuration         |                    |                          |      |
|---------------------------|--------------------|--------------------------|------|
| Mode:                     | 802.11ax HE20 RU52 | Duty Cycle (%):          | 96.4 |
| Modulation Coding Scheme: | MCS2x1             | DCCF (dB):               | -    |
| Antenna Configuration:    | SISO               | Peak Antenna Gain (dBi): | 6.13 |
| Active Port(s):           | B (Core 1)         | Active Chain(s):         | 1    |

| Test Frequency (MHz) | Maximum Conducted Output Power (dBm) |       |   |   |          | Limit (dBm) | Margin (dB) |
|----------------------|--------------------------------------|-------|---|---|----------|-------------|-------------|
|                      | A                                    | B     | C | D | $\Sigma$ |             |             |
| 2412                 | -                                    | 17.15 | - | - | -        | 29.87       | -12.72      |
| 2442                 | -                                    | 17.18 | - | - | -        | 29.87       | -12.69      |
| 2472                 | -                                    | -0.18 | - | - | -        | 29.87       | -30.05      |

**Table 39 - FCC Maximum Conducted (average) Output Power Results**

| Test Frequency (MHz) | Maximum Conducted Output Power (dBm) |       |   |   |          | Limit (dBm) | Margin (dB) | EIRP (dBm) | EIRP Limit (dBm) | EIRP Margin (dB) |
|----------------------|--------------------------------------|-------|---|---|----------|-------------|-------------|------------|------------------|------------------|
|                      | A                                    | B     | C | D | $\Sigma$ |             |             |            |                  |                  |
| 2412                 | -                                    | 17.15 | - | - | -        | 30.00       | -12.85      | 23.28      | 36.00            | -12.72           |
| 2442                 | -                                    | 17.18 | - | - | -        | 30.00       | -12.82      | 23.31      | 36.00            | -12.69           |
| 2472                 | -                                    | -0.18 | - | - | -        | 30.00       | -30.18      | 5.95       | 36.00            | -30.05           |

**Table 40 - ISSED Maximum Conducted (average) Output Power Results**



| Test Configuration       |                                 |                 |                   |
|--------------------------|---------------------------------|-----------------|-------------------|
| Frequency Range:         | 2400-2483.5 MHz                 | Band:           | 2.4 GHz           |
| Limit Clause(s):         | 15.247 (b)(3)<br>RSS-247 5.4 d) | Test Method(s): | C63.10 11.9.2.3.2 |
| Additional Reference(s): | -                               |                 |                   |

| DUT Configuration         |                     |                          |      |
|---------------------------|---------------------|--------------------------|------|
| Mode:                     | 802.11ax HE20 RU106 | Duty Cycle (%):          | 97.8 |
| Modulation Coding Scheme: | MCS2x1              | DCCF (dB):               | -    |
| Antenna Configuration:    | SISO                | Peak Antenna Gain (dBi): | 6.13 |
| Active Port(s):           | B (Core 1)          | Active Chain(s):         | 1    |

| Test Frequency (MHz) | Maximum Conducted Output Power (dBm) |       |   |   |          | Limit (dBm) | Margin (dB) |
|----------------------|--------------------------------------|-------|---|---|----------|-------------|-------------|
|                      | A                                    | B     | C | D | $\Sigma$ |             |             |
| 2412                 | -                                    | 16.79 | - | - | -        | 29.87       | -13.08      |
| 2442                 | -                                    | 20.16 | - | - | -        | 29.87       | -9.71       |
| 2472                 | -                                    | 0.73  | - | - | -        | 29.87       | -29.14      |

**Table 41 - FCC Maximum Conducted (average) Output Power Results**

| Test Frequency (MHz) | Maximum Conducted Output Power (dBm) |       |   |   |          | Limit (dBm) | Margin (dB) | EIRP (dBm) | EIRP Limit (dBm) | EIRP Margin (dB) |
|----------------------|--------------------------------------|-------|---|---|----------|-------------|-------------|------------|------------------|------------------|
|                      | A                                    | B     | C | D | $\Sigma$ |             |             |            |                  |                  |
| 2412                 | -                                    | 16.79 | - | - | -        | 30.00       | -13.21      | 22.92      | 36.00            | -13.08           |
| 2442                 | -                                    | 20.16 | - | - | -        | 30.00       | -9.84       | 26.29      | 36.00            | -9.71            |
| 2472                 | -                                    | 0.73  | - | - | -        | 30.00       | -29.27      | 6.86       | 36.00            | -29.14           |

**Table 42 - ISD Maximum Conducted (average) Output Power Results**